

CHAPTER D

LUBRICATION AND MAINTENANCE

SECTION DI — MAINTENANCE DATA

SILVER CLOUD, BENTLEY SI AND BENTLEY CONTINENTAL SI

Engine

Valve clearance :

Inlet	0.006 in. (cold) (0.15 mm.)
Exhaust	0.012 in. (cold) (0.30 mm.)
Distributor contact breaker gap	0.019 in. to 0.021 in. (0.483 mm. to 0.533 mm.)
Distributor 'dwell angle'	44 deg. at 0.020 in. (0.508 mm.) gap
Sparking plugs:	
6.6 : 1 c.r.	Champion RN8 or Lodge CLNP
8.0 : 1 c.r.	Champion N5* or Lodge HLNP
Continental models	
7.25 : 1 c.r.	Champion RN8 or Lodge CLNP
8.0 : 1 c.r.	Champion N5* or Lodge HLNP
Sparkling plug gap	* Not for use on cars with wing mounted aerials
Firing order	0.025 in. (0.635 mm.)
Ignition timing	1, 4, 2, 6, 3, 5
Valve timing	2 deg. B.T.D.C. No. 1 inlet valve opens at T.D.C. with 0.030 in. (0.762 mm.) valve clearance

Capacities

	Imperial	U.S.	Litres
Engine sump	16 pints	19.2 pints	9
Automatic gearbox	20 pints	24 pints	11.4
Synchromesh gearbox	6 pints	7.2 pints	3.4
Rear axle	1 $\frac{3}{4}$ pints	2.1 pints	1
Steering box (manual)	2 pints	2.4 pints	1.1
Steering system (power assisted)	4 pints	4.8 pints	2.2
Cooling system	3 $\frac{1}{2}$ gallons.	4.2 gallons.	16
Fuel tank	18 gallons.	21.6 gallons.	81.8

Levels

Engine sump	Max mark on the dipstick
Automatic gearbox	F line on the dipstick
Rear axle	Bottom of the level plug orifice
Steering box (manual)	Filler plug orifice
Steering system (power assisted)	Full mark on the dipstick
Starter motor drive	Bottom of the filler plug orifice
Shock dampers	Bottom threads of the filler plug orifice
Hydraulic fluid reservoirs	Level mark on the clamping straps
Chassis lubrication reservoir	1 in. below the top of the filler orifice
Coolant level	Bottom of the radiator filler orifice
Battery electrolyte	$\frac{3}{8}$ in. above the top of the separators
Windscreen washer reservoir	1 in. below the top of the filler orifice

Tyre Pressures

Silver Cloud and Bentley S1 — Power assisted steering — 8·20 × 15 tyres

Front	21 lb/sq.in.	(1·48 kg/sq.cm.)	}
Rear	26 lb/sq.in.	(1·83 kg/sq.cm.)	

Cold

Silver Cloud and Bentley S1 — Manual steering — 8·20 × 15 tyres

Front	19 lb/sq.in.	(1·33 kg/sq.cm.)	}
Rear	26 lb/sq.in.	(1·83 kg/sq.cm.)	

Cold

Silver Cloud and Bentley S1 Long Wheelbase — Power assisted steering — 8·20 × 15 tyres

Front	22 lb/sq.in.	(1·55 kg/sq.cm.)	}
Rear	28 lb/sq.in.	(1·97 kg/sq.cm.)	

Cold

Bentley Continental S1 (early) — Manual steering — 7·60 × 15 tyres

Front	22 lb/sq.in.	(1·55 kg/sq.cm.)	}
Rear	24 lb/sq.in.	(1·70 kg/sq.cm.)	
Front	30 lb/sq.in.	(2·1 kg/sq.cm.)	}
Rear	36 lb/sq.in.	(2·46 kg/sq.cm.)	

Cold for normal
speed running
Cold for maximum
speed running

Bentley Continental S1 (late) — Manual steering — 8·00 × 15 tyres

Front	20 lb/sq.in.	(1·41 kg/sq.cm.)	}
Rear	25 lb/sq.in.	(1·76 kg/sq.cm.)	
Front	25 lb/sq.in.	(1·76 kg/sq.cm.)	}
Rear	30 lb/sq.in.	(2·11 kg/sq.cm.)	

Cold for normal
speed running
Cold for maximum
speed running

Electrical Equipment

Battery	Dagenite or Exide 12V 57 amp/hr.
Earth	Negative to frame
Generator	Lucas C-47 12V or C-48 12V
Starter motor	Lucas M-45G 12V
Horns	Lucas WT 618/1 Windtone
Bulbs:	
Headlamps	12V 60/36W standard 12V 42/36W Canada and South America 12V 45/36W 'Granolux' France 12V 45/40W Europe except France
Sidelamps	12V 6W
Stop/Tail lamps	12V 18/6W
Rear flashers	12V 21W
Fog lamps	12V 38/21W
Reverse lamp	12V 21W
Number plate lamp	12V 6W
Boot lamp	12V 6W
Roof lamp	12V 6W
Companion lamps	12V 6W
Map lamp	12V 6W
Inspection lamp	12V 6W
Fuses:	30 amp. (one strand of No. 28 S.W.G. (0.0148 in. dia.) tinned copper wire)
Horn fuse	25 amp. cartridge type
Radio fuse	5 amp. cartridge type

SECTION D2—MAINTENANCE DATA

SILVER CLOUD II, BENTLEY S2, BENTLEY CONTINENTAL S2 AND PHANTOM V

Engine

Distributor contact breaker gap	0.019 in. to 0.021 in. (0.483 mm. to 0.533 mm.)
Distributor 'dwell angle'	44 deg. at 0.020 in. (0.508 mm.) gap
Sparkling plugs	Champion RN8, Champion RN13P or Lodge CLNP
Sparkling plug gap	0.024 in. to 0.027 in. (0.609 mm. to 0.686 mm.)
Firing order	A1, B1, A4, B4, B2, A3, B3, A2 1, 5, 4, 8, 6, 3, 7, 2
Ignition timing	2 deg. B.T.D.C.
Valve timing	5 deg. A.T.D.C.

Capacities

	Imperial	U.S.	Litres
Engine sump	12 pints	14.40 pints	6.81
Automatic gearbox	20 pints	24 pints	11.36
Rear axle	1 $\frac{1}{2}$ pints	1.95 pints	0.92
Steering system	3 pints	3.60 pints	1.70
Steering (transfer box)	$\frac{5}{8}$ pint	0.75 pint	0.36
Cooling system	21 pints	25.21 pints	11.93
Fuel tank	18 gallons.	21.60 gallons.	81.82
Fuel tank (Phantom V)	23 gallons.	27.62 gallons.	104.56

Levels

Engine sump	Max mark on the dipstick
Automatic gearbox	F line on the dipstick
Rear axle	Bottom of the level plug orifice
Steering (transfer box)	Bottom of the level plug orifice
Steering system	Full mark on the dipstick
Shock dampers	Bottom threads of the filler plug orifice
Hydraulic fluid reservoirs	Level mark on the clamping straps
Coolant level	Bottom of the radiator filler orifice
Battery electrolyte	$\frac{3}{8}$ in. above the top of the separators
Windscreen washer reservoir	1 in. below the top of the filler orifice

Tyre Pressures

Silver Cloud II and Bentley S2 — 8.20 × 15 tyres

Front	22 lb/sq.in.	(1.55 kg/sq.cm.)	Cold
Rear	27 lb/sq.in.	(1.90 kg/sq.cm.)	

Silver Cloud II and Bentley S2 Long Wheelbase — 8.20 × 15 tyres

Front	23 lb/sq.in.	(1.62 kg/sq.cm.)	Cold
Rear	29 lb/sq.in.	(2.04 kg/sq.cm.)	

Bentley Continental S2 — 8.00 × 15 tyres

Front	20 lb/sq.in.	(1.41 kg/sq.cm.)	Cold for normal
Rear	25 lb/sq.in.	(1.76 kg/sq.cm.)	
Front	25 lb/sq.in.	(1.76 kg/sq.cm.)	Cold for maximum
Rear	30 lb/sq.in.	(2.11 kg/sq.cm.)	

Park Ward Convertible Coupe

Front	20 lb/sq.in.	(1.41 kg/sq.cm.)	Cold for normal
Rear	28 lb/sq.in.	(1.97 kg/sq.cm.)	
Front	25 lb/sq.in.	(1.76 kg/sq.cm.)	Cold for maximum
Rear	33 lb/sq.in.	(2.33 kg/sq.cm.)	

Phantom V — 8.90 × 15 tyres

Front	22 lb/sq.in.	(1.55 kg/sq.cm.)	Cold
Rear	27 lb/sq.in.	(1.90 kg/sq.cm.)	

Electrical Equipment

Battery	Dagenite or Exide 12V 67 amp/hr.
Earth	Negative to frame
Generator	Lucas C48 12V
Starter motor	Lucas M-45G 12V
Horns	Lucas WT 618/1
Bulbs:	
Headlamps	12V 60/36W 12V 42/36W Canada and South America 12V 45/36W 'Granolux' France 12V 45/40W Europe except France
Side lamps	12V 6W
Fog lamp/front flasher	12V 38/21W
Fog lamp (Switzerland)	12V 21W
Front flasher (Switzerland)	12V 21W
Stop/Tail lamps	12V 21/6W
Stop/Rear flasher (Switzerland)	12V 21/6W
Reverse lamp	12V 21W
Number plate lamp	12V 6W
Boot lamp	12V 6W
Roof lamp	12V 6W
Companion lamp	12V 6W
Inspection lamp	12V 6W
Rear flasher	12V 21W
Map lamp	12V 3W
Fuses:	30 amp. (one strand of No. 28 S.W.G. (0.0148 in. dia.) tinned copper wire)
Horn fuse	25 amp. cartridge type
Radio fuse	5 amp. cartridge type

SECTION D3—PERIODIC LUBRICATION AND ADJUSTMENT SCHEDULES

A system of periodic lubrication and maintenance has been established to assist retailers with the maintenance of Rolls-Royce and Bentley cars in their area.

Retailers are advised to institute this system as a normal routine and to make appropriate

arrangements with any owners wishing to avail themselves of this service.

Should some owners desire to carry out their own maintenance inspections, it should be noted that this system does not in any way supersede the instructions given in Owners' Handbooks.

The following schedules cover the whole car.

SILVER CLOUD, BENTLEY SI AND BENTLEY CONTINENTAL SI**Schedule A**

To be carried out every 5000 miles, covers all the items associated with the engine, chassis and coachwork requiring lubrication, cleaning and adjustment.

Schedule B

To be carried out every 10,000 miles. In addition to the repetition of the whole of Schedule A, it covers the complete change of lubricant of all the main components, together with the inspection and rectification of those items not included at the lower mileage.

Schedule C

To be carried out every 20,000 miles. This schedule repeats Schedule B and principally covers the change of lubricant for the automatic gearbox, rear axle and propeller shaft ball and trunnion joint.

SCHEDULE A
EVERY 5000 MILES

Lubrication

1. Ignition distributor shaft, contact breaker pivots and cam.
2. Gear range selector controls and accelerator linkage.
3. Brake system pivot pins and bearings.

Oil Level Checks

1. Steering box.
2. Chassis lubrication tank.
3. Clean carburettor air valves and check oil level in hydraulic damper chambers.
4. Brake master cylinder reservoirs.
5. Automatic gearbox. (Check with engine running as described in Automatic Gearbox Manual).
6. Rear axle.
7. Drain and re-fill the crankcase sump. Renew the oil filter element.
8. Power steering pump (if fitted).

Engine and Chassis Adjustments

1. Check the coolant level and top-up if required. (Check the specific gravity of the coolant and advise the owner if additional anti-freeze is required). Maintain anti-freeze in the system all the year round.
2. Check the tension of the driving belts and adjust if necessary. If individual tension is uneven a new **matched pair** of belts should be fitted.
3. Check and re-set the inlet clearances.
4. Clean the sparking plugs. Check and re-set the gaps.
5. Clean the contact breaker points. Re-set the gaps, check and re-set the ignition timing.

6. Check the functioning of the fuel pumps (disconnect the electrical leads and check each pump independently).
7. Adjust the rear brakes.
8. Check for excessive leakage at any point in the central chassis lubrication system.
9. Check and adjust the tyre pressures.
10. Clean the oil bath air filter element (if fitted) and re-fill with oil.
11. Clean the 'Vokes' air filter element (Continental models).
12. Inspect the condition of the propeller shaft sealing boot. Check the torque tightness of the four bolts securing the universal joint to the gearbox output flange.

Electrical System

1. Check the battery electrolyte level. Top-up with distilled water if required. Clean, apply a coat of petroleum jelly and tighten the battery terminals.
2. Check the complete electrical system for correct functioning.

Road Test

1. Test the car on the road.

SCHEDULE B EVERY 10,000 MILES

1. Repeat Schedule A.
2. Lubricate the three grease nipples on the rear propeller shaft.
3. Check the starter motor reduction gear oil level and re-fill if required.
4. Check the oil level in the front and rear shock dampers.
5. Remove the carburetter air filter element and wash in petrol or paraffin and then oil with engine oil. Allow to thoroughly drain before re-fitting.
6. Clean the fuel strainers.
 - (i) The main fuel filter on the chassis cross member just forward of the fuel tank.
 - (ii) The filter gauzes in each carburetter float chamber feed connection.
 - (iii) The filter gauzes in the fuel pumps.
7. Change the filter in the power steering pump reservoir (where fitted).

8. Check and if necessary adjust the brake servo.
9. Grease the master cylinder balance lever bearing (where applicable).
10. On cars fitted with Rolls-Royce Car Interior Cooling System, grease the coolant pump bearing using Retinax 'A' or similar type of grease.
11. Grease the steering points using Molyspring Lubricant 204G, or a good quality grease containing 20 per cent molybdenum disulphide.

SCHEDULE C

EVERY 20,000 MILES

1. Repeat Schedule B.
2. Drain and re-fill the automatic gearbox. Clean the oil breather in the top of the dipstick.
3. Drain and re-fill the rear axle.
4. Dismantle the front ball and trunnion joint on the propeller shaft, inspect and re-fill with $1\frac{1}{2}$ oz. of Mobilgrease No. 2. This should not be carried out if the joint shows no sign of leakage.
5. Remove the front drums and inspect the brake linings for wear. (Lining face should not be less than $\frac{1}{2}$ in. (0.8 mm.) above the rivets).
6. Renew the oil filter pad in the chassis lubrication pump.
7. Renew the 'Vokes' air filter element (Continental models).

EVERY 60,000 MILES

1. Examine the wheel bearings, if they are in a serviceable condition, re-pack with the correct grease.
2. Examine the propeller shaft centre bearing and re-pack with the correct grease.

ANNUALLY

1. Drain and flush the cooling system; re-fill with the correct anti-freeze mixture.

SPECIAL PRECAUTIONS

Should the car be operating in a sustained temperature of 0 deg. F. and below:

1. Drain the crankcase sump when thoroughly warm and re-fill with SAE 10 oil; the carburetter air valve guide should also be drained and re-filled with this oil.

SECTION D4—PERIODIC LUBRICATION AND ADJUSTMENT SCHEDULES**SILVER CLOUD II, BENTLEY S2, BENTLEY CONTINENTAL S2 AND PHANTOM V****2500 Miles Schedule**

To be carried out every 2500 miles — covers engine oil change, oil level checks, engine and chassis adjustments, electrical system checks and road test.

Schedule A

To be carried out every 5000 miles—covers all the items associated with engine, chassis and coachwork requiring lubrication, cleaning and adjustment.

Schedule B

To be carried out every 10,000 miles. In addition to the repetition of the whole of Schedule A, it covers the complete change of lubricant of all the main components, together with the inspection and rectification of those items not included at the lower mileage.

Schedule C

To be carried out every 20,000 miles. This Schedule repeats Schedule B and principally covers the change of lubricant for the automatic gearbox, rear axle and the propeller shaft ball and trunnion joint.

Schedule D

To be carried out at the conclusion of every 30,000 miles. This Schedule repeats Schedule B or C as required and covers renewal of the filter element in the steering pump reservoir.

2500 MILES SCHEDULE**Oil Changes**

1. Drain and re-fill the crankcase sump.

Oil Level Checks

1. Carburetter air valve damper.
2. Steering pump reservoir.
3. Brake fluid reservoirs.
4. Automatic gearbox. (Check with the engine running as described in the Automatic Gearbox Manual).

Engine and Chassis Adjustments

1. Check the coolant level (check the specific gravity of the coolant and advise the owner if additional anti-freeze is required). Maintain anti-freeze in the system all the year round.
2. Check the tension of the driving belts and adjust if necessary. If individual belt tension is uneven a new **matched pair** of belts should be fitted.
3. Check and if necessary adjust the rear brakes.
4. Check and adjust the tyre pressures (including spare).

Electrical System Checks

1. Check the battery electrolyte level and top-up with distilled water if required.
2. Check and if necessary top-up the windscreen washer reservoir with the correct mixture of distilled water and Rolls-Royce Windscreen Washer Fluid.
3. Check the complete electrical system for correct functioning.

Road Test

1. Test the car on the road.

SCHEDULE A**EVERY 5000 MILES**

1. Repeat the 2500 Miles Schedule.
2. Renew the oil filter element.
3. Check and if necessary top-up the rear axle oil level.
4. Lubricate the ignition distributor automatic advance mechanism, shaft bearings, governor spindle, contact breaker rocker arm pivots and cam.
5. Lubricate the gear range selector controls and accelerator linkage. **Do not** lubricate the automatic starting device controls.
6. Lubricate the brake system pivot pins and bearings.

7. Clean the contact breaker points and re-set the gaps. Check and re-set the ignition timing.
8. Check the functioning of the fuel pumps (disconnect the electrical leads and check each pump independently).
9. Remove any foreign matter from the refrigeration condenser matrix (if fitted).
10. Clean the air valves in the carburetters.
11. Check the torque tightness of the four bolts securing the universal joint to the gearbox output flange. Inspect the condition of the rubber boot.
12. Check the static and dynamic balance of the wheels and rectify if necessary. Interchange the front and rear wheels to equalise tyre wear. Check the front brake linings for wear (see Section G).
13. Clean and tighten the battery terminals. Apply them with a light coat of petroleum jelly.

SCHEDULE B**EVERY 10,000 MILES**

1. Repeat Schedule A.
2. Check the oil level in the front and rear shock dampers. This should not be carried out if the dampers show no sign of leakage.
3. Lubricate the grease nipple of the master cylinders balance lever pivot.
4. Lubricate the thirteen grease nipples on the steering mechanism.
5. Lubricate the eight grease nipples on the front suspension.
6. Lubricate the three grease nipples on the rear propeller shaft.
7. Clean the sparking plugs, test and if necessary renew.
8. Check and if necessary adjust the brake servo.
9. Remove the front drums and inspect the brake linings for wear. (Lining face should not be less than $\frac{3}{2}$ in. (0.8 mm.) above the rivets).
10. Renew the carburetter air filter element.
11. Clean the main fuel filter (adjacent to the fuel tank), both filter gauzes in the fuel pump and the filter gauze in each float chamber feed connection.

SCHEDULE C**EVERY 20,000 MILES**

1. Repeat Schedule B.
2. Drain and re-fill the automatic gearbox and fluid coupling — clean the oil breather in the top of the dipstick.
3. Drain and re-fill the rear axle.
4. Dismantle the front ball and trunnion joint of the propeller shaft, inspect and re-fill with $1\frac{1}{2}$ oz. of Mobilgrease No. 2. This should not be carried out if the joint shows no sign of leakage.
5. Inspect the generator commutator and brushes for wear, also the brushes for freedom in their holders.
6. Release — but do not remove — the fuel tank drain plug to allow any accumulated water to escape.
7. Remove the fuel pumps and bench test them.

SCHEDULE D**EVERY 30,000 MILES**

1. Repeat Schedule B or C as required.
2. Renew the filter element in the steering pump reservoir.

EVERY 60,000 MILES

1. Examine the wheel bearings; if they are in a serviceable condition re-pack with the correct grease.
2. Examine the propeller shaft centre bearing and re-pack with the correct grease.

ANNUALLY

1. Drain and flush the cooling system; re-fill with the correct anti-freeze mixture.

SPECIAL PRECAUTIONS

Should the car be operating in a sustained temperature of 0 deg. F. and below:

1. Drain the crankcase sump when thoroughly warm and re-fill with a viscosity SAE 10 oil; the carburetter air valve guides should also be drained and re-filled with this oil.

SECTION D5—LUBRICATION OF THE STEERING AND SUSPENSION POINTS—4 STAGES

Stage 1

When production of S1 cars commenced, lubrication was provided for by the Centralised Chassis Lubrication System.

This system supplies oil to all front suspension and steering joints (see Figs. D1A and D1B).

The rear springs on both S1 and S2 cars are pre-packed with grease.

Stage 2

During the production of S1 cars, grease lubrication was introduced on the steering mechanism.

At this stage the track rod ends only were adapted for grease. This modification (shown in Fig. D2) was introduced on the following chassis:

Bentley S1

B-FA.48, 208, 386, 394, 398, 516, 526, 532, 544, 552, 556-650 onwards

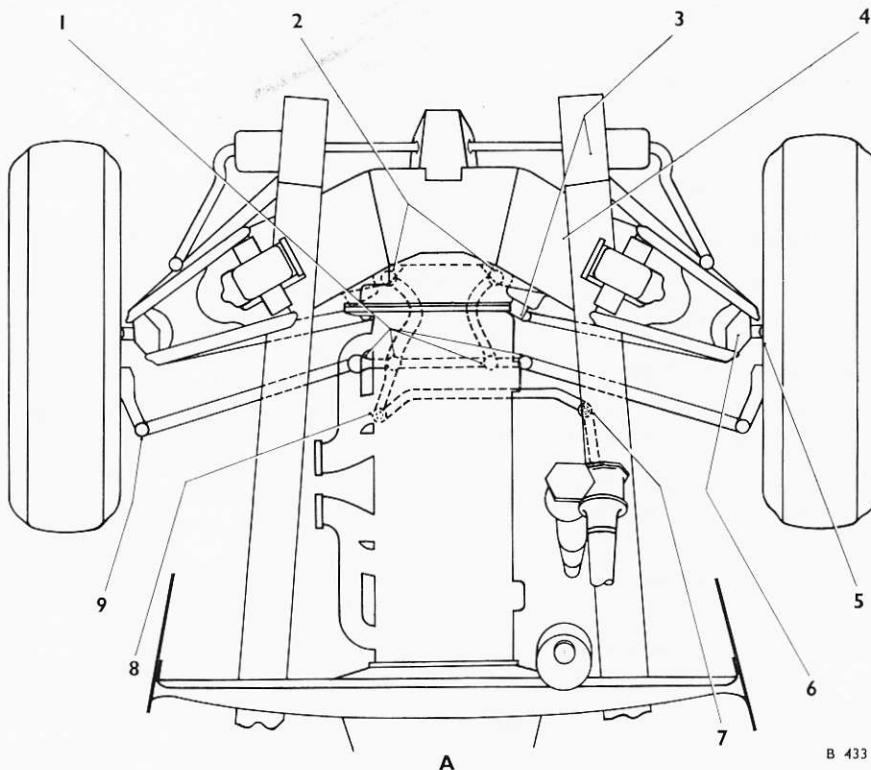


Fig. D1A Chassis lubrication system, right-hand arrangement

- | | | |
|--|---|---|
| 1. CROSS BEAM CENTRE
STEERING BALL JOINTS | 4. METER VALVE RATE 2 | 8. CENTRE STEERING
OPERATING LEVER/DRAG
LINK BALL JOINT |
| 2. CENTRE STEERING
LEVER PIVOTS | 5. SWIVEL PIN | |
| 3. LOWER TRIANGLE LEVER
FULCRUM BEARINGS | 6. YOKE BEARINGS | |
| | 7. PENDULUM LEVER/DRAG
LINK BALL JOINT | 9. SIDE STEERING LEVER-CROSS-
STEERING TUBE BALL JOINT |

Bentley Continental S1	F series onwards
Bentley S1 L.W.B.	ALB.14-18, 20 onwards
Silver Cloud	F series onwards
Silver Cloud L.W.B.	BLC.18, 19, 21, 23-35, 37-46, 50, 51 onwards

Stage 3

At a later stage in the production of S1 cars, grease lubrication was used more extensively. While the Centralised Chassis Lubrication System was still retained on the suspension, all the steering joints, except the centre steering lever pivot points, were changed to grease lubrication as illustrated in Figure D3.

This modification was introduced on the following chassis:

Bentley S1	B-FA.644 onwards
Bentley Continental S1	BC-FM.1 onwards
Bentley S1 L.W.B.	ALB.17, 21-24 onwards
Silver Cloud	F series onwards
Silver Cloud L.W.B.	BLC.28-40, 42 onwards

Stage 4

At the commencement of the production of S2 cars the Centralised Chassis Lubrication System was omitted and all suspension and steering joints were fitted with grease points (see Fig. D4).

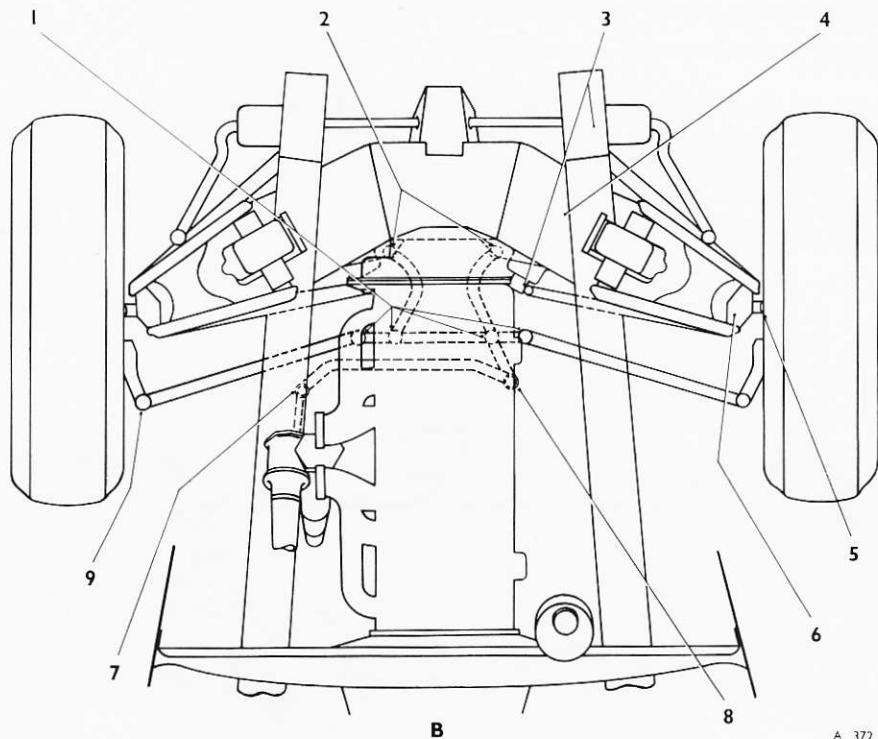
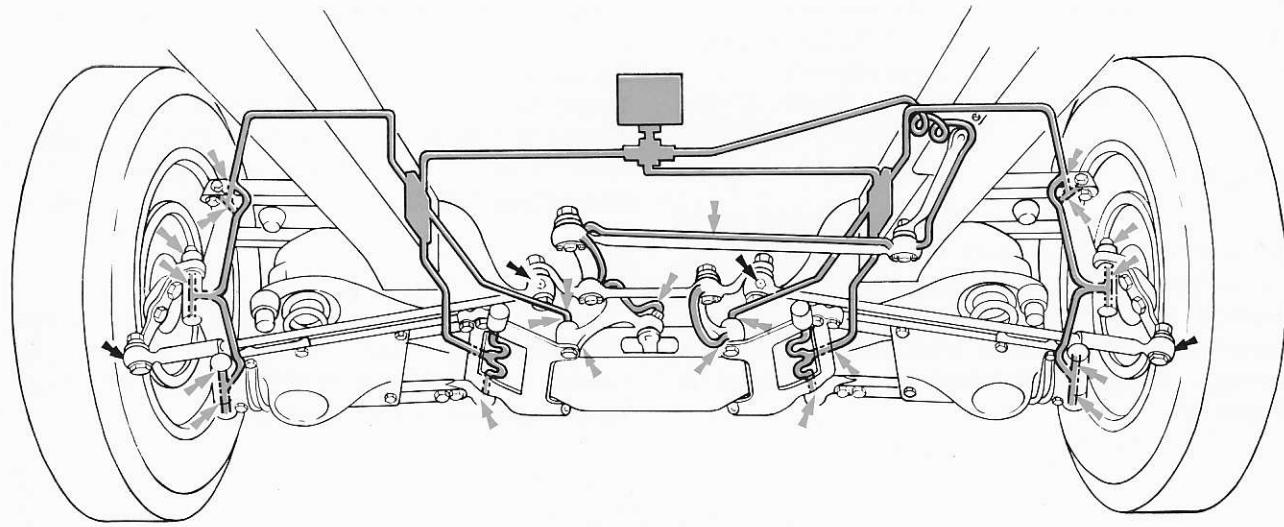


Fig. D1B Chassis lubrication system, left-hand arrangement

- | | | |
|--|---|--|
| 1. CROSS BEAM CENTRE
STEERING BALL JOINTS | 4. METER VALVE RATE 2 | 8. PENDULUM LEVER/DRAG
LINK BALL JOINT |
| 2. CENTRE STEERING
LEVER PIVOTS | 5. SWIVEL PIN | 9. SIDE STEERING LEVER/CROSS
STEERING TUBE BALL JOINT |
| 3. LOWER TRIANGLE LEVER
FULCRUM BEARINGS | 6. YOKE BEARINGS | |
| | 7. CENTRE STEERING
OPERATING LEVER/DRAG
LINK BALL JOINT | |



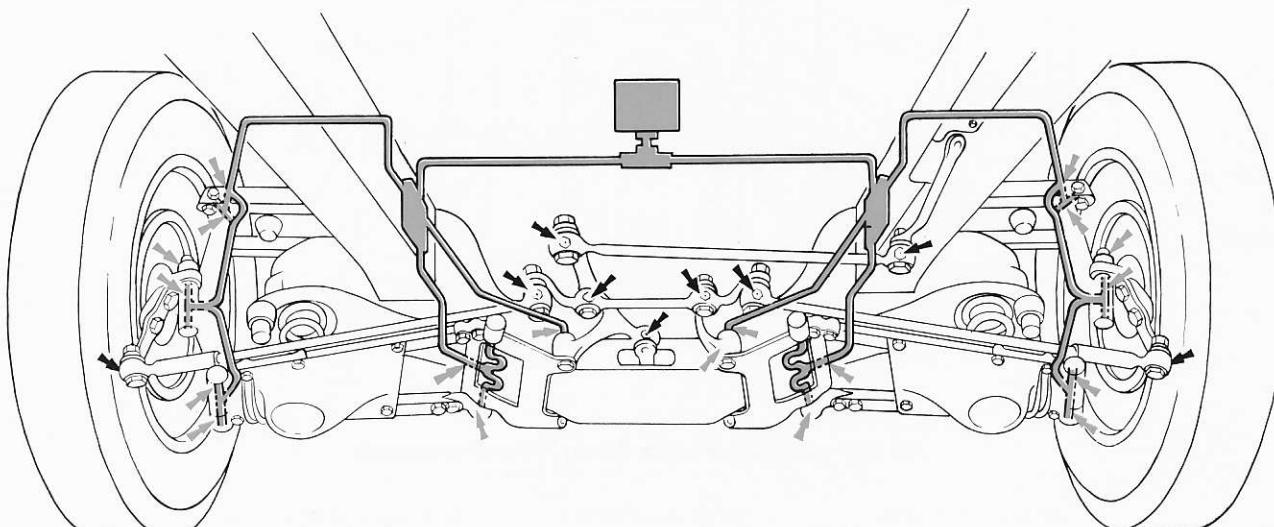
POINTS LUBRICATED BY THE EARLY TYPE ONE-SHOT LUBRICATION SYSTEM

GREASE LUBRICATED POINTS

B 405

Fig. D2 Early type one-shot oil lubrication system and grease lubricated track rods only

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POINTS LUBRICATED BY THE LATE TYPE ONE-SHOT LUBRICATION SYSTEM

GREASE LUBRICATED POINTS

B 404

Fig. D3 Late type one-shot oil lubrication system and grease lubricated steering joints

TSD 729

SECTION D6—THE CENTRALISED CHASSIS LUBRICATION SYSTEM

The Luvox Bijur foot-operated pump and combined oil reservoir is fitted on the front of the bulkhead and supplies oil through brass tubing to the front chassis lubrication points as shown in Figures D1A and B, D2 and D3.

The rear springs are interleaved and pre-packed with grease. They and the rubber-bushed shackle pins require no additional lubrication.

Figure D5. Pressure on the foot pedal raises the piston and compresses the return spring. Oil is drawn through a non-return ball valve in the centre of the piston to the underside of the piston. On releasing the pressure from the pedal, the piston is forced downward by the return spring and oil is forced through the filter pad to the outlet pipe.

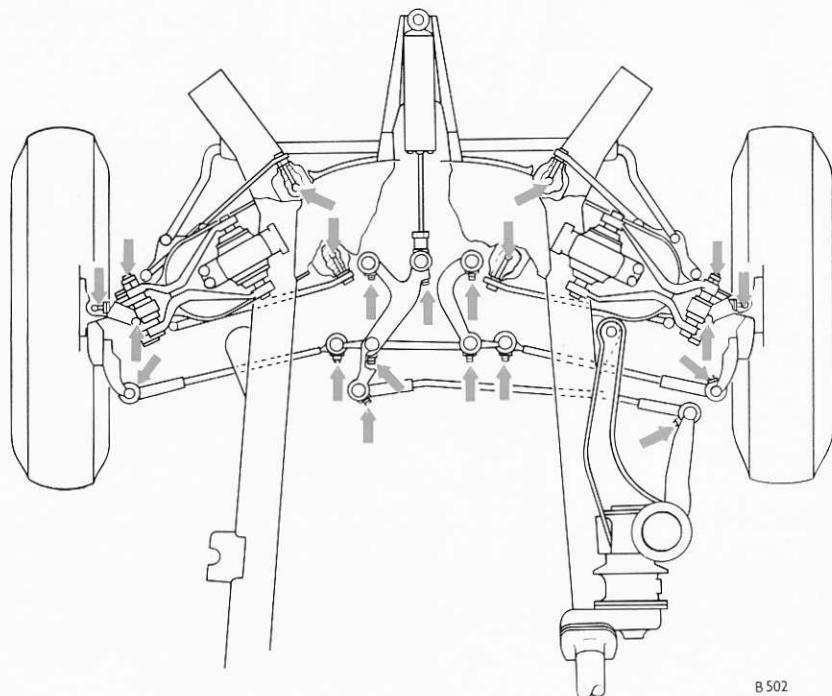


Fig. D4 Steering and front suspension joints, grease lubrication points

The oil delivered is not metered by drip plugs and each bearing point is designed to ensure that correct lubrication is effected. As this is a total loss system, oil leakage from the points is desirable but excessive individual leakage should be rectified. Joints and connections in the piping are made by cap nuts and olives.

The construction of the pump is shown in

The spring is so rated that the pressure is practically constant throughout the stroke and the rate of discharge depends upon the viscosity of the oil. Normally it should take approximately five minutes for the pedal to return to its original position. At the end of its stroke the piston seals the hole in the filter retaining plate, preventing oil leakage by gravity.

The pedal should be depressed four times every 200 miles to ensure adequate lubrication.

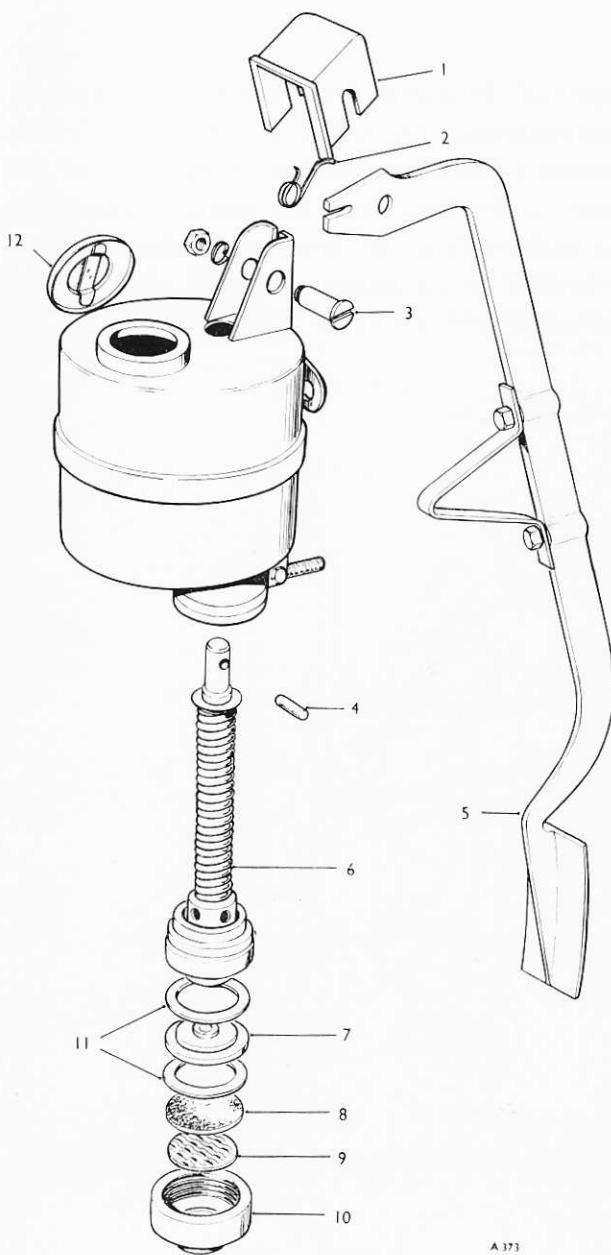


Fig. D5 Chassis lubrication pump

- | | |
|--------------------|---------------------|
| 1. COVER | 7. STRAINER PLATE |
| 2. PEDAL SPRING | 8. FELT STRAINER |
| 3. PEDAL PIN | 9. STRAINER SUPPORT |
| 4. PISTON ROD PIN | 10. CAP NUT |
| 5. PEDAL | 11. JOINT WASHERS |
| 6. PISTON ASSEMBLY | 12. FILLER CAP |

Pump Filter

If, with the pump unit correctly coupled to the pipe lines, the pump pedal does not return to its normal position within four to five minutes after being pressed down, it is probable that the filter is clogged.

Disconnect the chassis oil line at the pump outlet and unscrew the cap nut below the reservoir. Note the positioning of the filter retaining plate and gaskets to ensure correct re-assembly. Discard the felt disc and replace with a new one. Re-assemble and re-connect. Prime the system until oil is exuding from each bearing.

Pump — to test

Disconnect the chassis oil feed pipe from the connection at the bottom of the pump, and seal the outlet with a plug or re-connect a short piece of tube with its end hammered flat. Press down the pedal. If the pedal shows any upward movement during a period of two minutes a leak past the piston is indicated either at the leather cups or at the ball valve. Check that the reservoir is filled with the correct viscosity oil as too thin an oil will give the same effect. If a leak is evident replace the pump unit.

The approved oils are:

Castrol Hi-press S/C
Energol SAE 90 EP
Spirax 90 EP
Mobilube GX 90

Pump — to dismantle

Normally, reconditioning of an oil pump is only undertaken by the Manufacturers and it is advisable to fit a replacement unit and to return the original for repair. The following instructions are given for occasions when this is impracticable.

Disconnect the chassis feed pipe from the pump. Remove the three nuts, bevelled and plain washers situated under the carpet and insulating material at the front of the bulkhead. The stirrup, which acts as a travel limiter, must be removed from the pedal because

there is insufficient room for the pedal assembly to pass through the bulkhead. The pump may now be removed. Collect the three plain washers fitted between the pump and the bulkhead.

Remove the filler cap. Remove the nut and spring washer from the cheese-headed pedal pin. Slide the pedal spring cover forward and remove.

Tap out the pedal pin, collect the hairpin spring. Slide the pedal off the flats on the piston rod pin, remove the pin from the piston rod.

Remove the cap nut and remove the piston valve assembly downward.

To check for leakage disconnect the chassis feed pipe from the connection at the bottom of the pump and leave a piece of paper beneath the connection. Inspect after approximately half an hour.

If tightening the cap nut, or dismantling and cleaning does not effect a cure, a new pump should be fitted.

Pump — to assemble

Thoroughly clean all parts.

Oil the piston cup. With the leather joint washer in position on the collar near the top of the piston rod, fit the piston assembly to the tank. Fit the piston rod pin to the piston rod and slide the pedal on to the flats on the pin.

Fit the pedal pin and pedal spring, the shorter leg in the pedal notch and the longer leg under the small projecting pin (see Fig. D5). Fit the pedal spring cover. Push it fully home against the pedal pin and tighten the pedal pin nut.

With the strainer support, strainer, strainer plate and two washers in position in the cap nut, fit the nut to the tank and fully screw up.

Re-fit the pump to the bulkhead and connect the feed pipe.

Gravity Leakage from the Pump

A gravity leakage from the pump, due to the piston sealing disc not seating correctly on the raised face of the brass strainer plate, will be noticeable by excessive oiling at the joints.

Incorrect sealing of the piston discs may be due to the cylinder cap nut (see 6, Fig. D6) not being sufficiently tightened, or to foreign matter between the piston valve disc and strainer plate.

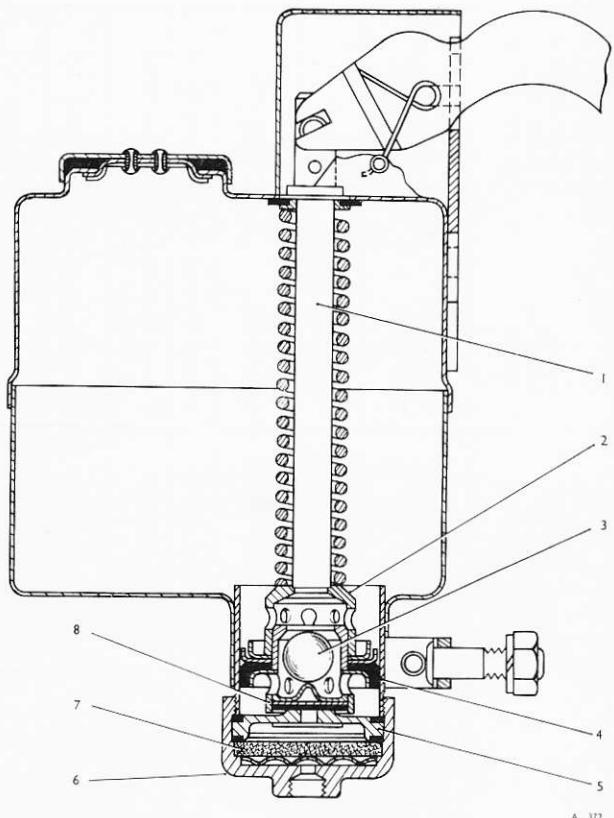


Fig. D6 Exploded view of pump

- | | |
|-------------------------|----------------------|
| 1. PISTON ROD | 5. STRAINER PLATE |
| 2. PISTON ROD VALVE NUT | 6. CYLINDER CAP NUT |
| 3. PISTON VALVE BALL | 7. FELT STRAINER |
| 4. PISTON CUP | 8. PISTON VALVE DISC |

SECTION D7 — APPROVED LUBRICANTS FOR S1 AND S2 CARS

	B.P.	CASTROL	SHELL	MOBIL	ESSO
Engine Winter Summer Multi-grade	Energol SAE 20W Energol SAE 30 Energol Viscostatic (10W/30)	Castrolite Castrol XL Castrolite	X-100 20/20W X-100 30 X-100 10W/30	Mobiloil Arctic Mobiloil A Mobiloil Special (10W/30)	Esso Extra Motor Oil 20W/30
Carburetter air valve damper hand oiling points Contact breaker pivots (S1 and S2 cars) Contact breaker cam (S1 cars only)	Energol SAE 20/W	Castrolite	X-100 20/20W	Mobiloil Arctic	Esso Extra Motor Oil 20W/30
Contact breaker cam (S2 cars)	Energrease L2	Castrolease LM	Retinax 'A'	Mobilgrease MP	Esso Multi-purpose Grease H
Automatic gearbox† Shock dampers† Steering pump P.A.S.†	Energol ATF Type A	Castrol TQ	Donax T6	Mobilfluid 200	Esso Automatic Transmission Fluid 55
Synchromesh gearbox	Energol SAE 80 EP	Castrol Hypoy Light	Spirax 80 EP	Mobilube GX 80	Esso Gear Oil GP 80
Rear axle Steering transfer box (S2 cars only)	Energol SAE 90 EP	Castrol Hi-press S/C* or Castrol Hypoy	Spirax 90 EP	Mobilube GX 90	Esso Gear Oil GP 90
Propeller shaft centre bearing Waterpump (S1 refrigerated cars only)	Energrease L2	Castrolease LM	Retinax 'A'*	Mobilgrease MP	Esso Multi-purpose Grease H
Front hubs Rear hubs	Energrease L2	Castrolease LM	Retinax 'A'*	Mobilgrease MP	Esso Multi-purpose Grease H
Propeller shaft sliding and rear universal joints	Energrease L2	Castrolease LM	Retinax 'A'*	Mobilgrease MP	Esso Multi-purpose Grease H
Propeller shaft front ball and trunnion joint	—	—	—	Mobilgrease No. 2	—
Steering box (manual) Starter motor gears (S1 cars only)	Energol SAE 30	Castrol XL	X-100 30	Mobiloil A	Esso Extra Motor Oil 20W/30
Chassis oil pump (S1 cars only)	Energol SAE 90 EP	Castrol Hi-press S/C	Spirax 90 EP	Mobilube GX 90	Esso Gear Oil GP 90
Distributor lubricator (S1 cars only)	Energrease L2	Castrolease LM	Retinax 'A'*	Mobilgrease MP	Esso Multi-purpose Grease H
Distributor lubricator (S2 cars)	Energol SAE 20	Castrolite	X-100 20/20W	Mobiloil Arctic	Esso Extra Motor Oil 20W/30
Master cylinder reservoir(s)	Castrol — Girling Brake Fluid (6293) — Crimson				
Master cylinder balance lever (S2 cars)	Energrease L2	Castrolease LM	Retinax 'A'*	Mobilgrease MP	Esso Multi-purpose Grease H
Steering joints and suspension pivots	Rocol Moly Spring Grease 204 G or Shell Grease S5466				
Refrigeration compressor (Tecumseh or Lehigh)	—	Icematic Heavy	Shell Clavus 33	Gargoyle Arctic 155	—
Refrigeration compressor (York A209)	Regent Texaco Capella E				

* First approval.

† Also approved is: General Motors — Hydramatic Fluid Type AQ ATF.

CHAPTER D

LUBRICATION AND MAINTENANCE

SECTION D1—MAINTENANCE DATA

SILVER CLOUD III, BENTLEY S3, BENTLEY CONTINENTAL S3 AND PHANTOM V

Engine

Silver Cloud III, Bentley S3 and
Continental S3

Distributor contact breaker gap	0.014 in. — 0.016 in.
Distributor 'dwell' angle	31° to 37° at 0.015 in. gap
Sparkling plugs	
9 : 1 compression ratio	Champion RN.8.
8 : 1 compression ratio	Champion RN.8, Champion RN.13P, Lodge CLNP.
Sparkling plug gap	0.025 in.
Firing order	A1, B1, A4, B4, B2, A3, B3, A2. (1, 5, 4, 8, 6, 3, 7, 2.)
Ignition timing	2° B.T.D.C.
Valve timing	5° A.T.D.C.

Engine

Phantom V

Distributor contact breaker gap	0.019 in. — 0.021 in.
Distributor 'dwell' angle	31° to 32½° at 0.020 in. gap
Sparkling plugs	
9 : 1 compression ratio	Champion RN.8.
8 : 1 compression ratio	Champion RN.8, Champion RN.13P, Lodge CLNP.
Sparkling plug gap	0.025 in.
Firing order	A1, B1, A4, B4, B2, A3, B3, A2. (1, 5, 4, 8, 6, 3, 7, 2.)
Ignition timing	2° B.T.D.C.
Valve timing	5° A.T.D.C.

Capacities

	Imperial	U.S.	Litres
Engine	12 pints	14.4 pints	6.81
Automatic gearbox	20 pints	24 pints	11.36
Rear axle — Silver Cloud III			
Bentley S3	1½ pints	1.95 pints	0.92
Continental S3			
Phantom V	1½ pints	2.1 pints	0.99
Steering system	3 pints	3.6 pints	1.7
Steering (transfer box)	½ pints	0.75 pints	0.355
Cooling system	22 pints	26.41 pints	12.5
Fuel tank — Silver Cloud III			
Bentley S3	18 gallons.	21.6 gallons.	81.82
Continental S3			
Phantom V	23 gallons.	27.62 gallons.	104.56

Levels

Engine sump	Maximum mark on dipstick
Automatic gearbox	F line on dipstick
Rear axle	Bottom of level plug orifice
Steering system	Just covering the filter
Steering (transfer box)	Bottom of level plug orifice
Shock dampers	Bottom threads of filler plug orifice
Hydraulic brake fluid reservoirs	Level marks on clamping straps
Coolant level	Bottom of radiator filler orifice
Battery electrolyte	½ in. above the top of separators
Windscreen washer reservoir	1 in. below the top of filler orifice

Tyre pressures

Silver Cloud III and Bentley S3 — 8.20 in. × 15 in. tyres

Front 22 lb/sq.in. (1.55 kg/sq.cm.)	Cold
Rear 27 lb/sq.in. (1.90 kg/sq.cm.)	

Silver Cloud III and Bentley S3 Long Wheelbase — 8.20 in. × 15 in. tyres

Front 23 lb/sq.in. (1.62 kg/sq.cm.)	Cold
Rear 29 lb/sq.in. (2.04 kg/sq.cm.)	

Bentley Continental S3 — 8.00 in. × 15 in. tyres

Front 20 lb/sq.in. (1.41 kg/sq.cm.)	Cold for normal speed running.
Rear 25 lb/sq.in. (1.76 kg/sq.cm.)	
Front 25 lb/sq.in. (1.76 kg/sq.cm.)	Cold for maximum speed running.
Rear 30 lb/sq.in. (2.11 kg/sq.cm.)	

Park Ward Convertible Coupe — 8.00 in. × 15 in. tyres

Front 20 lb/sq.in. (1.41 kg/sq.cm.)	Cold for normal speed running.
Rear 28 lb/sq.in. (1.97 kg/sq.cm.)	
Front 25 lb/sq.in. (1.76 kg/sq.cm.)	Cold for maximum speed running.
Rear 33 lb/sq.in. (2.33 kg/sq.cm.)	

Phantom V — 8.90 in. × 15 in. tyres

Front 22 lb/sq.in. (1.55 kg/sq.cm.)	Cold
Rear 27 lb/sq.in. (1.90 kg/sq.cm.)	

Note The tyre pressures quoted for Phantom V cars are nominal figures only, as the pressures may vary between individual cars according to the weight.

Electrical equipment

Battery	Dagenite or Exide 12v. 67 amp/hr.		
Earth	Negative to frame		
Generator	Lucas C48 12v.		
Starter motor	Lucas M-45 G 12v.		
Horns	Lucas WT 618/1		
Headlamps	Twin sealed-beam type		

Headlamp type and ratings

	Type	Rating	Colour	Fitting
U.K.	1A	12v 37½w	Clear	Push-in two blade
	2A	12v 37½/50w	Clear	Push-in three blade
Europe, except France	1A	12v 37½w	Clear	Push-in two blade
	European	12v 45/40w	Clear	Push-in three blade
France	1A	12v 37½w	Yellow	Push-in two blade
	2A	12v 45/40w	Yellow	Push-in three blade
Middle and Far East	1A	12v 37½w	Clear	Push-in two blade
Canada, South and America U.S.A. }	2 or 2A	12v 37½/50w	Clear	Push-in three blade

Bulbs

Foglamps

All countries except U.S.A. and Canada	12v 48w	Yellow	B.P.F.
U.S.A. and Canada	12v 48w	Clear	B.P.F.
Front side lamp	12v 6w	Clear	M.C.C. bayonet
Front flasher lamp	12v 21w	Clear	S.C.C. bayonet
Rear stop/tail lamp	12v 21/6w	Clear	S.B.C. bayonet
Rear flasher lamp	12v 21w	Clear	S.C.C. bayonet
Reversing lamp	12v 21w	Clear	S.C.C. bayonet
Number plate lamp	12v 6w	Clear	M.C.C. bayonet
Boot lamp	12v 6w	Clear	M.C.C. bayonet
Inspection lamp	12v 6w	Clear	M.C.C. bayonet
Companion lamp	12v 6w	Clear	M.C.C. bayonet
Map lamp	12v 6w	Clear	M.C.C. bayonet
Roof lamp	12v 6w	Clear	Double-ended festoon
Capping rail lamp	12v 3w	Clear	Double-ended festoon
Speedometer			
Illumination	12v 2·2w	Clear	M.E.S. screw
Flasher warning lamps	12v 2·2w	Clear	M.E.S. screw
Headlamp main beam	12v 2·2w	Clear	M.E.S. screw
'4' in '1' instrument lamp	12v 2·2w	Clear	M.E.S. screw
Clock illumination	12v 2·2w	Clear	M.E.S. screw
Hand brake warning lamp	12v 2·2w	Clear	M.E.S. screw
Switchbox			
Generator warning lamp	16v 3w	Clear	M.E.S. screw
Fuel level warning lamp	16v 3w	Clear	M.E.S. screw

Fuses

	30 amp. (one strand of No. 28 SWG (0·0148 in. dia.) tinned copper wire).		
Horn fuse	25 amp. cartridge type		
Headlamp flasher relay	25 amp. cartridge type		
Radio fuse	5 amp. cartridge type		

PERIODIC LUBRICATION AND MAINTENANCE

SCHEDULES FOR

SILVER CLOUD III, BENTLEY S3, BENTLEY CONTINENTAL S3 AND PHANTOM V

The following periodic service schedules have been drawn up to assist retailers and service personnel with the maintenance of Rolls-Royce and Bentley motor cars.

Retailers are advised to adopt these schedules as normal service procedure and to make appropriate arrangements with any owners wishing to avail themselves of this service.

Should some owners wish to carry out their own maintenance inspections, it should be noted that the schedules do not in any way supersede the instructions given in the Owner's Handbook.

INITIAL 3,000 MILE SCHEDULE

At the completion of the first 3000 miles (5000 Kms.) Engine oil change. Oil level checks, engine and chassis adjustments, electrical system checks and road test.

6000 MILE SCHEDULE

At the completion of every 6000 miles (10,000 Kms.).

Repetition of the 3000 mile schedule plus — Engine oil change — engine oil filter change — brake system check — minor engine, chassis and electrical system checks and lubrication.

12,000 MILE SCHEDULE

At the completion of every 12,000 miles (20,000 Kms.).

Repetition of the 6000 mile schedule plus — Complete lubrication of suspension, steering and transmission — further maintenance of engine, chassis and electrical system components.

24,000 MILE SCHEDULE

At the completion of every 24,000 miles (40,000 Kms.).

Repetition of the 12,000 mile schedule plus — change of major components — maintenance of power assisted steering unit.

INITIAL 3000 MILE (5000KM.) SCHEDULE

Oil changes

- 1 Drain and refill the crankcase sump. For subsequent oil changes refer to the 6000 mile schedule.

Oil level checks and lubrication

- 1 Carburetter air valve damper.
- 2 Steering pump reservoir.
- 3 Brake fluid reservoirs.
- 4 Automatic gearbox. (Check with the engine running as described in the Automatic Gearbox Manual.)
- 5 Lubricate the eight grease nipples on the front suspension.

Engine and chassis adjustments

- 1 Check the coolant level and if necessary top-up with the correct anti-freeze mixture. Tighten the worm drive clips securing all coolant hoses.
- 2 Check the tension of the belts driving the fan, steering pump, generator and refrigerant compressor (if fitted) and adjust if necessary. If individual belt tension is uneven a new matched pair of belts should be fitted.
- 3 Check and if necessary adjust the rear brakes and servo.
- 4 Check and adjust tyre pressures (including spare).

Electrical system checks

- 1 Check the level of the battery electrolyte and top-up if necessary.
- 2 Check, and if necessary top-up the windscreen washer reservoir with the correct mixture of distilled water and Rolls-Royce windscreen washer fluid.

Road test

- 1 Test the car on the road and adjust the T.V. rod ('A' rod) if necessary.

6000 MILE (10,000 KM.) SCHEDULE

- 1 Repeat the 3000 mile schedule.

Oil changes

- 1 Drain and refill the crankcase.

If the car is used regularly for town work and is subjected to a considerable amount of 'stop-start' operation, the engine crankcase should be drained and refilled every 3000 miles (5000 Kms.).

Engine adjustments and checks

- 1 Renew the oil filter element.
- 2 Clean the air valves in the carburetters.

Check the oil level in the air valve dampers and top-up if necessary to the correct level.

- 3 Lubricate the ignition distributor automatic advance mechanism, shaft bearings, governor spindle and cam.
- 4 Clean the contact breaker points, check the gap and apply one drop of engine oil to the pivot pin of each rocker arm.
Check and if necessary, reset the ignition timing.
- 5 Clean spark plugs and set gaps as necessary.
- 6 Remove, clean and re-oil the wire mesh air filter element.

Chassis adjustments and checks

- 1 Remove any foreign matter from the refrigerator condenser matrix (if fitted).
- 2 Lubricate the gear range selector controls and accelerator linkage.
- 3 Lubricate the brake system pivot pins and bearings.
- 4 Remove the brake drums and inspect the brake linings for wear. The face of a lining should not be less than $\frac{1}{8}$ in. above the rivets.
- 5 Interchange the wheels to minimise variations in tyre wear.
- 6 Check and if necessary balance the wheels.

Electrical system

- 1 Check that the heater controls are operating satisfactorily.
- 2 Check that all lights, flasher units and instruments are operating satisfactorily.

12,000 MILE (20,000 KM.) SCHEDULE

- 1 Repeat the 6000 mile schedule.

Oil level checks

- 1 Check the shock absorbers for signs of leakage; if apparent, inspect the oil level and top-up if necessary with the recommended oil.
- 2 Check and if necessary, top-up the rear axle with oil.

Engine adjustments and checks

- 1 Renew the sparking plugs.
- 2 Renew the carburetter air filter element — this only applies where the paper type air filter element is fitted (certain overseas countries only).
- 3 Clean the gauze filters and the carburetter float chamber feed connections.

Chassis adjustments and checks

- 1 Lubricate the grease nipple on the master cylinder balance lever.
- 2 Lubricate the thirteen grease nipples on the steering mechanism.
- 3 Lubricate the eight grease nipples on the front suspension.
- 4 Lubricate the three grease nipples on the rear propeller shaft.
- 5 Clean out the main fuel line filter and filter bowl and the filter gauzes in the fuel pump. Clean the electrical contact points and check the functioning of the fuel pumps. (Each pump should be tested independently.)

Electrical system checks

- 1 Clean, apply vaseline and tighten the battery terminals.

Heater (recirculatory)

- 1 Clean the filter gauze in the intake beneath the right-hand front seat. Test the car on the road.

24,000 MILE (40,000 KM.) SCHEDULE

- 1 Repeat the 12,000 mile schedule.

Oil changes

- 1 Drain the gearbox and fluid coupling; refill with the recommended fluid.
- 2 Drain and refill the rear axle.

Oil level checks

- 1 Check the oil level in the transfer steering box and top-up if necessary.

Engine adjustments and checks

- 1 Clean the flame traps in the crankcase breather tube.

Chassis adjustments and checks

- 1 Renew the filter element in the steering pump reservoir.
- 2 Release, but do not remove the fuel tank drain plug to allow any accumulated water to escape.

Electrical system checks

- 1 Inspect the generator commutator and brushes for wear and for freedom in their holders.

SEASONAL SCHEDULES

Every 12 months

Engine cooling system

- 1 Drain the anti-freeze from the radiator and both cylinder blocks. Thoroughly flush out the coolant passages with a continuous flow of water. This should be carried out just prior to the Autumn. (In the U.K. prior to September 21st.)

Refill the system with the correct anti-freeze mixture.

Refrigeration system (if fitted)

These operations should only be carried out by an experienced refrigeration engineer.

Check that the refrigeration system is functioning correctly and if necessary top-up the system with refrigerant. If loss of refrigerant is evident, check the system for leaks.

Check the level of oil in the refrigerant compressor.

Clean the filter gauze fitted over the evaporator air intake (boot units only).

Every 24 months

Repetition of 12 months schedule plus —
Renewal of heater and coolant hoses.

SPECIAL PRECAUTIONS

Should the car be used in constant temperatures of 0°F. and below

Carburetters

Drain and refill the carburetter air valve dampers with oil of viscosity S.A.E. 10.

Engine

Drain the engine sump when thoroughly warm and refill with oil of viscosity S.A.E. 10.