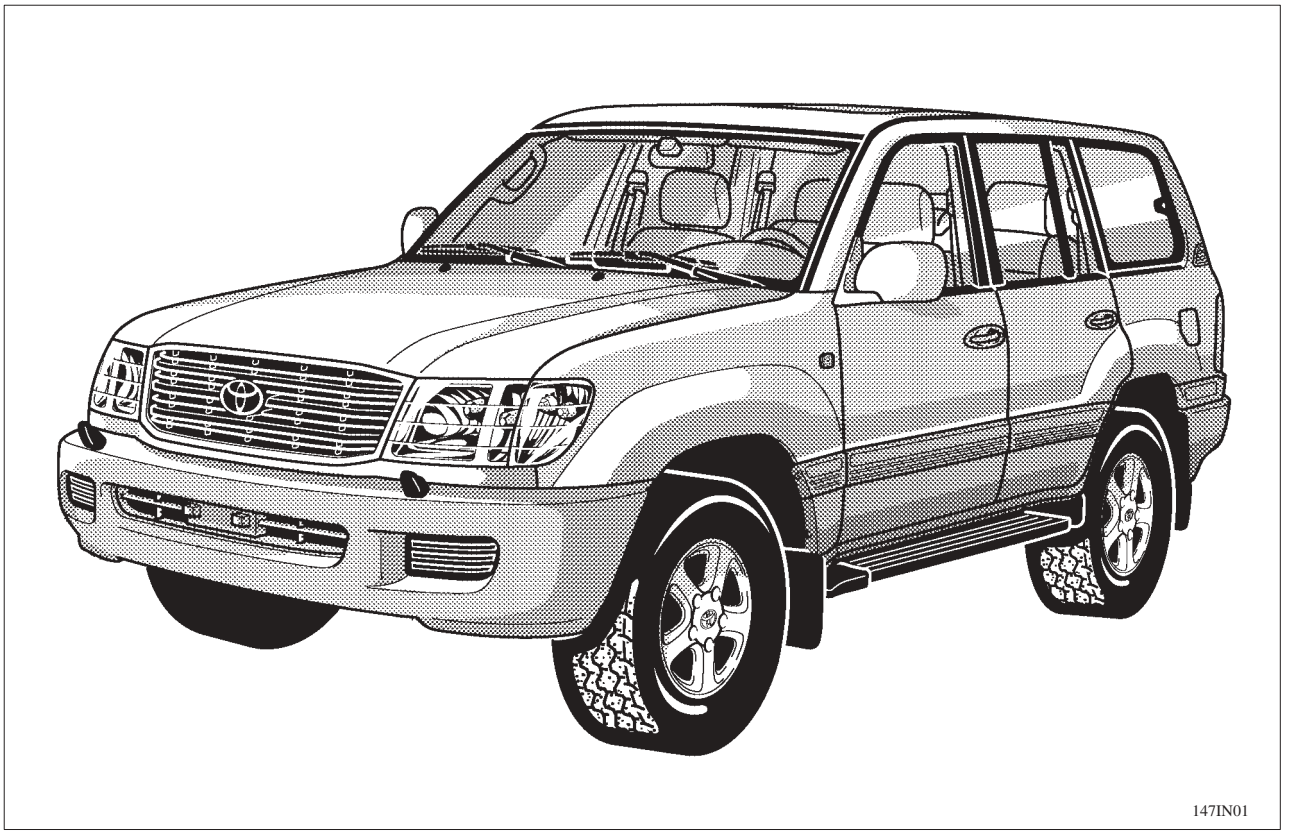
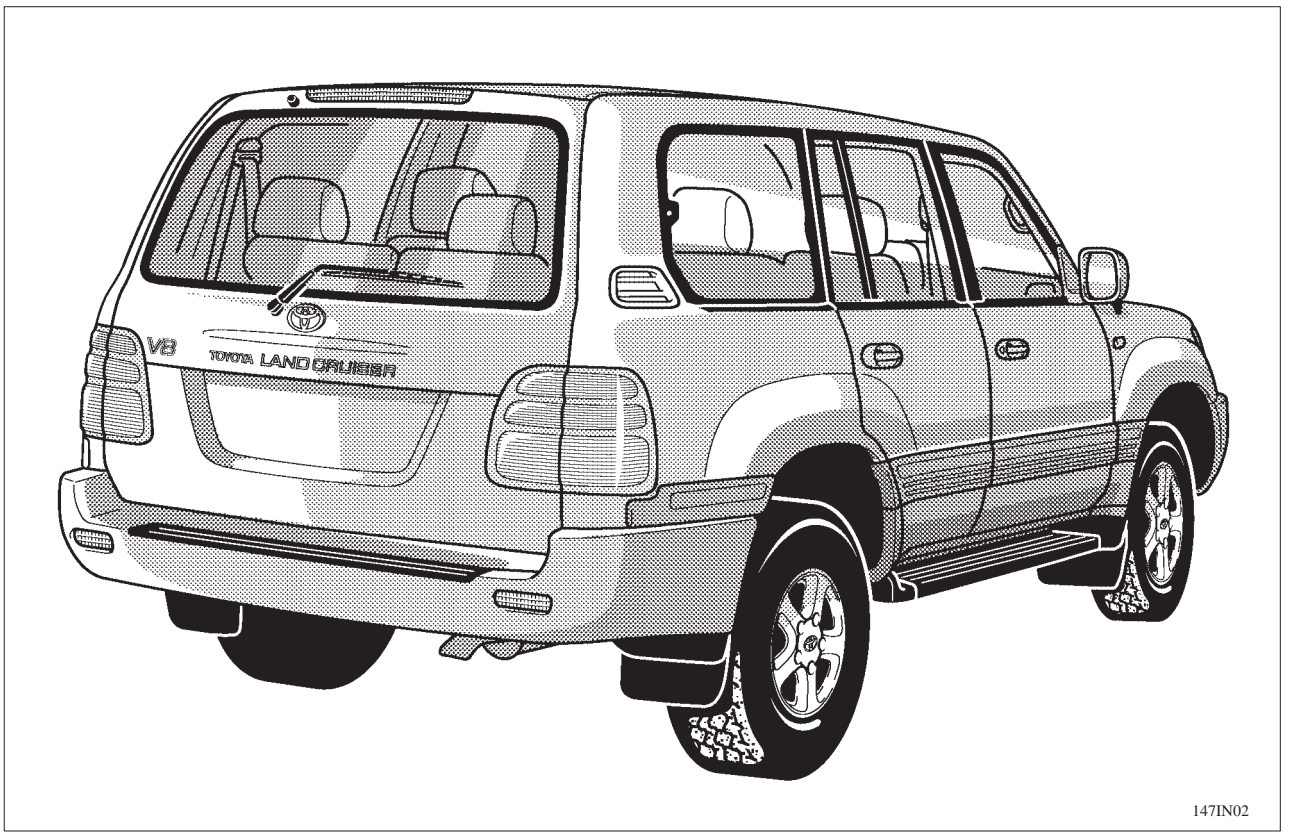
# EXTERIOR APPEARANCE

## LIFT-UP TYPE BACK DOOR MODEL



147IN01

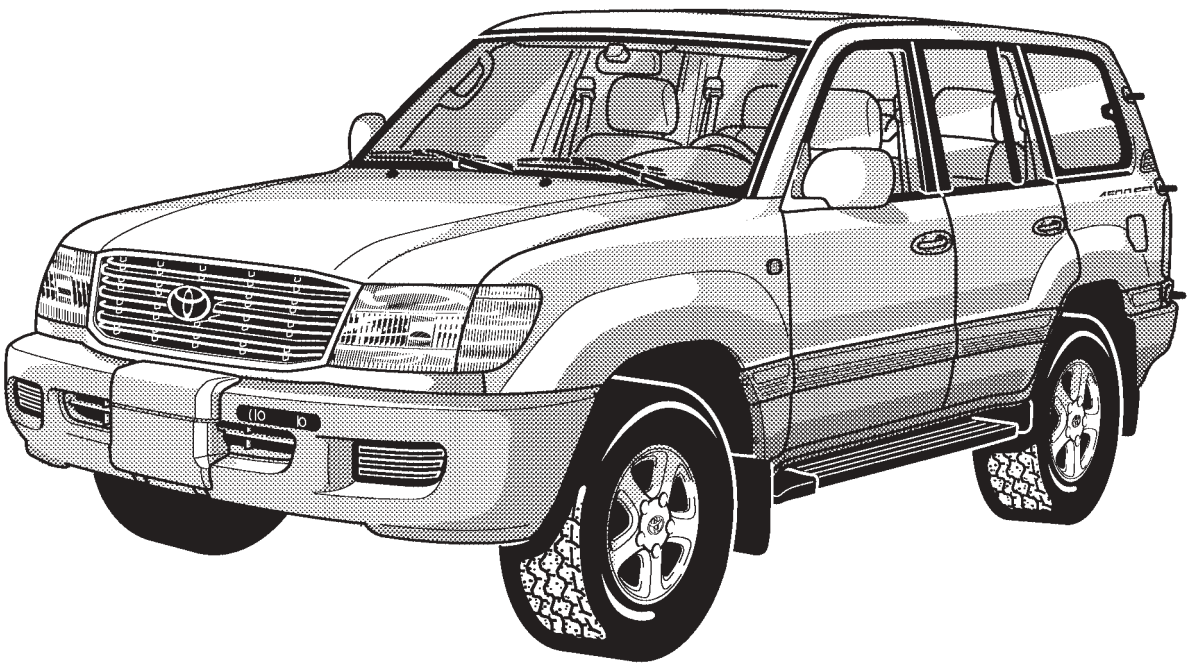



147IN02

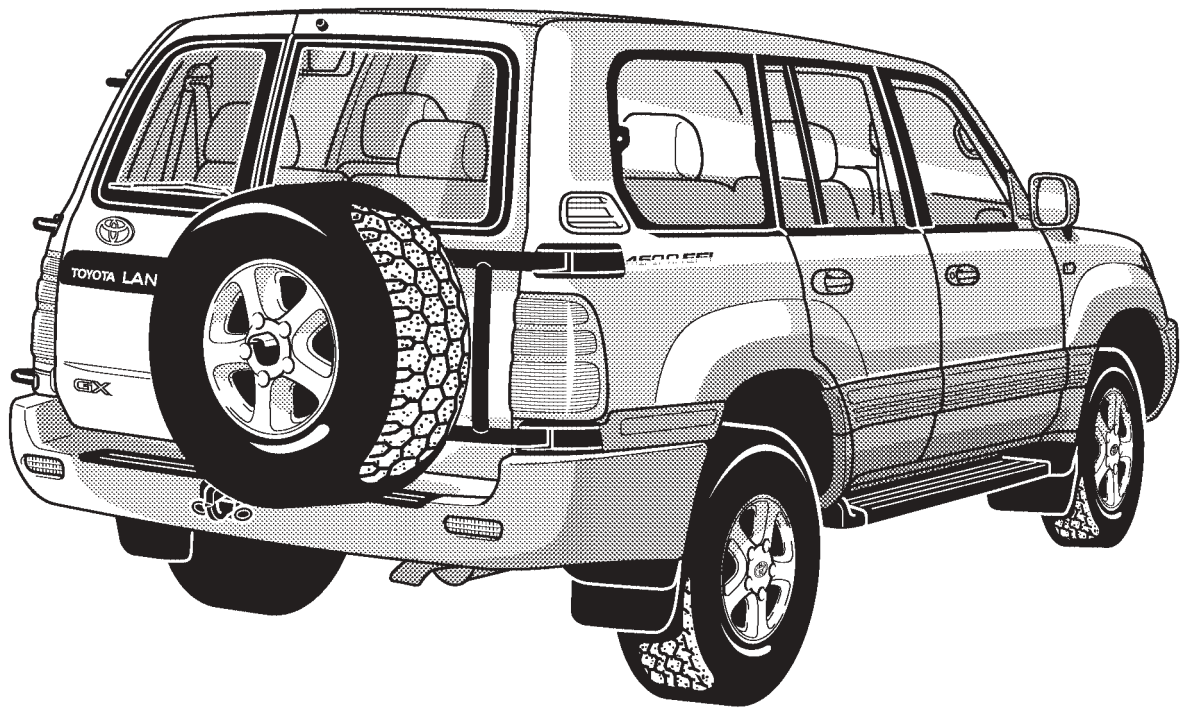
# EXTERIOR APPEARANCE



## SWING TYPE BACK DOOR MODEL



147IN03




147IN04

# MODEL CODE

## MODEL CODE

**UZJ100 L - G N P E K W**

① ② ③ ④ ⑤ ⑥ ⑦ ⑧

**① BASIC MODEL CODE**

| CODE | ENGINE | FRONT SUSPENSION |
|---|---|---|
| FZJ100 | 1FZ-FE | IFS*1 (Double Wishbone) |
| UZJ100 | 2UZ-FE | |
| HDJ100 | 1HD-T or 1HD-FTE | |
| FZJ105 | 1FZ-FE | RFS*2 (Leading Arm) |
| HZJ105 | 1HZ | |

**② STEERING WHEEL POSITION**

L : Left-Hand Drive
R : Right-Hand Drive

**③ BODY TYPE**

G : Station Wagon

**④ BACK DOOR TYPE**

C : Swing Back Door
N : Lift-Up Back Door

**⑤ GEARSHIFT TYPE**

M : 5-Speed Manual, Floor
P : 4-Speed Automatic, Floor

**⑥ GRADE**

R : STD
N : GX
E : VX

**⑦ ENGINE SPECIFICATION**

K : DOHC and EFI
S : Diesel
X : Turbocharger
Z : Multi Valve, Turbocharger and EFI

**⑧ DESTINATION**

W : Europe
Q : Australia
V : G.C.C. (Gulf Cooperation Council) Countries
Bank: General Countries

*1: IFS (Independent Front Suspension)
*2: RFS (Rigid Axle Front Suspension)

| DESTINATION | ENGINE | BACK DOOR | GRADE | FRONT SUSPENSION | DRIVE TYPE | TRANSMISSION | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 5-Speed Manual | | 4-Speed Automatic | |
| | | | | | | R151F | H151F | A343F | A442F |
| Europe | 2UZ-FE | Lift-Up | VX | IFS (Double Wishbone) | Full-Time | | | UZJ100 $^{R}_{L}$ - GNPEKW | |
| | 1HD-FTE | | | | | | HDJ100 $^{R}_{L}$ - GNMEZW | | HDJ100 $^{R}_{L}$ - GNPEZW |
| Australia | 1FZ-FE | Swing | STD | RFS (Leading Arm) | Part-Time | | FZJ105R-GCMRKQ | | |
| | | Lift-UP | GX | | Full-Time | | FZJ105R-GNMNKQ | | FZJ105R-GNPNKQ |
| | 2UZ-FE | Lift-UP | VX | IFS (Double Wishbone) | | | | | UZJ100R-GNPEKQ |
| | 1HZ | Swing | STD | RFS (Leading Arm) | Part-Time | HZJ105R-GCMRSQ | | | |
| | | Lift-Up | GX | | Full-Time | HZJ105R-GNMNSQ | | | HZJ105R-GNPNSQ |
| G.C.C. Countries | 1FZ-FE | Swing | STD | IFS (Double Wishbone) | Part-Time | | FZJ100L-GCMRKV | | |
| | | | GX | | Part-Time (Full-Time) | | FZJ100L-GCMNKV | | FZJ100L-GCPNKV |
| | | Lift-Up | | | | | FZJ100L-GNMNKV | | FZJ100L-GNPNKV |
| | 2UZ-FE | Swing | VX | | Full-Time | | UZJ100L-GCMEKV | | UZJ100L-GCPEKV |
| | | Lift-Up | | | | | UZJ100L-GNMEKV | | UZJ100L-GNPEKV |
| | 1HZ | Swing | GX | RFS (Leading Arm) | Part-Time (Full-Time) | HZJ105L-GCMNSV | | | |
| General Countries | 1FZ-FE | Swing | STD | RFS (Leading Arm) | Part Time | | FZJ105L-GCMRK | | |
| | | | GX | | Part-Time (Full-Time) | | FZJ105L-GCMNK | | |
| | | Lift-Up | | | | | FZJ105 $^{R}_{L}$ - GNMNK | | |
| | 2UZ-FE | | VX | IFS (Double Wishbone) | Full-Time | | UZJ100L-GNMEK | | UZJ100L-GNPEK |
| | 1HZ | Swing | STD | RFS (Leading Arm) | Part-Time (Full-Time)* | HZJ105 $^{R}_{L}$ - GCMRS | | | |
| | | | GX | | Part-Time (Full-Time) | HZJ105 $^{R}_{L}$ - GCMNS | | | |
| | | Lift-Up | | | | HZJ105 $^{R}_{L}$ - GNMNS | | | |
| | 1HD-T | Swing | VX | IFS (Double Wishbone) | Full-Time | | HDJ100L-GCMEX | | |
| | | Lift-Up | | | | | HDJ100 $^{R}_{L}$ - GNMEX | | HDJ100L-GNPEX |

( ): Option
*: LHD Model Only

# DEVELOPMENT OBJECTIVES

**To continue the tradition of the King of 4 x 4s:**

- ◆ Maintain high strength and durability performance
- ◆ Maintain offroad performance

**To provide the luxury, quality, comfort, and the interior space that are worthy of the Top of SUVs:**

- ◆ Improve dynamic performance and quiet operation
- ◆ Improve riding comfort and provide excellent high-speed driving stability
- ◆ Increase interior space

## Characteristics

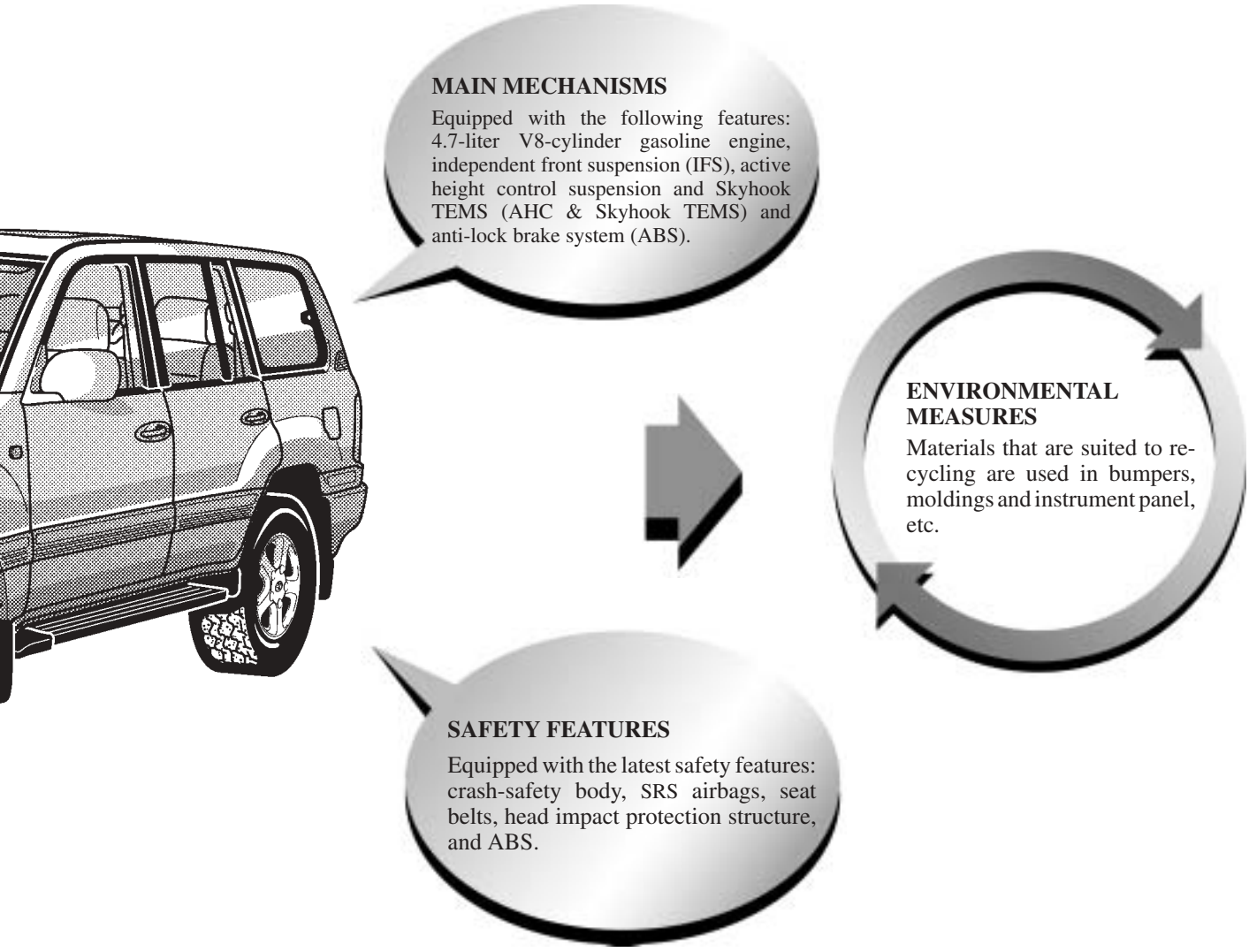
**DESIGN**

Development focused on the themes that are desired on the new Land Cruiser: distinctive character, refinement, and sophistication.

**EQUIPMENT**

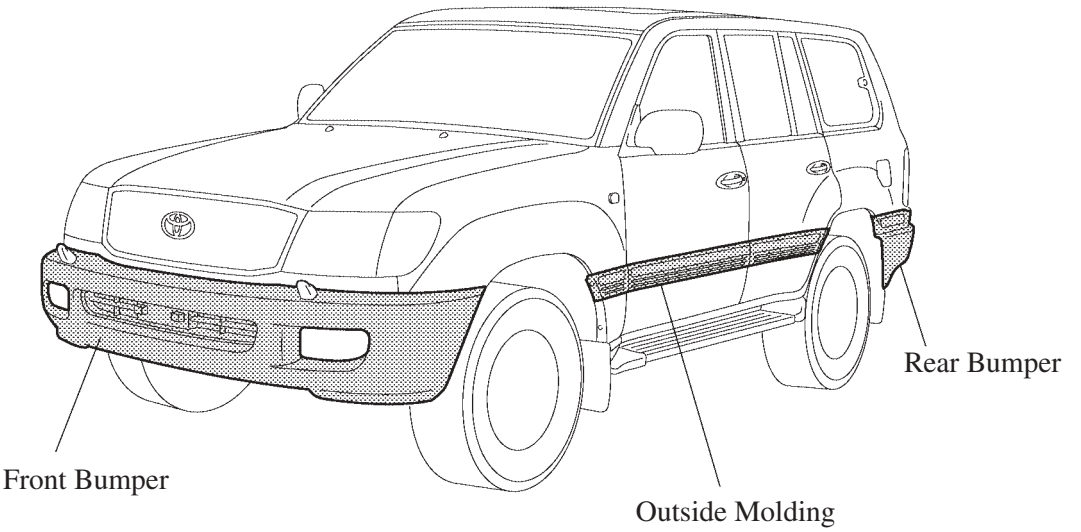
A full line of equipment is provided in which the high levels of functionality and superior quality that are worthy of a luxury SUV have been integrated.

To enable you to assess the overview of the new Land Cruiser in detail, this chapter describes the changes and the improvements of the new model over those of the previous model by focusing on the following five key points: design, equipment, main mechanisms, safety features, and environmental measures.

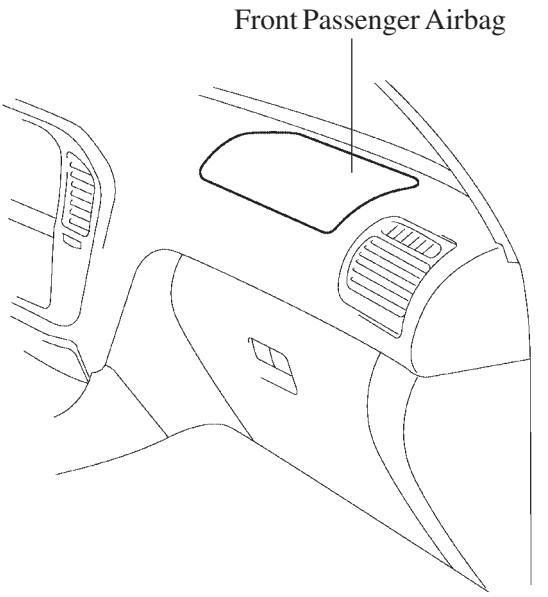


# ENVIRONMENTAL MEASURES

TSOP (The Super Olefin Polymer), which excels in recyclability, is used as the plastic materials for the areas such as the front and rear bumpers, outside moldings, instrument panel, etc. Also, a hybrid inflator has been adopted in the driver and front passenger airbags to address the environmental concerns associated with the disposal of the airbags.




147MO12




155MO34

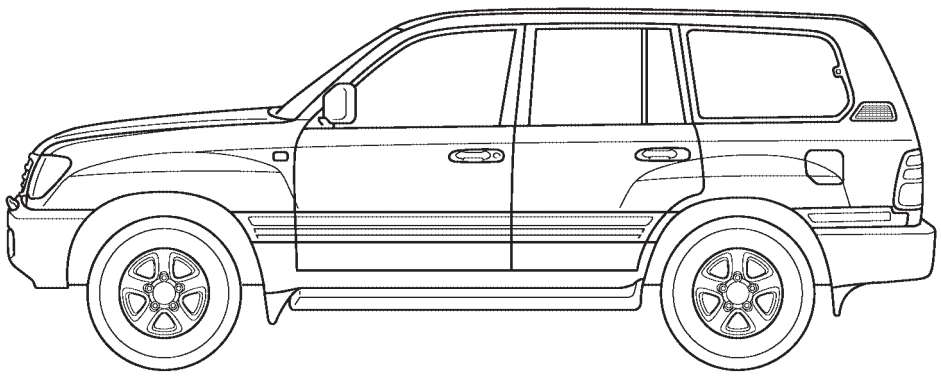
# DESIGN – EXTERIOR –

The exterior offers an innovative design with a changed look, in addition to continuing and improving the distinctive, powerful, and tough image that has been nurtured throughout the Land Cruiser's history.

- The overfenders have been discontinued and the body has been widened (+10 mm).
- The tread has been increased (front: +25 mm, rear: +15 mm) to achieve a wide design that gives a sense of stability.

## SIDE DESIGN

The clean sweep that extends from the door surface to the optimally proportioned wheel flares, which do not rely on retrofitted overfenders, expresses a sophisticated strength that distinguishes this model from the medium-level SUVs.



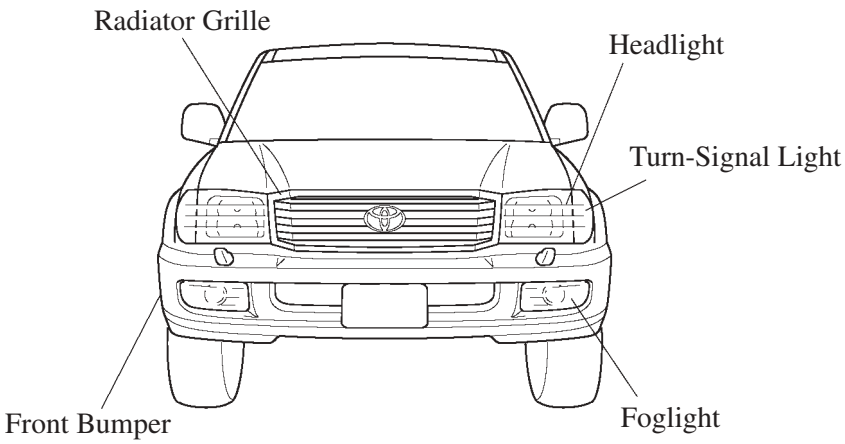
147MO01

## FRONT DESIGN

A powerful and distinctive front view has been realized through the adoption of the advanced, large-size headlights and the dimensional radiator grille shape.

- Discharge headlights for highbeam are provided for Australia and G.C.C. Countries as optional equipment.
- The turn-signal lights use amber light bulbs.



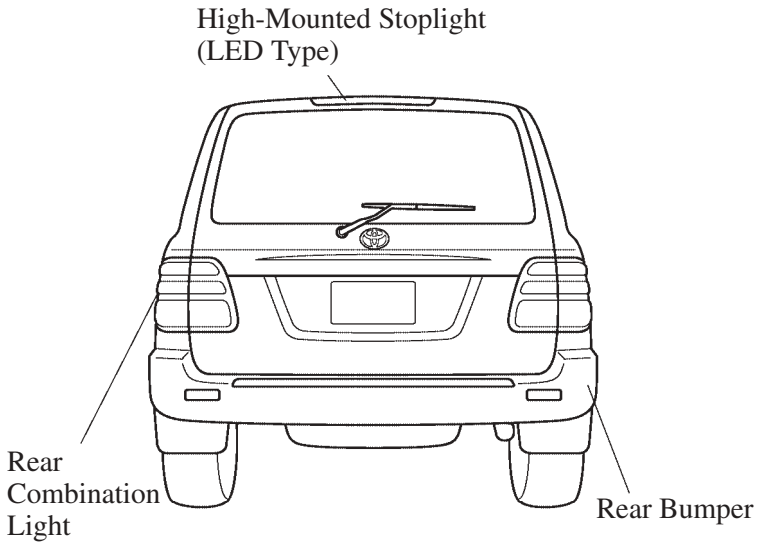



147MO14

## REAR DESIGN

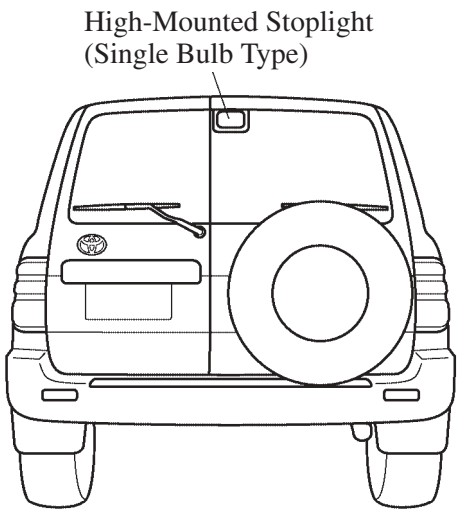
The rear view consists of a plump form and a stable design through the use of large rear combination lights and a large plastic composite bumper.

- The large rear combination lights provide a solid form and excellent visibility.
- The high-mounted stoplight is provided on the exterior of the back door.




**Lift-Up Type Back Door Model**

156MO03



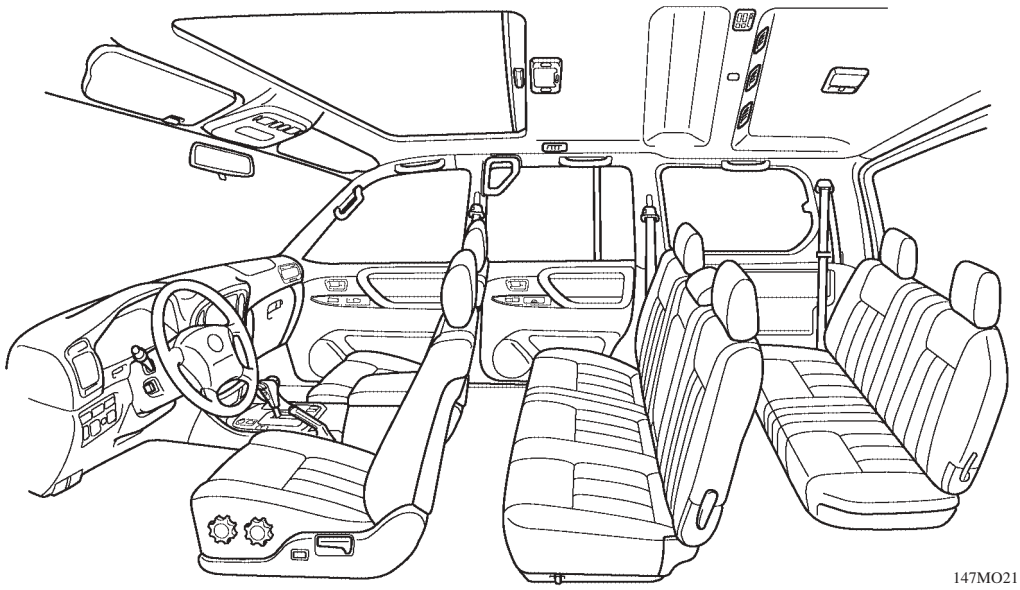

**Swing Type Back Door Model**

147MO02

# DESIGN – INTERIOR –

## INTERIOR DESIGN

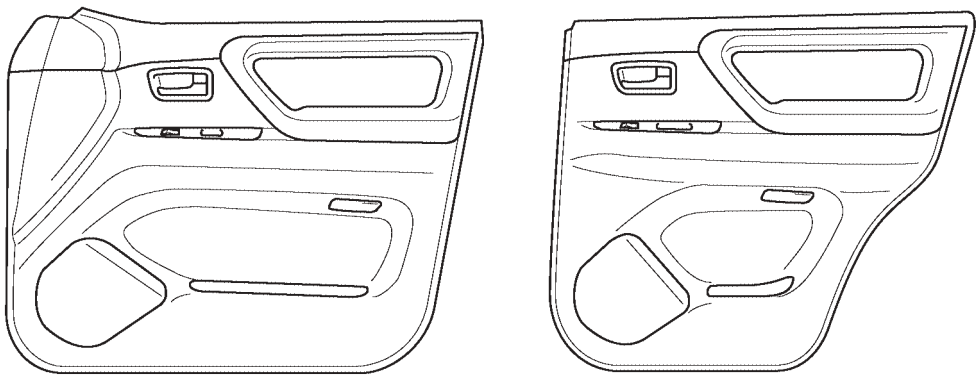
- The functionality that is worthy of the King of the 4x4s and the abundant space are synergized at high levels in order to create an attractive interior of the luxury SUV that enhances with use.
- The interior length and width have been considerably increased to realize a roomy interior space and luggage area.



147MO21

## TRIMS

The door trims express a functional beauty that achieves both the ample volume of a luxury vehicle and the powerfulness of a 4WD.

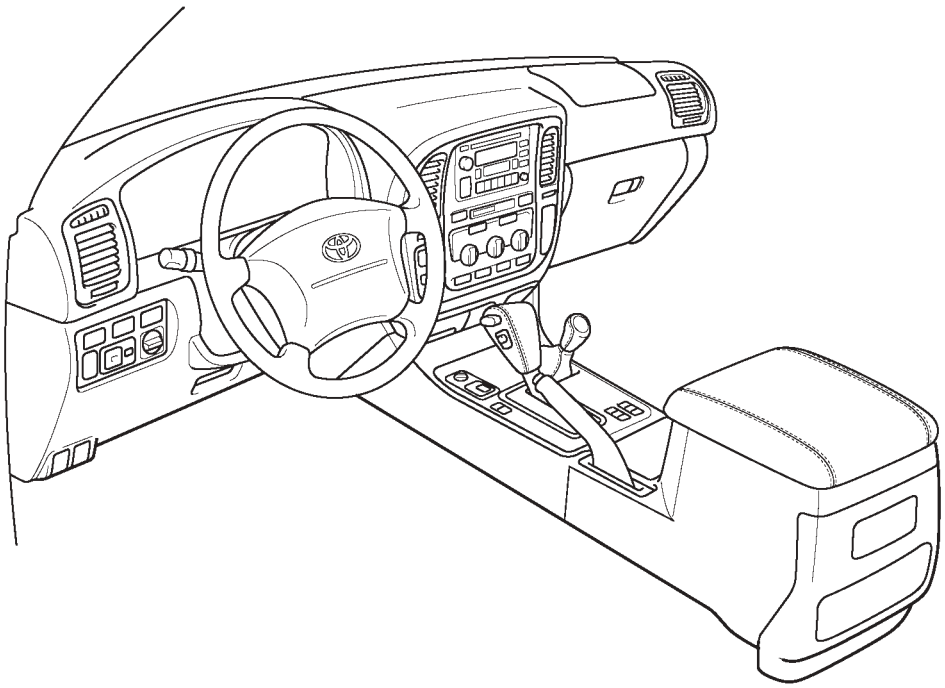


**Power Window Type**

156MO05

## INSTRUMENT PANEL

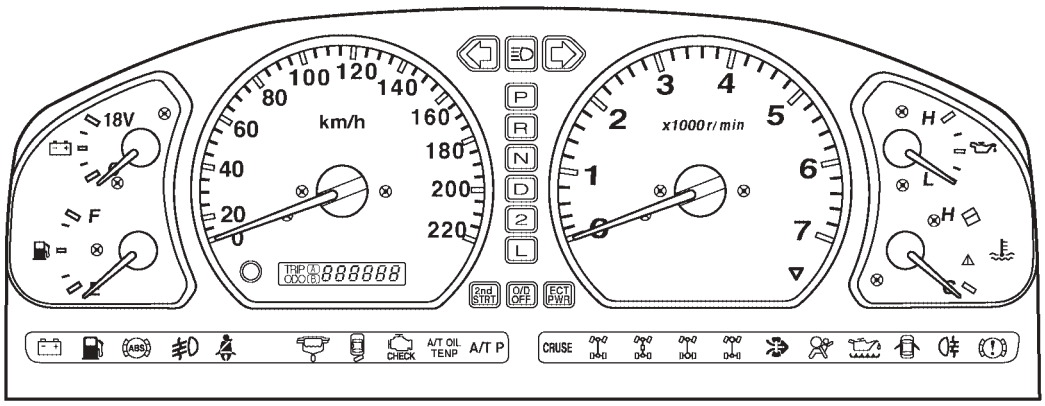
- Making the best use of the cabin space, the theme form that extends dynamically from the wide center cluster to the console achieves a prestigious space that is worthy of the topmost model.
- The front console box and the instrument panel have been joined together. In addition, the front console box and the rear console box have adopted an integrated-look shape by eliminating the offset, thus achieving a sense of continuous flow and quality.



147MO03

## COMBINATION METER

A combination meter that exudes high performance through its three-dimensional look is provided as standard equipment.




147MO04

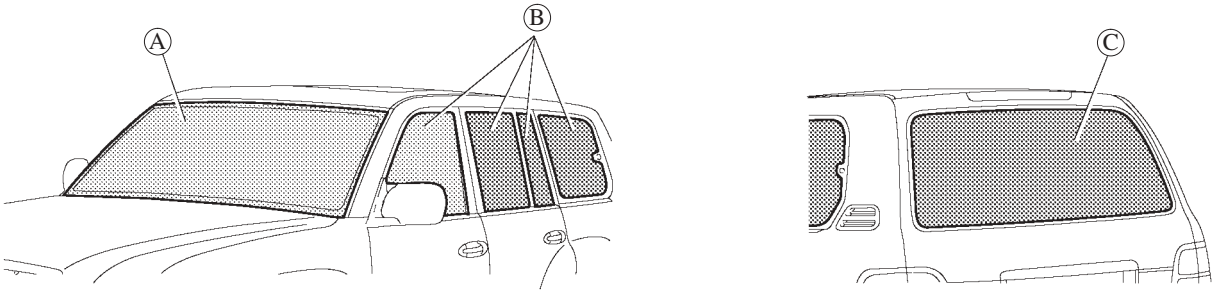
# MAIN EQUIPMENT – EXTERIOR –

## GLASS

UV reduction glass is used for the side glass as optional equipment to protect the vehicle interior and occupants inside from the ultraviolet rays.

**Glass Combination**

| Glass Position / Availability | Ⓐ Windshield | Ⓑ Front Door Window, Rear Door Quarter Window Rear Door Window, Quarter Window | Ⓒ Back Door |
|---|---|---|---|
| Standard | Green | Green | Green |
| Option | Green | Green, UV Reduction | Green |

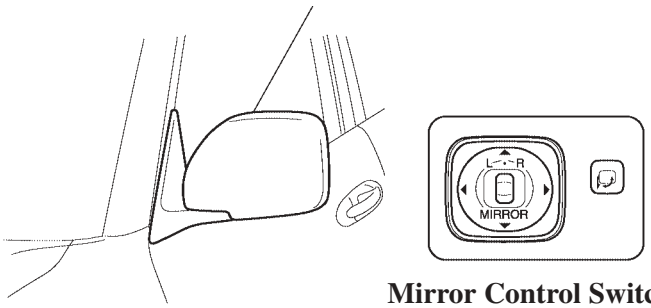



155MO08

## OUTSIDE REARVIEW MIRROR

The outside rearview mirrors have been shaped to achieve excellent aerodynamic characteristics, and a heater (for Europe only) and a power remote-control function have been provided as optional equipment to ensure their ease of use.

Outside Rear View Mirror

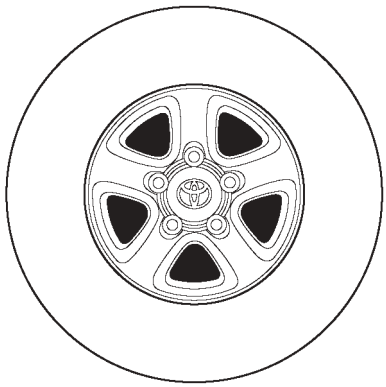



**Mirror Control Switch**

155MO09

## DISC WHEELS

- Aluminum disc wheels for use with wide tires are newly provided. The center ornament is made of plastic for weight reduction.
- The 16 x 6.5JJ disc wheel has been changed from the type with a side ring to a one-piece rim type for improved NV performance.

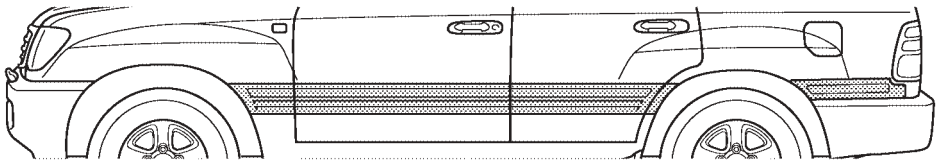


156MO10

**Aluminum Disc Wheel**

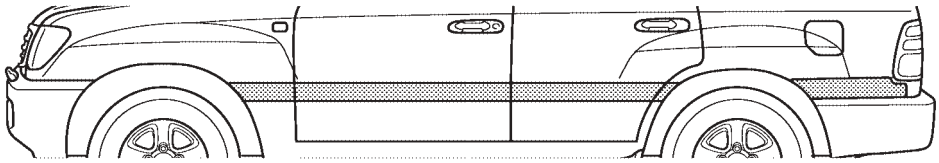
## OUTSIDE MOLDINGS

- Two types of outside moldings are available, wide and narrow.
- The surface of the painted, wide-type outside moldings is made grainless to improve their looks, and uses TSOP (The Super Olefin Polymer) as the plastic material to improve their recyclability.



**Wide Type**

147MO05

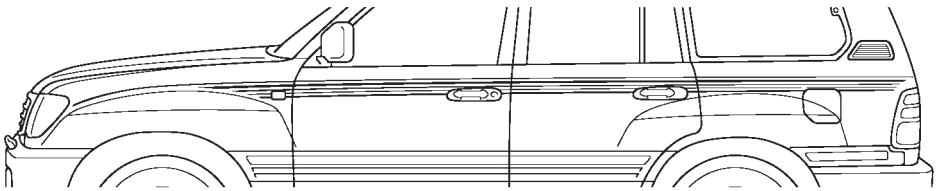


**Narrow Type**

147MO06

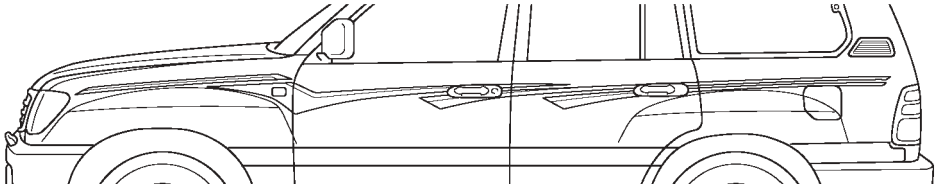
## BODY STRIPES

- Two types of body stripes are available as optional equipment, the high-grade type or the standard type.
- To match the character line, the high-grade type effects a change with its dotted mesh crack pattern over the gold theme.



**High-Grade Type**

147MO07



**Standard Type**

147MO08

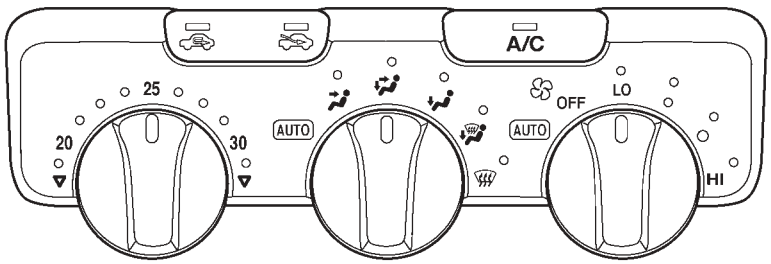
# NEW EQUIPMENT – INTERIOR –

## AIR CONDITIONER

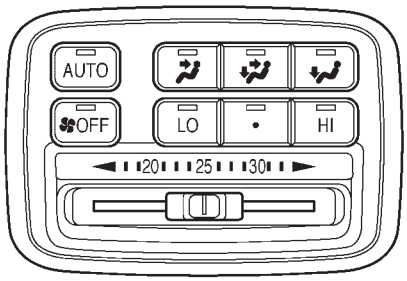
Two types of air conditioners are available, single and dual, and each type is available as a manual or auto air conditioner.

- Models equipped with rear heater are provided with a control panel on the back face of the rear console, enabling the occupants in the rear seat to operate the rear heater's airflow selector switch and temperature control to realize improved ease of use.
- The dual auto air conditioner enables the temperature of the rear seat area to be adjusted at the rear seat independently from the front seats, thus realizing improved comfort.

**▶ Dual Auto Air Conditioner ◀**



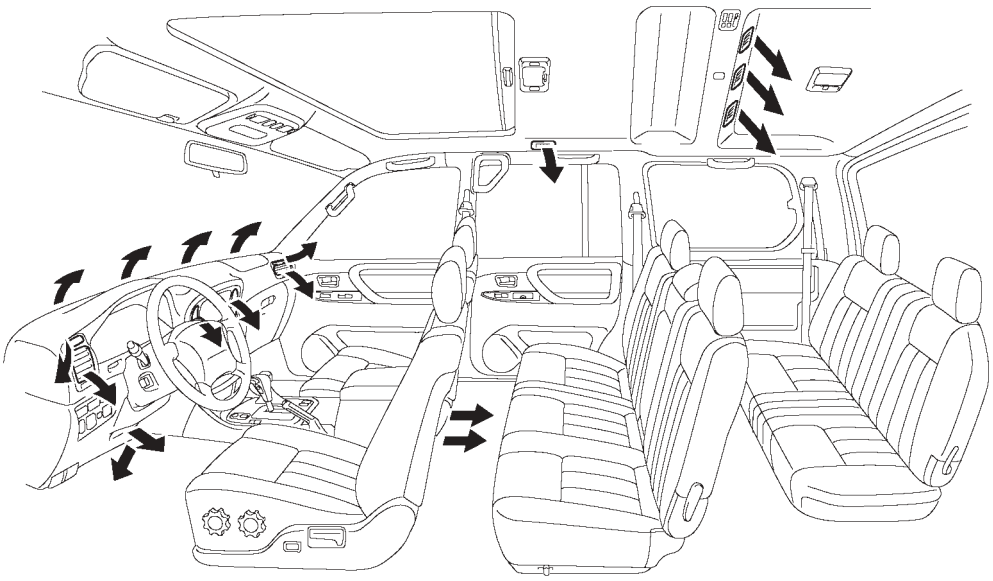

**Air Conditioner Front Control Panel**




**Air Conditioner Rear Control Panel (For Europe Model)**

147MO09

**Air Flow ➡**



147MO17

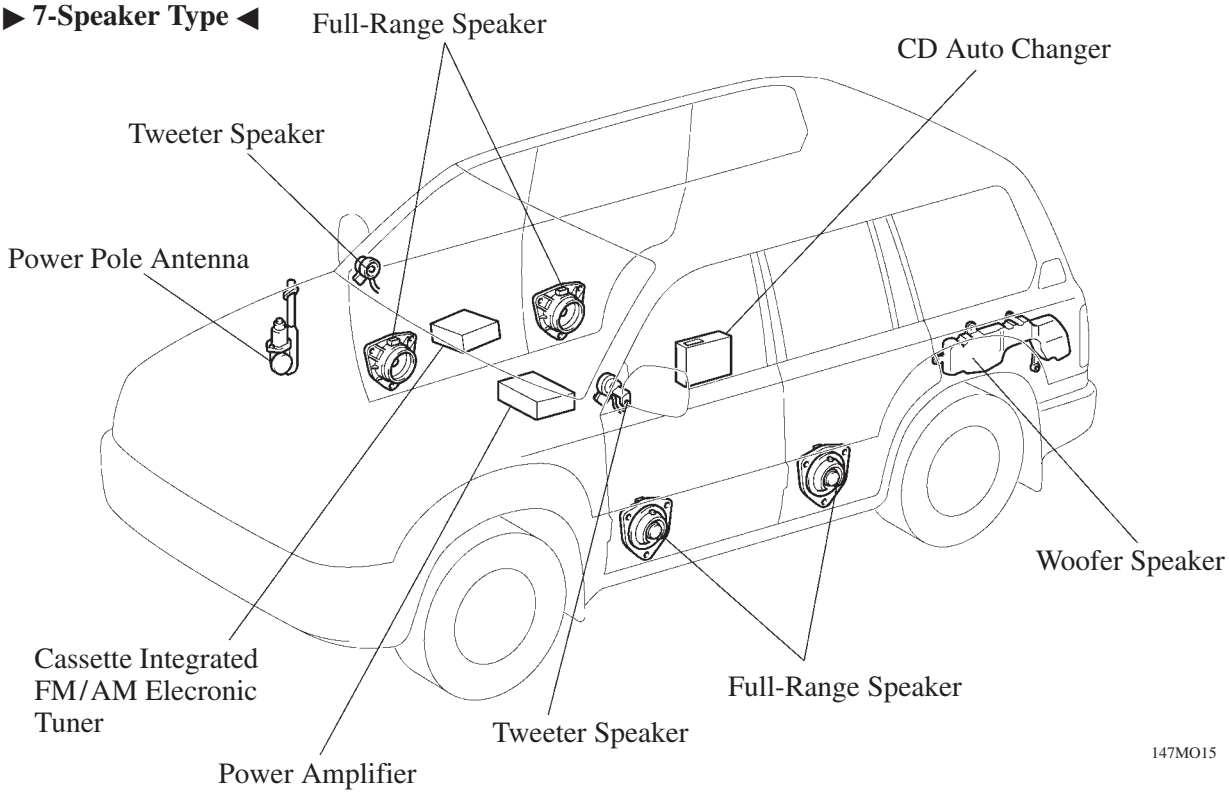
## AUDIO SYSTEM

A radio with 2DIN or 1DIN configuration is available. The speakers are available as a 2-speaker, 4-speaker, 6-speaker or 7-speaker system.

- Improved acoustics have been realized through the optimal allocation of units and the combination of a high-performance power amplifier and the latest model of radio.
- A CD auto changer for the rear console box is available as an option.

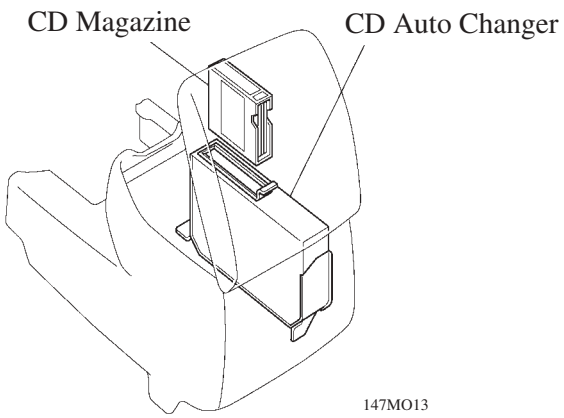


**▶ 7-Speaker Type ◀**




## CD AUTO CHANGER

The CD auto changer is equipped with magazines that accommodate up to 6 CDs, and the magazine moves up when the slide is opened.

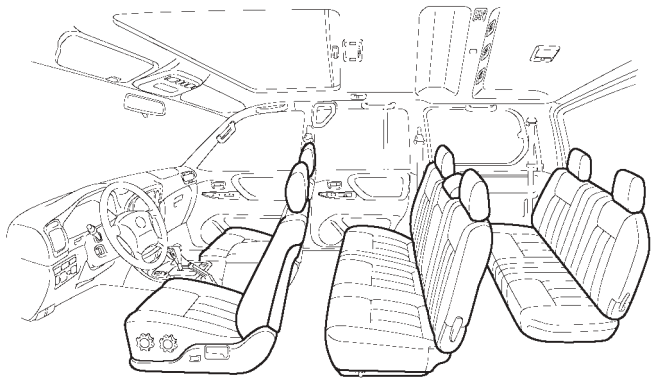


# NEW EQUIPMENT – INTERIOR –

## SEATS

High-quality seats have been achieved by providing a pleasant and distinctive character to the seats and enhancing their seating comfort.

- Genuine leather seat covers are available as optional equipment.

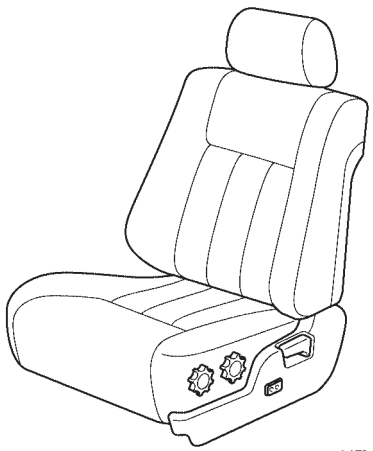


147MO18

## FRONT SEATS

The front seats exude high quality through their comfortable feel, high level holding performance, and powerful and generous form.

**▶ 4-Way Vertical Seat ◀**



147MO22

Front Seat Types

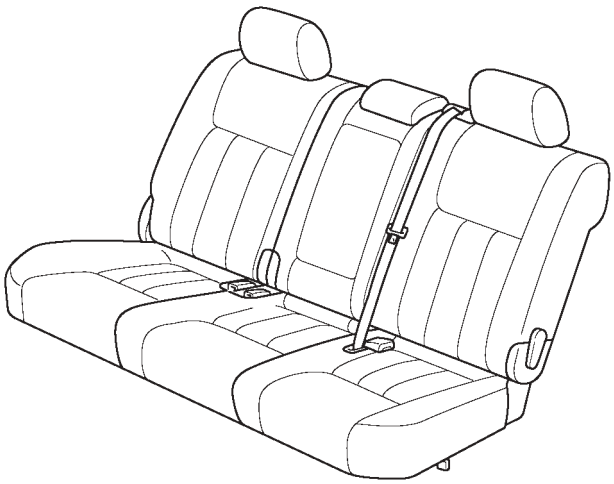
| | |
|---|---|
| Separate Seat | Power Seat |
| | 4-Way Vertical Seat |
| | Normal Seat |
| Bench Seat | — |

## SECOND-ROW SEAT

Proper support and roominess are provided to ensure comfort on long drives.

- The split seats have adopted a 60/40 split configuration to facilitate the in-and-out access to the third-row seat.

**▶ Split Seat ◀**



156MO16

Second-Row Seat Types

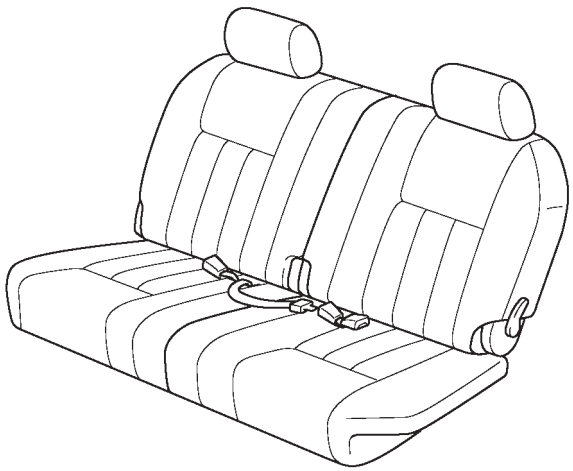
| |
|---|
| Split Seat |
| Bench Seat |

## THIRD-ROW SEAT

The front-facing seat is the detachable type, and the floor looks neat and orderly after the seat has been removed. In addition, it does not block rear visibility in the stored state.

- The large head rest is provided for Europe and Australia.

**▶ Front-Facing Seat ◀**



**For G.C.C. and General Countries**

156MO17

Third-Row Seat Types

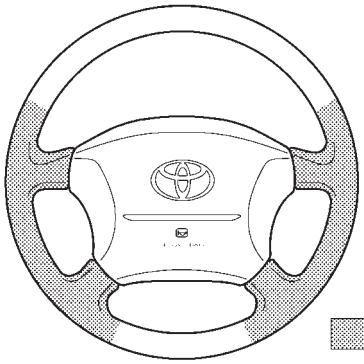
| |
|---|
| Front-Facing Seat |
| Parallel Seat |

# NEW EQUIPMENT – INTERIOR –

## STEERING WHEEL & COLUMN

The steering wheel has been designed with a well defined form that exudes sportiness and dimensionality.

- Two types of steering wheels are available: the 4-spoke type with airbag and the 3-spoke type without airbag.
- A manual tilt steering is provided as standard equipment and a power tilt & telescopic steering column is available as an option for improved ease of use.

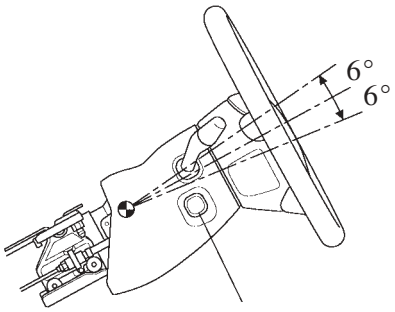


: Dimple Portion

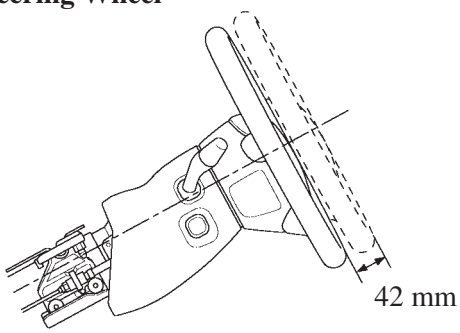
**4-Spoke, Leather-Wrapped Steering Wheel**

156MO13

**▶ Power Tilt & Telescopic Type ◀**




**Tilt Mechanism**



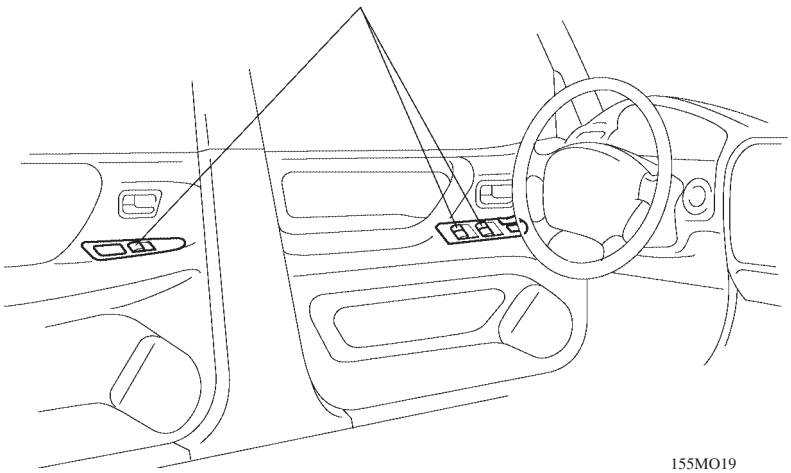

**Telescopic Mechanism**

155MO18

## POWER WINDOWS

- Power windows are provided on all models as standard or optional equipment.
- The power windows that are equipped with the one-touch up/down mechanism are provided with a jam protection function as standard equipment to prevent accidents.
- The switches are the pull-up type, and are provided with illumination to enhance their ease of use and visibility.

Power Window Switches



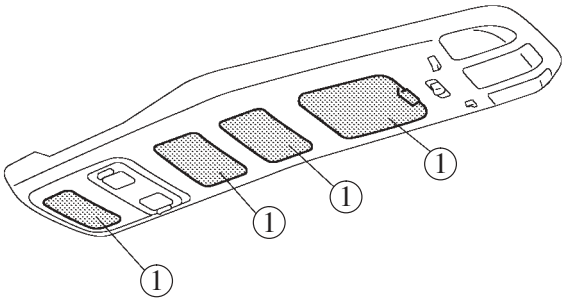
155MO19

## STORAGE SPACE

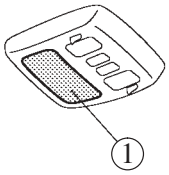
- Cup holders, storage compartments, and pockets are located in the various areas to improve ease of use.
- A small-size console for the model with a moon roof and a large-size console for the model without a moon roof are provided.



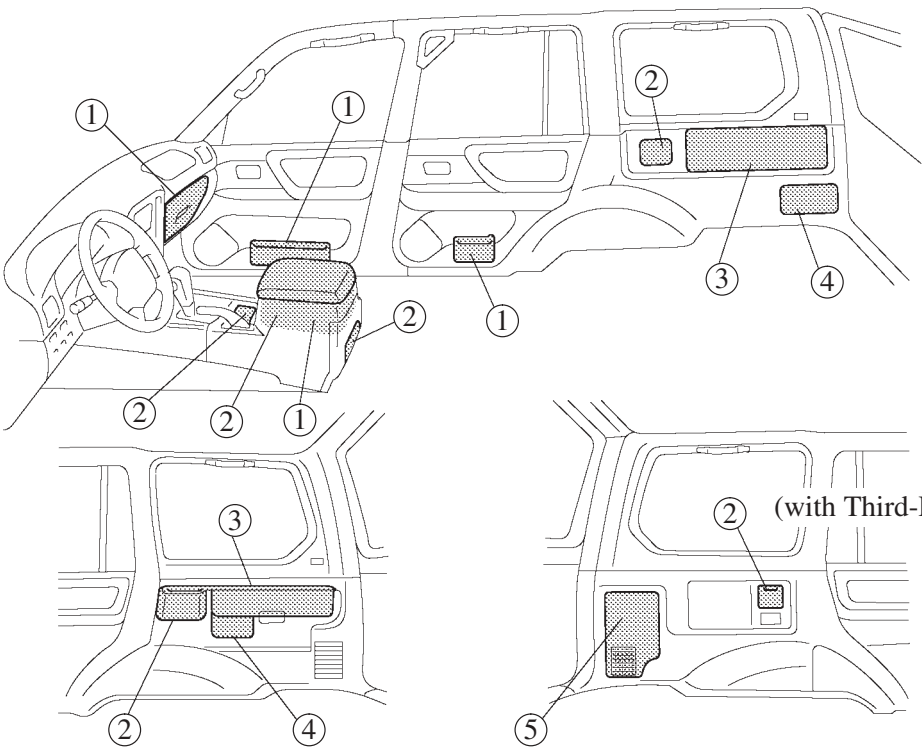
① Storage Compartments
② Cup Holders
③ Storage for Triangular Emergency Marker
④ Storage for First Aid Kit
⑤ Storage for Tools and Jack




**Large-size Console**




**Small-size Console**




**Dual Air Conditioner Type, RH** **LH**

# MAIN MECHANISMS

## ENGINE

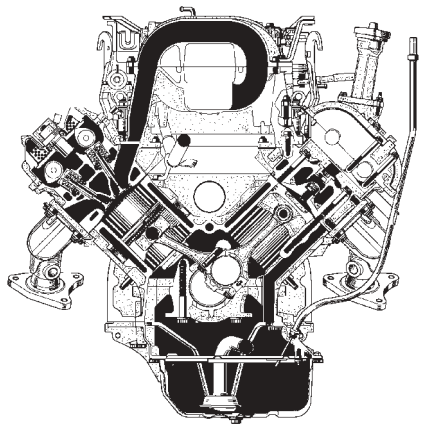
The new Land Cruiser is provided with two types of gasoline engines and three types of diesel engines.

| Engine Type | | No. of Cyls & Arrangement | Displacement $cm^3$ (cu in.) | Maximum Output kW @ rpm | Maximum Torque N·m @ rpm | Characteristic |
|---|---|---|---|---|---|---|
| Gasoline Engine | 2UZ-FE | 8-Cylinder, V Type | 4664 (284.5) | 173@4800*1 | 434@3400*1 | Newly developed |
| | | | | 170@4800*2 | 410@3400*2 | Newly developed |
| | | | | 186@4800*3 | 431@3400*3 | Newly developed |
| | 1FZ-FE | 6-Cylinder, In-Line | 4477 (273.1) | 165@4600*2 | 387@3600*2 | Improved performance; complies with exhaust gas regulations |
| | | | | 179@4600*3 | 407@3600*3 | |
| Diesel Engine | 1HD-FTE | 6-Cylinder, In-Line | 4164 (254.1) | 150@3400*1 | 1400*1 430@≀3200 | Equipped with intercooler and EFI (electronic fuel injection) |
| | 1HD-T | 6-Cylinder, In-Line | 4164 (254.1) | 118@3600*2 | 360@2100*2 | Continual application |
| | | | | 96@3800*2 | 285@2200*2 | |
| | 1HZ | 6-Cylinder, In-Line | 4164 (254.1) | 100@3800*3 | 290@2200*3 | Continual application |

*1: EEC (for Europe)
*2: SAE-NET (For Australia and General Countries)
*3: SAE-GROSS (For G.C.C. Countries)

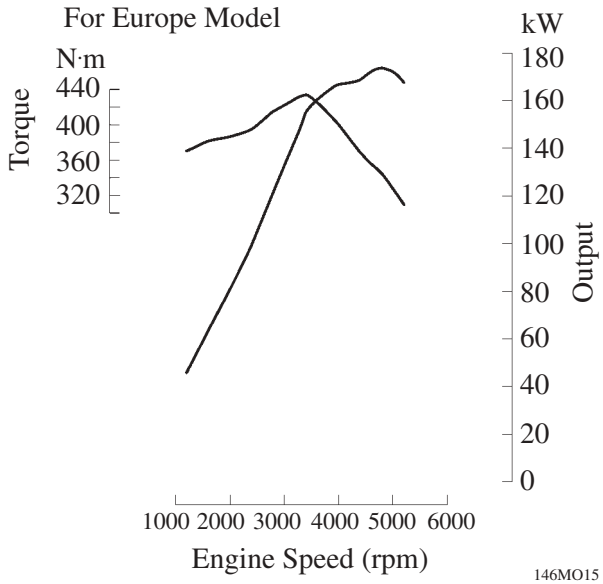
### ▶ 2UZ-FE Engine ◀

**Cross Section Drawing**



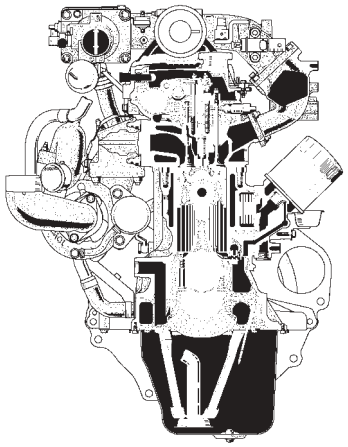
155MO40

**Performance Curve**



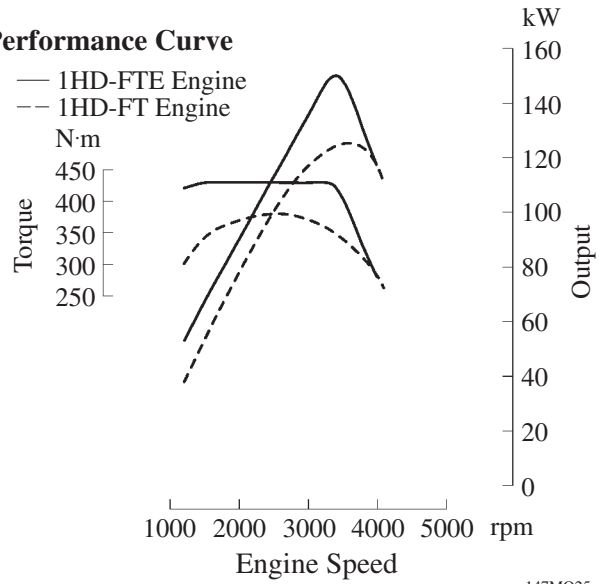

146MO15

**▶ 1HD-FTE Engine ◀**
**Cross Section Drawing**



147MO24

**Performance Curve**



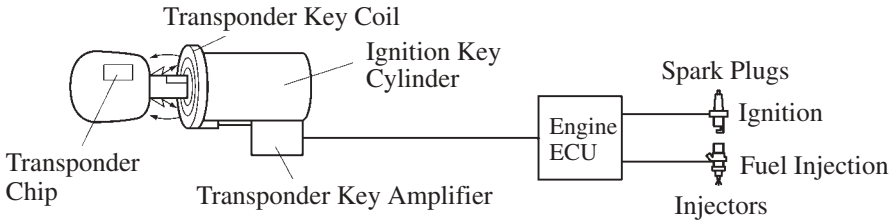

147MO25

## ENGINE IMMOBILISER

An engine immobiliser system, which determines if an attempted theft is taking place and which prohibits the ignition and the injection of fuel in the engine, is provided.

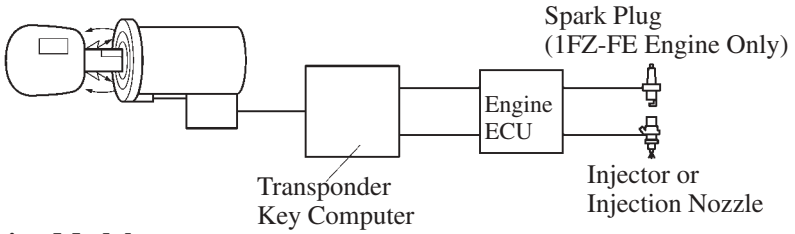
- The engine immobiliser system prevents vehicle theft by comparing the ID code that is stored in the engine ECU (2UZ-FE engine model) or transponder key computer (except 2UZ-FE engine model) against the ID code that is stored in the ignition key and permits ignition and the injection of fuel if the codes match.

**▶ 2UZ-FE Engine Model ◀**



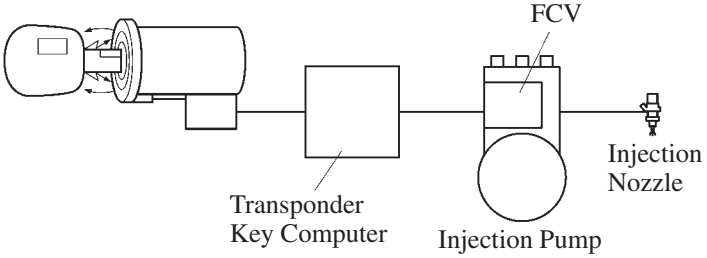

155MO25

**▶ 1FZ-FE and 1HD-FTE Engine Models ◀**



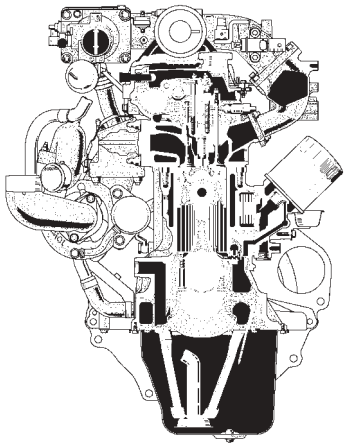

147MO19

**▶ 1HZ and 1HD-T Engine Models ◀**



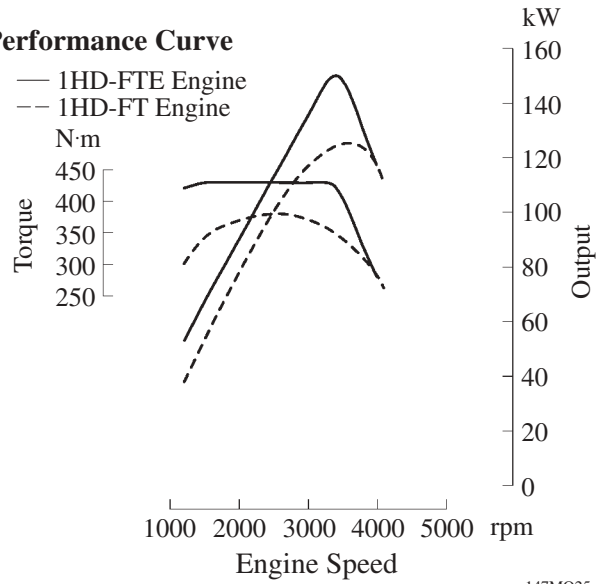

147MO20

**▶ 1HD-FTE Engine ◀**
**Cross Section Drawing**



147MO24

**Performance Curve**




147MO25

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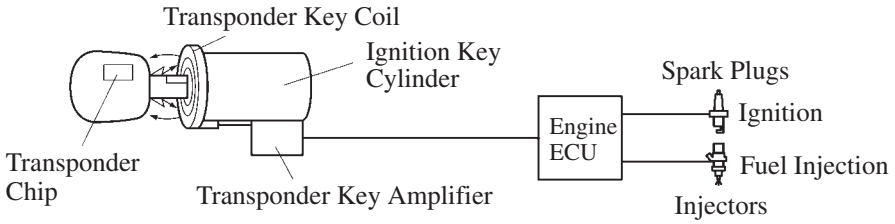
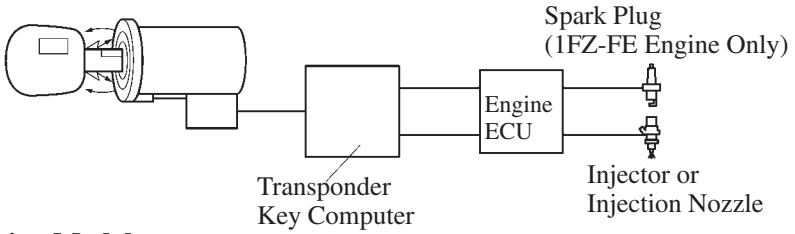
**▶ 2UZ-FE Engine Model ◀**



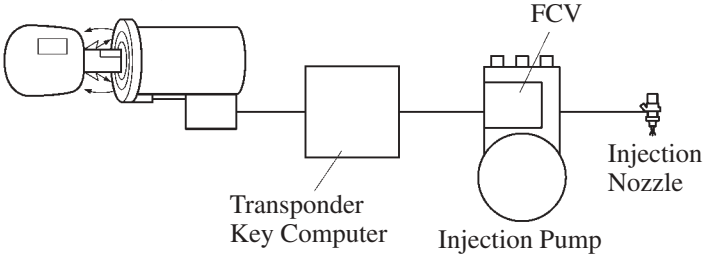

155MO25

**▶ 1FZ-FE and 1HD-FTE Engine Models ◀**




147MO19

**▶ 1HZ and 1HD-T Engine Models ◀**




147MO20

# MAIN MECHANISMS

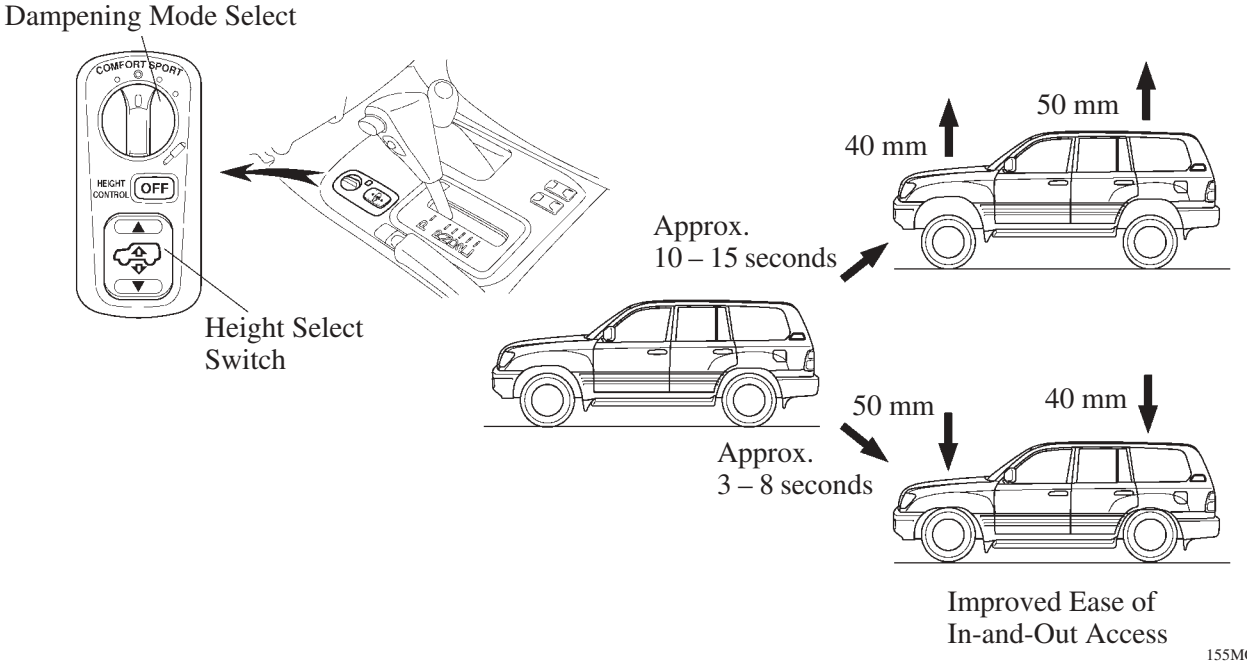
## SUSPENSION

The front suspension of the new model has adopted an independent front suspension (IFS) in addition to the rigid front suspension (RFS) of the previous model.

- The IFS is available with AHC & Skyhook TEMS as optional equipment for controlling the vehicle height and damping force.

**▶ AHC ◀**

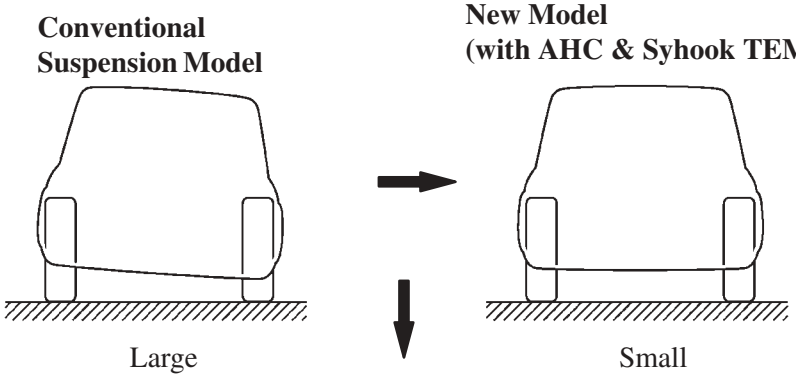
- Operating the switch to lower the vehicle height quickly allows easy in-and-out access and raising the vehicle height will make it difficult to occur the interference with the off-road surface.
- By maintaining the vehicle height at a constant level at all times regardless of the loading condition such as the number of occupants, luggage, etc., the suspension strokes are used effectively and stable driving comfort are always ensured.




155MO26

**▶ Skyhook TEMS (Toyota Electronic Modulated Suspension) ◀**

Based on the signals received from the various sensors and switches, this mechanism adjusts the vehicle height and controls the damping force of the suspension to achieve the high levels of both handling stability and riding comfort.



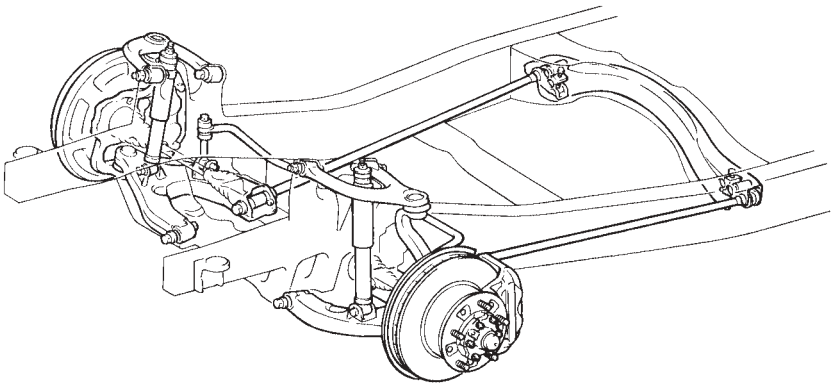

155MO27

**Improved Vehicle Posture During Steering**

## Independent Front Suspension(IFS)

An Independent Front Suspension (IFS) system in which both wheels move independently according to the road surface conditions has been adopted for the front wheels. This suspension greatly contributes to realizing excellent riding comfort and driving stability.



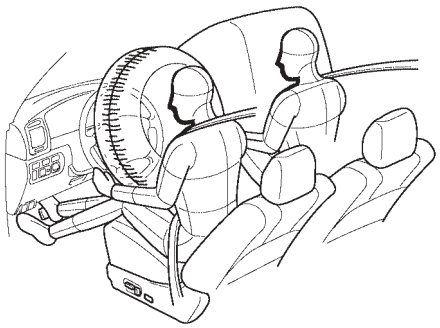


155MO37

# SAFETY FEATURES

## SRS AIRBAG

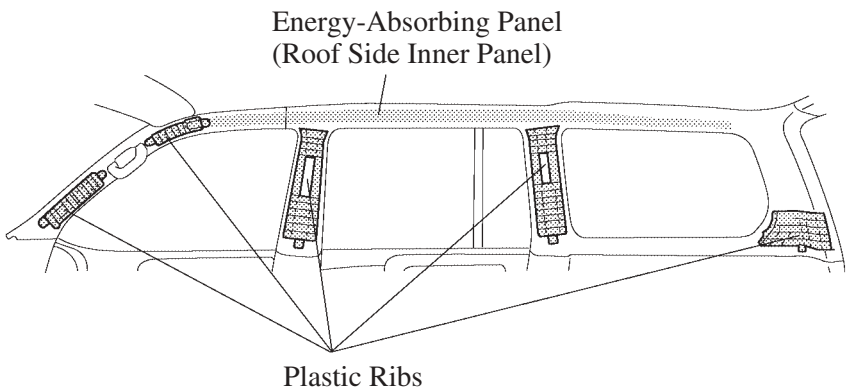
The SRS airbags that absorb the impact during a collision and help protect the occupants when used in conjunction with the seat belts are provided as standard or optional equipment for the front seat occupants.



155MO35

## Head Impact Protection Structure

The pillar garnish has adopted a head impact protection structure to dampen the impact on the occupants' head portion.

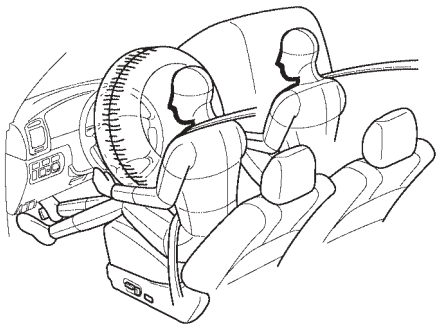



156MO24

# SAFETY FEATURES

## SRS AIRBAG

The SRS airbags that absorb the impact during a collision and help protect the occupants when used in conjunction with the seat belts are provided as standard or optional equipment for the front seat occupants.



155MO35

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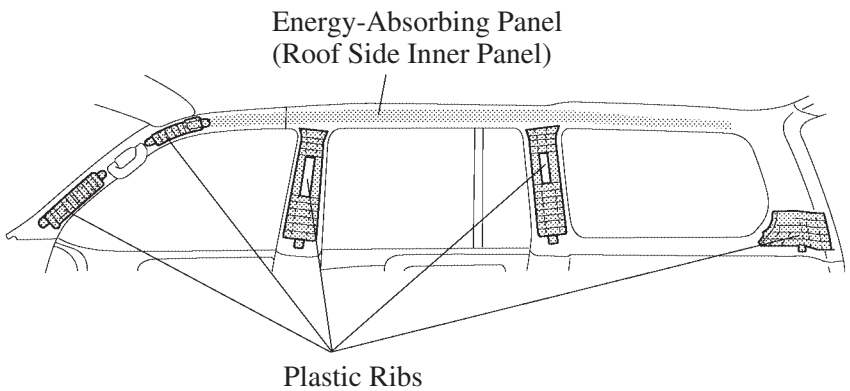
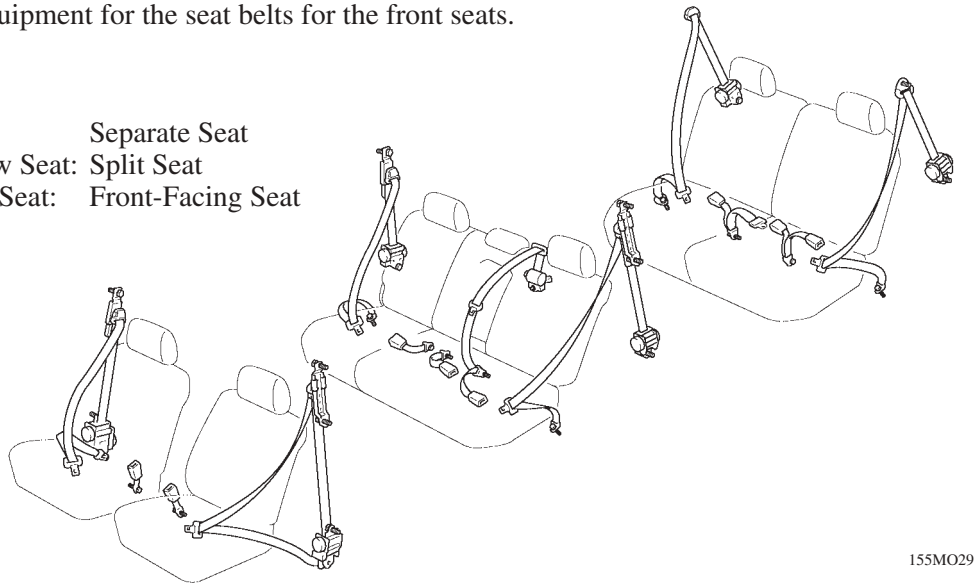



156MO24

## SEAT BELTS

- The driver and front passenger seats are provided with a 3-point ELR seat belt with a pretensioner and force limiter mechanism as standard or optional equipment.
- Seat belt adjustable anchors that can adjust the shoulder anchor position in 5 steps have been provided as standard equipment for the seat belts for the front seats.

Front Seat: Separate Seat
Second-Row Seat: Split Seat
Third-Row Seat: Front-Facing Seat

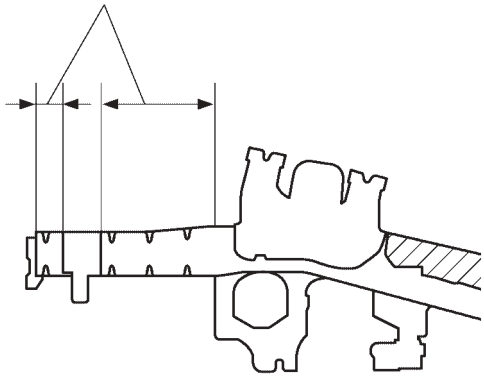


155MO29

## CRASH SAFETY BODY

- IFS model uses the same ladder-shape frame that is used on the previous model. In addition, the crossmembers have been optimally allocated to ensure an even higher level of crash safety.
- The siderail tips are made into axial-compression type collapsible zones to ensure excellent energy-absorption characteristics.

Side Rail Axial Compression Portion



155MO38

## SEAT BELTS

- The driver and front passenger seats are provided with a 3-point ELR seat belt with a pretensioner and force limiter mechanism as standard or optional equipment.
- Seat belt adjustable anchors that can adjust the shoulder anchor position in 5 steps have been provided as standard equipment for the seat belts for the front seats.

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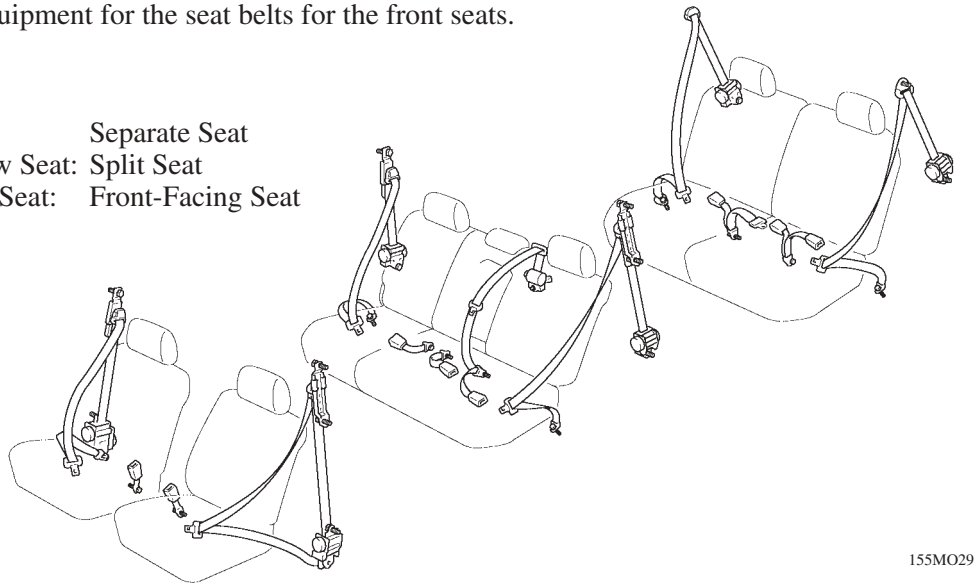
Third-Row Seat: Front-Facing Seat



155MO29

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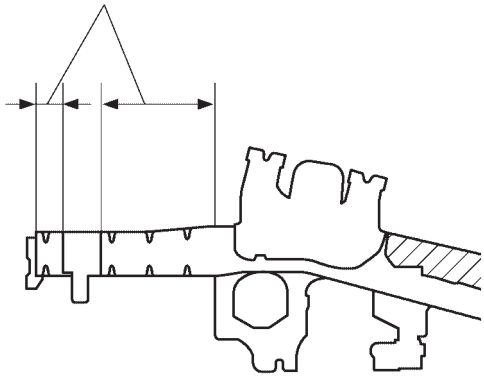
Side Rail Axial Compression Portion



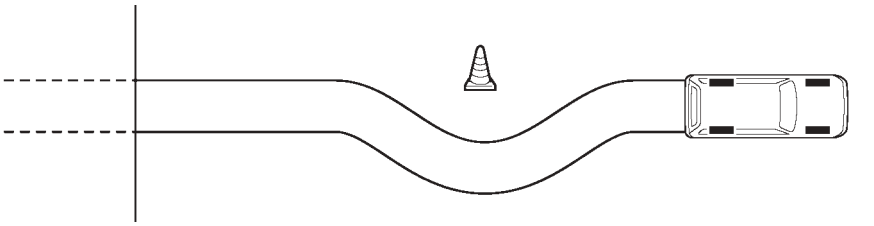
155MO38

# SAFETY FEATURES

## ABS (Anti-lock Brake System)

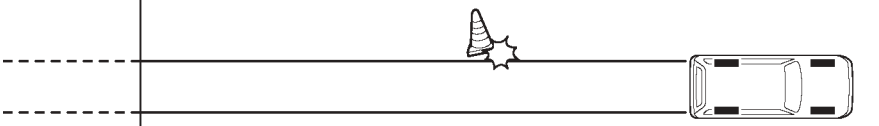
The vehicle is provided with an ABS system as standard or optional equipment that ensures the excellent handling of the steering and the stability of the vehicle by preventing the wheels from locking during sudden braking or braking on slippery terrain.

**ABS Equipped Vehicle**



The brakes start to operate.

**Non-ABS Equipped Vehicle**

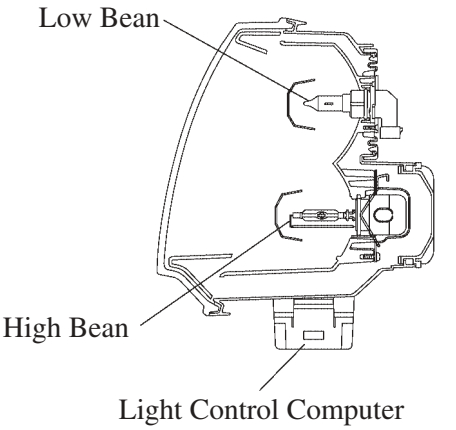


The illustration shows the image of ABS effect.

155MO31

## Discharge Headlights

Discharge headlights provide approximately three times the brightness of the halogen headlights and offer excellent light diffusion characteristics to realize excellent nighttime visibility.



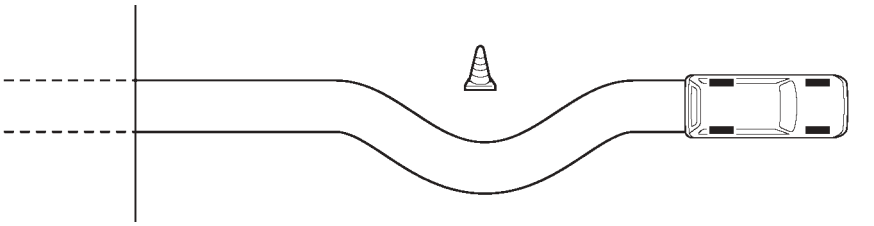

147MO11

# SAFETY FEATURES

## ABS (Anti-lock Brake System)

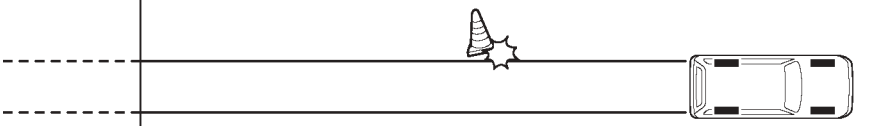
The vehicle is provided with an ABS system as standard or optional equipment that ensures the excellent handling of the steering and the stability of the vehicle by preventing the wheels from locking during sudden braking or braking on slippery terrain.

**ABS Equipped Vehicle**



The brakes start to operate.

**Non-ABS Equipped Vehicle**



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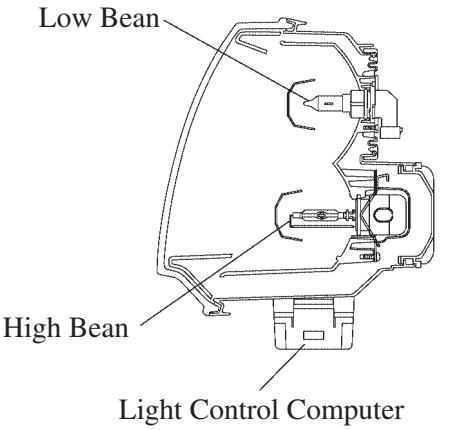



147MO11

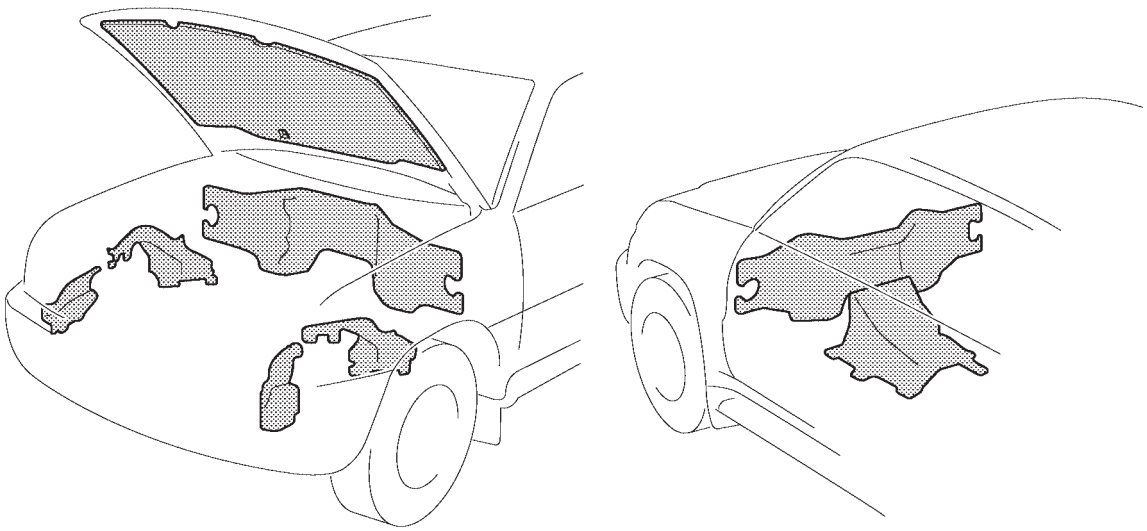
# QUIETER OPERATION

## BODY

Silencer, asphalt sheet, and foam material have been effectively allocated in the various areas of the body to improve the vehicle's quietness.

**▶ Areas Applied with Silencer ◀**

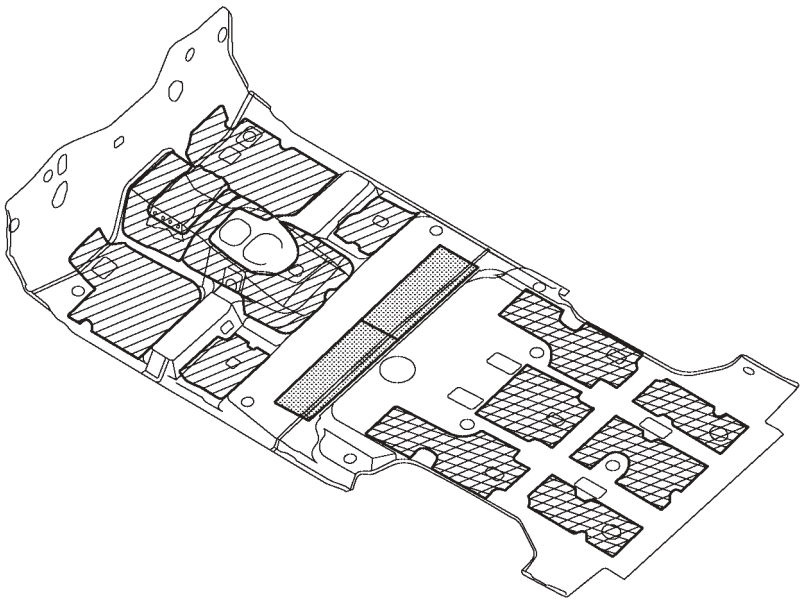




155MO32

**2UZ-FE Engine Model**

**▶ Areas Applied with Asphalt Sheet ◀**



156MO26

# LIST OF EQUIPMENT



## Europe

| Equipment | | | Grade |
|---|---|---|---|
| | | | VX |
| Exterior | Halogen Headlights (Multi-Reflector) | | S |
| | Headlight Cleaner | | S*1, O*2 |
| | Foglights | Front | O |
| | | Rear | S |
| | Outside Rearview Mirror | Remote Control | S*2, S*3 |
| | | Power Retraction Remote Control | S*4 |
| | Window Glass | Green with Top Band | S |
| | Side Glass | Green | S |
| | Power Door Lock | | S |
| | Wireless Door Lock | | S |
| | Outside Molding | | S |
| | Mud Guards (front + rear) | | S |
| | Tires | 275/70R16 | S |
| | Rear Window Wiper | | S |
| | Power Moon Roof | | O |
| | Pintle Hook | | O |

S : Standard equipment
O : Optional equipment
*1: RHD model
*2: LHD model
*3: New Zealand model
*4: RHD model other than New Zealand

## Europe

| Equipment | | | | Grade |
|---|---|---|---|---|
| | | | | VX |
| Interior | Steering Wheel | | 4-Spoke, Leather-Wrapped | S |
| | Steering Column | | Manual Tilt | S |
| | | | Power Tilt & Telescopic with Memory | O |
| | Overhead Console | | | S |
| | Sunvisors | | With Vanity Mirror Illumination, Variable Mechanism | S |
| | Cup Holders | | | S |
| | Front Seat | | Bench (Russia only) | S*1 |
| | | | Separate | S |
| | Second-Row Seat | | 60/40 Split | S |
| | Third-Row Seat | | Parallel (Russia only) | S*1 |
| | | | Front-Facing | P |
| | | | None | S |
| | Seat Covers | | Genuine Leather | O |
| | | | Moquette | S |
| | Front Seat Belts | Bench Seat | ELR 3-2-3, Pretensioner + Force Limiter | S*1 |
| | | Separate Seats | ELR 3-3, Pretensioner + Force Limiter | S |
| | Second-Row Seat Belts | ELR 3-3-3 | | S |
| | Third-Row Seat Belts | ELR 3-3 | | S |
| | Air Conditioner | | Single Auto | O |
| | | | Single | D |
| | SRS Airbag (for driver & front passenger) | | | S |
| | Cruise Control | | | S |
| | Memory System (front seat, steering column, Outside Rearview Mirror) | | | O |
| | Power Windows | | | S |
| | Illuminated Entry System | | | S |
| | Immobiliser System | | | S |
| | Power Outlets (center cluster, steering column) | | | S |
| | Wiring Harness for Trailer | | | O |

S : Standard equipment
O : Optional equipment
D : Dealer optional equipment
*1 : Manual transmission model on 1HD-FTE engine

# LIST OF EQUIPMENT



## Australia

| Equipment | | | Grade | | |
|---|---|---|---|---|---|
| | | | STD | GX | VX |
| Exterior | Headlights | Halogen | S | S | S |
| | | Halogen (Low Beam) and Discharge Headlight (High Beam) | – | – | O |
| | Foglights | | – | – | O |
| | Outside Rearview Mirrors | Standard | S | S | – |
| | | Remote Control | – | O | S |
| | Window Glass | Green | S | S | – |
| | | Green with Top Band | – | O | S |
| | Side Glass | Green | S | S | S |
| | | Green UV Reduction | – | O | O |
| | Power Door Lock | | – | S | S |
| | Wireless Door Lock | | – | – | O |
| | Outside Molding | | – | O (Narrow Type) | O (Wide Type) |
| | Mud Guards (front + rear) | | S | S | S |
| | Tires | 275/70R16 | – | O | S |
| | | 235/85R16LT | S | S | – |
| | Rear Window Wiper | | S | S | S |
| | Power Moon Roof | | – | O | O |

S : Standard equipment
O : Optional equipment

## Australia

| Equipment | | | | Grade | | |
|---|---|---|---|---|---|---|
| | | | | STD | GX | VX |
| Interior | Steering Wheel | | 3-Spoke, Urethane | S | S | – |
| | | | 4-Spoke, Urethane | O | O | – |
| | | | 4-Spoke, Leather-Wrapped | – | – | S |
| | Steering Column | | Manual Tilt | S | S | S |
| | | | Power Tilt & Telescopic | – | – | O |
| | Overhead Console | | | – | O*2 | S |
| | Sunvisors | | Standard | S | S | – |
| | | | With Vanity Mirror Illumination, Variable Mechanism | – | O*2 | S |
| | Cup Holders | | | S | S | S |
| | Front Seat | | Bench | S | – | – |
| | | | Separate | O | S | S |
| | | | Separate, Power | – | – | O |
| | Second-Row Seat | | 60/40 Split | – | S | S |
| | | | Fixed Solid | S | – | – |
| | Third-Row Seat | | Front-Facing | – | O | S |
| | | | None | S | S | – |
| | Seat Covers | | Genuine Leather | – | – | O |
| | | | Moquette | – | – | S |
| | | | Fabric | O | S | – |
| | | | Leather | S | – | – |
| | Front Seat Belts | Bench Seat | ELR 3-2-3, Pretensioner | S | – | – |
| | | | ELR 3-2-3, Pretensioner + Force Limiter | O | – | – |
| | | Separate Seats | ELR 3-3, Pretensioner | S | S | – |
| | | | ELR 3-3, Pretensioner + Force Limiter | O | O | S |
| | Second-Row Seat Belts | Fixed | ELR 3-2-3 | S | – | – |
| | | Split Reclining | ELR 3-3-3 | – | S | S |
| | Third-Row Seat Belts | ELR 3-2-3 | | – | S | S |
| | Air Conditioner | | Single | D | O, D | – |
| | | | Single Auto | – | – | S |
| | | | Dual Auto | – | – | O |
| | SRS Airbag (for driver & front passenger) | | | O | O | S |
| | Cruise Control | | | – | O*1 | S |
| | Power Windows | | | S | S | S |
| | Illuminated Entry System | | | S | S | S |
| | Immobiliser System | | | S | S | S |
| | Power Outlets (center cluster, rear quarter) | | | O | S | S |

S : Standard equipment
O : Optional equipment
D : Dealer optional equipment
*1: 1FZ-FE engine model
*2: Set option with moon roof

# LIST OF EQUIPMENT



## G.C.C. Countries

| Equipment | | | Grade | | |
|---|---|---|---|---|---|
| | | | G | GX, GX-R | VX-R |
| Exterior | Headlights | Halogen | S | S | – |
| | | Multi-Reflector | – | – | S |
| | | Halogen (Low Beam) and Discharge Headlight (High Beam) | – | – | O |
| | Headlight Cleaner | | – | – | O |
| | Foglights | | – | – | O |
| | Grille Guard | | – | – | O |
| | Outside Rearview Mirrors | Standard | S | – | – |
| | | Remote Control | – | S | S |
| | Window Glass | Green | S | S | – |
| | | Green with Top Band | – | O | S |
| | Side Glass | Green | S | S | S |
| | | Green UV Reduction | – | – | O |
| | Power Door Lock | | – | S | S |
| | Wireless Door Lock | | – | O | O |
| | Outside Molding | | – | S*1 | S |
| | Mud Guards (front + rear) | | S | S | S |
| | Tires | 275/70R16 | – | O | S |
| | | 235/85R16LT | S | S | – |
| | Rear Window Wiper | | O | O | S |
| | Power Moon Roof | | – | O | O |

S : Standard equipment
O : Optional equipment
*1 : GX-R grade

## G.C.C. Countries

| Equipment | | | | Grade | | |
|---|---|---|---|---|---|---|
| | | | | G | GX, GX-R | VX-R |
| Interior | Steering Wheel | | 3-Spoke, Urethane | S | S | – |
| | | | 4-Spoke, Urethane | O | O | S |
| | | | 4-Spoke, Leather-Wrapped | – | – | O |
| | Steering Column | | Manual Tilt | S | S | S |
| | | | Power Tilt & Telescopic | – | – | O |
| | Overhead Console | | | – | O*1 | S |
| | Sunvisors | | Standard | S | S | – |
| | | | With Vanity Mirror Illumination, Variable Mechanism | – | O*1 | S |
| | Cup Holders | | | S | S | S |
| | Front Seat | | Bench | S | S*2 | – |
| | | | Separate | O | S*3<br>O*2 | S |
| | | | Separate, Power | – | – | O |
| | Second-Row Seat | | 60/40 Split | – | O*4 | S |
| | | | Fixed Solid | S | S | – |
| | Third-Row Seat | | Front-Facing | – | O | S*5<br>O*6 |
| | | | Parallel (swing-out type back doors model) | O | S*6 | S*6 |
| | | | None | S | S*6<br>O*5 | O |
| | Seat Covers | | Genuine Leather | – | – | O |
| | | | Moquette | – | – | S |
| | | | Fabric | S | S | – |
| | Front Seat Belts | Bench Seat | ELR 3-2-3 | S | S*2 | – |
| | | | ELR 3-2-3, Pretensioner + Force Limiter (Outer seat)*7 | O | O*2 | – |
| | | Separate Seats | ELR 3-3 | S | S | – |
| | | | ELR 3-3, Pretensioner + Force Limiter (Outer seat)*7 | O | O | S |
| | Second-Row Seat Belts | Fixed | ELR 3-2-3 | S | S | – |
| | | Split Reclining | ELR 3-3-3 | – | S | S |
| | Third- Row Seat Belts | Parallel Seats | Not available | – | – | – |
| | | Front- Facing Seat | ELR 3-2-3 | – | S | S |
| | Air Conditioner | | Single | O | O | – |
| | | | Single Auto | – | – | S |
| | | | Dual | – | O | – |
| | | | Dual Auto | – | – | O |
| | SRS Airbag (for driver & front passenger) | | | O | O | S |
| | Cruise Control | | | – | – | O |
| | Power Windows | | | – | – | – |
| | Illuminated Entry System | | | – | – | – |
| | Immobiliser System | | | – | – | – |
| | Power Outlets (center cluster, rear quarter) | | | O | S | S |

S : Standard equipment
O : Optional equipment
*1 : Set option with moon roof
*2 : Manual transmission model
*3 : Automatic transmission model
*4 : Set option with front facing third-row seat
*5 : Liftgate type back door model
*6 : Swing-out type back doors model
*7 : Set option with SRS airbag

# LIST OF EQUIPMENT



## General Countries

| Equipment | | | Grade | | |
|---|---|---|---|---|---|
| | | | STD | GX | VX |
| Exterior | Headlights | Halogen | S | S | – |
| | | Multi-Reflector | O*1 | O*1 | S |
| | Headlight Cleaner (Russia model only) | | S | S | – |
| | Foglights | Front | – | – | O |
| | | Rear (Russia model only) | S | S | – |
| | Grille Guard | | – | – | O |
| | Outside Rearview Mirrors | Standard | S | S | – |
| | | Remote Control | – | O | S |
| | Window Glass | Green | S | S | – |
| | | Green with Top Band | – | O | S |
| | Side Glass | Green | S | S | S |
| | | Green UV Reduction | – | – | O |
| | Power Door Lock | | – | S | S |
| | Wireless Door Lock, TVSS | | – | O | O |
| | Outside Molding | | – | O (Narrow Type) | S (Wide Type) |
| | Mud Guards (front + rear) | | S | S | S |
| | Tires | 275/70R16 | – | O | O |
| | | 235/85R16LT | S | S | S |
| | Rear Window Wiper | | O | O | S |
| | Power Moon Roof | | – | O | O |

S : Standard equipment
O : Optional equipment
*1 : Russia model

## General Countries

| Equipment | | | | Grade | | |
|---|---|---|---|---|---|---|
| | | | | STD | GX | VX |
| Interior | Steering Wheel | | 3-Spoke, Urethane | S | S | – |
| | | | 4-Spoke, Urethane | O | O | S |
| | | | 4-Spoke, Leather-Wrapped | – | – | O |
| | Steering Column | | Manual Tilt | S | S | S |
| | | | Power Tilt & Telescopic | – | – | O |
| | Overhead Console | | | – | O*1 | S |
| | Sunvisors | | Standard | S | S | – |
| | | | With Vanity Mirror Illumination, Variable Mechanism | – | O*1 | S |
| | Cup Holders | | | S | S | S |
| | Front Seat | | Bench | S | S*2 | S*3 |
| | | | Separate | O | S*4, O*2 | S |
| | | | Separate, Power | – | – | O |
| | Second-Row Seat | | 60/40 Split | – | O*5 | S |
| | | | Fixed Solid | S | S | – |
| | Third-Row Seat | | Front-Facing | – | O | O |
| | | | Parallel (swing-out type back doors model) | O | O | S*3 |
| | | | None | S | S | S |
| | Seat Covers | | Genuine Leather | – | – | O |
| | | | Moquette | – | – | S |
| | | | Fabric | – | S | – |
| | | | Leather | S | – | – |
| | Front Seat Belts | Bench Seat | ELR 3-2-3 | S | S | S |
| | | | ELR 3-2-3, Pretensioner + Force Limiter*6 | O | – | – |
| | | Separate Seats | ELR 3-3 | S | S | – |
| | | | ELR 3-3, Pretensioner | – | O*7 | – |
| | | | ELR 3-3, Pretensioner + Force Limiter*6 | O | O | S |
| | Second-Row Seat Belts | Fixed | ELR 3-2-3 | S | S | – |
| | | Split Reclining | ELR 3-3-3 | – | S | S |
| | Third-Row Seat Belts | Parallel Seats | Not available | – | – | – |
| | | Front-FacingSeat | ELR 3-2-3 | – | S | S |
| | Air Conditioner | | Single | O | O | O |
| | | | Dual | – | – | O |
| | SRS Airbag (for driver & front passenger) | | | O | O | S |
| | Power Windows | | | – | O | S |
| | Illuminated Entry System | | | S | S | S |
| | Immobiliser System | | | – | S*7 O | S*7 |
| | Power Outlets (center cluster, rear quarter) | | | O | S | S |
| | Wiring Harness for Trailer | | | – | – | O |

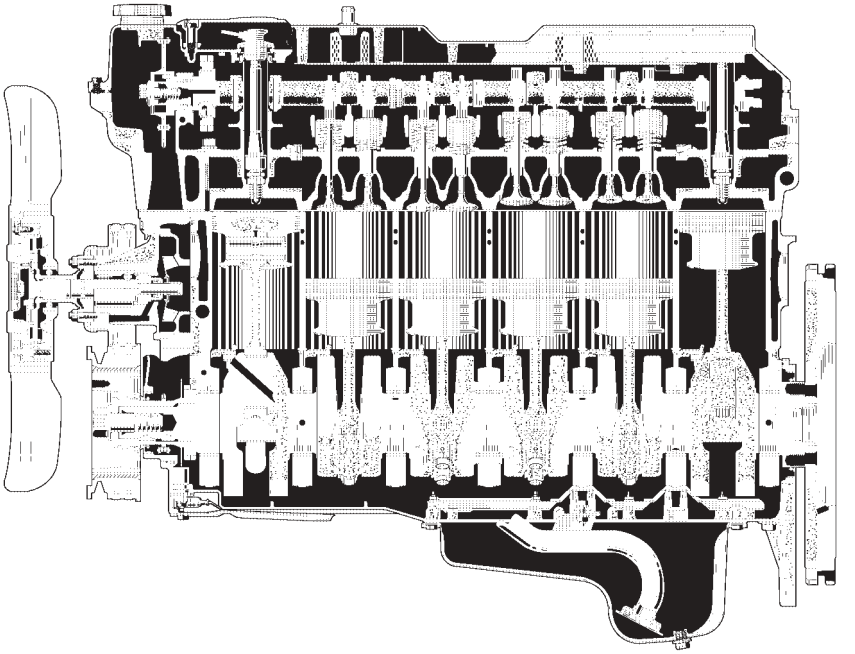
S : Standard equipment
O : Optional equipment
*1: Set option with moon roof
*2: LHD model
*3: Swing-out type back doors model
*4: RHD model
*5: Set option with front facing third-row seat
*6: Set option with SRS airbag
*7: South Africa model

# ENGINE

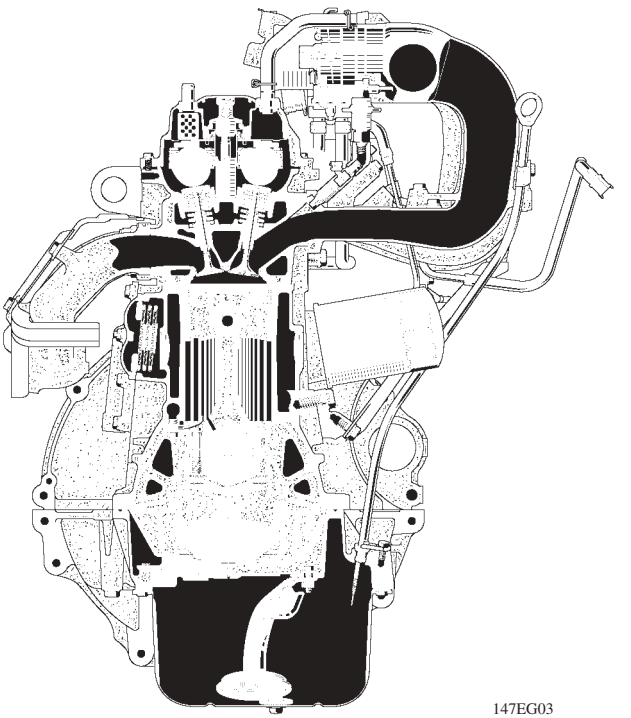
## 1FZ-FE ENGINE

### ■ DESCRIPTION

Various improvements have been made to the 1FZ-FE engine to improve engine performance, reduce noise and vibration, and improve reliability. The 1FZ-F engine has been discontinued along with the model change.



147EG04



147EG03

## ■ENGINE SPECIFICATIONS AND PERFORMANCE CURVES

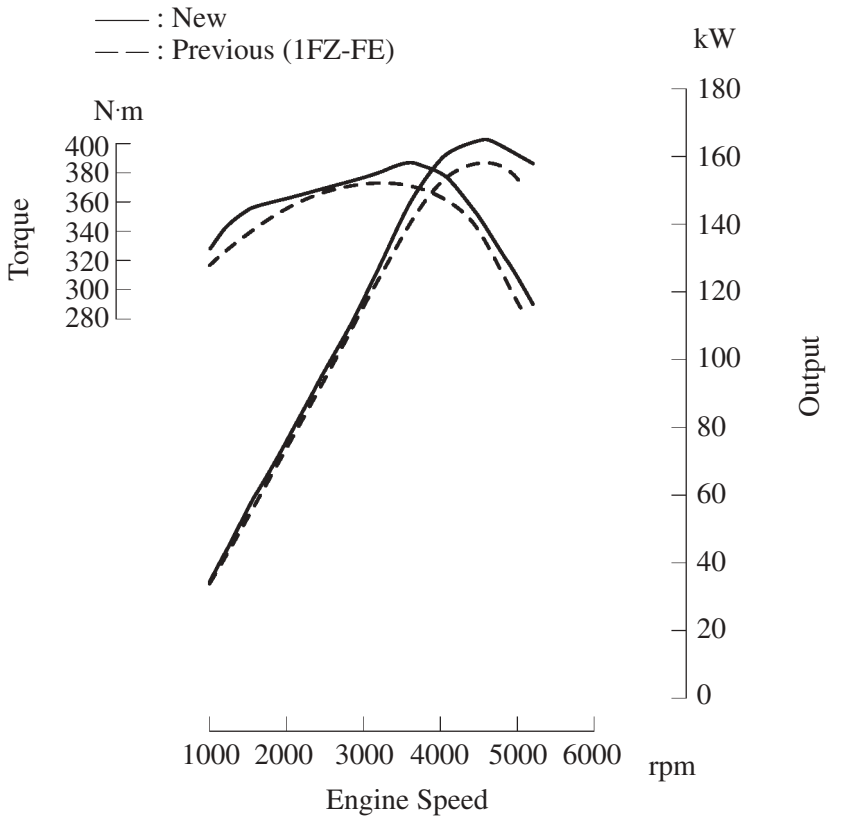
| Model / Engine / Item | | | New | Previous | |
|---|---|---|---|---|---|
| | | | 1FZ-FE | 1FZ-FE | 1FZ-F |
| No. of Cyls. & Arrangement | | | 6-Cylinder, In-Line | | |
| Valve Mechanism | | | 24-Valve DOHC, Chain & Gear Drive | | |
| Combustion Chamber | | | Pentroof Type | | |
| Manifolds | | | Cross-Flow | | |
| Fuel System | | | EFI | ← | Carburetor |
| Displacement $cm^3$ (cu. in.) | | | 4477 (273.1) | ← | ← |
| Bore x Stroke mm (in.) | | | 100 x 95.0 (3.97 x 3.74) | ← | ← |
| Compression Ratio | | | 9.0 : 1 | ← | 8.5 |
| Max. Output | | SAE-NET*1 | 165 kW @ 4600 rpm | 158 kw @ 4600 rpm | 145 kw @ 4400 rpm |
| | | SAE-GROSS*2 | 179 kW @ 4600 rpm | 171 kW @ 4600 rpm | 157 kW @ 4600 rpm |
| Max. Torque | | SAE-NET*1 | 387 N·m @ 3600 rpm | 373 N·m @ 3200 rpm | 363 N·m @ 2800 rpm |
| | | SAE-GROSS*2 | 407 N·m @ 3600 rpm | 392 N·m @ 3200 rpm | 373 N·m @ 3000 rpm |
| Valve Timing | Intake | Open | 5° BTDC | ← | ← |
| | | Close | 40° ABDC | ← | ← |
| | Exhaust | Open | 40° BBDC | ← | ← |
| | | Close | 5° ATDC | ← | ← |
| Fuel Octane Number (RON) | | | 91 | ← | ← |
| Oil Grade | | | API SH EC-II, SJ EC or ILSAC | ← | ← |

*1: For Australia and General Countries

*2: For G.C.C. Countries

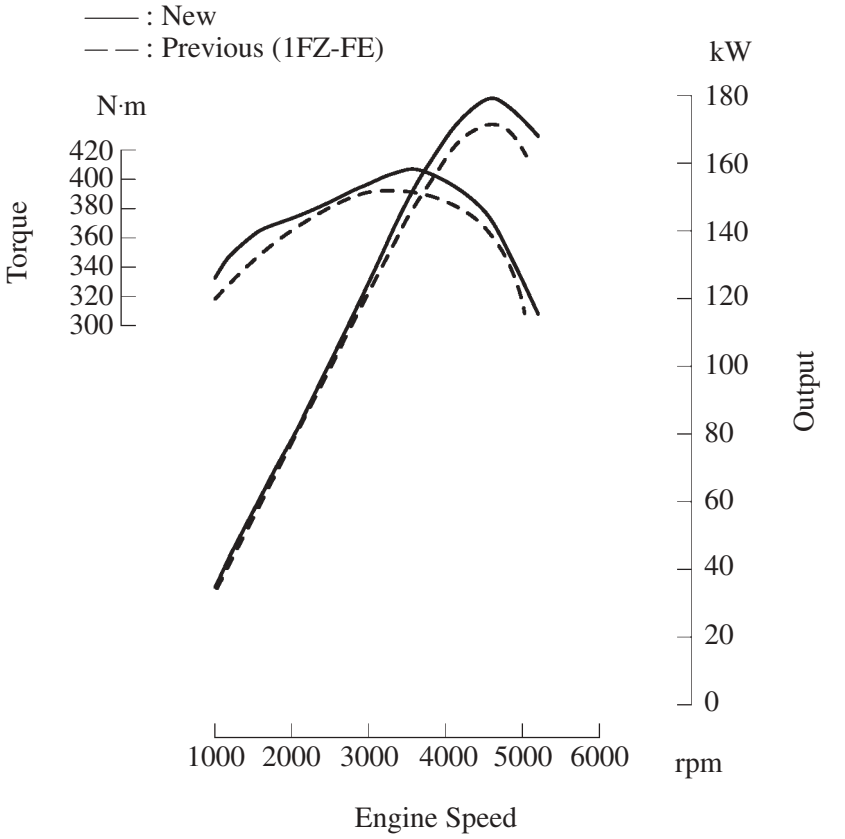
EG

**▶ Australia and General Countries (SAE-NET) ◀**




147EG01

**▶ G.C.C. Countries (SAE-GROSS) ◀**




147EG02

## ■ MAJOR DIFFERENCES

The following changes have been made to the 1FZ-FE engine.

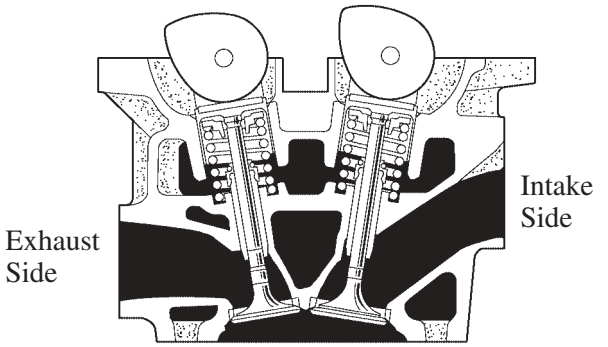
| System | Features |
|---|---|
| Engine Proper | ● The engine performance has been improved by changing the shape of the cylinder head's combustion chamber and enlarging the intake port diameter.<br>● Reinforcements have been added to the cylinder block ribs and skirts to reduce noise and vibration.<br>● The shape of the piston has been changed for weight reduction and improved reliability. |
| Valve Mechanism | ● The amount of valve has been increased (both intake and exhaust from 8.3 mm to 8.7 mm) to improve engine performance. |
| Cooling System | ● An aluminum radiator core is used for weight reduction.<br>● The shape of the portion of the cylinder block to which the water pump is mounted has been optimized to improve the water flow characteristics, thus improving the reliability of the engine.<br>● A step-up linear type temperature controlled fluid coupling has been adopted. |
| Intake and Exhaust System | ● The shape of the intake manifold has been changed for weight reduction and the capacity of the intake air chamber has been increased to improve the engine performance.<br>● The methed for joining exhaust pipes together is changed from the flange type to the clamp type. For details, see page 80.<br>● The exhaust pipe is made of stainless steel to improve its corrosion resistance. |
| Fuel System | ● 4-hole type fuel injectors have been adopted to improve the atomization of fuel.<br>● A quick connector is used to connect the fuel filter and the fuel hose together to improve serviceabaility.<br>● The sub fuel tank system has been changed. |
| Ignition System | ● The DIS (Direct Ignition System) is used to enhance the reliability of the ignition system. |
| Engine Control System | ● The fuel injection system is changed from sequential multiport fuel injection type to 3-group injection type.<br>● The ISC valve is changed from step moter type to rotary solenoid type.<br>● Engine immobiliser system is adopted.<br>● M-OBD (Multiplex On-Board Diagnosis) system is adopted. |

## ■ENGINE PROPER

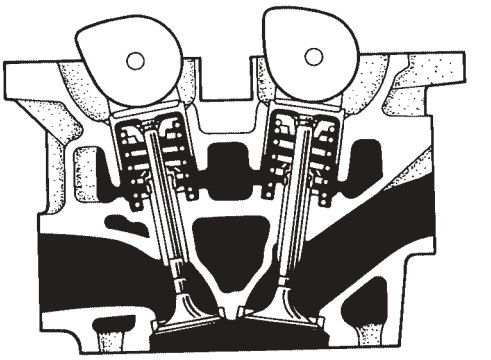
### 1. Cylinder Head

- The shape of the combustion chamber in the cylinder head has been optimized to improve its volumetric efficiency. As a result, the performance of the engine has been improved.
- The intake port diameter has been increased and the portion to which the intake valve seat is installed has been optimized to improve engine performance.

**▶ Cylinder Head Cross Section ◀**



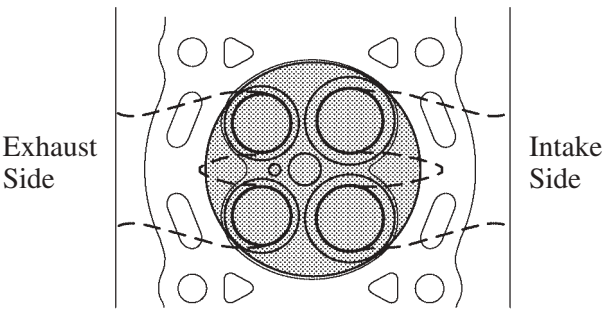

**New**



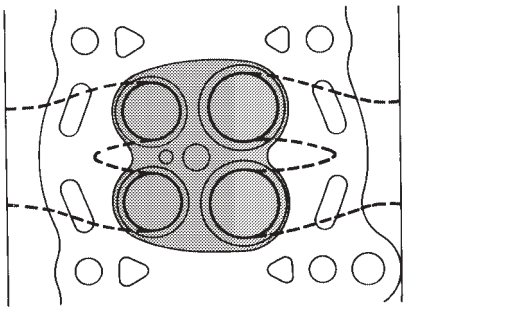

**Previous**

**▶ Combustion Chamber ◀**

**: Combustion Chamber**




**New**




**Previous**

### 2. Piston

The piston has been made more compact in its skirt area for weight reduction and reduced friction loss.

147EG08

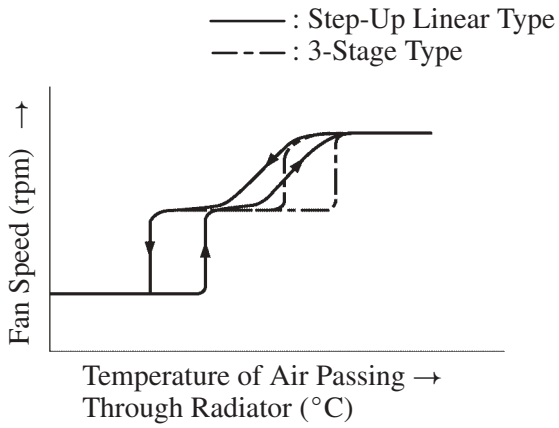
**New** **Previous**



## ■COOLING SYSTEM

### 1. Coupling Fan

A step-up linear type temperature controlled fluid coupling has been adopted to realize both cooling performance and noise reduction.




147EG06

### 2. Piston

The piston has been made more compact in its skirt area for weight reduction and reduced friction loss.

147EG08

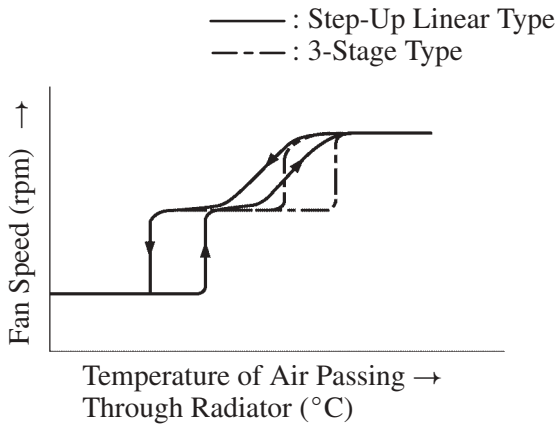
**New** **Previous**



## ■COOLING SYSTEM

### 1. Coupling Fan

A step-up linear type temperature controlled fluid coupling has been adopted to realize both cooling performance and noise reduction.

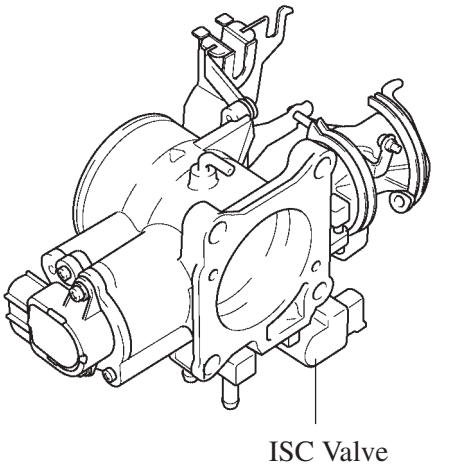



147EG06

## ■INTAKE AND EXHAUST SYSTEM

### 1. Throttle Body

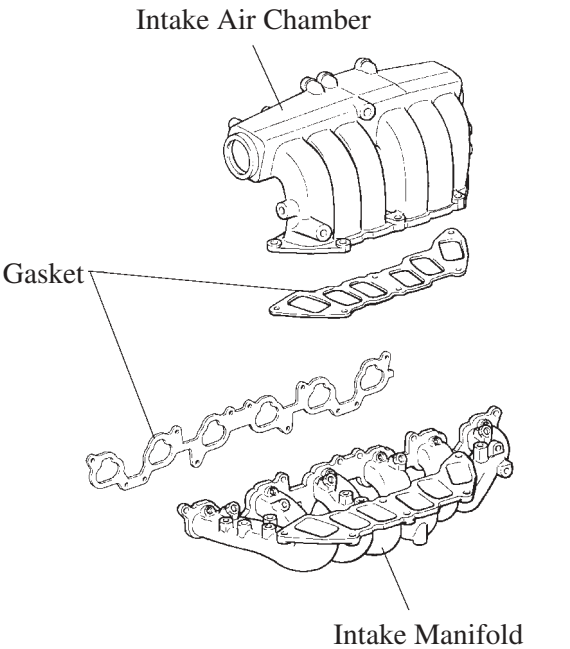
The throttle body has been made lightweight and compact by shortening its length and adopting a rotary solenoid type ISC valve.




147EG45

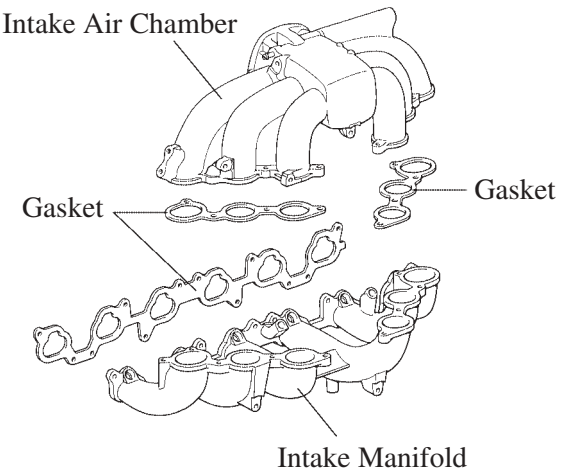
### 2. Intake Manifold

The shape of the intake manifold has been revised for weight reduction. In addition, the capacity of the intake air chamber has been increased to improve the engine performance.




147EG09

**New**



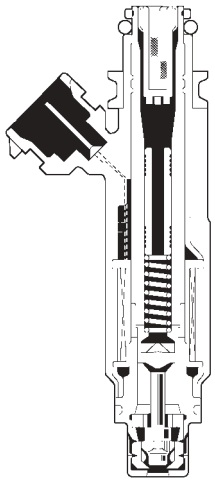

147EG19

**Previous**

## ■FUEL SYSTEM

### 1. Injector

The injector has been made more compact and lightweight. In addition, the injection nozzle has been changed (from 2 to 4 holes) to improve the atomization of the fuel.

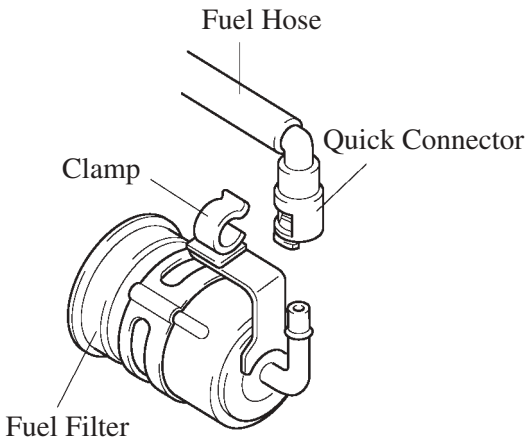


147EG07



### 2. Fuel Filter

A quick connector is used to connect the fuel filter and the fuel hose together to improve serviceability.

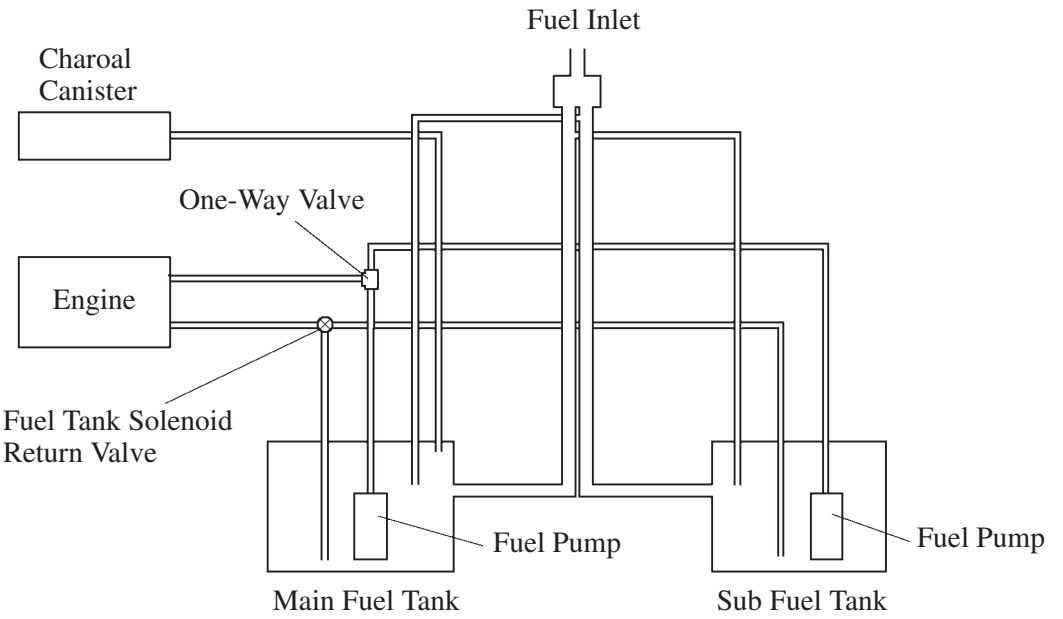



156EG27

## 3. Sub Fuel Tank System

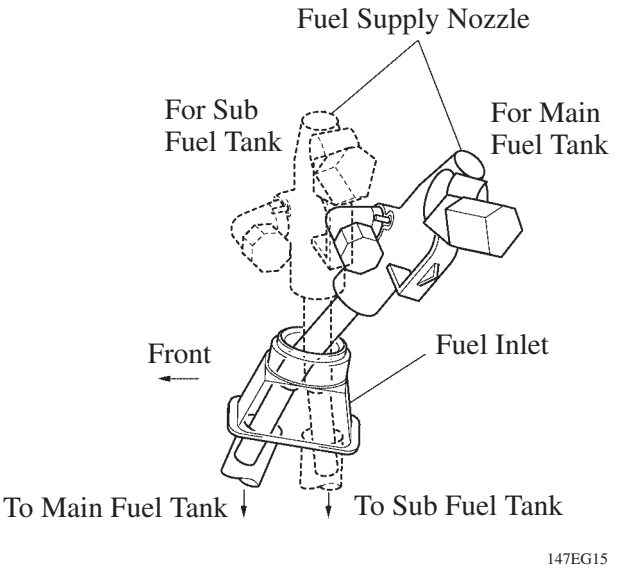
### General

The previous model used a system that transfers the fuel from the sub fuel tank to the main fuel tank. However, on the new model, the switching of fuel supply between the main and sub fuel tanks is accomplished by engaging the appropriate fuel pump (main or sub) and switching the fuel tank solenoid return valve. For details, see page 58 in the Engine Control System section.
Furthermore, this system is designed so that the return fuel flows into the sub fuel tank at the time the engine is started so that the amount of fuel in the sub fuel tank increases gradually.




### Fuel Inlet

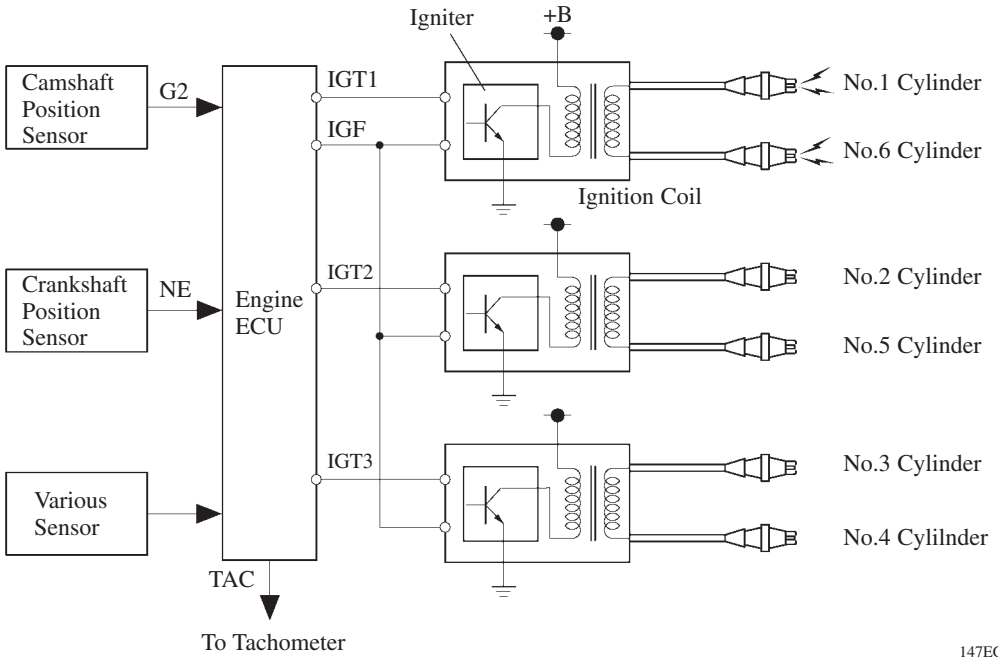
On the previous model, fuel was filled into the desired fuel tank, main or sub, by switching the fuel supply valve. However, on the new model, the fuel supply nozzle is inserted into either of the two fuel inlets to fill the desired fuel tank.



## ■IGNITION SYSTEM

### 1. General

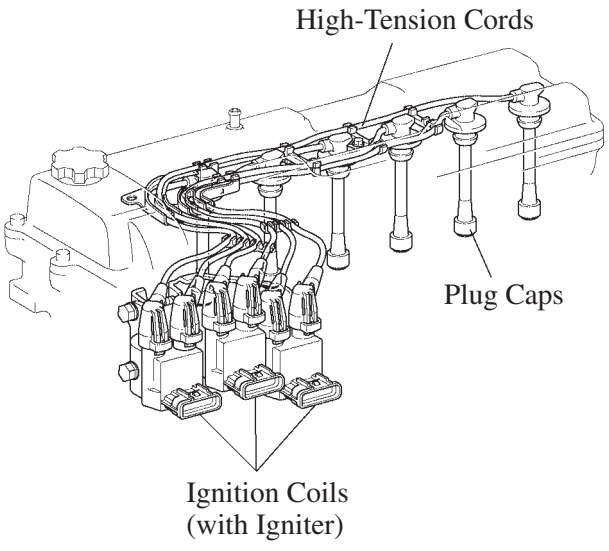
A DIS (Direct Ignition System) has been adopted in the new 1FZ-FE engine. The DIS improves the ignition timing accuracy, reduces high-voltage loss, and enhances the overall reliability of the ignition system by eliminating the distributor.
The DIS in new 1FZ-FE engine is a 2-cylinder simultaneous ignition system which ignites 2 cylinders simultaneously with one ignition coil.

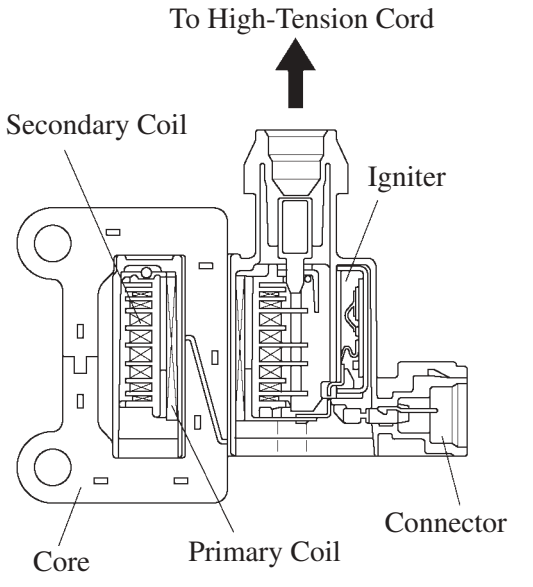



### 2. Ignition Coil

#### Construction

Construction of the DIS system of the 1FZ-FE engine consists of 3 sets of ignition coils integrated with the igniter and with the high-tension cords attached directly to the ignition coil.

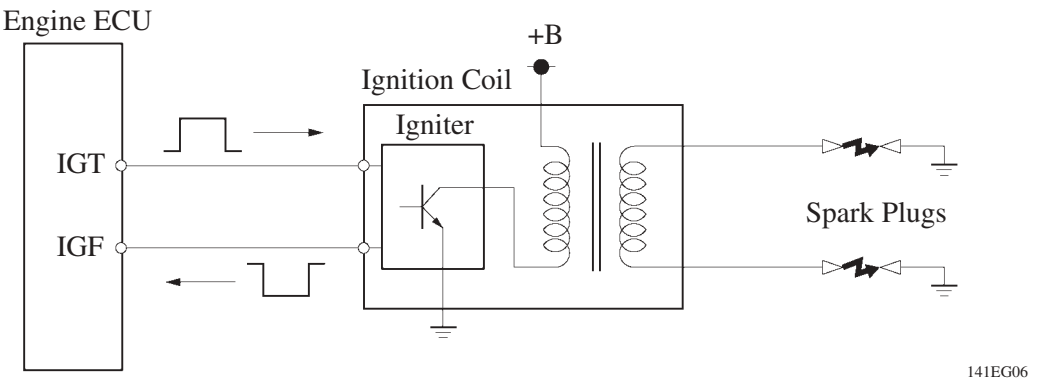



**Ignition Coil Cross Section**

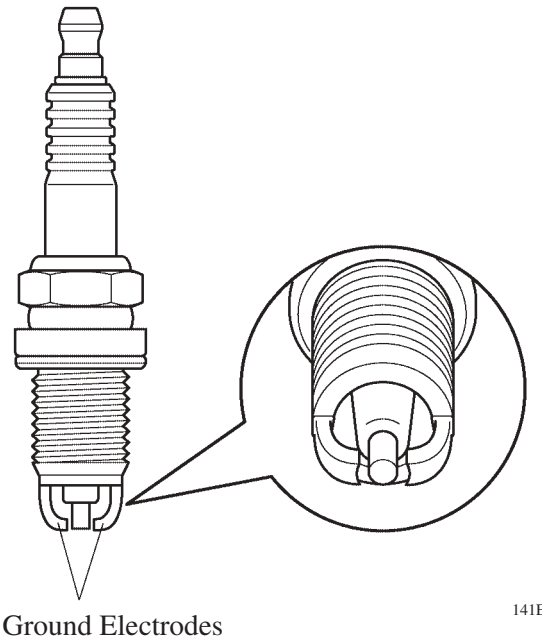
### Operation

Prompted by the IGT signal received from the engine ECU, the power transistors in the igniter cut off the current to the primary coil in the ignition coil. Accordingly, the high voltage generated in the secondary coil is supplied simultaneously to the 2 spark plugs via the high-tension cords that are connected to the both ends of the secondary coil. At the same time, the igniter also sends an ignition confirmation signal (IGF) as a fail-safe function to the engine ECU.




## 3. Spark Plugs

Twin ground electrode spark plugs are used on the 1FZ-FE engine. Due to the adoption of the DIS system, the number of sparks produced is double that produced in the conventional ignition system. To maintain spark plug durability, the ground electrodes have been made bipolar.




**▶ Recommended Spark Plugs ◀**

| | |
|---|---|
| DENSO | K16TR11 |
| NGK | BKR5EKB11 |
| Plug Gap | 1.0 – 1.1 mm<br>(0.039 – 0.043 in.) |

## ■ENGINE CONTROL SYSTEM

### 1. General

The engine control system has been changed to the D-type EFI system and the 3-grope type fuel injection system. In addition, the sub fuel tank control system, engine immobiliser system, and M-OBD (Multiplex On-Board Diagnosis) system have been newly adopted.
The engine control system of the new 1FZ-FE engine and previous 1FZ-FE engine are compered below.

| System | Outline | New | Previous |
|---|---|---|---|
| EFI (Electronic Fuel Injection) | A D-type EFI system is used, which indirectly detects intake air volume by manifold pressure sensor signal. | ○ | — |
| | An L-type EFI system is used, which directly detects the intake air mass with a hot-wire type air flow meter. | — | ○ |
| | The fuel injection system is a 3-group type, each of which injects 2 cylinders simultaneously. | ○ | — |
| | The fuel injection system is a sequential multiport fuel injection system. | — | ○ |
| ESA (Electronic Spark Advance) | Ignition timing is determined by the engine ECU based on signals from various sensors. | ○ | ○ |
| | It retards ignition timing to suppress knocking when it occurs. | ○ | ○ |
| | In vehicles equipped with automatic transaxle, torque control correction during gear shifting has been used to minimize the shift shock. | ○ | ○ |
| ISC (Idle Speed Control) | A rotary solenoid type ISC system is used to control the fast idle and idle speeds. | ○ | — |
| | A step motor type ISC system controls the fast idle and idle speeds. | — | ○ |
| Fuel Pump Control | Under light engine loads, pump speed is low to reduce electric power loss. | ○ | — |
| Air Conditioner Cut-Off Control | By controlling the air conditioner compressor in accordance with the throttle valve opening angle and the vehicle speed, driveability is maintained. | ○ | — |
| Sub Fuel Tank Control | Drivers use the fuel tank changeover switch to select the fuel tank (main or sub) they wish to use. | ○*1 | — |
| Engine Immobiliser | Prohibits fuel delivery and ignition if an attempt is made to start the engine with an invalid ignition key. | ○*2 | — |
| Diagnosis | When the engine ECU detects a malfunction, the engine ECU diagnoses and memorizes the failed section. | ○ | ○ |
| | A newly developed diagnostic system which utilizes a high speed bi-directional communication line to provide extended diagnostic capabilities and features. | ○ | — |
| Fail-Safe | When the engine ECU detects a malfunction, the engine ECU stops or controls the engine according to the data already stored in memory. | ○ | ○ |

*1: Only on models equipped with sub tank system.
*2: Only on models equipped with the engine immobiliser system.

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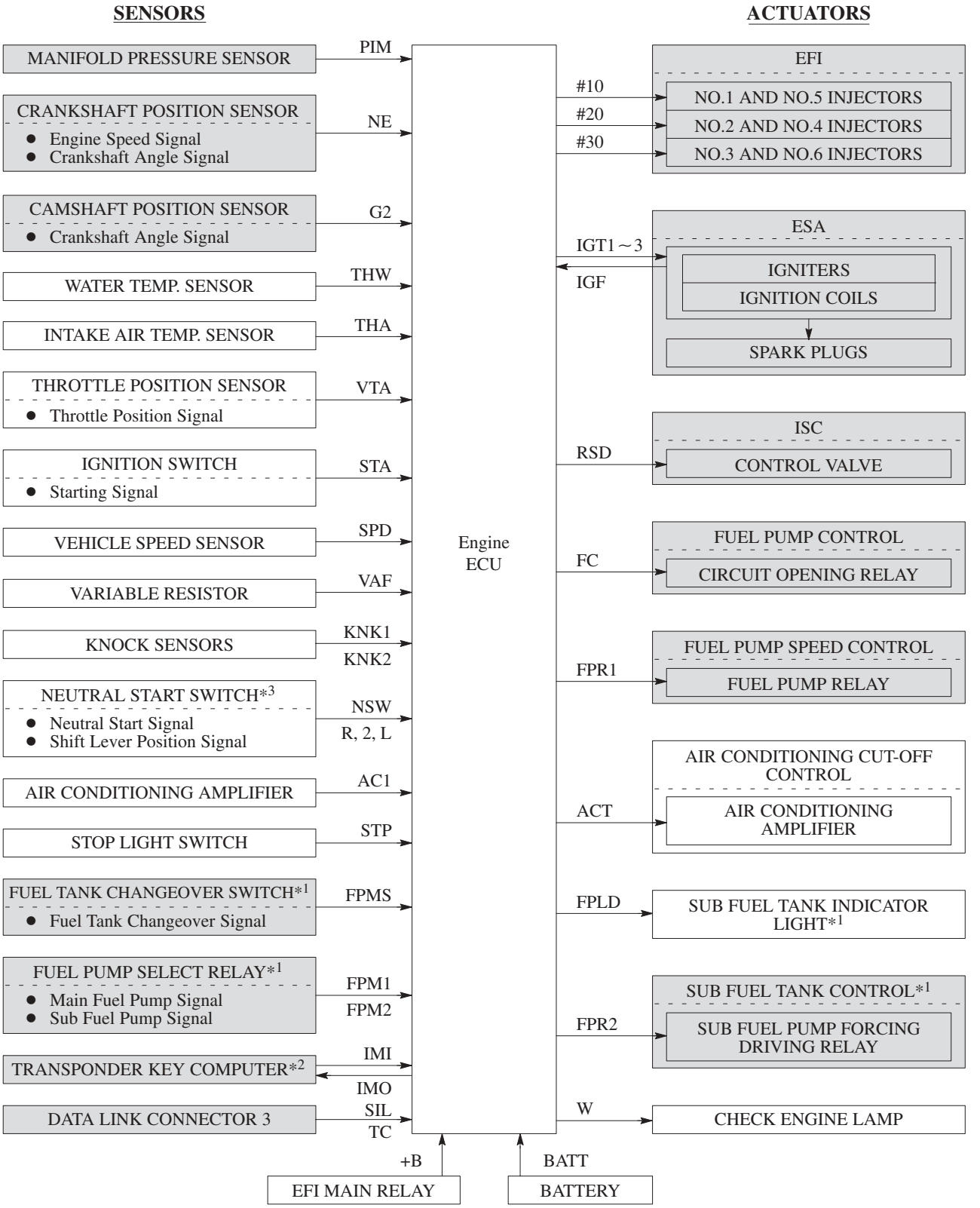
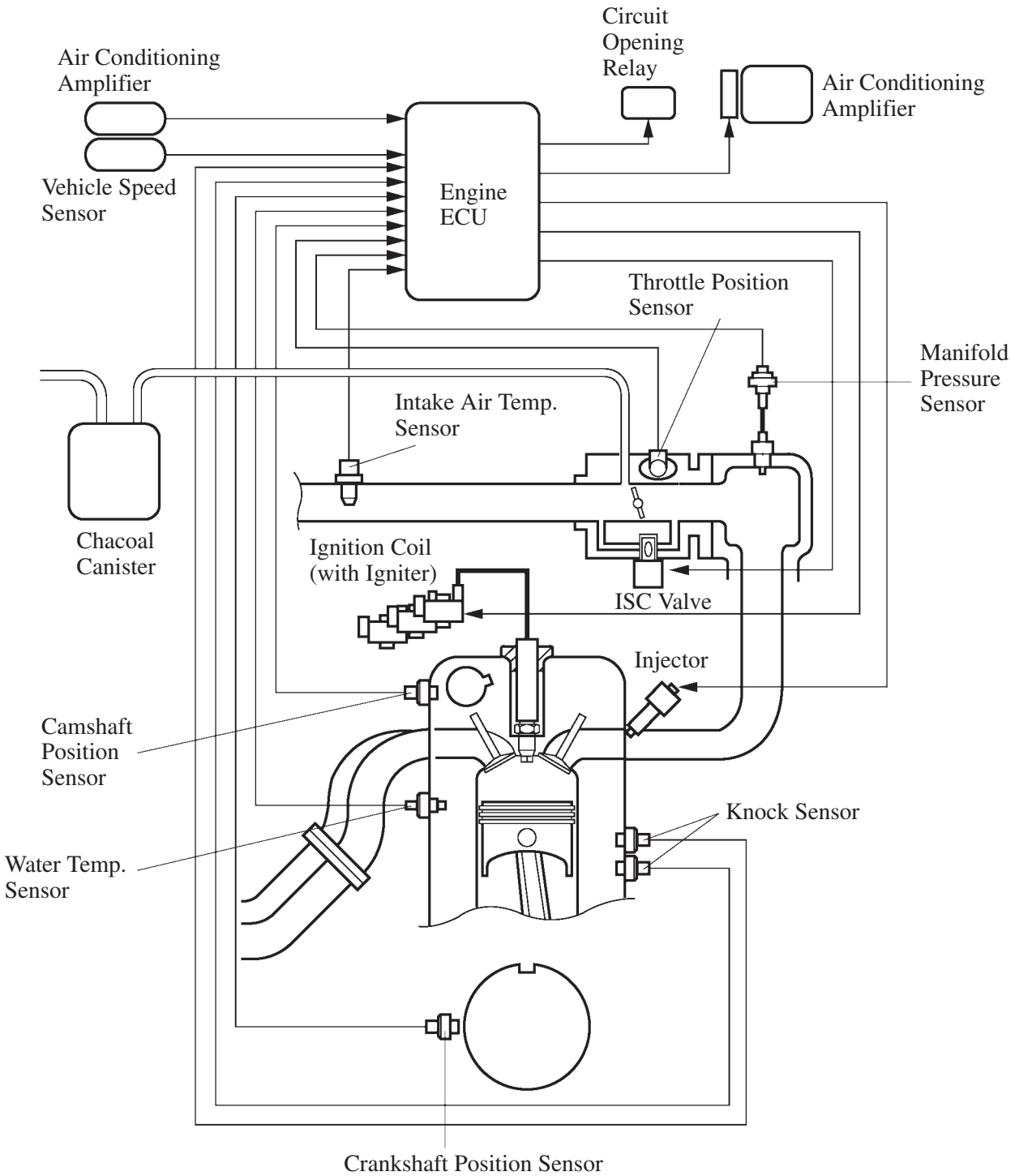
## 2. Construction

The configuration of the engine control system in the new 1FZ-FE engine is as shown in the following chart. Shaded portions [ ] differ from the previous 1FZ-FE engine.




*1: Only on models sub fuel tank system.
*2: Only on models with the engine immobiliser system.
*3: Applicable only to automatic transmission model.

## 3. Engine Control System Diagram

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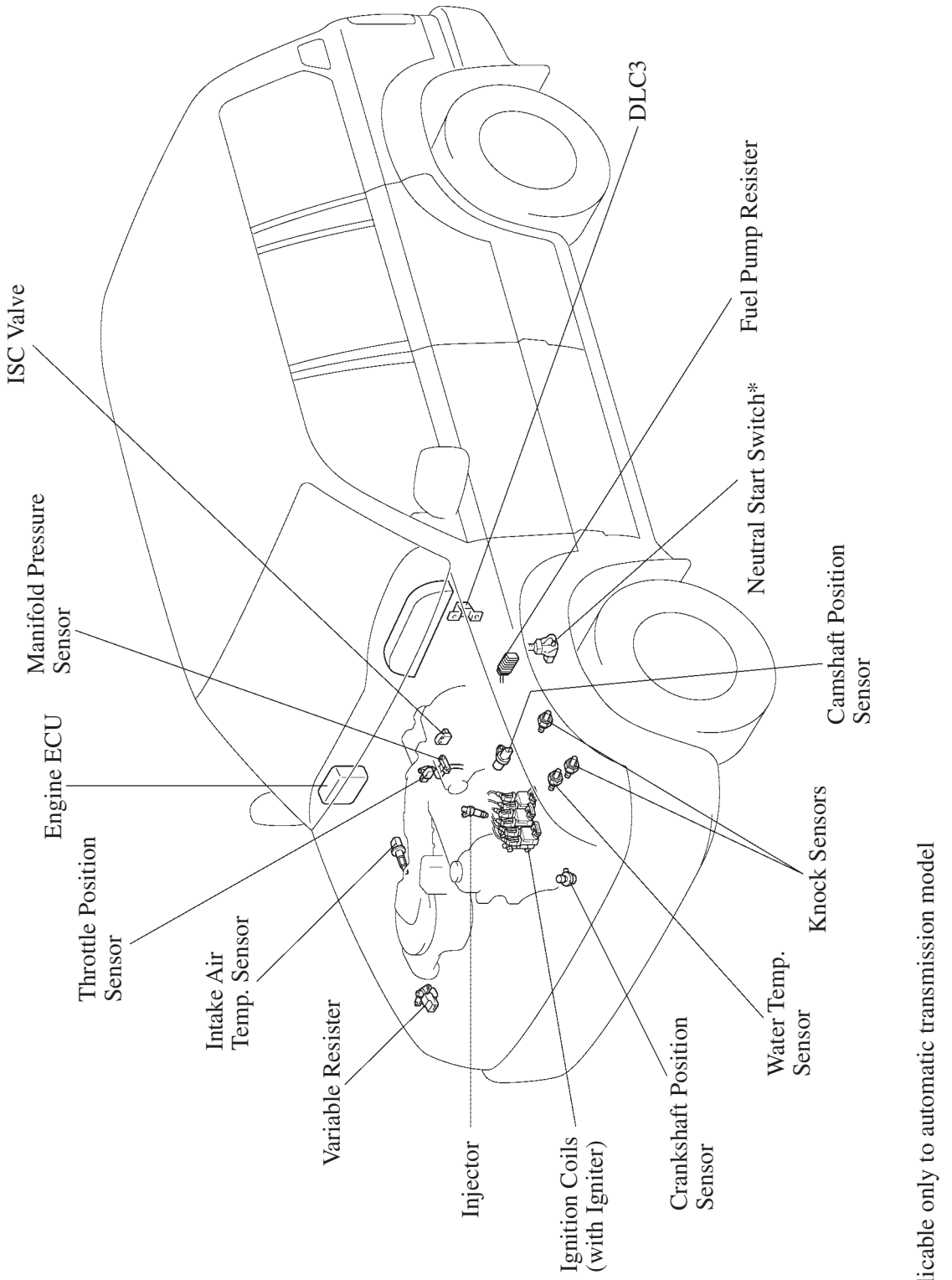
## 4. Layout of Components




*: Applicable only to automatic transmission model

## 4. Main Components of Engine Control System

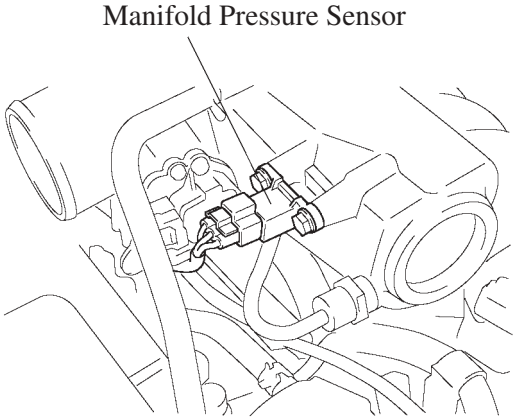
### General

The following table compares the main components of the new 1FZ-FE engine and previous 1FZ-FE engine.

| 1FZ-FE Engine / Components | | New | Previous |
|---|---|---|---|
| Manifold Pressure Sensor | | Semiconductor Type | — |
| Air Flow Meter | | — | Hot-Wire Type |
| Crankshaft Position Sensor | | Pick-Up Coil Type, 1 | — |
| Camshaft Position Sensor | | Pick-Up Coil Type, 1 | — |
| Distributor | Crankshaft Angle Sensor and Engine Speed Sensor | — | 3 Pick-Up Coil (G1, G2, NE) |
| Throttle Position Sensor | | Linear Type | ← |
| Knock Sensor | | Built-In Piezoelectric Type, 2 | ← |
| Injector | | 4-Hole Type | 2-Hole Type |
| ISC Valve | | Rotary Solenoid Type | Step Motor Type |

### Manifold Pressure Sensor

The manifold pressure sensor consists of a semiconductor which utilizes the characteristic of a silicon chip that changes its electrical resistance when pressure is applied to it. The sensor converts the manifold pressure into an electrical signal, and sends it to the engine ECU in an amplified form.

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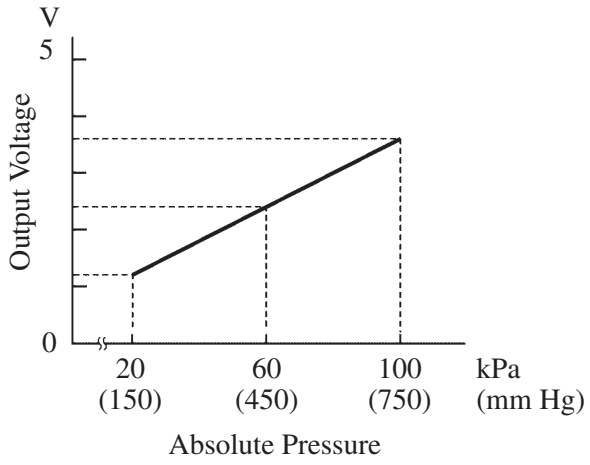


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**Manifold Pressure Sensor Output Characteristics**

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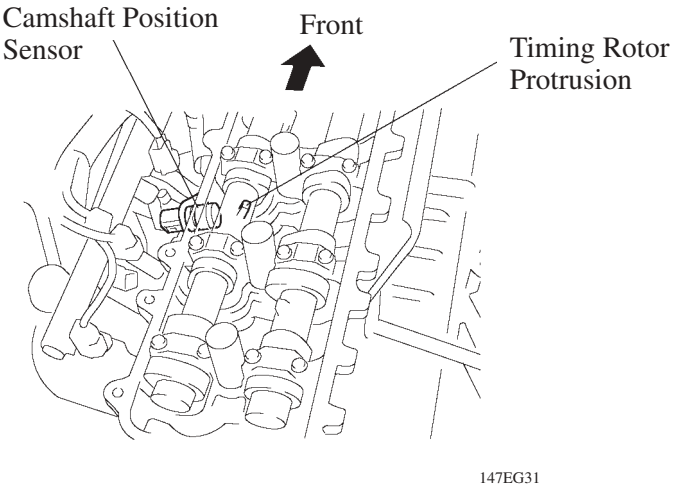
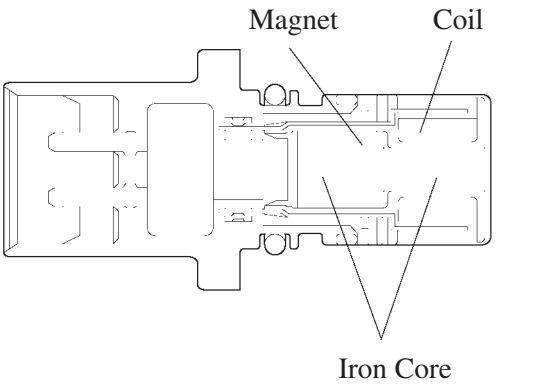
### Camshaft Position Sensor

The camshaft position sensor consists of a magnet, coil and iron core, and mounted onto the intake side of the cylinder head. The timing rotor is integrated with the intake camshaft.
Each time when the camshaft rotates, the air gap between the camshaft position sensor and the protrusion integrated onto the camshaft is varied. This causes the magnetic flux passing through the pickup coil to increase and decrease, generating an electromotive force. Since the voltage generated when the camshaft protrusion approaches the pickup coil is the opposite of when it departs, an alternating electrical current is produced.

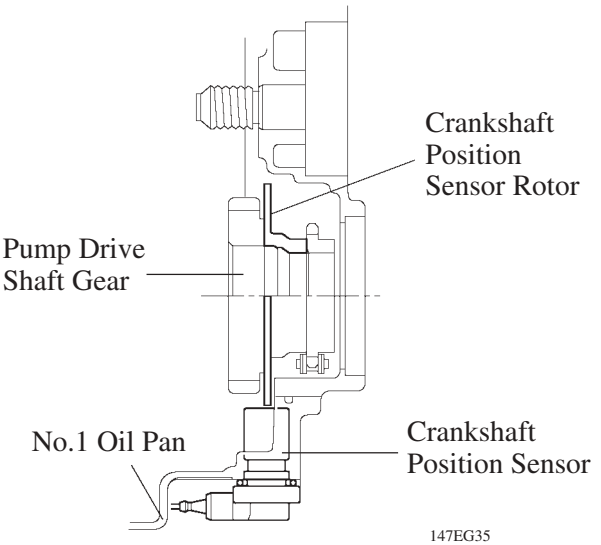


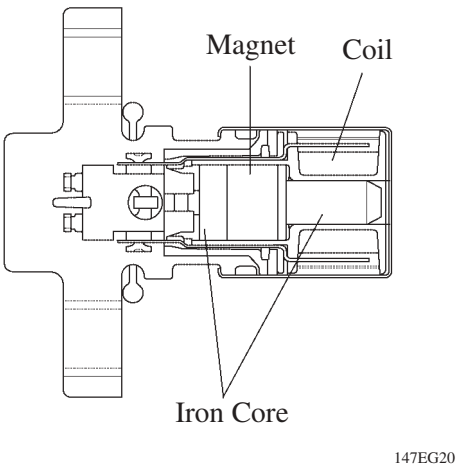




**Camshaft Position Sensor Cross Section**

### Crankshaft Position Sensor

The crankshaft position sensor also consists of a magnet, coil and iron core, and is mounted on the No.1 oil pan as illustrated below.
The timing rotor is integrated with the crankshaft pulley. The rotor's teeth are spaced 10° apart, according to crankshaft angle, but since there are 2 teeth missing, as illustrated below, there is a total of 34 teeth. Accordingly, the engine ECU can detect the crankshaft angle in addition to the crankshaft speed.

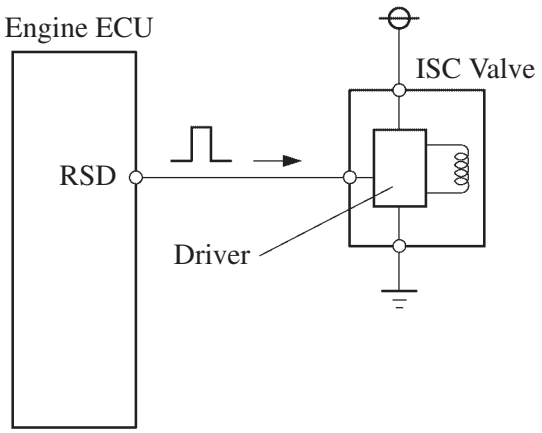



**Crankshaft Position Sensor Cross Section**

### ISC Valve

A lightweight and compact rotary solenoid type ISC valve has been adopted. Also, a 1-coil type ISC valve with a built-in driver has been adopted to simplify the system.



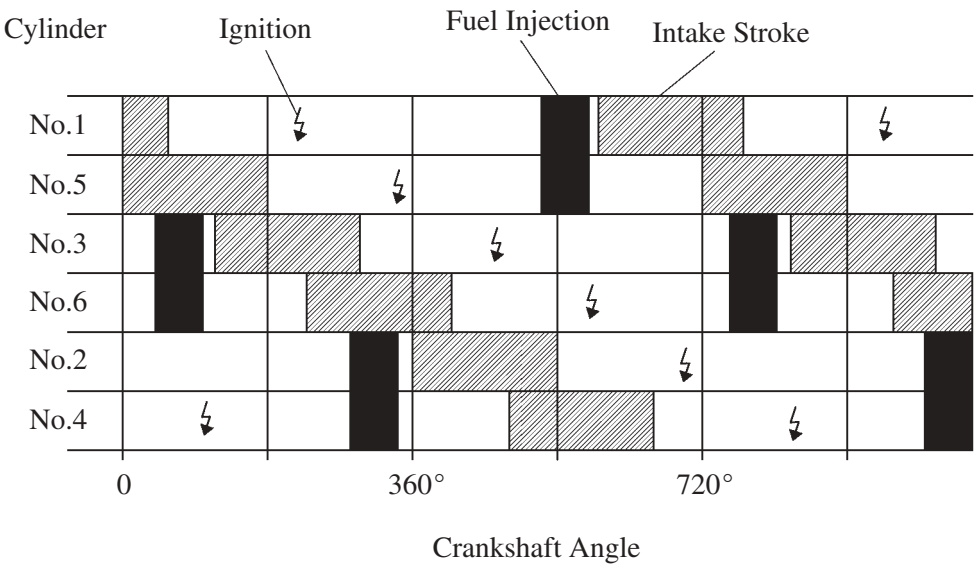

141EG30



## 6. EFI (Electronic Fuel Injection)

### 1) Fuel Injection Pattern

The previous sequential multiport fuel injection system has been changed to the 3-group injection system in which fuel is injected simultaneously into 2 cylinder each time the engine makes 2 revolutions.

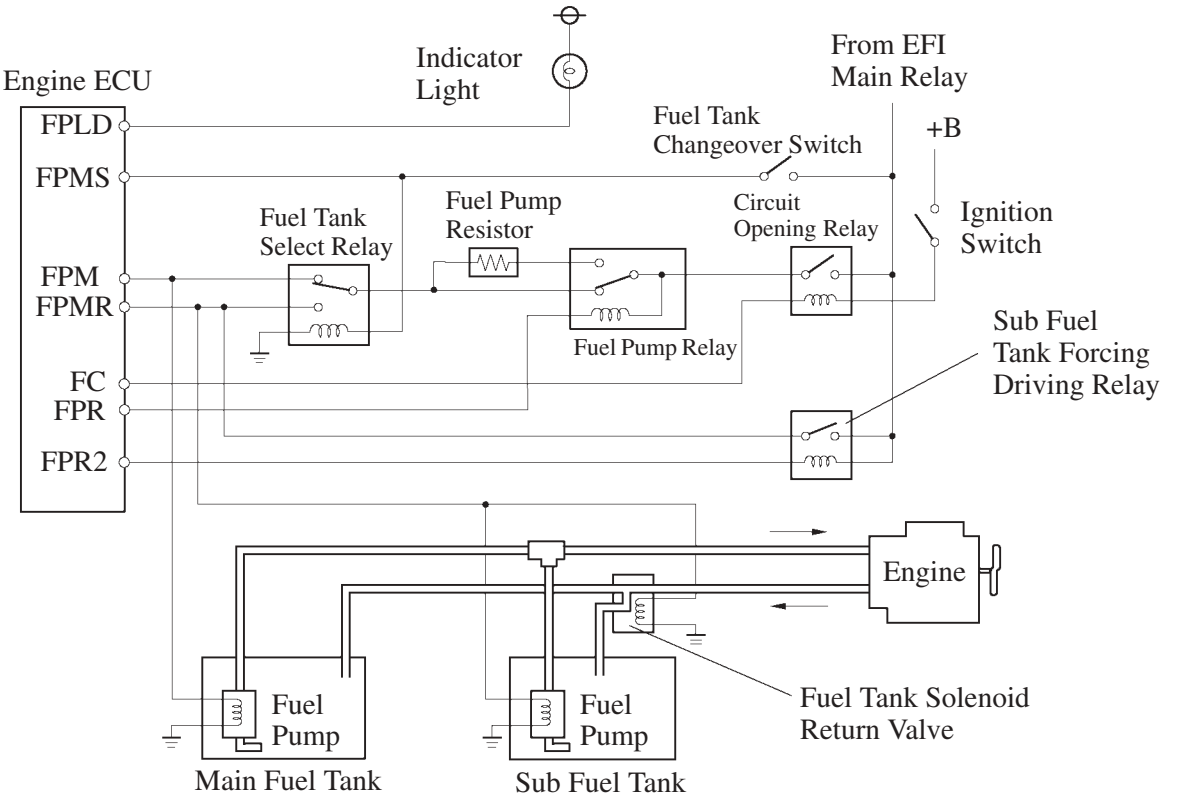



147EG13

## 7. Sub Fuel Tank Control

### General

- By activating the fuel pump of the fuel tank (main or sub) that was selected by the fuel tank changeover switch, and by changing over the fuel return valve, fuel is supplied to the engine from the fuel tank selected by the driver.
- If a problem occurs in the electrical circuitry, the indicator light flashes to inform the driver.
- A diagnosis function is included for this system.



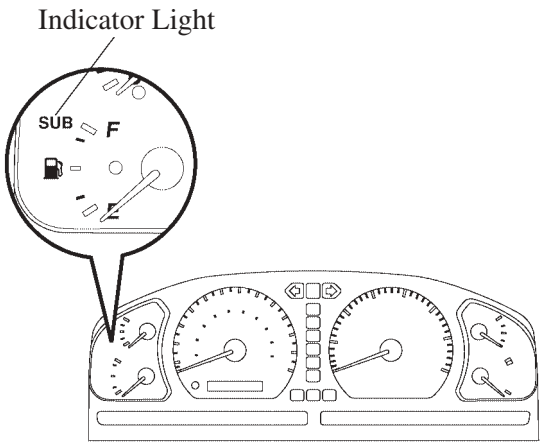

147EG16

### Operation

- Turning the fuel tank changeover switch ON causes the fuel tank select relay to turn ON. This causes the fuel pump for the sub fuel tank to operate and supply the fuel in the sub fuel tank to the engine. At the same time, the fuel tank solenoid return valve turns ON to return the fuel to the sub fuel tank.
  In addition, the engine ECU turns on the indicator light to inform the driver that fuel is being supplied from the sub fuel tank.
- After the engine has started, if the engine coolant temperature is below a specified value, the engine ECU turns ON the sub fuel pump. This forces the driving relay to operate the sub fuel pump for a given time, thus preventing the sub fuel pump from seizure.
  Because the fuel tank solenoid return valve is also turned ON at this time, the return fuel is supplied to the sub fuel tank.

### Diagnosis

If malfunction occurs in electrical circuity, the indicator light will blinks and alert the driver that a malfunction has occurred. The ECU will also store the codes of the malfunctions. For the diagnostic code check method, diagnostic code and diagnostic code clearance, see the 1FZ-FE Engine Repair Manual Supplement (Pub. No. RM619E).

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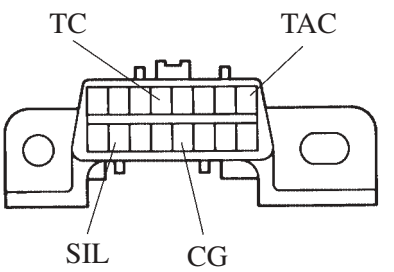
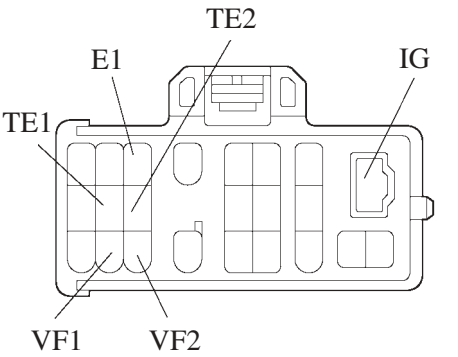
## 8. Engine Immobiliser System

The engine immobiliser system has been designed to prevent the vehicle from being stolen. This system uses a transponder key computer that stores the ID code of the authorized ignition key. If an attempt is made to start the engine using an unauthorized key, the transponder key computer emits a signal to the engine ECU to prohibit fuel delivery and ignition, effectively disabling the engine. For details, see page 277 in the Engine Immobiliser System section.

## 9. Diagnosis System

The M-OBD (Multiplex On-Board Diagnostic) system that has been adopted in the 1FZ-FE engine is the system that has been improved upon the previous diagnostic system in order to perform troubleshooting in a more efficient and accurate manner.
The functions of the M-OBD system can be fully utilized through the use of a hand-held tester.
The following table compares the M-OBD system and previous diagnostic system.

| System / Item | M-OBD | Previous Diagnostic |
|---|---|---|
| Check Connector and Data Link Connector | The DLC3 (Data Lilnk Connector 3) has been newly provided. In addition, the check connector terminals TE1, TE2, and IG have been discontinued.<br>▶ **DLC3** ◀<br>  <br><br>140EG127<br>CG: Chassis Ground<br>SIL: Provides communication between the engine ECU and the hand-held tester.<br>TAC: Outputs the engine speed signal.<br>TC: Provides the same function as the previous TE1 terminal. | The check connector is provided.<br>▶ **Check Connector** ◀<br>  <br><br>140EG39 |
| Diagnostic Trouble Code Check Method | After connecting terminals TC and CG of the DLC3, displays the code on CHECK Engine Lamp in the combination meter. | After connecting terminals TE1 and E1 of the check connector, displays the code on CHECK Engine Lamp in the combination meter. |
| Output Engine ECU Date | The engine ECU's control data can be output by connecting the hand-held tester to the DLC3.<br>Output Date Speed: 9.6 kbps | The engine ECU's control data can be output by connecting the hand-held tester to the check connector.<br>Output Date speed: 125 bps |

Furthermore, on the M-OBD system, the functions listed below can be utilized by connecting the hand-held tester to the DLC3.

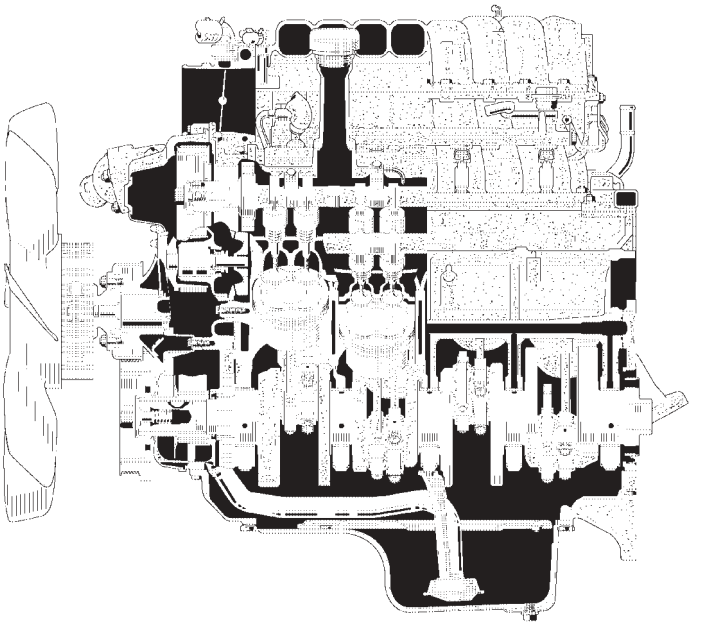
| Function | Details |
|---|---|
| Diagnostic Trouble Code | The system can output 5-digit diagnostic trouble codes to the tester, which are more detailed than the previous 2-digit diagnostic trouble codes, thus making it easier to identify the location of the problem.<br>Example:<br>Code 28 (Oxygen Sensor) → P0130 (Oxygen Sensor)<br>→ P0135 (Oxygen Sensor Heater) |
| Freeze-Frame Data | The system can output freeze-frame data to the tester. This data (which depicts the condition of the engine control system and the vehicle) is stored in the engine ECU at the very moment when the engine ECU has detected its last data of malfunction. |
| Active Test | Through the use of the tester, the actuators (VSV, fuel pump, ISC valve, etc.) can be activated to a desired state. |
| Trouble Code Clear | Through the use of the tester, trouble codes stored in the engine ECU can be cleared. |

- For details of the diagnostic trouble codes, active test, etc. described above, refer to the 1FZ-FE Engine Repair Manual Supplement (Pub. No. RM619E).
- For details of the hand-held tester, refer to the Hand-Held Tester Operator's Manual.

# 2UZ-FE ENGINE

## ■ DESCRIPTION

A new V8, 4.7-liter, 32-valve DOHC engine that has been developed to realize high performance, quieter operation, and improved fuel economy, the 2UZ-FE engine features the ETCS-i (Electronic Throttle Control System-intelligent) to ensure excellent controllability of the vehicle and improve its comfort.



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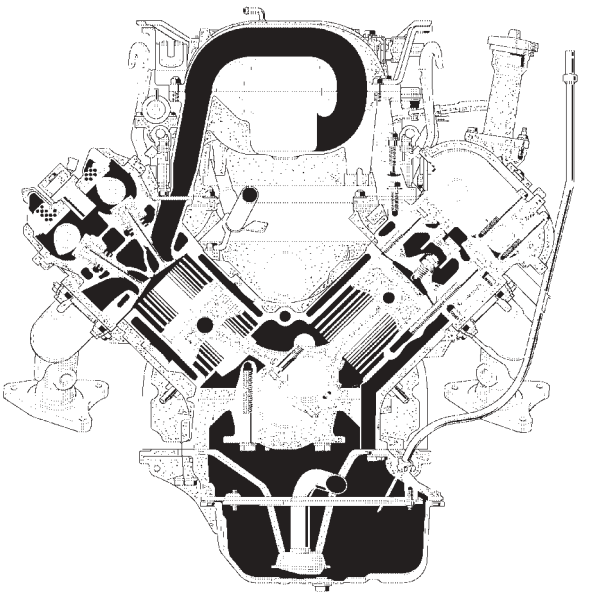

156EG24

## ■ENGINE SPECIFICATIONS AND PERFORMANCE CURVES

| Item \ Engine | | | 2UZ-FE |
|---|---|---|---|
| No. of Cyls. & Arrangement | | | 8-Cylinder, V Type |
| Valve Mechanism | | | 32-Valve DOHC, Belt & Gear Drive |
| Combustion Chamber | | | Pentroof Type |
| Manifolds | | | Cross-Flow |
| Fuel System | | | EFI |
| Displacement cm³ (cu. in.) | | | 4664 (284.5) |
| Bore X Stroke mm (in.) | | | 94.0 x 84.0 (3.70 x 3.31) |
| Compression Ratio | | | 9.6 : 1 |
| Max. Output | | Europe | 173 kW @ 4800 rpm (EEC) |
| | | Australia and General Countries | 170 kW @ 4800 rpm (SAE-NET) |
| | | G.C.C. Countries | 186 kW @ 4800 rpm (SAE-GROSS) |
| Max. Torque | | Europe | 434 N·m @ 3400 rpm (EEC) |
| | | Australia and General Countries | 410 N·m @ 3400 rpm (SAE-NET) |
| | | G.C.C. Countries | 431 N·m @ 3400 rpm (SAE-GROSS) |
| Valve Timing | Intake | Open | 3° BTDC |
| | | Close | 36° ABDC |
| | Exhaust | Open | 46° BBDC |
| | | Close | 3° ATDC |
| Fuel Octane Number RON | | | 95*1, 91*2 |
| Oil Grade | | | API SH EC-II, SJ EC or ILSAC |

*1: For Europe

*2: For Australia, G.C.C. Countries and General Countries

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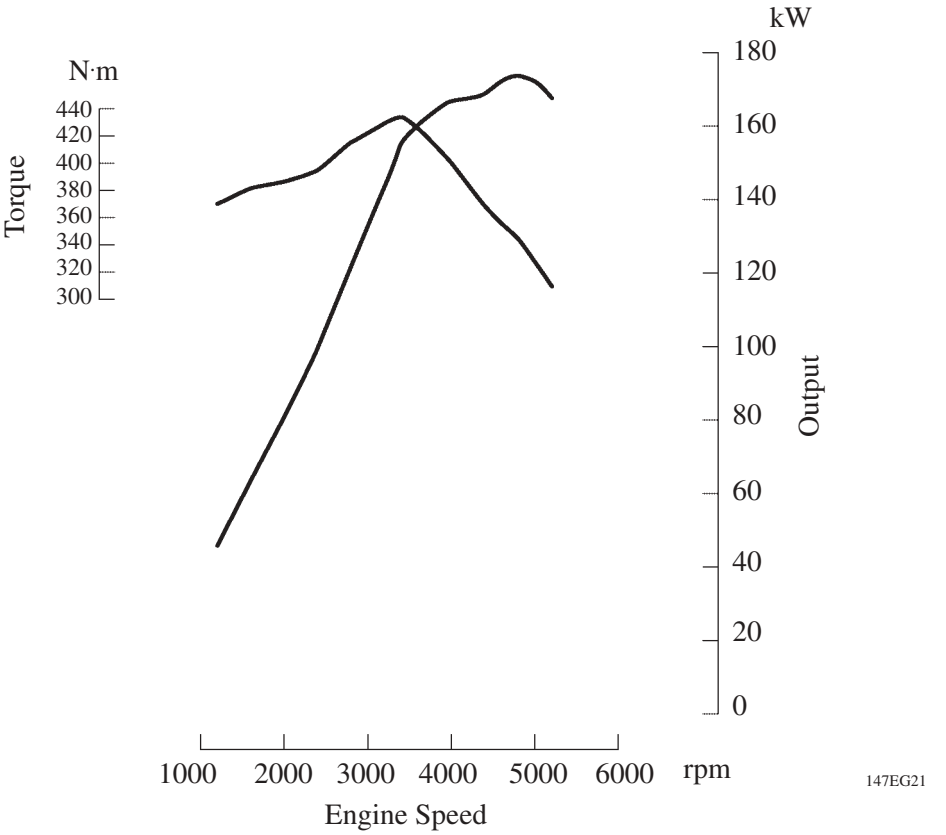
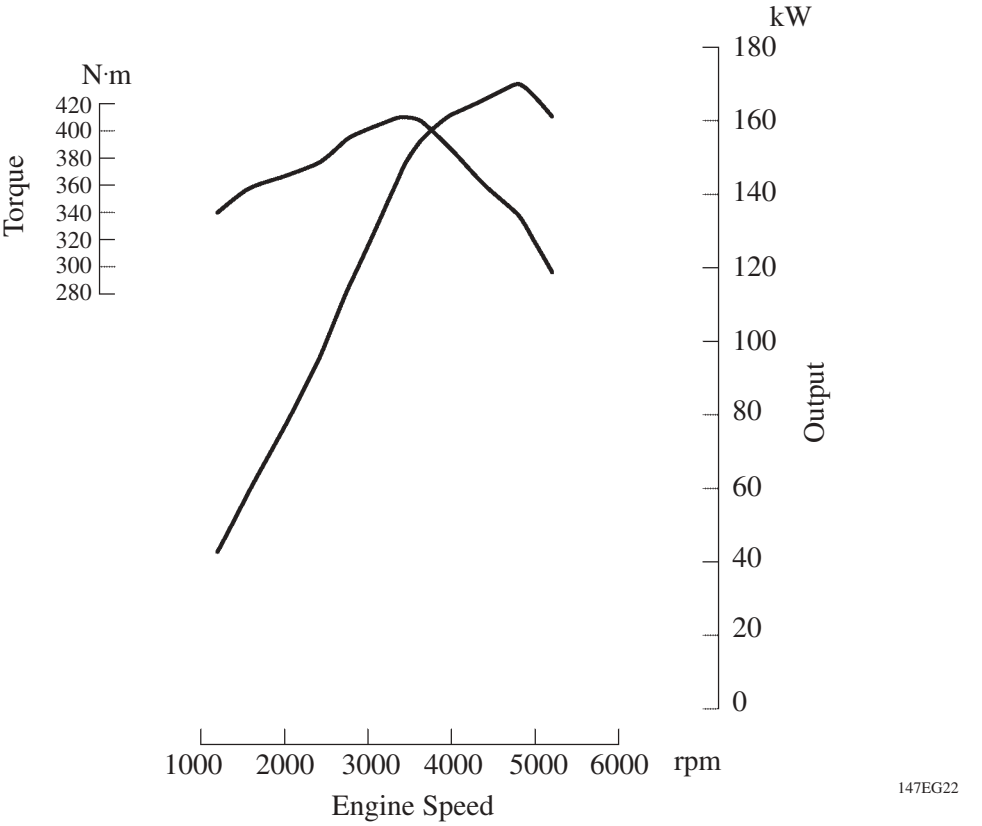
▶ **Europe** ◀




▶ **Australia, General Countries and G.C.C. Countries*** ◀




*: Because the figures for the G.C.C. countries are indicated in SAE-NET, they appear to be lower than the SAE-GROSS figures.

## ■ FEATURES OF 2UZ-FE ENGINE

Features of the 2UZ-FE engine are listed below.

| System | Features |
|---|---|
| Engine Proper | ● An upright intake port has been adopted to improve the intake efficiency.<br>● A taper squish configuration has been adopted to improve the combustion efficiency.<br>● A steel laminate type cylinder head gasket has been adopted to improve its reliability.<br>● An aluminum oil pan that is integrated with stiffeners has been adopted to reduce noise and vibration.<br>● The skirt portion of the piston has been applied with ting plating to reduce friction. |
| Valve Mechanism | ● Inner shim type valve lifters have been adopted.<br>● Large-diameter intake and exhaust valves have been adopted to reduce the intake and exhaust resistance. |
| Intake and Exhaust System | ● A long port intake manifold is used to improve the engine's torque in the low-to mid speed range.<br>● A 2-way exhaust control system has been adopted to improve engine performance and to ensure an even quieter operation. |
| Fuel System | ● 4-hole type fuel injectors have been adopted to improve the atomization of fuel.<br>● A quick connector is used to connect the fuel filter and the fuel hose together to improve serviceability.<br>● A fuel pump inertia switch, which stops the fuel pump if an extremely strong impact such as that of a collision is detected, has been adopted to realize excellent safety performance.*1 |
| Ignition System | ● The DIS (Direct Ignition System) is used to enhance the reliability of the ignition system.<br>● Iridium-tipped spark plugs have been adopted to improve ignition.*2 |
| Engine Control System | ● ETCS-i has been adopted to realize excellent controllability and comfort of the vehicle.<br>● The cruise control system and the engine immobiliser system have been integrated with the engine ECU.<br>● M-OBD (Multiplex On-Board Diagnosis) system is adopted. |

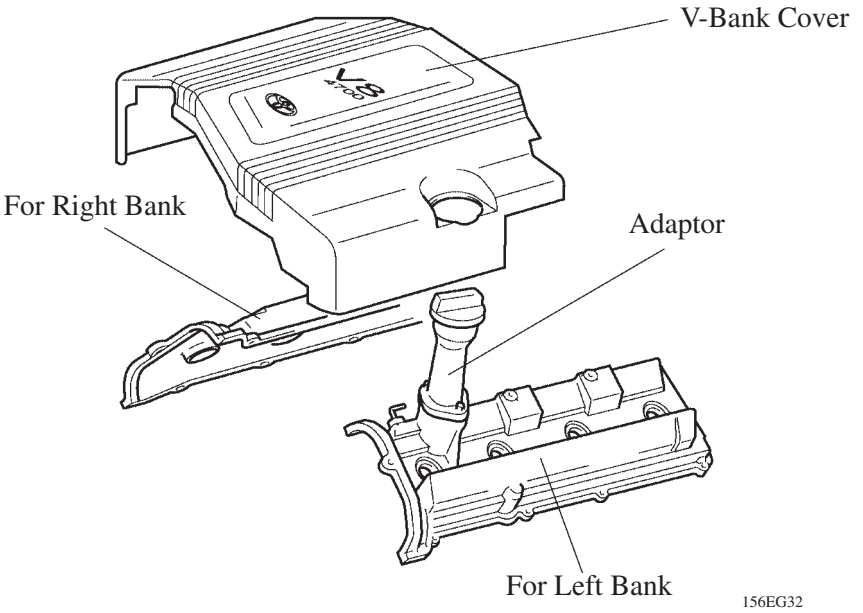
*1: Only for Europe Model

*2: Only for Europe and Australia Model

## ■ENGINE PROPER

### 1. Cylinder Head Cover

- Lightweight yet high-strength aluminum head covers are used.
- An adaptor has been provided on the left bank cylinder head cover to improve the serviceability when filling the engine oil.
- The cylinder head cover gaskets have adopted a double-bead cross-sectional construction to improve their reliability.
- A large V-bank cover has been adopted for improved design effect.

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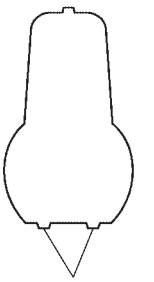


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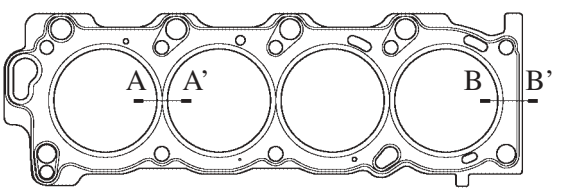
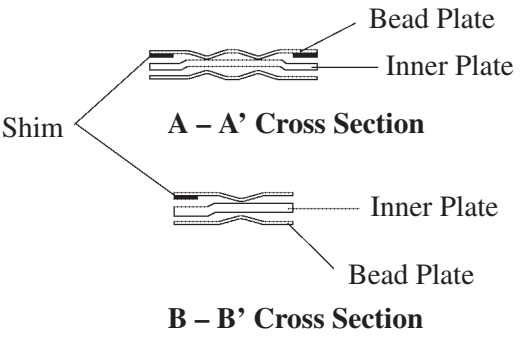
**Cylinder Head Cover Gasket Cross Section**

### 2. Cylinder Head Gasket

3-layer cylinder head gaskets with shims have been adopted to improve reliability and to minimize the deformation of the cylinder bore. This resulted in improved fuel economy and reduced the consumption rate of engine oil and the emission of exhaust gases.



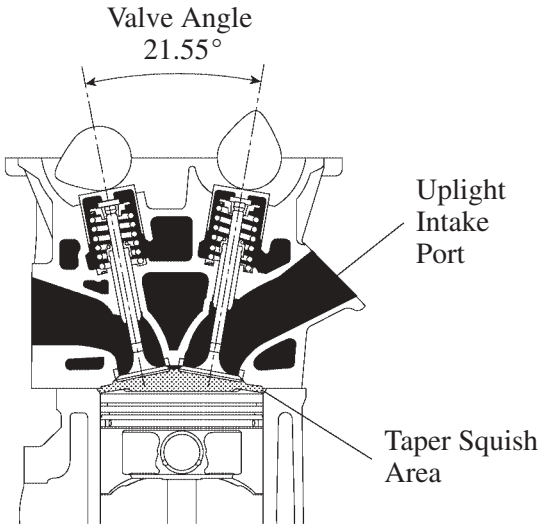




156EG33

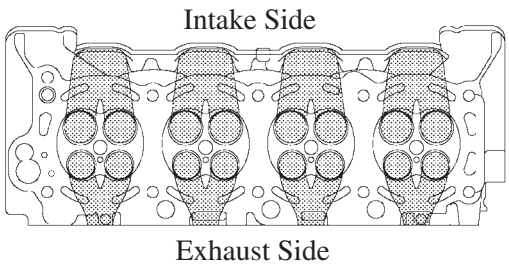
## 3. Cylinder Head

- The cylinder head, which is made of aluminum, has adopted a pentroof-type combustion chamber. The spark plug has been located in the center of the combustion chamber in order to improve the engine's anti-knocking performance.
- The angle of the intake and exhaust valves is narrowed and set at 21.55° to permit a compact cylinder head.
- Uplight intake port have been adopted to improve the intake efficiency.
- A taper squish combustion chamber has been adopted to improve anti-knocking performance and intake efficiency. In addition, engine performance and fuel economy have been improved.
- Plastic region tightening bolt is used for the cylinder head bolts for good axial tension.





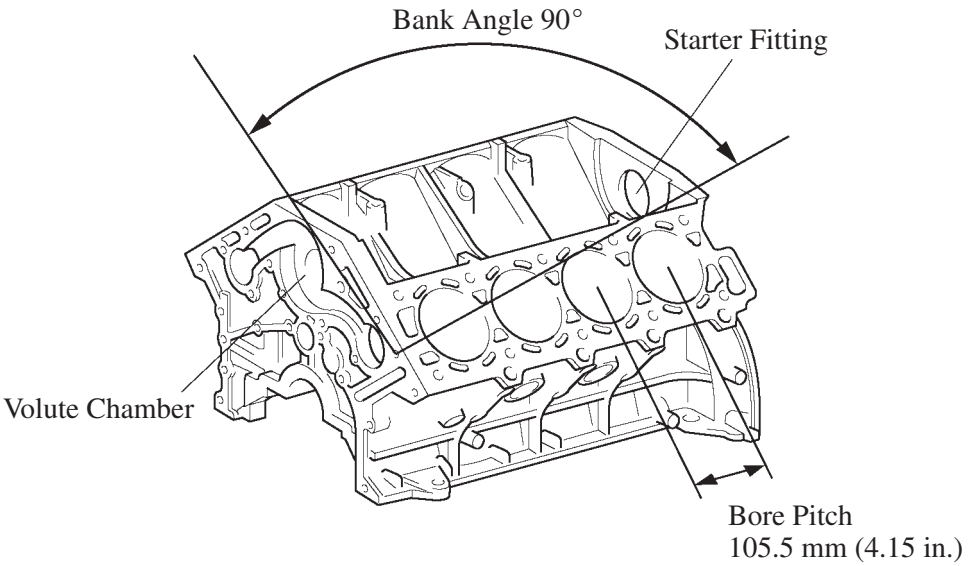

156EG34




156EG35

## 4. Cylinder Block

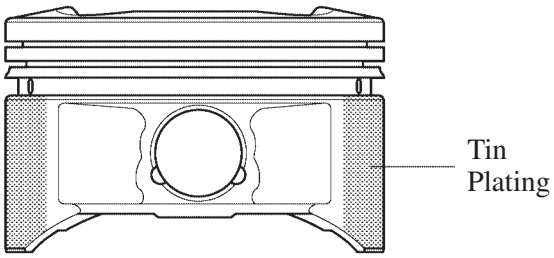
- The cylinder block is made of cast iron.
- The cylinder block has a bank angle of 90°, a bank offset of 21 mm (0.827 in.) and a bore pitch of 105.5 mm (4.15 in.), resulting in a compact block in its length and width even for its displacement.
- Part of the volute chamber of the water pump is incorporated into the cylinder block to shorten the engine length.
- Installation bosses of the two knock sensors are located on the inner side of left and right banks.
- The plastic region tightening bolts are used, for the crankshaft bearing caps.
- The starter is located inside the V-bank.




156EG36

## 5. Piston

- The piston is made of aluminum alloy.
- The piston head portion has adopted a taper squish to improve the fuel combustion efficiency.
- The piston ring grooves have been treated with alumite coating to improve the piston's wear resistance.
- The piston skirt has been applied with tin plating to reduce friction loss.
- Semi floating type piston pinsare used.

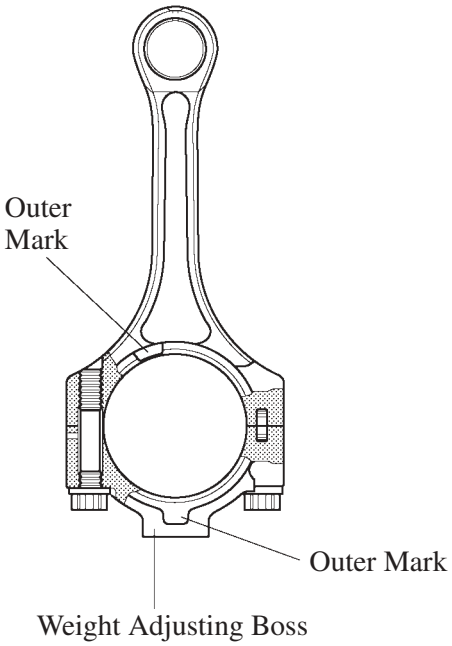



156EG02

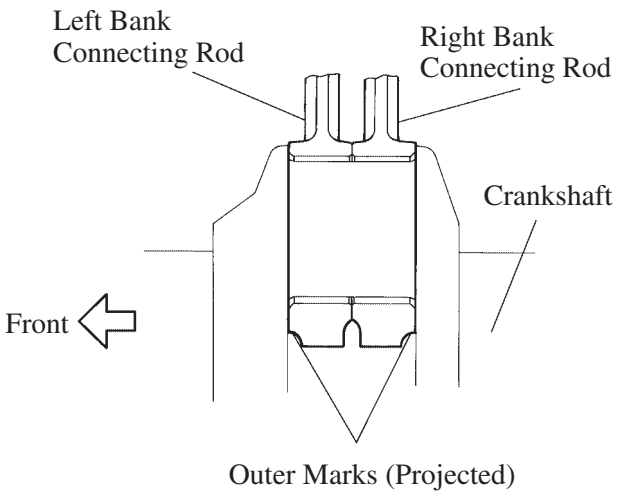


## 6. Connecting Rod

- The sintered and forged connecting rod is very rigid and has little weight fluctuation.
- A weight-adjusting boss is provided at the big end to reduce fluctuation of weight and balance the engine assembly.
- The connecting rod cap is held by plastic region tightening bolts.
- The connecting rods for the right and left banks are placed in opposite directions with the outer marks facing the crankshaft.
- The connecting rod bearing is made of aluminum alloy.



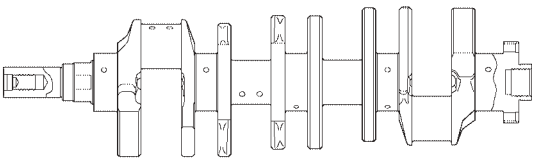

156EG03




156EG09

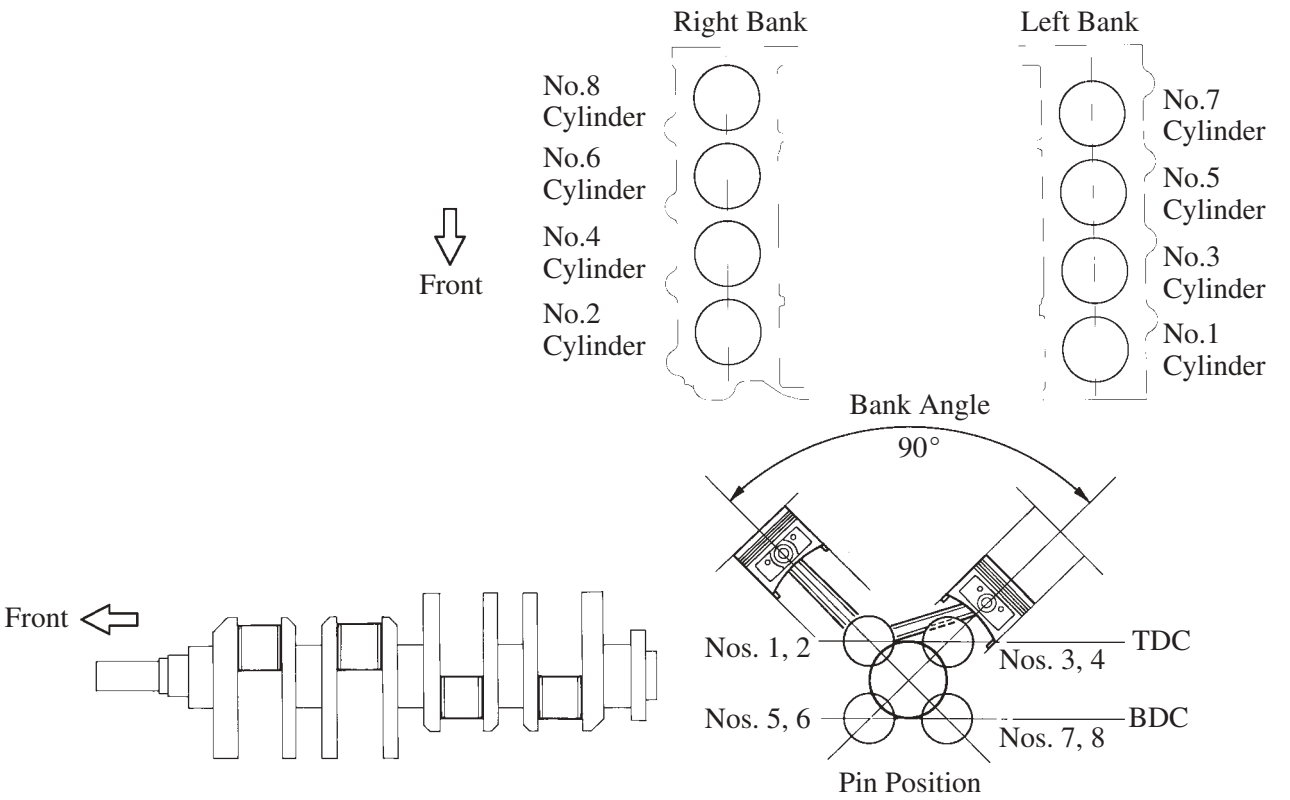
## 7. Crankshaft

- A crankshaft made of steel, which excels in rigidity and wear resistance, has been adopted.
- The crankshaft has 5 jounals and 8 counter weights.
- The crankshaft bearing is made of aluminum alloy.



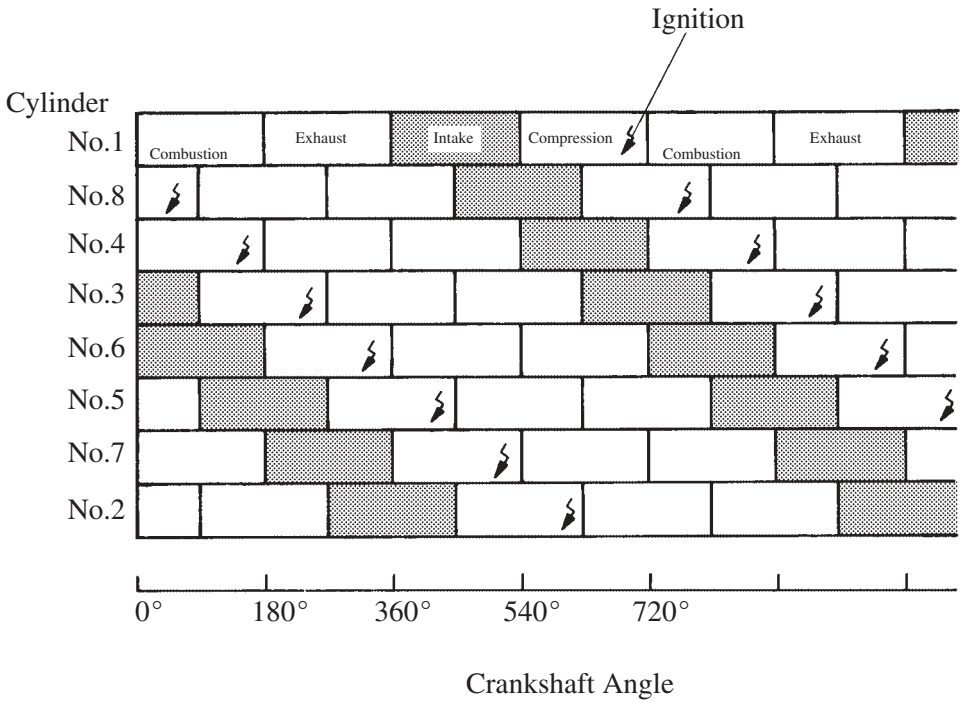
156EG25

**NOTE:** The positions of the crankshaft pins and pistons are illustrated below. The numbers of the crankshaft and the pistons are shown on the right.




156EG10

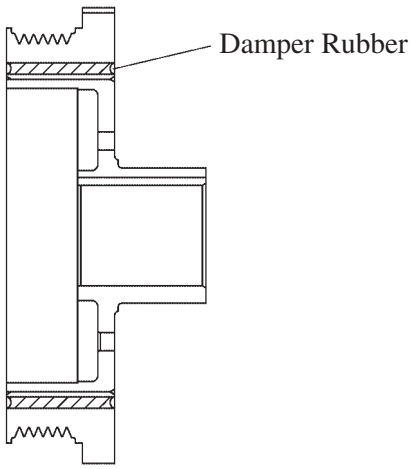
- Crankshaft angles and engine strokes (intake, compression, combustion and exhaust) are shown in the table below. The firing order is 1 – 8 – 4 – 3 – 6 – 5 – 7 – 2.




156EG11

## 8. Crankshaft Pully

The rigidity of the torsional damper rubber has been optimized to reduce noise.

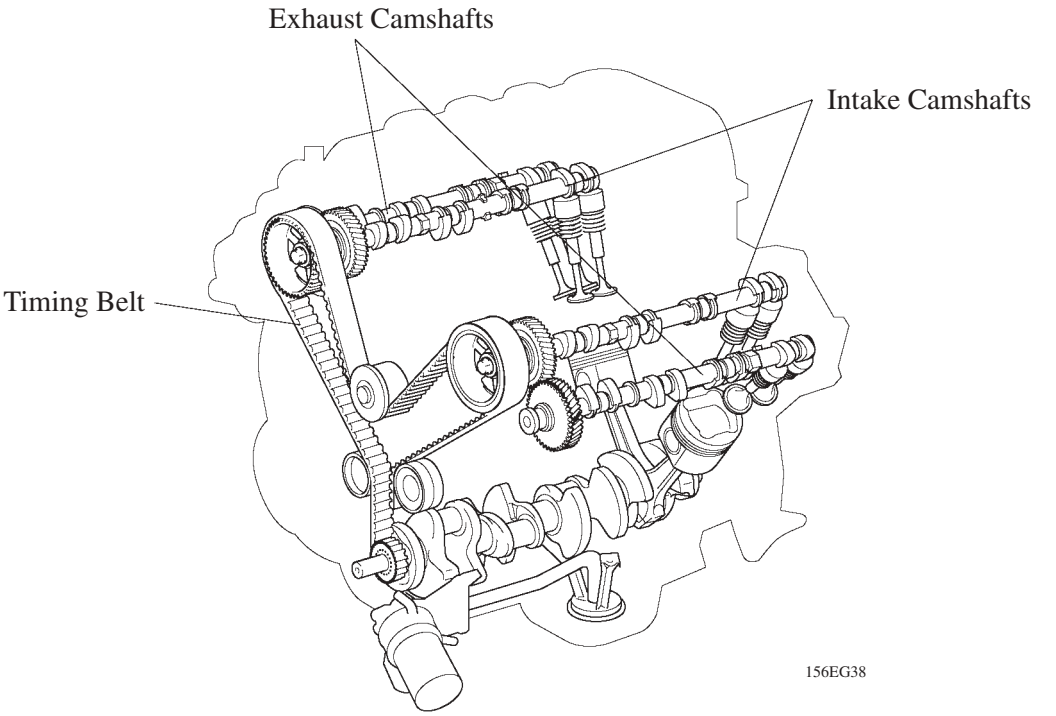



156EG37

## ■ VALVE MECHANISM

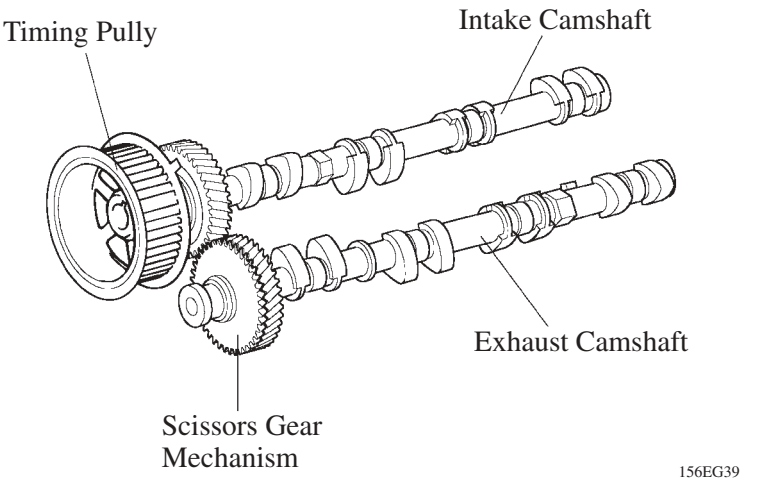
### 1. General

- Each cylinder has 2 intake valves and 2 exhaust valves. Intake and exhaust efficiency is increased by means of the larger total port areas.
- The valves are directly opened and closed by 4 camshafts.
- The intake camshafts are driven by a timing belt, while the exhaust camshafts are driven through gears on the intake camshafts.



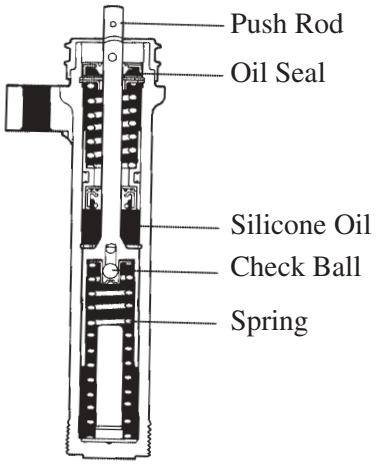

### 2. Camshafts

- The camshafts are made of cast iron alloy. The cam nose has been chill treated to increase its abrasion resistance.
- The exhaust camshafts are driven by gears on the intake camshafts. The scissors gear mechanism is used on the exhaust camshaft to control backlash and suppress gear noise.



## 3. Automatic Tensioner

The automatic tensioner is made up of a spring and oil damper, and maintains proper timing belt tension at all time. The automatic tensioner suppresses noise generated by the timing belt.

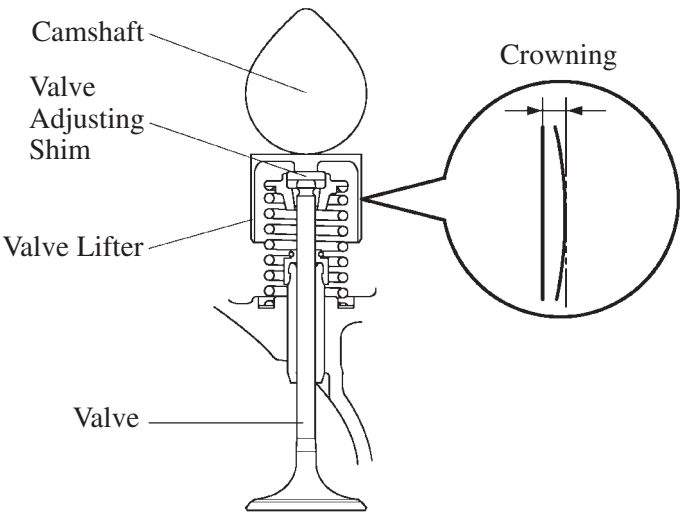



**Automatic Tensioner** 156EG12



## 4. Intake and Exhaust Valve and Valve Lifter

- Intake and exhaust valves with large-diameter valve face have been adopted to improve the intake and exhaust efficiency. In addition, narrower valve stems have been adopted to reduce the intake and exhaust resistance and for weight reduction.
- Inner shim type valve adjusting shims, which allow a greater amount of valve lift, have been adopted.
- Valve lifters made of steel have been adopted.
  The valve lifter, which has been made lighter and thinner, provides crowning on its side sliding portion to reduce noise and friction.

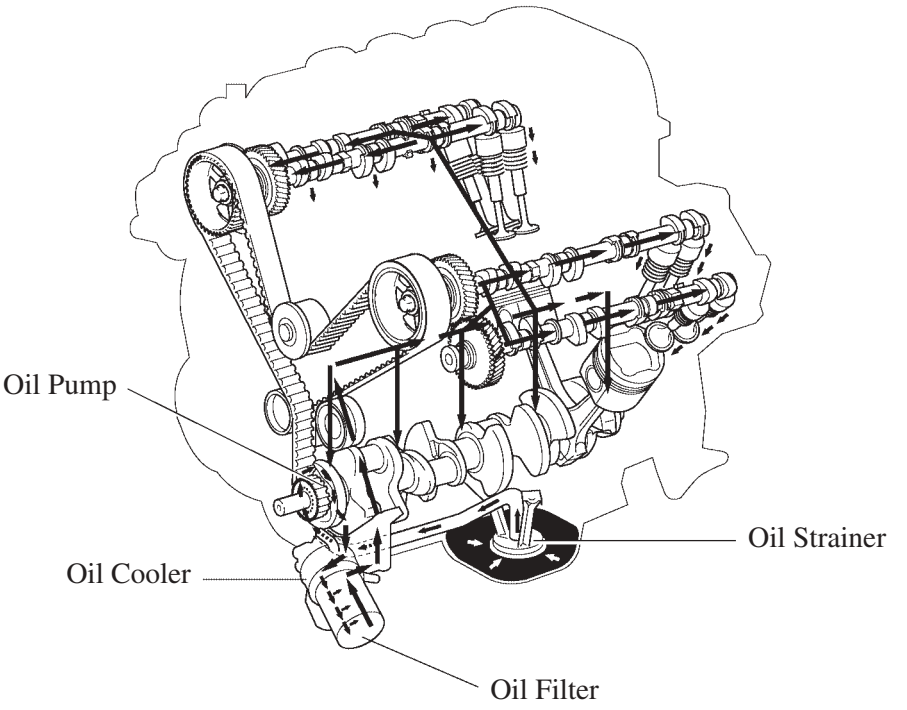


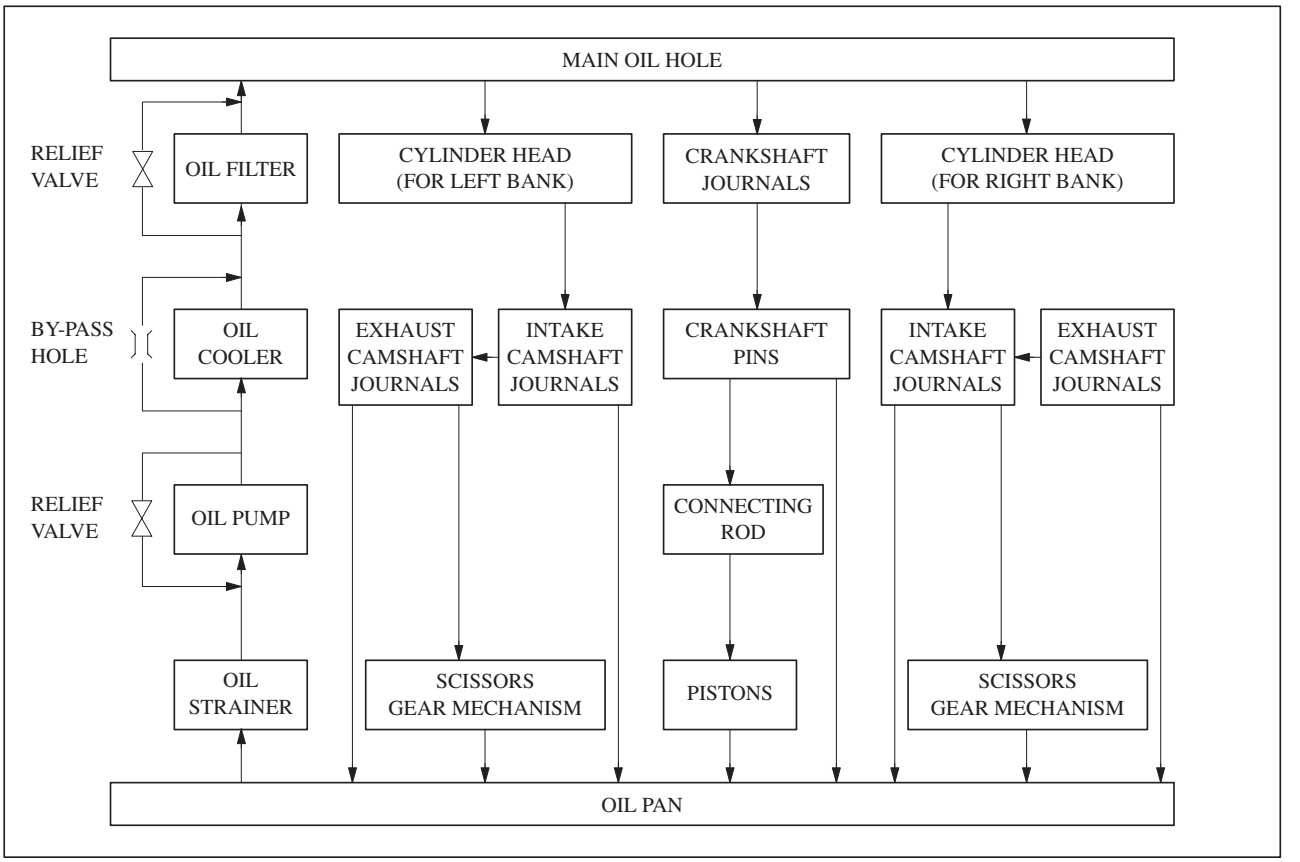

151EG34

## ■LUBRICATION SYSTEM

### 1. General

- The lubrication circuit is fully pressurized and all oil passes through an oil filter.
- A trochid gear type oil pump is directly driven by crankshaft.
- The water-cooled type engine oil cooler is used to lower the oil temperature.

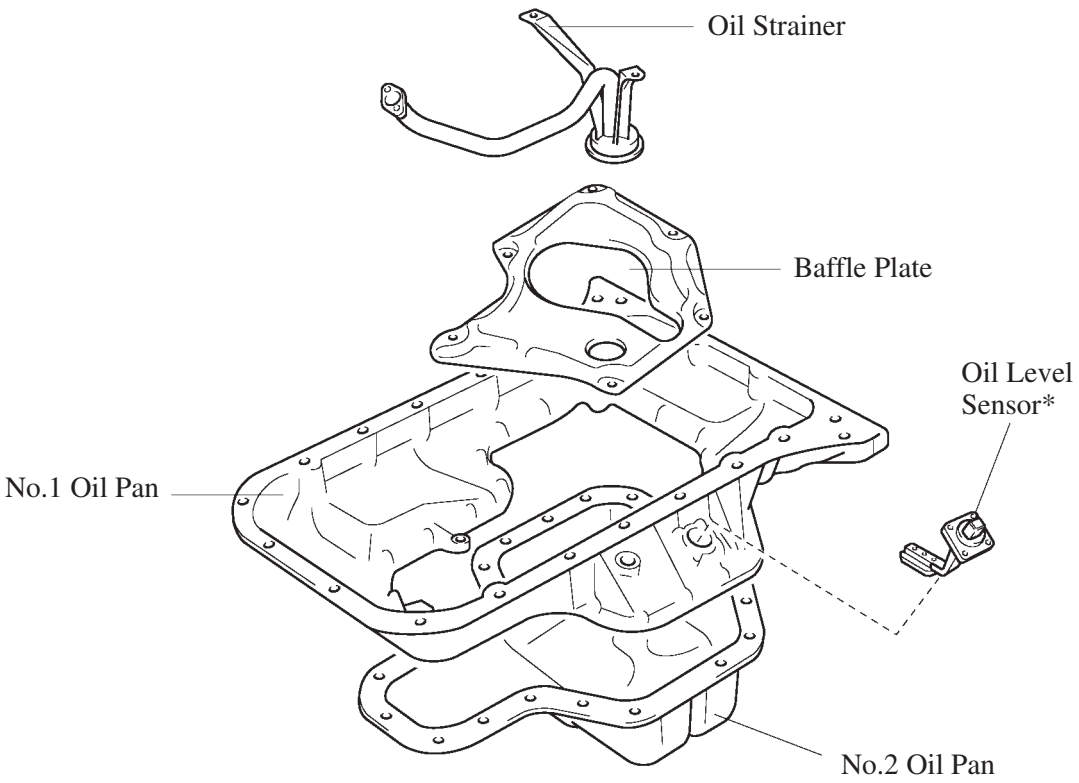


## 2. Oil Pan

- The oil pan is made up of 2 pieces. No.1 oil pan is made of aluminum alloy and No.2 oil pan is made of steel sheet.
- No.1 oil pan is secured to the cylinder block and the torque converter housing and is increasing rigidity.
- For Europe model, an oil level sensor is provided in the oil pan for efficient servicing.
  When the oil level falls below the specified level, the oil level sensor causes the low engine oil level warning light inside the combination meter to light up.



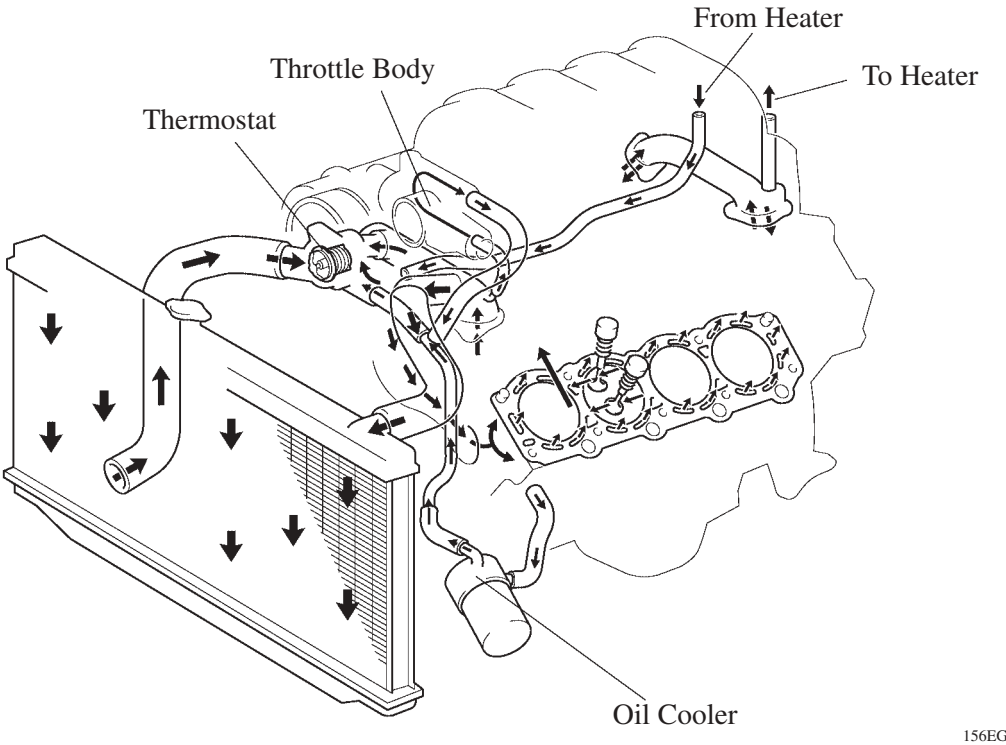



*: Only for Europe Model

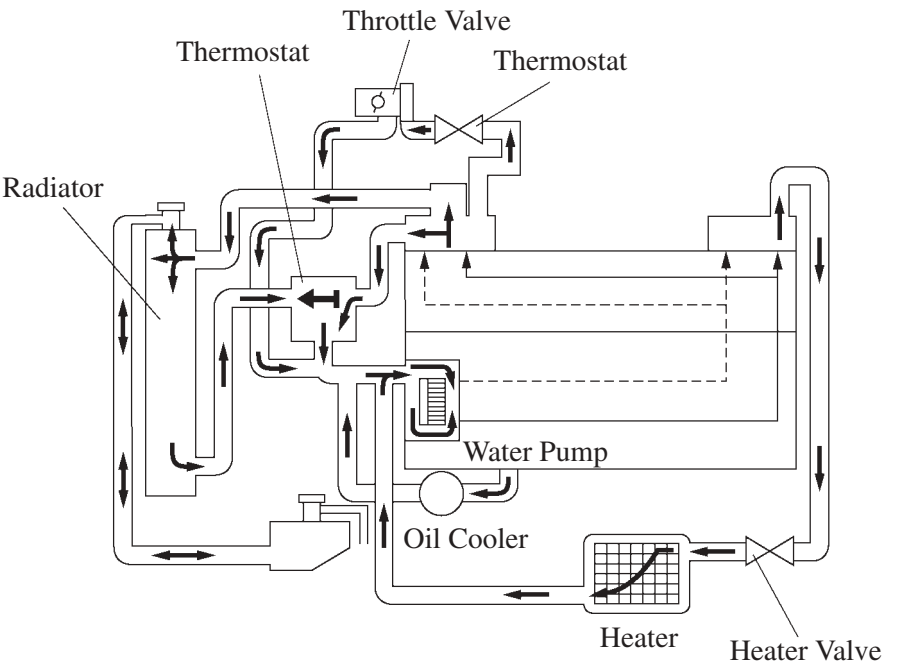
## ■COOLING SYSTEM

### 1. General

- The cooling system is a pressurized, forced-circulation type.
- A thermostat with a bypass valve is located on the water inlet housing to maintain suitable temperature distribution in the cooling system.
- An aluminum radiator core is used for weight reduction.



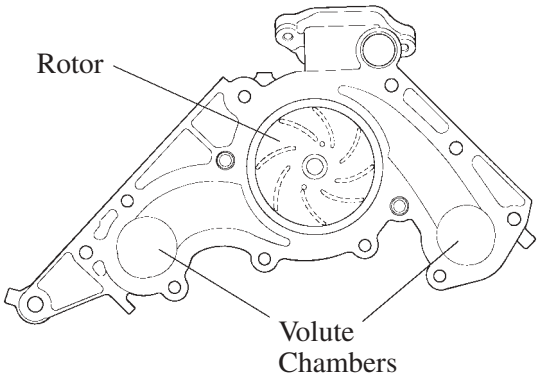

156EG42



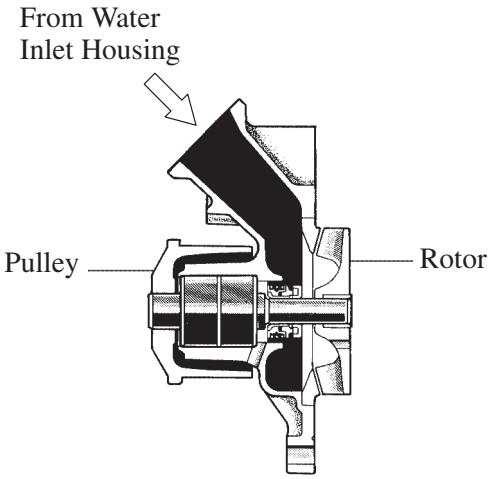

156EG43

## 2. Water Pump

- The water pump has two volute chambers, and circulates coolant uniformly to the left and right banks of the cylinder block.
- The water pump is driven by the back of the timing belt.
- The rotor is made of resin.




156EG13




156EG14



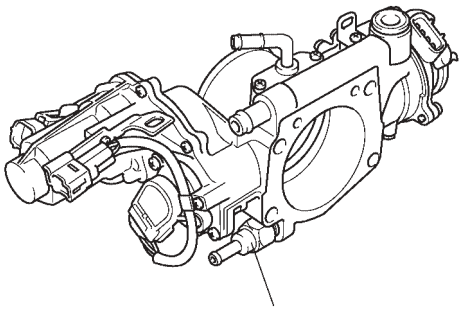
## 3. Coupling Fan

A 3-stage temperature-controlled coupling fan is used. It rotates at lower speeds when the engine is started to minimize the fan noise.

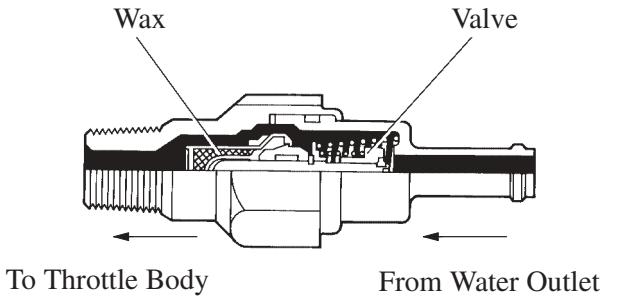
## ■INTAKE AND EXHAUST SYSTEM

### 1. Throttle Body

- The adoption of the ETCS-i has realized excellent throttle control.
- The ISC system and cruise control system are controlled comprehensively by the ETCS-i. Thus, the ISC valve has been discontinued.
- A thermostat is installed in the throttle body. The thermostat uses the thermal expansion of the wax to open and close the valve to shut off the flow of warm coolant when the coolant temperature is high in the throttle body's warm coolant passage. This prevents the throttle body temperature from rising more than the needed level, thus restraining the rise in the intake air temperature.




147EG24

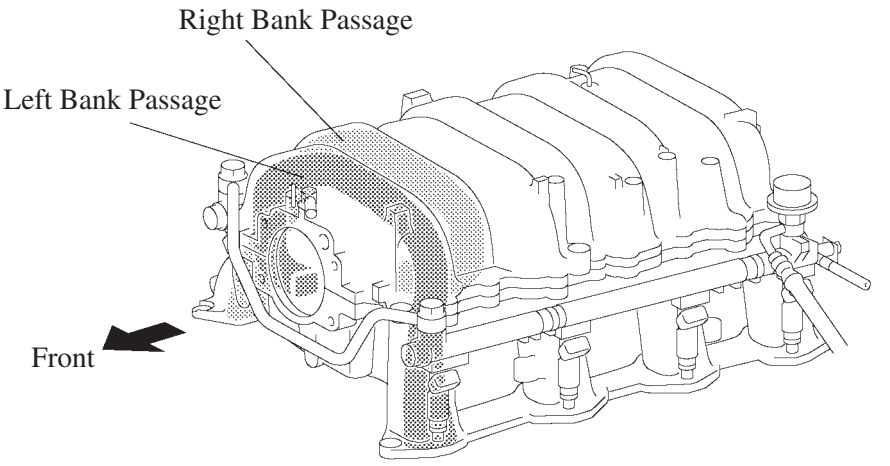



**Thermostat**

150EG21

### 2. Intake Manifold

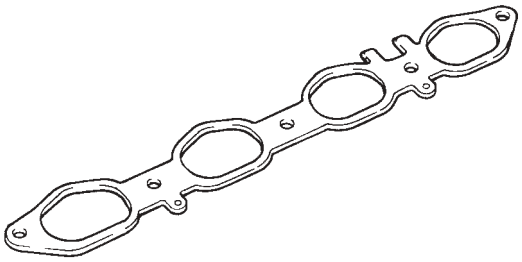
The low-to mid-speed range torque has been improved by increasing the length of the intake manifold port.



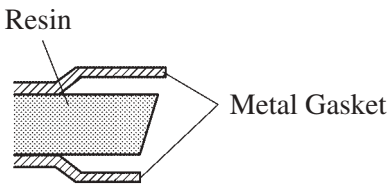

156EG44

## 3. Intake Manifold Gasket

- A heat-barrier gasket has been adopted for use between the cylinder head and the intake manifold. This gasket, which restrains the heat transfer from the cylinder head to the intake manifold, helps restrain the intake air temperature and improve the charging efficiency.
- The construction of the gasket consists of resin that is sandwiched between metal gaskets.



151EG69



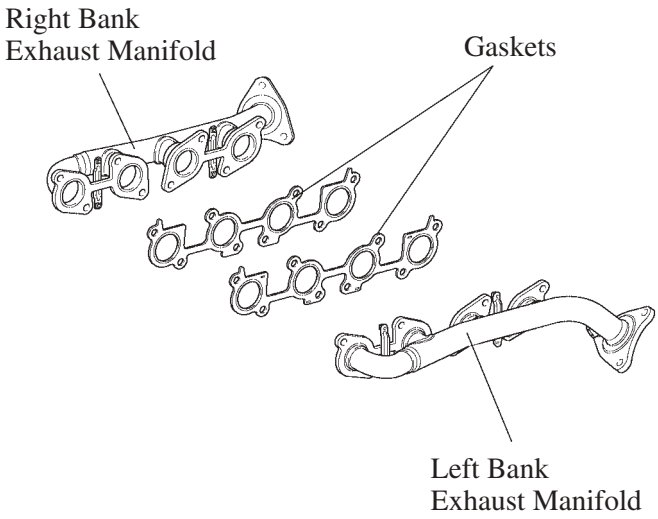

**Cross Section**

144EG04



## 4. Exhaust Manifold

The exhaust manifolds are made of stainless steel for weight reduction.

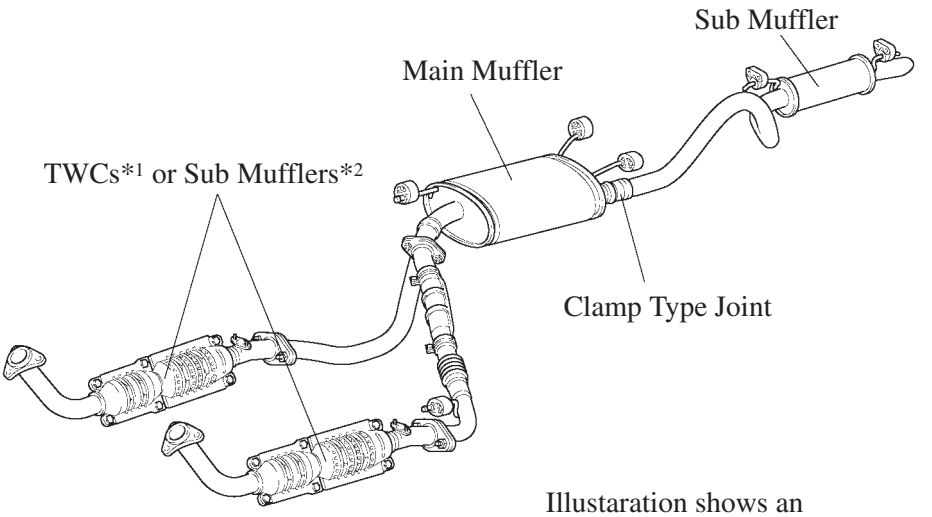



156EG04

## 5. Exhaust Pipe

### General

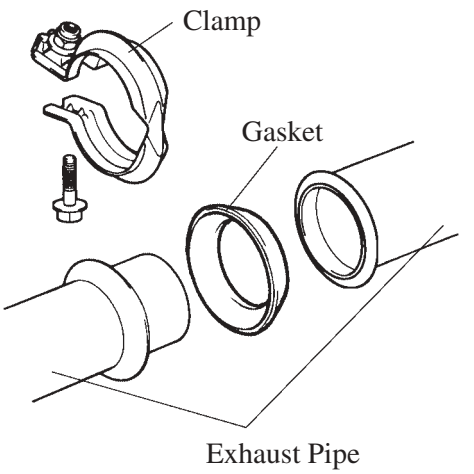
- The exhaust pipe is made of stainless steel for improved rust resistance.
- A clamp type joint is used to join the center pipe and tail pipe to realize weight reduction.
- A 2-way exhaust control system has been adopted to improve engine performane and to ensure an even quieter operation.




Illustaration shows an European Model

*1: Europe Model
*2: Except Europe Model

156EG05




**Connecting Exhaust Pipe**

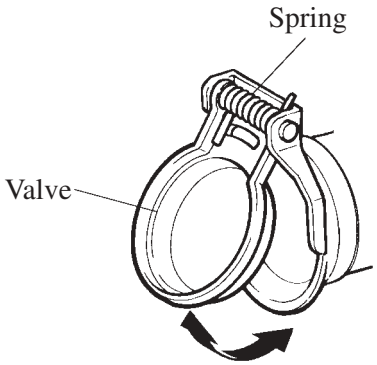
156EG06

## 2-Way Exhaust Control System

- A 2-way exhaust control system is used. This system reduces the back pressure by opening and closing a variable valve that is enclosed in the main muffler, thus varying the exhaust gas passage.
- The valve opens steplessly in accordance with the operating condition of the engine, thus enabling a quieter operation at lower engine speeds, and reducing back pressure at higher engine speeds.

### 1) Construction

The control valve is enclosed in the main muffler. When the exhaust gas pressure overcomes the spring pressure, the control valve opens steplessly in accordance with the exhaust gas pressure.




156EG01

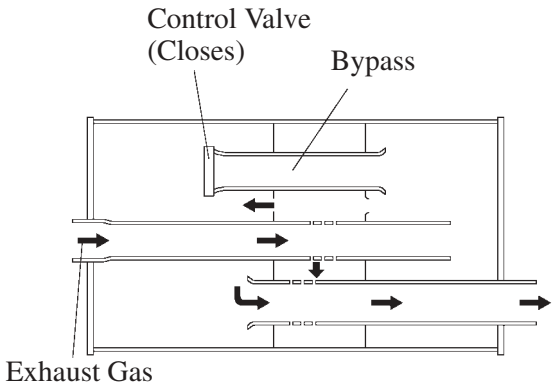
### 2) Operation

#### a. When Control Valve is Closed (low engine speed)

Since the pressure in the main muffler is low, the control valve is closed. Hence exhaust gas does not pass the bypass passage, and exhaust noise is decreased by the main muffler.

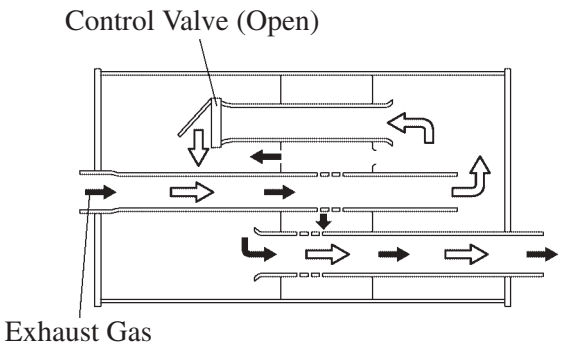
#### b. When Control Valve is Open (middle to high engine speed)

The valve opens more as the engine speed and the back pressure in the muffler increase. This allows alarge volume of exhaust gas to pass the bypass passage, thereby substantially decreasing the back pressure.




**Control Valve Closed**

156EG07




**Control Valve Open**

156EG08

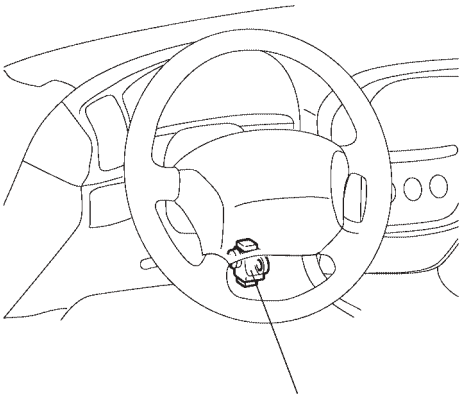
EG

## ■FUEL SYSTEM

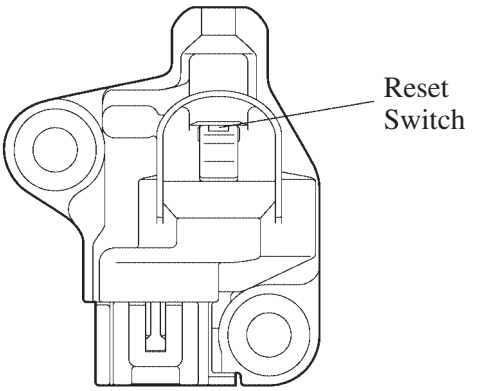
### 1. Fuel Pump Inertia Switch (Only for Europe Model)

#### General

- A fuel pump inertia switch, which stops the fuel pump if the vehicle is involved in a violent collision, has been adopted to minimize fuel leakage.
- The fuel pump inertia switch maintains a circuit between the Engine ECU and the fuel pump ECU, and if a collision is detected, it cuts off the circuit to the fuel pump ECU.
- By taking the ease of its operation into consideration, the fuel pump inertia switch has been located in the vicinity of the instrument panel.



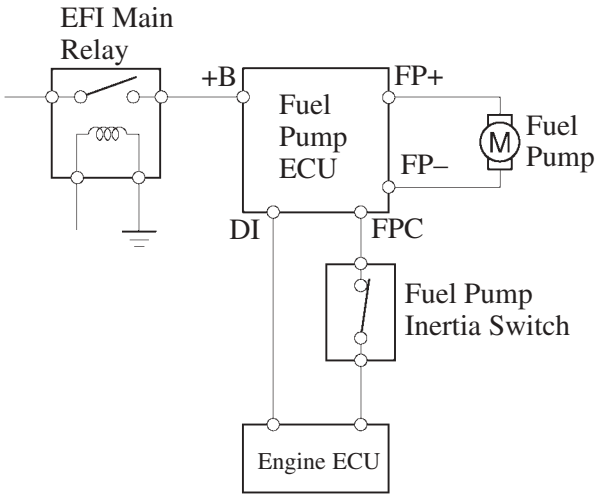

156EG22



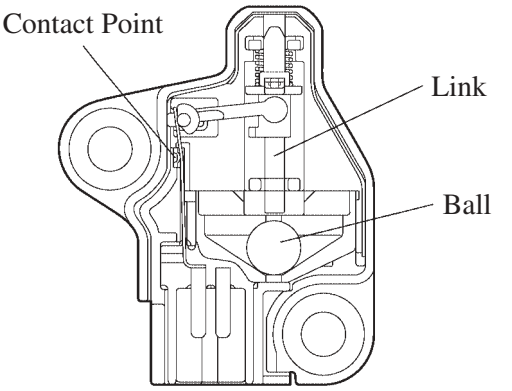

**Fuel Pump Inertia Switch**

156EG19

**▶ System Diagram ◀**




156EG18

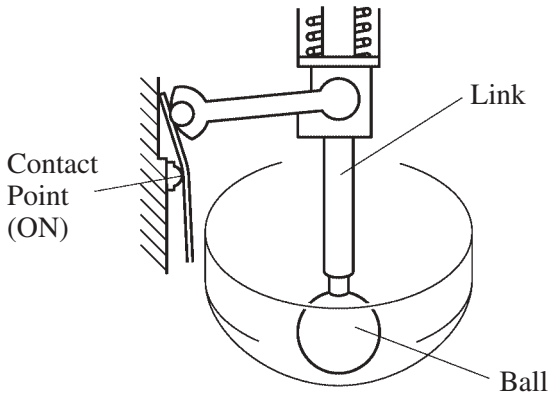



**Cross Section**

156EG20

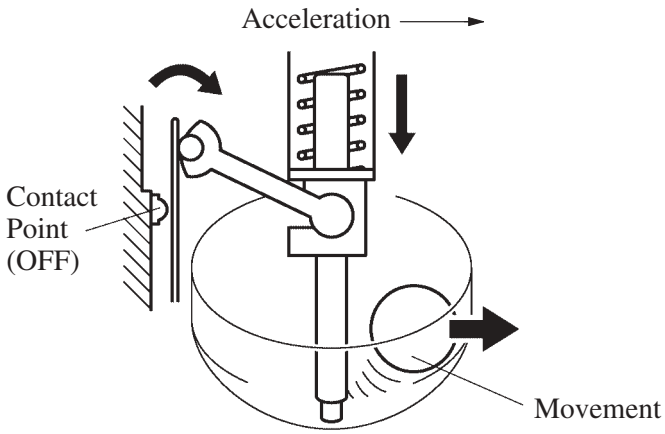
### Construction and Operation

The fuel pump inertia switch consists of a ball that detects a collision, link, contact point, and reset switch. When the acceleration that is generated during a collision of the vehicle exceeds a predetermined value, the ball moves, the link moves downward, and the contact point opens. As a result, the circuit to the fuel pump ECU is cut off, and so the fuel pump stops.




**Normal**

156EG45



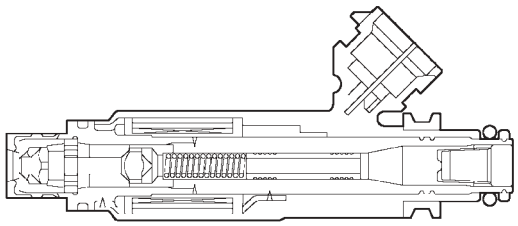

**Detecting a Collision**

156EG46

**NOTE:** In the event that the fuel pump inertia switch has tripped, and the switch must be reinstated, push up the reset switch for 1 second or longer.

## 2. Injector

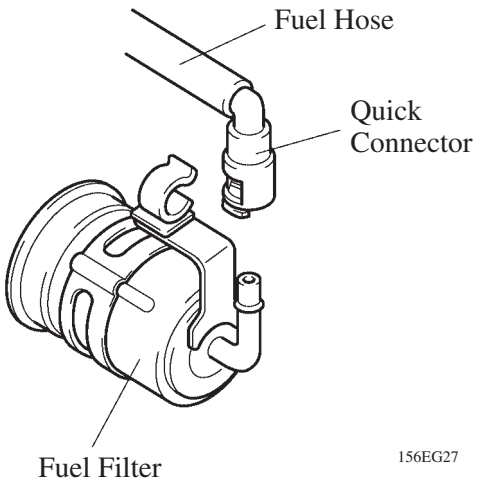
A compact 4-hole type injector has been adopted to improve the atomization of fuel.



156EG15

## 3. Quic Connector

A quick connector is used to connect the fuel filter and the fuel hose together to improve serviceability.



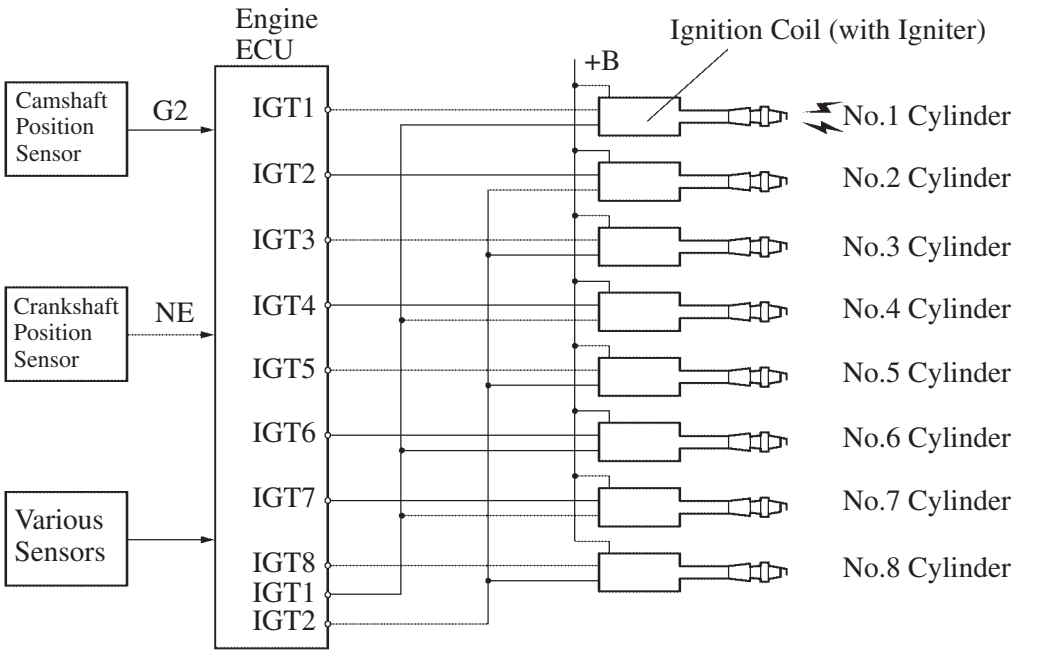

156EG27

EG

## ■IGNITION SYSTEM

### 1. General

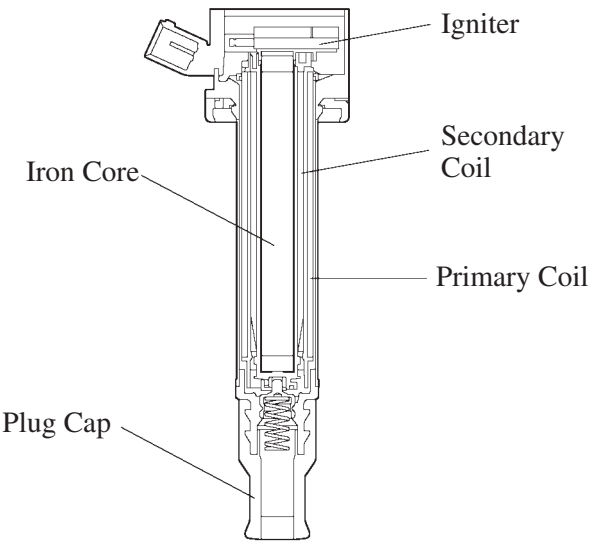
A DIS (Direct Ignition System) has been adopted in the 2UZ-FE engine. The DIS improves the ignition timing accuracy, reduces high-voltage loss, and enhances the overall reliability of the ignition system by eliminating the distributor.
The DIS in 2UZ-FE engine is an independent ignition system which has one ignition coil for each cylinder.




151EG05

### 2. Ignition Coil

The DIS provides 8 ignition coils, one for each cylinder. The spark plug caps, which provide contact to the spark plugs, are integrated with an ignition coil. Also, an igniter is enclosed to simplify the system.

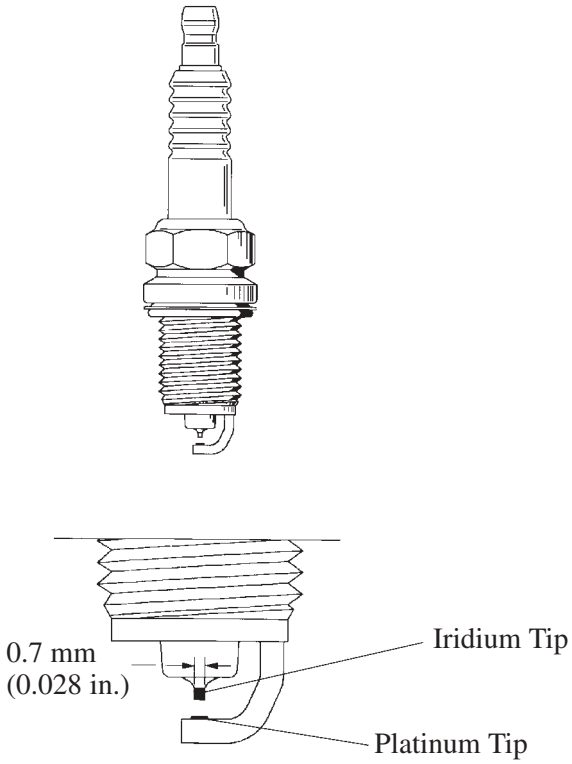



156EG16

**Ignition Coil Cross Section**

## 3. Spark Plug (Only for Europe and Australia Models)

Iridium-tipped spark plugs have been adopted. Their center electrode is made of iridium, which excels in wear resistance. As a result, the center electrode is made with a smaller diameter and improved the ignition performance.



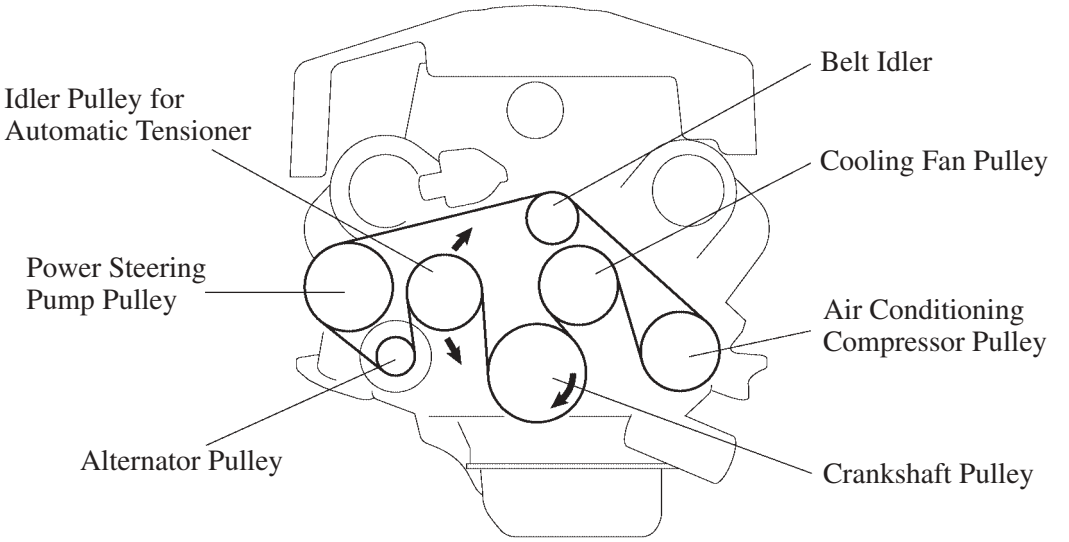

**▶ Recommended Spark Plugs ◀**

| | |
|---|---|
| DENSO | SK20R11 |
| NGK | IFR6A11 |
| Plug Gap | 1.0 – 1.1 mm<br>(0.039 – 0.043 in.) |

## ■ SERPENTINE BELT DRIVE SYSTEM

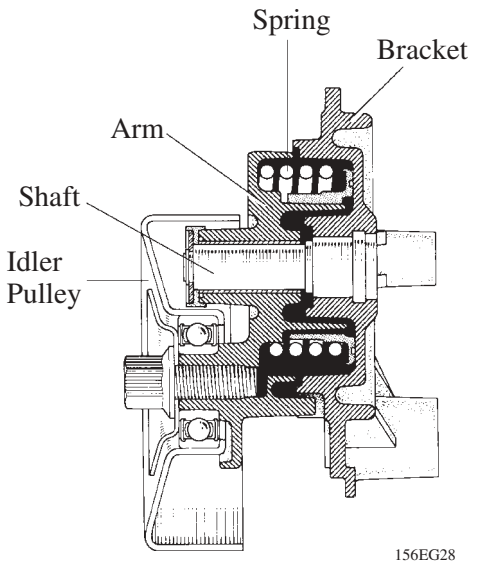
### 1. General

- The serpentine belt drive system drives accessory components with a single V-ribbed belt. It reduces the overall engine length, weight and number of engine parts.
- An automatic tensioner eliminates the need for tension adjustment.

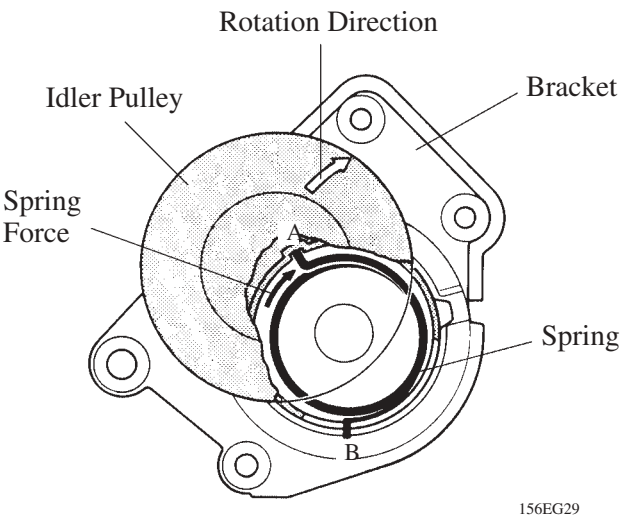



### 2. Automatic Tensioner

The tension of the V-ribbed belt is properly maintained by the torsion spring that is enclosed in the automatic tensioner.




**Cross Section**




A: Fixed to the Arm
B: Fixed to the Bracket

## ■ENGINE CONTROL SYSTEM

### 1. General

- In addition to the EFI (Electronic Fuel Injection) system and the ESA (Electronic Spark Advance) system, the engine control system has adopted the ETCS-i (Electronic Throttle Control System-intelligent) to ensure excellent controllability of the vehicle and improve its comfort.
- The M-OBD (Multiplex On-Board Diagnostic) system has been adopted to improve serviceability.
- The cruise control system and engine immobiliser system have been integrated with engine ECU.

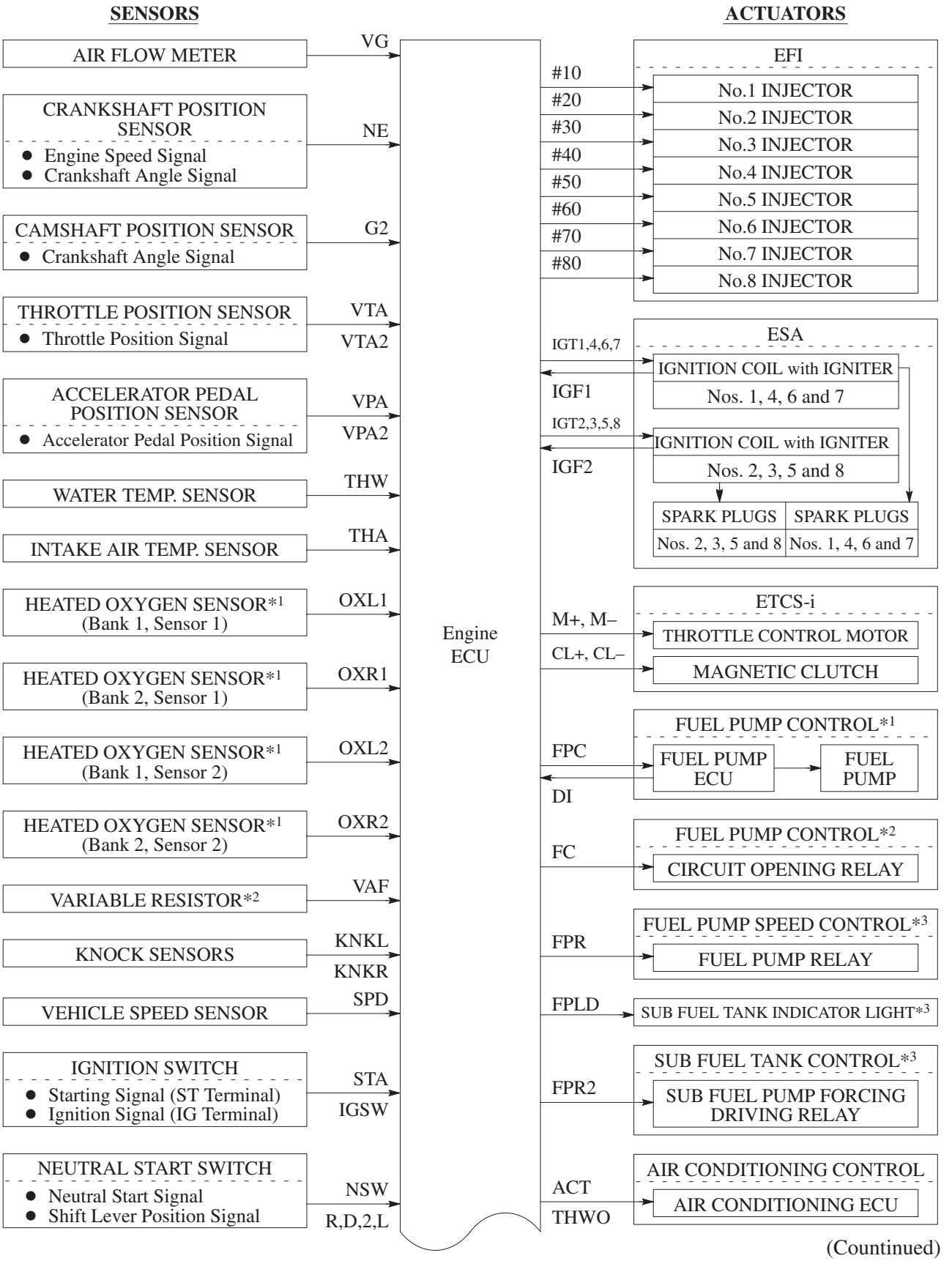
The engine control system for the 2UZ-FE engine has following system.

| System | Outline |
|---|---|
| EFI (Electronic Fuel Injection) | ● A L-type EFI system directly detects the intake air volume with a hot-wire type air flow meter.<br>● The fuel injection system is a sequential multiport fuel injection system. |
| ESA (Electronic Spark Advance) | ● Ignition timing is determined by the engine ECU based on signals from various sensors. Corrects ignition timing in response to engine knocking.<br>● The torque control correction during gear shifting has been used to minimize the shift shock.<br>● 2 knock sensors are used to further improve knock detection. |
| ETCS-i (Electronic Throttle Control System-intelligent) | Optimally controls the throttle valve opening in accordance with the amount of the accelerator pedal effort, and the conditions of the engine and the vehicle, and comprehensively controls the ISC, and cruise control. |
| Fuel Pump Control | Under light engine loads, pump speed is low to reduce electric power loss. |
| Oxygen Sensor Heater Control*1 | Maintains the temperature of the oxygen sensor at an appropriate level to increase accuracy of detection of the oxygen concentration in the exhaust gas. |
| Air Conditioning Cut-Off Control | By controlling the air conditioning compressor ON or OFF in accordance with the engine condition, drivability is maintained. |
| Evaporative Emission Control | The engine ECU controls the purge flow of evaporative emissions (HC) in the charcoal canister in accordance with engine conditions. |
| Sub Fuel Tank Control*2 | Drivers use the fuel tank changeover switch to select the fuel tank (main or sub) they wish to use. |
| Engine Immobiliser*3 | Prohibits fuel delivery and ignition if an attempt is made to start the engine with an invalid ignition key. |
| Diagnosis | ● When the engine ECU detects a malfunction, the engine ECU diagnoses and memorizes the failed section.<br>● A newly developed diagnostic system which utilizes a high speed bi-directional communication line to provide extended diagnostic capabilities and features. |
| Fail-Safe | When the engine ECU detects a malfunction, the engine ECU stops or controls the engine according to the data already stored in memory. |

*1: Only for Europe Model
*2: Only on models equipped with sub tank system.
*3: Only on models equipped with the engine immobiliser system.

## 2. Construction

The configuration of the engine control system in the 2UZ-FE engine is as shown in the following chart.

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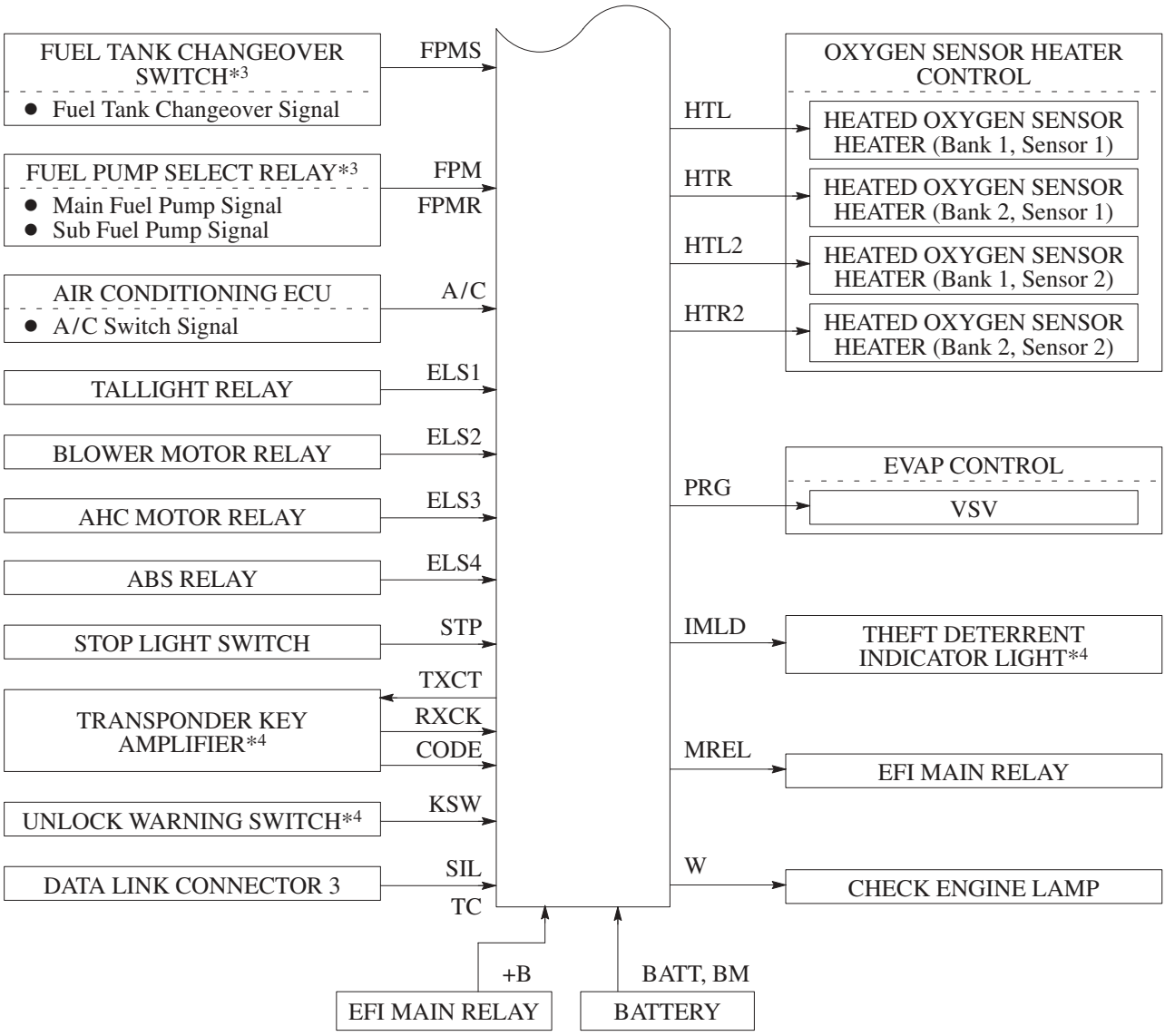


*1: Only for Europe
*2: Except for Europe
*3: Only on models equipped with sub fuel tank system.
*4: Only on models equipped with the engine immobiliser system.

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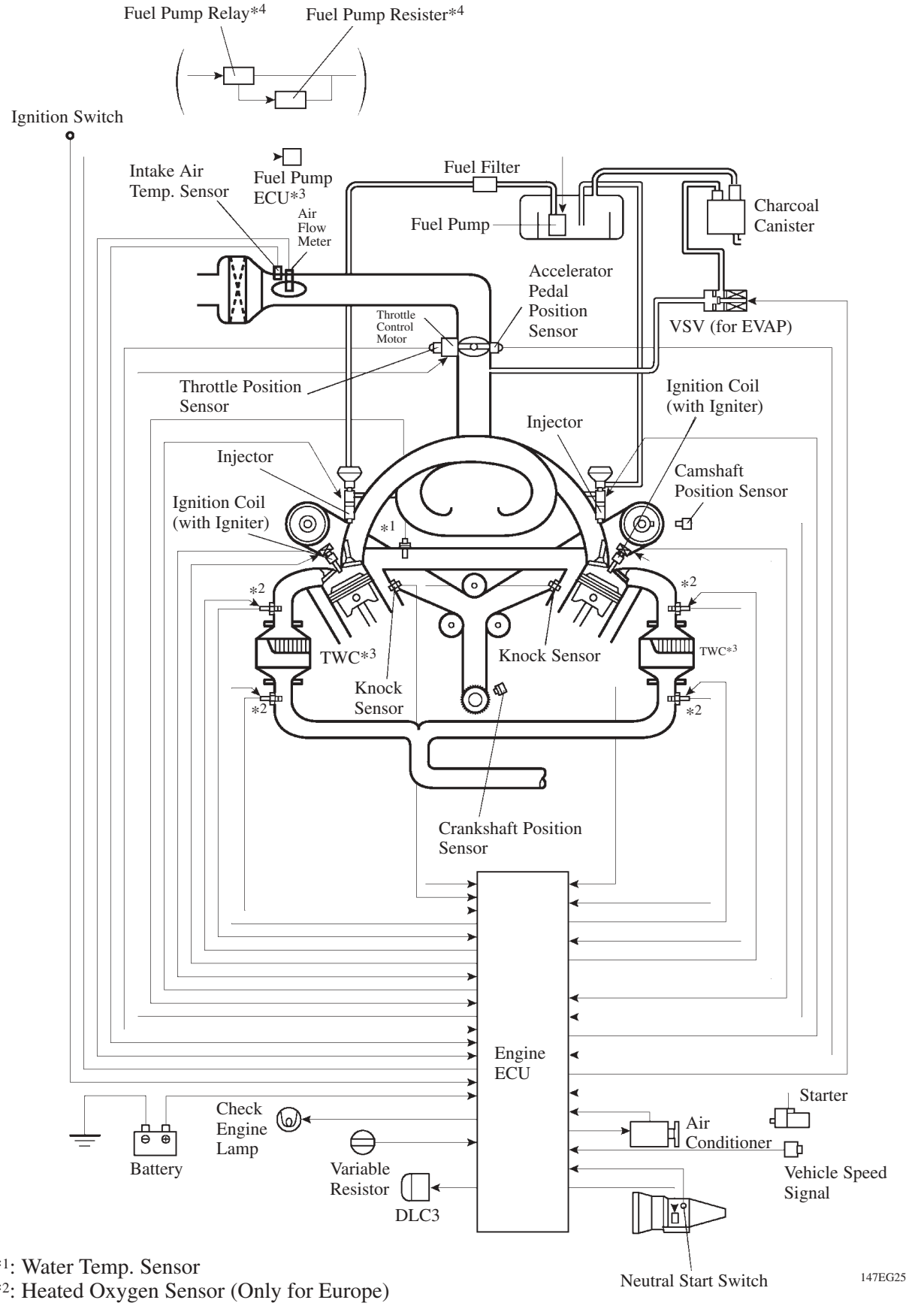
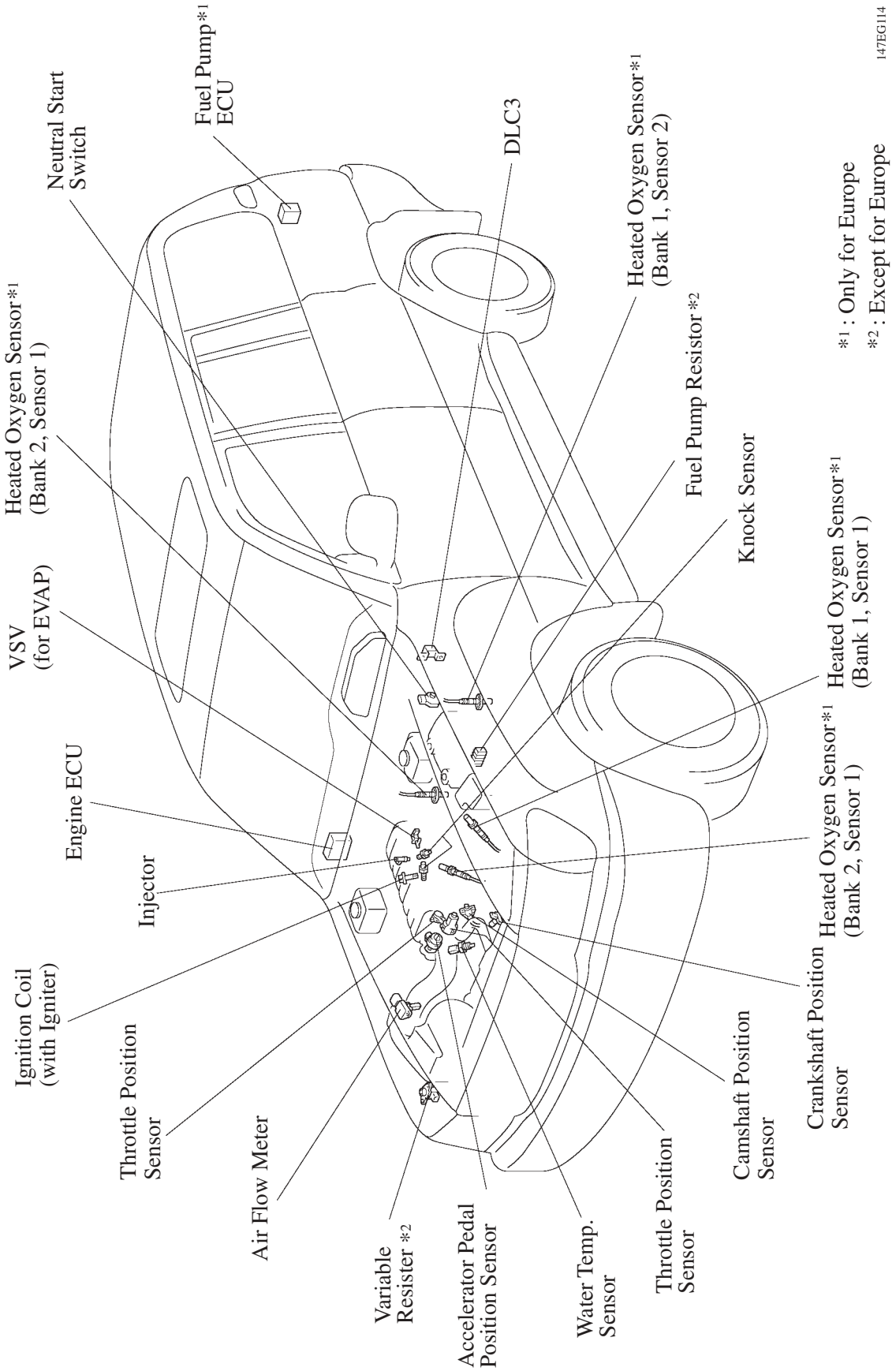
## 3. Engine Control System Diagram




*1: Water Temp. Sensor
*2: Heated Oxygen Sensor (Only for Europe)
*3: Only for Europe
*4: Except for Europe

## 4. Layout of Components

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## 5. Main Components of Engine Control System

### General

The main components of the 2UZ-FE engine control system are as follows:

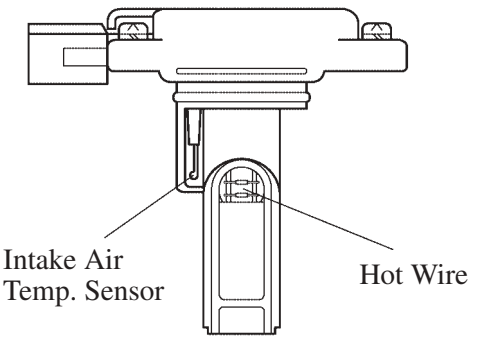
| Components | Outline |
|---|---|
| Air Flow Meter | Hot-Wire Type |
| Crankshaft Position Sensor | Pick-Up Coil Type, 1 |
| Camshaft Position Sensor | Pick-Up Coil Type, 1 |
| Throttle Position Sensor | Linear Type, 2 |
| Accelerator Pedal Position Sensor | Linear Type, 2 |
| Knock Sensor | Built-In Piezoelectric Type, 2 |
| Oxygen Sensor* | Heated Oxygen Sensor<br>(Bank 1, Sensor 1)<br>(Bank 2, Sensor 1)<br>(Bank 1, Sensor 2)<br>(Bank 2, Sensor 2) |
| Injector | 4-Hole Type |

*: Only for Europe Model

### Air Flow Meter

The 2UZ-FE engine adopts the hot-wire type air flow meter designed for direct electrical measurement of the intake air mass flow.
This air flow meter offers superior measuring precision and its plastic housing is shaped for minimal flow resistance. It has the following features:

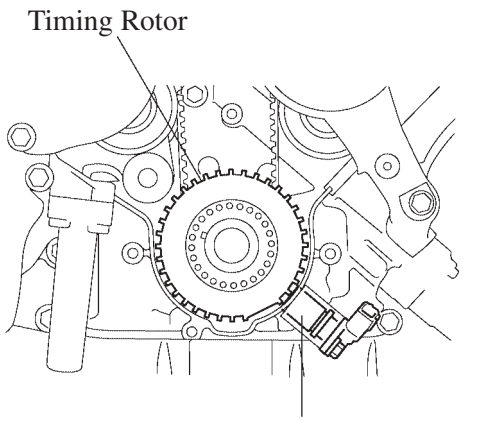
- Compact and lightweight
  The pressure loss caused by this sensor is small and offers only slight intake air flow resistance.
- Superior response and measuring accuracy
- Ability to measure a wide airflow range
- Having no mechanical functions, it offers a superior durability.




140EG45

### Crankshaft Position Sensor

The crankshaft position sensor is mounted on the oil pump body as illustrated.
The timing rotor is integrated with the crankshaft pulley. The rotor's teeth are spaced 10° apart, according to crankshaft angle, but since there are 2 teeth missing, as illustrated below, there is a total of 34 teeth.
Accordingly, the engine ECU can detect the crankshaft angle in addition to the crankshaft speed.

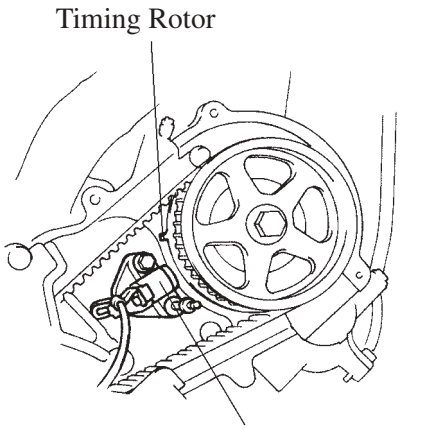



151EG18



### Camshaft Position Sensor

The camshaft position sensor is mounted on the left bank cylinder head. To detect the camshaft position, a protrusion that is provided on the timing pulley is used to generate 1 pulse for every 2 revolutions of the crankshaft.

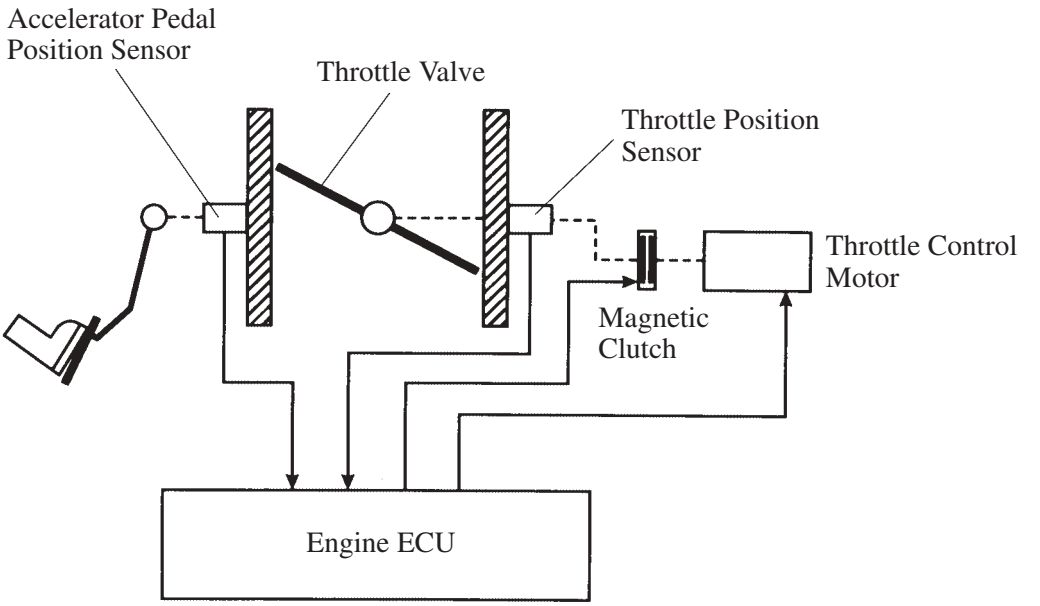



156EG26

## 6. ETCS-i (Electronic Throttle Control System-intelligent)

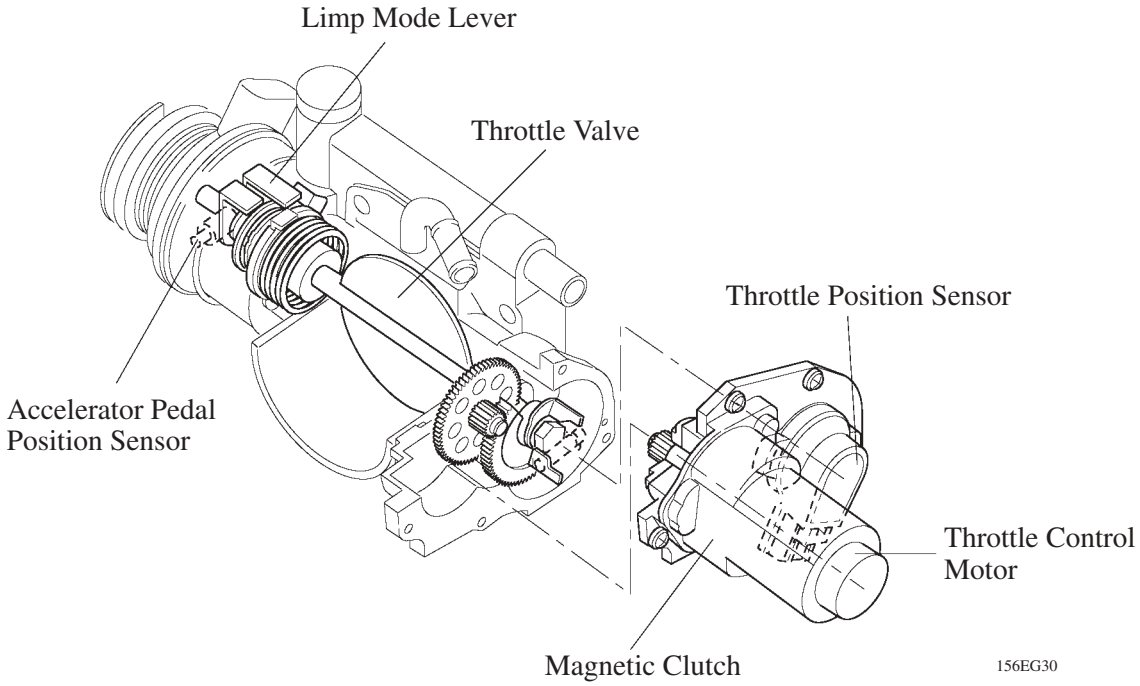
### General

- The ETCS-i system, which realizes excellent throttle control in all the operating ranges, has been adopted.
- In the conventional throttle body, the throttle valve opening is determined invariably by the amount of the accelerator pedal effort. In contrast, the ETCS-i uses the engine ECU to calculate the optimal throttle valve opening that is appropriate for the respective driving condition and uses a throttle control motor to control the opening.
- The ETCS-i controls the ISC (Idle Speed Control) system and the cruise control system.
- A duplicate system is provided to ensure a high level of reliability, and the system shuts off in case of an abnormal condition. Even when the system is shut off, the accelerator pedal can be used to operate the vehicle in the limp mode.




150EG71

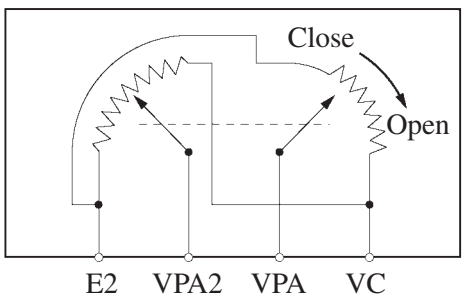
## Construction

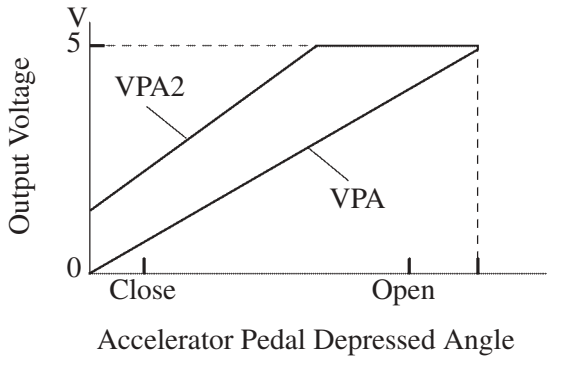





### 1) Accelerator Pedal Position Sensor

The accelerator pedal position sensor, which is mounted on the throttle body, is integrated with the throttle lever, which is connected to the cable that extends from the accelerator pedal.
The accelerator pedal position sensor converts the amount of accelerator pedal effort into two types of electrical signals with distinct output characteristics. The signals are then input into the engine ECU.




### 2) Throttle Position Sensor

The throttle position sensor converts the throttle valve opening into an electrical signal and inputs into the engine ECU. The output characteristics are the same as those of the accelerator pedal position sensor.

### 3) Throttle Control Motor

A DC motor with excellent response and minimal power consumption is used for the throttle control motor. The engine ECU performs the duty ratio control of the direction and the amperage of the current that flows to the throttle control motor in order to regulate the opening of the throttle valve.

**4) Magnetic Crutch**

Ordinarily, the magnetic clutch engages the clutch to enable the throttle control motor to open and close the throttle valve. In case that a malfunction occurs in the system, this clutch is disengaged to prevent the throttle control motor to open and close the throttle valve.

## Operation

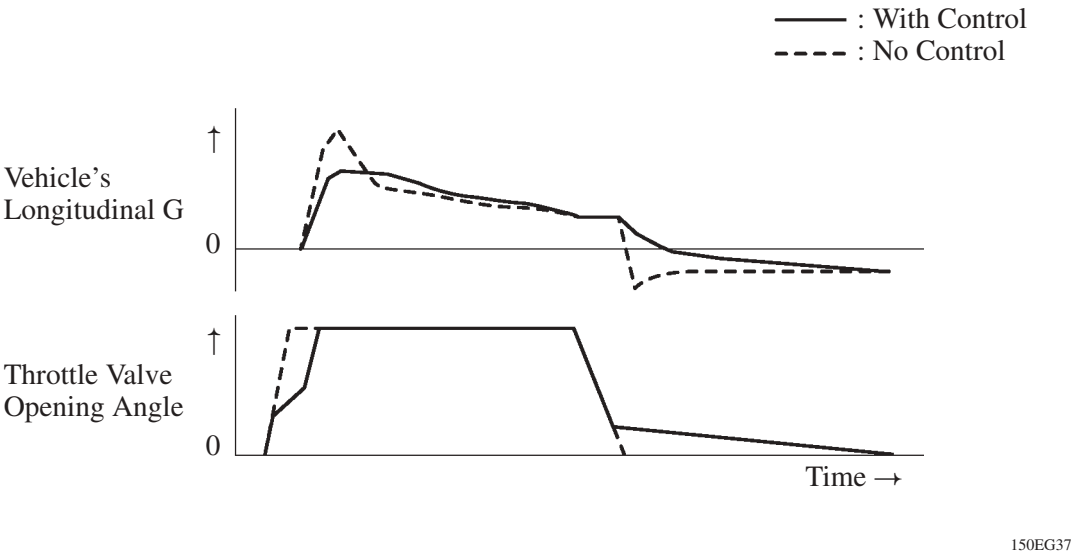
The engine ECU drives the throttle control motor by determining the target throttle valve opening in accordance with the respective operating condition.

1) Non-Linear Control
2) Idle Speed Control
3) Cruise Control

**1) Non-Linear Control**

Controls the throttle to an optimal throttle valve opening that is appropriate for the driving condition such as the amount of the accelerator pedal effort and the engine speed in order to realize excellent throttle control and comfort in all operating ranges.

**▶ Control Examples During Acceleration and Deceleration ◀**




**2) Idle Speed Control**

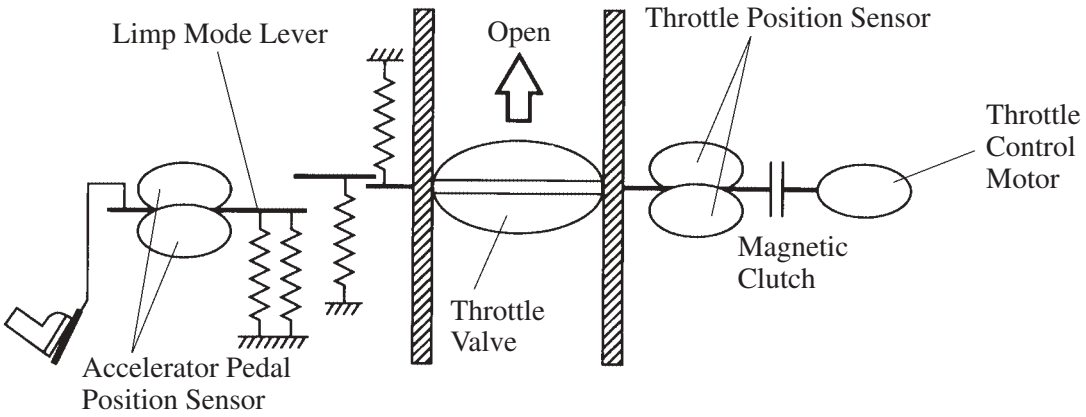
Previously, ISC valve was used to perform idle speed control such as fast idle during cold operating conditions and idle-up. In conjunction with the adoption of the ETCS-i, idle speed control is now performed by the throttle control motor, which controls the throttle valve opening.

**3) Cruise Control**

Previously, the vehicle speed was controlled by the cruise control actuator, which opened and closed the throttle valve. Along with the adoption of the ETCS-i, the vehicle speed is now controlled by the throttle control motor, which controls the throttle valve.

### Fail-Safe

If an abnormal condition occurs with the ETCS-i, the CHECK ENGINE lamp illuminates to alert the driver. At the same time, the current to the throttle control motor and magnetic clutch are cut off in order not to operate the ETCS-i. This enables the return spring to close the throttle valve.
Even in this situation, the accelerator pedal can be used to operate the limp mode lever, which operates the throttle valve to enable the vehicle to be driven in the limp mode.




150EG42



### Diagnosis

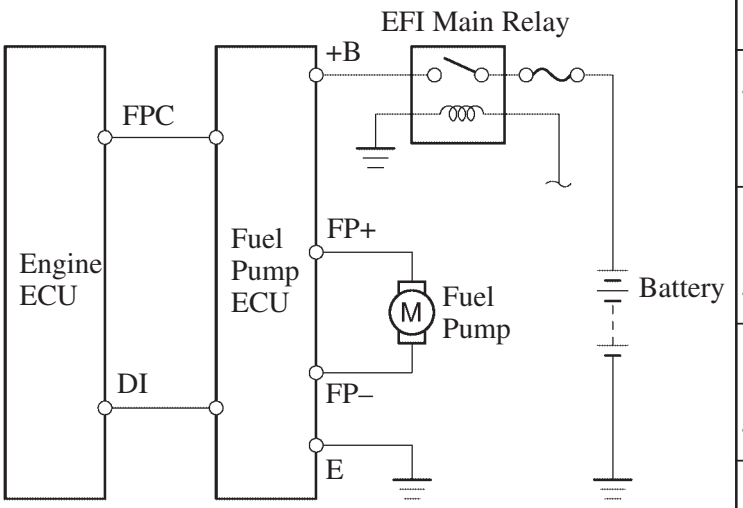
If the diagnostic trouble code 89 is being output to the CHECK ENGINE lamp, it means that the engine ECU has detected a malfunction in the ETCS-i, and outputs the diagnostic trouble code of the ETCS-i to the "ETCS"*1 (or "2nd STRT"*2) indicator light.
Also, the diagnostic trouble code can be output to a hand-held tester via the data link connector 3.
For details, refer to the 2UZ-FE Engine Repair Manual (Pub. No RM630E).

*1: For Manual Transmission Model
*2: For Automatic Transmission Model

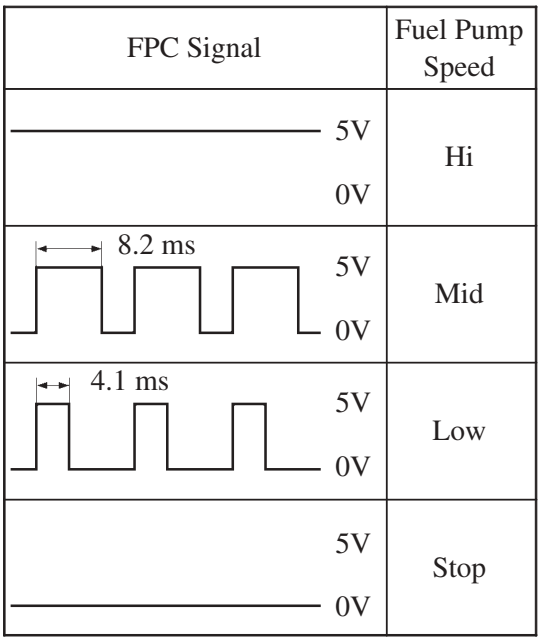
## 7. Fuel Pump Control (Only for Europe Model)

The fuel pump speed control has adopted a fuel pump ECU to execute 3-step fuel pump speed control.

**▶ System Diagram ◀**




152EG11

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## 8. Sub Fuel Tank Control

By activating the fuel pump of the fuel tank (main or sub) that was selected by the fuel tank changeover switch, and by changing over the fuel return valve, fuel is supplied to the engine from the fuel tank selected by the driver.
The construction and operation of the sub fuel tank control system is basically the same as the 1FZ-FE engine.
For detail, see page 58.

## 9. Engine Immobiliser System

The engine immobiliser system has been designed to prevent the vehicle from being stolen. This system uses a engine ECU that stores the ID code of the authorized ignition key. If an attempt is made to start the engine using an unauthorized key, the engine ECU prohibit fuel delivery and ignition, effectively disabling the engine. For details see page 277 in the Engine Immobiliser System section.

## 10. Diagnosis

An M-OBD (Multiplex On-Board Diagnostic) system has been adopted to improve serviceability.
The operation of the M-OBD system is basically the same as the 1FZ-FE engine.
For details, see page 60.

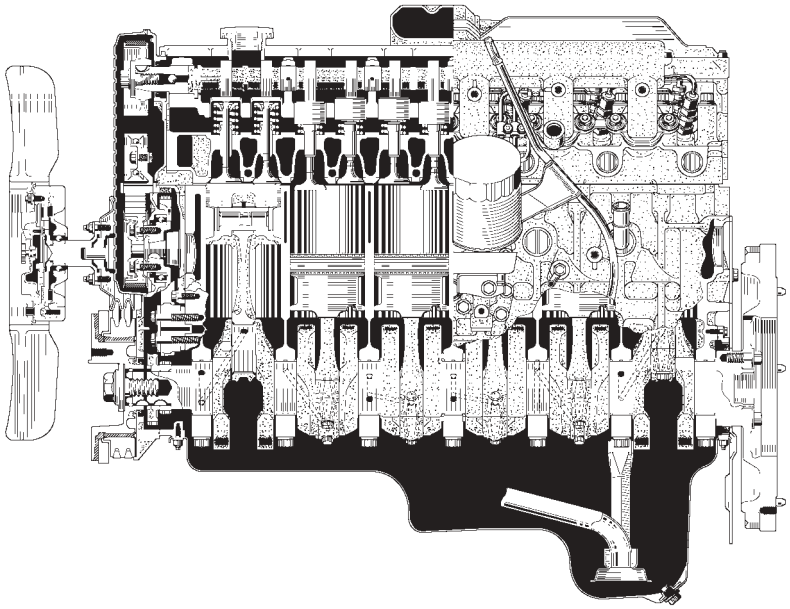
# 1HZ AND 1HD-T ENGINES

## ■ DESCRIPTION

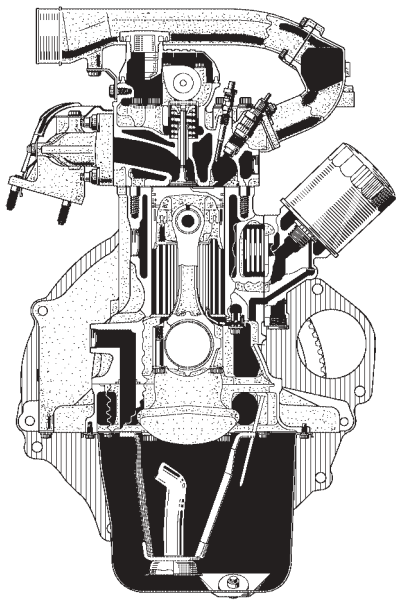
In the 1HZ engine, the injection nozzles have been changed and the shape of the combustion chamber has been changed to reduce exhaust emissions and the rigidity of the cylinder block has been improved to reduce noise and vibration. Similar to the 1HZ engine, the rigidity of the cylinder block of the 1HD-T engine has been improved to reduce noise and vibration.

**▶ 1HZ Engine (Manual Transmission Model) ◀**



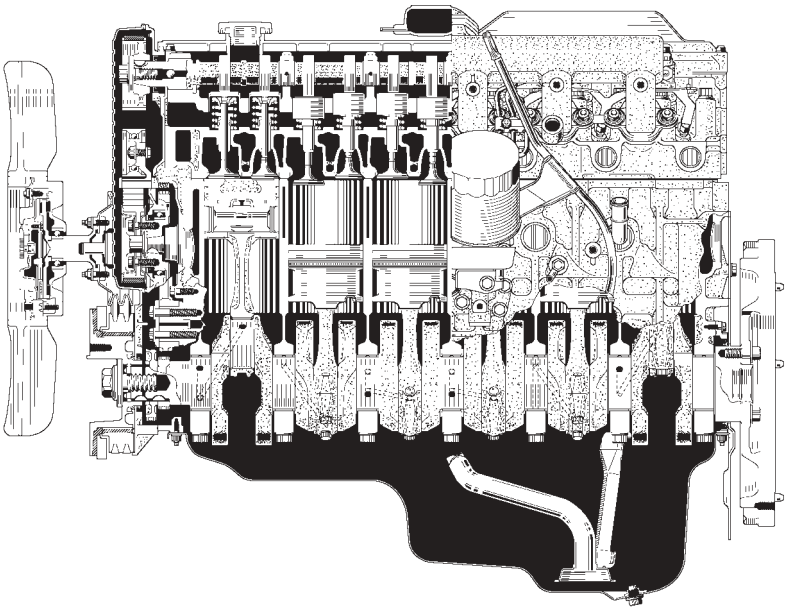


147EG37

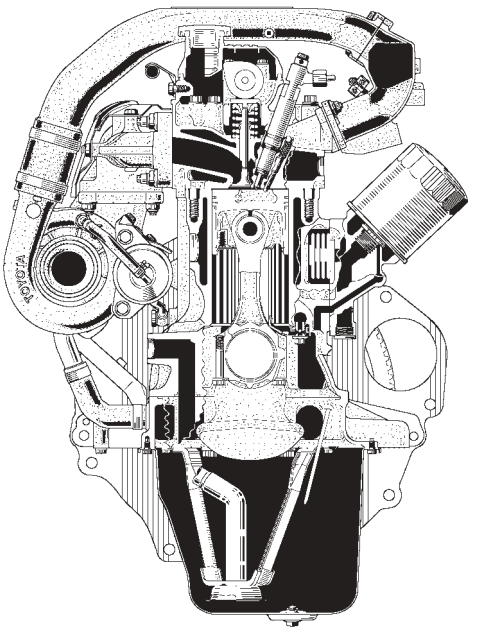


147EG38

**▶ 1HD-T Engine (Manual Transmission Model) ◀**



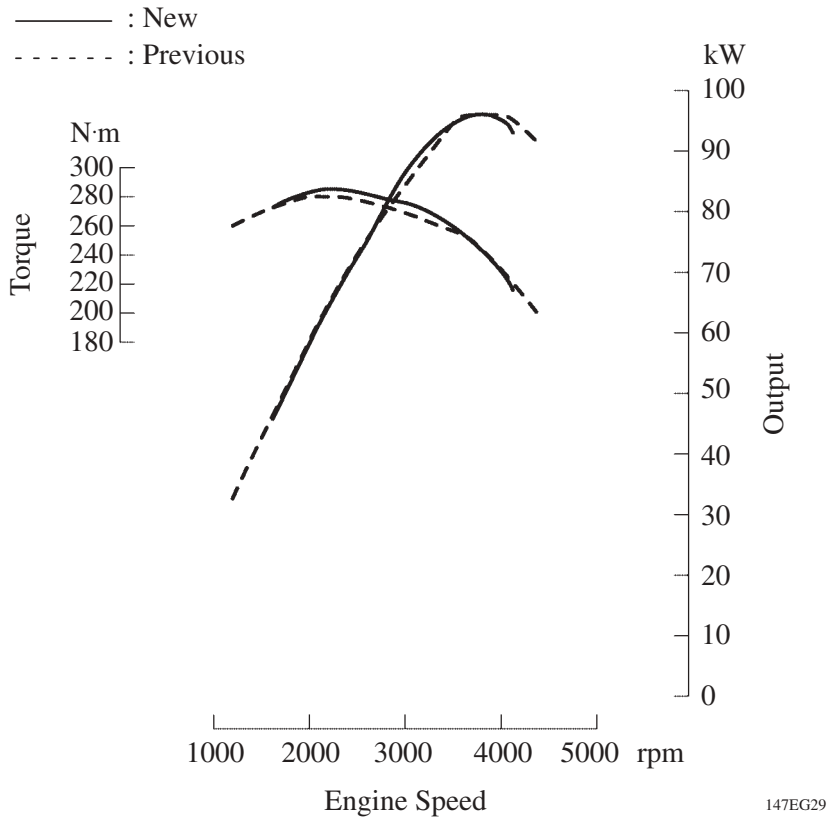
147EG39




147EG40

## ■ENGINE SPECIFICATIONS AND PERFORMANCE CURVE (1HZ ENGINE)

| Item \ 1HZ Engine | | | New | Previous |
|---|---|---|---|---|
| No. of Cyls. & Arrangement | | | 6-Cylinder, In-Line | ← |
| Valve Mechanism | | | 12-Valve, OHC, Gear and Belt Drive | ← |
| Combustion Chamber | | | Swirl Type | ← |
| Manifolds | | | Cross-Flow | ← |
| Displacement cm³ (cu. in.) | | | 4164 (254.0) | ← |
| Bore x Stroke mm (in.) | | | 94.0 x 100.0 (3.70 x 3.94) | ← |
| Compression Ratio | | | 22.4 : 1 | 22.7 : 1 |
| Max. Output | | SAE-NET | 96 kW @ 3800 rpm | 96 kW @ 4000 rpm |
| | | SAE-GROSS | 100 kW @ 3800 rpm | 100 kW @ 4000 rpm |
| Max. Torque | | SAE-NET | 285 N·m @ 2200 rpm | 280 N·m @ 2000 rpm |
| | | SAE-GROSS | 290 N·m @ 2200 rpm | 285 N·m @ 2000 rpm |
| Valve Timing | Intake | Open | 8° BTDC | ← |
| | | Close | 36° ABDC | ← |
| | Exhaust | Open | 51° BBDC | ← |
| | | Close | 5° ATDC | ← |
| Fuel Cetane Number | | | 48 or higher | ← |
| Oil Grade | | | API CF-4 | API CD or Better |




The engine performance curve above is shown in SAE-NET figures.

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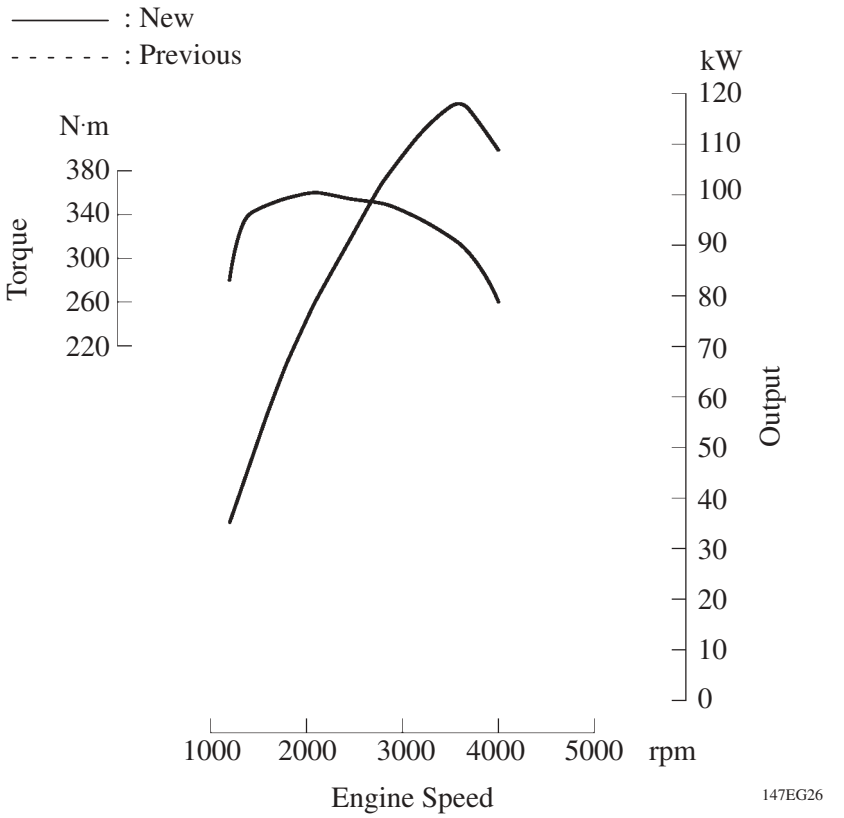
## ■ENGINE SPECIFICATIONS AND PERFORMANCE CURVE (1HD-T ENGINE)

| Item \ 1HD-T Engine | | | New | Previous |
|---|---|---|---|---|
| No. of Cyls. & Arrangement | | | 6-Cylinder, In-Line | ← |
| Valve Mechanism | | | 12-Valve, OHC, Gear and Belt Drive | ← |
| Combustion Chamber | | | Direct Injection Type | ← |
| Manifolds | | | Cross-Flow | ← |
| Displacement cm³ (cu. in.) | | | 4164 (254.0) | ← |
| Bore x Stroke mm (in.) | | | 94.0 x 100.0 (3.70 x 3.94) | ← |
| Compression Ratio | | | 18.6 : 1 | ← |
| Max. Output | | SAE-NET | 118 kW @ 3600 rpm | ← |
| Max. Torque | | SAE-NET | 360 N·m @ 2100 rpm | ← |
| Valve Timing | Intake | Open | 8° BTDC | ← |
| | | Close | 29° ABDC | ← |
| | Exhaust | Open | 51° BBDC | ← |
| | | Close | 5° ATDC | ← |
| Fuel Cetane Number | | | 48 or higher | ← |
| Oil Grade | | | API CF-4 | API CD or Better |



## ■ MAJOR DIFFERENCES

The following changes have been made to the 1HZ and 1HD-T engines.

- The changes described below are the same as those of the 1HD-FTE engine. For details, see the 1HD-FTE engine section.

| Item | Details | 1HZ | 1HD-T |
|---|---|---|---|
| Engine Proper | ● The rigidity of the cylinder block has been improved to reduce noise and vibration.<br>● The crankshaft has been made highly rigid to reduce noise and vibration.<br>● The crankshaft bearings have been machine-bored to improve their reliability. | ○ | ○ |
| Cooling System | ● An aluminum radiator core is used for weight reduction.<br>● A step-up linear type temperature controlled fluid coupling has been adopted to improve cooling performance. | ○ | ○ |
| Lubrication System | ● A high-performance oil filter element has been adopted to improve the cleanliness of the engine oil.<br>● A drip pan is provided on the oil cooler cover to improve serviceability. | ○ | ○ |
| | The oil capacity of the engine has been increased to improve its reliability. | – | ○ |
| Intake and Exhaust System | ● A ball joint has been adopted in the front exhaust pipe to reduce noise and vibration.<br>● A clamp type joint is used to join the center pipe and tail pipe to realize weight reduction. | – | ○ |

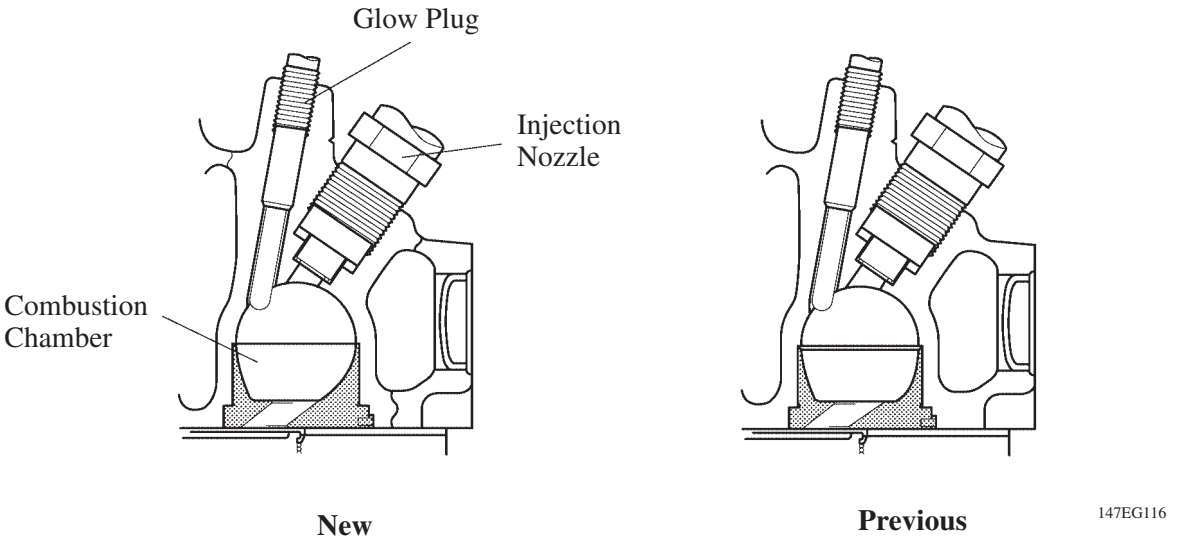
- In addition to those listed above, the following changes have been made to the 1HZ and 1HD-T engines.

| Item | Detail | 1HZ | 1HD-T |
|---|---|---|---|
| Engine Proper | ● The shape of the combustion chamber of the cylinder head and the piston has been optimized to reduce exhaust emissions.<br>● The inertial weight of the flywheel has been increased to reduce the fluctuations in engine speed. | ○ | – |
| Valve Mechanism | ● A hydraulic type auto tensioner has been adopted to achieve proper timing belt tension.<br>● The shape of the timing gear cover has been changed for quieter operation. | ○ | ○ |
| Fuel System | ● The orifice of the injection nozzle has been increased to optimize the injection rate. | ○ | – |
| | ● The injection pump is provided with FCVC (Fuel Cut Valve Control) in conjunction with the adoption of the engine immobiliser system. | ○ | ○ |
| Glow System | ● New glow plugs made of metal have been adopted and the glow plug resistor and sub-relay have been discontinued. | ○ | ○ |

## ■ENGINE PROPER (1HZ ENGINE)

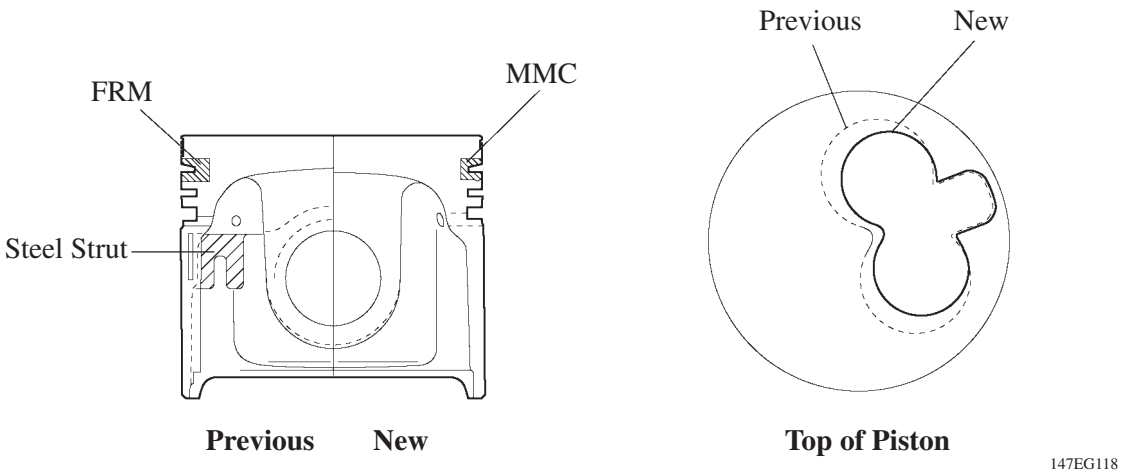
### 1. Cylinder Head

The shape of the combustion chamber has been optimized to reduce exhaust emissions.




### 2. Piston

- The piston is made of aluminum alloy that offers high temperature strength. The top ring groove has been treated with MMC (Metal Matrix Composites) to improve its wear resistance.
- The shape of the piston skirt has been optimized to improve its rigidity. Accordingly, the steel strut has been discontinued.
- The shape of the combustion chamber at the top of the piston has been changed. Along with the change in the shape of the combustion chamber in the cylinder head, improved combustion efficiency has been realized.




***– REFERENCE –***

*MMC (Metal Matrix Composites)*

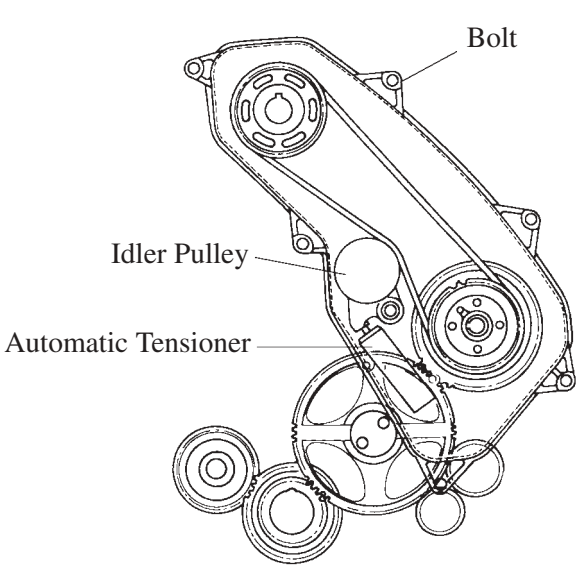
It is a type of composite material that is made of a metal matrix for the purpose of obtaining characteristics such as high strength, high elasticity, and low thermal expansion. Because of its excellent heat transmission performance, this material helps to dissipate the piston's heat through the piston ring to the cylinder block.

## ■ VALVE MECHANISM

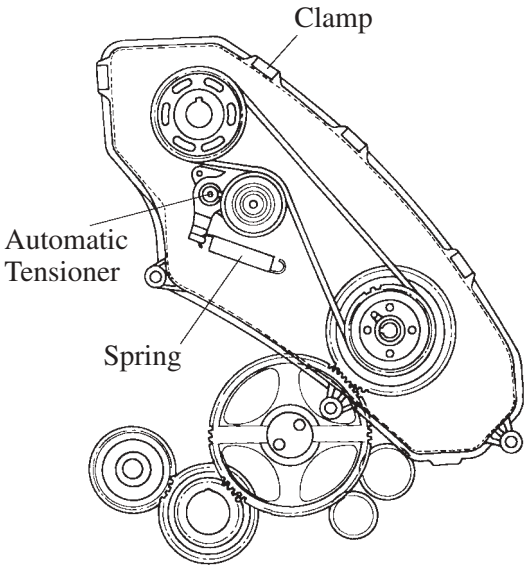
### 1. General

- The auto tensioner has been changed from the wear reducing type to the hydraulic type. As a result, proper timing belt tension has been realized.
- For the timing belt cover gasket, a cover with integrated foam rubber has been adopted for improved serviceability.
- The timing belt cover installation portion has adopted a floating construction to reduce noise.



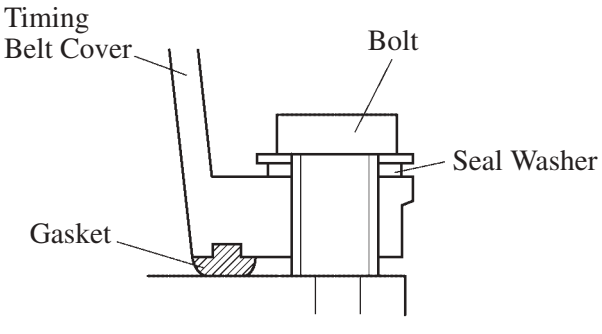



**New**



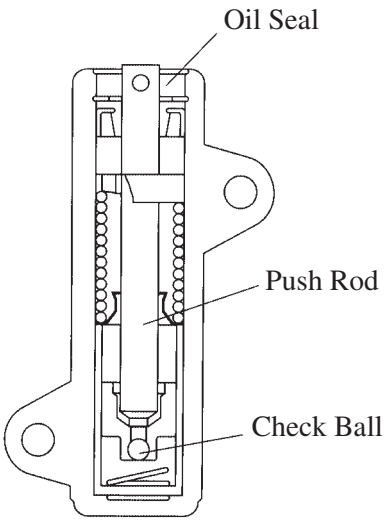

**Previous**

147EG121




**Timing Belt Cover Installation Portion**

147EG122

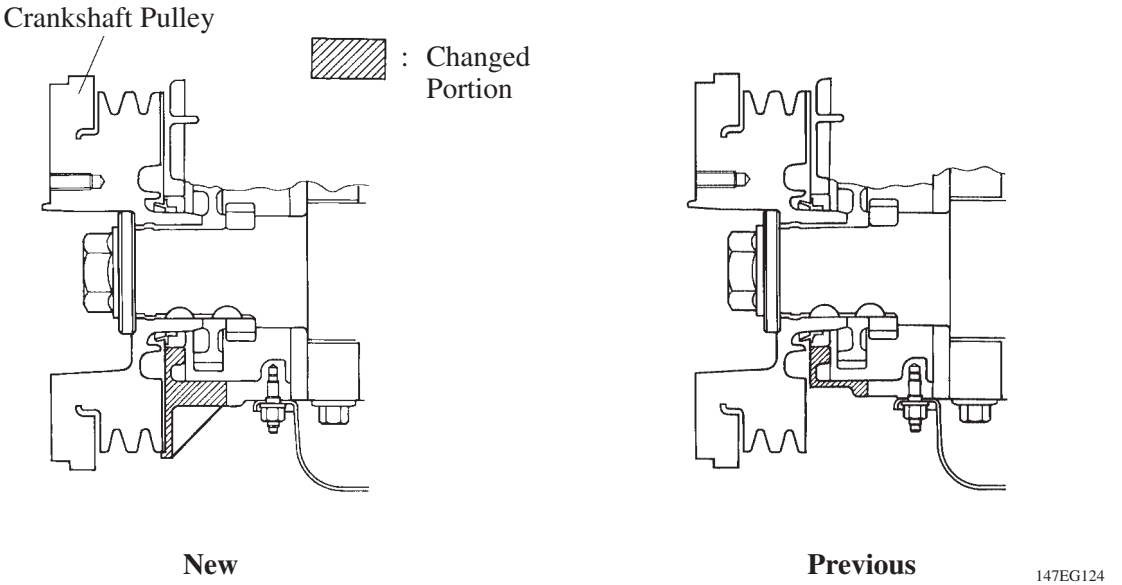



**Hydraulic Automatic Tensioner**

147EG123

### 2. Timing Gear Cover

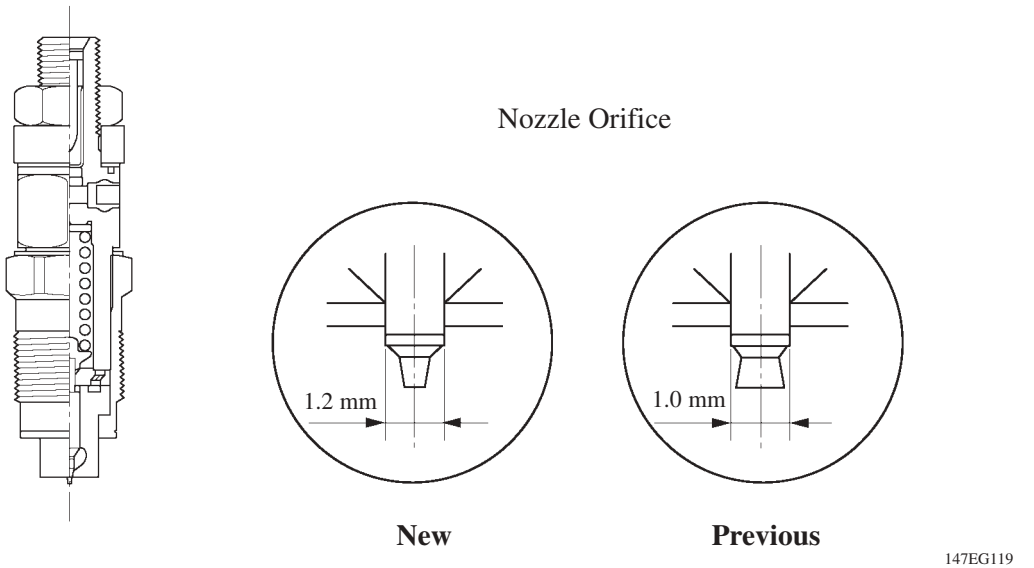
The shape of the bottom of the timing gear cover has been changed to reduce the amount of sound that is radiated towards the bottom of the engine.




## ■FUEL SYSTEM

### 1. Injection Nozzle (1HZ Engine)

The injection nozzle's orifice has been changed in shape and enlarged to optimize the injection efficiency.



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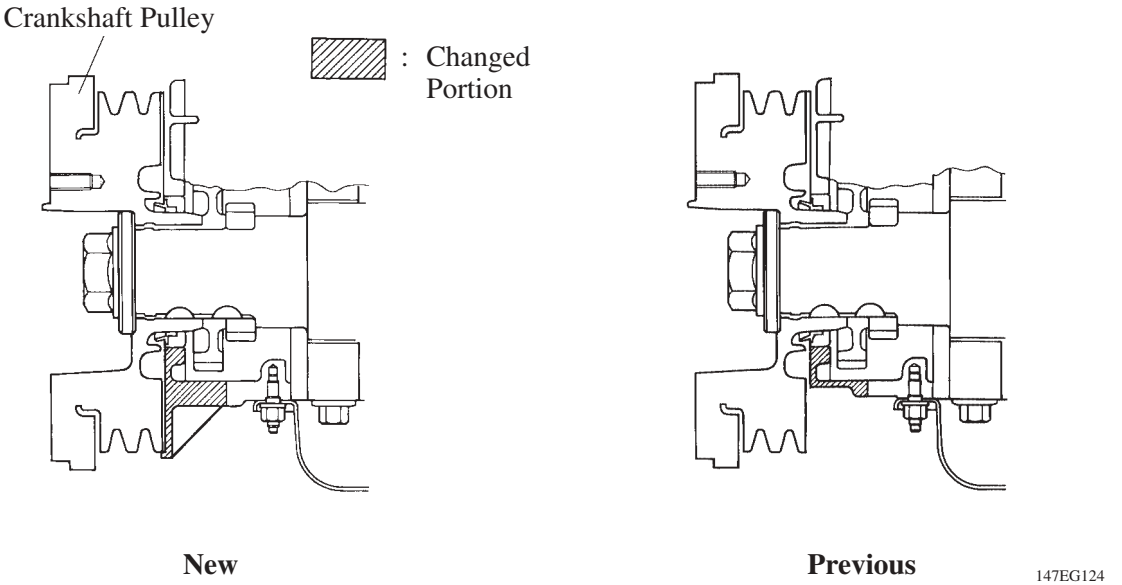


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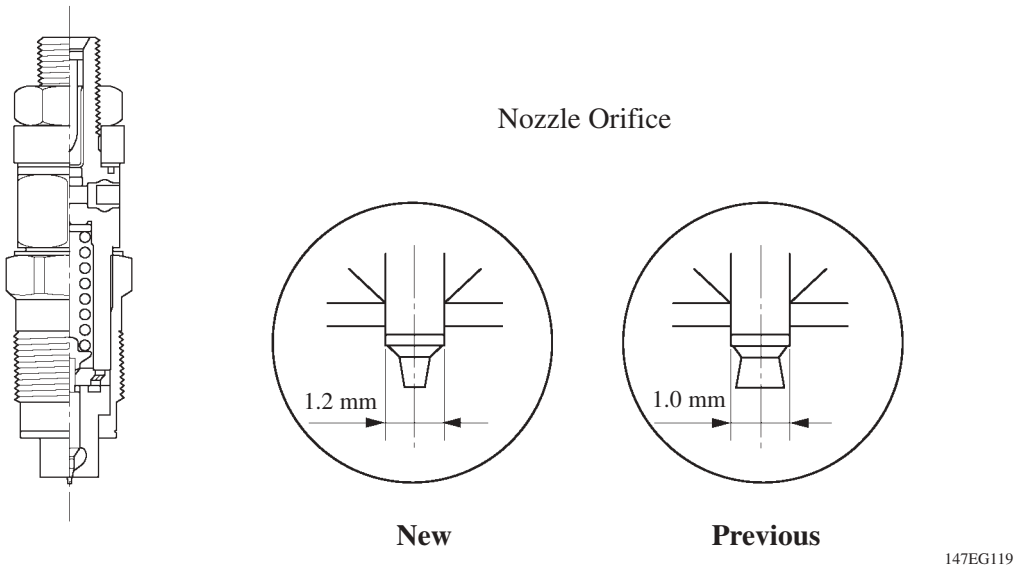
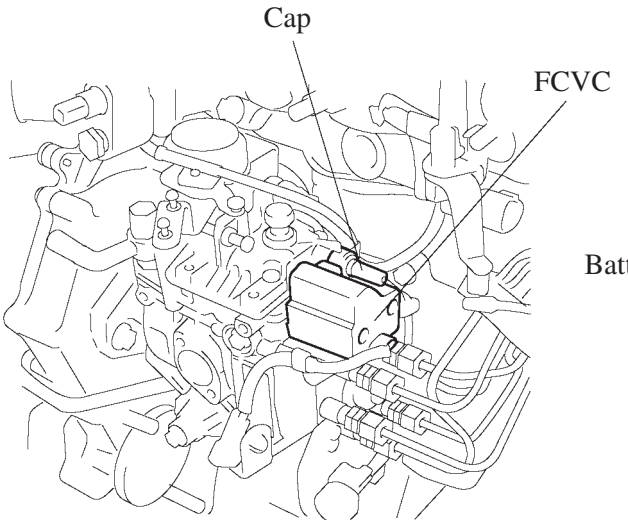
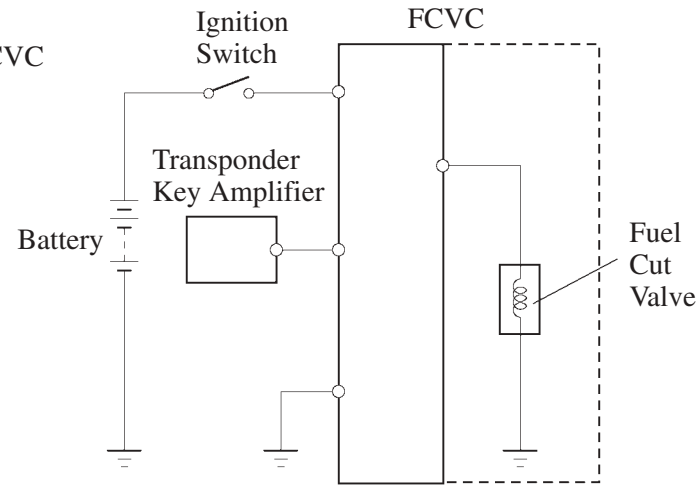


## 2. Injection Pump

- Along with the changes made to the shape of its combustion chamber, the 1HZ engine has realized optimal injection volume, injection characteristics, and injection timing.
- The injection pump is provided with FCVC (Fuel Cut Valve Control) in conjunction with the adoption of the engine immobiliser system. Upon receiving communication from the transponder key computer, the FCVC turns OFF the fuel cut valve to prohibit the engine from starting if an invalid ignition key is used in an attempt to start the engine.
- A tampering-proof cap is placed over the full-load setting screw on the models for the General Countries.




147EG125



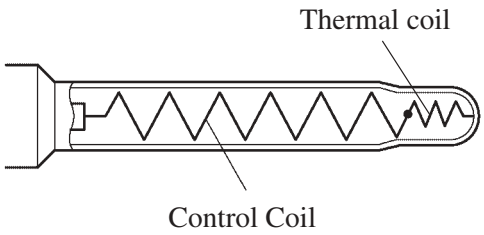

147EG120



# ■ GLOW SYSTEM

## 1. Glow Plug

- New glow plugs made of metal have been adopted. Using an optimal control coil material and providing a temperature control function in the glow plug itself, the system has been simplified by discontinuing the glow plug resister and sub-relay.




147EG127

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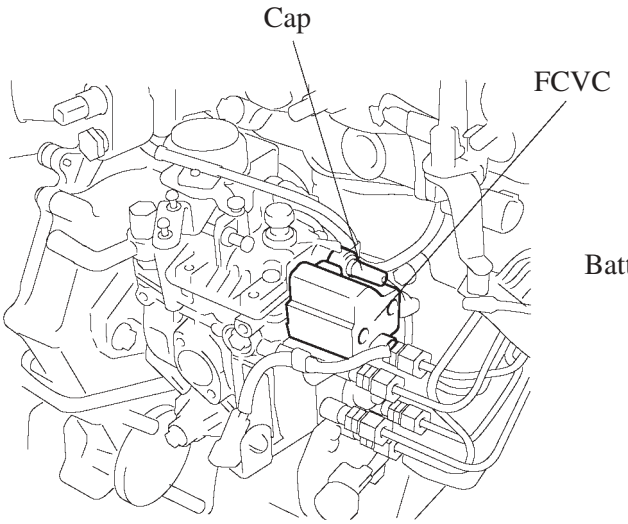


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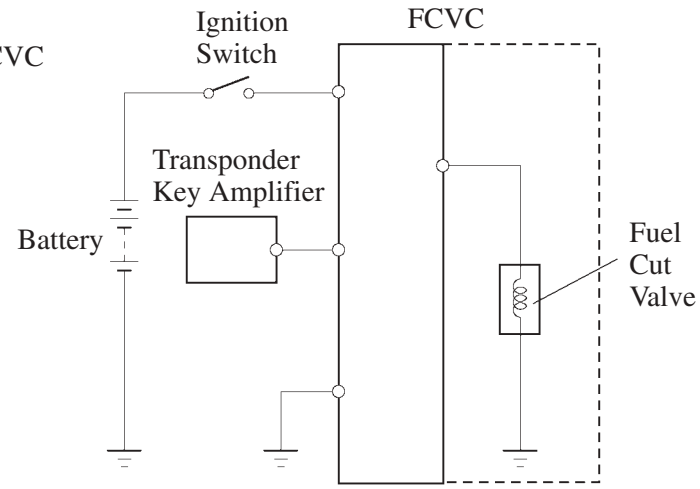


147EG120



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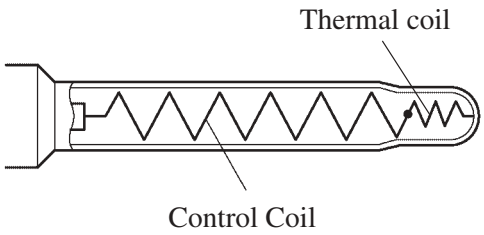
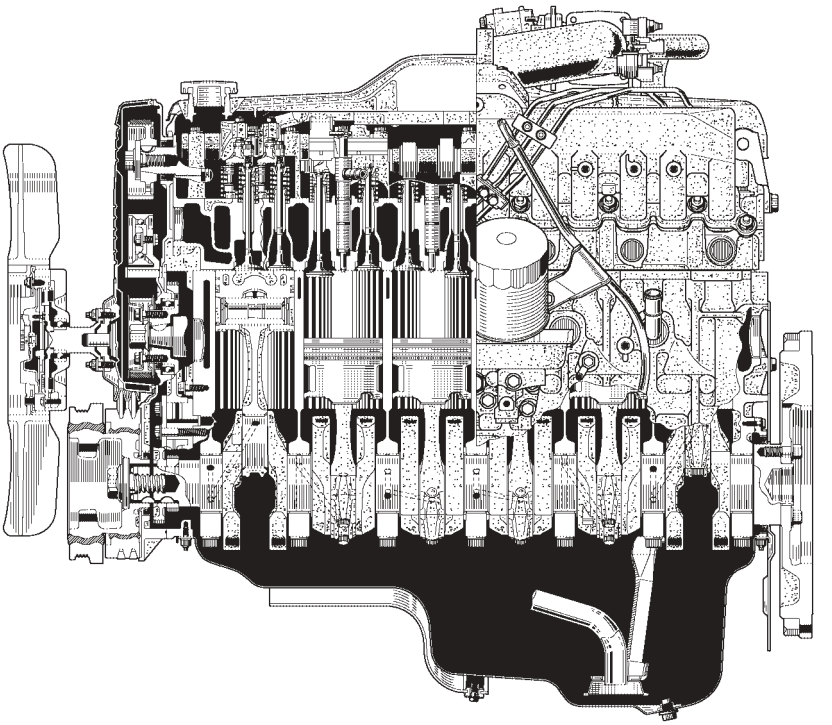



147EG127

# 1HD-FTE ENGINE

## ■ DESCRIPTION

Based on the previous 1HD-FT engine, the 1HD-FTE engine has adopted an electronically controlled injection pump and an intercooler and has undergone improvements in the various areas of the engine to improve the engine performance and fuel economy while reducing exhaust emissions. At the same time, this engine contributes to the vehicle's quieter operation and improved reliability.



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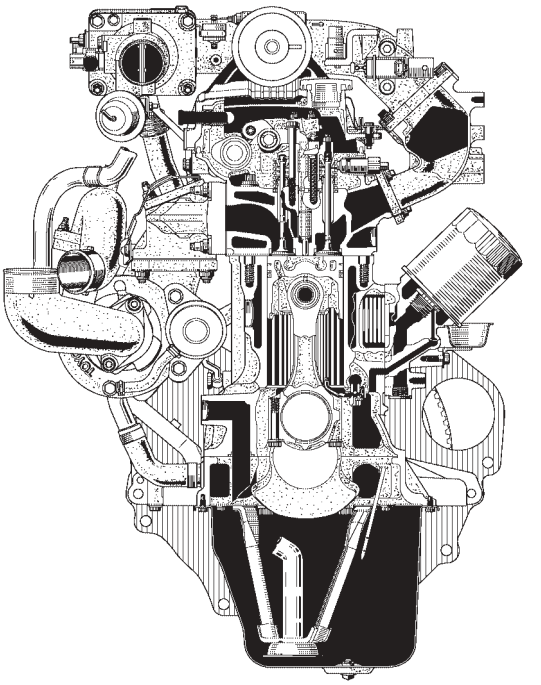
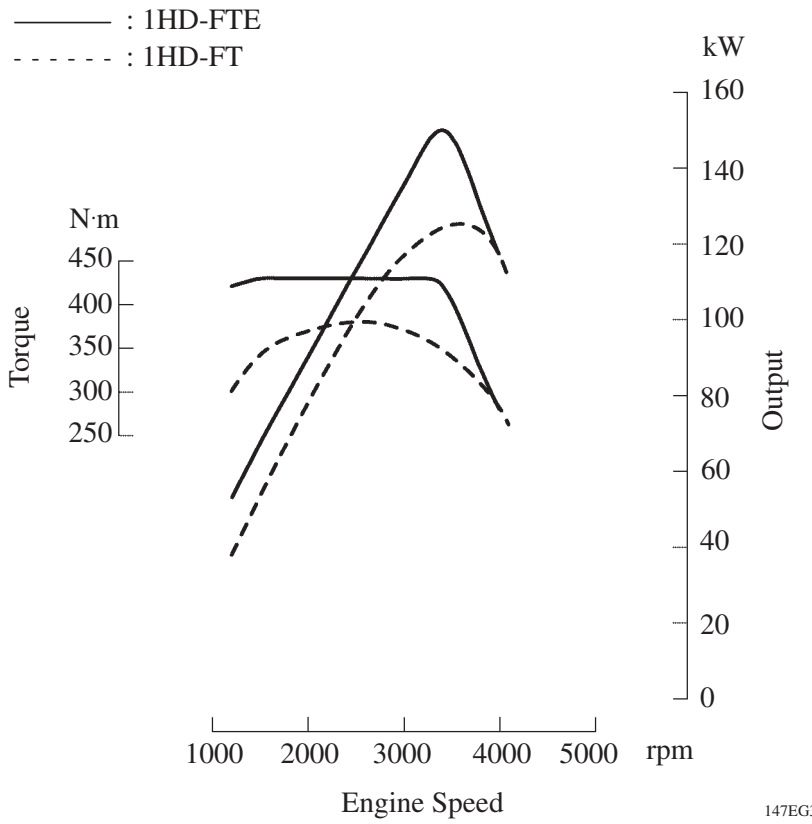


147EG27

## ■ENGINE SPECIFICATIONS AND PERFORMANCE CURVE

| Item \ Engine | | | 1HD-FTE | 1HD-FT |
|---|---|---|---|---|
| No. of Cyls. & Arrangement | | | 6-Cylinder, In-Line | ← |
| Valve Mechanism | | | 24-Valve, OHC, Belt & Gear Drive | ← |
| Combustion Chamber | | | Direct Injection Type | ← |
| Manifolds | | | Cross-Flow | ← |
| Fuel System | | | Distributor Type (Electronically Controlled) | Distributor Type (Mechanically Controlled) |
| Displacement cm³ (cu. in.) | | | 4164 (254.0) | ← |
| Bore x Stroke mm (in.) | | | 94.0 x 100.0 (3.70 x 3.94) | ← |
| Compression Ratio | | | 18.8 : 1 | 18.6 : 1 |
| Max. Output [EEC] | | | 150 kW @ 3400 rpm | 125 kW @ 3600 rpm |
| Max. Torque [EEC] | | | 430 N·m @ 1400 ~ 3200 rpm | 380 N·m @ 2500 rpm |
| Valve Timing | Intake | Open | 12° BTDC | ← |
| | | Close | 24° ABDC | 32° ABDC |
| | Exhaust | Open | 54° BBDC | ← |
| | | Close | 12° ATDC | ← |
| Intercooler | | | With | N.A. |
| Fuel Cetane Number | | | 48 or higher | ← |
| Oil Grade | | | API CF-4 | API CD or Better |




EG

## ■ MAJOR DIFFERENCES

Major differences of the new 1HD-FTE engine and previous 1HD-FT engine are listed below.

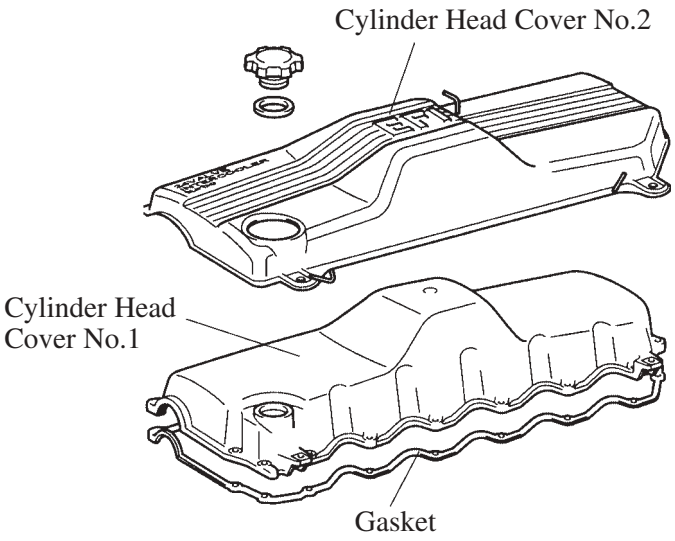
| Item | Features |
|---|---|
| Engine Proper | ● A cylinder head cover made of resin has been adopted for weight reduction and low-noise operation.<br>● The rigidity of the cylinder block has been improved to reduce noise and vibration.<br>● Newly designed pistons have been adopted to improve the engine performance and reliability.<br>● The crankshaft has been made highly rigid to reduce noise and vibration.<br>● The crankshaft bearings have been machine-bored to improve their reliability. |
| Cooling System | ● An aluminum radiator core is used for weight reduction.<br>● A step-up linear type temperature controlled fluid coupling has been adopted to improve cooling performance. |
| Lubrication System | ● A high-performance oil filter element has been adopted to improve the cleanliness of the engine oil.<br>● The oil capacity of the engine has been increased to improve its reliability.<br>● A drip pan is provided on the oil cooler cover to improving serviceability. |
| Intake and Exhaust System | ● A ball joint has been adopted in the front exhaust pipe to reduce noise and vibration.<br>● An oxidation catalytic converter has been adopted in the front exhaust pipe to reduce exhaust emissions. |
| Turbocharger System | ● A compact turbocharger has been adopted to attain a widely ranging high-efficiency region from the low- to the high-speed range.<br>● An intercooler has been adopted to improve engine performance. |
| Fuel System | ● A radial plunger type electronically controlled injection pump that produces a high injection pressure has been adopted to improve the engine performance while reducing exhaust emissions.<br>● The injection nozzles have been optimized to improve the engine performance and reduce exhaust emissions. |
| Starting System | The 12/24 volt switchover system has been discontinued to simplify the wiring system. |
| Engine Control System | ● An electronic fuel injection system has been adopted.<br>● M-OBD (Multiplex On-Board Diagnosis) system is adopted. |

## ■ENGINE PROPER

### 1. Cylinder Head Cover

- The No.1 cylinder head cover is made of resin, adopts a curved shape, and has optimally allocated ribs for weight reduction and reduced noise.
- Spaced bolts are used for fastening the cylinder head covers. In addition, vibration isolating washers containing laminated layers of rubber and aluminum sheets have been adopted to achieve a floating retaining construction that reduces noise and improves reliability.
- The blowby gas passage in the cylinder head cover has adopted a maze-like configuration to minimize the consumption of engine oil through blowby gas.
- A No.2 cylinder head cover has been adopted. The No.2 cylinder head cover, which is made of iron sheet, is completely covered with foam rubber on the inside. A vibration isolating rubber gasket is used to achieve a floating retaining construction to improve sound insulation.



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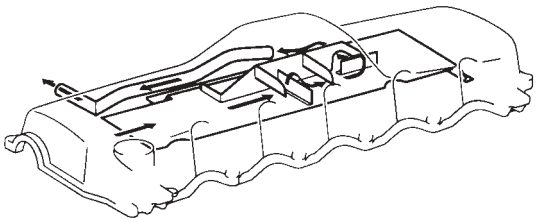
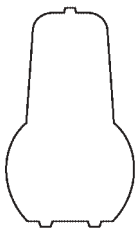


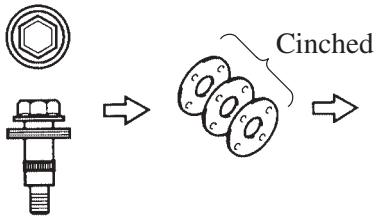
**Blowby Gas Flow**

147EG47

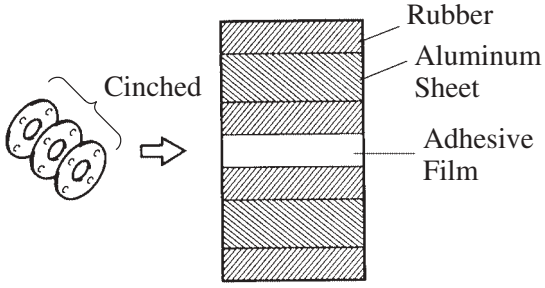


151EG33

**Gasket Cross Section**



**Spaced Bolt**

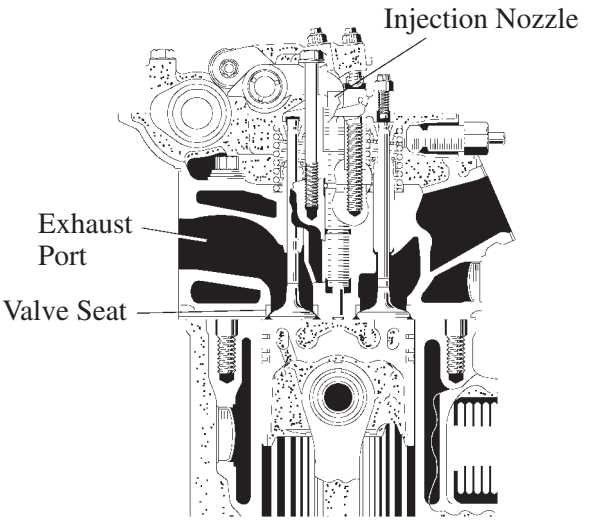



**Vibration Isolating Washer**

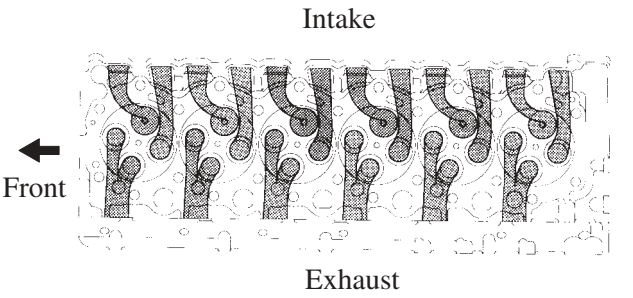
147EG48

## 2. Cylinder Head

- Similar to the previous 1HD-FT engine, the adoption of the 4-valve mechanism has made it possible to position the injection nozzle perpendicularly over the center of the cylinder bore. Together with the adoption of 2 intake ports of different shapes, this enables the generation of an optimal swirl and the introduction of an ample volume of intake air. As a result, the mixing of fuel and air has been accelerated to achieve an appropriate combustion.
- The cooling performance has been improved by enlarging the water jacket around the exhaust valves and the injection nozzles, thus improving the reliability of the engine.
- The exhaust valve seats have been changed to a type made of sintered alloy that excels in wear resistance.



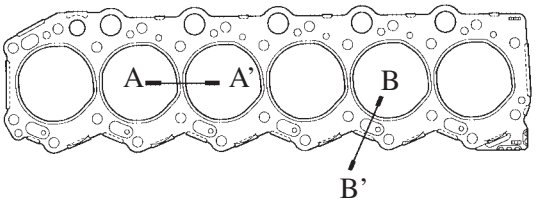

147EG102

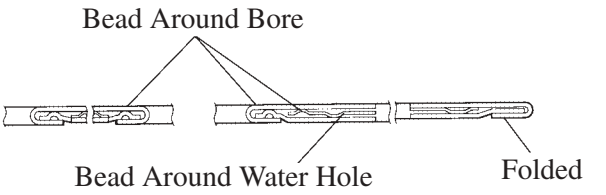



147EG49

## 3. Cylinder Head Gasket

- A 3-layer steel laminate type cylinder head gasket has been adopted.
- The gasket has adopted a bead construction at its cylinder bores, water holes, and oil holes. The periphery of the gasket has been folded to accept bearing stress. This prevents unnecessary bearing stress from being applied to the sealing portions such as at the bores, thus restraining the deformation of the bores over the cylinder block.



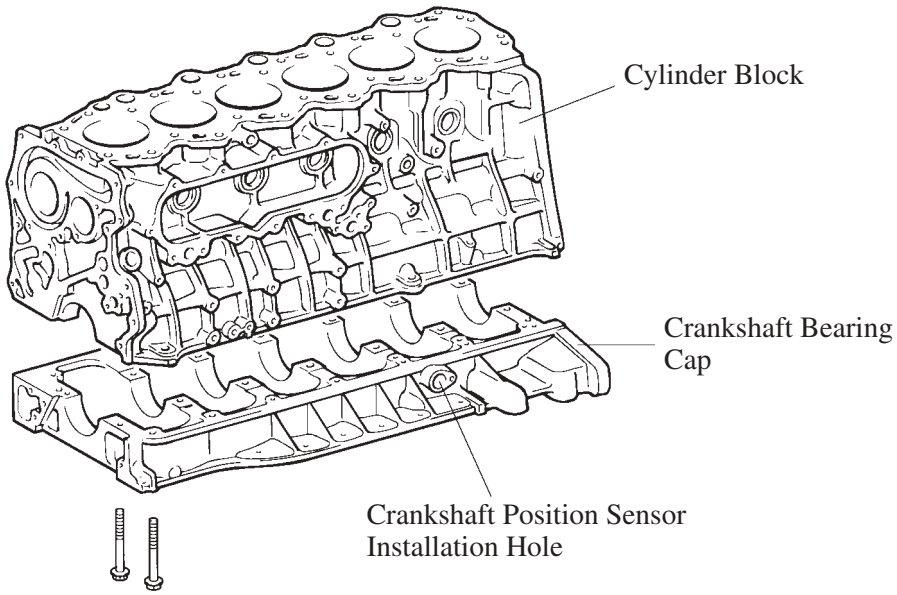




**A – A' Cross Section** **B – B' Cross Section**

147EG50

## 4. Cylinder Block

- Crankshaft bearing caps with a ladder frame construction have been adopted as in the previous model. To accommodate the high performance engine, the ladder frame has been optimally designed to improve its rigidity while restraining the increase of its weight, thus reducing noise and vibration.
- Along with the adoption of the engine control system, the hole for installing the crankshaft position sensor is provided in the crankshaft bearing cap.

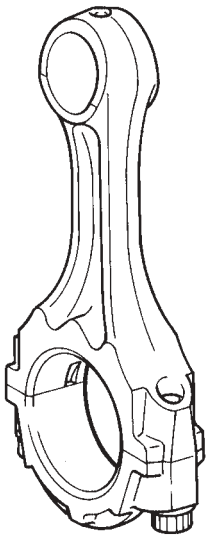



147EG51



## 5. Connecting Rod

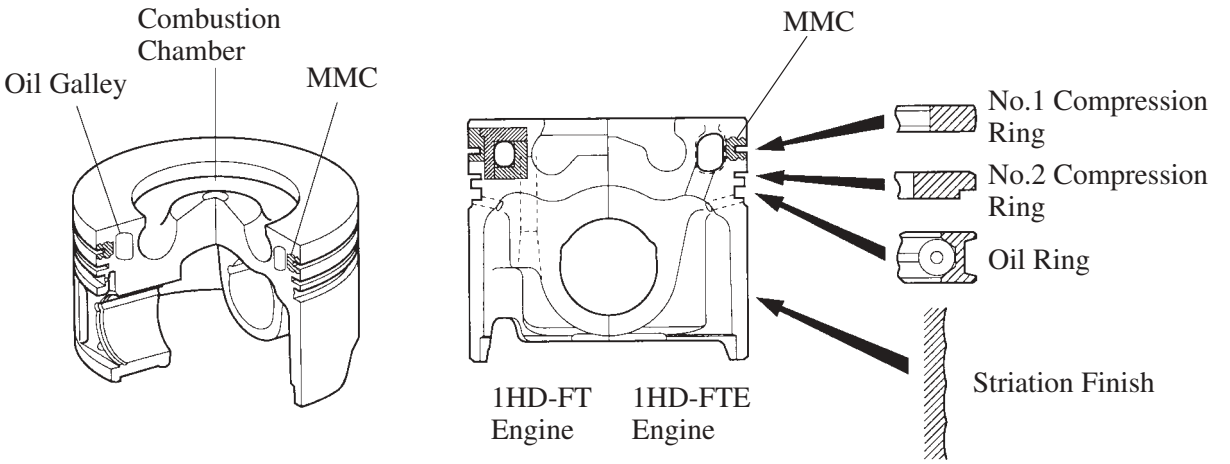
- The connecting rod is made of a lightweight carbon steel that withstand higher speed and high output operation.
- The small end of the connecting rods has been given a tapered shape to reduce weight.



147EG52

## 6. Piston

- The piston is made of aluminum alloy that offers high temperature strength. The top ring groove has been treated with MMC (Metal Matrix Composites) to improve its wear resistance.
- The combustion chamber has been designed with an optimal shape to improve the engine performance while reducing exhaust emissions.
- The piston skirt has been designed with an optimal shape to reduce noise and vibration.
- The cross sectional area of the oil galley in the piston has been enlarged to improve the piston's cooling performance and reduce its temperature during high power output.
- A gas nitriding process has been applied to the piston ring surface to improve its durability and reduce the piston ring tension, thus reducing the friction loss.



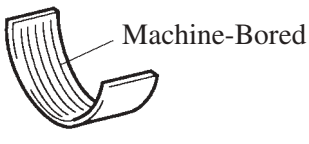

***– REFERENCE –***

*MMC (Metal Matrix Composites)*

It is a type of composite material that is made of a metal matrix for the purpose of obtaining characteristics such as high strength, high elasticity, and low thermal expansion. Because of its excellent heat transmission performance, this material helps to dissipate the piston's heat through the piston ring to the cylinder block.

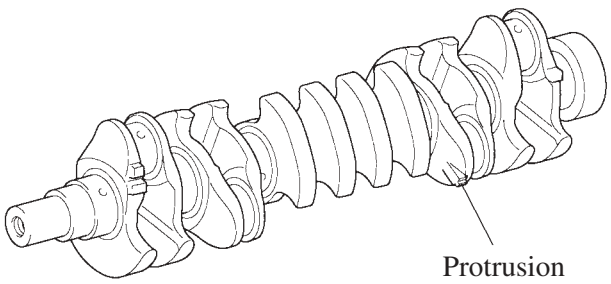
## 7. Crankshaft

- As in the previous engine, a crankshaft with 7 forged journals and 12 balance weights has been adopted. Along with the high performance of the engine, the rigidity of its arms and the balance rate of its weights have been improved.
- Along with the adoption of the engine control system, a protrusion is provided for the crankshaft position sensor.
- The inner surface of the crankshaft bearing has been machine-bored to provide minute crests and valleys in the circumferential direction. This process helps to improve the bearing's break-in and engine oil retention, thus improving the reliability of the engine.

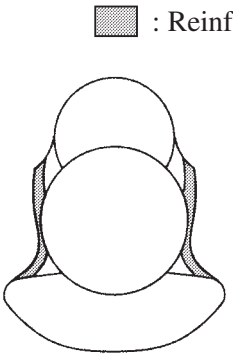



147EG54

**Crankshaft Bearing**




147EG55

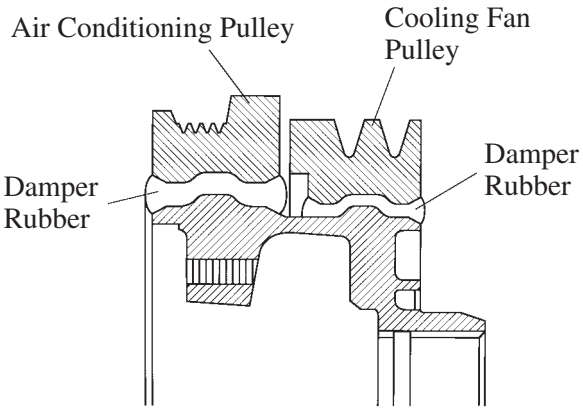



**Cross Section**

147EG56

## 8. Crankshaft Pulley

A torsional damper pulley has been adopted to reduce noise and vibration.
The pulley for air conditioning, which had previously been retrofitted, has now been integrated with the pulley for the cooling fan. At the same time, the pulley's inertial moment has been improved and a high-damping rubber damper has been adopted to further reduce noise and vibration.

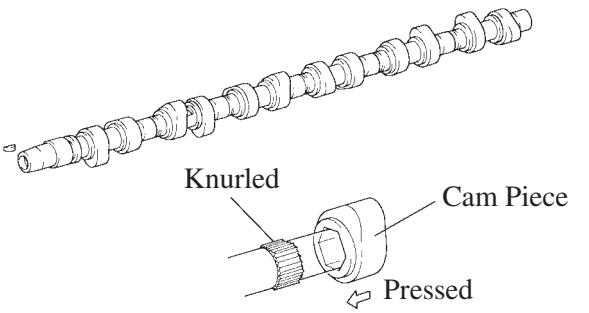



147EG57

## ■ VALVE MECHANISM

### 1. Camshaft

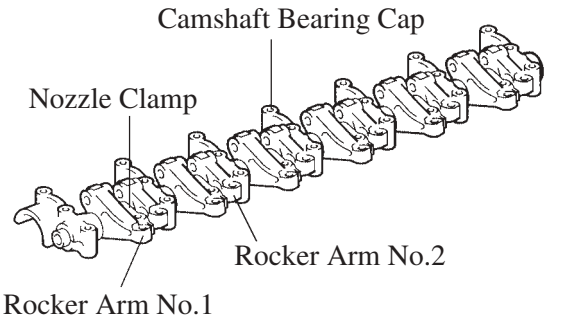
- As in the previous engine, an assembled type camshaft in which cam pieces that are pressed over the knurled shaft has been adopted.
- The shaft is made of carbon steel and is hollow for weight reduction.




147EG59

### 2. Rocker Arm Shaft

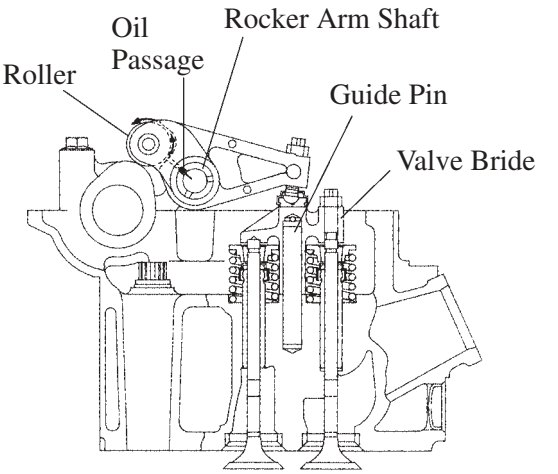
The rocker arm shaft, to which the rocker arms, nozzle clamps, and camshaft bearing caps are attached, is mounted on the cylinder head via the camshaft bearing caps.




147EG60

### 3. Rocker Arm and Valve

- As in the previous engine, the rocker arms are made of aluminum and use rollers to improve wear resistance and to reduce friction loss.
- The length of the exhaust valve has been extended so that the valve in its fully closed state is positioned closer to the piston in order to reduce the unnecessary amount of space in the combustion chamber. As a result, the combustion efficiency has been improved and exhaust emissions have been reduced.

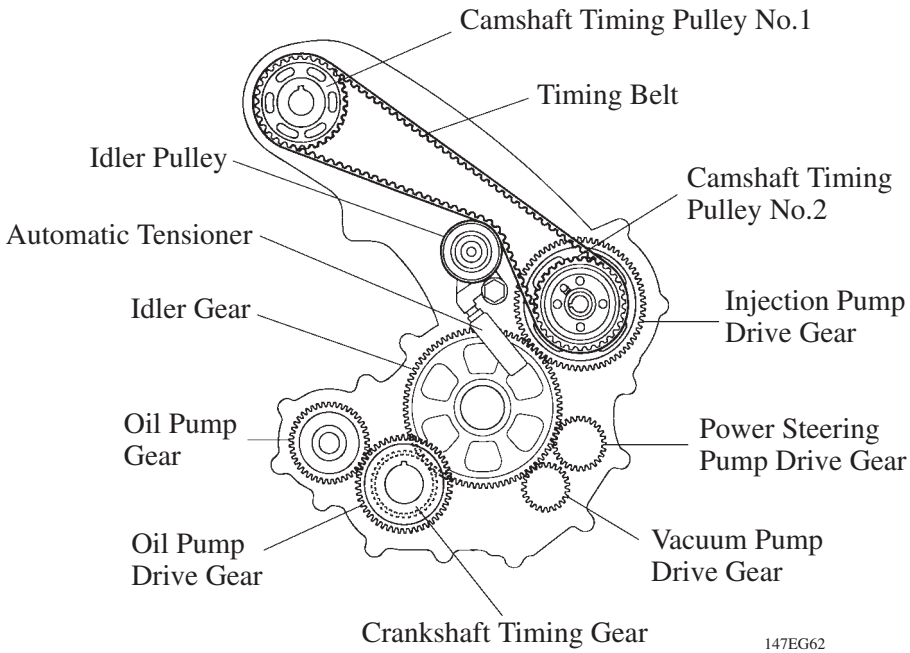


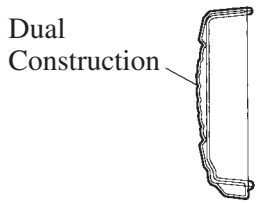

147EG61

## 4. Timing Gear Train

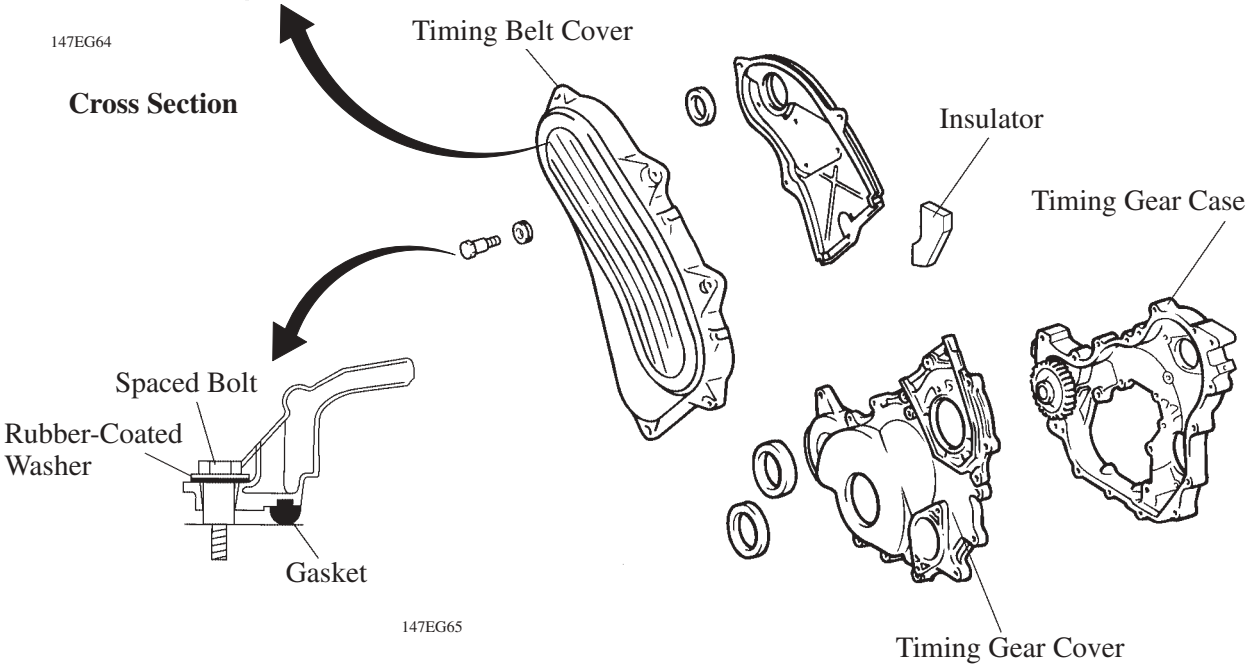
- As in the previous engine, an OHC mechanism that is driven by a belt and gears has been adopted.
- The backlash between the crankshaft timing gear, idle gear, and the injection pump drive gear has been reduced and the precision of the gear tooth flank has been improved to reduce noise.
- A bearing is used between the idle gear and the idler gear shaft to improve reliability.
- The timing belt cover has adopted a dual construction cross sectional shape containing an air layer and the portion that attaches to the engine has adopted a floating construction to reduce noise.
- The timing belt cover gasket uses foam rubber that is integrated with the cover to improve serviceability.
- A hydraulic type automatic tensioner has been adopted.





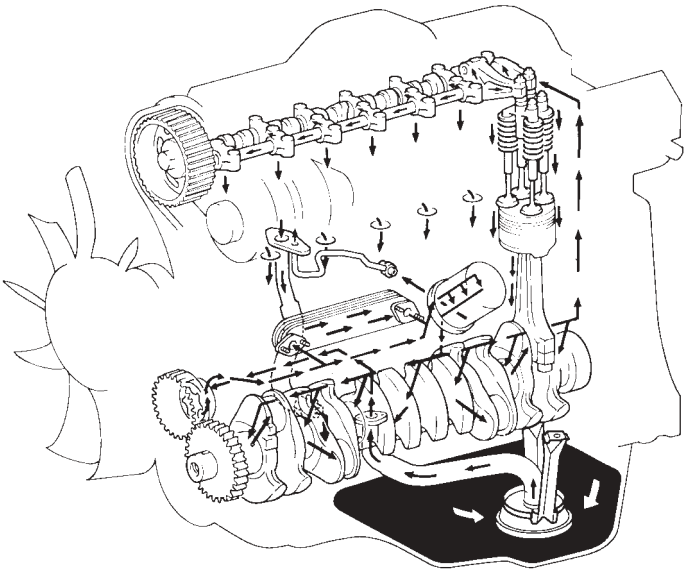

**Cross Section**



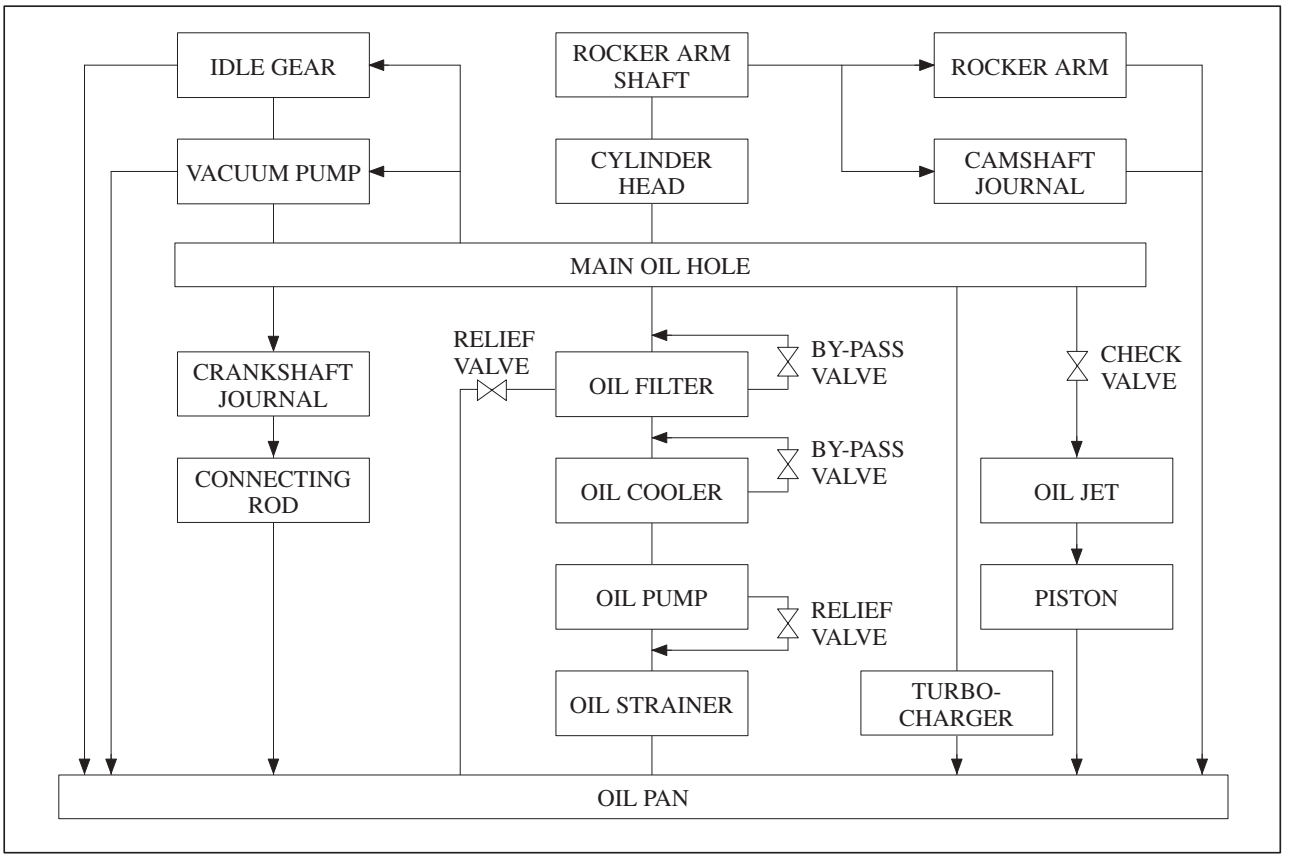
## ■LUBRICATION SYSTEM

### 1. General

- The lubrication circuit is fully pressurized and all oil passes through an oil filter.
- A trochid gear type oil pump is directly driven by crankshaft.
- The water-cooled type engine oil cooler is used to lower the oil temperature.

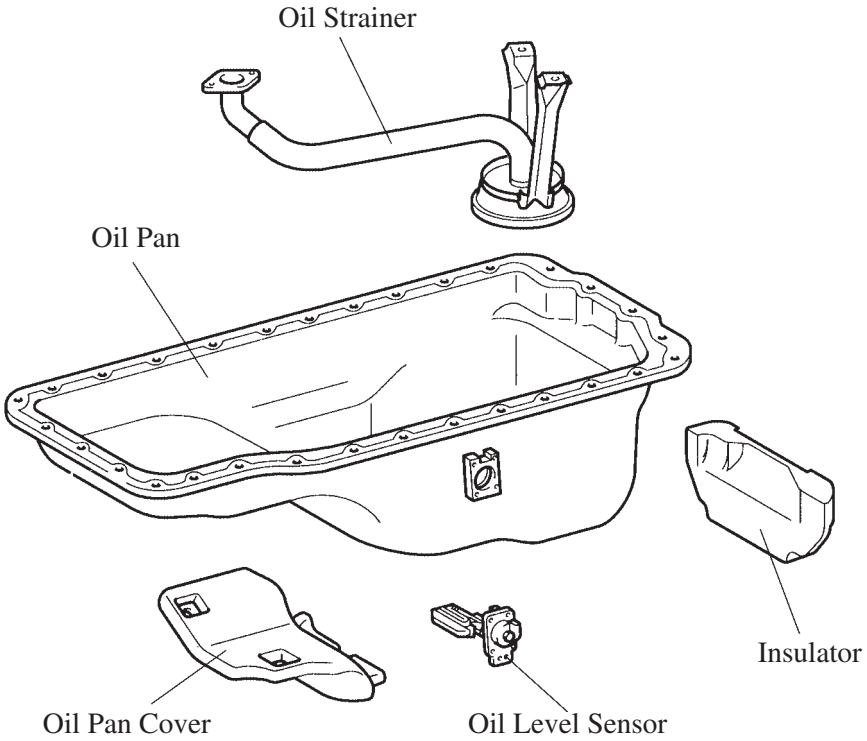


147EG66



## 2. Oil Pan and Oil Strainer

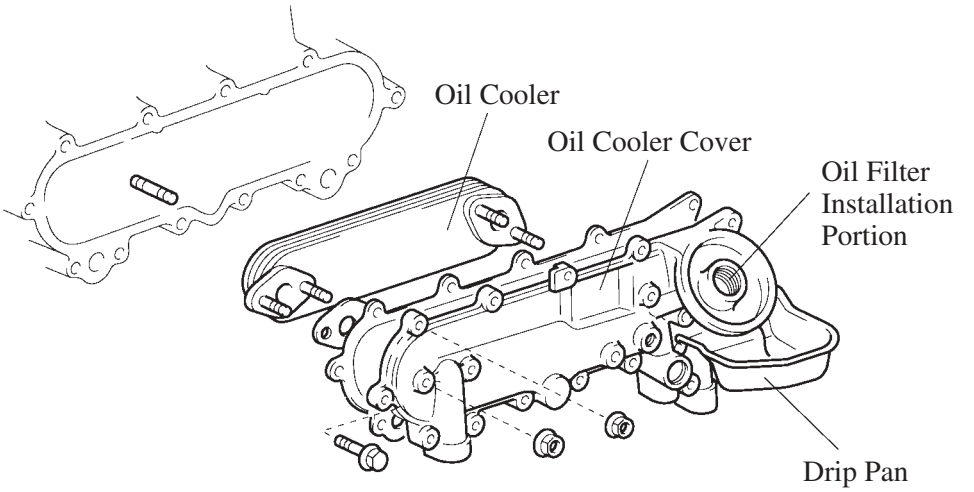
- As in the previous engine, a vibration damping steel plate is used for the oil pan for quieter operation. In addition, an oil pan cover and an insulator have been installed for noise reduction.
- The curvature of the oil strainer pipe has been increased and the length of the pipe has been shortened to reduce the oil intake resistance, thus improving the oil pressure build-up when the engine is started.
- An oil level sensor is provided in the oil pan for efficient servicing.
  When the oil level falls below the specified level, the oil level sensor causes the low engine oil level warning light inside the combination meter to light up.
- The oil capacity of the oil pan has been increased by changing the shape of the oil pan.




147EG67

## 3. Oil Cooler

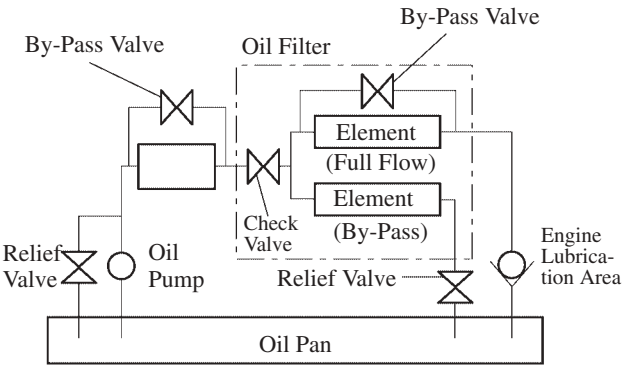
- The water-cooled oil cooler is enclosed in the cylinder block.
- A drip pan is provided in the oil cooler cover to catch the oil that could drip when the oil filter is replaced.




147EG68

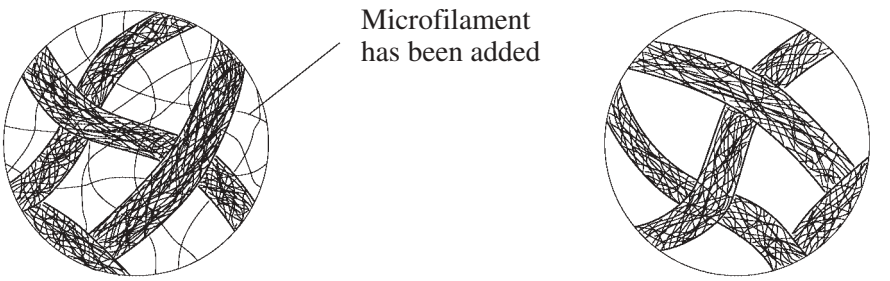
## 4. Oil Filter

- A twin-element type oil filter, in which a full-flow and bypass elements are combined, is used to increase the cleaning performance of the oil.
- The filter element uses newly developed filter paper to improve the filter's oil cleaning performance.




147EG42

**▶ Oil Filter Element ◀**




**New** **Previous**

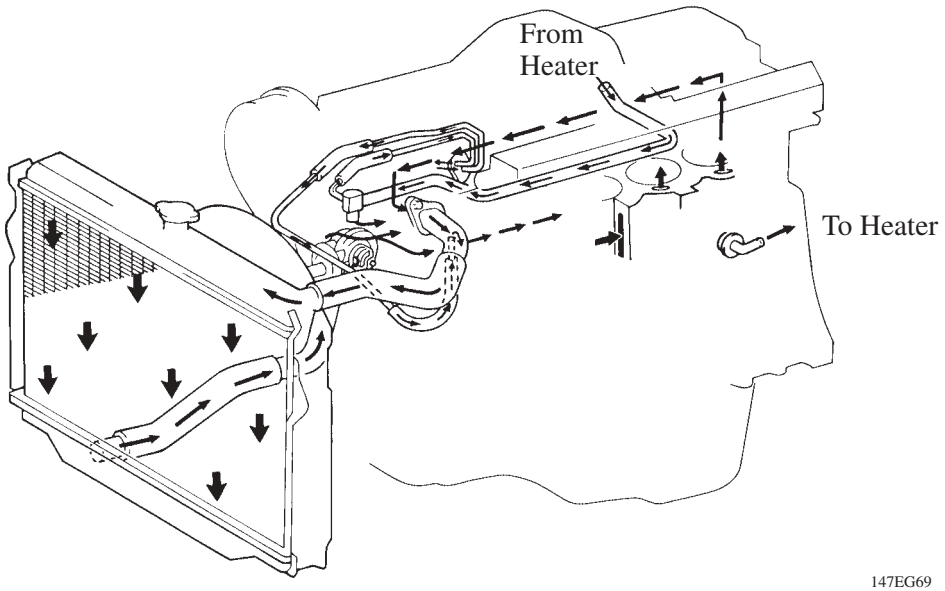
147EG41

## ■COOLING SYSTEM

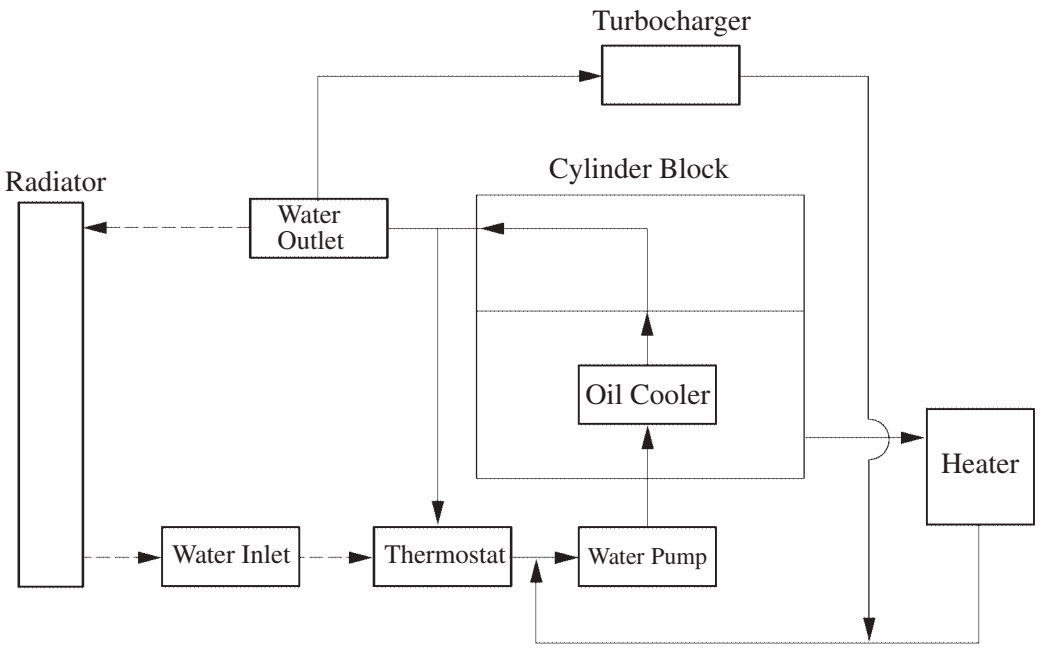
### 1. General

- The cooling system is a pressurized, forced-circulation type.
- A thermostat with a bypass valve is located on the water inlet housing to maintain suitable temperature distribution in the cooling system.
- An aluminum radiator core is used for weight reduction.
- A viscous type power heater has been adopted on the cold specification model for Europe to promote the warming of the engine and to improve the heating performance of the heater during extremely cold temperatures.





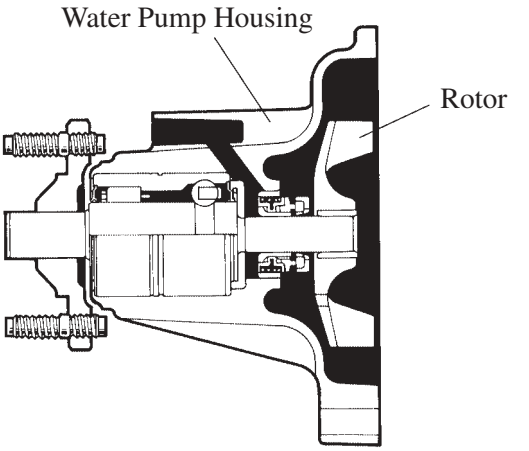

147EG69




147EG43

## 2. Water Pump

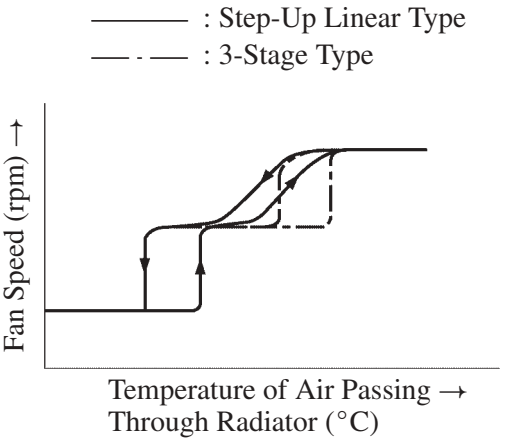
As in the previous engine, the water pump housing is made of aluminum and the rotor is made of resin for weight reduction. In addition, the volute chamber has been optimally designed to achieve a compact shape.




147EG70

## 3. Coupling Fan

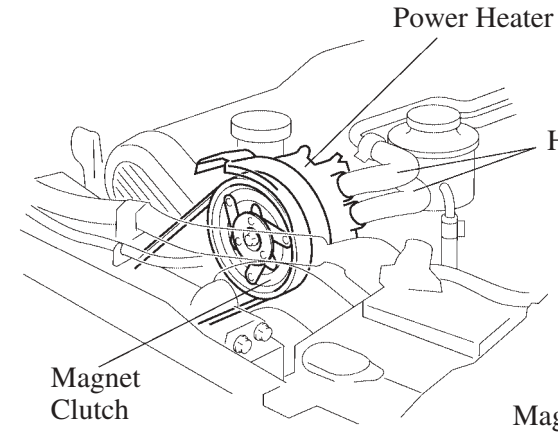
A step-up linear type temperature controlled fluid coupling has been adopted to realize both cooling performance and noise reduction.



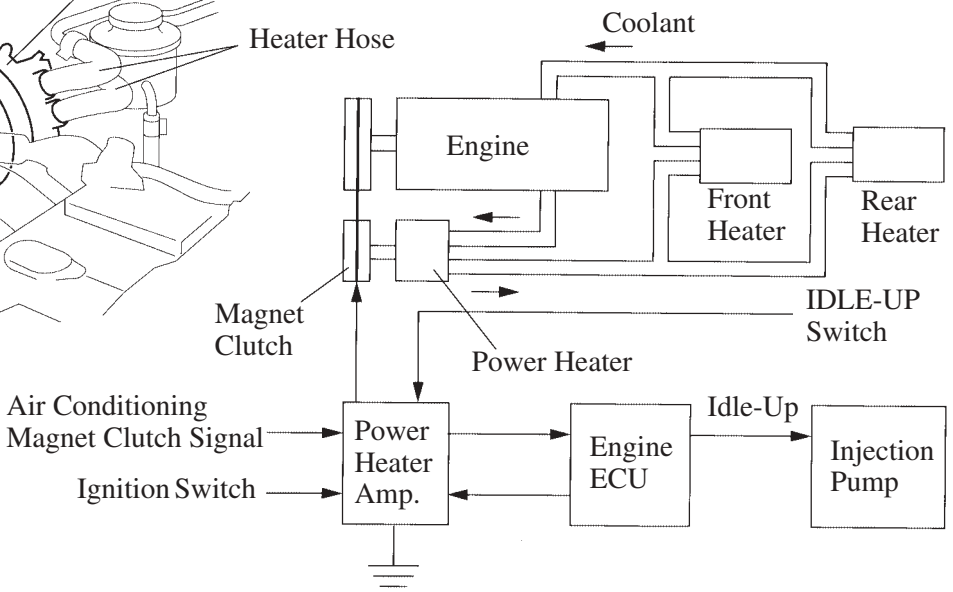

147EG06

## 4. Power Heater

A viscous type power heater has been adopted on the cold specification model for Europe. The power heater increases the coolant temperature by utilizing the shear heat of the silicon oil and by increasing the engine load.



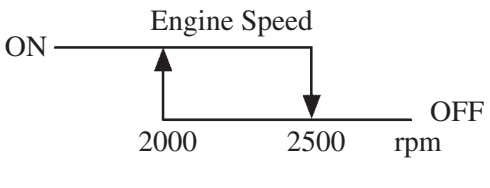

147EG71



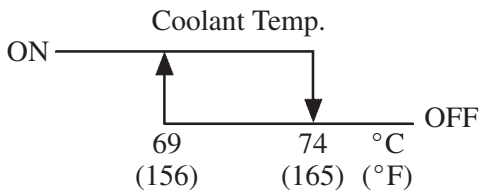

147EG72

### Construction and Operation

- The power heater, which is located on top of the engine, is driven by a drive belt. Pressing the Idle-Up switch provided in the instrument panel engages the magnetic clutch, causing the rotor in the power heater to rotate and the silicon oil to mix. The shear heat that is thus generated heats the coolant.
- The power heater is controlled according to engine speed and coolant temperature as described below. While the power heater is engaged, the engine idling speed increases to 1200 rpm.




147EG44-1




147EG44-2

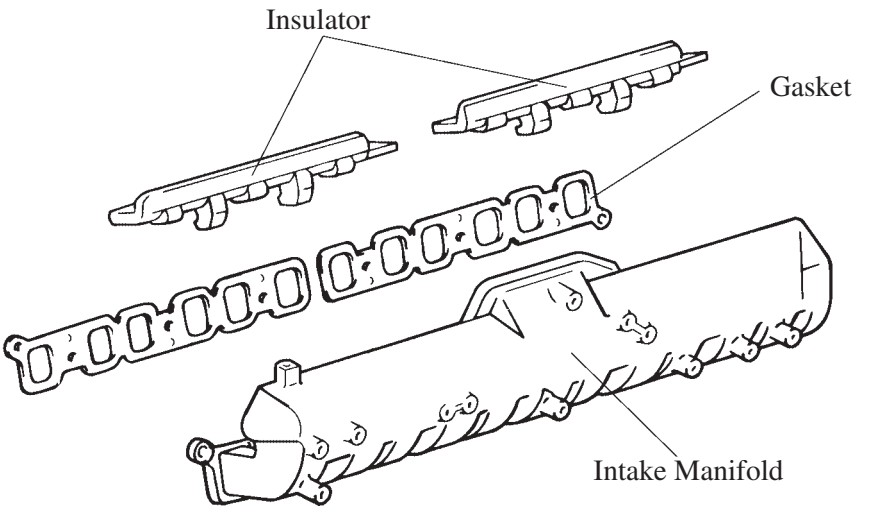
However, the power heater is turned OFF when the engine is started, the air conditioning is ON, or the vehicle is accelerating (for 5 seconds while the vehicle speed is under 30 km/h (19 mph) and the throttle opening angle is more than 45%).

EG

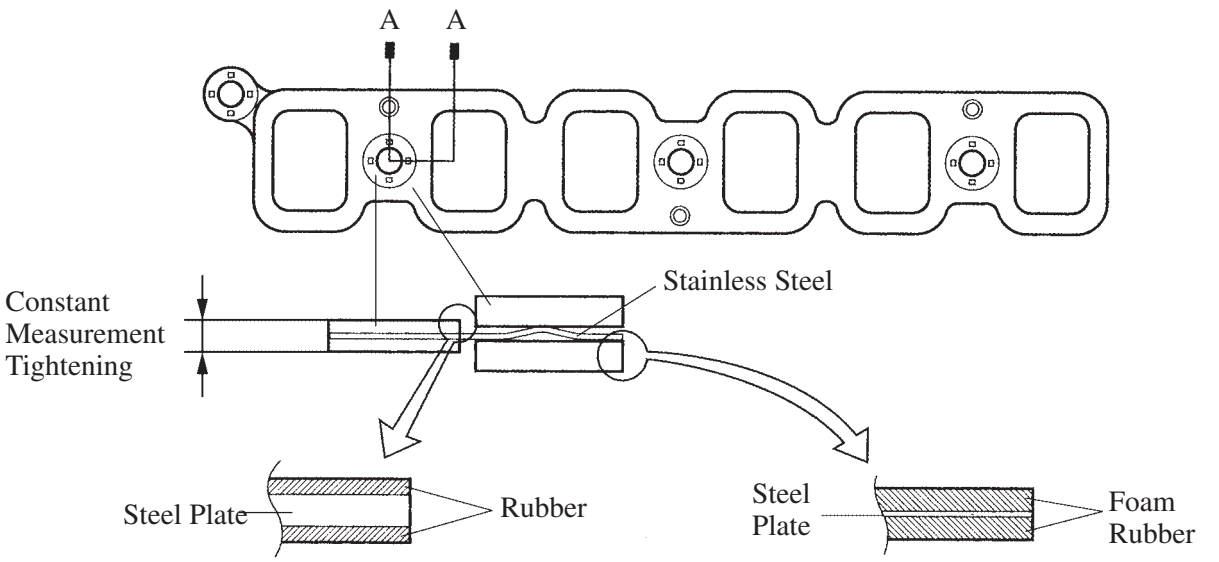
## ■INTAKE AND EXHAUST SYSTEM

### 1. Intake Manifold

- As in the previous engine, an intake manifold made of aluminum and integrated with the intake air chamber has been adopted. In addition, a large-capacity intake air chamber and isometric intake ports have been adopted to improve the engine performance.
- Insulators are provided at the area of the intake manifold that mounts onto the cylinder head for noise reduction.
- The intake manifold gasket is constructed of steel plates that are coated with foam rubber on both sides, then riveted to the both sides of a stainless steel substrate. A composite gasket cinched with layered washers is provided for the areas that are tightened with bolts to achieve a floating retaining construction of the intake manifold for noise reduction.
- Vibration isolating washers with a layered construction have been adopted for the washers used in installing the intake manifold.



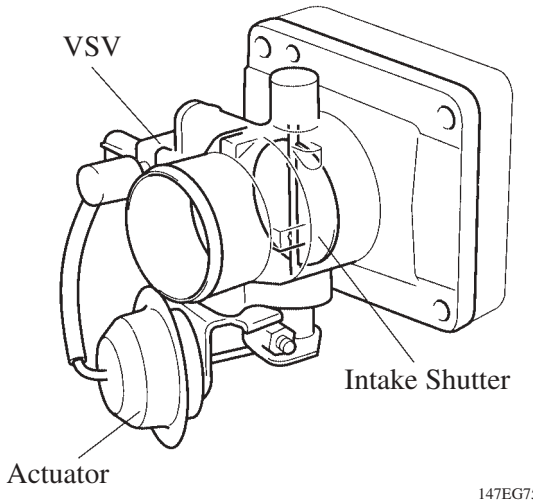

147EG73




**Layered Washer Portion** **Foam Rubber Portion** 147EG74

## 2. Intake Shutter

The intake manifold is provided with an intake shutter which shuts out air to reduce vibration when stopping the engine.

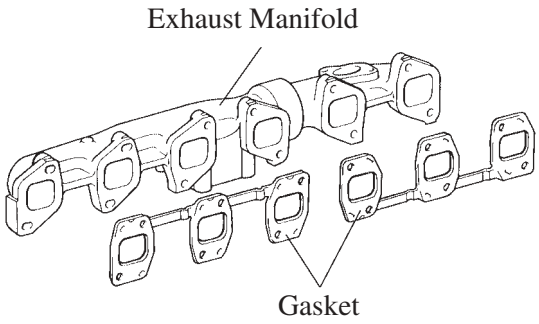



147EG75



## 3. Exhaust Manifold

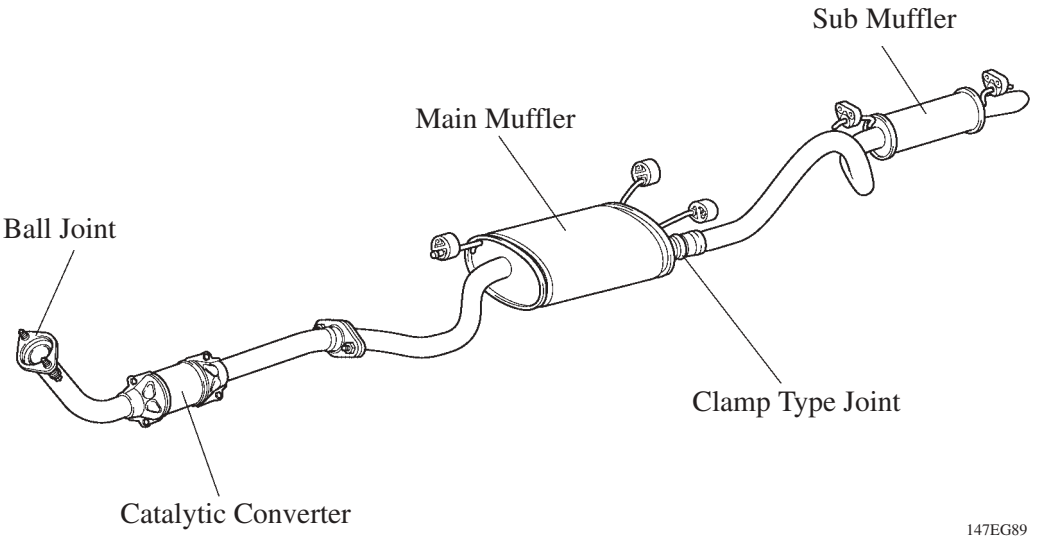
- As in the previous engine, an exhaust manifold made of cast iron has been adopted.
- A 5-layer steel laminate type exhaust manifold gasket has been adopted.

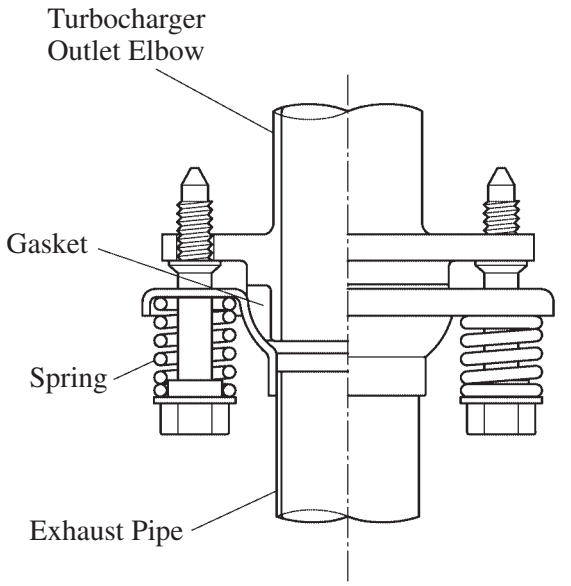



147EG76

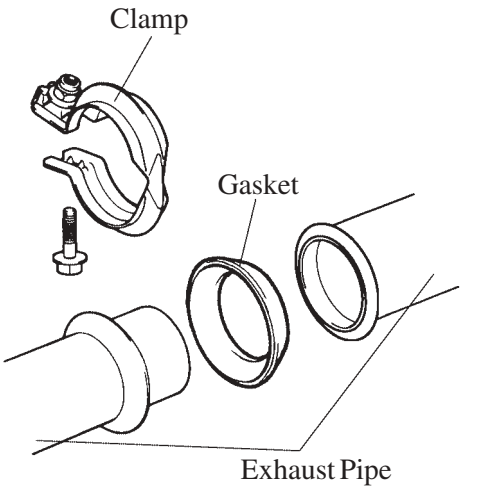
## 4. Exhaust Pipe

- The exhaust pipe is made of stainless steel for improved rust resistance.
- An oxidation catalytic converter has been adopted for the front exhaust pipe to reduce exhaust emissions.
- A ball joint has been adopted for joining the turbocharger and the front exhaust pipe for weight reduction and for reducing noise and vibration.
- A clamp type joint is used to join the center exhaust pipe and tail pipe to realize weight reduction.




**Ball Joint** 147EG58

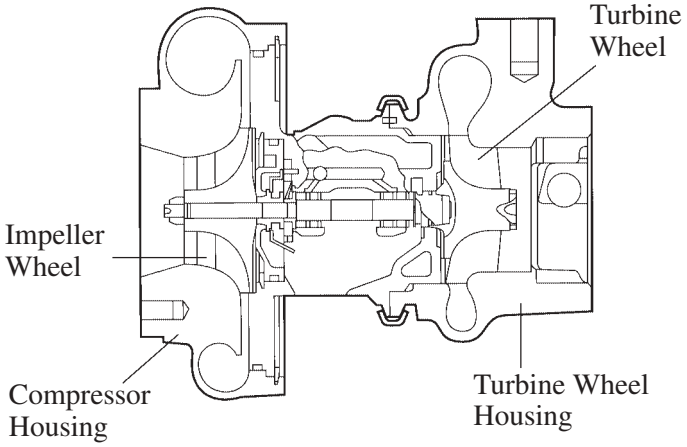



**Connecting Exhaust Pipe** 156EG06

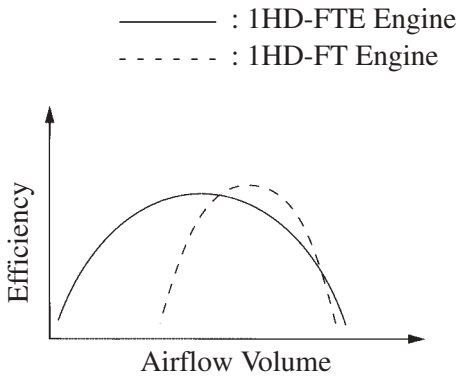
## ■TURBOCHARGER SYSTEM

### 1. Turbocharger

In place of the previous turbocharger, a compact and lightweight turbocharger that achieves a wide range of high-efficiency region has been adopted.




147EG77

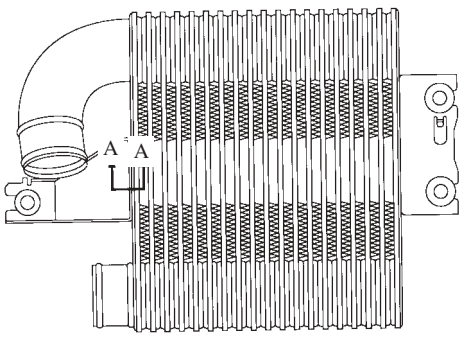



**Conceptual Drawing**

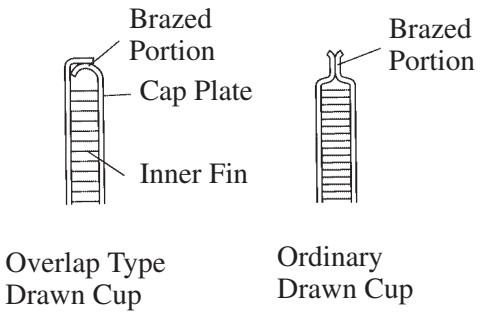
147EG90

### 2. Intercooler

- An air-cooled type intercooler has been adopted to lower the intake air temperature. As a result, the volumetric efficiency has been improved to enhance the engine performance and reduce exhaust emissions.
- Through the adoption of an overlap type drawn cup, a high-density core, and optimally shaped fins, the intercooler has been made more compact and lightweight while ensuring ample heat dissipating performance.




147EG78




**A – A' Cross Section**

147EG79

***– REFERENCE –***

*Overlap Type Drawn Cup*

It is a type of cup in which the vertical surface of the cup plate is brazed in order to effectively utilize the brazed portion between the cup plates that ordinarily remains a dead space.

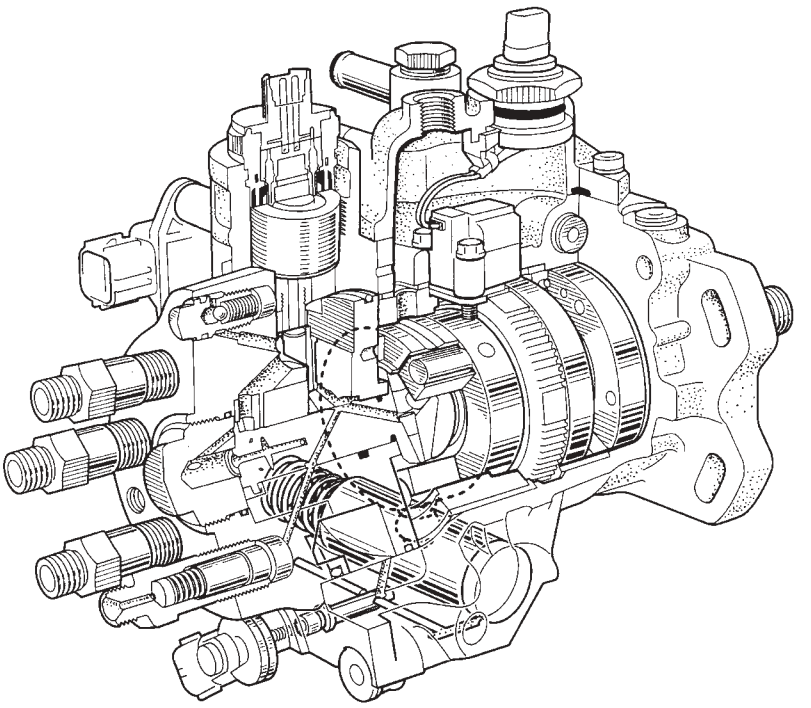
EG

## ■FUEL SYSTEM

### 1. Injection Pump

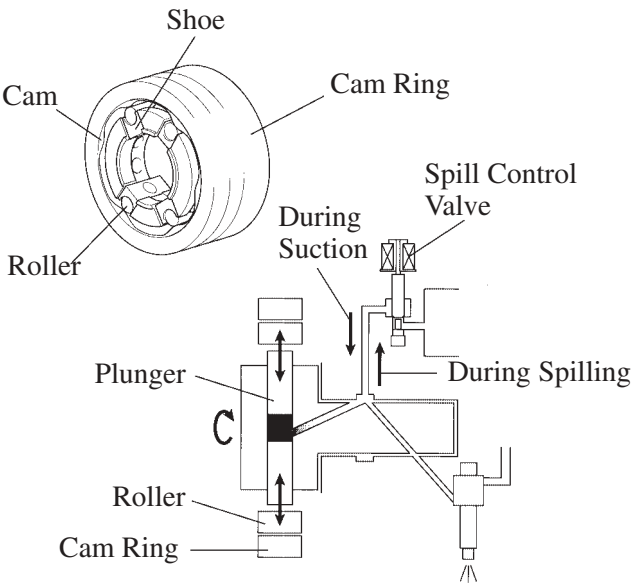
#### General

An electronically controlled distributor type injection pump has been adopted. A radial plunger type that produces a higher injection pressure than the previous axial plunger type has been adopted. As a result, it has become possible for the injected fuel to become finely atomized in order to realize both improved engine performance and reduced exhaust emissions.
In the axial plunger type pump, the rollers slip as they roll along the cam plate. Because this slippage does not occur in a radial plunger type pump, it can inject fuel at a higher pressure.

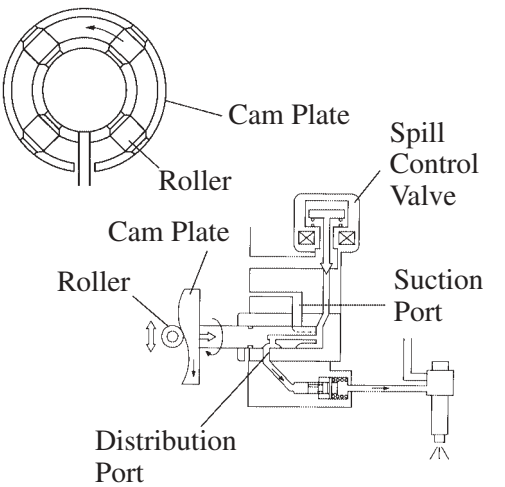


147EG80

**Radial Plunger Type Injection Pump**

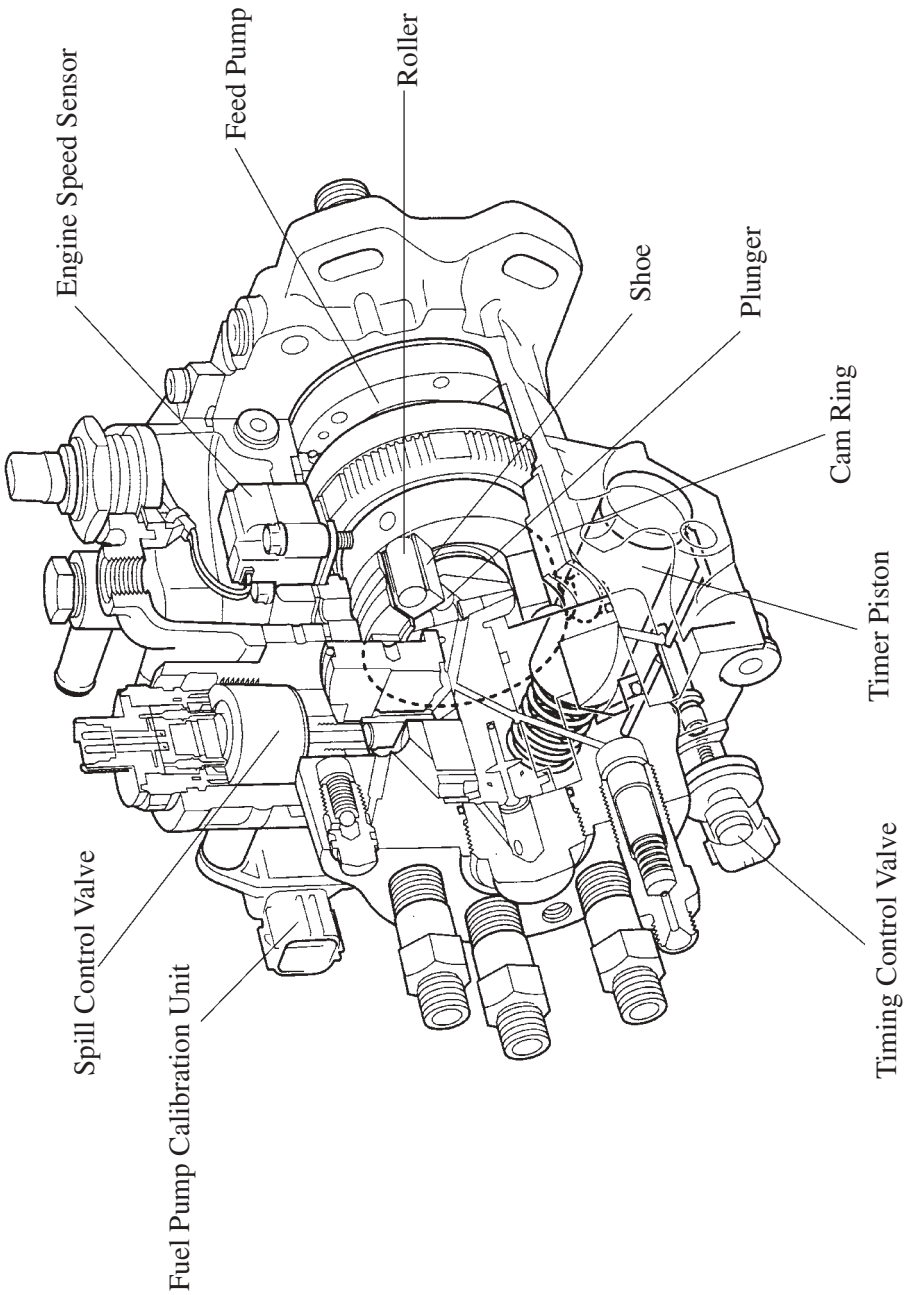



**Radial Plunger Type** 147EG92




**Axial Plunger Type** 147EG93

## Construction and Operation




EG

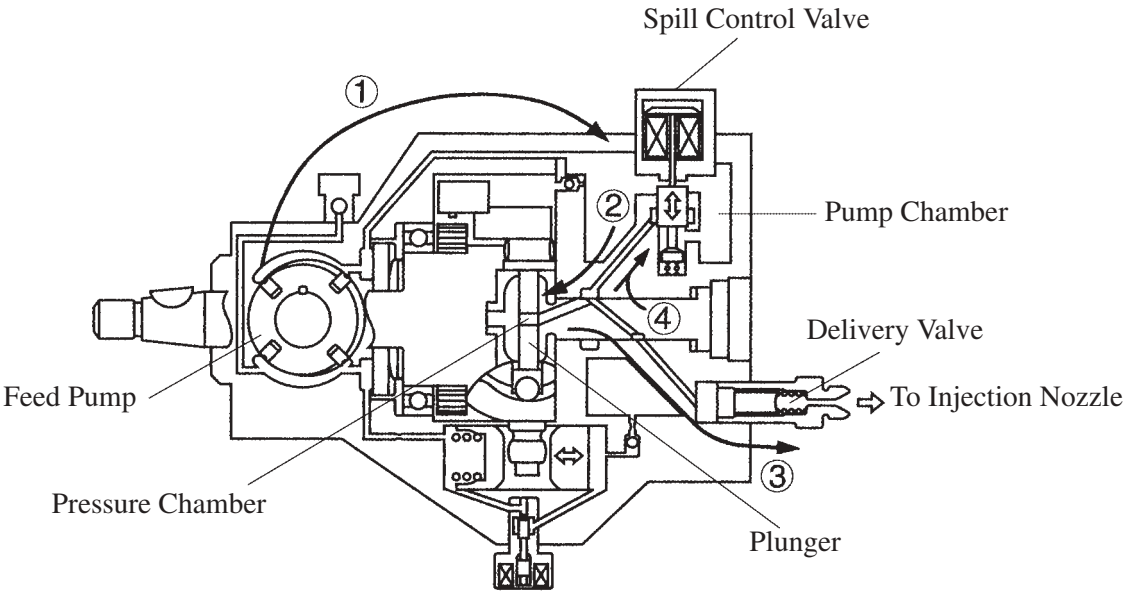
**1) Operation Outline**

①: The feed pump delivers the fuel from the fuel tank to the pump chamber and maintains its pressure between 1.5 – 2.0 MPa.

②: When the spill control valve opens, the fuel fills the pressure chamber.

③: After the spill control valve closes, the fuel that is charged in the pressure chamber is compressed by the plunger. Passing through the delivery valve and injection pipe, the pressurized fuel is pumped to the injection nozzle and injection starts.

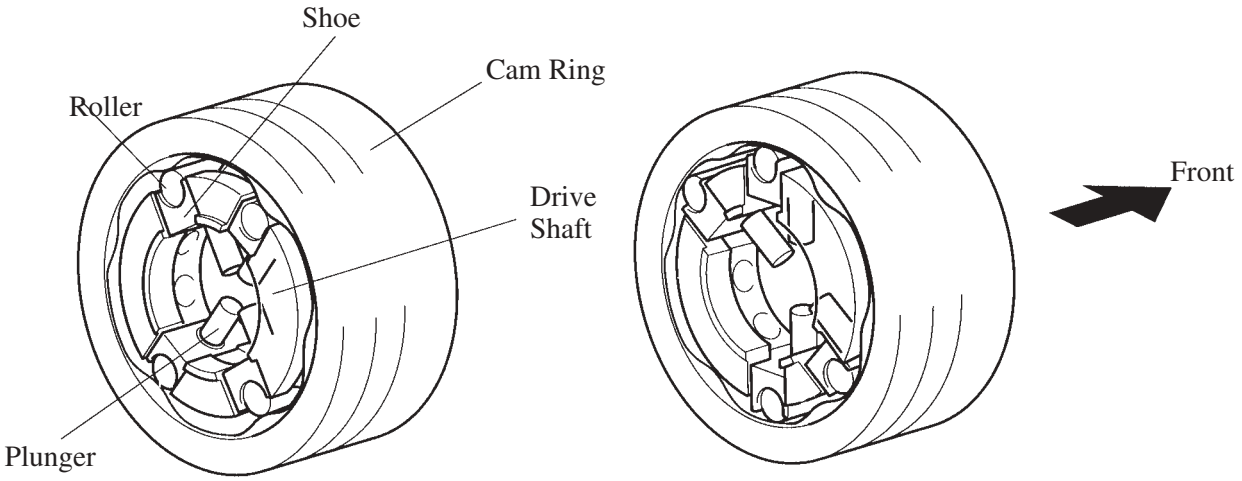
④: As the spill control valve opens and the pressure in the pressure chamber drops, the injection of fuel is completed.




147EG82

**2) High-Pressure Generation Mechanism**

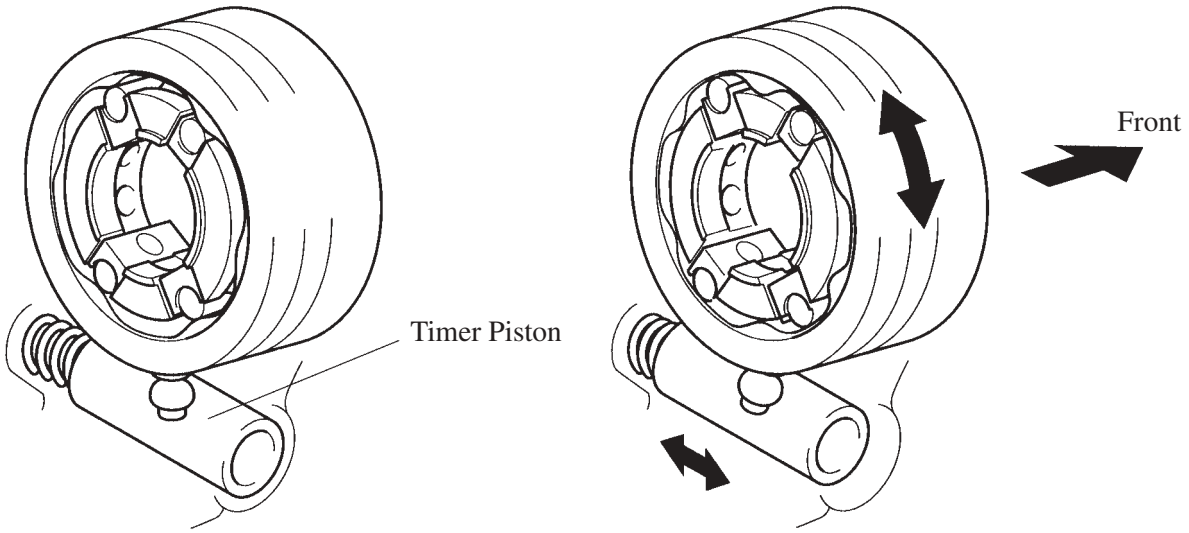
This mechanism consists of a cam ring, drive shaft, rollers, shoes and plungers. As the drive shaft rotates, the shoes, rollers and the plungers that are attached to the shaft rotate along the inside of the cam ring. At that time, the protrusions on the cam ring cause the 4 rollers and plungers to move simultaneously to the center, causing the fuel pressure to increase.




**During Generation of High Pressure** **During Suction** 147EG83

**3) Timer Mechanism**

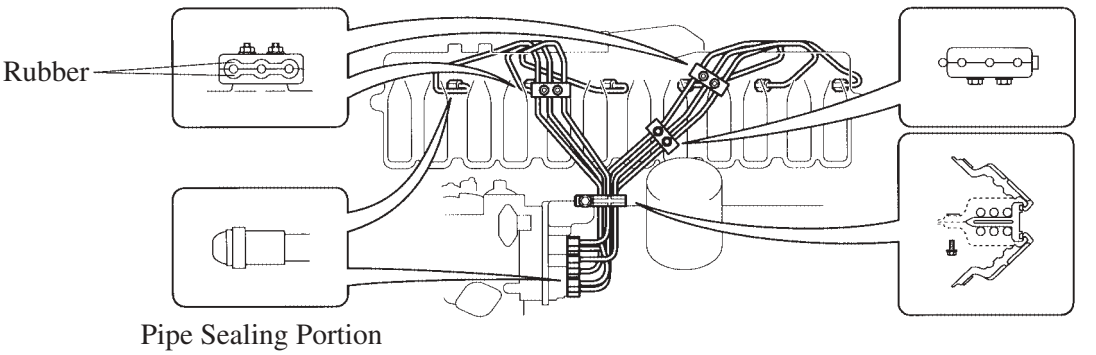
The movement of the timer piston, which is linked to the cam ring, causes the cam ring to oscillate. As a result, the relational positions of the drive shaft and the cam ring change, which causes the plunger to compress the fuel, thus changing the starting position (injection timing).




**Most Retarded Timing** **During Operation** 147EG84

## 2. Injection Pipes

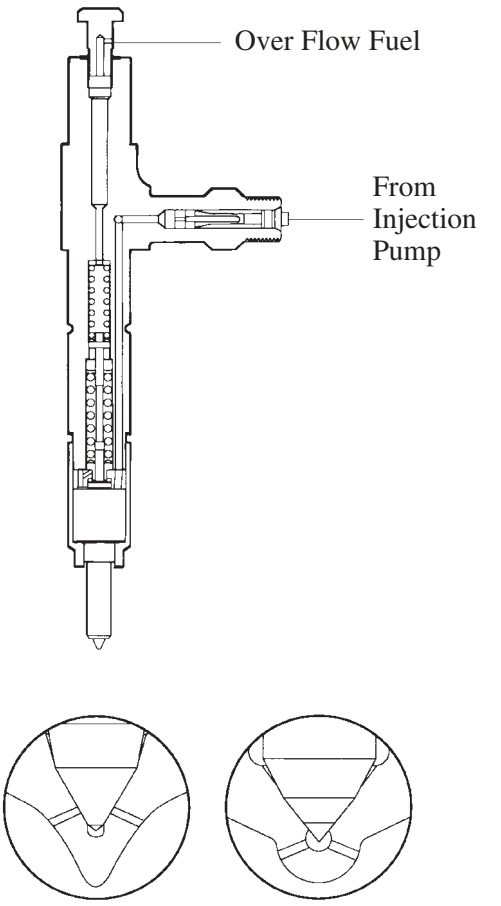
- Along with the adoption of the high-pressure injection, the seal portions at the both ends of the pipes have been spherically shaped to improve their sealing performance.
- The pipes are clamped together up in the air adjacent to the injection pump. Also, at the areas where the pipes are clamped to the intake manifold, rubber cushions are used to achieve a floating construction. As a result, improved reliability and quieter operation have been realized.




147EG85

## 3. Injection Nozzle

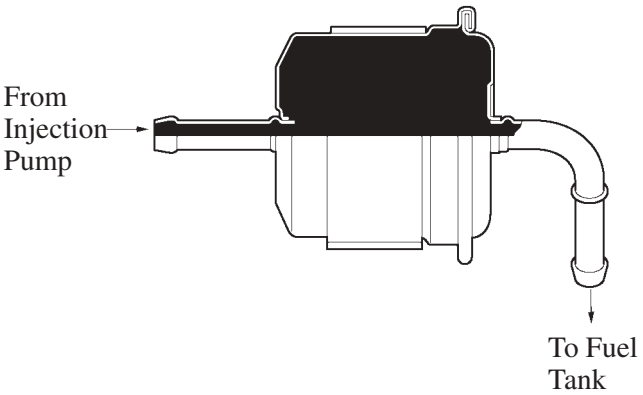
- As in the previous engine, 2-stage injection nozzles are used. For this model, the amount of pre-lift has been decreased to reduce the combustion sound.
- The VCO (Valve Covered Orifice) nozzles that provide excellent injection characteristics have been adopted to reduce white smoke and exhaust odor.
- The nozzle needle seats more gently to improve the nozzle's durability.




147EG86

### 4. Fuel Damper

A fuel damper has been adopted to reduce the vibration of the fuel return pipe.

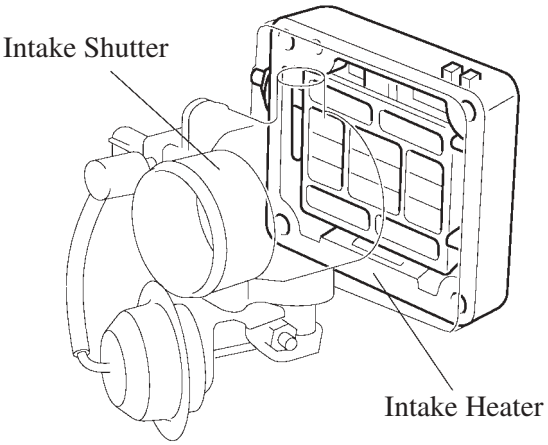



147EG128



## ■ INTAKE HEATER

- An intake heater has been adopted to heat the intake air at low temperature to improve the cold starting performance of the engine. The intake heater continues to operate for a prescribed length of time even after the engine has started in order to reduce the generation of diesel knocks and white smoke immediately following the starting of the engine.
- The intake heater uses a PTC (Positive Temperature Coefficient) element and is controlled by the engine ECU.

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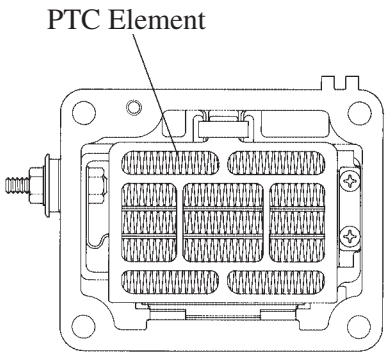


**Intake Heater**

147EG88

## ■ STARTING SYSTEM

The previous 12/24 volt switchover system has been discontinued to simplify the system. The resistance in the wiring between the batteries and the starter is minimized by connecting the batteries in parallel in order to ensure the same level of starting performance as that of the previous model.

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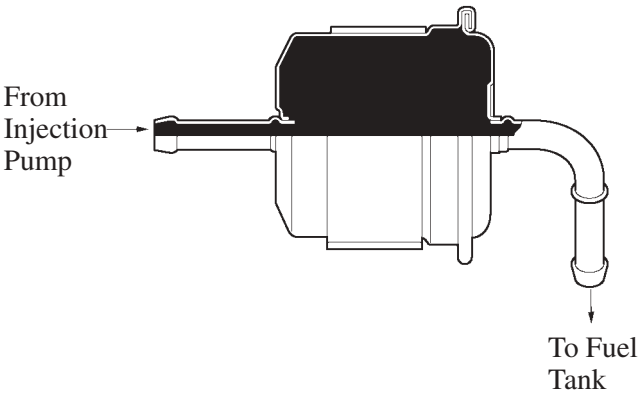


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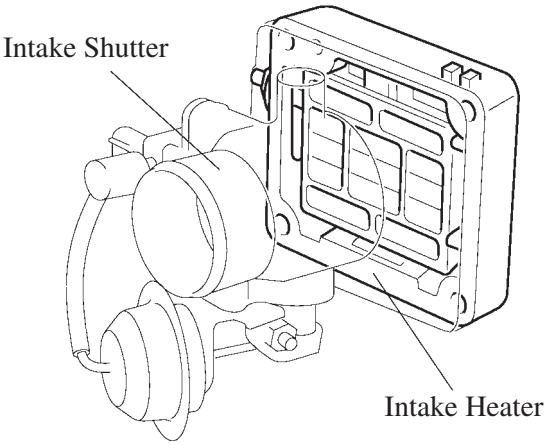


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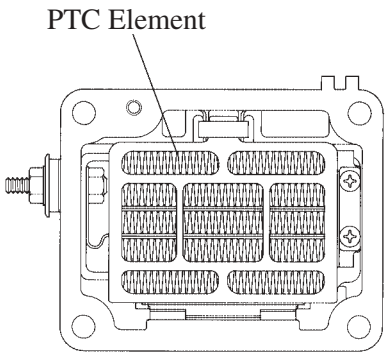


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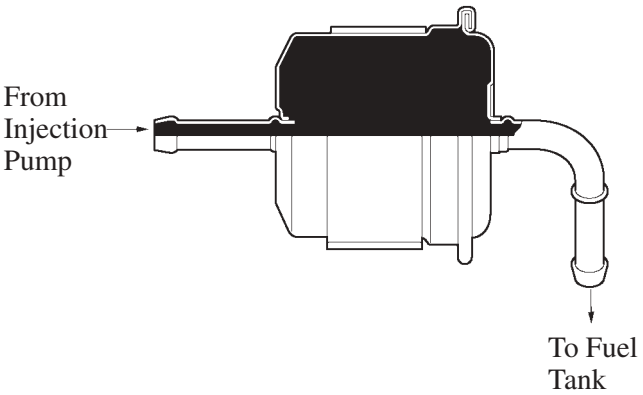


147EG128



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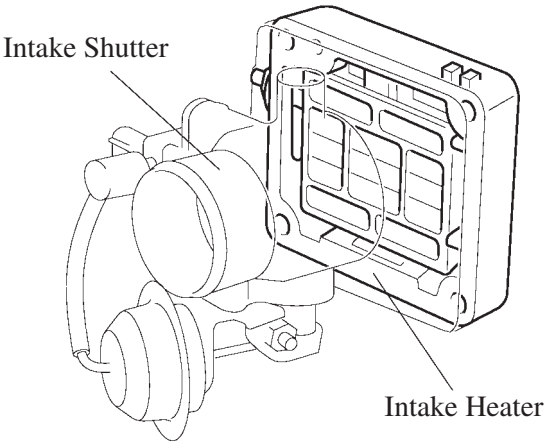


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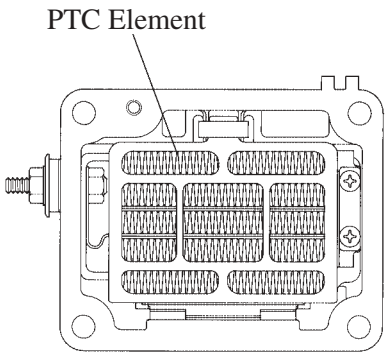


**Intake Heater**

147EG88

## ■ STARTING SYSTEM

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## ■ENGINE CONTROL SYSTEM

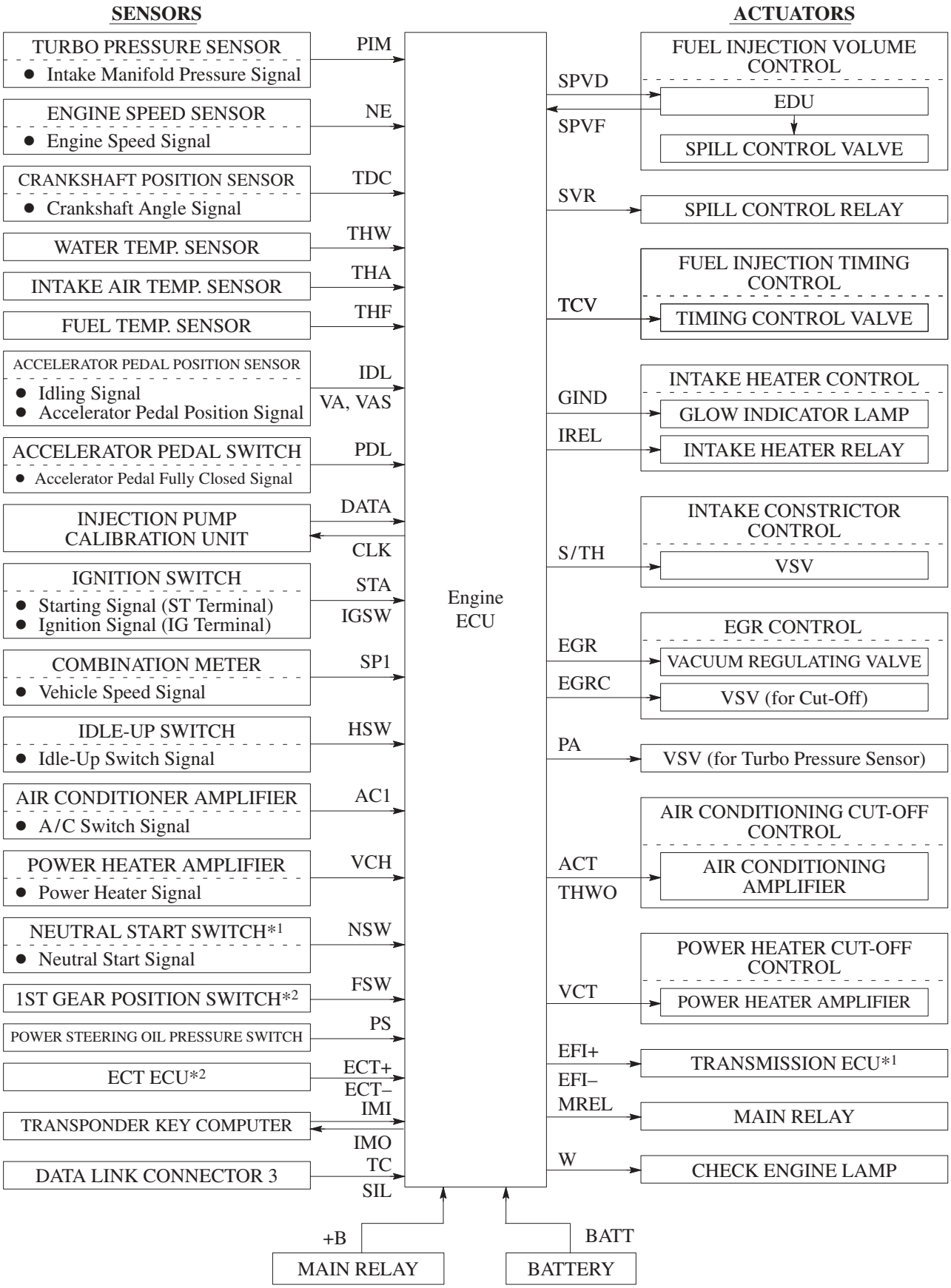
### 1. General

To operate the engine is an optimal condition. The engine control system of the 1HD-FTE engine have general control of the following functions: fuel injection volume control, fuel injection timing control and idle speed control. In addition, a diagnosis function has been added to improve the serviceability of the engine. Furthermore, the cruise control system has been enclosed in the engine ECU.

| System | Outline |
|---|---|
| Fuel Injection Volume Control | ● Based on the signals received from the sensors, the engine ECU determines the fuel injection volume in accordance with the engine condition.<br>● In vehicles equipped with automatic transmission, torque control compensation during gear shifting is used to minimize the shift shock. |
| Fuel Injection Timing Control | Based on the signals received from the sensors, the engine ECU determines the fuel injection timing in accordance with the engine condition. |
| Idle Speed Control | The engine ECU determines the idle speed in accordance with the engine condition, and controls the fuel injection volume in order to achieve the target idle speed. |
| Stable Idling Control | Corrects the fuel injection volume that is directed to each cylinder during idling, thus reducing engine vibration. |
| Cruise Control | Controls the vehicle speed by regulating the injection volume in accordance with the instructions received from the cruise control computer that is integrated in the engine ECU. |
| Intake Constrictor Control | Shuts off the intake air to reduce the vibration when the engine stopped. |
| Intake Heater Control | Controls the length of time when the current is applied to the Intake Heater in accordance with the coolant temperature. |
| EGR Control | Controls the engine EGR volume in accordance with the engine condition. |
| Air Conditioning Cut-Off Control | ● By controlling the air conditioning compressor ON or OFF in accordance with the engine condition, drivability is maintained.<br>● Also controls the power heater on the models equipped with a power heater. |
| Engine Immobiliser | Prohibits fuel delivery if an attempt is made to start the engine with an invalid ignition key. |
| Diagnosis | ● When the engine ECU detects a malfunction, the engine ECU diagnoses and memorizes the failed section.<br>● A newly developed diagnostic system which utilizes a high speed bi-directional communication line to provide extended diagnostic capabilities and features. |
| Fail-Safe | When the engine ECU detects a malfunction, the engine ECU stops or controls the engine according to the data already stored in memory. |

## 2. Construction

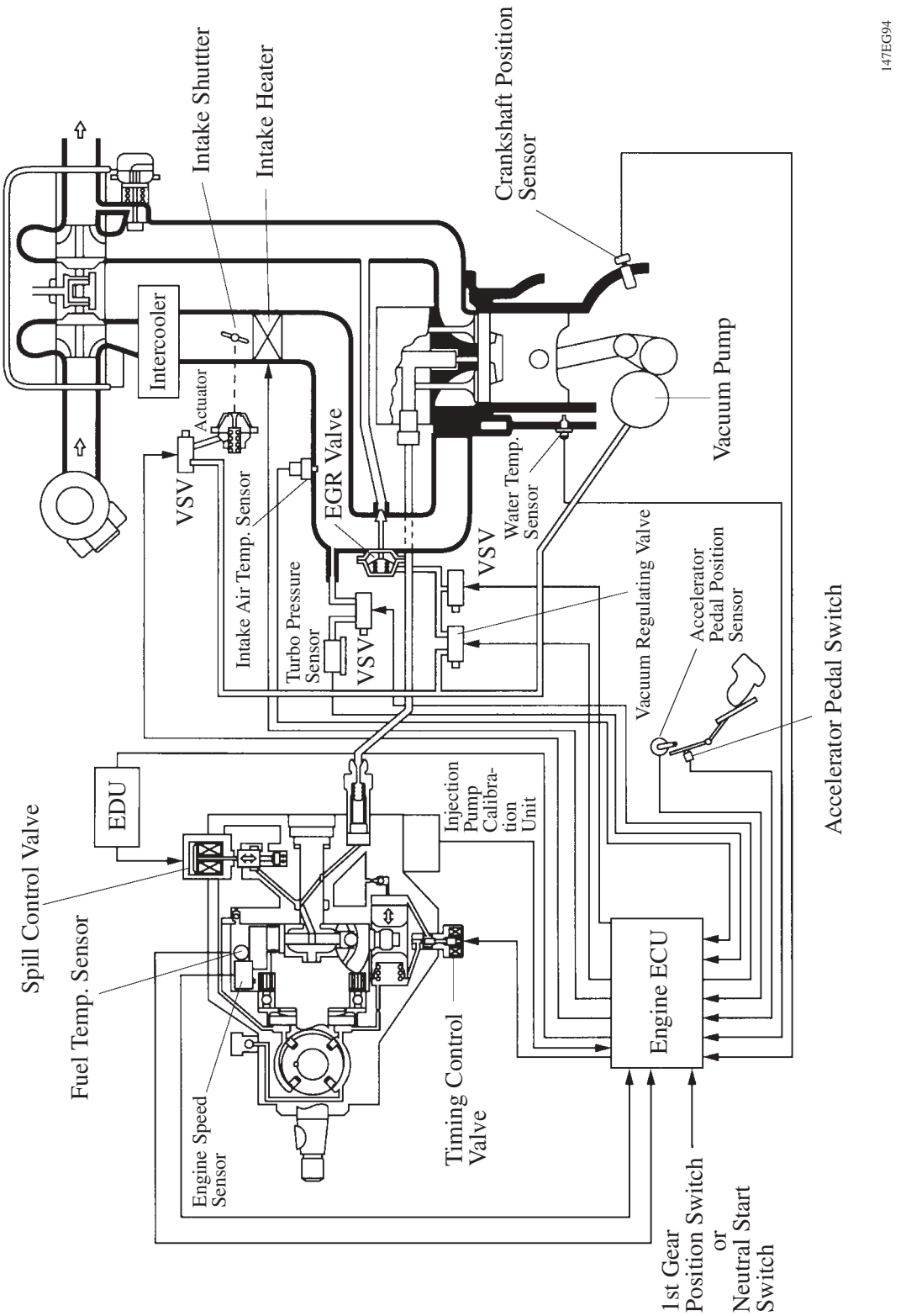
The configuration of the engine control system which can be broadly divided into three groups: the engine ECU, the sensors and the actuators, is shown in the following chart.



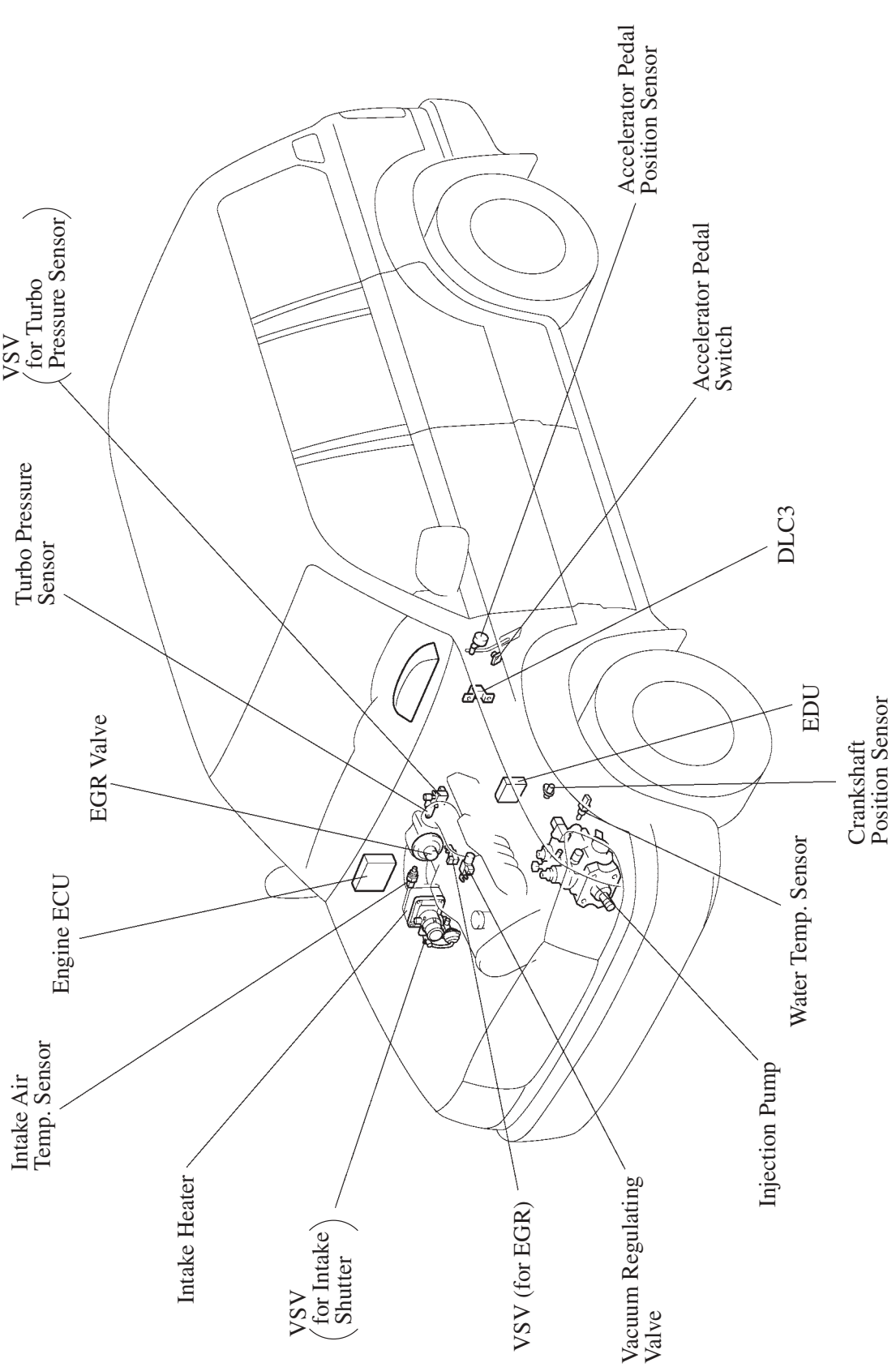

*1: Only for Automatic Transmission Model *2: Only for Manual Transmission Model

EG

## 3. Engine Control System Diagram



## 4. Layout of Components

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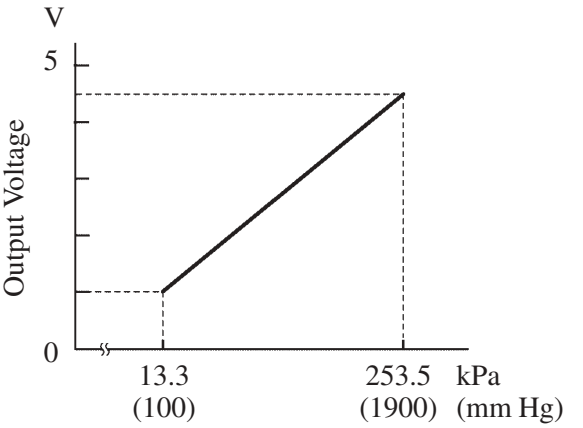
## 5. Main Components of Engine Control System

### Turbo Pressure Sensor

The turbo pressure sensor consists of a semiconductor which utilizes the characteristic of a silicon chip that changes its electrical resistance when pressure is applied to it. The sensor converts the intake air pressure into an electrical signal, and sends it to the engine ECU in an amplified form.
In addition, the atmospheric pressure can be detected by switching the piping passage through the operation of the VSV.

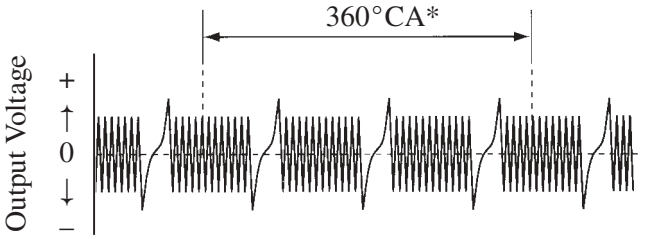



147EG103

**Turbo Pressure Sensor Output Characteristics**

### Engine Speed Sensor

The engine speed sensor is attached to the roller ring in the injection pump to detect the engine speed. The timing rotor is attached to the drive shaft. Missing 3 teeth at each of the 6 locations, the timing rotor generates a signal every 7.5° (crankshaft angle) with its 78 teeth.

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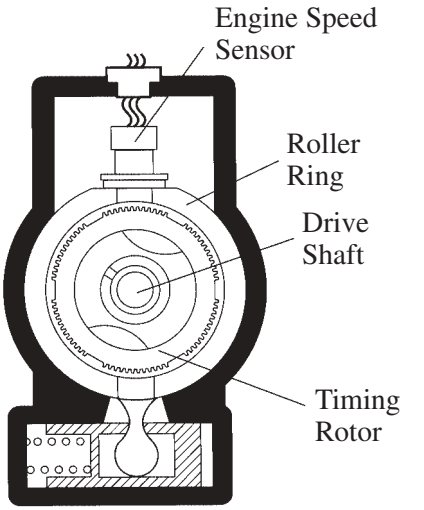
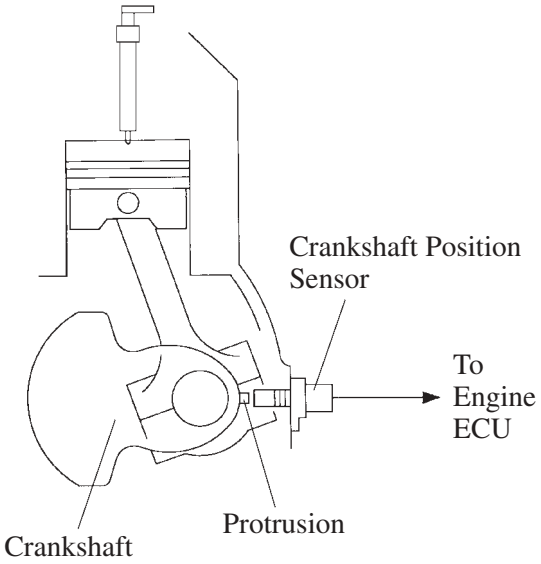



147EG98

*: CA (Crankshaft Angle)

### Crankshaft Position Sensor

The crankshaft position sensor is attached to the cylinder block. Using the protrusion that is provided on the crankshaft, the sensor generates 1 signal for every revolution. This signal is then sent to the engine ECU as a crankshaft position signal.




147EG91

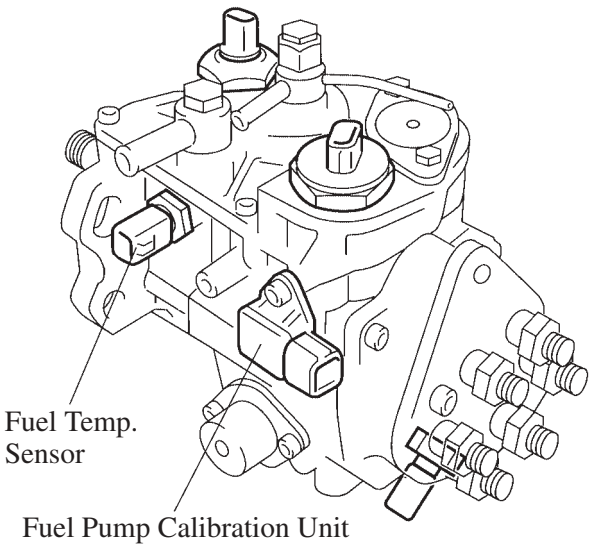


### Fuel Temperature Sensor

The fuel temperature sensor is attached to the injection pump, and uses an internal thermistor to detect the fuel temperature.

### Fuel Pump Calibration Unit

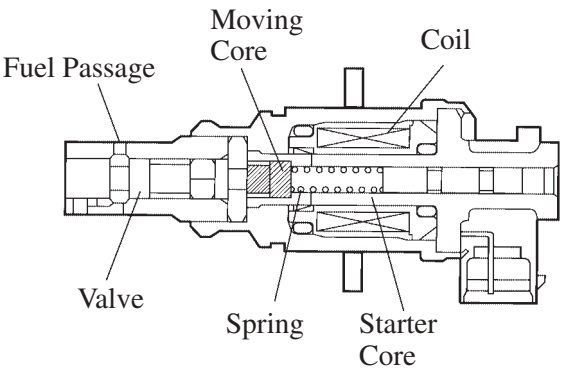
To compensate for the shift in injection volume and injection timing caused by the variances in the injection pump itself, a correction is made by using the data that is stored in the ROM in the fuel pump calibration unit.




147EG97

### Timing Control Valve

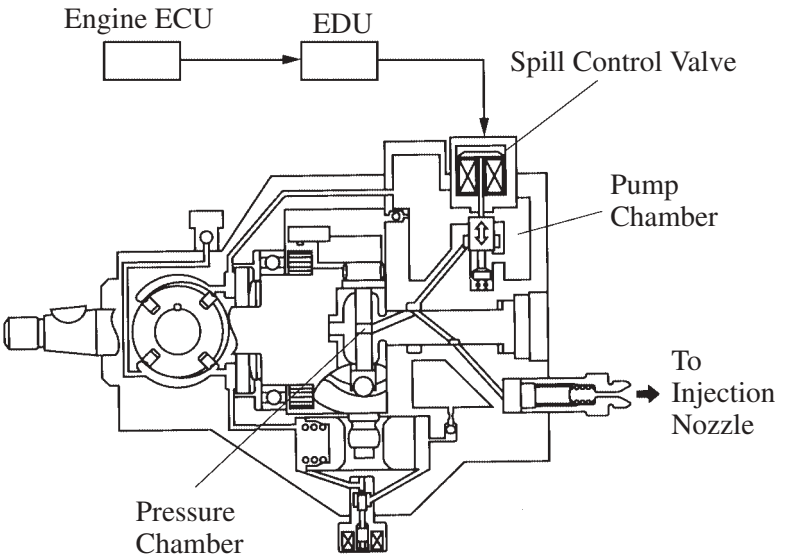
The timing control valve is attached to the injection pump. In accordance with the signals from the engine ECU, it opens the valve in the fuel passage between the pump chamber and the suction side, thus controlling the injection timing. When the current flows to the coil of the timing control valve, the starter core becomes an electromagnet to push and compress the spring. This causes the moving core to retract and open the fuel passage.



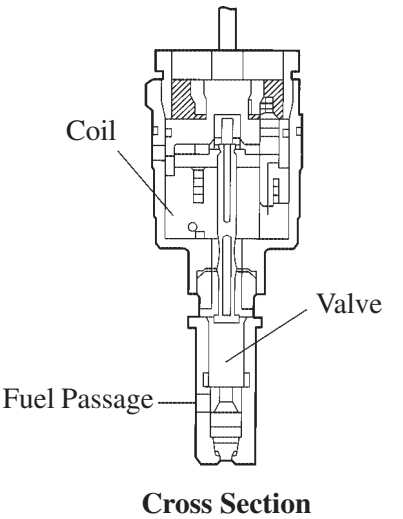

147EG99

### Spill Control Valve

The spill control valve is attached to the injection pump to control the fuel injection volume in a accordance with the signals received from the engine ECU.
When the spill control valve is turned OFF, the passage between the high-pressure chamber and the pump chamber opens, causing the pressure in the high-pressure chamber to drop. This completes the injection of the fuel from the injection nozzle.
The length of time till the spill control valve is turned OFF becomes the fuel injection time. Thus, the fuel injection volume is controlled by increasing or decreasing the length of time till the spill control valve is turned OFF.




147EG100




**Cross Section**

147EG96

### Acceleration Position Sensor

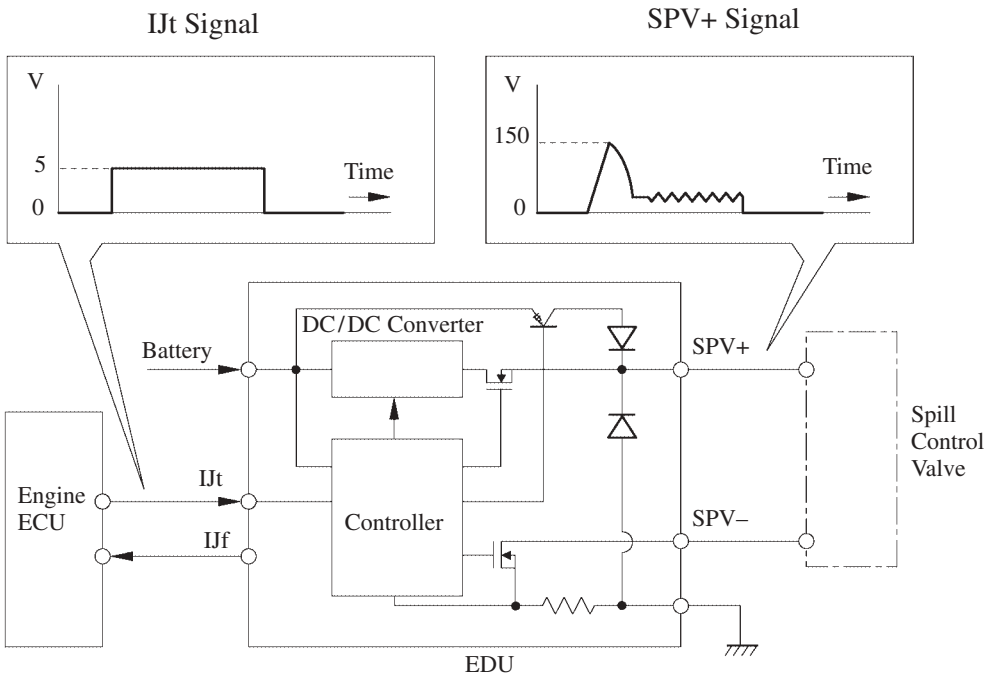
- The accelerator position sensor uses a Hall element that outputs voltage that changes linearly in relation to the amount of pedal effort that is applied to the accelerator pedal.
  The accelerator position sensor uses a duplex system to ensure its reliability.
- An idle switch that detects the fully closed condition of the accelerator pedal is enclosed in the accelerator pedal position sensor.

### Accelerator Pedal Switch

Attached to the accelerator pedal in addition to the accelerator pedal position sensor, the accelerator pedal switch detects the fully closed condition of the accelerator pedal.

### EDU (Electronic Driving Unit)

- The EDU has been adopted to drive the spill control valve at high speeds. The EDU has realized high-speed driving under high fuel pressure conditions through the use of a DC/DC converter that provides a high-voltage, quick-charging system.
- The engine ECU constantly monitors the EDU and stops the engine in case an abnormal condition is detected.



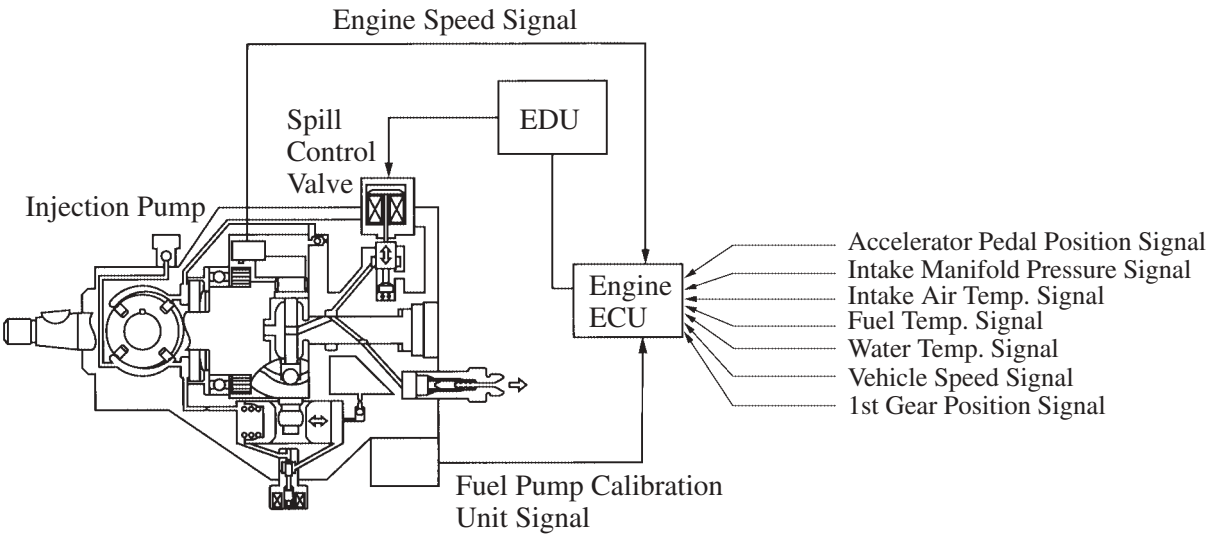

147EG126

### Operation

The battery voltage is increased by the DC/DC converter. A voltage of approximately 150V is applied to the spill control valve in accordance with the IJt signal received from the engine ECU. Also at this time, the injection verification signal (IJf) is sent to the engine ECU.

## 6. Fuel Injection Volume Control

- Based on sensor signals, the engine ECU controls the fuel injection volume by calculating the fuel injection volume that is appropriate for the engine condition.
- On the manual transmission model, the engine's output is limited in 1st gear.




### Function of Engine ECU

The engine ECU calculates the basic injection volume based on the throttle opening and engine speed, and the maximum injection volume for the engine condition. The two injection volumes are then compared, and the lesser of the two is selected. A correction value, which is obtained via the correction resistors, is added to that injection volume, thus determining the final injection volume.

**1) Basic Injection Volume**

Determined in accordance with the throttle opening and the engine speed.

**2) Maximum Injection Volume**

Based on the signals received from the sensors, correction values are added to the theoretically required injection volume (basic maximum injection volume) to determine the maximum injection volume during engine operation.

**a. Basic Maximum Injection Volume**

Determined in accordance with the engine speed.

**b. Intake Manifold Pressure Correction**

Corrects the basic maximum injection volume in accordance with the intake manifold pressure. The higher the intake manifold pressure becomes, the larger the injection volume becomes.

**c. Intake Air Temperature Correction**

Corrects the variance in the air-fuel ratio that is created by the difference in the density of the intake air in accordance with the intake air temperature. The higher the intake air temperature becomes, the smaller the injection volume becomes.

**d. Fuel Temperature Correction**

Corrects the variance in the injection volume that is created by the difference in the density of the fuel in accordance with the fuel temperature. The higher the fuel temperature becomes, the smaller the injection volume becomes.

**e. Water Temperature Correction**

The lower the engine coolant temperature, the greater the injection volume becomes in order to ensure drivability immediately following cold-starting.

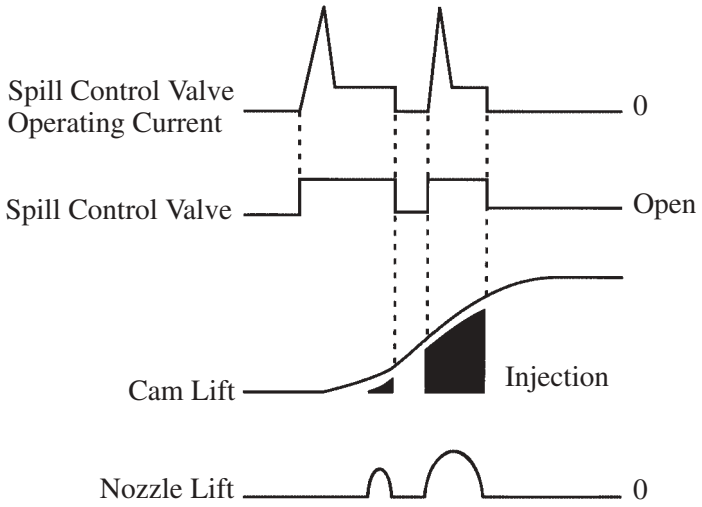


**3) Starting Injection Volume Control**

Determines the fuel injection volume during starting in accordance with the starting signal and the water temperature signal. When the engine is cold, the lower the coolant temperature becomes, the larger the injection volume becomes.

**4) Split Injection Control**

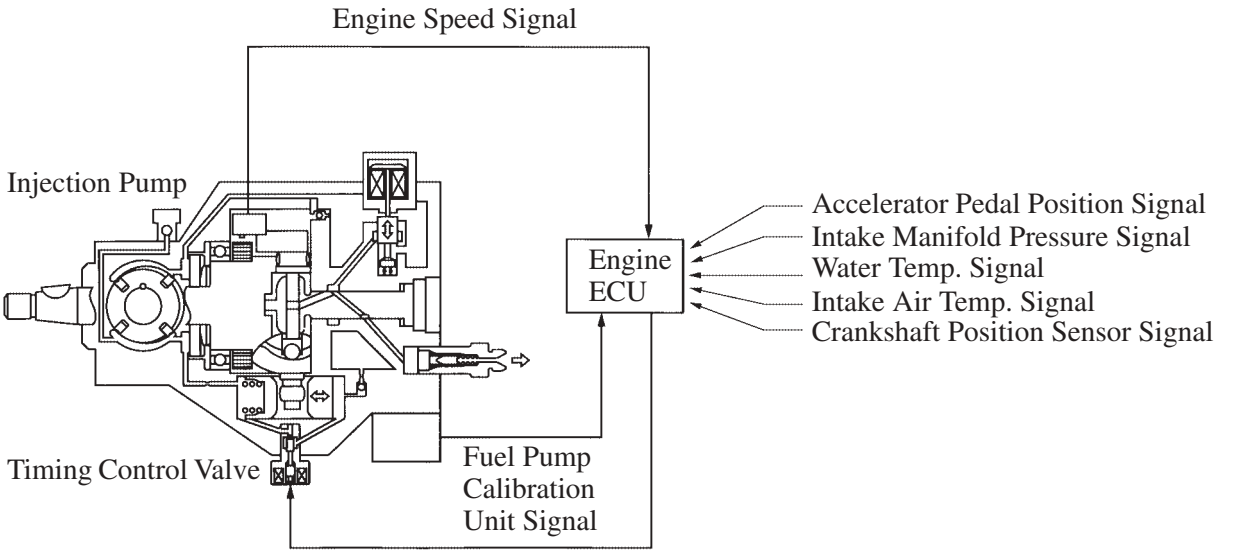
Split injection is performed when starting the engine at extremely low temperatures in order to improve the startability and greatly reduce the emission of white smoke and black smoke. In contrast to the ordinary injection that occurs once, fuel is injected twice during split injection.




147EG105

## 7. Fuel Injection Timing Control

Based on the signals received from the sensors, the engine ECU calculates and controls the fuel injection timing to be optimal for the engine condition.




### Function of Engine ECU

The engine ECU adds the corrections from the sensor signals to the basic fuel injection timing to calculate the fuel injection timing that is optimal for the engine condition.

**1) Basic Injection Timing**

The basic injection timing is determined in accordance with the throttle opening and the engine speed.

**2) Injection Timing Correction**

**a. Intake Manifold Pressure Correction**

Corrects the basic fuel injection timing in accordance with the intake air pressure. The injection timing is advanced when the intake air pressure is low in such the case as of high altitude areas.

**b. Water Temperature Control**

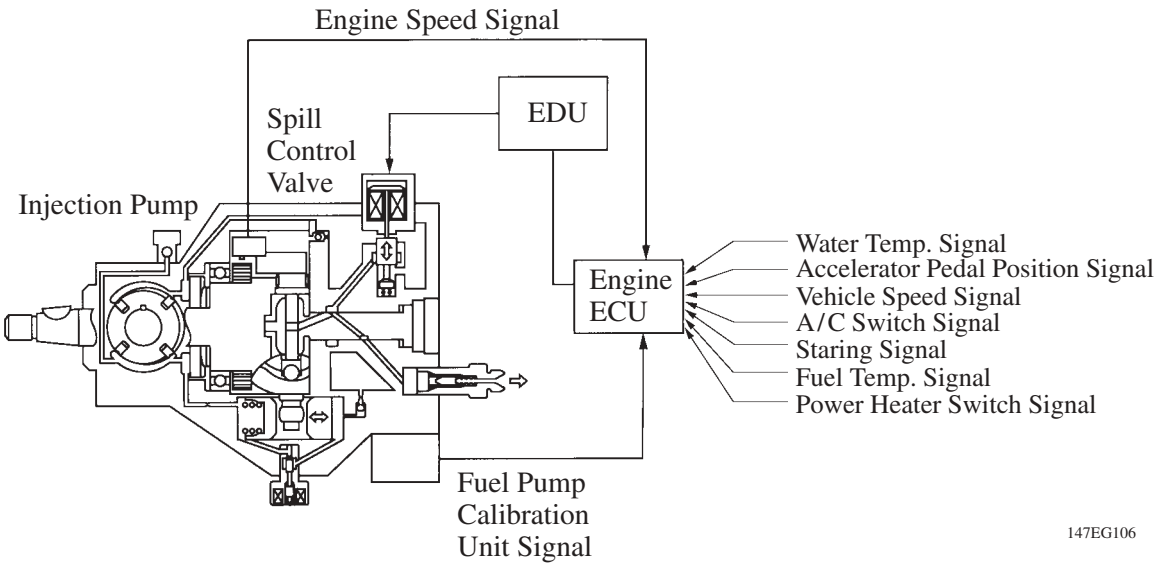
Corrects the basic fuel injection timing in accordance with the water temperature. The injection timing is advanced when the water temperature is low.

**3) Starting Injection Timing Control**

The starting injection timing is determined in accordance with the starting signal, water temperature signal, and engine speed. The injection timing is advanced when the engine speed is high.

## 8. Idle Speed Control

- In this system, the engine ECU calculates the target engine speed in accordance with the engine condition, and determines the fuel injection volume, thus controlling the idle speed rpm.
- Increases the idle speed during the operation of the power heater to improve its heating performance.




### Function of Engine ECU

**1) Feedback Control**

During idling, the feedback control controls the injection volume to achieve the target idle speed, if there is a difference between the target idle speed calculated by the engine ECU and the actual idle speed.

**2) Warm-Up Control**

Controls the injection volume during warm-up to achieve an optimal fast idle speed in accordance with water temperature.

**3) Engine Speed Change Estimate Control**

Immediately after the air conditioning switch is engaged, the idle speed can be affected by the change in the load that is applied to the engine. To prevent this symptom, the engine speed-change estimate control increases or decreases the injection volume before the idle speed changes.

## 9. Stable Idling Control

Immediately after the air conditioning switch is turned ON or OFF, the load applied to the engine changes, causing the idle speed to fluctuate. To prevent this symptom, the engine speed-change estimate control increases or decreases the injection volume before the idle speed fluctuates.

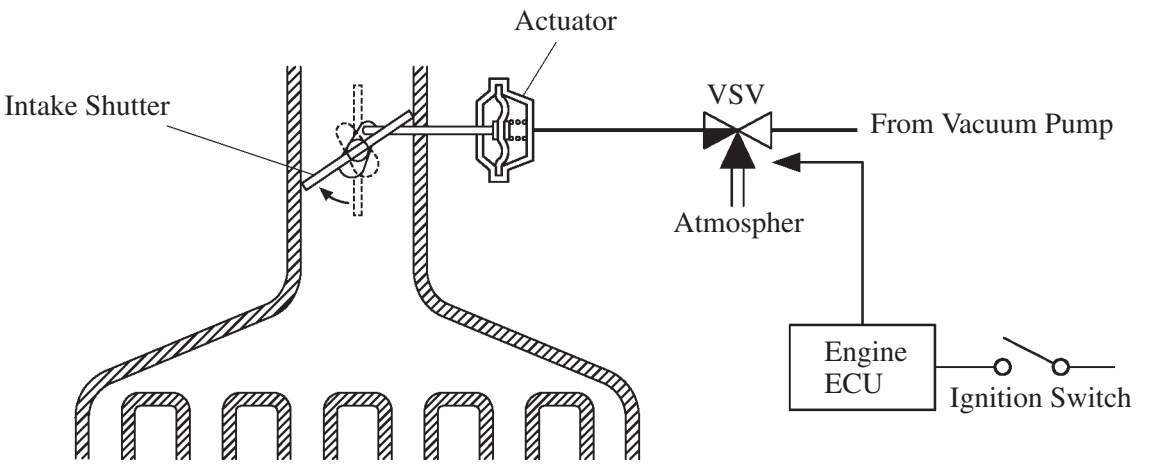
## 10. Cruise Control

In the previous cruise control system, the cruise control actuator moved the adjusting lever to control the vehicle speed. On this model, however, the injection volume is controlled in accordance with the instructions received from the cruise control computer that is integrated in the engine ECU in order to control the vehicle speed.

## 11. Intake Air Control

When the engine is stopped, the intake air control system closes the intake shutter that is provided in the intake pipe to shut off the intake air and reduce vibrations.

**▶ System Diagram ◀**




147EG104

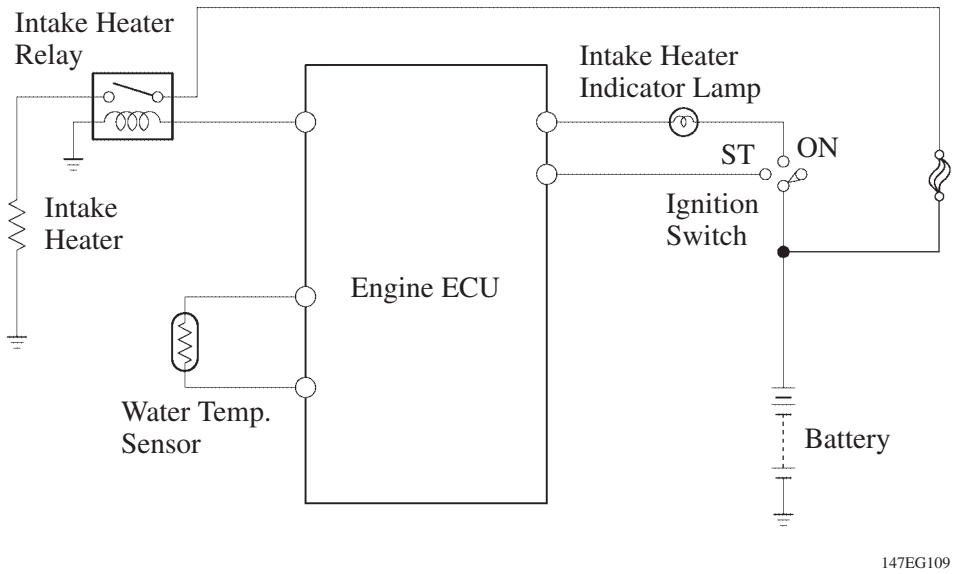
### Operation

When the engine is stopped, the engine ECU turns the VSV ON to introduce air to the actuator, thus closing the intake shutter.

## 12. Intake Heater Control

Applies current to the intake heater during cold-starting to increase the intake air temperature and improve the engine's startability.

**▶ System Diagram ◀**



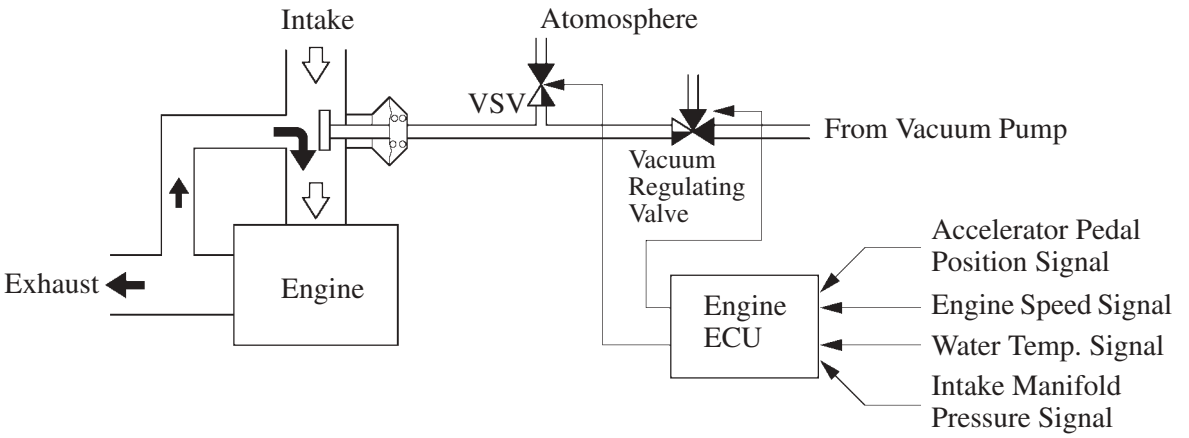

### Operation

- When the engine coolant temperature is below 40°C, turning the ignition switch ON causes the intake heater relay to turn ON, allowing the intake heater to operate. The intake heater operates until the engine coolant temperature becomes higher than 40°C, or the maximum of 90 seconds.
- At the same time, the intake heater indicator lamp is illuminated in accordance with the engine coolant temperature (maximum 10 seconds).

## 13. EGR Control

In the EGR control system, the engine ECU controls the vacuum regulating valve to recirculate an appropriate amount of exhaust gas to the combustion chamber in accordance with the engine condition. This results in slower combustion rate, lower combustion temperature, and reduced NOx emissions.

**▶ System Diagram ◀**

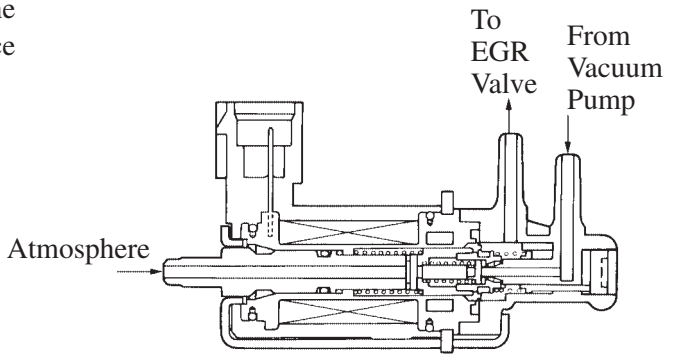



147EG110

### Construction

**1) Vacuum Regulating Valve**

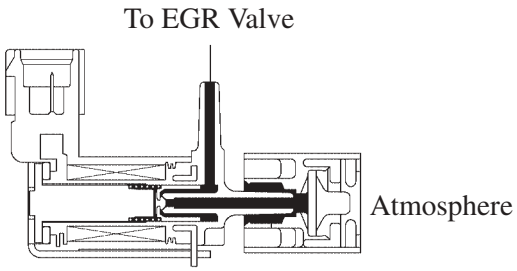
Controls the vacuum that is applied by the vacuum pump to the EGR valve in accordance with the signals from the engine ECU.




141EG51

**2) VSV**

Releases the vacuum that is applied to the EGR valve when the EGR is OFF in order to improve the response when the valve is closed.

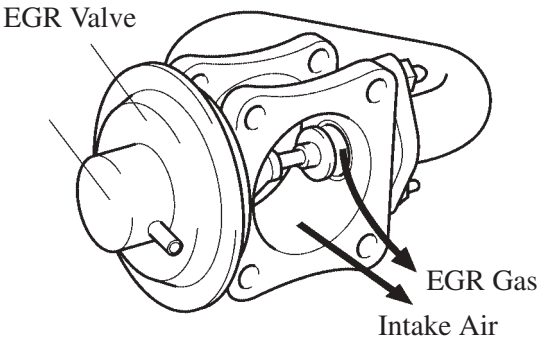



147EG115

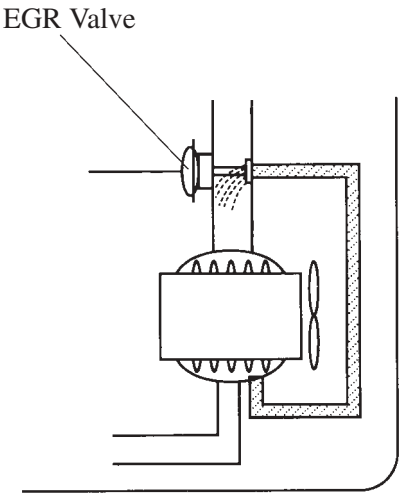


**3) EGR Valve**

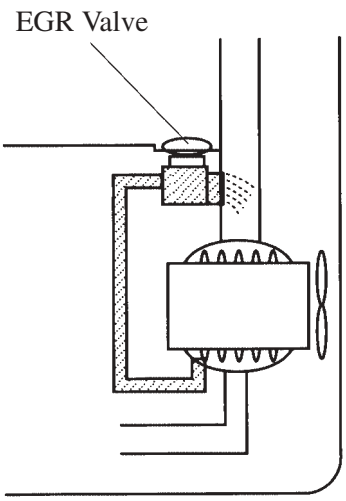
- Using the vacuum from the vacuum regulating valve, the EGR valve opens and closes the valve to introduce exhaust gas into the intake manifold.
- By providing the EGR valve in the intake passage, the various parts in the EGR valve are cooled by the intake air, thus enabling EGR control at higher load conditions.




147EG111




**1HD-FTE Engine**




**Ordinary Engine**

147EG112

### Operation

1) Based on the signals from the sensors, the engine ECU applies duty control to the current that is applied to the vacuum regulating valve, thus regulating the vacuum that is applied to the EGR valve. Thus, the EGR valve opening is controlled to provide the volume of EGR gas that is appropriate for the engine condition.
2) The EGR function is stopped under the conditions given below to ensure drivability and to reduce diesel smoke.

- The water temperature is low.
- The vehicle is driven under high load condition.
- During deceleration (The EGR operates at idle)

## 14. Engine Immobiliser System

The engine immobiliser system has been designed to prevent the vehicle from being stolen. This system uses a engine ECU that stores the ID code of the authorized ignition key. If an attempt is made to start the engine using an unauthorized key, the engine ECU to prohibit fuel delivery effectively in order to disable the engine. For details, see page 277 in the Engine Immobiliser system section.

## 15. Diagnosis

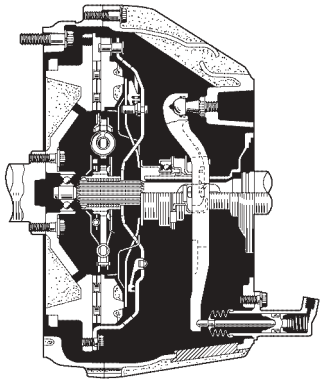
- If the engine ECU detects any problem with a sensor or an electrical circuit, it turns ON the CHECK ENGINE lamp in the combination meter to inform the driver. In addition, the malfunction code will be stored in memory.
- An M-OBD (Multiplex On-Board Diagnostic) System has been adopted to improve serviceability. The operation of the M-OBD system is basically the same as the 1FZ-FE engine.
  For details, see page 60.

# CHASSIS

## CLUTCH

### ■ DESCRIPTION

- A dry, single-plate clutch operated by hydraulic pressure is used, which is matched to the performance of the particular engine.
- The self-adjusting type clutch cover is used on the 1FZ-FE and 2UZ-FE engine models.
- A clutch accumulator is used on all models to reduce the vibration and noise that is transmitted to the clutch pedal.



147CH011–1

**2UZ-FE Engine Model**



**▶ Specifications ◀**

| | | 1FZ-FE | 2UZ-FE | 1HZ | 1HD-T<br>1HD-FTE |
|---|---|---|---|---|---|
| Clutch | Type | Dry Type Single Plate Clutch Diaphragm Spring | ← | ← | ← |
| | Operation | Hydraulic | ← | ← | ← |
| Clutch Cover | Type | Self-Adjusting | ← | DST*1 | ← |
| | Size mm (in.) | 300 (11.81) | ← | 275 (10.83) | 300 (11.81) |
| | Installed Load N (kgf) | 8532 (870) | ← | 5884 (600) | 8336 (850) |
| Clutch Disc | Facing Size*2 mm (in.) | 300 x 190 x 3.8 (11.81 x 7.48 x 0.15) | ← | 275 x 175 x 3.5 (10.83 x 6.89 x 0.14) | 300 x 190 x 3.5 (11.81 x 7.48 x 0.14) |
| | Facing Area $cm^2$ ($in.^2$) | 423 (65.57) | ← | 353 (54.72) | 423 (65.57) |
| Master Cylinder | Type | Conventional | ← | ← | ← |
| | Cylinder Dia. mm (in.) | 15.87 (0.62) | 19.05 (0.75) | ← | ← |
| Release Cylinder | Type | Non-Adjustable | ← | ← | ← |
| | Cylinder Dia. mm (in.) | 19.05 (0.75) | ← | 23.81 (0.94) | ← |

*1: DST (Diaphragm Spring Turnover)

*2: Outer Diameter x Inner Diameter x Thickness

## ■CLUTCH COVER

### 1. General

- High installed load clutch cover is applied for the 1HD-FTE engine model.
- The self-adjusting type clutch cover is used on the 1FZ-FE and 2UZ-FE engine models.

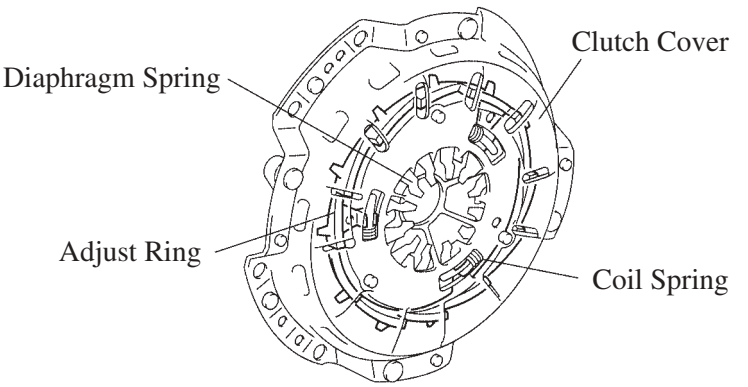
### 2. Self-Adjusting Type Clutch Cover

#### General

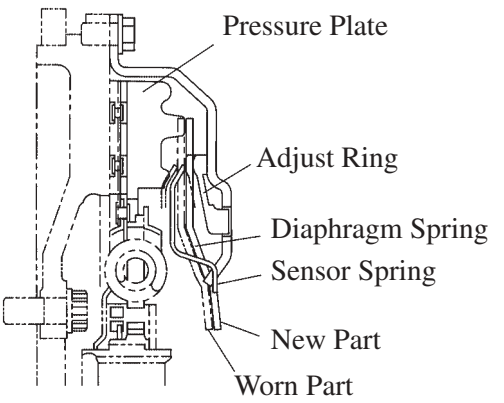
The self-adjusting type clutch cover maintains a constant diaphragm spring posture regardless of the amount of the clutch disc wear. Consequently, it maintains the clutch pedal effort constant to ensure a comfortable clutch feel and to prolong the use life of the clutch disc.

#### Construction

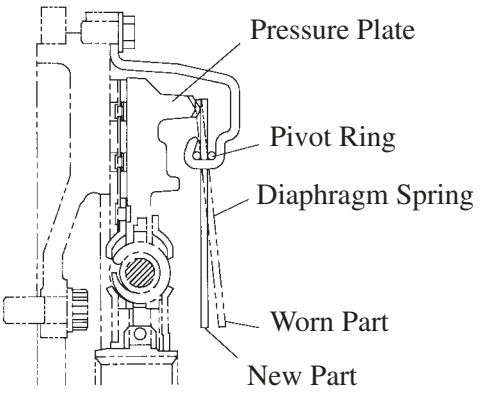
Unlike the conventional clutch cover that uses a pivot ring to support the diaphragm spring, the self-adjusting type clutch cover uses a sensor spring and an adjusting ring to support the diaphragm spring.
The adjusting ring provides a slanted portion to enable the pressure plate and the diaphragm spring to move towards the clutch disc, and coil springs are provided between the cover and the adjusting ring.
In contrast to the conventional clutch cover in which the posture of the diaphragm spring changes as the spring pivots on the pivot ring in accordance with the wearing of the clutch disc, the diaphragm spring of the self-adjusting type clutch cover moves parallel to the clutch disc while maintaining a constant posture.




147CH06



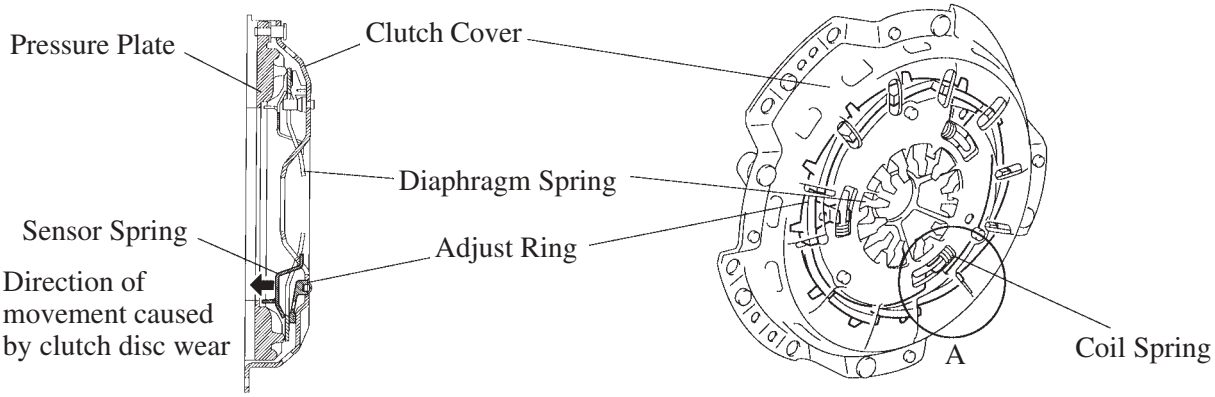

**Self-Adjusting Type** 147CH06



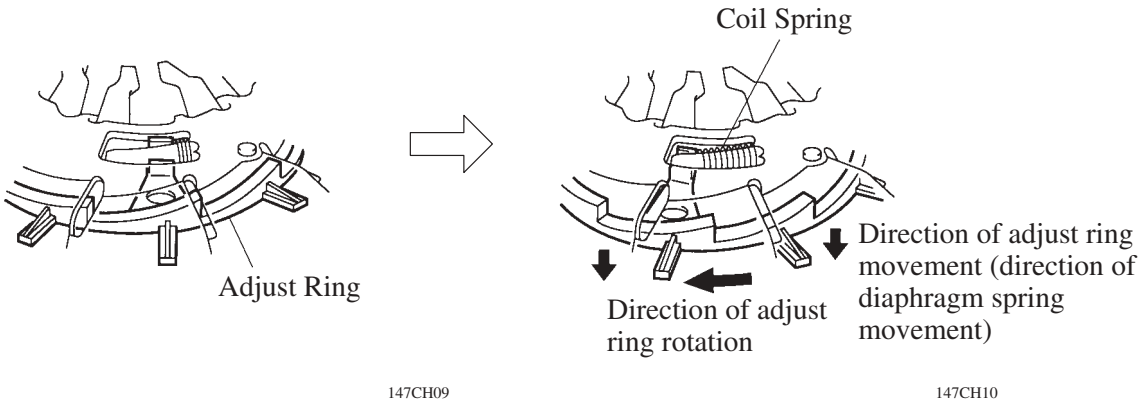

**Conventional type** 147CH07

## Operation

When the clutch disc becomes worn, the diaphragm spring moves forward together with the sensor spring. Then, the clearance between the diaphragm spring and the clutch cover expands, and the coil springs cause the adjust ring to push out by rotating in the circumferential direction, thus reducing the clearance. As a result, the diaphragm spring constantly maintains a proper posture and load.






**Before clutch disc wear** **Clutch Disc Wear**

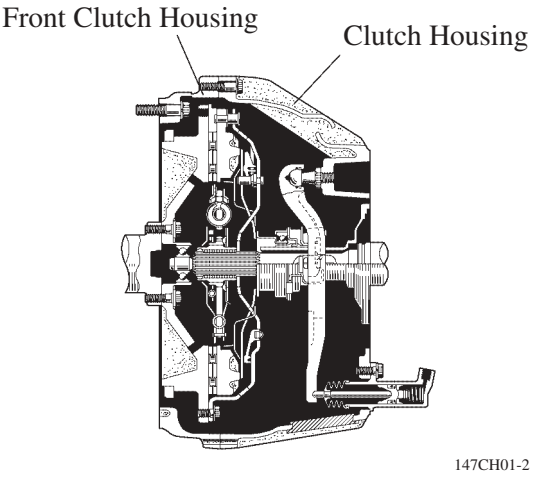
**Exploded view of portion A**

**Service Tip**

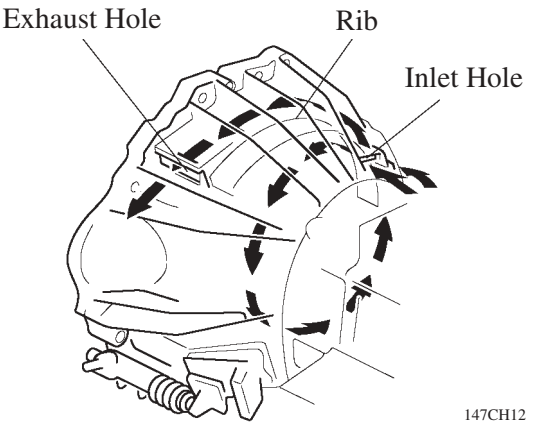
Make sure to replace the clutch cover whenever the clutch disc is replaced. If the clutch disc is replaced without replacing the clutch cover, a proper diaphragm spring posture cannot be attained, which could cause the clutch to slip and make it more difficult to operate the clutch.
Fully press the clutch pedal 10 times after replacing the clutch cover and the clutch disc in order to reset the diaphragm spring posture to its initial setting. Although the clutch pedal could feel stiff immediately after the replacement, this does not indicate an abnormal condition. A proper amount of pedal effort can be attained by repeating the operation mentioned above.

## ■CLUTCH HOUSING

- The clutch housing for the 2UZ-FE engine model splits into two, the front and rear sections, thus adopting a large-size clutch while keeping compact the portion of the clutch housing that is joined to the engine.

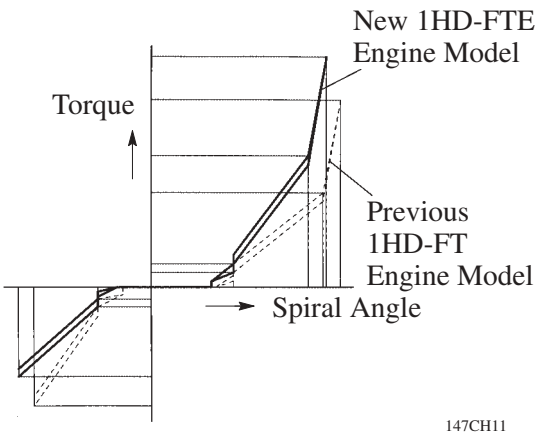



- The shapes of the ribs, intake holes, and exhaust holes of the clutch housing for all models have been optimized to improve the cooling performance in the clutch housing in order to prolong the use life of the clutch disc.




## ■CLUTCH DISC

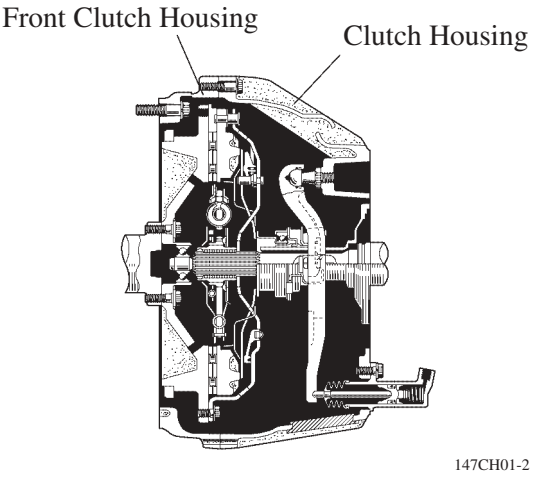
The spiral characteristics of clutch disc have been changed to reduce the noise and vibration of the drive line for the 1HD-FTE engine model.




**Spiral Characteristics of Clutch Disc**

## ■CLUTCH HOUSING

- The clutch housing for the 2UZ-FE engine model splits into two, the front and rear sections, thus adopting a large-size clutch while keeping compact the portion of the clutch housing that is joined to the engine.

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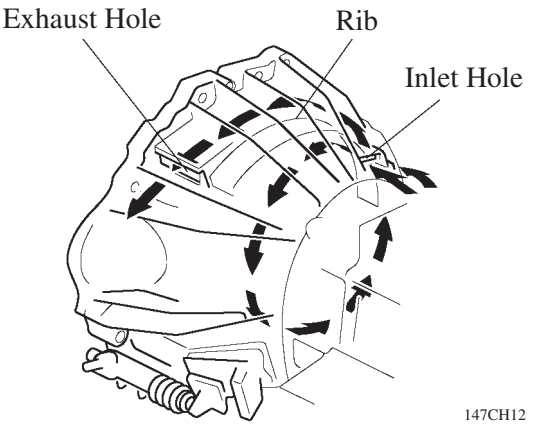


## ■CLUTCH DISC

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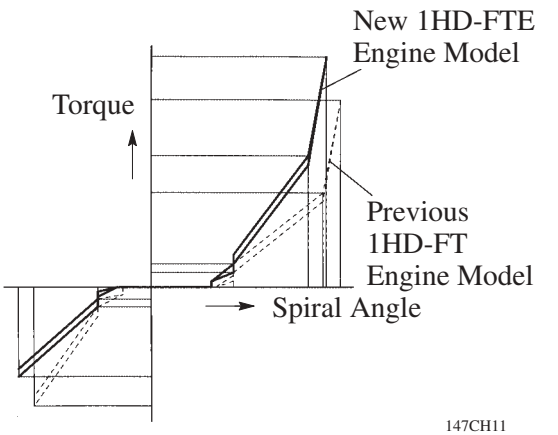
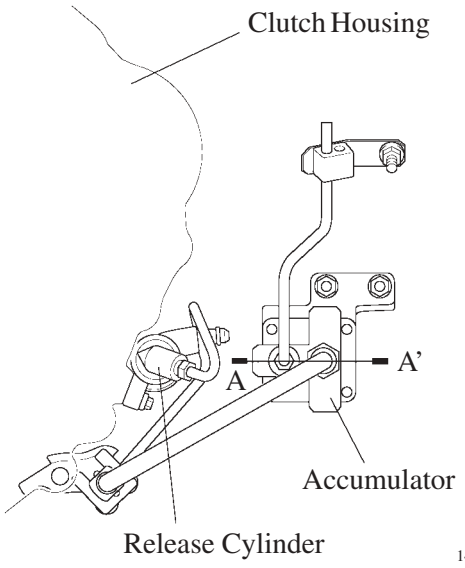


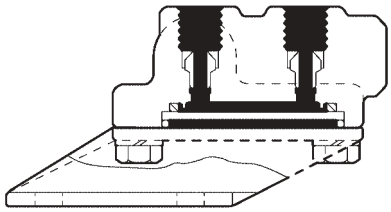

**Spiral Characteristics of Clutch Disc**

## ■ MASTER CYLINDER AND ACCUMULATOR

To reduce the noise and vibration that is transmitted to the clutch pedal, an accumulator is used on all models. On the 1HD-T and 1HD-FTE engine models, an accumulator is used in the middle of the clutch pipe. On other models, an accumulator that is integrated with the master cylinder is used. Further more, the clevis damper is used for the 2UZ-FE and 1HZ engine models.

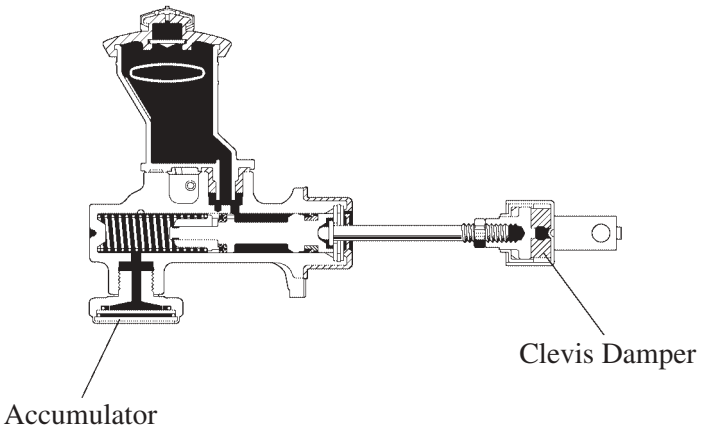



147CH02



147Ch03

**A – A' Cross Section**

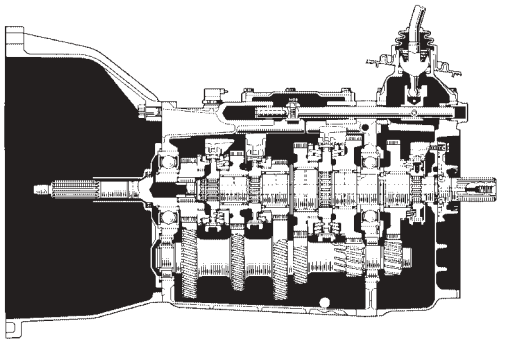



147CH04

# MANUAL TRANSMISSION

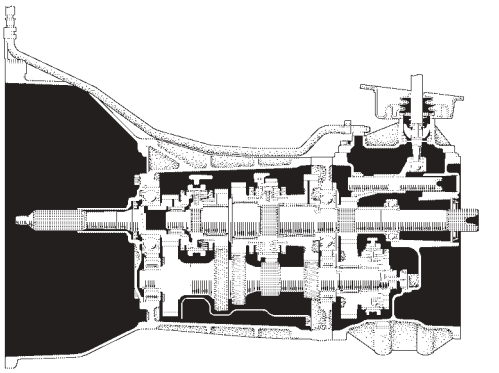
## ■ DESCRIPTION

The H151F manual transmission is used on the 1FZ-FE, 2UZ-FE, 1HD-T and 1HD-FTE engine models, and the R151F manual transmission is used on the 1HZ engine model.
Both manual transmissions have adopted a triple-cone type synchromesh mechanism in the 1st, 2nd, and 3rd gears, and a single-cone type synchromesh mechanism in the 4th, 5th, and reverse gears to ensure excellent shift feeling. However, only H151F manual transmission is adopted triple-cone type synchromesh mechanism for the reverse gear.



147CH13

**H151F Manual Transmission**



147CH17

**R151F Manual Transmission**

**▶ Specifications ◀**

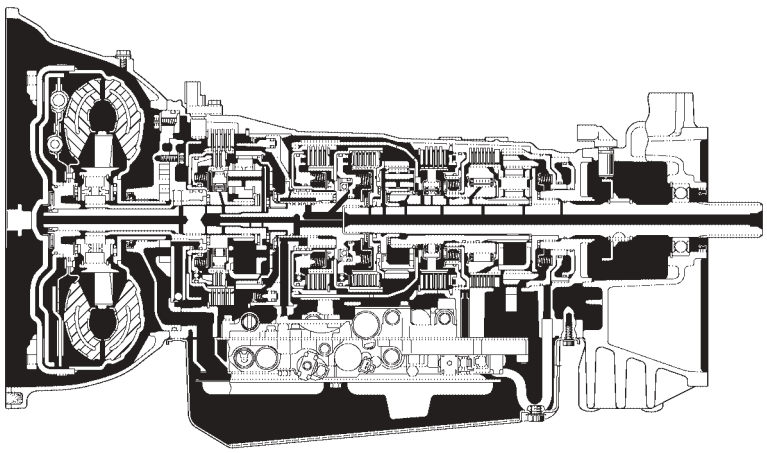
| Transmission Type / Engine Type / Item | | H151F | R151F |
|---|---|---|---|
| | | 1FZ-FE, 2UZ-FE 1HD-T, 1HD-FTE | 1HZ |
| Gear Ratio | 1st | 4.081 | 4.313 |
| | 2nd | 2.294 | 2.330 |
| | 3rd | 1.490 | 1.436 |
| | 4th | 1.000 | ← |
| | 5th | 0.881 | 0.838 |
| | Reverse | 4.313 | 4.220 |
| Oil Capacity | Liters (US qts, Imp. qts) | 2.7 (2.9, 2.4) | 2.2 (2.3, 1.9) |
| Oil Viscosity | | SAE 75W-90 | ← |
| Oil Grade | | API GL-4 or GL-5 | ← |

# A343F AUTOMATIC TRANSMISSION

## ■ DESCRIPTION

The A343F automatic transmission is used on the 2UZ-FE engine model for Europe. The A343F automatic transmission features following characteristics;

- A torque converter and planetary gear unit that accommodate the high-performance 2UZ-FE engine have been adopted.
- The engine ECU regulates the solenoid valve SLT to control the line pressure.
- An O/D direct clutch speed sensor has been adopted to detect the input shaft speed in order to realize smooth shift characteristics.



155CH01



**▶ Specifications ◀**

| Transmission Type / Engine Type / Item | | A343F / 2UZ-FE |
|---|---|---|
| Gear Ratio | 1st | 2.804 |
| | 2nd | 1.531 |
| | 3rd | 1.000 |
| | 4th (Overdrive) | 0.753 |
| | Reverse | 2.393 |
| Fluid Capacity Liters (US qts, Imp. qts) | | 12.0 (12.7, 10.6) |
| Fluid Type | | ATF D-II or DEXRON®III (DEXRON®II) |

## ■TORQUE CONVERTER AND PLANETARY GEAR UNIT

- The shape of the turbine blades in the torque converter has been optimized to accommodate the high-performance 2UZ-FE engine.
- The rear planetary gears use 5 pinion gears to accommodate the high-performance 2UZ-FE engine.

**▶ Specifications ◀**

| Item | | | | Engine Type: 2UZ-FE |
|---|---|---|---|---|
| Torque Converter | Converter Type | | | 3-Element, 1-Step, 2-Phase, with Lock-Up Mech |
| | Stall Torque Ratio | | | 1.770 |
| Planetary Gear Unit | $C_1$ | Forward Clutch | The No. of Discs | 7 |
| | $C_2$ | Direct Clutch | | 5 |
| | $C_0$ | OD Direct Clutch | | 2 |
| | $B_1$ | 2nd Coast Brake | Band Width mm (in.) | 40 (1.57) |
| | $B_2$ | 2nd Brake | The No. of Discs | 5 |
| | $B_3$ | 1st & Reverse Brake | | 7 |
| | $B_0$ | OD Brake | | 5 |
| | $F_1$ | No.1 One-Way Clutch | The No. of Sprags | 22 |
| | $F_2$ | No.2 One-Way Clutch | | 28 |
| | $F_0$ | OD One-Way Clutch | | 24 |
| | Front Planetary Gear | | The No. of Sun Gear Teeth | 42 |
| | | | The No. of Pinion Gear Teeth | 19 |
| | | | The No. of Ring Gear Teeth | 79 |
| | Rear Planetary Gear | | The No. of Sun Gear Teeth | 33 |
| | | | The No. of Pinion Gear Teeth | 23 |
| | | | The No. of Ring Gear Teeth | 79 |
| | OD Planetary Gear | | The No. of Sun Gear Teeth | 31 |
| | | | The No. of Pinion Gear Teeth | 33 |
| | | | The No. of Ring Gear Teeth | 95 |

## ■ELECTRONIC CONTROL SYSTEM

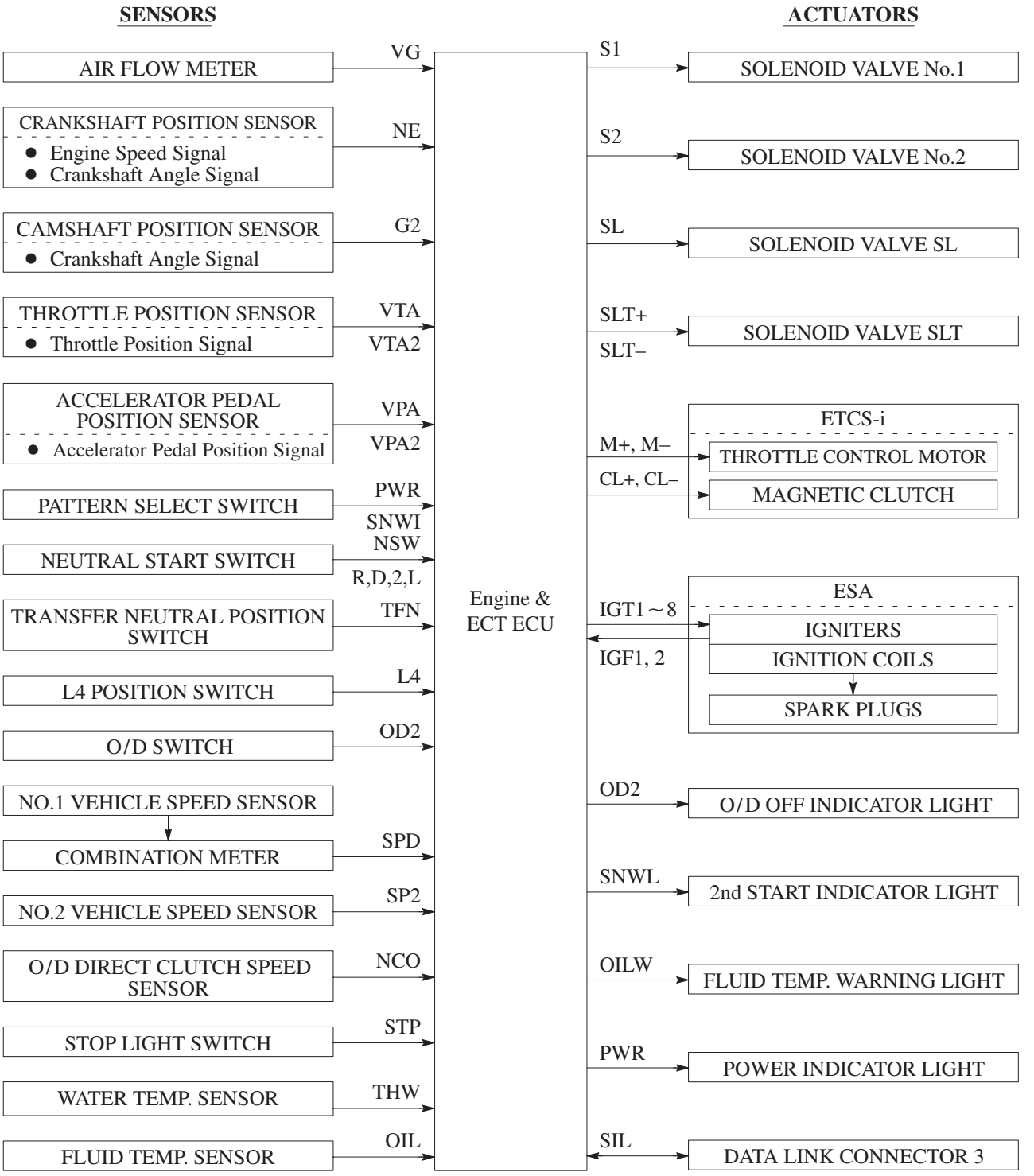
### 1. General

The electronic control system of the A343F automatic transmission consists of the controls listed below.

| System | Function |
|---|---|
| Shift Timing Control | The optimum shift pattern is selected from 2 shift patterns in the engine & ECT ECU by the pattern select switch. The engine & ECT ECU sends current to the solenoid valve No.1 and/or No.2 based on signals from each sensor and shifts the gear. |
| Lock-Up Timing Control | The optimum lock-up pattern is selected from 2 lock-up patterns in the engine & ECT ECU by the pattern select switch.<br>The engine & ECT ECU sends current to the solenoid valve SL based on signals from each sensor and engages or disengages the lock-up clutch. |
| Line-Pressure Control | Based on the throttle opening angle, the engine & ECT ECU sends a signal to solenoid valve SLT to generate line pressure according to the engine output, to effect a smooth gear shift change. |
| "N" to "D" Squat Control | When the shift lever is shifted from "N" to "D" range, the gear is temporarily shifted to OD and then to 1st to reduce vehicle squat. |
| Engine Torque Control | Retards the engine ignition timing temporarily to improve shift feeling during up or down shifting. |
| 2nd Start System | Enabling the vehicle to take off in the 2nd gear and thus make it easy to take off on snowy, sandy or muddy terrain. |
| Self-Diagnosis | When the engine & ECT ECU detects the electrical circuit malfunctions, it flashes the O/D OFF indicator light to alert the driver. In addition, the engine & ECT ECU stores the codes of the malfunctions. Diagnosis code can be confirmed with flashing of O/D OFF indicator light. As this system adapts M-OBD, a hand-held tester can be connected to DLC3 to check the codes. For details on the diagnostic code check method, diagnostic codes, and diagnostic code clearance, see the Land Cruiser Chassis and Body Repair Manual (Pub. No. RM616E). |
| Fail-Safe | Controls other normally operating components, permitting continued driving when malfunctions occur in the electrical circuit. |

## 2. Construction

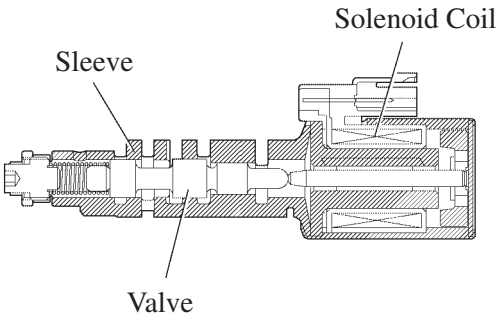
The configuration of the electronic control system in the A343F is as shown in the following chart.



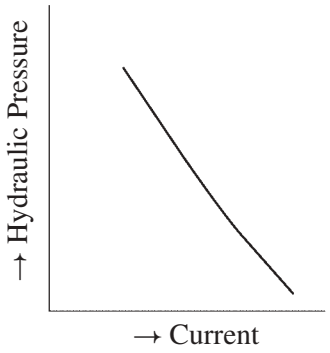
## 3. Construction and Operation of Main Components

### Solenoid Valve SLT

In order to provide a hydraulic pressure that is in proportion to the current that flows to the solenoid coil, the solenoid valve SLT linearly controls the line pressure based on the signals it receives from the engine & ECT ECU.




155CH02

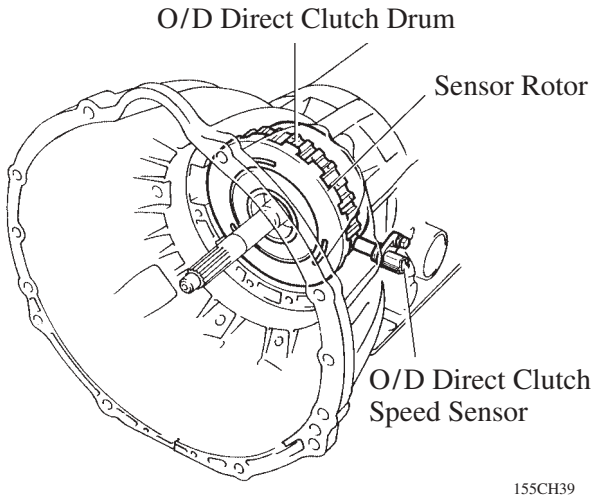



155CH03

CH

### O/D Direct Clutch Speed Sensor

The O/D direct clutch speed sensor is fitted to the transmission case to detect revolution of the transmission input shaft.
The sensor rotor is fitted to the O/D direct clutch drum.

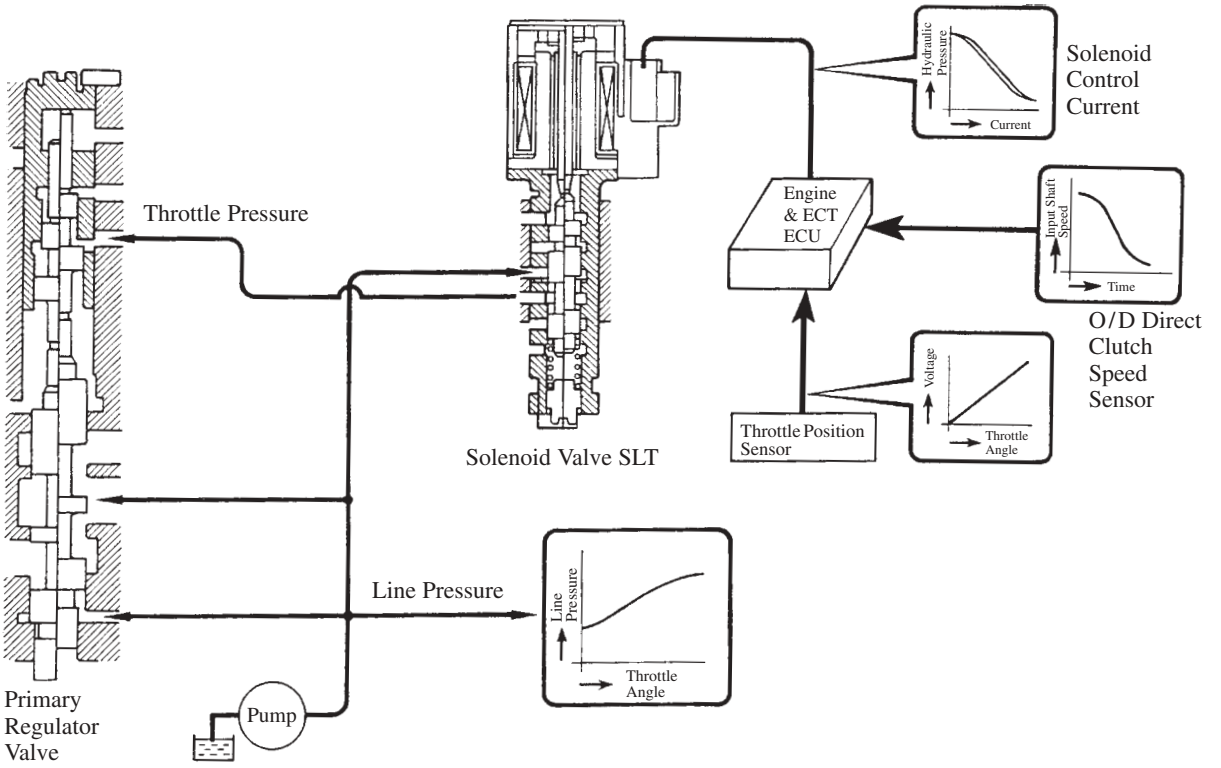



155CH39

## 4. Function of Engine & ECT ECU

### Line Pressure Control

The previous mechanical control, which consisted of a throttle cable, cam, and throttle valve, has been changed to an electronic control system that uses a solenoid valve SLT.
In order to obtain a predetermined line pressure characteristic according to the throttle position sensor (VTA) signal the engine & ECT ECU activates the solenoid valve SLT to regulate the throttle pressure.
This makes it possible for the primary regulator valve to precisely and minutely control the line pressure, in accordance with the engine output, and thus realize smoother shift characteristics.
And also, the engine & ECT ECU detects the speed of the transmission input shaft to determine whether or not the transmission is shifting properly in order to ensure the smooth engagement of the clutch.
To ensure the optimal speed changes in the transmission input shaft, the engine & ECT ECU controls the solenoid valve SLT to finely regulate the line pressure.

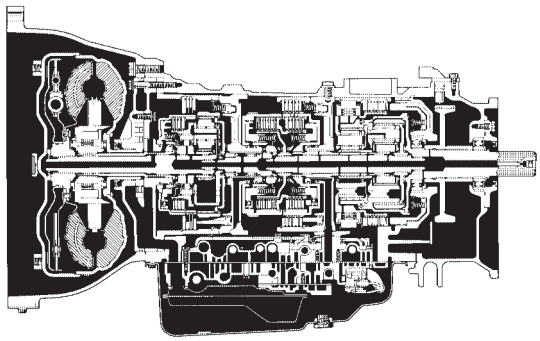


# A442F AUTOMATIC TRANSMISSION

## ■ DESCRIPTION

No changes have been made to the A442F automatic transmission of the 1HZ and 1HD-T engine models. The following changes have been made to the A442F automatic transmission of the 1FZ-FE, 2UZ-FE (except models for Europe), and 1HD-FTE engine models:

- The planetary gear unit accommodates the high-performance engine in conjunction with the improvements made to the 1FZ-FE engine and the adoption of the 2UZ-FE and 1HD-FTE engines.
- A torque converter has been changed for the 1HD-FTE engine model.
- The engine & ECT ECU regulats the solenoid valve SLT to control the line pressure for the 2UZ-FE and the 1HD-FTE engine models.
- The fluid temperature sensor is used on the 2UZ-FE and the 1HD-FTE engine models.
- The timing to engage and release the clutches during 2nd-3rd shifting has been finely tuned according to driving conditions in order to reduce the shift shock.



147CH14

**1HD-FTE Engine Model**



**▶ Specifications ◀**

| Transmission Type / Engine Type / Item | | A442F |
|---|---|---|
| | | 1FZ-FE, 2UZ-FE*, 1HZ, 1HD-T, 1HD-FTE |
| Gear Ratio | 1st | 2.950 |
| | 2nd | 1.530 |
| | 3rd | 1.000 |
| | 4th (Overdrive) | 0.765 |
| | Reverse | 2.678 |
| Fluid Capacity | Liters (US qts, Imp. qts) | 13.0 (13.7, 11.4)*1, 14.0 (14.8, 12.3)*2 |
| Fluid Type | | ATF D-II or DEXRON®III (DEXRON®II) |

*: Except Models for Europe

*1: For 1FZ-FE, 2UZ-FE and 1HZ Engine Model

*2: For 1HD-T and 1HD-FTE Engine Model

## ■TORQUE CONVERTER AND PLANETARY GEAR UNIT

- The blades of the torque converter pump, turbine, and stator of the 1HD-FTE engine model have been optimized to achieve the torque converter characteristics that are optimized for the 1HD-FTE engine.
- In the automatic transmission of the 1FZ-FE, 2UZ-FE, and 1HD-FTE engine models, the various parts of the planetary gear unit have been increased in strength.

| Components | Description of Changes |
|---|---|
| OD Planetary Gear | Pinion roller diameter increased, pinion pin diameter increased, pinion inner diameter increased. |
| Front Planetary Gear | Pinion roller diameter increased, pinion gear width increased, pinion inner diameter increased, pinion pin length and material changed. |
| Rear Planetary Gear | Pinion pin material changed, pinion gear width increased. |
| OD Input Shaft | Shot-peening treatment |
| Input Shaft | Shot-peening treatment |
| Intermediate Shaft | Shot-peening treatment |
| $B_2$ Brake | Plate sheet thickness increased. |

### ▶ Specifications ◀

| Engine Type | | | | 1FZ-FE | 2UZ-FE | 1HZ | 1HD-T | 1HD-FTE |
|---|---|---|---|---|---|---|---|---|
| Torque Converter | Converter Type | | | 3-Element, 1-Step, 2-Phase, with Lock-Up Mechanism | | | | |
| | Stall Torque Ratio | | | 1.770 | ← | ← | 1,840 | ← |
| Planetary Gear Unit | $C_1$ | Forward Clutch | The No. of Discs | 7 | ← | 6 | 7 | ← |
| | $C_2$ | Direct Clutch | | 5 | ← | ← | ← | ← |
| | $C_0$ | OD Direct Clutch | | 3 | ← | ← | ← | ← |
| | $B_2$ | 2nd Brake | | 5 | ← | 4 | 5 | ← |
| | $B_3$ | 1st & Reverse Brake | | 6 | ← | ← | ← | ← |
| | $B_0$ | OD Brake | | 3 | ← | ← | ← | ← |
| | $F_2$ | No.2 One-Way Clutch | The No. of Sprags | 46 | ← | ← | ← | ← |
| | $F_0$ | OD One-Way Clutch | | 22 | ← | ← | ← | ← |
| | Front Planetary Gear | | The No. of Sun Gear Teeth | 28 | ← | ← | ← | ← |
| | | | The No. of Pinion Gear Teeth | 23 | ← | ← | ← | ← |
| | | | The No. Ring Gear Teeth | 75 | ← | ← | ← | ← |
| | Rear Planetary Gear | | The No. of Sun Gear Teeth | 44 | ← | ← | ← | ← |
| | | | The No. of Pinion Gear Teeth | 20 | ← | ← | ← | ← |
| | | | The No. of Ring Gear Teeth | 83 | ← | ← | ← | ← |
| | OD Planetary Gear | | The No. of Sun Gear Teeth | 31 | ← | ← | ← | ← |
| | | | The No. of Pinion Gear Teeth | 35 | ← | ← | ← | ← |
| | | | The No. of Ring Gear Teeth | 101 | ← | ← | ← | ← |

## ■ELECTRONIC CONTROL SYSTEM

### 1. General

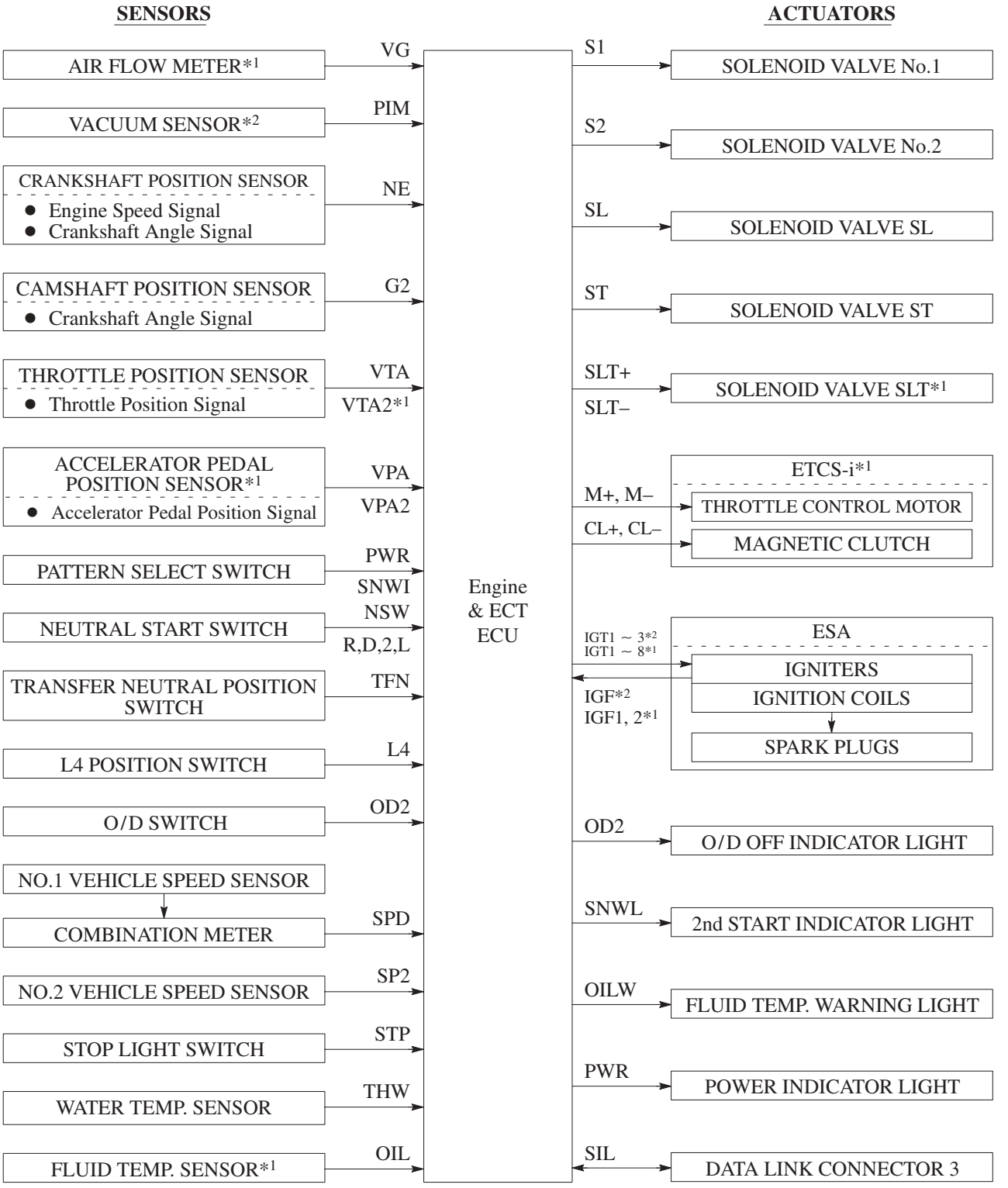
The electronic control system of the A442F automatic transmission consists of the controls listed below.

| System | Function | 1FZ-FE | 2UZ-FE | 1HZ, 1HD-T | 1HD-FTE |
|---|---|---|---|---|---|
| Shift Timing Control | The optimum shift pattern is selected from 2 shift patterns in the engine & ECT ECU or ECT ECU* by the pattern select switch. The engine & ECT ECU or ECT ECU* sends current to the solenoid valve No.1 and/or No.2 based on signals from each sensor and shifts the gear. | ○ | ○ | ○ | ○ |
| Lock-Up Timing Control | The optimum lock-up pattern is selected from 2 lock-up patterns in the engine & ECT ECU or ECT ECU* by the pattern select switch. The engine & ECT ECU or ECT ECU* sends current to the solenoid valve SL based on signals from each sensor and engages or disengages the lock-up clutch. | ○ | ○ | ○ | ○ |
| Line Pressure Control | Based on the throttle opening angle, the engine & ECT ECU or ECT ECU* sends a signal to solenoid valve SLT to generate line pressure according to the engine output, to effect a smooth gear shift change. | – | ○ | – | ○ |
| "N" ro "D" Squat Control | When the shift lever is shifted from "N" to "D" range, the gear is temporarily shifted to 3rd and then to 1st to reduce vehicle squat. | ○ | ○ | ○ | ○ |
| Engine Torque Control | Retards the engine ignition timing temporarily to improve shift feeling during up or down shifting. | ○ | ○ | – | – |
| | Effects engine torque control in accordance with the fuel injection volume to reduce the shift shock. | – | – | – | ○ |
| 2nd Start System | Enablilng the vehicle to take off in the 2nd gear and thus make it easy to take off on snowy, sandy or muddy terrain. | ○ | ○ | ○ | ○ |
| Self-Diagnosis | When the engine & ECT ECU or ECT ECU* detects the electrical circuit malfunctions, it flashes the O/D OFF indicator light to alert the driver. In addition, the engine & ECT ECU or ECT ECU* stores the codes of the malfunctions. Diagnosis code can be confirmed with flashing of O/D OFF indicator light. | ○ | ○ | ○ | ○ |
| | As the M-OBD system is supported, a hand-held tester can be connected to DLC3 to check the diagnostic codes. | ○ | ○ | – | – |
| Fail-Safe | Controls other normally operating components, permitting continued driving when malfunctions occur in the electrical circuit. | ○ | ○ | ○ | ○ |

*: For Diesel Engine Model

## 2. Construction

The configuration of the electronic control system in the gasoline engine model's A442F is as shown in the following chart.




*1: Only 2UZ-FE Engine Model
*2: Only 1FZ-FE Engine Model

The configuration of the electronic control system in the diesel engine model's A442F is as shown in the following chart.


*1: Except 1HD-FTE Engine Model

*2: For 1HD-FTE Engine Model

CH

## 3. Construction and Operation of Main Components

### Solenoid Valve SLT

The solenoid valve SLT is used to control the line pressure for the 2UZ-FE and the 1HD-FTE engine models. The basic construction and operation are the same as in the A343F's solenoid valve SLT. For details, see page 161.

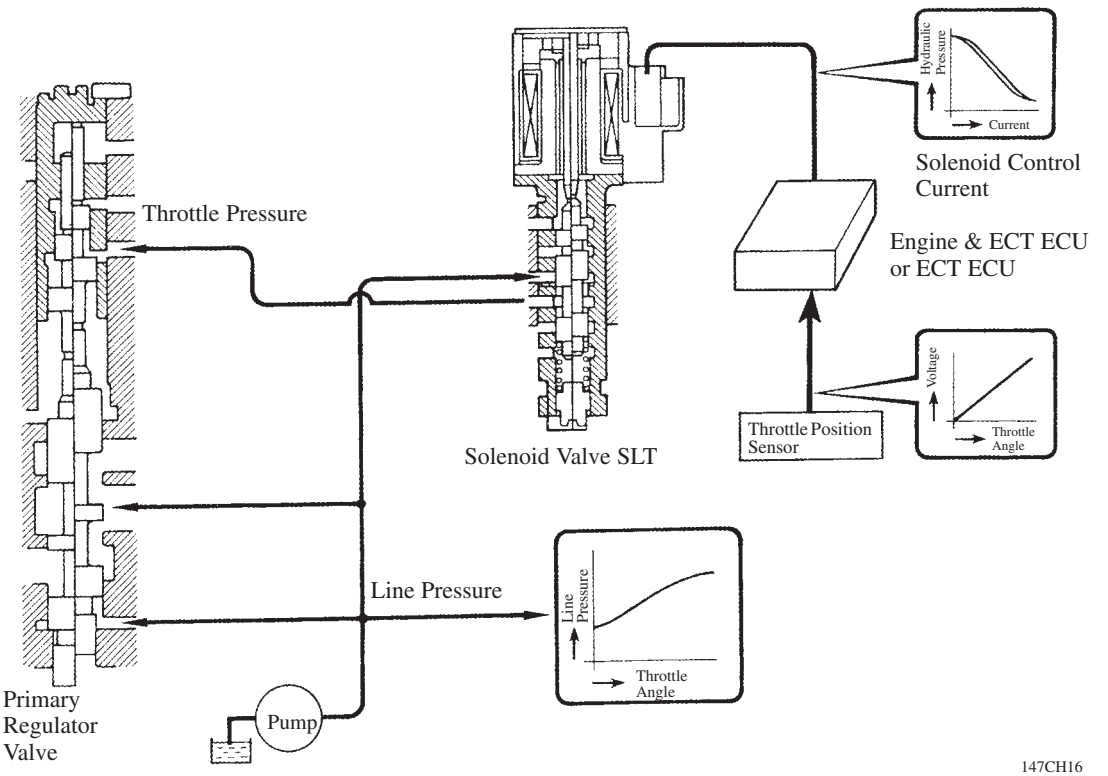
### Fluid Temperature Sensor

A fluid temperature sensor is fixed onto in the valve body to detect the temperature of the fluid in the transmission of the 2UZ-FE and 1HD-FTE engine models. Finely tuned shift control has been realized by monitoring the fluid temperature.

## 4. Function of Engine & ECT ECU or ECT ECU

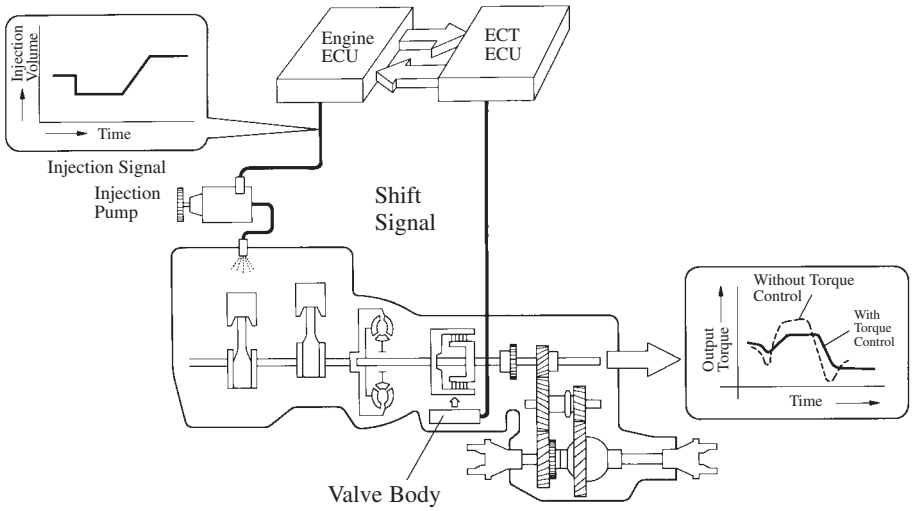
### Line Pressure Control

The previous mechanical control, which consisted of a throttle cable, cam, and throttle valve, has been changed to an electronic control system that uses a solenoid valve SLT.
In order to obtain a predetermined line pressure characteristic according to the throttle position sensor (VTA) signal the engine & ECT ECU or ECT ECU activates the solenoid valve SLT to regulate the throttle pressure.
This makes it possible for the primary regulator valve to precisely and minutely control the line pressure, in accordance with the engine output, and thus realize smoother shift characteristics.



### Engine Torque Control (For 1HD-FTE Engine Model)

Engagement of the clutches and brakes of the planetary gear unit in the transmission is controlled smoothly by momentarily reducing the fuel injection volume when gears are shifted up or down in the transmission. When the ECT ECU judges a gear shift timing according to signals from various sensors, it activates the shift control solenoid valves to perform gear shifting. When the gear shifting starts, the engine ECU reduces the fuel injection volume to reduce the engine torque. As a result, engagement force of the clutches and brakes of the planetary gear units is weakened and the gear shift change is performed smoothly.

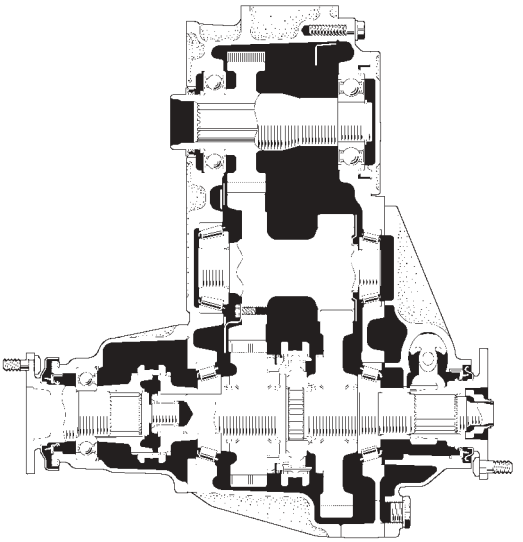



147CH15

# TRANSFER

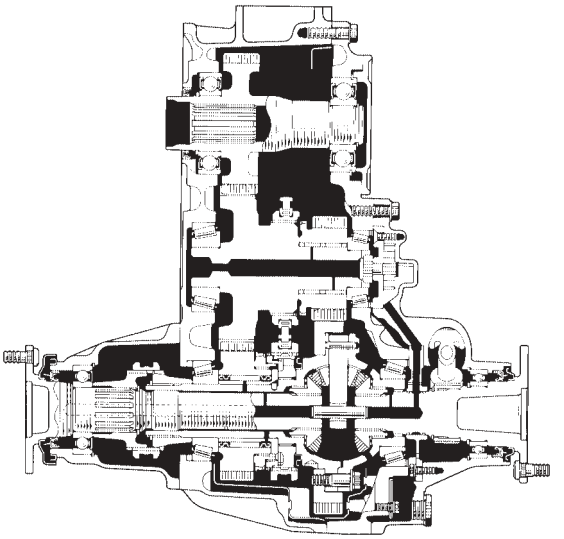
## ■ DESCRIPTION

As in the previous models, HF1A part-time 2-speed transfer and HF2A full-time 2-speed transfer are provided.
There is a type of HF1A transfer in which the 2WD/4WD selection is made by a transfer shift lever, and another type in which the 2WD/4WD selection is made by a 2-4 select switch.
The HF2A transfer is equipped with a center differential lock mechanism.
The basic construction and operation are the same as in the previous model.
However, the gear teeth specification has been changed in order to accommodate the high-performance engine and to reduce noise and vibration.



147CH20

**HF1A Transfer**



155CH46

**HF2A Transfer**

**▶ Specifications ◀**

| Transfer Type / Drive Type / Item | | HF1A | HF2A |
|---|---|---|---|
| | | Part-Time | Full-Time |
| Reduction Gear Type | | Idler Gear | ← |
| Gear Ratio | H2 | 1.000 | – |
| | H4 | 1.000 | ← |
| | L4 | 2.488 | ← |
| Center Differential Gear Type | | – | Straight Bevel Gear with Diff. Lock Mechanism |
| Oil Capacity Liters (US qts, Imp. qts) | | 1.5 (1.6, 1.3) | 1.3 (1.4, 1.1) |
| Oil Viscosity | | SAE 75W-90 | ← |
| Oil Grade | | API GL-4 or GL-5 | ← |

# PROPELLER SHAFT

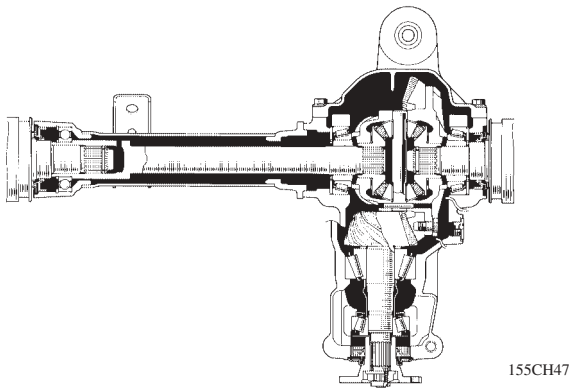
## ■ DESCRIPTION

As in the previous model, both front and rear propeller shafts have adopted the 2-joint type propeller shaft with a center sliding mechanism.

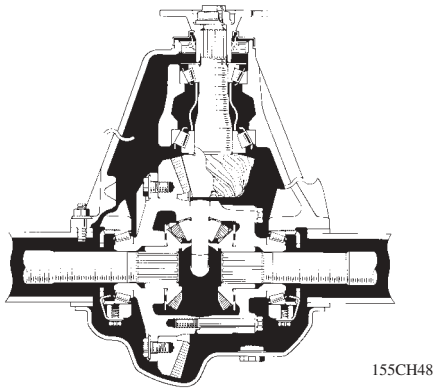
# DIFFERENTIAL

## ■ DESCRIPTION

- The front differential of the previous model continues to be used on the models with the rigid-axle front suspension.
- A front differential designed for independent front suspension has been provided in conjunction with the introduction of the models with independent front suspension.
- Based on the rear differential of the previous model, various parts have been improved.




**Front Differential for Independent Suspension**




**Rear Differential**



**▶ Specifications ◀**

| Differential / Suspension Type / Item | Front | | Rear |
|---|---|---|---|
| | Rigid Axle | Independent | Rigid Axle |
| Ring Gear Size in. | 8” | ← | 9.5” |
| Differential Gear Ratio | 4.300 | 4.300<br>3.909*1<br>4.100*2 | ← |
| No. of Differential Pinions | 2 | ← | 4 |
| Oil Capacity<br>Liters (US qts, Imp. qts) | 2.8 (3.0, 2.5)<br>2.65 (2.8, 2.3)*3 | 1.7 (1.8, 1.5) | 3.3 (3.5, 2.9)<br>3.2 (3.4, 2.8)*3 |
| Oil Viscosity | SAE 90*4<br>SAE 80W or 80W-90*5 | ← | ← |
| Oil Grade | API GL-5 | ← | ← |
| Oil Type | Hypoid | ← | Hypoid<br>Hypoid for LSD*6 |

*1: 1HD-FTE Engine Model with Manual Transmission for Europe
*2: 1HD-FTE Engine Model with Automatic Transmission for Europe
*3: With Differential Lock Mechanism
*4: Temperatures Above –18°C (0°F)
*5: Temperatures Below –18°C (0°F)
*6: With LSD

# PROPELLER SHAFT

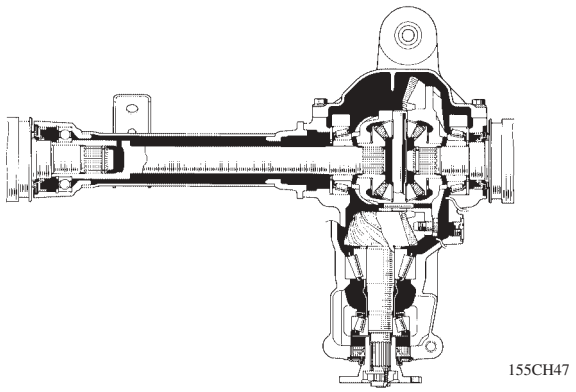
## ■ DESCRIPTION

As in the previous model, both front and rear propeller shafts have adopted the 2-joint type propeller shaft with a center sliding mechanism.

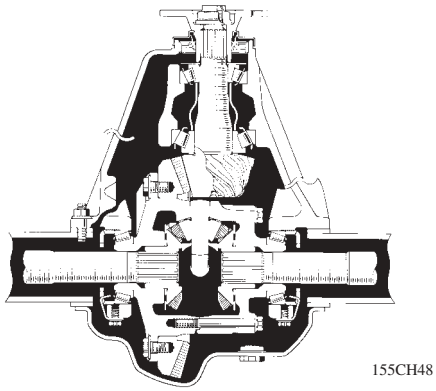
# DIFFERENTIAL

## ■ DESCRIPTION

- The front differential of the previous model continues to be used on the models with the rigid-axle front suspension.
- A front differential designed for independent front suspension has been provided in conjunction with the introduction of the models with independent front suspension.
- Based on the rear differential of the previous model, various parts have been improved.




**Front Differential for Independent Suspension**




**Rear Differential**



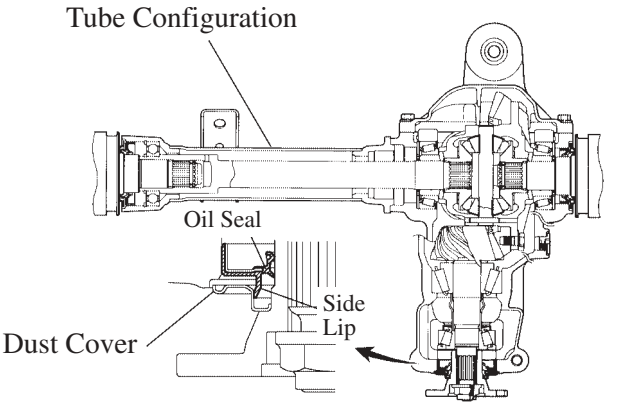
**▶ Specifications ◀**

| Differential / Suspension Type / Item | Front | | Rear |
|---|---|---|---|
| | Rigid Axle | Independent | Rigid Axle |
| Ring Gear Size in. | 8” | ← | 9.5” |
| Differential Gear Ratio | 4.300 | 4.300<br>3.909*1<br>4.100*2 | ← |
| No. of Differential Pinions | 2 | ← | 4 |
| Oil Capacity<br>Liters (US qts, Imp. qts) | 2.8 (3.0, 2.5)<br>2.65 (2.8, 2.3)*3 | 1.7 (1.8, 1.5) | 3.3 (3.5, 2.9)<br>3.2 (3.4, 2.8)*3 |
| Oil Viscosity | SAE 90*4<br>SAE 80W or 80W-90*5 | ← | ← |
| Oil Grade | API GL-5 | ← | ← |
| Oil Type | Hypoid | ← | Hypoid<br>Hypoid for LSD*6 |

*1: 1HD-FTE Engine Model with Manual Transmission for Europe
*2: 1HD-FTE Engine Model with Automatic Transmission for Europe
*3: With Differential Lock Mechanism
*4: Temperatures Above –18°C (0°F)
*5: Temperatures Below –18°C (0°F)
*6: With LSD

## ■ FRONT DIFFERENTIAL (FOR INDEPENDENT FRONT SUSPENSION)

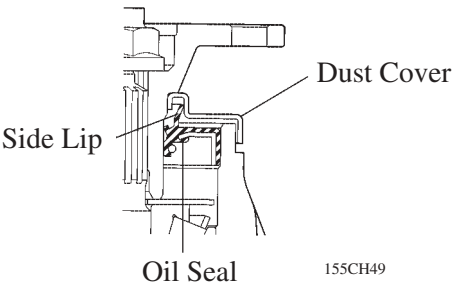
- A front differential that supports the independent front suspension has been adopted.
- The differential carrier has adopted a tube configuration to equalize the lengths of the right and left drive shafts.
- For the purpose of improving dust resistance, a type of oil seal with a side lip that contacts the dust cover has been adopted.



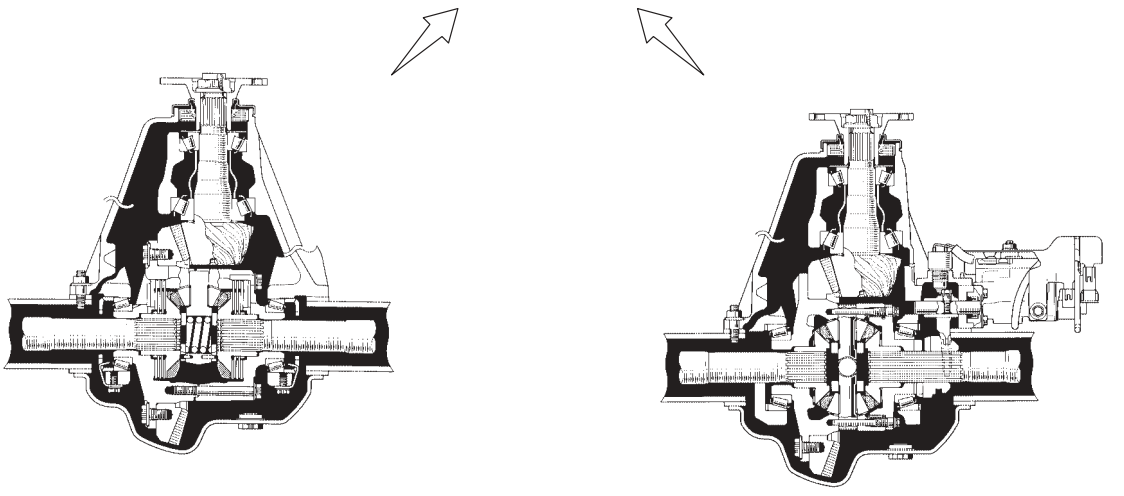

155CH13

## ■ REAR DIFFERENTIAL

- The tooth configuration of the gears has been optimized to reduce noise and vibration.
- Similar to the front differential, a type of oil seal with a side lip that contacts the dust cover has been adopted.




155CH49



155CH50

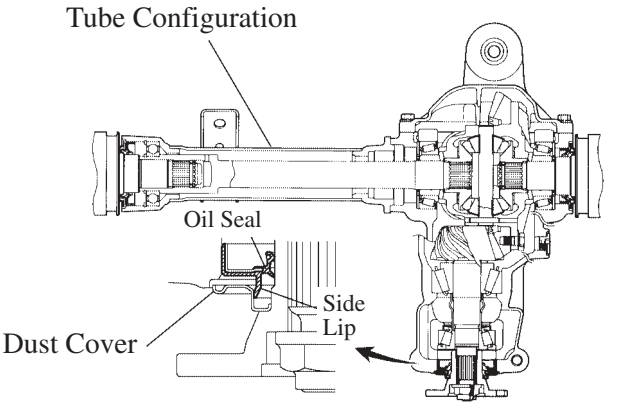
**With LSD**

155CH51

**With Differential Lock Mechanism**

## ■ FRONT DIFFERENTIAL (FOR INDEPENDENT FRONT SUSPENSION)

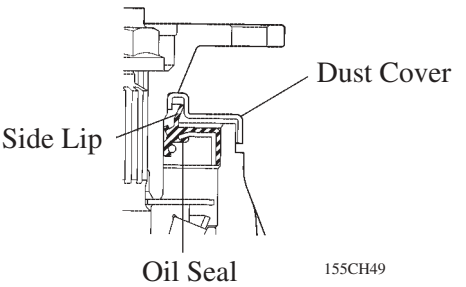
- A front differential that supports the independent front suspension has been adopted.
- The differential carrier has adopted a tube configuration to equalize the lengths of the right and left drive shafts.
- For the purpose of improving dust resistance, a type of oil seal with a side lip that contacts the dust cover has been adopted.



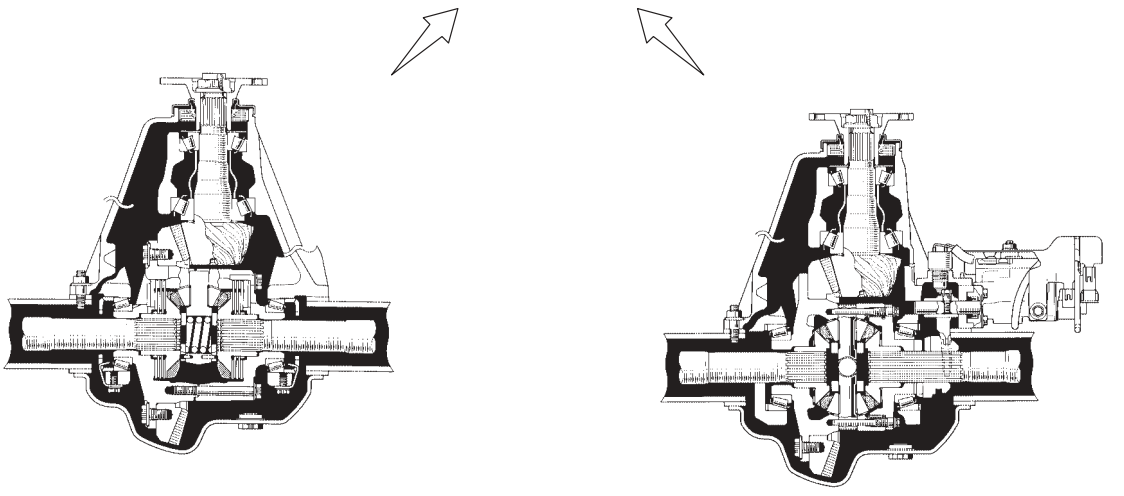

155CH13

## ■ REAR DIFFERENTIAL

- The tooth configuration of the gears has been optimized to reduce noise and vibration.
- Similar to the front differential, a type of oil seal with a side lip that contacts the dust cover has been adopted.




155CH49



155CH50

**With LSD**

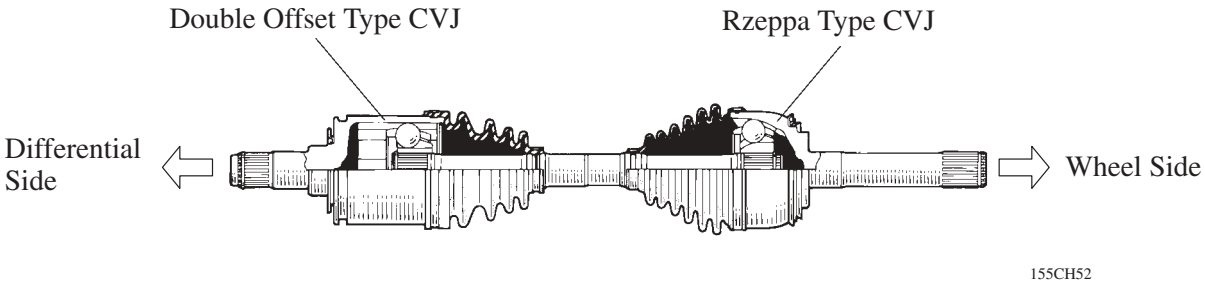
155CH51

**With Differential Lock Mechanism**

# FRONT DRIVE SHAFT

## ■ DESCRIPTION

In conjunction with the adoption of the independent front suspension, drive shafts which use the double offset type CVJ (Constant-Velocity Joint) on the differential side, and the Rzeppa type CVJ on the wheel side have been adopted.

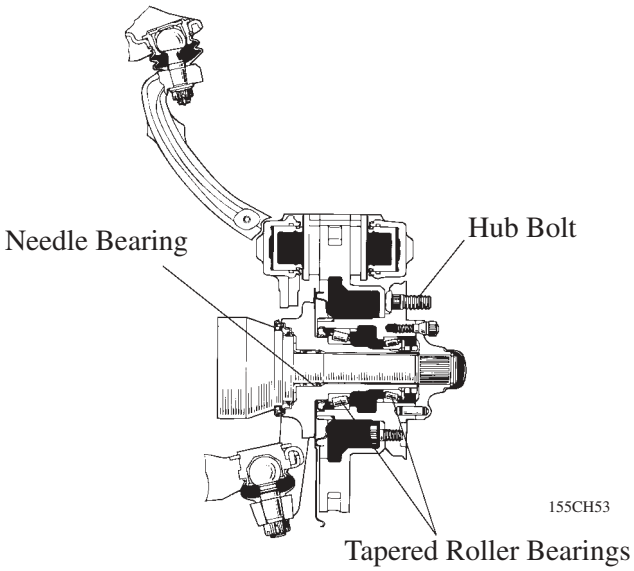



# AXLES

## ■ FRONT AXLE

- A full-floating type axle is used on all models.
- A needle bearing is used between the steering knuckle and the drive shaft on the independent front suspension model.
- A free wheel hub is available as an option on the part-time 4WD model.
- The hub bolt's size, quantity, and PCD (Pitch Circle Diameter) have been changed.






**Independent Front Suspension Model**

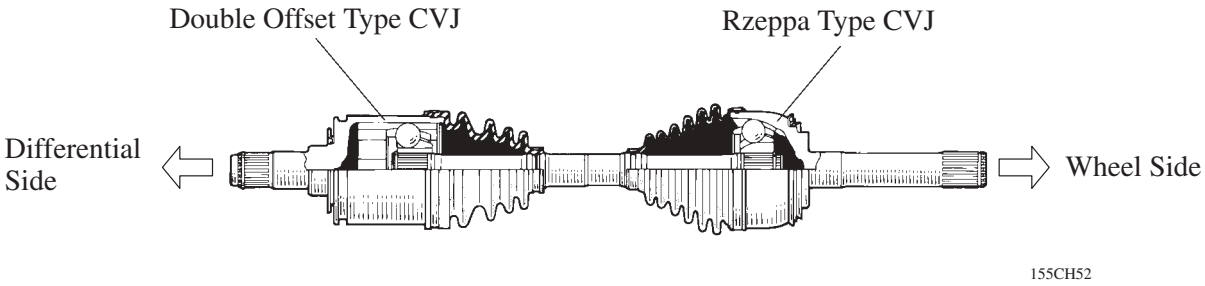
**▶ Specifications ◀**

| Model / Item | New | Previous |
|---|---|---|
| Hub Bolt Size | M14 x 1.5 | M12 x 1.5 |
| No. of the Hub Bolt | 5 | 6 |
| P.C.D. mm (in.) | 150 (5.9) | 139.7 (5.5) |
| Hub Nut Size (Width Across Flat) | 22 | 21 |

# FRONT DRIVE SHAFT

## ■ DESCRIPTION

In conjunction with the adoption of the independent front suspension, drive shafts which use the double offset type CVJ (Constant-Velocity Joint) on the differential side, and the Rzeppa type CVJ on the wheel side have been adopted.

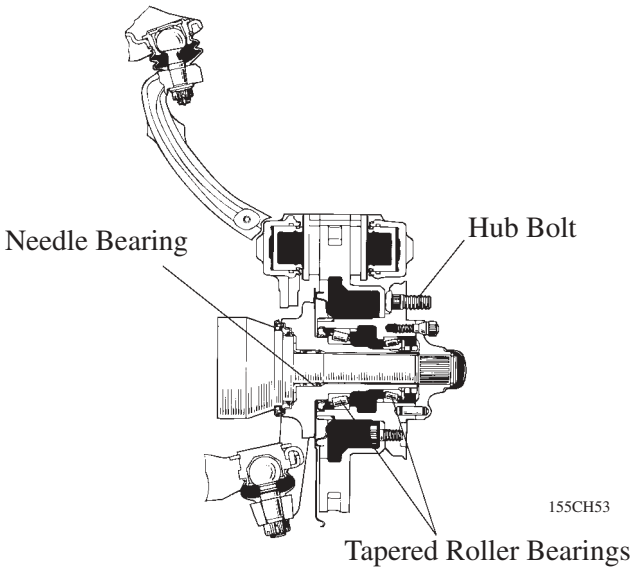



# AXLES

## ■ FRONT AXLE

- A full-floating type axle is used on all models.
- A needle bearing is used between the steering knuckle and the drive shaft on the independent front suspension model.
- A free wheel hub is available as an option on the part-time 4WD model.
- The hub bolt's size, quantity, and PCD (Pitch Circle Diameter) have been changed.





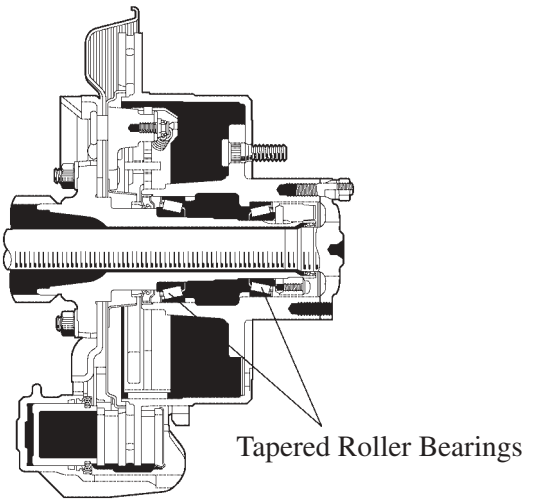

**Independent Front Suspension Model**

**▶ Specifications ◀**

| Model / Item | New | Previous |
|---|---|---|
| Hub Bolt Size | M14 x 1.5 | M12 x 1.5 |
| No. of the Hub Bolt | 5 | 6 |
| P.C.D. mm (in.) | 150 (5.9) | 139.7 (5.5) |
| Hub Nut Size (Width Across Flat) | 22 | 21 |

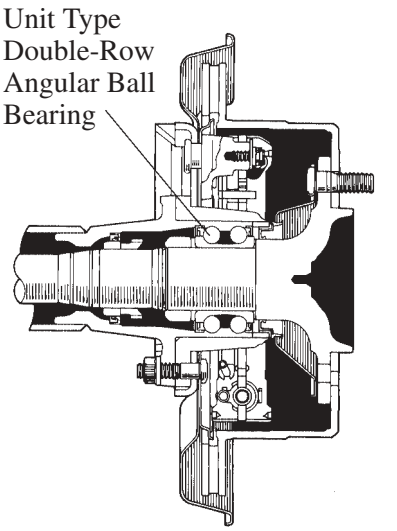
## ■ REAR AXLE

- The full-floating axle is used on the rigid axle front suspension model.
- The semi-floating axle is used on the independent front suspension model.
- The axle housing is provided with large reinforcements to realize excellent rigidity.



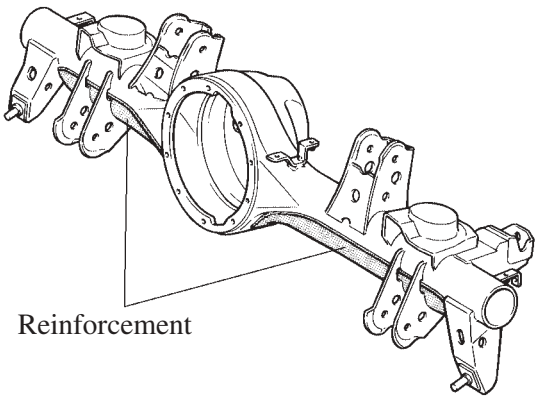

147CH19

**Rigid Front Suspension Model**




155CH54

**Independent Front Suspension Model**



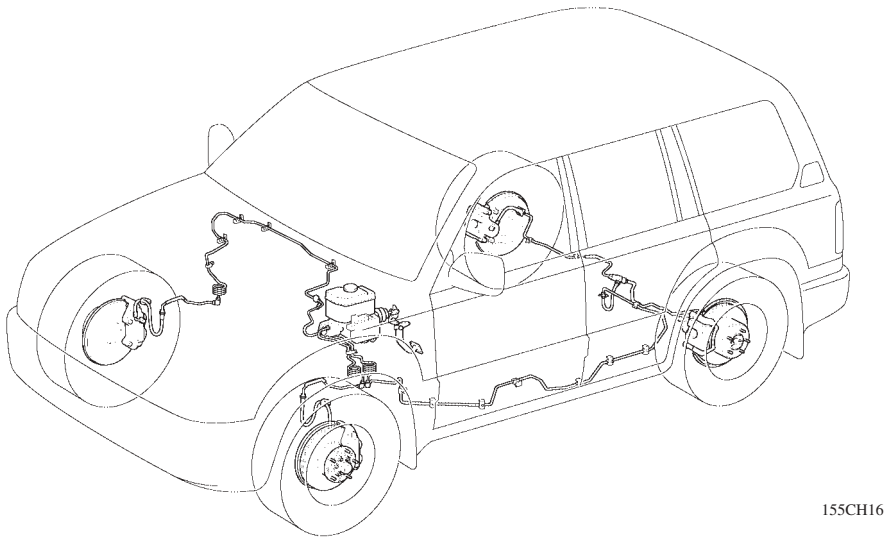

155CH55

# BRAKES

## ■ DESCRIPTION

The brakes of new model have following features.

- Four-piston opposed type calipers with reduced brake drag are used for the front brakes.
- As in the previous model, the leading trailing drum brakes are used on the rear drum brake model.
- The rear brakes of the rigid-axle front suspension model with rear disc brakes use FS14 type calipers and the rear brakes of the independent front suspension model with rear disc brakes use FSX14 type calipers.
- The shape of the parking brake lever has been changed.
- A double-link type variable lever ratio brake pedal has been adopted.
- A hydraulic brake booster in which the ABS actuator and P&B valve are integrated is standard equipment on the models for Europe and is optional equipment on other models except FZJ105R-GCMRKQ, FZJ105R-GCMRK, HZJ105R-GCMRSQ, and HZJ105R-GCMRS.




**LHD Model With Hydraulic Brake Booster**

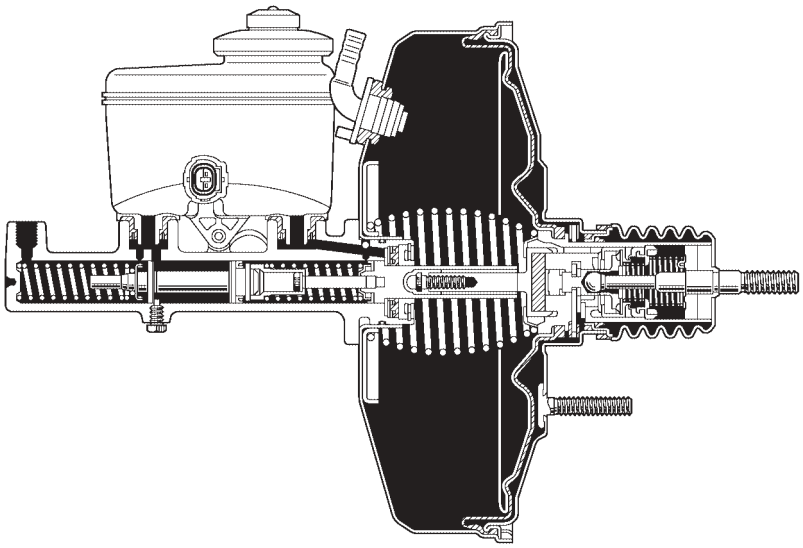
**▶ Specifications ◀**

| Front Suspension Type / ABS / Item | | Rigid Axle | | Independent | |
|---|---|---|---|---|---|
| | | Without | With | Without | With |
| Master Cylinder | Type | Tandem | Single (Double Piston) | Tandem | Single (Double Piston) |
| | Diameter mm (in.) | 20.64 (0.81) | 26.99 (1.06) | 20.64 (0.81) | 26.99 (1.06) |
| Brake Booster | Type | Vacuum Single | Hydraulic | Vacuum Single | Hydraulic |
| | Size in. | 9” | – | 9” | – |
| Front Brake | Type | Ventilated Disc | ← | ← | ← |
| | Caliper Type | S15 + 13 | S14 + 12 | S15 + 13 | S14 + 12<br>S15 + 13*1 |
| | Pad Area cm² (in.²) | 60 (9.30) | ← | ← | ← |
| | Wheel Cylinder Diameter mm (in.) | 51.1 x 2 + 45.4 x 2 (2.04 x 2+ 1.79 x 2) | 48.1 x 2 + 42.85 x 2 (1.89 x 2 + 1.69 x 2) | 51.1 x 2 + 45.4 x 2 (2.04 x 2 + 1.79 x 2) | 48.1 x 2 + 42.85 x 2 (1.89 x 2 + 1.69 x 2)<br>51.1 x 2 + 45.4 x 2*1 (2.04 x 2 + 1.79 x 2) |
| | Rotor Size (D x T)*2 mm (in.) | 322 x 32 (12.68 x 1.26) | ← | 313 x 32 (12.32 x 1.26) | ← |
| Rear Drum Brake | Type | Leading Trailing Drum | – | Leading Trailing Drum | – |
| | Lining Area cm² (in.²) | 178 (27.59) | – | 178 (27.59) | – |
| | Wheel Cyllinder Diameter mm (in.) | 25.4 (1.00) | – | 25.4 (1.00) | – |
| | Drum Inner Diameter mm (in.) | 295 (11.61) | – | 295 (11.61) | – |
| Rear Disc Brake | Type | Ventilated Disc*3, 4 | Ventilated Disc | Ventilated Disc*3 | Ventilated Disc |
| | Caliper Type | FS14*3, 4 | FS14 | FSX 14*3, 4 | FSX 14 |
| | Pad Area cm² (in.²) | 37 (5.74)*3, 4 | 37 (5.74) | 34 (5.27)*3 | 34 (5.27) |
| | Rotor Size (D x T)*2 mm (in.) | 335 x 18*3, 4 (13.19 x 0.71) | 335 x 18 (13.19 x 0.71) | 329.4 x 18*3 (12.97 x 0.71) | 329.4 x 18 (12.97 x 0.71) |
| Parking Brake | Type | Drum | ← | ← | ← |
| | Size mm (in.) | 295 (11.61)<br>230 (9.06)*5 | 230 (9.06) | 295 (11.61)<br>230 (9.06)*5 | 230 (9.06) |
| | Lever Type | Center Lever | ← | ← | ← |
| Brake Control Valve Type | | LSP & BV | P & B Valve*6 | LSP & BV | P & B Valve*6 |

*1: Models for Europe
*2: D: Outer Diameter, T: Thickness
*3: Option
*4: Standard for GX Gread Model for Australia
*5: Models with Rear Disc Brake
*6: Enclosed in Hydraulic Brake Booster

## ■ MASTER CYLINDER AND BRAKE BOOSTER

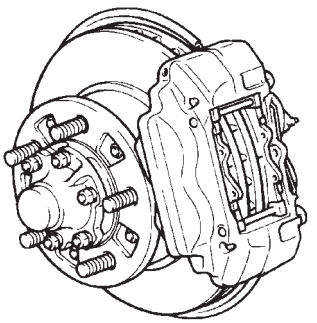
A small-diameter and long-stroke type master cylinder has been adopted on the models without ABS.
This has been combined with a bouble-link type variable lever ratio brake pedal to realize excellent brake feeling.
Its construction is the same Lockheed type tandem master cylinder used in the previous model.
To prevent the increase in the total length due to the adoption of the long-stroke master cylinder as much as possible, the brake booster has been constructed so that the master cylinder is partially enclosed in the booster.



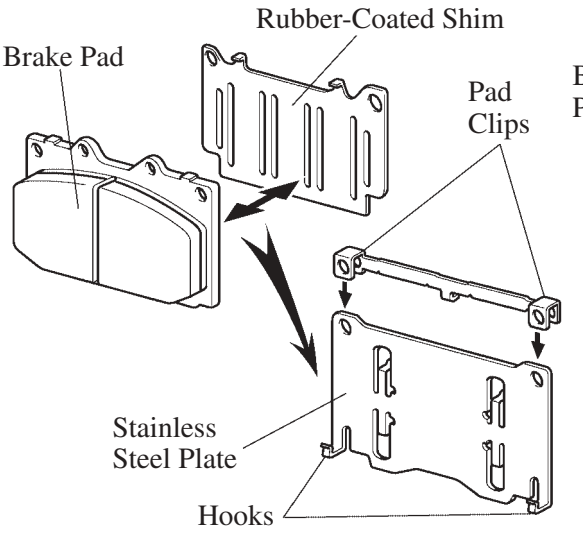
147CH18

## ■ FRONT BRAKE

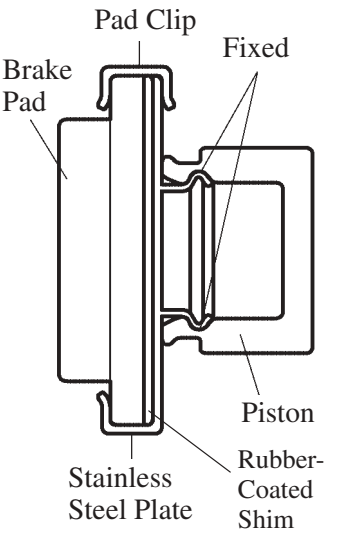
The brake caliper with low brake drag is used on the new model. This caliper uses a stainless steel plate that is secured onto the piston. The plate has hooks that insert into the brake pad, and pad clips are used to secure the brake pad together with the rubber-coated shim onto the stainless steel plate.
When the brake is released, and as the piston retracts, this construction allows the brake pad to separate from the disc rotor, thus reducing the brake drag.
Furthermore, the size of the piston seal groove has been revised to increase the amount of piston retraction.



155CH56



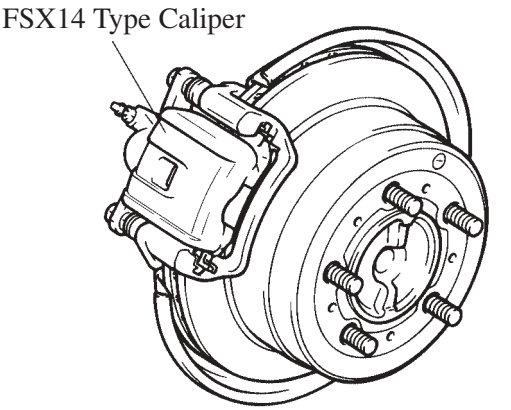

155CH11




155CH12

## ■ REAR BRAKE

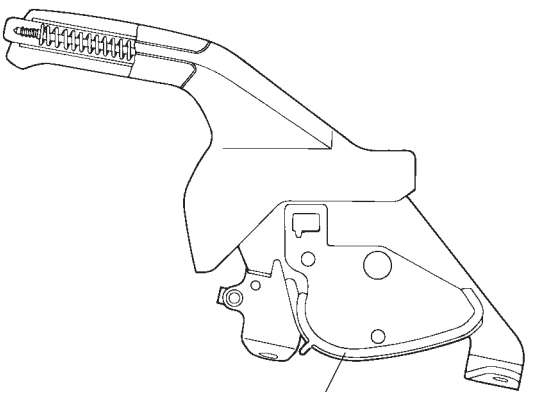
The FSX14 type brake caliper is used on the independent front suspension model with rear disc brake.




155CH57

## ■ PARKING BRAKE

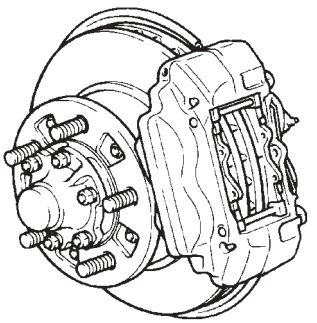
The shape of the parking brake lever's cable retractor has been changed to reduce the amount of the lever travel and to improve the operating feeling.



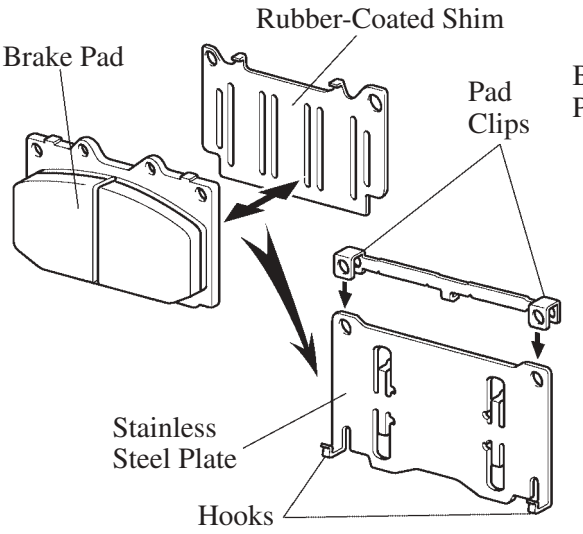

155CH58

## ■ FRONT BRAKE

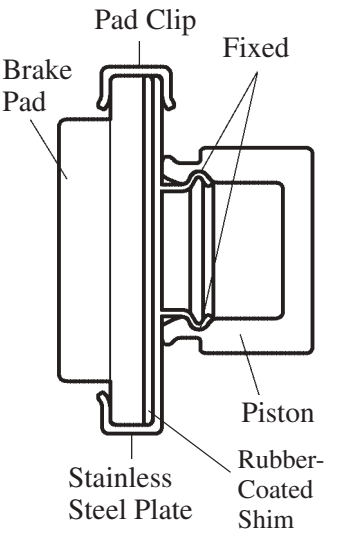
The brake caliper with low brake drag is used on the new model. This caliper uses a stainless steel plate that is secured onto the piston. The plate has hooks that insert into the brake pad, and pad clips are used to secure the brake pad together with the rubber-coated shim onto the stainless steel plate.
When the brake is released, and as the piston retracts, this construction allows the brake pad to separate from the disc rotor, thus reducing the brake drag.
Furthermore, the size of the piston seal groove has been revised to increase the amount of piston retraction.



155CH56



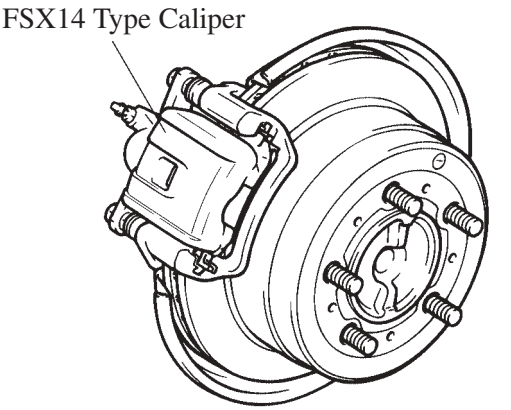

155CH11




155CH12

## ■ REAR BRAKE

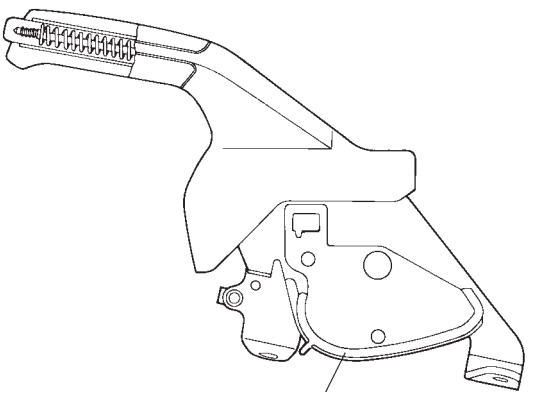
The FSX14 type brake caliper is used on the independent front suspension model with rear disc brake.




155CH57

## ■ PARKING BRAKE

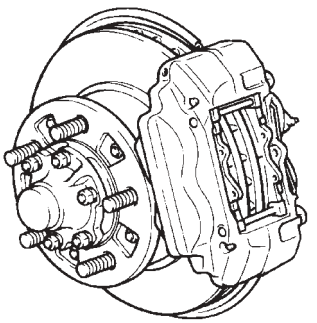
The shape of the parking brake lever's cable retractor has been changed to reduce the amount of the lever travel and to improve the operating feeling.



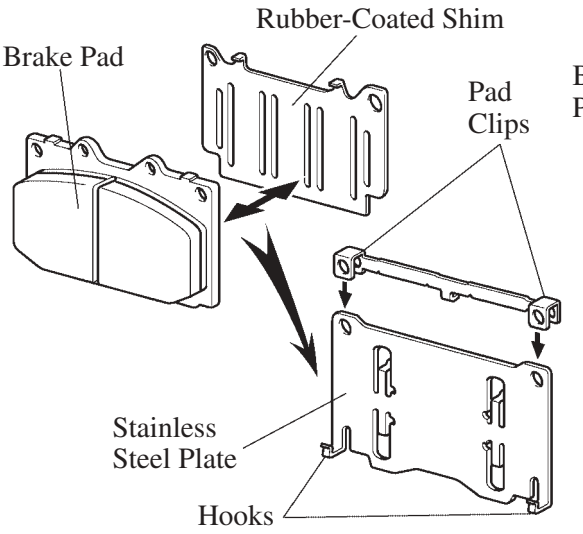

155CH58

## ■ FRONT BRAKE

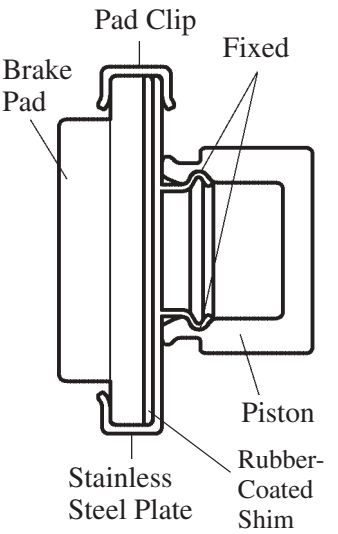
The brake caliper with low brake drag is used on the new model. This caliper uses a stainless steel plate that is secured onto the piston. The plate has hooks that insert into the brake pad, and pad clips are used to secure the brake pad together with the rubber-coated shim onto the stainless steel plate.
When the brake is released, and as the piston retracts, this construction allows the brake pad to separate from the disc rotor, thus reducing the brake drag.
Furthermore, the size of the piston seal groove has been revised to increase the amount of piston retraction.



155CH56



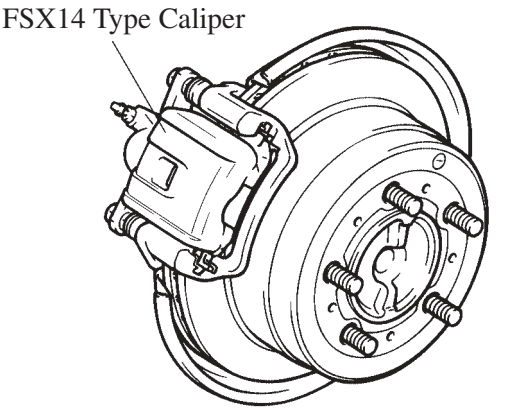

155CH11




155CH12

## ■ REAR BRAKE

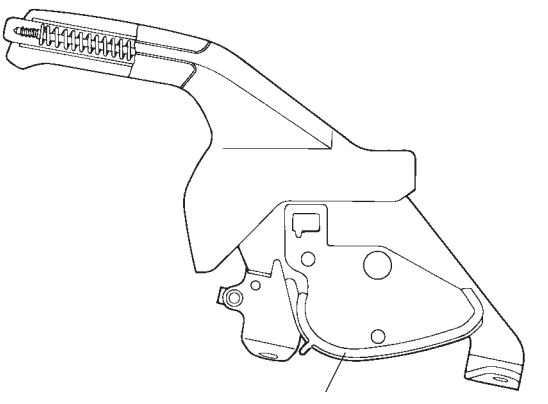
The FSX14 type brake caliper is used on the independent front suspension model with rear disc brake.




155CH57

## ■ PARKING BRAKE

The shape of the parking brake lever's cable retractor has been changed to reduce the amount of the lever travel and to improve the operating feeling.

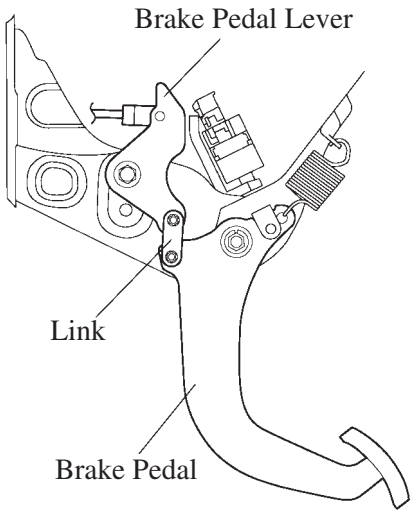



155CH58

## ■ BRAKE PEDAL

### 1. General

A double-link type variable lever ratio brake pedal has been adopted to provide an excellent brake feeling.




155CH59

### 2. Construction

The bouble-link type variable lever ratio brake pedal has adopted a construction in which the brake pedal and brake pedal lever are joined by a link to vary the lever ratio.

### 3. Operation



#### Small Pedal Stroke

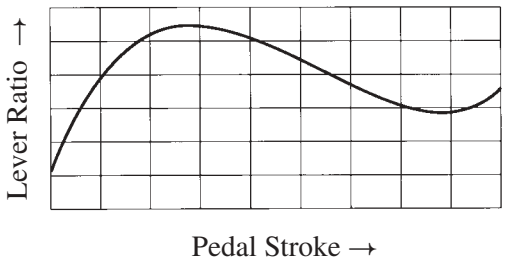
When the pedal stroke is small, the lever ratio is set small, assuming a normal gradual brake application. Thus, the brake fluid is delivered quickly into the calipers to effect smooth braking.

#### Medium Pedal Stroke

When the pedal stroke is medium, the lever ratio is set large, assuming a full brake application such as sudden braking. Thus, the brake pedal effort is minimized.

#### Large Pedal Stroke

When the pedal stroke is large, the lever ratio is set small in order to provide an appropriate amount of pedal rigidity. Thus, proper pedal response is realized.



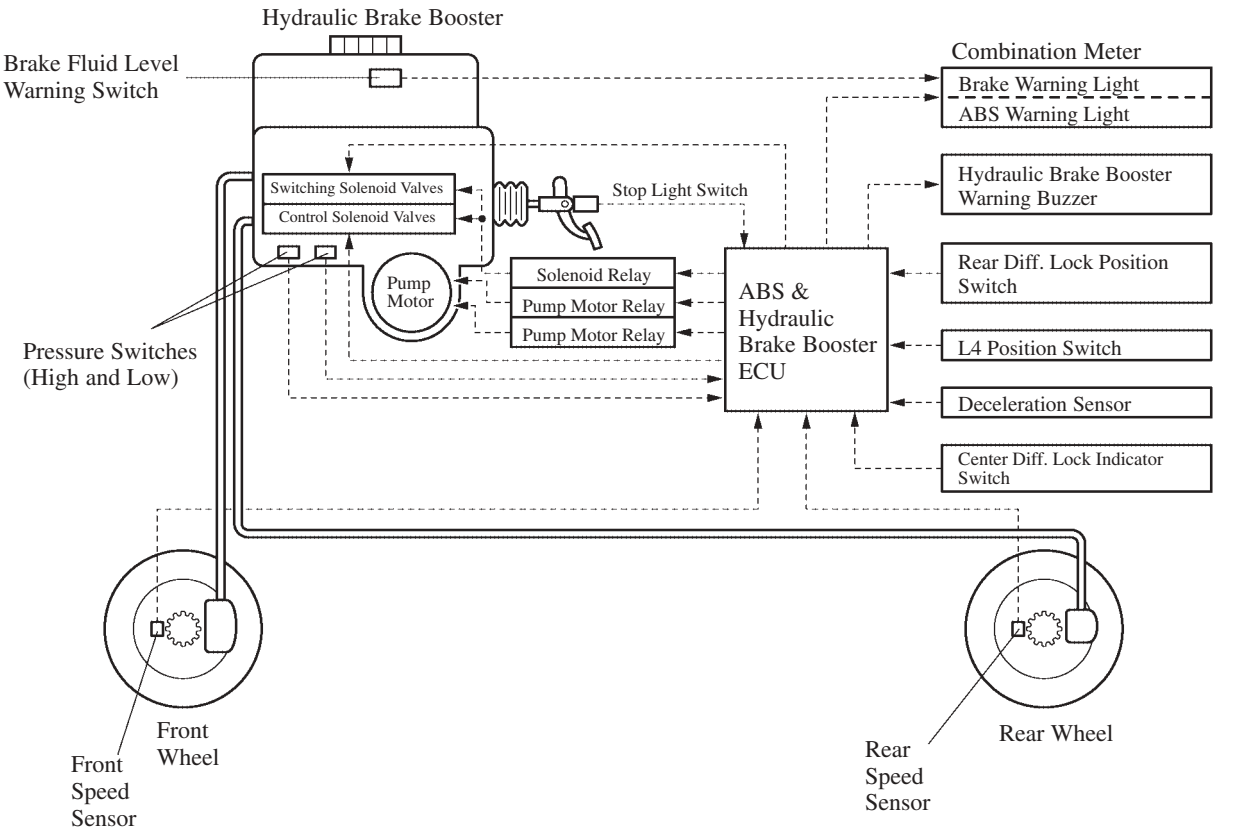

155CH60

## ■ ABS

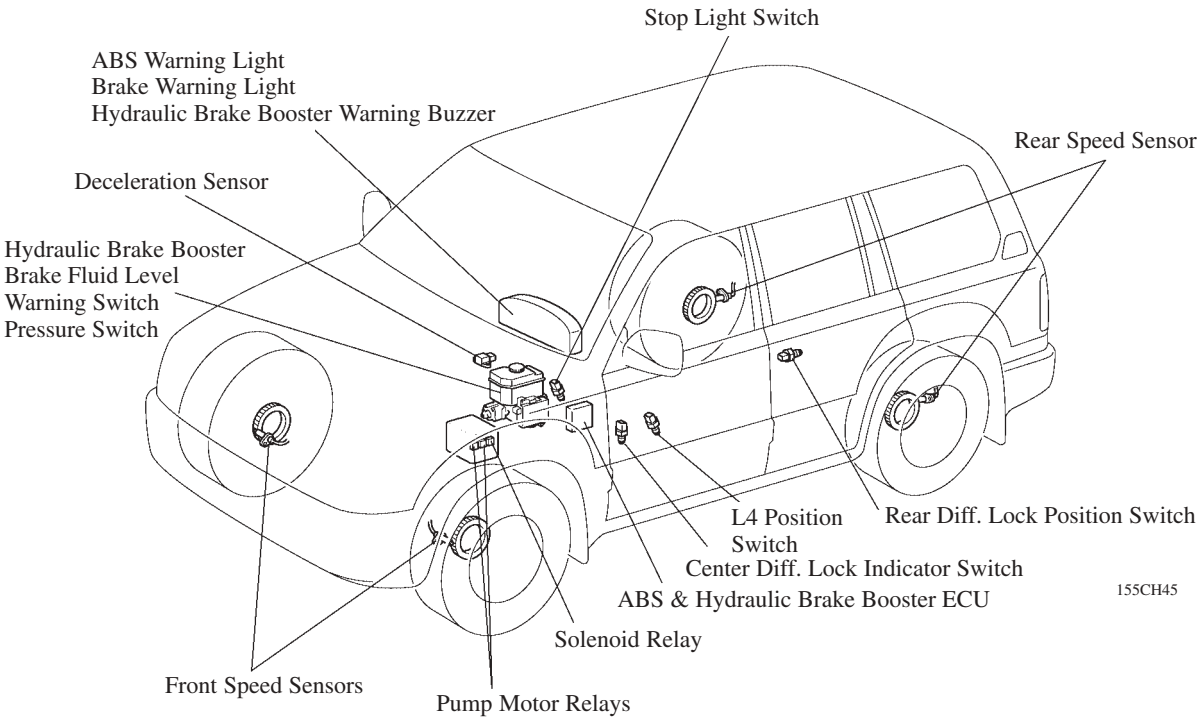
### 1. General

- The ABS actuator and the hydraulic brake booster have been integrated to form a compact actuator.
- The hydraulic brake booster uses the brake fluid that has been stored under high pressure to provide a power assist to the pedal effort that is applied to the brake pedal. Furthermore, the brake fluid that has been stored under high pressure is also used as the hydraulic pressure for controlling the ABS.
- The M-OBD (Multiplex On-Board Diagnostic) system is supported.

### 2. System Diagram



## 3. Layout of Components





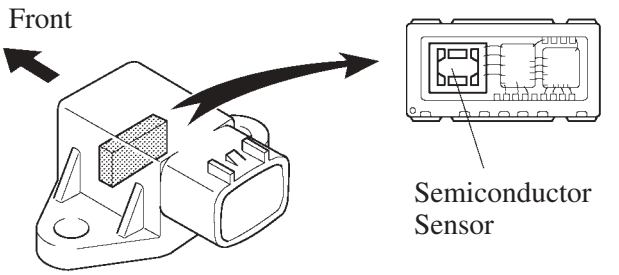

## 4. Function of Components

| Components | Function |
|---|---|
| Speed Sensors | Detect the wheel speed of each of four wheels. |
| Deceleration Sensor | Detects the vehicle's acceleration in the longitudinal direction. |
| ABS & Hydraulic Brake Booster ECU | Controls the operation of the ABS brake and the hydraulic brake booster based on the signals received from the speed sensors, the deceleration sensor, the pressure switches, etc. |
| Brake Fluid Level Warning Switch | Detects the brake fluid level. |
| Hydraulic Brake Booster | ● Assists with the pedal effort applied to the brake pedal.<br>● Changes the fluid path based on the signals from the ABS & hydraulic brake booster ECU during the operation of the ABS, in order to control the fluid pressure that is applied to the wheel cylinders. |
| Pump Motor Relays | Control the pump motor operation in the hydraulic brake booster. |
| Solenoid Relay | Supply power to the solenoid valves in the hydraulic brake booster. |
| ABS Warning Light | Lights up to alert the driver when the ECU detects the malfunction in the ABS. |
| Brake Warning Light | Lights up to alert the driver when the ECU detects the malfunction in the brake system. |
| Hydraulic Brake Booster Warning Buzzer | Emits a continuous sound to inform the driver that the ECU detects a malfunction in the hydraulic brake booster. |
| Stop Light Switch | Detects the brake signal. |
| Rear Diff. Lock Position Switch | Detects the condition of the rear differential lock. |
| L4 Position Switch | Detects the transfer shifted in the low. |
| Center Diff. Lock Indicator Switch | Detects the condition of the center differential lock. |
| Pressure Switches | Monitors the hydraulic pressure of the accumulator and outputs control signals for the pump motor.<br>There are two types: the pressure switch PH for controlling the pump, and the pressure switch PL for giving a warning when the pressure is low. |

## 5. Construction and Operation of Main Components

### Deceleration Sensor

A deceleration sensor that uses a semiconductor sensor is provided inside the center console.
When a force is applied to the deceleration sensor, the semiconductor sensor flexes, and this distortion is measured and converted into an electric signal.
This semiconductor sensor is used to detect the acceleration and deceleration rate in the vehicle's longitudinal direction.



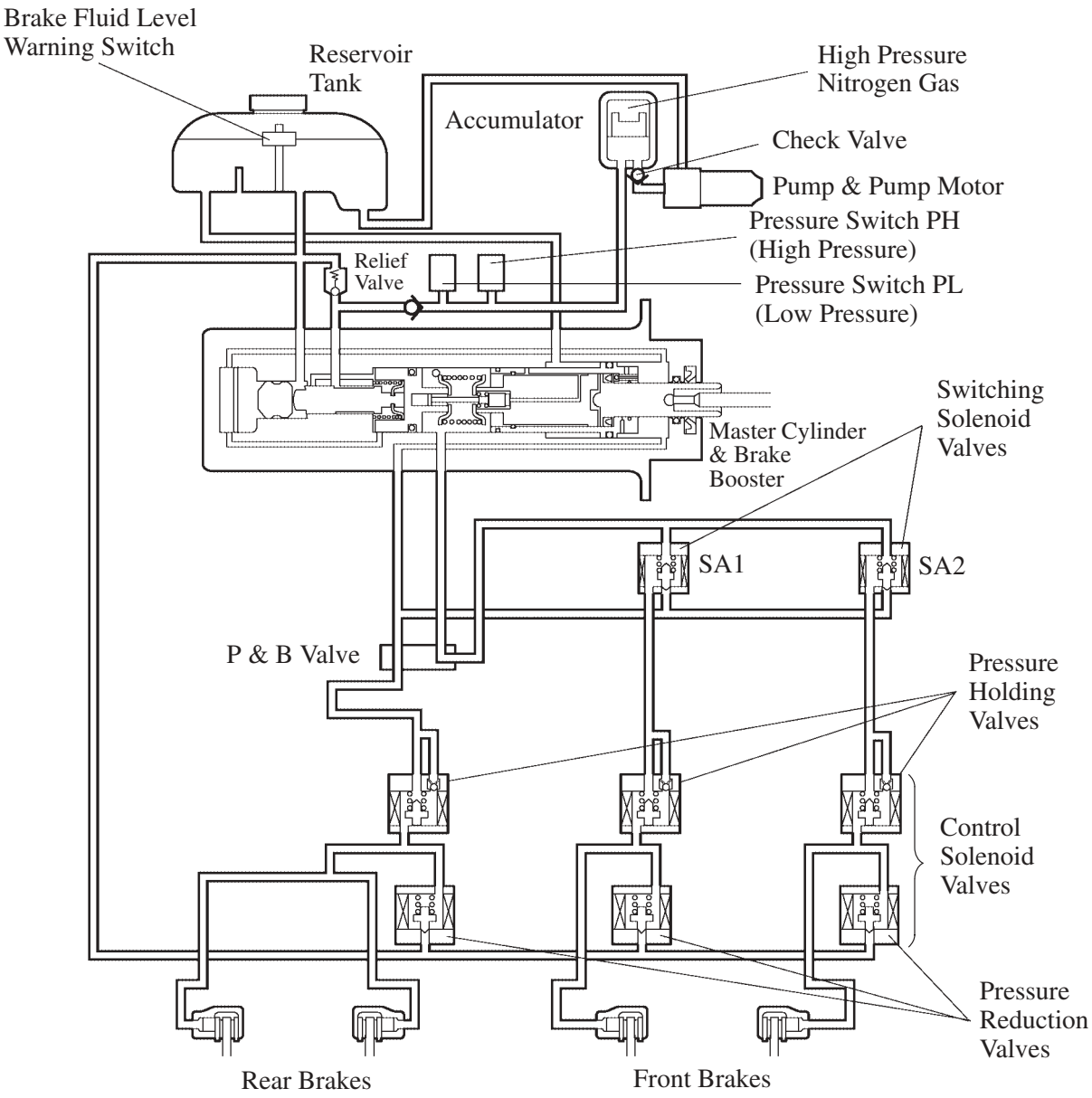

155CH34

### Hydraulic Brake Booster

The hydraulic brake booster consists of the following components:

| Components | Function |
|---|---|
| Pump and Pump Motor | Draws up the brake fluid from the reservoir tank and provides high hydraulic pressure to the accumulator. |
| Accumulator | Stores the hydraulic pressure that was generated by the pump. The accumulator is filled with high-pressure nitrogen gas. |
| Pressure Switches | Monitors the hydraulic pressure of the accumulator and outputs control signals for the pump motor.<br>There are two types: the pressure switch PH for controlling the pump, and the pressure switch PL for giving a warning when the pressure is low. |
| Relief Valve | Returns the brake fluid to the reservoir tank to prevent excessive pressure if the pump operates continuously due to a malfunction of the pressure switch, for example. |
| Reservoir Tank | Stores the brake fluid. |
| Brake Fluid Level Warning Switch | Detects the low brake fluid level. |
| Master Cylinder | Generates the hydraulic pressure that is provided to the wheel cylinders during normal braking. |
| Brake Booster | Regulates the accumulator pressure in accordance with the pedal effort that is applied to the brake pedal and introduces this pressure to the booster chamber in order to provide a power assist to the brakes. |
| P & B Valve | Controls the hydraulic pressure of the rear brake system to achieve an appropriate distribution of front/rear braking force. However, if the front brake system fails, the P & B valve does not control the hydraulic pressure of the rear brake system. |
| Switching Solenoid Valves (SA1, SA2) | Switches the brake hydraulic path when the ABS is activated, or normal braking is applied. |
| Control Solenoid Valves<br>(Pressure Holding Valves<br>Pressure Reduction Valves) | Controls the hydraulic pressure that is applied to the wheel cylinders during ABS control. |

**▶ Hydraulic Circuit ◀**




155CH61

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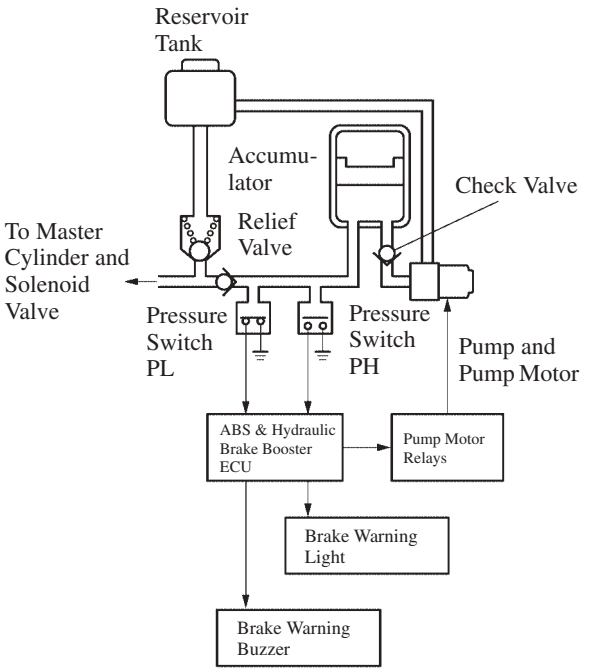
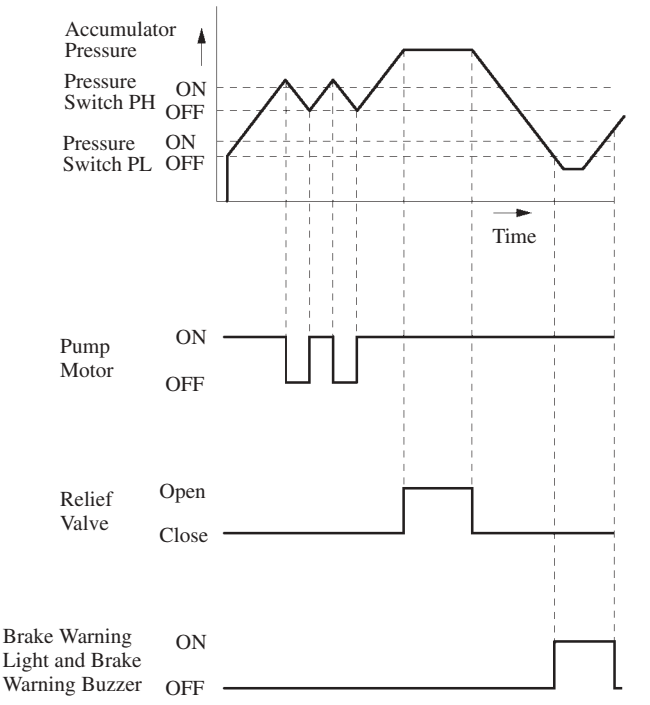
### 1) Pump, Pump Motor, Accumulator, Pressure Switches and Relief Valve

If the accumulator pressure becomes lower than the pressure that is specified in the pressure switch PH, which is used for detecting high pressure, the pressure switch PH turns OFF. Then, the ABS & hydraulic brake booster ECU turns ON the pump motor relays to operate the pump motor and the pump.
The brake fluid that is discharged by the pump passes through the check valve and is stored in the accumulator. The hydraulic pressure that is stored in the accumulator is used for providing the hydraulic pressure that is needed for normal braking and for operating the ABS.
If the accumulator pressure becomes higher than the pressure that is specified in the pressure switch PH, the pressure switch PH turns ON. Then, after several seconds, the ABS & hydraulic brake booster ECU turns OFF the pump.
At this time, if the pressure switch PH malfunctions and causes the pump to operate continuously, the relief valve opens to prevent excessive pressure from being generated.
Moreover, if the accumulator pressure becomes lower than the pressure that is specified in the pressure switch PL, which is used for detecting low pressure, the pressure switch PL turns OFF. As a result, the brake warning light turns ON and the brake warning buzzer activates.
As this time, the ABS is prohibited from operating.




155CH96



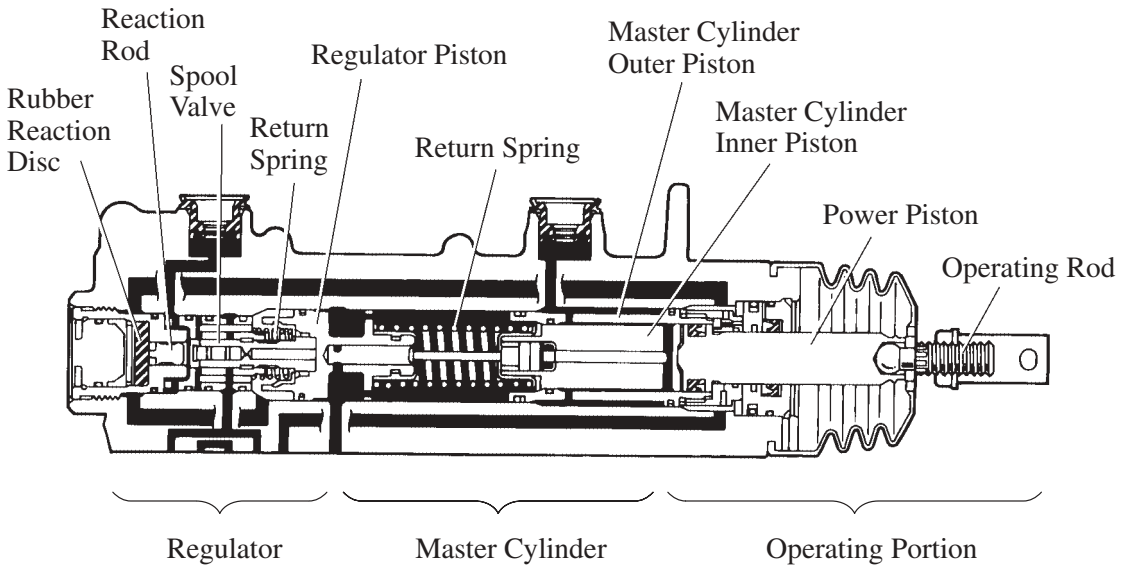

155CH97

### 2) Master Cylinder and Brake Booster

#### a. Construction

- This construction enables the hydraulic pressure that is generated by the brake booster to be applied directly to the rear brakes.
- The master cylinder is the center port type single master cylinder, which is used for the front brakes only.
- The brake booster is integrated with the master cylinder. The operating portion, master cylinder, and regulator are positioned coaxially to achieve a simple and compact construction.
- The master cylinder and brake booster consists of an operating rod, a power piston, master cylinder pistons, a regulator piston, a spool valve, a reaction rod and a rubber reaction disc.
- The operating rod and the power piston are linked directly to transmit the pedal effort that is applied to the brake pedal.
- The regulator piston and the spool valve are linked directly. A forward (leftward) force generated by the master cylinder pressure and a rearward (rightward) force generated by the power assist of the booster are applied to the regulator piston. Both forces maintain a balance.
- The regulator piston's return spring is provided for the regulator piston to ensure the return of the spool valve.
- The master cylinder pistons have adopted a dual construction consisting of outer and inner pistons. Ordinarily, the outer and inner pistons operate in unison. If the accumulator pressure is not applied, only the inner piston operates to ensure braking force.



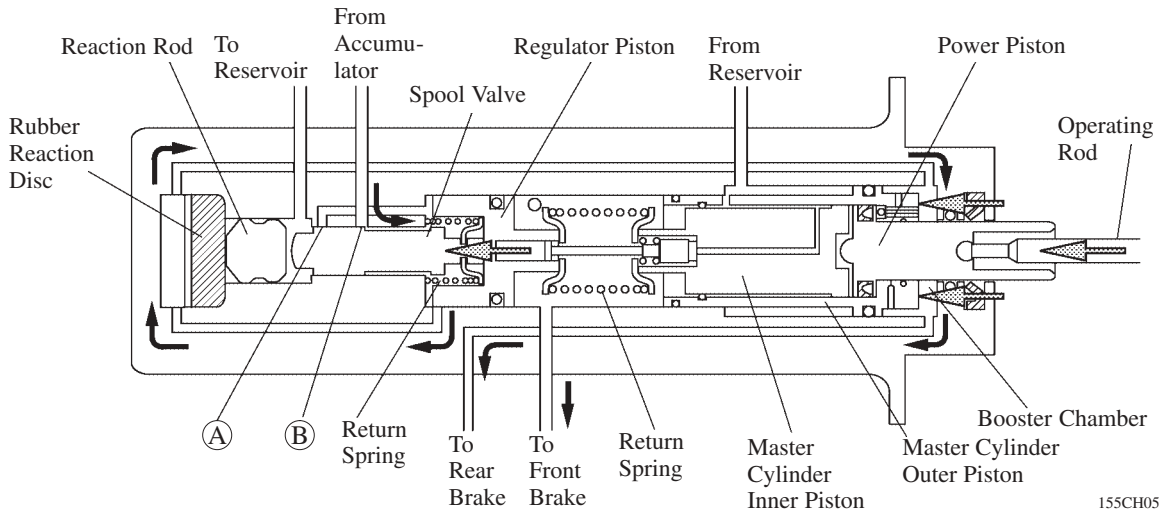



155CH62

### b. Operation

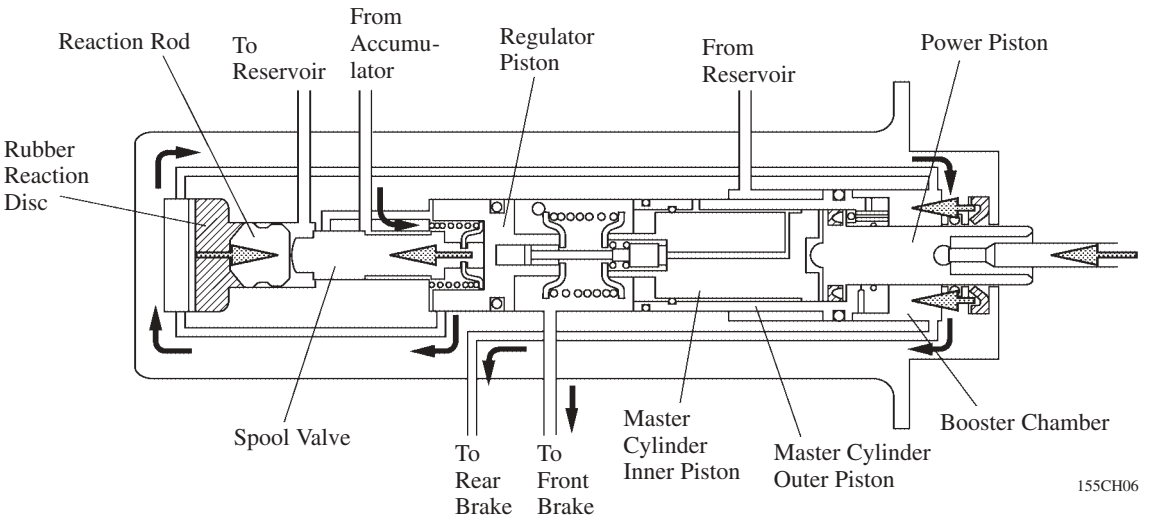
#### i) Pressure Increase (Low Pressure)

The pedal effort that is applied to the brake pedal is transmitted via the operating rod, power piston, and master cylinder inner piston. However, because the load setting of the master cylinder's return spring is higher than that of the regulator piston's return spring, the regulator piston gets pushed before the volume in the master cylinder becomes compressed. As a result, the spool valve moves forward. The spool valve closes the path Ⓐ between the reservoir and the booster chamber (behind the power piston) and opens the path Ⓑ between the accumulator and the booster chamber. Then, the pressurized brake fluid is introduced into the booster chamber to provide a power assist to the pedal effort.
When the pressure is introduced into the booster chamber, the power assist overcomes the force of the master cylinder's return spring. This causes the volume in the master cylinder to become compressed and increases the pressure that is applied to the front brakes. At the same time, the pressure in the booster chamber increases the pressure that is applied to the rear brakes.
During the initial stage of the brake operation, the booster pressure that is applied to the rubber reaction disc is small. Therefore, a return force in the rightward direction does not apply to the spool valve via the reaction rod.




#### ii) Pressure Increase (High Pressure)

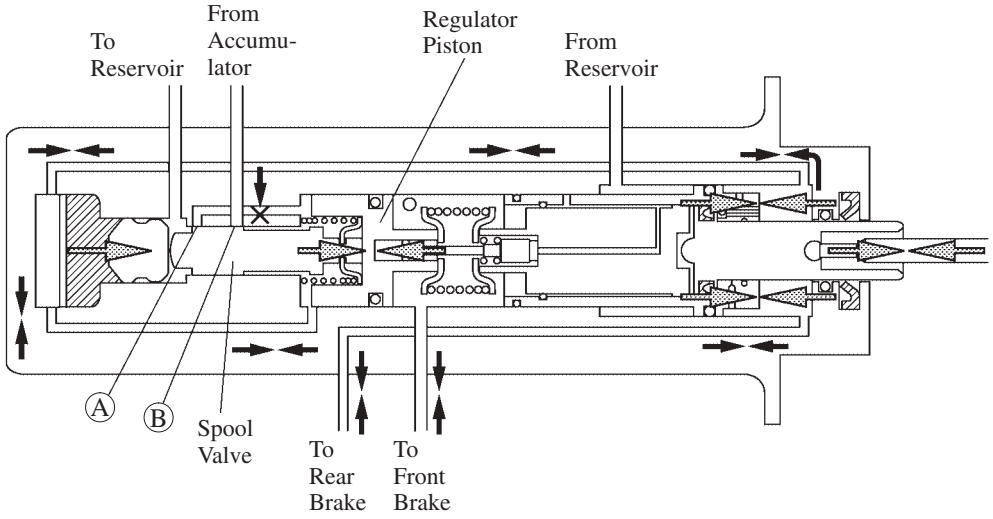
In contrast to the time when the pressure is low, when the pressure is high, the booster pressure that is applied to the rubber reaction disc increases. Accordingly, the rubber reaction disc deforms and causes a return force in the rightward direction to be applied to the spool valve via the reaction rod. Therefore, in contrast to the time when the pressure is low, a greater reaction force is transmitted to the brake pedal.
As a result, a variable servo mechanism is realized, in which the servo ratio is lower during high pressure than during low pressure.



### iii) Holding

This is a state in which the force that is applied via the brake pedal and the master cylinder pressure are in balance.

The forces that are applied to the front and the rear of the regulator piston, in other words, forces that are generated by the master cylinder pressure and the regulator pressure become balanced. This causes the spool valve to close both path Ⓑ from the booster chamber to the accumulator and path Ⓐ to the reservoir. As a result, the brake system is in the holding state.

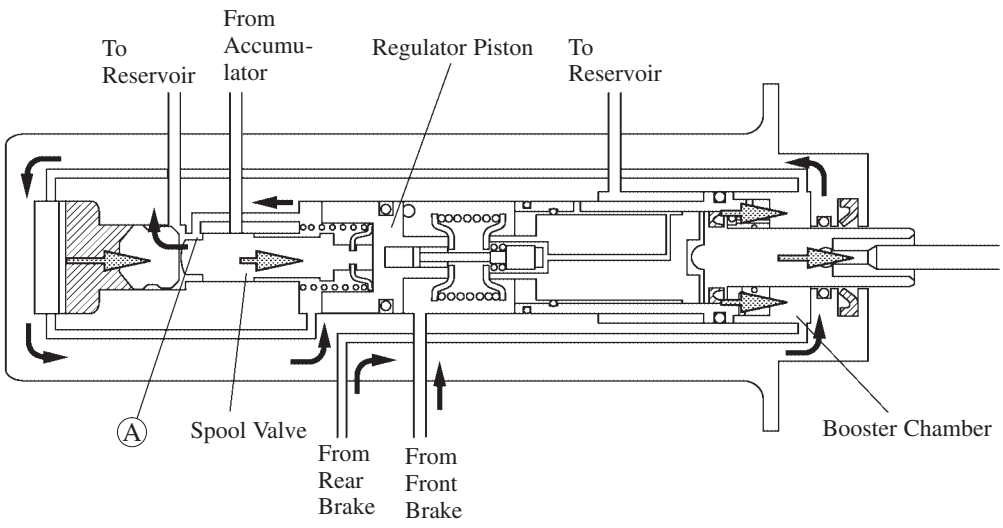



155CH07

### iv) Pressure Reduce

When the pressure that is applied to the brake pedal is relaxed, the master cylinder pressure decreases. Then, the regulator piston's return (rightward) force becomes relatively greater, causing the regulator piston to retract and the spool valve to also retract. As a result, the path Ⓐ between the reservoir and the booster chamber opens.

The booster pressure becomes reduced in this state, creating a balance that corresponds to the force that is newly applied via the brake pedal. This process is performed repetitively to reduce the booster pressure and the master cylinder pressure in accordance with the force that is applied via the brake pedal.




155CH08

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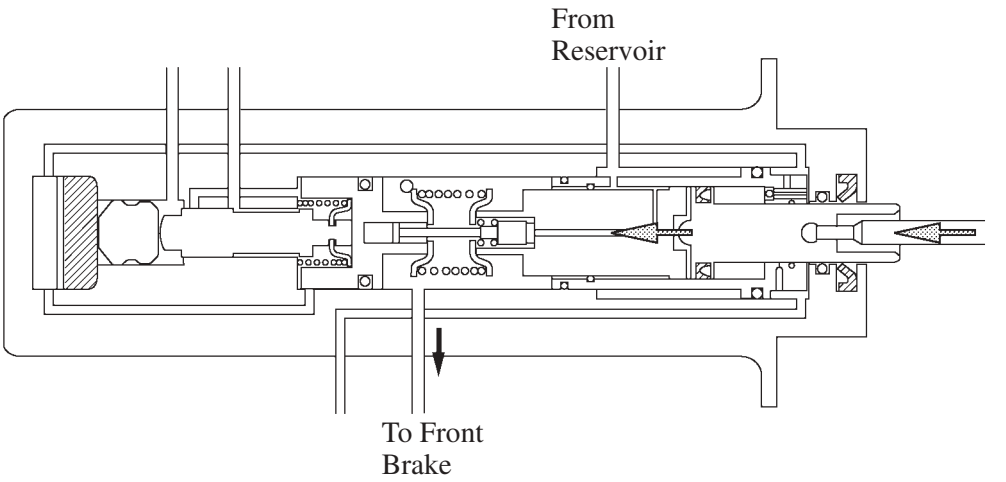
**v) During Power Supply Malfunction**

If the accumulator pressure is affected due to some type of malfunction, no pressure will be supplied by the regulator. Then, a power assist cannot be provided to the force that is applied via the brake pedal and the pressure to the rear brakes cannot be increased.
Because the power assist is not applied to the master cylinder outer piston, the master cylinder outer piston does not operate and remains in its initial position.
The pressure to the front brakes will be increased by the master cylinder inner piston in accordance with the pedal effort applied to the brake pedal.




**3) Solenoid Valves**

**a. Switching Solenoid Valves**

Two switching solenoid valves (SA1 and SA2) are provided.
The control signals from the ABS & hydraulic brake booster ECU open and close the switching solenoid valves to switch the brake fluid paths.
The solenoid valves SA1 and SA2 switch during normal braking of the front brakes and during the activation of the ABS. During normal braking, the path to the master cylinder side is opened, and the path to the booster chamber side is opened during the activation of the ABS.

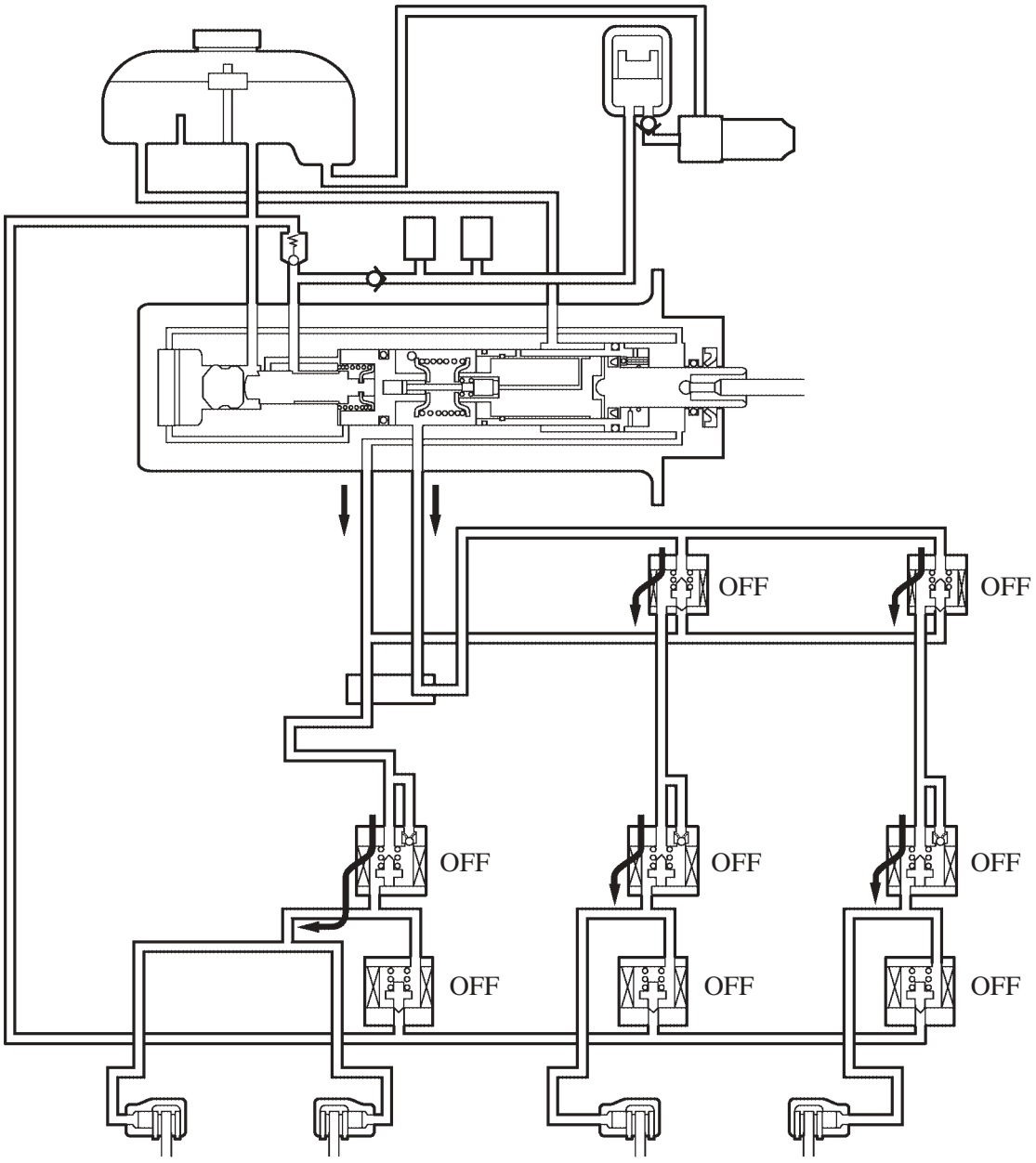
**b. Control Solenoid Valves**

The control solenoid valve consists of 3 pressure holding valves and 3 pressure reduction valves.
Each of the brake circuits consists of a pressure holding valve and a pressure reduction valve. The valves are turned ON and OFF during the activation of the ABS. The pressure increase mode, the pressure holding mode, and the pressure reduction mode are effected based on the combination of these valves that are turned ON and OFF, in order to control the hydraulic pressure that is applied to each of the wheel cylinders.

### c. System Operation

#### i) Normal Braking

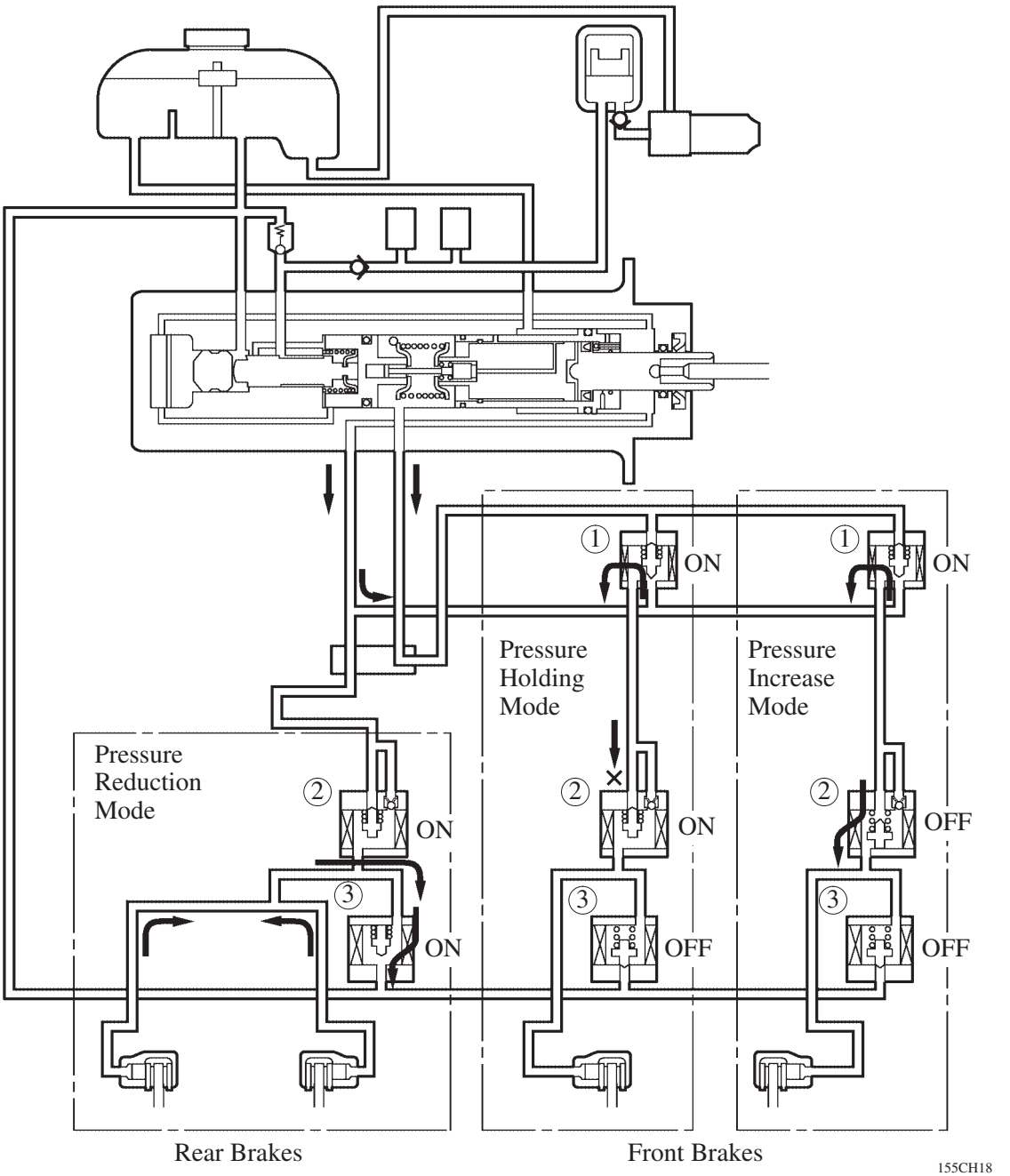
During normal braking, all solenoid valves are turned OFF.




155CH17

### ii) ABS Operation

The solenoid valves are turned ON and OFF as described below to switch the fluid paths in order to control the brakes.
At this time, the hydraulic path between the master cylinder and the front brakes is shut off to prevent the brake pedal from vibrating and to improve the feeling during brake application.



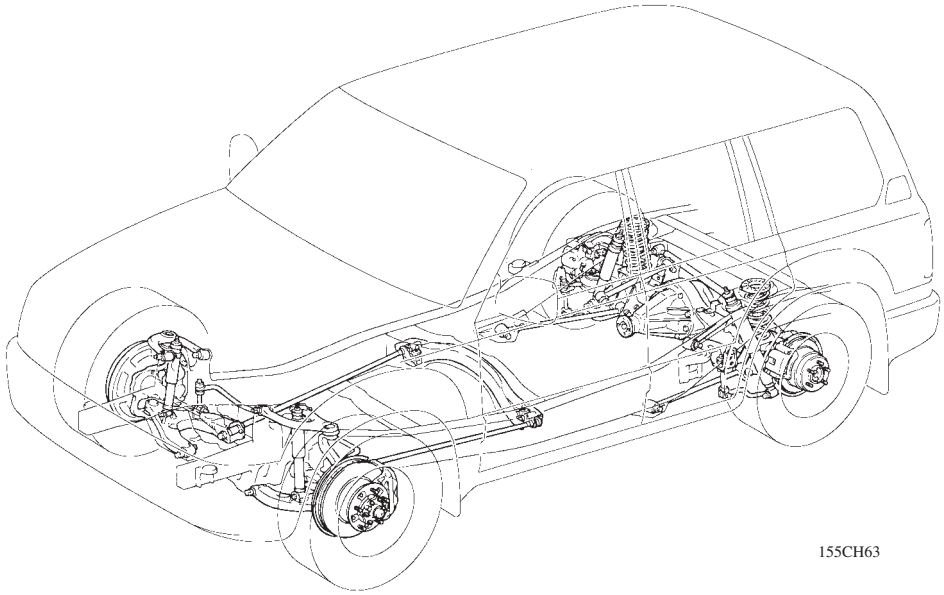

155CH18

| Mode / Solenoid Valves | | Pressure Reduction Mode | Pressure Holding Mode | Pressure Increase Mode |
|---|---|---|---|---|
| Front Brake | ① Solenoid Valve SA1, SA2 | ON | ON | ON |
| | ② Pressure Holding Valve | ON | ON | OFF |
| | ③ Pressure Reduction Valve | ON | OFF | OFF |
| | Wheel Cylinder Pressure | Reduction | Hold | Increase |
| Rear Brake | ② Pressure Holding Valve | ON | ON | OFF |
| | ③ Pressure Reduction Valve | ON | OFF | OFF |
| | Wheel Cylinder Pressure | Reduction | Hold | Increase |

# SUSPENSION

## ■ DESCRIPTION

As in the previous model, the leading arm coil spring rigid axle suspension with lateral rod is used for the front suspension.
A lower torsion bar spring type double-wishbone independent suspension has been newly adopted for the front suspension.
The rear suspension uses a 4-link coil spring with lateral rod type suspension for all models as in the previous model.
An active height control suspension and skyhook TEMS (Toyota Electronic Modulated Suspension) is optional equipment for the independent front suspension model except swing type back door model for General Countries.




**Independent Front Suspension Model**

**▶ Specifications ◀**

| Front Suspension Type / Item | | | Rigid Axle | Independent | Independent*1 |
|---|---|---|---|---|---|
| Tread | Front | mm (in.) | 1605 (63.2) | 1620 (63.8)*2<br>1640 (64.6) | ← |
| | Rear | mm (in.) | 1600 (63.0) | 1615 (63.6)*2<br>1635 (64.4) | ← |
| Front Wheel Alignment*3 | Caster | degrees | 1°40'*4, 2°30'*5<br>2°10'*6 | 2°10'*7, 2°50'*5<br>2°15'*9, 2°25'*10 | 3°05' |
| | Camber | degrees | 1°00' | 0°05' | 0°00' |
| | Toe-In | mm (in.) | 2 (0.08) | 1 (0.04) | 0 |
| | King Pin Inclination | degrees | 13°00' | 12°10' | 12°15' |

*1: Models with Active Height Control Suspension and Skyhook TEMS
*2: With 275/70 R 16 Tire
*3: Unloaded Vehicle Condition
*4: Models for Australia
*5: Models for G.C.C. Countries
*6: Models for General Countries
*7: Models for Europe and Australia, and 2UZ-FE Engine Model for General Countries
*8: 1FZ-FE Engine Model for G.C.C. Countries
*9: 2UZ-FE Engine Model for G.C.C. Countries
*10: 1HD-T Engine Model for General Countries

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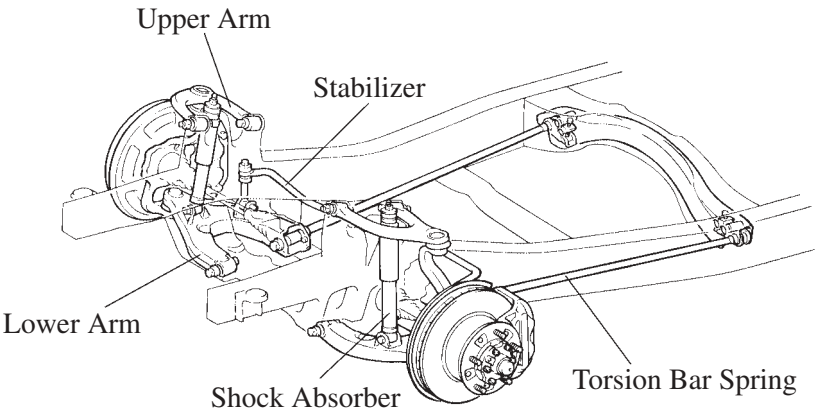
## ■ INDEPENDENT FRONT SUSPENSION (IFS)

### 1. General

A lower torsion bar type double-wishbone independent suspension is used.
The vehicle's offroad drivability is maintained by optimizing the allocation of the various components, resulting in excellent riding comfort, stability, and controllability.



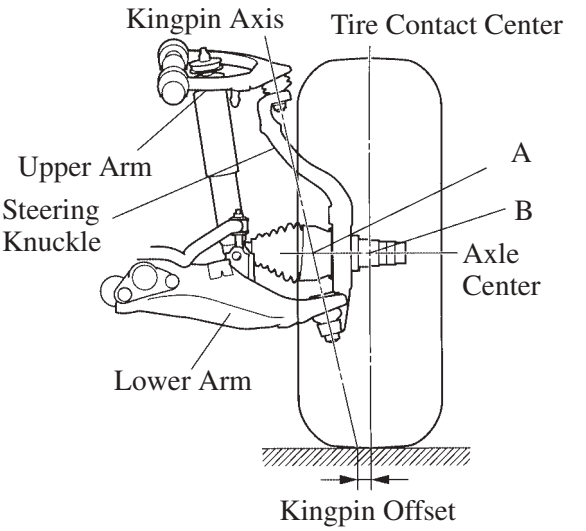

155CH64

### 2. Geometry

The allocation of the upper and lower arms has been optimized to lower the roll center height during cornering. Accordingly, a stable postural behavior has been ensured during cornering and excellent cornering performance has been realized. In addition, the front suspension has adopted an anti-dive geometry to suppress the front dive during braking.

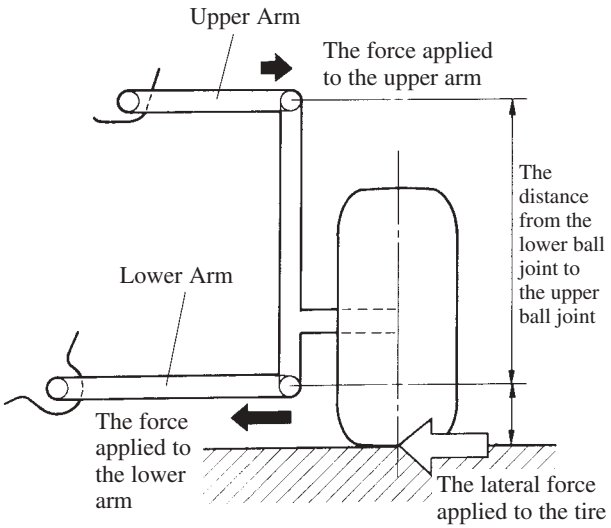
### 3. Steering Knuckle

- A steering knuckle that positions the upper arm higher has been adopted to maintain offroad drivability while providing excellent riding comfort, stability, and controllability.
- Through the adoption of this steering knuckle, the A-B distance between the kingpin offset and the axle center has been reduced. Accordingly, the rotational torque that is generated at the kingpin axis has been reduced, thus ensuring the vehicle's stability during braking. In addition, the generation of flutter has been restrained.




155CH65

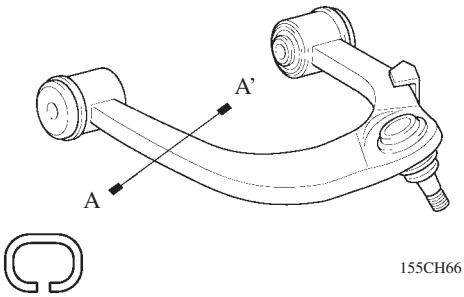
- During cornering, the force from the tire is applied to the arms as illustrated.
  This force, which is applied to the arms, influences the distance between the upper and lower arms, and has a tendency to decrease with the increase in the distance between the arms.
  Through the adoption of the steering knuckle that positions the upper arm higher, the force that is applied to the arms has been reduced. In addition, it enabled the suspension system to sufficiently withstand the lateral force even though a softer suspension arm bushing has been adopted. This resulted in excellent riding comfort, stability, and controllability.



155CH40

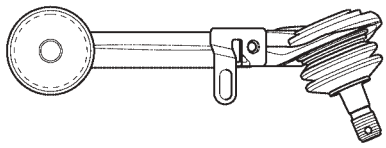
## 4. Upper Arm

By mounting the upper arm higher, the force that is applied from the road has been reduced. Furthermore, by adopting the type of ball joint that is pressed into the arm, the offset between the ball joint center and the upper arm center has been minimized, thus reducing the torsional force that is applied to the upper arm.
Accordingly, the construction of the upper arm has been simplified to that of a pressed single-sheet product.



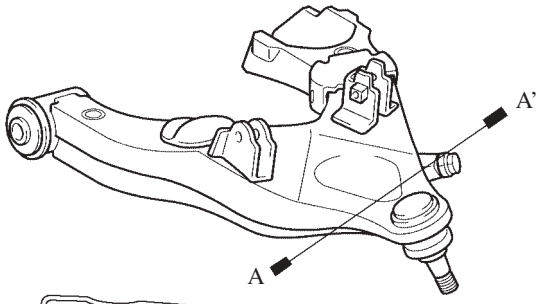
155CH66

**A – A' Cross Section** 155CH37


155CH38

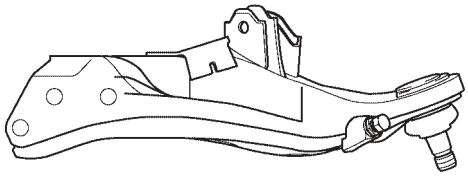
## 5. Lower Arm

To ensure a long suspension stroke, a long lower arm has been adopted. Also, to prevent road interference, the lower arm has been mounted higher.
The lower arm has adopted a closed cross section to minimize damage in case of road interference.
As in the upper arm, the lower arm has adopted the type of ball joint that is pressed into the arm, thus minimizing the offset between the ball joint center and the lower arm center and reducing the torsional force that is applied to the lower arm.



155CH67

**A – A' Cross Section** 155CH35


155CH36

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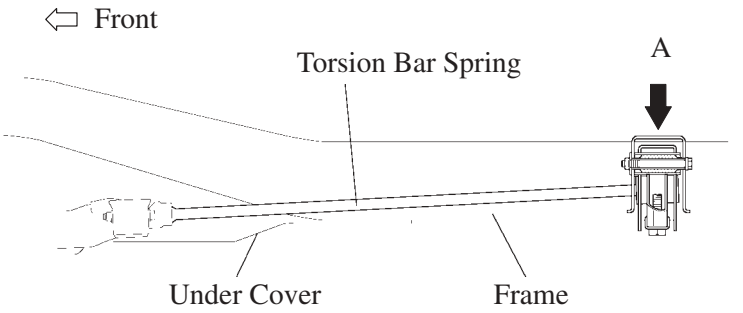
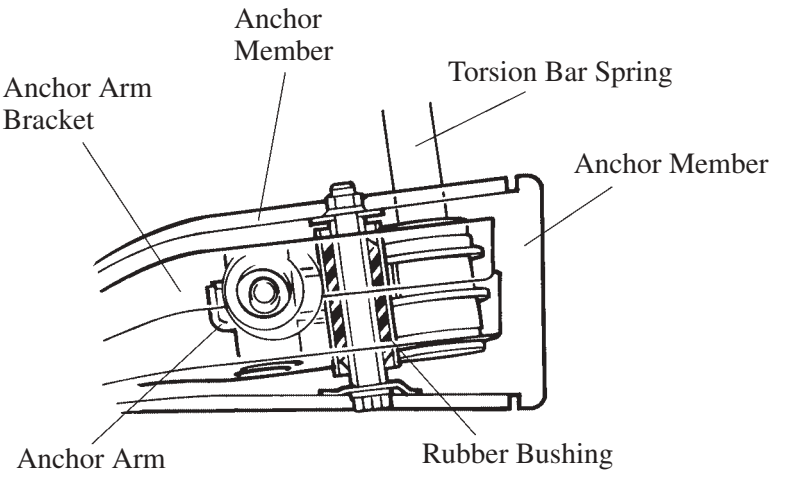
## 6. Torsion Bar Spring

To obtain a longer suspension stroke a lower torsion bar spring has been adopted.
To prevent road interference, the torsion bar spring has been positioned higher than the under cover and the bottom of the frame.
An anchor arm bracket, which is provided with an anchor arm, has been float-mounted to the anchor member via a rubber bushing. Accordingly, a longitudinal compliance of the front suspension has been ensured to provide excellent riding comfort.




155CH44




155CH68

**View A**

## 7. Stabilizer

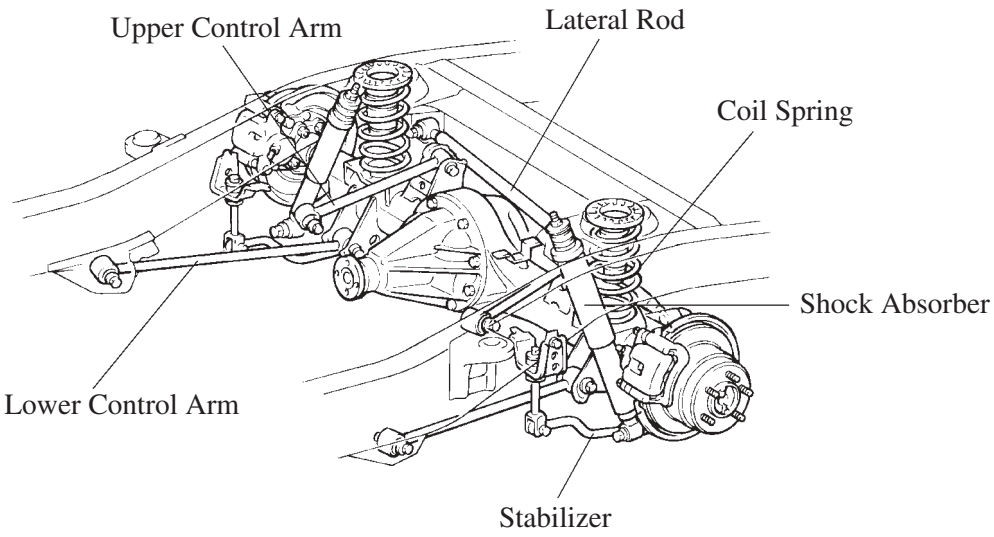
A solid bar type stabilizer is used to provide excellent riding comfort, stability and controllability.

## 8. Shock Absorber

As in the previous model, the shock absorbers inhibit cavitation and offer outstanding damping force characteristics through the use of low-pressure nitrogen gas for models without active height control suspension and skyhook TEMS.

## ■ REAR SUSPENSION

As in the previous model, a 4-link coil spring with lateral rod type suspension is used.
However, the vehicle's offroad drivability is maintained while providing excellent riding comfort, stability, and controllability by increasing the suspension stroke, increasing the tread, optimizing the bushing shape and characteristics, and optimizing the position of the control arms.




155CH69

# ■ ACTIVE HEIGHT CONTROL SUSPENSION AND SKYHOOK TEMS (TOYOTA ELECTRONIC MODULATED SUSPENSION)

## 1. General

- The active height control suspension and skyhook TEMS is a suspension system in which comfort and convenience have been significantly improved through the integration of a vehicle height adjustment system and a damping force control system.
- The vehicle height adjustment system improves the occupants' in-and-out access by quickly lowering the vehicle height at the touch of a switch. Furthermore, by raising the vehicle height, the occurrence of road interference can be minimized on unpaved roads. Also, by maintaining a constant vehicle height regardless of the load conditions such as the number of occupants or the weight of the cargo, under the prescribed loading condition the suspension stroke can be utilized effectively to ensure constantly stable riding comfort.
- Based on the skyhook theory, the damping force control system controls the suspension to achieve an optimal damping force in accordance with the bumpiness of the road surface. Furthermore, through the use of the various types of sensors, this system detects the vehicle's operating condition to obtain an optimal damping force to provide excellent riding comfort, stability, and controllability.
- The M-OBD (Multiplex On-Board Diagnostic) system is supported.

## 2. System Function

### Vehicle Height Control Function

#### 1) Vehicle Height Selection Function

The following three types of vehicle heights can be selected by operating the switch: normal vehicle height (N), low vehicle height (Lo), and high vehicle height (Hi).

| Selected Height Position | | Lo | N | Hi |
|---|---|---|---|---|
| Vehicle Height | Front | Approximately –50 mm (–2.0 in.) | Standard Vehicle Height | Approximately +40 mm (+1.6 in.) |
| | Rear | Approximately –40 mm (–1.6 in.) | Standard Vehicle Height | Approximately +50 mm (+2.0 in.) |
| Vehicle Height Adjustment Speed | Up | Lo to N or N to Hi<br>Approximately 10 to 15 seconds*<br>(Main accumulator in the stored state) | | |
| | Down | Hi to N or N to Lo<br>Approximately 3 to 8 seconds* | | |

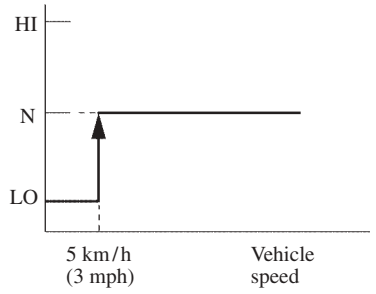
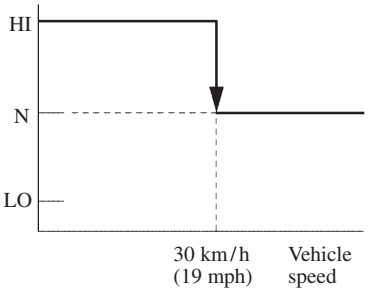
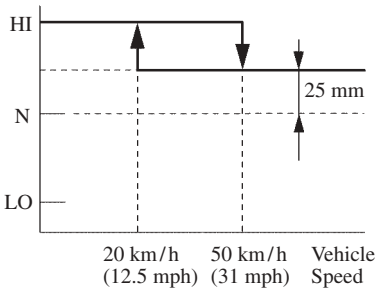
*: Vehicle height control speed differs depending on the loaded condition.

#### 2) Automatic Leveling Function

This function maintains the vehicle height constant regardless of the load conditions such as the number of occupants or the weight of the cargo under the prescribed loading condition. It effects constant control so that the vehicle height is maintained at a prescribed value when the normal vehicle height is selected.

### 3) Vehicle Speed Sensing Function

This function automatically adjusts the vehicle height in accordance with the vehicle speed in order to ensure stability and riding comfort while driving.

| During Lo Position | During Hi Position | During Hi Position* |
|---|---|---|
|  |  |  |
| When the vehicle speed becomes higher than approximately 5 km/h (3 mph), the vehicle height transfers to normal. The normal vehicle height is maintained even if the vehicle speed becomes lower than 5 km/h (3 mph). | When the vehicle speed becomes higher than approximately 30 km/h (19 mph), the vehicle height transfers to normal. The normal vehicle height is maintained even if the vehicle speed becomes lower than 30 km/h (19 mph). | When the vehicle speed becomes higher than approximately 50 km/h (31 mph), the vehicle height transfers to a height that is approximately 25 mm (1 in.) higher than the normal vehicle height. When the vehicle speed becomes lower than approximately 20 km/h (12.5 mph), it returns to the high vehicle height. |

*: Transfer shifted in the low.

### 4) Extra High Mode

While driving on an unpaved road with the transfer shifted in the low range and the vehicle height set to high, if one of the wheels freewheels, the vehicle height raises automatically by approximately 30 mm (1.2 in.) at the front and approximately 20 mm (0.8 in.) at the rear.

### 5) Vehicle Height Adjustment Prohibition Control

When the vehicle is raised on a jack or is being towed, the vehicle adjustment can be prohibited by operating the height control switch. However, the prohibition control cancels automatically when the vehicle speed becomes higher than approximately 80 km/h (50 mph) at the normal vehicle height, or higher than approximately 30 km/h (19 mph) at the high or low vehicle height.

**NOTE:** Occasionally, the set vehicle height may not be maintained when the vehicle is carrying a load that is heavier than a prescribed amount. At times, it might not be possible to raise the vehicle height even by operating the switch.

- Up to 4 occupants* plus about 300 kg (661 lb.) in the normal mode.
- Up to 4 occupants* plus about 170 kg (375 lb.) in the high mode.

*: About 68 kg (150 lb.) for a person.

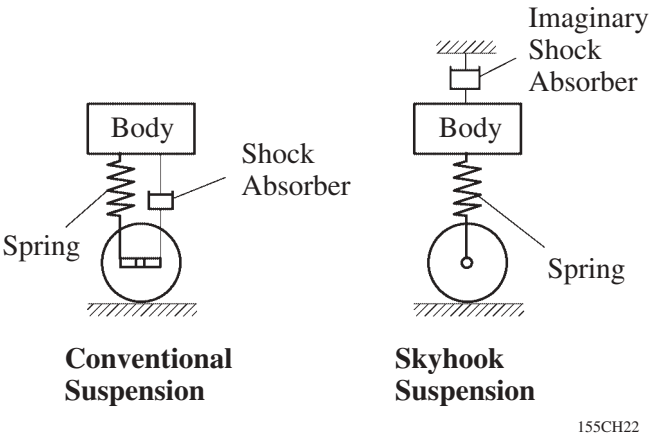
## Damping Force Control Function

### 1) Float and Pitch Control (Skyhook Control)

Based on the skyhook theory to take semi-active control of the damping force, this function effects independent front/rear control of the damping force in order to achieve an optimal damping force in accordance with the bumpiness of the road surface.
The suspension control ECU calculates the relative speed between the body and the wheels based on the signals received from the height control sensor and controls the actuators to maintain a flat and stable vehicle posture in various road conditions.

#### a. Skyhook Theory

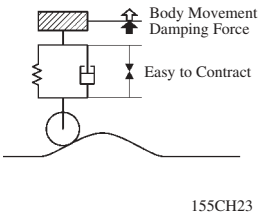
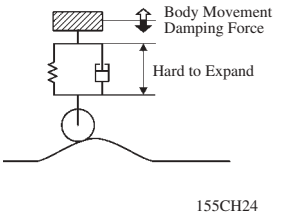
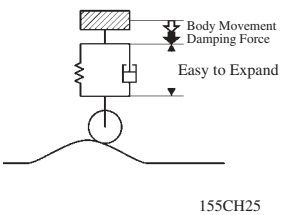
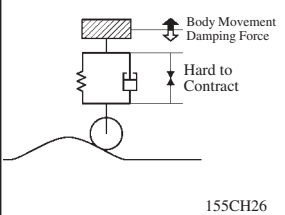
This theory proposes an imaginary shock absorber suspended in the air. This imaginary shock absorber is inactive against any force that is applied from the ground, but effectively activates a damping force against body vibrations.




#### b. Semi-Active Control

The conditions in which the vehicle overcomes mild bumps are demonstrated through the use of a model in the following four conditions:

① The shock absorber contracts and the body moves upward.
② The body keeps moving upward causing the shock absorber to elongate gradually.
③ The shock absorber keeps elongating and the body starts moving downward.
④ The body keeps moving downward causing the shock absorber to contract gradually.

| Stage ① | Stage ② | Stage ③ | Stage ④ |
|---|---|---|---|
|   |   |   |   |
| Assisting the Vibrations | Suppressing the Vibrations | Assisting the Vibrations | Suppressing the Vibrations |

Thus, during stages ① and ③ the shock absorbers assist the vibration to create a softer damping force, and during stages ② and ④ the shock absorber suppress the vibration to create a hard damping force, the shock absorbers are minutely controlled to suppress the vibration to restrain the movement of the body and of the shock absorbers.
The above processes are performed independently between the front and rear wheels in order to stabilize the vehicle to a flat posture.

**2) Thumping Sensitive Control**

When the road surface condition does not require a damping force, this function controls the actuator so that their damping force will not increase.
As a result, both flatness and a soft ride have been achieved.

**3) Unsprung Vibration Control**

If unsprung resonance is detected, this function controls so that the damping force will not decrease below a certain level, in order to reduce the unsprung resonance.
As a result, excellent road-holding performance has been ensured without affecting riding comfort.

**4) Speed Sensitive Control**

To optimally balance the vehicle's riding comfort and road-holding performance, the damping force is increased along with the increase in vehicle speed, in order to ensure stability during high-speed driving.

**5) Anti-Roll Control**

During cornering, this function makes the damping force firmer, thus restrating the body roll speed in order to provide excellent stability and controllability.



**6) Anti-Dive Control**

During braking, this function makes the damping force firmer to restrain the body dive, thus ensuring excellent stability and controllability.

**7) Anti-Squat Control**

During acceleration, this function makes the damping force firmer to minimize the changes in the vehicle body posture to provide excellent stability and controllability.

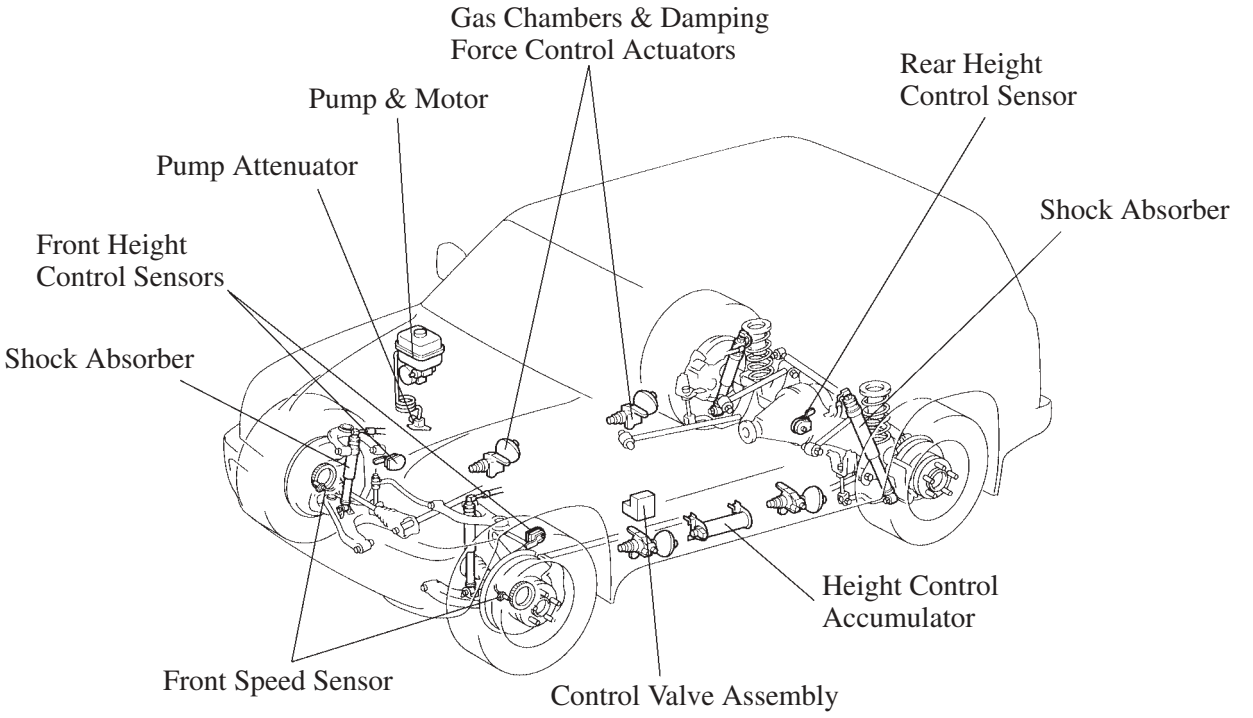
**8) Damping Force Control**

The actuator uses a 16-step step motor to generate a continually variable damping force. This provides a wide selection of damping force and enables a smooth transition of the damping force.
As a result, a minutely controlled damping force that accommodates various types of driving conditions has been made possible.

## Right-Left Wheel Communicating Function

Normally, an oil passage remains open between the shock absorbers for the right and left wheels. This enables the suspension to contract and elongate smoothly when the right and left wheels move gradually at opposite phases and provides excellent road-holding performance while driving on a winding road.
When the driver operates the steering wheel, the oil passage between the right and left shock absorbers closes according to that condition. This restrains the increase of the vehicle body roll during cornering, thus ensuring the vehicle's stability and controllability.

## 3. Layout of Components

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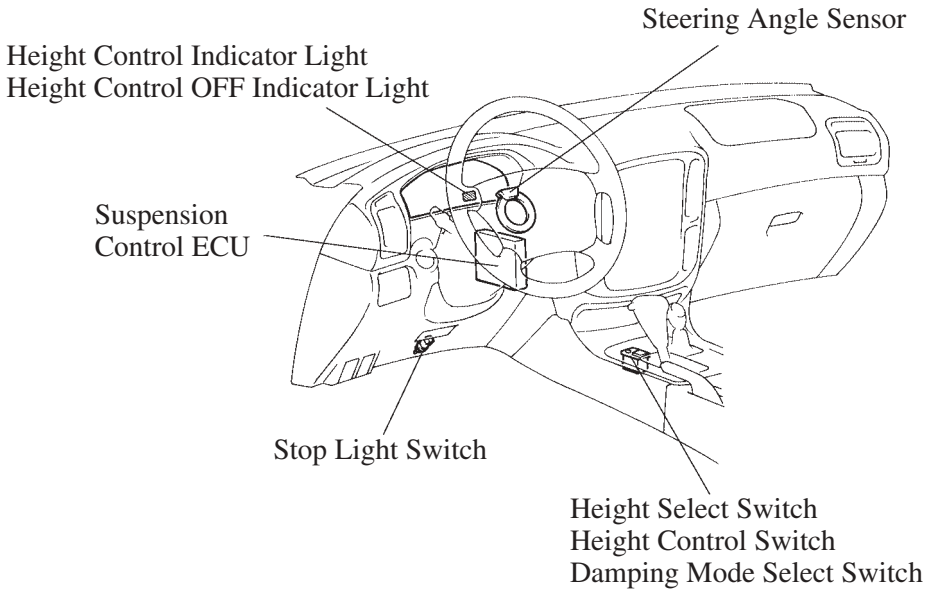



155CH95

**LHD Model**

## 4. Function of Components

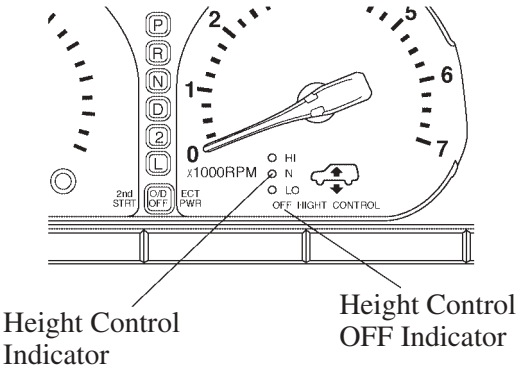
| Components | | Function |
|---|---|---|
| Height Control Indicator Light | | Indicates the present vehicle height condition. |
| Height Control OFF Indicator Light | | ● Lights to inform the driver when the active height control system is turned OFF by the height control switch.<br>● Blinks to alert the driver when the ECU detects the malfunction in the active height control suspension and skyhook TEMS.<br>● Indicates the diagnostic code. |
| Height Select Switch | | Selects the target vehicle height. |
| Height Control Switch | | Prohibits the adjustment of the vehicle height. |
| Damping Mode Select Switch | | Selects a damping force control mode. |
| Front Speed Sensors | | Detect the wheel speed. |
| Height Control Sensors | | Detect the vehicle height. |
| Steering Angle Sensor | | Detects the steering direction and angle of the steering wheel. |
| Pump and Motor | | Generates the high hydraulic pressure that is necessary for raising the vehicle height. |
| | Reservoir Tank | Maintains the amount of fluid that is returned during the low vehicle height and the amount of fluid that is discharged during the high vehicle height. |
| | Return Valve | Opens and closes the oil passage between the control valve assembly and the reservoir tank. |
| | Pressure Sensor | Detects the pump's discharge pressure. |
| | Temperature Sensor | Detects the fluid temperature. |
| Pump Attenuator | | Dampens the hydraulic pulsation of the fluid that is discharged by the pump. |
| Height Control Accumulator | | Stores the hydraulic pressure to accelerate the speed in which the vehicle height is raised. |
| Control Valve Assembly | Leveling Valves | Open and close the oil passage between the pump and the gas chambers of the wheels. |
| | Gate Valves | Open and close the oil passage between the right and left shock absorbers. |
| Gas Chambers | | Perform the same functions as those of the gas chamber of the conventional shock absorber. |
| Damping Force Control Actuators | | Switch the damping force. |
| Shock Absorbers | | Generate a damping force similar to the conventional shock absorber. |
| High Pressure Hose | | Serves as the oil passage that links the gas chambers and the shock absorbers. |
| Suspension Control ECU | | Controls the entire system by performing the calculations for height control and damping force control based on the signals received from the sensors and switches. |
| Center Diff. Lock Position Switch | | Detects that the center differential is locked. |
| L4 Position Switch | | Detects the transfer shifted in the low. |
| Stop Light Switch | | Detects the brake signal. |
| Courtesy Switches | | Detects the open and closed condition of the doors. |
| Generator L Terminal | | Detects that the engine is operating. |
| AHC Main Relay | | Supplies power to the suspension system. |
| AHC Motor Relay | | Supplies power to the pump motor. |

## 5. Construction and Operation of Main Components

### Indicator Lights

#### 1) Height Control Indicator Light

The height control indicator light has been provided below the tachometer in the combination meter. It informs the driver by illuminating the indicator light for the present vehicle height position.
When the height select switch is pressed to effect height control, the indicator for the present height position turns OFF and the indicator light for the target height position blinks. After height control is completed, the indicator light for the height position that has been attained illuminates.



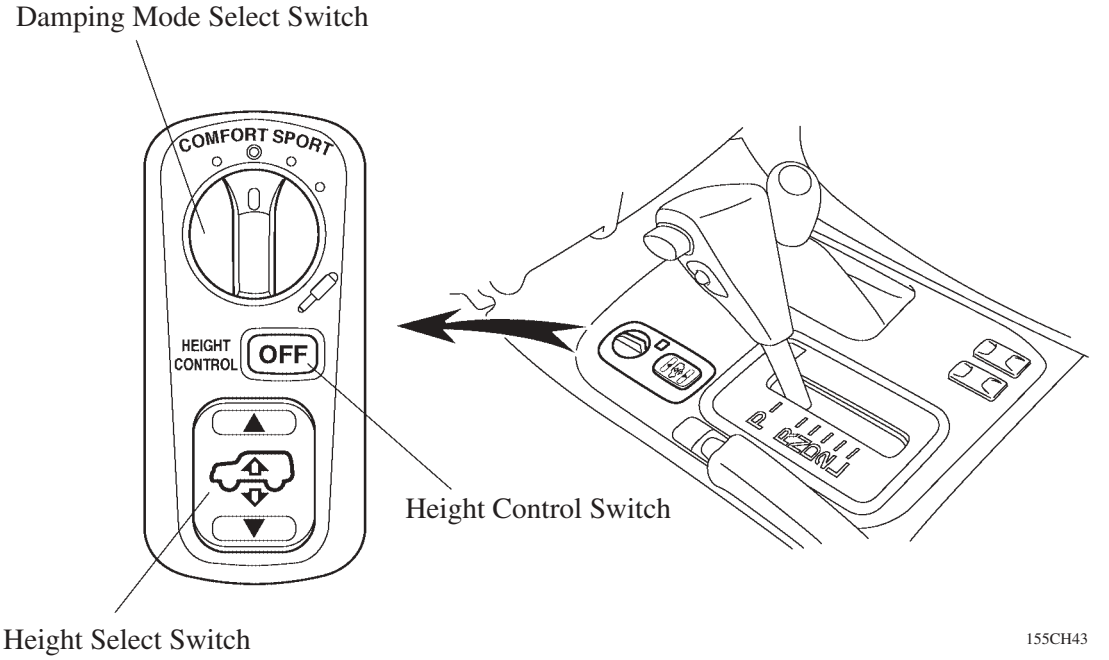

155CH70

#### 2) Height Control OFF Indicator Light

The height control OFF indicator light is located under the height control indicator light.
This indicator light lights up to inform the driver when the active height control system is turned off by the height control switch.
This indicator light blinks to alert the driver when the ECU detects the malfunction in the active height control suspension and skyhook TEMS.
By effecting the DTC (Diagnostic Trouble Code) check mode, the DTCs can be obtained from this indicator light. For details, see the Land Cruiser Chassis and Body Repair Manual (Pub. No. RM616E).

### Control Switches

The height select switch, the height control switch and the damping mode select switch are located in front of the shift lever.




155CH43

**1) Height Select Switch**

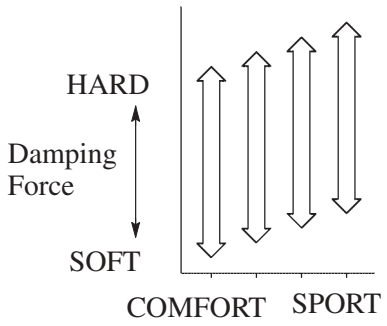
A seesaw type momentary switch has been adopted for the height select switch that is used for selecting a desired height. Pressing the ▲ (up) side of the switch once raises the vehicle height, and pressing the ▼ (down) side once lowers the vehicle height.

**2) Height Control Switch**

Pressing this switch prohibits the height control function. Pressing it again cancels the prohibition.
The prohibition cancels automatically when the vehicle speed becomes higher than 80 km/h (50 mph) at the normal vehicle height, or higher than 30 km/h (19 mph) at any other vehicle height.
The state of height control prohibition is stored in memory even after the ignition switch has been turned OFF.

**3) Damping Mode Select Switch**

As shown on the right, this control switch enables the driver to select a desired damping force from the 4 modes.




**Select Switch Position**

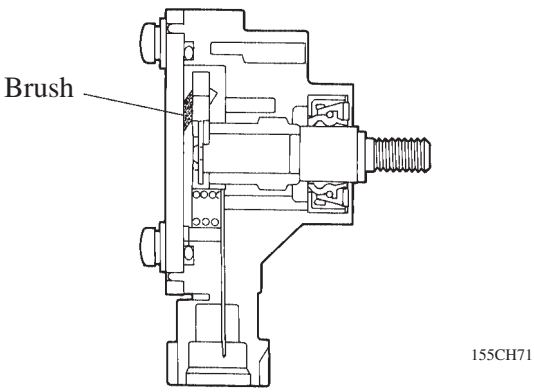


## Front Speed Sensors

The sensors detect the individual speeds of the front wheels. The wheel speed signals are then input into the suspension control ECU via the ABS & hydraulic brake booster ECU.

## Height Control Sensors

A total of 3 sliding resistance type height control sensors are provided: 1 in each of the right and left front wheel housings and 1 in the center of the cross member located above the rear axle.
The sensor consists of a brush that is integrated with a shaft, which slides on the resistor that is formed on a substrate. Because the resistance value between the brush and the resistor terminal varies in proportion to the shaft's rotational angle, a prescribed amount of voltage is applied to the resistor so that a change in the rotational angle can be detected in the form of a voltage change.




**Cross Section**

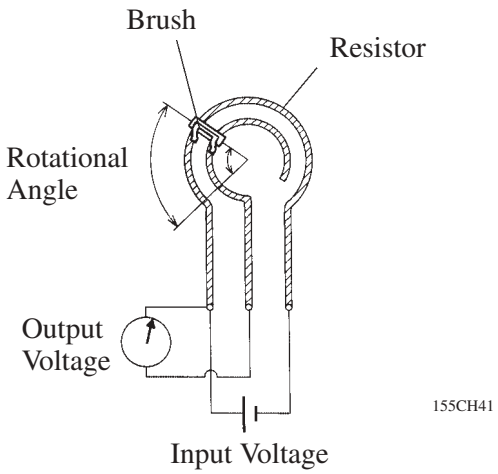
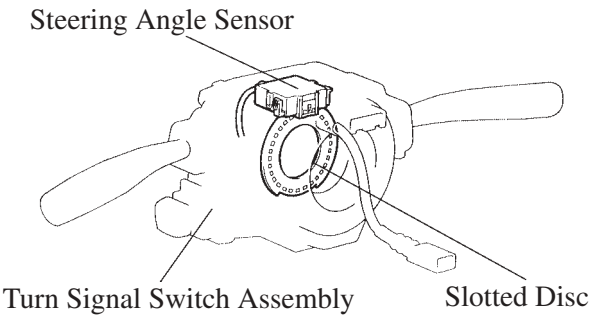



**Diagram of the Principle**

## Steering Angle Sensor

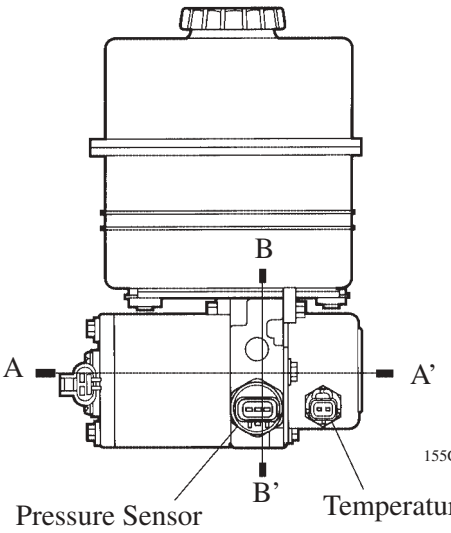
The steering angle sensor is fitted to the turn signal switch assembly and detects the steering direction and angle.
The sensor contains 2 photo interrupters with phases, and a slotted disc interrupts the light to turn the photo transistor ON and OFF to detect the steering direction and angle.



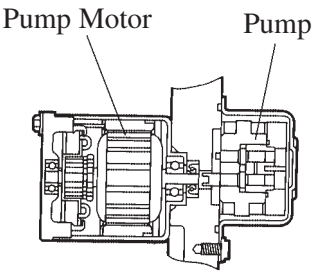

155CH42

## Pump and Motor

A system in which the pump, pump motor, reservoir tank, return valve, pressure sensor, and temperature sensor are integrated has been adopted.

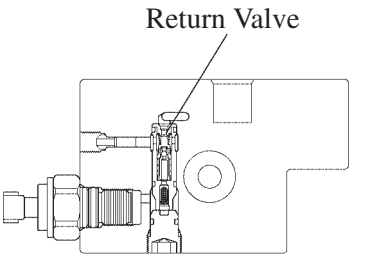



155CH72




**A – A' Cross Section**

155CH73

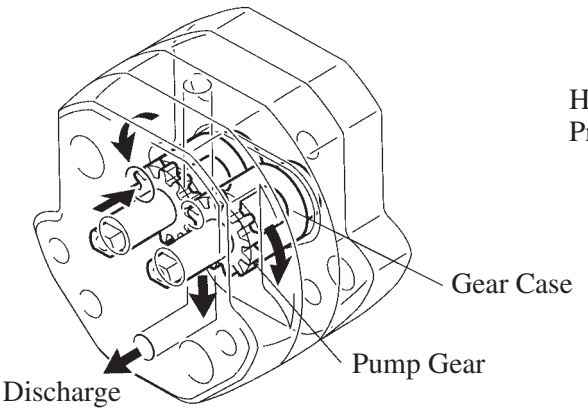



**B – B' Cross Section**

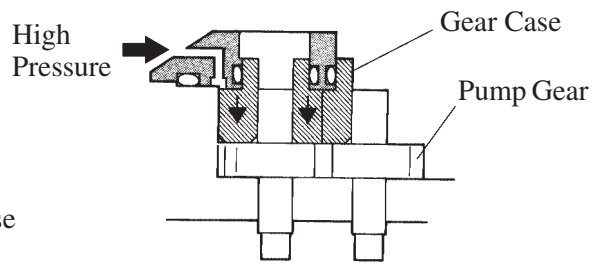
155CH28

### 1) Pump

An external gear pump that contains less parts and excels in durability has been adopted. Also, the pump is a pressure-loading type in which the discharge pressure of the pump itself is utilized and routed via the gear case to push on the side of the pump gear in order to reduce the internal leakage, thus making high-pressure discharge possible.




155CH74



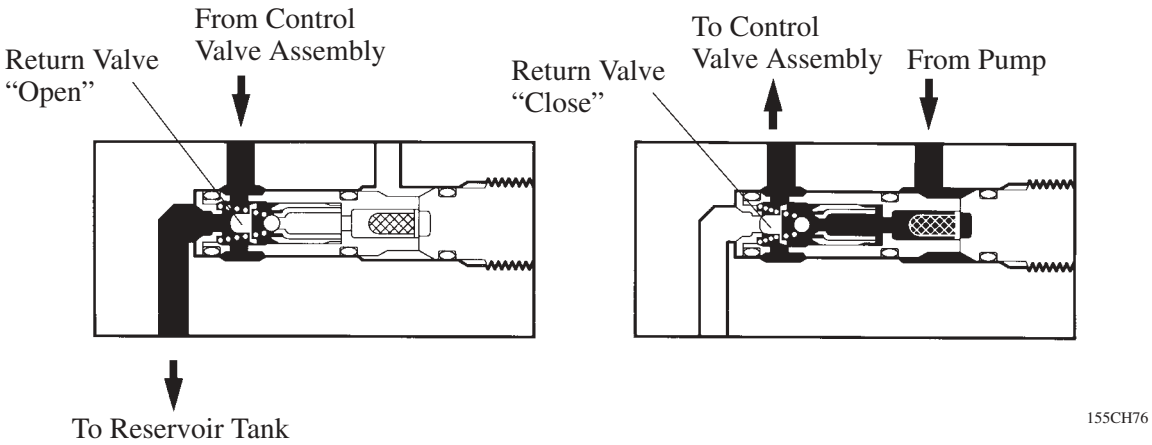

155CH75

**2) Motor**

A DC motor with 4-pole brushes has been adopted to realize excellent durability and high torque.

**3) Return Valve**

The return valve opens and closes the oil passage between the control valve assembly and the reservoir tank. The return valve has been simplified by adopting a construction in which the valve is closed by the flow of the discharged fluid.
Normally, a spring force is applied to the return valve to maintain the oil passage between the control valve assembly and the reservoir tank open.
When the pump operates in order to raise the vehicle height, the pressure of the fluid that is discharged by the pump causes the return valve to move to the left of the diagram as illustrated.
Accordingly, the oil passage between the control valve assembly and the reservoir tank closes, and the fluid that is discharged from the pump flows towards the control valve assembly.

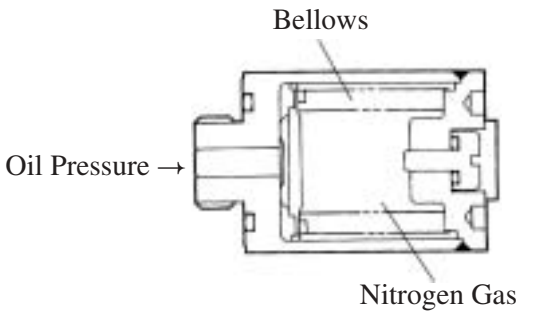



**Normal Condition** **Pump in Operation**



## Pump Attenuator

The pump attenuator dampens the hydraulic pulsation of the fluid that is discharged by the pump.
A bellows type accumulator that is made of stainless steel, which offers excellent gas penetration resistance and good pulsation absorption performance, has been adopted.




**▶ Specifications ◀**

| | |
|---|---|
| Sealed Gas | Nitrogen Gas |
| Gas Chamber Volume cc (cu in.) | 2 (0.12) |
| Sealed Gas Pressure MPa (kgf/cm², psi) | 1.96 (20, 284) |

## Height Control Accumulator

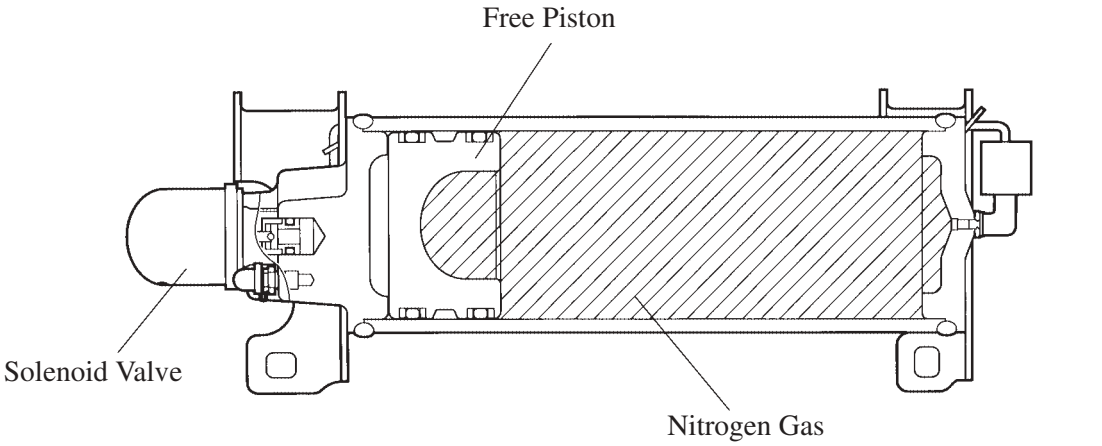
A free piston type accumulator, which provides a large gas chamber capacity, has been adopted for the height control accumulator.

The height control accumulator consists of a cylinder, free piston, and solenoid valve. When raising the vehicle height, the accumulator discharges the stored fluid to accelerate the raising speed.

Normally, the solenoid valve remains closed. When the vehicle height is being raised or the fluid is being stored in the main accumulator, the solenoid valve opens in accordance with the signal received from the suspension control ECU.

**▶ Specifications ◀**

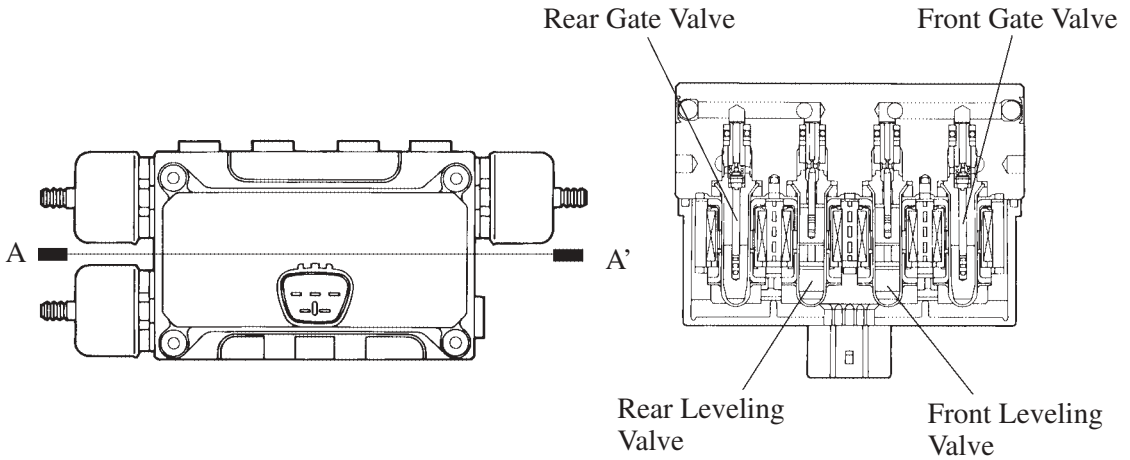
| | |
|---|---|
| Sealed Gas | Nitrogen Gas |
| Gas Chamber Volume cc (cu in.) | 945 (57.7) |
| Sealed Gas Pressure MPa (kgf/cm$^2$, psi) | 5.9 (60, 853) |




155CH78

## Control Valve Assembly

The control valve assembly consists of the leveling valves for adjusting the vehicle height and the gate valves for controlling the right-left wheel communicating function. There are 4 valves each for the front and rear.

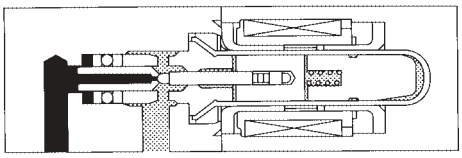



**A – A' Cross Section**

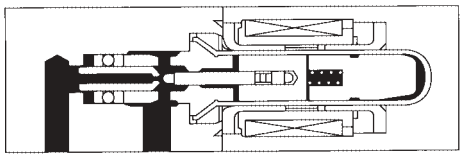
155CH79

### 1) Leveling Valve

This valve opens and closes the oil passage between the pump and the gas chamber located at each wheel. Normally, the oil passage remains closed, and during vehicle height control, the oil passage opens in accordance with the signal received from the suspension control ECU.




**Close**



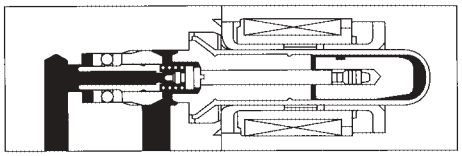

**Open**

155CH80

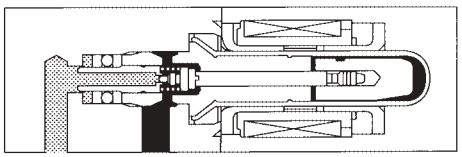
### 2) Gate Valve

This valve opens and closes the oil passage between the right and left shock absorbers. Normally, the oil passage remains open, connecting the right and left shock absorbers. When the suspension control ECU determines that the oil passage between the right and left shock absorbers must be closed, the gate valve activates to close the oil passage.






**Open**

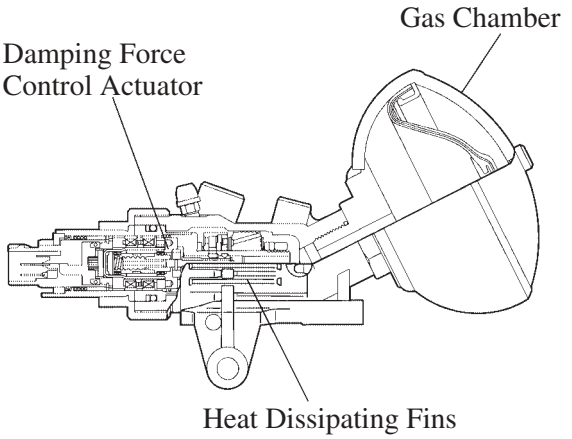



**Close**

155CH81

## Gas Chamber and Damping Force Control Actuator

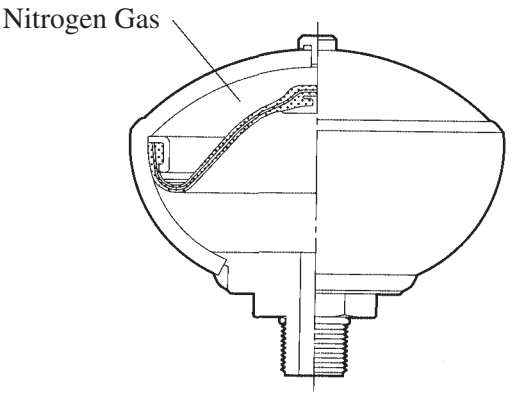
A gas chamber (a substitute for the gas chamber in the conventional shock absorber) and an actuator to switch the damping force have been integrated.
The housing is provided with heat dissipating fins to improve the dissipation of the heat that is generated by the actuator.




155CH93

### 1) Gas Chamber

The gas chamber uses the bladder type hydropneumatic accumlator.
A resin membrane is sandwiched between rubber layers to realize excellent gas penetration resistance.
The internal pressure of the gas chamber is varied by allowing the fluid to flow in and out of this gas chamber in order to raise or lower the vehicle height.



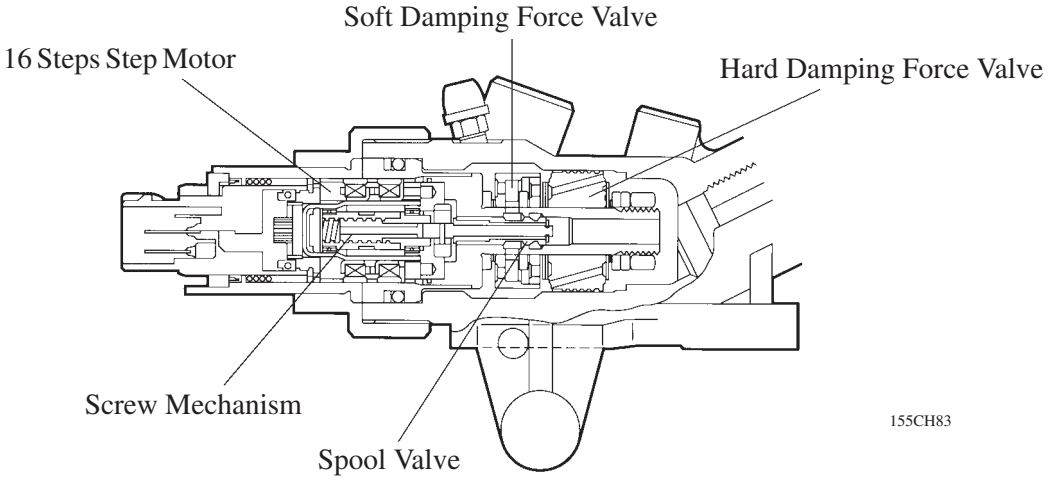

155CH82

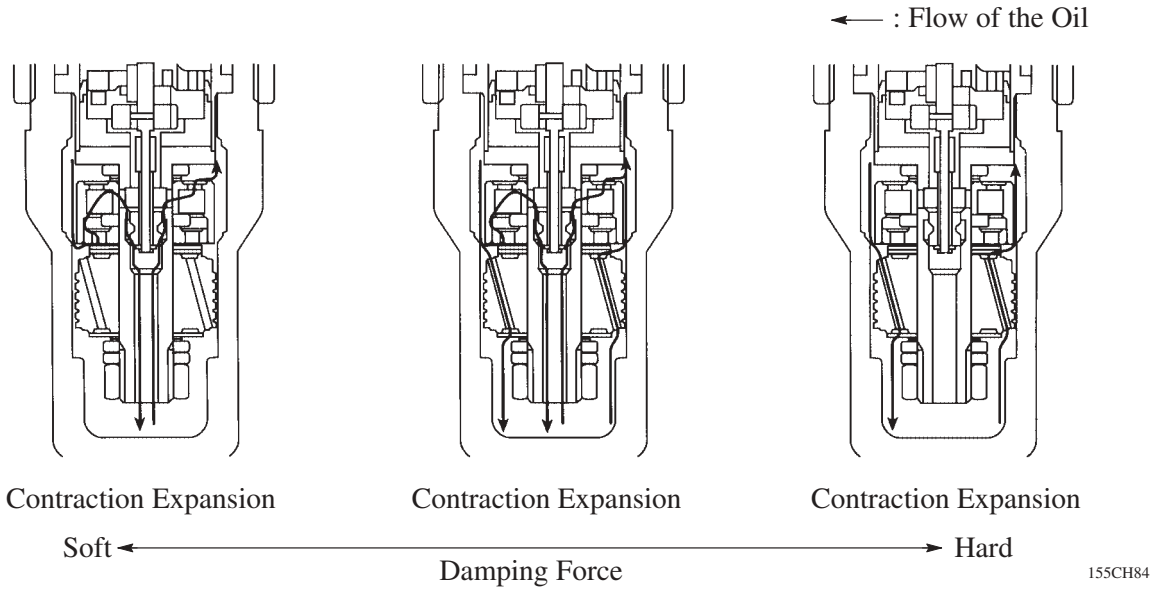
**▶ Specifications ◀**

| | Front | Rear |
|---|---|---|
| Sealed Gas | Nitrogen Gas | ← |
| Gas Chamber Volume cc (cu in.) | 400 (24.4) | 500 (30.5) |
| Sealed Gas Pressure MPa (kgf/cm$^2$, psi) | 2.26 (23, 327) | 2.65 (27, 384) |

### 2) Damping Force Control Actuator

This actuator consists of the 16 steps step motor, a screw mechanism (which converts the rotational movement to a linear movement), a spool valve, a soft damping force valve and hard damping force valve.
Signals from the suspension control ECU activate the actuator causing the spool valve to switch the oil passage. Thus, the volume of oil that passes through each valve is varied in order to control the damping force in 16 steps.

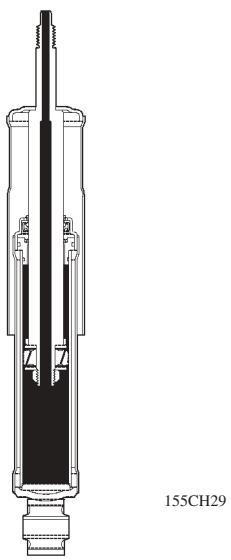


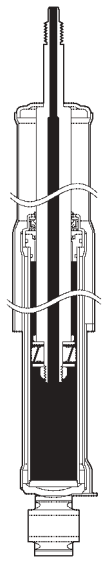



## Shock Absorber

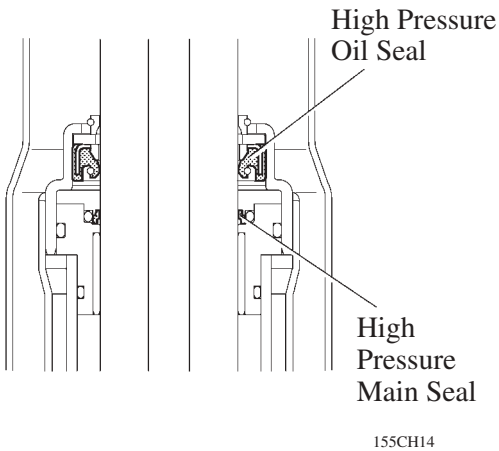
The shock absorber has adopted a dual construction using a high-pressure main seal made of fluoroethylene resin and a high-pressure oil seal made of nitrile rubber and provided with a backup ring in order to ensure sealing performance and to reduce friction.




**Front Shock Absorber**




**Rear Shock Absorber**




**Seals**

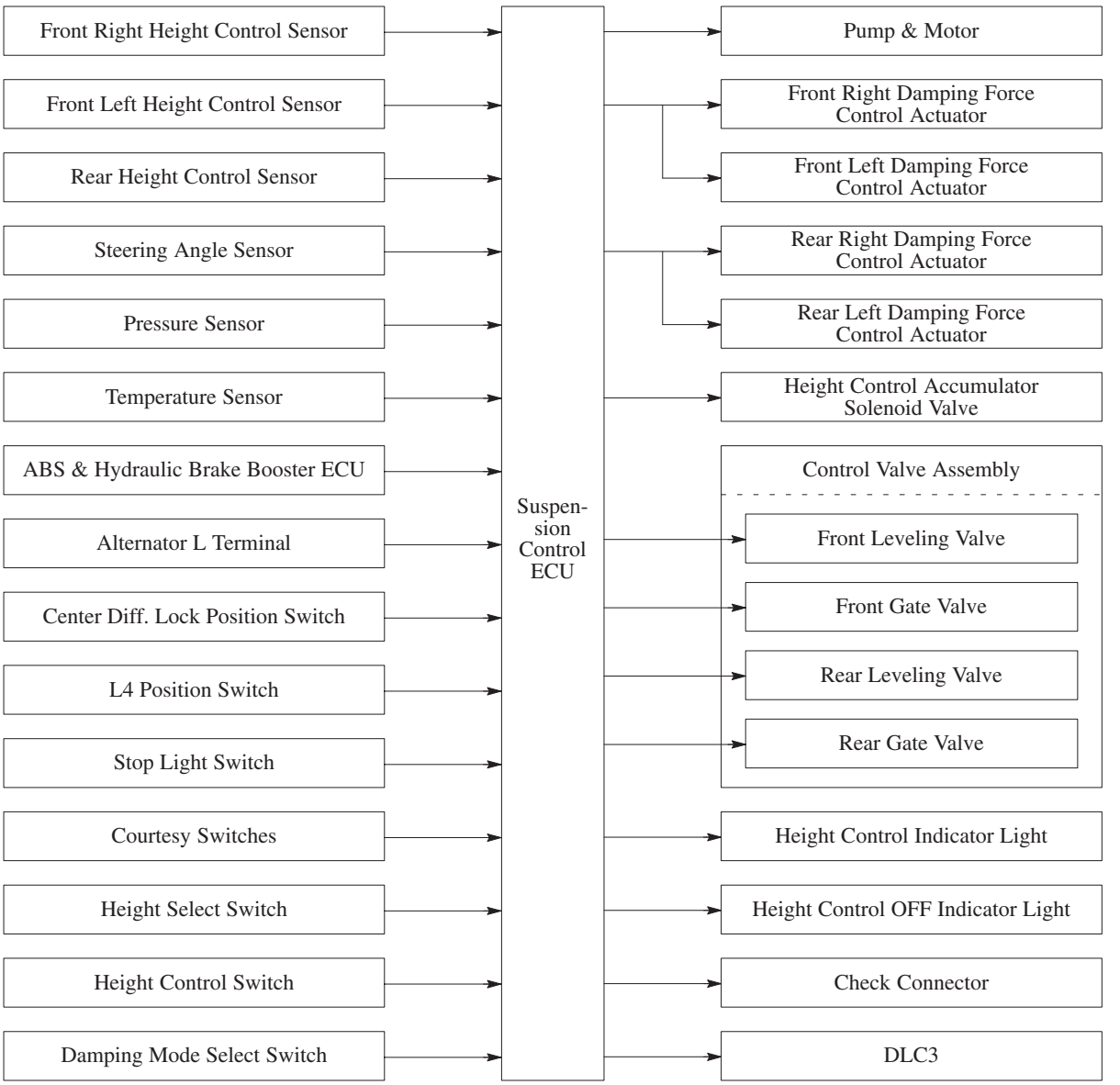
## Fluid

This system uses a fluid called the “Active Suspension Fluid AHC”.

## Suspension Control ECU

### 1) General

The suspension control ECU is located in the driver’s side instrument panel.
Based on the signals received from the sensors and switches, the suspension control ECU detects the vehicle height and vehicle conditions and outputs the control signals to the actuators and the pump.



**2) Self-Diagnosis**

If the suspension control ECU detects a malfunction in this system, it blinks the height control OFF indicator light to alert the driver of the malfunction. The ECU will also store the codes of the malfunctions. The diagnostic trouble codes (DTCs) can be accessed through the blinking of the height control OFF indicator light or the use of a hand-held tester. For details, see the Land Cruiser Chassis and Body Repair Manual (Pub. No. RM616E).

**3) Test Mode**

The operation of the sensors and the switches can be inspected in the test mode. For details, see the Land Cruiser Chassis and Body Repair Manual (Pub. No. RM616E).

**4) Active Test**

A Lexus hand-held tester can be used to activate the actuators for inspecting their operation. For details, see the Land Cruiser Chassis and Body Repair Manual (Pub. No. RM616E).

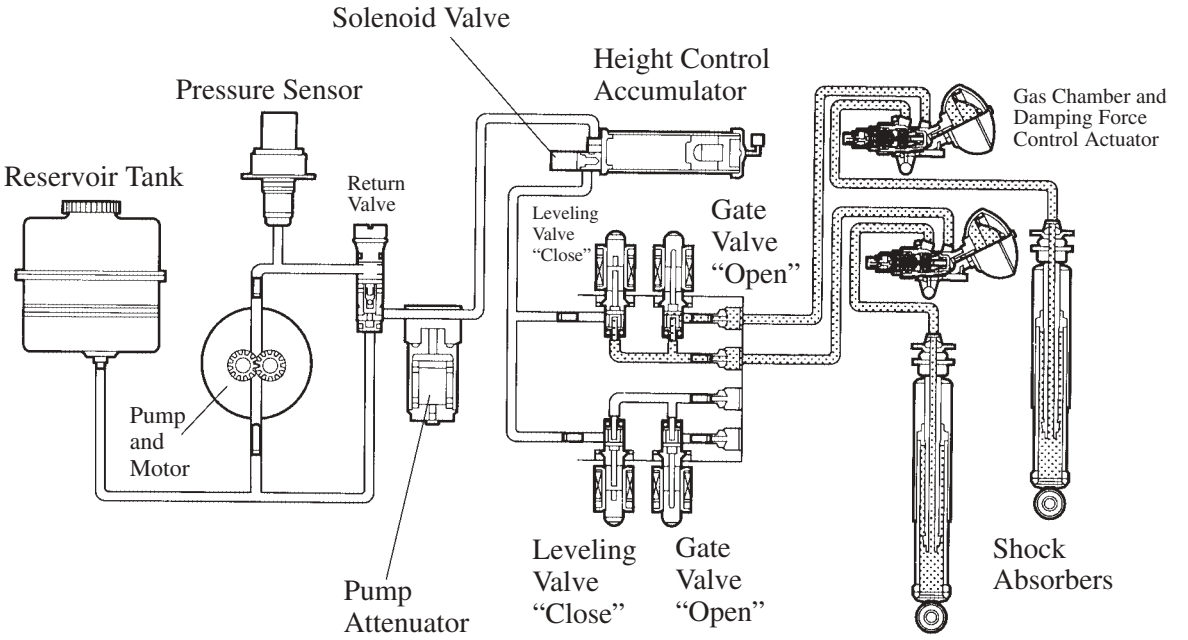
**5) Fail-Safe**

If a malfunction occurs in any of the sensors or actuator, the ECU prohibits the vehicle height control and the damping force control.

## 6. System Operation

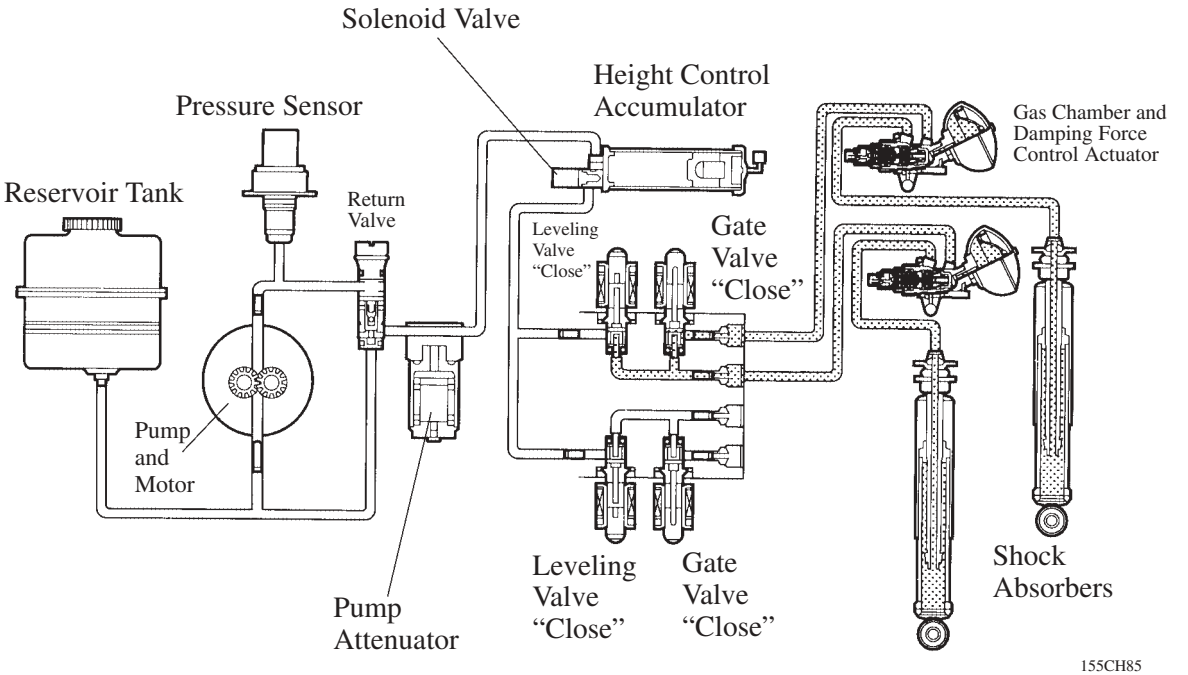
### Normal Driving (Straightline Driving)

The high pressure in the gas chamber and the shock absorber is shut off with the leveling valve. The gate valve remains open, and the right and left shock absorbers remain connected. The damping force is controlled in accordance with road surface conditions.




### Cornering

The high pressure in the gas chamber and the shock absorber is shut off with the leveling valve. The gate valve is closed, and the right and left shock absorbers are shut off from each other. The damping force is controlled in accordance with road surface conditions and the operating condition of the steering wheel.



## Raising the Vehicle Height

Operating the height select switch to raise the vehicle height activates the pump motor, which rotates the pump. The fluid that is discharged by the pump is sent to the gas chambers and shock absorbers in order to raise the vehicle height.

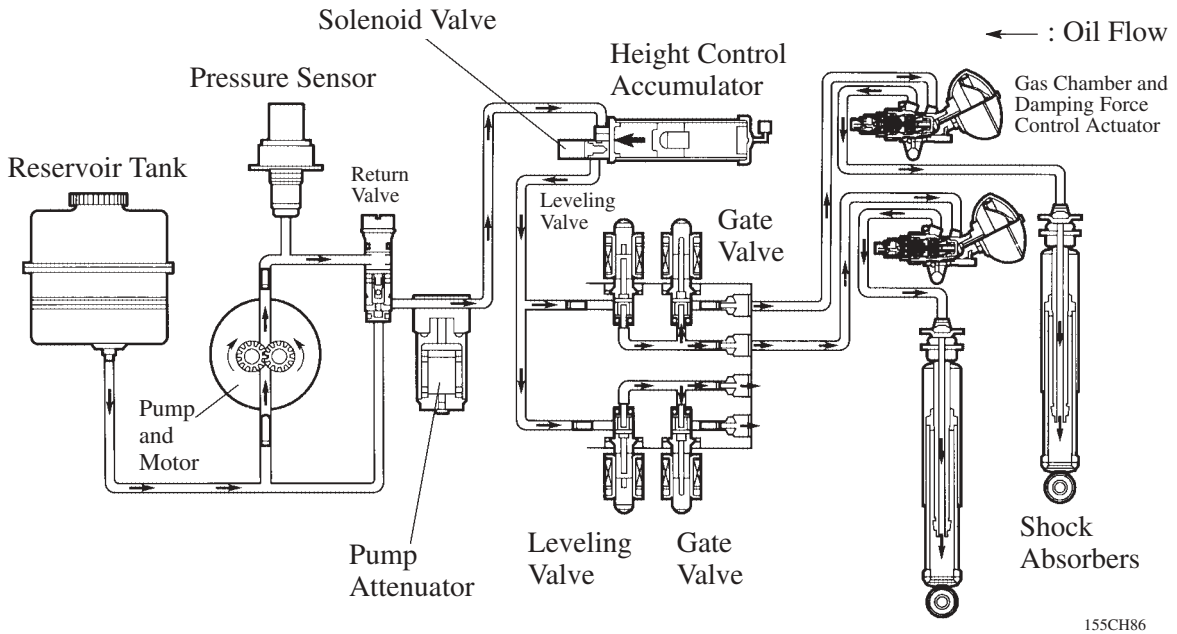
### 1) Vehicle Stopped

The solenoid valve of the height control accumulator is opened in order to use the fluid that is stored in the height control accumulator, which accelerates the raising speed of the vehicle height.
To use the fluid that is stored in the accumulator, the front and rear leveling valves are opened simultaneously to raise all 4 wheels at the same time.
When the stored fluid has been depleted, the front and rear leveling valves are opened alternately to raise the suspension of the front wheels and the rear wheels alternately.

### 2) Vehicle in Motion

When the vehicle speed is less than approximately 25 km/h (16 mph), the fluid that is stored in the height control accumulator is used in the same way as when the vehicle is stopped.
When the vehicle speed is higher than approximately 25 km/h (16 mph), the vehicle height is raised using only the fluid that is discharged by the pump, without using the height control accumulator. At this time, the front and rear leveling valves are opened alternately to raise the suspension of the front wheels and the rear wheels alternately.
When the vehicle height it at low, it is automatically raised to normal when the vehicle speed becomes higher than approximately 5 km/h (3 mph). At this time, the fluid that is stored in the height control accumulator is also used.

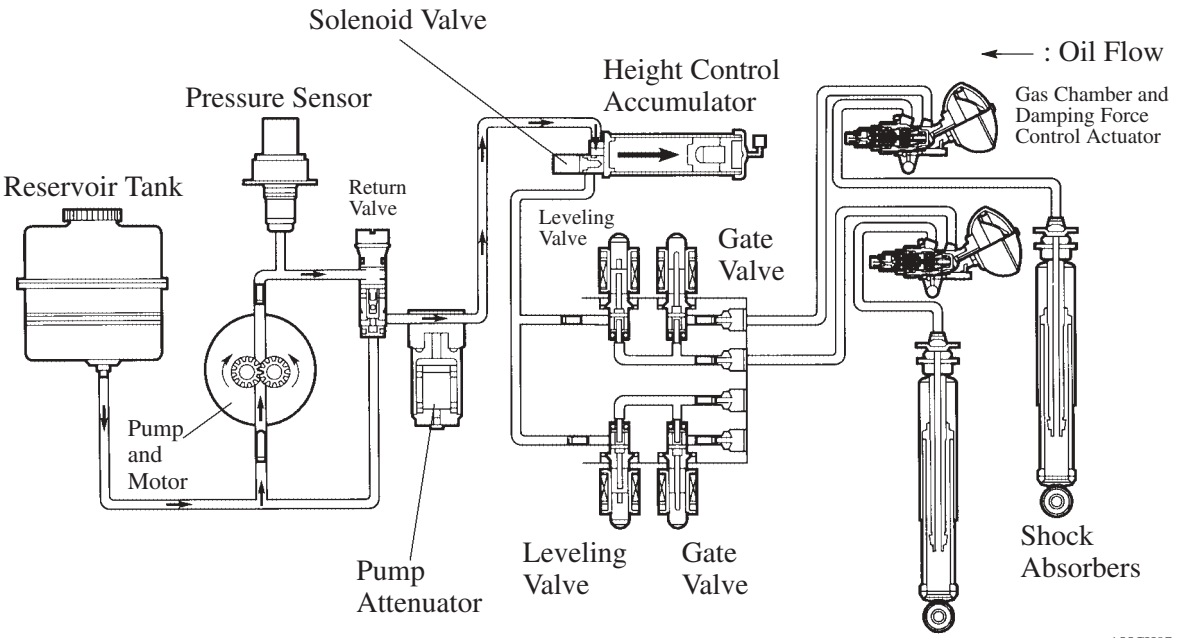





| Condition | | | Vehicle Stopped | | Vehicle in Motion | |
|---|---|---|---|---|---|---|
| | | | Use Height Control Accumulator | Not Use Height Control Accumulator | 25 km/h (16 mph) or less and at the time of using the height control accumulator | Except the left mentioned condition |
| Control Valve Assembly | Front | Leveling Valve | Open | Open and Close | Open | Open and Close |
| | | Gate Valve | Open | Open | Open | Open |
| | Rear | Leveling Valve | Open | Open and Close | Open | Open and Close |
| | | Gate Valve | Open | Open | Open | Open |
| Height Control Accumulator Solenoid Valve | | | Open | Close | Open | Close |
| Pump and Motor | | | Operation | Operation | Operation | Operation |

### Fluid Stored in Height Control Accumulator

Normally, the height control accumulator stores only the amount of fluid that is equivalent to that used in raising the vehicle height once. Therefore, after the vehicle has been raised from low to normal, or from normal to high, it is necessary to replenish the fluid in the height control accumulator.
At this time, the pump motor is operated to rotate the pump, the leveling valves are closed, the solenoid valve of the height control accumulator is opened, and the fluid is stored in the height control accumulator.
When the vehicle height is raised while the fluid that is stored in the height control accumulator has not reached a prescribed pressure, only the fluid that is discharged by the pump is used for raising the vehicle height, without using the fluid in the height control accumulator.




| | | | |
|---|---|---|---|
| Control Valve Assembly | Front | Leveling Valve | Close |
| | | Gate Valve | Open |
| | Rear | Leveling Valve | Close |
| | | Gate Valve | Open |
| Height Control Accumulator Solenoid Valve | | | Open |
| Pump and Motor | | | Operation |

## Lowering the Vehicle Height

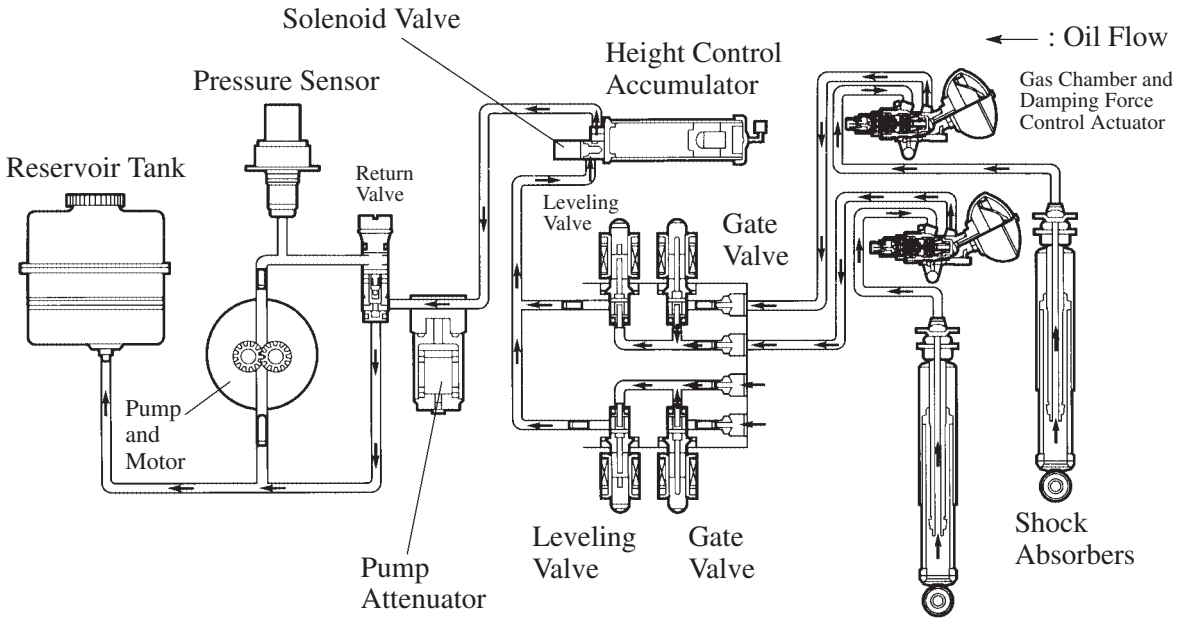
### 1) Vehicle Speed Under 5 km/h (3 mph)

When the height select switch is operated to lower the vehicle height from high to normal, or from normal to low, the front and rear leveling valves are opened simultaneously to allow the fluid in the gas chambers and the shock absorbers at the 4 wheels to return to the reservoir tank, causing the height of the suspension at all 4 wheels to become lowered at the same time.
However, if the rear side is expected to become lower more quickly due to the load condition, and the difference between the lowering of the front side and the rear side becomes greater than a prescribed value, the rear leveling valve closes once, allowing only the vehicle height to become lowered at the front side. This feature prevents the headlights from being aimed upward.

### 2) Vehicle Speed Over 5 km/h (3 mph)

When the height select switch is operated to lower the vehicle height from high to normal, the front and rear leveling valves are opened alternately to lower the suspension of the front wheels and the rear wheels alternately.
When the vehicle speed is higher than approximately 5 km/h (3 mph), the vehicle height will not be lowered from normal to low.



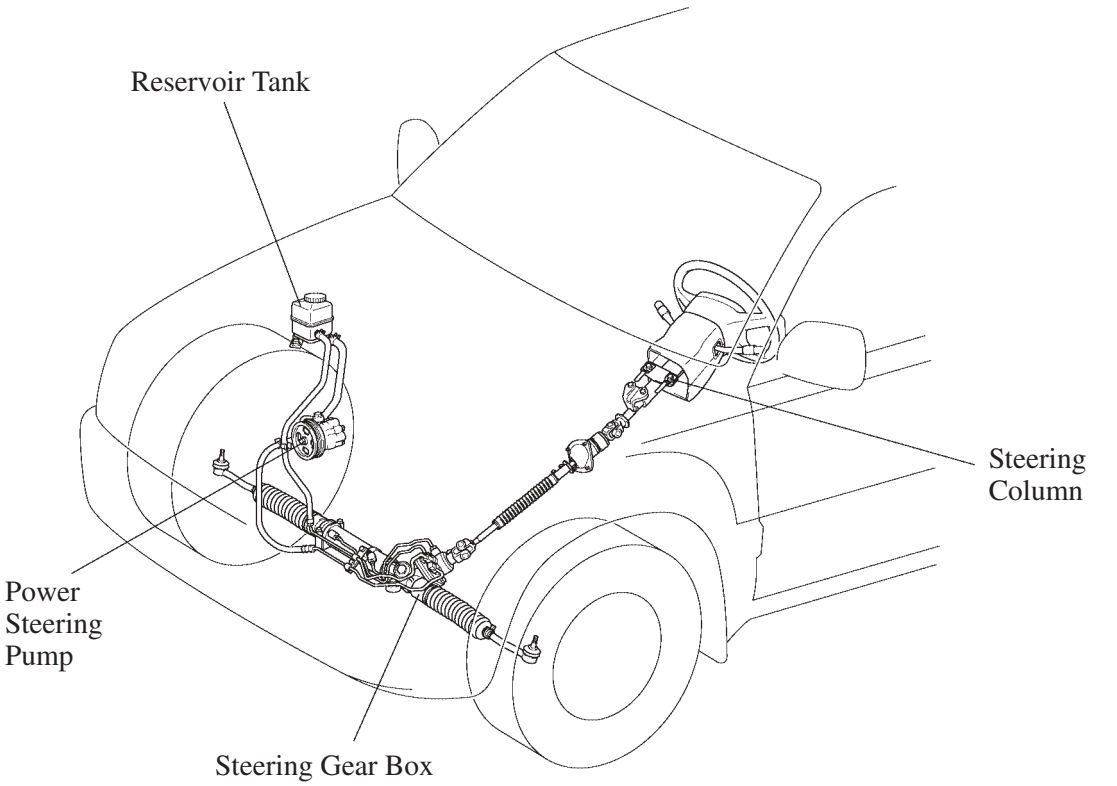



| Condition | | | Under 5 km/h (3 mph) | | Over 5 km/h (3 mph) |
|---|---|---|---|---|---|
| | | | When lowering the four wheels simultaneously | Except lowering the four wheels simultaneously | |
| Control Valve Assembly | Front | Leveling Valve | Open | Open or Close | Open and Close |
| | | Gate Valve | Open | Open | Open |
| | Rear | Leveling Valve | Open | Open or Close | Open and Close |
| | | Gate Valve | Open | Open | Open |
| Height Control Accumulator Solenoid Valve | | | Close | Close | Close |
| Pump and Motor | | | Stop | Stop | Stop |

# STEERING

## ■ DESCRIPTION

- As in the previous model, the engine revolution sensing type recirculating ball type power steering is used for the rigid axle front suspension model.
- The engine revolution sensing type rack and pinion power steering is used for the independent front suspension model.
- A compact and lightweight tilt mechanism is used.
- A power tilt and power telescopic mechanism is optional equipment for the independent front suspension model except 1FZ-FE engine model for G.C.C. Countries and the swing type back door model for General Countries.
- An energy absorbing plate type energy absorbing mechanism is used in the steering column.



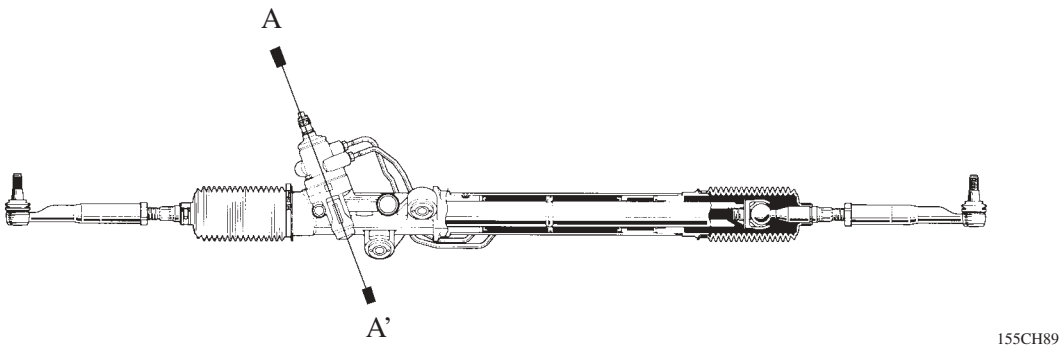

**LHD Model with 2UZ-FE Engine**

**▶ Specifications ◀**

| | | | |
|---|---|---|---|
| Steering Gear Type | | Recirculating Ball Type | Rack and Pinion Type |
| Gear Ratio (Overall) | | 18.59 | 19.8 |
| No. of Turns Lock to Lock | | 3.4 | 3.8 |
| Rack Stroke | mm (in.) | – | 178 (7.01) |
| Fluid Type | | ATF Type DEXRON®II or III | ← |

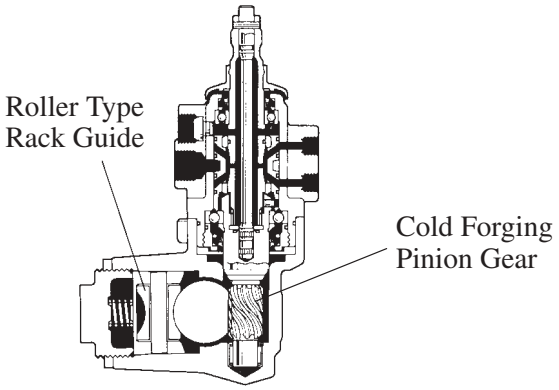
## ■RACK AND PINION POWER STEERING GEAR (FOR IFS)

- A compact and lightweight rack and pinion type steering gear has been adopted to provide a good steering feeling.
- A cold-forged pinion gear with an improved precision of the gear tooth flank has been adopted to improve the steering feeling.
- The hydraulic characteristics have been optimized to enable the steering to be handled easily during stationary and low-speed conditions and to provide substantial response in the medium- to high-speed range.
- Aroller type rack guide is used to realize smoother steering feeling and excellent steering response.




155CH89



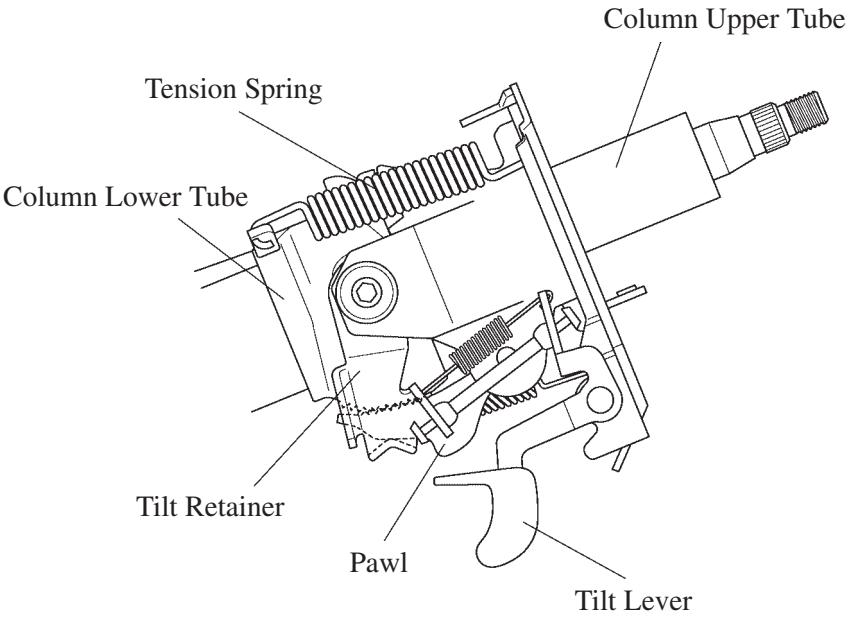



155CH92

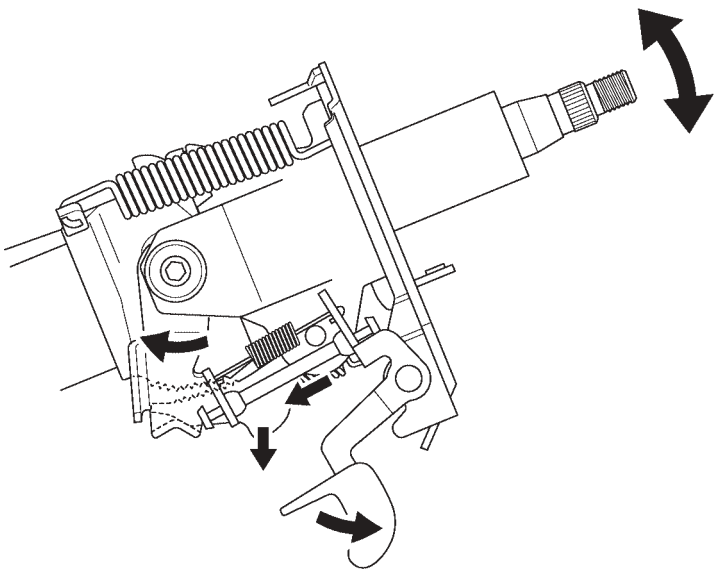
**A – A' Cross Section**

## ■ TILT STEERING

A tilt mechanism consists of a column upper tube, lower tube, pawl, tilt retainer, tilt lever and tension springs etc.
The pawl is attached to the column upper tube. Under spring tension, the pawl is pushed by the tilt retainer against the ratchet in the lower tube, thus locking the tilt steering.
By operating the tilt lever, the tilt retainer moves in unison to release the pawl. The pawl disengages from the ratchet in the lower tube, allowing the steering to tilt.




156CH02



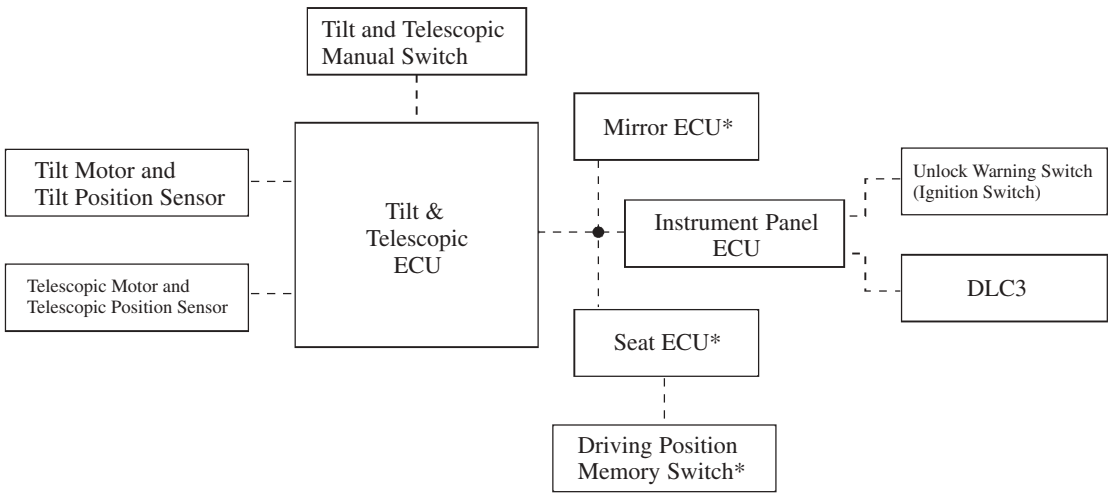
156CH03

## ■POWER TILT AND POWER TELESCOPIC STEERING COLUMN

### 1. General

- A compact and lightweight power tilt and power telescopic steering column that uses ultrasonic motors is available as an option.
- The auto set function has been adopted.
- The steering column can be set to 2 positions in conjunction with the driving position memory function for Europian model.
- A self-diagnosis function is used. The M-OBD (Multiplex On-Board Diagnostic) system is supported.

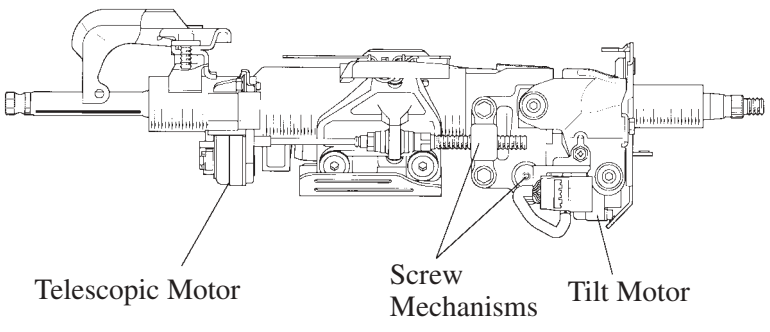
### 2. System Diagram




*: Models for Europe

### 3. Construction

Using ultrasonic motors that feature low-speed and high-torque characteristics, the power tilt and power telescopic steering column has adopted a compact and light weight tilt and telescopic mechanism that does not require a reduction mechanism.
Each of the ultrasonic motors contains a position sensor that uses a Hall IC and a magnet to detect the tilt position or the telescopic position.
The tilt and telescopic mechanism uses a screw mechanism to convert the motor's rotational movement to a linear movement.

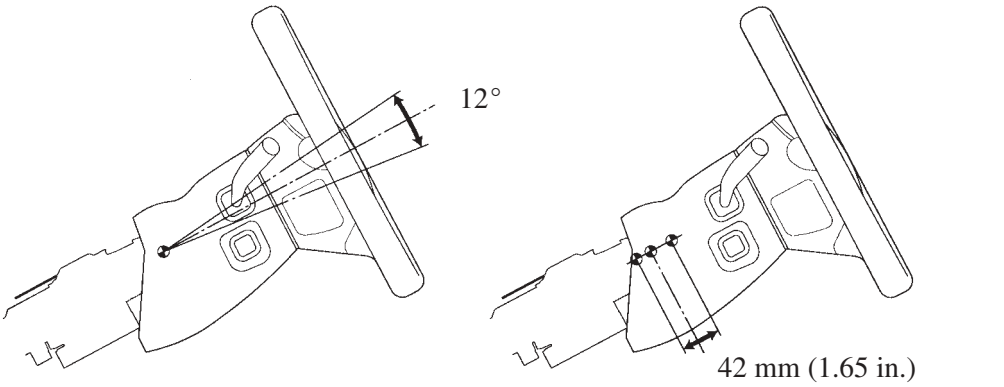



CH

## 4. Operation

### Manual Operation

The tilt position and the telescopic position can be adjusted as desired by operating the tilt and telescopic switch.
A stepless adjustment enables the tilt mechanism to be tilted 12° vertically, and the telescopic mechanism to be moved 42 mm (1.65 in.) longitudinally.




**Tilt** **Telescopic**

### Auto Set Function

When the ignition key is removed, the steering column moves forward away from the driver and also tilts up for easy exit and entry.
When the ignition key is inserted in the ignition switch, the steering column returns to the previously set position.
The auto set function can be prohibited by using a hand-held tester.

### Position Detection

The rotation of the motor is sensed and the tilt and telescopic positions are detected by the position sensor in the motor, which uses a Hall IC and a magnet.

### Driving Position Memory Function (Models for Europe)

Pressing the driving position memory switch that is located in the driver's door duplicates the tilt and telescopic positions that have been previously stored in memory. Up to 2 sets of tilt and telescopic position can be stored.

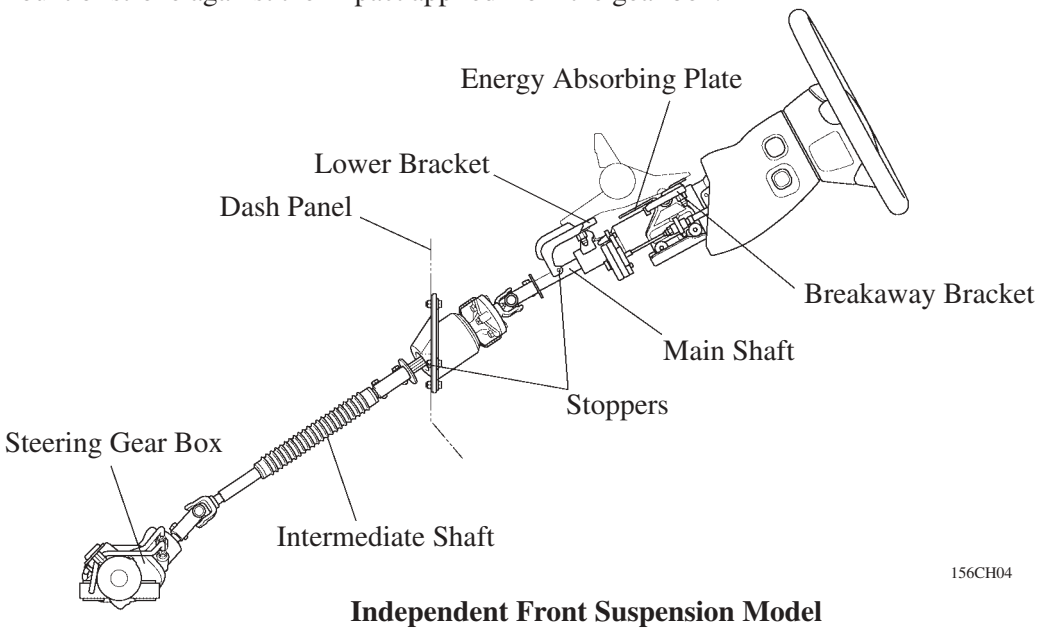
### Self-Diagnosis Function

If the tilt and telescopic ECU detects a malfunction in the power tilt and power telescopic system, the ECU stores the malfunction data in memory. Then, by connecting a hand-held tester to the DLC3 terminal, the diagnostic trouble codes (DTCs) can be accessed and an active test can be performed. For details, see the Land Cruiser Chassis and Body Repair Manual (Pub. No. RM616E).

## ■ENERGY ABSORBING MECHANISM

### 1. Construction

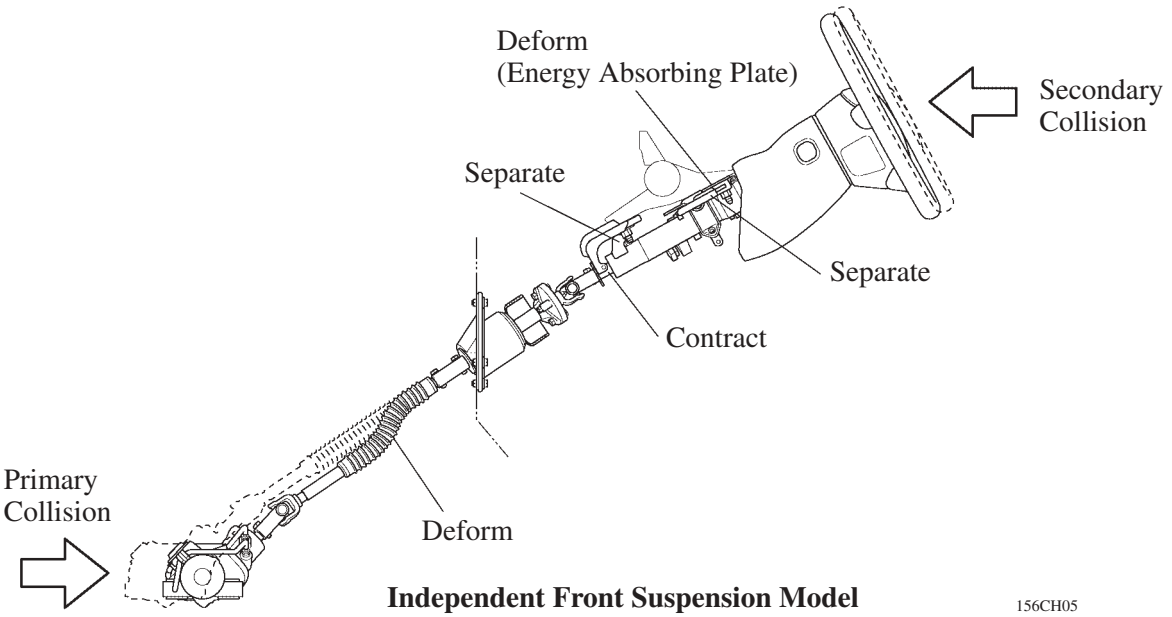
The energy absorbing mechanism in the steering column consists of a lower bracket, breakaway bracket, energy absorbing plate and a contractile main shaft. The steering column is mounted onto the instrument panel reinforcement via a lower bracket and breakaway bracket which is supported via a capsule and energy absorbing plate. The steering column and the steering gear box are connected with an intermediate shaft that contains a corrugated tube. In addition, the stoppers are provided on the lower bracket and the dash panel to regulate the amount of stroke against the impact applied from the gear box.




**Independent Front Suspension Model**

### 2. Operation

When the steering gear box moves during a collision (primary collision), the corrugated tube of intermediate shaft deformes and, the main shaft contracts, thus reducing the steering column and the steering wheel from protruding into the cabin.
When an impact is transmitted to the steering wheel in a collision (secondary collision), the steering wheel and the steering wheel pad help absorb the impact. In addition, the breakaway bracket and the lower bracket separate, causing the entire steering column to move forward.
At this time, the energy absorbing plate becomes deformed to help absorb the impact of the secondary collision.




**Independent Front Suspension Model**

# BODY

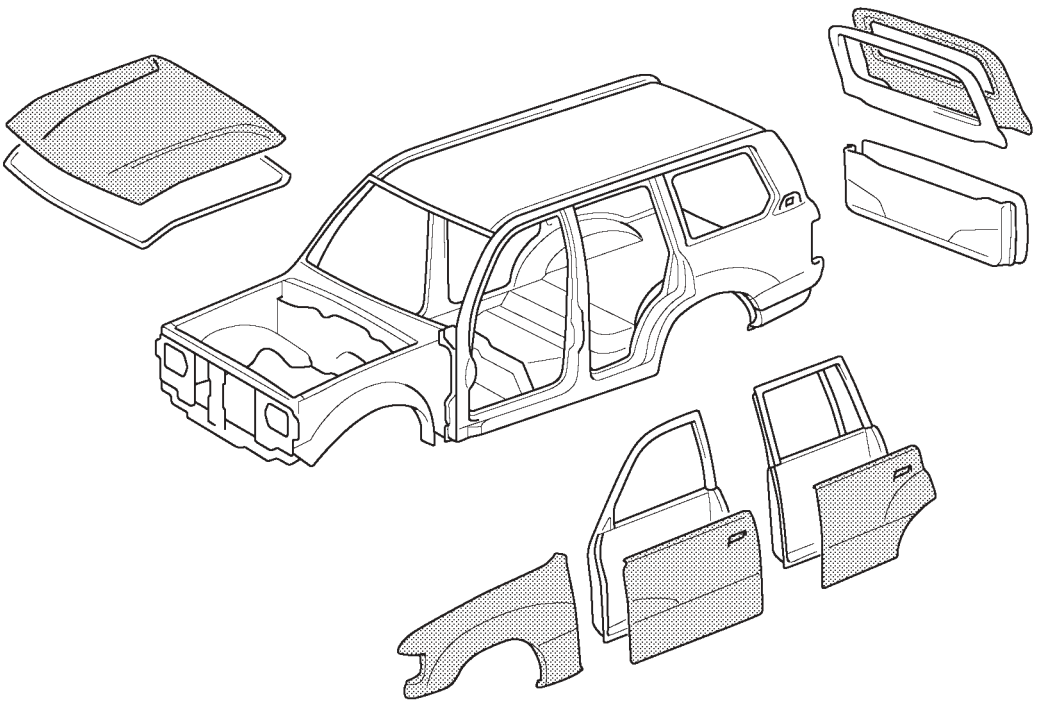
## HIGHLY RIGID BODY

The body of the Land Cruiser has been made lightweight and highly rigid through the refinement of the shape and construction of each part, optimized allocation of reinforcements and members, and use of high strength sheet steel.

### ■ HIGH STRENGTH SHEET STEEL

High strength sheet steel is used for the hood and door panels, etc.

**: High Strength Sheet Steel**

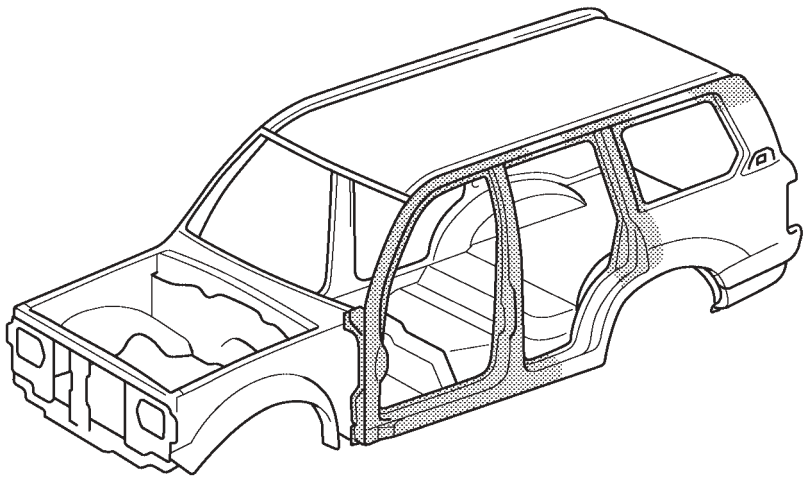


155BO53

## ■ BODY SHELL

- The areas that join the pillars to the roof side rail or the rocker are provided with reinforcements to ensure a strong pillar construction. In addition, reinforcements are efficiently located throughout the body to realize excellent body rigidity.

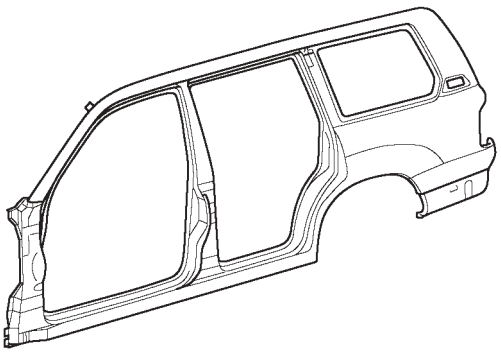
**: Reinforcements**



155BO29

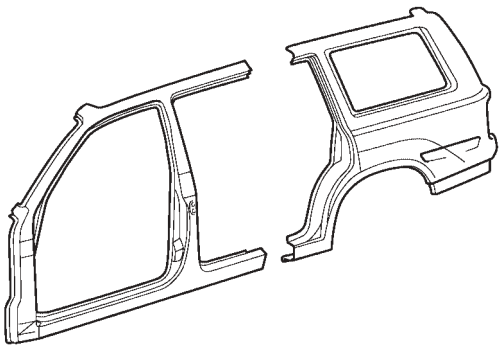
- The side member panel has been integrated in order to realize excellent panel precision and joining rigidity.





155BO02

**New**



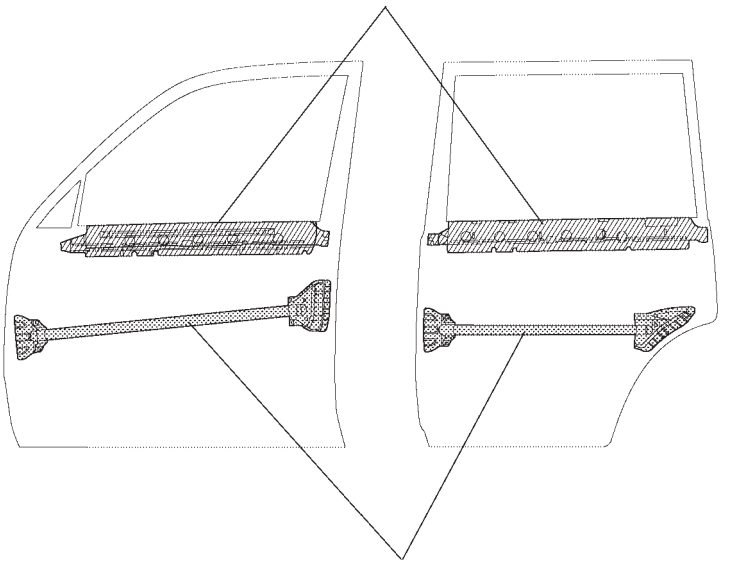
155BO03

**Previous**

## ■ DOORS

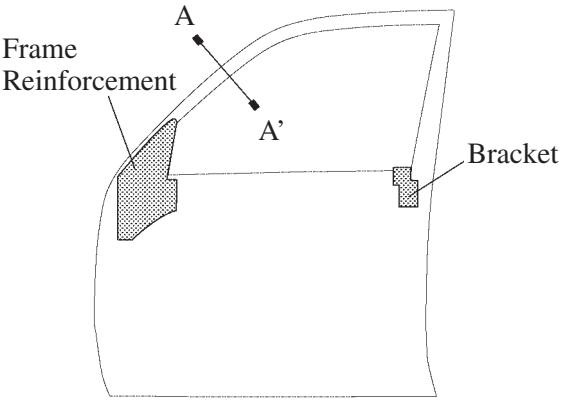
- Pipe type side impact protection beams are mounted in the center space between the outer and inner door panels.
- The inner and outer reinforcements are applied to the belt line area of the front and rear doors to make the doors more energy absorbent.

Inner and Outer Reinforcements

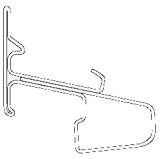


Side Impact Protection Beams 155BO07

- The cross section of the door frame has been made smaller to improve the looks.
- The rigidity of the area of the door frame on which the door is installed has been improved and the wind noise has been reduced by changing the shape of the frame reinforcement and adding a bracket.

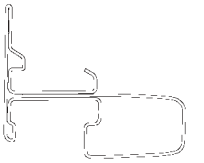



155BO31



155BO11

**New**



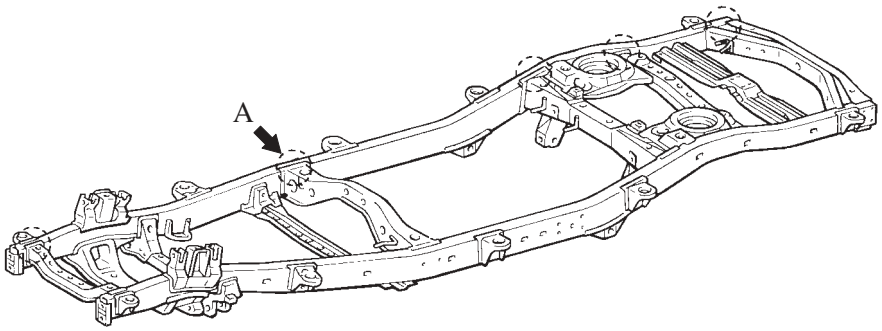
155BO12

**Previous**

**A – A' Cross Section**

## ■FRAME

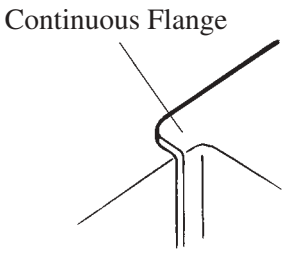
- The shape of the various areas of the frame has been modified in order to realize excellent collision safety performance, good driving stability and riding comfort.
- A continuous flange type construction has been adopted in the areas that join the side rails to the cross members to realize excellent joining rigidity. Similarly, the continuous flange type construction has been adopted in the areas that join the brackets.




155BO42

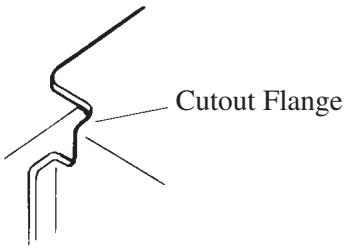
**Models with Independent Front Suspension**






155BO43

**New**




155BO44

**Previous**

**View A**

## ■IMPACT ABSORBING STRUCTURE

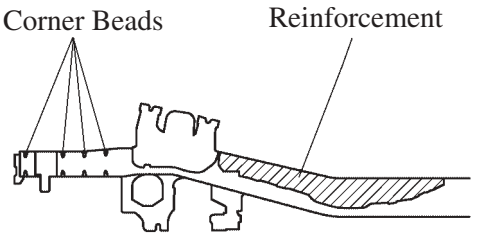
### 1. General

The impact absorbing structure of the new Land Cruiser provides a body and frame construction that can effectively absorb the energy of impact in the event of a front, rear or side collision.
Also, an excellent occupant protection performance has been realized by adopting a frame construction that effectively absorbs and disperses the impact energy, and a strong body construction has been made possible through the use of the large and optimally allocated frame materials around the cabin.

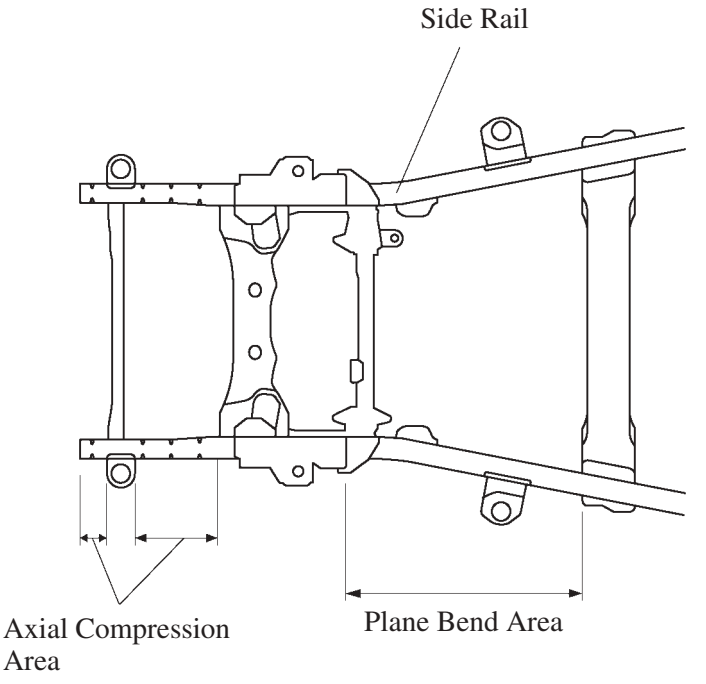
### 2. Construction

#### Impact Absorbing Structure for Front Collision

Corner beads have been provided in the front area of the side rail. Also, the cross section area of the side rail has been enlarged and reinforcements have been provided inside the side rail. Through these measures, the deformation of the frame can be controlled in accordance with the impact energy that is applied during a frontal collision, thus effectively absorbing the impact energy that is transmitted to the cabin and minimizing the deformation of the cabin.




155BO04

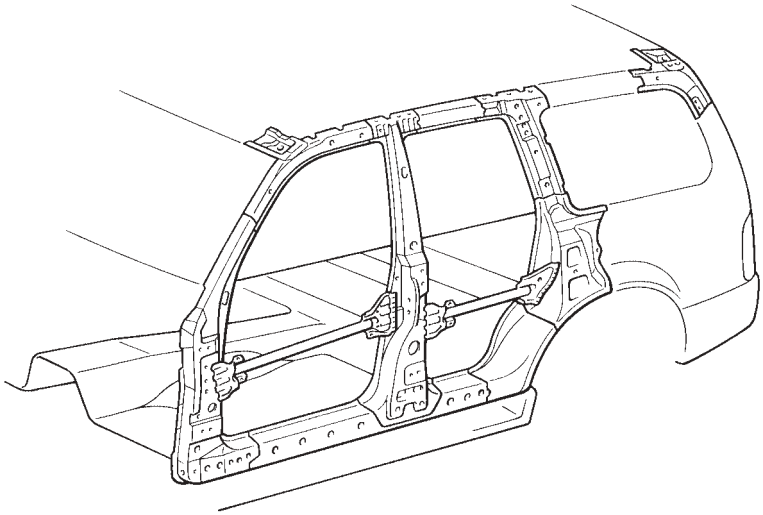



155BO05

## Impact Absorbing Structure for Side Collision

- Impact energy of a side collision directed to the cabin area is dispersed throughout the body via pillar reinforcements, side impact protection beams, floor cross members, etc. This dispersion of energy keeps the energy directed to the cabin to a minimum level.
  As a result, the deformation of the cabin is minimized.
- A Head Impact Protection Structure has been adopted. With this type of construction, if the occupant's head hits against the roof side rail and pillar in reaction to a collision, the inner ribs of the roof side rail and pillars collapses to help reduce the impact.

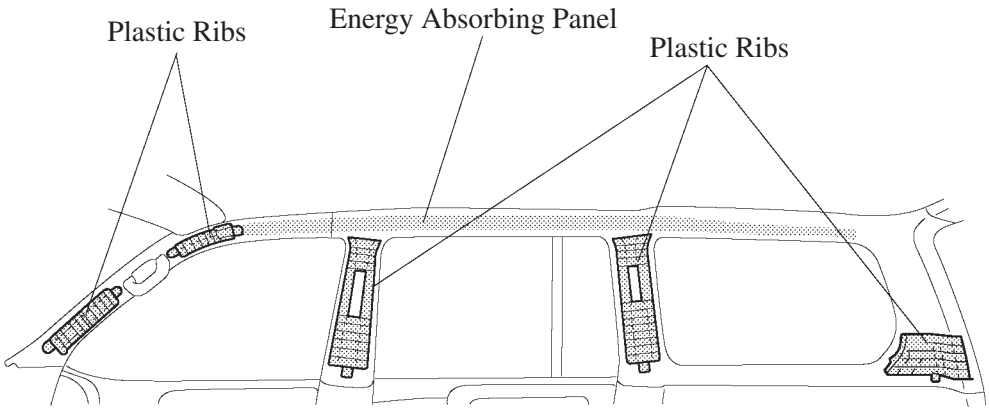
**▶ Impact Absorbing Structure for Side Collision ◀**



155BO48



**▶ Head Impact Protection Structure ◀**



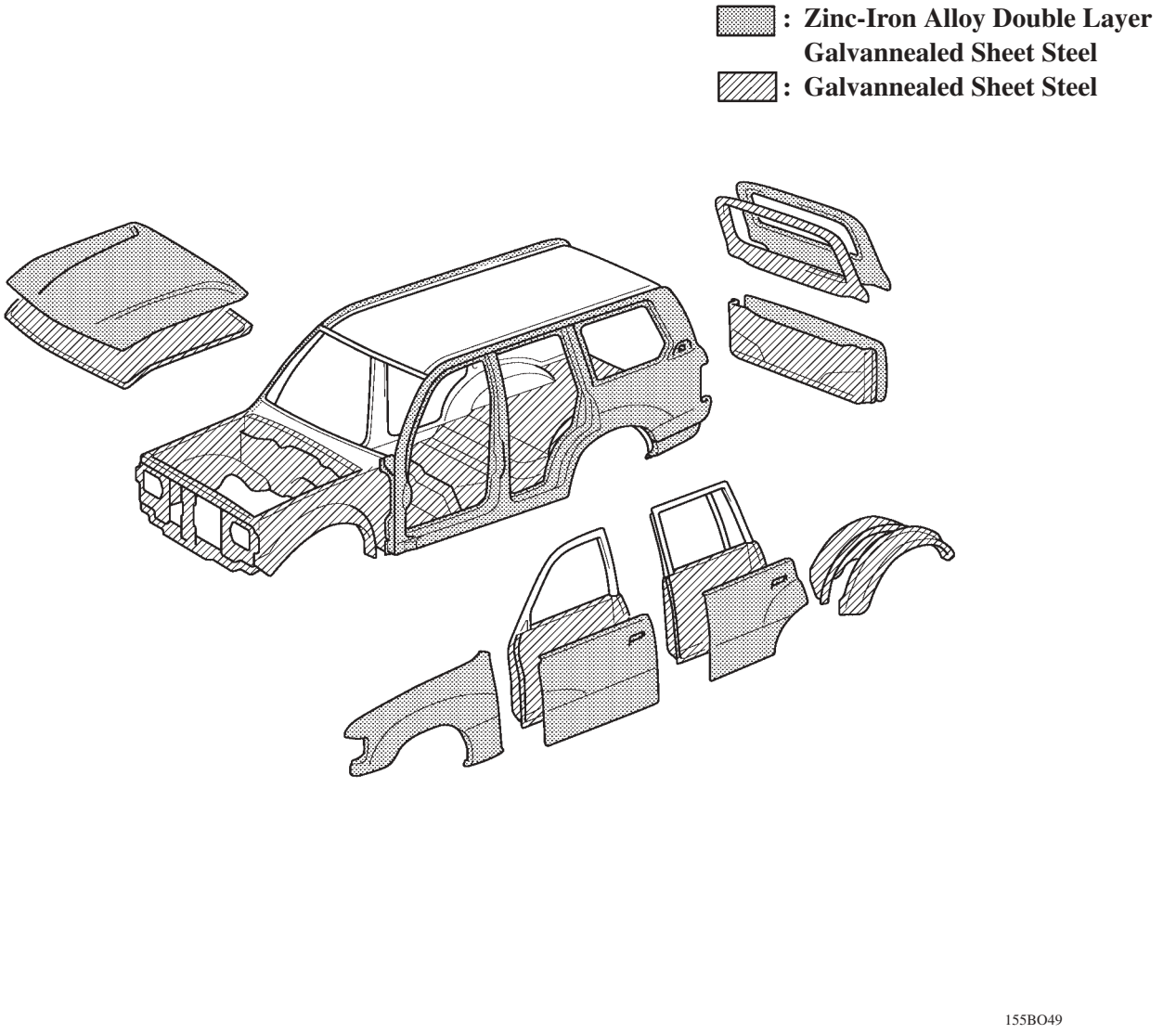

156BO04

# RUST–RESISTANT BODY

Rust-resistant performance is increased by using anti-corrosion sheet steel and anti-corrosion treatment by applying wax, sealer, anti-chipping paint, etc. to easily corroded parts such as the hood, doors, rocker panels, etc.

## ■ ANTI–CORROSION SHEET STEEL

2 types of anti-corrosion sheet steel are used: galvannealed sheet steel and zinc-iron alloy double layer galvannealed sheet steel. Galvannealed sheet steel is used for many inner panels and the engine compartment, etc. Zinc-iron alloy double layer galvannealed sheet steel is used for major outer panels such as the hood, doors and back door.



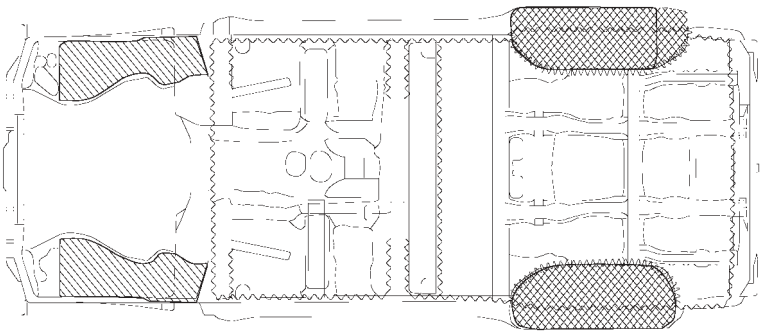
## ■ WAX AND SEALER

Wax and sealer are applied to the hemmed portions of the hood, door panels, hinge and etc. to improve rust-resistant performance.

## ■ UNDER COAT

PVC (Polyvinyl Chloride) coating is applied to the under side of the body. The fender apron and other parts which are subject to damage by flying stones, etc. given a thick coating to improve rust-resistant performance.

**: PVC Coating Area**
**: PVC Coating Area (Thick Coating)**
**: Edge Seal**

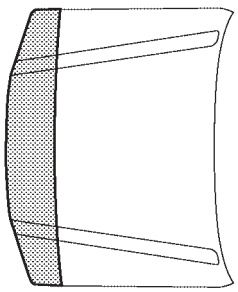


155BO09

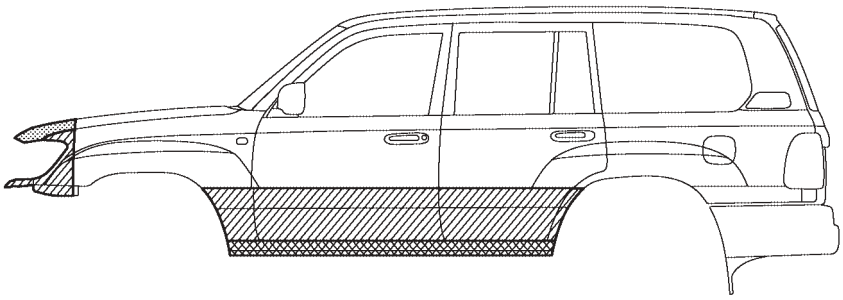


## ■ ANTI–CHIPPING APPLICATION

PVC chipping primer is applied to the rocker panel area to protect them from flying stones Soft-chip primer is applied to the hood and front end panels.
In addition, anti-chipping paint is applied to the lower door panel area on models without side step.



**: Soft-Chip Primer**
**: Anti-Chipping Paint**
**: PVC Chipping Primer**



156BO01

## ■ WAX AND SEALER

Wax and sealer are applied to the hemmed portions of the hood, door panels, hinge and etc. to improve rust-resistant performance.

## ■ UNDER COAT

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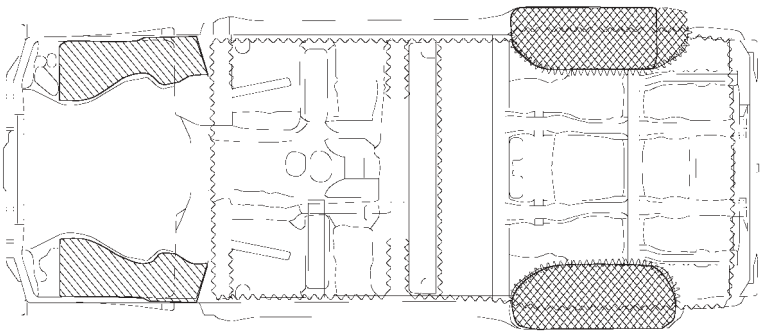
**: PVC Coating Area**
**: PVC Coating Area (Thick Coating)**
**: Edge Seal**



155BO09



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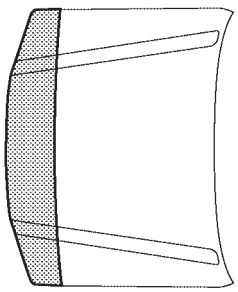
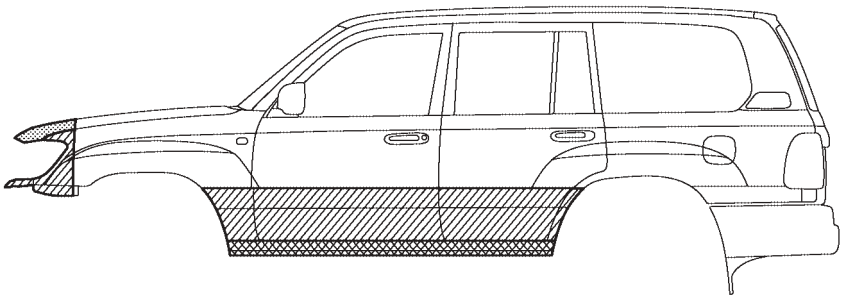


**: Soft-Chip Primer**
**: Anti-Chipping Paint**
**: PVC Chipping Primer**



156BO01

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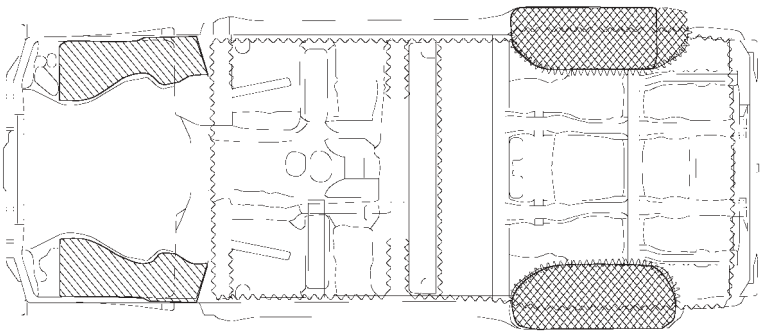
**: PVC Coating Area**
**: PVC Coating Area (Thick Coating)**
**: Edge Seal**



155BO09



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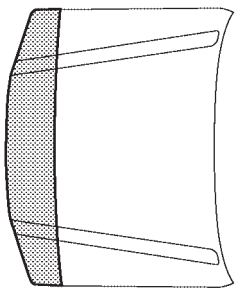
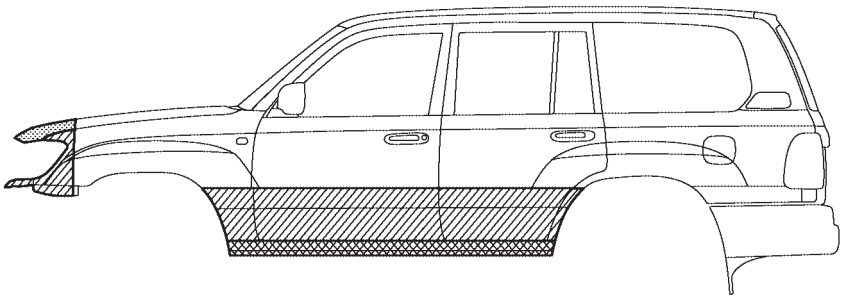


**: Soft-Chip Primer**
**: Anti-Chipping Paint**
**: PVC Chipping Primer**



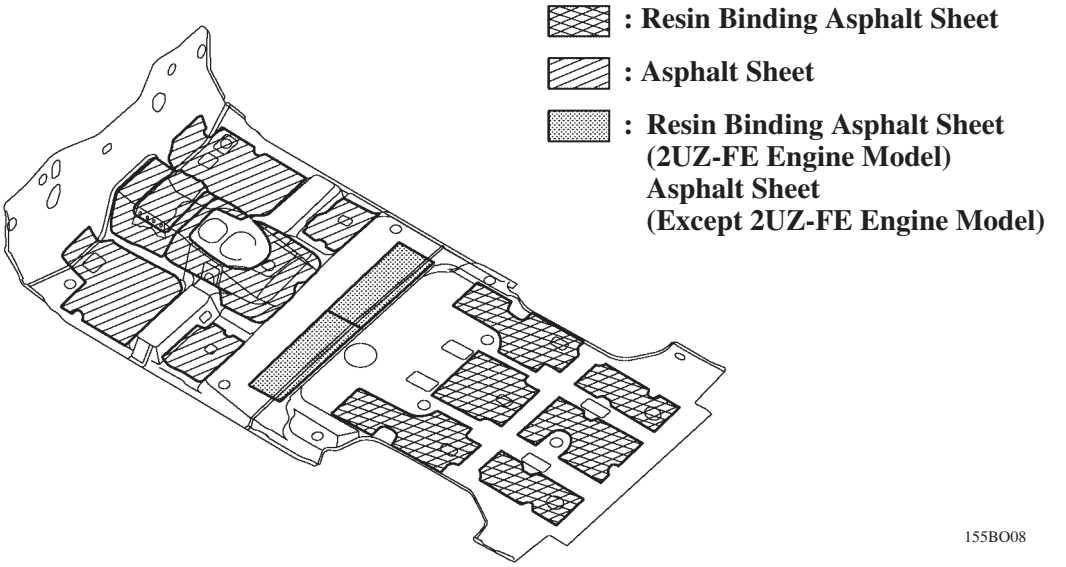
156BO01

# LOW VIBRATION, LOW NOISE BODY

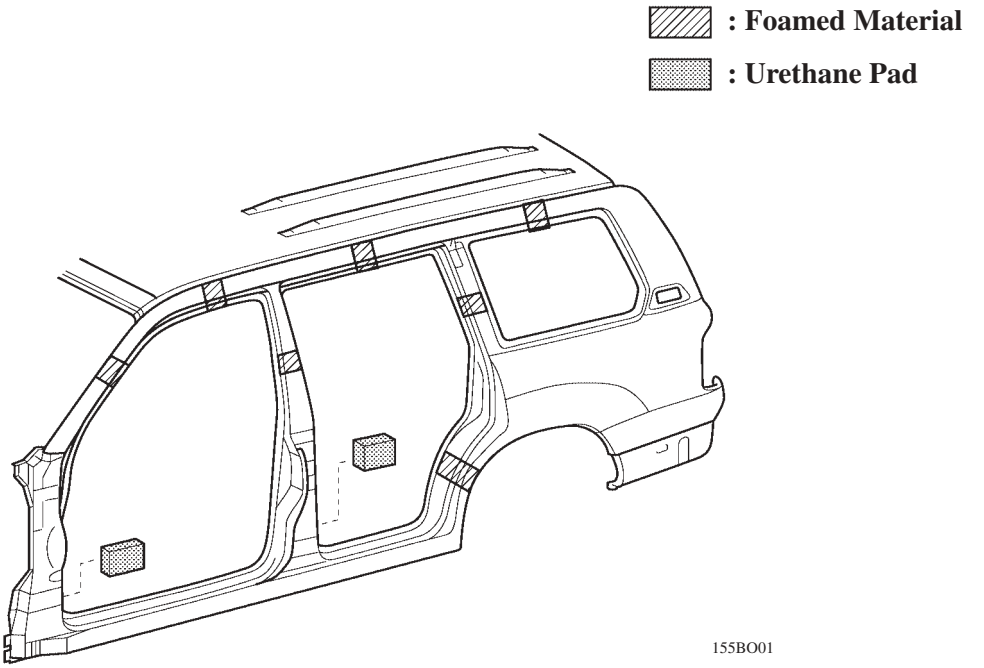
An effective application of vibration damping and noise suppresant materials reduces engine and road noise.

## ■ SOUND ABSORBING AND VIBRATION DAMPING MATERIALS

- Resin binding asphalt sheets and asphalt sheets are optimally allocated to reduce engine and road noise for quieter vehicle operation.

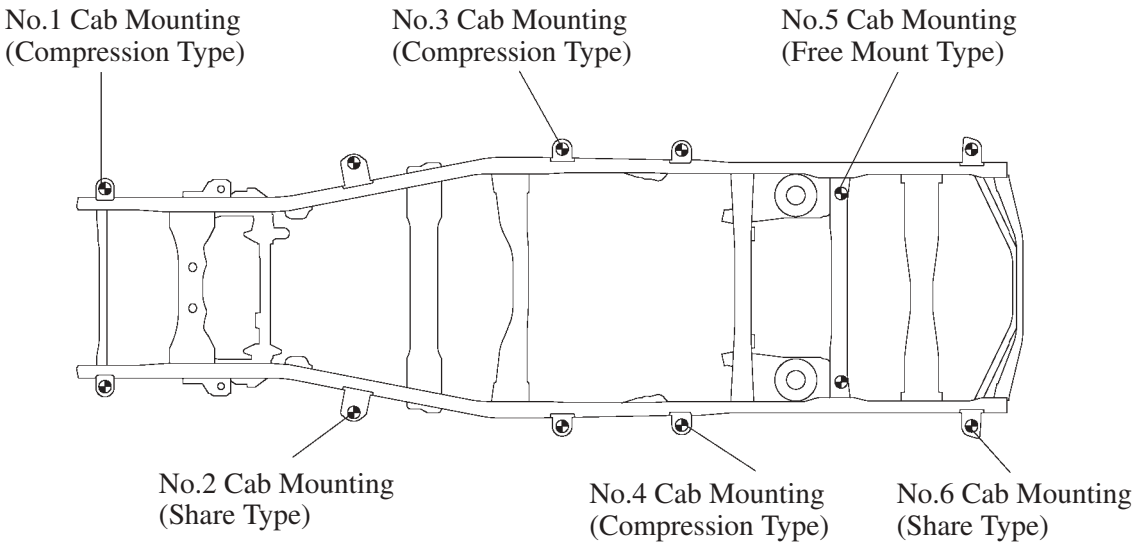



- Foamed material is provided inside the pillar and the roof rail and urethane pad is provided at the bottom of the pillars. As a result, the wind noise and the road noise that are transmitted to the rockers and the pillars have been reduced.

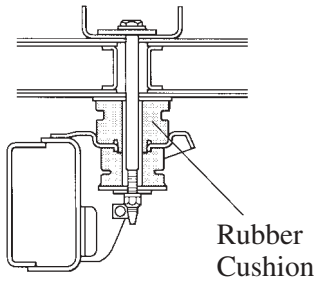


## ■CAB MOUNTING

- The allocation of the cab mounts have been revised and the characteristics of the rubber cushion of the cab mounts have been optimized. Accordingly, the vehicle's riding comfort has been improved and noise and vibration have been reduced.
- The No.1 mount has been changed from the share-type to the compression type. The No.2 mount has been changed from the compression type to the share type. The remaining cab mounts use the same mounts as those of the previous model.

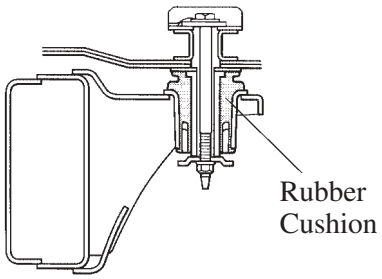



155BO06



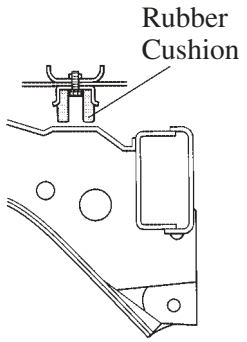

155BO45

**No.1 Mounting (Compression Type)**




155BO46

**No.2 Mounting (Share Type)**

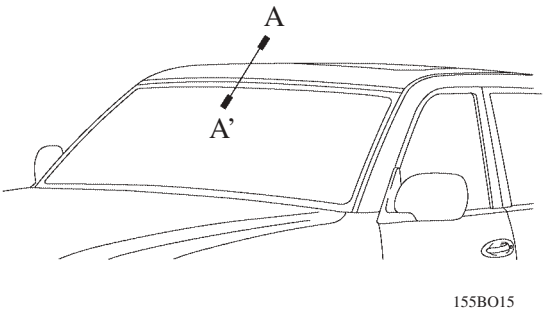



155BO47

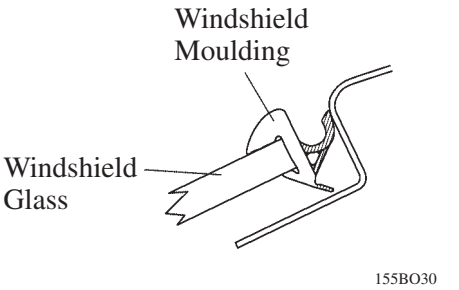
**No.5 Mounting (Free Mount Type)**

## ■ WINDOW

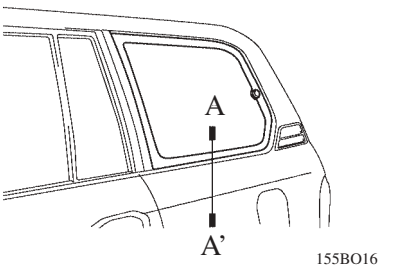
The fitting construction of the windshield glass and the quarter window glass has been changed. As a result, the height variance between the body and the window has been decreased, thus reducing the wind noise.



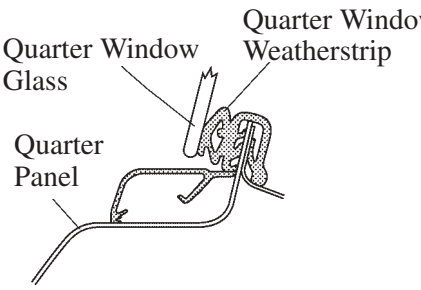

**Windshield Glass**



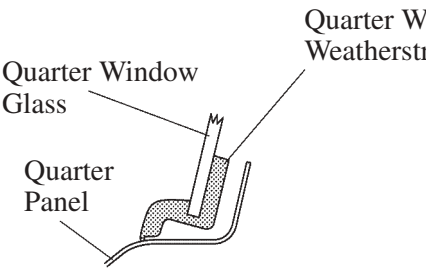

**A – A' Cross Section**




**Quarter Window Glass**




**Swing Type**



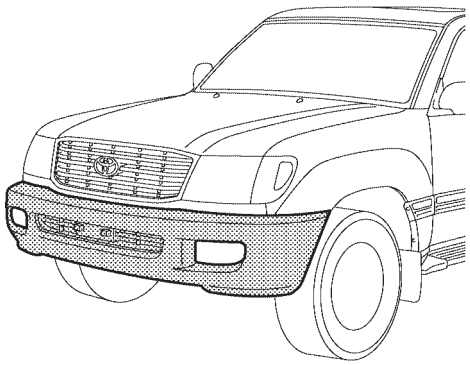

**Fix Type**

**A – A' Cross Section**

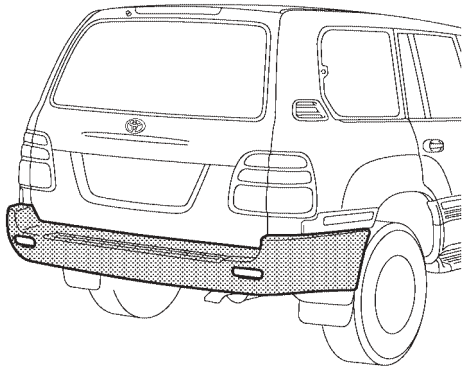
# ENHANCEMENT OF PRODUCT APPEAL

## ■BUMPER

- A one-piece resin bumper made of TSOP (The Super Olefin Polymer) that excels in recyclability is used for both the front and rear bumpers.

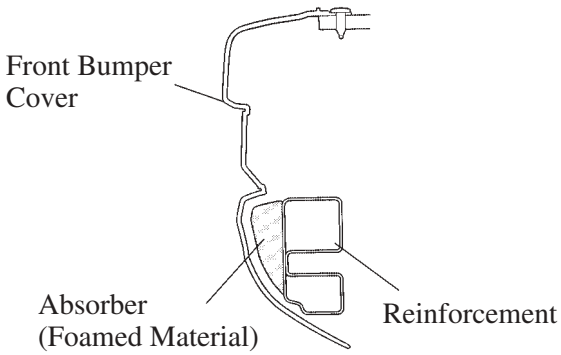


**Front** 156BO02



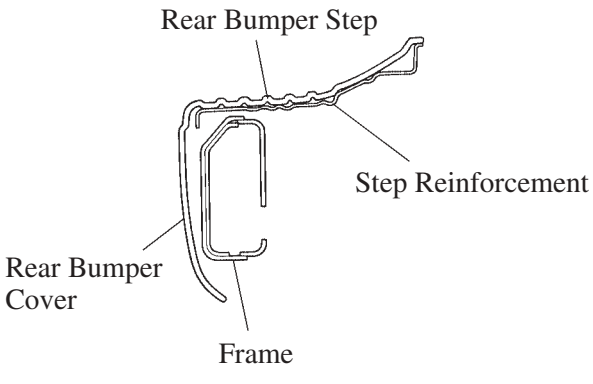
**Rear** 156BO03

- Reinforcements and an absorber (foamed material) are provided in the front bumper to reduce the damage to the body during a light collision.




155BO50

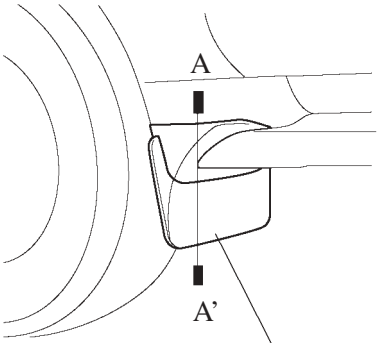
- The rear bumper step has been integrated with the rear bumper cover through composite manufacturing to improve the looks. Also, a step reinforcement has been provided inside the bumper cover to ensure the level of rigidity that is necessary when using the bumper as a step.



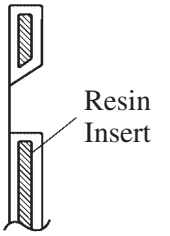

155BO51

## ■ MUD GUARD

The material of both the front and rear mud guard inserts has been changed from metal to resin for weight reduction and improved corrosion resistance.

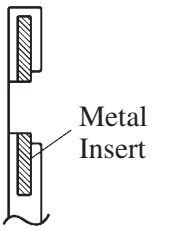



155BO13




155BO40

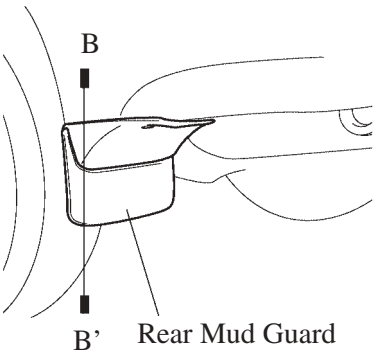
**New**



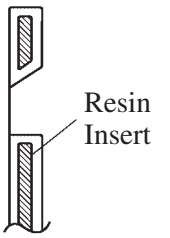

155BO41

**Previous**

**A – A' Cross Section**

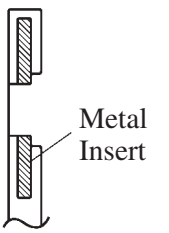



155BO14




155BO40

**New**



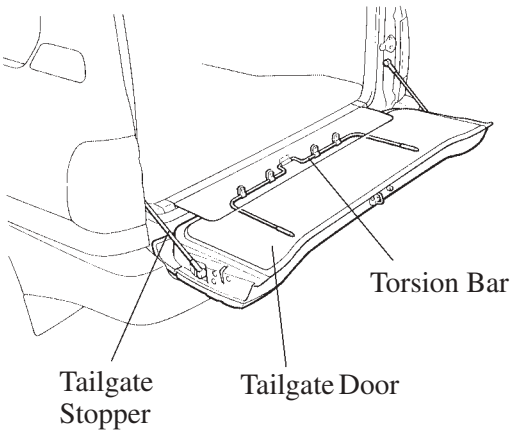

155BO41

**Previous**

**B – B' Cross Section**

## ■ TAILGATE STOPPER

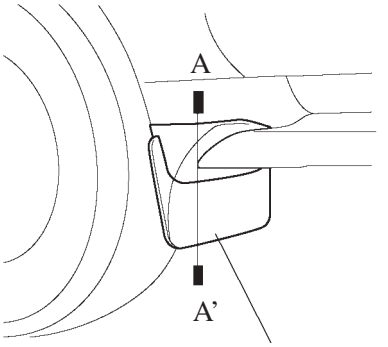
The tailgate stopper has been changed from the folding-arm type to the cable type and a torsion bar has been provided inside the tailgate. As a result, the tailgate can be opened and closed more smoothly.



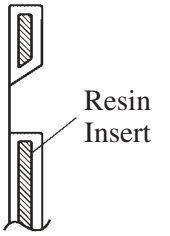

155BO52

## ■ MUD GUARD

The material of both the front and rear mud guard inserts has been changed from metal to resin for weight reduction and improved corrosion resistance.

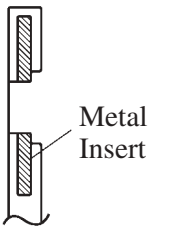



155BO13




155BO40

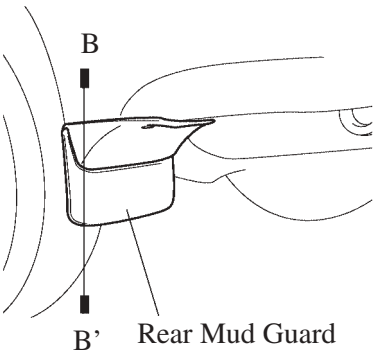
**New**



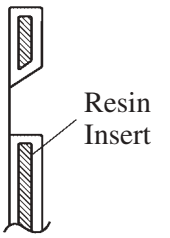

155BO41

**Previous**

**A – A' Cross Section**

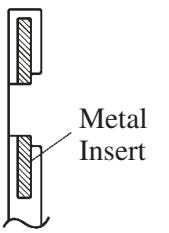



155BO14




155BO40

**New**



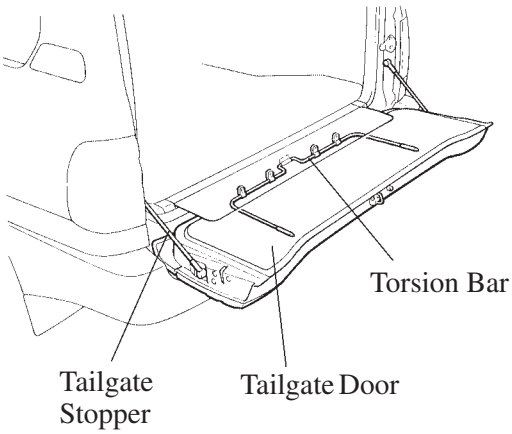

155BO41

**Previous**

**B – B' Cross Section**

## ■ TAILGATE STOPPER

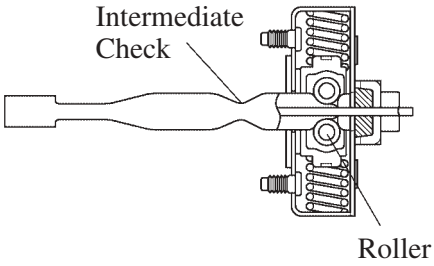
The tailgate stopper has been changed from the folding-arm type to the cable type and a torsion bar has been provided inside the tailgate. As a result, the tailgate can be opened and closed more smoothly.




155BO52

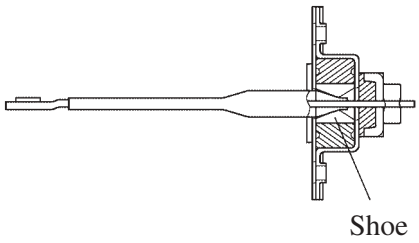
## ■ DOOR CHECK (FRONT AND REAR DOORS)

- The fitting construction of the door check to the body has been changed from the pin-fitted type to the bolt-fitted type. As a result, the appearance and the corrosion resistance of the area where the door check is fitted have been improved.
- The construction of the door check has been changed from the shoe type to the roller type to ensure the smoother operation of the door. In addition, an intermediate check mechanism to maintain the door open at the midway point has been provided for improved convenience.




**New**

155BO38

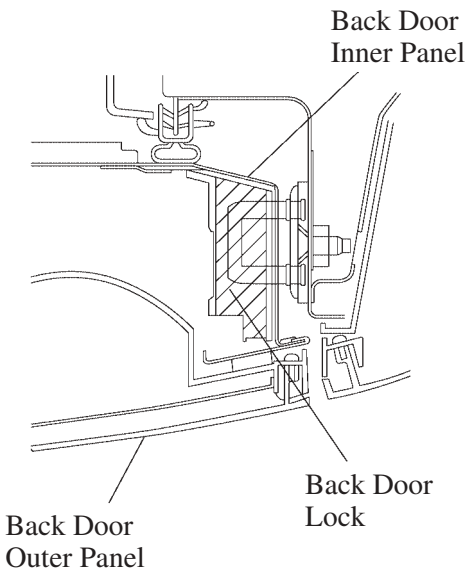



**Previous**

155BO39

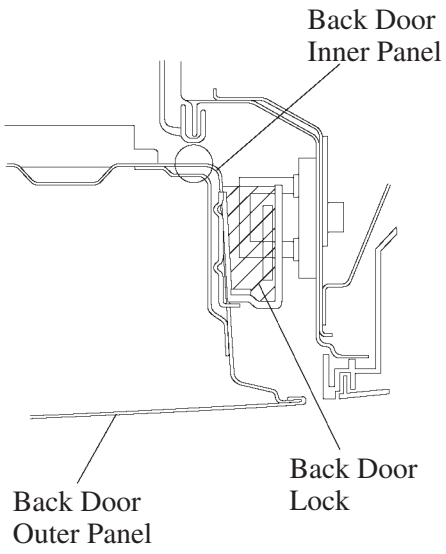
## ■ BACK DOOR LOCK

The position in which the back door lock is fitted has been changed from the outside of the back door to the inside of the back door. Also, the control mechanism of the back door lock has been changed from the link type to the cable type. As a result, the appearance of the back door lock area has been improved and the ease of use of the lock control has been improved.




155BO55

**New**

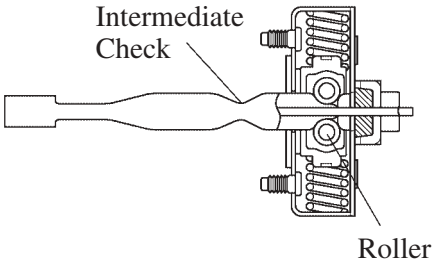



155BO56

**Previous**

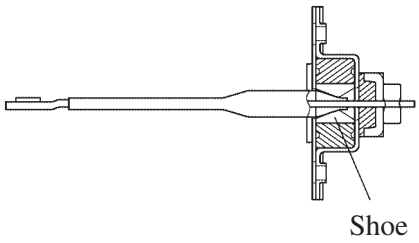
## ■ DOOR CHECK (FRONT AND REAR DOORS)

- The fitting construction of the door check to the body has been changed from the pin-fitted type to the bolt-fitted type. As a result, the appearance and the corrosion resistance of the area where the door check is fitted have been improved.
- The construction of the door check has been changed from the shoe type to the roller type to ensure the smoother operation of the door. In addition, an intermediate check mechanism to maintain the door open at the midway point has been provided for improved convenience.




**New**

155BO38

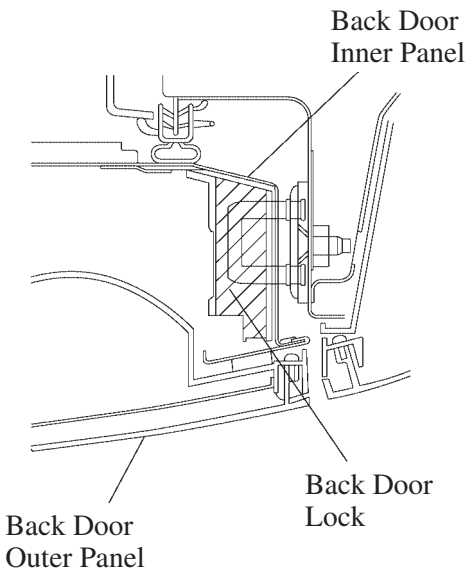



**Previous**

155BO39

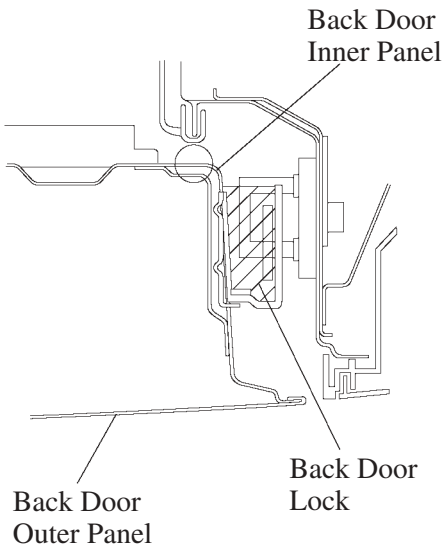
## ■ BACK DOOR LOCK

The position in which the back door lock is fitted has been changed from the outside of the back door to the inside of the back door. Also, the control mechanism of the back door lock has been changed from the link type to the cable type. As a result, the appearance of the back door lock area has been improved and the ease of use of the lock control has been improved.




155BO55

**New**




155BO56

**Previous**

## ■ SEAT BELT

### 1. General

- An adjustable shoulder belt anchor is provided for the front seat and the outer seat of No.1 rear seat.
- The center seat of the No.1 rear seat is provided with a 3-point ELR (Emergency Locking Retractor) seat belt.
- The mechanical sensing type seat belt pretensioner or the electrically sensing type seat belt pretensioner and force limiter are provided for the front seat belt of the new Land Cruiser as described on the chart below.

●: Standard ○: Option

| Destination / Type | Europe | Australia | G.C.C. Countries | General Countries |
|---|---|---|---|---|
| Mechanical Sensing Type Seat Belt Pretensioner | | ●*1 | | ●*3 |
| Electrically Sensing Type Sear Belt Pretensioner and Force Limiter | ● | ●*2, ○*1 | ●*2, ○*1 | ●*2, ○*1 |

*1: STD and GX Grade Model
*2: VX Grade Model
*3: Models for South Africa

### 2. Center Seat Belt of No.1 Rear Seat

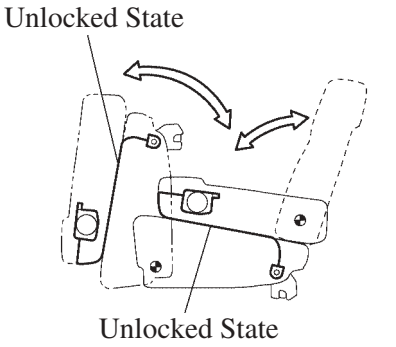
#### General

- A 3-point ELR seat belt with its retractor enclosed in the seat back is provided as the center seat belt.
- Along with its enclosure in the seat back, the retractor has adopted a mechanism in which the deceleration sensor for activating the ELR unlocks mechanically when the seat belt is fully retracted.
- A reclining detection function has been adopted to constantly maintain the deceleration speed in which the center seat belt ELR activates when the seat back is reclined.

## Construction and Operation

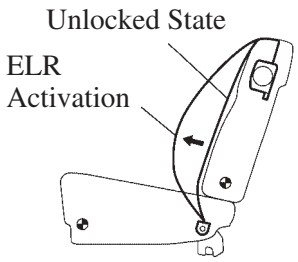
### 1) ELR Mechanism

The ELR of the center seat belt has adopted a mechanism in which the deceleration sensor for activating the ELR unlocks mechanically when the seat belt is fully retracted. As a result, the ease of tilting forward or folding the seat back has been improved.
When a prescribed amount of the seat belt is pulled out, the deceleration sensor is released from its unlocked state and the ELR assumes the normal ELR operation.



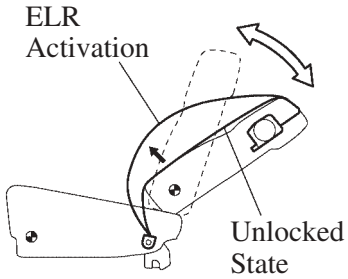

155BO33

**Seat Back in the Tilted Forward or Folded State**




155BO34

**Normal State**



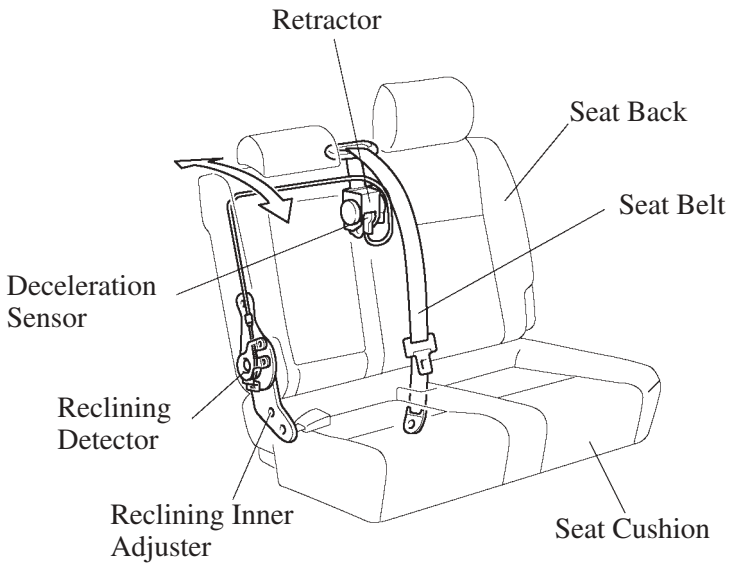

155BO35

**Reclined State**

### 2) Reclining Detection Mechanism

#### a. Construction

The reclining detection mechanism consists of a retractor, a deceleration sensor for activating the ELR, a reclining detector, and a control cable that connects the deceleration sensor with the reclining detection area. The reclining detector, which is installed on the reclining inner adjuster, detects the difference in the angles of the seat back and the seat cushion.

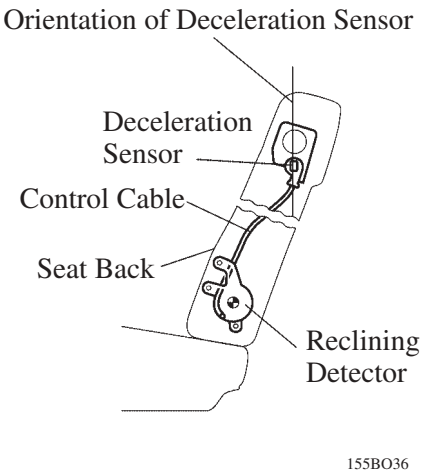



155BO32

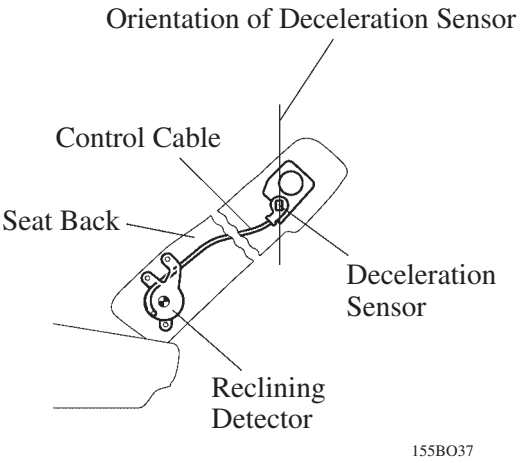
BO

**b. Operation**

When the seat back is reclined, the retractor moves along with the seat back movement. At the same time, the point on which the control cable is attached to the reclining detector rotates together with the movement of the seat back.
Accordingly, the deceleration sensor that is connected to the control cable rotates, without changing the orientation of the sensor regardless of the reclining angle. Thus, the ELR activates at a prescribed deceleration rate regardless of the reclining angle of the seat back.




**Normal State**




**Reclined State**

## 3. Mechanical Sensing Type Seat Belt Pretensioner

### General

In a collision, the pretensioner sensor detects the shock and if the front-to-rear shock is greater than a specified value, the seat belt pretensioner is activated instantaneously to pull in a predetermined length of the seat belt.

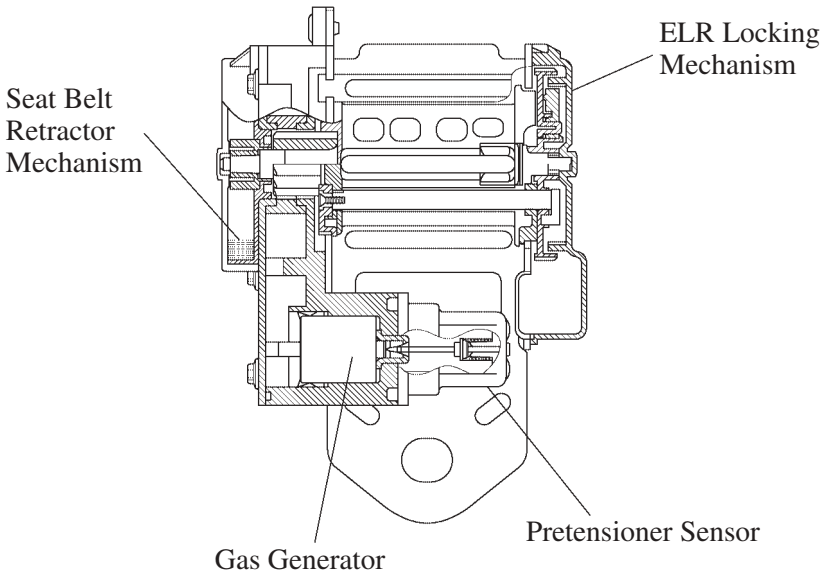
***– REFERENCE –***

*The mechanical sensing type seat belt pretensioner is equipped with an independent pretensioner sensor. For this reason, depending on the circumstances of the collision, there is a case that either right or left seat belt pretensioner alone operates.*

### Construction and Operation

#### 1) General

The seat belt retractor with pretensioner consists of the pretensioner mechanism, retractor mechanism, and ELR locking mechanism. The pretensioner mechanism consists of a pretensioner sensor, gas generator, rotor, gear clutch, key clutch, etc.. When the pretensioner is activated, the key clutch engages the rotor to the gear clutch. Since the rotor and gear clutch are not normally engaged, the gear clutch and the shaft can rotate freely, thus permitting normal seat belt operation.

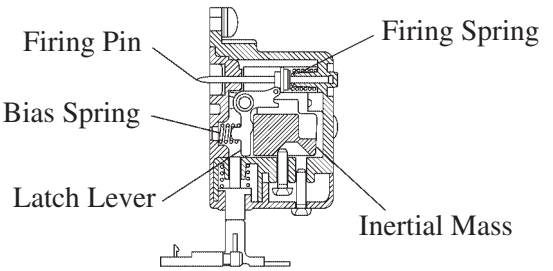



147BO01

**2) Pretensioner Sensor**

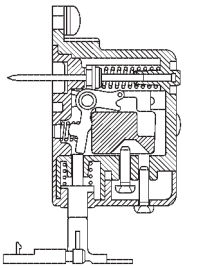
The pretensioner sensor consists of an inertial mass, latch lever, sub-lever, firing pin, firing spring, etc. The latch lever, sub-lever and firing pin are normally engaged with each other so that the firing pin is not ejected. In addition, any unnecessary inertial mass movement is suppressed by the bias spring force so that the seat belt pretensioner is not activated by mistake.
If a severe frontal collision occurs, the vehicle decelerates instantaneously. The inertial mass begins to move despite the bias spring force. If rapid deceleration continues, the spring force of the firing spring disengages the firing pin from the latch lever, ejects the firing pin, and ignites the primer. The flame spreads instantaneously to the gas generator, and a large amount of gas is generated from the gas generator.

**▶ Non-Deployed State ◀**




147BO02

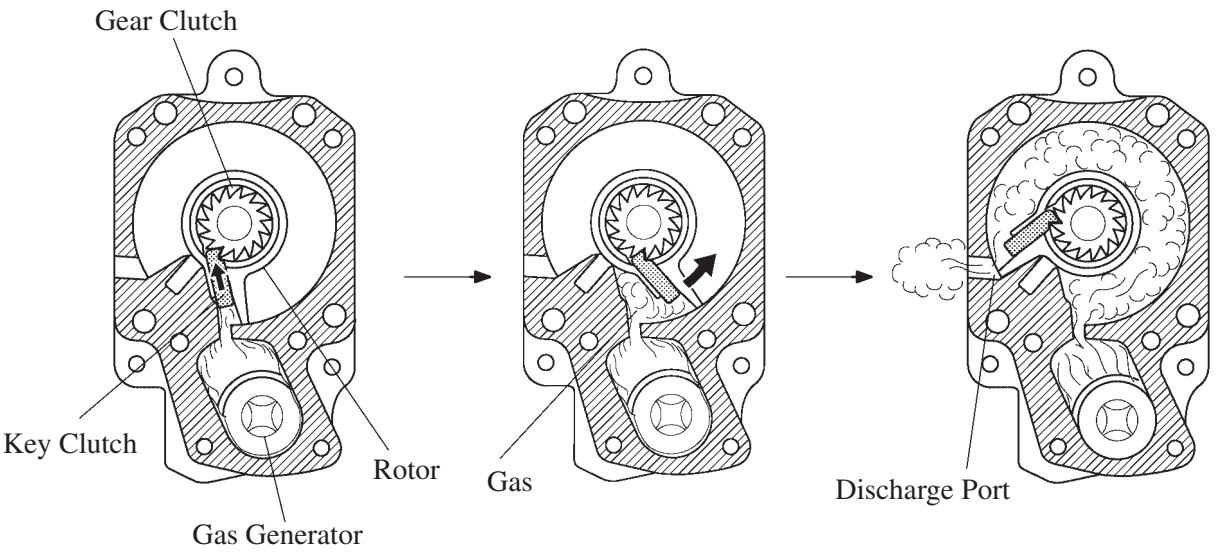
**▶ Deployed State ◀**



147BO03

**3) Pretensioner Mechanism**

The large amount of gas generated by the gas generator flows from the accumulator in the housing to the cylinder. The pressure of the gas introduced into the cylinder pushes the key clutch, which in turn meshes with the teeth of the gear clutch, and causes the rotor and gear clutch to engage. After the internal pressure of the cylinder increases further, the rotor and the gear clutch rotate together. Accordingly, the shaft that is meshed to the teeth of the gear clutch also rotates. According to the rotation of the rotor, the shaft rotates approximately a full turn in the wind-up direction of the seat belt and pulls in a predetermined length of the belt to restrain the occupant. After the rotation of the rotor has been completed, the gas that caused the rotation is discharged from the discharge port, and the internal pressure in the cylinder decreases. After the internal pressure in the cylinder decreases, the key clutch is kept engaged with the teeth of the gear clutch. As a results, the shaft will not be albe to rotate any further, so the seat belt is not pulled out.

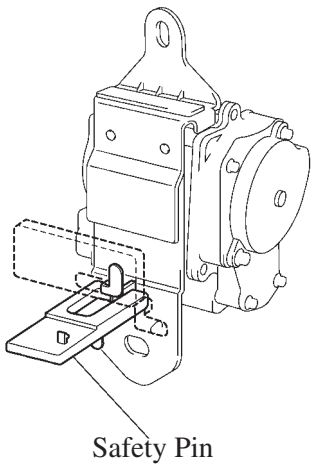



147BO04 147BO05 147BO06

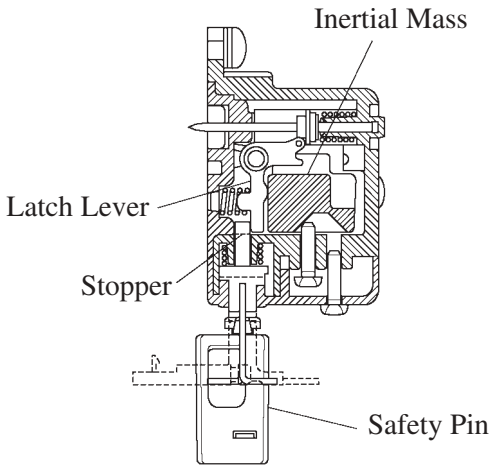
**4) Safety Device**

In order to prevent unintended deployment when removing the seat belt or when handling the seat belt pretensioner by itself, the seat belt pretensioner is equipped with a safety device that stops the operation of the sensor.
To activate the safety device, pull up the safety pin and the safety pin must be pushed, which causes the safety lever to turn 90° clockwise. Accordingly, the stopper that is attached to the tip of the safety lever moves to the position to restrain the movement of the latch lever. Therefore, even if a large deceleration is applied to the inertial mass, the latch lever will not move and the pretensioner sensor will not activate.

**▶ Safety Device Activation ◀**




147BO07




147BO08

## 4. Electrically Sensing Type Seat Belt Pretensioner and Force Limiter

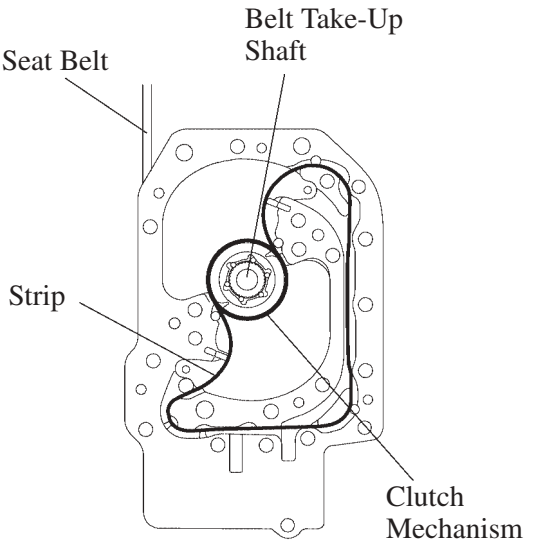
### General

- In the beginning of a collision, the seat belt pretensioner instantly takes up the seat belt, thus realizing the excellent belt's effectiveness in restraining the occupant.
  When the impact of a collision causes the tension of the seat belt that is applied to the occupant to reach a predetermined level, the force limiter restrains the tension, thus reducing the force that is applied to the occupant's chest area.
- In accordance with the ignition signal received from the airbag sensor assembly, the seat belt pretensioner activates simultaneously with the deployment of the SRS airbag for the driver and front passenger.

### Seat Belt Pretensioner

#### 1) Construction

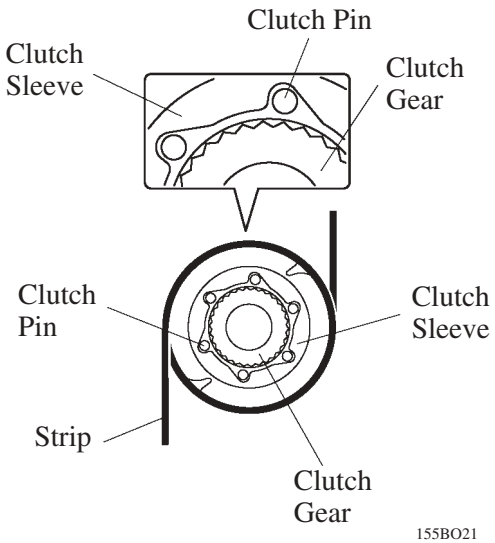
The seat belt pretensioner consists of the pretensioner mechanism, retracting mechanism, and locking mechanism. The pretensioner mechanism consists of a gas generator, strip, clutch mechanism and etc.



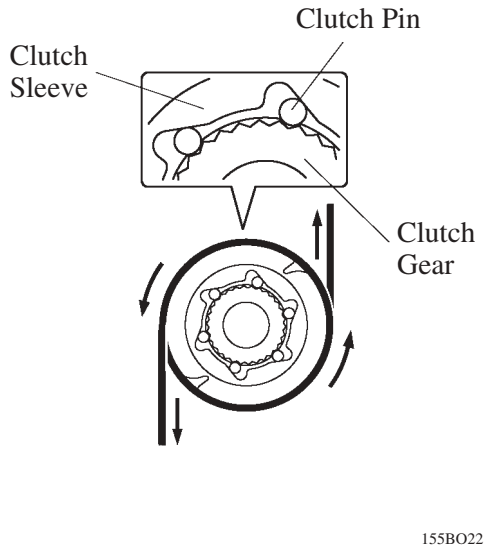

155BO19

### a. Clutch Mechanism

The clutch mechanism consists of a clutch sleeve, clutch pin, base, and clutch gear. The clutch gear is integrated with the belt take-up shaft. The clutch sleeve has a strap wrapped around it.
Normally, the clutch pin is engaged with the base so that the rotation of the clutch gear is not obstructed. The movement of the strap, which is prompted by the gas that is generated by the gas generator, causes the clutch sleeve to rotate. Then, the clutch sleeve causes the clutch pin to shear off from the base, causing the clutch sleeve and clutch gear to engage. As a result, the clutch gear and shaft rotate together.




**Before Activation**



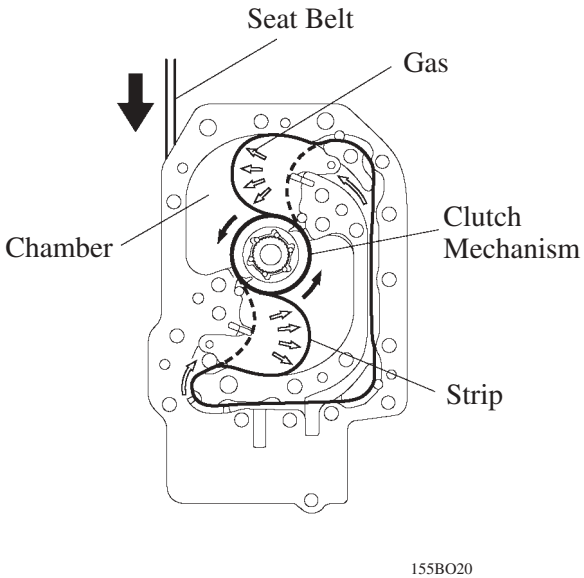

**During Activation**

BO

## 2) Operation

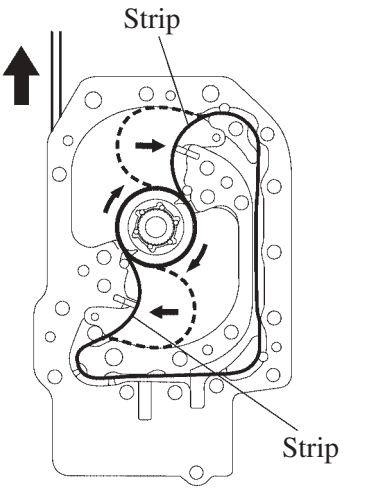
### a. During Activation

According to the igniter signal received from the airbag sensor, the gas generator generates a large volume of high-pressure gas in the chamber.
Then, the strip that is wrapped around the clutch sleeve expands, causing the clutch sleeve to rotate.
Then, the movement of the clutch mechanism causes the clutch gear and shaft to rotate, thus taking up the seat belt.



**b. After Completing Activation**

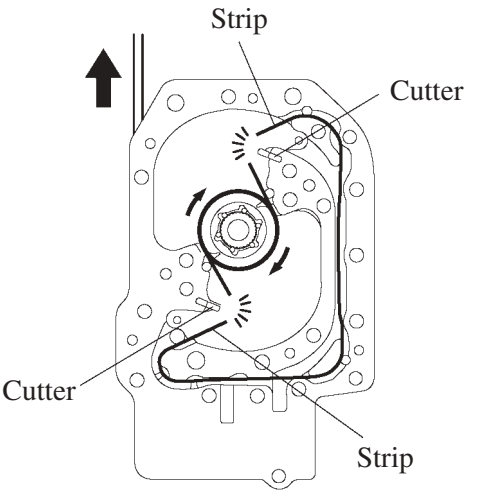
When the activation of the seat belt pretensioner is completed and the seat belt is pulled out by the movement of the occupant, the locking mechanism activates to lock the movement of the belt.
Thereafter, if the force limiter activates, the seat belt is pulled out again, and the rotation of the shaft causes the strip to be taken up by the clutch sleeve.




155BO23

**c. If the Activation Amount of the Force Limiter is Large**

If the amount of seat belt that is pulled out by the activation of the force limiter is greater than the amount of seat belt that is taken up by the activation of the pretensioner, it would prevent the strap from applying resistance to the rotation of the shaft. Therefore, the cutter cuts the strip.
Accordingly, the force limiter can be activated, so that the seat belt's force to restrain the occupant does not become excessive.

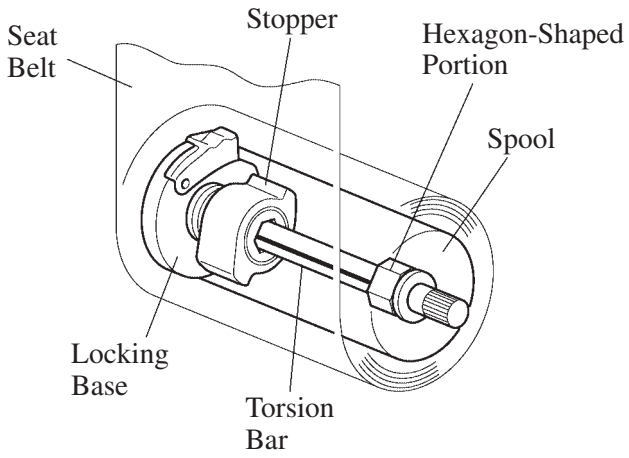



155BO24

## Seat Belt Force Limiter

### 1) Construction

The seat belt force limiter consists of a spool, torsion bar, locking gear, and stopper. One end of the torsion bar is secured to the locking base and the other end is integrated with the hexagon-shaped portion of the spool. The stopper is coupled to the threaded portion of the locking base and rotates in unison with the rotation of the spool.

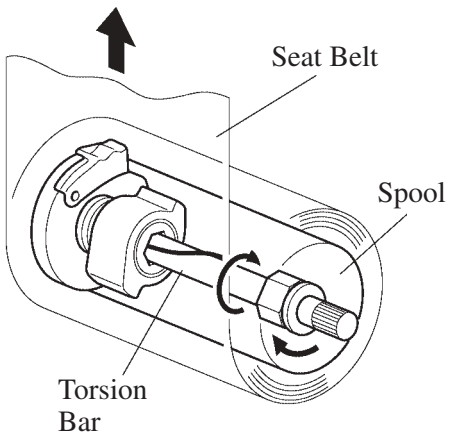



155BO25

### 2) Operation

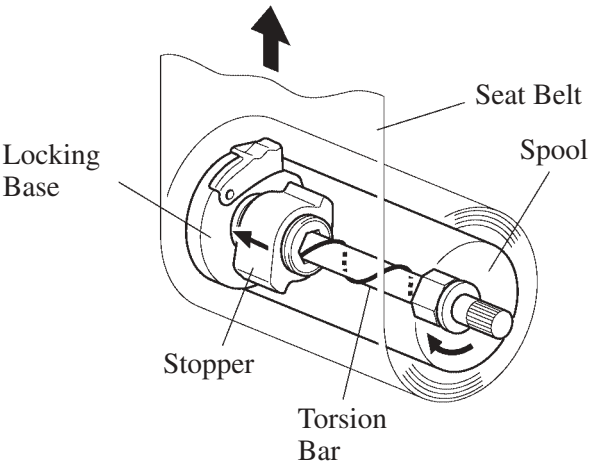
- When the ELR mechanism is activated, if a force that exceeds a predetermined load is applied to the seat belt, the torsion bar becomes twisted, causing the spool to rotate and the belt to be released.



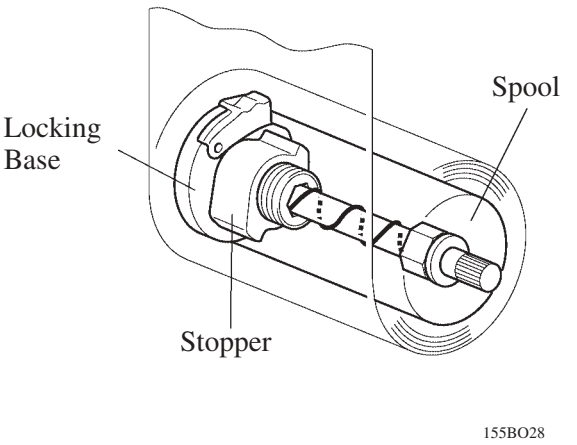



155BO26

- Along with the movement of the spool, the stopper moves while rotating on the threaded portion of the locking base. The twisting force that is generated in the torsion bar along with the rotation of the spool acts as a resistance against the pulling of the belt.




- When the stopper comes in contact with the top of the locking base, the stopper will not be able to rotate any further. As a result, the spool will not rotate, thus stopping the pulling of the belt.



# BODY ELECTRICAL

## LIGHTING

### ■ DESCRIPTION

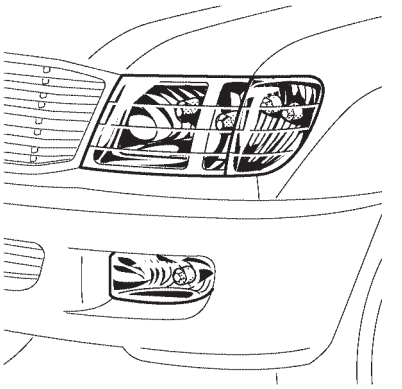
The new Land Cruiser has the following systems:

| System | Outline |
|---|---|
| Headlights | A 4-light headlight system with vertically laid out low and high-beams has been adopted. On the VX grade models, the headlight construction has been adopted to multi-reflector type headlights.<br>Also, Discharge headlights for high-beam are optional equipment on models for Australia and G.C.C. Countries. |
| Daytime Running Light System | This system is designed to automatically activate the headlights during the daytime. |
| Headlight Beam Level Control System | This system keeps the beam of the headlights adjusted to the appropriate level in accordance with the number (weight) of passengers and volume of luggage. The headlight beam level can be adjusted in stepless by operating the headlight beam level control switch.<br>This system is optional equipment on models for Europe. |
| Rear Fog Light | The rear fog light makes the car highly visible in the rain or fog to other drivers driving behind.<br>This system is standard equipment on models for Europe. |
| Light Auto Turn-Off System | When the ignition key is turned from ON to ACC or LOCK position and the driver's door is opened with the taillights and headlights turned on, this system automatically turns them off.<br>This system is standard equipment on the GX and VX grade models for Australia. |
| Interior Light Reminder System | If there is no change in the condition of the vehicle during a prescribed length of time in which any of the interior lights such as the dome light or map light illuminate, this system automatically turns OFF the interior lights.<br>For details, see page 252. |
| Light Reminder System | When the ignition key is turned from the ON or ACC to LOCK position while the driver door is open with the taillights and headlights turned on, this system warns the driver that the lights remain on by sounding the buzzer.<br>This system is standard equipment on the VX grade models except models for Australia. |
| Headlight Cleaner | When the headlight cleaner switch is turned on while the headlights are on, this system sprays washer fluid on the headlight lenses to wash the dirt off them. |
| Illuminated Entry System | This system is useful when entering the vehicle, fastening the seat belts and inserting the ignition key into the key cylinder in the dark.<br>2 types of this system are used in the Land Cruiser.<br>In the first type, when the driver's or passenger's door is opened, the illuminated entry system turns on the illumination lights around the ignition key cylinder, dome light (only when the control switch is at DOOR position) and courtesy light simultaneously. The illumination light around the ignition key cylinder turn off in about 5 seconds. The dome light and courtesy light fade out in about 15 seconds.<br>In the second type, when the driver's or passenger's door is opened, the illuminated entry system turns on the dome light (only when the control switch is at DOOR position). The dome light fades out in about 15 seconds. |

## ■ HEADLIGHTS

### 1. General

- A 4-light headlight system with vertically laid out low and high beams has been adopted.
- The multi-reflector type headlight system has been adopted on the VX grade models.
- Discharge headlights that realize a high level of visibility are optional equipment for the high beams on the VX grade model for the G.C.C. countries and Australia.

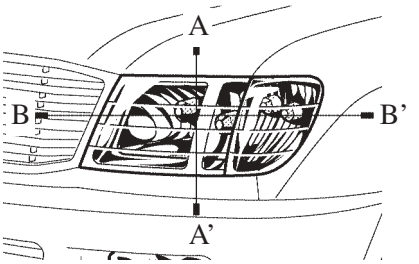


147BE22

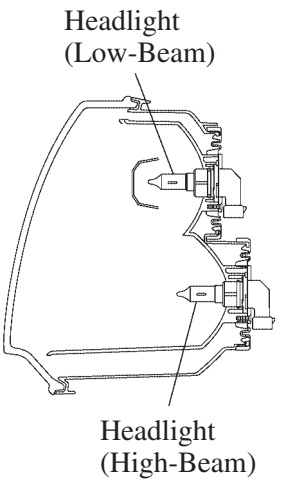
### 2. Construction

#### 4-Light Headlight System

The low and high beam headlights and clearance light are integrated into one housing. The low-beam headlight bulb is located in the upper part of this housing, and the high-beam headlight bulb in the lower part. The parking light is enclosed in the outer side of the headlights.

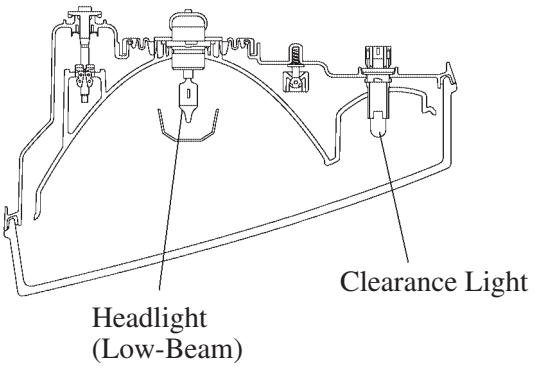



147BE22




**A – A' Cross Section**

156BE12



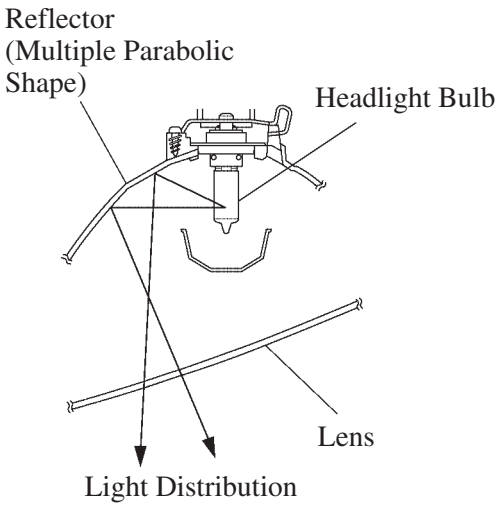

**B – B' Cross Section**

156BE11

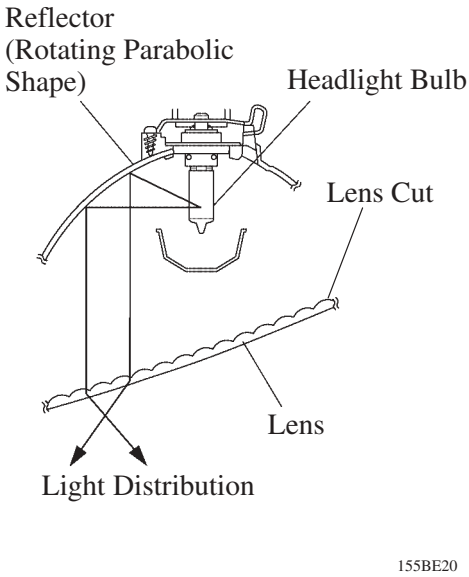
## Multi-Reflector Type Headlight

Conventional headlights accomplish the dispersion and distribution of light which is emitted by the bulbs through the lens cut pattern. However, with the multi-reflector type headlights, the light from the bulbs is dispersed and distributed through multiple parabolic shaped reflectors. As a result, the lens cut pattern is no longer provided in the center of the lens, thus realizing a clear look.

**▶ Light Distribution Diagram ◀**




**Multi-Reflector Type Headlight**




**Conventional Headlight**

## Discharge Headlight

BE

### 1) General

The Discharge Headlight system applies high voltage to the electrodes on the light bulb to discharge arcs, causing the metal atoms that are enclosed in the bulb to emit light.

### 2) Construction and Operation

The Discharge Headlight system consists of metal halide bulbs and a light control computer.

#### a. Metal Halide Bulb

##### i) Construction

The metal halide bulb contains xenon gas, mercury, and metal halide.

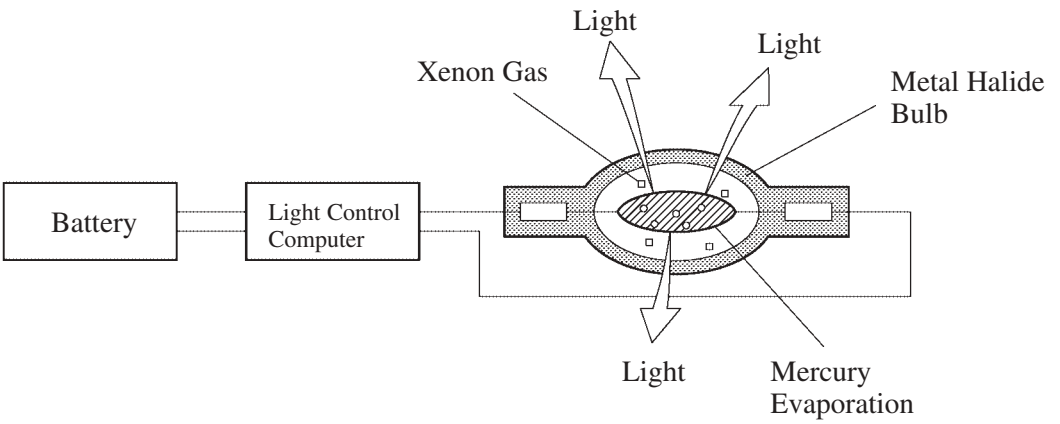
##### ii) Operation

① When high voltage (approximately 20,000 volts) is applied to the electrodes of the metal halide bulb, the xenon gas in the bulb emits light.

② As the temperature in the bulb rises, the mercury evaporates and causes arcs to be discharged.

③ As the temperature in the bulb rises even further, the metal halide in the mercury arc separates into metal atoms and iodine atoms.

④ The separated metal atoms discharge light, which causes the bulb to emit light.




146BE11

#### b. Light Control Computer

The light control computer is an electronic control unit which is necessary for illuminating the metal halide bulb. A light control computer is located under each headlight unit.
This computer provides the functions listed below.

- Generates the high voltage (approximately 20,000 volts) which is applied to the electrodes of the bulbs to enable the Discharge headlights to start to illuminate.
- Optimally controls the amperage and voltage in order to quickly provide an optimal amount of light immediately after the bulbs have been turned ON and to enable the bulbs to continue to illuminate in a stable manner.
- A fail-safe function is provided as a countermeasure against the high voltage that is generated in case that a problem occurs in the headlight system.

### i) Fail-Safe Function

The light control computer executes the fail-safe actions listed below in accordance with the item that has been detected.

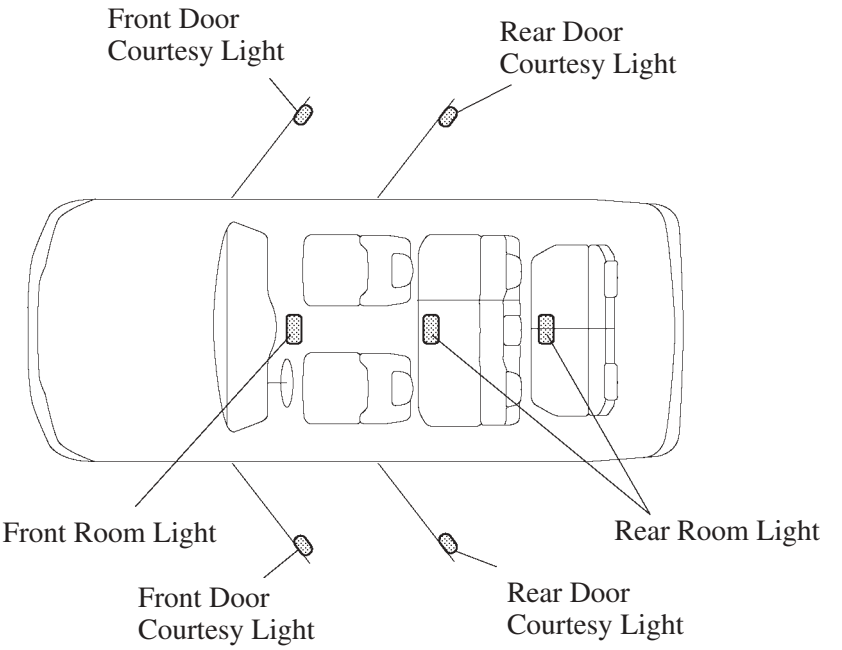
| Item | Outline |
|---|---|
| Detection of Abnormal Input Voltage | If the voltage that is input to the light control computer deviates from the operating voltage (9-16 volts), the computer stops illuminating the headlights, and resumes illuminating the headlights once the voltage reverts to the operating voltage range. However, if the input voltage decreases after the headlights have illuminated, the headlights will remain illuminated until the bulbs are extinguished. |
| Detection of Abnormal Output (Open Circuit or Short Circuit) or Flashing Bulb | If an abnormal condition (open or short circuit) occurs in the voltage that is output by the light control computer, or if the bulb flashes, the computer stops illuminating the headlights and will maintain this state until the power is reinstated (by turning the headlight control switch from OFF to ON). |
| Detection of Bulb Open | If a bulb is not inserted in its socket, the computer stops generating high voltage until the power source switch (headlight control switch or ignition switch) turns from ON to OFF, the bulb is inserted correctly and the power is reinstated (by turning the headlight control switch from OFF to ON or turning the ignition switch from OFF to ON). |

## ■INTERIOR LIGHT REMINDER SYSTEM

### 1. General

The interior light reminder system provides two functions: interior light cutoff function and the door courtesy switch linked light cutoff function.
The interior light cutoff function turns OFF the light main relay when the ignition switch is turned OFF and no changes have occurred in all the door courtesy light switches within 30 minutes.
When the ignition switch is turned OFF and if any of the doors remain open longer than 5 minutes, the door courtesy switch-linked light cutoff function automatically turns OFF the lights that are linked to that door.

### 2. Layout of Interior Light




155BE16

### 3. Normal Operation

The interior lights that illuminate along with the opening of the doors are listed in the table below.

◎: ON (With Fade-Out), ○: ON, X: OFF

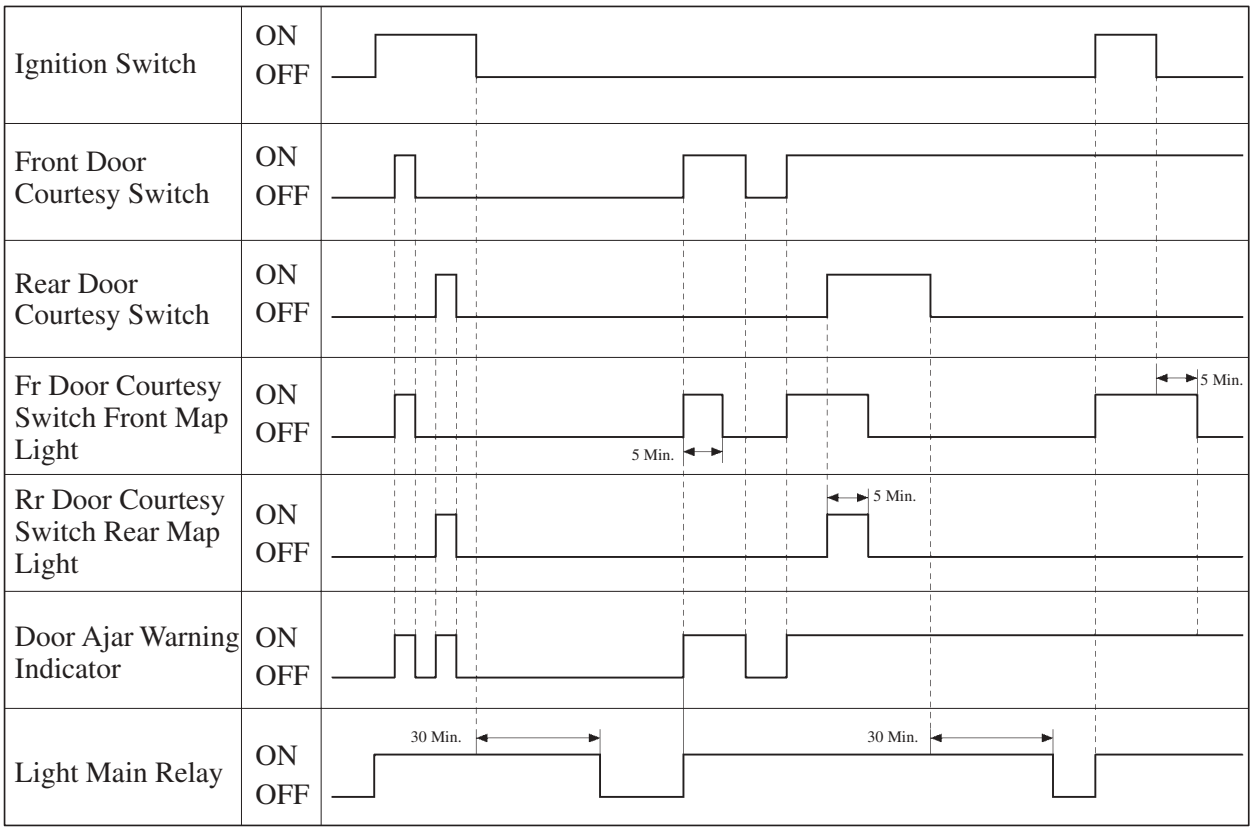
| Interior Light / Door to be opened | Front Door Courtesy Light | | Front Room Light | Rear Door Courtesy Light | | Rear Room Light |
|---|---|---|---|---|---|---|
| | Driver | Passenger | | Left | Right | |
| Driver Side Front Door | ◎ | ◎ | ◎ | X | X | X |
| Passenger Side Front Door | ◎ | ◎ | ◎ | X | X | X |
| Left Side Rear Door | X | X | X | ○ | ○ | ○ |
| Right Side Rear Door | X | X | X | ○ | ○ | ○ |
| Back Door | X | X | X | ○ | ○ | ○ |

## 4. Interior Light Cut Off Function

When the ignition switch is turned OFF, the instrument panel ECU monitors the condition of the door courtesy light switches and starts counting time. When 30 minutes have elapsed after no changes have occurred in any of the door courtesy light switches, the instrument panel ECU turns OFF the light main relay to cut off the current to the interior lights. As a result, the interior lights turn OFF.
As a result, the interior light turns OFF.
However, the activation of this function is canceled and the time count is reset if the condition of the vehicle meets any of the items given below.

- The ignition switch is turned to ACC or ON position.
- Any of the doors is opened or closed.

These functions help prevent the light front being left ON.




155BE11

## 5. Door Courtesy Switch Linked Light Cut Off Function

When the ignition switch is turned OFF and any of the doors are opened, the instrument panel ECU monitors the condition of the door courtesy light switches and starts counting time. When 5 minutes have elapsed after no changes have occurred in any of the door courtesy light switches, the instrument panel ECU turns OFF the interior lights that are linked to the opening of a door.
However, the activation of this function is canceled and the time count is reset if the condition of the vehicle meets any of the items given below.

- The ignition switch is turned to ACC or ON position.
- All doors are closed.

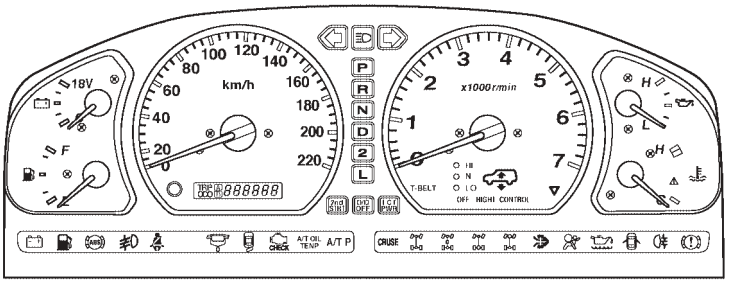
In addition, while the timer is counting time, if any of the previously closed doors are opened, the timer resets itself and starts counting time.
These functions help prevent the interior lights from being left ON if a door is unintendedly left open.

# METER

## ■COMBINATION METER

The combination meter of new Land Cruiser has the following features:

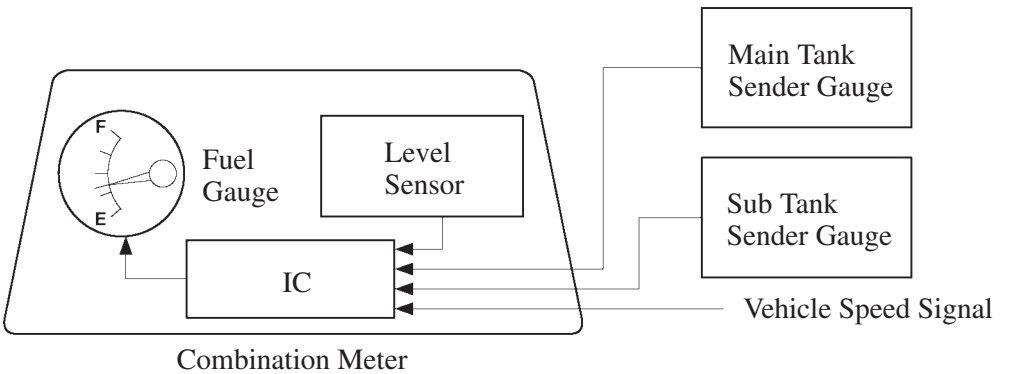
- The meters and the gauges listed below are operated together by a single CPU.
  - ① Speedmeter
  - ② Tachometer
  - ③ Fuel Gauge
  - ④ Odometer and Trip Meter
- An electronic twin-trip meter and an electronic odometer are used for convenience and good visibility.




147BE15

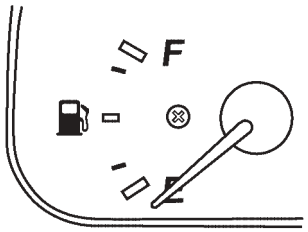
- A level sensor is provided in the combination meter to detect the inclination of the vehicle. This sensor prevents the fuel gauge from indicating erroneously due to the fluctuation of the fuel surface, which occurs when driving on a slope.

**▶ System Diagram ◀**



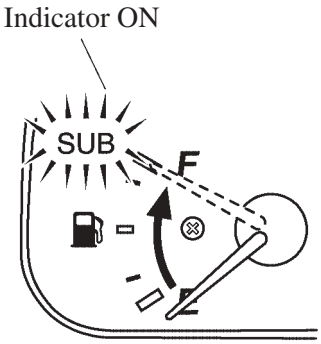

146BE19

- The main fuel gauge and the sub fuel gauge have been integrated into a single gauge. The gauge can be switched to function as the main fuel gauge or the sub fuel gauge by operating the sub fuel switch.




147BE16

**Main Fuel Gauge Indication**




147BE17

**Sub Fuel Gauge Indication**

# AIR CONDITIONING

## ■ DESCRIPTION

### 1. General

The air conditioning system in the Land Cruiser has the following features:

- The front heater and the front-and-rear heater are provided as standard or optional equipment as described in the following table.
- Four types of air conditioners are provided as standard or optional equipment as described in the following table. The rear air conditioner adopts a construction in which the rear heater and the rear cooler are separate.
- A viscous type power heater that improves heating performance is provided as optional equipment for the cold area specification model with 1HD-FTE engine for Europe.
- An easy-to-use rotary switch type front heater control panel is used.
- A rotary switch type rear heater control panel is used on models with rear heater or front and rear manual air conditioner.
- A slide switch type rear cooler control panel is used on models with front and rear manual air conditioner.
- A push button type rear heater control panel has been adopted on the models with the front and rear automatic air conditioner.
- A 3-flow level type heater unit, which features lower air flow resistance, is used.
- The construction of the evaporator, heater core, and blower fan has been changed.
- A sub-cool condenser, which cools the refrigerant twice, has been adopted.

**▶ Availability (Heater) ◀**

●: Standard ○: Option

| Destination / Type | Europe | Australia | G.C.C. Countries | General Countries |
|---|---|---|---|---|
| Front Heater | – | ● | ● | ● |
| Front and Rear Heater | ● | ○ | – | ○ |

**▶ Availability (Air Conditioner) ◀**

●: Standard ○: Option

| Destination / Type | Europe | Australia | G.C.C. Countries | General Countries |
|---|---|---|---|---|
| Front Manual Air Conditioner | – | ○*1 | ○*1, 2 | ○ |
| Front and Rear Manual Air Conditioner | – | – | ○*1 | ○*3 |
| Front Automatic Air Conditioner | ○ | ●*3 | ●*3 | – |
| Front and Rear Automatic Air Conditioner | – | ○*3 | ○*3 | – |

*1: GX Grade Model
*2: STD Grade Model
*3: VX Grade Model

## 2. Performance and Specifications

### Front Heater and Front Air Conditioner

#### 1) Models for Europe (LHD) and General Countries (LHD)

**▶ Performance ◀**

| Item \ Model | | New | Previous |
|---|---|---|---|
| Heater | Heat Output W (Kcal/h) | 4850 (4170)<br>5000 (4300)*1 | 4680 (4020)<br>4750 (4090)*1 |
| | Air Flow Volume $m^3/h$ | 290*1, 300 | ← |
| | Power Consumption W | 140 | ← |
| Air Conditioner | Heat Output W (Kcal/h) | 6100 (5250)*2, 3<br>5860 (5040)*5 | 5810 (5000)*3, 4<br>5580 (4800)*6 |
| | Air Flow Volume $m^3/h$ | 520 | ← |
| | Power Consumption W | 260 | 215 |

**▶ Specifications ◀**

| Item \ Model | | | New | Previous |
|---|---|---|---|---|
| Ventilation and Heater | Heater Core | Type | Multi-Flow Type | Dimpled Tube Type |
| | | Size W x H x L mm (in.) | 216.9 x 140 x 27<br>(8.5 x 5.5 x 1.1)<br>216.9 x 140 x 46*1<br>(8.5 x 5.5 x 1.8) | 155.7 x 200 x 36<br>(6.1 x 7.9 x 1.4)<br>155.7 x 200 x 58*1<br>(6.1 x 7.9 x 2.3) |
| | | Fin Pitch mm (in.) | 1.8 (0.07) | ← |
| | Blower | Motor Type | S80FS12 | S70F13T |
| | | Fan Size Dia. x H mm (in.) | 158 x 80 (6.2 x 3.1) | 150 x 65 (5.9 x 2.6) |
| Air Conditioner | Condenser | Type | Multi-Flow Type<br>(Sub-Cool Type) | 3-Passage Flow Type |
| | | Size W x H x L mm (in.) | 444.8 x 570 x 16<br>(17.5 x 22.4 x 0.6)<br>359.3 x 670 x 16*7, 9<br>(14.1 x 26.4 x 0.6)<br>520.8 x 650 x 16*8<br>(20.5 x 25.6 x 0.6) | 362.8 x 706 x 22<br>(14.3 x 27.8 x 0.9) |
| | | Fin Pitch mm (in.) | 3.2 (0.13) | 4.5 (0.18) |
| | Evaporator | Type | Drawn Cup Type | ← |
| | | Size W x H x L mm (in.) | 266.2 x 255 x 90<br>(10.5 x 10.0 x 3.5) | 279 x 260 x 105<br>(11.0 x 10.2 x 4.1) |
| | | Fin Pitch mm (in.) | 3.5 (0.14) | ← |
| | Compressor | Type | 10PA15*5, 7, 10PA17,<br>10PA20*2 | 10PA15*6, 7, 10PA17,<br>10PA20*3, 4, 8 |

*1: Cold Area Specification Models
*2: 2UZ-FE Engine Model
*3: 1FZ-FE Engine Model
*4: 1FZ-F Engine Model
*5: 1HD-FTE, 1HD-T and 1HZ Engines Model
*6: 1HD-FT, 1HD-T and 1HZ Engines Model
*7: Models with Front Air Conditioner
*8: Models with Front and Rear Air Conditioner
*9: Models with Rigid Axle Front Suspension

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**2) Models for Europe (RHD), Australia and General Countries (RHD)**

**▶ Performance ◀**

| Item \ Model | | New | Previous |
|---|---|---|---|
| Heater | Heat Output W (Kcal/h) | 4850 (4170)<br>5000 (4300)*1 | 4680 (4020)<br>4750 (4090)*1 |
| | Air Flow Volume $m^3/h$ | 290*1, 300 | ← |
| | Power Consumption W | 140 | ← |
| Air Conditioner | Heat Output W (Kcal/h) | 6100 (5250)*2, 3<br>5860 (5040)*5 | 5810 (5000)*3, 4<br>5580 (4800)*6 |
| | Air Flow Volume $m^3/h$ | 520 | ← |
| | Power Consumption W | 260 | 215 |

**▶ Specifications ◀**

| Item \ Model | | | New | Previous |
|---|---|---|---|---|
| Ventilation and Heater | Heater Core | Type | Multi-Flow Type | Dimpled Tube Type |
| | | Size W x H x L mm (in.) | 169.7 x 180 x 27<br>(6.7 x 7.1 x 1.1)<br>169.7 x 180 x 46*1<br>(6.7 x 7.1 x 1.8) | 155.7 x 200 x 36<br>(6.1 x 7.9 x 1.4)<br>155.7 x 200 x 58*1<br>(6.1 x 7.9 x 2.3) |
| | | Fin Pitch mm (in.) | 1.8 (0.07) | ← |
| | Blower | Motor Type | S80FS12T | S70F14T |
| | | Fan Size Dia. x H mm (in.) | 160 x 41 + 142 x 46<br>(6.3 x 1.6 + 5.6 x 1.8) | 150 x 65<br>(5.9 x 2.6) |
| Air Conditioner | Condenser | Type | Multi-Flow Type<br>(Sub-Cool Type) | 3-Passage Flow Type |
| | | Size W x H x L mm (in.) | 444.8 x 570 x 16<br>(17.5 x 22.4 x 0.6)<br>359.3 x 670 x 16*7, 9<br>(14.1 x 26.4 x 0.6)<br>520.8 x 650 x 16*8<br>(20.5 x 25.6 x 0.6) | 362.8 x 706 x 22<br>(14.3 x 27.8 x 0.9) |
| | | Fin Pitch mm (in.) | 3.2 (0.13) | 4.5 (0.18) |
| | Evaporator | Type | Drawn Cup Type | ← |
| | | Size W x H x L mm (in.) | 266.2 x 255 x 90<br>(10.5 x 10.0 x 3.5) | 279 x 260 x 105<br>(11.0 x 10.2 x 4.1) |
| | | Fin Pitch mm (in.) | 3.5 (0.14) | ← |
| | Compressor | Type | 10PA15*5, 7, 10PA17,<br>10PA20*2 | 10PA15*6, 7, 10PA17,<br>10PA20*3, 4, 8 |

*1: Cold Area Specification Models
*2: 2UZ-FE Engine Model
*3: 1FZ-FE Engine Model
*4: 1FZ-F Engine Model
*5: 1HD-FTE, 1HD-T and 1HZ Engines Model
*6: 1HD-FT, 1HD-T and 1HZ Engines Model
*7: Models with Front Air Conditioner
*8: Models with Front and Rear Air Conditioner
*9: Models with Rigid Axle Front Suspension

### 3) Models for G.C.C. Countries

**▶ Performance ◀**

| Model / Item | | New | Previous |
|---|---|---|---|
| Heater | Heat Output W (Kcal/h) | 4800 (4130)<br>5150 (4430)*1 | 4500 (3870)<br>5150 (4430)*1 |
| | Air Flow Volume $m^3/h$ | 340*1, 350 | ← |
| | Power Consumption W | 195*1, 200 | ← |
| Air Conditioner | Heat Output W (Kcal/h) | 6600 (5680) | 6510 (5600)*5, 7<br>6280 (5400)*6 |
| | Air Flow Volume $m^3/h$ | 580 | 610 |
| | Power Consumption W | 270 | ← |

**▶ Specifications ◀**

| Model / Item | | | New | Previous |
|---|---|---|---|---|
| Ventilation and Heater | Heater Core | Type | Multi-Flow Type | Dimpled Tube Type |
| | | Size W x H x L mm (in.) | 216.9 x 140 x 21<br>(8.5 x 5.5 x 0.8)<br>216.9 x 140 x 27*1<br>(8.5 x 5.5 x 1.1) | 155.7 x 200 x 27<br>(6.1 x 7.9 x 1.1)<br>155.7 x 200 x 36*1<br>(6.1 x 7.9 x 1.4) |
| | | Fin Pitch mm (in.) | 1.8 (0.07) | ← |
| | Blower | Motor Type | S80F11.5T | ← |
| | | Fan Size Dia. x H mm (in.) | 158 x 80 (6.2 x 3.1) | 150 x 85 (5.9 x 3.3) |
| Air Conditioner | Condenser | Type | Multi-Flow Type<br>(Sub-Cool Type) | 3-Passage Flow Type |
| | | Size W x H x L mm (in.) | 359.3 x 670 x 16*2<br>(14.1 x 26.4 x 0.6)<br>520.8 x 650 x 16<br>(20.5 x 25.6 x 0.6) | 362.8 x 706 x 22*4<br>(14.3 x 27.8 x 0.9)<br>362.8 x 706 x 32*3<br>(14.3 x 27.8 x 1.3) |
| | | Fin Pitch mm (in.) | 3.2 (0.13) | 4.0 (0.16)*3,<br>4.5 (0.18)*4 |
| | Evaporator | Type | Drawn Cup Type | ← |
| | | Size W x H x L mm (in.) | 266.2 x 255 x 90<br>(10.5 x 10.0 x 3.5) | 279 x 260 x 105<br>(11.0 x 10.2 x 4.1) |
| | | Fin Pitch mm (in.) | 3.5 (0.14) | ← |
| | Compressor | Type | 10PA15*4, 6,<br>10PA17*3, 6 / *4, 5, 10PA20 | 10PA15*4, 6, 10PA17,<br>10PA20*3, 5, 7 |

*1: Models with Automatic Air Conditioner
*2: Models with Front Air Conditioner and Rigid Axle Suspension
*3: Models with Front and Rear Air Conditioner
*4: Models with Front Air Conditioner
*5: 1FZ-FE Engine Model
*6: 1HZ Engine Model
*7: 1FZ-F Engine Model

## Rear Air Conditioner (Rear Heater and Rear Cooler)

**▶ Performance of Rear Heater and Rear Cooler ◀**

| Model / Item | | | New | Previous |
|---|---|---|---|---|
| Rear Heater | Heat Output | W (Kcal/h) | 2100 (1800) | 1860 (1600) |
| | Air Flow Volume | $m^3/h$ | 110 | ← |
| | Power Consumption | W | 40 | 50 |
| Rear Cooler | Heat Output | W (Kcal/h) | 3170 (2730) | — |
| | Air Flow Volume | $m^3/h$ | 285 | — |
| | Power Consumption | W | 170 | — |

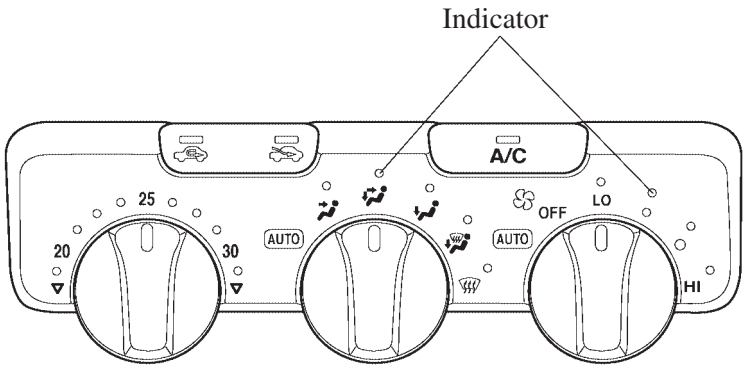
**▶ Specifications of Rear Heater and Rear Cooler ◀**

| Model / Item | | | New | Previous |
|---|---|---|---|---|
| Rear Heater | Heater Core | Type | U-turn Flow Type | Flat Tube Type |
| | | Size W x H x L mm (in.) | 140 x 105.3 x 27 (5.5 x 4.1 x 1.1) | 120 x 92.7 x 36 (4.7 x 3.6 x 1.4) |
| | | Fin Pitch mm (in.) | 1.8 (0.07) | 2.8 (0.11) |
| | Blower | Motor Type | S50FS | 50F23T |
| | | Fan Size Dia. x H mm (in.) | 120 x 75 (4.7 x 3.0) | 115.3 x 65 (4.5 x 2.6) |
| Rear Cooler | Evaporator | Type | Drawn Cup Type | — |
| | | Size W x H x L mm (in.) | 159 x 200 x 90 (6.3 x 7.9 x 3.5) | — |
| | | Fin Pitch mm (in.) | 4.5 (0.18) | — |
| | Blower | Motor Type | S70F12T | — |
| | | Fan Size Dia. x H mm (in.) | 135 x 70 (5.3 x 2.8) | — |

## ■CONSTRUCTION AND OPERATION

### 1. Front Heater Control Panel

- An easy-to-use rotary switch type front heater control panel is used. The design of the switches has been optimized to realize excellent ease of use.
- On models with automatic air condiitoner, an indicator is provided above the blower switch and the mode switch so that the airflow volume and the air outlet mode can be verified in the automatic mode.




147BE05

**Automatic Air Conditioner Model**

### 2. Air Conditioning Unit

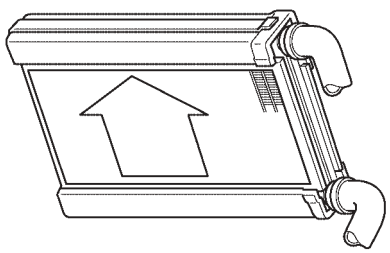
The air conditioning unit incorporates a blower, heater and cooler units. This provides low ventilating resistance and improves quietness and performance.

#### Blower Fan

A shroud fan has been adopted for the blower fan to achieve both increased airflow and decreased noise. Along with the adoption of the shroud fan, the air inlet at the bottom of the blower unit that was provided in the previous model has been discontinued.

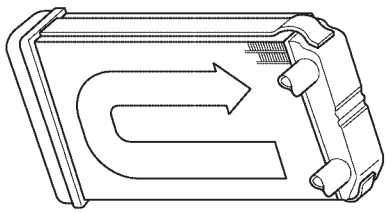
#### Heater Core

The flow of the heater water in the heater core has been changed from the previous U-turn flow to a full-path flow. Due to the resulting improvement in the heat exchanging efficiency of the heater core, the heater core itself could be made thinner.



155BE26

**New**



155BE27

**Previous**

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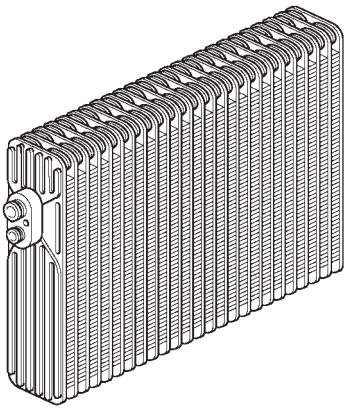
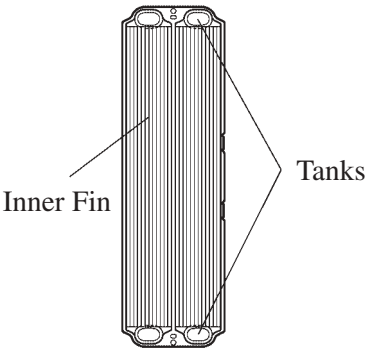
## Evaporator

By placing the tanks at the top and the bottom of the evaporator unit and by adopting an inner fin construction, the heat exchanging efficiency has been improved and the evaporator unit's temperature distribution has been made more uniform. As a result, it has become possible to realize a thinner evaporator construction.

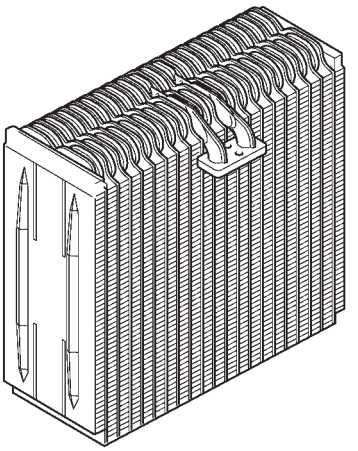


155BE05

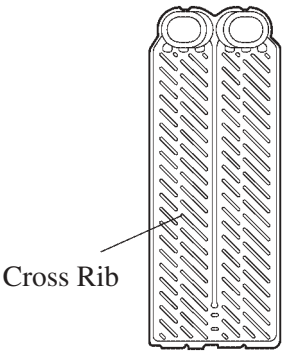



155BE06

**New**



155BE29




155BE30

**Previous**

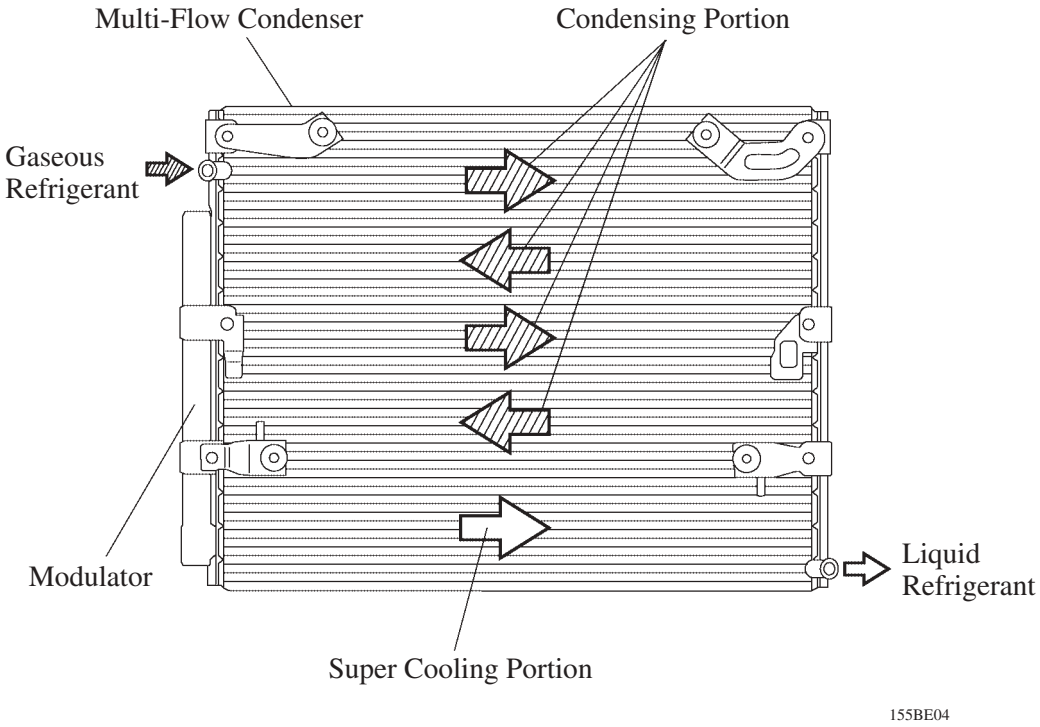
## 3. Condenser

The Land Cruiser has newly adopted a sub-cool condenser in which a multi-flow condenser (consisting of two cooling portions: a condensing portion and a super-cooling portion) and a gas-liquid separator (modulator) have been integrated. This condenser has adopted the sub-cool cycle for its cooling cycle system to improve the heat exchanging efficiency.

### Sub-Cool Cycle

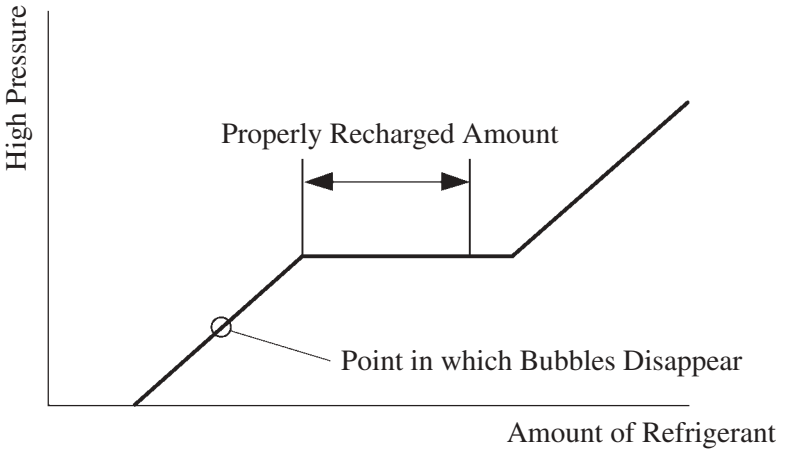
The receiver cycle of the previous condenser could not convert the gaseous refrigerant that was sent by the compressor into a completely liquefied state in the condenser. Thus, a portion of the refrigerant remained in the gaseous state as it was sent to the evaporator.

In the sub-cool cycle of the sub-cool condenser that has been adopted on the new model, after the refrigerant passes through the condensing portion of the condenser, both the liquid refrigerant and the gaseous refrigerant that could not be liquefied are cooled again in the super-cooling portion. Thus, the refrigerant is sent to the evaporator in an almost completely liquefied state.




**Models with Front and Rear Air Conditioner**

**NOTE:** The point at which the air bubbles disappear in the refrigerant of the sub-cool cycle is lower than the proper amount of refrigerant with which the system must be filled. Therefore, if the system is recharged with refrigerant based on the point at which the air bubbles disappear, the amount of refrigerant would be insufficient. As a result, the cooling performance of the system will be affected.
For the proper method of verifying the amount of the refrigerant and to recharge the system with refrigerant, see the Land Cruiser Chassis and Body Repair Manual (Pub. No. RM616E).



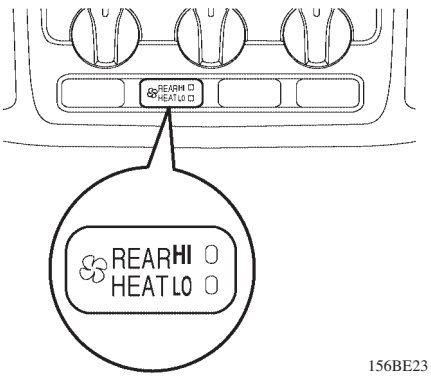

155BE24

## 4. Power Heater

A viscous type power heater is provided as optional equipment for the cold area specification model with 1HD-FTE engine for Europe.
The power heater raises the coolant temperature by the shearing heat that is generated by the silicon oil when the silicon oil that is sealed in the heater is stirred by a rotor. Consequently, the temperature of the coolant that flows through the heater core becomes higher than normal, thus improving the output performance of the heater.
For details, see page 123.

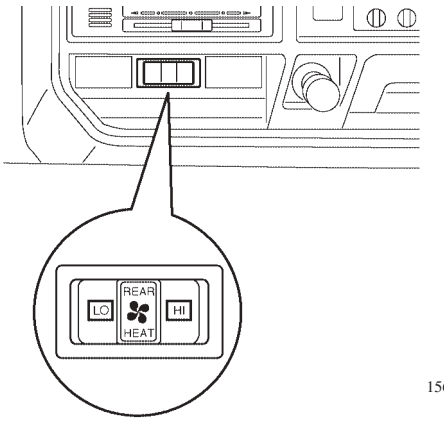
## 5. Rear Heater Control Switch

On models with rear heater, a rear heater control switch is provided in the center console.
On the new model, the construction of the switch has been changed from the seesaw type of the previous model to a momentary type.




156BE23

**New**

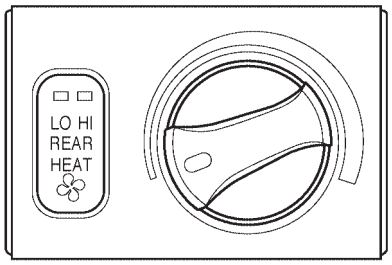



156BE24

**Previous**

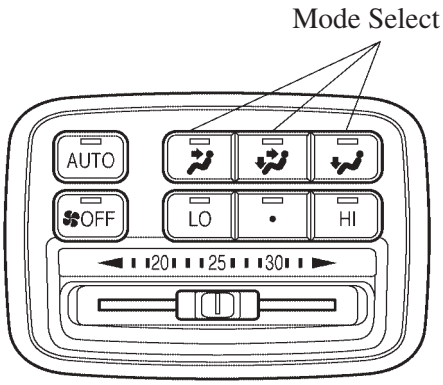
## 6. Rear Heater Control Panel

There are two types of rear heater control panels, depending on whether the vehicle is equipped with rear heater or rear air conditioner.
The models with rear heater or rear manual air conditioner has adopted a push and rotary switch type heater control panel. This control panel is located on the back of the rear console box.
The models with rear automatic air conditioner has adopted a push switch type heater control panel. This control panel is provided on the ceiling above the No.2 rear seat.
A rear heater is not provided on the models for the G.C.C. countries. Therefore, the rear heater control panel of the model with rear automatic air conditioner for the G.C.C. countries is not provided with a mode select switch to switch between the rear cooler and the rear heater.



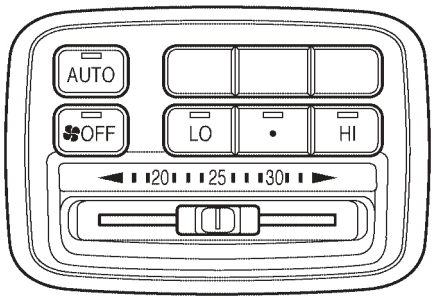

155BE25

**Push and Rotary Switch Type Control Panel**




146BE03

**Models for Australia**




146BE04

**Models for G.C.C. Countries**

**Push Switch Type Control Panel**

**▶ Mode Select Switches Control Unit ◀**

| | | |
|---|---|---|
| Cooler | Cooler and Heater | Heater |

146BE23

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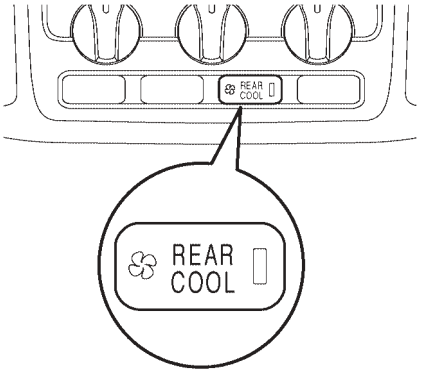
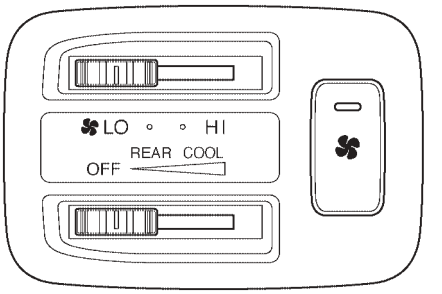
## 7. Rear Cooler Switch and Rear Cooler Control Panel

On models with rear manual air conditioner, a rear cooler switch is provided in the center cluster. Also, a slide switch type rear cooler control panel is provide on the ceiling above the No.2 rear seat.




147BE20

**Rear Cooler Switch**

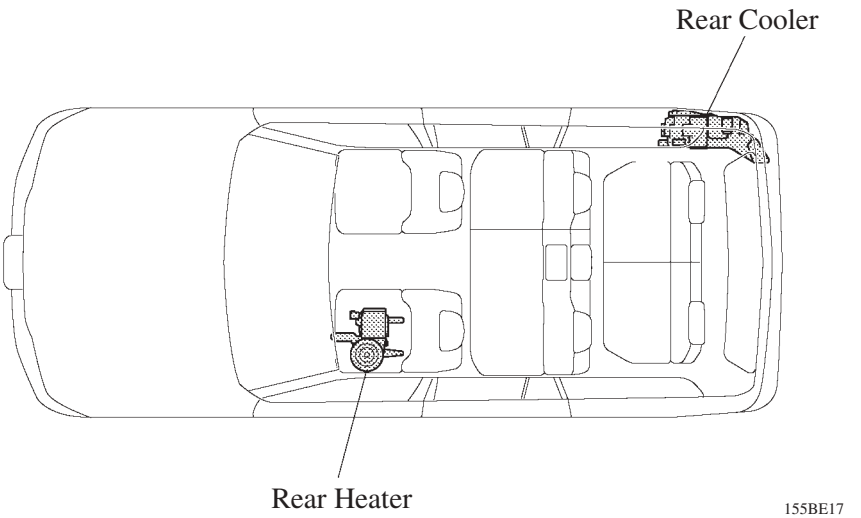



147BE06

**Rear Cooler Control Panel**

## 8. Rear Air Conditioning Unit

The rear air conditioner is separated into the rear heater unit and the rear cooler unit.



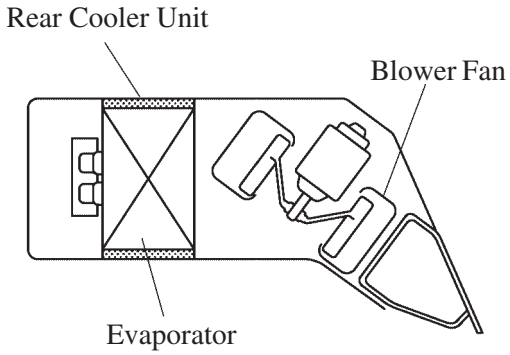

155BE17

### Rear Heater Unit

- The rear heater unit is located under the front seat.
- The rear heater with a full-air mix type temperature control is used.

### Rear Cooler Unit

- The rear cooler unit is mounted inside the right rear quarter trim.
- A suction-type rear cooler unit that provides a blower fan downstream from the evaporator has been adopted to reduce noise.




155BE18

## 9. Duct

- The rear cooler ducts are enclosed entirely inside the pillar garnish and the roof lining for improved looks.
- The blower outlet of the rear cooler is located in front of the occupants. The occupants' comfort has been improved by directing the cool air from the front of the occupants, to their face level.

# ACCESSORIES

## ■ DESCRIPTION

The new Land Cruiser includes the accessory systems shown in the following table.

| System | Outline |
|---|---|
| Power Window System | The power window system includes one-touch auto down and key-off operation functions. The one-touch auto down function automatically opens the driver's door window fully. The key-off operation function makes it possible to operate the power windows for approximately 45 seconds after the ignition key is turned to the ACC or LOCK position, if the front doors are not opened.<br>In addition, the models for Europe provides one-touch auto up and jam protection functions.<br>The one-touch auto up and down function automatically closes and opens the driver's side window fully.<br>A jam protection function automatically stops the power window and moves it downward, if a foreign object becomes jammed in the window during one-touch auto-up operation of the driver's window.<br>For details, see page 270. |
| Door Lock Control System | This system has "key-linked lock and unlock" and "door lock control switch" functions. All doors can be locked and unlocked simultaneously by operation of the door key or door lock control switch. |
| Wireless Door Lock Remote Control System | The multi-function type wireless door lock remote control system has been adopted. This system uses a transmitter that can be used to lock and unlock all the doors, operate the panic alarm.<br>For details, see page 273. |
| Theft Deterrent System | When an attempt is made to forcibly enter the vehicle or open the hood or trunk lid without a key, or when the battery terminals are removed and reconnected, this system sounds the horn and flashes the headlights, taillights and turn signal lights for about 1 minute to alert the owner. |
| Engine Immobiliser System | This is a theft-deterrent system which disables the engine unless the ignition key used to start the engine has an ID code that matches the pre-registered code in the vehicle.<br>For details, see page 277. |
| SRS Airbag | The SRS (Supplemental Restraint System) airbag is provided for the driver and front passenger. The SRS airbag has been designed to lessen the shock to the head and chest of the driver and front passenger with a frontal impact in the even of a collision.<br>3 sensor type airbag system is used in which the detection of deceleration during a collision as well as control of the airbag system is accomplished by the front airbag sensor and airbag sensor assembly.<br>For details, see page 283. |

| System | Outline |
|---|---|
| Cruise Control System | Once it has been set at desired vehicle speed, this system automatically adjusts the engine throttle position to maintain the vehicle speed at the desired speed without operating the acceleration pedal.<br>For details, see page 290. |
| Moon Roof | A moon roof provides good ventilation and exhilarating open air driving. This system includes “one-touch slide open and close (except models for Australia)” and “jam-protection” functions.<br>For details, see page 295. |
| Power Seat | The power seats are power assisted by electric motors so that the seat positions can be adjusted easily by a simple switch operation. |
| Memory System | The desired seat position can be stored (as well as tilt and telescopic steering and outside rear view mirror positions) in memory.<br>2 different driving positions can be memorized in the power seat ECU.<br>This system is optional equipment on models for Europe. |
| Seat Heater | The seat heater system improves the comfort of the driver and the front passenger in a cold weather by heating the surface of the seats.<br>Also, on the new Land Cruiser, the heating area of the seat cushion has been extended to the sides of the cushion. |
| Outside Rear View Mirror | An electrical remote control type outside rear view mirror that enables mirror angle to be adjusted by a switch operation is provided.<br>An internal heater which operates in conjunction with the rear window defogger have been adopted on models for Europe.<br>Also, on the RHD models for Europe provides the power retraction function that retracts and reinstates the mirror bodies through a switch operation.<br>For details, see page 298. |
| Seat Belt Warning System | If the driver or the front passenger has not buckled the respective seat belt when the ignition switch is turned ON, the seat belt warning system illuminates the warning light and sounds the buzzer to inform the driver and the front passenger that their seat belts have not been buckled.<br>For details, see page 300. |
| Key Reminder System | When the driver’s door is opened with the ignition key in the ACC or LOCK position, this system sounds a buzzer to warn the driver that the ignition key has not been removed. |

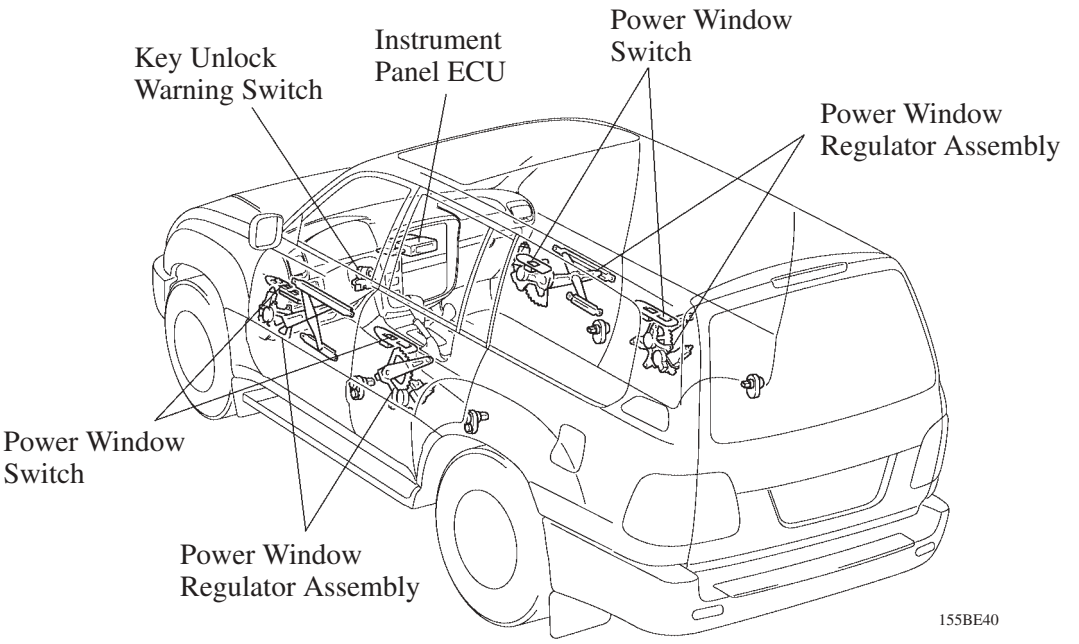
## ■POWER WINDOW

### 1. General

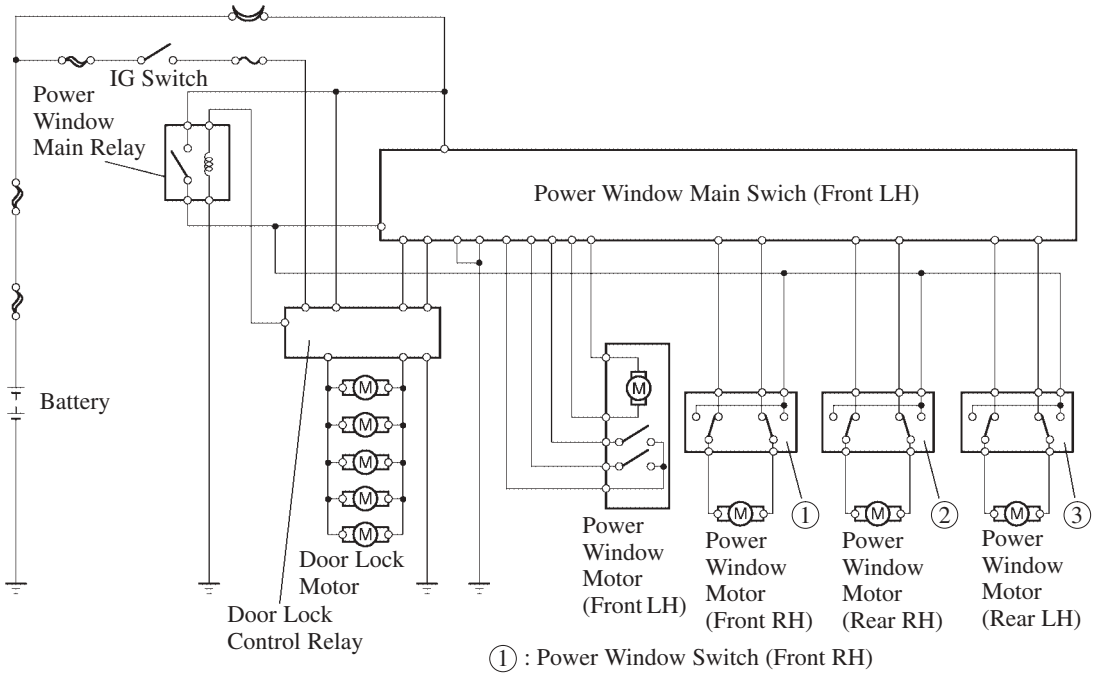
- The new model has adopted a one-touch auto-down function, which enable the door window to fully open at a touch of the power window switch.
- On models for Europe, in addition to the one-touch auto-down function, a one-touch auto-up function has been added, thus enabling the driver's door window to fully close at the touch of the switch.
  In conjunction with this function, a jam protection function has been newly added. If a foreign object becomes jammed between the glass and the window frame during one-touch auto-up or key-off operation, this function automatically stops the power window's upward movement and moves it downward.
- All models are provided with a key-off operation function in which the power windows can be operated for a prescribed length of time even after the ignition switch has been turned OFF.

### 2. Layout of Components

The major function parts of jam protection function of the power window are shown below.



## 3. Wiring Diagram



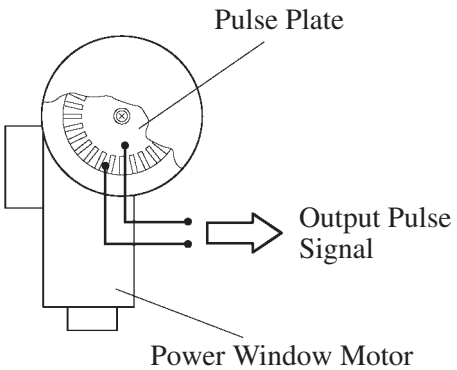

156BE16

**LHD Model**

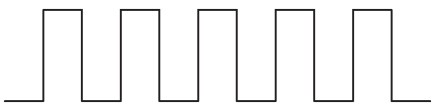
## 4. Construction

### Pulse Sensor and Limit Switch

By way of the pulse plate that is attached to the reduction gear of the power window motor, the pulse sensor outputs a pulse signal with an amplitude that is appropriate for the rpm of the motor to the controller. In addition, a limit switch is enclosed in the reduction gear. This switch determines the neutral zone in which the jam function does not operate.




155BE21



**Output Pulse Signal**

155BE38

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### Controller

Consisting of a pulse input circuit, jam judgment circuit, and motor drive circuit, the controller is integrated with the power window master switch.
The jam judgment circuit detects if a foreign object is jammed in the window by sensing a change in the signal that is output by the pulse sensor.

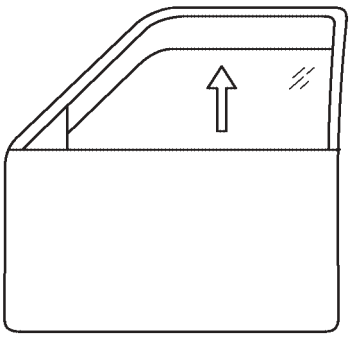
### Power Window Master Switch

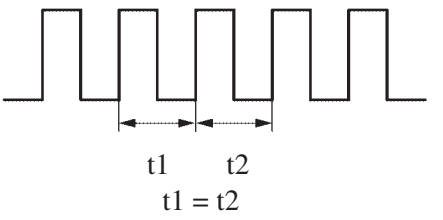
The power window master switch outputs control signals for the power window's up, down, one-touch auto-up, one-touch auto-down functions to the power window motor.

## 5. Operation

### Normal Operation

During the normal operation of the power window, the power window motor rotates at a constant speed. Accordingly, the width of the pulse signals that are output by the pulse sensor to the controller is uniform. When the controller receives pulse signals with a uniform width, it determines that no jamming occurred. Thus, the controller determines the power window movement according to the signal that is received by the controller.

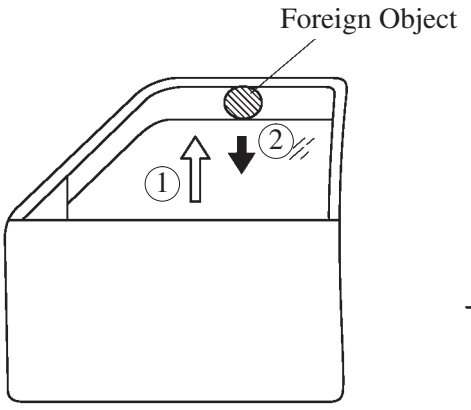


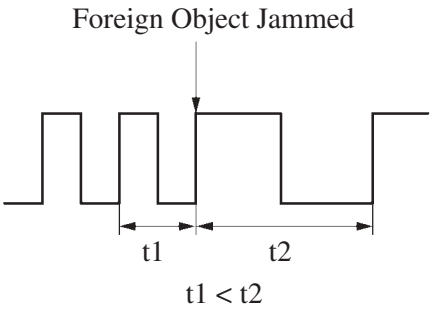



**Output Pulse Signal** 155BE22

### Jam Protection Operation

If an object becomes jammed between the glass and the window frame during one-touch auto-up operation, the power window motor's speed decreases (①). Accordingly, the width of the pulse signals that are output by the pulse sensor to the controller increases. After the motor's deceleration rate exceeds a predetermined value, the jam judgment circuit determines that jamming occurred.
Then, the controller stops the upward movement of the window, and automatically moves the window downward so that there will be a window opening of 200 mm (7.9 in.) or more (②).
The jam protection function operates only during a one-touch auto-up operation.




**Output Pulse Signal** 155BE23

**NOTE:** Immediately before the window is fully closed, there is an area in which the jam protection function does not operate.

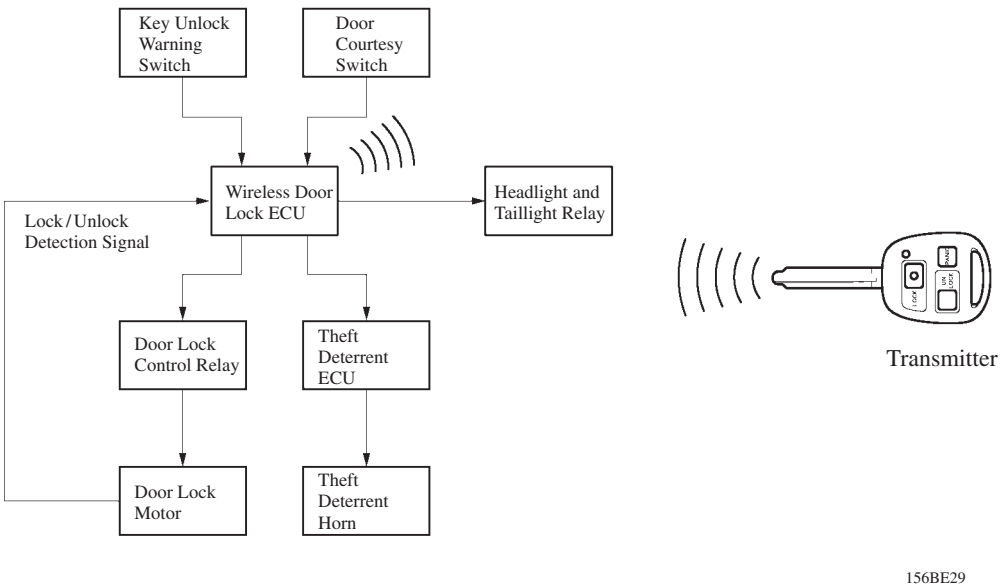
## ■ WIRELESS DOOR LOCK REMOTE CONTROL SYSTEM

### 1. General

The wireless door lock remote control system is a convenient system for locking and unlocking all the doors, at a distance. This system in the Land Cruiser has the following features:

- A multi-function type wireless door lock remote control system that provides a lock/unlock function for all doors, panic alarm operation function, etc. has been adopted.
- An easy-to-use key-integrated type transmitter has been adopted.
- An LED (Light Emitting Diode) is enclosed in the transmitter to monitor if the battery is discharged.
- A rolling code function has been adopted, which changes the recognition code each time the transmitter is pressed.
- To facilitate the verification of its operation, this system flashes the parking lights and taillights upon completion of each operation.

**▶ System Diagram ◀**




**Models for General Countries**

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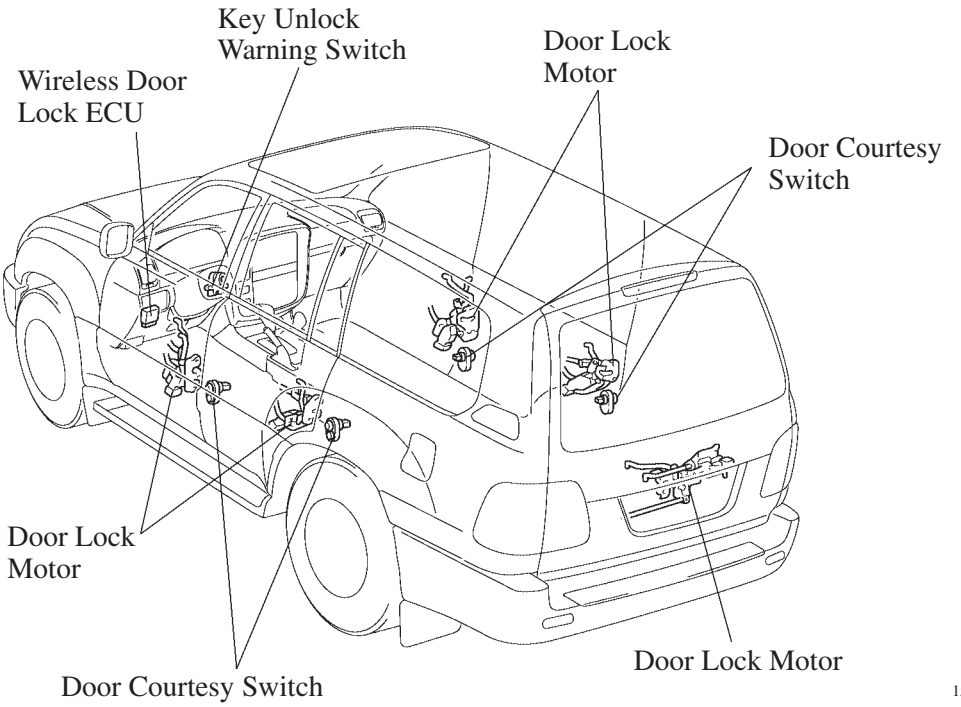
## 2. Layout of Components

The major functional parts of the wireless door lock remote control system are shown below.

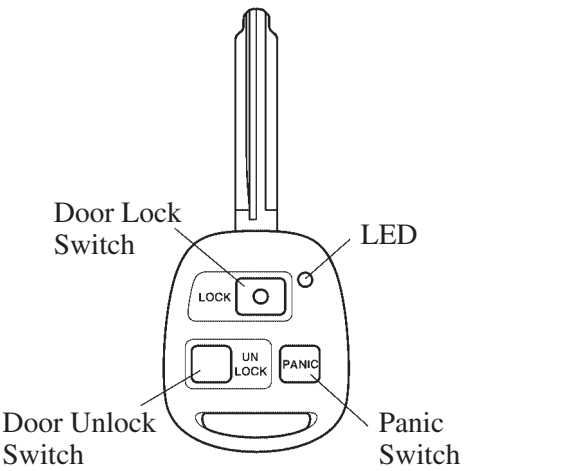



**LHD Model**

## 3. Construction

### Transmitter

- To accommodate the multiple functions provided in the wireless door lock remote control system, the multi-function type transmitter has been enclosed in the key grip. As a result, a transmitter with excellent portability and ease of use has been realized.
- On models for General Countries, this transmitter is equipped with a panic switch which activates the security alarm of the theft deterrent system to activate.
- An LED (Light Emitting Diode) is enclosed in the key grip to monitor if the battery is discharged.
- The key mold portion and the transmitter module has been separated to improve their serviceability.




**Models for General Countries**

### Wireless Door Lock ECU

- An antenna that receives the signals from the transmitter is enclosed in the ECU.
- The ECU outputs the control signals to the integration relay, buzzer, etc., in accordance with the signals received from the transmitter.
- The wireless door lock ECU is located in the instrument panel on the driver side.

## 4. Function

The wireless door lock remote control system in the Land Cruiser has the following functions.

▶ **Availability** ◀

| Destination / Function | Europe | Australia | G.C.C. Countries | General Countries |
|---|---|---|---|---|
| All Doors Lock Function | ○ | ○ | ○ | ○ |
| All Doors Unlock Function | ○ | ○ | ○ | ○ |
| Panic Alarm Function | – | – | – | ○ |
| Operation Verification Light Function | – | ○ | ○ | ○ |
| Auto Lock Function | ○ | ○ | ○ | ○ |
| Transmitter Switch Misoperation Prevention Function | ○ | ○ | ○ | ○ |
| Repeat Function | ○ | ○ | ○ | ○ |
| Security Function | ○ | ○ | ○ | ○ |
| Transmitter Recognition Code Registration Function | ○ | ○ | ○ | ○ |
| Self-Diagnosis Function | ○ | ○ | ○ | ○ |

### All Doors Lock Function

Pressing the “door lock” switch of the transmitter locks all doors.

### All Doors Unlock Function

Pressing the “door unlock” switch of the transmitter unlocks all doors.

### Panic Alarm Function

Pressing the “panic” switch of the transmitter activates the alarm of the theft deterrent system (to sound the horn and flash the headlights and taillights).

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### Operation Verification Light Function

When the doors are locked by the transmitter switch operation, the parking light and taillight flashes once to confirm that the operation has been completed.
Similarly, the parking light flashes twice when the doors are unlocked.

▶ **Light Flash Patterns** ◀

| | | | |
|---|---|---|---|
| Lock | Light Flash | ON | 0.20 Sec. |
| | | OFF | |
| Unlock | | ON | |
| | | OFF | |

156BE27

### Auto Lock Function

If none of the doors are opened within 30 seconds after they are unlocked by the wireless door lock remote control, all the doors are locked again automatically.

### Transmitter Switch Misoperation Prevention Function

When an ignition key is in the ignition key cylinder or any of the doors is not closed completely, the wireless door lock remote control is temporarily cancelled to prevent misoperation.

### Repeat Function

If a door is not locked in response to the locking operation of the transmitter, the wireless door lock ECU will output a lock signal once after 2 seconds.

### Security Function

An operation signal is transmitted by a rolling code function in which the recognition code is changed each time the transmitter switch is pressed.

### Transmitter Recognition Code Registration Function

The table below shows the 4 special coded ID registration function modes (rewrite mode, add mode, confirm mode and prohibit mode) through which up to 4 different codes can be registered. The codes are electronically registered (written to and stored) in the EEPROM.
For details of the recognition code registration procedure, refer to the Land Cruiser Chassis and Body Repair Manual (Pub. No. RM616E) to register the codes correctly.

| Mode | Function |
|---|---|
| Rewrite Mode | Erases all previously registered codes and registers only the newly received codes. This mode is used whenever a transmitter or the wireless door lock ECU is replaced. |
| Add Mode | Adds a newly received code while preserving any previously registered codes.<br>This mode is used when adding a new transmitter. If the number of codes exceeds 4, the oldest registered code is erased first. |
| Confirm Mode | Confirms how many codes are currently registered. When adding a new code, this mode is used to check how many codes already exist. |
| Prohibit Mode | To delete all the registered codes and to prohibit the wireless door lock function.<br>This mode is used when the transmitter is lost. |

### Self-Diagnosis Function

Determines whether or not the signals received from the transmitter during the diagnostic mode is normal and operates the taillights and the parking lights in accordance with the switches that have been pressed.

## ■ENGINE IMMOBILISER SYSTEM

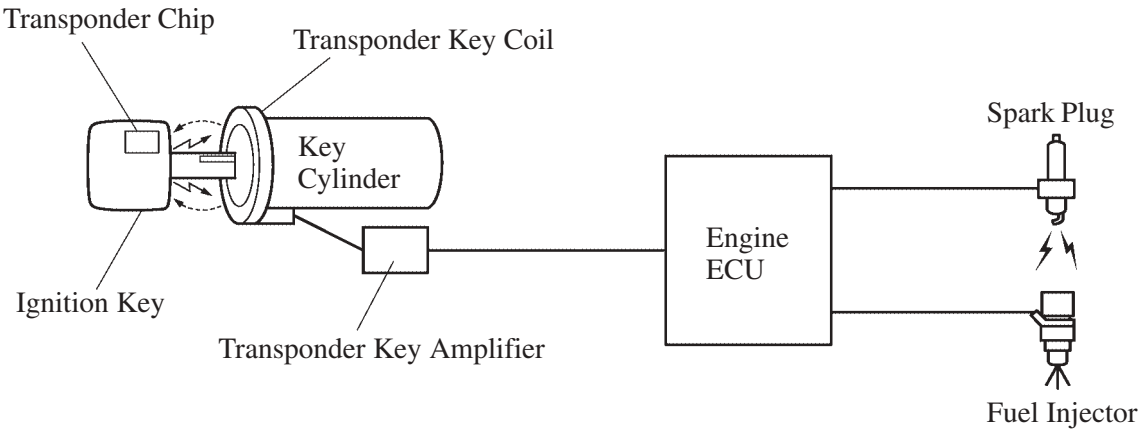
### 1. General

The engine immobiliser system is a theft-deterrent system which disables the engine from starting using the ignition key with an ID code that matches with the pre-registered code in the vehicle.

### 2. System Outline

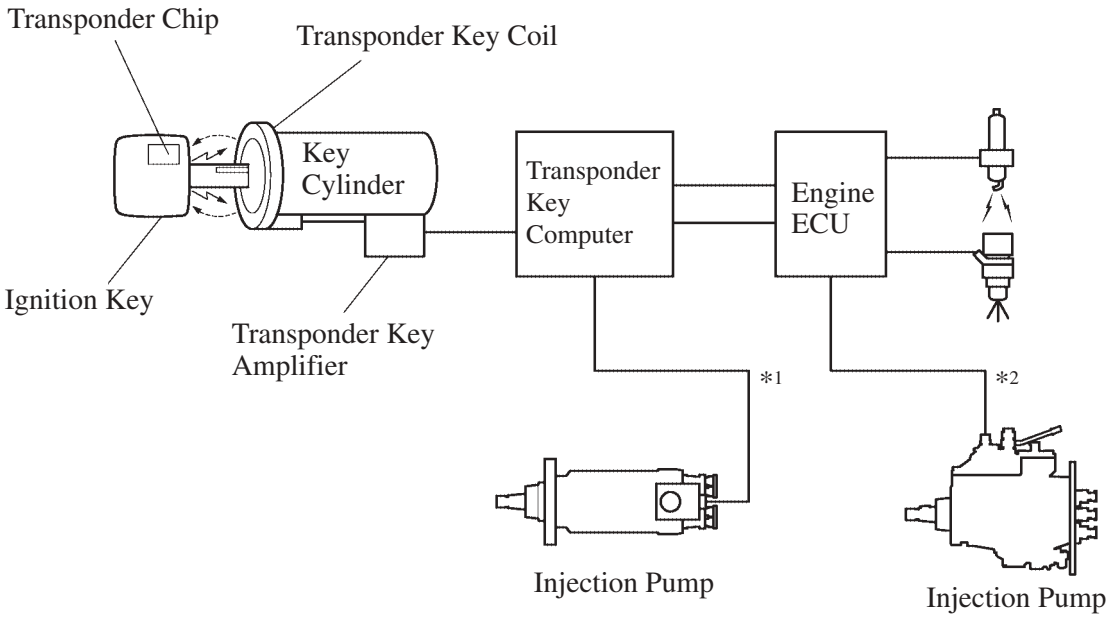
The engine immobiliser system compares the ID code that is registered in the transponder key computer with the ID code of the transponder chip that is embedded in the ignition key. The immobiliser system unsets if these ID codes match. Thus, on the 2UZ-FE, 1FZ-FE, and 1HD-FTE engine models, the transponder key computer and the engine ECU communicate with each other to authorize fuel injection and ignition, enabling the engine to start. On the 1HZ and 1HD-T engine models, the transponder key computer and FCVC (Fuel Cutoff Valve Control) communicate with each other to authorize the delivery of fuel, enabling the engine to start.

On the 2UZ-FE engine model, the transponder key computer and the engine ECU are integrated.




**2UZ-FE Engine Model**

147BE01




**Diesel Engine Model**

147BE09

*1: 1HZ and 1HD-T Engines Model
*2: 1HD-FTE Engine Model

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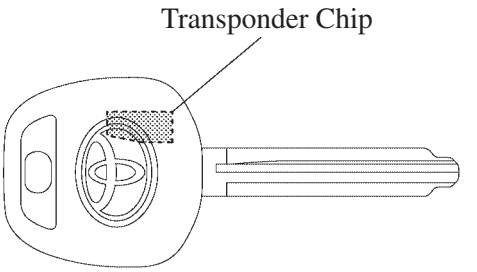
## 3. Construction

The engine immobiliser system consists of the transponder key (ignition key), transponder key coil, transponder key amplifier, engine ECU (2UZ-FE engine model) and transponder key computer (except 2UZ-FE engine model).

### Transponder Key (Ignition Key)

A transponder chip is embedded in the grip of the ignition key. Each transponder chip contains an individual transponder key code (ID code). The key does not need an internal battery to transmit a key code.




156BE30

### Transponder Key Coil and Transponder Key Amplifier

The transponder key coil is a ring-shaped coil installed around the ignition key cylinder. The transponder key amplifier is installed in the back of the ignition cylinder.
On the 2UZ-FE engine model, in conjunction with the integration of the transponder key computer with the engine ECU, the power circuit for the electricity to be supplied to the transponder key coil has been enclosed in the amplifier.

### Engine ECU (2UZ-FE Engine Model)

The transponder key computer has been integrated with the engine ECU. As a result, the wiring of the system has been reduced. Also, the engine starting time has been reduced when the transponder key code did not match, thus improving the vehicle's theft deterrent performance.
A maximum of 10 different transponder key codes (master key: 7 types, sub key: 3 types) can be registered in the engine ECU.

### Transponder Key Computer (Except 2UZ-FE Engine Model)

The transponder key computer is mounted inside the passenger side instrument panel.
A maximum of 6 different transponder key codes (master key: 4 types, sub key: 2 types) can be registered in the key computer.

## 4. Operation

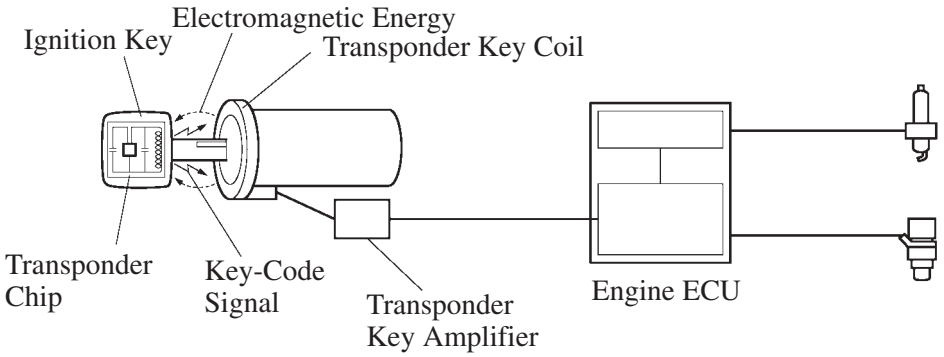
### Setting the Engine Immobiliser System

When the ignition key is removed from the key cylinder, the engine immobiliser system will be set.

### Unsetting the Engine Immobiliser System

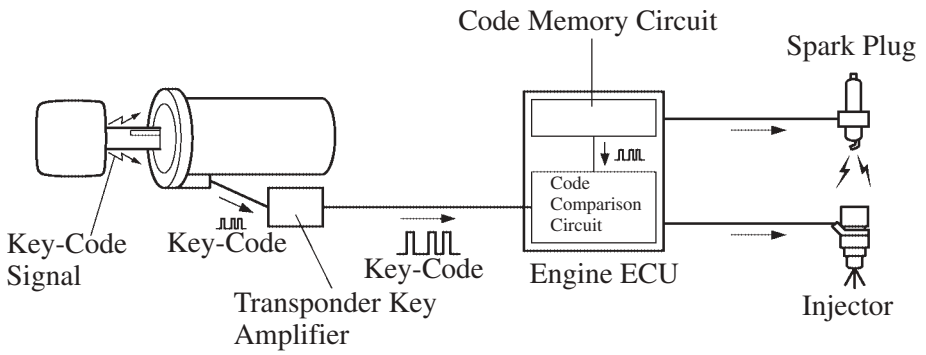
**1) Gasoline Engine Model (2UZ-FE Engine Model)**

① When the ignition key is inserted in the key cylinder, the engine ECU instructs the transponder key coil to supply the electromagnetic energy that enables the transponder chip to transmit a key-code signal. The condenser in the transponder chip converts and stores this energy as electrical energy. The transponder chip then uses this electrical energy to transmit a key-code signal.




147BE02

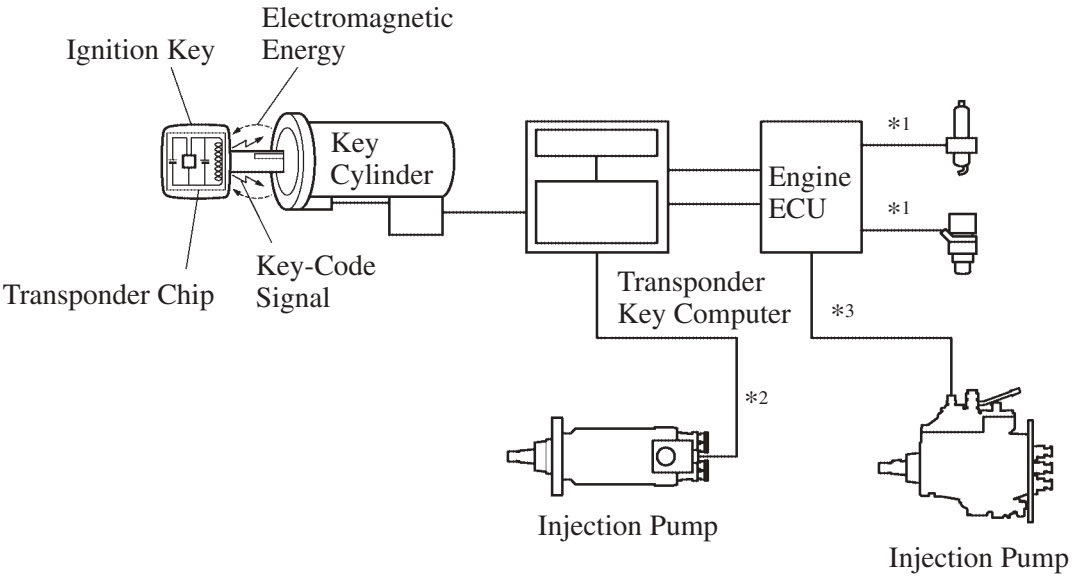
② The key code signal that has been received at the coil is amplified by the transponder key amplifier and sent to the engine ECU. The key code that has been received by the engine ECU is then compared to the key code that is stored in the engine ECU. The code comparison process takes place, and if the codes match in a row, the engine ECU unsets the immobiliser system. As a result, the engine will be able to start.




147BE03

**2) Gasoline Engine Model (Except 2UZ-FE Engine Model) and Diesel Engine Model**

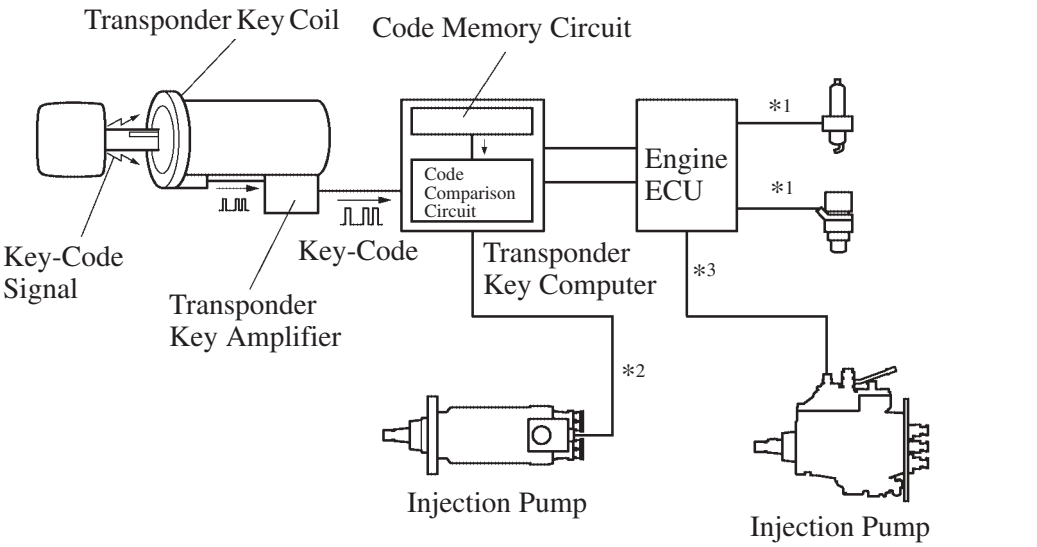
(1) When the ignition key is inserted in the key cylinder, the transponder key computer instructs the transponder key coil to supply the electromagnetic energy that enables the transponder chip to transmit a key-code signal. The condensor in the transponder chip converts and stores this energy as electrical energy. The transponder chip then uses this electrical energy to transmit a key-code signal.




147BE10

*1: 1FZ-FE Engine Model
*2: 1HZ and 1HD-T Engine Model
*3: 1HD-FTE Engine Model

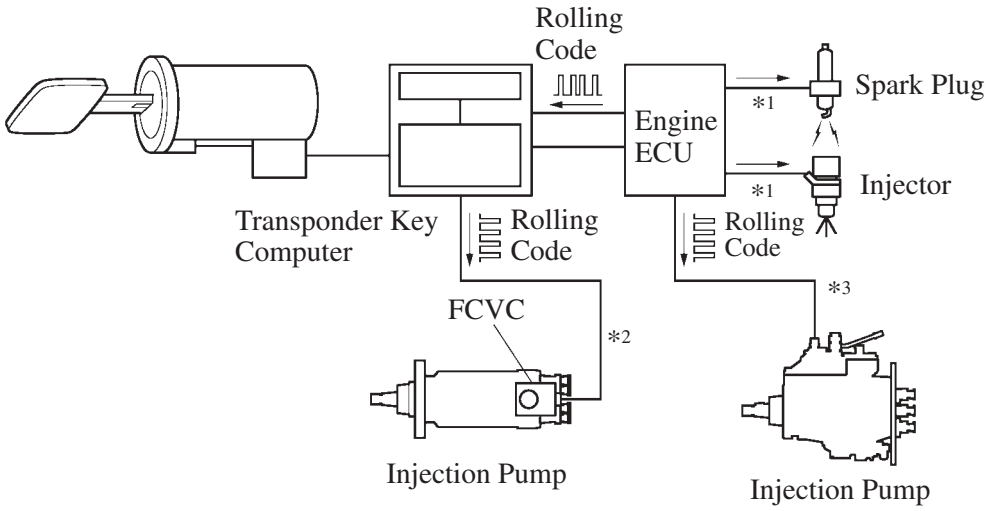
(2) The key code signal that has been received at the coil is amplified by the transponder key complifier and sent to the computer. The key code that has been received by the computer is then compared to the key code that is stored in the computer. The code comparison process takes place twice, and if the codes match twice in a row, the computer unsets the immobiliser system.




147BE11

*1: 1FZ-FE Engine Model
*2: 1HZ and 1HD-T Engine Model
*3: 1HD-FTE Engine Model

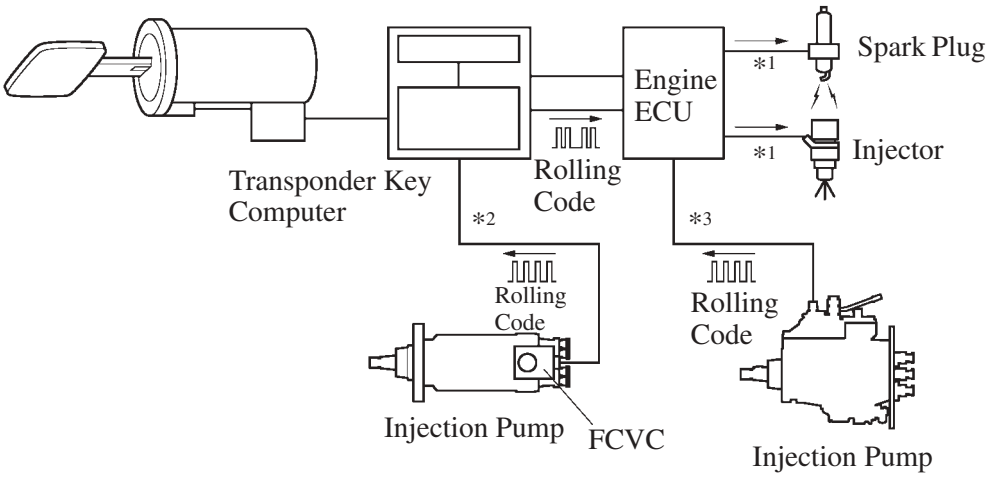
③ If the immobiliser system is unset, on the gasoline engine model, the engine ECU allows the current to flow to the injectors and to the spark plugs to enable fuel delivery and ignition. On the diesel engine model, the ECU allows the current to flow to the FCVC, thus enabling the injection pump to inject fuel. As a result, the engine can be started.
Then the engine ECU generates a rolling code based on certain parameters and sends it to the computer.




*1: 1FZ-FE Engine Model
*2: 1HZ and 1HD-T Engine Model
*3: 1HD-FTE Engine Model

④ Upon receiving the rolling code from the engine ECU, the computer converts the rolling code according to certain parameters and sends it to the engine ECU. This communication between the computer and the engine ECU will take place for a few seconds until the correct signal is sent by the computer to the engine ECU. Within this time, if the correct signal is sent from the computer to the engine ECU, the engine will continue to operate. However, if the correct signal is not sent by the computer within this period, the engine ECU will prohibit fuel delivery and ignition (gasoline engine model only), thus disabling the engine.






*1: 1FZ-FE Engine Model
*2: 1HZ and 1HD-T Engine Model
*3: 1HD-FTE Engine Model

## 5. Functions

The engine immobiliser system provides the following functions:

### Immobiliser Cancel Function

The immobiliser system is cancelled when the following condition is met, thus permitting authorized operation of the engine:

- The ignition key has been inserted in the key cylinder (after the transponder key computer reads the key code of the transponder chip and that code matches the pre-registered key code).

### New Transponder Key Code Registration Function

This function allows the registration of the key code of a new master or sub key to the transponder key computer or engine ECU. On the 2UZ-FE engine model, a maximum of 10 different transponder key codes (7 for master keys and 3 for sub keys) can be registered in the engine ECU. On the other model, a maximum of 6 different transponder key codes (4 for master keys and 2 for sub keys) can be registered in the transponder key computer. This function is used if the transponder key computer is replaced with a new one.

### Additional Transponder Key Code Registration Function

This function enables the registration of the key code for a new master key or sub key, while retaining the key codes that are already registered. This function is used for the purpose of adding a new master or sub key.

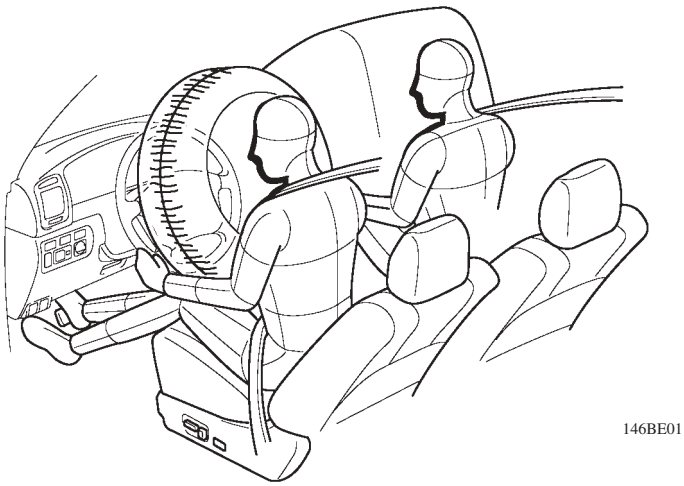
### Transponder Key Code Delete Function

This function deletes all the transponder key codes that are registered in the transponder key computer except for the key code of the master key that was used to execute the delete function.

## ■ SRS AIRBAG

### 1. General

- The SRS (Supplemental Restraint System) airbag is designed to help lessen the shock to the driver and front passenger as a supplement to the seat belt.
  In a collision, the airbag sensor detects the shock and if the front-to-rear shock is greater than a specified value, the airbags stored in the steering wheel pad for the driver and above the glove box for the front passenger inflate instantly to help reduce the likelihood of the driver's or front passenger's head and chest directly hitting the steering wheel or instrument panel.
- A 3-sensor type airbag system is used, in which the detection of deceleration during a collision is accomplished by the front airbag sensor and airbag sensor enclosed in the airbag sensor assembly.

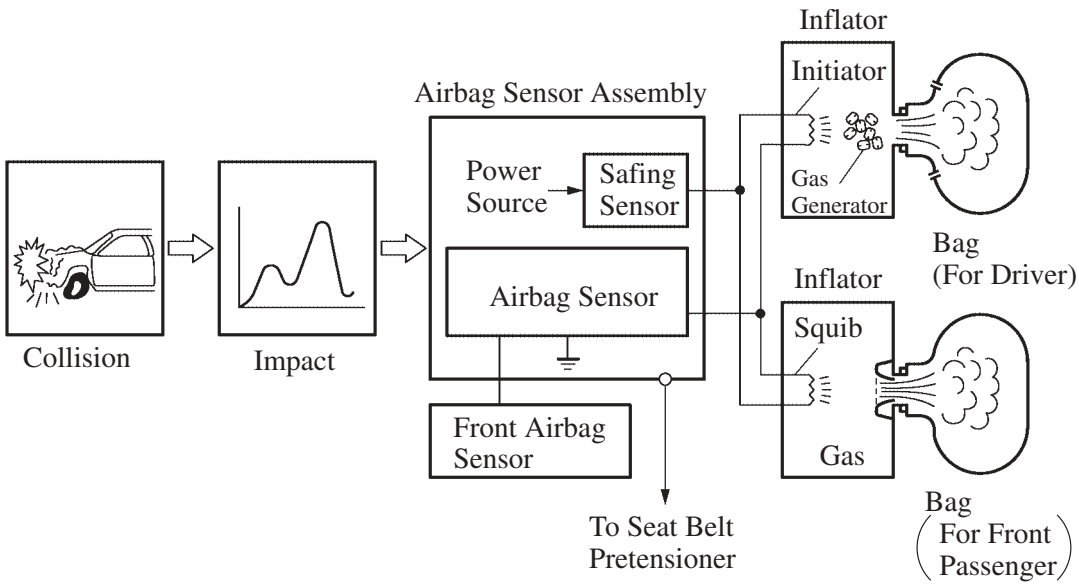


146BE01

**▶ System Diagram ◀**



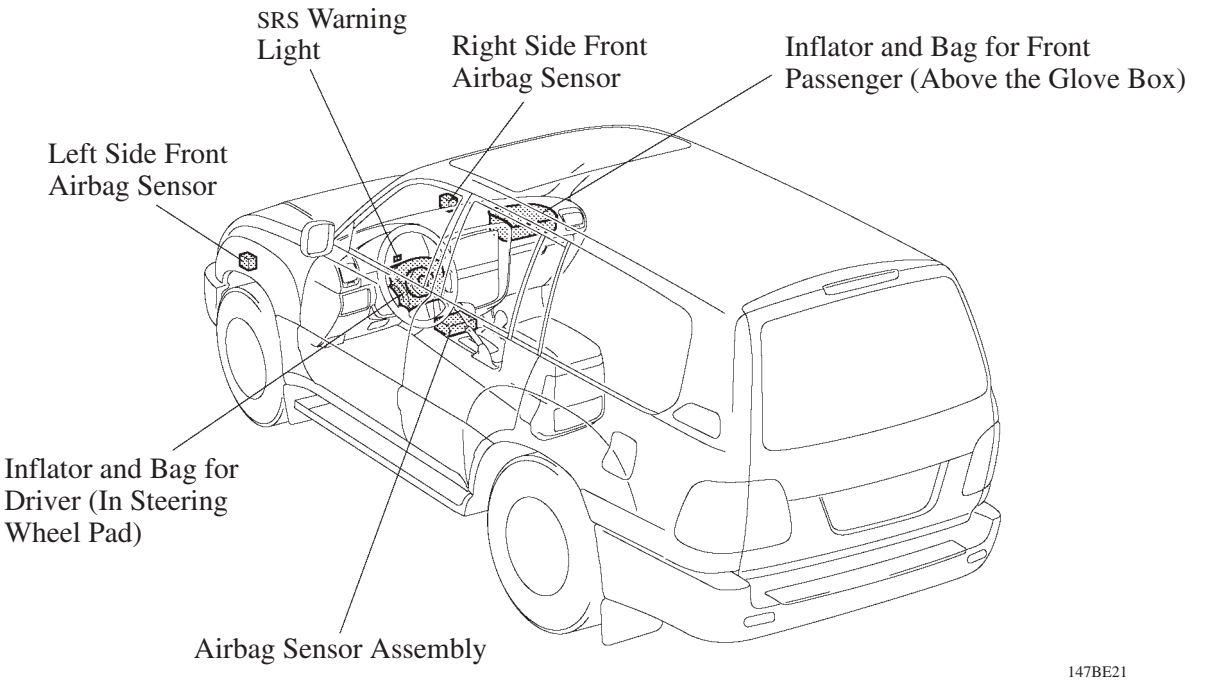
The activation processes of the SRS airbag is as illustrated below.



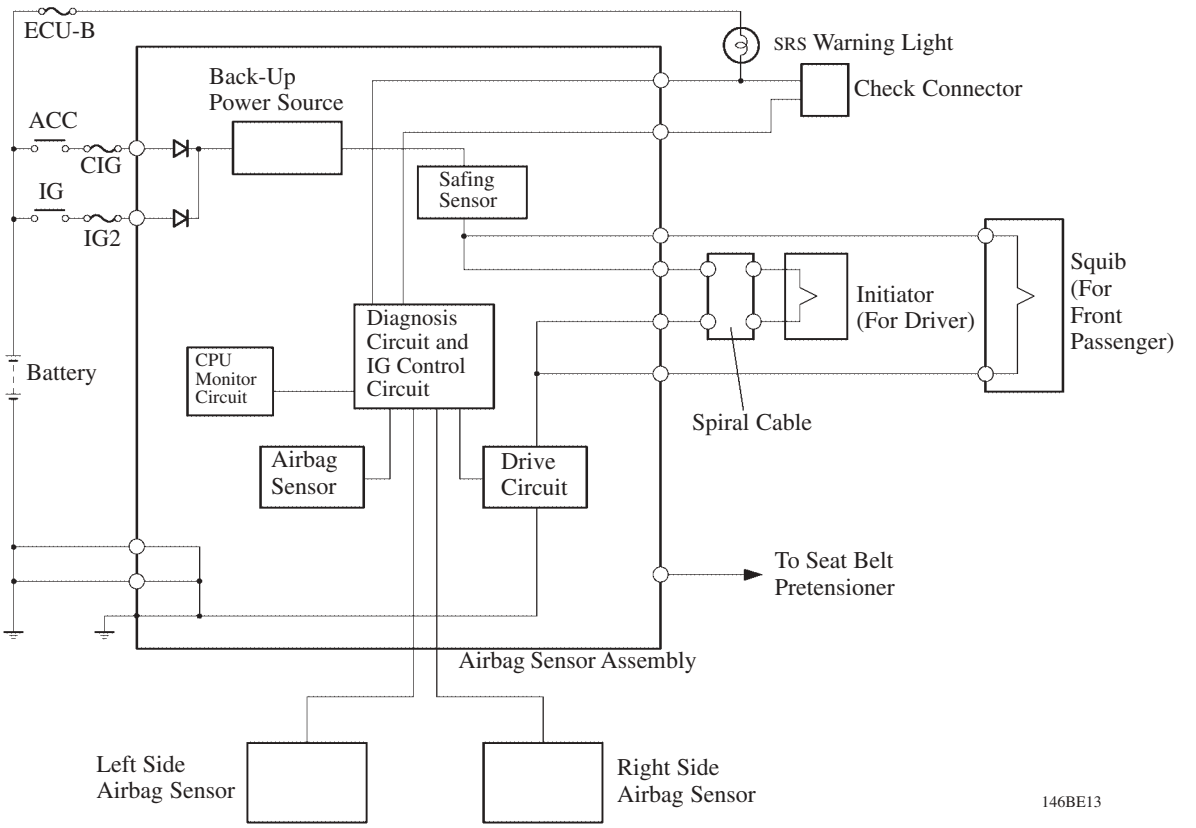

146BE12

## 2. Layout of Components

The major function parts of the airbag system are shown below.



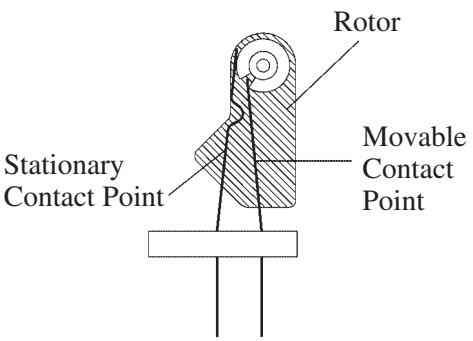

## 3. Wiring Diagram



## 4. Construction and Operation

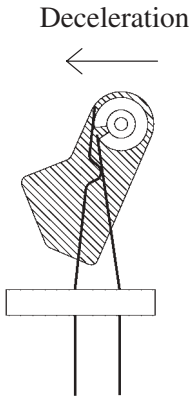
### Front Airbag Sensor

The front airbag sensor consists of rotor, movable contact point and a stationary contact point.
The rotor is fixed by the initial set load of the movable contact point. At the same time, the movable contact point restrains the movement of the rotor which is generated during vehicle deceleration, thus preventing the unintended activation of the system.
If a sudden deceleration that exceeds a predetermined value occurs due to a collision of the vehicle, the rotor will rotate. The rotational movement of the rotor pushes the movable contact point and causes the movable and stationary contact points to come into contact. As a result, an ON signal is generated and transmitted to the airbag sensor assembly.




**Normal Condition**

146BE14




**Activated Condition**

146BE15

### Airbag Sensor Assembly



#### 1) Description

The airbag sensor assembly is mounted on the center floor under the instrument panel. It receives signals from the airbag sensor enclosed in the airbag sensor assembly and front airbag sensor and judges whether the airbag and seat belt pretensioner must be activated or not, and then diagnoses system malfunctions.

#### 2) Construction and Operation

The airbag sensor assembly consists of airbag sensor, safing sensor, ignition control circuit, diagnosis circuit, etc.

**a. Airbag Sensor, Ignition Control Circuit**

- The airbag sensor is enclosed in the airbag sensor assembly. Based on the deceleration of the vehicle that occurs during a collision, the distortion that is created in the sensor is converted into an electric signal. This signal is a linear representation of the deceleration rate.
- The ignition control circuit performs a prescribed calculation based on the signal output by the airbag sensor and the front airbag sensor. If these calculated values are larger than a predetermined value, it activates the ignition operation.

**b. Safing Sensor**

The safing sensor is enclosed in the airbag sensor assembly. The sensor turns ON and outputs an ON signal to the airbag sensor assembly if a deceleration force that is higher than a predetermined value is applied to the safing sensor as a result of a frontal collision.

**c. Back-Up Power Source**

The back-up power source consists of a power supply capacitor and a DC-DC converter. In case of a power system failure during a collision, the power supply capacitor discharges and supplies electric power to the system. The DC-DC converter is a boosting transformer when the battery voltage drops below a certain level.

**d. Diagnosis Circuit**

This circuit constantly diagnoses the system for any malfunction. When a malfunction is detected, it lights up the SRS warning light on the combination meter to alert the driver.

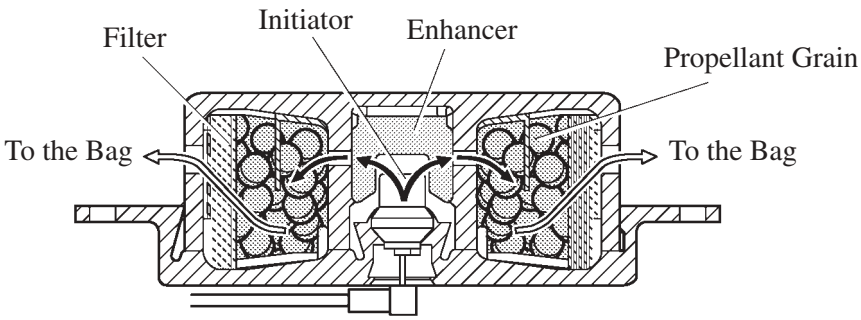
**e. Memory Circuit**

When a malfunction is detected by the diagnosis circuit, it is coded and stored in this memory circuit. However, if the power supply is cut off by turning the ignition switch OFF or by disconnecting the battery terminal, the diagnosis code will be deleted from the memory circuit.

## Inflator

### 1) For Driver

The inflator for driver is compraised of an initiator, enhancer, propellant grain, etc.
If the airbag sensor is activated by deceleration due to frontal collision, electric current then ignites the initiator located in the inflator. The flame spreads instantaneously to the propellant grain, and a large amount of nitrogen gas is generated from the propellant grain. The gas flows through the filter where cinders are removed and the gas is cooled before filling the bag. Then, as it expands, the driver's bag tears open the wheel pad outer layer to expand further and to help to restrain the impact applied to the head and chest of the driver.

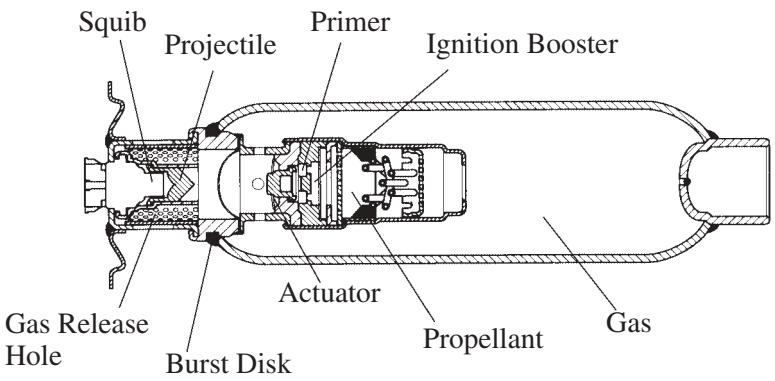



→ : Propagation of Fire
⇨ : Flow of Nitrogen Gas 146BE16

### 2) For Front Passenger

The inflator for front passenger is comprised of a squib, projectile, burst disk, propellant, high pressure argon gas and etc.
If the airbag sensor is turned on by deceleration due to frontal collision, electric current then ignites the squib located in the inflator. The projectile which fired by the ignition of the squib pierces through the burst disk and collides with the actuator, which causes the primer to ignite. The flame of the primer spreads instantaneously to the ignition booster and to the propellant. The gas which expanded by the heat of the ignition of the propellant flows into the airbag via the gas release hole, thus inflating the airbag.

**▶ Construction ◀**

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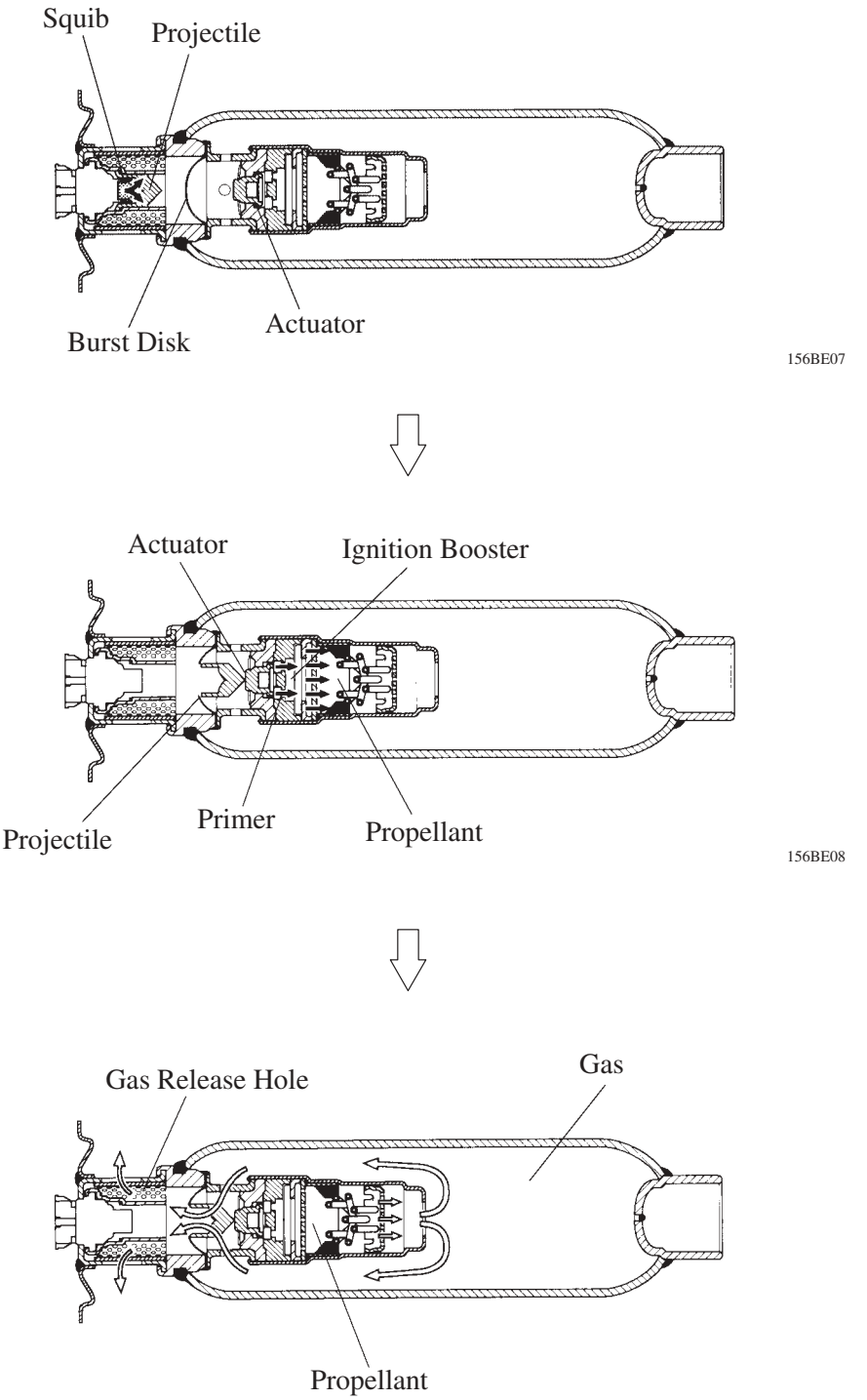
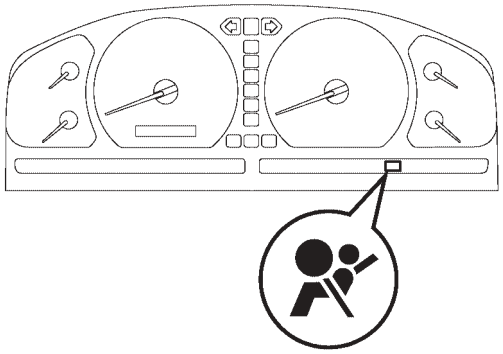
**▶ Operation ◀**


Squib
Projectile
Burst Disk
Actuator
156BE07
Actuator
Ignition Booster
Projectile
Primer
Propellant
156BE08
Gas Release Hole
Gas
Propellant
156BE09
: Propagation of Fire
: Flow of Argon Gas

## SRS Warning Light

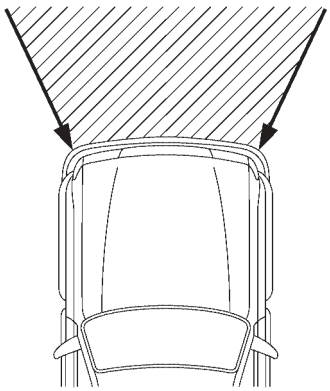
The SRS warning light is located on the combination meter.
It comes on to alert the driver about the system trouble when a malfunction is detected in self-diagnosis of the airbag sensor assembly and side airbag sensor assembly. In normal operating conditions when the ignition switch is turned to the ACC or ON position, the light comes on for about 6 seconds and then goes off.



147BE07

## Ignition Judgement and Condition

- When the vehicle collides in the hatched are (Fig. 1) and the shock is larger than a predetermined level, the airbag and the seat belt pretensioner are activated automatically. The airbag sensor is characteristically turned in such a way that can judge the need for ignition in collisions within the hatched area.
- The safing sensor is designed to be activated by a smaller deceleration rate than that of the airbag sensor. As illustrated in Fig. 2 below, ignition is operated when current flows to the squib. This happens when a safing sensor and the airbag sensor go on simultaneously.
- Airbag sensor assembly judges whether or not to inflate the airbag in accordance with ON/OFF of the front airbag sensor and the deceleration detected by the airbag sensor.



147BE08

**Fig. 1**

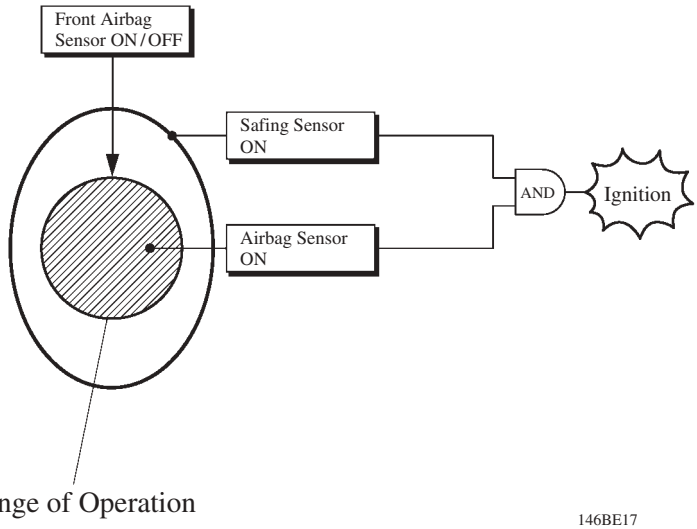



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**Fig. 2**

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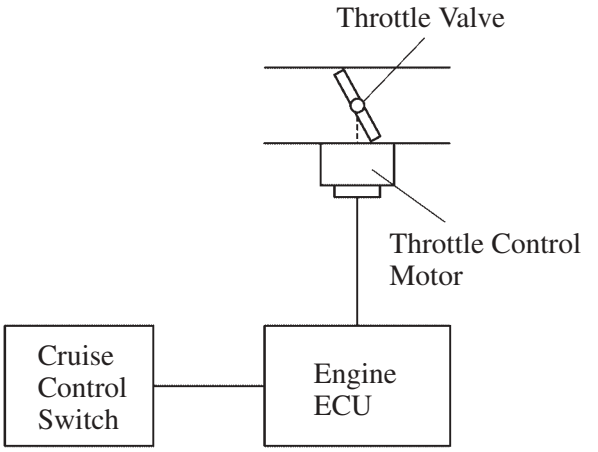
## ■CRUISE CONTROL SYSTEM

### 1. General

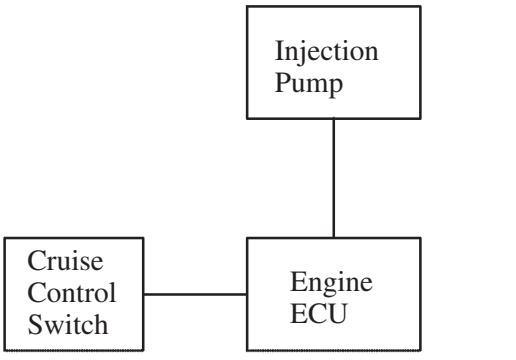
Once the system is set to a desired vehicle speed, the engine throttle position is adjusted automatically to maintain the vehicle speed at that speed without depressing the accelerator pedal.
This system in the Land Cruiser has the following features:

- On the 2UZ-FE engine models, in conjunction with the adoption of the ETCS-i in the engine, a cruise control system that uses the throttle control motor, which is a part of the ETCS-i, has been adopted. Also, the cruise control ECU has been integrated with the engine ECU.
- On the 1HD-FTE engine models, a cruise control system that controls the speed through the use of fuel injection control has been adopted. Also, as in the 2UZ-FE engine models, the cruise control ECU has been integrated with the engine ECU.
- On the 1HD-T engines models, a new motor type actuator that is both lightweight and simple in construction has been adopted. Also, the cruise control ECU has been made more compact.

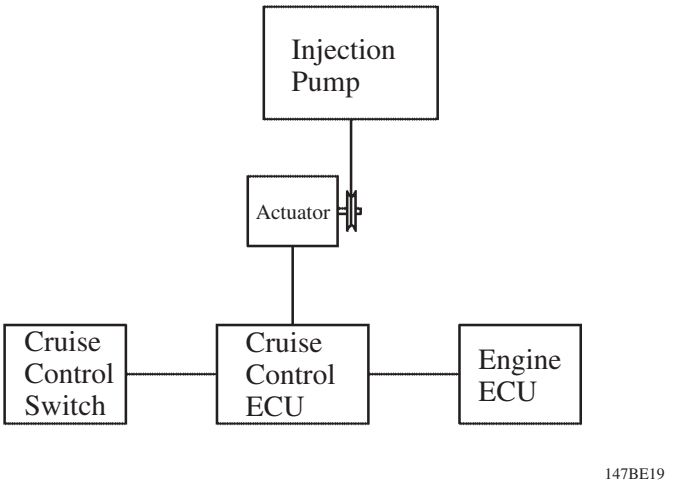
**▶ System Diagram ◀**




**2UZ-FE Engine Model**




**1HD-FTE Engine Model**




**1HD-T Engine Model**

## 2. Construction and Operation

### 2UZ-FE Engine Model

#### 1) Actuator (Throttle Control Motor)

The 2UZ-FE engine model uses a throttle control motor, which is a part of the ETCS-i (Electronic Throttle Control System-intelligent). Based on the signals received from the engine ECU, the throttle control motor controls the throttle valve opening so that the current vehicle speed matches the desired vehicle speed that is set in the system.
For details of construction and operation of throttle control motor, see page 94.

#### 2) Engine ECU

The cruise control ECU has been integrated with the engine ECU. The engine ECU receives the signals from the sensors and controls all cruise control functions.

### 1HD-FTE Engine Model

#### 1) Injection Pump

The 1HD-FTE engine model uses a electronically controlled distributor type injection pump.
Based on the signals received from the engine ECU, the injection pump controls the fuel injection volume so that the current vehicle speed matches the desired vehicle speed that is set in the system.
For details of construction and operation of injection pump, see page 128.

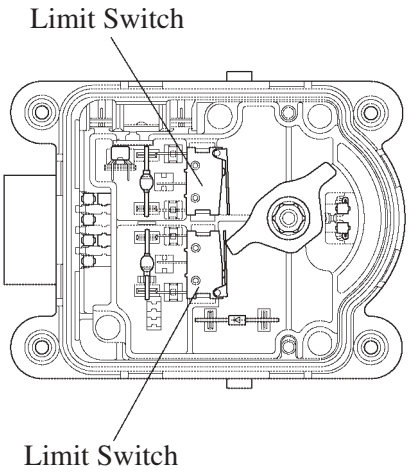
#### 2) Engine ECU

The cruise control ECU has been integrated with the engine ECU. The engine ECU receives the signals from the sensors and controls all cruise control functions.

## 1HD-T Engine Model

### 1) Actuator

The 1HD-T engine model uses a new motor type actuator.
The potentiometer that measured the opening angle of the control link and transmitted the signals to the cruise control ECU has been discontinued in the new actuator. The new actuator is equipped it with a compact motor. As a result, the new actuator is made both lightweight and simple in construction.
Without the potentiometer, the new actuator continuously regulates the opening angle of the control link. This is made possible by the ECU, which compares the current vehicle speed input with the desired vehicle speed that is stored in memory, and the result of that comparison is transmitted to the actuator.

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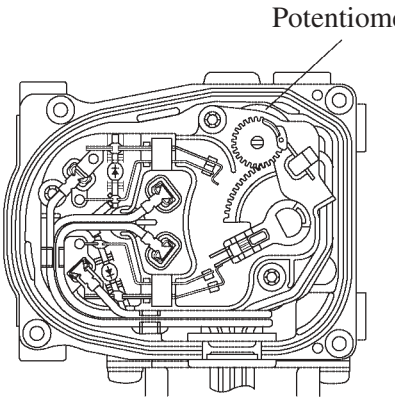
**New**




147BE05

**Previous**

### 2) Cruise Control ECU

The cruise control ECU has been made more compact by changing its internal circuits into an IC and by reducing the number of connector terminals by revising the functions.
Also, the backup power source has been discontinued with the adoption of the EEPROM (Electrical Erasable Programmable ROM).

## 3. Function

The functions of the cruise control system are basically the same as those of the previous model, except for the functions listed below.

### Constant Speed Control Function

As in the previous model, the constant speed control function of the 2UZ-FE engine model and 1HD-T engine model controls the vehicle speed through the use of an actuator that regulates the throttle valve opening. The vehicle speed of the 1HD-FTE engine model is controlled by enabling the injection pump to regulate the fuel injection volume.

### Manual Cancel Function

The following manual cancel has been changed.

| New | Previous |
|---|---|
| Transmission shifted to positions other than "D" | ● Transmission shifted to "N" position<br>● Pull up the parking brake lever |

### Auto Cancel Function

When the vehicle is being driven under cruise control, if any of the following conditions is present, the vehicle speed stored in memory is deleted, the control is lifted, the current to the actuator is disrupted, and the power indicator light is made to flash.

| Engine Type | Condition | How to Reactivate |
|---|---|---|
| 2UZ-FE | An abnormal condition in the ETCS-i components. | Turn off the ignition switch, and turn it back on. Then turn on the main switch. |
| 1HD-FTE | An abnormal condition in the fuel injection pump. | |
| 1HD-T | ● Continuous current applied to the motor's acceleration output.<br>● The motor did not move. | |
| 2UZ-FE and 1HD-FTE | ● An open or short circuit in the stop light switch.<br>● An abnormal condition of the vehicle speed signal. | Turn the main switch back on. |
| 1HD-T | ● Excessive current flowed to the motor or magnetic clutch drive transistor.<br>● Open circuit in magnetic clutch.<br>● The vehicle speed signal is not sent for a predetermined period of time (approx. 140 msec.) | |

### Diagnosis Function

Among the conditions in which the cruise control becomes canceled, a diagnosis function which uses a power indicator light, is implemented for some of the conditions.
For details of inspection, diagnostic trouble codes and repair procedures, see Land Cruiser Chassis and Body Repair Manual (Pub. No. RM616E).

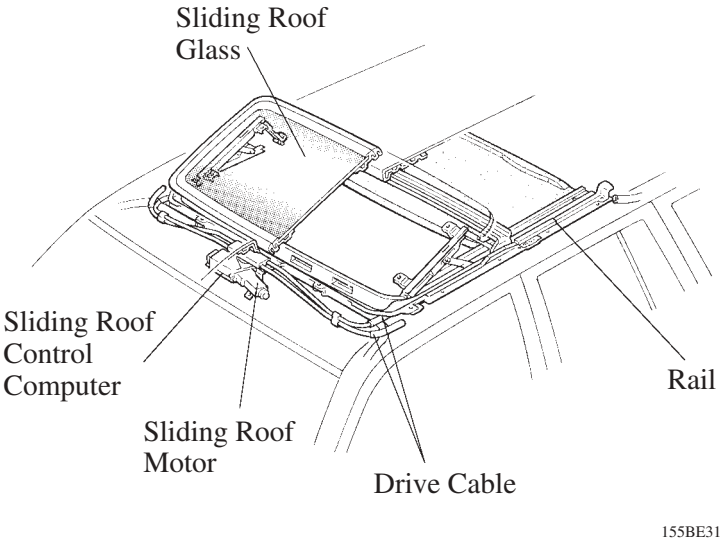
## ■ MOON ROOF

### 1. General

The moon roof in the Land Cruiser has the following features:

- A tilt-and-slide type power moon roof with "one-touch operation (except models for Australia)" and "jam protection" functions has been adopted.
  The "one-touch operation" function enables the moon roof to effect a fully open or a fully closed tilt-and-slide operation.
  The "jam protection" function detects if a foreign object gets caught while the moon roof is closing (in the slide-close mode).
- The sliding roof microcomputer and the sliding roof motor have been integrated to reduce the number of components.

### 2. Layout of Components

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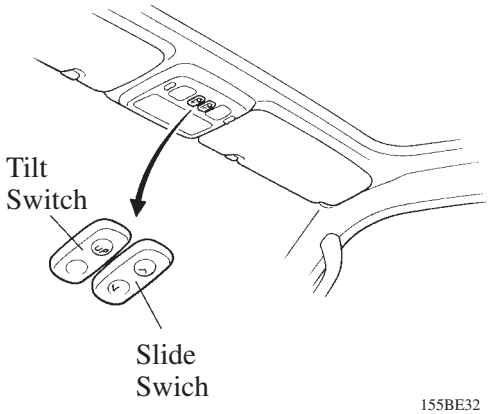


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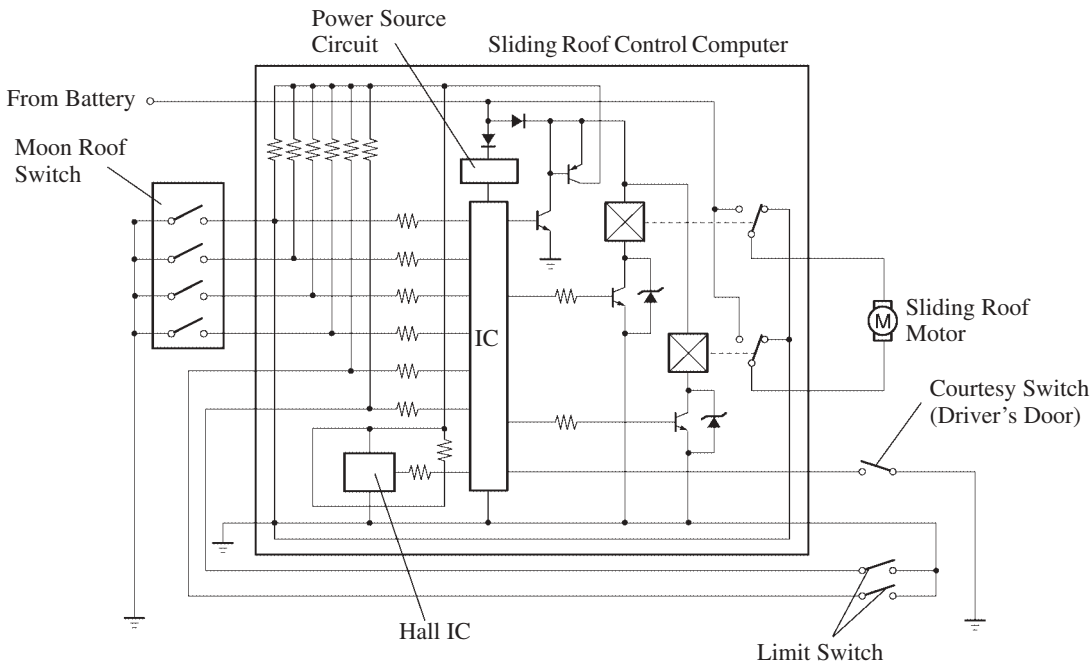
### 3. Wiring Diagram

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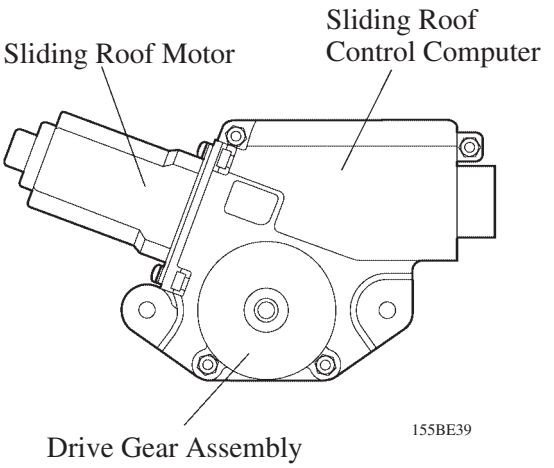
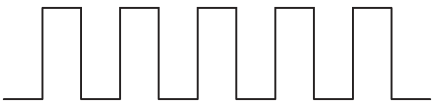
## 4. Construction

### Sliding Roof Drive Gear Assembly

- The sliding roof drive gear assembly consists of a microcomputer that contains a Hall IC and a drive unit that contains a sliding roof motor and a drive gear.
- The sliding roof drive gear assembly contains a pulse sensor to detect if any foreign object gets caught in the sliding roof.
  The pulse sensor consists of a magnet and a hall IC. The magnet rotates with the sliding roof motor. The hall IC detects a polarity change which is caused by the rotation of the magnet, and converts it into a pulse signal. The pulse sensor (hall IC) outputs a pulse signal to the microcomputer.



**Output Pulse Signal**

155BE38

## 5. Operation

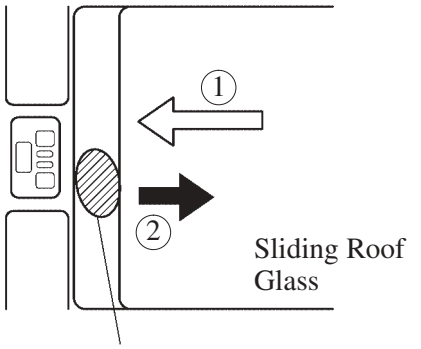
### One-Touch Operation

When one of the moon roof switches (the slide switch or the tilt switch) is pressed longer than 0.3 seconds, the microcomputer causes the sliding moon roof motor to rotate in accordance with the switch operation. At the same time, the timer function in the microcomputer activates, allowing the current to be applied to the motor even if the finger is released from the switch. Thus, the moon roof will carry out the slide-open, slide-close, tilt-up, and tilt-down operations even if the switch is no longer pressed.
The one-touch operation stops its operation when one of the conditions given below is met.

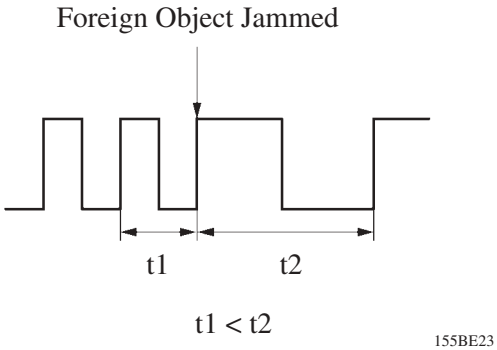
- The microcomputer determines that the motor has seized (by the activation of the “jam protection” function), according to the signals from the Hall IC.
- The moon roof fully opens or fully closes during a tilt-up or down operation or a slide-open or close operation.
- One of the moon roof switches (the slide switch or the tilt switch) is pressed during the moon roof operation.
- The slide switch and the tilt switch are turned ON simultaneously.

### Jam Protection Operation

If an object becomes jammed between the moon roof and the body during slide close operation, the sliding roof motor's speed decrease (①). Accordingly, the amplitude of the pulse signals that are output by the pulse sensor to microcomputer increases.
When the motor's deceleration rate exceeds a predetermined value or the seizure of the motor is detected, the microcomputer determines that jamming has occurred.
Then, the microcomputer stops the close movements of the moon roof, and automatically moves the moon roof open.
If jamming occurs during a slide-close operation, the moon roof slide opens until the roof opening is 200 mm (7.9 in.) or more (②).




**Slide Operation**




**Output Pulse Signal**

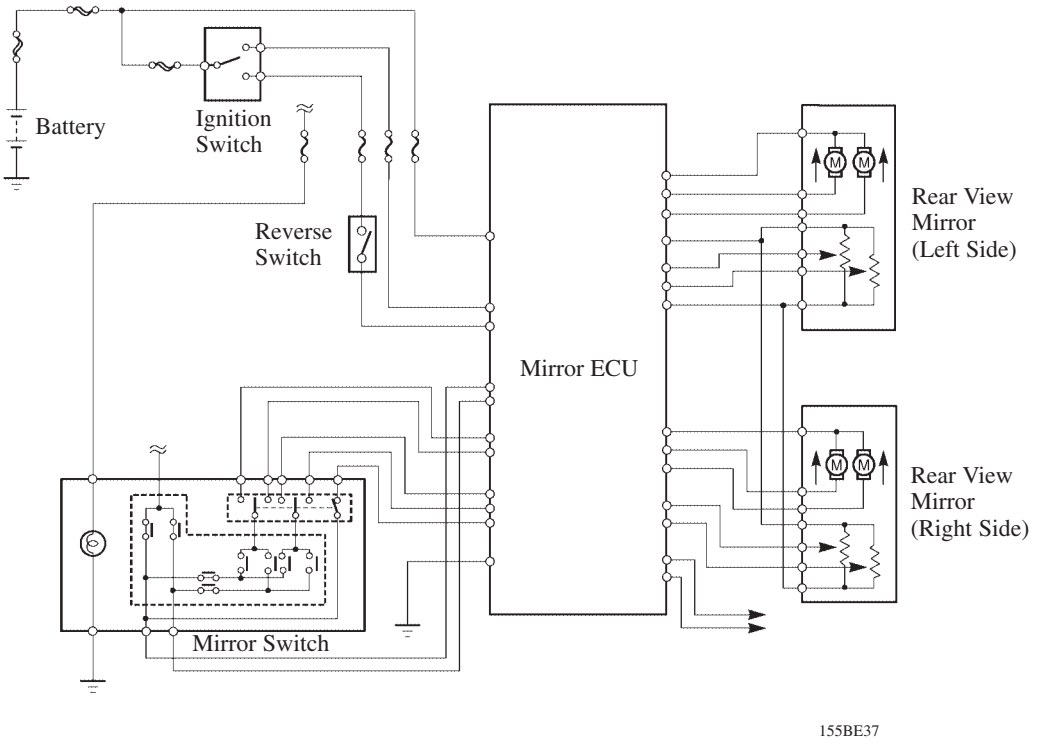
## ■OUTSIDE REAR VIEW MIRROR

### 1. General

The outside rear view mirror in the Land Cruiser has the following features:

- An electrical remote control type outside rear view mirror that enables mirror angle to be adjusted by a switch operation is provided on all models.
- An internal heater which operates in conjunction with the rear window defogger have been adopted on models for Europe.
- The RHD model for Europe is provided with a power retraction function in which the mirrors can be retracted or reinstated by operating a switch.

### 2. Wiring Diagram




**RHD models for Europe**

## 3. Power Retraction Function (RHD models for Europe)

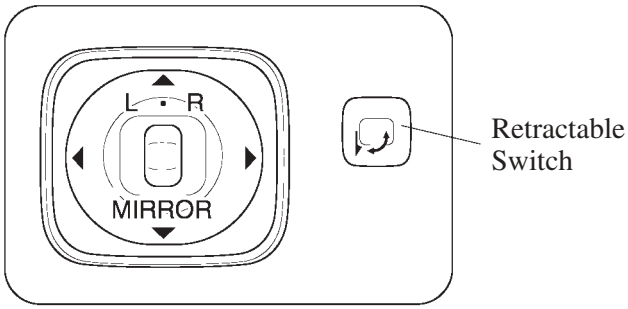
### Construction

#### 1) Outside Rear View Mirror

A photo coupler for detecting the seizure amperage has been adopted in the power retraction system to ensure a compact retraction unit.

#### 2) Retractable Switch

The retractable switch is located on the instrument panel, together with the mirror control switch. The retractable switch is a lock type switch.

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### Operation

- When the ignition switch is in the ACC or ON position, operating the retractable switch causes the mirror to retract or reinstate.
- If the ignition switch is turned OFF during the retraction or reinstating operation, the mirror immediately stops its movement. Then, when the ignition switch is turned back to the ACC or ON position, the mirror will resume its retraction or reinstating operation.
- If the setting of the retractable switch and the position of the mirror do not match (e.g., the retractable switch is set to the retraction side while the mirror itself is in its extended state), turning the ignition switch to the ACC or ON position will cause the mirror to retract or reinstate in order to match the setting of the retractable switch.

## ■SEAT BELT WARNING SYSTEM

### 1. General

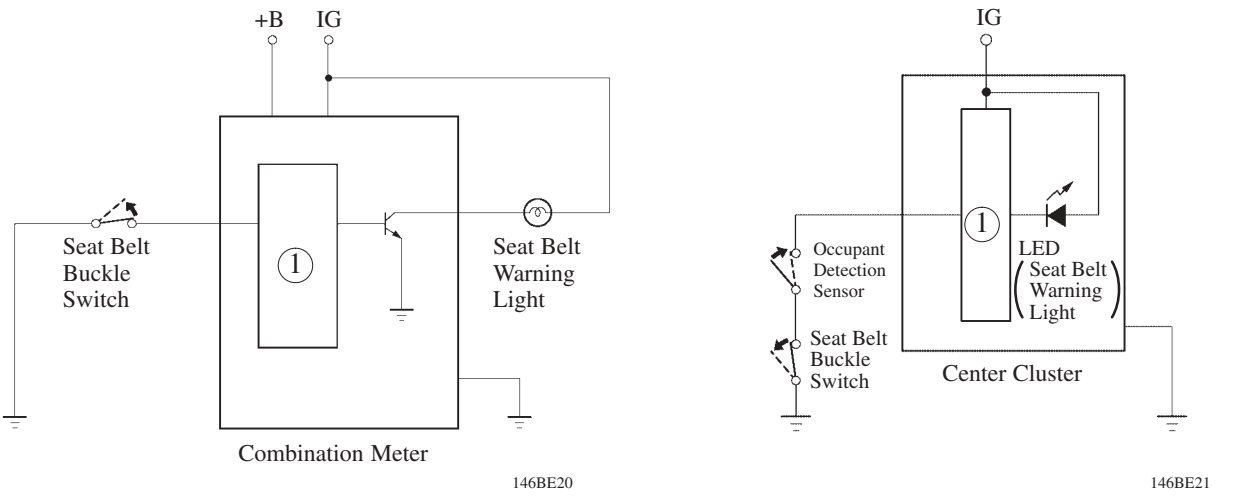
The seat belt warning system illuminates the warning light or sounds the buzzer to inform the driver or the front passenger that their seat belts have not been buckled, if the driver or the front passenger has not buckled the respective seat belt when the ignition switch is turned ON.
This system is provided as shown in the following table.

**▶ Availability ◀**

●: Standard ○: Option

| Destination and Grade / Seat for Warning | Warning Method | Europe | Australia | | | G.C.C. Countries | | | General Countries | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | VX | VX | GX | STD | VX | GX | STD | VX | GX | STD |
| Driver and Front Passenger | Light and Buzzer | | | | | ● | ○ | ○ | | | |
| | Light | ● | ● | ○ | ○ | | | | ● | ○ | ○ |
| Driver | Light and Buzzer | | | | | | ● | ● | | | |
| | Light | | | ● | ● | | | | | ● | ● |

### 2. Wiring Diagram




(1) : Driving Flashing Circuit

**For Driver** **For Front Passenger**

## 3. Seat Belt Warning for Driver

### Construction

The seat belt warning for the driver consists of the driver seat belt buckle switch, seat belt warning light for the driver and warning buzzer for driver (models with warning buzzer).

**1) Driver Seat Belt Buckle Switch**

The driver seat belt buckle switch is enclosed in the seat belt buckle of the driver seat to detect whether or not the seat belt for the driver is being worn.

**2) Seat Belt Warning Light for Driver**

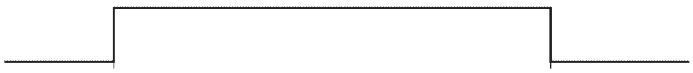
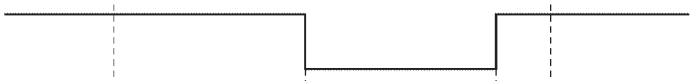
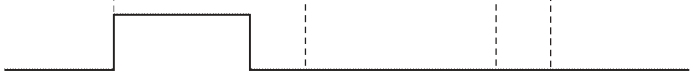
The seat belt warning light for the driver is located in the combination meter. This light flashes to warn if the driver does not have the seat belt buckled.

**3) Warning Buzzer for Driver (Models with Warning Buzzer)**

The warning buzzer for the driver is located in the combination meter.
The warning buzzer sounds for several seconds if the driver's seat belt is not buckled.

### Operation

If the driver's seat belt is not buckled when the ignition switch is turned ON, the warning light in the combination meter flashes. The warning light continues to flash until the driver wears the seat belt.
The models with warning buzzer sounds the warning buzzer for several seconds simultaneously with the flashing of the warning light.

| | | |
|---|---|---|
| Ignition Switch | ON<br>OFF |  |
| Driver Seat Belt Buckle Switch | ON<br>OFF |  |
| Seat Belt Warning Light for Driver | ON<br>OFF |  |
| Warning Buzzer for Driver | ON<br>OFF |  |

146BE22

## 4. Seat Belt Warning for Front Passenger

### Construction

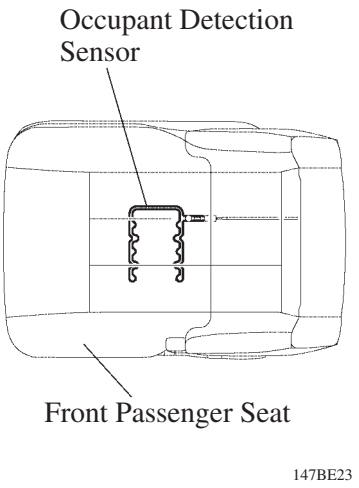
The seat belt warning for the front passenger consists of the front passenger seat belt buckle switch, occupant detection sensor, seat belt warning light for the front passenger.

#### 1) Front Passenger Seat Belt Buckle Switch

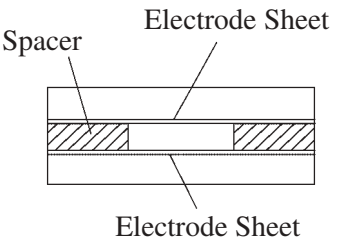
The front passenger seat belt buckle switch is enclosed in the seat belt buckle of the front passenger seat to detect whether or not the seat belt for the front passenger is being worn.

#### 2) Belt Warning Occupant Detection Sensor

The occupant detection sensor, which is enclosed in the seat cushion of the front passenger seat, is used to detect whether or not the front passenger seat is occupied.
This sensor, which is shaped as illustrated below, consists of a construction in which two sheets of electrodes sandwich a spacer. When the occupant is seated, the electrode sheets come in contact with each other through the hole that is provided in the spacer portion, thus enabling the current to flow.
Thus, the sensor detects whether or not an occupant is seated in the front passenger seat.

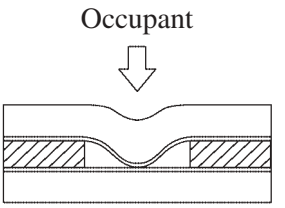



147BE23




156BE19

**Sensor OFF**

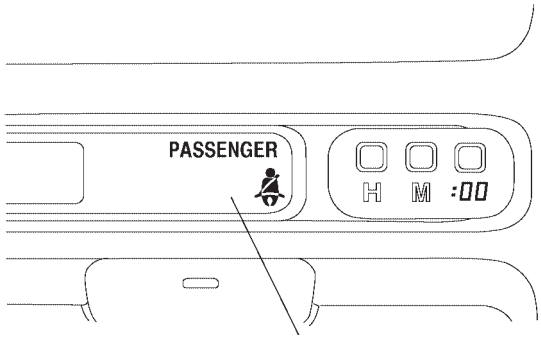



156BE20

**Sensor ON**

### 3) Seat Belt Warning Light for Front Passenger

The seat belt warning light for the front passenger is located in the display of the center cluster. This light flashes to warn if the front passenger does not have the seat belt buckled.




## Operation

When an occupant is seated in the front passenger seat, the occupant detection sensor activates, thus enabling the system to recognize that the occupant has seated. When the ignition switch is turned ON, a warning light flashes if the front passenger is not wearing the seat belt. The warning light continues to flash until the front passenger wears the seat belt.
If the front passenger seat is not occupied, the warning light remains extinct regardless of the condition of the seat belt.

# MAJOR TECHNICAL SPECIFICATIONS

| Item \ Area | | | | Europe | | | |
|---|---|---|---|---|---|---|---|
| Body Type | | | | Wagon (Lift-Up Back Door) | | | |
| Vehicle Grade | | | | VX | | | |
| Model Code | | | | UZJ100R-GNPEKW | UZJ100L-GNPEKW | HDJ100R-GNMEZW | HDJ100R-GNPEZW |
| Major Dimensions & Vehicle Weights | Overall | Length | mm (in.) | 4890 (192.5)*1 | ← | ← | ← |
| | | Wide | mm (in.) | 1940 (76.4) | ← | ← | ← |
| | | Height* | mm (in.) | 1880 (74.0)*2, 1850 (72.8)*2, 3 | ← | ← | ← |
| | Wheel Base | | mm (in.) | 2850 (112.2) | ← | ← | ← |
| | Tread | Front | mm (in.) | 1620 (63.8) | ← | ← | ← |
| | | Rear | mm (in.) | 1615 (63.6) | ← | ← | ← |
| | Room | Length | mm (in.) | 2505 (98.6)*4 | ← | ← | ← |
| | | Wide | mm (in.) | 1620 (63.8) | ← | ← | ← |
| | | Height | mm (in.) | 1145 (45.1), 1150 (45.3)*15 | ← | ← | ← |
| | Cargo Space | Length | mm (in.) | 335 (13.2)*4 | ← | ← | ← |
| | | Wide | mm (in.) | — | — | — | — |
| | | Height | mm (in.) | 995 (39.2)*4 | ← | ← | ← |
| | Overhang | Front | mm (in.) | 895 (35.2)*1 | ← | ← | ← |
| | | Rear | mm (in.) | 1145 (45.1) | ← | ← | ← |
| | Min. Running Ground Clearance | | mm (in.) | — | — | — | — |
| | Angle of Approach | | degrees | — | — | — | — |
| | Angle of Departure | | degrees | — | — | — | — |
| | Curb Weight | Front | kg (lb) | 1370 (3020) | ← | 1475 (3252) | 1495 (3296) |
| | | Rear | kg (lb) | 1150 (2535) | ← | 1135 (2502) | 1145 (2524) |
| | | Total | kg (lb) | 2520 (5555) | ← | 2610 (5754) | 2640 (5820) |
| | Gross Vehicle Weight | Front | kg (lb) | 1415 (3120) | ← | 1535 (3384) | 1560 (3439) |
| | | Rear | kg (lb) | 1845 (4068) | ← | 1725 (3803) | 1700 (3748) |
| | | Total | kg (lb) | 3260 (7187) | ← | ← | ← |
| | Fuel Tank Capacity | | ℓ (Imp.gal.) | 96 (21.1) | ← | ← | ← |
| | Luggage Compartment Capacity | | $m^3$ (cu.ft.) | — | — | — | — |
| Performance | Max. Speed | | km / h (mph) | 175 (109) | ← | 160 (99) | 175 (109) |
| | Max. Cruising Speed | | km / h (mph) | — | — | — | — |
| | Max. Permissible Speed | 1st Gear | km / h (mph) | 23 (14)*5, 57 (35)*6 | ← | 14 (9)*5, 36 (22)*6 | 18 (11)*5, 45 (28)*6 |
| | | 2nd Gear | km / h (mph) | 42 (26)*5, 104 (65)*6 | ← | 26 (16)*5, 64 (40)*6 | 35 (22)*5, 87 (54)*6 |
| | | 3rd Gear | km / h (mph) | — | — | 40 (25)*5, 98 (61)*6 | — |
| | | 4th Gear | km / h (mph) | — | — | 59 (37)*5, 147 (91)*6 | — |
| | Min. Turning Radius | Tire | m (ft.) | 5.9 (19.4) | ← | ← | ← |
| | | Body | m (ft.) | 6.3 (20.7) | ← | ← | ← |
| Engine | Engine Type | | | 2UZ-FE | ← | 1HD-FTE | ← |
| | Valve Mechanism | | | 32-Valve, DOHC | ← | 24-Valve, OHC | ← |
| | Bore x Stroke | | mm (in.) | 94.0 x 84.0 (3.70 x 3.31) | ← | 94.0 x 100.0 (3.70 x 3.94) | ← |
| | Displacement | | $cm^3$ (cu.in.) | 4664 (284.5) | ← | 4164 (254.0) | ← |
| | Compression Ratio | | | 9.6 : 1 | ← | 18.8 : 1 | ← |
| | Fuel System | | | EFI | ← | Distributor Type | ← |
| | Research Octane No. or Cetane No. | | | 96 | ← | 48 or higher | ← |
| | Max. Output | | kW / rpm | 173 / 4800 (EEC) | ← | 150 / 3400 (EEC) | ← |
| | Max. Torque | | N·m / rpm | 434 / 3400 (EEC) | ← | 430 / 1400 ~ 3200 (EEC) | ← |
| Engine Electrical | Battery Capacity (5HR) | | Voltage & Amp. Hr. | 12-55, 64*7 | ← | 12-55 x 2, 64 x 2*7 | ← |
| | Generator Output | | Watts | 960 | ← | 960, 1440*7 | ← |
| | Starter Output | | | 2.0 | ← | 3.0 | ← |
| Chassis | Clutch Type | | | — | — | Dry, single, Diaphragm | — |
| | Transaxle Type | | | A343F | ← | H151F | A442F |
| | Transmission Gear Ratio | In First | | 2.804 | ← | 4.081 | 2.950 |
| | | In Second | | 1.531 | ← | 2.294 | 1.530 |
| | | In Third | | 1.000 | ← | 1.490 | 1.000 |
| | | In Fourth | | 0.753 | ← | 1.000 | 0.765 |
| | | In Fifth | | — | — | 0.881 | — |
| | | In Reverse | | 2.393 | ← | 4.313 | 2.678 |
| | Transfer Gear Ratio H4 / L4 | | | 1.000 / 2.488 | ← | ← | ← |
| | Differential Gear Ratio (Front / Rear) | | | 4.300 / 4.300 | ← | 3.909 / 3.909 | 4.100 / 4.100 |
| | Differential Gear Size (Front / Rear) | | in. | 8" / 9.5" | ← | ← | ← |
| | Brake Type | Front | | Ventilated Disc | ← | ← | ← |
| | | Rear | | Ventilated Disc | ← | ← | ← |
| | Parking Brake Type | | | Drum | ← | ← | ← |
| | Brake Booster Type | | | Hydraulic | ← | ← | ← |
| | Proportioning Valve Type | | | P & B Valve | ← | ← | ← |
| | Suspension Type | Front | | Double Wishbone | ← | ← | ← |
| | | Rear | | 4-Lilnk with Lateral Rod | ← | ← | ← |
| | Stabilizer Bar | Front | | STD | ← | ← | ← |
| | | Rear | | STD | ← | ← | ← |
| | Steering Gear Type | | | Rack & Pinion | ← | ← | ← |
| | Steering Gear Ratio (Overall) | | | 19.8 | ← | ← | ← |
| | Power Steering Type | | | Integral Type | ← | ← | ← |

*: Unladed Vehicle
*1: With Electrical Winch +50 mm (2.0 in.)
*2: With Roof Rail +40 mm (1.6 in.)
*3: With AHC & Skyhook TEMS
*4: With 3rd Seat
*5: Transfer in Low
*6: Transfer in High
*7: Option
*8: With 275 / 70R16 Tire
*9: With ABS
*15: With Moon Roof

| Europe | | Australia | | | |
|---|---|---|---|---|---|
| Wagon (Lift-Up Back Door) | | Wagon (Swing Back Door) | Wagon (Lift-Up Back Door) | | Wagon (Swing Back Door) |
| VX | | STD | GX | | STD |
| HDJ100L-GNMEZW | HDJ100L-GNPEZW | FZJ105R-GCMRKQ | FZJ105R-GNMNKQ | FZJ105R-GNPNKQ | HZJ105R-GCMRSQ |
| ← | ← | 4890 (192.5) | ← | ← | ← |
| ← | ← | ← | ← | ← | ← |
| ← | ← | 1920 (75.6) | 1920 (75.6), 1915 (75.4)*8 | ← | 1920 (75.6) |
| ← | ← | ← | ← | ← | ← |
| ← | ← | 1605 (63.2) | 1605 (63.2), 1620 (63.8)*8 | ← | 1605 (63.2) |
| ← | ← | 1600 (63.0) | 1600 (63.0), 1615 (63.6)*8 | ← | 1600 (63.0) |
| ← | ← | 1805 (71.1) | ← | ← | ← |
| ← | ← | 1615 (63.6) | ← | ← | ← |
| ← | ← | 1180 (46.5) | 1180 (46.5), 1150 (45.3)*15 | ← | 1180 (46.5) |
| ← | ← | 1085 (42.7) | ← | ← | ← |
| — | — | — | — | — | — |
| ← | ← | 1065 (41.9) | ← | ← | ← |
| ← | ← | 895 (35.2) | ← | ← | ← |
| ← | ← | ← | ← | ← | ← |
| — | — | — | — | — | — |
| — | — | — | — | — | — |
| — | — | — | — | — | — |
| 1475 (3252) | 1495 (3296) | 1190 (2624) | 1240 (2734) | 1260 (2778) | 1230 (2712) |
| 1135 (2502) | 1145 (2524) | 1120 (2469) | 1160 (2557) | ← | 1130 (2491) |
| 2610 (5754) | 2640 (5820) | 2310 (5093) | 2400 (5291) | 2420 (5335) | 2360 (5203) |
| 1535 (3384) | 1560 (3439) | 1330 (2932) | 1355 (2987) | 1380 (3042) | ← |
| 1725 (3803) | 1700 (3748) | 1850 (4079) | 1825 (4023) | 1800 (3968) | ← |
| ← | ← | 3180 (7011) | ← | ← | ← |
| ← | ← | 95 + 50 (20.9 + 11.0) | ← | ← | ← |
| — | — | — | — | — | — |
| 160 (99) | 175 (109) | 180 (112) | ← | ← | 155 (96) |
| — | — | — | — | — | — |
| 14 (9)*5, 36 (22)*6 | 18 (11)*5, 45 (28)*6 | 16 (10)*5, 40 (25)*6 | ← | 21 (13)*5, 53 (33)*6 | 13 (8)*5, 33 (21)*6 |
| 26 (16)*5, 64 (40)*6 | 35 (22)*5, 87 (54)*6 | 29 (18)*5, 71 (44)*6 | ← | 41 (25)*5, 102 (63)*6 | 25 (15)*5, 61 (83)*6 |
| 40 (25)*5, 98 (61)*6 | — | 44 (27)*5, 110 (68)*6 | ← | — | 40 (25)*5, 100 (62)*6 |
| 59 (37)*5, 147 (91)*6 | — | 66 (41)*5, 164 (102)*6 | ← | — | 58 (36)*5, 143 (89)*6 |
| ← | ← | 6.0 (19.7) | ← | ← | ← |
| ← | ← | 6.4 (21.0) | ← | ← | ← |
| ← | ← | 1FZ-FE | ← | ← | 1HZ |
| ← | ← | 24-Valve, DOHC | ← | ← | 12-Valve, OHC |
| ← | ← | 100.0 x 95.0 (3.97 x 3.74) | ← | ← | 94.0 x 100.0 (3.70 x 3.94) |
| ← | ← | 4477 (573.1) | ← | ← | 4164 (254.0) |
| ← | ← | 9.0 : 1 | ← | ← | 22.4 : 1 |
| ← | ← | EFI | ← | ← | Distributor Type |
| ← | ← | 91 | ← | ← | 48 or higher |
| ← | ← | 165 / 4600 (SAE-NET) | ← | ← | 96 / 3800 (SAE-NET) |
| ← | ← | 387 / 3600 (SAE-NET) | ← | ← | 285 / 2200 (SAE-NET) |
| ← | ← | 12-55 | ← | ← | 12-64 |
| ← | ← | 1200 | ← | ← | 960, 1440*7 |
| ← | ← | 1.4 | ← | ← | 2.5 |
| Dry, Single, Diaphragm | — | Dray, Single, Diaphragm | ← | — | Dry, Single, Diaphragm |
| H151F | A442F | H151F | ← | A442F | R151F |
| 4.081 | 2.950 | 4.081 | ← | 2.950 | 4.313 |
| 2.294 | 1.530 | 2.294 | ← | 1.530 | 2.330 |
| 1.490 | 1.000 | 1.490 | ← | 1.000 | 1.436 |
| 1.000 | 0.765 | 1.000 | ← | 0.765 | 1.000 |
| 0.881 | — | 0.881 | ← | — | 0.838 |
| 4.313 | 2.678 | 4.313 | ← | 2.678 | 4.220 |
| ← | ← | ← | ← | ← | ← |
| 3.909 / 3.909 | 4.100 / 4.100 | 4.300 / 4.300 | ← | ← | ← |
| ← | ← | ← | ← | ← | ← |
| ← | ← | ← | ← | ← | ← |
| ← | ← | L. T Drum, Ventilated Disc*7 | Ventilated Disc | ← | L. T Drum, Ventilated Disc*7 |
| ← | ← | ← | ← | ← | ← |
| ← | ← | Vacuum | Vacuum, Hydraulic*9 | ← | Vacuum |
| ← | ← | LSP & BV | LSP & BV, P & B Valve*9 | ← | LSP & BV |
| ← | ← | Leading Arm, Coil | ← | ← | ← |
| ← | ← | ← | ← | ← | ← |
| ← | ← | ← | ← | ← | ← |
| ← | ← | ← | ← | ← | ← |
| ← | ← | Recerculating Ball | ← | ← | ← |
| ← | ← | 18.59 | ← | ← | ← |
| ← | ← | ← | ← | ← | ← |

AP

| Item \ Area | | | | Australia | | | G.C.C. Countries |
|---|---|---|---|---|---|---|---|
| Body Type | | | | Wagon (Lift-Up Back Door) | | | Wagon (Swing Back Door) |
| Vehicle Grade | | | | GX | | VX | GX |
| Model Code | | | | HZJ105R-GNMNSQ | HZJ105R-GNPNSQ | UZJ100R-GNPEKQ | HZJ105L-GCMNSV |
| Major Dimensions & Vehicle Weights | Overall | Length | mm (in.) | 4890 (192.5) | ← | ← | 4890 (192.5)*1, 10 |
| | | Wide | mm (in.) | 1940 (76.4) | ← | ← | ← |
| | | Height* | mm (in.) | 1920 (75.6), 1915 (75.4)*8 | ← | 1890 (74.4), 1850 (72.8)*3 | 1905 (75.0)*11, 1885 (74.2)*8, 11 |
| | Wheel Base | | mm (in.) | 2850 (112.2) | ← | ← | ← |
| | Tread | Front | mm (in.) | 1605 (63.2), 1620 (63.8)*8 | ← | 1620 (63.8) | 1605 (63.2) |
| | | Rear | mm (in.) | 1600 (63.0), 1615 (63.6)*8 | ← | 1615 (63.6) | 1600 (63.0) |
| | Room | Length | mm (in.) | 1805 (71.1) | ← | 2505 (98.6) | — |
| | | Wide | mm (in.) | 1615 (63.6) | ← | 1620 (63.8) | 1615 (63.6) |
| | | Height | mm (in.) | 1180 (46.5), 1150 (45.3)*15 | ← | 1145 (45.1), 1150 (45.3)*15 | 1180 (46.5), 1150 (45.3)*15 |
| | Cargo Space | Length | mm (in.) | 1085 (42.7) | ← | 335 (13.2) | — |
| | | Wide | mm (in.) | — | — | — | — |
| | | Height | mm (in.) | 1065 (41.9) | ← | 995 (39.2) | — |
| | Overhang | Front | mm (in.) | 895 (35.2) | ← | ← | 895 (35.2)*1 |
| | | Rear | mm (in.) | 1145 (45.1) | ← | ← | 1145 (45.1)*10 |
| | Min. Running Ground Clearance | | mm (in.) | — | — | — | — |
| | Angle of Approach | | degrees | — | — | — | — |
| | Angle of Departure | | degrees | — | — | — | — |
| | Curb Weight | Front | kg (lb) | 1270 (2800) | 1300 (2866) | 1310 (2888) | 1315 (2899) |
| | | Rear | kg (lb) | 1170 (2579) | 1180 (2601) | 1270 (2800) | 1305 (2877) |
| | | Total | kg (lb) | 2440 (5379) | 2480 (5467) | 2580 (5688) | 2620 (5776) |
| | Gross Vehicle Weight | Front | kg (lb) | 1390 (3064) | 1425 (3142) | 1440 (3175) | 1430 (3153) |
| | | Rear | kg (lb) | 1790 (3946) | 1755 (3869) | 1820 (4012) | 1730 (3814) |
| | | Total | kg (lb) | 3180 (7011) | ← | 3260 (7187) | 3160 (6967) |
| | Fuel Tank Capacity | | ℓ (Imp.gal.) | 95 + 50 (20.9 + 11.0) | ← | 96 + 45 (21.1 + 9.9) | 95 + 50 (20.9 + 11.0) |
| | Luggage Compartment Capacity | | $m^3$ (cu.ft.) | — | — | — | — |
| Performance | Max. Speed | | km / h (mph) | 155 (96) | 145 (90) | 190 (118) | 155 (96) |
| | Max. Cruising Speed | | km / h (mph) | — | — | — | — |
| | Max. Permissible Speed | 1st Gear | km / h (mph) | 13 (8)*5, 33 (21)*6 | 19 (12)*5, 46 (29)*6 | 22 (14)*5, 54 (34)*6 | 13 (8)*5, 33 (21)*6 |
| | | 2nd Gear | km / h (mph) | 25 (15)*5, 61 (38)*6 | 36 (22)*5, 89 (55)*6 | 42 (26)*5, 104 (65)*6 | 25 (15)*5, 61 (38)*6 |
| | | 3rd Gear | km / h (mph) | 40 (25)*5, 100 (62)*6 | — | — | 40 (25)*5, 100 (62)*6 |
| | | 4th Gear | km / h (mph) | 58 (36)*5, 143 (89)*6 | — | — | 58 (36)*5, 143 (89)*6 |
| | Min. Turning Radius | Tire | m (ft.) | 6.0 (19.7) | ← | 5.9 (19.4) | 6.0 (19.7) |
| | | Body | m (ft.) | 6.4 (21.0) | ← | 6.3 (20.7) | 6.4 (21.0) |
| Engine | Engine Type | | | 1HZ | ← | 2UZ-FE | 1HZ |
| | Valve Mechanism | | | 12-Valve, OHC | ← | 32-Valve, DOHC | 12-Valve, OHC |
| | Bore x Stroke | | mm (in.) | 94.0 x 100.0 (3.70 x 3.94) | ← | 94.0 x 84.0 (3.70 x 3.31) | 94.0 x 100.0 (3.70 x 3.94) |
| | Displacement | | $cm^3$ (cu.in.) | 4164 (254.0) | ← | 4664 (284.5) | 4164 (254.0) |
| | Compression Ratio | | | 22.4 : 1 | ← | 9.6 : 1 | 22.4 : 1 |
| | Fuel System | | | Distributor Type | ← | EFI | Distributor Type |
| | Research Octane No. or Cetane No. | | | 48 or higher | ← | 91 | 48 or higher |
| | Max. Output | | kW / rpm | 96 / 3800 (SAE-NET) | ← | 170 / 4800 (SAE-NET) | 100 / 3800 (SAE-GROSS) |
| | Max. Torque | | N·m / rpm | 285 / 2200 (SAE-NET) | ← | 410 / 3400 (SAE-NET) | 290 / 2200 (SAE-GROSS) |
| Engine Electrical | Battery Capacity (5HR) | | Voltage & Amp. Hr. | 12-64 | ← | 12-55 | ← |
| | Generator Output | | Watts | 960, 1440*7 | ← | 1200 | 840, 960*7 |
| | Starter Output | | | 2.5 | ← | 1.4 | 2.5 |
| Chassis | Clutch Type | | | Dry, Single, Diaphragm | — | — | Dry, Single, Diaphragm |
| | Transaxle Type | | | R151F | A442F | ← | R151F |
| | Transmission Gear Ratio | In First | | 4.313 | 2.950 | ← | 4.313 |
| | | In Second | | 2.330 | 1.530 | ← | 2.330 |
| | | In Third | | 1.436 | 1.000 | ← | 1.436 |
| | | In Fourth | | 1.000 | 0.765 | ← | 1.000 |
| | | In Fifth | | 0.838 | — | — | 0.838 |
| | | In Reverse | | 4.220 | 2.678 | ← | 4.220 |
| | Transfer Gear Ratio H4 / L4 | | | 1.000 / 2.488 | ← | ← | ← |
| | Differential Gear Ratio (Front / Rear) | | | 4.300 / 4.300 | ← | ← | ← |
| | Differential Gear Size (Front / Rear) | | in. | 8" / 9.5" | ← | ← | ← |
| | Brake Type | Front | | Ventilated Disc | ← | ← | ← |
| | | Rear | | Ventilated Disc | ← | ← | L. T Drum, Ventilated Disc*7 |
| | Parking Brake Type | | | Drum | ← | ← | ← |
| | Brake Booster Type | | | Vacuum, Hydraulic*9 | ← | ← | Vacuum, Hydraulic*9 |
| | Proportioning Valve Type | | | LSP & BV, P & B Valve*9 | ← | ← | LSP & BV, P & B Valve*9 |
| | Suspension Type | Front | | Leading Arm, Coil | ← | Double Wishbone | Leading Arm, Coil |
| | | Rear | | 4-Link with Lateral Rod | ← | ← | ← |
| | Stabilizer Bar | Front | | STD | ← | ← | ← |
| | | Rear | | STD | ← | ← | ← |
| | Steering Gear Type | | | Recerculating Ball | ← | Rack & Pinion | Recerculating Ball |
| | Steering Gear Ratio (Overall) | | | 18.59 | ← | 19.8 | 18.59 |
| | Power Steering Type | | | Integral Type | ← | ← | ← |

*: Unladed Vehicle
*1: With Electrical Winch +50 mm (2.0 in.)
*3: With AHC & Skyhook TEMS
*5: Transfer in Low
*6: Transfer in High
*7: Option
*8: With 275 / 70R16 Tire
*9: With ABS
*10: With Back Door-Mounted Spare Tire, Tire Size 235 / 85R16 +295 mm (11.6 in.), Tire Size 275 / 70R16 +305 (12.0 in.), Tire Size 7.50R16 +265 mm (10.4 in.)
*11: With Roof Rack +230 mm (9.1 in.)
*12: With Grille Guard +75 mm (3.0 in.)
*15: With Moon Roof

| G.C.C. Countries | | | | | |
|---|---|---|---|---|---|
| Wagon (Swing Back Door) | | Wagon (Lift-Up Back Door) | Wagon (Swing Back Door) | Wagon (Lift-Up Back Door) | Wagon (Swing Back Door) |
| STD | GX | GX | GX | GX | VX |
| FZJ100L-GCMRKV | FZJ100L-GCMNKV | FZJ100L-GNMNKV | FZJ100L-GCPNKV | FZJ100L-GNPNKV | UZJ100L-GCMEKV |
| ← | ← | ← | ← | ← | 4890 (192.5)*1, 10, 12 |
| ← | ← | ← | ← | ← | ← |
| 1880 (74.0)*11 | 1880 (74.0)*11, 1860 (73.2)*8,11 | ← | ← | ← | 1860 (73.2)*11, 1850 (72.8)*3,11 |
| ← | ← | ← | ← | ← | ← |
| 1640 (64.6) | 1640 (64.6), 1620 (63.8)*8 | ← | ← | ← | 1620 (63.8) |
| 1635 (64.4) | 1635 (64.4), 1615 (63.6)*8 | ← | ← | ← | 1615 (63.6) |
| 1805 (71.1) | — | 1805 (71.1) | — | 1805 (71.1) | — |
| 1615 (63.6) | ← | ← | ← | ← | 1620 (63.8) |
| 1180 (46.5) | 1180 (46.5), 1150 (45.3) | ← | ← | ← | 1145 (45.1), 1150 (45.3)*15 |
| 1085 (42.7) | — | 1085 (42.7) | — | 1085 (42.7) | — |
| — | — | — | — | — | — |
| 1065 (41.9) | — | 1065 (41.9) | — | 1065 (41.9) | — |
| ← | ← | ← | ← | ← | 895 (35.2)*1, 12 |
| ← | ← | ← | ← | ← | 1145 (45.1)*10 |
| — | — | — | — | — | — |
| — | — | — | — | — | — |
| — | — | — | — | — | — |
| 1280 (2822) | 1305 (2877) | 1310 (2888) | 1340 (2954) | 1345 (2965) | 1370 (3020) |
| 1240 (2734) | 1325 (2921) | 1275 (2810) | 1340 (2954) | 1290 (2844) | 1360 (2998) |
| 2520 (5556) | 2630 (5798) | 2585 (5698) | 2680 (5908) | 2635 (5809) | 2730 (6019) |
| 1375 (3031) | 1420 (3131) | 1410 (3109) | 1420 (3131) | 1415 (3120) | 1445 (3186) |
| 1785 (3935) | 1740 (3836) | 1750 (3858) | 1740 (3836) | 1745 (3847) | 1815 (4001) |
| ← | ← | ← | ← | ← | 3260 (7187) |
| 96 + 45 (21.1 + 9.9) | ← | 95 + 45 (20.9 + 11.0) | ← | ← | ← |
| — | — | — | — | — | — |
| 180 (112) | ← | ← | ← | ← | 190 (118) |
| — | — | — | — | — | — |
| 16 (10)*5, 40 (25)*6 | ← | ← | 21 (13)*5, 53 (33)*6 | ← | 17 (10)*5, 41 (26)*6 |
| 29 (18)*5, 71 (44)*6 | ← | ← | 41 (25)*5, 102 (63)*6 | ← | 29 (18)*5, 73 (46)*6 |
| 44 (27)*5, 110 (68)*6 | ← | ← | — | — | 45 (28)*5, 113 (70)*6 |
| 66 (41)*5, 164 (102)*6 | ← | ← | — | — | 68 (42)*5, 168 (104)*6 |
| 5.9 (19.4) | ← | ← | ← | ← | ← |
| 6.3 (20.7) | ← | ← | ← | ← | ← |
| 1FZ-FE | ← | ← | ← | ← | 2UZ-FE |
| 24-Valve, DOHC | ← | ← | ← | ← | 32-Valve, DOHC |
| 100.0 x 95.0 (3.97 x 3.74) | ← | ← | ← | ← | 94.0 x 84.0 (3.70 x 3.31) |
| 4477 (573.1) | ← | ← | ← | ← | 4664 (284.5) |
| 9.0 : 1 | ← | ← | ← | ← | 9.6 : 1 |
| EFI | ← | ← | ← | ← | EFI |
| 91 | ← | ← | ← | ← | 91 |
| 179 / 4600 (SAE-GROSS) | ← | ← | ← | ← | 186 / 4800 (SAE-GROSS) |
| 407 / 3600 (SAE-GROSS) | ← | ← | ← | ← | 432 / 3400 (SAE-GROSS) |
| ← | ← | ← | ← | ← | ← |
| 960, 1200*7 | ← | ← | ← | ← | 960 |
| 1.4 | ← | ← | ← | ← | ← |
| ← | ← | ← | — | — | Dry, Single, Diaphragm |
| H151F | ← | ← | A442F | ← | H151F |
| 4.081 | ← | ← | 2.950 | ← | 4.081 |
| 2.294 | ← | ← | 1.530 | ← | 2.294 |
| 1.490 | ← | ← | 1.000 | ← | 1.490 |
| 1.000 | ← | ← | 0.765 | ← | 1.000 |
| 0.881 | ← | ← | — | — | 0.881 |
| 4.313 | ← | ← | 2.678 | ← | 4.313 |
| ← | ← | ← | ← | ← | ← |
| ← | ← | ← | ← | ← | ← |
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| ← | ← | ← | ← | ← | ← |
| Double Wishbone | ← | ← | ← | ← | ← |
| ← | ← | ← | ← | ← | ← |
| ← | ← | ← | ← | ← | ← |
| ← | ← | ← | ← | ← | ← |
| Rack & Pinion | ← | ← | ← | ← | ← |
| 19.8 | ← | ← | ← | ← | ← |
| ← | ← | ← | ← | ← | ← |

AP

| Item \ Area | | | | G.C.C. Countries | | | General Countries |
|---|---|---|---|---|---|---|---|
| Body Type | | | | Wagon (Lift-Up Back Door) | Wagon (Swing Back Door) | Wagon (Lift-Up Back Door) | Wagon (Swing Back Door)VX |
| Vehicle Grade | | | | VX | VX | VX | STD |
| Model Code | | | | UZJ100L-GNMEKV | UZJ100L-GCPEKV | UZJ100L-GNPEKV | FZJ105L-GCMRK |
| Major Dimensions & Vehicle Weights | Overall | Length | mm (in.) | 4890 (192.5)*1, 10, 12 | ← | ← | 4890 (192.5)*1, 10 |
| | | Wide | mm (in.) | 1940 (76.4) | ← | ← | ← |
| | | Height* | mm (in.) | 1860 (73.2)*11, 1850 (72.8)*3,11 | ← | ← | 1925 (75.8)*2,11, 1930 (76.0)*2,11,13 |
| | Wheel Base | | mm (in.) | 2850 (112.2) | ← | ← | ← |
| | Tread | Front | mm (in.) | 1620 (63.8) | ← | ← | 1605 (63.2) |
| | | Rear | mm (in.) | 1615 (63.6) | ← | ← | 1600 (63.0) |
| | Room | Length | mm (in.) | 2505 (98.6) | — | 2505 (98.6) | 1805 (71.1) |
| | | Wide | mm (in.) | 1620 (63.8) | ← | ← | 1615 (63.6) |
| | | Height | mm (in.) | 1145 (45.1), 1150 (45.3)*15 | ← | ← | 1180 (46.5) |
| | Cargo Space | Length | mm (in.) | 335 (13.2) | — | 335 (13.2) | 1085 (42.7) |
| | | Wide | mm (in.) | — | — | — | — |
| | | Height | mm (in.) | 995 (39.2) | — | 995 (39.2) | 1065 (41.9) |
| | Overhang | Front | mm (in.) | 895 (35.2)*1, 12 | ← | ← | 895 (35.2)*1 |
| | | Rear | mm (in.) | 1145 (45.1)*10 | ← | ← | ← |
| | Min. Running Ground Clearance | | mm (in.) | — | — | — | — |
| | Angle of Approach | | degrees | — | — | — | — |
| | Angle of Departure | | degrees | — | — | — | — |
| | Curb Weight | Front | kg (lb) | 1370 (3020) | 1380 (3042) | ← | 1280 (2822) |
| | | Rear | kg (lb) | 1390 (3064) | 1360 (2998) | 1390 (3064) | 1230 (2712) |
| | | Total | kg (lb) | 2760 (6085) | 2740 (6041) | 2770 (6107) | 2510 (5534) |
| | Gross Vehicle Weight | Front | kg (lb) | 1460 (3219) | 1455 (3208) | 1475 (3252) | 1370 (3020) |
| | | Rear | kg (lb) | 1800 (3968) | 1805 (3979) | 1785 (3935) | 1790 (3946) |
| | | Total | kg (lb) | 3260 (7187) | ← | ← | 3160 (6967) |
| | Fuel Tank Capacity | | ℓ (Imp.gal.) | 96 + 45 (21.1 + 9.9) | ← | ← | 95 (20.9), 95 + 50 (20.9 + 11.0)*7 |
| | Luggage Compartment Capacity | | $m^3$ (cu.ft.) | — | — | — | — |
| Performance | Max. Speed | | km / h (mph) | 190 (118) | ← | ← | 175 (109) |
| | Max. Cruising Speed | | km / h (mph) | — | — | — | — |
| | Max. Permissible Speed | 1st Gear | km / h (mph) | 17 (10)*5, 41 (26)*6 | 22 (14)*5, 54 (34)*6 | ← | 16 (10)*5, 49 (25)*6 |
| | | 2nd Gear | km / h (mph) | 29 (18)*5, 73 (46)*6 | 42 (26)*5, 104 (65)*6 | ← | 29 (18)*5, 71 (44)*6 |
| | | 3rd Gear | km / h (mph) | 45 (28)*5, 113 (70)*6 | — | — | 44 (27)*5, 110 (68)*6 |
| | | 4th Gear | km / h (mph) | 68 (42)*5, 168 (104)*6 | — | — | 66 (41)*5, 164 (102)*6 |
| | Min. Turning Radius | Tire | m (ft.) | 5.9 (19.4) | ← | ← | 6.0 (19.7) |
| | | Body | m (ft.) | 6.3 (20.7) | ← | ← | 6.4 (21.0) |
| Engine | Engine Type | | | 2UZ-FE | ← | ← | 1FZ-FE |
| | Valve Mechanism | | | 32-Valve, DOHC | ← | ← | 24-VAlve, DOHC |
| | Bore x Stroke | | mm (in.) | 94.0 x 84.0 (3.70 x 3.31) | ← | ← | 100.0 x 95.0 (3.97 x 3.74) |
| | Displacement | | $cm^3$ (cu.in.) | 4664 (284.5) | ← | ← | 4477 (573.1) |
| | Compression Ratio | | | 9.6 : 1 | ← | ← | 9.0 : 1 |
| | Fuel System | | | EFI | ← | ← | EFI |
| | Research Octane No. or Cetane No. | | | 91 | ← | ← | 91 |
| | Max. Output | | kW / rpm | 186 / 4800 (SAE-GROSS) | ← | ← | 165 / 4600 (SAE-NET) |
| | Max. Torque | | N·m / rpm | 432 / 3400 (SAE-GROSS) | ← | ← | 387 / 3600 (SAE-NET) |
| Engine Electrical | Battery Capacity (5HR) | | Voltage & Amp. Hr. | 12-55 | ← | ← | ← |
| | Generator Output | | Watts | 960 | ← | ← | ← |
| | Starter Output | | | 1.4 | ← | ← | 1.4, 2.0*7 |
| Chassis | Clutch Type | | | Dry, Single, Diaphragm | ← | ← | Dry, Single, Diaphragm |
| | Transaxle Type | | | H151F | A442F | ← | H151F |
| | Transmission Gear Ratio | In First | | 4.081 | 2.950 | ← | 4.081 |
| | | In Second | | 2.294 | 1.530 | ← | 2.294 |
| | | In Third | | 1.490 | 1.000 | ← | 1.490 |
| | | In Fourth | | 1.000 | 0.765 | ← | 1.000 |
| | | In Fifth | | 0.881 | — | — | 0.881 |
| | | In Reverse | | 4.313 | 2.678 | ← | 4.313 |
| | Transfer Gear Ratio H4 / L4 | | | 1.000 / 2.488 | ← | ← | ← |
| | Differential Gear Ratio (Front / Rear) | | | 4.300 / 4.300 | ← | ← | ← |
| | Differential Gear Size (Front / Rear) | | in. | 8" / 9.5" | ← | ← | ← |
| | Brake Type | Front | | Ventilated Disc | ← | ← | ← |
| | | Rear | | L. T Drum, Ventilated Disc*7 | ← | ← | ← |
| | Parking Brake Type | | | Drum | ← | ← | ← |
| | Brake Booster Type | | | Vacuum, Hydraulic*9 | ← | ← | Vacuum |
| | Proportioning Valve Type | | | LSP & BV, P & B Valve*9 | ← | ← | LSP & BV |
| | Suspension Type | Front | | Double Wishbone | ← | ← | Leading Arm, Coil |
| | | Rear | | 4-Link with Lateral Rod | ← | ← | ← |
| | Stabilizer Bar | Front | | STD | ← | ← | ← |
| | | Rear | | STD | ← | ← | ← |
| | Steering Gear Type | | | Rack & Pinion | ← | ← | Recerculating Ball |
| | Steering Gear Ratio (Overall) | | | 19.8 | ← | ← | 18.59 |
| | Power Steering Type | | | Integral Type | ← | ← | ← |

*: Unladed Vehicle
*1: With Electrical Winch +50 mm (2.0 in.)
*2: With Roof Rail +40 mm (1.6 in.)
*3: With AHC & Skyhook TEMS
*5: Transfer in Low
*6: Transfer in High
*7: Option
*8: With 275 / 70R16 Tire
*9: With ABS
*10: With Back Door-Mounted Spare Tire, Tire Size 235 / 85R16 +295 mm (11.6 in.), Tire Size 275 / 70R16 +305 (12.0 in.), Tire Size 7.50R16 +265 mm (10.4 in.)
*11: With Roof Rack +230 mm (9.1 in.)
*12: With Grille Guard +75 mm (3.0 in.)
*13: With 7.50R16 Tire
*15: With Moon Roof

| General Countries | | | | | |
|---|---|---|---|---|---|
| Wagon (Swing Back Door) | Wagon (Lift-Up Back Door) | | Wagon (Swing Back Door) | | |
| GX | GX | | STD | | GX |
| FZJ105L-GCMNK | FZJ105L-GNMNK | FZJ105R-GNMNK | HZJ105R-GCMRS | HZJ105L-GCMRS | HZJ105R-GCMNS |
| ← | ← | ← | ← | ← | ← |
| ← | ← | ← | ← | ← | ← |
| 1925 (75.8)*2,11, 1920 (75.6)*2,8,11, 1930 (76.0)*2,11,13 | ← | ← | 1925 (75.8)*2,11, 1930 (76.0)*2,11,13 | ← | 1925 (75.8)*2,11, 1920 (75.6)*2,8,11, 1930 (76.0)*2,11,13 |
| ← | ← | ← | ← | ← | ← |
| ← | ← | ← | ← | ← | ← |
| ← | ← | ← | ← | ← | ← |
| ← | ← | ← | ← | ← | ← |
| ← | ← | ← | ← | ← | ← |
| ← | ← | ← | 1180 (46.5) | ← | 1180 (46.5), 1150 (45.3)*15 |
| 1085 (42.7) | ← | ← | ← | ← | ← |
| — | — | — | — | — | — |
| 1065 (41.9) | ← | ← | ← | ← | ← |
| ← | ← | ← | ← | ← | ← |
| ← | ← | ← | ← | ← | ← |
| — | — | — | — | — | — |
| — | — | — | — | — | — |
| — | — | — | — | — | — |
| 1315 (2899) | 1295 (2855) | 1300 (2866) | 1320 (2910) | 1330 (2932) | 1360 (2998) |
| 1255 (2767) | 1265 (2789) | 1270 (2800) | 1240 (2734) | ← | 1260 (2778) |
| 2570 (5666) | 2560 (5644) | 2570 (5666) | 2560 (5644) | 2570 (5666) | 2620 (5776) |
| 1415 (3120) | 1395 (3075) | 1360 (2998) | 1420 (3131) | 1430 (3153) | 1425 (3142) |
| 1745 (3847) | 1765 (3891) | 1800 (3968) | 1740 (3836) | 1730 (3814) | 1735 (3825) |
| ← | ← | ← | ← | ← | ← |
| ← | ← | ← | ← | ← | ← |
| — | — | — | — | — | — |
| ← | ← | ← | 155 (96) | ← | ← |
| — | — | — | — | — | — |
| ← | ← | ← | 13 (8)*5, 33 (21)*6 | ← | ← |
| ← | ← | ← | 25 (15)*5, 61 (38)*6 | ← | ← |
| ← | ← | ← | 40 (25)*5, 100 (62)*6 | ← | ← |
| ← | ← | ← | 58 (36)*5, 143 (89)*6 | ← | ← |
| ← | ← | ← | ← | ← | ← |
| ← | ← | ← | ← | ← | ← |
| ← | ← | ← | 1HZ | ← | ← |
| ← | ← | ← | 12-Valve, OHC | ← | ← |
| ← | ← | ← | 94.0 x 100.0 (3.70 x 3.94) | ← | ← |
| ← | ← | ← | 4164 (254.0) | ← | ← |
| ← | ← | ← | 22.4 : 1 | ← | ← |
| ← | ← | ← | Distributor Type | ← | ← |
| ← | ← | ← | 48 or higher | ← | ← |
| ← | ← | ← | 96 / 3800 (SAE-NET) | ← | ← |
| ← | ← | ← | 285 / 2200 (SAE-NET) | ← | ← |
| ← | ← | ← | 12-55, 64*7 | 12-55, 64*7, 64 x 2*7 | 12-55, 64*7 |
| ← | ← | ← | 840 | 84,960*7 | 840 |
| ← | ← | ← | 2.5 | 2.5, 3.0*7 | 2.5 |
| ← | ← | ← | ← | ← | ← |
| ← | ← | ← | R151F | ← | ← |
| ← | ← | ← | 4.313 | ← | ← |
| ← | ← | ← | 2.330 | ← | ← |
| ← | ← | ← | 1.436 | ← | ← |
| ← | ← | ← | 1.000 | ← | ← |
| ← | ← | ← | 0.838 | ← | ← |
| ← | ← | ← | 4.220 | ← | ← |
| ← | ← | ← | ← | ← | ← |
| ← | ← | ← | ← | ← | ← |
| ← | ← | ← | ← | ← | ← |
| ← | ← | ← | ← | ← | ← |
| ← | ← | ← | ← | ← | ← |
| ← | ← | ← | ← | ← | ← |
| Vacuum, Hydraulic*9 | ← | ← | Vacuum | Vacuum, Hydraulic*9 | ← |
| LSP & BV, P & B Valve*9 | ← | ← | LSP & BV | LSP & BV, P & B Valve*9 | ← |
| ← | ← | ← | ← | ← | ← |
| ← | ← | ← | ← | ← | ← |
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AP

| Item \ Area | | | | General Countries | | | |
|---|---|---|---|---|---|---|---|
| Body Type | | | | Wagon (Lift-Up Back Door) | Wagon (Swing Back Door) | Wagon (Lift-Up Back Door) | |
| Vehicle Grade | | | | GX | GX | GX | VX |
| Model Code | | | | HZJ105R-GNMNS | HZJ105L-GCMNS | HZJ105L-GNMNS | UZJ100L-GNMEK |
| Major Dimensions & Vehicle Weights | Overall | Length | mm (in.) | 4890 (192.5)*1, 10 | ← | ← | 4890 (192.5)*1, 10, 12 |
| | | Wide | mm (in.) | 1940 (76.4) | ← | ← | ← |
| | | Height* | mm (in.) | 1925 (75.8)*2,11, 1920 (75.6)*2,8,11, 1930 (76.0)*2,11,13 | ← | ← | 1920 (75.6)*2,11,14, 1900 (74.8)*2,8,11,14 |
| | Wheel Base | | mm (in.) | 2850 (112.2) | ← | ← | ← |
| | Tread | Front | mm (in.) | 1605 (63.2) | ← | ← | 1640 (64.6), 1620 (63.8)*8 |
| | | Rear | mm (in.) | 1600 (63.0) | ← | ← | 1635 (64.4), 1615 (63.6)*8 |
| | Room | Length | mm (in.) | 1805 (71.1) | ← | ← | 2505 (98.6)*4 |
| | | Wide | mm (in.) | 1615 (63.6) | ← | ← | 1620 (63.8)*4 |
| | | Height | mm (in.) | 1180 (46.5), 1150 (45.3)*15 | ← | ← | 1145 (45.1), 1150 (45.3)*4 |
| | Cargo Space | Length | mm (in.) | 1085 (42.7) | ← | ← | 335 (13.1)*4 |
| | | Wide | mm (in.) | — | — | — | — |
| | | Height | mm (in.) | 1065 (41.9) | ← | ← | 995 (39.2)*4 |
| | Overhang | Front | mm (in.) | 859 (35.2)*1 | ← | ← | 895 (35.2)*1, 12 |
| | | Rear | mm (in.) | 1145 (45.1)*10 | ← | ← | ← |
| | Min. Running Ground Clearance | | mm (in.) | — | — | — | — |
| | Angle of Approach | | degrees | — | — | — | — |
| | Angle of Departure | | degrees | — | — | — | — |
| | Curb Weight | Front | kg (lb) | 1330 (2932) | 1355 (2987) | 1375 (3031) | 1370 (3020) |
| | | Rear | kg (lb) | 1270 (2800) | 1255 (2767) | ← | 1340 (2954) |
| | | Total | kg (lb) | 2600 (5732) | 2610 (5754) | 2630 (5798) | 2710 (5975) |
| | Gross Vehicle Weight | Front | kg (lb) | 1395 (3075) | 1460 (3219) | 1485 (3274) | 1435 (3164) |
| | | Rear | kg (lb) | 1765 (3891) | 1700 (3748) | 1675 (3693) | 1825 (4023) |
| | | Total | kg (lb) | 3160 (6967) | ← | ← | 3260 (7187) |
| | Fuel Tank Capacity | | ℓ (Imp.gal.) | 95 (20.9), 95 + 50 (20.9 + 11.0)*7 | ← | ← | 96 (21.1), 96 + 45 (21.1 + 9.9)*7 |
| | Luggage Compartment Capacity | | $m^3$ (cu.ft.) | — | — | — | — |
| Performance | Max. Speed | | km / h (mph) | 155 (96) | ← | ← | 180 (112) |
| | Max. Cruising Speed | | km / h (mph) | — | — | — | — |
| | Max. Permissible Speed | 1st Gear | km / h (mph) | 13 (8)*5, 33 (21)*6 | ← | ← | 17 (11)*5, 42 (26)*6 |
| | | 2nd Gear | km / h (mph) | 25 (15)*5, 61 (38)*6 | ← | ← | 30 (19)*5, 75 (47)*6 |
| | | 3rd Gear | km / h (mph) | 40 (25)*5, 100 (62)*6 | ← | ← | 46 (29)*5, 116 (72)*6 |
| | | 4th Gear | km / h (mph) | 58 (36)*5, 143 (89)*6 | ← | ← | 69 (43)*5, 172 (107)*6 |
| | Min. Turning Radius | Tire | m (ft.) | 6.0 (19.7) | ← | ← | 5.9 (19.4) |
| | | Body | m (ft.) | 6.4 (21.0) | ← | ← | 6.3 (20.7) |
| Engine | Engine Type | | | 1HZ | ← | ← | 2UZ-FE |
| | Valve Mechanism | | | 12-Valve, OHC | ← | ← | 32-Valve, DOHC |
| | Bore x Stroke | | mm (in.) | 94.0 x 100.0 (3.70 x 3.94) | ← | ← | 94.0 x 84.0 (3.70 x 3.31) |
| | Displacement | | $cm^3$ (cu.in.) | 4164 (254.0) | ← | ← | 4664 (284.5) |
| | Compression Ratio | | | 22.4 : 1 | ← | ← | 9.6 : 1 |
| | Fuel System | | | Distributor Type | ← | ← | EFI |
| | Research Octane No. or Cetane No. | | | 48 or Higher | ← | ← | 91 |
| | Max. Output | | kW / rpm | 96 / 3800 (SAE-NET) | ← | ← | 170 / 4800 (SAE-NET) |
| | Max. Torque | | N·m / rpm | 285 / 2200 (SAE-NET) | ← | ← | 410 / 3400 (SAE-NET) |
| Engine Electrical | Battery Capacity (5HR) | | Voltage & Amp. Hr. | 12-55, 64*7 | 12-55, 64*7, 64 x 2*7 | ← | 12-55 |
| | Generator Output | | Watts | 840 | 840, 960*7 | ← | 960 |
| | Starter Output | | | 2.5 | 2.5, 3.0*7 | ← | 1.4 |
| Chassis | Clutch Type | | | Dry, Single, Diaphragm | ← | ← | ← |
| | Transaxle Type | | | R151F | ← | ← | H151F |
| | Transmission Gear Ratio | In First | | 4.313 | ← | ← | 4.081 |
| | | In Second | | 2.330 | ← | ← | 2.294 |
| | | In Third | | 1.436 | ← | ← | 1.490 |
| | | In Fourth | | 1.000 | ← | ← | 1.000 |
| | | In Fifth | | 0.838 | ← | ← | 0.881 |
| | | In Reverse | | 4.220 | ← | ← | 4.313 |
| | Transfer Gear Ratio H4 / L4 | | | 1.000 / 2.488 | ← | ← | ← |
| | Differential Gear Ratio (Front / Rear) | | | 4.300 / 4.300 | ← | ← | ← |
| | Differential Gear Size (Front / Rear) | | in. | 8" / 9.5" | ← | ← | ← |
| | Brake Type | Front | | Ventilated Disc | ← | ← | ← |
| | | Rear | | L. T Drum, Ventilated Disc*7 | ← | ← | ← |
| | Parking Brake Type | | | Drum | ← | ← | ← |
| | Brake Booster Type | | | Vacuum, Hydraulic*9 | ← | ← | ← |
| | Proportioning Valve Type | | | LSP & BV, P & B Valve*9 | ← | ← | ← |
| | Suspension Type | Front | | Leading Arm, Coil | ← | ← | Double Wishbone |
| | | Rear | | 4-Link with Lateral Rod | ← | ← | ← |
| | Stabilizer Bar | Front | | STD | ← | ← | ← |
| | | Rear | | STD | ← | ← | ← |
| | Steering Gear Type | | | Recerculating Ball | ← | ← | Rack & Pinion |
| | Steering Gear Ratio (Overall) | | | 18.59 | ← | ← | 19.8 |
| | Power Steering Type | | | Integral Type | ← | ← | ← |

*: Unladed Vehicle
*1: With Electrical Winch +50 mm (2.0 in.)
*2: With Roof Rail +40 mm (1.6 in.)
*3: With AHC & Skyhook TEMS
*4: With 3RD Seat
*5: Transfer in Low
*6: Transfer in High
*7: Option
*8: With 275 / 70R16 Tire
*9: With ABS
*10: With Back Door-Mounted Spare Tire, Tire Size 235 / 85R16 +295 mm (11.6 in.), Tire Size 275 / 70R16 +305 (12.0 in.), Tire Size 7.50R16 +265 mm (10.4 in.)
*11: With Roof Rack +230 mm (9.1 in.)
*12: With Grille Guard +75 mm (3.0 in.)
*13: With 7.50R16 Tire
*14: With AHC & Skyhook TEMS –50mm (2.0 in.)
*15: With Moon Roof

| General Countries | | | | |
|---|---|---|---|---|
| Wagon (Lift-Up Back Door) | | Wagon (Swing Back Door) | Wagon (Lift-Up Back Door) | |
| VX | | VX | VX | |
| UZJ100L-GNPEK | HDJ100R-GNMEX | HDJ100L-GCMEX | HDJ100L-GNMEX | HDJ100L-GNPEX |
| ← | ← | ← | ← | ← |
| ← | ← | ← | ← | ← |
| ← | ← | 1920 (75.6)*2,11, 1900 (4.8)*2,8,11 | ← | ← |
| ← | ← | ← | ← | ← |
| ← | ← | ← | ← | ← |
| ← | ← | ← | ← | ← |
| ← | ← | — | 2505 (98.6)*4 | ← |
| ← | ← | ← | 1620 (63.8)*4 | ← |
| ← | ← | ← | ← | ← |
| ← | ← | — | 335 (13.1)*4 | ← |
| — | — | — | — | — |
| ← | ← | — | 995 (39.2)*4 | ← |
| ← | ← | ← | ← | ← |
| ← | ← | ← | ← | ← |
| — | — | — | — | — |
| — | — | — | — | — |
| — | — | — | — | — |
| 1380 (3042) | 1440 (3175) | 1410 (3109) | 1440 (3175) | 1480 (3263) |
| ← | 1350 (2976) | 1290 (2844) | 1350 (2976) | ← |
| 2720 (5997) | 2790 (6151) | 2700 (5953) | 2790 (6151) | 2830 (6239) |
| 1445 (3186) | 1515 (3340) | 1520 (3351) | 1515 (3340) | 1565 (3450) |
| 1815 (4001) | 1745 (3847) | 1740 (3836) | 1745 (3847) | 1695 (3737) |
| ← | ← | ← | ← | ← |
| ← | ← | ← | ← | ← |
| — | — | — | — | — |
| ← | 150 (93) | ← | ← | 165 (103) |
| — | — | — | — | — |
| 22 (14)*5, 55 (34)*6 | 13 (8)*5, 33 (21)*6 | ← | ← | 18 (11)*5, 44 (27)*6 |
| 43 (27)*5, 107 (66)*6 | 24 (15)*5, 59 (37)*6 | ← | ← | 34 (21)*5, 85 (53)*6 |
| — | 37 (23)*5, 92 (57)*6 | ← | ← | — |
| — | 55 (34)*5, 136 (85)*6 | ← | ← | — |
| ← | ← | ← | ← | ← |
| ← | ← | ← | ← | ← |
| ← | 1HD-T | ← | ← | ← |
| ← | 12-Valve, OHC | ← | ← | ← |
| ← | 94.0 x 100.0 (3.70 x 3.94) | ← | ← | ← |
| ← | 4164 (254.0) | ← | ← | ← |
| ← | 18.6 : 1 | ← | ← | ← |
| ← | Distributor Type | ← | ← | ← |
| ← | 48 or Higher | ← | ← | ← |
| ← | 118 / 3800 (SAE-NET) | ← | ← | ← |
| ← | 360 / 2200 (SAE-NET) | ← | ← | ← |
| ← | 12-55, 64*7 | ← | ← | ← |
| ← | 840, 960*7 | ← | ← | 960 |
| ← | 2.5 | ← | ← | ← |
| — | Dry, Single, Diaphragm | ← | ← | — |
| A442F | H151F | ← | ← | A442F |
| 2.950 | 4.081 | ← | ← | 2.950 |
| 1.530 | 2.294 | ← | ← | 1.530 |
| 1.000 | 1.490 | ← | ← | 1.000 |
| 0.765 | 1.000 | ← | ← | 0.765 |
| — | 0.881 | ← | ← | — |
| 2.678 | 4.313 | ← | ← | 2.678 |
| ← | ← | ← | ← | ← |
| ← | ← | ← | ← | ← |
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| ← | ← | ← | ← | ← |

# LAND CRUISER (100 series)

## OUTLINE OF NEW FEATURES

The following changes are made for the new Land Cruiser (100 series).

### 1. Model Line-up

- An A750F automatic transmission has been added to the 2UZ-FE engine model and the 1HD-FTE engine model for Australia and General countries.
- The 1FZ-FE engine has been discontinued and the 2UZ-FE engine has been re-introduced on the model for Australia.
- The 1HD-T engine has been discontinued and the 1HD-FTE engine has been introduced on the model for General countries.

### 2. Exterior

- The designs of the front bumper and radiator grille have been changed.
- The outer lens color of the turn-signal lights in the rear combination lights has been changed from amber to clear.
- The design of the back door molding has been changed.
- The design of the side stripes, provided as an option on all models, have been changed.
- 275/65R17 tires and newly designed 17 x 8JJ-60 wheels are provided on the GX and VX grade independent front suspension models as standard or optional equipment.
- 275/60R18 tires and newly designed 18 x 8JJ-60 wheels are provided on the VX grade model for Europe as optional equipment.
- The following exterior colors have been added:

| Added Color No. | Added Color Name |
|---|---|
| 4R3 | Gold Mica Metallic |
| 1E9 | Dark Gray Mica Metallic |
| 3Q2 | Dark Red Mica Metallic |

### 2. Interior

- The design of the center cluster has been changed.
- The design of the combination meter has been changed.
- The steering wheel with steering pad switch is used.
- The designs of the center pillar garnish and roof side portion have been changed.
- The design of the assist grip and coat hook has been changed on the model with the curtain shield airbags.

## 3. 2UZ-FE Engine

- The ETCS-i (Electronic Control System-intelligent) continues to be used from the previous model. However, on the new model, the accelerator cable has been discontinued and an accelerator position sensor has been provided on the accelerator pedal.
- A no-contact type throttle position sensor has been adopted on all models.
- A TWC (Three-Way Catalytic Converter) is used on the model for Australia to comply with the European STEP-II regulations.
- The composition of the TWC (Three-Way Catalytic Converter) has been changed for the G.C.C. countries model (for Saudi Arabia) to comply with the European STEP-II regulations.
- Cranking hold function has been adopted. Once the ignition switch is turned to the START position, this control continues to operate the starter until the engine starts.

## 4. 1FZ-FE Engine

A TWC (Three Way Catalytic Converter) construction change or addition has been implemented for G.C.C.countries (for Saudi Arabia, FZJ100L-GNMKNKV for China and Peru and FZJ100L-GNPNKV for China) models to comply with the European STEP-II or STEP-I regulations.



## 5. 1HZ Engine

The following features have been adopted on the model for Australia and the HZJ105L-GCMNSV model for China to comply with the European STEP-II regulations:

- Emission Control System
- EGR System
- Injection Pump with TCV (Timing Control Valve) and BACS (Boost Altitude Compensation System)

## 6. 1HD-FTE Engine

- A pipe, which retrieves the engine oil that has accumulated in the intercooler pipe, is provided on the throttle body.
- An intake restrictor control system, which uses the same step motor type intake restrictor valve that is used on the Europe model, has been adopted on the models for Australia and general countries.
- An oxidation catalytic converter has been provided on the model for Australia to comply with the European STEP-II regulations.

## 7. A750F Automatic Transmission

- A newly developed A750F 5-speed automatic transmission [Super ECT (Electronically Controlled Transmission)] has been adopted on all the 2UZ engine models and on the 1HD-FTE engine models for Australia and general countries.
- The gate type shift lever has been adopted.

## 8. Transfer

The same HF2A type transfer that was used on the previous model is used on the A750F automatic transmission model.

## 9. Propeller Shaft

Along with the adoption of the A750F automatic transmission, the construction of the front and rear propeller shafts has been changed as follows:

- All the joints of both the front and rear propeller shafts have been optimized and have been strengthened while maintaining the same shape as the previous model.
- The tube diameter of both the front and rear propeller shafts has been increased to improve their strength.

| Propeller Tube Diameter | New (A750F) | Previous (A343F, A442F) |
|---|---|---|
| Front | 65.0 mm (2.6 in.) | 54.0 mm (2.1 in.) |
| Rear | 75.0 mm (3.0 in.) | 65.0 mm (2.6 in.) |

## 10. Differential

The differential gear ratio has been optimized for use with the A750F automatic transmission.

| Type | | Gear Ratio (Front and Rear Diff.) |
|---|---|---|
| A750F | 2UZ-FE | 4.100 |
| | 1HD-FTE | 3.909 |

## 11. Brake Control System (ABS with EBD, Brake Assist, A-TRC, and VSC system)

- The deceleration sensor that is provided for the brake control system (ABS with EBD, Brake Assist, A-TRC, and VSC system) has been integrated in the yaw rate sensor.
- Information on the steering angle, vehicle speed, and the actual turning angle of the wheels can now be exchanged between the skid control ECU and the VGRS ECU, which has been newly added for the VGRS (Variable Gear Ratio Steering).
- By changing the resistance value of the coil of the solenoid valves in the hydraulic brake booster established in A-TRC as shown in the following table, the heat resistance has been improved. As a result, the consecutive operation time of this system has increased.

| Solenoid Valve | New Model | Previous Model |
|---|---|---|
| SA3, SFRH, SFLH, SRRH, SRLH | Approx. 7.2 Ω | Approx. 5.0 Ω |
| STR, SA1, SA2 | Approx. 4.3 Ω | Approx. 3.7 Ω |

## 12. Steering (for Models with Rack-and-Pinion Type Steering Gear)

- A VGRS (Variable Gear Ratio Steering) system, which variably controls the steering angle in accordance with the vehicle speed, has been adopted as optional equipment on the model for Europe.
- The construction and specifications of the steering gear box and the power steering pump have been changed on the models with the rack-and-pinion type steering gear.
- In the optional memory system of the Europe model, the DTC outputs of the tilt-and-telescopic ECU has been changed so that they can be output even when the ignition switch is turned OFF.

## 13. Body

- Noise and vibration have been reduced through the adoption of the following features:
- The urethane pad at the bottom of the center pillar has been changed to a foam material.
- A sealing material has been provided on the door frame (on VX grade and GX-R grade for G.C.C. countries).
- The capacity of the silencer that is provided on the fender apron has been increased (1HD-FTE engine model).
- An ISO-FIX bar for securing a child seat has been provided on the No. 1 rear seat of the Europe model.

## 14. Body Electrical System Control

- The configuration of the BEAN (Body Electronics Area Network) has been changed in accordance with the addition of equipment.
- The instrument ECU is based on the previous model. On the new model, the body ECU provides additional control functions in order to comprehensively control the body electrical system.
- A customized body electronic system is used in order to set the control functions of the ECUs through the use of a hand-held tester.



## 15. Combination Meter

The design and construction of the combination meter has been changed.

## 16. Wiper System (Only for Europe Model)

A wiper system with a raindrop sensing function has been adopted on the VX grade Europe model as optional equipment.

## 17. Air Conditioner

- A rear air conditioner has been provided on the 1HD-FTE engine model for Europe, Australia, and General Countries. The basic construction and operation are the same as the previous model.
- A seal and a baffle plate that prevent the detour of warm air from the engine compartment has been adopted to improve the cooling performance of the 2UZ-FE and 1HD-FTE engine models with a rear air conditioner and the 1FZ-FE engine model for the G.C.C. countries. Accordingly, the electric fan that was provided on the models equipped with a rear air conditioner for Europe, Australia, and General Countries has been discontinued. As a result, a reduction in weight and fan noise has been achieved.

## 18. Multi Display (Only for Europe Model)

A multi display has been provided on the center cluster panel as an option for Europe model. The display, which consists of a wide 7.0-inch LCD (Liquid Crystal Display) screen with a pressure sensitive touch panel, offers improved ease of use.

## 19. Multi Information Display

A multi-information display has been adopted on the VX grade models.

## 20. Power Window System

- The one-touch auto-up operation and jam protection function for all the seats, which is already used on the model for Europe, has been adopted on all VX grade models as standard equipment, and as optional equipment on other grades.
- A correction function has been added to the jam protection function to prevent it from activating unintendedly while the vehicle is driven on rough roads.

## 21. Door Lock Control System

For improved theft deterrence, a double locking system has been added as standard equipment on the RHD models for Europe and as optional equipment on the LHD models for Europe.

## 22. Engine Immobiliser System (Only for 2UZ-FE Engine Model)

On the previous model, the engine ECU used to control the system. However, a change is made on new model that a transponder key ECU is newly adopted to control the system.

## 23. Theft Deterrent System

- A theft deterrent system has been provided on the models for Europe and G.C.C. countries as standard or optional equipment. Its basic construction and operation are the same as the model for general countries. However, unlike other models, the model for Europe uses a self-power siren in place of the security horn.
- The warning specifications of this system are listed below.

| | | |
|---|---|---|
| Warning Method | Interior Light | Illuminates |
| | Hazard Light | Flashing |
| | Vehicle Horn | Sounds a warning at approx. 0.4 second cycles |
| | Security Horn*1 | Sounds a warning at approx. 0.4 second cycles |
| | Self Power Siren*2 | Sounds a warning at the cycle of the self-powered siren itself. |
| | Door Lock Motor | Locking |
| Warning Time | | 30 sec. |

*1: except European Model
*2: Only for European Model

## 24. SRS Airbag System

- The side and curtain shield airbags have been adopted as optional equipment on the model for Europe.
- Roll sensing of curtain shield airbags control has been adopted in order to deploy the curtain shield airbags and the seat belt pretensioners for the driver and front passenger, in the event that the vehicle rolls over. A roll sensing of curtain shield airbags cutoff switch is provided on the driver side of the instrument panel to enable the driver to disable this system.
- A dual-stage SRS airbag system has been adopted for the driver and front passenger airbags on the model for Europe as standard equipment.
- In accordance with the adoption of the dual-stage SRS airbag system, a seat position sensor has been established for the driver seat.
- On the new model, the previous mechanical type front airbag sensor assembly (consisting of movable and stationary contact points) has been changed to an electrical (deceleration sensor) type front airbag sensor assembly.
- Front passenger airbag door is made invisible. This means that without the airbag door, the airbag will be inflated by breaking to open the cleavage line stored in the instrument panel inflating.
- 2UZ-FE engine model has adopted a fuel cut control that stops the fuel pump when the airbag is deployed.

## 25. Power Seat System (Only for European Model)

Infrared communication has been newly adopted between the seat ECU and the power seat operation switch, which are used in the power seat system that is provided as optional equipment for Europe.

## 26. Moon Roof

The functions listed below have been changed or added.

| Destination | | Australia | |
|---|---|---|---|
| Function | | New | Previous |
| Ignition Switch OFF (43 sec after ignition OFF) | Slide | Manual with Jam Protection | Manual |
| | Tilt | Manual with Jam Protection | Manual |
| Ignition Switch ON | Slide | Manual | ← |
| | Tilt | Manual | ← |

| Destination | | Europe | |
|---|---|---|---|
| Function | | New | Previous |
| Ignition Switch OFF (43 sec after ignition OFF) | Slide | Manual with Jam Protection | Automatic close operation with Jam Protection |
| | Tilt | Manual | |
| Ignition Switch ON | Slide | Press switch more than 0.3 sec.<br>↓<br>Automatic close operation with Jam Protection | |
| | | Press switch less than 0.3 sec.<br>↓<br>Manual | |
| | Tilt | Manual | |

| Destination | | Others | |
|---|---|---|---|
| Function | | New | Previous |
| Ignition Switch OFF (43 sec after ignition OFF) | Slide and Tilt | Press switch more than 0.3 sec.<br>↓<br>Automatic close operation with Jam Protection | Automatic close operation with Jam Protection |
| | | Press switch less than 0.3 sec.<br>↓<br>Manual | |
| Ignition Switch ON | Slide and Tilt | Press switch more than 0.3 sec.<br>↓<br>Automatic close operation with Jam Protection | |
| | | Press switch less than 0.3 sec.<br>↓<br>Manual | |

## 27. Audio System

- An RSAS (Rear Seat Audio System) has been adopted as optional equipment on the model for Europe.
- A steering wheel with a steering pad switch has been adopted as optional equipment on the VX grade.

## MODEL CODE

# UZJ100 L – G N A E K W

1 2 3 4 5 6 7 8

**1 BASIC MODEL CODE**

| CODE | ENGINE | FRONT SUSPENSION |
|---|---|---|
| FZJ100 | 1FZ-FE | IFS*1 (Double Wishbone) |
| UZJ100 | 2UZ-FE | |
| HDJ100 | 1HD-FTE | |
| FZJ105 | 1FZ-FE | RFS*2 (Leading Arm) |
| HZJ105 | 1HZ | |

**2 STEERING WHEEL POSITION**

L : Left-Hand Drive
R : Right-Hand Drive

**3 BODY TYPE**

G : Station Wagon

**4 BACK DOOR TYPE**

C : Swing Back Door
N : Lift-Up Back Door

*1: IFS (Independent Front Suspension)
*2: RFS (Rigid Axle Front Suspension)

**5 GEAR SHIFT TYPE**

M : 5-Speed Manual, Floor
P : 4-Speed Automatic, Floor
A : 5-Speed Automatic, Floor

**6 GRADE**

R : STD
N : GX
E : VX

**7 ENGINE SPECIFICATION**

K : DOHC and EFI
S : Diesel
Z : Multi Valve, Turbocharger and EFI

**8 DESTINATION**

W : Europe
Q : Australia
V : G.C.C. (Gulf Cooperation Council) Countries
Bank : General Countries

| DESTI-NATION | ENGINE | BACK DOOR | GRADE | FRONT SUSPENSION | DRIVE TYPE | TRANSMISSION | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 5-Speed Manual | | 4-Speed Automatic | 5-Speed Automatic |
| | | | | | | R151F | H151F | A442F | A750F |
| Europe | 2UZ-FE | Lift-Up | VX | IFS (Double Wishbone) | Full-Time | — | — | — | UZJ100 $^{R}_{L}$ -GNAEKW |
| | 1HD-FTE | | | | | — | HDJ100 $^{R}_{L}$ -GNMEZW | HDJ100 $^{R}_{L}$ -GNPEZW | — |
| | | Swing | STD | | | — | HDJ100L-GCMRZW | — | — |
| Australia | 2UZ-FE | Lift-Up | GX | IFS (Double Wishbone) | Full-Time | — | UZJ100R-GNMNKQ | — | UZJ100R-GNANKQ |
| | | | VX | | | — | — | — | UZJ100R-GNAEKQ |
| | 1HZ | Swing | STD | RFS (Leading Arm) | Part-Time | HZJ105R-GCMRSQ | — | — | — |
| | | Lift-Up | GX | | Full-Time | HZJ105R-GNMNSQ | — | — | — |
| | 1HD-FTE | | | | | — | HDJ100R-GNMNZQ | — | HDJ100R-GNANZQ |
| | | | VX | | | — | — | — | HDJ100R-GNAEZQ |
| G.C.C. Countries | 1FZ-FE | Swing | STD | IFS (Double Wishbone) | Part-Time | — | FZJ100L-GCMRKV | — | — |
| | | | GX | | Part-Time (Full-Time) | — | FZJ100L-GCMNKV | FZJ100L-GCPNKV | — |
| | | Lift-Up | | | | — | FZJ100L-GNMNKV | FZJ100L-GNPNKV | — |
| | 2UZ-FE | Swing | VX | | Full-Time | — | UZJ100L-GCMEKV | — | UZJ100L-GCAEKV |
| | | Lift-Up | | | | — | UZJ100L-GNMEKV | — | UZJ100L-GNAEKV |
| | 1HZ | Swing | GX | RFS (Leading Arm) | Part-Time (Full-Time) | HZJ105L-GCMNSV | — | — | — |
| General Countries | 1FZ-FE | Swing | STD | RFS (Leading Arm) | Part-Time | — | FZJ105L-GCMRK | — | — |
| | | | GX | | Part-Time (Full-Time) | — | FZJ105L-GCMNK | — | — |
| | | Lift-Up | | | | — | FZJ105L $^{R}_{L}$ -GNMNK | — | — |
| | 2UZ-FE | | VX | IFS (DoubleWishbone) | Full-Time | — | — | — | UZJ100L-GNAEK |
| | 1HZ | Swing | STD | RFS (Leading Arm) | Part-Time (Full-Time)* | HZJ105 $^{R}_{L}$ -GCMRS | — | — | — |
| | | | GX | | Part-Time (Full-Time) | HZJ105 $^{R}_{L}$ -GCMNS | — | — | — |
| | | Lift-Up | | | | HZJ105 $^{R}_{L}$ -GNMNS | — | — | — |
| | 1HD-FTE | Swing | VX | IFS (Double Wishbone) | Full-Time | — | HDJ100L-GCMEZ | — | — |
| | | Lift-Up | | | | — | HDJ100 $^{R}_{L}$ -GNMEZ | — | HDJ100L-GNAEZ |

( ): Option *: LHD Model Only

# MAJOR TECHNICAL SPECIFICATIONS

| Item \ Area | | | | Europe | | | |
|---|---|---|---|---|---|---|---|
| Body Type | | | | Wagon (Lift-Up Back Door) | | | |
| Vehicle Grade | | | | VX | | | |
| Model Code | | | | UZJ100R-GNAEKW | UZJ100L-GNAEKW | HDJ100R-GNMEZW | HDJ100R-GNPEZW |
| Major Dimensions & Vehicle Weights | Overall | Length | mm (in.) | 4890 (192.5)*1 | 4890 (192.5)*1 | 4890 (192.5)*1 | 4890 (192.5)*1 |
| | | Width | mm (in.) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) |
| | | Height | mm (in.) | 1880 (74.0)*2, 1850 (72.8)*2, 3 | 1880 (74.0)*2, 1850 (72.8)*2, 3 | 1880 (74.0)*2, 1850 (72.8)*2, 3 | 1880 (74.0)*2, 1850 (72.8)*2, 3 |
| | Wheel Base | | mm (in.) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) |
| | Tread | Front | mm (in.) | 1620 (63.8) | 1620 (63.8) | 1620 (63.8) | 1620 (63.8) |
| | | Rear | mm (in.) | 1615 (63.6) | 1615 (63.6) | 1615 (63.6) | 1615 (63.6) |
| | Room | Length | mm (in.) | 2505 (98.6)*4 | 2505 (98.6)*4 | 2505 (98.6)*4 | 2505 (98.6)*4 |
| | | Width | mm (in.) | 1620 (63.8) | 1620 (63.8) | 1620 (63.8) | 1620 (63.8) |
| | | Height | mm (in.) | 1145 (45.1), 1150 (45.3)*15 | 1145 (45.1), 1150 (45.3)*15 | 1145 (45.1), 1150 (45.3)*15 | 1145 (45.1), 1150 (45.3)*15 |
| | Cargo Space | Length | mm (in.) | 335 (13.2)*4 | 335 (13.2)*4 | 335 (13.2)*4 | 335 (13.2)*4 |
| | | Width | mm (in.) | — | — | — | — |
| | | Height | mm (in.) | 995 (39.2)*4 | 995 (39.2)*4 | 995 (39.2)*4 | 995 (39.2)*4 |
| | Overhang | Front | mm (in.) | 895 (35.2)*1 | 895 (35.2)*1 | 895 (35.2)*1 | 895 (35.2)*1 |
| | | Rear | mm (in.) | 1145 (45.1) | 1145 (45.1) | 1145 (45.1) | 1145 (45.1) |
| | Min. Running Ground Clearance | | mm (in.) | — | — | — | — |
| | Angle of Approach | | degrees | — | — | — | — |
| | Angle of Departure | | degrees | — | — | — | — |
| | Curb Weight*19 | Front | kg (lb) | 1190 - 1340 (2623 - 2954) | 1190 - 1340 (2623 - 2954) | 1350 -1495 (2976 - 3296) | 1355 - 1430 (2987 - 3153) |
| | | Rear | kg (lb) | 1080 - 1135 (2381 - 2502) | 1080 - 1135 (2381 - 2502) | 1095 - 1145 (2414 -2524) | 1105 - 1180 (2436 - 2601) |
| | | Total | kg (lb) | 2270 - 2475 (5004 - 5456) | 2270 - 2475 (5004 - 5456) | 2445 - 2640 (5390 - 5820) | 2460 - 2610 (5423 - 5754) |
| | Gross Vehicle Weight | Front | kg (lb) | — | — | — | — |
| | | Rear | kg (lb) | — | — | — | — |
| | | Total | kg (lb) | 3260 (7187) | 3260 (7187) | 3260 (7187) | 3260 (7187) |
| | Fuel Tank Capacity | | ℓ (Imp.gal.) | 96 (21.1) | 96 (21.1) | 96 (21.1) | 96 (21.1) |
| | Luggage Compartment Capacity | | $m^3$ (cu.ft.) | — | — | — | — |
| Performance | Max. Speed | | km / h (mph) | 180 (112) | 180 (112) | 160 (99) | 175 (109) |
| | Max. Cruising Speed | | km / h (mph) | — | — | — | — |
| | Max. Permissible Speed | 1st Gear | km / h (mph) | 19 (12)*5, 47 (29)*6 | 19 (12)*5, 47 (29)*6 | 14 (9)*5, 35 (22)*6 | 18 (11)*5, 44 (27)*6 |
| | | 2nd Gear | km / h (mph) | 33 (20)*5, 81 (50)*6 | 33 (20)*5, 81 (50)*6 | 26 (16)*5, 63 (39)*6 | 35 (22)*5, 85 (54)*6 |
| | | 3rd Gear | km / h (mph) | — | — | 39 (24)*5, 97 (60)*6 | — |
| | | 4th Gear | km / h (mph) | — | — | 59 (37)*5, 144 (89)*6 | — |
| | Min. Turning Radius | Tire | m (ft.) | 5.9 (19.4) | 5.9 (19.4) | 5.9 (19.4) | 5.9 (19.4) |
| | | Body | m (ft.) | 6.3 (20.7) | 6.3 (20.7) | 6.3 (20.7) | 6.3 (20.7) |
| Engine | Engine Type | | | 2UZ-FE | 2UZ-FE | 1HD-FTE | 1HD-FTE |
| | Valve Mechanism | | | 32-Valve, DOHC | 32-Valve, DOHC | 24-Valve, OHC | 24-Valve, OHC |
| | Bore x Stroke | | mm (in.) | 94.0 x 84.0 (3.70 x 3.31) | 94.0 x 84.0 (3.70 x 3.31) | 94.0 x 100.0 (3.70 x 3.94) | 94.0 x 100.0 (3.70 x 3.94) |
| | Displacement | | $cm^3$ (cu.in.) | 4664 (284.5) | 4664 (284.5) | 4164 (254.0) | 4164 (254.0) |
| | Compression Ratio | | | 9.6 : 1 | 9.6 : 1 | 18.5 : 1 | 18.5 : 1 |
| | Carburetor Type or Injection Pump Type (Diesel) | | | EFI | EFI | Distributor Type | Distributor Type |
| | Research Octane No. or Cetane No. (Diesel) | | | 95 | 95 | 48 or higher | 48 or higher |
| | Max. Output | | kW / rpm | 175 / 4800 (EEC) | 175 / 4800 (EEC) | 150 / 3400 (EEC) | 150 / 3400 (EEC) |
| | Max. Torque | | N·m / rpm | 434 / 3400 (EEC) | 434 / 3400 (EEC) | 430 / 1400 - 3200 (EEC) | 430 / 1400 - 3200 (EEC) |
| Engine Electrical | Battery Capacity (5HR) | | Voltage & Amp. hr. | 12 - 55, 64*7 | 12 - 55, 64*7 | 12 - 55 x 2, 64 x 2*7 | 12 - 55 x 2, 64 x 2*7 |
| | Alternator Output | | Watts | 960 | 960 | 960, 1440*7 | 960, 1440*7 |
| | Starter Output | | kW | 2.0 | 2.0 | 3.0 | 3.0 |
| Chassis | Clutch Type | | | — | — | Dry, Single, Diaphragm | — |
| | Transmission Type | | | A750F | A750F | H151F | A442F |
| | Transmission Gear Ratio | In First | | 3.520 | 3.520 | 4.081 | 2.950 |
| | | In Second | | 2.042 | 2.042 | 2.294 | 1.530 |
| | | In Third | | 1.400 | 1.400 | 1.490 | 1.000 |
| | | In Fourth | | 1.000 | 1.000 | 1.000 | 0.765 |
| | | In Fifth | | 0.716 | 0.716 | 0.881 | — |
| | | In Reverse | | 3.224 | 3.224 | 4.313 | 2.678 |
| | Transfer Gear Ratio H4 / L4 | | | 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 |
| | Differential Gear Ratio (Front / Rear) | | | 4.100 / 4.100 | 4.300 / 4.300 | 3.909 / 3.909 | 4.100 / 4.100 |
| | Differential Gear Size (Front / Rear) | | in. | 8" / 9.5" | 8" / 9.5" | 8" / 9.5" | 8" / 9.5" |
| | Brake Type | Front | | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc |
| | | Rear | | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc |
| | Parking Brake Type | | | Drum | Drum | Drum | Drum |
| | Brake Booster Type and Size | | in. | Hydraulic | Hydraulic | Hydraulic | Hydraulic |
| | Proportioning Valve Type | | | P & B Valve, —*16 | P & B Valve, —*16 | P & B Valve | P & B Valve |
| | Suspension Type | Front | | Double Wishbone | Double Wishbone | Double Wishbone | Double Wishbone |
| | | Rear | | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod |
| | Stabilizer Bar | Front | | STD | STD | STD | STD |
| | | Rear | | STD | STD | STD | STD |
| | Steering Gear Type | | | Rack & Pinion | Rack & Pinion | Rack & Pinion | Rack & Pinion |
| | Steering Gear Ratio (Overall) | | | 17.3, 12.4 - 18.0*18 | 17.3, 12.4 - 18.0*18 | 17.3 | 17.3 |
| | Power Steering Type | | | Integral Type | Integral Type | Integral Type | Integral Type |

*: Unladed Vehicle
*1: With Electrical Winch +50 mm (2.0 in.)
*2: With Roof Rail +40 mm (1.6 in.)
*3: With AHC
*4: With 3rd Seat
*5: Transfer in Low
*6: Transfer in High
*7: Option
*8: With 275 / 70R16 Tire
*9: With ABS
*10: With Back Door-Mounted Spare Tire, Tire Size 235 / 85R16 +295 mm (11.6 in.), Tire Size 275 / 70R16 +305 (12.0 in.), Tire Size 7.50R16 +265 mm (10.4 in.)
*11: With Roof Rack +230 mm (9.1 in.)
*12: With Grille Guard +75 mm (3.0 in.)
*13: With 7.50R16 Tire

| | Europe | | | Australia | | |
|---|---|---|---|---|---|---|
| | Wagon (Lift-Up Back Door) | | Wagon (Swing Back Door) | Wagon (Lift-Up Back Door) | | |
| | VX | | STD | GX | | VX |
| | HDJ100L-GNMEZW | HDJ100L-GNPEZW | HDJ100L-GCMRZW | UZJ100R-GNMNKQ | UZJ100R-GNANKQ | UZJ100R-GNAEKQ |
| 5 | 4890 (192.5)*1 | 4890 (192.5)*1 | 4890 (192.5)*1 | 4890 (192.5)*1 | 4890 (192.5)*1 | 4890 (192.5)*1 |
| | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) |
| | 1880 (74.0)*2, 1850 (72.8)*2, 3 | 1880 (74.0)*2, 1850 (72.8)*2, 3 | 1880 (74.0)*2, 1850 (72.8)*2, 3 | 1890 (74.4) | 1890 (74.4) | 1890 (74.4) |
| | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) |
| | 1620 (63.8) | 1620 (63.8) | 1620 (63.8) | 1620 (63.8), 1640 (64.6)*17 | 1620 (63.8), 1640 (64.6)*17 | 1620 (63.8), 1640 (64.6)*17 |
| 10 | 1615 (63.6) | 1615 (63.6) | 1615 (63.6) | 1615 (63.6), 1635 (64.4)*17 | 1615 (63.6), 1635 (64.4)*17 | 1615 (63.6), 1635 (64.4)*17 |
| | 2505 (98.6)*4 | 2505 (98.6)*4 | 2505 (98.6)*4 | 1805 (71.1) | 1805 (71.1) | 2505 (98.6) |
| | 1620 (63.8) | 1620 (63.8) | 1620 (63.8) | 1615 (63.6) | 1615 (63.6) | 1620 (63.8) |
| | 1145 (45.1), 1150 (45.3)*15 | 1145 (45.1), 1150 (45.3)*15 | 1145 (45.1), 1150 (45.3)*15 | 1180 (46.5), 1150 (45.3)*15 | 1180 (46.5), 1150 (45.3)*15 | 1145 (45.1), 1150 (45.3)*15 |
| | 335 (13.2)*4 | 335 (13.2)*4 | 335 (13.2)*4 | 1085 (42.7) | 1085 (42.7) | 335 (13.2) |
| 15 | — | — | — | — | — | — |
| | 995 (39.2)*4 | 995 (39.2)*4 | 995 (39.2)*4 | 1665 (41.9) | 1665 (41.9) | 995 (39.2) |
| | 895 (35.2)*1 | 895 (35.2)*1 | 895 (35.2)*1 | 895 (35.2) | 895 (35.2) | 895 (35.2) |
| | 1145 (45.1) | 1145 (45.1) | 1145 (45.1) | 1145 (45.1) | 1145 (45.1) | 1145 (45.1) |
| | — | — | — | — | — | — |
| 20 | — | — | — | — | — | — |
| | — | — | — | — | — | — |
| | 1350 - 1495 (2976 - 3296) | 1355 - 1430 (2987 - 3153) | 1375 - 1405 (3031 - 3097) | 1245 - 1265 (2745 - 2789) | 1260 - 1280 (2778 - 2822) | 1290 - 1305 (2844 - 2877)*20 |
| | 1095 - 1145 (2414 - 2524) | 1105 - 1180 (2436 - 2601) | 1060 - 1100 (2337 - 2425) | 1060 - 1080 (2337 - 2381) | 1065 - 1085 (2348 - 2392) | 1190 - 1215 (2623 - 2679)*20 |
| | 2445 - 2640 (5390 - 5820) | 2460 - 2610 (5423 - 5754) | 2435 - 2505 (5368 - 5523) | 2305 - 2345 (5082 - 5170) | 2325 - 2365 (5126 - 5214) | 2480 - 2520 (5467 - 5556)*20 |
| 25 | — | — | — | — | — | — |
| | — | — | — | — | — | — |
| | 3260 (7187) | 3260 (7187) | 3260 (7187) | 3260 (7187) | 3260 (7187) | 3260 (7187) |
| | 96 (21.1) | 96 (21.1) | 96 (21.1) | 95 + 50 (20.9 + 11.0) | 95 + 50 (20.9 + 11.0) | 95 + 50 (20.9 + 11.0) |
| | — | — | — | — | — | — |
| 30 | 160 (99) | 175 (109) | 160 (99) | 180 (112) | 180 (112) | 180 (112) |
| | — | — | — | — | | |
| | 14 (9)*5, 35 (22)*6 | 18 (11)*5, 44 (28)*6 | 14 (9)*5, 35 (22)*6 | 17 (11)*5, 40 (25)*6 | 19 (12)*5, 47 (29)*6 | 19 (12)*5, 47 (29)*6 |
| | 26 (16)*5, 63 (39)*6 | 35 (22)*5, 85 (53)*6 | 26 (16)*5, 63 (39)*6 | 29 (18)*5, 72 (45)*6 | 33 (20)*5, 81 (50)*6 | 33 (20)*5, 81 (50)*6 |
| | 39 (24)*5, 97 (60)*6 | — | 39 (24)*5, 97 (60)*6 | 45 (28)*5, 111 (69)*6 | — | — |
| 35 | 59 (37)*5, 144 (89)*6 | — | 59 (37)*5, 144 (89)*6 | 67 (42)*5, 165 (102)*6 | — | — |
| | 5.9 (19.4) | 5.9 (19.4) | 5.9 (19.4) | 5.9 (19.4) | 5.9 (19.4) | 5.9 (19.4) |
| | 6.3 (20.7) | 6.3 (20.7) | 6.3 (20.7) | 6.3 (20.7) | 6.3 (20.7) | 6.3 (20.7) |
| | 1HD-FTE | 1HD-FTE | 1HD-FTE | 2UZ-FE | 2UZ-FE | 2UZ-FE |
| | 24-Valve, OHC | 24-Valve, OHC | 24-Valve, OHC | 32-Valve, DOHC | 32-Valve, DOHC | 32-Valve, DOHC |
| 40 | 94.0 x 100.0 (3.70 x 3.94) | 94.0 x 100.0 (3.70 x 3.94) | 94.0 x 100.0 (3.70 x 3.94) | 94.0 x 84.0 (3.70 x 3.31) | 94.0 x 84.0 (3.70 x 3.31) | 94.0 x 84.0 (3.70 x 3.31) |
| | 4164 (254.0) | 4164 (254.0) | 4164 (254.0) | 4664 (284.5) | 4664 (284.5) | 4664 (284.5) |
| | 18.5 : 1 | 18.5 : 1 | 18.5 : 1 | 9.6 : 1 | 9.6 : 1 | 9.6 : 1 |
| | Distributor Type | Distributor Type | Distributor Type | EFI | EFI | EFI |
| | 48 or higher | 48 or higher | 48 or higher | 91 or more | 91 or more | 91 or more |
| 45 | 150 / 3400 (EEC) | 150 / 3400 (EEC) | 150 / 3400 (EEC) | 170 / 4800 (SAE-NET) | 170 / 4800 (SAE-NET) | 170 / 4800 (SAE-NET) |
| | 430 / 1400 - 3200 (EEC) | 430 / 1400 - 3200 (EEC) | 430 / 1400 - 3200 (EEC) | 410 / 3400 (SAE-NET) | 410 / 3400 (SAE-NET) | 410 / 3400 (SAE-NET) |
| | 12 - 55 x 2, 64 x 2*7 | 12 - 55 x 2, 64 x 2*7 | 12 - 64 x 2 | 12 - 55 | 12 - 55 | 12 - 55 |
| | 960, 1440*7 | 960, 1440*7 | 1440 | 1200 | 1200 | 1200 |
| | 3.0 | 3.0 | 3.0 | 1.4 | 1.4 | 1.4 |
| 50 | Dry, Single, Diaphragm | — | Dry, Single, Diaphragm | Dry, Single, Diaphragm | — | — |
| | H151F | A442F | H151F | H151F | A750F | A750F |
| | 4.081 | 2.950 | 4.081 | 4.081 | 3.520 | 3.520 |
| | 2.294 | 1.530 | 2.294 | 2.294 | 2.042 | 2.042 |
| | 1.490 | 1.000 | 1.490 | 1.490 | 1.400 | 1.400 |
| 55 | 1.000 | 0.765 | 1.000 | 1.000 | 1.000 | 1.000 |
| | 0.881 | — | 0.881 | 0.881 | 0.716 | 0.716 |
| | 4.313 | 2.678 | 4.313 | 4.313 | 3.224 | 3.224 |
| | 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 |
| | 3.909 / 3.909 | 4.100 / 4.100 | 3.909 / 3.909 | 4.300 / 4.300 | 4.100 / 4.100 | 4.100 / 4.100 |
| 60 | 8” / 9.5” | 8” / 9.5” | 8” / 9.5” | 8” / 9.5” | 8” / 9.5” | 8” / 9.5” |
| | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc |
| | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc |
| | Drum | Drum | Drum | Drum | Drum | Drum |
| | Hydraulic | Hydraulic | Hydraulic | Hydraulic | Hydraulic | Hydraulic |
| 65 | P & B Valve | P & B Valve | P & B Valve | P & B Valve | P & B Valve | P & B Valve |
| | Double Wishbone | Double Wishbone | Double Wishbone | Double Wishbone | Double Wishbone | Double Wishbone |
| | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod |
| | STD | STD | STD | STD | STD | STD |
| | STD | STD | STD | STD | STD | STD |
| 70 | Rack & Pinion | Rack & Pinion | Rack & Pinion | Rack & Pinion | Rack & Pinion | Rack & Pinion |
| | 17.3 | 17.3 | 17.3 | 17.3 | 17.3 | 17.3 |
| | Integral Type | Integral Type | Integral Type | Integral Type | Integral Type | Integral Type |

*14: With AHC –50 mm (2.0 in.)
*15: With Moon Roof
*16: With VSC
*17: With 235 / 85R16 Tire
*18: With VGRS
*19: Separate Seat, Seating Capacity: 5
*20: Seating Capacity: 8

| Item \ Area | | | | Australia | | | |
|---|---|---|---|---|---|---|---|
| Body Type | | | | Wagon (Swing Back Door) | Wagon (Lift-Up Back Door) | | |
| Vehicle Grade | | | | STD | GX | | |
| Model Code | | | | HZJ105R-GCMRSQ | HZJ105R-GNMNSQ | HDJ100R-GNMNZQ | HDJ100R-GNANZQ |
| Major Dimensions & Vehicle Weights | Overall | Length | mm (in.) | 4890 (192.5) | 4890 (192.5) | 4890 (192.5) | 4890 (192.5) |
| | | Width | mm (in.) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) |
| | | Height | mm (in.) | 1920 (75.6), 1915 (75.4)*8 | 1920 (75.6), 1915 (75.4)*8 | 1890 (74.4) | 1890 (74.4) |
| | Wheel Base | | mm (in.) | 2850 (112.2) | 2850 (112.2) | 2850 (11.2) | 2850 (11.2) |
| | Tread | Front | mm (in.) | 1605 (63.2) | 1605 (63.2) | 1620 (63.8), 1640 (64.6)*17 | 1620 (63.8), 1640 (64.6)*17 |
| | | Rear | mm (in.) | 1600 (63.0) | 1600 (63.0) | 1615 (63.6), 635 (64.4)*17 | 1615 (63.6), 635 (64.4)*17 |
| | Room | Length | mm (in.) | 1805 (71.1) | 1805 (71.1) | 1805 (71.1) | 1805 (71.1) |
| | | Width | mm (in.) | 1615 (63.6) | 1615 (63.6) | 1615 (63.6) | 1615 (63.6) |
| | | Height | mm (in.) | 1180 (46.5) | 1180 (46.5), 1150 (45.3)*15 | 1180 (46.5), 1150 (45.3)*15 | 1180 (46.5), 1150 (45.3)*15 |
| | Cargo Space | Length | mm (in.) | 1085 (42.7) | 1085 (42.7) | 1085 (42.7) | 1085 (42.7) |
| | | Width | mm (in.) | — | — | — | — |
| | | Height | mm (in.) | 1065 (41.9) | 1065 (41.9) | 1065 (41.9) | 1065 (41.9) |
| | Overhang | Front | mm (in.) | 895 (35.2) | 895 (35.2) | 895 (35.2) | 895 (35.2) |
| | | Rear | mm (in.) | 1145 (45.1) | 1145 (45.1) | 1145 (45.1) | 1145 (45.1) |
| | Min. Running Ground Clearance | | mm (in.) | — | — | — | — |
| | Angle of Approach | | degrees | — | — | — | — |
| | Angle of Departure | | degrees | — | — | — | — |
| | Curb Weight*19 | Front | kg (lb) | 1195 - 1230 (2634 - 2712) | 1205 - 1230 (2657 - 2712) | 1330 - 1350 (2932 - 2976) | 1355 - 1375 (2987 - 3031) |
| | | Rear | kg (lb) | 1130 - 1155 (2491 - 2546) | 1120 - 1140 (2469 - 2513) | 1150 - 1170 (2535 - 2579) | 1155 - 1175 (2546 - 2590) |
| | | Total | kg (lb) | 2325 - 2385 (5126 - 5258) | 2325 - 2370 (5126 - 5225) | 2480 - 2520 (5467 - 5556) | 2510 - 2550 (5534 - 5622) |
| | Gross Vehicle Weight | Front | kg (lb) | — | — | — | — |
| | | Rear | kg (lb) | — | — | — | — |
| | | Total | kg (lb) | 3180 (7011) | 3180 (7011) | 3260 (7187) | 3260 (7187) |
| | Fuel Tank Capacity | | ℓ (Imp.gal.) | 95 + 50 (20.9 + 11.0) | 95 + 50 (20.9 + 11.0) | 96 + 45 (21.1 + 9.9) | 96 + 45 (21.1 + 9.9) |
| | Luggage Compartment Capacity | | $m^3$ (cu.ft.) | — | — | — | — |
| Performance | Max. Speed | | km / h (mph) | 155 (96) | 155 (96) | — | — |
| | Max. Cruising Speed | | km / h (mph) | — | — | — | — |
| | Max. Permissible Speed | 1st Gear | km / h (mph) | 13 (8)*5, 32 (20)*6 | 13 (8)*5, 32 (20)*6 | 14 (9)*5, 35 (22)*6 | 16 (10)*5, 39 (24)*6 |
| | | 2nd Gear | km / h (mph) | 25 (16)*5, 60 (37)*6 | 25 (16)*5, 60 (37)*6 | 26 (16)*5, 63 (39)*6 | 27 (17)*5, 67 (42)*6 |
| | | 3rd Gear | km / h (mph) | 40 (25)*5, 97 (60)*6 | 40 (25)*5, 97 (60)*6 | 39 (24)*5, 97 (60)*6 | — |
| | | 4th Gear | km / h (mph) | 57 (35)*5, 140 (87)*6 | 57 (35)*5, 140 (87)*6 | 59 (37)*5, 144 (89)*6 | — |
| | Min. Turning Radius | Tire | m (ft.) | 6.0 (19.7) | 6.0 (19.7) | 6.0 (19.7) | 6.0 (19.7) |
| | | Body | m (ft.) | 6.4 (21.0) | 6.4 (21.0) | 6.4 (21.0) | 6.4 (21.0) |
| Engine | Engine Type | | | 1HZ | 1HZ | 1HD-FTE | 1HD-FTE |
| | Valve Mechanism | | | 12-Valve, OHC | 12-Valve, OHC | 24-Valve, OHC | 24-Valve, OHC |
| | Bore x Stroke | | mm (in.) | 94.0 x 100.0 (3.70 x 3.94) | 94.0 x 100.0 (3.70 x 3.94) | 94.0 x100.0 (3.70 x 3.94) | 94.0 x 100.0 (3.70 x 3.94) |
| | Displacement | | $cm^3$ (cu.in.) | 4164 (254.0) | 4164 (254.0) | 4164 (254.0) | 4164 (254.0) |
| | Compression Ratio | | | 22.4 : 1 | 22.4 : 1 | 18.8 : 1 | 18.8 : 1 |
| | Carburetor Type or Injection Pump Type (Diesel) | | | Distributor Type | Distributor Type | Distributor Type | Distributor Type |
| | Research Octane No. or Cetane No. (Diesel) | | | 48 or higher | 48 or higher | 48 or higher | 48 or higher |
| | Max. Output | | kW / rpm | 96 / 3800 (SAE-NET) | 96 / 3800 (SAE-NET) | 150 / 3400 (EEC) | 150 / 3400 (EEC) |
| | Max. Torque | | N·m / rpm | 285 / 2200 (SAE-NET) | 285 / 2200 (SAE-NET) | 430 / 1400 - 3200 (EEC) | 430 / 1400 - 3200 (EEC) |
| Engine Electrical | Battery Capacity (5HR) | | Voltage & Amp. hr. | 12 - 64 | 12 - 64 | 12 - 55 x 2 | 12 - 55 x 2 |
| | Alternator Output | | Watts | 960, 1440*7 | 960, 1440*7 | 1440 | 1440 |
| | Starter Output | | kW | 2.5 | 2.5 | 3.0 | 3.0 |
| Chassis | Clutch Type | | | Dry, Single, Diaphragm | Dry, Single, Diaphragm | Dry, Single, Diaphragm | — |
| | Transmission Type | | | R151F | R151F | H151F | A750F |
| | Transmission Gear Ratio | In First | | 4.313 | 4.313 | 4.081 | 3.520 |
| | | In Second | | 2.330 | 2.330 | 2.294 | 2.042 |
| | | In Third | | 1.436 | 1.436 | 1.490 | 1.400 |
| | | In Fourth | | 1.000 | 1.000 | 1.000 | 1.000 |
| | | In Fifth | | 0.838 | 0.838 | 0.881 | 0.716 |
| | | In Reverse | | 4.220 | 4.220 | 4.313 | 3.224 |
| | Transfer Gear Ratio H4 / L4 | | | 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 |
| | Differential Gear Ratio (Front / Rear) | | | 4.300 / 4.300 | 4.300 / 4.300 | 4.100 / 4.100 | 3.909 / 3.909 |
| | Differential Gear Size (Front / Rear) | | in. | 8" / 9.5" | 8" / 9.5" | 8" / 9.5" | 8" / 9.5" |
| | Brake Type | Front | | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc |
| | | Rear | | L. T Drum, Ventilated Disc*7 | Ventilated Disc | Ventilated Disc | Ventilated Disc |
| | Parking Brake Type | | | Drum | Drum | Drum | Drum |
| | Brake Booster Type and Size | | in. | Vacuum | Vacuum, Hydraulic*9 | Hydraulic | Hydraulic |
| | Proportioning Valve Type | | | LSP &BV | LSP & BV, P & B Valve*9 | P & B Valve | P & B Valve |
| | Suspension Type | Front | | Leading Arm, Coil | Leading Arm, Coil | Double Wishbone | Double Wishbone |
| | | Rear | | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod |
| | Stabilizer Bar | Front | | STD | STD | STD | STD |
| | | Rear | | STD | STD | STD | STD |
| | Steering Gear Type | | | Rack & Pinion | Recerculating Ball | Rack & Pinion | Rack & Pinion |
| | Steering Gear Ratio (Overall) | | | 17.3 | 18.59 | 17.3 | 17.3 |
| | Power Steering Type | | | Integral Type | Integral Type | Integral Type | Integral Type |

*: Unladed Vehicle
*1: With Electrical Winch +50 mm (2.0 in.)
*2: With Roof Rail +40 mm (1.6 in.)
*3: With AHC
*4: With 3rd Seat
*5: Transfer in Low
*6: Transfer in High
*7: Option
*8: With 275 / 70R16 Tire
*9: With ABS
*10: With Back Door-Mounted Spare Tire, Tire Size 235 / 85R16 +295 mm (11.6 in.), Tire Size 275 / 70R16 +305 (12.0 in.), Tire Size 7.50R16 +265 mm (10.4 in.)
*11: With Roof Rack +230 mm (9.1 in.)
*12: With Grille Guard +75 mm (3.0 in.)
*13: With 7.50R16 Tire

| Australia | G.C.C. Countries | | | | |
|---|---|---|---|---|---|
| Wagon (Lift-Up Back Door) | Wagon (Swing Back Door) | | | Wagon (Lift-Up Back Door) | Wagon (Swing Back Door) |
| VX | GX | STD | GX | | |
| HDJ100R-GNAEZQ | HZJ105L-GCMNSV | FZJ100L-GCMRKV | FZJ100L-GCMNKV | FZJ100L-GNMNKV | FZJ100L-GCPNKV |
| 4890 (192.5) | 4890 (192.5)*1, 10 | 4890 (192.5)*1, 10 | 4890 (192.5)*1, 10 | 4890 (192.5)*1, 10 | 4890 (192.5)*1, 10 |
| 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) |
| 1890 (74.4) | 1905 (75.0)*11, 1885 (74.2)*8, 11 | 1880 (74.0)*11 | 1880 (74.0)*11, 1860 (73.2)*8, 11 | 1880 (74.0)*11, 1860 (73.2)*8, 11 | 1880 (74.0)*11, 1860 (73.2)*8, 11 |
| 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) |
| 1620 (63.8), 1640 (64.6)*17 | 1605 (63.2) | 1640 (64.6) | 1640 (64.6), 1620 (63.8)*8 | 1640 (64.6), 1620 (63.8)*8 | 1640 (64.6), 1620 (63.8)*8 |
| 1615 (63.6), 1635 (64.4)*17 | 1600 (63.0) | 1635 (64.4) | 1635 (64.4), 1615 (63.6)*8 | 1635 (64.4), 1615 (63.6)*8 | 1635 (64.4), 1615 (63.6)*8 |
| 2505 (98.6) | — | 1805 (71.1) | — | 1805 (71.1) | — |
| 1620 (63.8) | 1615 (63.6) | 1615 (63.6) | 1615 (63.6) | 1615 (63.6) | 1615 (63.6) |
| 1145 (45.1), 1150 (45.3)*15 | 1180 (46.5), 1150 (45.3)*15 | 1180 (46.5) | 1180 (46.5), 1150 (45.3) | 1180 (46.5), 1150 (45.3) | 1180 (46.5), 1150 (45.3) |
| 335 (13.2) | — | 1085 (42.7) | — | 1085 (42.7) | — |
| — | — | — | — | — | — |
| 995 (39.2) | — | 1065 (41.9) | — | 1065 (41.9) | — |
| 895 (35.2) | 895 (35.2)*1 | 895 (35.2)*1 | 895 (35.2)*1 | 895 (35.2)*1 | 895 (35.2)*1 |
| 1145 (45.1) | 1145 (45.1)*10 | 1145 (45.1)*10 | 1145 (45.1)*10 | 1145 (45.1)*10 | 1145 (45.1)*10 |
| — | — | — | — | — | — |
| — | — | — | — | — | — |
| — | — | — | — | — | — |
| 1405 - 1415 (3097 - 3120)*20 | 1215 - 1310 (2679 - 2888) | 1175 - 1255 (2590 - 2767) | 1195 - 1295 (2635 - 2855) | 1185 - 1290 (2612 - 2844) | 1225 - 1325 (2701 - 2921) |
| 1240 - 1265 (2734 - 2789)*20 | 1095 - 1275 (2414 - 2811) | 1110 - 1225 (2447 - 2701) | 1095 - 1290 (2414 - 2844) | 1120 - 1280 (2469 - 2822) | 1100 - 1295 (2425 - 2855) |
| 2645 - 2680 (5831 - 5908)*20 | 2310 - 2585 (5093 – 5699) | 2285 - 2480 (5038 - 5467) | 2290 - 2585 (5049 - 5699) | 2305 - 2570 (5082 - 5666) | 2325 - 2620 (5126 - 5776) |
| — | — | — | — | — | — |
| — | — | — | — | — | — |
| 3260 (7187) | 3160 (6967) | 3160 (6967) | 3160 (6967) | 3160 (6967) | 3160 (6967) |
| 96 + 45 (21.1 + 9.9) | 95 + 50 (20.9 + 11.0) | 96 + 45 (21.1 + 9.9) | 96 + 45 (21.1 + 9.9) | 96 + 45 (21.1 + 9.9) | 96 + 45 (21.1 + 9.9) |
| — | — | — | — | — | — |
| — | 155 (96) | 180 (112) | 180 (112) | 180 (112) | 180 (112) |
| — | — | — | — | — | — |
| 16 (10)*5, 39 (24)*6 | 13 (8)*5, 32 (20)*6 | 16 (10)*5, 39 (24)*6 | 16 (10)*5, 39 (24)*6 | 16 (10)*5, 39 (24)*6 | 21 (13)*5, 51 (31)*6 |
| 27 (17)*5, 67 (42)*6 | 25 (16)*5, 60 (37)*6 | 28 (17)*5, 70 (43)*6 | 28 (17)*5, 70 (43)*6 | 28 (17)*5, 70 (43)*6 | 40 (25)*5, 97 (60)*6 |
| — | 40 (25)*5, 97 (60)*6 | 44 (27)*5, 107 (66)*6 | 44 (27)*5, 107 (66)*6 | 44 (27)*5, 107(66)*6 | — |
| — | 57 (35)*5, 140 (87)*6 | 65 (40)*5, 160 (99)*6 | 65 (40)*5, 160 (99)*6 | 65 (40)*5, 160 (99)*6 | — |
| 6.0 (19.7) | 6.0 (19.7) | 5.9 (19.4) | 5.9 (19.4) | 5.9 (19.4) | 5.9 (19.4) |
| 6.4 (21.0) | 6.4 (21.0) | 6.3 (20.7) | 6.3 (20.7) | 6.3 (20.7) | 6.3 (20.7) |
| 1HD-FTE | 1HZ | 1FZ-FE | 1FZ-FE | 1FZ-FE | 1FZ-FE |
| 24-Valve, OHC | 12-Valve, OHC | 24-Valve, DOHC | 24-Valve, DOHC | 24-Valve, DOHC | 24-Valve, DOHC |
| 94.0 x 100.0 (3.70 x 3.94) | 94.0 x 100.0 (3.70 x 3.94) | 100.0 x 95.0 (3.97 x 3.74) | 100.0 x 95.0 (3.97 x 3.74) | 100.0 x 95.0 (3.97 x 3.74) | 100.0 x 95.0 (3.97 x 3.74) |
| 4164 (254.0) | 4164 (254.0) | 4477 (573.1) | 4477 (573.1) | 4477 (573.1) | 4477 (573.1) |
| 18.8 : 1 | 22.4 : 1 | 9.0 : 1 | 9.0 : 1 | 9.0 : 1 | 9.0 : 1 |
| Distributor Type | Distributor Type | EFI | EFI | EFI | EFI |
| 48 or higher | 48 or higher | 91 | 91 | 91 | 91 |
| 150 / 3400 (EEC) | 100 / 3800 (SAE-GROSS) | 179 / 4600 (SAE-GROSS) | 179 / 4600 (SAE-GROSS) | 179 / 4600 (SAE-GROSS) | 179 / 4600 (SAE-GROSS) |
| 430 / 1400 - 3200 (EEC) | 290 / 2200 (SAE-GROSS) | 407 / 3600 (SAE-GROSS) | 407 / 3600 (SAE-GROSS) | 407 / 3600 (SAE-GROSS) | 407 / 3600 (SAE-GROSS) |
| 12 - 55 x 2 | 12 - 55, 12 - 64 x 2*7 | 12 - 55 | 12 - 55 | 12 - 55 | 12 - 55 |
| 1440 | 840, 960*7 | 960 | 960, 1200*7 | 960, 1200*7 | 960, 1200*7 |
| 3.0 | 2.5, 3.0*7 | 1.4 | 1.4 | 1.4, 2.0*7 | 1.4 |
| — | Dry, Single, Diaphragm | Dry, Single, Diaphragm | Dry, Single, Diaphragm | Dry, Single, Diaphragm | — |
| A750F | R151F | H151F | H151F | H151F | A442F |
| 3.520 | 4.313 | 4.081 | 4.081 | 4.081 | 2.950 |
| 2.042 | 2.330 | 2.294 | 2.294 | 2.294 | 1.530 |
| 1.400 | 1.436 | 1.490 | 1.490 | 1.490 | 1.000 |
| 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 0.765 |
| 0.716 | 0.838 | 0.881 | 0.881 | 0.881 | — |
| 3.224 | 4.220 | 4.313 | 4.313 | 4.313 | 2.678 |
| 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 |
| 3.909 / 3.909 | 4.300 / 4.300 | 4.300 / 4.300 | 4.300 / 4.300 | 4.300 / 4.300 | 4.300 / 4.300 |
| 8” / 9.5” | 8” / 9.5” | 8” / 9.5” | 8” / 9.5” | 8” / 9.5” | 8” / 9.5” |
| Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc |
| Ventilated Disc | L. T Drum, Ventilated Disc*9 | L. T Drum, Ventilated Disc*9 | L. T Drum, Ventilated Disc*9 | L. T Drum, Ventilated Disc*9 | L. T Drum, Ventilated Disc*9 |
| Drum | Drum | Drum | Drum | Drum | Drum |
| Hydraulic | Vacuum, Hydraulic*9 | Vacuum, Hydraulic*9 | Vacuum, Hydraulic*9 | Vacuum, Hydraulic*9 | Vacuum, Hydraulic*9 |
| P & B Valve | LSP & BV, P & B Valve*9 | LSP & BV, P & B Valve*9 | LSP & BV, P & B Valve*9 | LSP & BV, P & B Valve*9 | LSP & BV, P & B Valve*9 |
| Double Wishbone | Leading Arm, Coil | Double Wishbone | Double Wishbone | Double Wishbone | Double Wishbone |
| 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod |
| STD | STD | STD | STD | STD | STD |
| STD | STD | STD | STD | STD | STD |
| Rack & Pinion | Recerculating Ball | Rack & Pinion | Rack & Pinion | Rack & Pinion | Rack & Pinion |
| 17.3 | 18.59 | 17.3 | 17.3 | 17.3 | 17.3 |
| Integral Type | Integral Type | Integral Type | Integral Type | Integral Type | Integral Type |

*14: With AHC –50 mm (2.0 in.)
*15: With Moon Roof
*16: With VSC
*19: Separate Seat, Seating Capacity: 5
*20: Seating Capacity: 8

| Item \ Area | | | | G.C.C. Countries | | | |
|---|---|---|---|---|---|---|---|
| Body Type | | | | Wagon (Lift-Up Back Door) | Wagon (Swing Back Door) | Wagon (Lift-Up Back Door) | Wagon (Swing Back Door) |
| Vehicle Grade | | | | GX | VX | | |
| Model Code | | | | FZJ100L-GNPNKV | UZJ100L-GCMEKV | UZJ100L-GNMEKV | UZJ100L-GCAEKV |
| Major Dimensions & Vehicle Weights | Overall | Length | mm (in.) | 4890 (192.5)*1, 10 | 4890 (192.5)*1, 10, 12 | 4890 (192.5)*1, 10, 12 | 4890 (192.5)*1, 10, 12 |
| | | Width | mm (in.) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) |
| | | Height | mm (in.) | 1880 (74.0)*11, 1860 (73.2)*8, 11 | 1860 (73.2)*11, 1850 (72.8)*3, 11 | 1860 (73.2)*11, 1850 (72.8)*3, 11 | 1860 (73.2)*11, 1850 (72.8)*3, 11 |
| | Wheel Base | | mm (in.) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) |
| | Tread | Front | mm (in.) | 1640 (64.6), 1620 (63.8)*8 | 1620 (63.8) | 1620 (63.8) | 1620 (63.8) |
| | | Rear | mm (in.) | 1635 (64.4), 1615 (63.6)*8 | 1615 (63.6) | 1615 (63.6) | 1615 (63.6) |
| | Room | Length | mm (in.) | 1805 (71.1) | — | 2505 (98.6) | — |
| | | Width | mm (in.) | 1615 (63.6) | 1620 (63.8) | 1620 (63.8) | 1620 (63.8) |
| | | Height | mm (in.) | 1180 (46.5), 1150 (45.3) | 1145 (45.1), 1150 (45.3)*15 | 1145 (45.1), 1150 (45.3)*15 | 1145 (45.1), 1150 (45.3)*15 |
| | Cargo Space | Length | mm (in.) | 1085 (42.7) | — | 335 (13.2) | — |
| | | Width | mm (in.) | — | — | — | — |
| | | Height | mm (in.) | 1065 (41.9) | — | 995 (39.2) | — |
| | Overhang | Front | mm (in.) | 895 (35.2)*1 | 895 (35.2)*1, 12 | 895 (35.2)*1, 12 | 895 (35.2)*1, 12 |
| | | Rear | mm (in.) | 1145 (45.1)*10 | 1145 (45.1)*10 | 1145 (45.1)*10 | 1145 (45.1)*10 |
| | Min. Running Ground Clearance | | mm (in.) | — | — | — | — |
| | Angle of Approach | | degrees | — | — | — | — |
| | Angle of Departure | | degrees | — | — | — | — |
| | Curb Weight*19 | Front | kg (lb) | 1215 - 1320 (2679 - 2910) | 1230 - 1345 (2712 - 2965) | 1240 - 1345 (2734 - 2965) | 1240 – 1365 (2734 - 3009) |
| | | Rear | kg (lb) | 1130 - 1290 (2491 - 2844) | 1090 - 1275 (2403 - 2811) | 1080 - 1305 (2381 - 2877) | 1090 - 1265 (2043 - 2789) |
| | | Total | kg (lb) | 2345 - 2610 (5170 - 5754) | 2320 - 2620 (5115 - 5776) | 2320 - 2650 (5115 - 5842) | 2330 - 2630 (5137 - 5798) |
| | Gross Vehicle Weight | Front | kg (lb) | — | — | — | — |
| | | Rear | kg (lb) | — | — | — | — |
| | | Total | kg (lb) | 3160 (6967) | 3260 (7187) | 3260 (7187) | 3260 (7187) |
| | Fuel Tank Capacity | | ℓ (Imp.gal.) | 96 + 45 (21.1 + 9.9) | 96 + 45 (21.1 + 9.9) | 96 + 45 (21.1 + 9.9) | 96 + 45 (21.1 + 9.9) |
| | Luggage Compartment Capacity | | $m^3$ (cu.ft.) | — | — | — | — |
| Performance | Max. Speed | | km / h (mph) | 180 (112) | 180 (112) | 180 (112) | 180 (112) |
| | Max. Cruising Speed | | km / h (mph) | — | — | — | — |
| | Max. Permissible Speed | 1st Gear | km / h (mph) | 21 (13)*5, 51 (31)*6 | 17 (11)*5, 40 (25)*6 | 17 (11)*5, 40 (25)*6 | 19 (12)*5, 47 (29)*6 |
| | | 2nd Gear | km / h (mph) | 40 (25)*5, 97 (60)*6 | 29 (18)*5, 72 (45)*6 | 29 (18)*5, 72 (45)*6 | 33 (20)*5, 81(50)*6 |
| | | 3rd Gear | km / h (mph) | — | 45 (28)*5, 111 (69)*6 | 45 (28)*5, 111 (69)*6 | — |
| | | 4th Gear | km / h (mph) | — | 67 (42)*5, 165 (102)*6 | 67 (42)*5, 165 (102)*6 | — |
| | Min. Turning Radius | Tire | m (ft.) | 5.9 (19.4) | 5.9 (19.4) | 5.9 (19.4) | 5.9 (19.4) |
| | | Body | m (ft.) | 6.3 (20.7) | 6.3 (20.7) | 6.3 (20.7) | 6.3 (20.7) |
| Engine | Engine Type | | | 1FZ-FE | 2UZ-FE | 2UZ-FE | 2UZ-FE |
| | Valve Mechanism | | | 24-Valve, DOHC | 32-Valve, DOHC | 32-Valve, DOHC | 32-Valve, DOHC |
| | Bore x Stroke | | mm (in.) | 100.0 x 95.0 (3.97 x 3.74) | 94.0 x 84.0 (3.70 x 3.31) | 94.0 x 84.0 (3.70 x 3.31) | 94.0 x 84.0 (3.70 x 3.31) |
| | Displacement | | $cm^3$ (cu.in.) | 4477 (573.1) | 4664 (284.5) | 4664 (284.5) | 4664 (284.5) |
| | Compression Ratio | | | 9.0 : 1 | 9.6 : 1 | 9.6 : 1 | 9.6 : 1 |
| | Carburetor Type or Injection Pump Type (Diesel) | | | EFI | EFI | EFI | EFI |
| | Research Octane No. or Cetane No. (Diesel) | | | 91 | 91 | 91 | 91 |
| | Max. Output | | kW / rpm | 179 / 4600 (SAE-GROSS) | 185 / 4800 (SAE-GROSS) | 185 / 4800 (SAE-GROSS) | 185 / 4800 (SAE-GROSS) |
| | Max. Torque | | N·m / rpm | 407 / 3600 (SAE-GROSS) | 430 / 3400 (SAE-GROSS) | 430 / 3400 (SAE-GROSS) | 430 / 3400 (SAE-GROSS) |
| Engine Electrical | Battery Capacity (5HR) | | Voltage & Amp. hr. | 12 - 55 | 12 - 55 | 12 - 55 | 12 - 55 |
| | Alternator Output | | Watts | 960, 1200*7 | 960 | 960 | 960 |
| | Starter Output | | kW | 1.4, 2.0*7 | 1.4 | 1.4 | 1.4 |
| Chassis | Clutch Type | | | — | Dry, Single, Diaphragm | Dry, Single, Diaphragm | |
| | Transmission Type | | | A442F | H151F | H151F | A750F |
| | Transmission Gear Ratio | In First | | 2.950 | 4.081 | 4.081 | 3.520 |
| | | In Second | | 1.530 | 2.294 | 2.294 | 2.042 |
| | | In Third | | 1.000 | 1.490 | 1.490 | 1.400 |
| | | In Fourth | | 0.765 | 1.000 | 1.000 | 1.000 |
| | | In Fifth | | — | 0.881 | 0.881 | 0.716 |
| | | In Reverse | | 2.678 | 4.313 | 4.313 | 3.224 |
| | Transfer Gear Ratio H4 / L4 | | | 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 |
| | Differential Gear Ratio (Front / Rear) | | | 4.300 / 4.300 | 4.300 / 4.300 | 4.300 / 4.300 | 4.100 / 4.100 |
| | Differential Gear Size (Front / Rear) | | in. | 8" / 9.5" | 8" / 9.5" | 8" / 9.5" | 8" / 9.5" |
| | Brake Type | Front | | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc |
| | | Rear | | L. T Drum, Ventilated Disc*9 | L. T Drum, Ventilated Disc*9 | L. T Drum, Ventilated Disc*9 | L. T Drum, Ventilated Disc*9 |
| | Parking Brake Type | | | Drum | Drum | Drum | Drum |
| | Brake Booster Type and Size | | in. | Vacuum, Hydraulic*9 | Vacuum, Hydraulic*9 | Vacuum, Hydraulic*9 | Vacuum, Hydraulic*9 |
| | Proportioning Valve Type | | | LSP & BV, P & B Valve*9 | LSP & BV, P & B Valve*9 | LSP & BV, P & B Valve*9 | LSP & BV, P & B Valve*9, —*16 |
| | Suspension Type | Front | | Double Wishbone | Double Wishbone | Double Wishbone | Double Wishbone |
| | | Rear | | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod |
| | Stabilizer Bar | Front | | STD | STD | STD | STD |
| | | Rear | | STD | STD | STD | STD |
| | Steering Gear Type | | | Rack & Pinion | Rack & Pinion | Rack & Pinion | Rack & Pinion |
| | Steering Gear Ratio (Overall) | | | 17.3 | 17.3 | 17.3 | 17.3 |
| | Power Steering Type | | | Integral Type | Integral Type | Integral Type | Integral Type |

*: Unladed Vehicle
*1: With Electrical Winch +50 mm (2.0 in.)
*2: With Roof Rail +40 mm (1.6 in.)
*3: With AHC
*4: With 3rd Seat
*5: Transfer in Low
*6: Transfer in High
*7: Option
*8: With 275 / 70R16 Tire
*9: With ABS
*10: With Back Door-Mounted Spare Tire, Tire Size 235 / 85R16 +295 mm (11.6 in.), Tire Size 275 / 70R16 +305 (12.0 in.), Tire Size 7.50R16 +265 mm (10.4 in.)
*11: With Roof Rack +230 mm (9.1 in.)
*12: With Grille Guard +75 mm (3.0 in.)
*13: With 7.50R16 Tire

| G.C.C. Countries | General Countries | | | | |
|---|---|---|---|---|---|
| Wagon (Lift-Up Back Door) | Wagon (Swing Back Door) VX | Wagon (Swing Back Door) | Wagon (Lift-Up Back Door) | | Wagon (Swing Back Door) |
| VX | STD | GX | | | STD |
| UZJ100L-GNAEKV | FZJ105L-GCMRK | FZJ105L-GCMNK | FZJ105L-GNMNK | FZJ105R-GNMNK | HZJ105R-GCMRS |
| 4890 (192.5)*1, 10, 12 | 4890 (192.5)*1, 10 | 4890 (192.5)*1, 10 | 4890 (192.5)*1, 10 | 4890 (192.5)*1, 10 | 4890 (192.5)*1, 10 |
| 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) |
| 1860 (73.2)*11, 1850 (72.8)*3, 11 | 1925 (75.8)*2, 11, 1930 (76.0)*2, 11, 13 | 1925 (75.8)*2, 11, 1920 (75.6)*2, 8, 11, 1930 (76.0)*2, 11, 13 | 1925 (75.8)*2, 11, 1920 (75.6)*2, 8, 11, 1930 (76.0)*2, 11, 13 | 1925 (75.8)*2, 11, 1920 (75.6)*2, 8, 11, 1930 (76.0)*2, 11, 13 | 1925 (75.8)*2, 11, 1930 (76.0)*2, 11, 13 |
| 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) |
| 1620 (63.8) | 1605 (63.2) | 1605 (63.2) | 1605 (63.2) | 1605 (63.2) | 1605 (63.2) |
| 1615 (63.6) | 1600 (63.0) | 1600 (63.0) | 1600 (63.0) | 1600 (63.0) | 1600 (63.0) |
| 2505 (98.6) | 1805 (71.1) | 1805 (71.1) | 1805 (71.1) | 1805 (71.1) | 1805 (71.1) |
| 1620 (63.8) | 1615 (63.6) | 1615 (63.6) | 1615 (63.6) | 1615 (63.6) | 1615 (63.6) |
| 1145 (45.1), 1150 (45.3)*15 | 1180 (46.5) | 1180 (46.5) | 1180 (46.5) | 1180 (46.5) | 1180 (46.5) |
| 335 (13.2) | 1085 (42.7) | 1085 (42.7) | 1085 (42.7) | 1085 (42.7) | 1085 (42.7) |
| — | — | — | — | — | — |
| 995 (39.2) | 1065 (41.9) | 1065 (41.9) | 1065 (41.9) | 1065 (41.9) | 1065 (41.9) |
| 895 (35.2)*1, 12 | 895 (35.2)*1 | 895 (35.2)*1 | 895 (35.2)*1 | 895 (35.2)*1 | 895 (35.2)*1 |
| 1145 (45.1)*10 | 1145 (45.1)*10 | 1145 (45.1)*10 | 1145 (45.1)*10 | 1145 (45.1)*10 | 1145 (45.1)*10 |
| — | — | — | — | — | — |
| — | — | — | — | — | — |
| — | — | — | — | — | — |
| 1250 - 1370 (2756 – 3020) | 1160 - 1250 (2557 - 2756) | 1170 - 1300 (2579 - 2866) | 1165 - 1290 (2568 - 2844) | 1165 - 1285 (2568 - 2833) | 1200 - 1290 (2646 - 2844) |
| 1080 - 1295 (2381 - 2855) | 1090 - 1230 (2403 - 2712) | 1080 - 1240 (2381 - 2739) | 1090 - 1245 (2403 - 2745) | 1090 - 1245 (2403 - 2745) | 1080 - 1220 (2381 - 2690) |
| 2330 - 2665 (5137 - 5875) | 2250 - 2480 (4960 - 5467) | 2250 - 2540 (4960 - 5660) | 2255 - 2535 (4971 - 5589) | 2255 - 2530 (4971 - 5578) | 2280 - 2510 (5027 - 5534) |
| — | — | — | — | — | — |
| — | — | — | — | — | — |
| 3260 (7187) | 3160 (6967) | 3160 (6967) | 3160 (6967) | 3160 (6967) | 3160 (6967) |
| 96 + 45 (21.1 + 9.9) | 95 (20.9), 95 + 50 (20.9 + 11.0)*7 | 95 (20.9), 95 + 50 (20.9 + 11.0)*7 | 95 (20.9), 95 + 50 (20.9 + 11.0)*7 | 95 (20.9), 95 + 50 (20.9 + 11.0)*7 | 95 (20.9), 95 + 50 (20.9 + 11.0)*7 |
| — | — | — | — | — | — |
| 180 (112) | 175 (109) | 175 (109) | 175 (109) | 175 (109) | 155 (96) |
| — | — | — | — | — | — |
| 19 (12)*5, 47 (29)*6 | 16 (10)*5, 39 (24)*6 | 16 (10)*5, 39 (24)*6 | 16 (10)*5, 39 (24)*6 | 16 (10)*5, 39 (24)*6 | 13 (8)*5, 32 (20)*6 |
| 33 (20)*5, 81 (50)*6 | 28 (17)*5, 70 (43)*6 | 28 (17)*5, 70 (43)*6 | 28 (17)*5, 70 (43)*6 | 28 (17)*5, 70 (43)*6 | 25 (16)*5, 60 (37)*6 |
| — | 44 (27)*5, 107 (66)*6 | 44 (27)*5, 107 (66)*6 | 44 (27)*5, 107 (66)*6 | 44 (27)*5, 107 (66)*6 | 40 (25)*5, 97 (60)*6 |
| — | 65 (40)*5, 160 (99)*6 | 65 (40)*5, 160 (99)*6 | 65 (40)*5, 160 (99)*6 | 65 (40)*5, 160 (99)*6 | 57 (35)*5, 140 (87)*6 |
| 5.9 (19.4) | 6.0 (19.7) | 6.0 (19.7) | 6.0 (19.7) | 6.0 (19.7) | 6.0 (19.7) |
| 6.3 (20.7) | 6.4 (21.0) | 6.4 (21.0) | 6.4 (21.0) | 6.4 (21.0) | 6.4 (21.0) |
| 2UZ-FE | 1FZ-FE | 1FZ-FE | 1FZ-FE | 1FZ-FE | 1HZ |
| 32-Valve, DOHC | 24-Valve, DOHC | 24-Valve, DOHC | 24-Valve, DOHC | 24-Valve, DOHC | 12-Valve, OHC |
| 94.0 x 84.0 (3.70 x 3.31) | 100.0 x 95.0 (3.97 x 3.74) | 100.0 x 95.0 (3.97 x 3.74) | 100.0 x 95.0 (3.97 x 3.74) | 100.0 x 95.0 (3.97 x 3.74) | 94.0 x 100.0 (3.70 x 3.94) |
| 4664 (284.5) | 4477 (573.1) | 4477 (573.1) | 4477 (573.1) | 4477 (573.1) | 4164 (254.0) |
| 9.6 : 1 | 9.0 : 1 | 9.0 : 1 | 9.0 : 1 | 9.0 : 1 | 22.4 : 1 |
| EFI | EFI | EFI | EFI | EFI | Distributor Type |
| 91 | 91 | 91 | 91 | 91 | 48 or higher |
| 185 / 4800 (SAE-GROSS) | 165 / 4600 (SAE-NET) | 165 / 4600 (SAE-NET) | 165 / 4600 (SAE-NET) | 165 / 4600 (SAE-NET) | 96 / 3800 (SAE-NET) |
| 430 / 3400 (SAE-GROSS) | 387 / 3600 (SAE-NET) | 387 / 3600 (SAE-NET) | 387 / 3600 (SAE-NET) | 387 / 3600 (SAE-NET) | 285 / 2200 (SAE-NET) |
| 12 - 55 | 12 - 55 | 12 - 55 | 12 - 55 | 12 - 55 | 12 - 55, 64*7 |
| 960 | 960 | 960 | 960 | 960 | 840 |
| 1.4 | 1.4, 2.0*7 | 1.4, 2.0*7 | 1.4, 2.0*7 | 1.4, 2.0*7 | 2.5 |
| | Dry, Single, Diaphragm | Dry, Single, Diaphragm | Dry, Single, Diaphragm | Dry, Single, Diaphragm | Dry, Single, Diaphragm |
| A750F | H151F | H151F | H151F | H151F | R151F |
| 3.520 | 4.081 | 4.081 | 4.081 | 4.081 | 4.313 |
| 2.042 | 2.294 | 2.294 | 2.294 | 2.294 | 2.330 |
| 1.400 | 1.490 | 1.490 | 1.490 | 1.490 | 1.436 |
| 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 0.716 | 0.881 | 0.881 | 0.881 | 0.881 | 0.838 |
| 3.224 | 4.313 | 4.313 | 4.313 | 4.313 | 4.220 |
| 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 |
| 4.100 / 4.100 | 4.300 / 4.300 | 4.300 / 4.300 | 4.300 / 4.300 | 4.300 / 4.300 | 4.300 / 4.300 |
| 8” / 9.5” | 8” / 9.5” | 8” / 9.5” | 8” / 9.5” | 8” / 9.5” | 8” / 9.5” |
| Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc |
| L. T Drum, Ventilated Disc*9 | L. T Drum, Ventilated Disc*9 | L. T Drum, Ventilated Disc*9 | L. T Drum, Ventilated Disc*9 | L. T Drum, Ventilated Disc*9 | L. T Drum, Ventilated Disc*9 |
| Drum | Drum | Drum | Drum | Drum | Drum |
| Vacuum, Hydraulic*9 | Vacuum | Vacuum, Hydraulic*9 | Vacuum, Hydraulic*9 | Vacuum, Hydraulic*9 | Vacuum |
| LSP & BV, P & B Valve*9, —*16 | LSP & BV | LSP & BV, P & B Valve*9 | LSP & BV, P & B Valve*9 | LSP & BV, P & B Valve*9 | LSP & BV |
| Double Wishbone | Leading Arm, Coil | Leading Arm, Coil | Leading Arm, Coil | Leading Arm, Coil | Leading Arm, Coil |
| 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod |
| STD | STD | STD | STD | STD | STD |
| STD | STD | STD | STD | STD | STD |
| Rack & Pinion | Recerculating Ball | Recerculating Ball | Recerculating Ball | Recerculating Ball | Recerculating Ball |
| 17.3 | 18.59 | 18.59 | 18.59 | 18.59 | 18.59 |
| Integral Type | Integral Type | Integral Type | Integral Type | Integral Type | Integral Type |

*14: With AHC –50 mm (2.0 in.)
*15: With Moon Roof
*16: With VSC
*19: Separate Seat, Seating Capacity: 5

| Item / Area | | | | General Countries | | | |
|---|---|---|---|---|---|---|---|
| Body Type | | | | Wagon (Swing Back Door) | | Wagon (Lift-Up Back Door) | Wagon (Swing Back Door) |
| Vehicle Grade | | | | STD | GX | | |
| Model Code | | | | HZJ105L-GCMRS | HZJ105R-GCMNS | HZJ105R-GNMNS | HZJ105L-GCMNS |
| Major Dimensions & Vehicle Weights | Overall | Length | mm (in.) | 4890 (192.5)*1, 10 | 4890 (192.5)*1, 10 | 4890 (192.5)*1, 10 | 4890 (192.5)*1, 10 |
| | | Width | mm (in.) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) |
| | | Height | mm (in.) | 1925 (75.8)*2, 11, 1930 (76.0)*2, 11, 13 | 1925 (75.8)*2, 11, 1920 (75.6)*2, 8, 11, 1930 (76.0)*2, 11, 13 | 1925 (75.8)*2, 11, 1920 (75.6)*2, 8, 11, 1930 (76.0)*2, 11, 13 | 1925 (75.8)*2, 11, 1920 (75.6)*2, 8, 11, 1930 (76.0)*2, 11, 13 |
| | Wheel Base | | mm (in.) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) |
| | Tread | Front | mm (in.) | 1605 (63.2) | 1605 (63.2) | 1605 (63.2) | 1605 (63.2) |
| | | Rear | mm (in.) | 1600 (63.0) | 1600 (63.0) | 1600 (63.0) | 1600 (63.0) |
| | Room | Length | mm (in.) | 1805 (71.1) | 1805 (71.1) | 1805 (71.1) | 1805 (71.1) |
| | | Width | mm (in.) | 1615 (63.6) | 1615 (63.6) | 1615 (63.6) | 1615 (63.6) |
| | | Height | mm (in.) | 1180 (46.5) | 1180 (46.5), 1150 (45.3)*15 | 1180 (46.5), 1150 (45.3)*15 | 1180 (46.5), 1150 (45.3)*15 |
| | Cargo Space | Length | mm (in.) | 1085 (42.7) | 1085 (42.7) | 1085 (42.7) | 1085 (42.7) |
| | | Width | mm (in.) | — | — | — | — |
| | | Height | mm (in.) | 1065 (41.9) | 1065 (41.9) | 1065 (41.9) | 1065 (41.9) |
| | Overhang | Front | mm (in.) | 895 (35.2)*1 | 895 (35.2)*1 | 859 (35.2)*1 | 859 (35.2)*1 |
| | | Rear | mm (in.) | 1145 (45.1)*10 | 1145 (45.1)*10 | 1145 (45.1)*10 | 1145 (45.1)*10 |
| | Min. Running Ground Clearance | | mm (in.) | — | — | — | — |
| | Angle of Approach | | degrees | — | — | — | — |
| | Angle of Departure | | degrees | — | — | — | — |
| | Curb Weight*19 | Front | kg (lb) | 1200 - 1300 (2646 - 2866) | 1210 - 1340 (2668 - 2954) | 1205 - 1330 (2657 - 2932) | 1210 - 1340 (2668 - 2954) |
| | | Rear | kg (lb) | 1080 - 1220 (2381 -2690) | 1090 - 1245 (2403 - 2745) | 1100 - 1250 (2425 - 2756) | 1090 - 1250 (2403 - 2756) |
| | | Total | kg (lb) | 2280 - 2520 (5027 - 5556) | 2300 - 2585 (5071 - 5699) | 2305 - 2580 (5082 - 5688) | 2300 - 2590 (5071 - 5710) |
| | Gross Vehicle Weight | Front | kg (lb) | — | — | — | — |
| | | Rear | kg (lb) | — | — | — | — |
| | | Total | kg (lb) | 3160 (6967) | 3160 (6967) | 3160 (6967) | 3160 (6967) |
| | Fuel Tank Capacity | | ℓ (Imp.gal.) | 95 (20.9), 95 + 50 (20.9 + 11.0)*7 | 95 (20.9), 95 + 50 (20.9 + 11.0)*7 | 95 (20.9), 95 + 50 (20.9 + 11.0)*7 | 95 (20.9), 95 + 50 (20.9 + 11.0)*7 |
| | Luggage Compartment Capacity | | $m^3$ (cu.ft.) | — | — | — | — |
| Performance | Max. Speed | | km / h (mph) | 155 (96) | 155 (96) | 155 (96) | 155 (96) |
| | Max. Cruising Speed | | km / h (mph) | — | — | — | — |
| | Max. Permissible Speed | 1st Gear | km / h (mph) | 13 (8)*5, 32 (20)*6 | 13 (8)*5, 32 (20)*6 | 13 (8)*5, 32 (20)*6 | 13 (8)*5, 32 (20)*6 |
| | | 2nd Gear | km / h (mph) | 25 (16)*5, 60 (37)*6 | 25 (16)*5, 60 (37)*6 | 25 (16)*5, 60 (37)*6 | 25 (16)*5, 60 (37)*6 |
| | | 3rd Gear | km / h (mph) | 40 (25)*5, 97 (60)*6 | 40 (25)*5, 97 (60)*6 | 40 (25)*5, 97 (60)*6 | 40 (25)*5, 97 (60)?6 |
| | | 4th Gear | km / h (mph) | 57 (35)*5, 140 (87)*6 | 57 (35)*5, 140 (87)*6 | 57 (35)*5, 140 (87)*6 | 57 (35)*5, 140 (87)*6 |
| | Min. Turning Radius | Tire | m (ft.) | 6.0 (19.7) | 6.0 (19.7) | 6.0 (19.7) | 6.0 (19.7) |
| | | Body | m (ft.) | 6.4 (21.0) | 6.4 (21.0) | 6.4 (21.0) | 6.4 (21.0) |
| Engine | Engine Type | | | 1HZ | 1HZ | 1HZ | 1HZ |
| | Valve Mechanism | | | 12-Valve, OHC | 12-Valve, OHC | 12-Valve, OHC | 12-Valve, OHC |
| | Bore x Stroke | | mm (in.) | 94.0 x 100.0 (3.70 x 3.94) | 94.0 x 100.0 (3.70 x 3.94) | 94.0 x 100.0 (3.70 x 3.94) | 94.0 x 100.0 (3.70 x 3.94) |
| | Displacement | | $cm^3$ (cu.in.) | 4164 (254.0) | 4164 (254.0) | 4164 (254.0) | 4164 (254.0) |
| | Compression Ratio | | | 22.4 : 1 | 22.4 : 1 | 22.4 : 1 | 22.4 : 1 |
| | Carburetor Type or Injection Pump Type (Diesel) | | | Distributor Type | Distributor Type | Distributor Type | Distributor Type |
| | Research Octane No. or Cetane No. (Diesel) | | | 48 or higher | 48 or higher | 48 or higher | 48 or higher |
| | Max. Output | | kW / rpm | 96 / 3800 (SAE-NET) | 96 / 3800 (SAE-NET) | 96 / 3800 (SAE-NET) | 96 / 3800 (SAE-NET) |
| | Max. Torque | | N·m / rpm | 285 / 2200 (SAE-NET) | 285 / 2200 (SAE-NET) | 285 / 2200 (SAE-NET) | 285 / 2200 (SAE-NET) |
| Engine Electrical | Battery Capacity (5HR) | | Voltage & Amp. hr. | 12 - 55, 64*7, 64 x 2*7 | 12 - 55, 64*7 | 12 - 55, 64*7 | 12 - 55, 64*7, 64 x 2*7 |
| | Alternator Output | | Watts | 84, 960*7 | 840 | 840 | 840, 960*7 |
| | Starter Output | | kW | 2.5, 3.0*7 | 2.5 | 2.5 | 2.5, 3.0*7 |
| Chassis | Clutch Type | | | Dry, Single, Diaphragm | Dry, Single, Diaphragm | Dry, Single, Diaphragm | Dry, Single, Diaphragm |
| | Transmission Type | | | R151F | R151F | R151F | R151F |
| | Transmission Gear Ratio | In First | | 4.313 | 4.313 | 4.313 | 4.313 |
| | | In Second | | 2.330 | 2.330 | 2.330 | 2.330 |
| | | In Third | | 1.436 | 1.436 | 1.436 | 1.436 |
| | | In Fourth | | 1.000 | 1.000 | 1.000 | 1.000 |
| | | In Fifth | | 0.838 | 0.838 | 0.838 | 0.838 |
| | | In Reverse | | 4.220 | 4.220 | 4.220 | 4.220 |
| | Transfer Gear Ratio H4 / L4 | | | 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 |
| | Differential Gear Ratio (Front / Rear) | | | 4.300 / 4.300 | 4.300 / 4.300 | 4.300 / 4.300 | 4.300 / 4.300 |
| | Differential Gear Size (Front / Rear) | | in. | 8" / 9.5" | 8" / 9.5" | 8" / 9.5" | 8" / 9.5" |
| | Brake Type | Front | | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc |
| | | Rear | | L. T Drum, Ventilated Disc*9 | L. T Drum, Ventilated Disc*9 | L. T Drum, Ventilated Disc*9 | L. T Drum, Ventilated Disc*9 |
| | Parking Brake Type | | | Drum | Drum | Drum | Drum |
| | Brake Booster Type and Size | | in. | Vacuum, Hydraulic*9 | Vacuum, Hydraulic*9 | Vacuum, Hydraulic*9 | Vacuum, Hydraulic*9 |
| | Proportioning Valve Type | | | LSP & BV, P & B Valve*9 | LSP & BV, P & B Valve*9 | LSP & BV, P & B Valve*9 | LSP & BV, P & B Valve*9 |
| | Suspension Type | Front | | Leading Arm, Coil | Leading Arm, Coil | Leading Arm, Coil | Leading Arm, Coil |
| | | Rear | | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod |
| | Stabilizer Bar | Front | | STD | STD | STD | STD |
| | | Rear | | STD | STD | STD | STD |
| | Steering Gear Type | | | Recerculating Ball | Recerculating Ball | Recerculating Ball | Recerculating Ball |
| | Steering Gear Ratio (Overall) | | | 18.59 | 18.59 | 18.59 | 18.59 |
| | Power Steering Type | | | Integral Type | Integral Type | Integral Type | Integral Type |

*: Unladed Vehicle
*1: With Electrical Winch +50 mm (2.0 in.)
*2: With Roof Rail +40 mm (1.6 in.)
*3: With AHC
*4: With 3rd Seat
*5: Transfer in Low
*6: Transfer in High
*7: Option
*8: With 275 / 70R16 Tire
*9: With ABS
*10: With Back Door-Mounted Spare Tire, Tire Size 235 / 85R16 +295 mm (11.6 in.), Tire Size 275 / 70R16 +305 (12.0 in.), Tire Size 7.50R16 +265 mm (10.4 in.)
*11: With Roof Rack +230 mm (9.1 in.)
*12: With Grille Guard +75 mm (3.0 in.)
*13: With 7.50R16 Tire

| | General Countries | | | | | |
|---|---|---|---|---|---|---|
| | Wagon (Lift-Up Back Door) | Wagon (Lift-Up Back Door) | | Wagon (Swing Back Door) | Wagon (Lift-Up Back Door) | |
| | GX | VX | | | | |
| | HZJ105L-GNMNS | UZJ100L-GNAEK | HDJ100R-GNMEZ | HDJ100L-GCMEZ | HDJ100L-GNMEZ | HDJ100L-GNAEZ |
| 5 | 4890 (192.5)*1, 10 | 4890 (192.5)*1, 10, 12 | 4890 (192.5)*1, 10, 12 | 4890 (192.5)*1, 10, 12 | 4890 (192.5)*1, 10, 12 | 4890 (192.5)*1, 10, 12 |
| | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) |
| | 1925 (75.8)*2, 11, 1920 (75.6)*2, 8, 11, 1930 (76.0)*2, 11, 13 | 1920 (75.6)*2, 11, 14, 1900 (74.8)*2, 8, 11, 14 | 1920 (75.6)*2, 11, 14, 1900 (74.8)*2, 8, 11, 14 | 1920 (75.6)*2, 11, 1900 (4.8)*2, 8, 11 | 1920 (75.6)*2, 11, 1900 (4.8)*2, 8, 11 | 1920 (75.6)*2, 11, 1900 (4.8)*2, 8, 11 |
| | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) |
| | 1605 (63.2) | 1640 (64.6), 1620 (63.8)*8 | 1640 (64.6), 1620 (63.8)*8 | 1640 (64.6), 1620 (63.8)*8 | 1640 (64.6), 1620 (63.8)*8 | 1640 (64.6), 1620 (63.8)*8 |
| 10 | 1600 (63.0) | 1635 (64.4), 1615 (63.6)*8 | 1635 (64.4), 1615 (63.6)*8 | 1635 (64.4), 1615 (63.6)*8 | 1635 (64.4), 1615 (63.6)*8 | 1635 (64.4), 1615 (63.6)*8 |
| | 1805 (71.1) | 2505 (98.6)*4 | 2505 (98.6)*4 | 2505 (98.6)*4 | 2505 (98.6)*4 | 2505 (98.6)*4 |
| | 1615 (63.6) | 1620 (63.8)*4 | 1620 (63.8)*4 | 1620 (63.8)*4 | 1620 (63.8)*4 | 1620 (63.8)*4 |
| | 1180 (46.5), 1150 (45.3)*15 | 1145 (45.1), 1150 (45.3)*4 | 1145 (45.1), 1150 (45.3)*4 | 1145 (45.1), 1150 (45.3)*4 | 1145 (45.1), 1150 (45.3)*4 | 1145 (45.1), 1150 (45.3)*4 |
| | 1085 (42.7) | 335 (13.1)*4 | 335 (13.1)*4 | 335 (13.1)*4 | 335 (13.1)*4 | 335 (13.1)*4 |
| 15 | — | — | — | — | — | — |
| | 1065 (41.9) | 995 (39.2)*4 | 995 (39.2)*4 | 995 (39.2)*4 | 995 (39.2)*4 | 995 (39.2)*4 |
| | 895 (35.2)*1 | 895 (35.2)*1, 12 | 895 (35.2)*1, 12 | 895 (35.2)*1, 12 | 895 (35.2)*1, 12 | 895 (35.2)*1, 12 |
| | 1145 (45.1)*10 | 1145 (45.1)*10 | 1145 (45.1)*10 | 1145 (45.1)*10 | 1145 (45.1)*10 | 1145 (45.1)*10 |
| | — | — | — | — | — | — |
| 20 | — | — | — | — | — | — |
| | — | — | — | — | — | — |
| | 1205 - 1330 (2657 - 2932) | 1220 - 1385 (2690 - 3053) | 1280 - 1425 (2822 - 3142)*21 | 1280 - 1375 (2822 - 3031) | 1280 - 1425 (2822 - 3142) | 1320 - 1435 (2910 - 3164) |
| | 1100 - 1255 (2425 - 2767) | 1110 - 1280 (2447 - 2822) | 1120 - 1305 (2469 - 2877)*21 | 1150 - 1280 (2535 - 2822) | 1120 - 1305 (2469 - 2877) | 1120 - 1310 (2469 - 2888) |
| | 2305 - 2585 (5082 - 5699) | 2330 - 2665 (5137 - 5875) | 2400 - 2730 (5291 - 6019)*21 | 2430 - 2655 (5357 - 5853) | 2400 - 2730 (5291 - 6019) | 2440 - 2745 (5379 - 6052) |
| 25 | — | — | — | — | — | — |
| | — | — | — | — | — | — |
| | 3160 (6967) | 3260 (7187) | 3260 (7187) | 3260 (7187) | 3260 (7187) | 3260 (7187) |
| | 95 (20.9), 95 + 50 (20.9 + 11.0)*7 | 96 + 45 (21.1 + 9.9) | 96 (21.1), 96 + 45 (21.1 + 9.9)*7 | 96 (21.1), 96 + 45 (21.1 + 9.9)*7 | 96 (21.1), 96 + 45 (21.1 + 9.9)*7 | 96 (21.1), 96 + 45 (21.1 + 9.9)*7 |
| | — | — | — | — | — | — |
| 30 | 155 (96) | — | — | — | — | — |
| | — | — | — | — | — | — |
| | 13 (8)*5, 32 (20)*6 | 19 (12)*5, 47 (29)*6 | 14 (19)*5, 35 (22)*6 | 14 (19)*5, 35 (22)*6 | 14 (19)*5, 35 (22)*6 | 14 (19)*5, 35 (22)*6 |
| | 25 (16)*5, 60 (37)*6 | 33 (20)*5, 81 (50)*6 | 26 (16)*5,63 (39)*6 | 26 (16)*5, 63 (39)*6 | 26 (16)*5, 63 (39)*6 | 26 (16)*5, 63 (39)*6 |
| | 40 (25)*5, 97 (60)*6 | — | 39 (24)*5, 97 (60)*6 | 39 (24)*5, 97 (60)*6 | 39 (24)*5, 97 (60)*6 | 39 (24)*5, 97 (60)*6 |
| 35 | 57 (35)*5, 140 (87)*6 | — | 59 (37)*5, 144 (89)*6 | 59 (37)*5, 144 (89)*6 | 59 (37)*5, 144 (89)*6 | 59 (37)*5, 144 (89)*6 |
| | 6.0 (19.7) | 5.9 (19.4) | 5.9 (19.4) | 5.9 (19.4) | 5.9 (19.4) | 5.9 (19.4) |
| | 6.4 (21.0) | 6.3 (20.7) | 6.3 (20.7) | 6.3 (20.7) | 6.3 (20.7) | 6.3 (20.7) |
| | 1HZ | 2UZ-FE | 1HD-FTE | 1HD-FTE | 1HD-FTE | 1HD-FTE |
| | 12-Valve, OHC | 32-Valve, DOHC | 24-Valve, OHC | 24-Valve, OHC | 24-Valve, OHC | 24-Valve, OHC |
| 40 | 94.0 x 100.0 (3.70 x 3.94) | 94.0 x 84.0 (3.70 x 3.31) | 94.0 x 100.0 (3.70 x 3.94) | 94.0 x 100.0 (3.70 x 3.94) | 94.0 x 100.0 (3.70 x 3.94) | 94.0 x 100.0 (3.70 x 3.94) |
| | 4164 (254.0) | 4664 (284.5) | 4164 (254.0) | 4164 (254.0) | 4164 (254.0) | 4164 (254.0) |
| | 22.4 : 1 | 9.6 : 1 | 18.8 : 1 | 18.8 : 1 | 18.8 : 1 | 18.8 : 1 |
| | Distributor Type | EFI | Distributor Type | Distributor Type | Distributor Type | Distributor Type |
| | 48 or higher | 91 | 48 or higher | 48 or higher | 48 or higher | 48 or higher |
| 45 | 96 / 3800 (SAE-NET) | 170 / 4800 (SAE-NET) | 150 / 3400 (EEC) | 150 / 3400 (EEC) | 150 / 3400 (EEC) | 150 / 3400 (EEC) |
| | 285 / 2200 (SAE-NET) | 410 / 3400 (SAE-NET) | 430 / 1400 - 3200 (EEC) | 430 / 1400 - 3200 (EEC) | 430 / 1400 - 3200 (EEC) | 430 / 1400 - 3200 (EEC) |
| | 12 - 55, 64*7, 64 x 2*7 | 12 - 55 | 12 - 55 x 2 | 12 - 55 x 2 | 12 - 55 x 2 | 12 - 55 x 2 |
| | 840, 960*7 | 960 | 840, 960*7 | 960 | 840, 960*7 | 960 |
| | 2.5 | 1.4 | 3.0 | 3.0 | 3.0 | 3.0 |
| 50 | Dry, Single, Diaphragm | — | Dry, Single, Diaphragm | Dry, Single, Diaphragm | Dry, Single, Diaphragm | — |
| | R151F | A750F | H151F | H151F | H151F | A750F |
| | 4.313 | 3.520 | 4.081 | 4.081 | 4.081 | 3.520 |
| | 2.330 | 2.042 | 2.294 | 2.294 | 2.294 | 2.042 |
| | 1.436 | 1.400 | 1.490 | 1.490 | 1.490 | 1.400 |
| 55 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| | 0.838 | 0.716 | 0.881 | 0.881 | 0.881 | 0.716 |
| | 4.220 | 3.224 | 4.313 | 4.313 | 4.313 | 3.224 |
| | 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 |
| | 4.300 / 4.300 | 4.100 / 4.100 | 4.100 / 4.100 | 4.100 / 4.100 | 4.100 / 4.100 | 3.909 / 3.909 |
| 60 | 8” / 9.5” | 8” / 9.5” | 8” / 9.5” | 8” / 9.5” | 8” / 9.5” | 8” / 9.5” |
| | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc |
| | L. T Drum | L. T Drum, Ventilated Disc*9 | L. T Drum, Ventilated Disc*9 | L. T Drum, Ventilated Disc*9 | L. T Drum, Ventilated Disc*9 | L. T Drum, Ventilated Disc*9 |
| | Drum | Drum | Drum | Drum | Drum | Drum |
| | Vacuum, Hydraulic*9 | Vacuum, Hydraulic*9 | Vacuum, Hydraulic*9 | Vacuum, Hydraulic*9 | Vacuum, Hydraulic*9 | Vacuum, Hydraulic*9 |
| 65 | LSP & BV, P & B Valve*9 | LSP & BV, P & B Valve*9, —*16 | LSP & BV, P & B Valve*9 | LSP & BV, P & B Valve*9 | LSP & BV, P & B Valve*9 | LSP & BV, P & B Valve*9 |
| | Leading Arm, Coil | Double Wishbone | Double Wishbone | Double Wishbone | Double Wishbone | Double Wishbone |
| | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod |
| | STD | STD | STD | STD | STD | STD |
| | STD | STD | STD | STD | STD | STD |
| 70 | Recerculating Ball | Rack & Pinion | Rack & Pinion | Rack & Pinion | Rack & Pinion | Rack & Pinion |
| | 18.59 | 17.3 | 17.3 | 17.3 | 17.3 | 17.3 |
| | Integral Type | Integral Type | Integral Type | Integral Type | Integral Type | Integral Type |

*14: With AHC –50 mm (2.0 in.)
*15: With Moon Roof
*16: With VSC
*19: Separate Seat, Seating Capacity: 5
*21: Bench Seat, Seating capacity: 10

# GENERAL FEATURES

## DESCRIPTION

The new TOYOTA models have the following systems:

| System | Outline | Model Name |
|---|---|---|
| DTC<br>(Diagnostic Trouble Code) | To comply with the OBD-II regulations, all the DTC (Diagnostic Trouble Code) have been made to correspond to the SAE controlled codes. Some of the DTC have been further divided into smaller detection areas than in the past, and new DTC have been assigned to them. | Land Cruiser<br>(Only for 2UZ-FE Engine) |

The following table shows part of DTC subdivided from the old DTC. See Repair Manual of each new TOYOTA model for the details.

| Old DTC | New DTC | Detection Item | Old DTC | New DTC | Detection Item |
|---|---|---|---|---|---|
| P0110 | P0110 | Intake air temperature circuit | P0150 | P0150 | Oxygen sensor circuit (Bank 2 Sensor 1) |
| | P0112 | Intake air temperature circuit low input | | P2197 | Oxygen sensor signal stuck lean (Bank 2 Sensor 1) |
| | P0113 | Intake air temperature circuit high input | | P2198 | Oxygen sensor signal stuck rich (Bank 2 Sensor 1) |
| P0115 | P0115 | Engine coolant temperature circuit | P0155 | P0051 | Oxygen sensor heater control circuit low (Bank 2 Sensor 1) |
| | P0117 | Engine coolant temperature circuit low input | | P0052 | Oxygen sensor heater control circuit high (Bank 2 Sensor 1) |
| | P0118 | Engine coolant temperature circuit high input | P0161 | P0057 | Oxygen sensor heater control circuit low (Bank 2 Sensor 2) |
| P0116 | P0116 | Engine coolant temperature circuit range/Performance problem | | P0058 | Oxygen sensor heater control circuit high (Bank 2 Sensor 2) |
| | P0125 | Insufficient coolant temperature for closed loop fuel control | P0167 | P0063 | Oxygen sensor heater control circuit low (Bank 2 Sensor 3) |
| P0125 | P0134 | Oxygen sensor circuit no activity detected (Bank 1 Sensor 1) | | P0064 | Oxygen sensor heater control circuit high (Bank 2 Sensor 3) |
| | P0154 | Oxygen sensor circuit no activity detected (Bank 2 Sensor 1) | P0325 | P0325 | Knock sensor 1 circuit (Bank 1 or Signal sensor) |
| | P1134 | A/F sensor circuit no activity detected (Bank 1 Sensor 1) | | P0327 | Knock sensor 1 circuit low input (Bank 1 or Signal sensor) |
| | P1154 | A/F sensor circuit no activity detected (Bank 2 Sensor 1) | | P0328 | Knock sensor 1 circuit high input (Bank 1 or Signal sensor) |
| P0130 | P2195 | Oxygen sensor signal stuck lean (Bank 1 Sensor 1) | | P0332 | Knock sensor 2 circuit low input (Bank 2) |
| | P2196 | Oxygen sensor signal stuck rich (Bank 1 Sensor 1) | | P0333 | Knock sensor 2 circuit high input (Bank 2) |
| P0135 | P0031 | Oxygen sensor heater control circuit low (Bank 1 Sensor 1) | P0340 | P0340 | Camshaft position sensor “A” circuit (Bank 1 or Signal sensor) |
| | P0032 | Oxygen sensor heater control circuit high (Bank 1 Sensor 1) | | P0341 | Camshaft position sensor “A” circuit range/Performance (Bank 1 or Signal sensor) |
| P0141 | P0037 | Oxygen sensor heater control circuit low (Bank 1 Sensor 2) | | P1340 | Camshaft position sensor “A” (Bank 1 Sensor 2) |
| | P0038 | Oxygen sensor heater control circuit high (Bank 1 Sensor 2) | | P1341 | |
| P0147 | P0043 | Oxygen sensor heater control circuit low (Bank 1 Sensor 3) | P1130 | P1130 | A/F sensor circuit (Bank 1 Sensor 1) |
| | P0044 | Oxygen sensor heater control circuit high (Bank 1 Sensor 3) | | P1131 | A/F sensor circuit low (Bank 1 Sensor 1) |

| New DTC | Old DTC | Detection Item | New DTC | Old DTC | Detection Item |
|---|---|---|---|---|---|
| P0120 | P1230 | Throttle/Pedal position sensor/ Switch “A” circuit | P0166 | — | Oxygen sensor circuit no activity detected (Bank 2 Sensor 3) |
| P0122 | — | Throttle/Pedal position sensor/ Switch “A” circuit low input | P0169 | — | Incorrect fuel composition |
| P0123 | — | Throttle/Pedal position sensor/ Switch “A” circuit high input | P0170 | — | Fuel trim bank 1 |
| P0125 | P0116 | Insufficient coolant temperature for close loop fuel control | P0173 | — | Fuel trim bank 2 |
| P0134 | P0125 | Oxygen sensor circuit no activity detected (Bank 1 Sensor 1) | P0176 | — | Fuel composition sensor circuit |
| P0135 | — | Oxygen sensor heater circuit (Bank 1 Sensor 1) | P0177 | — | Fuel composition sensor circuit range/performance |
| P0137 | — | Oxygen sensor circuit low voltage (Bank 1 Sensor 2) | P0178 | — | Fuel composition sensor circuit low input |
| P0138 | — | Oxygen sensor circuit high voltage (Bank 1 Sensor 2) | P0179 | — | Fuel composition sensor circuit high input |
| P0140 | — | Oxygen sensor circuit no activity detected (Bank 1 Sensor 2) | P0182 | — | Fuel temperature sensor “A” circuit low input |
| P0143 | — | Oxygen sensor circuit low voltage (Bank 1 Sensor 3) | P0183 | — | Fuel temperature sensor “A” circuit high input |
| P0144 | — | Oxygen sensor circuit high voltage (Bank 1 Sensor 3) | P0187 | — | Fuel temperature sensor “B” circuit low input |
| P0145 | — | Oxygen sensor circuit slow response (Bank 1 Sensor 3) | P0188 | — | Fuel temperature sensor “B” circuit high input |
| P0146 | — | Oxygen sensor circuit no activity detected (Bank 1 Sensor 3) | P0195 | — | Engine oil temperature sensor |
| P0148 | — | Fuel delivery error | P0196 | — | Engine oil temperature sensor range/performance |
| P0149 | — | Fuel timing error | P0197 | — | Engine oil temperature sensor low |
| P0152 | — | Oxygen sensor circuit high voltage (Bank 2 Sensor 1) | P0198 | — | Engine oil temperature sensor high |
| P0154 | P0125 | Oxygen sensor circuit no activity detected (Bank 2 Sensor 1) | P0199 | — | Engine oil temperature sensor intermittent |
| P0157 | — | Oxygen sensor circuit low voltage (Bank 2 Sensor 2) | P0200 | P1215 | Injector circuit open |
| P0158 | — | Oxygen sensor circuit high voltage (Bank 2 Sensor 2) | | P1264 | |
| P0160 | — | Oxygen sensor circuit no activity detected (Bank 2 Sensor 2) | | P1265 | |
| P0163 | — | Oxygen sensor circuit low voltage (Bank 2 Sensor 3) | P0219 | P1678 | Engine overspeed condition |
| P0164 | — | Oxygen sensor circuit high voltage (Bank 2 Sensor 3) | P0220 | P0120 | Throttle/Pedal position switch/ switch “B” circuit |
| P0165 | — | Oxygen sensor circuit slow response (Bank 2 Sensor 3) | P0222 | — | Throttle/Pedal position sensor/ switch “B” circuit low input |

| New DTC | Old DTC | Detection Item | New DTC | Old DTC | Detection Item |
|---|---|---|---|---|---|
| P0223 | — | Throttle/Pedal position sensor/ switch “B” circuit high input | P0299 | P1255 | Turbo/super charger under boost |
| P0224 | — | Throttle/Pedal position sensor/ switch “B” circuit intermittent | P0326 | — | Knock sensor 1 circuit range/performance |
| P0225 | — | Throttle/Pedal position sensor/ switch “C” circuit | P0327 | P0325 | Knock sensor 1 circuit low input (Bank 1 or Signal sensor) |
| P0226 | — | Throttle/Pedal position sensor/ switch “C” circuit range/performance | P0328 | | Knock sensor 1 circuit high input (Bank 1 or Signal sensor) |
| P0227 | — | Throttle/Pedal position sensor/ switch “C” circuit low input | P0329 | — | Knock sensor 1 circuit input intermittent (Bank 1 or Signal sensor) |
| P0228 | — | Throttle/Pedal position sensor/ switch “C” circuit high input | P0331 | — | Knock sensor 2 circuit range/performance (Bank 2) |
| P0229 | — | Throttle/Pedal position sensor/ switch “C” circuit intermittent | P0332 | P0325 | Knock sensor 2 circuit low input (Bank 2) |
| P0230 | P1200 | Fuel pump primary circuit | P0333 | | Knock sensor 2 circuit high input (Bank 2) |
| P0231 | P1202 | Fuel pump secondary circuit low | P0334 | — | Knock sensor 2 circuit input intermittent (Bank 2) |
| P0232 | — | Fuel pump secondary circuit high | P0336 | P1355 | Crankshaft position sensor “A” circuit range/performance |
| P0233 | — | Fuel pump secondary circuit intermittent | | P1356 | |
| P0234 | P1256 | Turbo/super charger overboost condition | P0337 | — | Crankshaft position sensor “A” circuit low input |
| | P1512 | | P0338 | — | Crankshaft position sensor “A” circuit high input |
| P0235 | P1405 | Turbo/Super charger boost sensor “A” circuit | P0339 | P1335 | Crankshaft position sensor “A” circuit intermittent |
| P0236 | P1406 | Turbo/Super charger boost sensor “A” circuit range/performance | P0340 | P1345 | Camshaft position sensor “A” circuit (Bank 1 or Signal sensor) |
| P0237 | — | Turbo/Super charger boost sensor “A” circuit low | P0341 | P0340 | Camshaft position sensor “A” circuit range/Performance (Bank 1 or Signal sensor) |
| P0238 | — | Turbo/super charger boost sensor “A” circuit high | | P1345 | Camshaft position sensor “A” circuit range/Performance (Bank 1 or Signal sensor) |
| P0263 | P1267 | Cylinder 1 contribution/balance | P0342 | | Camshaft position sensor “A” circuit low input (Bank 1 or Signal sensor) |
| P0266 | P1268 | Cylinder 2 contribution/balance | P0343 | | Camshaft position sensor “A” circuit high input (Bank 1 or Signal sensor) |
| P0269 | P1269 | Cylinder 3 contribution/balance | P0344 | — | Camshaft position sensor “A” circuit intermittent (Bank 1 or signal sensor) |
| P0272 | P1270 | Cylinder 4 contribution/balance | P0345 | P1350 | Camshaft position sensor “A” circuit (Bank 2) |

| New DTC | Old DTC | Detection Item | New DTC | Old DTC | Detection Item |
|---|---|---|---|---|---|
| P0346 | P1350 | Camshaft position sensor “A” circuit range/Performance (Bank 2) | P0392 | — | Camshaft position sensor “B” circuit low input (Bank 2) |
| P0347 | | Camshaft position sensor “A” circuit low input (Bank 2) | P0393 | — | Camshaft position sensor “B” circuit high input (Bank 2) |
| P0348 | | Camshaft position sensor “A” circuit high input (Bank 2) | P0394 | — | Camshaft position sensor “B” circuit intermittent (Bank 2) |
| P0349 | — | Camshaft position sensor “A” circuit intermittent (Bank 2) | P0403 | P1673 | Exhaust gas recirculation control circuit |
| P0350 | — | Ignition coil primary/secondary circuit | P0404 | — | Exhaust gas recirculation control circuit range/performance |
| P0351 | P1300 | Ignition coil “A” primary/ Secondary circuit | P0405 | P1410 | Exhaust gas recirculation sensor “A” circuit low |
| P0352 | P1305 | Ignition coil “B” primary/ Secondary circuit | P0406 | — | Exhaust gas recirculation sensor “A” circuit high |
| P0353 | P1310 | Ignition coil “C” primary/ Secondary circuit | P0409 | P1411 | Exhaust gas recirculation sensor “A” circuit |
| P0354 | P1315 | Ignition coil “D” primary/ Secondary circuit | P0411 | P1205 | Secondary air injection system incorrect flow detected |
| P0355 | P1320 | Ignition coil “E” primary/ Secondary circuit | P0425 | — | Catalyst temperature sensor (Bank 1) |
| P0356 | P1325 | Ignition coil “F” primary/ Secondary circuit | P0426 | — | Catalyst temperature sensor range/performance (Bank 1) |
| P0357 | P1330 | Ignition coil “G” primary/ Secondary circuit | P0427 | P1110 | Catalyst temperature sensor low input (Bank 1) |
| P0358 | P1340 | Ignition coil “H” primary/ Secondary circuit | P0428 | P1111 | Catalyst temperature sensor high input (Bank 1) |
| P0365 | P1360 | Camshaft position sensor “B” circuit (Bank 1) | P0440 | — | Evaporative emission control system |
| P0366 | P1357 | Camshaft position sensor “B” circuit range/performance (Bank 1) | P0442 | P0440 | Evaporative emission control system leak detected (small leak) |
| P0367 | — | Camshaft position sensor “B” circuit low input (Bank 1) | P0448 | P1239 | Evaporative emission system vent control circuit shorted |
| P0368 | — | Camshaft position sensor “B” circuit high input (Bank 1) | P0452 | — | Evaporative emission control system pressure sensor/switch low input |
| P0369 | — | Camshaft position sensor “B” circuit intermittent (Bank 1) | P0453 | — | Evaporative emission control system pressure sensor/switch high input |
| P0390 | P1365 | Camshaft position sensor “B” circuit (Bank 2) | P0456 | P0442 | Evaporative emission control system leak detected (very small leak) |
| P0391 | P1358 | Camshaft position sensor “B” circuit range/performance (Bank 2) | P0475 | P1273 | Exhaust pressure control valve |

| New DTC | Old DTC | Detection Item | New DTC | Old DTC | Detection Item |
|---|---|---|---|---|---|
| P0475 | P1274 | Exhaust pressure control valve | P0559 | — | Brake booster pressure sensor circuit intermittent |
| P0475 | P1420 | Exhaust pressure control valve | P0560 | P1600 | System voltage |
| P0480 | B1305 | Fan 1 control circuit | P0571 | P1520 | Brake system “A” circuit |
| P0488 | P1222 | Exhaust gas recirculation throttle position control range/performance | P0604 | P1633 | Internal control module random access memory (RAM) error |
| P0503 | P0500 | Vehicle speed sensor “A” intermittent/Erratic/High | P0606 | P0605 | ECM/PCM processor |
| P0504 | P1520 | Brake switch “A”/“B” correlation | | P1633 | |
| P0511 | P0505 | Idle air control circuit | P0607 | P1565 | Control module performance |
| P0512 | P1545 | Starter request circuit | | P1566 | |
| P0513 | B2795 | Incorrect immobilizer key | | P1633 | |
| P0516 | — | Battery temperature sensor circuit low | P0613 | P0740 | TCM processor |
| P0517 | — | Battery temperature sensor circuit high | P0615 | P1522 | Starter relay circuit |
| P0544 | P1280 | Exhaust gas temperature sensor circuit (Bank 1 Sensor 1) | P0627 | P1228 | Fuel pump control circuit/Open |
| P0545 | — | Exhaust gas temperature sensor circuit low (Bank 1 Sensor 1) | P0657 | P1633 | Actuator supply voltage circuit/Open |
| P0546 | — | Exhaust gas temperature sensor circuit high (Bank 1 Sensor 1) | P0660 | P1651 | Intake manifold turning valve control circuit/Open (Bank 1) |
| P0552 | — | Power steering pressure sensor/Switch circuit low input | P0663 | P1666 | Intake manifold turning valve control circuit/Open (Bank 2) |
| P0553 | — | Power steering pressure sensor/Switch circuit high input | P0705 | P1780 | Transmission range sensor circuit malfunction (PRNDL input) |
| P0555 | P1540 | Brake booster pressure sensor circuit | P0712 | — | Transmission fluid temperature sensor “A” circuit low input |
| P0556 | C1201 | Brake booster pressure sensor circuit range/Performance | P0713 | — | Transmission fluid temperature sensor “A” circuit high input |
| | P1541 | | P0717 | P0715 | Input/Turbine speed sensor “A” circuit No signal |
| P0557 | C1200 | Brake booster pressure sensor circuit low input | | P1707 | |
| P0558 | | Brake booster pressure sensor circuit high input | | P1727 | |

| New DTC | Old DTC | Detection Item | New DTC | Old DTC | Detection Item |
|---|---|---|---|---|---|
| P0720 | P1700 | Output speed sensor circuit | P0842 | — | Transmission fluid pressure sensor/Switch “A” circuit low |
| P0722 | P1702 | Output speed sensor circuit no signal | P0843 | — | Transmission fluid pressure sensor/Switch “A” circuit high |
| | P1827 | | P0850 | P1780 | Park/Neutral switch input circuit |
| P0724 | P1520 | Brake switch “B” circuit high | P0962 | — | Pressure control solenoid “A” control circuit low |
| P0741 | P0770 | Torque converter clutch circuit performance or Stuck off | P0963 | — | Pressure control solenoid “A” control circuit high |
| P0743 | P0773 | Torque converter clutch circuit electrical | P0966 | — | Pressure control solenoid “B” control circuit low |
| P0746 | P0750 | Pressure control solenoid “A” performance or Stuck off | P0967 | — | Pressure control solenoid “B” control circuit high |
| P0748 | P0753 | Pressure control solenoid “A” electrical | P0973 | — | Shift solenoid “A” control circuit low |
| P0751 | P0750 | Shift solenoid “A” performance or Stuck off | P0974 | — | Shift solenoid “A” control circuit high |
| P0756 | P0755 | Shift solenoid “B” performance or Stuck off | P0976 | — | Shift solenoid “B” control circuit low |
| P0761 | P0760 | Shift solenoid “C” performance or Stuck off | P0977 | — | Shift solenoid “B” control circuit high |
| P0766 | P0765 | Shift solenoid “D” performance or Stuck off | P0979 | — | Shift solenoid “C” control circuit low |
| P0771 | P1816 | Shift solenoid “E” performance or Stuck off | P0980 | — | Shift solenoid “C” control circuit high |
| P0776 | P0755 | Pressure control solenoid “B” performance or Stuck off | P0982 | — | Shift solenoid “D” control circuit low |
| P0778 | P0758 | Pressure control solenoid “B” electrical | P0983 | — | Shift solenoid “D” control circuit high |
| P0787 | — | Shift/Timing solenoid low | P0985 | — | Shift solenoid “E” control circuit low |
| P0788 | — | Shift/Timing solenoid high | P0986 | — | Shift solenoid “E” control circuit high |
| P0793 | P1732 | Intermediate shaft speed sensor “A” circuit no signal | P0998 | — | Shift solenoid “F” control circuit low |
| P0796 | P0760 | Pressure control solenoid “C” performance or stuck off | P0999 | — | Shift solenoid “F” control circuit high |
| P0798 | P0763 | Pressure control solenoid “C” electrical | P1010 | P1690 | OCV for VVTL circuit (Bank 1) |
| P0818 | P1783 | Driveline disconnect switch input circuit | P1011 | P1692 | OCV for VVTL open malfunction (Bank 1) |
| P0840 | P1845 | Transmission fluid pressure sensor/Switch “A” circuit | P1012 | P1693 | OCV for VVTL close malfunction (Bank 1) |
| P0841 | P1846 | Transmission fluid pressure sensor/Switch “A” circuit range/Performance | P1020 | P1695 | OCV for VVTL circuit (Bank 2) |

| New DTC | Old DTC | Detection Item | New DTC | Old DTC | Detection Item |
|---|---|---|---|---|---|
| P1021 | P1697 | OCV for VVTL open malfunction (Bank 2) | P2010 | — | Intake manifold runner control circuit high (Bank 2) |
| P1022 | P1698 | OCV for VVTL close malfunction (Bank 2) | P2014 | P1415 | Intake manifold runner position sensor/Switch circuit (Bank 1) |
| P1031 | P1135 | A/F sensor heater circuit low (Bank 1 Sensor 1) | P2016 | — | Intake manifold runner position sensor/Switch circuit low (Bank 1) |
| P1032 | | A/F sensor heater circuit high (Bank 1 Sensor 1) | P2017 | — | Intake manifold runner position sensor/Switch circuit high (Bank 1) |
| P1051 | P1155 | A/F sensor heater circuit low (Bank 2 Sensor 1) | P2031 | P1281 | Exhaust gas temperature sensor circuit (Bank 1 Sensor 2) |
| P1052 | | A/F sensor heater circuit high (Bank 2 Sensor 1) | P2032 | — | Exhaust gas temperature sensor circuit low (Bank 1 Sensor 2) |
| P1131 | P1130 | A/F sensor circuit low (Bank 1 Sensor 1) | P2033 | — | Exhaust gas temperature sensor circuit high (Bank 1 Sensor 2) |
| P1132 | | A/F sensor circuit high (Bank 1 Sensor 1) | P2047 | P1385 | Reductant injector circuit/Open (Bank 1 Unit 1) |
| P1134 | P0125 | A/F sensor circuit no activity detected (Bank 1 Sensor 1) | P2102 | P1125 | Throttle actuator control motor circuit low |
| P1151 | P1150 | A/F sensor circuit low (Bank 2 Sensor 1) | P2103 | | Throttle actuator control motor circuit high |
| P1152 | | A/F sensor circuit high (Bank 2 Sensor 1) | P2111 | P1128 | Throttle actuator control system – Stuck open |
| P1154 | P0125 | A/F sensor circuit no activity detected (Bank 2 Sensor 1) | P2112 | | Throttle actuator control system – Stuck closed |
| P1550 | P1542 | Battery current sensor circuit | P2118 | P1127 | Throttle actuator control motor current range/Performance |
| P1551 | — | Battery current sensor circuit low | P2119 | P1129 | Throttle actuator control throttle body range/Performance |
| P1552 | — | Battery current sensor circuit high | P2120 | P1120 | Throttle/Pedal position sensor/ Switch “D” circuit |
| P1660 | P1668 | VSV for AICVS circuit | P2121 | P1121 | Throttle/Pedal position sensor/ Switch “D” circuit range/Performance |
| P2004 | — | Intake manifold runner control stuck open (Bank 1) | P2122 | — | Throttle/Pedal position sensor/ Switch “D” circuit low input |
| P2006 | — | Intake manifold runner control stuck close (Bank 1) | P2123 | — | Throttle/Pedal position sensor/ Switch “D” circuit high input |
| P2008 | P1416 | Intake manifold runner control circuit open (Bank 1) | P2125 | P1120 | Throttle/Pedal position sensor/ Switch “E” circuit |
| | P1653 | | P2127 | — | Throttle/Pedal position sensor/ Switch “E” circuit low input |
| | P1667 | | P2128 | — | Throttle/Pedal position sensor/ Switch “E” circuit high input |
| P2009 | — | Intake manifold runner control circuit low (Bank 1) | P2135 | P0120 | Throttle/Pedal position sensor/ Switch “A”/“B” voltage correlation |

| New DTC | Old DTC | Detection Item |
|---|---|---|
| P2138 | P1120 | Throttle/Pedal position sensor/ Switch "D"/"E" voltage correlation |
| P2195 | P0130 | Oxygen sensor signal stuck lean (Bank 1 Sensor 1) |
| P2196 | | Oxygen sensor signal stuck rich (Bank 1 Sensor 1) |
| P2197 | P0150 | Oxygen sensor signal stuck lean (Bank 2 Sensor 1) |
| P2198 | | Oxygen sensor signal stuck rich (Bank 2 Sensor 1) |
| P2226 | P1100 | Barometric pressure circuit |
| P2228 | — | Barometric pressure circuit low input |
| P2229 | — | Barometric pressure circuit high input |
| P2611 | — | A/C refrigerant distribution valve control circuit/Open |
| P2714 | P1761 | Pressure control solenoid "D" performance or stuck off |
| | P1885 | |
| P2716 | P1763 | Pressure control solenoid "D" electrical |
| | P1853 | |
| | P1888 | |
| P2734 | P1890 | Pressure control solenoid "F" electrical |
| P2740 | P1745 | Transmission fluid temperature sensor "B" circuit |
| P2741 | P1746 | Transmission fluid temperature sensor "B" circuit range |
| P2742 | — | Transmission fluid temperature sensor "B" circuit low |
| P2743 | — | Transmission fluid temperature sensor "B" circuit high |
| P2757 | P0770 | Torque converter clutch pressure control solenoid control circuit performance or stuck off |
| | P1895 | |
| | P1896 | |
| P2759 | P1755 | Torque converter clutch pressure control solenoid control circuit electrical |
| | P1898 | |
| P2763 | — | Torque converter clutch pressure control solenoid control circuit high |
| P2764 | — | Torque converter clutch pressure control solenoid control circuit low |
| P2767 | P1822 | Input/Turbine speed sensor "B" no signal |
| P3195 | P1130 | A/F sensor circuit range/ Performance lean side (Bank 1 Sensor 1) |
| P3196 | | A/F sensor circuit range/ Performance rich side (Bank 1 Sensor 1) |
| P3197 | P1150 | A/F sensor circuit range/ Performance lean side (Bank 2 Sensor 1) |
| P3198 | | A/F sensor circuit range/ Performance rich side (Bank 2 Sensor 1) |
| P3231 | P1130 | A/F sensor plus minus circuit correlation (Bank 1 Sensor 1) |
| P3232 | | A/F sensor plus minus circuit correlation low (Bank 1 Sensor 1) |
| P3233 | P1130 | A/F sensor plus minus circuit correlation high (Bank 1 Sensor 1) |
| P3234 | P1150 | A/F sensor plus minus circuit correlation (Bank 2 Sensor 1) |
| P3235 | | A/F sensor plus minus circuit correlation low (Bank 2 Sensor 1) |
| P3236 | | A/F sensor plus minus circuit correlation high (Bank 2 Sensor 1) |
| P3243 | P1130 | A/F sensor plus circuit (Bank 1 Sensor 1) |
| P3245 | | A/F sensor plus circuit low voltage (Bank 1 Sensor 1) |
| P3246 | | A/F sensor plus circuit high voltage (Bank 1 Sensor 1) |
| P3247 | P1150 | A/F sensor plus circuit (Bank 2 Sensor 1) |
| P3249 | | A/F sensor plus circuit low voltage (Bank 2 Sensor 1) |
| P3250 | | A/F sensor plus circuit high voltage (Bank 2 Sensor 1) |
| P3251 | P1130 | A/F sensor minus circuit (Bank 1 Sensor 1) |

| New DTC | Old DTC | Detection Item |
|---|---|---|
| P3252 | P1130 | A/F sensor minus circuit low voltage (Bank 1 Sensor 1) |
| P3253 | | A/F sensor minus circuit high voltage (Bank 1 Sensor 1) |
| P3254 | P1150 | A/F sensor minus circuit (Bank 2 Sensor 1) |
| P3255 | | A/F sensor minus circuit low voltage (Bank 2 Sensor 1) |
| P3256 | | A/F sensor minus circuit high voltage (Bank 2 Sensor 1) |
| U0001 | P1647 | High speed CAN communication bus |
| U0100 | P1631 | Lost communication with ECM/PCM |
| U0122 | P1630 | Lost communication with vehicle dynamics control module |

The following table shows part of DTC which were modified from the old DTC and which were newly established. See Repair Manual of each new TOYOTA model for the details.

| Old DTC | New DTC | Detection Item | New DTC | Old DTC | Detection Item |
|---|---|---|---|---|---|
| P0005 | P1165 | Fuel shutoff valve control circuit open | P0048 | P1254 | Turbo/super charger boost control solenoid circuit high |
| P0006 | — | Fuel shutoff valve control circuit low | P0051 | P0155 | Oxygen sensor heater control circuit low (Bank 2 Sensor 1) |
| P0007 | — | Fuel shutoff valve control circuit high | P0052 | | Oxygen sensor heater control circuit high (Bank 2 Sensor 1) |
| P0010 | P1656 | Camshaft position “A” actuator circuit (Bank 1) | P0057 | P0161 | Oxygen sensor heater control circuit low (Bank 2 Sensor 2) |
| P0011 | P1349 | Camshaft position “A” – timing over-advanced or system performance (Bank 1) | P0058 | | Oxygen sensor heater control circuit high (Bank 2 Sensor 2) |
| P0012 | | Camshaft position “A” – timing over-retarded (Bank 1) | P0063 | P0167 | Oxygen sensor heater control circuit low (Bank 2 Sensor 3) |
| P0016 | P0336 | Crankshaft position – camshaft position correlation (Bank 1 Sensor A) | P0064 | | Oxygen sensor heater control circuit high (Bank 2 Sensor 3) |
| | P1346 | | P0087 | P1233 | Fuel rail/system pressure too low |
| P0018 | P1351 | Crankshaft position – Camshaft position correlation (Bank 2 Sensor A) | P0088 | P1237 | Fuel rail/system pressure too high |
| P0020 | P1663 | Camshaft position “A” actuator circuit (Bank 2) | P0093 | P1226 | Fuel system leak detected large leak |
| P0021 | P1354 | Camshaft position “A” – Timing over-advanced or system performance (Bank 2) | P0095 | P1115 | Intake air temperature sensor 2 circuit |
| P0022 | | Camshaft position “A” – Timing over-retarded (Bank 2) | P0097 | — | Intake air temperature sensor 2 circuit low |
| P0031 | P0135 | Oxygen sensor heater control circuit low (Bank 1 Sensor 1) | P0098 | — | Intake air temperature sensor 2 circuit high |
| P0032 | | Oxygen sensor heater control circuit High (Bank 1 Sensor 1) | P0102 | — | Mass or volume air flow circuit low input |
| P0037 | P0141 | Oxygen sensor heater control circuit low (Bank 1 Sensor 2) | P0103 | — | Mass or volume air flow circuit high input |
| P0038 | | Oxygen sensor heater control circuit High (Bank 1 Sensor 2) | P0107 | — | Manifold absolute pressure/Barometric pressure circuit low input |
| P0043 | P0147 | Oxygen sensor heater control circuit low (Bank 1 Sensor 3) | P0108 | — | Manifold absolute pressure/Barometric pressure circuit high input |
| P0044 | | Oxygen sensor heater control circuit High (Bank 1 Sensor 3) | P0112 | P0110 | Intake air temperature circuit low input |
| P0045 | P1250 | Turbo/super charger boost control solenoid circuit open | P0113 | | Intake air temperature circuit high input |
| | P1252 | | P0117 | P0115 | Engine coolant temperature circuit low input |
| P0047 | P1253 | Turbo/super charger boost control solenoid circuit low | P0118 | | Engine coolant temperature circuit high input |

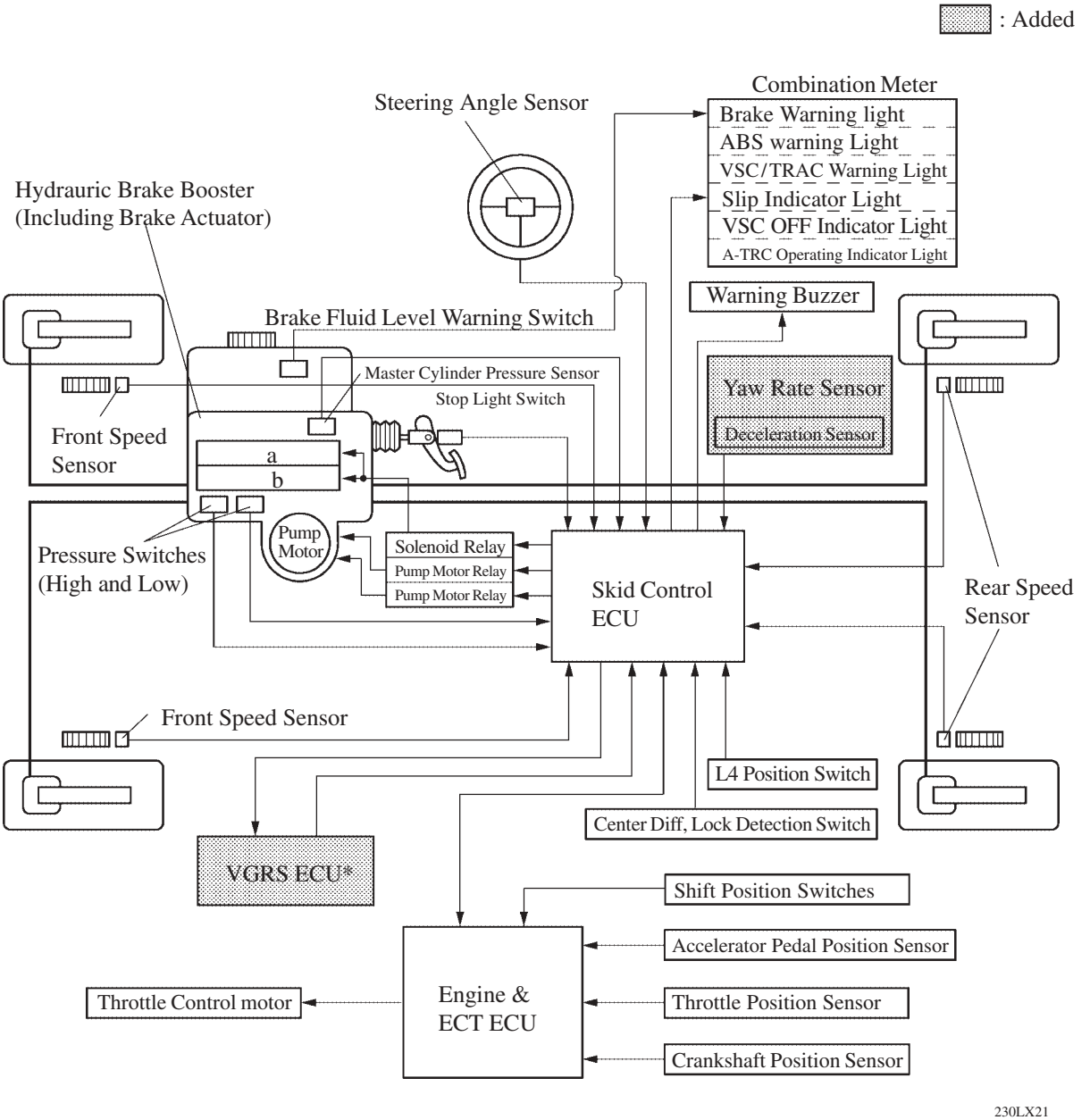
| Old DTC | New DTC | Detection Item | Old DTC | New DTC | Detection Item |
|---|---|---|---|---|---|
| P1130 | P1132 | A/F sensor circuit high (Bank 1 Sensor 1) | P1150 | P3236 | A/F sensor plus minus circuit correlation high (Bank 2 Sensor 1) |
| | P3195 | A/F sensor circuit range/ Performance lean side (Bank 1 Sensor 1) | | P3249 | A/F sensor plug circuit low voltage (Bank 2 Sensor 1) |
| | P3196 | A/F sensor circuit range/ Performance rich side (Bank 1 Sensor 1) | | P3250 | A/F sensor plus circuit high voltage (Bank 2 Sensor 1) |
| | P3231 | A/F sensor plus minus circuit correlation (Bank 1 Sensor 1) | | P3254 | A/F sensor minus circuit (Bank 2 Sensor 1) |
| | P3232 | A/F sensor plus minus circuit correlation low (Bank 1 Sensor 1) | | P3255 | A/F sensor minus circuit low voltage (Bank 2 Sensor 1) |
| | P3233 | A/F sensor plus minus circuit correlation high (Bank 1 Sensor 1) | | P3256 | A/F sensor minus circuit high voltage (Bank 2 Sensor 1) |
| | P3243 | A/F sensor plus circuit (Bank 1 Sensor 1) | P1155 | P1155 | A/F sensor heater circuit (Bank 2 Sensor 1) |
| | P3245 | A/F sensor plus circuit low voltage (Bank 1 Sensor 1) | | P1051 | A/F sensor heater circuit low (Bank 2 Sensor 1) |
| | P3246 | A/F sensor plus circuit high voltage (Bank 1 Sensor 1) | | P1052 | A/F sensor heater circuit high (Bank 2 Sensor 1) |
| | P3251 | A/F sensor minus circuit (Bank 1 Sensor 1) | P1215 | P0201 | Injector circuit/Open – (Cylinder 1) |
| | P3252 | A/F sensor minus circuit low voltage (Bank 1 Sensor 1) | | P0202 | Injector circuit/Open – (Cylinder 2) |
| | P3253 | A/F sensor minus circuit high voltage (Bank 1 Sensor 1) | | P0203 | Injector circuit/Open – (Cylinder 3) |
| P1135 | P1135 | A/F sensor heater circuit (Bank 1 Sensor 1) | | P0204 | Injector circuit/Open – (Cylinder 4) |
| | P1031 | A/F sensor heater circuit low (Bank 1 Sensor 1) | | P0205 | Injector circuit/Open – (Cylinder 5) |
| | P1032 | A/F sensor heater circuit high (Bank 1 Sensor 1) | | P0206 | Injector circuit/Open – (Cylinder 6) |
| P1150 | P1150 | A/F sensor circuit (Bank 2 Sensor 1) | | P0207 | Injector circuit/Open – (Cylinder 7) |
| | P1151 | A/F sensor heater circuit low (Bank 2 Sensor 1) | | P0208 | Injector circuit/Open – (Cylinder 8) |
| | P1152 | A/F sensor heater circuit high (Bank 2 Sensor 1) | P1345 | P0341 | Camshaft position sensor "A" circuit range/Performance (Bank 1 or Signal sensor) |
| | P3197 | A/F sensor circuit range/ Performance lean side (Bank 2 Sensor 1) | | P0342 | Camshaft position sensor "A" circuit low input (Bank 1 or Signal sensor) |
| | P3198 | A/F sensor circuit range/ Performance rich side (Bank 2 Sensor 1) | | P0343 | Camshaft position sensor "A" circuit high input (Bank 1 or Signal sensor) |
| | P3235 | A/F sensor plus minus circuit correlation low (Bank 2 Sensor 1) | P1349 | P0011 | Camshaft position "A" – timing over-advance or system performance (Bank 1) |

| Old DTC | New DTC | Detection Item | Old DTC | New DTC | Detection Item |
|---|---|---|---|---|---|
| P1349 | P0012 | Camshaft position “A” – timing over-retarded (Bank 1) | P1354 | P0021 | Camshaft position “A” – Timing over-advanced or system performance (Bank 2) |
| P1350 | P0345 | Camshaft position “A” circuit (Bank 2) | | P0022 | Camshaft position “A” – Timing over-retarded (Bank 2) |
| | P0346 | Camshaft position sensor “A” circuit range/Performance (Bank 2) | C1200 | P0557 | Brake booster pressure sensor circuit low input |
| | P0347 | Camshaft position sensor “A” circuit low input (Bank 2) | | P0558 | Brake booster pressure sensor circuit high input |
| | P0348 | Camshaft position sensor “A” circuit high input (Bank 2) | — | — | — |

## ■BRAKE CONTROL SYSTEM ABS with EBD, Brake Assist, A-TRC and VSC System)

- The deceleration sensor that is provided for the brake control system (ABS with EBD, Brake Assist, A-TRC, and VSC system) has been integrated in the yaw rate sensor.
- Information on the steering angle, vehicle speed, and the actual turning angle of the wheels can now be exchanged between the skid control ECU and the VGRS ECU, which has been newly added for the VGRS (Variable Gear Ratio Steering) system. These pieces of information are used for controlling the VGRS system.

### ▶ System Diagram ◀




a: Switching Solenoid Valves
b: Control Solenoid Valves

*: Only for Models with VGRS System

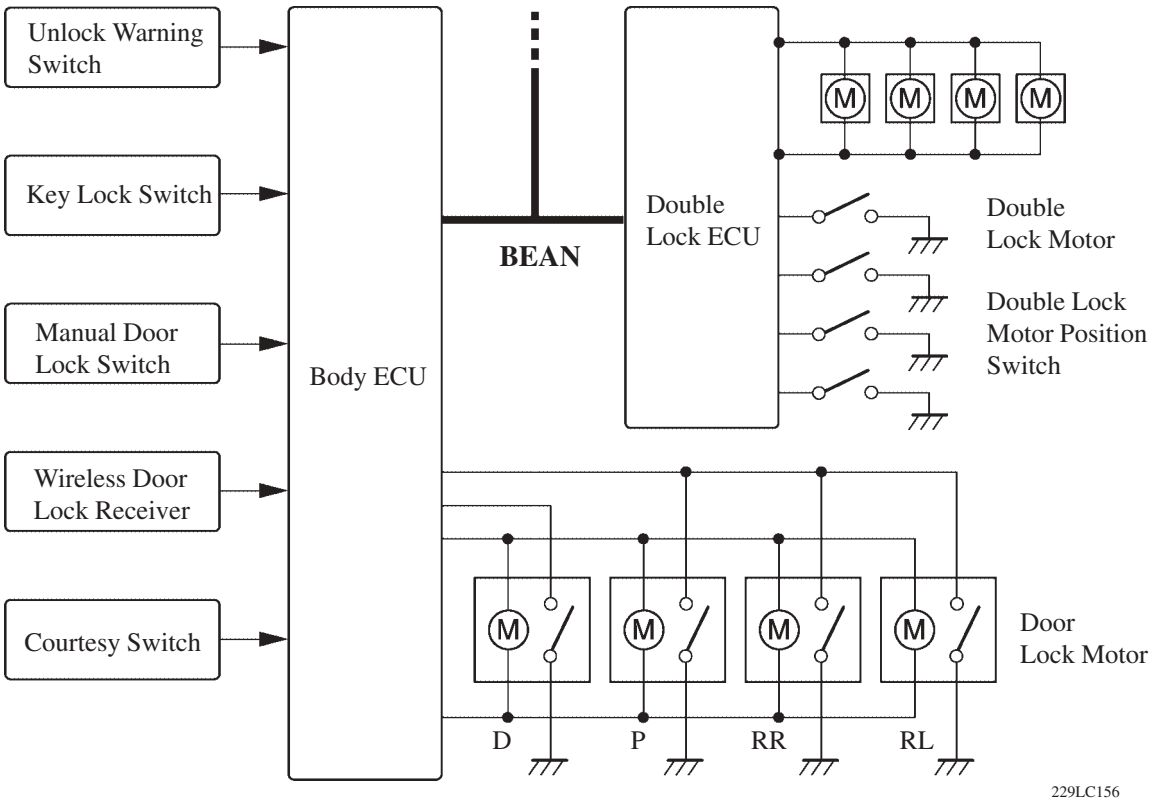
## ■ DOOR LOCK CONTROL SYSTEM

- For improved theft deterrence performance, a double locking system has been added as standard equipment on the RHD models for Europe and optional equipment on the LHD models for Europe.
- The double lock ECU communicates with the body ECU.
- The double locking system has the following functions.:

  1) The double locking system also prevents the doors from being opened through the operation of the inside door knobs. Thus, the doors cannot be opened either from the inside or the outside of the vehicle.

  2) To lock the doors with this system, pressing the transmitter's LOCK switch, then pressing it again within 5 seconds activates the double locking system.

  3) However, as an emergency unlocking maneuver, the driver's and passenger's door can be unlocked with key.




**CAUTION**

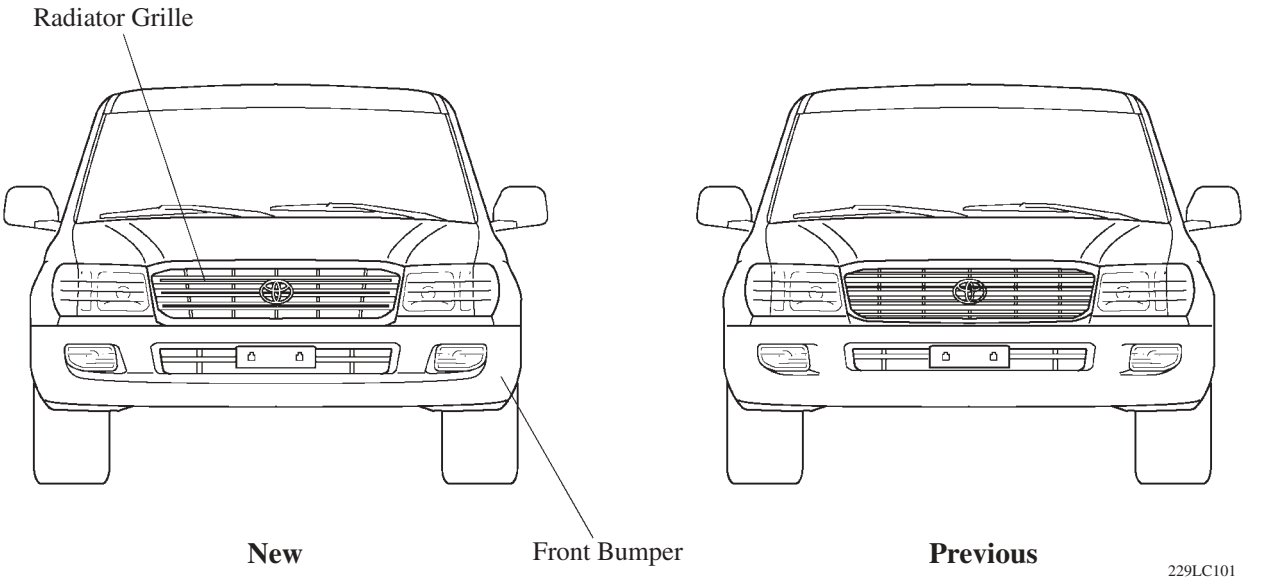
Never activate the double locking system when there are people in the vehicle because the doors cannot be opened from the inside of the vehicle.
If locking the doors by accident, press "Unlock" button of the transmitter.

# NEW FEATURES

## ■ EXTERIOR

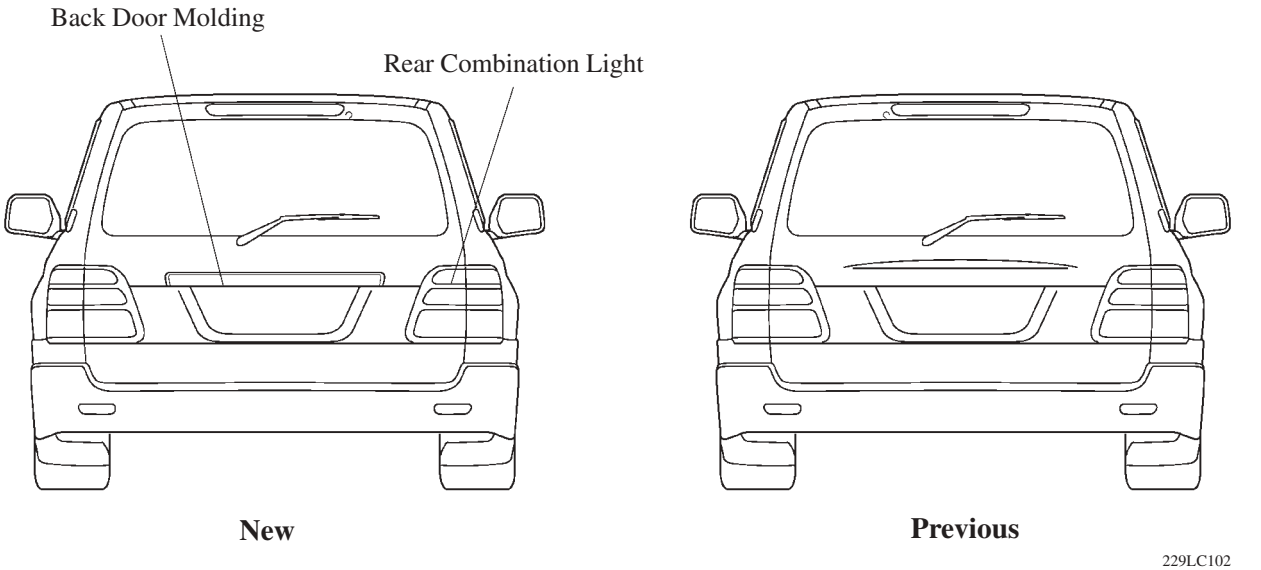
### 1. Front Design

The designs of the front bumper and radiator grille have been changed.




### 2. Rear Design

- The outer lens color of the turn-signal lights in the rear combination lights has been changed from amber to clear.
- The design of the back door molding has been changed.

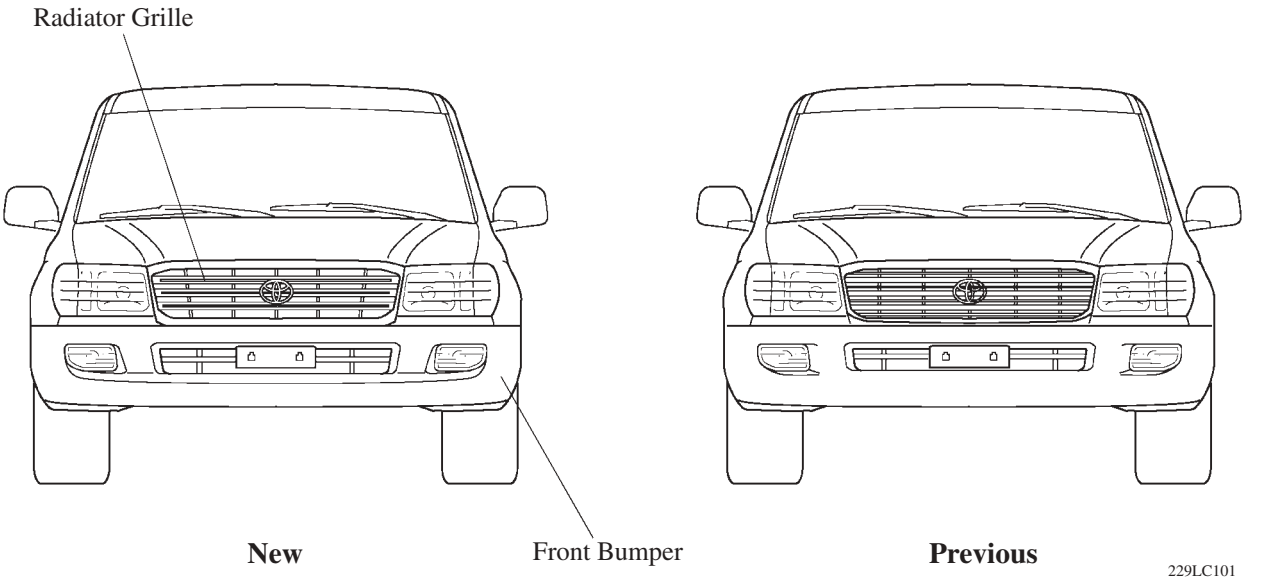


# NEW FEATURES

## ■ EXTERIOR

### 1. Front Design

The designs of the front bumper and radiator grille have been changed.




### 2. Rear Design

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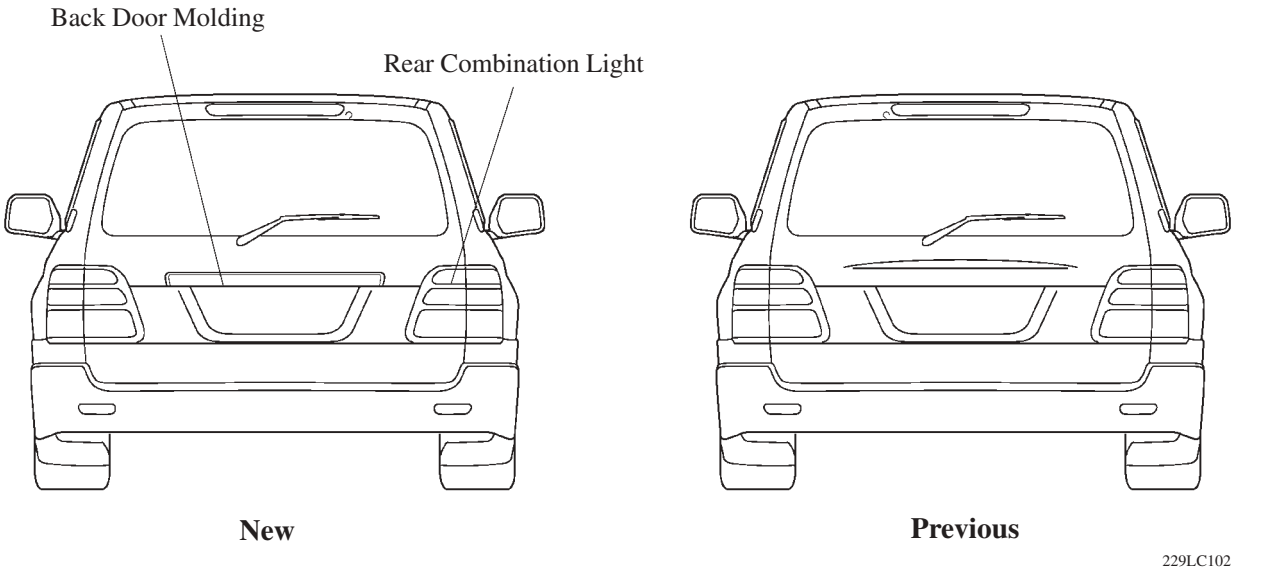
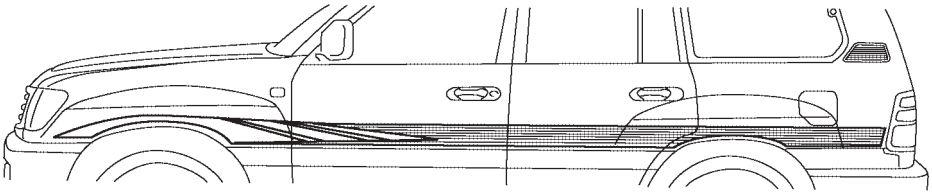
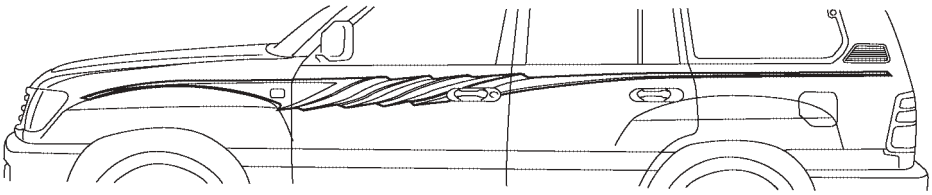


## 3. Side Design

The design of the side stripes, provided as an option on all models, have been changed.



**STD and GX Grade**



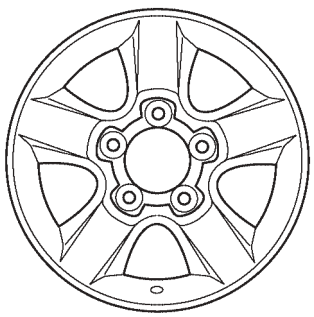
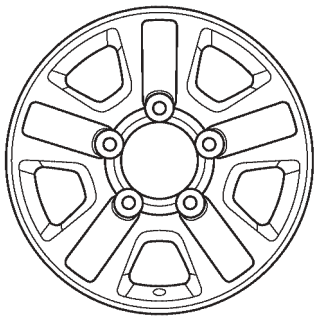
**VX Grade**

229LC103



## 4. Tire and Disc Wheel

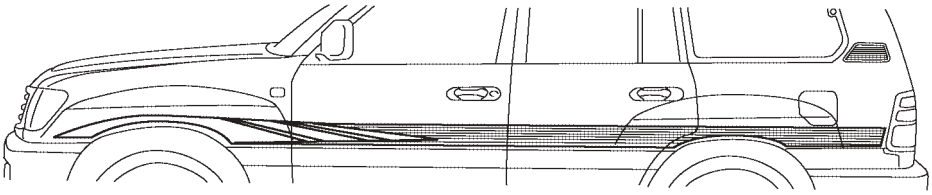
- 275/65R17 tires and newly designed 17 x 8JJ-60 wheels are provided on the GX and VX grade independent front suspension models as standard or optional equipment.
- 275/60R18 tires and newly designed 18 x 8JJ-60 wheels are provided on the VX grade model for Europe as optional equipment.

| Tire Size | 275/60R18 | 275/65R17 |
|---|---|---|
| Disc Wheel Size | 18 x 8JJ | 17 x 8JJ |
| Disc Wheel Material | Aluminum | ← |
| P.C.D.* mm (in.) | 150 (5.9) | ← |
| Off Set mm (in.) | 60 (2.4) | ← |
| Wheel Design |  229LC105 |  229LC104 |

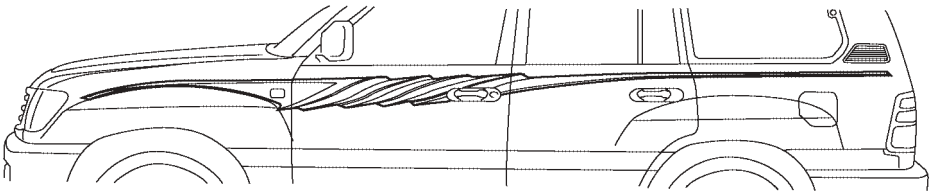
*: Pitch Circle Diameter

## 3. Side Design

The design of the side stripes, provided as an option on all models, have been changed.



**STD and GX Grade**



**VX Grade**

229LC103



## 4. Tire and Disc Wheel

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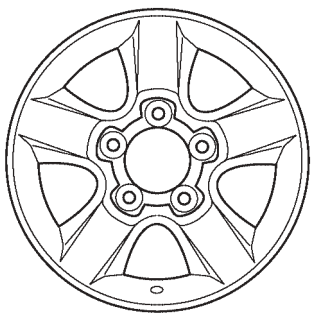
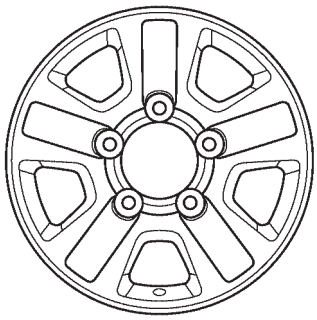
- 275/60R18 tires and newly designed 18 x 8JJ-60 wheels are provided on the VX grade model for Europe as optional equipment.

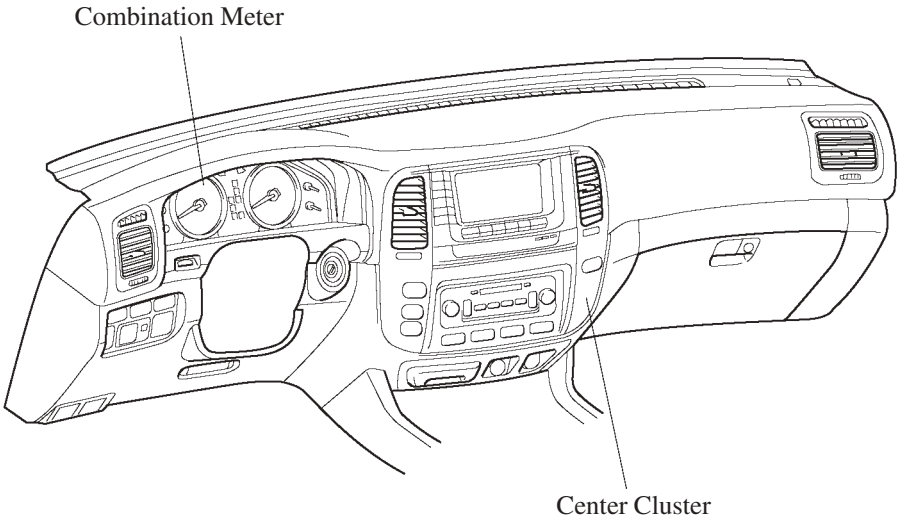
| Tire Size | 275/60R18 | 275/65R17 |
|---|---|---|
| Disc Wheel Size | 18 x 8JJ | 17 x 8JJ |
| Disc Wheel Material | Aluminum | ← |
| P.C.D.* mm (in.) | 150 (5.9) | ← |
| Off Set mm (in.) | 60 (2.4) | ← |
| Wheel Design |  229LC105 |  229LC104 |

*: Pitch Circle Diameter

## ■INTERIOR

### 1. Instrument Panel

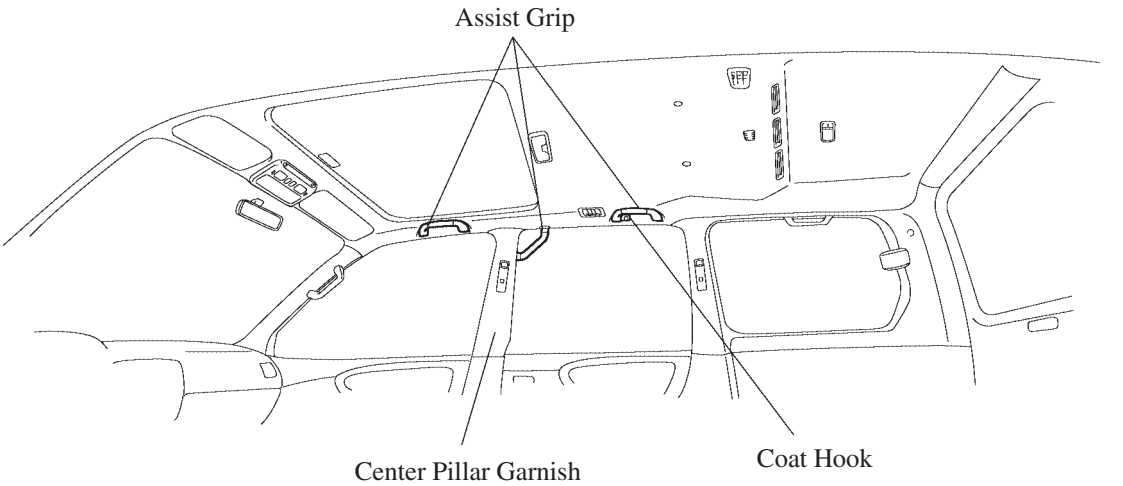
- The design of the center cluster has been changed.
- The design of the combination meter has been changed. For details, refer to the Combination Meter section of the page 239.




229LC106

### 2. Pillar Garnish and Roof Side Portion

- The designs of the center pillar garnish and roof side portion have been changed.
- The design of the assist grip and coat hook have been changed on the model with the curtain shield airbags.

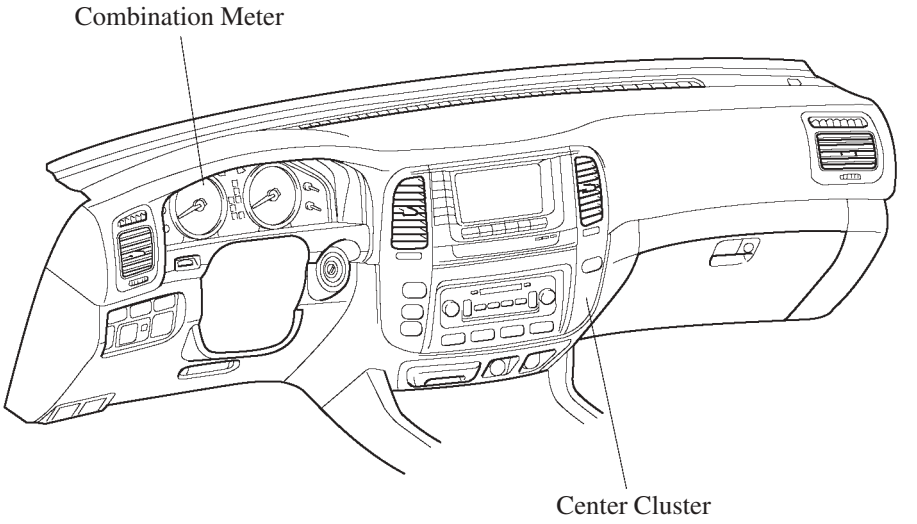



229LC107

## ■INTERIOR

### 1. Instrument Panel

- The design of the center cluster has been changed.
- The design of the combination meter has been changed. For details, refer to the Combination Meter section of the page 239.




229LC106

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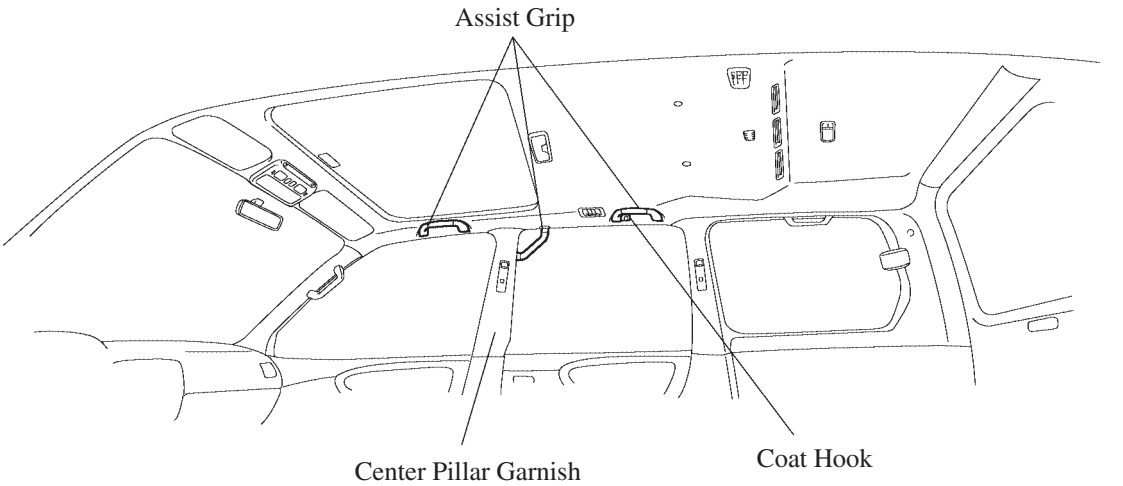
- The design of the assist grip and coat hook have been changed on the model with the curtain shield airbags.




229LC107

## ■2UZ-FE ENGINE

### 1. General

The main features described below have been adopted on the new Land Cruiser (100 series). Refer to the "Major Difference" indicated on the next page for details on the changes.

- The ETCS-i (Electronic Control System-intelligent) continues to be used from the previous model. However, on the new model, the accelerator cable has been discontinued and an accelerator pedal position sensor has been provided on the accelerator pedal.
- A no-contact type throttle position sensor has been adopted on all models.
- A TWC (Three-Way Catalytic Converter) is used on the model for Australia to comply with the European STEP-II regulations.
- The composition of the TWC (Three-Way Catalytic Converter) has been changed for the G.C.C. countries model (for Saudi Arabia) to comply with the European STEP-II regulations.
- Cranking hold function has been adopted. Once the ignition switch is turned to the START position, this control continues to operate the starter until the engine starts.

**▶ Engine Specifications ◀**



| Model | | | New Land Cruiser (100 series) | Previous Land Cruiser (100 series) |
|---|---|---|---|---|
| Destination | | | Australia and G.C.C. Countries Model*1 | ← |
| No. of Cyls. & Arrangement | | | 8-Cylinder, V Type | ← |
| Valve Mechanism | | | 32-Valve DOHC, Belt & Gear Drive | ← |
| Combustion Chamber | | | Pentroof Type | ← |
| Manifolds | | | Cross-Flow | ← |
| Fuel System | | | EFI | ← |
| Ignition System | | | DIS | ← |
| Displacement | $cm^3$ (cu. in.) | | 4664 (284.5) | ← |
| Bore x Stroke | mm (in.) | | 94.0 x 84.0 (3.70 x 3.31) | ← |
| Compression Ratio | | | 9.6 : 1 | ← |
| Max. Output | SAE-NET | | 170 kW @ 4800 rpm | ← |
| Max. Torque | SAE-NET | | 410 N·m @ 3400 rpm | ← |
| Valve Timing | Intake | Open | 3° BTDC | ← |
| | | Close | 36° ABDC | ← |
| | Exhaust | Open | 46° BBDC | ← |
| | | Close | 3° ATDC | ← |
| Firing Order | | | 1-8-4-3-6-5-7-2 | ← |
| Research Octane Number | | | 91 or more | ← |
| Emission Regulation | | | European STEP II | —*2 European STEP I*1 |
| Oil Grade | | | API SL-EC, SJ-EC or ILSAC | ← |
| Engine Service Mass | kg (lb) | | 229 (505) | ← |

*1: G.C.C. Countries Model (for Saudi Arabia)
*2: Australia Model

## 2. Major Difference

| Item | Outline | |
|---|---|---|
| Destination | Australia | G.C.C. Countries (for Saudi Arabia) |
| Intake and Exhaust System (See Page 149) | ● Adoption of the link-less type ETCS-i<br>● Adoption of TWC<br>● Discontinuance of air cleaner warning switch | ● Adoption of the link-less type ETCS-I<br>● Changed composition of TWC<br>● Discontinuance of air cleaner warning switch |
| Fuel System (See Page 150) | ● A tether has been provided on the fuel filler cap.<br>● Changed capacity of charcoal canister* | ● A tether has been provided on the fuel filler cap.<br>● Changed capacity of charcoal canister* |
| Engine Control System (See Page 151) | ● Changed engine ECU to 32-bit type<br>● Discontinuance of variable resistor<br>● Adoption of the heated oxygen sensor<br>● Adoption of the no-contact type throttle position sensor.<br>● Accelerator pedal position sensor located on the accelerator pedal<br>● Adoption of the cranking hold function*<br>● Changed failsafe control of accelerator pedal position sensor and throttle position sensor<br>● Correspondence of all DTC (Diagnostic Trouble Code) to SAE-controlled codes | ● Changed engine ECU to 32-bit type<br>● Adoption of the no-contact type throttle position sensor.<br>● Accelerator pedal position sensor located on the accelerator pedal<br>● Adoption of the cranking hold function*<br>● Changed failsafe control of accelerator pedal position sensor and throttle position sensor<br>● Correspondence of all DTC (Diagnostic Trouble Codes) to SAE-controlled codes |
| Other | Configuration and structure are the same as previous model | |

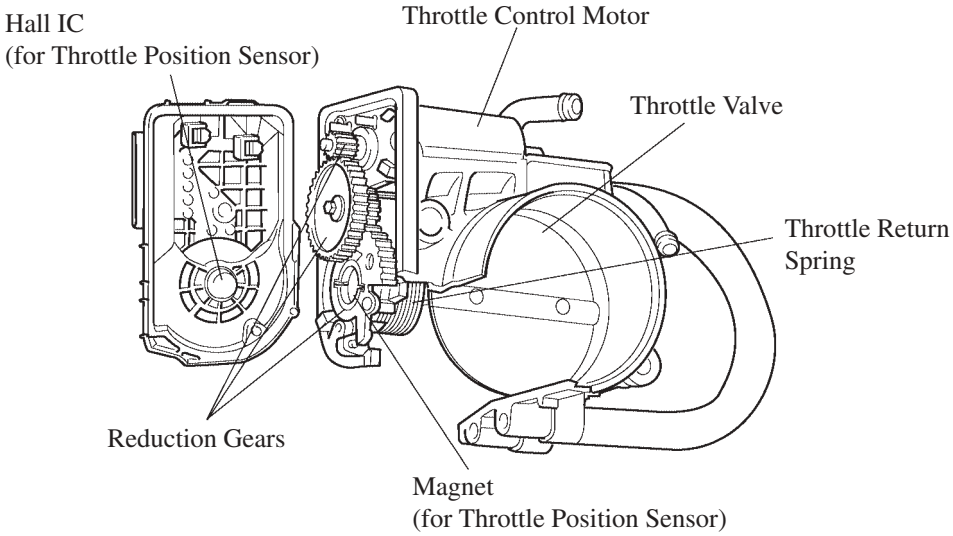
| Item | Outline | |
|---|---|---|
| Destination | Europe | General Countries and G.C.C. Countries (except Saudi Arabia) |
| Intake and Exhaust System (See Page 149) | Adoption of the link-less type ETCS-i | ● Adoption of the link-less type ETCS-i<br>● Discontinuance of air cleaner warning switch |
| Fuel System (See Page 150) | Configuration and structure are the same as previous model | A tether has been provided on the fuel filler cap. |
| Engine Control System (See Page 151) | ● Adoption of the no-contact type throttle position sensor.<br>● Accelerator pedal position sensor located on the accelerator pedal<br>● Changed fuel pump control<br>● Adoption of the cranking hold function*<br>● Changed failsafe control of accelerator pedal position sensor and throttle position sensor<br>● Correspondence of all DTC (Diagnostic Trouble Codes) to SAE-controlled codes | ● Changed engine ECU to 32-bit type<br>● Adoption of the no-contact type throttle position sensor.<br>● Accelerator pedal position sensor located on the accelerator pedal<br>● Adoption of the cranking hold function*<br>● Changed failsafe control of accelerator pedal position sensor and throttle position sensor<br>● Correspondence of all DTC (Diagnostic Trouble Codes) to SAE-controlled codes |
| Other | Configuration and structure are the same as previous model | |

*: Only for Automatic Transmission Model

## 3. Intake and Exhaust System

### Throttle Body

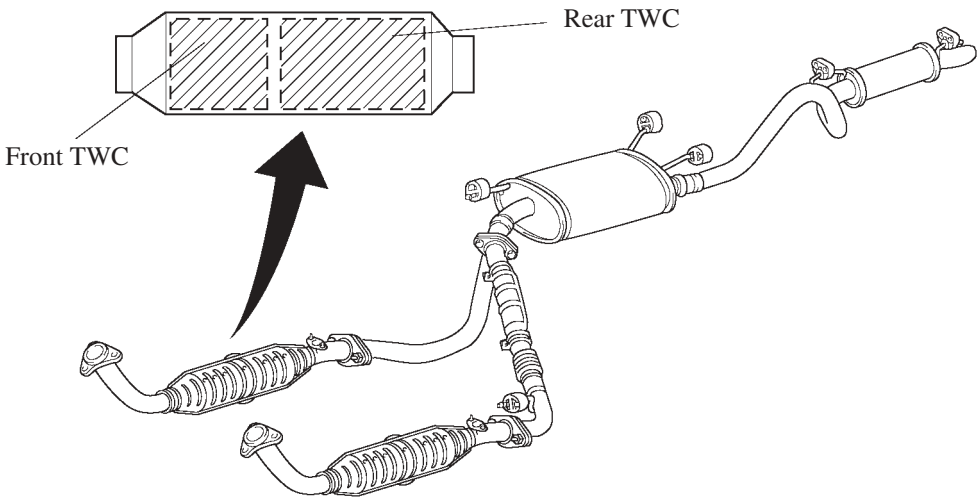
- The link-less type ETCS-i is used, providing excellent throttle control. For details of ETCS-i control, refer to see page 157.
- The no-contact type throttle position sensor has been adopted.




229LC108

### TWC (Three-Way Catalytic Converter)

- A TWC (Three-Way Catalytic Converter) is used on the model for Australia to comply with the European STEP-II regulations.
- The composition of the TWC has been changed for the G.C.C. countries model (for Saudi Arabia) to comply with the European STEP-II regulations.




229LC109

**▶ Specifications ◀**

| Location | New (Australia and G.C.C. countries model*) | | | Previous (G.C.C. countries model*) | | |
|---|---|---|---|---|---|---|
| | Cell Density | Volume | Material | Cell Density | Volume | Material |
| Front x 2 | 62 cells/cm$^2$ (400 cells/in.$^2$) | 875 cm$^3$ (53.4 cu in.) | Ceramic | 62 cells/cm$^2$ (400 cells/in.$^2$) | 697 cm$^3$ (42.5 cu in.) | Metallic |
| Rear x 2 | 62 cells/cm$^2$ (400 cells/in.$^2$) | 1083 cm$^3$ (66.1 cu in.) | Ceramic | 62 cells/cm$^2$ (400 cells/in.$^2$) | 1291 cm$^3$ (78.8 cu in.) | Ceramic |

*: Only for Saudi Arabia Model

## 4. Fuel System

- A tether has been provided on the fuel filler cap to prevent the cap from being lost, which results in preventing the leakage of fuel or the evaporative gas.
- The capacity of the charcoal canister on the automatic transmission models for Australia and G.C.C. countries (for Saudi Arabia) has been increased to reduce evaporative emissions.

**▶ Charcoal Canister Capacity ◀**

| New | Previous |
|---|---|
| 2.45 liters (2.59 US qts, 2.16 Imp. qts) | 1.4 liters (1.48 US qts, 1.23 Imp. qts) |

## 5. Engine Control System

### General

The engine control system of the 2UZ-FE engine on the new Land Cruiser (100 series) and 2UZ-FE engine on the previous model are compared below.

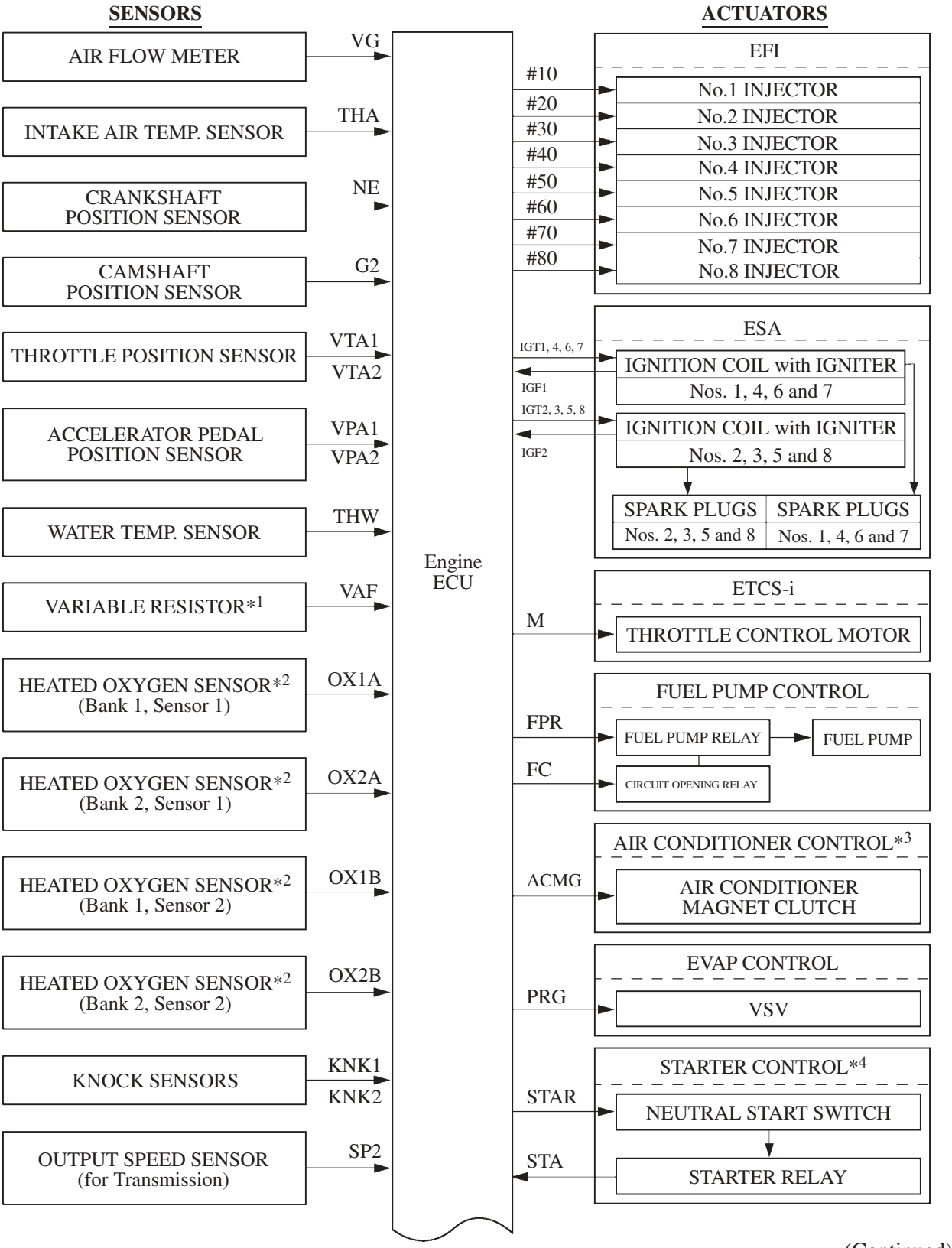
| System | Outline | New | Previous |
|---|---|---|---|
| EFI (Electronic Fuel Injection) | An L-type EFI system directly detects the intake air mass with a hot wire type mass air flow meter. | ○ | ○ |
| ESA (Electronic Spark Advance) | Ignition timing is determined by the engine ECU based on signals from various sensors. The engine ECU corrects ignition timing in response to engine knocking. | ○ | ○ |
| ETCS-i (Electronic Throttle Control System-intelligent) (See page 157) | Optimally controls the throttle valve opening in accordance with the amount of accelerator pedal effort and the condition of the engine and the vehicle | ○ | ○ |
| | ● A link less type is used, without an accelerator cable.<br>● An accelerator pedal position sensor is provided on the accelerator pedal.<br>● No-contact type throttle position sensor has been adopted. | ○ | — |
| Fuel Pump Control (See page 158) | The fuel pump ECU has been used to execute 3-step fuel pump speed control. | — | ○*1 |
| | The fuel pump speed is controlled by the fuel pump relay and the fuel pump resistor. | ○ | ○*2 |
| | A fuel cut control is adopted to stop the fuel pump when the airbag is deployed. | ○ | — |
| Oxygen Sensor Heater Control | Maintains the temperature of the oxygen sensor at an appropriate level to increase accuracy of detection of the oxygen concentration in the exhaust gas. | ○*5 | ○*3<br>—*4 |
| Evaporative Emission Control | The engine ECU controls the purge flow of evaporative emission (HC) in the charcoal canister in accordance with engine conditions. | ○ | ○ |
| Air Conditioner Cut-off Control | By turning the air conditioning compressor ON or OFF in accordance with the engine condition, drivability is maintained. | ○ | ○ |
| Engine Immobiliser | Prohibits fuel delivery and ignition if an attempt is made to start the engine with an invalid ignition key. | ○ | ○ |
| Starting System*6 (See page 159) | Once the ignition switch is turned to the START position, this control continues to operate the starter until the engine starts. | ○ | — |
| Diagnosis (See page 161) | When the engine ECU detects a malfunction, the engine ECU diagnoses and memorizes the failed section. | ○ | ○ |
| | All the DTC (Diagnostic Trouble Code) have been made to correspond to the SAE controlled codes. | ○ | — |
| Fail-Safe (See page 161) | When the engine ECU detects a malfunction, the engine ECU stops or controls the engine according to the data already stored in the memory. | ○ | ○ |

*1: Europe Model
*2: except Europe Model
*3: Europe and G.C.C. Countries Model (for Saudi Arabia)
*4: Australia and General Countries Model
*5: except General Countries Model and G.C.C. Countries Model (except Saudi Arabia)
*6: Models with Automatic Transmission

6

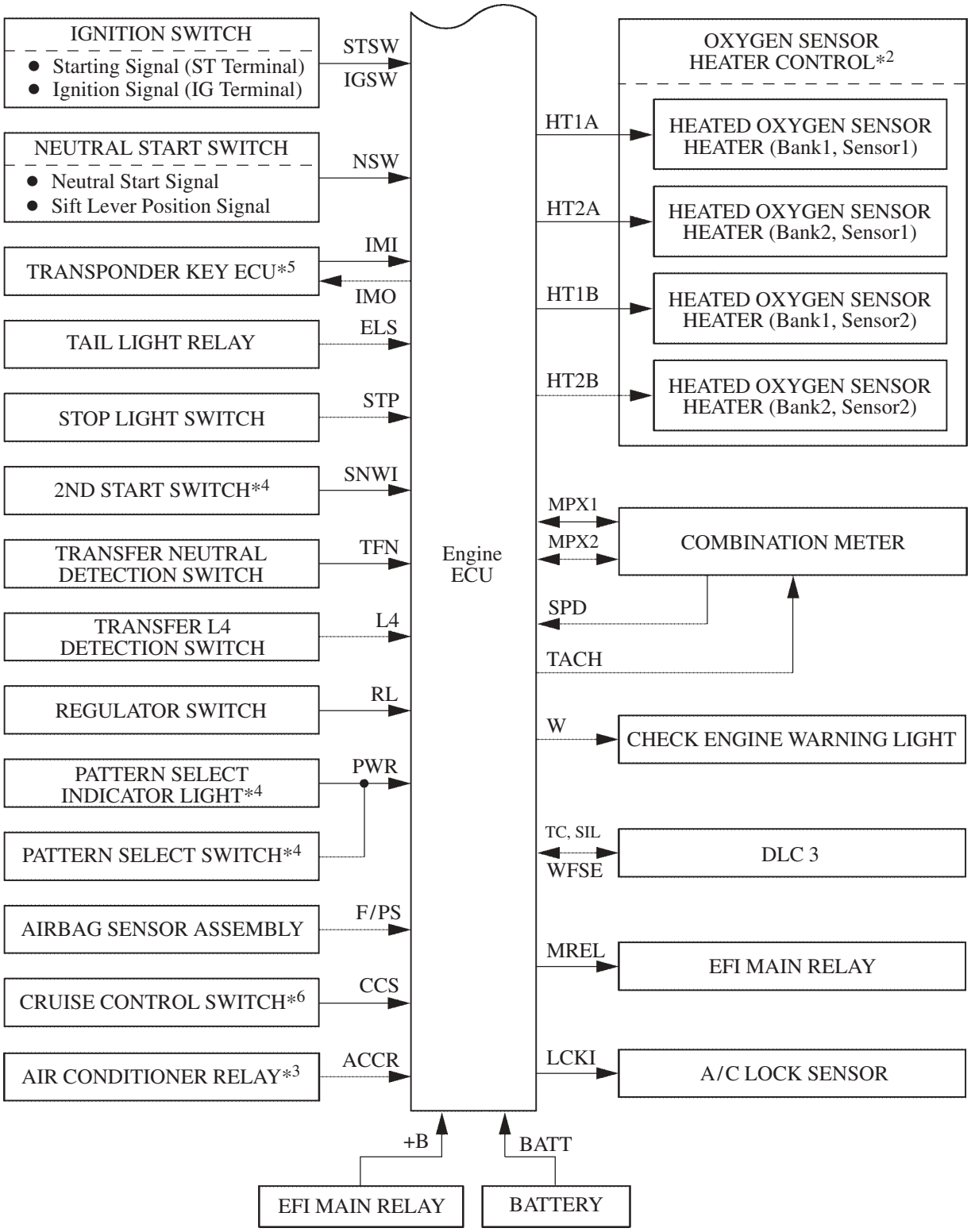
## Construction

The configuration of the engine control system of the 2UZ-FE engine is as shown in the following chart.




(Continued)

229LC110

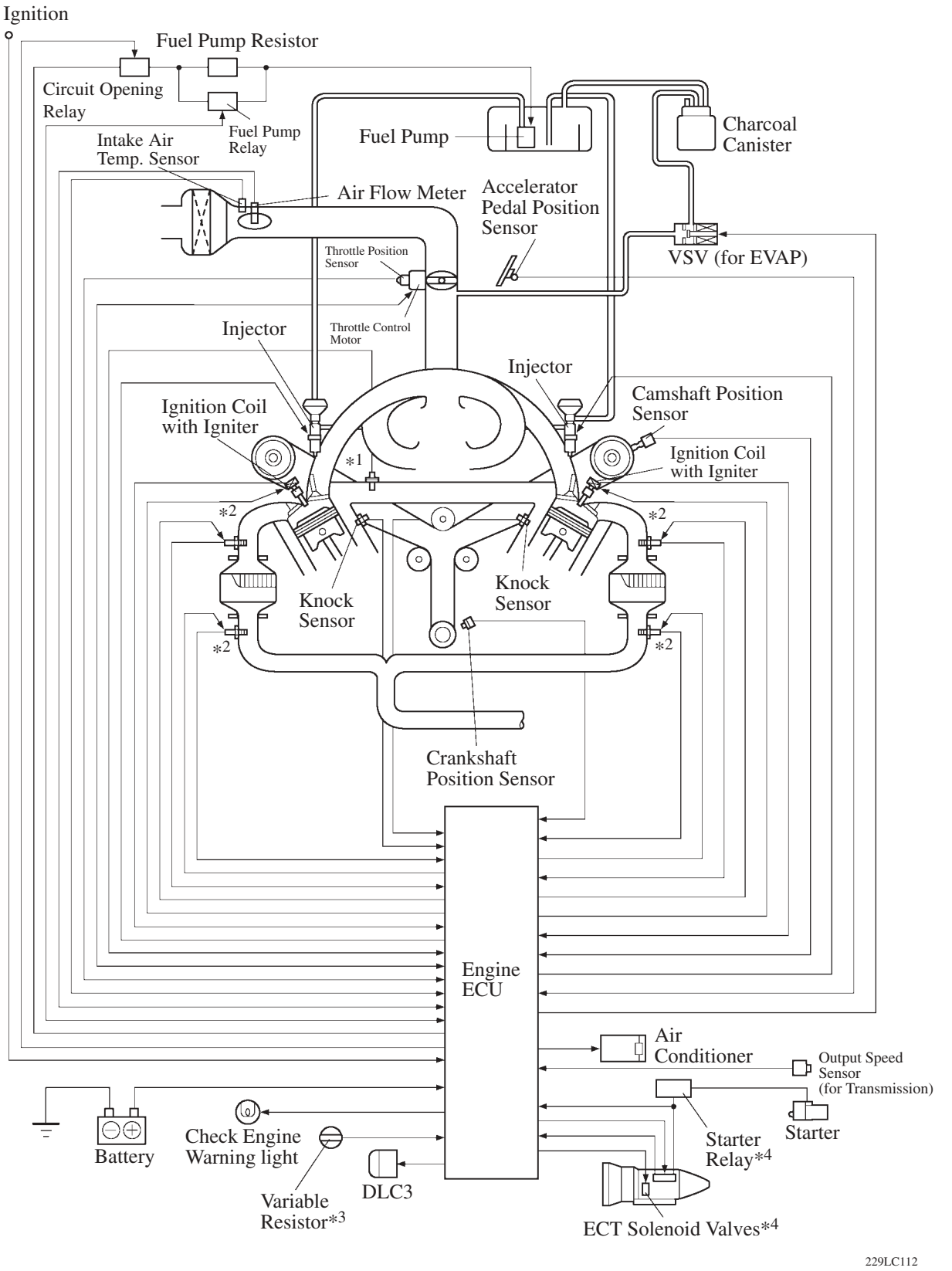



229LC111

*1: for General Countries Model and G.C.C. Countries Model (except Saudi Arabia)
*2: except General Countries Model and G.C.C. Countries Model (for Saudi Arabia)
*3: Models with Air Conditioner
*4: Models with Automatic Transmission
*5: Models with Engine Immobiliser System
*6: Models with Cruise Control System

6

## Engine Control System Diagram




*1: Water Temp. Sensor
*2: Heated Oxygen Sensor
*3: for Models without Heated Oxygen Sensor
*4: for Models with Automatic Transmission

## Main Component of Engine Control System

### 1) General

The following table compares the main components.

| Model Type | New | | Previous | |
|---|---|---|---|---|
| Component | Outline | Quantity | Outline | Quantity |
| Engine ECU | 32-bit CPU | 1 | ←*2<br>16-bit CPU*3 | |
| Air Flow Meter | Hot-wire Type | 1 | ← | |
| Crankshaft Position Sensor (Rotor Teeth) | Pick-up Coil Type (36-2) | 1 | ← | |
| Camshaft Position Sensor (Rotor Teeth) | Pick-up Coil Type (1) | 1 | ← | |
| Accelerator Pedal Position Sensor | Linear Type (Mounted on accelerator pedal) | 1 | Linear Type (Mounted on throttle body) | 1 |
| Throttle Position Sensor | No-contact Type | 1 | Linear Type | 1 |
| Knock Sensor | Built-in Piezoelectric Type | 2 | ← | |
| Oxygen Sensor<br>(Bank 1, Sensor 1)<br>(Bank 1, Sensor 2)<br>(Bank 2, Sensor 1)<br>(Bank 2, Sensor 2) | with Heater*1 | 4 | ←*4<br>—*5 | |
| Injector | 4-Hole Type | 8 | ← | |

*1: except General Countries Model and G.C.C. Countries Model (except Saudi Arabia)
*2: Europe Model
*3: except Europe Model
*4: Europe and G.C.C. Countries Model (for Saudi Arabia)
*5: Australia, General Countries Models and G.C.C. Countries Model (except Saudi Arabia)

### 2) Engine ECU

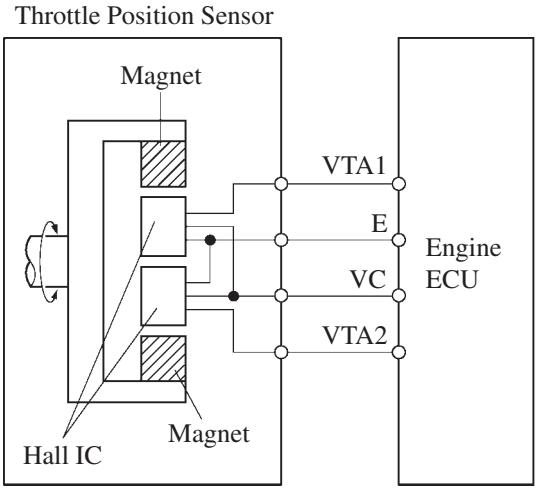
The 32-bit CPU of the engine ECU is used to increase the speed for processing the signals.

**Service Tip**

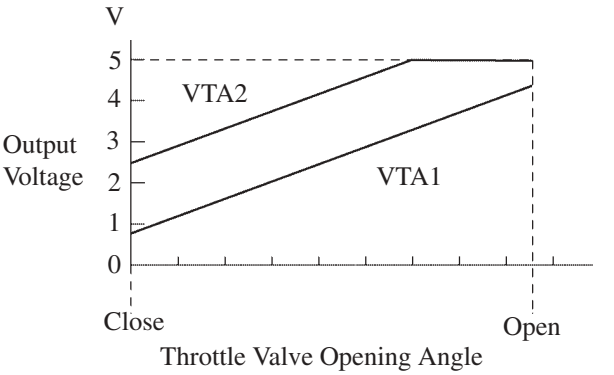
The length of time to clear the DTC via the battery terminal has been changed from 10 seconds to 1 minute.

### 3) Throttle Position Sensor (No-Contact Type)

To detect the opening angle of the throttle valve, the throttle position sensor converts the magnetic flux density into electric signals that change when the magnetic yoke (located on the same axis as the throttle shaft) rotates around the hall IC.



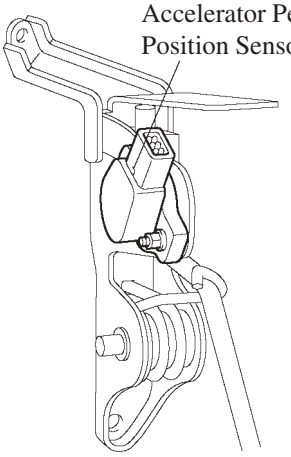

230LX12



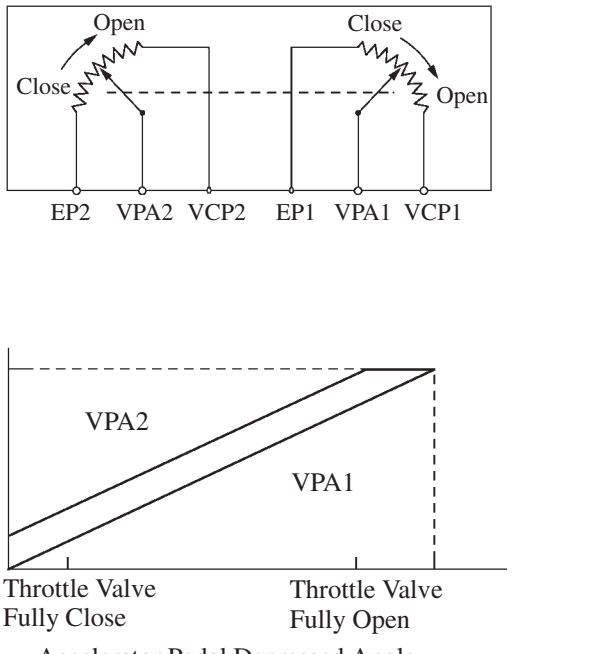

230LX13

### 4) Accelerator Pedal Position Sensor

- This sensor converts the accelerator pedal depressed angles into electric signals with two differing characteristics and outputs them to the engine ECU. One is the VPA signal that linearly outputs the voltage along the entire range of the accelerator pedal depressed angle. The other is the VPA2 signal that outputs on offset voltage.
- The accelerator pedal position sensor is attached to the accelerator pedal.




230LX14




199EG40

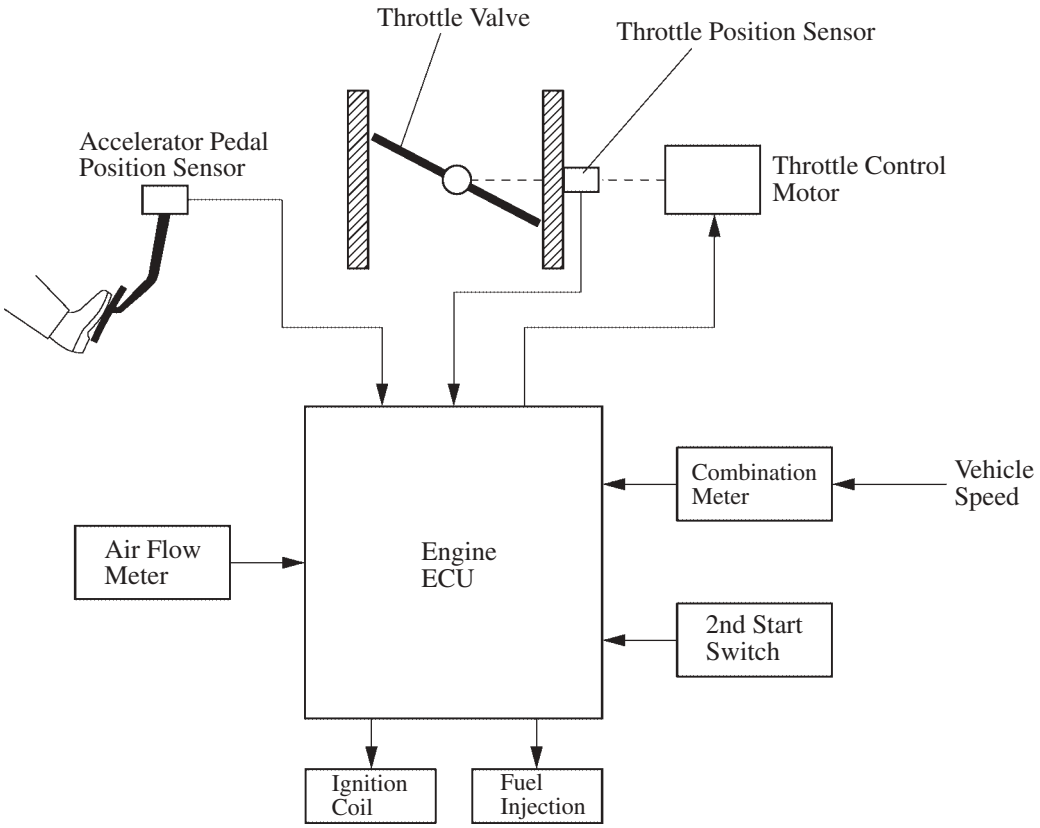
## ETCS-i (Electronic Throttle Control System-intelligent)

In the conventional throttle body, the throttle valve opening is determined invariably by the amount of the accelerator pedal effort. In contrast, the ETCS-i uses the engine ECU to calculate the optimal throttle valve opening that is appropriate for the respective driving condition and uses a throttle control motor to control the opening.

In contrast to the ETCS-i on the previous model, the following items have been changed on the new model:

- The accelerator cable and link have been discontinued, and an accelerator position sensor has been provided on the accelerator pedal.
- No-contact type throttle position sensor has been adopted.
- Accordingly, the limp-mode control, in the fail-safe mode has been changed.

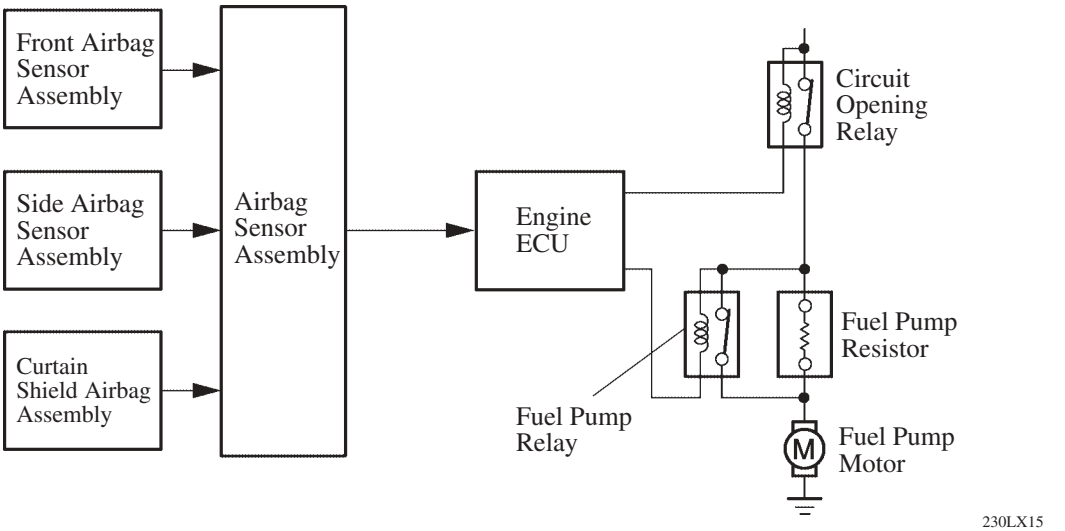
### ▶ System Diagram ◀



## Fuel Pump Control

- On the previous model for Europe, the fuel pump ECU effected 3-step fuel pump speed control. However, on all the new models, the control has been changed to 2-step fuel pump speed control, which is effected by the fuel pump relay and the fuel pump resistors.
- This control system increases the fuel pump output by switching the fuel pump speed to high if a large volume of fuel is required by the engine ECU. In normal operations where the engine speeds are low, the fuel pump rotates at low speed to reduce unnecessary consumption of electric power and to maintain fuel pump durability.
- A fuel cut control is adopted to stop the fuel pump when the airbag is deployed. In this system, the airbag deployment signal from the airbag sensor assembly is detected by the engine ECU, which turns OFF the circuit opening relay.
  After the fuel cut control has been activated, turning the ignition switch from OFF to ON cancels the fuel cut control, thus engine can be restarted.

**▶ System Diagram ◀**

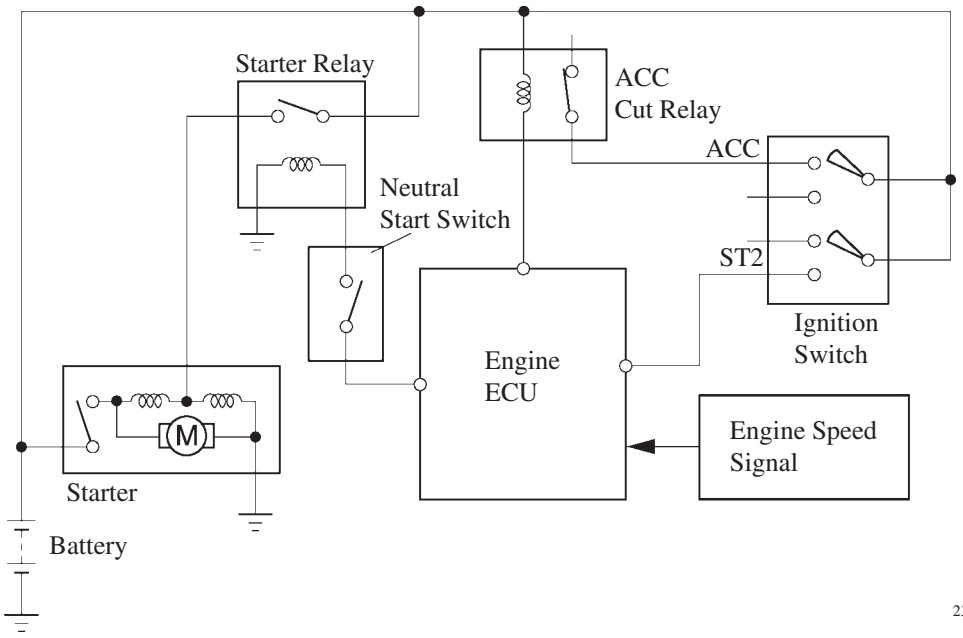


## Cranking Hold Function

### 1) General

- The new Land Cruiser (100 series) with automatic transmission has adopted a cranking hold function. Once the ignition switch is turned to the START position, this control continues to operate the starter until the engine starts, without having to hold the ignition switch in the START position. This prevents starting failures and the engine from being cranked after it has started.
- When the engine ECU detects a start signal from the ignition switch, this system monitors the engine speed (NE) signal and continues to operate the starter until it has determined that the engine has started. Furthermore, even if the engine ECU detects a start signal from the ignition switch, it will not operate the starter if it has determined that the engine has already started.

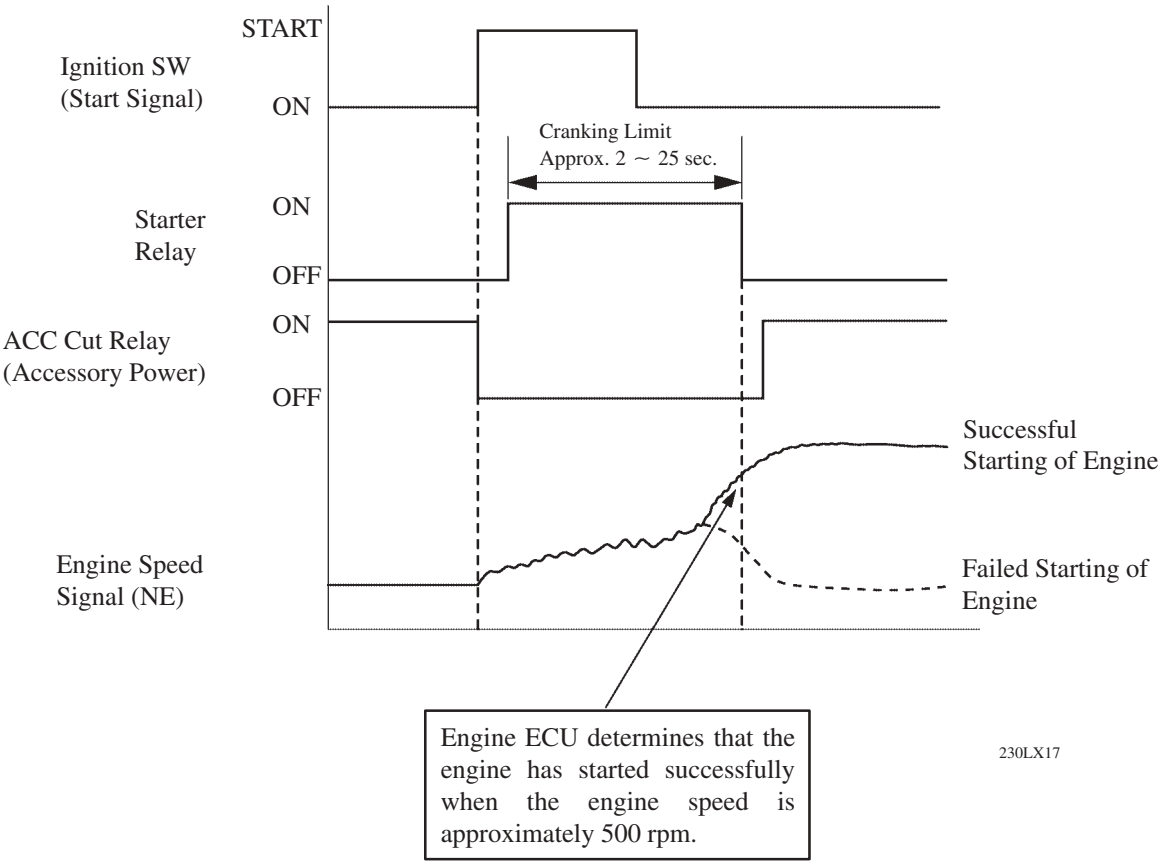
**▶ System Diagram ◀**



### 2) Operation

- As indicated in the timing chart shown below, when the engine ECU detects a start signal from the ignition switch, it energizes the starter relay to operate the starter. If the engine is already running, the engine ECU will not energize the starter relay.
- After the starter operates and the engine speed becomes higher than approximately 500 rpm, the engine ECU determines that the engine has started and stops the operation of the starter.
- If the engine has any failure and will not work, the starter operates as long as its maximum continuous operation time and stops automatically. The maximum continuous operation time is approximately 2 seconds through 25 seconds depending on the engine coolant temperature condition. When the engine coolant temperature is extremely low, it is approximately 25 seconds and when the engine is warmed up sufficiently, it is approximately 2 seconds.
- This system cuts off the current that powers the accessories while the engine is cranking to prevent the accessory illumination from operating intermittently due to the unstable voltage that is associated with the cranking of the engine.

**▶ Timing Chart ◀**



## Diagnosis

- When the engine ECU detects a malfunction, the engine ECU makes a diagnosis and memorizes the failed section. Furthermore, the check engine warning light in the combination meter illuminates or blinks to inform the driver. The engine ECU will also store the DTC (Diagnostic Trouble Code) of the malfunctions. The DTC can be accessed the use of the hand-held tester or SST (09843-18040).
- All the DTC have been made to correspond to the SAE controlled codes. Some of the DTC have been further divided into smaller detection areas than in the past, and new DTC have been assigned to them. For details, see the General Features Section.

## Fail-Safe

### 1) General

When the engine ECU detects a malfunction, the engine ECU stops or controls the engine according to the data already stored in the memory.

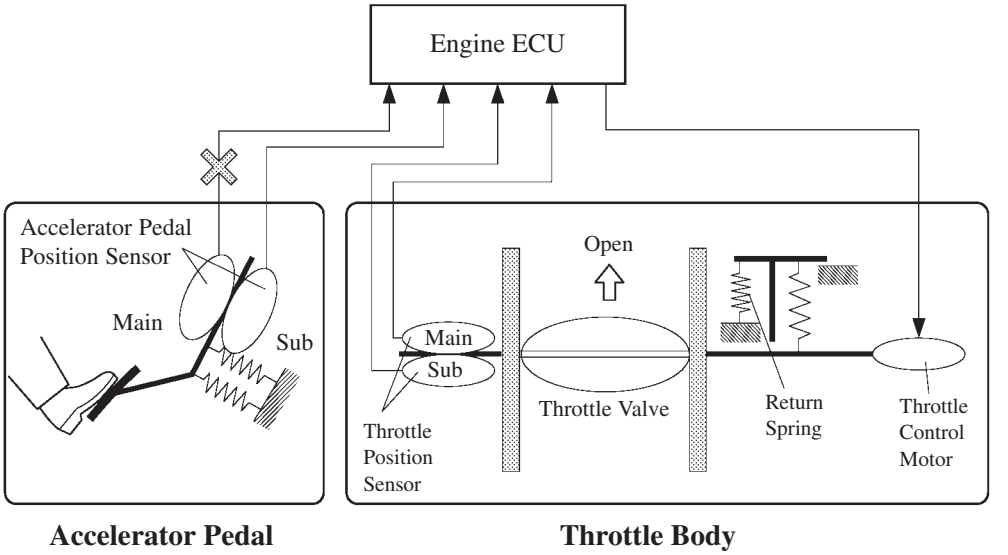
**▶ Fail-Safe Control List ◀**

**□: New**

| Location on Malfunction | Description Control |
|---|---|
| Air Flow Meter | In case of a signal malfunction, the engine could operate poorly or the catalyst could overheat if the engine continues to be controlled with the signals from the sensors.<br>Therefore, the engine ECU effects control by using the values in the engine ECU or stops the engine. |
| Accelerator Pedal Position Sensor<br>(For details, see page 162) | In case of a signal malfunction, the engine ECU calculates the accelerator pedal opening angle that is limited by the dual circuits sensor value and continues effecting throttle valve control. If both circuits malfunction, the engine ECU considers that the accelerator pedal is fully closed. |
| Throttle Position Sensor<br>(For details, see page 163) | In case of a signal malfunction, the engine ECU cuts off the current to the throttle control motor. The throttle valve returns to the prescribed opening by the force of the return spring. The engine ECU then adjusts the engine output by controlling the fuel injection and ignition timing in accordance with the accelerator pedal opening angle to enable the vehicle to continue driving. |
| Water Temp. Sensor<br>and<br>Intake Air Temp. Sensor | In case of a signal malfunction, the use of the values from the sensors will make the air-fuel ratio become too rich or too lean, which could causes the engine to stall or to run poorly during cold operation. Therefore, the engine ECU fixes the air-fuel ratio to the stoichiometric ratio and uses the constant values of 80°C water temperature and 20°C intake air temperature to perform the calculation. |
| Knock Sensor | In case of a malfunction in the knock sensor or in the knocking signal system (open or short circuit), the engine could become damaged if the timing is advanced despite the presence of knocking. Therefore, if a malfunction is detected in the knock sensor system, the engine ECU turns the timing retard correction of the knock sensor into the maximum retard value. |
| Ignition Coil<br>(with Igniter) | In case of a malfunction in the ignition system, such as an open circuit in the ignition coil, the catalyst could be become overheated due to engine misfire. Therefore, if the (IGF) ignition signal is not input twice or more in a row, the engine ECU determines that a malfunction occurred in the ignition system and stops only the injection of fuel into the cylinder with the malfunction. |

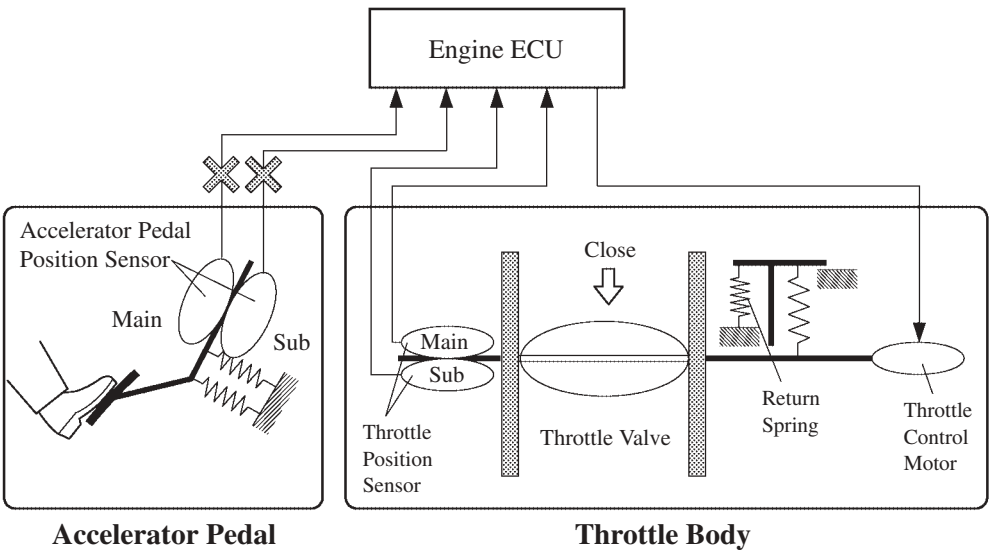
**2) Fail-Safe of Accelerator Pedal Position Sensor**

- The accelerator pedal position sensor comprises two (main, sub) sensor circuits. If a malfunction occurs in either one of the sensor circuits, the engine ECU detects the abnormal signal voltage difference between these two sensor circuits and switches to the limp mode. In the limp mode, the remaining circuit is used to calculate the accelerator pedal opening, in order to operate the vehicle under limp mode control.




199EG45

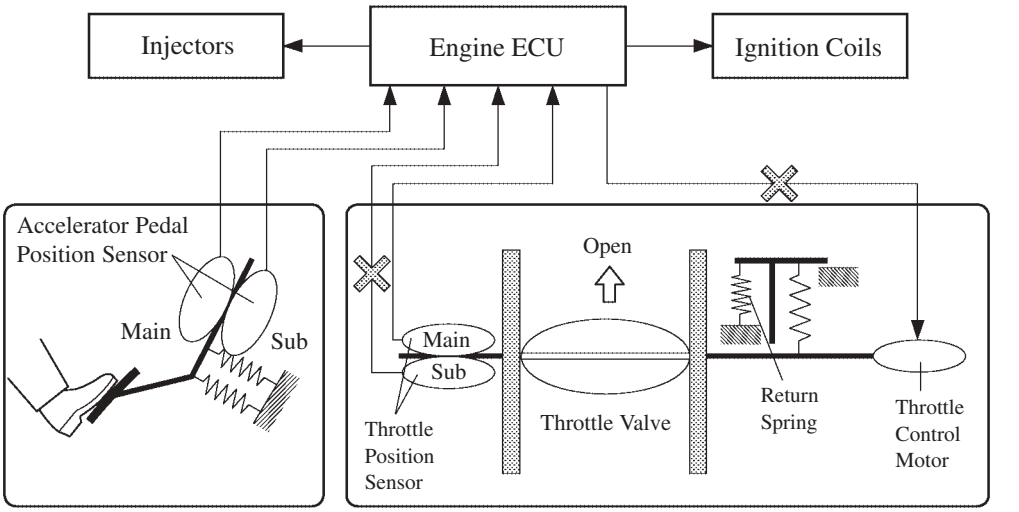
- If both circuits malfunction, the engine ECU detects the abnormal signal voltage between these two sensor circuits and regards that the opening angle of the accelerator pedal is fully opened and then continues the throttle control. At this time, the vehicle can be driven within its idling range.




199EG46

### 3) Fail-Safe of Throttle Position Sensor

- The throttle position sensor comprises two (main, sub) sensor circuits. If a malfunction occurs in either one of the sensor circuits, the engine ECU detects the abnormal signal voltage difference between these two sensor circuits, cuts off the current to the throttle control motor, and switches to the limp mode. Then, the force of the return spring causes the throttle valve to return and stay at the prescribed opening. At this time, the vehicle can be driven in the limp mode while the engine output is regulated through the control of the fuel injection and ignition timing in accordance with the accelerator opening.
- The same control as above is effected if the engine ECU detects a malfunction in the throttle control motor system.



## ■1FZ-FE ENGINE

### 1. General

A TWC (Three Way Catalytic Converter) construction change or addition has been implemented as shown in the following table for G.C.C.countries (for Saudi Arabia, FZJ100L-GNMNKV for China and Peru and FZJ100L-GNPNKV for China) models to comply with the European STEP-II or STEP-I regulations.

| Destination Countries | | New Model | | Previous Model | |
|---|---|---|---|---|---|
| | | TWC Specification | Emission Regulation | TWC Specification | Emission Regulation |
| G.C.C. Countries (for Saudi Arabia) | M/T | 1.3 ℓ | European Step-I | ← | |
| | A/T | 0.9 ℓ + 1.3 ℓ | European STEP-I | — | — |
| G.C.C. Countries (Others) | M/T | — | — | ← | |
| | A/T | — | — | ← | |
| FZJ100L-GNMNKV (for China and Peru) | M/T | 0.9 ℓ + 1.3 ℓ | European STEP-II | 1.3 ℓ*1 | European Step-I*1 |
| | | | | —*2 | —*2 |
| FZJ100L-GNPNKV (for China) | A/T | 0.9 ℓ + 1.3 ℓ | European STEP-II | — | — |

*1: for Chaina
*2: for Peru

## ▶ Engine Specifications ◀

| Model | | | G.C.C. Countries (Saudi Arabia, China and Peru) | G.C.C. Countries (Others) |
|---|---|---|---|---|
| No. of Cyls. & Arrangement | | | 6-Cylinder, In-line | ← |
| Valve Mechanism | | | 24-Valve DOHC, Chain Drive | ← |
| Combustion Chamber | | | Pentroof Type | ← |
| Manifolds | | | Cross-Flow | ← |
| Fuel System | | | EFI | ← |
| Ignition System | | | ESA | ← |
| Displacement $cm^3$ (cu. in.) | | | 4477 (273.1) | ← |
| Bore x Stroke mm (in.) | | | 100.0 x 95.0 (3.97 x 3.74) | ← |
| Compression Ratio | | | 9.0 : 1 | ← |
| Max. Output | | SAE-NET | 155 kW @ 4600 rpm*1 | — |
| | | SAE-GROSS | 179 kW @ 4600 rpm*2 | ← |
| Max. Torque | | SAE-NET | 373 N·m @ 3600 rpm*1 | — |
| | | SAE-GROSS | 407 N·m @ 3600 rpm*2 | ← |
| Valve Timing | Intake | Open | 5°BTDC | ← |
| | | Close | 40°ABDC | ← |
| | Exhaust | Open | 40°BBDC | ← |
| | | Close | 5°ATDC | ← |
| Firing Order | | | 1-5-3-6-2-4 | ← |
| Research Octane Number | | | 91 or more | ← |
| Emission Regulation | | | European STEP I*2<br>European STEP II*1 | — |
| Oil Grade | | | API SL-EC or ILSAC | ← |
| Engine Service Mass kg (lb.) | | | M/T : 257 (566.6)<br>A/T : 243 (535.7) | ← |

*1: China and Peru
*2: Saudi Arabia

6

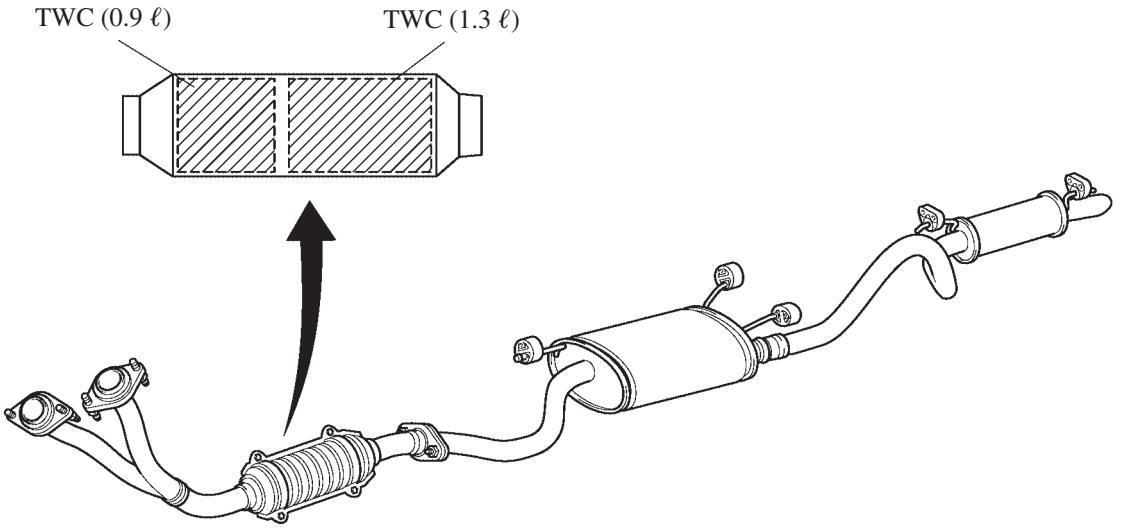
## 2. Major Difference (from Previous Model)

| Item | Outline |
|---|---|
| Intake and Exhaust System | ● Addition of TWC*1<br>● Changed composition of TWC*2<br>● Discontinuance of air cleaner warning switch*3 |
| Fuel System | A tether has been provided on the fuel filler cap*3 |
| Cooling System | Changed radiator core size *4 |
| Other | Configuration and structure are the same as previous model*3 |

*1: G.C.C. Countries model with automatic transmission (for Saudi Arabia), FZJ100L-GNPNKV for China and FZJ100L-GNMNKV for Peru
*2: FZJ100L-GNMNKV for China
*3: All Model
*4: G.C.C. countries model with automatic transmission

## 3. TWC (Three-Way Catalytic Converter)

Two TWCs are used to comply with the European STEP-I or European STEP-II regulations.




229LC113

**▶ Specifications ◀**

| Location | G.C.C. countries model*1 | | | G.C.C. countries model*2 (M/T Model for Saudi Arabia) | | |
|---|---|---|---|---|---|---|
| | Cell Density | Volume | Material | Cell Density | Volume | Material |
| Front | 62 cells/cm$^2$ (400 cells/in$^2$) | 875 cm$^3$ (53.4 cu in.) | Ceramic | 62 cells/cm$^2$ (400 cells/in$^2$) | 1291 cm$^3$ (78.8 cu in.) | Ceramic |
| | 62 cells/cm$^2$ (400 cells/in$^2$) | 1291 cm$^3$ (78.8 cu in.) | Ceramic | | | |

*1: G.C.C. Countries model with automatic transmission (for Saudi Arabia), FZJ100L-GNPNKV for China and FZJ100L-GNMNKV for China and Peru
*2: G.C.C. Countries model with manual transmission (for Saudi Arabia)

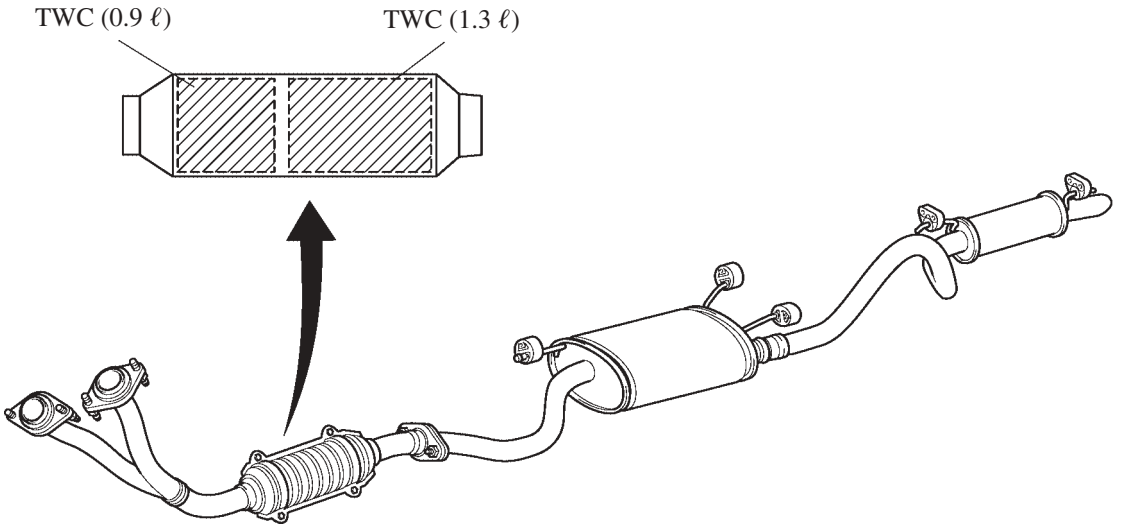
## 2. Major Difference (from Previous Model)

| Item | Outline |
|---|---|
| Intake and Exhaust System | ● Addition of TWC*1<br>● Changed composition of TWC*2<br>● Discontinuance of air cleaner warning switch*3 |
| Fuel System | A tether has been provided on the fuel filler cap*3 |
| Cooling System | Changed radiator core size *4 |
| Other | Configuration and structure are the same as previous model*3 |

*1: G.C.C. Countries model with automatic transmission (for Saudi Arabia), FZJ100L-GNPNKV for China and FZJ100L-GNMNKV for Peru
*2: FZJ100L-GNMNKV for China
*3: All Model
*4: G.C.C. countries model with automatic transmission

## 3. TWC (Three-Way Catalytic Converter)

Two TWCs are used to comply with the European STEP-I or European STEP-II regulations.




229LC113

**▶ Specifications ◀**

| Location | G.C.C. countries model*1 | | | G.C.C. countries model*2 (M/T Model for Saudi Arabia) | | |
|---|---|---|---|---|---|---|
| | Cell Density | Volume | Material | Cell Density | Volume | Material |
| Front | 62 cells/cm$^2$ (400 cells/in$^2$) | 875 cm$^3$ (53.4 cu in.) | Ceramic | 62 cells/cm$^2$ (400 cells/in$^2$) | 1291 cm$^3$ (78.8 cu in.) | Ceramic |
| | 62 cells/cm$^2$ (400 cells/in$^2$) | 1291 cm$^3$ (78.8 cu in.) | Ceramic | | | |

*1: G.C.C. Countries model with automatic transmission (for Saudi Arabia), FZJ100L-GNPNKV for China and FZJ100L-GNMNKV for China and Peru
*2: G.C.C. Countries model with manual transmission (for Saudi Arabia)

## 4. Cooling System

The size of the radiator core has been changed on the automatic transmission model for the G.C.C. countries, resulting in improved cooling performance.

**▶ Specifications ◀**

| Item | New | Previous |
|---|---|---|
| Core Size WxHxL mm (in.) | 703.8 x 510 x 48 (27.7 x 20.1 x 1.9) | 703.8 x 510 x 3 6 (27.7 x 20.1 x 1.4) |
| Fin Pitch mm (in.) | 4.0 mm (0.16) | 3.5 mm (0.14) |

## ■1HZ ENGINE

### 1. General

The following features have been adopted on the model for Australia and the HZJ105L-GCMNSV model for China to comply with the European STEP-II regulations:

- Emission Control System
- EGR System
- Injection Pump with TCV (Timing Control Valve) and BACS (Boost Altitude Compensation System)

**▶ Engine Specifications ◀**

| Model | | | Australia and HZJ105L-GCMNSV for China | G.C.C. and General Countries |
|---|---|---|---|---|
| No. of Cyls. & Arrangement | | | 6-Cylinder, In-line | ← |
| Valve Mechanism | | | 12-Valve OHC, Gear and Belt Drive | ← |
| Combustion Chamber | | | Swirl Type | ← |
| Manifolds | | | Cross-Flow | ← |
| Fuel System | | | Distributor Type (Mechanically Controlled) | ← |
| Displacement | | $cm^3$ (cu. in.) | 4164 (254.0) | ← |
| Bore x Stroke | | mm (in.) | 94.0 x 100.0 (3.70 x 3.94) | ← |
| Compression Ratio | | | 22.4 : 1 | ← |
| Max. Output | | SAE-NET | 96 kW @ 3800 rpm | ← |
| Max. Torque | | SAE-NET | 285 N·m @ 2200 rpm | ← |
| Valve Timing | Intake | Open | 8°BTDC | ← |
| | | Close | 36°ABDC | ← |
| | Exhaust | Open | 51°BBDC | ← |
| | | Close | 5°ATDC | ← |
| Firing Order | | | 1-4-2-6-3-5 | ← |
| Fuel Cetane Number | | | 48 or more | ← |
| Emission Regulation | | | European STEP II | — |
| Oil Grade | | | API CF-4 | ← |
| Engine Service Mass | | kg (lb) | 317 (699) | 313 (690) |

## 2. Major Difference

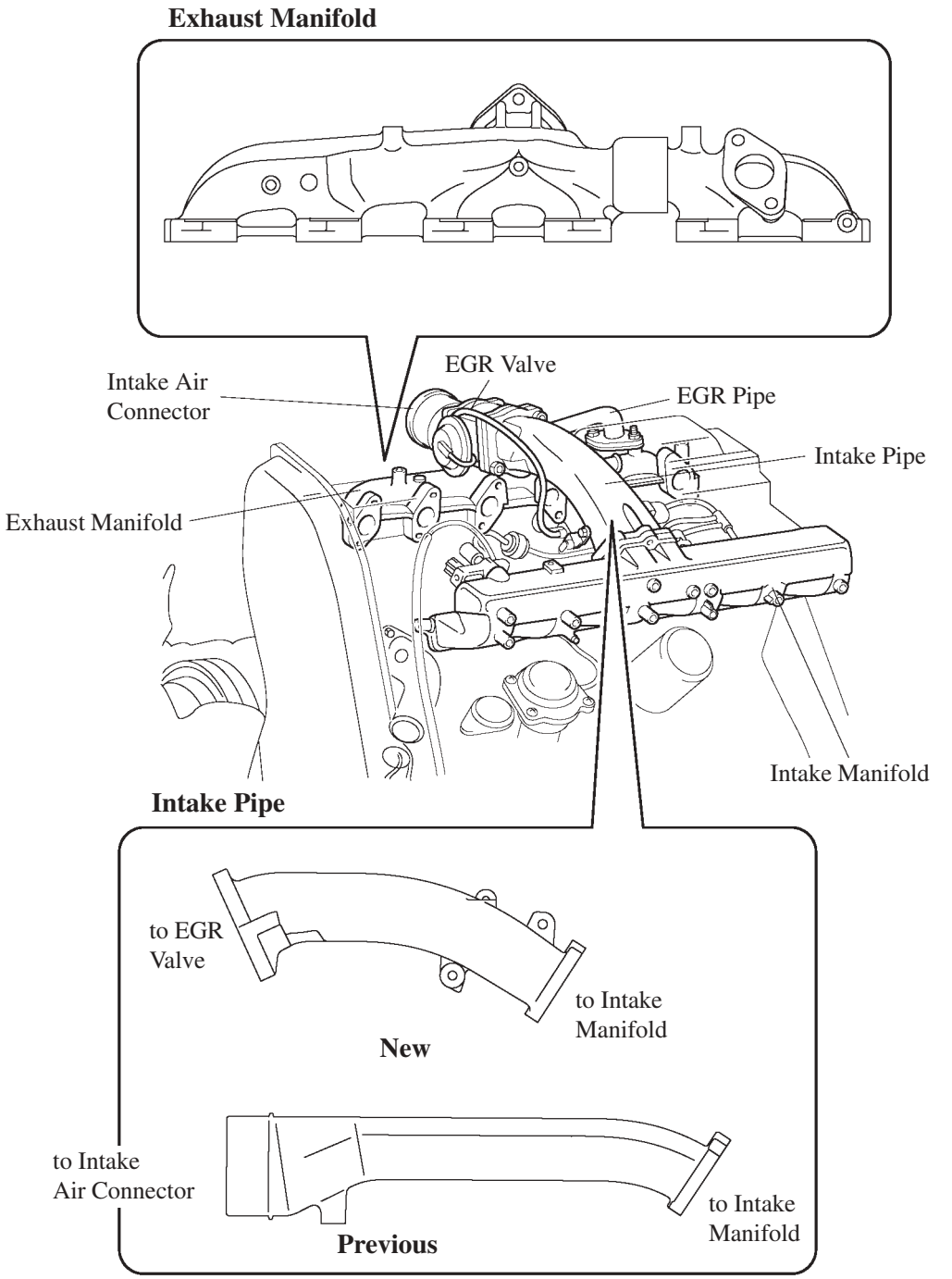
| Item | Outline |
|---|---|
| Lubrication System*1 | Adoption of oil level sensor |
| Intake and Exhaust System*2 (See Page 170) | ● Adoption of EGR system<br>● Adoption of stainless steel EGR pipe<br>● Changed shape of intake pipe to mount EGR valve<br>● Provided EGR pipe mounting flange on exhaust manifold |
| Fuel System (See Page 172) | ● Adopted BACS and TCV in injection pump*2<br>● Changed injection nozzle needle diameter*2<br>● A tether has been provided on the fuel filler cap*3 |
| Emission Control System*2 (See Page 173) | ● Adoption of the emission control ECU<br>● Adoption of the throttle position sensor<br>● Adoption of the water temperature sensor<br>● Adoption of the vacuum sensor<br>● Adoption of the engine speed sensor<br>● Adoption of diagnosis system and failsafe function<br>● Discontinuance of pre-heating timer<br>● The glow plug control that was previously handled by the pre-heating timer, has now been changed to the emission control ECU. |
| Other*3 | Configuration and structure are the same as previous model |

*1: Only for G.C.C Countries Model
*2: Australia and HZJ105L-GCMNSV for China
*3: All Model

## 3. Intake and Exhaust System

### General

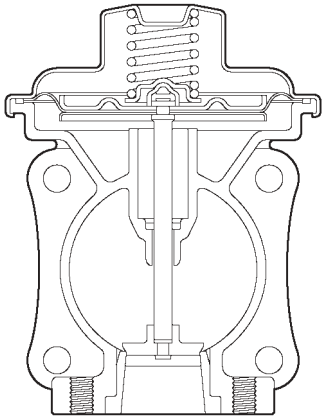
- An EGR valve has been provided in the intake passage.
- The shape of the intake pipe has been changed to mount the EGR valve.
- A flange for mounting the EGR pipe has been provided on the exhaust manifold.
- A stainless steel EGR pipe that excels in heat resistance and rust resistance has been adopted.




229LC114

## EGR Valve

By adopting the EGR valve in the intake pipe, this makes it possible to lower the temperature of the EGR valve and re-circulate the great amount of exhaust gas. For details of EGR control, see page 180.



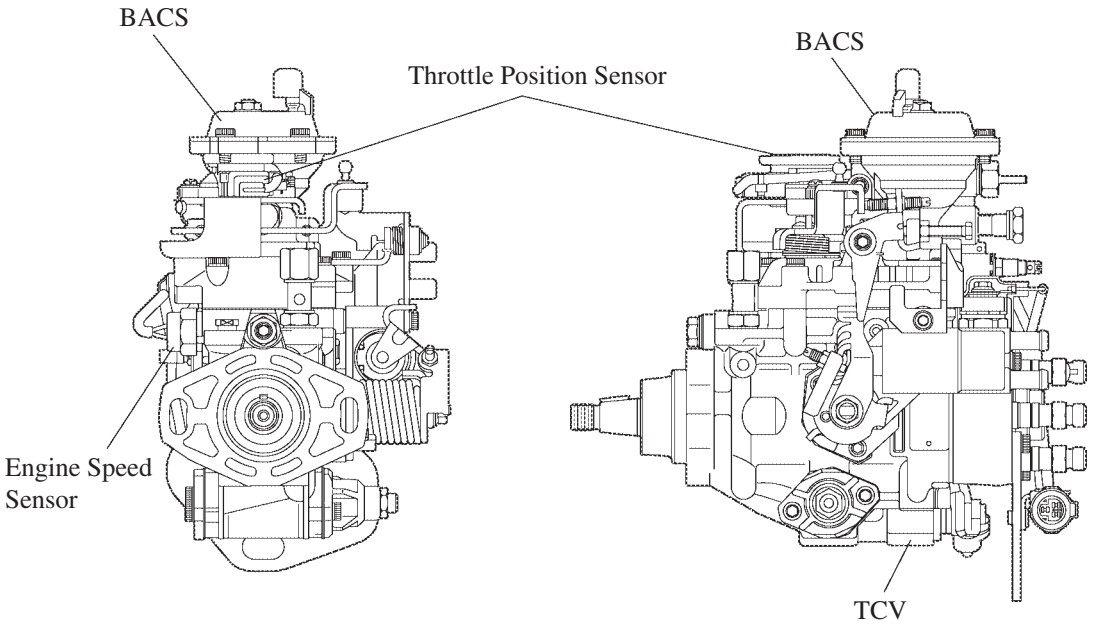
from Exhaust Manifold

229LC115

## 4. Fuel System

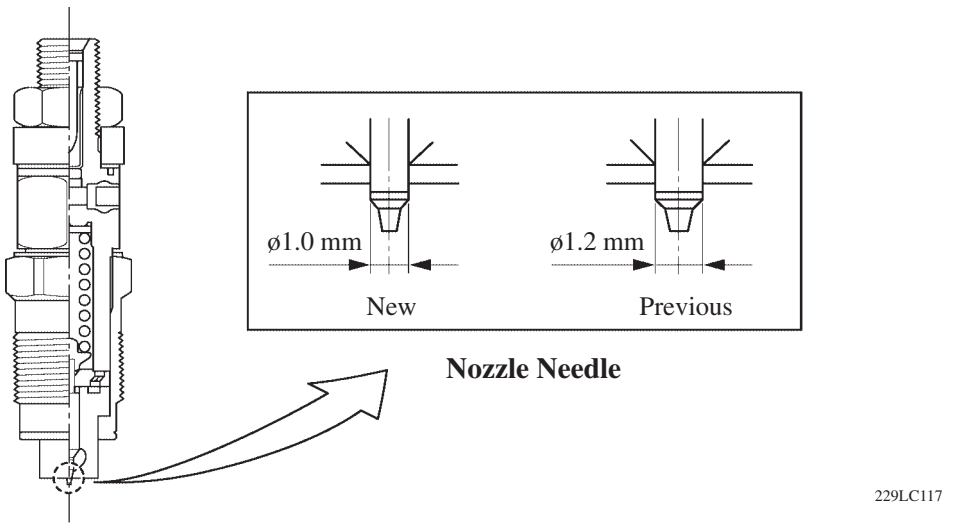
### General

Along with the adoption of the emission control system, a throttle position sensor, engine speed sensor, TCV, and BACS have been installed in the injection pump.
The basic construction and operation of the injection pump are the same as on the previous model.




### Injection Nozzle

The diameter of the nozzle needle has been changed (ø1.2 mm → ø1.0 mm) to optimize its injection characteristics.



## 5. Emission Control System

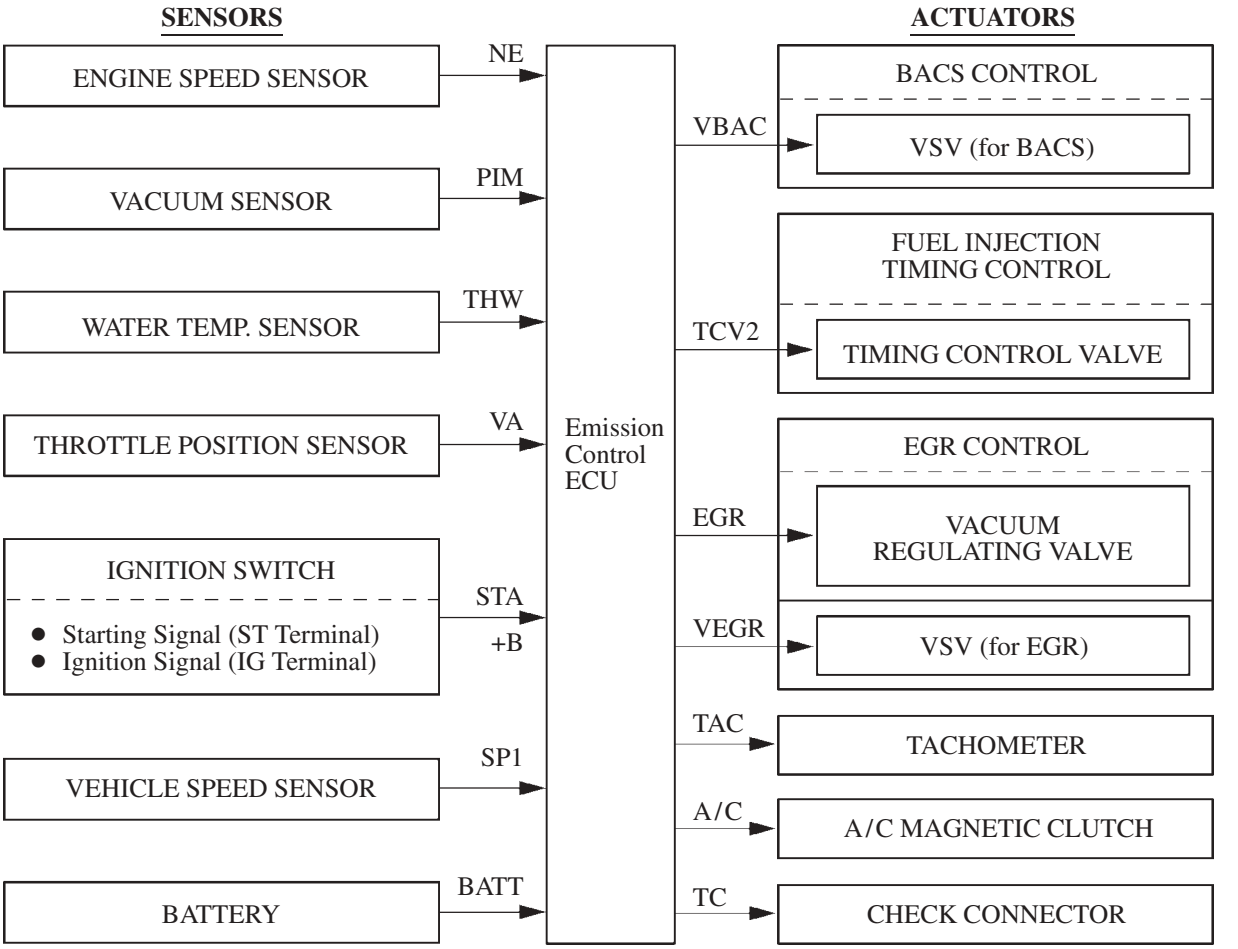
### General

The engine control system of the 1HZ engine has following system.

| System | Outline |
|---|---|
| Glow Plug Control | Controls the length of time when the current is applied to the glow plugs, in accordance with engine coolant temperature. |
| BACS Control (For details, see page 178) | Controls the vacuum that is applied to the BACS in accordance with the engine conditions, thus controlling the maximum injection volume and restraining the discharge of black smoke. |
| TCV Control (For details, see page 179) | Controls the fuel injection timing in accordance with the engine conditions. |
| EGR Control (For details, see page 180) | Controls the EGR volume via EGR valve in accordance with the engine condition. |
| Diagnosis (For details, see page 181) | When the emission control ECU detects a malfunction, the ECU diagnoses and memorizes the failed section. |
| Fail-Safe (For details, see page 181) | When the emission control ECU detects a malfunction, the ECU stops or controls the EGR control, fuel injection volume control and fuel injection timing control according to the data already stored in the memory. |

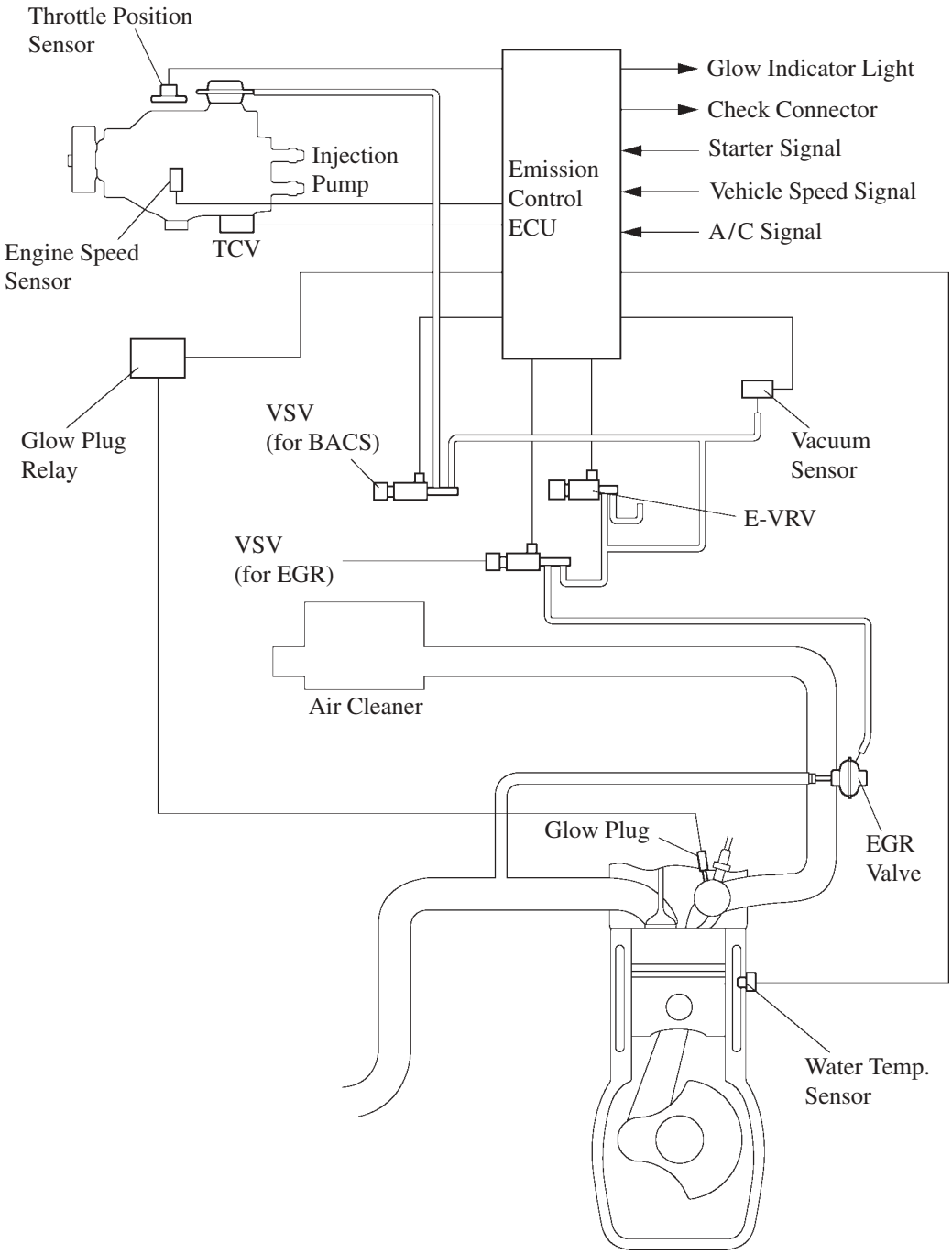
## Construction

The configuration of the emission control system in 1HZ engine is shown in the following chart.




229LC118

## Emission Control System Diagram



## Main Component of Emission Control System

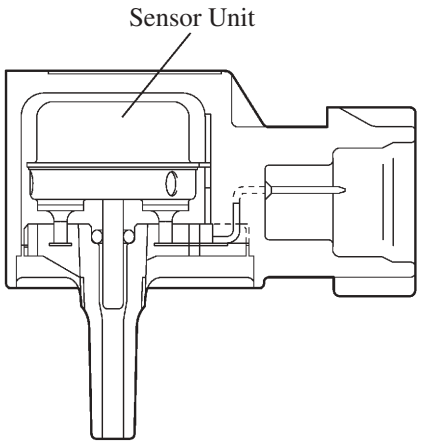
### 1) General

The main components of the emission control system are as follows:

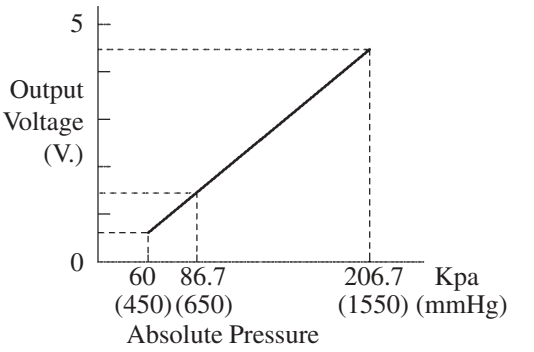
| Components | Outline | Quantity |
|---|---|---|
| Vacuum Sensor | Semiconductor Type | 1 |
| Engine Speed sensor (Rotor Teeth) | Pick-Up Coil Type (37) | 1 |
| Throttle Position Sensor | Linear Type | 1 |
| Water Temperature Sensor | Thermistor Type | 1 |

### 2) Vacuum Sensor

The vacuum sensor consists of a semiconductor, which utilizes the characteristic of a silicon chip that changes its electrical resistance when pressure is applied to it. The sensor converts the pressure into an electrical signal, and sends it to the emission control ECU in an amplified form.



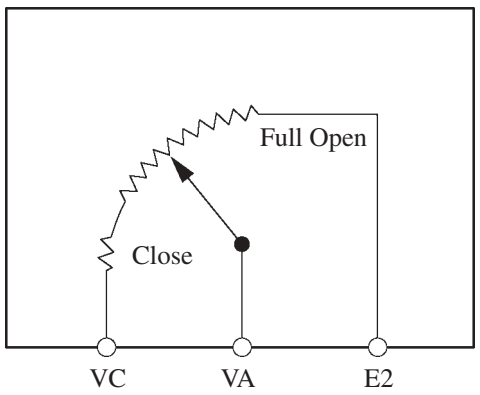

215EG09



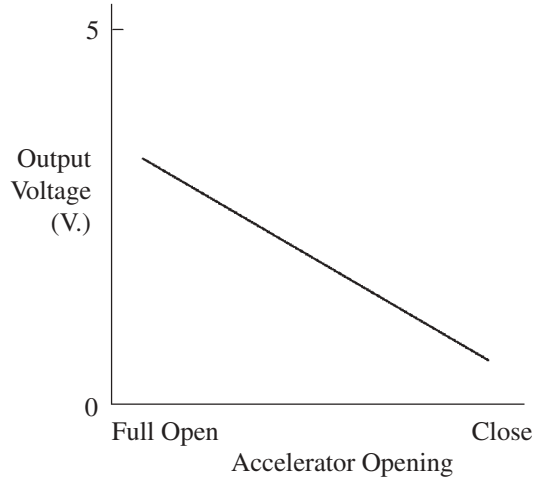

215EG10

### 3) Throttle Position Sensor

The throttle position sensor is mounted on the adjusting lever of the injection pump. It converts the accelerator opening into voltage and sends it as the throttle position signal to the ECU. A 5V constant voltage is applied to the VC terminal from the emission control ECU. As the contact point slides along the resistor in accordance with the accelerator opening, voltage is applied to the VA terminal in proportion to this angle.



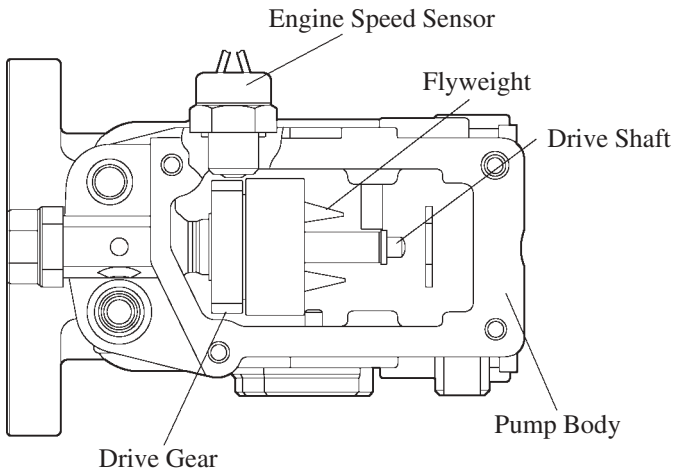

229LC120




229LC121

### 4) Engine Speed Sensor

The engine speed is detected by way of the flyweight gear teeth (37 teeth), which is driven by the drive shaft of the injection pump, and the pick-up coil of the engine speed sensor.

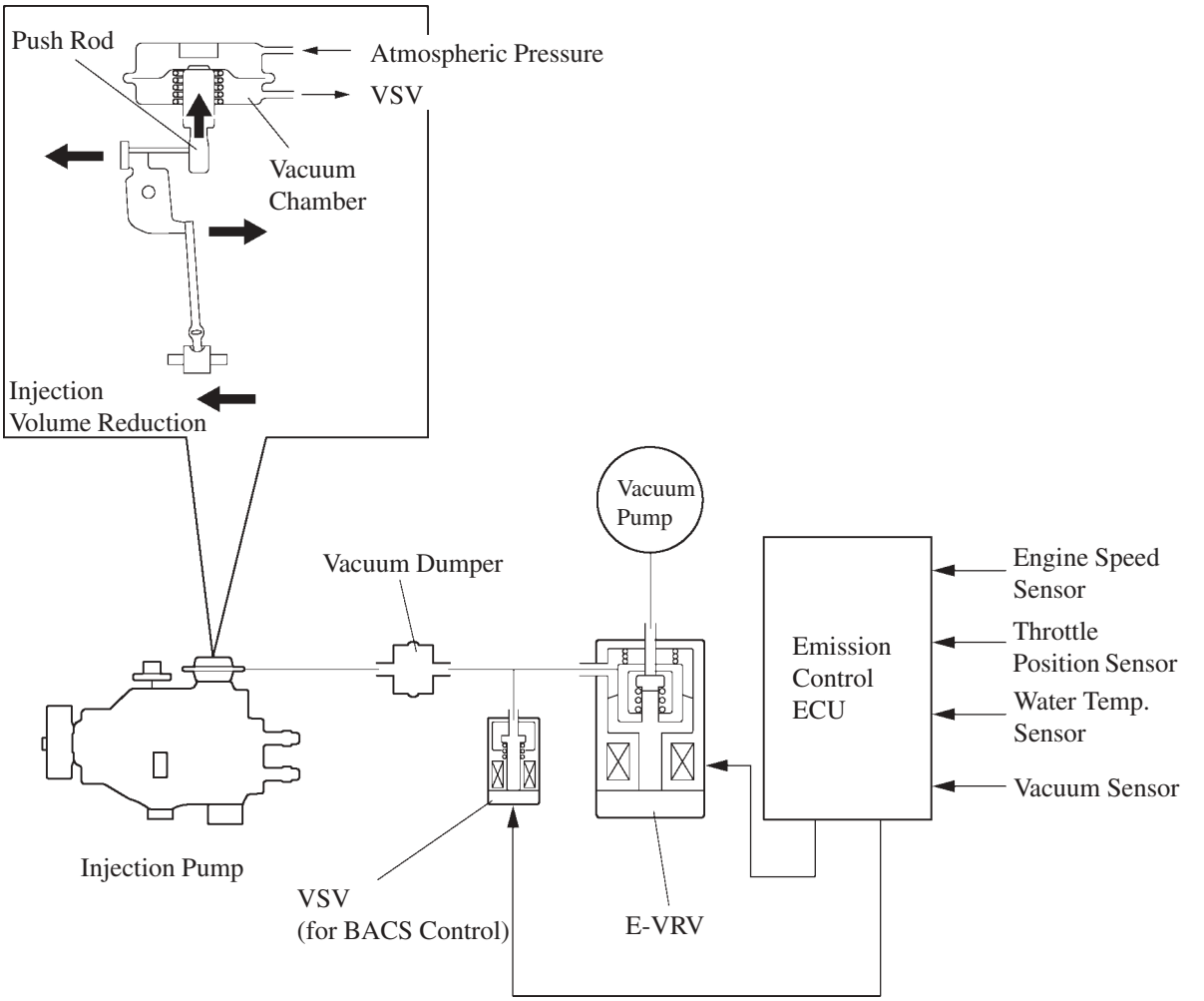



229LC122

6

### BACS Control

- When the intake air volume decreases while the vehicle is being driven at high altitudes, the emission control ECU, by way of the E-VRV, reduces the vacuum that acts on the bottom of the vacuum chamber diaphragm. Accordingly, the pushrod lifts up and the spill ring moves in the direction to reduce the injection volume, in order to reduce the maximum injection volume and restrain the discharge of black smoke.
- During sudden acceleration, the emission control ECU calculates the target BACS vacuum valve in accordance with the signals from the sensors (which determine the conditions of the engine). Then, by way of the E-VRV and VSV (for BACS), the emission control ECU controls the vacuum that acts on the bottom of the vacuum chamber diaphragm in order to control the maximum injection volume and restrain the discharge of black smoke.

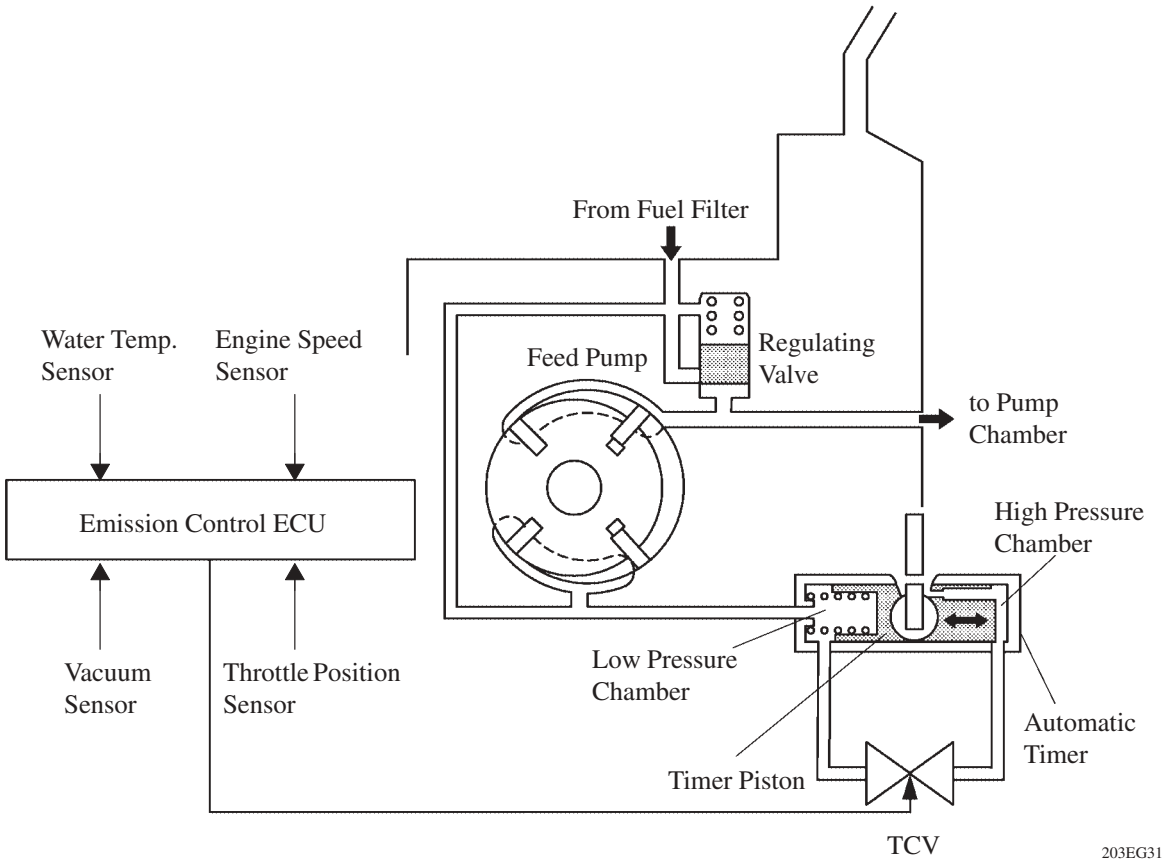



229LC123

## TCV Control

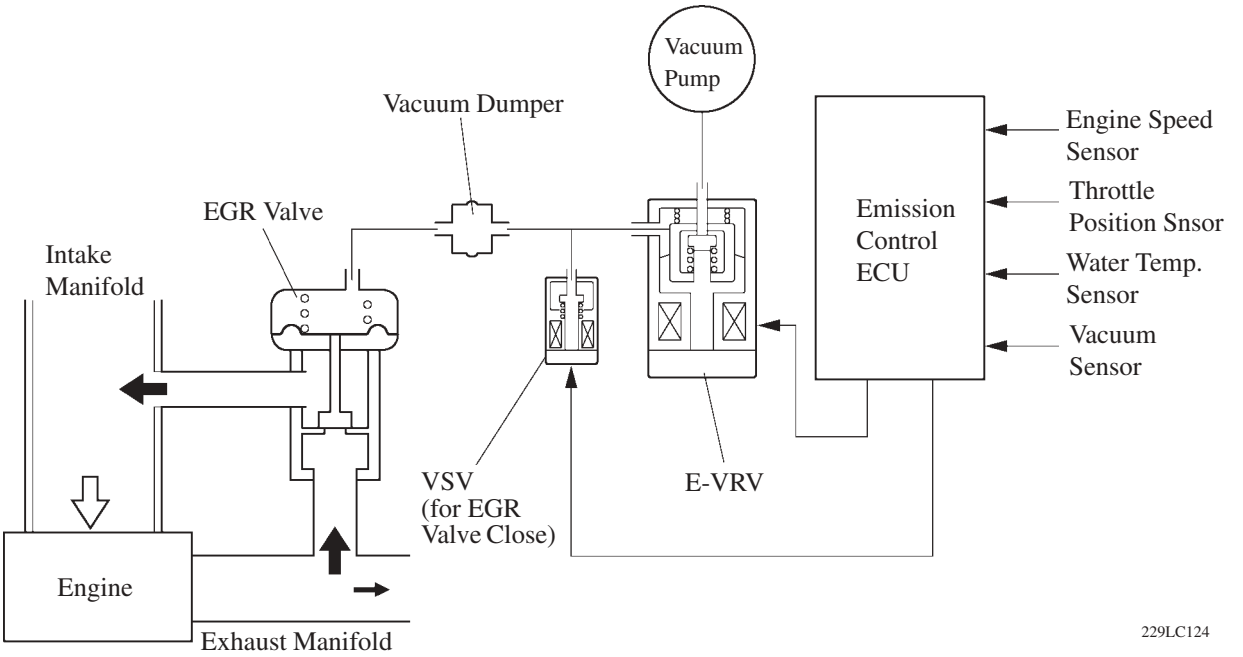
The TCV uses an automatic timer to optimize the timing advance control in accordance with the signals from the emission control ECU. As a result, it restrains the discharge of black smoke while the engine is operating at partial load.

- Engine operating at a full load:
  The TCV is inactive during a full load operation. Therefore, as with the previous model, the fuel pressure that is applied to the timer piston is mechanically controlled by way of the feed pump and the regulating valve in order to control the injection timing.
- Engine operating at a partial load:
  The TCV controls the fuel pressure that is applied to the timer piston in accordance with the signals from the emission control ECU in order to control the injection timing towards the retard side.



## EGR System

- This system is designed to reduce and control NOx formation due to a slight reduction of peak temperature in the engine combustion chamber, which is accomplished by introducing a small amount of inert gas into intake manifold.
- By sensing the engine driving conditions, the emission control ECU electrically operates both the E-VRV and VSV (for EGR valve close), which controls the magnitude of vacuum introduced into diaphragm of EGR valve.



## Diagnosis

- When the emission control ECU detects a malfunction, the emission control ECU makes a diagnosis and memorizes the failed section. Furthermore, glow indicator light in the combination meter illuminates or blinks to inform the driver. The emission control ECU will also store the DTC (Diagnosis Trouble Code) of the malfunctions.
- The DTC can be accessed by connecting the SST (09843-18020) to the check connector terminal TE1 and E1, and reading the blinking of the glow indicator light.

**▶ DTC List ◀**

| DTC No. | Detection Item | DTC No. | Detection Item |
|---|---|---|---|
| 13 | Engine Speed Sensor Circuit Malfunction | 42 | Vehicle Speed Sensor Signal Circuit Malfunction |
| 22 | Water Temp. Sensor Circuit Malfunction | 43 | Starter Signal Circuit Malfunction |
| 31 | Vacuum Sensor Circuit Malfunction | 51 | Switch Condition Signal Circuit Malfunction |
| 41 | Throttle Position Sensor Circuit Malfunction | 71 | EGR System Malfunction |



## Fail Safe

When the emission control ECU detects a malfunction, the emission control ECU stops or controls the EGR, BACS, TCV control according to the data already stored in the memory.

**▶ Fail Safe Control List ◀**

| Location of Malfunction | Description of Control |
|---|---|
| Water Temp. Sensor | ● Stops EGR control<br>● Stops BACS control<br>● Stops TCV control |
| Throttle Position sensor | |
| Vacuum Sensor | |
| Engine Speed Sensor | |

## ■ 1HD-FTE ENGINE

### 1. General

- A pipe, which retrieves the engine oil that has accumulated in the intercooler pipe, is provided on the throttle body.
- An intake restrictor control system, which uses the same step motor type intake restrictor valve that is used on the Europe model, has been adopted on the models for Australia and general countries.
- An oxidation catalytic converter has been provided on the model for Australia to comply with the European STEP-II regulations.

**▶ Engine Specifications ◀**

| Model | | | Australia | General Countries |
|---|---|---|---|---|
| No. of Cyls. & Arrangement | | | 6-Cylinder, In-line | ← |
| Valve Mechanism | | | 24-Valve OHC, Gear and Belt Drive | ← |
| Combustion Chamber | | | Direcrt Injection Type | ← |
| Manifolds | | | Cross-Flow | ← |
| Fuel System | | | EFI | ← |
| Displacement $cm^3$ (cu. in.) | | | 4164 (254.0) | ← |
| Bore x Stroke mm (in.) | | | 94.0 x 100.0 (3.70 x 3.94) | ← |
| Compression Ratio | | | 18.8 : 1 | ← |
| Max. Output SAE-NET | | | 150 kW @ 3400 rpm | 151 kW @ 3400 rpm |
| Max. Torque SAE-NET | | | 430 N·m @ 1400 ~ 3200 rpm | 431 N·m @ 1800 rpm |
| Valve Timing | Intake | Open | 12° BTDC | ← |
| | | Close | 24° ABDC | ← |
| | Exhaust | Open | 54° BBDC | ← |
| | | Close | 12° ATDC | ← |
| Firing Order | | | 1-4-2-6-3-5 | ← |
| Fuel Cetane Number | | | 48 or more | ← |
| Emission Regulation | | | European STEP II | — |
| Oil Grade | | | API CF-4 | ← |
| Engine Service Mass kg (lb.) | | | M/T : 348 (767)<br>A/T : 341 (752) | M/T : 347 (765)<br>A/T : 340 (750) |

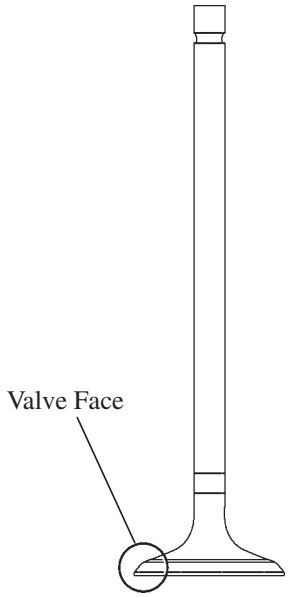
## 2. Major Difference

| Item | Outline | |
|---|---|---|
| Destination | Australia and General Countries Models | Europe Model |
| Valve Mechanism (See Page 183) | ● Change in surface treatment of intake valve<br>● Change in material of intake valve seat | |
| Intake and Exhaust System (See Page 184) | ● Adoption of the step motor type intake restrictor valve<br>● Discontinuance of intake shutter<br>● Provision of pipe on throttle body to retrieve engine oil that has accumulated in intercooler pipe<br>● Adoption of Oxidation Catalytic Converter* | ● Provision of pipe on throttle body to retrieve engine oil that has accumulated in intercooler pipe<br>● Adoption of metal gasket between turbocharger and exhaust manifold, and metal gasket for turbine outlet elbow |
| Fuel System | A tether has been provided on the fuel filler cap. | Configuration and structure are the same as previous Europe model |
| Engine Control System (See Page 186) | Adoption of the intake restrictor control system | |
| Other | Configuration and structure are the same as previous Europe model | |

*: Australia Model

## 3. Valve Mechanism

- To help protect the environment, a lead-free material has been adopted for the intake valve seat.
- The thickness of the tufftride process layer has been increased to improve the rigidity of the intake valve face.




229LC125

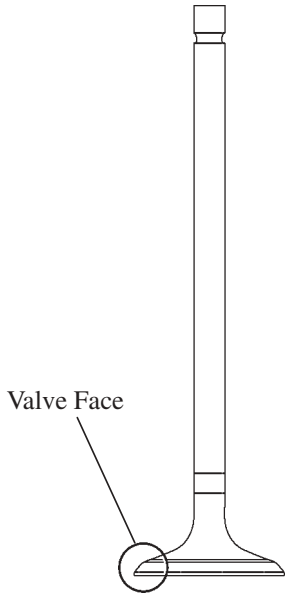
## 2. Major Difference

| Item | Outline | |
|---|---|---|
| Destination | Australia and General Countries Models | Europe Model |
| Valve Mechanism (See Page 183) | ● Change in surface treatment of intake valve<br>● Change in material of intake valve seat | |
| Intake and Exhaust System (See Page 184) | ● Adoption of the step motor type intake restrictor valve<br>● Discontinuance of intake shutter<br>● Provision of pipe on throttle body to retrieve engine oil that has accumulated in intercooler pipe<br>● Adoption of Oxidation Catalytic Converter* | ● Provision of pipe on throttle body to retrieve engine oil that has accumulated in intercooler pipe<br>● Adoption of metal gasket between turbocharger and exhaust manifold, and metal gasket for turbine outlet elbow |
| Fuel System | A tether has been provided on the fuel filler cap. | Configuration and structure are the same as previous Europe model |
| Engine Control System (See Page 186) | Adoption of the intake restrictor control system | |
| Other | Configuration and structure are the same as previous Europe model | |

*: Australia Model

## 3. Valve Mechanism

- To help protect the environment, a lead-free material has been adopted for the intake valve seat.
- The thickness of the tufftride process layer has been increased to improve the rigidity of the intake valve face.

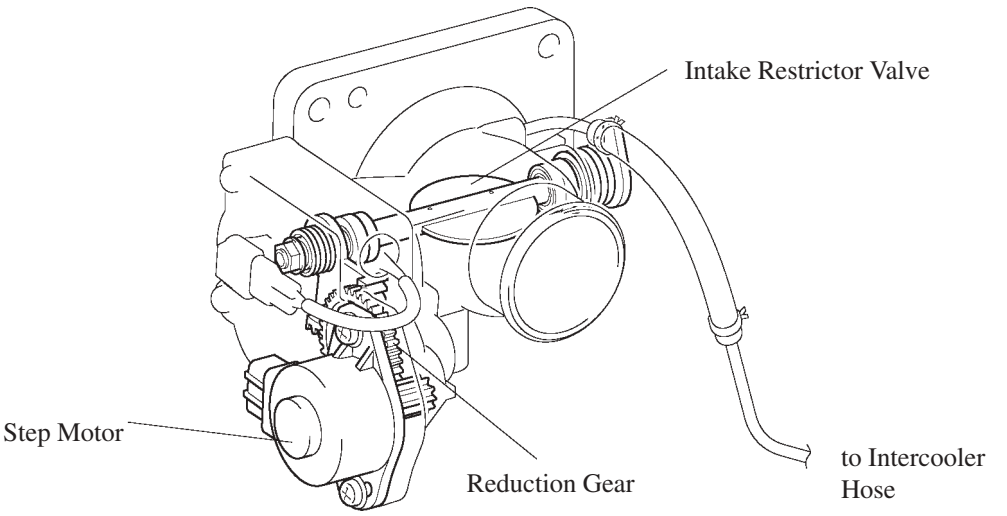



229LC125

## 4. Intake and Exhaust System

### Throttle Body

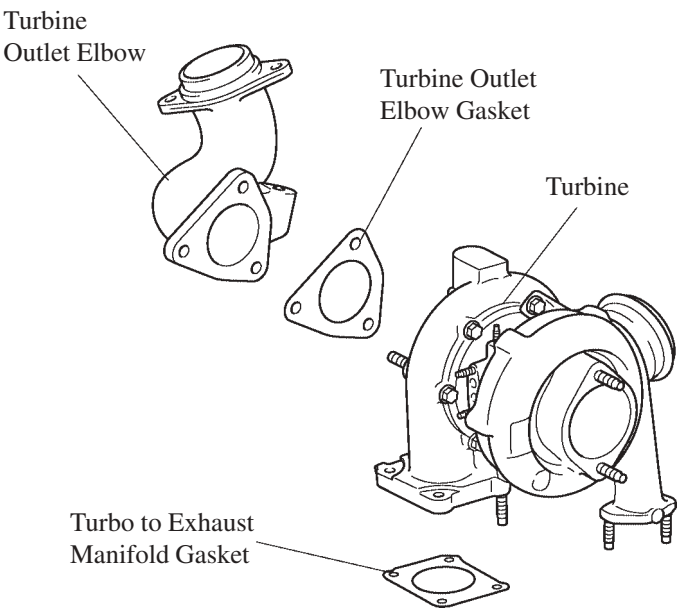
- A step motor type intake restrictor valve is used to improve EGR performance and to reduce the vibration when stopping the engine.
- A pipe, which utilizes the vacuum generated after the intake restrictor valve to retrieve the engine oil that has accumulated in the intercooler hose, has been provided.




229LC126

### Turbocharger

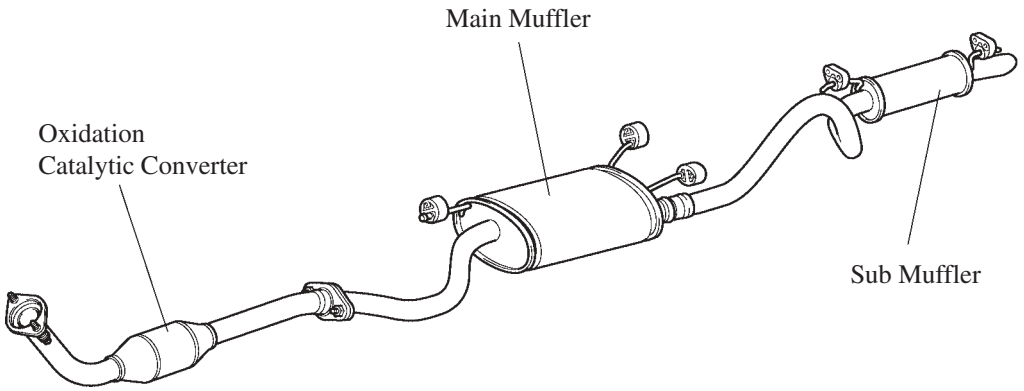
On the Europe model, metal gaskets that excel in sealing performance are used in the following areas: between the turbocharger and the exhaust manifold, and at the turbine outlet elbow.




229LC127

### Exhaust Pipe

An oxidation catalytic converter has been provided on the model for Australia to comply with the European STEP-II regulations.



## 5. Engine Control System

### General

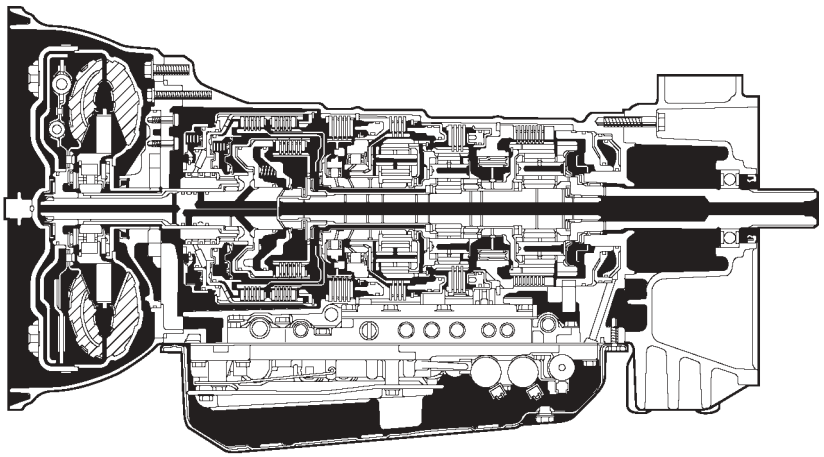
The engine control system of the 1HD-FTE engine on the new Land Cruiser (100 series) is basically same in construction and operation as that of the 1HD-FTE engine on the previous model.
The engine control system for the 1HD-FTE engine has following systems.

| System | Outline | New | | Previous |
|---|---|---|---|---|
| | | Australia and General Countries | Europe | Australia and General Countries |
| Fuel Injection Volume Control | Based on the signals received from the sensors, the engine ECU determines the fuel injection volume in accordance with the engine condition. | ○ | ○ | ○ |
| Fuel Injection Timing Control | Based on the signals received from the sensors, the engine ECU determines the fuel injection timing in accordance with the engine condition. | ○ | ○ | ○ |
| Idle Speed Control | The engine ECU determines the idle speed in accordance with the engine condition, and controls the fuel injection volume in order to achieve the target idle speed. | ○ | ○ | ○ |
| Stable Idling Control | Corrects the fuel injection volume that is directed to each cylinder during idling, thus reducing engine vibration. | ○ | ○ | ○ |
| Cruise Control | Controls the vehicle speed by regulating the injection volume in accordance with the instructions received from the cruise control ECU that is integrated in the engine ECU | ○ | ○ | ○ |
| Intake Restrictor Control | Fully close the intake restrictor valve in order to reduce the vibration when the engine is stopped. | ○ | ○ | ○ |
| EGR Control | Controls the EGR volume in accordance with the engine condition. | — | — | ○ |
| | Based on the signals received from the sensors, the engine ECU determines the EGR volume via EGR valve and intake restrictor valve in accordance with the engine condition. | ○ | ○ | — |
| Turbo Pressure Control | Based on the signals received from the sensors, the engine ECU controls the actuator via VRV in accordance with the engine condition. | — | ○ | — |
| Intake Heater Control | Controls the length of time when the current is applied to the intake heater in accordance with the coolant temperature. | ○ | ○ | ○ |
| Air Conditioner Cut-off Control | ● By turning the air conditioning compressor ON or OFF in accordance with the engine condition, drivability is maintained.<br>● Also controls the power heater on the models equipped with a power heater. | ○ | ○ | ○ |
| Engine Immobiliser | Prohibits fuel delivery and ignition if an attempt is made to start the engine with an invalid ignition key. | ○ | ○ | ○ |
| Diagnosis | When the engine ECU detects a malfunction, the engine ECU diagnoses and memorizes the failed section. | ○ | ○ | ○ |
| Fail-Safe | When the engine ECU detects a malfunction, the engine ECU stops or controls the engine according to the data already stored in the memory. | ○ | ○ | ○ |

## ■A750F AUTOMATIC TRANSMISSION

### 1. General

A newly developed A750F 5-speed automatic transmission [Super ECT (Electronically Controlled Transmission)] has been adopted on all the 2UZ-FE engine models and on the 1HD-FTE engine models for Australia and general countries.
In addition, the vehicle's fuel economy and driving performance have been improved by the change into a 5-speed.



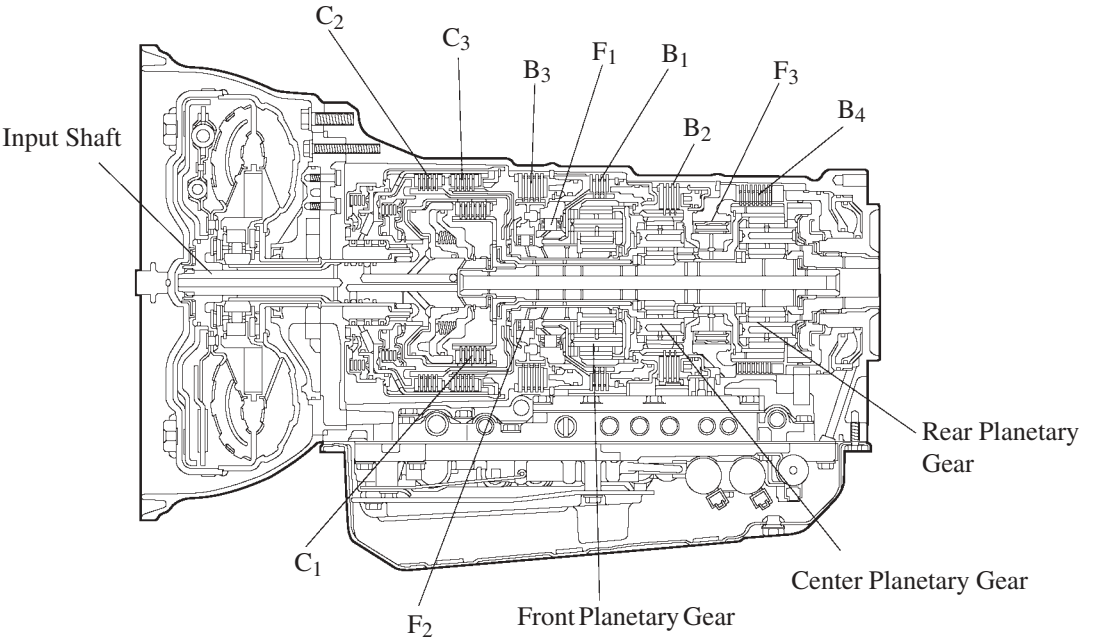
229LC170



**▶ Specifications ◀**

| Model | | New | | Previous | |
|---|---|---|---|---|---|
| Transmission Type | | A750F | | A343F | A442F |
| Engine Type | | 2UZ-FE | 1HD-FTE* | 2UZ-FE | 1HD-FTE |
| Gear Ratio | 1st | 3.520 | ← | 2.804 | 2.950 |
| | 2nd | 2.042 | ← | 1.531 | 1.530 |
| | 3rd | 1.400 | ← | 1.000 | 1.000 |
| | 4th | 1.000 | ← | 0.754 | 0.765 |
| | 5th | 0.716 | ← | — | — |
| | Reverse | 3.224 | ← | 2.393 | 2.678 |
| Fluid Capacity Liters (US qts, Imp. qts) | | 10.8 (11.4, 9.5) | 11.4 (12.0, 10.0) | 12.0 (12.7, 10.6) | 14.0 (14.8, 12.3) |
| Fluid Type | | ATF Type T-IV | ← | ATF D-II or equivalent | ← |
| Dry Weight | kg (lb) | 79.9 (176.1) | 85.7 (188.9) | 78.6 (173.3) | 100.0 (220.5) |

*: except Europe Model

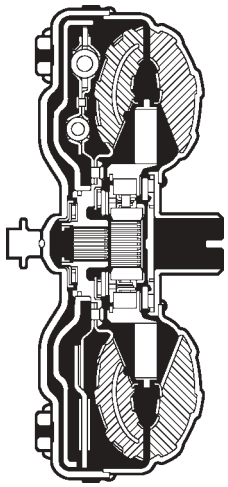



**▶ Specifications ◀**

| Model | | | | A750F | |
|---|---|---|---|---|---|
| | | | | 2UZ-FE | 1HD-FTE |
| $C_1$ | No.1 Clutch | The No. of Discs | | 6 | 7 |
| $C_2$ | No.2 Clutch | | | 5 | 6 |
| $C_3$ | No.3 Clutch | | | 5 | ← |
| $B_1$ | No.1 Brake | | | 3 | 4 |
| $B_2$ | No.2 Brake | | | 3 | 4 |
| $B_3$ | No.3 Brake | | | 4 | ← |
| $B_4$ | No.4 Brake | | | 8 | ← |
| $F_1$ | No.1 One-Way Clutch | The No. of Sprags | | 24 | ← |
| $F_2$ | No.2 One-Way Clutch | | | 25 | ← |
| $F_3$ | No.3 One-Way Clutch | | | 26 | ← |
| Front Planetary Gear | | The No. of Sun Gear Teeth | | 40 | ← |
| | | The No. of Pinion Gear Teeth | Inner | 21 | ← |
| | | | Outer | 22 | ← |
| | | The No. of Ring Gear Teeth | | 91 | ← |
| Center Planetary Gear | | The No. of Sun Gear Teeth | | 31 | ← |
| | | The No. of Pinion Gear Teeth | | 23 | ← |
| | | The No. of Ring Gear Teeth | | 77 | ← |
| Rear Planetary Gear | | The No. of Sun Gear Teeth | | 25 | ← |
| | | The No. of Pinion Gear Teeth | | 19 | ← |
| | | The No. of Ring Gear Teeth | | 63 | ← |

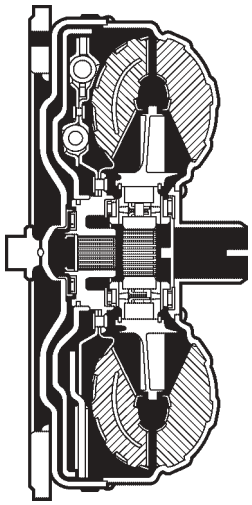
## 2. Torque Converter

- A compact, lightweight and high-capacity torque converter has been adopted.
- Compared to the previous model, this torque converter offers improved transmission efficiency and a more compact and lightweight construction by optimizing the fluid passages and the impeller configuration.
- The torque converter clutch of the 2UZ-FE engine model for Europe supports flex lock-up clutch control, thus improving the fuel economy.



**For 2UZ-FE Engine**

229LC172



**For 1HD-FTE Engine**

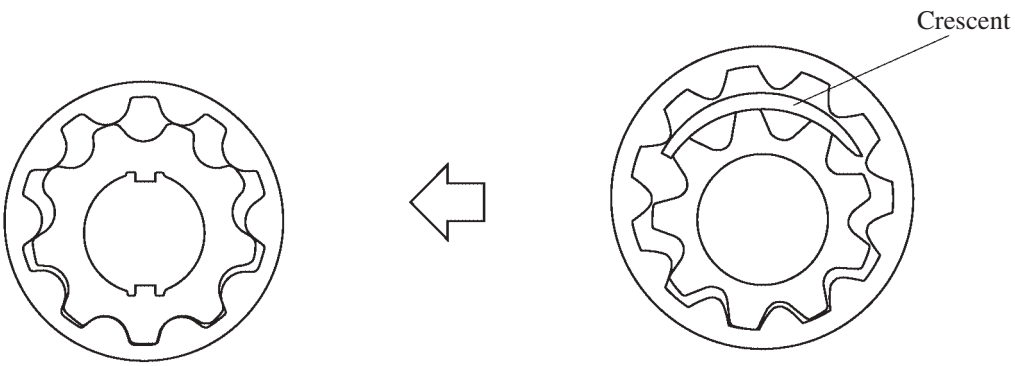
229LC173

**▶ Specification ◀**

| A/T type | A750F | | A343F | A442F |
|---|---|---|---|---|
| Engine type | 2UZ-FE | 1HD-FTE | 2UZ-FE | 1HD-FTE |
| Type | 3-Element, 1-Step, 2-Phase | ← | ← | ← |
| Stall Torque Ratio | 1.80 | 1.85 | 1.80 | 1.85 |
| Dry Weight kg (lb.) | 15.2 (33.5) | 19.6 (43.2) | 16.2 (35.7) | 18.3 (40.3) |

## 3. Oil Pump

A new type oil pump is used in which the shape of the teeth in the oil pump have been changed and the crescent has been discontinued. As a result, the oil pump has been made more compact, and the driving torque has been reduced, thus attaining excellent volumetric efficiency during low-speed operation.

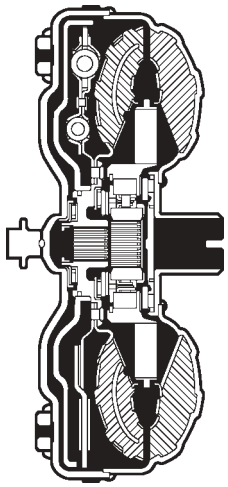



**A750F** **Conventional**

165CH10

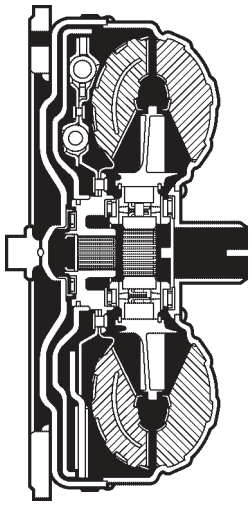
## 2. Torque Converter

- A compact, lightweight and high-capacity torque converter has been adopted.
- Compared to the previous model, this torque converter offers improved transmission efficiency and a more compact and lightweight construction by optimizing the fluid passages and the impeller configuration.
- The torque converter clutch of the 2UZ-FE engine model for Europe supports flex lock-up clutch control, thus improving the fuel economy.



**For 2UZ-FE Engine**

229LC172



**For 1HD-FTE Engine**

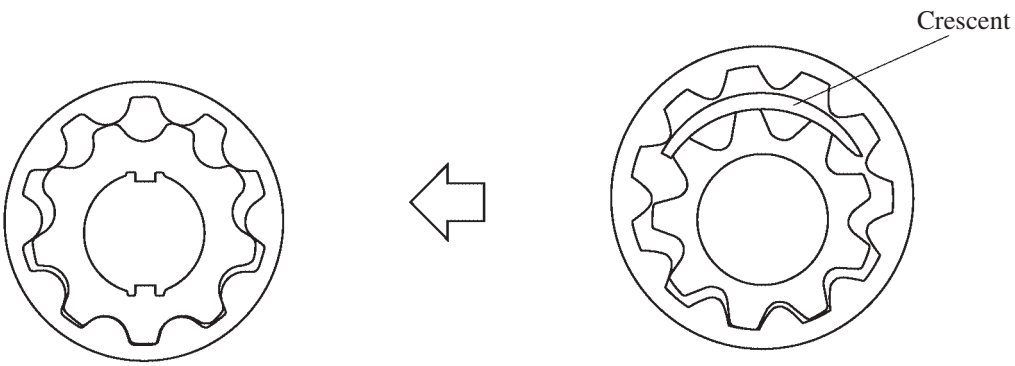
229LC173

**▶ Specification ◀**

| A/T type | A750F | | A343F | A442F |
|---|---|---|---|---|
| Engine type | 2UZ-FE | 1HD-FTE | 2UZ-FE | 1HD-FTE |
| Type | 3-Element, 1-Step, 2-Phase | ← | ← | ← |
| Stall Torque Ratio | 1.80 | 1.85 | 1.80 | 1.85 |
| Dry Weight kg (lb.) | 15.2 (33.5) | 19.6 (43.2) | 16.2 (35.7) | 18.3 (40.3) |

## 3. Oil Pump

A new type oil pump is used in which the shape of the teeth in the oil pump have been changed and the crescent has been discontinued. As a result, the oil pump has been made more compact, and the driving torque has been reduced, thus attaining excellent volumetric efficiency during low-speed operation.



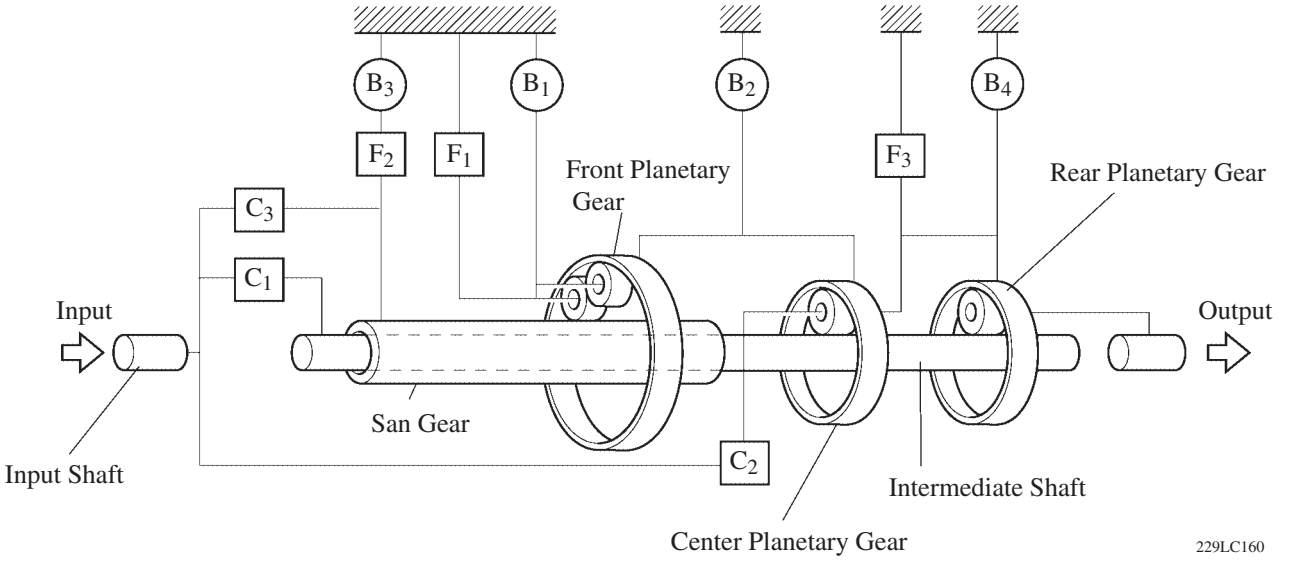

**A750F** **Conventional**

165CH10

## 4. Planetary Gear Unit

### Construction

- The 5-speed configuration has been achieved without increasing the number of planetary gears, thus creating a 5-speed automatic transmission, practically the same as the previous 4-speed automatic transmission.
- The front planetary carrier is made of aluminum to reduce the weight.
- A centrifugal fluid pressure canceling mechanism has been adopted in the $C_1$, $C_2$, and $C_3$ clutches that are applied when shifting from 2nd to 3rd, from 3rd to 4th and from 4th to 5th. For details, refer to page 195.




### Function of Component

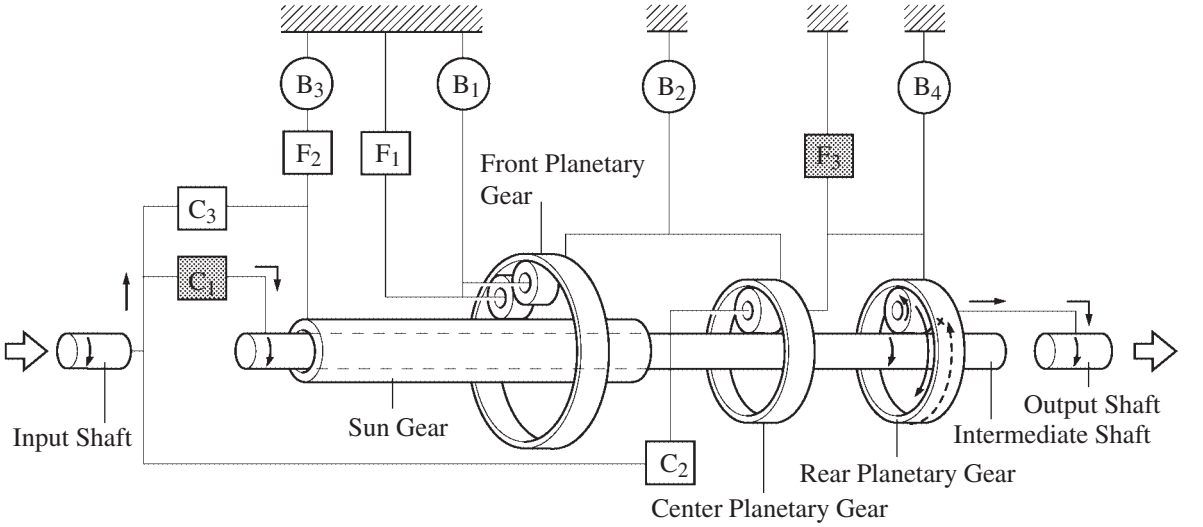
| Component | | Function |
|---|---|---|
| $C_1$ | No.1 Clutch | Connects input shaft and intermediate shaft. |
| $C_2$ | No.2 Clutch | Connects input shaft and center planetary carrier. |
| $C_3$ | No.3 Clutch | Connects input shaft and front sun gear. |
| $B_1$ | No.1 Brake | Prevents front planetary carrier from turning either clockwise or counterclockwise. |
| $B_2$ | No.2 Brake | Prevents front and center ring gear from turning either clockwise or counterclockwise. |
| $B_3$ | No.3 Brake | Prevents outer race of $F_2$ from turning either clockwise or counterclockwise. |
| $B_4$ | No.4 Brake | Prevents rear ring gear from turning either clockwise or counterclockwise. |
| $F_1$ | No.1 One-Way Clutch | Prevents front planetary carrier from turning counterclockwise. |
| $F_2$ | No.2 One-Way Clutch | When $B_3$ is operating, prevents planetary sun gear from turning counterclockwise. |
| $F_3$ | No.3 One-Way Clutch | Prevents center planetary carrier and rear ring gear from turning counterclockwise. |
| Planetary Gears | | These gears change the route through which driving force is transmitted, in accordance with the operation of each clutch and brake, in order to increase or reduce the input and output speed. |

## Transmission Power Flow

| Shift Lever Position | Gear | Solenoid Valve | | | | | | Clutch | | | Brake | | | | One-way | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | S1 | S2 | SR | SL1 | SL2 | SLU | $C_1$ | $C_2$ | $C_3$ | $B_1$ | $B_2$ | $B_3$ | $B_4$ | $F_1$ | $F_2$ | $F_3$ |
| P | Park | ON | | | | ON | | | | | | | | | | | |
| R | Reverse* | ON | | | | ON | | | | ○ | ○ | | | ○ | ○ | | |
| N | Neutral | ON | | | | ON | | | | | | | | | | | |
| D | 1st | ON | | | | ON | | ○ | | | | | | | | | ○ |
| | 2nd | ON | ON | | | ON | | ○ | | | | | ○ | | ○ | ○ | |
| | 3rd | | ON | | | ON | | ○ | | ○ | | | ● | | ○ | | |
| | 4th | | | | | ON | ON | ○ | ○ | ● | | | ● | | | | |
| | 5th | | | ON | ON | | ON | | ○ | ○ | ○ | | ● | | | | |
| 4 | 1st | ON | | | | ON | | ○ | | | | | | | | | ○ |
| | 2nd | ON | ON | | | ON | | ○ | | | | | ○ | | ○ | ○ | |
| | 3rd | | ON | | | ON | | ○ | | ○ | | | ● | | ○ | | |
| | 4th | | | | | ON | ON | ○ | ○ | ● | | | ● | | | | |
| 3 | 1st | ON | | | | ON | | ○ | | | | | | | | | ○ |
| | 2nd | ON | ON | | | ON | | ○ | | | | | ○ | | ○ | ○ | |
| | 3rd* | | ON | | | | | ○ | | ○ | ○ | | ● | | | | |
| 2 | 1st | ON | | | | ON | | ○ | | | | | | | | | ○ |
| | 2nd* | ON | ON | ON | | | | ○ | | | | ○ | ○ | | | | |
| L | 1st* | ON | | | | | | ○ | | | | | | ○ | | | |

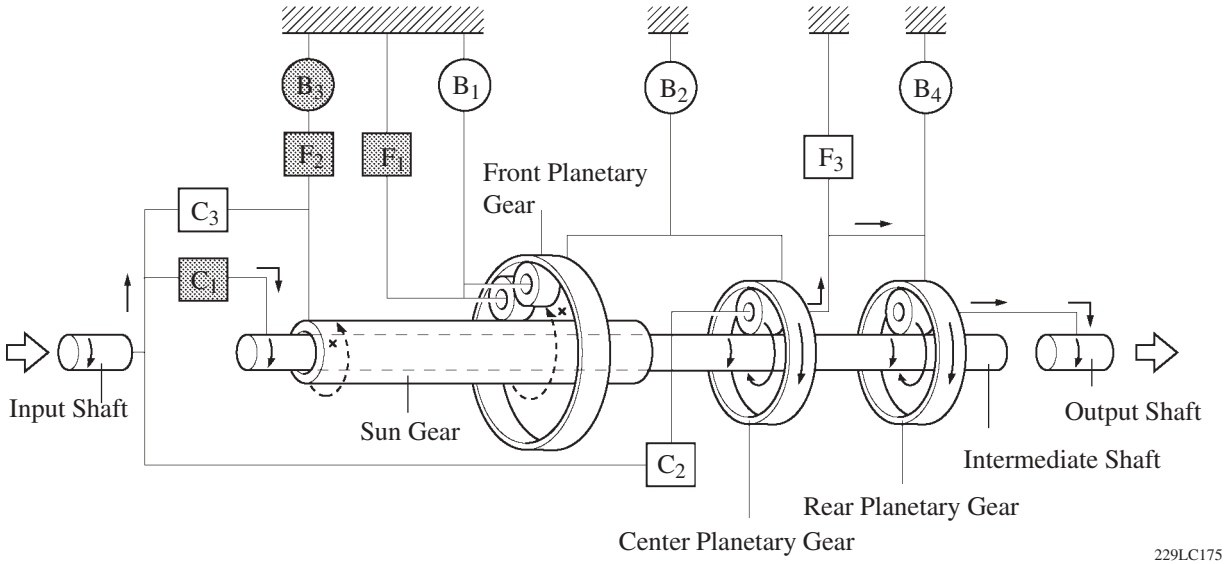
○ : Operation
● : Operate but is not related to power transmission
* : with Engine Brake

### 1st Gear (D, 4, 3 or 2 Position)



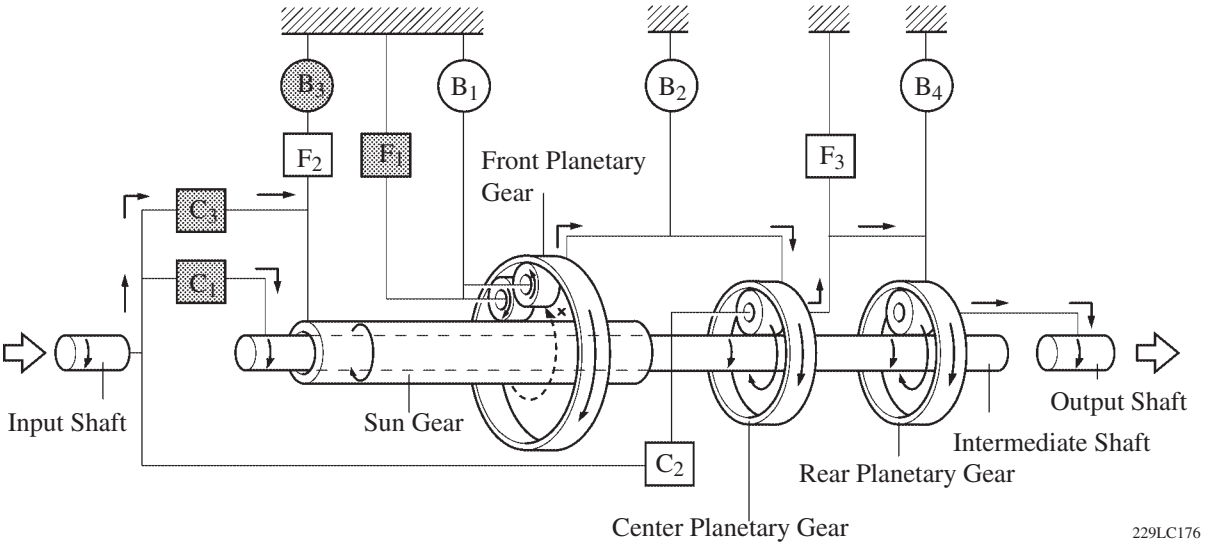

229LC174

### 2nd Gear (D, 4 or 3 Position)



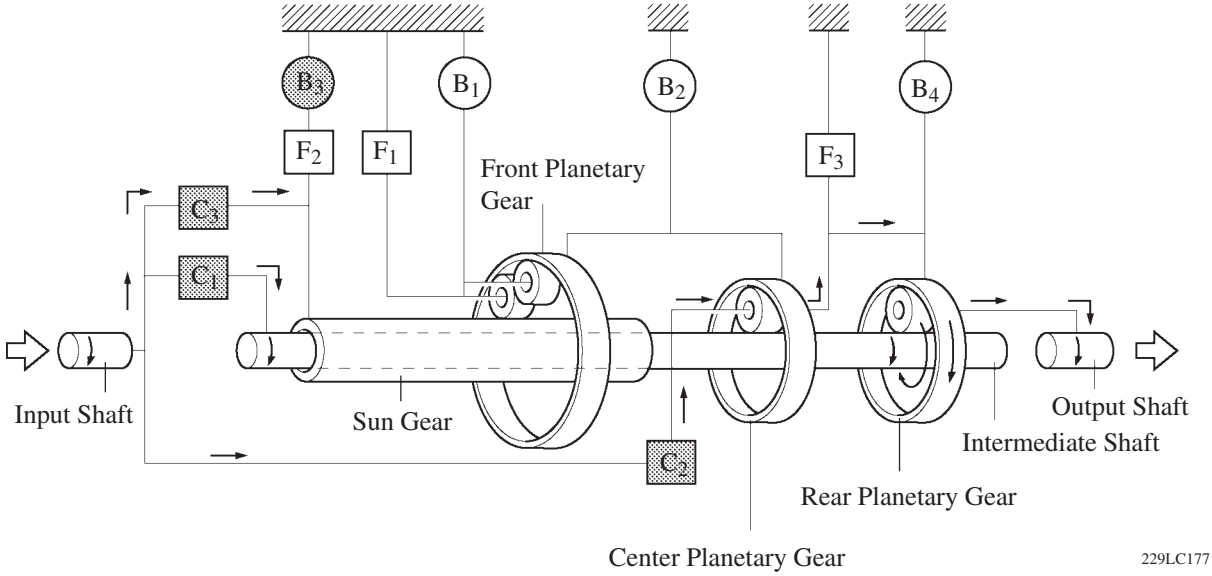

229LC175

### 3rd Gear (D or 4 Position)

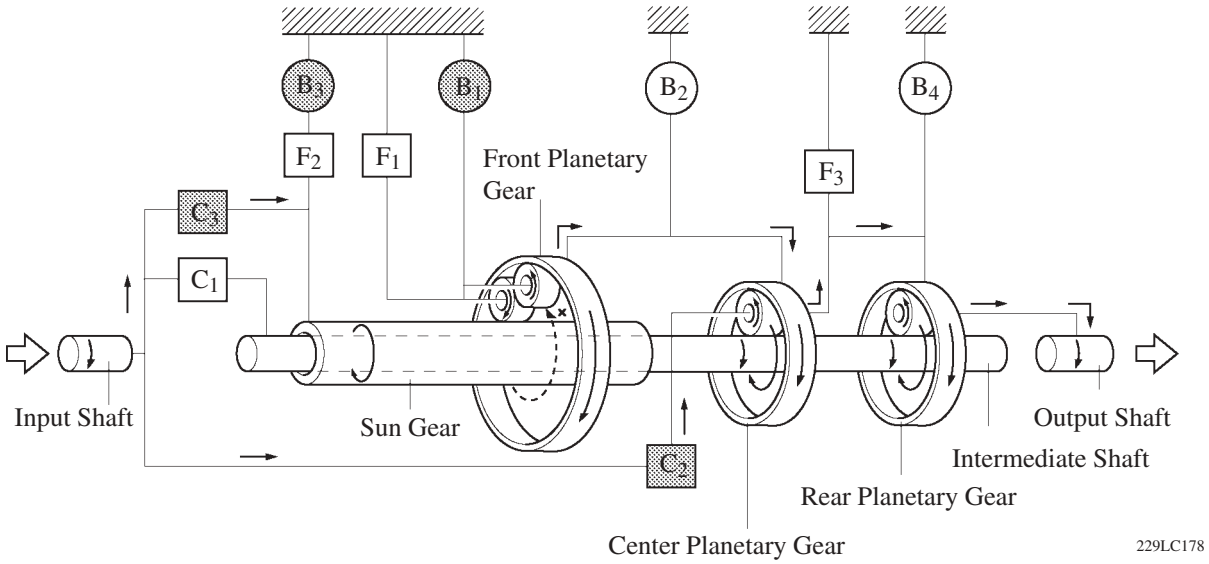



229LC176

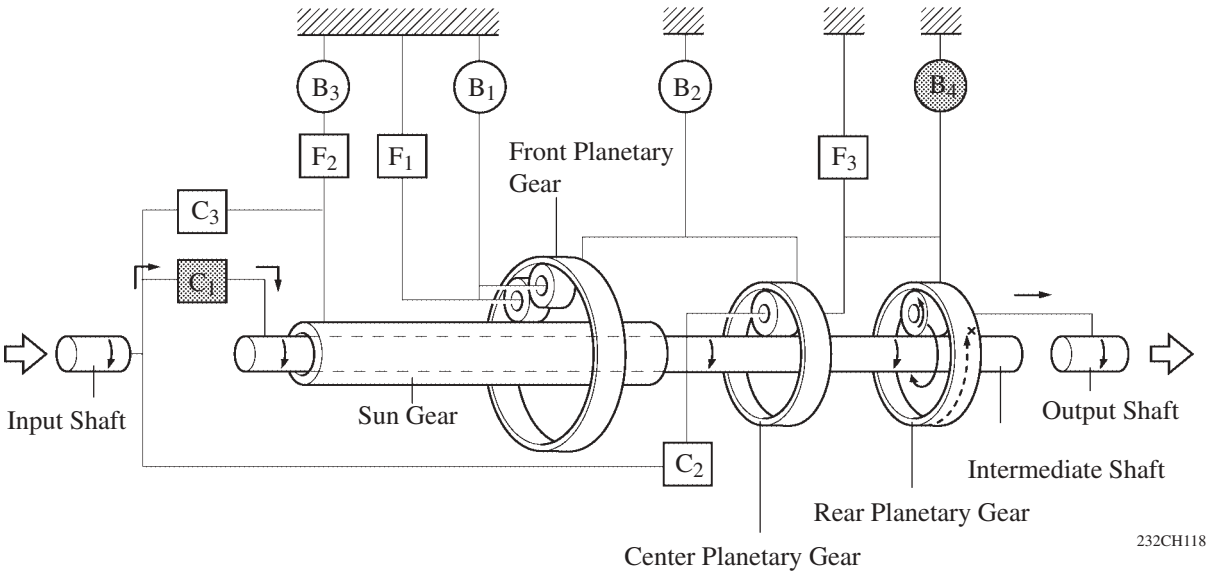
### 4th Gear (D or 4 Position)




### 5th Gear (D Position)

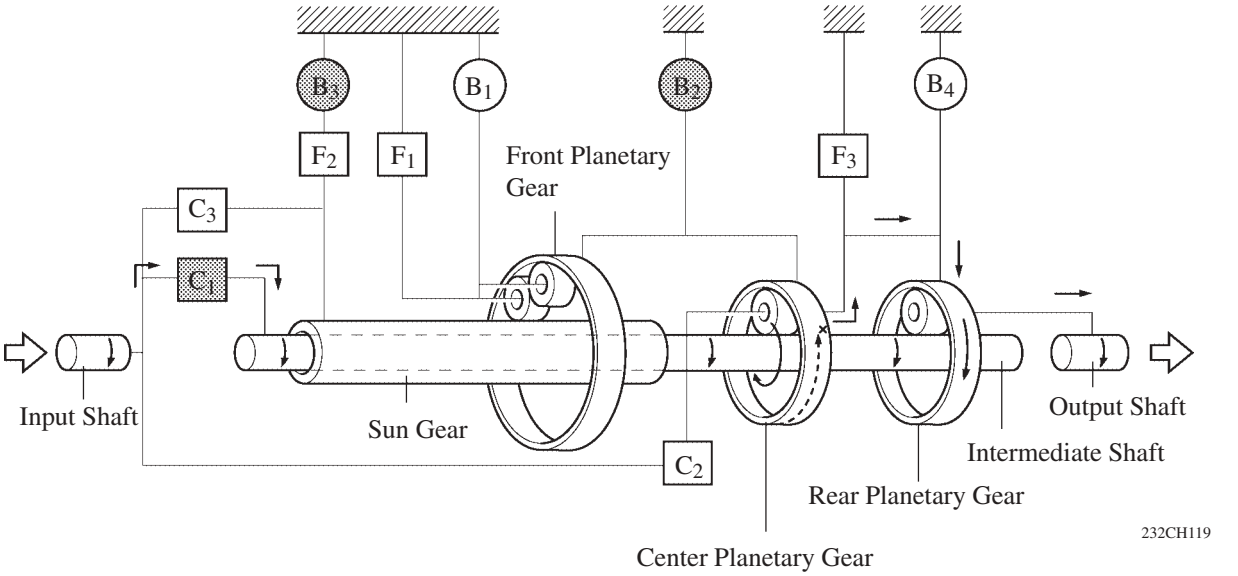



### 1st Gear (L Position)

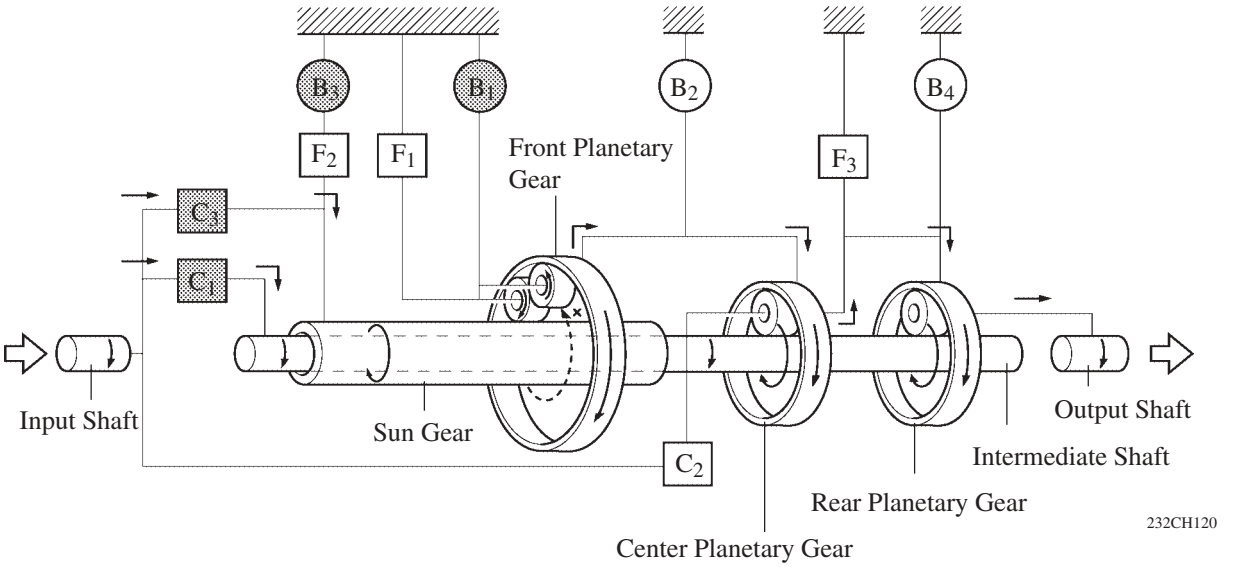



6

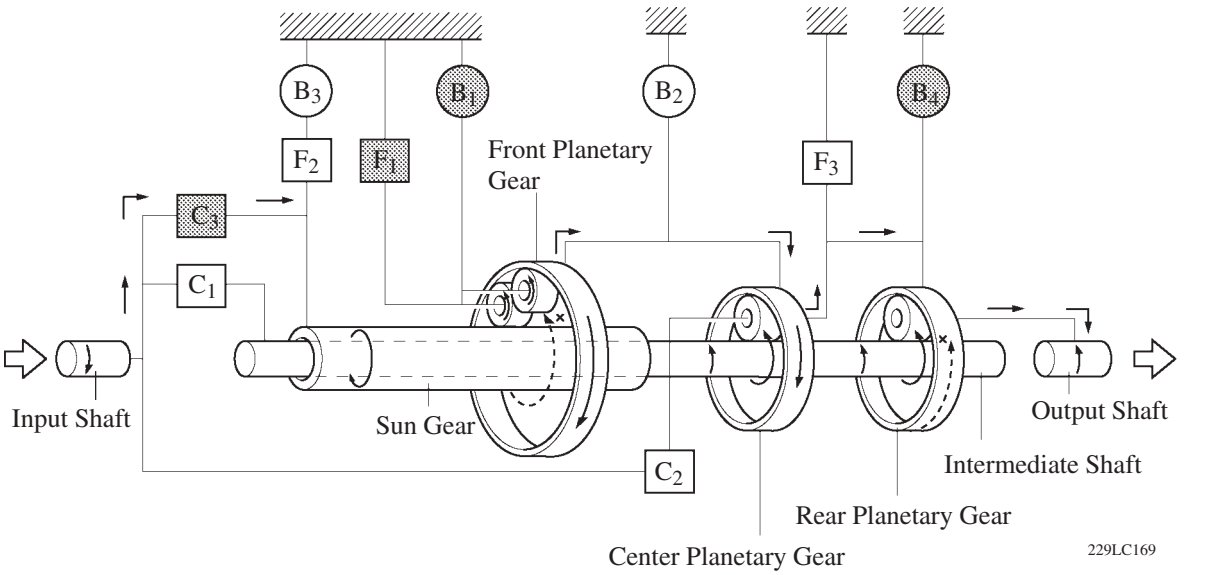
### 2nd Gear (2nd Position)




### 3rd Gear (3rd Position)




### Reverse Gear (R Position)

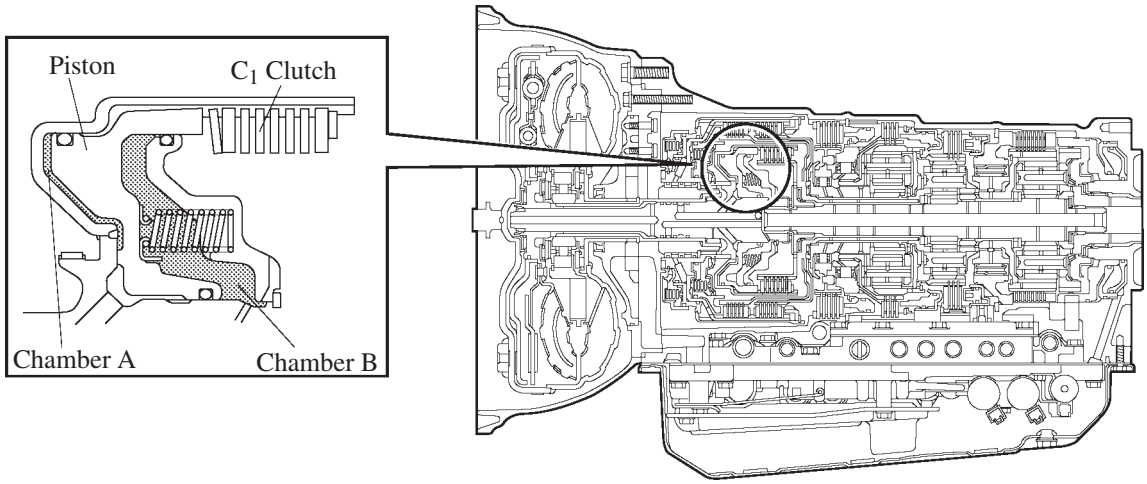


### Centrifugal Fluid Pressure Canceling Mechanism

There are two reasons for improving the conventional clutch mechanism:

- To prevent the generation of pressure by centrifugal force applied to the fluid in the piston fluid pressure chamber (hereafter referred to as "chamber A") when the clutch is released, a check ball is provided. Therefore, before the clutch could be subsequently applied, it took time to fill chamber A.
- During shifting, in addition to the original clutch pressure that is controlled by the valve body, centrifugal pressure acts on the fluid in the chamber A exerting increased pressure depending on RPM.

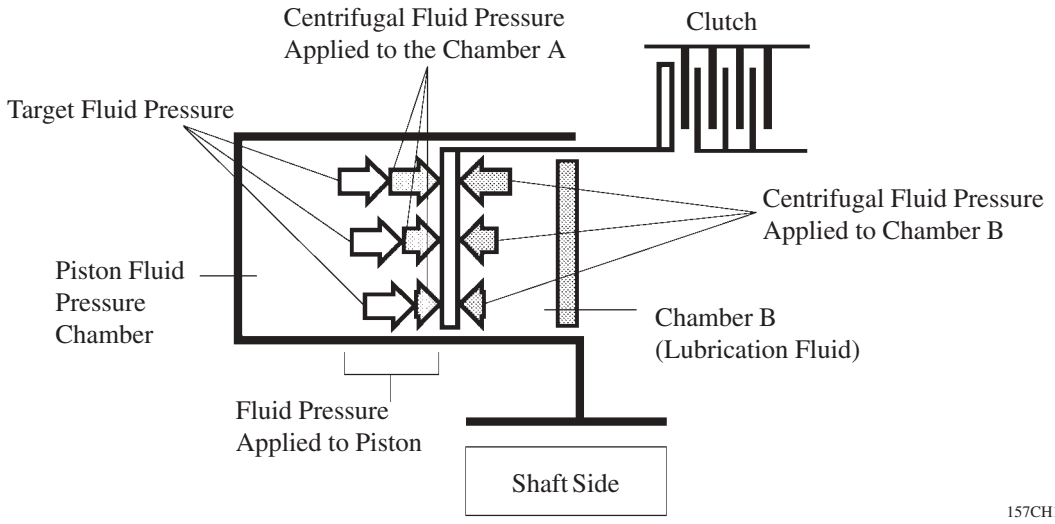
To address these two needs for improvement, a canceling fluid pressure chamber (hereafter referred to as "chamber B") has been provided opposite chamber A.




229LC168



By utilizing the lubrication fluid such as that of the shaft, the same amount of centrifugal force is applied, thus canceling the centrifugal force that is applied to the piston itself. Accordingly, it is not necessary to discharge the fluid through the use of a check ball, and a highly responsive and smooth shifting characteristic has been achieved.



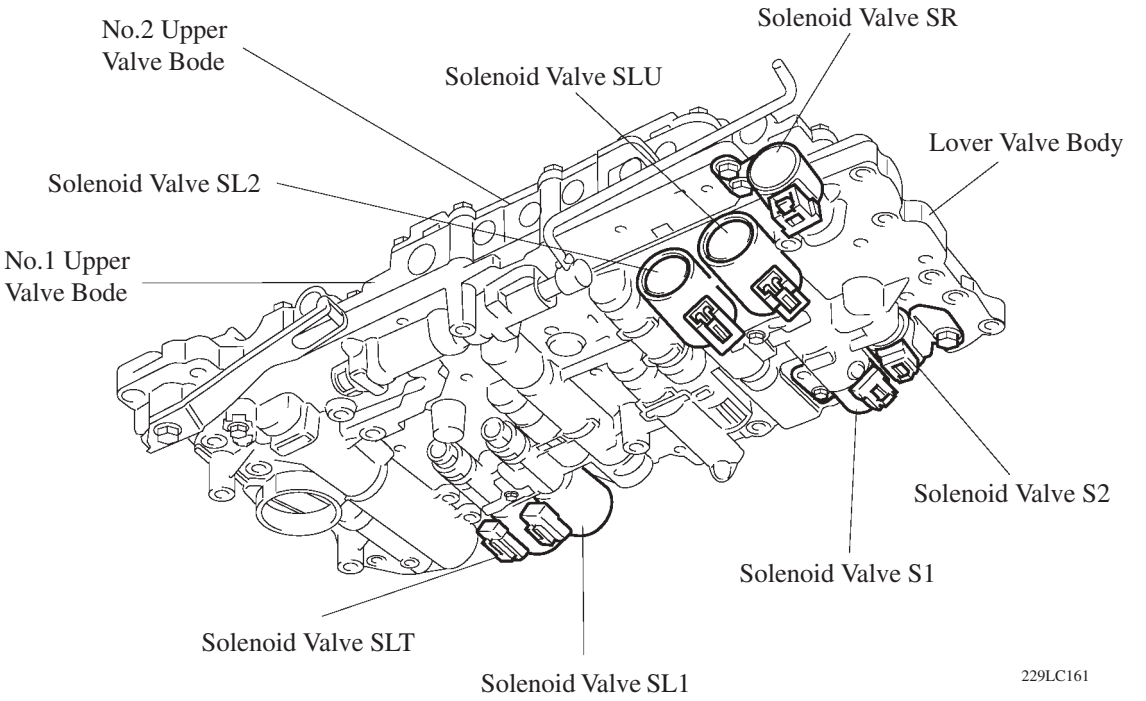

157CH17

| | | | | |
|---|---|---|---|---|
| Fluid pressure applied to piston | — | Centrifugal fluid pressure applied to chamber B | = | Target fluid pressure (original clutch pressure) |

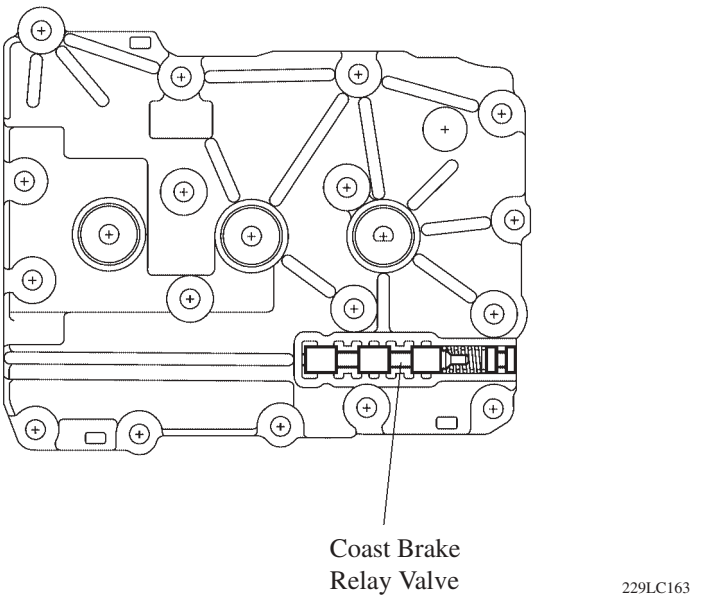
## 5. Valve Body Unit

### General

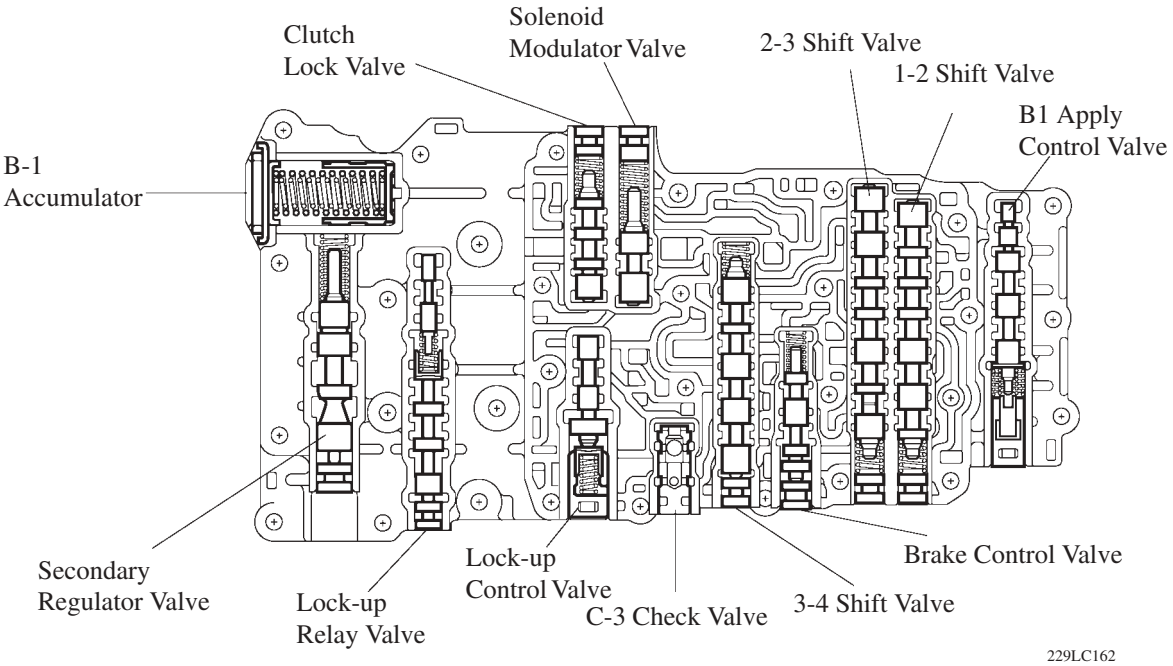
The valve body consists of the upper and lower valve bodies and 7 solenoid valves.



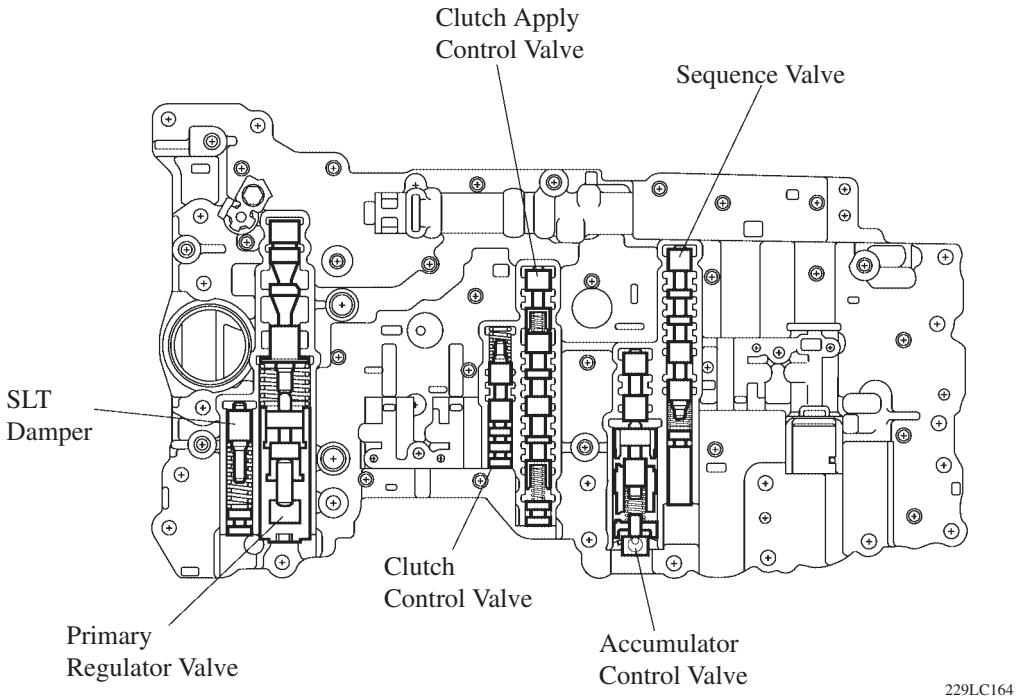

**▶ No.2 Upper Valve Body ◀**



**▶ No. 1 Upper Valve Body ◀**




**▶ Lower Valve Body ◀**

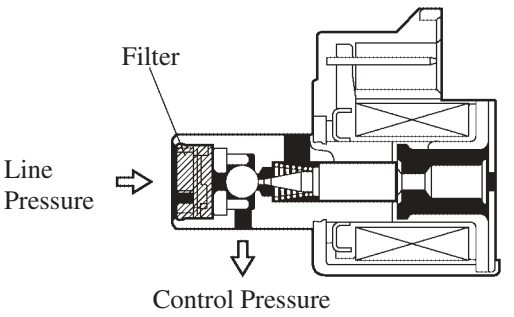



6

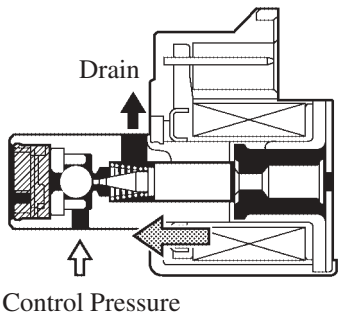
## Solenoid Valve

### 1) Solenoid Valve S1, S2 and SR

- Solenoid valves S1 and SR use a 3-way solenoid valve.
- Solenoid valve S2 uses a 2-way solenoid valve.
- A filter has been provided at the tip of the solenoid valve to further improve operational reliability.

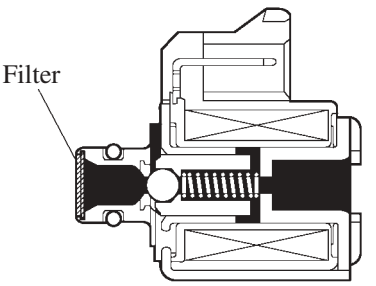



**Solenoid Valve S1 OFF**

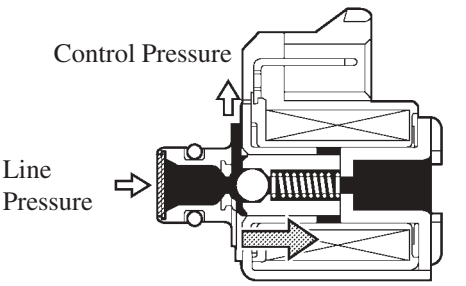



**Solenoid Valve S1 ON**

229LC165




**Solenoid Valve S2 OFF**




**Solenoid Valve S2 ON**

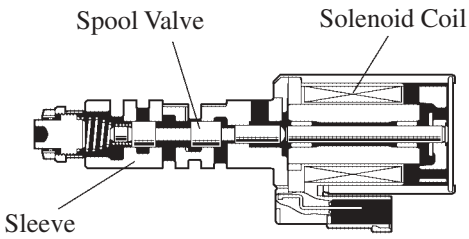
229LC166

**▶ Function of Solenoid Valve S1, S2 and SR ◀**

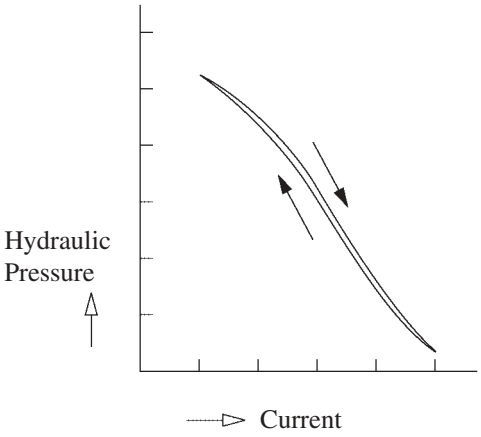
| Solenoid Valve | Type | Function |
|---|---|---|
| S1 | 3-way | Switches the 2-3 shift valve. |
| S2 | 2-way | ● Switches the 1-2 shift valve.<br>● Switches the 3-4 shift valve. |
| SR | 3-way | Switches the clutch apply control valve. |

### 2) Solenoid Valve SL1, SL2, SLT and SLU

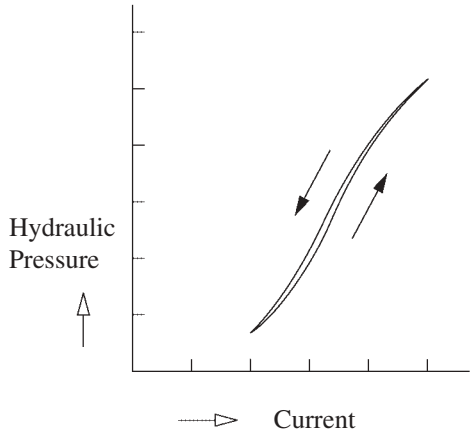
- In order to provided a hydraulic pressure that is proportion to current that flows to the solenoid coil, the solenoid valve SL1, SL2, SLT, and SLU linearly controls the line pressure and clutch and brake engagement pressure based on the signals it receives from the Engine & ECT ECU.
- The solenoid valves SL1, SL2, SLT, and SLU have the same basic structure.




**Solenoid Valve SLT**




**Solenoid Valve SL1, SL2 and SLT**




**Solenoid Valve SLU**

229LC181

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**▶ Function of Solenoid Valve SL1, SL2, SLT and SLU ◀**

| Solenoid Valve | Function |
|---|---|
| SL1 | ● $C_1$ clutch pressure control<br>● Accumulator back pressure control |
| SL2 | $B_1$, $B_2$ and $B_4$ clutch pressure control |
| SLT | ● Line pressure control<br>● Accumulator back pressure control |
| SLU | ● Lock-up clutch pressure control<br>● Accumulator back pressure control |

## 6. Electronic Control System

### General

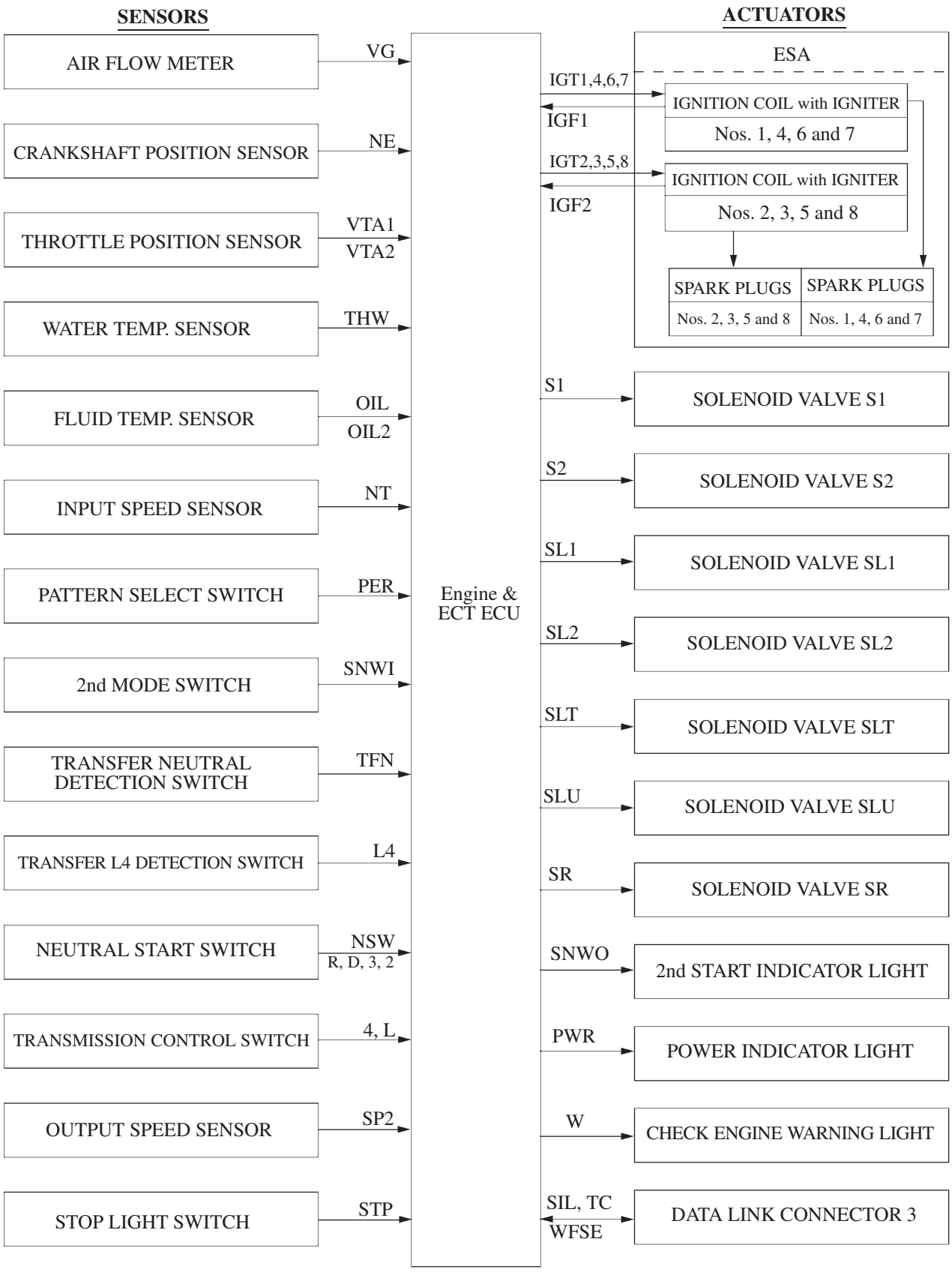
The electronic control system of the A750F automatic transmission consists of the controls listed below.

| System | Function | 2UZ-FE | 1HD-FTE |
|---|---|---|---|
| Clutch Pressure Control (See Page 205) | ● Controls the pressure that is applied directly to $B_1$ brake and $C_1$ clutch by actuating the linear solenoid valves SL1 and SL2 in accordance with the engine & ECT ECU signals.<br>● The solenoid valve SLT and SL1 minutely controls the clutch pressure in accordance with the engine output and driving conditions. | ○ | ○ |
| Line Pressure Optimal Control (See Page 206) | Actuates the solenoid valve SLT to control the line pressure in accordance with information from the engine & ECT ECU and the operating conditions of the transmission. | ○ | ○ |
| Engine Torque Control | Retards the engine ignition timing temporarily to improve shift feeling during up or down shifting. | ○ | — |
| | Effects engine torque control in accordance with the fuel injection volume to reduce the shift shock | — | ○ |
| Shift Timing Control | The engine & ECT ECU sends current to the solenoid valve S1, S2 and/or SR based on signals from each sensor and shifts the gear. | ○ | ○ |
| Flex Lock-up Clutch Control (See Page 207) | Controls the solenoid valve SLU, provides an intermediate mode between the ON/OFF operation of the lock-up clutch, and increase the operating range of the lock-up clutch to improve fuel economy. | ○* | — |
| Lock-up Timing Control | The engine & ECT ECU sends current to the shift solenoid valve SLU based on signals from each sensor and engages or disengages the lockup clutch. | ○ | ○ |
| "N" to "D" Squat Control | When the shift lever is shifted from "N" to "D" position, the gear is temporarily shifted to 2nd and then to 1st to reduce vehicle squat. | ○ | ○ |
| 2nd Start System | Enabling the vehicle to take off in the 2nd gear and thus make it easy to take off on snowy, sandy or muddy terrain. | ○ | ○ |
| AI (artificial Intelligence) -SHIFT (See Page 208) | Based on the signals from various sensors, the engine & ECT ECU determines the road conditions and the intention of the driver. Thus, the shift pattern is automatically regulated to an optimal level, thus improving drivability. | ○ | ○ |
| Diagnosis | When the engine & ECT ECU detects a malfunction, the engine & ECT ECU makes a diagnosis and memorizes the failed section. | ○ | ○ |
| | To increase the speed for processing the signals, the 32-bit CPU of the engine & ECT ECU has been adopted. | ○ | ○ |
| Fail-safe | Even if a malfunction is detected in the sensors or solenoids, the engine & ECT ECU effects fail-safe control to prevent the vehicle's drivability from being affected significantly. | ○ | ○ |

*: Only for Europe Model

## Construction

The configuration of the electronic control system in the 2UZ-FE engine model's A750F is as shown in the following chart.




229LC129

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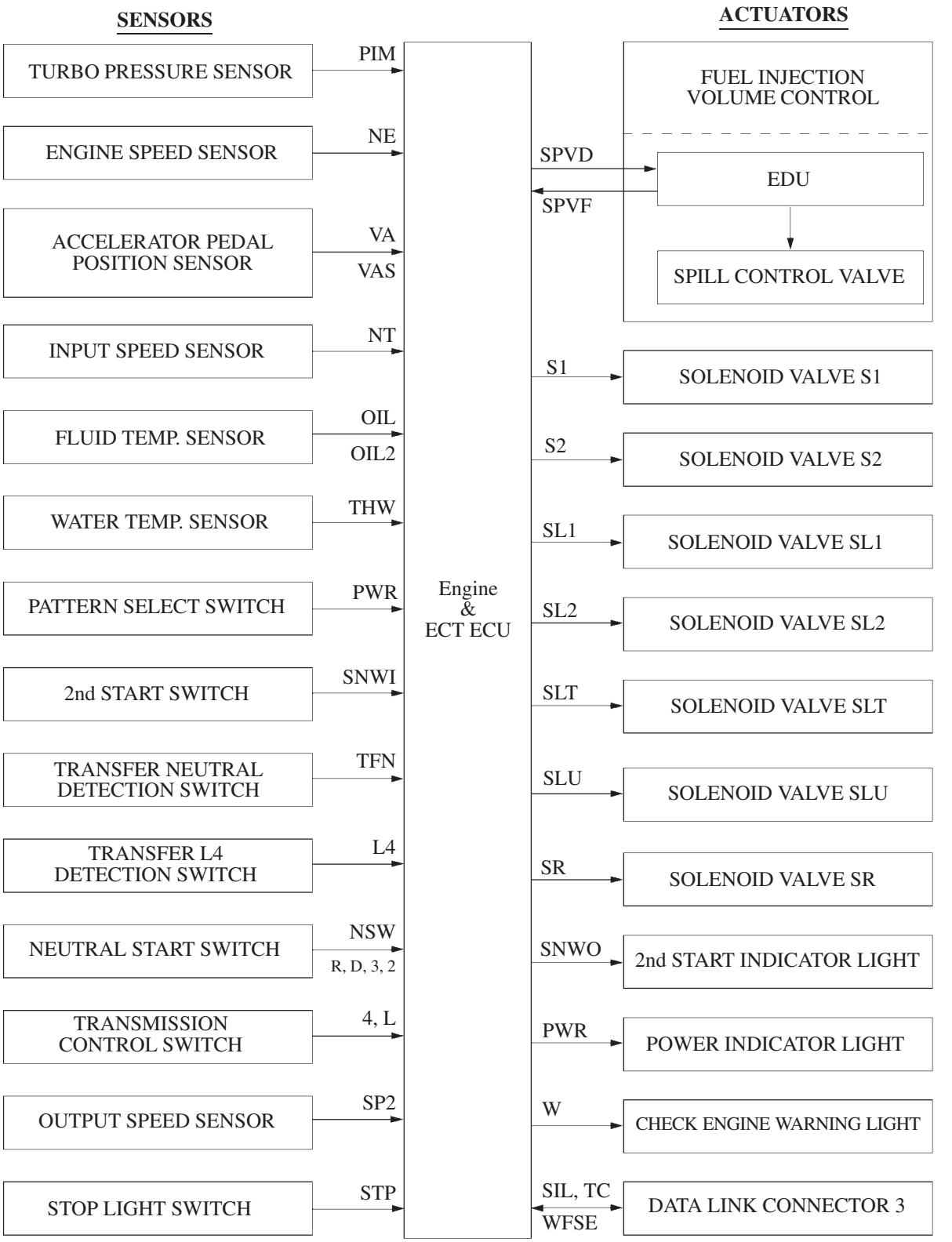
The configuration of the electronic control system in the 1HD-FTE engine model's A750F is as shown in the following chart.

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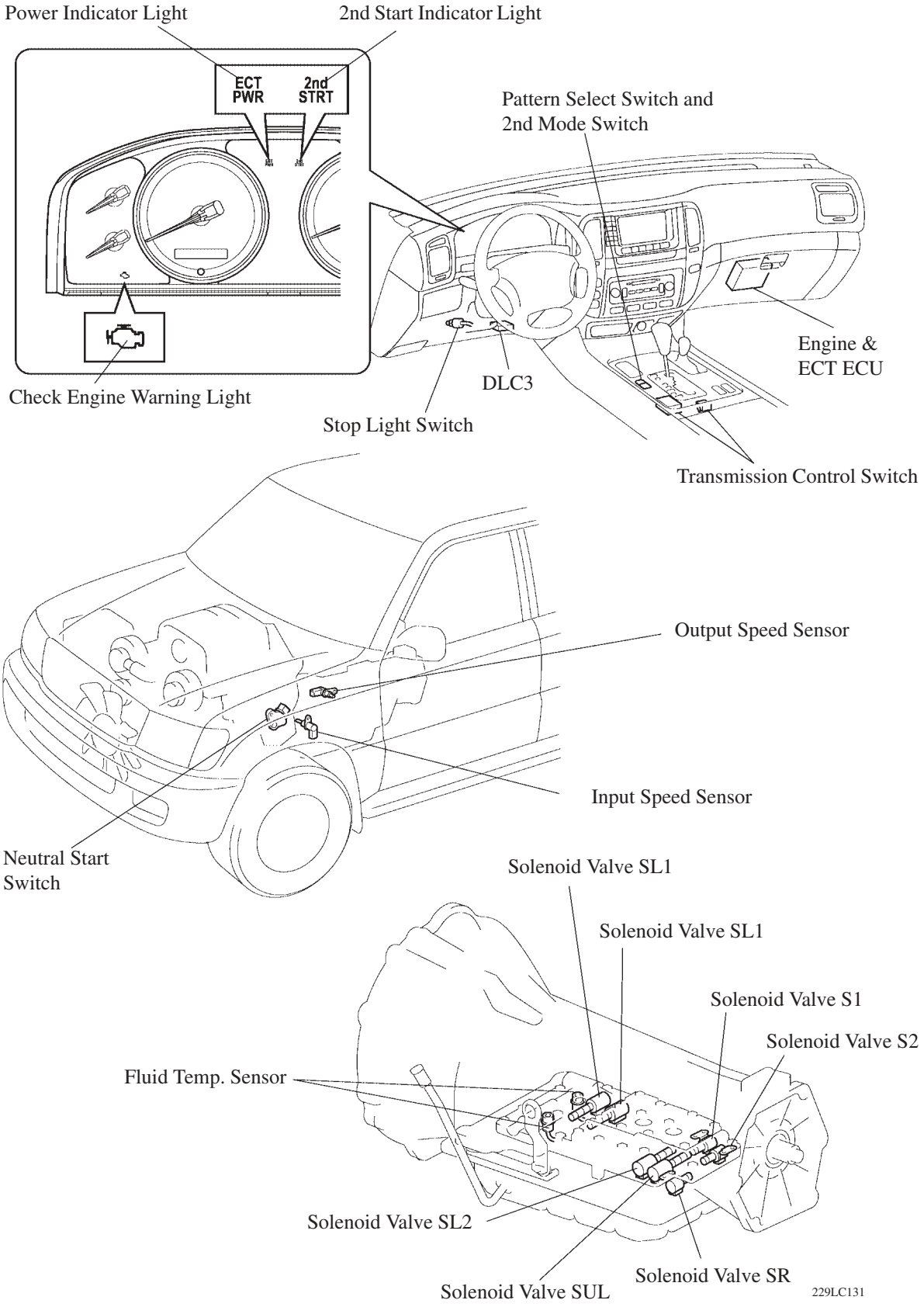
## Layout of Component

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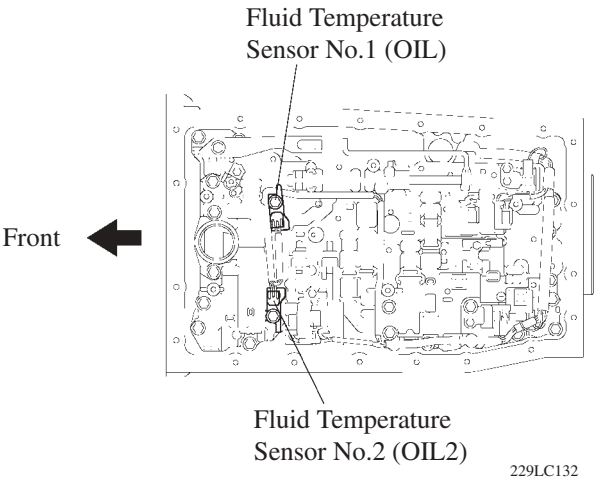
## Construction and Operation of Main Component

### 1) Fluid Temperature Sensor No.1 and No.2

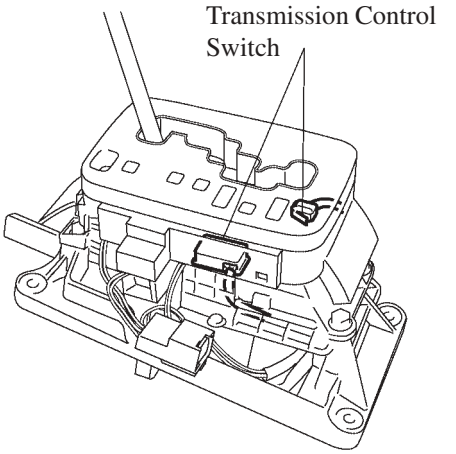
- Fluid temperature sensor No.1 (OIL) is used for hydraulic pressure control. This sensor is used for revision of clutches and brakes pressure to keep smooth shift quality every time.
- Fluid temperature sensor No.2 (OIL2) is used for the switching of the shift timing control of ECT when the fluid temperature is high and ATF temp. warning light control.




229LC132

### 2) Transmission Control Switch

The transmission control switch is installed inside shift lever assembly to detect the shift lever position ("4th" or "D" and "2nd" or "L") and to inform engine & ECT ECU the shift position indicator light in the combination meter.




229LC133

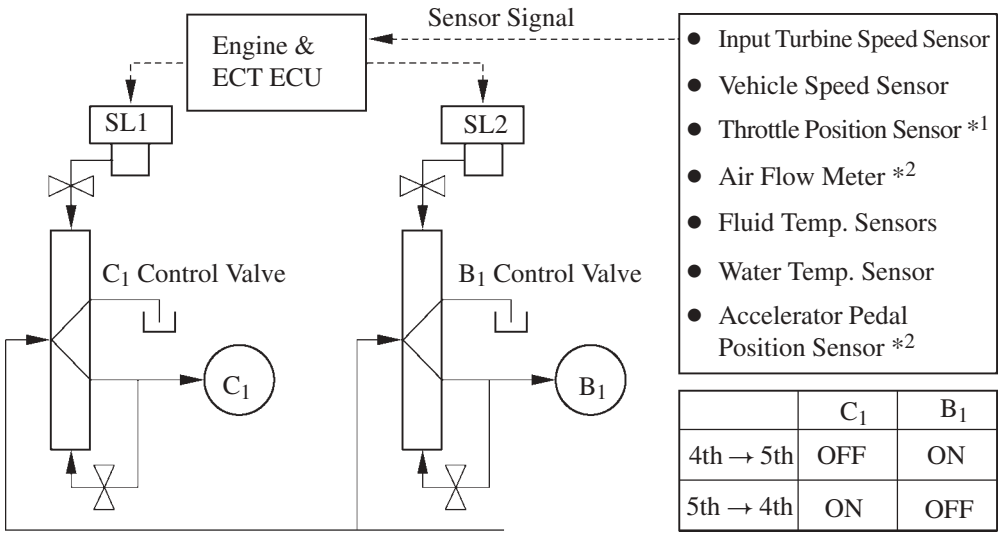
### 3) Output Speed Sensor and Input Speed Sensor

- A rotor is provided on the output shaft of the transmission, and the output speed sensor on the right side of the transmission case detects the speed and outputs it to the engine & ECT ECU.
- The input speed sensor detects the input speed of the transmission. The direct clutch drum is used as the timing rotor for this sensor.

## Clutch Pressure Control

### 1) Clutch to Clutch Pressure Control

This control has been adopted for shifting from the 4th to 5th gear and from the 5th to 4th gear.
Actuates solenoid valves SL1 and SL2 in accordance with the signals from the Engine & ECT ECU, and guides this output pressure directly to the control valves $B_1$ and $C_1$ in order to regulate the line pressure that acts on the $B_1$ brake and $C_1$ clutches.
As a result, high response and excellent shift characteristics have been realized.



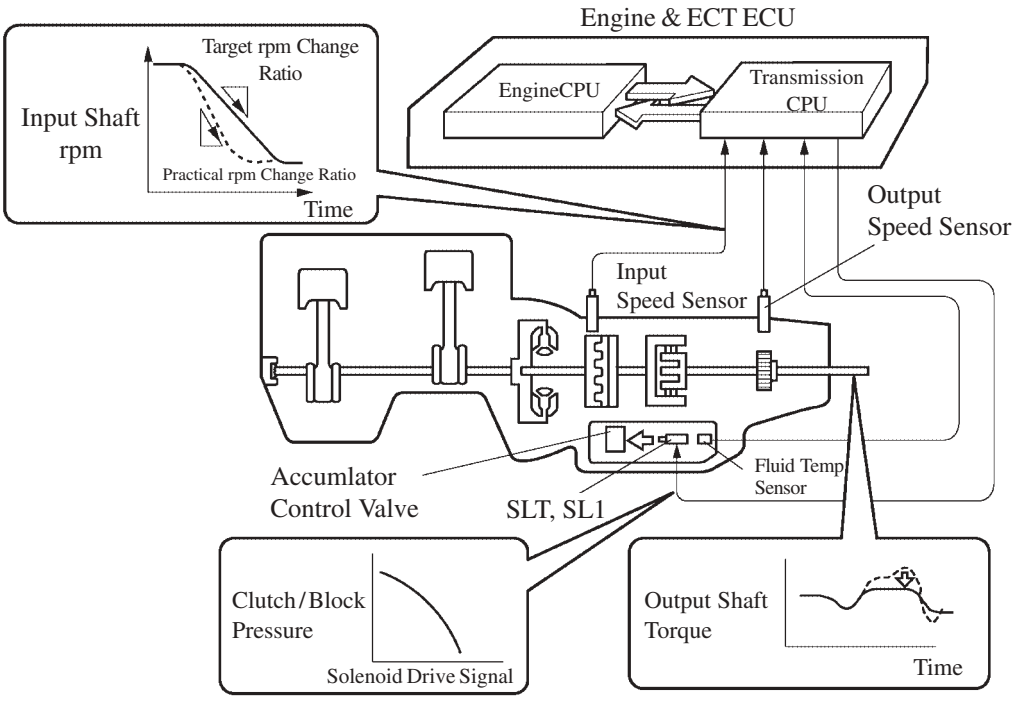

| | $C_1$ | $B_1$ |
|---|---|---|
| 4th → 5th | OFF | ON |
| 5th → 4th | ON | OFF |

*1: for 2UZ-FE Engine Model
*2: for 1HD-FE Engine Model

229LC134

### 2) Clutch Pressure Optimal Control

The Engine & ECT ECU monitors the signals from various types of sensor such as the input turbine speed sensor, allowing shift solenoid valves SLT and SL1 to minutely control the clutch pressure in accordance with engine output and driving conditions.
As a result, smooth shift characteristics have been realized.

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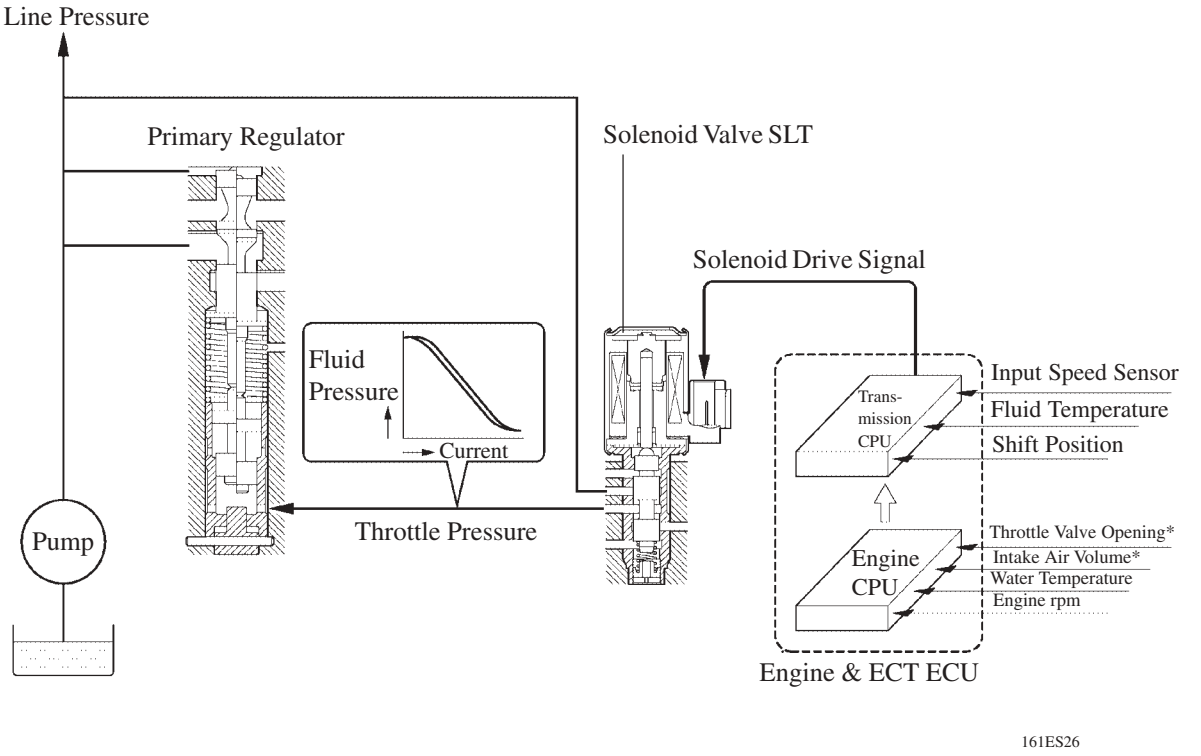
## Line Pressure Optimal Control

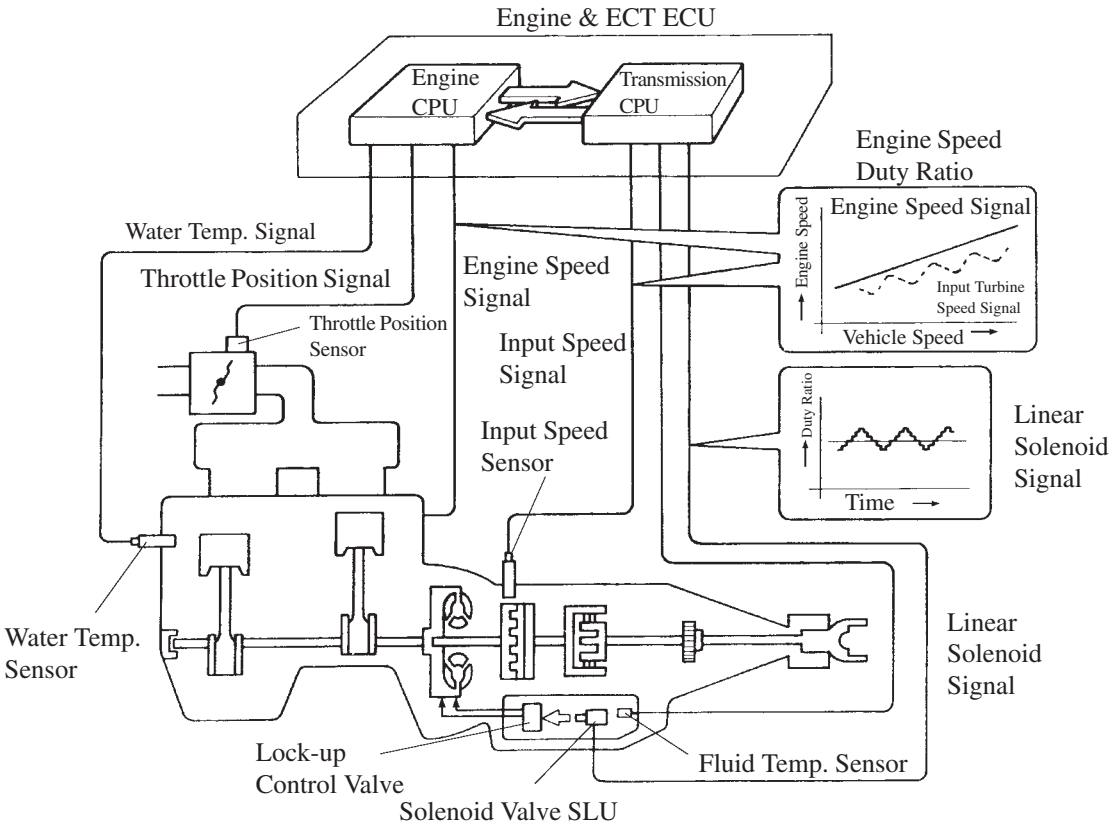
Through the use of the solenoid valve SLT, the line pressure is optimally controlled in accordance with the engine toque information, as well as with the internal operating conditions of the toque converter and the transmission.
Accordingly, the line pressure can be controlled minutely in accordance with the engine output, traveling condition, and the ATF temperature, thus realizing smooth shift characteristics and optimizing the workload in the oil pump.



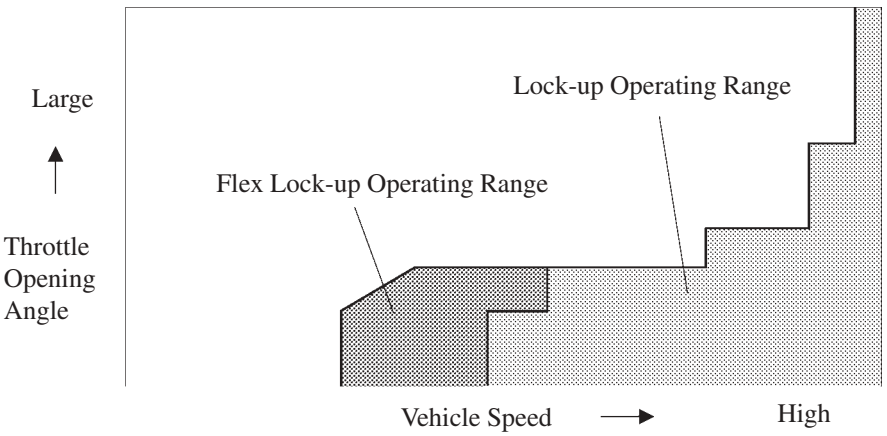

*: for 2UZ-FE Engine Model

## Flex Lock-up Clutch Control (Only for 2UZ-FE Engine Model)

In addition to the conventional lock-up timing control, a flex lock-up clutch control is used.
In the low-to mid-speed range, this flex lock-up clutch control regulates the solenoid valve SLU to provide an intermediate mode between the ON/OFF operation of the lock-up clutch in order to improve the energy transmitting efficiency in this range.
As a result, the operating range of the lock-up clutch has been increased and fuel economy has been improved. The flex lock-up clutch control operates in the 4th and 5th gears in the D range and 4th gear in the 4 range.




189CH11




151CH26

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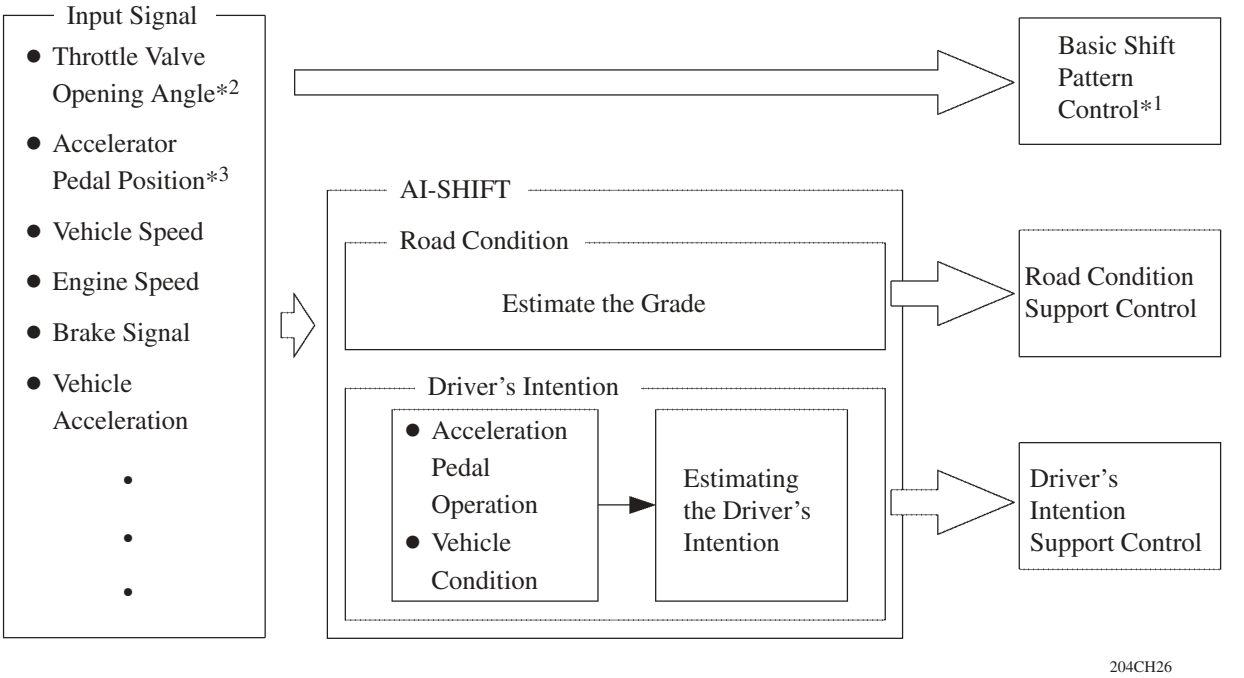
## AI (Artificial Intelligence)-SHIFT Control

### 1) General

In addition to the switching of the shift pattern through the pattern select switch, the AI-SHIFT control enables the engine & ECT ECU to estimate the road conditions and the driver's intention in order to automatically switch the optimal shift pattern. As a result, comfortable ride has been realized at high levels.




*1: Shift control that is determined by the PWR or 2nd mode that is selected by the pattern select switch, or by the normal mode.

*2: for 2UZ-FE Engine Model

*3: for 1HD-FTE Engine Model

### 2) Road Condition Support Control

Under road condition support control, the engine & ECT ECU determines the road condition where the vehicle is being driven through the throttle valve opening angle and the vehicle speed.

### 3) Driver's Intention Support Control

Estimates the driver's intention based on the accelerator operation and vehicle condition to switch to a shift pattern that is well-suited to each driver, without the need to operate the shift pattern select switch.

## Diagnosis

- When the Engine & ECT ECU detects a malfunction, the Engine & ECT ECU makes a diagnosis and memorizes the failed section. Furthermore, the check engine warning light in the combination meter illuminates or blinks to inform the driver.
- At the same time, the DTC (Diagnosis Trouble Codes) are stored in memory. The DTCs can be read by the SST (09843-18040) between the Tc and CG terminals DLC3 and observing the blinking of the check engine warning light, or by connecting a hand-held tester.

**Service Tip**

The length of time to clear the DTC by the battery terminal disconnection has been changed from the previous 10 seconds to 1 minute.

## Fail Safe

This function minimizes the loss of operability when any abnormality occurs in each sensor or solenoid.

**▶ Fail-Safe Control List ◀**

| Malfunction Part | Function |
|---|---|
| Output Speed Sensor (SP2) | During an output speed sensor malfunction, shift control is effected through the input speed sensor signal. |
| Fluid Temp. Sensor No.1 | During a fluid temperature sensor No.1 malfunction, 5th upshift and flex lock-up clutch control are prohibited. |
| Solenoid Valve S1, S2 and SR | The current to the failed solenoid valve is cut off and control is effected by operating the other solenoid valves with normal operation. Shift control is effected depending on the failed solenoid as described in the table on the next page. |
| Solenoid Valve SL1 and SL2 | During a solenoid valve SL1 or SL2 malfunction, 5th upshift is prohibited. |
| Solenoid Valve SLU | During a solenoid valve SLU malfunction, the current to the solenoid valve is stopped. Because this stops lock-up control and flex lock-up control, the fuel economy decreases. |
| Solenoid Valve SLT | During a solenoid valve SLT malfunction, the current to the solenoid valve is stopped. Because this stops line pressure optimal control, the shift shock increases. However, shifting is effected through normal clutch pressure control. |

| Position | Normal | | | | | | Shift Solenoid Valve S1 Malfunction | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Shift Solenoid | | | | | Gear | Shift Solenoid | | | | | Gear |
| | S1 | S2 | SR | SL1 | SL2 | | S1 | S2 | SR | SL1 | SL2 | |
| D | ON | OFF | OFF | OFF | ON | 1st | x | OFF → ON | OFF | OFF | ON | 4th → 3rd |
| | ON | ON | OFF | OFF | ON | 2nd | x | ON | OFF | OFF | ON | 3rd |
| | OFF | ON | OFF | OFF | ON | 3rd | x | ON | OFF | OFF | ON | 3rd |
| | OFF | OFF | OFF | OFF | ON | 4th | x | OFF | OFF | OFF | ON | 4th |
| | OFF | OFF | ON | ON | OFF | 5th | x | OFF | ON | ON | OFF | 5th |
| 4 | ON | OFF | OFF | OFF | ON | 1st | x | OFF → ON | OFF | OFF | ON | 4th → 3rd |
| | ON | ON | OFF | OFF | ON | 2nd | x | ON | OFF | OFF | ON | 3rd |
| | OFF | ON | OFF | OFF | ON | 3rd | x | ON | OFF | OFF | ON | 3rd |
| | OFF | OFF | OFF | OFF | ON | 4th | x | OFF | OFF | OFF | ON | 4th |
| 3 | ON | OFF | OFF | OFF | ON | 1st | x | OFF → ON | OFF | OFF | ON → OFF | 3rd → 3rd (E/B) |
| | ON | ON | OFF | OFF | ON | 2nd | x | ON | OFF | OFF | ON → OFF | 3rd → 3rd (E/B) |
| | OFF | ON | OFF | OFF | OFF | 3rd (E/B) | x | ON | OFF | OFF | OFF | 3rd (E/B) |
| 2 | ON | OFF | OFF | OFF | ON | 1st | x | OFF | OFF | OFF | ON | 1st |
| | ON | ON | ON | OFF | OFF | 2nd (E/B) | x | ON | ON | OFF | OFF | 3rd (E/B) |
| L | ON | OFF | OFF | OFF | OFF | 1st (E/B) | x | OFF | OFF | OFF | OFF | 1st (E/B) |

| Position | Shift Solenoid Valve S2 Malfunction | | | | | | Shift Solenoid Valve SR Malfunction | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Shift Solenoid | | | | | Gear | Shift Solenoid | | | | | Gear |
| | S1 | S2 | SR | SL1 | SL2 | | S1 | S2 | SR | SL1 | SL2 | |
| D | ON | x | OFF | OFF | ON | 1st | ON | OFF | x | OFF | ON | 1st |
| | ON→ OFF | x | OFF | OFF | ON | 1st → 4th | ON | ON | x | OFF | ON | 2nd |
| | OFF | x | OFF | OFF | ON | 4th | OFF | ON | x | OFF | ON | 3rd |
| | OFF | x | OFF | OFF | ON | 4th | OFF | OFF | x | OFF | ON | 4th |
| | OFF | x | ON | ON | OFF | 5th | OFF | OFF | x | ON | OFF | 4th |
| 4 | ON | x | OFF | OFF | ON | 1st | ON | OFF | x | OFF | ON | 1st |
| | ON → OFF | x | OFF | OFF | ON | 1st → 4th | ON | ON | x | OFF | ON | 2nd |
| | OFF | x | OFF | OFF | ON | 4th | OFF | ON | x | OFF | ON | 3rd |
| | OFF | x | OFF | OFF | ON | 4th | OFF | OFF | x | OFF | ON | 4th |
| 3 | ON | x | OFF | OFF | ON | 1st | ON | OFF | x | OFF | ON | 1st |
| | ON → OFF | x | OFF | OFF | ON → OFF | 1st → 3rd (E/B) | ON | ON | x | OFF | ON | 2nd |
| | OFF | x | OFF | OFF | OFF | 3rd (E/B) | OFF | ON | x | OFF | OFF → ON | 3rd (E/B) → 3rd |
| 2 | ON | x | OFF | OFF | ON | 1st | ON | OFF | x | OFF | ON | 1st |
| | ON → OFF | x | ON | OFF | OFF → ON | 2nd (E/B) → 4th | ON | ON | x | OFF | OFF | 2nd |
| L | ON | x | OFF | OFF | OFF | 1st (E/B) | ON | OFF | x | OFF | OFF | 1st (E/B) |

E/B: Engine Brake

| Position | Shift Solenoid Valve S1 and S2 Malfunction | | | | | | Shift Solenoid Valve S1 and SR Malfunction | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Shift Solenoid | | | | | Gear | Shift Solenoid | | | | | Gear |
| | S1 | S2 | SR | SL1 | SL2 | | S1 | S2 | SR | SL1 | SL2 | |
| D | x | x | OFF | OFF | ON | 4th | x | OFF → ON | x | OFF | ON | 4th → 3rd |
| | x | x | OFF | OFF | ON | 4th | x | ON | x | OFF | ON | 3rd |
| | x | x | OFF | OFF | ON | 4th | x | ON | x | OFF | ON | 3rd |
| | x | x | OFF | OFF | ON | 4th | x | OFF | x | OFF | ON | 4th |
| | x | x | ON | ON | OFF | 5th | x | OFF | x | ON→ OFF | OFF → ON | 4th |
| 4 | x | x | OFF | OFF | ON | 4th | x | OFF → ON | x | OFF | ON | 4th → 3rd |
| | x | x | OFF | OFF | ON | 4th | x | ON | x | OFF | ON | 3rd |
| | x | x | OFF | OFF | ON | 4th | x | ON | x | OFF | ON | 3rd |
| | x | x | OFF | OFF | ON | 4th | x | OFF | x | OFF | ON | 4th |
| 3 | x | x | OFF | OFF | ON → OFF | 3rd → 3rd (E/B) | x | OFF → ON | x | OFF | ON | 3rd |
| | x | x | OFF | OFF | ON → OFF | 3rd → 3rd (E/B) | x | ON | x | OFF | ON | 3rd |
| | x | x | OFF | OFF | OFF | 3rd (E/B) | x | ON | x | OFF | OFF → ON | 3rd (E/B) → 3rd |
| 2 | x | x | OFF | OFF | ON | 1st | x | OFF | x | OFF | ON | 1st |
| | x | x | ON | OFF | OFF → ON | 4th | x | ON | x | OFF | OFF | 2nd |
| L | x | x | OFF | OFF | OFF | 1st (E/B) | x | OFF | x | OFF | OFF | 1st (E/B) |

| Position | Shift Solenoid Valve S2 and SR Malfunctio | | | | | | Shift Solenoid Valve S1, S2 and SR Malfunction | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Shift Solenoid | | | | | Gear | Shift Solenoid | | | | | Gear |
| | S1 | S2 | SR | SL1 | SL2 | | S1 | S2 | SR | SL1 | SL2 | |
| D | ON | x | x | OFF | ON | 1st | x | x | x | OFF | ON | 4th |
| | ON → OFF | x | x | OFF | ON | 1st → 4th | x | x | x | OFF | ON | 4th |
| | OFF | x | x | OFF | ON | 4th | x | x | x | OFF | ON | 4th |
| | OFF | x | x | OFF | ON | 4th | x | x | x | OFF | ON | 4th |
| | OFF | x | x | ON → OFF | OFF → ON | 4th | x | x | x | ON → OFF | OFF → ON | 4th |
| 4 | ON | x | x | OFF | ON | 1st | x | x | x | OFF | ON | 4th |
| | ON → OFF | x | x | OFF | ON | 1st → 4th | x | x | x | OFF | ON | 4th |
| | OFF | x | x | OFF | ON | 4th | x | x | x | OFF | ON | 4th |
| | OFF | x | x | OFF | ON | 4th | x | x | x | OFF | ON | 4th |
| 3 | ON | x | x | OFF | ON | 1st | x | x | x | OFF | ON | 3rd |
| | ON → OFF | x | x | OFF | ON | 1st → 3rd | x | x | x | OFF | ON | 3rd |
| | OFF | x | x | OFF | OFF → ON | 3rd (E/B) → 3rd | x | x | x | OFF | OFF → ON | 3rd (E/B) → 3rd |
| 2 | ON | x | x | OFF | ON | 1st | x | x | x | OFF | ON | 1st |
| | ON | x | x | OFF | OFF → ON | 1st (E/B) → 1st | x | x | x | OFF | OFF → ON | 1st (E/B) → 1st |
| L | ON | x | x | OFF | OFF | 1st (E/B) | x | x | x | OFF | OFF | 1st (E/B) |

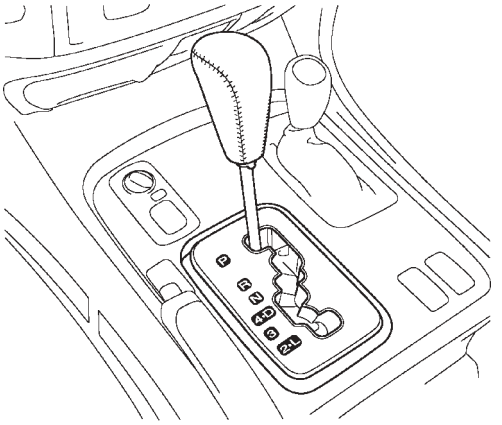
E/B: Engine Brake

6

## 7. Shift Control Mechanism

### General

- A gate type shift lever is used in conjunction with the installation of the 5-speed automatic transmission. With the gate type, the shift lever button and the overdrive switch of the straight type shift lever have been discontinued. Similar functions are achieved through a single-shift operation (fore-aft and side-to-side).
- The shift lock system consists of the key interlock device and shift lock mechanism.



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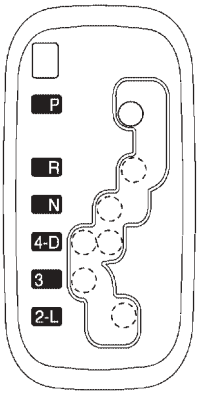


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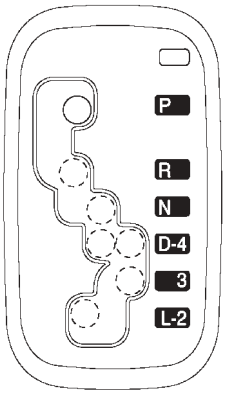
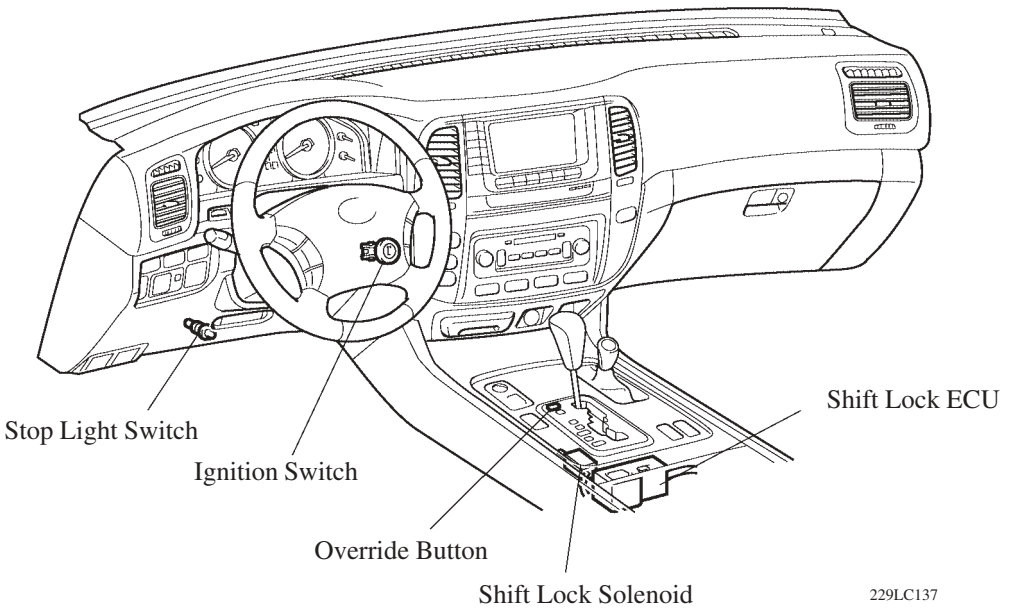



RHD 211CH22

### Shift Lock System

#### 1) General

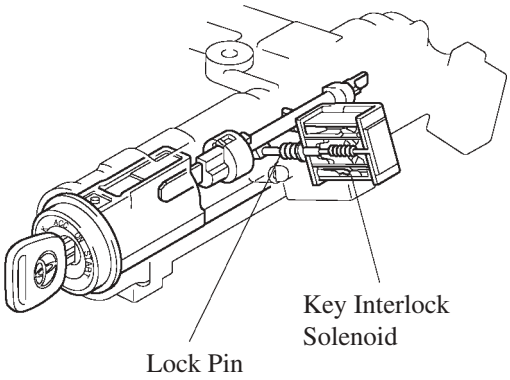
- A shift lock system with key interlock device and shift lock mechanism, that helps prevent the unintended operation of the shift lever has been provided.
- An electrical key interlock device and an electrical shift lock mechanism are used.




229LC137

### 2) Key Interlock Device

The activation of the key interlock solenoid that is mounted on the upper column bracket moves the lock pin to restrict the movement of the key cylinder. Therefore, if the shift lever is shifted to any position other than "P", the ignition key cannot be moved from "ACC" to the "LOCK" position.

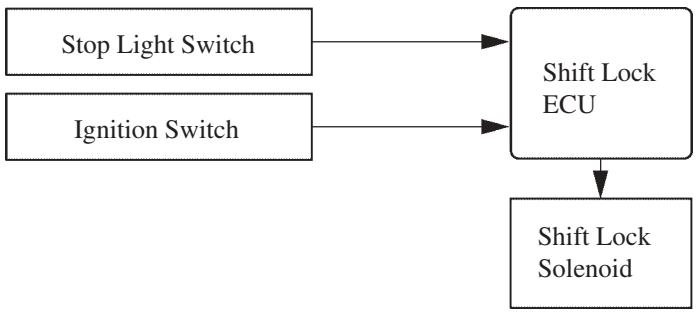



229LC138

### 3) Shift Lock Mechanism

- The shift lock mechanism prevents the shift lever from being shifted out of the "P" position to any other position unless the ignition switch is turned ON and the brake pedal is pressed.
- A shift lock override button, which manually overrides the shift lock mechanism, is provided.

**▶ System Diagram ◀**

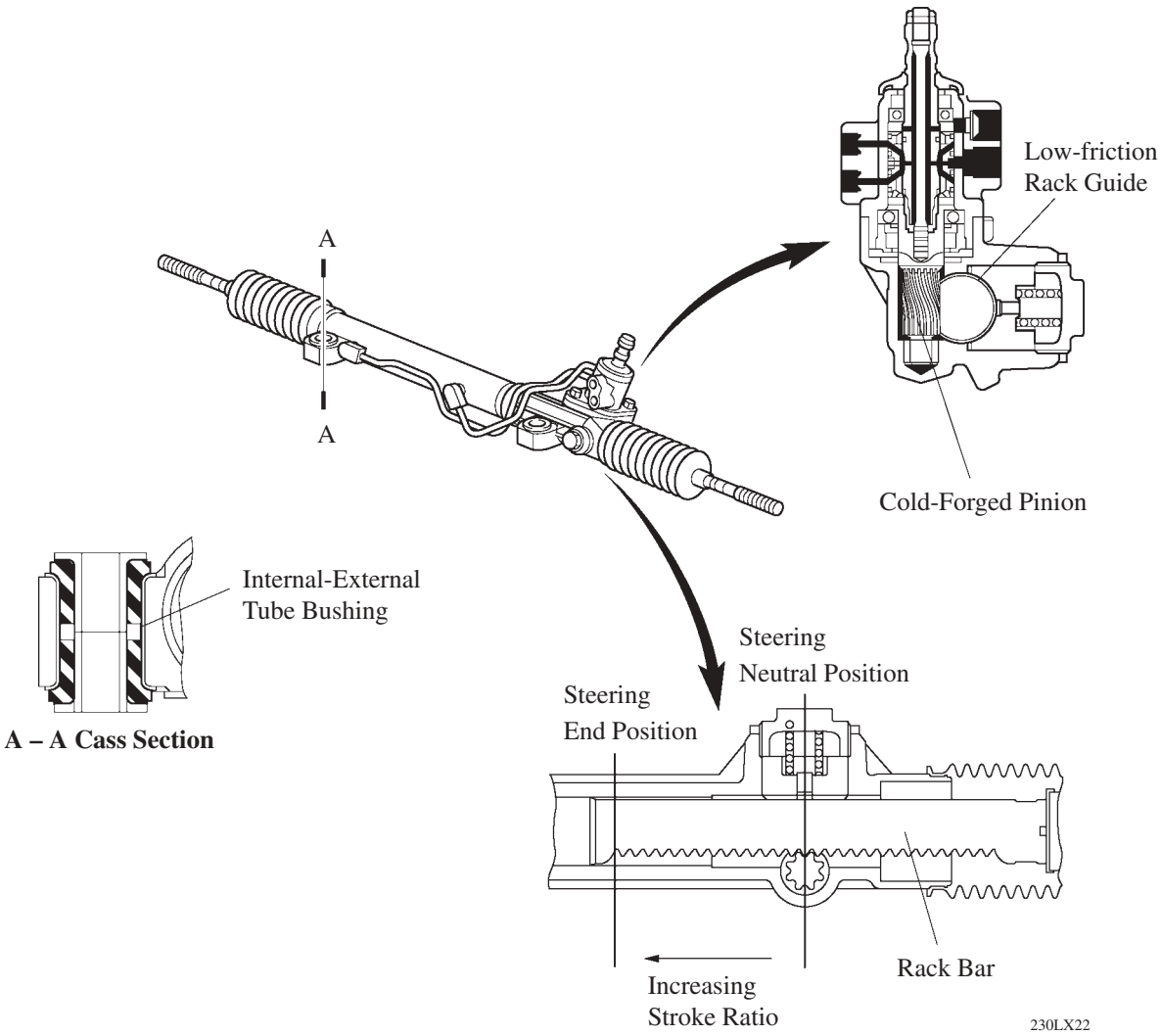



229LC139

## ■STEERING (for Models with Rack-and-Pinion type Steering Gear)

### 1. Steering Gear

- Internal-external tube bushings are now used to mount the steering gear assembly on the vehicle in order to facilitate a natural steering feel.
- A variable gear ratio type rack bar has been adopted. This rack bar its gear ratio established to increase the stroke ratio gradually as it changes from the steering neutral position to the end position. With this, steering maneuver will become reduced.
- A low friction rack guide and a cold-forged pinion are used in the power steering gear. A natural steering feeling has been realized through these features.



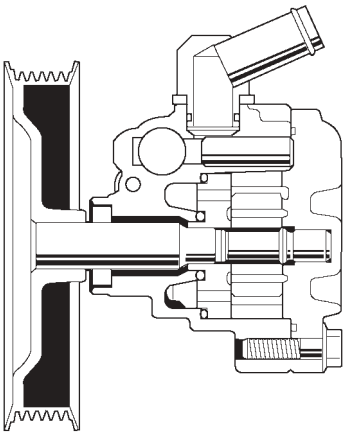

**▶ Specifications ◀**

| Item | Models with VGRS System | Models without VGRS System |
|---|---|---|
| Gear Ratio (Overall) | 12.4 - 18.0*<br>(Low Speed - High Speed) | 17.3 |
| No. of Turns Lock to Lock | 2.4 - 3.5*<br>(Low Speed - High Speed) | 3.3<br>(All Speed) |
| Fluid Type | ATF Type DEXRON® II or III | ← |

*: The gear ratio and the number of lock-to-lock turns are made variable for the VGRS system.

## 2. Vane Pump

A compact and lightweight vane pump, which uses die-cast aluminum as the material for its housing, has been adopted.
By optimizing its internal construction, this vane pump has realized a low-friction operation, which leads to low fuel consumption.
To match the characteristics of the engine that has been adopted in the new model, this vane pump differs slightly in construction, fluid discharge volume, and control flow volume.



**2UZ-FE Engine Model for Europe**

230LX23

**▶ Specifications ◀**

| Engine | | 2UZ-FE | 1FZ-FE | 1HD-FTE |
|---|---|---|---|---|
| Operating Speed | rpm | 500 - 7,000 | ← | ← |
| Theoretical Discharge Rate | l/min | 13* | ← | ← |
| Relief Pressure | MPa (kgf/cm$^2$, psi) | 10 (102, 1450) | 8.3 (85, 1204) | 10 (102, 1450) |

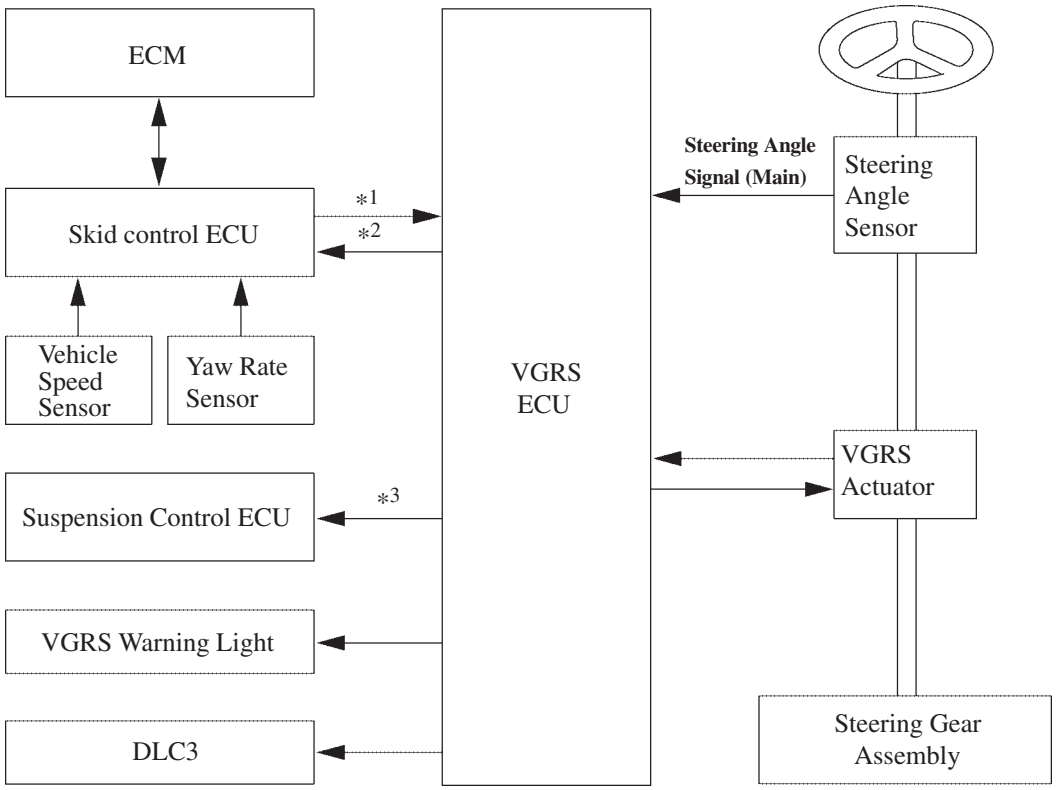
*: at 1,000 rpm

## 3. VGRS (Variable Gear Ratio Steering) System

### General

- A VGRS (Variable Gear Ratio Steering) system, which variably controls the steering angle in accordance with the driving speed, has been adopted as optional equipment on the model for Europe.
- This system is controlled by the VGRS ECU, which operates the VGRS actuator that is mounted on the steering intermediate shaft. The operating angle of the actuator is thus added to the steering angle of the intermediate shaft in order to vary the turning angle of the front wheels in accordance with the vehicle speed.
- The VGRS ECU is equipped with a diagnosis function and a fail-safe function.

**▶ System Diagram ◀**




∗1: VGRS ECU Input Signal (Vehicle speed, Steering Angle (Sub), Steering Wheel Neutral Position)
∗2: VGRS ECU Output Signal (VGRS Actuator Operating Angle)
∗3: VGRS ECU Output Signal (Steering Wheel Steering Angle + VGRS Actuator Operating Angle)

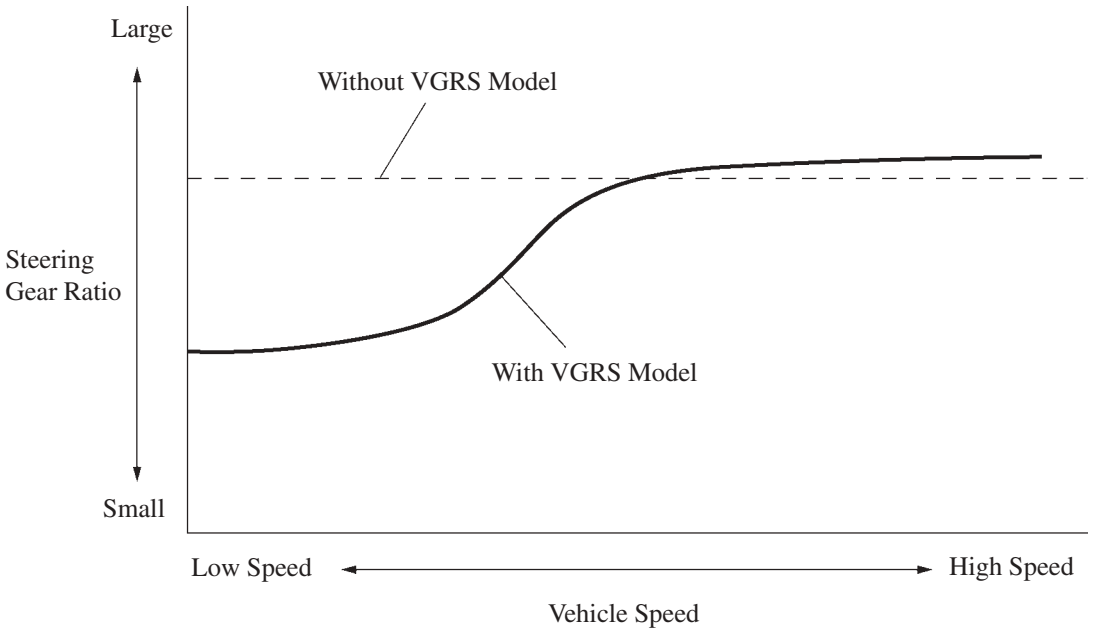
## Outline of VGRS System

### 1) General

In the conventional steering system, the gear ratio is set primarily for the high-speed driving mode to prevent the vehicle from making over-sensitive movements in response to the driver's steering angle. For this reason, it requires a large the driver's steering angle while driving at low speeds.
In the VGRS system, the steering gear ratio can be changed at will. Thus, the VGRS ECU operates the VGRS actuator in order to constantly realize an optimal gear ratio in accordance with the driving conditions of the vehicle. Thus, it attains a high level of maneuverability and stability between the low- and the high-speed driving ranges.

- In the extremely low-speed range, which is used when the driver is attempting to park the vehicle, this system changes the steering gear into the smallest gear ratio in order to reduce the driver's steering angle.
- In the low- to medium-speed range, which is used when driving on city streets or on a winding road, this system changes the steering gear ratio to an optimal level in accordance with the vehicle speed. As a result, the vehicle responds with more agility and handles more easily.
- In the high-speed range, the steering gear ratio is set to the maximum level to prevent the vehicle from making over-sensitive movements in response to the driver's steering angle. Thus, this system ensures a stable vehicle response.
- If a vehicle that is driven straight ahead over a road surface with different friction coefficients brakes suddenly and causes the VSC to activate, the vehicle posture becomes disrupted, thus requiring the driver to operate the steering wheel. When this occurs, the steering gear ratio is rendered even smaller than that of the ordinary VGRS system in order to reduce the driver's steering angle.

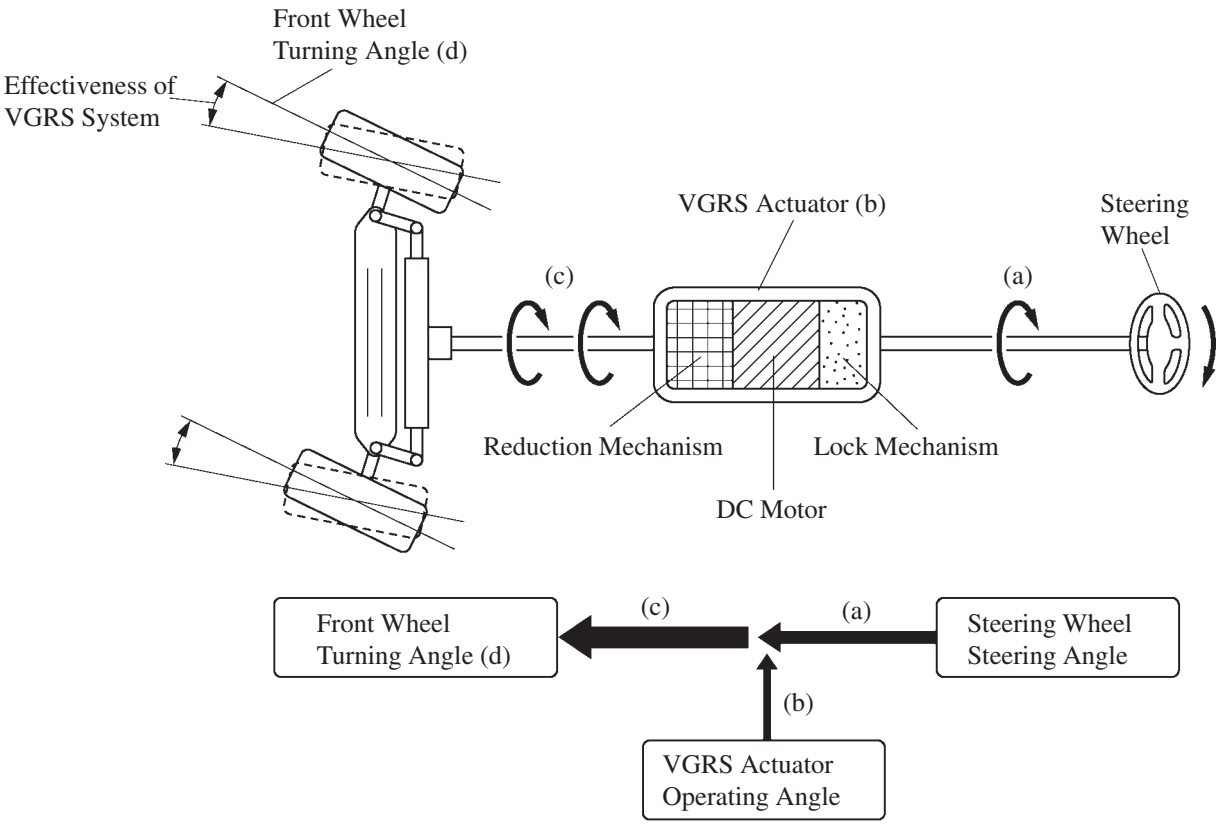
**▶ Imaginary Diagram of Steering Gear Ratio ◀**



### 2) Main Function

- In accordance with the vehicle speed signals that are obtained from the skid control ECU, the VGRS ECU selects the driver's steering angle and direction (which are obtained from the steering angle sensor signals) and the actuator operating angle data (which is preset in the VGRS ECU in accordance with the vehicle speed). Based on these two pieces of information, the VGRS ECU controls the VGRS actuator in order to attain the proper actuator target operating angle.
- The VGRS actuator, which is mounted on the steering shaft, rotates constantly in unison with the shaft. The turning angle of the front wheels is the sum of the optimal operating angle of the VGRS actuator that the VGRS ECU has determined from the vehicle speed and the angle of the steering wheel that the driver has steered.
- As shown in the previously mentioned imaginary diagram, the VGRS actuator rotates in the direction that increases the turning angle of the front wheels in the low-speed range (in which a reduction in the steering wheel operating effort is desired) or in the medium-speed range (in which a more agile vehicle response is desired). In the high-speed range (in which an over-sensitive movement response of the vehicle is not desired), the VGRS actuator rotates in the direction to slightly decrease the turning angle of the front wheels.
  The VGRS actuator rotates only when the driver turns the steering wheel. Furthermore, when the VGRS actuator rotates in the negative direction, its rotation will not exceed the steering effort of the driver.
- This system contains a lock mechanism. When the VGRS ECU detects a system failure, it stops the operation of the actuator and locks it to prevent it from rotating. Thus, even if the system fails, the steering function of the conventional steering system is ensured. To protect the system, this lock mechanism activates even when the engine is stopped.

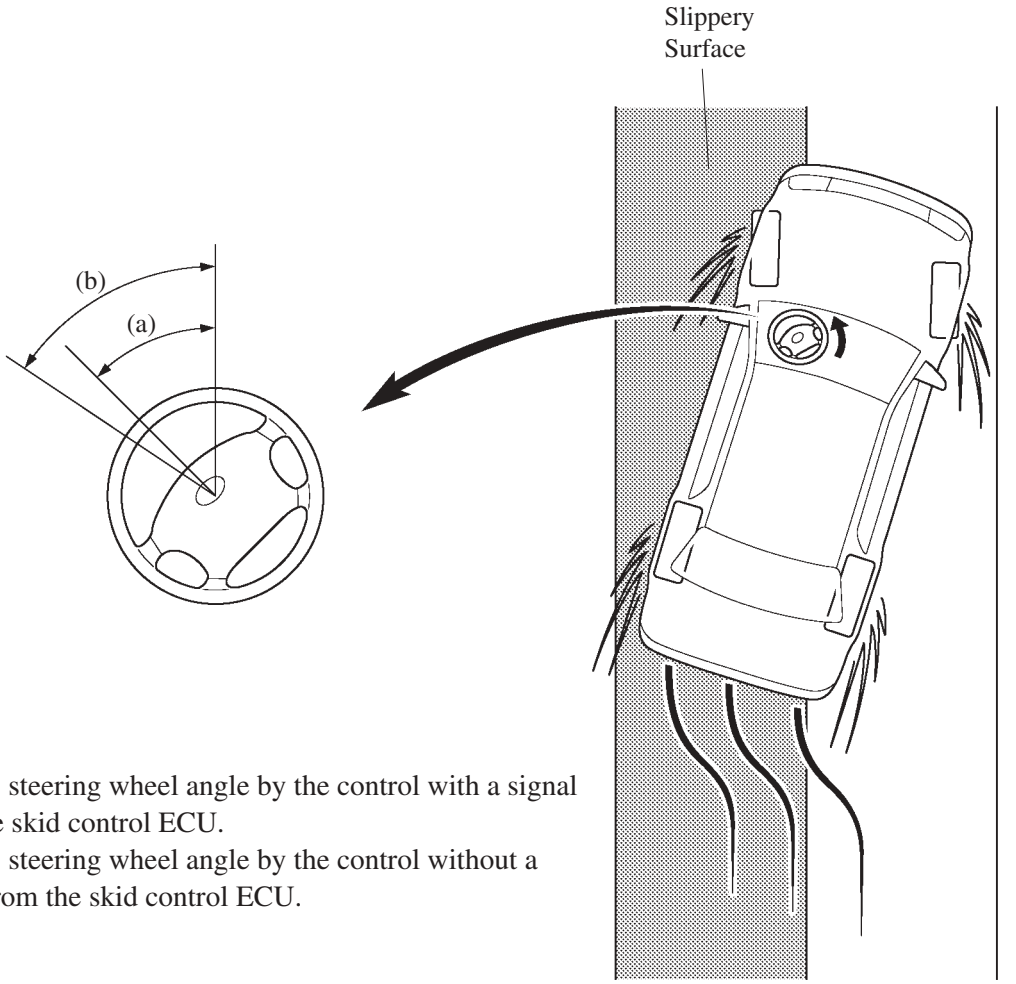





230LX26

**3) Control with a signal from the skid control ECU**

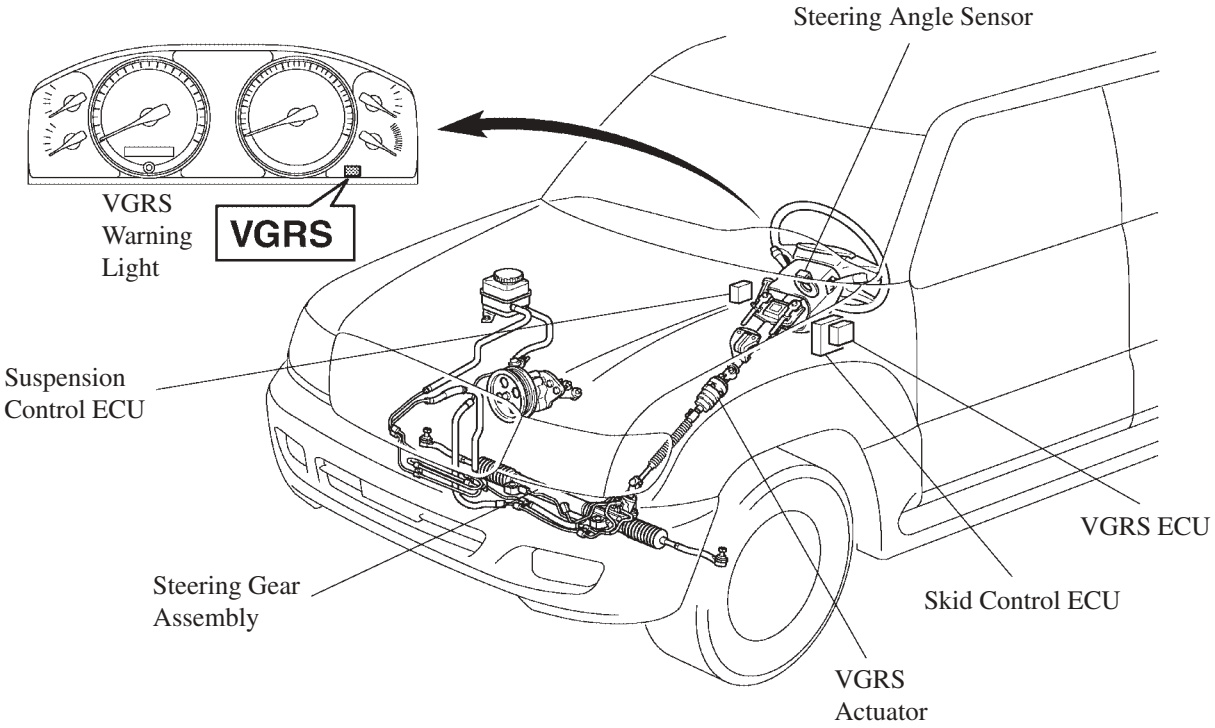
If a vehicle that is driven straight ahead over a road surface with different friction coefficients brakes suddenly and causes the VSC to activate, the vehicle posture becomes disrupted, thus requiring the driver to operate the steering wheel. When this occurs, the skid control ECU transmits signals to the VGRS ECU. When the VGRS ECU receives these signals, it calculates the target operating angle for the VGRS actuator based on the driver's steering angle and direction (which are obtained from the steering angle sensor signals) and the vehicle speed signal (which is obtained from the skid control ECU). Then, the VGRS ECU operates the VGRS actuator to make the steering gear ratio smaller than that during usual VGRS system operation, thus reducing the driver's steering ability.




(a): Driver's steering wheel angle by the control with a signal from the skid control ECU.
(b): Driver's steering wheel angle by the control without a signal from the skid control ECU.

230LX27

## Layout of Main Components




## Function of Main Components

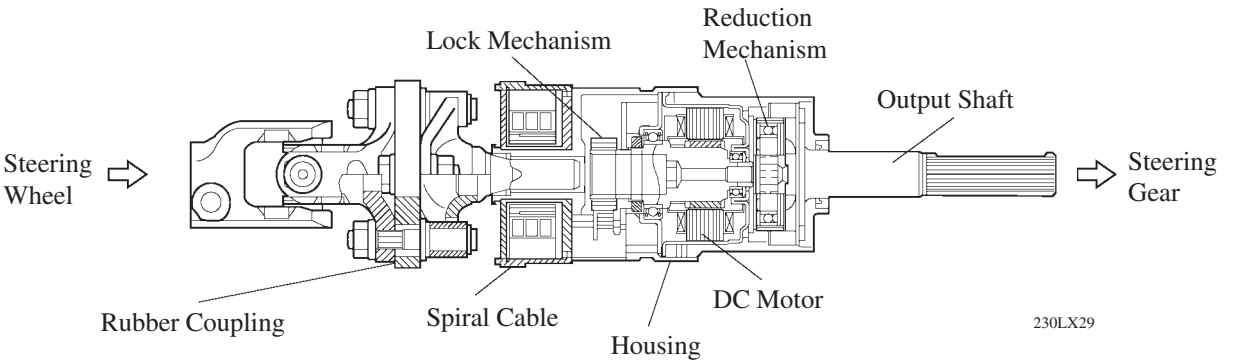
| Components | | Function |
|---|---|---|
| VGRS Actuator | DC Motor | Rotates to create the operating angle of the actuator. |
| | Reduction Mechanism | Uses a strain wave gear type reduction mechanism to reduce the rotation of the DC motor to the 1:50 ratio. |
| | Spiral Cable | Has practically the same construction as the spiral cable that is used for the driver's airbag of the SRS airbag system. It functions as the contact point for the wiring harness between the DC motor and the lock solenoid in the rotating actuator and the VGRS ECU. |
| | Lock Mechanism | Locks the motor shaft so that the DC motor will not rotate in case of a system failure or when the system is stopped due to the stopping of the engine. |
| VGRS ECU | | Effects comprehensive control of the VGRS system. It primarily controls the following items:<br>● Operates the DC motor by calculating the operating angle of the actuator based on the signals from the steering angle sensor and the vehicle speed sensor.<br>● Controls the failsafe function and the diagnosis function. |
| Steering Angle Sensor | | Detects the steering angle and direction of the steering wheel and transmits them to the VGRS ECU. |
| Skid Control ECU | | Transmits the vehicle speed signal, steering neutral position information, and the engine speed signal to the VGRS ECU.<br>Furthermore, it transmits the operating signal to enable this system to effect the control with a signal from the skid control ECU. |
| VGRS Warning Light | | Illuminates to alert the driver if a failure occurs in the VGRS system. |
| Suspension Control ECU | | Receives from the VGRS ECU the steered angle of the steering wheel (the sum of the steered angle of the steering wheel operated by the driver and the operating angle of the actuator), which is necessary for controlling the active height control suspension. |

## Construction and Operation of Main Components

### 1) VGRS Actuator

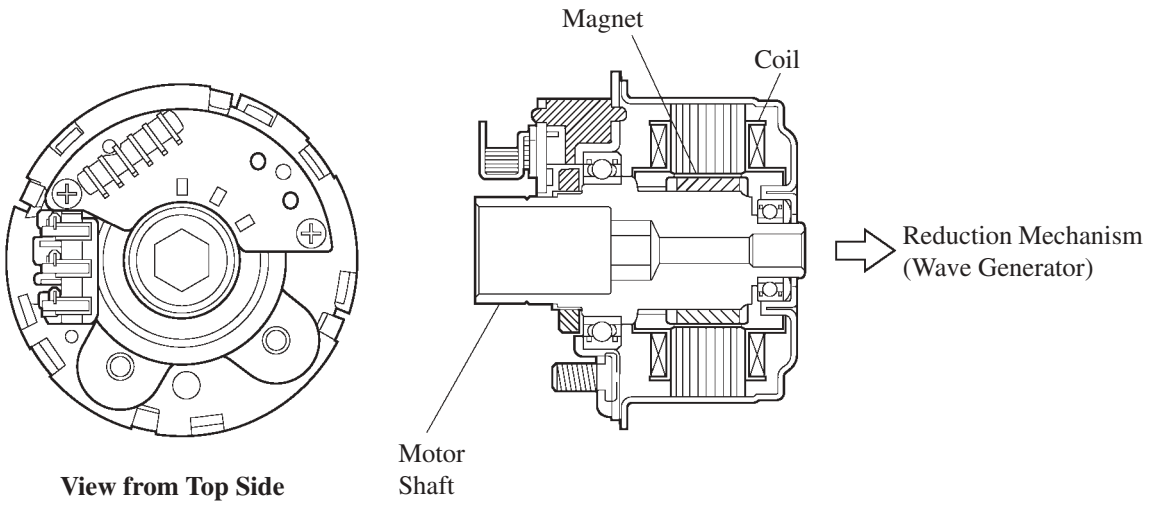
#### a. General

- The VGRS actuator mainly consists of a housing, DC motor, reduction mechanism, spiral cable, lock mechanism and output shaft.
- The VGRS actuator is integrated with the rubber coupling.




#### b. DC Motor

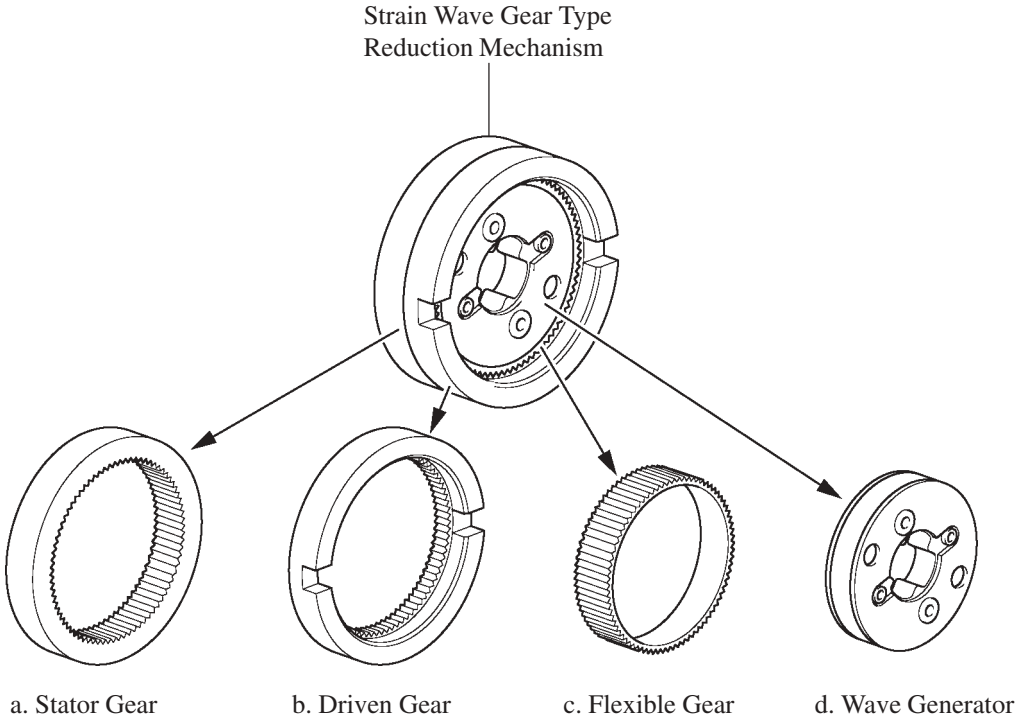
- A DC motor that is compact, has high power output, generates less noise, and is brushless, has been adopted. This DC motor is mounted on the housing.
- This DC motor mainly consists of a magnet, coil, and motor shaft. The motor shaft is coupled to the wave generator of the reduction mechanism in order to transmit the rotational movement of the motor to the reduction mechanism.
- This DC motor, which is controlled by the duty cycle signal from the VGRS ECU, rotates either clockwise or counterclockwise, depending on the steered direction of the steering wheel.
- This DC motor contains an rotational angle sensor. When the VGRS ECU receives the signals from this sensor, it calculates the operating angle of the VGRS actuator based on the rotational angle and the rotational direction of the DC motor.



### c. Reduction Mechanism

#### i) General

- A strain wave gear type reduction mechanism is used.
- This reduction mechanism mainly consists of a driven gear, stator gear, flexible gear and wave generator.
- This reduction mechanism reduces the rotation to the 1:50 ratio.

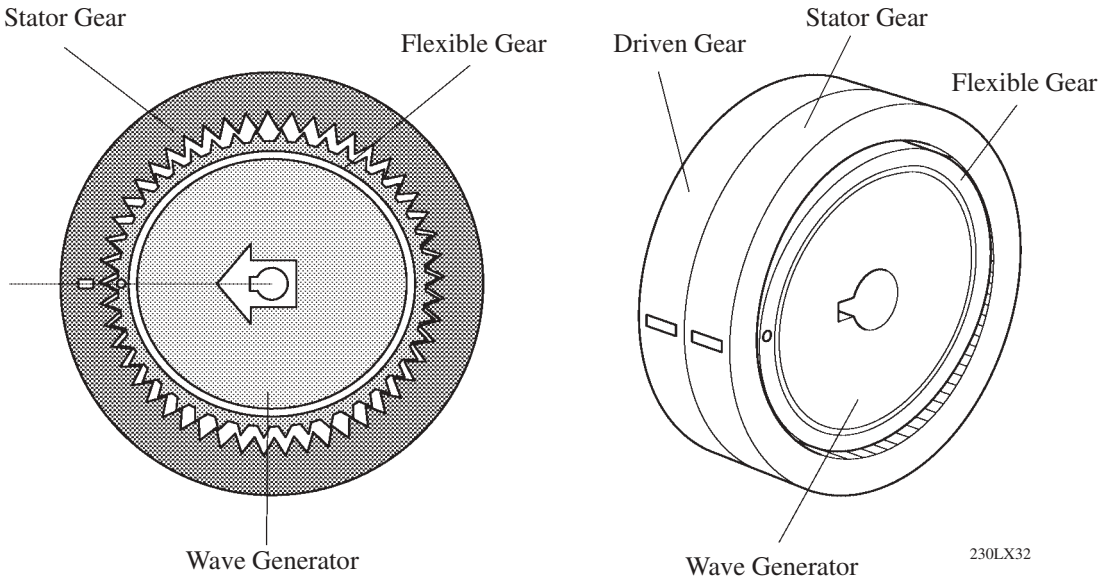



- The construction of the main components of the reduction mechanism is shown in the table below.

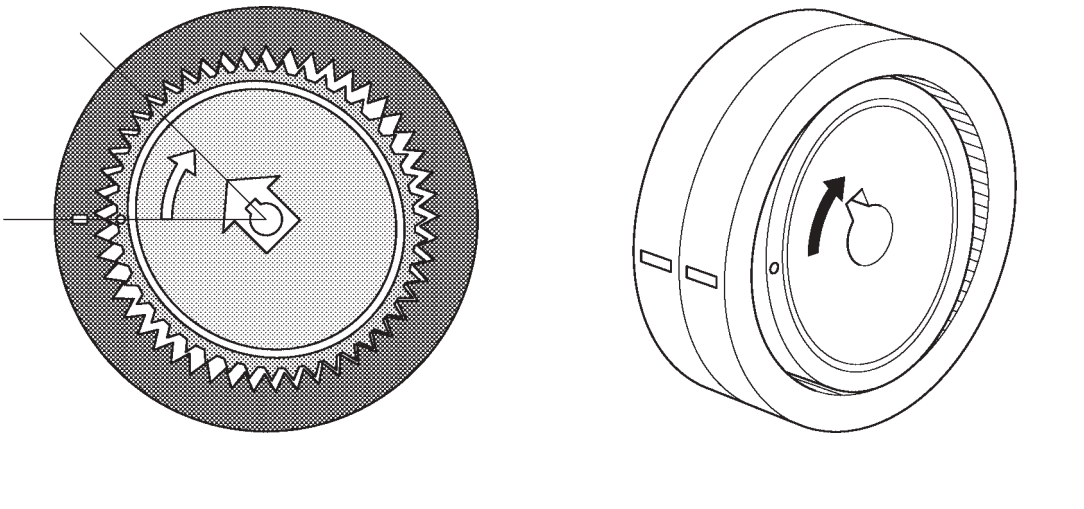
| Item | | Construction |
|---|---|---|
| a | Stator Gear | ● Has a rigid body, a ring shape, and contains 102 teeth along the inner circumference.<br>● Positioned parallel with the driven gear.<br>● Coupled to the housing of the VGRS actuator. |
| b | Driven Gear (Output) | ● Has a rigid body, a ring shape, and contains 100 teeth along the inner circumference.<br>● Positioned parallel with the stator gear.<br>● Coupled to the output shaft of the VGRS actuator. |
| c | Flexible Gear | ● Has a flexible metal body that forms a belt shape and contains 100 teeth along the outer circumference.<br>● Located outside of the wave generator, and positioned in such a way that its gear teeth are meshed with the inside of both stator gear and driven gear. |
| d | Wave Generator (Input) | ● Consists of an oval-shaped cam and a ball bearing that is fitted around the cam.<br>● Coupled to the motor shaft of the DC motor, and rotates inside the flexible gear while pushing the flexible gear against the stator gear and the driven gear. |

### ii) Operating Principle of Reduction Mechanism

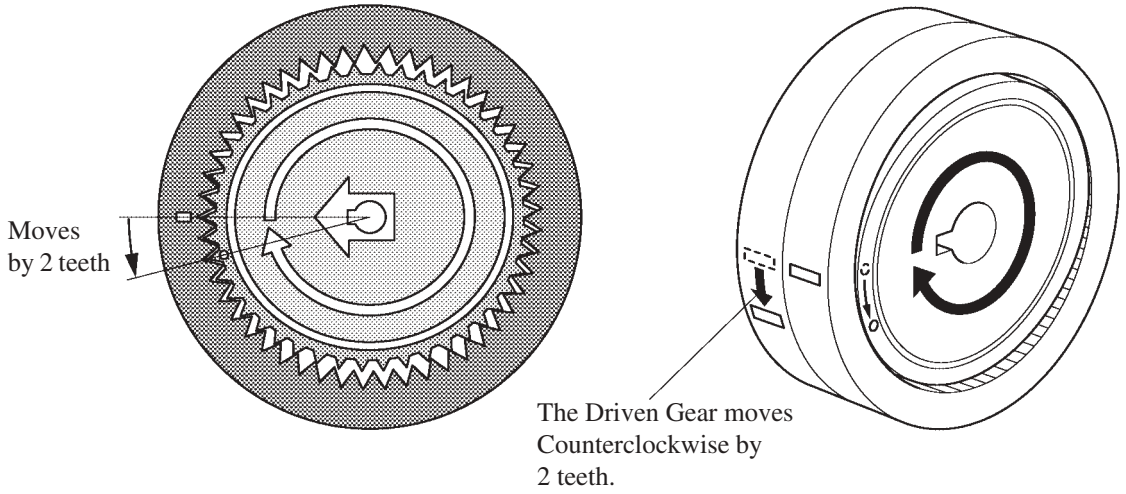
- The flexible gear is fitted inside the driven gear and the stator gear as illustrated. Furthermore, the wave generator is fitted inside the flexible gear.
  The flexible gear is flexed into an oval shape by the wave generator. The teeth at the long axis of the oval shape meshes with the teeth of the driven gear and stator gear, and the teeth at the short axis are disengaged.




- For example, if the wave generator (input) rotates clockwise while pushing the flexible gear, due to the rotational movement of the DC motor, the meshed area of the flexible gear and the driven gear and stator gear moves in sequence.



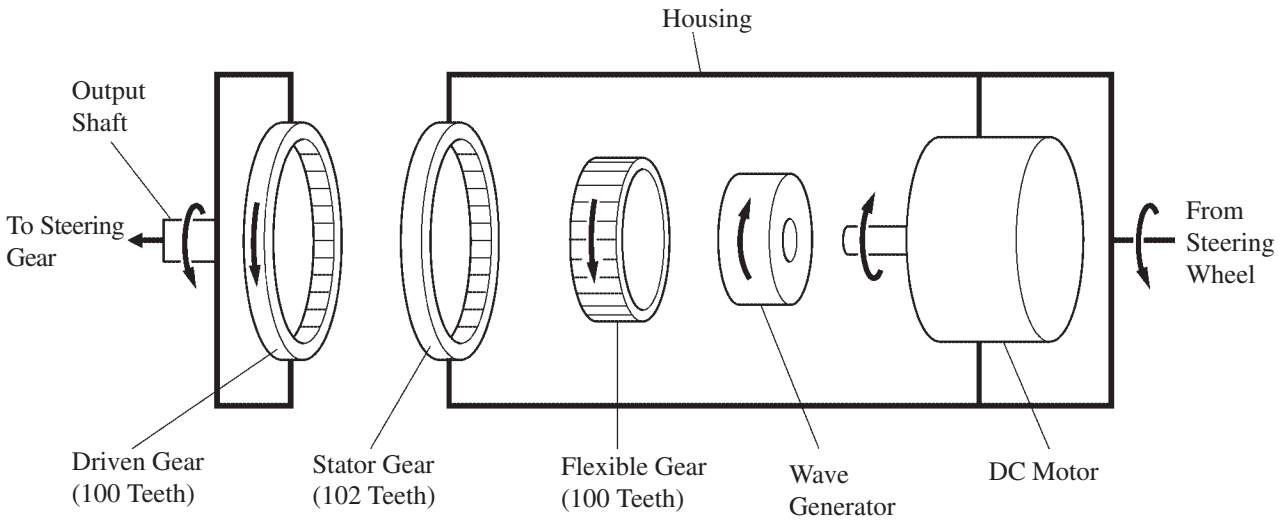
- When the wave generator makes one turn, the flexible gear moves counterclockwise by 2 teeth because the flexible gear has 2 fewer teeth than the stator gear. The driven gear and the flexible gear have the same number of teeth, so their rotational movements are identical. Therefore, the driven gear (output) moves by 2 teeth.




230LX34



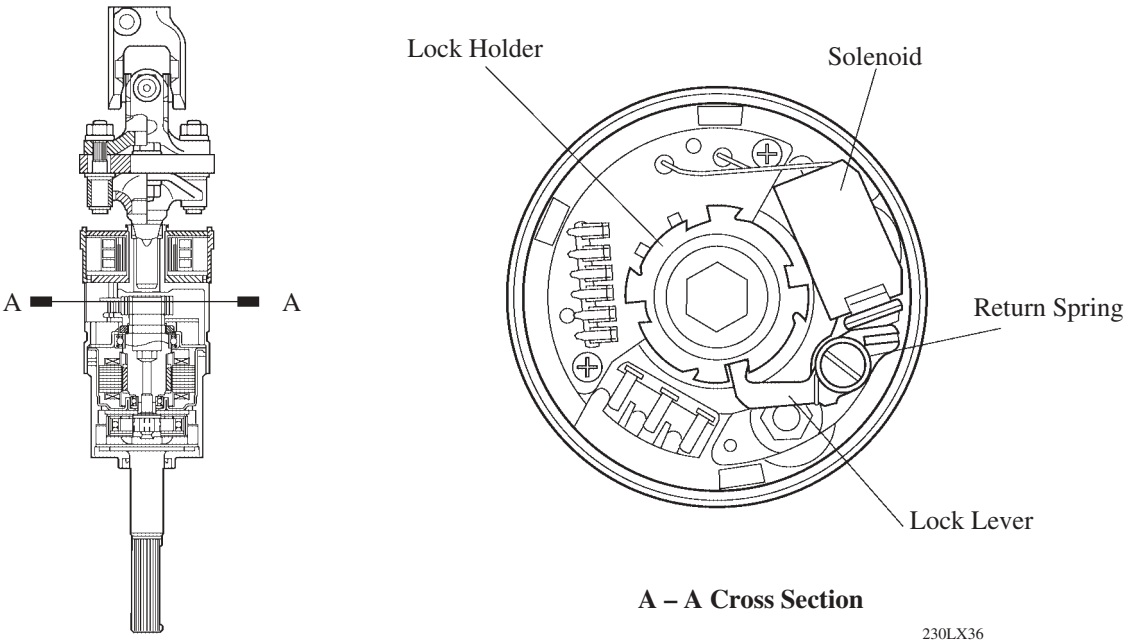
- Due to the aforementioned principle, when the DC motor rotates clockwise, the rotational movement that is input by the wave generator (which is coupled to the motor shaft) outputs to the output shaft of the VGRS actuator (which is coupled to the driven gear). As a result, the output shaft rotates counterclockwise at the 1:50 gear ratio. This rotational angle is added to the actual steered angle of the steering wheel, thus changing the turning angle of the front wheels.




230LX35

### d. Lock Mechanism

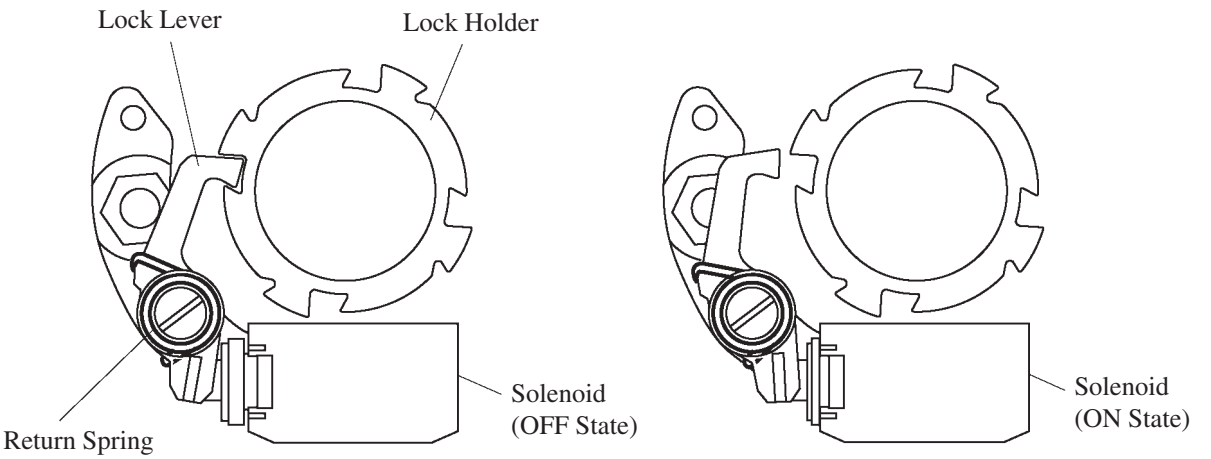
- This system contains a lock mechanism that mechanically locks the DC motor so that the motor will not rotate if a failure occurs or when the engine is not running. With this, the housing and the output shaft become united.
- The lock mechanism is mounted on the DC motor. It consists primarily of a lock holder that is secured to the motor shaft, a lock lever that is mounted on the housing, and a solenoid that operates the lock lever.




**A – A Cross Section**

230LX36

- When the lock mechanism is activated, the VGRS ECU turns OFF the current to the solenoid, and the return spring pushes the lock lever against the lock holder. Then, the lock lever meshes with the groove in the lock holder in order to mechanically lock the movement of the DC motor.
  When the lock is disengaged, the VGRS ECU turns ON the current to the solenoid, thus disengaging the lock lever and the lock holder and freeing the movement of the DC motor.




**Lock State**

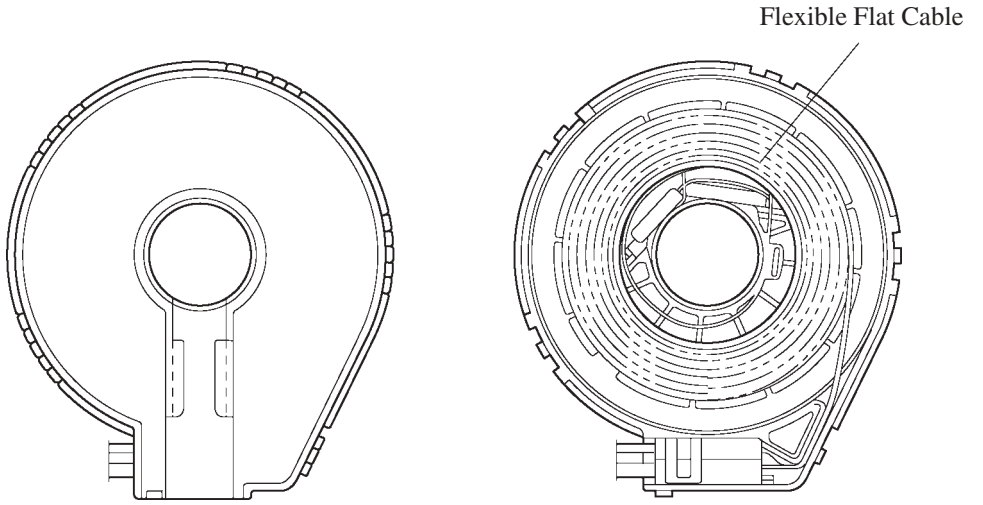
230LX37

**Unlock State**

230LX38

### e. Spiral Cable

- The construction of the spiral cable is almost identical as that of the one used for the driver's airbag of the SRS airbag system. It functions as the contact point for the wiring harness between the DC motor and the lock solenoid in the rotating actuator and the VGRS ECU.
- This spiral cable is mounted above the housing.
- The spiral cable is an internal flexible flat cable with a dual winding construction, which consists of two systems: the power system and the signal system.
- The operating range of this spiral cable is 5.0 turns.




**Cross Section** 230LX39



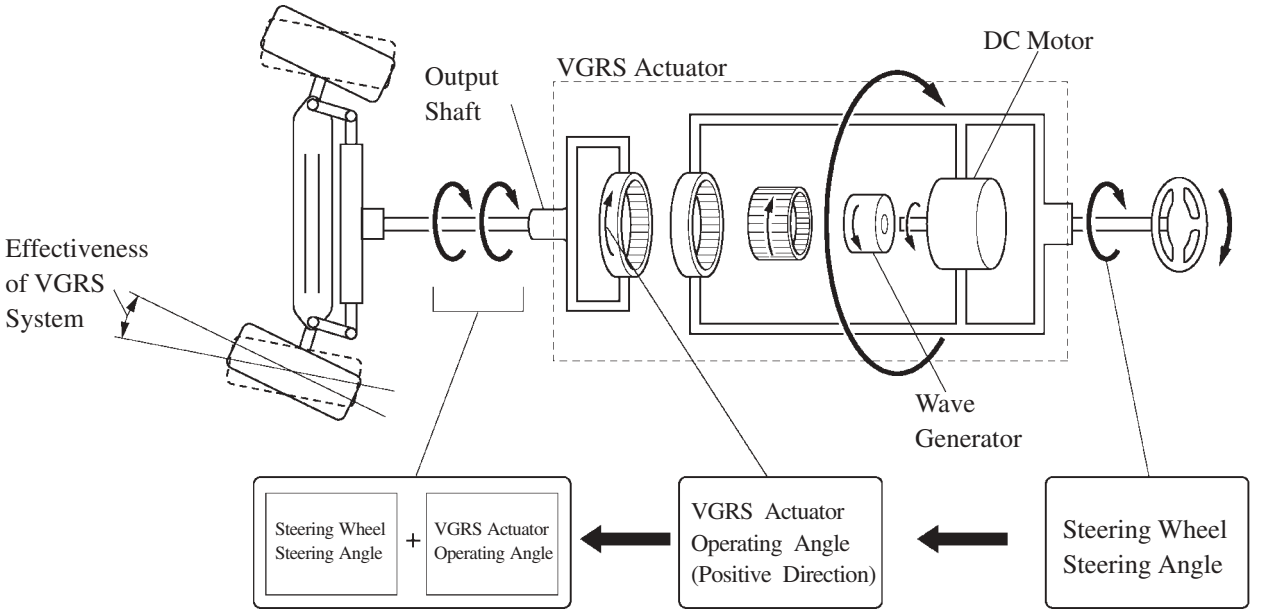
**Service Tip**

If the VGRS actuator must be removed from the vehicle and reinstalled or disconnect the steering linkage, it is necessary to verify the neutral position of the spiral cable for VGRS System and spiral cable for SRS Airbag System. For details, refer to the Land Cruiser Chasis and Body Repair Manual Supplement (Pub. No. RM970E).

### 2) Steering Torpue Transmission

#### a. Low and Middle Speed Range

This system rotates the VGRS actuator in the positive direction in the low-speed range (in which a reduction in the steering wheel operating effort is desired) or in the medium-speed range (in which a more agile vehicle response is desired).
For example, if the driver turns the steering wheel clockwise, the torque is transmitted as illustrated below.
In order to create the target operating angle for the actuator that has been determined by the VGRS ECU, the DC motor in the VGRS actuator rotates counterclockwise. Then, the rotational movement of the DC motor is input into the reduction mechanism by way of the wave generator. The rotational movement is reduced to a 1:50 gear ratio, and is output from the output shaft in the clockwise direction. This operating angle of the VGRS actuator is then added to the angle in which the steering wheel is steered by the driver. Thus, the intermediate shaft rotates more clockwise than the steered angle of the steering wheel by the amount of the operating angle of the VGRS actuator. As a result, the front wheels turn more to the right.




230LX40

**b. High Speed Range**

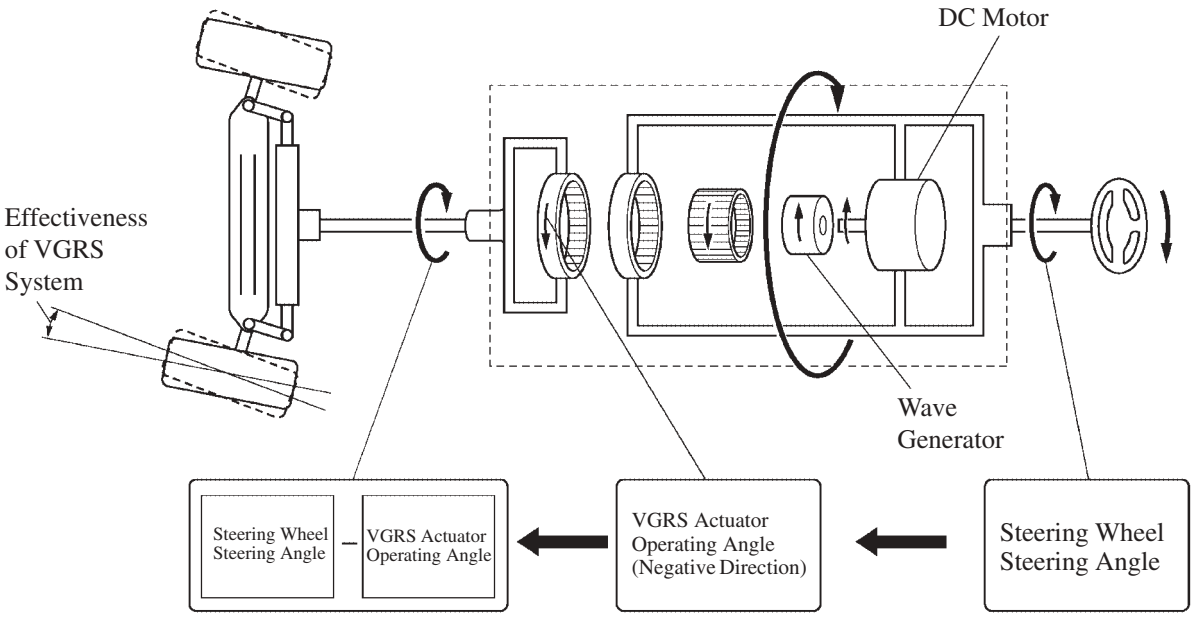
In the high-speed range (in which an over-sensitive movement response of the vehicle is not desired), the VGRS actuator of this system rotates slightly in the negative direction.

For example, if the driver turns the steering wheel clockwise, the torque is transmitted as illustrated below.

In order to create the target operating angle for the actuator that has been determined by the VGRS ECU, the DC motor in the VGRS actuator rotates clockwise. Then, the rotational movement of the DC motor is input into the reduction mechanism by way of the wave generator. The rotational movement is reduced to a 1:50 gear ratio, and is output a little from the output shaft in the counterclockwise direction. This operating angle of the VGRS actuator is then subtracted from the angle in which the steering wheel is steered by the driver. Thus, the intermediate shaft rotates less clockwise than the steered angle of the steering wheel by the amount of the operating angle of the VGRS actuator. As a result, the front wheels turn less to the right.

When the VGRS actuator rotates in the negative direction, it will not rotate in excess of the driver's steering angle.






230LX41

### 3) VGRS ECU

#### a. General

- In accordance with the vehicle speed signals that are obtained from the skid control ECU, the VGRS ECU selects the driver's steering angle and direction (which are obtained from the steering angle sensor signals) and the actuator operating angle data (which is preset in the VGRS ECU in accordance with the vehicle speed). Based on these two pieces of information, the VGRS ECU controls the VGRS actuator in order to attain the proper actuator target operating angle.
- The VGRS ECU is located near the area where the brake pedal is mounted.
- The VGRS ECU stores in its memory the neutral position of the VGRS actuator that has been determined as desired. Thus, the VGRS ECU effects control by using this neutral position as a reference. Furthermore, the VGRS ECU constantly stores in its memory the operating angle of the VGRS actuator. These data that have been stored in memory will not be erased even if the battery terminals are disconnected.
- The VGRS ECU is equipped with a diagnosis function and a fail-safe function.

**Service Tip**

The VGRS ECU stores in its memory the neutral position of the VGRS actuator that has been determined as desired. If the VGRS ECU or the VGRS actuator must be replaced, it is necessary to correct the neutral position with respect to the operating angle of the VGRS actuator.
For details, refer to the Land Cruiser Chasis and Body Repair Manual Supplement (Pub. No. RM970E).

#### b. Diagnosis

- If the VGRS ECU detects a malfunction in the VGRS system, it will immediately stop the operation of the system, and illuminate the VGRS warning light that is provided in the combination meter in order to alert the driver.
  At the same time, the DTC (Diagnostic Trouble Code) are stored in memory.
  The DTC can be read by connecting the SST (09843-18040) between the Tc and CG terminals of DLC3 and observing the blinking of the VGRS warning light or by connecting a hand-held tester.
- The table below indicates the DTCs that are associated with this system. For details concerning the DTCs, see the Land Cruiser Chasis and Body Repair Manual Supplement (Pub. No. RM970E).

| DTC No. | Detection Item | DTC No. | Detection Item |
|---|---|---|---|
| C1511/11 | Steering Angle Sensor Malfunction | C1551/51 | IG Power Source Voltage Malfunction |
| C1515/15 | VGRS Actuator Neutral Position undone | C1552/52 | DC Motor Power Source voltage Malfunction |
| C1516/16 | VGRS Actuator Neutral Position undone | C1554/54 | Power Source Relay Failure |
| C1521/21 | VGRS Actuator Malfunction | C1555/55 | Predriver Source Relay Failure |
| C1522/22 | VGRS Actuator Malfunction | C1561/61 | Lock Mechanism Malfunction |
| C1527/27 | VGRS Actuator Malfunction | C1567/67 | Lock Mechanism Insertion Malfunction |
| C1528/28 | VGRS Actuator Malfunction | C1568/68 | Lock Holder Deviation Detection |
| C1531/31 | VGRS ECU Malfunction | C1569/69 | Lock Mechanism Release Incomplete |
| C1532/32 | VGRS ECU Malfunction | C1571 | Vehicle Speed Sensor Malfunction (FLO) |
| C1533/33 | VGRS ECU Malfunction | C1572 | Vehicle Speed Sensor Malfunction (FRO) |
| C1541/41 | Skid Control System Malfunction | C1575 | Steering Angle Sensor Malfunction |
| C1549/49 | Skid Control System Communication Malfunction | C1576 | DC Motor Revolution Angle Sensor Malfunction |

**c. Fail-Safe**

- If the VGRS ECU detects a malfunction in the VGRS system, it will take the actions indicated in the table below.
- The VGRS ECU has a built-in temperature sensor in order to effect failsafe control if it overheats. Furthermore, this ECU monitors any changes in the actuating voltage of the DC motor in order to detect the overheating of the motor.

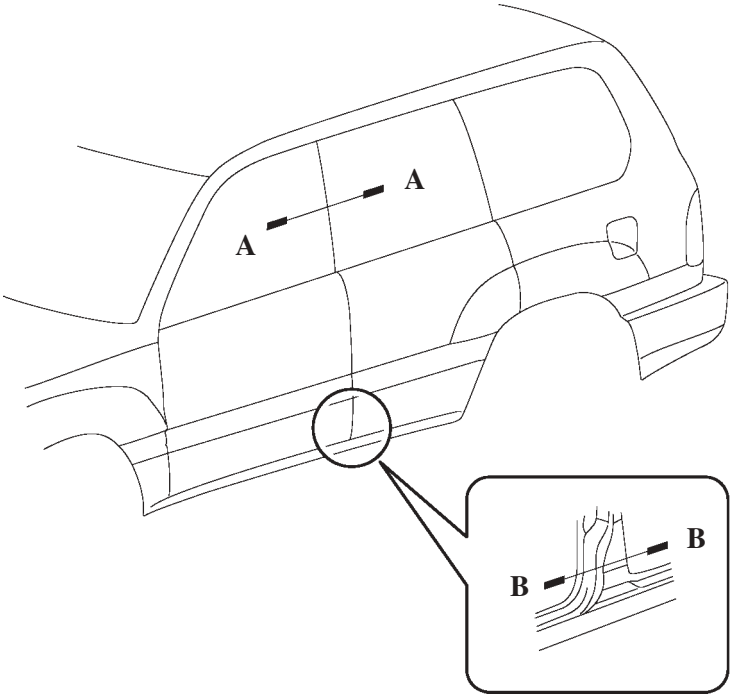
| Malfunction Item | Description of Control | VGRS Warning Light*1 | DTC Memory Condition*2 |
|---|---|---|---|
| Steering Angle Sensor Malfunction | Stops the control | ○ | ○ |
| DC Motor Malfunction | † | ○ | ○ |
| VGRS ECU Malfunction | † | ○ | ○ |
| DC Motor Circuit Malfunction | † | ○ | ○ |
| Lock Mechanism Circuit Malfunction | † | ○ | ○ |
| Vehicle Speed Signal Malfunction | † | ○ | ○ |
| Skid Control ECU Communication Signal Malfunction | † | ○ | ○ |
| DC Motor Overheat | First, the control is stopped; then, the control resumes after the system resumes its normal operation. | — | — |
| VGRS ECU Overheat | † | — | — |
| PIG Power Source Drop Voltage Malfunction | † | — | — |
| VGRS Actuator Malfunction*3 | † | — | — |

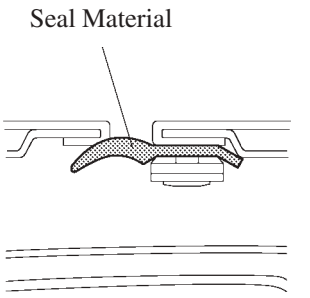
*1: ○ = VGRS Warning Light lights up
— = VGRS Warning Light does not light up.
*2: ○ = Memorize
— = None
*3: Specific Examples:
(1) When the steering is operated while the output of the power steering pump is unstable, immediately after starting a cold engine.
(2) If the driver attempts to operate the steering wheel further after it has been steered entirely to the rack end.

## ■BODY

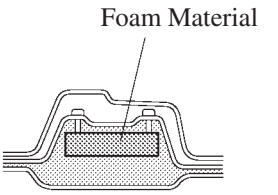
### 1. Low Vibration and Low Noise Body

- The urethane pad at the bottom of the center pillar has been changed to a foam material. As a result, noise and vibration have been reduced.
- A sealing material has been provided on the door frame of the VX grade and the GX-R grade for the G.C.C. countries. As a result, noise and vibration have been reduced.
- The capacity of the silencer that is provided in the fender apron of the 1HD-FTE engine model has been increased in order to reduce engine noise.




**A – A Cross Section**

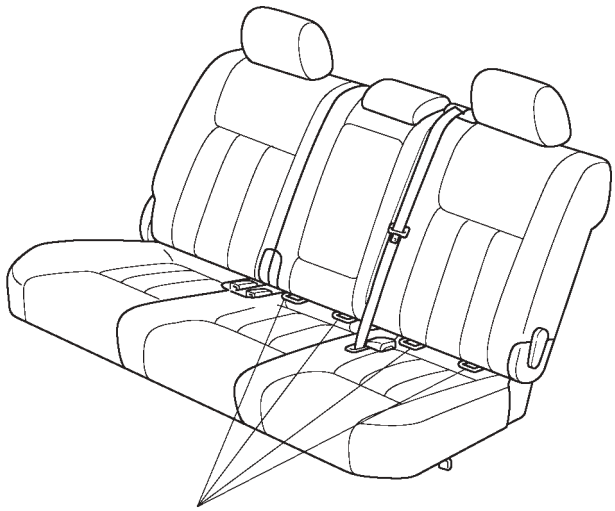



**B – B Cross Section**

229LC140

## 2. No.1 Rear Seat

An ISO-FIX bar for securing a child seat has been provided on the No. 1 rear seat of the Europe model.



ISO-FIX Bar

229LC141

## ■BODY ELECTRICAL SYSTEM CONTROL

### 1. Multiplex Communication System

#### General

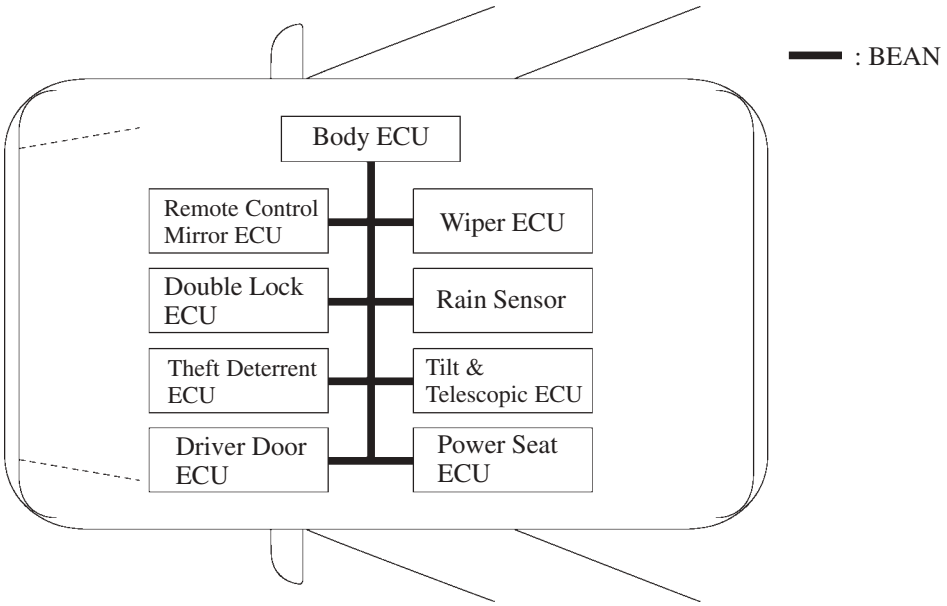
- The configuration of the BEAN (Body Electronics Area Network) has been changed in accordance with the addition of equipment.
  This system is divided into two buses: the bus in which communication is centered on the body ECU, and the bus in which communication is centered on the engine ECU.
- The instrument ECU is based on the previous model. On the new model, the body ECU provides additional control functions in order to comprehensively control the body electrical system.
- The communication between the control signals related to the audio and visual systems and the gateway ECU is established via the AVC-LAN (Audio Visual Communication-Local Area Network). The transmission of the signals exchanged between BEAN and AVC-LAN is carried out by the gateway function of the gateway ECU.
- A customized body electronic system is used in order to set the control functions of the ECUs through the use of a hand-held tester.

**▶ ECUs that Support Multiplex Communication System ◀**

| Destination | G.C.C. and General Countries Model | | Australia | | | Europe | |
|---|---|---|---|---|---|---|---|
| Engine | 1FZ-FE 1HZ | 2UZ-FE 1HD-FTE | 1HZ | 2UZ-FE 1HD-FTE | 2UZ-FE 1HD-FTE | 1HD-FTE | 2UZ-FE |
| Grade | STD GX | VX | STD | GX | VX | VX | VX |
| Body ECU | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Driver Door ECU | Δ | ○ | — | Δ | ○ | ○ | ○ |
| Theft Deterren ECU | Δ | ○ | — | — | — | ○ | ○ |
| Double Lock ECU | — | — | — | — | — | Δ | Δ |
| Power Seat ECU | — | — | — | — | — | Δ | Δ |
| Tilt & Telescopic ECU | — | Δ | — | — | Δ | Δ | Δ |
| Remote Control Mirror ECU | — | — | — | — | — | Δ | Δ |
| Wiper ECU | — | — | — | — | — | Δ | Δ |
| Rain Sensor | — | — | — | — | — | Δ | Δ |
| Engine ECU | — | ○ | — | ○ | ○ | — | ○ |
| Meter ECU | — | ○ | — | ○ | ○ | — | ○ |
| A/C ECU | — | — | — | — | — | — | Δ |
| Gateway ECU | — | — | — | — | — | Δ | Δ |
| Multi Display | — | — | — | — | — | Δ | Δ |

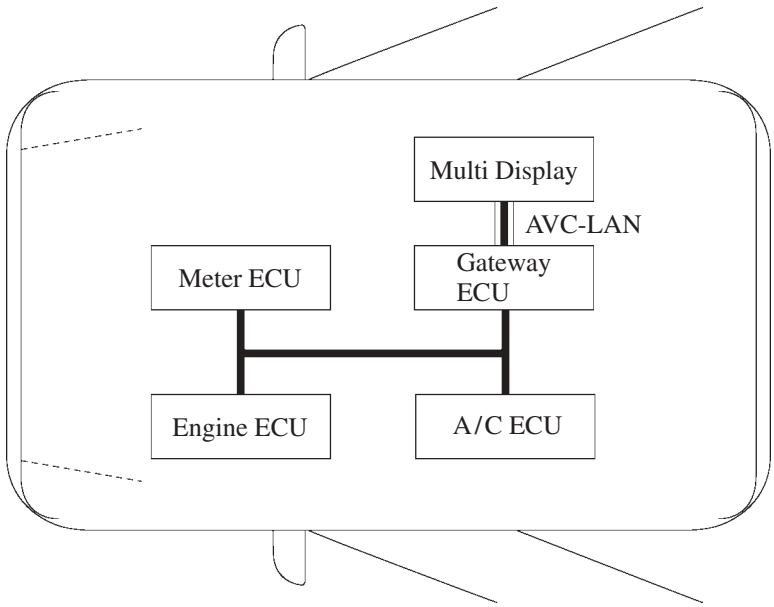
○: Standard Δ: Option —: Not supported or not provided

## System Diagram




229LC142

**Bus centered on Body ECU**

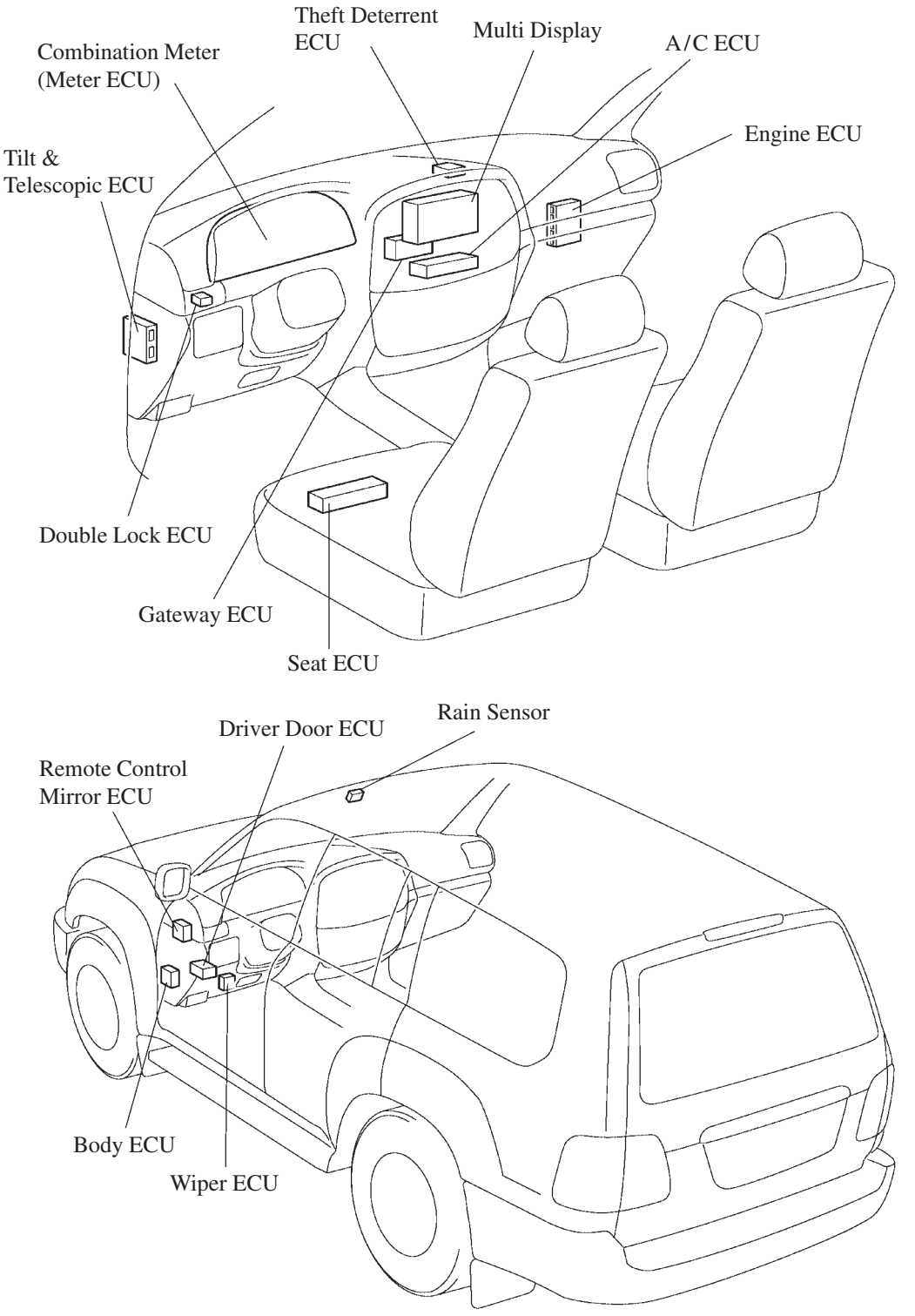



229LC143

**Bus centered on Engine ECU**

6

## Layout of Main Component



## 2. System Operation

### General

The ECUs that pertain to the body electrical system perform the functions and system controls described in the following chart.

| ECU | | Function and System Control |
|---|---|---|
| Bus centered on Body ECU | Body ECU | ● Exterior Light Control<br>● Interior Light Control<br>● Warning Control<br>● Door Lock Control<br>(for models with door lock control system)<br>● Passenger and Rear Power Window Control<br>(for models with power window system)<br>● Wireless Door Lock Remote Control<br>(for models with wireless door lock control system)<br>● Theft Deterrent System Control<br>(for models with theft deterrent system)<br>● Customize |
| | Driver Door ECU<br>(for models<br>with power window system) | ● Power Window System Control<br>● Customize |
| | Theft Deterrent ECU<br>(for models<br>with theft deterrent system) | ● Theft Deterrent System Control<br>● Customize |
| | Double Lock ECU<br>(for models with double lock system) | Double Lock System Control |
| | Power Seat ECU<br>(for models with Power Seat) | ● Power Seat Function<br>● Memory System<br>● Customize |
| | Tilt & Telescopic ECU<br>(for models with power tilt and<br>telescopic steering column) | ● Power Tilt and Telescopic Steering Column Control<br>● Customize |
| | Remote Control Mirror ECU<br>(for models<br>with remote control mirror) | ● Outside Rear View Mirror Control<br>● Customize |
| | Wiper ECU<br>(for models with wiper system<br>with raindrop sensing function) | ● Wiper control<br>● Customize |
| | Rain Sensor<br>(for models with wiper system<br>with raindrop sensing function) | ● Raindrop Sensing Function<br>● Customize |
| Bus centered on Engine ECU | Engine ECU | ● Engine Control<br>● A/T Control<br>● Cruise Control<br>(for models with cruise control system) |
| | Meter ECU | ● Combination Meter Display<br>● Buzzer System |
| | A/C ECU<br>(for models with multi display) | Air Conditioner Control |
| | Gateway ECU<br>(for models with multi display) | Gateway Function |
| | Multi Display<br>(for models with multi display) | ● Navigation System<br>● Air Conditioner System Operation Function<br>● Trip Information Function |

## Customized Body Electronics System

### 1) General

The customized body electronics system enables the control function settings of the ECUs to be changed through the use of a hand-held tester.
However, this system can change the settings of only the ECUs that belong to the bus in which communication is centered on the body ECU.

### 2) Operation

Operating a hand-held tester can change the specifications of the systems and functions.
The changed contents that are open to users are shown in the following list.

| System | Hand-Held Tester Display Content | Contents | Default | Selection |
|---|---|---|---|---|
| Wireless Door Lock Remote Control System | AUTO LOCK DELAY (Auto lock time) | To change the time until re-locking after unlocking with the wireless door lock function. | 30 sec. | 30 sec. /60 sec. |
| | HAZARD ANS BACK (Hazard answer back of the wireless) | Function to light up the all turn signal light once when pressing the transmitter lock button and twice when pressing the unlock button under the condition that the Engine Hood, all the doors are closed. | ON | ON/OFF |
| | ALARM FUNCTION*1 (Panic function) | Function to operate the theft deterrent system by keeping pressing the lock button of the transmitter for 2.5 seconds. If there is the panic button, press the panic button instead of the lock button. | ON | ON/OFF |
| | WIRELESS OPER (Wireless door lock control function) | ON/OFF of the wireless door lock function. | ON | ON/OFF |
| Wiper System*2 | REWIPE CONTROL (Rewipe control) | Function to change time until operating the wiper to prevent dropping after having used the washer. | SPD MOD | OFF/3 sec. /SPD MOD |
| | SPEED MODE (Speed mode) | Function to change to the intermittent operation when the vehicle comes to a stop (0 vehicle speed) from running condition in case that the wiper switch is at the LO position. | AVAIL | AVAIL /NOT AVAIL |
| Illuminated Entry System | I/L ON/UNLOCK (Interior light ON w/door key unlock) | Function to light up the interior light, ignition light and step light when unlocking with the door key cylinder. | ON | ON/OFF |
| | LIGHT CONTROL (Lighting time) | To change the lighting time after closing the door. (It will quickly fade out in case of turning the ignition ON.) | 15 sec. | 7.5 sec. /15 sec. /30sec. |
| | I/L ON/ACC OFF (Light the I/L when ACC OFF) | Function to light the interior light when the ignition switch is operated from “ACC” to “LOCK”. | ON | ON/OFF |

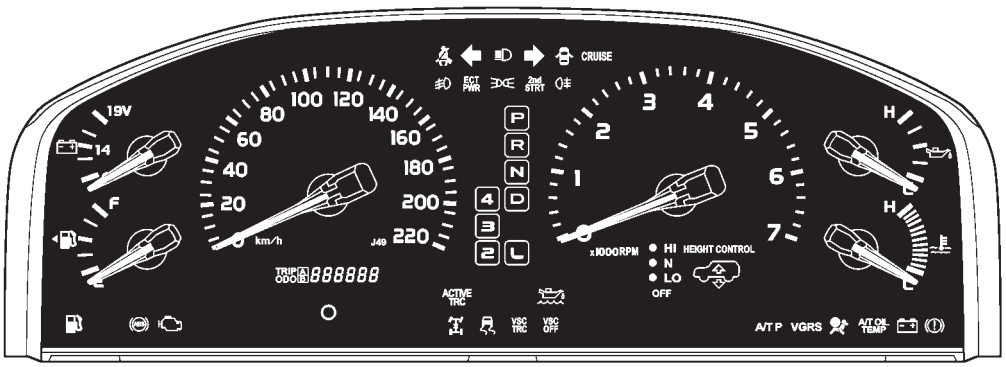
*1: Only for General countries models with Theft Deterrent System
*2: Only for Europe models with wiper system with a rain drop sensing function

## ■COMBINATION METER

### 1. General

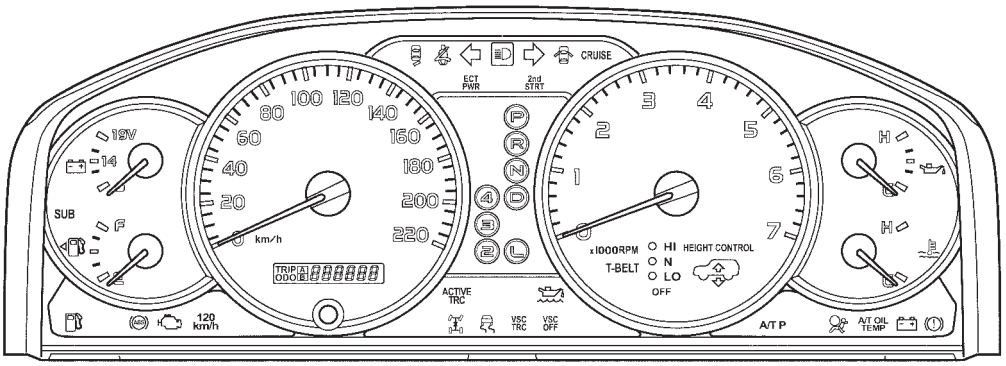
- The design of the combination meter has been changed.
- The movement for actuating the indicator of the speedometer and the tachometer has been changed from the cross-coil type of the previous model to a step-motor type.
- An optitron display type combination meter has been adopted on the VX grade for Europe. The optitron display type meter realizes excellent visibility through the use of smoke acrylic in the protective panel, and LEDs (Light Emitting Diodes) that is vary bright and has high contrast for illuminating the indicator and the dial.
- A fade-in function that gradually turns ON the illumination, and a fade-out function that gradually turns OFF the illumination, have been adopted on the models with the Optitron display type combination meter to enhance product appeal.
- A speed warning system that sounds a buzzer and blinks a warning light has been adopted on the models for the G.C.C. countries.






**Optitron type for Europe LHD Model**

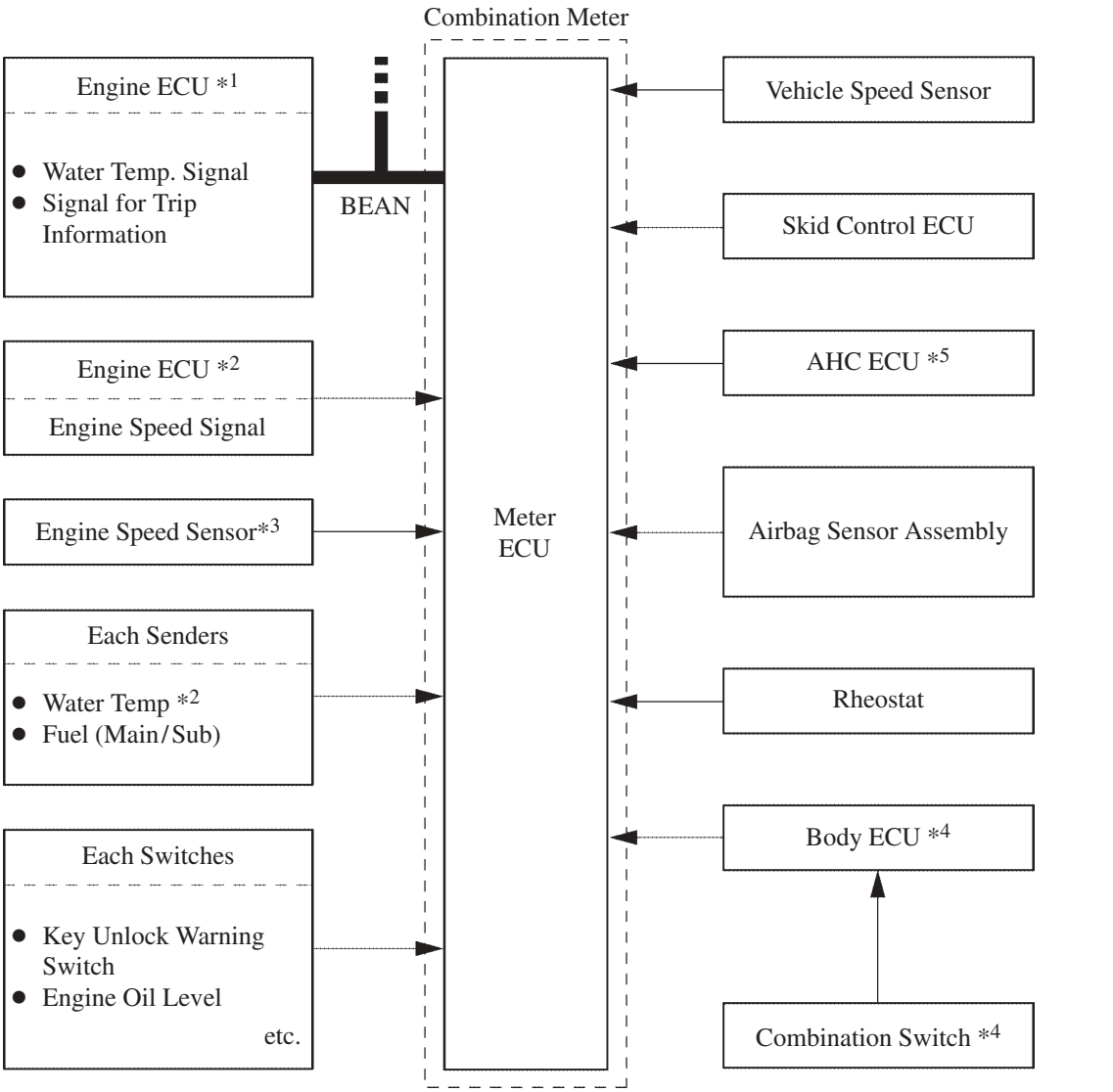
229LC144




**Conventional type for G.C.C. Countries Model**

229LC145

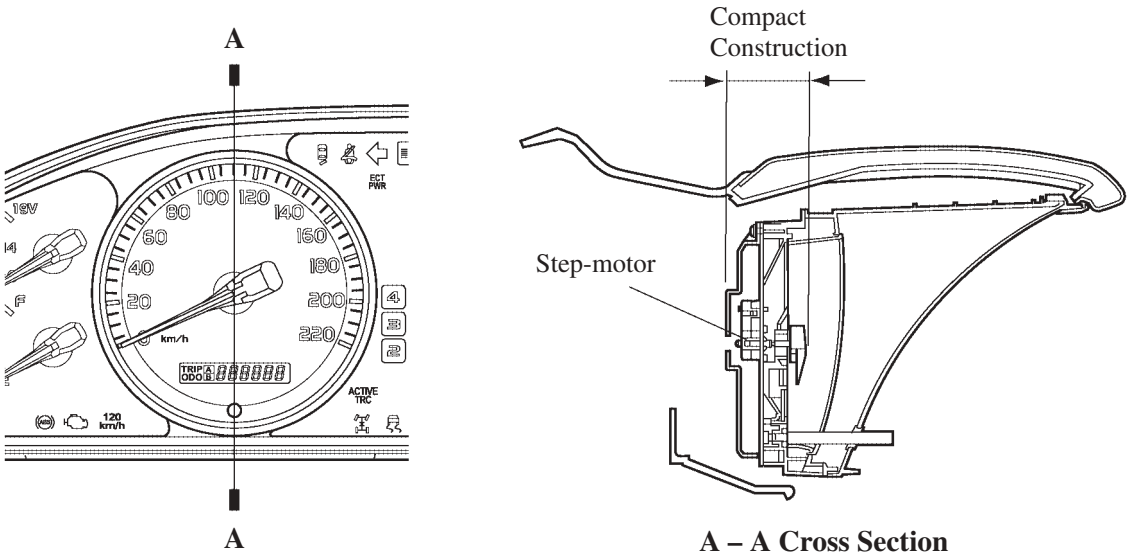
## 2. System Diagram




*1: Models with Multi-Information Display or Multi-Display
*2: Models without Multi-Information Display or Multi-Display
*3: 1HZ Engine Model (except Australia Model)
*4: Models with Optitron Display type Combination Meter
*5: Models with AHC (Active Height Control)

## 3. Construction

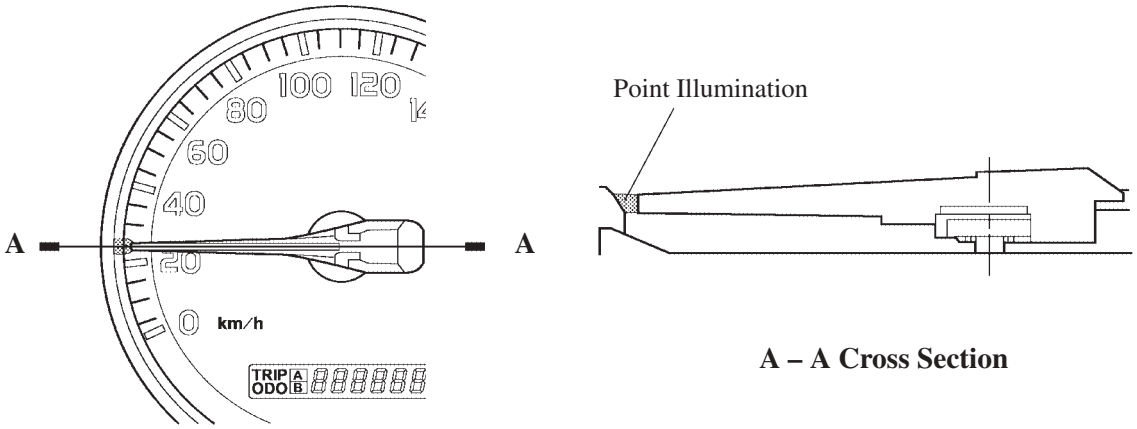
- The indicator actuation movement for the speedometer and the tachometer has been changed from the cross coil type to the step-motor type. This has resulted in a thinner indicator actuation movement, thus achieving a lightweight and compact construction.
- In the case of the step-motor type, when the power to the combination meter is turned ON through the reconnection of the battery terminal, the step-motor initializes once to recognize the zero point of the indicator in relation to the step-motor. However, if the ignition switch is turned ON after 60 seconds or more have elapsed after the initialization, the step-motor initializes again.




**A – A Cross Section**

229LC146

- A point illumination, in which a blue light is emitted from the tip of the indicator of the speedometer and the tachometer, has been adopted on the Optitron display type combination meter to enhance product appeal.



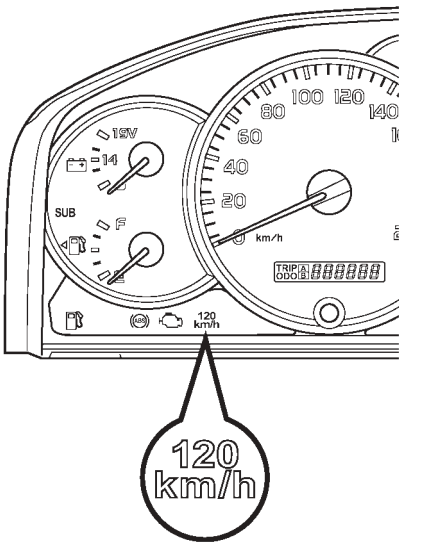

**A – A Cross Section**

229LC147

6

## 4. Speed Warning System

On the previous model for the G.C.C. countries, the buzzer of the speed warning system continues to sound at speeds of 120 km/h or higher. This has been changed to a system that sounds the buzzer in the combination meter for a prescribed duration (6 seconds) and then blinks the speed warning light in the combination meter.




Speed Warning Light

229LC148

## ■ WIPER SYSTEM (Only for Europe Model)

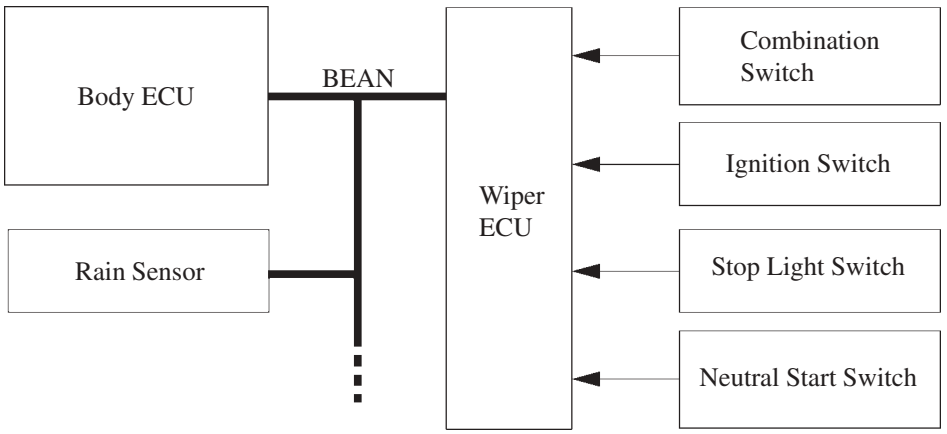
### 1. General

- A wiper system with a raindrop sensing function has been adopted on the VX grade for Europe as optional equipment.
- As a rule, the control of the wiper operation is effected by the wiper ECU. However, the control of the rain drop sensing function is effected by the rain sensor.
- This system has the following function.

| Function | Outline |
|---|---|
| Vehicle Speed-Sensing, Adjustable Interval INT Function | This function controls the wiper interval time in accordance with the vehicle speed when the wiper switch is in the AUTO position. |
| Vehicle Speed Switching Function | This function automatically switches the operating condition of the wipers while the vehicle is stopped or starting off, when the wiper switch is in the LO position. |
| Washer-Linked Wiper with Drip-Preventive Function | To prevent the fluid from dripping after the washer has been operated, this function operates the wipers once after they have operated in unison with the washer. |
| Raindrop Sensing Function | This function controls the wiping timing in accordance with the amount of raindrops when the wiper switch is in the AUTO position. |

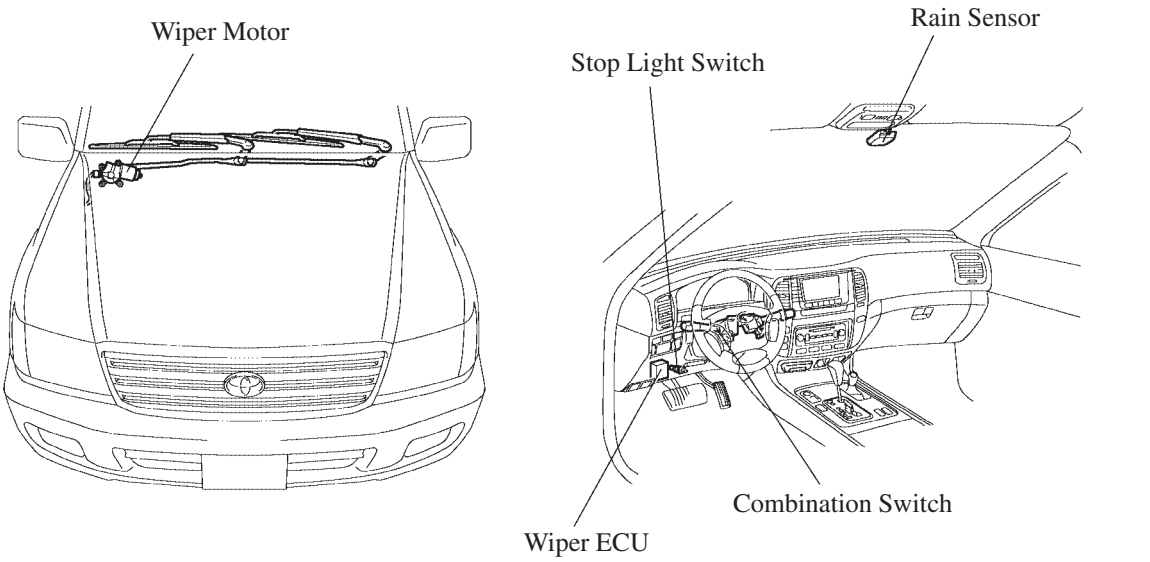


**▶ System Diagram ◀**




229LC149

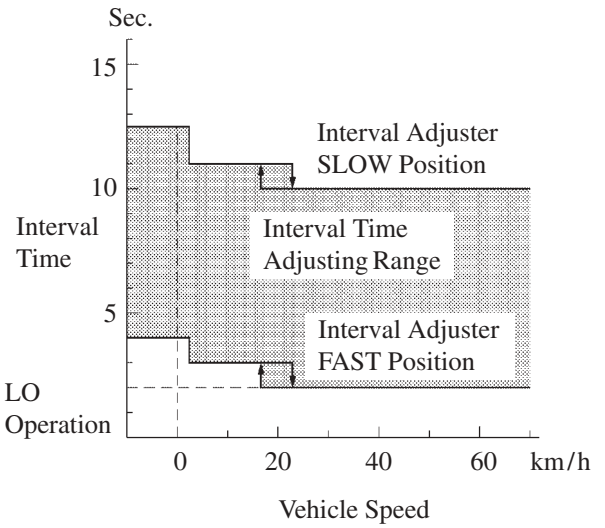
## 2. Layout of Main Component



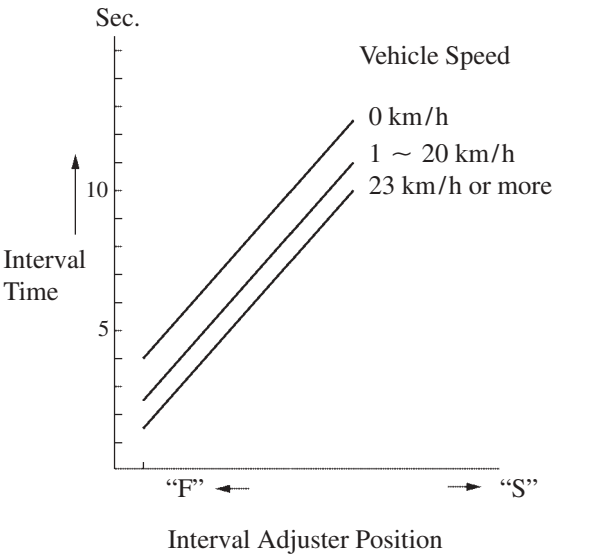

229LC150

## 3. Vehicle Speed-Sensing, Adjustable Interval INT Function

This function controls the interval time of the wipers in accordance with the vehicle speed when the wiper switch is in the AUTO position. The interval time adjusting range consists of 3 steps, which can be selected by operating the interval adjuster. The interval time can be controlled steplessly within each range.

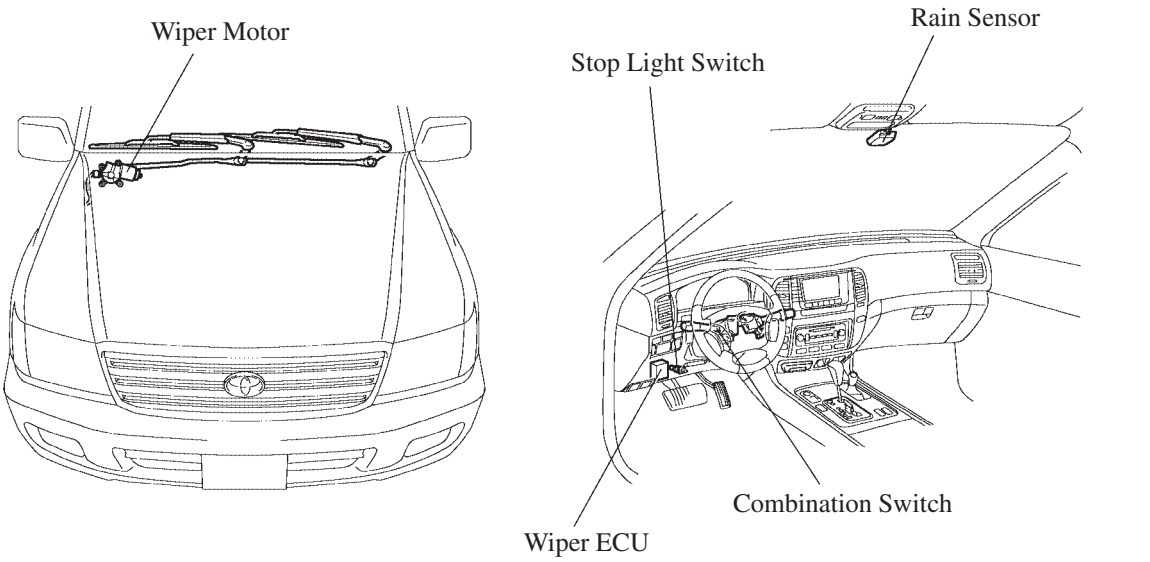



189BE87




229LC180

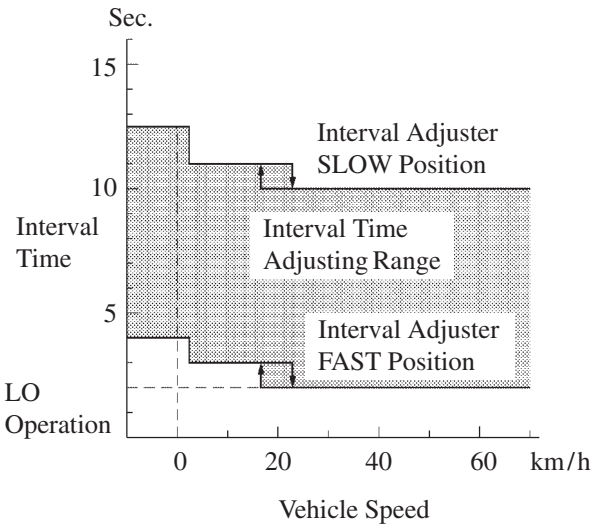
## 2. Layout of Main Component




229LC150

## 3. Vehicle Speed-Sensing, Adjustable Interval INT Function

This function controls the interval time of the wipers in accordance with the vehicle speed when the wiper switch is in the AUTO position. The interval time adjusting range consists of 3 steps, which can be selected by operating the interval adjuster. The interval time can be controlled steplessly within each range.

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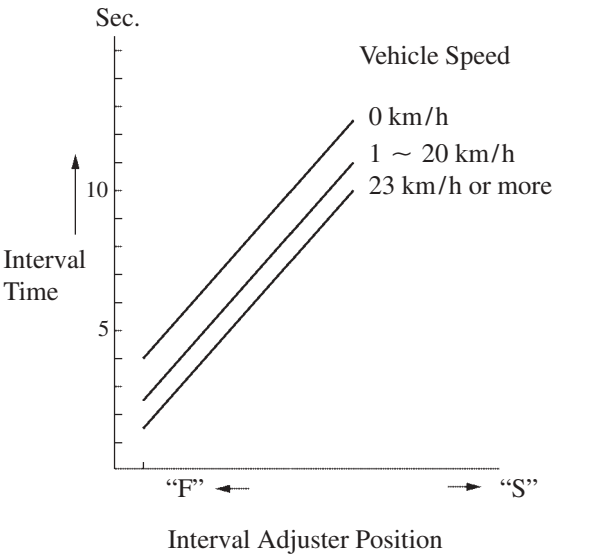



229LC180

## 4. Vehicle Speed Switching Function

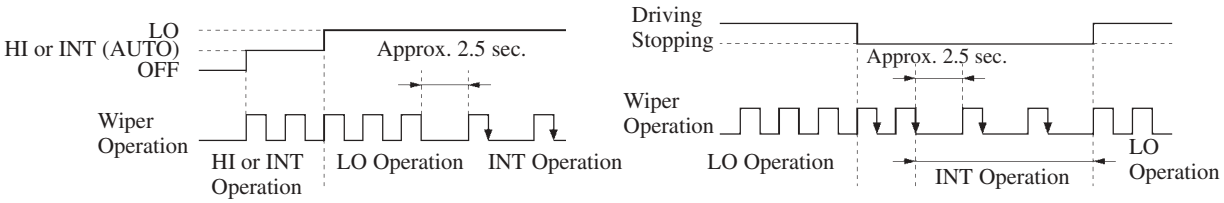
### General

This function that automatically switches to the intermittent operation when the wiper switch is in the LO position and the vehicle is stopped. To perform this function, the stopping and driving conditions of the vehicle are determined as described below.

| | |
|---|---|
| Driving Judgment | When the vehicle speed is other than 0 km/h, or the stop light and the perking brake are OFF and the shift lever is in a position other than P or N. |
| Stopping Judgment | When a condition other than the driving judgment has been detected. |

### Operation

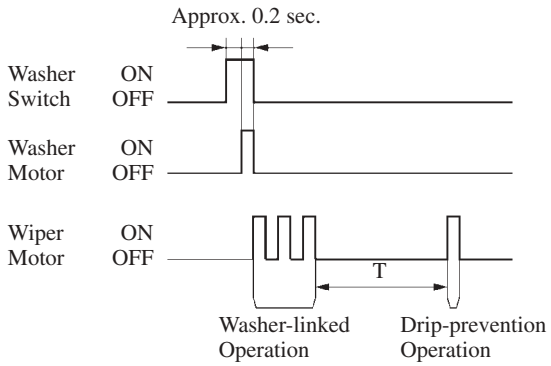
When the vehicle is stopped, operating the wiper switch from the AUTO or HI position to the LO position causes the wipers to operate 3 times at the low speed, and then automatically switch to intermittent operation with an interval time of approximately 2.5 seconds. When the vehicle is being driven and the switch is in the LO position, stopping the vehicle causes the wipers to operate twice, and then switch to intermittent operation with an interval time of approximately 2.5 seconds.




189BE89

## 5. Washer-Linked Wiper with Drip-Preventive Function

With this function, when the wiper switch is in the OFF or AUTO position, turning the washer switch ON for approximately 0.2 seconds or longer causes the washers to operate, and after the washer switch has been turned OFF, the wipers operate in unison 3 times at the low speed. Approximately 3 seconds (when the vehicle speed is between 0 to 59 km/h) after the low-speed operation of the wipers has been completed, the wipers operate once again to wipe off the washer fluid that has dripped. The drip prevention interval times are shown in the table below, according to the vehicle speed.




T: Varies according to the vehicle speed.

189BE91

| Vehicle Speed | Interval Time | Vehicle Speed | Interval Time |
|---|---|---|---|
| 0 to 59 km/h | Approx. 3 sec. | 120 to 159 km/h | Approx. 5 sec. |
| 60 to 79 km/h | Approx. 5 sec. | 160 to 169 km/h | Approx. 3 sec. |
| 80 to 119 km/h | Approx. 7 sec. | 170 km/h or more | No Operation |

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## 4. Vehicle Speed Switching Function

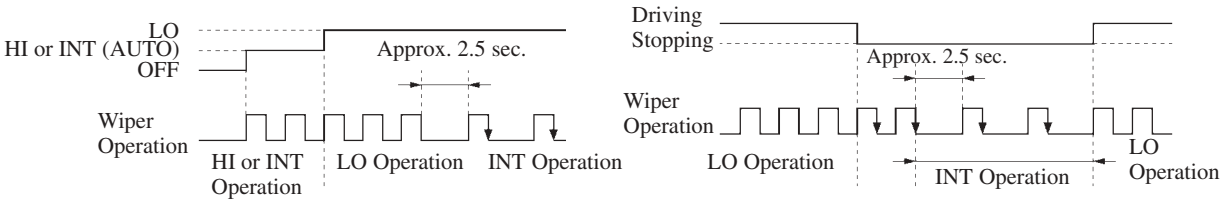
### General

This function that automatically switches to the intermittent operation when the wiper switch is in the LO position and the vehicle is stopped. To perform this function, the stopping and driving conditions of the vehicle are determined as described below.

| | |
|---|---|
| Driving Judgment | When the vehicle speed is other than 0 km/h, or the stop light and the perking brake are OFF and the shift lever is in a position other than P or N. |
| Stopping Judgment | When a condition other than the driving judgment has been detected. |

### Operation

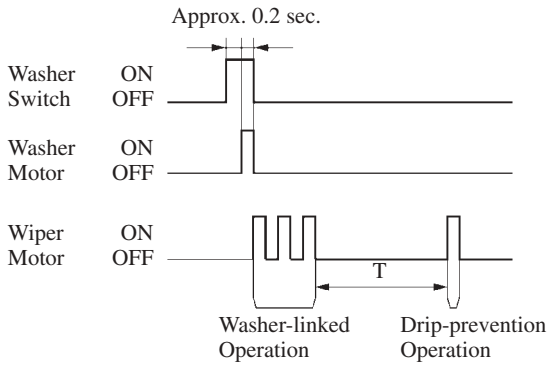
When the vehicle is stopped, operating the wiper switch from the AUTO or HI position to the LO position causes the wipers to operate 3 times at the low speed, and then automatically switch to intermittent operation with an interval time of approximately 2.5 seconds. When the vehicle is being driven and the switch is in the LO position, stopping the vehicle causes the wipers to operate twice, and then switch to intermittent operation with an interval time of approximately 2.5 seconds.




189BE89

## 5. Washer-Linked Wiper with Drip-Preventive Function

With this function, when the wiper switch is in the OFF or AUTO position, turning the washer switch ON for approximately 0.2 seconds or longer causes the washers to operate, and after the washer switch has been turned OFF, the wipers operate in unison 3 times at the low speed. Approximately 3 seconds (when the vehicle speed is between 0 to 59 km/h) after the low-speed operation of the wipers has been completed, the wipers operate once again to wipe off the washer fluid that has dripped. The drip prevention interval times are shown in the table below, according to the vehicle speed.




T: Varies according to the vehicle speed.

189BE91

| Vehicle Speed | Interval Time | Vehicle Speed | Interval Time |
|---|---|---|---|
| 0 to 59 km/h | Approx. 3 sec. | 120 to 159 km/h | Approx. 5 sec. |
| 60 to 79 km/h | Approx. 5 sec. | 160 to 169 km/h | Approx. 3 sec. |
| 80 to 119 km/h | Approx. 7 sec. | 170 km/h or more | No Operation |

6

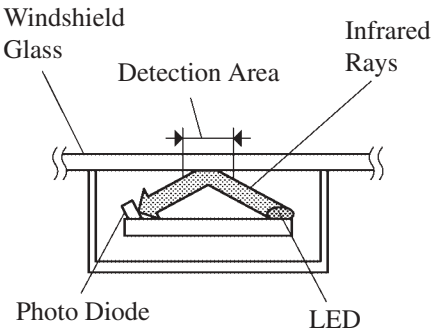
## 6. Raindrop Sensing Function

### General

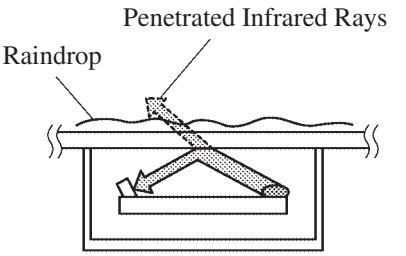
When the wiper switch is in the AUTO position, this function uses a rain sensor that is mounted on the front windshield glass to detect the amount of raindrops, and controls an optimal wiping timing accordingly.

### Construction and Operation

The rain sensor consists mainly of an LED (Light Emitting Diode) that emits infrared rays, and a photo diode that receives those rays. The detection method is based on the infrared rays that are reflected by the front windshield glass.
For example, if no raindrops are present in the detection area, the infrared rays emitted by the LED are all reflected from the windshield glass and are received by the photo diode. If raindrops are present in the detection area, a portion of the emitted infrared rays penetrates with the change of index of reflection outward of the windshield glass via the raindrops, thus reducing the amount of infrared rays that are received by the photo diode. The amount of this reduction is then used to detect the amount of raindrops. Thus, this function controls the INT, LO, and HI operations in order to operate the wipers at an optimal wiping timing.




**If no raindrops are present**




**If raindrops are present**

189BE93

**Service Tip**

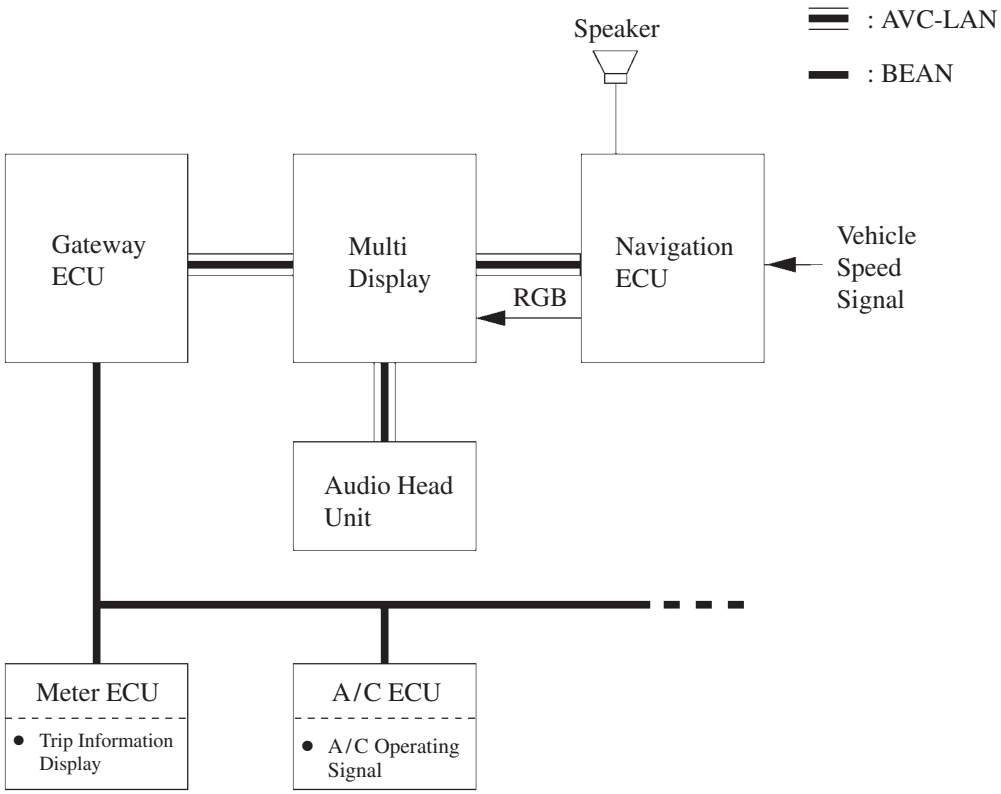
If the rain sensor tape has been peeled during a windshield glass replacement, make sure to affix a new rain sensor tape. Failure to do so will lead to a system malfunction.

## ■ MULTI DISPLAY (Only for Europe Model)

### 1. General

- A multi display has been provided on the center cluster panel as an option only for Europe model. The display, which consists of a wide 7.0-inch LCD (Liquid Crystal Display) screen with a pressure sensitive touch panel, offers improved ease of use.
- Through the use of the GPS (Global Positioning System) and map data in a DVD (Digital Versatile Disc), this navigation system analyzes the position of the vehicle and indicates that position on the map that is displayed on the screen. Additionally, it provides voice instructions to guide the driver through the route to reach the destination that has been selected.
- Upon receiving the vehicle information that is transmitted by the gateway ECU, the navigation information that is transmitted by the navigation ECU, the trip information that is transmitted by the meter ECU and the operation information from audio unit, multi display displays theses data on the display.

### 2. System Diagram



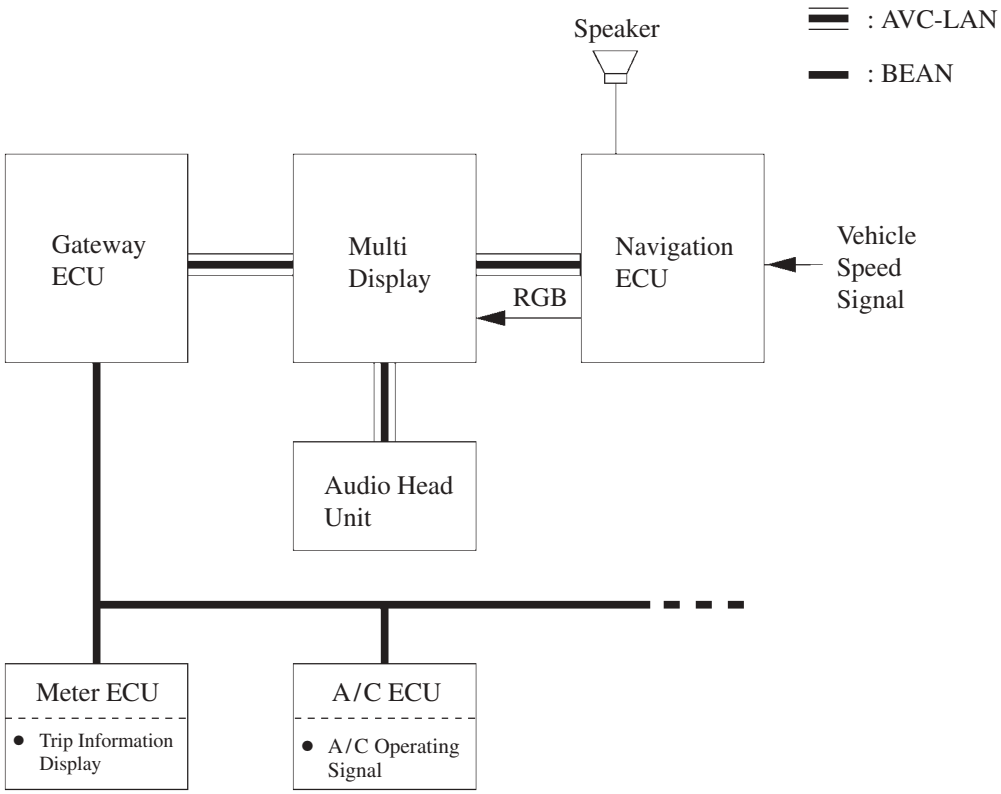

230LX96

## ■ MULTI DISPLAY (Only for Europe Model)

### 1. General

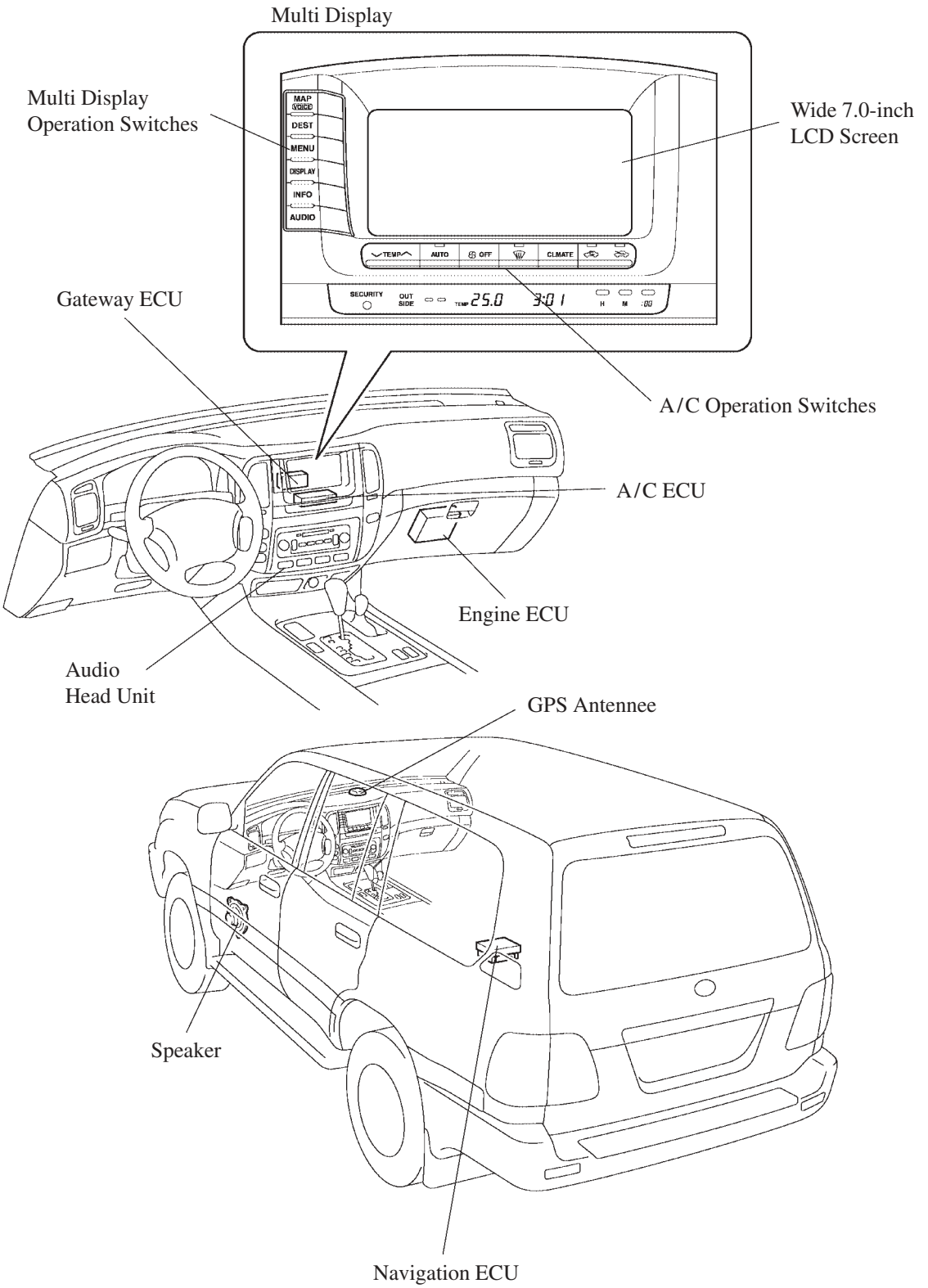
- A multi display has been provided on the center cluster panel as an option only for Europe model. The display, which consists of a wide 7.0-inch LCD (Liquid Crystal Display) screen with a pressure sensitive touch panel, offers improved ease of use.
- Through the use of the GPS (Global Positioning System) and map data in a DVD (Digital Versatile Disc), this navigation system analyzes the position of the vehicle and indicates that position on the map that is displayed on the screen. Additionally, it provides voice instructions to guide the driver through the route to reach the destination that has been selected.
- Upon receiving the vehicle information that is transmitted by the gateway ECU, the navigation information that is transmitted by the navigation ECU, the trip information that is transmitted by the meter ECU and the operation information from audio unit, multi display displays theses data on the display.

### 2. System Diagram




230LX96

## 3. Layout of Component




229lc152

## 4. Construction and Operation

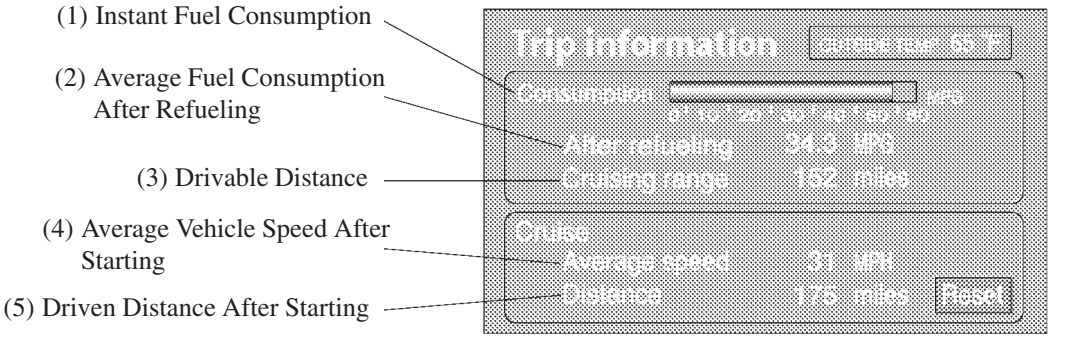
### Multi Display

#### 1) General

Listed below are the main functions of the multi display.

| Function | Outline |
|---|---|
| Audio Screen Display | ● Status of audio equipment and audio operation screen indication.<br>● Sound quality adjustment screen indication. |
| On-screen Display | ● Display the operating condition of the air conditioner.<br>● Display the outside temperature. |
| Adjustment Screen Display | Image quality adjustment screen indication. |
| Trip Information Display<br>(See page 250) | ● Instant Fuel Consumption.<br>● Average Fuel Consumption after refueling.<br>● Drivable Distance.<br>● Average vehicle speed after starting.<br>● Driven distance after starting. |
| Navigation Screen Display<br>(See page 251) | ● Language selector display.<br>● Enlargement/reduction, rotation and movement of map.<br>● Indication of current position and direction of travel.<br>● Correction of current position.<br>● Setting change and indication of route.<br>● Voice guidance.<br>There are many additional functions. |
| Diagnosis Screen Display<br>(See page 252) | ● Service Check Menu.<br>● Display Check.<br>● Navigation Check. |

### 2) Trip Information Display




230LX56

| Item | | Outline |
|---|---|---|
| (1) | Instant Fuel Consumption | ● Displays the value that has been calculated by the meter ECU, which is based on the driven distance and the fuel consumption volume (fuel injection signal from No. 1 injector), provided that the ignition switch is turned ON.<br>● The display updates every 2 seconds. |
| (2) | Average Fuel Consumption After Refueling | ● Displays the value that has been calculated by the meter ECU, which is based on the driven distance after refueling and the fuel consumption volume (fuel injection signal from No. 1 injector).<br>● The meter ECU determines that the vehicle has been refueled in accordance with the signal from the fuel sender gauge.<br>● The display updates every 10 seconds. |
| (3) | Drivable Distance | ● Displays the value that has been calculated by the meter ECU, which is based on the fuel consumption data that the meter ECU continuously monitors and stores in its memory and the residual fuel volume data, provided that the ignition switch is turned ON.<br>● The display updates every mile or kilometer. |
| (4) | Average Vehicle Speed After Starting | ● Displays the value that has been calculated by the meter ECU, which is based on the elapsed time and driven distance after the ignition switch has been turned ON or the RESET button has been pressed 0.8 seconds or longer.<br>● The display updates every 10 seconds. |
| (5) | Driven Distance After Starting | ● Displays the driven distance that is output by the meter ECU after the ignition switch has been turned ON or the RESET button has been pressed 0.8 seconds or longer.<br>● The display updates every mile or kilometer. |

### 3) Navigation Screen Display

Based on the map data on the DVD, signal from the GPS satellites, signals from the built-in gyro sensor, and signals from the vehicle's speed sensor, the vehicle's present position, direction of travel, and driven distance are calculated and displayed on the navigation display. This screen has the display functions listed below.

| Item | | Function |
|---|---|---|
| Map Display | Linear Touch Scroll | Enables smooth scrolling by connecting the touch points on the screen. |
| | On-route Scroll | Scrolls the center of the cursor forward and reverse constantly along the route. |
| | Heading Up | Displays the map so that the direction of the route progression head up during route guidance. |
| | Map Color Change | Automatically changes the map display color by season. |
| | Front Wide | Displays a map in the direction of travel of the vehicle in an enlarged form. (Heading up only) |
| | Step-less Scale Display | Changes the scale of the map from the basic 13 steps to an even finer display. |
| | Direct Scale Change | Directly selects and displays the map scale. |
| | Multi-step Scale Display | Changes and displays the map scale in 13 stages. |
| | Split-view Display | Displays different modes on a screen that is split into two views. |
| | Points-of-Interest Display | Displays selected types of marks on the map. |
| | Taillight-interlocked Map Color Change | Changes the displayed color on the map screen when the taillights are turned ON. |
| | Road Number Sign Board Display | Displays the road number on the map. |
| Destination Search | Last Destination Memory | Stores 20 locations of coordinates, names and times that have been set as destinations in the past. |
| | Hybrid Points-of-interest Search | Narrows the search by names of the points-of-interest, category, and areas. |
| | Points-of-interest Pinpoint Display | Pinpoints and displays the position of the point-of-interest. |
| | House Number Search | Searches for a house number. |
| | Preset Destinations | Sets a pre-registered point as a destination point while driving. |
| | Nearest Point-of-interest Search List Display | Searches nearest points-of-interest and displays a list. |
| | Intersection Search | By specifying two streets, the point at which they intersection is set as the destination point. |
| | Motorway Entrance/ Exit Search | Searches for the destination by the name of the street that connects to a motorway entrance/exit. |
| Route Search | Multiple Destination Setting | Sets multiple destinations. It can also rearrange the sequence of the destinations. |
| | Route Search | Searches for multiple routes. |
| | Search Condition Designation | Searches for the recommended, shortest, and other routes. |
| | Regulated Road Consideration | Performs search while considering regulated roads. |
| | Avoidance Area | Avoids a designated area and searches a route. |

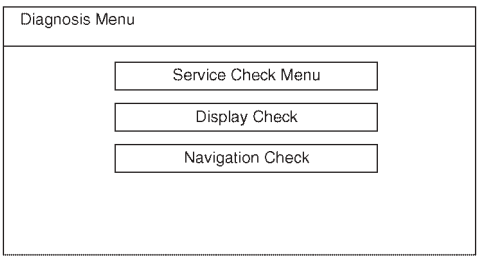
(Continued)

| Item | | Function |
|---|---|---|
| Guidance | Destination Direction Arrow Display | Function to display the direction from the current position to the destination in case of being off the route during the guidance. |
| | Off-Route Arrow Display | Function to display the route ahead on the route guidance line in case of being off the route during the guidance. |
| | Rotary Guidance | To guide with a special voice phrase in the rotary. |
| | Right or Left Turn Guidance | Voice guidance to instruct the direction of travel to be taken. |
| | Motorway Direction of Travel Guidance | Voice guidance to instruct the direction of travel to take on the motorway. |
| | Distance Display Destination | Displays the distance from the present location to the destination. |
| | Motorway Branch Type Specimen Guidance | Type specimen for guidance to a motorway branch. |
| | Intersection Zoom-in Display | Zoom-in display when approaching an intersection. |
| | Turn List Display | Displays a turn list on the right side of the two-screen display when approaching an intersection. |
| Others | Language Selector | The language of the text displayed on the navigation screen and of the voice guidance can be selected from 8 languages. |
| | Calendar | Enables calendar display until 2020 and memo registration. |

### 4) Diagnosis Screen Display

The navigation display is equipped with a self-diagnosis system and can display the diagnosis menus shown on the right.
The diagnosis menu contains the following three items.

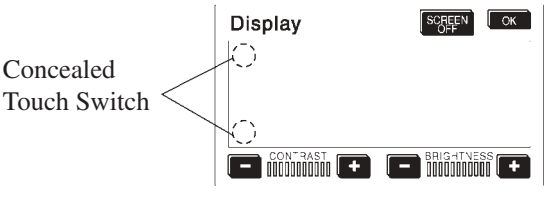
a) Service Check Menu
b) Display Check
c) Navigation Check




187BE37

**Service Tip**

The diagnosis menu screen can be displayed according to the procedure given below.
1) Vehicle speed should be 0 km/h (0 mph).
2) Apply the parking brake.
3) Turn the ignition switch to ACC or ON.
4) Push the DISPLAY button.
5) Activate the screen adjustment screen.
6) Alternately touch the upper and lower bottom parts of the left end of the screen 3 times.




199BE404

For details, refer to the Land Cruiser Chassis and Body Repair Manual Supplement (Pub. No. RM970E).

## ■ MULTI-INFORMATION DISPLAY

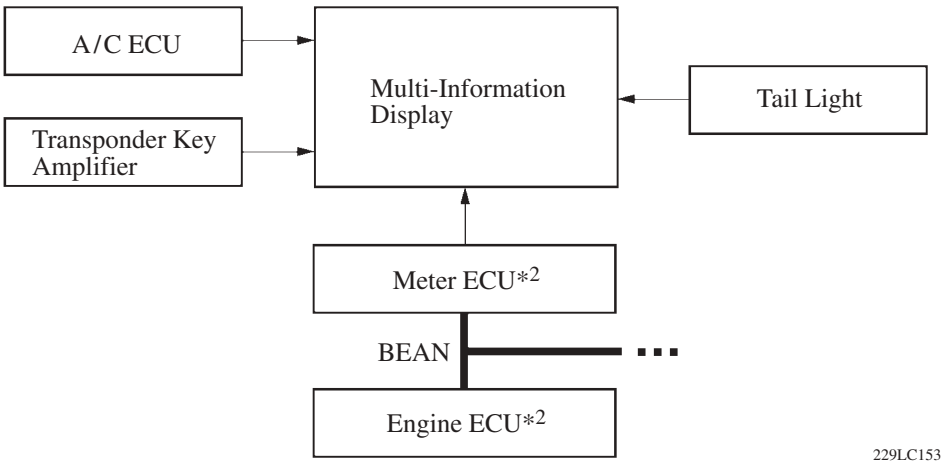
### 1. General

- A multi-information display has been adopted on the VX grade of all models (except models with multi display).
- In this system, the respective ECUs that are connected to the display calculate the contents that are displayed above. However, the accessories meter ECU in the display controls the displays.
- The multi information display has following functions:

| Function | VX Grade | VX Grade (1HD-FTE model for Europe) |
|---|---|---|
| Clock Display | ○ | ○ |
| Ambient Temp. Display | ○ | ○ |
| Security Indicator Light | ○ | ○ |
| Trip Information Display | ○ | — |
| English/Metric Switching function | ○ | — |



### 2. System Diagram




*1: Only for Models with Optitron Display type Combination Meter
*2: Except 1HD-FTE Engine Model for Europe

## ■ MULTI-INFORMATION DISPLAY

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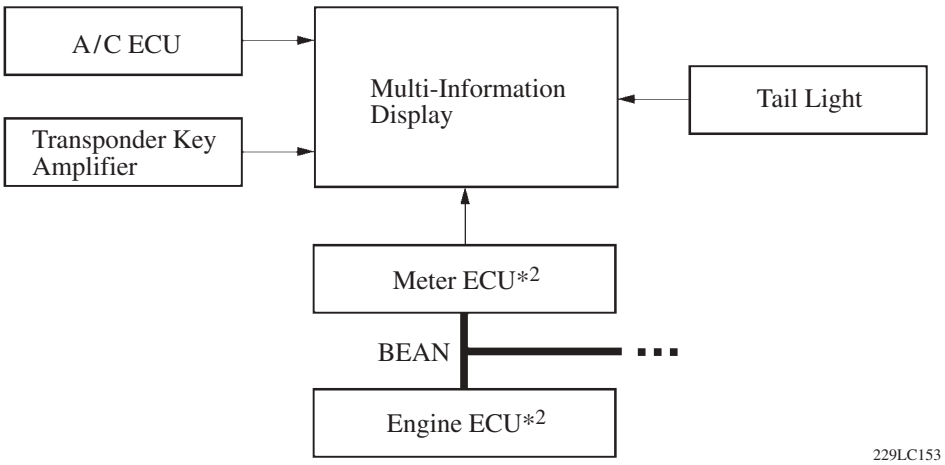
|---|---|---|
| Clock Display | ○ | ○ |
| Ambient Temp. Display | ○ | ○ |
| Security Indicator Light | ○ | ○ |
| Trip Information Display | ○ | — |
| English/Metric Switching function | ○ | — |

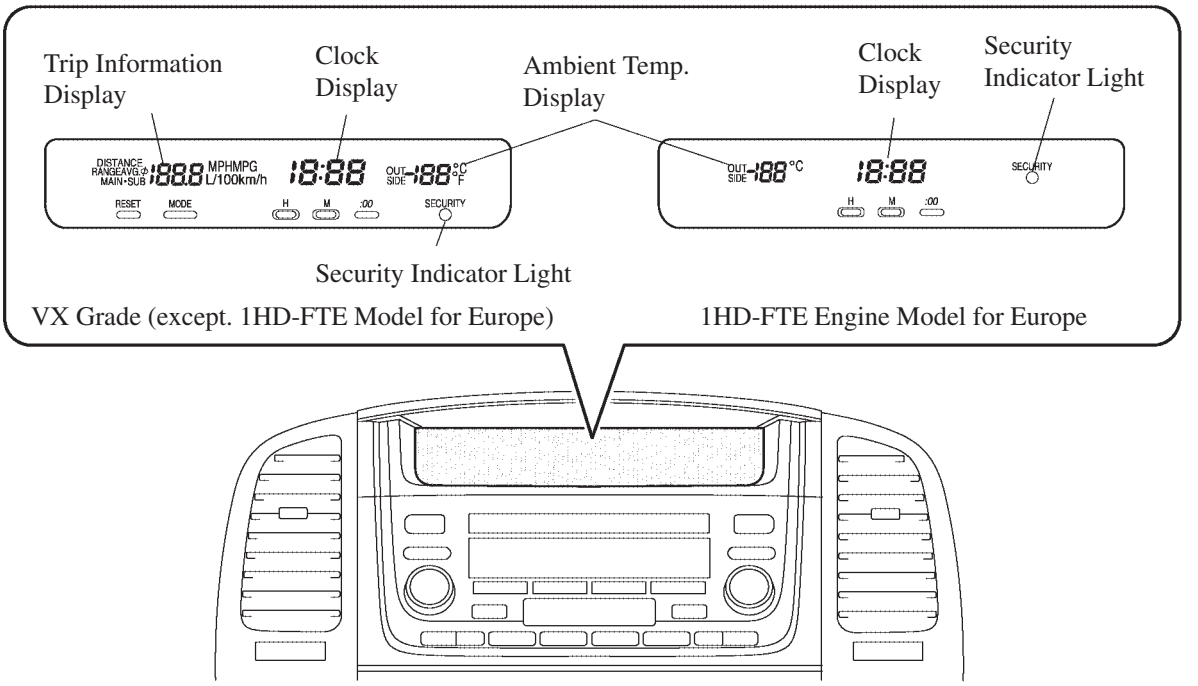


### 2. System Diagram




*1: Only for Models with Optitron Display type Combination Meter
*2: Except 1HD-FTE Engine Model for Europe

## 3. Display Portion




229LC154

| Item | | Display Contents | Outline |
|---|---|---|---|
| Clock and Ambient Temperature Display | | 17:05 OUT SIDE 18°C 229LC155 | ● Clock display<br>● Displays ambient temperature in accordance with the ambient temperature sensor signal. |
| Trip Information Display | Average Vehicle Speed After Starting | AVG. 52.5 km/h 211BE08 | ● Displays the value that has been calculated by the meter ECU, which is based on the elapsed time and driven distance after the ignition switch has been turned ON or the RESET button has been pressed 0.8 seconds or longer.<br>● The display updates every 10 seconds. |
| | Average Fuel Consumption After Refueling | AVG. 9.6 L/100km 230LX60 | ● Displays the value that has been calculated by the meter ECU, which is based on the driven distance after refueling and the fuel consumption volume (fuel injection signal from No. 1 injector).<br>● The meter ECU determines that the vehicle has been refueled in accordance with the signal from the fuel sender gauge.<br>● The display updates every 10 seconds. |
| | Instant Fuel Consumption | 9.2 L/100km 230LX61 | ● Displays the value that has been calculated by the meter ECU, which is based on the driven distance and the fuel consumption volume (fuel injection signal from No. 1 injector), provided that the ignition switch is turned ON.<br>● The display updates every 2 seconds. |

(Continued)

| Item | | Display Contents | Outline |
|---|---|---|---|
| Trip Information Display | Display Contents After Starting | DISTANCE 27.0 km<br>230LX62 | ● Displays the driven distance that is output by the meter ECU after the ignition switch has been turned ON or the RESET button has been pressed 0.8 seconds or longer.<br>● The display updates every kilometer. |
| | Drivable Distance | RANGE 53.6 km<br>230LX63 | ● Displays the value that has been calculated by the meter ECU, which is based on the fuel consumption data that the meter ECU continuously monitors and stores in its memory and the residual fuel volume data, provided that the ignition switch is turned ON.<br>● The display updates every kilometer. |

## 4. Switch

| Switch | Function |
|---|---|
| MODE | ● Pressing MODE switch changes the contents of the multi-information display in the following sequence:<br>Average Vehicle Speed After Starting → Driven Distance After Starting → Drivable Distance → Average Fuel Consumption After Refueling → Instant Fuel Consumption → (back to Average Vehicle Speed After Starting)<br>● If the MODE switch is pressed 1.7 seconds or longer while the ignition switch is ON, the display changes into the display unit switching mode (by blinking the display unit). By pressing the RESET switch at this time, a display unit that matches the destination of the vehicle can be selected. |
| RESET | Pressing the RESET switch 0.8 seconds or longer resets the display contents of each mode. |

| Item | | Display Contents | Outline |
|---|---|---|---|
| Trip Information Display | Display Contents After Starting | DISTANCE 27.0 km<br>230LX62 | ● Displays the driven distance that is output by the meter ECU after the ignition switch has been turned ON or the RESET button has been pressed 0.8 seconds or longer.<br>● The display updates every kilometer. |
| | Drivable Distance | RANGE 53.6 km<br>230LX63 | ● Displays the value that has been calculated by the meter ECU, which is based on the fuel consumption data that the meter ECU continuously monitors and stores in its memory and the residual fuel volume data, provided that the ignition switch is turned ON.<br>● The display updates every kilometer. |

## 4. Switch

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| MODE | ● Pressing MODE switch changes the contents of the multi-information display in the following sequence:<br>Average Vehicle Speed After Starting → Driven Distance After Starting → Drivable Distance → Average Fuel Consumption After Refueling → Instant Fuel Consumption → (back to Average Vehicle Speed After Starting)<br>● If the MODE switch is pressed 1.7 seconds or longer while the ignition switch is ON, the display changes into the display unit switching mode (by blinking the display unit). By pressing the RESET switch at this time, a display unit that matches the destination of the vehicle can be selected. |
| RESET | Pressing the RESET switch 0.8 seconds or longer resets the display contents of each mode. |

## ■SRS AIRBAG SYSTEM

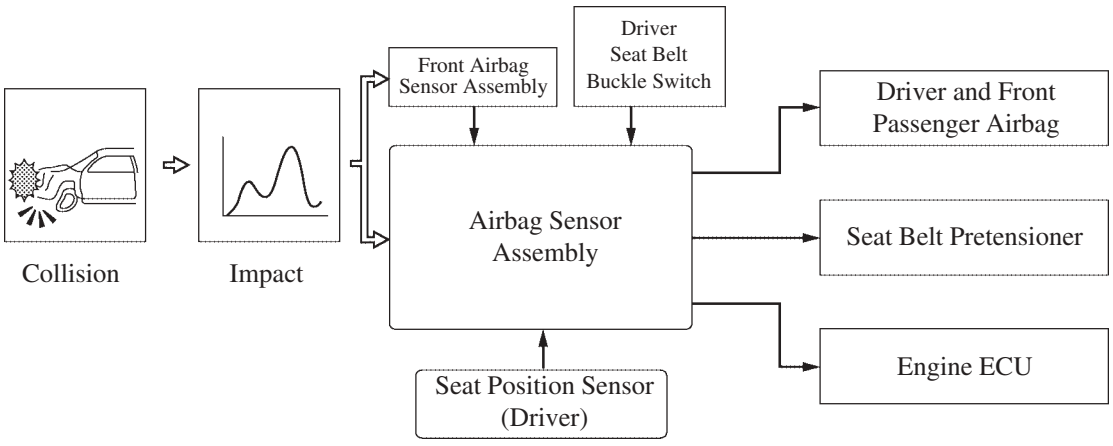
### 1. General

- On the new Land Cruiser, a curtain shield airbag system that helps reduce the impact applied to the front and rear seat occupants with a single curtain shield airbag has been adopted as optional equipment for Europe.
  In conjunction with this system, a side and curtain shield airbag sensor assembly has been provided at the bottom of the center pillar and a curtain shield airbag sensor assembly at the bottom of the rear pillar.
- In this system, a front side collision is detected by the side and curtain shield airbag sensor assembly in order to simultaneously deploy the side and curtain shield airbags. A rear side collision is detected by the curtain shield airbag sensor assembly and the airbag sensor assembly in order to deploy only the curtain shield airbag.
- Roll sensing of curtain shield airbags control has been adopted in order to deploy the curtain shield airbags and the seat belt pretensioners for the driver and front passenger, in the event that the vehicle rolls over. A roll sensing of curtain shield airbags cutoff switch is provided on the driver side of the instrument panel to enable the driver to disable this system.
- Dual-stage SRS airbags system, that controls the airbag inflating output optimum by judging the extent of impact and seat position, has been used for the driver and front passenger airbags on the model for Europe as standard equipment.
- In accordance with the adoption of the dual-stage SRS airbag system, a seat position sensor has been established for the driver seat.
- On the new model, the previous mechanical type front airbag sensor assembly (consisting of movable and stationary contact points) has been changed to an electrical (deceleration sensor) type front airbag sensor assembly.
- Front passenger airbag door is made invisible. This means that without the airbag door, the airbag will be inflated by breaking to open the cleavage line stored in the instrument panel inflating.
- This system has adopted a fuel cut control that stops the fuel pump when the airbag is deployed.
- Along with the aforementioned changes, new DTCs (Diagnostic Trouble Codes) have been added.



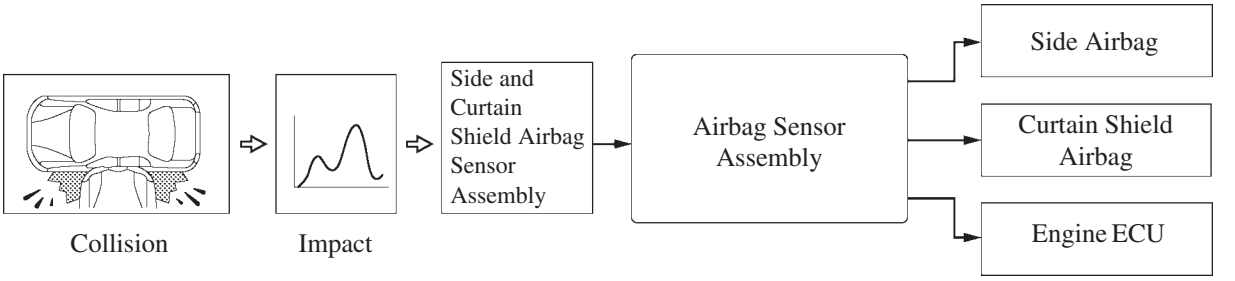
### 2. System Diagram

**▶ Front Airbag Operation ◀**



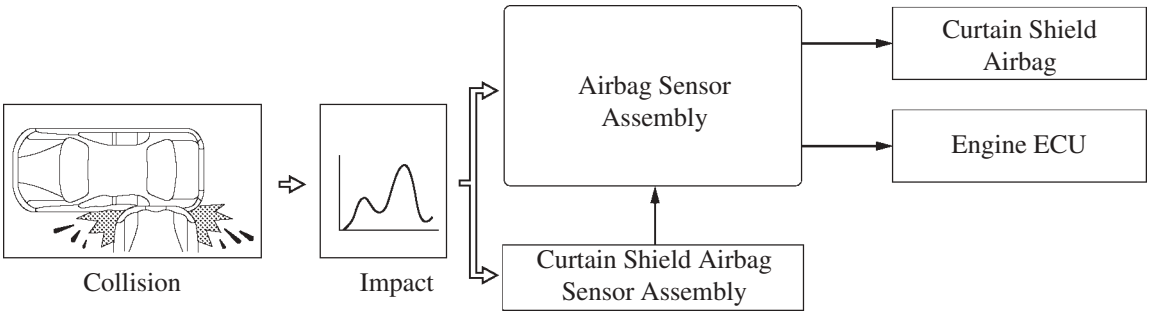

231LX12

### ▶ Side and Curtain Shield Airbag Operation ◀



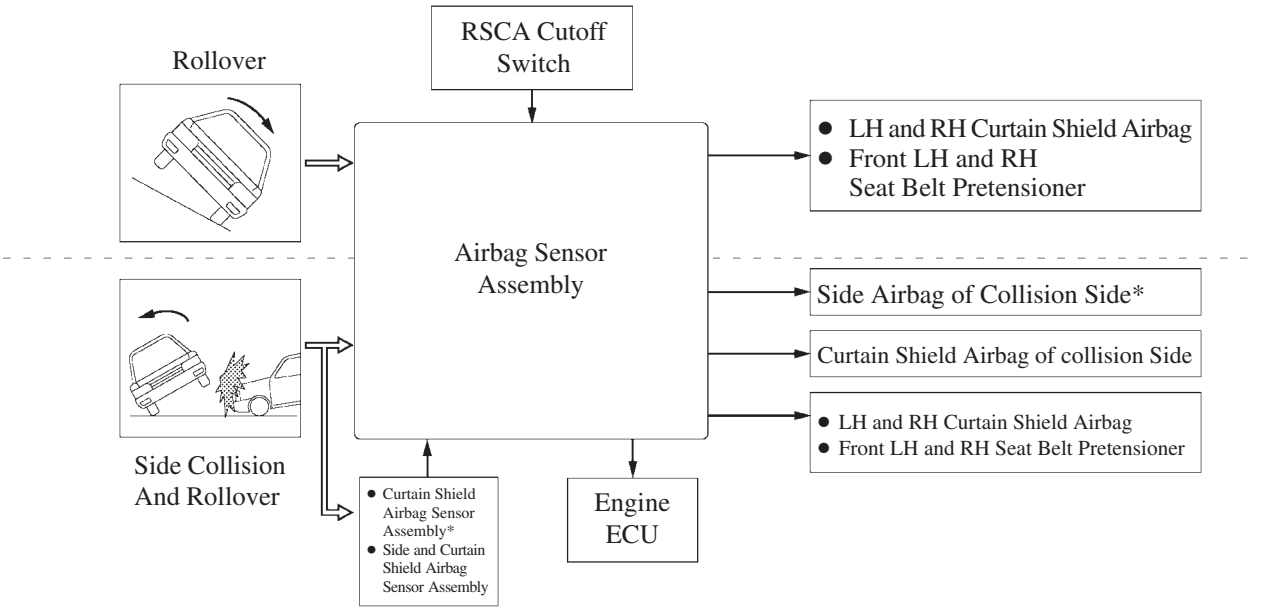

231LX13

### ▶ Curtain Shield Airbag Operation ◀




231LX14

### ▶ Roll Sensing of Curtain Shield Airbags Operation ◀




231LX15

*: Activates depending on the condition of the collision.

## ■SRS AIRBAG SYSTEM

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- Roll sensing of curtain shield airbags control has been adopted in order to deploy the curtain shield airbags and the seat belt pretensioners for the driver and front passenger, in the event that the vehicle rolls over. A roll sensing of curtain shield airbags cutoff switch is provided on the driver side of the instrument panel to enable the driver to disable this system.
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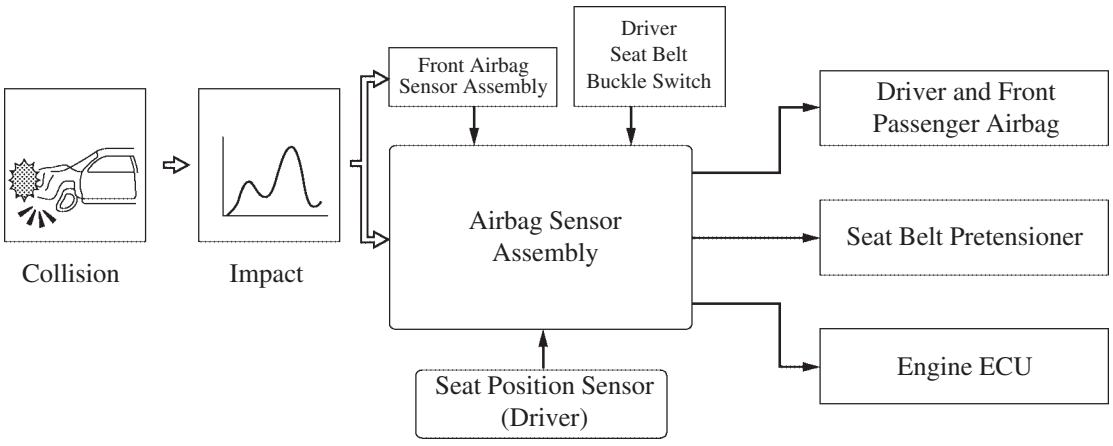
- Front passenger airbag door is made invisible. This means that without the airbag door, the airbag will be inflated by breaking to open the cleavage line stored in the instrument panel inflating.
- This system has adopted a fuel cut control that stops the fuel pump when the airbag is deployed.
- Along with the aforementioned changes, new DTCs (Diagnostic Trouble Codes) have been added.



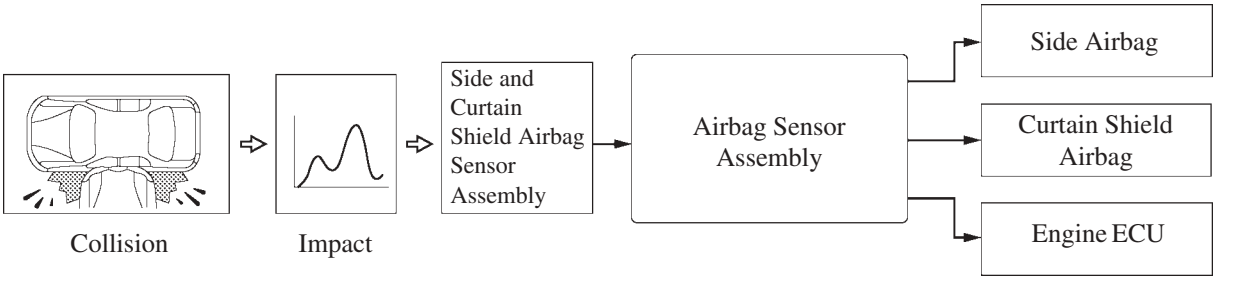
### 2. System Diagram

**▶ Front Airbag Operation ◀**



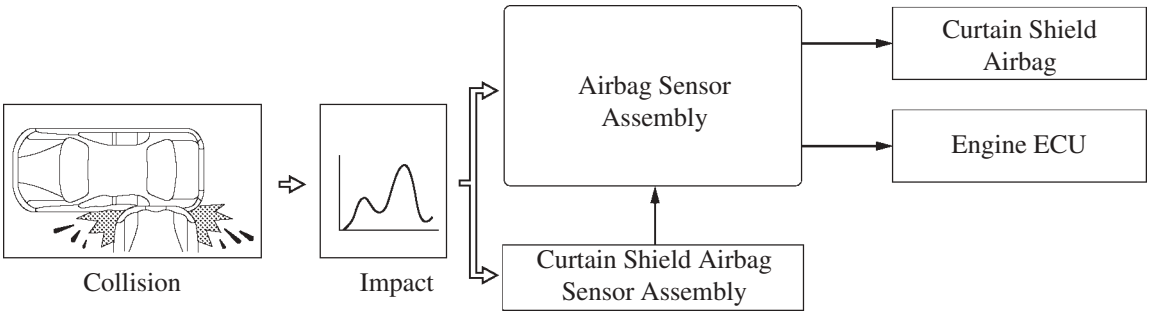

231LX12

### ▶ Side and Curtain Shield Airbag Operation ◀



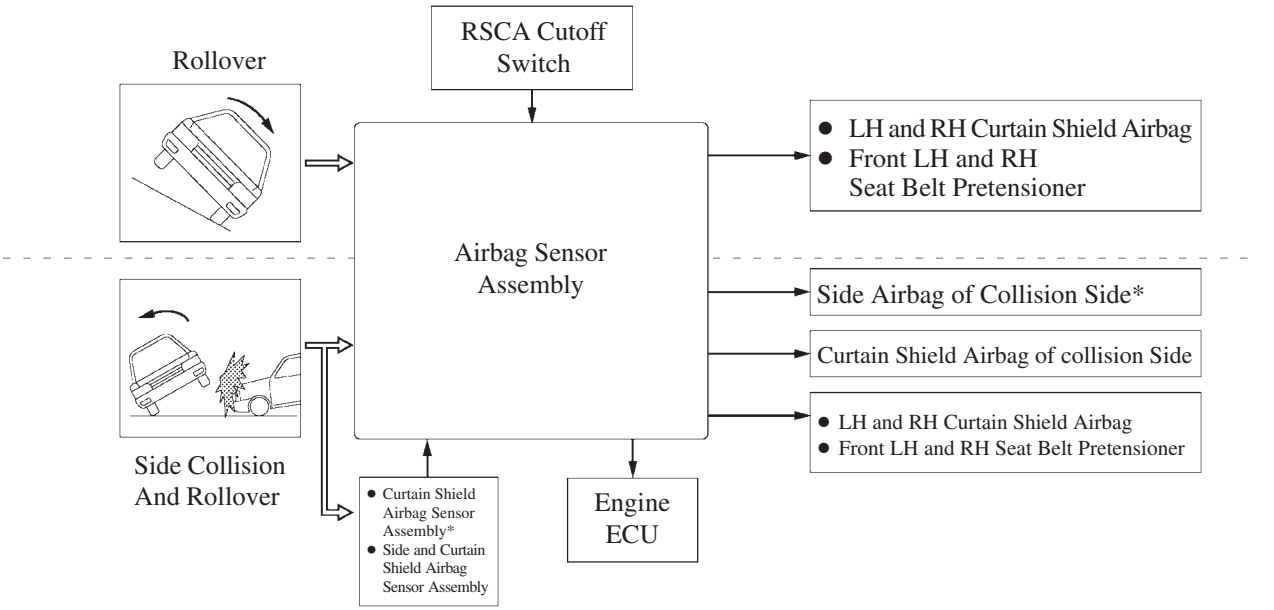

231LX13

### ▶ Curtain Shield Airbag Operation ◀




231LX14

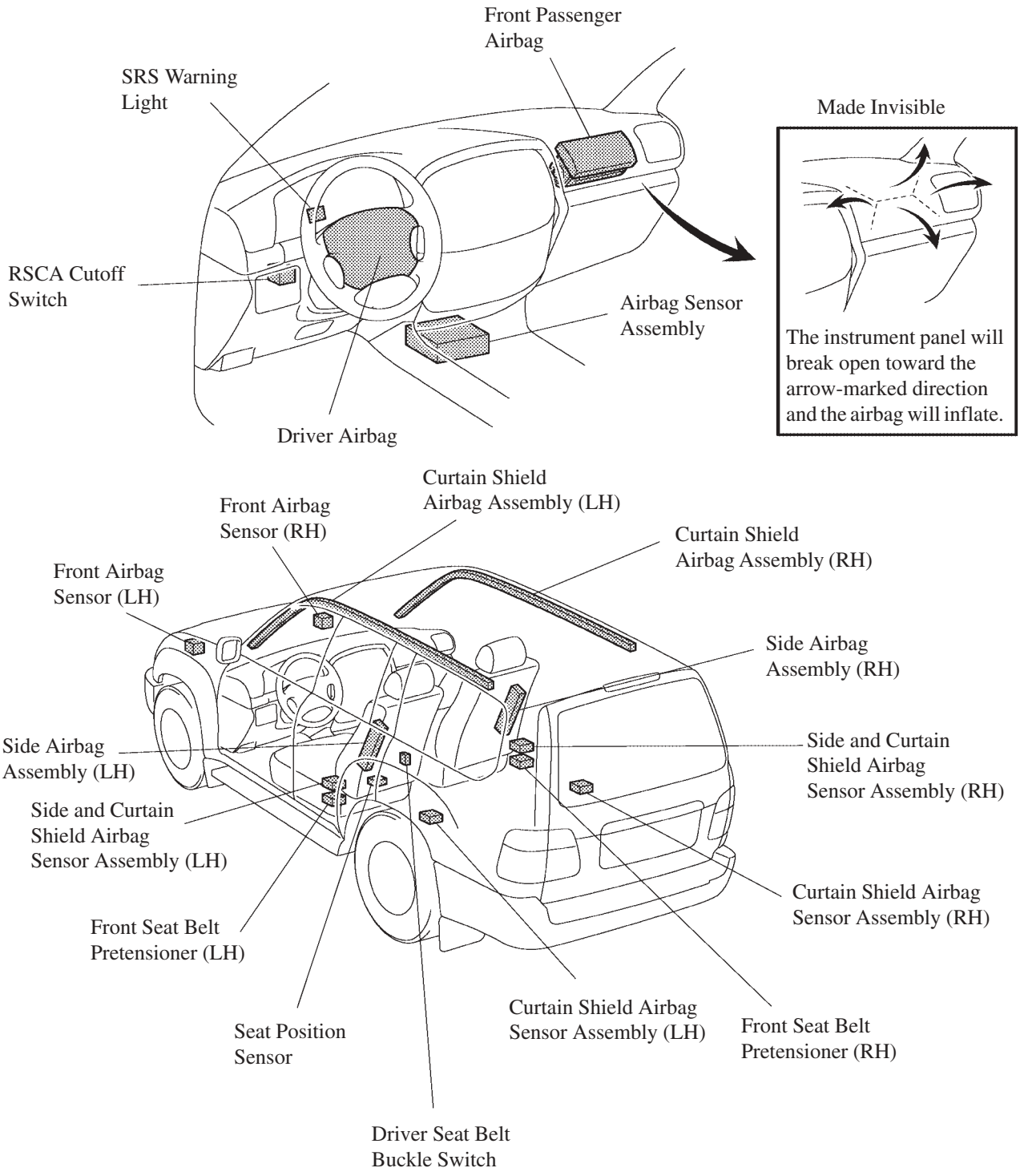
### ▶ Roll Sensing of Curtain Shield Airbags Operation ◀




231LX15

*: Activates depending on the condition of the collision.

## 3. Layout of Main Components




**LHD Model**

230LX68

6

## 4. Construction and Operation

### Dual-stage SRS Airbags System

#### 1) General

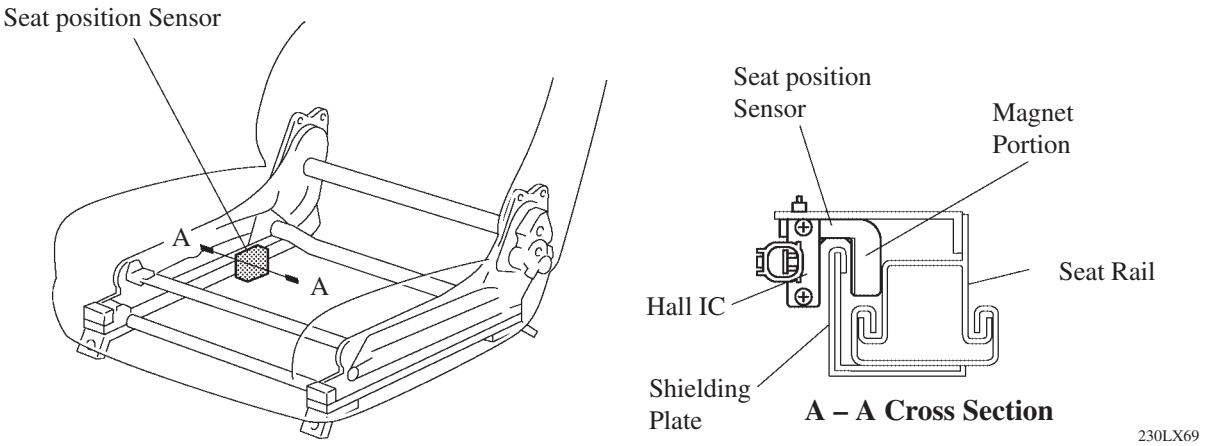
In this system, when the front airbag sensors and airbag sensor assembly detect the front collision, the airbag sensor assembly judges the extent of impact and seat position, Thus making the airbag inflating output optimum by delaying the inflating timing of the 2nd initiator and the 1st initiator.

**Service Tip**

In accordance with the structure change of the driver and front passenger inflators on new Land Cruiser, a SST (09082-00800) used for scrapping driver and front passenger airbag assemblies of the vehicle has been newly established.

#### 2) Seat Position Sensor

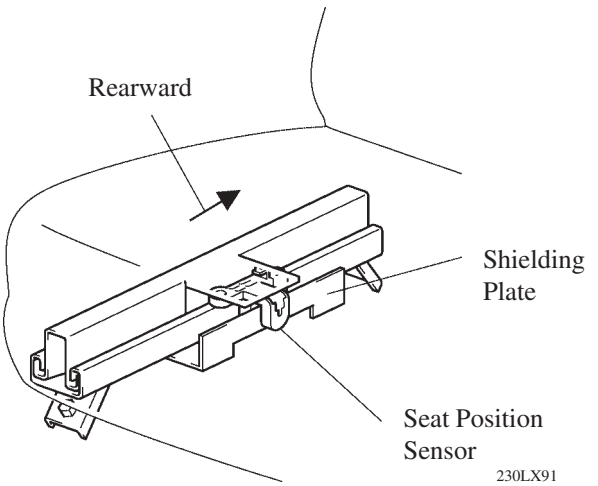
- The seat position sensor, which is attached to the seat rail of the driver seat, detects the sliding position of the seat. In addition, the shielding plate to make the seat position sensor judge the seat position is installed on this seat rail.
- The seat position sensor use a Hall IC for its sensor and has magnet portion on its opposite side.



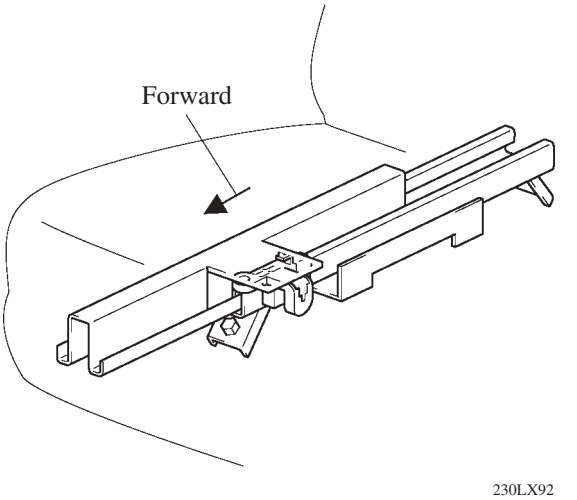

**LHD Model**

- The seat position detection by the seat position sensor judges that the seat position is rearward if the shielding plate is between the sensor and the seat position is forward if the shielding plate is not between the sensor.

**▶ Seat position is rearward ◀**




**▶ Seat position is forward ◀**




**LHD Model**

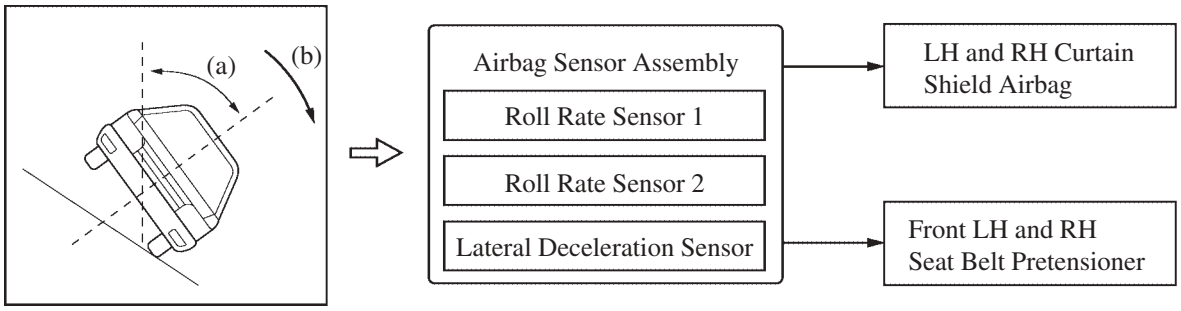
## Roll Sensing of Curtain Shield Airbags Control

### 1) General

- In this system, the airbag sensor assembly contains a roll rate sensor 1 and roll rate sensor 2 (that determine the inclination angle of the vehicle) and a lateral deceleration sensor (that determine the lateral force that is applied to the vehicle). These sensors detect the vehicle's roll angle (a), rotational speed (b), and lateral acceleration speed (c).
- Based on the information obtained from the sensors, the airbag sensor assembly makes an overall judgment of the vehicle's roll angle (a), rotational speed (b), and lateral acceleration speed (c). If the airbag sensor assembly determines that the vehicle has rolled over due to a cause other than the side collision, it deploys the right and left curtain shield airbags and the front right and left seat belt pretensioners.
  If the airbag sensor assembly determines that the vehicle has rolled over due to a cause such as a side collision, it deploys the side and curtain shield airbags on the side of the vehicle that has sustained the collision, as well as the curtain shield airbag of the opposite side and the front right and left seat belt pretensioners.
- This system provides a roll sensing of curtain shield airbags cutoff switch on the driver side of the instrument panel with which the driver can stop the operation of the function.
  However, by operating this cutoff switch and while the roll sensing of the curtain shield airbag control is OFF, and when the airbag sensor assembly judges to operate the side and curtain shield airbag system in the event of side collision, it is no need to prohibit this operation.

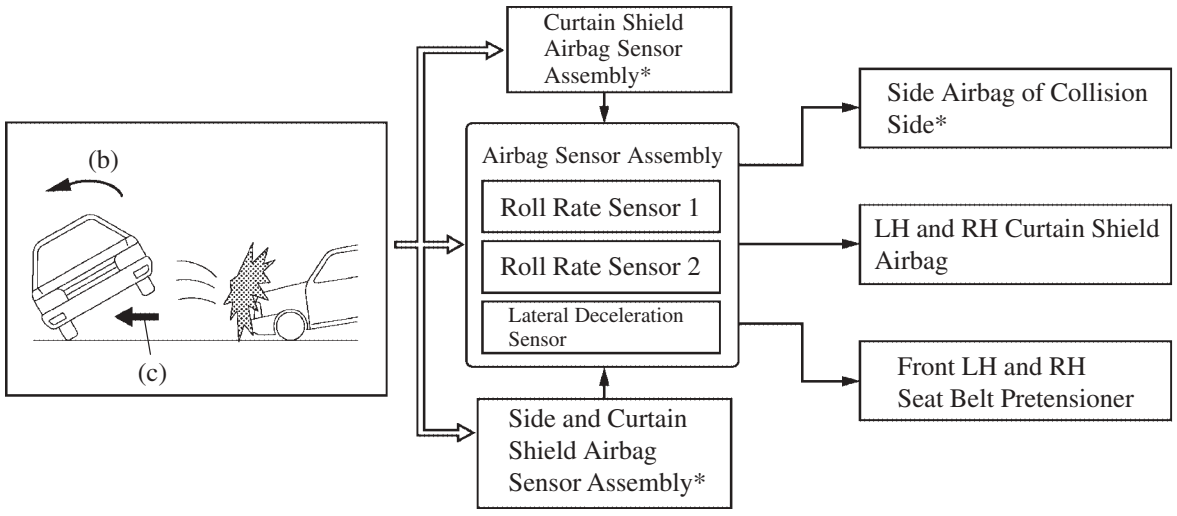


**▶ Rollover Detection ◀**




230LX71

**▶ Side Collision and Rollover Detection ◀**

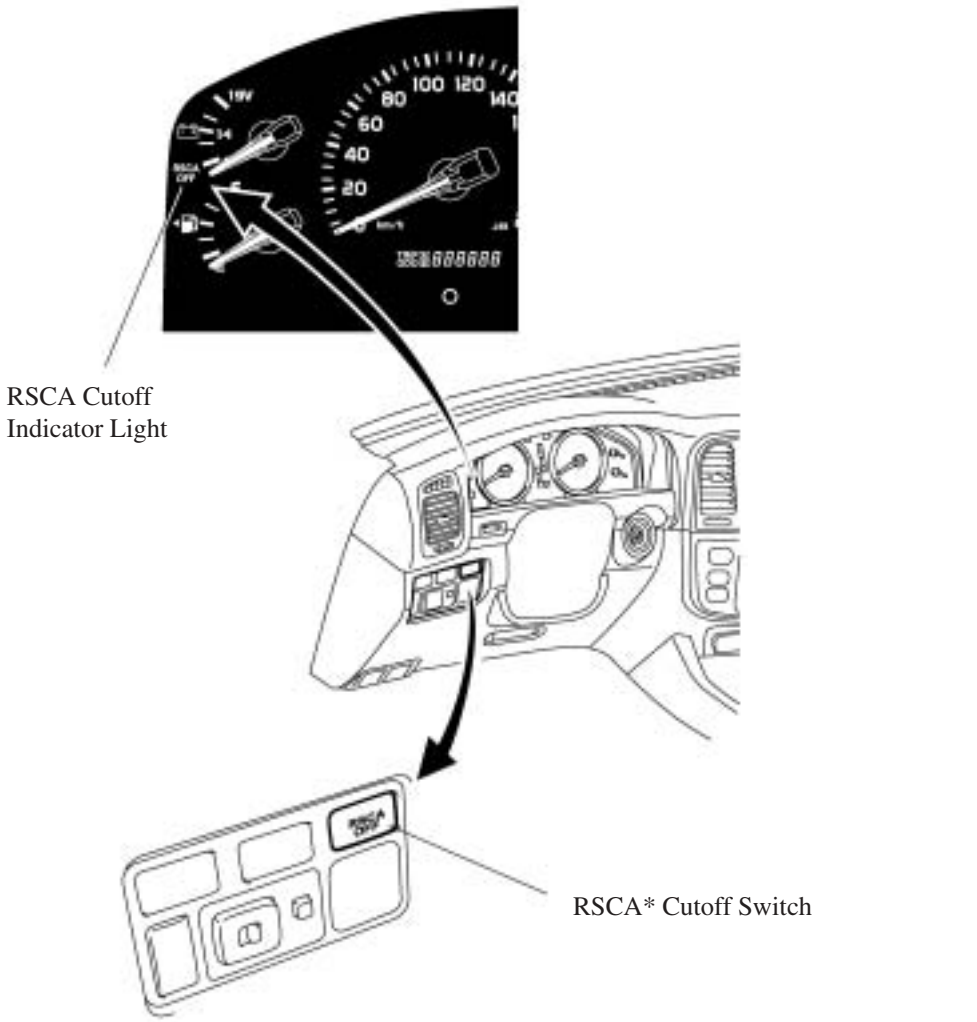



230LX72

*: Activates depending on the condition of the collision.

**2) Roll Sensing of Curtain Shield Airbags Cutoff Switch**

- The roll sensing of curtain shield airbags cutoff switch is mounted on the driver side of the instrument panel.
- Pressing this switch longer than 2 seconds, it enables to cut off the operation of the roll sensing of the curtain shield airbags control.
- This switch is a momentary type. Each time when the ignition switch is turned ON, in spite of the condition selected previously, roll sensing of the curtain shield airbags control will return to ON condition.
- When this switch is turned ON, an indicator light in the combination meter illuminates to inform the driver that the operation of the roll sensing of curtain shield airbags control has been disabled.




**LHD Model**

*: RSCA (Roll Sensing of Curtain Shield Airbags)

### Front Airbag Sensor Assembly

- The front airbag sensor assembly is mounted on the radiator support.
- The deceleration sensor is enclosed in the front airbag sensor assembly based on the deceleration of the vehicle that occurs during a front collision. The distortion that is created in the sensor is converted into an electric signal. Accordingly, the extent of the initial collision can be detected in detail.

### Diagnosis Function

The following DTC is newly added.

| DTC No. | Detection Item | DTC No. | Detection Item |
|---|---|---|---|
| B1180/17 | Short in D squib (2nd step) circuit | B0100/43 | Short in side squib (RH) circuit |
| B1181/18 | Open in D squib (2nd step) circuit | B0111/44 | Open in side squib (RH) circuit |
| B1182/19 | Short in D squib (2nd step) circuit (to ground) | B0117/45 | Short in side squib (LH) circuit (to ground) |
| B1183/22 | Short in D squib (2nd step) circuit (to B+) | B0118/46 | Short in side squib (LH) circuit (to B+) |
| B1153/25 | Seat position sensor assembly malfunction | B0115/47 | Short in side squib (LH) circuit |
| *1B0121/26 | Seat belt buckle switch (RH) malfunction | B0116/48 | Open in side squib (LH) circuit |
| *1B0122/26 | Seat belt buckle switch (RH) malfunction | B1187/55 | Short in P squib (2nd step) circuit (to ground) |
| *2B0126/27 | Seat belt buckle switch (LH) malfunction | B1188/56 | Short in P squib (2nd step) circuit (to B+) |
| *2B0127/27 | Seat belt buckle switch (LH) malfunction | B1185/57 | Short in P squib (2nd step) circuit |
| B1628/29 | RSCA*3 cutoff indicator light malfunction | B1186/58 | Open in P squib (2nd step) circuit |
| B1140/32 | Side airbag sensor assembly (RH) malfunction | B1162/81 | Short in curtain shield airbag (RH) circuit (to ground) |
| B1141/33 | Side airbag sensor assembly (LH) malfunction | B1163/82 | Short in curtain shield airbag (RH) circuit (to B+) |
| B1148/36 | Front airbag sensor (RH) malfunction | B1160/83 | Short in curtain shield airbag (RH) squib circuit |
| B1149/37 | Front airbag sensor (LH) malfunction | B1161/84 | Open in curtain shield airbag (RH) squib circuit |
| B1154/38 | Curtain shield airbag sensor assembly (RH) malfunction | B1167/85 | Short in curtain shield airbag (LH) circuit (to ground) |
| B1155/39 | Curtain shield airbag sensor assembly (LH) malfunction | B1168/86 | Short in curtain shield airbag (LH) circuit (to B+) |
| B0112/41 | Short in side squib (RH) circuit (to ground) | B1165/87 | Short in curtain shield airbag (LH) squib circuit |
| B0113/42 | Short in side squib (RH) circuit (to B+) | B1166/88 | Open in curtain shield airbag (LH) squib circuit |

*1: Only for RHD model
*2: Only for LHD model
*3: RSCA (Roll sensing of curtain shield airbags)

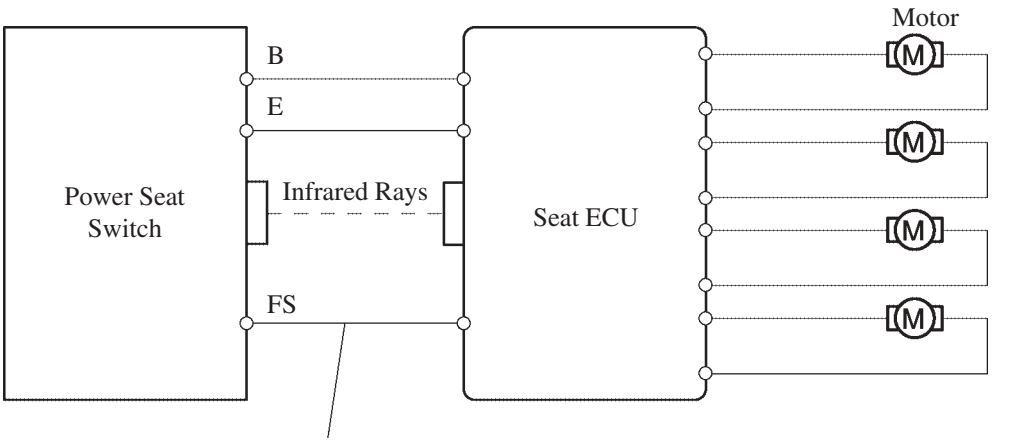
6

## ■POWER SEAT SYSTEM (Only for Europe Model)

### 1. General

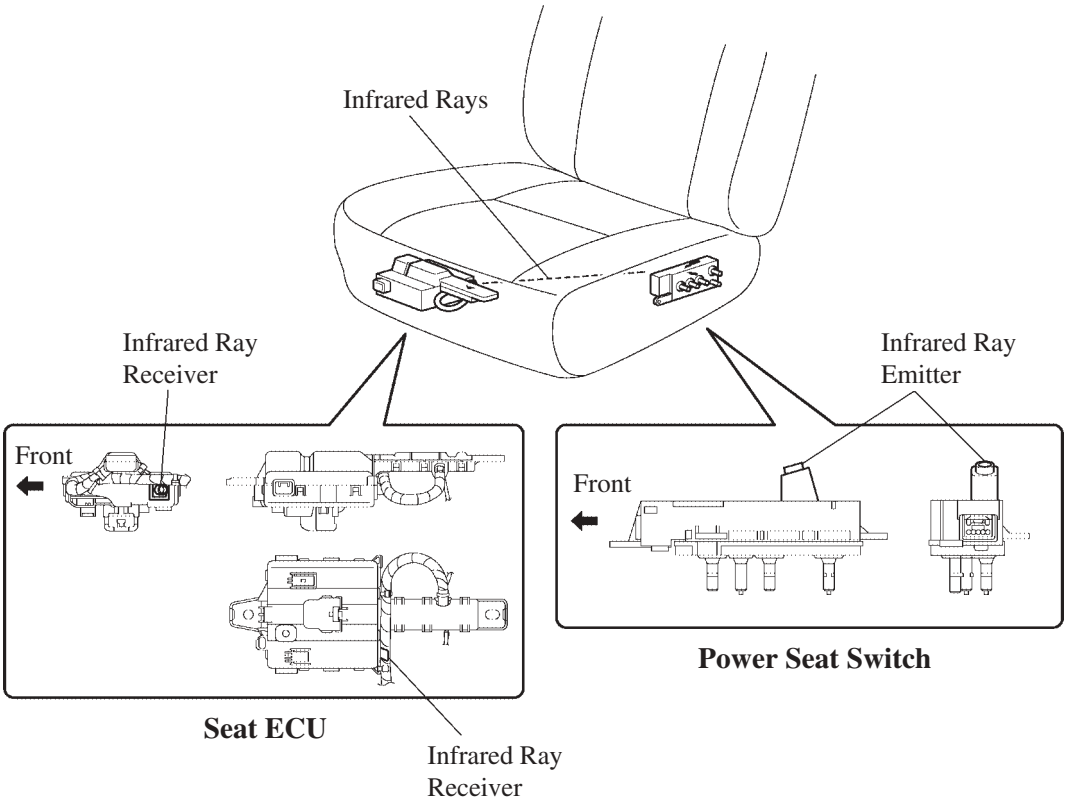
- Infrared communication has been newly adopted between the driver seat ECU that is used in the power seat system and the power seat operation switch. As a result, the number of parts have been reduced.
- When the driver operates the power seat switch, this switch emits an infrared operation signal from the infrared emitter that is located in the power seat switch. Then, the receiver that is located in the seat ECU receives this signal in order to actuate the motor.
- In the event that a malfunction occurs during infrared communication, this system has a failsafe function to only slide the seat.

**▶ System Diagram ◀**




230LX76

### 2. Layout of Main Component




**LHD Model**

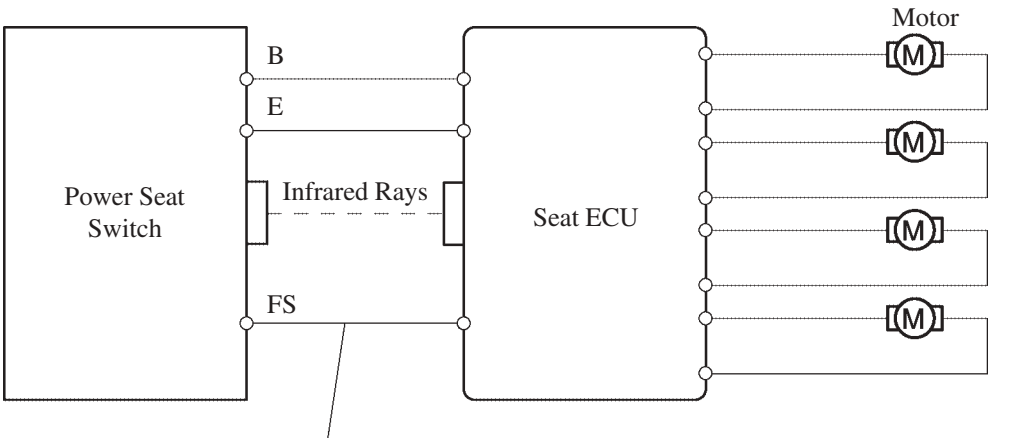
230LX77

## ■POWER SEAT SYSTEM (Only for Europe Model)

### 1. General

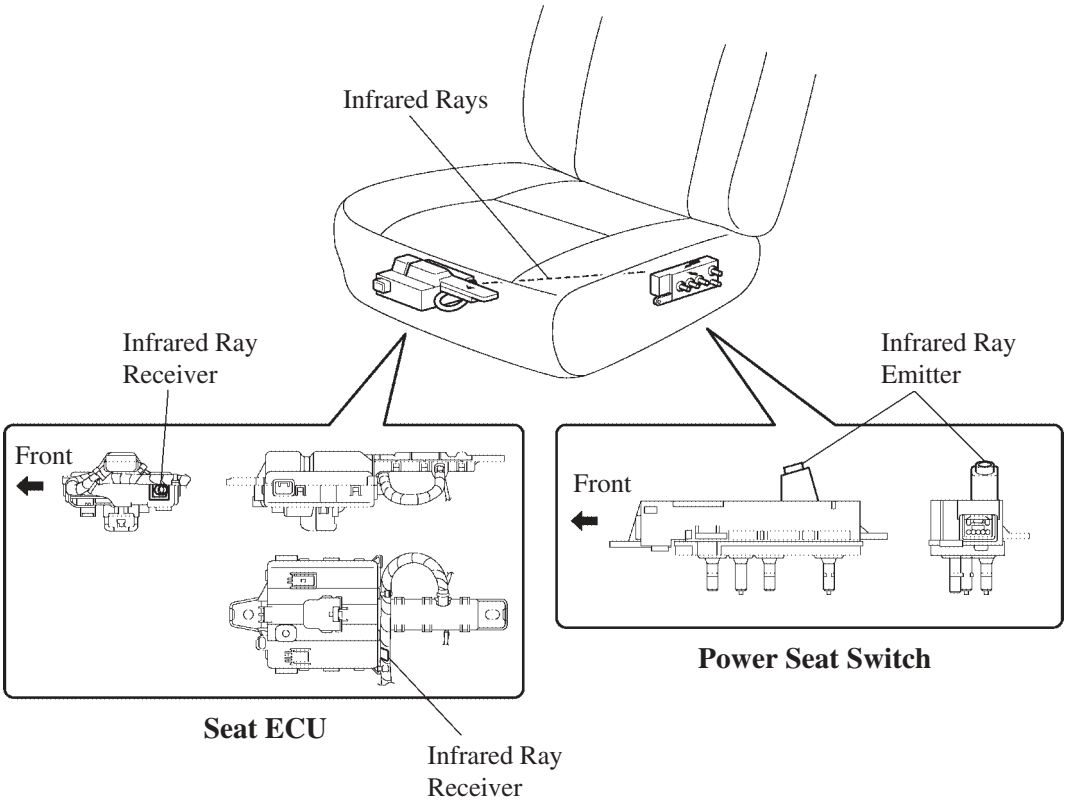
- Infrared communication has been newly adopted between the driver seat ECU that is used in the power seat system and the power seat operation switch. As a result, the number of parts have been reduced.
- When the driver operates the power seat switch, this switch emits an infrared operation signal from the infrared emitter that is located in the power seat switch. Then, the receiver that is located in the seat ECU receives this signal in order to actuate the motor.
- In the event that a malfunction occurs during infrared communication, this system has a failsafe function to only slide the seat.

**▶ System Diagram ◀**




230LX76

### 2. Layout of Main Component




**LHD Model**

230LX77

## ■AUDIO SYSTEM

### 1. RSAS (Rear Seat Audio System)

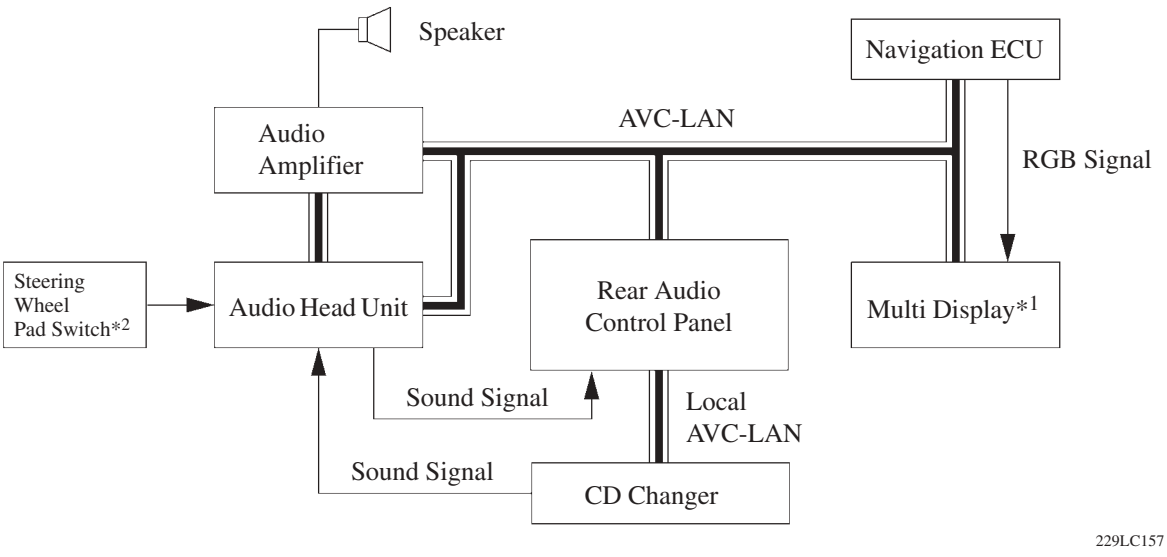
#### General

- An RSAS (Rear Seat Audio System) has been adopted as optional equipment on the model for Europe.
- In this system, a rear audio control panel is provided behind the center console. By using headphones on this panel, the rear seat occupants can listen to an audio mode different from the one that is currently selected in the front head unit.
- The table below shows the modes that can be selected with this system.

| Front \ Rear | | OFF | Radio | | Cassette | CD Changer |
|---|---|---|---|---|---|---|
| | | | AM | FM | | |
| OFF | | ○ | ○ | ○ | ○ | ○ |
| Radio | AM | ○ | ○ * | — | ○ | ○ |
| | FM | ○ | — | ○ * | ○ | ○ |
| Cassette | | ○ | ○ | ○ | ○ | ○ |
| CD Changer | | ○ | ○ | ○ | ○ | ○ |

*: It is not possible to tune to a different radio station between the front and rear seats.

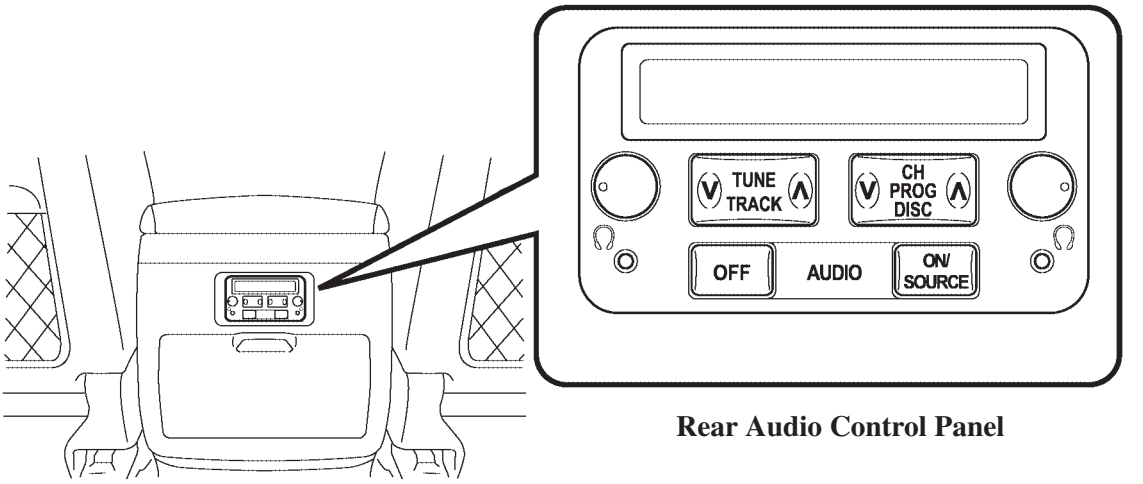
#### System Diagram




*1: Optional Equipment for Europe
*2: Optional Equipment for All Models

6

### Layout of Main Component



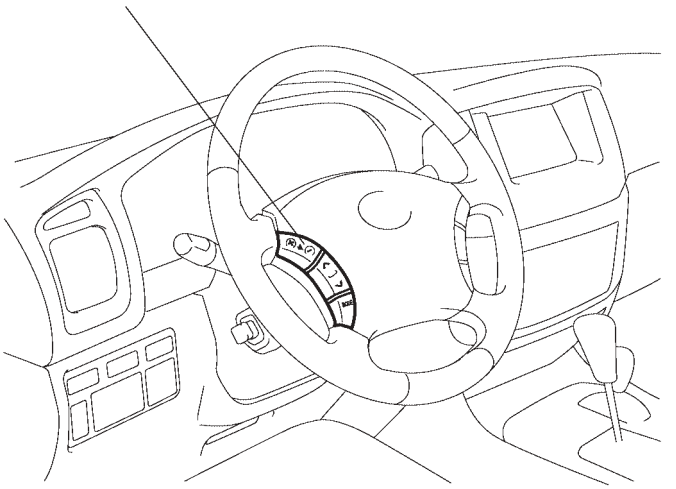

**Rear Audio Control Panel**

229LC158

## 2. Steering Pad Switch

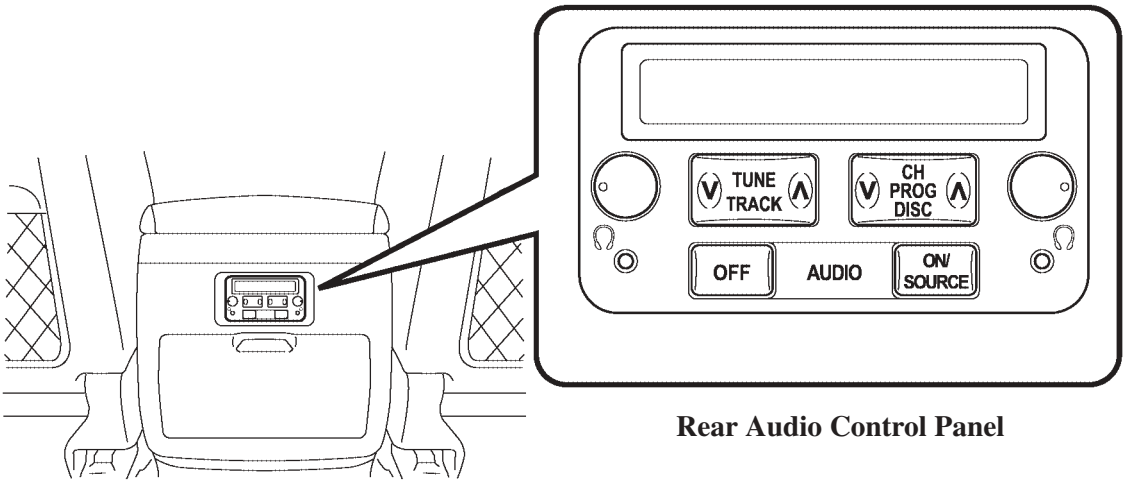
- The steering wheel with steering pad switch has been adopted as optional equipment on the VX grade.
- The audio control switches with a high use frequency have located on the steering pad in the form of steering pad switches to improve the ease of use.

Steering Pad Switch



230LX90

### Layout of Main Component



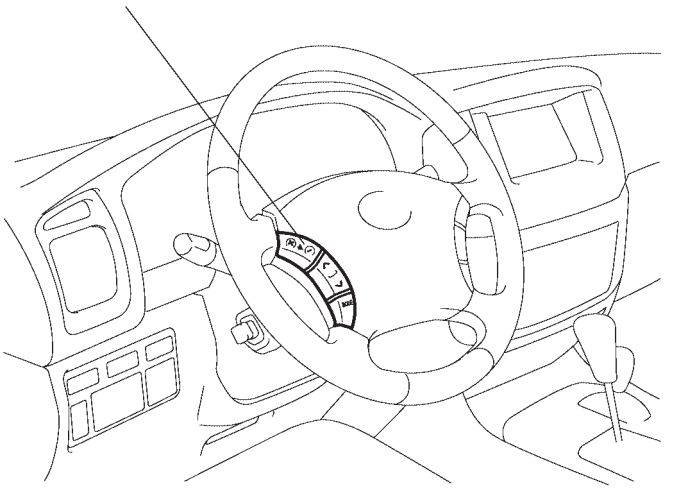

**Rear Audio Control Panel**

229LC158

## 2. Steering Pad Switch

- The steering wheel with steering pad switch has been adopted as optional equipment on the VX grade.
- The audio control switches with a high use frequency have located on the steering pad in the form of steering pad switches to improve the ease of use.

Steering Pad Switch



230LX90

# LAND CRUISER (100 series)

## OUTLINE OF NEW FEATURES

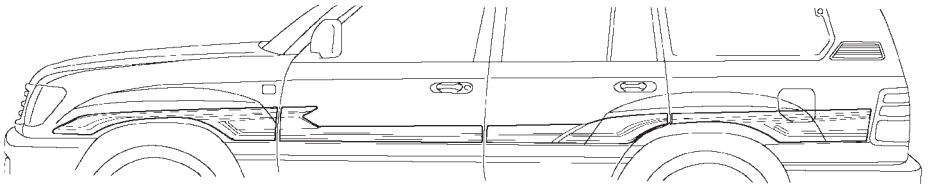
The following changes are made for the new Land Cruiser (100 series).

### 1. Model Line-up

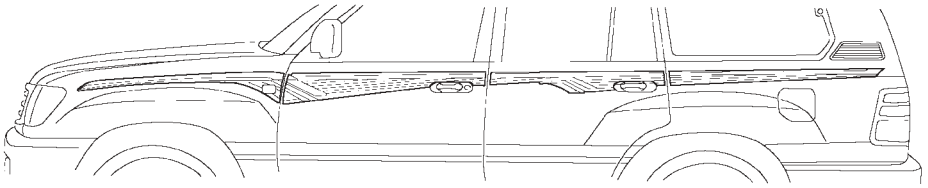
A442F Automatic Transmission of the 1HD-FTE Engine on the Europe model has been discontinued and the A750F Automatic Transmission has been re-introduced.

### 2. Exterior

The design of the side stripes, provided as an option on all models, have been changed.



**STD and GX Grade**



**VX Grade**

258LC04

### 3. Interior

The steering wheel of the 5-speed automatic transmission mode has been changed from urethane to a leather-wrapped type.

### 4. All Engines

The TOYOTA genuine Super Long Life Coolant (SLLC) has been adopted. As result, the maintenance interval has been extended.

### 5. A750F Automatic Transmission

The following areas of the A750F automatic transmission have been changed.

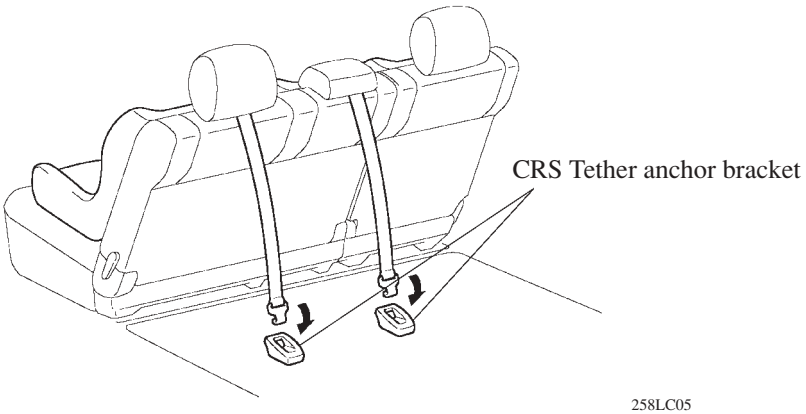
- Fluid type has been changed from the ATF type T-IV to the ATF WS. For details, see page 291.
- ATF level detection mechanism has been adopted. For details, see page 292.

### 6. Brake Control System (ABS with EBD, Brake Assist, A-TRC and VSC System)

- The brake control system (ABS with EBD, Brake Assist, A-TRC and VSC system) has been added to the models equipped with the 1HD-FTE engine and 5-speed automatic transmission for Australia and Europe, as optional equipment.
  It is available as a set with the VGRS (Variable Gear Ratio Steering) system on the models equipped with the 1HD-FTE engine and 5-speed automatic transmission for Europe.
- Along with the changes made to the skid control ECU, the diagnosis detection performance has been improved.

## 7. Rear No.1 Seat

A CRS tether anchor bracket for securing a child seat has been provided on the Europe model.




258LC05



## 8. Wind Washer System

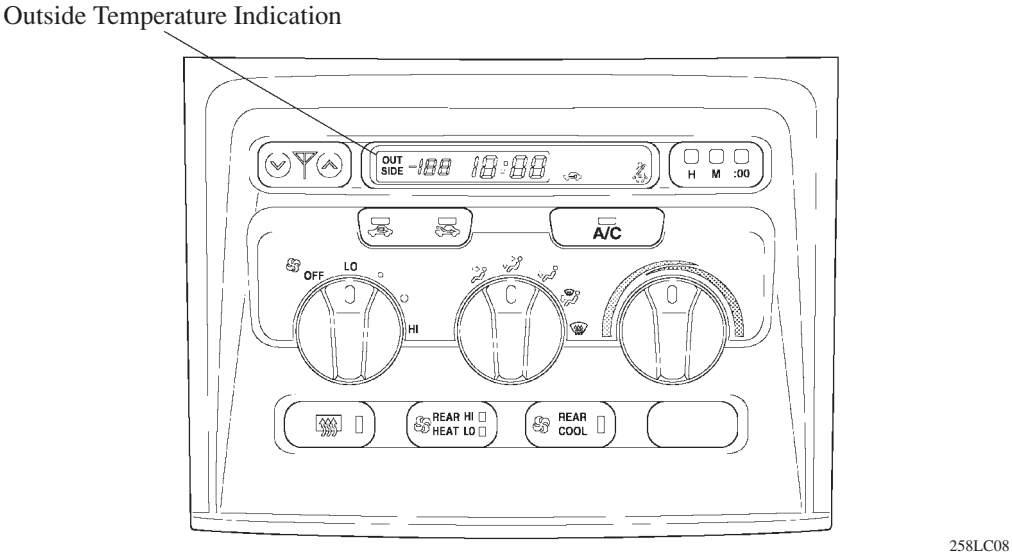
The inlet of the washer tank has been widened in order to shorten the length of time it takes to fill the washer tank.

## 9. Headlight Leveling System

The headlight leveling system has been added to the models for Saudi Arabia, expect for the model with the active height control suspension and skyhook TEMS (Toyota Electronic Modulated Suspension).

## 10. Heater Control Panel

An outside temperature indication function has been added to the heater control panel on the GX and STD grades for the G.C.C. countries.




258LC08

## 11. Combination Meter

- VSC and VGRS (Variable Gear Ratio Steering) indicators have been added to the 1HD-FTE engine model for Europe.
- A VSC indicator has been added to the 1HD-FTE engine model for Australia.
- Along with the new provision of the 5-speed automatic transmission on the 1HD-FTE engine model for Europe, the shift indicator in the combination meter has been changed for 5-speed application.

## 12. Multi Display

- The multi display contains an updated navigation system in which new functions have been added.
- A hands-free function that supports the Bluetooth communication protocol has been newly added in the multi display.

## 13. Rear View Monitor System

The rear view monitor system has been newly added as an option in Europe.

## MODEL CODE

# UZJ100 L–G N A E K W

1 2 3 4 5 6 7 8

| 1 | BASIC MODEL CODE | | |
|---|---|---|---|
| | CODE | ENGINE | FRONT SUSPENSION |
| | FZJ100 | 1FZ-FE | IFS*1 (Double Wishbone) |
| | UZJ100 | 2UZ-FE | |
| | HDJ100 | 1HD-FTE | |
| | FZJ105 | 1FZ-FE | RFS*2 (Leading Arm) |
| | HZJ105 | 1HZ | |

| 2 | STEERING WHEEL POSITION |
|---|---|
| | L: Left-Hand Drive<br>R: Right-Hand Drive |

| 3 | BODY TYPE |
|---|---|
| | G: Station Wagon |

| 4 | BACK DOOR TYPE |
|---|---|
| | C: Swing Back Door<br>N: Lift-up Back Door |

*1: IFS (Independent Front Suspension)
*2: RFS (Rigid Axle Front Suspension)

| 5 | GEAR SHIFT TYPE |
|---|---|
| | M: 5-Speed Manual, Floor<br>P : 4-Speed Automatic, Floor<br>A : 5-Speed Automatic, Floor |

| 6 | GRADE |
|---|---|
| | R: STD<br>N: GX<br>E : VX |

| 7 | ENGINE SPECIFICATION |
|---|---|
| | K: DOHC and EFI<br>S : Diesel<br>Z: Multi Valve, Turbocharger and EFI |

| 8 | DESTINATION |
|---|---|
| | W: Europe<br>Q : Australia<br>V : G.C.C. (Gulf Cooperation Council) Countries |

## MODEL LINE-UP

| DESTINATION | ENGINE | BACK DOOR | GRADE | FRONT SUSPENSION | DRIVE TYPE | TRANSMISSION | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 5-Speed Manual | | 4-Speed Automatic | 5-Speed Automatic |
| | | | | | | R151F | H151F | A442F | A750F |
| Europe | 2UZ-FE | Lift-Up | VX | IFS (Double Wishbone) | Full-Time | — | — | — | UZJ100$^{R}_{L}$-GNAEKW |
| | 1HD-FTE | | | | | — | HDJ100$^{R}_{L}$-GNMEZW | — | UZJ100$^{R}_{L}$-GNAEZW |
| | | Swing | STD | | | — | HDJ100L-GCMRZW | — | — |
| Australia | 2UZ-FE | Lift-Up | GX | IFS (Double Wishbone) | Full-Time | — | UZJ100R-GNMNKQ | — | UZJ100R-GNANKQ |
| | | | VX | | | — | — | — | UZJ100R-GNAEKQ |
| | 1HZ | Swing | STD | RFS (Leading Arm) | Part-Time | HZJ105R-GCMRSQ | — | — | — |
| | | Lift-Up | GX | | Full-Time | ZJ10H5R-GNMNSQ | — | — | — |
| | 1HD-FTE | | | | | — | HDJ100R-GNMNZQ | — | HD100R-GNANZQ |
| | | | VX | | | — | — | — | HDJ100R-GNAEZQ |
| G.C.C. Countries | 1FZ-FE | Swing | STD | IFS (Double Wishbone) | Part-Time | — | FZJ100L-GCMRKV | — | — |
| | | | GX | | Part-Time (Full-Time) | — | FZJ100L-GCMNKV | FZJ100L-GCPNKV | — |
| | | Lift-Up | | | | — | FZJ100L-GNMNKV | FZJ100L-GNPNKV | — |
| | 2UZ-FE | Swing | VX | | Full-Time | — | FZJ100L-GCMEKV | — | UZJ100L-GCAEKV |
| | | Lift-Up | | | | — | FZJ100L-GNMEKV | — | UZJ100L-GNAEKV |
| | 1HZ | Swing | GX | RFS (Leading Arm) | Part-Time (Full-Time) | HZJ105L-GCMNSV | — | — | — |
| General Countries | 1FZ-FE | Swing | STD | RFS (Leading Arm) | Part-Time | — | FZJ105L-GCMRK | — | — |
| | | | GX | | Part-Time (Full-Time) | — | FZJ105L-GCMNK | — | — |
| | | Lift-Up | | | | — | FZJ105$^{R}_{L}$-GNMNK | — | — |
| | 2UZ-FE | | VX | IFS (Double Wishbone) | Full-Time | — | — | — | UZJ100L-GNAEK |
| | 1HZ | Swing | STD | RFS (Leading Arm) | Part-Time (Full-Time) | HZJ105$^{R}_{L}$-GCMRS | — | — | — |
| | | | GX | | Part-Time (Full-Time) | HZJ105$^{R}_{L}$-GCMNS | — | — | — |
| | | Lift-Up | | | | HZJ105$^{R}_{L}$-GNMNS | — | — | — |
| | 1HD-FTE | Swing | VX | IFS (Double Wishbone) | Full-Time | — | HDJ100L-GCMEZ | — | — |
| | | Lift-Up | | | | — | HDJ100$^{R}_{L}$-GNMEZ | — | HDJ100L-GNAEZ |

□ : New

# MAJOR TECHNICAL SPECIFICATIONS

| Item \ Area | | | | Europe | | | |
|---|---|---|---|---|---|---|---|
| Body Type | | | | Wagon (Lift-Up Back Door) | | | |
| Vehicle Grade | | | | VX | | | |
| Model Code | | | | UZJ100R-GNAEKW | UZJ100L-GNAEKW | HDJ100R-GNMEZW | HDJ100R-GNAEZW |
| Major Dimensions & Vehicle Weights | Overall | Length | mm (in.) | 4890 (192.5)*1 | 4890 (192.5)*1 | 4890 (192.5)*1 | 4890 (192.5)*1 |
| | | Width | mm (in.) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) |
| | | Height | mm (in.) | 1880 (74.0)*2, 1850 (72.8)*2, *3 | 1880 (74.0)*2, 1850 (72.8)*2, *3 | 1880 (74.0)*2, 1850 (72.8)*2, *3 | 1880 (74.0)*2, 1850 (72.8)*2, 3 |
| | Wheel Base | | mm (in.) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) |
| | Tread | Front | mm (in.) | 1620 (63.8) | 1620 (63.8) | 1620 (63.8) | 1620 (63.8) |
| | | Rear | mm (in.) | 1615 (63.6) | 1615 (63.6) | 1615 (63.6) | 1615 (63.6) |
| | Room | Length | mm (in.) | 2505 (98.6)*4 | 2505 (98.6)*4 | 2505 (98.6)*4 | 2505 (98.6)*4 |
| | | Width | mm (in.) | 1620 (63.8) | 1620 (63.8) | 1620 (63.8) | 1620 (63.8) |
| | | Height | mm (in.) | 1145 (45.1), 1150 (45.3)*15 | 1145 (45.1), 1150 (45.3)*15 | 1145 (45.1), 1150 (45.3)*15 | 1145 (45.1), 1150 (45.3)*15 |
| | Cargo Space | Length | mm (in.) | 335 (13.2)*4 | 335 (13.2)*4 | 335 (13.2)*4 | 335 (13.2)*4 |
| | | Width | mm (in.) | — | — | — | — |
| | | Height | mm (in.) | 995 (39.2)*4 | 995 (39.2)*4 | 995 (39.2)*4 | 995 (39.2)*4 |
| | Overhang | Front | mm (in.) | 895 (35.2)*1 | 895 (35.2)*1 | 895 (35.2)*1 | 895 (35.2)*1 |
| | | Rear | mm (in.) | 1145 (45.1) | 1145 (45.1) | 1145 (45.1) | 1145 (45.1) |
| | Min. Running Ground Clearance | | mm (in.) | — | — | — | — |
| | Angle of Approach | | degrees | — | — | — | — |
| | Angle of Departure | | degrees | — | — | — | — |
| | Curb Weight*19 | Front | kg (lb) | 1190 - 1340 (2623 - 2954) | 1190 - 1340 (2623 - 2954) | 1350 - 1495 (2976 - 3296) | 1355 - 1430 (2987 - 3153) |
| | | Rear | kg (lb) | 1080 - 1135 (2381 - 2502) | 1080 - 1135 (2381 - 2502) | 1095 - 1145 (2414 - 2524) | 1105 - 1180 (2436 - 2601) |
| | | Total | kg (lb) | 2270 - 2475 (5004 - 5456) | 2270 - 2475 (5004 - 5456) | 2445 - 2640 (5390 - 5820) | 2460 - 2610 (5423 - 5754) |
| | Gross Vehicle Weight | Front | kg (lb) | — | — | — | — |
| | | Rear | kg (lb) | — | — | — | — |
| | | Total | kg (lb) | 3260 (7187) | 3260 (7187) | 3260 (7187) | 3260 (7187) |
| | Fuel Tank Capacity | | ℓ (Imp.gal.) | 96 (21.1) | 96 (21.1) | 96 (21.1) | 96 (21.1) |
| | Luggage Compartment Capacity | | $m^3$ (cu.ft.) | — | — | — | — |
| Performance | Max. Speed | | km / h (mph) | 180 (112) | 180 (112) | 170 (105) | 180 (112) |
| | Max. Cruising Speed | | km / h (mph) | — | — | — | — |
| | Max. Permissible Speed | 1st Gear | km / h (mph) | 19 (12)*5, 47 (29)*6 | 19 (12)*5, 47 (29)*6 | 14 (9)*5, 35 (22)*6 | 18 (11)*5, 44 (27)*6 |
| | | 2nd Gear | km / h (mph) | 33 (20)*5, 81 (50)*6 | 33 (20)*5, 81 (50)*6 | 26 (16)*5, 63 (39)*6 | 35 (22)*5, 85 (54)*6 |
| | | 3rd Gear | km / h (mph) | — | — | 39 (24)*5, 97 (60)*6 | — |
| | | 4th Gear | km / h (mph) | — | — | 59 (37)*5, 144 (89)*6 | — |
| | Min. Turning Radius | Tire | m (ft.) | 5.9 (19.4) | 5.9 (19.4) | 5.9 (19.4) | 5.9 (19.4) |
| | | Body | m (ft.) | 6.3 (20.7) | 6.3 (20.7) | 6.3 (20.7) | 6.3 (20.7) |
| Engine | Engine Type | | | 2UZ-FE | 2UZ-FE | 1HD-FTE | 1HD-FTE |
| | Valve Mechanism | | | 32-Valve, DOHC | 32-Valve, DOHC | 24-Valve, OHC | 24-Valve, OHC |
| | Bore x Stroke | | mm (in.) | 94.0 x 84.0 (3.70 x 3.31) | 94.0 x 84.0 (3.70 x 3.31) | 94.0 x 100.0 (3.70 x 3.94) | 94.0 x 100.0 (3.70 x 3.94) |
| | Displacement | | $cm^3$ (cu.in.) | 4664 (284.5) | 4664 (284.5) | 4164 (254.0) | 4164 (254.0) |
| | Compression Ratio | | | 9.6 : 1 | 9.6 : 1 | 18.5 : 1 | 18.5 : 1 |
| | Fuel System | | | EFI | EFI | Distributor Type | Distributor Type |
| | Research Octane No. or Cetane No. (Diesel) | | | 91 or higher | 91 or higher | 48 or higher | 48 or higher |
| | Max. Output | | kW/rpm | 175 / 4800 (EEC) | 175 / 4800 (EEC) | 150 / 3400 (EEC) | 150 / 3400 (EEC) |
| | Max. Torque | | N·m / rpm | 434 / 3400 (EEC) | 434 / 3400 (EEC) | 430 / 1400 - 3200 (EEC) | 430 / 1400 - 3200 (EEC) |
| Engine Electrical | Battery Capacity (5HR) | | Voltage & Amp. hr. | 12-55, 64*7 | 12-55, 64*7 | 12-55 x 2, 64 x 2*7 | 12-55 x 2, 64 x 2*7 |
| | Alternator Output | | Watts | 960 | 960 | 960, 1440*7 | 960, 1440*7 |
| | Starter Output | | kW | 2.0 | 2.0 | 3.0 | 3.0 |
| Chassis | Clutch Type | | | — | — | Dry, Single Plate Diaphragm | — |
| | Transmission Type | | | A750F | A750F | H151F | A750F |
| | Transmission Gear Ratio | In First | | 3.520 | 3.520 | 4.081 | 3.520 |
| | | In Second | | 2.042 | 2.042 | 2.294 | 2.042 |
| | | In Third | | 1.400 | 1.400 | 1.490 | 1.400 |
| | | In Fourth | | 1.000 | 1.000 | 1.000 | 1.000 |
| | | In Fifth | | 0.716 | 0.716 | 0.881 | 0.716 |
| | | In Reverse | | 3.224 | 3.224 | 4.313 | 3.224 |
| | Transfer Gear Ratio H4 / L4 | | | 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 |
| | Differential Gear Ratio (Front / Rear) | | | 4.100 / 4.100 | 4.100 / 4.300 | 3.909 / 3.909 | 4.100 / 4.100 |
| | Differential Gear Size (Front / Rear) | | in. | 8" / 9.5" | 8" / 9.5" | 8" / 9.5" | 8" / 9.5" |
| | Brake Type | Front | | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc |
| | | Rear | | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc |
| | Parking Brake Type | | | Drum | Drum | Drum | Drum |
| | Brake Booster Type and Size | | in. | Hydraulic | Hydraulic | Hydraulic | Hydraulic |
| | Proportioning Valve Type | | | P & B Valve, -*16 | P & B Valve, -*16 | P & B Valve | P & B Valve |
| | Suspension Type | Front | | Double Wishbone | Double Wishbone | Double Wishbone | Double Wishbone |
| | | Rear | | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod |
| | Stabilizer Bar | Front | | Standard | Standard | Standard | Standard |
| | | Rear | | Standard | Standard | Standard | Standard |
| | Steering Gear Type | | | Rack & Pinion | Rack & Pinion | Rack & Pinion | Rack & Pinion |
| | Steering Gear Ratio (Overall) | | | 17.3, 12.4 - 18.0*18 | 17.3, 12.4 - 18.0*18 | 17.3 | 17.3 |
| | Power Steering Type | | | Integral Type | Integral Type | Integral Type | Integral Type |

*: Unladed Vehicle
*1: With Electrical Winch +50 mm (2.0 in.)
*2: With Roof Rail +40 mm (1.6 in.)
*3: With AHC
*4: With 3rd Seat
*5: Transfer in Low
*6: Transfer in High
*7: Option
*8: With 275 / 70R16 Tire
*9: With ABS
*10: With Back Door-Mounted Spare Tire, Tire Size 235 / 85R16 +295 mm (11.6 in.), Tire Size 275 / 70R16 +305 (12.0 in.), Tire Size 7.50R16 +265 mm (10.4 in.)
*11: With Roof Rack +230 mm (9.1 in.)
*12: With Grille Guard +75 mm (3.0 in.)
*13: With 7.50R16 Tire

| | Europe | | | Australia | | |
|---|---|---|---|---|---|---|
| | Wagon (Lift-Up Back Door) | | Wagon (Swing Back Door) | Wagon (Lift-Up Back Door) | | |
| | VX | | STD | GX | | VX |
| | HDJ100L-GNMEZW | HDJ100L-GNAEZW | HDJ100L-GCMRZW | UZJ100R-GNMNKQ | UZJ100R-GNANKQ | UZJ100R-GNAEKQ |
| 5 | 4890 (192.5)*1 | 4890 (192.5)*1 | 4890 (192.5)*1 | 4890 (192.5)*1 | 4890 (192.5)*1 | 4890 (192.5)*1 |
| | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) |
| | 1880 (74.0)*2, 1850 (72.8)*2, *3 | 1880 (74.0)*2, 1850 (72.8)*2, *3 | 1880 (74.0)*2, 1850 (72.8)*2, *3 | 1890 (74.4) | 1890 (74.4) | 1890 (74.4) |
| | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) |
| | 1620 (63.8) | 1620 (63.8) | 1620 (63.8) | 1620 (63.8), 1640 (64.6)*17 | 1620 (63.8), 1640 (64.6)*17 | 1620 (63.8), 1640 (64.6)*17 |
| 10 | 1615 (63.6) | 1615 (63.6) | 1615 (63.6) | 1615 (63.6), 1635 (64.4)*17 | 1615 (63.6), 1635 (64.4)*17 | 1615 (63.6), 1635 (64.4)*17 |
| | 2505 (98.6)*4 | 2505 (98.6)*4 | 2505 (98.6)*4 | 1805 (71.1) | 1805 (71.1) | 2505 (98.6) |
| | 1620 (63.8) | 1620 (63.8) | 1620 (63.8) | 1615 (63.6) | 1615 (63.6) | 1620 (63.8) |
| | 1145 (45.1), 1150 (45.3)*15 | 1145 (45.1), 1150 (45.3)*15 | 1145 (45.1), 1150 (45.3)*15 | 1180 (46.5), 1150 (45.3)*15 | 1180 (46.5), 1150 (45.3)*15 | 1145 (45.1), 1150 (45.3)*15 |
| | 335 (13.2)*4 | 335 (13.2)*4 | 335 (13.2)*4 | 1085 (42.7) | 1085 (42.7) | 335 (13.2) |
| 15 | — | — | — | — | — | — |
| | 995 (39.2)*4 | 995 (39.2)*4 | 995 (39.2)*4 | 1665 (41.9) | 1665 (41.9) | 995 (39.2) |
| | 895 (35.2)*1 | 895 (35.2)*1 | 895 (35.2)*1 | 895 (35.2) | 895 (35.2) | 895 (35.2) |
| | 1145 (45.1) | 1145 (45.1) | 1145 (45.1) | 1145 (45.1) | 1145 (45.1) | 1145 (45.1) |
| | — | — | — | — | — | — |
| 20 | — | — | — | — | — | — |
| | — | — | — | — | — | — |
| | 1350 - 1495 (2976 - 3296) | 1355 - 1430 (2987 - 3153) | 1375 - 1405 (3031 - 3097) | 1245 - 1265 (2745 - 2789) | 1260 - 1280 (2778 - 2822) | 1290 - 1305 (2844 - 2877)*20 |
| | 1095 - 1145 (2414 - 2524) | 1105 - 1180 (2436 - 2601) | 1060 - 1100 (2337 - 2425) | 1060 - 1080 (2337 - 2381) | 1065 - 1085 (2348 - 2392) | 1190 - 1215 (2623 - 2679)*20 |
| | 2445 - 2640 (5390 - 5820) | 2460 - 2610 (5423 - 5754) | 2435 - 2505 (5368 - 5523) | 2305 - 2345 (5082 - 5170) | 2325 - 2365 (5126 - 5214) | 2480 - 2520 (5467 - 5556)*20 |
| 25 | — | — | — | — | — | — |
| | — | — | — | — | — | — |
| | 3260 (7187) | 3260 (7187) | 3260 (7187) | 3260 (7187) | 3260 (7187) | 3260 (7187) |
| | 96 (21.1) | 96 (21.1) | 96 (21.1) | 95 + 50 (20.9 + 11.0) | 95 + 50 (20.9 + 11.0) | 95 + 50 (20.9 + 11.0) |
| | — | — | — | — | — | — |
| 30 | 170 (105) | 180 (112) | 170 (105) | 180 (112) | 180 (112) | 180 (112) |
| | — | — | — | — | | |
| | 14 (9)*5, 35 (22)*6 | 18 (11)*5, 44 (28)*6 | 14 (9)*5, 35 (22)*6 | 17 (11)*5, 40 (25)*6 | 19 (12)*5, 47 (29)*6 | 19 (12)*5, 47 (29)*6 |
| | 26 (16)*5, 63 (39)*6 | 35 (22)*5, 85 (53)*6 | 26 (16)*5, 63 (39)*6 | 29 (18)*5, 72 (45)*6 | 33 (20)*5, 81 (50)*6 | 33 (20)*5, 81 (50)*6 |
| | 39 (24)*5, 97 (60)*6 | — | 39 (24)*5, 97 (60)*6 | 45 (28)*5, 111 (69)*6 | — | — |
| 35 | 59 (37)*5, 144 (89)*6 | — | 59 (37)*5, 144 (89)*6 | 67 (42)*5, 165 (102)*6 | — | — |
| | 5.9 (19.4) | 5.9 (19.4) | 5.9 (19.4) | 5.9 (19.4) | 5.9 (19.4) | 5.9 (19.4) |
| | 6.3 (20.7) | 6.3 (20.7) | 6.3 (20.7) | 6.3 (20.7) | 6.3 (20.7) | 6.3 (20.7) |
| | 1HD-FTE | 1HD-FTE | 1HD-FTE | 2UZ-FE | 2UZ-FE | 2UZ-FE |
| | 24-Valve, OHC | 24-Valve, OHC | 24-Valve, OHC | 32-Valve, DOHC | 32-Valve, DOHC | 32-Valve, DOHC |
| 40 | 94.0 x 100.0 (3.70 x 3.94) | 94.0 x 100.0 (3.70 x 3.94) | 94.0 x 100.0 (3.70 x 3.94) | 94.0 x 84.0 (3.70 x 3.31) | 94.0 x 84.0 (3.70 x 3.31) | 94.0 x 84.0 (3.70 x 3.31) |
| | 4164 (254.0) | 4164 (254.0) | 4164 (254.0) | 4664 (284.5) | 4664 (284.5) | 4664 (284.5) |
| | 18.5 : 1 | 18.5 : 1 | 18.8 : 1 | 9.6 : 1 | 9.6 : 1 | 9.6 : 1 |
| | Distributor Type | Distributor Type | Distributor Type | EFI | EFI | EFI |
| | 48 or higher | 48 or higher | 48 or higher | 91 or higher | 91 or higher | 91 or higher |
| 45 | 150 / 3400 (EEC) | 150 / 3400 (EEC) | 150 / 3400 (EEC) | 170 / 4800 (SAE-NET) | 170 / 4800 (SAE-NET) | 170 / 4800 (SAE-NET) |
| | 430 / 1400 - 3200 (EEC) | 430 / 1400 - 3200 (EEC) | 430 / 1400 - 3200 (EEC) | 410 / 3400 (SAE-NET) | 410 / 3400 (SAE-NET) | 410 / 3400 (SAE-NET) |
| | 12-55 x 2, 64 x 2*7 | 12-55 x 2, 64 x 2*7 | 12-64 x 2 | 12-55 | 12-55 | 12-55 |
| | 960, 1440*7 | 960, 1440*7 | 1440 | 1200 | 1200 | 1200 |
| | 3.0 | 3.0 | 3.0 | 1.4 | 1.4 | 1.4 |
| 50 | Dry, Single Plate Diaphragm | — | Dry, Single Plate Diaphragm | Dry, Single Plate Diaphragm | — | — |
| | H151F | A750F | H151F | H151F | A750F | A750F |
| | 4.081 | 3.520 | 4.081 | 4.081 | 3.520 | 3.520 |
| | 2.294 | 2.042 | 2.294 | 2.294 | 2.042 | 2.042 |
| | 1.490 | 1.400 | 1.490 | 1.490 | 1.400 | 1.400 |
| 55 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| | 0.881 | 0.716 | 0.881 | 0.881 | 0.716 | 0.716 |
| | 4.313 | 3.224 | 4.313 | 4.313 | 3.224 | 3.224 |
| | 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 |
| | 3.909 / 3.909 | 4.100 / 4.100 | 3.909 / 3.909 | 4.300 / 4.300 | 4.100 / 4.100 | 4.100 / 4.100 |
| 60 | 8” / 9.5” | 8” / 9.5” | 8” / 9.5” | 8” / 9.5” | 8” / 9.5” | 8” / 9.5” |
| | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc |
| | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc |
| | Drum | Drum | Drum | Drum | Drum | Drum |
| | Hydraulic | Hydraulic | Hydraulic | Hydraulic | Hydraulic | Hydraulic |
| 65 | P & B Valve | P & B Valve | P & B Valve | P & B Valve | P & B Valve | P & B Valve |
| | Double Wishbone | Double Wishbone | Double Wishbone | Double Wishbone | Double Wishbone | Double Wishbone |
| | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod |
| | Standard | Standard | Standard | Standard | Standard | Standard |
| | Standard | Standard | Standard | Standard | Standard | Standard |
| 70 | Rack & Pinion | Rack & Pinion | Rack & Pinion | Rack & Pinion | Rack & Pinion | Rack & Pinion |
| | 17.3 | 17.3 | 17.3 | 17.3 | 17.3 | 17.3 |
| | Integral Type | Integral Type | Integral Type | Integral Type | Integral Type | Integral Type |

*14: With AHC -50 mm (2.0 in.)
*15: With Moon Roof
*16: With VSC
*17: With 235 / 85R16 Tire
*18: With VGRS
*19: Separate Seat, Seating Capacity : 5
*20: Seating Capacity : 8

5

| Item \ Area | | | | Australia | | | |
|---|---|---|---|---|---|---|---|
| Body Type | | | | Wagon (Swing Back Door) | Wagon (Lift-Up Back Door) | | |
| Vehicle Grade | | | | STD | GX | | |
| Model Code | | | | HZJ105R-GCMRSQ | HZJ105R-GNMNSQ | HDJ100R-GNMNZQ | HDJ100R-GNANZQ |
| Major Dimensions & Vehicle Weights | Overall | Length | mm (in.) | 4890 (192.5) | 4890 (192.5) | 4890 (192.5) | 4890 (192.5) |
| | | Width | mm (in.) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) |
| | | Height | mm (in.) | 1920 (75.6), 1915 (75.4)*8 | 1920 (75.6), 1915 (75.4)*8 | 1890 (74.4) | 1890 (74.4) |
| | Wheel Base | | mm (in.) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) |
| | Tread | Front | mm (in.) | 1605 (63.2) | 1605 (63.2) | 1620 (63.8), 1640 (64.6)*17 | 1620 (63.8), 1640 (64.6)*17 |
| | | Rear | mm (in.) | 1600 (63.0) | 1600 (63.0) | 1615 (63.6), 1635 (64.4)*17 | 1615 (63.6), 1635 (64.4)*17 |
| | Room | Length | mm (in.) | 1805 (71.1) | 1805 (71.1) | 1805 (71.1) | 1805 (71.1) |
| | | Width | mm (in.) | 1615 (63.6) | 1615 (63.6) | 1615 (63.6) | 1615 (63.6) |
| | | Height | mm (in.) | 1180 (46.5) | 1180 (46.5), 1150 (45.3)*15 | 1180 (46.5), 1150 (45.3)*15 | 1180 (46.5), 1150 (45.3)*15 |
| | Cargo Space | Length | mm (in.) | 1085 (42.7) | 1085 (42.7) | 1085 (42.7) | 1085 (42.7) |
| | | Width | mm (in.) | — | — | — | — |
| | | Height | mm (in.) | 1065 (41.9) | 1065 (41.9) | 1065 (41.9) | 1065 (41.9) |
| | Overhang | Front | mm (in.) | 895 (35.2) | 895 (35.2) | 895 (35.2) | 895 (35.2) |
| | | Rear | mm (in.) | 1145 (45.1) | 1145 (45.1) | 1145 (45.1) | 1145 (45.1) |
| | Min. Running Ground Clearance | | mm (in.) | — | — | — | — |
| | Angle of Approach | | degrees | — | — | — | — |
| | Angle of Departure | | degrees | — | — | — | — |
| | Curb Weight*19 | Front | kg (lb) | 1195 - 1230 (2634 - 2712) | 1205 - 1230 (2657 - 2712) | 1330 - 1350 (2932 - 2976) | 1355 - 1375 (2987 - 3031) |
| | | Rear | kg (lb) | 1130 - 1155 (2491 - 2546) | 1120 - 1140 (2469 - 2513) | 1150 - 1170 (2535 - 2579) | 1155 - 1175 (2546 - 2590) |
| | | Total | kg (lb) | 2325 - 2385 (5126 - 5258) | 2325 - 2370 (5126 - 5225) | 2480 - 2520 (5467 - 5556) | 2510 - 2550 (5534 - 5622) |
| | Gross Vehicle Weight | Front | kg (lb) | — | — | — | — |
| | | Rear | kg (lb) | — | — | — | — |
| | | Total | kg (lb) | 3180 (7011) | 3180 (7011) | 3260 (7187) | 3260 (7187) |
| | Fuel Tank Capacity | | ℓ (Imp.gal.) | 95 + 50 (20.9 + 11.0) | 95 + 50 (20.9 + 11.0) | 96 + 45 (21.1 + 9.9) | 96 + 45 (21.1 + 9.9) |
| | Luggage Compartment Capacity | | $m^3$ (cu.ft.) | — | — | — | — |
| Performance | Max. Speed | | km / h (mph) | 155 (96) | 155 (96) | 175 (109) | 180 (112) |
| | Max. Cruising Speed | | km / h (mph) | — | — | — | — |
| | Max. Permissible Speed | 1st Gear | km / h (mph) | 13 (8)*5, 32 (20)*6 | 13 (8)*5, 32 (20)*6 | 14 (9)*5, 35 (22)*6 | 16 (10)*5, 39 (24)*6 |
| | | 2nd Gear | km / h (mph) | 25 (16)*5, 60 (37)*6 | 25 (16)*5, 60 (37)*6 | 26 (16)*5, 63 (39)*6 | 27 (17)*5, 67 (42)*6 |
| | | 3rd Gear | km / h (mph) | 40 (25)*5, 97 (60)*6 | 40 (25)*5, 97 (60)*6 | 39 (24)*5, 97 (60)*6 | — |
| | | 4th Gear | km / h (mph) | 57 (35)*5, 140 (87)*6 | 57 (35)*5, 140 (87)*6 | 59 (37)*5, 144 (89)*6 | — |
| | Min. Turning Radius | Tire | m (ft.) | 6.0 (19.7) | 6.0 (19.7) | 6.0 (19.7) | 6.0 (19.7) |
| | | Body | m (ft.) | 6.4 (21.0) | 6.4 (21.0) | 6.4 (21.0) | 6.4 (21.0) |
| Engine | Engine Type | | | 1HZ | 1HZ | 1HD-FTE | 1HD-FTE |
| | Valve Mechanism | | | 12-Valve, OHC | 12-Valve, OHC | 24-Valve, OHC | 24-Valve, OHC |
| | Bore x Stroke | | mm (in.) | 94.0 x 100.0 (3.70 x 3.94) | 94.0 x 100.0 (3.70 x 3.94) | 94.0 x 100.0 (3.70 x 3.94) | 94.0 x 100.0 (3.70 x 3.94) |
| | Displacement | | $cm^3$ (cu.in.) | 4164 (254.0) | 4164 (254.0) | 4164 (254.0) | 4164 (254.0) |
| | Compression Ratio | | | 22.4 : 1 | 22.4 : 1 | 18.8 : 1 | 18.8 : 1 |
| | Fuel System | | | Distributor Type | Distributor Type | Distributor Type | Distributor Type |
| | Research Octane No. or Cetane No. (Diesel) | | | 48 or higher | 48 or higher | 48 or higher | 48 or higher |
| | Max. Output | | kW / rpm | 96 / 3800 (SAE-NET) | 96 / 3800 (SAE-NET) | 150 / 3400 (EEC) | 150 / 3400 (EEC) |
| | Max. Torque | | N·m / rpm | 285 / 2200 (SAE-NET) | 285 / 2200 (SAE-NET) | 430 / 1400 - 3200 (EEC) | 430 / 1400 - 3200 (EEC) |
| Engine Electrical | Battery Capacity (5HR) | | Voltage & Amp. hr. | 12-64 | 12-64 | 12-55 x 2 | 12-55 x 2 |
| | Alternator Output | | Watts | 960, 1440*7 | 960, 1440*7 | 1440 | 1440 |
| | Starter Output | | kW | 2.5 | 2.5 | 3.0 | 3.0 |
| Chassis | Clutch Type | | | Dry, Single Plate Diaphragm | Dry, Single Plate Diaphragm | Dry, Single Plate Diaphragm | — |
| | Transmission Type | | | R151F | R151F | H151F | A750F |
| | Transmission Gear Ratio | In First | | 4.313 | 4.313 | 4.081 | 3.520 |
| | | In Second | | 2.330 | 2.330 | 2.294 | 2.042 |
| | | In Third | | 1.436 | 1.436 | 1.490 | 1.400 |
| | | In Fourth | | 1.000 | 1.000 | 1.000 | 1.000 |
| | | In Fifth | | 0.838 | 0.838 | 0.881 | 0.716 |
| | | In Reverse | | 4.220 | 4.220 | 4.313 | 3.224 |
| | Transfer Gear Ratio H4 / L4 | | | 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 |
| | Differential Gear Ratio (Front / Rear) | | | 4.300 / 4.300 | 4.300 / 4.300 | 4.100 / 4.100 | 3.909 / 3.909 |
| | Differential Gear Size (Front / Rear) | | in. | 8" / 9.5" | 8" / 9.5" | 8" / 9.5" | 8" / 9.5" |
| | Brake Type | Front | | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc |
| | | Rear | | L. T Drum, Ventilated Disc*7 | Ventilated Disc | Ventilated Disc | Ventilated Disc |
| | Parking Brake Type | | | Drum | Drum | Drum | Drum |
| | Brake Booster Type and Size | | in. | Vacuum | Vacuum, Hydraulic*9 | Hydraulic | Hydraulic |
| | Proportioning Valve Type | | | LSP &BV | LSP & BV, P & B Valve*9 | P & B Valve | P & B Valve |
| | Suspension Type | Front | | Leading Arm, Coil | Leading Arm, Coil | Double Wishbone | Double Wishbone |
| | | Rear | | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod |
| | Stabilizer Bar | Front | | Standard | Standard | Standard | Standard |
| | | Rear | | Standard | Standard | Standard | Standard |
| | Steering Gear Type | | | Rack & Pinion | Recerculating Ball | Rack & Pinion | Rack & Pinion |
| | Steering Gear Ratio (Overall) | | | 17.3 | 18.59 | 17.3 | 17.3 |
| | Power Steering Type | | | Integral Type | Integral Type | Integral Type | Integral Type |

*: Unladed Vehicle
*1: With Electrical Winch +50 mm (2.0 in.)
*2: With Roof Rail +40 mm (1.6 in.)
*3: With AHC
*4: With 3rd Seat
*5: Transfer in Low
*6: Transfer in High
*7: Option
*8: With 275 / 70R16 Tire
*9: With ABS
*10: With Back Door-Mounted Spare Tire, Tire Size 235 / 85R16 +295 mm (11.6 in.), Tire Size 275 / 70R16 +305 (12.0 in.), Tire Size 7.50R16 +265 mm (10.4 in.)
*11: With Roof Rack +230 mm (9.1 in.)
*12: With Grille Guard +75 mm (3.0 in.)
*13: With 7.50R16 Tire

| Australia | G.C.C. Countries | | | | |
|---|---|---|---|---|---|
| Wagon (Lift-Up Back Door) | Wagon (Swing Back Door) | | | Wagon (Lift-Up Back Door) | Wagon (Swing Back Door) |
| VX | GX | STD | GX | | |
| HDJ100R-GNAEZQ | HZJ105L-GCMNSV | FZJ100L-GCMRKV | FZJ100L-GCMNKV | FZJ100L-GNMNKV | FZJ100L-GCPNKV |
| 4890 (192.5) | 4890 (192.5)*1, 10 | 4890 (192.5)*1, 10 | 4890 (192.5)*1, 10 | 4890 (192.5)*1, 10 | 4890 (192.5)*1, 10 |
| 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) |
| 890 (74.4) | 1905 (75.0)*11, 1885 (74.2)*8, *11 | 1880 (74.0)*11 | 1880 (74.0)*11, 1860 (73.2)*8, *11 | 1880 (74.0)*11, 1860 (73.2)*8, *11 | 1880 (74.0)*11, 1860 (73.2)*8, *11 |
| 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) |
| 1620 (63.8), 1640 (64.6)*17 | 1605 (63.2) | 1640 (64.6) | 1640 (64.6), 1620 (63.8)*8 | 1640 (64.6), 1620 (63.8)*8 | 1640 (64.6), 1620 (63.8)*8 |
| 1615 (63.6), 1635 (64.4)*17 | 1600 (63.0) | 1635 (64.4) | 1635 (64.4), 1615 (63.6)*8 | 1635 (64.4), 1615 (63.6)*8 | 1635 (64.4), 1615 (63.6)*8 |
| 2505 (98.6) | — | 1805 (71.1) | — | 1805 (71.1) | — |
| 1620 (63.8) | 1615 (63.6) | 1615 (63.6) | 1615 (63.6) | 1615 (63.6) | 1615 (63.6) |
| 1145 (45.1), 1150 (45.3)*15 | 1180 (46.5), 1150 (45.3)*15 | 1180 (46.5) | 1180 (46.5), 1150 (45.3) | 1180 (46.5), 1150 (45.3) | 1180 (46.5), 1150 (45.3) |
| 335 (13.2) | — | 1085 (42.7) | — | 1085 (42.7) | — |
| — | — | — | — | — | — |
| 995 (39.2) | — | 1065 (41.9) | — | 1065 (41.9) | — |
| 895 (35.2) | 895 (35.2)*1 | 895 (35.2)*1 | 895 (35.2)*1 | 895 (35.2)*1 | 895 (35.2)*1 |
| 1145 (45.1) | 1145 (45.1)*10 | 1145 (45.1)*10 | 1145 (45.1)*10 | 1145 (45.1)*10 | 1145 (45.1)*10 |
| — | — | — | — | — | — |
| — | — | — | — | — | — |
| — | — | — | — | — | — |
| 1405 - 1415 (3097 - 3120)*20 | 1215 - 1310 (2679 - 2888) | 1175 - 1255 (2590 - 2767) | 1195 - 1295 (2635 - 2855) | 1185 - 1290 (2612 - 2844) | 1225 - 1325 (2701 - 2921) |
| 1240 - 1265 (2734 - 2789)*20 | 1095 - 1275 (2414 - 2811) | 1110 - 1225 (2447 - 2701) | 1095 - 1290 (2414 - 2844) | 1120 - 1280 (2469 - 2822) | 1100 - 1295 (2425 - 2855) |
| 2645 - 2680 (5831 - 5908)*20 | 2310 - 2585 (5093 - 5699) | 2285 - 2480 (5038 - 5467) | 2290 - 2585 (5049 - 5699) | 2305 - 2570 (5082 - 5666) | 2325 - 2620 (5126 - 5776) |
| — | — | — | — | — | — |
| — | — | — | — | — | — |
| 3260 (7187) | 3160 (6967) | 3160 (6967) | 3160 (6967) | 3160 (6967) | 3160 (6967) |
| 96 + 45 (21.1 + 9.9) | 95 + 50 (20.9 + 11.0) | 96 + 45 (21.1 + 9.9) | 96 + 45 (21.1 + 9.9) | 96 + 45 (21.1 + 9.9) | 96 + 45 (21.1 + 9.9) |
| — | — | — | — | — | — |
| 180 (112) | 155 (96) | 180 (112) | 180 (112) | 180 (112) | 180 (112) |
| — | — | — | — | — | — |
| 16 (10)*5, 39 (24)*6 | 13 (8)*5, 32 (20)*6 | 16 (10)*5, 39 (24)*6 | 16 (10)*5, 39 (24)*6 | 16 (10)*5, 39 (24)*6 | 21 (13)*5, 51 (31)*6 |
| 27 (17)*5, 67 (42)*6 | 25 (16)*5, 60 (37)*6 | 28 (17)*5, 70 (43)*6 | 28 (17)*5, 70 (43)*6 | 28 (17)*5, 70 (43)*6 | 40 (25)*5, 97 (60)*6 |
| — | 40 (25)*5, 97 (60)*6 | 44 (27)*5, 107 (66)*6 | 44 (27)*5, 107 (66)*6 | 44 (27)*5, 107 (66)*6 | — |
| — | 57 (35)*5, 140 (87)*6 | 65 (40)*5, 160 (99)*6 | 65 (40)*5, 160 (99)*6 | 65 (40)*5, 160 (99)*6 | — |
| 6.0 (19.7) | 6.0 (19.7) | 5.9 (19.4) | 5.9 (19.4) | 5.9 (19.4) | 5.9 (19.4) |
| 6.4 (21.0) | 6.4 (21.0) | 6.3 (20.7) | 6.3 (20.7) | 6.3 (20.7) | 6.3 (20.7) |
| 1HD-FTE | 1HZ | 1FZ-FE | 1FZ-FE | 1FZ-FE | 1FZ-FE |
| 24-Valve, OHC | 12-Valve, OHC | 24-Valve, DOHC | 24-Valve, DOHC | 24-Valve, DOHC | 24-Valve, DOHC |
| 94.0 x 100.0 (3.70 x 3.94) | 94.0 x 100.0 (3.70 x 3.94) | 100.0 x 95.0 (3.97 x 3.74) | 100.0 x 95.0 (3.97 x 3.74) | 100.0 x 95.0 (3.97 x 3.74) | 100.0 x 95.0 (3.97 x 3.74) |
| 4164 (254.0) | 4164 (254.0) | 4477 (573.1) | 4477 (573.1) | 4477 (573.1) | 4477 (573.1) |
| 18.8 : 1 | 22.4 : 1 | 9.0 : 1 | 9.0 : 1 | 9.0 : 1 | 9.0 : 1 |
| Distributor Type | Distributor Type | EFI | EFI | EFI | EFI |
| 48 or higher | 48 or higher | 91 or higher | 91 or higher | 91 or higher | 91 or higher |
| 150 / 3400 (EEC) | 96 / 3800 (SAE-NET) | 161 / 4600 (SAE-NET) | 161 / 4600 (SAE-NET) | 161 / 4600 (SAE-NET) | 155 / 4600 (SAE-NET) |
| 430 / 1400 - 3200 (EEC) | 285 / 2200 (SAE-NET) | 116 / 3600 (SAE-NET) | 116 / 3600 (SAE-NET) | 116 / 3600 (SAE-NET) | 113 / 3600 (SAE-NET) |
| 12-55 x 2 | 12-55, 12-64 x 2*7 | 12-55 | 12-55 | 12-55 | 12-55 |
| 1440 | 840, 960*7 | 960 | 960, 1200*7 | 960, 1200*7 | 960, 1200*7 |
| 3.0 | 2.5, 3.0*7 | 1.4 | 1.4 | 1.4, 2.0*7 | 1.4 |
| — | Dry, Single Plate Diaphragm | Dry, Single Plate Diaphragm | Dry, Single Plate Diaphragm | Dry, Single Plate Diaphragm | — |
| A750F | R151F | H151F | H151F | H151F | A442F |
| 3.520 | 4.313 | 4.081 | 4.081 | 4.081 | 2.950 |
| 2.042 | 2.330 | 2.294 | 2.294 | 2.294 | 1.530 |
| 1.400 | 1.436 | 1.490 | 1.490 | 1.490 | 1.000 |
| 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 0.765 |
| 0.716 | 0.838 | 0.881 | 0.881 | 0.881 | — |
| 3.224 | 4.220 | 4.313 | 4.313 | 4.313 | 2.678 |
| 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 |
| 3.909 / 3.909 | 4.300 / 4.300 | 4.300 / 4.300 | 4.300 / 4.300 | 4.300 / 4.300 | 4.300 / 4.300 |
| 8” / 9.5” | 8” / 9.5” | 8” / 9.5” | 8” / 9.5” | 8” / 9.5” | 8” / 9.5” |
| Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc |
| Ventilated Disc | L. T Drum, Ventilated Disc*9 | L. T Drum, Ventilated Disc*9 | L. T Drum, Ventilated Disc*9 | L. T Drum, Ventilated Disc*9 | L. T Drum, Ventilated Disc*9 |
| Drum | Drum | Drum | Drum | Drum | Drum |
| Hydraulic | Vacuum, Hydraulic*9 | Vacuum, Hydraulic*9 | Vacuum, Hydraulic*9 | Vacuum, Hydraulic*9 | Vacuum, Hydraulic*9 |
| P & B Valve | LSP & BV, P & B Valve*9 | LSP & BV, P & B Valve*9 | LSP & BV, P & B Valve*9 | LSP & BV, P & B Valve*9 | LSP & BV, P & B Valve*9 |
| Double Wishbone | Leading Arm, Coil | Double Wishbone | Double Wishbone | Double Wishbone | Double Wishbone |
| 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod |
| Standard | Standard | Standard | Standard | Standard | Standard |
| Standard | Standard | Standard | Standard | Standard | Standard |
| Rack & Pinion | Recerculating Ball | Rack & Pinion | Rack & Pinion | Rack & Pinion | Rack & Pinion |
| 17.3 | 18.59 | 17.3 | 17.3 | 17.3 | 17.3 |
| Integral Type | Integral Type | Integral Type | Integral Type | Integral Type | Integral Type |

*14: With AHC -50 mm (2.0 in.)
*15: With Moon Roof
*16: With VSC
*19: Separate Seat, Seating Capacity : 5
*20: Seating Capacity : 8

| Item \ Area | | | | G.C.C. Countries | | | |
|---|---|---|---|---|---|---|---|
| Body Type | | | | Wagon (Lift-Up Back Door) | Wagon (Swing Back Door) | Wagon (Lift-Up Back Door) | Wagon (Swing Back Door) |
| Vehicle Grade | | | | GX | VX | | |
| Model Code | | | | FZJ100L-GNPNKV | UZJ100L-GCMEKV | UZJ100L-GNMEKV | UZJ100L-GCAEKV |
| Major Dimensions & Vehicle Weights | Overall | Length | mm (in.) | 4890 (192.5)*1, *10 | 4890 (192.5)*1, *10, *12 | 4890 (192.5)*1, *10, *12 | 4890 (192.5)*1, *10, *12 |
| | | Width | mm (in.) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) |
| | | Height | mm (in.) | 1880 (74.0)*11, 1860 (73.2)*8, *11 | 1860 (73.2)*11, 1850 (72.8)*3, *11 | 1860 (73.2)*11, 1850 (72.8)*3, *11 | 1860 (73.2)*11, 1850 (72.8)*3, *11 |
| | Wheel Base | | mm (in.) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) |
| | Tread | Front | mm (in.) | 1640 (64.6), 1620 (63.8)*8 | 1620 (63.8) | 1620 (63.8) | 1620 (63.8) |
| | | Rear | mm (in.) | 1635 (64.4), 1615 (63.6)*8 | 1615 (63.6) | 1615 (63.6) | 1615 (63.6) |
| | Room | Length | mm (in.) | 1805 (71.1) | — | 2505 (98.6) | — |
| | | Width | mm (in.) | 1615 (63.6) | 1620 (63.8) | 1620 (63.8) | 1620 (63.8) |
| | | Height | mm (in.) | 1180 (46.5), 1150 (45.3) | 1145 (45.1), 1150 (45.3)*15 | 1145 (45.1), 1150 (45.3)*15 | 1145 (45.1), 1150 (45.3)*15 |
| | Cargo Space | Length | mm (in.) | 1085 (42.7) | — | 335 (13.2) | — |
| | | Width | mm (in.) | — | — | — | — |
| | | Height | mm (in.) | 1065 (41.9) | — | 995 (39.2) | — |
| | Overhang | Front | mm (in.) | 895 (35.2)*1 | 895 (35.2)*1, *12 | 895 (35.2)*1, *12 | 895 (35.2)*1, *12 |
| | | Rear | mm (in.) | 1145 (45.1)*10 | 1145 (45.1)*10 | 1145 (45.1)*10 | 1145 (45.1)*10 |
| | Min. Running Ground Clearance | | mm (in.) | — | — | — | — |
| | Angle of Approach | | degrees | — | — | — | — |
| | Angle of Departure | | degrees | — | — | — | — |
| | Curb Weight*19 | Front | kg (lb) | 1215 - 1320 (2679 - 2910) | 1230 - 1345 (2712 - 2965) | 1240 - 1345 (2734 - 2965) | 1240 - 1365 (2734 - 3009) |
| | | Rear | kg (lb) | 1130 - 1290 (2491 - 2844) | 1090 - 1275 (2403 - 2811) | 1080 - 1305 (2381 - 2877) | 1090 - 1265 (2043 - 2789) |
| | | Total | kg (lb) | 2345 - 2610 (5170 - 5754) | 2320 - 2620 (5115 - 5776) | 2320 - 2650 (5115 - 5842) | 2330 - 2630 (5137 - 5798) |
| | Gross Vehicle Weight | Front | kg (lb) | — | — | — | — |
| | | Rear | kg (lb) | — | — | — | — |
| | | Total | kg (lb) | 3160 (6967) | 3260 (7187) | 3260 (7187) | 3260 (7187) |
| | Fuel Tank Capacity | | ℓ (Imp.gal.) | 96 + 45 (21.1 + 9.9) | 96 + 45 (21.1 + 9.9) | 96 + 45 (21.1 + 9.9) | 96 + 45 (21.1 + 9.9) |
| | Luggage Compartment Capacity | | $m^3$ (cu.ft.) | — | — | — | — |
| Performance | Max. Speed | | km / h (mph) | 180 (112) | 180 (112) | 180 (112) | 180 (112) |
| | Max. Cruising Speed | | km / h (mph) | — | — | — | — |
| | Max. Permissible Speed | 1st Gear | km / h (mph) | 21 (13)*5, 51 (31)*6 | 17 (11)*5, 40 (25)*6 | 17 (11)*5, 40 (25)*6 | 19 (12)*5, 47 (29)*6 |
| | | 2nd Gear | km / h (mph) | 40 (25)*5, 97 (60)*6 | 29 (18)*5, 72 (45)*6 | 29 (18)*5, 72 (45)*6 | 33 (20)*5, 81 (50)*6 |
| | | 3rd Gear | km / h (mph) | — | 45 (28)*5, 111 (69)*6 | 45 (28)*5, 111 (69)*6 | — |
| | | 4th Gear | km / h (mph) | — | 67 (42)*5, 165 (102)*6 | 67 (42)*5, 165 (102)*6 | — |
| | Min. Turning Radius | Tire | m (ft.) | 5.9 (19.4) | 5.9 (19.4) | 5.9 (19.4) | 5.9 (19.4) |
| | | Body | m (ft.) | 6.3 (20.7) | 6.3 (20.7) | 6.3 (20.7) | 6.3 (20.7) |
| Engine | Engine Type | | | 1FZ-FE | 2UZ-FE | 2UZ-FE | 2UZ-FE |
| | Valve Mechanism | | | 24-Valve, DOHC | 32-Valve, DOHC | 32-Valve, DOHC | 32-Valve, DOHC |
| | Bore x Stroke | | mm (in.) | 100.0 x 95.0 (3.97 x 3.74) | 94.0 x 84.0 (3.70 x 3.31) | 94.0 x 84.0 (3.70 x 3.31) | 94.0 x 84.0 (3.70 x 3.31) |
| | Displacement | | $cm^3$ (cu.in.) | 4477 (573.1) | 4664 (284.5) | 4664 (284.5) | 4664 (284.5) |
| | Compression Ratio | | | 9.0 : 1 | 9.6 : 1 | 9.6 : 1 | 9.6 : 1 |
| | Fuel System | | | EFI | EFI | EFI | EFI |
| | Research Octane No. or Cetane No. (Diesel) | | | 91 or higher | 91 or higher | 91 or higher | 91 or higher |
| | Max. Output | | kW/rpm | 155 / 4600 (SAE-NET) | 170 / 4800 (SAE-NET) | 170 / 4800 (SAE-NET) | 170 / 4800 (SAE-NET) |
| | Max. Torque | | N·m / rpm | 373 / 3600 (SAE-NET) | 410 / 3400 (SAE-NET) | 410 / 3400 (SAE-NET) | 410 / 3400 (SAE-NET) |
| Engine Electrical | Battery Capacity (5HR) | | Voltage & Amp. hr. | 12-55 | 12-55 | 12-55 | 12-55 |
| | Alternator Output | | Watts | 960, 1200*7 | 960 | 960 | 960 |
| | Starter Output | | kW | 1.4, 2.0*7 | 1.4 | 1.4 | 1.4 |
| Chassis | Clutch Type | | | — | Dry, Single Plate Diaphragm | Dry, Single Plate Diaphragm | — |
| | Transmission Type | | | A442F | H151F | H151F | A750F |
| | Transmission Gear Ratio | In First | | 2.950 | 4.081 | 4.081 | 3.520 |
| | | In Second | | 1.530 | 2.294 | 2.294 | 2.042 |
| | | In Third | | 1.000 | 1.490 | 1.490 | 1.400 |
| | | In Fourth | | 0.765 | 1.000 | 1.000 | 1.000 |
| | | In Fifth | | — | 0.881 | 0.881 | 0.716 |
| | | In Reverse | | 2.678 | 4.313 | 4.313 | 3.224 |
| | Transfer Gear Ratio H4 / L4 | | | 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 |
| | Differential Gear Ratio (Front / Rear) | | | 4.300 / 4.300 | 4.300 / 4.300 | 4.300 / 4.300 | 4.100 / 4.100 |
| | Differential Gear Size (Front / Rear) | | in. | 8" / 9.5" | 8" / 9.5" | 8" / 9.5" | 8" / 9.5" |
| | Brake Type | Front | | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc |
| | | Rear | | L. T Drum, Ventilated Disc*9 | L. T Drum, Ventilated Disc*9 | L. T Drum, Ventilated Disc*9 | L. T Drum, Ventilated Disc*9 |
| | Parking Brake Type | | | Drum | Drum | Drum | Drum |
| | Brake Booster Type and Size | | in. | Vacuum, Hydraulic*9 | Vacuum, Hydraulic*9 | Vacuum, Hydraulic*9 | Vacuum, Hydraulic*9 |
| | Proportioning Valve Type | | | LSP & BV, P & B Valve*9 | LSP & BV, P & B Valve*9 | LSP & BV, P & B Valve*9 | LSP & BV, P & B Valve*9, -*16 |
| | Suspension Type | Front | | Double Wishbone | Double Wishbone | Double Wishbone | Double Wishbone |
| | | Rear | | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod |
| | Stabilizer Bar | Front | | Standard | Standard | Standard | Standard |
| | | Rear | | Standard | Standard | Standard | Standard |
| | Steering Gear Type | | | Rack & Pinion | Rack & Pinion | Rack & Pinion | Rack & Pinion |
| | Steering Gear Ratio (Overall) | | | 17.3 | 17.3 | 17.3 | 17.3 |
| | Power Steering Type | | | Integral Type | Integral Type | Integral Type | Integral Type |

*: Unladed Vehicle
*1: With Electrical Winch +50 mm (2.0 in.)
*2: With Roof Rail +40 mm (1.6 in.)
*3: With AHC
*4: With 3rd Seat
*5: Transfer in Low
*6: Transfer in High
*7: Option
*8: With 275 / 70R16 Tire
*9: With ABS
*10: With Back Door-Mounted Spare Tire, Tire Size 235 / 85R16 +295 mm (11.6 in.), Tire Size 275 / 70R16 +305 (12.0 in.), Tire Size 7.50R16 +265 mm (10.4 in.)
*11: With Roof Rack +230 mm (9.1 in.)
*12: With Grille Guard +75 mm (3.0 in.)
*13: With 7.50R16 Tire

| G.C.C. Countries | General Countries | | | | |
|---|---|---|---|---|---|
| Wagon (Lift-Up Back Door) | Wagon (Swing Back Door) VX | Wagon (Swing Back Door) | Wagon (Lift-Up Back Door) | | Wagon (Swing Back Door) |
| VX | STD | GX | | | STD |
| UZJ100L-GNAEKV | FZJ105L–GCMRK | FZJ105L–GCMNK | FZJ105–GNMNK | FZJ105R–GNMNK | HZJ105R–GCMRS |
| 4890 (192.5)*1, *10, *12 | 4890 (192.5)*1, *10 | 4890 (192.5)*1, *10 | 4890 (192.5)*1, *10 | 4890 (192.5)*1, 10 | 4890 (192.5)*1, 10 |
| 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) |
| 860 (73.2)*11, 1850 (72.8)*3, *11 | 1925 (75.8)*2, *11, 1930 (76.0)*2, *11, *13<br>1930 (76.0)*2, *11, *13 | 1925 (75.8)*2, *11, 1920 (75.6)*2, *8, *11,<br>1930 (76.0)*2, *11, *13 | 1925 (75.8)*2, *11, 1920 (75.6)*2, *8, *11,<br>1930 (76.0)*2, *11, *13 | 1925 (75.8)*2, *11, 1920 (75.6)*2, *8, *11,<br>1930 (76.0)*2, *11, *13 | 1925 (75.8)*2, *11, 1930 (76.0)*2, *11, *13 |
| 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) |
| 1620 (63.8) | 1605 (63.2) | 1605 (63.2) | 1605 (63.2) | 1605 (63.2) | 1605 (63.2) |
| 1615 (63.6) | 1600 (63.0) | 1600 (63.0) | 1600 (63.0) | 1600 (63.0) | 1600 (63.0) |
| 2505 (98.6) | 1805 (71.1) | 1805 (71.1) | 1805 (71.1) | 1805 (71.1) | 1805 (71.1) |
| 1620 (63.8) | 1615 (63.6) | 1615 (63.6) | 1615 (63.6) | 1615 (63.6) | 1615 (63.6) |
| 1145 (45.1), 1150 (45.3)*15 | 1180 (46.5) | 1180 (46.5) | 1180 (46.5) | 1180 (46.5) | 1180 (46.5) |
| 335 (13.2) | 1085 (42.7) | 1085 (42.7) | 1085 (42.7) | 1085 (42.7) | 1085 (42.7) |
| — | — | — | — | — | — |
| 995 (39.2) | 1065 (41.9) | 1065 (41.9) | 1065 (41.9) | 1065 (41.9) | 1065 (41.9) |
| 895 (35.2)*1, 12 | 895 (35.2)*1 | 895 (35.2)*1 | 895 (35.2)*1 | 895 (35.2)*1 | 895 (35.2)*1 |
| 1145 (45.1)*10 | 1145 (45.1)*10 | 1145 (45.1)*10 | 1145 (45.1)*10 | 1145 (45.1)*10 | 1145 (45.1)*10 |
| — | — | — | — | — | — |
| — | — | — | — | — | — |
| — | — | — | — | — | — |
| 1250 - 1370 (2756 - 3020) | 1160 - 1250 (2557 - 2756) | 1170 - 1300 (2579 - 2866) | 1165 - 1290 (2568 - 2844) | 1165 - 1285 (2568 - 2833) | 1200 - 1290 (2646 - 2844) |
| 1080 - 1295 (2381 - 2855) | 1090 - 1230 (2403 - 2712) | 1080 - 1240 (2381 - 2739) | 1090 - 1245 (2403 - 2745) | 1090 - 1245 (2403 - 2745) | 1080 - 1220 (2381 - 2690) |
| 2330 - 2665 (5137 - 5875) | 2250 - 2480 (4960 - 5467) | 2250 - 2540 (4960 - 5660) | 2255 - 2535 (4971 - 5589) | 2255 - 2530 (4971 - 5578) | 2280 - 2510 (5027 - 5534) |
| — | — | — | — | — | — |
| — | — | — | — | — | — |
| 3260 (7187) | 3160 (6967) | 3160 (6967) | 3160 (6967) | 3160 (6967) | 3160 (6967) |
| 6 + 45 (21.1 + 9.9) | 95 (20.9), 95 + 50 (20.9 + 11.0)*7 | 95 (20.9), 95 + 50 (20.9 + 11.0)*7 | 95 (20.9), 95 + 50 (20.9 + 11.0)*7 | 95 (20.9), 95 + 50 (20.9 + 11.0)*7 | 95 (20.9), 95 + 50 (20.9 + 11.0)*7 |
| — | — | — | — | — | — |
| 180 (112) | 175 (109) | 175 (109) | 175 (109) | 175 (109) | 155 (96) |
| — | — | — | — | — | — |
| 19 (12)*5, 47 (29)*6 | 16 (10)*5, 39 (24)*6 | 16 (10)*5, 39 (24)*6 | 16 (10)*5, 39 (24)*6 | 16 (10)*5, 39 (24)*6 | 13 (8)*5, 32 (20)*6 |
| 33 (20)*5, 81 (50)*6 | 28 (17)*5, 70 (43)*6 | 28 (17)*5, 70 (43)*6 | 28 (17)*5, 70 (43)*6 | 28 (17)*5, 70 (43)*6 | 25 (16)*5, 60 (37)*6 |
| — | 44 (27)*5, 107 (66)*6 | 44 (27)*5, 107 (66)*6 | 44 (27)*5, 107 (66)*6 | 44 (27)*5, 107 (66)*6 | 40 (25)*5, 97 (60)*6 |
| — | 65 (40)*5, 160 (99)*6 | 65 (40)*5, 160 (99)*6 | 65 (40)*5, 160 (99)*6 | 65 (40)*5, 160 (99)*6 | 57 (35)*5, 140 (87)*6 |
| 5.9 (19.4) | 6.0 (19.7) | 6.0 (19.7) | 6.0 (19.7) | 6.0 (19.7) | 6.0 (19.7) |
| 6.3 (20.7) | 6.4 (21.0) | 6.4 (21.0) | 6.4 (21.0) | 6.4 (21.0) | 6.4 (21.0) |
| 2UZ-FE | 1FZ-FE | 1FZ-FE | 1FZ-FE | 1FZ-FE | 1HZ |
| 32-Valve, DOHC | 24-Valve, DOHC | 24-Valve, DOHC | 24-Valve, DOHC | 24-Valve, DOHC | 12-Valve, OHC |
| 94.0 x 84.0 (3.70 x 3.31) | 100.0 x 95.0 (3.97 x 3.74) | 100.0 x 95.0 (3.97 x 3.74) | 100.0 x 95.0 (3.97 x 3.74) | 100.0 x 95.0 (3.97 x 3.74) | 94.0 x 100.0 (3.70 x 3.94) |
| 4664 (284.5) | 4477 (573.1) | 4477 (573.1) | 4477 (573.1) | 4477 (573.1) | 4164 (254.0) |
| 9.6 : 1 | 9.0 : 1 | 9.0 : 1 | 9.0 : 1 | 9.0 : 1 | 22.4 : 1 |
| EFI | EFI | EFI | EFI | EFI | Distributor Type |
| 91 or higher | 91 or higher | 91 or higher | 91 or higher | 91 or higher | 48 or higher |
| 170 / 4800 (SAE-NET) | 165 / 4600 (SAE-NET) | 165 / 4600 (SAE-NET) | 165 / 4600 (SAE-NET) | 165 / 4600 (SAE-NET) | 96 / 3800 (SAE-NET) |
| 410 / 3400 (SAE-NET) | 387 / 3600 (SAE-NET) | 387 / 3600 (SAE-NET) | 387 / 3600 (SAE-NET) | 387 / 3600 (SAE-NET) | 285 / 2200 (SAE-NET) |
| 12-55 | 12-55 | 12-55 | 12-55 | 12-55 | 12-55, 64*7 |
| 960 | 960 | 960 | 960 | 960 | 840 |
| 1.4 | 1.4, 2.0*7 | 1.4, 2.0*7 | 1.4, 2.0*7 | 1.4, 2.0*7 | 2.5 |
| — | Dry, Single Plate Diaphragm | Dry, Single Plate Diaphragm | Dry, Single Plate Diaphragm | Dry, Single Plate Diaphragm | Dry, Single Plate Diaphragm |
| A750F | H151F | H151F | H151F | H151F | R151F |
| 3.520 | 4.081 | 4.081 | 4.081 | 4.081 | 4.313 |
| 2.042 | 2.294 | 2.294 | 2.294 | 2.294 | 2.330 |
| 1.400 | 1.490 | 1.490 | 1.490 | 1.490 | 1.436 |
| 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 0.716 | 0.881 | 0.881 | 0.881 | 0.881 | 0.838 |
| 3.224 | 4.313 | 4.313 | 4.313 | 4.313 | 4.220 |
| 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 |
| 4.100 / 4.100 | 4.300 / 4.300 | 4.300 / 4.300 | 4.300 / 4.300 | 4.300 / 4.300 | 4.300 / 4.300 |
| 8” / 9.5” | 8” / 9.5” | 8” / 9.5” | 8” / 9.5” | 8” / 9.5” | 8” / 9.5” |
| Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc |
| L. T Drum, Ventilated Disc*9 | L. T Drum, Ventilated Disc*7 | L. T Drum, Ventilated Disc*9 | L. T Drum, Ventilated Disc*9 | L. T Drum, Ventilated Disc*9 | L. T Drum, Ventilated Disc*7 |
| Drum | Drum | Drum | Drum | Drum | Drum |
| Vacuum, Hydraulic*9 | Vacuum | Vacuum, Hydraulic*9 | Vacuum, Hydraulic*9 | Vacuum, Hydraulic*9 | Vacuum |
| LSP & BV, P & B Valve*9, -*16 | LSP & BV | LSP & BV, P & B Valve*9 | LSP & BV, P & B Valve*9 | LSP & BV, P & B Valve*9 | LSP & BV |
| Double Wishbone | Leading Arm, Coil | Leading Arm, Coil | Leading Arm, Coil | Leading Arm, Coil | Leading Arm, Coil |
| 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod |
| Standard | Standard | Standard | Standard | Standard | Standard |
| Standard | Standard | Standard | Standard | Standard | Standard |
| Rack & Pinion | Recerculating Ball | Recerculating Ball | Recerculating Ball | Recerculating Ball | Recerculating Ball |
| 17.3 | 18.59 | 18.59 | 18.59 | 18.59 | 18.59 |
| Integral Type | Integral Type | Integral Type | Integral Type | Integral Type | Integral Type |

*14: With AHC -50 mm (2.0 in.)
*15: With Moon Roof
*16: With VSC
*19: Separate Seat, Seating Capacity : 5

5

| Item / Area | | | | General Countries | | | |
|---|---|---|---|---|---|---|---|
| Body Type | | | | Wagon (Swing Back Door) | | Wagon (Lift-Up Back Door) | Wagon (Swing Back Door) |
| Vehicle Grade | | | | STD | GX | | |
| Model Code | | | | HZJ105L-GCMRS | HZJ105R-GCMNS | HZJ105R-GNMNS | HZJ105L-GCMNS |
| Major Dimensions & Vehicle Weights | Overall | Length | mm (in.) | 4890 (192.5)*1, 10 | 4890 (192.5)*1, 10 | 4890 (192.5)*1, 10 | 4890 (192.5)*1, 10 |
| | | Width | mm (in.) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) |
| | | Height | mm (in.) | 1925 (75.8)*2, *11, 1930 (76.0)*2, *11, *13 | 1925 (75.8)*2, *11, 1920 (75.6)*2, *8, *11, 1930 (76.0)*2, *11, *13 | 1925 (75.8)*2, *11, 1920 (75.6)*2, *8, *11, 1930 (76.0)*2, *11, *13 | 1925 (75.8)*2, *11, 1920 (75.6)*2, *8, *11, 1930 (76.0)*2, *11, *13 |
| | Wheel Base | | mm (in.) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) |
| | Tread | Front | mm (in.) | 1605 (63.2) | 1605 (63.2) | 1605 (63.2) | 1605 (63.2) |
| | | Rear | mm (in.) | 1600 (63.0) | 1600 (63.0) | 1600 (63.0) | 1600 (63.0) |
| | Room | Length | mm (in.) | 1805 (71.1) | 1805 (71.1) | 1805 (71.1) | 1805 (71.1) |
| | | Width | mm (in.) | 1615 (63.6) | 1615 (63.6) | 1615 (63.6) | 1615 (63.6) |
| | | Height | mm (in.) | 1180 (46.5) | 1180 (46.5), 1150 (45.3)*15 | 1180 (46.5), 1150 (45.3)*15 | 1180 (46.5), 1150 (45.3)*15 |
| | Cargo Space | Length | mm (in.) | 1085 (42.7) | 1085 (42.7) | 1085 (42.7) | 1085 (42.7) |
| | | Width | mm (in.) | - | — | — | — |
| | | Height | mm (in.) | 1065 (41.9) | 1065 (41.9) | 1065 (41.9) | 1065 (41.9) |
| | Overhang | Front | mm (in.) | 895 (35.2)*1 | 895 (35.2)*1 | 859 (35.2)*1 | 859 (35.2)*1 |
| | | Rear | mm (in.) | 1145 (45.1)*10 | 1145 (45.1)*10 | 1145 (45.1)*10 | 1145 (45.1)*10 |
| | Min. Running Ground Clearance | | mm (in.) | — | — | — | — |
| | Angle of Approach | | degrees | — | — | — | — |
| | Angle of Departure | | degrees | — | — | — | — |
| | Curb Weight*19 | Front | kg (lb) | 1200 - 1300 (2646 - 2866) | 1210 - 1340 (2668 - 2954) | 1205 - 1330 ( 2657 - 2932) | 1210 - 1340 (2668 - 2954) |
| | | Rear | kg (lb) | 1080 - 1220 (2381 - 2690) | 1090 - 1245 (2403 - 2745) | 1100 - 1250 (2425 - 2756) | 1090 - 1250 (2403 - 2756) |
| | | Total | kg (lb) | 2280 - 2520 (5027 - 5556) | 2300 - 2585 (5071 - 5699) | 2305 - 2580 (5082 - 5688) | 2300 - 2590 (5071 - 5710) |
| | Gross Vehicle Weight | Front | kg (lb) | — | — | — | — |
| | | Rear | kg (lb) | — | — | — | — |
| | | Total | kg (lb) | 3160 (6967) | 3160 (6967) | 3160 (6967) | 3160 (6967) |
| | Fuel Tank Capacity | | ℓ(Imp.gal.) | 95 (20.9), 95 + 50 (20.9 + 11.0)*7 | 95 (20.9), 95 + 50 (20.9 + 11.0)*7 | 95 (20.9), 95 + 50 (20.9 + 11.0)*7 | 95 (20.9), 95 + 50 (20.9 + 11.0)*7 |
| | Luggage Compartment Capacity | | $m^3$ (cu.ft.) | — | — | — | — |
| Performance | Max. Speed | | km / h (mph) | 155 (96) | 155 (96) | 155 (96) | 155 (96) |
| | Max. Cruising Speed | | km / h (mph) | — | — | — | — |
| | Max. Permissible Speed | 1st Gear | km / h (mph) | 13 (8)*5, 32 (20)*6 | 13 (8)*5, 32 (20)*6 | 13 (8)*5, 32 (20)*6 | 13 (8)*5, 32 (20)*6 |
| | | 2nd Gear | km / h (mph) | 25 (16)*5, 60 (37)*6 | 25 (16)*5, 60 (37)*6 | 25 (16)*5, 60 (37)*6 | 25 (16)*5, 60 (37)*6 |
| | | 3rd Gear | km / h (mph) | 40 (25)*5, 97 (60)*6 | 40 (25)*5, 97 (60)*6 | 40 (25)*5, 97 (60)*6 | 40 (25)*5, 97 (60)*6 |
| | | 4th Gear | km / h (mph) | 57 (35)*5, 140 (87)*6 | 57 (35)*5, 140 (87)*6 | 57 (35)*5, 140 (87)*6 | 57 (35)*5, 140 (87)*6 |
| | Min. Turning Radius | Tire | m (ft.) | 6.0 (19.7) | 6.0 (19.7) | 6.0 (19.7) | 6.0 (19.7) |
| | | Body | m (ft.) | 6.4 (21.0) | 6.4 (21.0) | 6.4 (21.0) | 6.4 (21.0) |
| Engine | Engine Type | | | 1HZ | 1HZ | 1HZ | 1HZ |
| | Valve Mechanism | | | 12-Valve, OHC | 12-Valve, OHC | 12-Valve, OHC | 12-Valve, OHC |
| | Bore x Stroke | | mm (in.) | 94.0 x 100.0 (3.70 x 3.94) | 94.0 x 100.0 (3.70 x 3.94) | 94.0 x 100.0 (3.70 x 3.94) | 94.0 x 100.0 (3.70 x 3.94) |
| | Displacement | | $cm^3$ (cu.in.) | 4164 (254.0) | 4164 (254.0) | 4164 (254.0) | 4164 (254.0) |
| | Compression Ratio | | | 22.4 : 1 | 22.4 : 1 | 22.4 : 1 | 22.4 : 1 |
| | Fuel System | | | Distributor Type | Distributor Type | Distributor Type | Distributor Type |
| | Research Octane No. or Cetane No. (Diesel) | | | 48 or higher | 48 or higher | 48 or higher | 48 or higher |
| | Max. Output | | kW/rpm | 96 / 3800 (SAE-NET) | 96 / 3800 (SAE-NET) | 96 / 3800 (SAE-NET) | 96 / 3800 (SAE-NET) |
| | Max. Torque | | N·m / rpm | 285 / 2200 (SAE-NET) | 285 / 2200 (SAE-NET) | 285 / 2200 (SAE-NET) | 285 / 2200 (SAE-NET) |
| Engine Electrical | Battery Capacity (5HR) | | Voltage & Amp. hr. | 12-55, 64*7, 64 x 2*7 | 12-55, 64*7 | 12-55, 64*7 | 12-55, 64*7, 64 x 2*7 |
| | Alternator Output | | Watts | 84, 960*7 | 840 | 840 | 840, 960*7 |
| | Starter Output | | kW | 2.5, 3.0*7 | 2.5 | 2.5 | 2.5, 3.0*7 |
| Chassis | Clutch Type | | | Dry, Single Plate Diaphragm | Dry, Single Plate Diaphragm | Dry, Single Plate Diaphragm | Dry, Single Plate Diaphragm |
| | Transmission Type | | | R151F | R151F | R151F | R151F |
| | Transmission Gear Ratio | In First | | 4.313 | 4.313 | 4.313 | 4.313 |
| | | In Second | | 2.330 | 2.330 | 2.330 | 2.330 |
| | | In Third | | 1.436 | 1.436 | 1.436 | 1.436 |
| | | In Fourth | | 1.000 | 1.000 | 1.000 | 1.000 |
| | | In Fifth | | 0.838 | 0.838 | 0.838 | 0.838 |
| | | In Reverse | | 4.220 | 4.220 | 4.220 | 4.220 |
| | Transfer Gear Ratio H4 / L4 | | | 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 |
| | Differential Gear Ratio (Front / Rear) | | | 4.300 / 4.300 | 4.300 / 4.300 | 4.300 / 4.300 | 4.300 / 4.300 |
| | Differential Gear Size (Front / Rear) | | in. | 8" / 9.5" | 8" / 9.5" | 8" / 9.5" | 8" / 9.5" |
| | Brake Type | Front | | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc |
| | | Rear | | L. T Drum, Ventilated Disc*9 | L. T Drum, Ventilated Disc*9 | L. T Drum, Ventilated Disc*9 | L. T Drum, Ventilated Disc*9 |
| | Parking Brake Type | | | Drum | Drum | Drum | Drum |
| | Brake Booster Type and Size | | in. | Vacuum, Hydraulic*9 | Vacuum, Hydraulic*9 | Vacuum, Hydraulic*9 | Vacuum, Hydraulic*9 |
| | Proportioning Valve Type | | | LSP & BV, P & B Valve*9 | LSP & BV, P & B Valve*9 | LSP & BV, P & B Valve*9 | LSP & BV, P & B Valve*9 |
| | Suspension Type | Front | | Leading Arm, Coil | Leading Arm, Coil | Leading Arm, Coil | Leading Arm, Coil |
| | | Rear | | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod |
| | Stabilizer Bar | Front | | Standard | Standard | Standard | Standard |
| | | Rear | | Standard | Standard | Standard | Standard |
| | Steering Gear Type | | | Recerculating Ball | Recerculating Ball | Recerculating Ball | Recerculating Ball |
| | Steering Gear Ratio (Overall) | | | 18.59 | 18.59 | 18.59 | 18.59 |
| | Power Steering Type | | | Integral Type | Integral Type | Integral Type | Integral Type |

*: Unladed Vehicle
*1: With Electrical Winch +50 mm (2.0 in.)
*2: With Roof Rail +40 mm (1.6 in.)
*3: With AHC
*4: With 3rd Seat
*5: Transfer in Low
*6: Transfer in High
*7: Option
*8: With 275 / 70R16 Tire
*9: With ABS
*10: With Back Door-Mounted Spare Tire, Tire Size 235 / 85R16 +295 mm (11.6 in.), Tire Size 275 / 70R16 +305 (12.0 in.), Tire Size 7.50R16 +265 mm (10.4 in.)
*11: With Roof Rack +230 mm (9.1 in.)
*12: With Grille Guard +75 mm (3.0 in.)
*13: With 7.50R16 Tire

| | General Countries | | | | | |
|---|---|---|---|---|---|---|
| | Wagon (Lift-Up Back Door) | Wagon (Lift-Up Back Door) | | Wagon (Swing Back Door) | Wagon (Lift-Up Back Door) | |
| | GX | VX | | | | |
| | HZJ105L-GNMNS | UZJ100L-GNAEK | HDJ100R-GNMEZ | HDJ100L-GOMEZ | HDJ100L-GNMEZ | HDJ100L-GNAEZ |
| 5 | 4890 (192.5)*1, 10 | 4890 (192.5)*1, 10, 12 | 4890 (192.5)*1, 10, 12 | 4890 (192.5)*1, 10, 12 | 4890 (192.5)*1, 10, 12 | 4890 (192.5)*1, 10, 12 |
| | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) |
| | 1925 (75.8)*2, *11, 1920 (75.6)*2, *8, *11, 1930 (76.0)*2, *11, *13 | 1920 (75.6)*2, *11, *14 1900 (74.8)*2, *8, *11, *14 | 1920 (75.6)*2, *11, *14 1900 (74.8)*2, *8, *11, *14 | 1920 (75.6)*2, *11, 1900 (4.8)*2, *8, *11 | 1920 (75.6)*2, 11, 1900 (4.8)*2, 8, 11 | 1920 (75.6)*2, *11, 1900 (4.8)*2, *8, *11 |
| | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) |
| | 1605 (63.2) | 1640 (64.6), 1620 (63.8)*8 | 1640 (64.6), 1620 (63.8)*8 | 1640 (64.6), 1620 (63.8)*8 | 1640 (64.6), 1620 (63.8)*8 | 1640 (64.6), 1620 (63.8)*8 |
| 10 | 1600 (63.0) | 1635 (64.4), 1615 (63.6)*8 | 1635 (64.4), 1615 (63.6)*8 | 1635 (64.4), 1615 (63.6)*8 | 1635 (64.4), 1615 (63.6)*8 | 1635 (64.4), 1615 (63.6)*8 |
| | 1805 (71.1) | 2505 (98.6)*4 | 2505 (98.6)*4 | 2505 (98.6)*4 | 2505 (98.6)*4 | 2505 (98.6)*4 |
| | 1615 (63.6) | 1620 (63.8)*4 | 1620 (63.8)*4 | 1620 (63.8)*4 | 1620 (63.8)*4 | 1620 (63.8)*4 |
| | 1180 (46.5), 1150 (45.3)*15 | 1145 (45.1), 1150 (45.3)*4 | 1145 (45.1), 1150 (45.3)*4 | 1145 (45.1), 1150 (45.3)*4 | 1145 (45.1), 1150 (45.3)*4 | 1145 (45.1), 1150 (45.3)*4 |
| | 1085 (42.7) | 335 (13.1)*4 | 335 (13.1)*4 | 335 (13.1)*4 | 335 (13.1)*4 | 335 (13.1)*4 |
| 15 | — | — | — | — | — | — |
| | 1065 (41.9) | 995 (39.2)*4 | 995 (39.2)*4 | 995 (39.2)*4 | 995 (39.2)*4 | 995 (39.2)*4 |
| | 895 (35.2)*1 | 895 (35.2)*1, 12 | 895 (35.2)*1, 12 | 895 (35.2)*1, 12 | 895 (35.2)*1, 12 | 895 (35.2)*1, 12 |
| | 1145 (45.1)*10 | 1145 (45.1)*10 | 1145 (45.1)*10 | 1145 (45.1)*10 | 1145 (45.1)*10 | 1145 (45.1)*10 |
| | — | — | — | — | — | — |
| 20 | — | — | — | — | — | — |
| | — | — | — | — | — | — |
| | 1205 - 1330 (2657 - 2932) | 1220 - 1385 (2690 - 3053) | 1280 - 1425 (2822 - 3142)*21 | 1280 - 1375 (2822 - 3031) | 1280 - 1425 (2822 - 3142) | 1320 - 1435 (2910 - 3164) |
| | 1100 - 1255 (2425 - 2767) | 1110 - 1280 (2447 - 2822) | 1120 - 1305 (2469 - 2877)*21 | 1150 - 1280 (2535 - 2822) | 1120 - 1305 (2469 - 2877) | 1120 - 1310 (2469 - 2888) |
| | 2305 - 2585 (5082 - 5699) | 2330 - 2665 (5137 - 5875) | 2400 - 2730 (5291 - 6019)*21 | 2430 - 2655 (5357 - 5853) | 2400 - 2730 (5291 - 6019) | 2440 - 2745 (5379 - 6052) |
| 25 | | | | | | |
| | | | | | | |
| | 3160 (6967) | 3260 (7187) | 3260 (7187) | 3260 (7187) | 3260 (7187) | 3260 (7187) |
| | 95 (20.9), 95 + 50 (20.9 + 11.0)*7 | 96 + 45 (21.1 + 9.9) | 96 (21.1), 96 + 45 (21.1 + 9.9)*7 | 96 (21.1), 96 + 45 (21.1 + 9.9)*7 | 96 (21.1), 96 + 45 (21.1 + 9.9)*7 | 96 (21.1), 96 + 45 (21.1 + 9.9)*7 |
| | — | — | — | — | — | — |
| 30 | 155 (96) | 180 (112) | 175 (109) | 175 (109) | 175 (109) | 180 (112) |
| | — | — | — | — | — | — |
| | 13 (8)*5, 32 (20)*6 | 19 (12)*5, 47 (29)*6 | 14 (19)*5, 35 (22)*6 | 14 (19)*5, 35 (22)*6 | 14 (19)*5, 35 (22)*6 | 14 (19)*5, 35 (22)*6 |
| | 25 (16)*5, 60 (37)*6 | 33 (20)*5, 81 (50)*6 | 26 (16)*5, 63 (39)*6 | 26 (16)*5, 63 (39)*6 | 26 (16)*5, 63 (39)*6 | 26 (16)*5, 63 (39)*6 |
| | 40 (25)*5, 97 (60)*6 | — | 39 (24)*5, 97 (60)*6 | 39 (24)*5, 97 (60)*6 | 39 (24)*5, 97 (60)*6 | 39 (24)*5, 97 (60)*6 |
| 35 | 57 (35)*5, 140 (87)*6 | — | 59 (37)*5, 144 (89)*6 | 59 (37)*5, 144 (89)*6 | 59 (37)*5, 144 (89)*6 | 59 (37)*5, 144 (89)*6 |
| | 6.0 (19.7) | 5.9 (19.4) | 5.9 (19.4) | 5.9 (19.4) | 5.9 (19.4) | 5.9 (19.4) |
| | 6.4 (21.0) | 6.3 (20.7) | 6.3 (20.7) | 6.3 (20.7) | 6.3 (20.7) | 6.3 (20.7) |
| | 1HZ | 2UZ-FE | 1HD-FTE | 1HD-FTE | 1HD-FTE | 1HD-FTE |
| | 12-Valve, OHC | 32-Valve, DOHC | 24-Valve, OHC | 24-Valve, OHC | 24-Valve, OHC | 24-Valve, OHC |
| 40 | 94.0 x 100.0 (3.70 x 3.94) | 94.0 x 84.0 (3.70 x 3.31) | 94.0 x 100.0 (3.70 x 3.94) | 94.0 x 100.0 (3.70 x 3.94) | 94.0 x 100.0 (3.70 x 3.94) | 94.0 x 100.0 (3.70 x 3.94) |
| | 4164 (254.0) | 4664 (284.5) | 4164 (254.0) | 4164 (254.0) | 4164 (254.0) | 4164 (254.0) |
| | 22.4 : 1 | 9.6 : 1 | 18.8 : 1 | 18.8 : 1 | 18.8 : 1 | 18.8 : 1 |
| | Distributor Type | EFI | Distributor Type | Distributor Type | Distributor Type | Distributor Type |
| | 48 or higher | 91 or higher | 48 or higher | 48 or higher | 48 or higher | 48 or higher |
| 45 | 96 / 3800 (SAE-NET) | 170 / 4800 (SAE-NET) | 150 / 3400 (EEC) | 150 / 3400 (EEC) | 150 / 3400 (EEC) | 150 / 3400 (EEC) |
| | 285 / 2200 (SAE-NET) | 410 / 3400 (SAE-NET) | 430 / 1400 - 3200 (EEC) | 430 / 1400 - 3200 (EEC) | 430 / 1400 - 3200 (EEC) | 430 / 1400 - 3200 (EEC) |
| | 12-55, 64*7, 64 x 2*7 | 12-55 | 12-55 x 2 | 12-55 x 2 | 12-55 x 2 | 12-55 x 2 |
| | 840, 960*7 | 960 | 840, 960*7 | 960 | 840, 960*7 | 960 |
| | 2.5 | 1.4 | 3.0 | 3.0 | 3.0 | 3.0 |
| 50 | Dry, Single Plate Diaphragm | — | Dry, Single Plate Diaphragm | Dry, Single Plate Diaphragm | Dry, Single Plate Diaphragm | — |
| | R151F | A750F | H151F | H151F | H151F | A750F |
| | 4.313 | 3.520 | 4.081 | 4.081 | 4.081 | 3.520 |
| | 2.330 | 2.042 | 2.294 | 2.294 | 2.294 | 2.042 |
| | 1.436 | 1.400 | 1.490 | 1.490 | 1.490 | 1.400 |
| 55 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| | 0.838 | 0.716 | 0.881 | 0.881 | 0.881 | 0.716 |
| | 4.220 | 3.224 | 4.313 | 4.313 | 4.313 | 3.224 |
| | 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 | 1.000 / 2.488 |
| | 4.300 / 4.300 | 4.100 / 4.100 | 4.100 / 4.100 | 4.100 / 4.100 | 4.100 / 4.100 | 3.909 / 3.909 |
| 60 | 8” / 9.5” | 8” / 9.5” | 8” / 9.5” | 8” / 9.5” | 8” / 9.5” | 8” / 9.5” |
| | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc |
| | L. T Drum | L. T Drum, Ventilated Disc*9 | L. T Drum, Ventilated Disc*9 | L. T Drum, Ventilated Disc*9 | L. T Drum, Ventilated Disc*9 | L. T Drum, Ventilated Disc*9 |
| | Drum | Drum | Drum | Drum | Drum | Drum |
| | Vacuum, Hydraulic*9 | Vacuum, Hydraulic*9 | Vacuum, Hydraulic*9 | Vacuum, Hydraulic*9 | Vacuum, Hydraulic*9 | Vacuum, Hydraulic*9 |
| 65 | LSP & BV, P & B Valve*9 | LSP & BV, P & B Valve*9, -*16 | LSP & BV, P & B Valve*9 | LSP & BV, P & B Valve*9 | LSP & BV, P & B Valve*9 | LSP & BV, P & B Valve*9 |
| | Leading Arm, Coil | Double Wishbone | Double Wishbone | Double Wishbone | Double Wishbone | Double Wishbone |
| | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod |
| | Standard | Standard | Standard | Standard | Standard | Standard |
| | Standard | Standard | Standard | Standard | Standard | Standard |
| 70 | Recerculating Ball | Rack & Pinion | Rack & Pinion | Rack & Pinion | Rack & Pinion | Rack & Pinion |
| | 18.59 | 17.3 | 17.3 | 17.3 | 17.3 | 17.3 |
| | Integral Type | Integral Type | Integral Type | Integral Type | Integral Type | Integral Type |

*14: With AHC -50 mm (2.0 in.)
*15: With Moon Roof
*16: With VSC
*19: Separate Seat, Seating Capacity : 5
*21: Bench Seat, Seating Capacity : 10

5

– MEMO –

## ■BRAKE CONTROL SYSTEM (ABS with EBD, Brake Assist, A-TRC and VSC System)

- The conditions for detecting malfunctions in the speed sensor have been added to realize an excellent malfunction detection performance.
- The TS terminal, which was located at the DLC1 and DLC3 connectors to enable the brake control system to check the speed sensors, has been discontinued. Therefore, use a hand-held tester to check the speeds sensors.

### ▶ Speed Sensor Malfunction Detection Conditions ◀

: New

| DTC No. | DTC Detecting Condition |
|---|---|
| C0200 / 31<br>C0205 / 32<br>C0210 / 33<br>C0215 / 34 | Detection of any of conditions 1. through 4.:<br>1. At vehicle speed of 10km/h(6 mph) or more, pulses are not input for 15 sec.<br>2. Momentary interruption of the speed sensor signal occurs at least 7 times in the time between switching it OFF.<br>3. Continuous noise occurs into the speed sensor signals with the vehicle speed at 20 km/h (12 mph) or more.<br>4. The condition that the speed sensor signal circuit is open continues for 0.12 sec. Or more. |
| | 5. ABS inactive.<br>6. Brake pedal released.<br>7. Parking brake lever disengaged.<br>8. Rear differential unlocked. |

# NEW FEATURES

## ■ALL ENGINES

### Cooling System

The TOYOTA genuine Super Long Life Coolant (SLLC) has been adopted. As result, the maintenance interval has been extended. The following chart for all engine model.

**▶ Specifications for Europe ◀**

<table>
<tr><th colspan="6">Model</th><th>New</th><th>Previous</th></tr>
<tr><td rowspan="11">Engine Coolant</td><td rowspan="8">Capacity<br>Liters<br>(US qts,<br>Imp. qts)</td><td rowspan="2">2UZ-FE Engine</td><td>Automatic Transmission</td><td>Without Rear Heater</td><td>14.8 (15.6, 13.0)</td><td>←</td></tr>
<tr><td>With Rear Heater</td><td>15.3 (16.2, 13.5)</td><td>←</td></tr>
<tr><td rowspan="6">1HD-FTE Engine</td><td rowspan="3">Manual Transmission</td><td>Without Rear and power Heater</td><td>13.2 (14.0, 11.6)</td><td>←</td></tr>
<tr><td>Rear Heater</td><td>13.7 (14.5, 12.1)</td><td>←</td></tr>
<tr><td>Power Heater</td><td>14.2 (15.0, 12.6)</td><td>←</td></tr>
<tr><td rowspan="3">Automatic Transmission</td><td>Without Rear and power Heater</td><td>12.8 (13.5, 11.3)</td><td>←</td></tr>
<tr><td>Rear Heater</td><td>13.3 (14.1, 12.1)</td><td>←</td></tr>
<tr><td>Power Heater</td><td>13.8 (14.6, 12.2)</td><td>←</td></tr>
<tr><td colspan="5">Type</td><td>TOYOTA Genuine (SLLC)</td><td>TOYOTA Genuine (LLC)</td></tr>
<tr><td colspan="5">Color</td><td>Pink</td><td>Red</td></tr>
<tr><td rowspan="2">Maintenance Intervals</td><td colspan="4">First time</td><td>160,000 km (100,000 mile)</td><td>60,000km (37,500 mile)</td></tr>
<tr><td colspan="4">Subsequent</td><td>Every 80,000 km (50,000 mile)</td><td>Every 30,000km (18,000 mile)</td></tr>
</table>

- SLLC is pre-mixed (50% coolant and 50% distilled water), so no dilution is needed when adding or replacing SLLC in the vehicle.
- If LLC is mixed with SLLC, the interval for LLC (every 30,000 km / 18,000 mile or 24 months) should be used.
- You can also apply the new maintenance interval (every 80,000 km / 50,000 mile) to vehicles initially filled with LLC (red-colored), if you use SLLC (pink-colored) for the coolant change.

**▶ Australia, G.C.C. and General countries Specifications ◀**

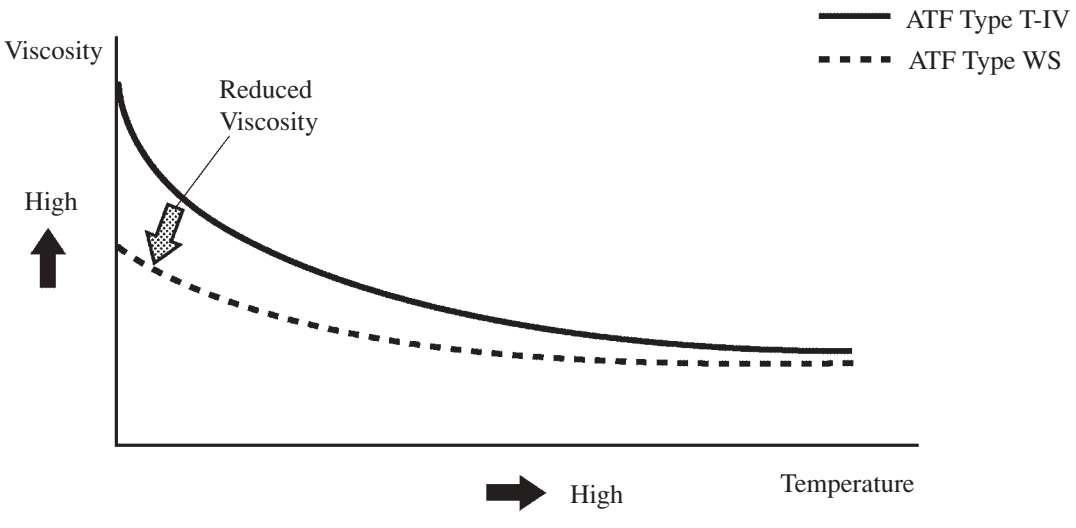
| Model | | | | | | New | Previous |
|---|---|---|---|---|---|---|---|
| Engine Coolant | Capacity Liters (US pts, Imp. qts) | 2UZ-FE Engine | Manual Transmission | Without Rear Heater | | 15.2 (16.1,13.4) | ← |
| | | | | With Rear Heater | | 15.7 (16.6, 13.8) | ← |
| | | | Automatic Transmission | Without Rear Heater | | 14.8 (15.6, 13.0) | ← |
| | | | | With Rear Heater | | 15.3 (16.2, 13.5) | ← |
| | | 1FZ-FE Engine | Manual Transmission | G.C.C countries | | 13.9 (14.7, 12.2) | ← |
| | | | | Other | Without Rear Heater | 13.8 (14.7, 12.3) | ← |
| | | | | | With Rear Heater | 14.3 (15.1, 12.6) | ← |
| | | | Automatic Transmission | | | 14.0 | ← |
| | | 1HD-FTE Engine | Manual Transmission | Without Rear and power Heater | | 13.2 (14.0, 11.6) | ← |
| | | | | Rear Heater | | 13.7 (14.5, 12.1) | ← |
| | | | Automatic Transmission | Without Rear and power Heater | | 12.8 (13.5, 11.3) | ← |
| | | | | Rear Heater | | 13.3 (14.1, 12.1) | ← |
| | | 1HZ Engine | Manual Transmission | Without Rear Heater | | 12.9 | ← |
| | | | | With Rear Heater | | 13.4 | ← |
| | | | Automatic Transmission | | | — | ← |
| | Type | | | | | TOYOTA Genuine (SLLC) | TOYOTA Genuine (LLC) |
| | Color | | | | | Pink | Red |
| | Maintenance Intervals | | | First time | | 160,000 km (100,000 mile) | Every 40,000km (25,000 mile) or 24 months Whichever come first |
| | | | | Subsequent | | Every 80,000 km (50,000 mile) | |

- SLLC is pre-mixed (50% coolant and 50% distilled water), so no dilution is needed when adding or replacing SLLC in the vehicle.
- If LLC is mixed with SLLC, the interval for LLC (every 40,000 km / 25,000 mile or 24 months) should be used.
- You can also apply the new maintenance interval (every 80,000 km / 50,000 mile) to vehicles initially filled with LLC (red-colored), if you use SLLC (pink-colored) for the coolant change.

## ■A750F AUTOMATIC TRANSMISSION

### 1. ATF WS

- The T-IV type ATF (Automatic Transmission Fluid) of the A750F automatic transmission on the previous Land Cruiser has been changed to the WS type on the new Land Cruiser. The reduced viscosity in the practical operating temperature range of the ATF WS enables to reduce drag loss and improve fuel economy.
- The ATF WS is not interchangeable with other types of ATF (ATF type T-IV, or D-II).




**Service Tip**

If a vehicle with a transmission filled with ATF WS is replenished with other type of ATF, the vehicle might not start off at extremely low temperatures. However, it will start off after it has been warmed up for a few minutes.

## 2. ATF Filling Procedures

- The ATF level gauge (dip-stick) has been discontinued, and the ATF inspection method and the oil level inspection method have been changed.
- This mechanism consists of a refill plug, overflow plug, ATF temperature sensor No.2, and A/T OIL TEMP warning light.

**Service Tip**

**ATF Filling procedures using SST (09843-18020):**
When a large amount of ATF needs to be filled (i. e. after removal and installation of oil pan or torque converter), perform the procedure from step 1. When the small amount of ATF is required (i. e. removal and installation of the oil cooler tube, repair of oil leak), perform the procedure from step 7.
1) Raise the vehicle keeping it level.
2) Remove the refill plug and overflow plug.
3) Fill ATF from the refill plug until it overflows from the overflow plug.
4) Install the overflow plug.
5) Fill the specified amount of ATF determined by procedure and install the refill plug.
   - Example

| Procedure | Amount Liters (US qts, Imp.qts) |
|---|---|
| Removal and installation of an oil pan (including oil drainage) | 1.7 (1.80, 1.50) |
| Removal and installation of a transmission valve body | 4.3 (4.54, 3,78) |
| Replacement of a torque converter | 5.4 (5.70, 4.75) |

6) Lower the vehicle down.
7) Use the SST (09843-18020) to short the terminals Tc and CG of the DLC3 connector:
8) Start the engine and allow it to idle.
   - A/C switch must be turned OFF.
9) Move the shift lever slowly through each of the positions from the P to the L position, and move it back to the P position.
10) Move the shift lever from the D position, and quickly move then back and forth between N and D (once per less than 1.5 seconds) for at least six seconds. This will activate the oil temperature detection mode.

**Standard:** The A/T OIL TEMP warning light remains illuminated for 2 seconds and it goes off.
11) Return the shift lever to the P position and disconnect the terminal Tc.
12) Idle the engine to raise the oil temperature.
13) Immediately after the ATF OIL TEMP warning light turns on, lift the vehicle up.
   - The A/T OIL TEMP warning light will indicate the ATF temperature according to the following table. (Insert table here)

| ATF Temp. | Below proper ATF temperature | Proper ATF temperature | More than proper ATF temperature |
|---|---|---|---|
| A/T OIL TEMP Warning light | Turn OFF | Turn ON | Blinking |

14) Remove the overflow plug and adjust oil quantity.
   - If the ATF overflows, go to step 17, and if the ATF does not overflow, go to step 15.
15) Remove the refill plug.
16) Fill ATF to the refill plug until it flows out from the overflow plug.
17) When the ATF flow slows to a trickle, install the overflow plug.
18) Install the refill plug (only if the refill plug has been removed).
19) Lower the vehicle down.
20) Turn the ignition switch OFF to stop the engine.

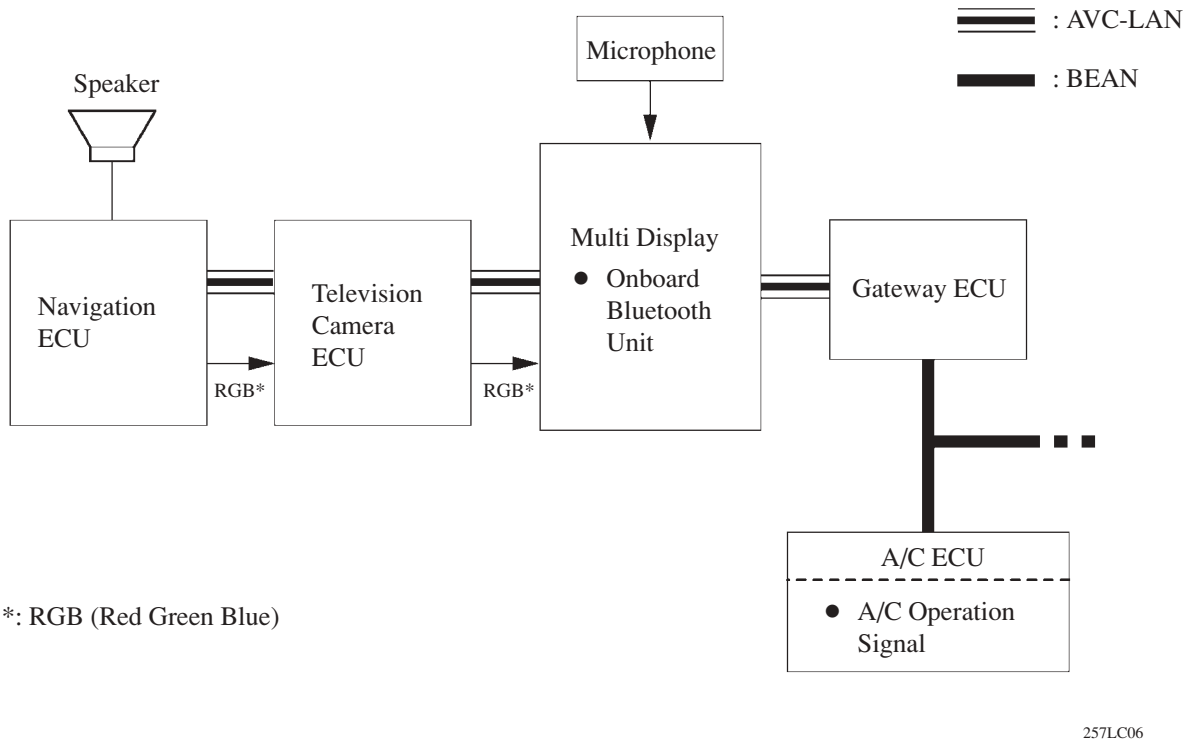
For details about the ATF Filling procedures, see the Land Cruiser Repair Manual (Pub. No. RM1072E)

## ■MULTI DISPLAY

### 1. General

- The design of the screen has been improved in the navigation system in order to improve its visibility. Furthermore, new functions have been added for improved convenience.
- On the Europe model, a voice recognition function has been adopted in the multi display to enable the user to turn the air conditioner ON/OFF and set its temperature.
  This function recognizes voice commands in English and German.

**▶ System Diagram ◀**

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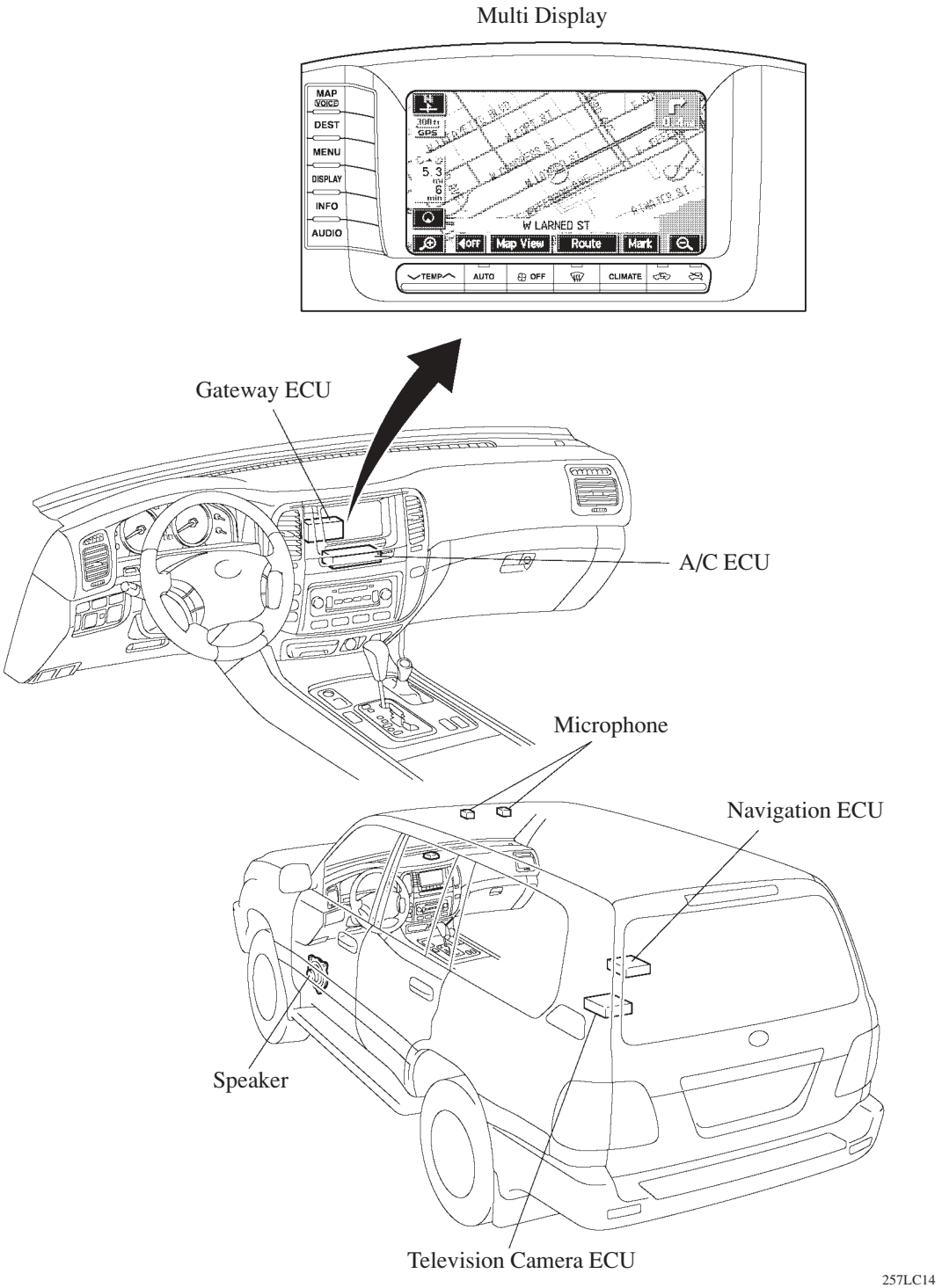
## 2. Layout of Main Components

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## 3. Navigation System

The new Land Cruiser has the GPS voice navigation system functions listed below

:New function

| Item | | Function |
|---|---|---|
| Map Display | Linear Touch Scroll | Enables smooth scrolling by connecting the touch points on the screen. |
| | On-route Scroll | Scrolls the center of the cursor forward and reverse constantly along the route. |
| | Heading Up | Displays the map so that the direction of the route progression head up during route guidance. |
| | Map Color Change | Depending on the position of the headlight switch, the screen changes to the day mode or night mode. |
| | Front Wide | Displays a map in the direction of travel of the vehicle in an enlarged form. (Heading up only) |
| | Multi-step Scale Display | Changes and displays the map scale in 13 stages. |
| | Step-less Scale Display | Changes the scale of the map to the desired scale without the basic 13 steps. |
| | Direct Scale Change | Directly selects and displays the map scale. |
| | Split-view Display | Displays different modes on a screen that is split into two views. |
| | Points-of-Interest Display | Displays selected types of marks on the map. |
| | Road Number Sign Board Display | Displays the road number on the map. |
| | Compass Mode Screen | Displays the direction of travel and detailed data of the present location. |
| | RDS-TMC info. Indication (for Europe model) | Receives FM multiplex broadcasts and displays traffic information on the map screen. |
| | Map Coverage info Screen | Displays the map area that is recorded on DVD. |
| | Whole Route Function (except for Australia model) | Changes the display scale of the map screen and displays the whole route. |
| | Street Name Indication on Scrolled Map | Displays the street name and the city name even when the map screen is being scrolled. |
| Destination Search | Last Destination Memory | Stores 20 locations of coordinates, names and times that have been set as destinations in the past. |
| | Hybrid Points-of-interest Search | Narrows the search by names of the points-of-interest, category, and areas. |
| | Points-of-interest Pinpoint Display | Pinpoints and displays the position of the point-of-interest. |
| | House Number Search | Searches for a house number. |
| | Special Memory Point | Sets a pre-registered point as a destination point while driving. |
| | Nearest Point-of-interest Search List Display | Searches nearest points-of-interest and displays a list. |
| | Intersection Search | By specifying two streets, the point at which they intersect is set as the destination point. (only for the intersections of trunk roads) |
| | Motorway Entrance / Exit Search | Searches for the destination by the name of the street that connects to a Motorway entrance / exit. |
| | Coordinate Search | User can input destination like a oasis in the desert etc. |
| | Telephone Number Search (except for Australia model) | Searches a facility by its telephone number. |
| | POI, Brand Icon Indication (except for Australia model) | Displays icons for points of interest. |

(Continued)

| Item | | Function |
|---|---|---|
| Route Search | Multiple Destination Setting | Sets multiple destinations. It can also rearrange the sequence of the destinations. |
| | Route Search | Searches for multiple routes. |
| | Search Condition Designation | Searches for the recommended, shortest, and other routes. |
| | Regulated Road Consideration | Performs search while considering regulated roads. |
| | Avoidance Area | Avoids a designated area and searches a route. |
| | Route Search Considering Traffic info. (for Europe model) | Searches for a route that detours traffic congestion. |
| | Motorway Mode Screen (except for Australia model) | Displays information on facilities in the vicinity of the motorway exits and entrances. |
| | Border Guidance (except for Australia model) | Displays a border mark when crossing a border. |
| Guidance | Destination Direction Arrow Display | Uses arrows along the road to display the direction of the destination during route guidance. |
| | Off-Route Arrow Display | Uses arrows to display the direction of the destination during off-route. |
| | Roundabout Guidance | Guidance that renders the entry and exit into a rotary as a single branching point. |
| | Right or Left Turn Guidance | Voice guidance to instruct the direction of travel to be taken. |
| | Motorway Direction of Travel Guidance | Voice guidance to instruct the direction of travel to take on the Motorway. |
| | Distance DisplayDestination | Displays the distance from the present location to the destination. |
| | Motorway Branch Type Specimen Guidance (except for Australia model) | Type specimen for guidance to a Motorway branch. |
| | Intersection Map Display | Intersection map appears approaching an intersection. |
| | Turn List Display | Displays a turn list on the right side of the two-screen display. |
| | Calendar | Anniversary or appointment dates can be input and displayed. |

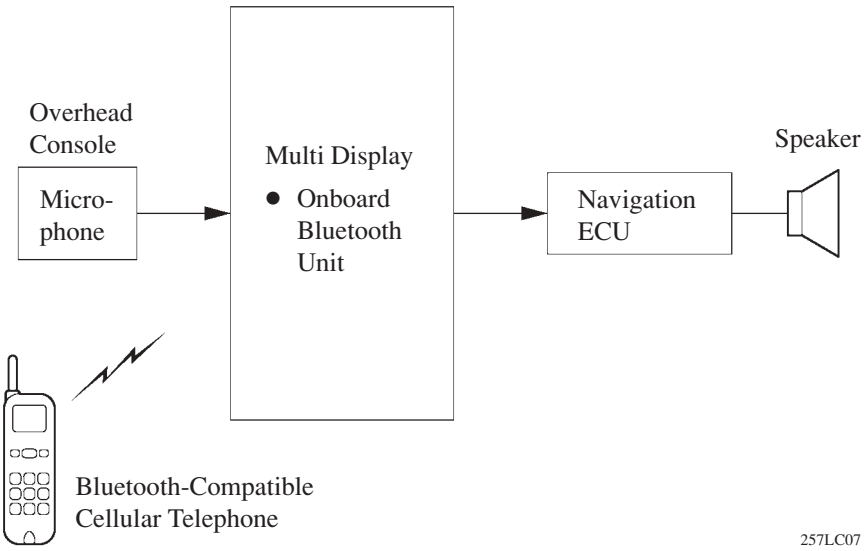
## 4. Bluetooth Hands Free System

### General

Bluetooth is a short-distance, high-speed wireless data communication system that uses the 2.4 GHz frequency band prescribed by the Bluetooth SIG (Special Interest Group).
Through the use of the Bluetooth communication protocol, various computer and communication devices can exchange wireless audio or data communication without relying on any cables.

- On the new Land Cruiser, an onboard Bluetooth unit has been integrated in the multi display.
- This enables hands free communication with bluetooth-compatible cellular telephone.

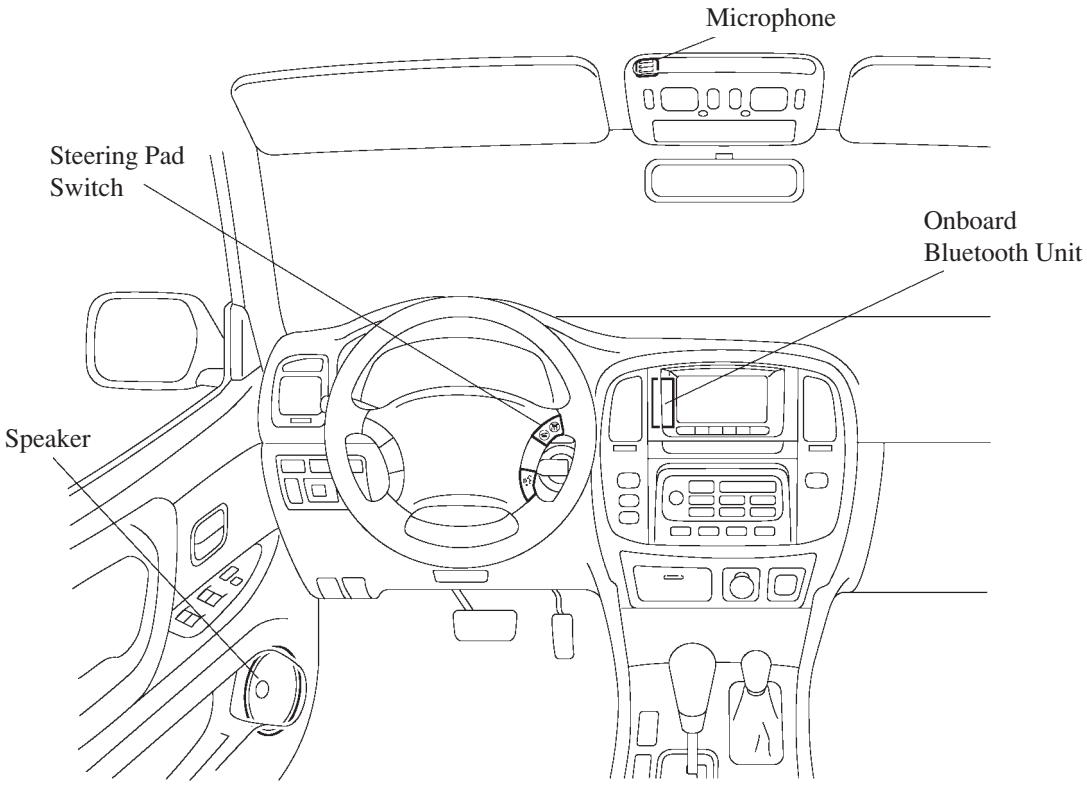
**▶ System Diagram ◀**




**▶ Specification ◀**

| Item | Specifications |
|---|---|
| Communication Distance | Approximate 10 meter radius |
| Number of devices connected simultaneously | 1 device (Registration, max 4 phones) |
| Use frequency range | 2.45 GHz (ISM band range) |

## Layout of Main Components

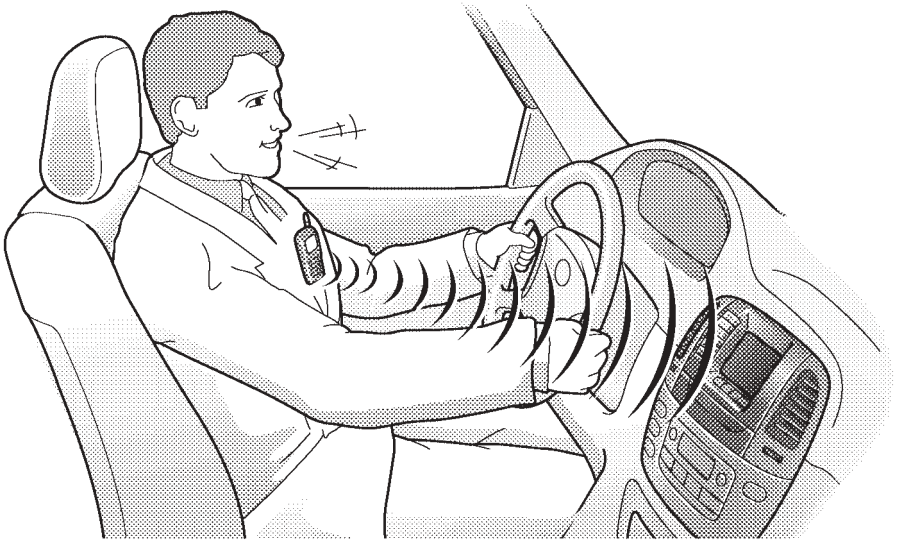



### ▶ Function of Main Components ◀

| Item | Outline |
|---|---|
| Onboard Bluetooth Unit | The onboard Bluetooth unit consists of an antenna and a module. The module contains an interface to connect the onboard Bluetooth unit to the multi display. Another function of the module is to process the data that is being transmitted or received by the antenna. |
| Steering Pad Switch | Contains “on-hook” and “off-hook” switches for operating the telephone. |
| Microphone | These items are used by an occupant in the vehicle to operate the hands-free function while talking with another person on the cellular telephone. |
| Speaker | |

### Operation Procedure

- When making a phone call, select a person to call while keeping bluetooth-compatible cellular telephone in a bag or a shirt pocket. The number is transmitted by the multi display or the steering pad switch to converse with another person on the cellular telephone circuit via bluetooth communication.
- Unlike in the past, it is not necessary to connect the cellular telephone with the onboard Bluetooth unit. Also, because Bluetooth communication connects automatically, no complex setups are required to use it each time. However, a Bluetooth-compatible cellular telephone must be registered initially with the onboard device.



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### Procedures for Registering, Selecting, and Deleting Bluetooth-Compatible Cellular Telephones

#### 1) General

- To use the hands-free function, a Bluetooth-compatible cellular telephone must be registered with the onboard device.
- Once a Bluetooth-compatible cellular telephone has been registered, it connects automatically so that it can be used subsequently for making hands-free telephone calls. A maximum of four Bluetooth-compatible cellular telephones can be registered with an onboard Bluetooth unit.

#### 2) Procedure for Registering Cellular Telephones

- On the “Settings” screen of the multi display, press the “Entry” button.


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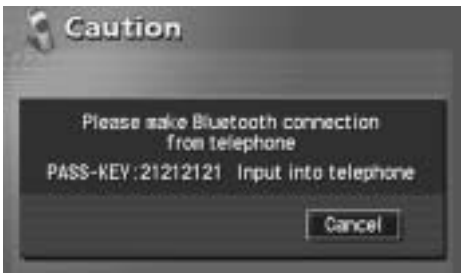
- A screen appears, prompting you to enter the Bluetooth pass key on a cellular telephone. Enter the pass key number, which appears on the screen, on a Bluetooth-compatible cellular telephone.

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- A connection will start once the Bluetooth pass key number has been entered on a Bluetooth-compatible cellular telephone. When a connection is completed normally, the device name of the Bluetooth-compatible cellular telephone and the Bluetooth unit address will appear on the screen. This completes the registration process.


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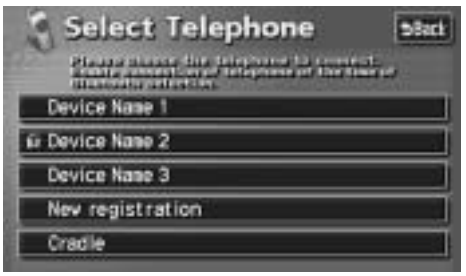
5

### 3) Procedure for Switching Registered Cellular Telephones

- Up to four Bluetooth-compatible cellular telephones can be registered on the onboard Bluetooth unit. However, only one Bluetooth-compatible cellular telephone can connect automatically. To switch between multiple Bluetooth-compatible cellular telephones that have been registered on the onboard unit, select the device name of the Bluetooth-compatible cellular telephone on the "Select Telephone" screen. After completing the foregoing selection, if you wish to change the connection to another Bluetooth-compatible cellular telephone, perform a device selection again.
  (The Bluetooth-compatible cellular telephone that is registered last becomes activated as default device.)




257LC12

### 4) Procedure for Deleting Registered Cellular Telephones

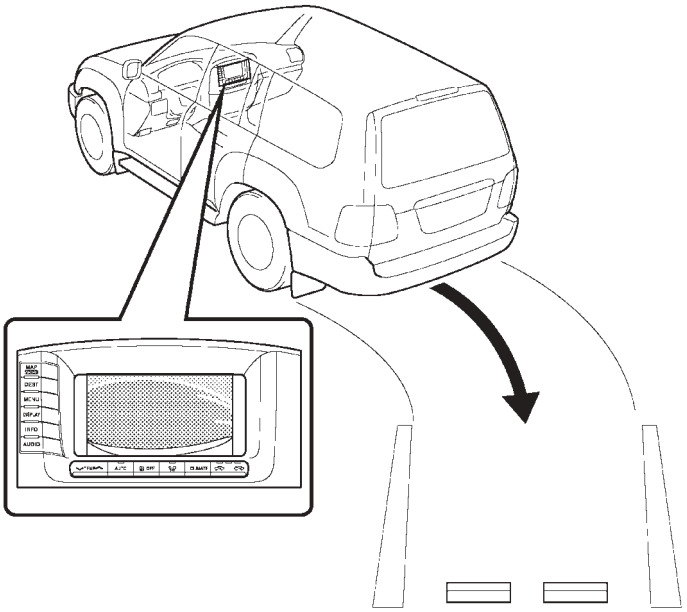
- Perform the following procedure to delete the registration data of Bluetooth-compatible cellular telephones from the onboard Bluetooth unit.
  On the "Delete Telephone" screen, select the device name that you wish to delete, and press the "OK" button.
  The registered data has been deleted from the registration list.


257LC13

## ■REAR VIEW MONITOR SYSTEM

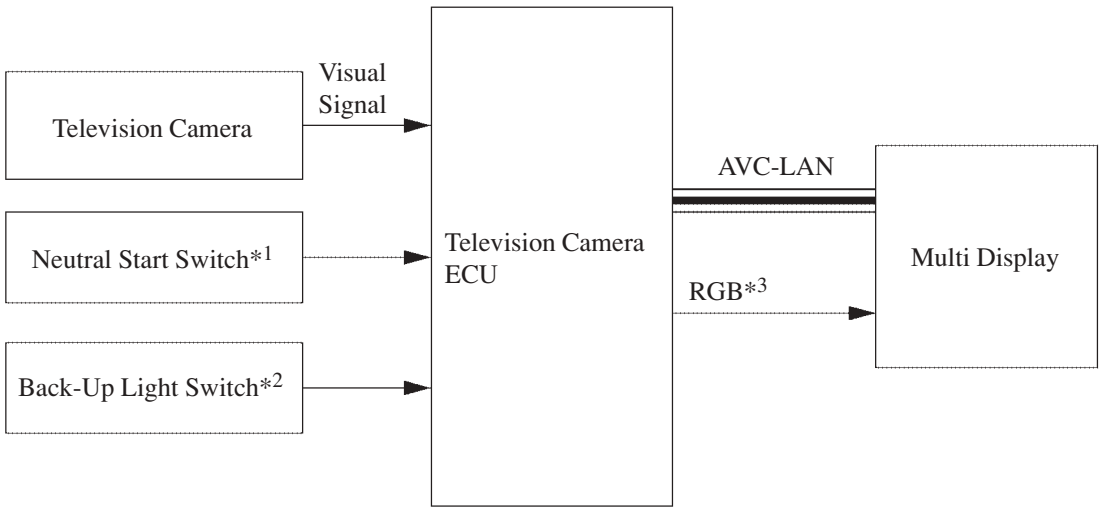
### 1. General

- To assist the driver in parking the vehicle by monitoring the rear view, this system has a television camera mounted on the back door to display the rearview of the vehicle on the multi display.



257LC02

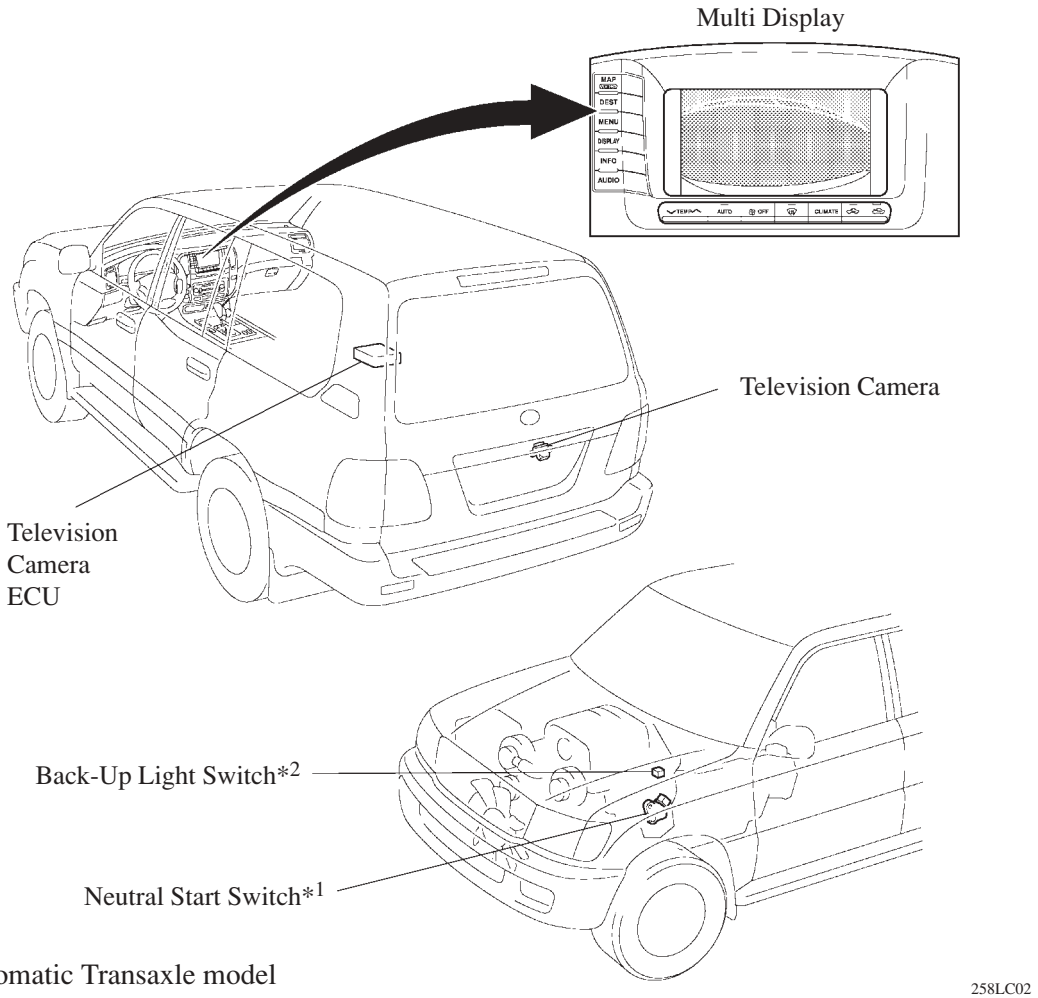
**▶ System Diagram ◀**




258LC01

*1: For Automatic Transaxle model
*2: For Manual Transaxle model
*3: RGB (Red Green Blue)

## 2. Layout of Main Components




*1: For Automatic Transaxle model
*2: For Manual Transaxle model

### ▶ Function of Main Components ◀

| Item | Function |
|---|---|
| Television Camera | ● Mounted on the back door to transmit the rearview image of the vehicle to the Television Camera ECU.<br>● A color video camera that uses a CCD (Charge Coupled Device) and a wide-angle lens. |
| Television Camera ECU | ● Transmits video signals, which contain a composite of the rear view of the vehicle taken with the television camera and the warning message, to the multi display.<br>● Television camera ECU effects control of the system by receiving the signal from the Neutral Start Switch (or Back-Up Light Switch). |
| Multi Display | Receives video signals containing a composite of the rear view of the vehicle and the warning message from the television camera ECU, and displays on the multi display. |
| Neutral Start Switch (AT) | Transmits a reverse shift position signal to the Television camera ECU. |
| Back-Up Light Switch (MT) | |

5

## 3. Operation

### 1) General

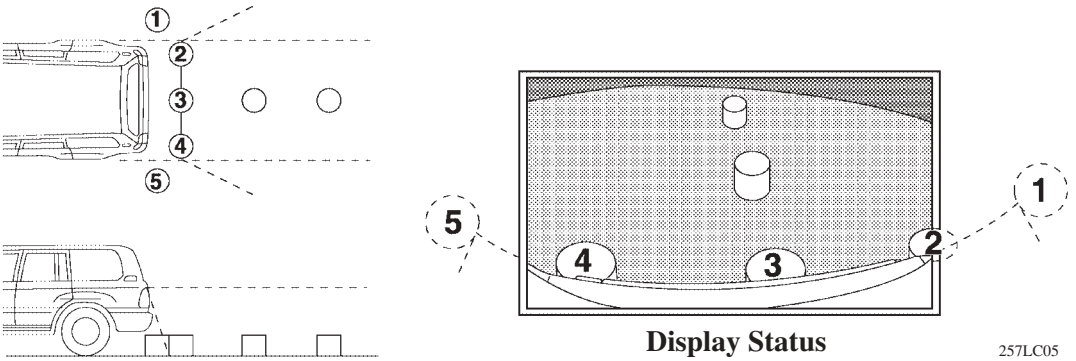
- With the ignition switch ON, if the driver shifts the shift lever to reverse, the display of the multi display switches to operate this system. In this state, if the driver moves the shift lever to a position other than reverse, or switches the modes on the multi display, the rear view display stops and switches to the display of another mode.

**CAUTION**

- Never depend on the rear view monitor system entirely when backing up. Always make sure your intended path is clear. Use caution, just as you would when backing up any vehicle.
- Never back up while locking only at the screen. The image on the screen is different from actual conditions. Depicted distances between objects and flat surfaces will differ from actual distance. If you back up while looking only at the screen, you may hit a vehicle, a person or an object. When backing up, be sure to check visually behind and all around the vehicle, both directly and with mirrors, before proceeding.

### 2) Area Displayed on Screen

- On the Multi Display, objects on the right of the vehicle appear on the right side of the display panel, and objects on the left of the vehicle appear on the left side of the display panel.
- The television camera uses a wide-angle lens. The perceived distance from the image that appears on the screen differs from the actual distance.




**Display Status** 257LC05

**NOTE**: Area displayed on screen may vary according to vehicle status or road conditions.
The area detected by the television camera is limited. The television camera dose not detects objects close to either corner of the bumper or under bumper.

### 3) Fail Safe

The table below indicates the conditions of detecting malfunctions in this system.

| Malfunction Parts | Detection Item | Function |
|---|---|---|
| Television Camera | Transmission of television camera malfunction signal | Stops signal reception and displays a dark screen |
| Television Camera ECU | Malfunction of television camera ECU unit | Stops system operation |

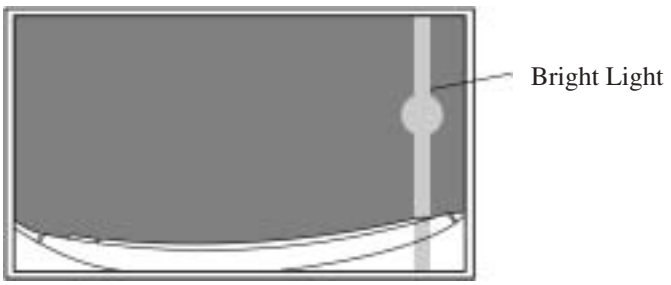
### 4) Self-Diagnosis Function

- The rear view monitor system is equipped with a self-diagnosis system and can display the diagnosis menu.
- The method for starting the diagnosis menu screen is the same as navigation system on the previous Land Cruiser. For details, refer to the Land Cruiser Repair Manual (Pub. No. RM1072E).



## 4. Handling Precaution

- In the following cases, it may become difficult to see the images on the screen, even when the system is functioning.
  - — In the dark (for example, at night)
  - — When the temperature near the lens is high or low
  - — When water droplets are adhering to the television camera, or when humidity is high. (for example, when it rains)
  - — When foreign matter (for example, snow or mud) is adhering to the television camera
  - — When the sun or the beam of headlights is shining directly into the television camera lens
- If a bright light (for example, sunlight reflected off the vehicle body) is picked up by the television camera, the smear effect*, peculiar to the camera, may occur.




**Display Status**

***— REFERENCE —***

*: Smear effect
A phenomenon that occurs when a bright light is picked up by the television camera; when transmitted by the television camera, the light source appears to have a vertical streak above and below it.

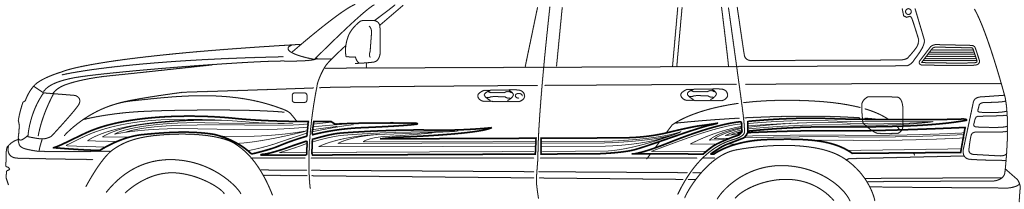
# LAND CRUISER (100 series)

## OUTLINE OF NEW FEATURES

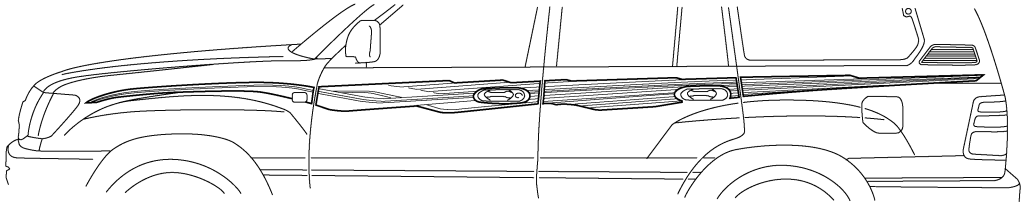
The following changes are made for the new Land Cruiser (100 series).

### 1. Exterior

- The design of the side stripes, provided as an optional equipment on all models, has been changed.



**Standard and GX Grade**



276LC01

**VX Grade**

### 2. 2UZ-FE Engine

A segment conductor type alternator has been adopted.

### 3. 1HZ Engine

A snorkel is available as optional equipment on the standard grade model for Australia.

### 4. Shift Lock System

A shift lock system with an electrical key interlock device and an electrical shift lock mechanism is provided on the automatic transmission models.

### 5. Combination Meter

On the models for Europe, the position lamp indicator has been changed to illuminate while the daytime running lights are operating.

### 6. Multi Display

On the VX grade model with multi display for Europe, an RDS-TMC (Radio Data System - Traffic Message Channel) has been added.

## MODEL CODE

# UZJ100 L - G N A E K W

1 2 3 4 5 6 7 8

| 1 | BASIC MODEL CODE | | |
|---|---|---|---|
| | CODE | ENGINE | FRONT SUSPENSION |
| | FZJ100 | 1FZ-FE | IFS*1 (Double Wishbone) |
| | UZJ100 | 2UZ-FE | |
| | HDJ100 | 1HD-FTE | |
| | FZJ105 | 1FZ-FE | RFS*2 (Leading Arm) |
| | HZJ105 | 1HZ | |

| 2 | STEERING WHEEL POSITION |
|---|---|
| | L : Left-Hand Drive<br>R : Right-Hand Drive |

| 3 | BODY TYPE |
|---|---|
| | G: Station Wagon |

| 4 | BACK DOOR TYPE |
|---|---|
| | C : Swing Back Door<br>N : Lift-up Back Door |

| 5 | GEAR SHIFT TYPE |
|---|---|
| | M : 5-Speed Manual, Floor<br>P : 4-Speed Automatic, Floor<br>A : 5-Speed Automatic, Floor |

| 6 | GRADE |
|---|---|
| | R : Standard<br>N : GX<br>E : VX |

| 7 | ENGINE SPECIFICATION |
|---|---|
| | K : DOHC and EFI<br>S : Diesel<br>Z : Multi Valve, Turbocharger and EFI |

| 8 | DESTINATION |
|---|---|
| | W : Europe<br>Q : Australia<br>V : G.C.C. (Gulf Cooperation Council) Countries<br>Blank: General Countries |

*1: IFS (Independent Front Suspension)
*2: RFS (Rigid Axle Front Suspension)

4

# MODEL LINE-UP

| DESTINATION | ENGINE | BACK DOOR | GRADE | FRONT SUSPENSION | DRIVE TYPE | TRANSMISSION | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | 5-Speed Manual | | 4-Speed Automatic | 5-Speed Automatic |
| | | | | | | R151F | H151F | A442F | A750F |
| Europe | 2UZ-FE | Lift-Up | VX | IFS (Double Wishbone) | Full-Time | — | — | — | UZJ100R-GNAEKW |
| | | | | | | — | — | — | UZJ100L-GNAEKW |
| | 1HD-FTE | | | | | — | HDJ100R-GNMEZW | — | HDJ100R-GNAEZW |
| | | | | | | — | HDJ100L-GNMEZW | — | HDJ100L-GNAEZW |
| | | Swing | Standard | | | — | HDJ100L-GCMRZW | — | — |
| Australia | 2UZ-FE | Lift-Up | GX | IFS (Double Wishbone) | Full-Time | — | UZJ100R-GNMNKQ | — | UZJ100R-GNANKQ |
| | | | VX | | | — | — | — | UZJ100R-GNAEKQ |
| | 1HZ | Swing | Standard | RFS (Leading Arm) | Part-Time | HZJ105R-GCMRSQ | — | — | — |
| | | Lift-Up | GX | | Full-Time | HZJ105R-GNMNSQ | — | — | — |
| | 1HD-FTE | | | IFS (Double Wishbone) | | — | HDJ100R-GNMNZQ | — | HDJ100R-GNANZQ |
| | | | VX | | | — | — | — | HDJ100R-GNAEZQ |
| G.C.C. Countries | 1FZ-FE | Swing | Standard | IFS (Double Wishbone) | Part-Time | — | FZJ100L-GCMRKV | — | — |
| | | | GX | | Part-Time (Full-Time) | — | FZJ100L-GCMNKV | FZJ100L-GCPNKV | — |
| | | Lift-Up | | | | — | FZJ100L-GNMNKV | FZJ100L-GNPNKV | — |
| | 2UZ-FE | Swing | VX | | Full-Time | — | UZJ100L-GCMEKV | — | UZJ100L-GCAEKV |
| | | Lift-Up | | | | — | UZJ100L-GNMEKV | — | UZJ100L-GNAEKV |
| | 1HZ | Swing | GX | RFS (Leading Arm) | Part-Time (Full-Time) | HZJ105L-GCMNSV | — | — | — |
| General Countries | 1FZ-FE | Swing | Standard | RFS (Leading Arm) | Part-Time | — | FZJ105L-GCMRK | — | — |
| | | | GX | | Part-Time (Full-Time) | — | FZJ105L-GCMNK | — | — |
| | | Lift-Up | | | | — | FZJ105R-GNMNK | — | — |
| | | | | | | — | FZJ105L-GNMNK | — | — |
| | 2UZ-FE | | VX | IFS (Double Wishbone) | Full-Time | — | — | — | UZJ100L-GNAEK |
| | 1HZ | Swing | Standard | RFS (Leading Arm) | Part-Time (Full-Time) | HZJ105R-GCMRS | — | — | — |
| | | | | | | HZJ105L-GCMRS | — | — | — |
| | | | GX | | Part-Time (Full-Time) | HZJ105R-GCMNS | — | — | — |
| | | | | | | HZJ105L-GCMNS | — | — | — |
| | | Lift-Up | | | | HZJ105R-GNMNS | — | — | — |
| | | | | | | HZJ105L-GNMNS | — | — | — |
| | 1HD-FTE | Swing | VX | IFS (Double Wishbone) | Full-Time | — | HDJ100L-GCMEZ | — | — |
| | | Lift-Up | | | | — | HDJ100R-GNMEZ | — | HDJ100L-GNAEZ |
| | | | | | | — | HDJ100L-GNMEZ | — | — |

# MAJOR TECHNICAL SPECIFICATIONS

| Item / Area | | | | Europe | | | |
|---|---|---|---|---|---|---|---|
| Body Type | | | | Wagon (Lift-Up Back Door) | | | |
| Vehicle Grade | | | | VX | | | |
| Model Code | | | | UZJ100R-GNAEKW | UZJ100L-GNAEKW | HDJ100R-GNMEZW | HDJ100R-GNAEZW |
| Major Dimensions & Vehicle Weights | Overall | Length | mm (in.) | 4890 (192.5), 4940 (194.5)*1 | 4890 (192.5), 4940 (194.5)*1 | 4890 (192.5), 4940 (194.5)*1 | 4890 (192.5) |
| | | Width | mm (in.) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) |
| | | Height* | mm (in.) | 1880 (74.0)*2, 1850 (72.8)*2 *3 | 1880 (74.0)*2, 1850 (72.8)*2 *3 | 1880 (74.0)*2, 1850 (72.8)*2 *3 | 1880 (74.0)*2, 1850 (72.8)*2 *3 |
| | Wheel Base | | mm (in.) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) |
| | Tread | Front | mm (in.) | 1620 (63.8) | 1620 (63.8) | 1620 (63.8) | 1620 (63.8) |
| | | Rear | mm (in.) | 1615 (63.6) | 1615 (63.6) | 1615 (63.6) | 1615 (63.6) |
| | Room | Length | mm (in.) | 2505 (98.6)*6 | 2505 (98.6)*6 | 2505 (98.6)*6 | 2505 (98.6)*6 |
| | | Width | mm (in.) | 1620 (63.8) | 1620 (63.8) | 1620 (63.8) | 1620 (63.8) |
| | | Height | mm (in.) | 1145 (45.1), 1150 (45.3)*7 | 1145 (45.1), 1150 (45.3)*7 | 1145 (45.1), 1150 (45.3)*7 | 1145 (45.1), 1150 (45.3)*7 |
| | Cargo Space | Length | mm (in.) | 335 (13.2)*6 | 335 (13.2)*6 | 335 (13.2)*6 | 335 (13.2)*6 |
| | | Width | mm (in.) | - | - | - | - |
| | | Height | mm (in.) | 995 (39.2)*6 | 995 (39.2)*6 | 995 (39.2)*6 | 995 (39.2)*6 |
| | Overhang | Front | mm (in.) | 895 (35.2), 945 (37.2)*1 | 895 (35.2), 945 (37.2)*1 | 895 (35.2), 945 (37.2)*1 | 895 (35.2) |
| | | Rear | mm (in.) | 1145 (45.1) | 1145 (45.1) | 1145 (45.1) | 1145 (45.1) |
| | Min. Running Ground Clearance | | mm (in.) | - | - | - | - |
| | Angle of Approach | | degrees | - | - | - | - |
| | Angle of Departure | | degrees | - | - | - | - |
| | Curb Weight*8 | Front | kg (lb) | 1190 - 1340 (2623 - 2954) | 1190 - 1340 (2623 - 2954) | 1350 - 1495 (2976 - 3296) | 1355 - 1430 (2987 - 3153) |
| | | Rear | kg (lb) | 1080 - 1135 (2381 - 2502) | 1080 - 1135 (2381 - 2502) | 1095 - 1145 (2414 - 2524) | 1105 - 1180 (2436 - 2601) |
| | | Total | kg (lb) | 2270 - 2475 (5004 - 5456) | 2270 - 2475 (5004 - 5456) | 2445 - 2640 (5390 - 5820) | 2460 - 2610 (5423 - 5754) |
| | Gross Vehicle Weight | Front | kg (lb) | - | - | - | - |
| | | Rear | kg (lb) | - | - | - | - |
| | | Total | kg (lb) | 3260 (7187) | 3260 (7187) | 3260 (7187) | 3260 (7187) |
| | Fuel Tank Capacity | | ℓ (Imp. gal.) | 96 (21.1) | 96 (21.1) | 96 (21.1) | 96 (21.1) |
| | Luggage Compartment Capacity | | $m^3$ (cu.ft.) | - | - | - | - |
| Performance | Max. Speed | | km/h (mph) | 180 (112) | 180 (112) | 170 (105) | 180 (112) |
| | Max. Cruising Speed | | km/h (mph) | - | - | - | - |
| | Max. Permissible Speed | 1st Gear | km/h (mph) | 19 (12)*10, 47 (29)*11 | 19 (12)*10, 47 (29)*11 | 14 (9)*10, 35 (22)*11 | 18 (11)*10, 44 (27)*11 |
| | | 2nd Gear | km/h (mph) | 33 (20)*10, 81 (50)*11 | 33 (20)*10, 81 (50)*11 | 26 (16)*10, 63 (39)*11 | 35 (22)*10, 85 (54)*11 |
| | | 3rd Gear | km/h (mph) | - | - | 39 (24)*10, 97 (60)*11 | - |
| | | 4th Gear | km/h (mph) | - | - | 59 (37)*10, 144 (89)*11 | - |
| | Min. Turning Radius | Tire | m (ft.) | 5.9 (19.4) | 5.9 (19.4) | 5.9 (19.4) | 5.9 (19.4) |
| | | Body | m (ft.) | 6.3 (20.7) | 6.3 (20.7) | 6.3 (20.7) | 6.3 (20.7) |
| Engine | Engine Type | | | 2UZ-FE | 2UZ-FE | 1HD-FTE | 1HD-FTE |
| | Valve Mechanism | | | 32-Valve, DOHC | 32-Valve, DOHC | 24-Valve, OHC | 24-Valve, OHC |
| | Bore × Stroke | | mm (in.) | 94.0 × 84.0 (3.70 × 3.31) | 94.0 × 84.0 (3.70 × 3.31) | 94.0 × 100.0 (3.70 × 3.94) | 94.0 × 100.0 (3.70 × 3.94) |
| | Displacement | | $cm^3$ (cu.in.) | 4664 (284.5) | 4664 (284.5) | 4164 (254.0) | 4164 (254.0) |
| | Compression Ratio | | | 9.6:1 | 9.6:1 | 18.5:1 | 18.5:1 |
| | Fuel System | | | EFI | EFI | Distributor Type | Distributor Type |
| | Research Octane No. or Cetane No. (Diesel) | | | 91 or higher | 91 or higher | 48 or higher | 48 or higher |
| | Max. Output | | kW/rpm | 175/4800 (EEC) | 175/4800 (EEC) | 150/3400 (EEC) | 150/3400 (EEC) |
| | Max. Torque | | N·m/rpm | 434/3400 (EEC) | 434/3400 (EEC) | 430/1400 - 3200 (EEC) | 430/1400 - 3200 (EEC) |
| Engine Electrical | Battery Capacity (5HR) | | Voltage & Amp. hr. | 12-55, 64*12 | 12-55, 64*12 | 12-55 × 2, 64 × 2*12 | 12-55 × 2, 64 × 2*12 |
| | Alternator Output | | Watts | 960 | 960 | 960*12, 1440 | 960*12, 1440 |
| | Starter Output | | kW | 2.0 | 2.0 | 3.0 | 3.0 |
| Chassis | Clutch Type | | | - | - | Dry, Single Plate Diaphragm | - |
| | Transmission Type | | | A750F | A750F | H151F | A750F |
| | Transmission Gear Ratio | In First | | 3.520 | 3.520 | 4.081 | 3.520 |
| | | In Second | | 2.042 | 2.042 | 2.294 | 2.042 |
| | | In Third | | 1.400 | 1.400 | 1.490 | 1.400 |
| | | In Fourth | | 1.000 | 1.000 | 1.000 | 1.000 |
| | | In Fifth | | 0.716 | 0.716 | 0.881 | 0.716 |
| | | In Reverse | | 3.224 | 3.224 | 4.313 | 3.224 |
| | Transfer Gear Ratio H4/L4 | | | 1.000/2.488 | 1.000/2.488 | 1.000/2.488 | 1.000/2.488 |
| | Differential Gear Ratio (Front/Rear) | | | 4.100/4.100 | 4.100/4.300 | 3.909/3.909 | 4.100/4.100 |
| | Differential Gear Size (Front/Rear) | | in. | 8"/9.5" | 8"/9.5" | 8"/9.5" | 8"/9.5" |
| | Brake Type | Front | | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc |
| | | Rear | | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc |
| | Parking Brake Type | | | Drum | Drum | Drum | Drum |
| | Brake Booster Type and Size | | in. | Hydraulic | Hydraulic | Hydraulic | Hydraulic |
| | Proportioning Valve Type | | | P & B Valve, -*13 | P & B Valve, -*13 | P & B Valve | P & B Valve, -*13 |
| | Suspension Type | Front | | Double Wishbone | Double Wishbone | Double Wishbone | Double Wishbone |
| | | Rear | | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod |
| | Stabilizer Bar | Front | | Standard | Standard | Standard | Standard |
| | | Rear | | Standard | Standard | Standard | Standard |
| | Steering Gear Type | | | Rack & Pinion | Rack & Pinion | Rack & Pinion | Rack & Pinion |
| | Steering Gear Ratio (Overall) | | | 17.3, 12.4 - 18.0*14 | 17.3, 12.4 - 18.0*14 | 17.3 | 17.3 |
| | Power Steering Type | | | Integral Type | Integral Type | Integral Type | Integral Type |

*: Unladed Vehicle
*1: With Electrical Winch
*2: With Roof Rail +40 mm (1.6 in.)
*3: With AHC
*4: With Roof Rack +230 mm (9.1 in.)
*5: With 275/70R16 Tire
*6: With 3rd Seat
*7: With Moon Roof
*8: Separate Seat, Seating Capacity : 5

| Europe | | | Australia | | |
|---|---|---|---|---|---|
| Wagon (Lift-Up Back Door) | | Wagon (Swing Back Door) | Wagon (Lift-Up Back Door) | | |
| VX | | STD | GX | | VX |
| HDJ100L-GNMEZW | HDJ100L-GNAEZW | HDJ100L-GCMRZW | UZJ100R-GNMNKQ | UZJ100R-GNANKQ | UZJ100R-GNAEKQ |
| 4890 (192.5), 4940 (194.5)*1 | 4890 (192.5) | 4890 (192.5), 4940 (194.5)*1 | 4890 (192.5) | 4890 (192.5) | 4890 (192.5) |
| 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) |
| 1880 (74.0)*2, 1850 (72.8)*2 *3 | 1880 (74.0)*2, 1850 (72.8)*2 *3 | 1880 (74.0)*2 *4 | 1890 (74.4) | 1890 (74.4) | 1890 (74.4) |
| 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) |
| 1620 (63.8) | 1620 (63.8) | 1640 (64.6), 1620 (63.8)*5 | 1640 (64.6), 1620 (63.8)*5 | 1640 (64.6), 1620 (63.8)*5 | 1620 (63.8) |
| 1615 (63.6) | 1615 (63.6) | 1635 (64.4), 1615 (63.6)*5 | 1635 (64.4), 1615 (63.6)*5 | 1635 (64.4), 1615 (63.6)*5 | 1615 (63.6) |
| 2505 (98.6)*6 | 2505 (98.6)*6 | 2505 (98.6)*6 | 1805 (71.1) | 1805 (71.1) | 2505 (98.6) |
| 1620 (63.8) | 1620 (63.8) | 1620 (63.8) | 1615 (63.6) | 1615 (63.6) | 1620 (63.8) |
| 1145 (45.1), 1150 (45.3)*7 | 1145 (45.1), 1150 (45.3)*7 | 1145 (45.1), 1150 (45.3)*7 | 1180 (46.5), 1150 (45.3)*7 | 1180 (46.5), 1150 (45.3)*7 | 1145 (45.1), 1150 (45.3)*7 |
| 335 (13.2)*6 | 335 (13.2)*6 | 335 (13.2)*6 | 1085 (42.7) | 1085 (42.7) | 335 (13.2) |
| - | - | - | - | - | - |
| 995 (39.2)*6 | 995 (39.2)*6 | 995 (39.2)*6 | 1065 (41.9) | 1065 (41.9) | 995 (39.2) |
| 895 (35.2), 945 (37.2)*1 | 895 (35.2) | 895 (35.2), 945 (37.2)*1 | 895 (35.2) | 895 (35.2) | 895 (35.2) |
| 1145 (45.1) | 1145 (45.1) | 1145 (45.1) | 1145 (45.1) | 1145 (45.1) | 1145 (45.1) |
| - | - | - | - | - | - |
| - | - | - | - | - | - |
| - | - | - | - | - | - |
| 1350 - 1495 (2976 - 3296) | 1355 - 1430 (2987 - 3153) | 1375 - 1405 (3031 - 3097) | 1245 - 1265 (2745 - 2789) | 1260 - 1280 (2778 - 2822) | 1290 - 1305 (2844 - 2877)*9 |
| 1095 - 1145 (2414 - 2524) | 1105 - 1180 (2436 - 2601) | 1060 - 1100 (2337 - 2425) | 1060 - 1080 (2337 - 2381) | 1065 - 1085 (2348 - 2392) | 1190 - 1215 (2623 - 2679)*9 |
| 2445 - 2640 (5390 - 5820) | 2460 - 2610 (5423 - 5754) | 2435 - 2505 (5368 - 5523) | 2305 - 2345 (5082 - 5170) | 2325 - 2365 (5126 - 5214) | 2480 - 2520 (5467 - 5556)*9 |
| - | - | - | - | - | - |
| - | - | - | - | - | - |
| 3260 (7187) | 3260 (7187) | 3260 (7187) | 3260 (7187) | 3260 (7187) | 3260 (7187) |
| 96 (21.1) | 96 (21.1) | 96 (21.1) | 95 + 50 (20.9 + 11.0) | 95 + 50 (20.9 + 11.0) | 95 + 50 (20.9 + 11.0) |
| - | - | - | - | - | - |
| 170 (105) | 180 (112) | 170 (105) | 180 (112) | 180 (112) | 180 (112) |
| - | - | - | - | | |
| 14 (9)*10, 35 (22)*11 | 18 (11)*10, 44 (28)*11 | 14 (9)*10, 35 (22)*11 | 17 (11)*10, 40 (25)*11 | 19 (12)*10, 47 (29)*11 | 19 (12)*10, 47 (29)*11 |
| 26 (16)*10, 63 (39)*11 | 35 (22)*10, 85 (53)*11 | 26 (16)*10, 63 (39)*11 | 29 (18)*10, 72 (45)*11 | 33 (20)*10, 81 (50)*11 | 33 (20)*10, 81 (50)*11 |
| 39 (24)*10, 97 (60)*11 | - | 39 (24)*10, 97 (60)*11 | 45 (28)*10, 111 (69)*11 | - | - |
| 59 (37)*10, 144 (89)*11 | - | 59 (37)*10, 144 (89)*11 | 67 (42)*10, 165 (102)*11 | - | - |
| 5.9 (19.4) | 5.9 (19.4) | 5.9 (19.4) | 5.9 (19.4) | 5.9 (19.4) | 5.9 (19.4) |
| 6.3 (20.7) | 6.3 (20.7) | 6.3 (20.7) | 6.3 (20.7) | 6.3 (20.7) | 6.3 (20.7) |
| 1HD-FTE | 1HD-FTE | 1HD-FTE | 2UZ-FE | 2UZ-FE | 2UZ-FE |
| 24-Valve, OHC | 24-Valve, OHC | 24-Valve, OHC | 32-Valve, DOHC | 32-Valve, DOHC | 32-Valve, DOHC |
| 94.0 × 100.0 (3.70 × 3.94) | 94.0 × 100.0 (3.70 × 3.94) | 94.0 × 100.0 (3.70 × 3.94) | 94.0 × 84.0 (3.70 × 3.31) | 94.0 × 84.0 (3.70 × 3.31) | 94.0 × 84.0 (3.70 × 3.31) |
| 4164 (254.0) | 4164 (254.0) | 4164 (254.0) | 4664 (284.5) | 4664 (284.5) | 4664 (284.5) |
| 18.5:1 | 18.5:1 | 18.8:1 | 9.6:1 | 9.6:1 | 9.6:1 |
| Distributor Type | Distributor Type | Distributor Type | EFI | EFI | EFI |
| 48 or higher | 48 or higher | 48 or higher | 91 or higher | 91 or higher | 91 or higher |
| 150/3400 (EEC) | 150/3400 (EEC) | 150/3400 (EEC) | 170/4800 (SAE-NET) | 170/4800 (SAE-NET) | 170/4800 (SAE-NET) |
| 430/1400 - 3200 (EEC) | 430/1400 - 3200 (EEC) | 430/1400 - 3200 (EEC) | 410/3400 (SAE-NET) | 410/3400 (SAE-NET) | 410/3400 (SAE-NET) |
| 12-55 × 2, 64 × 2*12 | 12-55 × 2, 64 × 2*12 | 12-64 × 2 | 12-55 | 12-55 | 12-55 |
| 960*12, 1440 | 960*12, 1440 | 1440 | 1200 | 1200 | 1200 |
| 3.0 | 3.0 | 3.0 | 1.4 | 1.4 | 1.4 |
| Dry, Single Plate Diaphragm | - | Dry, Single Plate Diaphragm | Dry, Single Plate Diaphragm | - | - |
| H151F | A750F | H151F | H151F | A750F | A750F |
| 4.081 | 3.520 | 4.081 | 4.081 | 3.520 | 3.520 |
| 2.294 | 2.042 | 2.294 | 2.294 | 2.042 | 2.042 |
| 1.490 | 1.400 | 1.490 | 1.490 | 1.400 | 1.400 |
| 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 0.881 | 0.716 | 0.881 | 0.881 | 0.716 | 0.716 |
| 4.313 | 3.224 | 4.313 | 4.313 | 3.224 | 3.224 |
| 1.000/2.488 | 1.000/2.488 | 1.000/2.488 | 1.000/2.488 | 1.000/2.488 | 1.000/2.488 |
| 3.909/3.909 | 4.100/4.100 | 3.909/3.909 | 4.300/4.300 | 4.100/4.100 | 4.100/4.100 |
| 8"/9.5" | 8"/9.5" | 8"/9.5" | 8"/9.5" | 8"/9.5" | 8"/9.5" |
| Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc |
| Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc |
| Drum | Drum | Drum | Drum | Drum | Drum |
| Hydraulic | Hydraulic | Hydraulic | Hydraulic | Hydraulic | Hydraulic |
| P & B Valve | P & B Valve, -*13 | P & B Valve | P & B Valve | P & B Valve, -*13 | P & B Valve, -*13 |
| Double Wishbone | Double Wishbone | Double Wishbone | Double Wishbone | Double Wishbone | Double Wishbone |
| 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod |
| Standard | Standard | Standard | Standard | Standard | Standard |
| Standard | Standard | Standard | Standard | Standard | Standard |
| Rack & Pinion | Rack & Pinion | Rack & Pinion | Rack & Pinion | Rack & Pinion | Rack & Pinion |
| 17.3 | 17.3 | 17.3 | 17.3 | 17.3 | 17.3, 12.4 - 18.0*14 |
| Integral Type | Integral Type | Integral Type | Integral Type | Integral Type | Integral Type |

*9: Seating Capacity : 8
*10: Transfer in Low
*11: Transfer in High
*12: Option
*13: With VSC
*14: With VGRS

| Item / Area | | | | Australia | | | |
|---|---|---|---|---|---|---|---|
| Body Type | | | | Wagon (Swing Back Door) | Wagon (Lift-Up Back Door) | | |
| Vehicle Grade | | | | STD | GX | | |
| Model Code | | | | HZJ105R-GCMRSQ | HZJ105R-GNMNSQ | HDJ100R-GNMNZQ | HDJ100R-GNANZQ |
| Major Dimensions & Vehicle Weights | Overall | Length | mm (in.) | 4890 (192.5) | 4890 (192.5) | 4890 (192.5) | 4890 (192.5) |
| | | Width | mm (in.) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) |
| | | Height* | mm (in.) | 1920 (75.6) | 1920 (75.6), 1915 (75.4)*5 | 1890 (74.4) | 1890 (74.4) |
| | Wheel Base | | mm (in.) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) |
| | Tread | Front | mm (in.) | 1605 (63.2) | 1605 (63.2) | 1640 (64.6), 1620 (63.8)*5 | 1640 (64.6), 1620 (63.8)*5 |
| | | Rear | mm (in.) | 1600 (63.0) | 1600 (63.0) | 1635 (64.4), 1615 (63.6)*5 | 1635 (64.4), 1615 (63.6)*5 |
| | Room | Length | mm (in.) | 1805 (71.1) | 1805 (71.1) | 1805 (71.1) | 1805 (71.1) |
| | | Width | mm (in.) | 1615 (63.6) | 1615 (63.6) | 1615 (63.6) | 1615 (63.6) |
| | | Height | mm (in.) | 1180 (46.5) | 1180 (46.5), 1150 (45.3)*7 | 1180 (46.5), 1150 (45.3)*7 | 1180 (46.5), 1150 (45.3)*7 |
| | Cargo Space | Length | mm (in.) | 1085 (42.7) | 1085 (42.7) | 1085 (42.7) | 1085 (42.7) |
| | | Width | mm (in.) | - | - | - | - |
| | | Height | mm (in.) | 1065 (41.9) | 1065 (41.9) | 1065 (41.9) | 1065 (41.9) |
| | Overhang | Front | mm (in.) | 895 (35.2) | 895 (35.2) | 895 (35.2) | 895 (35.2) |
| | | Rear | mm (in.) | 1145 (45.1) | 1145 (45.1) | 1145 (45.1) | 1145 (45.1) |
| | Min. Running Ground Clearance | | mm (in.) | - | - | - | - |
| | Angle of Approach | | degrees | - | - | - | - |
| | Angle of Departure | | degrees | - | - | - | - |
| | Curb Weight*8 | Front | kg (lb) | 1195 - 1230 (2634 - 2712) | 1205 - 1230 (2657 - 2712) | 1330 - 1350 (2932 - 2976) | 1355 - 1375 (2987 - 3031) |
| | | Rear | kg (lb) | 1130 - 1155 (2491 - 2546) | 1120 - 1140 (2469 - 2513) | 1150 - 1170 (2535 - 2579) | 1155 - 1175 (2546 - 2590) |
| | | Total | kg (lb) | 2325 - 2385 (5126 - 5258) | 2325 - 2370 (5126 - 5225) | 2480 - 2520 (5467 - 5556) | 2510 - 2550 (5534 - 5622) |
| | Gross Vehicle Weight | Front | kg (lb) | - | - | - | - |
| | | Rear | kg (lb) | - | - | - | - |
| | | Total | kg (lb) | 3180 (7011) | 3180 (7011) | 3260 (7187) | 3260 (7187) |
| | Fuel Tank Capacity | | ℓ (Imp. gal.) | 95 + 50 (20.9 + 11.0) | 95 + 50 (20.9 + 11.0) | 96 + 45 (21.1 + 9.9) | 96 + 45 (21.1 + 9.9) |
| | Luggage Compartment Capacity | | $m^3$ (cu.ft.) | - | - | - | - |
| Performance | Max. Speed | | km/h (mph) | 155 (96) | 155 (96) | 175 (109) | 180 (112) |
| | Max. Cruising Speed | | km/h (mph) | - | - | - | - |
| | Max. Permissible Speed | 1st Gear | km/h (mph) | 13 (8)*10, 32 (20)*11 | 13 (8)*10, 32 (20)*11 | 14 (9)*10, 35 (22)*11 | 16 (10)*10, 39 (24)*11 |
| | | 2nd Gear | km/h (mph) | 25 (16)*10, 60 (37)*11 | 25 (16)*10, 60 (37)*11 | 26 (16)*10, 63 (39)*11 | 27 (17)*10, 67 (42)*11 |
| | | 3rd Gear | km/h (mph) | 40 (25)*10, 97 (60)*11 | 40 (25)*10, 97 (60)*11 | 39 (24)*10, 97 (60)*11 | - |
| | | 4th Gear | km/h (mph) | 57 (35)*10, 140 (87)*11 | 57 (35)*10, 140 (87)*11 | 59 (37)*10, 144 (89)*11 | - |
| | Min. Turning Radius | Tire | m (ft.) | 6.0 (19.7) | 6.0 (19.7) | 6.0 (19.7) | 6.0 (19.7) |
| | | Body | m (ft.) | 6.4 (21.0) | 6.4 (21.0) | 6.4 (21.0) | 6.4 (21.0) |
| Engine | Engine Type | | | 1HZ | 1HZ | 1HD-FTE | 1HD-FTE |
| | Valve Mechanism | | | 12-Valve, OHC | 12-Valve, OHC | 24-Valve, OHC | 24-Valve, OHC |
| | Bore × Stroke | | mm (in.) | 94.0 × 100.0 (3.70 × 3.94) | 94.0 × 100.0 (3.70 × 3.94) | 94.0 × 100.0 (3.70 × 3.94) | 94.0 × 100.0 (3.70 × 3.94) |
| | Displacement | | $cm^3$ (cu.in.) | 4164 (254.0) | 4164 (254.0) | 4164 (254.0) | 4164 (254.0) |
| | Compression Ratio | | | 22.4:1 | 22.4:1 | 18.8:1 | 18.8:1 |
| | Fuel System | | | Distributor Type | Distributor Type | Distributor Type | Distributor Type |
| | Research Octane No. or Cetane No. (Diesel) | | | 48 or higher | 48 or higher | 48 or higher | 48 or higher |
| | Max. Output | | kW/rpm | 155/4600 (SAE-NET) | 96/3800 (SAE-NET) | 150/3400 (EEC) | 150/3400 (EEC) |
| | Max. Torque | | N·m/rpm | 113/3600 (SAE-NET) | 285/2200 (SAE-NET) | 430/1400 - 3200 (EEC) | 430/1400 - 3200 (EEC) |
| Engine Electrical | Battery Capacity (5HR) | | Voltage & Amp. hr. | 12-64 | 12-64 | 12-55 × 2 | 12-55 × 2 |
| | Alternator Output | | Watts | 960, 1440*12 | 960, 1440*12 | 1440 | 1440 |
| | Starter Output | | kW | 2.5 | 2.5 | 3.0 | 3.0 |
| Chassis | Clutch Type | | | Dry, Single Plate Diaphragm | Dry, Single Plate Diaphragm | Dry, Single Plate Diaphragm | - |
| | Transmission Type | | | R151F | R151F | H151F | A750F |
| | Transmission Gear Ratio | In First | | 4.313 | 4.313 | 4.081 | 3.520 |
| | | In Second | | 2.330 | 2.330 | 2.294 | 2.042 |
| | | In Third | | 1.436 | 1.436 | 1.490 | 1.400 |
| | | In Fourth | | 1.000 | 1.000 | 1.000 | 1.000 |
| | | In Fifth | | 0.838 | 0.838 | 0.881 | 0.716 |
| | | In Reverse | | 4.220 | 4.220 | 4.313 | 3.224 |
| | Transfer Gear Ratio H4/L4 | | | 1.000/2.488 | 1.000/2.488 | 1.000/2.488 | 1.000/2.488 |
| | Differential Gear Ratio (Front/Rear) | | | 4.300/4.300 | 4.300/4.300 | 4.100/4.100 | 3.909/3.909 |
| | Differential Gear Size (Front/Rear) | | in. | 8"/9.5" | 8"/9.5" | 8"/9.5" | 8"/9.5" |
| | Brake Type | Front | | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc |
| | | Rear | | L. T Drum, Ventilated Disc*12 | Ventilated Disc | Ventilated Disc | Ventilated Disc |
| | Parking Brake Type | | | Drum | Drum | Drum | Drum |
| | Brake Booster Type and Size | | in. | Vacuum | Vacuum, Hydraulic*16 | Hydraulic | Hydraulic |
| | Proportioning Valve Type | | | LSP & BV | LSP & BV, P & B Valve*16 | P & B Valve | P & B Valve-*13 |
| | Suspension Type | Front | | Leading Arm, Coil | Leading Arm, Coil | Double Wishbone | Double Wishbone |
| | | Rear | | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod |
| | Stabilizer Bar | Front | | Standard | Standard | Standard | Standard |
| | | Rear | | Standard | Standard | Standard | Standard |
| | Steering Gear Type | | | Recerculating Ball | Recerculating Ball | Rack & Pinion | Rack & Pinion |
| | Steering Gear Ratio (Overall) | | | 18.59 | 18.59 | 17.3 | 17.3 |
| | Power Steering Type | | | Integral Type | Integral Type | Integral Type | Integral Type |

*: Unladed Vehicle
*1: With Electrical Winch
*2: With Roof Rail +40 mm (1.6 in.)
*4: With Roof Rack +230 mm (9.1 in.)
*5: With 275/70R16 Tire
*7: With Moon Roof
*8: Separate Seat, Seating Capacity : 5
*9: Seating Capacity : 8
*10: Transfer in Low

| Australia | G.C.C. Countries | | | | |
|---|---|---|---|---|---|
| Wagon (Lift-Up Back Door) | Wagon (Swing Back Door) | | | Wagon (Lift-Up Back Door) | Wagon (Swing Back Door) |
| VX | GX | STD | GX | | |
| HDJ100R-GNAEZQ | HZJ105L-GCMNSV | FZJ100L-GCMRKV | FZJ100L-GCMNKV | FZJ100L-GNMNKV | FZJ100L-GCPNKV |
| 4890 (192.5) | 4890 (192.5)*15, 4940 (194.5)*1 *15 | 4890 (192.5)*15, 4940 (194.5)*1 *15 | 4890 (192.5)*15, 4940 (194.5)*1 *15 | 4890 (192.5)*15, 4940 (194.5)*1 *15 | 4890 (192.5)*15, 4940 (194.5)*1 *15 |
| 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) |
| 1890 (74.4) | 1905 (75.0)*2 *4, 1885 (74.2)*2 *4 *5 | 1880 (74.0)*2 *4 | 1880 (74.0)*2 *4, 1860 (73.2)*2 *4 *5 | 1880 (74.0)*2 *4, 1860 (73.2)*2 *4 *5 | 1880 (74.0)*2 *4, 1860 (73.2)*2 *4 *5 |
| 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) |
| 1620 (63.8) | 1605 (63.2) | 1640 (64.6) | 1640 (64.6), 1620 (63.8)*5 | 1640 (64.6), 1620 (63.8)*5 | 1640 (64.6), 1620 (63.8)*5 |
| 1615 (63.6) | 1600 (63.0) | 1635 (64.4) | 1635 (64.4), 1615 (63.6)*5 | 1635 (64.4), 1615 (63.6)*5 | 1635 (64.4), 1615 (63.6)*5 |
| 2505 (98.6) | - | 1805 (71.1) | - | 1805 (71.1) | - |
| 1620 (63.8) | 1615 (63.6) | 1615 (63.6) | 1615 (63.6) | 1615 (63.6) | 1615 (63.6) |
| 1145 (45.1), 1150 (45.3)*7 | 1180 (46.5), 1150 (45.3)*7 | 1180 (46.5) | 1180 (46.5), 1150 (45.3)*7 | 1180 (46.5), 1150 (45.3)*7 | 1180 (46.5), 1150 (45.3)*7 |
| 335 (13.2) | - | 1085 (42.7) | - | 1085 (42.7) | - |
| - | - | - | - | - | - |
| 995 (39.2) | - | 1065 (41.9) | - | 1065 (41.9) | - |
| 895 (35.2) | 895 (35.2), 945 (37.2)*1 | 895 (35.2), 945 (37.2)*1 | 895 (35.2), 945 (37.2)*1 | 895 (35.2), 945 (37.2)*1 | 895 (35.2), 945 (37.2)*1 |
| 1145 (45.1) | 1145 (45.1)*15 | 1145 (45.1)*15 | 1145 (45.1)*15 | 1145 (45.1)*15 | 1145 (45.1)*15 |
| - | - | - | - | - | - |
| - | - | - | - | - | - |
| - | - | - | - | - | - |
| 1405 - 1415 (3097 - 3120)*9 | 1215 - 1310 (2679 - 2888) | 1175 - 1255 (2590 - 2767) | 1195 - 1295 (2635 - 2855) | 1185 - 1290 (2612 - 2844) | 1225 - 1325 (2701 - 2921) |
| 1240 - 1265 (2734 - 2789)*9 | 1095 - 1275 (2414 - 2811) | 1110 - 1225 (2447 - 2701) | 1095 - 1290 (2414 - 2844) | 1120 - 1280 (2469 - 2822) | 1100 - 1295 (2425 - 2855) |
| 2645 - 2680 (5831 - 5908)*9 | 2310 - 2585 (5093 - 5699) | 2285 - 2480 (5038 - 5467) | 2290 - 2585 (5049 - 5699) | 2305 - 2570 (5082 - 5666) | 2325 - 2620 (5126 - 5776) |
| - | - | - | - | - | - |
| - | - | - | - | - | - |
| 3260 (7187) | 3160 (6967) | 3160 (6967) | 3160 (6967) | 3160 (6967) | 3160 (6967) |
| 96 + 45 (21.1 + 9.9) | 95 + 50 (20.9 + 11.0) | 96 + 45 (21.1 + 9.9) | 96 + 45 (21.1 + 9.9) | 96 + 45 (21.1 + 9.9) | 96 + 45 (21.1 + 9.9) |
| - | - | - | - | - | - |
| 180 (112) | 155 (96) | 180 (112) | 180 (112) | 180 (112) | 180 (112) |
| - | - | - | - | - | - |
| 16 (10)*10, 39 (24)*11 | 13 (8)*10, 32 (20)*11 | 16 (10)*10, 39 (24)*11 | 16 (10)*10, 39 (24)*11 | 16 (10)*10, 39 (24)*11 | 21 (13)*10, 51 (31)*11 |
| 27 (17)*10, 67 (42)*11 | 25 (16)*10, 60 (37)*11 | 28 (17)*10, 70 (43)*11 | 28 (17)*10, 70 (43)*11 | 28 (17)*10, 70 (43)*11 | 40 (25)*10, 97 (60)*11 |
| - | 40 (25)*10, 97 (60)*11 | 44 (27)*10, 107 (66)*11 | 44 (27)*10, 107 (66)*11 | 44 (27)*10, 107 (66)*11 | - |
| - | 57 (35)*10, 140 (87)*11 | 65 (40)*10, 160 (99)*11 | 65 (40)*10, 160 (99)*11 | 65 (40)*10, 160 (99)*11 | - |
| 6.0 (19.7) | 6.0 (19.7) | 5.9 (19.4) | 5.9 (19.4) | 5.9 (19.4) | 5.9 (19.4) |
| 6.4 (21.0) | 6.4 (21.0) | 6.3 (20.7) | 6.3 (20.7) | 6.3 (20.7) | 6.3 (20.7) |
| 1HD-FTE | 1HZ | 1FZ-FE | 1FZ-FE | 1FZ-FE | 1FZ-FE |
| 24-Valve, OHC | 12-Valve, OHC | 24-Valve, DOHC | 24-Valve, DOHC | 24-Valve, DOHC | 24-Valve, DOHC |
| 94.0 × 100.0 (3.70 × 3.94) | 94.0 × 100.0 (3.70 × 3.94) | 100.0 × 95.0 (3.97 × 3.74) | 100.0 × 95.0 (3.97 × 3.74) | 100.0 × 95.0 (3.97 × 3.74) | 100.0 × 95.0 (3.97 × 3.74) |
| 4164 (254.0) | 4164 (254.0) | 4477 (573.1) | 4477 (573.1) | 4477 (573.1) | 4477 (573.1) |
| 18.8:1 | 22.4:1 | 9.0:1 | 9.0:1 | 9.0:1 | 9.0:1 |
| Distributor Type | Distributor Type | EFI | EFI | EFI | EFI |
| 48 or higher | 48 or higher | 91 or higher | 91 or higher | 91 or higher | 91 or higher |
| 150/3400 (EEC) | 96/3800 (SAE-NET) | 161/4600 (SAE-NET) | 161/4600 (SAE-NET) | 161/4600 (SAE-NET) | 155/4600 (SAE-NET) |
| 430/1400 - 3200 (EEC) | 285/2200 (SAE-NET) | 116/3600 (SAE-NET) | 116/3600 (SAE-NET) | 116/3600 (SAE-NET) | 113/3600 (SAE-NET) |
| 12-55 × 2 | 12-64 | 12-55 | 12-55 | 12-55 | 12-55 |
| 1440 | 840, 960*12 | 960 | 960, 1200*12 | 960, 1200*12 | 960, 1200*12 |
| 3.0 | 2.5 | 1.4 | 1.4 | 1.4 | 1.4 |
| | Dry, Single Plate Diaphragm | Dry, Single Plate Diaphragm | Dry, Single Plate Diaphragm | Dry, Single Plate Diaphragm | - |
| A750F | R151F | H151F | H151F | H151F | A442F |
| 3.520 | 4.313 | 4.081 | 4.081 | 4.081 | 2.950 |
| 2.042 | 2.330 | 2.294 | 2.294 | 2.294 | 1.530 |
| 1.400 | 1.436 | 1.490 | 1.490 | 1.490 | 1.000 |
| 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 0.765 |
| 0.716 | 0.838 | 0.881 | 0.881 | 0.881 | - |
| 3.224 | 4.220 | 4.313 | 4.313 | 4.313 | 2.678 |
| 1.000/2.488 | 1.000/2.488 | 1.000/2.488 | 1.000/2.488 | 1.000/2.488 | 1.000/2.488 |
| 3.909/3.909 | 4.300/4.300 | 4.300/4.300 | 4.300/4.300 | 4.300/4.300 | 4.300/4.300 |
| 8"/9.5" | 8"/9.5" | 8"/9.5" | 8"/9.5" | 8"/9.5" | 8"/9.5" |
| Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc |
| Ventilated Disc | L. T Drum, Ventilated Disc*16 | L. T Drum, Ventilated Disc*16 | L. T Drum, Ventilated Disc*16 | L. T Drum, Ventilated Disc*16 | L. T Drum, Ventilated Disc*16 |
| Drum | Drum | Drum | Drum | Drum | Drum |
| Hydraulic | Vacuum, Hydraulic*16 | Vacuum, Hydraulic*16 | Vacuum, Hydraulic*16 | Vacuum, Hydraulic*16 | Vacuum, Hydraulic*16 |
| P & B Valve | LSP & BV, P & B Valve*16 | LSP & BV, P & B Valve*16 | LSP & BV, P & B Valve*16 | LSP & BV, P & B Valve*16 | LSP & BV, P & B Valve*16 |
| Double Wishbone | Leading Arm, Coil | Double Wishbone | Double Wishbone | Double Wishbone | Double Wishbone |
| 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod |
| Standard | Standard | Standard | Standard | Standard | Standard |
| Standard | Standard | Standard | Standard | Standard | Standard |
| Rack & Pinion | Recerculating Ball | Rack & Pinion | Rack & Pinion | Rack & Pinion | Rack & Pinion |
| 17.3 | 18.59 | 17.3 | 17.3 | 17.3 | 17.3 |
| Integral Type | Integral Type | Integral Type | Integral Type | Integral Type | Integral Type |

*11: Transfer in High
*12: Option

*15: With Back Door-Mounted Spare Tire,
Tire Size 235/85R16 +295 mm (11.6 in.),
Tire Size 275/70R16 or 275/65R17 +305 mm (12.0 in.),
Tire Size 7.50R16 +265 mm (10.4 in.)

*16: With ABS

| Item / Area | | | | G.C.C. Countries | | | |
|---|---|---|---|---|---|---|---|
| Body Type | | | | Wagon (Lift-Up Back Door) | Wagon (Swing Back Door) | Wagon (Lift-Up Back Door) | Wagon (Swing Back Door) |
| Vehicle Grade | | | | GX | | VX | |
| Model Code | | | | FZJ100L-GNPNKV | UZJ100L-GCMEKV | UZJ100L-GNMEKV | UZJ100L-GCAEKV |
| Major Dimensions & Vehicle Weights | Overall | Length | mm (in.) | 4890 (192.5)*15, 4940 (194.5)*1 *15 | 4890 (192.5)*15 *17 *15,17, 4940 (194.5)*1 *15 | 4890 (192.5)*15 *17 *15,17, 4940 (194.5)*1 *15 | 4890 (192.5)*15 *17 *15,17, 4940 (194.5)*1 *15 |
| | | Width | mm (in.) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) |
| | | Height* | mm (in.) | 1880 (74.0)*2 *4, 1860 (73.2)*2 *4 *5 | 1880 (74.0)*2 *4, 1850 (72.8)*2 *3 *4 | 1880 (74.0)*2 *4, 1850 (72.8)*2 *3 *4 | 1880 (74.0)*2 *4, 1850 (72.8)*2 *3 *4 |
| | Wheel Base | | mm (in.) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) |
| | Tread | Front | mm (in.) | 1640 (64.6), 1620 (63.8)*5 | 1620 (63.8) | 1620 (63.8) | 1620 (63.8) |
| | | Rear | mm (in.) | 1635 (64.4), 1615 (63.6)*5 | 1615 (63.6) | 1615 (63.6) | 1615 (63.6) |
| | Room | Length | mm (in.) | 1805 (71.1) | - | 2505 (98.6) | - |
| | | Width | mm (in.) | 1615 (63.6) | 1620 (63.8) | 1620 (63.8) | 1620 (63.8) |
| | | Height | mm (in.) | 1180 (46.5), 1150 (45.3)*7 | 1145 (45.1), 1150 (45.3)*7 | 1145 (45.1), 1150 (45.3)*7 | 1145 (45.1), 1150 (45.3)*7 |
| | Cargo Space | Length | mm (in.) | 1085 (42.7) | - | 335 (13.2) | - |
| | | Width | mm (in.) | - | - | - | - |
| | | Height | mm (in.) | 1065 (41.9) | - | 995 (39.2) | - |
| | Overhang | Front | mm (in.) | 895 (35.2), 945 (37.2)*1 | 895 (35.2)*17, 945 (37.2)*1 | 895 (35.2)*17, 945 (37.2)*1 | 895 (35.2)*17, 945 (37.2)*1 |
| | | Rear | mm (in.) | 1145 (45.1)*15 | 1145 (45.1)*15 | 1145 (45.1)*15 | 1145 (45.1)*15 |
| | Min. Running Ground Clearance | | mm (in.) | - | - | - | - |
| | Angle of Approach | | degrees | - | - | - | - |
| | Angle of Departure | | degrees | - | - | - | - |
| | Curb Weight*8 | Front | kg (lb) | 1215 - 1320 (2679 - 2910) | 1230 - 1345 (2712 - 2965) | 1240 - 1345 (2734 - 2965) | 1240 - 1365 (2734 - 3009) |
| | | Rear | kg (lb) | 1130 - 1290 (2491 - 2844) | 1090 - 1275 (2403 - 2811) | 1080 - 1305 (2381 - 2877) | 1090 - 1265 (2043 - 2789) |
| | | Total | kg (lb) | 2345 - 2610 (5170 - 5754) | 2320 - 2620 (5115 - 5776) | 2320 - 2650 (5115 - 5842) | 2330 - 2630 (5137 - 5798) |
| | Gross Vehicle Weight | Front | kg (lb) | - | - | - | - |
| | | Rear | kg (lb) | - | - | - | - |
| | | Total | kg (lb) | 3160 (6967) | 3260 (7187) | 3260 (7187) | 3260 (7187) |
| | Fuel Tank Capacity | | ℓ (Imp. gal.) | 96 + 45 (21.1 + 9.9) | 96 + 45 (21.1 + 9.9) | 96 + 45 (21.1 + 9.9) | 96 + 45 (21.1 + 9.9) |
| | Luggage Compartment Capacity | | $m^3$ (cu.ft.) | - | - | - | - |
| Performance | Max. Speed | | km/h (mph) | 180 (112) | 180 (112) | 180 (112) | 180 (112) |
| | Max. Cruising Speed | | km/h (mph) | - | - | - | - |
| | Max. Permissible Speed | 1st Gear | km/h (mph) | 21 (13)*10, 51 (31)*11 | 17 (11)*10, 40 (25)*11 | 17 (11)*10, 40 (25)*11 | 19 (12)*10, 47 (29)*11 |
| | | 2nd Gear | km/h (mph) | 40 (25)*10, 97 (60)*11 | 29 (18)*10, 72 (45)*11 | 29 (18)*10, 72 (45)*11 | 33 (20)*10, 81 (50)*11 |
| | | 3rd Gear | km/h (mph) | - | 45 (28)*10, 111 (69)*11 | 45 (28)*10, 111 (69)*11 | - |
| | | 4th Gear | km/h (mph) | - | 67 (42)*10, 165 (102)*11 | 67 (42)*10, 165 (102)*11 | - |
| | Min. Turning Radius | Tire | m (ft.) | 5.9 (19.4) | 5.9 (19.4) | 5.9 (19.4) | 5.9 (19.4) |
| | | Body | m (ft.) | 6.3 (20.7) | 6.3 (20.7) | 6.3 (20.7) | 6.3 (20.7) |
| Engine | Engine Type | | | 1FZ-FE | 2UZ-FE | 2UZ-FE | 2UZ-FE |
| | Valve Mechanism | | | 24-Valve, DOHC | 32-Valve, DOHC | 32-Valve, DOHC | 32-Valve, DOHC |
| | Bore × Stroke | | mm (in.) | 100.0 × 95.0 (3.97 × 3.74) | 94.0 × 84.0 (3.70 × 3.31) | 94.0 × 84.0 (3.70 × 3.31) | 94.0 × 84.0 (3.70 × 3.31) |
| | Displacement | | $cm^3$ (cu.in.) | 4477 (573.1) | 4664 (284.5) | 4664 (284.5) | 4664 (284.5) |
| | Compression Ratio | | | 9.0:1 | 9.6:1 | 9.6:1 | 9.6:1 |
| | Fuel System | | | EFI | EFI | EFI | EFI |
| | Research Octane No. or Cetane No. (Diesel) | | | 91 or higher | 91 or higher | 91 or higher | 91 or higher |
| | Max. Output | | kW/rpm | 155/4600 (SAE-NET) | 170/4800 (SAE-NET) | 170/4800 (SAE-NET) | 170/4800 (SAE-NET) |
| | Max. Torque | | N·m/rpm | 373/3600 (SAE-NET) | 410/3400 (SAE-NET) | 410/3400 (SAE-NET) | 410/3400 (SAE-NET) |
| Engine Electrical | Battery Capacity (5HR) | | Voltage & Amp. hr. | 12-55 | 12-55 | 12-55 | 12-55 |
| | Alternator Output | | Watts | 960, 1200*12 | 960 | 960 | 960 |
| | Starter Output | | kW | 1.4 | 1.4 | 1.4 | 1.4 |
| Chassis | Clutch Type | | | - | Dry, Single Plate Diaphragm | Dry, Single Plate Diaphragm | - |
| | Transmission Type | | | A442F | H151F | H151F | A750F |
| | Transmission Gear Ratio | In First | | 2.950 | 4.081 | 4.081 | 3.520 |
| | | In Second | | 1.530 | 2.294 | 2.294 | 2.042 |
| | | In Third | | 1.000 | 1.490 | 1.490 | 1.400 |
| | | In Fourth | | 0.765 | 1.000 | 1.000 | 1.000 |
| | | In Fifth | | - | 0.881 | 0.881 | 0.716 |
| | | In Reverse | | 2.678 | 4.313 | 4.313 | 3.224 |
| | Transfer Gear Ratio H4/L4 | | | 1.000/2.488 | 1.000/2.488 | 1.000/2.488 | 1.000/2.488 |
| | Differential Gear Ratio (Front/Rear) | | | 4.300/4.300 | 4.300/4.300 | 4.300/4.300 | 4.100/4.100 |
| | Differential Gear Size (Front/Rear) | | in. | 8"/9.5" | 8"/9.5" | 8"/9.5" | 8"/9.5" |
| | Brake Type | Front | | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc |
| | | Rear | | L. T Drum, Ventilated Disc*16 | L. T Drum, Ventilated Disc*16 | L. T Drum, Ventilated Disc*16 | L. T Drum, Ventilated Disc*16 |
| | Parking Brake Type | | | Drum | Drum | Drum | Drum |
| | Brake Booster Type and Size | | in. | Vacuum, Hydraulic*16 | Vacuum, Hydraulic*16 | Vacuum, Hydraulic*16 | Vacuum, Hydraulic*16 |
| | Proportioning Valve Type | | | LSP & BV, P & B Valve*16 | LSP & BV, P & B Valve*16 | LSP & BV, P & B Valve*16 | LSP & BV, P & B Valve*16, -*13 |
| | Suspension Type | Front | | Double Wishbone | Double Wishbone | Double Wishbone | Double Wishbone |
| | | Rear | | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod |
| | Stabilizer Bar | Front | | Standard | Standard | Standard | Standard |
| | | Rear | | Standard | Standard | Standard | Standard |
| | Steering Gear Type | | | Rack & Pinion | Rack & Pinion | Rack & Pinion | Rack & Pinion |
| | Steering Gear Ratio (Overall) | | | 17.3 | 17.3 | 17.3 | 17.3 |
| | Power Steering Type | | | Integral Type | Integral Type | Integral Type | Integral Type |

*: Unladed Vehicle
*1: With Electrical Winch
*2: With Roof Rail +40 mm (1.6 in.)
*3: With AHC
*4: With Roof Rack +230 mm (9.1 in.)
*5: With 275/70R16 Tire
*7: With Moon Roof
*8: Separate Seat, Seating Capacity : 5
*10: Transfer in Low

| G.C.C. Countries | General Countries | | | | |
|---|---|---|---|---|---|
| Wagon (Lift-Up Back Door) | Wagon (Swing Back Door) | Wagon (Swing Back Door) | Wagon (Lift-Up Back Door) | | Wagon (Swing Back Door) |
| VX | STD | GX | | | STD |
| UZJ100L-GNAEKV | FZJ105L-GCMRK | FZJ105L-GCMNK | FZJ105L-GNMNK | FZJ105R-GNMNK | HZJ105R-GCMRS |
| 4890 (192.5)*15 *17 *15.17, 4940 (194.5)*1 *15 | 4890 (192.5)*15, 4940 (194.5)*1 *15 | 4890 (192.5)*15, 4940 (194.5)*1 *15 | 4890 (192.5)*15, 4940 (194.5)*1 *15 | 4890 (192.5)*15, 4940 (194.5)*1 *15 | 4890 (192.5)*15, 4940 (194.5)*1 *15 |
| 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) |
| 1880 (74.0)*2 *4, 1850 (72.8)*2 *3 *4 | 1925 (75.8)*2 *4, 1930 (76.0)*2 *4 *18 | 1925 (75.8)*2 *4, 1920 (75.6)*2 *4 *5, 1930 (76.0)*2 *4 *18 | 1925 (75.8)*2 *4, 1920 (75.6)*2 *4 *5, 1930 (76.0)*2 *4 *18 | 1925 (75.8)*2 *4, 1920 (75.6)*2 *4 *5, 1930 (76.0)*2 *4 *18 | 1925 (75.8)*2 *4, 1930 (76.0)*2 *4 *18 |
| 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) |
| 1620 (63.8) | 1605 (63.2) | 1605 (63.2) | 1605 (63.2) | 1605 (63.2) | 1605 (63.2) |
| 1615 (63.6) | 1600 (63.0) | 1600 (63.0) | 1600 (63.0) | 1600 (63.0) | 1600 (63.0) |
| 2505 (98.6) | 1805 (71.1) | 1805 (71.1) | 1805 (71.1) | 1805 (71.1) | 1805 (71.1) |
| 1620 (63.8) | 1615 (63.6) | 1615 (63.6) | 1615 (63.6) | 1615 (63.6) | 1615 (63.6) |
| 1145 (45.1), 1150 (45.3)*7 | 1180 (46.5) | 1180 (46.5) | 1180 (46.5) | 1180 (46.5) | 1180 (46.5) |
| 335 (13.2) | 1085 (42.7) | 1085 (42.7) | 1085 (42.7) | 1085 (42.7) | 1085 (42.7) |
| - | - | - | - | - | - |
| 995 (39.2) | 1065 (41.9) | 1065 (41.9) | 1065 (41.9) | 1065 (41.9) | 1065 (41.9) |
| 895 (35.2)*17, 945 (37.2)*1 | 895 (35.2), 945 (37.2)*1 | 895 (35.2), 945 (37.2)*1 | 895 (35.2), 945 (37.2)*1 | 895 (35.2), 945 (37.2)*1 | 895 (35.2), 945 (37.2)*1 |
| 1145 (45.1)*15 | 1145 (45.1)*15 | 1145 (45.1)*15 | 1145 (45.1)*15 | 1145 (45.1)*15 | 1145 (45.1)*15 |
| - | - | - | - | - | - |
| - | - | - | - | - | - |
| - | - | - | - | - | - |
| 1250 - 1370 (2756 - 3020) | 1160 - 1250 (2557 - 2756) | 1170 - 1300 (2579 - 2866) | 1165 - 1290 (2568 - 2844) | 1165 - 1285 (2568 - 2833) | 1200 - 1290 (2646 - 2844) |
| 1080 - 1295 (2381 - 2855) | 1090 - 1230 (2403 - 2712) | 1080 - 1240 (2381 - 2739) | 1090 - 1245 (2403 - 2745) | 1090 - 1245 (2403 - 2745) | 1080 - 1220 (2381 - 2690) |
| 2330 - 2665 (5137 - 5875) | 2250 - 2480 (4960 - 5467) | 2250 - 2540 (4960 - 5660) | 2255 - 2535 (4971 - 5589) | 2255 - 2530 (4971 - 5578) | 2280 - 2510 (5027 - 5534) |
| - | - | - | - | - | - |
| - | - | - | - | - | - |
| 3260 (7187) | 3160 (6967) | 3160 (6967) | 3160 (6967) | 3160 (6967) | 3160 (6967) |
| 96 + 45 (21.1 + 9.9) | 95 (20.9), 95 + 50 (20.9 + 11.0)*12 | 95 (20.9), 95 + 50 (20.9 + 11.0)*12 | 95 (20.9), 95 + 50 (20.9 + 11.0)*12 | 95 (20.9), 95 + 50 (20.9 + 11.0)*12 | 95 (20.9), 95 + 50 (20.9 + 11.0)*12 |
| - | - | - | - | - | - |
| 180 (112) | 175 (109) | 175 (109) | 175 (109) | 175 (109) | 155 (96) |
| - | - | - | - | - | - |
| 19 (12)*10, 47 (29)*11 | 16 (10)*10, 39 (24)*11 | 16 (10)*10, 39 (24)*11 | 16 (10)*10, 39 (24)*11 | 16 (10)*10, 39 (24)*11 | 13 (8)*10, 32 (20)*11 |
| 33 (20)*10, 81 (50)*11 | 28 (17)*10, 70 (43)*11 | 28 (17)*10, 70 (43)*11 | 28 (17)*10, 70 (43)*11 | 28 (17)*10, 70 (43)*11 | 25 (16)*10, 60 (37)*11 |
| - | 44 (27)*10, 107 (66)*11 | 44 (27)*10, 107 (66)*11 | 44 (27)*10, 107 (66)*11 | 44 (27)*10, 107 (66)*11 | 40 (25)*10, 97 (60)*11 |
| - | 65 (40)*10, 160 (99)*11 | 65 (40)*10, 160 (99)*11 | 65 (40)*10, 160 (99)*11 | 65 (40)*10, 160 (99)*11 | 57 (35)*10, 140 (87)*11 |
| 5.9 (19.4) | 6.0 (19.7) | 6.0 (19.7) | 6.0 (19.7) | 6.0 (19.7) | 6.0 (19.7) |
| 6.3 (20.7) | 6.4 (21.0) | 6.4 (21.0) | 6.4 (21.0) | 6.4 (21.0) | 6.4 (21.0) |
| 2UZ-FE | 1FZ-FE | 1FZ-FE | 1FZ-FE | 1FZ-FE | 1HZ |
| 32-Valve, DOHC | 24-Valve, DOHC | 24-Valve, DOHC | 24-Valve, DOHC | 24-Valve, DOHC | 12-Valve, OHC |
| 94.0 × 84.0 (3.70 × 3.31) | 100.0 × 95.0 (3.97 × 3.74) | 100.0 × 95.0 (3.97 × 3.74) | 100.0 × 95.0 (3.97 × 3.74) | 100.0 × 95.0 (3.97 × 3.74) | 94.0 × 100.0 (3.70 × 3.94) |
| 4664 (284.5) | 4477 (573.1) | 4477 (573.1) | 4477 (573.1) | 4477 (573.1) | 4164 (254.0) |
| 9.6:1 | 9.0:1 | 9.0:1 | 9.0:1 | 9.0:1 | 22.4:1 |
| EFI | EFI | EFI | EFI | EFI | Distributor Type |
| 91 or higher | 91 or higher | 91 or higher | 91 or higher | 91 or higher | 48 or higher |
| 170/4800 (SAE-NET) | 165/4600 (SAE-NET) | 165/4600 (SAE-NET) | 165/4600 (SAE-NET) | 165/4600 (SAE-NET) | 96/3800 (SAE-NET) |
| 410/3400 (SAE-NET) | 387/3600 (SAE-NET) | 387/3600 (SAE-NET) | 387/3600 (SAE-NET) | 387/3600 (SAE-NET) | 285/2200 (SAE-NET) |
| 12-55 | 12-55 | 12-55 | 12-55 | 12-55 | 12-55, 64*12 |
| 960 | 960 | 960 | 960 | 960 | 840 |
| 1.4 | 1.4, 2.0*12 | 1.4, 2.0*12 | 1.4, 2.0*12 | 1.4, 2.0*12 | 2.5 |
| - | Dry, Single Plate Diaphragm | Dry, Single Plate Diaphragm | Dry, Single Plate Diaphragm | Dry, Single Plate Diaphragm | Dry, Single Plate Diaphragm |
| A750F | H151F | H151F | H151F | H151F | R151F |
| 3.520 | 4.081 | 4.081 | 4.081 | 4.081 | 4.313 |
| 2.042 | 2.294 | 2.294 | 2.294 | 2.294 | 2.330 |
| 1.400 | 1.490 | 1.490 | 1.490 | 1.490 | 1.436 |
| 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| 0.716 | 0.881 | 0.881 | 0.881 | 0.881 | 0.838 |
| 3.224 | 4.313 | 4.313 | 4.313 | 4.313 | 4.220 |
| 1.000/2.488 | 1.000/2.488 | 1.000/2.488 | 1.000/2.488 | 1.000/2.488 | 1.000/2.488 |
| 4.100/4.100 | 4.300/4.300 | 4.300/4.300 | 4.300/4.300 | 4.300/4.300 | 4.300/4.300 |
| 8"/9.5" | 8"/9.5" | 8"/9.5" | 8"/9.5" | 8"/9.5" | 8"/9.5" |
| Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc |
| L. T Drum, Ventilated Disc*16 | L. T Drum, Ventilated Disc*12 | L. T Drum, Ventilated Disc*16 | L. T Drum, Ventilated Disc*12 | L. T Drum, Ventilated Disc*16 | L. T Drum, Ventilated Disc*16 |
| Drum | Drum | Drum | Drum | Drum | Drum |
| Vacuum, Hydraulic*16 | Vacuum | Vacuum, Hydraulic*16 | Vacuum, Hydraulic*16 | Vacuum, Hydraulic*16 | Vacuum |
| LSP & BV, P & B Valve*16, -*13 | LSP & BV | LSP & BV, P & B Valve*16 | LSP & BV, P & B Valve*16 | LSP & BV, P & B Valve*16 | LSP & BV |
| Double Wishbone | Leading Arm, Coil | Leading Arm, Coil | Leading Arm, Coil | Leading Arm, Coil | Leading Arm, Coil |
| 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod |
| Standard | Standard | Standard | Standard | Standard | Standard |
| Standard | Standard | Standard | Standard | Standard | Standard |
| Rack & Pinion | Recerculating Ball | Recerculating Ball | Recerculating Ball | Recerculating Ball | Recerculating Ball |
| 17.3 | 18.59 | 18.59 | 18.59 | 18.59 | 18.59 |
| Integral Type | Integral Type | Integral Type | Integral Type | Integral Type | Integral Type |

*11: Transfer in High
*12: Option
*13: With VSC
*15: With Back Door-Mounted Spare Tire,
Tire Size 235/85R16 +295 mm (11.6 in.),
Tire Size 275/70R16 or 275/65R17 +305 mm (12.0 in.),
Tire Size 7.50R16 +265 mm (10.4 in.)
*16: With ABS
*17: With Grille Guard +140 mm (5.5 in.)
*18: With 7.50R16 Tire

| Item / Area | | | | General Countries | | | |
|---|---|---|---|---|---|---|---|
| Body Type | | | | Wagon (Swing Back Door) | | Wagon (Lift-Up Back Door) | Wagon (Swing Back Door) |
| Vehicle Grade | | | | STD | GX | | |
| Model Code | | | | HZJ105L-GCMRS | HZJ105R-GCMNS | HZJ105R-GNMNS | HZJ105L-GCMNS |
| Major Dimensions & Vehicle Weights | Overall | Length | mm (in.) | 4890 (192.5)*15, 4940 (194.5)*1 *15 | 4890 (192.5)*15, 4940 (194.5)*1 *15 | 4890 (192.5)*15, 4940 (194.5)*1 *15 | 4890 (192.5)*15, 4940 (194.5)*1 *15 |
| | | Width | mm (in.) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) |
| | | Height* | mm (in.) | 1925 (75.8)*2 *4, 1920 (75.6)*2 *4 *5, 1930 (76.0)*2 *4 *18 | 1925 (75.8)*2 *4, 1920 (75.6)*2 *4 *5, 1930 (76.0)*2 *4 *18 | 1925 (75.8)*2 *4, 1920 (75.6)*2 *4 *5, 1930 (76.0)*2 *4 *18 | 1925 (75.8)*2 *4, 1920 (75.6)*2 *4 *5, 1930 (76.0)*2 *4 *18 |
| | Wheel Base | | mm (in.) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) |
| | Tread | Front | mm (in.) | 1605 (63.2) | 1605 (63.2) | 1605 (63.2) | 1605 (63.2) |
| | | Rear | mm (in.) | 1600 (63.0) | 1600 (63.0) | 1600 (63.0) | 1600 (63.0) |
| | Room | Length | mm (in.) | 1805 (71.1) | 1805 (71.1) | 1805 (71.1) | 1805 (71.1) |
| | | Width | mm (in.) | 1615 (63.6) | 1615 (63.6) | 1615 (63.6) | 1615 (63.6) |
| | | Height | mm (in.) | 1180 (46.5) | 1180 (46.5), 1150 (45.3)*7 | 1180 (46.5), 1150 (45.3)*7 | 1180 (46.5), 1150 (45.3)*7 |
| | Cargo Space | Length | mm (in.) | 1085 (42.7) | 1085 (42.7) | 1085 (42.7) | 1085 (42.7) |
| | | Width | mm (in.) | - | - | - | - |
| | | Height | mm (in.) | 1065 (41.9) | 1065 (41.9) | 1065 (41.9) | 1065 (41.9) |
| | Overhang | Front | mm (in.) | 895 (35.2), 945 (37.2)*1 | 895 (35.2), 945 (37.2)*1 | 895 (35.2), 945 (37.2)*1 | 895 (35.2), 945 (37.2)*1 |
| | | Rear | mm (in.) | 1145 (45.1)*15 | 1145 (45.1)*15 | 1145 (45.1)*15 | 1145 (45.1)*15 |
| | Min. Running Ground Clearance | | mm (in.) | - | - | - | - |
| | Angle of Approach | | degrees | - | - | - | - |
| | Angle of Departure | | degrees | - | - | - | - |
| | Curb Weight*8 | Front | kg (lb) | 1200 - 1300 (2646 - 2866) | 1210 - 1340 (2668 - 2954) | 1205 - 1330 ( 2657 - 2932) | 1210 - 1340 (2668 - 2954) |
| | | Rear | kg (lb) | 1080 - 1220 (2381 - 2690) | 1090 - 1245 (2403 - 2745) | 1100 - 1250 (2425 - 2756) | 1090 - 1250 (2403 - 2756) |
| | | Total | kg (lb) | 2280 - 2520 (5027 - 5556) | 2300 - 2585 (5071 - 5699) | 2305 - 2580 (5082 - 5688) | 2300 - 2590 (5071 - 5710) |
| | Gross Vehicle Weight | Front | kg (lb) | - | - | - | - |
| | | Rear | kg (lb) | - | - | - | - |
| | | Total | kg (lb) | 3160 (6967) | 3160 (6967) | 3160 (6967) | 3160 (6967) |
| | Fuel Tank Capacity | | ℓ (Imp. gal.) | 95 (20.9), 95 + 50 (20.9 + 11.0)*12 | 95 (20.9), 95 + 50 (20.9 + 11.0)*12 | 95 (20.9), 95 + 50 (20.9 + 11.0)*12 | 95 (20.9), 95 + 50 (20.9 + 11.0)*12 |
| | Luggage Compartment Capacity | | $m^3$ (cu.ft.) | - | - | - | - |
| Performance | Max. Speed | | km/h (mph) | 155 (96) | 155 (96) | 155 (96) | 155 (96) |
| | Max. Cruising Speed | | km/h (mph) | - | - | - | - |
| | Max. Permissible Speed | 1st Gear | km/h (mph) | 13 (8)*10, 32 (20)*11 | 13 (8)*10, 32 (20)*11 | 13 (8)*10, 32 (20)*11 | 13 (8)*10, 32 (20)*11 |
| | | 2nd Gear | km/h (mph) | 25 (16)*10, 60 (37)*11 | 25 (16)*10, 60 (37)*11 | 25 (16)*10, 60 (37)*11 | 25 (16)*10, 60 (37)*11 |
| | | 3rd Gear | km/h (mph) | 40 (25)*10, 97 (60)*11 | 40 (25)*10, 97 (60)*11 | 40 (25)*10, 97 (60)*11 | 40 (25)*10, 97 (60)*11 |
| | | 4th Gear | km/h (mph) | 57 (35)*10, 140 (87)*11 | 57 (35)*10, 140 (87)*11 | 57 (35)*10, 140 (87)*11 | 57 (35)*10, 140 (87)*11 |
| | Min. Turning Radius | Tire | m (ft.) | 6.0 (19.7) | 6.0 (19.7) | 6.0 (19.7) | 6.0 (19.7) |
| | | Body | m (ft.) | 6.4 (21.0) | 6.4 (21.0) | 6.4 (21.0) | 6.4 (21.0) |
| Engine | Engine Type | | | 1HZ | 1HZ | 1HZ | 1HZ |
| | Valve Mechanism | | | 12-Valve, OHC | 12-Valve, OHC | 12-Valve, OHC | 12-Valve, OHC |
| | Bore × Stroke | | mm (in.) | 94.0 × 100.0 (3.70 × 3.94) | 94.0 × 100.0 (3.70 × 3.94) | 94.0 × 100.0 (3.70 × 3.94) | 94.0 × 100.0 (3.70 × 3.94) |
| | Displacement | | $cm^3$ (cu.in.) | 4164 (254.0) | 4164 (254.0) | 4164 (254.0) | 4164 (254.0) |
| | Compression Ratio | | | 22.4:1 | 22.4:1 | 22.4:1 | 22.4:1 |
| | Fuel System | | | Distributor Type | Distributor Type | Distributor Type | Distributor Type |
| | Research Octane No. or Cetane No. (Diesel) | | | 48 or higher | 48 or higher | 48 or higher | 48 or higher |
| | Max. Output | | kW/rpm | 96/3800 (SAE-NET) | 96/3800 (SAE-NET) | 96/3800 (SAE-NET) | 96/3800 (SAE-NET) |
| | Max. Torque | | N·m/rpm | 285/2200 (SAE-NET) | 285/2200 (SAE-NET) | 285/2200 (SAE-NET) | 285/2200 (SAE-NET) |
| Engine Electrical | Battery Capacity (5HR) | | Voltage & Amp. hr. | 12-55, 64*12, 64 × 2*12 | 12-55, 64*12 | 12-55, 64*12 | 12-55, 64*12, 64 × 2*12 |
| | Alternator Output | | Watts | 840, 960*12 | 840 | 840 | 840, 960*12 |
| | Starter Output | | kW | 2.5, 3.0*12 | 2.5 | 2.5 | 2.5, 3.0*12 |
| Chassis | Clutch Type | | | Dry, Single Plate Diaphragm | Dry, Single Plate Diaphragm | Dry, Single Plate Diaphragm | Dry, Single Plate Diaphragm |
| | Transmission Type | | | R151F | R151F | R151F | R151F |
| | Transmission Gear Ratio | In First | | 4.313 | 4.313 | 4.313 | 4.313 |
| | | In Second | | 2.330 | 2.330 | 2.330 | 2.330 |
| | | In Third | | 1.436 | 1.436 | 1.436 | 1.436 |
| | | In Fourth | | 1.000 | 1.000 | 1.000 | 1.000 |
| | | In Fifth | | 0.838 | 0.838 | 0.838 | 0.838 |
| | | In Reverse | | 4.220 | 4.220 | 4.220 | 4.220 |
| | Transfer Gear Ratio H4/L4 | | | 1.000/2.488 | 1.000/2.488 | 1.000/2.488 | 1.000/2.488 |
| | Differential Gear Ratio (Front/Rear) | | | 4.300/4.300 | 4.300/4.300 | 4.300/4.300 | 4.300/4.300 |
| | Differential Gear Size (Front/Rear) | | in. | 8"/9.5" | 8"/9.5" | 8"/9.5" | 8"/9.5" |
| | Brake Type | Front | | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc |
| | | Rear | | L. T Drum, Ventilated Disc*16 | L. T Drum, Ventilated Disc*12 | L. T Drum, Ventilated Disc*16 | L. T Drum, Ventilated Disc*12 |
| | Parking Brake Type | | | Drum | Drum | Drum | Drum |
| | Brake Booster Type and Size | | in. | Vacuum, Hydraulic*16 | Vacuum, Hydraulic*16 | Vacuum, Hydraulic*16 | Vacuum, Hydraulic*16 |
| | Proportioning Valve Type | | | LSP & BV, P & B Valve*16 | LSP & BV, P & B Valve*16 | LSP & BV, P & B Valve*16 | LSP & BV, P & B Valve*16 |
| | Suspension Type | Front | | Leading Arm, Coil | Leading Arm, Coil | Leading Arm, Coil | Leading Arm, Coil |
| | | Rear | | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod |
| | Stabilizer Bar | Front | | Standard | Standard | Standard | Standard |
| | | Rear | | Standard | Standard | Standard | Standard |
| | Steering Gear Type | | | Recerculating Ball | Recerculating Ball | Recerculating Ball | Recerculating Ball |
| | Steering Gear Ratio (Overall) | | | 18.59 | 18.59 | 18.59 | 18.59 |
| | Power Steering Type | | | Integral Type | Integral Type | Integral Type | Integral Type |

*: Unladed Vehicle
*1: With Electrical Winch
*2: With Roof Rail +40 mm (1.6 in.)
*3: With AHC
*4: With Roof Rack +230 mm (9.1 in.)
*5: With 275/70R16 Tire
*6: With 3rd Seat
*7: With Moon Roof
*8: Separate Seat, Seating Capacity : 5
*10: Transfer in Low

| | General Countries | | | | | |
|---|---|---|---|---|---|---|
| | Wagon (Lift-Up Back Door) | Wagon (Lift-Up Back Door) | | Wagon (Swing Back Door) | Wagon (Lift-Up Back Door) | |
| | GX | VX | | | | |
| | HZJ105L-GNMNS | UZJ100L-GNAEK | HDJ100R-GNMEZ | HDJ100L-GCMEZ | HDJ100L-GNMEZ | HDJ100L-GNAEZ |
| 5 | 4890 (192.5)*15, 4940 (194.5)*1 *15 | 4890 (192.5)*15 *17 *15,17, 4940 (194.5)*1 *15 | 4890 (192.5)*15 *17 *15,17, 4940 (194.5)*1 *15 | 4890 (192.5)*15 *17 *15,17, 4940 (194.5)*1 *15 | 4890 (192.5)*15 *17 *15,17, 4940 (194.5)*1 *15 | 4890 (192.5)*15 *17 *15,17 |
| | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) | 1940 (76.4) |
| | 1925 (75.8)*2 *4, 1920 (75.6)*2 *4 *5, 1930 (76.0)*2 *4 *18 | 1920 (75.6)*2 *4, 1900 (74.8)*2 *4 *5, 1870 (73.6)*2 *3 *4, 1850 (72.8)*2 *3 *4 *5 | 1920 (75.6)*2 *4, 1900 (74.8)*2 *4 *5, 1870 (73.6)*2 *3 *4, 1850 (72.8)*2 *3 *4 *5 | 1920 (75.6)*2 *4, 1900 (74.8)*2 *4 *5 | 1920 (75.6)*2 *4, 1900 (74.8)*2 *4 *5, 1870 (73.6)*2 *3 *4, 1850 (72.8)*2 *3 *4 *5 | 1920 (75.6)*2 *4, 1900 (74.8)*2 *4 *5, 1870 (73.6)*2 *3 *4, 1850 (72.8)*2 *3 *4 *5 |
| | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) | 2850 (112.2) |
| | 1605 (63.2) | 1640 (64.6), 1620 (63.8)*5 | 1640 (64.6), 1620 (63.8)*5 | 1640 (64.6), 1620 (63.8)*5 | 1640 (64.6), 1620 (63.8)*5 | 1640 (64.6), 1620 (63.8)*5 |
| 10 | 1600 (63.0) | 1635 (64.4), 1615 (63.6)*5 | 1635 (64.4), 1615 (63.6)*5 | 1635 (64.4), 1615 (63.6)*5 | 1635 (64.4), 1615 (63.6)*5 | 1635 (64.4), 1615 (63.6)*5 |
| | 1805 (71.1) | 2505 (98.6)*6 | 2505 (98.6)*6 | 2505 (98.6)*6 | 2505 (98.6)*6 | 2505 (98.6)*6 |
| | 1615 (63.6) | 1620 (63.8)*6 | 1620 (63.8)*6 | 1620 (63.8)*6 | 1620 (63.8)*6 | 1620 (63.8)*6 |
| | 1180 (46.5), 1150 (45.3)*7 | 1145 (45.1), 1150 (45.3)*7 | 1145 (45.1), 1150 (45.3)*7 | 1145 (45.1), 1150 (45.3)*7 | 1145 (45.1), 1150 (45.3)*7 | 1145 (45.1), 1150 (45.3)*7 |
| | 1085 (42.7) | 335 (13.1)*6 | 335 (13.1)*6 | 335 (13.1)*6 | 335 (13.1)*6 | 335 (13.1)*6 |
| 15 | - | - | - | - | - | - |
| | 1065 (41.9) | 995 (39.2)*6 | 995 (39.2)*6 | 995 (39.2)*6 | 995 (39.2)*6 | 995 (39.2)*6 |
| | 895 (35.2), 945 (37.2)*1 | 895 (35.2)*17, 945 (37.2)*1 | 895 (35.2)*17, 945 (37.2)*1 | 895 (35.2)*17, 945 (37.2)*1 | 895 (35.2)*17, 945 (37.2)*1 | 895 (35.2)*17, 945 (37.2)*1 |
| | 1145 (45.1)*15 | 1145 (45.1)*15 | 1145 (45.1)*15 | 1145 (45.1)*15 | 1145 (45.1)*15 | 1145 (45.1)*15 |
| | - | - | - | - | - | - |
| 20 | - | - | - | - | - | - |
| | - | - | - | - | - | - |
| | 1205 - 1330 (2657 - 2932) | 1220 - 1385 (2690 - 3053) | 1280 - 1425 (2822 - 3142)*19 | 1280 - 1375 (2822 - 3031) | 1280 - 1425 (2822 - 3142) | 1320 - 1435 (2910 - 3164) |
| | 1100 - 1255 (2425 - 2767) | 1110 - 1280 (2447 - 2822) | 1120 - 1305 (2469 - 2877)*19 | 1150 - 1280 (2535 - 2822) | 1120 - 1305 (2469 - 2877) | 1120 - 1310 (2469 - 2888) |
| | 2305 - 2585 (5082 - 5699) | 2330 - 2665 (5137 - 5875) | 2400 - 2730 (5291 - 6019)*19 | 2430 - 2655 (5357 - 5853) | 2400 - 2730 (5291 - 6019) | 2440 - 2745 (5379 - 6052) |
| 25 | - | - | - | - | - | - |
| | - | - | - | - | - | - |
| | 3160 (6967) | 3260 (7187) | 3260 (7187) | 3260 (7187) | 3260 (7187) | 3260 (7187) |
| | 95 (20.9), 95 + 50 (20.9 + 11.0)*12 | 96 + 45 (21.1 + 9.9) | 96 (21.1), 96 + 45 (21.1 + 9.9)*12 | 96 (21.1), 96 + 45 (21.1 + 9.9)*12 | 96 (21.1), 96 + 45 (21.1 + 9.9)*12 | 96 (21.1), 96 + 45 (21.1 + 9.9)*12 |
| | - | - | - | - | - | - |
| 30 | 155 (96) | 180 (112) | 175 (109) | 175 (109) | 175 (109) | 180 (112) |
| | - | - | - | - | - | - |
| | 13 (8)*10, 32 (20)*11 | 19 (12)*10, 47 (29)*11 | 14 (19)*10, 35 (22)*11 | 14 (19)*10, 35 (22)*11 | 14 (19)*10, 35 (22)*11 | 14 (19)*10, 35 (22)*11 |
| | 25 (16)*10, 60 (37)*11 | 33 (20)*10, 81 (50)*11 | 26 (16)*10, 63 (39)*11 | 26 (16)*10, 63 (39)*11 | 26 (16)*10, 63 (39)*11 | 26 (16)*10, 63 (39)*11 |
| | 40 (25)*10, 97 (60)*11 | - | 39 (24)*10, 97 (60)*11 | 39 (24)*10, 97 (60)*11 | 39 (24)*10, 97 (60)*11 | 39 (24)*10, 97 (60)*11 |
| 35 | 57 (35)*10, 140 (87)*11 | - | 59 (37)*10, 144 (89)*11 | 59 (37)*10, 144 (89)*11 | 59 (37)*10, 144 (89)*11 | 59 (37)*10, 144 (89)*11 |
| | 6.0 (19.7) | 5.9 (19.4) | 5.9 (19.4) | 5.9 (19.4) | 5.9 (19.4) | 5.9 (19.4) |
| | 6.4 (21.0) | 6.3 (20.7) | 6.3 (20.7) | 6.3 (20.7) | 6.3 (20.7) | 6.3 (20.7) |
| | 1HZ | 2UZ-FE | 1HD-FTE | 1HD-FTE | 1HD-FTE | 1HD-FTE |
| | 12-Valve, OHC | 32-Valve, DOHC | 24-Valve, OHC | 24-Valve, OHC | 24-Valve, OHC | 24-Valve, OHC |
| 40 | 94.0 × 100.0 (3.70 × 3.94) | 94.0 × 84.0 (3.70 × 3.31) | 94.0 × 100.0 (3.70 × 3.94) | 94.0 × 100.0 (3.70 × 3.94) | 94.0 × 100.0 (3.70 × 3.94) | 94.0 × 100.0 (3.70 × 3.94) |
| | 4164 (254.0) | 4664 (284.5) | 4164 (254.0) | 4164 (254.0) | 4164 (254.0) | 4164 (254.0) |
| | 22.4:1 | 9.6:1 | 18.8:1 | 18.8:1 | 18.8:1 | 18.8:1 |
| | Distributor Type | EFI | Distributor Type | Distributor Type | Distributor Type | Distributor Type |
| | 48 or higher | 91 or higher | 48 or higher | 48 or higher | 48 or higher | 48 or higher |
| 45 | 96/3800 (SAE-NET) | 170/4800 (SAE-NET) | 150/3400 (EEC) | 150/3400 (EEC) | 150/3400 (EEC) | 150/3400 (EEC) |
| | 285/2200 (SAE-NET) | 410/3400 (SAE-NET) | 430/1400 - 3200 (EEC) | 430/1400 - 3200 (EEC) | 430/1400 - 3200 (EEC) | 430/1400 - 3200 (EEC) |
| | 12-55, 64*12 | 12-55 | 12-55 × 2 | 12-55 × 2 | 12-55 × 2 | 12-55 × 2 |
| | 840 | 960 | 840, 960*12 | 960 | 840, 960*12 | 960 |
| | 2.5 | 1.4 | 3.0 | 3.0 | 3.0 | 3.0 |
| 50 | Dry, Single Plate Diaphragm | - | Dry, Single Plate Diaphragm | Dry, Single Plate Diaphragm | Dry, Single Plate Diaphragm | - |
| | R151F | A750F | H151F | H151F | H151F | A750F |
| | 4.313 | 3.520 | 4.081 | 4.081 | 4.081 | 3.520 |
| | 2.330 | 2.042 | 2.294 | 2.294 | 2.294 | 2.042 |
| | 1.436 | 1.400 | 1.490 | 1.490 | 1.490 | 1.400 |
| 55 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| | 0.838 | 0.716 | 0.881 | 0.881 | 0.881 | 0.716 |
| | 4.220 | 3.224 | 4.313 | 4.313 | 4.313 | 3.224 |
| | 1.000/2.488 | 1.000/2.488 | 1.000/2.488 | 1.000/2.488 | 1.000/2.488 | 1.000/2.488 |
| | 4.300/4.300 | 4.100/4.100 | 4.100/4.100 | 4.100/4.100 | 4.100/4.100 | 3.909/3.909 |
| 60 | 8"/9.5" | 8"/9.5" | 8"/9.5" | 8"/9.5" | 8"/9.5" | 8"/9.5" |
| | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc | Ventilated Disc |
| | L. T Drum | L. T Drum, Ventilated Disc*16 | L. T Drum, Ventilated Disc*16 | L. T Drum, Ventilated Disc*16 | L. T Drum, Ventilated Disc*16 | L. T Drum, Ventilated Disc*16 |
| | Drum | Drum | Drum | Drum | Drum | Drum |
| | Vacuum, Hydraulic*16 | Vacuum, Hydraulic*16 | Vacuum, Hydraulic*16 | Vacuum, Hydraulic*16 | Vacuum, Hydraulic*16 | Vacuum, Hydraulic*16 |
| 65 | LSP & BV, P & B Valve*16 | LSP & BV, P & B Valve*16, -*13 | LSP & BV, P & B Valve*16 | LSP & BV, P & B Valve*16 | LSP & BV, P & B Valve*16 | LSP & BV, P & B Valve*16 |
| | Leading Arm, Coil | Double Wishbone | Double Wishbone | Double Wishbone | Double Wishbone | Double Wishbone |
| | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod | 4-Link with Lateral Rod |
| | Standard | Standard | Standard | Standard | Standard | Standard |
| | Standard | Standard | Standard | Standard | Standard | Standard |
| 70 | Recerculating Ball | Rack & Pinion | Rack & Pinion | Rack & Pinion | Rack & Pinion | Rack & Pinion |
| | 18.59 | 17.3 | 17.3 | 17.3 | 17.3 | 17.3 |
| | Integral Type | Integral Type | Integral Type | Integral Type | Integral Type | Integral Type |

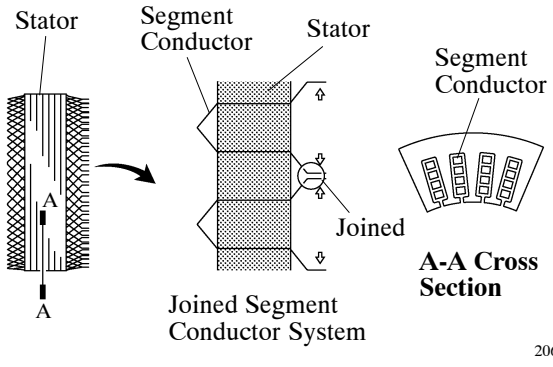
*11: Transfer in High
*12: Option
*13: With VSC
*15: With Back Door-Mounted Spare Tire,
Tire Size 235/85R16 +295 mm (11.6 in.),
Tire Size 275/70R16 or 275/65R17 +305 mm (12.0 in.),
Tire Size 7.50R16 +265 mm (10.4 in.)
*16: With ABS
*17: With Grille Guard +140 mm (5.5 in.)
*18: With 7.50R16 Tire
*19: Bench Seat, Sating Capacity : 10

# NEW FEATURES

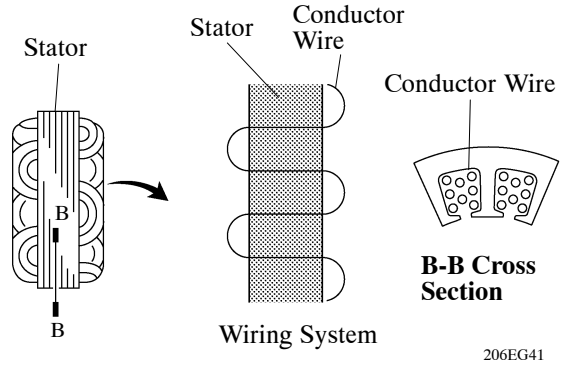
## ■2UZ-FE ENGINE

### Charging system

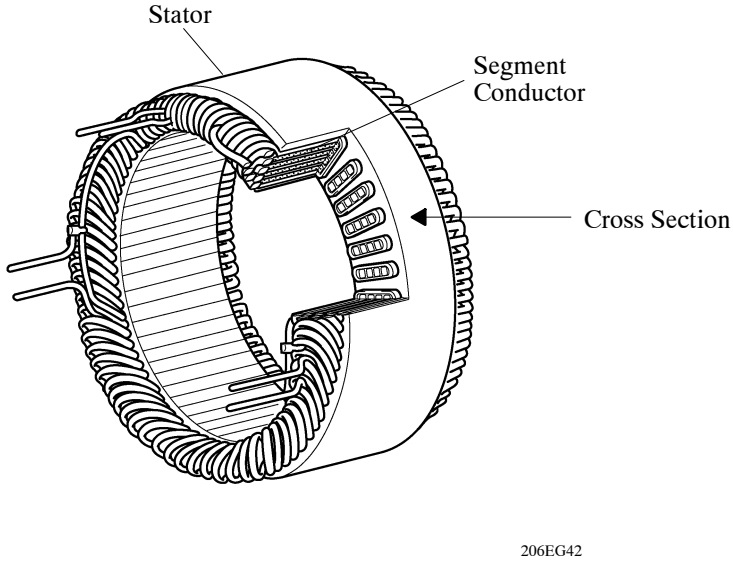
- A compact and lightweight Segment Conductor type alternator that generates high amperage output in a highly efficient manner has been adopted on standard equipment.
- This alternator has a joined segment conductor system, in which multiple segment conductors are welded together to form the stator. Compared to the conventional winding system, the electrical resistance is reduced due to the shape of the segment conductors, and their arrangement helps to make the alternator more compact.




**Segment Conductor Type Alternator**




**Conventional Type Alternator**

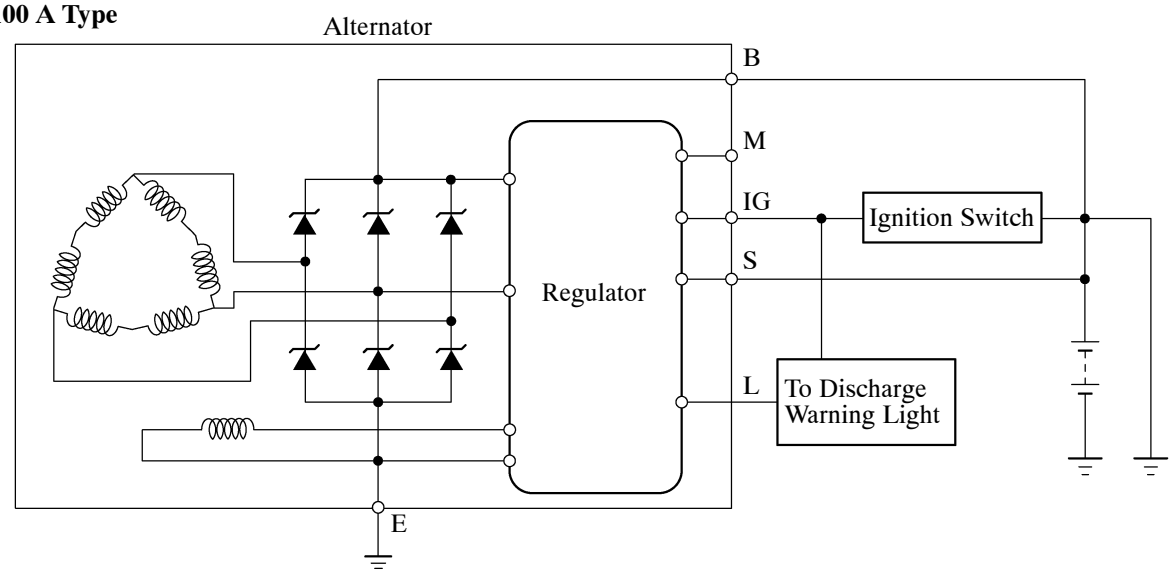



**Stator of Segment Conductor Type Alternator**

4

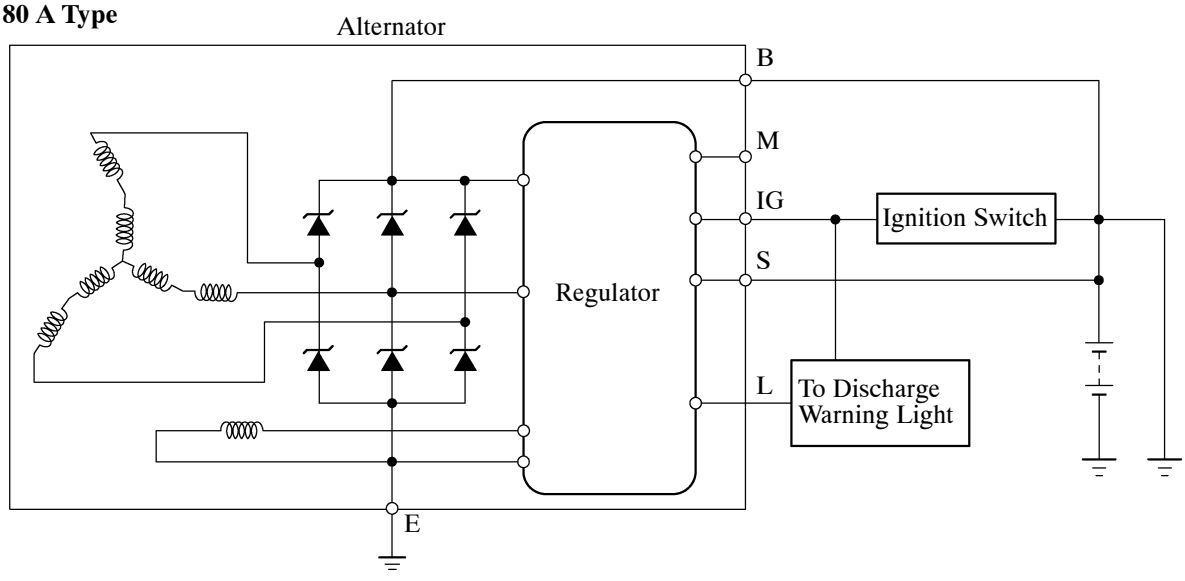
**▶ Wiring Diagram ◀**

**100 A Type**




251EG03

**80 A Type**




276LC03

**Service Tip**

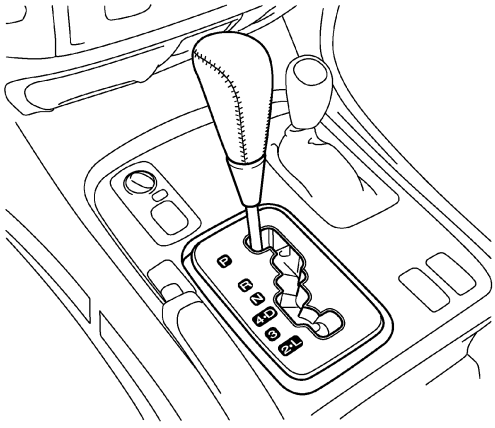
Although the charging circuit of a conventional alternator is checked through the F terminal, this check cannot be performed on the Segment Conductor type alternator through the use of the F terminal because the F terminal has been eliminated.

For details, refer to the Land Cruiser 100 Repair Manual Supplement (Pub. No. RM1148E).

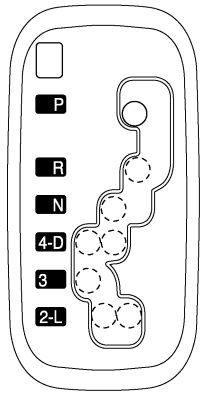
## ■SHIFT CONTROL MECHANISM

### 1. General

- A gate type shift lever is used in conjunction with the installation of the all automatic transmission. With the gate type, the shift lever button and the overdrive switch of the straight type shift lever have been discontinued. Similar functions are achieved through a single-shift operation (fore-aft and side-to-side).
- The shift lock system consists of the key interlock device and shift lock mechanism.

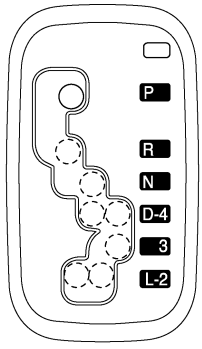


276LC06




276LC04

LHD




276LC05

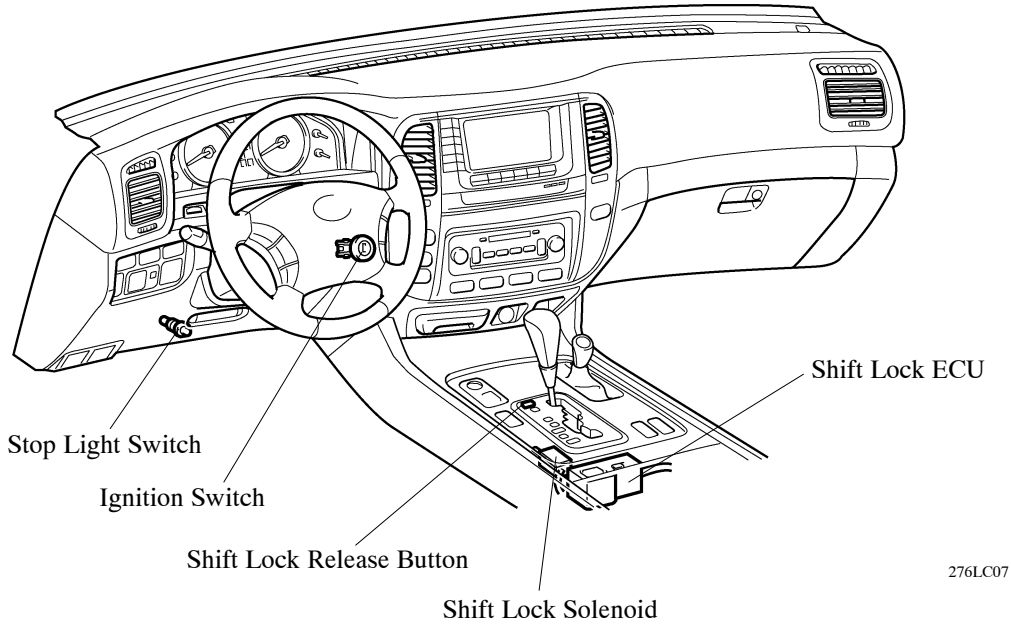
RHD

4

### 2. Shift Lock System

#### General

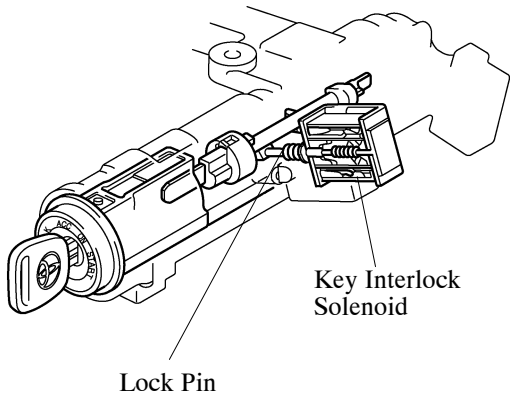
- A shift lock system with key interlock device and shift lock mechanism, that helps prevent the unintended operation of the shift lever has been provided.
- An electrical key interlock device and an electrical shift lock mechanism are used.




276LC07

### Key Interlock Device

The activation of the key interlock solenoid, mounted on the upper column bracket, moves the lock pin to restrict the movement of the key cylinder.
Therefore, if the shift lever is shifted to any position other than “P”, the ignition key cannot be moved from “ACC” to the “LOCK” position.

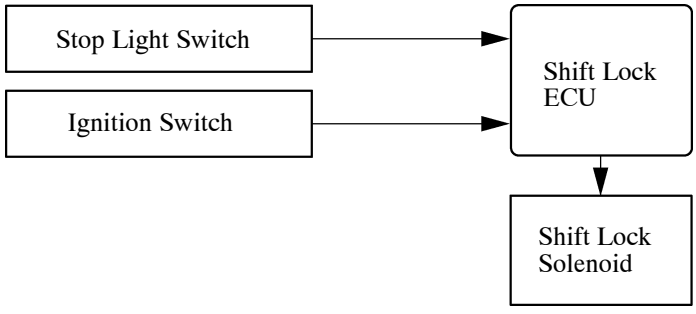



229LC138

### Shift Lock Mechanism

- The shift lock mechanism prevents the shift lever from being shifted out of the “P” position to any other position unless the ignition switch is turned ON and the brake pedal is pressed.
- A shift lock release button, which manually overrides the shift lock mechanism, is provided.

**▶ System Diagram ◀**

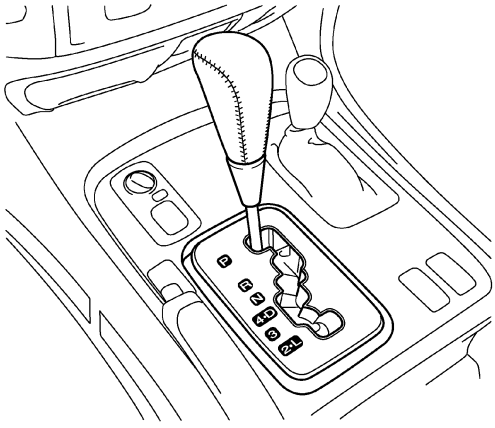



229LC139

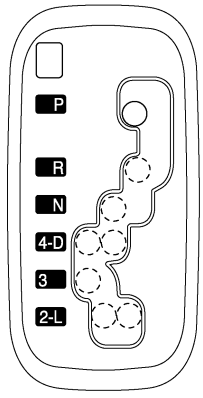
## ■SHIFT CONTROL MECHANISM

### 1. General

- A gate type shift lever is used in conjunction with the installation of the all automatic transmission. With the gate type, the shift lever button and the overdrive switch of the straight type shift lever have been discontinued. Similar functions are achieved through a single-shift operation (fore-aft and side-to-side).
- The shift lock system consists of the key interlock device and shift lock mechanism.

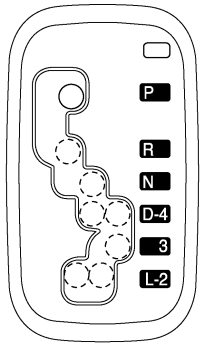


276LC06




276LC04

LHD




276LC05

RHD

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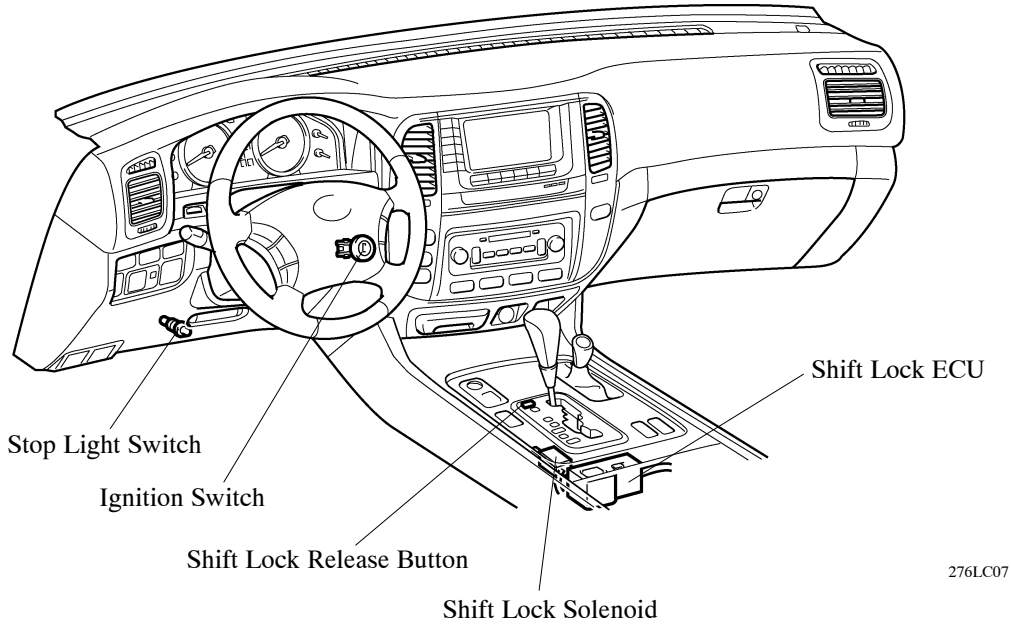
### 2. Shift Lock System

#### General

- A shift lock system with key interlock device and shift lock mechanism, that helps prevent the unintended operation of the shift lever has been provided.
- An electrical key interlock device and an electrical shift lock mechanism are used.




276LC07

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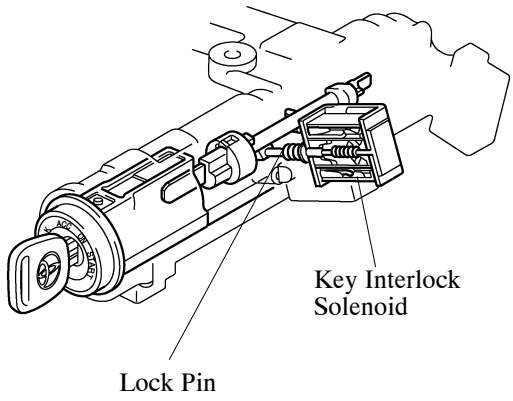
Therefore, if the shift lever is shifted to any position other than “P”, the ignition key cannot be moved from “ACC” to the “LOCK” position.




229LC138

### Shift Lock Mechanism

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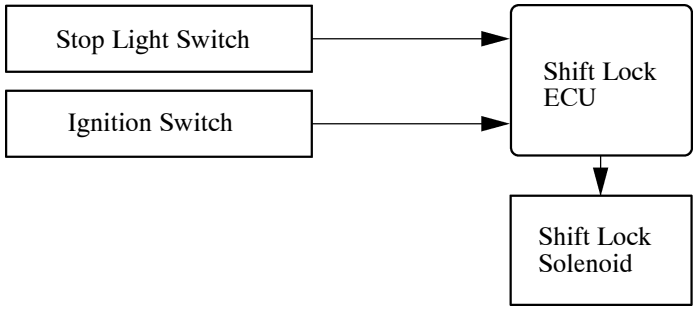
**▶ System Diagram ◀**

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