WORKSHOP MAINTENANCE 5

WORKSHOP MAINTENANCE SCHEDULES

The following maintenance should be carried out by trained personnel in a fully equipped workshop. If the vehicle is operating in a remote area where workshop facilities are not available, maintenance and repair work should be carried out by experienced mechanics in safe conditions. Maintenance should normally be carried out at 10,000 km (6000 mile) intervals or six months, whichever is first, as described in the following schedules. In severe conditions, such as deep mud or sand, or a very dusty atmosphere, the intervals should be reduced to monthly, weekly or even daily for some items. Ask your Land Rover Dealer for advice.

WARNING: DO NOT use any lubricants solvents or sealants etc, before reading any warnings and instructions supplied with these substances, as they could be harmful if improperly used.

WARNING: Two wheel roller tests must be restricted to 5 km/hour (3 miles/hour). DO NOT engage the differential lock or the vehicle will drive off the roller test rig because the Land Rover is in permanent wheel drive.

WARNING: Use care when draining oil from the engine, gearbox and axles, if it is hot it could cause personal scalding.

WARNING: DO NOT work underneath the vehicle unless it is safely parked and the wheels chocked, or it is supported by heavy duty stands, otherwise the vehicle could move causing personal injury.

MAINTENANCE INTERVALS

- kilometers x 1000	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
- miles x 1000 or months	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90
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	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
6 Remove battery connections: clean and grease - refit		•		•		•		•		•		•		•	
7 Renew brake servo filter						•						•			
VEHICLE EXTERIOR															
8 Check/adjust headlamp and auxiliary lamp alignment *		•		•		•		•		•		•		•	
9 Check front wheel alignment		•		•		•		•		•		•		•	
10 Remove road wheels	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
11 Check tyres for: compliance with manufacturers specification; visually for cuts, lumps, bulges, uneven tread wear and depth; tyre pressures (including spare) adjust if required -	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
12 Inspect brake pads for wear, calipers for leaks and discs for condition	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
13 Remove road wheel brake drums, wash out dust, inspect shoes for wear and drums for condition	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

* Where applicable

· kilometers x 1000	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
· miles x 1000 or months	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90
14 Inspect wheel cylinders for fluid leaks	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
15 Refit road wheel brake drums	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
16 Adjust road wheels brakes	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
17 Refit road wheels to original hub position	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
18 Check operation of all doors, bonnet and tailgate locks		•		•		•		•		•		•		•	
19 Lubricate all hinges and door-check mechanisms	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
UNDER BONNET 20 Check cooling and heater systems for leaks, hoses for security and condition		•		•		•		•		•		•		•	
21 Check brake servo hose for security and condition		•		•		•		•		•		•		•	
22 Check condition of heater plug wiring for fraying, chafing and deterioration (diesel only)		•		•		•		•		•		•		•	
23 Check ignition wiring and H.T.leads for fraying, chafing and deterioration		•		•		•		•		•		•		•	
24 Clean distributor cap, check for cracks and tracking.		•		•		•		•		•		•		•	
25 Lubricate distributor motor spindle with rotor arm removed				•				•				•			
26 Clean/adjust distributor points (not V8)		•		•		•		•		•		•		•	
27 Renew distributor points (not V8)				•				•				•			
28 Clean/adjust spark plugs	•		•		•		•		•		•		•		•
29 Renew spark plugs		•		•		•		•		•		•		•	
30 Check/adjust valve clearances at first 6,000 ml, 12,000 ml & thereafter at every 12,000 ml (Tdi only)	•	•		•		•		•		•		•		•	

· kilometers x 1000	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
· miles x 1000 or months	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90
(Under bonnet continued)															
31 Check/adjust valve clearances (all models except Tdi & V8)		•		•		•		•		•		•		•	
32 Diesel injectors: check for correct spray pattern, ensure no leakage is evident				•				•				•			
33 Renew fuel filter element (diesel)		•		•		•		•		•		•		•	
34 Check crankcase breathing system for leaks, hoses for security and condition	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
35 Renew air cleaner element(s)		•		•		•		•		•		•		•	
36 Check air cleaner dump valve, clean or renew		•		•		•		•		•		•		•	
37 Renew engine breather filter (V8)				•				•				•			
38 Clean engine breather filter (all models except V8)		•		•		•		•		•		•		•	
39 Renew engine flame traps(s) (V8)		•		•		•		•		•		•		•	
40 Check condition of driving belts - adjust if required	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
41 Check throttle operation		•		•		•		•		•		•		•	
42 Top-up carburetter piston dampers	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
43 Check/top-up cooling system	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
44 Check/top-up fluid in power steering reservoir	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
45 Check/top-up steering box (manual steering)		•		•		•		•		•		•		•	
46 Check/top-up clutch fluid reservoir	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
47 Check/top-up brake fluid reservoir	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
48 Check/top-up windscreen and rear washer reservoir	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
49 Lubricate accelerator control linkages and pedal pivot		•		•		•		•		•		•		•	

* Where applicable

- kilometers x 1000	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
- miles x 1000 or months	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90
(Under bonnet continued) 50 Check dwell angle - adjust as necessary (not V8)	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
51 Check voltage drop between coil CB and earth		•		•		•		•		•		•		•	
52 Check/adjust ignition timing **Note:** It is important that the ignition timing dwell angle and carburetter adjustments are set in accordance with the vehicle engine specification and fuel octane rating. Refer to the relevant workshop manual for details	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
53 Check operation of air intake temperature control system (V8)		•		•		•		•		•		•		•	
54 Check/adjust engine idle speed and carburetter mixture settings with engine at normal running temperature	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
55 Check/adjust steering box		•		•		•		•		•		•		•	
UNDER VEHICLE 56 Clean diesel intercooler element (Tdi engines only)									•						
57 Renew engine oil and filter	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
58 Renew gearbox oil - 4 cylinder models				•				•				•			
59 Renew gearbox oil - V8 models		•		•		•		•		•		•		•	
60 Check/top up gearbox oil - 4 cylinder models	•	•	•		•	•	•		•	•	•		•	•	•
61 Check/top up gearbox oil - V8 models	•		•		•		•		•		•		•		•
62 Renew transfer box oil				•				•				•			
63 Check/top up transfer box oil	•	•	•		•	•	•		•	•	•		•	•	•
64 Renew front axle oil				•				•				•			
65 Check/top up front axle oil	•	•	•		•	•	•		•	•	•		•	•	•
66 Renew swivel pin housing oil				•				•				•			
67 Check/top up swivel pin housing oil	•	•	•		•	•	•		•	•	•		•	•	•

* Where applicable

- kilometers x 1000	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
- miles x 1000 or months	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90
(Under vehicle continued) 68 Renew rear axle oil				•				•				•			
69 Check/top up rear axle oil	•	•	•		•	•	•		•	•	•		•	•	•
70 Lubricate propeller shaft sliding joints				•				•				•			
71 Lubricate propeller shaft universal joints		•		•		•		•		•		•		•	
72 Lubricate handbrake mechanical linkage	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
73 Check visually brake, fuel, clutch pipes/unions for chafing, leaks and corrosion		•		•		•		•		•		•		•	
74 Check exhaust system for leakage, security and damage		•		•		•		•		•		•		•	
75 Check for fluid leaks from power, manual steering and suspension systems, hydraulic pipes and unions for chafing and corrosion	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
76 Check/tighten steering unit and steering rod ball joint fixings, check condition of ball joint and dust covers	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
77 Check tightness of propeller shaft coupling fixings		•		•		•		•		•		•		•	
78 Ensure front and rear axle breathers are free from obstruction		•		•		•		•		•		•		•	
79 Check/tighten front and rear axle suspension link fixings, check conditions of mounting rubbers	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
80 Check for oil leaks from engine and transmission		•		•		•		•		•		•		•	
81 Clean fuel sedimenter (diesel only)		•		•		•		•		•		•		•	
82 Renew fuel filter element (petrol)		•		•		•		•		•		•		•	
83 Drain flywheel housing if drain plug is fitted for wading (refit)		•		•		•		•		•		•		•	

* Where applicable

- kilometers x 1000	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
- miles x 1000 or months	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90
(Under Vehicle continued) 84 Clean camshaft drive belt housing filter (diesel)		•		•		•		•		•		•		•	
85 Adjust handbrake if required	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
86 Carry out road or roller test	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
87 Check turbo charger boost pressure (2.5 litre diesel only)				•				•				•			

Camshaft drive belt - 2 1/2 litre diesel engines
The engine timing gears are driven by a flexible rubber belt which must be renewed at intervals determined by the severity of operating conditions.
In reasonable, temperate climate operation, renew the belt every 100,000 km (60,000 miles) or every five years whichever occurs earlier.
In adverse operating conditions such as work in dusty atmospheres, high ambient temperatures and desert and tropical zones, renew the belt every 50,000 km (30,000 miles) or every two and a half years \ whichever occurs earlier.
CAUTION: If the drive belt is not renewed at the correct interval, it could fail, resulting in serious engine damage.

It is recommended that:
At 18,000 mile (30,000 km) intervals or every 18 months, whichever is the sooner, the hydraulic brake fluid should be completely renewed.
At 36,000 mile (60,000 km) 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 36,000 mile (60,000 km) 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. The battery electrolyte level should be checked and topped up, if required, every three years in temperate climates and once a year in high ambient temperatures. Air cleaner. When the vehicle is used in dusty or field conditions or deep wading, frequent attention to the air cleaner may be required.

DIESEL ENGINES:
If the vehicle is operated on fuel with a high sulphur content (over 1%) the engine oil change intervals must not exceed 5000 km (3000 miles)

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 DEPENDING ON OPERATING CONDITIONS:

Check/top-up transfer box oil.
Check steering rubber boots for security and condition. Renew if damaged.
Check brake fluid level: consult your dealer if any fluid loss is suspected.
Clean brake discs and calipers.
Lubricate front and rear propeller 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.

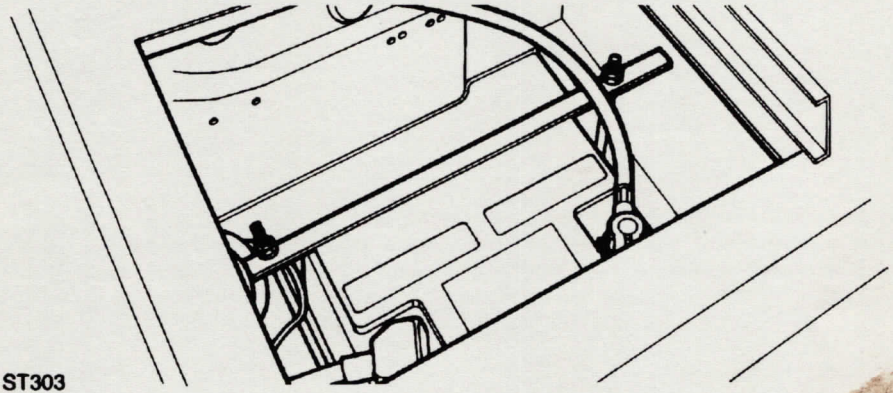
MONTHLY

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

DOING THE WORKSHOP MAINTENANCE

The 'Maintenance Schedules' and the methods described on the following pages are in the same order. Work through the schedules progressively, refering to the methods as necessary. Where a method has not been included, it is either, a simple check covered by the description in the schedule, has already been covered in Section 4, or needs reference to the appropriate Workshop Manual.

WARNING: Do not let the engine run without battery connected.
Do not use a high-speed battery charger as a starting aid.
When using a high-speed charger to charge the battery, the battery must be disconnected from the rest of the vehicle's electrical system.
When installing, ensure that the battery is connected with the correct polarity.
No larger battery than 12v must be used.
DO NOT use steam to clean the engine compartment.
The battery MUST be disconnected before carrying out any electrical welding on the vehicle.
IF A REPLACEMENT BATTERY IS FITTED TO THE VEHICLE, IT SHOULD BE THE SAME TYPE AS THE ORIGINAL BATTERY. 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.



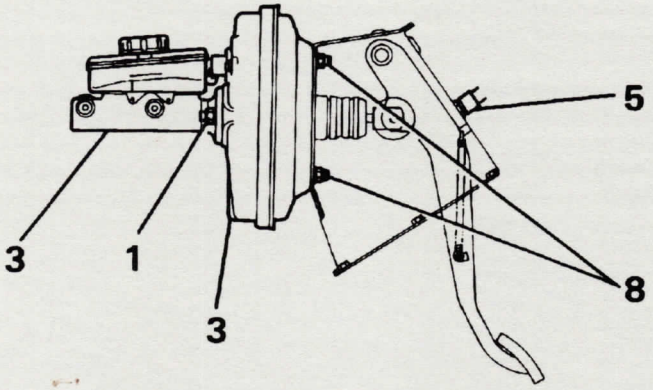
ST303

BATTERY ELECTROLYTE

A low maintenance battery is installed in the vehicle underneath the left-hand front seat. The battery compartment (Fig. ST303) is accessible by pulling up the front of theseat to release it from retaining clips and drawing it forward. This will reveal the compartment cover which can be removed after release of a catch on the front edge. Dependent upon climate conditions the electrolyte levels should be checked as follows:
Temperature 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.

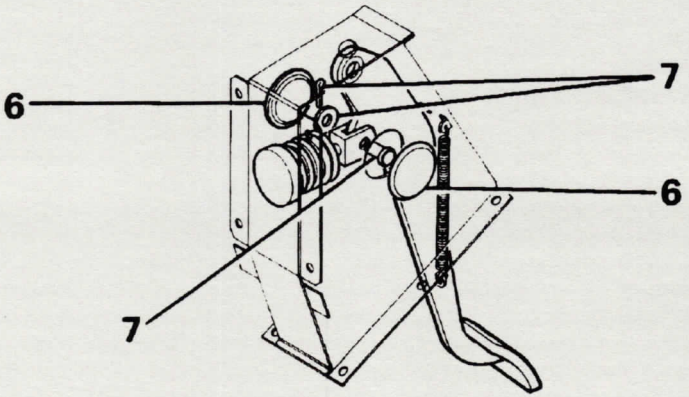
RENEW BRAKE SERVO FILTER - Figs. ST304, ST305 and ST1485

Remove the nuts (1) securing the master cylinder to the servo.
Release the clip retaining the brake pipe to the clutch pipe.
Separate the master cylinder (3) from the servo.
Disconnect the vacuum hose from the servo.
Disconnect the leads (5) from the stop lamp switch at the rear of the pedal box.

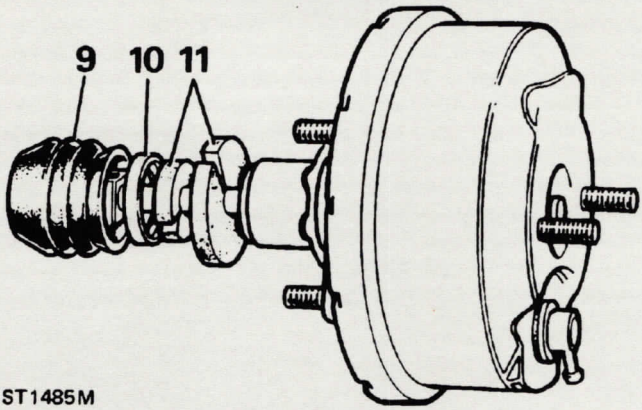


ST304

Remove the blanking grommets (6) from the pedal box.
Remove the split pin (7) from the clevis and withdraw the clevis pin and washer.
Remove the four nuts (8) securing the servo to the pedal box and remove the servo.



ST305

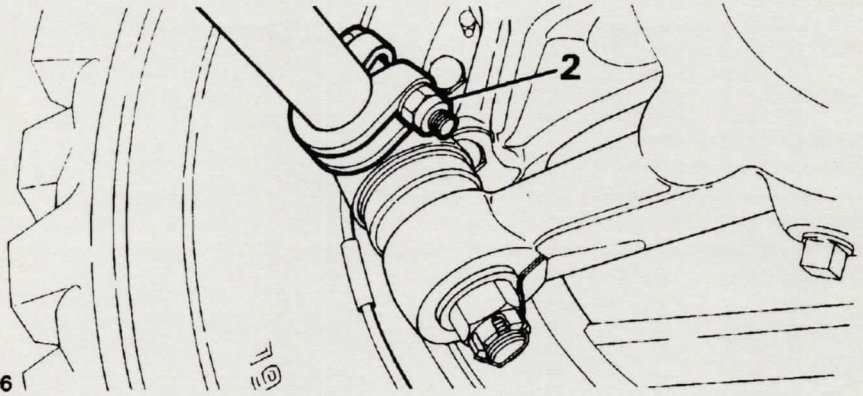


ST1485M

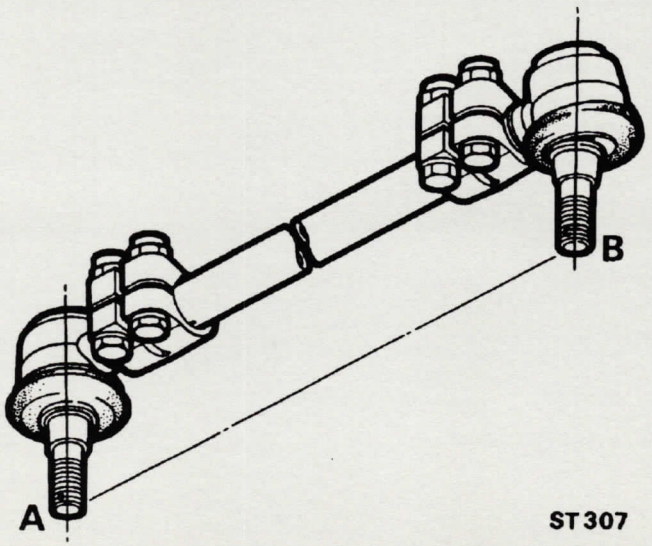
Pull back the dust cover (9).
Release the end-cap (10).
Cut the filters (11) to remove them from the shaft. Clean the filter seating and fit the new filters noting that they must be cut to fit over the shaft. Fit the end-cap and dust cover and refit the servo and master cylinder to the vehicle reversing the removal procedure. Use a new split pin to secure the clevis. Test the brakes.

CHECK FRONT WHEEL ALIGNMENT Fig. ST306 AND ST307

Use recognised wheel alignment equipment to perform this check and adjustment. The correct setting is: Front wheel toe out: 1,19 to 2,38 mm (3/64 to 3/32 in). Check and adjust with the vehicle on level ground. Set the road wheels to the straight ahead position and push the vehicle forward a short distance. Slacken the clamp bolts (2) securing the ball joints at both ends of the track rod. Twist the track-rod to decrease or increase its effective length as required to achieve the correct alignment. Push the vehicle rearwards whilst moving the steering wheel from side to side to settle the ball joints. Then with the wheels in the straight ahead position push the vehicle forward a short distance and recheck the alignment. If necessary make further adjustments. When the alignment is correct tighten the ball joint clamp bolts. When adjusting the track rod it is important to ensure that the ball joints are in the same angular plane and that the ball joint pins are central in their respective housings, as example 'A' illustrated below. Premature wear could result if the pins are inclined to one-side as illustration B.



ST306



ST307

This symbol may be found on your vehicle or equipment and it means **'CAUTION** - do not touch or attempt adjustments until you have read the special instructions concerned on the relevant pages of the Driver's Handbook.'

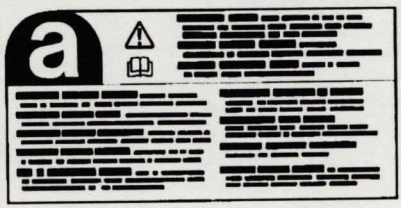
WARNING: Some components on your vehicle, such as gaskets and friction surfaces (brake linings or clutch discs), may contain asbestos. Inhaling asbestos dust is dangerous to your health. You are therefore advised to have any maintenance or repair operations on such components carried out by a recognised Land Rover/Range Rover dealer or distributor. If, however, service operations are to be undertaken on parts containing asbestos, the following essential precautions must be observed:

Work out of doors or in a well ventilated area and wear an approved protective breathing mask.

Dust found on the vehicle or produced during work on the vehicle should be removed by extraction and not by blowing.

Dust waste should be dampened, 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 and only hand tools or low speed power tools used.

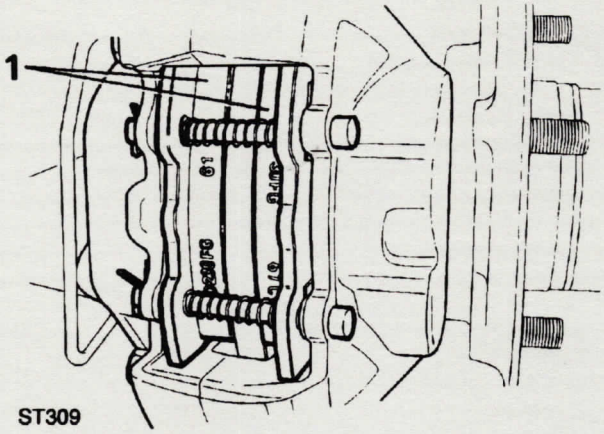


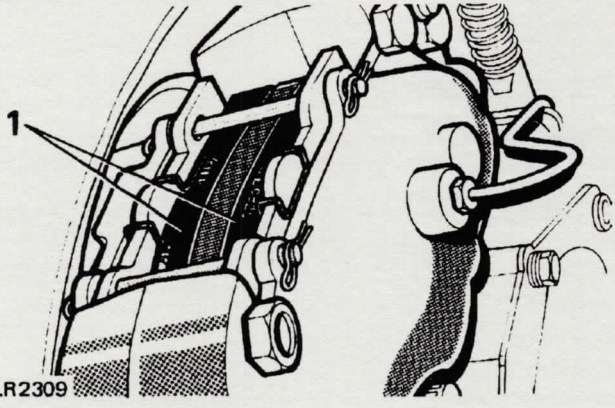
For your further guidance, Land Rover replacement parts which contain asbestos are progressively being identified by the symbol on the left. If you are in any doubt, please consult your dealer or distributor.

The following instructions should be read in conjunction with the brake maintenance recommendations in this Handbook.

BRAKE PAD REPLACEMENT

Your brake pads will require replacement when there is less than 3 mm (0.125 in) of brake lining material remaining. The brake pads fitted to variants with an auxiliary warning system have a built-in electrical sensor to activate the instrument cluster warning light when the pads are worn. If your vehicle has this feature, when purchasing replacement disc pad kits, it is important to ensure that they have sensors and that they have the same friction characteristics.





CHECK/ADJUST ROAD WHEEL BRAKES

FRONT BRAKE PADS - Figs. ST309 and LR2309

The upper illustration shows the front brake for the Land Rover Ninety; and the lower illustration for the Land Rover One Ten.

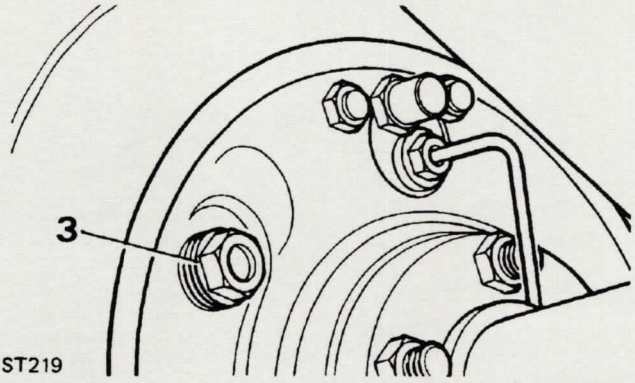
Hydraulic disc brakes are fitted at the front and the correct brake adjustment is automatically maintained; no provision is therefore made for adjustment.

Check the thickness of the front brake pads (1) and renew if the minimum is less than 3,0 mm (0.125 in).

Check that rear of brake pad is even across the friction face.

Check for oil contamination on brake pads and discs, also check condition of brake discs for wear and/or corrosion.

If replacement or rectification is necessary, this should be carried out by your Land Rover Distributor or Dealer.



REAR BRAKE LININGS (NINETY MODELS ONLY) - Fig. ST219

Hydraulic drum brakes are fitted at the rear and require the following attention.

When the vehicle is used in deep muddy conditions the brake drums must be periodically removed and cleaned, at the same time the brake shoes and anchor plate should be thoroughly cleaned.

When used continuously under exceptionally wet and muddy conditions this operation may be advisable once, or even twice a week, to prevent the abrasive action of packed mud rapidly wearing out brake linings and drums.

When lining wear has reached the point where the pedal travel becomes excessive, it is necessary to adjust the brake shoes closer to the drum.

Proceed as follows:

The shoes are set by a single hexagon adjustment bolt operating through a serrated snail cam enabling both shoes to be adjusted to obtain the best results.

Jack up one rear wheel.

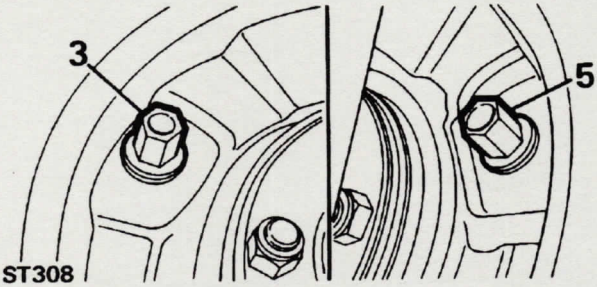
Check that the raised wheel rotates freely then turn the adjuster (3) until the brake shoe is in firm contact with the drum.

Slacken off the adjuster just sufficiently for the drum to rotate freely.

Lowerthe wheel to the ground.

Repeat the procedure for the other wheel.

WARNING: See WARNING'S at the start of the section.



REAR BRAKE LININGS (ONE TEN MODELS ONLY) - Fig. ST308

Hydraulic drum brakes are fitted at the rear and require the following attention.

When the vehicle is used in deep muddy conditions the brake drums must be periodically removed and cleaned, at the same time the brake shoes and anchor plate should be thoroughly cleaned.

When used continuously under exceptionally wet and muddy conditions this operation may be advisable once, or even twice a week, to prevent the abrasive action of packed mud rapidly wearing out brake linings and drums.

When lining wear has reached the point where the pedal travel becomes excessive, it is necessary to adjust the brake shoes closer to the drum.

Proceed as follows:

Each shoe is independently set by means of a hexagon adjustment bolt operating through a serrated snail cam and each shoe should be set individually to obtain the best results.

Jack up one rear wheel.

Check that the raised wheel rotates freely then turn one adjuster (3) until the brakeshoe is in firm contact with the drum.

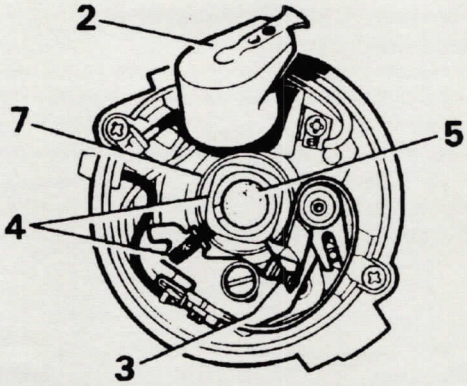
Slacken off the adjuster just sufficiently for the drum to rotate freely.

Repeat for the other brake shoe (5).

Lower the wheel to the ground.

Repeat the procedure for the other wheel.

WARNING: See WARNING'S at the start of the section.

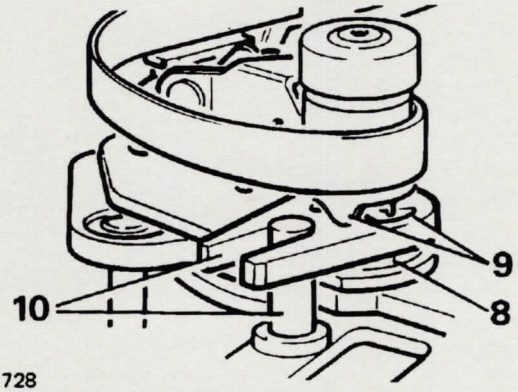


ST1727

DISTRIBUTOR - CLEAN AND LUBRICATE (4-CYLINDER PETROL MODELS) - Fig. ST1727 and ST1728

Cleaning the points. Release the clips and remove the distributor cap. Pull the rotor arm (2) from the cam spindle. Clean the contact points (3) with fine emery cloth or carborundum stone and wipe clean. Renew the points if worn or pitted. Lubrication. Lightly smear the cam (4) with grease. Do not oil the cam wiping pad. Add a few drops of oil to the felt pad (5) in the top of the cam spindle. Apply a few drops of oil through the gap in the base plate to lubricate the advance mechanism.

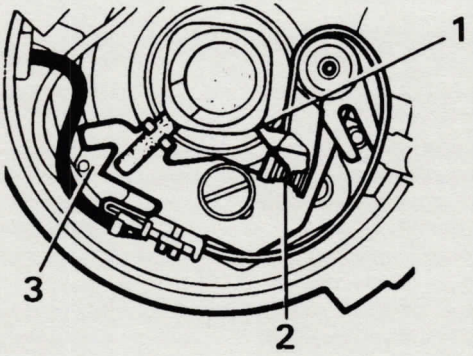
Every 40,000 km (24,000 miles) add a drop of oil to the moving plate bearing groove. Using grease lubricate the underside of the heel actuator (8). Grease the actuator ramps and contact breaker heel ribs (9). Apply grease to the fixed pin and the actuator fork. Align the cam slot and rotor peg and press the rotor arm onto the spindle. Clean the inside of the cap and refit, noting that the cap is located on a peg and can only be fitted one way.



ST1728

DISTRIBUTOR - (4-CYLINDER PETROL MODELS) - Fig. ST348

Check and adjust the contact points clearance as follows:
Remove the distributor cap and rotor arm.
Rotate the crankshaft until the contact heel (2) is on the highest point of a cam.
Adjust the gap (3) by inserting a screwdriver blade between the 'V' shaped notch (4) and pip and twist the screwdriver.
Insert a 0,35 to 0,40 mm (0.014 to 0.016 in) feeler gauge between the points and adjust to a sliding fit and tighten the retaining screw.
Fit the rotor arm and distributor cap.

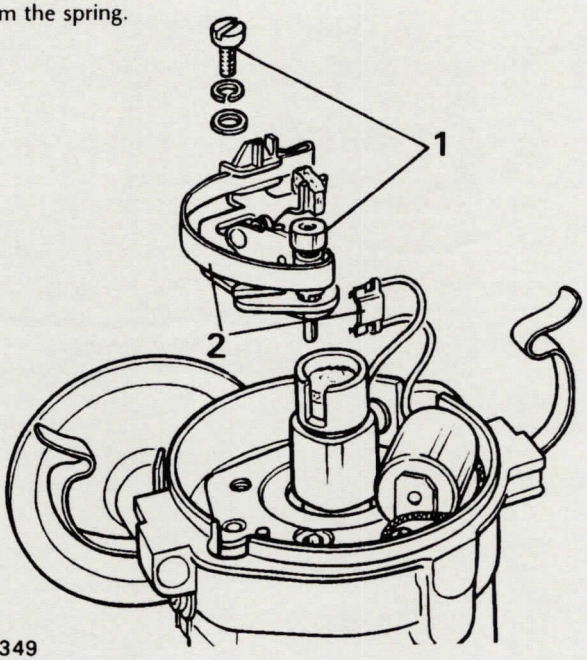


ST348

DISTRIBUTOR (4-CYLINDER PETROL MODELS) RENEWING THE CONTACT BREAKER POINTS

REMOVE THE OLD CONTACTS - ST349

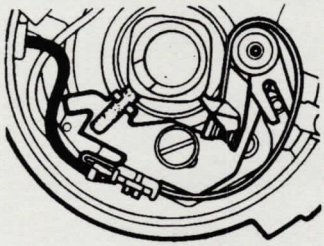
Remove the distributor cap. Remove the rotor arm. Remove the retaining screw (3) and lift the contact set complete from the plate. Press the contact set spring (4) and release the terminal plate and leads from the spring.

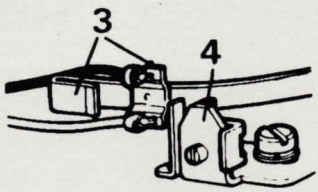


ST349

FIT NEW CONTACTS - ST350

Clean the points with petrol to remove the protective coating. Press the contact spring and fit the terminal plate (6) with the black lead uppermost. Fit the contact set to the moving plate, ensuring that the peg (7), underneath the contact pivot, locates in the hole in the moving plate. The sliding contact actuating fork must also locate over the fixed peg. Loosely secure the assembly with the screw, plain and spring washer. Check that the contact leaf spring (10) locates properly in the insulation shoe. Adjust the contact points, as previously described.





ST350

ELECTRONIC IGNITION (V8 CYLINDER PETROL MODELS) - Fig. RR1249

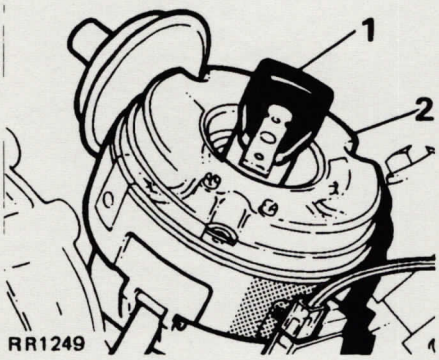
A Lucas model 35DM8 distributor is employed. This is an improved design which produces signals from rotating parts, instead of the 'lever' type contact points associated with earlier designs. This results in improved reliability and greatly reduced maintenance.

MAINTENANCE

40 000 km (24 000 miles). Remove the distributor cap and rotor arm and lubricate the rotor spindle with three drops of oil. 80,000 km (48,000 miles). Remove the distributor cap and rotor arm (1) and wipe inside with a nap-free cloth. Do not disturb the clear plastic insulating cover (2) which protects the magnetic pick-up module.

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.

Checking of any part of the electronic ignition system must be referred to your Land Rover Dealer or Distributor.



CLEAN/ADJUST SPARK PLUGS (PETROL MODELS) - Fig. ST051

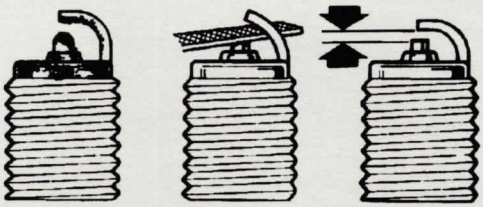
The sparking plugs are fitted with plastic covers.

To gain access to the plugs for cleaning and gap-setting, pull off the plug covers without detaching them from the high tension leads. Using a spark plug spanner and tommy bar, remove the plugs and washers. Examine the spark plugs. If they are in good condition, clean and adjust as follows: Wire-brush the plug threads; open the gap slightly, and vigorously file the electrode sparking surfaces using a point file. This operation is important to ensure correct plug operation by squaring the electrode sparking surfaces. Set the electrode gap to the clearance specified in DATA, Section 6. If satisfactory the plugs and washers may be refitted to the engine but do not overtighten. When pushing the leads on to the plugs, ensure that the shrouds are firmly seated on the plugs.

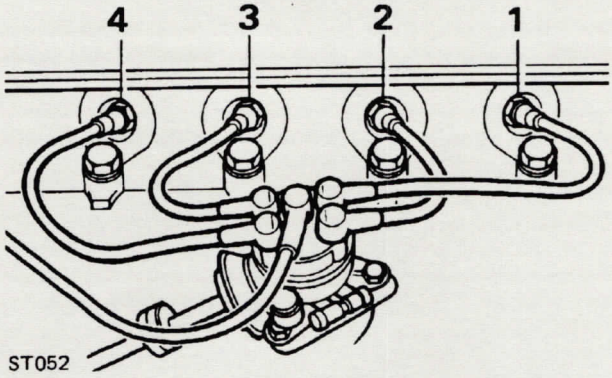
If new spark plugs are required, use only the type specified in Section 6.

Fig. ST051 shows:

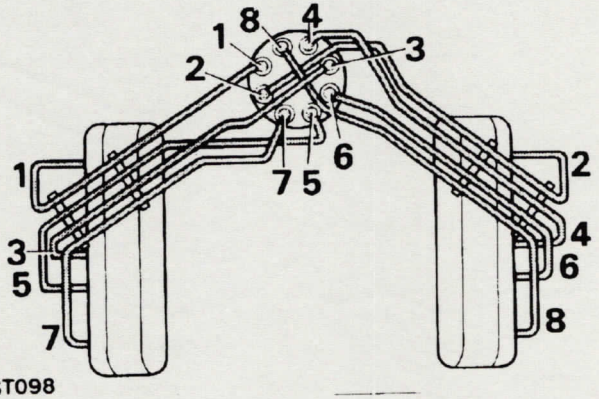
A Dirty plug
B Filing plug electrodes
C A clean plug correctly set



ST051



ST052



ST098

RENEW SPARK PLUGS (PETROL MODELS) - Figs. ST052 and ST098

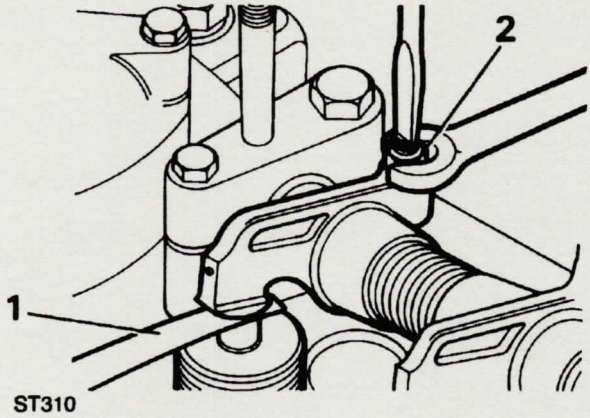
To remove spark plugs proceed as follows:
Remove the leads from the spark plugs.
Using spark plug spanner and tommy bar, remove the plugs and washers.
It is important that only spark plugs specified in Data section are used for replacements.
Incorrect grades of plug may lead to piston over-heating and engine failure.
Wash the new plugs in petrol to remove the protective coating, then set the electrode gaps to the dimension specified in Section 6.
Fit the new plugs and washers to the engine but do not overtighten. Push the leads firmly on.

NOTE: The plug leads must be fitted in the order illustrated or the engine will mis-fire. The 4-cylinder engine is illustrated at the top of this page with the V8 below.

CHECK/ADJUST VALVE CLEARANCES (NOT V8) - Fig. ST310

NOTE: During the following procedure, the crankshaft must be turned a number of times, and this can be made easier if the spark plugs or heater plugs are removed, as applicable.

Turn the engine over until number eight valve (counting from front of engine) is fully open. Using a feeler gauge (1) check the clearance between the valve tip and rocker pad of number one valve.
The correct clearance is:
Petrol and Diesel except Tdi, ... 0.25mm (0.010in)
Tdi 0.20mm (0.008in)
Adjust the clearance by slackening the lock nut (2) and turning the tappet adjusting screw clockwise to reduce clearance and anti-clockwise to increase clearance. Recheck the clearance after tightening the lock nut.



ST310

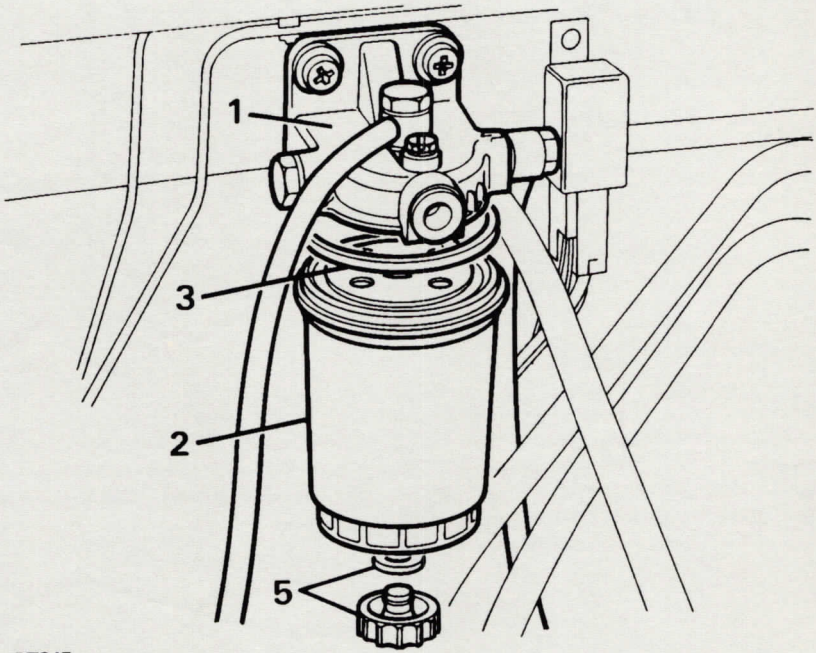
Continue to check and adjust the remaining tappets in the following sequence:
Set No.3 tappet with No.6 valve fully open.
Set No.5 tappet with No.4 valve fully open.
Set No.2 tappet with No.7 valve fully open.
Set No.8 tappet with No.1 valve fully open.
Set No.6 tappet with No.3 valve fully open.
Set No.4 tappet with No.5 valve fully open.
Set No.7 tappet with No.2 valve fully open.

FIT THE ROCKER COVER

Using a new gasket, fit the rocker cover and secure with the dome nuts and washers. Tighten evenly to the correct torque. Do not overtighten.
Refit the spark plugs or heater plugs, as applicable. Tighten them firmly but not excessively.

RENEW FUEL FILTER ELEMENT - DIESEL MODELS - Fig. ST345

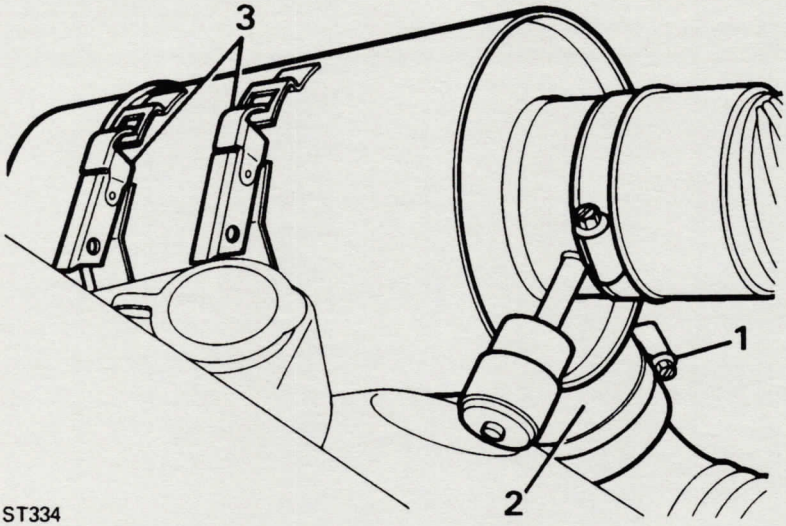
The fuel filter body is located at the rear of the engine bay on the engine bulkhead. Clean the area around the filter head (1) and place a container beneath the filter



ST345

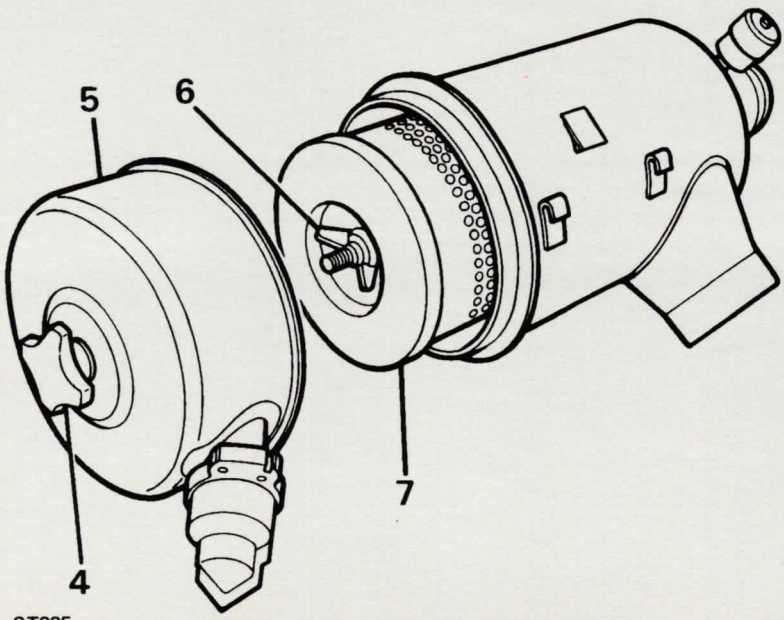
Unscrew the filter (2) and catch the fuel that is released in the container. A large spanner or strap wrench will grip the flats formed on the base of the filter element.
Wet the seal (3) of the new filter element with diesel fuel.
Screw the new filter into position and tighten with a spanner.
Ensure that the drain tap (5) at the base of the filter is closed.

AIR CLEANER ON 4-CYLINDER PETROL AND DIESEL MODELS - Figs. ST334 and ST335
NOTE: The Tdi air cleaner is illustrated, other models are similar.



ST334

Prop open the bonnet. Slacken the clip (1) and disconnect the hose (2) from the air cleaner. Pull up the clips (3) and raise the air cleaner from the cradle. Unscrew the knob (4) and pull off the end cover (5). Unscrew the wing nut (6), remove the sealing washer and pull the element (7) from the frame and discard it.



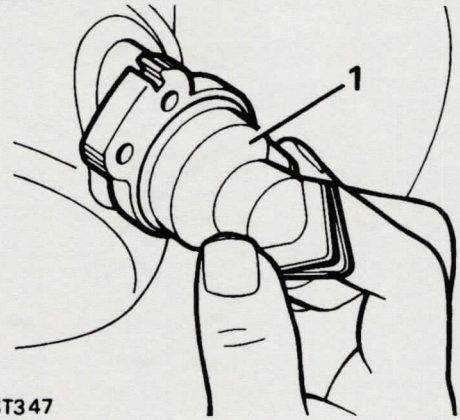
ST335

CHECK AIR CLEANER DUMP VALVE - Fig. ST347

The dump valve provides an automatic drain for the air cleaner and is fitted in the base of the air cleaner support bracket.

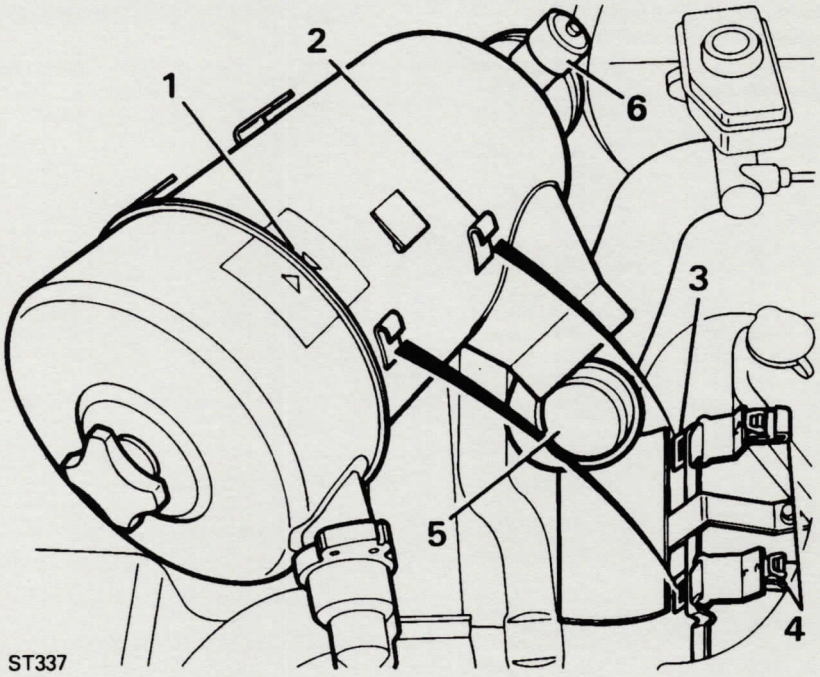
Squeeze open the dump valve (1) and check that the interior is clean. Also check that the rubber is flexible and in a good condition.

If necessary, remove the dump valve to clean the interior. Fit a new valve if the original is in a poor condition.



ST347

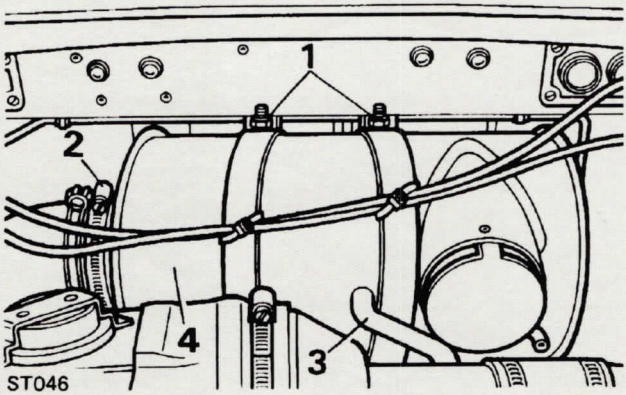
REASSEMBLING - Fig. ST337
Fit a new element and reassemble the air cleaner, aligning the arrows (1) before tightening the cover knob. Locate the air cleaner on to the cradle, engaging the hooks (2) into the cradle slots (3). Fasten the retaining clips (4), reconnect the hose and tighten the clip (5).



Tdi - AIR CLEANER ELEMENT CHANGE INDICATOR - Where fitted - Fig. ST337
Located on the air cleaner case, this indicator clearly shows, by means of a red band moving across a clear aperture, when the filter requires changing. Having changed the filter, reset the indicator by pressing the button (6) until the red band is no longer visible.

AIR CLEANER UNDER ARDUOUS CONDITIONS
When the vehicle is used in dusty, deep wading or field conditions, attention to the air cleaner must be more frequent.

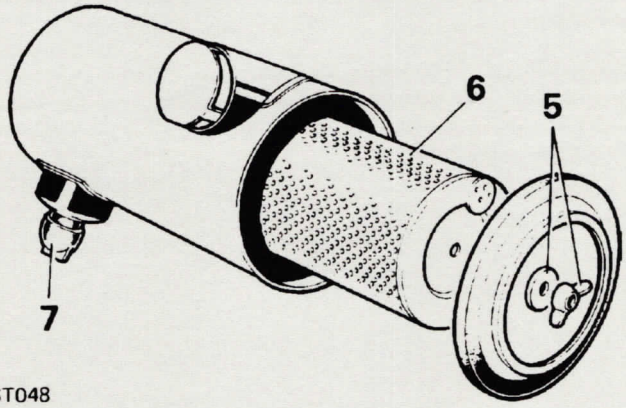
AIR CLEANER (V8 CYLINDER MODELS) - Figs. ST046 and ST048



ST046

REMOVING AIR CLEANER ELEMENT

Unscrew the two air cleaner strap retaining nuts (1). Disconnect the air cleaner hose (2). Remove the engine breather hose (3). Withdraw air cleaner canister (4). Unscrew element wing nut and washer (5) and remove filter. Remove the element (6). The old element should be discarded and a new one fitted during reassembly. If a new element is not available, it may be possible to clean the old one as described on previous pages.



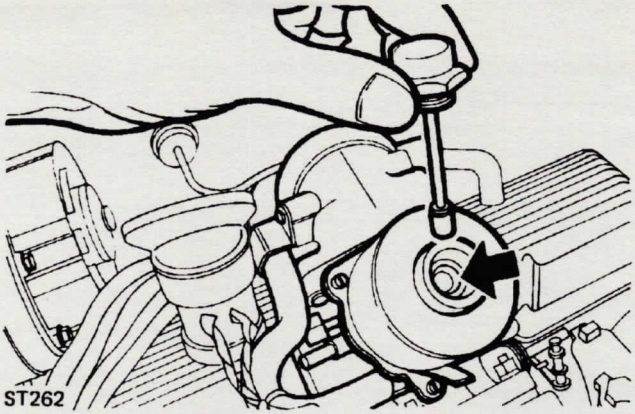
ST048

CHECK AIR CLEANER DUMP VALVE

Squeeze open the dump valve (7) and check that the interior is clean. Also check that the rubber is flexible and in a good condition. If necessary, remove the dump valve to clean the interior. Fit a new valve if the original is in a poor condition.

REASSEMBLING

Fit a new element and reassemble the air cleaner. Replacement procedure is the reverse of the removal.



Carburetters

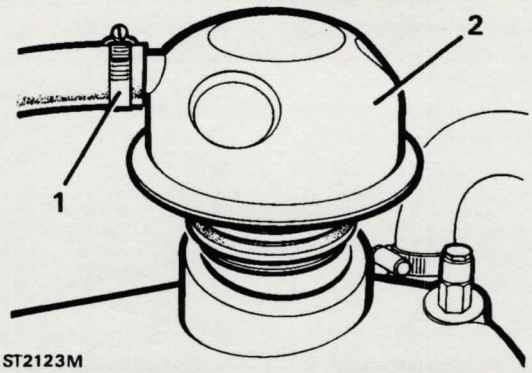
Carburetter mixture ratio and idle speed settings are pre-set at manufacture and must not be interfered with. Under normal circumstances they do not require attention except at major engine overhaul.

However, should it become necessary to check any aspect of carburetter adjustment the work must be carried out by a qualified Land Rover Distributor or Dealer, who has the specialised equipment needed to carry out adjustments to the close limits necessary to ensure that the engine conforms to the legal requirements in respect of exhaust emission.

European Countries - Under no circumstances must the mixture setting be disturbed, as this would almost certainly result in the vehicle failing to meet with legal requirements in respect of air pollution.

Carburetter hydraulic damper - V8 cylinder models - Fig. ST262

1. Unscrew the cap on top of the suction chamber, withdraw cap and plunger. Top up with clean engine oil to bring the level to the top of the hollow piston rod. screw the cap firmly into the carburetter.



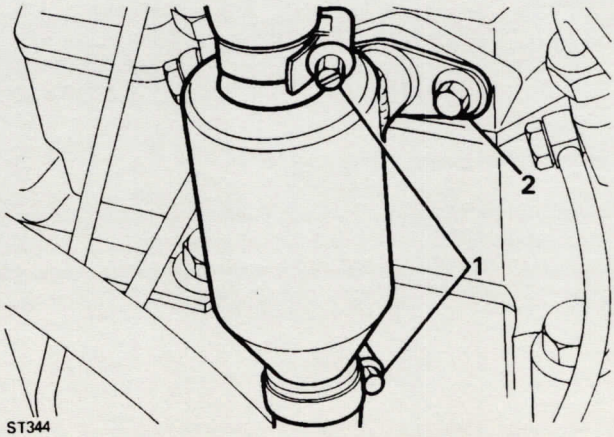
ST2123M

CLEAN ENGINE BREATHER FILTER FOUR CYLINDER MODELS EXCEPT Tdi - Fig. ST2123

The engine breather filter is fitted on top of the engine.
Disconnect the hoses (1) one on Petrol engines, two on Diesels.
Pull the breather filter (2) from the rocket corner.
Wash the gauge filter in clean filter in clean fuel. Drain and allow to dry. Refit the engine breather filter.

CLEAN ENGINE BREATHER CLEANER: Tdi engine - Fig. ST344

Slacken the hose clips (1) securing the hoses to the top and bottom of the cleaner body and pull off the hoses.
Remove the two bolts (2) securing the cleaner to the rocker cover.
Pull away the cleaner from the rocker cover taking care not to tear the sealing gasket.
Immerse the cleaner in a small container of kerosene to dissolve oily deposits which may have accumulated.
When the cleaner is free of deposits, remove it from the solvent and dry it completely.
CAUTION: The cleaner must be completely dry before it is refitted to the engine, otherwise overspeeding of the engine may result.
Refit the cleaner to the rocker cover using a new gasket.
Refit hoses to the cleaner ensuring that the clips are fully tightened for a gas-tight seal.



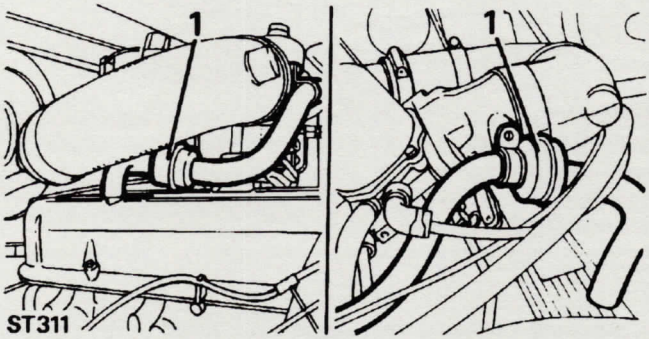
ST344

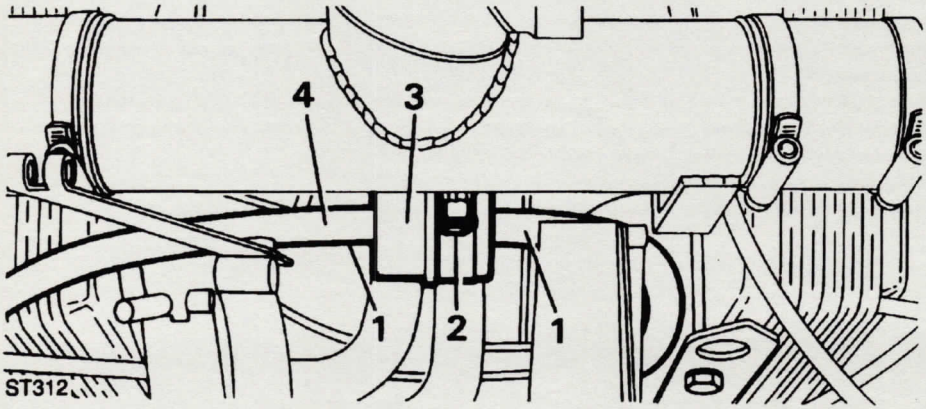
RENEW ENGINE FLAME TRAPS (V8 ONLY) - Fig. ST311

Disconnect the hoses from each side of the left-hand and right-hand flame traps (1) and discard the traps. The right-hand trap is situated beneath the right-hand carburetter inlet elbow.

Examine the hoses and renew any that are perished, split or blocked.

Fit new flame traps to the original or new hoses.

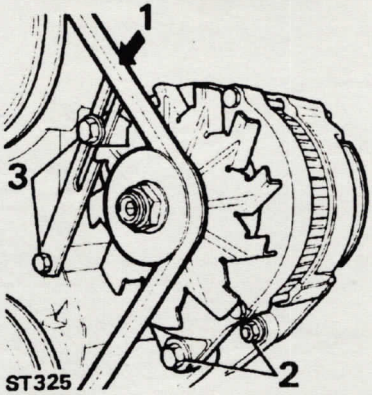




RENEW ENGINE BREATHER FILTER (V8 ONLY) - Fig. ST312

Replace as follows:

Remove the air cleaner as detailed under 'Air cleaner'. Pull off the two hoses (1) from the engine beneath filter, slacken the filter clip (2) and withdraw the filter (3). Fit new filter with end marked 'IN' connected to the hose from the air element (4). Refit hoses and tighten clip.



DRIVE BELTS - GENERAL

Examine all pulleys for damage and check there are no pebbles or grit trapped in the V-grooves that could damage or reduce the life of the drive belts.

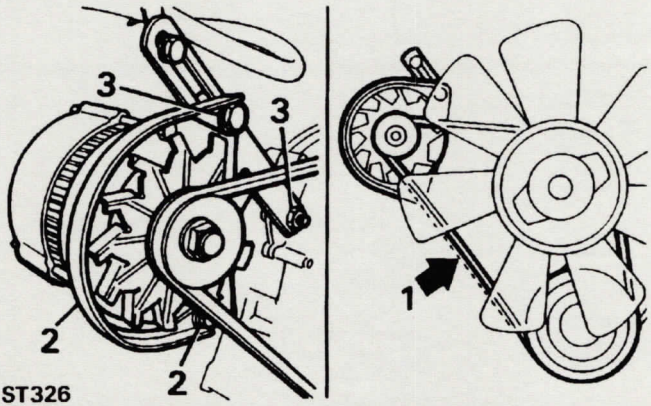
WARNING: Disconnect the vehicle battery before checking or adjusting any of the drive belts, to prevent the possiblity of personal injury if the engine was started.

4-CYLINDER MODELS - Fig. ST325

Check by thumb pressure (1) between the fan and alternator pulleys. Movement should be approximately 9 mm (3/8 in).

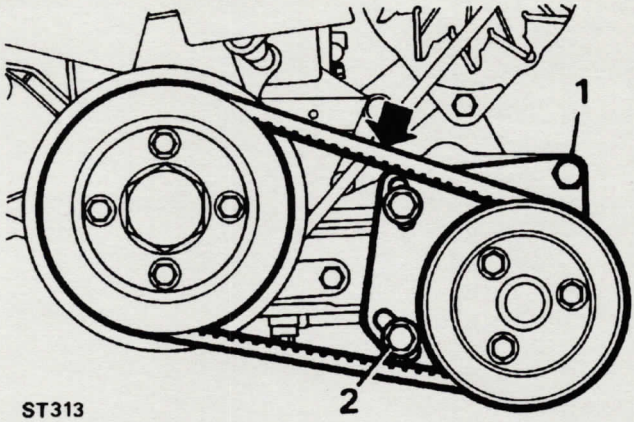
V8 CYLINDER MODELS - Fig. ST326

Check by thumb pressure (1) between alternator and crankshaft pulleys. Movement should be approximately 12 mm (1/2 in).



CHECK FAN DRIVING BELT, ADJUST OR RENEW AS NECESSARY

Whenever a new fan belt is fitted, re-check deflection after approximately 1.500 km (1,000 miles) running. If necessary adjust as follows: Slacken the bolts (2) securing the alternator to the mounting bracket. Slacken the fixings (3) at the top and bottom of the adjustment link. Pivot the alternator inwards or outwards as necessary and adjust until the correct tension is obtained, tighten the bolt at the top of the adjustment link. Finally tighten the nut securing the bottom of the adjustment link and the two mounting bracket bolts.



ST313

CHECK DRIVING BELT FOR POWER STEERING PUMP (WHEN FITTED) - ADJUST OR RENEW AS NECESSARY

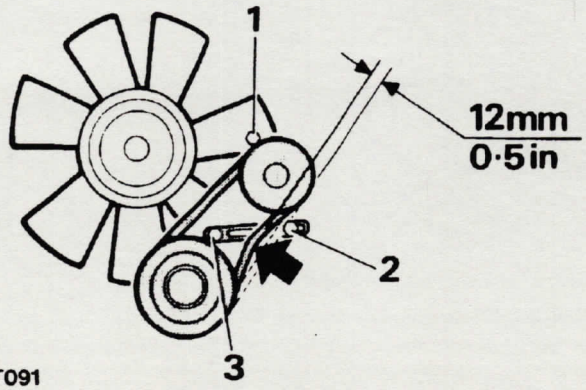
Whenever a new belt is fitted check adjustment again after approximately 1.500 km (1,000 miles) running. Check by thumb pressure the belt tension between the crankshaft and pump pulley. Movement should be approximately 12 mm (0.5 in). If adjustment is necessary:

4-CYLINDER MODELS - Fig. ST313

Slacken the pump pivot bolt (1) and the two adjustment clamp bolts (2) and move the pump mounting plate either up or down, as necessary, within the elongated holes, to achieve the correct belt tension.

CAUTION: DO NOT lever or apply pressure to the pump body to tension the belt since this will cause permanent damage to the pump.

Tighten the clamp bolts first and then the pivot bolt.
Reconnect the battery, turn the engine over a few times and recheck the belt tension.



ST091

V8 CYLINDER MODELS - Fig. ST091

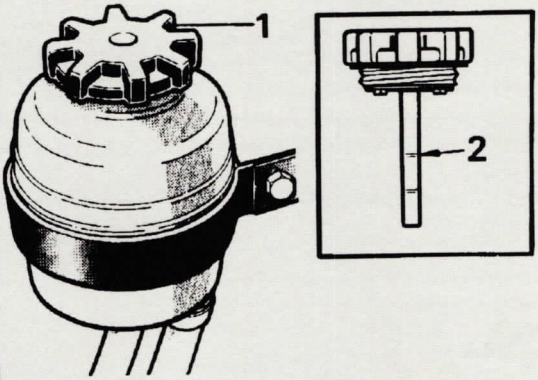
Slacken the nut (1) on the pivot bolt securing the pump mounting bracket to the cylinder head. Slacken the bolt (2) securing the pump lower bracket to the slotted adjustment link. Slacken the bolt (3) securing the slotted adjustment link to the support bracket mounted on the water pump cover. Pivot the pump as necessary and adjust until the correct belt tension is obtained. Maintaining the tension, tighten the pump adjusting bolts and pivot bolt nut and re-check the tension.

CHECK/TOP-UP POWER STEERING RESERVOIR - Fig. LR2241

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 (2) on the dipstick.

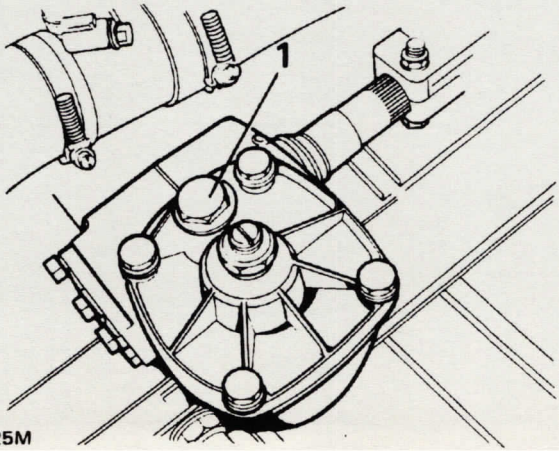


LR2241

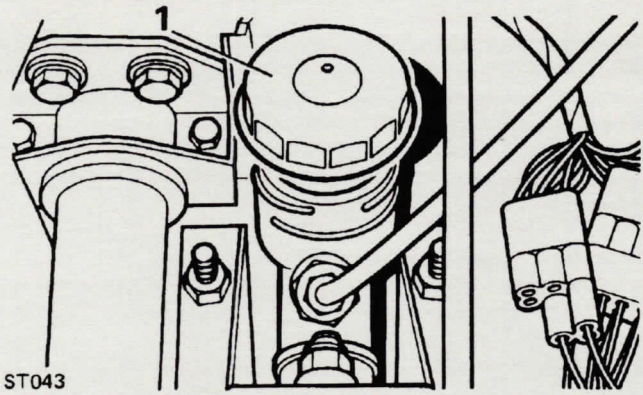
CHECK/TOP-UP MANUAL STEERING BOX - Fig. ST925

Remove the oil filler plug (1) and observe the oil level which should be 25 mm (1.0 in) below the top of the filler hole.

If necessary top-up to the correct level with a recommended oil. Clean and refit the plug and wipe away any surplus oil.

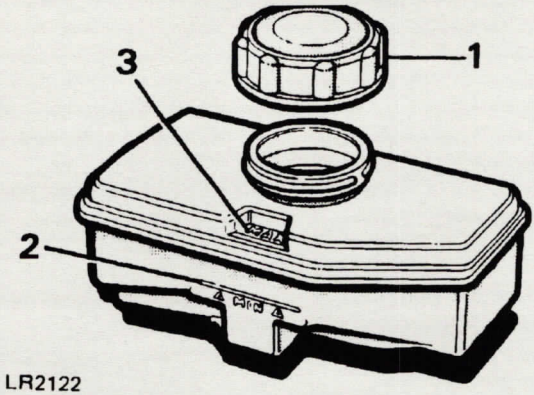


ST 925M



CLUTCH FLUID RESERVOIR - Fig. ST043
Check the fluid level in the reservoir, mounted on the bulkhead adjacent to the brake servo. Remove the cap (1); top-up if necessary to bottom of filler neck. Use the correct fluid specified in Data section.
If significant topping-up is required, check for leaks at master cylinder, slave cylinder and connecting pipes.

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



LR2122

BRAKE FLUID RESERVOIR - Fig. LR2122
The tandem brake fluid reservoir is integral with the servo unit and master cylinder. Check the fluid level as follows:
Unscrew the reservoir filler cap (1).
Check the fluid level in the reservoir.
The level is indicated on the translucent reservoir body (2).
Top-up if necessary with fluid specified in the Data section to the MAX mark (3).
Replace the filler cap.

If significant topping-up is required, check master cylinder, wheel cylinders and brake pipes for leakage; 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.
Where a vehicle is operated in extremely dusty conditions, consult your Land Rover Distributor or Dealer for advice on servo air filter change intervals. The filter is situated on the brake pedal side of the servo unit.

LOW FLUID LEVEL/BRAKE CIRCUIT WARNING LIGHT

WARNING: As this test requires the release of the handbrake ensure the vehicle is on level ground and the wheels are chocked.

Normally the warning light remains off, however to check that the circuit is operative, switch on the ignition and release the handbrake. Press the flexible contact located in the filler cap centre, the RED warning light on the instrument panel should illuminate; if it does not energise, and the bulb has not failed, consult your Land Rover Distributor or Dealer immediately.

LUBRICATION

Draining of used oil should take place after a run when the oil is warm. Always clean the drain and filler-level plugs before removing. In the interests of safety chock the wheels and disconnect the vehicle battery to prevent the engine being started and the vehicle moved inadvertently, while oil changing is taking place.
Allow as much time as possible for the oil to drain completely except where blown sand or dirt can enter the drain holes. In these conditions clean and refit the drain plugs immediately the main bulk of oil has drained.
Where possible, always refill with oil of the make and specification recommended in the lubrication charts and from sealed containers.

USED ENGINE OILS

WARNING: Prolonged and repeated contact with used engine oil may cause serious skin disorders, including dermatitis and cancer.
- Avoid excessive contact, wash thoroughly after contact.
- Keep out of reach of children.

PROTECT THE ENVIRONMENT It is illegal in the UK and many other countries to pollute drains, water courses or soil. Use authorised waste disposal facilities, including civic amenity sites and garages providing facilities for receipt of used oil. If in doubt, contact your local Local Authority for advice.

CAUTION: V8 Engines: DO NOT remove the engine oil filter whilst the sump is drained, otherwise the engine oil pump will have to be primed.

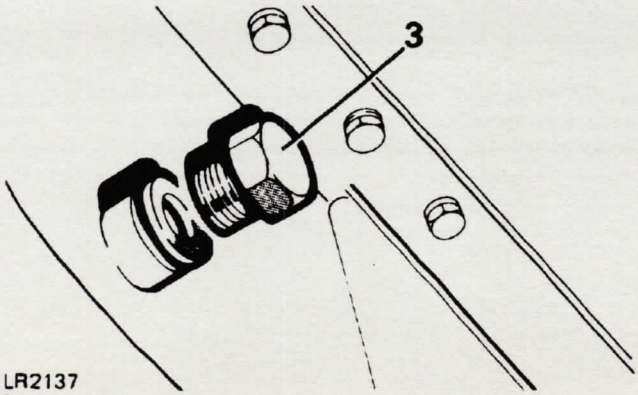
RENEW ENGINE OIL AND FILTER

DRAIN THE OIL - ALL ENGINES - Fig. LR2137

Drive vehicle to level ground and chock the wheels.
Run the engine to warm the oil; switch off the engine and disconnect the battery for safety.
Place an oil tray under the drain plug.

WARNING: Use care when draining the engine oil, if it is very hot it could cause personal scalding.

Remove the drain plug (3) in the bottom of the sump at the left-hand side - V8, and right-hand side 4-cylinder engines. Allow oil to drain away completely and replace the plug and tighten to the correct torque.
NOTE: The example shown below is a 4 cylinder engine sump.



LR2137

REFILL SUMP WITH OIL - ALL ENGINES

Clean the outside of the oil filler cap, remove it from the rocker cover and clean the inside. Pour in the correct quantity of new oil of the correct grade from a sealed container to the high mark on the dipstick and firmly replace the filler cap.

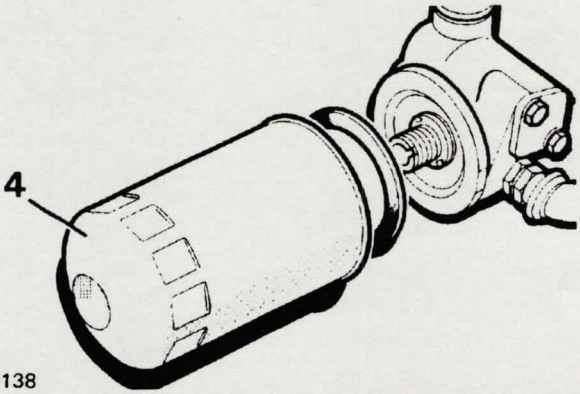
CAUTION: DO NOT fill the sump above the high (H) mark on the dipstick, or engine damage may be caused.

RENEW ENGINE OIL FILTER - ALL ENGINES - Fig. LR2138

Place an oil tray under the engine.

Unscrew the filter (4) anti-clockwise, using a strap spanner as necessary.

Smear a little clean engine oil on the rubber washer of the new filter, then screw the filter on clockwise until the rubber sealing ring touches the machined face, then tighten a further half turn by hand only. Do not overtighten.



LR2138

Reconnect the battery, run the engine and check for leaks from the filter. Stop the engine, allow the oil to run back into the sump for a few minutes, then check the oil level again and top up if necessary.

Remove chocks from the wheels.

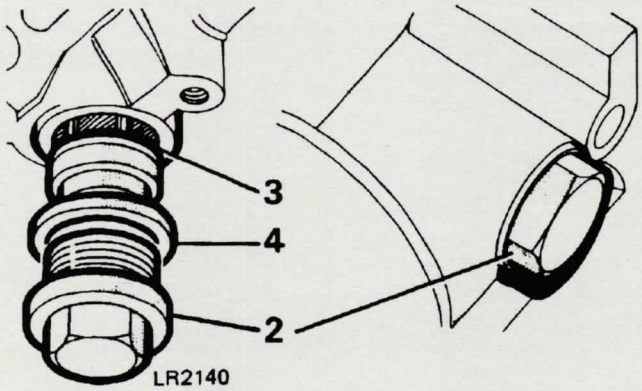
RENEW GEARBOX OIL

Drive the vehicle to level ground, chock the wheels and place a suitable container under the gearbox to catch the old oil.

WARNING: See WARNING'S at the start of the section.

4-CYLINDER ENGINES - Fig. LR2140

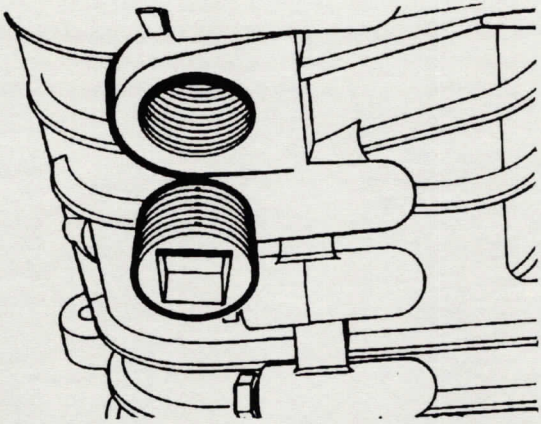
Remove the gearbox and extension case drain plugs (2) and allow the oil to drain completely. Wash the extension case filter (3) in kerosene and refit the plugs using new washer (4), if necessary, and tighten to the correct torque: 25 to 35 Nm.(19 to 26 lbf.ft).



LR2140

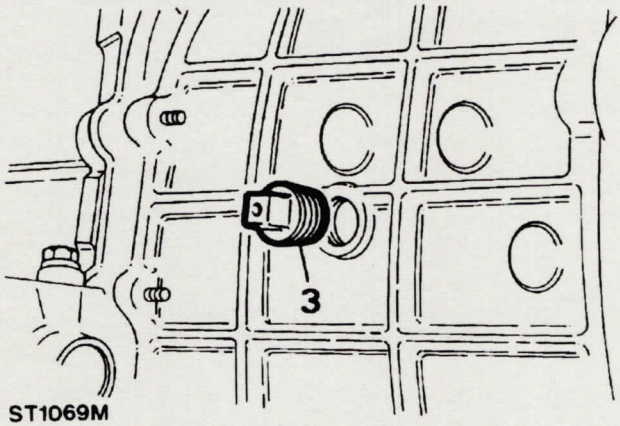
WARNING: See WARNING'S at the start of the section.

V8 ENGINES: Fig. LR2480 Remove the drain plug and allow the oil to drain completely. Refit the plug and tighten to the correct torque: 25 to 35 Nm. (19 to 26 lbf.ft).



LR2480

Remove the oil filler-level plug (3) - Fig. ST1069 and inject the approximate quantity of new oil of the correct make and grade until it begins to run out of the filler-level hole. Fit the plug and tighten to the correct torque: 25 to 35 Nm. (19 to 26 lbf.ft).



ST1069M

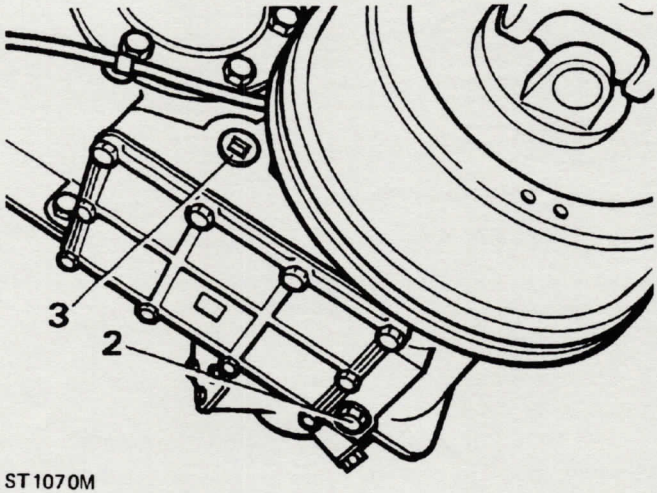
WARNING: See WARNING'S at the start of the section.

DRAIN AND RENEW TRANSFER GEARBOX OIL - Fig. ST1070

Drive the vehicle to level ground, chock the wheels and place a container under the gearbox to catch the old oil.

Remove the drain plug (2) and allow the oil to drain. Fit the plug using a new washer, if necessary, and tighten to the correct torque: 25 to 35 Nm. (19 to 26 lbf.ft).

Remove the filler-level plug (3) and inject the approximate quantity of the recommended oil until it begins to run from the plug hole. Fit the level plug and tighten only to the correct torque 25 to 35 Nm, do not overtighten, wipe away any surplus oil. Remove the wheel chocks.



ST1070M

WARNING: See WARNING'S at the start of the section.

RENEW FRONT AND REAR AXLE OIL - Fig. LR2136

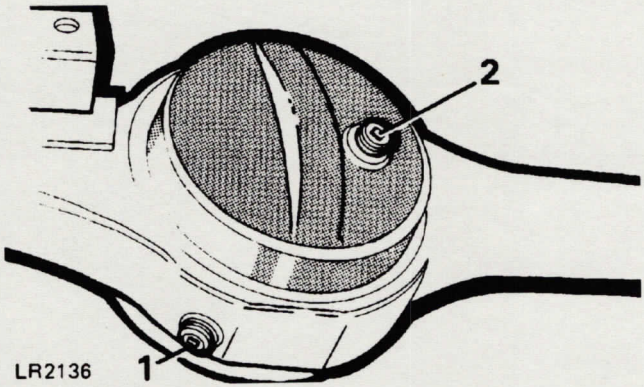
NOTE: A front axle is illustrated, but the procedure is the same for the rear axle.

Drive the vehicle to level ground chock the wheels and place a container under the axle to be drained.

Using a spanner with a 13 mm (0.5 in) square drive remove the drain plug (1) and allow the oil to drain completely. Clean and refit the drain plug.

Remove the oil filler-level plug (2) and inject new oil of a recommended make and grade until it begins to run from the hole. Clean and fit the filler-level plug and wipe away any surplus oil.

Remove the wheel chocks.



LR2136

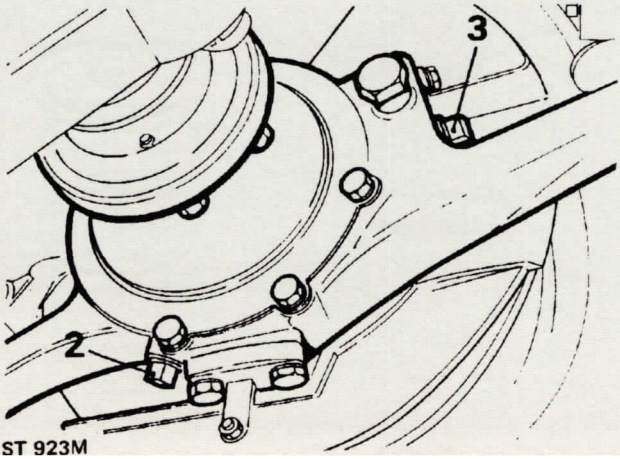
RENEW SWIVEL PIN HOUSING OIL - Fig. ST923M

Drive the vehicle to level ground, chock the wheels and place a container under each swivel housing to catch the used oil.

Remove the drain plug (2) and allow the oil to drain completely and clean and refit the plugs.

Remove the oil filler-level plug (3) and inject the recommended make and grade of oil until oil begins to run from the level hole. Clean and fit the level plugs and wipe away and surplus oil.

Remove the wheel chocks.



ST 923M

WARNING: See WARNING'S at the start of the section.

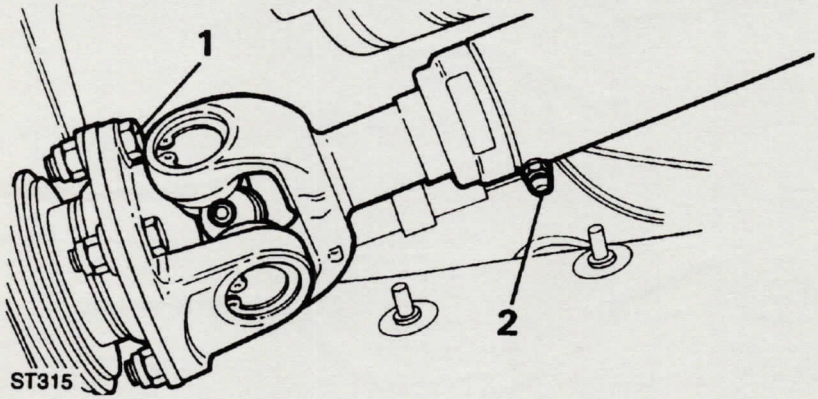
LUBRICATE PROPELLER SHAFTS Fig. ST315

Clean all the grease nipples on the front and rear propshaft universal joints, and sliding portion of the rear shaft.

Charge a low pressure hand grease gun with grease of a recommended make and grade and apply to grease nipples.

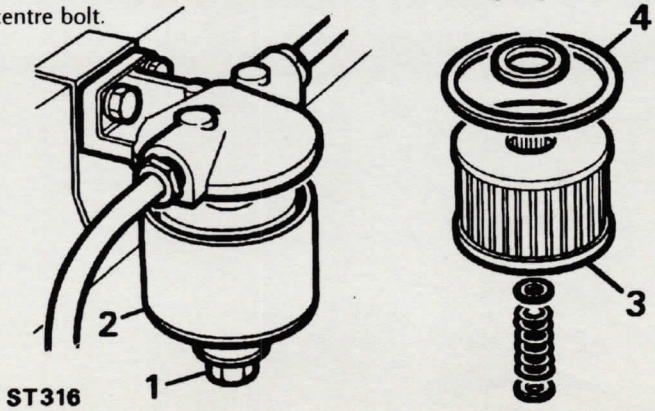
Disconnect one end of the front propeller (1) shaft and compress the sliding portion whilst applying grease to the nipple (2). It is necessary to compress the shaft to prevent over filling with grease. It should be noted that this sliding portion must only be lubricated at 40.000 km (24,000 mile) intervals.

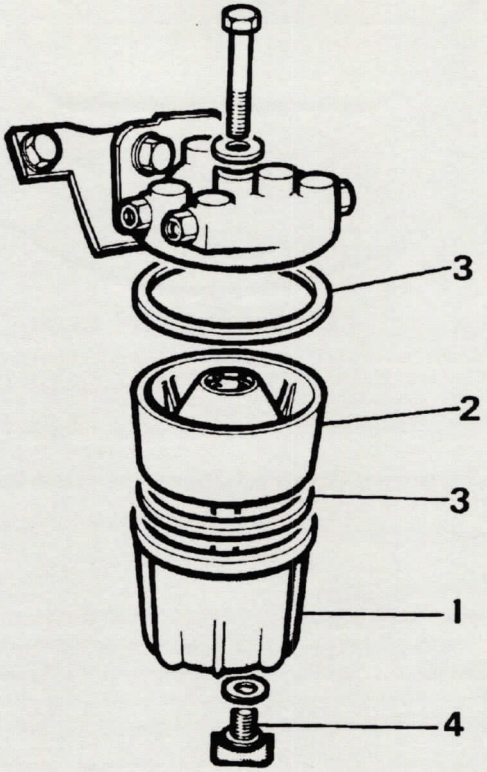
Reconnect the propeller shaft, remove the grease nipple and fit the screwed plug.



RENEW FUEL FILTER ELEMENT (PETROL MODELS) - Fig. ST316

The element provides a filter between the pump and carburetter and is located next to fuel pump on the chassis. Replace as follows: Unscrew the centre bolt (1). Withdraw the filter bowl (2). Remove the small sealing ring and remove element (3). Withdraw the large sealing ring (4) from the underside of the filter head. Discard the old element and thoroughly clean the filter bowl. Ensure that the centre and top sealing rings are in good condition and replace as necessary. Fit new element, small hole downwards. Refit sealing rings. Replace filter bowl and tighten the centre bolt.

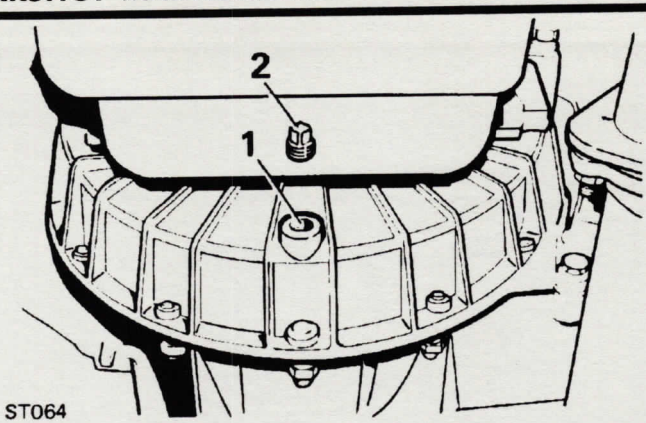




LR2178

CLEAN FUEL SEDIMENTER (where fitted) - DIESEL ONLY. Fig. LR2178
The sedimenter is fitted on the chassis side member, near the rear wheel.

CLEAN ELEMENT
Disconnect fuel inlet pipe at sedimenter and raise pipe above level of fuel tank to prevent draining from tank. Support in this position. Support sedimenter bowl (1) and unscrew bolt on top of unit and remove bowl. Remove the sedimenter element (2). Clean all parts in kerosene. Fit new seals (3) and reverse removal procedure. Slacken off the drain plug (4), when pure diesel fuel runs out tighten plug. If necessary, prime the system. Start engine and check for leaks from sedimenter.



WARNING: See WARNING'S at the start of the section.

DRAIN FLYWHEEL HOUSING IF DRAIN PLUG IS FITTED FOR WADING

4-CYLINDER MODELS - Fig. ST064

V8 CYLINDER MODELS - Fig. ST317

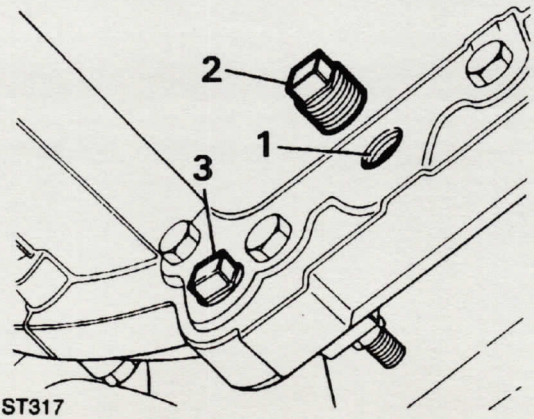
The flywheel housing can be completely sealed to exclude mud and water under severe wading conditions, by fitting a plug in the drain hole (1) at the bottom of the housing. The plug (2) should only to fitted when the vehicle is expected to do wading or very muddy work. When the plug is in use it must be removed periodically and all oil allowed to drain off before the plug is replaced. When the plug is not in use it should be stowed as follows:

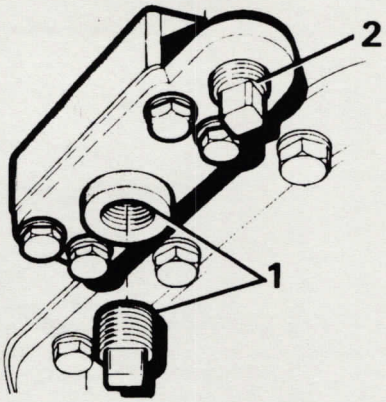
4-CYLINDER MODELS

Plug stowed in vehicle tool kit.

V8 CYLINDER MODELS Fig. ST317

Plug is normally stored in the tool kit, but can also be screwed into the housing (3) near the drain hole.





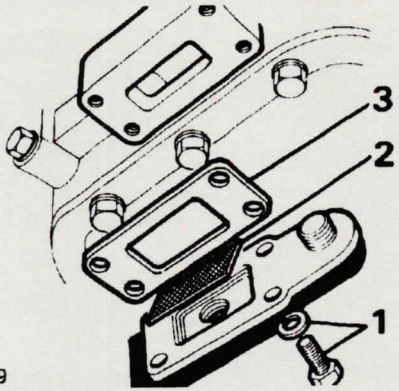
ST332

DRAIN ENGINE FRONT TIMING COVER IF PLUG IS FITTED FOR WADING - DIESEL MODELS (NOT Tdi) - Fig. ST332

WARNING: See WARNING'S at the start of the section.

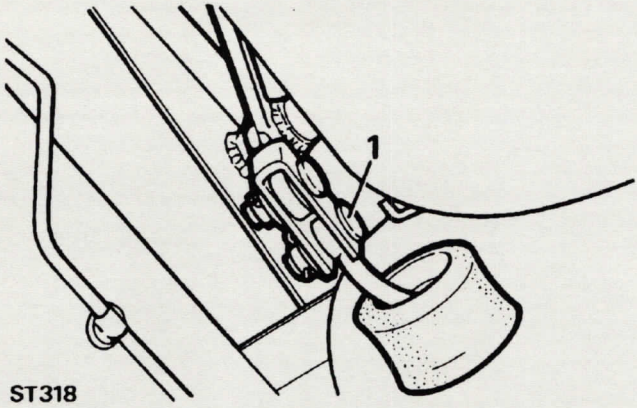
The timing cover can be completely sealed to exclude mud and water under severe wading conditions, by fitting a plug in the drain hole (1) at the bottom of the cover. The plug should only be fitted when the vehicle is expected to do wading or very muddy work. When the plug is in use it must be removed periodically to allow any oil to drain off before the plug is replaced.

NOTE: There should not be any oil in the timing cover, but if there is, the cause should be investigated as soon as possible, as the timing belt will deteriorate if it becomes contaminated with oil.
When the plug is not in use it should be stowed in the tapped hole (2) adjacent to the drain hole.



LR2059

CLEAN FILTER - ENGINE TIMING COVER - DIESEL MODELS (NOT Tdi) - Fig. LR2059
A gauze filter is fitted at the bottom of the engine timing cover to help prevent mud and other debris entering the drain hole, when the wading plug is not in use. The filter must be removed and cleaned periodically, to ensure that it does not become blocked and prevent the timing cover draining properly. Under normal circumstances, the filter should be cleaned at the intervals specified in the Maintenance Schedule or, more frequently if the vehicle operates regularly in wet or dusty conditions. From underneath of a safely parked vehicle, remove the four bolts (1) and plain washers and, withdraw the wading plug plate from the bottom of the timing cover. Wash the filter (2) in kerosene or clean fuel. Brush off any mud or other debris and ensure that the whole filter is clean. Check the condition of the gasket (3) for the wading plug plate. If necessary fit a new gasket. Refit the wading plug plate. Tighten the securing bolts.



ST318

CHECK/ADJUST TRANSMISSION HANDBRAKE - Fig. ST318, ST319 and ST320

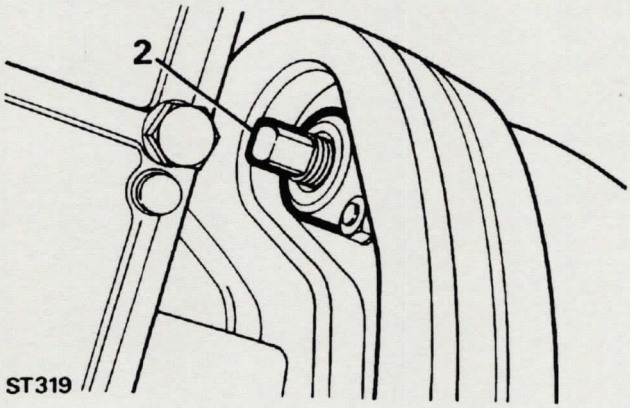
If handbrake movement is excessive, adjust as follows:

Set the vehicle on level ground and chock the wheels.

Release the handbrake fully.

Remove the clevis pin (1) connecting the handbrake lever to the relay at the gearbox end.

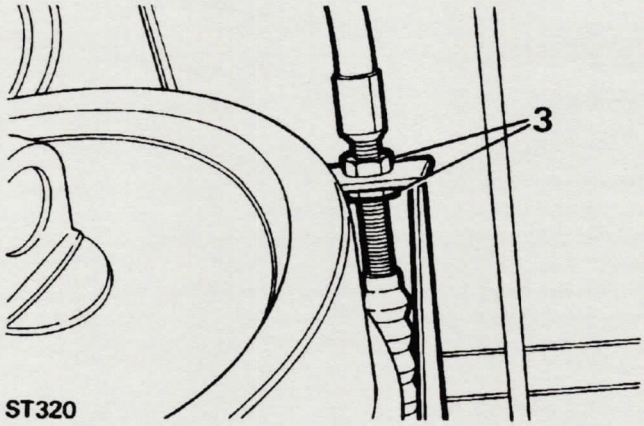
Fully adjust the handbrake shoe assembly (so that it is fully on) by means of the adjuster (2) on the backplate.



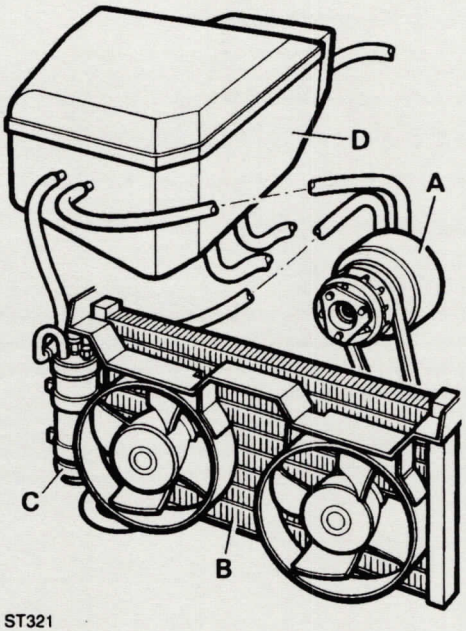
ST319

Adjust the outer sheath of the handbrake cable by means of the two locknuts (3) at the gearbox end until the holes in the clevis on the inner cable line up with the hole of the relay lever.
Fit the clevis pin, washer and a NEW split pin.
Slacken the adjuster 1 or 2 notches until handbrake shoes just clear the drum.
Apply the handbrake gradually. The drum should still rotate on the first ratchet and start to come on at the second ratchet.

CAUTION: DO NOT over adjust the handbrake, the drum must be free to rotate when the handbrake is released, otherwise serious damage will result.



ST320



ST321

AIR CONDITIONING SYSTEM (option) - Fig. ST321

The air conditioning system operates in conjunction with the vehicle heater to provide cooled and dried recirculated or fresh air.

The system is made up of four separate units.

(A) An engine-mounted compressor.
(B) A condenser mounted in front of the radiator.
(C) A receiver/drier unit located in the engine compartment.
(D) An evaporator-heater unit mounted in the engine compartment.

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 as it enters the vehicle. The system delivers hot, cooled, fresh, recirculated and dehumidified air as required to all positions. The installation incorporates temperature, fan speed and distribution controls mounted on the fascia.

WARNING: The air conditioning system is filled at high pressure with a potentially toxic material. Follow service instructions when dismantling or applying excessive heat, e.g., painting, etc. Servicing must only be carried out by a qualified engineer in accordance with instructions in the Repair Operation Manual.

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
Check the pipe connections for signs of fluid leakage.

COMPRESSOR
Check the pipe connections for fluid leakage and hoses for swelling.

RECOMMENDED REFRIGERANTS AND OILS
See Data Section 6.

WARNING: Adjustments or rectification procedures should be carried out by your Land Rover Dealer or an approved automotive air conditioning specialist. Under no circumstances should non-qualified personnel attempt repair or servicing of air conditioning equipment.

WARNING: Disconnect the vehicle battery before checking or adjusting any of the drive belts, to prevent the possibility of personal injury if the engine was started.

COMPRESSOR DRIVE-BELT

The belt must be adjusted within the specified limits of 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 be evident during operation.

If necessary adjust as follows:

BELT ADJUSTMENT (V8 PETROL MODEL) Fig. ST327

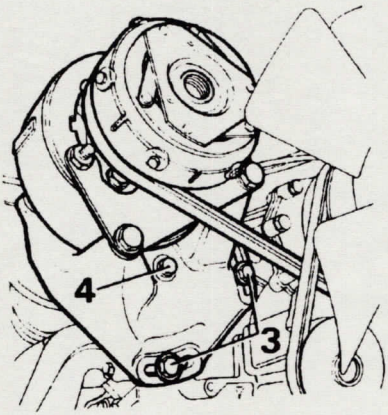
Check by thumb pressure midway between the compressor and the engine fan pulleys. The total deflection of the belt should be aproximately 4 to 6 mm. If necessary adjust as follows:

Slacken the compressor mounting bolts (1) and the pivot bolt (2).

Adjust the position of the compressor to give the correct belt tension of 4 to 6 mm (0.19 to 0.25 in).

CAUTION: DO NOT lever or apply pressure to the compressor body to tension the belt since this will cause permanent damage to the compressor.

Tighten all fixings and recheck the belt tension.



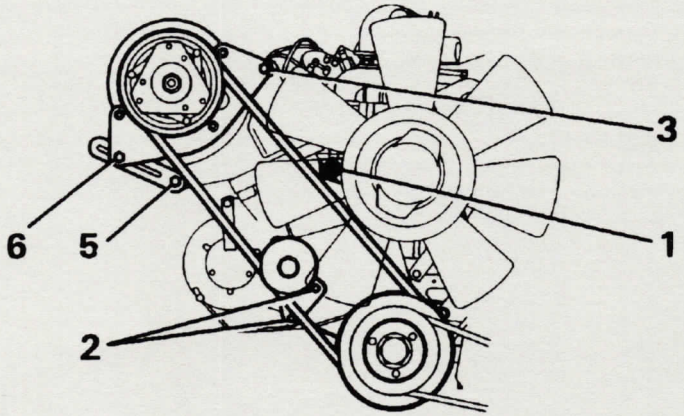
ST327

BELT ADJUSTMENT (4-CYLINDER PETROL AND DIESEL MODELS) - Fig. ST323

Check by thumb pressure (1) between the compressor and crankshaft. The total deflection of the belt should be approximately 12 mm (0.5 in). If necessary adjust as follows:

Slacken the damper clamp bolts (2) and move the damper pulley clear of the belt. Slacken the compressor pivot bolts (3), the adjustment link pivot blot (5) and the adjustment clamp bolts (6). Pivot the compressor clockwise until all slackness is removed from the belt, then tighten the clamp and pivot bolts.

Adjust the position of the damper pulley so that it is just in contact to 1 mm clear of the bolt.



ST323