

SECTION O

LUBRICATION AND MAINTENANCE

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O.1. - MAINTENANCE - GENERAL.

In order to maintain the vehicle in an efficient, safe and economical running condition, regular and thorough servicing is essential. The Lotus voucher scheme has been established to provide this service and covers both lubrication and regular mechanical maintenance using recommendations laid down by the technical staff of Lotus Cars Ltd.

The voucher service commences with a FREE 'After Sales Service'. Further vouchers are included in the Service Voucher Book to cover lubrication and maintenance at intervals of every 5,000 miles (8,000 km.).

It is very important that the vouchers should be used in the correct sequence and at the appropriate mileage. If any particular service is accidentally omitted, the remaining sequence of operation will be affected.

It must be understood that all oils and materials used in these services will be charged for in addition to the charges for the services.

In line with our policy of continuous improvement, Lotus Dealers are informed of all technical developments or improvements that have been made to subsequent vehicles, which could improve the performance of all vehicles.

Lotus Cars Ltd. reserve the right to change prices, specifications and equipment at any time without notice.

O.2. - FREE SERVICE (500 miles; 800 km.)

Free After Sales Service.

1. LUBRICATION

Drain engine, gearbox and rear axle, and refill all units with new oil. Fit new oil filter. Lubricate propeller shaft U/J's. Lubricate lower steering swivels. Lubricate clutch, brake and accelerator pedal pivots and linkage. Lubricate boot and bonnet hinges, catches and door catches.

2. ENGINE

Check torque loading of cylinder head bolts. Check valve clearances, and adjust if necessary. Check vertical movement of carburetters on manifold. Check water hoses including heater for condition. Check and tighten all hose clips. Top up engine coolant including recuperator bottle.

Check generator (or alternator) belt tension. Check security of manifolds, exhaust system, engine mountings, distributor and generator (or alternator) bolts. Check timing chain tensioner adjustment. Set slow running (idle) mixture and idle rpm. Check engine for oil and/or water leaks.

### 3. IGNITION

Check distributor contact breaker gap and adjust if necessary. Check sparking plug gaps and adjust if necessary. Check ignition timing, contact breaker dwell angle and adjust if necessary.

### 4. BRAKES AND CLUTCH

Check brake and clutch fluid reservoir levels, topping up if necessary; if low check for cause. Check clutch slave cylinder push rod to release arm clearance. Check handbrake adjustment.

### 5. STEERING AND SUSPENSION

Check steering system for condition and security. Check front wheel toe-in, and adjust if necessary. Check front hub bearings adjustment, adjust if necessary. Check front wishbone, lower trunion and damper attachments for security. Check rear wishbone and Rotoflex coupling attachments for security.

### 6. ELECTRICAL

Top up battery electrolyte, check terminals for security. Check battery attachments for security. Check cooling fan operation. Check operation of tachometer, oil pressure, water temperature, fuel and battery condition (or ammeter) gauges. Check operation of all lamps, windscreen wash and wipe, windows and rear screen heater (if fitted). Check headlamp beam setting, adjusting if necessary.

### 7. WHEELS AND TYRES

Check and tighten all wheel nuts for security. Check all tyres for condition and set tyre pressures including spare.

### 8. BODY

Check door adjustment and operation of doors, bonnet and boot lock catches and locks; adjust if necessary. Check operation of seat belts.

### 9. GENERAL

Check condition and security of engine mounting bolts, and propeller shaft retaining nuts and bolts.

0.3 - 'A' SERVICE (every 5,000 miles; 8,000 km.)1. LUBRICATION

Drain engine and refill with new oil. Fit new oil filter. Check gearbox and rear axle oil levels, topping up if necessary and check for leaks. Lubricate propeller shaft U/J's. Lubricate lower steering swivels. Lubricate throttle linkage. Lubricate distributor cam weights. Lubricate door locks, boot and bonnet locks and hinges.

2. ENGINE

Check security of exhaust system, including manifold. Check tightness of fuel pipe connections. Check security and vertical movement of carburettors. Check generator (or alternator) belt tension and condition, and check tightness of mounting bolts. Inspect all water hoses for condition. Top up engine coolant including recuperator bottle. Check all vacuum pipes and hoses for condition and security. Clean air filter element (or replace). Top up screen wash reservoir. Check engine for oil and/or water leaks. Set slow running (idle) mixture and idle rpm.

3. IGNITION

Check ignition contact breaker points condition and gap. Clean and reset sparking (or replace). Check ignition timing at idle, adjust if necessary.

4. BRAKES AND CLUTCH

Check brake and clutch fluid reservoir levels, topping up if necessary; if low, check for cause. Check braking system (including handbrake) for correct operation. Check all brake pipes including vacuum pipes, for condition and security. Check clutch slave cylinder push rod to release arm clearance. Check all brake pads for material remaining; if down to 2.4 mm. MINIMUM, replace pads.

5. STEERING AND SUSPENSION

Repack front hubs with grease and re-adjust bearings. Check steering system for security and moving parts for wear. Check front wishbones, lower trunnion and dampers for condition and security. Check front disc mounting bolts for security. Check front wheel toe-in. Check rear wishbone and damper attachments for condition and security. Check Rotoflex couplings for condition and security of mounting bolts.

6. ELECTRICAL

Top up battery electrolyte, check terminals for security. Lubricate battery terminals. Check battery attachments for security. Check cooling fan operation. Check heater system operation. Check operation of tachometer, oil pressure, water temperature, fuel and battery condition (or ammeter) gauges. Check operation of all lamps, windscreen wash and wipe, windows and rear screen heater (if fitted). Check headlamp beam setting.

7. WHEELS AND TYRES

Check all wheel nuts for security. Check all tyres for condition and set tyre pressures including spare.

8. BODY

Check door adjustment. Check operation of all locks and catches.

9. GENERAL

Check condition and security of engine mounting bolts, gearbox and rear axle mounting bolts and propeller shaft retaining nuts and bolts.

0.4 - 'B' SERVICE (every 10,000 miles; 16,000 km.)

Carry out the 'A' Service, plus the following:

1. LUBRICATION

Drain engine and gearbox and refill units with new oil. Check gearbox for leaks. Lubricate steering unit pinion.

2. ENGINE

Check timing chain tension, adjust if necessary. Check torque loading of cylinder head bolts. Check valve clearances, adjust if necessary. Clean petrol pump filter. Check and tighten all water hose clips. Clean air filter body and fit new element.

3. IGNITION

Check ignition contact breaker points condition (or replace) and check gap. Clean and reset sparking plugs gap(or replace).

4. BRAKES AND CLUTCH

Renew brake servo air filter. Check for wear on brake and clutch master cylinder linkage and pivots.

5. STEERING AND SUSPENSION

Repack front hub bearings with grease, check condition of bearings and re-adjust. Check rear hub bearings and tightness of hub retaining nut.

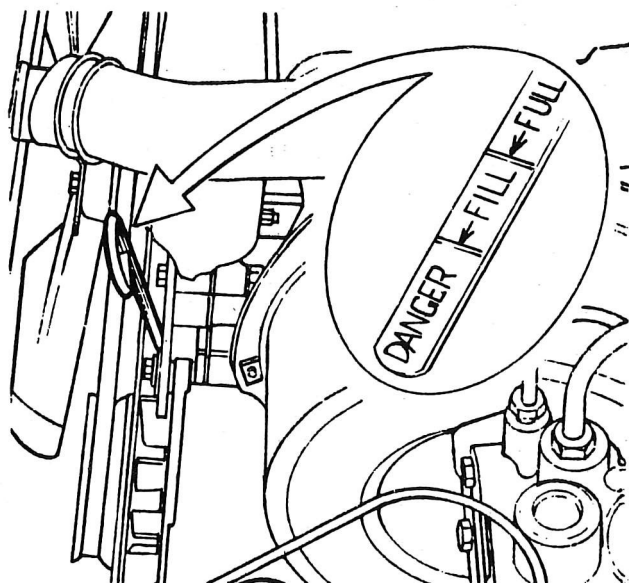


Fig.1. DIP STICK

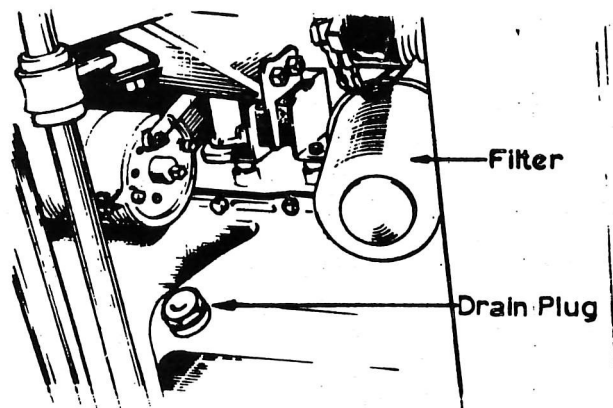


Fig. 2. SUMP DRAIN PLUG

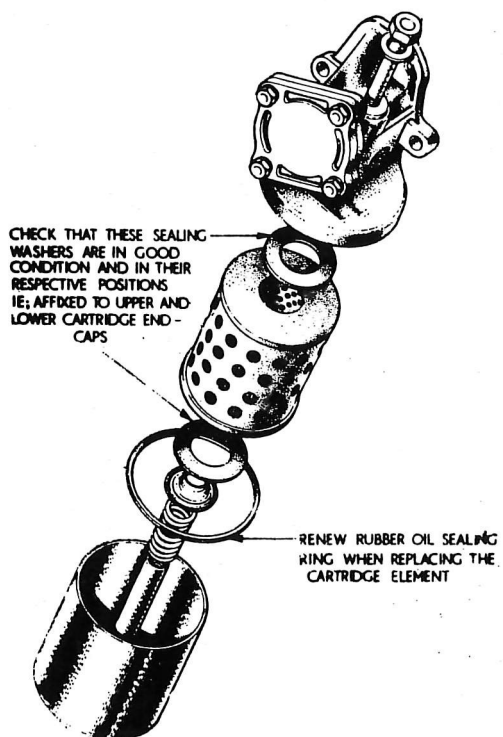


Fig.3 OIL FILTER ASSEMBLY

O. 6. - LUBRICATION - GENERAL.

Conscientious and regular attention to the various lubrication points cannot be over emphasised. Correct lubrication with the recommended grades will ensure maximum performance and life from the components with efficiency and reliability in operation.

It is most important that the intervals shown under the 'A' and 'B' Services are strictly adhered to.

O. 7. - LUBRICATION INTERVALS.ENGINE.

The correct level is to the 'FULL' mark on the dipstick, which is located to the left-hand side of the timing cover. The oil filler cap is at the rear of the left-hand side of the camshaft cover. Inspect the oil level daily, topping-up if necessary to the correct level. DO NOT overfill. Replace the oil filler cap securely (double notch), otherwise an oil loss will occur and could result in a complete failure of the engine lubrication system.

Draining the Sump - Draining the sump will be greatly facilitated if carried out when the car has just completed a run and the oil is warm, thus flowing more readily. Allow to drain thoroughly, clean the drain plug and replace.

The drain plug is located at the right-hand rear of the sump.

NOTE: If the engine oil is renewed at the recommended intervals there is no necessity to use a flushing oil. The use of a flushing oil is NOT recommended because of the difficulty in draining it completely.

Oil Filter - It is recommended that the oil filter element be renewed at intervals of every 5,000 miles (8,000 km.).

To renew the filter element, release the central bolt retaining the filter body to the oil pump body, on the right-hand side of the engine. Thoroughly clean the inside of the filter body, fit new sealing rings and element, and refit to engine. Torque load the central retaining bolt to the loading given in 'TECHNICAL DATA'.

It is pointed out that it is false economy to fit a new oil filter alone; always refill engine with new oil, after draining the sump.

GEARBOX

A combined filler and level plug is fitted on the left-hand side of the gearbox, the drain plug being situated below the gearbox. The oil level should reach the bottom of the filler plug orifice and Extreme Pressure oil of the correct grade added if necessary. Gearbox lubricant should be drained at 10,000 miles (16,000 km.) intervals, preferably when the oil is warm after a run. Ensure



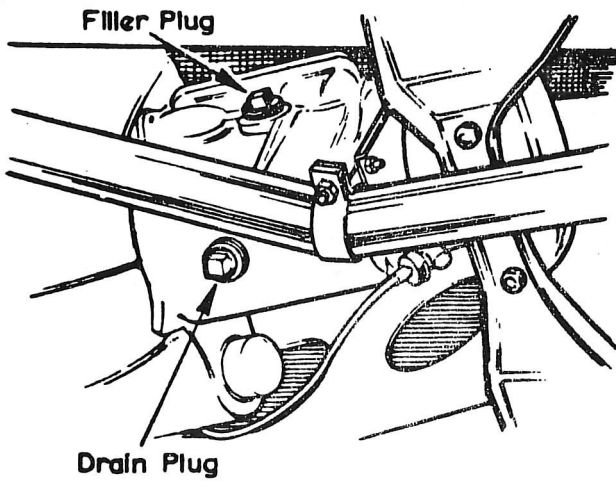


Fig.4. OIL FILLER & DRAIN PLUGS.

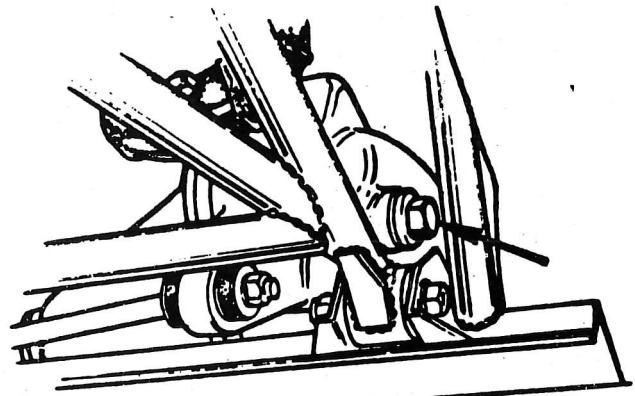


Fig.5. FILLER/LEVEL PLUG

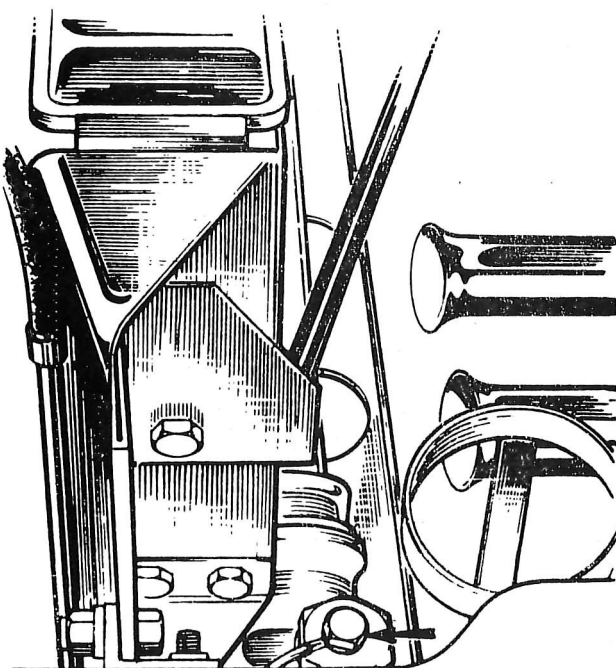


Fig. 6. STEERING UNIT PLUG

that the drain plug is cleaned thoroughly before being replaced and tightened.

### DIFFERENTIAL UNIT

The differential when new is filled with a special 'running-in' oil. The used lubricant must be drained, and the differential housing flushed out (with a good quality flushing oil, not paraffin) at 500 miles (800 km.). The level is checked every 10,000 miles (16,000 km.). Refill the axle with the specified lubricant, after ensuring that all flushing oil is removed.

The combined filler/level plug is located on the rear face of the differential housing, and the drain plug at the right-hand lower front.

### STEERING UNIT

At intervals of every 10,000 miles (16,000 km.), remove the plug from the top of the unit and fit a screwed grease nipple. Apply the grease gun filled with one of the recommended greases (see Section '0.8') and give FIVE STROKES ONLY; over-greasing can cause damage to the bellows. Remove the nipple and refit the plug.

### LOWER STEERING SWIVELS

At intervals of every 5,000 miles (8,000 km.) remove the plugs and fit screwed grease nipples. Apply a grease gun filled with one of the recommended lubricants and pump the gun until oil exudes from the swivels. Remove the nipples and refit the plugs.

### CARBURETTORS - ZENITH STROMBERG

At intervals of every 3,000 miles (5,000 km.) check the oil level in the carburettor damper reservoirs, by releasing the black cap from the top of each carburettor and withdrawing the damper assembly. The oil level should be  $\frac{1}{4}$  in. (6.35 mm.) from the top of the centre rod. When topping-up use the recommended engine oil. Replace the caps securely taking care not to overtighten as this will extrude the rubber sealing rings.

### BRAKE AND CLUTCH FLUID RESERVOIRS

The brake and clutch fluid reservoirs are located at the rear end of the engine compartment, just forward of the main bulkhead, on the driving side.

Check fluid levels in the reservoirs at intervals of every 5,000 miles (8,000 km.) topping-up if necessary to within  $\frac{1}{2}$  in. (12 mm.) of the top. Use only the specified fluid for topping-up.

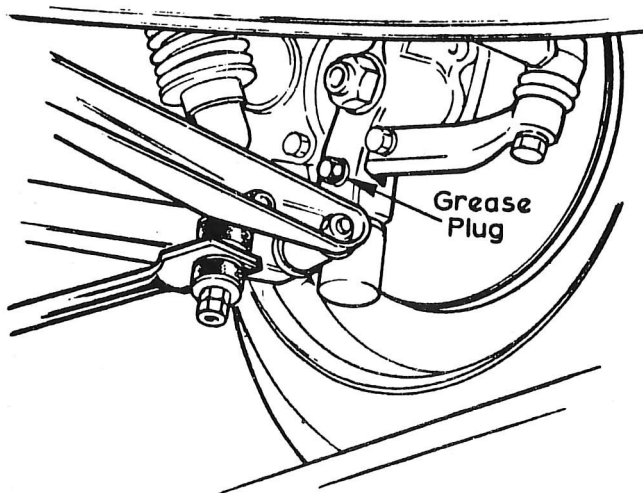


Fig. 7. STEERING SWIVEL PLUG

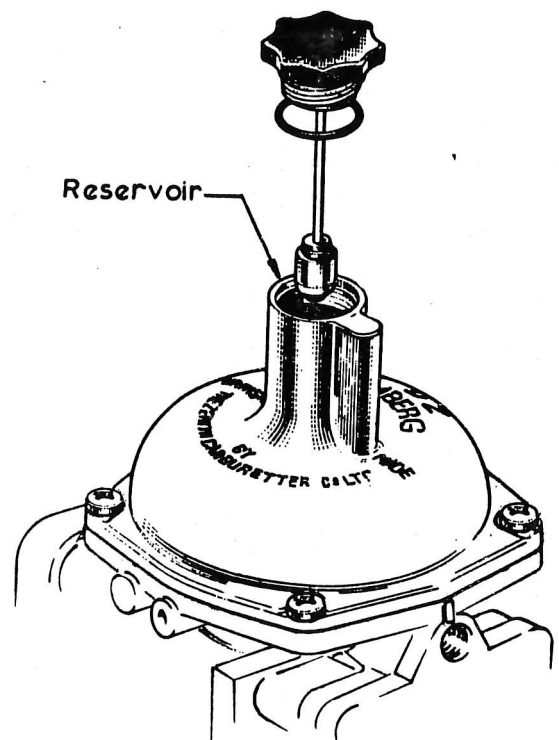


Fig. 8. DAMPER RESERVOIR (ZENITH-STROMBERG)

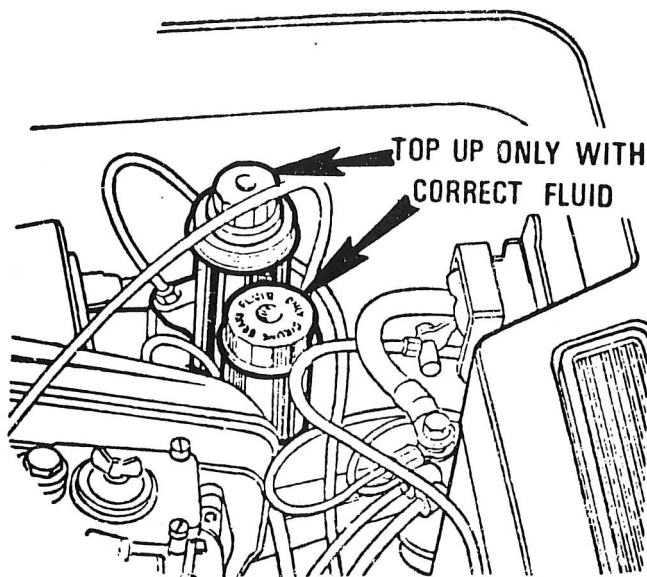


Fig. 9. POSITION OF FLUID RESERVOIRS

0.8 - RECOMMENDED LUBRICANTS

The products listed are not shown in any order of preference

	<u>Duckhams</u>	<u>Texaco</u>	<u>Shell</u>	<u>Esso</u>	<u>Castrol</u>	<u>B.P.</u>	<u>Mobil</u>
Engine (above 0°C.)	Duckhams Q Motor Oil (20W/50)	Havoline 20W/50	Shell Super 100	Uniflo SAE 10W/50	Castrol GTX	Super Viscostatic 20W/50	Mobiloil Super
Engine (below 0°C)	Duckhams Q Motor Oil (20W/50)	Havoline 10W/40	Shell Super 10W/50	Uniflo SAE 10W/50	Castrolite	Super Viscostatic	Mobiloil Super
Gearbox (4 or 5 speed)	Duckhams Hypoid 80	Multigear Lubricant EP.80	Shell Spirax 80 EP	Esso Gear Oil GP.80W	Castrol Hypoy Light	B.P. Gear Oil 80 E.P	Mobilube HD.80
Differential	Duckhams Hypoid 90	Multigear Lubricant EP.90	Shell Spirax 90 EP	Esso Gear Oil GX.85W/140	Castrol Hypoy	Energol EP SAE.90	Mobilube HD.90
Steering Swivels	Duckhams Hypoid 90	Multigear Lubricant EP.90	Shell Spirax 90 EP	Esso Gear Oil GX.85W/140	Castrol Hypoy	B.P. Gear Oil 90 EP	Mobilube HD.90
Propeller Shaft, Drive Shafts, Front Hubs	Duckhams LB.10	Marfak All-purpose	Shell Retinax A	Esso Multi-purpose Grease	Castrol- grease LM	B.P. Energrease L.2.	Mobilgrease MP

Brake and Clutch Master Cylinder Reservoirs:  
Zenith-Stromberg Carburetter Dampers:  
Castrol Girling Crimson Brake Fluid (7OR.3)  
Any of the engine oils listed above

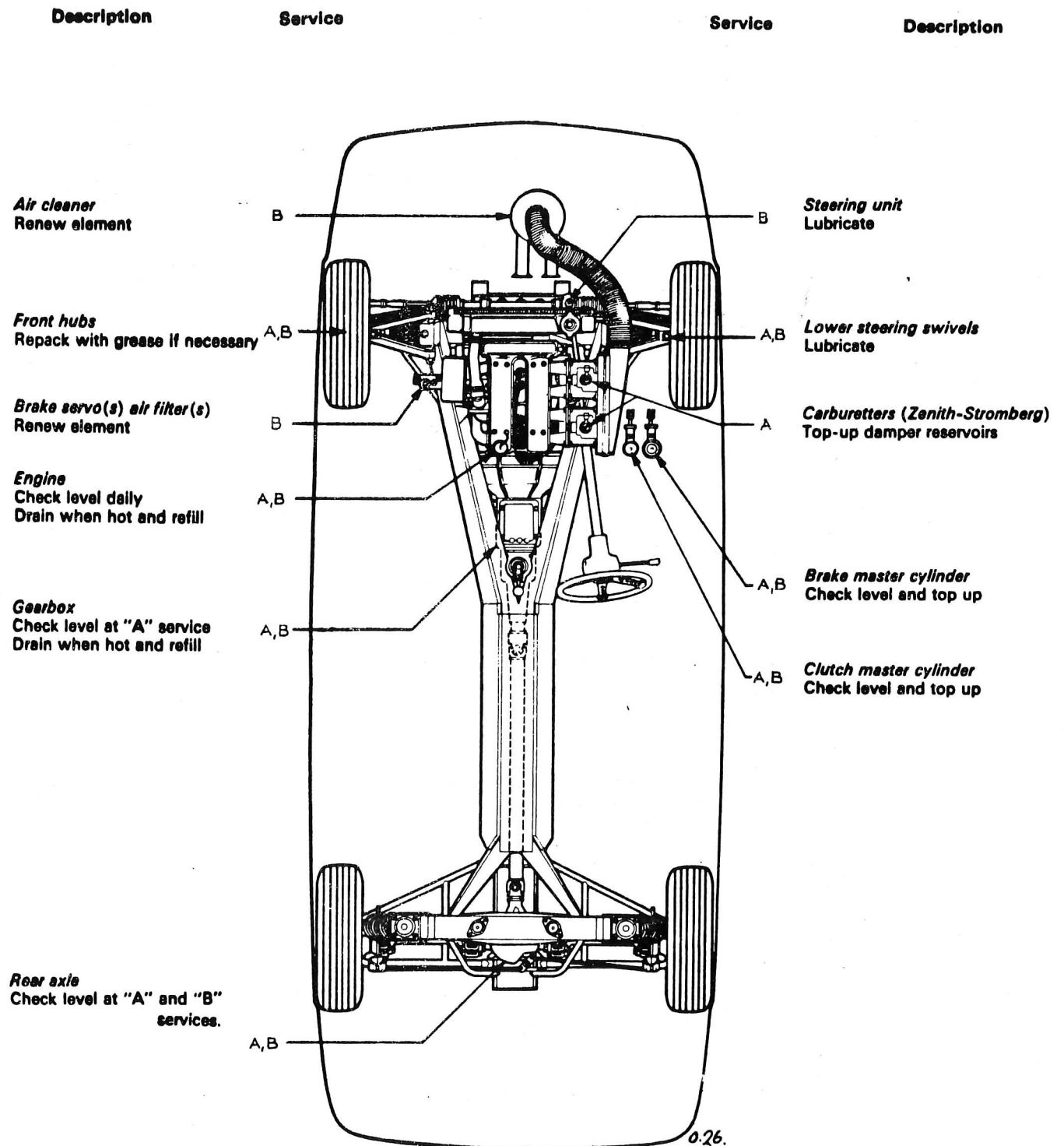


Fig. 10. LUBRICATION DIAGRAM

Distributor

Shaft and cam bearing )

Contact breaker pivot )

Timing (spark) control )

Cam profile

Battery Terminals

Engine oil

Light grease

Silicone grease

Generator Rear Bearing

Engine oil

Body

Hinges, locks, catches

Engine oil or silicone grease

IMPORTANT.

There is no need to use additives with any of the specified lubricants as those constituents considered necessary have already been included during blending. It should be specially noted that, under no circumstances, should additives of any kind be used in the differential unit.

O. 9 - APPROVED ANTI-FREEZE SOLUTIONS.

Lotus Cars Limited approve anti-freeze solutions, for use in the engine cooling system, based on inhibited ethylene glycol provided it conforms to British Standards Specification 'BS.3151'.

<u>Solution Strength</u>	<u>Against Frost Damage</u>	<u>Safe Pump Circulation</u>
25%	-15°F. (-26°C.)	10°F. (-12°C.)
30%	-28°F. (-33°C.)	3°F. (-16°C.)
35%	-38°F. (-39°C.)	- 4°F. (-20°C.)
40%	-42°F. (-41°C.)	- 10°F. (-23°C.)
50%	-53°F. (-47°C.)	- 32°F. (-36°C.)

O. 10 - EXHAUST EMISSION ENGINES

The following additional servicing is recommended for all cars equipped with the above engine.

500 miles (800 km.) Free Service

1. ENGINE

Adjust both carburetter idle trimming screws to give best quality idle and driveability.

2. IGNITION

Check and adjust if necessary, with aid of timing lamp, ignition advance.

At FIRST 1,000 (1,600 km)

1. ENGINE

Adjust both carburetter idle trimming screws to give best quality idle and driveability.

2. IGNITION

Check and adjust if necessary, with aid of timing lamp, ignition advance.

Every 6,000 miles (10,000 km.).

1. IGNITION

Fit new sparking plugs.

Every 12,000 miles (20,000 km)

1. ENGINE

Carry out carburetter 'Yellow' service (see Section 'L.15'). Renew adaptor flange 'O' rings. Check for induction leaks and renew all gaskets which are disturbed. Clean crankcase breather tube.

2. IGNITION

Check and adjust if necessary, with aid of timing lamp, ignition advance.

Fit new sparking plugs.

Every 24,000 miles (40,000 km)

1. ENGINE

Carry out carburetter 'Red' service (see Section 'L.16'). Renew adaptor flange 'O' rings. Renew all induction system gaskets. Check for induction leaks. Visually inspect secondary throttle spindle seals. Clean crankcase breather tube.

2. IGNITION.

Check and adjust if necessary, with aid of timing lamp, ignition advance. Fit new sparking plugs. Fit new distributor contact breaker points.

C.11 - AIR HORNS LUBRICATION

Where air horns are fitted the compressor should be lubricated, through the oil hole provided, initially on installation and subsequently at monthly intervals.