






# Chapter 1 Part B:

## Routine maintenance & servicing - diesel models

### Contents

Accelerator mechanism checking and lubrication . . . . .	18	Handbrake adjustment . . . . .	36
Air cleaner dump valve check (200 TDI engine models) . . . . .	16	Handbrake linkage lubrication . . . . .	26
Air cleaner element renewal . . . . .	10	Headlight and auxiliary light adjustment check . . . . .	38
Airbag module renewal . . . . .	57	Hinge and lock check and lubrication . . . . .	43
Automatic transmission fluid and oil screen renewal . . . . .	49	Idle speed checking and adjustment . . . . .	6
Automatic transmission fluid level check . . . . .	8	Intercooler element cleaning . . . . .	55
Auxiliary drivebelt checking and renewal . . . . .	17	Introduction . . . . .	1
Axle breather check . . . . .	31	Jack and tools security check . . . . .	20
Axle oil level check . . . . .	23	Manual transmission fluid renewal . . . . .	21
Axle oil renewal . . . . .	46	Propeller shaft joint lubrication . . . . .	25
Battery electrolyte level check . . . . .	5	Propeller shaft securing bolt check . . . . .	30
Brake fluid renewal . . . . .	50	Regular maintenance . . . . .	2
Brake pad and disc check . . . . .	41	Road test . . . . .	37
Brake vacuum servo hose check . . . . .	13	Seat belt check . . . . .	44
Braking system seal, vacuum servo filter and hose renewal . . . . .	53	Shock absorber check . . . . .	52
Catalytic converter check and renewal . . . . .	56	Spare wheel check . . . . .	42
Clutch fluid level check . . . . .	7	Steering and suspension component check . . . . .	29
Coolant renewal . . . . .	51	Steering gear backlash check . . . . .	19
Cooling system and heater system hose check . . . . .	12	Sunroof maintenance . . . . .	39
Crankcase breather hose check . . . . .	15	Swivel pin housing oil level check . . . . .	24
Engine breather filter cleaning . . . . .	11	Swivel pin housing oil renewal . . . . .	47
Engine oil and filter renewal . . . . .	3	Timing belt renewal . . . . .	54
Exhaust system check . . . . .	28	Towing bracket check . . . . .	35
Flywheel housing and timing belt housing draining . . . . .	33	Transfer gearbox oil level check . . . . .	22
Front wheel alignment check . . . . .	40	Transfer gearbox oil renewal . . . . .	45
Fuel filter renewal . . . . .	9	Turbocharger boost pressure check . . . . .	48
Fuel sedimenter cleaning . . . . .	32	Underbody component, pipe, hose and wiring check . . . . .	27
Fuel tank security check . . . . .	34	Valve clearances (checking and adjustment) . . . . .	4
Glow plug wiring check . . . . .	14		

### Degrees of difficulty

<b>Easy</b> , suitable for novice with little experience 	<b>Fairly easy</b> , suitable for beginner with some experience 	<b>Fairly difficult</b> , suitable for competent DIY mechanic 	<b>Difficult</b> , suitable for experienced DIY mechanic 	<b>Very difficult</b> , suitable for expert DIY or professional 
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Trium

# 1B•2 Servicing specifications - diesel models

## Lubricants and fluids

Refer to end of *Weekly checks* on page 0•17

### Capacities

Engine oil:

Sump capacity (drain and refill, including oil filter):

200 TDi engine	6.9 litres
300 TDi engine	6.7 litres

Cooling system:

Manual transmission models	11.5 litres
Automatic transmission models	11.7 litres

Manual transmission	2.7 litres
Automatic transmission	9.8 litres

Transfer gearbox:

Up to suffix D	2.3 litres
From suffix E	2.8 litres

Front axle	1.7 litres
Rear axle	1.7 litres

Steering box and power steering reservoir:

Right-hand-drive models	3.4 litres
Left-hand-drive models	2.9 litres

Swivel pin housing oil (each)	0.35 litre
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Fuel tank:

Models built up to March 1993	81.8 litres
Models built from April 1993	89.0 litres

Washer fluid reservoir	7.0 litres
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### Engine

Valve clearances (inlet and exhaust)	0.20 mm
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### Cooling system

Antifreeze mixture:

Minimum strength	25% antifreeze, 75% water
Maximum strength	60% antifreeze, 40% water
Protection to -36°C	50% antifreeze, 50% water

### Fuel system

Glow plugs	Bosch 0 250 202 040
Turbocharger maximum boost pressure	0.8 to 1.0 bar

### Brakes

Minimum front brake disc pad thickness	3.0 mm
Minimum rear brake disc pad thickness	3.0 mm

### Tyre pressures

Refer to end of *Weekly checks* on page 0•18

### Torque wrench settings

	Nm	lbf ft
Engine sump drain plug:		
200 TDi engine	45	33
300 TDi engine	35	26
Propeller shaft and rubber coupling securing bolts	47	35
Roadwheel nuts	129	95
Transfer gearbox oil drain plug	30	22
Transfer gearbox oil filler/level plug	30	22

T10

The maintenance intervals in this manual are provided with the assumption that you, not the dealer, will be carrying out the work. These are the minimum intervals recommended for vehicles driven daily. If you

wish to keep your vehicle in peak condition at all times, you may wish to perform some of these procedures more often. We encourage frequent maintenance, since it enhances the efficiency, performance and resale value of

your vehicle.

When the vehicle is new, it should be serviced by a dealer service department, in order to preserve the factory warranty.

## Every 250 miles (400 km) or weekly

- Refer to *Weekly checks*

## Every 6000 miles (10 000 km) or 6 months, whichever comes first

- Renew the engine oil and filter (Section 3)
- Check and if necessary adjust the valve clearances\* (Section 4)
- Check the battery electrolyte level, where possible (Section 5)
- Check and if necessary adjust the engine idle speed\* (Section 6)

\*Check at first 6000 miles (10 000 km), then at 12 000 miles (20 000 km) intervals

## Every 12 000 miles (20 000 km) or 12 months, whichever comes first

In addition to all the items listed above, carry out the following:

- Check the clutch fluid level (Section 7)
- Check the automatic transmission fluid level (Section 8)
- Renew the fuel filter element (Section 9)
- Renew the air cleaner element (Section 10)
- Clean the engine breather filter (Section 11)
- Check the cooling and heater system hoses for security and leaks (Section 12)
- Check the brake vacuum servo hose for security (Section 13)
- Check the condition and security of the glow plug wiring (Section 14)
- Check the condition of the crankcase breather system hoses (Section 15)
- Check the condition of the air cleaner dump valve - 200 TDi engine models (Section 16)
- Check the condition of the auxiliary drivebelt(s), and adjust if necessary (Section 17)
- Check the operation of the accelerator mechanism, and lubricate the moving components (Section 18)
- Check and if necessary adjust the steering gear backlash (Section 19)
- Check the security of the jack and tools (Section 20)
- Renew the manual transmission fluid (Section 21)
- Check the transfer gearbox oil level (Section 22)
- Check the front and rear axle oil levels (Section 23)
- Check the swivel pin housing oil level (Section 24)
- Lubricate the propeller shaft universal joints and sliding joints (Section 25)
- Lubricate the handbrake linkage (Section 26)
- Check all underbody pipes and hoses for leaks and condition (Section 27)

## Every 12 000 miles (20 000 km) or 12 months, whichever comes first (continued)

- Check the exhaust system for security and condition (Section 28)
- Check the steering and suspension components, including all hydraulic pipes and hoses, for leaks and condition (Section 29)
- Check the tightness of the propeller shaft coupling bolts (Section 30)
- Check the front and rear axle breathers for obstructions (Section 31)
- Clean the fuel sedimenter (Section 32)
- Drain the flywheel housing and timing belt housing, where applicable (Section 33)
- Check the security of the fuel tank (Section 34)
- Check the security of the towing bracket (Section 35)
- Check the handbrake adjustment (Section 36)
- Carry out a road test (Section 37)
- Check and if necessary adjust the headlight and auxiliary light adjustment (Section 38)
- Check the operation of the sunroof(s), and clear sunroof drain tubes (Section 39)
- Check the front wheel alignment (Section 40)
- Check the condition of the brake pads and discs (Section 41)
- Check the condition of the spare wheel (Section 42)
- Check and lubricate all door, bonnet and tailgate locks (Section 43)
- Check the condition and operation of all seat belts (Section 44)

## Every 24 000 miles (40 000 km) or 2 years, whichever comes first

In addition to all the items listed above, carry out the following:

- Renew the transfer gearbox oil (Section 45)
- Renew the front and rear axle oil (Section 46)
- Renew the swivel pin housing oil (Section 47)
- Check the turbocharger boost pressure (Section 48)
- Renew the automatic transmission fluid and oil screen (Section 49)

## Every 2 years, regardless of mileage

- Renew the brake fluid (Section 50)
- Renew the coolant (Section 51)

Continued overleaf . . .

Verion

# 1B•4 Maintenance schedule - diesel models

## Every 36 000 miles (60 000 km) or 3 years, whichever comes first

In addition to all the items listed above, carry out the following:

- Check all shock absorbers for condition and operation (Section 52)
- Renew all braking system hydraulic fluid seals, the vacuum servo filter, and all flexible brake fluid hoses (Section 53)
- Renew the timing belt (Section 54)

**Note:** The normal interval for timing belt renewal is 72 000 miles (100 000 km), it is strongly recommended that the interval is halved to 36 000 miles (60 000 km) or 3 years, particularly on vehicles which are subjected to intensive use, ie. mainly short journeys, stop-start driving, off-road driving or towing. Land Rover recommend this shorter interval in any case for vehicles used in dusty conditions or high ambient temperatures. The actual belt renewal interval is therefore very much up to the individual owner, but bear in mind that severe engine damage will result if the belt breaks.

## Every 48 000 miles (80 000 km) or 4 years, whichever comes first

- Clean the intercooler element (Section 55)

## Every 96 000 miles (154 000 km)

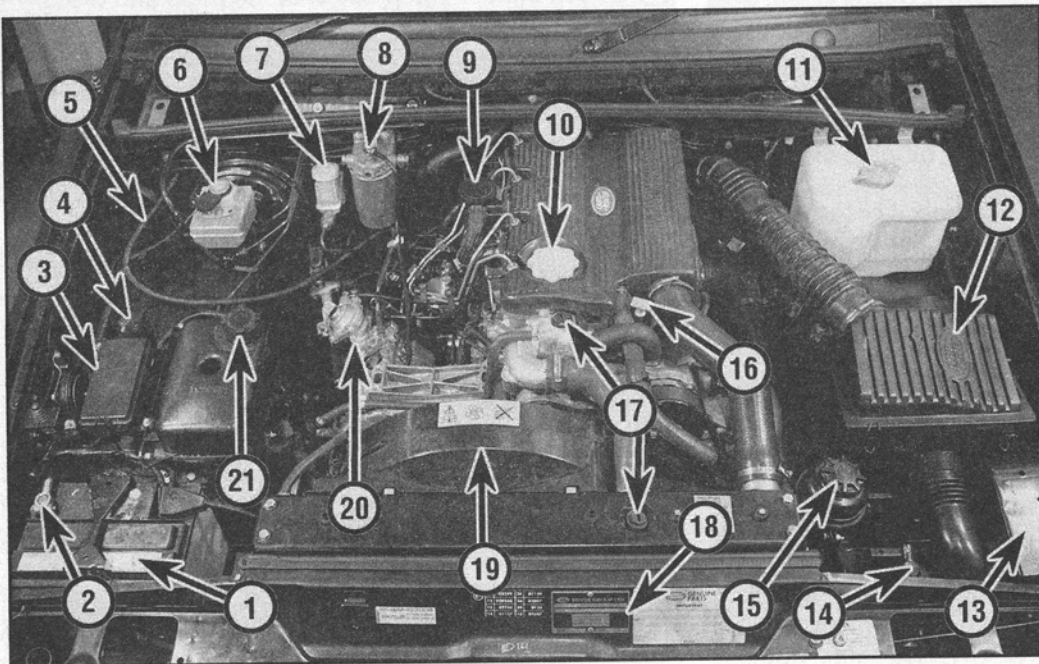
- Check and renew the catalytic converter, if applicable (Section 56)

## Every 10 years

- Renew the airbag module, where applicable (Section 57)

## Maintenance - component location

### Underbonnet view of a 300 TDi engine model

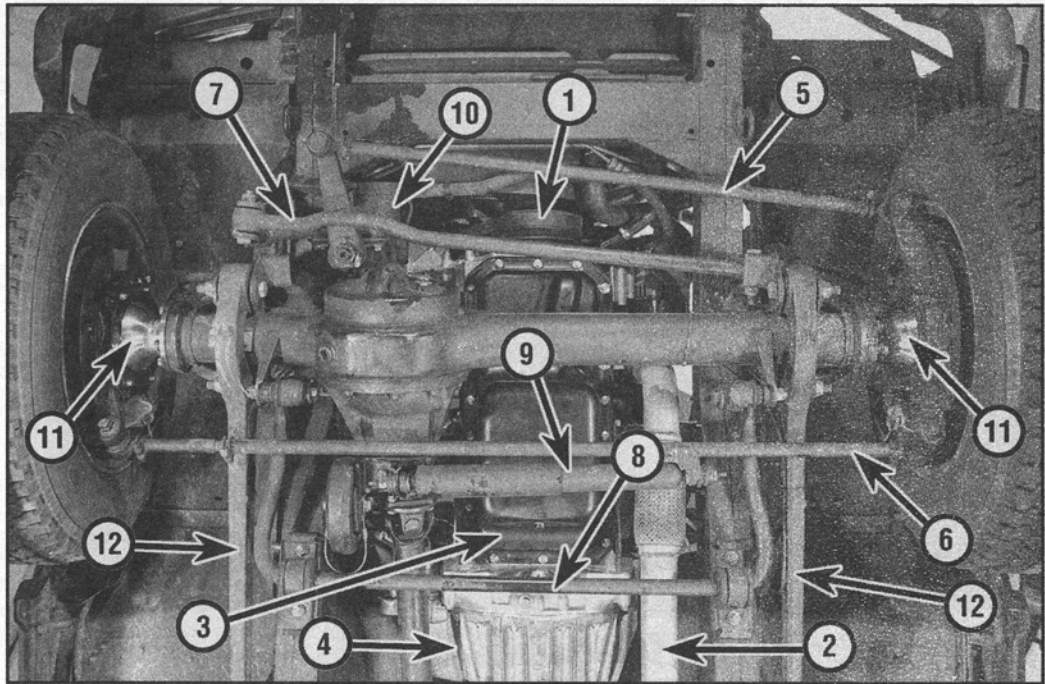


- 1 Battery
- 2 Battery negative lead
- 3 Fusebox
- 4 Preheating system relay/timer unit
- 5 Accelerator cable
- 6 Brake fluid reservoir
- 7 Clutch fluid reservoir
- 8 Fuel filter assembly
- 9 Engine breather filter
- 10 Engine oil filler cap
- 11 Washer fluid reservoir
- 12 Air cleaner casing
- 13 Wheel chock
- 14 Jack
- 15 Power steering fluid reservoir
- 16 Engine oil level dipstick
- 17 Cooling system bleed screw
- 18 VIN plate
- 19 Cooling fan cowl
- 20 Fuel injection pump
- 21 Coolant expansion tank cap

Dennis

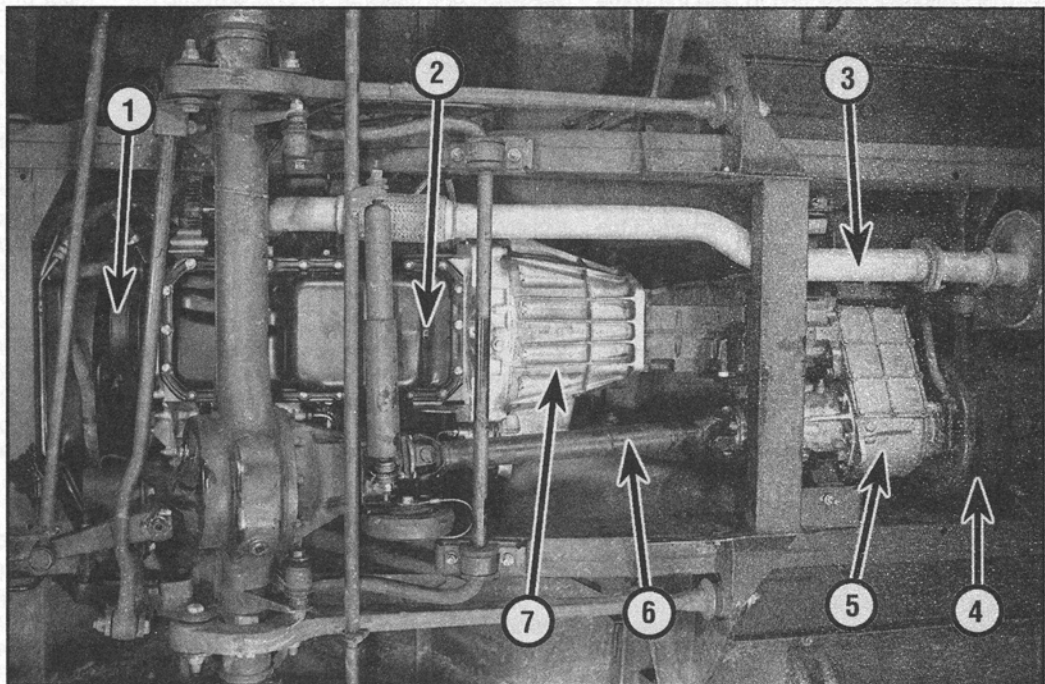
Front underbody view

- 1 Crankshaft pulley
- 2 Exhaust
- 3 Sump
- 4 Gearbox bellhousing
- 5 Drag link
- 6 Track rod
- 7 Panhard rod
- 8 Anti-roll bar
- 9 Steering damper
- 10 Steering box
- 11 Swivel pin housing
- 12 Radius arm



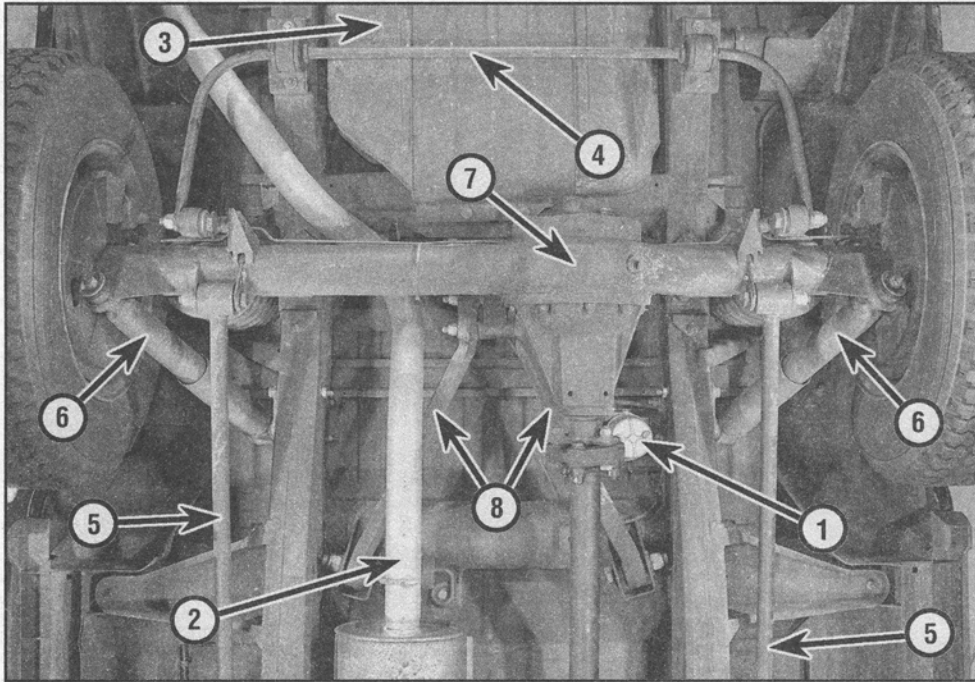
Centre underbody view

- 1 Crankshaft pulley
- 2 Sump drain plug
- 3 Exhaust
- 4 Handbrake drum
- 5 Transfer gearbox
- 6 Front propeller shaft
- 7 Main gearbox bellhousing



Scanned

Rear underbody view



- 1 Fuel sedimenter
- 2 Exhaust
- 3 Fuel tank
- 4 Anti-roll bar
- 5 Lower link
- 6 Shock absorber
- 7 Differential unit
- 8 Upper links

Maintenance procedures

1 Introduction

This Chapter is designed to help the home mechanic maintain his/her vehicle for safety, economy, long life and peak performance.

The Chapter contains a master maintenance schedule, followed by Sections dealing specifically with each task in the schedule. Visual checks, adjustments, component renewal and other helpful items are included. Refer to the accompanying illustrations of the engine compartment and the underside of the vehicle for the locations of the various components.

Servicing your vehicle in accordance with the mileage/time maintenance schedule and the following Sections will provide a planned maintenance programme, which should result in a long and reliable service life. This is a comprehensive plan, so maintaining some items but not others at the specified service intervals will not produce the same results.

As you service your vehicle, you will discover that many of the procedures can - and should - be grouped together, because of the particular procedure being performed, or because of the proximity of two otherwise unrelated components to one another. For example, if the vehicle is raised for any reason, the exhaust can be inspected at the same time as the suspension and steering components.

The first step in this maintenance programme is to prepare yourself before the

actual work begins. Read through all the Sections relevant to the work to be carried out, then make a list and gather all the parts and tools required. If a problem is encountered, seek advice from a parts specialist, or a dealer service department.

2 Regular maintenance

1 If, from the time the vehicle is new, the routine maintenance schedule is followed closely, and frequent checks are made of fluid levels and high-wear items, as suggested throughout this manual, the engine will be kept in relatively good running condition, and the need for additional work will be minimised.

2 It is possible that there will be times when the engine is running poorly due to lack of regular maintenance. This is even more likely if a used vehicle, which has not received regular and frequent maintenance checks, is purchased. In such cases, additional work may need to be carried out, outside of the regular maintenance intervals.

3 If engine wear is suspected, a compression test (refer to the relevant Part of Chapter 2) will provide valuable information regarding the overall performance of the main internal components. Such a test can be used as a basis to decide on the extent of the work to be carried out. If, for example, a compression test indicates serious internal engine wear, conventional maintenance as described in this

Chapter will not greatly improve the performance of the engine, and may prove a waste of time and money, unless extensive overhaul work is carried out first.

4 The following series of operations are those most often required to improve the performance of a generally poor-running engine:

Primary operations

- a) Clean, inspect and test the battery (See Weekly checks, Section 5 and Chapter 5A).
- b) Check all the engine-related fluids (See Weekly checks).
- c) Drain the water from the fuel filter (Section 9).
- d) Check the condition and tension of the auxiliary drivebelt(s) (Section 17).
- e) Check the condition of the air filter, and renew if necessary (Section 10).
- f) Check the condition of all hoses, and check for fluid leaks (Sections 12 and 15).
- g) Check the engine idle speed setting (Chapter 4C).

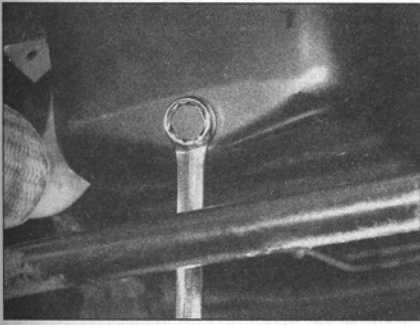
5 If the above operations do not prove fully effective, carry out the following secondary operations:

Secondary operations

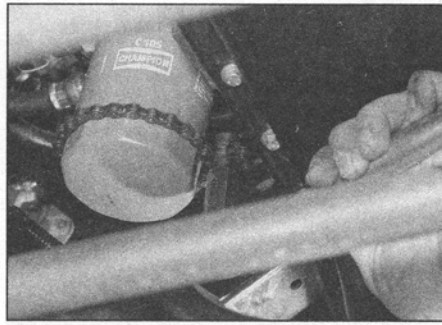
All items listed under Primary operations, plus the following:

- a) Check the charging system (see Chapter 5A).
- b) Check the preheating system (see Chapter 5C).
- c) Renew the fuel filter (Section 9) and check the fuel system (see Chapter 4C).

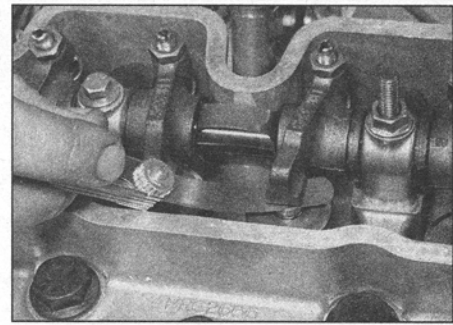
*Vertical*



3.4 Slackening the sump drain plug



3.8 Slackening the oil filter using a chain wrench



4.3 Measuring a valve clearance

## Every 6000 miles or 6 months, whichever comes first

### 3 Engine oil and filter renewal



**Frequent oil and filter changes are the most important preventative maintenance procedures that can be undertaken by the DIY owner. As engine oil ages, it becomes diluted and contaminated, which leads to premature engine wear.**

1 Before starting this procedure, gather together all the necessary tools and materials. Also make sure that you have plenty of clean rags and newspapers handy, to mop up any spills. Ideally, the engine oil should be warm, as it will drain better and more built-up sludge will be removed with it. Take care, however, not to touch the exhaust or any other hot parts of the engine when working under the vehicle. To avoid any possibility of scalding, and to protect yourself from possible skin irritants and other harmful contaminants in used engine oils, it is advisable to wear rubber gloves when carrying out this work.

2 Access to the underside of the vehicle will be greatly improved if it can be raised on a lift, driven onto ramps, or jacked up and supported on axle stands (see *Jacking and vehicle support*). Whichever method is chosen, make sure that the vehicle remains as level as possible, to enable the oil to drain fully.

3 Remove the oil filler cap from the valve cover, then position a suitable container beneath the sump.

4 Clean the drain plug (located at the bottom left-hand side of the sump) and the area around it, then slacken it using a suitable socket or spanner (see illustration). If possible, try to keep the plug pressed into the sump while unscrewing it by hand the last couple of turns. As the plug releases from the threads, move it away sharply, so that the stream of oil issuing from the sump runs into the container, not up your sleeve.

5 Allow some time for the old oil to drain,

noting that it may be necessary to reposition the container as the oil flow slows to a trickle. 6 After all the oil has drained, wipe off the drain plug with a clean rag, and check the condition of the copper sealing washer. Renew the washer if necessary. Clean the area around the drain plug opening, then refit and tighten the plug to the specified torque setting.

7 Move the container into position under the oil filter, screwed onto the adapter on the right-hand side of the cylinder block.

8 Using an oil filter removal tool if necessary, slacken the filter initially (see illustration). Loosely wrap some rags around the oil filter, then unscrew it, and immediately position it with its open end uppermost to prevent further spillage of oil. Remove the oil filter from the engine compartment, and empty the oil into the container.

9 Use a clean rag to remove all oil, dirt and sludge from the filter sealing area on the engine. Check the old filter to make sure that the rubber sealing ring hasn't stuck to the engine. If it has, carefully remove it.

10 Apply a light coating of clean oil to the sealing ring on the new filter, then screw it into position on the engine. Tighten the filter firmly by hand only - do not use any tools. Wipe clean the exterior of the oil filter.

11 Remove the old oil and all tools from under the vehicle, then (if applicable) lower the vehicle to the ground.

12 Fill the engine with the specified quantity and grade of oil. Pour the oil in slowly, otherwise it may overflow from the top of the valve cover. Check that the oil level is up to the correct level on the dipstick (see *Weekly checks*), then refit and tighten the oil filler cap.

13 Run the engine for a few minutes, and check that there are no leaks around the oil filter seal and the sump drain plug.

14 Switch off the engine, and wait a few minutes for the oil to settle in the sump once more. With the new oil circulated and the filter now completely full, recheck the level on the dipstick, and add more oil if necessary.

15 Dispose of the used engine oil safely with reference to *General repair procedures* in the Reference Section of this manual.

### 4 Valve clearances checking and adjustment



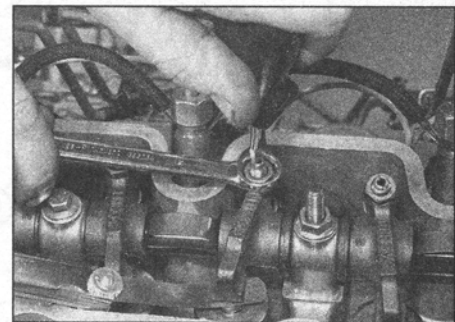
**Warning: If the crankshaft is rotated with excessive valve clearances, it is possible for the pushrods to become dislodged, and fracture the tappet slides. To prevent the possibility of damage, turn the adjusters to eliminate all clearance from any loose rocker arms before turning the crankshaft to check the valve clearances.**

1 Remove the valve cover, as described in Chapter 2B.

2 Using a spanner or socket on the crankshaft pulley bolt (the bolt is most easily reached from underneath the vehicle), turn the crankshaft until No 8 valve is fully open (valve spring fully compressed). The valves are numbered from the front of the engine. Turning the engine will be much easier if the glow plugs are removed first - see Chapter 5C.

3 Using a feeler blade of the specified thickness (refer to the Specifications at the start of this Chapter), check the clearance between the top of No 1 valve stem, and the valve stem contact face of the rocker arm (see illustration).

4 If the clearance is not as specified, slacken the adjuster locknut, and turn the tappet adjuster screw as required to give the specified clearance (see illustration). Turn the adjuster



4.4 Adjusting a valve clearance

Review

## 1B•8 Every 6000 miles or 6 months - diesel models

screw clockwise to reduce the clearance, and anti-clockwise to increase the clearance.

5 When the clearance is correct, tighten the adjuster locknut. Hold the adjuster screw stationary as the locknut is tightened.

6 With the locknut tightened, re-check the clearance, and re-adjust if necessary.

7 Turn the crankshaft, and continue to check the remaining valve clearances in the following order.

Valve fully open	Valve clearance to be checked
No 6	No 3
No 4	No 5
No 7	No 2
No 1	No 8
No 3	No 6
No 5	No 4
No 2	No 7

8 When all the valve clearances have been checked, refit the valve cover as described in Chapter 2B.

### 5 Battery electrolyte level check



**Warning:** The electrolyte inside a battery is diluted acid - it is a good idea to wear suitable rubber gloves. When topping-up, don't overfill the cells so that the electrolyte overflows. In the event of any spillage, rinse the electrolyte off without delay. Refit the cell covers and rinse the battery with copious quantities of clean water. Don't attempt to siphon out any excess electrolyte.

1 The battery is located in the front right-hand corner of the engine compartment. Where applicable, unclip and remove the cover from the top of the battery.

2 Some models covered by this manual will be fitted with a maintenance-free battery as standard equipment, or may have had one fitted as a replacement. If the battery in your vehicle is marked 'Freedom', 'Maintenance-Free' or similar, electrolyte level checking may not be possible (the battery is often completely sealed, preventing any topping-up).

3 Batteries which do require their electrolyte

level to be checked can be recognised by the presence of removable covers over the battery cells - the battery casing is also sometimes translucent, so that the electrolyte level can be more easily checked.

4 Remove the cell caps or covers (these either unscrew, or are prised/pulled out), and look down inside the battery to see the level webs or the separators between the cells. The electrolyte should cover the battery plates (maximum 3 mm above the plates), and should be up to the level of the indicator webs or separators. If markings are provided on the battery casing, these can be used instead.

5 If necessary, top up a little at a time with distilled (de-ionised) water until the level in all six cells is correct - don't fill the cells up to the brim. Wipe up any spillage, then refit the cell covers.

6 Further information on the battery, charging and jump starting can be found at the start of this manual and in Chapter 5A.

### 6 Idle speed checking and adjustment

Refer to Chapter 4C.

## Every 12 000 miles or 12 months, whichever comes first

### 7 Clutch fluid level check



**Warning:** Hydraulic fluid is poisonous; wash off immediately and thoroughly in the case of skin contact, and seek immediate medical advice if any fluid is swallowed or gets into the eyes. Hydraulic fluid is also an effective paint stripper, and will attack plastics; if any is spilt, it should be washed off immediately, using copious quantities of clean water. Finally, it is hygroscopic (it absorbs moisture from the air). While this is not as important in the clutch system as it is in the braking system, old fluid may be too contaminated for further use. When topping-up or renewing the fluid, always use the recommended type, and ensure that it comes from a freshly-opened, sealed container.

1 The clutch fluid reservoir is attached to the master cylinder, which is located on the right-hand side of the engine compartment on right-hand-drive models, or on the left-hand side of the engine compartment on left-hand-drive models.

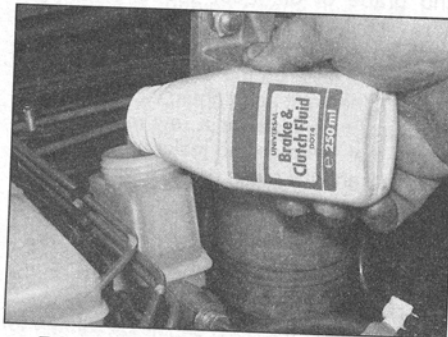
2 On models with level marks on the side of the reservoir, the fluid level should be maintained between the MAX and MIN marks. On models with no level markings, the fluid

level should be up to the lower edge of the filler neck on the reservoir.

3 If topping-up is required, wipe round the reservoir and filler cap before unscrewing the cap - it is important not to introduce dirt into the system. Using the fluid recommended at the end of *Weekly checks*, top up to the required level (see illustration).

4 On completion, refit the filler cap, tightening it securely, and wipe up or wash away any fluid spillage.

5 There should be no significant drop in fluid level during normal operation of the clutch. Any significant loss of fluid is likely to be due to a leak in the hydraulic system, and should be investigated and corrected.



7.3 Topping-up the clutch fluid level

### 8 Automatic transmission fluid level check

1 The automatic transmission fluid level is checked with a dipstick which extends through a tube and into the sump at the bottom of the transmission. The dipstick is located on the right-hand side of the engine.

2 The fluid level should be checked with the transmission cold, as follows.

3 Check that the vehicle is parked on level ground.

4 With the handbrake fully applied, and the engine running at normal idle speed, select position P with the transmission selector lever.

5 Withdraw the dipstick from the tube, and wipe it clean.

6 Re-insert the dipstick to its full depth, and remove it for a second time to take a reading.

7 The fluid level should be maintained between the two level marks on the dipstick.

8 If necessary, top-up the fluid level, using the correct type of fluid (see end of *Weekly checks*) through the dipstick tube. Do not overfill the transmission. Note that 0.25 litre of fluid will raise the level from the 'low' to the 'high' mark on the dipstick.

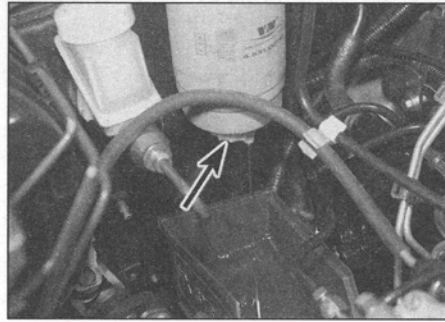
9 Ensure that the dipstick is inserted correctly after checking the level.

10 Any significant loss of fluid should be investigated and corrected.

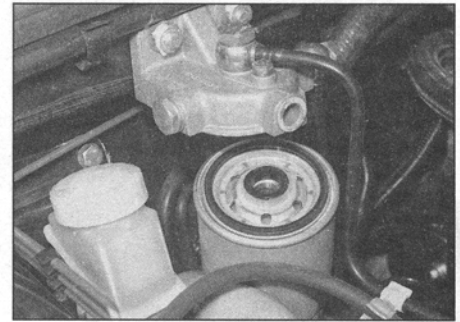




9.2a Loosen the bleed screw . . .



9.2b . . . and unscrew the drain tap (arrowed) to drain the water



9.4 Removing the fuel filter element

## 9 Fuel filter renewal

1 The fuel filter assembly is located on the engine compartment bulkhead, to the right-hand side of the engine.

2 Before the filter is renewed, any water present should be drained from the filter bowl as follows:

- a) Loosen the bleed screw on the top of the filter head (see illustration).
- b) Hold a small container beneath the drain tap at the bottom of the filter, then unscrew the tap by half a turn (see illustration).
- c) Drain off water and sediment until clean fuel flows from the tap.
- d) Immediately close the tap when fuel flows from it - failure to do so may result in the fuel system requiring bleeding.

3 Clean the area around the filter head, and place a container beneath the filter.

4 Unscrew the filter, and catch the fuel which is released (see illustration). A strap wrench can be used to grip the base of the filter if necessary.

5 Lubricate the seals of the new filter with a little fuel.

6 Screw the new filter into position, and tighten the filter firmly by hand only.

7 Make sure that the drain tap at the base of the filter is closed.

8 Prime the fuel system by operating the priming lever on the fuel lift pump until fuel free from air bubbles emerges from the bleed screw on the filter head, then tighten the bleed screw.

9 Start the engine and check for leaks around the filter.

## 10 Air cleaner element renewal

### 200 TDi engine

1 Working in the engine compartment, slacken the clip at the front of the air cleaner casing, and pull the air outlet ducting from the casing (see illustration).

2 Release the two clips securing the air cleaner body to the mounting bracket, and lift the air cleaner away from the engine compartment, easing the air inlet spout from the inlet on the front body panel.

3 Unscrew the nut securing the air cleaner lid to the body, then withdraw the lid (see illustration).

4 Unscrew the now-exposed wing nut securing the air cleaner element, and recover the sealing washer.

5 Pull the element from the casing, and discard it.

6 Thoroughly clean the inside of the air cleaner casing and the lid.

7 Squeeze open the air cleaner dump valve, which is located at the bottom of the casing. Check that the valve is flexible, and is in good condition.

8 If it needs cleaning, pull the dump valve from the air cleaner casing. Fit a new valve if necessary.

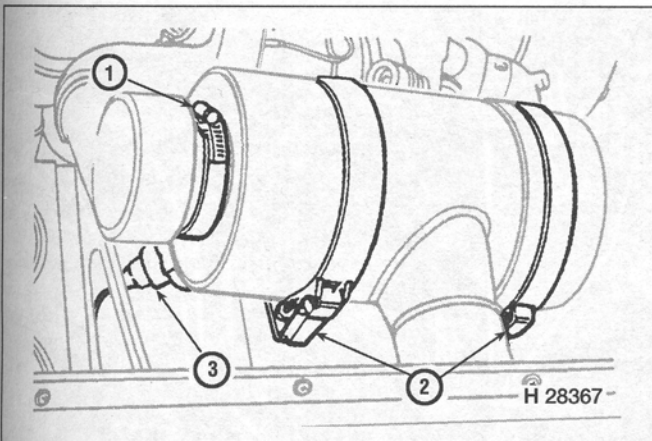
9 Fit the new element to the casing, ensuring that the sealing rubber is towards the air cleaner outlet.

10 Refit the wing nut to the casing, ensuring that the sealing washer is in place, and tighten to secure the element.

11 Refit the air cleaner lid, and tighten the securing nut.

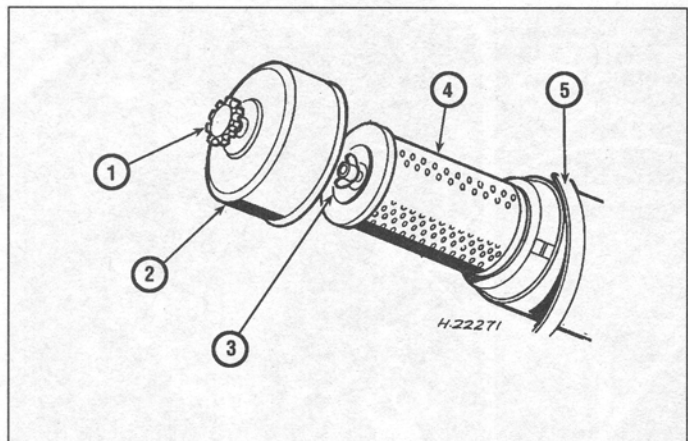
12 Refit the air cleaner to the mounting bracket, ensuring that the air inlet spout engages with the inlet on the front body panel.

13 Push the air outlet ducting into position on the front of the casing, ensuring that the locating lug on the casing engages with the corresponding cut-out in the air outlet ducting elbow. Tighten the clip.



10.1 Air cleaner location - 200 TDi engine

- |                              |              |
|------------------------------|--------------|
| 1 Air outlet ducting clip    | 3 Dump valve |
| 2 Air cleaner mounting clips |              |



10.3 Air cleaner element components - 200 TDi engine

- |       |            |                 |
|-------|------------|-----------------|
| 1 Nut | 3 Wing nut | 5 Mounting clip |
| 2 Lid | 4 Element  |                 |

Triton



10.15 Releasing an air cleaner lid securing clip - 300 TDi engine

14 Secure the air cleaner in position with the two clips.

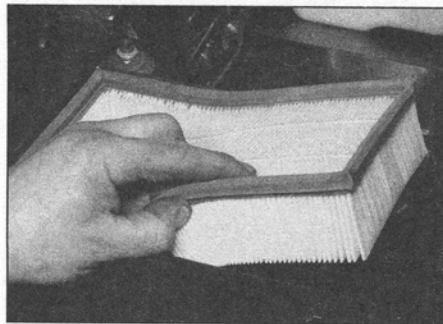
**300 TDi engine**

15 Working under the bonnet, release the four clips securing the lid to the air cleaner assembly (see illustration).

16 Lift off the lid, taking care not to strain the air outlet hose, and lift out the element (see illustration).

17 Thoroughly clean the inside of the air cleaner casing and the lid.

18 Fit the new element, then refit the lid and secure with the clips.



10.16 Lifting out the air cleaner element - 300 TDi engine

4 Fill a suitable container with clean paraffin, then immerse the filter in the paraffin to dissolve any oily deposits which may have formed inside.

5 Once satisfied that the filter is clean, remove it from the paraffin, and dry thoroughly. **Note:** It is vital that the filter is absolutely dry before it is refitted to the engine.

6 Refit the filter to the valve cover, using a new gasket, and tighten the securing bolts.

7 Reconnect the two hoses to the filter, ensuring that the clips are securely tightened to produce a gas-tight seal.

hose is squeezed. Pay close attention to the hose clips that secure the hoses to the cooling system components. Hose clips can pinch and puncture hoses, resulting in cooling system leaks. If wire-type hose clips are used, it may be a good idea to replace them with screw-type clips.



**A leak in the cooling system will usually show up as white or rust-coloured deposits on the area adjoining the leak.**

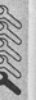
3 Inspect all the cooling system components (hoses, joint faces etc.) for leaks. Where any problems of this nature are found on system components, renew the component or gasket with reference to Chapter 3.

**13 Brake vacuum servo hose check**



1 Working from the vacuum pump back to the servo unit, examine the vacuum hose for signs of damage or deterioration; at the same time, also check the servo unit check valve rubber grommet. If necessary, renew the hose/grommet, referring to the information given in Chapter 10.

**14 Glow plug wiring check**



1 Where applicable, to improve access, remove the oil filler cap, and unclip the plastic cover from the valve cover.

2 Check all the glow plug wiring for signs of fraying, chafing and general deterioration (see illustration).

3 Check that the nuts securing the wiring to the glow plugs are secure. Also check the security of the wiring connector at the

**11 Engine breather filter cleaning**



**Note:** A new gasket will be required when refitting the filter.

1 The filter is located at the rear right-hand corner of the valve cover (see illustration).

2 Loosen the clips securing the hoses to the top and bottom of the filter, noting their locations to ensure correct refitting.

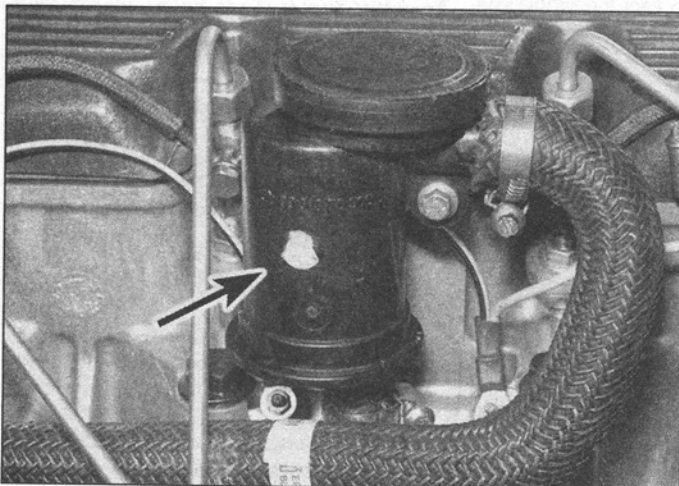
3 Unscrew the two bolts securing the filter to the valve cover, then carefully pull the filter away from the valve cover, and recover the gasket.

**12 Cooling system and heater system hose check**

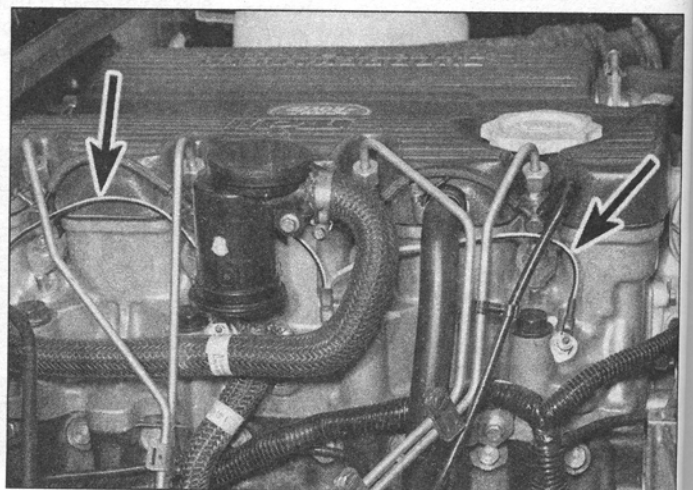


1 Check the security and condition of all the engine-related coolant pipes and hoses. Ensure that all cable-ties or securing clips are in place, and in good condition. Clips which are broken or missing can lead to chafing of the hoses, pipes or wiring which could cause more serious problems in the future.

2 Carefully check the radiator hoses and heater hoses along their entire length. Renew any hose which is cracked, swollen or deteriorated. Cracks will show up better if the



11.1 Engine breather filter (arrowed) - 300 TDi engine



14.2 Check the condition of the glow plug wiring (arrowed)

Vertical

preheating system relay/timer unit, located on the rear of the fusebox at the right-hand side of the engine compartment (see Chapter 5C).

## 15 Crankcase breather hose check



1 Check all the engine breather hoses for signs of cracking, leaks, and general deterioration.

2 It is advisable to loosen the hose clips, and remove each hose to check for a build-up of deposits, which may cause restrictions or even blockage. If necessary, clean the hose using paraffin, but ensure that the hose is completely dry before refitting.

## 16 Air cleaner dump valve check (200 TDi engine models)

Refer to Section 10.

## 17 Auxiliary drivebelt checking and renewal



### 200 TDi engine

#### Cooling fan/coolant pump/power steering pump drivebelt checking and adjustment

1 Correct tensioning of the drivebelt will ensure that it has a long life. Beware, however, of overtightening, as this can cause excessive wear in the ancillary components.

2 To improve access, remove the viscous cooling fan and coupling as described in Chapter 3.

3 The belt should be inspected along its entire length, and if it is found to be worn, frayed or cracked, it should be renewed as a precaution against breakage in service. It is advisable to carry a spare drivebelt of the correct type in the vehicle at all times.

4 The belt tension should be checked at the mid-point of the belt run between the coolant pump and the power steering pump (see illustration).

5 Measure the length of the belt run between the centres of the coolant pump and power steering pump pulleys. Under normal finger pressure, the belt should deflect by 0.5 mm for every 25.0 mm of belt run between pulley centres.

6 If adjustment is required, slacken the front and rear alternator mounting bolts, and the alternator adjuster link mounting bolt at the power steering pump plate.

7 Slacken the bolt securing the alternator to the adjuster link.

8 Slacken the three power steering pump mounting plate bolts, then turn the power

steering pump as necessary to achieve the correct belt tension. **Do not** lever against the power steering pump body to move it.

9 When the correct tension is achieved, tighten the power steering pump mounting plate bolts, then re-check the tension and repeat the adjustment procedure if necessary.

10 On completion, adjust the alternator drivebelt tension as described later in this Section.

11 If a new drivebelt has been fitted, start the engine and run it for five minutes at a fast idle, then re-check the tension of both drivebelts and adjust if necessary.

12 Where applicable, refit the viscous fan and coupling as described in Chapter 3.

#### Cooling fan/coolant pump/power steering pump drivebelt removal and refitting

13 To remove the belt, simply loosen the alternator mounting bolts, the alternator adjuster link bolts, and the power steering pump mounting plate bolts, as described previously, and slacken the belt sufficiently to slip it from the pulleys.

14 Refit the belt and tension it as described previously.

#### Alternator drivebelt checking and adjustment

15 Proceed as described in paragraphs 1 to 3 inclusive.

16 The belt tension should be checked at the mid-point of the belt run.

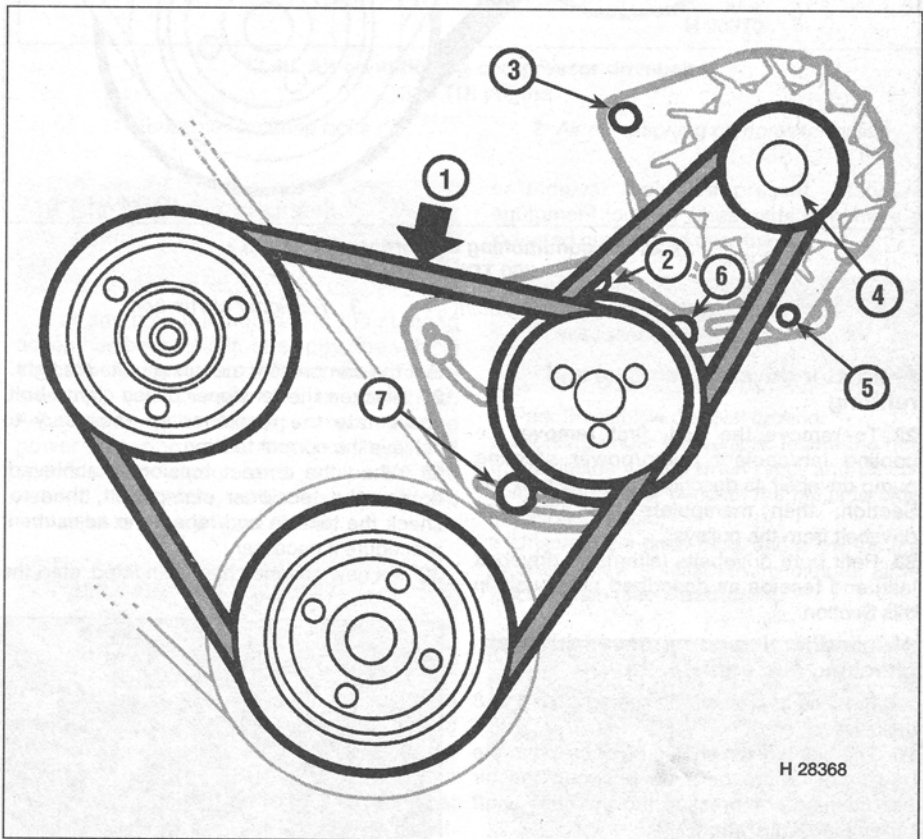
17 Measure the length of the belt run between the centres of the power steering pump and alternator pulleys. Under normal finger pressure, the belt should deflect by 0.5 mm for every 25.0 mm of belt run between pulley centres.

18 If adjustment is required, slacken the front and rear alternator mounting bolts, and the alternator adjuster link bolts.

19 Pivot the alternator as necessary to achieve the correct belt tension. **Do not** lever against the alternator body to move it.

20 When the correct tension is achieved, tighten the alternator mounting bolts and the adjuster link bolts, then re-check the tension and repeat the adjustment procedure if necessary.

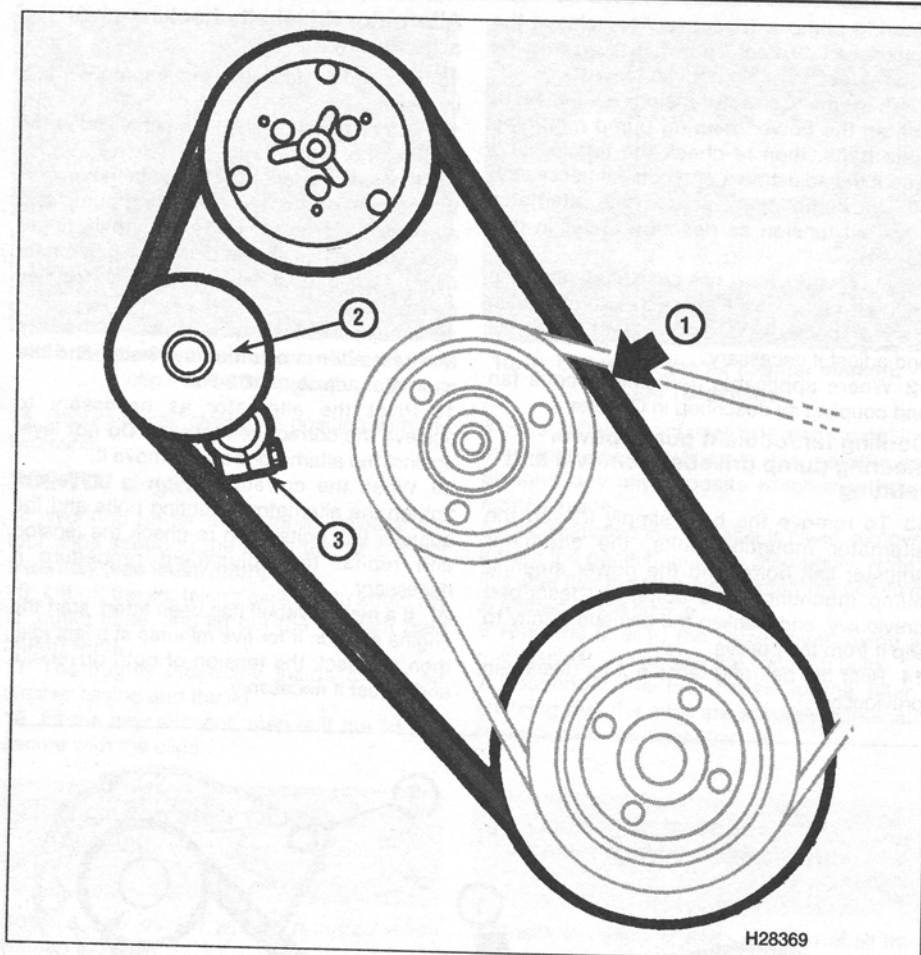
21 If a new drivebelt has been fitted, start the engine and run it for five minutes at a fast idle, then re-check the tension of both drivebelts and adjust if necessary.



17.4 Cooling fan/coolant pump/power steering pump drivebelt and alternator drivebelt - 200 TDi engine

- |                                      |                                    |
|--------------------------------------|------------------------------------|
| 1 Belt tension checking point        | 5 Alternator-to-adjuster link bolt |
| 2 Power steering pump mounting bolts | 6 Adjuster link mounting bolt      |
| 3 Alternator mounting bolt           | 7 Power steering pump pulley       |
| 4 Alternator pulley                  |                                    |

Twin



17.25 Air conditioning compressor drivebelt - 200 TDi engine

- 1 Belt tension checking point
- 2 Tensioner pulley
- 3 Tensioner clamp bolt

**Alternator drivebelt removal and refitting**

22 To remove the belt, first remove the cooling fan/coolant pump/power steering pump drivebelt as described previously in this Section, then manipulate the alternator drivebelt from the pulleys.

23 Refit both drivebelts (alternator drivebelt last) and tension as described previously in this Section.

**Air conditioning compressor drivebelt checking and adjustment**

24 Proceed as described in paragraphs 1 to 3 inclusive.

25 The belt tension should be checked at the mid-point of the belt run between the air conditioning compressor and the crankshaft pulley (see illustration).

26 Measure the length of the belt run between the centres of the air conditioning compressor and crankshaft pulleys. Under normal finger pressure, the belt should deflect by 0.5 mm for every 25.0 mm of belt run between pulley centres.

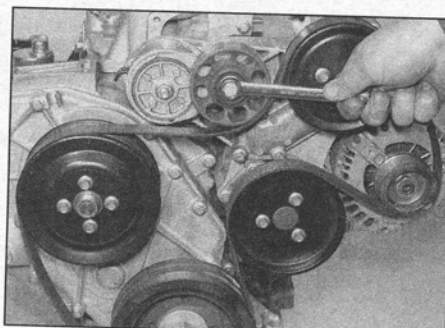
27 If adjustment is required, firstly ensure

that the compressor mounting bolts are tight.

28 Slacken the tensioner pulley clamp bolt, and rotate the tensioner as necessary to achieve the correct tension.

29 When the correct tension is achieved, tighten the tensioner clamp bolt, then re-check the tension and repeat the adjustment procedure if necessary.

30 If a new drivebelt has been fitted, start the



17.40 Levering the belt tensioner to relieve the tension in the drivebelt (viewed with engine removed for clarity) - 300 TDi engine

engine and run it for five minutes at a fast idle, then re-check the tension of both drivebelts and adjust if necessary.

**Air conditioning compressor drivebelt removal and refitting**

31 To remove the belt, first remove the cooling fan/coolant pump/power steering pump drivebelt as described previously in this Section.

32 Slacken the air conditioning compressor drivebelt tensioner pulley bolt. Rotate the tensioner as necessary to allow the belt to be slipped from the pulleys.

33 Refit both drivebelts (air conditioning compressor drivebelt last), and tension as described previously in this Section.

**300 TDi engine**

**Cooling fan/coolant pump/power steering pump/alternator drivebelt checking and adjustment**

34 Proceed as described in paragraphs 1 to 3 inclusive.

35 An automatic drivebelt tensioner is fitted, and no checking of the tension is necessary, however the belt should be inspected for wear or damage at the recommended intervals.

36 To improve access, remove the cooling fan upper cowl.

37 The belt should be inspected along its entire length, and if it is found to be worn, frayed or cracked, it should be renewed as a precaution against breakage in service. It is advisable to carry a spare drivebelt of the correct type in the vehicle at all times.

38 Refit the upper cooling fan cowl on completion.

**Cooling fan/coolant pump/power steering pump/alternator drivebelt removal and refitting**

39 Remove the upper cooling fan cowl.

40 Using a suitable ring spanner, lever the belt tensioner pulley retaining bolt to move the tensioner and relieve the tension in the belt (see illustration).

41 Slide the belt from the pulleys, and manipulate it over the viscous fan blades.

42 If the original belt is to be refitted, mark the running direction to ensure correct refitting.

43 Refitting is a reversal of removal, but ensure that the belt is correctly seated on the pulleys.

44 On completion, refit the upper cooling fan cowl.

**Air conditioning compressor drivebelt checking and adjustment**

45 Proceed as described in paragraphs 1 to 3 inclusive.

46 Correct tensioning of the drivebelt will ensure that it has a long life. Beware, however, of overtightening, as this can cause excessive wear in the ancillary components.

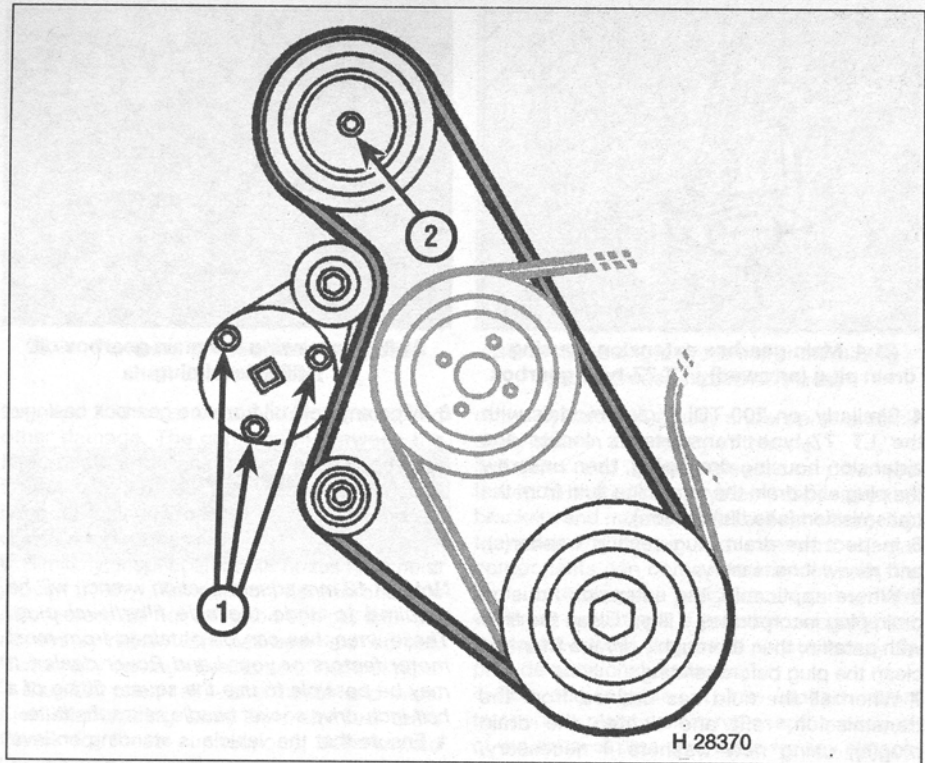
47 To improve access, remove the air conditioning compressor shield.

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- 48 Loosen the three bolts securing the belt tensioner to the timing belt cover (see illustration).
- 49 Fit a suitable square-drive extension to a torque wrench, and engage the extension with the square hole in the centre of the tensioner.
- 50 Apply and hold a torque of 35 Nm (26 lbf ft), then tighten the tensioner securing bolts.
- 51 Rotate the engine through two full turns.
- 52 Again, apply and hold a torque of 35 Nm (26 lbf ft) to the tensioner pulley, then fully loosen and tighten the tensioner securing bolts. Tighten the bolts securely.
- 53 Refit the air conditioning compressor shield.

**Air conditioning compressor drivebelt removal and refitting**

- 54 Remove the cooling fan/coolant pump/power steering pump/alternator drivebelt, as described previously in this Section.
- 55 Remove the air conditioning compressor shield.
- 56 Loosen the three belt tensioner securing bolts, then move the tensioner sufficiently to allow the belt to be removed.
- 57 If the original belt is to be refitted, mark the running direction to ensure correct refitting.
- 58 Refit and tension the belt as described previously in this Section.



17.48 Air conditioning compressor drivebelt - 300 TDi engine

1 Tensioner securing bolts

2 Air conditioning compressor pulley

**18 Accelerator mechanism checking and lubrication**



**Note:** On models with Electronic Diesel Control (EDC - see Chapter 4C), no throttle cable is fitted, and no adjustment of the throttle pedal position sensor is possible. If an EDC system is fitted, the operation of the accelerator pedal should be checked, but any suspected problems with the operation of the throttle should be referred to a Land Rover dealer or a suitably-equipped specialist.

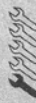
- 1 Check the operation of the accelerator pedal. Make sure that the pedal pivots freely, and if necessary, lightly lubricate the pivot bushes using a little multi-purpose grease.
- 2 On models with an accelerator cable (all except models with EDC - see Chapter 4C), check the condition of the accelerator cable. Make sure that the cable is routed correctly, free from kinks, and clear of surrounding components. Check the cable for signs of chafing and fraying, particularly at the injection pump end, and renew the cable if necessary.
- 3 Lubricate the accelerator (and cruise control, where fitted) linkages and pivots using a little multi-purpose grease.
- 4 Check that when the accelerator pedal is fully depressed, the accelerator lever on the injection pump moves to the full-throttle position.
- 5 Check the cable freeplay. Details of cable removal, refitting, and adjustment can be found in Chapter 4C.

**19 Steering gear backlash check**



If at any time it is noted that the steering action has become stiff or sloppy, the vehicle should be taken to a Land Rover dealer for the steering components to be checked. Adjustments to the steering components and power steering box are possible, but specialist knowledge and equipment are needed. Therefore, this task must be entrusted to a Land Rover dealer.

**20 Jack and tools security check**



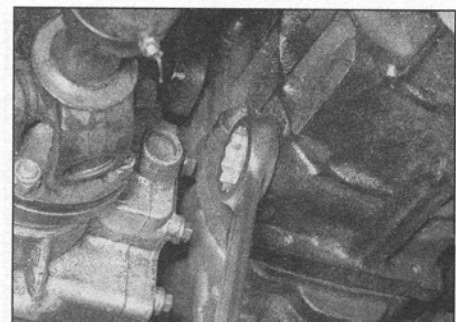
- 1 Lift the bonnet, and check that the vehicle jack and the wheel chock are securely stowed in their bay at the front of the engine compartment. Check the condition of the rubber strap securing the jack, and check that the wing nut securing the wheel chock is tight.
- 2 Similarly, check the security of the jack handle and the wheel nut wrench, which are located in a bag under the rear seats. Tilt the rear seat cushions forwards for access.
- 3 If the car has alloy wheels, one of the roadwheel nuts on each wheel may be of locking type. If so, check that the removal key

or removal tools are present. Standard-equipment locking wheel nuts may have an indented cover fitted over the nut.

**21 Manual transmission fluid renewal**

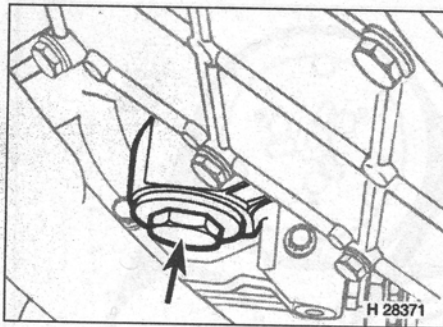


- 1 Park the vehicle on level ground.
- 2 Working under the vehicle, locate the main transmission casing drain plug, and place a suitable container beneath the plugs to catch the escaping fluid.
- 3 Unscrew the drain plug, and allow the fluid to drain. Allow at least ten minutes for all the fluid to drain (see illustration).



21.3 Unscrewing the main gearbox drain plug

Toniw



**21.4 Main gearbox extension housing drain plug (arrowed) - LT 77-type gearbox**

4 Similarly, on 200 TDi engine models with the LT 77-type transmission, locate the extension housing drain plug, then unscrew the plug and drain the remaining fluid from the transmission (see illustration).

5 Inspect the drain plug sealing washer(s), and renew if necessary.

6 Where applicable, the extension housing drain plug incorporates a filter. Clean the filter with paraffin, then thoroughly dry the filter and clean the plug before refitting.

7 When all the fluid has drained from the transmission, refit and tighten the drain plug(s), using new washers if necessary. Tighten the plugs securely.

8 Unscrew the fluid filler/level plug from the side of the main transmission casing, and place a suitable container beneath the hole to catch any excess fluid which may be spilled when the transmission is filled (see illustration).

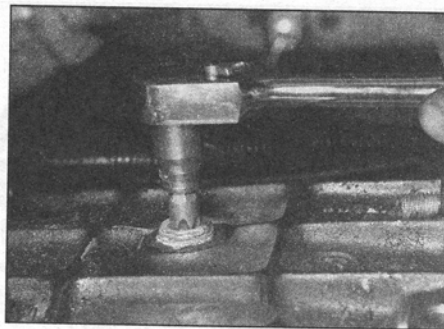
9 Fill the transmission with the specified grade of fluid (see end of *Weekly checks*), until the fluid flows from the filler/level plug hole. It is advisable to fill the transmission slowly, to avoid a sudden spillage.

10 On completion, refit the filler/level plug, and tighten securely. Do not overtighten the plug, as it has a tapered thread.

11 Wipe any split fluid from the transmission casing.

**22 Transfer gearbox oil level check**

- 1 Park the vehicle on level ground.
- 2 Locate the oil filler/level plug in the side of the transfer gearbox casing, and place a suitable container beneath the hole to catch any escaping oil.
- 3 Unscrew the filler/level plug, and check the oil level. The level should be up to the lower edge of the filler/level plug hole (see illustration).
- 4 If necessary, add oil of the specified type (see end of *Weekly checks*) until the oil overflows from the filler/level hole.
- 5 Clean and refit the filler/level plug, and tighten to the specified torque. Do not over-tighten the plug, as it has tapered threads.



**21.8 Unscrewing the main gearbox oil filler/level plug**

6 Wipe any split oil from the gearbox casing.

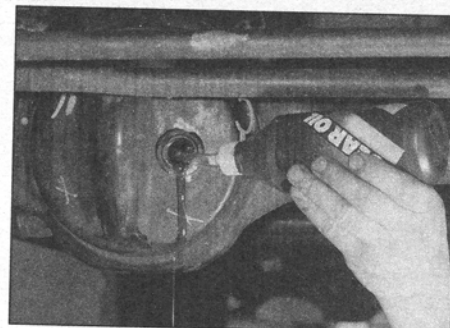
**23 Axle oil level check**

**Note:** A 13 mm square-section wrench will be required to undo the axle filler/level plug. These wrenches can be obtained from most motor factors or your Land Rover dealer. It may be possible to use the square fitting of a half-inch-drive socket handle as a substitute.

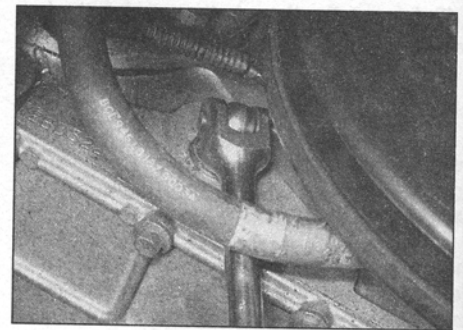
- 1 Ensure that the vehicle is standing on level ground, and that the handbrake is applied.
- 2 Working underneath the vehicle, unscrew the front axle oil filler/level plug, which is located in the differential housing.
- 3 The oil level should be up to the lower edge of the filler/level plug hole.
- 4 If necessary, top-up with the specified grade of oil, until oil just begins to run from the plug hole. Do not overfill - if too much oil is added, wait until the excess has run out of the plug hole (see illustration).
- 5 Once the level is correct, refit the filler/level plug and tighten it securely.
- 6 Repeat the procedure for the rear axle.

**24 Swivel pin housing oil level check**

**Note:** From approximately 1998 onwards, Land Rover (and their dealers) drain the oil and fill the swivel pin housing with a special grease,



**23.4 Topping-up the axle oil level**



**22.3 Unscrewing the transfer gearbox oil filler/level plug**

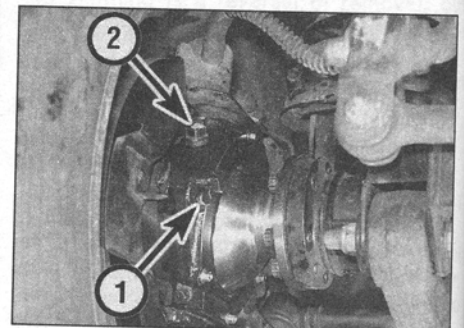
which then requires no further maintenance. This grease is available from Land Rover dealers, under part number FTC3435.

- 1 Ensure that the vehicle is standing on level ground, and that the handbrake is applied.
- 2 Working underneath the vehicle, unscrew the left-hand swivel pin housing level plug. The level plug has a square-section head, and is situated approximately halfway up the housing (see illustration).
- 3 The oil level should be up to the lower edge of the level plug hole.
- 4 If topping-up is necessary, unscrew the filler plug from the top of the swivel pin housing; the filler plug also has a square-section head. Top-up the housing via the filler plug hole using the specified grade of oil, until oil just begins to run from the level plug hole. Do not overfill - if too much oil is added, wait until the excess has run out of the level plug hole.
- 5 Once the level is correct, refit both the filler and level plugs, and tighten them securely.
- 6 Repeat the above procedure on the right-hand swivel pin housing.

**25 Propeller shaft joint lubrication**

**Note:** A low-pressure grease gun will be required for this operation.

- 1 Working under the vehicle, locate the grease nipples on the front and rear propeller shafts universal joint spiders, and the shaft sliding joints.
- 2 Thoroughly clean the around each nipple.

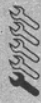


**24.2 Swivel pin housing level plug (1) and filler plug (2)**

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3 Fill a suitable grease gun with the recommended type of grease (see end of *Weekly checks*), then apply the grease gun to each of the nipples in turn, and pump grease into the joints (see illustrations). Apply grease until it emerges from the end of the nipple, then wipe away the excess.

## 26 Handbrake linkage lubrication



### Early models (with rod-actuated brake assembly)

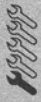
1 To improve access, firmly apply the handbrake, then jack up the front of the vehicle and support it on axle stands.

2 Thoroughly degrease the handbrake rod linkage assembly, which is mounted onto the side of the transfer box. Apply fresh high-melting point grease to all the linkage pivot points and to the exposed end of the handbrake cable, then lower the vehicle to the ground.

### Later models (with cable-actuated brake assembly)

3 On these models, no lubrication is necessary.

## 27 Underbody component, pipe, hose and wiring check



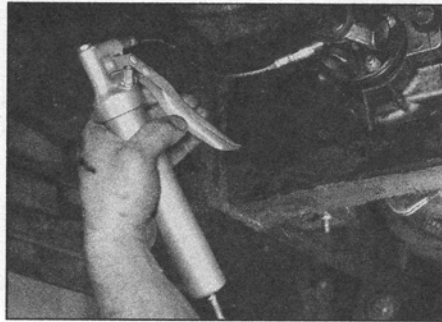
1 Visually inspect the engine joint faces, gaskets and seals for any signs of water or oil leaks. Pay particular attention to the areas around the valve cover, cylinder head, oil filter and sump joint faces. Bear in mind that over a period of time some very slight seepage from these areas is to be expected - what you are really looking for is any indication of a serious leak. Should a leak be found, renew the offending gasket or oil seal by referring to the appropriate Chapter(s) in this manual.

2 Similarly, check the transmission components for oil leaks, and investigate and rectify any problems found.

3 Check the security and condition of all the engine-related pipes and hoses. Ensure that all cable-ties or securing clips are in place and in good condition. Clips which are broken or missing can lead to chafing of the hoses, pipes or wiring, which could cause more serious problems in the future.

4 Carefully check the condition of all coolant, fuel and brake hoses. Renew any hose which is cracked, swollen or deteriorated. Cracks will show up better if the hose is squeezed gently. Pay close attention to the hose clips that secure the hoses to the system components. Hose clips can pinch and puncture hoses, resulting in leaks. If wire-type hose clips are used, it may be a good idea to replace them with screw-type clips.

5 With the vehicle raised, inspect the fuel



25.3a Pumping grease into a propeller shaft universal joint

tank and filler neck for punctures, cracks and other damage. The connection between the filler neck and tank is especially critical. Sometimes, a rubber filler neck or connecting hose will leak due to loose retaining clamps or deteriorated rubber.

6 Similarly, inspect all brake hoses and metal pipes. If any damage or deterioration is discovered, do not drive the vehicle until the necessary repair work has been carried out. Renew any damaged sections of hose or pipe.

7 Carefully check all rubber hoses and metal fuel lines leading away from the fuel tank. Check for loose connections, deteriorated hoses, crimped lines and other damage. Pay particular attention to the vent pipes and hoses, which often loop up around the filler neck and can become blocked or crimped. Follow the lines to the front of the vehicle carefully inspecting them all the way. Renew damaged sections as necessary.

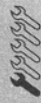
8 From within the engine compartment, check the security of all fuel hose attachments and pipe unions, and inspect the fuel hoses and vacuum hoses for kinks, chafing and deterioration.

9 Check the condition of the oil cooler hoses and pipes.

10 Check the condition of the power steering fluid hoses and pipes and, where applicable, check the condition of the automatic transmission fluid hoses and pipes.

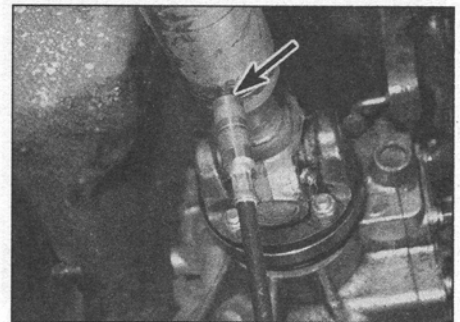
11 Check the condition of all exposed wiring harnesses, paying particular attention to the ABS wheel sensor wiring harnesses, where applicable.

## 28 Exhaust system check



1 With the engine cold (at least an hour after the vehicle has been driven), check the complete exhaust system from the engine to the end of the tailpipe. Ideally the inspection should be carried out with the vehicle raised (see *Jacking and vehicle support*).

2 Check the exhaust pipes and connections for evidence of leaks, severe corrosion and damage. Make sure that all brackets and mountings are in good condition and tight. Leakage at any of the joints or in other parts



25.3b Greasing a propeller shaft sliding joint (grease nipple arrowed)

of the system will usually show up as a black sooty stain in the vicinity of the leak.

3 Rattles and other noises can often be traced to the exhaust system, especially the brackets and mountings (see illustration). Try to move the pipes and silencers. If the components can come into contact with the body or suspension parts, secure the system with new mountings; if possible, separate the joints, and twist the pipes as necessary to provide additional clearance.

4 Run the engine at idle speed, then temporarily place a cloth rag over the rear end of the exhaust pipe, and listen for any escape of exhaust gases that would indicate a leak.

5 On completion, where applicable, lower the vehicle to the ground.

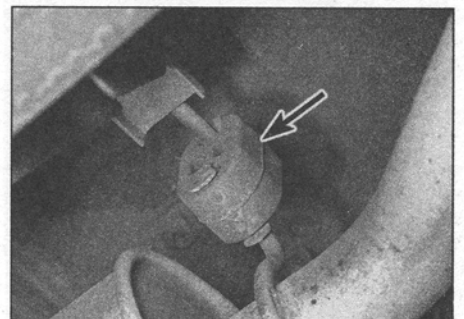
## 29 Steering and suspension component check



1 Apply the handbrake, then raise the front of the vehicle and securely support it on axle stands.

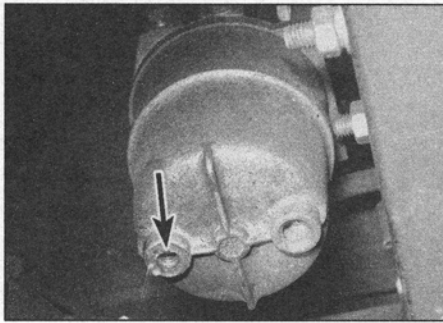
2 Visually inspect the balljoint dust covers for splits, chafing or deterioration. Any damage will cause loss of lubricant, together with dirt and water entry, resulting in rapid deterioration of the balljoints.

3 Check the power steering fluid hoses for chafing or deterioration, and the pipe and hose unions for fluid leaks. Also check for signs of fluid leakage under pressure from the steering box, which would indicate failed fluid seals within the steering box assembly.



28.3 Rear exhaust mounting rubber (arrowed)

Vertical



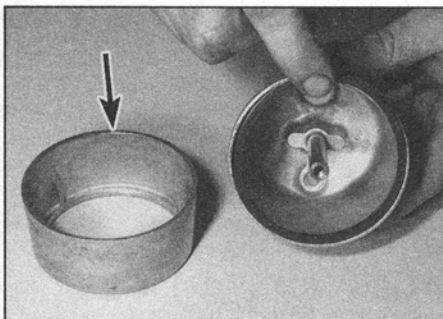
**32.3 Allow any water to drain from the fuel sedimenter drain hole (arrowed)**

4 Grasp the roadwheel at the 12 o'clock and 6 o'clock positions, and try to rock it. Very slight freeplay may be felt, but if the movement is appreciable, further investigation is necessary to determine the source. Continue rocking the wheel while an assistant depresses the footbrake. If the movement is now eliminated or significantly reduced, it is likely that the hub bearings are at fault. If the freeplay is still evident with the footbrake depressed, then there is wear in the suspension joints or mountings.

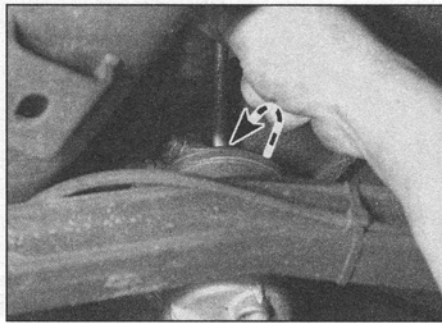
5 Now grasp the wheel at the 9 o'clock and 3 o'clock positions, and try to rock it as before. Any movement felt now may again be caused by wear in the hub bearings or the steering track rod and drag link balljoints. If a balljoint is worn, the visual movement will be obvious.

6 Using a large screwdriver or flat bar, check for wear in the suspension mounting bushes by levering between the relevant suspension component and its attachment point. Some movement is to be expected as the mountings are made of rubber, but excessive wear should be obvious. Also check the condition of any visible rubber bushes, looking for splits, cracks or contamination of the rubber.

7 With the vehicle standing on its wheels, have an assistant turn the steering wheel back and forth. There should be very little, if any, lost movement between the steering wheel and roadwheels. If this is not the case, closely observe the joints and mountings previously described, but in addition, check the steering column universal joints for wear. The steering box backlash is adjustable, but adjustment



**32.7 Fit a new seal to the top of the sedimenter bowl. Sleeve arrowed**



**32.5 Unscrewing the fuel sedimenter securing bolt**

should be entrusted to a Land Rover dealer (see Section 19).

### 30 Propeller shaft securing bolt check

1 Working under the vehicle, use a torque wrench to check the tightness of the bolts securing the propeller shafts to the transfer gearbox and axle drive flanges.

2 Also check the bolts securing the rear propeller shaft rubber coupling, where applicable.

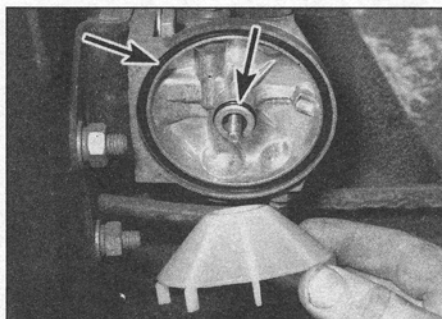
### 31 Axle breather check

1 Ensure that the vehicle is standing on level ground, and that the handbrake is applied.

2 Check that both the front and rear axle breather tubes are securely retained by all the relevant retaining clips, and show no signs of damage or deterioration.

3 If renewal is necessary, unscrew the union bolt securing the breather hose to the top of the axle, and recover the sealing washers from the hose union. Free the hose from its retaining clips, and remove it from the vehicle.

4 Position a new sealing washer on each side of the hose union, and refit the union bolt. Ensure that the hose is correctly routed and retained by all the necessary clips, then securely tighten the union bolt.



**32.8 Fitting the plastic collar to the sedimenter head. Seals arrowed**

### 32 Fuel sedimenter cleaning

1 The fuel sedimenter is designed to increase the life of the fuel filter, by removing the larger droplets of water and dirt from the fuel before it reaches the filter.

2 The sedimenter is located under the vehicle, on the inboard right-hand side of the chassis, forward of the rear axle.

3 Before cleaning the sedimenter element, drain off the water as follows. Remove the drain plug at the bottom of the sedimenter body, and allow the water to run out (see illustration). When clean, uncontaminated fuel runs from the drain hole, refit and tighten the drain plug.

4 Disconnect the fuel inlet pipe from the sedimenter, and lift the pipe above the level of the fuel tank. Alternatively, plug the end of the pipe to prevent fuel draining from the tank.

5 Support the sedimenter bowl, then unscrew the bolt at the top of the sedimenter head, until the bowl can be removed (see illustration).

6 Remove the sedimenter sleeve from the bowl, and recover the plastic collar, then clean the components in clean paraffin.

7 Fit new seals to the sedimenter head, and fit a new seal to the top of the bowl, then fit the sleeve to the bowl (see illustration).

8 Fit the plastic collar to the sedimenter head, then fit the bowl/sleeve assembly (see illustration).

9 Tighten the bolt to secure the bowl.

10 Reconnect the fuel pipe and tighten the union.

11 Slacken the drain plug at the bottom of the sedimenter body, and tighten the plug when clean, uncontaminated fuel runs from the drain hole.

12 Prime the fuel system as described in Chapter 4C.

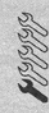
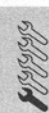
13 Start the engine, and check for fuel leaks around the sedimenter.

### 33 Flywheel housing and timing belt housing draining

#### Flywheel housing

1 In production, the flywheel housing plug is not normally fitted. The plug can be fitted to the oil drain hole in the housing, to seal the housing if the vehicle is likely to be used off-road in very muddy conditions, or under severe wading conditions. A suitable plug can be obtained from a Land Rover dealer (see illustration).

2 If the vehicle is regularly used in adverse conditions, the plug should be fitted permanently, but if the vehicle is normally used on the road, the plug should be removed.



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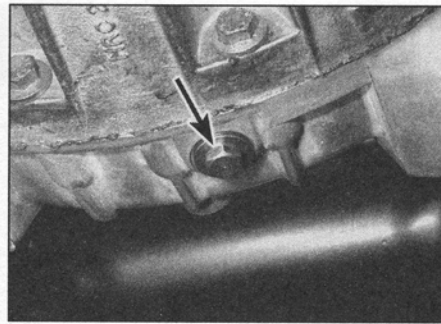


3 If the plug is permanently fitted, it should be removed at the recommended intervals to allow any accumulated oil to drain from the housing.

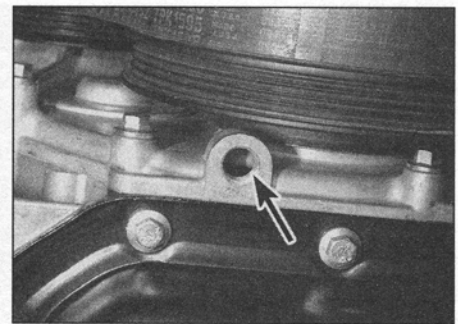
4 Clean the plug before refitting.

### Timing belt housing

5 Refer to paragraphs 1 to 4, but note that the plug should be treated as an inspection plug - there should be no oil in the timing belt housing (see illustration). If oil is present, investigate the cause immediately, as the timing belt will deteriorate if contaminated with oil.



33.1 Flywheel housing drain plug location (arrowed)



33.5 Timing belt housing inspection hole location (arrowed)

### 34 Fuel tank security check



1 Working under the vehicle, check the fuel tank for any signs of damage or corrosion.

2 If there is any sign of significant damage or corrosion, remove the fuel tank (see the relevant part of Chapter 4) and take it to a professional for repair. Do not under any circumstances attempt to weld or solder a fuel tank.

### 35 Towing bracket check



1 Where applicable, check the security of the towbar bracket mountings. Also check that all wiring is intact, and that the trailer electrical systems function correctly.

### 36 Handbrake adjustment



1 The handbrake mechanism is mounted onto the rear of the transfer box assembly. Place the transmission in gear (manual) or P (automatic), then release the handbrake lever and check the front wheels.

2 Jack up the rear of the vehicle, and support it on axle stands so the wheels are clear of the ground.

#### Early models (with rod-actuated brake)

3 From underneath the vehicle, slacken the cable locknut, then loosen the adjuster nut to obtain plenty of freeplay in the cable.

4 Using a suitable spanner, rotate the adjuster on the rear of the handbrake assembly clockwise until both shoes are fully expanded against the drum.

5 With the shoes in full contact with the drum, remove all but a slight amount of freeplay from the handbrake cable, using the adjuster nut. Hold the adjuster nut in this position, and securely tighten the cable locknut.

6 Rotate the handbrake drum adjuster in an

anti-clockwise direction, until the drum is free to rotate easily.

7 Applying normal, moderate pressure, pull the handbrake lever to the fully-applied position whilst counting the number of clicks emitted from the handbrake ratchet mechanism. The handbrake should be fully-applied on the second or third click of the ratchet mechanism. If necessary, adjust by rotating the drum adjuster in the relevant direction.

8 When adjustment is correct, release the handbrake lever, and check that the drum is free to rotate easily.

9 Apply a smear of high-melting point grease to all the linkage pivot points and to the exposed end of the handbrake cable, then lower the vehicle to the ground.

#### Later models (with cable-actuated brake)

10 Release the handbrake lever gaiter from the console, and remove the switch panel cover plate. Undo the retaining screws, then withdraw the switch panel and disconnect its wiring connectors. Access can then be gained to the handbrake cable knurled adjuster nut (see illustration).

11 Slacken the cable knurled cable adjuster ring to obtain some freeplay in the cable.

12 From underneath the vehicle, using a suitable spanner, rotate the adjuster on the rear of the handbrake assembly clockwise until both shoes are fully expanded against the drum.

13 With the shoes in full contact with the drum, rotate the handbrake adjuster in an anti-clockwise direction until the handbrake drum is free to rotate easily.

14 Applying normal, moderate pressure, pull the handbrake lever to the fully-applied position, counting the number of clicks emitted from the handbrake ratchet mechanism. The handbrake should be fully-applied on the third click of the ratchet mechanism. If necessary, adjust the cable setting using the adjuster nut.

15 When adjustment is correct, release the handbrake lever, and check that the drum is free to rotate easily. If all is well, lower the vehicle to the ground.

16 Reconnect the wiring connectors to the

centre console switch panel, and refit the panel to the console. Securely tighten the panel retaining screws, and clip the cover plate and handbrake lever gaiter back into position.

### 37 Road test



#### Instruments and electrical equipment

1 Check the operation of all instruments and electrical equipment.

2 Make sure that all instruments read correctly, and switch on all electrical equipment in turn to check that it functions properly.

#### Steering and suspension

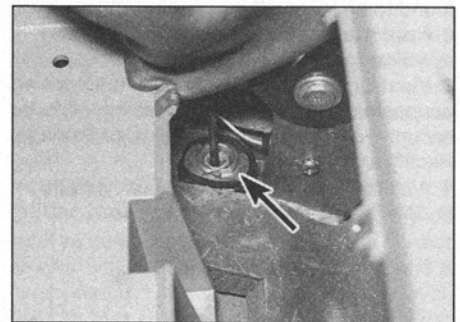
3 Check for any abnormalities in the steering, suspension, handling or road 'feel'.

4 Drive the vehicle, and check that there are no unusual vibrations or noises.

5 Check that the steering feels positive, with no excessive sloppiness, or roughness, and check for any suspension noises when cornering and driving over bumps.

#### Drivetrain

6 Check the performance of the engine, clutch (where applicable), transmission and propeller shafts.



36.10 On later models, access to the handbrake cable adjuster nut (arrowed) can be gained once the switch panel has been removed from the centre console

Tom

- 7 Listen for any unusual noises from the engine, clutch and transmission.
- 8 Make sure that the engine runs smoothly when idling, and that there is no hesitation when accelerating.
- 9 If applicable, check that the clutch action is smooth and progressive, that the drive is taken up smoothly, and that the pedal travel is not excessive. Also listen for any noises when the clutch pedal is depressed.
- 10 Check that all gears can be engaged smoothly without noise, and that the gear lever action is not abnormally vague or 'notchy'. This check applies to both the manual/automatic transmission and the transfer gearbox.

**Braking system**

- 11 Make sure that the vehicle does not pull to one side when braking, and that the wheels do not lock prematurely when braking hard.
- 12 Check that there is no vibration through the steering when braking.
- 13 Check that the handbrake operates correctly without excessive movement of the lever, and that it holds the vehicle stationary on a slope.
- 14 Test the operation of the brake servo unit as follows. With the engine switched off, depress the footbrake four or five times to exhaust the vacuum, then start the engine, keeping the pedal depressed. As the engine starts, there should be a noticeable 'give' in the brake pedal as vacuum builds up. Allow the engine to run for at least two minutes, and then switch it off. If the brake pedal is now depressed, it should be possible to detect a hiss from the servo as the pedal is depressed. After about four or five applications, no further hissing should be heard, and the pedal should feel considerably harder.

**38 Headlight and auxiliary light adjustment check**

- 1 Check the operation of all the electrical equipment, ie lights, direction indicators, horn, etc. Refer to the appropriate Sections of Chapter 13 for details if any of the circuits are found to be inoperative.
- 2 Note that stop-light switch adjustment is described in Chapter 10.
- 3 Visually check all accessible wiring connectors, harnesses and retaining clips for security, and for signs of chafing or damage. Rectify any faults found.
- 4 Accurate adjustment of the headlight beam is only possible using optical beam-setting

equipment, and this work should therefore be carried out by a Land Rover dealer or service station with the necessary facilities.

- 5 Basic adjustments can be carried out in an emergency, and further details are given in Chapter 13.
- 6 On models with an electrically-operated headlight levelling system, check the operation of both headlight motors. Refer to the appropriate Sections of Chapter 13 if any of the circuits are found to be inoperative.

**39 Sunroof maintenance**

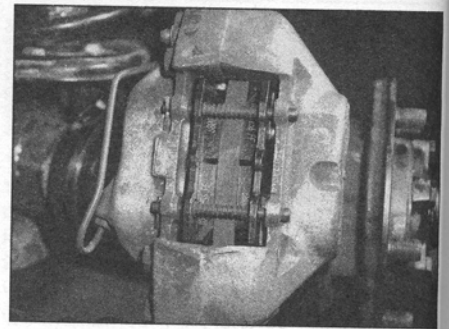
- 1 Check the operation of each sunroof (on cars so equipped). If the action is at all stiff, clean and lubricate the sunroof guide rails and slides with a little multi-purpose grease.
- 2 With the sunroof open, check that the sunroof drain tubes at the corners of the sunroof aperture are clear. Carefully pour a little water into the drain channel, and have an assistant watch for the water emerging under the car. Beware of probing the drain tubes with wire, as this may damage the tubes. If available, an air line should be used to clear any blockages.

**40 Front wheel alignment check**

Check the front wheel alignment as described in Chapter 11.

**41 Brake pad and disc check**

- 1 Jack up the vehicle, support securely on axle stands, then remove the roadwheels (see *Jacking and vehicle support*).
- 2 For a quick check, the thickness of friction material remaining on each pad can be measured through the slot in the caliper body (see illustration). If any pad is worn to the specified minimum thickness or less, all four pads must be renewed (see Chapter 10).
- 3 For a comprehensive check, the brake pads should be removed and cleaned. This will allow the operation of the caliper to be checked, and the condition of the brake disc itself to be fully examined on both sides (see Chapter 10).



41.2 Brake pad friction material thickness can be checked with the caliper in position

**42 Spare wheel check**

Refer to *Weekly checks* and Section 20.

**43 Hinge and lock check and lubrication**

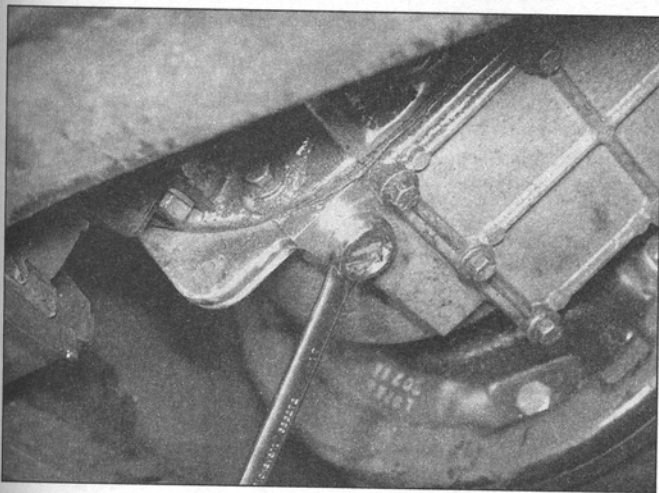
- 1 Lubricate the hinges of the bonnet, doors and tailgate with a light general-purpose oil. Similarly, lubricate all latches, locks and lock strikers. At the same time, check the security and operation of all the locks, adjusting them if necessary (see Chapter 12).
- 2 Lightly lubricate the bonnet release mechanism and cable with a suitable grease.

**44 Seat belt check**

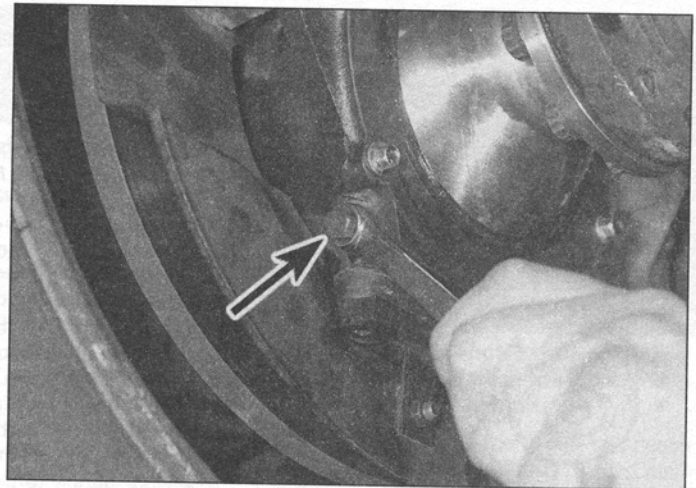
- 1 Carefully examine the seat belt webbing for cuts, or any signs of serious fraying or deterioration. If the seat belt is of the retractable type, pull the belt all the way out, and examine the full extent of the webbing.
- 2 Fasten and unfasten the belt, ensuring that the locking mechanism holds securely, and releases properly when intended. If the belt is of the retractable type, check also that the retracting mechanism operates correctly when the belt is released.
- 3 Check the security of all seat belt mountings and attachments which are accessible, without removing any trim or other components, from inside the vehicle.
- 4 Renew any worn components as described in Chapter 12.

**Note:** A required These w motor fa may be p half-inch 1 This o efficient sufficien normal o 2 Park t

7000



45.3 Unscrewing the transfer gearbox oil drain plug



47.5 Removing the swivel pin housing drain plug (arrowed)

## Every 24 000 miles or 2 years, whichever comes first

### 45 Transfer gearbox oil renewal



- 1 Park the vehicle on level ground.
- 2 Locate the filler/level plug in the side of the transfer gearbox casing, the unscrew the plug (see Section 22).
- 3 Place a suitable container beneath the drain plug in the bottom of the gearbox casing, then unscrew the drain plug and allow the oil to drain (see illustration). Recover the sealing washer.
- 4 When the oil has finished draining, refit and tighten the drain plug, using a new sealing washer if necessary.
- 5 Refill the gearbox with oil of the specified type (see end of *Weekly checks*) through the filler/level hole, until the oil level reaches the lower edge of the hole (place a container beneath the hole to catch any escaping oil).
- 6 Clean and refit the filler/level plug, and tighten to the specified torque. **Do not** overtighten the plug, as it has tapered threads.
- 7 Wipe any split oil from the gearbox casing.

### 46 Axle oil renewal



**Note:** A 13 mm square-section wrench will be required to undo the axle filler/level plug. These wrenches can be obtained from most motor factors or your Land Rover dealer. It may be possible to use the square fitting of a half-inch-drive socket handle as a substitute.

- 1 This operation is much quicker and more efficient if the car is first taken on a journey of sufficient length to warm the axle oil up to normal operating temperature.
- 2 Park the car on level ground, switch off the

'ignition' and apply the handbrake firmly.

3 Wipe clean the area around the front axle filler/level plug, which is on the differential housing. Unscrew the plug and clean it.

4 Position a suitable container under the drain plug situated on the base of the differential housing.

5 Unscrew the drain plug, and allow the oil to drain completely into the container. If the oil is hot, take precautions against scalding. Examine the sealing washer for signs of damage, renewing it if necessary, and clean both the filler/level and the drain plugs.

6 When the oil has finished draining, clean the drain plug threads and those of the differential casing, then refit the drain plug and washer, tightening it securely.

7 Refilling the axle is an extremely awkward operation. Above all, allow plenty of time for the oil level to settle properly before checking it. Note that the car must be parked on flat level ground when checking the oil level.

8 Refill the axle with the exact amount of the specified type of oil, then check the oil level as described in Section 23. If the correct amount was poured into the housing, and a large amount flows out on checking the level, refit the filler/level plug, and take the car on a short journey so that the new oil is distributed fully around the axle components, then check the level again on your return.

9 When the level is correct, refit the filler/level plug, tightening it securely, and wash off any spilt oil.

10 Repeat the procedure for the rear axle.

### 47 Swivel pin housing oil renewal



**Note:** From approximately 1998 onwards, Land Rover (and their dealers) drain the oil and fill the swivel pin housing with a special

grease, which then requires no further maintenance. This grease is available from Land Rover dealers, under part number FTC3435.

1 This operation is much quicker and more efficient if the car is first taken on a journey of sufficient length to warm the swivel pin housing oil up to normal operating temperature.

2 Park the car on level ground, switch off the 'ignition' and apply the handbrake firmly.

3 Working underneath the vehicle, unscrew the left-hand swivel pin housing level plug and filler. Both plugs can be identified by their square-section heads (see Section 24).

4 Position a suitable container under the drain plug situated on the base of the swivel pin housing.

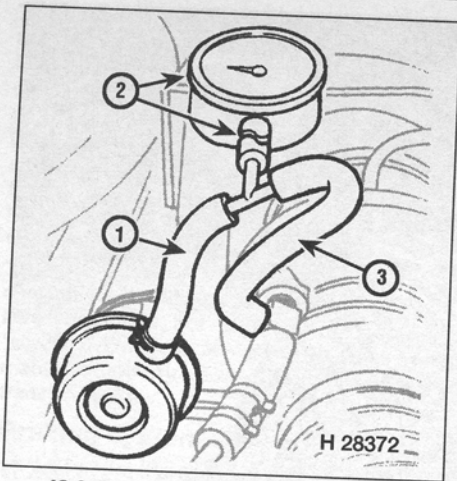
5 Unscrew the drain plug, and allow the oil to drain completely into the container (see illustration). If the oil is hot, take precautions against scalding. Examine the sealing washer for signs of damage, renewing it if necessary, and clean the threads of all removed plugs.

6 When the oil has finished draining, clean the drain plug threads and those of the housing, then refit the drain plug and washer, tightening it securely.

7 Refilling the housing is an extremely awkward operation. Above all, allow plenty of time for the oil level to settle properly before checking it. Note that the car must be parked on flat level ground when checking the oil level.

8 Refill the housing with the exact amount of the specified type of oil, then check the oil level as described in Section 24. If the correct amount was poured into the housing, and a large amount flows out on checking the level, refit the filler and level plugs, and take the car on a short journey so that the new oil is distributed fully around the swivel pin housing components, then check the level again on your return.

Vertical



#### 48.2 Turbocharger boost pressure checking

- 1 Wastegate actuator hose
- 2 T-piece and pressure gauge
- 3 Hose to turbocharger

- 9 When the level is correct, refit the filler and level plugs, tightening them securely, and wash off any spilt oil.
- 10 Repeat the above operation on the right-hand swivel pin housing.

#### 48 Turbocharger boost pressure check

**Note:** A pressure gauge capable of registering pressure in excess of 1 bar will be required for this check.

- 1 Working in the engine compartment, disconnect the hose connecting the wastegate actuator to the turbocharger, at the turbocharger.
- 2 Connect the hose to a T-piece, and use a short length of hose to connect the T-piece to the turbocharger (see illustration).
- 3 Obtain a length of hose long enough to run from the T-piece in the engine compartment to the passenger compartment, to enable a pressure gauge to be read by the driver or passenger whilst the vehicle is being driven. Note that the hose must be long enough to enable it to be routed so that it is not trapped when the bonnet is closed.
- 4 Connect the hose between the T-piece and the pressure gauge. Carefully lower the bonnet, taking care not to trap the hose. Do not fully close the bonnet (as this will trap the hose), but ensure that the safety catch is engaged, so that there is no risk of the bonnet

opening when the vehicle is driven. As a safety precaution, it is advisable to secure the bonnet using a length of string or a cable-tie around the lock and striker.

- 5 Start the engine, and drive the vehicle normally until the engine reaches normal operating temperature.
- 6 When the engine is warm, drive the vehicle normally, up a suitable shallow hill, in such a manner that full throttle can be maintained, with the engine speed held steady between 2500 and 3000 rpm.
- 7 Under these conditions, the maximum boost pressure should be as specified at the start of this Chapter.
- 8 If the reading is not as specified, it is likely that there is a fault with the turbocharger wastegate. In this case, have the problem investigated by a Land Rover dealer.

#### 49 Automatic transmission fluid and oil screen renewal

This is an involved operation, and is best entrusted to a Land Rover dealer.

### Every 2 years, regardless of mileage

#### 50 Brake fluid renewal

1 The procedure is similar to that for the bleeding of the hydraulic system as described in Chapter 10, except that the brake fluid reservoir should be emptied by siphoning, using a (clean) old battery hydrometer or similar before starting, and allowance should be made for the old fluid to be expelled from the circuit when bleeding each section of the circuit.

#### 51 Coolant renewal

**Warning:** Wait until the engine is cold before starting this procedure. Do not allow antifreeze to come in contact with your skin, or with the painted surfaces of the vehicle. Rinse off spills immediately with plenty of water. Never leave antifreeze lying around in an open container, or in a puddle in the driveway or garage floor. Children and pets are attracted by its sweet smell, but antifreeze is fatal if ingested. Refer to the 'Antifreeze mixture' sub-Section before proceeding.

#### Cooling system draining

- 1 To drain the cooling system, first cover the

expansion tank cap with a wad of rag, and slowly turn the cap anti-clockwise to relieve the pressure in the cooling system (a hissing sound will normally be heard). Wait until any pressure remaining in the system is released, then continue to turn the cap until it can be removed.

- 2 Position a suitable container beneath the radiator bottom hose connection, then slacken the hose clip and ease the hose from the radiator stub. If the hose joint has not been disturbed for some time, it will be necessary to manipulate the hose to break the joint. Allow the coolant to drain into the container.
- 3 To fully drain the system, also slacken and remove the coolant drain plug from the left-hand side of the cylinder block, and allow any residual coolant to drain from the block. When the flow of coolant has stopped, wipe clean the threads of the drain plug and block. Where the plug was fitted with a sealing washer, fit a new sealing washer; where no washer was fitted, apply a smear of suitable sealant to the drain plug threads. Refit the drain plug to the block, and tighten it securely.
- 4 If the coolant has been drained for a reason other than renewal, then provided it is clean and less than two years old, it can be re-used.

#### Cooling system flushing

5 If coolant renewal has been neglected, or if the antifreeze mixture has become diluted, then in time, the cooling system may gradually lose efficiency, as the coolant passages

become restricted due to rust, scale deposits and other sediment. The cooling system efficiency can be restored by flushing the system clean.

- 6 The radiator should be flushed independently of the engine, to avoid unnecessary contamination.
- 7 To flush the radiator, disconnect the top hose at the radiator, then insert a garden hose into the radiator top inlet. Direct a flow of clean water through the radiator, and continue flushing until clean water emerges from the radiator bottom outlet (the bottom radiator hose should have been disconnected to drain the system). If after a reasonable period, the water still does not run clear, the radiator can be flushed with a good proprietary cleaning agent. It is important that the cleaning agent manufacturer's instructions are followed carefully. If the contamination is particularly bad, insert the hose in the radiator bottom outlet, and flush the radiator in reverse ('reverse-flushing').
- 8 Remove the thermostat as described in Chapter 3, then temporarily refit the thermostat cover.
- 9 With the radiator top and bottom hoses disconnected from the radiator, insert a hose into the radiator bottom hose. Direct a clear flow of water through the engine, and continue flushing until clean water emerges from the radiator top hose.
- 10 On completion of flushing, refit the thermostat with reference to Chapter 3, and reconnect the hoses.

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**Antifreeze mixture**

11 Always use an ethylene-glycol based antifreeze which is suitable for use in mixed-metal cooling systems. The quantity of antifreeze and levels of protection are indicated in the Specifications.

12 Before adding antifreeze, the cooling system should be completely drained, preferably flushed, and all hoses and clips checked for condition and security.

13 After filling with antifreeze, a label should be attached to the radiator or expansion tank, stating the type and concentration of antifreeze used, and the date installed. Any subsequent topping-up should be made with the same type and concentration of antifreeze.

**Cooling system filling**

14 Before attempting to fill the cooling system, make sure that all hoses and clips are in good condition, and that the clips are tight. Note that an antifreeze mixture must be used all year round, to prevent corrosion of the alloy engine components.

15 Remove the expansion tank cap. On 200 TDi engines, unscrew the filler cap from the top of the radiator; on 300 TDi engines, unscrew the filler cap from the top of the thermostat housing (see illustration). Recover the cap sealing ring (where fitted), and renew it if it shows signs of damage or deterioration.

16 Fill the system by slowly pouring the coolant into the radiator/thermostat housing (as applicable) to prevent airlocks from forming.

17 If the coolant is being renewed, begin by pouring in a couple of litres of water, followed by the correct quantity of antifreeze, then top-up with more water.

18 When coolant free of air bubbles emerges from the filler, refit the filler cap and tighten it securely.

19 Top-up the expansion tank level up to the indicator (see *Weekly checks*), then refit the expansion tank cap.

20 Start the engine and run it until it reaches normal operating temperature, then stop the engine and allow it to cool for several hours (preferably overnight).

21 Check for leaks, particularly around disturbed components.

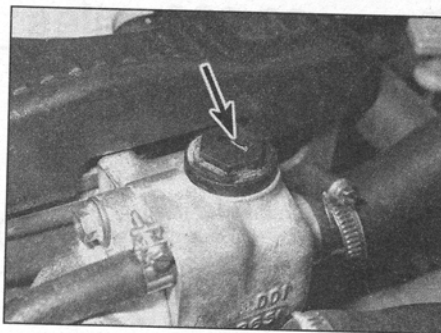
22 Check the coolant level in the expansion tank, and top-up if necessary. Note that the system must be cold before an accurate level is indicated in the expansion tank.

**Airlocks**

23 If, after draining and refilling the system, symptoms of overheating are found which did not occur previously, then the fault is almost certainly due to trapped air at some point in the system, causing an airlock and restricting the flow of coolant; usually, the air is trapped because the system was refilled too quickly.

24 If an airlock is suspected, first try gently squeezing all visible coolant hoses. A coolant hose which is full of air feels quite different to one full of coolant, when squeezed. After refilling the system, most airlocks will clear once the system has cooled, and been topped-up.

25 While the engine is running at operating



51.15 On 300 TDi engines, the filler cap (arrowed) is situated on the top of the thermostat housing

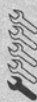
temperature, switch on the heater and heater fan, and check for heat output. Provided there is sufficient coolant in the system, lack of heat output could be due to an airlock in the system.

26 Airlocks can have more serious effects than simply reducing heater output - a severe airlock could reduce coolant flow around the engine. Check that the radiator top hose is hot when the engine is at operating temperature - a top hose which stays cold could be the result of an airlock (or a non-opening thermostat).

27 If the problem persists, stop the engine and allow it to cool down **completely**, before unscrewing the expansion tank filler cap or partially disconnecting hoses to bleed out the trapped air. In the worst case, the system will have to be at least partially drained (this time, the coolant can be saved for re-use) and flushed to clear the problem.

**Every 36 000 miles or 3 years, whichever comes first**

**52 Shock absorber check**



1 Check for any signs of fluid leakage around the shock absorber body, or from the rubber gaiter around the piston rod. Should any fluid be noticed, the shock absorber is defective internally and should be renewed. **Note:** Shock absorbers should always be renewed in pairs on the same axle.

2 The efficiency of the shock absorber may be checked by bouncing the vehicle at each

corner. Generally speaking, the body will return to its normal position and stop after being depressed. If it rises and returns on a rebound, the shock absorber is probably suspect. Examine also the shock absorber upper and lower mountings for any signs of wear.

**53 Braking system seal, vacuum servo filter and hose renewal**



Land Rover recommend that all the braking

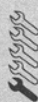
system and rubber hoses are renewed, and the hydraulic system filled with fresh fluid. At the same time, the vacuum servo unit filter should also be renewed. Refer to the relevant Sections of Chapter 10 for renewal information.

**54 Timing belt renewal**

The timing belt renewal procedure is described in Chapter 2B.

**Every 48 000 miles or 4 years, whichever comes first**

**55 Intercooler element cleaning**



1 Remove the intercooler as described in Chapter 4C.

2 Check the element for damage and deterioration, and renew if necessary.

3 If the original element is to be refitted, flush

the element with ICI Genklene or a suitable alternative, following the instructions supplied with the cleaner.

4 Dry the element thoroughly, then refit as described in Chapter 4C.

*Handwritten signature or mark in the bottom right corner.*

## Every 96 000 miles

### 56 Catalytic converter check and renewal

The catalytic converter is integral with the exhaust front section. For more information, refer to Chapter 4D - the converter need only be renewed if it is no longer effective.

## Every 10 years

### 57 Airbag module renewal



Land Rover recommend that the airbag module be replaced after 10 years. In the interests of safety, this advice should be heeded - consult a Land Rover dealer for more information. The module can be removed and refitted as described in Chapter 13, but on completion, its operation should be checked by a Land Rover dealer.

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