RANGE ROVER

Owner's Handbook

1988 ON

FORECOURT DATA.

		9.35:1 compression ratio	8.13:1 compression ratio	Diesel.
FUEL	Grade - UK rating	4 star **** 97 minimum	2 star ** 90 minimum	gas oil or derv to BSI 2869, Class A1
	Tank capacity	79 - 5 litres (17 -5 gallons)		
Engine Oil		Dependant on engine type and operating conditions. see pages 143 - 146.		

Tyre pressures	Normal on and off road use all speeds and loads	Front. 1-9 bar (28 lbs per sq in) Rear. 2-4 bar (35 lbs per sq in)

If in doubt or for specific conditions see page 139.

Notes.....

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BY APPOINTMENT
TO HM THE QUEEN
MANUFACTURERS OF LAND ROVERS
AND RANGE ROVERS
LAND ROVER UK LTD., SOLIHULL

BY APPOINTMENT
TO HRH THE DUKE OF EDINBURGH
VEHICLE MANUFACTURERS
LAND ROVER UK LTD., SOLIHULL

BY APPOINTMENT
TO HM QUEEN ELIZABETH THE QUEEN MOTHER
MANUFACTURERS OF LAND ROVERS
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BY APPOINTMENT
TO HRH THE PRINCE OF WALES
VEHICLE MANUFACTURERS
LAND ROVER UK LTD., SOLIHULL

RANGE ROVER

Specification details set out in this Handbook apply to a range of vehicles and not to any particular vehicle. For the specification of any particular vehicle owners should consult their Distributor or Dealer.

The Manufacturers reserve the right to vary their specifications with or without notice and at such times and in such manner as they think fit. Major as well as minor changes may be involved in accordance with the Manufacturer's policy of constant product improvement.

Whilst every effort is made to ensure the accuracy of the particulars contained in this Handbook, neither the Manufacturer nor the Distributor or Dealer by whom this Handbook is supplied, shall in any circumstances be held liable for any inaccuracy or the consequences thereof.

LAND - ROVER **Land Rover Ltd**

Land Rover Limited
Lode Lane
Solihull
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England

SELF HELP IN AN EMERGENCY

Remember the breakdown safety code

If breakdown occurs while travelling:-

- Wherever possible, consistent with road safety and traffic conditions, the vehicle should be moved off the main thoroughfare preferably into a lay-by. If breakdown occurs on a motorway, pull well over to the inside of the hard shoulder.
- Switch on hazard lights.
- If possible, position a warning triangle or flashing amber light at an appropriate distance from the vehicle to warn other traffic of the breakdown. Note the legal requirements of some areas in this respect.
- Consider evacuating passengers through nearside doors on to the verge as a precaution in case of your Range Rover being struck by another vehicle.

A simple solution?

Many causes of breakdown are often simple and easily resolved. We suggest that the following checks are made before reference to the more detailed fault finding list given in Section 3 of this handbook.

If the engine will not start

- Is there fuel in the tank?
- Are battery and earth connections secure and clean?
- Is there sufficient charge in the battery to operate the starter efficiently? If not, see 'Overcoming a discharged battery problem' in Section 3.
- On an automatic model, is the main gear selector either fully forward in the 'P' (park) position or in the 'N' (Neutral) position? Otherwise the starter will not operate.

If a fault is found, it should be rectified and then an attempt made to start the engine before progression to the next check.

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THE FORMAL INTRODUCTION

1

A quality product
Congratulations on receiving your new Range Rover, a quality product vaguely imitated by some but still a world leader in the luxury 4 x 4 market. The manufacturer, Land Rover UK Limited, achieves high standards in the design and production of the vehicle to ensure reliability and efficiency in operation.

These standards can be continued throughout the life of the Range Rover by proper maintenance and care from the operator.

The important first step in preventive maintenance, the Pre-delivery Inspection of your vehicle, will have been completed by your Dealer or Distributor who should also be contacted for advice, subsequent inspections or planned servicing requirements as recommended in this book.

Now it's up to you. Use your Dealer or Distributor and use this book to help you ensure a long and efficient operating life for this highly mobile aristocrat.

The structure of this book
Generally it is assumed that the reader has no previous knowledge or experience in the operation of a Range Rover but is, of course, a qualified driver.

Therefore, the information in this book is presented to guide the reader progressively from reception of the vehicle through familiarisation with controls and instrumentation, starting and driving techniques, day-to-day running requirements and longer term workshop maintenance. A 'Data' section is included at the end of the book.

Where specific information is sought, first consult the list of contents which will direct you to the relevant page or pages.

Models covered
This book covers petrol-engined electronic fuel injection (EFI) models with either the manual or automatic gearbox. Two- or four-door versions, diesel models and various items of optional equipment are also mentioned.

Note however that all petrol-engined models feature electronic ignition using the Lucas 35 DLM8 distributor which is factory pre-set and should not be altered or disturbed. Any attention required on this item or on any aspect of the electronic fuel injection system used on some models must be referred to your qualified Range Rover Dealer or Distributor.

Key numbers
For security reasons the key numbers are not stamped on the locks. Loss of the one key for the ignition and all locks (except on two-door models which have a separate key for the lockable fuel filler cap) completely immobilises the vehicle. The key is of a special design obtainable only from Land Rover Limited or authorised agents, dealers and spares stockists. The key and a duplicate, both attached to a tag bearing the common key number, are supplied with each vehicle.

Owners and operators are advised therefore to take the following action:
(a) Immediately on receipt of the vehicle, record the key number so that in case of loss, a replacement can be obtained. Remove the tag after recording the key number.
(b) Keep the spare key away from the vehicle in a safe place but where it is readily accessible.

Read on and enjoy real motoring!

Warnings and cautions
For the protection of yourself and others and the longer service life of your vehicle please heed the instructions carefully and note particularly the warnings, cautions and notes that are given throughout this handbook in the following form:

WARNING: Procedures which must be followed precisely to avoid the possibility of personal injury or other damage.

CAUTION: This calls attention to procedures which must be followed to avoid damage to components.

NOTE: This offers advice or calls attention to methods which make a job easier to perform.

WARNING: Your Range Rover has a higher ground clearance and hence a higher centre of gravity than an ordinary passenger car to enable it to perform in a wide variety of off-road applications. An abrupt manoeuvre at an inappropriate speed or on an unsuitable surface could cause the Range Rover to go out of control.

WARNINGS: In the interests of road safety, your attention is drawn to the following important safety procedures:

Be sure to read the on- and off-road guidelines given under 'Driving techniques' in Section 3

Always use the seat belt, even on the shortest journeys. This is a legal requirement in the United Kingdom and many other areas.

Before driving, familiarise yourself with the layout and purpose of all controls, gears and switches.

Adjust the seat as necessary to achieve a comfortable driving position with full control over the vehicle.

Always start vehicle and operate controls from the driving position.

Do not reach through the steering wheel to operate any controls.

Do not adjust the drivers seat while the vehicle is in motion, as this may result in the loss of vehicle control.

The head restraints should not be removed while the seat is occupied.

It is advisable to restore the operation of the interior release handle when the child proof lock facility is not required.

Do not carry passengers in the load space.

Do not carry unsecured equipment, tools or luggage which could move and cause personal injury in the event of an accident or emergency manoeuvre either on or off-road.

Do not loosely store the load space cover in the vehicle. When not in use the cover should be stored vertically in the space provided directly behind the rear seat.

All tools should be correctly stored in their location after use.

WARNINGS (Continued): In the interests of road safety, your attention is drawn to the following important safety procedures:

Under no circumstances should the ignition key be turned to the 'steering locked' position or any attempt made to withdraw the key whilst the vehicle is in motion.

Ensure your speed is low enough for an emergency stop to be effective and safe under all road and vehicle loading conditions.

Do not drive with the tailgate open; poisonous carbon monoxide fumes can enter the vehicle.

Auxiliary devices such as roller generators intended to be driven by one wheel of a vehicle MUST NOT be used with your Range Rover. The viscous coupling in the transfer box will not allow drive to one wheel alone, therefore, any attempt to utilise the drive in this way will produce movement of the vehicle and may cause damage and/or injury.

Parking

Always fully apply the parking brake when leaving your vehicle or it may roll and cause damage or injury. Also be certain to leave a manual transmission in low gear (always ensuring that neutral is selected before re-starting the engine) and an automatic transmission in 'Park'.

A manual transmission vehicle should be parked in a low forward gear when facing uphill and in reverse gear when facing downhill.
For extra security, particularly on slopes, engage low transfer gear.
On slopes and particularly with the low transfer range engaged, ensure that the parking pawl of the automatic gearbox has fully engaged by carefully releasing the brakes and allowing the vehicle to 'rock' into 'Park'. Never leave keys in the vehicle.

An illuminated brake warning light does not indicate that the parking brake is fully applied, only that the brake is not disengaged.

On a vehicle fitted with automatic transmission, never use the 'P' park position (gear selection) as a substitute for the parking brake. It should be used IN ADDITION to the parking brake.

Never leave unsupervised children in your vehicle.

(Continued)

WARNINGS (Continued): In the interests of road safety, your attention is drawn to the following important safety procedures:

Safety in general maintenance

Frequently clean the windscreen, rear and side windows to achieve clear vision. Use a solvent in the screen washer reservoir.

Maintain all external lights in good working order and ensure correct setting of headlamp beams.

Maintain correct tyre condition and pressures. These should be checked at least each month, or more frequently when high-speed touring or under cross-country conditions, even to the extent of a daily check.

Under no circumstances should cross-ply tyres be used on this vehicle. It is particularly important that you heed the warnings and information given under "Tyres and Wheels" in Section 4. Wheels, tyres and tyre pressures are specified in Section 6.

Keep hands, hair and clothing well clear of all moving parts.

Do not remove the expansion tank filler or radiator filler plug when the engine is hot, because the cooling system is pressurised and personal scalding could result.

Do not remove any drain plugs while the fluid is hot, otherwise serious burns or scalding may be caused.

Many liquids and other substances used in motor vehicles are poisonous, they must not be consumed under any circumstances and must be kept away from open wounds. These substances include anti-freeze, brake fluid, fuel, windscreen washer additives, lubricants, battery contents and various adhesives.

Some components on your vehicle may contain asbestos. Breathing asbestos dust is dangerous to your health and you should heed the information on the subject given in Section 5.

Do not use any lubricants, solvents or sealants, etc. before reading and understanding any warnings and instructions supplied with these substances which could be harmful if improperly used.

Do not use reclaimed brake fluid, mineral oil or brake fluid that has been stored in old or open containers.

NOTE: The braking system is servo assisted only when the engine is running. The steering system is power-assisted only when the engine is running.

The suspension levelling unit contains pressurised gas and must not be dismantled nor the casing screws removed. Repair is by replacement of the complete unit only.

(Continued)

1 WARNING LABEL LOCATION

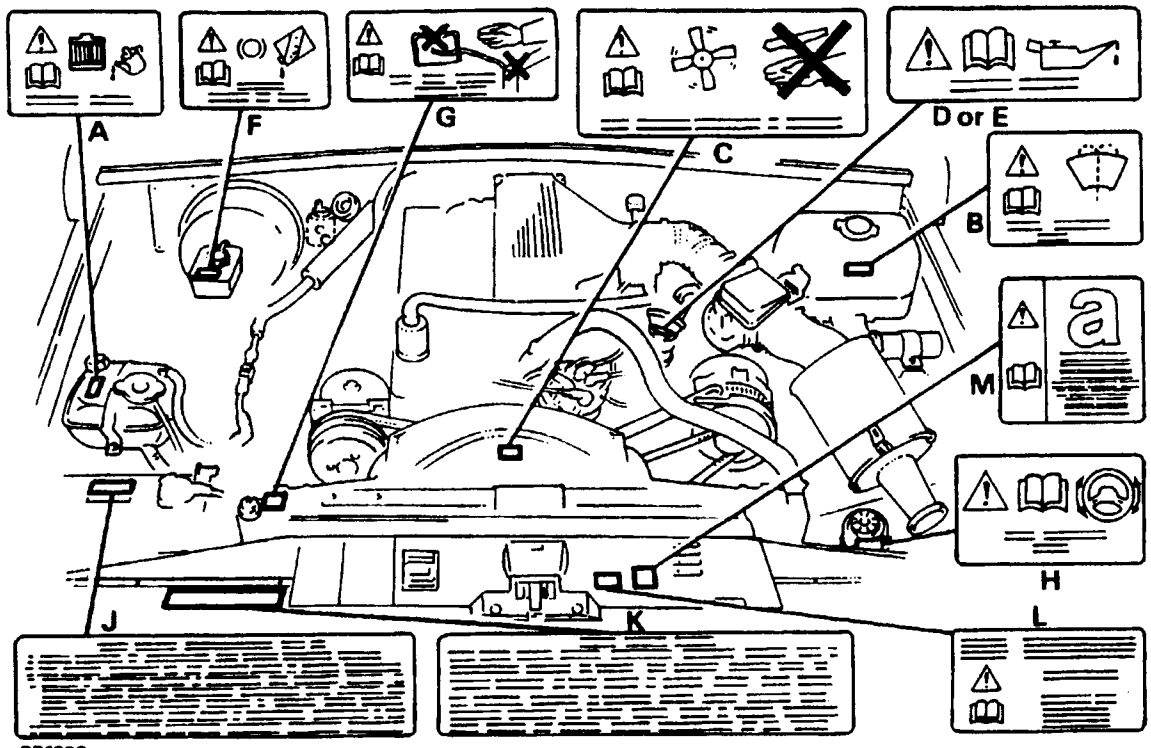


Fig. RR1383 - ***Note;*** *This illustration is for general guidance only as the position of components and the extent of labelling on the vehicle will vary between models in the range.*

Key to warning label location - Fig. RR1383

A Engine coolant

B Screen washer fluid

C Keep clear of rotating parts

D Petrol models:
Engine oil

E Diesel models:
WARNING - ENGINE OIL
Refer to handbook for approved oils.
Use of non-approved oils in this turbo-charged engine may seriously reduce engine life.

F Brake fluid DOT 4

G Do not remove when hot

H Power steering fluid

J WARNING: Explosive gases - Sulphuric acid

1. Keep sparks and flames away from battery. No smoking.
2. Contains sulphuric acid, flush with water if splashed on skin or eyes.
3. Re-charge off the vehicle in a well-ventilated area.
4. Disconnect earth lead first - re-connect last.
5. Switch off charger before disconnecting charger leads.
6. After securing in vehicle, wait 5 minutes before re-connecting. Ensure correct polarity before fitting. Keep away from children.

K WARNING: Air conditioning
This system is filled at high pressure with a potentially toxic material. Follow servicing instuctions when dismantling or applying excessive heat e.g. steam cleaning, painting, etc. Servicing must only be carried out by a qualified engineer in accordance with instructions in the workshop manual.

L Symbol. Identification.
WARNING: Refer to handbook.

M WARNING: Contains asbestos.
Breathing asbestos dust is dangerous to health. Follow safety instructions.

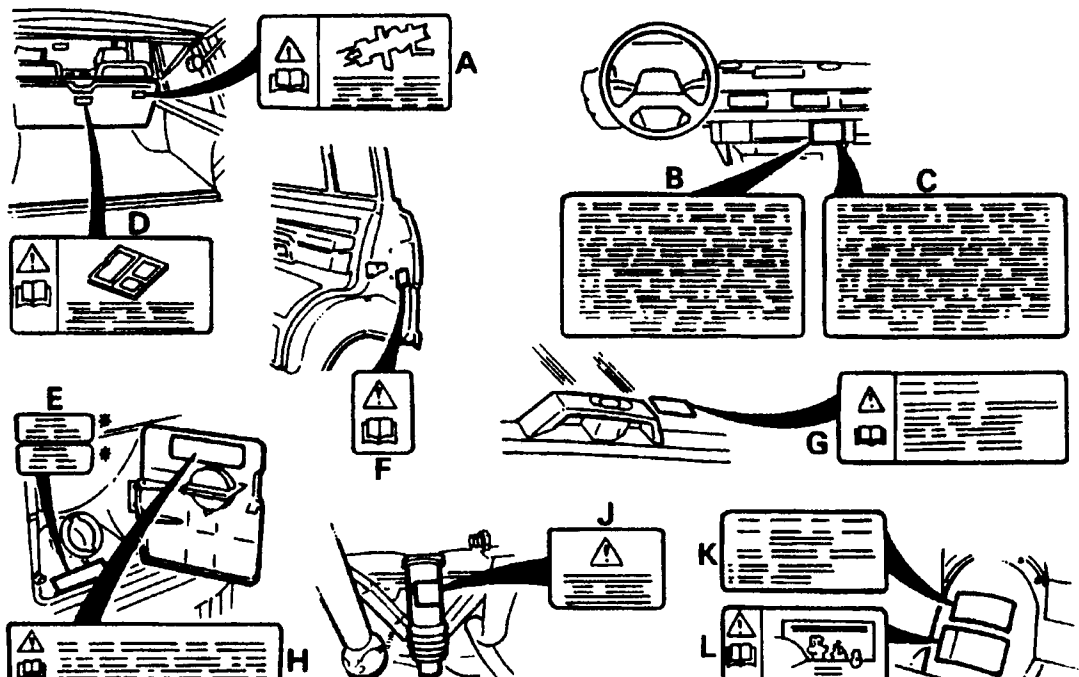


Fig. RR1384 - **Note;** *This illustration is for general guidance only as the position of components and the extent of labelling on the vehicle will vary between models in the range.*

Key to warning label location - Fig. RR1384

A Replace seat belt in the stowage clip when not in use.

B Automatic transmission:
Important - transfer gearbox information.
To change transfer ratio, reduce speed to below 8km/hour (5mph), select auto N', move high/low lever rapidly to required position, select auto gear. Alternatively, stop vehicle, make selection as above. For maximum engine braking, select auto 1', keep engine running.
WARNING: This vehicle must not be driven on a two wheel rolling road unless precautions are taken. For further information on correct driving techniques and rolling road operation, refer to driver's manual.

C Manual transmission:
Important - transfer gearbox information. To change transfer box ratio, reduce speed to below 8km/h (5mph), select neutral, move high/low lever rapidly to required position, select gear. Alternatively, stop vehicle and make selection as above.
WARNING: This vehicle must not be driven on a two wheel rolling road unless precautions are taken.
For further information on correct driving techniques and rolling road operation, refer to driver's manual.

D Do not store loose in the vehicle.

E Diesel fuel only *
Unleaded fuel only *
* (where applicable)

F Caution! See handbook.

G Do not drive the vehicle with the upper and/or lower tailgate open.

H Fuel spillage - Unless absolutely necessary the fuel filler cap should not be removed unless the vehicle is standing on flat and level ground.

J Pressurised! Do not dismantle.

K Important:
Before jacking vehicle
1. Apply handbrake.
2. Chock wheels.

L Tool storage.

WARNINGS (Continued): In the interests of road safety, your attention is drawn to the following important safety procedures:

Combat theft
Never leave your vehicle unattended with the key in the ignition switch. Always remove the key and lock all doors when leaving your vehicle unattended. Check that windows are secure and remove or conceal any items that might create the temptation to steal.

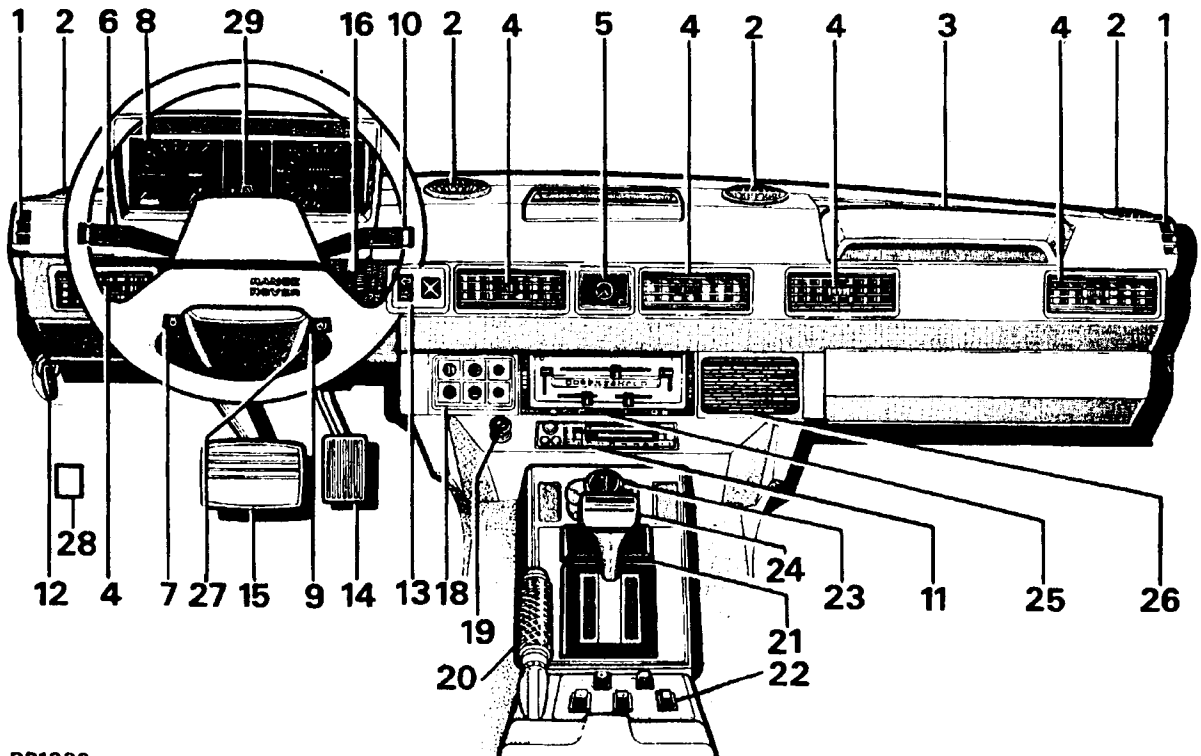
See also 'Ignition switch and keys' (Section 2) for further security measures.

USED Engine Oils
Prolonged and repeated contact with used engine oil may cause serious skin disorders, including Dermatitis and Cancer. Therefore, excessive skin contact with such oil should be avoided. Any skin affected should be washed thoroughly after contact. Used engine oil should particularly be kept out of reach of children.

Protect the environment
In many areas, it is illegal to pollute drains, water courses or soil. Use authorised waste disposal facilities, including civic amenity sites or vehicle servicing centres providing facilities for receipt of used oil. If in doubt, contact your local authority for advice.

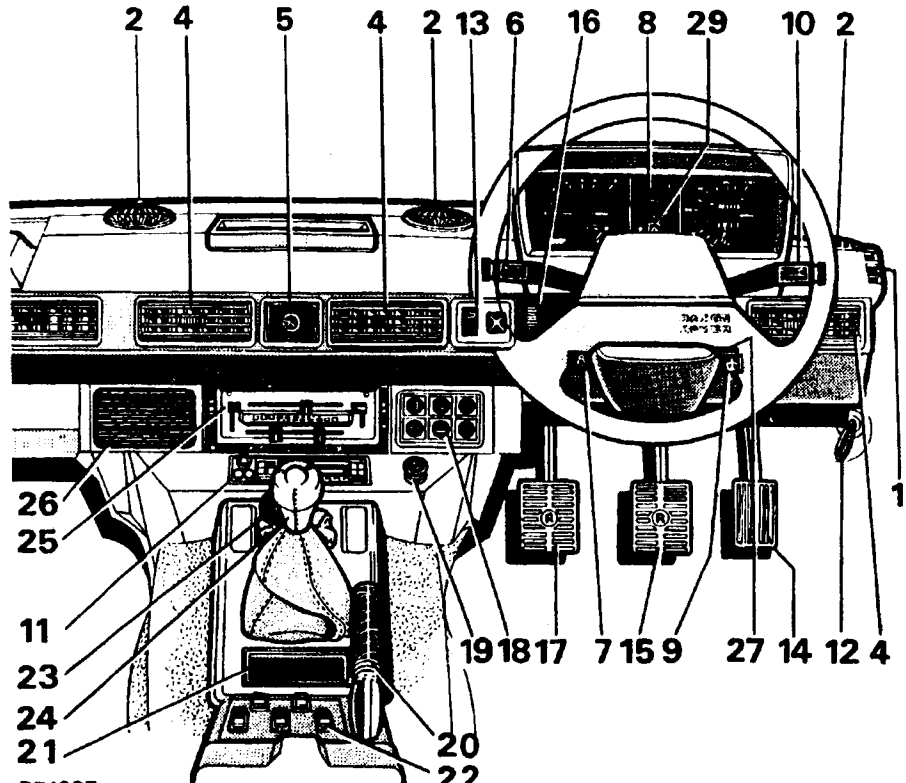
GETTING TO KNOW YOUR VEHICLE

2


1 2 6 8 29 16 10 2 4 5 4 2 4 3 4 2 1
28
12 4 7 27 15 9 14 13 18 19 20 21 22 24 23 11 25 26
RR1386

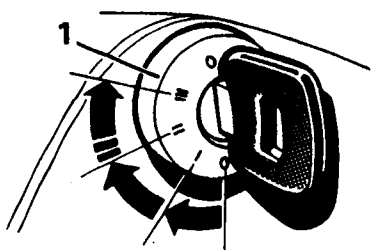
Key to fascia layouts - Figs. RR1386 and RR1387

1. Front door side demister vent
2. Windscreen demister vents
3. Grab handle
4. Ventilation louvres (Two only on non-airconditioned model)
5. Clock
6. Headlamp dip, flash, direction indicators and horn switch
7. Main light switch
8. Main instrument binnacle
9. Rear screen wiper and screen wash switch
10. Front windscreen wiper and screen wash switch
11. Radio/cassette unit (optional) or pocket
12. Bonnet release handle
13. Electrically operated exterior mirror controls (optional)
14. Accelerator pedal
15. Foot brake pedal
16. Instrument illumination electronic dimming control
17. Clutch pedal (manual gearbox only)
18. Auxiliary switch panel
19. Cigar lighter
20. Transmission handbrake/park brake
21. Ashtray
22. Electrically operated window control switches (optional)
23. Transfer gear lever
24. Main gear lever
25. Interior climate controls
26. Fuse box
27. Steering lock and ignition switch
28. Footrest
29. Hazard warning switch



RR1387

2 IGNITION SWITCH AND KEY



RR1177

Steering lock and starter switch Fig. RR1177
The four-position, key-operated switch (1) located on the right-hand side of the steering column, controls the mechanical steering lock, ignition, starter motor and, on diesel models, the heater plugs.
The steering lock/ignition starter switch and its electrical circuits are designed to prevent the ignition system and starter from being energised while the steering lock is engaged. Serious consequences could result from alterations to or substitution of the steering lock/ignition switch or its wiring. In no circumstances must the ignition switch be separated from the steering lock.

Switch positions:
'O' Insertion or removal of the key is possible only at this position;
Always remove the ignition key when leaving the vehicle unattended.

Removal of the key and movement of the steering to the straight ahead position will engage the steering lock.

To disengage the steering lock, the key must be inserted and turned clockwise. Slight movement of the steering wheel will assist in disengagement of the lock.

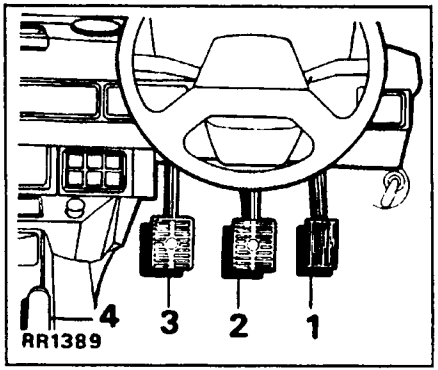
'I' Steering unlocked, ignition off;
Where applicable, the audio unit, electric window lifts, electric seat adjustment and front screen wipers can be operated.

'II' Ignition switched on;
Petrol driven models - all electrical circuits can be operated.
Diesel models - all electrical circuits switched on, heater plugs operating.

Leave the key in this position until the heater plug warning light (symbol shown on the left) goes off, then turn the key to the next position.

'III' Starter motor operates;
The key will return to the position **'II'** as soon as released.

WARNING: Do not under any circumstances return the key to the 'O' position until the vehicle is stationary.
To prevent the steering column lock engaging it is most important that before the vehicle is moved in any way i.e. for towing or coasting purposes, the ignition key must be inserted in the lock and turned to the auxiliary position 'I'. If, due to an accident or electrical fault, it is considered unsafe to turn the key, the negative lead of the battery must first be disconnected and then the key turned.



Steering
The hydraulic power-assisted steering is progressively geared. When steering straight ahead it is relatively low geared but becomes progressively higher geared as the steering wheel is turned.

CAUTION: Under no circumstances must the steering wheel be held on full lock for more than thirty seconds in any one minute, otherwise there will be a tendency for the oil to overheat and damage to the seals may result.

WARNING: Land Rover Ltd. do not recommend that any modifications be made to the suspension or steering system, as this could seriously affect the handling characteristics of the vehicle.

Pedals - Fig. RR1389
Clutch (3 - manual gearbox models only), brake (2) and accelerator (1) pedals are the pendant type and function in the normal way. The brake and clutch operate hydraulically (with servo assistance for the brake when the engine is running).

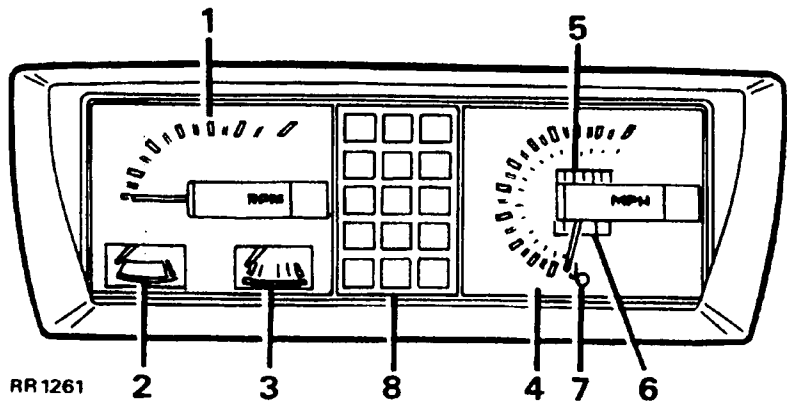
To avoid needless wear of the clutch withdrawal mechanism, do not rest the foot on the clutch pedal while driving.

On automatic models, the accelerator pedal, in addition to controlling engine speed, can be used to obtain a rapid downshift in the automatic gearbox by depressing the pedal fully (kickdown).

Handbrake - Fig. RR1389
A drum-type handbrake operates directly on the transfer box rear output shaft and is designed for parking use only.

The brake is applied by pulling back the lever (4). To release, pull the lever slightly back, depress and hold the release button while pushing the lever down to the limit of its travel.

WARNING: Do not apply the handbrake while the vehicle is in motion as this could result in loss of vehicle control which may cause personal injury and, at the very least, damage to the transmission.



Main Instrument Binnacle - Fig. RR1261
Mounted on the top of the fascia directly in front of the driver, the binnacle houses the following easily-visible instruments:

The **tachometer (1)** indicates the engine speed in revolutions per minute. For normal road work, petrol engine speeds of between 2,000 and 5,000 rev/min and diesel engine speeds between 2000 and 3500 rev/min will be found to produce the most satisfactory performance from your Range Rover. Engine speed should never exceed 5,500 rev/min on petrol-driven models or 4,700 rev/min on diesel versions: these maximums should be considerably reduced during the recommended 'Running-in' period (see Section 3).

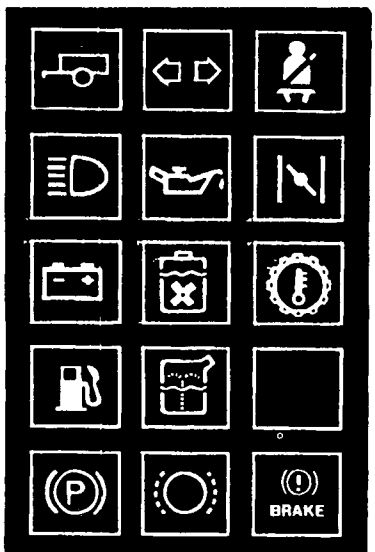
The **coolant temperature indicator (2)** needle should register in the mid-way area under normal running conditions. Should the needle travel to the hot (orange coloured) area during normal usage, the vehicle must be stopped and the cause investigated.

Fuel Gauge (3). With the ignition switched on, the needle will indicate the approximate level of fuel in the tank. Low fuel level is indicated when the needle position approaches the orange-coloured marker on the left of the gauge and is also indicated by illumination of a warning light in the centre panel. For fuel tank capacity details see the 'Data' section at the rear of this book.

The **speedometer (4)** is a mechanical instrument which also incorporates an **odometer (5)** showing total distance travelled and a **distance trip meter (6)** which can be reset to zero by depressing the **button (7)** projecting from the instrument face.

The **warning light central panel (8)** which will vary between diesel and petrol-driven models, uses symbols (shown on the following pages) which include a symbol for the high temperature of automatic gearbox oil where appropriate.

Binnacle Centre Panel Warning Lights - Fig. RR1262



RR1262

NOTE: Warning lights are intended to be of assistance only in the operation of your vehicle and should not be solely relied on for evidence of malfunction.

The driver's own judgement is important. If any malfunction is suspected, the vehicle should be stopped as soon as possible (consistent with road safety) and the cause investigated.

Trailer indicators

The green trailer warning light is only operative when a trailer is connected to the vehicle via a multi-pin socket (see Section 4)

The warning light will flash in conjunction with the vehicle direction indicator warning lights, thus demonstrating that the trailer indicator lamps are functioning correctly. In the event of a direction indicator bulb failure, the trailer warning light will **not** be illuminated.

Direction Indicators

Both green arrows flash in conjunction with the selected set of direction indicator lights. In addition the flasher unit is audible while the lights are flashing. Should a direction indicator bulb fail, the panel warning light will **not** function but the flasher unit will be heard.

NOTE: Direction indicators and warning lights should flash simultaneously when the hazard warning switch on the top of the steering column is operated.

Seat Belt

The red warning light illuminates and will remain on when the driver's seat belt is not fastened and the ignition is switched to the "II" position.

NOTE: The seat belt warning symbol appears on all Range Rover binnacles but will only illuminate when territory regulations require a seat belt warning system.

Audible warnings

For certain market requirements only, the vehicle specification will include the following audible warning systems:

Driver's safety belt reminder - a buzzer will operate when the ignition key is turned to position 'II' until the driver's seat belt buckle is correctly fastened.

Excess speed warning - a buzzer will operate whenever the vehicle speed is in excess of approximately 120 km/hour.

2 BINNACLE WARNING LIGHTS

Main beam

The blue warning light is illuminated when the headlamp main beams are in use; its purpose is to remind you to dip the headlamps when entering a brightly lit area, or when approaching other traffic. The warning light will also be illuminated when the headlamp flasher switch is used.

Low engine oil pressure

The red warning light should always glow when the ignition is first switched on. If the light remains on with the engine running, the engine must be stopped immediately and the cause investigated.

Ignition

The red ignition warning light should glow when the ignition is first switched on. If the light stays on when the engine is running, stop the engine and investigate.

Low coolant level

This red signal will flash when the coolant level is too low.

The fault must be rectified at the earliest opportunity but in the meantime care must be taken to ensure that the engine does not overheat.

Fuel level

The amber warning light will be illuminated when there is less than approximately 13 litres (approximately 3 gallons) left in the fuel tank. The light will remain on until the fuel supply is replenished. Intermittent flashing may occur when cornering before the low fuel sensing level is reached.

Automatic gearbox oil temperature (where applicable)

If the vehicle is being worked hard in high transfer gear at low speeds, the oil temperature in the automatic gearbox will rise and cause illumination of the warning light. The driver must change to a lower gear to extinguish the light by selecting position **3, 2** or **1.**

If the light remains on, the LOW (L) transfer gear ratio must be engaged (see Changing transfer gear ratio' details later in this section). If the light remains on with the transmission in low transfer and main gear position 2 or 1 selected, the vehicle MUST be stopped, N' neutral selected and the engine kept running at approximately 2,000 rev/min until the transmission oil temperature has fallen and the light is extinguished.

Transmission (parking only) handbrake

Application of the handbrake with ignition 'on' illuminates a red warning light showing this symbol.

WARNING: Illumination of this light does not indicate that the brake is fully applied, merely that the brake is not disengaged.

Low screenwash fluid level

Illumination of this amber signal while the ignition switch is in the 'II' position indicates reduction of the washer reservoir contents below approximately 1/4 litre (1/2 pint). The reservoir should be replenished at the earliest opportunity.

Heater plug operation (diesel models only)

This symbol will be illuminated to indicate that the heater plugs are warming up. During this period, the ignition key should be kept in the II' position until the warning light is extinguished before the key is turned to the III' position to operate the starter motor.

Brake pad wear

This symbol has an amber light which will illuminate when the brake pads have worn down to the minimum permissible thickness and must be renewed.

Brake fluid level failure / handbrake applied

With the ignition switched on, this red signal will illuminate if the handbrake is not disengaged or if there is a loss of fluid from the braking system.

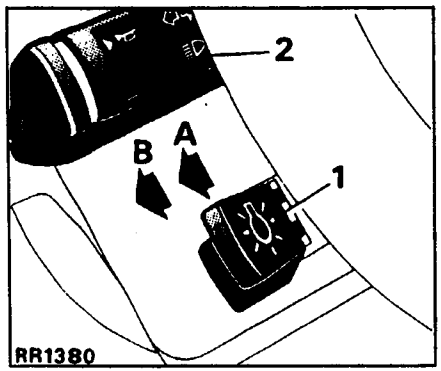
As a fail-safe precaution against total brake failure, a primary and secondary hydraulic system is incorporated. Should one of the hydraulic circuits fail, the other circuit will continue to function. This will result in increased brake pedal travel and effort.

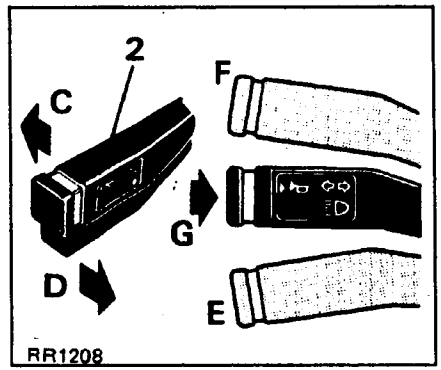
Do not pump the brake pedal in an attempt to restore pedal pressure. If there is pressure failure in one of the brake circuits the cause must be investigated immediately.

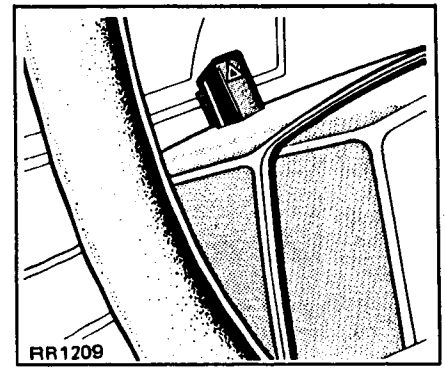
Unless as a result of investigation you are satisfied that it is safe to proceed, you should leave the vehicle where it is and call for assistance. Even if you are satisfied that it is safe to proceed, extreme care should be taken and heavy braking avoided. In deciding whether it is safe to proceed you should consider whether you will be infringing the law.

WARNING: DO NOT drive the vehicle while the brake warning light is illuminated.

2 ILLUMINATION AND HORN CONTROL







Lights, direction indicator and horn - Figs. RR1380 and RR1208

Headlamps "Dim dip" lighting (UK only)
Vehicles manufactured after October 1st 1986, must comply with new lighting regulations which prohibit such vehicles being driven on side lights only. On Range Rovers, this is achieved by the addition of an electronic control unit in the lighting system, so that when the side lights are switched on with the engine running, low voltage current is also supplied to the headlamp dipped beam circuit, giving dim dipped lighting. When the headlamps are switched on, full voltage is automatically restored, giving normal headlamp lighting.

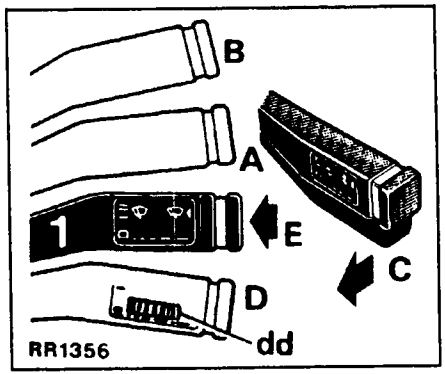
Sidelights and headlights
Move the paddle switch (**1**), on the left-hand side of the steering column, away from the driver to illuminate the sidelights (headlight dim dip' and sidelights in U.K. only) and panel lights. Move the switch to position **B** to illuminate the headlights which are operative only while the ignition is switched on.

Headlight dip and main beam
Move the lever (**2**) away from the driver **C**) to switch on the headlight main beam. Flick the lever towards the driver **D**) to flash the headlights.

Direction indicators
Move the lever down (**E**) to indicate the intention to turn LEFT. Move the lever up (**F**) to indicate the intention to turn RIGHT. Hold the lever against spring pressure when indicating lane change.

Horn
To operate, press the end of the lever inwards (**G**).

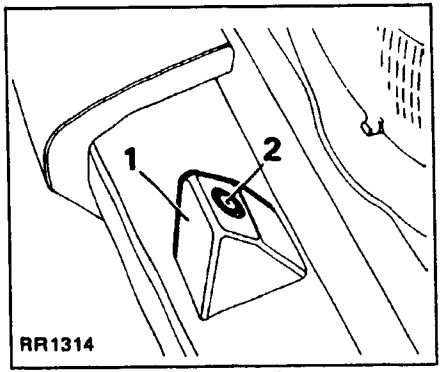
Hazard warning - Fig RR1209
Press the switch to make all the direction indicators flash together as hazard warning lights; the RED light in the switch and the direction indicator light in the centre warning light panel will also flash. To switch off, press the switch again.



Front screen wipers and wash/wipe - Fig. RR1356

CAUTION: To prevent possible overload damage to the linkage or the wiper motors in either freezing or very hot conditions, ensure that the blades are not adhering to the glass before switching on the wipers.

Raise the lever **(1)** to its first position **(A)** for normal wipe and to its second position **(B)** for fast wipe. Flick the lever towards the driver position **(C)** to obtain a single wipe. Move the lever down **(D)** to obtain intermittent wiping and move the projection (dd) to vary the delay between wipes as required. Always cancel and allow the front wipers to return to their parked positions before switching off the ignition. Press the end of the lever inwards **(E)** to obtain a windscreen wash and wipe. The wash/wipe will continue for as long as the lever is depressed.



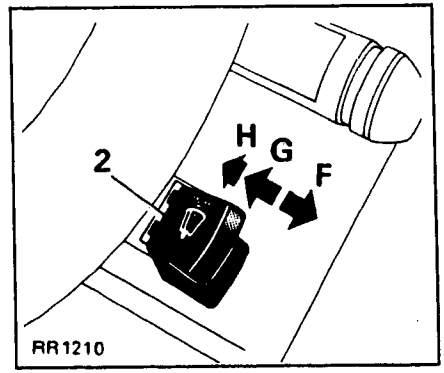
When released, the wash will stop immediately but the wipers will continue for a further five seconds approximately. When selected, this sequence will override any other wiper function.

Note: Your vehicle is fitted with electrically heated front windscreen washer jets. The jet heaters will automatically come into operation at temperatures below approx. 4°C (39°F).

Headlamp wash - Fig. RR1314

If the headlamp washer facility is fitted (optional), this will operate in conjunction with the windscreen washer when the headlamps are switched on in the dipped position.

The headlamp washer jet units (1) are fitted on the top of the front bumper, one in front of each headlamp. The jet direction can be adjusted with the aid of a needle inserted into the orifice (2) which can also be cleared with a fine needle or wire when necessary.



Rear screen wash/wipe - Fig.RR1210

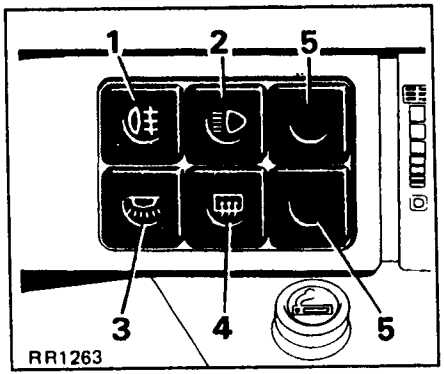
Move the paddle switch (2) away from the driver **(F)** against spring pressure for a jet of wash solution onto the rear screen, with a wipe cycle which will continue for a few wipes after release of the paddle switch.

The rear screen wiper will automatically return to the parked position when a door or the tailgate is opened.

Move the paddle switch towards the driver **(G)** against spring pressure to commence intermittent wiping (a few wipes then delay). Move the switch towards the driver **(H)** and release to cancel intermittent wiping.

If a door or the tailgate is opened during intermittent operation, the wiper will return to the parked position and, if the door or tailgate is then closed, the intermittent wiping cycle will resume a few seconds later.

2 AUXILIARY SWITCH PANEL



The **auxiliary switch panel (Fig. RR1263)** on the fascia has provision for six 'push-push' switches including two blank accessory positions. Relevant switches incorporate integral symbols which are illuminated when the vehicle lights are on.

The rear fog lights and heated rear screen switches incorporate individual bulbs illuminated when each switch is operated.

Rear fog guard lights

Operated by the switch **(1)** these lights are operative only when main or dipped headlights are in use. The amber symbol in the switch will be illuminated when the fog guard lights are on.

Auxiliary driving lights

Used in conjunction with the main light switch on the side of the steering column, the switch **(2)** controls the two auxiliary driving lights mounted in the detachable front spoiler fitted to some models of the Range Rover.

Interior roof and tailgate lights

This switch **(3)** is provided for illumination of the interior roof and tailgate lights when necessary with the doors closed. With this switch in the off position, interior lights will be illuminated via courtesy switches when a side door or tailgate is opened. In relation to front side doors only, the lights will remain on for approximately 15 to 18 seconds after the last door is closed. However, the lights will be extinguished as soon as the ignition is switched on.

Heated rear screen

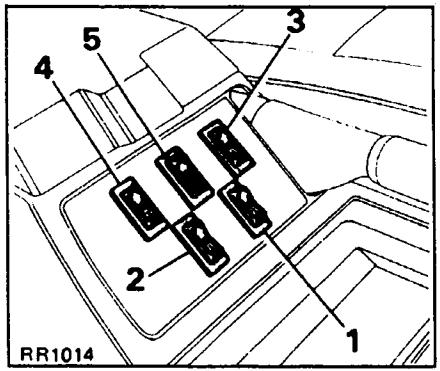
Press down the switch **(4)**. The amber warning light in the switch will be illuminated. The heated rear screen is only operative when the ignition is switched on.

A voltage sensitive switch is incorporated in the circuit to allow the heated rear screen and air conditioning to be used simultaneously under normal conditions.

However, should the total electrical loadings be such that the alternator cannot maintain adequate charge, for instance, when using all electrical services in a traffic jam, the voltage sensitive switch, will cut-out, rendering the heated rear screen inoperative. The switch will automatically cut-in again restoring the heated screen function as soon as conditions are favourable.

Accessory positions

Two switch apertures are fitted with blank covers **(5)** which are removable to facilitate the fitting of extra accessory switches if required.

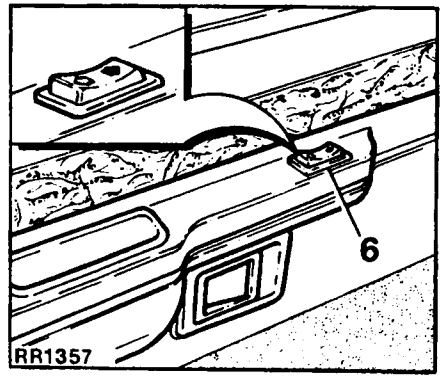


Electrically operated side door windows (where applicable) - Figs. RR1014 and RR1357

All side windows can be raised or lowered from four of the rocker-type operating switches mounted in the front face of the stowage box set between the front seats.

1. Left side, rear window } operating
2. Right side, rear window } switches
3. Left side, front window } switches
4. Right side, front window } switches
5. Isolating switch - rear window switches.

Additionally, for the convenience of rear seat passengers, both rear side doors are also fitted with a rocker switch **(6)**, integral with the door pull handle, which provides independent rear side window control.



Operating switches (1 to 4)

To **lower** glass depress **bottom** of switch, to **raise** glass depress **top** of switch.

Release switch as soon as window is fully open or closed.

The driver's window control is designed to lower the glass fully at a single touch on the lower part of the relevant switch. However, where partial opening only is required, the downward movement of the glass can be halted by momentary operation of the upper part of the switch. The glass can also be 'inched' down by momentary pressure on the lower part of the switch.

Isolating switch (5)

To isolate switches for rear windows, depress the top of the central switch in the group. Use of the facility **must** be considered whenever children are present in the rear seats.

To restore independent rear passenger control depress **the bottom** of the switch.

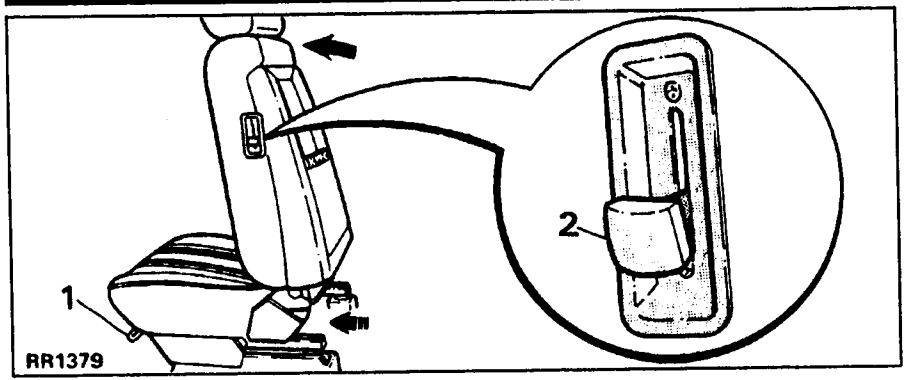
Rear side door window switch (6) - Fig. RR1357

Depress switch as indicated to lower or raise the glass.

CAUTION: Do not attempt to raise or lower a window when it is jammed by ice. Should a window be obstructed when being raised or lowered, a thermal cut-out will render the window inoperative. In this event, release the switch and remove the obstruction. The window can be re-operated after two seconds.

WARNING: Particular care should be taken that children are kept away from windows when raising or lowering is in progress.

2 SEAT ADJUSTMENT



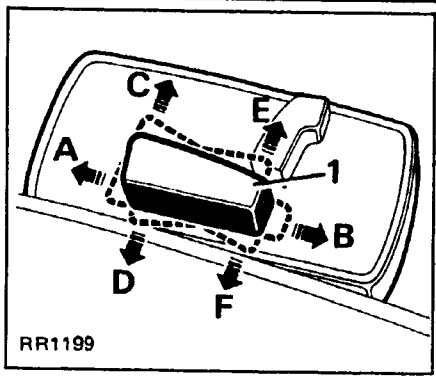
The new driver should adjust the seat as necessary to achieve a comfortable driving position to ensure full control of the vehicle and clear vision all round.

Front seat adjustment, two door models - Fig. RR1379
Fore and aft adjustment of the front seats is controlled by lifting the locking bar (1) at the front of the seat cushion.

To allow easy access to the rear seat, the backrests can be tilted forward after lifting the release lever (2) on the outboard side of each seat. The seat can then be moved forward on runners to provide the maximum space.

To restore the seat to its normal position, return the backrest to its pre-set angle and use the locking bar (1) to assist in moving the seat rearward. Ensure that the seat squab and backrest are securely located.

Rotate the handwheel, located on the inboard side of the seat, to alter the angle of the backrest as required.



Electrically adjustable front seats (where applicable) - Figs. RR1199 and RR1200

Some models of the Range Rover are fitted with power-operated front seat adjustment controlled from switches mounted on the inboard side of each seat and shown above.

WARNING: To avoid the risk of loss of control and personal injury, never adjust the driver's seat or seatback while the vehicle is in motion.

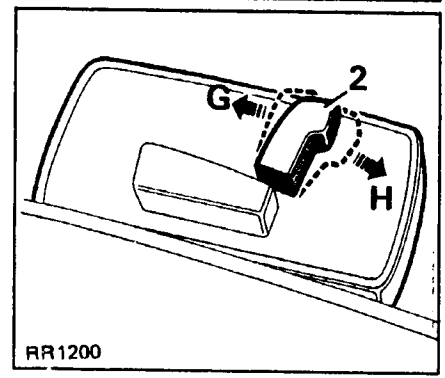
Seat adjustment switches are operative when the ignition key is turned to positions 'I' or 'II'. Regardless of the ignition switch, the driver's seat is also adjustable when the driver's door is open.

As you will observe, the switch unit simulates the seat profile and is operated in the same manner as the seat movement required i.e. as follows:

Seat adjustment - Switch (1) - Fig. RR1199
Fore and aft - switch to A or B.

Seat front up or down - switch to C or D.

Seat rear up or down - switch to E or F.

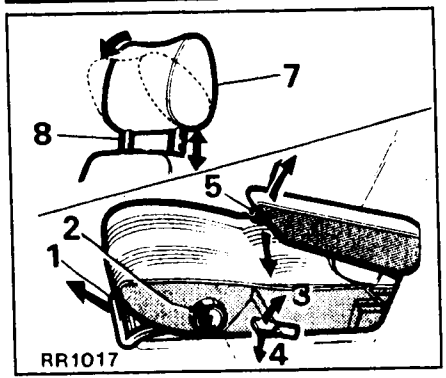


Backrest angle - switch (2) - Fig. RR1200
Decrease recline - switch to G.

Increase recline - switch to H.

Note: The fuse box and other equipment relative to the powered seating is housed under the left-hand seat. See Section 4 for fuse details.

2 SEAT ADJUSTMENT



Reclining front seats - Fig. RR1017
These seats have fore and aft position adjustment and fully reclinable backrests. On four-door models, height adjustment is also provided.

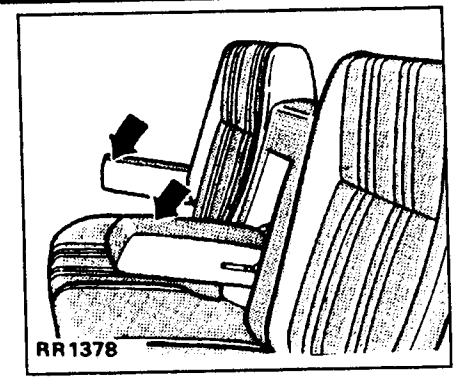
Fore and aft adjustment
Lift the bar **(1)** and slide the seat forward or backward to the required position. Lower the bar to lock the seat in position.

Backrest reclining adjustment
Rotate the handwheel **(2)** to alter the angle of the backrest as required.

Height adjustment, four-door models only - Fig. RR1017
To raise or lower the front of the seat squab, lift up the lever (3) and retain it in this position while occupying the seat and leaning the body forward or backward to obtain the seat height required.

To raise or lower the rear of the seat squab, push down the lever and retain it there while leaning the body forward or backward to obtain the required height.

Release the lever to lock the seat height.



Folding armrests (where fitted) - Figs. RR1017 and RR1378
A **centre** and two **outer** folding **fixed angle** armrests are fitted to the rear seat backrest. Two **adjustable angle** armrests are fitted to the **inner** side of the front seat backrests only. These complement the padded door pulls which provide an **outer** armrest facility.

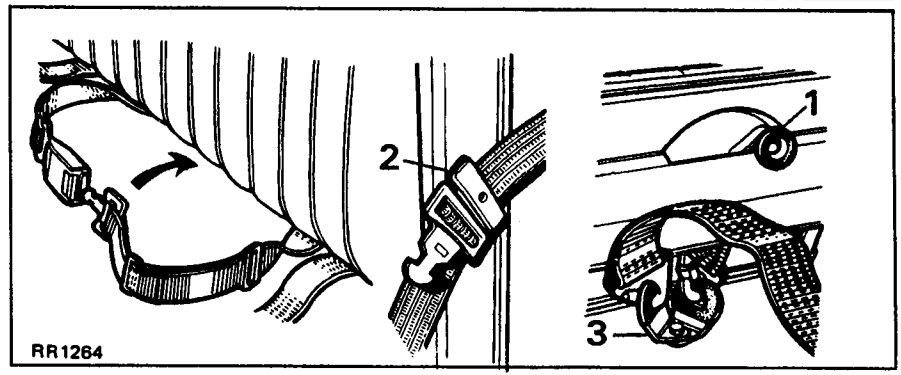
Armrest angle adjustment
Pull the armrest down into position then turn the knob **(5)** in the end of the armrest to preset the angle required.

Head restraints - Fig. RR1017
The head restraint is designed to support the back of the head, **not** the neck.

WARNING: The purpose of head restraints is to reduce the possibility of serious injury in a rear-end collision. Each head restraint should be adjusted be adjusted properly to provide maximum effectiveness in the event of a collision.

To adjust
The head restraint (7) may be raised or lowered into one of three set positions and/or swivelled forward or rearwards as required.

To remove
Lift the complete unit from its retaining guides (8) in the seat back.



Non-split rear seats (where applicable) - Fig. RR1264
The backrest and seat can be folded forward to increase the loading area in the rear compartment, but first on four door models open both rear passenger doors. The seat is secured in the normally upright position by catches at each end of the backrest which can be released by use of the lever (1) at the rear centre of the backrest.

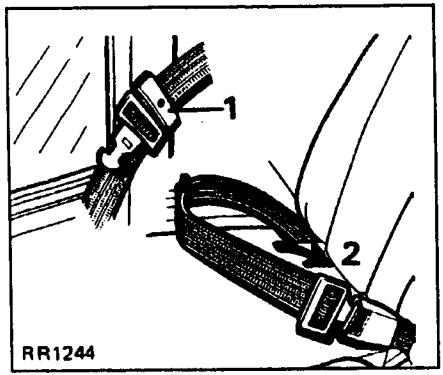
Protection of rear seat belts (where fitted)
Before folding down the rear seat back first ensure that the outer inertia type belts are correctly stowed in their clip holders (2).

To avoid damage to inner inertia type belts and static lap type centre belts mounted on the floor behind the rear seat, pass the four belts between the bottom of the seat back and the seat to the rear floor area as indicated.

Before erecting the rear seat ensure that all centre floor mounted belts are extended rearwards to prevent them from being trapped beneath the seatbase.

If the vehicle payload is likely to damage or chafe the belts in the rear floor area they should be removed temporarily. In this event unhook the belts from their respective floor mounted brackets by holding open the spring-loaded safety catch (3) . After reconnection ensure that the safety catch fully returns to the closed position.

2 FOLDING REAR SEATS

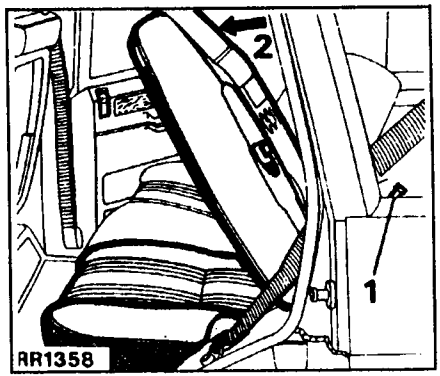


Split rear seating (where applicable)

One or both parts of the split rear seating can be either partially folded to provide a useful horizontal surface or fully folded forward to increase the rear load space.

Before folding either part of the seat, open the relevant rear passenger door (to avoid interference with the door furniture) and ensure that the inertia type outer seat belt is correctly stowed in the belt clip. **(1 - Fig. RR1244).**

To avoid damage to the lap-type centre-seat belts anchored to the floor behind the rear seat, pass the four belts carefully through the junction of the backrest and seat base as indicated **(2) so that they are clear of the folding seat.**



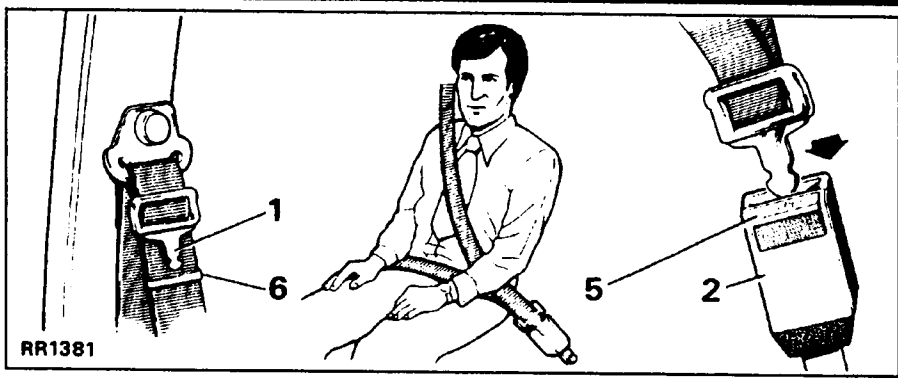
Folding the rear seat - Figs. RR 1358 and RR 1359

Each rear seat backrest is retained in the normal upright position by a latch at the window side of the backrest. Depressing the button (1) will release the latch and allow the backrest to be moved forward (2) to provide a horizontal surface on the seat or to be folded forward with the seat into a vertical position at the rear of the front seat (3).

Before erecting the rear seat ensure that all centre floor mounted belts are extended rearwards to prevent them from being trapped beneath the seatbase.

Then return the seatbase to the horizontal position but retain the backrest at approximately 45° to allow the passage of the belts between the squab and the backrest. Ensure the belts pass through inboard the seat frame and cannot be trapped or damaged. Then push the backrest into its vertical latched position.

WARNING: When the seat is erected, the latching mechanism should be visually checked and physically tested to ensure that the latch is secure.



Inertia type front seat belts - Figs. RR 1381 (2-door models) and RR1021 (4-door models)
Seat belts fitted to both front seats are of the inertia reel type designed for one-handed engagement.

Under normal driving conditions the reel will allow the belt to extend and retract to permit normal body movement without locking but will lock automatically in the event of hard braking or fast cornering.

No adjustment is required as the automatic retraction of the reel retains the belt at the correct tension.

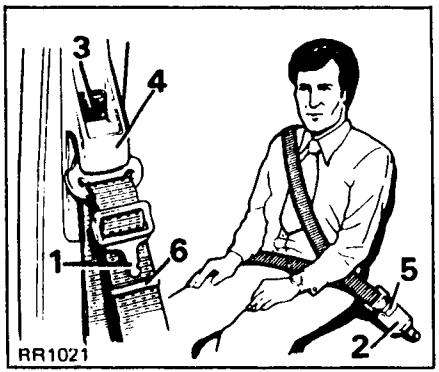
Using the seat belt
Using the tongue (1) draw the belt out of the carriage on the door pillar until a loop is formed, then pass the arm nearest to the door through the loop.

Pass the belt across the chest and push the tongue into the buckle unit (2) attached to the inner seat fixings. A positive 'click' will indicate when the buckle is safely engaged.

In some circumstances, perhaps due to the vehicle being on sloping ground, the automatic locking mechanism may engage and prevent the initial extension of the belt. This is not a fault, ease the belt from its attachment to fit.

WARNING: Seat belts are designed to bear upon the bony structure of the body and should be worn across the pelvis, chest and shoulder. Wearing the lap section of the belt across the abdominal area must be avoided. Belts should not be worn with the straps twisted.

(Continued)



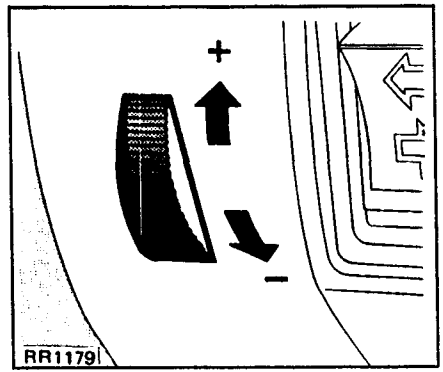
Height adjustment (4-door models only) - Fig. RR1021
The height of the seat belt upper anchorage is adjustable to allow for persons of differing stature. Adjustment can be made before or after the belt is fastened as follows:
Depress the release push button (3) and slide the carriage (4) fitted on the door pillar to the required position. There are five positions available and the carriage will 'click' into one of these when the push button is released.

WARNING: Ensure that the carriage is correctly located in one of the positions and that the push button has fully returned to its normal position before moving off in the vehicle.

Releasing the seat belt
To release the belt depress the button (5)on the buckle unit and allow the belt to retract fully into the carriage on the door pillar, manually assisting it for the last few inches. Position the slider (6) on the belt close to the door pillar bracket.

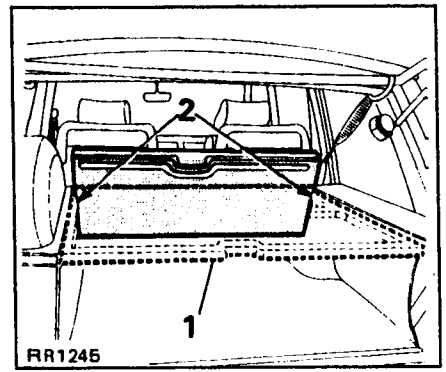
WARNING: All vehicle occupants should wear their seat belts for protection in the event of a collision or sudden stop.
Always protect the infant and child occupants of your vehicle with a restraint system designed especially for them and which conforms to motor vehicle safety standards.
Never leave a child unattended in your vehicle.

Infant and child restraints
All infant and child restraint systems are designed to be secured in vehicle seats by means of a lap belt or the lap belt portion of a lap/shoulder belt. When installing and using any infant or child restraint system, always follow the instructions provided by the manufacturer concerning its installation and use.
The failure to properly secure the child restraint system in the vehicle can endanger the child in the event of a collision or sudden stop and cause injury to other passengers. The centre rear seating position is fitted with lap belts which can be manually tightened to secure the infant or child restraint system. Older children should use the lap/shoulder belt.



Instrument illumination electronic dimming control - Fig. RR1179
Rotate the control **upwards** to increase the intensity of instrument illumination and **downwards** to reduce intensity. The dimming control unit also controls the clock, heater and cigar lighter illumination.

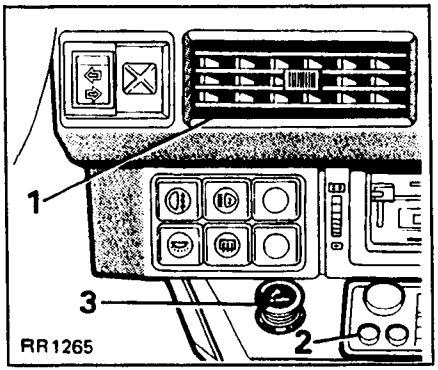
Illumination of the radio/stereo unit panel is not influenced by the dimming control but is automatically dimmed when the vehicle lights are on.



Loadspace cover - Fig. RR1245

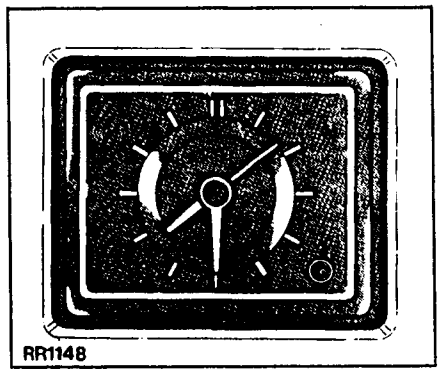
WARNING: The loadspace cover is a simple lightweight item of trim not designed to support weight or to be used as a shelf behind the rear seats. Objects must not be carried on the cover as they may obscure vision and could become dangerous projectiles in the event of a sudden stop or collision. The cover is not intended to restrain luggage or loose items. Therefore all equipment, luggage or tools carried in the loadspace area must be secured to minimise the risk of injury from unsecured items in the event of an accident or emergency manoeuvre. When not required in its normal position (1), the cover can be folded and slotted into recesses (2) provided for its stowage behind the rear seating.

2 AIDS TO COMFORT

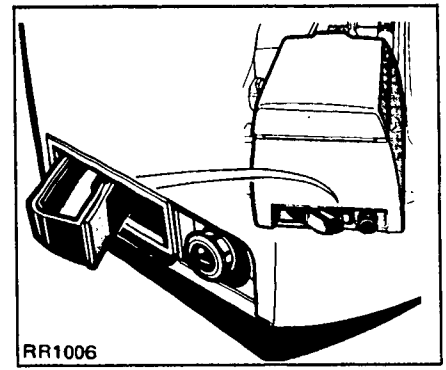


Ventilation louvres (1) - Fig. RR1265
Fascia-mounted louvres can be set to provide fresh or recirculated air in the horizontal or near-vertical planes. The vanes of the louvres can also be opened or closed by use of the knurled adjuster in the centre of each unit to regulate the direction and amount of air flow.

Radio receiver (2)
All Range Rover models can be fitted with a radio receiver of the owners choice. An aerial and speaker units may already be fitted and there are leads incorporated in the vehicle wiring harness to facilitate installation.



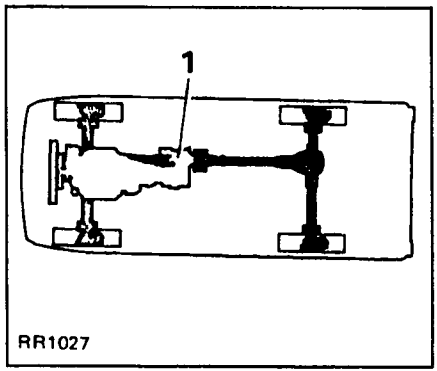
Cigar lighter (3)
This is located to the side of the central storage pocket or audio housing. A second lighter is mounted on the rear face of the centre stowage box for the convenience of rear passengers. The units operate only whilst the ignition is switched on.
To operate, press in the button in the centre of the lighter unit. When ready for use the lighter will automatically partially eject and can then be withdrawn for use. When the side lights are on, the socket surrounding is illuminated to facilitate its location in darkness.



Clock - Fig. RR1148
The hands of the electronic clock mounted in the centre of the fascia may be set by depressing and rotating the black knob in the clock face.

Centre stowage box - Fig. RR1006
The centre stowage box can be used to store small items for the driver's convenience.

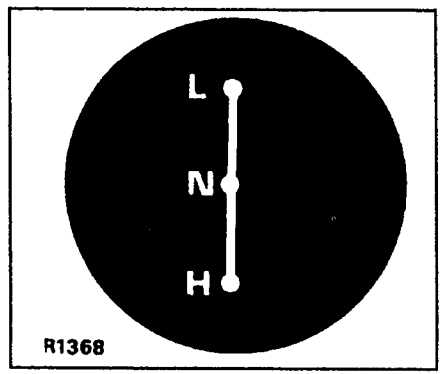
A cigar lighter, operating in the same manner as its front seat counterpart, and swivel-type ashtray are provided in the back of the centre stowage box for the convenience of the rear seat passengers.



Gearbox differential - Fig. RR1027
To allow the necessary variation of wheel speeds during cornering with permanent four-wheel drive, the Range Rover incorporates a third differential between the drive shafts to front and rear axles.

In conditions such as ice, snow, mud or on other surfaces requiring maximum traction, uncontrolled spinning of individual wheels will be prevented by a viscous coupling unit which is combined with the centre differential.

The action of the viscous coupling unit is automatic and its effect is to distribute the driving torque from the transfer box to the axles in proportion to the available adhesion.



Gearbox controls and ranges
The main gearbox of the Range Rover is augmented by a two-speed transfer box giving high and low ranges selected through the lever located immediately in front of the main gear selector.

Therefore the five-speed manual gearbox used in conjunction with the transfer gearing produces ten forward and two reverse speeds. In the same manner, the four-speed automatic box may be regarded as producing eight forward and two reverse ratios.

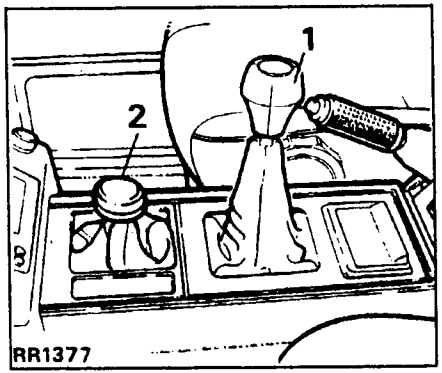
The low range should only be required where progress in the normal 'high' range is found difficult to maintain easily and safely or in any situation where heavy-load manoeuvring is necessary.

Transfer gear lever positions - Fig. RR 1368
The transfer gear lever, located immediately in front of the main gear selector, controls the selection of the high or low gear ranges through the following positions:

Central (N)
Transfer box in neutral. In this position drive cannot be transmitted to the road wheels regardless of the main gear selector position. If, for any reason, the vehicle has to be towed, this position MUST be used.

Fully forward (L)
Transfer gearbox low range engaged. This position should only be required where progress in the normal 'high' range is found difficult to maintain easily and safely or in any situation where heavy-load maneuvering is necessary.

Fully rearward (H)
Transfer gearbox high range engaged. This position is used for all normal driving.



Manual gearbox, main gear change lever - Fig. RR1377
In neutral, light-spring loads align the main gear lever (1) with the third/fourth gear positions to assist smooth gearchanging and to ensure selection of the required gear.

To select first or second gear, move the lever to the left against the spring and select the required ratio as normal. When changing between first and second gears, remember to continue to hold against the spring or the lever will return to the third/fourth position.

When changing from second to third gear, as second gear is disengaged, allow the spring to align the lever with the third position before engaging third gear.

To engage fifth gear, move the lever to the right against the spring and select the gear as normal. When changing from fifth to third or fourth gears, as fifth is disengaged, allow the spring to align the lever with the third/fourth positions before engaging the required gear. To change from fifth to second or first gear, allow the lever to return to the third/fourth position and move the lever towards the left against the spring as already described. Note that fifth gear is designed to reduce engine speed and thus improve fuel economy when cruising. Ensure that while it is in use the engine runs easily without labouring, otherwise use a lower gear.

Reverse is protected against inadvertent selection by an additional 'knock-over' spring load. To engage reverse, strike the lever as far as possible towards the left using the palm of the hand and move it forward to engage the gear. To disengage, pull the lever rearwards and allow the spring load to return it to its normal position in neutral.

It is recommended that, before driving away for the first time, the driver becomes familiar with the operation of the gear change by changing up and down through all ratios several times.

Use of the transfer gear lever on manual models - Fig. RR1377

*CAUTION: Changing from high **(H)** to low **(L)**, **should only be attempted when the vehicle is stationary.** Depress the clutch, pedal and push the lever **(2)** fully forward, release the clutch. Should there be any hesitation in the gear engaging, do not force the lever. With the engine running, engage a gear with the main gear lever and release the clutch momentarily, then return the main gear lever to neutral and try the transfer control again.*

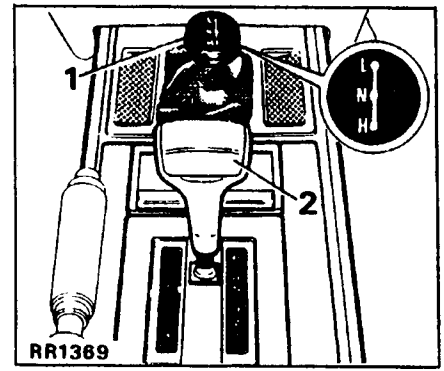
Use of the transfer gear lever on manual models (Continued)

Changes from low (**L**) to high (**H**) can easily be made as follows without stopping the vehicle.
Depress the clutch pedal and release the accelerator pedal as for a normal gearchange. Move the transfer lever into neutral(**N**). Release the clutch pedal for 3 seconds. Depress the clutch pedal and move the transfer lever firmly to the 'high' (**H**) position. Then move the main gear lever to second gear and release the clutch pedal while depressing the accelerator to take up the drive smoothly. As the vehicle accelerates, change gear in the main gearbox in the normal way. This operation can be carried out smoothly and quickly after a little practice. Proper use of the gearbox range will ensure optimum efficiency and transmission component life.

Use of the transfer gear lever on automatic models - Fig. RR 1369

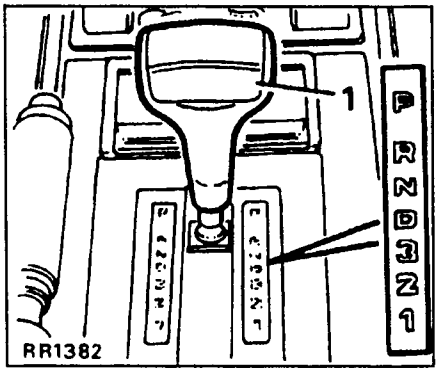
To change ratio from high to low, or low to high, while the vehicle is moving, proceed as follows:

(a) Reduce or accelerate the vehicle speed as applicable to 8km/hour (5 miles/hour).
(b) At this speed, remove your foot from the accelerator.
(c) Move the automatic transmission selector lever (2) to the N' (Neutral) position.
(d) Move the transfer gear lever (1) rapidly to the required L' or H' (Low or High) position.
(e) Reselect D' (Drive) on the automatic transmission selector lever.



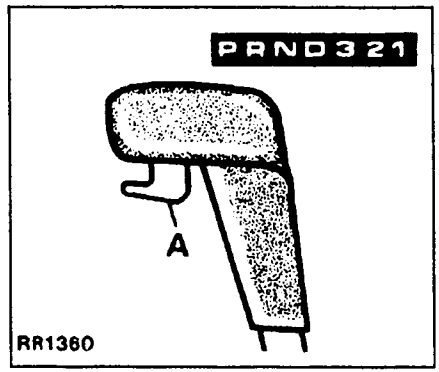
To change ratio with the vehicle stationary, apply both footbrake and handbrake and simply move the main gearbox selector (2) to the N' (neutral) position before selecting the transfer ratio required.

If the transfer gear can not be engaged immediately, do not force the lever. With the engine running, apply footbrake and handbrake, momentarily engage position D' with the main gearbox selector (2), then return it to the N' position and repeat the above procedure.



Main gear selector lever, automatic gearbox - Fig. RR1382
The gear lever (1) is mounted on the transmission tunnel. The upper face of the gear shift housing is marked with the symbols **P, R, N, D, 3, 2** and **1** which indicate the following functions:

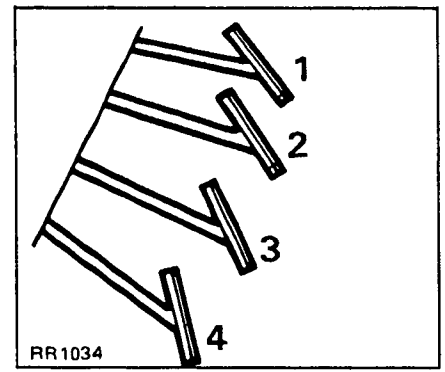
P Park
R Reverse
N Neutral
D Drive - first, second, third and fourth gears
3 First, second and third gears only
2 First and second gears only
1 First gear only with engine braking



NOTE: If either '2' or '1' is selected from 'D' or '3' while the vehicle is travelling at high speed, third gear will immediately engage. Progressive deceleration will cause downshifts into second then first gear at the appropriate road speeds.

Selector operation - Fig. RR1360
The gear lever movement is restricted to facilitate selection. Those positions normally used in sequence are grouped together to prevent inadvertent engagement of **N, R, P** or **1.**
The gear lever moves in a detented gate.

Movement through the detents is effected by pressing in the button 'A' under the gear knob thereby releasing the spring loaded catch and moving the lever to select the desired gear.



The lever will move freely between **D** and **3.** There is an additional stage of interlock protecting the **P** position from the **R** position.

WARNING: The handbrake or footbrake should be applied fully before selecting any of the forward or reverse drive ranges from a stationary position.

Accelerator pedal positions - Fig. RR1034

1 - Idle
2 - Part throttle
3 - Full throttle
4 - Kick down

Using the 'D' Drive range
The selector **'D'** position provides full automatic up and down changes through all forward gears, depending on vehicle speed and accelerator pedal position. Use **'D'** for all normal driving on good roads. The gearchange points have been chosen to give best fuel economy during normal driving with moderate accelerator pedal positions. With **'D'** selected, **minimum acceleration from rest** will result in low road speed upshifts through first, second, third and fourth gears.
From rest, **maximum acceleration**- by pushing the accelerator fully down (kick down) - will result in delayed upshifts through the gearing.

Intermediate acceleration from rest with **'D'** selected will cause upshifts through first, second, third and fourth gear. With practise these shifts can be made to occur at any required road speed betweeen maximum and minimum depending on how the pedal is depressed.

When in fourth gear below speeds of 84 kph (52 mph) a downshift (lower gear) can be obtained by pushing the accelerator pedal partly down.

To provide **rapid acceleration for overtaking**with **'D'** selected, kickdown will cause a downshift into the lowest appropriate gear. When the accelerator is released from the kickdown position, normal changes - dependent on road speed and pedal position - will resume.

Above speeds of 85km/h (53 miles/h) with 4th gear engaged, an automatic feature locks the torque converter, eliminating slip as a further aid to fuel economy.

Selector in position '3'
The **'3'** position provides automatic up and down changes between first, second and third gears only. For **maximum acceleration from stationary,**kickdown will cause first, second and third gears to engage in sucession. When the pedal is released from the kickdown position, normal automatic changes between these three gears will be resumed. Fourth gear will not engage.

If **'3'** is selected from **'D'** with the vehicle moving at high speed, third gear will be engaged.

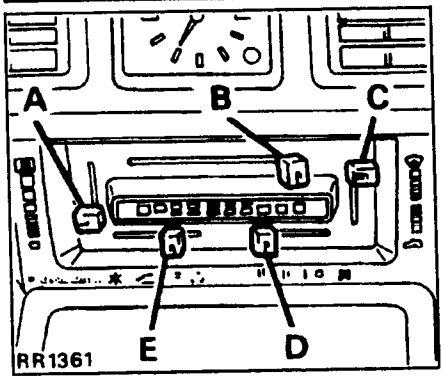
Selector in position '2'
The **'2'** position provides automatic up and down shifts between first and second gears only.

From a standing start in **'2'** , first gear will be engaged changing to second as the vehicle gathers speed. Once second gear has engaged no further upshift will occur unless **'3' or 'D'** is selected. Care should be taken not to overspeed the engine when the selector is in position **'2'** or **'1'** . The **'3'** or **'2'** position should be selected when driving in hilly terrain to avoid unwanted upshifts when the accelerator pedal is momentarily released.

Position **'2'** will give moderate engine braking downhill.

Selector in position '1'
The **'1'** position selected from rest will provide operation only in first gear. Therefore care should be taken to not overspeed the engine. The **'1'** position should be used when driving in very hilly terrain, particularly when towing a trailer, to avoid the engine labouring uphill and to provide the appropriate engine braking downhill.

Positions **'2' or '1'**may be selected from **'D' or '3'**at any road speed but, if the speed is high, third gear will be engaged followed by second then first gear when the road speed has dropped to an appropriate level.



Air conditioning/heating system (where applicable) - Fig. RR 1361
This system provides cooled, heated or fresh air to the interior of the vehicle.

The heater can be used with either fresh or recirculated air but recirculated air only is used by the air-conditioning unit.

Dependent on the control settings, the selected air supply is distributed to vents below the windscreen, to adjustable vents in the fascia, to the front footwells and to ducts in the rear of the centre stowage box.

The simple slider controls of the fascia-mounted unit can be set as follows to give you the conditions you require:

Slider 'A' - Air supply to fascia ventilation louvres

Maximum fresh or recirculated air is supplied to the louvres when this left-hand vertical slider is in its top position and the supply reduces as the slider is moved down. At the bottom of the stroke, the fresh or recirculated supply is cut off but this position allows maximum flow when air conditioning is selected.

Slider B' - Temperature selector
Set the temperature of the selected air supply by moving the slider between the cold (left) and hot (right) extremes of the scale.

Note: Warm or hot air will only be available when the engine has attained operating temperature.

Slider 'C' - Air supply to screen and footwells

The right-hand vertical slider position determines the proportions of the selected air supplied to the windscreen and front side window demister vents or the front footwells and the outlet duct under the centre stowage box for the benefit of rear passengers.

Slider D' - Air blower control
From its extreme right (off) position - indicated by the symbol O' and providing ram air - this control can be moved left to provide progressively faster blower speeds up to the maximum (III). The blower motor is operational only with the ignition key turned to its auxiliary I' or ignition II' positions.

Slider 'E' - Air supply selector

Air conditioning
- with the slider in this position and a blower speed selected (slider D'), the air conditioning function is engaged to provide cooled and dried recirculated air from face level vents.

Fresh outside air
- in this position ambient air is allowed into the vehicle through an air intake grille situated on the outside at the base of the windscreen. This grille must be kept clear of snow, fallen leaves and other debris to ensure efficient operation.

Internally recirculated air
- this slider position is used to give an airflow with minimal intake of outside air to avoid undesirable ambient conditions such as obnoxious fumes in heavy, slow-moving traffic conditions or dust and sand in arid climates.

(Continued)

Air conditioning combined with heat facility
With the slide in this position, a combination of cool air at a fixed rate can be supplied through the face level vents while variable warm air is supplied to the footwells and to the demister vents below the windscreen.

Using the interior climate controls

Heating. Move the slider B' to the desired position between the extremes of hot and cold, set the slider D' to the required blower speed, slider E' to the fresh outside air position and set the sliders A' and C' to distribute the heat as necessary.

Freshening the interior. Use the temperature control (slider 'B') and the blower control (slider 'D') in conjunction with the slider 'E' set at the fresh outside air position to provide an effective means of removing excessive tobacco smoke or stale air from the vehicle.

For maximum demisting - the controls should be set to the indicated **orange** coloured positions on the unit, i.e. as shown in Fig. RR1361.

Defrosting - For clearing the screens in severe conditions or for defrosting before the engine has warmed up, switch on the heated front screen (where applicable) and the heated rear screen (operative only with the engine running).

For longer term defrosting, move slider A' to its lowest position, slider B' to the extreme right (hot) position, slider C' to the top of its stroke, slider D' to position III' (high blower speed) and select the fresh air position with slider E'. With a cold engine, effective heat will not be available until the system has warmed up.

Normal cooling. Move the temperature selector (slider B') to a position between centre and its extreme left (cold) position, set the blower speed (slider D') to provide enough air circulation for comfort, select the combined air conditioning and heater position with slider E' and set sliders A' and C' to midway positions. Adjust the direction of airflow by moving the fascia louvres as required. Allow time for the vehicle interior temperature to stabilise before re-adjusting any setting.

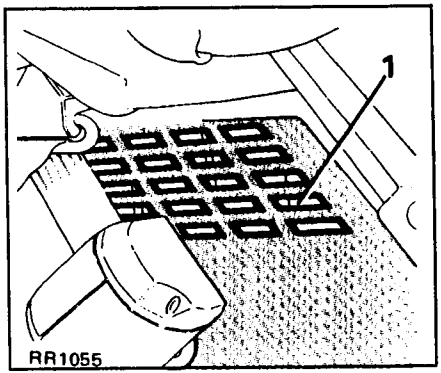
Air conditioned models only - Fig. RR1361
For **maximum cooling** in high ambient temperatures or in hot humid conditions, ensure that all exterior vents are closed, open a window and set the following controls:-

Sliders 'A' and 'C' to bottom of slides
Slider 'B' to extreme left (cold) position
Slider 'D' to blower speed 'III'
Slider 'E' to the air-conditioning position.

After a few minutes of driving, the majority of the warm air inside the vehicle will be expelled. Close the window and adjust the blower speed (slider 'D') as required. When the temperature inside the vehicle becomes confortable, move the temperature control (slider 'B') slightly to the right.

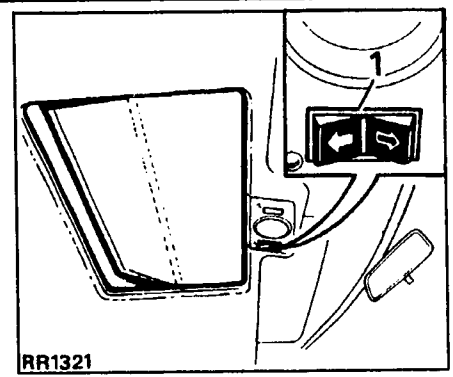
CAUTION: Do not operate the air conditioning for long periods with the windows open or, where applicable, the sunroof open. This would entail the system working ineffectually at maximum output which could result in component damage.

Highway driving. During a long journey when the ambient temperature and humidity are extremely high and the air conditioning is in use, frost may form on the cooling coils of the evaporator. The unit is equipped with an automatic defrost system which normally will prevent this. However if the temperature control is maintained in its coldest position for extended periods, the defrost system will not operate and the unit will not function correctly. Therefore, whenever possible, move the temperature selector (slider 'B') slightly away from its extreme left (cold) position.



Through-flow ventilation - Fig. RR1055
A through-flow ventilation system is achieved in the Range Rover by means of one-way air extraction vents (1) incorporated in both rear quarter panels. Each vent is automatically opened or closed progressively increasing or decreasing the amount of ventilation to suit interior conditions.

Sunroof (where applicable) - Fig. RR1321
While the ignition is switched on, the optional sunroof operates in a tilt and slide action controlled from the switch (1) adjacent to the front interior lamp.



WARNING: Ensure that the sunroof is not obstructed during opening or closing. Particular care should be taken that passengers, especially children, are kept clear of the sunroof when it is being operated. All passengers should wear seat belts at all times, in particular when the sunroof is open. Do not operate the sunroof in freezing conditions or when the roof panel is covered with ice or snow.

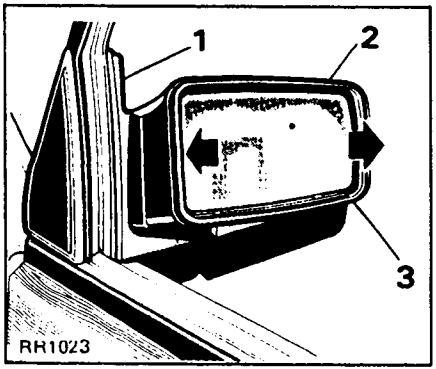
To open the sunroof panel, press the front end of the switch; the rear edge of the sunroof will rise to the full tilt position. Pressing the rear of the switch will cause the tilted panel to return to the horizontal position. Press again and the panel will slide open. An air deflector will rise into position as soon as the roof opening permits.

To close the sunroof panel, press the front end of the switch.

Important: The aperture surround, channels, drain tubes and slides (accessible with the panel fully open) should be kept clear and regularly cleaned for efficient operation.

This requirement is particularly important in dusty enironments.
If in doubt, consult your dealer.

Should sunroof operation fail in the open position, an emergency closing handle (included in the tool kit) can be engaged in the sunroof motor spindle and used to turn the spindle and manually close the panel. The spindle is accessible by release of two turnbuckles securing the switch mounting plate.

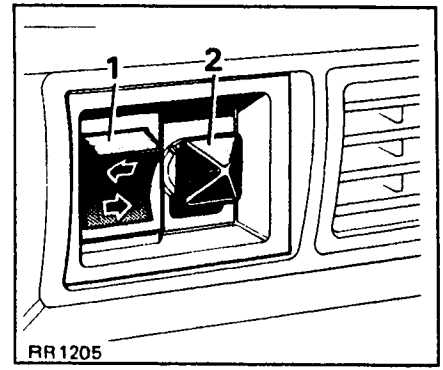


Exterior driving mirrors - Fig. RR1023
The mirror housing is hinged vertically **(1)** and should be set in one of the two fixed angle positions provided to suit the respective left or right side mirror location.

Additionally, for safety and convenience, the mirror housing **(2)** is designed to fold completely forwards or rearwards against the vehicle body.

Setting the mirror, manual version
The glass **(3)** angle is finely adjusted by moving it vertically or horizontally as required.

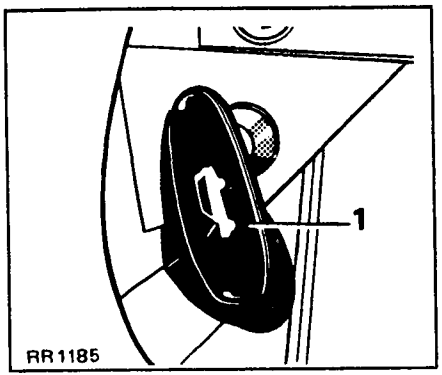
Interior rear view mirror, all models
The required rear view is obtained by moving the mirror frame about its swivel; lens deflection for anti-dazzle night driving is obtained by moving the two-position spring-loaded lever, protruding from the base of the mirror.

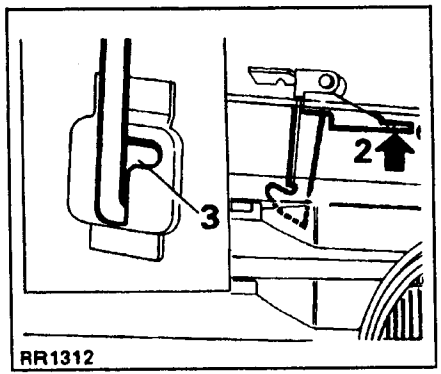


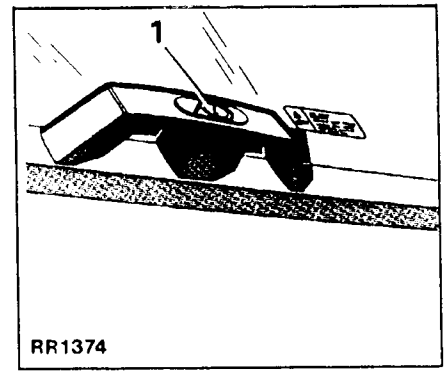
Adjustment of electrically operated mirrors (Where applicable) - Fig. RR1205
The two-way switch **(1)** is used to select the mirror requiring adjustment i.e. pressing the top of the switch selects the left-hand mirror and pressing the lower part of the switch selects the right-hand mirror. The fingertip control **(2)** is then moved left, right, up or down to adjust the position of the mirror selected which will respond accordingly.

The mirror also incorporates a demist facility, activated by operation of the rear window demist switch.

2 BONNET AND TAILGATE LOCKS







Bonnet lock control - Figs. RR1185 and RR1312

To open the bonnet, pull the control knob (1), located below the driver's side fascia. This disengages the locking plate and allows the bonnet to spring open sufficiently to provide access to the safety catch located at the front right-hand side of the bonnet (viewed from the front of the vehicle). Fingertip lifting of the lever (2) assisted by slight downward pressure on the bonnet will release the catch.

After release of the catch, the assisted lift feature of the bonnet allows it to be raised easily.

In the fully open position, the bonnet must be held by the support rod, which should be engaged in the slotted hole (3) in the centre top of the bonnet locking platform.

To close the bonnet, replace the support rod in its retaining clip on the underside of the bonnet, lower the bonnet to approximately 300 mm (12 inches) above the grille and allow it to drop into position.

If it is necessary to push down on the bonnet, this should be done without excessive pressure using the palms of both hands approximately one metre apart equi-distant from the centre and on the front edge of the bonnet.

Tailgates - Fig. RR1374

WARNING: Do not drive with the tailgate open; poisonous carbon monoxide fumes can enter the vehicle.

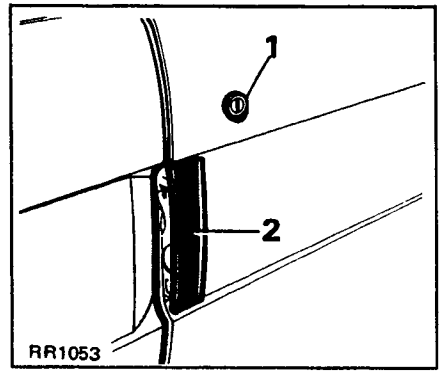
The upper tailgate, which must be opened before the lower tailgate can be lowered, is released by depressing the locking button in the centre of the handle (1). The upper tailgate can then be raised to its fully elevated position, where it is supported by means of telescopic gas struts which also assist in raising the tailgate.

(Continued)

Tailgates (continued)

NOTE: The upper tailgate is included in the central locking system fitted to some models. To mechanically override the electrical unlocking of the tailgate, the key should be inserted in the handle button (1) and turned 90° clockwise. To remove the mechanical override, insert and turn the key from the 3 o'clock position marginally clockwise then anticlockwise into the vertical position before withdrawing the key.

The lower tailgate is an all-steel construction for greater strength. It is supported in the lowered position by means of folding stays. The lower tailgate latches automatically on closure and has an interior centrally located release handle.

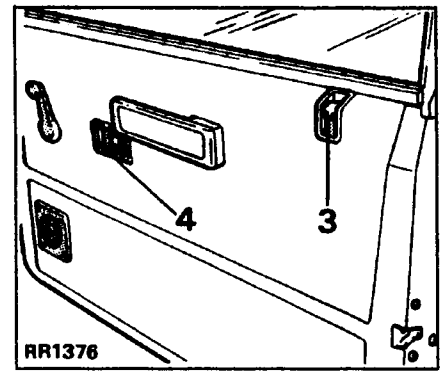


Door locks and controls, two-door models

Exterior operation - Fig. RR1053
To **unlock** a front door insert the ignition key in the 'private' lock (1), turn it **towards** the **rear** of the vehicle, return it to the **original** position and remove.

To **open** the door pull out the vertical door release handle (2).

To **lock** a front door the key is turned **towards** the **front** of the vehicle.



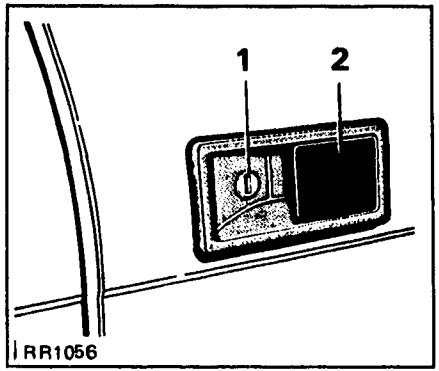
Keyless locking - Fig. RR 1376
To lock a front door without using a key, first ensure that the key is not left inside the vehicle.

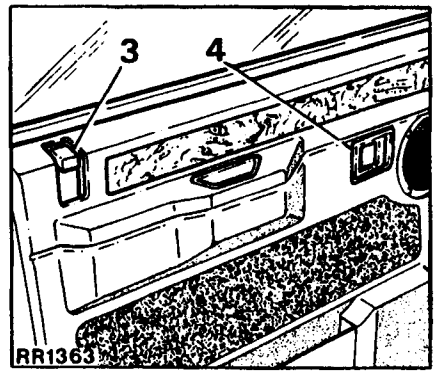
Then depress the interior sill locking button (3), close the door and check that it is locked.

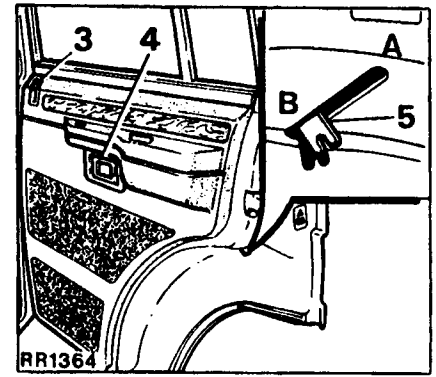
Interior operation - Fig. RR 1376
To unlock either front door from inside, lift up the sill locking button (3).

To open the door, pull out the interior release handle (4).

2 DOOR CONTROLS - FOUR-DOOR MODELS







Door locks and controls, four door models

Exterior operation - Figs. RR1056, RR1363 and RR1364
To **unlock** a front door insert the ignition key in the 'private' lock (1), turn it **towards** the **rear** of the vehicle, return it to the **original** position and remove.

To **open** the door pull out the door release handle (2).

To **lock** a front door, the key is turned **towards the front** of the vehicle then returned to the original position for removal from the lock.

To lock a rear door without using the central locking system (where applicable), depress the interior sill locking button (3), close the door and check that it is locked.

Interior operation - Figs RR1363 and RR1364
To unlock any door from inside, lift up the sill locking button (3).

To open any door, pull out the interior release handle (4).

Electrically operated central locking (where applicable)

Locking or unlocking of the driver's door either from outside by key or from inside by sill button will automatically lock or unlock all four side doors, the tailgate and the fuel filler flap.

Front and rear passenger doors can be independently locked or unlocked from inside by sill button operation but this can be over-ridden by further operation of the driver's door lock controls.

Children's safety lock - Fig. RR1364. Both rear doors are fitted with an additional locking lever which renders the inside release handle inoperative. This is pre-set as follows:

Open a rear door. Move the small lever (5) which projects through the door shut face, to position 'A'.

To **restore** inside release handle operation move the lever to position 'B'.

DRIVING AND TECHNIQUES

3

Before starting
Check that the handbrake is on and that the gear lever is in neutral (manual gearbox) or the selector lever is in 'P' or 'N' (automatic gearbox).

The **electronic fuel injection (EFI) version** of the Range Rover incorporates a cold start injector which operates automatically whenever the engine temperature is below 35°C.
DO NOT use the accelerator pedal during the INITIAL starting procedure.

Manual transmission models: In cold weather, depress the clutch pedal while the starter motor is in operation to improve engine cranking speed.

Starter operation
Petrol models: Insert and turn the ignition key to operate the starter, release the key as soon as the engine starts.
Diesel models: Insert and turn the ignition key to position II'.

Leave the key in this position until the heater plug warning light (symbol shown on the left) goes off, then turn the key to the next position to operate the starter. Release the key as soon as the engine starts.

All models:
The RED ignition and oil pressure warning lights will go out when the engine is running. If the engine does not start within 10 seconds, fully depress the accelerator pedal and operate the starter for a further five to ten seconds.
Do not operate the starter for longer than 10 seconds; switch off the ignition and wait 10 seconds before re-using the starter. If the engine still fails to start, switch off the ignition and investigate the cause. Continued use of the starter will not only discharge the battery but may also damage the starter.

WARNING: Automatic gearbox models: When the engine has started, BEFORE moving the gear selector lever out of 'N' or 'P' it is important that the handbrake or footbrake is firmly applied and the accelerator pedal is not depressed - otherwise the vehicle may move immediately the gear lever is moved to any of the drive positions (1, 2, 3, D or R). This is particularly important if the engine is cold because the engine revolutions will be faster than normal.

With a cold engine, the faster than normal engine speed may mean that more care is needed in manoeuvring the vehicle. Under these circumstances, the footbrake should be used to control the vehicle until the engine is warm and running at normal speed.

Warming-up

When the engine is cold, drive the vehicle as soon as the engine has started. Do not warm-up the engine by running it at a slow speed with the vehicle stationary.

WARNING: Never start or leave the engine running in an enclosed unventilated area. Exhaust fumes contain carbon monoxide, a colourless and odourless gas which if inhaled may be fatal. Do not drive with the rear window or tailgate open. Do not modify the exhaust system from the original design. Repair exhaust or body leaks immediately.

Diesel-engined models

Extra fuel for cold starting is automatically supplied by the injector pump. Also, the engine MUST NOT be run above fast idle until the oil pressure warning light goes off; this is to ensure that the turbo-charger bearings are receiving lubricant before being run at speed.

NOTE: Before stopping the diesel engine, allow it to idle for 10 seconds to give time for the turbo-charger to slow down whilst oil pressure is available at the bearings. Switching the engine off too quickly could leave the turbine rotating at several thousand revolutions without oil pressure.

Engine restart - Automatic models

WARNING: If the engine stalls for any reason whilst the vehicle is moving, it cannot be restarted by selecting a low gear. In addition, power braking and steering assistance will be lost.

Therefore the vehicle should be brought to rest as quickly as possible consistent with traffic conditions and overall safety.

The gear selector lever must be moved to **N** and the engine restarted in the normal way. Steering assistance will resume as soon as the engine starts and, by moving the gear lever back to its original position, normal drive and power braking will be restored. If the engine refuses to restart after two attempts, the cause of the engine stalling must be investigated.

3 OVERCOMING A DISCHARGED BATTERY PROBLEM

Starting a vehicle which has a discharged battery
A Range Rover automatic gearbox model cannot be started by pushing or towing. In an emergency, use one of the following methods.

Substitution of the battery.
The easiest method of overcoming a discharged battery situation is usually by substitution of the battery.

Where substitution is not possible due to differing size or terminal types, a slave battery may be connected to the vehicle battery using booster cables which must be of sufficient capacity to carry starter motor current.

NOTE: Do not disconnect the battery terminal clamps of the immobilised vehicle unless a substitute battery is to be fitted.

The slave battery must be 12 volt supply.

Use of Booster Cables
If a donor vehicle is used, park the two vehicles with the battery locations adjacent, ensuring that a road hazard is not being caused, that the two vehicles do not touch and that the parking brakes of both vehicles are fully applied.

If it is impossible to place the vehicles together remove the battery from the 'donor' vehicle and place it on the ground adjacent to the immobilised vehicle.

If the batteries are not of the permanently sealed type,remove the vent caps from both batteries and place a cloth over the open vent wells.

Ensure that all electrical accessories are switched off and remove the plastic cover from the positive terminal of the discharged battery.

Connect one booster cable from the positive (+) terminal on the discharged battery to the positive (+) terminal of the donor battery.

Connect the other booster cable from the negative (-) terminal of the discharged battery to a suitable point on the donor battery vehicle such as a clean metal part of the chassis or engine block where it is clear of any moving parts and at least 450mm (18in) from the battery.

WARNING: Do not connect positive (+) terminals to negative (-) terminals. Keep booster cables clear of moving parts in the engine compartment. Follow the cable manufacturers instructions and cautions carefully.

Where applicable, start the engine of the donor vehicle and let it idle for a few minutes, then start the engine of the vehicle with the discharged battery in the normal manner.

When the engine is running normally, switch off the engine of the donor vehicle, disconnect the booster cables, first removing the cable from both negative (-) terminals and then the one from both positive (+) terminals. Ensure that no contact is made between either cables or the vehicles.

Where a free-standing battery is used, of course, the foregoing procedure will apply without the assistance of a donor vehicle engine.

Remove the cloths covering the battery vent wells and dispose of them safely. Replace the vent caps.

The battery and charging system should be checked for condition by your Dealer.

These engine fault diagnosis pages have been compiled for your general assistance in an emergency.

Checking of any part of the electronic ignition or fuel injection systems must be referred to your Range Rover Dealer or Distributor.

WARNING: The electronic ignition system involves very high voltages. Inexperienced personnel and wearers of medical pacemaker devices should not be allowed near any part of the high-tension circuit.

Symptom	Probable cause	Remedy
Petrol Models		
Starter will not turn engine (headlights dim)	Battery low in charge, often causing the solenoid to chatter	Charge battery and check charging system
	Defective battery	Renew battery
	Corroded battery cables or loose connections	Clean battery connections or renew battery cables. Tighten battery and starter-motor connections
Starter will not turn engine (headlights bright)	Starter jammed	Free starter
	Defective starter solenoid	Renew
	Defective starter	Renew
	Defective starter switch	Renew
Engine turns slowly but will not start	Battery low in charge	Charge battery and check charging system
	Defective battery	Renew
	Corroded battery cables or loose connections	Clean and secure battery connections
	Poor engine-to-chassis earth strap connection	Clean and secure connection
	Defective starter	Renew
Engine turns normally but will not fire	Ignition fault	Consult your Dealer or Distributor
	No fuel	Remove petrol-tank cap and check for fuel (fuel gauge may be inaccurate)

(Continued)

Symptom	Probable cause	Remedy
Petrol Models (cont'd)		
Engine backfires violently	Ignition timing faulty	Consult your Dealer
	Damp distributor cap and leads	Dry thoroughly and check firing order
Engine fires, but fails to keep running	Ignition or fuel fault	Consult your dealer
Engine has rough idle	Fouled or improperly gapped spark-plugs	Clean and adjust plug gaps or renew plugs
	Incorrect ignition timing	Consult your Dealer
	Intake vacuum leak	Check manifold, any connections to manifold and vacuum advance
Engine stalls on acceleration	Air-cleaner element dirty	Clean or renew filter element. Conform to recommended maintenance schedule
Engine has poor acceleration	Incorrect ignition timing	Consult your dealer
	Accelerator linkage out of adjustment	Adjust as necessary.
Diesel Models		
Failure to start	Fuel tank empty	Fill tank and bleed air
	Obstructed fuel lines	Purge fuel lines
Fuel	Fuel filter clogged	Renew filter and bleed system of air
	Fuel line leakage	Check all fuel line connections for tightness
	Air in fuel system	Bleed fuel system
	Faulty fuel pump	Renew pump
	Clogged air cleaner	Clean or renew filter
Electrical	Discharged battery	Check electrolyte and recharge
	Loose cable connection	Tighten battery terminals
	Faulty starter switch	Renew starter switch
	Faulty starter	Renew/repair starter
	Faulty glow plugs	Renew glow plugs
	Faulty injection pump solenoid valve	Check electrical supply. Renew solenoid valve

(Continued)

Symptom	Probable cause	Remedy
Diesel Models (Cont'd)		
Starts and stops	Obstructed fuel lines	Purge fuel lines
	Fuel filter clogged	Renew filter and bleed system of air
	Air in fuel system	Bleed fuel system
	Low idle speed	Check and adjust minimum engine rev/min
	Faulty fuel pump	Renew pump
	Clogged fuel tank breather	Clear fuel tank breather
Poor engine performance	Insufficient fuel to supply to injectors	Check for fuel leaks, air in system, clogged fuel filter, wrong type of or contaminated fuel
	Valve clearance out of adjustment	Readjust valve clearance
	Faulty injection pump timing	Check/adjust pump timing or consult Dealer
	Injector fault	Renew injectors
Exhaust smokes badly	Injector fault	Test/adjust injectors
	Faulty injection pump timing	Check/adjust pump timing or consult Dealer
	Clogged air cleaners	Clean/renew filter
	Oil sump overfilled	Drain to proper level
Engine overheats	Low coolant level	Fill the cooling system to the correct level
	Faulty water pump	Repair/renew pump
	Water leaks	Check hoses, fittings, plugs and radiator
	Faulty temperature gauge	Renew gauge
	Low oil level	Fill to proper level
	Clogged cooling system	Drain and flush cooling system
	Incorrect timing	Readjust timing

Range Rover driving in general

WARNING: Always wear a seat belt for personal protection while either ON-ROAD or OFF-ROAD driving. Driving off-road can be particularly hazardous therefore do not take risks. Drive carefully.

Do not use the handbrake while the vehicle is moving.

Do not rest your foot on the brake pedal while travelling as this may overheat the brakes, reduce their efficiency and cause excessive wear.

Do not overload the vehicle for sustained cross country work. See 'Vehicle weights and payloads' Section 6.

Do not wrap your thumbs round the steering wheel as any steering kick-back over rough ground may result in personal injury.

Do not coast with the engine switched off as the brake servo and steering assistance will not operate. The brakes will still function but more foot pressure will be required.

WARNING: Driving through water or heavy rain will result in braking surfaces becoming coated with moisture. This will affect braking efficiency until the surfaces are dried by intermittent light application of the brakes which should be done at a safe distance from other vehicles. Brakes should be dried and tested immediately after driving through water, every few miles when driving in heavy rain and especially before leaving a wet motorway. When parking, do not rely on the handbrake alone to hold the vehicle if the brake linings have been subjected to immersion in mud and water (See 'After wading' details later in this section).

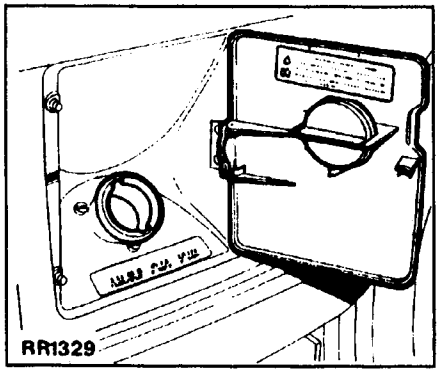
Do not continue to drive an automatic Range Rover if the transmission oil temperature warning light comes on. If this should happen, either position 2 or 1 should be engaged on the main gear selector and, if this fails to extinguish the light, the low transfer range should be engaged as detailed in Section 2. If the warning light remains on in low range, the vehicle must be stopped and the engine left running with the main selector lever in neutral until the transmission oil cools down and the light is extinguished.

NOTE: The warning light should illuminate only under very hot arduous conditions. If the light comes on under reasonable conditions, the cause should be investigated by your dealer.

Manual gearbox models

Do not use a gear which is too high for the vehicle speed and travel conditions involved; it is preferable to select a lower gear and use more revolutions rather than allow the engine to labour at low speed.

Do not use the clutch pedal as a foot rest. Keep the left foot well clear of the clutch pedal while the vehicle is in motion.



Unleaded petrol
Petrol with minimal quantities of lead is now available in certain territories. Range Rover non-catalytic, low compression models are designed to operate satisfactorily on leaded or unleaded petrol of the required octane rating. High-compression engines can be modified by your Dealer if required for use with unleaded petrol. ***For vehicles fitted with catalytic converters, UNLEADED FUEL ONLY (95 octane minimum) must be used.***

Fuel filler - Fig. RR1329
The fuel filler is located in the rear right-hand wing and is covered by a hinged flap. The flap is locked and unlocked by the central electrically- operated door locking system on models fitted with this feature. Two-door models are fitted with a lockable filler cap.

Fuel recommendations
Use fuel specified. No advantage will be gained by use of higher octane fuels.

CAUTION: Do not use oxygenated fuels such as blends of methanol/gasoline or ethanol/gasoline (e.g. 'Gasohol').

WARNING: DO NOT fill the tank completely and park the vehicle in direct sunlight or high ambient temperature, as this would cause the fuel to expand and escape through the breather pipe to the ground.

Saving fuel
Fuel consumption can be influenced by two major factors:
- How you maintain your vehicle.
- How you drive your vehicle.

To obtain optimum fuel economy, it is essential that your engine is correctly tuned and that the vehicle is maintained in accordance with the recommendations given in this Handbook.

Items such as ignition timing, the condition of plugs, air cleaner element, tyre pressures and wheel alignment can have a significant effect on the fuel efficiency of your vehicle.

Above all, the way in which you drive can radically affect fuel consumption. The following driving hints will help you to save fuel:-
- Ensure that the tyres are inflated to the correct pressures.
- Avoid fast starts; accelerate gently from rest.
- Do not drive in the lower gears longer than is needed.
- Decelerate gently and avoid sudden and heavy braking.
- Anticipate obstructions, road junctions, sharp corners or traffic lights and adjust your speed accordingly well in advance.

DRIVE GENTLY - SAVE FUEL

3 FUEL ECONOMY RESULTS

PASSENGER CAR FUEL CONSUMPTION ORDER 1983 No.1486 (80/1268 EEC)

RANGE ROVER - FUEL ECONOMY						
	Simulated urban cycle	Constant speed 56 mph	Constant speed 75 mph	Simulated urban cycle	Constant speed 90 kph	Constant speed 120 kph
	mpg	mpg	mpg	L/100 km	L/100 km	L/100 km
Fuel injection versions:						
5 speed manual model - with front spoiler	15.4	27.2	20.9	18.3	10.4	13.5
5 speed manual model - without front spoiler			20.4			13.9
4 speed automatic model - with front spoiler	14.6	26.2	20.2	19.4	10.8	14.0
4 speed automatic model - without front spoiler			19.7			14.4
Carburetter versions:						
5 speed manual model - with front spoiler	14.3	26.4	20.9	19.7	10.7	13.5
5 speed manual model - without front spoiler			20.2			13.9
4 speed automatic model - with front spoiler	15.2	24.8	18.9	18.6	11.4	14.9
4 speed automatic model - without front spoiler			18.4			15.4
Diesel version:						
5 speed manual model	25.5	34.1	24.4	11.0	8.3	11.6

Important note:

The above results were achieved under controlled test conditions in compliance with the Order and do not express or imply any guarantee of the fuel consumption of the particular Range Rover with which this information is supplied. The vehicle itself has not been tested and there are inevitably differences between individual vehicles of the same model. In addition, this vehicle may incorporate particular modifications. The driver's style, road and traffic conditions, and the standard of maintenance, will affect the vehicles consumption.

Running-in
The importance of correct running-in cannot be too strongly emphasized, for during the first few thousand miles of motoring, all working surfaces of the power train are 'bedding in'.

Progressive running-in of your new Range Rover has a direct bearing on reliability and smooth running throughout its life.

The most important point is not to hold the vehicle on large throttle openings for any sustained periods. To start with, the maximum speed should be limited to 80 kph (50 mph) on a light throttle and this may be progressively increased within legal limits over the first 2,500 km (1,500 miles).

As with other components of a new vehicle, the brakes require a period of 'bedding in'which will also apply to replacement brake pads. During the first 320km (200 miles), avoid situations where heavy or continuous braking is required.

Driving techniques
The combination of gears available to the driver of the Range Rover is designed to cope with many variations in terrain and vehicle load conditions. To assist drivers, the following pages contain illustrated examples of various driving conditions and instructions on selecting the most suitable combination of gears to obtain maximum wheel traction and efficiency. These instructions are intended as an introductory guide; proficiency can only be achieved by experience.

Use of gear ranges
Use high range for all normal driving on good roads and surfaces. Low range can be used for cross-country and rough terrain driving, or for moving heavy loads.

The two ranges may be used progressively when changing up, if conditions demand.

As an example of how the full progressive range of the gearbox may be used, consider a vehicle which is heavily laden or towing a heavy trailer and which is required to pull away from a standing start up a steep gradient. With the transfer gear in the 'L' (Low) position, the vehicle will pull away in first gear and, on the manual gearbox model, progressive gear changes can be done in the normal way with the main gear lever.

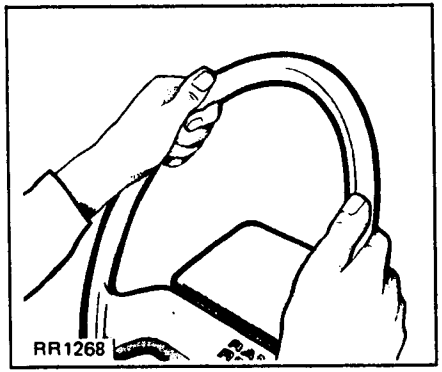
On automatic models with the main gear selector set at 'D' (Drive), the vehicle will pull away and the gearbox will provide the necessary changes to suit road speed and throttle position.

When road conditions are suitable, the high range may be brought into operation as described in Section 2.

Rough terrain
Before traversing a 'difficult' section, select neutral on the main gearbox, change to low transfer range and then select position 'D' on the automatic model or second or third gear on the manual model.

Remain in this combination whilst the terrain is difficult and use care when applying the accelerator pedal as a sudden power surge may induce wheel spin. Change to high (H) transfer range (as described in Section 2) as soon as conditions improve.

Note: A viscous control unit incorporated in the transfer box of this vehicle automatically prevents excessive centre differential speeds under conditions of poor adhesion. The unit obviates any need for a mechanical lock on the centre differential.



Riding the clutch - Manual gearbox
Keep the foot away from the clutch pedal. The practice of resting the foot on the clutch pedal should be avoided. Apart from premature clutch wear, a sudden bump could cause the pedal to be depressed too far, disengaging the drive and causing the vehicle to go out of control.

Braking
Keep the application of the brake pedal to a minimum. Braking on wet or muddy slopes can induce sliding and loss of control.

Use of the engine for braking
Before descending steep slopes, stop the vehicle at least its length before the descent, select neutral on the main gearbox, engage the low range transfer gear and then select position '1' or '2' on the main gearbox depending on the severity of the incline. Check that gear is engaged before moving off.
While descending the slope it should be remembered that the engine will provide sufficient braking effort to control the speed of descent, and that the brakes should not be applied as this may cause the trailing wheels to lock on loose or slippery surfaces resulting in loss of control. Although vehicles fitted with automatic transmission have adequate engine over-run braking, remember that the effect of the torque convertor combined with the higher first gear in the automatic gearbox will result in a slightly faster descent than would be experienced with manual transmission.

Driving on soft ground
Where conditions are soft, such as marshy ground or sand, reduced tyre pressure (see Data Section) will increase the contact area of the tyres with the ground. This will help to improve traction and reduce the tendency to sink. **Tyre pressures should of course be brought back to normal when such situations have passed.**

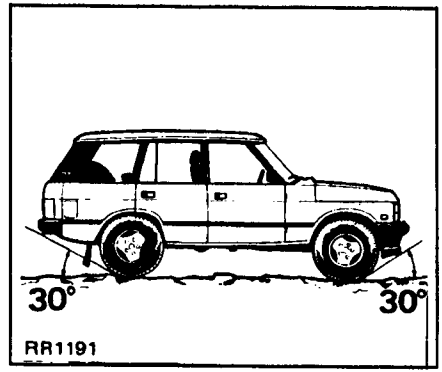
WARNING: Do not drive at highway speeds on under-inflated tyres. This will cause excessive tyre temperatures which could lead to tyre failure and loss of vehicle control.

Rough rocky tracks
With due care, beaten rough tracks can be negotiated in normal high transfer gear drive.

If the track is very rough or rocky, low range may be necessary for easier control of the Range Rover.

NOTE: The detachable front spoiler and auxiliary driving lamps fitted to certain models should be removed before travelling over any terrain which might cause ground contact damage to the spoiler. Details of removal are given in the 'Running Requirements' section 4.

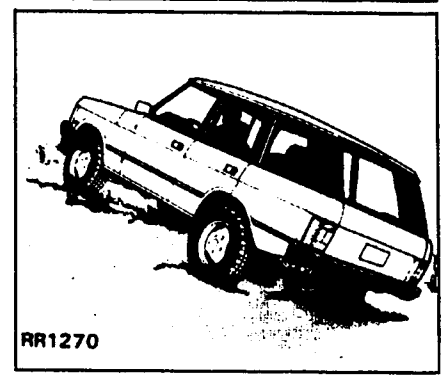
Do not hold the steering wheel with the thumbs inside the rim. A sudden violent kick of the wheel could damage or even break the thumbs. Grip the wheel on the outside of the rim (as shown in Fig. RR1268) when travelling across country.



RR1191

Ground clearance - Fig. RR1191
Be aware of the need to maintain ground clearance under the chassis and a clear approach and departure angle. Avoid existing deep wheel ruts, sudden changes in slope and obstacles which could interfere with the chassis, differential or spoiler and auxiliary driving lights (where applicable).
NOTE: If the front spoiler (fitted to certain models) is removed, the approach angle is improved by 12°.

Rutted and existing wheel tracks
Generally the tendency is to over-steer the vehicle under these circumstances, resulting in the vehicle being driven on left- or right-hand lock in ruts. This should be avoided as it produces drag at the road wheels and can be dangerous, causing the vehicle to veer off the track the moment the front wheels reach level ground or find traction.


RR1270

Allow the steering to follow the rut where possible and remember to keep your thumbs on the outside of the steering wheel.

Crossing ridges - Fig. RR1270
Select a path so that the conditions under each wheel of the same axle are similar. This principle should be applied both in avoiding dissimilar ground surfaces and in assessing the correct angle of approach to an obstacle to avoid the wheels being lifted off the ground.

Approach a ridge at right angles so that both front wheels go over together. If approached at an angle, traction can be completely lost through diagonally opposite wheels leaving the ground.

3 UP OR DOWN STEEP SLOPES

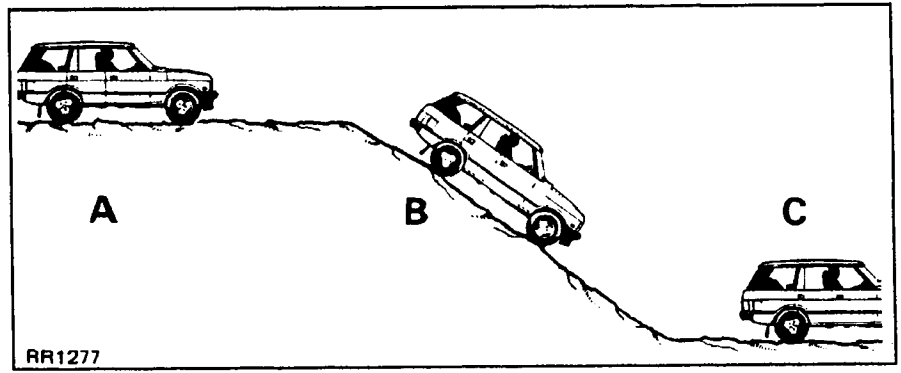
Climbing steep slopes
Steep slopes will usually require the use of the low range transfer gearing with the 'D' position selected on the automatic main gearbox or second or third gear selected on the manual main box.

Should the slope be slippery, use only enough pressure on the accelerator to keep the engine running without stalling while climbing the slope.

If the vehicle fails to climb the slope but the engine does not stall, the following procedure should be carried out.

Hold the vehicle on the footbrake and engage reverse gear as quickly as possible. Release the brakes and allow vehicle to reverse down the slope whilst ensuring that both feet are clear of the brake and clutch pedals. **Do not attempt to turn the vehicle around while it is on the slope.** If the engine stalls on a slope, hold the vehicle on the footbrake, then proceed as follows:

Manual transmission models:
Engage reverse gear and remove the feet from both clutch and brake pedals. Switch ignition key to position 'II' and allow the Range Rover to reverse down the slope, using only the retardation effect of the engine for braking.



Automatic transmission models:
Select 'N' or 'P', restart the engine and select reverse gear.

WARNING: On automatic models, the engine MUST be restarted before reversing down the slope as there will be no braking effort from the gearbox unless the engine is running.

All models
On a slippery slope never use heavy braking to check speed while reversing as this will almost certainly result in the locking of the front wheels and loss of directional control.

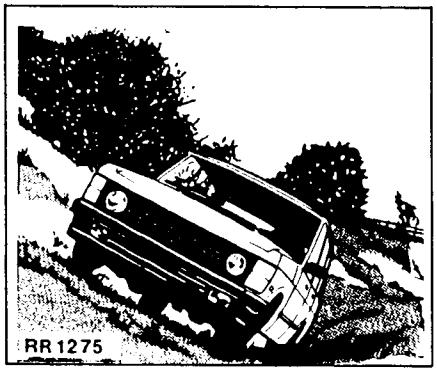
When back on level ground, or where forward traction can be regained, then a possible faster approach will give the extra momentum which will often enable the slope to be climbed successfully.

Descending steep slopes - Fig. RR1277
Stop the vehicle at least its own length before the slope (A), select neutral on the main gearbox and engage low range transfer gearing. Then select position '1' on the automatic or first gear on the manual main gearbox.

Check gear engagement before moving off. Do not use heavy braking or operate the clutch pedal (where applicable) during the descent (B) - the engine will limit the speed and the vehicle will remain perfectly under control while the wheels are turning.

If the vehicle begins to slide, accelerate gently to maintain directional stability.

When conditions permit (C), select neutral on the main gearbox, engage high range transfer gear and resume normal driving.

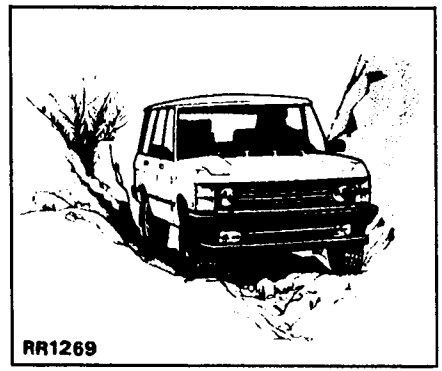


Traversing slopes - Fig. RR1275 The following precautions should be observed before traversing a slope;

(a) Check that the terrain is firm under all wheels and that the ground is not slippery as this may result in the vehicle sliding off the slope.

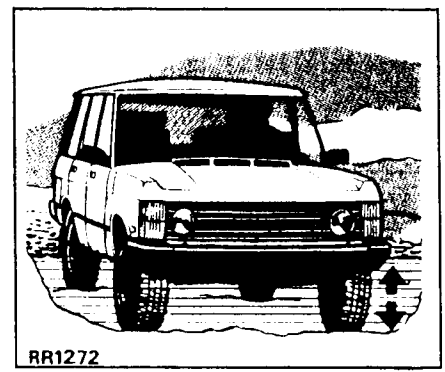
(b) Check that the downhill wheels are not likely to drop into a sudden depression in the ground as this will suddenly increase the angle of tilt.

(c) For the same reason ensure that the uphill wheels, do not run over rocks, tree roots, or similar obstacles.



(d) Any load carried in the back of the vehicle should be evenly distributed as low as possible and made secure. A sudden shift of load while traversing a slope could cause the vehicle to overturn. Passengers in the rear should sit on the uphill side or, in extreme conditions, vacate the vehicle until severe slopes have been negotiated.

Negotiating a 'V' shaped gully - Fig. RR1269
This should be tackled with caution since steering up or down the gully walls could lead to the vehicle becoming trapped on the bank or on an obstacle such as a tree or rock.



Wading - Fig. RR1272
The maximum advisable wading depth is approximately 0,5m (20 in). Before wading, the detachable spoiler fitted to some models should be removed (as described in Section 4) and on all models, a check must be made to ensure that the flywheel/converter housing drain plug is in position, (see 'Wading' page in Section 4).

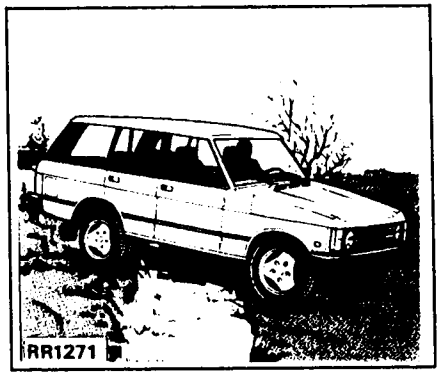
If the water is deeper than 0,5m removing the fan belt will eliminate the risk of the cooling fan spraying water over the ignition system and air cleaner. If, for various reasons, it is not possible to remove the fan belt, a sheet of plastic or other water resistant material draped in front of the radiator grill (to prevent any water from passing through) will reduce the risk of saturation of the ignition system.

After wading
Remove any plastic sheets placed in front of radiator.
Drive the vehicle a short distance and apply the footbrake to check that brakes are fully effective.

WARNING: Do not rely on the handbrake alone to hold the vehicle once the transmission brake has been subjected to mud and water.
On a manual transmission model, apply the handbrake fully, engage the low range of transfer gearing and leave the vehicle parked in first gear in the main box.
On an automatic transmission model, apply the handbrake, engage the low transfer ratio and select the 'P' (park) position on the main gearbox. Ensure that the parking pawl is fully engaged by momentarily releasing the brake and allowing the vehicle to 'rock' into the pawl location. Then fully apply the handbrake.

Refit the fan belt and remove the flywheel converter housing drain plug. If the water was particularly muddy it is possible that the radiator may be blocked with mud and leaves and this should be cleared immediately to reduce the risk of overheating.

If deep water is regularly negotiated it would be wise to check all transmission oils for signs of water contamination after each trip. Oil contaminated with water can easily be recognised by its milky appearance.



Crossing a ditch - Fig. RR1271
Ditches should always be crossed at an angle so that three wheels maintain contact with the ground assisting the passage of the fourth wheel through the ditch. If approached straight on, both front wheels will drop into the ditch probably with the chassis and the front bumper trapped on opposite sides of the ditch.

Driving in soft, dry sand
It is generally advisable to select low range before driving over soft dry sand to avoid the risk of being unable to continue after stopping in these conditions for a change from high to low range.

When conditions are soft, reduced tyre pressures will increase the contact area, help improve traction and reduce the tendency to sink but first consult the 'Data' section 6 of this book for the pressures recommended and remember that pressure reduction will also reduce ground clearance.

Tyre pressures must be returned to normal immediately after driving in such conditions.

Manual gearbox models -
Select a gear that can be maintained and stay in that gear because the drag of the sand may stop the vehicle instantly if the clutch is disengaged for a gear change.

Automatic gearbox models -
On coarse firm sand: select 'N' on the main gearbox, engage the high range of transfer gearing and then select the 'D' position.

On fine soft sand: select 'N' on the main gearbox, engage the low range of transfer gearing and then select the 'D' position.

Restarting on soft sand
When stopping your vehicle in sand remember that re-starting while facing up a slope is almost impossible and you should therefore park on level ground, or with the vehicle facing down hill.

(Continued)

Restarting on soft sand (Continued)

A standing start with minimal wheel spin is best achieved by engagement of the low transfer range, selection of second or third gear (manual main gearbox) or 'D' (automatic main gearbox) and the use of minimum accelerator pressure necessary to produce forward motion.

Exercise care in applying the accelerator pedal as sudden power will induce wheel spin and cause the vehicle to dig itself deeper into the sand.

If forward motion is lost do not try to accelerate out of trouble as this can only make things worse. Clear the sand from the tyres and ensure that the chassis and axles are not touching the sand.

If the wheels have sunk deep into the sand it will be necessary to lift the vehicle using an air bag or high lift jack and then build up the sand under the wheels so that the vehicle, when lowered, will be on level ground. If a restart is still not possible it may be necessary to place sand mats or ladders beneath the wheels.

Ice and snow

Range Rovers are, of course, used extensively in snow and icy conditions. The driving techniques are generally the same as driving on mud or wet grass.

Engage the high range transfer gearing, a high gear on the manual main gearbox or position D' on the automatic main gearbox and use only sufficient engine revolutions to just move the vehicle forward. Avoid violent movements of the steering wheel, using the brakes with extra care and only if necessary.

Snow chains

Chains may be fitted to the Range Rover rear wheels to provide increased traction during extremely adverse heavy snow conditions.

Never fit chains to one wheel only, always fit a pair of snow chains to the rear wheels only. Remove the chains immediately the road is clear of snow.

Lost traction

Should the vehicle become immobile due to loss of wheel grip, the following hints could be of value.

Avoid prolonged wheel spin; this will only make matters worse.

Try to remove obstacles rather than force the vehicle to cross them.

If the ground is very soft, reduce tyre pressures if this has not previously been done.

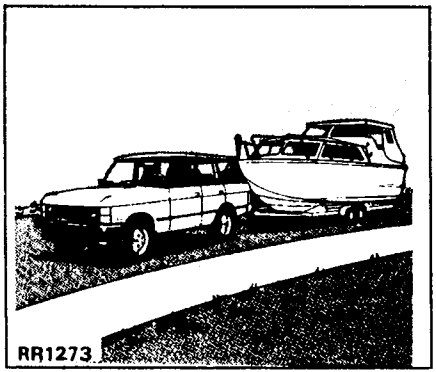
Clear clogged tyre treads.

Reverse as far as possible or as far as deemed necessary so that the momentum reached in going forward again may get the vehicle over the obstacle.

Brushwood, sacking, or any similar 'mat' material placed in front of the tyres will help in producing tyre grip.

If possible, jack up the vehicle and place material under the wheels. Great care must be taken when doing this to avoid personal injury.

See also 'Vehicle Recovery' information at the end of this section.



Towing
It is the driver's responsibility to ensure that the towing equipment fitted is suitable for its intended use and that all regulations with regard to towing are complied with according to the territory in which the vehicle is operated. All relevant information should be obtained from an appropriate motoring organisation. See also 'Trailer socket facility' in Section 4.

Weight limitations
The 'Data' section shows maximum laden trailer weights which are based on the ability of the vehicle to move a given load from a dead stop on a pre-determined uphill slope. It is not necessarily the weight the vehicle will tow at sustained highway speed or at altitudes; engine performance is progressively reduced above 300m (1,000 ft).

Many trailer manufacturers recommend that the maximum laden trailer weight should not exceed the gross vehicle weight.

Towing stability
In addition to weight restrictions, there are other parameters to be considered to ensure a safe, stable vehicle and trailer combination. These include; road conditions, altitude, terrain gradients, number and location of trailer axles, vehicle wheelbase length and -- perhaps most important of all -- the expertise of the driver.

A comprehensive recommendation on those parameters is not possible in this book. Therefore, if you intend any trailer towing, consult your Range Rover dealer and the trailer manufacturer for more information.

Guidelines which will generally improve stability include:-

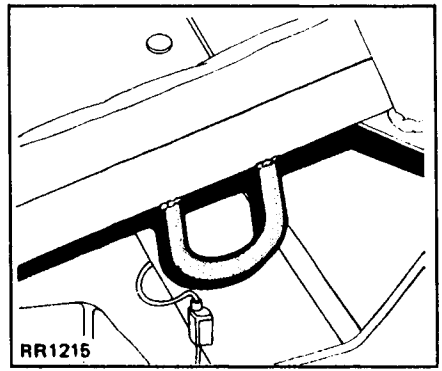
1. Position all trailer loads as low as possible.
2. Within the confines of gross vehicle weight and axle load limits, carry weight in the Range Rover in preference to the trailer.
3. Do not exceed the designed load limits of the trailer.
4. Adjust vehicle tyre pressures as recommended in the 'Data' section.
5. Adjust trailer tyre pressures as recommended by the trailer manufacturer.
6. Where appropriate, with the trailer and the vehicle both unladen, adjust the height of the tow ball so that the trailer is level.

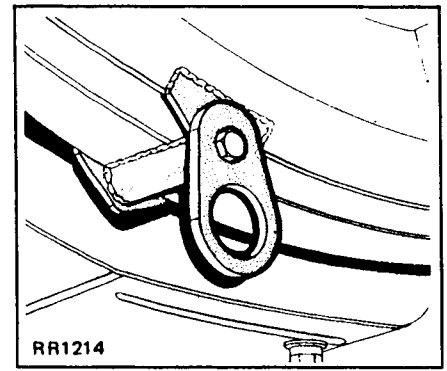
Use of transfer gearing
As a general guide, there is no need to use low range when towing lightweight trailers or campers and such in normal road conditions.

However, situations can be envisaged in which the low transfer range would be used. For example, moving a heavily-laden livestock or boat trailer up a steep slope or on a loose surface.

For such abnormal loads or conditions, consult earlier pages on the use of low transfer gearing. It is advisable to become proficient in control of these features on your Range Rover without a trailer before attempting to use them with a loaded trailer.

WARNING: Unskilled gearchanging should not be attempted on a slope as control of the vehicle may be lost.





Vehicle recovery
If the vehicle should suffer a breakdown or accident damage and it becomes necessary to transport the vehicle to a repair facility, it is essential to adhere to one of the following procedures depending on the type of tow to be undertaken.

CAUTION: The Range Rover has permanent four-wheel drive and is fitted with a steering lock. These instructions must be carefully followed to prevent damage to the vehicle. The preferred method of transport is by a flatbed trailer.

Transporting the Range Rover on a flatbed trailer
Lashing eyes are provided on the front (Fig.RR1215) and rear (RR1214) chassis members to facilitate the securing of the vehicle to a trailer.

When the vehicle is properly located and secured on the trailer, the Range Rover's main gearbox selector should be set to neutral and the handbrake firmly applied before transportation commences.

Suspended tow by breakdown vehicle.
The propeller shaft must be disconnected from the axle which is to remain on the ground.

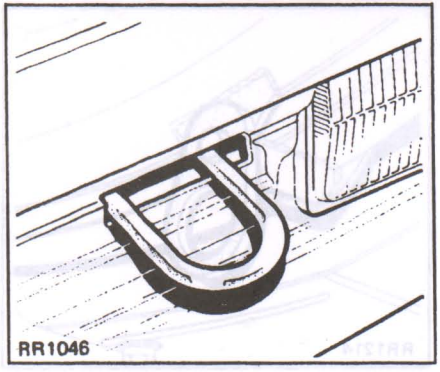
NOTE: Before removal, the propeller shaft flange and shaft must be marked to allow accurate refitting to the original position.
Secure the suspended propeller shaft safely to prevent damage.

If the front axle is to remain on the ground, it will also be necessary to set the ignition key in position 'I' to release the steering lock.

*CAUTION: The steering wheel and/or linkage **MUST** be secured in a straight ahead position but the steering lock **MUST NOT** be used for this purpose.*

The vehicle can then be attached to the breakdown vehicle and raised for towing.

3 TOWING THE RANGE ROVER



Towing the Range Rover (on four wheels)

Set both the main gearbox and the transfer gearbox in neutral.

Set the ignition/steering lock key in position 'I', to release the steering lock.

Secure towing attachment to the vehicle connection (Fig. RR1046).

Release the handbrake.

CAUTION: *The vehicle tow connection (Fig. RR1046) should be used only in normal road conditions and "snatch" recovery should be avoided.*

WARNING: Unless the engine is running, brake servo and steering effort cannot be maintained. This will result in a considerable increase in pedal pressure being required to apply the brakes.

WARNING: Under no circumstances should the front lashing eyes (Fig. RR1215) be used for towing purposes.

RUNNING REQUIREMENTS

4

4 BASIC ATTENTION

In addition to the more specialised Workshop Maintenance briefly described later in this book, this section shows the general but very important day-to-day attention usually carried out by the driver and essential for maintaining the overall efficiency of your Range Rover.

For specified tyres and pressures: for recommended lubricants, fuel, coolant, hydraulic fluid, and quantities of fluids required, see Data section.

Battery
The battery is designated Maintenance Free' and should require no topping up for a period of 3 years in temperate climates and 1 year in hot climates. See more details later in this section.

Sunroof (where applicable)
For efficient operation, it is important that the sunroof aperture, surround, channels, drain tubes and slides (accessible with the panel fully open) are kept clear and regularly cleaned.

This requirement is particularly important in dusty environments.
If in doubt, consult your dealer.

Daily or Weekly Checks in Normal Highway Operating Conditions
Check and if necessary top up:-
- Engine oil.
- Gearbox oil.
- Cooling system.
- Brake fluid reservoir.
- Windscreen washer reservoir.
- Power steering reservoir.

Where applicable, diesel sedimenters should be daily checked and drained as described in Section 5.

For safety, check the following:
- Operation of inertia reel seat belts.
- Operation of exterior lights.
- Operation of horn.
- Operation of warning indicators.
- Operation of screen wipers and all washers. Keep washer bottle filled with water, adding recommended solution (or methylated spirits) when necessary to prevent freezing.
- Condition of driving mirrors.
- Tyre pressures and tyre condition.

Special Operating Conditions
When the vehicle is operated in extremely arduous conditions or on dusty, wet or muddy terrain, more frequent attention should be paid to all servicing requirements.

Additional Daily or Weekly Attention Dependent on Operating Conditions:
- Check/top up transfer box oil.
- Check steering rubber boots for security and condition. Renew if damaged.
- Check brake and clutch fluid levels: consult your dealer if any fluid loss is suspected.
- Clean brake discs and calipers.
- Lubricate front and rear propellor shaft grease points and front sliding joint. Under tropical or severe conditions, particularly where sand is encountered, the sliding joints must be lubricated very frequently to prevent ingress of abrasive material.
- Every week and every maintenance inspection check tyre pressures and inspect tyre treads and side walls; under arduous cross-country conditions the tyre pressures should be checked much more frequently, even to the extent of a daily check.

Monthly
- Renew gearbox oil.
- Renew transfer box oil.
- Check air cleaner element and renew every 6 months or as necessary.

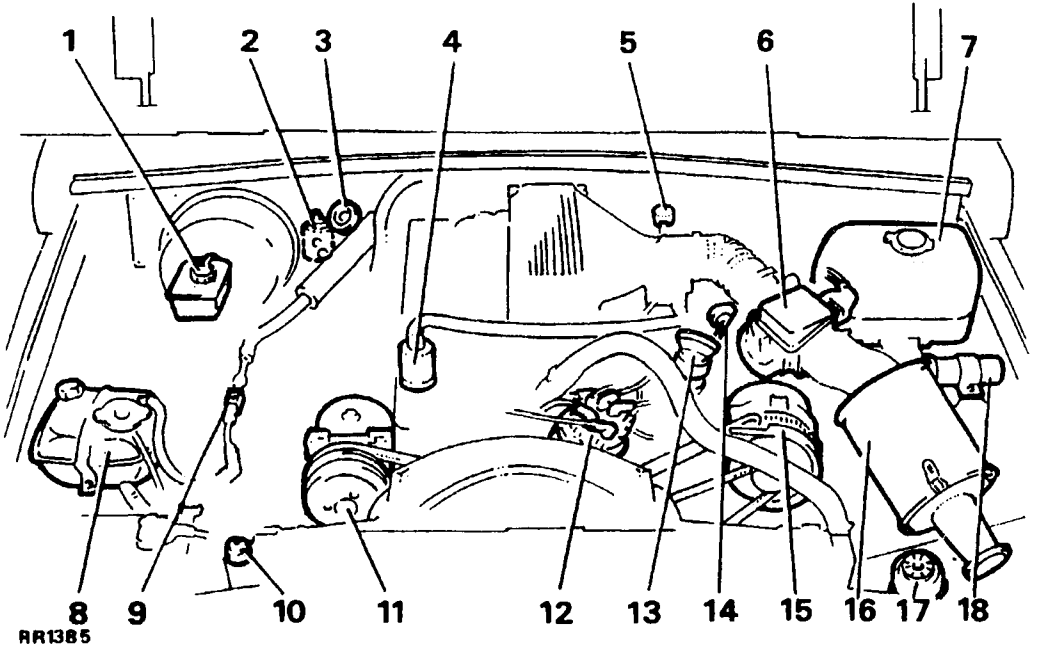
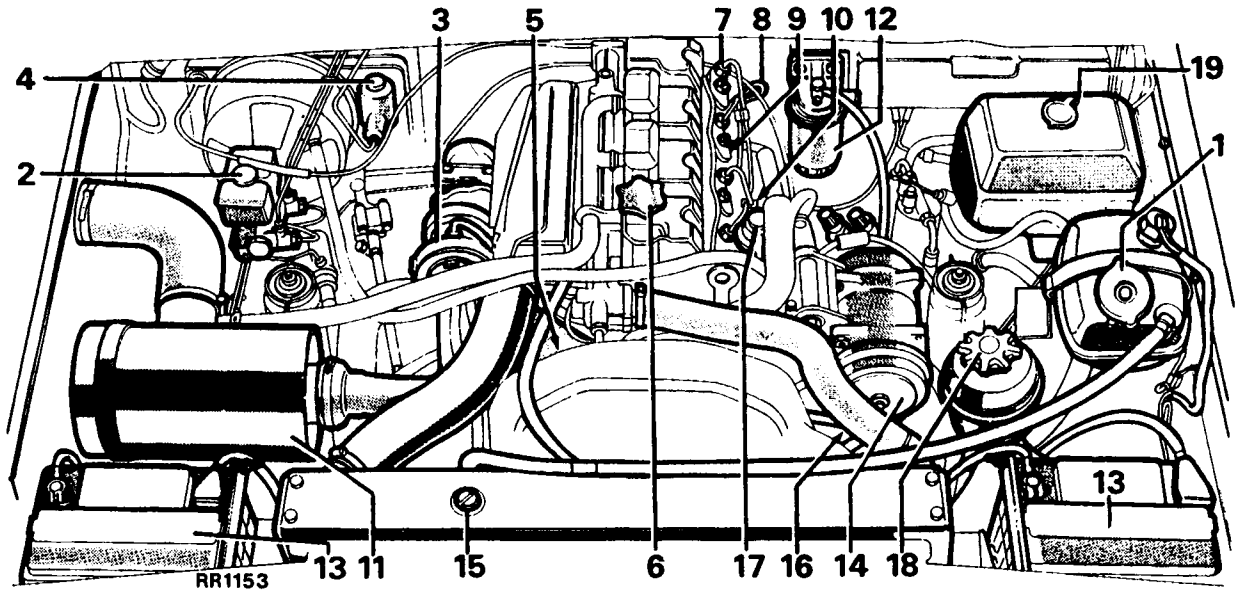


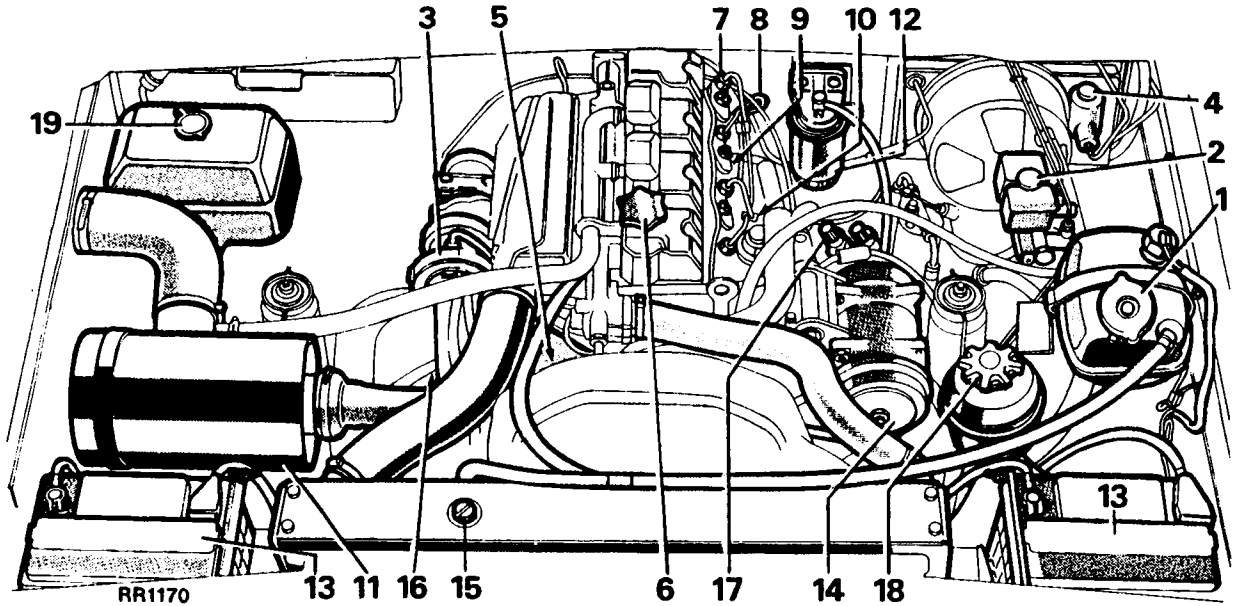
Fig. RR1385 - Under bonnet components of the electronic fuel injection, automatic transmission Range Rover with air conditioning.

1. Brake fluid reservoir
2. Clutch fluid reservoir (manual model only)
3. Automatic transmission fluid filler and dipstick.
4. Breather flame trap
5. Engine crankcase breather
6. Airflow meter
7. Front and rear screen wash and headlamp wash reservoir
8. Engine coolant expansion tank
9. Air conditioning receiver dryer sightglass
10. Radiator filler plug
11. Air conditioning compressor
12. Electronic distributor
13. Engine oil filler cap
14. Engine oil dipstick
15. Alternator
16. Air cleaner
17. Power steering fluid reservoir
18. Ignition coil.

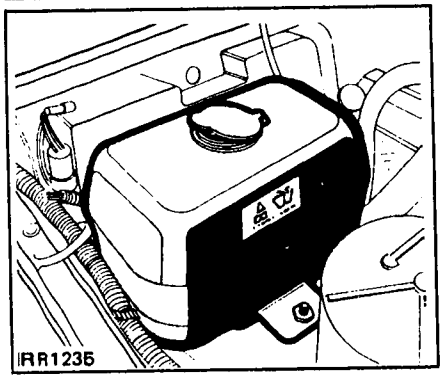


Engine Compartment

1. Coolant filler cap
2. Brake fluid reservoir
3. Turbo-charger
4. Clutch fluid reservoir
5. Oil filter cartridge
6. Engine oil filler cap
7. Injector
8. Engine oil dipstick
9. Glow plug



10. Fuel lift pump
11. Air cleaner
12. Fuel filter
13. Battery
14. Air conditioning compressor (option)
15. Coolant filler plug
16. Alternator
17. Fuel injection pump
18. Power steering fluid reservoir
19. Screen washer reservoir



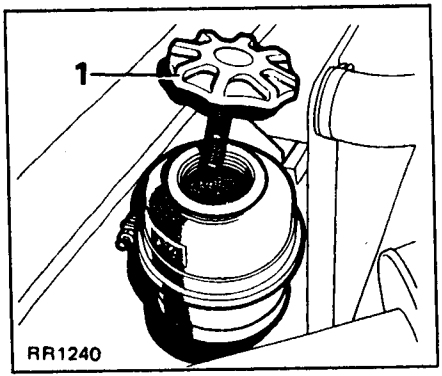
Check/adjust operation of both screen washers and top up reservoir - Fig. RR1235
The combined windscreen/rear screen/ headlamp washer reservoir is located on the bulkhead on the passenger side of the vehicle.

Unclip the cap and top up reservoir to within approximately 25 mm (1 in) below bottom of filler neck.

Use a screen washer solvent in the reservoir, this will assist in removing mud, flies and road films from screens.

In cold weather, to prevent freezing of water, add 'Isopropyl Alcohol' or methylated spirits.

Operate the washer switches and check that the nozzles are clear and properly directed.



Check/top up power steering reservoir - Fig. RR1240
The power steering units are lubricated by the operating fluid. The only lubrication attention required is to check the reservoir level as follows:

Unscrew the fluid reservoir cap (1) which is fitted with a dipstick.

Check that the fluid is up to the high mark on the dipstick.

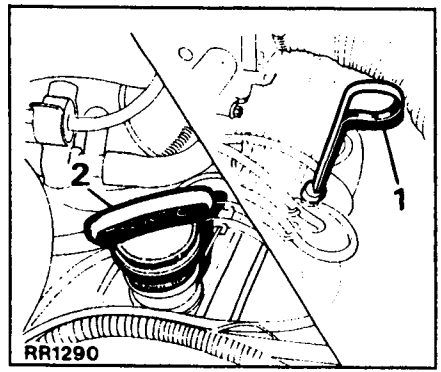
ABS BRAKE FLUID RESERVOIR.
IF FITTED.

Check/top up fluid level.

1. Park vehicle on level ground.
2. Turn ignition ON, to activate hydraulic pump. If pump does not activate depress brake pedal several times until pump is heard to start.
3. When the pump stops, check that the level is between the 'MIN' and 'MAX' marks.
4. If the level is below MIN, top up fluid level to the MAX mark on the reservoir using the correct fluid,- see section 6: Lubricants and fluids.

WARNING: Clean the reservoir body and filler cap before removing the cap. Use only fluid from a sealed container. DO NOT OVERFILL THE RESERVOIR.

FOR NON ABS BRAKES SEE PAGE 78

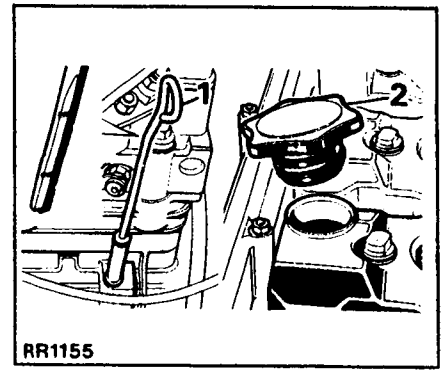


Petrol Engines

Check/top up engine oil level - Fig. RR1290
Position the vehicle on level ground and allow the oil to drain back into the sump.

Withdraw the dipstick (1), at left-hand side of engine; wipe it clean, reinsert to its full depth and remove a second time to take reading. The oil level should not be allowed to fall below the 'LOW' mark on the dipstick.

Add oil as necessary through the screw-on filler cap (2) marked 'ENGINE OIL' on the right-hand front rocker cover. Never fill above the 'HIGH' mark.

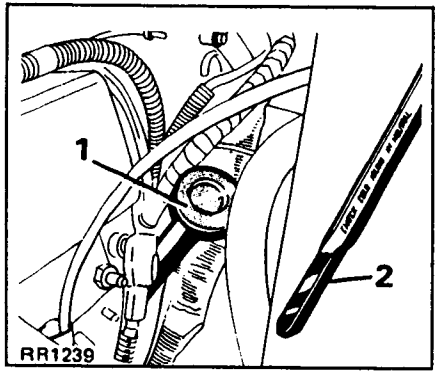


Diesel Engine

Oil level checking and topping up - Fig. RR1155
Withdraw the dipstick (1) and wipe the blade clean.

Reinsert the dipstick fully, then withdraw it and check the oil level indication, which must be between the 'MAX' (top) mark and 'MIN' (bottom) mark.

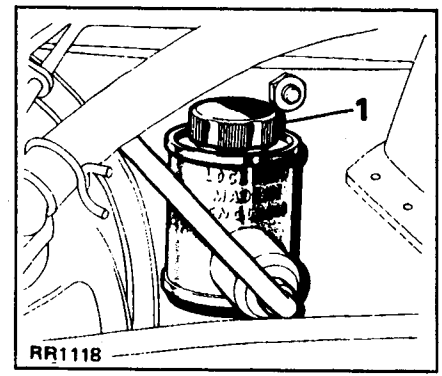
To top up, remove the filler cap (2) and top up the engine with new oil, then repeat the checking and topping up procedure until the oil level is correct. Do not overfill. Do not forget to replace the filler cap.



Automatic transmission

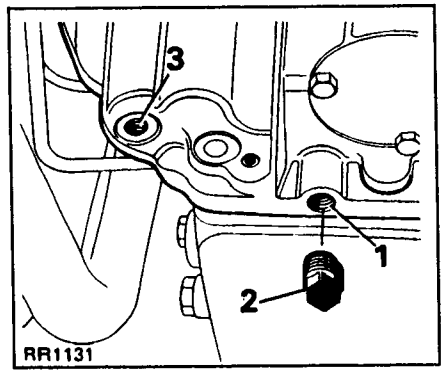
Automatic gearbox fluid level - Fig. RR1239
The combined filler tube cap/dipstick (**1**) is marked with maximum and minimum 'Check Cold' levels (**2**).
Ensure that the vehicle is on level ground with the handbrake applied when checking oil level. Ensure the engine is running at idle and with neutral selected. Withdraw the dipstick from the filler tube and wipe the blade with a piece of clean paper or a nap-free cloth. Reinsert the dipstick fully and withdraw it immediately and check the fluid level indication. This must be between the two markings on the dipstick.

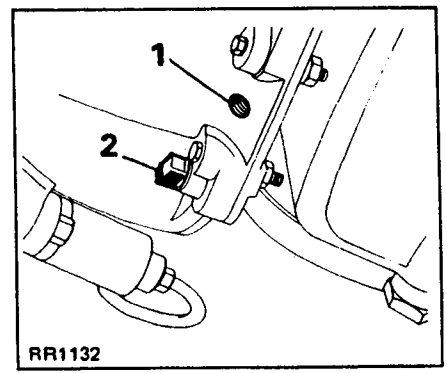
If necessary, top up via the combined dipstick/filler tube using the correct grade of fluid stated in the 'Data' section.
Do not overfill. Approximately 0.25 litre (1/2 pint) of fluid will raise the level from the low mark to the high.
After checking fluid level, be sure that the dipstick is reseated correctly to prevent dirt or water from entering the gearbox.



Manual transmission

Check/top up clutch fluid reservoir - Fig. RR1118
Check the fluid level in the reservoir (**1**), mounted on the bulkhead adjacent to the brake servo.
Remove the cap, top up if necessary to bottom of filler neck. Use the correct fluid specified in Data, Section 6.
If significant topping up is required, check for leaks at master cylinder, slave cylinder and connecting pipes.





Automatic gearbox models

Converter housing drain plug - Fig. RR1131
The drain hole (1) in the bottom of the converter housing must only be plugged to prevent the entry of water or mud while the vehicle is wading or operating in very muddy conditions.

If the plug (2) is continually used in position (1), it must be frequently removed to allow any water or oil to drain away and the plug replaced before wading or muddy work is resumed.

In normal conditions, the drain hole should be kept clear and the plug securely screwed into its retaining position (3).

***NOTE:** If excessive amounts of oil are present during drainage, the cause should be investigated.*

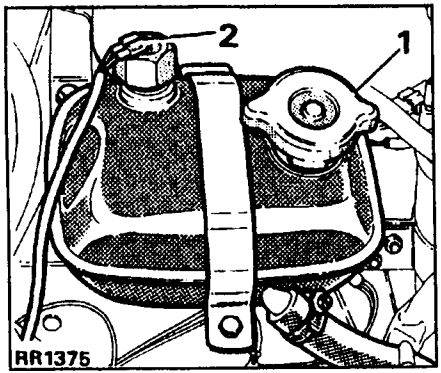
Manual gearbox models

Drain flywheel housing if plug has been fitted for wading - Fig. RR1132
The flywheel housing can be completely sealed to exclude mud and water under severe wading conditions, by means of a plug fitted in the bottom of the housing (1).

When not in use, the plug is retained in position (2), and should only be fitted in position (1) when the vehicle is expected to do wading or very muddy work.

When the plug is in use it must be removed periodically and any water or oil in the housing allowed to drain off before the plug is replaced.

***NOTE:** If excessive amounts of oil are present during drainage, the cause should be investigated.*



Engine coolant - Fig. RR1375
The level of coolant in the expansion tank should be checked daily or weekly dependant on operating conditions.

The expansion tank is located in the top of the engine compartment and is fitted with a spring loaded filler cap (1) and a low coolant' sensor (2).

WARNING: Do not remove the expansion tank filler cap or the hexagonal plug in the top of the radiator when the engine is hot, because the cooling system is pressurised and personal scalding could result.

When removing the filler cap, first turn it anti-clockwise a quarter of a turn and allow all pressure to escape, before turning further in the same direction to lift it off.

With a cold engine, the correct coolant level should be up to 25mm (1 in) below the rim of the filler neck.

'Topping-up' procedure

Whenever coolant is to be added to the cooling system, the following procedure should be adopted:

(a) With the cooling system COLD, remove the expansion tank filler cap.

(b) Remove the radiator filler plug.

(c) Start the engine and allow it to run at 1,500 rev/min while items (d) to (g) are carried out.

(d) Add coolant to the radiator until it is full.

(e) Replace the radiator filler plug.

(f) Add coolant to the expansion tank until the level is 25mm (1 in) below the rim of the filler neck.

(g) Replace the expansion tank filler cap.

When replacing the filler cap, it is important that it is tightened down fully, not just to the first stop. Failure to tighten the filler cap properly may result in water loss with consequent possible damage to the engine through overheating.

Frost precautions and engine protection

To prevent corrosion of the aluminium alloy engine parts and radiator, it is imperative that the cooling system is filled with the specified strength solution of clean water and correct type of anti-freeze, winter and summer, or water and inhibitor if frost precautions are not required.

Never fill or top up with water only; always use the correct anti-freeze solution or add an inhibitor if anti-freeze is not necessary. See Data', Section 6, for solution strength, anti-freeze specification and inhibitor details.

CAUTION: Do not use salt water even with an inbitor otherwise corrosion will occur. In certain territories where the only available water supply has some salt content use only rain or distilled water.

Inhibitor solution should be drained and flushed out and new inhibitor solution introduced every two years or sooner where the purity of the water is questionable.

(Continued)

Cooling System (Continued)

Anti-freeze can remain in the coolant system and will provide adequate protection for two years provided that the specific gravity and level of coolant is maintained. Coolant should be checked before the onset of the second winter and topped up with fresh anti-freeze solution as required. The specific gravity of 50% anti-freeze solution at 68°F (20°C) is 1.075.

After the second winter the system should be drained and thoroughly flushed by using a hose inserted in the radiator filler orifice. Before adding new anti-freeze examine all joints and renew defective hoses to make sure that the system is leak-proof.

To change the solution proceed as follows:

Ensure that the cooling system is leak-proof; anti-freeze solutions are far more searching at joints than water alone.

Place a suitable container in position to accomodate the old coolant and remove the radiator filler plug to assist drainage. Release the bottom hose at its junction with the *radiator and remove the drain plugs - one on* each side of the cylinder block.

NOTE: It is impracticable to drain the coolant retained in the heater system. After draining, flush through the system with clean water.

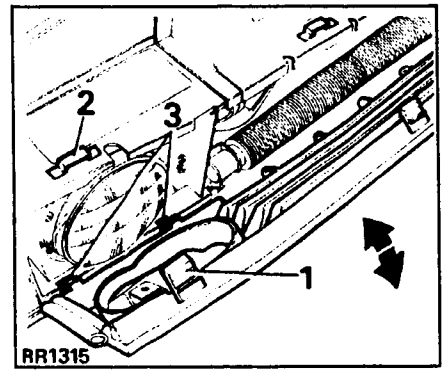
Securely re-fit drain plugs and re-connect the bottom hose. Pour 50% water and suitable anti-freeze solution or inhibitor solution into the expansion tank until the coolant level is up to 25mm (1 inch) below the filler neck.

Start the engine and run it until normal operating temperature is attained, topping up as necessary with the correct anti-freeze solution or inhibitor solution.

Re-fit the radiator filler plug ensuring that its O' ring seal is in good condition. Do not over-tighten the filler plug.

Replace the pressure cap on the expansion tank. When the engine is cool, check coolant level and top up if necessary.

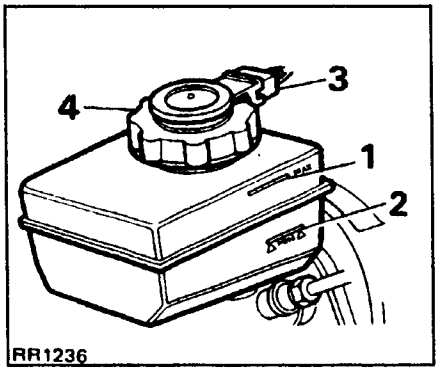
Range Rover models have the cooling system filled with 50% of anti-freeze mixture. This gives protection against frost down to -36°C (-33°F). Vehicles so filled can be identified by the green label affixed to the radiator.



Radiator grille removal and refitting - Fig. RR 1315
Raise the bonnet and secure it with the support rod. Remove the four upper retaining lugs (1) from the locating brackets (2) and ease the top of the grille forward.

Then, taking care not to damage the paintwork on the lower flange of the moulding, manoeuvre the grille out of the bottom lug locations (3) and clear of the bumper.

Refitting is the reverse of this procedure.



Check/top up brake fluid reservoir - Fig. RR1236
The tandem brake reservoir is integral with the servo unit and master cylinder. The level of fluid in the brake fluid reservoir will fall slightly as a normal result of brake pad wear. With the vehicle safely parked on level ground, check that the fluid is up to the 'MAX' level indicator (1) on the reservoir body.

WARNING: DO NOT drive the vehicle if the fluid level has dropped far enough below the 'MIN' mark (2) to allow air to be drawn into the system, making the brakes inefficient. Consult your dealer immediately.

If the level requires topping up:

WARNING: Clean reservoir body and filler cap before removing cap. Use only DOT 4 fluid from a sealed container.

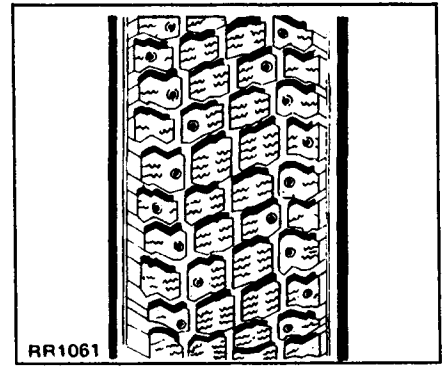
Hold the centre terminal block (3) stationary and unscrew the filler cap (4). Using the correct specified fluid, top up to the MAX' level and carefully replace the cap and terminal block.

If significant topping up is required, check master cylinder, brake disc cylinders, brake pipes and connections; any leakage must be rectified immediately.

CAUTION: When topping up the reservoir, care should be taken to ensure that brake fluid does not come into contact with any paintwork on the vehicle.

New tyres
It is advisable to run-in new tyres by driving at reasonable speeds for the first 400 km (250 miles) or so before driving at high speeds.

Check/adjust tyre pressures including spare.
These should be checked at least every month for normal road use and at least weekly, preferably daily, if the vehicle is used off the road or for high-speed touring. See Data Section for specified pressures.



Whenever possible check with the tyres cold, as the pressure is about 0,21 bar (3 lb/in^2) 0,2 kg/cm^2 higher at running temperature.

WARNING: If the vehicle has been parked in strong sunlight or used in high ambient temperatures, DO NOT reduce tyre pressures; move the vehicle into shade and allow the tyres to cool before checking.

Replace the valve caps, as they form a positive seal.

Check that pressures on all tyres, including the spare, are correct. Any unusual pressure loss in excess of 0,21 bar (3 lb/in^2) 0,2 kg/cm^2 per week should be investigated and corrected.

(Continued)

Tyres (continued)

Check tyres for tread depth and visually for external cuts in the fabric exposure of ply or cord structure.
Most tyres fitted to Range Rovers as original equipment include wear indicators in their tread pattern. When the tread has worn to a remaining depth of 1,6 mm (1/16") the indicators appear at the surface as bars which connect the tread pattern across the full width of the tyre. When the indicators appear in two or more adjacent grooves, at three locations around the tyre, a new tyre should be fitted. If the tyres do not have wear indicators, the tread should be measured at every maintenance inspection and when the tread has worn to a remaining depth of 1,6 mm (1/16"), new tyres should be fitted. Do not continue to use tyres that have worn to the specified limit or the safety of the vehicle could be affected and legal regulations concerning tread depth may be broken.

Check that there are no lumps or bulges in the tyres or exposure of the ply or cord structure.

Clean off any oil or grease, using white spirit sparingly. At the same time remove embedded flints, etc. from the treads with the aid of a penknife or similar tool, and check that tyres have no 'breaks' in the fabric or cuts to sidewalls, etc.

Wheel and tyre units are accurately balanced on initial assembly with the aid of weights secured to wheel rims.

Check that replacement tyres comply with manufacturers specification.

WARNING: Many off-road types of tyre have a maximum speed capability below that of the Range Rover. Therefore, when tyre replacements are required, radial-ply tyres of the approved type must be used. Under no circumstances should cross-ply tyres be used.

Fuel injection vehicles MUST be fitted with 'S' rated tyres.

See tyre details given in the 'Data' section.

Always use the same make and type of radial-ply tyre throughout the vehicle.

Only the wheels, tyres and tyre pressures specified for use on this vehicle must be used,

WARNING: The Range Rover is a multi-purpose vehicle and as such the wheels and tyres are designed for both on- and off-road usage. The replacement of wheels with any type other than genuine Range Rover wheels is not recommended. Wheel design has very important relationships with the proper operation of the suspension system and vehicle handling. Alternative wheels which do not meet original equipment specifications should not be installed on your Range Rover.

The type of wheels fitted to your Range Rover will determine the type of tyre required.

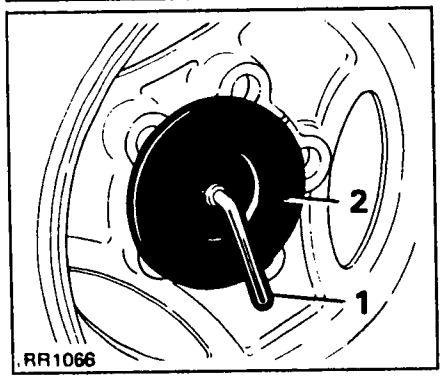
Steel wheels must be fitted with inner tubes.

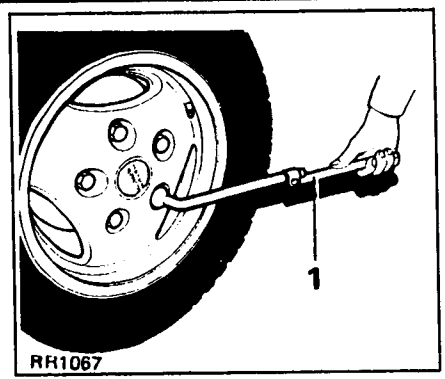
Alloy wheels should be checked to determine whether they are marked 'TUBED' or 'TUBELESS'.

If the wheel is marked **'TUBED'** an inner tube **must** be fitted even when a tubeless tyre is used.

If the wheel is marked **'TUBELESS'** an inner tube must **never** be fitted.

4 WHEEL CHANGING





Spare wheel access
The spare wheel is mounted in the interior of the vehicle, positioned at the left hand rear side. From the rear of the vehicle, open both upper and lower tailgates and fold forward the near portion of the loadspace cover. Then pull the folded cover slightly to release the clip at each end of the hinge and lift the cover off its locating pins.

With the loadspace cover removed, the side panel can be drawn away for access to the spare wheel which is fitted with a fabric cover to prevent soiling of articles in the vehicle.

Spare wheel removal - Fig. RR1066
Remove the loose cover from the wheel and unscrew the locking lever (1) to allow removal of the clamping plate (2) and removal of the wheel.

Wheel changing - Fig. RR1067
Slacken the five wheel nuts, using the hinged type wheel nut wrench (1) - from the vehicle tool kit - in the fully extended position. This will provide additional leverage for removal of wheel nuts.

Jack up the corner of the vehicle - see 'Jacking the vehicle' details.

Remove the nuts and gently withdraw the wheel over the studs.

Lightly oil or grease the wheel studs to assist in replacement and if alloy wheels are being fitted, lightly smear the wheel mounting spigot face with oil or an approved anti-seize compound. These substances should not be sprayed on.

Extreme care must be taken to ensure that oil or compound is not allowed to contact any brake components.

This measure is necessary to minimise the tendency of adhesion between wheel and spigot. Where in an emergency situation this procedure is not immediately practicable, the spare wheel should be fitted for the time being but subsequently removed and treated at the earliest possible opportunity under normal conditions.

After carefully locating the wheel on the studs, tighten the wheel nuts as much as possible with the hinged wheel nut wrench. The hinged part will automatically fold to provide normal leverage for refitting.

Lower the vehicle to the ground and fully tighten the nuts in a diagonal sequence.

After wheel changing, transfer the plastic centre finisher (fitted to certain models) from the previously fitted wheel to the newly fitted wheel.

Tools
The jack, together with a tool roll, two wheel chocks and a two- piece operating lever, will be found attached to the inside of the rear right-hand body panel and should be secured in this position when not in use.

Before jacking the vehicle
Read the jacking instructions carefully before proceeding. If you have any doubt, do not proceed, seek advice and assistance.

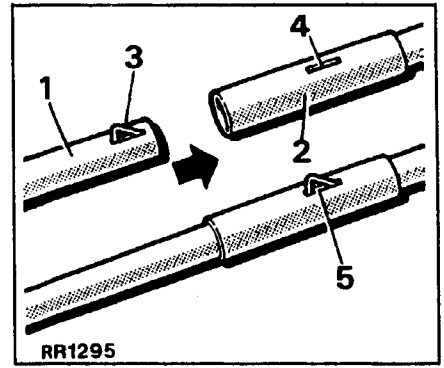
WARNING: The parking brake acts on the rear propeller shaft, not directly on the rear wheels. When any wheel is raised clear of the ground, no vehicle holding or braking effect is possible, therefore wheels must be chocked (using the two wheel chocks supplied in the tool kit) in these circumstances. Always engage low gear in the transfer box.

Apply the hand brake, engage main gearbox position 'P' (automatic transmission) or first gear (manual transmission). Turn off the ignition and remove the key.

WARNING: The jack must only be used with the vehicle securely parked on firm, level ground. No person must remain in a vehicle being jacked. If the vehicle is coupled to a trailer, disconnect the trailer from the vehicle before commencing jacking. This is to prevent the trailer from pulling the vehicle off the jack and causing personal injury.

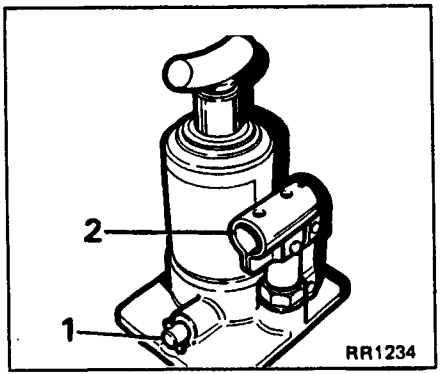
Before jacking up a wheel, the two wheel chocks supplied in the tool kit should be firmly positioned against the front and rear of the wheel diagonally opposite the wheel to be raised.

WARNING: It is unsafe to work under the vehicle using only the jack to support it. Always use heavy duty stands or other suitable supports to provide adequate safety. Care must be taken to avoid accidental contact with any underbody parts but especially the hot exhaust system components likely to cause personal injury during raising or lowering of the vehicle.



For this reason, the complete two-piece jack operating lever must be used throughout the jacking operation particularly when releasing the jack. Ensure that the space under and around the vehicle is free from obstruction as it is lowered.

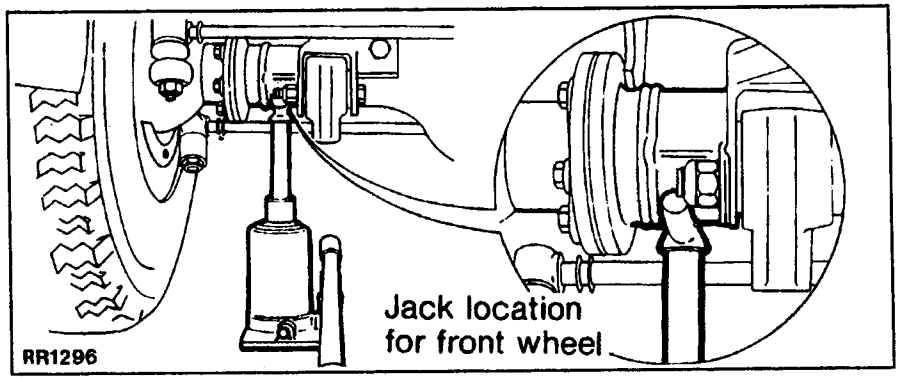
Assembling the jack operating lever - Fig. RR1295
Assemble the two-piece jack operating lever as shown by inserting piece 1 into piece 2 ensuring that when assembled the spring clip 3 protrudes from the engagement slot 4 as shown at 5.



Operating the hydraulic jack - Fig. RR1234

Check that the release valve (1) at the bottom of the jack body is closed (turned fully clockwise). With the operating lever inserted into the socket (2), pump the lever up and down to raise the jack.

To lower the jack, withdraw the lever from the socket, engage it over the pegs on the release valve (1) and use it to slowly turn the release valve anti-clockwise. Downward pressure on the cradle will lower it.

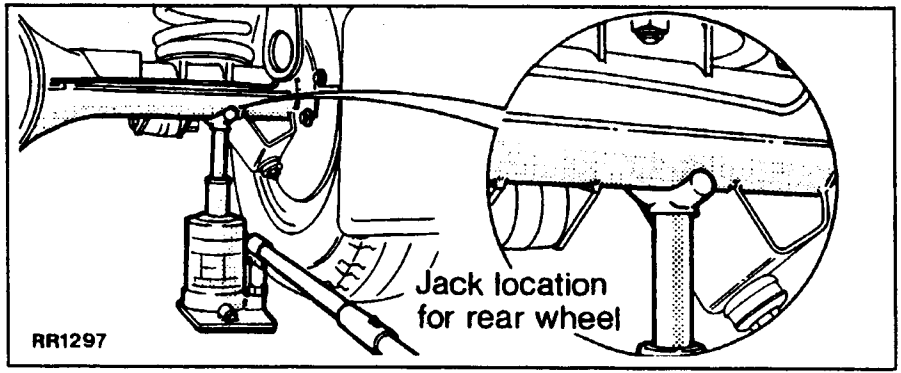


Positioning the jack to raise a front wheel - Fig. RR1296

Enter the jack underneath the vehicle from directly in front of the jacking point.

CAUTION: Never attempt to use the jack from the side of the vehicle.

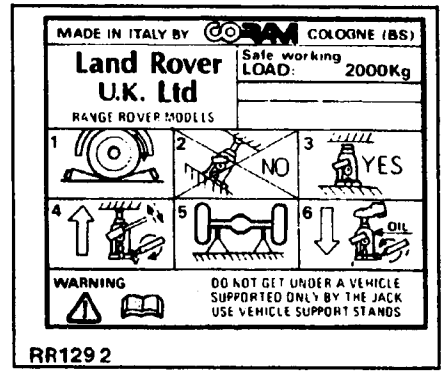
Position the jack so that, when raised, it will engage with the front axle casing immediately below the coil spring. The cradle of the jack must locate between the flange at the end of the axle casing and a large bracket to which front suspension members are mounted.



Positioning the jack to raise a rear wheel - Fig. RR1297
Push the rear mud flap up behind the tyre to allow a clear view of the jacking point. Return the flap to its correct position at completion of jacking.

Enter the jack underneath the vehicle from the rear and directly in line with the jacking point.

Position the jack so that when it is raised, it will engage with the rear axle casing immediately below the coil spring and as close as possible to the shock absorber mounting bracket.

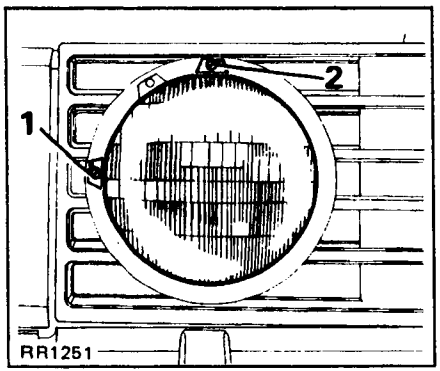


Care of the jack - Fig. RR1292
Neglect of the jack may lead to difficulty in a roadside emergency. Examine the jack occasionally; clean and grease the moving parts, particularly the ram,to prevent rust.

The jack oil level should be checked at normal servicing intervals and if necessary topped up with an hydraulic oil with a viscosity to BS4231 grade 32 and ISO proof 32.

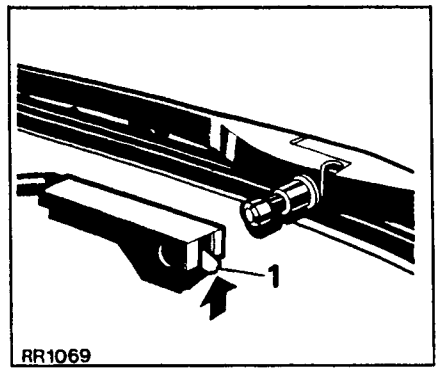
To avoid contamination, the jack should always be returned to its fully closed position before stowage in its correct position.

4 BEAM ALIGNMENT, WIPERS AND SPOILER



Headlamp beam alignment - Fig. RR1251
This operation requires special equipment and should be carried out by your local Distributor or Dealer.

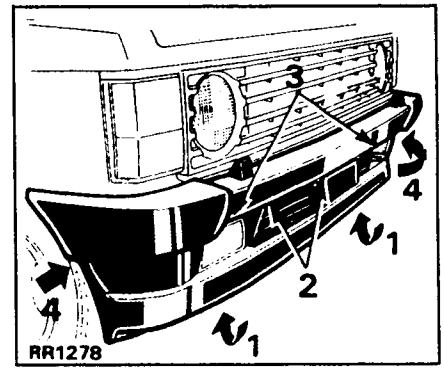
In an emergency each headlamp unit can be adjusted by means of the headlamp horizontal adjusting screw (1) and the headlamp vertical adjusting screw (2).



Check and, if necessary, renew wiper blades - Fig. RR1069
To renew a wiper blade, lift the retaining lever (1) and remove the blade. Locate the new blade spindle into the arm and check that it is retained by the lever (1).

Spoiler removal - Fig. RR1278
The front spoiler fitted to some models of the Range Rover must be removed before driving over terrain which may damage it.

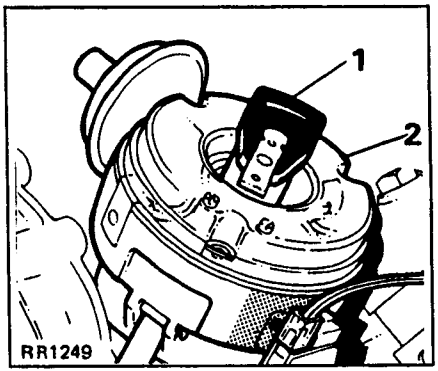
Where such off-road operation is planned, it is preferable to remove the spoiler beforehand where facilities and conditions are appropriate. Otherwise, it should be ascertained that a suitable spanner and screwdriver are always carried in the vehicle for use in such a situation. Removal is as follows:



Disconnect the auxiliary driving lamp connections (1) accessible through the front wheel arches and from the front, remove the two screws complete with spring washers (2) securing the centre of the spoiler.

Then remove the four nuts and washers (3) located behind the bumper above the lamp housings. After removal of two more screws and washers (4) which secure the spoiler to the corners of the front wings, the spoiler - complete with driving lamps - can be lifted clear.

The lamp connectors and wiring on the vehicle should be safely secured before the vehicle is driven.



Electronic distributor - Fig. RR1249
The electronic ignition system uses an appropriate distributor.

This has an vacuum advance unit and centrifugal automatic advance mechanism.

A pick-up module, in conjunction with a rotating timing reluctor inside the distributor body, generates timing signals. These are applied to an electronic ignition amplifier unit fitted on the side of the distributor body.

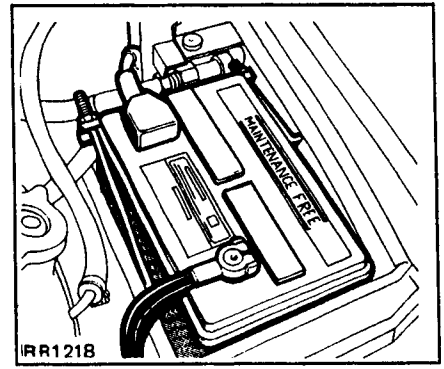
Should it become necessary to check any aspect of the system, the work must be done by a qualified Range Rover distributor or dealer who has the specialised equipment necessary.

The only driver maintenance possible is periodic removal of the distributor cap and rotor arm (1) for the application of three drops of oil to the top of the distributor shaft. Use a clean dry nap-free cloth to wipe the inside of the cap and the top of the clear plastic insulating cover (2) which protects the magnetic pick-up module. This cover must not be disturbed.

Battery - Fig. RR1218
A low maintenance battery is installed in the vehicle. Dependant upon climate conditions the electrolyte levels should be checked as follows: temperate climates every 3 years, hot climates every year.

The exterior of the battery should be occasionally wiped clean to remove any dirt or grease.

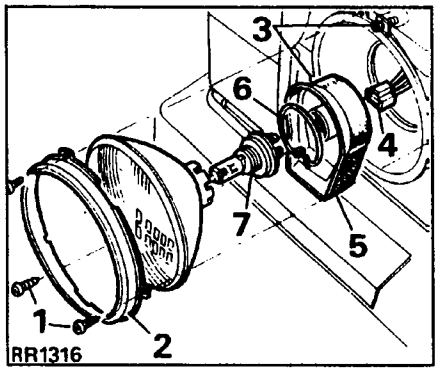
Periodically remove the battery terminals to clean and coat with petroleum jelly.



To check if maintenance is required, gently prise off the vent covers and inspect the electrolyte level of the centre cell. This should be no lower than 1 mm (0.04 in) above the top of the plates. If necessary, top up (with distilled water only) to a maximum of 3 mm (0.12 in) above the plates.

WARNING: If a new replacement battery is to be fitted to the vehicle, it should be the same type as the original. Other batteries may vary in size and terminal positions and this could be a possible fire hazard if the terminals or leads come into contact with the battery clamp assembly. When fitting a new battery, ensure that the terminals and leads are well clear of the battery clamp assembly.

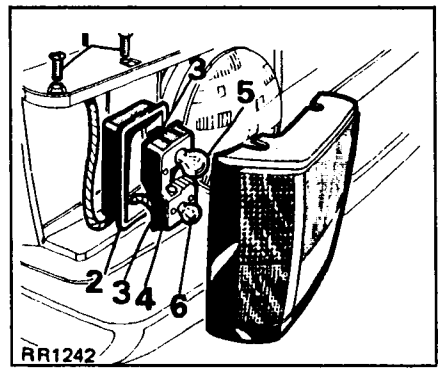
4 EXTERIOR BULB RENEWAL



Headlamp bulb renewal - Fig. RR1316
Prop open the bonnet and remove the grille as described earlier in this section.

Supporting the headlamp unit to prevent it falling, release the three screws (1) in the retaining rim (2). Do not disturb the two beam alignment adjusting screws (3).

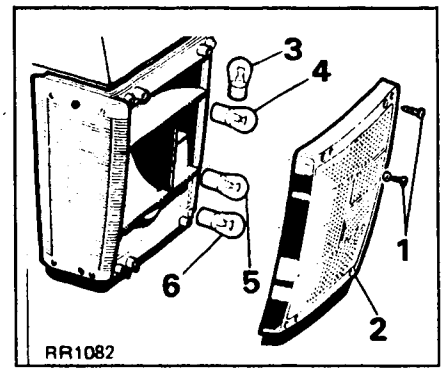
Draw the assembly forward slightly to allow access and disconnect the multi-plug lead (4). Remove the dust cover (5), release the bulb retaining clip (6), remove the faulty bulb and fit a replacement of the correct 'Halogen' type; the bulb holder (7) is keyed to facilitate fitting. IMPORTANT: Do not touch the quartz envelope of the bulb with the fingers. If contact is accidentally made, wipe the envelope gently with methylated spirits.



Refit the components and have the beam alignment checked at the earliest opportunity.

Front sidelight or indicator bulb replacement - Fig. RR1242

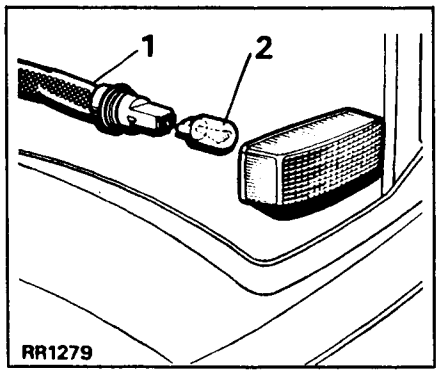
Open the bonnet, remove the two crosshead screws (1) securing the lamp assembly to the vehicle and lift the assembly away just sufficiently to allow access to the rear of the unit. From the rear, remove the cover (2), squeeze the retaining lugs (3) and lift the bulb holder block (4) out of the lens unit for access to the bulbs. The direction indicator flasher bulb (5) is located in the upper part of the block and the sidelight or parking light bulb (6) in the lower section.



Remove the faulty bulb by slight rotation anti-clockwise and withdraw from the block. After renewal of the bulb, refitting of the assembly is simply the reverse of removal.

To replace flasher, tail, reverse and fog guard lamp bulbs - Fig. RR1082

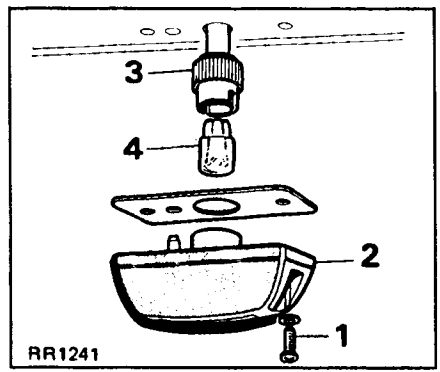
Remove four screws (1) retaining lens.
Remove lens (2).
Replace bulb: tail/stop lamp bulb (3), direction indicator flasher lamp bulb (4), centre inner reverse lamp bulb (5) or bottom fog guard lamp bulb (6).
Refit lens, do not overtighten screws.



Direction indicator side repeater lamps, on front wings - Fig. RR1279

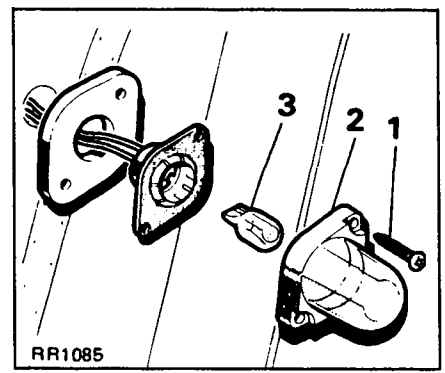
NOTE: The amber lens of this unit is not removeable for bulb renewal.

From the underside of the wing, easily accessible through the front wheelarch, a slight anti-clockwise twist of the bulb holder (1) will release it from the assembly so that the capless 12 volt, 5 watt bulb (2) can be pulled out and renewed. Replacement, of course, is simply reversal of the above.



Number plate illumination - Fig. RR1241

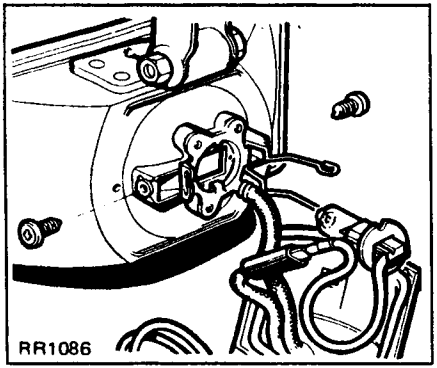
For access to the bulb, remove the two screws (1) complete with fibre washers, and draw off the lens assembly (2) complete with its mounting gasket and bulb holder (3). A slight anti-clockwise twist of the holder will release it from the assembly so that it can be withdrawn to reveal the bulb (4). If necessary, remove and renew the 12 volt, 5 watt bulb and refit the assembly ensuring that the gasket is correctly located.



Underbonnet lamp - Fig. RR1085

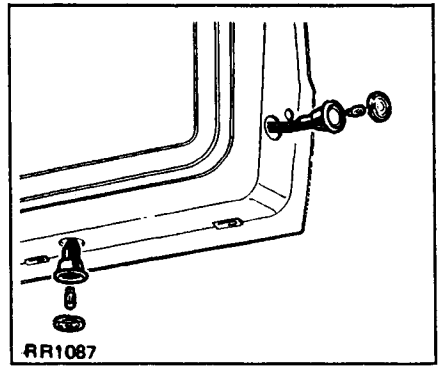
To renew the underbonnet lamp bulb:

Release the two screws (1) and remove the lens (2). Pull the capless bulb (3) from its holder, insert the new bulb and refit the assembly.



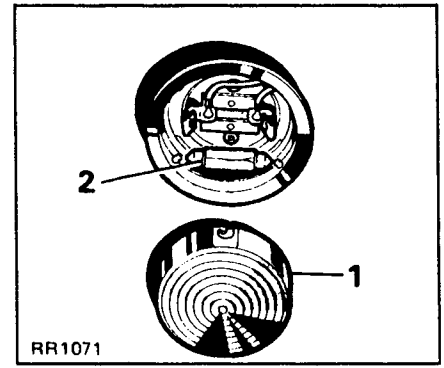
Auxiliary driving lamp bulb replacement - Fig. RR1086
Disconnect the negative (-) lead of the battery. Gain access to the rear of the lamp through the front wheel arch.

Withdraw the electrical connector from the rear of the lamp and remove the lamp securing nut and washer located beneath the front wing adjacent to the front body fixing. Then from the front of the vehicle, manoeuvre the lamp out of the spoiler aperture. Remove the two screws retaining the rear cover of the lamp, withdraw the cover, disconnect the 'Lucar' connector and release the spring clip securing the bulb.



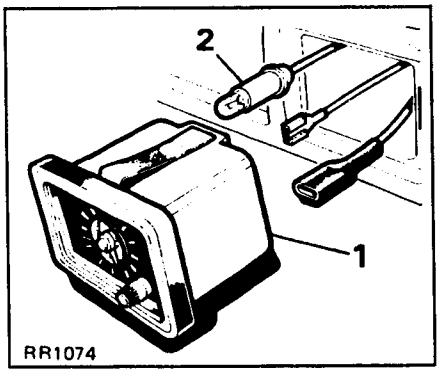
Change the 12 volt, 55 watt H3 halogen bulb taking care not to touch the bulb envelope with the fingers. Ensure that the two notches on the bulb body locate properly with registers on the lamp unit and refit the assembly.

Door edge/puddle lamps bulb replacement - Fig. RR1087
Disconnect the negative (-) lead of the battery and carefully prise out the lamp lens. Withdraw the lamp body from the door as far as the electrical leads permit and pull out the bulb. Replace it with the correct 12 volt, 5 watt capless type bulb, refit the lamp lens and return the assembly to its seating in the door edge.



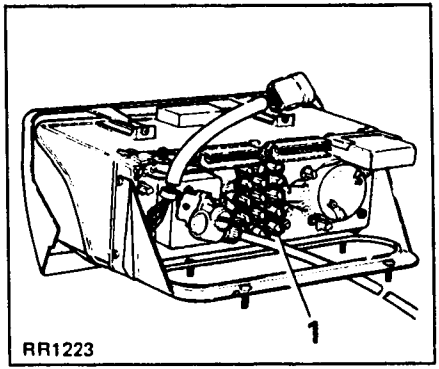
Interior roof lamps - Fig. RR1071

There are two circular lamps in the front and rear of the compartment.
Turn lens (1) anti-clockwise and withdraw. Replace the 12 volt, 10 watt bulb (2) and refit lens.



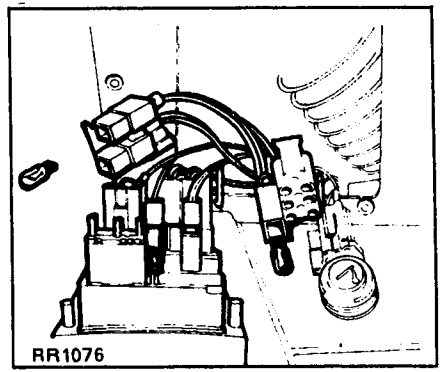
Clock bulb replacement - Fig. RR1074
First disconnect the negative (-) lead of the battery.

Carefully prise the clock (1) out of the fascia panel and draw it forward enough to allow removal of the 12 volt, 2 watt bayonet type bulb and holder (2) from the rear of the instrument. After renewal of the bulb, refitting of the unit is simply the reverse of removal. The clock hands can be reset by depressing and rotating the knob on the clock face.



Binnacle centre warning light cluster bulb renewal - Fig. RR1223
Disconnect the negative (-) lead of the battery before unclipping the back cover of the binnacle for access to the rear of the cluster (1). Remove the appropriate bulb holder unit by rotating it anti-clockwise and withdrawing it.

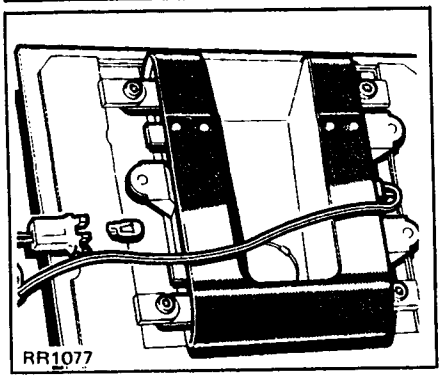
NOTE: The 'No Charge' ignition warning light bulb, identified by its red holder, is of 12 volt, 2 watt wedge base type and is the only one in the cluster that can be pulled from its holder and replaced independently. The remainder are 12 volt, 1.2 watt bulb holder units which can be released from the back of the binnacle by slight anti-clockwise, rotation, removed and replaced by similar units locked in position by clockwise rotation.



Auxiliary switch panel bulb replacement - Fig. RR1076
This panel incorporates a number of 12 volt, 1,2 watt wedge-base (capless) bulbs.

To replace any of these bulbs, first disconnect the negative (-) lead of the battery and carefully prise the panel surround away from the centre console. From the rear of the panel, unclip the multi-plug holding the relevant bulb which can then be pulled out. Renew the bulb, refit the multi- plug and carefully press the panel and surround back into position.

4 INTERIOR BULB RENEWAL



Automatic gearbox selector panel bulb replacement - Fig. RR1077
Disconnect the negative (-) lead of the battery, unclip the cover from the top of the gear selector knob, remove the circlip retaining the detent button and withdraw the button.

Remove the lower circlip above the knob securing nut, remove the nut and serrated washer and slide the selector knob off the shaft.

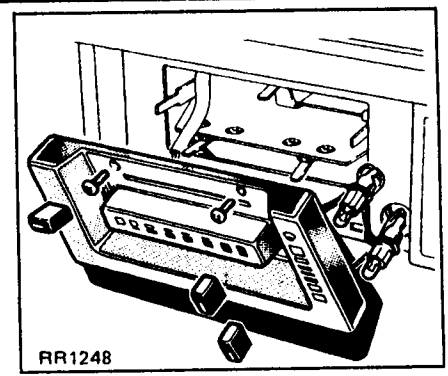
Carefully prise the inset panel, complete with the illumination panel and ashtray, out of the floor-mounted console and extract the appropriate bulb holder.

If necessary, remove the four screws securing the illumination panel to the outer surround.

Pull the 24 volt, 5 watt wedge base (capless) bulb from the holder and replace as necessary.

Refitting is the reverse of removal procedure but care must be taken to prevent the trapping of any electrical lead between mating surfaces.

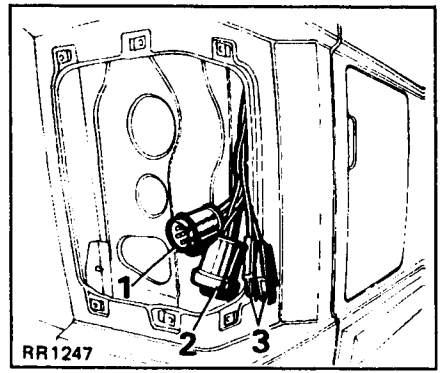
Do not overtighten the selector knob retaining nut.



Interior climate control panel bulb replacement - Fig. RR1248
This panel is illuminated by four 12 volt, 1.2 watt wedge type (capless) bulbs located in the rear of the panel.

To gain access, disconnect the negative (-) lead of the battery, pull off the five finger-tip control knobs from the levers, remove the two screws at the top of the panel and carefully draw the panel away from the centre console only as far as the electrical leads will permit.

Pull the appropriate bulb holder out of the panel and extract the bulb. Insert the new bulb in the holder, push the holder firmly back into its location in the rear of the panel and refit the assembly ensuring that no electrical lead is trapped between panel and console.



Trailer socket facility - Fig. RR1247
Incorporated in the vehicle electrical circuit is a facility for fitting a multi-pin trailer lighting socket.

The pick-up point is located behind the right hand rear tail light cluster and is accessible by removing the tail light assembly.

The pick-up point consists of a multi-pin pre-wired plug, a fused line feed and reverse light lead.

Disconnect the battery.

Remove the rear tail light assembly and disconnect the electrical plug (1).

Remove the protective cap (2) from the trailer pick-up point plug.

A seven- core cable (fitted with a pre-wired plug to one end-suitable for connection to pick-up point), is available as an accessory from your Range Rover dealer. The cable should be fed down between the inner and outer body panels through the rear light aperture.

Pull the cable through the aperture between the chassis side member and fuel tank.

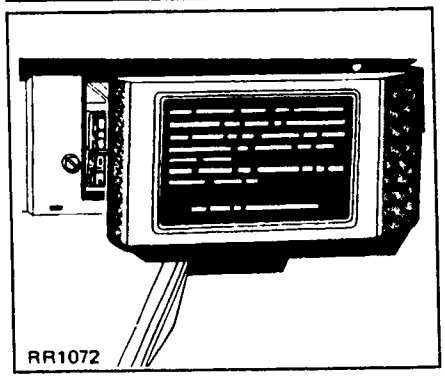
Fit two retaining clips to the cable and secure it to the rear end cross member.

Connect the electrical leads to the vehicle trailer socket. (Refer to current trailer wiring regulations). Secure trailer socket to the tow bar. If it is necessary to provide a line feed and reverse light feed, provision is made for this by the presence of two extra leads (3) in the rear light aperture. Means of identification are as follows:

Fused auxiliary line feed - Purple/White lead

Reverse light feed - Green/Brown lead

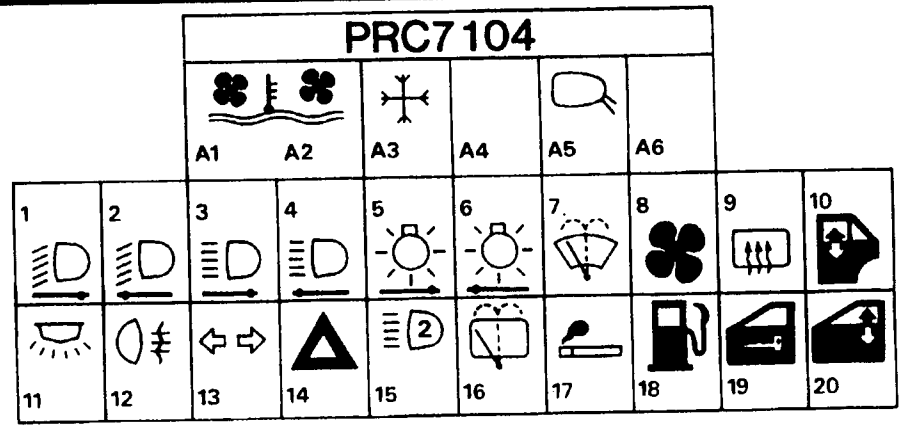
Refit the rear tail light and reconnect the battery.



Fuse Box - Figs. RR1072 and RR1350
The fuse box on the lower fascia contains appropriate blade type fuses each of which is colour coded and marked with its continuous current rating.

To gain access, the side of the cover furthest from the driver should be drawn forward approximately 20mm (3/4in) and then the complete cover moved slightly away from the driver. This will release the cover from locating lugs and allow it to be lifted off.

A fuse extractor on the inside of the cover allows easy removal and replacement of any fuse. A label (Fig. RR1350) identifying the position of each fuse is also attached inside the cover.

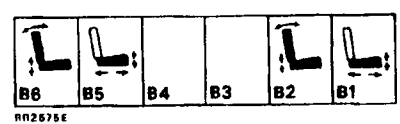


RR1350

Sunroof fuse (where applicable)

The sunroof fuse is a 20 amp blade type, located on the side of the sunroof main relay mounted on the side of the pedal box behind the lower fascia panel.

Electrically operated seat fuses - Fig. RR2575E
A separate auxilliary fuse box and a relay for the electrically operated seats are located under the front left-hand seat. Access to the fuses is by lifting off the top cover of the box.



RR2575E

B1	**Green**	30 amp	Driver's seat base height front
B2	**Green**	30 amp	Driver's seat recline height rear
B5	**Green**	30 amp	Passenger's seat base height front
B6	**Green**	30 amp	Passenger's seat recline height rear

Key to fuse box circuits

Fuse No.	Colour Code	Fuse Value	Circuit served	Ignition Key Controlled
Main Fuse Panel				
1	Brown	7.5 amp	RH headlamp dipped beam and power wash	-
2	Brown	7.5 amp	LH headlamp dipped beam	-
3	Brown	7.5 amp	RH headlamp main beam	-
4	Brown	7.5 amp	LH headlight main beam, auxiliary lights switch	-
5	Tan	5 amp	RH parking lights and instrument illumination	-
6	Tan	5 amp	LH parking lights and radio illumination*	-
7	Blue	15 amp	Front wash/wipe motors, seat relay*, window lift relays, aerial antenna amplifier.	AUX
8	Green	30 amp	Heater/air conditioning motors	AUX
9	White	25 amp	Heated rear screen	IGN
10	Green	30 amp	Rear window lifts*	AUX
11	Blue	15 amp	Interior light delay, seat relay*, clock, audio unit, underbonnet illumination, trailer pick-up point.	AUX
12	Red	10 amp	Rear fog guard (from dipped headlamps)	-
13	Blue	15 amp	Direction indicators, low coolant monitor, stop and reverse lamps, electric mirrors*, interior light delay, heater/air conditioning relay, heated jets and RH steering auto gearbox graphic illumination.	IGN
14	Yellow	20 amp	Hazard switch, horns, headlight flash.	-
15	Blue	15 amp	Auxiliary driving lamps*	-
16	Red	10 amp	Rear wash/wipe motor, heated rear screen switch.	IGN
17	Yellow	20 amp	Cigar lighters and LH steering auto gearbox graphic illumination.	IGN
18	Red	10 amp	Fuel pump	IGN
19	Red	10 amp	Central locking*	-
20	Green	30 amp	Front window lifts*	AUX
Auxiliary fuse panel - (A)				
A1	Yellow	20 amp	Air conditioning fan*	IGN
A2	Yellow	20 amp	Air conditioning fan*	IGN
A3	Tan	5 amp	Air conditioning compressor clutch*	IGN
A4	-	-	Blank	-
A5	Violet	3 amp	Electric mirror motors*	IGN
A6	-	-	Blank	-

NOTE: *Radio/cassette combination - An in-line type 5 amp fuse is incorporated in the power input lead of the unit.*
** Where applicable*

Care of the belts
The safety belts fitted to this vehicle represent valuable and possible life-saving equipment which should be regarded with the same importance as steering and brake systems. Frequent inspection is advisable to ensure continued effectiveness in the event of an accident.

Inspect belt webbing periodically for signs of abrasion or wear, paying particular attention to fixing points. Do not attempt to make any alterations or additions to the seat belts or their fixings as this could impair their efficiency.

If belts are correctly worn and stowed, deterioration will be kept to a minimum and protection to a maximum.

Seat belt assemblies must be replaced if the vehicle has been involved in an accident or if, upon inspection, there is evidence of cutting or fraying of the webbing, incorrect buckle or tongue locking function and/or any damage to the buckle.

Seat belt cleaning
Do not attempt to bleach the belt webbing or re-dye it. If the belts become soiled, sponge with warm water using a non-detergent soap and allow them to dry naturally. Do not use caustic soap, chemical cleaners or detergents for cleaning: do not dry with artificial heat or by direct exposure to the sun.

Checking inertia reel mechanism
The following road test must be carried out only under maximum safe road conditions, i.e. on a dry, straight, traffic-free road. With the safety belt fitted, drive the car at 8 km/h (5 m.p.h.) and, ensuring that it is safe to do so, brake sharply. The safety belt should lock automatically holding the user securely in position. It is important when braking that the body is not thrown forward in anticipation.

Snatch test
Whilst seated, fasten the seat belt and grip the shoulder belt at approximately shoulder level with the opposite hand. Pull the belt sharply in a downwards direction; the belt should lock.

If the belt fails to lock on either test, consult your Dealer.

Body care
It is always preferable to clean the bodywork and exterior trim with water and sponge, using plenty of water. Do not wash the vehicle in the direct rays of the sun, or use strong soap or chemical detergents. Any cleaning agents used should be washed off promptly and not allowed to dry on the bodywork. Dry with a chamois leather. After a period of use, the formation of traffic film will cause the paintwork to lose some of its lustre, even though the vehicle has been carefully and regularly washed. Brilliance may be restored after washing by using a non-abrasive cleaner and polish. Being the most durable, wax preparations are preferable, but where these are used regularly the old wax must first be removed with a cleaner before application of new wax. The frequency at which polishing is necessary will depend on local conditions of air pollution.Avoid using wax on the vinyl-covered rear quarter panels.

CAUTION: Care should be taken to avoid damage by the fuel filler flap being blown open by air dryers in some car wash installations. The central locking system fitted to some Range Rovers includes locking of the flap and use of the system is recommended in such circumstances.

Door and body sill drain holes
Drain holes in the bottom of the doors and the sills should be kept clear using stiff wire.

Underbody maintenance
The use of salt on the roads during frosty weather, sometimes in quite strong concentrations, is widely practised. Due to its highly corrosive nature, salt deposited should be washed off as soon as possible by thorough underwashing of the vehicle with a hose.
Corrosive materials used for ice and snow removal and dust control can collect on underbody parts. If these materials are not removed, accelerated rusting can occur on parts such as frame, floor pan and the exhaust system.

At least every spring, flush these materials from the underbody with plain water. Take care to clean well any areas where mud and other debris can collect.

Cast alloy road wheels
The cast alloy road wheels are covered with a protective coating. To prevent corrosion it is essential that this coating is not damaged. To clean the wheels use a warm soapy liquid, stubborn stains can be removed using a soft brush.

Vinyl covered rear quarter panels
Wash the vinyl surface over with warm soapy water (use soap flakes or mild tablet soap). If dirt is ingrained the use of a soft nail brush will help. Rinse off with clean cold water ensuring that all soap is removed. During normal cleaning of the vehicle the vinyl will not be affected by mild detergents such as are used in automobile car washes. Avoid the use of wax polish, creams, solvents or strong detergents. Under no circumstances should white spirit or motor fuel be used to remove oil or grease marks from the vinyl surface.

Long term storage
If the Range Rover is not in regular use or is garaged for long periods, the efficiency of the braking system and other components could be impaired. Therefore your dealer should be consulted on preparation of your vehicle for any period of inactivity.

Interior
We suggest you brush and clean the inside of the vehicle each time you wash and polish the outside. Use a vacuum cleaner where possible and ensure complete removal of all dust from the interior and trim. Clean the upholstery with a clean cloth or soft brush dampened with a little luke-warm, non-caustic, soapy water. Do not use detergents or household cleaners as these may cause damage. Remove all traces of suds with a clean, damp cloth and thoroughly dry the upholstery with a dry duster or towel. Wipe the fascia and instrument panel with a damp cloth only.

Wax or other polishes should not be used inside the vehicle. Dust in the headlining should be removed with a vacuum cleaner. Stains may be removed by rubbing briskly, without pressure, with a clean lint-free white cloth moistened with methylated spirit.

Leather upholstery (where applicable)
Dust and dirt can penetrate the pores and creases of the leather upholstery, causing the surface to wear and become brittle. Regular cleaning is essential to maintain the leather in first class condition.

Wipe the leather surfaces using a cloth moistened with warm soapy water, but avoid flooding. Repeat using a clean cloth and clean water. Dry the leather and rub with a clean soft cloth.

Use only a mild non-caustic soap. DO NOT use petrol, detergents or household cleaners, as these could cause damage.

For very dirty areas, the use of a proprietary leather cleaner is recommended.

Carpets
Carpets may be cleaned with a brush or vacuum cleaner. Use a good quality carpet cleaner to remove stains.

Heated rear screen
The following precautions must be taken to avoid irreparable damage being caused to the printed circuit which is 'fired' on to the interior of the screen.
Do not remove labels or stickers from the screen with the aid of sharp instruments or similar equipment likely to scratch the glass. Care should be taken to avoid inadvertently scratching the glass with a ringed finger etc., when cleaning or wiping the screen.
Do not clean the screen with harsh abrasives.

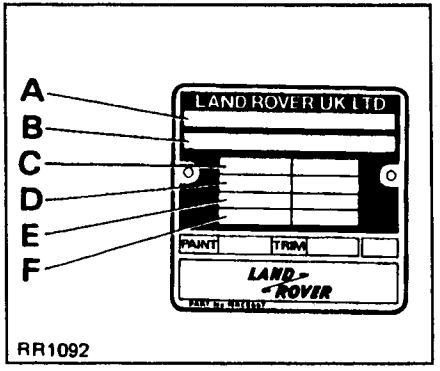
Paint finish damage
Any stone chips, fractures or deep scratches in the bodywork should be repaired promptly. Bare metal will corrode quickly and minor damage can develop into major repair expense. Minor chips and scratches can be repaired with touch-up materials available from your dealer. Larger areas of damage must be corrected to professional standards immediately.

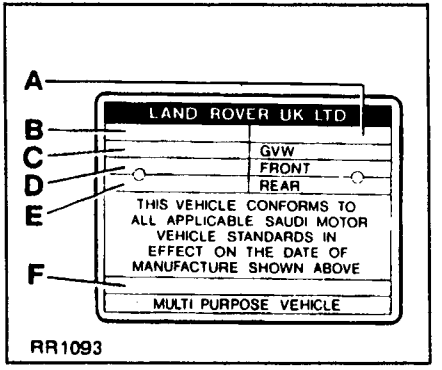
Sheet metal damage
If your vehicle is damaged and requires sheet metal replacement, be sure the body repair shop restores rust protection by applying anti-corrosion material to the parts repaired or replaced.

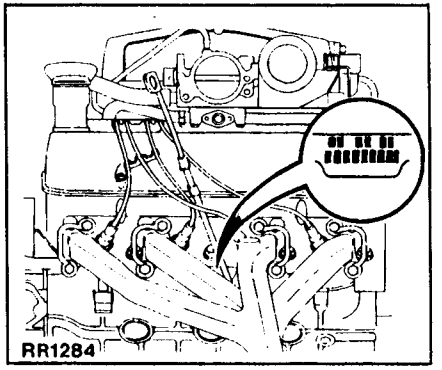
SERVICE AND MAINTENANCE

5

5 VEHICLE IDENTIFICATION NUMBER







Vehicle identification number (VIN)
The plate carrying the VIN together with the recommended maximum vehicle weights will be found under the bonnet riveted to the top of the front grille at the front of the engine compartment.

The VIN is also stamped on the right side of the chassis adjacent to the front shock absorber. Always quote the complete number when writing to the Company or your Distributor or Dealer on any matter concerning your Range Rover.

Key to vehicle identification number plate - (U.K. Europe and Australia) - Fig. RR1092
A Type approval
B VIN (minimum of 17 digits)
C Maximum permitted laden weight
D Maximum vehicle and trailer weight
E Maximum road weight - front axle
F Maximum road weight - rear axle

Key to vehicle identification number plate - (Gulf States) - Fig. RR1093
A Year of manufacture
B Month of manufacture
C Maximum vehicle weight
D Maximum road weight - front axle
E Maximum road weight - rear axle
F VIN (minimum of 17 digits)

Engine serial number - Fig. RR1284
The engine serial number is stamped on a cast pad on the cylinder block between numbers 3 and 5 cylinders, i.e. on the left hand cylinder bank.

NOTE: The appropriate engine compression ratio is stamped above the serial number and should be recorded, as the recommended fuel octane rating and some of the maintenance procedures vary according to the engine compression ratio, see other pages in this section and the 'Data' Section 6.

Spare parts and accessories
When new parts or accessories are required, obtain genuine Land Rover parts, or parts supplied through sources approved by the Company.

Land Rover Distributors and Dealers are obligated to supply only such parts.

Through other sources, parts are often sold as being suitable for Range Rovers but frequently these are not made to the same standard or specification as the Company parts and are therefore less likely to give the requisite performance.

Genuine Land Rover parts and accessories are designed and tested for your vehicle and have the full backing of the Land Rover Limited Vehicle Service Statement. ONLY WHEN GENUINE LAND ROVER PARTS ARE USED CAN RESPONSIBILITY BE CONSIDERED UNDER THE TERMS OF THE STATEMENT.
In accordance with Company policy, the Genuine Parts range is one of continued improvement and should always be used when servicing or replacing parts on your Range Rover. For further information on the Genuine Parts range and Accessories see your Land Rover Distributor or Dealer.

Safety features embodied in the vehicle may be impaired if other than genuine parts are fitted. In certain territories, legislation prohibits the fitting of parts not to the vehicle manufacturer's specification. Owners purchasing accessories while travelling abroad should ensure that the accessory and its fitted location on the vehicle conform to mandatory requirements existing in their country of origin.

Owners should ensure that whenever new parts are fitted to their vehicles they obtain from the Distributor or Dealer who carried out the repairs assurance in writing that the parts concerned conform to the safety and emission control regulations currently in force.

Non-approved equipment
A wide variety of non-approved equipment is offered for fitment to the Range Rover. Consult your Range Rover Dealer for advice before fitting any equipment.

Vehicle Service Statement (Warranty)
Land Rover Limited issue (under the heading of Vehicle Service Statement) an undertaking regarding its Service Policy.

Home market: The Vehicle Service Statement is supplied in the Literature Pack.

Export market: The Warranty, Vehicle Service Statement, should be obtained from the Distributor or Dealer at the time of purchase.

The following notes are given for guidance in the event of a claim being put forward.

1. The vehicle or the part in respect of which a claim is made must be taken immediately to a Land Rover Distributor or Dealer. This should, wherever possible, be the Distributor or Dealer responsible for the sale of the vehicle to the owner.
2. The Distributor or Dealer will examine the parts or vehicle and will without charge advise on the action to be taken in respect of the claim. It will be noted that the Company must reserve the right to examine any alleged defective parts or material prior to the settlement of any claim.
3. It must be understood that the factors of wear and tear and any possible lack of maintenance or unapproved alteration will be taken into consideration in respect of any claim submitted.
4. It will be noted that tyres and glass are expressly excluded. The manufacturers of those tyres which the Company fits as standard to its vehicles will always be prepared to consider any genuine claim.
5. It is recommended that owners should confirm with their insurers that breakage of window glass is claimable without affecting any 'No Claim' discount.

Planned maintenance
As efficient maintenance is one of the most prominent factors in ensuring the continued reliability and efficiency of your Range Rover, detailed schedules have been prepared and are reproduced in the following pages to advise you of the planned maintenance requirements of your vehicle at specific mileages.

Workshop schedules

The following maintenance should be carried out by trained personnel in a fully equipped workshop. If the vehicle is used in an area where ideal workshop facilities are not available, maintenance should at least be done by experienced mechanics in safe conditions.

Absolute cleanliness is essential when carrying out the work.

Maintenance should normally be carried out as described in the following schedules which extend up to 100,000km (60,000 miles) after which they can be repeated.

NOTE: The schedules in this book relate only to non-catalytic vehicles. Maintenance requirements for vehicles fitted with catalytic emission control are shown in a supplementary publication supplied with such vehicles.

Climatic and operating conditions affect maintenance intervals to a large extent; in severe operating conditions, such as desert sand, deep mud or in a very dusty atmosphere, the intervals should be reduced to monthly, weekly or even daily for some items. Therefore the determination of such intervals must be left to the good judgement of the owner or to advice from a Range Rover Distributor or Dealer but the schedules will serve as a firm basis for consideration.

Some of the operations may require the use of specialised knowledge and equipment and are best left to your Range Rover Dealer or Distributor.

NOTE: The fuel system is pressurised and is controlled by electronic components. Any adjustment, maintenance or servicing requires absolute cleanliness, specialist knowledge and equipment which the average Range Rover driver will not possess. Therefore attention to any part of the system should only be entrusted to your local Dealer or Distributor to ensure safety and optimum vehicle performance is obtained.

WARNING: The Range Rover has permanent four wheel drive; see details later in this section before any dynamometer (rolling road) testing.

Boge Hydromat self levelling unit.

WARNING: The levelling unit contains pressurised gas and must not be dismantled nor the casing screws removed. Repair is by replacement of the complete unit only.

The Boge Hydromat levelling unit is totally self-contained and cannot be serviced. A slight oil seepage is permissible as this takes place due to the designed self lubrication, however should the level of seepage give rise for concern please take the vehicle to your nearest Land Rover dealer for investigation and correction if necessary.

Attention required at distance travelled or age of vehicle, whichever least:

- kilometers x 1000	**10**	**20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**	**110**	**120**	**130**	**140**	**150**	**160**
- miles x 1000 or months	**6**	**12**	**18**	**24**	**30**	**36**	**42**	**48**	**54**	**60**	**66**	**72**	**78**	**84**	**90**	**96**
VEHICLE INTERIOR																
1 Check condition and security of seats, seat belt mountings, seat belts, buckles and operation of inertia seat belts.		•		•		•		•		•		•		•		•
2 Check operation of foot brake and clutch * with engine running; stop engine		•		•		•		•		•		•		•		•
3 Check operation of all lamps, horns, warning indicators		•		•		•		•		•		•		•		•
4 Check operation of front/rear screen wipers and washers and condition of wiper blades		•		•		•		•		•		•		•		•
5 Check security and operation of hand brake; release fully after checking	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
VEHICLE EXTERIOR																
6 Check/adjust headlamp and auxiliary lamp alignment *		•		•		•		•		•		•		•		•
7 Check front wheel alignment		•		•		•		•		•		•		•		•
8 Remove road wheels	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
9 Check tyres for: compliance with manufacturers specification; visually for cuts, lumps, bulges, uneven tread wear and depth; tyre pressures (including spare) adjust if required - see 'Data' Section.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
10 Inspect brake pads for wear, calipers for leaks and discs for condition	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
11 Refit road wheels to original position	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

* Where applicable

(Continued)

Attention required at distance travelled or age of vehicle, whichever least:

- kilometers x 1000		10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160
- miles x 1000 or months		6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96
(Vehicle exterior - continued)																	
12	Check operation of all doors, bonnet and tailgate locks		•		•		•		•		•		•		•		•
13	Lubricate all hinges and door-check mechanisms	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
UNDER BONNET																	
14	Check cooling and heater systems for leaks, hoses for security and condition		•		•		•		•		•		•		•		•
15	Check brake servo hose for security and condition		•		•		•		•		•		•		•		•
16	Check ignition wiring and H.T.leads for fraying, chafing and deterioration		•		•		•		•		•		•		•		•
17	Clean distributor cap, check for cracks and tracking.		•		•		•		•		•		•		•		•
18	Lubricate distributor rotor spindle with rotor arm removed				•				•				•				•
19	Check crankcase breathing system for leaks, hoses for security and condition		•		•		•		•		•		•		•		•
20	Clean/adjust spark plugs	•		•		•		•		•		•		•		•	
21	Renew spark plugs		•		•		•		•		•		•		•		•
22	Renew air cleaner element		•		•		•		•		•		•		•		•
23	Check air cleaner dump valve, clean or renew		•		•		•		•		•		•		•		•
24	Clean or renew engine flame trap / breather filter		•		•		•		•		•		•		•		•

(Continued)

Attention required at distance travelled or age of vehicle, whichever least:

- kilometers x 1000		10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160
- miles x 1000 or months		6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96
(Under bonnet continued)																	
25	Check condition of driving belts - adjust if required	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
26	Renew engine crankcase intake filter				•				•				•				•
27	Clean plenum chamber - ventilation passageway (E.F.I. engines)				•				•				•				•
28	Renew charcoal canister *								•								•
29	Check/top up automatic transmission fluid *	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
30	Check/top up cooling system	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
31	Check/top up fluid in power steering reservoir	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
32	Check/top up clutch fluid reservoir *	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
33	Check/top up brake fluid reservoir	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
34	Check/top up windscreen washer reservoir	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
35	Check/top up engine oil level	•		•		•		•		•		•		•		•	
36	Lubricate accelerator control linkages and pedal pivot		•		•		•		•		•		•		•		•
37	Check throttle and automatic transmission cable operation		•		•		•		•		•		•		•		•

* Where applicable

(Continued)

Attention required at distance travelled or age of vehicle, whichever least:

	· kilometers x 1000	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160
	· miles x 1000 or months	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96
	(Under bonnet continued)																
38	Check/adjust ignition timing (refer to the relevant workshop manual for details)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
39	Check/adjust idle and mixture setting (E.F.I. engines)		•		•		•		•		•		•		•		•
40	Check/adjust steering box		•		•		•		•		•		•		•		•
41	Remove battery connections; clean and grease · refit		•		•		•		•		•		•		•		•
	UNDER VEHICLE																
42	Renew engine oil and filter		•		•		•		•		•		•		•		•
	AUTOMATIC TRANSMISSION																
43	Check/top up automatic transmission fluid level	•	•	•		•	•	•		•	•	•		•	•	•	
44	Renew automatic transmission fluid and filter				•				•				•				•
45	Check/top up transfer box oil level	•	•	•		•	•	•		•	•	•		•	•	•	
46	Renew transfer box oil				•				•				•				•
	MANUAL TRANSMISSION																
47	Check/top up gearbox oil level	•		•		•		•		•		•		•		•	
48	Renew gearbox oil		•		•		•		•		•		•		•		•
49	Check/top up transfer box oil level	•		•		•		•		•		•		•		•	
50	Renew transfer box oil				•				•				•				•

* Where applicable

(Continued)

Attention required at distance travelled or age of vehicle, whichever least:

- kilometers x 1000		10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160
- miles x 1000 or months		6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96
(Under vehicle continued)																	
51	Check/top up front axle oil level	•	•	•		•	•	•		•	•	•		•	•	•	
52	Renew front axle oil				•				•				•				•
53	Check/top up swivel pin housing oil levels (2)	•	•	•		•	•	•		•	•	•		•	•	•	
54	Renew swivel pin housing oil levels (2)				•				•				•				•
55	Check/top up rear axle oil	•	•	•		•	•	•		•	•	•		•	•	•	
56	Renew rear axle oil				•				•				•				•
57	Lubricate handbrake mechanical linkage and adjust to manufacturer's instructions if required		•		•		•		•		•		•		•		•
58	Lubricate propeller shaft universal joints		•		•		•		•		•		•		•		•
59	Lubricate propeller shaft sliding joints				•				•				•				•
60	Check visually brake, fuel, clutch pipes/unions for chafing, leaks and corrosion		•		•		•		•		•		•		•		•
61	Check exhaust system for leakage, security and damage		•		•		•		•		•		•		•		•
62	Check for fluid leaks from power, manual steering and suspension systems, hydraulic pipes and unions for chafing and corrosion	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
63	Check condition and security of steering unit, joints and gaiters		•		•		•		•		•		•		•		•
64	Check tightness of propeller shaft coupling bolts		•		•		•		•		•		•		•		•
65	Ensure front and rear axle breathers are free from obstruction		•		•		•		•		•		•		•		•

* Where applicable

(Continued)

5 MAINTENANCE SCHEDULE

Attention required at distance travelled or age of vehicle, whichever least:

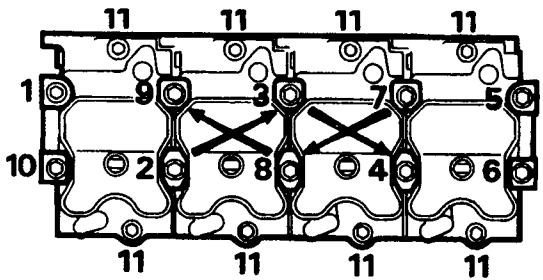
- kilometers x 1000		10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160
- miles x 1000 or months		6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96
(Under Vehicle continued)																	
66	Check security and condition of suspension fixings		•		•		•		•		•		•		•		•
67	Check for oil leaks from engine and transmission		•		•		•		•		•		•		•		•
68	Check suspension self-levelling unit for leaks		•		•		•		•		•		•		•		•
69	Renew fuel filter (E.F.I. engines)								•								•
70	Drain flywheel housing if drain plug is fitted for wading (refit)		•		•		•		•		•		•		•		•
71	Carry out road or roller test; endorse Service Record, report any unusual features of vehicle condition and additional work required.	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

It is recommended that:-
The battery electrolyte level should be checked and topped up if required once a year in high ambient temperatures and once every three years in moderate ambient temperatures.
At 10,000 km (6,000 mile) intervals clean sunroof drain tubes *
At 20,000 km (12,000 mile) intervals clean sunroof drain tubes and channels *
At 30,000 km (18,000 mile) intervals or every 18 months, whichever is the sooner, the hydraulic brake fluid should be completely renewed.
At 60,000 km (36,000 mile) intervals or every 3 years, whichever is the sooner,all hydraulic brake fluid, seals and flexible hoses should be renewed. All working surfaces of the master cylinder, wheel cylinders and caliper cylinders should be examined and renewed where necessary.
At 60,000 km (36,000 mile) intervals remove all suspension dampers, test for correct operation, refit or renew as necessary.
At two-yearly intervals or at the onset of the second winter, the cooling system should be drained, flushed and refilled with the required water and anti-freeze solution.

***NOTE:** Vehicles operating under arduous conditions will require more frequent servicing.*

* Where applicable

The following supplementary schedule should be used together with the schedule in the preceding pages for the complete maintenance of Range Rover Diesel models.



RR1757M

Special Maintenance Instruction - Fig. RR1757M

Tighten in the sequence shown above, the centre six cylinder head bolts a further 10° at the first 40,000 km (24,000 miles) only and similarly at the first 40,000 km (24,000 miles) after the cylinder heads have been removed and refitted.

The maintenance intervals in this schedule are for European highway driving conditions. For change intervals of engine oil and all filters, under severe abnormal operating conditions, consult your nearest Range Rover Dealer.

Every 500 km (250 miles)
- Check engine oil level

After first 1,500 km (1,000 miles)
- Tighten inlet manifold, exhaust manifold and turbo-charger bolts
- Change engine oil and oil filter
- Check drive belt tension
- General check for fluid leaks
- Check tappet clearance

Every 10,000 km (6,000 miles)*
- Change engine oil and oil filter
- Drain sedimenter
- Change fuel filter
- Check for fluid leaks
- Check drive belt tension

Every 20,000 km (12,000 miles)**
- Clean lift pump filter
- Clean fuel sedimenter
- Clean fuel tank breather pipe
- Change air filter element
- Check engine cold idle speed

Every 40,000 km (24,000 miles)
- Check tappet clearance
- Check glow plug operation (continuity)
- Remove diesel injectors, spray test and refit

Every 80,000 km (48,000 miles)
- Remove intercooler element and flush out

Every 96,000 km (60,000 miles)
- Check turbo-charger impeller shaft axial and radial clearance
- Check wastegate operation

* Or every 6 months whichever is sooner.
** Or every 12 months whichever is sooner.

Emission control
As air pollution from all sources is increasing, new and more stringent regulations are continually being introduced to limit the amount of harmful emissions from the internal combustion engine.

This requirement therefore determines the specification and type of equipment fitted to the vehicle and the calibration requirements for such equipment.

Range Rover models supplied to European countries where emission control regulations apply are specially equipped to control the emissions of hydrocarbons, oxides of nitrogen and carbon monoxide from the exhaust system.

Crankcase emission control is achieved by venting the crankcase fumes to be burnt in the combustion chambers.

Evaporative loss control system (where fitted)
Fitted on vehicles for certain territories, this system reduces the amount of fuel vapour vented to atmosphere.

An adsorption canister, located in the engine compartment collects vapour from the engine fuel system and is purged by engine depression which causes the vapour to be burnt in the combustion chamber.

For renewal of the canister, consult your Range Rover Dealer.

A fuel expansion tank ensures sufficient free volume is available to accommodate any fuel displaced from the main tank as a result of temperature rise.

Ignition timing
The correct setting of ignition timing is of extreme importance, and the satisfactory functioning of the emission control system relies to a large extent on its accuracy. It is necessary to set the ignition timing dynamically with the engine at idling speed. This requires the use of a suitable tachometer, for determining the engine speed, and a stroboscopic lamp for determining the points in the engine cycle at which the ignition sparks occur. It is obvious therefore that this work should be carried out by a Range Rover Distributor or Dealer.

Catalytic Converters
Three catalytic converters are fitted into the exhaust system to reduce carbon monoxide, oxides of nitrogen and hydrocarbon emissions. The two down pipes from the exhaust manifolds each house an oxygen sensor located forward of the catalytic convertors.

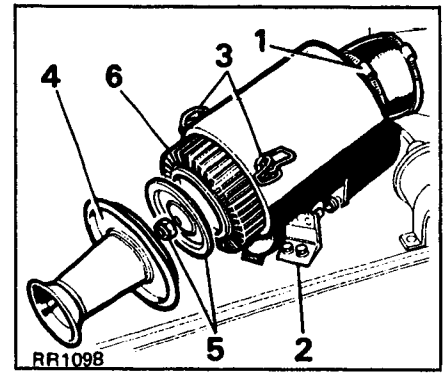
The active constituents of the catalytic device are platinum and rhodium. In order for the device to function correctly, it is necessary to control very closely the oxygen concntration in the exhaust gas entering the catalyst. This is achieved by the use of a fuel control system which continuously monitors the oxygen content of the exhaust gas by means of the oxygen sensor and adjusts the mixture level to obtain the required oxygen content.

Unleaded fuel must be used on catalyst equipped vehicles, labels to indicate this are displayed on the instrument panel and inside the fuel filler flap. The filler neck is designed to accommodate unleaded fuel pump nozzles only.

The emission control system fitted to this engine is designed to keep emissions within legislated limits, providing the engine is correctly maintained and is in sound mechanical condition.

Renew air intake cleaner elements
Attention to the air cleaner is extremely important. Replace elements and clean or renew dump valve every 20,000 km (12,000 miles) or 12 months. Under severe dusty conditions this must be done more frequently as performance will be seriously affected if the engine is run with an excessive amount of dust or industrial deposits in the elements.

For air cleaner removal proceed as follows, following the instructions applicable to the type of air cleaner fitted:



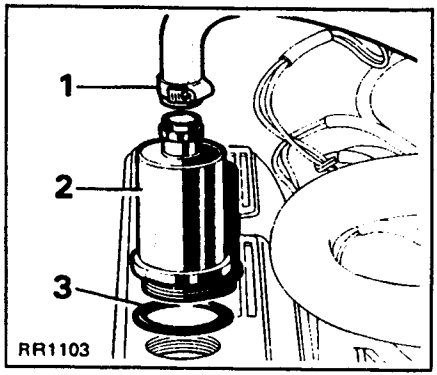
Fuel injection models

Air cleaner element renewal - Fig. RR1098
Release the clip (1) securing the hose to the rear of the air cleaner body. Remove the two nuts and bolts (2) on the retaining bracket and remove the complete air cleaner assembly from the vehicle.

Release the three clips (3) and detach the front inlet tube (4). Remove the nut and end plate (5), withdraw and discard the old element (6).

Insert the new element, reassemble the unit and refit in the vehicle.

5 ENGINE BREATHER FILTERS



Fuel injection models

Crankcase flame trap/breather filter cleaning or renewal - Fig. RR1103

Release the clip (1) and draw the hose off the canister (2), then unscrew the canister and remove it from the rocker cover.

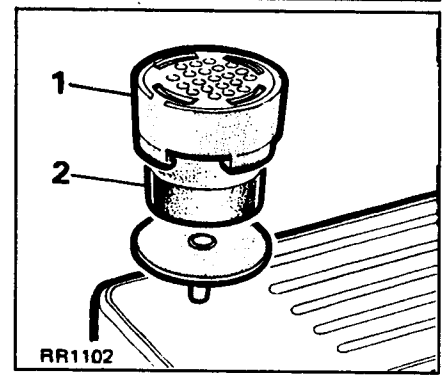
Remove the large 'O' ring (3) from the screwed end of the canister and visually inspect the condition of the wire gauze inside.
If it is in poor condition, the complete assembly should be renewed but if the condition of the gauze is acceptable the canister and gauze can be immersed in a solvent bath for a short time to clear any debris within.

On removal from the bath the canister and gauze should be allowed to dry out in still air.

When dry, fit a new rubber 'O' ring and screw the canister into the rocker cover to hand tightness only. Refit the hose and its clip securely.

NOTE: The hose from flame trap to plenum chamber should be inspected for cracks, general deterioration and blockage caused by debris. Any hose which may be suspect is to be replaced.

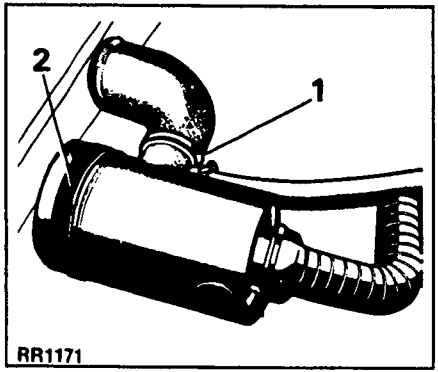
WARNING: Do not use compressed air to dry off traces of solvent or to remove debris as this could cause fire or personal injury.

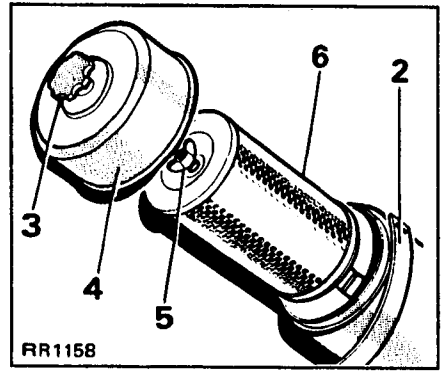


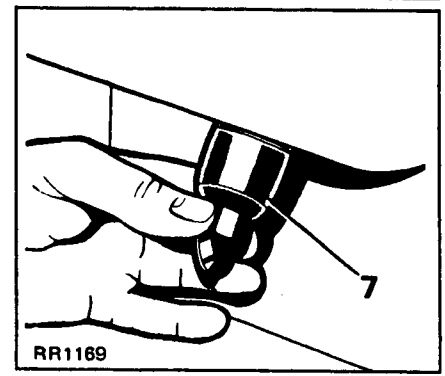
Fuel injection models

Crankcase air intake filter renewal - Fig. RR1102
Carefully prise the filter outer cover (1) upwards to release it from the rocker cover. Remove and discard the sponge filter element (2) and insert the new element. Replace the filter holder by clipping it firmly into place on the rocker cover.

***CAUTION:** On no account use any spurious sponge foam for this application as this could create difficulties with the engine breathing system.*







Diesel model

Renew air cleaner element - Fig RR1171 and Fig RR1158
Disconnect the hose (1) from the air cleaner. Release the retaining strap (2) and lift up the air cleaner assembly.

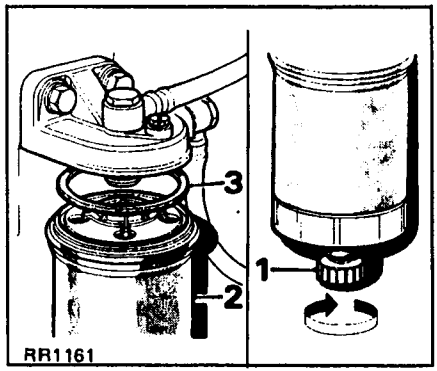
Unscrew the knob (3) and remove the end cover (4) from the air cleaner casing. Unscrew the wing nut (5), discard the element (6) and wipe clean the casing and cover.

Fit a new element and re-fit the other components.

Check air cleaner dump valve - Fig. RR1169
Squeeze open the dump valve (7) and check that the interior is clean. Also, check that the rubber is flexible and in good condition. If necessary, remove the dump valve to clean the interior. Fit a new valve if the original is in poor condition.

Fit a new element, rubber seal end first, and reassemble the air cleaner.

5 MAIN FUEL FILTER - DIESEL MODEL



Main fuel filter - Fig. RR1161

Draining off water and sediment
It is essential that any water and sediment in the fuel filter is drained off, as water in the fuel can result in damage to the injection pump.

Hold a small receptacle beneath the drain cock. Unscrew the drain cock (1) at the bottom of the filter half a turn. Drain off water and sediment.

Immediately fuel starts to flow from the drain cock tighten the drain cock.

NOTE: Any delay in tightening the drain cock when fuel starts to flow could necessitate bleeding the fuel system.

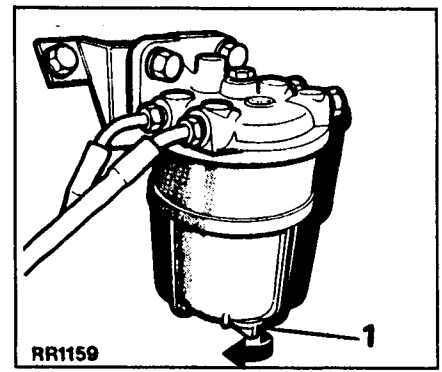
Renewing the fuel filter element
Clean the area around the filter head, and place a container beneath the filter.

Unscrew the filter (2) - a quantity of fuel will be released - and discard the filter. A hexagon is formed on the base of the filter for unscrewing it with a filter wrench.

Moisten the seal (3) of the new filter with fuel.

Screw the new filter into position and tighten with a filter wrench.

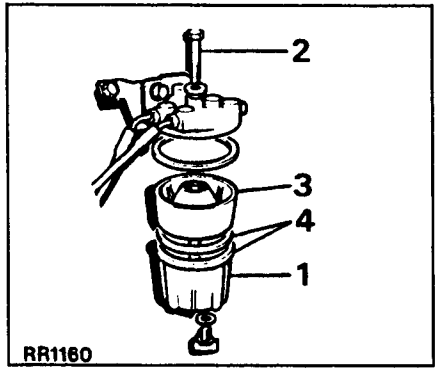
Ensure that the drain cock at the bottom of the filter is screwed up tight.



Fuel sedimenter
The sedimenter is attached to the left-hand side of the chassis frame near the fuel tank, and increases the working life of the fuel filter by removing the larger droplets of water and larger particles of foreign matter from the fuel.

Drain off the water as follows:

Drain off water - Fig. RR1159
Slacken off drain plug (1) and allow water to run out. When pure diesel fuel is emitted, tighten the drain plug.



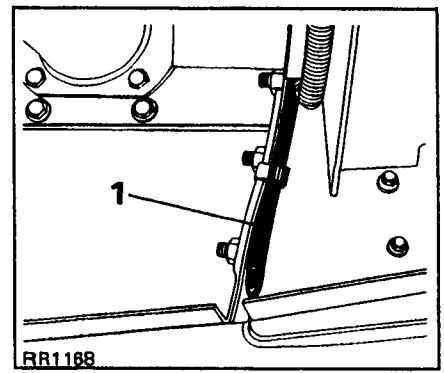
Clean element - Fig. RR1160
If fuel is used from dubious storage facilities, the sedimenter should be removed and cleaned as circumstances require or as specified in the maintenance schedule.

Disconnect the fuel inlet pipe from the sedimenter and raise pipe above the level of the fuel tank and support in this position to prevent fuel draining from the tank.

Support the sedimenter bowl (1), unscrew the bolt (2) on the top of the unit and remove the bowl.

Remove the sedimenter element (3) and clean all parts in kerosene. Fit new seals (4) and reassemble the sedimenter.

Slacken off the drain plug; when pure diesel fuel runs out, tighten plug. Start the engine and check the sedimenter for leaks.

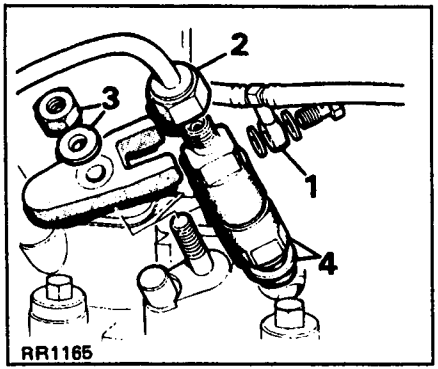


Cleaning fuel tank breather pipe - Fig. RR1168
The fuel tank breather pipe must be cleaned regularly to prevent diesel oil residue and road dust causing blockage. The pipe is located underneath the vehicle and runs down the body panel joint, to the rear of the fuel tank filler neck.

Clean the pipe at the intervals specified in the maintenance schedule, or more frequently if operating in dusty or muddy conditions.

Wipe clean the end of the breather pipe (1) and use a short piece of wire to clear the inside.

5 FUEL INJECTORS - DIESEL MODEL



Injectors - Fig. RR1165
To locate a faulty injector, slacken the feed pipe union nut on the suspected injector and run the engine slowly. If there is no change in the engine performance or if a faulty condition, such as a smoky exhaust, has disappeared, it can be assumed that the injector is faulty and a replacement injector should be fitted.

Unscrew the retaining nut and remove the rocker cover adjacent to the injector to be removed.

Disconnect the fuel leak-off pipe (1) and the high pressure pipe (2) from the injector.

Unscrew the mounting nut (3), and remove the mounting clamp, injector (4) and sealing washer.

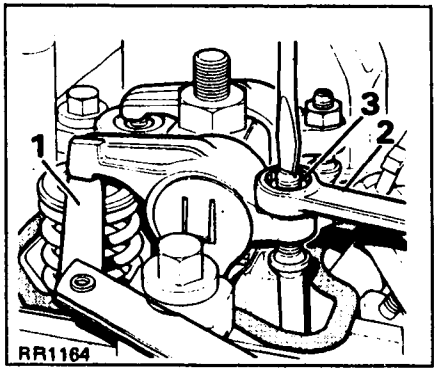
Before fitting an injector fit a new sealing washer.

Fit the injector, its mounting clamp and tighten the injector retaining nut to a torque tightness of 1,7 kgf m (12 lbf ft).

Refit the high pressure feed pipe and leak-off pipe.

Refit the rocker cover; renew the gasket if it is damaged; check that the collars and seals are located on the top of the rocker cover before fitting and tightening the rocker cover.

NOTE: *Fit the rocker cover with the oil filler cap on No.1 cylinder and fit the rocker covers with the breather pipes to No.2 and No.3 cylinders.*



Tappet adjustment - Fig. RR1164
The correct clearance is: inlet and exhaust, 0,30 mm (0.012 in) engine cold.

Remove rocker cover
Unscrew the centre retaining bolts and remove the rocker covers for each cylinder, taking care not to lose the seals from the top of the rocker covers.

Check and adjust tappets.
Turn the engine over until number one valve (counting from front of engine) is fully open.

Using a 0,30 mm (0.012 in) feeler gauge (1) check the clearance between the valve tip and rocker pad of number seven valve.

Adjust the clearance by slackening the lock nut (2) and turning the tappet adjusting screw (3) clockwise to reduce clearance and anti-clockwise to increase clearance. Recheck the clearance after tightening the lock nut.

Continue to check and adjust the remaining tappets in the following sequence:

Set No. 1 tappet with No. 7 valve fully open
Set No. 8 tappet with No. 2 valve fully open
Set No. 5 tappet with No. 3 valve fully open
Set No. 4 tappet with No. 6 valve fully open
Set No. 7 tappet with No. 1 valve fully open
Set No. 2 tappet with No. 8 valve fully open
Set No. 3 tappet with No. 5 valve fully open
Set No. 6 tappet with No. 4 valve fully open

Alternative method
Rotate the crankshaft until the valves of number four cylinder are rocking then adjust the clearance of number one valves. Adjust the remaining valve clearances in the following order:-

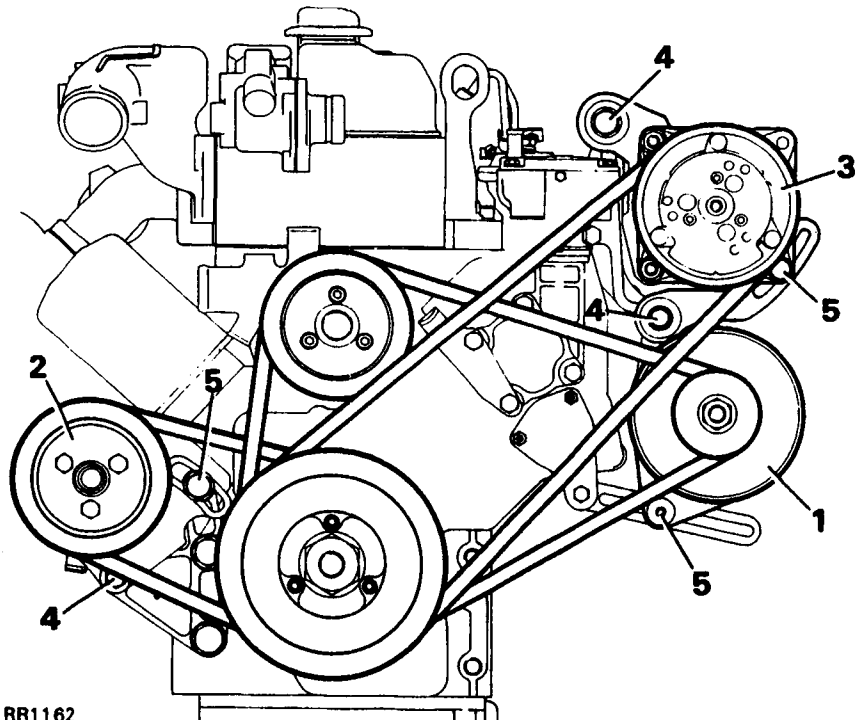
Adjust:-
Valves of No. 3 cyl with No. 2 valves rocking
Valves of No. 4 cyl with No. 1 valves rocking
Valves of No. 2 cyl with No. 3 valves rocking

Refitting the rocker covers
Clean the rocker cover gasket sealing face.

Inspect the rocker cover gaskets; renew if damaged.

Position the rocker cover with the oil filler cap on No.1 cylinder; position the rocker covers with the breather pipes on No.2 and No.3 cylinders.

Check that the collars and seals are located on the top of the rocker covers, then fit the rocker covers and tighten the retaining nuts.



RR1162

Check and adjust drive belts - Fig. RR1162

WARNING: Disconnect the battery to prevent any possibility of the starter motor being operated.

The procedure for checking and adjusting the drive belts for the alternator (1), power steering pump (2) and the optional, air conditioning compressor (3) is similar.

NOTE: Any marks on the outside of the air conditioning drive belt, caused by the belt slipper bracket, can be ignored.

(Continued)

Right-hand steering - Fig. RR1162

(Continuation)

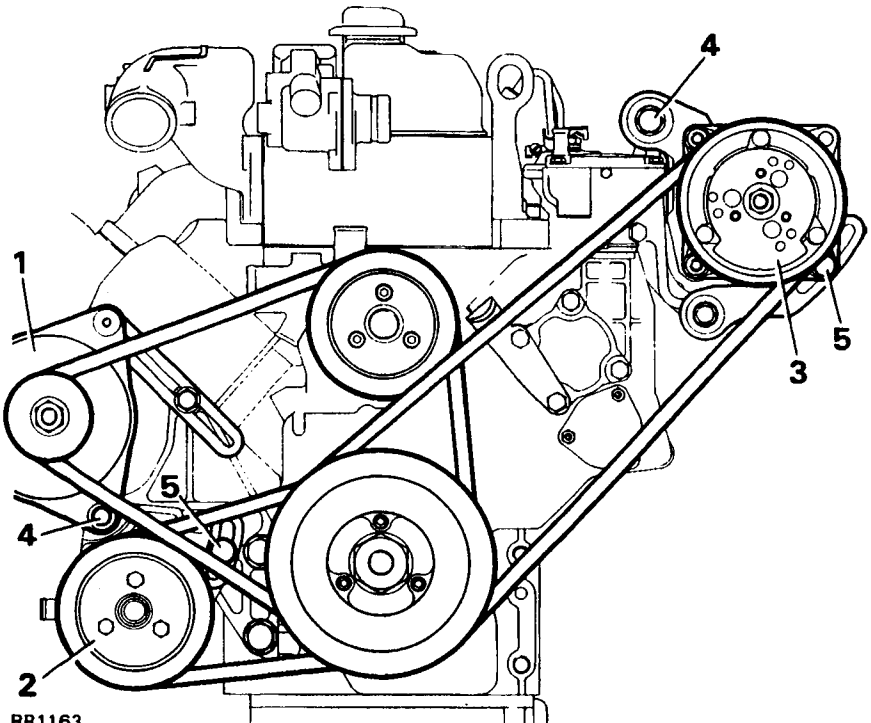
Check the tension of each drive belt, the belts should deflect within the following dimensions, when checked at the mid-point between the pulleys with moderate hand pressure.

Alternator drive belt, 7 to 12 mm (1/4 to 1/2 inch).

Power steering pump drive belt 3 to 7 (1/8 to 1/4 inch).

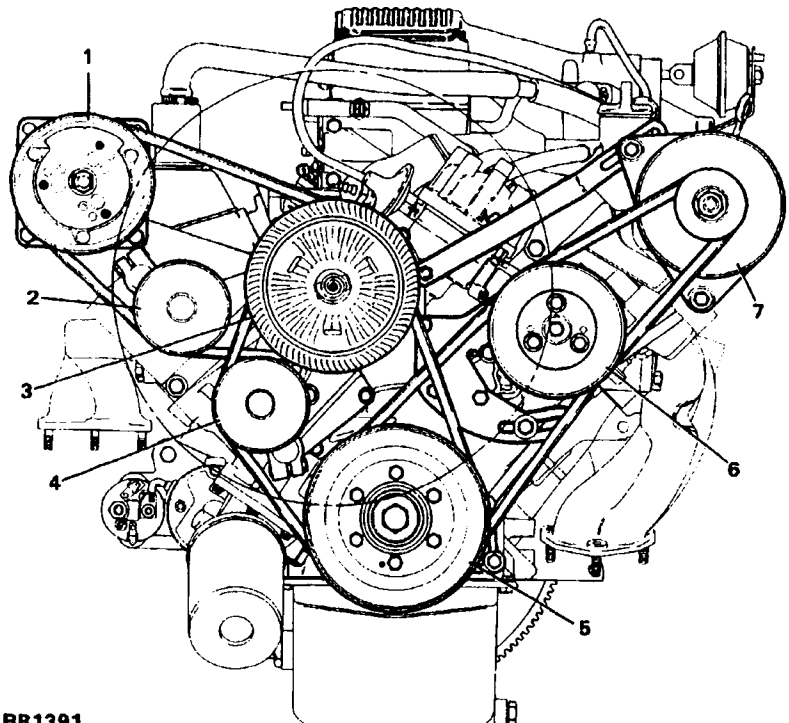
Air conditioning compressor drive belt (option) 7 to 12 mm (1/4 to 1/2 inch).

If any of the drive belts require adjustment, slacken the applicable pivot bolt (4) and the adjusting bracket nut and screw (5), pull the driven unit away from the engine until the belt is tight. Tighten the adjusting bracket then tighten the pivot bolt. Check the belt tension and readjust if necessary.



RR1163

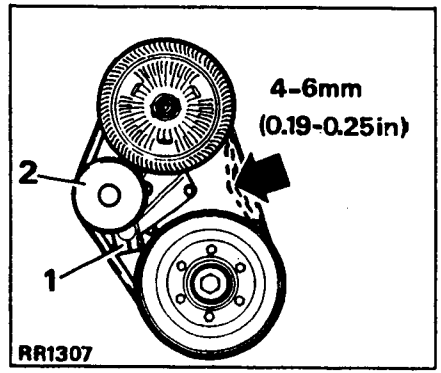
Left-hand steering - Fig. RR1163

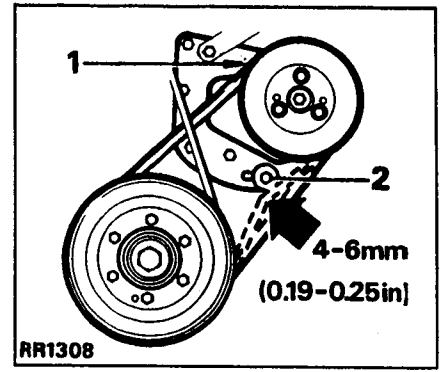


RR1391

Driving belt arrangement - Fig. RR1391 (Air conditioned model illustrated)

1. Air conditioning compressor
2. Jockey wheel
3. Viscous fan/water pump unit
4. Jockey wheel
5. Crankshaft
6. Power steering pump
7. Alternator



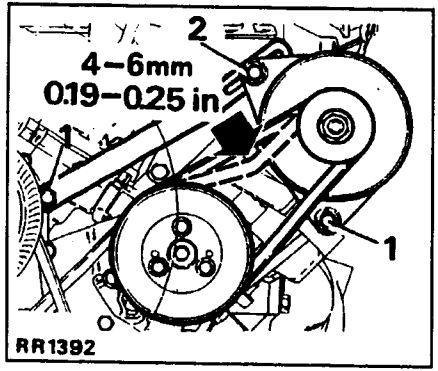


Driving belt tension
Each belt should be tight enough to drive without undue strain on bearings. Using moderate thumb pressure at the points indicated in the illustrations, each belt should not deflect more than 4 to 6 mm (0.19 to 0.25 in). Deflection beyond this limit indicates belt slackness which may cause a loud whining or knocking noise in operation and intermittent drive.

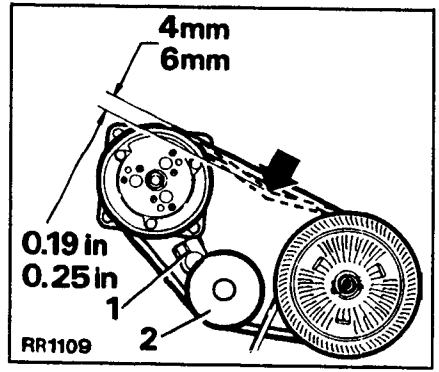
CAUTION: In tensioning belts, do not lever against or apply pressure to the pump body or other components as permanent damage will be caused.

Fan belt adjustment - Fig. RR1307
Slacken the jockey wheel securing bolt (1) and adjust the wheel (2) position until the correct tension is obtained. Tighten the securing bolt and re-check the deflection.

Steering pump belt adjustment - Fig. RR1308
Slacken the pivot bolt (1) and the adjustment bolt (2) and adjust the position of the unit until the correct tension is obtained. Then re-tighten the two bolts and re-check the deflection.



Alternator belt adjustment - Fig. RR1392
Slacken the pivot bolts (1) securing the alternator and pivot bracket, then slacken the adjustment bolt (2). Adjust the position of the unit until the correct tension is obtained then retighten the pivot bolts on the alternator and adjustment bolt, finally tighten the pivot bracket bolt. Recheck the deflection.

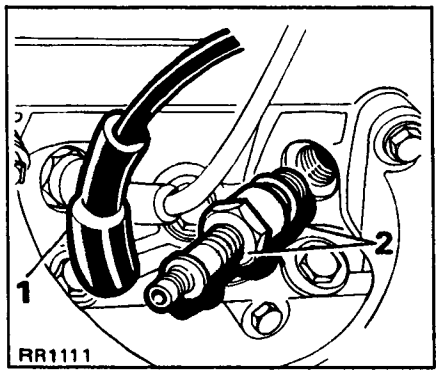


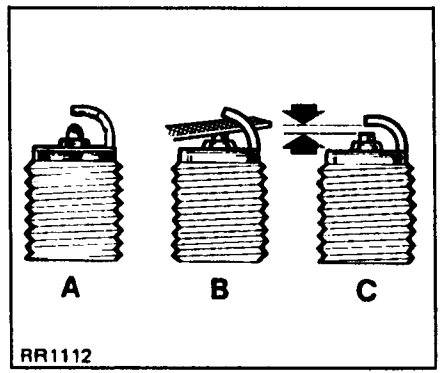
Compressor drive-belt - Fig. RR1109
The belt must be tight with not more than 4 to 6 (0.19 to 0.25 in.) total deflection when checked by hand mid-way between the pulleys on the longest run.

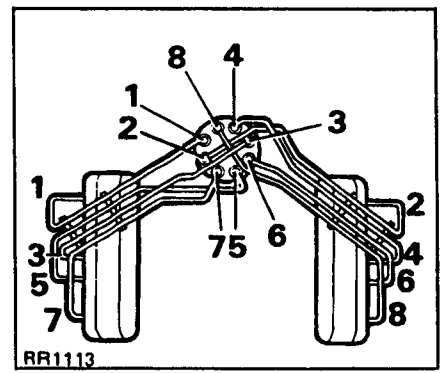
Where the belt has stretched beyond the limits, a noisy whine or knock will often be evident during operation.

If necessary, adjust as follows:

Slacken the jockey wheel securing bolt (1) and adjust the wheel (2) position until the correct tension is obtained. Tighten the securing bolt and re-check the deflection.







Removing spark plugs - Fig. RR1111
To remove spark plugs proceed as follows:

Remove the leads (1) from the spark plugs.

When removing spark plug leads hold the rubber shroud and NOT the H.T. leads. This will ensure no damage will occur to the H.T. lead connector during removal.

Using the special spark plug spanner and tommy bar supplied in the vehicle tool kit, remove the plugs and washers (2).

Before removing spark plugs ensure that the recesses are free from debris to avoid foreign matter entering the cylinder head.

Clean/adjust spark plugs - Fig. RR1112
Check to replace the spark plugs as applicable. If the plugs are in good condition but require resetting wire-brush the plug threads, open the gap slightly (A) and carefully file the electrode sparking surfaces flat using a point file (B). Squaring of the electrode sparking surfaces is important for correct plug operation.

Set the electrode gap to the recommended clearance (C) of 0,72 to 0,88 mm (0.028 to 0.035 in).

Refit spark plugs
If satisfactory the plugs and washers may be refitted to the engine and tightened to a torque of 19,0 to 21,7 Nm (14 to 16 lbf.ft).

It is important that only spark plugs specified in Data, Section 6 are used for replacements.

Incorrect grades of plug may lead to piston over-heating, engine failure and serious damage to components.

Take great care when fitting spark plugs not to cross-thread the plug tappings, otherwise costly damage to the cylinder head will result.

Refit high tension leads - Fig. RR1113
When pushing the leads on to the plugs, ensure that the shrouds are firmly seated on the plugs.

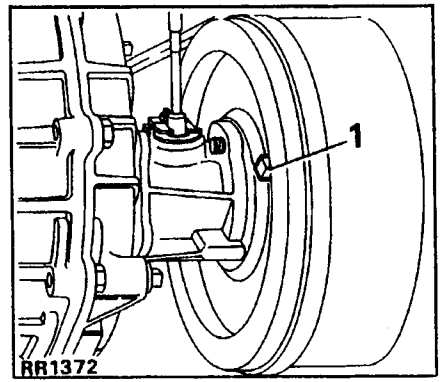
High tension leads must be replaced in the correct relationship to each other to ensure correct firing order i.e. 1, 8, 4, 3, 6, 5, 7, 2. Incorrect refitting will result in engine mis-fire. The correct plug lead positions are illustrated.

Range Rover testing on dynamometers ('rolling roads')

Four-wheel dynamometers: Provided that front and rear rollers of the equipment are rotating at the same peripheral speed and that normal workshop safety standards are observed, there is no speed restriction on testing except for any that may apply to the tyres.

Two-wheel dynamometers: Testing of vehicle driveability on a single axle roller rig must only be undertaken with the transfer gearbox in HIGH RANGE and the drive shaft to the stationary axle removed.

Testing the brakes of your vehicle on a single axle roller rig must only be undertaken with NEUTRAL selected in both the main and transfer gearboxes, the drive shaft to the stationary axle removed and the engine idling.



Check/adjust transmission park brake - Fig. RR 1372

Park the vehicle safely on level ground with 'P' selected on the main gearbox and the wheels chocked.

Disconnect the battery negative terminal and fully release the parking brake.

From underneath the vehicle, rotate the adjuster (1) - on the brake drum backplate - clockwise until the brake shoes are fully expanded against the brake drum. Then unscrew the adjuster only enough to free the drum and check that the brake is fully operational on the second or third notch of the ratchet.

On completion of the adjustment, apply the parking brake, re-connect the battery and remove the chocks.

If the linkage requires adjustment, consult your Dealer.

WARNING: The cable adjustment thumbwheel, located under the base of the glove box must only be used to compensate for cable stretch; it must not be used to take up brake shoe wear which must be adjusted at the brake drum.

General brake maintenance
The hydraulic system comprises two completely independent circuits.The upper pistons in the front calipers are operated by the primary circuit; the rear calipers and the lower pistons in the front calipers are part of the secondary circuit.

NOTE: References to 'primary' and 'secondary' are not intended to imply main and emergency systems but to denote hydraulic line identification.

Bleeding the brake system
If the brakes feel spongy, this may be caused by air in the hydraulic system. This air must be removed by bleeding the hydraulic system at the calipers; one bleed point at each side on the rear, and three at each side on the front. The following additional points should be noted when bleeding the dual system.

***Important:** When bleeding the systems commence with the caliper **furthest** from the master cylinder, and bleed from the screw on the same side as the fluid inlet pipes, then close the screw, and bleed from the screw on the opposite side on the same caliper.*

One advantage with the dual system is the possibility of changing certain brake components without the necessity of bleeding both systems. If the rear brake line only is disturbed, only the secondary system requires bleeding. If the front calipers or master cylinder are disconnected then both primary and secondary systems will require bleeding.

WARNING: Care must be taken to observe the following points:

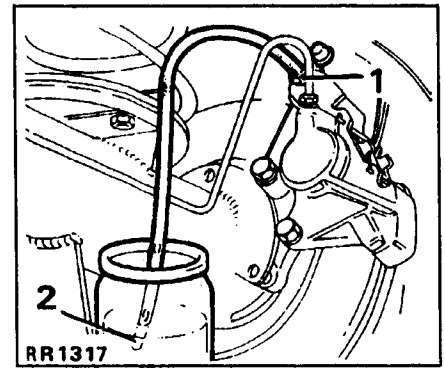
Clean reservoir body and filler cap before removing. Use only the recommended brake fluid from a sealed container.

Never leave fluid in unsealed containers. It absorbs moisture quickly and can be dangerous if used in your braking system in this condition.

Fluid drained from the system or used for bleeding must be discarded.

The necessity for absolute cleanliness throughout cannot be over-emphasised.

Bleeding the system requires two people and should be carried out as follows:



Bleeding the rear brakes - Fig. RR1317

Attach a length of rubber tubing to the bleed screw (1) on the rear caliper furthest from the master cylinder and place the lower end of the tube under the surface of brake fluid (2) contained in a glass jar.

Retaining the tube in this position throughout the bleed procedure to prevent air from entering the system, slacken the bleed screw.

Slowly depress the brake pedal to the end of its stroke and retain it there while the bleed screw is closed. Then allow the pedal to return to its normal position.

(continued)

Bleeding the rear brakes (continuation)

Repeat this part of the procedure until the fluid issuing from the system shows no sign of containing air bubbles.

NOTE: Do not allow the brake fluid level in the reservoir to fall so low as to permit the entry of air into the system.

Finally tighten the bleed screw while the brake pedal is fully depressed and replace the dust cap.

Repeat the complete procedure for the other rear wheel caliper.

Bleeding the front brakes - Fig. RR1318

Attach a bleed tube to the primary bleed screw (3) on the front caliper **furthest away** from the master cylinder.

Attach a second bleed tube to the secondary bleed screw (4) on the same side of the caliper as the primary bleed screw.

Using two separate bleed jars containing fluid and retaining both tube outlets below the fluid surface throughout the operation, slacken both bleed screws.

Slowly depress the brake pedal to the end of its stroke and retain it there while both bleed screws are closed. Then allow the pedal to return to its normal position.

Ensuring that the reservoir fluid level is kept well above the minimum position, repeat this part of the operation until the fluid issuing from the system shows no sign of containing air bubbles.

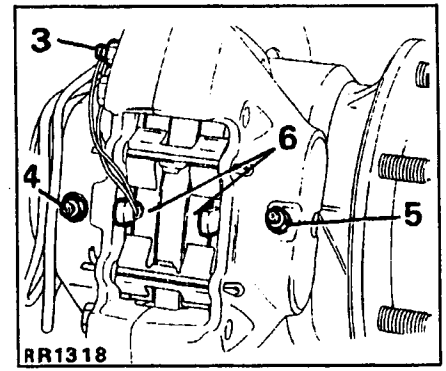
Finally tighten both bleed screws while the brake pedal is fully depressed and replace both dust caps.

Attach a bleed tube to the remaining secondary bleed screw (5) on the same caliper. Slacken the bleed screw.

Slowly depress the brake pedal to the end of its stroke and retain it there while the bleed screw is closed. Then allow the pedal to return to its normal position.

Still ensuring that the reservoir fluid level is maintained, repeat this part of the operation until the fluid issuing from the system is clear of air bubbles.

Finally tighten the bleed screw while the brake pedal is fully depressed and replace the dust cap.



Repeat the complete procedure for the front caliper **nearest** to the master cylinder.

The fluid in the reservoir should be replenished throughout the operation to prevent another air lock being formed, using only new fluid of the recommended type from sealed tins.

Inspect brake pads for wear and discs for condition - Fig. RR1318
Hydraulic disc brakes are fitted and the correct brake adjustment is automatically maintained, therefore no provision is made for adjustment.

Check for oil contamination on brake pads (6) and discs, also check condition of brake discs for wear and/or corrosion.

(continued)

Brake pads (continuation)

The brake pad wear warning light in the binnacle will be illuminated on application of the footbrake (with ignition on) whenever certain inboard pads (fitted with sensors) are worn to approximately 3 mm (0.118 in.) thickness denoting that pad renewal is required.

Brake pads must be renewed in axle sets. On each axle, one of the brake pads fitted has a built in electrical sensor to activate the instrument cluster warning light when the pads are worn.

When purchasing replacement disc pad kits, it is important to ensure that the sensor is located in the correct position and that only genuine Range Rover replacement parts obtained from an authorised Range Rover dealer are used.

If replacement or rectification is necessary, this should be carried out by your local Range Rover Distributor or Dealer.

Renewing hydraulic brake fluid
If the following procedure is adhered to, air will not enter the system and the time taken to change the fluid will be kept to a minimum.

Proceed in the same manner and order as for bleeding the system and connect a bleed tube (incorporating a transparent section to allow observation of the condition of fluid being bled) between a bleed screw and a suitable jar.

Pump out most, but not all, of the fluid in the brake fluid reservoir.

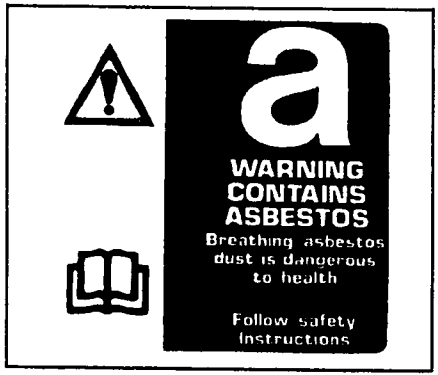
***NOTE:** Do not allow the level of fluid in the reservoir to fall so low as to permit the entry of air into the system.*

Clean the reservoir filler cap before removal and top up the reservoir with new unused fluid of the correct grade from a sealed container.

Ensure the reservoir is kept topped up and bleed until the old and discoloured fluid is ejected and the new fluid is seen in the transparent section; continue to bleed for two full strokes of the pedal and close the bleed screw.

Repeat procedure at each bleed screw in turn.

Top up reservoir and road test vehicle.



WARNING: Some components on your vehicle, such as gaskets and friction surfaces (brake pads, or automatic transmission brake bands), may contain asbestos. Breathing asbestos dust is dangerous to your health. You are therefore advised to have any maintenance or repair operations on such components carried out be a recognised Range Rover Distributor or Dealer. If, however, service operations are to be undertaken on parts containing asbestos, the following essential precautions must be observed.

- ***Wear an approved protective breathing mask.***
- ***Work out of doors or in a well ventilated area.***
- ***Dust found on the vehicle or produced during work on the vehicle should be removed by extraction not by blowing.***
- ***Dust waste should be dampened with water, placed in a sealed container and marked to ensure safe disposal.***
- ***If any cutting, drilling etc, is attempted on materials containing asbestos the item should be dampened with water and only hand tools or low speed power tools used.***

For your further guidance, Range Rover replacement parts which contain asbestos are progressively being identified by the above symbol. If you are in any doubt, please consult your Dealer.

ABS BRAKE FLUID RESERVOIR.
IF FITTED.

Check/top up fluid level.

1. Park vehicle on level ground.
2. Turn ignition ON, to activate hydraulic pump. If pump does not activate depress brake pedal several times until pump is heard to start.
3. When the pump stops, check that the level is between the 'MIN' and 'MAX' marks.
4. If the level is below MIN, top up fluid level to the MAX mark on the reservoir using the correct fluid,- see section 6: Lubricants and fluids.

WARNING: Clean the reservoir body and filler cap before removing the cap. Use only fluid from a sealed container. DO NOT OVERFILL THE RESERVOIR.

FOR NON ABS BRAKES SEE PAGE 78

Lubricants
Land Rover Limited attaches very great importance to the nature of the lubricants used in its products and therefore gives specific recommendations. See Data section.

The recommended lubricants for the Range Rover should be used whenever possible in the grades specified. When ordering oil, the correct grade, as well as the make, should be clearly stated.

The oils recommended by Land Rover Limited are complete in themselves and additives should not be used. Should any of the recommended lubricants not be available in certain territories, the Range Rover Distributor or Dealer for that territory will obtain specific guidance from Land Rover Limited, or owners may communicate with the Company where they so wish.

Engine oil
Maintain oil specified to correct level.

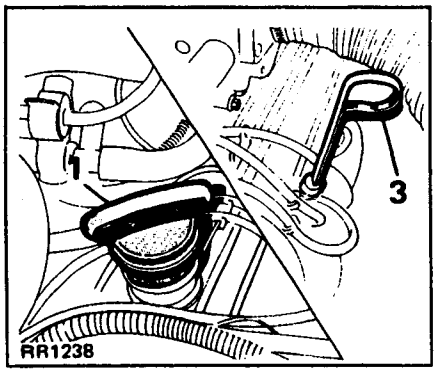
Under severe conditions of mud or dust, the oil changes must be more frequent, even to the extent of a daily change. Under deep wading conditions through water carrying mud and grit, a daily oil change is essential.

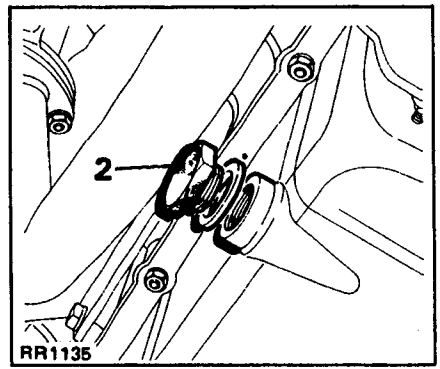
Gearbox, transfer box, differentials and swivel pin housings
It is essential to change oil much more frequently than indicated if the vehicle is operated under severe conditions, especially if deep wading is carried out.

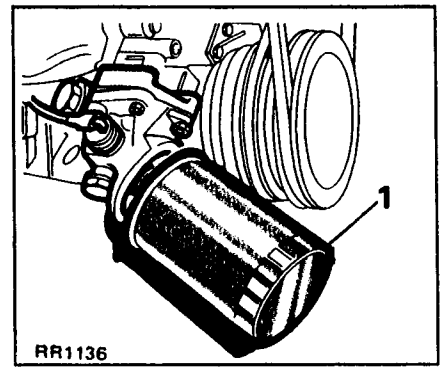
Check for oil - fuel - fluid leaks
Open the bonnet and examine the engine for oil leaks. Check for leaks underneath the engine.

Check the fuel pipes, hydraulic fluid pipes and hoses within the engine compartment for leaks.

If any leakage is discovered remedial action must be taken immediately.







Engine oil renewal - Figs. RR1238 and RR1135
With the engine oil thoroughly warm to assist drainage and with the vehicle safely parked on level ground, remove the oil filler cap (1) and position a suitable receptacle for the old oil under the drain plug (2) in the bottom left side of the sump.

Remove the drain plug and its copper washer and allow the old oil to drain completely.

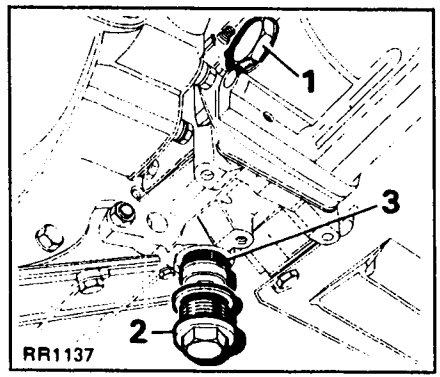
WARNING: Observe due care when removing the plug and when draining as the oil can be very hot.

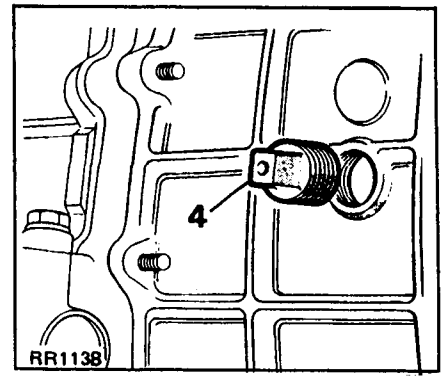
On completion of draining, clean the plug and its mating surface on the sump before securely refitting the plug complete with a new copper washer.

Replenish the engine with fresh oil of the correct grade and quantity (as specified in the 'Data' section of the book) through the filler tube, allowing time to obtain a true reading on the dipstick (3). When the correct level of oil is shown on the dipstick, replace the filler cap.

Engine oil filter renewal - Fig. RR1136
To avoid draining the oil pump, it is essential that the engine is filled with oil to the correct level before the filter is removed. It is therefore recommended that the renewal of engine oil is completed before work on the filter commences.

Clean the area around the filter head, and place a container beneath the engine. Using a strap spanner or similar tool, unscrew the filter (1) anti- clockwise and discard it. Smear the seal of the new filter with clean engine oil and screw on the filter clockwise until it is securely in position. Use hand force only and avoid overtightening.





Engine oil filter removal (Continued)

Start and run the engine to fill the oil filter with oil. Check for leaks.

Stop the engine, wait a few minutes, then check the oil level and top up if necessary.

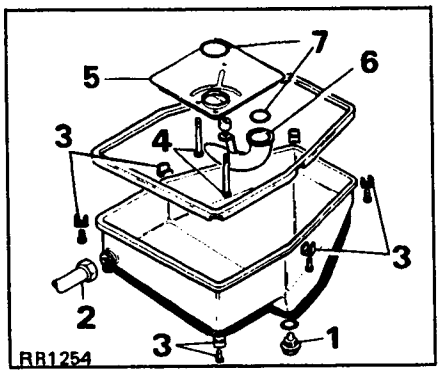
Manual gearbox oil renewal - Figs. RR1137 and RR1138

Park the vehicle safely on firm, level ground and place a suitable container under the gearbox to catch the old oil.

Remove the gearbox and extension case drain plugs (1 and 2) and allow the oil to drain completely. Wash the extension case filter (3) in kerosene, refit it and the plugs using new washers if necessary, and tighten securely.

Remove the oil filler level plug (4) and, using a suitable dispenser, refill with the appropriate quantity of new oil (to the specification shown in Section 6) until it begins to run out of the filler level hole. Fit the plug and tighten securely.

Since the plug has a tapered thread it must not be overtightened. Wipe away any surplus oil.



Renewal of automatic gearbox fluid and filter/screen - Fig. RR1254

Safely park the vehicle on level ground or over a suitable pit and position a suitable receptacle for the fluid under the gearbox drain plug (1).

Remove the plug and sealing washer from the gearbox sump and allow the fluid to drain out. Lift the bonnet and remove the gearbox dipstick to aid drainage.

From underneath the vehicle, release the large nut (2) securing the filler tube to the front of the gearbox sump and detach the tube.

Release the six bolts, washers and clamps (3) retaining the gear box sump and remove it.

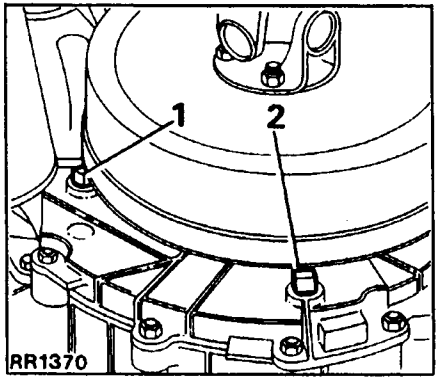
Remove the three screws and washers (4) securing the oil screen (5) to the valve body and remove the screen. Separate the screen from the suction tube (6) and discard the screen and 'O' rings (7). Fit two new 'O' rings to the new oil screen, using a light grease to ensure correct positioning, and fit the suction tube to the oil screen.

Fit the new screen tightening the three screws to a torque of 8 Nm (6 lbf.ft).
Fit a new 'U' gasket to the sump face and refit the sump using all retaining screws and clamps.

Tighten the four corner clamps first, followed by the two centre clamps, all to a torque of 8 Nm (6 lbf. ft).
Reconnect the filler tube to the front of the gearbox sump, tightening the large nut to a torque of 60 to 75 Nm (45 to 55 lbf ft).

Clean and refit the plug with a new sealing washer and tighten to 10 Nm (7 lbf.ft).

Replenish the gearbox fluid to the correct level as described in Section 4.



Check/top up transfer gearbox transmission fluid - Fig. RR 1370
With the vehicle safely parked on firm level ground, disconnect the battery negative terminal and clean the immediate area around the filler/level plug (1).

Remove the plug and check that the fluid level is up to the bottom of the threads of the hole. If necessary, top up with the recommended grade of fluid (see 'Data' Section 6), using a suitable dispenser, until fluid begins to seep from the hole.

Clean the filler/level plug, apply Hylomar sealant (or equivalent) to the threads and re-fit the plug to a torque of 19 to 30 Nm (14 to 22 lbf ft). Wipe away any spillage and reconnect the battery.

If significant topping up is required, check for fluid leakage and consult your Dealer.

Renew transfer gearbox transmission fluid - Fig. RR 1370
Ensure that the vehicle is safely parked on firm, level ground and disconnect the battery negative terminal. Clean the immediate area around the filler/level and drain plugs (1 & 2) and position a suitable receptacle for the old fluid below the gearbox.

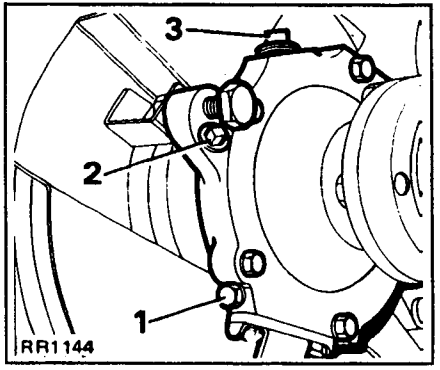
WARNING: Observe due care when removing plugs and during draining; parts and fluid can be very hot.

Remove the filler/level plug (1) to assist drainage, remove the plug (2) and allow time for the fluid to drain.

Clean the drain plug of any remaining old sealant and apply Hylomar sealant (or equivalent) to the threads before re-fitting and tightening the plug to a torque of 19 to 30 Nm (14 to 22 lbf ft).

Using a suitable dispenser, replenish the gearbox with the recommended transmission fluid (see 'Data' Section 6) until the level reaches the bottom of the threads. Wipe away any surplus fluid.

Clean any remaining sealant from the filler/level plug, apply Hylomar sealant (or equivalent) to the threads and refit the plug tightened to a torque of 19 to 30 Nm (14 to 22 lbf ft). Reconnect the battery.



Topping up swivel pin oil level - Fig. RR1144
Front constant velocity joints and swivel pins receive lubrication from the swivel pin housing.

With the vehicle safely parked on firm level ground, removal of the square-headed plug (2) will allow checking of the level of oil in the housing. Oil should be up to the bottom of the hole and can be topped if necessary through the filler plug (3) hole using a suitable dispenser and the specified lubricants (see 'Data' Section 6).

If significant topping up is required, check for leaks at oil plugs, joint faces and oil seals.

From each housing, remove the filler plug (3) to assist in drainage and remove the drain plug (1).

Allow the oil to drain away completely and then replace the drain plugs.

For the housing oil capacity, see Section 6.

Remove the square-headed plug (2) from the oil level hole and, using a suitable dispenser, refill with oil of the correct grade through the filler plug hole of each housing until oil begins to seep from the oil level hole.

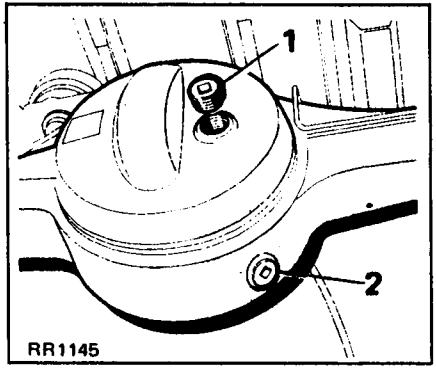
Replace the filler and level plugs.

Front and rear differential oil level check and renewal - Fig. RR1145
Remove filler/level plug (1) check oil level and top up, if necessary, to the bottom of the filler/level plug hole.

If significant topping up is required, check for oil leaks at plugs, joint faces, and oil seals adjacent to axle shaft flanges and propeller shaft driving flange.

Drain and refill monthly under severe wading conditions.

To change the differential oil, proceed as follows:

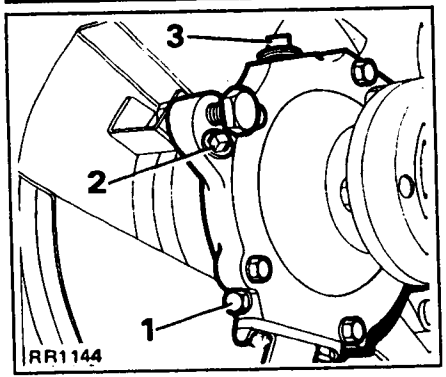


Immediately after a run, when the oil is warm, place a container under the axle drain plug (2) and remove the filler/level plug (1) to assist in drainage by venting the unit during the operation.

Remove the drain plug and allow the oil to drain into the container. Then replace the drain plug, refill with the correct quantity and grade of oil (see 'Capacities' and 'Lubrication Recommendations' in Section 6) and replace the filler plug.

IMPORTANT: Do not overfill, otherwise damage to the seals may occur.

5 SWIVEL PIN HOUSINGS AND DIFFERENTIAL LUBRICATION



Topping up swivel pin oil level - Fig. RR1144

Front constant velocity joints and swivel pins receive lubrication from the swivel pin housing.

With the vehicle safely parked on firm level ground, removal of the square-headed plug (2) will allow checking of the level of oil in the housing. Oil should be up to the bottom of the hole and can be topped if necessary through the filler plug (3) hole using a suitable dispenser and the specified lubricants (see 'Data' Section 6).

If significant topping up is required, check for leaks at oil plugs, joint faces and oil seals.

From each housing, remove the filler plug (3) to assist in drainage and remove the drain plug (1).

Allow the oil to drain away completely and then replace the drain plugs.

For the housing oil capacity, see Section 6.

Remove the square-headed plug (2) from the oil level hole and, using a suitable dispenser, refill with oil of the correct grade through the filler plug hole of each housing until oil begins to seep from the oil level hole.

Replace the filler and level plugs.

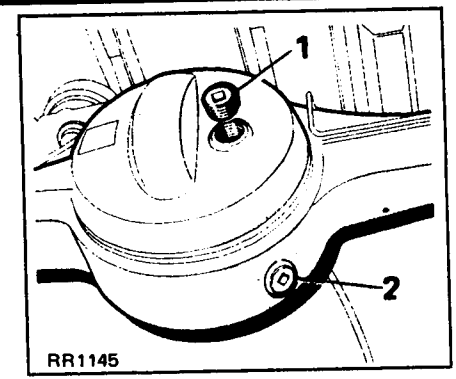
Front and rear differential oil level check and renewal - Fig. RR1145

Remove filler/level plug (1) check oil level and top up, if necessary, to the bottom of the filler/level plug hole.

If significant topping up is required, check for oil leaks at plugs, joint faces, and oil seals adjacent to axle shaft flanges and propeller shaft driving flange.

Drain and refill monthly under severe wading conditions.

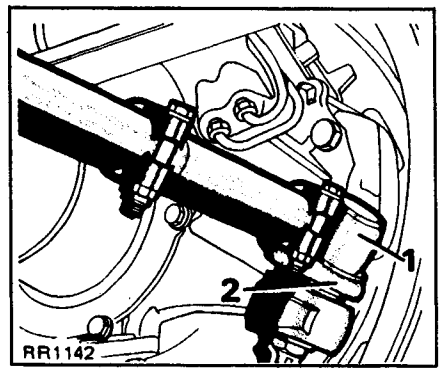
To change the differential oil, proceed as follows:

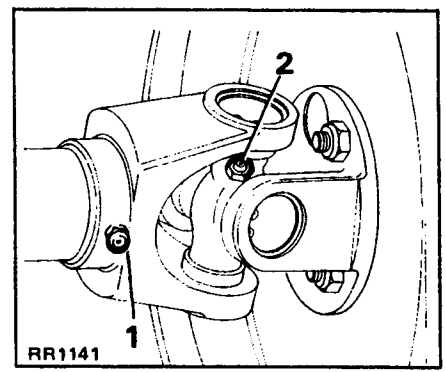


Immediately after a run, when the oil is warm, place a container under the axle drain plug (2) and remove the filler/level plug (1) to assist in drainage by venting the unit during the operation.

Remove the drain plug and allow the oil to drain into the container. Then replace the drain plug, refill with the correct quantity and grade of oil (see 'Capacities' and 'Lubrication Recommendations' in Section 6) and replace the filler plug.

IMPORTANT: Do not overfill, otherwise damage to the seals may occur.





Lubricate handbrake mechanical linkage and lever pivot
The handbrake operates a mechanical brake unit mounted on the output shaft from the transfer box. Lubricate the handbrake linkage with grease (see Recommended Lubricants).

Steering joints - Fig. RR1142
Check rubber boots daily when operating under arduous conditions.

The steering joints (1) have been designed to retain the initial filling of grease for the normal life of the ball joints; however, this applies only if the rubber boot remains in the correct position.

Check to ensure that the rubber boots (2) have not become dislodged or damaged, and check for wear in the joint.

This can be done by moving the ball joint vigorously up and down. Should there be any appreciable free movement the complete joint must be replaced.

Lubricate propeller shafts - Fig. RR1141
Apply one of the recommended greases to the lubrication nipple (1) on the sliding portion of both propeller shafts.

Apply grease to nipples (2) fitted to the universal joints at each end of both front and rear shafts.

***NOTE:** Due to the type of sliding joint used in these propeller shafts, light greasing only is required.*

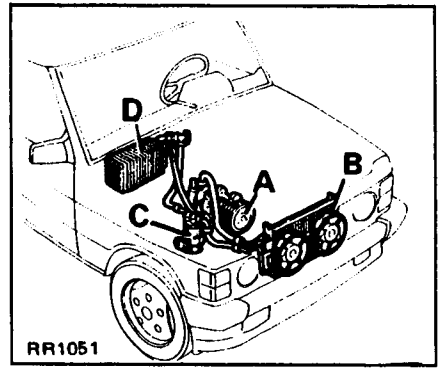
Air conditioning system * - Fig. RR1051
The air conditioning system operates independently of the heater to provide cooled and dried recirculated air.

WARNING: The air conditioning system is filled at high pressure with a potentially toxic fluid. Follow service instructions when dismantling or applying excessive heat, e.g. steam cleaning, painting, etc. Servicing adjustments or rectification procedures must only be carried out by your Range Rover Distributor or Dealer or by a qualified engineer in accordance with instructions in the Workshop Manual. Under no circumstances should non-qualified personnel attempt repair or servicing of air conditioning equipment.

The system is made up of four separate units:

An engine-mounted compressor (A).
A condenser (B) mounted in front of the radiator
A receiver/drier unit (C) located in the engine compartment.
An evaporator unit (D) mounted behind the fascia.

* Where applicable



The four units are interconnected by hoses carrying refrigerant. The refrigerant circuit cools the evaporator which is connected to the ventilation system, and thus cools the air inside the vehicle.

Routine maintenance - Every 20,000 km (12,000 miles)
Check the following items as indicated;
Adjust the compressor drive belt if required.
For specified compressor oils and refrigerant see Lubrication chart, Section 6.

Condenser
Using a water hose or air-line, clean the exterior of the condenser matrix.
Check the pipe connections for signs of fluid leakage.

Evaporator
Examine the pipe connections for signs of fluid leakage.

Receiver/drier sight-glass
After running the engine for five minutes, with the air conditioning system in operation, examine the sight-glass, there should be no sign of bubbles.

If bubbles are present, check the pipe connections for signs of fluid leakage, rectify if necessary and recharge the system.

Compressor
Check the pipe connections for fluid leakage and the hoses for swellings.

Fuses - air conditioning electrical circuit
The air conditioning electrical circuit is protected by a block of four push-in fuses in the fuse box on the lower fascia. (See Section 4).

DATA

6

Petrol Engines

Type	V8	Cylinder capacity	3528 cm^3 (215 in^3)	Ignition coil	Bosch 12 volt electronic
Bore	88,9 mm (3.5 in)	Spark plug type	Champion N9YC	Distributor type	Lucas 35 DLM8
Stroke	71,12 mm (2.8 in)	Spark plug gap	0,72 to 0,88 mm (0.028 to 0.035 in)	Distributor air gap	0,20 to 0,35 mm (0.008 to 0.014 in)
Number of cylinders	Eight	Firing order	1,8,4,3,6,5,7,2		

Compression ratio	9.35:1	8.13:1
Maximum power	EEC 1269: 120 kW (161 bhp) at 4750 rev/min DIN 70020: 123 kW (165 bhp) at 4750 rev/min	EEC 1269: 109 kW (146 bhp) at 4750 rev/min DIN 70020: 112 kW (150 bhp) at 4750 rev/min
Maximum torque	EEC 1269: 271 Nm (200 lbf.ft) at 3000 rev/min DIN 70020: 280 Nm (207 lbf.ft) at 3200 rev/min	EEC 1269: 249 Nm (183 lbf.ft) at 2500 rev/min DIN 70020: 258 Nm (190 lbf.ft) at 2500 rev/min
Idle speed, rev/min	700 to 800	700 to 800
Ignition timing (dynamic)	TDC $\pm$ 1° at 600 rev/min max (vacuum pipe disconnected)	TDC $\pm$ 1° at 600 rev/min max (vacuum pipe disconnected)
Exhaust gas CO content at idle	0.5 to 1.0%	0.5 to 1.0%
Fuel required	97 octane ***Use UNLEADED ONLY (95 octane minimum) for vehicles with catalytic converters***	90 octane
Fuel injection system	Lucas 'L'	Lucas 'L'
Fuel pump, electrical	A.C. Delco high pressure (in fuel tank)	A.C. Delco high pressure (in fuel tank)
Fuel pump delivery pressure	1,83 to 2,5 kgf/cm^2 (26 to 36 lbf/in^2)	1,83 to 2,5 kgf/cm^2 (26 to 36 lbf/in^2)
Fuel filter	Bosch in-line canister type	Bosch in-line canister type

NOTE: Maximum power and torque figures are derived from bench tests and do not allow for installation losses in the vehicle.

(Continued)

Petrol Engines (Continuation)

Lubrication

System	Wet sump, pressure fed
Oil pressure	2,11 to 2,81 kgf/cm^2 (30 to 40 lbf/in^2) at 80 km/h (50 mph) in top gear with engine warm (2400 rev/min)
Oil filter - internal	Gauze pump intake filter in sump
Oil filter - external	Full-flow, self-contained cartridge

Cooling system

Type	Pressurised spill return system with thermostat control, fan assisted and pump
Thermostat	88°C
Pump type	Centrifugal

Clutch (Manual transmission models only)

Type	Borg and Beck diaphragm spring
Centre plate diameter	267 mm (10.5 in)
Hydraulic fluid	See 'Recommended fluids' later in this section

Tappets

Type	Hydraulic, non adjustable

Diesel engined models

Engine	Engine type	VM-HR 492 HI	
	Bore	92 mm	3.622 in
	Stroke	90 mm	3.543 in
	No. of cylinders	4	
	Capacity	2393 cm^3	146.03 in^3
	Compression ratio	22:1	
	Maximum power	EEC 1269: 78kW (105 bhp) at 4200 rev/min	
		DIN 70020: 84 kW (113 bhp) at 4200 rev/min	
	Maximum torque	EEC 1269: 238 Nm (175 lbf.ft) at 2400 rev/min	
		DIN 70020: 248 Nm (183 lbf.ft) at 2400 rev/min	
	Injection order	1, 3, 4, 2,	
	Valve clearance (cold): Inlet	0,30 mm	0.012 in
	Valve clearance (cold): Exhaust	0,30 mm	0.012 in
	Static injection timing	3° B.T.D.C.	
	Idle speed	750 to 800 rev/min	
	Engine speed at maximum power	4200 rev/min	
	Maximum light running speed	4700 rev/min	
Fuel system	Fuel injection pump	Bosch	
	Type	VE4/10F 2100L168/1	
	Fuel lift pump	'BCD' mechanical type driven from camshaft	
	Fuel injectors	Bosch KBE 58S 4/4	
	Nozzle type	DN OSD 263	
	Main fuel filter	Bosch	
	Glow plugs	Bosch	
	Injector nut tightness	24 to 28 Nm	18 to 21 lbf ft
		2,5 to 3 kgf m	
Cooling system	Thermostat	88°C ± 2°C	
	Pressure cap	1,06 kgf/cm^2	15 lbf/in^2
Clutch	Make and type	Verto diaphragm	
	Diameter	241 mm	9.5 in

Main Gearbox

Manual

Type ..... Five speed and reverse, single helical constant mesh with synchromesh on all forward gears

Main gearbox ratios

5th	0.770:1
4th	1.000:1
3rd	1.397:1
2nd	2.132:1
1st	Diesel 3.692:1, Petrol 3.321:1
Reverse	3.429:1

Automatic

Four speed and reverse epicyclic with fluid torque converter and lock up

4th	0.728:1
3rd	1.000:1
2nd	1.480:1
1st	2.480:1
Reverse	2.086:1

Transfer gearbox - Borg-Warner

Type ..... Two speed reduction on main gearbox output. Front and rear drive permanently engaged via a third differential controlled by viscous control unit.

Transfer gearbox ratios

High	1.206:1
Low	3.244:1

Overall ratio (final drive):

	Manual		Automatic	
	high transfer	low transfer	high transfer	low transfer
5th	3.29:1	8.84:1		
4th	4.27:1	11.48:1	3.11:1	8.36:1
3rd	5.97:1	16.05:1	4.27:1	11.48:1
2nd	9.10:1	24.48:1	6.32:1	17.00:1
1st	Diesel 15.76:1, Petrol 14.18:1	Diesel 42.40, Petrol 38.14:1	10.59:1	28.50:1
Reverse	14.64:1	39.38:1	8.91:1	23.96:1

Rear axle

Type	Spiral bevel, fully floating shafts
Ratio	3.54:1

Front axle

Type	Spiral bevel, enclosed constant velocity joints, fully floating shafts
Angularity of universal joint on full lock	32°
Ratio	3.54:1

Propeller shafts

Front:	Open type, 28,6 mm (1.125 in) diameter bar on catalyst vehicles, 51 mm (2 in) on others. 03EHD type universal joints
Rear:	Open type, 51 mm (2 in) diameter tube. 03EHD type universal joints

Suspension

Front	Coil springs, radius arms and panhard rod.
Rear	Coil springs, lower links, 'A' frame location arms with 'Boge' hydromat self-energising levelling device
Hydraulic dampers	Telescopic double acting non-adjustable 35 mm (1.375 in) bore

Brakes

Foot brake	Front: Outboard disc brakes with four pistons per caliper Disc diameter 298 mm (11.75 in) Hydraulic, servo-assisted, self-adjusting Rear: Outboard disc brakes with two pistons per caliper Disc diameter 290 mm (11.42 in) Hydraulic, servo-assisted, self-adjusting
Approx. pad area - front calipers	98cm^2 (15.2 in^2) each
- Rear calipers	66cm^2 (10.2 in^2) each
- Total	328cm^2 (50.8 in^2)
Total swept area	3056 cm^2 (474 in^2)
Handbrake ('park' brake)	Mechanical 254 mm (10 in) diameter, 70 mm (2.75 in) width duo-servo drum brake on rear of transfer box output shaft.

Steering

Power assisted type ..... Adwest recirculating ball
Steerng wheel ..... Two-spoke: 406 mm (16 in) diameter
Turns lock to lock 3.375
Front wheel alignment* ..... 1,2 to 2,44 mm (0,046 to 0,093 inch) toe-out
Camber angle* ..... 0°
Castor angle* ..... 3°
Swivel pin inclination* ..... 7°

* Check with vehicle in static unladen condition. That is, vehicle with water, oil and 22.5 litres (5 gallons) of fuel. Rock the vehicle up and down at the front to allow it to take up a static position.

Tyres

Sizes ..... 205R16 or 215/75R16 ***NOTE:*** *Fuel injection vehicles must be fitted with 'S' rated tyres.*
Make ..... Michelin. See your Range Rover Distributor or Dealer for the type of tyre currently recommended.

WARNING: The type of wheels fitted to your vehicle will determine the type of tyre required. See 'Wheels and Tyres' Section 4.

Pressures: Check with tyres cold .....

WARNING: If the vehicle has been parked in strong sunlight or used in high ambient temperatures, DO NOT reduce tyre pressures; move the vehicle into shade and allow the tyres to cool before checking.

Normal on- and off-road use. All speeds and loads			** Off-road 'emergency' soft use maximum speed of 40 kph (25 mph)		
	Front	Rear		Front	Rear
bar	1,9	2,4	bar	1,1	1,6
lbf/in^2	28	35	lbf/in^2	16	23
kgf/cm^2	2,0	2,5	kgf/cm^2	1,1	1,6

** Normal operating pressures should be restored as soon as reasonable road conditions or hard ground is reached.

Normal pressures may be increased for rough off-road usage where the risk of tyre cutting or penetration is more likely.

Pressures may also be increased for sustained high speed motoring. Any such increase in pressures may be up to an absolute maximum pressure of 2,8 bars (41 lbf/in^2) 2,9 kgf/cm^2 or the maximum inflation pressure specified on the tyre wall whichever is the less.

After any usage off the road, tyres and wheels should be inspected for damage particularly if high cruising speeds are subsequently to be used.

See 'Tyres and Wheels' information, Section 4.

Dimensions

Overall length	4,450 m (175 in.)
Overall width	1,818 m (71.6 in.)
Overall height	1,792 m (70.8 in.)
Wheelbase	2,540 m (100 in.)
Track: front and rear	1,486 m (58.5 in.)
Ground clearance: under differential	190 mm (7.5 in.)
Ramp breakover angle (unladen)	29°
Turning circle	11,89 m (39 ft.)
Loading height	749 mm (29.5 in.)
Maximum cargo height	1,028 m (40.4 in.)
Rear opening height	870 mm (34.3 in.)
Usable luggage capacity, rear seat folded	2,00 m^3 (70.6 ft^3)
Usable luggage capacity, rear seat in use:	
- four door vehicles	1,03 m^3 (36.2 ft^3)
- two door vehicles	1,17 m^3 (41.48 ft^3)
Maximum roof rack load	75 kg (165 lb)

Maximum permissible towed weights	On-road	Off-road
Trailers without brakes	750 kg 1650 lb	750 kg 1650 lb
Trailers with overrun brakes	3500 kg 7700 lb	1000 kg 2200 lb
4-wheel trailers with continuous or semi-continuous brakes, i.e. coupled brakes	4000 kg 8800 lb	1000 kg 2200 lb

NOTE: *It is the Owner's responsibility to ensure that all regulations with regard to towing are complied with. This applies also when towing abroad. All relevant information should be obtained from the appropriate motoring organisation. See maximum trailer nose weight detail shown under 'Vehicle weights' later in this section. Also see 'Towing with the Range Rover' in Section 3.*

Vehicle weights

Petrol-engined models	Manual			Automatic		
	Front Axle kg (lb)	Rear Axle kg (lb)	Total kg (lb)	Front kg (lb)	Rear kg (lb)	Total kg (lb)
2 DOOR Unladen weight	893 (1969)	867 (1910)	1760 (3880)	920 (2028)	871 (1920)	1791 (3948)
EEC kerb weight	912 (2011)	983 (2167)	1895 (4178)	939 (2070)	987 (2070)	1926 (4246)
Gross vehicle weight *	1100 (2425)	1510 (3329)	2510 (5534)	1100 (2425)	1510 (3329)	2510 (5534)
4 DOOR Unladen weight	909 (2004)	883 (1947)	1792 (3951)	925 (2039)	911 (2008)	1836 (4048)
EEC kerb weight	928 (2046)	999 (2202)	1927 (4248)	944 (2081)	1027 (2264)	1971 (4345)
Gross vehicle weight *	1100 (2425)	1510 (3329)	2510 (5534)	1100 (2425)	1510 (3329)	2510 (5534)

Diesel-engined models	Manual		
	Front Axle kg (lb)	Rear Axle kg (lb)	Total kg (lb)
2 DOOR Unladen weight	981 (2163)	861 (1898)	1842 (4061)
EEC kerb weight	998 (2200)	986 (2174)	1984 (4374)
Gross vehicle weight *	1200 (2645)	1510 (3329)	2510 (5533)
4 DOOR Unladen weight	997 (2198)	877 (1933)	1874 (4131)
EEC kerb weight	1014 (2235)	1002 (2209)	2016 (4444)
Gross vehicle weight *	1200 (2645)	1510 (3329)	2510 (5533)

NOTE: UNLADEN WEIGHT is the minimum vehicle specification, excluding fuel and driver.
EEC KERB WEIGHT is the minimum vehicle specification, plus full fuel tank and 75 kg (165 lb) driver.
GROSS VEHICLE WEIGHT is the minimum all-up weight of the vehicle including driver, passengers, and equipment. This figure is liable to vary according to legal requirements in certain countries.

When air conditioning is fitted, 42 kg (93 lb) must be added to the above front axle weights and total weights.

Maximum recommended trailer nose weight: 250kg (550lb)

Vehicle weights

When loading a vehicle to its maximum (Gross Vehicle Weight), consideration must be taken of the unladen vehicle weight, the distribution of the load and tow hitch loading (where applicable) to ensure that axle loadings do not exceed the permitted maximum values.

**** NOTE: To accommodate different loading conditions (e.g. due to fitment of optional equipment such as winches) the sum of the maximum allowable front and rear axle loads exceeds the Gross vehicle weight. It is the customer's responsibility to limit the vehicle's load in an appropriate manner such that neither maximum axle loads nor Gross Vehicle Weight are exceeded.***

6 CAPACITIES

Approximate capacities

Component		Litres	Imperial unit
Engine sump oil	- petrol engines	5,1	9 pints
	- diesel engines	7	12 pints
Extra when refilling after fitting new filter	- petrol engines	0,56	1 pint
	- diesel engines	0,8	1.4 pints
Main gearbox oil	- manual model	2,27	4 pints
	- automatic model	9,1	16 pints
Transfer gearbox oil		2,1	3.7 pints
Rear differential oil		1,7	3 pints
Front differential oil		1,7	3 pints
Swivel housing oil (each)		0,35	0.6 pints
Power steering box and reservoir fluid		2,9	5 pints
Cooling system		11,3	20 pints
Fuel tank		76,4	16.8 gallons

NOTE: All levels must be checked by dipstick (using the correct procedure) or level plugs as applicable. After draining the automatic gearbox, oil will remain in the torque converter therefore fill to level on dipstick.

Anti-freeze solutions

	Litres	Pints
Cooling system capacity	11,3	20
Anti-freeze required for 50% solution	5,7	10

NOTE: Coolant solution must not fall below proportions of one part anti-freeze to three parts water, i.e. minimum 25% anti-freeze in coolant, otherwise engine damage will occur.

Corrosion inhibitor
When anti-freeze is not required, the cooling system must be flushed out with clean water and filled with a solution of one part Marstons SQ36 inhibitor to nine parts water to provide a 10% mixture concentration.

Recommended lubricants and fluids

Use only the recommended grades of oil as set out below. From the front of the vehicle, the oil level dipstick will be found on the right-hand side of the engine -- central on petrol models, towards the rear on diesel models. The oil filler cap is screwed into the right-hand rocker cover at the front of petrol engines and into the front rocker cover of diesel engines.

Oil consumption is likely to improve during the first 6,000 km (4,000 miles) of the vehicle's life as the piston rings, etc. bed in.

These recommendations apply to climates where operational temperatures are above -10°C (14°F).

COMPONENTS	BP	CASTROL	DUCKHAMS	ESSO	MOBIL	PETROFINA	SHELL	TEXACO
Petrol engine sump	BP Visco 2000 (15W/40) or BP Visco Nova (10W/40)	Castrol GTX (15W/50) or Castrolite (10W/40)	Duckhams Hypergrade 15W/50 Motor Oil	Esso Superlube + (15W/40)	Mobil Super 10W/40 or Mobil 1 Rally Formula 5W/50	Fina Supergrade Motor Oil 15W/40 or 10W/40	Shell Super Motor Oil 15W/40 or 10W/40	Havoline Motor Oil 15W/40 or Eurotex HD (10W/30)
Diesel engine sump	BP Vanellus C3 Extra (15W/40)	Castrol Turbomax (15W/40)	Duckhams Hypergrade 15W/50	Esso Super Diesel Oil TD 15W/40	Mobil Delvac 1400 Super (15W/40)	Fina Kappa LDO	Shell Myrina (15W/40)	Texaco Ursa Super TD

Other approved oils include:-

Agip Sigma Turbo, Aral OL P327, Autol Valve - SHP, Aviaticon Turbo, Caltex RPM Delo 450, Century SHPD, Chevron Delo 450 Multigrade, Divinol Multimax Extra, Ecubsol CD Plus, Elf Multiperformance, Esso Special Diesel, Fanal Indol X, Fuchs Titan Truck 1540, Gulf Superfleet Special, IP Taurus M, Total Rubia TIR, Valvoline Super HD LD.

The following oils to MIL-L-2104D or CCMC D2 or API Service levels CD or SE/CD are for emergency use only if the above oils are not available.

They can be used for topping-up without detriment, but if used for engine oil changing, they are limited to a maximum of 5,000 km (3,000 miles) between oil and filter changes.

BP Vanellus C3 Multigrade (15W/40),
Castrol Deusol RX Super (15W/40),
Esso Essolube XD-3 + (15W/40),
Mobil Delvac Super (15W/40),
Fina Dilano HPD (15W/40),
Shell Rimula X (15W/40) or
Texaco URSA Super Plus (15W/40)

Automatic gearbox	BP Autran DX2D	Castrol TQ Dexron IID	Duckhams Fleetmatic CD or Duckhams D-Matic	Esso ATF Dexron IID	Mobil ATF 220D	Fina Dexron IID	Shell ATF Dexron IID	Texamatic Fluid 9226
Manual gearbox	BP Autran G	Castrol TQF	Duckhams Q-Matic	Esso ATF Type G	Mobil ATF 210	Fina Purfimatic 33G	Shell Donax TF	Texmatic Type G

Recommended lubricants and fluids (temperate climates) - continued

COMPONENTS	BP	CASTROL	DUCKHAMS	ESSO	MOBIL	PETROFINA	SHELL	TEXACO
Front differential, Rear differential, Swivel pin housings	BP Gear Oil SAE 90EP	Castrol Hypoy SAE 90EP	Duckhams Hypoid 90	Esso Gear Oil GX 85W/90	Mobil Mobilube HD90	Fina Pontonic MP SAE 80W/90	Shell Spirax 90EP	Texaco Multigear Lubricant EP 85W/90
Prop. shaft, front and rear	BP Energrease L2	Castrol LM Grease	Duckhams LB 10	Esso Multi-purpose Grease H	Mobil- grease MP	Fina Marson HTL2	Shell Retinax A	Marfak All purpose Grease
Power steering box and fluid reservoir Transfer box	BP Autran DX2D *	Castrol TQ Dexron IID *	Duckhams Fleetmatic CD or Duckhams D-Matic *	Esso ATF Dexron IID *	Mobil ATF 220D *	Fina Dexron II *	Shell ATF Dexron IID *	Texamatic Fluid 9226 *
Brake and clutch reservoirs	Brake fluids having a minimum boiling point of 260°C (500°F) and complying with FMVSS 116 DOT3 or DOT4							
Lubrication nipples (hubs, ball joints, etc.)	BP Energrease L2	Castrol LM Grease	Duckhams LB 10	Esso Multi-purpose Grease H	Mobil- grease MP	Fina Marson HTL2	Shell Retinax A	Marfak All purpose Grease
Ball joint assembly Top link	Dextagrease Super GP							
Seat slides, Door lock striker	BP Energrease L2	Castrol LM Grease	Duckhams LB 10	Esso Multi-purpose Grease H	Mobil- grease MP	Fina Marson HTL2	Shell Retinax A	Marfak All purpose Grease
	NLGI-2 Multi-purpose Lithium-based Grease							

* Or fluids listed for manual gearbox

Recommended lubricants, fuels and fluids (temperate climates) - continued

Bonnet pintle	Graphite Lock Grease Type 'R'		
Door locks (anti-burst) Inertia reels	**DO NOT LUBRICATE.** These components are 'life' lubricated at the manufacturing stage		
Battery lugs Earthing surfaces Where paint has been removed	Petroleum jelly *Note: Do not use Silicone Grease*		
Fuel	Petrol engines -	9.35:1 compression ratio - 8.13:1 compression ratio -	97 octane fuel (4 star rating in UK) 90 octane fuel (2 star rating in UK)
	Diesel engines -	22:1 compression ratio -	Diesel fuel oil, distillate, diesel fuel, automotive gas oil or Derv fuel to British Standard 2869, 1967 Class A1
Windscreen washers	Screen Washer Fluid		
Engine cooling system	FOR ALL PETROL AND DIESEL MODELS Use an ethylene glycol based anti-freeze (containing no methanol) with non-phosphate corrosion inhibitors suitable for use in aluminim engines to ensure the protection of the cooling system against frost and corrosion in all seasons. Use one part anti-freeze to one part water for protection down to -36°C (-33°F) ***IMPORTANT:** Coolant solution must not fall below proportions of one part anti-freeze to three parts water, i.e. minimum 25% anti-freeze in coolant otherwise damage to engine is liable to occur.* When anti-freeze is not required, the cooling system must be flushed out with clean water and refilled with a solution of one part Marstons SQ36 inhibitor to nine parts water, i.e. minimum 10% inhibitor in coolant		
Air conditioning system Refrigerant	METHYLCHLORIDE REFRIGERANTS MUST NOT BE USED Use only with refrigerant 12. This includes 'Freon 12' and 'Arcton 12'		
Compressor Oil	Shell Clavus 68 BP Energol LPT68 Sunisco 4GS Texaco Capella E Wax Free 68		

Recommended lubricants and fluids - All climates and conditions

COMPONENTS	SERVICE CLASSIFICATION		AMBIENT TEMPERATURE °C
	Specification	SAE Classification	-30 -20 -10 0 10 20 30 40 50
Petrol models Engine sump	Oils must meet	5W/30	
	BLS.22.OL.07	5W/40)	
	or	5W/50)	
	CCMC G3	10W/30	
Oil can	or	10W/40)	
	API service levels SF	10W/50)	
	Oils must meet	15W/40)	
	BLS.22.OL.02	15W/50)	
	or CCMC G1	20W/40)	
	or G2	20W/50)	
	or API service	25W/40)	
	levels SE or SF	25W/50)	
Diesel models engine sump	Special high-performance	10W/30	
	diesel oils meeting CCMC D3	15W/40	
	* **Emergency only:** Oils meeting MIL-L-2104D or CCMCD2 or API CD		
Main gearbox, automatic	ATF Dexron IID		
Main Gearbox manual	ATF M2C33 (F or G)		
Transfer gearbox	ATF Dexron IID or ATF M2C 33G or Texaco 4291A Universal		
Final drive units Swivel pin housings	MIL-L-2105 or MIL-L-2105B	80W EP	
Power steering	ATF M2C 33 (F or G) or LATF Dexron II D		

* Oils for emergency use only if the above oils are not available. They can be used for topping up without detriment but, if used for engine oil changing, they are limited to a maximum of 5,000 km (3,000 miles) between oil and filter changes.

Recommended lubricants, fluids and anti-freeze solutions - All climates and conditions - (continued)

Lubrication nipples (hubs, ball joints, prop. shafts, etc.)	NLGI-2 Multipurpose Lithium based grease
Brake and clutch reservoirs	Universal Brake Fluids or other Brake Fluids having a minimum boiling point of 260°C (500°F) and complying with FMVSS 116 DOT4
Windscreen washers	Screen Washer Fluid
Engine cooling system	FOR ALL PETROL AND DIESEL MODELS Use an ethylene glycol based anti-freeze (containing no methanol) with non-phosphate corrosion inbibitors suitable for use in aluminim engines to ensure the protection of the cooling system against frost and corrosion in all seasons. Use one part anti-freeze to one part water for protection down to -36°C (-33°F) *IMPORTANT: Coolant solution must not fall below proportions of one part anti-freeze to three parts water, i.e. minimum 25% anti-freeze in coolant otherwise damage to engine is liable to occur.* When anti-freeze is not required, the cooling system must be flushed out with clean water and refilled with a solution of one part Marstons SQ36 inhibitor to nine parts water, i.e. minimum 10% inhibitor in coolant
Air conditioning system Refrigerant	METHYLCHLORIDE REFRIGERANTS MUST NOT BE USED Use only with refrigerant 12. This includes 'Freon 12' and 'Arcton 12'
Compressor Oil	Shell Clavus 68 BP Energol LPT68 Sunisco 4GS Texaco Capella E Wax Free 68

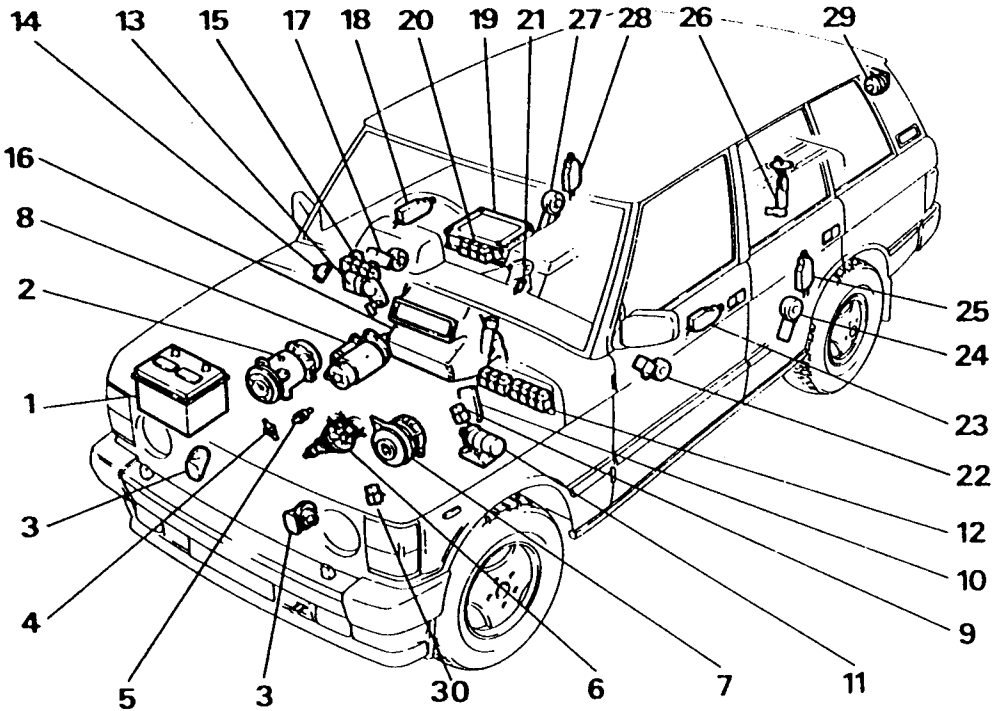
Electrical equipment

System	12 volt negative earth
Distributor	Lucas 35 DLM8
Battery	Land Rover Parts and Equipment Chloride maintenance-free: Petrol models: 9-plate 210/85/90 Diesel models: (2) 14-plate 380/120/90
Alternator	Lucas A127/65
Starter motor	Lucas M78R geared
Wiper motor - front	Lucas 28W, 2-speed
- rear	Imos
Fuses	Autofuse (blade type) blow ratings to suit individual circuits

Replacement bulbs

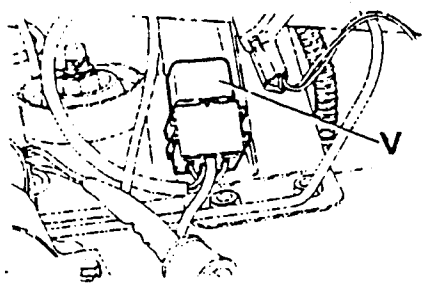
Headlamps	12V 60/55W (Halogen)
Headlamps - France amber	12V 60/55W (Halogen)
Auxiliary driving lamps	12V 55W H3 (halogen)
Sidelamps	12V 5W bayonet fitting
Stop/tail lamp	12V 5/21W bayonet fitting
Reverse lamps	12V 21W bayonet fitting
Rear fog guard lamps	12V 21W bayonet fitting
Direction indicator lamps	12V 21W bayonet fitting
Direction indicator repeater lamps	12V 4W bayonet fitting
Number plate lamps	12V 5W capless
Door edge/puddle lamps	12V 5W capless
Instrument panel lamps and warning lamps	12V 1.2W bulb/holder unit
Ignition warning lamp (instrument panel)	12V 2W capless
Interior roof lamps	12V 10W festoon
Clock illumination	12V 2W bayonet fitting
Cigar lighter illumination	12V 1.2W capless
Auxiliary switch panel illumination (green)	12V 1.2W capless
Heated rear screen warning lamp (amber)	12V 1.2W capless
Hazard warning lamp (red)	12V 1.2W capless
Automatic graphics illumination	24V 5W capless
Heater/air conditioning graphics illumination	12V 1.2W capless
Column switch illumination (fibre optic)	12V 1.2W capless
Rear fog warning lamp (amber)	12V 1.2W capless

CAUTION: *The fitting of headlamps or headlamp bulbs with wattages in excess of those specified will result in damage to the 'Dim Dip' unit (where applicable), wiring and switches.*

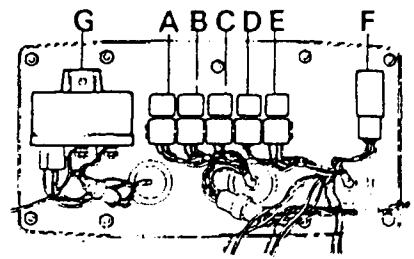


1. Battery
2. Air conditioning compressor (if fitted)
3. Horns
4. Oil pressure switch
5. Water temperature switch
6. Distributor
7. Alternator
8. Starter motor
9. Over-run fuel shut-off relay (fuel injection models only)
10. Power resistor (fuel injection models only
11. Coil and amplifer assembly
12. Relays
13. Front windscreen wiper motor
14. Choke warning light switch (carburetter versions only)
15. Relays
16. Heater
17. Window lift motor
18. Door lock actuator
19. Electronic control unit (fuel injection models only)
20. Relays (fuel injection models only)
21. Handbrake warning light switch
22. Window lift motor
23. Door lock actuator
24. Window lift motor
25. Door lock actuator
26. Electrical fuel pump
27. Window lift motor
28. Door lock actuator
29. Rear screen wiper motor
30. Fuel shut-off relay (carburetter only)

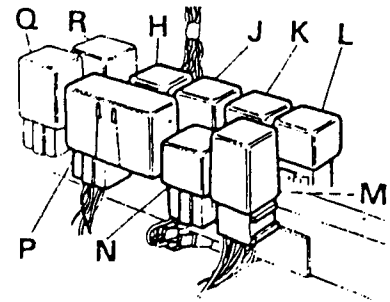
Note: Right-hand drive vehicle illustrated — certain electrical components may change position on left-hand drive vehicles but can be found within a similar location on the opposite side of the vehicle.



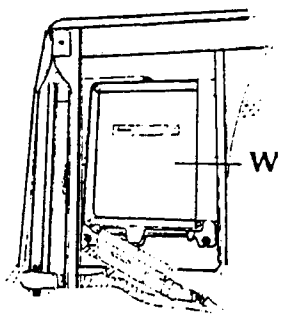
9 Over-run fuel shut-off relay (fuel injection only)
V Over-run fuel shut-off



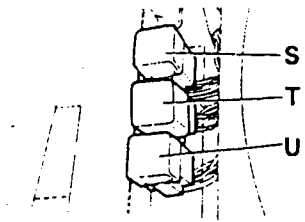
12 Relays
A Air conditioning/heater
B Condenser fan
C Compressor clutch
D Starter solenoid
E Heated rear window
F Headlamp wash timer unit
G Glow plug timer (diesel)



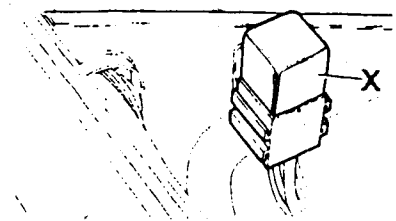
15 Relays
H Hazard/flasher unit
J Voltage sensitive switch
K Interior lamp delay
L Auxiliary driving lamps
M Front wiper delay
N Ignition load relay
P Rear wiper delay
Q Overspeed monitor (Saudi only)
R Overspeed buzzer (Saudi only)



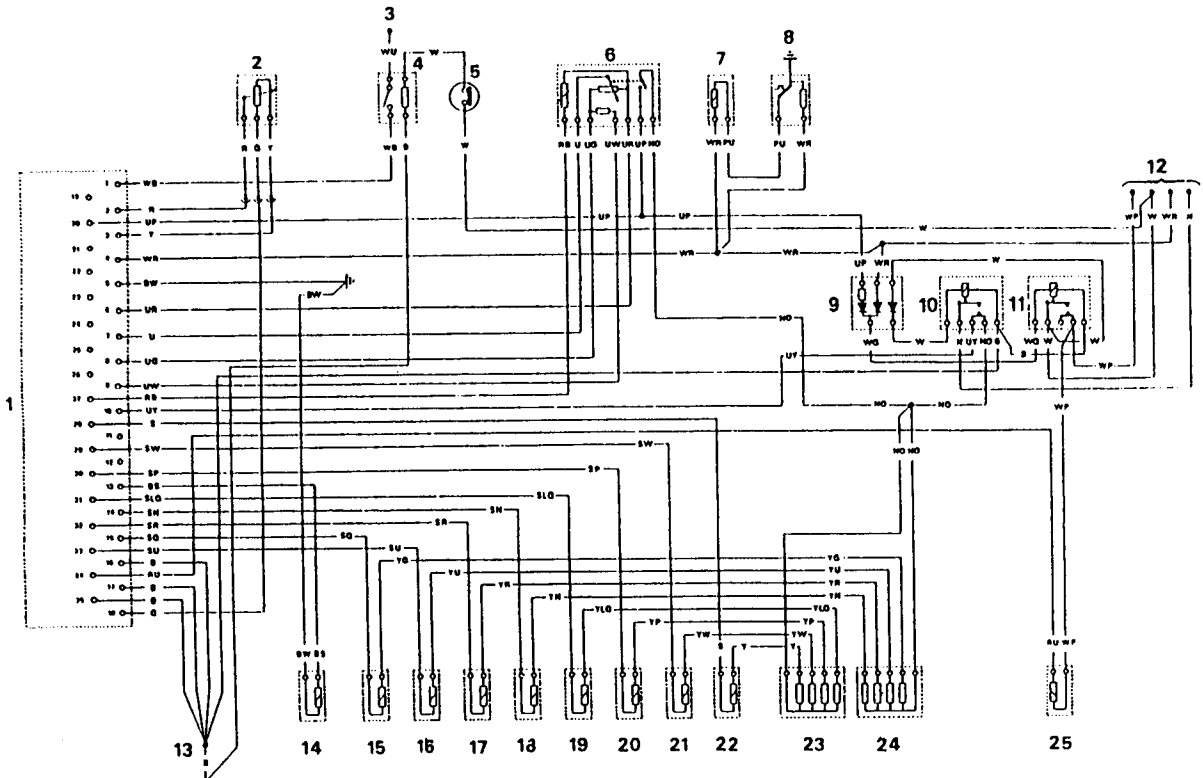
19 Electronic control unit (fuel injection only)
W Electronic control unit



20 Relays (fuel injection only)
S Fuel pump
T Steering module (red case)
U Main



30 Fuel shut-off relay (carburetter only)
X Fuel shut-off



RR612M

Circuit diagram — fuel injection — Fig. RR612M

1 Electronic control unit (ECU)
2 Throttle potentiometer
3 Ignition pick up point (142 on main circuit diagram)
4 Over run fuel shut off relay
5 Vacuum switch
6 Airflow meter
7 Cold start injecctor
8 Thermotime switch
9 Steering module for fuel injection relays
10 Main relay
11 Fuel pump relay
12 Pick up point fuel injection circuit (111 on main circuit diagram)
13 Clinch
14 Temperature sensor
15 Injector (No 1 cylinder)
16 Injector (No 3 cylinder)
17 Injector (No 5 cylinder)
18 Injector (No 7 cylinder)
19 Injector (No 2 cylinder)
20 Injector (No 4 cylinder)
21 Injector (No 6 cylinder)
22 Injector (No 8 cylinder)
23 Power resistors
24 Power resistors
25 Extra air valve

Key to cable colours

B — Black	G — Green
K — Pink	L — Light
N — Brown	O — Orange
P — Purple	R — Red
S — Slate	U — Blue
W — White	Y — Yellow

The last letter of a colour code denotes the tracer colour

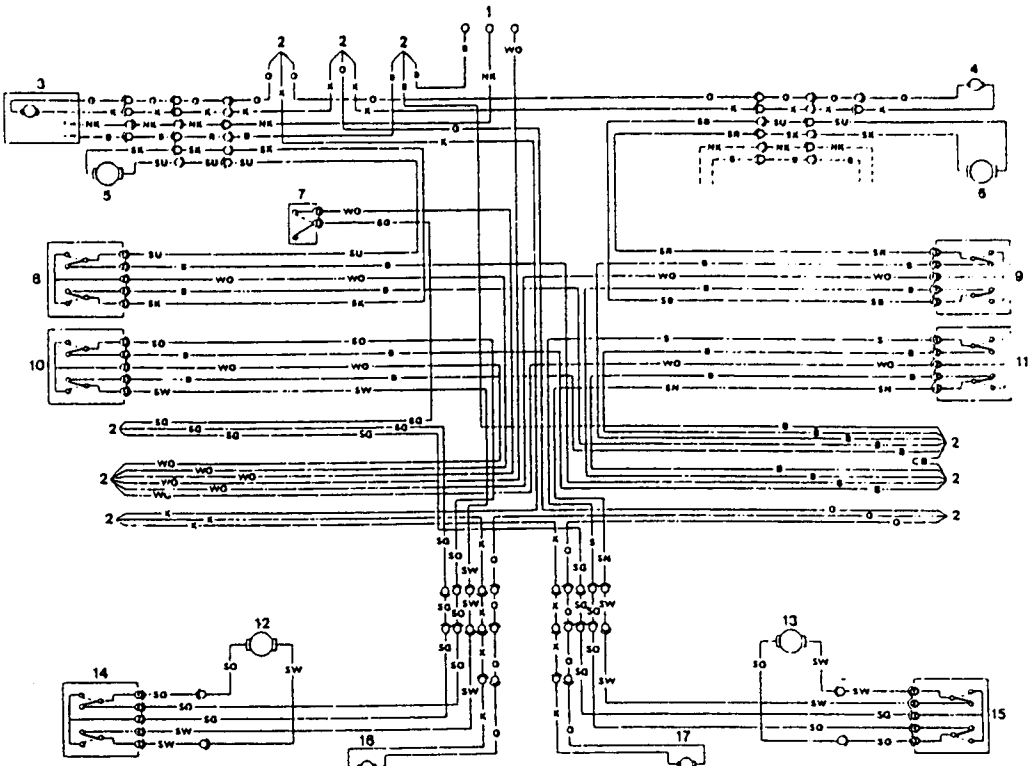
Connectors via plug and socket

Snap connectors

Permanent in-line connections

Earth connections via cables B

Earth connections via fixing bolts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RR427M

Optional electrical equipment — Range Rover 4-door models

Window lifts and door locks circuit diagram — Fig. RR427M

1 Main cable connections (item 107 on main circuit diagram)
2 Clinches
3 Switch unit central door locking (drivers door)
4 Lock unit central door locking (front passenger door)
5 Window lift motor left hand front
6 Window lift motor right hand front
7 Isolator switch
8 Window lift switch left hand front
9 Window lift switch right hand front
10 Window lift switch left hand rear
11 Window lift switch right hand rear
12 Window lift motor left hand rear
13 Window lift motor right hand rear
14 Window lift switch left hand rear door
15 Window lift switch right hand rear door
16 Lock unit central door locking left hand rear
17 Lock unit central door locking right hand rear

Key to cable colours

B — Black	G — Green
K — Pink	L — Light
N — Brown	O — Orange
P — Purple	R — Red
S — Slate	U — Blue
W — White	Y — Yellow

The last letter of a colour code denotes the tracer colour

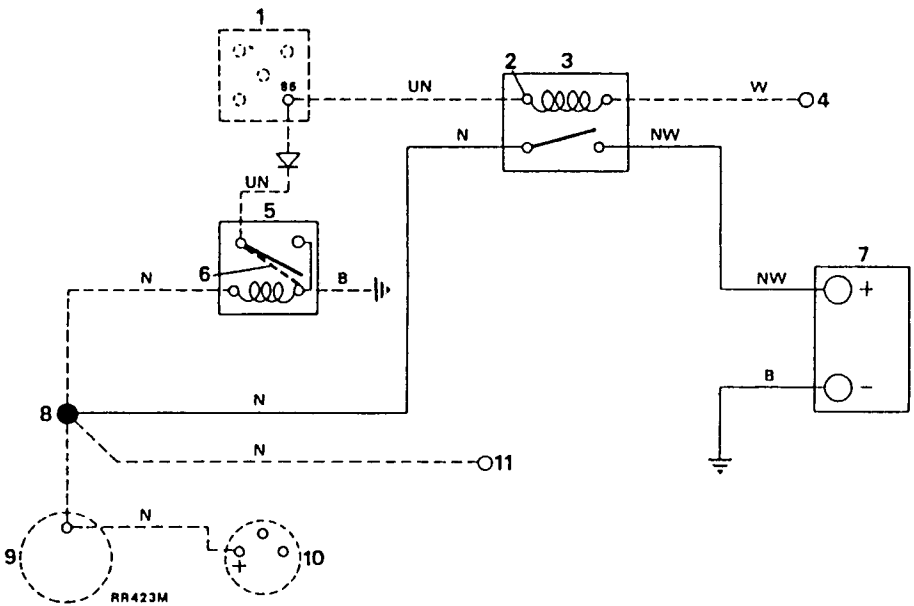
Connectors via plug and socket

Snap connectors

Permanent in-line connections

Earth connections via cables B

Earth connections via fixing bolts



Optional electrical equipment — Range Rover 2 and 4 door models

Split charge circuit diagram — Fig. RR423M

1 Heated rear window relay
2 Pick-up point for split charge relay (item 125 or 106 on main circuit diagram)
3 Split charge relay
4 Fuse box
5 Voltage sensitive switch
6 Link wire (removed from plug when voltage sensitive switch is fitted)
7 Terminal box auxiliary battery
8 Terminal post
9 Starter motor
10 Alternator
11 Vehicle battery

Note: Chain dotted lines indicate existing parts.

Connectors via plug and socket
Snap connectors
Permanent in-line connections
Earth connections via cables B
Earth connections via fixing bolts

Key to cable colours

B — Black	G — Green
K — Pink	L — Light
N — Brown	O — Orange
P — Purple	R — Red
S — Slate	U — Blue
W — White	Y — Yellow

The last letter of a colour code denotes the tracer colour

MAIN CIRCUIT DIAGRAM
Right Hand Steering - RR2571M & RR2572M

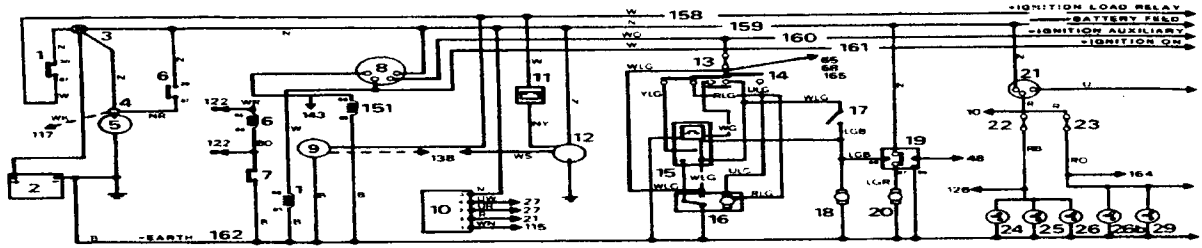
Numerical key

1 Ignition load relay
2 Battery
3 Terminal post
4 Starter solenoid
5 Starter motor
6 Starter relay
7 Starter inhibit switch (Automatic)
8 Ignition switch
9 Tachometer
10 Voltage transformer(dim dip)
11 Ignition warning lamp
12 Alternator
13 Fuse 7
14 Front wipe/wash switch
15 Front wipe delay unit
16 Front wiper motor
17 Front wash switch
18 Front wash pump
19 Headlamp wash timer unit (option)
20 Headlamp wash pump (option)
21 Main lighting switch
22 Fuse 6
23 Fuse 5
24 LH side lamp
25 LH tail lamp
26 LH number plate lamp
26b RH number plate lamp
27 Main beam dip/flash switch
28 Fuse 14
29 RH side lamp
30 RH tail lamp
31 Rheostat
32 Fuse 3
33 Fuse 4
34 Fuse 1
35 Fuse 2
36 Rear fog switch
37 Fuse 12
38 Switch illumination (2 off)
39 Cigar lighter illumination (2 off)
40 Heater illumination (4 off)
41 Clock illumination
42 Automatic gear selector illumination (2 off)
43 Instrument illumination (6 off)
43b Column switch illumination
44 Rear fog warning lamp
45 LH rear fog
46 RH rear fog
47 LH dip beam
48 RH dip beam
49 LH main beam
50 RH main beam
51 Main beam warning lamp
52 Fuel gauge
53 Fuel gauge sender unit
54 Water temperature gauge
55 Water temperature sender unit
56 Fuse 11
57 Horn switch
58 RH horn
59 LH horn
60 Under bonnet light switch
61 Under bonnet light
62 Clock
63 Fuse 19
64 Fuse 20
65 Pick-up point central locking/window lift (option)
66 Heated rear window relay
67 Fuse 9
68 Radio aerial amplifier
69 Heated rear screen
70 Heated rear screen switch
71 Heated rear screen warning lamp
72 Voltage sensitive switch
73 Fuse 13
74 Hazard switch
75 Flasher unit
76 Direction indicator switch
77 Hazard/indicator warning lamp
78 LH rear indicator lamp
79 LH front indicator lamp
80 LH side repeater lamp
81 RH side repeater lamp
82 RH front indicator lamp
83 RH rear indicator lamp
84 Trailer warning lamp
85 Fuse 15
86 Stop lamp switch
87 Reverse lamp switch
88 Auxiliary lamp relay (option)
89 LH stop lamp
90 RH stop lamp
91 LH reverse lamp
92 RH reverse lamp
93 LH auxiliary lamp (option)
94 RH auxiliary lamp (option)
95 Auxiliary lamp switch (option)
96 Fuse 17
97 Dash cigar lighter
98 Cubby box cigar lighter
99 Front interior lamp
100 Rear interior lamp
101 Interior lamp delay unit
102 LH door edge lamp
103 LH puddle lamp
104 RH door edge lamp
105 RH puddle lamp
106 Interior lamp switch
107 LH rear door switch
108 RH rear door switch
109 Tailgate switch
110 LH front door switch
111 RH front door switch
112 Heated jets
113 Thermostat heated jets
114 Oil pressure warning lamp
115 Oil pressure switch
116 Fuse 18
117 Fuel cut off relay (carburetter models)
118 Fuel pump (petrol models)
119 Ignition coil (petrol models)
120 Capacitor (petrol models)
121 Distributor (petrol models)
122 EFI harness plug
123 Fuel shut off solenoid (Diesel)
124 Not used
125 Radio fuse
126 Radio and four speakers
- LF-left hand front speaker
- LR-left hand rear speaker
- RF-right hand front speaker
- RR-right hand rear speaker
127 Sun roof pick up point (option)
128 Automatic transmission oil temperature warning lamp
129 Automatic transmission oil temperature switch
130 Fuse 16
131 Rear wash wipe switch
132 Rear wipe delay unit
133 Rear wiper motor
134 Rear screen wash pump
135 Low screen wash fluid level warning lamp
136 Low screen wash switch
137 Low coolant switch
138 Multi-function unit in binnacle
139 Low coolant level warning lamp
140 Low fuel level warning lamp
141 Cold start/diesel glow plug warning lamp
142 Cold start switch (carburetter)
143 Glow plug timer (diesel)
144 Glow plugs (diesel)
145 Handbrake warning lamp
146 Brake fail warning lamp
147 Handbrake warning switch
148 Brake fluid level warning switch
149 Brake pad wear warning lamp
150 Brake pad wear sensors
151 Brake check relay
152 Split charge relay (option)
153 Split charge terminal post (option)
154 Heater/air conditioning connections
155 Fuse 8
156 Coil negative (engine RPM input to ECU)
157 Headlamp relay
158 Ignition load relay (+)
159 Battery feed (+)
160 Ignition auxiliary (+)
161 Ignition on (+)
162 Earth (-)
163 Heater/air con relay
164 Trailer pick up point
165 Electric seats pick up point (option)
166 Fuse 10
167 Electric mirrors pick up point (option)
168 Alarm connection (dealer fit)

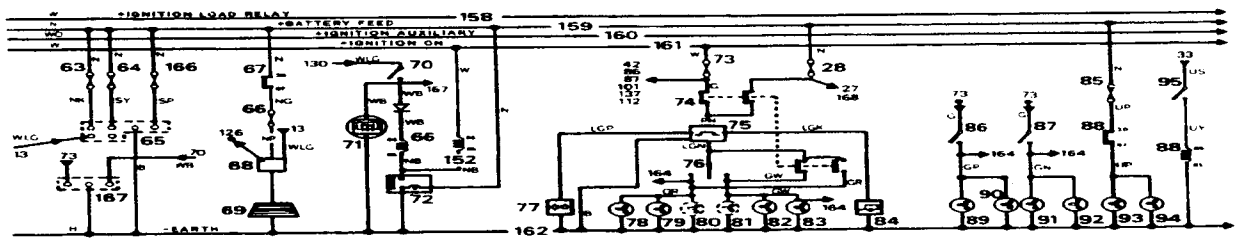
CABLE COLOUR CODE

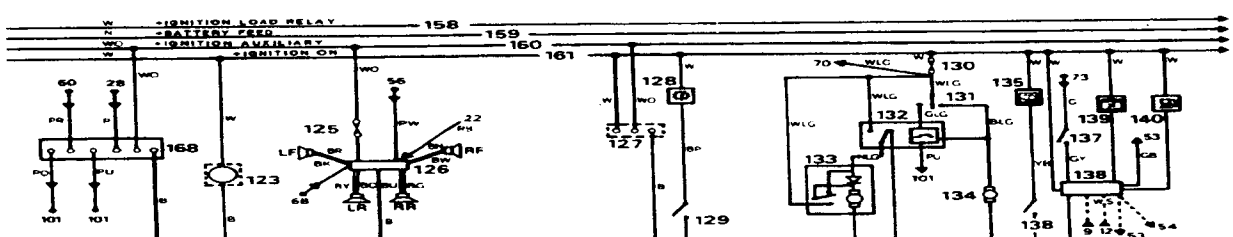
B	Black	**L**	Light	**P**	Purple	**U**	Blue
G	Green	**N**	Brown	**R**	Red	**W**	White
K	Pink	**O**	Orange	**S**	Grey	**Y**	Yellow

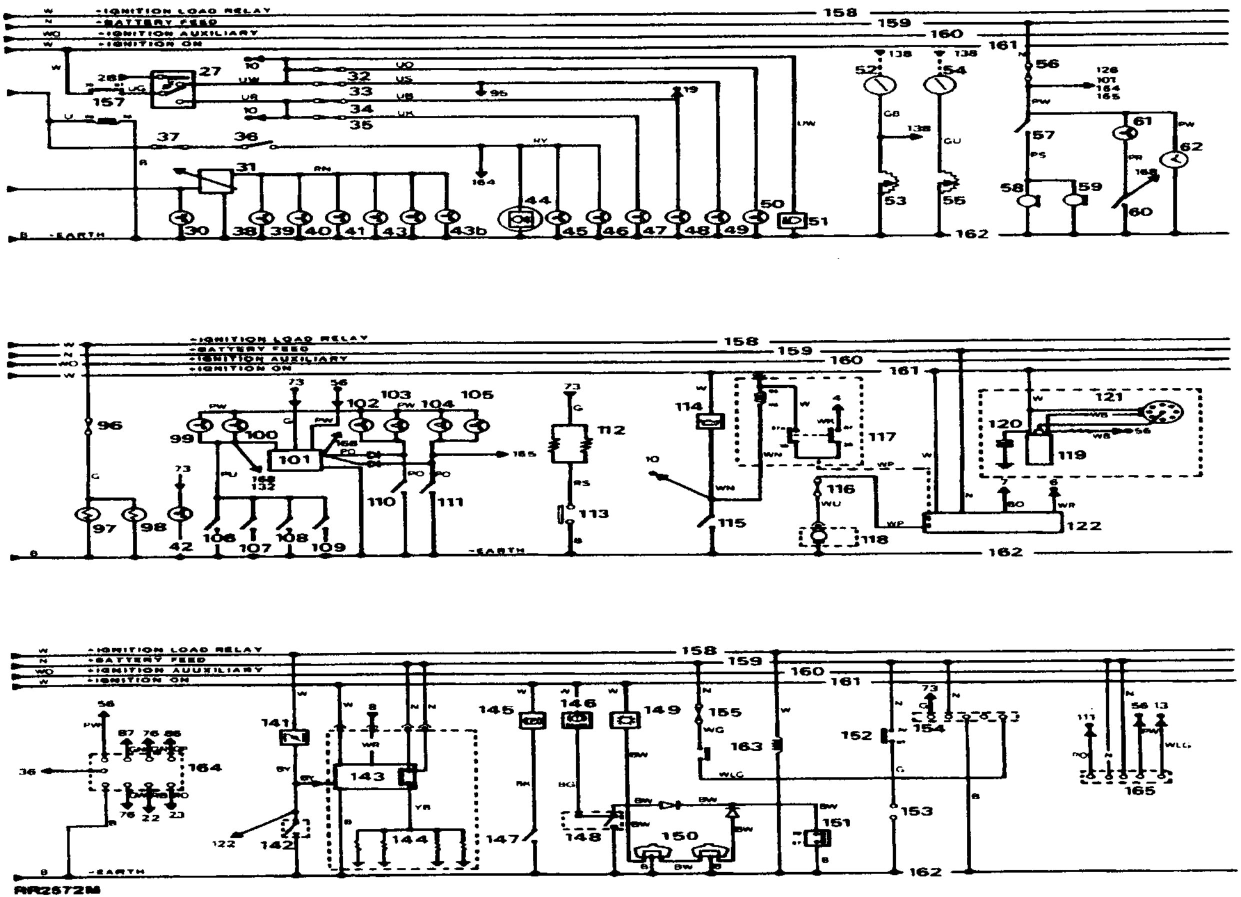
The last letter of a colour code denotes the tracer.



MAIN CIRCUIT DIAGRAM
Right hand steering - RR2571M & RR2572M






W +IGNITION LOAD RELAY
N +BATTERY FEED
WO +IGNITION AUXILIARY
W +IGNITION ON
B -EARTH
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