MAINTENANCE

Summary Chart

Routine Maintenance Operations

SUMMARY

1. Check engine oil level and water level in radiator daily or weekly depending on operating conditions.
2. Drain and refill engine sump every 10.000 km (6,000 miles) or every six months, whichever comes first.
3. Every month and every maintenance inspection check tyre pressures and inspect tyre treads; under arduous cross-country conditions the tyre pressures should be checked much more frequently, even to the extent of a daily check. If front wheel tread wear is uneven, check wheel alignment.
4. Every month and every maintenance inspection check fluid level in brake fluid reservoir and battery acid level.
5. Brakes. Change brake fluid every 20.000 km (12,000 miles) or twelve months.
6. Refer to VEH G309 for correct lubricants.

* Asterisk indicates operation to be carried out at appropriate servicing interval + 1000.

LUB defines operation which may be carried out in a Lubrication Bay.

		1.500 km Free Service	6 18 30 42 months 10 30 50 70 km	12 24 36 48 months 20 40 60 80 km
ENGINE COMPARTMENT. Check/report for oil leaks		*	*	*
Check/top-up oil level in steering box	*LUB*		*	*
Check/report condition of steering unit for security and backlash			*	*
Check/top-up clutch fluid reservoir: Castrol Girling Brake and Clutch Fluid 'Crimson' Specification J1703	*LUB*	*	*	*
Check/top-up brake fluid reservoir: Castrol Girling Brake and Clutch Fluid 'Crimson' Specification J1703	*LUB*	*	*	*
Change fuel filter element				*
Replace engine flame trap				*
Replace fuel evaporative charcoal container				Every 80 km or 48 mths
Replace charcoal container air filter			*	
Check/clean fuel emission hoses and connections			*	
Lubricate accelerator linkage and check operation		*	*	*
Check/top-up carburettor piston damper: 6 mm (0.25 in.) from top of tube		*	*	*
Check/adjust carburettor mixture and slow running		*	*	*
Empty/clean and refill oil bath air cleaner. Capacity: 0.5 litres (1.0 Imperial pints)	*LUB*			*
Check/adjust, if necessary report condition of distributor contact points. Gap: 0,40 to 0.50 mm (0.016 to 0.020 in.)		*	*	*
Check/adjust, if neccesary replace distributor contact points. Gap: 0,35 to 0,40 mm (0.014 to 0.016 in.)				*
Lubricate distributor and check automatic advance		*	*	*
Check/report condition of ignition leads and connections				*
Clean/adjust sparking plugs. Gap: 0,60 to 0,70 mm (0.023 to 0.031 in.)			*	
Replace spark plugs: Gap: 0,60 to 0,70 mm (0.023 to 0.031 in.)				
Bosch W175T2				*
Clean engine breather filters				*
Check/top-up battery		*	*	*
Check battery condition, grease connections if necessary			*	*
Check/top-up cooling system: 12,0 to 19,0 mm (0.5 to 0.75 in.) below bottom of filler neck (engine cold)		*	*	*
Examine/report cooling and heater system for leaks (renew hoses every 80.000 km (48,000 miles)		*	*	*
Check/top-up windscreen washer reservoir, 25 mm (1 in.) below filler neck		*	*	*
Check/adjust driving belt: 8 to 11 mm (0.312 to 0.437 in.) free movement		*		
Check/adjust, report condition of driving belt: 8 to 11 mm (0.312 to 0.437 in.) free movement			*	*
Check security of engine mountings		*		
Check/adjust tappet clearance:				
Inlet: 0,15 mm (0.006 in.) engine hot. Exhaust: 0.25 mm (0.010 in.) engine hot or cold				*
Check/adjust ignition timing, using electronic equipment				
2° ATDC (90 octane fuel)		*	*	*

* Asterisk indicates operation to be carried out at appropriate servicing interval + 1000.

LUB defines operations which may be carried out in a Lubrication Bay.

	1.500 km Free Service	6 18 30 42 months 10 30 50 70 km	12 24 36 48 months 20 40 60 80 km
UNDER BODY. Check/report for oil leaks	*	*	*
Check/report steering joints for securing backlash and gaiter condition	*	*	*
Check/top-up oil level in front winch (where fitted) *LUB*		*	*
Drain winch and refill *LUB*	*		*
Check/top-up oil level of front differential *LUB*		*	*
Drain front differential oil and refill, also every 20.000 km (12,000 miles). Capacity: 1,75 litres (3 Imperial pints) *LUB*	*		*
Check/top-up oil level of swivel pin housings *LUB*		*	*
Drain swivel pin housings and refill, also every 20.000 km (12,000 miles). Capacity: 0,5 litre (1 Imperial pint) *LUB*	*		*
Drain engine oil and refill. Capacity: 6,8 litres (12 Imperial pints) *LUB*	*	*	*
Renew oil filter element (add 0.5 litre to above amount) *LUB*	*	*	
Drain flywheel housing when drain plug is fitted		*	*
Check/top-up oil level of main and transfer gearbox *LUB*	*	*	
Drain main and transfer geabox oils and refill, also every 20.000 km (12,000 miles)	*		*
Capacities: Main gearbox: 1,5 litres (2.5 Imperial pints.). Transfer gearbox: 2,5 litres (4.5 Imperial pints) *LUB*			*
Check/top-up level in power take-off (where fitted) *LUB*	*	*	
Drain power take-off and refill (where fitted) *LUB*	*		*
Power take-off universal drive joints *LUB*			*
Lubricate handbrake linkage *LUB*	*	*	
Lubricate propeller shafts *LUB*	*	*	*
Lubricate front propeller shaft sealed sliding joint every 20.000 km (12,000 miles)			*
Check/top-up oil level of rear differential *LUB*			*
Drain rear differential oil and refill also every 20.000 km (12,000 miles). Capacity: 2,6 litres (4.5 Imperial pints) *LUB*			*
Lubricate pintle hook *LUB*	*	*	*
Check security of transmission fixings	*		
Check/report exhaust for leakage and security	*	*	*
Check visually/report fuel, clutch and brake pipes, unions and hoses for leakage, chaffing, corrosion or damage	*	*	*
PASSENGER COMPARTMENT. Check operation of foot and handbrake		*	*
Check operation of all lamps, direction indicators, warning lights, horns, instruments and other equipment	*	*	*
Check/report condition and security of seats and safety belts		*	*
Check/report rear view mirrors for looseness, cracks or crazing		*	*
Check operation of doors locks, window controls, safety catches, bonnet catch, etc., and lubricate	*	*	*
EXTERIOR. Inspect/report brake linnings for wear, drums for condition		*	*
Check tightness of road wheel fastenings	*	*	*
Check the tyres are in accordance with Manufacturer's specification		*	*
Check visually/report tyres for bulges, cuts or damage, unusual wear and tread depth of at least 1 mm	*	*	*
Check for correct tyre pressure, including spare	*	*	*
Check, if necessary adjust headlamp alignment	*	*	*
Check, if necessary replace windscreen wiper blades		*	*
Check/top-up lubricant in steering relay unit			*
Check/adjust front wheel alignment: 1,2 to 2,4 mm (0.046 to 0.093 in.) toe-in	*		
Check/report front wheel alignment: 1,2 to 2,4 mm (0.046 to 0.093 in.) toe-in		*	*
ROAD TEST. Road or roller test/report additional work required	*	*	*
Check for oil leaks	*	*	*
Ensure cleanliness of controls, door handles, steering wheel, etc.	*	*	*

Engine Compartment

Every Maintenance Inspection

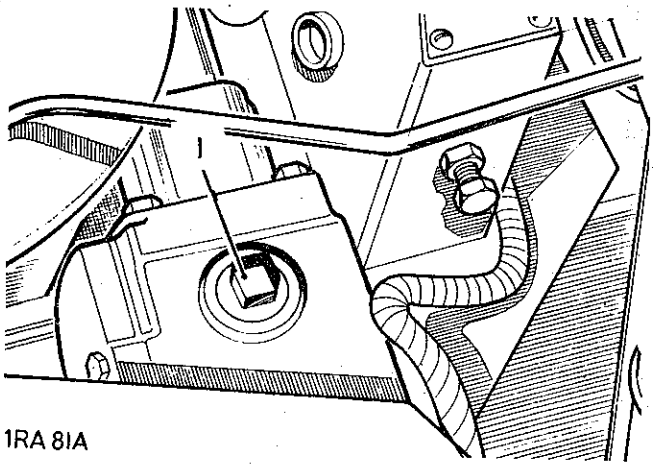
Check for oil leaks in engine compartment; rectify as necessary.

Steering box oil level—At free service 1.500 km (1,000 miles) and thereafter every 20.000 km (12,000 miles) or 12 months.

1. Check oil level and top up if necessary to the bottom of the filler-plug hole on the top of the cover plate. Access to the plug is gained by lifting the bonnet panel.
2. If significant topping up is required check for oil leaks at joint faces and rocker shaft oil seal.

Steering box—Every 10.000 km (6,000 miles) or 6 months.

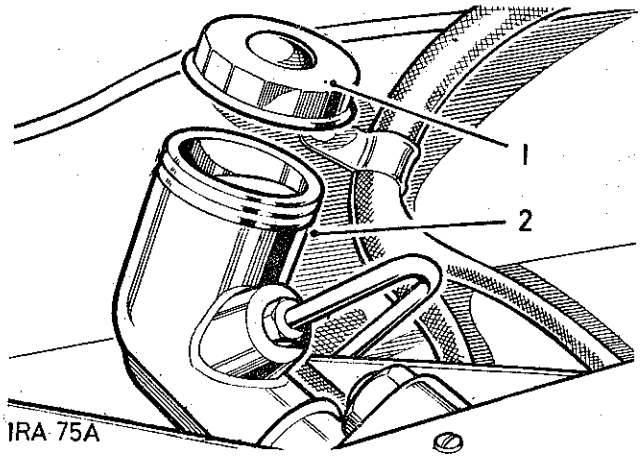
Check steering box mountings for security and steering box for backlash. Rectify as necessary.



1RA 81A

Clutch fluid reservoir—Every maintenance Inspection.

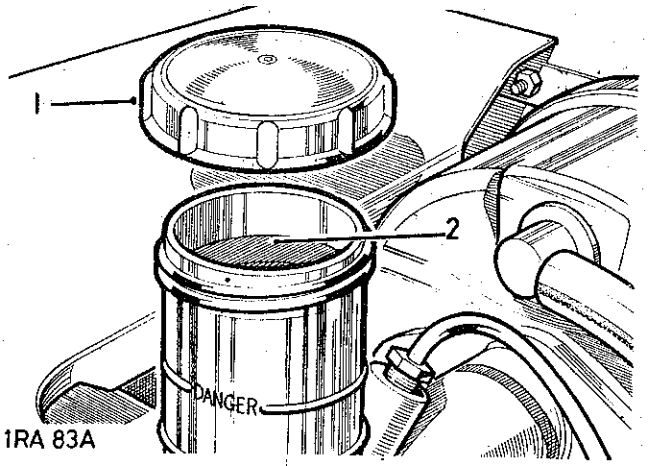
1. Check fluid level in reservoir by removing cap.
2. Top up to top of reservoir.



1RA 75A

Brake fluid reservoir—Every month and at every maintenance inspection.

1. Check fluid level in brake reservoir by removing cap.
2. Top up to level of filter screen.



1RA 83A

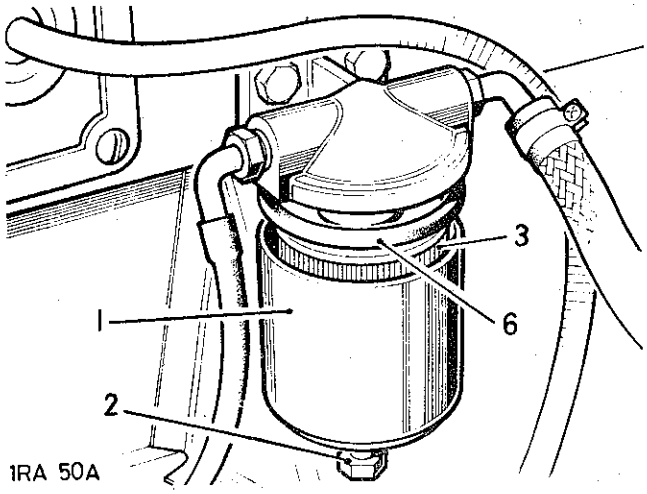
Engine Compartment

Fuel filter element, 6 cylinder models—Every 20.000 km (12,000 miles) or 12 months.

The fuel filter element, located on the rear end of the inlet manifold, provides additional filtration between pump and carburettor.

Replace element as follows:

1. Support element holder.
2. Unsrew the special bolt at bottom of filter. The element holder can now be removed.
3. Remove and discard the used element.
4. Thoroughly clean the element holder in petrol.
5. If necessary renew the upper and lower centre seals and also the seal for the centre bolt.
6. Fit the new element, large hole uppermost into the holder using the seal supplied with the element.
7. Place the element holder in position and secure with the special bolt.
8. Start the engine and check for fuel leaks.



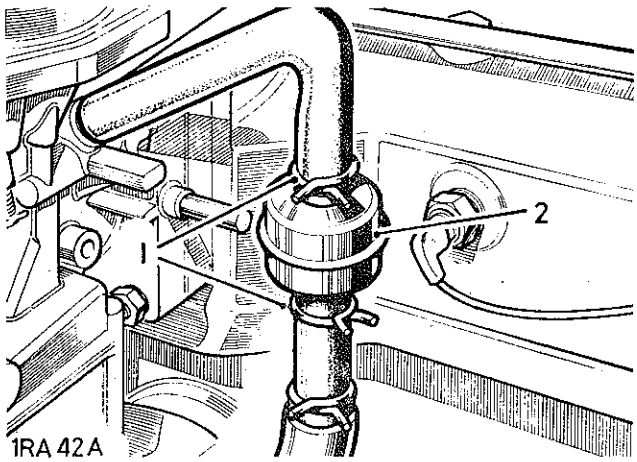
1RA 50A

Crankcase emission control, flame-trap type

Every 20.000 km (12,000 miles) or 12 months.

Replace as follows:

1. Detach the rubber hoses from each side of the flame trap by compressing the clips.
2. Withdraw flame trap.
3. Fit new flame trap by reversing removal procedure.
4. Warm up engine and re-adjust carburettor if necessary.



1RA 42A

Evaporative emission control system

Charcoal container—Every 80.000 km (48,000 miles) or 4 years.

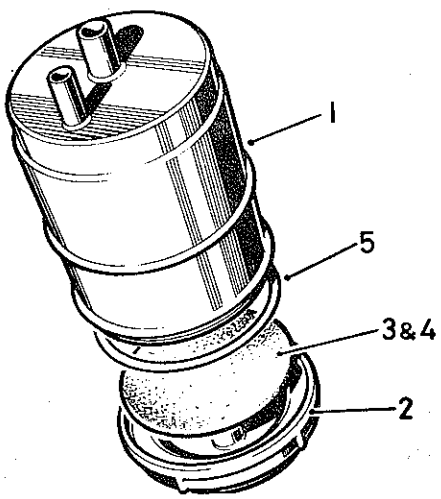
NOTE: Under normal operating conditions the charcoal container, situated at the right hand rear of the engine compartment, should require replacement only at 80.000 km (48,000 miles) intervals. If for any reason liquid fuel should find its way into the charcoal container, indicated by fuel weeping at the air inlet pipe, replace the container immediately, regardless of the mileage.

Air filter replacement—Every 20.000 km (12,000 miles) or 12 months.

Replace filter as follows:

1. Remove the container.
2. With filter inverted, unscrew the end cap from the container base.
3. Withdraw the filter.
4. Fit new filter with smooth side inward.
5. Re-assemble, using a new end cap seal.

NOTE: Position "open to atmosphere" pipe inboard and toward the rear of the engine compartment.

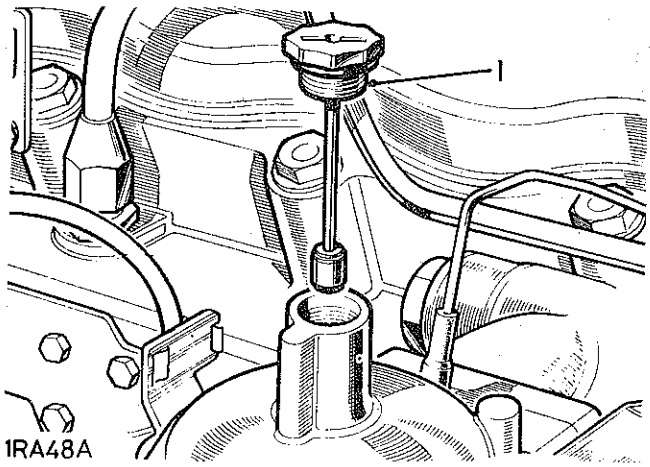


1RA179A

Engine Compartment

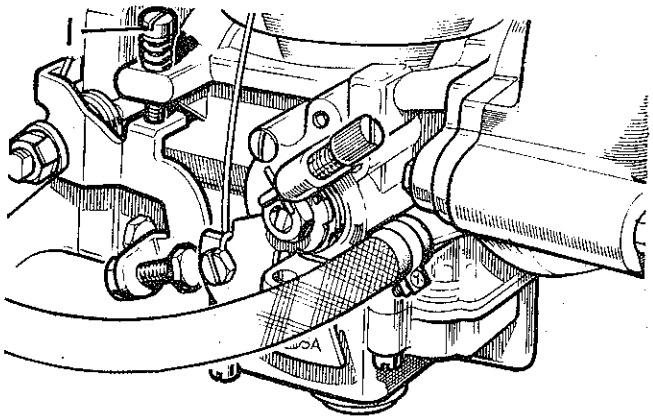
Accelerator linkage, 6 cylinder models—At free service 1.500 km (1,000 miles) and thereafter every 10.000 km (6,000 miles) or 6 months.

1. Prior to carburettor adjustments, lubricate the accelerator linkage using clean engine oil, paying particular attention to accelerator cross shaft bearings and ball joint sockets on the control rods.
2. Check the linkage for correct operation and ensure that there is no tendency to stick. Badly worn parts should be replaced as soon as possible.



Carburettor hydraulic damper—At free service 1.500 km (1,000 miles) and thereafter every 10.000 km (6,000 miles) or 6 months. 6-cylinder Petrol models.

1. Unscrew the cap on top of the suction chamber, withdraw cap and hydraulic damper, replenish the damper reservoir as necessary with engine oil to within about 6 mm (0.25 in.) from top of the tube. Then replace cap and hydraulic damper.



Carburettor slow-running adjustment—At free service 1.500 km (1,000 miles) and thereafter every 10.000 km (6,000 miles) or 6 months.

1. Run the engine until normal operating temperature is obtained. If necessary, adjust slow-run screw to give the correct idling speed of approximately 650 rev./min.
2. To check mixture control refer 19.15.17 Sheet 5.

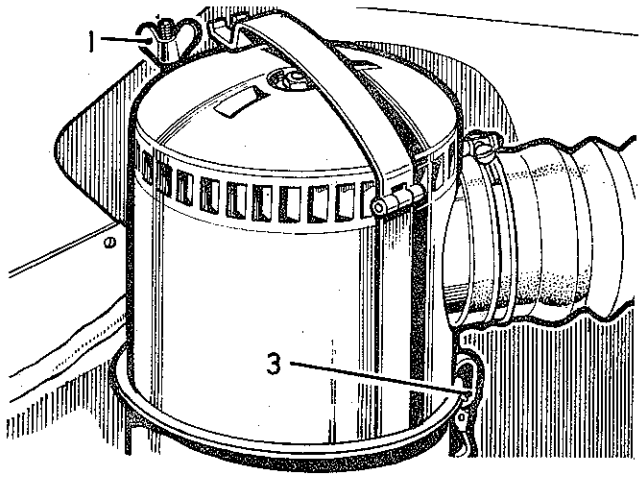
Air cleaner All models—At free service 1.500 km (1,000 miles) and thereafter every 20.000 km (12,000 miles) or 12 months.

Attention to the air cleaner is extremely important, especially under dusty conditions, as engine wear generally will be seriously affected if the vehicle is run with an excessive amount of sludge in the cleaner oil bath.

In cases where the vehicle is operated under dusty road or field conditions, attention must be more frequent, even to the extent of a daily oil change; under extremely bad conditions, cleaning twice daily may be called for.

Proceed as follows:

1. Slacken wing nut and release the clamping strap securing the complete air cleaner.
2. Disconnect the outlet elbow from the carburettor intake pipe and remove the cleaner from the vehicle.
3. Remove the oil bowl from the bottom of the cleaner by releasing the three securing clips.
4. Clean all dirty oil and sludge from the bowl and refill with fresh engine oil to the level indicated by a ring formed in the pressing; the capacity is approximately 0,5 litre (1.0 Imperial pints).
5. Clean the filter in the cleaner body by swilling the complete body in petrol or paraffin and shake off the surplus.
6. Replace the bowl and refit the complete unit in the vehicle.

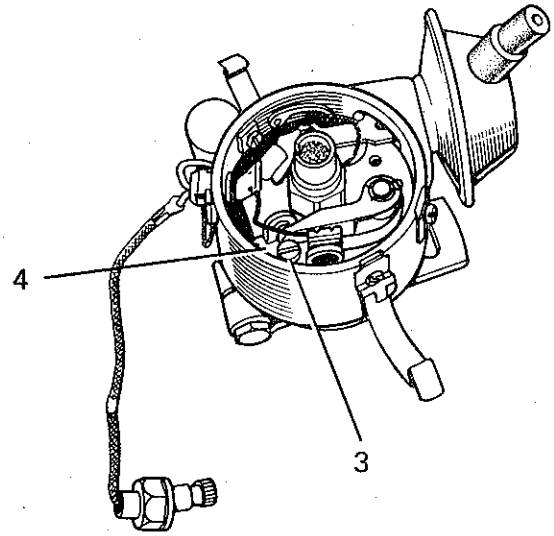


Engine compartment

Distributor contact points—At free service 1.500 km (1,000 miles) and thereafter every 10.000 km (6,000 miles) or 6 months. Replace every 20.000 km (12,000 miles) or 12 months.

Check and adjust the contact points clearance as follows.

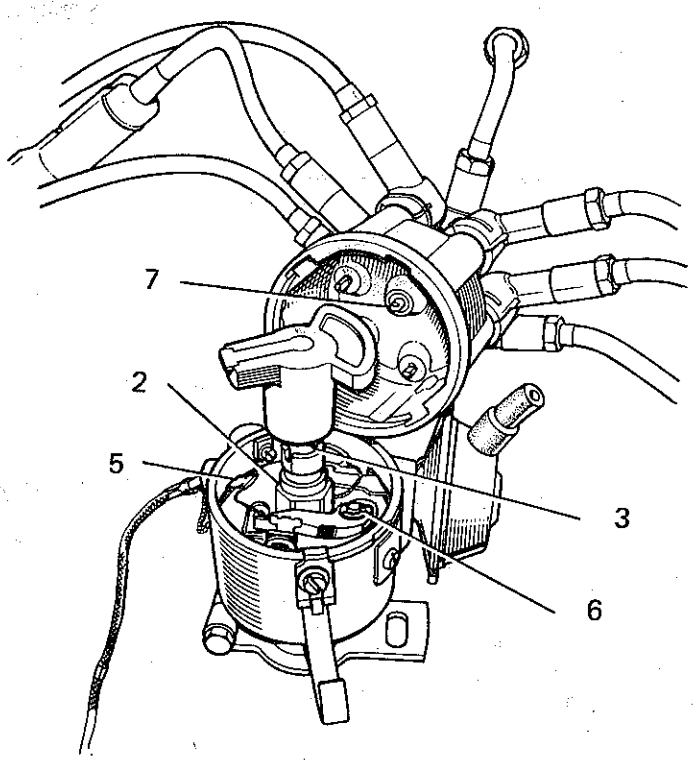
1. Remove the distributor cap and rotor arm; then turn the engine, using the starting handle, until the contacts are fully open.
2. **The clearance should be 0,40 to 0,50 mm (0.016 to 0.020 in.) with the feeler gauge a sliding fit between the contacts.**
3. If necessary, slacken the screw which secures the adjustable contact.
4. Adjust by the adjuster slot until the clearance is correct; re-tighten the retaining screw.
5. Replace the rotor arm and distributor cap.



Distributor maintenance—At free service 1.500 km (1,000 miles) and thereafter every 10.000 km (6,000 miles) or 6 months.

Lubricate as follows:

1. **Remove the distributor cap and rotor arm.**
2. **Lightly smear the cam with light grease.**
3. **Add a few drops of thin machine oil to lubricate the cam bearing and distributor shaft.**
4. **Add a few drops of thin machine oil through the side of the contact breaker base plate, to lubricate the automatic timing control.**
5. **Remove the slide-on clip on the terminal block, circlip and shim washer, then remove moving contact, also remove adjustable contact secured with a screw. Ensure that the contacts are free from grease or oil; if they are burned or blackened, clean with a fine carborundum stone and wipe with a petrol-moistened cloth.**
6. **Add a few drops of thin machine oil to the contact pivot before replacing the contacts. Then adjust as detailed in previous operation.**
7. **Wipe the inside and outside of the cap with a soft dry cloth; ensure that the small carbon brush works freely in its holder.**
8. **Replace rotor arm and distributor cap.**

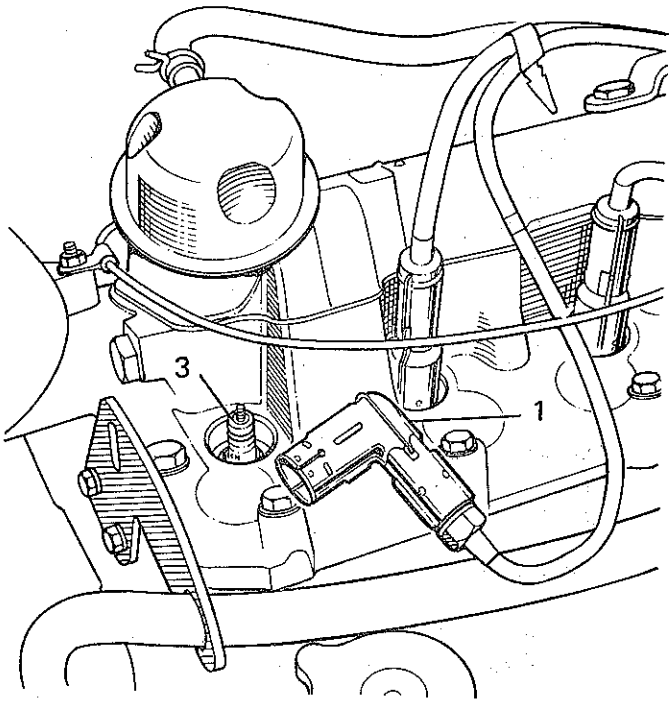


Engine compartment

High tension leads—Check every 20.000 km (12,000 miles) or 12 months.

NOTE: All ignition leads are radio suppressed. Distributor to spark plugs are fitted with special caps each end; if faulty, these caps and leads are replaced as a unit and when re-assembling leads to the cap, a light smear on the lead end with silicon grease is recommended. Silicon grease is also smeared on the distributor to coil lead.
This grease helps repell water, as well as eliminating radio interference.

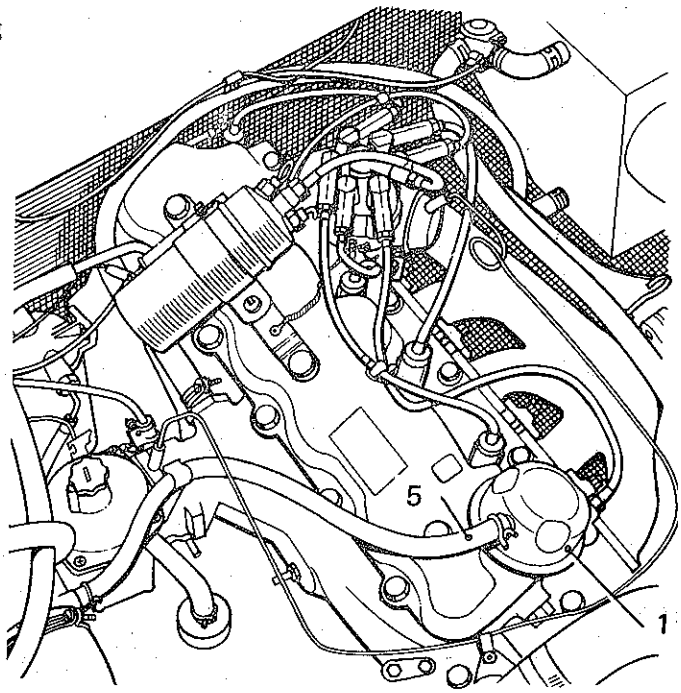
1. A careful examination should be carried out on all high tension leads including the coil to distributor lead.
2. Look for any signs of corrosion, insulation cracking or deterioration, particularly of the end contacts.
Replace any faulty leads.



Sparking plugs—Check every 10.000 km (6,000 miles); or 6 months, replace every 20.000 km (12,000 miles) or 12 months.

1. The sparking plugs are fitted with radio suppressed covers.
2. To gain access to the plugs for cleaning and gap-setting, pull off the plug covers without detaching them from the high tension leads.
3. Check or replace the sparking plugs as applicable. If the plugs are in good condition, they should be cleaned, preferably using an approved spark plug cleaning machine.
4. Test the plugs in accordance with the plug cleaning machine manufacturers recommendations.
5. If satisfactory set the electrode gap to 0,60 to 0,70 mm (0.023 to 0.031 in.) and replace.

It is important that only the recommended sparking plugs are used for replacement:
Bosch W175T2



Engine breather filter—Every 20.000 km (12,000 miles) or 12 months. All models.

Clean as follows:

1. Remove the filter.
2. Wash the gauze thoroughly by swilling the units in petrol.
3. Re-wet the gauze by dipping in clean engine oil and shake off the surplus.
4. Replace the filter, tightening the securing bolt.
5. Re-connect hose to top breather.

Engine compartment

Battery acid level—Every month and at every maintenance inspection.

Check weekly when operating under severe conditions. The battery is located under the left seat. To gain access, remove seat cushion and seat panel.

The specific gravity of the electrolyte should be checked at every maintenance inspection. Readings should be:

Temperate climate below 26.5°C (80°F) as commissioned for service, fully charged 1.270 to 1.290 specific gravity.

As expected during normal service, three-quarter charged 1.230 to 1.250 specific gravity.

If the specific gravity should read between 1.190 to 1.210, half-charged, the battery must be bench charged and the electrical equipment in the car should be checked.

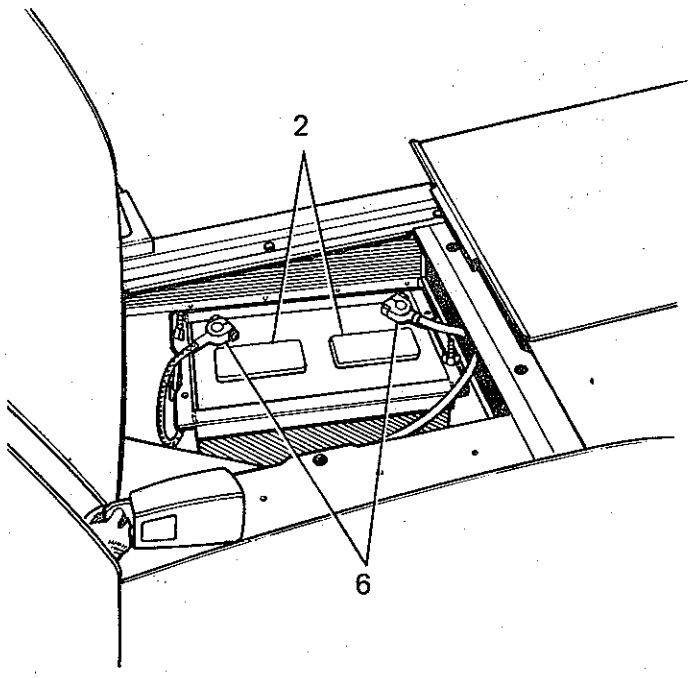
Tropical climate above 26.5°C (80°F) as commissioned for service, fully charged 1.210 to 1.230 specific gravity.

As expected during normal service, three-quarter charged 1.170 to 1.190 specific gravity.

If the specific gravity should read between 1.130 to 1.150, half-charged, the battery must be bench charged and the electrical equipment on the car should be checked.

Check acid level as follows:

1. Wipe all dirt and moisture from the battery top.
2. Remove the filler plugs or manifold lid. If necessary add sufficient distilled water to raise the level to the top of separators.
   Replace the filler plugs or manifold lid.
3. Avoid the use of a naked light when examining the cells.
4. In hot climates it will be necessary to top up the battery at more frequent intervals.
5. In very cold weather it is essential that the vehicle is used immediately after topping up, to ensure that the distilled water is thoroughly mixed with the electrolyte. Neglect of this precaution may result in the distilled water freezing and causing damage to the battery.



Battery terminals—Every 20.000 km (12,000 miles) or 12 months.

6. Remove battery terminals, clean, grease and refit.
7. Replace terminal screw; do not overtighten. Do not use the screw for pulling down the terminal.
8. Do NOT disconnect the battery cables while the engine is running or damage to alternator semiconductor devices may occur. It is also inadvisable to break or make any connection in the alternator charging and control circuits while the engine is running.
9. It is essential to observe the polarity of connections to the battery, alternator and regulator, as any incorrect connections made when reconnecting cables may cause irreparable damage to the semiconductor devices.

Engine compartment

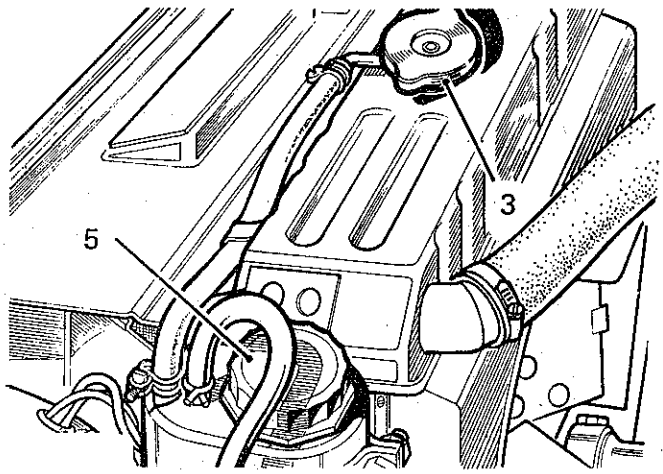
Radiator water level—Daily or weekly, depending on operating conditions, and at every maintenance inspection.

1. The radiator filler cap is under the bonnet panel.

All models

2. The cooling system is pressurised and care must be taken when removing the radiator filler cap, especially when the engine is hot.
3. When removing the filler cap first turn it anti-clockwise to the stop and allow all pressure to escape, before pressing it down and turning further in the same direction to lift it off.
4. 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.
5. All models have a semi-sealed cooling system, that is, an overflow bottle attached to the left-hand side of the radiator.
6. The water level in the cooling system is checked at the radiator only and topping-up is also carried out in the normal manner through the radiator filler. The pipe in the overflow bottle should always be submerged in water.
7. With a cold engine the correct water level is 12 to 19 mm (0.5 to 0.75 in.) below the bottom of the filler neck. For capacities see Division 09.

   Use soft water wherever possible; if the local water supply is hard, rainwater should be used.



Engine compartment

Cooling system—At free service 1.500 km (1,000 miles) and thereafter every 10.000 km (6,000 miles) or 6 months.

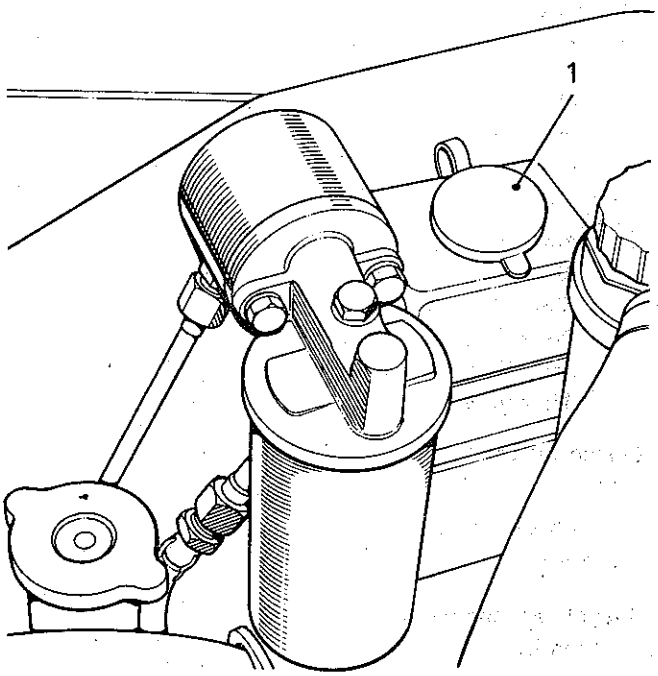
Examine the cooling system for leaks and rectify as necessary. Renew hoses every 80.000 km (48,000 miles).

Frost precautions
Refer to VEH A321-1.

Water level, windscreen washer as applicable—Every 1.000 km (750 miles) and at every maintenance inspection.

The windscreen washer reservoir is located on the left-hand bulkhead, adjacent to radiator reservoir overflow bottle.

1. Remove reservoir cap by unclipping plastic cap.
2. Top-up reservoir to within approximately 25 mm (1 in.) below bottom of filler neck.



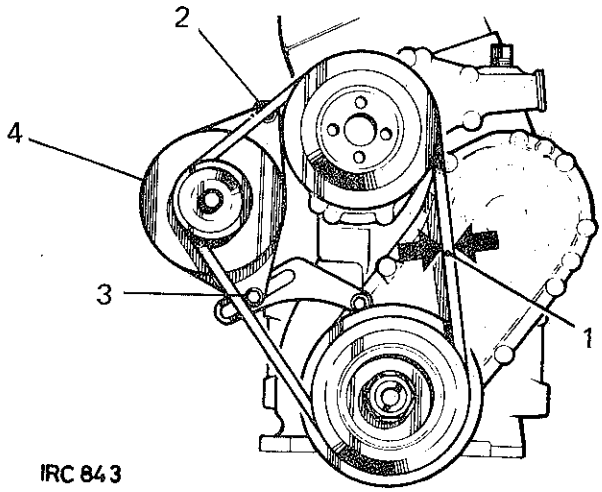
Engine compartment

Fan belt adjustment—At free service 1.500 km (1,000 miles) and thereafter every 10.000 km (6,000 miles) or 6 months.

1. Check by thumb pressure between the fan and crankshaft pulleys. Movement should be 8 to 11 mm (0.312 to 0.437 in.).

If necessary adjust as follows:

2. Slacken the pivot bolt securing the alternator to the mounting bracket.
3. Slacken the adjusting bolt.
4. Pivot the alternator inwards or outwards as necessary and adjust until the correct belt tension is obtained.
5. Tighten adjusting and pivot bolts.



IRC 843

Engine mountings—At free service 1.500 km (1,000 miles) only.

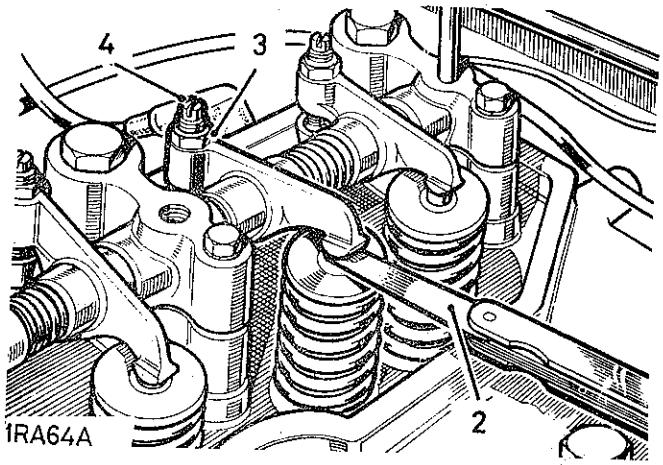
Check security of engine mountings; rectify as necessary.

Tappet adjustment—Every 20.000 km (12,000 miles) or 12 months.

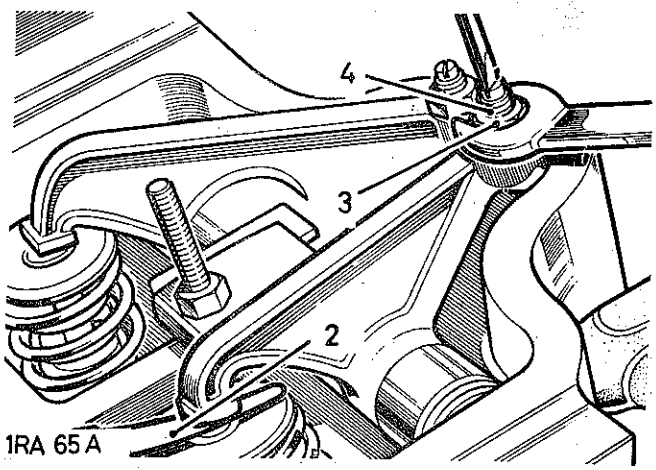
The correct clearance is: inlet 0,15 mm (0.006 in.) engine hot, and exhaust 0,25 mm (0.010 in.) with the engine hot or cold.

To carry out tappet adjustment, proceed as follows:

1. Rotate the engine in the running direction until the valve receiving attention is fully open and then rotate the engine one complete turn, to bring the tappet on to the back of the cam.
2. Check the tappet clearance with a feeler gauge.
3. If adjustment is required, slacken the locknut.
4. Rotate the tappet adjusting screw until the clearance is correct; re-tighten the locknut, taking care to ensure that this operation does not upset the clearance.
5. Repeat for the other valves in turn.



1RA64A

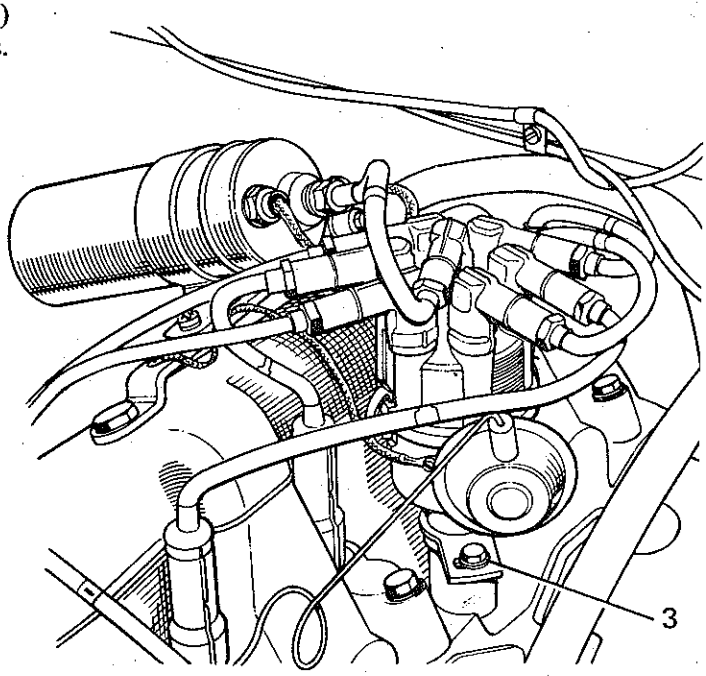


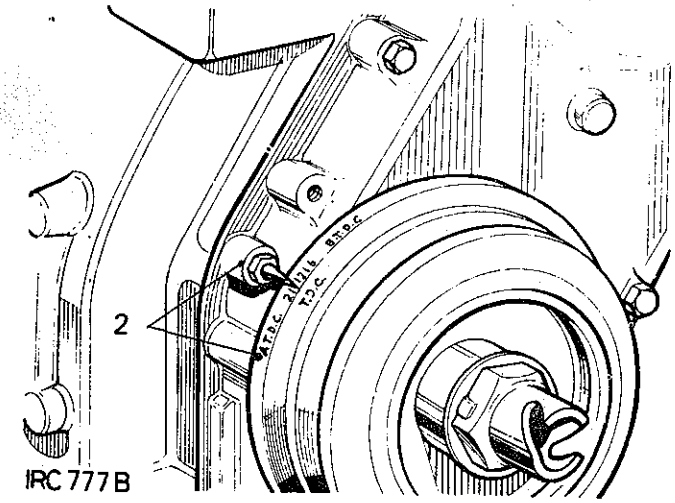
1RA 65 A

Engine compartment

Ignition timing—At free service 1.500 km (1,000 miles) and thereafter every 10.000 km (6,000 miles) or 6 months. Petrol models.

1. Set the contact breaker point gap to 0,40 to 0,50 mm (0.016 to 0.020 in.) with the points fully open.
2. Rotate the engine until the appropriate mark on the crankshaft pulley is in line with the pointer, as follows:
   2°ATCD when using 90 octane fuel.
3. After timing is set, tighten base clamp screw.





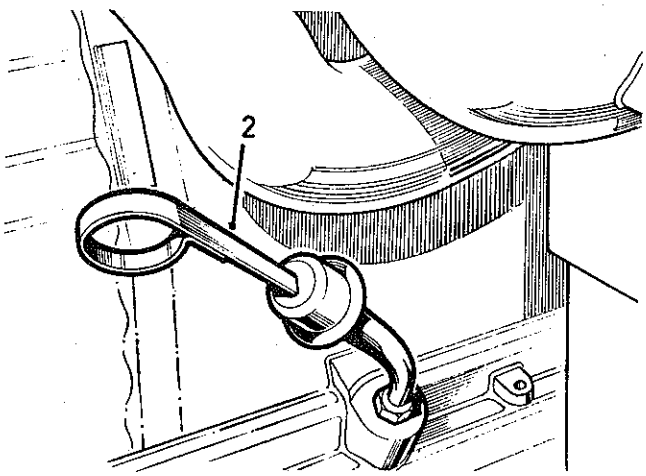
Engine compartment

6. The distributor rotor will now correspond with No. 1 cylinder high tension lead terminal.
7. Slacken the pinch bolt at the base of the distributor head, rotate the distributor bodily in the opposite direction to the arrow on the rotor arm until the contact breaker points are just opening, with the fibre cam follower on the leading side of the cam; re-tighten the pinch bolt.

Engine oil level—Daily or weekly depending on operating conditions.

Proceed as follows:

1. Stand the vehicle on level ground and allow the oil to drain back into the sump.
2. Withdraw the dipstick wipe it clean, re-insert to its full depth and remove a second time to take the reading. Add oil as necessary; never fill above the 'H' mark.
3. However, when the Land-Rover is being used at steep angles, the oil should not be allowed to fall below the intermediate mark 'L'. This will obviate any danger of oil pump starvation when the vehicle is facing downhill at a steep angle.



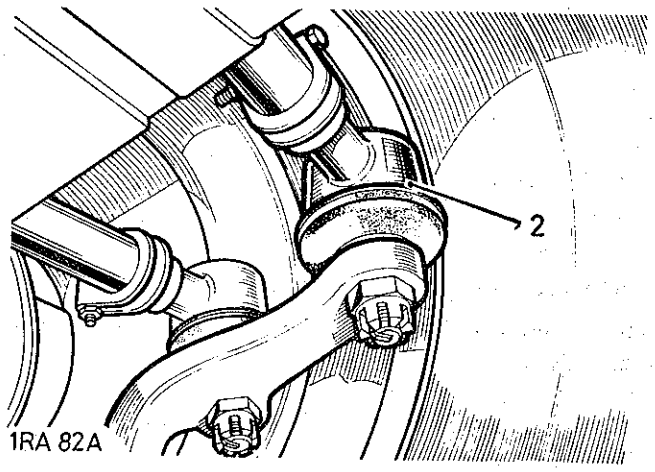
Underbody

Every maintenance inspection

Check for oil leaks; rectify as necessary.

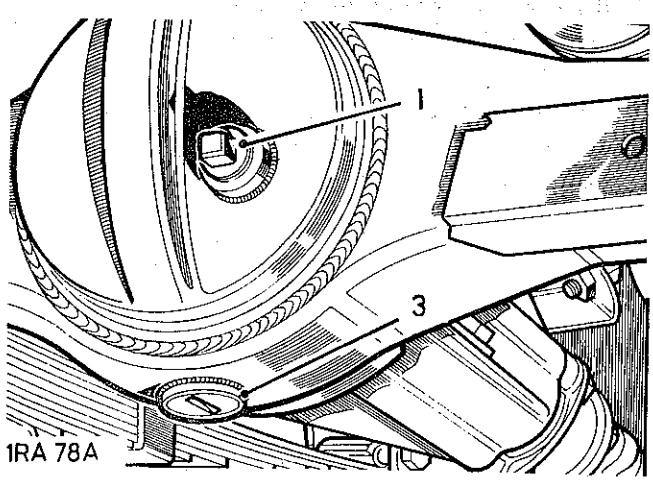
Steering ball joints—Every maintenance inspection.

1. Check rubber boots daily when operating under arduous conditions.
2. The steering joints have been designed to retain the initial filling of grease for the normal life of the ball joints; however, this applies only if the rubber boot remains in the correct position. Check to ensure that the rubber boots have not become dislodged or damaged, and check for wear in the joint.
3. This can be done by moving the ball joint vigorously up and down. Should there be any appreciable free movement the complete joint must be replaced.



Front differential oil level—Every 10.000 km (6,000 miles) or 6 months.

1. Check oil level and top up if necessary to the bottom of the filler plug hole located at the front of the axle casing.
   A second plug fitted at the rear of the axle casing can be disregarded.
2. If significant topping up is required check for oil leaks at plugs, joint faces and oil seals adjacent to axle shaft flanges and propeller shaft driving flange.



Front differential oil changes—At free service 1.500 km (1,000 miles) and thereafter every 20.000 km (12,000 miles) or 12 months.

To change the differential oil, proceed as follows:

3. Immediately after a run, when the oil is warm, drain off the oil by removing the drain plug in the bottom of the axle casing.
4. Replace the drain plug, remove filler-level plug and refill with oil of the correct grade; the capacity is approximately:
   1,75 litres (3 Imperial pints) 3.5 US pints.
   The drain plug has a slotted head and can be removed with the aid of the single-ended spanner in the tool kit.

Winch gearcase oil level—Every 10.000 km (6,000 miles) or 6 months (where fitted).

1. Check oil level and top-up if necessary to the bottom of the filler plug hole located at the front of the winch. Fill plug located on top of the winch.
2. If significant topping up is required, check for oil leaks at plugs, joint faces and oil seals.

Winch gearcase oil change—At free service 1.500 km (1,000 miles) and thereafter every 20.000 km (12,000 miles) or 12 months. (Where fitted).

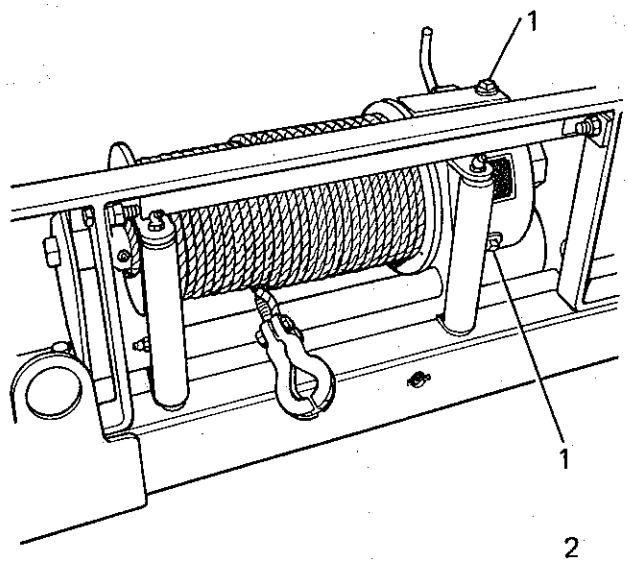
To change the winch gearcase oil, proceed as follows:

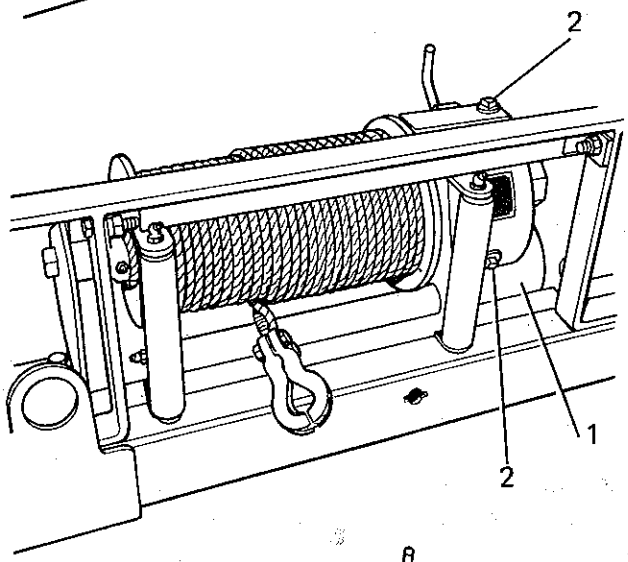
1. Drain off the oil by removing the drain plug in the bottom of the gearcase.
2. Replace the drain plug, remove level plug at front of winch and add oil, of the correct grade, to the plug at the top of the winch.

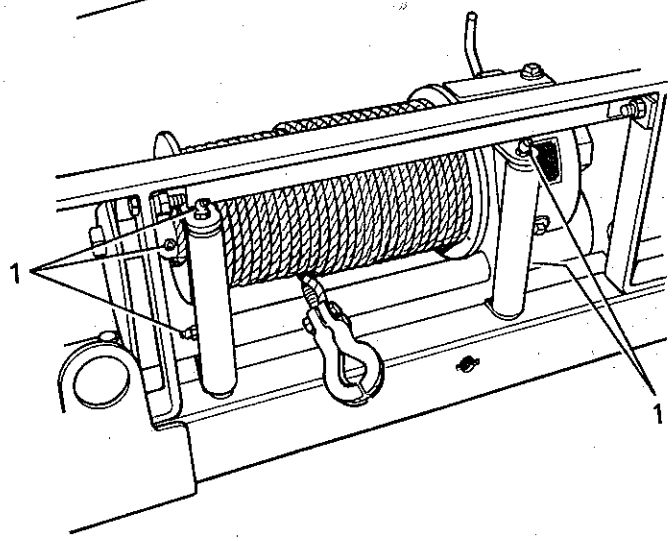
Winch fair leads and drum lubrication—At free service 1.500 km (1,000 miles) and thereafter every 10.000 km (6,000 miles) or 6 months.

1. Apply the recommended grease at the lubrication nipples.

   NOTE: Four shots only to drum assembly, every service.



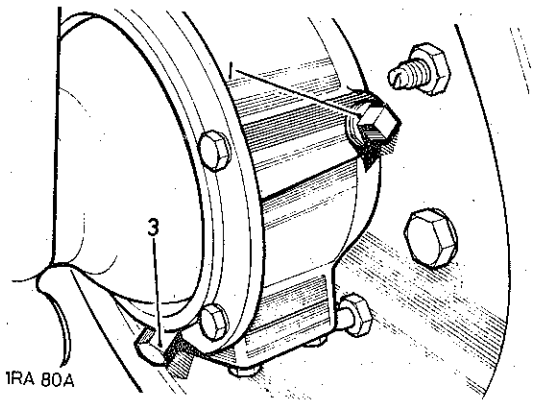




Underbody

Swivel pin housing oil level—Every 10.000 km (6,000 miles) or 6 months.

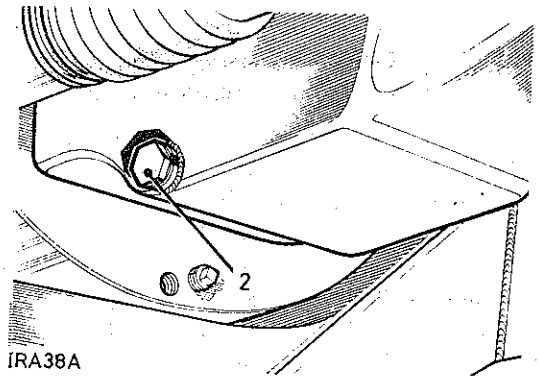
1. The front wheel drive universal joints, swivel pins and front hubs receive their lubrication from the swivel pin housings. Check oil level and top up if necessary to the bottom of the filler-level plug holes at the rear of the housings.
2. If significant topping up is required check for oil leaks at plugs, joint faces and oil seals.



Swivel pin housing oil changes—At free service 1.500 km (1,000 miles) and thereafter every 20.000 km (12,000 miles) or 12 months.

To change the swivel pin housing oil, proceed as follows:

3. Immediately after a run, when the oil is warm, remove the drain plug from the bottom of each housing; allow the oil to drain away completely and replace the plugs. Refill with oil of the correct grade through the filler-level plug holes; the capacity of each housing is approximately 0,5 litre (1 Imperial pint) 1.2 US pints.



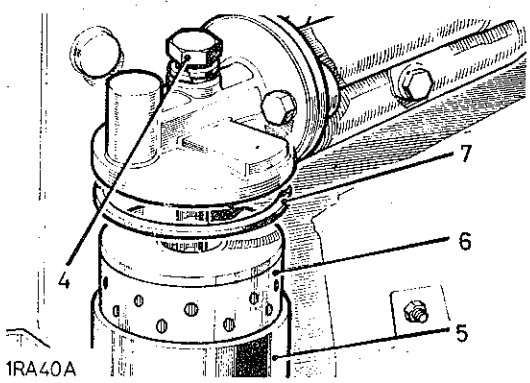
Engine oil changes and filter replacement. Oil changes—At free service 1.500 km (1,000 miles) and thereafter every 10.000 km (6,000 miles) or 6 months. **Filter replacment** – Every 10.000 km (6,000 miles) or 6 months.

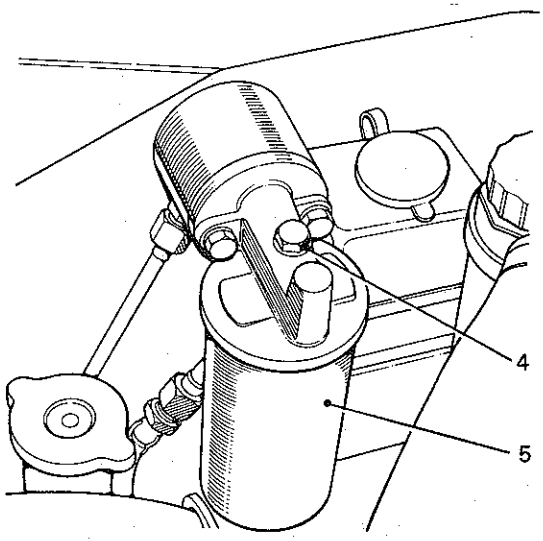
To change the engine oil:

1. Run the engine to warm up the oil, then stop.
2. Remove the drain plug in the right-hand side of the sump. Allow oil to drain away completely and replace the plug.

   To change filter located at left-hand side of engine.

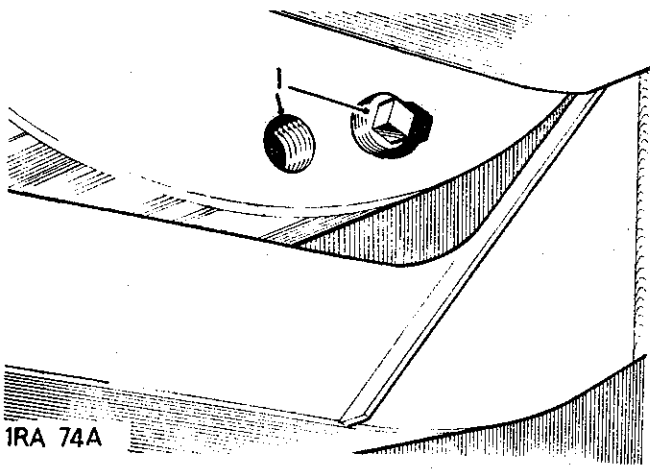
   NOTE: Models with winch, oil filter mounted on inner left guard, adjacent to washer reservoir.
3. Place oil tray under engine.
4. Unscrew the bolt from the filter adaptor.
5. Remove the container.
6. Remove the element.
7. Discard the used filter element and large rubber washer.
8. Wash the container in petrol.





Underbody

9. Place the new filter element in the container and reassemble the unit, using the new large rubber washer supplied with the element.
10. Ensure that all the sealing washers are in position and intact, and that the container is correctly located in the adaptor.
11. Refill with oil of the correct grade through the filler at the front of the engine; the total capacity including filter is: 6,8 litres (12 Imperial pints) 14 US pints.
12. Run engine and check for oil leaks at filter and drain plug.



Flywheel housing drain plug–Every 10.000 km (6,000 miles) or 6 months. When in use 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 a hole 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.

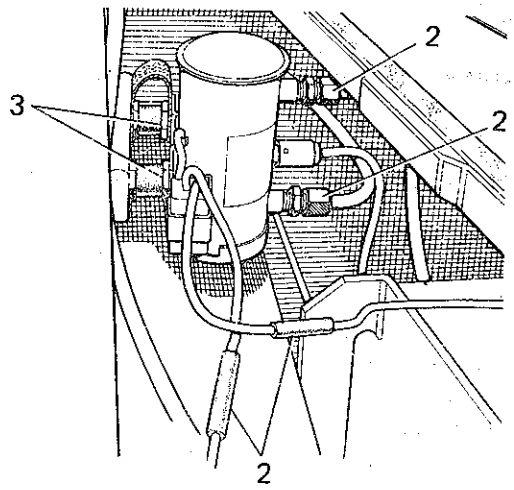
Underbody

Fuel pump filter element—Every 20.000 km (12,000 miles) or 12 months.

The fuel pump is an electric type and will operate immediately the ignition is switched on, so filling the carburettor for easy starting.

To replace the filter proceed as follows:

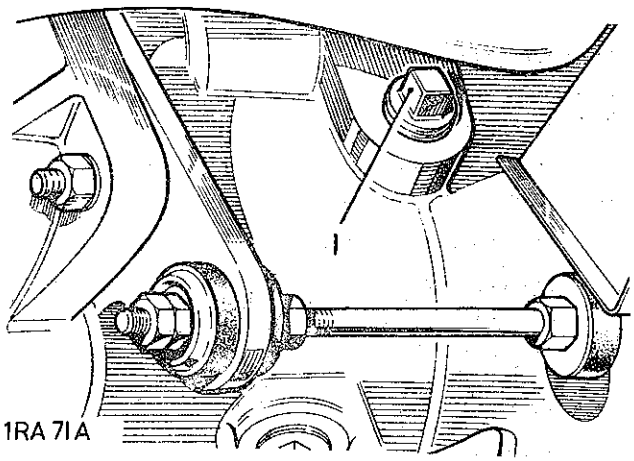
1. Remove right hand seat squab and seat box panel.
2. Disconnect leads and fuel lines.
3. Remove fuel pump fixings and remove pump.
4. Remove base of pump and filter.
5. Replace filter and refit pump.
6. Refit panel and seat squab.



Main gearbox oil level—Every 10.000 km (6,000 miles) or 6 months.

Check oil level daily or weekly when operating under severe wading conditions.

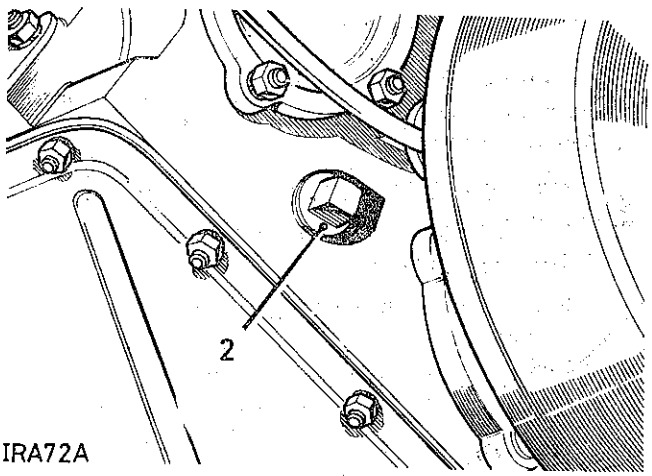
1. The main gearbox and clutch withdrawal mechanism are lubricated as one unit. Check oil level and top up if necessary to the bottom of the filler-level plug hole.
2. If significant topping up is required check for oil leaks at drain and filler plugs, all joint faces and through drain hole in bell housing.



Transfer box oil level—Every 10.000 km (6,000 miles) or 6 months.

Check oil level daily or weekly when operating under severe wading conditions.

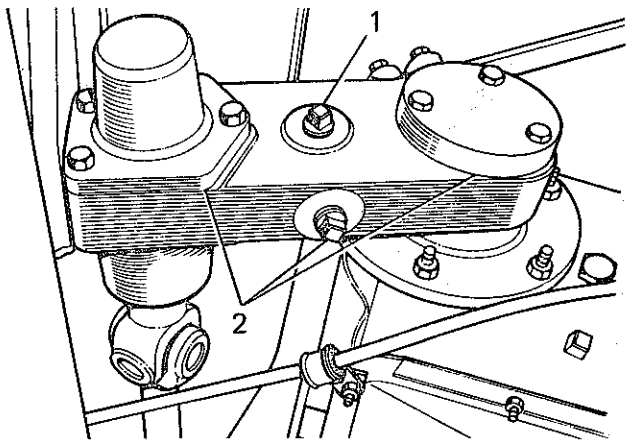
1. The transfer box and front wheel drive housing are lubricated as one unit.
2. Check oil level and top up if necessary to the bottom of the filler-level plug hole. The filler-level plug is in the rear face of the transfer box.
3. If significant topping up is required check for oil leaks at drain and filler plugs, all joint faces and through drain hole in bell housing.



Power take-off oil level—Every 10.000 km (6,000 miles) or 6 months. (Where fitted).

Check oil level daily or weekly when operating under severe wading conditions.

1. Check oil level and top-up, if necessary, to the bottom of the filler-level plug hole. The filler-level plug is in the rear face of the power take-off.
2. If significant topping up is required, check for oil leaks at drain and filler plugs and a joint faces.



Underbody

Main gearbox oil changes—At free service 1.500 km (1,000 miles) and thereafter every 20.000 km (12,000 miles) or 12 months.

Drain and refill monthly when operating under severe wading conditions.

To change the gearbox oil, proceed as follows:

1. Immediately after a run, when the oil is warm, drain off the oil by removing the drain plug in the bottom of the gearbox casing.
2. Replace the drain plug and refill gearbox with the correct grade of oil through the filler-level plug. The capacity is: 1,5 litres (2.5 Imperial pints) 3 US pints.

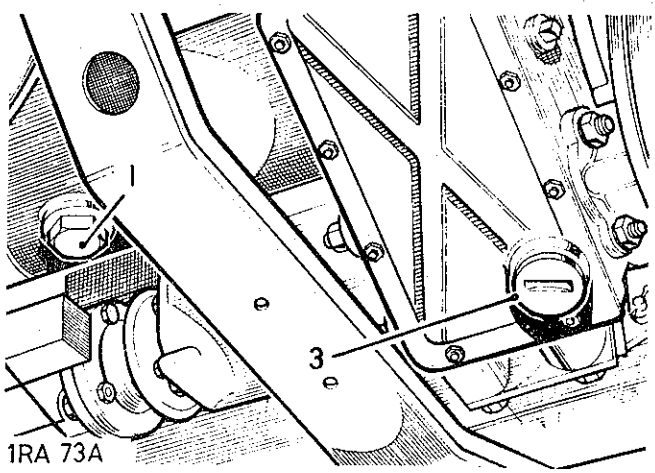
Transfer box oil changes—At free service 1.500 km (1,000 miles) and thereafter every 20.000 km (12,000 miles) or 12 months.

Drain and refill monthly when operating under severe wading conditions.

To change the transfer box oil proceed as follows:

3. Immediately after a run, when the oil is warm, drain off the oil by removing the drain plug in the bottom of the transfer box.
4. Replace the drain plug and refill transfer box with the correct grade of oil.

The capacity is: 2,5 litres (4.5 Imperial pints) 5.4 US pints.



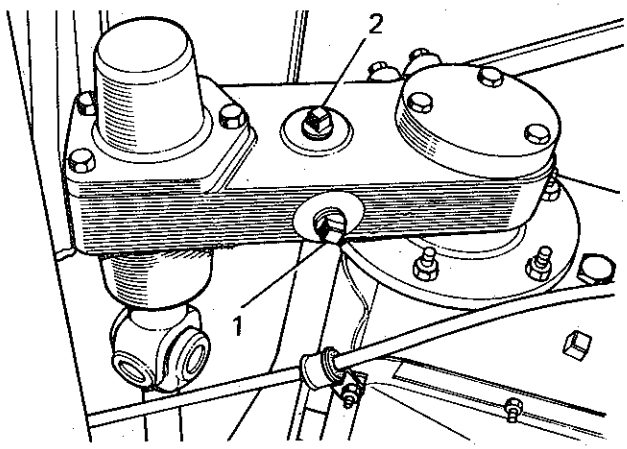
1RA 73A

Power take-off oil changes—At free service 1.500 km (1,000 miles) and thereafter every 20.000 km (12,000 miles) or 12 months. (Where filtted).

Drain and refill monthly when operating under severe wading conditions.

To change the power take-off oil, proceed as follows:

1. Remove the drain plug in the bottom of the power take-off.
2. Replace the drain plug and refill power take-off to the lower edge of the fill plug, with the correct grade of oil.



Handbrake linkage–Every 10.000 km (6,000 miles) or 6 months.

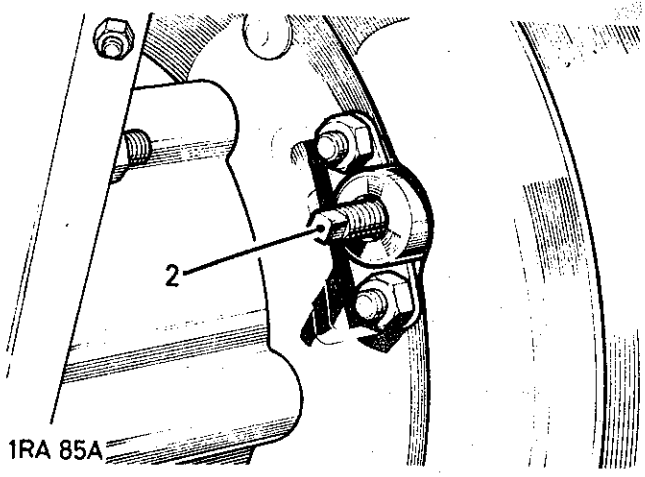
The handbrake operates a mechanical brake unit mounted on the output shaft from the transfer box.

Lubricate the handbrake linkage and check for worn parts. Take care not to contaminate the handbrake linings with oil.

Transmission brake adjustment–Every 20.000 km (12,000 miles) or 12 months.

If handbrake movement is excessive, adjust as follows:

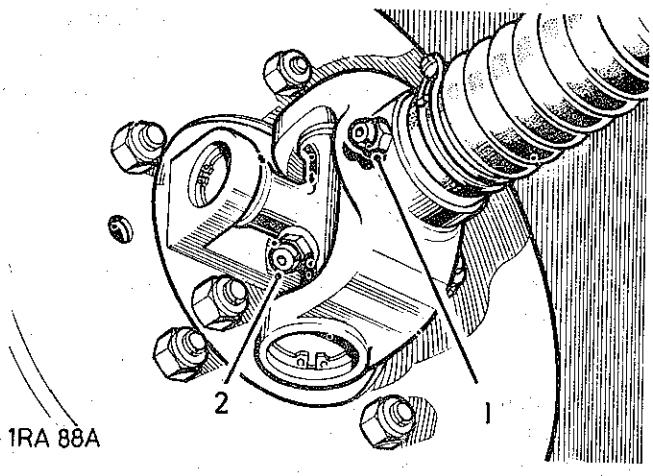
1. Release the hand brake. The adjuster protrudes from the front of the brake backplate.
2. During rotation of the adjuster a click will be felt and heard at each quarter revolution. Rotate adjuster in a clockwise direction until the brake shoes contact the drum. Then unscrew the adjuster two clicks and give the hand brake a firm application to centralise the shoes.



Underbody

Propeller shaft lubrication—At free service 1.500 km (1,000 miles) and thereafter every 10.000 km (6,000 miles) or 6 months.

1. Apply the recommended grease at the lubrication nipple on the sliding portion of the rear propeller shaft.
2. To the lubrication nipples fitted to the universal joints of both front and rear shafts.



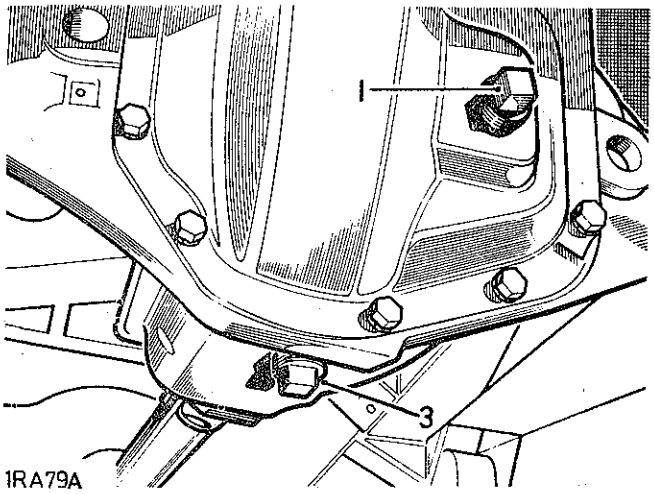
Front propeller shaft sliding portion—Every 20.000 km (12,000 miles) or 12 months.

Lubricate the sliding spline on the front propeller shaft, with the recommended grease, as follows:

1. Disconnect one end of the propeller shaft.
2. Remove plug in sliding spline and fit a suitable grease nipple.
3. *Important.* Compress propeller shaft at sliding joint to avoid overfilling, then apply grease.
4. Replace grease nipple with plug and reconnect propeller shaft.

Rear differential oil level—Every 10.000 km (6,000 miles) or 6 months.

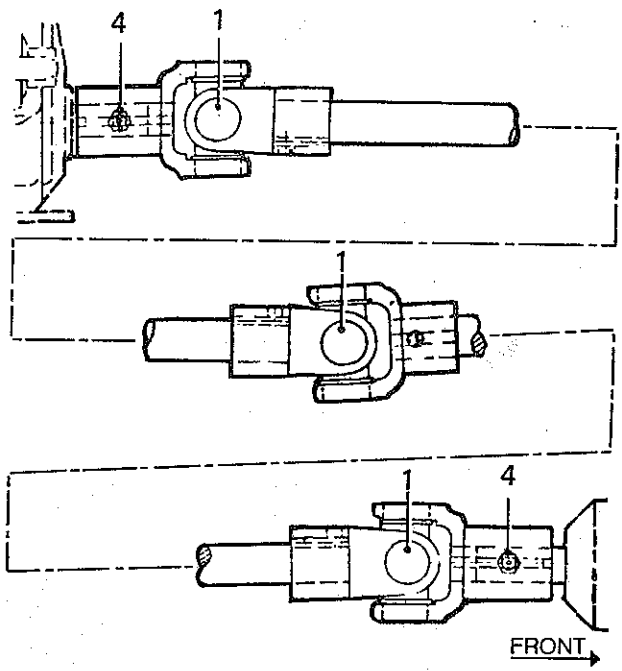
1. Check oil level and top up if necessary to the bottom of the filler plug hole.
2. If significant topping up is required check for oil leaks at plugs, joint faces and oil seals adjacent to axle flanges and propeller shaft driving flange.



Rear differential oil changes—At free service 1.500 km (1,000 miles) and thereafter every 20.000 km (12,000 miles) or 12 months.

To change the differential oil, proceed as follows:

3. Immediately after a run, when the oil is warm, drain off the oil by removing the drain plug in the bottom of the axle casing.
4. Replace the drain plug, remove filler-level plug and refill with oil of the correct grade; the capacity is approximately: 2,6 litres (4.5 Imperial pints) 5.4 US pints.



Power take-off propeller shaft lubrication—At free service 1.500 km (1,000 miles) and thereafter every 20.000 km (12,000 miles) or 12 months. (Where fitted).

To lubricate the propeller shaft, proceed as follow:

1. Remove plugs and fit suitable grease nipples.
2. Apply the correct grease carefully.
3. Remove grease nipples and refit plugs.
4. Apply grease to grease nipples at each end of the shaft.

Underbody

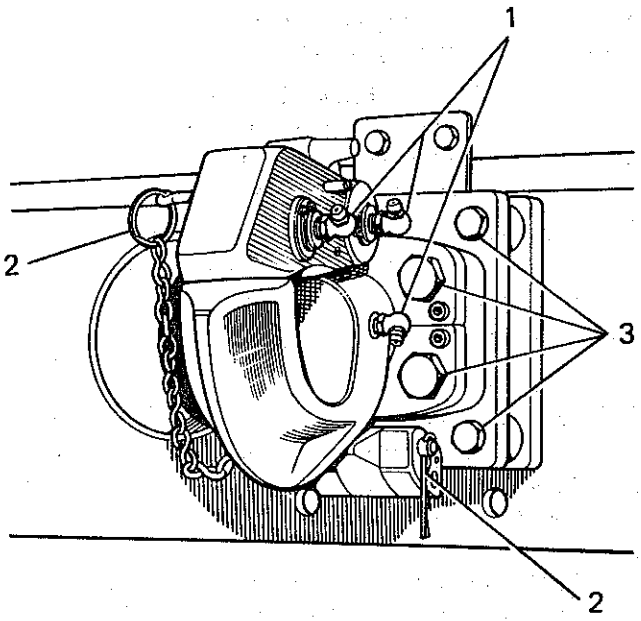
Transmission fixings—At free service 1.500 km (1,000 miles) only. Check security of transmission fixings, rectify as necessary.

Exhaust system, fuel, clutch and brake pipes—Every 10.000 km (6,000 miles) or 6 months.

1. Check exhaust system fixings for security, paying particular attention to heat shields, flexible mounting plates and clamps.
2. Examine the system for signs of leakage and blowing. Any silencers or pipes found to be leaking or badly corroded should be replaced.
3. At the same time check all fuel, clutch and brake pipes, unions and hoses for signs of leakage, corrosion, chafing or damage.

Pintle hook lubrication—At free service 1.500 km (1,000 miles) and thereafter every 10.000 km (6,000 miles) or 6 months.

1. Apply the recommended grease to the lubrication nipples.
2. Check safety pins and chains for security.
3. Check mounting bolts for tightness.



Passenger compartment

Foot and handbrake—Every 10.000 km (6,000 miles) or 6 months.

1. Check operation of foot and handbrake, ensure that the brake pedal travel is not excessive and maintains a satisfactory pressure under normal working load.
2. Excessive pedal travel indicates worn brake linings or the necessity for adjustment,
3. If the brakes feel spongy this may be caused by air in the hydraulic system and must be removed by bleeding the system at each wheel cylinder.
4. Prior to this operation, all hydraulic hoses, pipes and connections should be checked for leaks and any leaks rectified.
5. Check operation of handbrake and ensure that it holds the vehicle satisfactorily.

Electrical and interior equipment—Every maintenance inspection.

6. Check operation of all lamps, direction indicators, warning lights, horn, instruments and other equipment.

Seats, safety belts and rear view mirrors—Every 10.000 km (6,000 miles) or 6 months.

7. Check all seat fixings for security and examine conditon of safety harness. Safety harness which has been used in an accident or is frayed or cut, must be replaced.
8. Check rear view mirors for security and examine mirror face for signs of cracks or crazing.

Door locks and mechanisms—At free service 1.500 km (1,000 miles) and thereafter every 10.000 km (6,000 miles) or 6 months.

9. Check operation of all door locks and mechanisms, window controls, safety catches, bonnet catches, etc; apply a few spots of oil as necessary.

Exterior

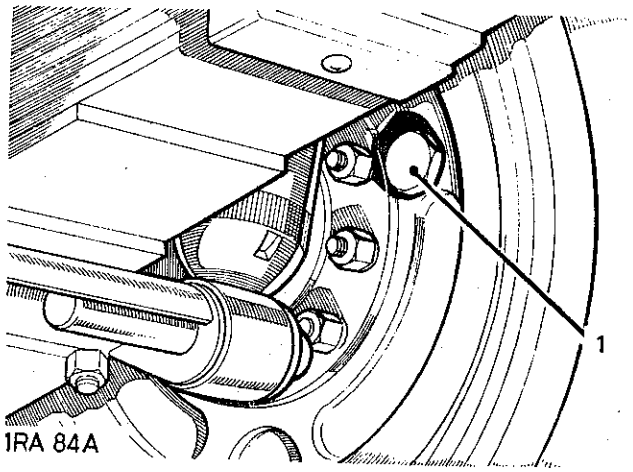
Wheel brake adjustment—Every 10.000 km (6,000 miles) or 6 months.

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

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

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

Proceed as follows:



1. Each shoe is independently set by means of a hexagon adjustment bolt operating through a serrated snail cam.
2. Apply the brakes and set the snail cam adjusters so that the brake shoes are in firm contact with the drums.
3. Slacken off each adjuster just sufficiently for the drum to rotate freely.
4. Repeat for the other wheels in turn.

Note: The rear brake shoes should be adjusted individually to obtain the best results.

Changing wheel positions—Every 10.000 km (6,000 miles) or 6 months.

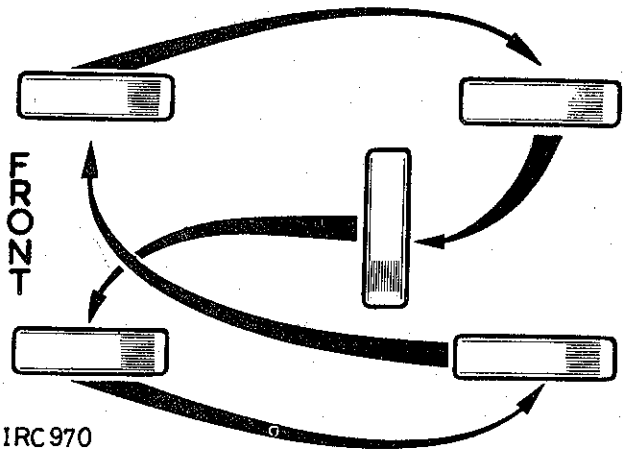
The road wheels should be changed round as illustrated to equalise tyre wear.

When cross-country tyres are used, the 'V' tread should be directed to the front at the top.

IMPORTANT. As the Land-Rover is fitted with a transmission brake, it is necessary before removing a road wheel to apply the hand brake and engage four-wheel drive.

This will ensure that the hand brake is operative on all four wheels.

Remember to engage two-wheel drive when the road wheel has been replaced.



Road wheel nuts—Every maintenance inspection.

Check road wheel nuts, tighten as necessary.

Exterior

Tyre pressures—Every month and at every maintenance inspection.

Maximum tyre life and performance will only be obtained if the tyres are maintained at the correct pressures.

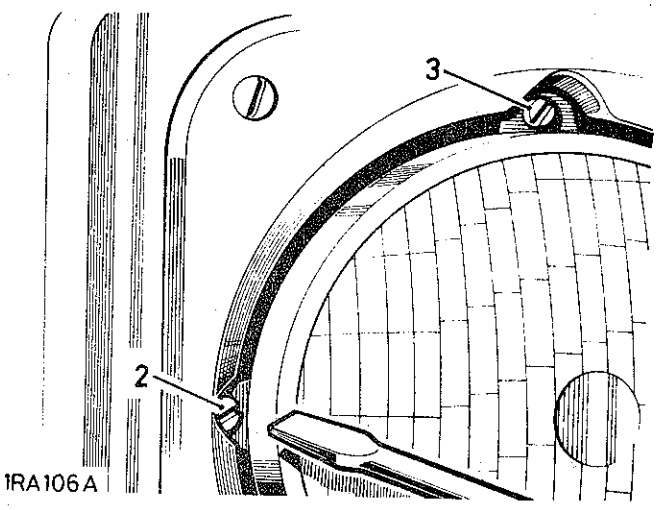
	Normal				Emergency soft	
	Highway		Cross-Country		Sand or Mud	
	Front	Rear	Front	Rear	Front	Rear
kPa	165	320	125	210	95	150
lb/sq.in.	24	46	18	30	14	22

1. Whenever possible check with the tyres cold as the pressure is about 14 kPa (2lb/sq.in.) higher at-running temperature.
2. Always replace the valve caps as they form a positive seal on the valves.
3. Any unusual pressure loss in excess of 7.0 to 20 kPa (1 to 3 lb/sq.in.) per week should be investigated and corrected.
4. Always check the spare wheel so that it is ready for use at any time.
5. At the same time remove embedded flints etc. from the tyre treads with the aid of a penknife or similar tool and check that the tyres have no breaks in the fabric or cuts to sidewalls etc. Clean off any oil or grease on the tyres using white spirit sparingly.
6. Check that there are no lumps or bulges in the tyres or exposure of the ply or cord structure.
7. 'Butyl' synthetic innertubes are fitted and all repairs must be vulcanised.
8. It is advisable to run-in new tyres by driving at reasonable speeds for the first 400 km (250 miles) or so before driving at higher speeds.

Exterior

Headlamp beam setting—Every maintenance inspection.

1. This operation requires special equipment.
2. Each headlamp can be adjusted by means of horizontal and vertical screws.
3. The adjusting screws are accessible through slots in the headlamp bezel.



Windscreen wiper blades—Check, if necessary replace every 10.000 km (6,000 miles) or 6 months.

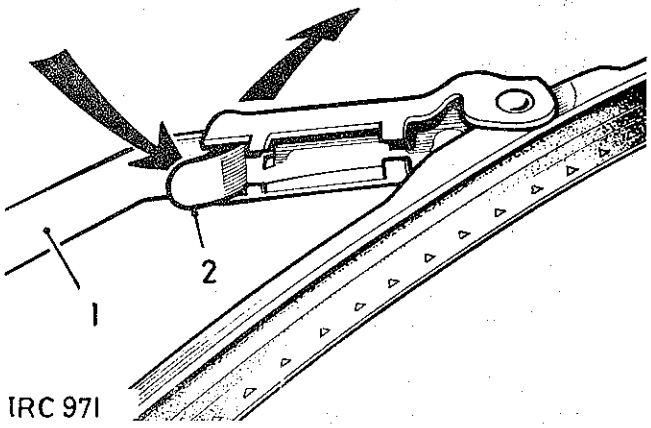
Examine condition of wiper blades, replace as necessary:

1. Full wiper arm forward.
2. Lift spring clip and withdraw blade from wiper arm.
3. To fit new blade reverse removal procedure.

Steering relay unit—Every 20.000 km (12,000 miles) or 12 months.

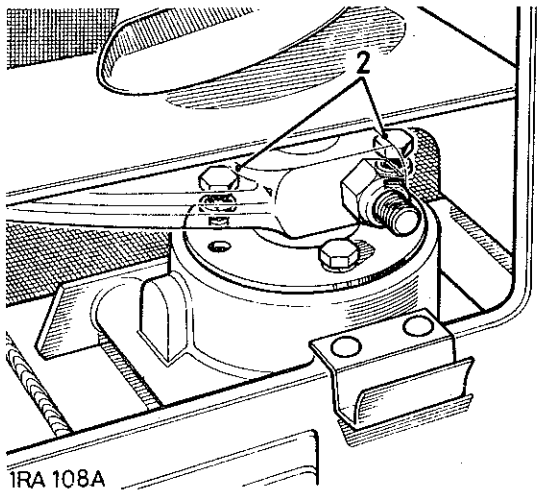
Check level and top-up if necessary until the lubricant is visible at the base of the filler and breather holes. If significant topping-up is required, check joints for leakage and fit new joint washers as necessary. To check level and top up, proceed as follows:

1. Remove the name plate and withdraw radiator grille.
2. Remove two of the bolts securing the relay top cover.
3. Using one of the holes as a filler (the other acting as a breather hole) fill the relay unit with the correct grade of lubricant to the bottom of the filler hole.



Exterior

4. Whilst filling, it is probable that the lubricant will eject through the breather hole. If this occurs *do not* assume that the relay unit is full. Time must be given to allow the lubricant to find its way to the main chamber. Wait a few moments until the breather hole is clear, then continue filling.
5. As the unit fills up, air is forced out usually in the form of a bubble, escaping through the breather hole, again giving the impression that the unit is full. Wait for the bubble to subside, then continue filling in this manner until the lubricant is clearly visible at the base of the filler and breather holes.
6. Replace the two top cover bolts.
   Refit the radiator grille and name plate.



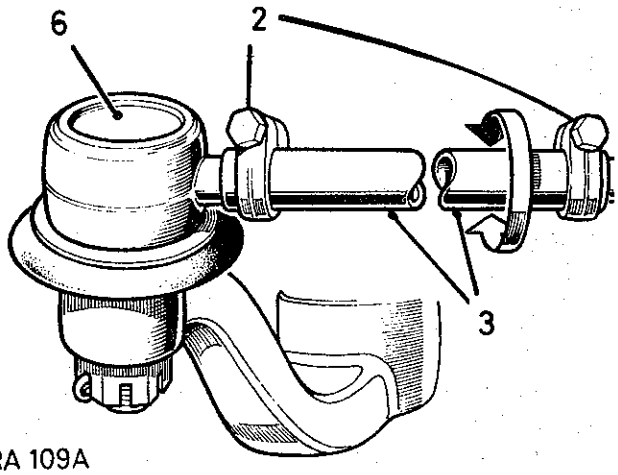
Wheel alignment—At free service 1.500 km (1,000 miles) and thereafter every 10.000 km (6,000 miles) or 6 months.

Special equipment is required to check wheel alignment.

For those owners who have suitable equipment, the alignment should be 1,2 to 2,4 mm (0.046 to 0.093 in.) toe-in.

To adjust

1. Set the vehicle on level ground with the road wheels in the straight ahead position and push it forward a short distance.
2. Slacken the clamps securing the ball joints at each end of the track rod.
3. Turn the track rod to decrease or increase its effective length as necessary until the toe-in is correct.
4. 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.
5. Recheck the toe-in, if necessary carry out further adjustment.
6. When the toe-in is correct, lightly tap the track rod ball joints towards the rear of the vehicle to the maximum of their travel. This ensures full unrestricted movement of the track rod. Then secure the ball joint clamps.



1RA 109A

Road Test

Road test—At free service 1.500 km (1,000 miles) and thereafter every 10.000 km (6,000 miles) or 6 months.

Give the vehicle a thorough road test and carry out any further adjustments required including brakes, clutch, throttle linkage etc.

Check steering and all gears in high and low range including the high range four-wheel drive control.

Check operation of all lights and instruments. After test check for oil, fuel and fluid leaks at all plugs, flanges, joints and unions.

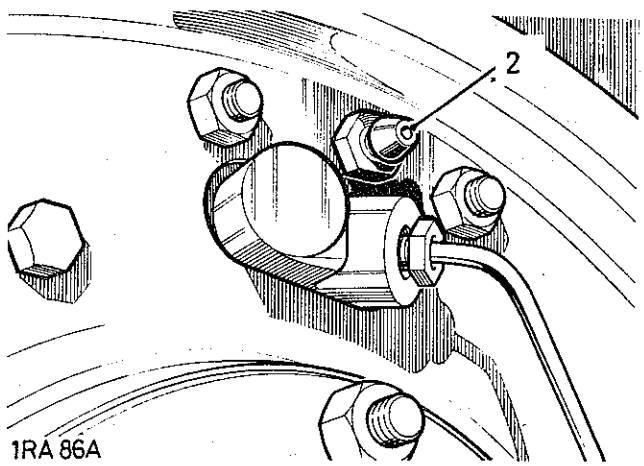
Preventive Maintenance

Bleeding the brake system.

When the fluid in the hydraulic system has been changed or any components replaced it will be necessary to remove the air by bleeding the hydraulic system at each wheel cylinder. Bleeding must always be carried out at all wheels.

Proceed as follows:

1. Slacken the adjusters off on all brake shoes.
2. Attach a length of rubber tubing to the bleed screw on the wheel cylinder furthest from the brake pedal and place the lower end of the tube in a glass jar containing brake fluid.
3. Slacken the bleed screw and depress the brake pedal and release slowly. Pause at each end of the return stroke to allow the master cylinder to recuperate. Continue pumping in this manner until the fluid issuing from the tube shows no signs of air bubbles when the tube is held below the surface of the fluid in the jar.
4. Hold the tube under the fluid surface and, with the foot brake fully depressed, tighten the bleed screw. Do not overtighten.
5. Repeat for the other three wheels in turn, finishing at the one nearest the brake pedal.
6. Pump brake pedal until rear shoes are in firm contact with the brake drums.
7. While holding pedal depressed, adjust rear adjusters up to the shoes.
8. Release pedal and slacken rear adjusters until shoes are just clear of the drums.
9. Adjust front shoes in the normal manner.



Preventive Maintenance

The fluid in the reservoir should be replenished throughout the operation, to prevent another air lock being formed, using only new fluid. Castrol Girling Brake and Clutch Fluid 'Crimson' (Specification J. 1703).

It will be obvious that the above operation requires two people.

Fluid changing, brake system—Every 20.000 km (12,000 miles) or 12 months.

All brake fluid absorbs moisture from the air and as a result its boiling point is lowered with a consequent deterioration in performance. In a sealed brake system, water absorption takes place over a period and can, if not remedied reduce brake performance to a dangerous level.

All the fluid in the brake system should be changed every 20.000 km (12,000 miles) or twelve months.