

MAINTENANCE SCHEDULES

Efficient maintenance is one of the biggest factors in ensuring continuing reliability and efficiency. For this reason the following detailed schedules are included so that at the appropriate intervals owners and operators may know what is required. The Maintenance Schedules are based upon intervals of 10,000 km (6,000 miles) or 6 months unless otherwise stated.

A = 10,000 km (6,000 miles)
 30,000 km (18,000 miles)
 50,000 km (30,000 miles)
 70,000 km (42,000 miles)

B = 20,000 km (12,000 miles)
 40,000 km (24,000 miles)
 60,000 km (36,000 miles)
 80,000 km (48,000 miles)

CORRECT = INCORRECT =

No.	A	B	Operations	No.	A	B	Operations
1	<input type="checkbox"/>		Check condition and security of seats, seat belt mountings, seat belts and buckles	28		<input type="checkbox"/>	Check visually brake, fuel, clutch pipes/unions for chafing, leaks and corrosion
2	<input type="checkbox"/>		Check operation of footbrake and clutch with engine running; stop engine	29	<input type="checkbox"/>	<input type="checkbox"/>	Check exhaust system for leakage and security
3	<input type="checkbox"/>		Check operation of; all lamps, horns, warning indicators	30		<input type="checkbox"/>	Lubricate hand brake mechanical linkage and adjust to manufacturers instructions if required
4	<input type="checkbox"/>		Check operation of front/rear screen wipers and washers and condition of wiper blades	31	<input type="checkbox"/>	<input type="checkbox"/>	Lubricate propeller shaft universal joints
5	<input type="checkbox"/>	<input type="checkbox"/>	Check security and operation of hand brake; release fully after checking	32	<input type="checkbox"/>	<input type="checkbox"/>	Lubricate propeller shaft sliding joints
6		<input type="checkbox"/>	Check rear view mirrors for security, cracks and crazing	33		<input type="checkbox"/>	Check tightness of propeller shaft coupling bolts
7	<input type="checkbox"/>	<input type="checkbox"/>	Remove road wheels	34		<input type="checkbox"/>	Ensure front and rear axle breathers are free from obstruction
8	<input type="checkbox"/>	<input type="checkbox"/>	Check tyres for: compliance with manufacturers specification; visually for cuts, lumps, bulges, uneven tread wear and depth; tyre pressures (including spare) adjust if required—see Owners Manual	35		<input type="checkbox"/>	Check security and condition of suspension fixings
9	<input type="checkbox"/>	<input type="checkbox"/>	Inspect brake pads for wear, calipers for leaks and discs for condition	36		<input type="checkbox"/>	Check for oil leaks from engine and transmission
10	<input type="checkbox"/>	<input type="checkbox"/>	Check for oil/fluid leaks from steering and suspension systems	37	<input type="checkbox"/>	<input type="checkbox"/>	Clean fuel pump filter
11		<input type="checkbox"/>	Check condition and security of steering, joints and gaiters	38		<input type="checkbox"/>	Check suspension self levelling unit for leaks
12	<input type="checkbox"/>	<input type="checkbox"/>	Refit road wheels to original position	39	<input type="checkbox"/>	<input type="checkbox"/>	Renew fuel filter (EFI engines)
13		<input type="checkbox"/>	Drain flywheel housing if drain plug is fitted for wading (refit)	40		<input type="checkbox"/>	Renew fuel filter element (carburettor engines)
14	<input type="checkbox"/>		Check/top up engine oil	41		<input type="checkbox"/>	Renew air cleaner element(s)
15		<input type="checkbox"/>	Renew engine oil and filter	42		<input type="checkbox"/>	Check air cleaner dump valve, clean or renew
16	<input type="checkbox"/>	<input type="checkbox"/>	Check/top up automatic transmission fluid	43	<input type="checkbox"/>	<input type="checkbox"/>	Renew engine breather filter
17	<input type="checkbox"/>	<input type="checkbox"/>	Renew automatic transmission fluid and filter	44		<input type="checkbox"/>	Clean or renew engine flame trap(s)
18	<input type="checkbox"/>	<input type="checkbox"/>	Check/top up gearbox oil	45	<input type="checkbox"/>	<input type="checkbox"/>	Check condition of driving belts—adjust if required
19	<input type="checkbox"/>	<input type="checkbox"/>	Renew gearbox oil	46	<input type="checkbox"/>	<input type="checkbox"/>	Renew charcoal canister
20	<input type="checkbox"/>	<input type="checkbox"/>	Check/top up transfer box oil	47		<input type="checkbox"/>	Check crankcase breathing system for leaks, hoses for security and condition
21	<input type="checkbox"/>	<input type="checkbox"/>	Renew transfer box oil	48	<input type="checkbox"/>		Clean/adjust spark plugs
22	<input type="checkbox"/>	<input type="checkbox"/>	Check/top up front axle oil	49		<input type="checkbox"/>	Renew spark plugs
23	<input type="checkbox"/>	<input type="checkbox"/>	Renew front axle oil	50	<input type="checkbox"/>	<input type="checkbox"/>	Top up carburettor piston dampers
24	<input type="checkbox"/>	<input type="checkbox"/>	Check/top up swivel pin housing oil	51	<input type="checkbox"/>	<input type="checkbox"/>	Check/top up cooling system
25	<input type="checkbox"/>	<input type="checkbox"/>	Renew swivel pin housing oil	52		<input type="checkbox"/>	Check brake servo hose for security and condition
26	<input type="checkbox"/>	<input type="checkbox"/>	Check/top up rear axle oil	53		<input type="checkbox"/>	Check ignition wiring and H.T. leads for fraying, chafing and deterioration
27	<input type="checkbox"/>	<input type="checkbox"/>	Renew rear axle oil	54		<input type="checkbox"/>	Clean distributor cap, check for cracks and tracking
				55	<input type="checkbox"/>	<input type="checkbox"/>	Check/adjust ignition timing (refer to the repair operation manual for details)
				56		<input type="checkbox"/>	Lubricate accelerator control linkages and pedal pivot

Continued

No.	A	B	Operations	No.	A	B	Operations
57		<input type="checkbox"/>	Check throttle operation	73	<input type="checkbox"/>	<input type="checkbox"/>	Road test—Check:
58	<input type="checkbox"/>	<input type="checkbox"/>	Lubricate all locks (not steering lock), hinges and door—check mechanisms		<input type="checkbox"/>	<input type="checkbox"/>	And ensure automatic gearbox starter/isolator switch will only operate in 'P' and 'N'
59		<input type="checkbox"/>	Check operation of all doors, bonnet and tailgate locks		<input type="checkbox"/>	<input type="checkbox"/>	For excessive engine noise
60	<input type="checkbox"/>	<input type="checkbox"/>	Check/adjust carburetter mixture settings, fuel injection idle air mixture and engine idle speed with engine at normal running temperature		<input type="checkbox"/>	<input type="checkbox"/>	Clutch for slipping/judder/spinning
61	<input type="checkbox"/>	<input type="checkbox"/>	Check operation of air intake temperature control system		<input type="checkbox"/>	<input type="checkbox"/>	Gear selection/noise—high and low range
62		<input type="checkbox"/>	Check/adjust steering box		<input type="checkbox"/>	<input type="checkbox"/>	Automatic gear selection/shift speeds
63	<input type="checkbox"/>	<input type="checkbox"/>	Check power steering system for leaks, hydraulic pipes and unions for chafing and corrosion		<input type="checkbox"/>	<input type="checkbox"/>	Steering for noise/abnormal effort required
64	<input type="checkbox"/>	<input type="checkbox"/>	Check/top up fluid in power steering reservoir		<input type="checkbox"/>	<input type="checkbox"/>	All instruments, pressure, fuel and temperature gauges, warning indicators
65	<input type="checkbox"/>	<input type="checkbox"/>	Check/top up clutch fluid reservoir		<input type="checkbox"/>	<input type="checkbox"/>	Heater and air conditioning systems
66	<input type="checkbox"/>	<input type="checkbox"/>	Check/top up brake fluid reservoir		<input type="checkbox"/>	<input type="checkbox"/>	Heated rear screen
67	<input type="checkbox"/>	<input type="checkbox"/>	Check/top up windscreen washer reservoir		<input type="checkbox"/>	<input type="checkbox"/>	Shock absorbers (irregularities in ride)
68		<input type="checkbox"/>	Check cooling and heater system for leaks, hoses for security and condition		<input type="checkbox"/>	<input type="checkbox"/>	Footbrake, on emergency stop, pulling to one side, binding, pedal effort
69		<input type="checkbox"/>	Check/top up battery electrolyte		<input type="checkbox"/>	<input type="checkbox"/>	Handbrake efficiency
70		<input type="checkbox"/>	Remove battery connections; clean and grease—refit		<input type="checkbox"/>	<input type="checkbox"/>	Fully extend seat belt, check for correct operation of retraction and latching. Inertia belts lock when snatched and when car is on slope
71		<input type="checkbox"/>	Check/adjust headlamp alignment	74	<input type="checkbox"/>	<input type="checkbox"/>	Endorse service record
72		<input type="checkbox"/>	Check front wheel alignment	75	<input type="checkbox"/>	<input type="checkbox"/>	Report any additional work required

It is recommended that:

At 30,000 km (18,000 mile) intervals or every 18 months, whichever is the sooner, the hydraulic brake fluid should be completely renewed.

At 60,000 km (36,000 mile) intervals or every 3 years, whichever is the sooner, all hydraulic brake fluid, seals and flexible hoses should be renewed, all working surfaces of the master cylinder, wheel cylinders and caliper cylinders should be examined and renewed where necessary.

At 60,000 km (36,000 mile) intervals remove all suspension dampers, test for correct operation, refit or renew as necessary.

MAINTENANCE SUMMARY

The following should be checked weekly or before a long journey.

Engine oil level	Windscreen/tailgate/headlamp washer. Reservoir level(s)	Operation of horn
Brake fluid level	Battery electrolyte level(s)	Operation of washers and wipers
Radiator coolant level	All tyres for pressure and condition	Operation of all lights

LUBRICATION

This first part of the maintenance section covers renewal of lubricating oils for the major units of the vehicle and other components that require lubrication, as detailed in the 'Maintenance Schedules'. Refer to the 'General Specification Data' for capacities and recommended lubricants.

Vehicles operating under severe conditions of dust, sand, mud and water should have the oils changed and lubrication carried out at more frequent intervals than that recommended in the maintenance schedules.

Draining of used oil should take place after a run when the oil is warm. Always clean the drain and filler-level plugs before removing. In the interests of safety disconnect the vehicle battery to prevent the engine being started and the vehicle moved inadvertently, while oil changing is taking place.

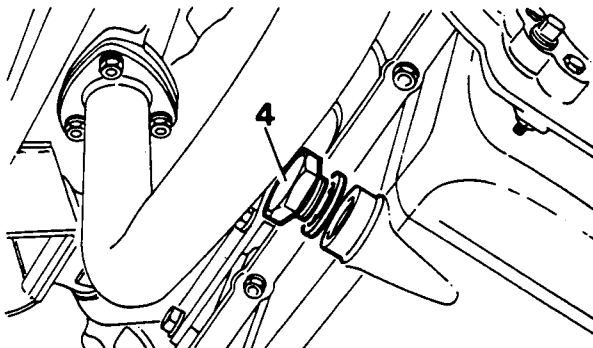
Allow as much time as possible for the oil to drain completely except where blown sand or dirt can enter the drain holes. In these conditions clean and refit the drain plugs immediately the main bulk of oil has drained.

Where possible, always refill with oil of the make and specification recommended in the lubrication charts and from sealed containers.

RENEW ENGINE OIL AND FILTER

DRAIN THE OIL

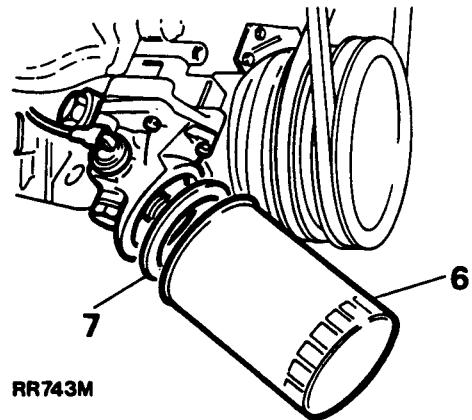
1. Drive vehicle to level ground.
2. Run the engine to warm the oil; switch off the ignition and disconnect the battery for safety.
3. Place an oil tray under the drain plug.
4. Remove the drain plug in the bottom of the sump at the left-hand side. Allow oil to drain away completely and replace the plug and tighten to the correct torque.



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Renew oil filter

5. Place an oil tray under the engine.
6. Unscrew the filter anti-clockwise, using a strap spanner as necessary.
7. Smear a little clean engine oil on the rubber washer of the new filter, then screw the filter on clockwise until the rubber sealing ring touches the machined face, then tighten a further half turn by hand only. Do not overtighten.



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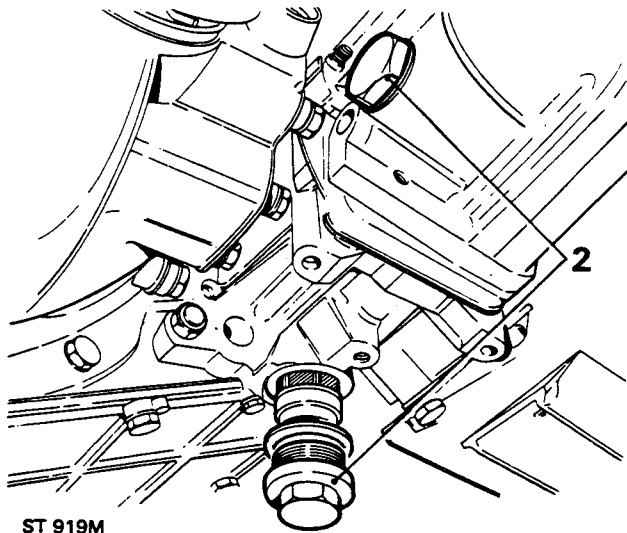
Refill sump with oil

8. Check that the drain plug is tight.
9. Clean the outside of the oil filler cap, remove it from the rocker cover or extension filler neck and clean the inside.
10. Pour in the correct quantity of new oil of the correct grade from a sealed container to the high mark on the dipstick and firmly replace the filler cap. **DO NOT FILL ABOVE 'HIGH' MARK.**
11. Run the engine and check for leaks from the filter. Stop the engine, allow the oil to run back into the sump for a few minutes, then check the oil level again and top up if necessary.

RENEW MAIN AND TRANSFER GEARBOX OILS

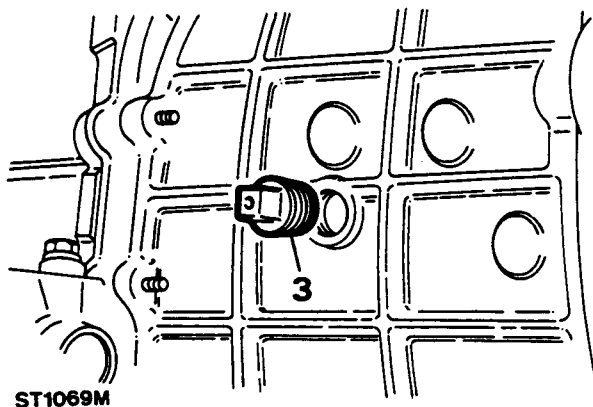
DRAIN AND REFILL 77 mm MAIN GEARBOX

1. Drive the vehicle to level ground and place a suitable container under the gearbox to catch the old oil.
2. Remove the gearbox and extension case drain plugs and allow the oil to drain completely. Wash the extension case filter in kerosene and refit the plugs using new washers, if necessary, and tighten to the correct torque.



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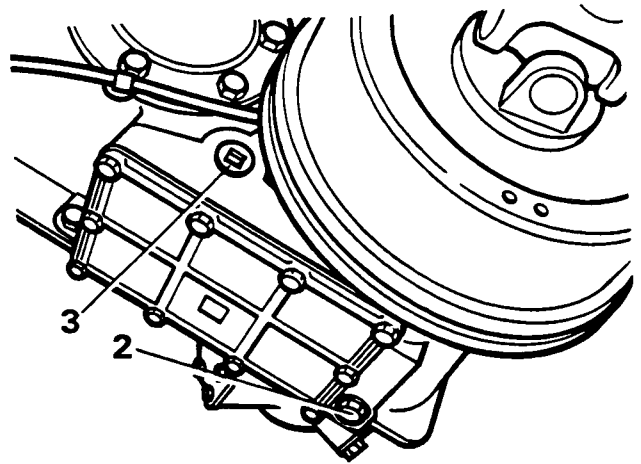
3. Remove the oil filler-level plug and inject the approximate quantity of new oil of the correct make and grade until it begins to run out of the filler-level hole. Fit the plug and tighten to the correct torque. Since the plug has a tapered thread it must not be overtightened. Wipe away any surplus oil.



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DRAIN AND RENEW 230T TRANSFER GEARBOX

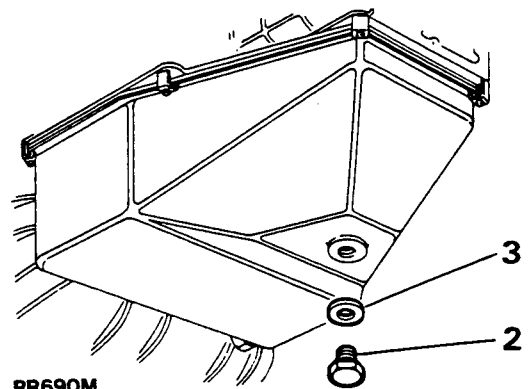
1. Drive the vehicle to level ground and place a container under the gearbox to catch the old oil.
2. Remove the drain plug and allow the oil to drain. Fit the plug using a new washer, if necessary, and tighten to the correct torque.
3. Remove the filler-level plug and inject the approximate quantity of the recommended oil until it begins to run from the plug hole. Fit the level plug and tighten only to the correct torque, do not overtighten, wipe away any surplus oil.



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RENEW ZF AUTOMATIC GEARBOX FLUID

1. Drive the vehicle onto a suitable hydraulic ramp. Obtain a suitable container to drain the gearbox fluid into.
2. Remove the drain plug from the bottom of the sump and allow time for the fluid to drain.
3. Refit the plug using a new sealing washer and tighten to the correct torque.



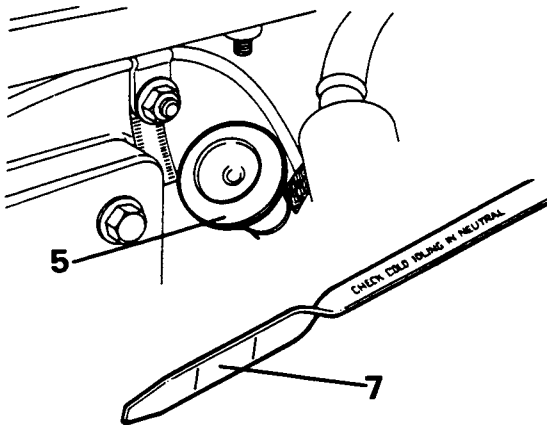
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REFILL ZF AUTOMATIC GEARBOX AND CHECK FLUID LEVEL

NOTE: The fluid level in the ZF automatic gearbox is checked when the engine is at normal ambient temperature, and idling in neutral gear.

4. Ensure the vehicle is on level ground.
5. Lift the bonnet and remove the gearbox dipstick located at the rear of the right-hand rocker cover.
6. Refill or top-up the fluid with the correct quantity and grade of fluid (see 'Data' section).
7. Ensure that the fluid level registers between the minimum and maximum level markings on the dipstick.



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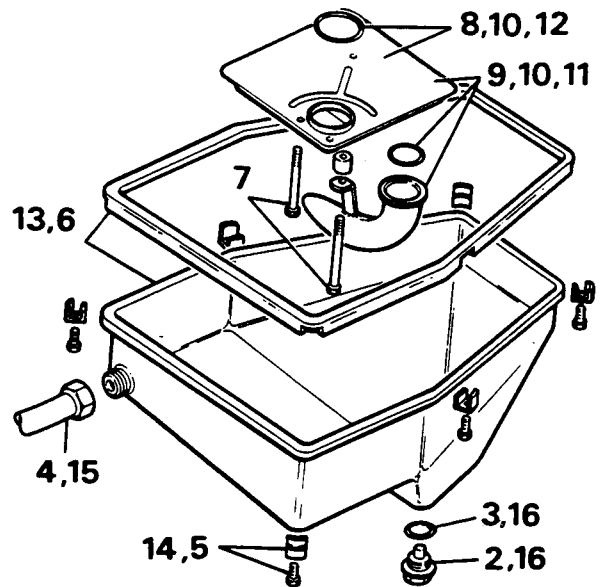
OIL SCREEN REPLACEMENT ZF AUTOMATIC GEARBOX

Removing

1. Place the vehicle on a ramp or over a pit, open the bonnet and disconnect the battery leads.
2. From underneath the vehicle drain the gearbox using a suitable container.
3. Discard the oil pan plug seal ring.
4. Remove the filler/level tube from the oil pan.
5. Remove the six retaining plates and bolts.
6. Remove the oil pan and discard the gasket.
7. Using TX27 torx bit undo the three screws which hold the oil screen.
8. Remove the oil screen and discard the 'O' rings.
9. Separate the oil screen from the suction tube and discard the 'O' ring and oil screen.

Refitting

10. Fit two new 'O' rings to the oil screen using a light grease for ease of assembly.
11. Fit the suction tube to the oil screen.
12. Fit the oil screen to the control unit and secure with three bolts using TX27 torx bit tighten to the specified torque.
13. Refit the oil pan using a new gasket.

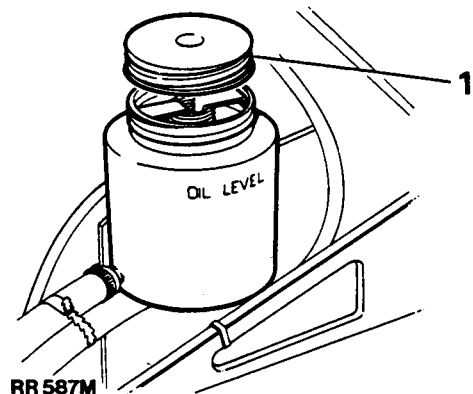


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14. Secure using the six retaining plates and bolts (two straight and four corner plates), tighten to the specified torque.
15. Reconnect the oil level/filler tube.
16. Fit oil pan plug using a new seal.
17. Connect the battery leads.
18. Fill the gearbox with the correct oil through the filler/level tube located within the engine bay (see 'Data' section).
19. Ensuring the vehicle is on level ground with the hand-brake applied, check oil level while engine is running at idle with neutral selected.

POWER STEERING—FLUID RESERVOIR

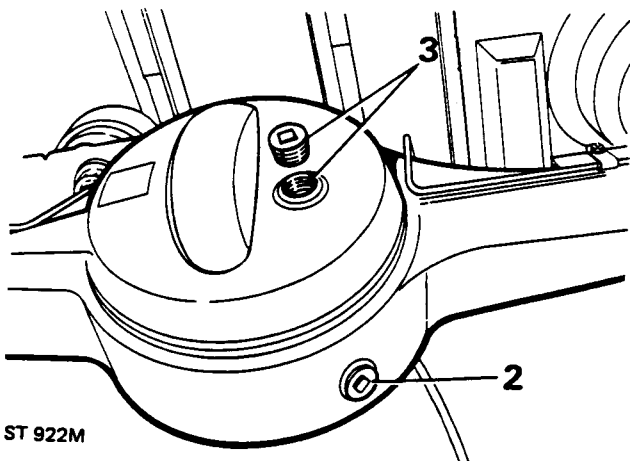
1. Clean and remove the reservoir cap, observe the fluid level in relation to the level mark on the side of the reservoir.
2. If necessary top-up with a recommended fluid (see 'Data' section), until the fluid is 12 mm (½ in) above the filter.
3. Refit the cap.



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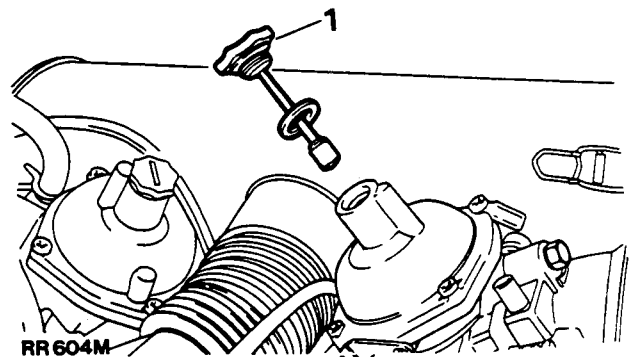
RENEW FRONT AND REAR AXLE OIL

1. Drive the vehicle to level ground and place a container under the axle to be drained.
2. Using a spanner with a 13 mm (0.5 in) square drive remove the drain plug and allow the oil to drain completely. Clean and refit the drain plug.
3. Remove the oil filler-level plug and inject new oil of a recommended make and grade until it begins to run from the hole. Clean and fit the filler-level plug and wipe away any surplus oil.



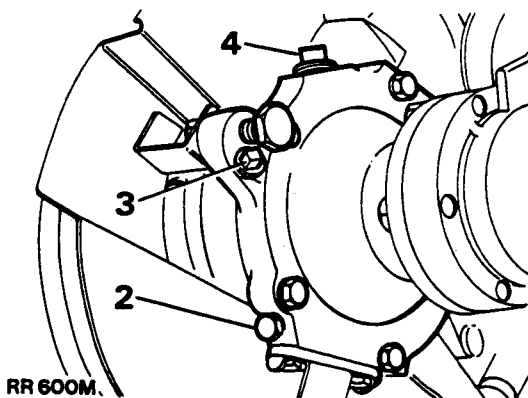
CHECK/TOP UP CARBURETTOR PISTON DAMPERS

1. Unscrew and withdraw the plug and damper assembly from the top of each carburettor.
2. Top-up the damper chambers with the seasonal grade of engine oil.
3. The oil level is correct, when utilising the damper as a dipstick its threaded plug is 6 mm above the dash pots and resistance is felt.
4. Screw down the damper plugs.



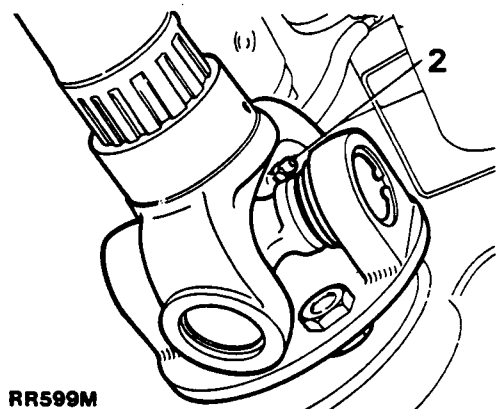
RENEW SWIVEL PIN HOUSING OIL

1. Drive the vehicle to level ground and place a container under each swivel housing to catch the old oil.
2. Remove the drain plug and allow the oil to drain completely, clean and refit the plug.
3. Remove the level plug.
4. Remove the filler plug and inject the recommended make and grade of oil until oil begins to run from the level hole.
5. Clean and refit the level and filler plugs, wipe away any surplus oil.



LUBRICATE PROPELLER SHAFTS

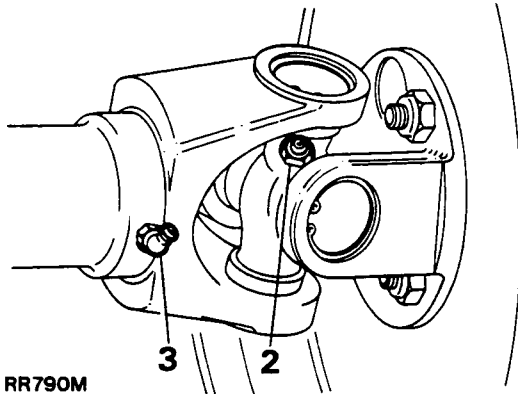
1. Clean all grease nipples on the front and rear propshaft universal joints and sliding portion of the rear shaft.
2. Charge a low pressure hand-grease gun with grease of a recommended make and grade and apply to the grease nipples.



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Lubricate the propeller shaft sliding joint

3. Disconnect one end of the front propeller shaft and compress the sliding portion whilst applying grease. It is necessary to compress the shaft to prevent over-filling with grease. It should be noted that this sliding joint must only be lubricated at 40,000 km (24,000 mile) intervals.

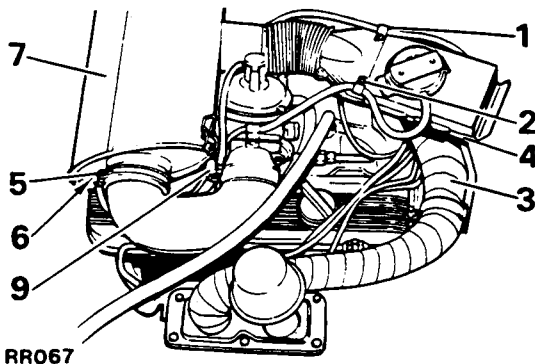


GENERAL MAINTENANCE AND ADJUSTMENT

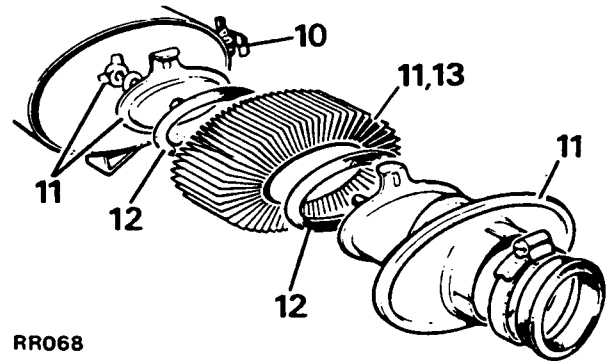
FILTERS

RENEW THE AIR CLEANER ELEMENT—carburettor type

1. Slacken the clip retaining the advance/retard vacuum pipes from the air intake and release pipes from intake.
2. Slacken the clip retaining hose air cleaner to temperature sensing device from air intake and remove pipe from flap valve on air intake.
3. Slacken the hose clip attaching warm air intake hose to air intake.
4. Withdraw air intake from steady post and hoses.
5. Slacken the clips and remove the air cleaner elbows.
6. Emission engines — slacken the clips and withdraw 'Pulsair' hoses.
7. Remove the air cleaner from the retaining posts by lifting and easing forward.
8. At the same time disconnect the hose engine breather filter to air cleaner. Place air cleaner to one side.

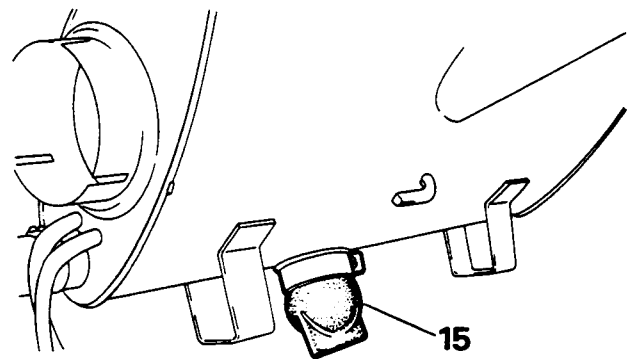


9. Remove hose with the non-return valve from the manifold.
The air cleaner can now be completely removed.
10. Release the two clips at each side of air cleaner casing and withdraw the frames and elements.
11. Release wing nuts and withdraw plate and sealing washers, and discard old elements.
12. Discard any faulty rubber seals.
13. Assemble new elements to air cleaner frames and secure with seals, end plate and wing nuts.
14. Fit the carrier frames and elements into the air cleaner body and secure with clips.



Check air cleaner dump valve

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



Fit air cleaner

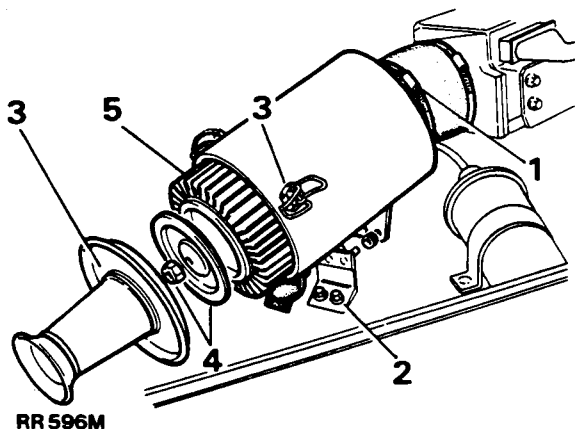
17. Reconnect hose with non-return valve to the manifold connection.
18. Place air cleaner on to the retaining posts.

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19. At the same time reconnect the breather filter hose to the base of the air cleaner.
20. Emission engines — reconnect and secure 'Pulsair' hoses.
21. Refit the air cleaner elbows and tighten clips.
22. Replace air intake on to steady post and reconnect air cleaner and warm air intake hoses. Tighten clip.
23. Reconnect pipe, air cleaner to temperature sensor and vacuum advance/retard pipe to air intake. Position pipes in retaining clips on air intake and tighten clips.

RENEW THE AIR CLEANER ELEMENT—fuel injection type

1. Release the clip securing the hose to the rear of the air cleaner case.
2. Remove the two nuts and bolts securing the air cleaner retaining bracket to the left-hand valance. Remove air cleaner case from the hose, and remove from the vehicle.
3. Unclip the three catches securing the inlet tube to the air cleaner body and remove the inlet tube.
4. Remove the nut and end plate securing the air cleaner element in position.
5. Withdraw and discard the old element.

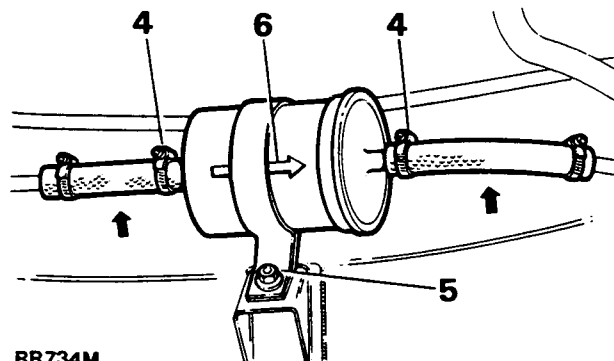


6. Reverse the removal instructions 1 to 5 ensuring that all hose connections are secure.

RENEW FUEL LINE FILTER—fuel injection type

WARNING: The spilling of fuel is unavoidable during this operation. Ensure that all necessary precautions are taken to prevent fire and explosion.

1. Depressurise the fuel system.
2. The fuel line filter is located on the right-hand chassis side member forward of the fuel tank filler neck. Access to the filter is gained through the right-hand rear wheel arch.
3. Clamp the inlet and outlet hoses to prevent the minimum of fuel spillage when disconnecting the hoses. (Denoted by the arrows.)
4. Slacken the two securing clip screws nearest the filter to enable the hoses to be removed from the filter canister.
5. Remove the filter from the chassis side member by releasing the securing bolt and bracket.



Fit new filter

6. Fit a new filter observing the direction of flow arrows stamped on the canister.
7. Start the engine and inspect for fuel leaks around the hose connections.

RENEW FUEL FILTER ELEMENT—carburettor type

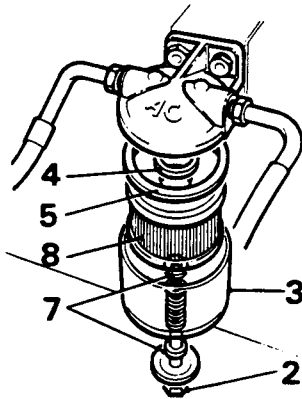
Renew fuel filter element

The element provides a filter between the pump and carburettor and is located on the front LH wing.

Replace as follows:

1. Remove all dirt, grit, grease from around the filter body before dismantling.
2. Unscrew the centre bolt.
3. Withdraw the filter bowl.
4. Remove the small sealing ring and remove the element.
5. Withdraw the large sealing ring from the underside of the filter body.
6. Discard the old element and replace with a new unit.

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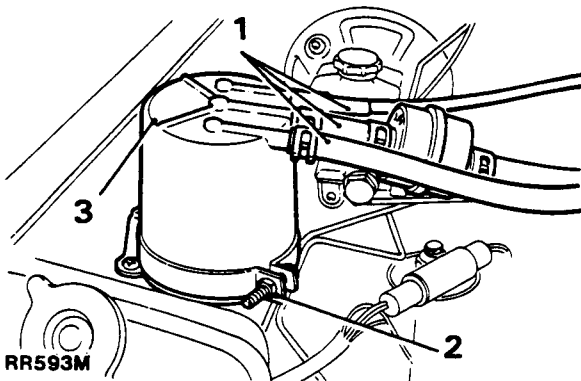


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7. Ensure that the centre and top sealing rings are in good condition and replace as necessary.
8. Fit new element, small hole downwards.
9. Refit sealing rings (small and large).
10. Replace filter bowl and tighten the centre bolt.

RENEW ADSORPTION CANISTER

1. Disconnect from the canister:
 - (i) Canister line to fuel tank.
 - (ii) Canister purge line.
 - (iii) Carburettor vent pipe (blanked off on 'fuel injection models').
2. Slacken the clamp nut screw.
3. Remove the canister.



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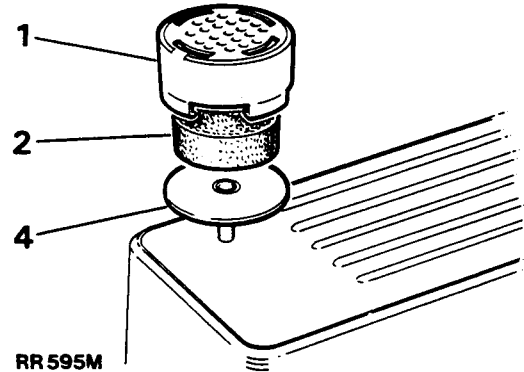
Fit new canister

4. Secure the canister in the clamp.
5. Reverse instructions 1 and 2 above.

WARNING: The use of compressed air to clean an adsorption canister or clear a blockage in the evaporative system is very dangerous. An explosive gas present in a fully saturated canister may be ignited by the heat generated when compressed air passes through the canister.

RENEW CRANKCASE AIR INTAKE FILTER—fuel injection type

1. Prise the filter holder upwards to release it from the rocker cover.



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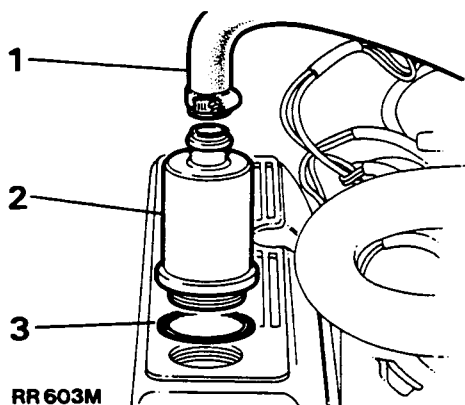
2. Discard the sponge filter.

Fit new filter

3. Insert a new filter into the plastic body.
4. Push filter holder onto the rocker cover until it clips firmly into place.

CLEAN CRANKCASE FLAME TRAP/BREATHER FILTER—fuel injection type

1. Release the hose clip and pull the hose off the canister.
2. Unscrew the canister and remove it from the rocker cover.
3. Remove the large 'O' ring from the screwed end of the canister.



4. Visually inspect the condition of the wire gauze within the canister, if in poor condition renew the whole assembly, if in an acceptable condition clean the gauze as follows:
5. Immerse canister in a small amount of petrol and allow time for the petrol to dissolve and loosen any engine fume debris within the canister.
6. Remove canister from petrol bath and allow to dry out in still air.

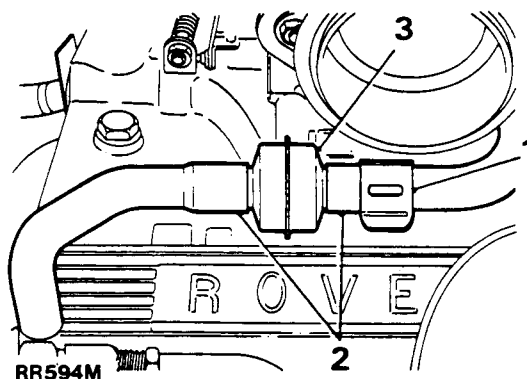
WARNING: Do not use a compressed air line to remove any remaining petrol or particles of debris within the canister as this could cause fire or personal injury.

Refitting the flame trap/breather

7. Fit a new rubber 'O' ring.
8. Screw the flame trap canister into the rocker cover, hand tight only.
9. Refit hose and tighten hose clip securely.

CLEAN OR RENEW ENGINE FLAME TRAP(S)—carburettor type

1. Pull the flame trap hoses out of the retaining clips.
2. Pull the hoses from the flame trap.
3. Withdraw the flame trap.



4. Visually inspect wire gauze inside the flame trap, if in poor condition renew the unit. If the gauze is in a satisfactory condition clean as follows:
5. Immerse flame traps in a small amount of petrol, allow time for the petrol to dissolve and loosen any debris within the flame trap.
6. Allow the flame traps to dry in still air.

WARNING: Do not use a compressed air line to dry or clean the flame traps as this could cause fire or personal injury.

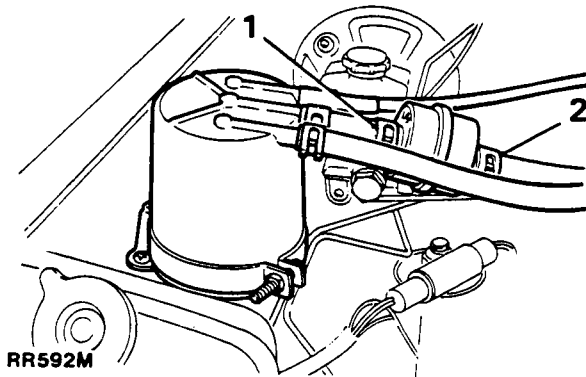
Fit engine flame traps

7. Push the hoses onto the flame trap and ensure that they are secure.
8. Locate the hoses in their respective retaining clips.

RENEW EVAPORATIVE LOSS FILTER—carburettor models

NOTE: Engine breather filters may have alternative locations according to engine build specification.

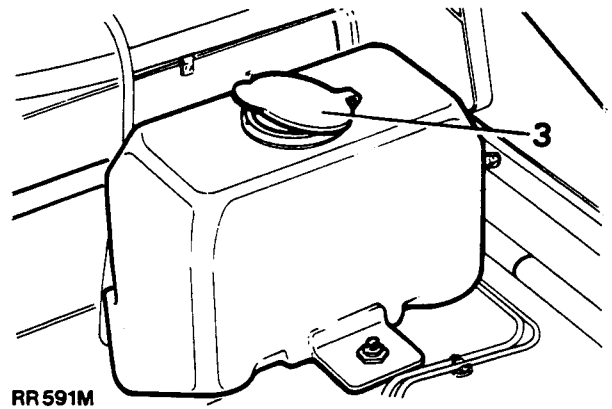
1. Squeeze the short centre hose retaining clip and pull the filter from the hose.
2. Squeeze the hose retaining clip on the opposite end of the filter and remove the hose.



3. Fit a new filter, ensuring that the end of the filter marked 'IN' is fitted to the short hose from the adsorption cannister.

CHECK/ADJUST OPERATION OF ALL WASHERS AND TOP-UP RESERVOIR

1. Check the operation of windscreen, tailgate and headlamp washers.
2. Adjust jets if necessary by inserting a needle or very fine sharp implement into the jet orifice and manoeuvring to alter the jet direction.
3. Unclip the reservoir cap.
4. Top up reservoir to within 25 mm (1 in) below the bottom of the filler neck.
Use a screen washer solvent in the reservoir, this will assist in removing mud, flies and road film.
5. In cold weather to prevent freezing of the water add 'Isopropyl Alcohol' to the reservoir.

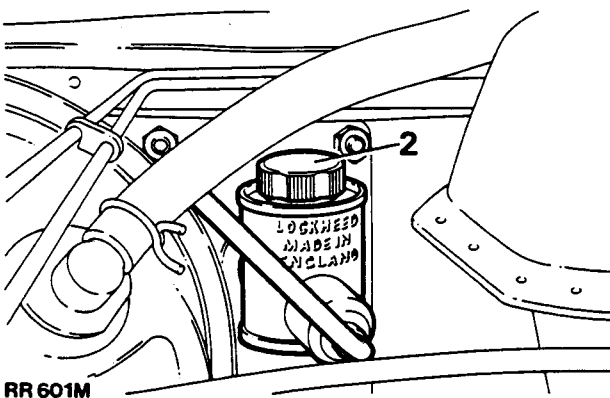


CHECK CLUTCH FLUID RESERVOIR

1. Check the fluid level in the reservoir mounted on the bulkhead adjacent to the brake servo.
2. Remove the cap, top-up if necessary to the bottom of the filler neck. (Use the correct fluid specified in the 'Data' section).

NOTE: If significant topping-up is required check for leaks at master cylinder, slave cylinder and connecting pipes.

3. Check clutch pipes for chafing and corrosion.



CHECK

Check ignition wiring and high tension leads for fraying, chafing and deterioration.

CHECK

Check/adjust ignition timing. (see engine tuning data/procedure) using suitable electronic equipment.

FUEL SYSTEM (All models)

Check all hose connections for leaks and hose deterioration, renew hoses or tighten hose clips as necessary.

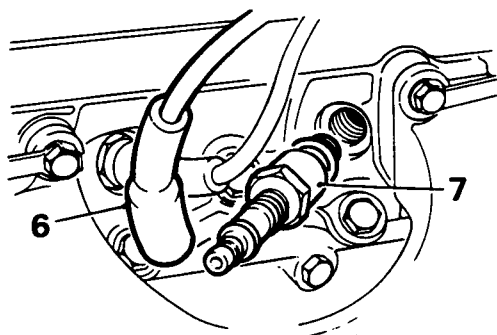
IGNITION

Clean/adjust or renew spark plugs

1. Use the special spark plug spanner and tommy bar supplied in the tool kit when removing or refitting spark plugs.
2. Take great care when fitting spark plugs not to cross-thread the plug, otherwise costly damage to the cylinder head will result.
3. Check or replace the spark plugs as applicable. If the plugs are in good condition, clean and reset the electrode gaps, refer to engine tuning data. At the same time file the end of the central electrode until bright metal can be seen.
4. It is important that only the correct type of spark plugs are used for replacements.
5. Incorrect grades of plugs may lead to piston overheating and engine failure.

To remove spark plugs proceed as follows:

6. Remove the leads from the spark plugs.
7. Remove the plugs and washers.

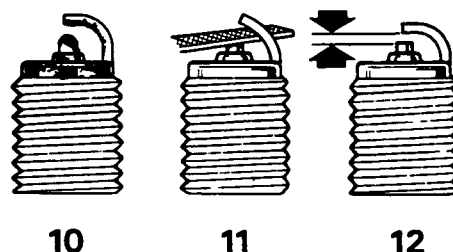


RR474M

Clean the spark plugs

8. (a) Fit the plug into a 14 mm adaptor of an approved spark plug cleaning machine.
 - (b) Wobble the plug in the adaptor with a circular motion for three or four seconds only with the abrasive blast in operation. Important: Excessive abrasive blasting will lead to severe erosion of the insulator nose. Continue to wobble the plug in its adaptor with air only, blasting the plug for a minimum of 30 seconds: this will remove abrasive grit from the plug cavity.
 - (c) Wire-brush the plug threads; open the gap slightly, and vigorously file the electrode sparking surfaces using a point file. This operation is important to ensure correct plug operation by squaring the electrode sparking surfaces.
 - (d) Wash new plugs in petrol to remove protective coating.
9. Set the electrode gap to the recommended clearance.

10. Shows dirty plug.
11. Filing plug electrodes.
12. Clean plug set to correct gap.



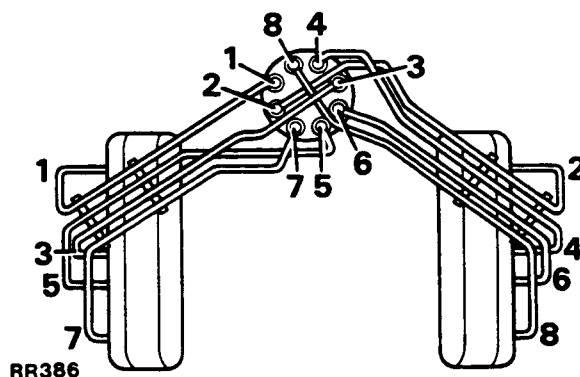
RR740M

13. Test the plugs in accordance with the plug cleaning machine manufacturers' recommendations.
14. If satisfactory the plugs can be refitted.
15. When pushing the leads onto the plugs, ensure that the shrouds are firmly seated on the plugs.

Fitting H.T. leads

16. Ensure that replacement H.T. leads are refitted in their spacing cleats in accordance with the correct layout illustrated.

Failure to observe this instruction may result in cross-firing between two closely fitted leads which are consecutive in the firing order.



RR386

DISTRIBUTOR – LUCAS 35DM8

The electronic ignition employs a Lucas 35DM8 distributor.

The internal operating parts of the distributor are pre-set at the factory and should not normally require resetting.

Adjustments should only be made, if the unit is known to be faulty or damaged.

Maintenance of the distributor consists of the following items.

1. Clean outer surfaces of distributor cap to remove dirt, grease etc.
2. Unclip the cap, check cap for signs of cracking.
3. Wipe inside cap with nap free cloth.
4. Check rotor arm, cap and flash shield for signs of tracking.
5. Apply three drops of clean engine oil to the felt pad in the rotor shaft.

DO NOT DISTURB the clear plastic insulating cover (flash shield) which protects the magnetic pick-up module.

CHECK AIR CONDITIONING SYSTEM (where fitted)

WARNING: Adjustments or rectification operations should be carried out by a Range Rover dealer or an approved automotive air conditioning specialist. Under no circumstances should non-qualified personnel attempt repair or servicing of air conditioning equipment.

The following items should be checked,

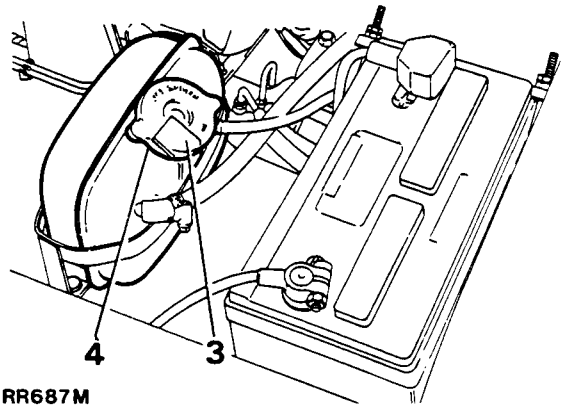
1. **Condenser:** Clean the exterior of the condenser matrix using a water hose or compressed air-line.
2. Check pipe connections for signs of fluid leakage.
3. **Evaporator:** Examine the pipe connections for signs of fluid leakage.
4. **Receiver/drier sight glass:** After running the engine for five minutes with the air conditioning system in operation, examine the sight glass, there should be no sign of bubbles.
5. Check pipe connections for signs of fluid leakage.
6. **Compressor:** Check the pipe connections for fluid leakage and the hoses for swellings.

CHECK/TOP UP COOLING SYSTEM

1. To prevent corrosion of the aluminium alloy engine parts it is imperative that the cooling system is filled with a solution of water and anti-freeze, winter or summer, or water and inhibitor during the summer only. Never fill or top up with plain water.
2. The expansion tank filler cap is under the bonnet.
3. With a cold engine, the correct coolant level should be up to the 'Water Level' plate situated inside the expansion tank below the filler neck.

WARNING: Do not remove the filler cap when engine is hot because the cooling system is pressurised and personal scalding could result.

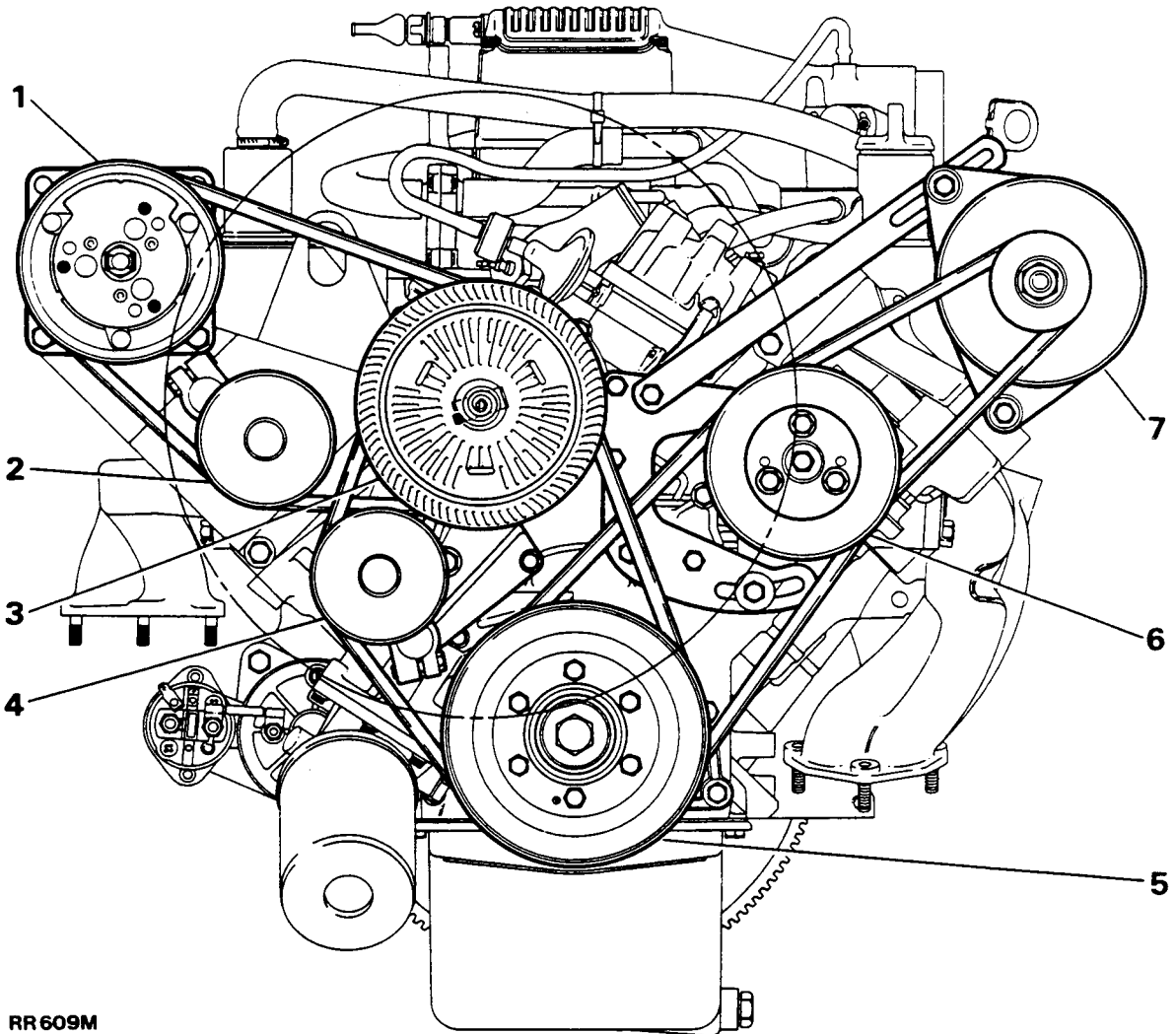
4. When removing the filler cap, first turn it anti-clockwise a quarter of a turn and allow all pressure to escape, before turning further in the same direction to lift it off.



5. When replacing the filler cap it is important that it is tightened down fully, not just to the first stop. Failure to tighten the filler cap properly may result in water loss, with possible damage to the engine through overheating. Use soft water whenever possible, if local water supply is hard, rainwater should be used.

Check cooling/heater systems for leaks and hoses for security and condition.

Cooling system hoses should be changed at the first signs of deterioration.



RR 609M

1. Air conditioning compressor
2. Jockey wheel
3. Viscous fan—water pump unit
4. Jockey wheel
5. Crankshaft
6. Power steering pump
7. Alternator

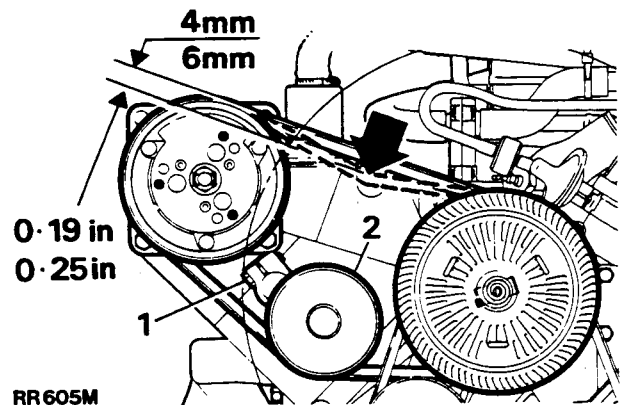
1. Slacken the jockey wheel securing bolt.
2. Adjust the position of the jockey wheel until the correct tension is obtained.
3. Tighten the securing bolt and re-check the belt tension.

DRIVE BELTS—adjust or renew

COMPRESSOR DRIVE BELT

The belt must be tight with not more than 4 to 6 mm (0.19 to 0.25 in) total deflection when checked by hand midway between the pulleys on the longest run.

Where a belt has stretched beyond the limits, a noisy whine or knock will often be evident during operation, if necessary adjust as follows:

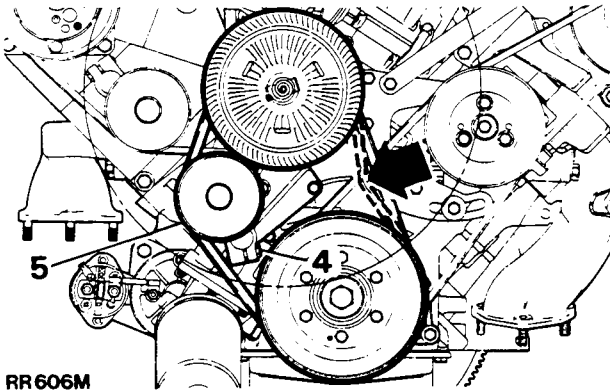


RR 605M

Check driving belts, adjust or renew as necessary

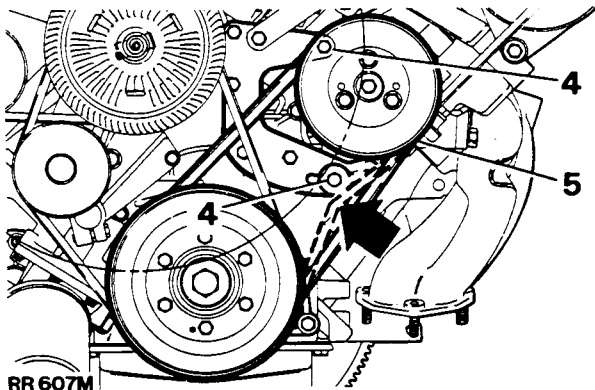
1. Examine the following belts for wear and condition and renew if necessary:
 - (A) Crankshaft—Jockey Pulley—Water Pump
 - (B) Crankshaft—Steering Pump
 - (C) Steering Pump—Alternator

Illustration A



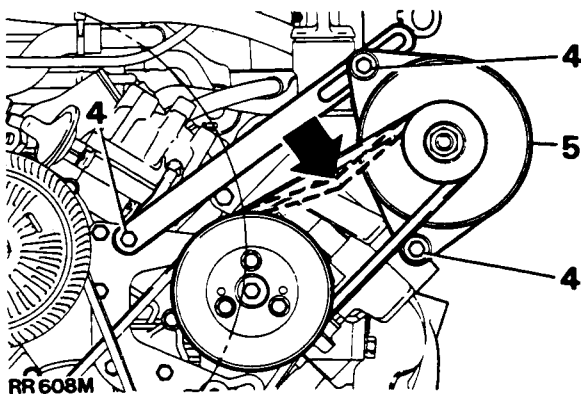
RR 606M

Illustration B



RR 607M

Illustration C



RR 608M

2. Each belt should be sufficiently tight to drive the appropriate auxiliary without undue load on the bearings.
3. Slacken the bolts securing the unit to its mounting bracket.
4. Slacken the appropriate pivot bolt or jockey wheel and the fixing at the adjustment link where applicable.
5. Pivot the unit inwards or outwards as necessary and adjust until the correct belt tension is obtained.
6. Belt tension should be approximately 11 to 14 mm (0.437 to 0.562 in) at the points denoted by the bold arrows.
7. Tighten all unit adjusting bolts. Check adjustment again, when a new belt is fitted, after approximately 1,500 km (1,000 miles) running.

CHECK AIR INTAKE TEMPERATURE CONTROL SYSTEM—carburettor type

1. Check operation of the mixing flap valve in the air cleaner by starting the engine from cold and observing the flap valve as the engine temperature rises.
2. The valve should start to open slowly within a few minutes of starting and continue to open until a stabilised position is achieved. This position and the speed of operation will be entirely dependent on prevailing ambient conditions.
3. Failure to operate indicates failure of flap valve vacuum capsule or thermostatically controlled vacuum switch or both.
4. Check by connecting a pipe directly from the banjo on No. 8 point inlet manifold to the flap valves, thus bypassing the temperature sensor.
5. If movement of the flap valve is evident the temperature sensor is faulty. If no movement is detected, the vacuum capsule is faulty.
6. Fit new parts where necessary.

STEERING AND SUSPENSION

Check condition and security of steering unit, joints, relays and gaiters

Check steering box for oil/fluid leaks

Check shock absorbers for fluid leaks

Check power steering system for leaks, hydraulic pipes and unions for chafing and corrosion

Check security of suspension fixings

CHECK STEERING BALL JOINTS

Ball joints are lubricated for the normal life of ball joints during manufacture and require no further lubrication. This applies only if the rubber gaiter has not become dislodged or damaged. The joints should be checked at the specified mileage intervals but more frequently if the vehicle is used under arduous conditions.

1. Check for wear in the joints by moving the ball joint up and down vigorously. If free movement is apparent renew the complete joint assembly.

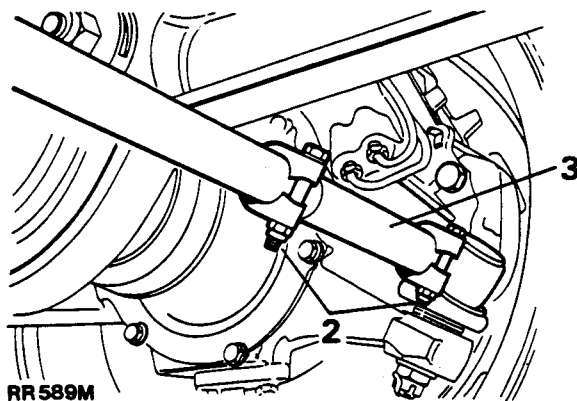
Check/adjust front wheel alignment

Use recognised wheel alignment equipment to perform this check and adjustment.

See 'Data' section for the correct alignment.

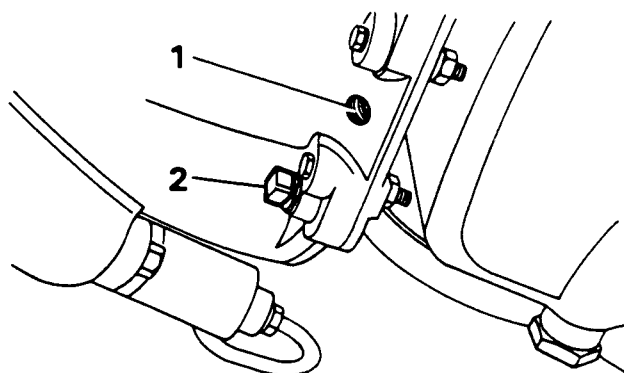
To adjust

1. Set the vehicle on level ground, with the road wheels in the straightforward position, and push it forward a short distance.
2. Slacken the clamps securing the adjusting shaft to the track rod.
3. Turn the adjusting shaft to decrease or increase the effective length of the track rod, as necessary, until the toe-out is correct.
4. Re-tighten the clamps.
5. Push the vehicle rearwards, turning the steering wheel from side to side to settle the ball joints. Then with the road wheels in the straight ahead position, push the vehicle forward a short distance.
6. Re-check the toe-out. If necessary carry out further adjustment.



Drain flywheel housing if drain plug is fitted for wading

1. The flywheel housing can be completely sealed to exclude mud and water under severe wading conditions, by means of a plug fitted in the bottom of the housing.
2. The plug is screwed into the housing adjacent to the drain hole, and should only be fitted when the vehicle is expected to do wading or very muddy work.
3. When the plug is in use it must be removed periodically and all oil allowed to drain off before the plug is replaced.



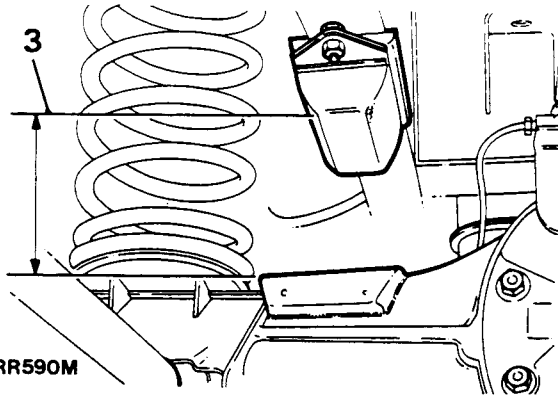
RR105M

CHECK ROAD SPRINGS

Verify that the vehicle is being operated within the specified maximum loading capabilities. Drive the vehicle onto level ground and remove all loads. Should the vehicle lean to one side it indicates a fault with the springs or shock absorbers, not the self-levelling unit. If the levelling unit is believed to be at fault, the procedure below should be followed:

1. Check the levelling unit for excessive oil leakage and if present the unit must be changed. Slight oil seepage is permissible.
2. Remove any excessive mud deposits and loose items from the rear seat and load area.
3. Measure the clearance between the rear axle bump pad and the bump stop rubber at the front outer corner on both sides of the vehicle. The average clearance should be in excess of 67 mm (2.8 in). If it is less than this figure remove the rear springs and check their free length against the 'Road Spring Data'. Replace any spring whose free length is more than 20 mm (0.787 in) shorter than the figure given. If after replacing a spring the average bump clearance is still less than 67 mm (2.8 in), replace the levelling unit.

Continued



RR590M

4. With the rear seat upright, load 450 kg (992 lb) into the rear of the vehicle, distributing the load evenly over the floor area. Check the bump stop clearance, with the driving seat occupied.
5. Drive the vehicle for approximately 5 km (3 miles) over undulating roads or graded tracks. Bring the vehicle to rest by light brake application so as not to disturb the vehicle loading. With the driving seat occupied, check the bump stop clearance again.
6. If the change in clearance is less than 20 mm (0.787 in) the levelling unit must be replaced.

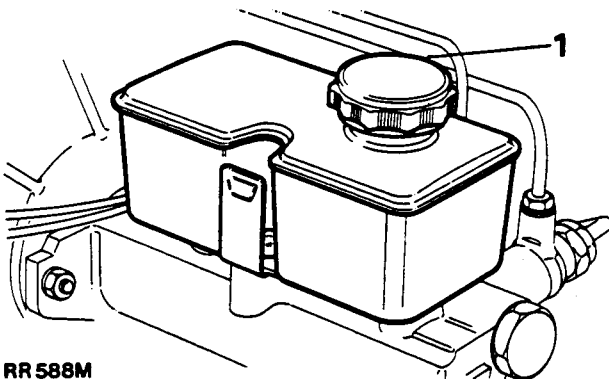
BRAKES

Check visually, hydraulic pipes and unions for chafing, leaks and corrosion.

Check/top up brake fluid reservoir

The tandem brake reservoir is integral with the servo unit and master cylinder.

1. Remove cap to check fluid level; top up if necessary until the fluid reaches the bottom of the filter neck. See 'Data' section for recommended fluids.
2. If significant topping up is required check master cylinder, brake disc cylinders and brake pipes and connections for leakage; any leakage must be rectified immediately.



RR 588M

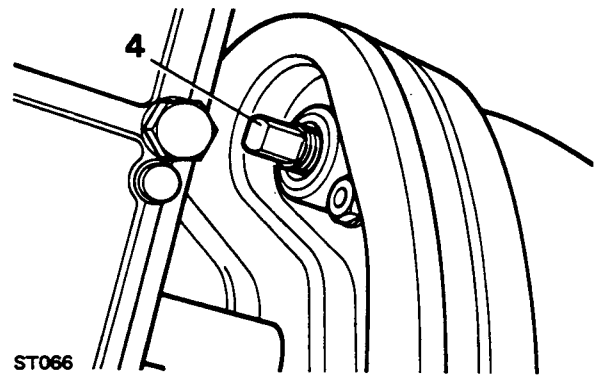
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CAUTION: When topping-up the reservoir, care should be taken to ensure that brake fluid does not come into contact with any paintwork on the vehicle.

CHECK AND ADJUST TRANSMISSION BRAKE (Handbrake)

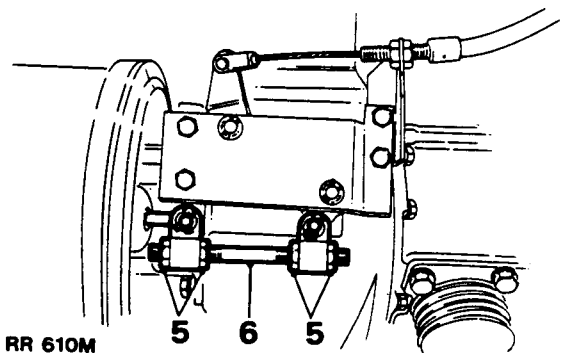
The handbrake lever acts on a transmission brake at the rear of the transfer box.

1. Set the vehicle on level ground.
2. Fully release the handbrake.
3. Disconnect the handbrake cable linkage at the transmission brake drum by removing the split pin, plain and spring washer and clevis pin.
4. Turn the adjuster on the back plate clockwise until the shoes are fully expanded against the drum.
5. Slacken the four locknuts on the handbrake adjustment link.



ST066

6. Rotate the link clockwise or anti-clockwise until the clevis pin holes in the link bracket and brake drum lever line up.
7. Fit the clevis pin, plain and spring washer and a new split pin, lightly grease the assembly.
8. Fully tighten the four link locknuts.



RR 610M

9. Slacken the brake drum adjuster, until the handbrake becomes fully operational on the third or fourth notch of the handbrake lever quadrant.

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

CHECK FOOTBRAKE OPERATION

If the footbrake is 'spongy' bleed the brake system. Check all hoses and pipes for security, fractures and leaks. Renew as necessary.

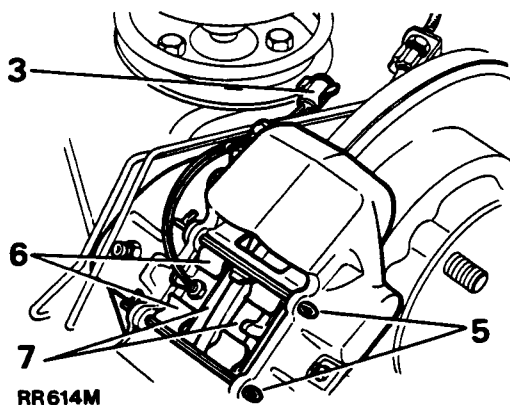
RENEW FRONT AND REAR BRAKE PADS

Brake pad wear is indicated by a pad wear warning light incorporated into the instrument binnacle. The warning lamp is illuminated when pad wear is reduced to approximately 3.0 mm (0.118 in). The system is operated by an electrical sensor incorporated into the front and rear right-hand side inboard brake pads.

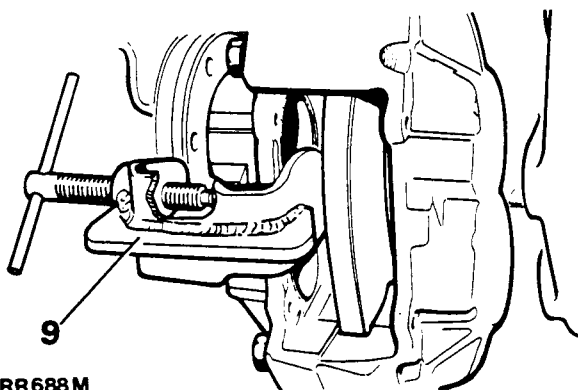
When pad wear is sufficient in either front or rear pads allowing the sensor within the pads to complete a circuit to earth through the disc, thus illuminating the warning lamp in the instrument binnacle.

Renew front brake pads

1. Slacken both front wheel nuts, jack up the vehicle and lower onto axle stands.
2. Disconnect the battery.
3. Disconnect the two-pin electrical plug at the rear of the disc mudshield (front right-hand side only).
4. Clean the exterior of the calipers.
5. Remove the split pins from the brake caliper.
6. Remove the retaining springs.
7. Withdraw the brake pads.
8. Clean the exposed parts of the pistons, using new brake fluid.



9. Using piston clamp 18G672 press each piston back into its bore, whilst ensuring that the displaced brake fluid does not overflow from the reservoir.
10. Smear the faces of the pistons with Lockheed disc brake lubricant taking care not to let any reach the lining material.



RR688M

11. Insert the new brake pads.
12. Place the brake pad retaining springs in position, fit new split pins and splay the ends.
13. Apply the footbrake several times to locate the pads.
14. Check the fluid reservoir and top-up if necessary.
15. Fit the road wheels, lower the vehicle and finally tighten the road wheels.

Renew rear brake pads

Jacking up the rear of the vehicle, follow the procedure as for front pads.

1. The two-pin electrical plug for rear brake pad wear indication is located on the rear left-hand inboard pad.

CHECK BRAKE SERVO HOSE(S)

Visually inspect all servo hoses and connections for condition and security.

RENEW BRAKE FLUID

Brake fluid absorbs water and in time the boiling point of the fluid will be lowered sufficiently to cause the fluid to be vapourised by the heat generated when the vehicle brakes are applied. This will result in loss of braking efficiency or in extreme cases brake failure.

Therefore, all fluid in the brake system should be changed every eighteen months or 30,000 km (18,000 miles), whichever is the sooner. It should also be changed before touring in mountainous areas if not done in the previous nine months.

Care must be taken always to observe the following points:

- (a) At all times use the recommended brake fluid.
- (b) Never leave fluid in unsealed containers. It absorbs moisture quickly and can be dangerous if used in the braking system in this condition.

Continued

- (c) Fluid drained from the system or used for bleeding is best discarded.
 - (b) The necessity for absolute cleanliness throughout cannot be over emphasised.
-

CLEAN THE THROTTLE BUTTERFLY HOUSING— plenum chamber

Fuel injection

At regular service intervals it is recommended that any carbon/oil build up around the throttle butterfly seat (plenum chamber bore), should be removed using a suitable solvent.

1. Remove the inlet pipe from the plenum chamber inlet neck.
 2. Open the throttle butterfly and remove any carbon/oil deposits around the butterfly seating.
 3. Refit inlet pipe.
 4. Check idle speed (see 'Engine Tuning Data').
 5. Check and reset CO levels as necessary (see 'Engine Tuning Data').
-

BATTERY

A low maintenance battery is installed in the vehicle. Dependent upon climate conditions the electrolyte levels should be checked as follows:

Temperate climates every three years.
Hot climates every year.

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

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

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

