

HOW TO USE THIS MANUAL

GENERAL INFORMATION

IN00U-44

1. INDEX

An INDEX is provided on the first page of each section to guide you to the item to be repaired. To assist you in finding your way through the manual, the Section Title and major heading are given at the top of every page.

2. PRECAUTION

At the beginning of each section, a PRECAUTION is given that pertains to all repair operations contained in that section.

Read these precautions before starting any repair task.

3. TROUBLESHOOTING

TROUBLESHOOTING tables are included for each system to help you diagnose the problem and find the cause. The fundamentals of how to proceed with troubleshooting are described on [page IN-24](#).

Be sure to read this before performing troubleshooting.

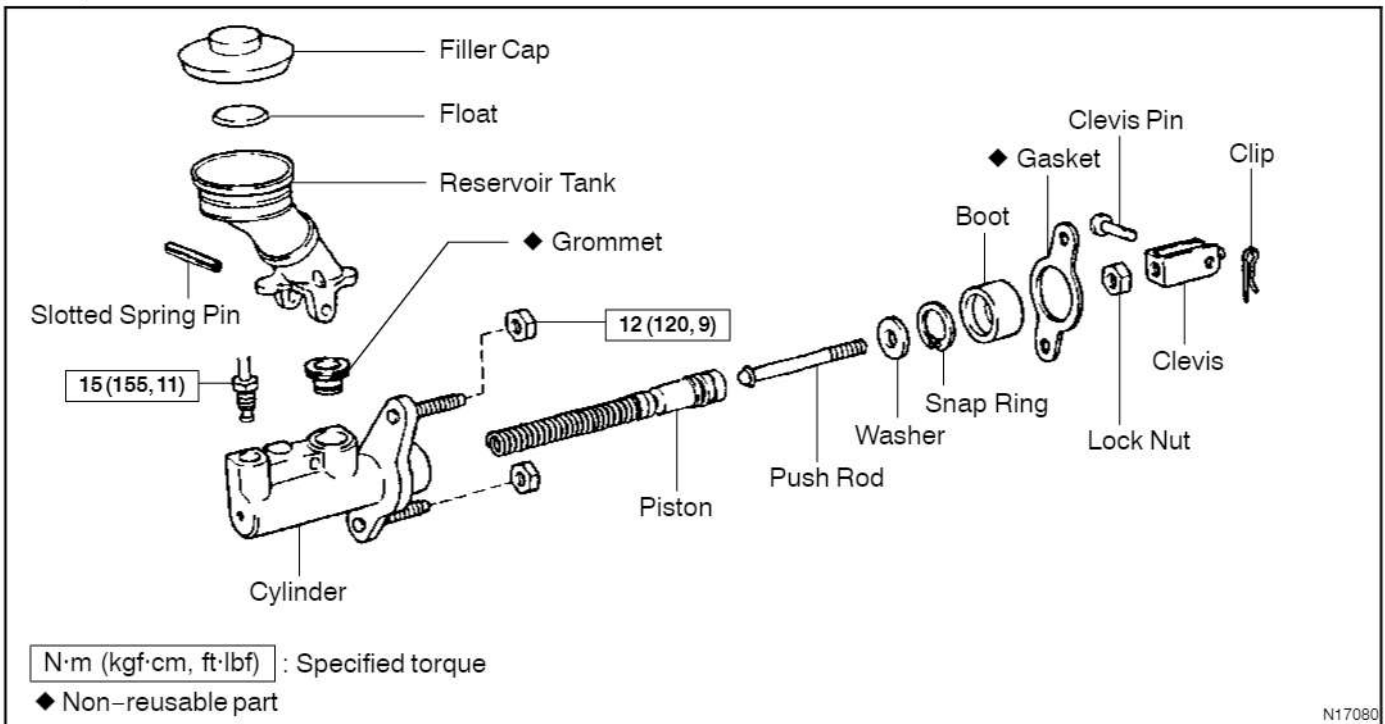
4. PREPARATION

Preparation lists the SST (Special Service Tools), recommended tools, equipment, lubricant and SSM (Special Service Materials) which should be prepared before beginning the operation and explains the purpose of each one.

5. REPAIR PROCEDURES

Most repair operations begin with an overview illustration. It identifies the components and shows how the parts fit together.

Example:



The procedures are presented in a step-by-step format:

- The illustration shows what to do and where to do it.
- The task heading tells what to do.
- The detailed text tells how to perform the task and gives other information such as specifications and warnings.

Example:

Task heading: what to do



21. CHECK PISTON STROKE OF OVERDRIVE BRAKE

- (a) Place SST and a dial indicator onto the overdrive brake piston as shown in the illustration.

SST 09350-30020 (09350-06120)

Set part No.

Component part No.

Detailed text: how to do task

- (b) Measure the stroke applying and releasing the compressed air (392 — 785 kPa, 4 — 8 kgf/cm² or 57 — 114 psi) as shown in the illustration.

Piston stroke: 1.40 — 1.70 mm (0.0551 — 0.0669 in.)

Specification

This format provides the experienced technician with a FAST TRACK to the information needed. The upper case task heading can be read at a glance when necessary, and the text below it provides detailed information. Important specifications and warnings always stand out in bold type.

6. REFERENCES

References have been kept to a minimum. However, when they are required you are given the page to refer to.

7. SPECIFICATIONS

Specifications are presented in bold type throughout the text where needed. You never have to leave the procedure to look up your specifications. They are also found in Service Specifications section for quick reference.

8. CAUTIONS, NOTICES, HINTS:

- CAUTIONS are presented in bold type, and indicate there is a possibility of injury to you or other people.
- NOTICES are also presented in bold type, and indicate the possibility of damage to the components being repaired.
- HINTS are separated from the text but do not appear in bold. They provide additional information to help you perform the repair efficiently.

9. SI UNIT

The UNITS given in this manual are primarily expressed according to the SI UNIT (International System of Unit), and alternately expressed in the metric system and in the English System.

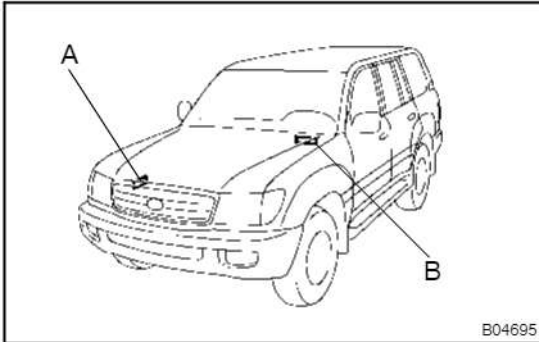
Example:

Torque: 30 N·m (310 kgf·cm, 22 ft·lbf)

IDENTIFICATION INFORMATION

VEHICLE IDENTIFICATION AND ENGINE SERIAL NUMBER

IN08Y-03



B04695

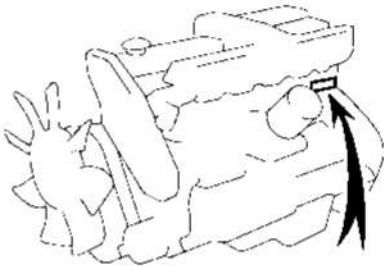
1. VEHICLE IDENTIFICATION NUMBER

The vehicle identification number is stamped on the outer surface of the front right side frame. This number is also stamped on the manufacturer's plate.

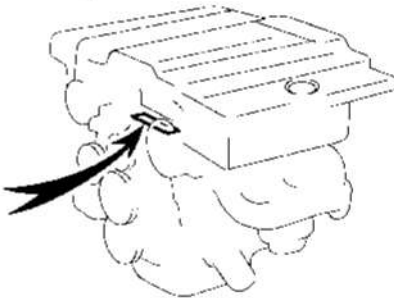
A: Vehicle Identification Number

B: Manufacturer's Plate

1HD-FTE Engine:



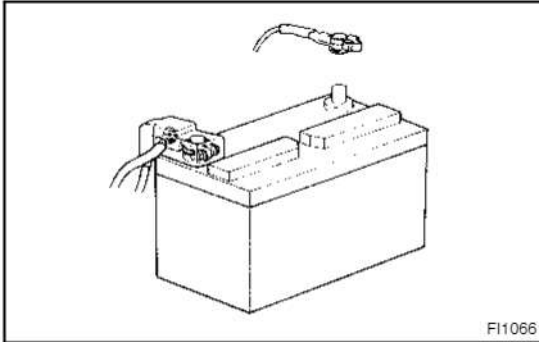
2UZ-FE Engine:



B13825

2. ENGINE SERIAL NUMBER

The engine serial number is stamped on the engine block, as shown in the illustration.



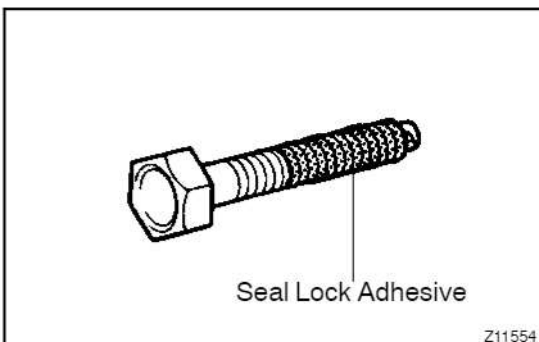
REPAIR INSTRUCTIONS

GENERAL INFORMATION

IN07M-07

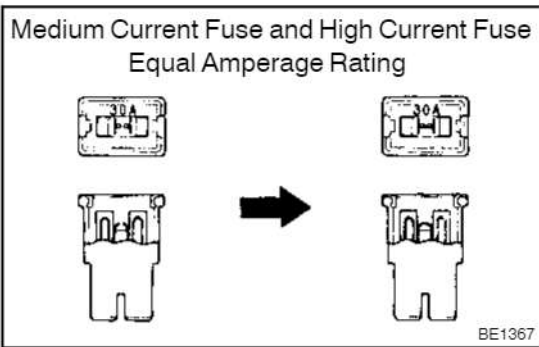
BASIC REPAIR HINT

- (a) Use fender, seat and floor covers to keep the vehicle clean and prevent damage.
- (b) During disassembly, keep parts in the appropriate order to facilitate reassembly.
- (c) Installation and removal of battery terminal:
 - (1) Before performing electrical work, disconnect the negative (-) terminal cable from the battery.
 - (2) If it is necessary to disconnect the battery for inspection or repair, first disconnect the negative (-) terminal cable.
 - (3) When disconnecting the terminal cable to prevent damage to battery terminal, loosen the cable nut and raise the cable straight up without twisting or prying it.
 - (4) Clean the battery terminals and cable ends with a clean shop rag. Do not scrape them with a file or other abrasive objects.
 - (5) Install the cable ends to the battery terminals after loosening the nut, and tighten the nut after installation. Do not use a hammer to tap the cable ends onto the terminals.
 - (6) Be sure the cover for the positive (+) terminal is properly in place.
- (d) Check hose and wiring connectors to make sure that they are connected securely and correctly.
- (e) Non-reusable parts
 - (1) Always replace cotter pins, gaskets, O-rings and oil seals, etc. with new ones.
 - (2) Non-reusable parts are indicated in the component illustrations by the "◆" symbol.



- (f) Precoated parts
Precoated parts are bolts and nuts, etc. that are coated with a seal lock adhesive at the factory.
 - (1) If a precoated part is retightened, loosened or caused to move in any way, it must be recoated with the specified adhesive.
 - (2) When reusing precoated parts, clean off the old adhesive and dry with compressed air. Then apply the specified seal lock adhesive to the bolt, nut or threads.

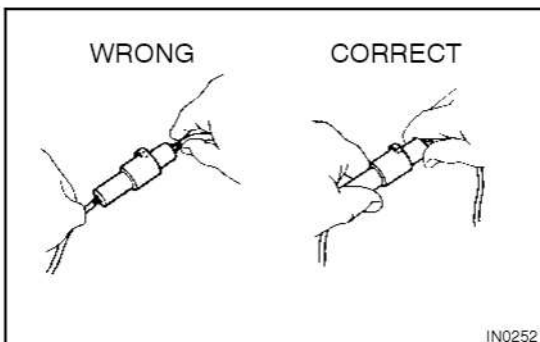
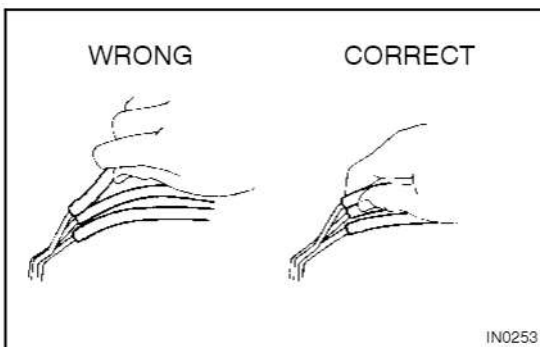
- (3) Precoated parts are indicated in the component illustrations by the "★" symbol.
- (g) When necessary, use a sealer on gaskets to prevent leaks.
- (h) Carefully observe all specifications for bolt tightening torques. Always use a torque wrench.
- (i) Use of special service tools (SST) and special service materials (SSM) may be required, depending on the nature of the repair. Be sure to use SST and SSM where specified and follow the proper work procedure. A list of SST and SSM can be found in Preparation section in this manual.



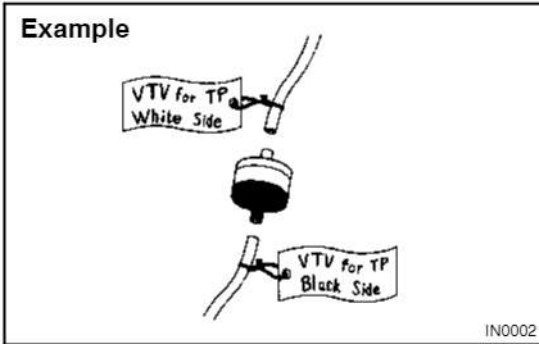
- (j) When replacing fuses, be sure the new fuse has the correct amperage rating. DO NOT exceed the rating or use one with a lower rating.

Illustration	Symbol	Part Name	Abbreviation
<p>BE5594</p>	<p>IN0365</p>	FUSE	FUSE
<p>BE5595</p>	<p>IN0366</p>	MEDIUM CURRENT FUSE	M-FUSE
<p>BE5596</p>	<p>IN0367</p>	HIGH CURRENT FUSE	H-FUSE
<p>BE5597</p>	<p>IN0367</p>	FUSIBLE LINK	FL
<p>BE5598</p>	<p>IN0368</p>	CIRCUIT BREAKER	CB

- (k) Care must be taken when jacking up and supporting the vehicle. Be sure to lift and support the vehicle at the proper locations (See page IN-8).
- Cancel the parking brake on the level place and shift the transmission in N range.
 - When jacking up the front wheels of the vehicle at first place stoppers behind the rear wheels.
 - When jacking up the rear wheels of the vehicle at first place stoppers before the front wheels.
 - When either the front or rear wheels only should be jacked up, set rigid racks and place stoppers in front and behind the other wheels on the ground.
 - After the vehicle is jacked up, be sure to support it on rigid racks. It is extremely dangerous to do any work on a vehicle raised on a jack alone, even for a small job that can be finished quickly.
- (l) Observe the following precautions to avoid damage to the following parts:
- (1) Do not open the cover or case of the ECU unless absolutely necessary. (If the IC terminals are touched, the IC may be destroyed by static electricity.)

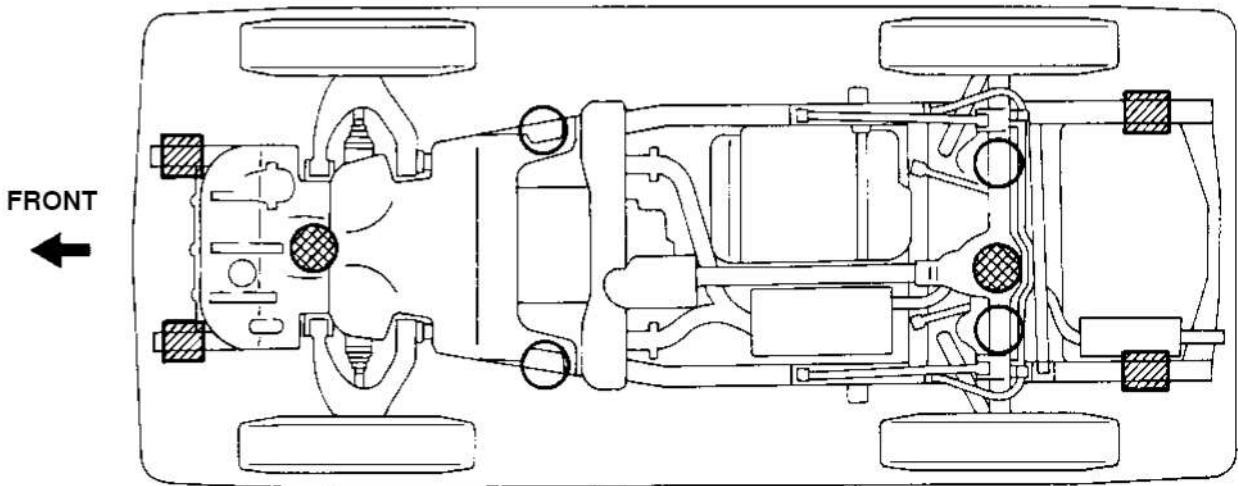


- (2) To disconnect vacuum hoses, pull off the end, not the middle of the hose.
- (3) To pull apart electrical connectors, pull on the connector itself, not the wires.
- (4) Be careful not to drop electrical components, such as sensors or relays. If they are dropped on a hard floor, they should be replaced and not reused.
- (5) When steam cleaning an engine, protect the electronic components, air filter and emission-related components from water.
- (6) Never use an impact wrench to remove or install temperature switches or temperature sensors.
- (7) When checking continuity at the wire connector, insert the tester probe carefully to prevent terminals from bending.
- (8) When using a vacuum gauge, never force the hose onto a connector that is too large. Use a step-down adapter for adjustment. Once the hose has been stretched, it may leak air.



- (m) Installation and removal of vacuum hose:
 - (1) When disconnecting vacuum hoses, use tags to identify how they should be reconnected to.
 - (2) After completing a job, double check that the vacuum hoses are properly connected. A label under the hood shows the proper layout.
- (n) Bleeding of hydraulic brake booster system
When repairing the hydraulic brake booster or ABS, bleeding the air out of the hydraulic brake booster (See Pub. No. RM731E on page BR-1).
- (o) Unless otherwise stated, all resistance is measured at an ambient temperature of 20°C (68°F). Because the resistance may be outside specifications if measured at high temperatures immediately after the vehicle has been running, measurement should be made when the engine has cooled down.

VEHICLE LIFT AND SUPPORT LOCATIONS





JACK POSITION ————— 

Front Engine under cover

Rear Rear differential carrier

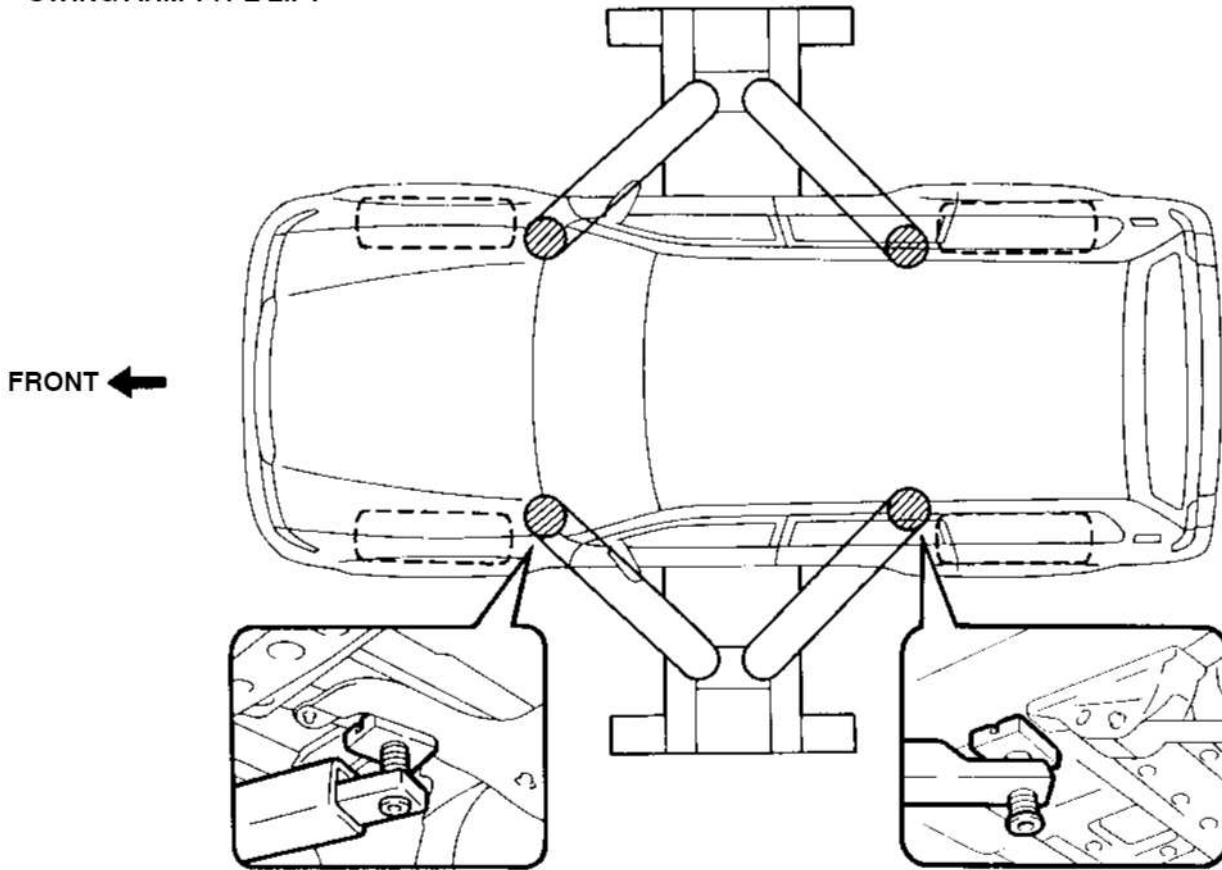
CAUTION : When jacking-up the front and rear, make sure the car is not carrying any extra weight.

SCREW TYPE JACK POSITION ————— 

SUPPORT POSITION
Safety stand 

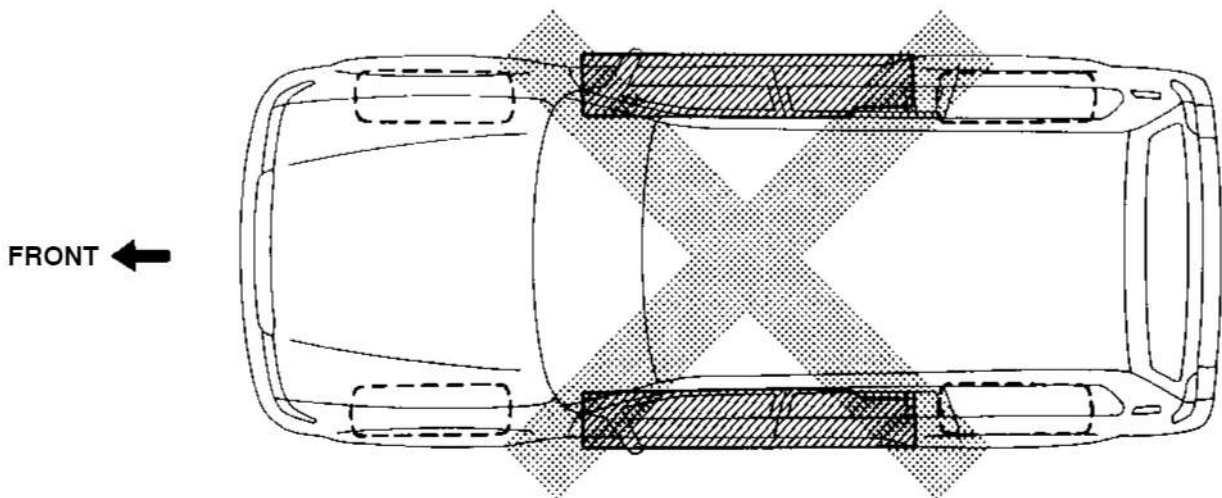
NOTICE: (w/ Active Height Control Suspension)
When jacking up the vehicle with the engine running, turn off the active height control suspension with the height control switch pushed.

SWING ARM TYPE LIFT



NOTICE: When lifting the vehicle, place the supports correctly at the positions shown above.

PLATE TYPE LIFT (DO NOT USE.)



NOTICE: Never use the plate type lift—using it to lift up the vehicle will cause the body shape to warp.

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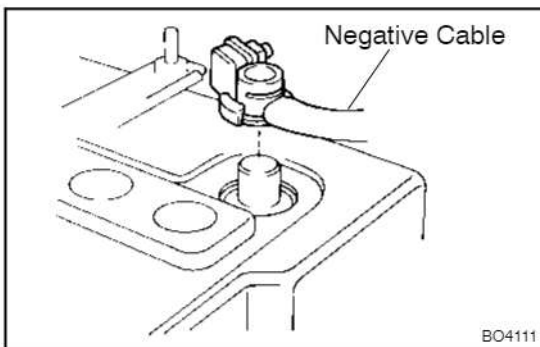
FOR ALL OF VEHICLES PRECAUTION

IN0EM-02

1. FOR VEHICLES EQUIPPED WITH SRS AIRBAG AND SEAT BELT PRETENSIONER

- (a) The LAND CRUISER is equipped with an SRS (Supplemental Restraint System), such as the driver airbag, front passenger airbag assembly and seat belt pretensioner. Failure to carry out service operations in the correct sequence could cause the supplemental restraint system to unexpectedly deploy during servicing, possibly leading to a serious accident.

Further, if a mistake is made in servicing the supplemental restraint system, it is possible the SRS may fail to operate when required. Before servicing (including removal or installation of parts, inspection or replacement), be sure to read the following items carefully, then follow the correct procedure described in this manual.



(b) GENERAL NOTICE

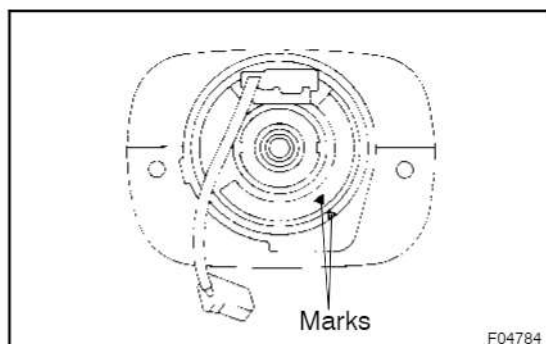
- (1) Malfunction symptoms of the supplemental restraint system are difficult to confirm, so the diagnostic trouble codes become the most important source of information when troubleshooting. When troubleshooting the supplemental restraint system, always inspect the diagnostic trouble codes before disconnecting the battery (See Pub. No. RM616E on page DI-447).

- (2) Work must be started after 90 seconds from the time the ignition switch is turned to the "LOCK" position and the negative (-) terminal cable is disconnected from the battery.

(The supplemental restraint system is equipped with a back-up power source so that if work is started within 90 seconds of disconnecting the negative (-) terminal cable from the battery, the SRS may deploy.)

When the negative (-) terminal cable is disconnected from the battery, memory of the clock and audio systems will be cancelled. So before starting work, make a record of the contents memorized by the each memory system. Then when work is finished, reset the clock and audio systems as before. To avoid erasing the memory of each memory system, never use a back-up power supply from another battery.

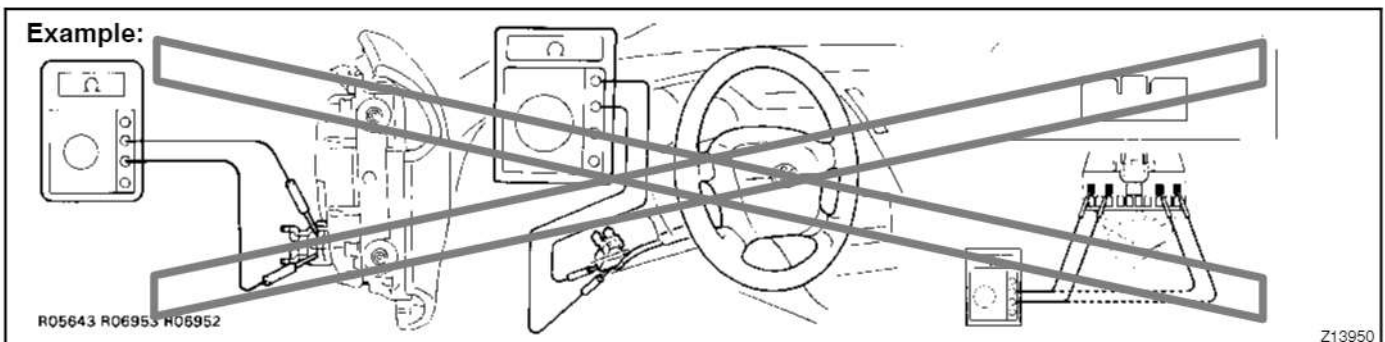
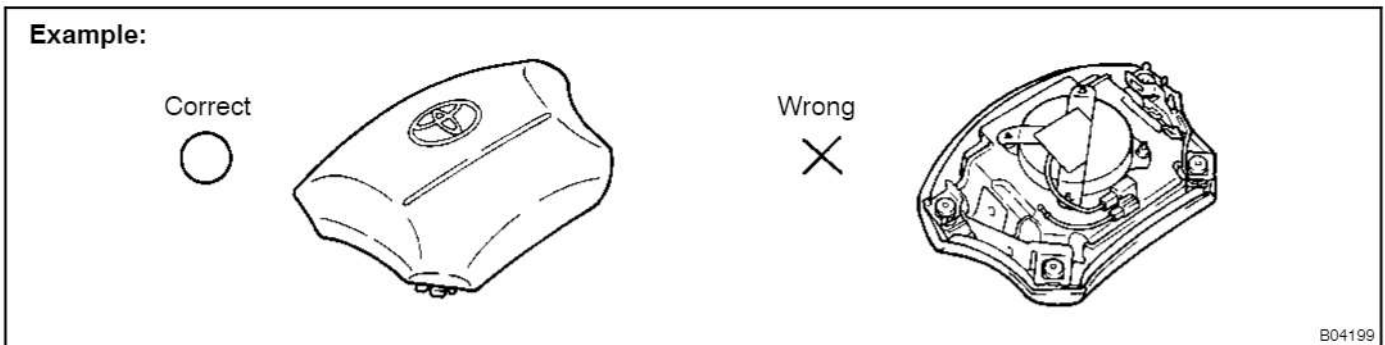
- (3) Even in cases of a minor collision where the SRS does not deploy, the steering wheel pad, front passenger airbag assembly and seat belt pretensioner should be inspected (See Pub. No. RM616E on page RS-12, RS-26 and BO-213).
- (4) Never use SRS parts from another vehicle. When replacing parts, replace them with new parts.
- (5) Before repairs, remove the airbag sensor if shocks are likely to be applied to the sensor during repairs.
- (6) Never disassemble and repair the airbag sensor assembly, steering wheel pad, front passenger airbag assembly or seat belt pretensioner in order to reuse them.
- (7) If the airbag sensor assembly, steering wheel pad, front passenger airbag assembly or seat belt pretensioner have been dropped, or if there are cracks, dents or other defects in the case, bracket or connector, replace them with new ones.
- (8) Do not directly expose the airbag sensor assembly, steering wheel pad, front passenger airbag assembly or seat belt pretensioner to hot air or flames.
- (9) Use a volt/ohmmeter with high impedance (10 k Ω /V minimum) for troubleshooting of the electrical circuit.
- (10) Information labels are attached to the periphery of the SRS components. Follow the instructions on the notices.
- (11) After work on the supplemental restraint system is completed, check the SRS warning light (See Pub. No. RM616E on page DI-447).



- (c) SPIRAL CABLE (in Combination Switch)
 The steering wheel must be fitted correctly to the steering column with the spiral cable at the neutral position, otherwise cable disconnection and other troubles may result. Refer to Pub. No. RM616E on page SR-37 of this manual concerning correct steering wheel installation.

(d) STEERING WHEEL PAD (with Airbag)

- (1) When removing the steering wheel pad or handling a new steering wheel pad, it should be placed with the pad top surface facing up.
Storing the pad with its metallic surface facing upward may lead to a serious accident if the airbag inflates for some reason. In addition do not store a steering wheel pad on top of another one.
- (2) Never measure the resistance of the airbag squib. (This may cause the airbag to deploy, which is very dangerous.)
- (3) Grease should not be applied to the steering wheel pad and the pad should not be cleaned with detergents of any kind.
- (4) Store the steering wheel pad where the ambient temperature remains below 93°C (200°F), without high humidity and away from electrical noise.
- (5) When using electric welding, first disconnect the airbag connector (yellow color and 2 pins) under the steering column near the combination switch connector before starting work.
- (6) When disposing of a vehicle or the steering wheel pad alone, the airbag should be deployed using an SST before disposal (See Pub. No. RM616E on page RS-14).
Carry out the operation in a safe place away from electrical noise.

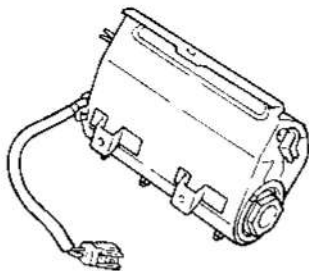


(e) FRONT PASSENGER AIRBAG ASSEMBLY

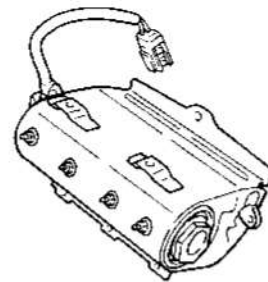
- (1) Always store a removed or new front passenger airbag assembly with the airbag deployment direction facing up.
Storing the airbag assembly with the airbag deployment direction facing down could cause a serious accident if the airbag inflates.
- (2) Never measure the resistance of the airbag squib. (This may cause the airbag to deploy, which is very dangerous.)
- (3) Grease should not be applied to the front passenger airbag assembly and the airbag door should not be cleaned with detergents of any kind.
- (4) Store the airbag assembly where the ambient temperature remains below 93°C (200°F), without high humidity and away from electrical noise.
- (5) When using electric welding, first disconnect the airbag connector (yellow color and 2 pins) installed on the assembly before starting work.
- (6) When disposing of a vehicle or the airbag assembly alone, the airbag should be deployed using an SST before disposal (See Pub. No. RM616E on page RS-28).
Perform the operation in a safe place away from electrical noise.

Example:

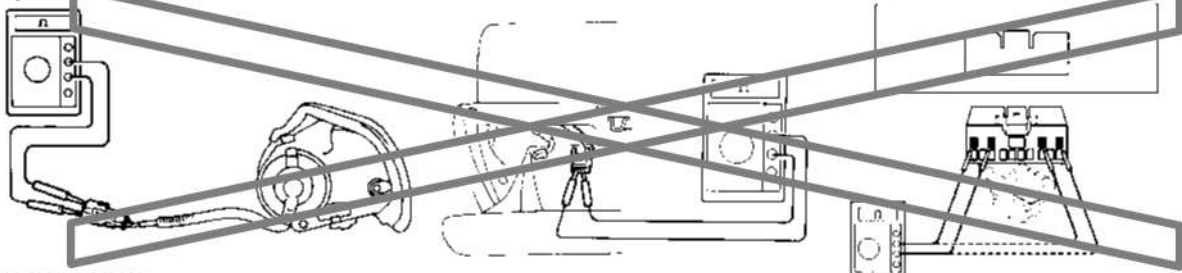
Correct



Wrong



B04200

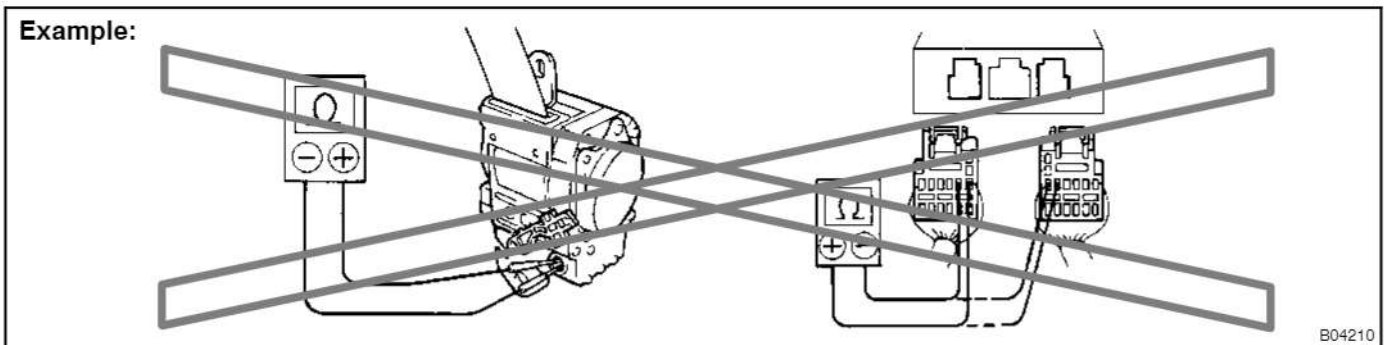
Example:

R05648 R05649 R06952

Z13951

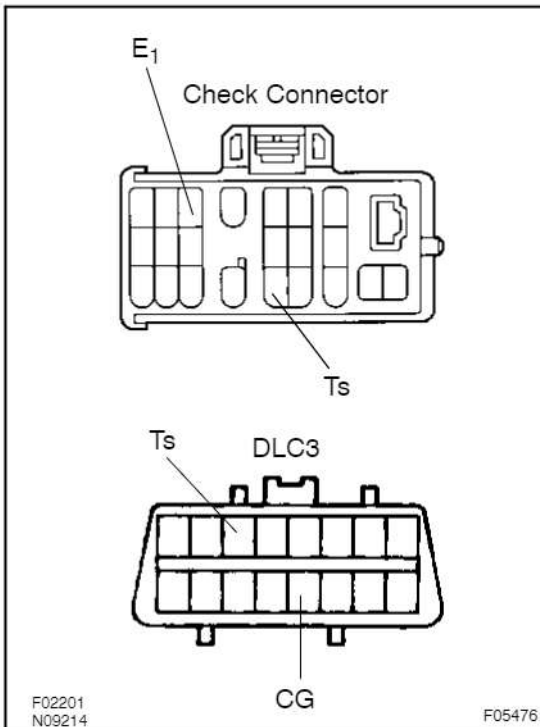
(f) SEAT BELT PRETENSIONER

- (1) Never measure the resistance of the seat belt pretensioner. (This may cause the seat belt pretensioner activation which is very dangerous.)
- (2) Never disassemble the seat belt pretensioner.
- (3) Never install the seat belt pretensioner in another vehicle.
- (4) Store the seat belt pretensioner where the ambient temperature remains below 80°C (176°F) and away from electrical noise without high humidity.
- (5) When using electric welding, first disconnect the connector (yellow color and 2 pins) before starting work.
- (6) When disposing of a vehicle or the seat belt pretensioner alone, the seat belt pretensioner should be activated before disposal (See Pub. No. RM616E on page BO-214). Perform the operation in a safe place away from electrical noise.
- (7) The seat belt pretensioner is hot after activation, so let it cool down sufficiently before the disposal. However never apply water to the seat belt pretensioner.



- (g) AIRBAG SENSOR ASSEMBLY
 - (1) Never reuse the airbag sensor assembly involved in a collision when the SRS has deployed.
 - (2) The connectors to the airbag sensor assembly should be connected or disconnected with the sensor mounted on the floor. If the connectors are connected or disconnected while the airbag sensor assembly is not mounted to the floor, it could cause undesired ignition of the supplemental restraint system.
 - (3) Work must be started after 90 seconds from the time the ignition switch is turned to the "LOCK" position and the negative (-) terminal cable is disconnected from the battery, even if only loosening the set bolts of the airbag sensor assembly.
- (h) WIRE HARNESS AND CONNECTOR

The SRS wire harness is integrated with the instrument panel wire harness assembly. The wires for the SRS wire harness are encased in a yellow corrugated tube and all the connectors in the system are a standard yellow color. If the SRS wire harness becomes disconnected or the connector becomes broken due to an accident, etc., repair or replace it.



2. FOR VEHICLE EQUIPPED WITH VEHICLE STABILITY CONTROL (VSC) SYSTEM

(a) Precaution when using drum tester:

When using a drum tester, make sure that the ignition switch is OFF, start the engine with the diagnosis connector short-circuited between Ts and E₁ (CG) and take a measurement.

NOTICE:

- Check that VSC warning light is blinking.
- Ensure that the vehicle does not move using wires.
- After the measurement, disconnect the short circuit and check that the VSC warning light is turned off when restarting the engine.

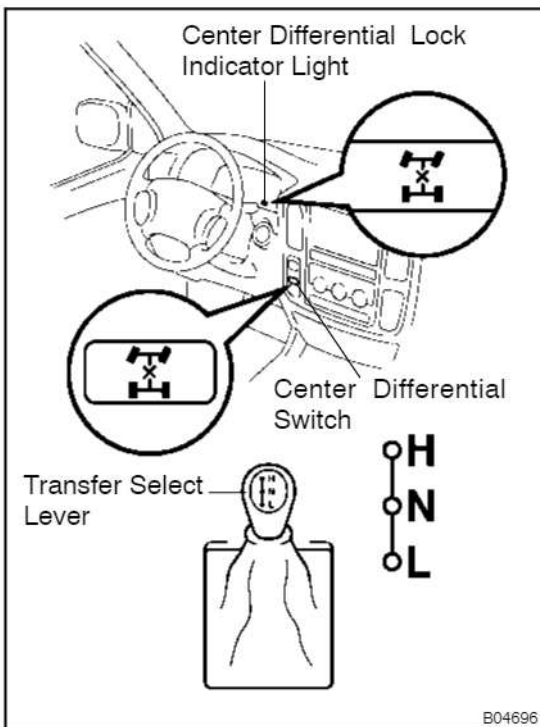
(b) Precaution during VSC operation:

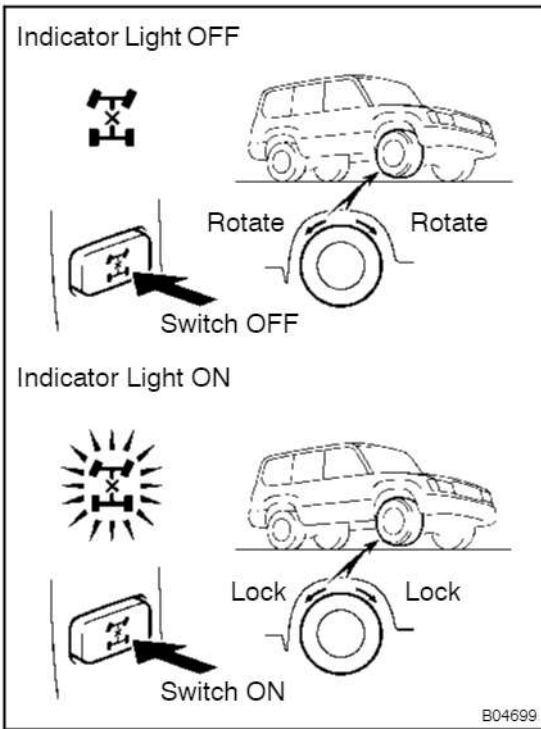
- (1) Since VSC may be affected by the removal/installation of the VSC-related parts, do not remove/install those parts unless absolutely necessary.
- (2) When operating on VSC, follow the instructions in BR section in this manual to surely make preparations or check after operations.

3. WHEN SERVICING FULL-TIME 4WD VEHICLES

The Full-time 4WD LAND CRUISER is equipped with the mechanical lock type center differential system.

During tests using a brake tester or chassis dynamometer, such as braking force tests or speedometer tests, if only the front or rear wheels are to be rotated, it is necessary to set the position of the center differential to FREE or LOCK depending on the type of the test being performed.





Center differential FREE condition:

	Condition	Wheel
Center differential switch	OFF	A lifted wheel cannot be rotated even if only one wheel is lifted up, as long as transmission is in Neutral (or N range).
Indicator light	OFF	
Transfer select lever (H/L)	w/ VSC: Either will do w/o VSC: H range only	

Center differential LOCK conditions (w/ VSC):

	Condition	Wheel
Center differential switch	ON	A lifted wheel cannot be rotated even if only one wheel is lifted up, as long as transmission is in Neutral (or N range).
Indicator light	ON	
Transfer select lever (H/L)	Either will do	

Center differential LOCK conditions (w/o VSC):

	Condition	Wheel
Center differential switch	ON	A lifted wheel cannot be rotated even if only one wheel is lifted up, as long as transmission is in Neutral (or N range).
Indicator light	ON	
Transfer select lever (H/L)	H position	

	Condition	Wheel
Center differential switch	ON or OFF	A lifted wheel cannot be rotated even if only one wheel is lifted up, as long as transmission is in Neutral (or N range).
Indicator light	ON	
Transfer select lever (H/L)	L position	

HINT:

w/o Vehicle stability control (VSC) system:

When the transfer select lever is put in "L" position, the center differential is put in LOCK condition regardless of the position of the center differential lock switch.

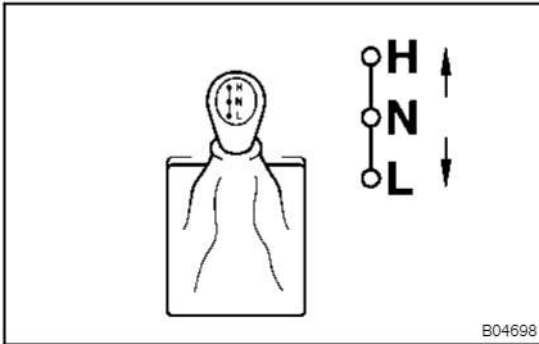
CAUTION:

Center differential "LOCK" ↔ "FREE" selecting procedure:

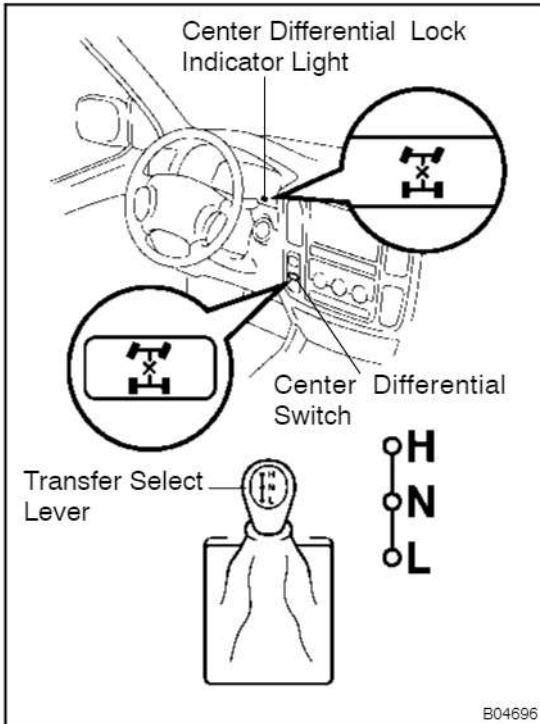
- Operate the switch only when all of 4 wheels are stopped or driven in a straight line.
- Never operate the switch when any wheel is slipping.
- Never operate the switch when any wheel is spinning freely.
- Never operate the switch when swerving or cornering.

HINT:

- Center differential "LOCK" ↔ "FREE" selecting procedure:
Move the vehicle forward or backward slightly if the indicator light does not operate correctly when the center differential lock switch is turned ON or OFF.



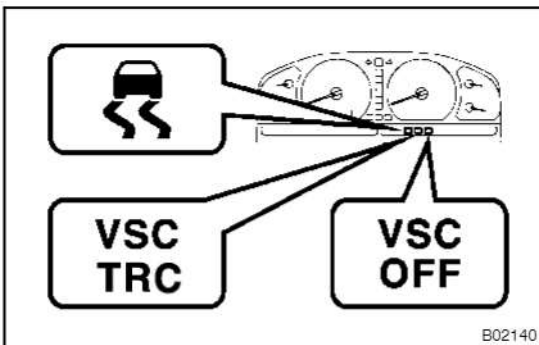
- Transfer gear "H" ↔ "L" gear shifting procedure:
When shifting, always put the shift lever of the transmission in N position. In other positions, the gears of the transfer clash, and switching cannot be performed.



4. WHEN TESTING BRAKES, SPEEDOMETER, ETC.

- (a) When carrying out any kind of servicing or testing on a Full-time 4WD in which the front or rear wheels are to be rotated (braking test, speedometer test), be sure to observe the precautions given below. Incorrect preparations or test procedures may cause danger as well as unsuccessful test results. Before starting any such servicing or test, be sure to check the following items:

- Center differential mode position (FREE or LOCK)

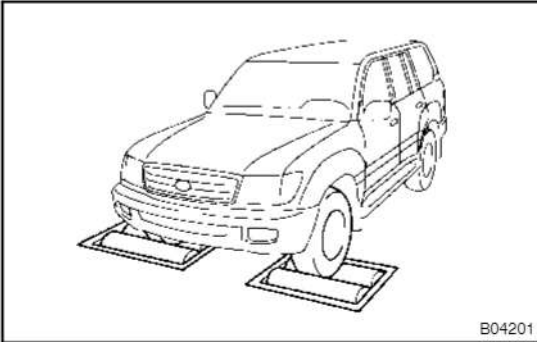


- Vehicle stability control (VSC) system (with or without):
If the vehicle is equipped with the system, the slip indicator light, the VSC/TRC indicator light and the VSC OFF indicator light come on with the ignition key turned to "ON". They will go off after about a few seconds.
- Whether wheels should be touching ground or jacked up
- Transmission gear position (N range)
- Transfer gear position (H or L position)
- Maximum testing vehicle speed
- Maximum testing time

HINT:

w/o Vehicle stability control (VSC) system:

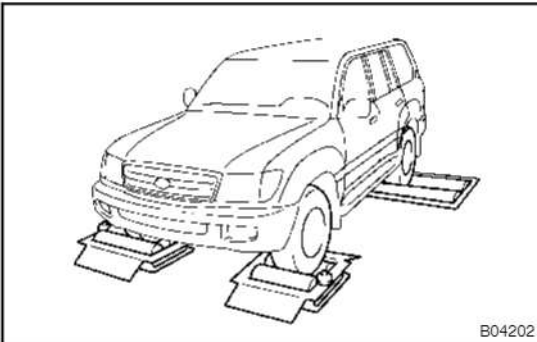
When the transfer select lever is put in "L" position, the center differential is put in LOCK condition regardless of the position of the center differential lock switch.



- (b) Using Braking Tester:
- Measure by low-speed type (Vehicle Speed: Below 0.5 km/h or 0.3 mph) brake tester and observe the following instructions before performing the test.
- (1) Position the wheels to be tested (front or rear) on the tester.
 - (2) Put the center differential in FREE position.
 - (3) If the vehicle is equipped with Vehicle Stability Control (VSC) system, prohibit the system from the activation (See step 2.).
 - (4) Shift the transmission shift lever to "N" range.

HINT:

Do not forget to change the Vehicle Stability Control (VSC) & Traction Control (TRC) system to operational condition after the test. Check that the VSC warning indicator light goes off when restarting the engine.



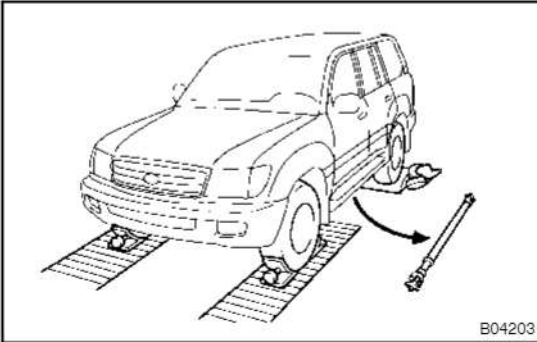
- (c) Using Speedometer Tester:
- Observe the following instructions and then measure with the rear wheels.
- (1) Position the rear wheels on the tester roller.
 - (2) Position the front wheels on the free roller or jack them up.
 - (3) Put the center differential in FREE position.
 - (4) If the vehicle is equipped with Vehicle Stability Control (VSC) & Traction Control (TRC) system, prohibit the system from the activation (See step 2.).
 - (5) Ensure that the vehicle does not move using wires.

CAUTION:

The maximum speed should be less than 60 km/h (37 mph) and maximum driving time should be 1 minute.

HINT:

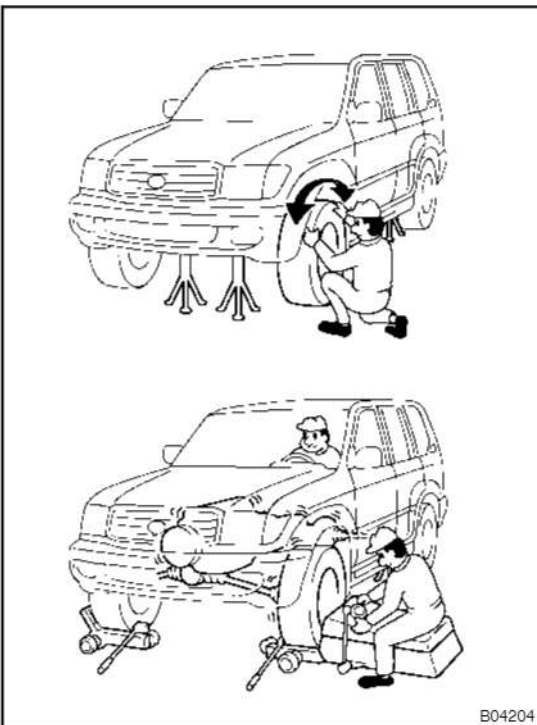
- Sudden shifting, braking, acceleration or deceleration is not allowed.
- Do not forget to change the Vehicle Stability Control (VSC) & Traction Control (TRC) system to operational condition after the test. Check that the VSC warning indicator light goes off when restarting the engine.



- (d) Using Chassis Dynamometer:
Observe the following instructions and then measure with the rear wheels.
- (1) Remove the front propeller shaft.
 - (2) Put the center differential in LOCK position.
 - (3) If the vehicle is equipped with Vehicle Stability Control (VSC) & Traction Control (TRC) system, prohibit the system from the activation (See step 2.).
 - (4) Ensure that the vehicle is securely fixed.

HINT:

- Sudden shifting, braking, acceleration or deceleration is not allowed.
- Do not forget to change the Vehicle Stability Control (VSC) & Traction Control (TRC) system to operational condition after the test. Check that the VSC warning indicator light goes off when restarting the engine.



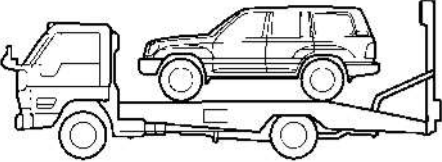
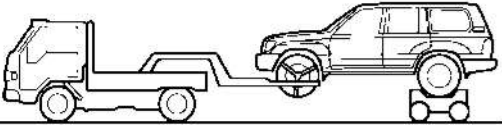
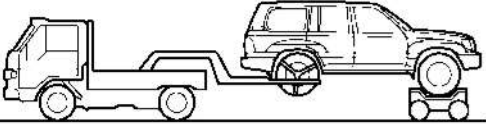
- (e) On-Vehicle Wheel Balancing:
When doing on-vehicle wheel balancing on a full-time 4WD vehicle, to prevent each wheel from being rotated at different speed in different directions (which could damage the center differential), always be sure to observe the following precautions.
- (1) All of 4 wheels should be jacked up, being apart from the ground completely.
 - (2) Put the center differential in LOCK position.
 - (3) If the vehicle is equipped with Vehicle Stability Control (VSC) & Traction Control (TRC) system, prohibit the system from the activation (See step 2.).
 - (4) The parking brake lever should be fully released.
 - (5) None of the brakes should be applied.
 - (6) The wheels should be driven on the wheel balancer with the engine running.
 - (7) Carry out the wheel balancing with the transmission position in D range.

HINT:

- When doing this balancing, pay attention to the other wheels rotating at the same time.
- Sudden acceleration, deceleration or braking is not allowed.
- Do not forget to change the Vehicle Stability Control (VSC) & Traction Control (TRC) system to operational condition after the test. Check that the VSC warning indicator light goes off when restarting the engine.

5. WHEN TOWING FULL-TIME 4WD VEHICLES

- Use one of the methods shown below to tow the vehicle.
- If the vehicle has trouble in the chassis and drive train, use method 1 (flat bed truck).

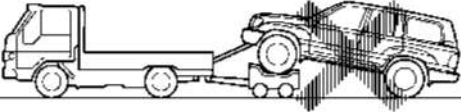
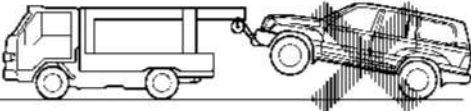
Towing Method	Conditions	Parking Brake	Transmission Shift Lever Position
<p>1. Flat Bed Truck</p> 		Applied	Any Position
<p>2. Wheel Lift Type Truck</p> <p>From Front</p>  <p>From Rear</p> 		Applied	Any Position

B04205

NOTICE:

Do not use any towing method other than those shown above.

- For example, the towing methods shown below are dangerous or damage the vehicle, so do not use them.

<p style="text-align: center;">NO</p> 	<ul style="list-style-type: none"> • Never tow the vehicle using a method where the lifted-up wheel cannot rotate. • If this towing method is used, either from the front or rear: <ul style="list-style-type: none"> (a) There is a danger of the drive train heating up and causing breakdown, or of the wheels flying off the dolly. (b) In addition, if the vehicle is equipped with the Vehicle Stability Control (VSC) & Traction Control (TRC) system, the system will apply the rotating wheels brake unless the engine isn't shut off.
<p style="text-align: center;">NO</p> 	<p>Do not use the sling type towing method, either from the front or rear, as this method causes damage to the body.</p>

B04206

6. FOR VEHICLES EQUIPPED WITH A CATALYTIC CONVERTER

CAUTION:

If large amount of unburned gasoline flows into the converter, it may overheat and create a fire hazard. To prevent this, observe the following precautions and explain them to your customer.

- (a) Use only unleaded gasoline.
- (b) Avoid prolonged idling.
Avoid running the engine at idle speed for more than 20 minutes.
- (c) Avoid spark jump test.
 - (1) Perform spark jump test only when absolutely necessary. Perform this test as rapidly as possible.
 - (2) While testing, never race the engine.
- (d) Avoid prolonged engine compression measurement.
Engine compression tests must be done as rapidly as possible.
- (e) Do not run engine when fuel tank is nearly empty.
This may cause the engine to misfire and create an extra load on the converter.
- (f) Avoid coasting with ignition turned off and prolonged braking.
- (g) Do not dispose of used catalyst along with parts contaminated with gasoline or oil.

7. IF VEHICLE IS EQUIPPED WITH MOBILE COMMUNICATION SYSTEM

For vehicles with mobile communication systems such as two-way radios and cellular telephones, observe the following precautions.

- (1) Install the antenna as far as possible away from the ECU and sensors of the vehicle's electronic system.
- (2) Install the antenna feeder at least 20 cm (7.87 in.) away from the ECU and sensors of the vehicle's electronic systems. For details about ECU and sensors locations, refer to the section on the applicable component.
- (3) Do not wind the antenna feeder together with the other wiring as much as possible, also avoid running the antenna feeder parallel with other wire harnesses.
- (4) Check that the antenna and feeder are correctly adjusted.
- (5) Do not install powerful mobile communications system.

8. FOR USING HAND-HELD TESTER

CAUTION:

Observe the following items for safety reasons:

- **Before using the hand-held tester, the hand-held tester's operator manual should be read thoroughly.**
- **Be sure to route all cables securely when driving with the hand-held tester connected to the vehicle. (i.e. Keep cables away from feet, pedals, steering wheel and shift lever.)**
- **Two persons are required when test driving with the hand-held tester, one person to drive the vehicle and the other person to operate the hand-held tester.**

HOW TO TROUBLESHOOT ECU CONTROLLED SYSTEMS

IN002-49

GENERAL INFORMATION

A large number of ECU controlled systems are used in the LAND CRUISER. In general, the ECU controlled system is considered to be a very intricate system requiring a high level of technical knowledge and expert skill to troubleshoot. However, the fact is that if you proceed to inspect the circuits one by one, troubleshooting of these systems is not complex. If you have adequate understanding of the system and a basic knowledge of electricity, accurate diagnosis and necessary repair can be performed to locate and fix the problem. This manual is designed through emphasis of the above standpoint to help service technicians perform accurate and effective troubleshooting, and is compiled for the following major ECU controlled systems: The troubleshooting procedure and how to make use of it are described on the following pages.

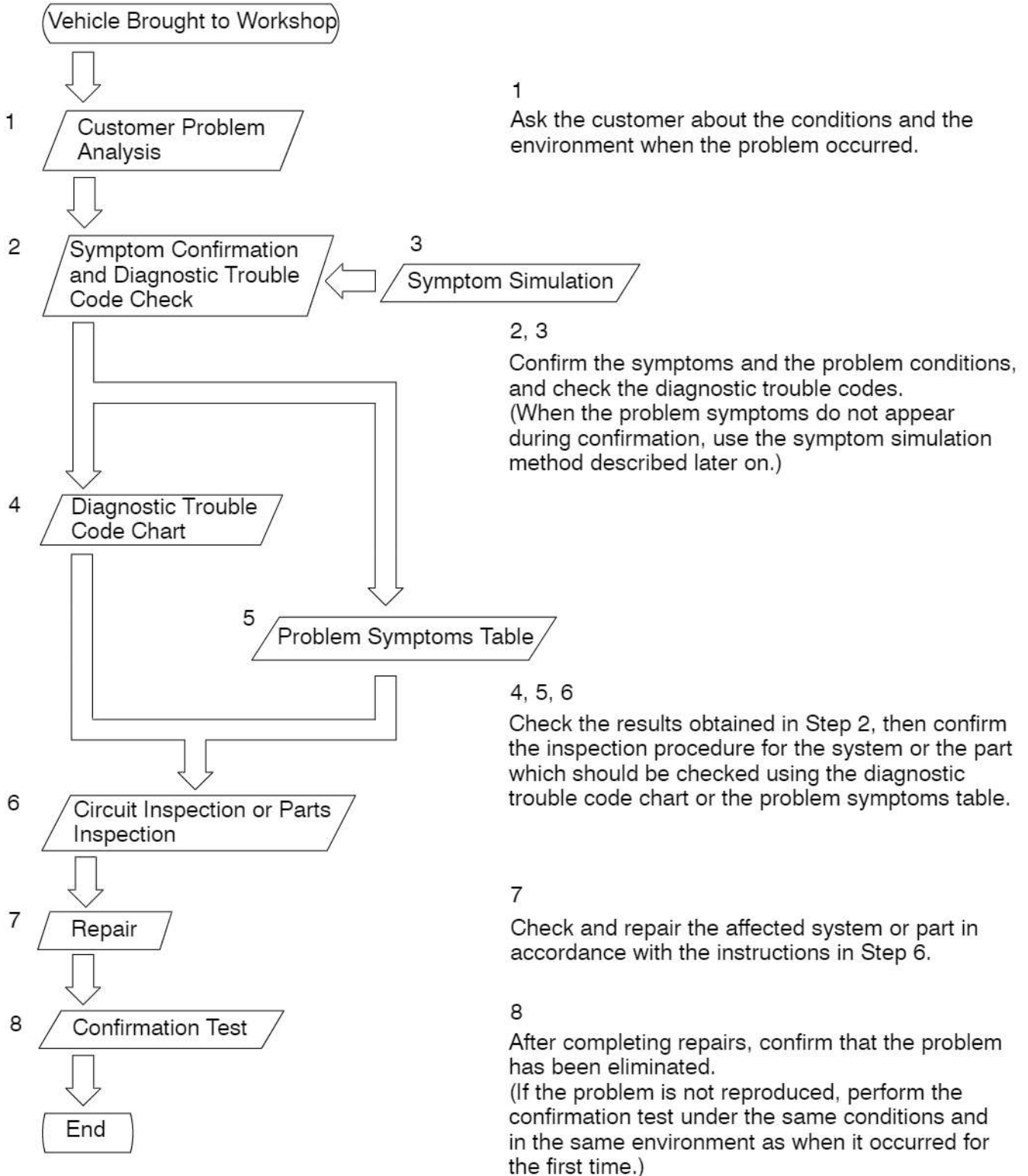
System	Page
1. Navigation System	DI-1
2. Air Conditioning System	DI-113

FOR USING HAND-HELD TESTER

- Before using the tester, the tester's operator manual should be read thoroughly.
- If the tester cannot communicate with ECU controlled systems when you have connected the cable of the tester to DLC3, turned the ignition switch ON and operated the tester, there is a problem on the vehicle side or tester side.
 - (1) If communication is normal when the tester is connected to another vehicle, inspect the diagnosis data link line (Bus \oplus line) or ECU power circuit of the vehicle.
 - (2) If communication is still not possible when the tester is connected to another vehicle, the problem is probably in the tester itself, so perform the Self Test procedures outline in the Tester Operator's Manual.

HOW TO PROCEED WITH TROUBLESHOOTING

Carry out troubleshooting in accordance with the procedure on the following page. Here, only the basic procedure is shown. Details are provided in Diagnostics section, showing the most effective methods for each circuit. Confirm the troubleshooting procedures first for the relevant circuit before beginning troubleshooting of that circuit.



1. CUSTOMER PROBLEM ANALYSIS

In troubleshooting, the problem symptoms must be confirmed accurately and all preconceptions must be cleared away in order to give an accurate judgement. To ascertain just what the problem symptoms are, it is extremely important to ask the customer about the problem and the conditions at the time it occurred.

Important Point in the Problem Analysis:

The following 5 items are important points in the problem analysis. Past problems which are thought to be unrelated and the repair history, etc. may also help in some cases, so as much information as possible should be gathered and its relationship with the problem symptoms should be correctly ascertained for reference in troubleshooting. A customer problem analysis table is provided in Diagnostics section for each system for your use.

Important Points in the Customer Problem Analysis

- What ----- Vehicle model, system name
- When ----- Date, time, occurrence frequency
- Where ----- Road conditions
- Under what conditions? ----- Running conditions, driving conditions, weather conditions
- How did it happen? ----- Problem symptoms

(Sample) Supplemental restraint system check sheet.

CUSTOMER PROBLEM ANALYSIS CHECK			
Supplemental Restraint System Check Sheet		Inspector's Name _____	
Customer's Name		Registration No.	
		Registration Year	/ /
		Frame No.	
Date Vehicle Brought In	/ /	Odometer Reading	km miles
Date Problem First Occurred	/ /		
Weather	<input type="checkbox"/> Fine <input type="checkbox"/> Cloudy <input type="checkbox"/> Rainy <input type="checkbox"/> Snowy <input type="checkbox"/> Other		
Temperature	Approx. _____		
Vehicle Operation	<input type="checkbox"/> Starting <input type="checkbox"/> Idling <input type="checkbox"/> Driving [<input type="checkbox"/> Constant speed <input type="checkbox"/> Acceleration <input type="checkbox"/> Deceleration] <input type="checkbox"/> Other		

2. SYMPTOM CONFIRMATION AND DIAGNOSTIC TROUBLE CODE CHECK

The diagnostic system in the LAND CRUISER fulfills various functions. The first function is the Diagnostic Trouble Code Check in which a malfunction in the signal circuits to the ECU is stored in code in the ECU memory at the time of occurrence, to be output by the technician during troubleshooting. Another function is the Input Signal Check which checks if the signals from various switches are sent to the ECU correctly. By using these check functions, the problem areas can be narrowed down quickly and troubleshooting can be performed effectively. Diagnostic functions are incorporated in the following systems in the LAND CRUISER.

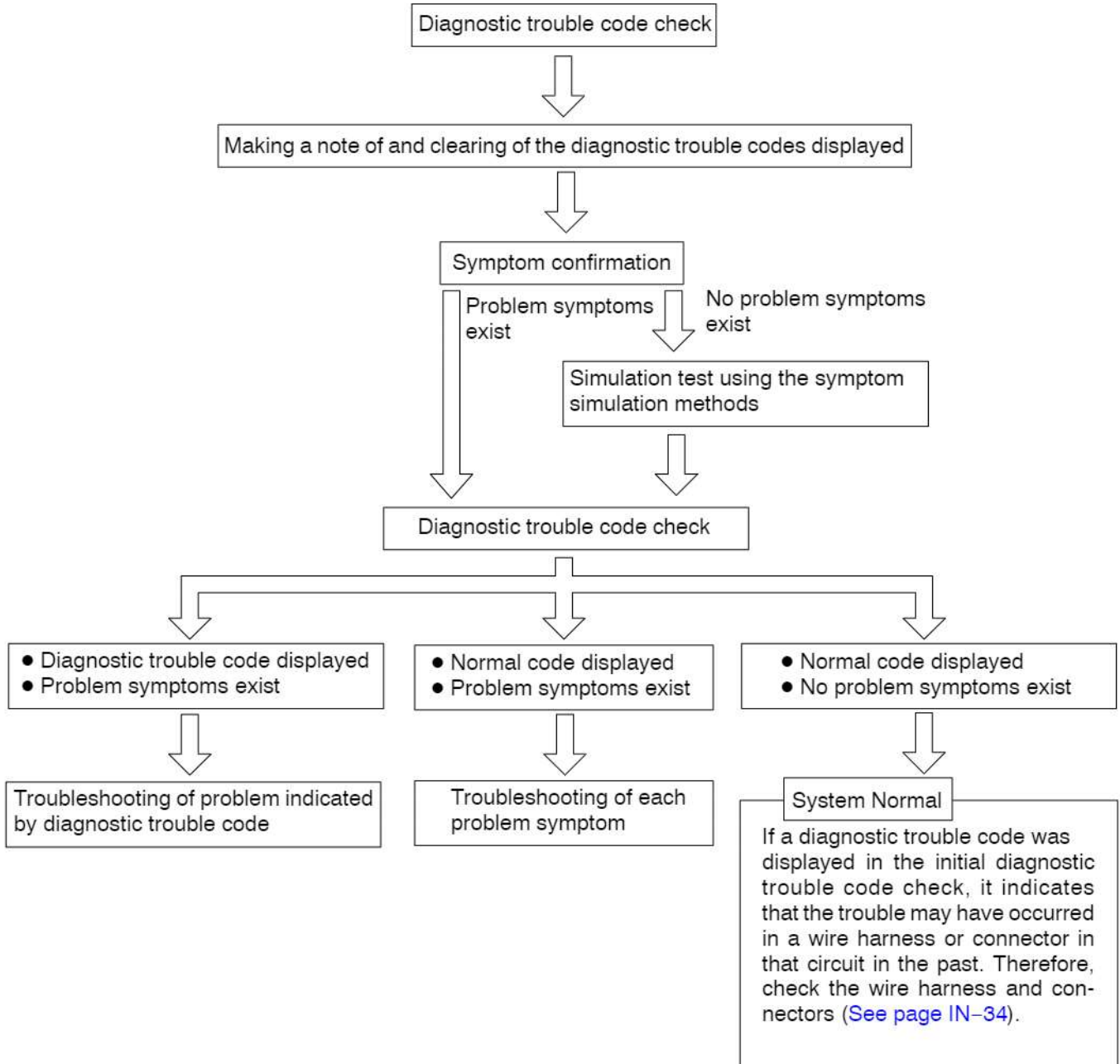
System	Diagnostic Trouble Code Check	Input Signal Check (Sensor Check)	Diagnostic Test Mode (Active Test)
Navigation System	○		
Air Conditioning System	○		

In diagnostic trouble code check, it is very important to determine whether the problem indicated by the diagnostic trouble code is still occurring or occurred in the past but returned to normal at present. In addition, it must be checked in the problem symptom check whether the malfunction indicated by the diagnostic trouble code is directly related to the problem symptom or not. For this reason, the diagnostic trouble codes should be checked before and after the symptom confirmation to determine the current conditions, as shown in the table below. If this is not done, it may, depending on the case, result in unnecessary troubleshooting for normally operating systems, thus making it more difficult to locate the problem, or in repairs not pertinent to the problem. Therefore, always follow the procedure in correct order and perform the diagnostic trouble code check.

DIAGNOSTIC TROUBLE CODE CHECK PROCEDURE

Diagnostic Trouble Code Check (Make a note of and then clear)	Confirmation of Symptoms	Diagnostic Trouble Code Check	Problem Condition
Diagnostic Trouble Code Display	Problem symptoms exist	Same diagnostic trouble code is displayed	Problem is still occurring in the diagnostic circuit
		Normal code is displayed	The problem is still occurring in a place other than in the diagnostic circuit (The diagnostic trouble code displayed first is either for a past problem or it is a secondary problem)
Normal Code Display	No problem symptoms exist		The problem occurred in the diagnostic circuit in the past
	Problem symptoms exist	Normal code is displayed	The problem is still occurring in a place other than in the diagnostic circuit
	No problem symptoms exist	Normal code is displayed	The problem occurred in a place other than in the diagnostic circuit in the past

Taking into account the points on the previous page, a flow chart showing how to proceed with troubleshooting using the diagnostic trouble code check is shown below. This flow chart shows how to utilize the diagnostic trouble code check effectively, then by carefully checking the results, indicates how to proceed either to diagnostic trouble code troubleshooting or to troubleshooting of problem symptoms table.



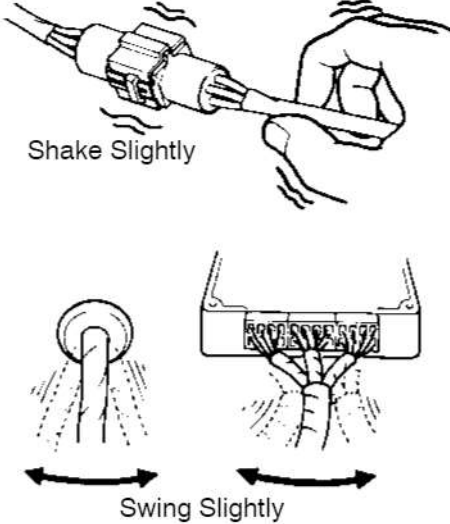
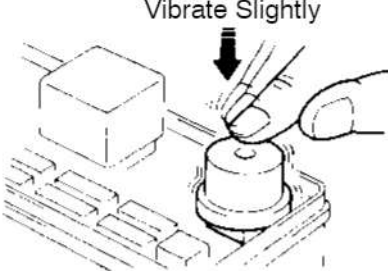
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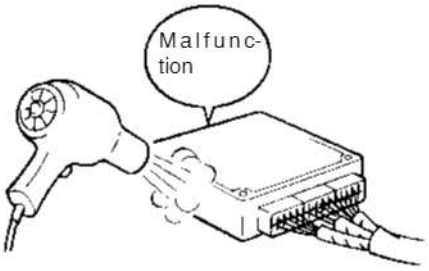

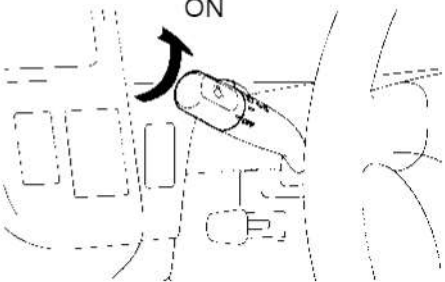
3. SYMPTOM SIMULATION

The most difficult case in troubleshooting is when there are no problem symptoms occurring. In such cases, a thorough customer problem analysis must be carried out, then simulate the same or similar conditions and environment in which the problem occurred in the customer's vehicle. No matter how much experience a technician has, or how skilled he or she may be, if he or she proceeds to troubleshoot without confirming the problem symptoms he or she will tend to overlook something important in the repair operation and make a wrong guess somewhere, which will only lead to a standstill. For example, for a problem which only occurs when the engine is cold, or for a problem which occurs due to vibration caused by the road during driving, etc., the problem can never be determined so long as the symptoms are confirmed with the engine hot condition or the vehicle at a standstill. Since vibration, heat or water penetration (moisture) is likely cause for problem which is difficult to reproduce, the symptom simulation tests introduced here are effective measures in that the external causes are applied to the vehicle in a stopped condition.

Important Points in the Symptom Simulation Test:

In the symptom simulation test, the problem symptoms should of course be confirmed, but the problem area or parts must also be found out. To do this, narrow down the possible problem circuits according to the symptoms before starting this test and connect a tester beforehand. After that, carry out the symptom simulation test, judging whether the circuit being tested is defective or normal and also confirming the problem symptoms at the same time. Refer to the problem symptoms table for each system to narrow down the possible causes of the symptom.

<p>1</p>	<p>VIBRATION METHOD: When vibration seems to be the major cause.</p>
<p>CONNECTORS Slightly shake the connector vertically and horizontally.</p> <p>WIRE HARNESS Slightly shake the wire harness vertically and horizontally. The connector joint, fulcrum of the vibration, and body through portion are the major areas to be checked thoroughly.</p>	 <p>The diagrams illustrate two vibration methods. The top diagram shows a hand holding a connector with the text 'Shake Slightly' and wavy lines indicating movement. The bottom diagram shows a hand holding a wire harness with the text 'Swing Slightly' and arrows indicating swinging motion.</p>
<p>PARTS AND SENSOR Apply slight vibration with a finger to the part of the sensor considered to be the problem cause and check that the malfunction occurs.</p> <p>HINT: Applying strong vibration to relays may result in open relays.</p>	 <p>The diagram shows a hand applying vibration to a sensor on a circuit board with the text 'Vibrate Slightly' and a downward arrow.</p>

<p>2</p>	<p>HEAT METHOD: When the problem seems to occur when the suspect area is heated.</p>
<p>Heat the component that is the likely cause of the malfunction with a hair dryer or similar object. Check to see if the malfunction occurs.</p> <p>NOTICE:</p> <p>(1) Do not heat to more than 60 °C (140 °F). (Temperature is limited not to damage the components.)</p> <p>(2) Do not apply heat directly to parts in the ECU.</p>	 <p>F12334</p>
<p>3</p>	<p>WATER SPRINKLING METHOD: When the malfunction seems to occur on a rainy day or in a high-humidity condition.</p>
<p>Sprinkle water onto the vehicle and check to see if the malfunction occurs.</p> <p>NOTICE:</p> <p>(1) Never sprinkle water directly into the engine compartment, but indirectly change the temperature and humidity by applying water spray onto the radiator front surface.</p> <p>(2) Never apply water directly onto the electronic components.</p> <p>HINT: If a vehicle is subject to water leakage, the leaked water may contaminate the ECU. When testing a vehicle with a water leakage problem, special caution must be taken.</p>	 <p>F16649</p>
<p>4</p>	<p>OTHER: When a malfunction seems to occur when electrical load is excessive.</p>
<p>Turn on all electrical loads including the heater blower, head lights, rear window defogger, etc. and check to see if the malfunction occurs.</p>	 <p>B02389</p>

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4. DIAGNOSTIC TROUBLE CODE CHART

The inspection procedure is shown in the table below. This table permits efficient and accurate troubleshooting using the diagnostic trouble codes displayed in the diagnostic trouble code check. Proceed with troubleshooting in accordance with the inspection procedure given in the diagnostic chart corresponding to the diagnostic trouble codes displayed. The Supplemental Restraint System diagnostic trouble code chart is shown below as an example.

● **DTC No.**
Indicates the diagnostic trouble code.

● **Page or Instructions**
Indicates the page where the inspection procedure for each circuit is to be found, or gives instructions for checking and repairs.

● **Trouble Area**
Indicates the suspect area of the problem.

● **Detection Item**
Indicates the system of the problem or contents of the problem.

DIAGNOSTIC TROUBLE CODE CHART
If a malfunction code is displayed during the DTC check, check the circuit for that code listed in the table below. (Proceed to the page given for that circuit).

DTC No. (See page)	Detection Item	Trouble Area	SRS Warning Light
B0100/13 (DI-119)	● Short in D squib circuit	<ul style="list-style-type: none"> ● Steering wheel pad (squib) ● Spiral cable ● Airbag sensor assembly ● Wire harness 	ON
B0101/14 (DI-124)	● Open in D squib circuit	<ul style="list-style-type: none"> ● Steering wheel pad (squib) ● Spiral cable ● Airbag sensor assembly ● Wire harness 	ON
B0102/11 (DI-128)	● Short in D squib circuit (to ground)	<ul style="list-style-type: none"> ● Steering wheel pad (squib) ● Spiral cable ● Airbag sensor assembly ● Wire harness 	ON
B0103/12 (DI-132)	● Short in D squib circuit (to B+)	<ul style="list-style-type: none"> ● Steering wheel pad (squib) ● Spiral cable ● Airbag sensor assembly ● Wire harness 	ON
B0105/53 (DI-136)	● Short in P squib circuit	<ul style="list-style-type: none"> ● Front Passenger airbag assembly (squib) ● Airbag sensor assembly ● Wire harness 	ON
B0106/54	● Open in P squib circuit	<ul style="list-style-type: none"> ● Front Passenger airbag assembly (squib) ● Airbag sensor assembly ● Wire harness 	
	● Short in P squib circuit (to Ground)	<ul style="list-style-type: none"> ● Front Passenger airbag assembly (squib) ● Airbag sensor assembly ● Wire harness 	

5. PROBLEM SYMPTOMS TABLE

The suspected circuits or parts for each problem symptom are shown in the table below. Use this table to troubleshoot the problem when a "Normal" code is displayed in the diagnostic trouble code check but the problem is still occurring. Numbers in the table indicate the inspection order in which the circuits or parts should be checked.

HINT:

When the problem is not detected by the diagnostic system even though the problem symptom is present, it is considered that the problem is occurring outside the detection range of the diagnostic system, or that the problem is occurring in a system other than the diagnostic system.

● Page
Indicates the page where the flow chart for each circuit is located.

● Circuit Inspection, Inspection Order
Indicates the circuit which needs to be checked for each problem symptom. Check in the order indicated by the numbers.

● Problem Symptom

● Circuit or Part Name
Indicates the circuit or part which needs to be checked.

PROBLEM SYMPTOMS TABLE
Proceed with troubleshooting of each circuit in the table below.

Symptom	Suspect Area	See page
<ul style="list-style-type: none"> With the ignition switch in the ACC or ON position, the SRS warning light sometimes lights up after approx. 6 seconds have elapsed. SRS warning light is always lit up even when ignition switch is in the LOCK position 	<ul style="list-style-type: none"> SRS warning light circuit (Always lights up when ignition switch is in LOCK position.) 	DI-180
<ul style="list-style-type: none"> With the ignition switch in the ACC or ON position, the SRS warning light does not light up. 	<ul style="list-style-type: none"> SRS warning light circuit (Does not light up when ignition switch is turned to ACC or ON.) 	DI-183
<ul style="list-style-type: none"> DTC is not displayed. SRS warning light is always lit up at the time of DTC check procedure. DTC is displayed without Tc and E1 terminal connection. 	<ul style="list-style-type: none"> Tc terminal circuit 	DI-187

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6. CIRCUIT INSPECTION

How to read and use each page is shown below.

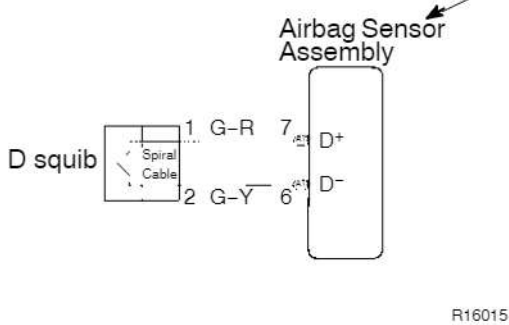
● Diagnostic Trouble Code No. and Detection Item

● Circuit Description
The major role and operation, etc. of the circuit and its component parts are explained.

DTC	B0100/13	Short in D Squib Circuit
CIRCUIT DESCRIPTION		
The D squib circuit consists of the airbag sensor assembly, spiral cable and steering wheel pad.		
It causes the airbag to deploy when the airbag deployment conditions are satisfied.		
For details of the function of each components, see OPERATION on page RS-2.		
DTC B0100/13 is recorded when a short is detected in the D squib circuit.		
DTC No.	DTC Detecting Condition	Trouble Area
B010013	<ul style="list-style-type: none"> • Short circuit between D+ wire harness and D- wire harness of squib • D squib malfunction • Spiral cable malfunction • Airbag sensor assembly malfunction 	<ul style="list-style-type: none"> • Steering wheel pad (D squib) • Spiral cable • Airbag sensor assembly • Wire harness

● Indicates the diagnostic trouble code, diagnostic trouble code set parameter and suspect area of the problem.

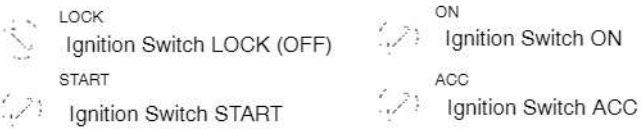
WIRING DIAGRAM



● Wiring Diagram
This shows a wiring diagram of the circuit. Use this diagram together with ELECTRICAL WIRING DIAGRAM to thoroughly understand the circuit.
Wire colors are indicated by an alphabetical code. B = Black, L = Blue, R = Red, BR = Brown, LG = Light Green, V = Violet, G = Green, O = Orange, W = White, GR = Gray, P = Pink, Y = Yellow, SB = Sky Blue
The first letter indicates the basic wire color and the second letter indicates the color of the stripe.

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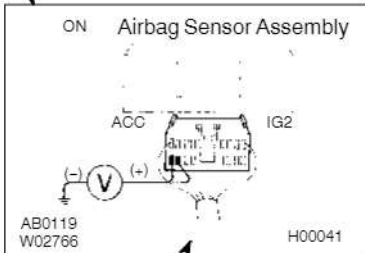
- Indicates the position of the ignition switch during the check.



- Inspection Procedure
Use the inspection procedure to determine if the circuit is normal or abnormal, and if it is abnormal, use it to determine whether the problem is located in the sensors, actuators, wire harness or ECU.

INSPECTION PROCEDURE

2 Check voltage at IG2 and ACC of airbag sensor assembly.



PREPARATION:

Turn ignition switch ON.

CHECK:

Measure voltage between terminals IG2 and ACC of airbag sensor assembly and body ground.

OK:

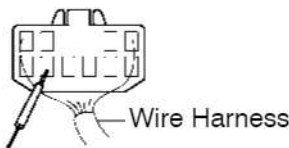
Voltage: Below 16 V

OK

NG

Check battery and charging system. (See charging system section)

- Indicates the place to check the voltage or resistance.
- Indicates the connector position to be checked, from the front or back side.

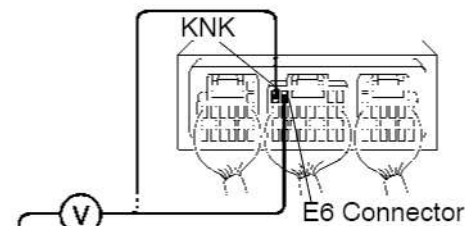


Check from the connector back side. (with harness)

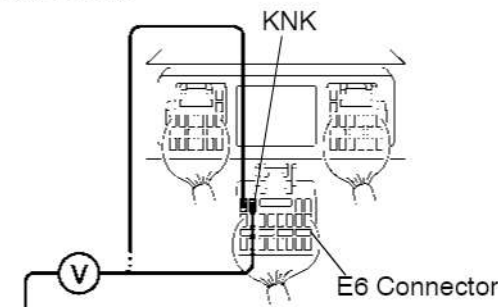


Check from the connector front side. (without harness)
In this case, care must be taken not to bend the terminals.

- Indicates the condition of the connector of ECU during the check.



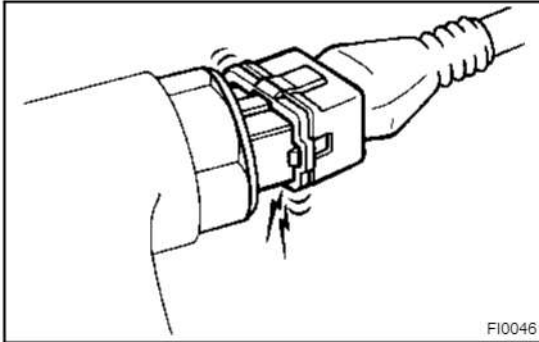
Connector being checked is connected.



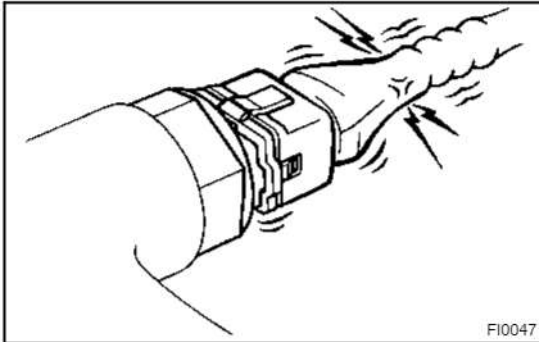
Connector being checked is disconnected.

B00691

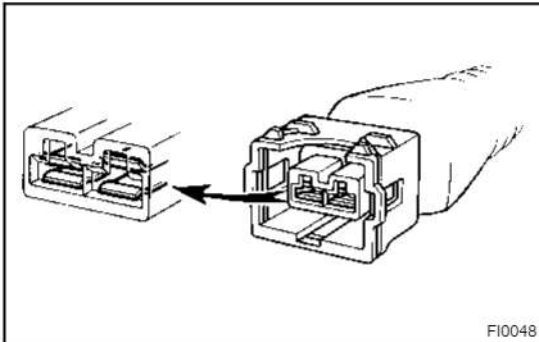
B00972



F10046



F10047



F10048

HOW TO USE THE DIAGNOSTIC CHART AND INSPECTION PROCEDURE

1. CONNECTOR CONNECTION AND TERMINAL INSPECTION

- For troubleshooting, diagnostic trouble code charts or problem symptom table are provided for each circuit with detailed inspection procedures on the following pages.
- When all the component parts, wire harnesses and connectors of each circuit except the ECU are found to be normal in troubleshooting, then it is determined that the problem is in the ECU. Accordingly, if diagnosis is performed without the problem symptoms occurring, refer to Step 8 to replace the ECU. So always confirm that the problem symptoms are occurring, or proceed with inspection while using the symptom simulation method.
- The instructions "Check wire harness and connector" and "Check and replace ECU" which appear in the inspection procedure, are common and applicable to all diagnostic trouble codes. Follow the procedure outlined below whenever these instructions appear.

OPEN CIRCUIT:

This could be due to a disconnected wire harness, faulty contact in the connector, and a connector terminal pulled out, etc.

HINT:

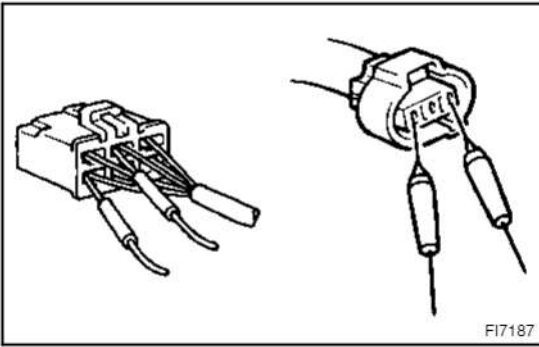
- It is rarely the case that a wire is broken in the middle of it. Most cases occur at the connector. In particular, carefully check the connectors of sensors and actuators.
- Faulty contact could be due to rusting of the connector terminals, to foreign materials entering terminals or a deformation of connector terminals. Simply disconnecting and reconnecting the connectors once changes the condition of the connection and may result in a return to normal operation. Therefore, in troubleshooting, if no abnormality is found in the wire harness and connector check, but the problem disappears after the check, then the cause is considered to be in the wire harness or connectors.

SHORT CIRCUIT:

This could be due to a contact between wire harness and the body ground or to a short circuit occurred inside the switch, etc.

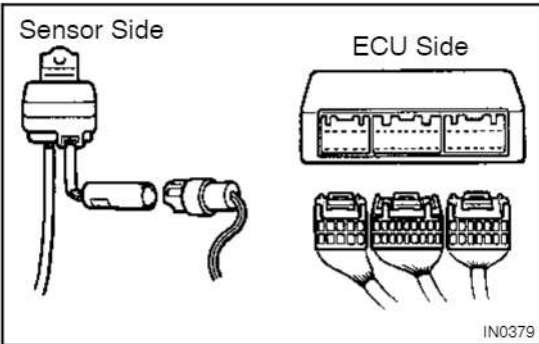
HINT:

When there is a short circuit between the wire harness and body ground, check thoroughly whether the wire harness is caught in the body or is clamped properly.



2. CONNECTOR HANDLING

When inserting tester probes into a connector, insert them from the rear of the connector. When necessary, use mini test leads. For water resistant connectors which cannot be accessed from behind, take good care not to deform the connector terminals.



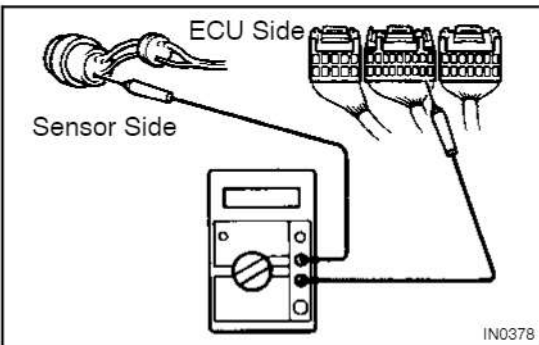
3. CONTINUITY CHECK (OPEN CIRCUIT CHECK)

- (a) Disconnect the connectors at both ECU and sensor sides.
- (b) Measure the resistance between the applicable terminals of the connectors.

Resistance: 1 Ω or less

HINT:

Measure the resistance while lightly shaking the wire harness vertically and horizontally.



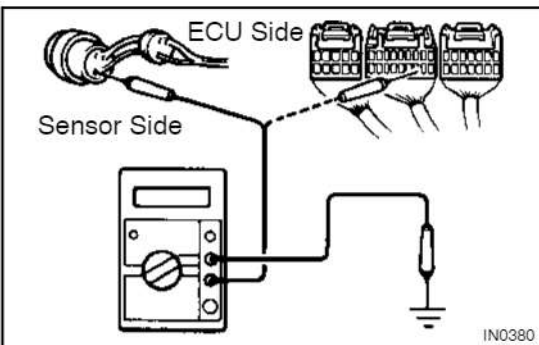
4. RESISTANCE CHECK (SHORT CIRCUIT CHECK)

- (a) Disconnect the connectors on both ends.
- (b) Measure the resistance between the applicable terminals of the connectors and body ground. Be sure to carry out this check on the connectors on both ends.

Resistance: 1 MΩ or higher

HINT:

Measure the resistance while lightly shaking the wire harness vertically and horizontally.

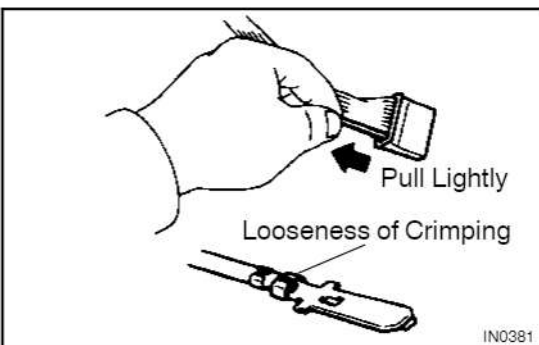


5. VISUAL CHECK AND CONTACT PRESSURE CHECK

- (a) Disconnect the connectors at both ends.
- (b) Check for rust or foreign material, etc. in the terminals of the connectors.
- (c) Check crimped portions for looseness or damage and check that the terminals are secured in lock portion.

HINT:

The terminals should not come out when pulled lightly from the back.



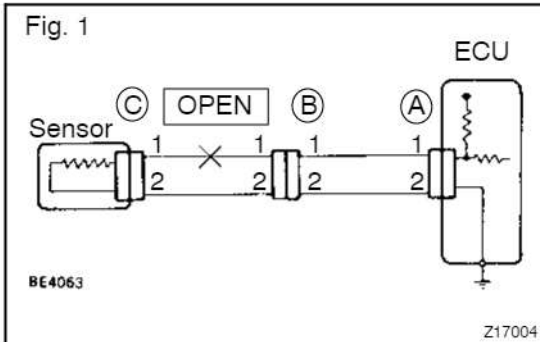
- (d) Prepare a test male terminal and insert it in the female terminal, then pull it out.

NOTICE:

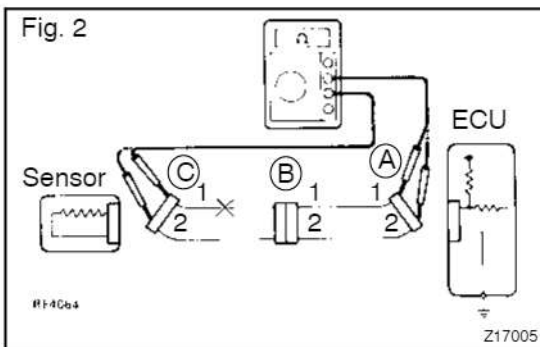
When testing a gold-plated female terminal, always use a gold-plated male terminal.

HINT:

When the test terminal is pulled out more easily than others, there may be poor contact in that section.

**6. CHECK OPEN CIRCUIT**

For the open circuit in the wire harness in Fig. 1, perform "(a) Continuity Check" or "(b) Voltage Check" to locate the section.



- (a) Check the continuity.

- (1) Disconnect connectors "A" and "C" and measure the resistance between them.

In the case of Fig. 2:

Between terminal 1 of connector "A" and terminal 1 of connector "C" → No continuity (open)

Between terminal 2 of connector "A" and terminal 2 of connector "C" → Continuity

Therefore, it is found out that there is an open circuit between terminal 1 of connector "A" and terminal 1 of connector "C".

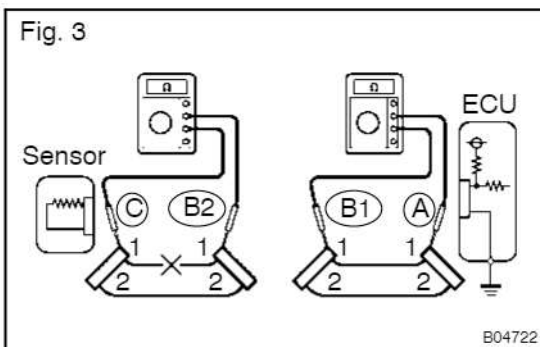
- (2) Disconnect connector "B" and measure the resistance between the connectors.

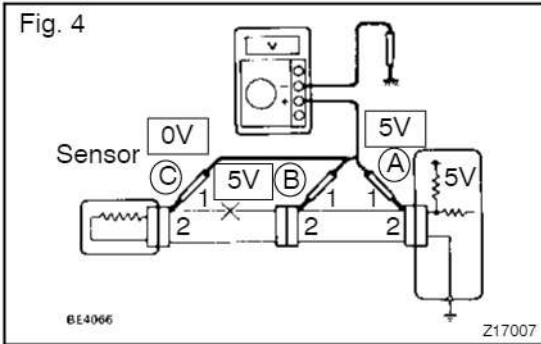
In the case of Fig. 3:

Between terminal 1 of connector "A" and terminal 1 of connector "B1" → Continuity

Between terminal 1 of connector "B2" and terminal 1 of connector "C" → No continuity (open)

Therefore, it is found out that there is an open circuit between terminal 1 of connector "B2" and terminal 1 of connector "C".





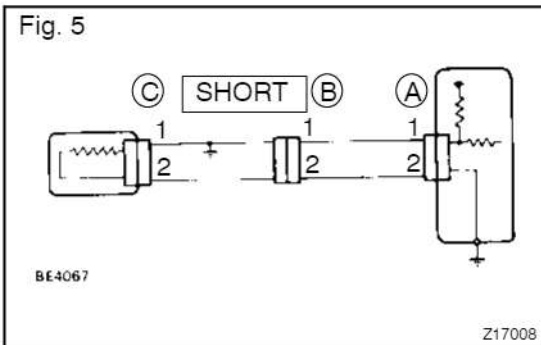
(b) Check the voltage.

In a circuit in which voltage is applied (to the ECU connector terminal), an open circuit can be checked for by conducting a voltage check.

As shown in Fig. 4, with each connector still connected, measure the voltage between body ground and terminal 1 of connector "A" at the ECU 5V output terminal, terminal 1 of connector "B", and terminal 1 of connector "C", in that order.

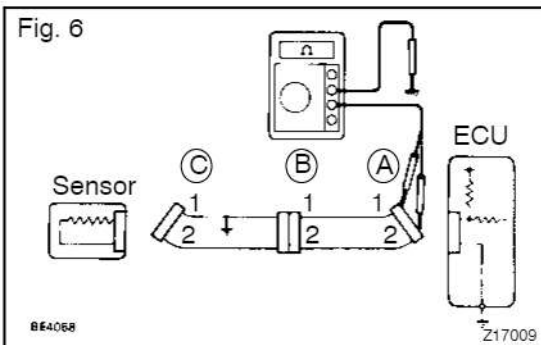
If the results are:

- 5V: Between Terminal 1 of connector "A" and Body Ground
 - 5V: Between Terminal 1 of connector "B" and Body Ground
 - 0V: Between Terminal 1 of connector "C" and Body Ground
- Then it is found out that there is an open circuit in the wire harness between terminal 1 of "B" and terminal 1 of "C".



7. CHECK SHORT CIRCUIT

If the wire harness is ground shorted as in Fig. 5, locate the section by conducting a "continuity check with ground".



Check the continuity with ground.

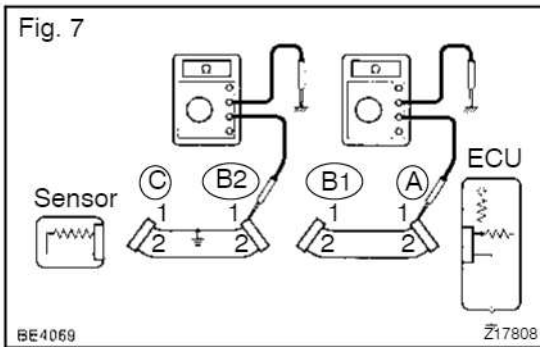
- (1) Disconnect connectors "A" and "C" and measure the resistance between terminal 1 and 2 of connector "A" and body ground.

In the case of Fig. 6:

Between terminal 1 of connector "A" and body ground → Continuity (short)

Between terminal 2 of connector "A" and body ground → No continuity

Therefore, it is found out that there is a short circuit between terminal 1 of connector "A" and terminal 1 of connector "C".



- (2) Disconnect connector "B" and measure the resistance between terminal 1 of connector "A" and body ground, and terminal 1 of connector "B2" and body ground.

In the case of Fig. 7:

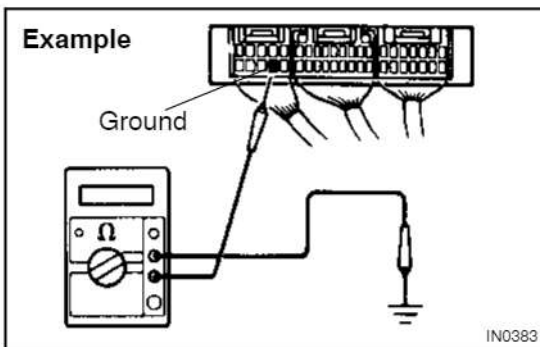
Between terminal 1 of connector "A" and body ground → No continuity

Between terminal 1 of connector "B2" and body ground → Continuity (short)

Therefore, it is found out that there is a short circuit between terminal 1 of connector "B2" and terminal 1 of connector "C".

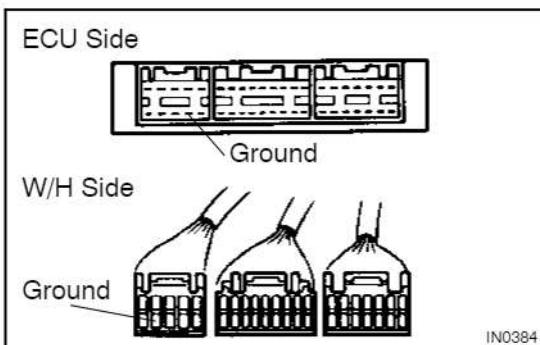
8. CHECK AND REPLACE ECU

First check the ECU ground circuit. If it is faulty, repair it. If it is normal, the ECU could be faulty, so replace the ECU with a normal functioning one and check that the symptoms appear.



- (1) Measure the resistance between the ECU ground terminal and the body ground.

Resistance: 1 Ω or less



- (2) Disconnect the ECU connector, check the ground terminals on the ECU side and the wire harness side for bend and check the contact pressure.

TERMS

ABBREVIATIONS USED IN THIS MANUAL

IN012-16

Abbreviations	Meaning
ABS	Anti-Lock Brake System
A/C	Air Conditioner
AC	Alternating Current
ACC	Accessory
ACIS	Acoustic Control Induction System
ACSD	Automatic Cold Start Device
A.D.D.	Automatic Disconnecting Differential
AHC	Active Height Control Suspension
ALR	Automatic Locking Retractor
ALT	Alternator
AMP	Amplifier
ANT	Antenna
APPROX.	Approximately
A/T	Automatic Transmission (Transaxle)
ATF	Automatic Transmission Fluid
AUTO	Automatic
BA	Brake Assist
BACS	Boost Altitude Compensation System
BAT	Battery
B/L	Bi-Level
BVSV	Bimetallic Vacuum Switching Valve
CB	Circuit Breaker
CD	Compact Disc
CH	Channel
CKD	Complete Knock Down
COMB.	Combination
CPE	Coupe
CRS	Child Restraint System
CTR	Center
DC	Direct Current
DIFF.	Differential
DIFF. LOCK	Differential Lock
DLC	Data Link Connector
DSP	Digital Signal Processor
DTC	Diagnostic Trouble Code
EBD	Electronic Brake Force Distribution
ECT	Electronic Control Transmission
ECU	Electronic Control Unit
EDU	Electronic Driving Unit
EFI	Electronic Fuel Injection
E/G	Engine
ELR	Emergency Locking Retractor

FF	Front-Engine Front-Wheel-Drive
FIPG	Formed In Place Gasket
FL	Fusible Link
Fr	Front
FR	Front-Engine Rear-Wheel-Drive
FWD	Front-Wheel-Drive
GND	Ground
H/B	Hatchback
HI	High
HID	High Intensity Discharge (Head Lamp)
HT	Hard Top
HWS	Heated Windshield System
IAC	Idle Air Control
IFS	Independent Front Suspension
IG	Ignition
INT	Intermittent
I/P	Instrument Panel
IRS	Independent Rear Suspension
J/B	Junction Block
J/C	Junction Connector
LAN	Local Area Network
LB	Liftback
LCD	Liquid Crystal Display
LED	Light Emitting Diode
LH	Left-Hand
LHD	Left-Hand Drive
LO	Low
LSD	Limited Slip Differential
LSP & PV	Load Sensing Proportioning And Bypass Valve
LSPV	Load Sensing Proportioning Valve
MAP	Manifold Absolute Pressure
MAX.	Maximum
MIC	Microphone
MIL	Malfunction Indicator Lamp
MIN.	Minimum
MP	Multipurpose
MPI	Multipoint Electronic Fuel Injection
MPX	Multiplex Communication System
M/T	Manual Transmission
N	Neutral
No.	Number
O2S	Oxygen Sensor
O/D	Overdrive
OPT	Option
P & BV	Proportioning And Bypass Valve
PCS	Power Control System

INTRODUCTION - TERMS


PKB	Parking Brake
PPS	Progressive Power Steering
PS	Power Steering
PTO	Power Take-Off
RAM	Random Access Memory
R/B	Relay Block
RBS	Recirculating Ball Type Steering
R/F	Reinforcement
RFS	Rigid Front Suspension
RH	Right-Hand
RHD	Right-Hand Drive
RLY	Relay
ROM	Read Only Memory
Rr	Rear
RR	Rear-Engine Rear-Wheel Drive
RRS	Rigid Rear Suspension
RWD	Rear-Wheel Drive
SDN	Sedan
SEN	Sensor
SICS	Starting Injection Control System
SPEC	Specification
SRS	Supplemental Restraint System
SSM	Special Service Materials
SST	Special Service Tools
STD	Standard
SW	Switch
SYS	System
T/A	Transaxle
TACH	Tachometer
TDC	Top Dead Center
TEMP.	Temperature
TEMS	TOYOTA Electronic Modulated Suspension
TFT	Toyota Free-Tronic
T/M	Transmission
TMC	TOYOTA Motor Corporation
TRC	Traction Control System
U/D	Underdrive
VENT	Ventilator
VIN	Vehicle Identification Number
VSC	Vehicle Stability Control
w/	With
WGN	Wagon
W/H	Wire Harness
w/o	Without
1st	First
2nd	Second

2WD	Two Wheel Drive Vehicle (4x2)
4WD	Four Wheel Drive Vehicle (4x4)

BODY

RECOMMENDED TOOLS

PP3HQ-01

	09070-20010 Moulding Remover .	
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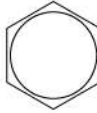

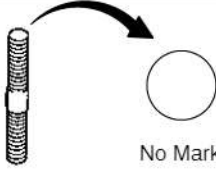
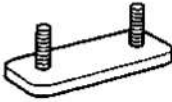























EQUIPMENT

Hog ring pliers	
Tape	To avoid surface damage
Adhesive tape	To avoid surface damage
Double-stick tape	
Hair dryer	
Tacker	BANZAI 303 XT
Tack pin	
Torx wrench	

STANDARD BOLT

HOW TO DETERMINE BOLT STRENGTH

SS028-01

Bolt Type				Class
Hexagon Head Bolt		Stud Bolt	Weld Bolt	
Normal Recess Bolt	Deep Recess Bolt			
  No Mark	 No Mark	 No Mark		4T
 				5T
  w/ Washer	 w/ Washer			6T
 	 			7T
		 		8T
				9T
	 			10T
	 			11T

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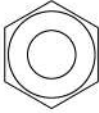
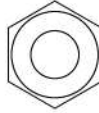
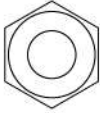




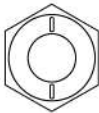

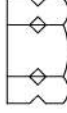





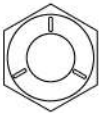






B06431

SPECIFIED TORQUE FOR STANDARD BOLTS

Class	Diameter mm	Pitch mm	Specified torque					
			Hexagon head bolt			Hexagon flange bolt		
			N·m	kgf·cm	ft·lbf	N·m	kgf·cm	ft·lbf
4T	6	1	5	55	48 in.·lbf	6	60	52 in.·lbf
	8	1.25	12.5	130	9	14	145	10
	10	1.25	26	260	19	29	290	21
	12	1.25	47	480	35	53	540	39
	14	1.5	74	760	55	84	850	61
	16	1.5	115	1,150	83	-	-	-
5T	6	1	6.5	65	56 in.·lbf	7.5	75	65 in.·lbf
	8	1.25	15.5	160	12	17.5	175	13
	10	1.25	32	330	24	36	360	26
	12	1.25	59	600	43	65	670	48
	14	1.5	91	930	67	100	1,050	76
	16	1.5	140	1,400	101	-	-	-
6T	6	1	8	80	69 in.·lbf	9	90	78 in.·lbf
	8	1.25	19	195	14	21	210	15
	10	1.25	39	400	29	44	440	32
	12	1.25	71	730	53	80	810	59
	14	1.5	110	1,100	80	125	1,250	90
	16	1.5	170	1,750	127	-	-	-
7T	6	1	10.5	110	8	12	120	9
	8	1.25	25	260	19	28	290	21
	10	1.25	52	530	38	58	590	43
	12	1.25	95	970	70	105	1,050	76
	14	1.5	145	1,500	108	165	1,700	123
	16	1.5	230	2,300	166	-	-	-
8T	8	1.25	29	300	22	33	330	24
	10	1.25	61	620	45	68	690	50
	12	1.25	110	1,100	80	120	1,250	90
9T	8	1.25	34	340	25	37	380	27
	10	1.25	70	710	51	78	790	57
	12	1.25	125	1,300	94	140	1,450	105
10T	8	1.25	38	390	28	42	430	31
	10	1.25	78	800	58	88	890	64
	12	1.25	140	1,450	105	155	1,600	116
11T	8	1.25	42	430	31	47	480	35
	10	1.25	87	890	64	97	990	72
	12	1.25	155	1,600	116	175	1,800	130

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HOW TO DETERMINE NUT STRENGTH

Present Standard Hexagon Nut	Nut Type		Class
	Old Standard Hexagon Nut		
	Cold Forging Nut	Cutting Processed Nut	
 No Mark			4N
 No Mark (w/ Washer)	 No Mark (w/ Washer)	 No Mark	5N (4T)
  			6N
	 	  *	7N (5T)
 			8N
 	 	 No Mark	10N (7T)
 			11N
 			12N

*: Nut with 1 or more marks on one side surface of the nut.

HINT:

Use the nut with the same number of the nut strength classification or the greater than the bolt strength classification number when tightening parts with a bolt and nut.

Example: Bolt = 4T

Nut = 4N or more

LAND CRUISER (W/G) SUP (RM829E)

BODY**TORQUE SPECIFICATION**

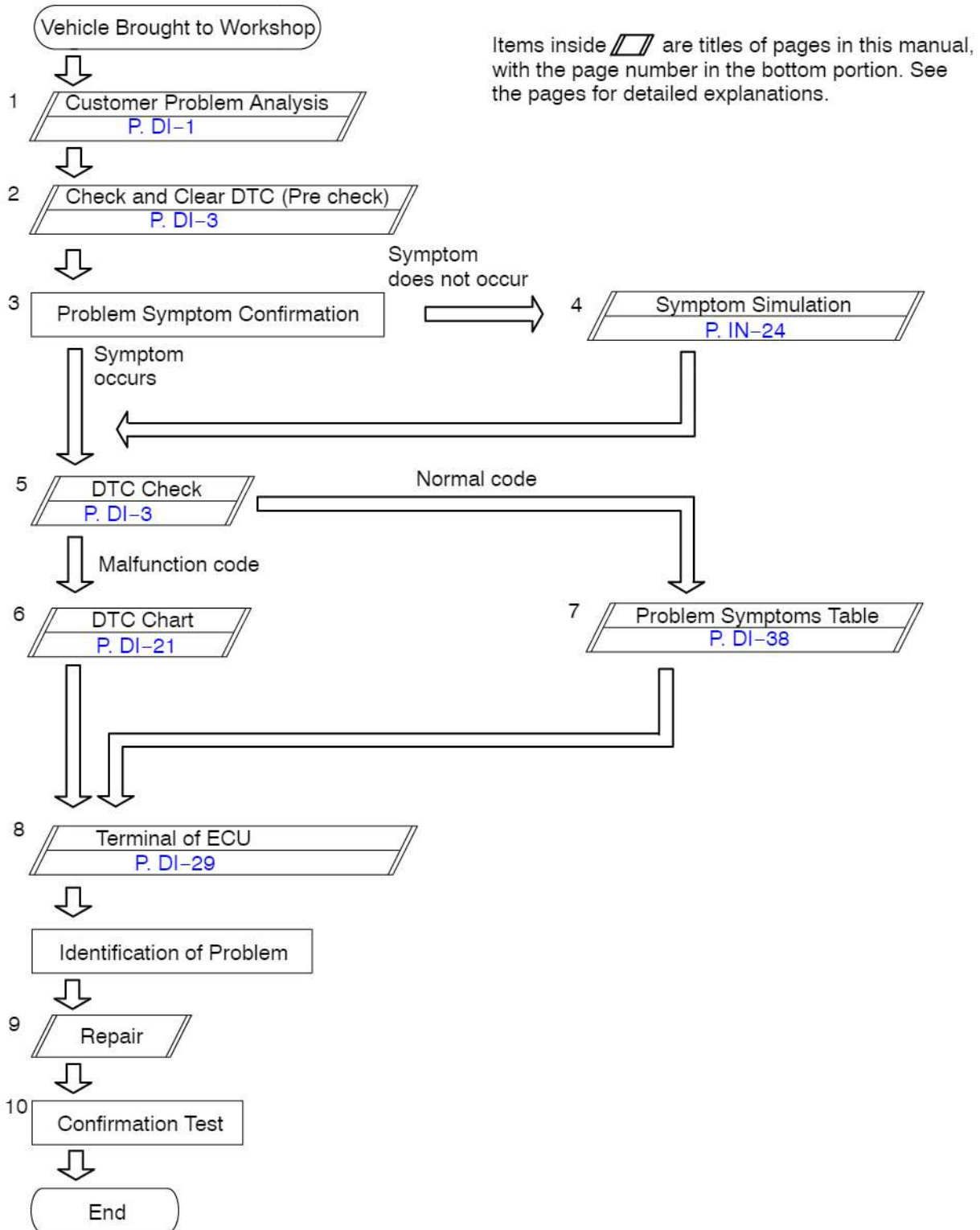
SS11F-01

Part tightened	N·m	kgf·cm	ft·lbf
INSTRUMENT PANEL	-	-	-
Front passenger airbag assembly x Reinforcement	20	204	15
Steering wheel set nut	50	510	37
Front passenger airbag assembly x Instrument panel	6.0	61	53 in.·lbf
FRONT SEAT (Separate Type: Power Adjuster)	-	-	-
Front seat adjuster x Body	42	430	31
Seatback assembly x Seat adjuster	43	440	32
Seat cushion assembly x Seat adjuster	21	210	15
Front seat inner belt x Seat adjuster	42	430	31

NAVIGATION SYSTEM

HOW TO PROCEED WITH TROUBLESHOOTING

DI27W-12



CUSTOMER PROBLEM ANALYSIS CHECK

NAVIGATION SYSTEM Check Sheet

Inspector's name: _____

Customer's Name		Registration No.	
		Registration Year	
		Frame No.	
Date of Vehicle Brought in	/ /	Odometer Reading	km Mile

Date Problem First Occurred	/ /
Frequency Problem Occurs	<input type="checkbox"/> Constant <input type="checkbox"/> Intermittent (Times a day)

Problem Symptom	Navigation malfunction	<input type="checkbox"/> Cursor movement is defective.
		<input type="checkbox"/> Cursor does not move.
		<input type="checkbox"/> GPS mark does not appear.
		<input type="checkbox"/> Map is not displayed.
		<input type="checkbox"/> Others ()
	Display malfunction	<input type="checkbox"/> Screen is dark.
		<input type="checkbox"/> Screen is white.
		<input type="checkbox"/> Color is not uniform.
		<input type="checkbox"/> Screen is in disorder.
		<input type="checkbox"/> Others ()
	Control Switch malfunction	<input type="checkbox"/> Can not operate with panel switches.
		<input type="checkbox"/> Can not operate with touch switches.
		<input type="checkbox"/> Others ()

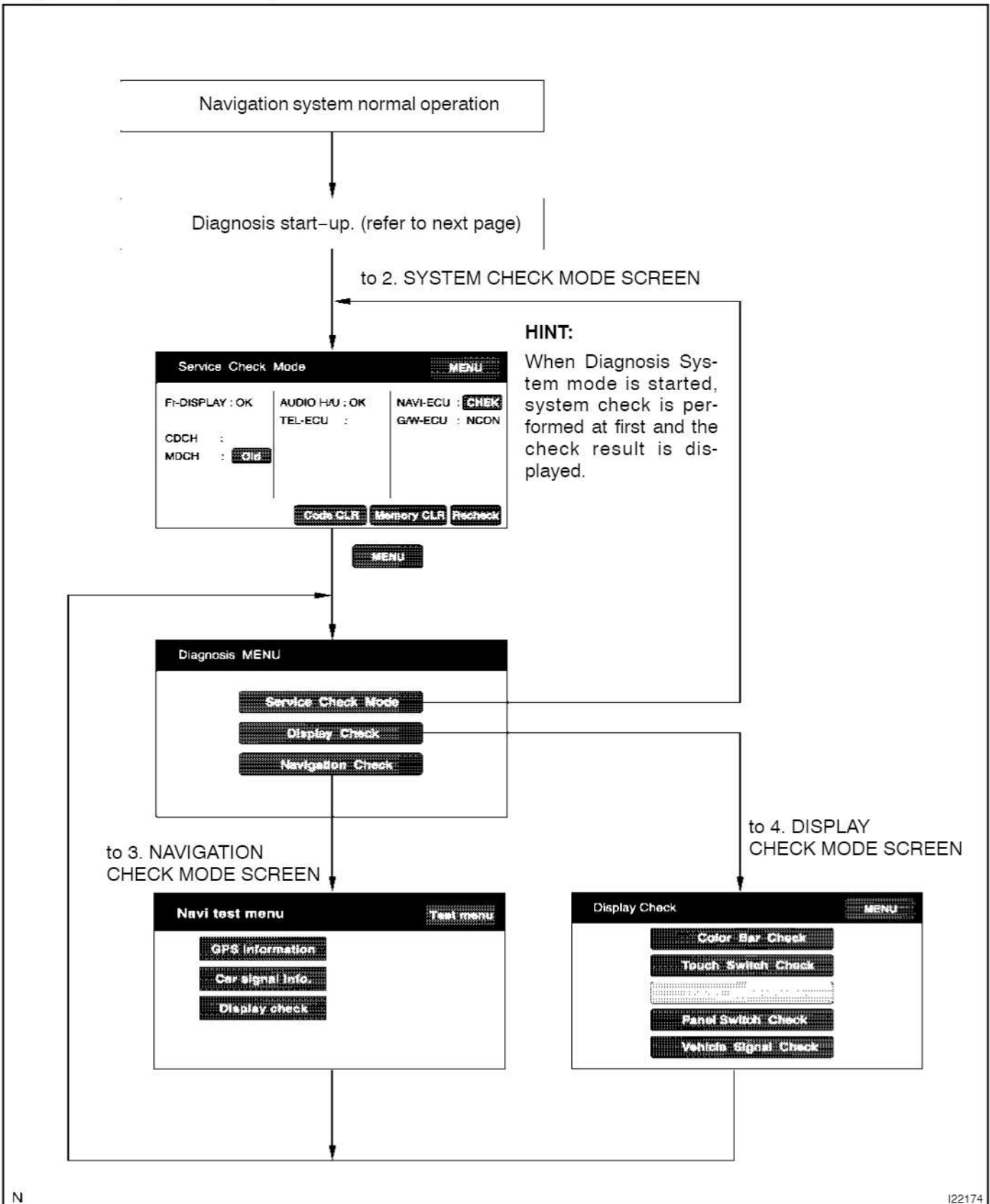
	Parts name	1st time malfunction code.	2nd time malfunction code.
DTC Check	Navigation ECU		
	Multi-display		
	Radio receiver assembly		
	Stereo component amplifier		
	Gateway ECU		
	CD auto changer		

PRE-CHECK

1. DIAGNOSIS SYSTEM MODE

HINT:

Diagnosis System Mode is operated as follows.



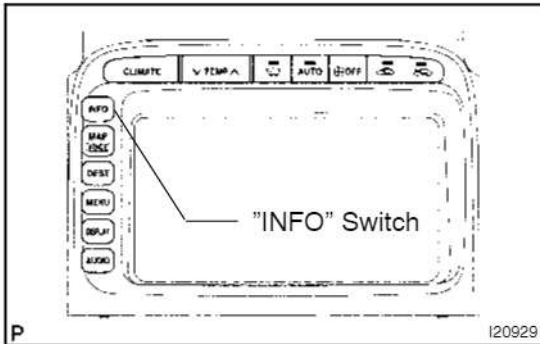
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(a) DIAGNOSIS START-UP

To start the diagnosis menu, there are 3 ways: using a diagnosis check wire and using a switch.

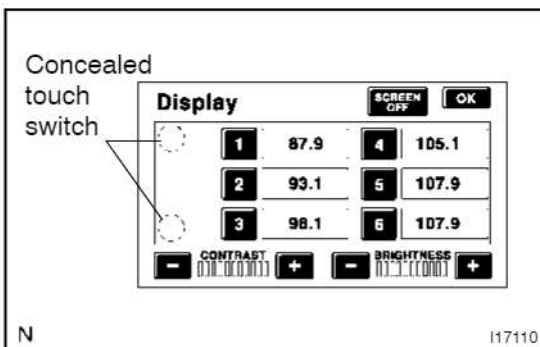


(b) START-UP BY SWITCH OPERATION (Light control switch)

- (1) Vehicle speed is 0 km/h (0 mph).
- (2) Parking brake switch is pressed.
- (3) While pressing "INFO" switch, by turning the light control switch to OFF, TAIL, OFF, TAIL, OFF, TAIL and OFF the system is started up.

(c) START-UP BY SWITCH OPERATION (Touch panel)

- (1) Vehicle speed is 0 km/h (0 mph).
- (2) Parking brake switch is pressed.
- (3) Press the "DISPLAY" switch to display the Screen Adjustment screen.



- (4) Repeatedly touch the upper and lower bottom parts of the left end of the screen 3 times.

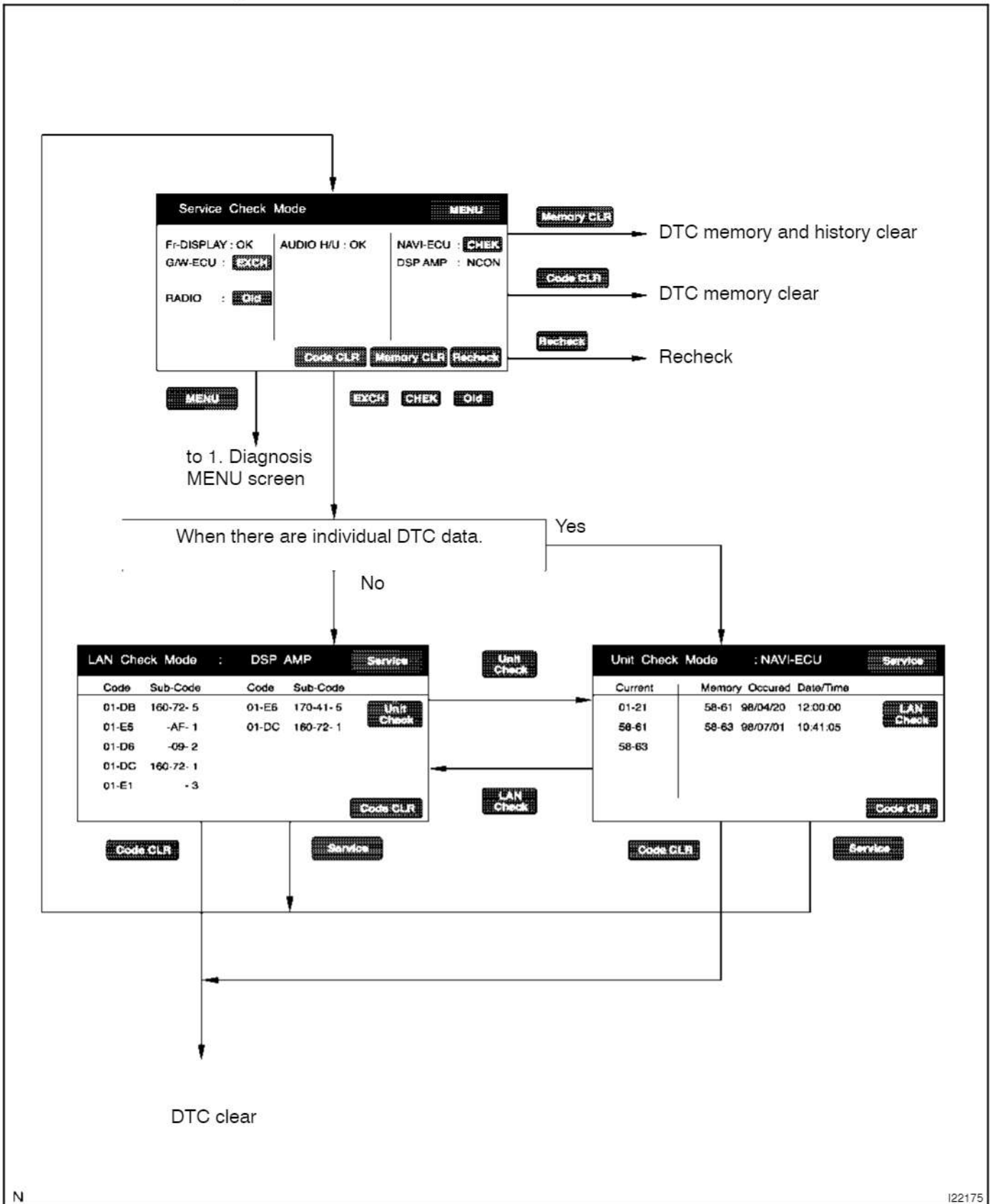
(d) FINISHING DIAGNOSIS SYSTEM MODE

Turn the ignition switch from ACC to OFF to finish the mode. If it is started by switch operation.

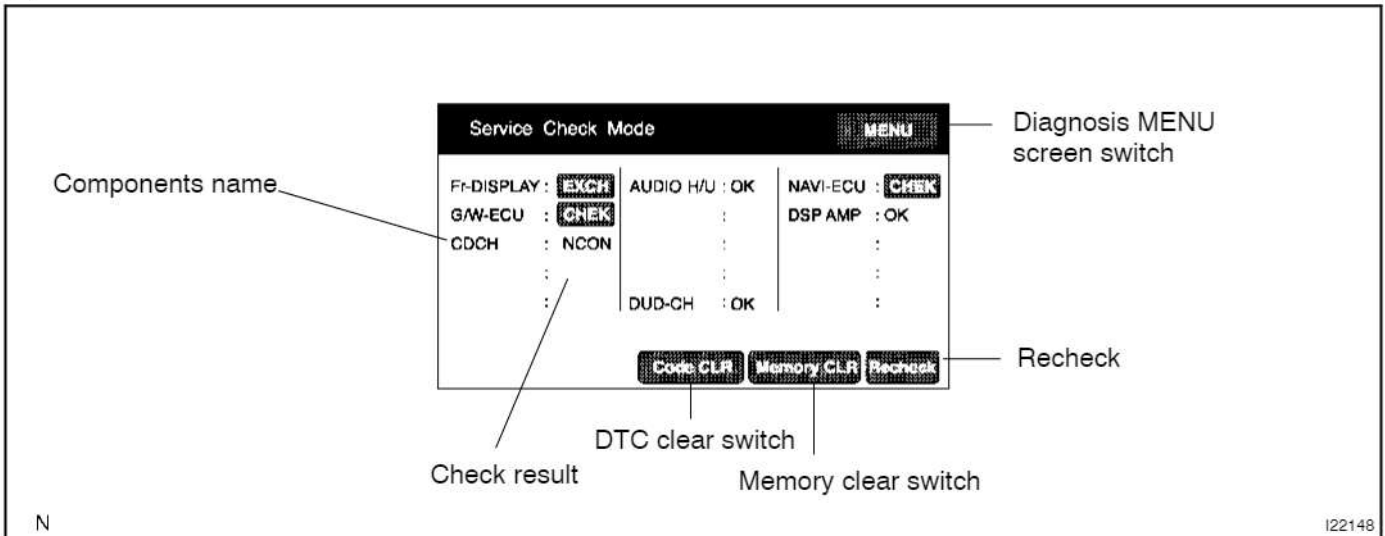
2. SERVICE CHECK MODE

HINT:

Service Check Mode is operated as follows.



(a) SERVICE CHECK SCREEN

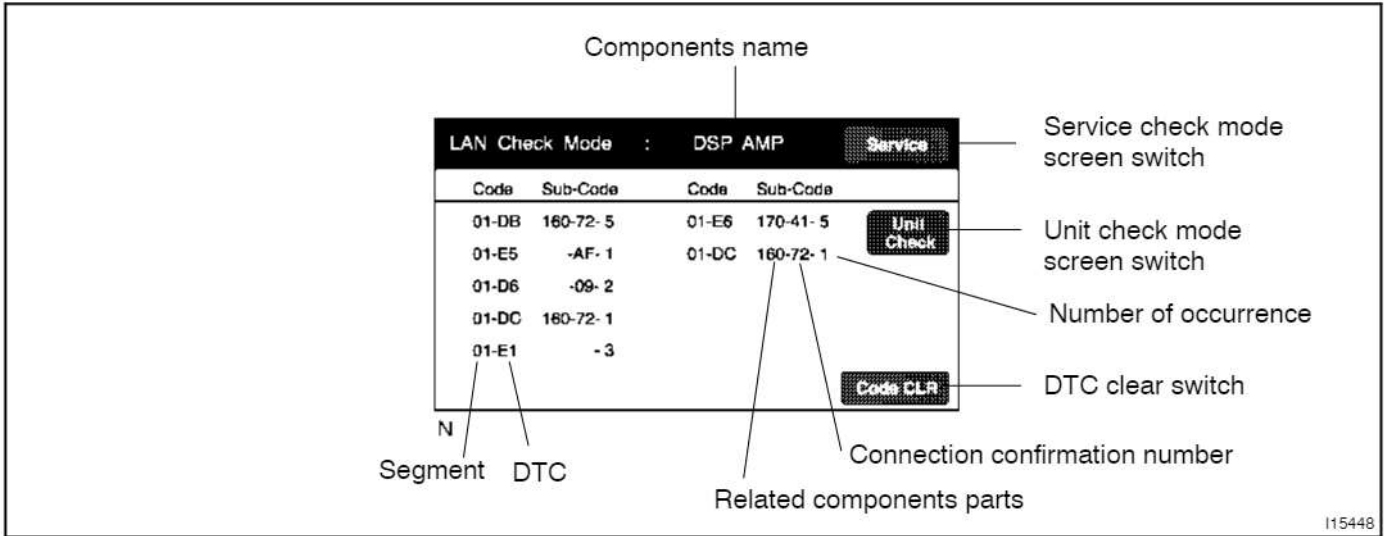


- (1) By performing system check and collecting data of diagnosis memory, this mode checks the current and past condition of the vehicle.
- (2) List of all components name or physical addresses.
It displays only the components that have been connected at least once.
- (3) The check result is displayed for all components.
- (4) The check result is displayed by 6 abbreviations: "OK", "EXCH", "CHEK", "NCON", "NRES" and "Old". ("EXCH", "CHEK" and "Old" have a function as switches.)
- (5) Based on all information obtained from "System Check Request", "Diagnosis Memory Request" and "Current Diagnosis Result" command, the following results are displayed:
OK: No error is identified.
EXCH: One or more error codes requesting for exchange are detected in any check result.
CHEK: Except the conditions for "EXCH", one or more error codes requesting for check are detected in any check result.
- (6) The other check results are as follows:
NCON: No response to "Diagnosis ON Instruction" command and it is not connected when the system is started.
Old: One or more error codes are detected when responding to "Diagnosis ON Instruction" command because of the old version .
NRES: No response to all commands of "System Check Request", "Diagnosis Memory Request" and "Current Diagnosis Result". Or no error is detected by any one of "System Check Request" or "Diagnosis Memory Request" when no response to the other command.
- (7) "EXCH", "CHEK" and "Old" are functioned as switches any by pressing these, LAN Check Mode and Unit Check Mode are activated.
- (8) Memory Clear Switch
Pressing this switch for 3 sec. deletes all information about master component registration and diagnosis memory of all components.
- (9) DTC Clear Switch
Pressing this switch for 3 sec. deletes diagnosis memory of all components.
- (10) Recheck Switch
Pressing this switch rechecks the system.

- (11) Menu Switch
Pressing this switch activated the Diagnosis Menu Screen.

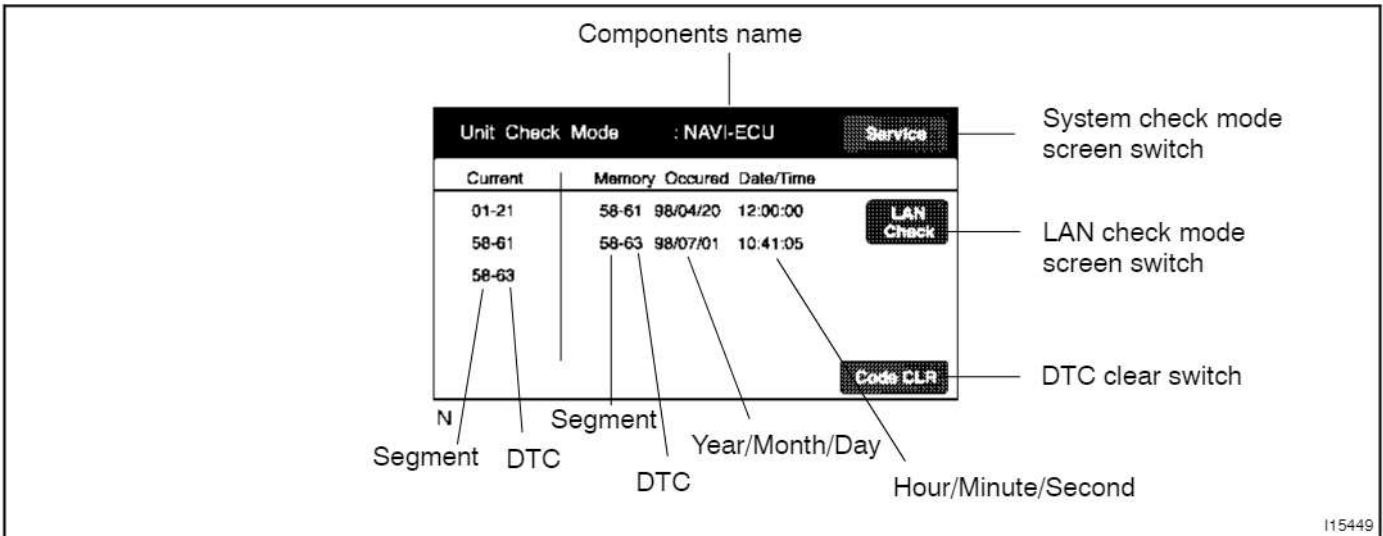


(b) LAN CHECK MODE SCREEN



- (1) As a detailed screen in the System Check Mode, LAN Check Mode is displayed.
- (2) Communication codes (logical address "01") are extracted from the diagnosis data obtained by "Diagnosis Memory Request" and displayed.
- (3) Component Name
Names of the components to be checked are displayed.
- (4) Segment
Logical address codes corresponding to DTC are displayed.
- (5) DTC
DTC displayed.
- (6) Related components address
Physical address codes corresponding to DTC are displayed.
- (7) Connection Confirmation Number
Connection confirmation numbers corresponding to DTC is displayed.
- (8) Number of Occurrence
The number of occurrence of the same DTC is displayed.
- (9) DTC Clear Switch
Pressing this switch for 3 sec. deletes DTC memory of the selected diagnosis component. When returning to the System Check Mode, the check result is shown as a blank.
- (10) Unit Check Mode Screen Switch
Pressing this switch activates the Unit Check Mode screen.
- (11) System Check Mode Screen Switch
Pressing this switch activates the System Check Mode screen.

(c) UNIT CHECK MODE SCREEN



- (1) As a detailed screen in the System Check Mode, the Unit Check Mode is displayed.
- (2) Up to 6 error codes detected by "The DTC obtained during the system check (including when starting the diagnosis mode)" can be displayed as "Current".
- (3) Up to 6 error codes detected by "DTC stored in the past" can be displayed as "Memory".
- (4) Component Name
Names of the components are displayed.
- (5) Segment
Logical address numbers corresponding to DTC are displayed.
- (6) DTC
DTC is displayed.
- (7) Year/Month/Day/Hour/Minute/Second
The date and time stamped at the time of code occurrence is displayed in the order of year-month-day-hour-minute-second. (Year is shown in 2-digit number.) If the date and time data is invalid, it is displayed as a blank.

HINT:

Time data is obtained after turning the ignition from ACC to ON. Until the valid time data is obtained, the data shown in the display shall be considered as invalid.

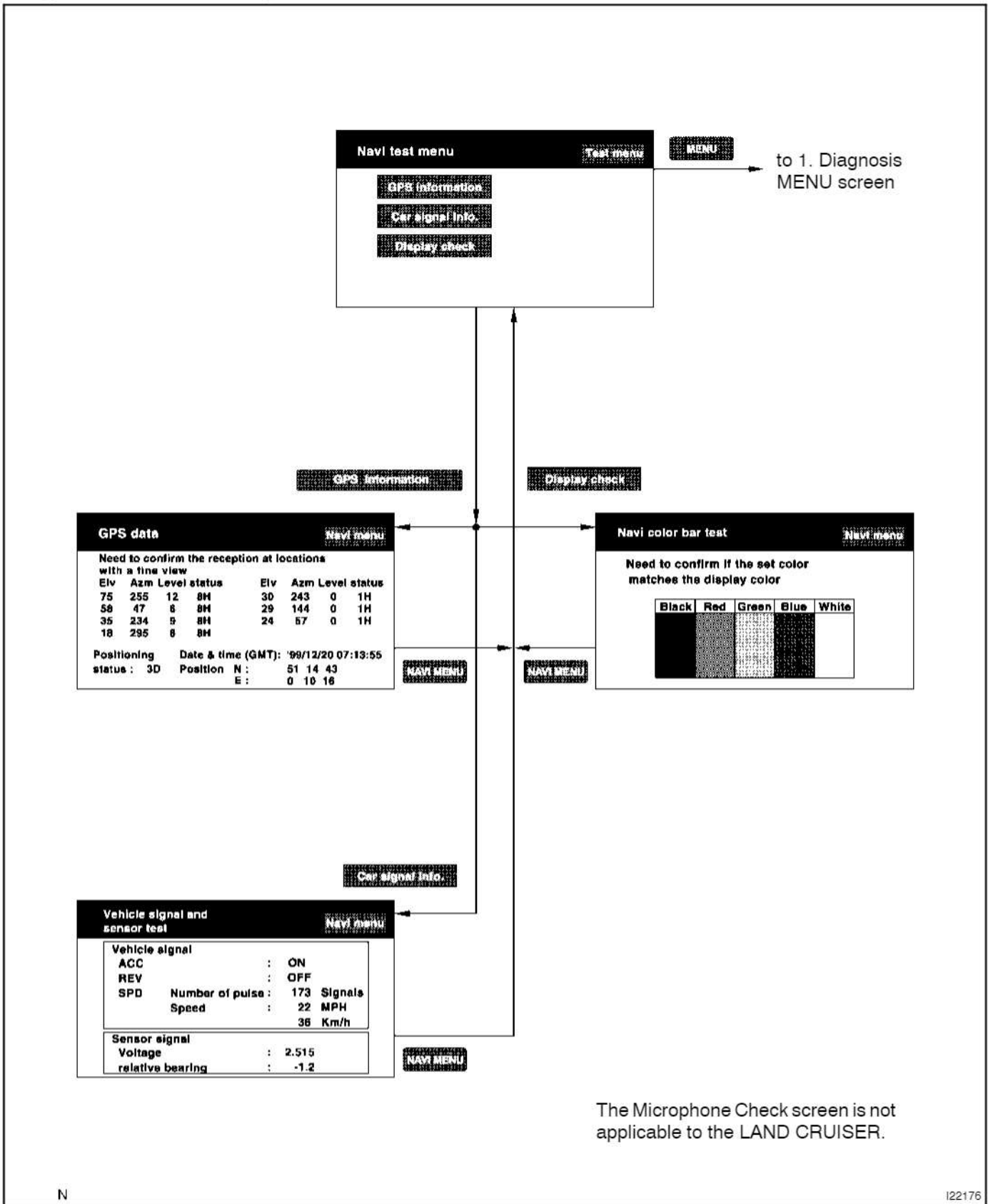
If stored before a valid time data is obtained, the data shall not be displayed.

- (8) DTC Clear Switch
Pressing this switch for 3 sec. deletes all diagnosis memory of the component. When returning to the System Check Mode, the check result is displayed as a blank.
- (9) Lan Check Mode Screen Switch
Pressing this switch activates the LAN Check Mode screen.
- (10) System Check Mode Screen .Switch
Pressing this switch activates the System Check Mode screen.

3. NAVIGATION CHECK MODE

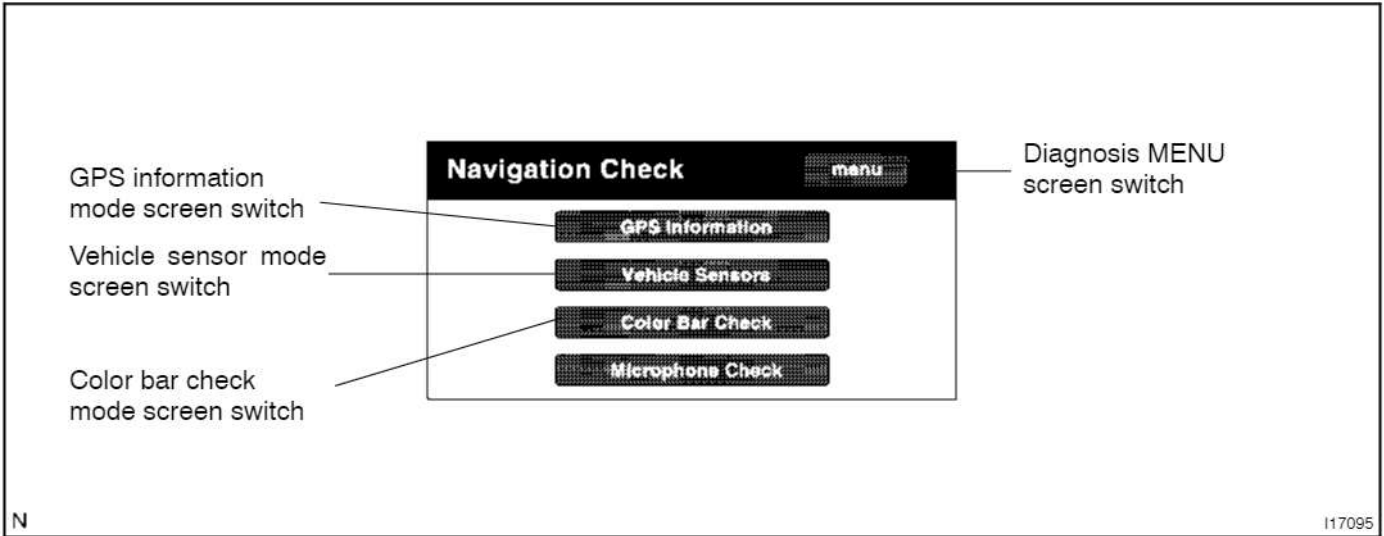
HINT:

Navigation Check Mode is operated as follows.



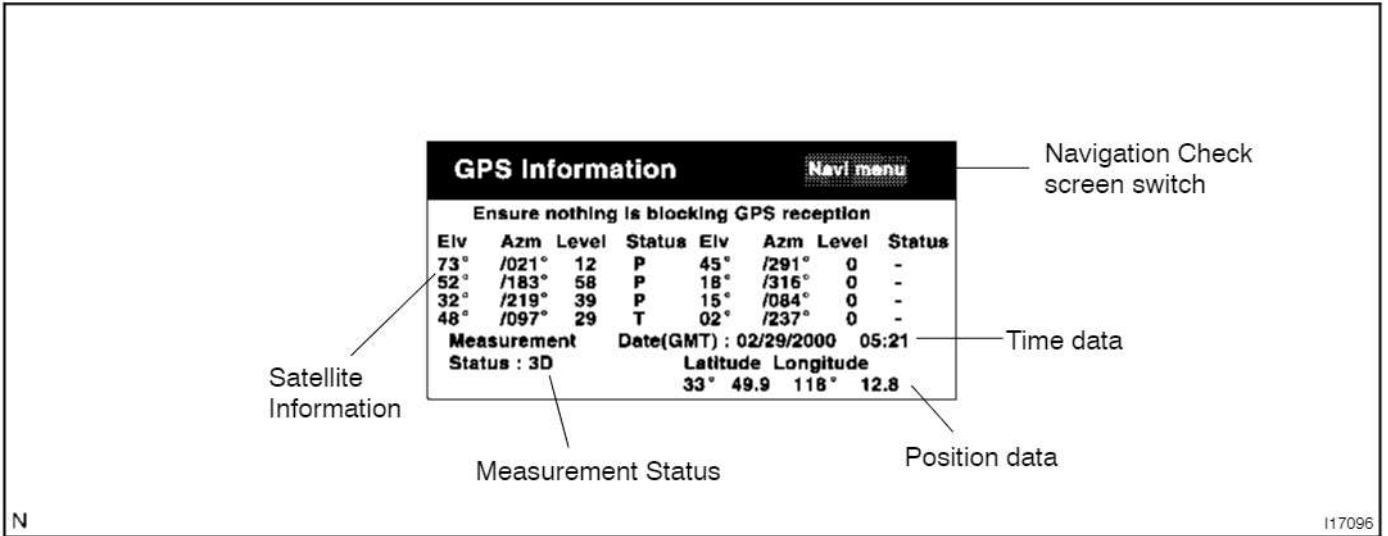
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(a) NAVIGATION CHECK MODE SCREEN



- (1) Various check screens for the Navigation ECU can be started from this menu screen.
- (2) GPS Information Mode Screen Switch
Pressing this switch activates GPS Information Mode Screen.
- (3) Vehicle Sensor Mode Screen Switch
Pressing this switch activates the Vehicle Signal Mode screen.
- (4) Color Bar Check Mode Screen Switch
Pressing this switch activates the Color Bar Check Mode screen.
- (5) Diagnosis Menu Screen Switch
Pressing this switch activates the Diagnosis Menu screen.

(b) GPS INFORMATION MODE SCREEN



- (1) This screen displays GPS related data.

HINT:

Data are updated every 1 sec.

- (2) Satellite Information

The angle of elevation of relevant satellite, azimuth signal level, and receiving condition of signals are displayed.

HINT:

The reception status shows receiving.

"T": means in operation but measurement is not being used for positioning.

"P": means measurement is being used for positioning.

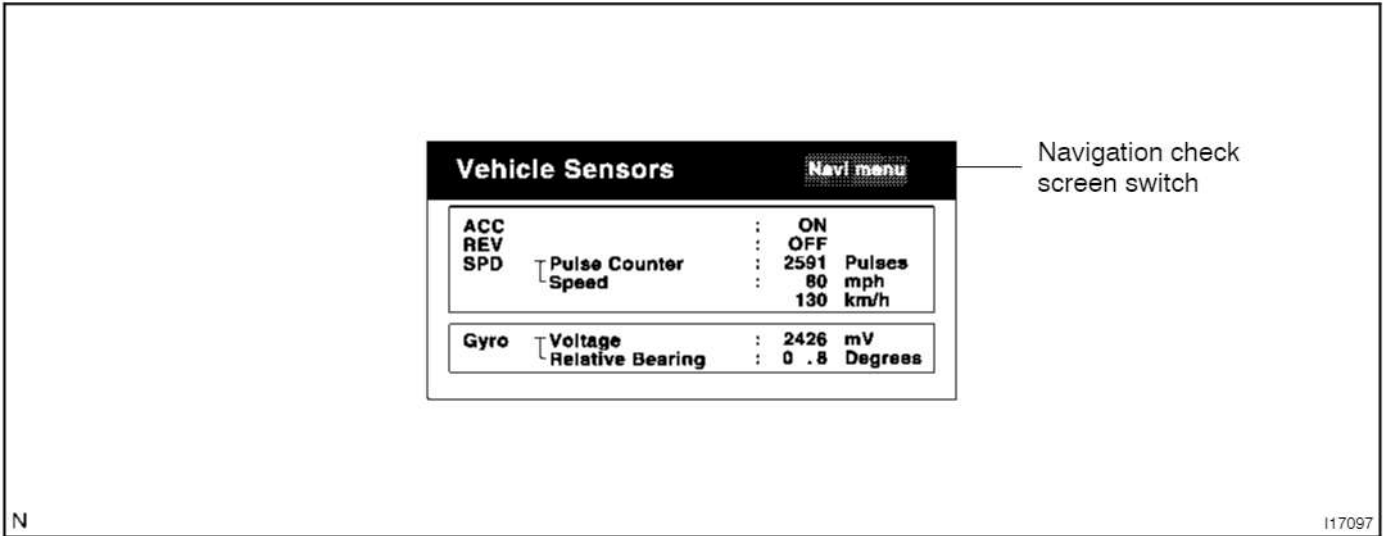
"-": means no data can be received.

Display area for up to 8 satellites is ensured.

Data shall be updated corresponding to change of information.

- (3) Time data: The time data obtained from a GPS receiver is displayed in month, day, year, hour and minute.
- (4) The displayed time is Greenwich Mean Time.
- (5) Position Data: The latitude and longitude of the current location are displayed in degree and minute.
- (6) Measurement Status is displayed in the following 5 items.
2D: 2 dimensions.
3D: 3 dimensions.
NG: GPS information cannot be used.
error: Receiving error occurs.
-: Other than the above.
- (7) Navigation Check Screen Switch
Pressing this switch activates the Navigation Check screen.

(c) VEHICLE SIGNAL CHECK MODE SCREEN



- (1) Status of the vehicle sensor which are input to the Navigation ECU is checked in this screen.

HINT:

Data are updated every 1 sec.

- (2) ACC signal status: Displayed as ON/OFF.
- (3) REV signal status: Displayed as ON/OFF.
- (4) SPD signal status: The following is displayed:
 - The cumulative value of the input pulse after displaying this screen. (shown in 5 digits)
 - Vehicle speed (Unit: km/h, mph)
- (5) Output condition of the gyro sensor: The following is displayed:
 - Voltage (Unit: mV, LSB: 1mV)
 - Relative azimuthal angle to the current point (0 degree).
Assuming the angle at a point when this screen is activated as 0 degree.
- (6) Navigation Check Menu Screen Switch
Pressing this switch displays the Navigation Check screen.

(d) COLOR BAR CHECK MODE SCREEN

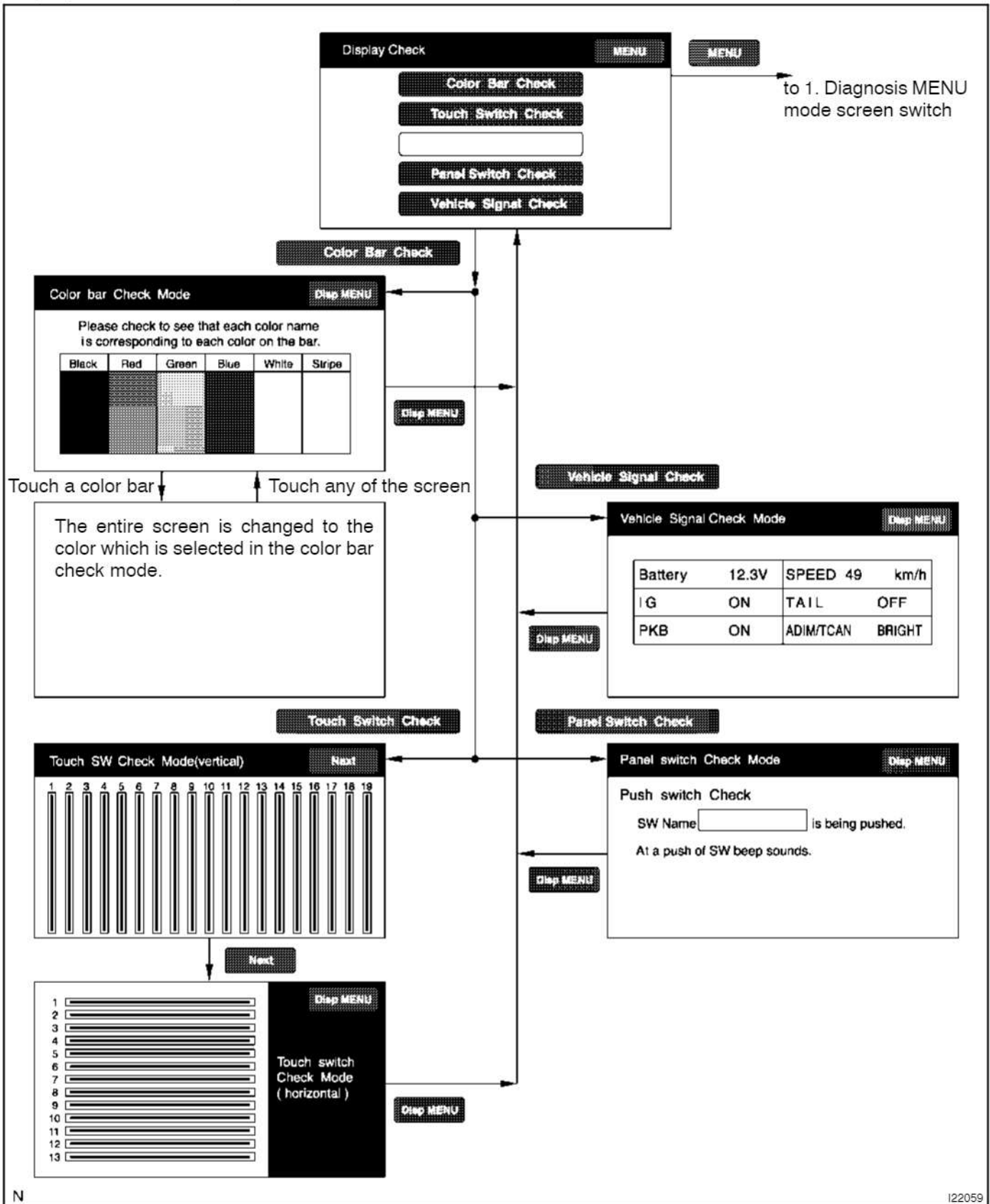


- (1) Color display of the Navigation ECU is checked in this screen.
- (2) Color Bars:
Five colors of "BLACK", "RED", "GREEN", "BLUE" and "WHITE" are displayed as bars.
- (3) Navigation Check Screen Switch
Pressing this switch displays the Navigation Check screen.

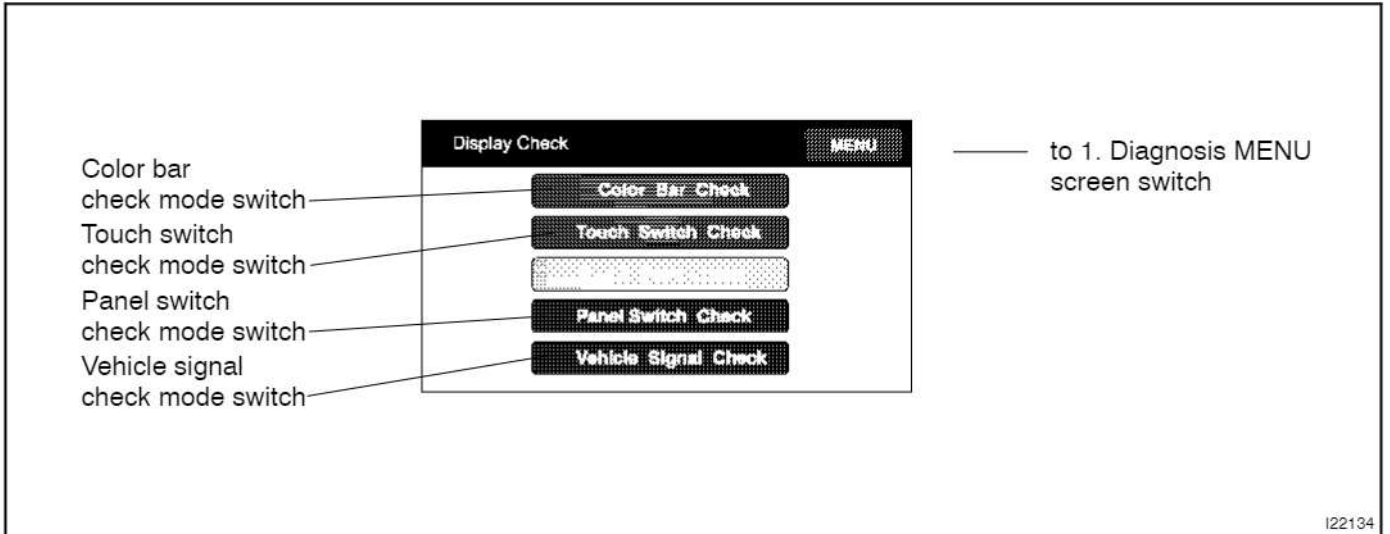
4. DISPLAY CHECK MODE

HINT:

Display Check Mode is operated as follows.

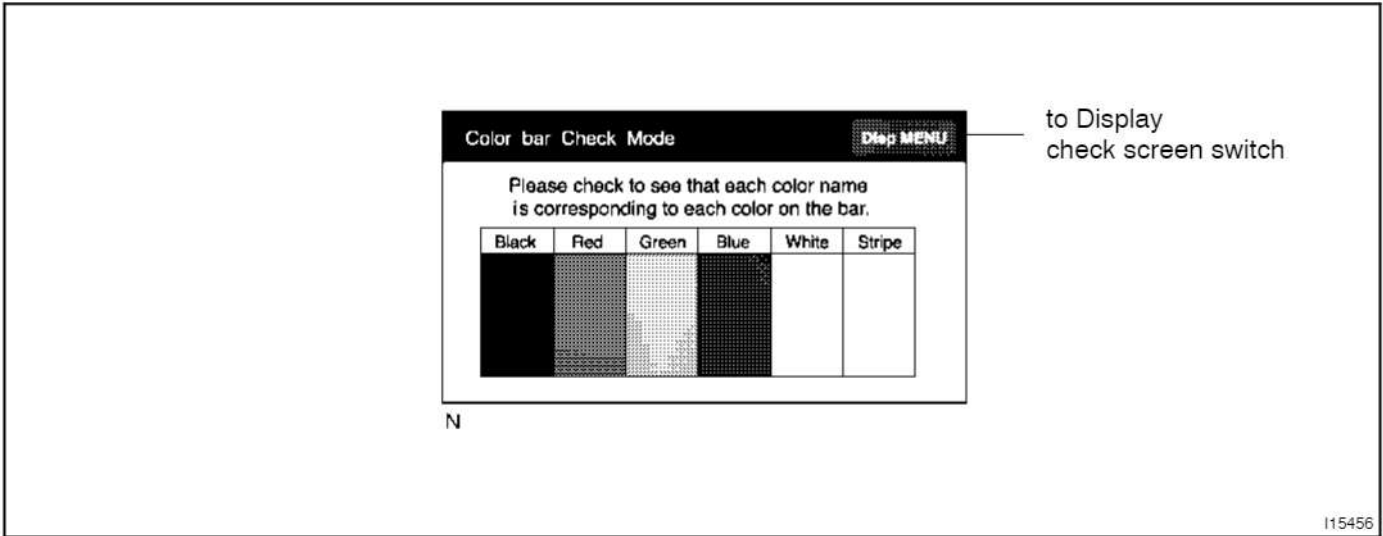


(a) DISPLAY CHECK MENU SCREEN



- (1) Various screens to check the display are started from this screen.
- (2) Color Bar Check Mode Switch
Pressing this switch activates the Color Bar Check Mode screen.
- (3) Touch Switch Check Mode Switch
Pressing this switch activates the Touch Switch Check Mode screen.
- (4) Vehicle Signal Check Mode Switch
Pressing this switch activates the Vehicle Signal Check Mode screen.
- (5) Diagnosis MENU Screen Switch
Pressing this switch activates the Diagnosis MENU screen.

(b) COLOR BAR CHECK MODE SCREEN



(1) Color display is checked in this screen.

(2) Color Bar:

Black, Red, Green, Blue, White and Stripe is displayed in bars.

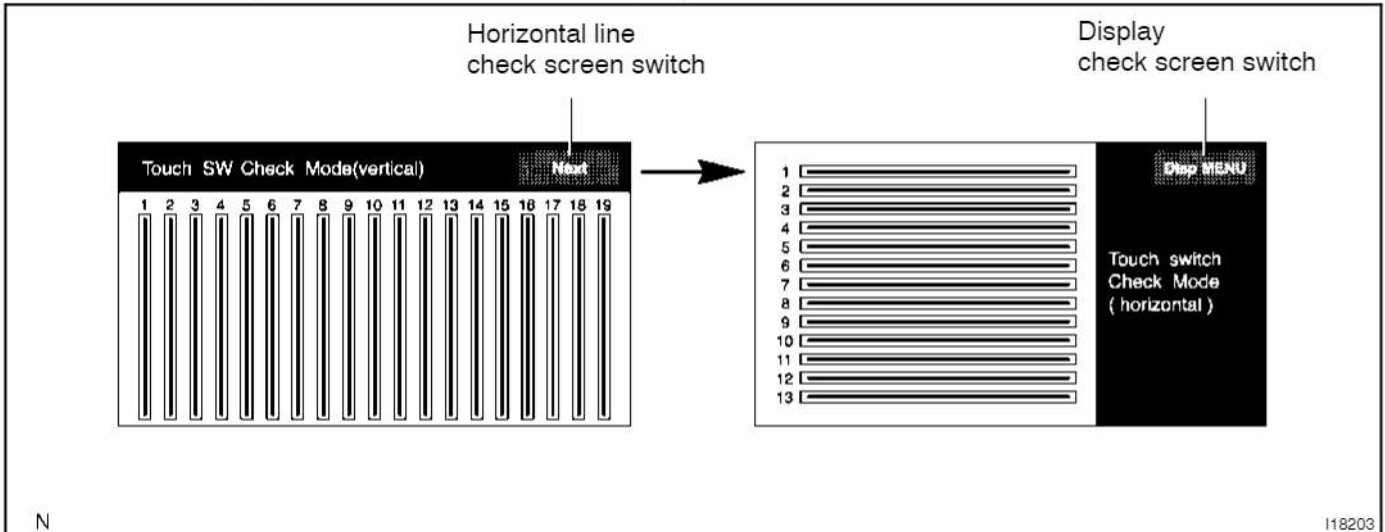
If a bar is touched, color or stripe of the bar is appeared all over the screen. When touched again, it returns to the previous screen.

(3) Display Check Screen Switch

Pressing this switch activates the Display Check Mode screen.

(c) TOUCH SWITCH CHECK MODE SCREEN

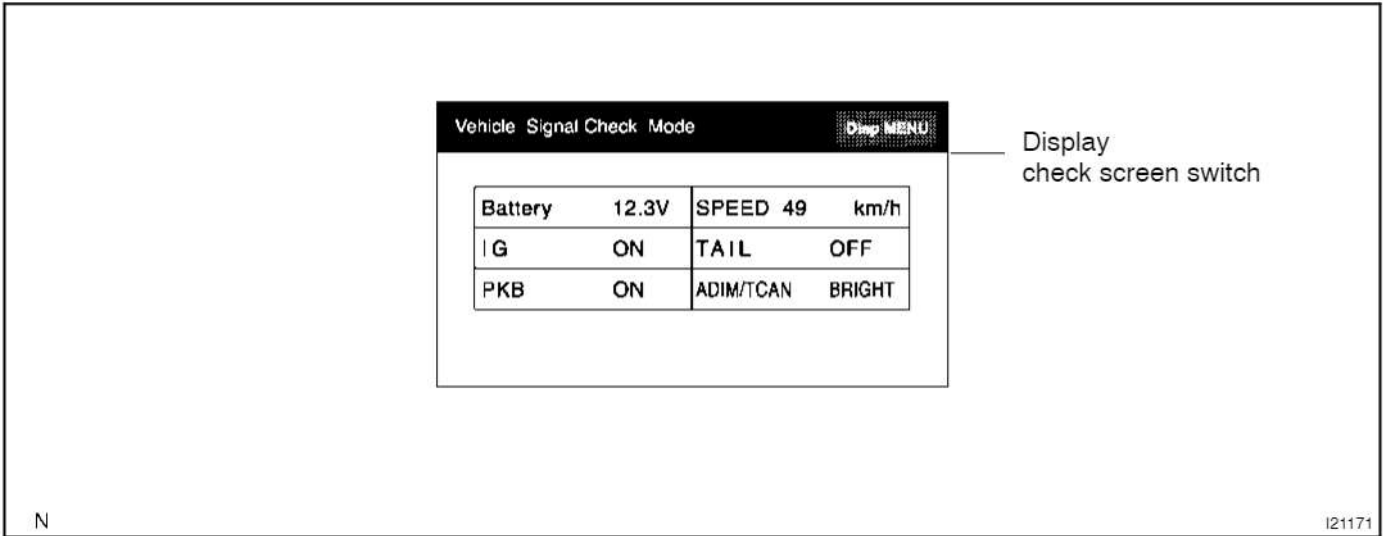
- (1) Operating condition is checked line by line in the Touch Switch Check Mode screen.
- (2) Check Line:
Lines are displayed by using infrared beams in this screen.
Once a beam is blocked off by touching the screen with a fingertip, the blocked part of the line is deleted.
- (3) Horizontal Line Check Screen Switch:
Pressing this switch activates a screen in which beams of horizontal lines are checked.
- (4) Display Check Mode Switch
Pressing this switch activates the Display Check Mode screen.



N

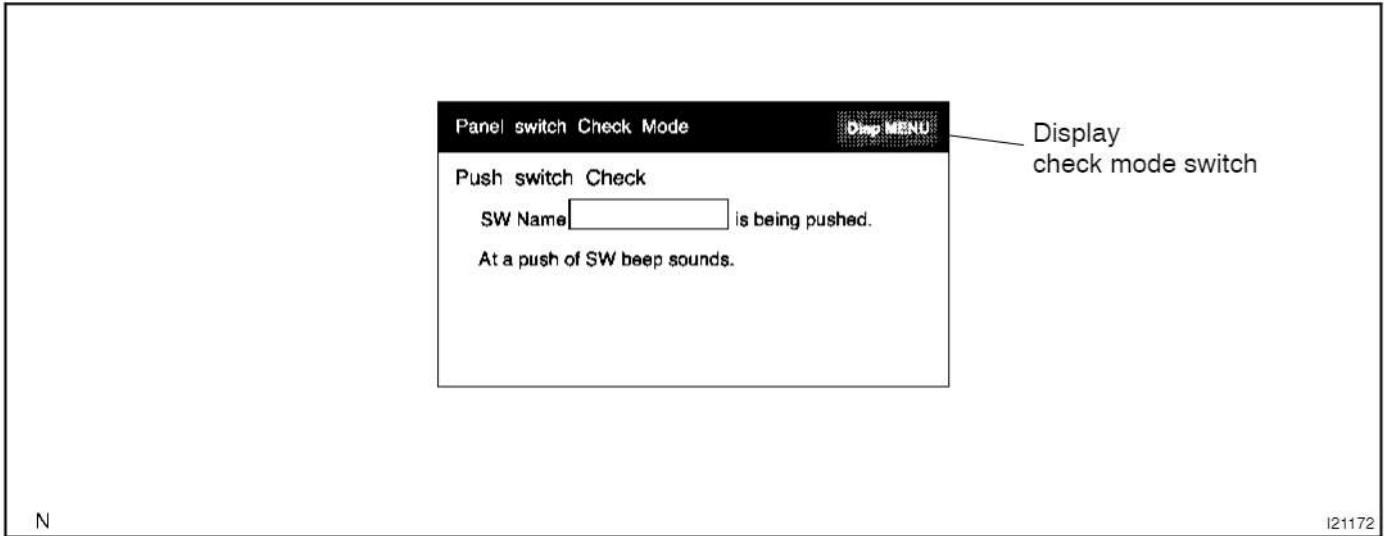
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(d) VEHICLE SIGNAL CHECK MODE SCREEN



- (1) Status of the Vehicle Signal which has been loaded into the display is checked in this screen.
- (2) Signal Description
 - Battery: Displays battery voltage in V.
 - IG: Displays ON or OFF of the ignition switch.
 - PKB: Displays ON (applied) or OFF (released) of the parking brake.
 - SPEED: Displays the vehicle speed in km/h.
 - TAIL: Displays ON or OFF of the tail light switch.
- (3) Display Check Screen Switch
 - Pressing this switch activates the Display Check Mode screen.

(e) PANEL SWITCH CHECK MODE SCREEN



- (1) Number of push-button switches: Name of push-button switches pressed are displayed.
- (2) When more than one switch are to be pressed at the same time, "MULTI SW" is displayed. When the condition is changed to the other in which one switch is to be pressed, the switch name is displayed.
- (3) Direction of Switch Rotation: The direction of rotation of the rotary switch (Volume Switch) is indicate inside the frame as "Counterclockwise", "Clockwise" or "Stopped".
- (4) Display Check Mode Switch
Pressing this switch activates the Display Check Mode screen.

DIAGNOSTIC TROUBLE CODE CHART

Terms	Meaning
Physical address	Three-digit code (shown in hexadecimal) which is given to each component comprising the AVC-LAN. Corresponding to the function, individual symbols are specified.
Logical address	Two-digit code (shown in hexadecimal) which is given to each function comprising the inner system of the AVC-LAN.

1. PHYSICAL ADDRESS: 110 MULTI DISPLAY

HINT:

- *1: Even if no failure is detected, it may be stored depending on the battery condition or voltage for starting an engine.
- *2: It is stored when 180 sec. has passed after the power supply connector is pulled out after engine start.
- *3: It may be stored when the engine key is turned again after engine start.
- *4: It may be stored when the engine key is turned 1 min. again after engine start.

(a) Logical address: 01 (Communication control)

DTC	Diagnosis item	diagnosis content	Countermeasure and inspected parts
21	ROM Error	Abnormal condition of ROM is detected.	Replace multi-display assembly.
22	RAM Error	Abnormal condition of RAM is detected.	Replace multi-display assembly.
D5 *1	Registered component disconnected	Component shown by auxiliary code is or was disconnected from system with ignition switch in ACC or ON. Communication with component shown by auxiliary code is not ensured when engine is started.	<ul style="list-style-type: none"> • Check harness for power supply of component shown by auxiliary code. • Check harness for communication system of component shown by auxiliary code.
D8 *2	No response to connection check	Component shown by auxiliary code is or was disconnected from system after engine is started.	<ul style="list-style-type: none"> • Check harness for power supply of component shown by auxiliary code. • Check harness for communication system of component shown by auxiliary code.
D9 *1	Last Mode Error	Component operated (sound and/or image was provided) before engine stop is or was disconnected with ignition switch in ACC or ON.	<ul style="list-style-type: none"> • Check harness for power supply of component shown by auxiliary code. • Check harness for communication system of component shown by auxiliary code.
DB *1	Mode Status Error	Dual alarm is detected.	<ul style="list-style-type: none"> • Check harness for power supply system of component shown by auxiliary code. • Check harness for communication system of component shown by auxiliary code.
DC *4	Transmission Error	Transmission to component shown by auxiliary code has been failed. (This code does not necessarily mean actual failure.)	If same auxiliary code is recorded in order component(s), check harness for power supply and communication system of all components shown by code.
DE *3	Slave Reset (Momentary Interruption)	After engine start, slave component has been disconnected. DB	<ul style="list-style-type: none"> • Check harness for power supply system of component shown by auxiliary code. • Check harness for communication system of component shown by auxiliary code.
E2	ON/OFF Instruction Parameter Error	Error is detected in ON/OFF control command from multi-display assembly.	Replace multi-display assembly.
E3 *1	Registration Request Transmission	<ul style="list-style-type: none"> • Registration Request command is output from slave component. • By reception of connection check instruction, Registration Request command is output from sub-master component. 	Since this DTC is provided for engineering, it may be detected when no actual failure exists.

(b) Logical address: 21 (Switch)

DTC	Diagnosis item	diagnosis content	Countermeasure and inspected parts
10	Panel Switch Error	Error in panel switch input part is detected. (Error in switch control part, or internal communication error with switch control part is detected.)	<ul style="list-style-type: none"> • Inspect all switches on panel switch test screen in display check mode. If any of them does not function, replace multi-display assembly. • If all switches function without problem, observe them for a while.
11	Touch Switch Error	Error in touch switch sensor is detected. (Light level of LED is detected to be less than a fixed value.)	<ul style="list-style-type: none"> • Inspect all touch switches on touch switch test screen in display check mode. If any of lines does not react, replace multi-display assembly. • If all of vertical and horizontal lines react normally, observe them for a while.

(c) Logical address: 34 (Front passenger monitor)

DTC	Diagnosis item	diagnosis content	Countermeasure and inspected parts
10	Error in Picture Circuit	Error in power supply system for picture circuit (abnormal voltage) is detected.	Replace multi-display assembly.
11	Back-light Error (No current)	Decline in power output from inverter circuit for back-light.	Replace multi-display assembly.
12	Back-light Error (Excess current)	Excess power output from inverter circuit for back-light.	Replace multi-display assembly.

2. PHYSICAL ADDRESS: 1C6 GATEWAY ECU

HINT:

*1: When 210 sec. has passed after pulling out the power supply connector of the master component with the ignition switch in ACC or ON, this code is stored.

Logical address: 01 (Communication control)

DTC	Diagnosis item	diagnosis content	Countermeasure and inspected parts
D4 *1	Regular Communication Error	Component in which this code is recorded has been disconnected after engine start. Or, when this code was recorded, multi-display was disconnected.	<ul style="list-style-type: none"> • Check harness for power supply system of multi-display assembly. • Check harness for communication system of multi-display assembly. • Check harness for power supply system of gateway ECU. • Check harness for communication system of gateway ECU.

3. PHYSICAL ADDRESS: 190 RADIO AND PLAYER

HINT:

- *1: Even if no failure is detected, it may be stored depending on the battery condition or voltage for starting an engine.
- *2: It is stored when 180 sec. has passed after the power supply connector is pulled out after engine start.
- *3: It may be stored when the engine key is turned 1 min. again after engine start.
- *4: It may be stored when the engine key is turned again after engine start.
- *5: When 210 sec. has passed after pulling out the power supply connector of the master component with the ignition switch in ACC or ON, this code is stored.

(a) Logical address: 01 (Communication control)

DTC	Diagnosis item	diagnosis content	Countermeasure and inspected parts
D6 *1	Absence of Master	Component in which this code is recorded has been disconnected from system with ignition in ACC or ON. Or, when this code was recorded, multi-display assembly was disconnected.	<ul style="list-style-type: none"> • Check harness for power supply system of multi-display. • Check harness for communication system of multi-display. • Check harness for power supply system of radio and player. • Check harness for communication system of radio and player.
D8 *2	No Response to Connection Check	Component shown by auxiliary code is or had been disconnected from system after engine is start. D9	<ul style="list-style-type: none"> • Check harness for power supply system of component shown by auxiliary code. • Check harness for communication system of component shown by auxiliary code.
D9 *1	Last Mode Error	Component operated (sounds and/or images were provided) before engine stop is or has been disconnected with ignition switch in ACC or ON.	<ul style="list-style-type: none"> • Check harness for power supply system of component shown by auxiliary code. • Check harness for communication system of component shown by auxiliary code.
DA	No Response to ON/OFF Instruction	No response is identified when changing mode (audio and visual mode change). Detected when sound and picture does not change by button operation.	<ul style="list-style-type: none"> • Check harness for power supply system of component shown by auxiliary code. • Check harness for communication system of component shown by auxiliary code. • If error occurs again, replace component shown by auxiliary code.
DB *1	Mode Status Error	Dual alarm is detected.	<ul style="list-style-type: none"> • Check harness for power supply of component shown by auxiliary code. • Check harness for communication system of component shown by auxiliary code.
DC *3	Transmission Error	Transmission to component shown by auxiliary code has been failed. (Detecting this DTC does not necessarily mean actual failure.)	If same auxiliary code is recorded in order component, check harness for power supply and communication system of all components shown by code.
DD *4	Master Reset (Momentary Interruption)	After engine is started, multi-display assembly was disconnected from system.	<ul style="list-style-type: none"> • Check harness for power supply system of multi-display. • Check harness for communication system of multi-display. • Check harness for power supply system of radio and player. • Check harness for communication system of radio and player. • If this error occurs frequently, replace multi-display assembly.

DE *4	Slave Reset (Momentary Interruption)	After engine is started, slave component was disconnected from system.	<ul style="list-style-type: none"> • Check harness for power supply of component shown by auxiliary code. • Check harness for communication system of component shown by auxiliary code.
DF *5	Master Error	Due to defective condition of component with a display, master function is switched to audio equipment. Error occurs in communication between sub-master (audio) and master component.	<ul style="list-style-type: none"> • Check harness for power supply of multi-display assembly. • Check harness for communication system of multi-display assembly. • Check harness for communication system between multi-display assembly and sub-master component.
E0 *1	Registration Completion Instruction Error	"Registration Completion Instruction" command from master cannot be received.	Since this DTC is provided for engineering purpose, it may be detected when no actual failure exists.
E1 *1	Audio processor ON error	While source equipment is operating, AMP output is stopped.	<ul style="list-style-type: none"> • Check harness for power supply of multi-display assembly. • Check harness for communication system of multi-display assembly.
E2	ON/OFF Instruction Parameter Error	Error occurs in ON/OFF controlling command from multi-display assembly.	Replace multi-display assembly.
E3 *1	Registration Request Transmission	Registration Request command is output from slave component. Receiving Connection Check Instruction, Registration Request command is output from sub-master component.	Since this DTC is provided for engineering purpose, it may be detected when no actual failure exists.
E4 *1	Multiple Frame Abort	Multiple frame transmission is aborted.	Since this DTC is provided for engineering purpose, it may be detected when no actual failure exists.

(b) Logical address: 61 (Cassette switch)

DTC	Diagnosis item	diagnosis content	Countermeasure and inspected parts
40	Mechanical of Media Error	Malfunction due to mechanical failure is identified. Or cassette tape is cut or entangled.	<ul style="list-style-type: none"> • Inspect cassette tape. • Replace radio and player.

4. PHYSICAL ADDRESS: 178 NAVIGATION ECU

HINT:

- *1: Even if no failure is detected, it may be stored depending on the battery condition or voltage for starting an engine.
- *2: When 210 sec. has passed after pulling out the power supply connector of the master component with the ignition switch in ACC or ON, this code is stored.
- *3: It may be stored when the engine key is turned 1 min. again after engine start.
- *4: It may be stored when the engine key is turned again after engine start.

(a) Logical address: 01 (Communication control)

DTC	Diagnosis item	diagnosis content	Countermeasure and inspected parts
D6 *1	Absence of Master	Component in which this code is recorded has been disconnected from system with ignition in ACC or ON. Or, when this code was recorded, multi-display assembly was disconnected.	<ul style="list-style-type: none"> • Check harness for power supply system of multi-display. • Check harness for communication system of multi-display. • Check harness for power supply system of navigation ECU. • Check harness for communication system of navigation ECU.

DIAGNOSTICS - NAVIGATION SYSTEM

D7 *2	Communication Check Error	Component in which this code is recorded has been disconnected from system after engine start. Or, when this code was recorded, multi-display assembly was disconnected. D6	<ul style="list-style-type: none"> • Check harness for power supply system of multi-display. • Check harness for communication system of multi-display. • Check harness for power supply system of navigation ECU. • Check harness for communication system of navigation ECU.
DC *3	Transmission Error	Transmission to component shown by auxiliary code has been failed. (This code does not necessarily mean actual failure.)	If same auxiliary code is recorded in other component(s), check harness for power supply and communication system of all components shown by code.
DD *4	Master Reset (Momentary Interruption)	Component that is to be master has been disconnected after engine start.	<ul style="list-style-type: none"> • Check harness for power supply system of multi-display assembly. • Check harness for communication system of multi-display assembly. • If error occurs frequently, replace multi-display assembly.
DF *4	Master Error	Due to defective condition of component with a display, master function is switched to audio equipment. Error occurs in communication between sub-master (audio) and master component.	<ul style="list-style-type: none"> • Check harness for power supply system of multi-display assembly. • Check harness for communication system of multi-display assembly. • Check harness for communication system between multi-display assembly and sub-master component.
E0 *1	Registration Completion Instruction Error	"Registration Completion Instruction" command from master cannot be received.	Since this DTC is provided for engineering, it may be detected when no actual failure exists.
E2	ON/OFF Instruction Parameter Error	Error is detected in ON/OFF control command from multi-display assembly.	Replace multi-display assembly.
E3 *1	Registration Request Transmission	<ul style="list-style-type: none"> • Registration Request command is output from slave component. • Registration Request command is output from sub-master component. 	Since this DTC is provided for engineering, it may be detected when no actual failure exists.
E4 *1	Multiple Frame Abort	<ul style="list-style-type: none"> • Multiplex frame transmission is aborted. 	Since this DTC is provided for engineering purpose, it may be detected when no actual failure exists.

(b) Logical address: 58 (Navigation ECU)

DTC	Diagnosis item	diagnosis content	Countermeasure and inspected parts
10	Gyro Error	Error in gyro sensor is detected. (Abnormal value in voltage output from sensor is detected for more than specified time.)	Replace navigation ECU.
11	GPS Receiver Error	Operation error of GPS receiver is detected.	At an outdoor site with a clear view, operate to display GPS data. If GPS mark is not properly displayed after 15 min. or more, replace navigation ECU.
40	GPS Receiver Error	Open condition of GPS antenna is detected. (Open circuit, connection failure of connectors, etc.)	Inspect antenna and replace if necessary.

41	Power Supply Error of GPS Antenna	Abnormal voltage of GPS antenna cable or short circuit is detected.	<ul style="list-style-type: none"> Inspect GPS antenna and replace if necessary. (When no continuity is identified between connector's core and sealed part, GPS antenna is normal.) If GPS antenna is normal, replace navigation ECU.
42	Map Disc Error	Data cannot be read for a certain time due to scratches or dirt on disc surface or insertion of disc.	Inspect disc and replace if necessary. (Visually check disc surface and wipe it with soft cloth.)
43	Vehicle Signal Error	Input error of vehicle signal is detected. (When no vehicle signal has been input for a certain time.)	<ul style="list-style-type: none"> Inspect wire harness. If wire harness is normal, replace navigation ECU.

5. PHYSICAL ADDRESS: 440 STEREO COMPONENT AMPLIFIER

HINT:

- *1: Even if no failure is detected, it may be stored depending on the battery condition or voltage for starting an engine.
- *2: It may be stored when the engine key is turned 1 min. again after engine start.
- *3: It may be stored when the engine key is turned again after engine start.
- *4: When 210 sec. has passed after pulling out the power supply connector of the master component with the ignition switch in ACC or ON, this code is stored.

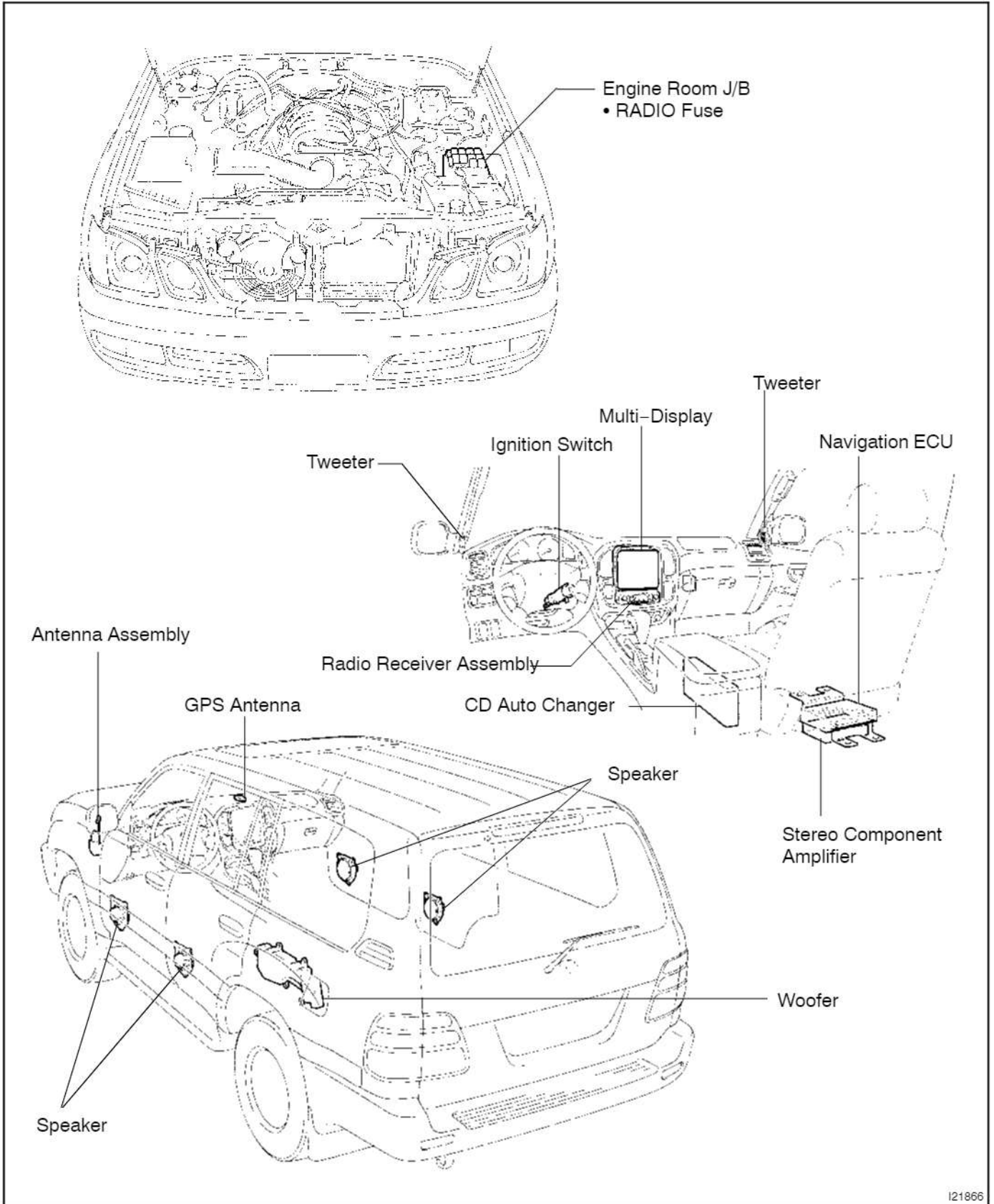
Logical address: 01 (Communication control)

DTC	Diagnosis item	diagnosis content	Countermeasure and inspected parts
D6 *1	Absence of Master	Component in which this code is recorded has been disconnected from system with ignition in ACC or ON. Or, when this code was recorded, multi-display assembly was disconnected.	<ul style="list-style-type: none"> Check harness for power supply of radio and player. Check harness for communication system of radio and player. Check harness for power supply of stereo component amplifier. Check harness for communication system of stereo component amplifier.
D7	Communication Check Error	Component in which this code is recorded is or was disconnected from system after engine start. Or, when recording this code, multi-display assembly was disconnected.	<ul style="list-style-type: none"> Check harness for power supply of radio and player. Check harness for communication system of radio and player. Check harness for power supply of stereo component amplifier. Check harness for communication system of stereo component amplifier.
DC *2	Transmission Error	Transmission to component shown by auxiliary code has been failed. (Detecting this DTC does not necessarily mean actual failure.)	If same auxiliary code is recorded in order component, check harness for power supply and communication system of all components shown by code.
DD *3	Master Reset (Momentary Interruption)	After engine is started, multi-display assembly was disconnected from system.	<ul style="list-style-type: none"> Check harness for power supply of radio and player. Check harness for communication system of radio and player. Check harness for power supply of stereo component amplifier. Check harness for communication system of stereo component amplifier. If this error occurs frequently, replace multi-display assembly.

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DF *4	Master Error	Due to defective condition of component with a display, master function is switched to audio equipment. Error occurs in communication between sub-master (audio) and master component.	<ul style="list-style-type: none"> • Check harness for power supply of multi-display assembly. • Check harness for communication system of multi-display assembly. • Check harness for communication system between multi-display assembly and sub-master component.
E0 *1	Registration Completion Instruction Error	"Registration Completion Instruction" command from master cannot be received.	Since this DTC is provided for engineering purpose, it may be detected when no actual failure exists.
E1 *1	Audio processor ON error	While source equipment is operating, AMP output is stopped.	<ul style="list-style-type: none"> • Check harness for power supply of multi-display assembly. • Check harness for communication system of multi-display assembly.
E2	ON/OFF Instruction Parameter Error	Error occurs in ON/OFF controlling command from multi-display assembly.	Replace multi-display assembly.
E3 *1	Registration Request Transmission	<ul style="list-style-type: none"> • Registration Request command is output from slave component. • Registration Connection Check Instruction, Registration Request command is output from sub-master component. 	Since this DTC is provided for engineering purpose, it may be detected when no actual failure exists.

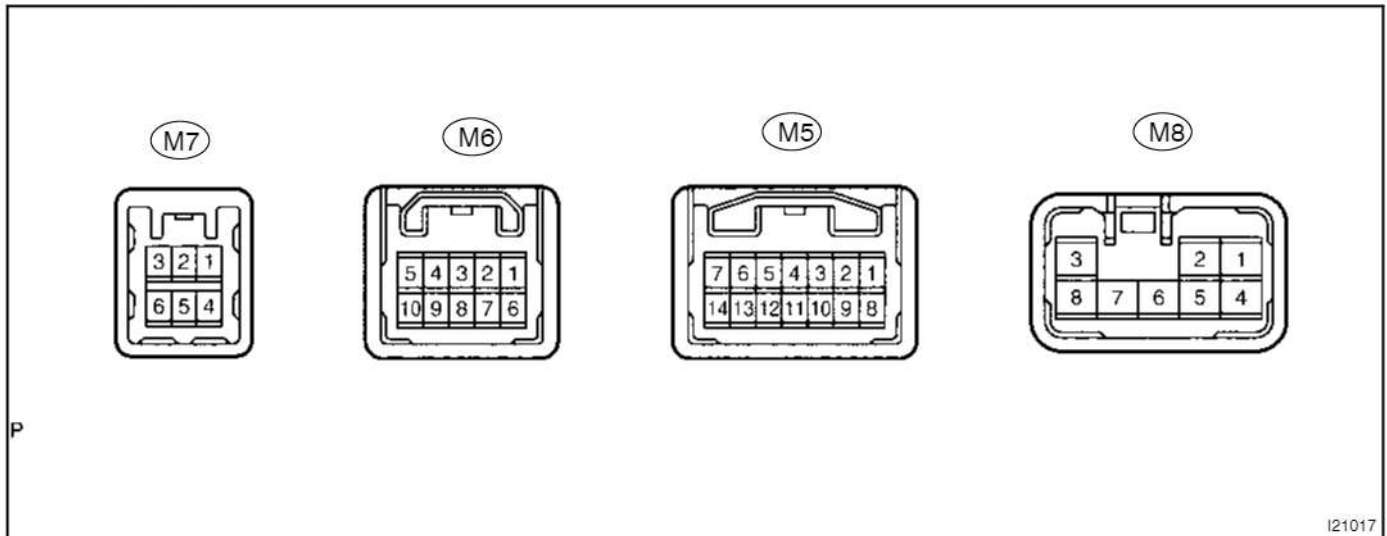
PARTS LOCATION



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TERMINALS OF ECU

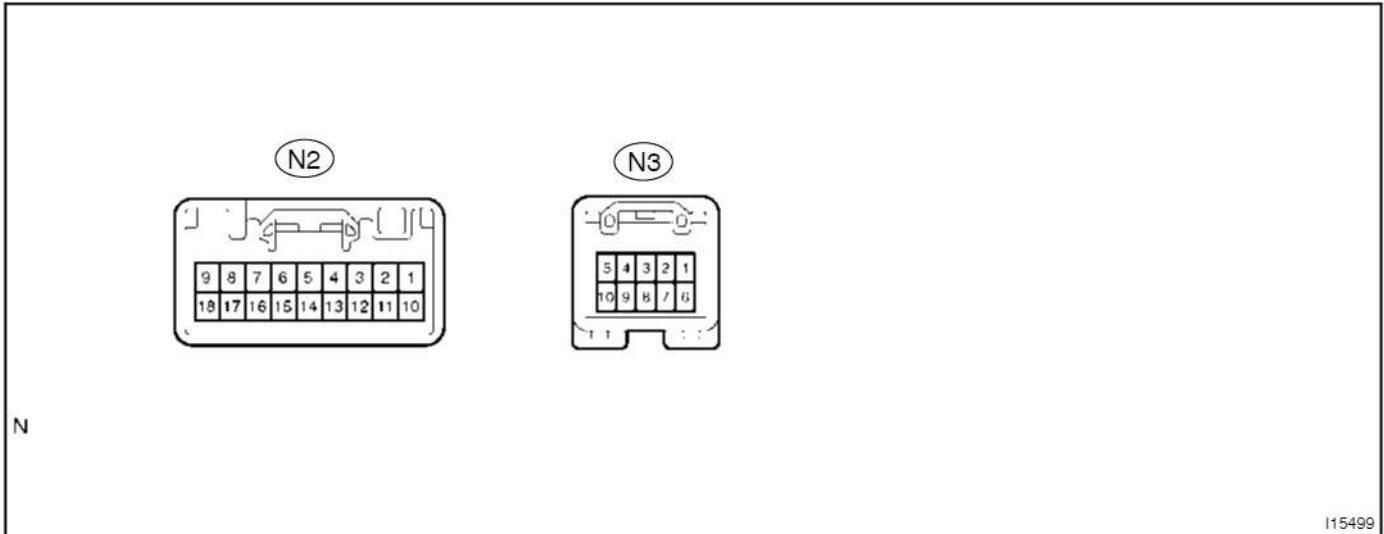
Multi-display:



Symbols (Terminal No.)	Condition	STD Voltage (V)	Problem symptom when open circuit is detected.
			Problem symptoms when short circuit is detected.
TX3+ (M5-4)	AVC-LAN communication circuit	-	Navigation system does not operate.
SPD ↔ GND1 (M5-5 ↔ M8-6)	Ignition switch ON, and driving wheel rotated smoothly	Repeatedly changes from below 1 to 9 V	Fuel efficiency cannot be calculated.
TX1- (M5-10)	AVC-LAN communication circuit	-	Navigation system does not operate.
TX3- (M5-11)	AVC-LAN communication circuit	-	Navigation system does not operate.
PKB ↔ GND1 (M5-13 ↔ M8-6)	Ignition switch ON, and parking brake switch ON (parking brake pedal released)	5 V	The system cannot enter Diagnostic system mode.
TC ↔ GND1 (M5-14 ↔ M8-6)	Ignition switch OFF and connect terminals TC and E1 of check connector	Continuity	Navigation system is normal.
			The system does not exit Service check mode.
VR ↔ VG (M6-1 ↔ M6-6)	Constant	Continuity	Screen noise or other types of noise occur.
R ↔ VG (M6-2 ↔ M6-6)	Diagnosis display check screen is white (Using an oscilloscope)	$0.7 \pm 0.1 \text{ V} *2$	Screen color turns to blue
B ↔ VG (M6-3 ↔ M6-6)	Diagnosis display check screen is white (Using an oscilloscope)	$0.7 \pm 0.1 \text{ V} *2$	Screen color turns to yellow
TX+ (M6-5)	AVC-LAN communication circuit	-	Navigation system does not operate.
VG ↔ GND1 (M6-6 ↔ M8-6)	Constant	Continuity	Screen noise or other types of noise occur.
			Navigation system does not operate.
SYNC ↔ GND1 (M6-8 ↔ M8-6)	-	-	-

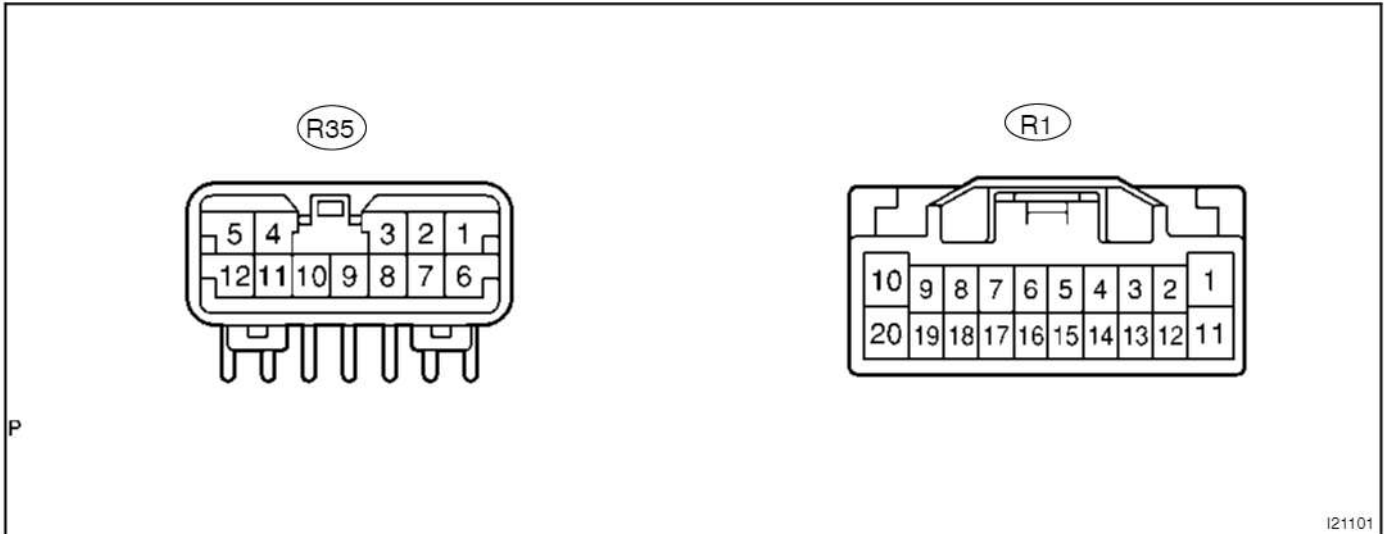
TX- (M6-10)	AVC-LAN communication circuit	-	Navigation system does not operate.
NTSC ↔ SGD1 (M7-3 ↔ M7-6)	-	-	-
ILL+ ↔ GND1 (M8-8 ↔ M8-6)	Light control switch TAIL or HEAD	9 V or more	Switching between night and day mode cannot be done.
ILL- ↔ GND1 (M8-7 ↔ M8-6)	Light control switch TAIL or HEAD	9 V or more	Switching between night and day mode cannot be done.
+B ↔ GND1 (M7-8 ↔ M8-6)	Constant	10 - 14 V	Navigation system does not operate.
IG ↔ GND1 (M7-8 ↔ M8-6)	Ignition switch ON	10 - 14 V	Navigation system does not operate.
ACC ↔ GND1 (M7-8 ↔ M8-6)	Ignition switch ACC	10 - 14 V	Navigation system does not operate.

Navigation ECU



Symbols (Terminals NO.)	Condition	STD Voltage (V)	Problem symptom when open circuit is detected.
			Problem symptom when short circuit is detected.
AUI+ - GND (N2-1 - N2-17)	Radio switch ON	5 - 7 V	Driver's side speaker does not sound.
AUO+ - GND (N2-2 - N2-17)	Radio switch ON	5 - 7 V	Driver's side speaker does not sound.
SPD - GND (N2-5 - N2-17)	Ignition switch ON and driving wheel rotated slowly	Repeatedly changes from below 1 to 9 V	Navigation operation is available during, or a cursor on present site does not move.
+B - GND (N2-9 - N2-17)	Constant	10 - 14 V	The set route can not be memo- rized. (The route disappears by turning the ignition switch OFF.) Fuse is blown.
AUI- - GND (N2-10 - N2-17)	Radio switch ON	5 - 7 V	Driver's side speaker does not sound.
AUO- - GND (N2-11 - N2-17)	Radio switch ON	5 - 7 V	Driver's side speaker does not sound.
REV - GND (N2-14 - N2-17)	A/T shift position R	5 V	The direction of advance of the ve- hicle is different from that of the cursor.
GND - Body ground (N2-17 - Body ground)	Constant	Below 1 V	Audio system is normal.
ACC - GND (N2-18 - N2-17)	Ignition switch ACC or ON	10 - 14 V	Audio system does not sound.
VR - VG (N3-1 - N3-6)	Constant	Continuity	Screen noise or other types of noise occur. Navigation system does not op- eration.
R - VG (N3-2 - N3-6)	Diagnosis display check screen is white (Using an oscilloscope)	0.7 V \pm 0.1 V*1	Screen color turns to blue.

Radio receiver assembly

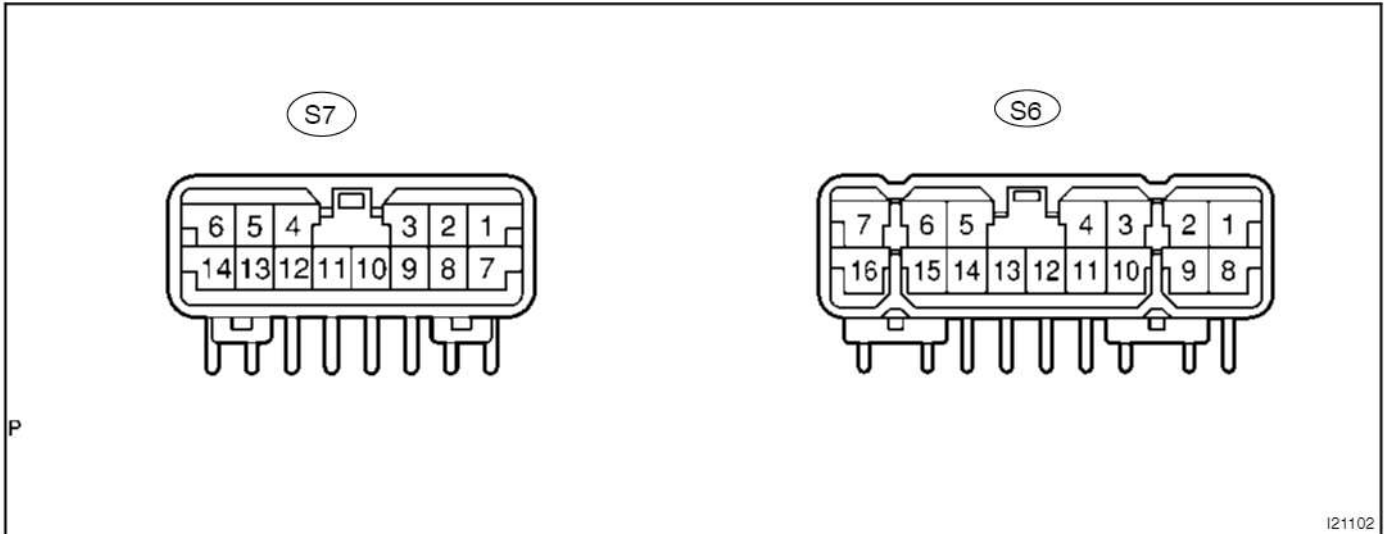


Symbols (Terminal No.)	Condition	STD Voltage (V)	Problem symptom when open circuit is detected.
			Problem symptoms when short circuit is detected.
B ↔ GND (R1-1 ↔ R1-20)	Constant	10 - 14 V	Audio system does not operate.
ILL+ ↔ GND (R1-2 ↔ R2-20)	Light control switch TAIL	10 - 14 V	Audio head unit illumination does not light up.
AMP ↔ GND (R1-3 ↔ R1-20)	-	-	-
TX+ (R1-5)	AVC-LAN Communication circuit	-	Audio system does not operate.
F.R ↔ GND (R1-8 ↔ R1-20)	Constant	10 - 14 V	Sound from front right speaker is small
F.L ↔ GND (R1-9 ↔ R1-20)	Constant	10 - 14 V	Sound from front left speaker is small
ACC ↔ GND (R1-11 ↔ R1-20)	Ignition switch ACC	10 - 14 V	Audio system does not operate.
ILL- ↔ GND (R1-12 ↔ R1-20)	Light control switch TAIL	Below 0.5 V	Audio head unit illumination does not light up.
ANT+ ↔ GND (R1-13 ↔ R2-20)	Radio switch ON	10 - 14 V	Antenna does not extend.
ILL- ↔ GND (R1-12 ↔ R2-20)	Light control switch TAIL	10 - 14 V	Fuse is blown.
TX- (R1-15)	AVC-LAN Communication circuit	-	Audio system does not operate.
R.R ↔ GND (R1-18 ↔ R1-20)	Constant	10 - 14 V	Sound from rear right side speaker is small.
R.L ↔ GND (R1-19 ↔ R1-20)	Constant	10 - 14 V	Sound from rear left side speaker is small.
GND ↔ Body ground (R1-20 ↔ Body ground)	Constant	Continuity	Audio system is normal.
CDR+ (R35-1)	-	-	Sound from right side speaker is small

DIAGNOSTICS - NAVIGATION SYSTEM

CDL+ (R35-2)	-	-	Sound from left side speaker is small
MUTE ↔ GND (R35-4 ↔ R1-20)	-	-	Pop sound etc. Audio system does not operate.
CDR- (R35-6)	-	-	Sound from right side speaker is small
CDL- (R35-7)	-	-	Sound from left side speaker is small
TXM+ ↔ GND (R35-9 ↔ R1-20)	AVC-LAN communication circuit	-	Audio system does not operate.
TXM+ (R35-10)	AVC-LAN communication circuit	-	Audio system does not operate.

Stereo component amplifier

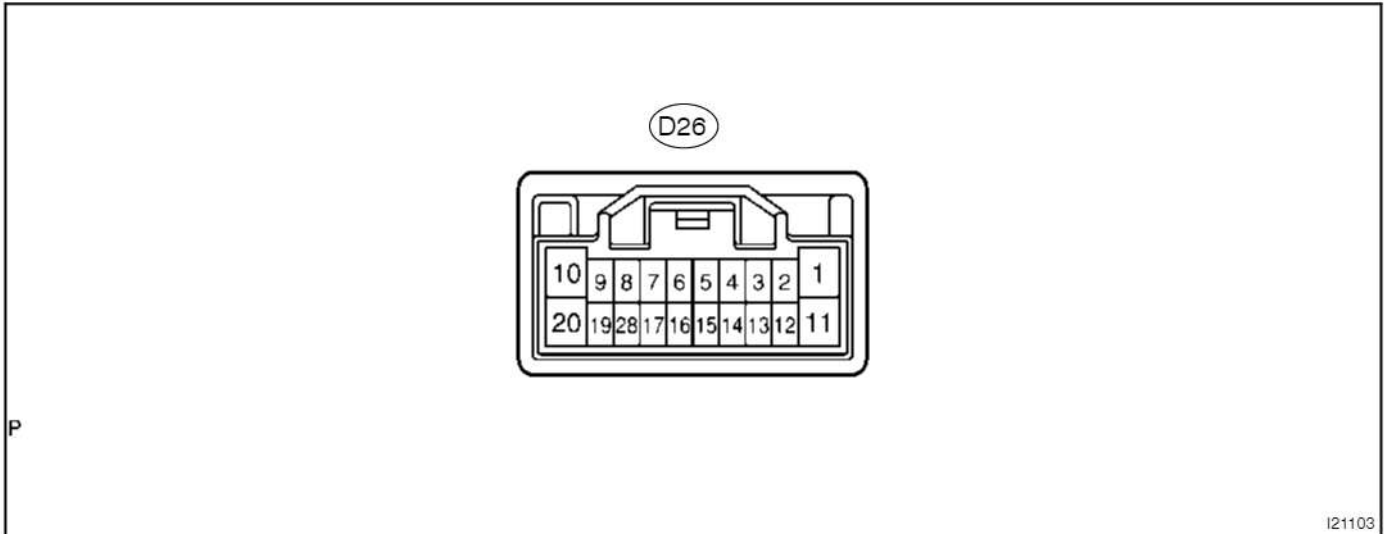


Symbols (Terminal No.)	Condition	STD Voltage (V)	Problem symptom when open circuit is detected.
FR+ ↔ GND1 (S6-1 ↔ S6-12)	Radio switch ON	5 - 7 V	RH side speaker does not sound.
FL+ ↔ GND1 (S6-2 ↔ S6-12)	Radio switch ON	5 - 7 V	LH side speaker does not sound.
RR+ ↔ GND1 (S6-3 ↔ S6-12)	Radio switch ON	5 - 7 V	Rear RH side speaker does not sound.
RL+ ↔ GND1 (S6-4 ↔ S6-12)	Radio switch ON	5 - 7 V	Rear LH side speaker does not sound.
WR+ ↔ GND1 (S6-5 ↔ S6-12)	Radio switch ON	5 - 7 V	Rear RH side speaker does not sound.
WL+ ↔ GND1 (S6-6 ↔ S6-12)	Radio switch ON	5 - 7 V	Rear LH side speaker does not sound.
+B ↔ GND1 (S6-7 ↔ S6-12)	Constant	10 - 14 V	All speaker does not sound
FR- ↔ GND1 (S6-8 ↔ S6-12)	Radio switch ON	5 - 7 V	RH side speaker does not sound.
FL- ↔ GND1 (S6-9 ↔ S6-12)	Radio switch ON	5 - 7 V	LH side speaker does not sound.
RL- ↔ GND1 (S6-11 ↔ S6-12)	Radio switch ON	5 - 7 V	Rear LH side speaker does not sound.
GND1 ↔ Body ground (S6-12 ↔ Body ground)	Constant	Continuity	-
GND2 ↔ Body ground (S6-13 ↔ Body ground)	Constant	Continuity	-
WR- ↔ GND1 (S6-14 ↔ S6-12)	Radio switch ON	5 - 7 V	Rear RH side speaker does not sound.
WL- ↔ GND1 (S6-14 ↔ S6-12)	Radio switch ON	5 - 7 V	Rear LH side speaker does not sound.
+B2 ↔ GND2 (S6-7 ↔ S6-13)	Constant	10 - 14 V	All speaker does not sound
AMP (S7-1)	-	-	-

DIAGNOSTICS - NAVIGATION SYSTEM

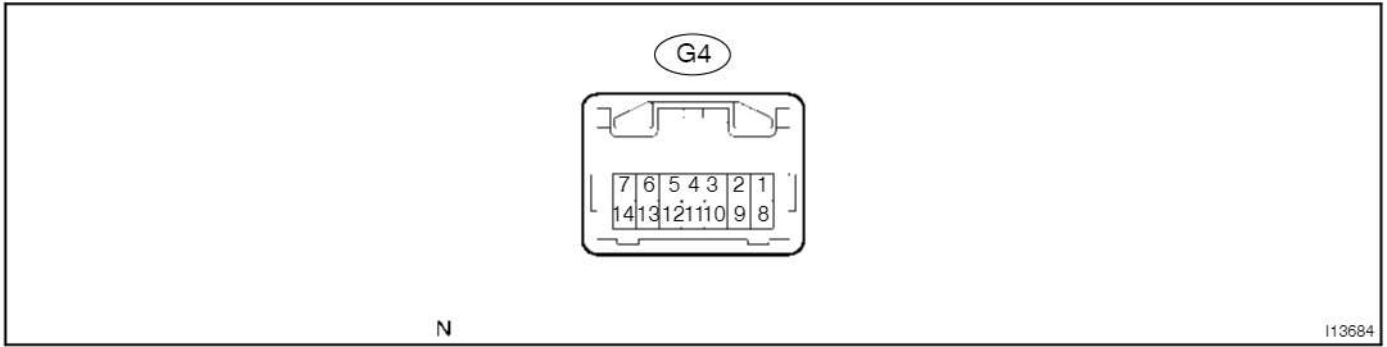
ACC ↔ GND1 (S7-2 ↔ S6-13)	Ignition switch ACC	10 - 14 V	Audio system does not operate.
BEEP (S7-4)	-	-	LH side speaker does not sound.
F.L ↔ GND1 (S7-5 ↔ S6-13)	Constant	10 - 14 V	Sound from front LH speaker is small.
F.R ↔ GND1 (S7-6 ↔ S6-13)	Constant	10 - 14 V	Sound from front RH speaker is small.
SGND ↔ GND1 (S7-11 ↔ S6-13)	-	5 - 7 V	-
MUTE ↔ GND1 (S7-12 ↔ S6-13)	Radio switch ON	5 - 7 V	Audio system does not operate.
R.L ↔ GND1 (S7-13 ↔ S6-13)	Constant	10 - 14 V	Sound from rear LH speaker is small.

CD auto changer:

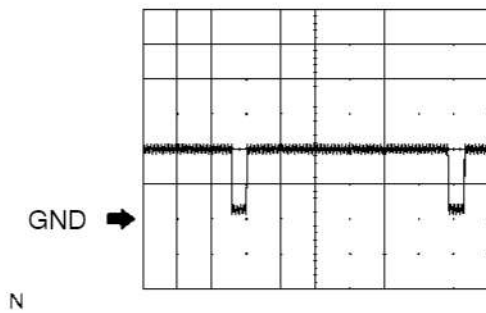


Symbols (Terminal No.)	Condition	STD Voltage (V)	Problem symptom when open circuit is detected.
ACC ↔ GND (D26-1 ↔ D26-20)	Ignition switch ACC	10 - 14 V	CD auto changer does not operate.
TXM+ ↔ GND (D26-3 ↔ D26-20)	AVC-LAN communication circuit	-	Audio system does not operate.
CDR+ (D26-5)	-	-	Sound from right side speaker is small.
CDL+ (D26-6)	-	-	Sound from left side speaker is small.
NTSC (D26-9)	-	-	-
+B ↔ GND (D26-10 ↔ D26-20)	Constant	10 - 14 V	CD auto changer does not operate.
MUTE ↔ GND (D26-11 ↔ D26-20)	DISC switch ON	5 - 7 V	Audio system does not operate.
TXM- ↔ GND (D26-13 ↔ D26-20)	AVC-LAN communication circuit	-	Audio system does not operate.
CDR- (D26-15)	-	-	Sound from right side speaker is small.
CDL- (D26-16)	-	-	Sound from left side speaker is small.

Gateway ECU:



Symbols (Terminals No.)	Wiring Color	Condition	STD Voltage (V)
IG ↔ GND (G4-2 ↔ G4-14)	GR ↔ W-B	Ignition switch ON.	10 - 14 V
MPD1 (G4-4)	w	Communication circuit (Gateway ECU and Center ECU)	-
GTX+ (G4-5)	BR	AVC-LAN communication circuit	-
CG ↔ Body ground (G4-7 ↔ Body ground)	W-B ↔ Body ground	Constant	Continuity
BATT ↔ GND (G4-8 ↔ G4-14)	G-W ↔ W-B	Constant	10 - 14 V
MPD2 (G4-11)	W	Communication circuit (Gateway ECU and Center ECU)	-
GTX- (G4-12)	Y	AVC-LAN communication circuit	-
GND ↔ Body ground (G4-7 ↔ Body ground)	W-B ↔ Body ground	Constant	Continuity

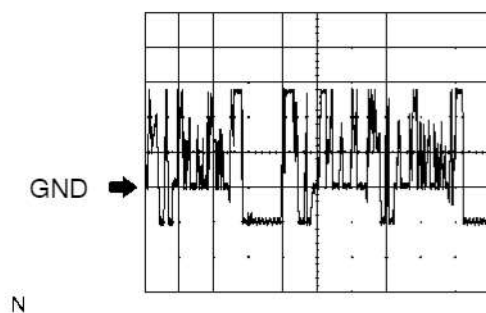


Oscilloscope

*1: wave1

- Measure terminal: SYNC ↔ GND1
- Measure set: 500 mV/DIV 10 μs/DV
- Condition: Navigation display is displayed

115531



Oscilloscope

*1: wave1

- Measure terminal: R, G, B ↔ GND1
- Measure set: 200 mV/DIV 10 μs/DV
- Condition: Navigation map is switched

115532

PROBLEM SYMPTOMS TABLE

Flow chart No. (See page)	Component	Symptom
1. (DI-40)	Multi display	Black screen (Nothing displayed)
2. (DI-41)		No sound with Power switch pressed. ("AUTO OFF" on audio screen)
3. (DI-42)		No navigation screen displayed when "MAP", "MENU" or "DEST" switch pressed. (Screen cannot be switched.)
4. (DI-45)		No corresponding screen displayed when "AUDIO" or "Information" switch pressed.
5. (DI-46)		No navigation displayed, "Audio OFF" on audio screen and no audio sound.
6. (DI-48)		Screen cannot be dimmed in night time.
7. (DI-50)		Navigation screen not stabilized. (Synchronous error)
8. (DI-51)		Color on navigation screen is unusual (RGB signal error)
9. (DI-53)		Black screen appears when "MAP", "Menu" or "DEST" switch pressed.
10. (DI-54)		Sound of radio, cassette tape or CD only cannot be heard from speaker.
11. (DI-55)		No sound (radio, cassette tape, CD) can be heard from driver side door speaker only.
12. (DI-57)		Map DISC cannot be inserted.
13. (DI-59)		MAP screen display does not appear. (Disc Caution screen does not change.)
14. (DI-60)		MAP is displayed in white or blue screen. (Switch and vehicle position mark is displayed.)
15. (DI-61)		Touch switch does not function. (Navigation screen only)
16. (DI-62)		Touch switch does not function. (A/C control screen only)
17. (DI-63)		Panel switch does not function. (Navigation screen only)
18. (DI-64)		Panel switch does not function. (A/C control screen only)
19. (DI-65)		The screen cannot be change to night mode color.
20. (DI-67)		Vehicle position is deviated from correct point badly.
21. (DI-70)		GPS mark does not appear.

22. (DI-72)		No voice navigation.
23. (DI-73)		Vehicle position rotates without control. (Map rotates without control)
24. (DI-75)		Driving direction is opposite to moving direction of vehicle position mark.
25. (DI-76)	Radio Receiver Assembly	Radio reception poor.
26. (DI-77)		Cassette tape cannot be inserted.
27. (DI-78)		Cassette tape cannot be ejected.
28. (DI-79)		Any speaker does not work.
29. (DI-80)	CD AUTO Changer	CD magazine cannot be inserted.
30. (DI-82)		CD magazine inserted, but no power.
31. (DI-84)		Power coming in, but CD auto changer not operating..
32. (DI-86)		Sound jumps.
33. (DI-87)		Sound quality poor. (Volume faint)
34. (DI-88)		CD magazine will not be ejected.
35. (DI-90)		Any speaker does not work.
36. (DI-91)	Power Amplifier	No power coming in.
37. (DI-94)		Any speaker does not work.
38. (DI-95)		No power coming, but woofer amplifier not operating.
39. (DI-98)	Noise	Noise occurs
40. (DI-101)		Noise produced by vibration or shock while driving.
41. (DI-102)		Noise produced when engine starts.

CIRCUIT INSPECTION

1. Black screen (Nothing displayed)

INSPECTION PROCEDURE

1 Check the ECU-IG fuse.

NG

Replace the fuse.

OK

2 Check multi-display.

PREPARATION:

Disconnect the multi- display connector.

CHECK:

Check voltage terminals +B.

OK:

+B: 10 - 14 V

CHECK:

Check voltage terminal ACC when turn ignition switch ACC or ON position.

OK:

ACC: 10 - 14 V

CHECK:

Check continuity terminal GND.

OK:

GND: Continuity

NG

Replace or repair wire harness or connector.

OK

Replace the multi-display.

2. No sound with POWER switch pressed. ("Audio OFF" on audio screen)

INSPECTION PROCEDURE

1 Service check mode. (Check radio receiver assembly)

NG

Troubleshoot for each diagnosis.

OK

2 Check the radio receiver assembly.

PREPARATION:

Disconnect the radio receiver assembly connector.

CHECK:

Check voltage terminals +B.

OK:

+B: 10 - 14 V

CHECK:

Check voltage terminal ACC when turn ignition switch ACC or ON position.

OK:

ACC: 10 - 14 V

CHECK:

Check continuity terminal GND1.

OK:

GND: Continuity

NG

Replace or repair wire harness or connector.

OK

Replace the radio receiver assembly.

3. No navigation screen displayed when "MAP", "Menu", or "DEST" switch pressed. (Screen cannot be switched.)

INSPECTION PROCEDURE

1	Service check mode. (Check the navigation ECU)
---	---

NG Troubleshoot for each diagnosis.

OK Replace multi-display.

Ncon

2	Check the navigation ECU.
---	----------------------------------

PREPARATION:

Disconnect the navigation ECU connector.

CHECK:

Check voltage terminals +B.

OK:

+B: 10 - 14 V

CHECK:

Check voltage terminal ACC when turn ignition switch ACC or ON position.

OK:

ACC: 10 - 14 V

CHECK:

Check continuity terminal GND.

OK:

GND: Continuity

NG Replace or repair wire harness or connector.

OK

3	Check the navigation ECU.
----------	----------------------------------

CHECK:

Check terminal R, G and B.

OK:

R, G, B: See "Navigation ECU" of "TERMINAL OF ECU".

NG

Replace the navigation ECU.

OK

4	Check the multi-display.
----------	---------------------------------

PREPARATION:

Disconnect the multi display connector.

CHECK:

Check voltage terminals +B.

OK:

+B: 10 - 14 V

CHECK:

Check voltage terminal ACC when turn ignition switch ACC or ON position.

OK:

ACC: 10 - 14 V

CHECK:

Check continuity terminal GND.

OK:

GND: Continuity

NG

Replace or repair wire harness or connector.

OK

5	Check the multi display.
----------	---------------------------------

CHECK:

Check terminal R, G and B.

OK:

R, G, B: See "multi display" of "TERMINAL OF ECU".

NG

Replace or repair wire harness or connector.

OK

Replace multi display.

4. No corresponding screen displayed when "Audio" or "Information" switch pressed.

INSPECTION PROCEDURE

1 Service check mode (Panel switch check mode screen)

NG

Troubleshoot for each diagnosis.

OK

2 Check AVC-LAN communication circuit (See page DI-104).

NG

Repair or replace AVC-LAN circuit.

OK

Replace the multi display.

5. No navigation displayed, "Audio OFF" on audio screen and no audio sound.

INSPECTION PROCEDURE

1 Service check mode.

NG

Troubleshoot for each diagnosis.

OK

2 Check the radio receiver assembly.

PREPARATION:

Disconnect the radio receiver assembly connector.

CHECK:

Check voltage terminals +B.

OK:

+B: 10 - 14 V

CHECK:

Check voltage terminal ACC when turn ignition switch ACC or ON position.

OK:

ACC: 10 - 14 V

CHECK:

Check continuity terminal GND.

OK:

GND: Continuity

NG

Replace or repair wire harness.

OK

3 Check "AVC-LAN communication circuit". (See page DI-104)

NG

Replace the AVC-LAN circuit or radio receiver assembly.

OK

Replace the multi display.

6. Screen cannot be dimmed in night time.

INSPECTION PROCEDURE

- | | |
|----------|---|
| 1 | Check if the screen is dimmed at night. (With the light control switch ON), do all screens except the navigation screen appear in Night Mode?) |
|----------|---|

NG

Check the light control switch.

OK

- | | |
|----------|---------------------------------|
| 2 | Check the multi display. |
|----------|---------------------------------|

CHECK:

Check terminal TAIL.

OK:

TAIL: See "Multi display" of "TERMINAL OF ECU".

NG

Replace or repair wire harness.

OK

- | | |
|----------|---------------------------------|
| 3 | Check the multi display. |
|----------|---------------------------------|

PREPARATION:

Disconnect the multi display connector.

CHECK:

Check voltage terminals +B.

OK:

+B: 10 – 14 V

CHECK:

Check voltage terminal ACC when turn ignition switch ACC or ON position.

OK:

ACC: 10 – 14 V

CHECK:

Check continuity terminal GND.

OK:

GND: Continuity

NG

Replace or repair wire harness.

OK

Replace the multi display.

7. Navigation screen not stabilized (Synchronous error).

INSPECTION PROCEDURE

1	Check the navigation ECU.
---	---------------------------

CHECK:

Check terminals +B.

OK:

+B: 10 - 14 V

CHECK:

Check terminal ACC when turn ignition switch ACC or ON position.

OK:

ACC: 10 - 14 V

CHECK:

Check terminal SYNC, VR or VG.

OK:

SYNC, VR, VG: See "Navigation ECU" of "TERMINAL OF ECU"

NG

Replace the wire harness when all terminals are faulty. Replace the wire harness when the SYNC terminal is faulty.

OK

Replace the multi-display.

8. Color on navigation screen is unusual (RGB signal error).

INSPECTION PROCEDURE

1 Display check mode (Color bar check).

NG

Replace the multi display.

2 Navigation check mode (Color bar check).

NG

Go to step 4.

OK

3 Check the screen setting. (Day or Night mode)

OK

Normal.

NG

4 Check the navigation ECU.

CHECK:

Check terminals +B.

OK:

+B: 10 - 14 V

CHECK:

Check terminal ACC when turn ignition switch ACC or ON position.

OK:

ACC: 10 - 14 V

CHECK:

Check terminal R, G, B, VR or VG.

OK:

R, G, B, VR or VG: See "Navigation ECU" of "TERMINAL OF ECU"

NG

Replace the wire harness when all terminals are faulty. Replace the wire harness when SYNC terminal is faulty.



Replace the multi display.

9. Black screen appears when "MAP", "Menu" or "DESTINATION" switch pressed.

INSPECTION PROCEDURE

1	Check the navigation ECU.
---	---------------------------

CHECK:

Check terminals +B.

OK:

+B: 10 - 14 V

CHECK:

Check terminal ACC when turn ignition switch ACC or ON position.

OK:

ACC: 10 - 14 V

CHECK:

Check terminal R, G, B, VR or VG.

OK:

R, G, B, VR or VG: See "Navigation ECU" of "TERMINAL OF ECU"

NG

Replace the wire harness when all terminals are faulty. Replace the wire harness when SYNC terminal is faulty.

OK

Replace the multi-display.

10. Sound of radio, cassette tape or CD only cannot be heard from speaker.

INSPECTION PROCEDURE

1	Check the radio receiver assembly.
---	------------------------------------

PREPARATION:

Disconnect the radio receiver assembly connector.

CHECK:

Check voltage terminals +B.

OK:

+B: 10 - 14 V

CHECK:

Check voltage terminal ACC when turn ignition switch ACC or ON position.

OK:

ACC: 10 - 14 V

CHECK:

Check continuity terminal GND.

OK:

GND: Continuity

NG

Replace or repair wire harness or connector.

OK

Replace the radio receiver assembly.

11. No sound (radio, cassette tape, CD) can be heard from driver side door speaker only.

INSPECTION PROCEDURE

1 Service check mode.

NG

Troubleshoot for each diagnosis.

OK

2 Check wire harness (between navigation ECU and stereo component amplifier).

PREPARATION:

Disconnect the navigation ECU and radio receiver assembly connector.

CHECK:

- Check continuity between terminal AUI+ of navigation ECU connector and terminal FL+ of radio receiver assembly.
- Check continuity between terminal AUI- of navigation ECU connector and terminal FL- of radio receiver assembly.

OK:

Continuity

NG

Replace or repair wire harness.

OK

3 Check the navigation system voice.

OK

Go to step 6.

NG

4	Check wire harness (between navigation ECU and driver side door speaker).
----------	--

PREPARATION:

Disconnect the navigation ECU and driver side door speaker connector.

CHECK:

- (a) Check continuity between terminal AUO+ of navigation ECU connector and terminal 1 of driver side door speaker.
- (b) Check continuity between terminal AUO- of navigation ECU connector and terminal 2 of driver side door speaker.

OK:

Continuity

NG

Replace or repair wire harness.

OK

5	Check the driver side door speaker.
----------	--

NG

Replace the speaker.

OK

Replace the navigation ECU.

6	Check the navigation ECU.
----------	----------------------------------

CHECK:

Check terminal AUO+, AUO-, AUI+ and AUI-.

OK:

AUO+, AUO-, AUI+ and AUI-: See "Navigation ECU" of "TERMINAL OF ECU".

NG

Replace the navigation ECU.

OK

Replace the stereo component amplifier.

12. Map DISC cannot be inserted.

INSPECTION PROCEDURE

1 Check the MAP DISC.

NG

Replace the MAP DISC.

OK

2 Insert a MAP DISC without tilt.

OK

Normal.

NG

3 Check the navigation ECU.

PREPARATION:

Disconnect the navigation ECU connector.

CHECK:

Check voltage terminals +B.

OK:

+B: 10 - 14 V

CHECK:

Check voltage terminal ACC when turn ignition switch ACC or ON position.

OK:

ACC: 10 - 14 V

CHECK:

Check continuity terminal GND.

OK:

GND: Continuity

NG

Replace or repair wire harness.

OK

Replace the navigation ECU.

13. MAP screen display does not appear. (Disc Caution screen does not change)

INSPECTION PROCEDURE

1 Take appropriate measures according to the caution screen.

OK

Normal.

NG

2 Check map DISC.

NG

Replace the disc.

OK

Replace the navigation ECU.

CAUTION SCREEN

CAUTION MESSAGE	CAUSE	CORRECTIVE ACTION
Cover is open. Close it.	The cover of the map disk slot is open.	Close the cover,
No disc is set. Set a map disc.	No map disk is inserted.	Insert a proper map disc.
Data cannot be read properly. Check it for scratches or dirt.	Data cannot be read because the map disc is dirty or scratched.	Wipe off dirt on the both disc surface with soft cloth.
Data cannot be read. Check the correct map disc is set.	Something other than map disc is inserted.	Insert a correct map disc.
Due to high temperature of the player, data cannot be read.	Pick-up part of the player is heated to a high temperature.	Stop the vehicle at a shaded cool place and turn the ignition switch OFF. When confirming that the temperature of the navigation ECU has been lowered, turn the ignition switch ON.
Data cannot be read. Contact your sales dealer.	The player cannot read data from the map disc temporarily.	Turn the ignition switch OFF and ON.*1

*1: If the same caution screen appears again after turning the ignition switch ON, replace the navigation ECU.

14. Map is displayed in white or blue screen. (Switches and vehicle position mark is displayed)

INSPECTION PROCEDURE

1 Set the map scale to the max.

OK

Normal.

HINT:

Correct the current position and check it again.

NG

2 Wipe the disc with a soft cloth, insert it again, and turn the ignition switch ON from OFF.

NG

Replace the disc.

OK

Normal.

HINT:

If the trouble still occurs, replace the navigation ECU.

15. Touch switch does not function. (Navigation screen only)**INSPECTION PROCEDURE**

1 Display check mode (Touch switch, Touch point screen).

NG

Replace the multi-display.

OK

2 Check "AVC-LAN communication circuit" (See page DI-104).

NG

Replace or repair AVC-LAN circuit.

OK

Replace the navigation ECU.

16. Touch switch does not function. (A/C control screen only)**INSPECTION PROCEDURE**

1 Display check mode (Touch switch, Touch point screen).

NG

Replace the multi-display.

OK

2 Check "AVC-LAN communication circuit" (See page DI-104).

NG

Replace or repair AVC-LAN circuit.

OK

3 Check wire harness between gateway ECU and A/C amplifier (Center ECU) (See page IN-34)

NG

Repair or replace wire harness and connector

OK

Check and replace A/C amplifier (Center ECU).

17. Panel switch does not function. (Navigation screen only)**INSPECTION PROCEDURE**

1 Display check mode (Panel switch check screen).

NG

Replace the multi display.

OK

2 Check "AVC-LAN communication circuit" (See page DI-104).

NG

Replace or repair AVC-LAN circuit.

OK

Replace the navigation ECU.

18. Panel Switch Does Not Function (A/C control only)

INSPECTION PROCEDURE

1 Display check mode (Panel Switch Check screen).

NG

Replace the multi display.

OK

2 Check "AVC-LAN communication circuit" (See page DI-104).

NG

Replace or repair AVC-LAN circuit.

OK

3 Check wire harness and connector between gateway ECU and A/C amplifier (Center ECU) (See page IN-34).

NG

Repair or replace wire harness and connector.

OK

Check and replace A/C amplifier (Center ECU).

19. Navigation screen cannot change to the night mode color.

INSPECTION PROCEDURE

1 Check the setting. (Is it set to Day Mode in screen adjustment?)

Yes

Normal.

No

2 Check if the screen is dimmed at night. (With the light control switch ON, do all screens except the navigation screen appear in Night Mode?)

NG

Go to step 5.

OK

3 Does the beep sound by operating switches on the navigation screen?

OK

Replace the navigation ECU.

NG

4 Check "AVC-LAN communication circuit" (See page DI-104).

NG

Replace or repair AVC-LAN circuit.

OK

Replace the navigation ECU.

5	Check the multi display.
----------	---------------------------------

CHECK:

Check terminal TAIL.

OK:

TAIL: See "Multi Display" of "TERMINAL OF ECU".

OK	Replace the multi display.
-----------	-----------------------------------

NG

Replace or repair wire harness.
--

20. Vehicle position is deviated from correct point badly.

INSPECTION PROCEDURE

1 Check the mark display. (At a place with a fine view, is GPS mark displayed or not?)

No Go to step 7.

Yes

2 Does the trouble occur in the specific area or not?

Yes Normal. (If the vehicle is positioned in the place where it is difficult to be identified, the current vehicle position may be incorrectly displayed.)

No

3 Check the setting (Color of the automatic calibration button on the calibration screen).

Green Normal. (Drive the vehicle (10 km or more) until calibration is completed.)

Blue

4 Service check mode. (Is "58-43" displayed in the unit check mode of the navigation ECU?)

Yes Troubleshoot for each diagnosis.

No

5 Navigation check mode (vehicle signal check mode: SPD).

NG

Replace or repair speed sensor wire harness.

OK

6 Recurrence Test (Confirm the phenomenon) (Correct the current position and drive the vehicle for a while with the GPS mark displayed).

OK

Normal.

NG

Replace the navigation ECU.

7 Check if the harness is caught or sharply bent or not.

NG

Navigation antenna is surely connected.

OK

8 Check optional components. (Does it become if the optionals such as the theft deterrent system is removed?)

Yes

Remove or change the position of the components.

HINT:

Some optionals receive radio signals, and if this happens, GPS reception may be affected.

No

9 Is there anything such as a film stuck to the window?

Yes

Reception may be affected by a screen such as a film.

No

10 Service check mode. (Is "80-40, 41" is displayed in the unit check mode of the navigation ECU?)

Yes

Troubleshoot for each diagnosis.

No

Replace the navigation antenna.

HINT:

If the trouble still occurs, replace the navigation ECU.

21. GPS mark does not appear.

INSPECTION PROCEDURE

- | | |
|----------|---|
| 1 | Check the mark display. (At a place with a fine view, is GPS mark displayed or not?) |
|----------|---|

Yes

Normal.

No

- | | |
|----------|---|
| 2 | Check if the harness is caught or sharply bent or not. |
|----------|---|

NG

Navigation antenna is surely connected.

OK

- | | |
|----------|---|
| 3 | Check optional components. (Does it become normal if the optionals such as the theft deterrent system is removed?) |
|----------|---|

Yes

Remove or change the position of the components.

HINT:

Some optionals receive radio signals, and if this happens, GPS reception may be affected.

No

4 Is there anything such as a film stuck to the window?

Yes

Reception may be affected by a screen such as a film.

No

5 Service check mode. (Is "80-40, 41" is displayed in the unit check mode of the navigation ECU?)

Yes

Troubleshoot for each diagnosis.

No

Replace the navigation antenna.

HINT:

If the trouble still occurs, replace the navigation ECU.

22. No voice navigation.

INSPECTION PROCEDURE

1 Set the volume to the max in the menu screen.

OK

Normal. (Voice navigation is not available. No destination is set, or the vehicle is running off the route.)

NG

2 Check wire harness (navigation ECU and driver side door speaker).

PREPARATION:

Disconnect the navigation ECU connector and driver side door speaker connector.

CHECK:

- (a) Check continuity between terminal AUO+ of navigation ECU connector and terminal 1 of driver side door speaker.
- (b) Check continuity between terminal AUO- of navigation ECU connector and terminal 2 of driver side door speaker.

OK:

Continuity

NG

Replace or repair wire harness.

OK

3 Check the sound. (Check if the radio sound can be heard from the driver side door speaker.)

OK

Replace the navigation ECU.

NG

Replace the speaker.

23. Vehicle position rotates without control. (Map rotates without control)

INSPECTION PROCEDURE

- | | |
|---|--|
| 1 | Recheck. (While not rotating the vehicle, turn the ignition switch ON from OFF again.) |
|---|--|

OK

Normal. (While the vehicle was turning, the ignition switch was turned ON.)

NG

- | | |
|---|--|
| 2 | System check mode. (Is "58-10" is displayed in the unit check mode of the navigation ECU?) |
|---|--|

Yes

Replace the navigation ECU.

No

- | | |
|---|--|
| 3 | System check mode. (Is "58-43" is displayed in the unit check mode of the navigation ECU?) |
|---|--|

Yes

Replace and repair SPD terminal wire harness.

No

- | | |
|---|--|
| 4 | Navigation check mode (vehicle signal check mode: SPD and gyro). |
|---|--|

OK

Replace the navigation ECU.

NG

Replace or repair wire harness.

24. Driving direction is opposite to moving direction of vehicle position mark.

INSPECTION PROCEDURE

1 Navigation check mode (vehicle signal check mode REV).

OK

Replace the navigation ECU.

NG

2 Check the navigation ECU.

CHECK:

Check terminal REV.

OK:

REV: See "Navigation ECU" of "TERMINAL OF ECU".

OK

Replace the navigation ECU.

NG

Replace or repair wire harness.

25. Radio reception poor.**INSPECTION PROCEDURE**

1 Check the reception. (Select an AM or FM station band which signals are strong)

Yes

An electric wave environment is bad.

No

2 Are there any additional installation parts? (Telephone antenna, etc.)

Yes

Does the condition get better if removing them?
Influence of additional installation parts.

No

3 Is the contact of the plug jack of the radio OK?

NG

Take a measure for contact.

OK

Is the antenna cord caught or broken?

26. Cassette tape cannot be inserted.

INSPECTION PROCEDURE

1 Is there a foreign object inside tape player?

Yes

Remove foreign object.

No

2 Is auto search button radio operating normally?

NG

Radio assembly faulty.

OK

3 Check the cassette tape for deformation or peeling-off of the label.

NG

Replace cassette.

OK

4 Is the tape slack?

NG

Remove slack before using.

OK

Replace the radio receiver assembly.

27. Cassette tape cannot be eject.

INSPECTION PROCEDURE

1 Check if ACC or DOME fuse is OK?

NG

Replace fuse.

OK

2 Check the radio receiver assembly.

PREPARATION:

Disconnect the radio receiver assembly connector.

CHECK:

Check voltage terminals +B.

OK:

+B: 10 - 14 V

CHECK:

Check voltage terminal ACC when turn ignition switch ACC or ON position.

OK:

ACC: 10 - 14 V

CHECK:

Check continuity terminal GND.

OK:

GND: Continuity

NG

Replace or repair wire harness.

HINT:

When sending it for repair, leave as it is without attempting to take it out by force.

OK

Replace the radio receiver assembly.

28. Any speaker does not work.

INSPECTION PROCEDURE

1 Is radio operating normally?

YES

Radio assembly faulty.

NO

2 Is hiss noise produced by non-functioning speaker.

YES

Radio assembly faulty.
Recheck system after repair.

NO

3 Does continuity exist in speaker wire harness?

NO

Speaker wire harness faulty.

YES

4 Temporarily install another speaker. Function OK?

YES

Speaker faulty.

NO

Power amplifier faulty.
Recheck system after repair.

29. CD MAGAZINE CANNOT BE INSERTED**INSPECTION PROCEDURE**

1 Is CD magazine already inserted?

YES

Eject CD magazine.

NO

2 Is auto search button of radio operating normally?

YES

Go to step 6.

NO

3 Check if RADIO fuse is OK?

NG

Replace RADIO No. 1 fuse.

OK

4 Is power supplied to +B terminal of stereo component amplifier?

NO

+B wire harness faulty.

YES

5 Check if GND (wire harness side) of radio receiver assembly.

NG

+B wire harness faulty.

OK

Radio assembly faulty.

6 Is power supplied to +B terminal of CD auto changer?

No

Radio receiver assembly faulty.

YES

7 Check if GND (wire harness side) of CD auto changer grounded normally?

NG

Radio receiver assembly faulty.

OK

DVD auto changer faulty.

30. CD magazine inserted, but no power.**INSPECTION PROCEDURE**

1 Is radio operating normally?

YES

Go to step 5.

NO

2 Check CIGER fuse is OK?

NG

Replace fuse.

OK

3 Is power supplied to ACC terminal of stereo component amplifier?

NO

ACC wire harness faulty.

YES

4 Is power supplied to ACC terminal of radio receiver assembly?

NO

Stereo component amplifier faulty.

YES

Radio receiver assembly faulty.

5 Is power supplied to ACC terminal of CD auto changer?

NO

Radio receiver assembly faulty.

YES

DVD auto changer faulty.

31. Power coming in, but CD auto changer not operating**INSPECTION PROCEDURE**

1 Is CD inserted with correct side up?

NO

Insert correctly.

YES

2 Function OK if different CD magazine inserted?

YES

CD magazine faulty.

NO

3 Is radio operating normally?

YES

Go to step 7.

NO

4 Does continuity exist in speaker wire harness?

NO

Speaker wire harness faulty.

YES

5 Temporarily install another speaker. Function OK?

YES

Speaker faulty.

NO

6 Hiss noise from speaker?

NO

Power amplifier faulty.
Recheck system after repair.

YES

Radio assembly faulty. Recheck system after repair.

7 Is temperature inside cabin hot?

YES

Protective circuit in operation.

NO

8 Has sudden temperature change?

YES

Formation of condensation due to temp. changes.

NO

CD auto changer faulty.

32. Sound jumps

INSPECTION PROCEDURE

1 Does sound jump only during strong vibration?

Yes

Jumping caused by vibration.

No

2 Is CD auto changer properly installed?

No

Install properly.

Yes

3 Functions OK if another CD is played?

Yes

CD faulty.

No

4 Has sudden temperature change occurred inside cabin?

Yes

Formation of condensation due to temp. changes.

No

CD auto changer faulty.

33. Sound quality poor (volume faint)

INSPECTION PROCEDURE

1 Function OK if another CD is played?

Yes

CD faulty.

No

2 Is radio operating normally?

Yes

Radio receiver assembly faulty.

No

3 Is speaker properly installed?

No

Install properly

YES

4 Temporarily install another speaker. Function OK?

Yes

Speaker faulty.

No

Radio assembly or CD auto changer or power amplifier faulty.

34. CD magazine will not be ejected.

INSPECTION PROCEDURE

1 Is auto search button of radio operating normally?

Yes

Go to step 5.

No

2 Check if RADIO fuse is OK?

NG

Replace fuse.

OK

3 Is power supplied to +B terminal of power amplifier?

No

+B wire harness faulty.

YES

4 Is power supplied to +B terminal of radio receiver?

No

Power amplifier faulty.

YES

Radio assembly faulty.

5 Is power supplied to +B terminal of CD auto changer?

No

Radio assembly faulty.

Yes

CD auto changer faulty.

35. Any speaker does not work**INSPECTION PROCEDURE**

1 Is radio operating normally?

YES

CD auto changer faulty.

NO

2 Is hiss noise produced by non-functioning speaker.

YES

Radio assembly faulty.
Recheck system after repair.

NO

3 Does continuity exist in speaker wire harness?

NO

Speaker wire harness faulty.

YES

4 Temporarily install another speaker. Function OK?

YES

Speaker faulty.

NO

Radio assembly faulty.
Recheck system after repair.

36. No power coming in.

INSPECTION PROCEDURE

1 Is tape player operating normally?

Yes

Radio assembly faulty.

No

2 Check if CIGAR fuse is OK?

NG

Replace fuse.

OK

3 Is power supplied to ACC terminal of power amplifier?

No

ACC wire harness faulty.

YES

4 Check if RADIO fuse is OK?

No

Replace fuse.

YES

5 Is power supplied to +B terminal of power amplifier?

No

+B wire harness faulty.

YES

6 Check if GND (wire harness side) of power amplifier grounded normally?

NG

Ground faulty.

OK

7 Is power supplied to ACC terminal of radio assembly?

No

Power amplifier or wire harness faulty.

YES

8 Is power supplied to +B terminal of radio receiver assembly?

No

Power amplifier or wire harness faulty.

YES

9 Check if GND (wire harness side) of radio receiver assembly grounded normally?

NG

Ground faulty.

OK

Radio receiver assembly faulty.

37. Any speaker does not work.

INSPECTION PROCEDURE

1 Is radio operating normally?

Yes

CD auto changer faulty.

No

2 Is hiss noise produced by non-functioning speaker?

Yes

Radio receiver assembly faulty.
Recheck system after repair.

No

3 Does continuity exist in speaker side harness?

No

Speaker wire harness faulty.

YES

4 Temporarily install another speaker. Function OK?

Yes

Speaker faulty.

No

Radio receiver assembly faulty.
Recheck system after repair.

38. No power coming, but woofer amplifier not operating.

INSPECTION PROCEDURE

1 Is tape player operating normally?

Yes

Radio receiver assembly faulty.

No

2 Check if CIGER No. 2 fuse is OK?

NG

Replace fuse.

OK

3 Is power supplied to ACC terminal of stereo component amplifier?

No

ACC wire harness faulty.

YES

4 Check if RADIO fuse is OK?

NG

Replace fuse.

OK

5 Is power supplied to +B terminal of stereo component amplifier?

No

+B wire harness faulty.

YES

6 Check if GND (wire harness side) of radio receiver assembly grounded normally.

NG

GND faulty.

OK

7 Is power supplied to ACC terminal of radio receiver assembly?

No

Stereo component amplifier faulty.

YES

8 Is power supplied to +B terminal of radio receiver assembly?

No

Stereo component amplifier faulty.

YES

9 Check if GND (wire harness side) of radio receiver assembly grounded normally.

NG

GND faulty.

OK

10	Does continuity exist in speaker wire harness?
-----------	---

No

Speaker wire harness faulty.

YES

11	Temporarily install another speaker. Functions OK?
-----------	---

Yes

Speaker faulty.

No

12	Hiss noise from speaker?
-----------	---------------------------------

No

Stereo component amplifier faulty.
Recheck system after repair.

YES

Radio receiver assembly faulty. Recheck system after repair.

39. Noise occurs**INSPECTION PROCEDURE**

1 Does the noise occur only in the radio?

NO

Refer to No. 24. (It occurs in the cassette and CD.)

YES

2 Does the noise occur in a particular place?

YES

An electric environment.

NO

3 Is there any additional installation part around the glass imprinted antenna?
(Sun shade film, telephone antenna etc.)

YES

Does the noise stop by removing it?
Influence of the film or the noise radiation of the additional installation part.

NO

4 Does the noise occur even pulling out the antenna cord from the radio?

YES

Check the radio.

NO

5 Does the noise occur even pulling out the antenna terminal on the glass surface?

YES

Noise mixing into the antenna cable.

NO

6 Isn't there any adhesive (Butyl rubber) stuck on the bases of the antenna terminal, defogger terminal and bus bar?

YES

Failure of glass installation. Must plane the butyl rubber.

NO

7 Does the noise occur even pulling out the defogger terminal?

YES

Interfering noise from the defogger line and choke coil.

NO

8 Check the grounding of the antenna, antenna cord, choke coil, and noise filter (See Pub. No. RM616E on page BE-167).

NG

Grounding failure.

OK

9 Does the condition get better by replacing the choke coil?

YES

Replace the choke coil.

NO

10 Does the condition get better by replacing the antenna cord.

YES

Replace the antenna cord.

NO

Noise radiates directly to the antenna from the generation source.

40. Noise produced by vibration or shock while driving

INSPECTION PROCEDURE

1 Is speaker properly installed?

NO

Install properly.

YES

2 Is speaker properly installed?

NO

Install properly.

YES

3 With vehicles stationary lightly tap each system. Is noise produced?

YES

Each system faulty.

NO

Noise is produced from static electricity accumulating in the vehicle body.

41. Noise produced when engine starts

INSPECTION PROCEDURE

- 1 Whistling noise which becomes high-pitched when accelerator strongly depressed, disappears shortly after engine stops.

YES

Alternator noise.

NO

- 2 Whining noise occurs when A/C is operating.

YES

A/C noise.

NO

- 3 Scratching noise occurs during sudden acceleration, driving on rough roads or when ignition switch is turned ON.

YES

Fuel gauge noise.

NO

- 4 Clicking sound is heard when horn button is pressed, then released. Whirring/grating sound is heard when pushed continuously.

YES

Horn noise.

NO

- 5 Murmuring sound stops when engine stops.

YES

Ignition noise.

NO

6 Tick-tack noise occurs in co-ordination with blinking offlasher.

YES

Turn signal noise.

NO

7 Noise occurs during window washer operation.

YES

Washer noise.

NO

8 Scratching noise occurs while engine is running, and continues a while even after engine stops.

YES

Water temp. gauge noise.

NO

9 Scraping noise in line with wiper beat.

YES

Wiper noise.

NO

Other type of noise.

AVC-LAN (Communication bus) Circuit

CIRCUIT DESCRIPTION

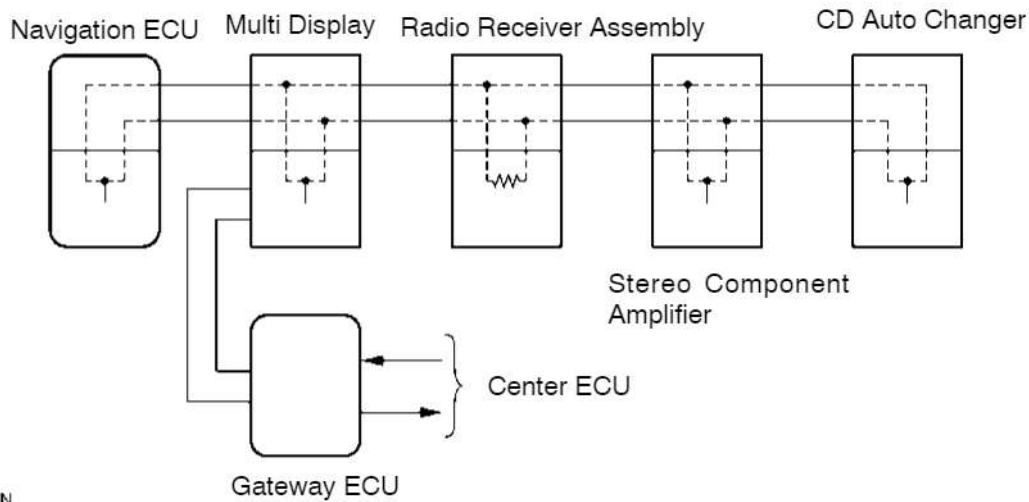
Each unit of navigation system connected with AVC-LAN (communication bus) transfers the signal of each switch by communication.

When +B short and GND short occur in this AVC-LAN, navigation system will not function normally as the communication is discontinued.

In this AVC-LAN, multi display becomes the master of the communication, and the radio receiver assembly has a terminator necessary for transmitting the communication.

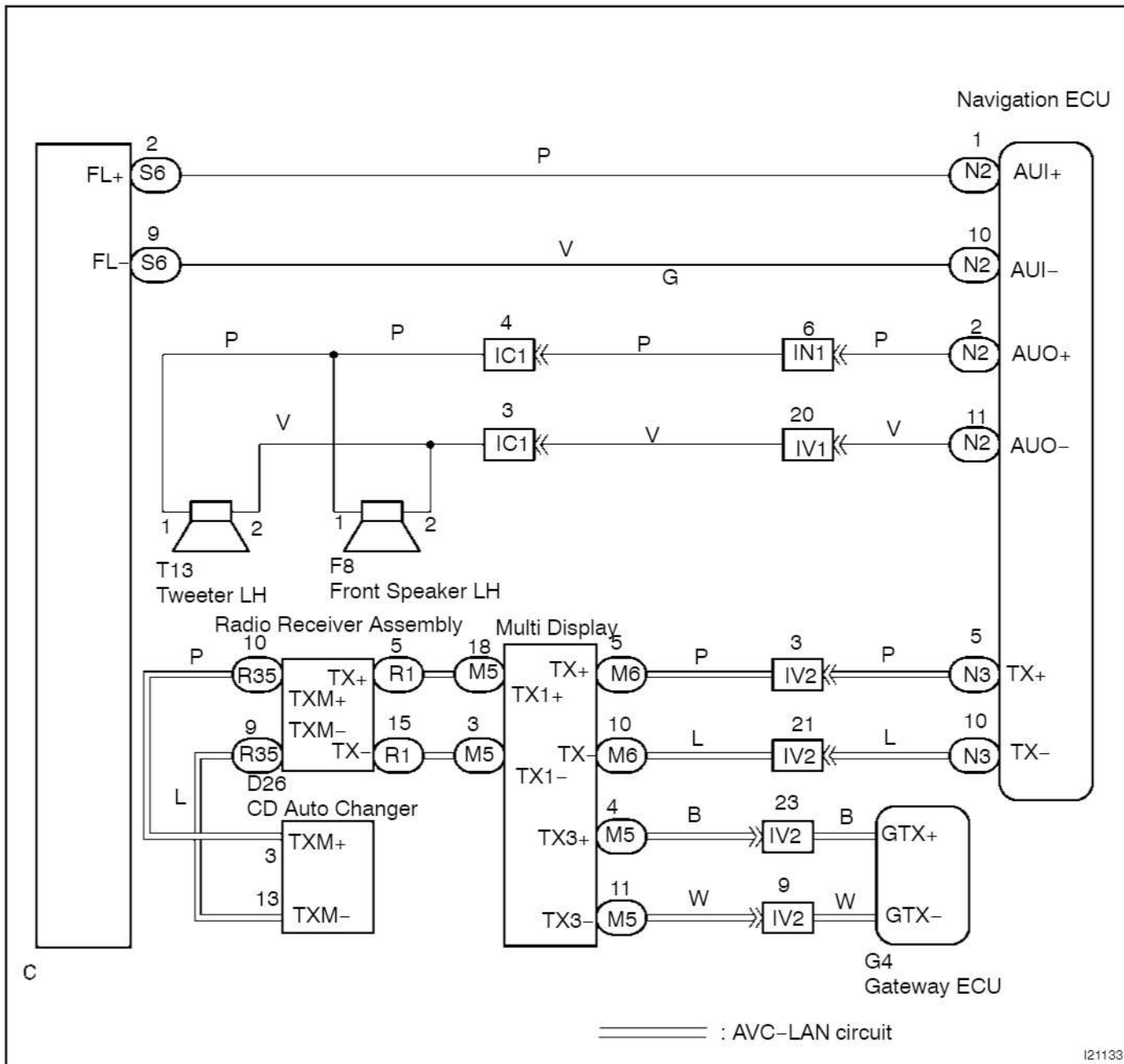
multi display is connected between navigation ECU and radio receiver assembly, navigation system has the structure that makes communication impossible without navigation ECU, multi display or radio receiver assembly.

AVC-LAN



I21092

WIRING DIAGRAM



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I21133

INSPECTION PROCEDURE

- | | |
|----------|---|
| 1 | Disconnect the connector "D26" of CD auto changer and check if AVC-LAN will be recovered normally. |
|----------|---|

CHECK:

Check that the display will change by pressing either of the Panel switch or Touch switch on the display.

HINT:

It can be judged that AVC-LAN is recovered if the display is changed.

OK	Replace the CD auto changer.
-----------	-------------------------------------

NG

- | | |
|----------|--|
| 2 | Disconnect the "S6" connector of the stereo component amplifier, check if AVC-LAN will be recovered normally. |
|----------|--|

CHECK:

Check that the display will change by pressing either of the Panel switch or Touch switch on the display.

HINT:

It can be judged that AVC-LAN is recovered if the display is changed.

OK	Repair or replace wire harness or connector between stereo component amplifier and CD auto changer.
-----------	--

NG

- | | |
|----------|--|
| 3 | Disconnect the "S6" connector of the stereo component amplifier, check if AVC-LAN will be recovered normally. |
|----------|--|

CHECK:

Check that the display will change by pressing either of the Panel switch or Touch switch on the display.

HINT:

It can be judged that AVC-LAN is recovered if the display is changed.

OK

Replace the stereo component amplifier.

NG

- | | |
|----------|---|
| 4 | Disconnect the "R1" connector of the radio receiver assembly, check if AVC-LAN will be recovered normally. |
|----------|---|

CHECK:

Check that the display will change by pressing either of the Panel switch or Touch switch on the display.

HINT:

It can be judged that AVC-LAN is recovered if the display is changed.

OK

Repair or replace wire harness or connector between radio receiver assembly and stereo component amplifier.

NG

- | | |
|----------|---|
| 5 | Check wire harness and connector between radio receiver assembly and multi display (See page IN-34). |
|----------|---|

NG

Repair or replace wire harness or connector between radio receiver assembly and multi display.

OK

- 6 Check wire harness and connector between multi display and navigation ECU.**
(See page IN-34)

NG

Repair or replace wire harness or connector between multi display and navigation ECU.

OK

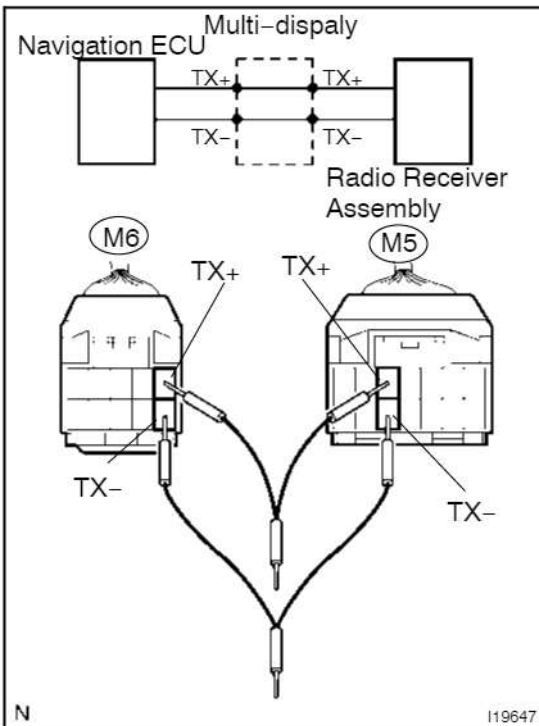
- 7 Check wire harness and connector between multi display and gateway ECU.**
(See page IN-34)

NG

Repair or replace wire harness or connector between multi display and gateway ECU.

OK

- 8 Skip multi display and check AVC-LAN.**

**PREPARATION:**

- Connect all the connectors except "M5" and "M6" of the multi display..
- Using 2 SSTs (Diagnosis check wire P/N 09893-12040), connect the terminal TX+ of connector "M3" and TX+ of connector "M6", the terminal TX- of connector "M3" and TX- of connector "M6" respectively of multi-display.

CHECK:

Operate audio head unit (CD, Cassette tape, etc.) and check that the sound comes out from the speaker.

(Check that AVC-LAN is recovered.)

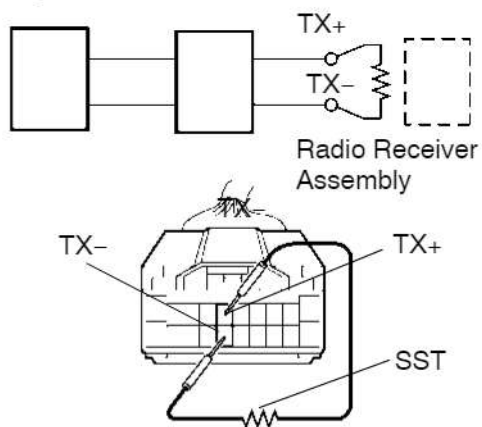
OK

Replace the Display ECU.

NG

9 Skip Audio head unit and check AVC-LAN.

Navigation ECU Multi-display



N

I21100

PREPARATION:

- Connect multi display connector.
- Disconnect Audio head unit "R1" connector.
- Using SST (Navigation Check Wire P/N 09843-18050), connect the terminal TX+ to terminal TX- of "R1" connector of radio receiver assembly.

CHECK:

Operate the panel switch and the touch switch of the display and check that the navigation functions. (Check that AVC-LAN is recovered.)

OK

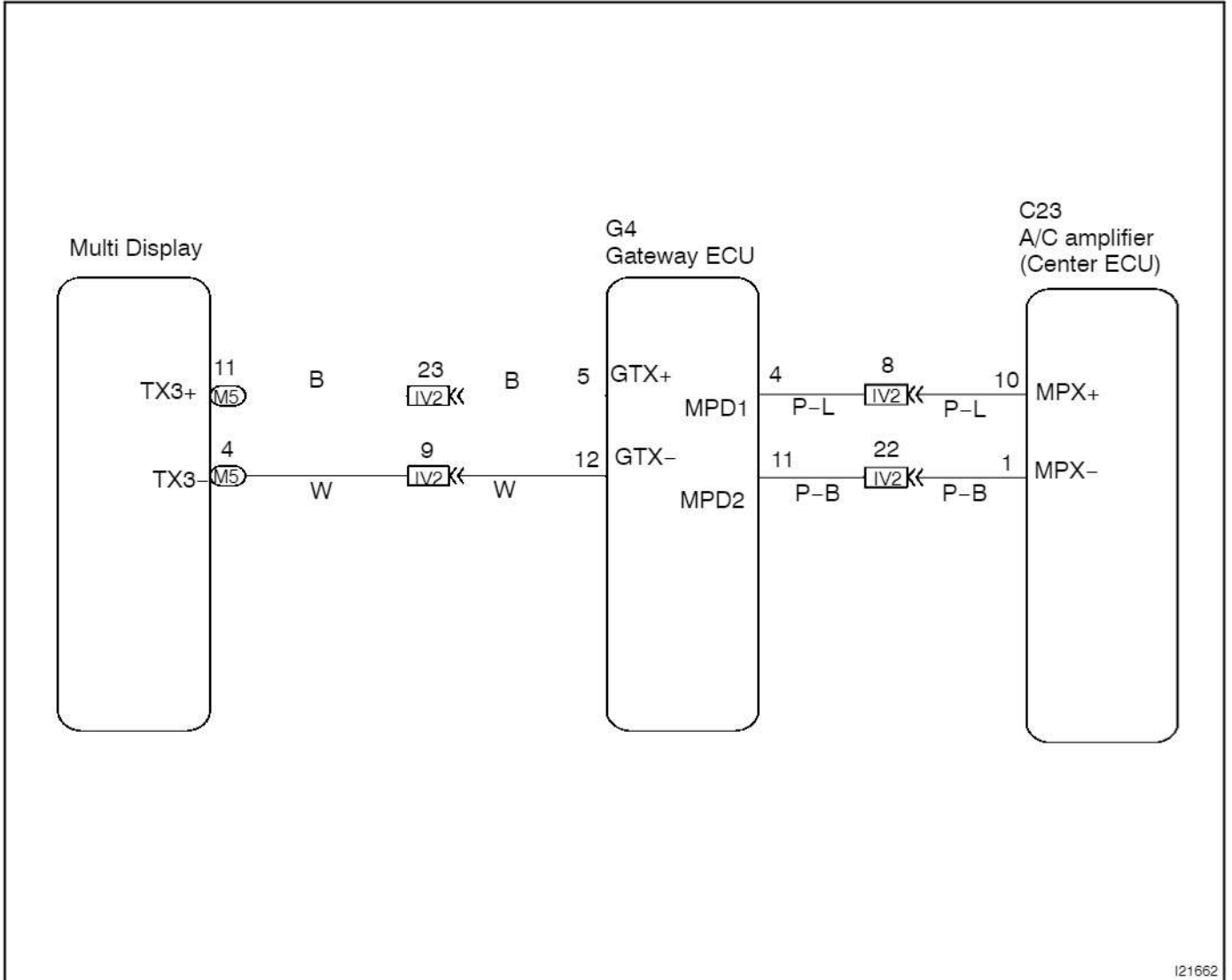
Replace the radio receiver assembly.

NG

Replace the navigation ECU.

Gateway ECU (AVC-LAN adapter) Circuit

WIRING DIAGRAM



INSPECTION PROCEDURE

1	Check "Service check mode" of audio system. (AVC-LAN diagnosis check) (See page DI-3)
----------	--

CHECK:

Connection of the gateway ECU can be checked by AVC-LAN diagnosis. ("Service check mode" of audio system)

OK:

Display

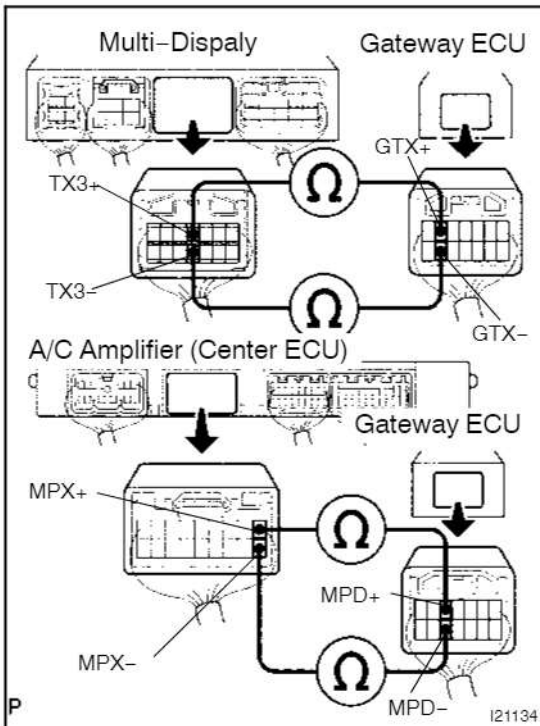
G/W: OK (System is normal)

G/W: NG (Communication error)

G/W: None (Never registered)



2 Check wire harness



PREPARATION:

Disconnect the connectors "G4" of gateway ECU, "M5" of multi-display and "C23" of A/C amplifier (Center ECU).

CHECK:

- Check continuity between terminals GTX+ of gateway ECU and TX3+ of multi display.
- Check continuity between terminals GTX- of gateway ECU and TX3- of multi display.

OK:

There is a continuity in wireharness of both (a) and (b), or either (a) or (b).

HINT:

If there is OPEN in wireharness of either (a) or (b), please repair it.

CHECK:

- Check continuity between terminals MPD1 of gateway ECU and MPX+ of A/C amplifier (Center ECU).
- Check continuity between terminals MPD2 of gateway ECU and MPX- of A/C amplifier (Center ECU).

OK:

There is a continuity in wireharness of both (a) and (b), or either (a) or (b).

HINT:

If there is OPEN in wireharness of either (a) or (b), please repair it.

NG

Repair or replace wireharness.

OK

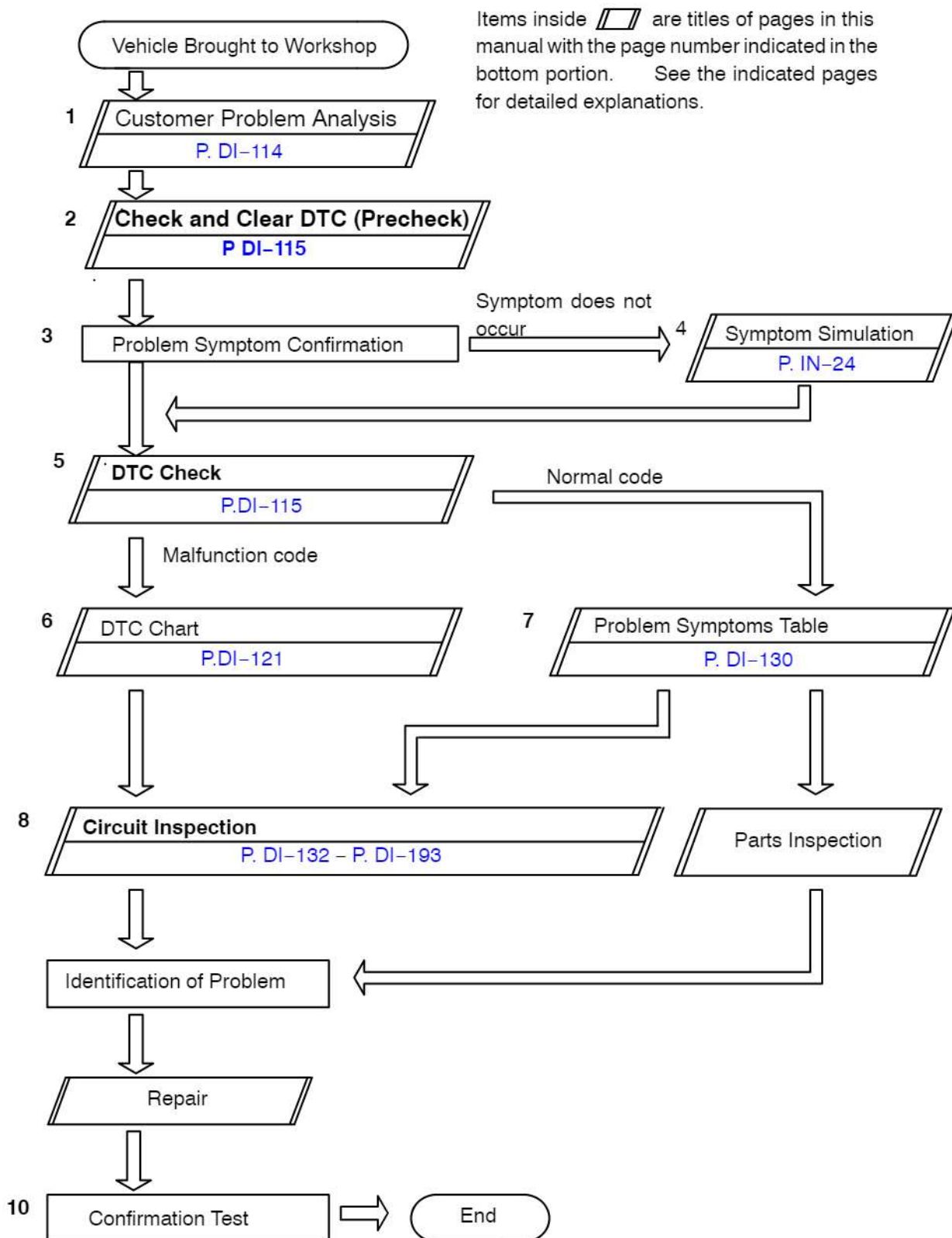
Replace the gateway ECU.

AIR CONDITIONING SYSTEM

HOW TO PROCEED WITH TROUBLESHOOTING

DI281-08

Perform troubleshooting in accordance with the procedure on the following page.



CUSTOMER PROBLEM ANALYSIS CHECK

AIR CONDITIONING SYSTEM Check Sheet

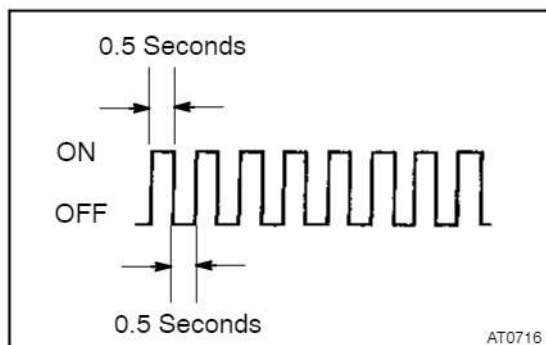
Inspector's name: _____

Customer's Name		Registration No.	
		Registration Year	
		Frame No.	
Date vehicle Brought In	/ /	Odometer Reading	km Miles

Date of Problem Occurrence	/ /
How Often does Problem Occur?	<input type="checkbox"/> Continuous <input type="checkbox"/> Intermittent (times a day)
Weather	<input type="checkbox"/> Fine <input type="checkbox"/> Cloudy <input type="checkbox"/> Snowy <input type="checkbox"/> Various / Other
Outdoor Temperature	<input type="checkbox"/> Hot <input type="checkbox"/> Warm <input type="checkbox"/> Cool <input type="checkbox"/> Cold (Approx. °F / °C)

Symptoms	Air Flow Control is Faulty	<input type="checkbox"/> Blower motor does not operation <input type="checkbox"/> Blower motor speed does not change (Always Hi, Always Med, Always Lo)
	Temperature Control is Faulty	<input type="checkbox"/> Cabin temperature does not go down <input type="checkbox"/> Cabin temperature does not rise <input type="checkbox"/> Response is slow
	Air Inlet Control is Faulty	<input type="checkbox"/> Cannot change between FRS and REC (Always Fresh or always Recirculating)
	Vent Control is Faulty	<input type="checkbox"/> Mode will not chage <input type="checkbox"/> Will not enter the desired mode

DTC Check	1st Time	<input type="checkbox"/> Normal Code <input type="checkbox"/> Malfunction Code (Code)
	2nd Time	<input type="checkbox"/> Normal Code <input type="checkbox"/> Malfunction Code (Code)



PRE-CHECK

1. WARNING FOR A/C COMPRESSOR LOCK

If compressor lock occurs during A/C operation, the A/C switch indicator on the A/C control assembly starts blinking.

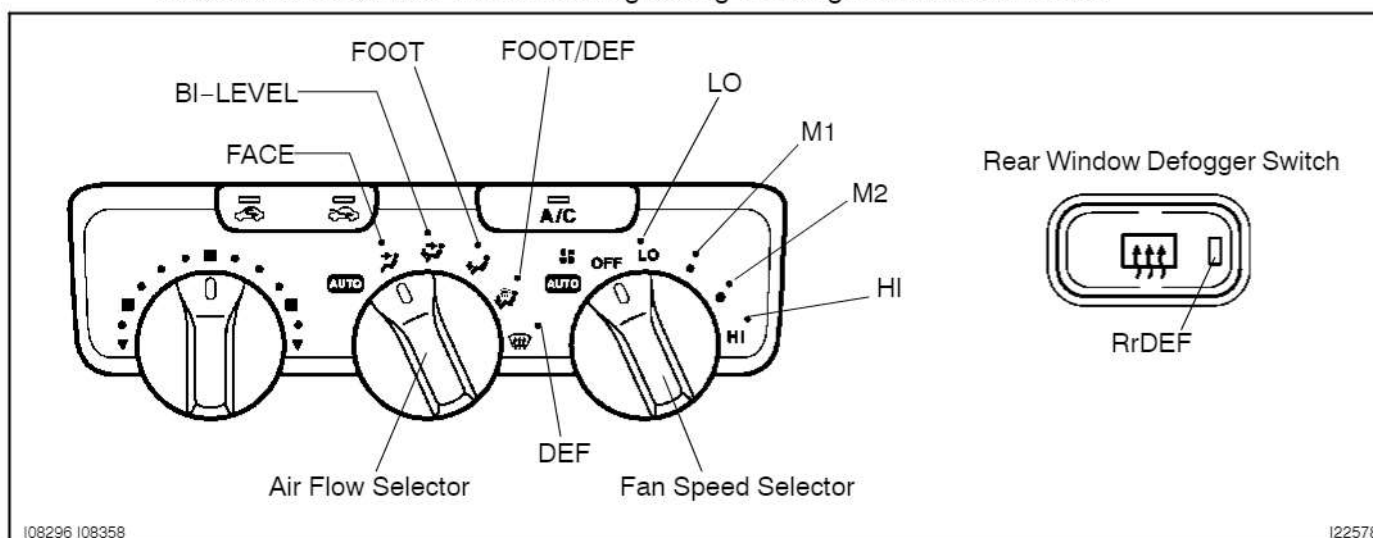
- When this occurs, check for compressor lock (DTC 22) using diagnosis trouble code check then proceed to inspect the circuit or the component.
- Compressor lock sensor circuit. → (See page DI-153)

2. PANEL DIAGNOSIS SYSTEM

(a) w/o Navigation system:

If a trouble occurs in A/C system, the specified lamp on the control panel starts blinking the diagnostic sensor check.

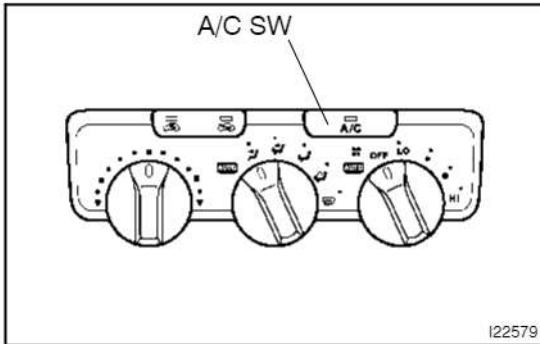
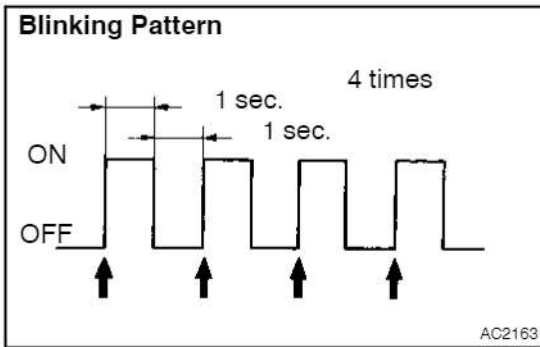
- During system diagnosis, a trouble is indicated on the panel by the blinking of a specified light instead of a code display (See TROUBLE CODE CHART).
- For example, when a trouble occurs in solar sensor circuit, the RrDEF switch indicator and DEF mode switch indicator will be blinking during the diagnostic sensor check.



I08296 I08358

I22578

No.	Indicator name	Symbol
1	Rear window defogger switch indicator light	RrDEF
2	Air flow selector: FACE	FACE
3	Air flow selector: BI-LEVEL	B/L
4	Air flow selector: FOOT	FOOT
5	Air flow selector: FOOT and DEFROSTER	F/D
6	Air flow selector: DEFROSTER	DEF
7	Fan Speed Selector: LO	LO
8	Fan Speed Selector: M1	M1
9	Fan Speed Selector: M2	M2
10	Fan Speed Selector: HI	HI



- (c) Check that all the indicators light up and go off at 1 second intervals 4 times in succession.

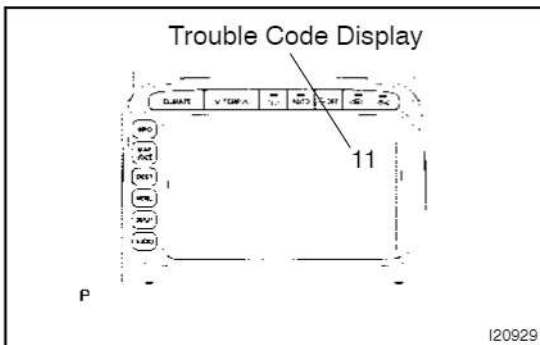
HINT:

- After the indicator check is ended, the diagnostic trouble code check begins automatically.
- Press the OFF switch when desiring to cancel the check mode.

**5. w/o Navigation system:
DIAGNOSTIC SENSOR CHECK**

- (a) Perform an indicator check. After the indicator check is completed, the system enters the diagnostic sensor check mode automatically.
- (b) Check the LED blinking on the panel. Refer to the list of codes on [page DI-121](#) when translating the trouble code from the LED blinking.

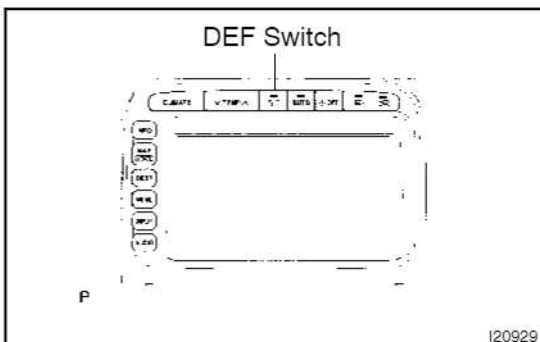
If the slower display is desired, press the A/C switch and change it to step operation. Each time the A/C switch is pressed, the blinking LED changes by 1 step.

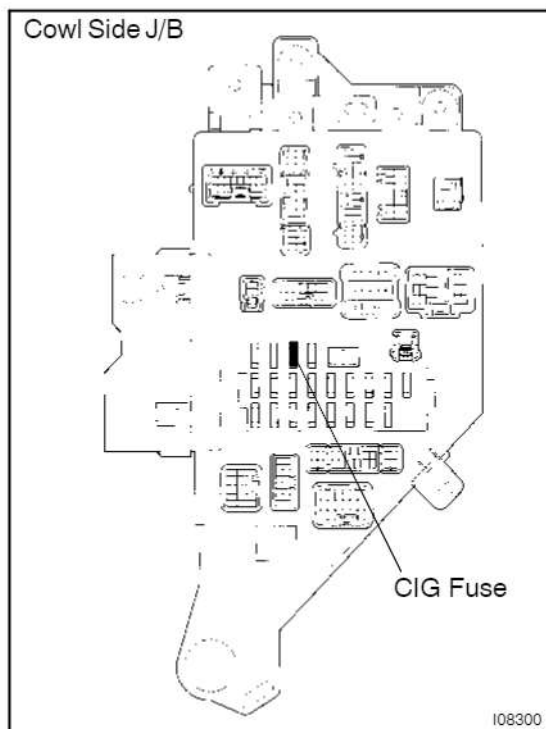


**6. w/ Navigation system
DTC CHECK (SENSOR CHECK)**

- (a) Perform an indicator check. After the indicator check is completed, the system enters the DTC check mode automatically.
- (b) Read the DTC displayed on the panel. Refer to the list of DTCs on [page DI-121](#) when reading the DTCs (DTCs are out put at the temperature display.).

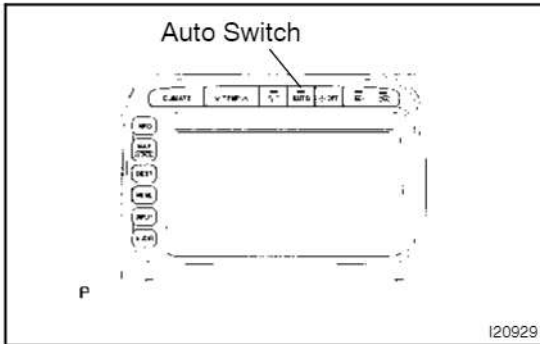
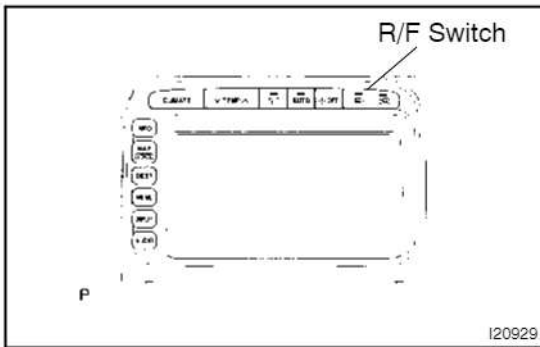
If the slower display is desired, press the DEF switch and change it to step operation. Each time the DEF switch is pressed, the display changes by 1 step.





7. CLEARING DTC

- (a) Pull out the CIG fuse in Cowl Side J/B for 10 sec. or longer to clear the trouble code's memory.
- (b) After reinserting the fuse, check that the normal code is output.



8. w/ Navigation system only: ACTUATOR CHECK

- (a) After entering the sensor check mode, press the R/F switch.
- (b) Since each damper, motor and relay automatically operates at 1 second intervals beginning in order from 20 in the temperature display, check the temperature and air flow visually and by hand.

If a slower display is desired, press the AUTO switch and change it to step operation. Each time the AUTO switch is pressed, the display changes by 1 step.

HINT:

- The buzzer sounds when the display trouble code changes.
- Code are displayed in order from the smaller to the larger numbers.
- To cancel the check mode, press the OFF switch.

Step No.	Display code	Conditions				
		Blower motor	Air flow vent	Air inlet damper	Magnetic clutch	Air mix damper
1	0	OFF	FACE	FRESH	OFF	Cool side (0% open)
2	1	LO	↑	↑	↑	↑
3	2	MED	↑	R/F (50% open)	ON	↑
4	3	↑	BI-LEVEL	RECIRC	↑	Cool / Hot (50%)
5	4	↑	FOOT	FRESH	↑	Cool / Hot (50% open)
6	5	↑	↑	↑	↑	Hot side (100% open)
7	6	HI	FOOT/DEF	↑	↑	↑
8	7	↑	DEF	↑	↑	↑

DIAGNOSTIC TROUBLE CODE CHART

If malfunction code is displayed during the DTC check, check the circuit listed for that code in the table below (Proceed to the page given for that circuit.)

w/o Navigation system:

Blinking light	Detection Item	Trouble Area	Memory
RrDEF	Normal	-	-
RrDEF FACE *1 (DI-132)	Front room temperature sensor circuit	<ul style="list-style-type: none"> Room temp. sensor Harness or connector between room temp. sensor and A/C amplifier A/C amplifier 	○ (8.5 min. or more)
RrDEF B/L *2 (DI-135)	Ambient temperature sensor circuit	<ul style="list-style-type: none"> Ambient temp. sensor Harness or connector between ambient temp. sensor and A/C amplifier A/C amplifier 	○ (8.5 min. or more)
RrDEF FOOT (DI-138)	Front evaporator temperature sensor circuit	<ul style="list-style-type: none"> Evaporator temp. sensor Harness or connector between evaporator temp. sensor and A/C amplifier A/C amplifier 	○ (8.5 min. or more)
RrACSW, FOOT (DI-144)	Rear evaporator temperature sensor circuit	<ul style="list-style-type: none"> Rear evaporator temp. sensor Harness or connector between Rear evaporator temp. sensor and A/C amplifier A/C amplifier 	○ (8.5 min. or more)
RrACSW, FACE *1 (DI-147)	Rear room temperature sensor circuit	<ul style="list-style-type: none"> Rear room temp. sensor Harness or connector between rear room temp. sensor and A/C amplifier A/C amplifier 	○ (8.5 min. or more)
RrDEF F/D (DI-141)	Engine coolant temperature sensor circuit	<ul style="list-style-type: none"> Engine coolant temp. sensor Harness or connector between engine coolant temp. sensor and A/C amplifier A/C amplifier 	-
RrDEF DEF *3 (DI-150)	Solar sensor circuit (Open)	<ul style="list-style-type: none"> Solar sensor Harness or connector between solar sensor and A/C amplifier A/C amplifier 	-
	Solar sensor circuit (Short)		○ (8.5 min. or more)
RrDEF FRS (DI-156)	Open in pressure sensor circuit Abnormal refrigerant pressure [below 196 kPa (2.0 kgf/cm ² , 28 psi) over 3,140 kPa (32.0 kgf/cm ² , 455 psi)]	<ul style="list-style-type: none"> Pressure switch Harness or connector between pressure switch and A/C amplifier Refrigerant pipe line A/C amplifier 	-
RrACSW, HI (DI-160)	Rear inlet air temperature sensor circuit	<ul style="list-style-type: none"> Rear inlet air temp. sensor Harness or connector between rear inlet air temp. sensor and A/C amplifier A/C amplifier 	○ (8.5 min. or more)
RrDEF REC (DI-163)	Front air mix damper position sensor circuit	<ul style="list-style-type: none"> Air mix damper position sensor A/C amplifier Harness or connector between air mix damper position sensor and A/C amplifier 	○ (1 min. or more)
RrDEF LO (DI-167)	air inlet damper position sensor circuit	<ul style="list-style-type: none"> Air inlet damper position sensor circuit A/C amplifier Harness or connector between air inlet damper position sensor and A/C amplifier 	○ (1 min. or more)

RrDEF M1 (DI-163 DI-174)	Front air mix damper position sensor circuit	<ul style="list-style-type: none"> • Air mix damper control servomotor • Air mix damper position sensor • Harness and connector between A/C amplifier and air mix position sensor • Harness and connector between A/C amplifier and air mix damper control servomotor • A/C amplifier 	○ (15secs. or more)
RrDEF M2 (DI-167 DI-177)	Air inlet damper position sensor circuit	<ul style="list-style-type: none"> • Air mix damper control servomotor • Air mix damper position sensor • Harness and connector between A/C amplifier and air mix position sensor • Harness and connector between A/C amplifier and mix damper control servomotor • A/C amplifier 	○ (15secs. or more)

HINT:

- *1 If the room temp. is approx. -20°C (-4°F) or lower, RrDEF and FACE indicator may be light up even though the system is normal.
- *2 If the ambient temperature is approx. -50°C (-58°F) or lower, a DTC may be output even though the system is normal.
- *3 If the check is being performed in a dark place, RrDEF and DEF (solar sensor circuit abnormal) could be light up. In this case, perform DTC check again while shining a light, such as an inspection light, on the solar sensor. If RrDEF and DEF is still light up, there could be trouble in the solar sensor circuit.

w/ Navigation system:

DTC No. (See page)	Detection Item	Trouble Area	Memory
00	Normal	-	-
11 *1 (DI-132)	Front room temperature sensor circuit	<ul style="list-style-type: none"> • Front room temp. sensor • Harness or connector between front room temp. sensor and A/C amplifier • A/C amplifier 	○ (8.5 min. or more)
12 *2 (DI-135)	Ambient temperature sensor circuit	<ul style="list-style-type: none"> • Ambient temp. sensor • Harness or connector between ambient temp. sensor and A/C amplifier • A/C amplifier 	○ (8.5 min. or more)
13 (DI-138)	Front evaporator temperature sensor circuit	<ul style="list-style-type: none"> • Front evaporator temp. sensor • Harness or connector between front evaporator temp. sensor and A/C amplifier • A/C amplifier 	○ (8.5 min. or more)
14 (DI-141)	Engine coolant temperature sensor circuit	<ul style="list-style-type: none"> • Engine coolant temp. sensor • Harness or connector between engine coolant temp. sensor and A/C amplifier • A/C amplifier 	-
21 *3 (DI-150)	Solar sensor circuit (Open)	<ul style="list-style-type: none"> • Solar sensor • Harness or connector between solar sensor and A/C amplifier • A/C amplifier 	-
	Solar sensor circuit (Short)		○ (8.5 min. or more)
22 *4 (DI-153)	All conditions below are detected for 3 sec. or more (a) Engine speed: 450 rpm or more (b) Ratio between engine and compressor rpm deviates 20% or more in comparison to normal operation.	<ul style="list-style-type: none"> • Compressor drive belt • Compressor lock sensor • Compressor • Harness and connector between A/C amplifier and compressor, compressor lock sensor • A/C amplifier 	-
23 (DI-156)	Open in pressure sensor circuit Abnormal refrigerant pressure [below 196 kPa (2.0 kgf/cm ² , 28 psi) over 3,140 kPa (32.0 kgf/cm ² , 455 psi)]	<ul style="list-style-type: none"> • Pressure switch • Harness or connector between pressure switch and A/C amplifier • Refrigerant pipe line • A/C amplifier 	-
31 (DI-163)	Front air mix damper position sensor circuit	<ul style="list-style-type: none"> • Front air mix damper position sensor • A/C amplifier • Harness or connector between front air mix damper position sensor and A/C amplifier 	○ (1 min. or more)
32 (DI-163)	Air inlet damper position sensor circuit	<ul style="list-style-type: none"> • Air inlet damper position sensor circuit • A/C amplifier • Harness or connector between air inlet damper position sensor and A/C amplifier 	○ (1 min. or more)

<p>41 (DI-163 DI-174)</p>	<p>Front air mix damper position sensor circuit</p>	<ul style="list-style-type: none"> • Front air mix damper control servomotor • Front air mix damper position sensor • Harness and connector between A/C amplifier front and air mix position sensor • Harness and connector between A/C amplifier and front air mix damper control servomotor • A/C amplifier 	<p style="text-align: center;">○ (15 secs. or more)</p>
<p>42 (DI-167 DI-177)</p>	<p>Air inlet damper position sensor circuit</p>	<ul style="list-style-type: none"> • Air mix damper control servomotor • Air mix damper position sensor • Harness and connector between A/C amplifier and air mix position sensor • Harness and connector between A/C amplifier and mix damper control servomotor • A/C amplifier 	<p style="text-align: center;">○ (15 secs. or more)</p>

HINT:

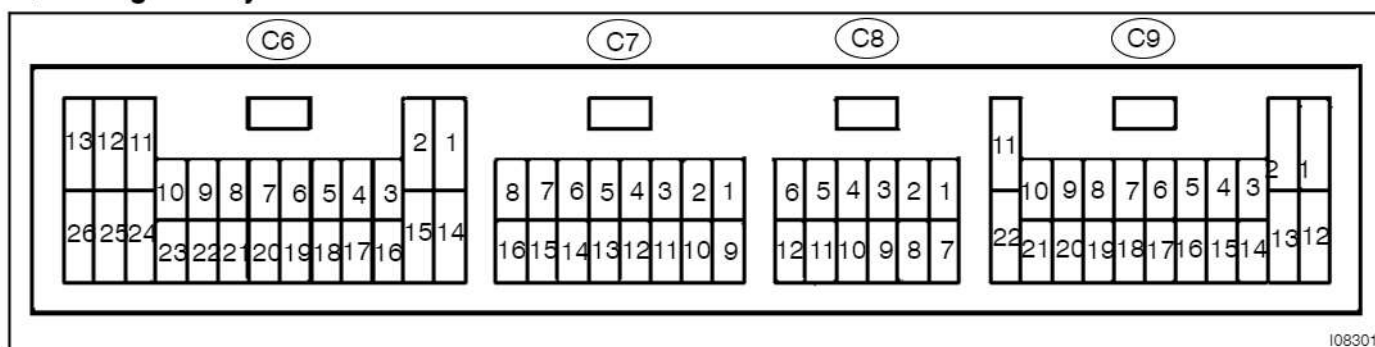
- *1 If the room temp. is approx. -20°C (-4°F) or lower, DTC 11 may be light up even though the system is normal.
- *2 If the ambient temperature is approx. -50°C (-58°F) or lower, a DTC may be output even though the system is normal.
- *3 If the check is being performed in a dark place, DTC 11 (solar sensor circuit abnormal) could be displayed. In this case, perform DTC check again while shining a light, such as an inspection light, on the solar sensor. If DTC 11 is still displayed, there could be trouble in the solar sensor circuit.
- *4 Compressor lock (DTC 22) is indicated only for a current malfunction. (See page DI-153)

To confirm DTC 22, preform the following steps.

- (1) With the engine ON, enter the DTC check mode.
- (2) Press the R/F switch to enter actuator check mode, and set the operation to Step No. 3.
- (3) Press the AUTO switch to return to DTC check mode.
- (4) The DTC is displayed after approx. 3 secs.

TERMINALS OF ECU

w/o Navigation system:

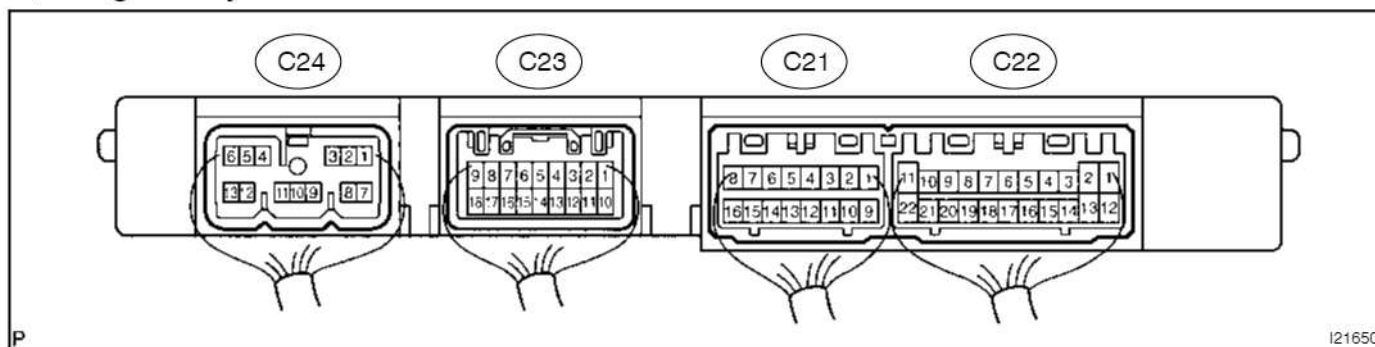


108301

Symbols (Terminals No.)	Wiring Color	Condition	STD Voltage (V)
IG ↔ GND (C9-1 ↔ C9-22)	R-L ↔ W-B	IG switch OFF → ON	10 - 14 V
ACC ↔ GND (C9-2 ↔ C9-22)	GR ↔ W-B	Turn ignition switch ACC	10 - 14 V
AIF ↔ GND (C9-6 ↔ C9-22)	G-W ↔ W-B	IG ON. Push REC switch	Below 1.0 V
		IG ON. Push FRS switch	10 - 14 V
AIR ↔ GND (C9-7 ↔ C9-22)	LG-B ↔ W-B	IG ON. Push REC switch	10 - 14 V
		IG ON. Push FRS switch	Below 1.0 V
FrAMC ↔ GND (C9-8 ↔ C9-22)	P-G ↔ W-B	IG ON. Set temp. : Max Cool	10 - 14 V
		IG ON. Set temp. : Max Hot	Below 1.0 V
FrAMH ↔ GND (C9-9 ↔ C9-22)	P-B ↔ W-B	IG ON. Set temp. : Max Cool	Below 1.0 V
		IG ON. Set temp. : Max Hot	10 - 14 V
+B ↔ GND (C9-12 ↔ C9-22)	G-R ↔ W-B	Always	10 - 14 V
FrS5 ↔ FrSG (C8-1 ↔ C8-12)	G-R ↔ Y-G	IG ON	4.5 - 5.5 V
FrTR ↔ FrSG (C8-2 ↔ C8-12)	B ↔ Y-G	IG ON. Cabin temp. : 25 °C (77 °F)	1.8 - 2.2 V
		IG ON. Cabin temp. : 40 °C (104 °F)	1.2 - 1.6 V
TAM ↔ FrSG (C8-3 ↔ C8-12)	L-Y ↔ Y-G	IG ON. Ambient temp. : 25 °C (77 °F)	1.3 - 1.8 V
		IG ON. Ambient temp. : 40 °C (104 °F)	0.8 - 1.3 V
FrTE ↔ FrSG (C8-4 ↔ C8-12)	GR-B ↔ Y-G	IG ON. Evaporator temp. : 0 °C (32 °F)	2.0 - 2.4 V
		IG ON. Evaporator temp. : 15 °C (59 °F)	1.4 - 1.8 V
TS ↔ FrSG (C8-6 ↔ C8-12)	B-Y ↔ Y-G	IG ON. Sensor subjected electric light	0.8 - 4.3V
		IG ON. Sensor covered by a cloth	Below 0.8 V
FrTP ↔ FrSG (C8-8 ↔ C8-12)	B-Y ↔ Y-G	IG ON. Set temp. : Max. Cool	3.5 - 4.5 V
		IG ON. Set temp. : Max. Hot	0.5 - 1.5 V
TPI ↔ FrSG (C8-9 ↔ C8-12)	L-R ↔ Y-G	IG ON. Push REC switch	3.5 - 4.5 V
		IG ON. Push FRS switch	0.5 - 1.5 V
FACE ↔ GND (C7-3 ↔ C9-22)	GR ↔ W-B	Mode control switch except FACE → FACE	From 10 - 14 V to below 1.0 V
B/L ↔ GND (C7-4 ↔ C9-22)	BR-W ↔ W-B	Mode control switch except BI-LEVEL → BI-LEVEL	From 10 - 14 V to below 1.0 V
FOOT ↔ GND (C7-5 ↔ C9-22)	W ↔ W-B	Mode control switch except FOOT → FOOT	From 10 - 14 V to below 1.0 V

F/D ↔ GND (C7-10 ↔ C9-22)	P-L ↔ W-B	Mode control switch except FOOT/DEF → FOOT/DEF	From 10 – 14 V to below 1.0 V
DEF ↔ GND (C7-11 ↔ C9-22)	B-W ↔ W-B	Mode control switch except DEF → DEF	From 10 – 14 V to below 1.0 V
FrBLW ↔ GND (C7-12 ↔ C9-22)	W-R ↔ W-B	Blower fan OFF → M2 → DEF	ON: Below 1.0 V OFF: 10 – 14 V
FrHR ↔ GND (C7-13 ↔ C9-22)	Y-R ↔ W-B	Blower fan OFF → ON	From 10 – 14 V to below 1.0 V
MGC ↔ GND (C7-14 ↔ C9-22)	L ↔ W-B	A/C compressor OFF → ON	From 10 – 14 V to below 1.0 V
LOCK ↔ FrSG (C6-7 ↔ C8-12)	W-L ↔ Y-G	A/C compressor ON	Pulse
TW ↔ GND (C6-9 ↔ C9-22)	Y-B ↔ W-B	IG ON.	Pulse
PSW ↔ GND (C6-10 ↔ C9-22)	L-W ↔ W-B	A/C refrigerant pressure: less than 0.19 MPa (2.0 kgf/cm ²) or more than 3.14 MPa (32 Kgf/cm ²)	From 10 – 14 V to below 1.0 V
IGN ↔ GND (C6-13 ↔ C9-22)	B ↔ W-B	Engine idling	Pulse
SPD ↔ GND (C6-22 ↔ C9-22)	V ↔ W-B	Turn propeller shaft slowly	Pulse
ACT ↔ GND (C6-23 ↔ C9-22)	L-B ↔ W-B	Start engine. A/C switch: ON Magnetic clutch: Engaged	10 – 14 V
		Start engine. A/C switch: ON Magnetic clutch: Not engaged	Below 1.0 V

w/ Navigation system:



Symbols (Terminals No.)	Wiring Color	Condition	STD Voltage (V)
B ↔ GND (C22-1 ↔ C22-11)	G-R ↔ W-B	Always	10 - 14 V
ILL+ ↔ GND (C22-2 ↔ C22-11)	G ↔ W-B	IG ON. Taillight switch: TAIL	10 - 14 V
PSW ↔ GND (C22-4 ↔ C22-11)	L-W ↔ W-B	A/C refrigerant pressure: less than 0.19 MPa (2.0 kgf/cm ²) or more than 3.14 MPa (3,140 kgf/cm ²)	From 10 - 14 to Below 1.0
SPD ↔ GND (C22-6 ↔ C22-11)	V ↔ W-B	IG ON. Turn front wheel slowly	Pulse generation
TW ↔ GND (C22-7 ↔ C22-11)	Y-B ↔ W-B	IG ON.	Pulse generation
ACT ↔ GND (C22-8 ↔ C22-11)	L-B ↔ W-B	Start engine. A/C switch: ON Magnetic clutch: Engaged	10 - 14 V
		Start engine. A/C switch: ON Magnetic clutch: Not engaged	Below 1.0 V
GND ↔ Body ground (C22-11 ↔ Body ground)	W-B	Always	Continuity
IG+ ↔ GND (C22-12 ↔ C22-11)	R-L ↔ W-B	IG ON.	10 - 14 V
ACC ↔ GND (C22-13 ↔ C22-11)	GR ↔ W-B	IG ACC.	10 - 14 V
AIR ↔ GND (C22-16 ↔ C22-11)	LG-B ↔ W-B	IG ON. Air intake selector: RECIRCULATE	10 - 14 V
		IG ON. Air intake selector: FRESH	Below 1.0 V
AIF ↔ GND (C22-17 ↔ C22-11)	G-W ↔ W-B	IG ON. Air intake selector: RECIRCULATE	Below 1.0 V
		IG ON. Air intake selector: FRESH	10 - 14 V
FRAMH ↔ GND (C22-18 ↔ C22-11)	P-B ↔ W-B	IG ON. Set temp. (Front A/C): MAX. COOL	Below 1.0 V
		IG ON. Set temp. (Front A/C): MAX. WARM	10 - 14 V
FRAMC ↔ GND (C22-19 ↔ C22-11)	P-G ↔ W-B	IG ON. Set temp. (Front A/C): MAX. COOL	10 - 14 V
		IG ON. Set temp. (Front A/C): MAX. WARM	Below 1.0 V
VER2 ↔ GND (C22-21 ↔ C22-11)	W-B ↔ W-B	Always	Continuity
TS ↔ SG (C21-2 ↔ C21-1)	G-R ↔ B-Y	IG ON. Solar sensor is subjected to electric light	0.8 - 4.3 V
		IG ON. Solar sensor is covered by a cloth	Below 0.8 V
TAM ↔ SG (C21-3 ↔ C21-1)	L-Y ↔ Y-G	IG ON. Ambient temp.: 25 °C (77 °F)	1.8 - 2.2 V
		IG ON. Ambient temp.: 40 °C (104 °F)	1.2 - 1.6 V
FrTP ↔ SG (C21-5 ↔ C21-1)	B-Y ↔ Y-G	IG ON. Set temp. (Front A/C): MAX. COOL	3.5 - 4.5 V
		IG ON. Set temp. (Front A/C): MAX. WARM	Below 1.0 V
FrLAT (C21-7)	W	Communication circuit (between front A/C amplifier and rear A/C amplifier)	-

FrCID (C21-8)	L	Communication circuit (between front A/C amplifier and rear A/C amplifier)	-
FrS5 ↔ SG (C21-9 ↔ C22-1)	G-R ↔ Y-G	IG ON.	4.5 – 5.5 V
FrTR ↔ SG (C21-10 ↔ C21-1)	B ↔ Y-G	IG ON. Cabin temp. (Front side): 25 °C (77 °F)	1.8 – 2.2 V
		IG ON. Cabin temp. (Front side): 40 °C (104 °F)	1.2 – 1.6 V
FrTE ↔ SG (C21-11 ↔ C21-1)	GR-B ↔ Y-G	IG ON. Evaporator temp. (Front A/C): 0 °C (32 °F)	2.0 – 2.4 V
		IG ON. Evaporator temp. (Front A/C): 15 °C (59 °F)	1.4 – 1.8 V
TPI ↔ SG (C21-13 ↔ C21-1)	L-R ↔ Y-G	IG ON. Air intake selector: RECIRCULATE	3.5 – 4.5 V
		IG ON. Air intake selector: FRESH	Below 1.0 V
FrCSD (C21-15)	R	Communication circuit (between front A/C amplifier and rear A/C amplifier)	-
FrCLK (C21-16)	G	Communication circuit (between front A/C amplifier and rear A/C amplifier)	-
MPX- (C23-1)	P-B	Multiplex communication circuit	-
CLK (C23-2)	L-R	Communication circuit (between front A/C amplifier and clock)	-
DPD (C23-3)	L-W	Communication circuit (between front A/C amplifier and center cluster integration panel)	-
DEF ↔ GND (C23-6 ↔ C22-11)	B-W ↔ W-B	IG ON. Air flow selector: DEF.	Below 1.0 V
		IG ON. Air flow selector: Except DEF.	10 – 14 V
B/L ↔ GND (C23-8 ↔ C22-11)	BR-W ↔ W-B	IG ON. Air flow selector: B/L	Below 1.0 V
		IG ON. Air flow selector: Except B/L	10 – 14 V
IGN ↔ GND (C23-9 ↔ C22-11)	B ↔ W-B	IG ON.	Pulse generation
MPX+ (C23-10)	P-L	Multiplex communication circuit	-
BLK (C23-11)	L	Communication circuit (between front A/C amplifier and center cluster integration panel)	-
STX (C23-12)	L-B	Communication circuit (between front A/C amplifier and center cluster integration panel)	-
SWD (C23-13)	L-Y	Communication circuit (between front A/C amplifier and center cluster integration panel)	-
LOCK ↔ GND (C23-15 ↔ C22-11)	W-L ↔ W-B	Start engine. Magnetic clutch: Engaged	Pulse generation
F/D ↔ GND (C23-16 ↔ C22-11)	P-L ↔ W-B	IG ON. Air flow selector: FOOT/DEF.	Below 1.0 V
		IG ON. Air flow selector: Except FOOT/DEF.	10 – 14 V
FOOT ↔ GND (C23-17 ↔ C22-11)	W ↔ W-B	IG ON. Air flow selector: FOOT	Below 1.0 V
		IG ON. Air flow selector: Except FOOT	10 – 14 V
FACE ↔ GND (C23-18 ↔ C22-11)	GR ↔ W-B	IG ON. Air flow selector: FACE	Below 1.0 V
		IG ON. Air flow selector: Except FACE	10 – 14 V
RDFGR ↔ GND (C24-3 ↔ C22-11)	LG ↔ W-B	IG ON. Rear deffogger switch: ON	Below 1.0 V
		IG ON. Rear deffogger switch: OFF	10 – 14 V
AC1 ↔ GND (C24-4 ↔ C22-11)	W-G ↔ W-B	Start engine. Magnetic clutch: Engaged	Below 1.0 V
		Start engine. Magnetic clutch: Not engaged	10 – 14 V
MGC ↔ GND (C24-11 ↔ C22-11)	L ↔ W-B	Start engine. Magnetic clutch: Engaged	Below 1.0 V
		Start engine. Magnetic clutch: Not engaged	10 – 14 V

DIAGNOSTICS - AIR CONDITIONING SYSTEM

FrHR ↔ GND (C24-12 ↔ C22-11)	Y-R ↔ W-B	IG ON. Blower motor: Operate	Below 1.0 V
		IG ON. Blower motor: Not operate	10 - 14 V
FrBLW ↔ GND (C24-13 ↔ C22-11)	W-R ↔ W-B	IG ON. Blower motor: Operate	Below 1.0 V
		IG ON. Blower motor: Not operate	10 - 14 V

PROBLEM SYMPTOMS TABLE

Symptom	Suspect Area	See page
Whole functions of the A/C system does not operate	1. A/C amplifier 2. ACC power source circuit	IN-35* DI-186
Air Flow Control: No blower operation	1. ACC power source circuit 2. Heater main relay 3. Blower motor circuit 4. A/C amplifier	DI-186 AC-157* DI-190 IN-35*
Air Flow Control: No blower control	1. Heater main relay 2. Blower motor circuit 3. A/C amplifier 4. Solar sensor circuit	AC-157* DI-190 IN-35* DI-150
Air Flow Control: Insufficient air flow	Blower motor circuit	DI-190
Temperature Control: No cool air comes out	1. Refrigerant volume 2. Drive belt tension 3. Refrigeration system inspection with manifold gauge set 4. Compressor circuit 5. Pressure switch circuit 6. Front air mix damper position sensor circuit 7. Front air mix damper control servomotor circuit 8. Front room temp. sensor circuit 9. Ambient temp. sensor circuit 10. A/C amplifier	AC-36* AC-22* AC-3* DI-193 DI-156 DI-163 DI-174 DI-132 DI-135 IN-35*
Temperature Control: No warm air comes out	1. Front air mix damper position sensor circuit 2. Front air mix damper control servomotor circuit 3. Front room temp. sensor circuit 4. Ambient temp. sensor circuit 5. Front evaporator temp. sensor circuit 6. A/C amplifier	DI-163 DI-174 DI-132 DI-135 DI-138 IN-35*
Temperature Control: Output air is warmer or cooler than the set temperature or response is slow	1. Refrigerant volume 2. Drive belt tension 3. Refrigeration system inspection with manifold gauge set 4. Cooling fan system 5. Solar sensor circuit 6. Front room temp. sensor circuit 7. Ambient temp. sensor circuit 8. Front Evaporator temp. sensor circuit 9. Front air mix damper position sensor circuit 10. Front air mix damper control servomotor circuit 11. Front air inlet damper position sensor circuit 12. Front air inlet damper control servomotor circuit 13. Condenser 14. Evaporator 15. Heater radiator 16. Expansion valve 17. A/C amplifier	AC-36* AC-22* AC-3* – DI-150 DI-132 DI-135 DI-138 DI-163 DI-174 DI-167 DI-177 AC-119* AC-131* AC-61* AC-37* IN-35*
Temperature Control: No temperature control (only Max. cool or Max. warm)	1. Front room temp. sensor circuit 2. Ambient temp. sensor circuit 3. Front air mix damper position sensor circuit 4. Front air mix damper control servomotor circuit 5. A/C amplifier	DI-132 DI-135 DI-163 DI-174 IN-35*
No air inlet control	1. Front air inlet damper position sensor circuit 2. Front air inlet damper control servomotor circuit 3. A/C amplifier	DI-167 DI-177 IN-35*

DIAGNOSTICS - AIR CONDITIONING SYSTEM

Symptom	Suspect Area	See page
No air flow mode	1. Air outlet damper control servomotor 2. A/C amplifier	- IN-35*
Engine idle up does not occur, or is continuous	1. Compressor circuit 2. A/C amplifier	DI-193 IN-35*

* See Pub. No. RM616E

CIRCUIT INSPECTION

DTC	RrDEF, FACE	Front Room Temperature Sensor Circuit
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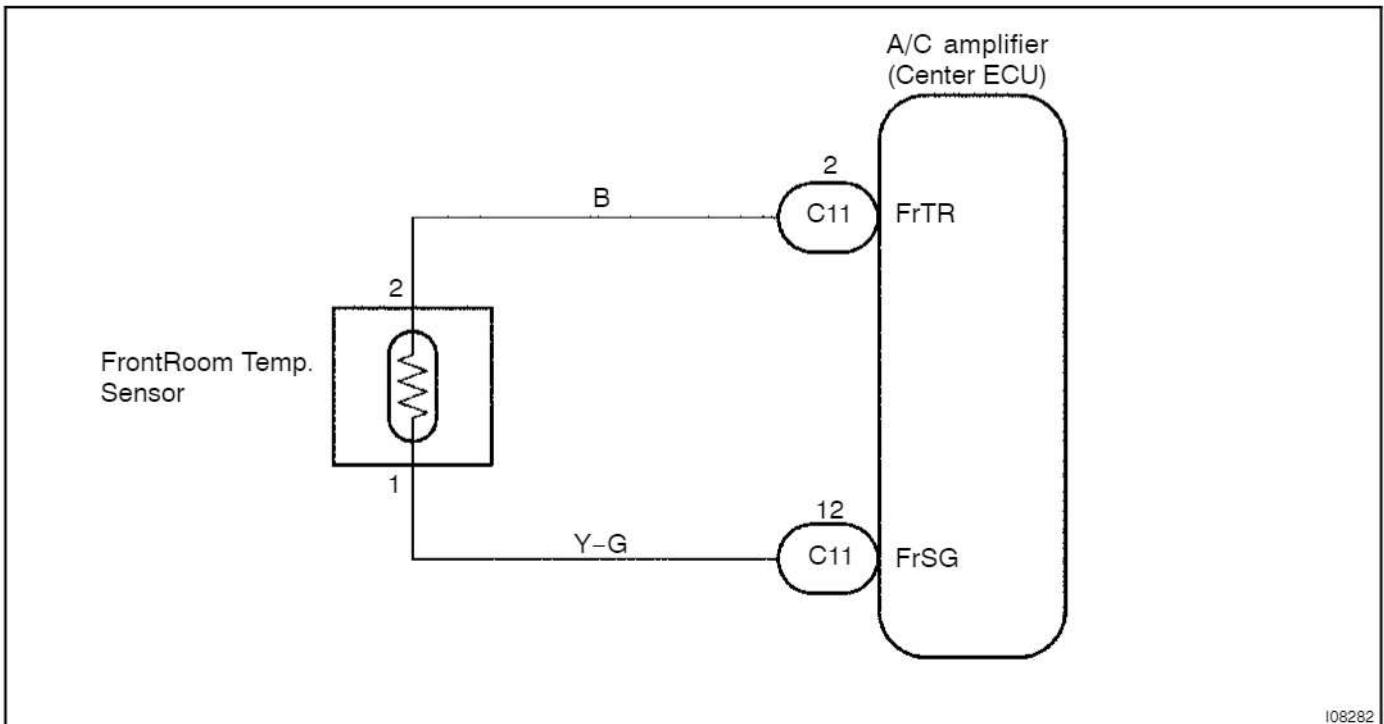
DTC	11	Front Room Temperature Sensor Circuit
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CIRCUIT DESCRIPTION

This sensor detects the temperature inside the cabin and sends the appropriate signals to the A/C amplifier.

Blinking light	Detection Item	Trouble Area
RrDEF FACE	Open or short in room temperature sensor circuit.	<ul style="list-style-type: none"> • Front room temperature sensor • Harness or connector between room temperature sensor and A/C amplifier • A/C amplifier
DTC No.	Detection Item	Trouble Area
11	Open or short in room temperature sensor circuit.	<ul style="list-style-type: none"> • Front room temperature sensor • Harness or connector between room temperature sensor and A/C amplifier • A/C amplifier

WIRING DIAGRAM

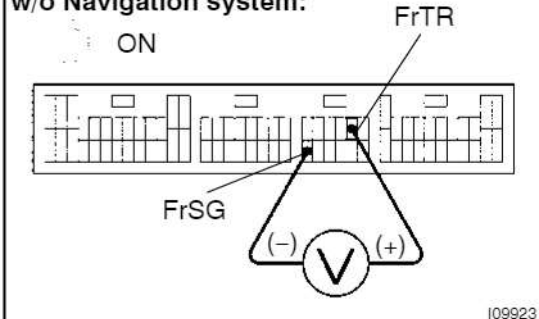


108282

INSPECTION PROCEDURE

- | | |
|----------|--|
| 1 | Check voltage between terminals FrTR and FrSG (or SG) of A/C amplifier connector. |
|----------|--|

w/o Navigation system:

**PREPARATION:**

Remove A/C amplifier with connectors still connected.

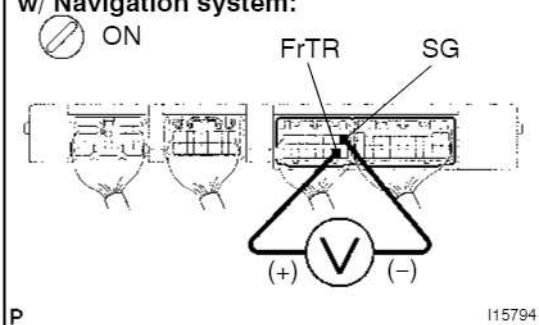
CHECK:

- (a) Turn ignition switch to ON.
- (b) Measure voltage between terminals FrTR and FrSG (or SG) of A/C amplifier connector at each temperature.

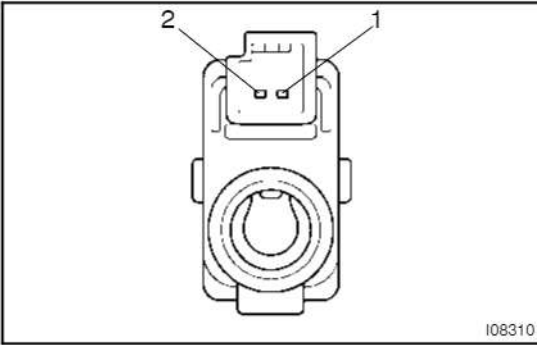
OK:**Voltage :****at 25°C (77°F) : 1.8 – 2.2 V****at 40°C (104°F) : 1.2 – 1.6 V****HINT:**

As the temperature increases, the voltage decreases.

w/ Navigation system:

**NG****Go to step 2.****OK**

Proceed to next circuit inspection shown on problem symptoms table (See page DI-130). However, if RrDEF and FACE indicators light up (or DTC 11 is displayed), check and replace amplifier.

2 Check front room temperature sensor.

PREPARATION:

Disconnect room temperature sensor connector.

CHECK:

Measure resistance between terminals 1 and 2 of room temperature sensor connector at each temperature.

OK:
Resistance :

at 25 °C (77 °F) : 1.65 – 1.75 kΩ

at 50 °C (122 °F) : 0.55 – 0.65 kΩ

HINT:

As the temperature increases, the resistance decreases.

NG
Replace front room temperature sensor.
OK
3 Check harness and connector between A/C amplifier and front room temperature sensor (See page IN-34).
NG
Repair or replace harness or connector.
OK
Check and replace A/C amplifier.

DTC	RrDEF, B/L	Ambient Temperature Sensor Circuit
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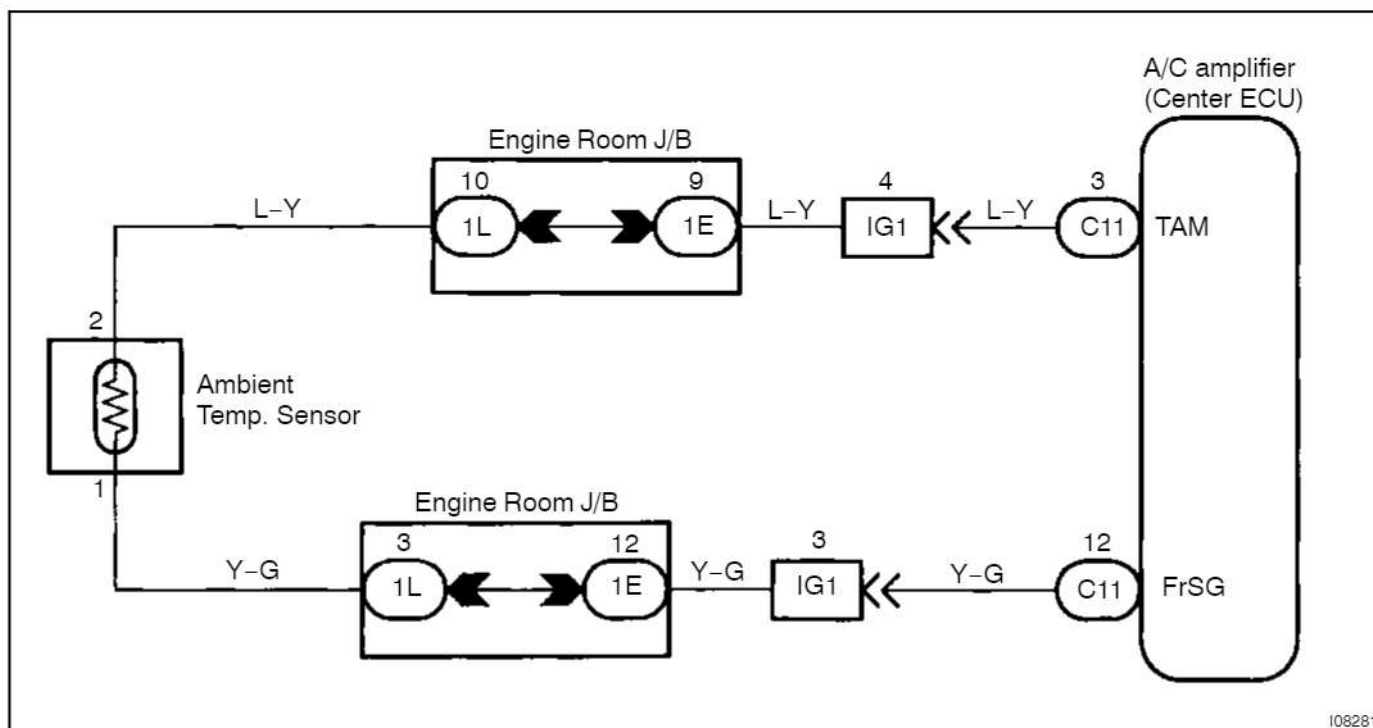
DTC	12	Ambient Temperature Sensor Circuit
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CIRCUIT DESCRIPTION

This sensor detects the ambient temperature and sends the appropriate signals to the A/C amplifier.

Blinking light	Detection Item	Trouble Area
RrDEF B/L	Open or short in ambient temperature sensor circuit.	<ul style="list-style-type: none"> • Ambient temperature sensor • Harness or connector between ambient temperature sensor and A/C amplifier • A/C amplifier
DTC No.	Detection Item	Trouble Area
12	Open or short in ambient temperature sensor circuit.	<ul style="list-style-type: none"> • Ambient temperature sensor • Harness or connector between ambient temperature sensor and A/C amplifier • A/C amplifier

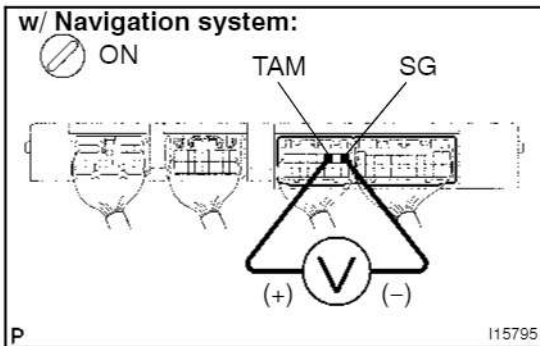
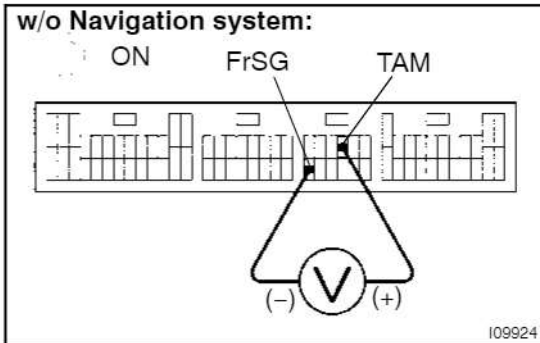
WIRING DIAGRAM



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INSPECTION PROCEDURE

1 Check voltage between terminals TAM and FrSG (or SG) of A/C amplifier.

**PREPARATION:**

Remove A/C amplifier with connectors still connected.

CHECK:

- Turn ignition switch to ON.
- Measure voltage between terminals TAM and FrSG (or SG) of A/C amplifier connector at each temperature.

OK:**Voltage :**

at 25°C (77°F) : 1.35 – 1.75 V

at 40°C (104°F) : 0.85 – 1.25 V

HINT:

As the temperature increases, the voltage decreases.

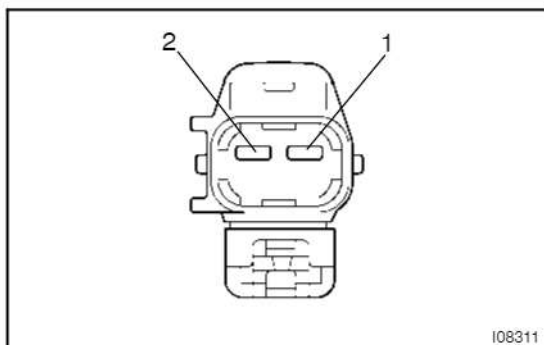
NG

Go to step 2.

OK

Proceed to next circuit inspection shown on problem symptoms table (See page DI-130). However, if RrDEF and B/L indicators light up (or DTC 12 displayed), check and replace A/C amplifier.

2 Check ambient temperature sensor.



PREPARATION:

Disconnect ambient temperature sensor connector.

CHECK:

Measure resistance between terminals 1 and 2 of ambient temperature sensor connector at each temperature.

OK:

Resistance :

at 25 °C (77 °F) : 1.6 – 1.8 kΩ

at 50 °C (122 °F) : 0.5 – 0.7 kΩ

HINT:

As the temperature increases, the resistance decreases.

NOTICE:

When installing the ambient temperature sensor, be sure to connect the sensor connector before connecting the battery.

NG

Replace ambient temperature sensor.

OK

3 Check harness and connector between ambient temperature sensor and A/C amplifier (See page IN-34).

NG

Repair or replace harness or connector.

OK

Check and replace and A/C amplifier.

DTC	RrDEF, FOOT	Front Evaporator Temperature Sensor Circuit
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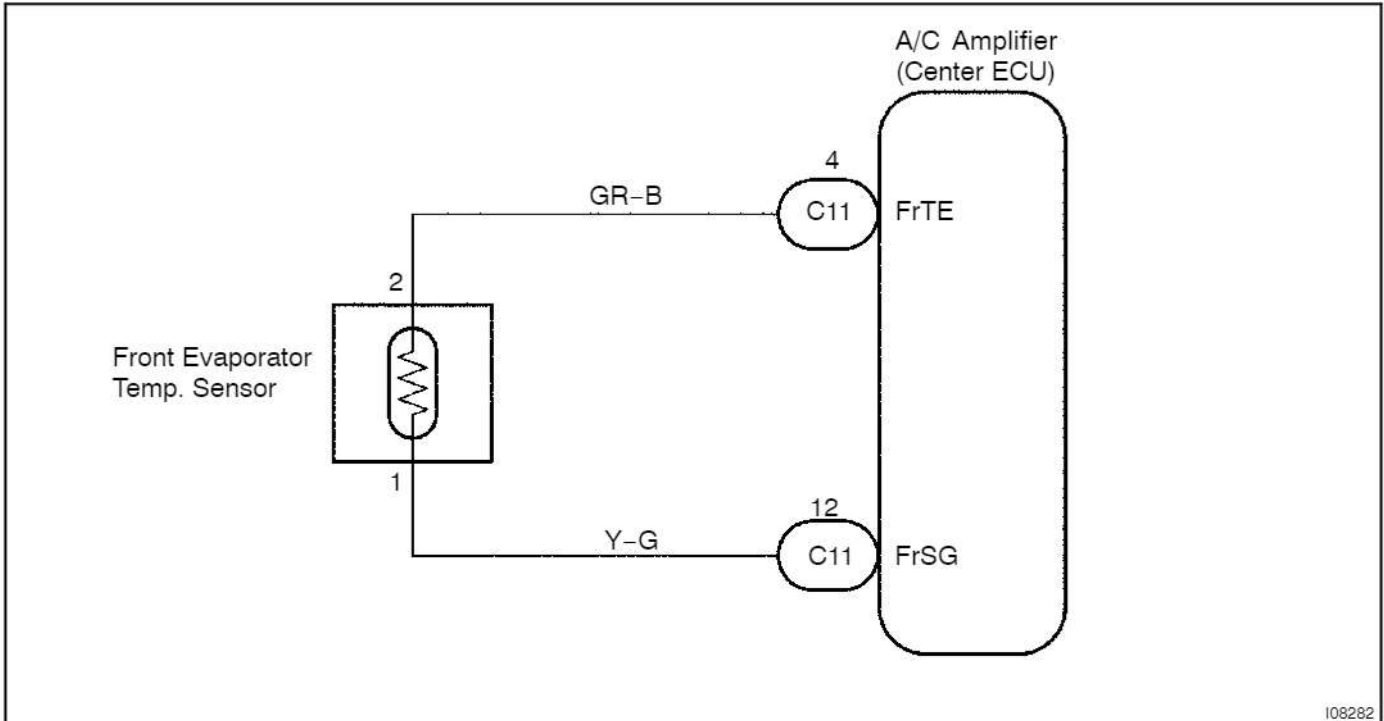
DTC	13	Front Evaporator Temperature Sensor circuit
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CIRCUIT DESCRIPTION

This sensor detects the temperature inside the cooling unit and sends the appropriate signals to the A/C amplifier.

Blinking light	Detection Item	Trouble Area
RrDEF FOOT	Open or short in evaporator temperature sensor circuit.	<ul style="list-style-type: none"> •Evaporator temperature sensor •Harness or connector between evaporator temperature sensor and A/C amplifier •A/C amplifier
DTC No.	Detection Item	Trouble Area
13	Open or short in evaporator temperature sensor circuit.	<ul style="list-style-type: none"> •Evaporator temperature sensor •Harness or connector between evaporator temperature sensor and A/C amplifier •A/C amplifier

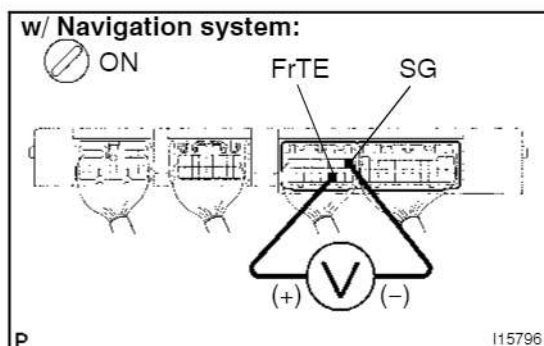
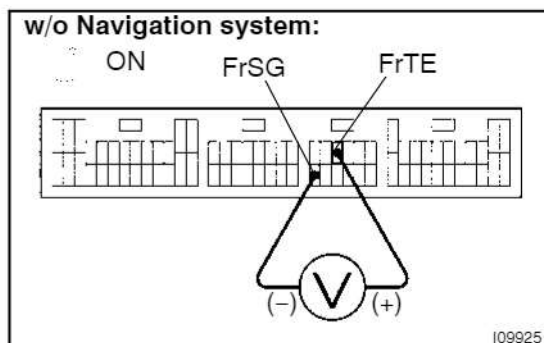
WIRING DIAGRAM



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INSPECTION PROCEDURE

- 1 Check voltage between terminals FrTE and FrSG (or SG) of A/C amplifier connector.

**PREPARATION:**

Remove A/C amplifier with connectors still connected.

CHECK:

- Turn ignition switch to ON.
- Measure voltage between terminals FrTE and FrSG (or SG) of A/C amplifier connector at each temperature.

OK:**Voltage :**

at 0 °C (32 °F) : 2.0 – 2.4 V

at 15 °C (59 °F) : 1.4 – 1.8 V

HINT:

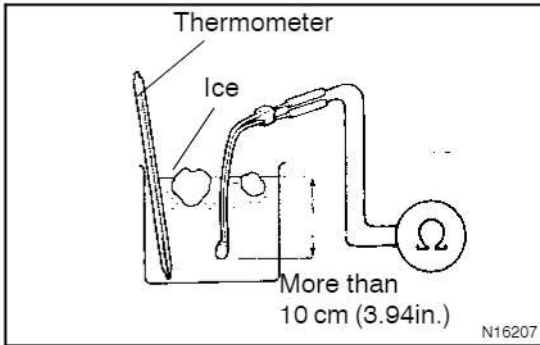
As the temperature increases, the voltage decreases.

NG

Go to step 2.

OK

Proceed to next circuit inspection shown on problem symptoms table (See page DI-130). However, if RrDEF and FOOT indicators light up (or DTC 13 is displayed), check and replace amplifier.

2 Check front evaporator temperature sensor.

PREPARATION:

Remove front evaporator temperature sensor.

CHECK:

Measure resistance between terminals 1 and 2 of front evaporator temperature sensor connector at each temperature.

OK:
Resistance :

at 0 °C (32 °F) : 4.5 – 5.2 kΩ

at 15 °C (59 °F) : 2.0 – 2.7 kΩ

HINT:

As the temperature increases, the resistance decreases.

NG
Replace evaporator temperature sensor.
OK
3 Check harness and connector between A/C amplifier and front evaporator temperature sensor (See page IN-34).
NG
Repair or replace harness or connector.
OK
Check and replace A/C amplifier.

DTC	RrDEF, F/D	Water Temperature Sensor Circuit
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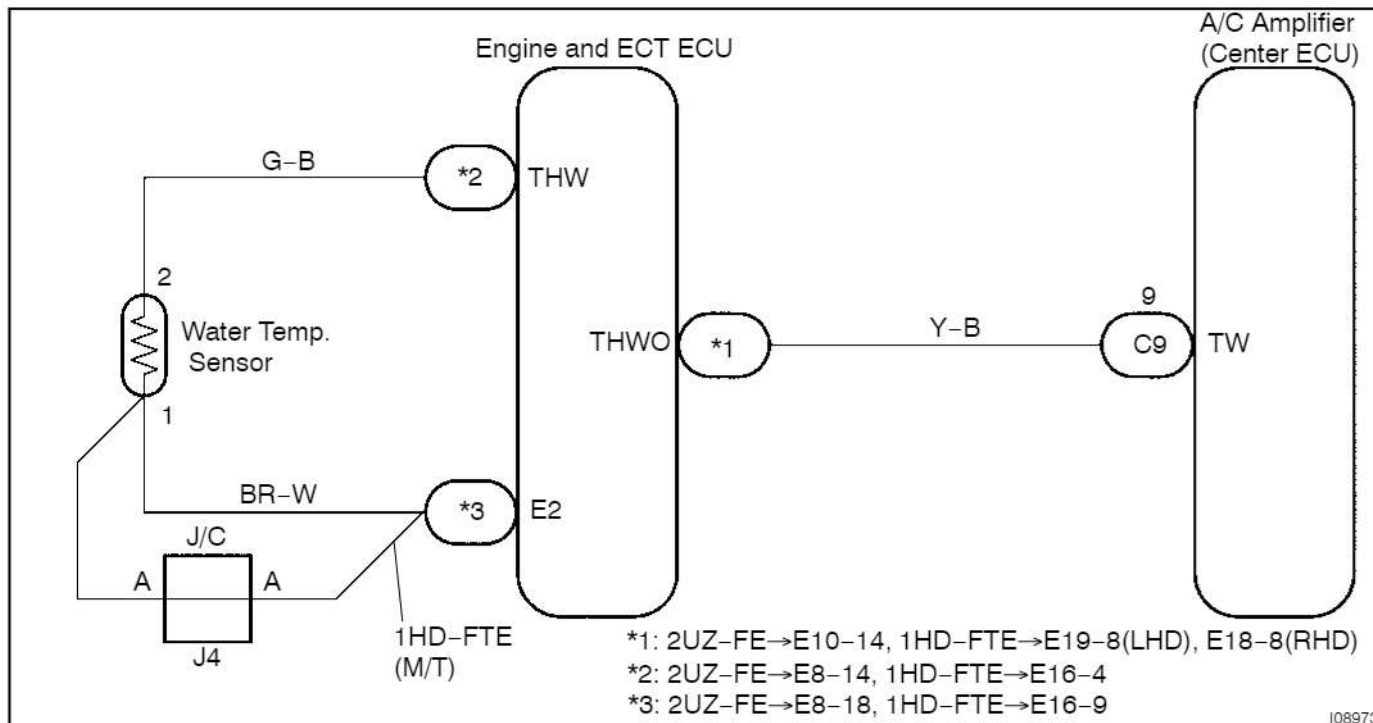
DTC	14	Water Temperature Sensor Circuit
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CIRCUIT DESCRIPTION

This sensor detects the water temperature and sends the appropriate signals to the A/C amplifier.

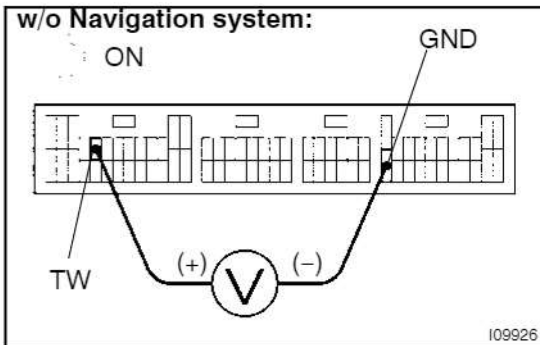
Blinking light	Detection Item	Trouble Area
RrDEF F/D	Open or short in water temperature sensor circuit.	<ul style="list-style-type: none"> • water temperature sensor • Harness or connector between water temperature sensor and ECM • Harness or connector between A/C amplifier and ECM • A/C amplifier • ECM
DTC No.	Detection Item	Trouble Area
14	Open or short in water temperature sensor circuit.	<ul style="list-style-type: none"> • water temperature sensor • Harness or connector between water temperature sensor and ECM • Harness or connector between A/C amplifier and ECM • A/C amplifier • ECM

WIRING DIAGRAM



INSPECTION PROCEDURE

1 Check voltage between terminals TW and GND of A/C amplifier connector.

**PREPARATION:**

Remove A/C amplifier with connectors still connected.

CHECK:

- Turn ignition switch to ON.
- Measure voltage between terminals TW and GND of A/C amplifier connector at each water temperature.

OK:**Voltage :**

at 25°C (77°F) : 1.8 – 2.2 V

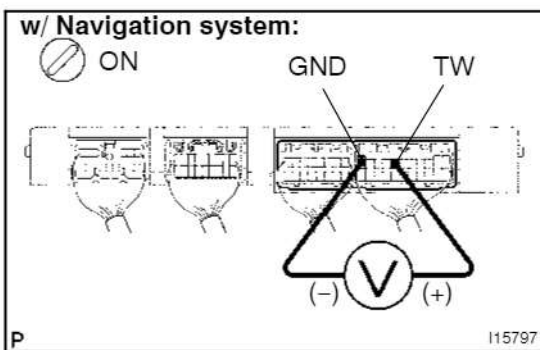
at 40°C (104°F) : 1.2 – 1.6 V

HINT:

As the temperature increases, the voltage decreases.

NG

Go to step 3.



OK

Proceed to next circuit inspection shown on problem symptoms table (See page DI-130). However, if RrDEF and F/D indicators light up (or DTC 14 is displayed), check and replace amplifier.

2 Check water temperature sensor circuit (Refer Engine Repair Manual).

NG

Replace water temperature sensor.

OK

3 Check harness and connector between A/C amplifier and ECM
(See page IN-34).

NG

Repair or replace harness or connector.

OK

Check and replace A/C amplifier.

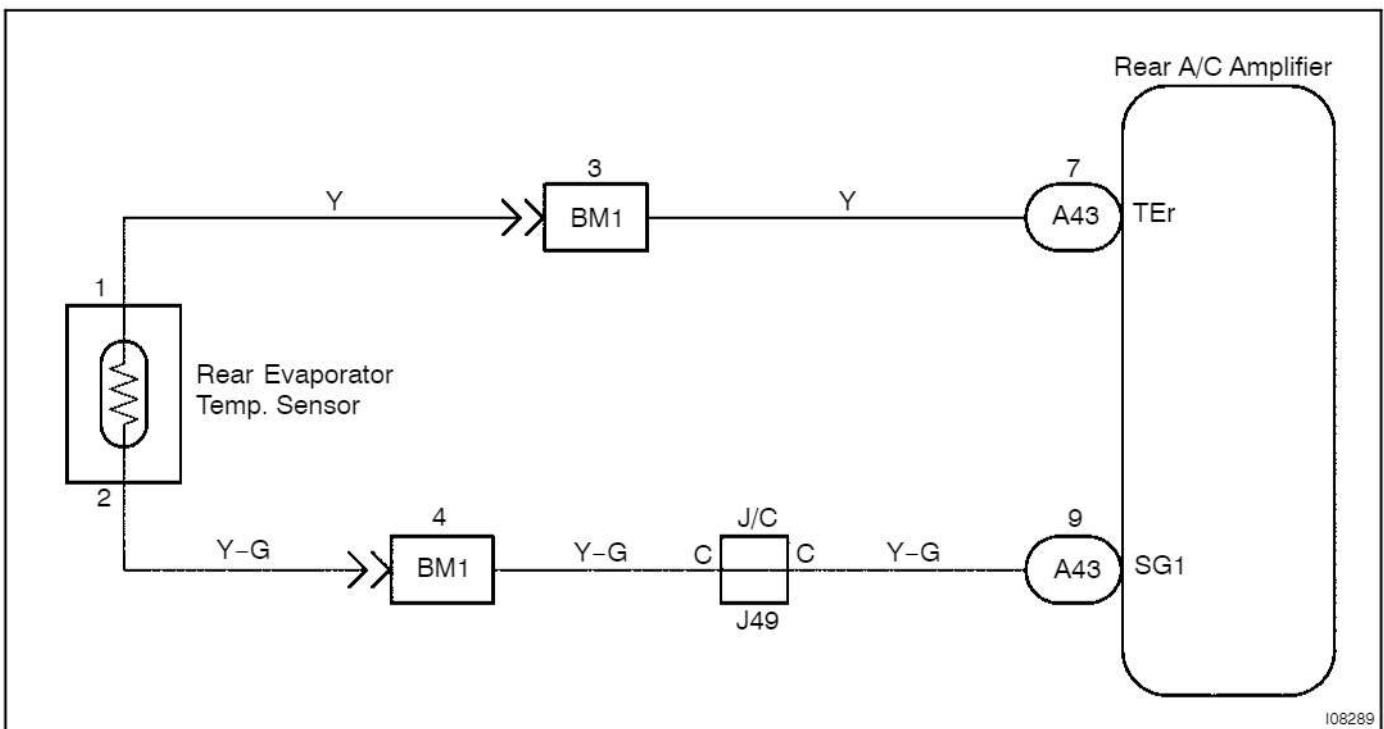
DTC	RrACSW, FOOT	Rear Evaporator Temperature Sensor Circuit
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CIRCUIT DESCRIPTION

This sensor detects the rear evaporator temperature and sends the appropriate signals to the A/C amplifier.

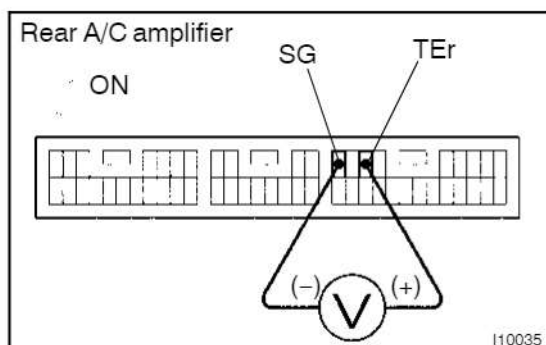
Blinking light	Detection Item	Trouble Area
RrACSW, FOOT	Open or short in rear evaporator temperature sensor circuit.	<ul style="list-style-type: none"> • Rear evaporator temperature sensor. • Harness or connector between rear evaporator temperature sensor and rear A/C amplifier. • Rear A/C amplifier

WIRING DIAGRAM



INSPECTION PROCEDURE

1 Check voltage between terminals TEr and SG of rear A/C amplifier connector.

**PREPARATION:**

Remove rear A/C amplifier with connectors still connected.

CHECK:

- (a) Turn ignition switch to ON.
- (b) Measure voltage between terminals TEr and SG of rear A/C amplifier connector at each temperature.

OK:**Voltage :**

at 0°C (32°F) : 2.0 - 2.4 V

at 15°C (59°F) : 1.4 - 1.8 V

HINT:

As the temperature increases, the voltage decreases.

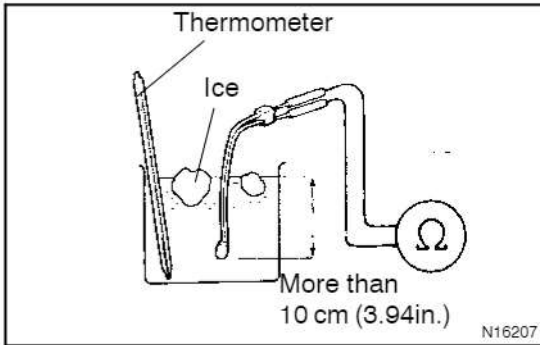
NG

Go to step 2.

OK

Proceed to next circuit inspection shown on problem symptoms table (See page DI-130). However, if RrACSW and FACE indicators light up (or DTC 17 is displayed), check and replace A/C amplifier.

2 Check rear evaporator temperature sensor.



PREPARATION:

Remove rear evaporator temperature sensor (See Pub. No. RM616E on page AC-43).

CHECK:

Measure resistance between terminals 1 and 2 of evaporator temperature sensor connector at each temperature.

OK:

Resistance :

at 0°C (32°F) : 4.5 – 5.2 kΩ

at 15°C (59°F) : 2.0 – 2.7 kΩ

HINT:

As the temperature increases, the resistance decreases.

NG

Replace rear evaporator temperature sensor.

OK

3 Check harness and connector between A/C amplifier and rear evaporator temperature sensor (See page IN-34).

NG

Repair or replace harness or connector.

OK

Check and replace A/C amplifier.

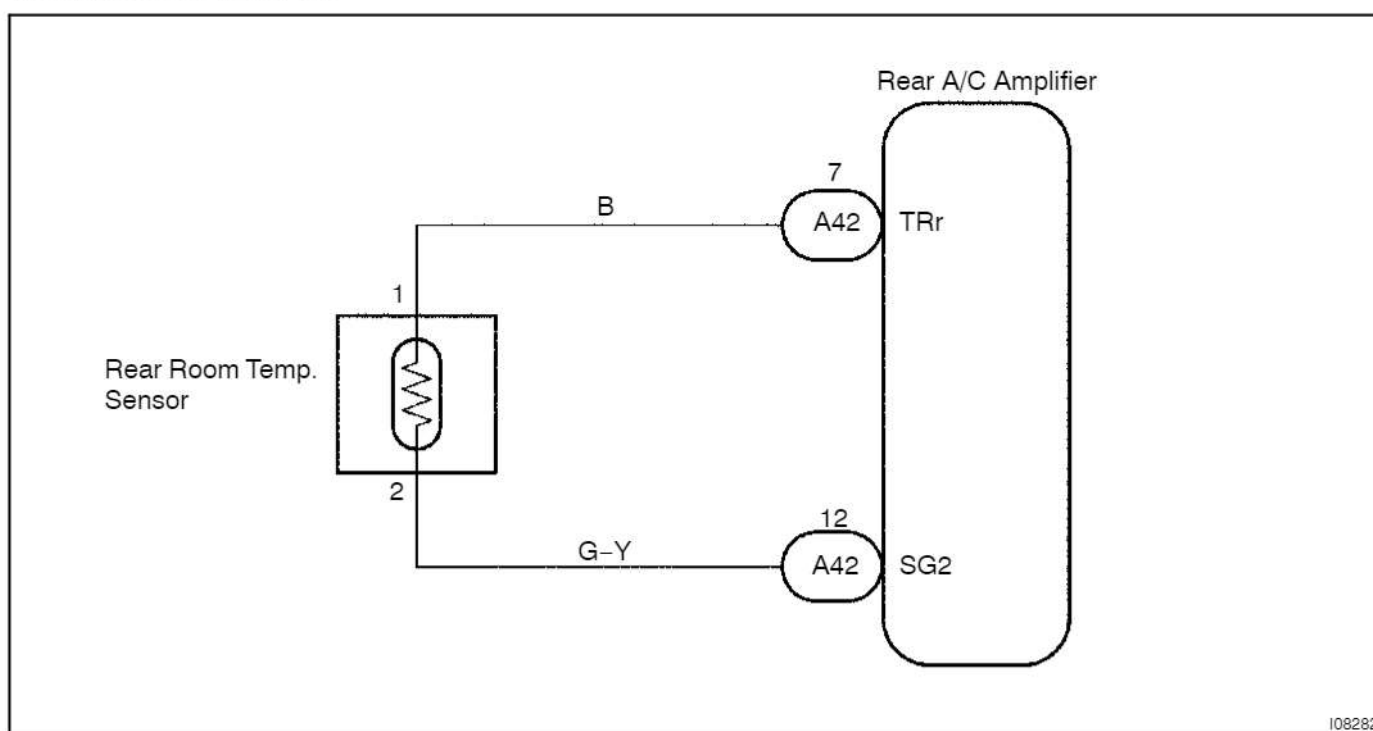
DTC	RrACSW, FACE	Rear Room Temperature Sensor Circuit
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CIRCUIT DESCRIPTION

This sensor detects the temperature inside the cabin and sends the appropriate signals to the rear A/C amplifier.

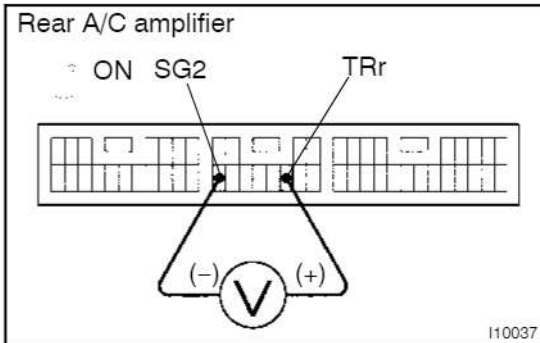
Blinking light	Detection Item	Trouble Area
RrACSW, FACE	Open or short in rear room temperature sensor circuit.	<ul style="list-style-type: none"> •Rear room temperature sensor. •Harness or connector between rear room temperature sensor and rear A/C amplifier. •Rear A/C amplifier.

WIRING DIAGRAM



INSPECTION PROCEDURE

1 Check voltage between terminals TRr and SG2 of A/C amplifier connector.

**PREPARATION:**

Remove rear A/C amplifier with connectors still connected.

CHECK:

- Turn ignition switch to ON.
- Measure voltage between terminals TRr and SG2 of rear A/C amplifier connector at each temperature.

OK:**Voltage :**

at 25°C (77°F) : 1.8 – 2.2 V

at 40°C (104°F) : 1.2 – 1.6 V

HINT:

As the temperature increases, the voltage decreases.

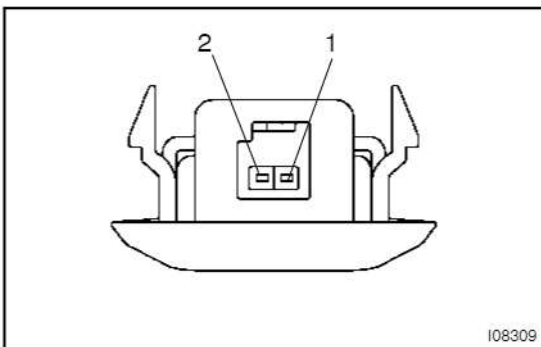
NG

Go to step 3.

OK

Proceed to next circuit inspection shown on problem symptoms table (See page DI-130). However, if RrACSW and FACE indicators light up (or DTC19 is displayed), check and replace A/C amplifier.

2 Check rear room temperature sensor.

**PREPARATION:**

Disconnect rear room temperature sensor connector.

CHECK:

Measure resistance between terminals 1 and 2 of room temperature sensor connector at each temperature.

OK:**Resistance :**

at 25°C (77°F) : 1.65 – 1.75 kΩ

at 50°C (122°F) : 0.55 – 0.65 kΩ

HINT:

As the temperature increases, the resistance decreases.

NG

Replace rear room temperature sensor.

OK

3 Check harness and connector between rear A/C amplifier and rear room temperature sensor (See page IN-34).

NG

Repair or replace harness or connector.

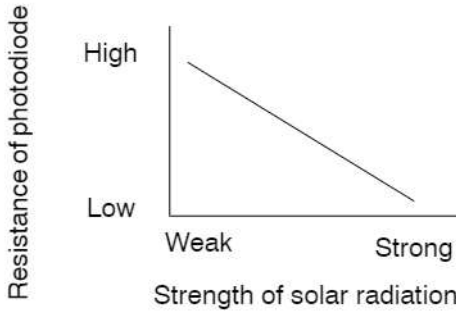
OK

Check and replace A/C amplifier.

DTC	RrDEF, DEF	Solar Sensor Circuit
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DTC	21	Solar Sensor Circuit
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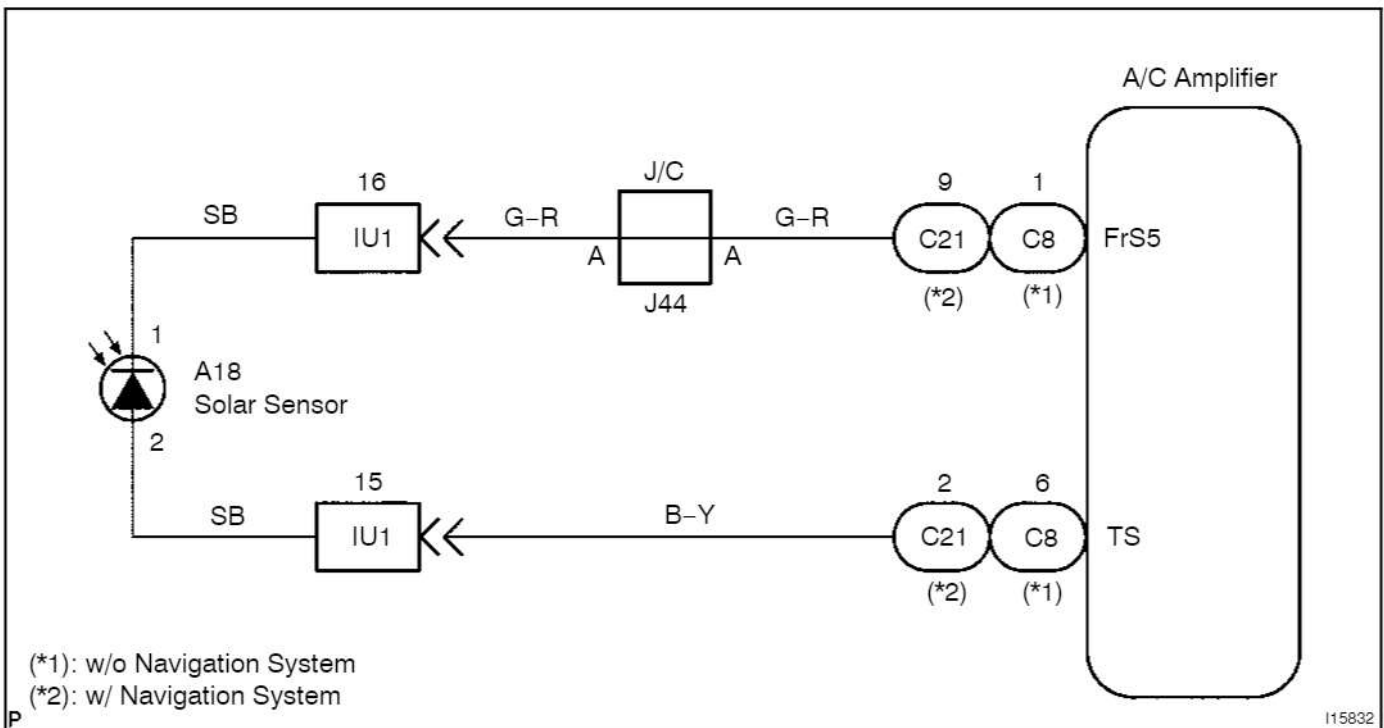
CIRCUIT DESCRIPTION



A photo diode in the solar sensor detects solar radiation and sends signals to the A/C control assembly.

Blinking light	Detection Item	Trouble Area
RrDEF DEF	Open or short in solar sensor circuit. Please note that display of diagnostic trouble code 21 is not abnormal when the sensor is not receiving solar radiation.	<ul style="list-style-type: none"> • Solar sensor • Harness or connector between solar sensor and A/C amplifier • A/C amplifier
DTC No.	Detection Item	Trouble Area
21	Open or short in solar sensor circuit. Please note that display of diagnostic trouble code 21 is not abnormal when the sensor is not receiving solar radiation.	<ul style="list-style-type: none"> • Solar sensor • Harness or connector between solar sensor and A/C amplifier • A/C amplifier

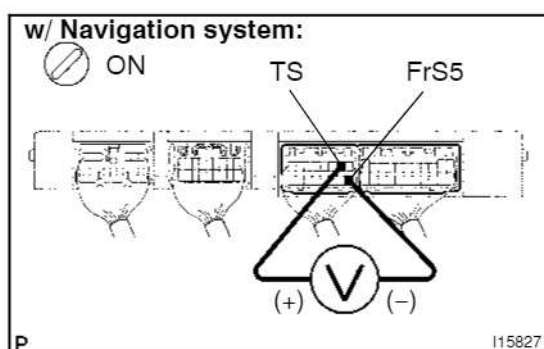
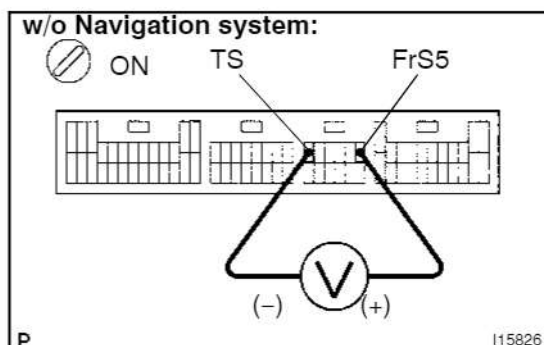
WIRING DIAGRAM



(*1): w/o Navigation System
 (*2): w/ Navigation System

INSPECTION PROCEDURE

1 Check voltage between terminals FrS5 and TS of A/C amplifier connector.

**PREPARATION:**

Remove A/C amplifier with connectors still connected.

CHECK:

- Turn ignition switch to ON.
- Measure voltage between terminals FrS5 and TS of A/C amplifier connector when the solar sensor is subjected to an electric light, and when the sensor is covered by a cloth.

OK:

Condition	Voltage
Sensor subjected to electric light	0.8 - 4.3 V
Sensor covered by a cloth	Below 0.8 V

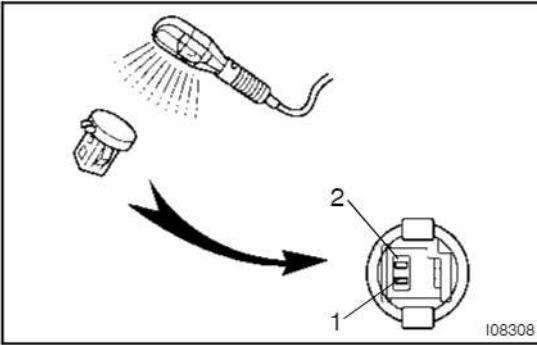
HINT:

As the inspection light is moved away from the sensor, the voltage increases.

NG**Go to step 2.****OK**

Proceed to next circuit inspection shown on problem symptoms table (See page DI-130). However, if RrDEF and DEF indicators light up (or DTC 21 is displayed), check and replace amplifier.

2	Check solar sensor.
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**PREPARATION:**

Remove solar sensor.

CHECK:

- (a) Cover the sensor with a cloth.
- (b) Measure resistance between terminals 1 and 2 of solar sensor connector.

HINT:

Connect positive (+) lead of ohmmeter to terminal 1 and negative (-) lead to terminal 2 of the solar sensor.

OK:**Resistance : $\infty \Omega$ (no continuity)****PREPARATION:**

- (a) Remove the cloth from the solar sensor and subject the sensor to electric light.
- (b) Measure resistance.

OK:**Resistance : Approx. 4 k Ω (continuity)****HINT:**

As the electric light is moved away from the sensor, the resistance increases.

NG	Replace solar sensor.
-----------	------------------------------

OK

3	Check harness and connector between A/C amplifier and solar sensor (See page IN-34).
----------	--

NG	Repair or replace harness or connector.
-----------	--

OK

Check and replace A/C control assembly.
--

DTC	22	Compressor Lock Sensor Circuit
------------	-----------	---------------------------------------

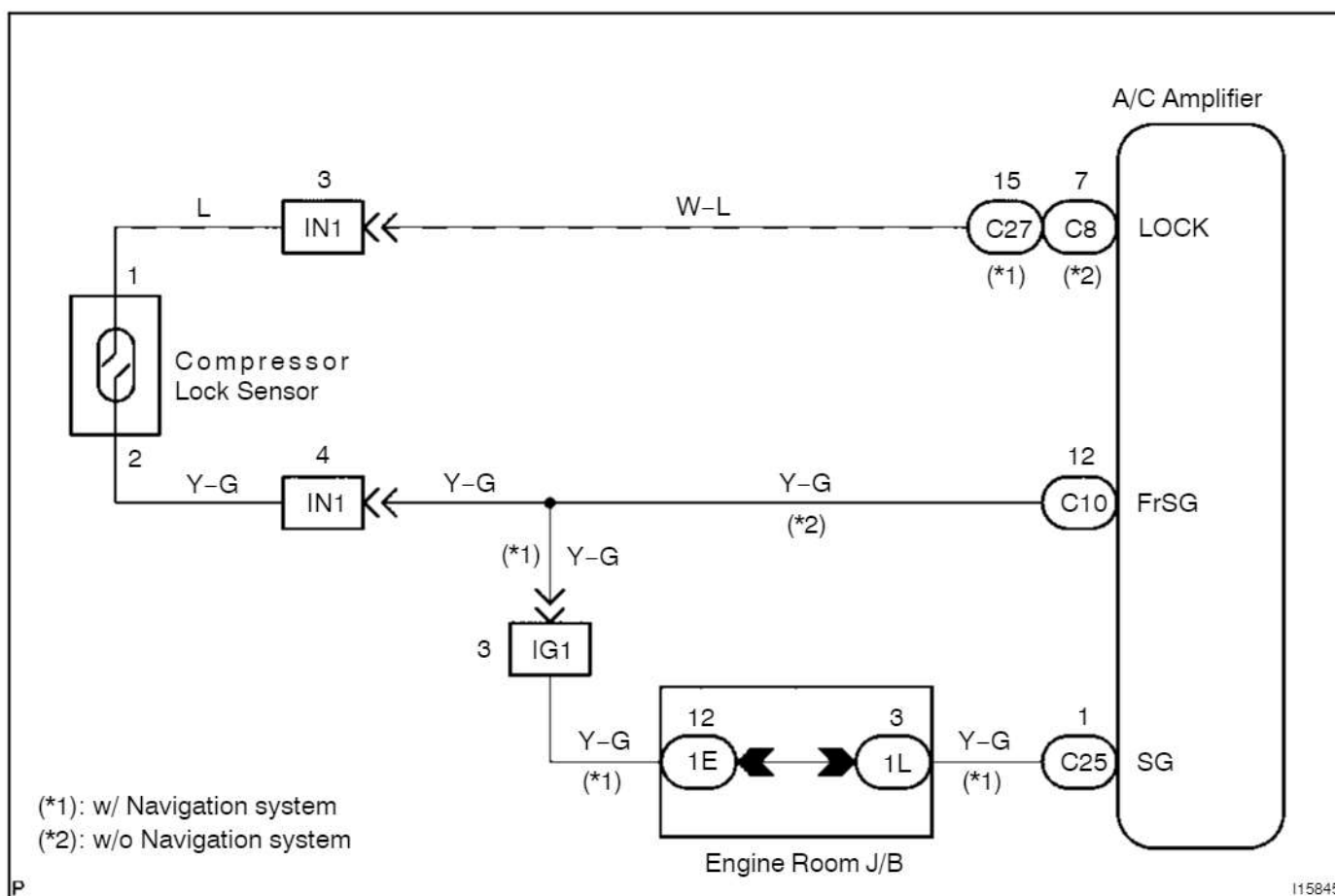
CIRCUIT DESCRIPTION

This sensor sends 4 pulses per engine revolution to the A/C amplifier.

If the number ratio of the compressor speed divided by the engine speed is smaller than a predetermined value, the A/C amplifier turns the compressor OFF. And, the indicator flashes at about 1 second intervals.

DTC No.	Detection Item	Trouble Area
22	All conditions below are detected for 3 secs. or more (a) Engine speed : 450 rpm or more (b) Ratio between engine and compressor speed deviates 20 % or more in comparison to normal operation.	<ul style="list-style-type: none"> • Compressor. • Compressor drive belt. • Compressor lock sensor. • Harness and connector between compressor lock sensor and A/C amplifier • A/C amplifier

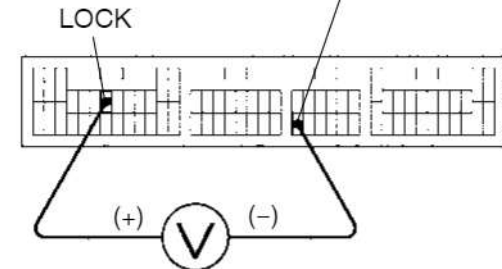
WIRING DIAGRAM



INSPECTION PROCEDURE

1 Check voltage between terminal LOCK and FrSG (or SG) of A/C amplifier.

w/o Navigation system: FrSG



108269

CHECK:

- Start engine.
- Push AUTO SW.
- Measure voltage between terminal LOCK and FrSG (or SG) of A/C amplifier connector when A/C switch is ON.

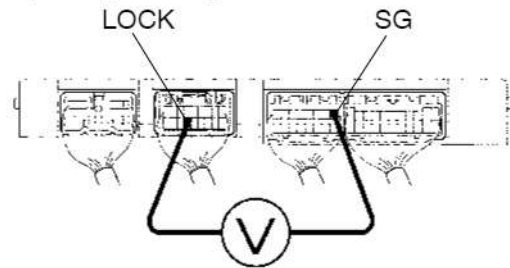
OK:

Voltage : 10 - 14 V

OK

Go to step 2.

w/ Navigation system:



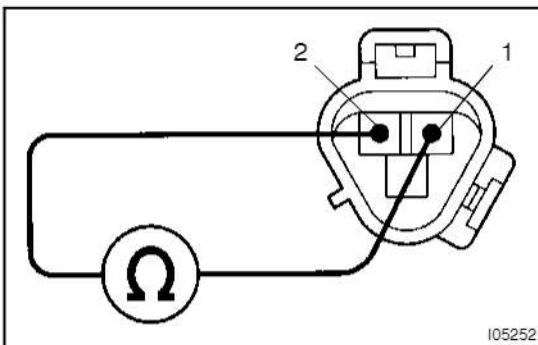
P

115846

NG

Proceed to next circuit inspection shown on problem symptoms table (See page DI-130). However, if DTC 22 is displayed, check and replace A/C amplifier.

2 Check compressor lock sensor.



105252

PREPARATION:

- Jack up the vehicle.
- Disconnect compressor lock sensor connector.

CHECK:

Measure resistance between terminals 1 and 2 of compressor lock sensor connector.

OK:

Resistance :

at 20 °C (68 °F) : 990 - 1210 Ω

at 100 °C (212 °F) : 1280 - 1550 Ω

NG

Replace compressor.

OK

3 Check harness and connectors between A/C amplifier and compressor lock sensor (See page IN-34).

NG

Repair or replace harness or connector.

OK

Check and replace A/C amplifier and compressor lock sensor.

DTC	RrDEF, FRS	Pressure Switch Circuit
------------	-------------------	--------------------------------

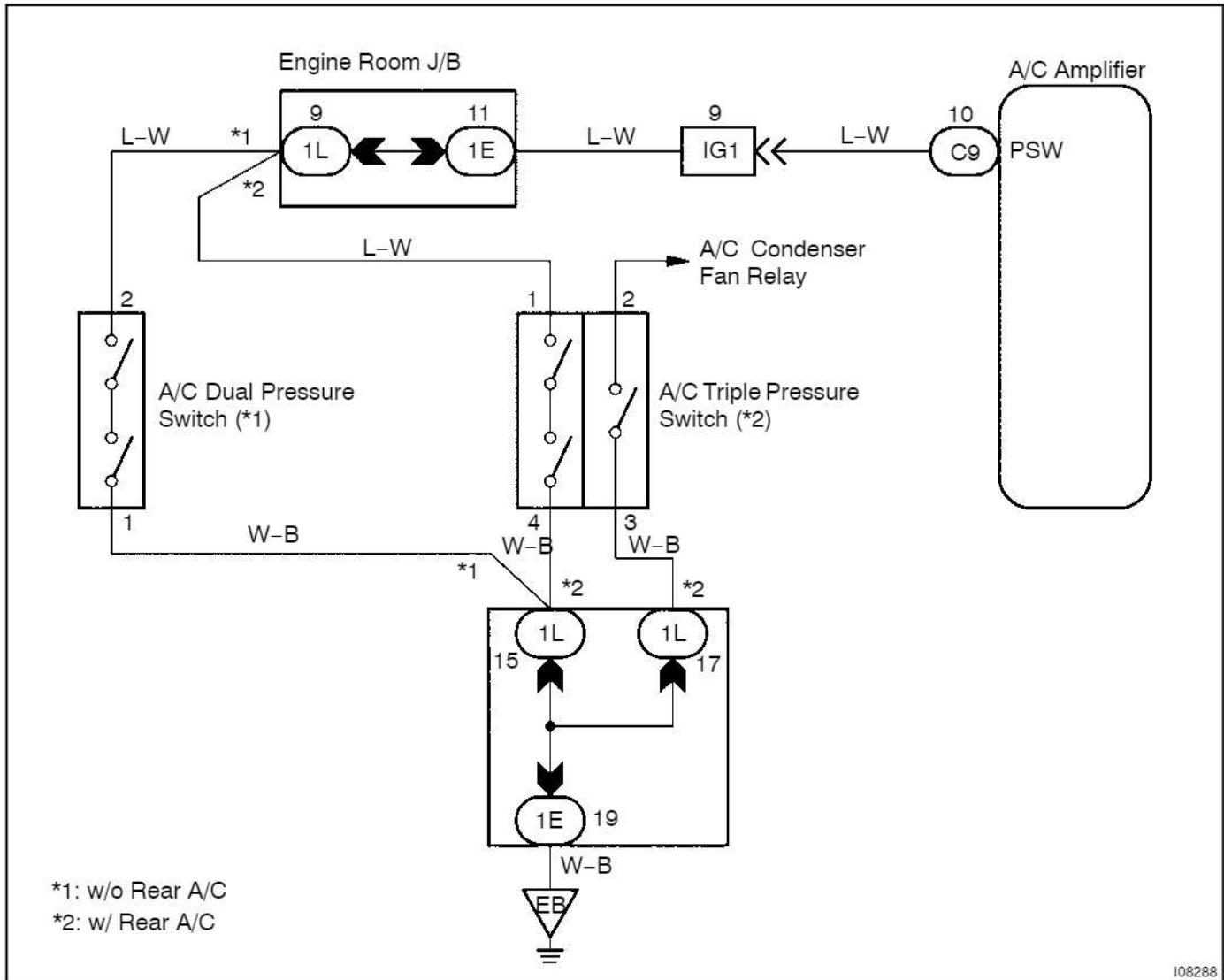
DTC	23	Pressure Switch Circuit
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CIRCUIT DESCRIPTION

The pressure switch sends the appropriate signals to the A/C amplifier when the A/C refrigerant pressure drops too low or rises too high. When the A/C amplifier receives these signals, it outputs signals via the A/C amplifier to switch OFF the compressor relay and turns the magnetic clutch OFF.

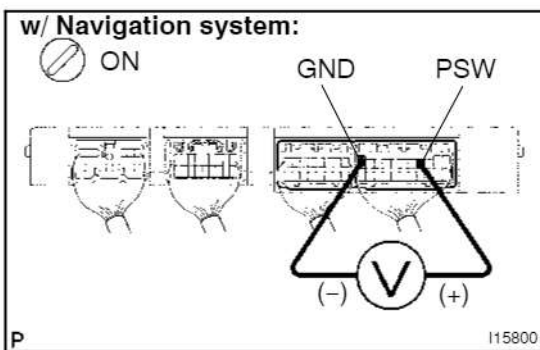
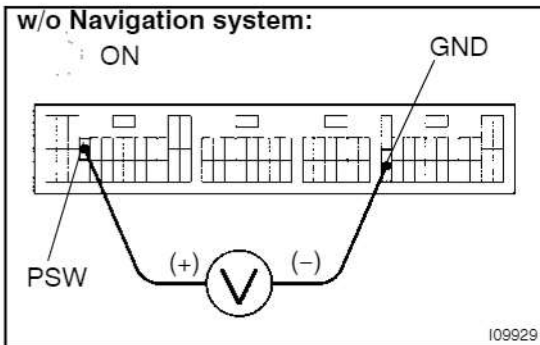
Blinking light	Detection Item	Trouble Area
RrDEF FRS	<ul style="list-style-type: none"> • Open in pressure sensor circuit. • Abnormal refrigerant pressure. below 196 kPa (2.0 kg/cm², 28 psi) over 3,140 kPa (32.0 kgf/cm², 455 psi) 	<ul style="list-style-type: none"> • Pressure switch • Harness or connector between pressure switch and A/C amplifier • Refrigerant pipe line • A/C amplifier
DTC No.	Detection Item	Trouble Area
23	<ul style="list-style-type: none"> • Open in pressure sensor circuit. • Abnormal refrigerant pressure. below 196 kPa (2.0 kg/cm², 28 psi) over 3,140 kPa (32.0 kgf/cm², 455 psi) 	<ul style="list-style-type: none"> • Pressure switch • Harness or connector between pressure switch and A/C amplifier • Refrigerant pipe line • A/C amplifier

WIRING DIAGRAM



INSPECTION PROCEDURE

1 Check voltage between terminals PSW and GND of A/C amplifier.

**PREPARATION:**

Install the manifold gauge set.

CHECK:

- Turn ignition switch to ON.
- Check voltage between terminal PSW of A/C amplifier connector and body ground when refrigerant pressure is changed.

OK:

The voltage changes with refrigerant pressure, as shown in the diagram below.

Low Pressure Cut Side	Reference: High Pressure Cut Side
ON (0V)	ON (0V)
196 kPa ↓	2,550 kPa ↑
225 kPa ↑	3,140 kPa ↓
OFF (12V)	OFF (12V)

NG

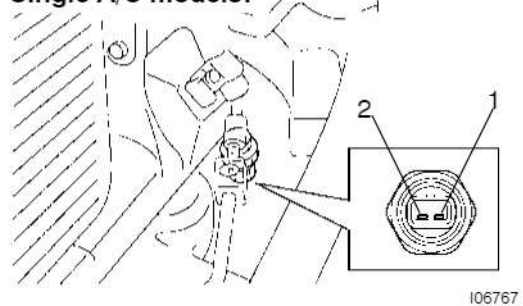
Go to step 2.

OK

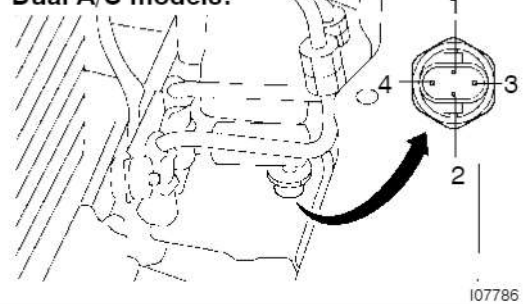
Proceed to next circuit inspection shown on problem symptoms table (See page DI-130). However, if RrDEF and FRS indicator light is light up (or DTC 23 is displayed), check and replace amplifier.

2 Check pressure switch.

Single A/C models:



Dual A/C models:



PREPARATION:

Disconnect pressure switch connector.

CHECK:

- (a) Turn ignition switch to ON.
- (b) Single A/C models:
Check continuity between terminals 1 and 2 of pressure switch when refrigerant pressure is changed.
- (c) Dual A/C models:
Check continuity between terminals 1 and 4 of pressure switch when refrigerant pressure is changed.

OK:

The continuity changes with refrigerant pressure as shown below.

Low Pressure Cut Side	Reference : High Pressure Cut Side
ON (continuity)	ON (continuity)
196 kPa	2,550kPa
211 kPa	3,140kPa
OFF (continuity)	OFF (continuity)

NG

Replace pressure switch.

OK

3 Check harness and connector between A/C amplifier and pressure switch (See page IN-34).

NG

Repair or replace harness or connector.

OK

Check and replace A/C amplifier.

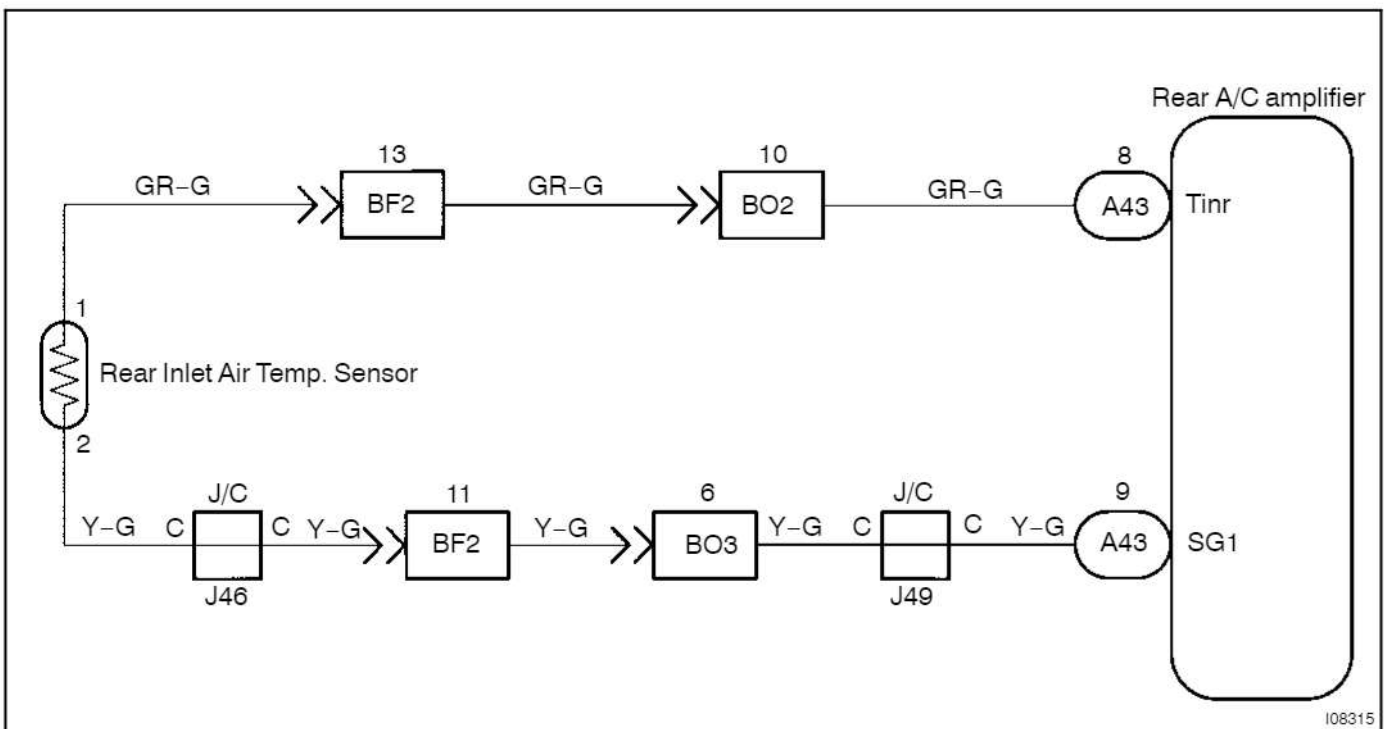
DTC	RrACSW, HI	Rear Inlet Air Temperature Sensor Circuit
------------	-------------------	--

CIRCUIT DESCRIPTION

This sensor detects the rear inlet air temperature and sends the appropriate signals to the A/C amplifier.

Blinking light	Detection Item	Trouble Area
RrACSW, HI	Open or short in rear inlet air temperature sensor circuit.	<ul style="list-style-type: none"> • Rear inlet air temperature sensor • Harness or connector between rear inlet air temperature sensor and rear A/C amplifier • Rear A/C amplifier

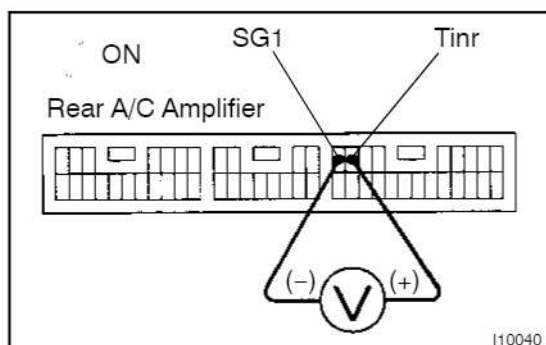
WIRING DIAGRAM



I08315

INSPECTION PROCEDURE

1 Check voltage between terminals Tinr and SG1 of rear A/C amplifier connector.

**PREPARATION:**

Remove rear A/C amplifier with connectors still connected.

CHECK:

- Turn ignition switch to ON.
- Measure voltage between terminals Tinr and SG1 of rear A/C amplifier connector at each temperature.

OK:**Voltage :**

at 25°C (77°F) : 1.8 – 2.2 V

at 40°C (104°F) : 1.2 – 1.6 V

HINT:

As the temperature increases, the voltage decreases.

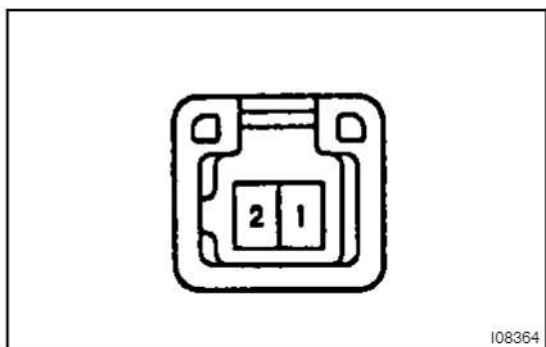
NG

Go to step 2.

OK

Proceed to next circuit inspection shown on problem symptoms table (See page DI-130). However, if RrACSW and HI indicators light up (or DTC 26 is displayed), check and replace rear A/C amplifier.

2 Check rear inlet air temperature sensor.

**PREPARATION:**

Disconnect rear inlet air temperature sensor connector.

CHECK:

Measure resistance between terminals 1 and 2 of rear inlet air temperature sensor connector at each temperature.

OK:**Resistance :**

at 25°C (77°F) : 1.65 – 1.75 kΩ

at 50°C (122°F) : 0.55 – 0.65 kΩ

HINT:

As the temperature increases, the resistance decreases.

NG

Replace rear inlet air temperature sensor.

OK

- | | |
|----------|--|
| 3 | Check harness and connector between rear A/C amplifier and inlet air temperature sensor (See page IN-34). |
|----------|--|

NG

Repair or replace harness or connector.

OK

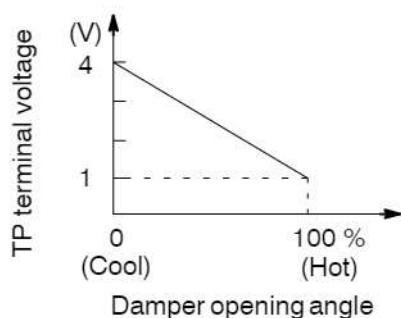
Check and replace rear A/C amplifier.

DTC	RrDEF, REC	Front Air Mix Damper Position Sensor Circuit
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DTC	RrDEF, M1	Front Air Mix Damper Position Sensor Circuit
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DTC	31, 41	Front Air Mix Damper Position Sensor Circuit
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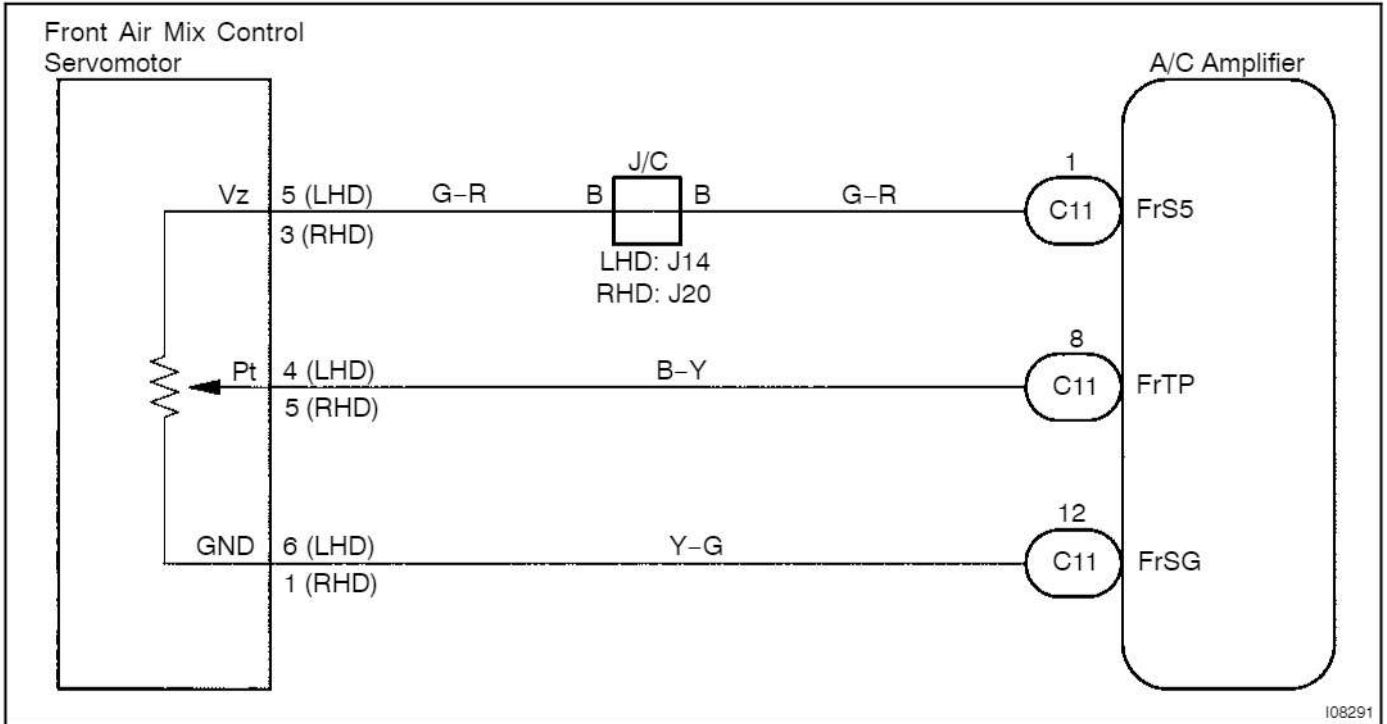
CIRCUIT DESCRIPTION



This sensor detects the position of the air mix damper and sends the appropriate signals to the A/C amplifier. The position sensor is built into the air mix damper control servomotor assembly.

Blinking light	Detection Item	Trouble Area
RrDEF REC	Short to ground or power source circuit in front air mix damper position sensor circuit.	<ul style="list-style-type: none"> • Front air mix damper position sensor • Harness or connector between front air mix damper control servomotor assembly and A/C amplifier • A/C amplifier
RrDEF M1	Front air mix damper position sensor value does not change even if A/C amplifier operates front air mix damper control servomotor.	
DTC No.	Detection Item	Trouble Area
31	Short to ground or power source circuit in front air mix damper position sensor circuit.	<ul style="list-style-type: none"> • Front air mix damper position sensor. • Harness or connector between front air mix damper control servomotor assembly and A/C amplifier. • A/C amplifier.
41	Front air mix damper position sensor value does not change even if A/C amplifier operates front air mix damper control servomotor.	

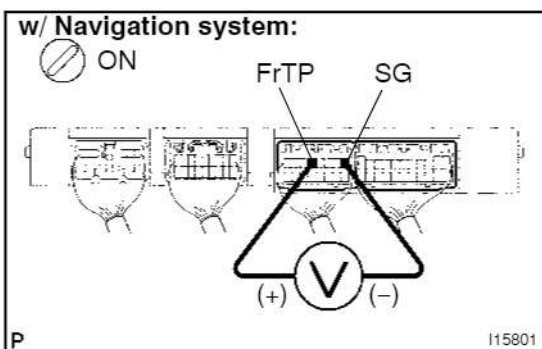
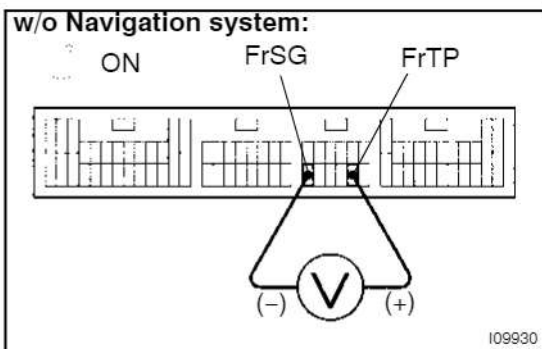
WIRING DIAGRAM



108291

INSPECTION PROCEDURE

1	Check voltage between terminals FrTP and FrSG (or SG) of A/C amplifier connector.
---	--



PREPARATION:

Remove A/C amplifier with connectors still connected.

CHECK:

- (a) Turn ignition switch to ON.
- (b) Change the set temperature to activate the air mix damper control servomotor and measure the voltage between terminals FrTP and FrSG (or SG) of A/C amplifier connector each time when the set temperature is changed.

OK:

Set Temperature	Voltage
Max. cool	3.5 - 4.5 V
Max. hot	0.5 - 1.5 V

HINT:

As the set temperature increases, the voltage decreases.

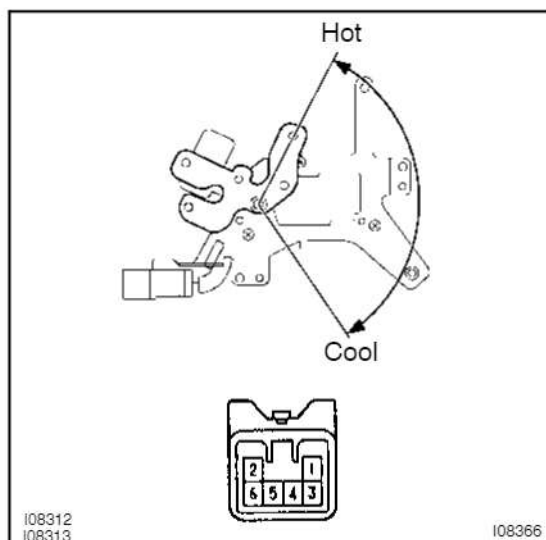
NG

Go to step 2.

OK

Proceed to next circuit inspection shown on problem symptoms table (See page DI-130). However, if RrDEF and REC or RrDEF and M1 indicators light up (or DTC 31 or 41 is displayed), check and replace amplifier.

2 Check air mix damper position sensor.



PREPARATION:

Remove air mix servomotor.

CHECK:

Measure resistance between terminals 4 and 6 of front air mix damper control servomotor assembly connector.

OK:

Resistance : 4.2 – 7.8 k Ω

CHECK:

While operating front air mix damper control servomotor, following the procedure, measure resistance between terminals 4 and 6 of front air mix damper control servomotor assembly connector.

OK:

Position	Resistance
Max. cool	3.6 – 6.8 k Ω
Max. hot	0.5 – 1.1 k Ω

HINT:

As the front air mix damper control servomotor moves from cool side to hot side, the resistance decreases.

NG

Replace front air mix damper control servomotor assembly.

OK

3 Check harness and connector between A/C amplifier and front air mix damper control servomotor assembly (See page IN-34).

NG

Repair or replace harness or connector.

OK

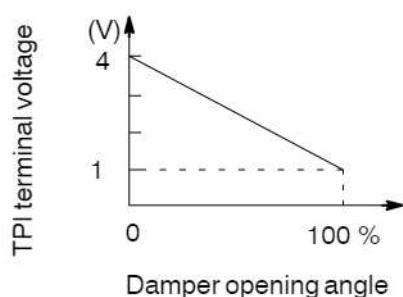
Check and replace A/C amplifier.

DTC	RrDEF, LO	Air Inlet Damper Position Sensor Circuit
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DTC	RrDEF, M2	Air Inlet Damper Position Sensor Circuit
------------	------------------	---

DTC	32, 42	Air Inlet Damper Position Sensor Circuit
------------	---------------	---

CIRCUIT DESCRIPTION

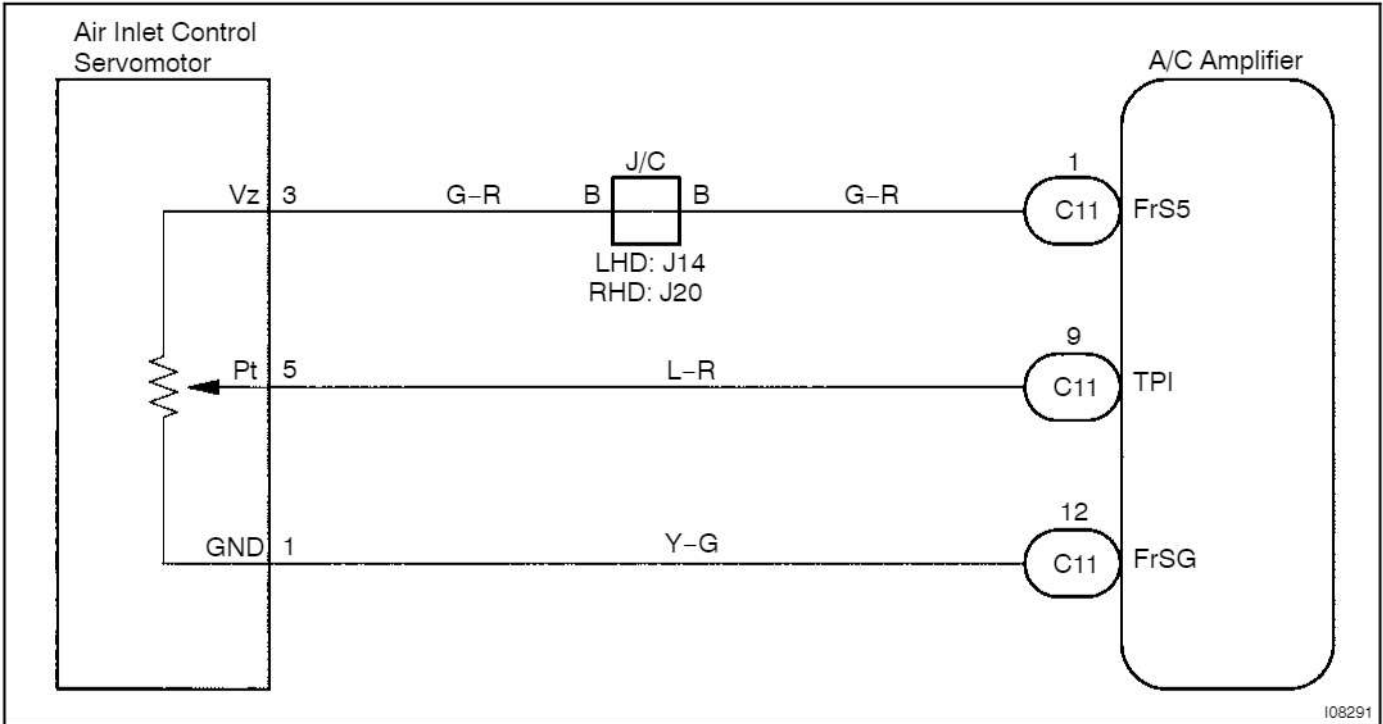


This sensor detects the position of the air inlet damper and sends the appropriate signals to the A/C amplifier.

The position sensor is built into the air inlet damper control servomotor assembly.

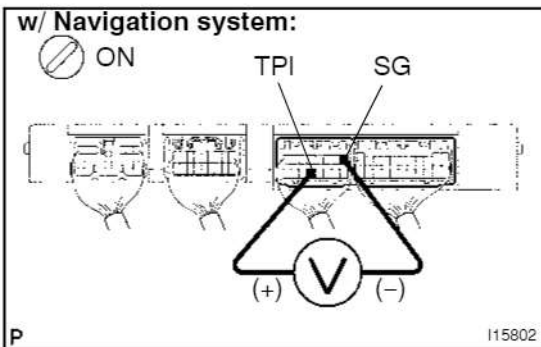
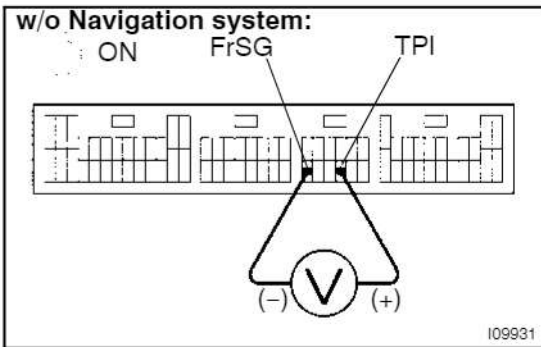
Blinking light	Detection Item	Trouble Area
RrDEF LO	Short to ground or power source circuit in air inlet damper position sensor circuit.	<ul style="list-style-type: none"> • Air inlet damper position sensor • Harness or connector between air inlet damper control servomotor assembly and A/C amplifier • A/C amplifier
RrDEF M2	Air inlet damper position sensor value does not change even if A/C amplifier operates air inlet damper control servomotor.	
DTC No.	Detection Item	Trouble Area
32	Short to ground or power source circuit in air inlet damper position sensor circuit.	<ul style="list-style-type: none"> • Air inlet damper position sensor • Harness or connector between air inlet damper control servomotor assembly and A/C amplifier • A/C amplifier.
42	Air inlet damper position sensor value does not change even if A/C amplifier operates air inlet damper control servomotor.	

WIRING DIAGRAM



INSPECTION PROCEDURE

- | | |
|---|---|
| 1 | Check voltage between terminals TPI and FrSG (or SG) of A/C amplifier connector. |
|---|---|



PREPARATION:

Remove A/C amplifier with connectors still connected.

CHECK:

- (a) Turn ignition switch to ON.
- (b) Press REC/FRS switch to change air inlet between fresh and recirculation air, and measure voltage between terminals TPI and FrSG (or SG) of A/C amplifier when the air inlet damper control servomotor operates.

OK:

FRS-REC Switch	Voltage
REC	3.5 - 4.5 V
FRS	0.5 - 1.5 V

HINT:

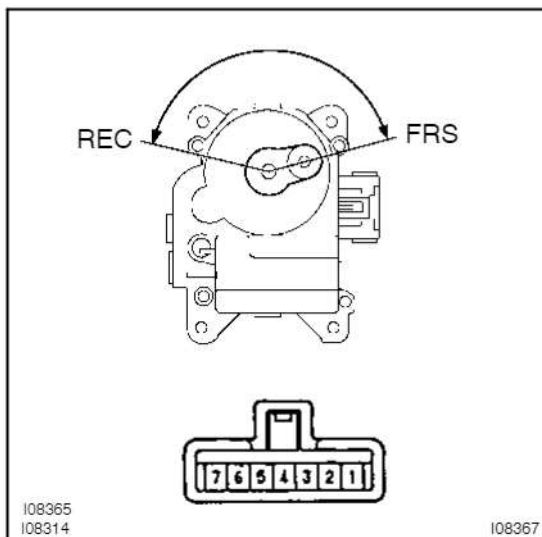
As the air inlet damper control servomotor is moved from REC side to FRS side, the voltage decreases.

NG	Go to step 2
-----------	---------------------

OK

Proceed to next circuit inspection shown on problem symptoms table (See page DI-130). However, if RrDEF and LO or RrDEF and M2 indicators light up (or DTC 32 or 42 is displayed), check and replace A/C amplifier.

2 Check air inlet damper position sensor.



PREPARATION:

Remove air inlet servomotor.

CHECK:

Measure resistance between terminals 1 and 5 of air inlet damper control servomotor assembly connector.

OK:

Resistance : 4.2 – 7.8 kΩ

CHECK:

While operating air inlet damper control servomotor, following the procedure on page DI-177, measure resistance between terminals 1 and 5 of air inlet damper control servomotor assembly connector.

OK:

Resistance

Damper Position	Resistance
REC side	3.1 – 5.8 kΩ
FRS side	0.8 – 1.6 kΩ

HINT:

As the air inlet damper control servomotor moves from REC side to FRS side, the resistance decreases.

NG

Replace air inlet damper control servomotor assembly.

OK

- | | |
|---|---|
| 3 | Check harness and connectors between A/C amplifier and air inlet damper control servomotor assembly (See page IN-34). |
|---|---|

NG

Repair or replace harness or connector.

OK

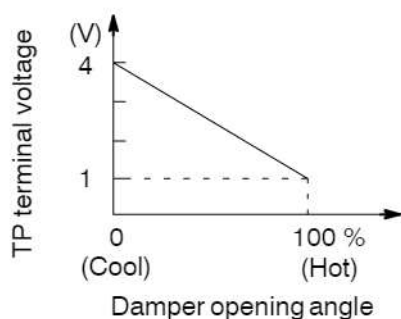
Check and replace A/C amplifier.

DTC	RrACSW, REC	Rear Air Mix Damper Position Sensor Circuit
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DTC	RrACSW, M1	Rear Air Mix Damper Position Sensor Circuit
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DTC	37, 47	Rear Air Mix Damper Position Sensor Circuit
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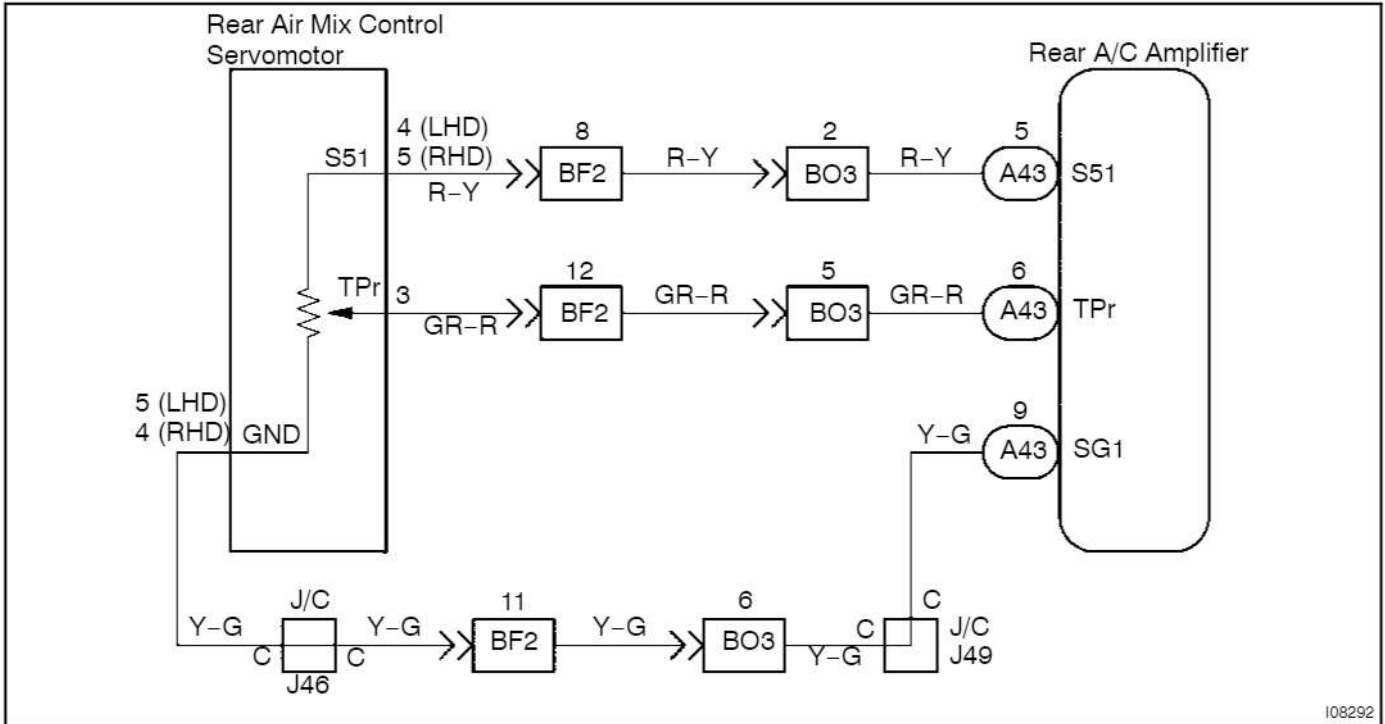
CIRCUIT DESCRIPTION



This sensor detects the position of the air mix damper and sends the appropriate signals to the rear A/C amplifier. The position sensor is built into the rear air mix damper control servomotor assembly.

Blinking light	Detection Item	Trouble Area
RrACSW, REC	Short to ground or power source circuit in rear air mix damper position sensor circuit.	<ul style="list-style-type: none"> •Rear air mix damper position sensor.
RrACSW, M1	Rear air mix damper position sensor value does not change even if A/C amplifier operates rear air mix damper control servomotor.	<ul style="list-style-type: none"> •Harness or connector between Rear air mix damper control servomotor assembly and A/C amplifier. •Rear A/C amplifier.
DTC No.	Detection Item	Trouble Area
37	Short to ground or power source circuit in rear air mix damper position sensor circuit.	<ul style="list-style-type: none"> •Rear air mix damper position sensor.
47	Rear air mix damper position sensor value does not change even if A/C amplifier operates rear air mix damper control servomotor.	<ul style="list-style-type: none"> •Harness or connector between Rear air mix damper control servomotor assembly and A/C amplifier. •Rear A/C amplifier.

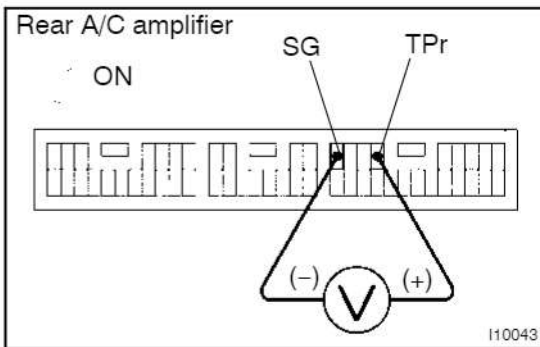
WIRING DIAGRAM



108292

INSPECTION PROCEDURE

- 1 Check voltage between terminals TPr and SG of rear A/C amplifier connector.



110043

PREPARATION:

Remove rear A/C amplifier with connectors still connected.

CHECK:

- Turn ignition switch to ON.
- Change the set temperature to activate the rear air mix damper control servomotor, and measure the voltage between terminals TPr and SG of rear A/C amplifier connector each time when the set temperature is changed.

OK:

Set Temperature	Voltage
Max. cool	3.5 - 4.5 V
Max. hot	0.5 - 1.5 V

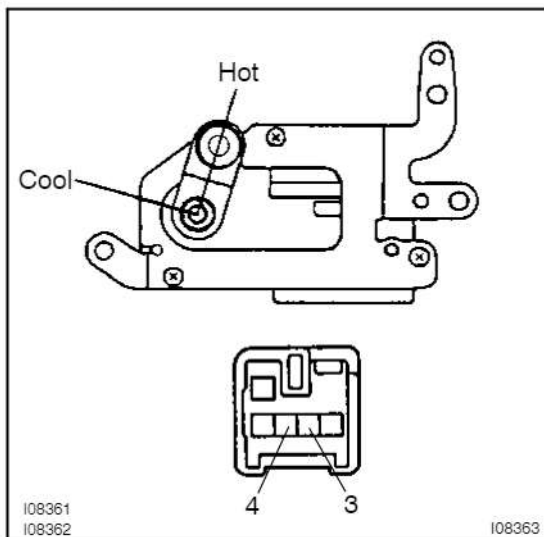
HINT:

As the set temperature increases, the voltage decreases.

NG**Go to step 2.****Ok**

Proceed to next circuit inspection shown on problem symptoms table (See page DI-130). However, if RrACSW and REC or M1 indicators light up (or DTC 37 or 47 is displayed), check and replace rear A/C amplifier.

2 Check rear air mix damper position sensor.



PREPARATION:

Remove rear air mix servomotor.

CHECK:

Measure resistance between terminals 3 and 4 of rear air mix damper control servomotor assembly connector.

OK:

Resistance : 4.2 – 7.8 k Ω

CHECK:

While operating rear air mix damper control servomotor, following the procedure, measure resistance between terminals 3 and 4 of rear air mix damper control servomotor assembly connector.

OK:

Position	Resistance
Max. cool	3.6 – 6.8 k Ω
Max. hot	0.5 – 1.1 k Ω

HINT:

As the rear air mix damper control servomotor moves from cool side to hot side, the resistance decreases.

NG

Replace rear air mix damper control servomotor assembly.

OK

3 Check harness and connector between rear A/C amplifier and rear air mix damper control servomotor assembly (See page IN-34).

NG

Repair or replace harness or connector.

OK

Check and replace A/C amplifier.

DTC	RrDEF, M1	Front Air Mix Damper Control Servomotor Circuit
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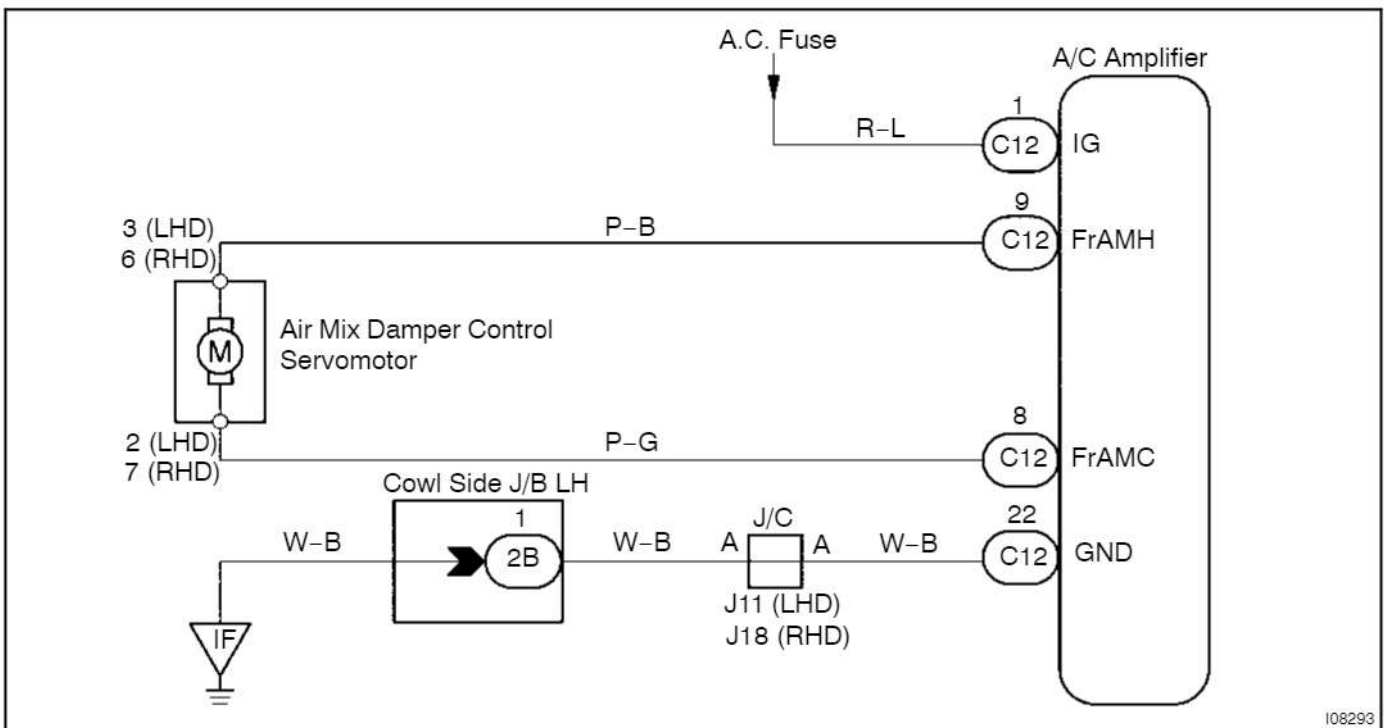
DTC	41	Front Air Mix Damper Control Servomotor Circuit
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CIRCUIT DESCRIPTION

The front air mix damper control servomotor is controlled by the A/C control assembly and moves the air mix damper to the desired position.

Blinking light	Detection Item	Trouble Area
RrDEF M1	Air mix damper position sensor value does not change even if A/C control assembly operates air mix damper control servomotor.	<ul style="list-style-type: none"> •Front air mix damper control servomotor •Front air mix damper position sensor •Harness or connector between front air mix control servomotor and A/C amplifier •A/C amplifier
DTC No.	Detection Item	Trouble Area
41	Air mix damper position sensor value does not change even if A/C control assembly operates air mix damper control servomotor.	<ul style="list-style-type: none"> •Front air mix damper control servomotor. •Front air mix damper position sensor. •Harness or connector between front air mix control servomotor and A/C amplifier •A/C amplifier

WIRING DIAGRAM



108293

INSPECTION PROCEDURE

HINT:

In case of w/ Navigation system, start the inspection step 1 and in case of w/o Navigation system, start the inspection step 2.

1	Actuator check.
----------	------------------------

PREPARATION:

- (a) Warm up the engine.
- (b) Set the actuator check mode ([See page DI-115](#)).
- (c) Press the UPDr switch and change it to step operation.

CHECK:

Press the UPDr switch and check the operation of the air mix damper and the condition of the blower.

OK:

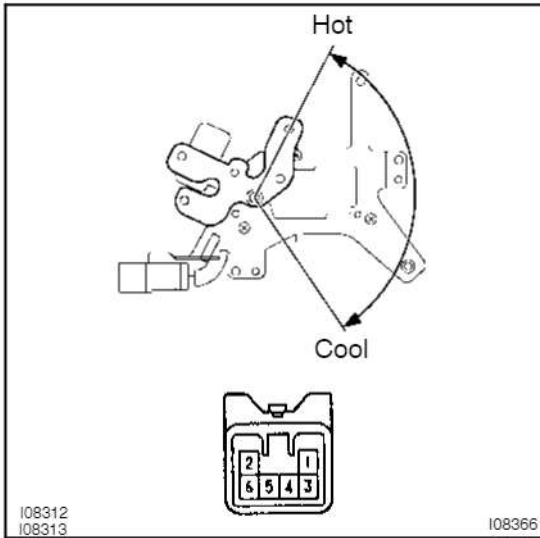
Display Code	Air Mix Damper	Condition
0 - 3	0 % (Fully closed)	Cool air comes out
4 - 5	50 %	
6 - 9	100 % (Full opened)	Warm air comes out

OK

Proceed to next circuit inspection shown on problem symptoms table ([See page DI-130](#)).

NG

2 Check front air mix damper control servomotor.



PREPARATION:

Remove front air mix servomotor (See Pub. No. RM616E on page AC-55 and AC-146).

CHECK:

Connect positive (+) lead to terminal 3 and negative (-) lead to terminal 2.

OK:

The lever turns smoothly to Hot side.

CHECK:

Connect positive (+) lead to terminal 2 and negative (-) lead to terminal 3.

OK:

The lever turns smoothly to Cool side.

NG

Replace front air mix damper control servomotor assembly.

OK

3 Check harness and connector between A/C amplifier and front air mix damper control servomotor assembly (See page IN-34).

NG

Repair or replace harness or connector.

OK

Check and replace A/C amplifier.

DTC	RrDEF, M2	Air Inlet Damper Control Servomotor Circuit
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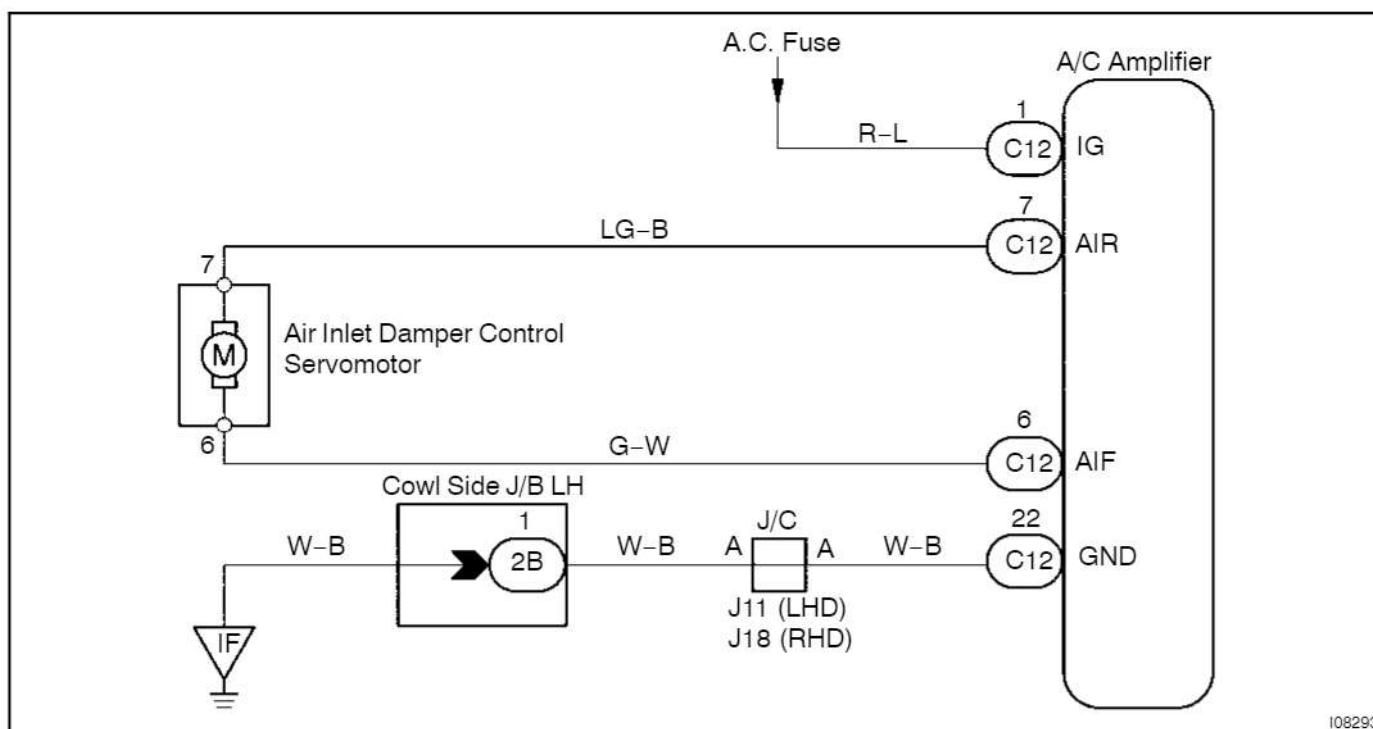
DTC	42	Air Inlet Damper Control Servomotor Circuit
------------	-----------	--

CIRCUIT DESCRIPTION

The air inlet damper control servomotor is controlled by the A/C amplifier and moves the air inlet damper to the desired position.

Blinking light	Detection item	Trouble Area
RrDEF M2	Air inlet damper position sensor value does not change even if A/C amplifier operated air inlet damper control servomotor.	<ul style="list-style-type: none"> • Air inlet damper position sensor • Harness or connector between air inlet damper control servomotor assembly and A/C amplifier • A/C amplifier
DTC No.	Detection item	Trouble Area
42	Air inlet damper position sensor value does not change even if A/C amplifier operated air inlet damper control servomotor.	<ul style="list-style-type: none"> • Air inlet damper position sensor • Harness or connector between air inlet damper control servomotor assembly and A/C amplifier • A/C amplifier

WIRING DIAGRAM



108293

INSPECTION PROCEDURE

HINT:

In case of w/ Navigation system, start the inspection step 1 and in case of w/o Navigation system, start the inspection step 2.

1	Actuator check.
----------	------------------------

PREPARATION:

- (a) Warm up the engine.
- (b) Set the actuator check mode ([See page DI-115](#))
- (c) Press the UPDr switch and change it to step operation.

CHECK:

Press the UPDr switch and check the operation of the air mix damper and the condition of the blower.

OK:

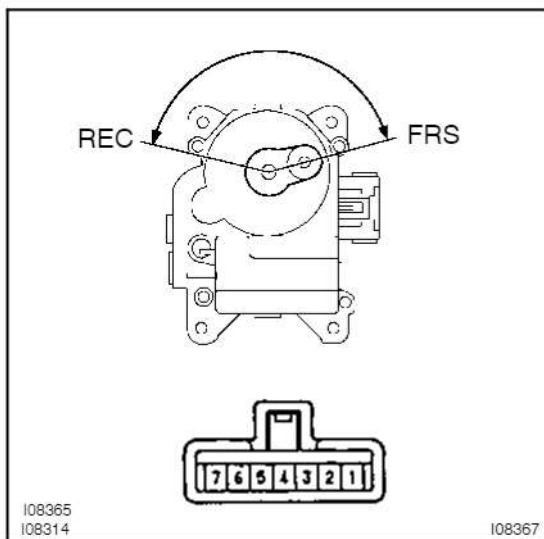
Display Code	Air Mix Damper	Condition
0 - 3	0 % (Fully closed)	Cool air comes out
4 - 5	50 %	
6 - 9	100 % (Full opened)	Warm air comes out

OK

Proceed to next circuit inspection shown on problem symptoms table ([See page DI-130](#))

NG

2 Check air inlet damper control servomotor.



PREPARATION:

- Remove air inlet servomotor.
- Disconnect the air inlet damper control servomotor assembly connector.

CHECK:

Connect positive (+) lead to terminal 7 and negative (-) lead to terminal 6.

OK:

The lever moves smoothly to REC position.

CHECK:

Connect positive (+) lead to terminal 6 and negative (-) lead to terminal 7.

OK:

The lever moves smoothly to FRS position.

NG

Replace air inlet damper control servomotor assembly.

OK

3 Check harness and connector between A/C amplifier and air inlet damper control servomotor (See page IN-34).

NG

Repair or replace harness or connector.

OK

Check and replace A/C amplifier.

DTC	RrACSW, M1	Rear Air Mix Damper Control Servomotor Circuit
------------	-------------------	---

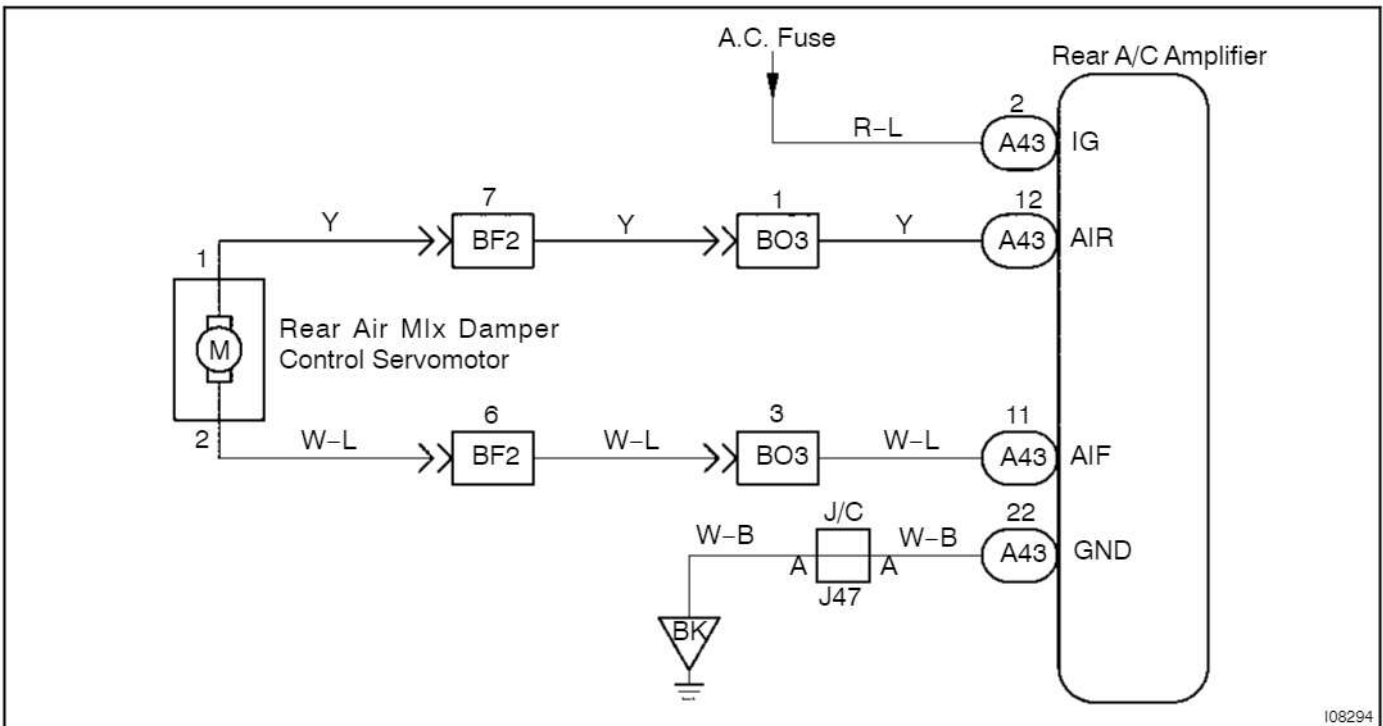
DTC	47	Rear Air Mix Damper Control Servomotor Circuit
------------	-----------	---

CIRCUIT DESCRIPTION

The rear air mix damper control servomotor is controlled by the A/C control assembly and moves the air mix damper to the desired position.

Blinking light	Detection Item	Trouble Area
RrACSW, M1	Air mix damper position sensor value does not change even if A/C control assembly operates air mix damper control servomotor.	<ul style="list-style-type: none"> •Rear air mix damper control servomotor •Rear air mix damper position sensor •Harness or connector between rear air mix control servomotor and rear A/C amplifier •Rear A/C amplifier
DTC No.	Detection Item	Trouble Area
47	Air mix damper position sensor value does not change even if A/C control assembly operates air mix damper control servomotor.	<ul style="list-style-type: none"> •Rear air mix damper control servomotor •Rear air mix damper position sensor •Harness or connector between rear air mix control servomotor and rear A/C amplifier •Rear A/C amplifier

WIRING DIAGRAM



108294

INSPECTION PROCEDURE

HINT:

In case of w/ Navigation system, start the inspection step 1 and in case of w/o Navigation system, start the inspection step 2.

1	Actuator check.
----------	------------------------

PREPARATION:

- (a) Warm up the engine.
- (b) Set the actuator check mode (See page DI-115).
- (c) Press the UPDr switch and change it to step operation.

CHECK:

Press the UPDr switch and check the operation of the air mix damper and the condition of the blower.

OK:

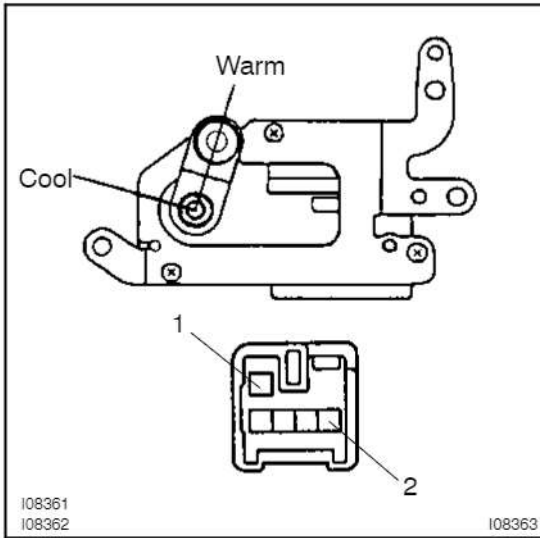
Display Code	Air Mix Damper	Condition
0 - 3	0 % (Fully closed)	Cool air comes out
4 - 5	50 %	
6 - 9	100 % (Full opened)	Warm air comes out

OK

Proceed to next circuit inspection shown on problem symptoms table (See page DI-130).

NG

2 Check rear air mix damper control servomotor.



PREPARATION:

Remove the rear air mix damper control servomotor.

CHECK:

Connect positive (+) lead to terminal 1 and negative (-) lead to terminal 2.

OK:

The lever turns smoothly to Warm side.

CHECK:

Connect positive (+) lead to terminal 2 and negative (-) lead to terminal 1.

OK:

The lever turns smoothly to Cool side.

NG

Replace rear air mix damper control servomotor assembly.

OK

3 Check harness and connector between rear A/C amplifier and rear air mix damper control servomotor assembly (See page IN-34).

NG

Repair or replace harness or connector.

OK

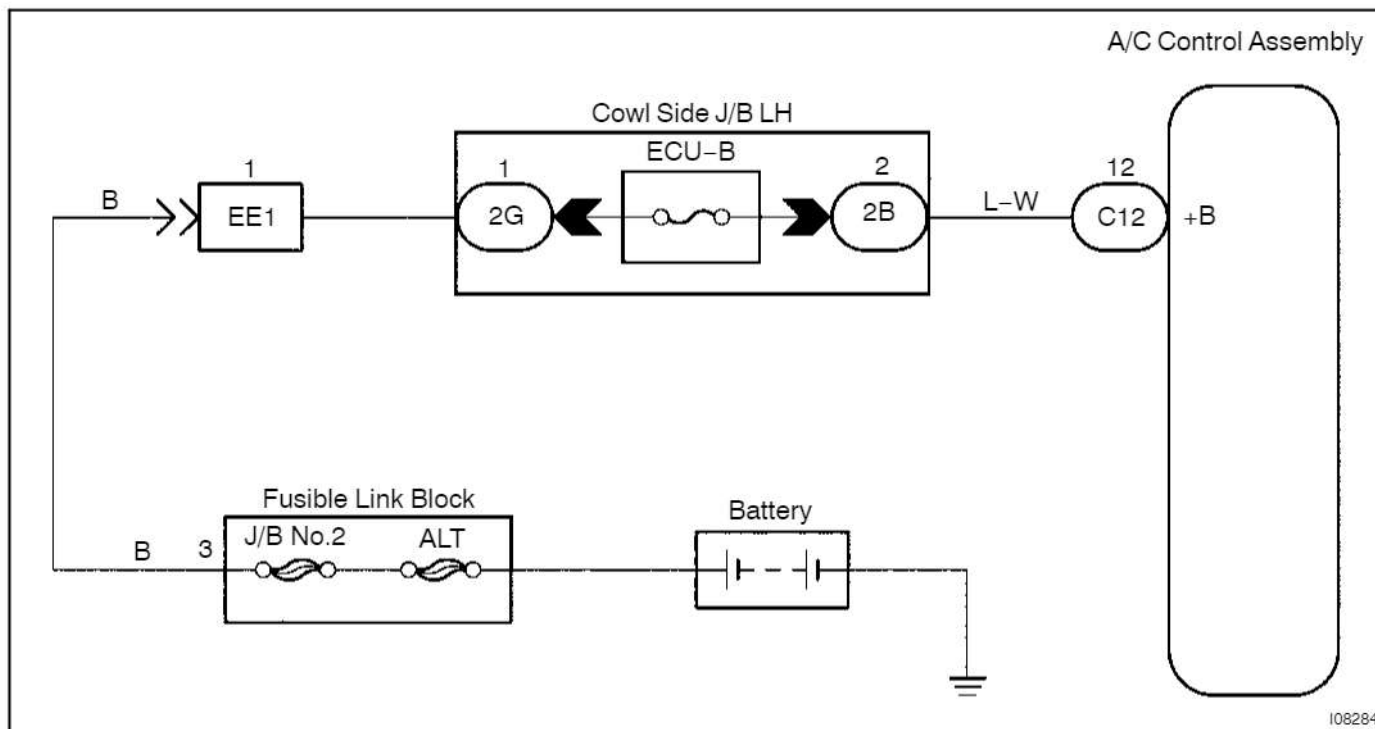
Check and replace rear A/C amplifier.

Back Up Power Source Circuit

CIRCUIT DESCRIPTION

This is the back up power source for the A/C control assembly. Power is supplied even when the ignition switch is off and is used for diagnostic trouble code memory, etc.

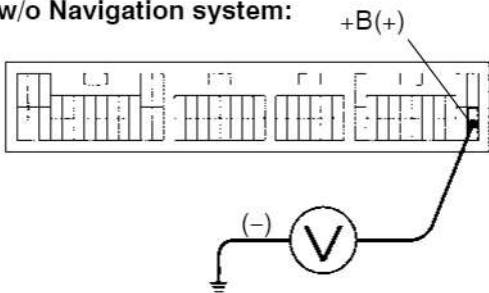
WIRING DIAGRAM



INSPECTION PROCEDURE

- | | |
|----------|---|
| 1 | Check voltage between terminal +B of A/C amplifier assembly connector and body ground. |
|----------|---|

w/o Navigation system:



108306

PREPARATION:

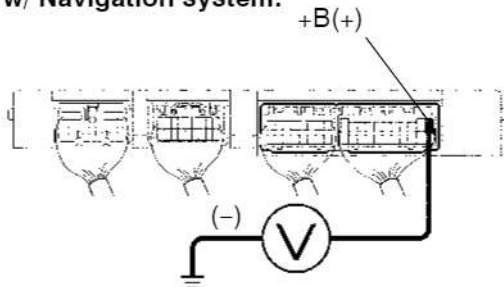
Remove the A/C amplifier with connector still connected.

CHECK:

Measure voltage between terminal +B of A/C amplifier connector and body ground.

OK:**Voltage : Battery positive voltage**

w/ Navigation system:



115803

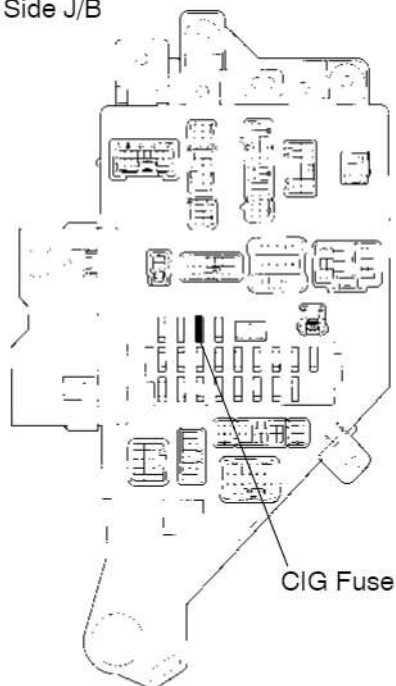
OK

Proceed to next circuit inspection shown on problem symptoms table (See page DI-130).

NG

2 Check CIG fuse.

Cowl Side J/B

**PREPARATION:**

Remove CIG fuse from cowl side J/B.

CHECK:

Check continuity of CIG fuse.

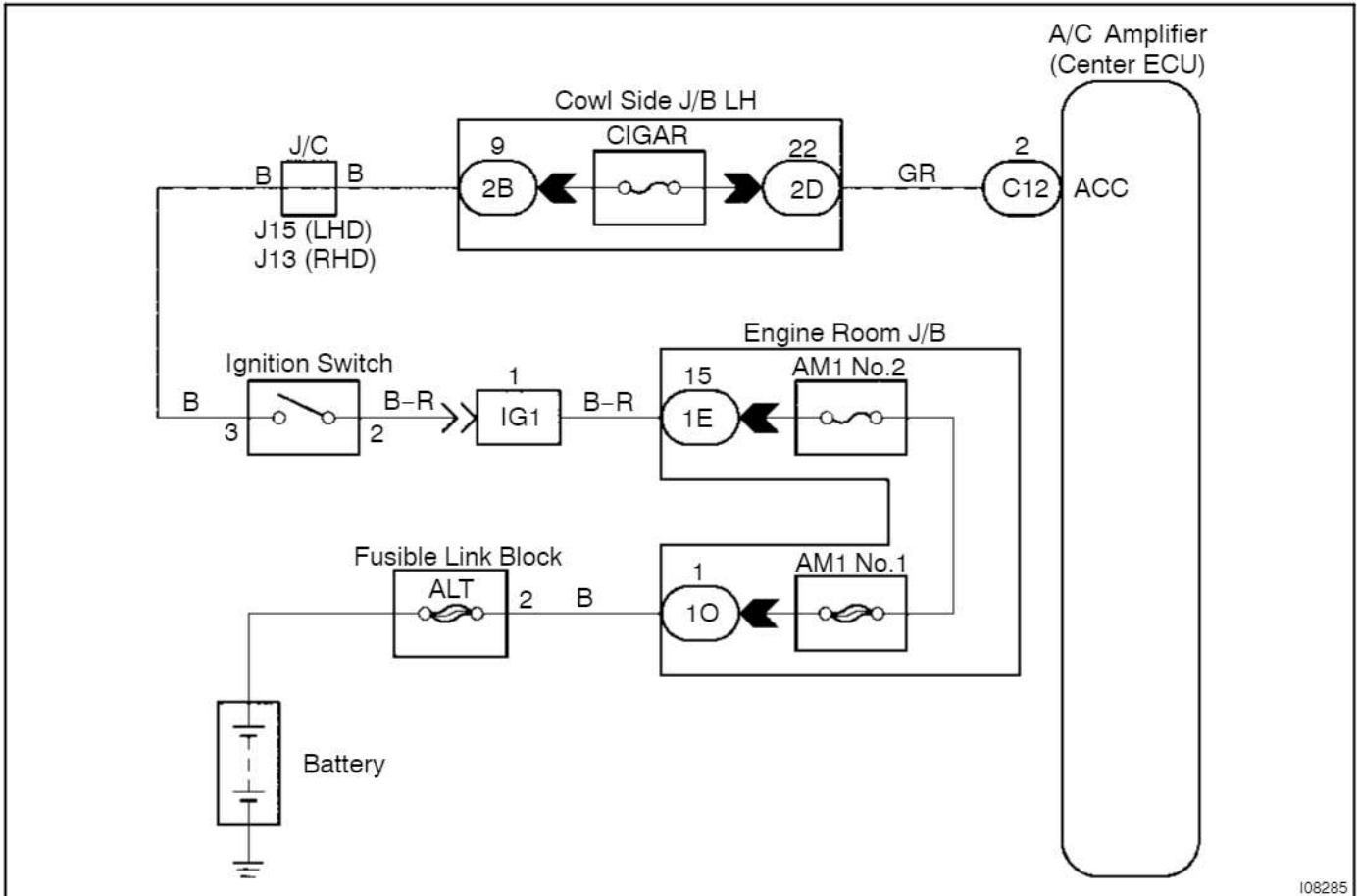
OK:**Continuity****NG****Check for short in all the harness and components connected to the CIG fuse (See attached wiring diagram).****OK****Check and repair harness and connector between A/C amplifier.**

ACC Power Source Circuit

CIRCUIT DESCRIPTION

This is the power source for A/C amplifier and servomotors, etc.

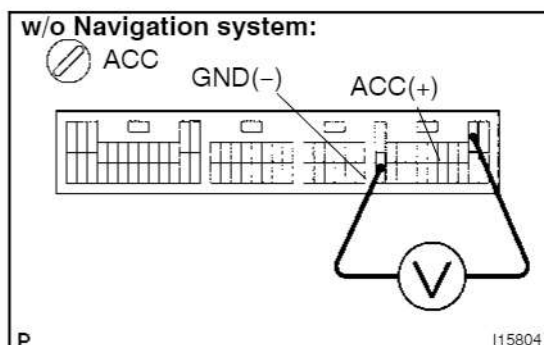
WIRING DIAGRAM



108285

INSPECTION PROCEDURE

1 Check voltage between terminals ACC and GND of A/C amplifier connector.

**PREPARATION:**

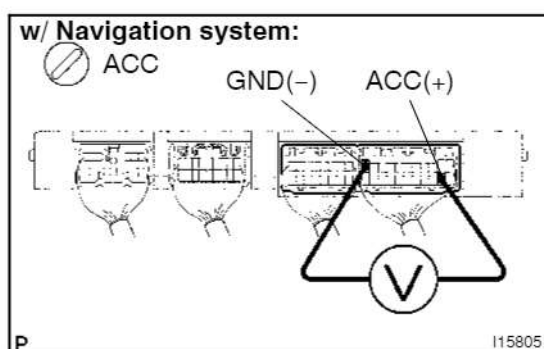
Remove A/C amplifier with connectors still connected.

CHECK:

- (a) Turn ignition switch ON.
- (b) Measure voltage between terminals ACC and GND of A/C amplifier.

OK:

Voltage : Battery positive voltage



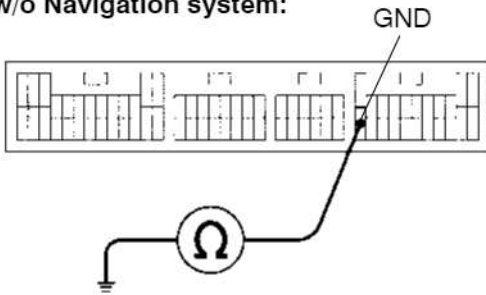
OK

Proceed to next circuit inspection shown on problem symptoms table (See page DI-130).

NG

2 Check continuity between terminal GND of A/C amplifier and body ground.

w/o Navigation system:



CHECK:

Measure resistance between terminal GND of A/C amplifier and body ground.

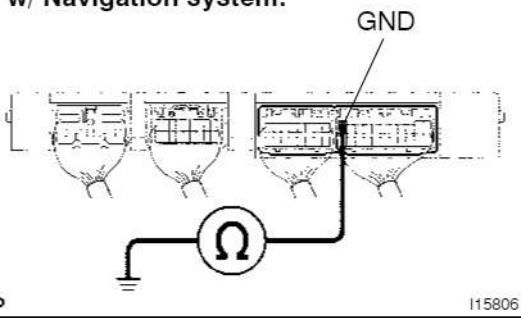
OK:

Resistance : 0 Ω (continuity)

NG

Repair or replace harness or connector.

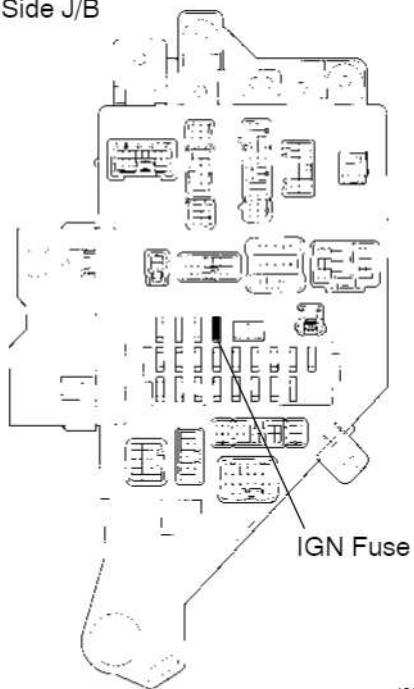
w/ Navigation system:



OK

3 Check IGN fuse.

Cowl Side J/B

**PREPARATION:**

Remove IGN fuse from cowl side J/B.

CHECK:

Check continuity of IGN fuse.

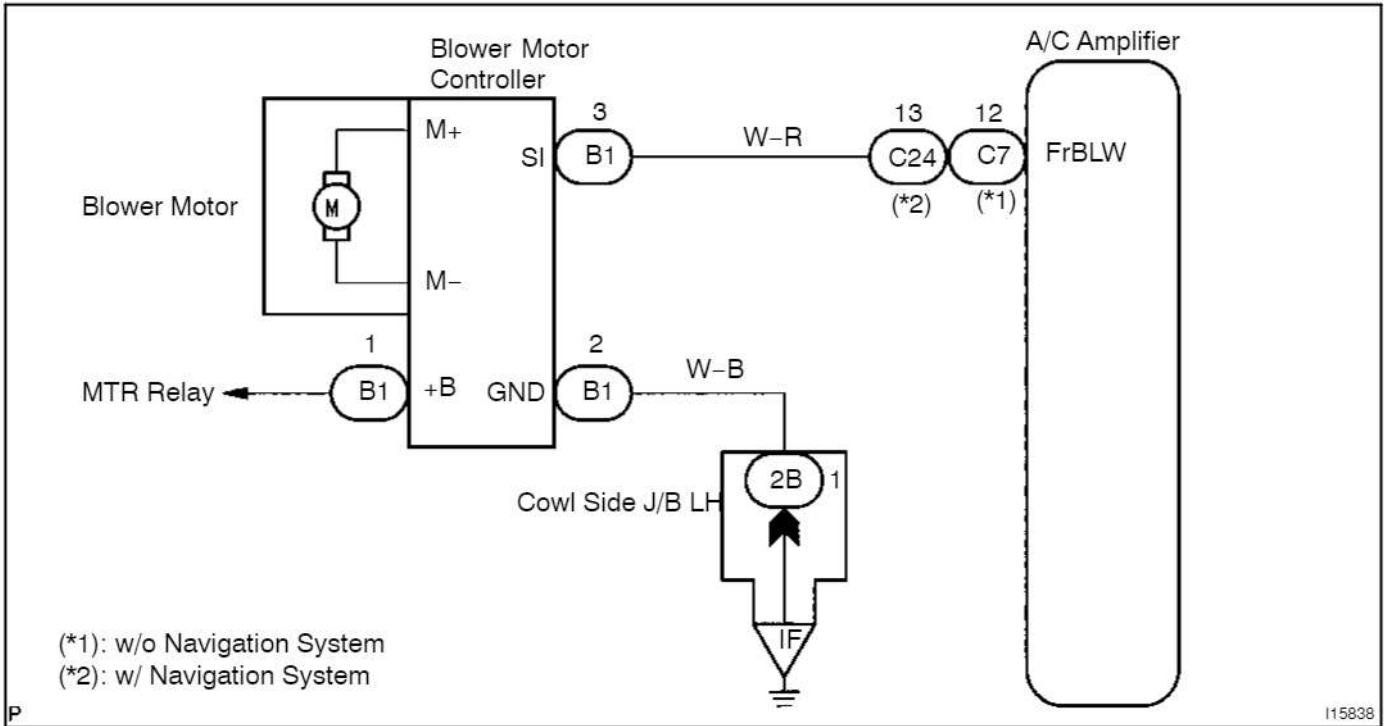
OK:**Continuity****NG****Check for short in all the harness and components connected to the IGN fuse (See attached wiring diagram).****OK****Check and repair harness and connector between A/C amplifier.**

Blower Motor Circuit

CIRCUIT DESCRIPTION

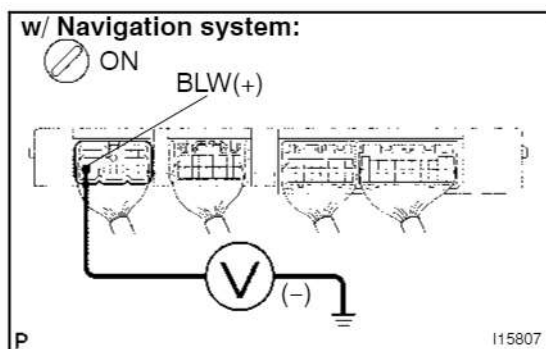
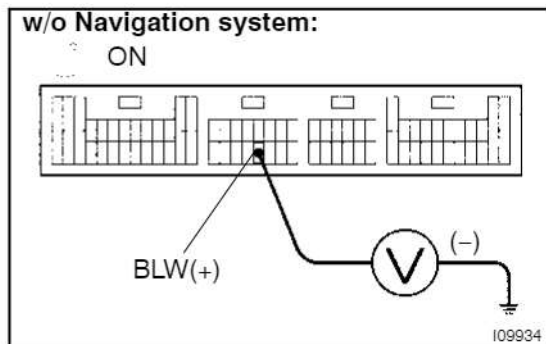
This is the power source for the blower motor.

WIRING DIAGRAM



INSPECTION PROCEDURE

- | | |
|----------|---|
| 1 | Check voltage between terminal BLW of A/C amplifier connector and body ground. |
|----------|---|

**PREPARATION:**

Remove the A/C amplifier with connector still connected.

CHECK:

- (a) Turn ignition switch to ON.
- (b) Operate blower motor.
- (c) Measure voltage between terminal BLW of A/C amplifier and body ground.

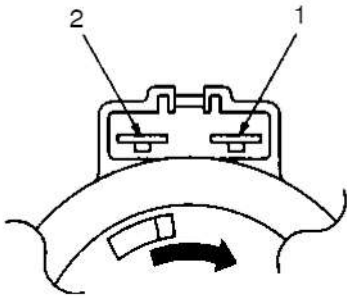
OK:

Voltage : 1 – 3 V

OK

Proceed to next circuit inspection shown on problem symptoms table (See page DI-130).

NG

2 Check blower motor.

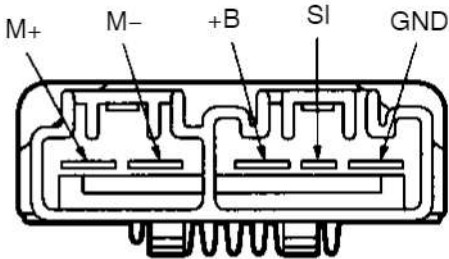
105290

PREPARATION:

Remove blower motor.

CHECK:

Connect the positive (+) lead from the battery to terminal 2 of blower motor connector and the negative (-) lead to terminal 1.

OK:**Blower motor operates smoothly.****NG****Replace blower motor.****OK****3 Check blower motor control relay.**

105291

PREPARATION:

Remove blower motor control relay with connectors still connected.

CHECK:

- (a) Turn ignition switch ON.
- (b) Operate blower motor (High blower speed).

OK:

Terminals	Standard Value
GND ↔ Body Ground	Continuity
+B ↔ Body Ground	Battery Positive Voltage
+M ↔ Body Ground	Battery Positive Voltage
M+ ↔ M-	Battery Positive Voltage
SI ↔ Body Ground	1 - 3 V

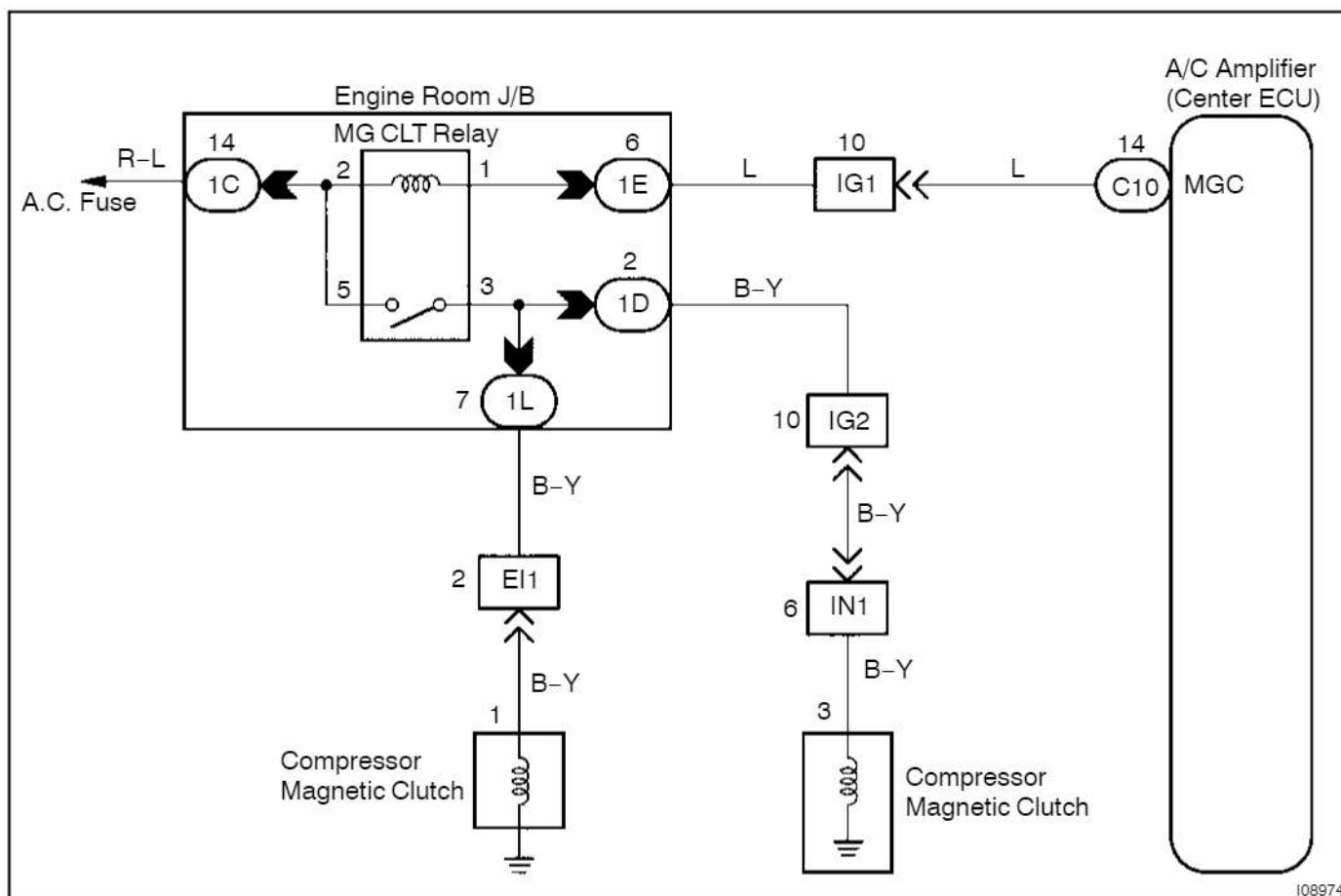
NG**Replace blower motor relay.****OK****Repair or replace harness or connector.**

Compressor Circuit

CIRCUIT DESCRIPTION

A/C amplifier switches the A/C magnetic clutch relay ON, thus turning the A/C compressor magnetic clutch ON.

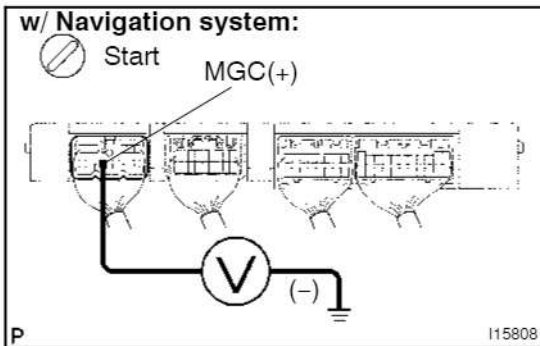
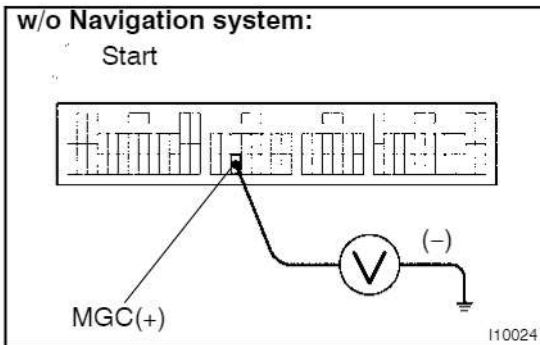
WIRING DIAGRAM



108974

INSPECTION PROCEDURE

1 Check voltage between terminal MGC of A/C amplifier connector.

**CHECK:**

- Start engine.
- Push AUTO SW.
- Measure voltage between terminal MGC of A/C amplifier connector and body ground when A/C switch is ON and OFF.

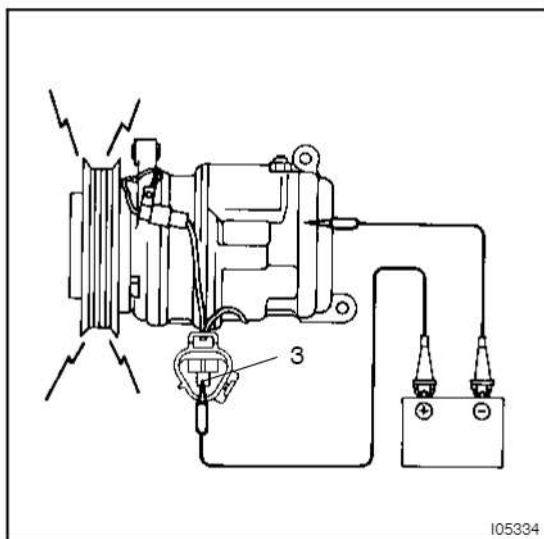
OK:

A/C switch	Voltage
ON	0 V
OFF	10 - 14 V

OK

Check and replace A/C amplifier.

NG

2 Check A/C compressor magnetic clutch.

PREPARATION:

Disconnect magnetic clutch connector.

CHECK:

Connect positive (+) lead connected to battery to magnetic clutch connector terminal 3.

OK:

Magnetic clutch is energized.

NG

Repair A/C compressor magnetic clutch.

OK

3 Check harness and connector between A/C compressor and MC CLT relay (See page IN-34).

NG

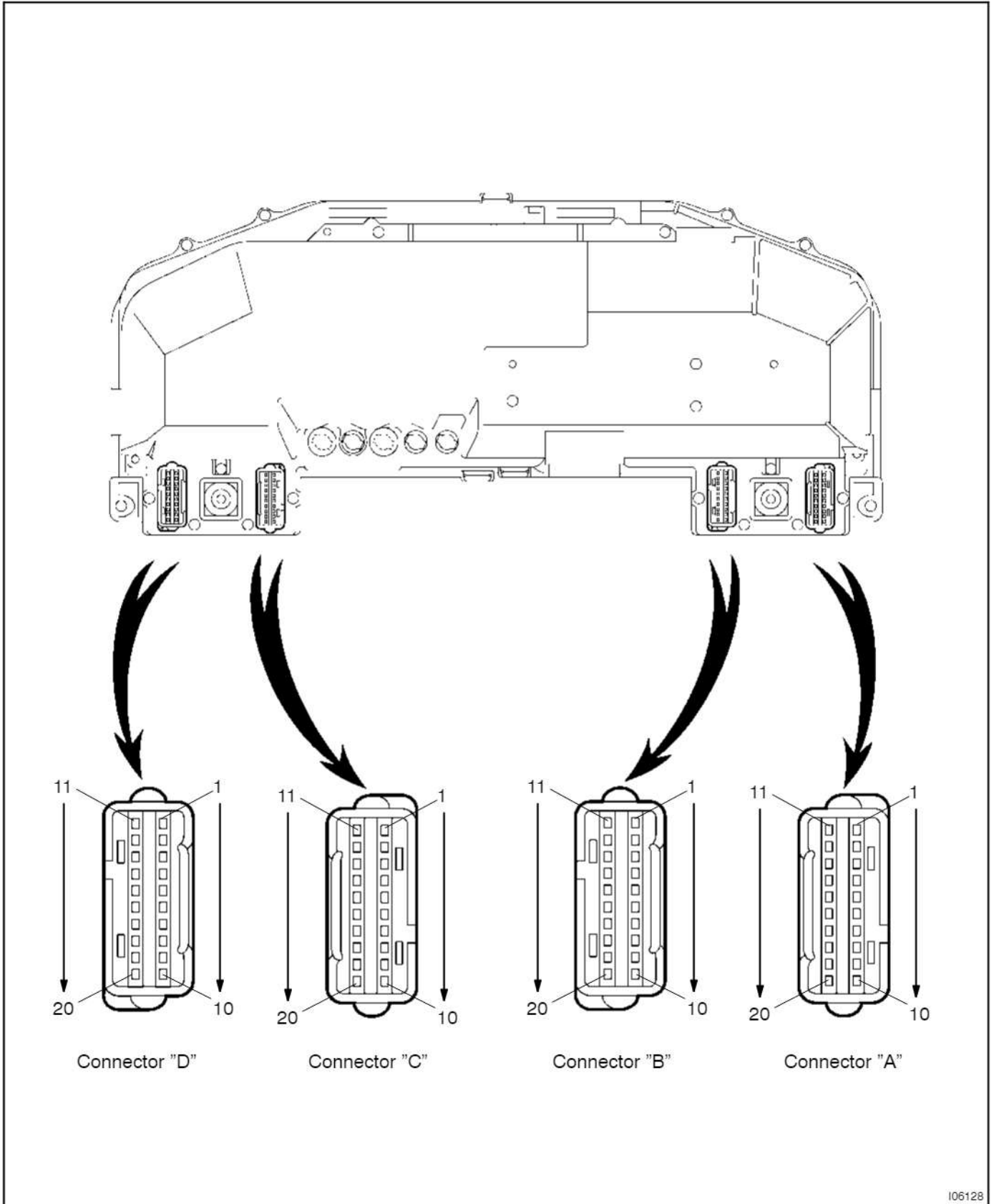
Repair or replace harness or connector.

OK

Check and replace A/C amplifier.

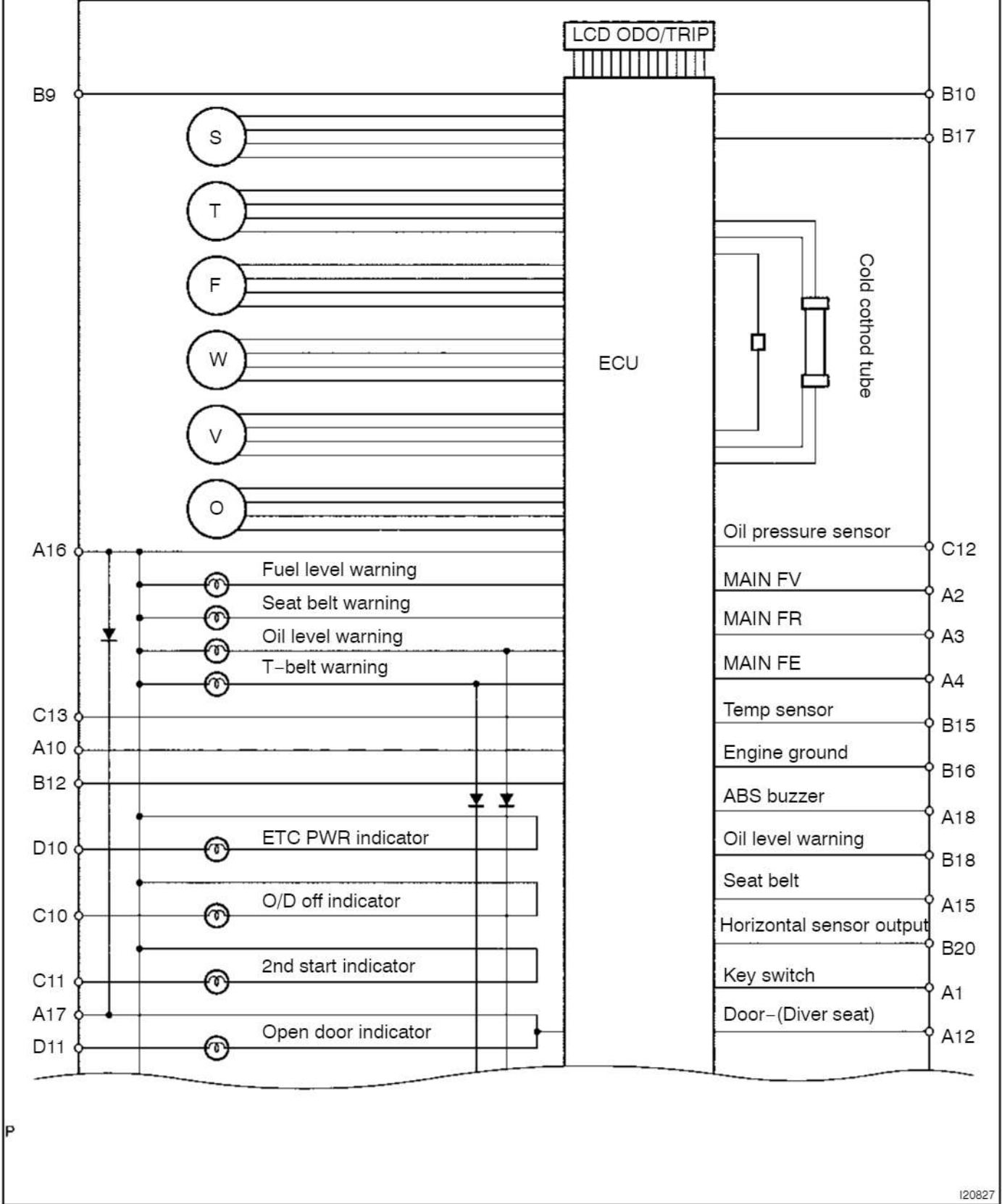
COMBINATION METER CIRCUIT

BE251-01



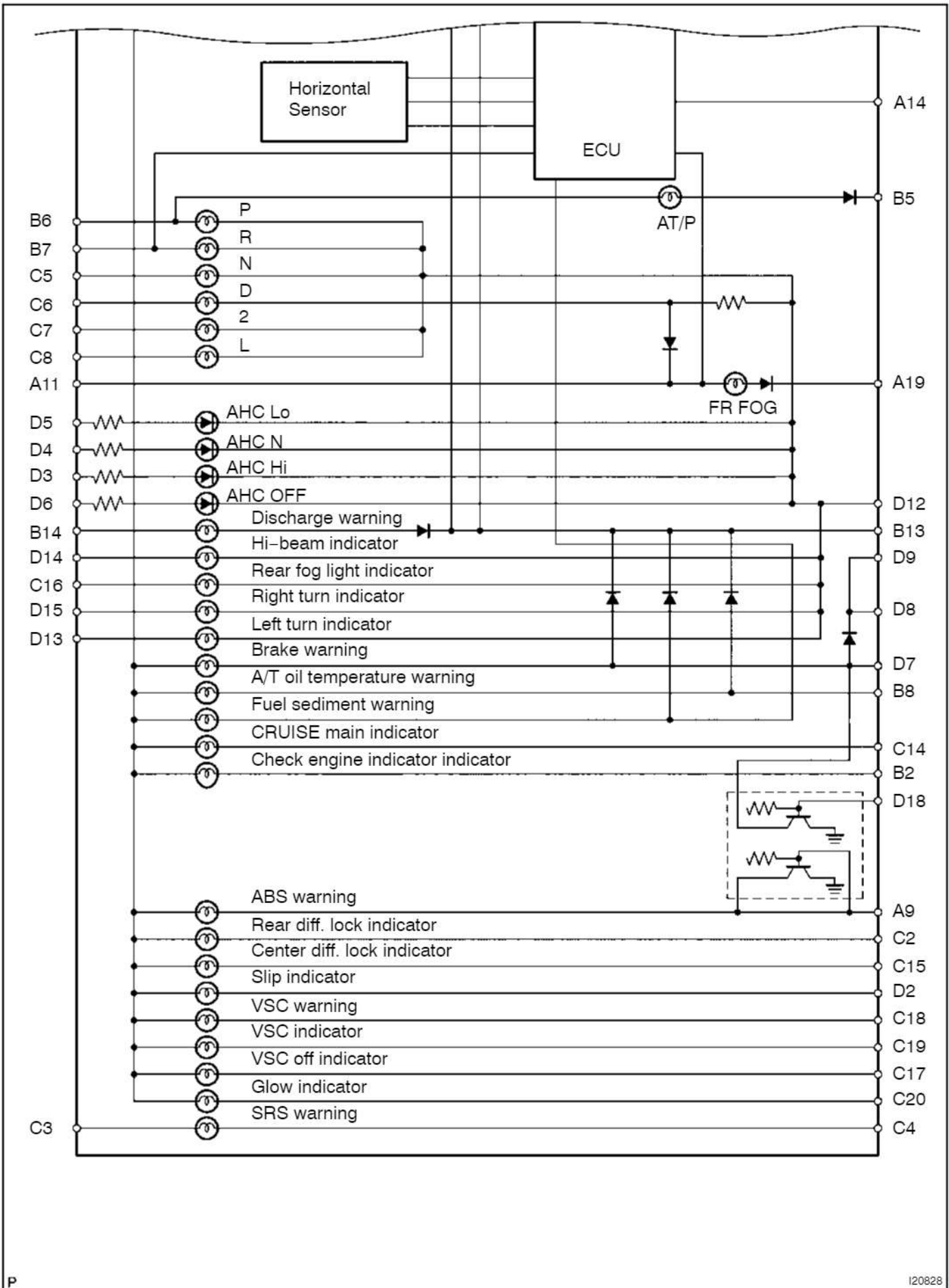
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- (S) : Speedometer
- (T) : Tachometer
- (F) : Fuel Receiver Gauge
- (V) : Voltmeter
- (W) : Water temperature gauge
- (O) : Oil Pressure Gauge



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BODY ELECTRICAL - COMBINATION METER

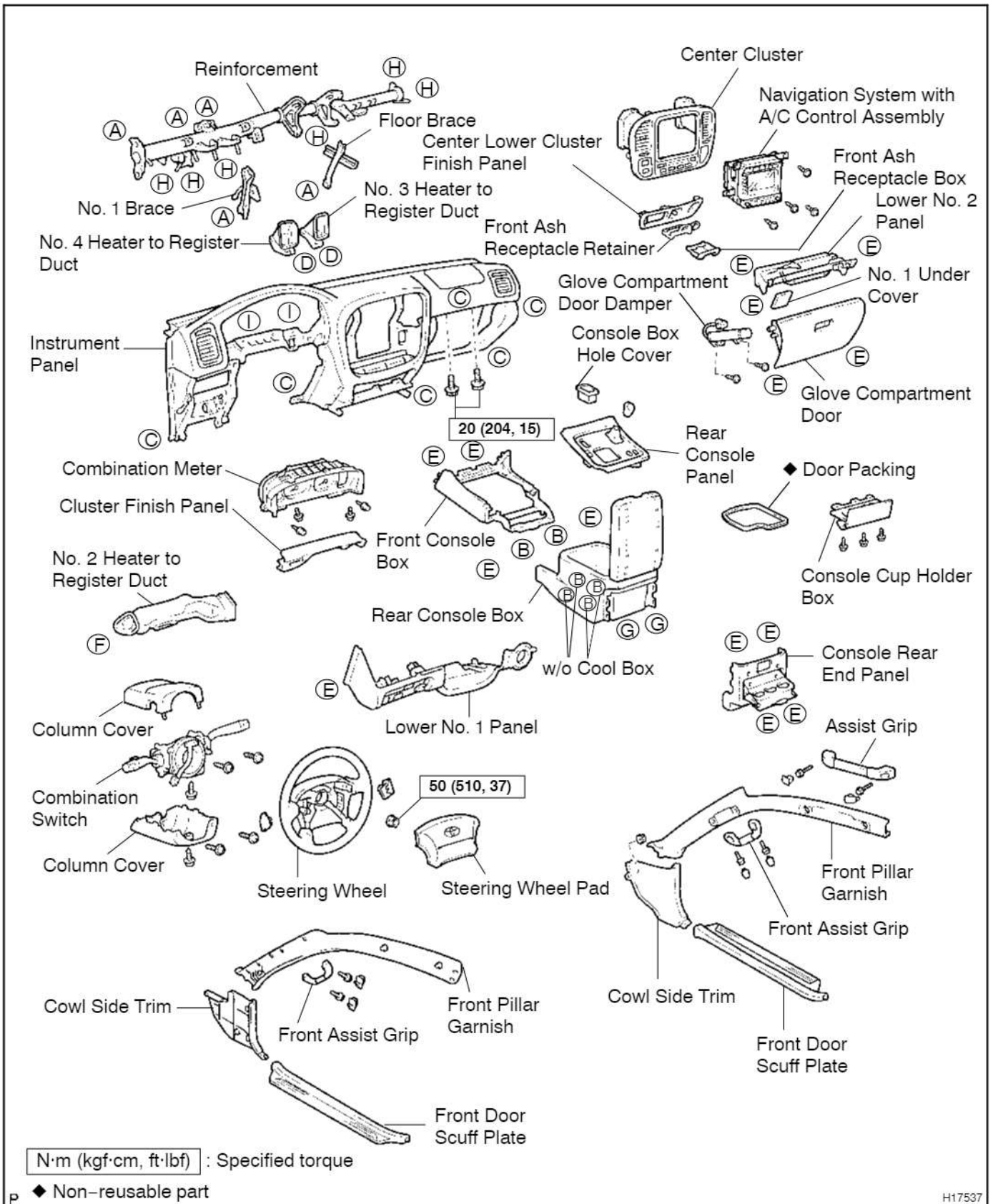


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No.	Wiring connector side	
A	1 Key unlock warning switch	
	2 Fuel sender gauge	
	3 Fuel sender gauge	
	4 Fuel sender gauge	
	9 ABS ECU	
	10 Light control rheostat	
	11 TAIL fuse	
	12 Driver door courtesy switch	
	14 Fuel sediment warning switch	
	15 Seat belt buckle switch	
	16 GAUGE fuse	
	17 DOME fuse	
	18 ABS ECU	
	19 Fog light switch	
	B	2 ECM
		4 MIRR fuse
		5 Park/ neutral position switch (P - position)
		6 Park/ neutral position switch (P + position)
		7 Park/ neutral position switch (R position)
8 Engine and ECT ECU		
9 Speed control unit		
10 Speed sensor		
11 Ground		
12 Light control rheostat		
13 Generator		
14 IGN fuse		
15 Water temperature sender gauge		
16 Ground		
17 Engine and ECU ECU		
C		2 Rear diff. lock detection switch
		3 ECU-B fuse
	4 Center airbag sensor assembly	
	5 Park/ neutral position switch (N position)	
	6 Park/ neutral position switch (P position)	
	7 Park/ neutral position switch (2 position)	
	8 Park/ neutral position switch (L position)	
	10 O/D main switch	
	11 Engine and ECU ECU	
	12 Low oil pressure warning switch	
	13 Starter relay	
	14 Engine and ECU ECU	
	16 Rear fog light switch	
	17 ABS, TRC, VSC, ECU	
	18 ABS, TRC, VSC, ECU	
	19 ABS, TRC, VSC, ECU	
	20 ABS, TRC, VSC, ECU	
	D	3 Suspension control ECU
		4 Suspension control ECU
		5 Suspension control ECU
6 Suspension control ECU		
7 ABS, TRC, VSC, ECU		
8 Parking brake switch		
10 Body control ECU (Instrument panel ECU)		
11 ECT pattern select switch		
12 Ground		
13 Turn signal switch (Left side)		
14 Headlight dimmer switch		
15 Turn signal switch (Right side)		
18 ABS, TRC, VSC, ECU		

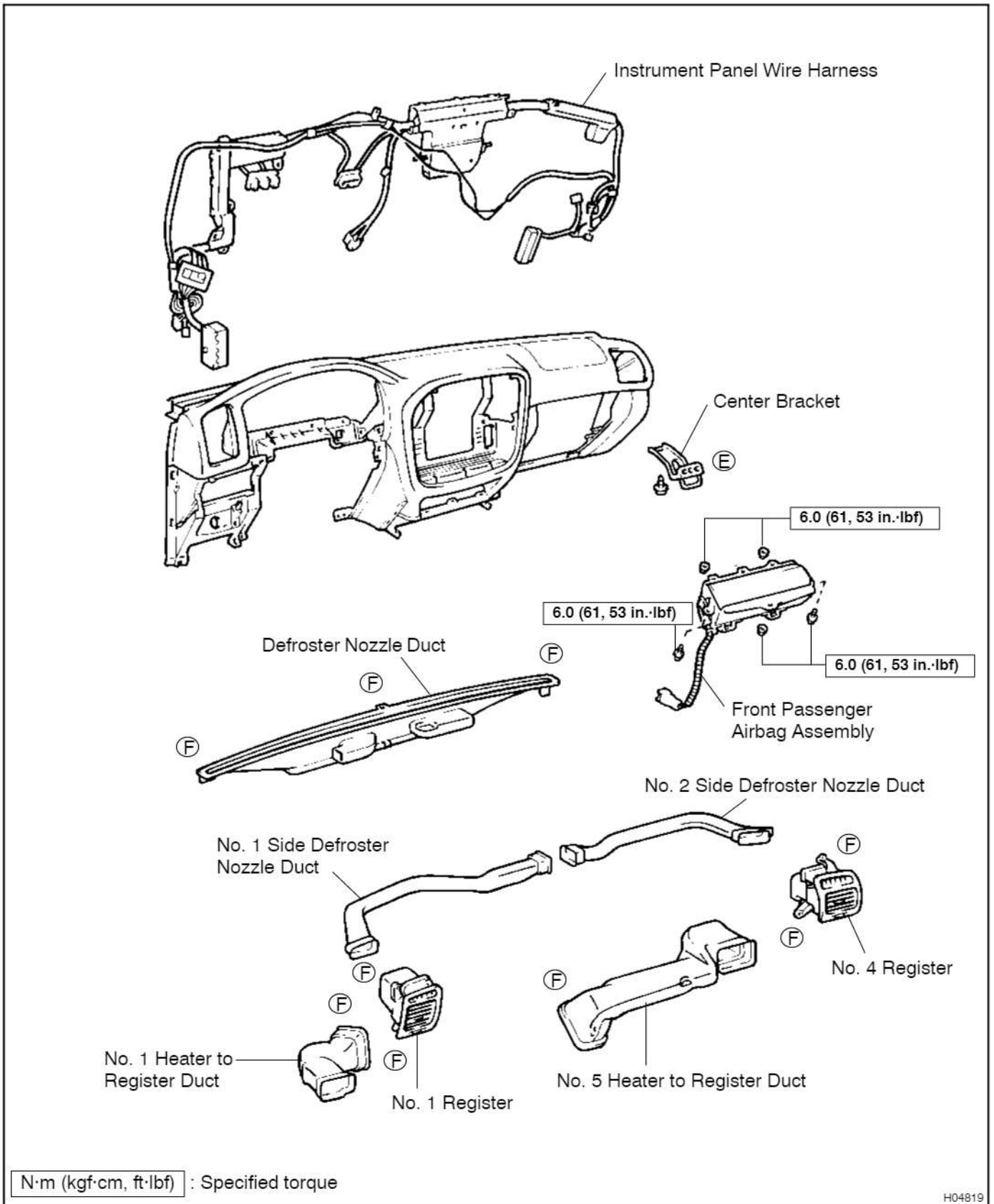
INSTRUMENT PANEL COMPONENTS

8042W-01



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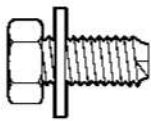
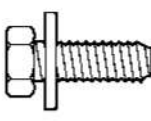
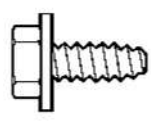
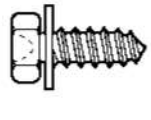
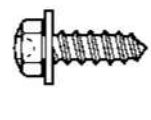


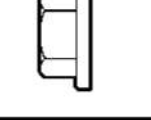
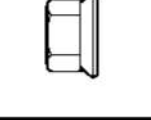
H17537



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HINT:

Screw shapes and sizes are indicated in the table below. The codes (A - I) correspond to those indicated on the previous page.

mm (in.)								
	Shape	Size		Shape	Size		Shape	Size
(A)		$\varnothing = 8$ (0.31) L = 16 (0.63)	(B)		$\varnothing = 6$ (0.24) L = 18 (0.71)	(C)		$\varnothing = 6$ (0.24) L = 16 (0.63)
(D)		$\varnothing = 6$ (0.24) L = 16 (0.63)	(E)		$\varnothing = 5$ (0.20) L = 16 (0.63)	(F)		$\varnothing = 5$ (0.20) L = 14 (0.55)
(G)		$\varnothing = 5$ (0.20) L = 14 (0.55)	(H)		$\varnothing = 8$ (0.31)	(I)		$\varnothing = 6$ (0.24)



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H04082

REMOVAL

1. REMOVE FRONT DOOR SCUFF PLATES
2. REMOVE COWL SIDE TRIMS
3. REMOVE FRONT DOOR OPENING TRIMS
4. REMOVE FRONT PILLAR GARNISH

(a) Driver's side:

Using a screwdriver, remove the 2 assist grip plugs, then remove the 2 screws and assist grip.

HINT:

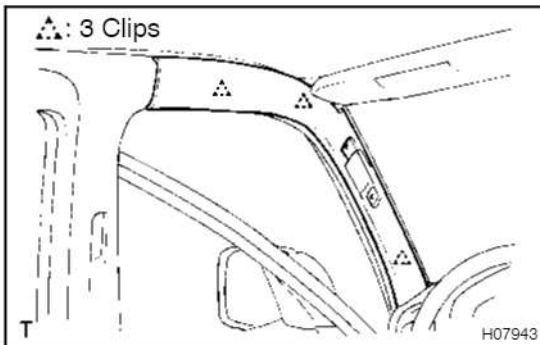
Tape the screwdriver tip before use.

(b) Passenger's side:

Using a screwdriver, remove the 4 assist grip plugs, then remove the 4 screws and 2 assist grips.

HINT:

Tape the screwdriver tip before use.



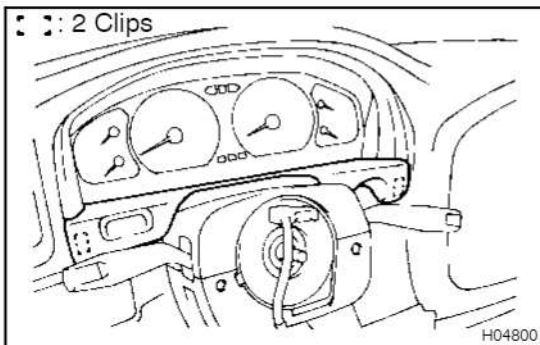
(c) Using a screwdriver, remove the front pillar garnish.

HINT:

Tape the screwdriver tip before use.

(d) Use the same manner described above to the other side.

5. REMOVE STEERING WHEEL (See Pub. No. RM616E on page SR-13 or SR-29)



6. REMOVE CLUSTER FINISH PANEL

Using a screwdriver, remove the cluster finish panel.

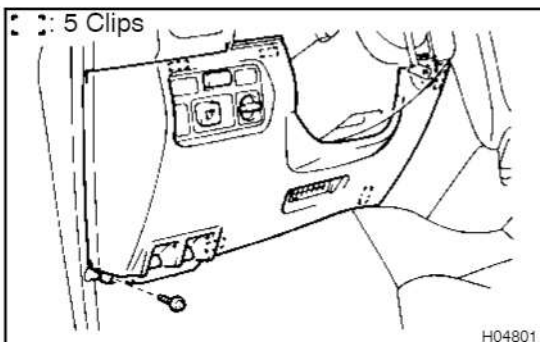
HINT:

Tape the screwdriver tip before use.

7. REMOVE HOOD LOCK AND FUEL LID CONTROL CABLE LEVER

(a) Remove the 2 screws and hood lock control cable.

(b) Remove the 2 screws and fuel lid control cable lever.



8. REMOVE LOWER NO. 1 PANEL

(a) Remove the screw.

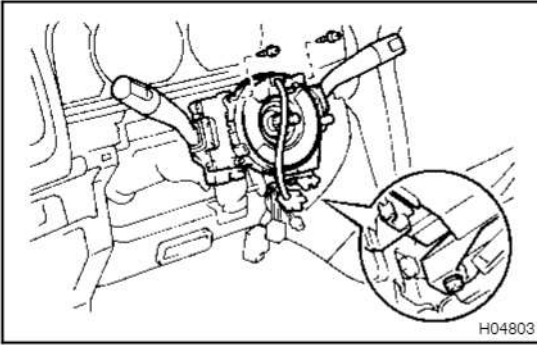
(b) Using a screwdriver, remove the lower No. 1 panel, then disconnect the connectors.

HINT:

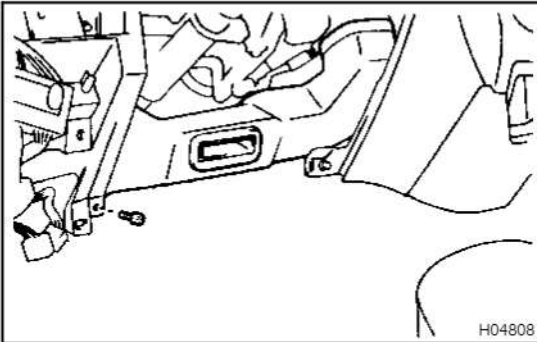
Tape the screwdriver tip before use.

9. REMOVE COLUMN COVERS

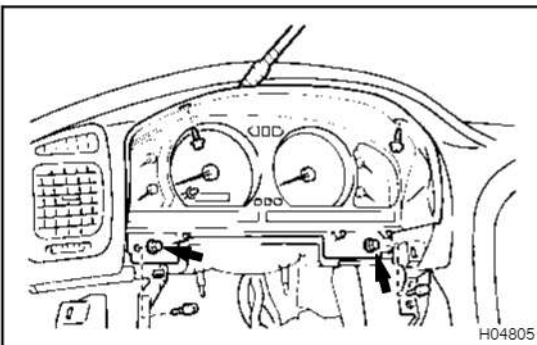
Remove the 3 screws and column covers.

**10. REMOVE COMBINATION SWITCH**

- (a) Disconnect the connectors.
- (b) Remove the clamp.
- (c) Remove the 3 screws and combination switch.

**11. REMOVE NO. 2 HEATER TO REGISTER DUCT**

Remove the screw and No. 2 heater to register duct as shown in the illustration.

12. REMOVE STEERING COLUMN (See Pub. No. RM616E on page SR-13 or SR-29)**13. REMOVE COMBINATION METER**

- (a) Disconnect the connectors.

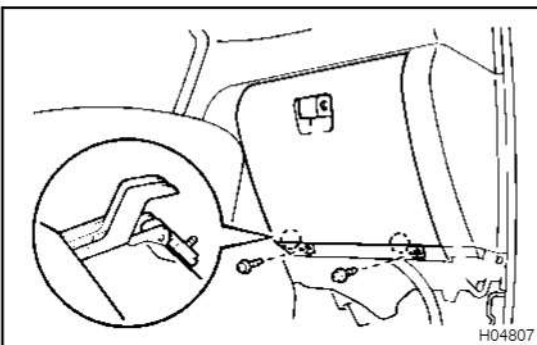
HINT:

The connectors can be disconnected by loosening the bolts.

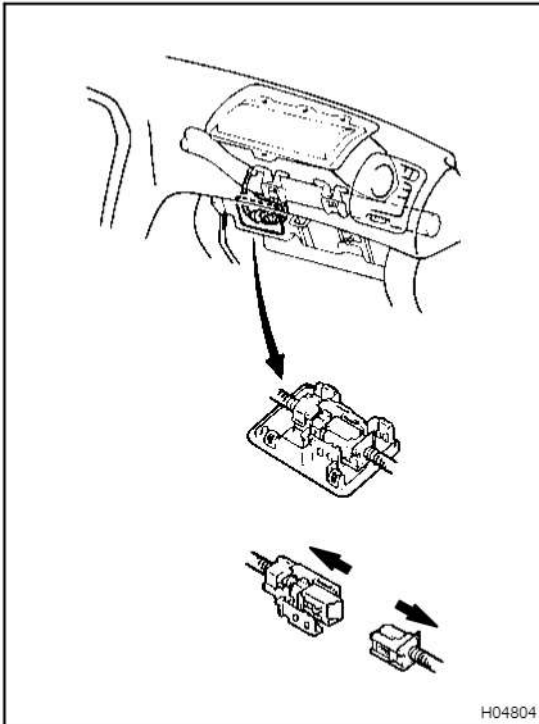
- (b) Remove the 4 screws.
- (c) Using a screwdriver, remove the combination meter.

HINT:

Tape the screwdriver tip before use.

**14. REMOVE GLOVE COMPARTMENT DOOR**

- (a) Remove the 2 screws.
- (b) Remove the glove compartment door, then disconnect the glove compartment door damper clip.



15. DISCONNECT AIRBAG CONNECTOR (See Pub. No. RM616E on page RS-25)

- (a) Using a screwdriver, remove the No. 1 under cover.

HINT:

Tape the screwdriver tip before use.

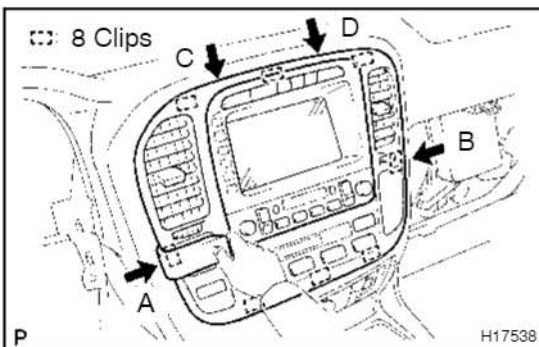
- (b) Pull up the airbag connector from the No. 1 under cover.
 (c) Disconnect the airbag connector.

NOTICE:

When handling the airbag connector, take care not to damage the airbag wire harness.

16. REMOVE LOWER NO. 2 PANEL

Remove the 3 screws and lower No. 2 panel.

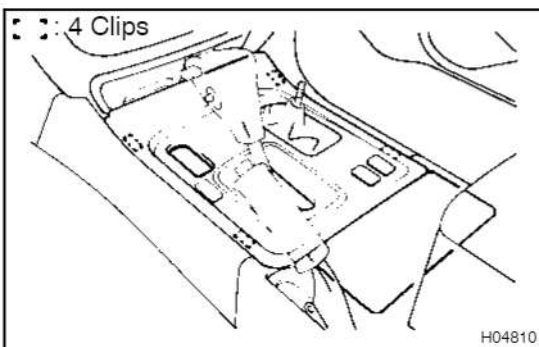


17. REMOVE CENTER CLUSTER

- (a) Using a moulding remover, remove the center cluster in order "A", "B", "C" and "D" as shown in the illustration.
 (b) Disconnect the connectors.

18. REMOVE NAVIGATION SYSTEM WITH A/C CONTROL ASSEMBLY

- (a) Remove the 4 screws.
 (b) Disconnect the connectors, then remove the navigation system with A/C control assembly.

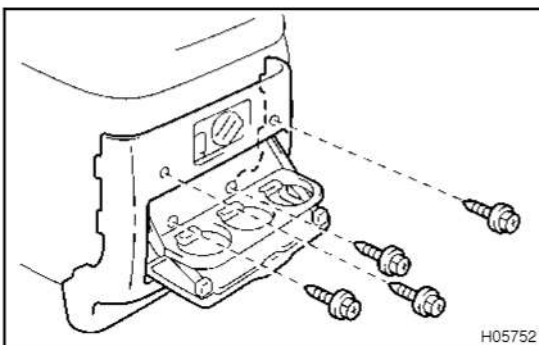


19. REMOVE REAR CONSOLE PANEL

- (a) Remove the transfer shift lever knob.
 (b) Using a screwdriver, remove the rear console panel.

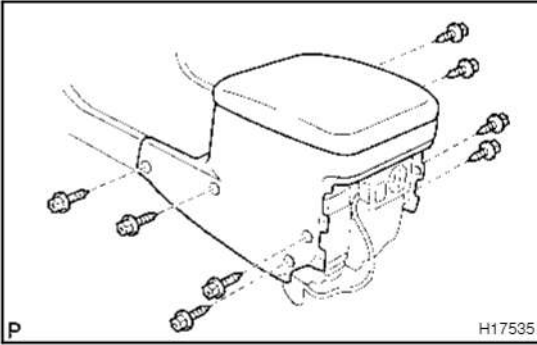
HINT:

Tape the screwdriver tip before use.



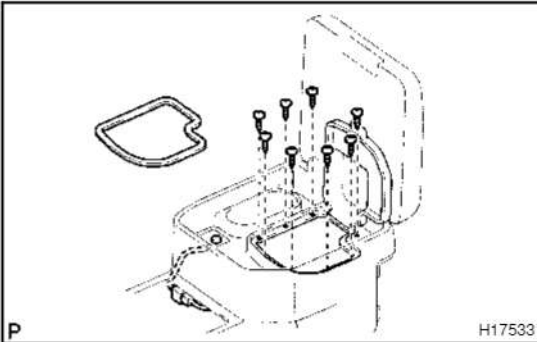
20. REMOVE CONSOLE REAR END PANEL

- (a) Remove the 4 screws.
 (b) Using a screwdriver, remove the console rear end panel.

**21. REMOVE REAR CONSOLE BOX**

(a) w/ Cool box:

Remove the 8 screws.

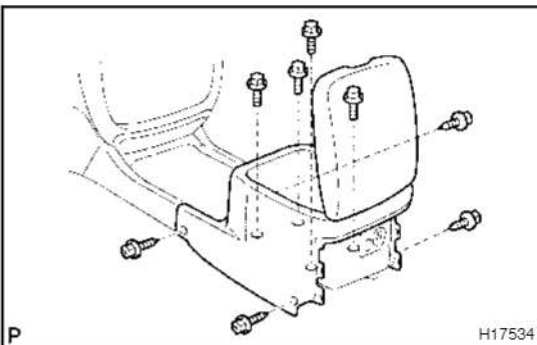


(b) w/ Cool box:

Disconnect the connector.

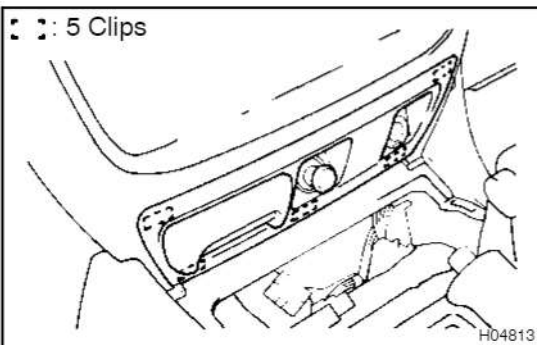
(c) w/ Cool box:

Remove the door packing, 8 screws and rear console box.



(d) w/o Cool box:

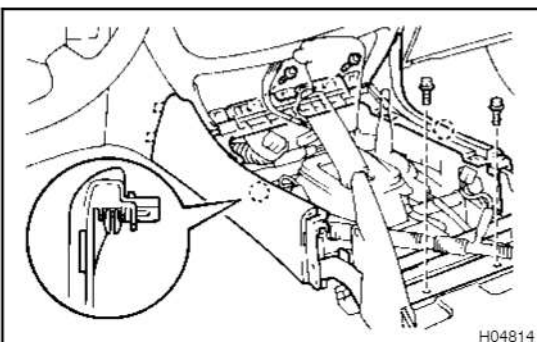
Remove the 4 bolts, 4 screws and rear console box.

**22. REMOVE CENTER LOWER CLUSTER FINISH PANEL**

Using a screwdriver, remove the center lower cluster finish panel, then disconnect the connector.

HINT:

Tape the screwdriver tip before use.

**23. REMOVE FRONT CONSOLE BOX**

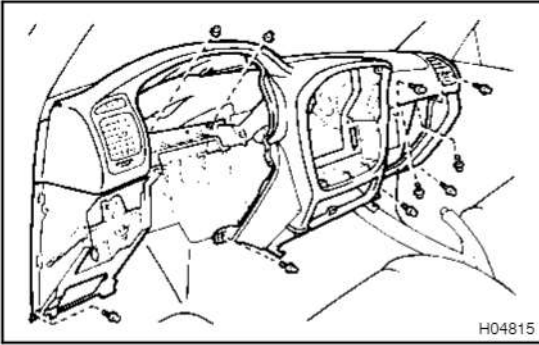
Remove the 2 bolts, 2 screws and front console box.

24. REMOVE INSTRUMENT PANEL

(a) Disconnect the junction connectors.

HINT:

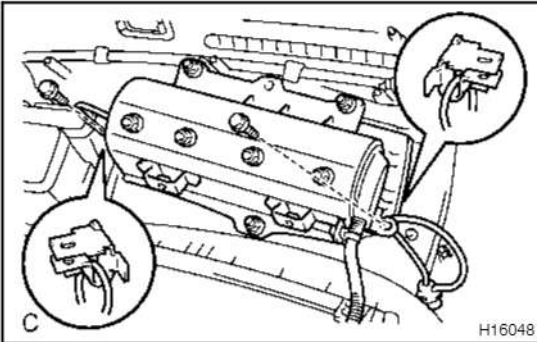
The connectors can be disconnected by loosening the bolts.



- (b) Disconnect the connector, then remove the 8 bolts, 2 nuts and instrument panel.
25. **REMOVE ECU**
 26. **REMOVE NO. 3 HEATER TO REGISTER DUCT**
 27. **REMOVE NO. 4 HEATER TO REGISTER DUCT**
 28. **REMOVE GLOVE COMPARTMENT DOOR DAMPER**
 29. **REMOVE FLOOR BRACE**
 30. **REMOVE NO. 1 BRACE**
 31. **REMOVE REINFORCEMENT**

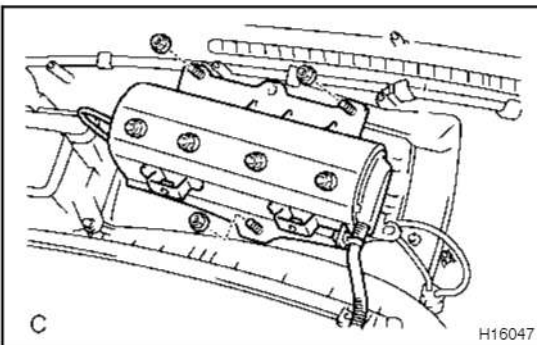
DISASSEMBLY

1. REMOVE NO. 2 SIDE DEFROSTER NOZZLE DUCT
2. REMOVE NO. 1 SIDE DEFROSTER NOZZLE DUCT
3. REMOVE DEFROSTER NOZZLE
4. REMOVE CENTER BRACKET
5. REMOVE NO. 1 HEATER TO REGISTER DUCT
6. REMOVE INSTRUMENT PANEL WIRE HARNESS
7. REMOVE NO. 5 HEATER TO REGISTER DUCT



8. REMOVE FRONT PASSENGER AIRBAG ASSEMBLY

- (a) Remove the 2 bolts and straps.
Torque: 6.0 N·m (61 kgf·cm, 53 in.·lbf)



- (b) Remove the 3 nuts and front passenger airbag assembly.
Torque: 6.0 N·m (61 kgf·cm, 53 in.·lbf)

CAUTION:

- Do not store the front passenger airbag assembly with the airbag deployment side facing down.
- Never disassemble the front passenger airbag assembly.

NOTICE:

At the time of reassembly, please refer to the following items.

- Pass the straps of the front passenger airbag door through the brackets on the right and left sides securely.
- Install the straps so that they are not pinched between the airbag and instrument panel.
- When installing the front passenger airbag assembly, make sure that the straps are not distorted and installed to the brackets securely.
- Make sure that the front passenger airbag assembly is installed to the specified torque.
- If the front passenger airbag assembly has been dropped, or there are cracks, dents or other defects in the case or connector, replace the front passenger airbag assembly with a new one.
- When installing the front passenger airbag assembly, take care that the wiring does not interfere with other parts and is not pinched between other parts.

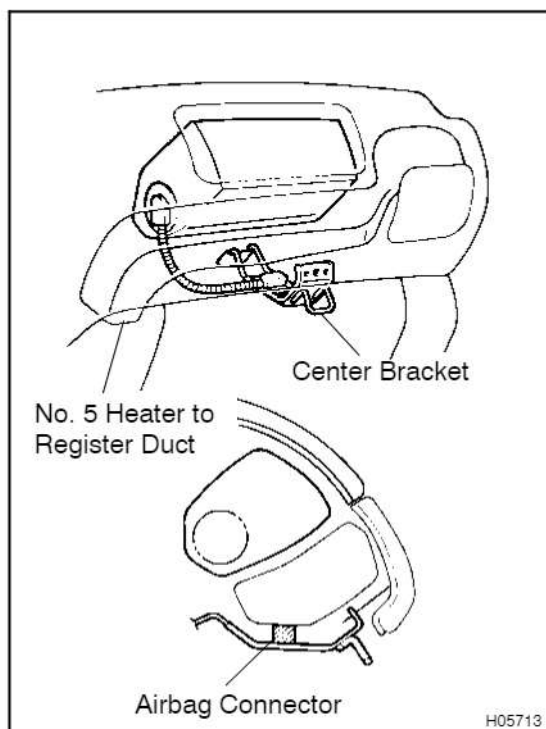
9. REMOVE NO. 1 REGISTER
10. REMOVE NO. 4 REGISTER

REASSEMBLY

Reassembly is in the reverse order of disassembly ([See page BO-9](#)).

INSTALLATION

1. INSTALL REINFORCEMENT
2. INSTALL NO. 1 BRACE
3. INSTALL FLOOR BRACE
4. INSTALL GLOVE COMPARTMENT DOOR DAMPER
5. INSTALL NO. 4 HEATER TO REGISTER DUCT
6. INSTALL NO. 3 HEATER TO REGISTER DUCT
7. INSTALL ECU



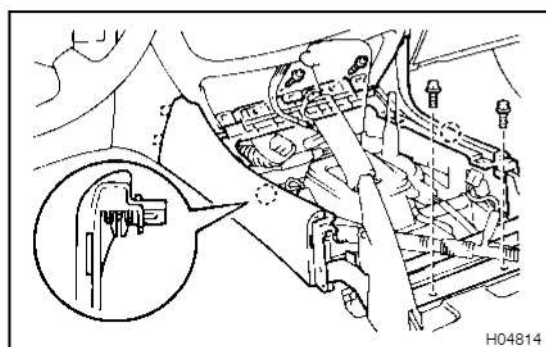
8. INSTALL INSTRUMENT PANEL

HINT:

- Install the airbag connector between the No. 5 heater to register duct and center bracket temporarily, then install the instrument panel.
 - Remove the airbag connector before installing the lower No. 2 panel.
- (a) Install the 6 bolts, 2 nuts and instrument panel, then connect the connectors.
 - (b) Install the 2 bolts to the front passenger airbag assembly.
Torque: 20 N·m (204 kgf·cm, 15 ft·lbf)
 - (c) Connect the junction connectors.

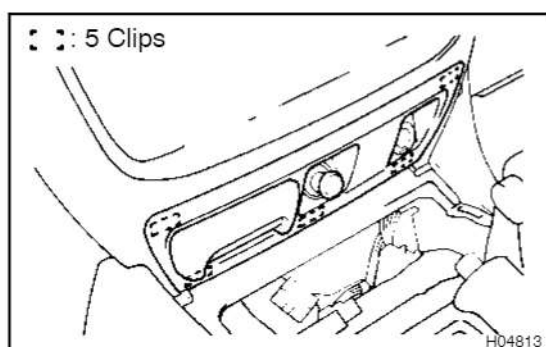
HINT:

The connectors can be connected by tightening the bolts.



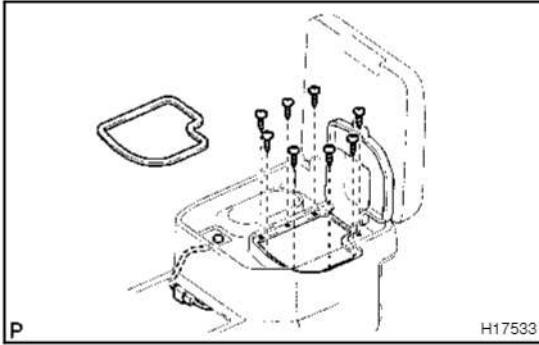
9. INSTALL FRONT CONSOLE BOX

Install the front console box with the 2 bolts and 2 screws.

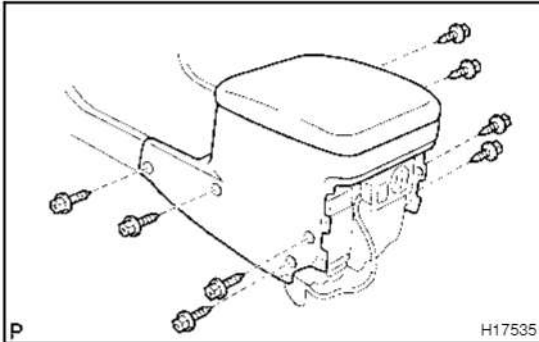


10. INSTALL CENTER LOWER CLUSTER FINISH PANEL

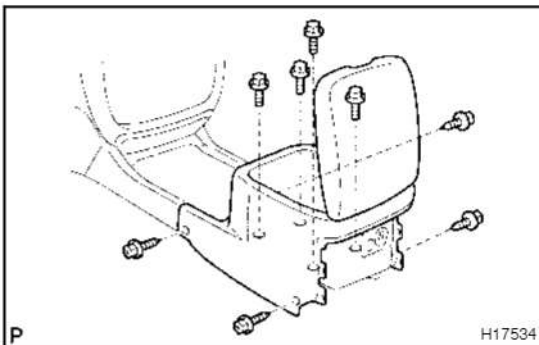
Connect the connector, then install the center lower cluster finish panel.

**11. INSTALL REAR CONSOLE BOX**

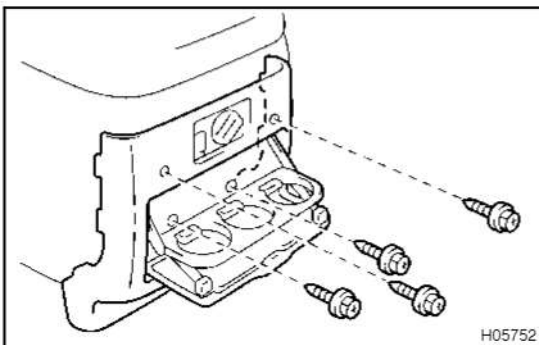
- (a) w/ Cool box:
Install the rear console box with the 8 screws.
- (b) w/ Cool box:
Install new door packing.
- (c) w/ Cool box:
Connect the connector.



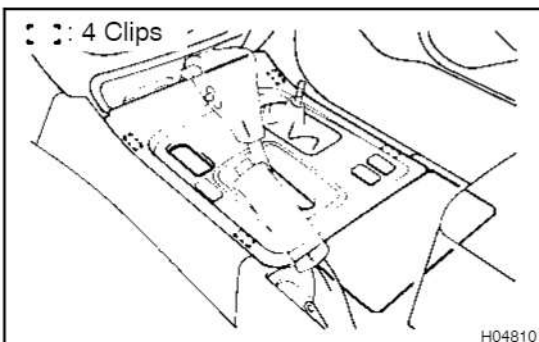
- (d) w/ Cool box:
Install the 8 screws.



- (e) w/o Cool box:
Install the rear console box with the 4 bolts and 4 screws.

**12. INSTALL CONSOLE REAR END PANEL**

Install the console rear end panel with the 4 screws.

**13. INSTALL REAR CONSOLE PANEL**

Install the rear console panel, then install the transfer shift lever knob.

14. INSTALL NAVIGATION SYSTEM WITH A/C CONTROL ASSEMBLY

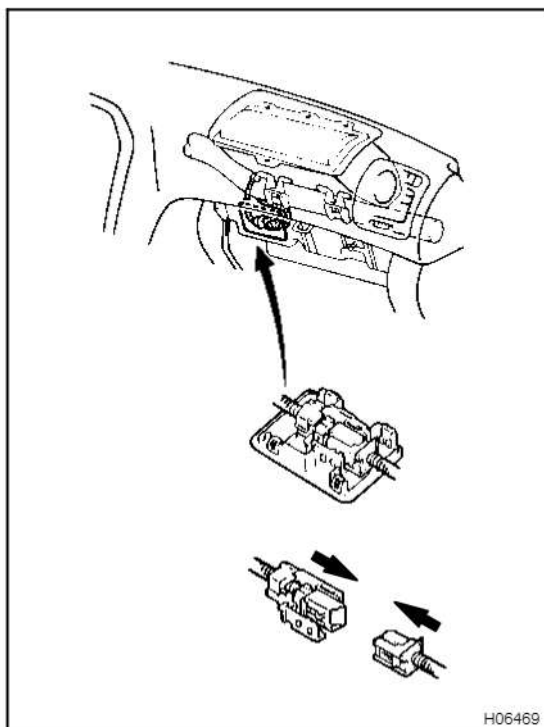
- (a) Connect the connectors, then install the navigation system with A/C control assembly.
- (b) Install the 4 screws.

15. INSTALL CENTER CLUSTER

Connect the connectors, then install the center cluster.

16. INSTALL LOWER NO. 2 PANEL

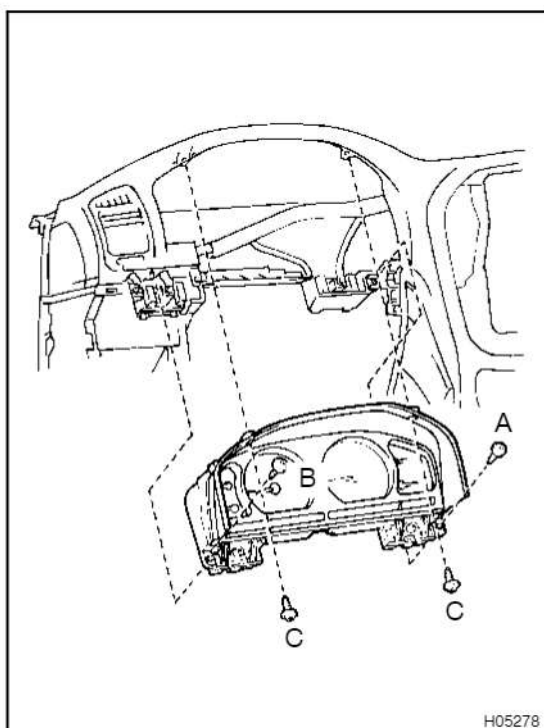
Install the lower No. 2 panel with the 3 screws.



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17. CONNECT AIRBAG CONNECTOR (See Pub. No. RM616E on page RS-35)**18. INSTALL GLOVE COMPARTMENT DOOR**

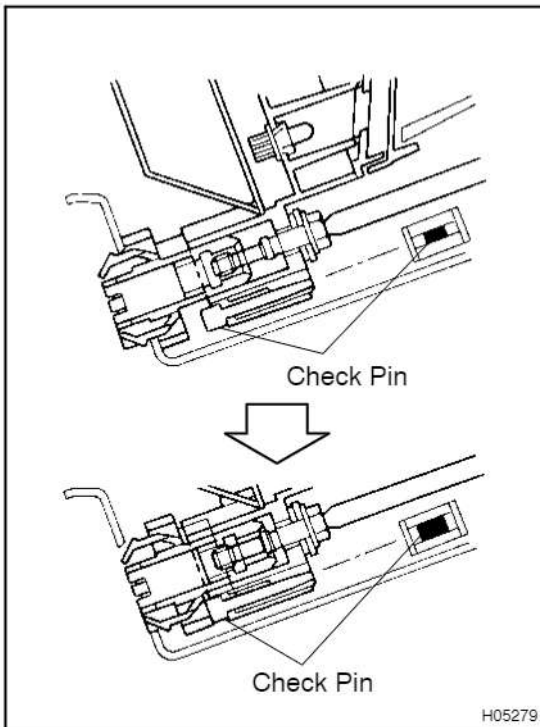
- (a) Connect the glove compartment door damper clip, then install the glove compartment door.
- (b) Install the 2 screws.



H05278

19. INSTALL COMBINATION METER

- (a) Check that the set-in connectors are connected in the installation holes on the instrument panel securely.
- (b) Place the combination meter on the instrument panel.
- (c) Install the combination meter by tightening the screws, "A", "B" and "C" in the order.



(d) Tighten the connection bolts.

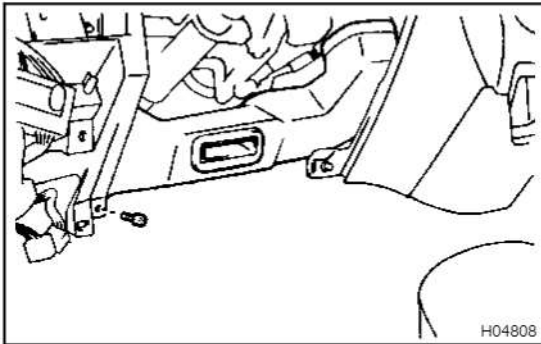
HINT:

- When connection completes, the bolts turn vainly, causing turning noise.
- Check this noise and that the connection check pins protrude from the lower side of the connection bolts.

NOTICE:

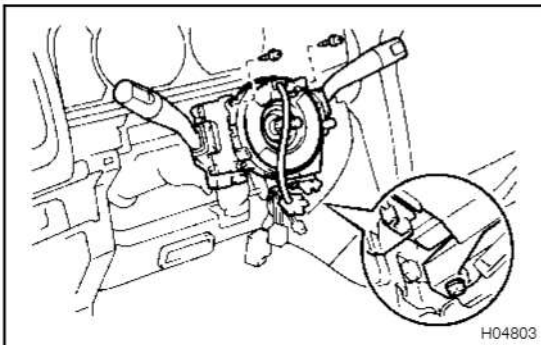
Follow the procedures in order of (c) and (d). Otherwise, set-in connectors on the wire harness side and connectors on the meter side might not be connected properly.

20. **INSTALL STEERING COLUMN** (See Pub. No. RM616E on page SR-24 or SR-37)



21. **INSTALL NO. 2 HEATER TO REGISTER DUCT**

Install the No. 2 heater to register duct with the screw.

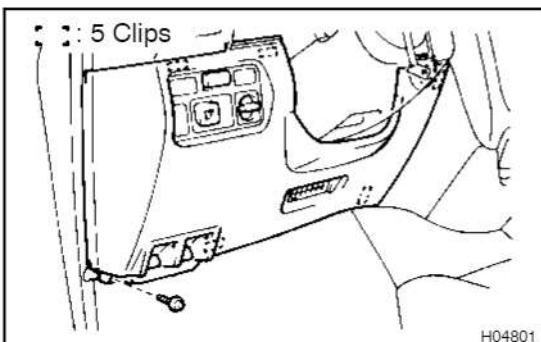


22. **INSTALL COMBINATION SWITCH**

- Install the combination switch with the 3 screws.
- Install the clamp, then connect the connectors.

23. **INSTALL COLUMN COVERS**

Install the column covers with the 3 screws.

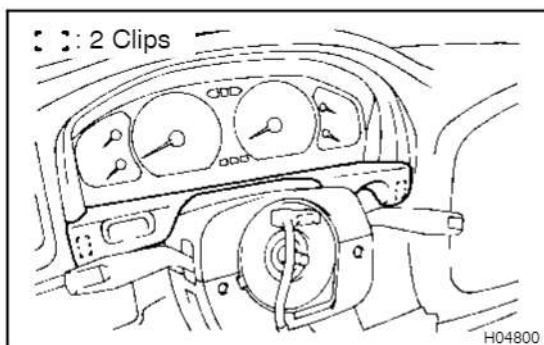


24. **INSTALL LOWER NO. 1 PANEL**

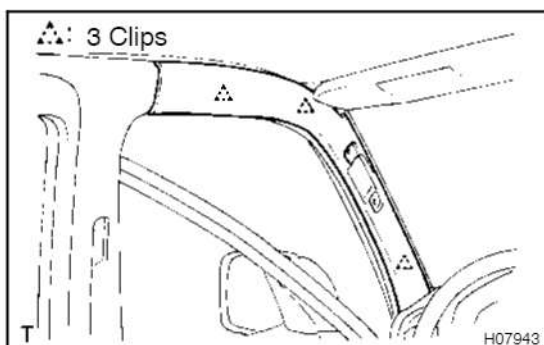
Connect the connector, then install the lower No. 1 panel with the screw.

25. **INSTALL HOOD LOCK AND FUEL LID CONTROL CABLE LEVER**

- Install the fuel lid control cable lever with the 2 screws.
- Install the hood lock control cable with the 2 screws.



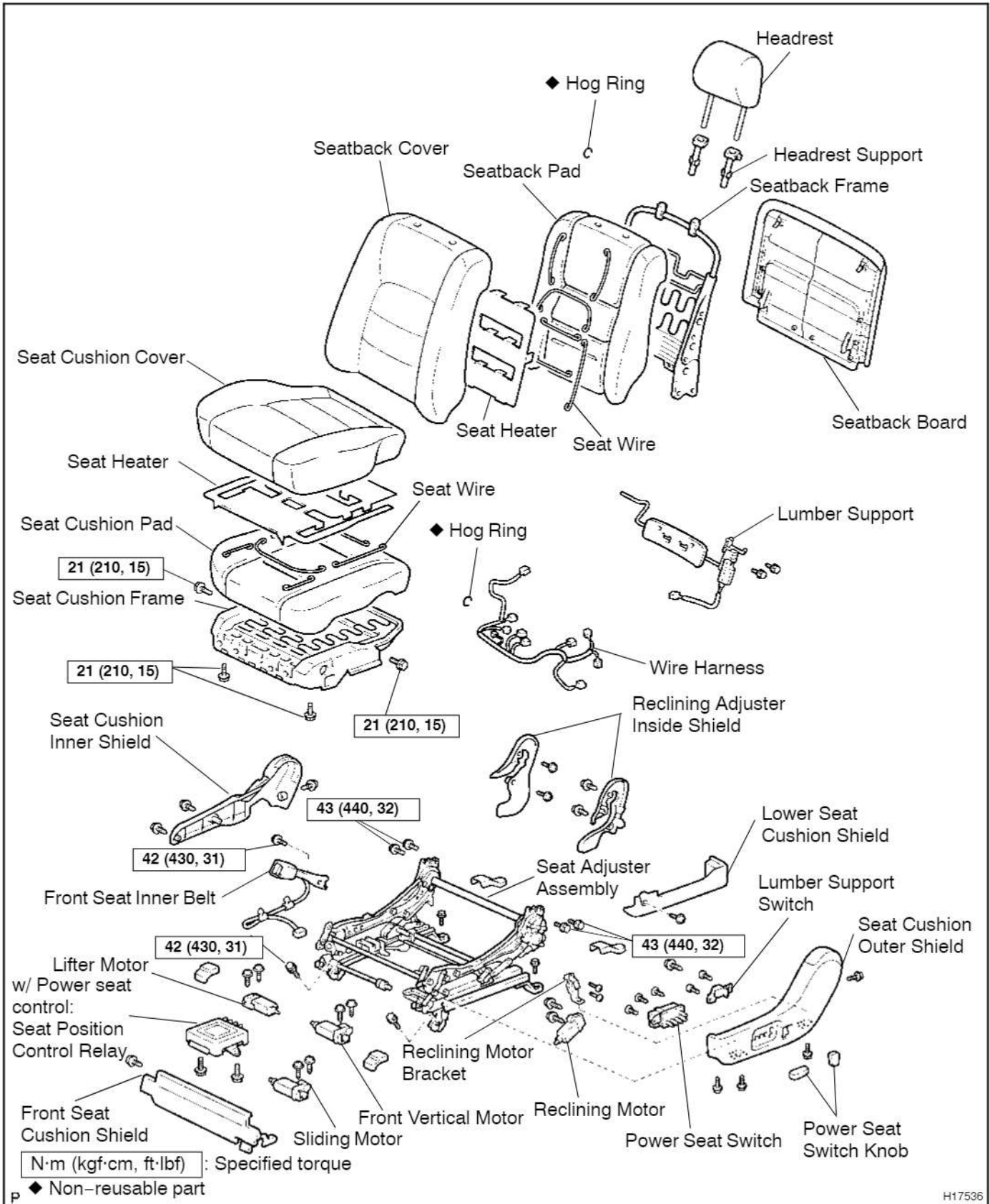
26. **INSTALL CLUSTER FINISH PANEL**
 27. **INSTALL STEERING WHEEL** (See Pub. No. RM616E on page SR-24 or SR-37)



28. **INSTALL FRONT PILLAR GARNISH**
 (a) Install the front pillar garnish.
 (b) Use the same manner described above to the other side.
 (c) Driver's side:
 Install the assist grip with the 2 screws, then install the 2 assist grip plugs.
 (d) Passenger's side:
 Install the 2 assist grips with the 4 screws, then install the 4 assist grip plugs.
29. **INSTALL FRONT DOOR OPENING TRIMS**
 30. **INSTALL COWL SIDE TRIMS**
 31. **INSTALL FRONT DOOR SCUFF PLATES**

FRONT SEAT (Separate Type: Power Adjuster) COMPONENTS

BO451-01



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H17536

REMOVAL

1. REMOVE SEAT TRACK OUTER COVERS

Using a screwdriver, remove the 4 seat track outer covers.

HINT:

Tape the screwdriver tip before use.

2. REMOVE FRONT SEAT

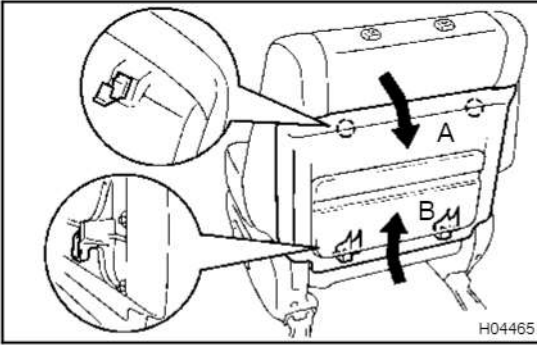
(a) Remove the 4 bolts.

Torque: 42 N·m (430 kgf·cm, 31 ft·lbf)

(b) Disconnect the connector, then remove the front seat.

NOTICE:

Be careful not to damage the body.



DISASSEMBLY

1. REMOVE SEATBACK BOARD

Remove the seatback board as shown in the illustration.

HINT:

Remove the seatback board in order "A" and "B" as shown in the illustration.

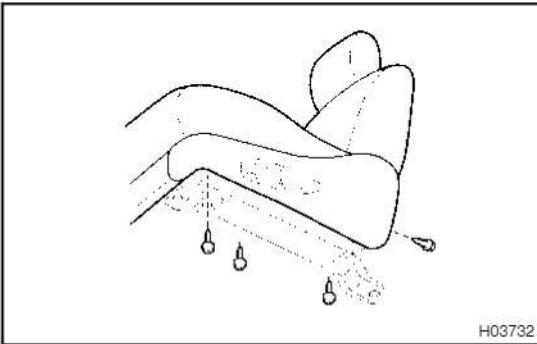
2. REMOVE HEADREST

3. REMOVE SEAT CUSHION OUTER SHIELD

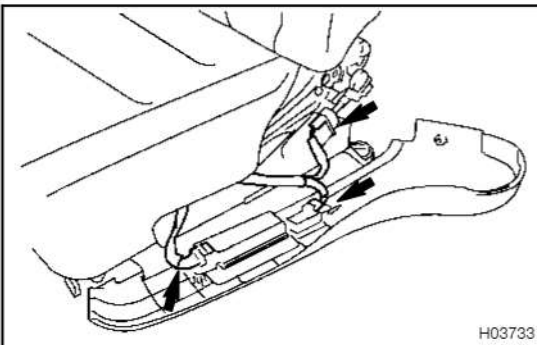
- (a) Using a screwdriver, remove the power seat switch knobs.

HINT:

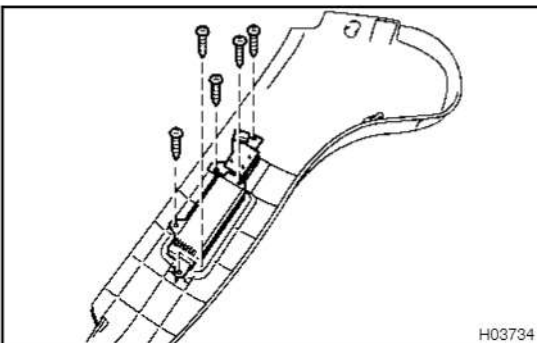
Tape the screwdriver tip before use.



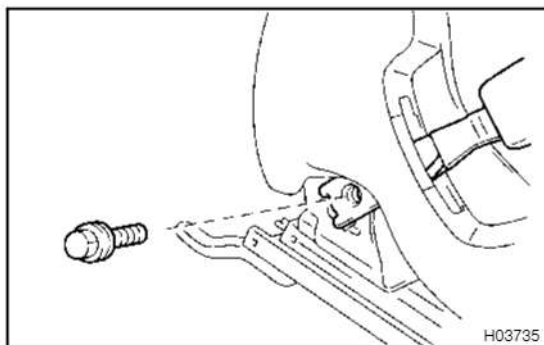
- (b) Remove the 4 screws.



- (c) Disconnect the connectors as shown in the illustration.
(d) Remove the seat cushion outer shield.

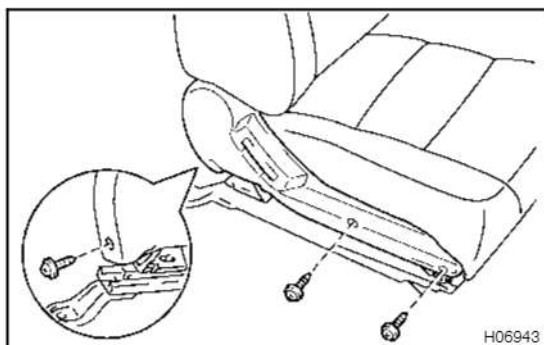


- (e) Remove the 3 screws and power seat switch from the seat cushion outer shield.
(f) Remove the 2 screws and lumbar support switch from the seat cushion outer shield.

**4. REMOVE FRONT SEAT INNER BELT**

- (a) Remove the clamp, then disconnect the connector.
- (b) Remove the bolt and inner belt.

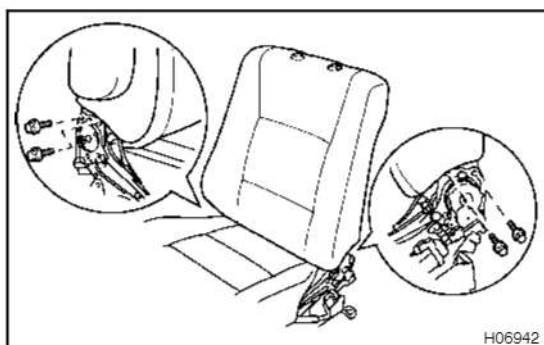
Torque: 42 N·m (430 kgf·cm, 31 ft·lbf)

**5. REMOVE SEAT CUSHION INNER SHIELD**

Remove the 3 screws and seat cushion inner shield.

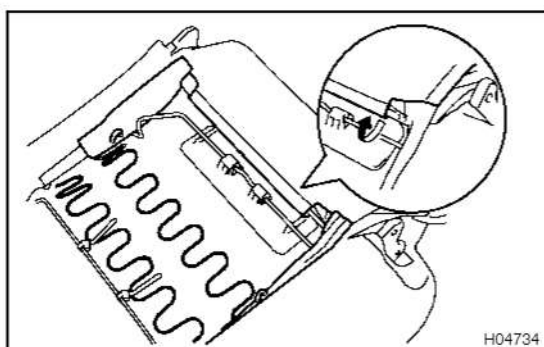
6. REMOVE SEATBACK ASSEMBLY

- (a) Disconnect the lumbar support connector and seat heater connector.



- (b) Remove the 4 bolts and seatback assembly.

Torque: 43 N·m (440 kgf·cm, 32 ft·lbf)

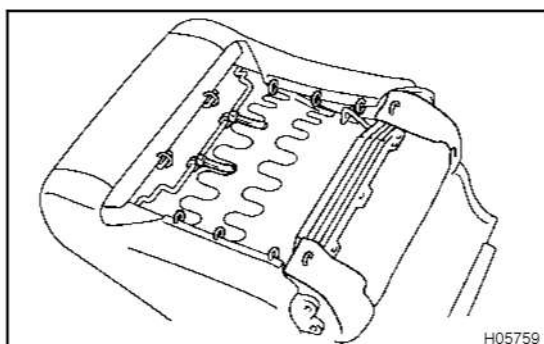
**7. REMOVE SEATBACK FRAME**

- (a) Remove the 2 hog rings.

HINT:

At the time of reassembly, please refer to the following item.
When installing hog rings, take care to prevent wrinkles as little as possible.

- (b) Disengage the hook as shown in the illustration.

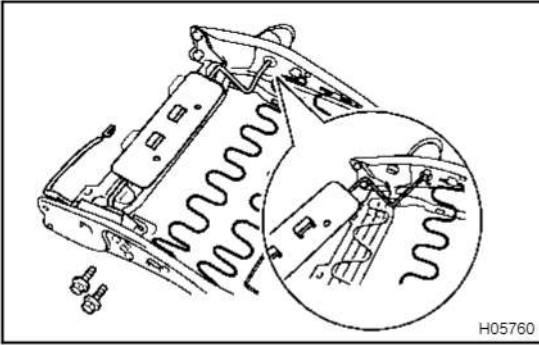


- (c) Remove the 10 hog rings and 2 clamps.

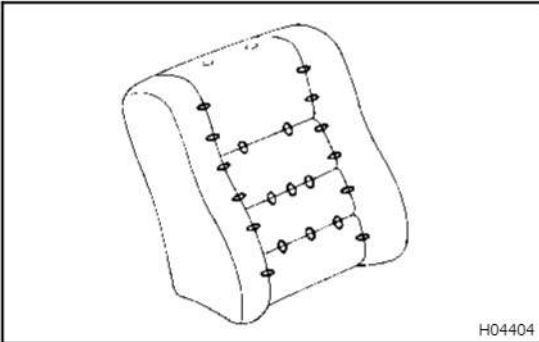
HINT:

At the time of reassembly, please refer to the following item.
When installing hog rings, take care to prevent wrinkles as little as possible.

- (d) Remove the 2 headrest supports.
- (e) Remove the seatback frame from the seatback cover with pad.

**8. REMOVE LUMBER SUPPORT**

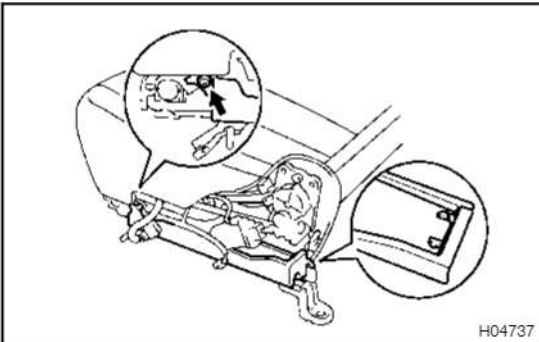
Remove the 2 bolts and lumbar support.

**9. REMOVE SEATBACK COVER**

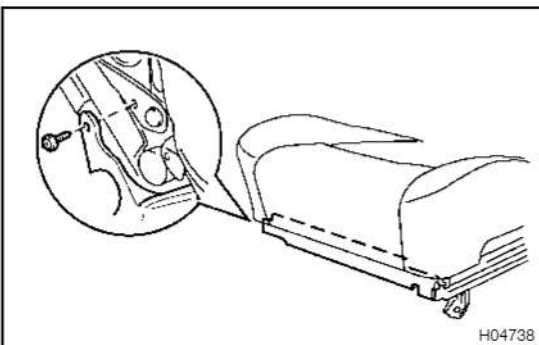
Remove the 20 hog rings and seatback cover from the seat-back pad.

HINT:

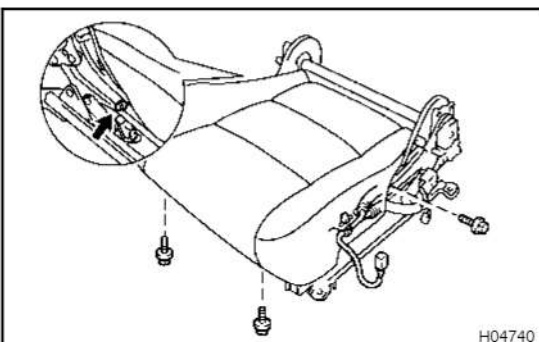
At the time of reassembly, please refer to the following item. When installing hog rings, take care to prevent wrinkles as little as possible.

10. IF NECESSARY, REPLACE SEATBACK HEATER
(See page BO-23)**11. REMOVE LOWER SEAT CUSHION SHIELD**

Remove the screw and lower seat cushion shield as shown in the illustration.

**12. REMOVE FRONT SEAT CUSHION SHIELD**

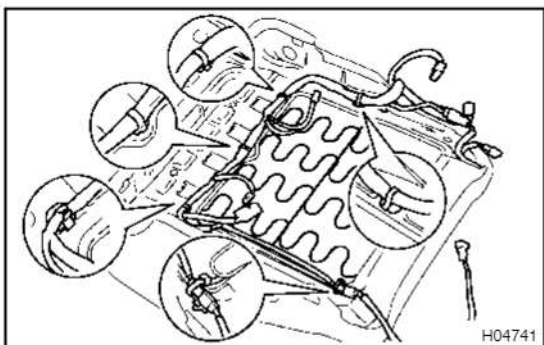
Remove the screw and front seat cushion shield.

**13. REMOVE SEAT CUSHION ASSEMBLY**

(a) Remove the 4 bolts.

Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)

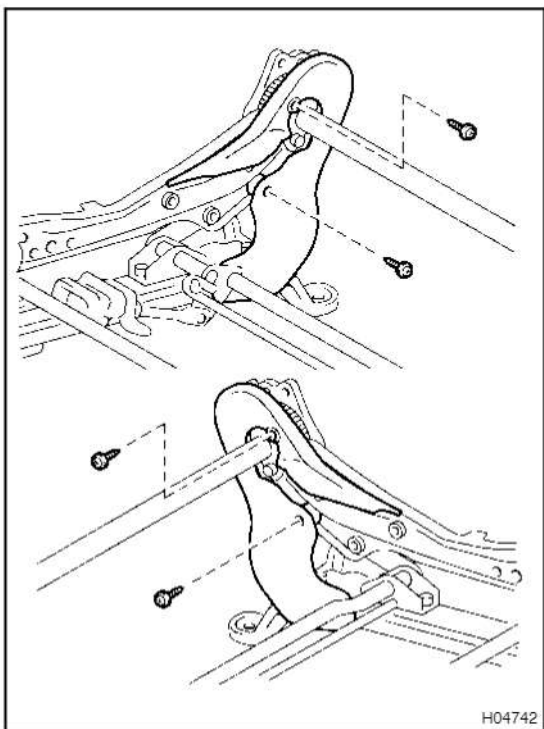
(b) Remove the wire harness clamp from the seat cushion assembly.

**14. REMOVE SEAT CUSHION FRAME**

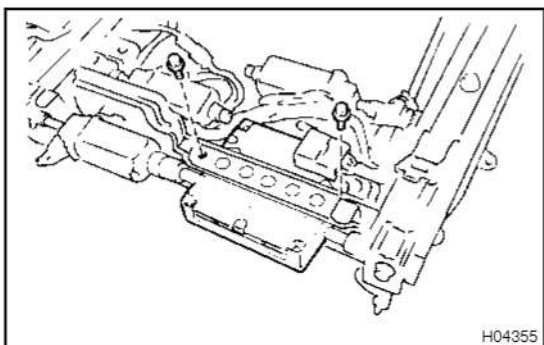
- (a) Remove the wire harness.
- (b) Disengage the hook.
- (c) Remove the 5 hog rings and seat cushion frame.

HINT:

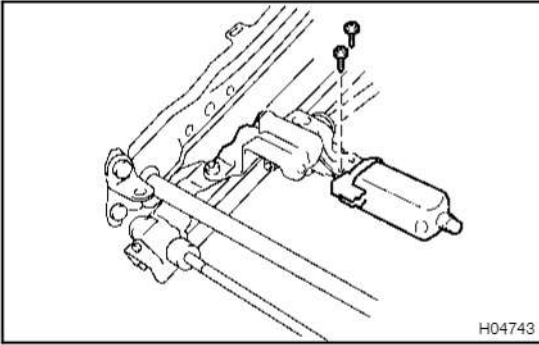
At the time of reassembly, please refer to the following item.
When installing hog rings, take care to prevent wrinkles as little as possible.

15. REMOVE SEAT CUSHION COVER (See page BO-23)**16. IF NECESSARY, REPLACE SEAT CUSHION HEATER (See page BO-23)****17. REMOVE RECLINING ADJUSTER INSIDE SHIELD**

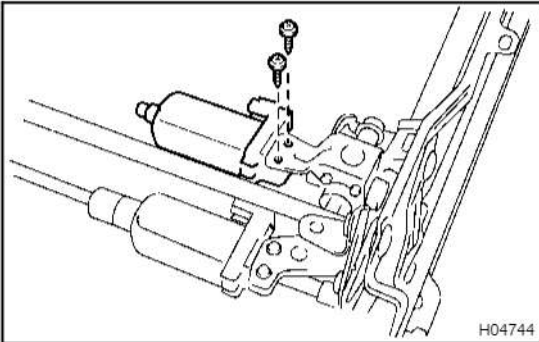
- (a) Remove the 2 screws and LH reclining adjuster inside shield.
- (b) Remove the 2 screws and RH reclining adjuster inside shield.

**18. w/ Power seat control:
REMOVE SEAT POSITION CONTROL RELAY**

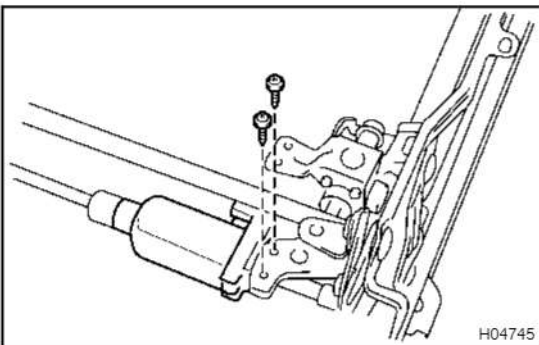
- (a) Disconnect the 2 connectors.
- (b) Remove the 2 bolts and seat position control relay.

**19. REMOVE LIFTER MOTOR**

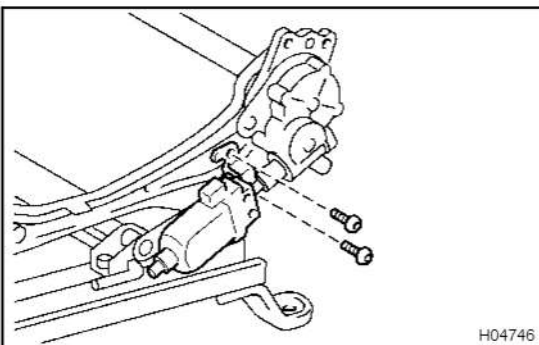
Remove the 2 screws and lifter motor.

**20. REMOVE FRONT VERTICAL MOTOR**

Remove the 2 screws and front vertical motor.

**21. REMOVE SLIDING MOTOR**

Remove the 2 screws and sliding motor.

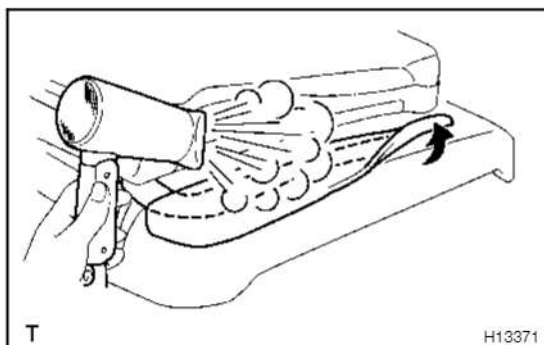
**22. REMOVE RECLINING MOTOR**

- (a) Using a torx wrench, remove the reclining motor.
- (b) Remove the 2 screws and reclining motor mounting bracket from the reclining motor.

REPLACEMENT

HINT:

- The following is the seat heater replacement procedure.
- Care should be taken during operation to protect the seat cover from scratches, dirt or accidental cut of thread.



1. REMOVE SIDE OF SEAT HEATER

- (a) Using a hair dryer, heat the adhesive tape.

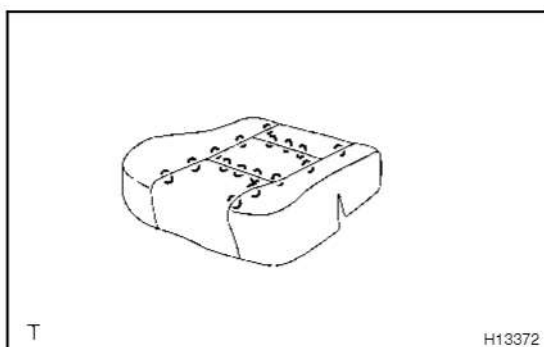
NOTICE:

Do not heat the adhesive tape excessively.

- (b) Peel the adhesive tape and remove the side of the seat cushion heater.
- (c) Use the same manner described above to the other side.

NOTICE:

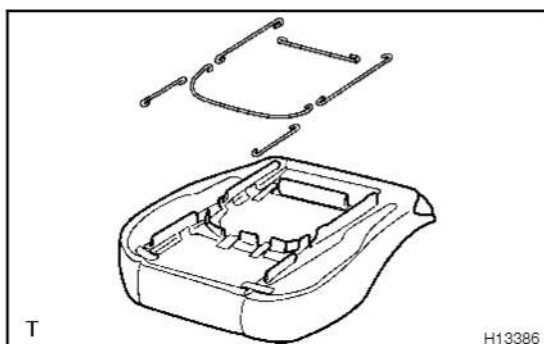
Heating the adhesive tape insufficiently may result in damage to the pad.



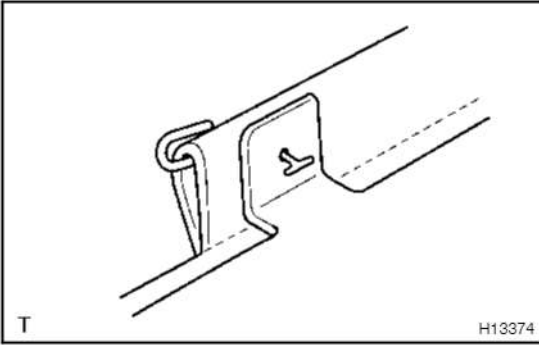
2. Seat cushion cover:

REMOVE SEAT HEATER

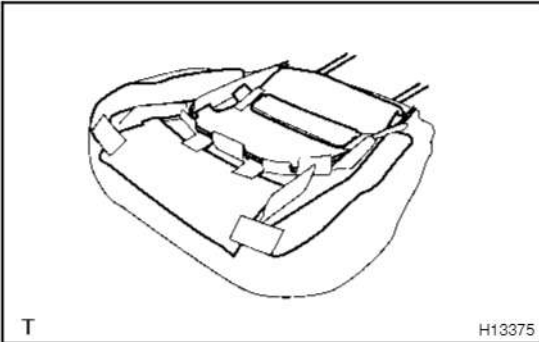
- (a) Remove the 16 hog rings.
- (b) Remove the seat cushion cover from pad.
- (c) Turn the seat cushion cover inside out.



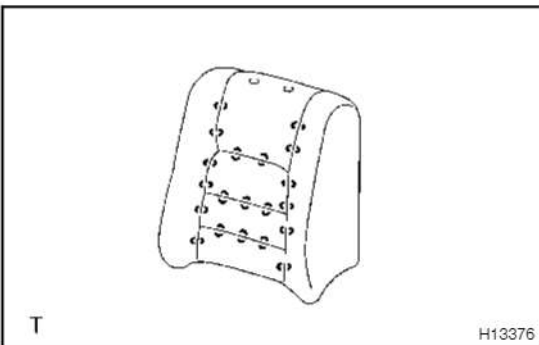
- (d) Disconnect the 6 seat wires.



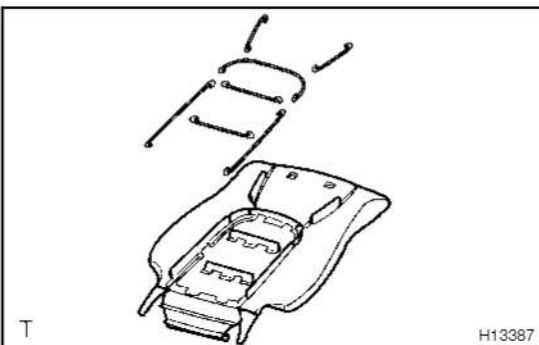
- (e) Remove the tack pins which are fastened to the heater.
- (f) Remove the seat heater from the seat cushion cover.

**HINT:**

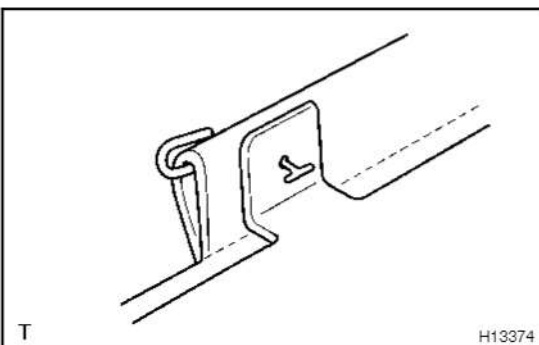
Surely remove the wire before removing the seat heater.

**3. Seatback cover:****REMOVE SEAT HEATER**

- (a) Remove the 20 hog rings and wires.
- (b) Remove the seatback cover from the pad.
- (c) Turn the seatback cover inside out.



- (d) Disconnect the 7 seat wires.



- (e) Remove the tack pins which are fastened to the seat heater.
 - (f) Remove the seat heater from the seatback cover.
- 4. INSTALL NEW SEAT HEATER TO SEAT COVER**
- (a) Using a tacker, install a new seat heater to the seat cushion cover with tack pins.

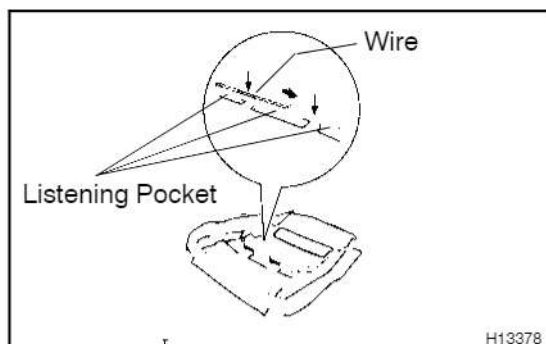
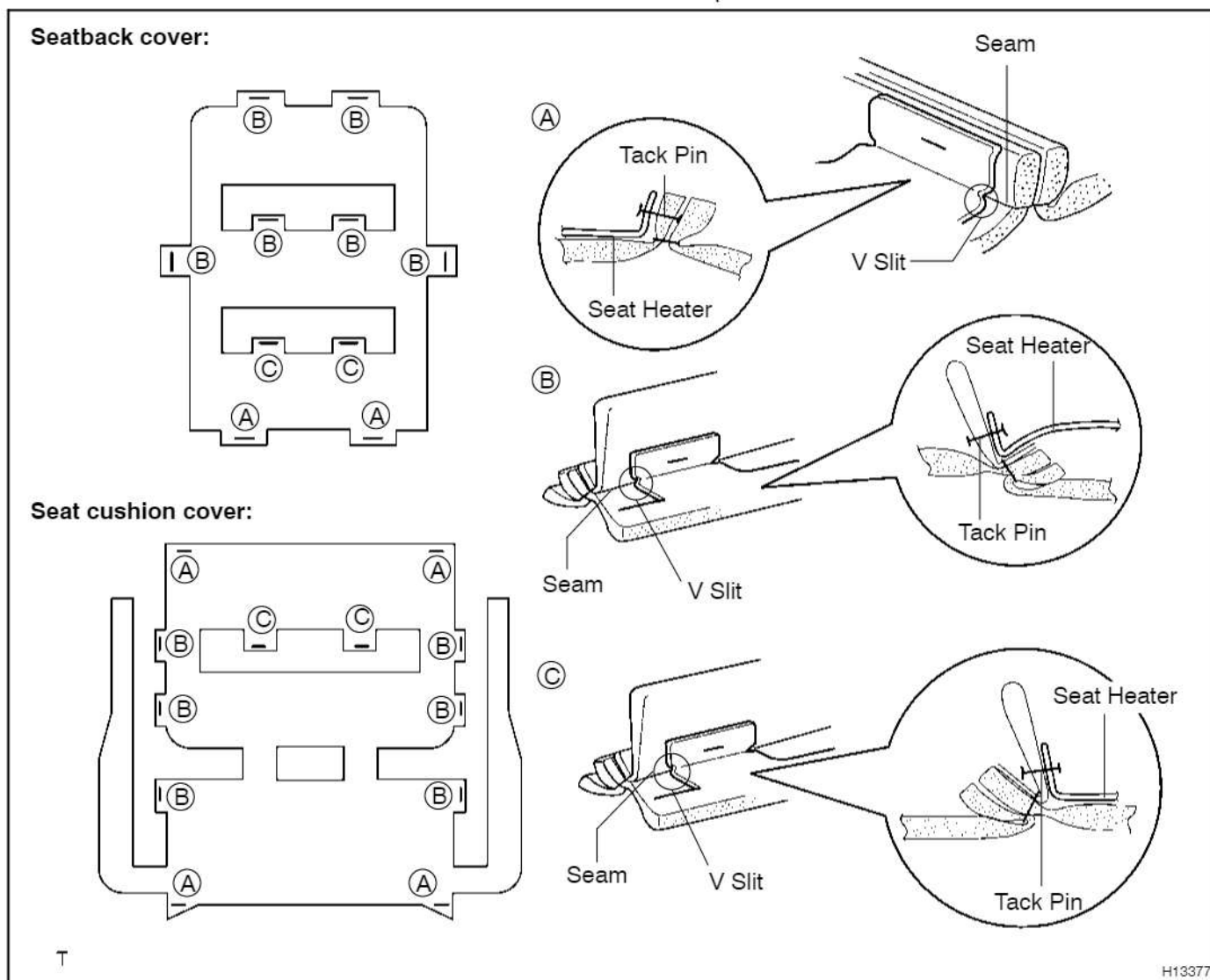
Tacker: BANZAI 303XT or equivalent

NOTICE:

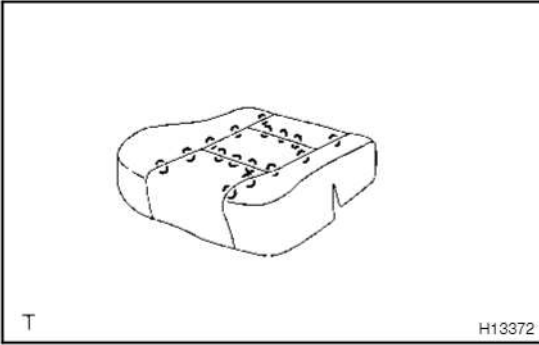
Do not substitute other metal parts in place of tack pins. Insufficient distance between the heater and cover may result damage to the heater.

HINT:

- Fasten the cover and heater with tack pins matching the seam with the v slit of heater.
- Sewing thread can be substituted for tack pins. However, allow a distance of 6 - 7 mm (0.24 - 0.28 in.) between both sewed parts of the heater and

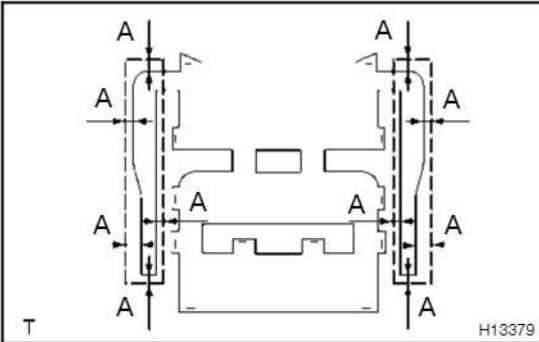


- (b) Thread the wire through the listing pocket after setting the seat heater to the seat cushion cover.



5. INSTALL SEAT CUSHION COVER TO SEAT CUSHION PAD

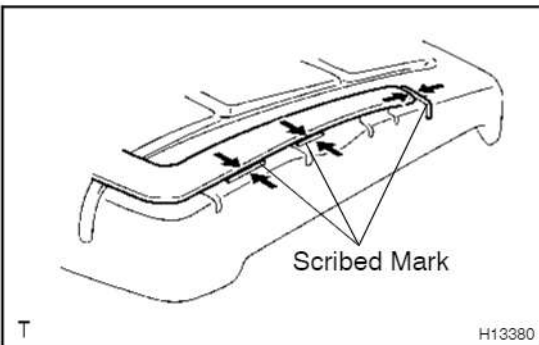
- (a) Thread the 6 wires through the listing pocket.
- (b) Install the seat cushion cover with 23 new hog rings.
- (c) Reverse turn the seat cushion cover back into its original position.



6. INSTALL SIDES OF NEW SEAT HEATER

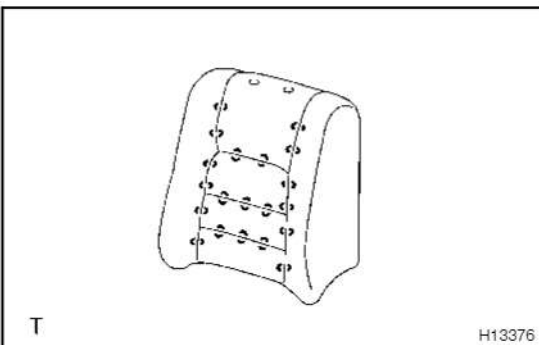
Install the sides of new seat heater to the seat cushion pad with adhesive tapes.

A: 15 mm (0.59 in.) or more



HINT:

Set the side of new seat heater, align its outline with the scribed marks.



7. INSTALL SEATBACK COVER TO PAD

- (a) Thread the 7 wires through the listing pocket.
- (b) Reverse the seatback cover back to its original position.
- (c) Install the seatback cover to pad with 26 new hog rings.

REASSEMBLY

Reassembly is in the reverse order of disassembly (See page BO-18).

INSTALLATION

Installation is in the reverse order of removal (See page [BO-17](#)).