General Specification Data and Maintenance

LAND-ROVER

SERIES III

ROVER SERVICE SCHOOL, SOLIHULL, WARWICKSHIRE, ENGLAND

ENGINE – 2¼ LITRE PETROL

Type	4 cylinder
Bore	90,47 mm (3.562 in)
Stroke	88,9 mm (3.500 in)
Capacity	2286 cm^3 (139.500 in^3)
Valve operation	Overhead by pushrod

Crankshaft

Main journal diameter	63,487 mm to 63,500 mm (2.4995 in to 2.500 in)
Minimum regrind diameter	62,48 mm (2.460 in)
Crankpin journal diameter	58,72 mm to 58,733 mm (2.312 in to 2.31275 in)
Minimum regrind diameter	57,70 mm (2.272 in)
Crankshaft end thrust	Taken on thrust washers at centre main bearing
Crankshaft end float	0,05 mm to 0,15 mm (0.002 in to 0.006 in)

Main bearings

Number and type	3 halved shells
Material	Steel shell, tin-aluminium lined
Diametrical clearance	0,020 mm to 0,055 mm (0.0008 in to 0.0022 in)
Undersizes	0,25 mm, 0,50 mm, 0,76 mm, 1,01 mm (0.010 in, 0.020 in, 0.030 in, 0.040 in)

Connecting rods

Type	Horizontally split big end, plain small end
Length between centres	175,36 mm to 175,46 mm (6.904 in to 6.908 in)

Big end bearings

Type and material	Steel shell, copper-lead lined
Diametrical clearance	0,019 mm to 0,063 mm (0.0007 in to 0.0025 in)
End float on crankpin	0,20 mm to 0,30 mm (0.007 in to 0.012 in)
Undersizes	0,25 mm, 0,50 mm, 0,76 mm, 1,01 mm (0.010 in., 0.020 in., 0.030 in., 0.040 in.)

Gudgeon pins

Type	Floating
Fit in piston	Push fit by hand
Clearance in connecting rod	0,007 mm to 0,015 mm (0.0003 in to 0.0006 in)

Pistons

Type	Aluminium alloy, flat top
Clearance in bore, measured at bottom of skirt at right angles to gudgeon pin	
Standard size pistons	0,058 mm to 0,068 mm (0.0023 in to 0.0027 in)
Oversize pistons	0,043 mm to 0,055 mm (0.0017 in to 0.0022 in)

ENGINE – 2¼ LITRE PETROL

Piston rings	
Compression	2
Gap in bore	0,38 mm to 0,50 mm (0.015 in to 0.020 in)
Clearance in groove	0,046 mm to 0,097 mm (0.0018 in to 0.0038 in)
Oil control	1
Gap in bore	0,38 mm to 0,50 mm (0.015 in to 0.020 in)
Clearance in groove	0,038 mm to 0,089 mm (0.0015 in to 0.0035 in)
Camshaft	
Location	Right-hand side (thrust side) of engine
End float	0,06 mm to 0,13 mm (0.0025 in to 0.0055 in)
Number of bearings	4
Material	Steel shell, white metal lined
Valves	
Length	
Inlet	111,25 mm to 111,60 mm (4.380 in to 4.394 in)
Exhaust	111,22 mm to 111,58 mm (4.379 in to 4.393 in)
Seat angle	
Inlet	30°
Exhaust	45°
Head diameter	
Inlet	44,45 mm to 44,57 mm (1.750 in to 1.755 in)
Exhaust	35,02 mm to 35,05 mm (1.375 in to 1.380 in)
Stem diameter	
Inlet	7,891 mm to 7,904 mm (0.3107 in to 0.3112 in)
Exhaust	8,661 mm to 8,674 mm (0.3410 in to 0.3145 in)
Stem to guide clearance	
Inlet	0,033 mm to 0,048 mm (0.0013 in to 0.0019 in)
Exhaust	0,058 mm to 0,073 mm (0.0023 in to 0.0029 in)
Valve lift	
Inlet	9,49 mm (0.374 in)
Exhaust	9,85 mm (0.388 in)
Valve springs	
Type	Duplex interference coil
Inner	
Length, free	42,67 mm (1.680 in)
Length, under 8,0 kg (17.7 lb) load	37,13 mm (1.462 in)
Outer	
Length, free	46,28 mm (1.822 in)
Length, under 21 kg (46 lb) load	40,30 mm (1.587 in)

ENGINE – 2¼ LITRE PETROL

Valve timing	
Inlet opens	6° BTDC
Inlet closes	52° ABDC
Inlet peak	113° ATDC
Exhaust opens	34° BBDC
Exhaust closes	24° ATDC
Exhaust peak	85° ABDC
Lubrication	
System	Wet sump, pressure fed
System pressure, engine warm at 2000 rev/min	3,16 to 4,57 kgf/cm^2 (45 to 65 lbf/in^2)
Oil pump	
Type	Double gear
Drive	Splined shaft from camshaft skew gear
End float of gears	
Steel gear	0,05 mm to 0,12 mm (0.002 in to 0.005 in)
Aluminium gear	0,07 mm to 0,15 mm (0.003 in to 0.006 in)
Radial clearance of gears	0,02 mm to 0,10 mm (0.001 in to 0.004 in)
Backlash of gears	0,15 mm to 0,28 mm (0.006 in to 0.012 in)
Oil pressure relief valve	
Type	Non-adjustable
Relief valve spring	
Full length	67,82 mm (2.670 in)
Compressed length at 2,58 kg (5.7 lb) load	61,23 mm (2.450 in)

ENGINE – 2¼ LITRE DIESEL

Type	4 cylinder
Bore	90,47 mm (3.562 in)
Stroke	88,9 mm (3.500 in)
Capacity	2286 cm^3 (139 in^3)
Valve operation	Overhead by push rod

Crankshaft

Main bearing journal diameter	63,487 mm to 63,500 mm (2.4995 in to 2.5000 in) Regrinding NOT permitted.
Crankpin journal diameter	58,72 mm to 58,733 mm (2.312 in to 2.31275 in) Regrinding NOT permitted.
Crankshaft end thrust	Taken on thrust washers at centre main bearing
Crankshaft end float	0,05 mm to 0,15 mm (0.002 in to 0.006 in)

Main bearings

Number and type	3 halved shells
Material	Steel shell, copper-lead lined, tin plated
Diametrical clearance	0,020 mm to 0,055 mm (0.0008 in to 0.0017 in)

Connecting rods

Type	Horizontally split big end, plain small end
Length between centres	175,38 mm to 175,43 mm (6.905 in to 6.907 in)

Big end bearings

Type and material	Steel shell, copper-lead lined
Diametrical clearance	0,019 mm to 0,063 mm (0.0007 in to 0.0025 in)
End float on crankpin	0,20 mm to 0,30 mm (0.007 in to 0.012 in)

Gudgeon pins

Type	Floating
Fit in piston	Push fit by hand
Clearance in connecting rod	0,002 mm to 0.02 mm (0.0001 in. to 0.0008 in.)

Pistons

Type	Aluminium alloy, with V shape recess in crown
Clearance in bore, measured at bottom of skirt at right angles to gudgeon pin	
Standard size pistons	0,111 mm to 0,134 mm (0.0044 in to 0.0053 in)
Oversize pistons	0,111 mm to 0,157 mm (0.0044 in to 0.0062 in)

ENGINE – 2¼ LITRE DIESEL

Piston rings	
Compression No. 1 (top)	
Type	Square friction edge, chrome plated
Gap in bore	0,35 mm to 0,50 mm (0.014 in to 0.019 in.)
Clearance in groove	0,06 mm to 0,11 mm (0.0025 in to 0.0045 in)
Compression Nos. 2 and 3	
Type	Bevelled friction edge. Marked 'T' or 'TOP' on upper side
Gap in bore	0,25 mm to 0,38 mm (0.010 in to 0.015 in)
Clearance in groove	0,06 mm to 0,11 mm (0.0025 in to 0.0045 in)
Oil control No. 4	
Type	Expander and rails
Gap in bore	0,38 mm to 1,14 mm (0.015 in to 0.045 in)
Clearance in groove	0,038 mm to 0,064 mm (0.0015 in to 0.0025 in)
Camshaft	
Location	Right hand side (thrust side) of engine
End float	0,06 mm to 0,13 mm (0.0025 in to 0.0055 in)
Number of bearings	4
Material	Steel shell, white metal lined
Valves	
Length	
Inlet	116,38 mm to 116,58 mm (4.582 in to 4.590 in)
Exhaust	116,89 mm to 117,09 mm (4.602 in to 4.610 in)
Seat angle	
Inlet	45°
Exhaust	45°
Head diameter	
Inlet	39,16 mm to 39,26 mm (1.542 in to 1.546 in)
Exhaust	33,32 mm to 33,42 mm (1.312 in to 1.316 in)
Stem diameter	
Inlet	7,891 mm to 7,904 mm (0.3107 in to 0.3112 in)
Exhaust	8,661 mm to 8,674 mm (0.3410 in to 0.3415 in)
Stem to guide clearance	
Inlet	0,033 mm to 0,048 mm (0.0013 in to 0.0019 in)
Exhaust	0,058 mm to 0,073 mm (0.0023 in to 0.0029 in)
Valve lift	
Inlet	9,85 mm (0.388 in)
Exhaust	10,26 mm (0.404 in)
Valve springs	
Type	Duplex Interference coil
Inner	
Length, free	42,67 mm (1.680 in)
Length, under 8,0 kg (17.7 lb) load	40,30 mm (1.587 in)
Outer	
Length, free	46,28 mm (1.822 in)
Length, under 21 kg (46 lb) load	40,30 mm (1.587 in)

ENGINE – 2¼ LITRE DIESEL

Valve timing	
Inlet opens	16° BTDC
Inlet closes	42° ABDC
Inlet peak	103° ATDC
Exhaust opens	51° BBDC
Exhaust closes	13° ATDC
Exhaust peak	109° BTDC
Lubrication	
System	Wet sump, pressure fed
System pressure, engine warm at 2000 rev/min	3,16 to 4,57 kgf/cm² (45 to 65 lbf/in²)
Oil pump	
Type	Double gear
Drive	Splined shaft from camshaft skew gear
End float of gears	
Steel gear	0,05 mm to 0,12 mm (0.002 in to 0.005 in)
Aluminium gear	0,07 mm to 0,15 mm (0.003 in to 0.006 in)
Radial clearance of gears	0,02 mm to 0,10 mm (0.001 in to 0.004 in)
Backlash of gears	0,15 mm to 0,28 mm (0.006 in to 0.012 in)
Oil pressure relief valve	
Type	Non-adjustable
Relief valve spring	
Free length	67,82 mm (2,670 in)
Compressed length at 2.58 kg (5.7 lb) load	61,23 mm (2.450 in)

ENGINE – 2.6 LITRE PETROL

Type	6 cylinder
Bore	77,8 mm (3.063 in)
Stroke	92,075 mm (3.625 in)
Capacity	2625 cm^3 (160.3 in^3)
Valve operation	Inlet – overhead by push rod Exhaust – side by cam follower

Crankshaft

Main journal diameter	66,64 mm to 66,66 mm (2.624 in to 6.6245 in)
Minimum regrind diameter	65,63 mm (2.584 in)
Crankpin journal diameter	47,62 mm to 47,64 mm (1.875 in to 1.87575 in)
Minimum regrind diameter	46,60 (1.835 in)
Crankshaft end thrust	Taken on thrust washers at rear main bearing
Crankshaft end float	0,05 mm to 0,15 mm (0.002 in to 0.006 in)

Main bearings

Number and type	7 halved shells
Material	Steel shell, copper-lead lined, tin plated
Diametrical clearance	0,015 mm to 0,050 mm (0.0006 in to 0.002 in)
Undersizes	0,25 mm, 0,50 mm, 0,76 mm, 1,01 mm (0.010 in, 0.020 in, 0.030 in, 0.040 in)

Connecting rods

Type	Horizontally split big end, plain small end
Length between centres	206,463 mm (8.1285 in.)

Big end bearings

Type and material	Steel shell, copper-lead, tin plated
Diametrical clearance	0,0114 mm to 0,043 mm (0.00045 in to 0.0017 in)
End float on crankpin	0,15 mm to 0,38 mm (0.006 in to 0.015 in)
Undersizes	0,25 mm, 0,50mm, 0,76 mm, 1,01 mm (0.010 in, 0.020 in, 0.030 in, 0.040 in)

Gudgeon pins

Type	Fully floating
Fit in piston	Push fit by hand
Clearance in connecting rod	Zero to 0,0241 mm (0.00095 in)

Pistons

Type	Aluminium alloy, ridged top
Clearance in bore, measured at bottom of skirt at right angles to gudgeon pin. Standard size and oversize pistons.	0,048 mm to 0,060 mm (0.0019 in to 0.0024 in)

ENGINE – 2.6 LITRE PETROL

Piston rings	
Compression	2
Gap in bore	0,38 mm to 0,50 mm (0.015 in to 0.020 in)
Clearance in groove	0,046 mm to 0,097 mm (0.0018 in to 0.0038 in)
Oil control	1
Gap in bore	0,38 mm to 0,80 mm (0.015 in to 0.033 in)
Clearance in groove	0,05 mm to 0,10 mm (0.002 in to 0.004 in)
Camshaft	
Location	Left hand side of engine
End float	0,11 mm to 0,16 mm (0.0045 in to 0.0065 in)
Number of bearings	6
Material	Split 'Mazak' castings
Valves	
Length	
Inlet	96,57 mm to 96,77 mm (3.802 in to 3.810 in)
Exhaust	116,07 mm to 116,28 mm (4.570 in to 4.578 in)
Seat angle	
Inlet	30°
Exhaust	45°
Head diameter	
Inlet	45,54 mm to 45,64 mm (1,793 in. to 1.797 in.)
Exhaust	32,02 mm to 32.13 mm (1.261 in. to 1,265 in.)
Stem diameter	
Inlet	8,68 mm to 8,69 mm (0.342 in to 0.3425 in)
Exhaust	8,66 mm to 8,67 mm (0.341 in to 0.3415 in)
Stem to guide clearance	
Inlet	0,033 mm to 0,048 mm (0.0013 in to 0.0019 in)
Exhaust	0,058 mm to 0,073 mm (0.0023 in to 0.0029 in)
Valve lift	
Inlet	9,49 mm (0.374 in)
Exhaust	10,23 mm (0.403 in)
Valve springs	
Type	Duplex. Interference coil
Inlet	
Inner	
Length, free	43,26 mm (1.703 in)
Length under 9,7 kg (21.5 lb) load	36,49 mm (1.437 in)
Outer	
Length, free	49,80 mm (1.960 in)
Length under 31,5 kg (69.5 lb) load	41,27 mm (1.625 in)
Exhaust	
Inner	
Length,free	43,26 mm (1.703 in)
Length under 9,1 kg (16.4 lb.) load	38,10 mm (1.500 in)
Outer	
Length, free	47,26 mm (1,861 in)
Length under 18,9 kg (41.8 lb) load	41,27 mm (1.625 in)

ENGINE – 2.6 LITRE PETROL

Valve timing	
Inlet opens	12° BTDC
Inlet closes	46° ABDC
Inlet peak	107° ATDC
Exhaust opens	47° BBDC
Exhaust closes	17° ATDC
Exhaust peak	75° ABDC
Lubrication	
System	Wet sump, pressure fed
System pressure, engine warm at 2000 rev/min	2,81 to 3,51 kgf/cm^2 (40 to 50 lbf in^2)
Oil pump	
Type	Spur gear
Drive	Splined shaft from camshaft skew gear
End float of gears	
Steel gear	0,05 mm to 0,12 mm (0.002 in to 0.005 in)
Aluminium gear	0,07 mm to 0,15 mm (0.003 in to 0.006 in)
Radial clearance of gears	0,02 mm to 0,102 mm (0.001 in to 0.004 in)
Backlash of gears	0,20 mm to 0,28 mm (0.008 in to 0.012 in)
Oil pressure relief valve	
Type	non-adjustable
Relief valve spring	
Free length	87,0 mm (3.425 in)
Compressed length at 7,9 kg (17.5 lb) load	50,55 (1.990 in)

Clutch

Make	Borg and Beck
Type	Diaphragm spring
Drive plate diameter	241,3 mm (9.500 in)
Damper spring colour	Dark green
Facing material	Raybestos WR7

TRANSMISSION

Main gearbox

Type	Single helical constant mesh with synchro-mesh on all forward speeds
Ratios: Top	Direct
Third	1.50:1
Second	2.22:1
First	3.68:1
Reverse	4.02:1

Transfer gearbox

Type: Two speed reduction on main gearbox output

Front wheel drive: Two/four wheel drive control on transfer, box output

Ratios:

		High transfer	Low transfer
Helical and spur gear transfer gearbox		1.15:1	2.35:1
All helical transfer gearbox		1.53:1	3.27:1
Overall ratios (final drive) with helical and spur gear transfer gearbox.	Top	5.4:1	11.1:1
	Third	8.05:1	16.5:1
	Second	12.0:1	24.6:1
	First	19.88:1	40.7:1
	Reverse	21.6:1	44.3:1
Overall ratios (final drive) with all helical transfer gearbox	Top	7.19:1	15.4:1
	Third	10.81:1	23.1:1
	Second	15.96:1	34.1:1
	First	26.46:1	56.56:1
	Reverse	28.91:1	61.78:1

REAR AXLE

Type	Spiral bevel	floating shafts
Ratio	4.7:1	

FRONT AXLE

Differential	Spiral bevel
Front wheel drive	Enclosed universal joints
Ratio	4.7:1

PROPELLER SHAFTS	
Type	Hardy-Spicer, needle bearing
Diameter of tubular shaft	50,8 mm (2.000 in)
Overall length (face to face in midway position)	
**Front shaft – 4 cylinder models	604,8 mm(23.812 in)**
**Front shaft – 6 cylinder models	693,7 mm(27.312 in)**
Rear shaft – 88 models	554,00 mm(21.812 in)
Rear shaft – 109 4-cylinder models	1042,9 mm (41.062 in)
Rear shaft – 109 6 cylinder models	940,6 mm (37.625 in)
COOLING SYSTEM	
Type	Pressurized spill return system with thermostat control, pump and fan assisted
Thermostat	72°C (162°F)
Pressure cap	0,6 kgf cm^2 (9 lbf in^2)
Type of pump	Centrifugal
FUEL SYSTEM	
Carburetter	see **'ENGINE TUNING DATA'**
Air cleaner	Oil bath with built in centrifugal pre-cleaner
Fuel pump	
2¼ litre 4-cylinder Petrol	
Type	Mechanical
Pressure range	0,10 to 0,17 kgf cm^2 (1.5 to 2.5 lbf in^2)
2¼ litre 4-cylinder Diesel	
Type	Mechanical
Pressure range	0,35 to 0,56 kgf cm^2 (5 to 8 lbf in^2)
2.6 litre 6-cylinder Petrol	
Type	Electrical – Dual inlet
Pressure range	0,15 to 0,26 kgf cm^2 (2.25 to 3.75 lbf in^2)
Injection system 2¼ litre Diesel	
Injection pump	CAV mechanically-governed distributor
Injectors	CAV Pintaux
Nozzle size	BDNO/SPC 6209
Operating pressure of nozzle valve	135 atm
Back leakage rate 150 to 100 atm	
New nozzle	7 seconds
Original nozzle	5 seconds
Start of injection	15° BTDC

SUSPENSION

Type	Rigid axles, semi-eliptic springs			
Springs	**88-Petrol**	**88-Diesel**	**109-Petrol**	**109-Diesel**
Front (Driver)				
Length	920,7 mm (36.25 in)	920,7 mm (36.25 in)	920,7 mm (36.25 in)	920,7 mm (36.25 in)
Width	63,5 mm (2.5 in)	63,5 mm (2.5 in)	63,5 mm (2.5 in)	63,5 mm (2.5 in)
No. of leaves	9	11	11	11
Thickness				
1 at	5,15 mm (0.203 in)	5,15 mm (0.203 in)	5,15 mm (0.203 in)	5,15 mm (0.203 in)
8 at	4,19 mm (0.165 in)			
10 at		4,36 mm (0.172 in)	4,36 mm (0.172 in)	4,36 mm (0.172 in)
Rate	35,9 kg cm (203 lb in)	48,3 kg cm (273 lb in)	48,3 kg cm (273 lb in)	48,3 kg cm (273 lb in)
Free camber	154,4 mm (6.080 in)	142,8 mm (5,625 in)	142,8 mm (5.625 in)	155,5 mm (6.125 in)
Front (Passenger)				
Length	920,7 mm (36.25 in)	920,7 mm (36.25 in)	920,7 mm (36.25 in)	920,7 mm (36.25 in)
Width	63,5 mm (2.5 in)	63,5 mm (2.5 in)	63,5 mm (2.5 in)	63,5 mm (2.5 in)
No. of leaves	9	11	11	11
Thickness				
1 at	5,15 mm (0.203 in)	5,15 mm (0.203 in)	5,15 mm (0.203 in)	5,15 mm (0.203 in)
8 at	4,19 mm (0.165 in)			
10 at		4,36 mm (0.172 in)	4,36 mm (0.172 in)	4,36 mm (0.172 in)
Rate	35,9 kg cm (203 lb in)	48,3 kg cm (273 lb in)	48,3 kg cm (273 lb in)	48,3 kg cm (273 lb in)
Free camber	135,3 mm (5.330 in)	130,1 mm (5.125 in)	130,1 mm (5.125 in)	142,8 mm (5.625 in)
Rear (Driver)				
Length	1219 mm (48 in)	1219 mm (48 in)	1219 mm (48 in)	1219 mm (48 in)
Width	63,5 mm (2.5 in)	63,5 mm (2.5 in)	63,5 mm (2.5 in)	63,5 mm (2.5 in)
No. of leaves	11	11	10	10
Thickness				
1 at	6,3 mm (0.250 in)	6,3 mm (0.250 in)	6,3 mm (0,250 in)	6,3 mm (0.250 in)
2 at			9,5 mm (0.375 in)	9,5 mm (0.375 in)
7 at			3,9 mm (0.156 in)	3,9 mm (0.516 in)
10 at	4,7 mm (0.187 in)	4,7 mm (0.187 in)		
Rate	29,4 kg cm (166 lb in)	29,4 kg cm (166 lb in)	47,8 kg cm (270 lb in)	47,8 kg cm (270 lb in)
Free camber	188,4 mm (7.420 in)	188,4 mm (7.420 in)	234,9 mm (9.250 in)	234,9 mm (9.250 in)
Rear (Passenger)				
Length	1219 mm (48 in)	1219 mm (48 in)	1219 mm (48 in)	1219 mm (48 in)
Width	63,5 mm (2.5 in)	63,5 mm (2.5 in)	63,5 mm (2.5 in)	63,5 mm (2.5 in)
No. of leaves	11	11	10	10
Thickness				
1 at	6,3 mm (0.250 in)	6,3 mm (0.250 in)	6,3 mm (0.250 in)	6,3 mm (0.250 in)
2 at			9,5 mm (0.375 in)	9,5 mm (0.375 in)
7 at			3,9 mm (0.156 in)	3,9 mm (0.156 in)
10 at	4,7 mm (0.187 in)	4,7 mm (0.187 in)		
Rate	29,4 kg cm (166 lb in)	29,4 kg cm (166 lb in)	47,8 kg cm (270 lb in)	47,8 kg cm (270 lb in)
Free camber	171,4 mm (6.750 in)	171,4 mm (6.750 in)	208,2 mm (8.200 in)	208,2 mm (8.200 in)

Hydraulic dampers	Telescopic: non-adjustable	
Piston diameter		
88 models	25,4 mm (1.000 in)	
109 models	34,6 mm (1.375 in)	
STEERING		
Type	Recirculating ball	
Ratio: Straight ahead	15.6:1	
Full lock	23.8:1	
Front wheel toe-in	1,2 mm to 2,4 mm (0.046 in to 0.093 in)	
Camber angle	1½°	
Castor angle	3°	
Swivel pin inclination	7°	
BRAKES		
System	Single line, none servo Single line with servo Dual line	According to requirements
Front		
Drum diameter		
88 models	254 mm (10 in)	
109 models	279,4 mm (11 in)	
Reclamation limit	0,75 mm (0.030 in) oversize	
Wheel cylinder bore diameter		
88 models	31,75 mm (1.250 in) Single leading shoe	
109 models	27,57 mm (1.125 in.) Twin leading shoe	
Lining dimensions		
88 models	220,98 mm x 38,1 mm x 4,75 mm (8.700 in x 1.500 in x 0.187 in)	
109 models	264,66 mm x 57,15 mm x 4,74 mm (10.42 in x 2.25 in x 0.187 in)	
Lining material	Mintex M22	
Rear		
Drum diameter		
88 models	254 mm (10 in)	
109 models	279,4 mm (11 in)	
Reclamation limit	0,75 mm (0.030 in) oversize	
Wheel cylinder bore diameter	31,75 mm (1.250 in) single leading shoe	
Lining dimensions		
88 models	220,98 mm x 38,1 mm x 4,74 mm (8.700 in x 1.500 in x 0.187 in)	
109 models	264,66 mm x 57,15 mm x 4,74 mm (10.42 in x 2.25 in x 0.187 in)	
Lining material	Mintex M22	
Total swept area, foot brakes		
88 models	1212,9 cm^2 (188.0 in^2)	
109 models	2000,0 cm^2 (310.0 in^2)	

Hand brake

Drum diameter	228,6 mm (9.000 ins)
Lining dimensions	209,55 mm x 44,45 mm x 4,74 mm (8.250 in x 1.750 in x 0.187 in)
Master cylinder bore diameter	
88 models, non servo	19,05 mm (0.750 in)
88 models, with servo	22,2 mm (0.875 in)
109 models, all	25,4 mm (1.000 in.)

WHEELS

Size	
88 models	5.00F x 16
109 models	5.50F x 16
109 One ton models	6.50L x 16

TYRES

Type/Size			
88 models:	Standard	Cross Ply	6.00–16
	Optional	Cross Ply	6.50–16
		Cross Ply	7.00–16
		Cross Ply	7.50–16 with 5.50F x 16 wheel.
109 models		Cross Ply	7.50–16
109 One Ton model		Cross Ply	9.00–16

Tyre pressures

		Normal				Emergency soft			
		Load under 250 kg (550 lb.)		Load over 250 kg (550 lb.)		Load under 250 kg (550 lb.)		Load over 250 kg (550 lb.)	
88 models		Front	Rear	Front	Rear	Front	Rear	Front	Rear
6.00 6.50 and 7.00 – 16	kg/cm^2	1,8	1,8	1,8	2,1	1,1	1,1	1,1	1,4
	lb/in.^{2}	25	25	25	30	15	15	15	20
	bars	1.72	1.72	1.72	2.07	1.03	1.03	1.03	1.38
7.50 – 16	kg/cm^2	1,8	1,8	1,8	2,1	0,8	0,8	0,8	1,4
	lb/in.^{2}	25	25	25	30	12	12	12	20
	bars	1.72	1.72	1.72	2.07	0.83	0.83	0.83	1.38
109 models	kg/cm^2	1,8	1,8	1,8	2,5	1,1	1,1	1,1	1,8
7.50 – 16	lb/in.^{2}	25	25	25	36	15	15	15	26
	bars	1.72	1.72	1.72	2.48	1.03	1.03	1.03	1.79
Michelin 7.50 – 16 XY	kg/cm^2	1,8	1,8	1,8	2,8	1,1	1,1	1,1	2,5
	lb/in.^{2}	25	25	25	40	15	15	15	35
	bars	1.72	1.72	1.72	2.81	1.03	1.03	1.03	2.41
109 One Ton Models	kg/cm^2	1,4	1,4	1,4	2,1	0,7	0,7	0,7	1,4
9.00 – 16	lb/in.^{2}	20	20	20	30	10	10	10	20
	bars	1.38	1.38	1.38	2.07	0.7	0.7	0.7	1.38

ELECTRICAL EQUIPMENT	
System	12 volt, negative earth
Battery	
Petrol models	
Make/type	Lucas CZ9 or Exide 6-XNM9R
Capacity	58 A H at 20 hour rate
Diesel models	
Make/type	Exide 6TXMZ–15L
Capacity	95 AH at 20 hour rate
Alternator	
Type	16 ACR
Nominal output	34 amps at 6000 Alternator rev/min
Field resistance	4.33 ohms ± 5%
Brush spring pressure	255 to 368g (9 to 13 oz)
Brush minimum length	5,0 mm (0.2 in) protruding beyond the brush box
Starter Motor	
Petrol models	
Make/type	Lucas M418G
Brush spring tension	850 to 1134g (30 to 40 oz)
Brush minimum length	8,0 mm (0.312 in)
Diesel models	
Make/type	Lucas M45G Pre-engaged, oil and waterproof
Brush spring tension	1,2 kg (42 oz)
Brush minimum length	8,0 mm (0.312 in)
Wiper motor	
Make/type	Lucas 14W single speed
Armature end float	0,1 to 0,2 mm (0.004 in to 0.008 in)
Brush minimum length	4,8 mm (0.190 in)
Brush spring tension	140 to 200g (5 to 7 oz)
Resistance of armature winding at 16°C (60°F) measured between adjacent commutator segments	0.23 to 0.35 ohms
Light running, rack disconnected	
Current at 13.5 V	2.0 amps
Speed, 60 seconds from cold	60 to 70 rev/min

GENERAL DIMENSIONS

Dimensions and Weights	88		88 Station Wagon		109		109 Station Wagon	
	Metric	British	Metric	British	Metric	British	Metric	British
Overall length	3,62 m	142.562 in.	3,62 m	142.562 in.	4,44 m	175 in.	4.44 m	175 in.
Overall width	1,68 m	66 in.	1,68 m	66 in.	1,68 m	66 in.	1,68 m	66 in.
Overall unladen height, hood up	1,97 m	77.5 in.	–	–	–	–	–	–
Overall unladen height, hood down, screen up	1,73 m	68 in.	–	–	–	–	–	–
Overall unladen height, hood down, screen down	1,46 m	57.5 in.	–	–	–	–	–	–
Overall unladen height, with cab or hard top	1,95 m	76.875 in.	1,98 m	77.875 in.	2,06 m	81 in.	2,07 m	81.375 in.
Wheelbase	2,23 m	88 in.	2,23 m	88 in.	2,77 m	109 in.	2,77 m	109 in.
Track	1,31 m	51.5 in.	1,31 m	51.5 in.	1,33 m	52.5 in.	1,33 m	52.5 in.
Turning circle	11,6 m	38 ft.	11,6 m	38 ft.	14,3 m	47 ft.	14,3 m	47 ft.
Unladen ground clearance under differentials, 6.00 x 16 tyres	177 mm	7 in.	177 mm	7 in.	–	–	–	–
Unladen ground clearance under differentials, 7.00 x 16 tyres	197 mm	7.75 in.	197 mm	7.75 in.	–	–	–	–
Unladen ground clearance under differentials, 7.50 x 16 tyres	–	–	–	–	209 mm	8.25 in	209 mm	8.25 in
Internal body dimensions:								
Length (between cappings)	1,206 m	47.5 in.	–	–	1,85 m	72.75 in.	–	–
Width (between cappings)	1,448 m	57 in.	–	–	1,44 m	56.875 in.	–	–
Height of body sides	508 mm	20 in.	–	–	495 mm	19.5 in.	–	–
Height of wheel arch	216 mm	8.5 in.	–	–	229 mm	9 in.	–	–
Width of wheel arch (to body side)	292 mm	11.5 in.	–	–	349 mm	13.75 in.	–	–
Width of floor (between wheel arches)	921 mm	36.25 in.	–	–	921 mm	36.25 in.	–	–
Height, floor to roof (maximum)	1.23 m	48.5 in.	–	–	1,22 m	48 in.	–	–

WEIGHTS

Dimensions and Weights	88		88 Station Wagon		109		109 Station Wagon	
	Metric	British	Metric	British	Metric	British	Metric	British
Maximum approved payload, normal roads	*Driver, two passengers and: 454 kg	1,000 lb.	*7 persons and: 45 kg	100lb.	Driver, two passengers and: 908 kg	2,000 lb.	10 persons and: 181 kg	400 lb.
Maximum approved payload, cross-country	Driver, two passengers and: 363 kg	800 lb.	6 persons and: 23 kg	50 lb.	Driver, two passengers and: 816 kg	1,800 lb.	10 persons and: 91 kg	200 lb.
Maximum drawbar pull, dependent upon surface conditions:								
Petrol models	1600 kg	4,000 lb.	1800 kg	4,000 lb.	1600 kg	3,500 lb.	1600 kg	3,500 lb.
Diesel models	1497 kg	3,300 lb.	1497 kg	3,300 lb.	1315 kg	2,900 lb.	1315 kg	2,900 lb.
Maximum roof rack load	50 kg	112 lb.	50 kg	112 lb.	50 kg	112 lb.	50 kg	112 lb.
Weight running, with water, oil, 5 gallons fuel:								
Petrol models	1339 kg	2,953 lb.	1488 kg	3,281 lb.	1497 kg	3,301 lb.	1702 kg	3,752 lb.
Diesel models	1405 kg	3,097 lb.	1554 kg	3,425 lb.	1574 kg	3,471 lb.	1779 kg	3,922 lb.

* Maximum loads for cross-country when heavy duty springs are fitted.

ENGINE	**2¼ litre 4-cylinder Petrol models **(Refer to Division 17 for emission controlled engines)****
Type	In line four cylinder four stroke, overhead valves
Capacity	2286 cm^3 (139,5 $in.^3$).
Compression ratio	
Standard	8.0:1 **(Engine number commencing 901.....)**
Optional	7.0:1 **(Engine number commencing 904.....)**
Firing Order	1–3–4–2
Compression pressure	
8.0:1 compression ratio	11,2 kgf.cm^2 (160 lbf. in^2).
7.0:1 compression ratio	10,2 kgf.cm^2 (145 lbf. in^2).
Idling speed	500 rev/min.
Fast idle setting	1,40 mm (0.055 in.) Throttle butterfly clearance
Ignition timing, static	
8.0:1 compression ratio	TDC when using 90 octane fuel 3° ATDC when using 85 octane fuel
7.0:1 compression ratio	6° BTDC when using 90 octane fuel 3° BTDC when using 83 octane fuel TDC when using 75 octane fuel
Timing marks	On crankshaft pulley
Valve clearance, inlet and exhaust	0,25 mm (0.010 in.).
DISTRIBUTOR	
Make/type	Lucas 25D4
Rotation of rotor	Anti-clockwise
Contact breaker gap	0,36 mm to 0,40 mm (0.014 in. to 0.016 in.).
Condenser capacity	0.2 microfarad
Serial number	5069
Centrifugal advance with TDC ignition timing	
Decelerating check with vacuum unit disconnected	
Crankshaft angle / Engine rev/min.	
38° to 42° / 4500	
30° to 34° / 3500	
22° to 26° / 2500	
12° to 16° / 1200	
4° to 12° / 900	
0° to 4° / 600	
No advance below / 450	
Vacuum advanc	
Starts	89 mm (3.5 in.) Hg.
Finishes	635 mm (25.0 in.) Hg.
SPARKING PLUGS	
Make/type	
8.0:1 compression ratio	Champion UN12Y
7.0:1 compression ratio	Champion N8
Gap	0,75 to 0,80 mm (0.029 to 0.032 in.).
IGNITION COIL	
Make/type	HA12
Primary resistance at 20°C (68°F)	3.0 to 3.5 ohms
Consumption–ignition on at engine idle speed	1.5 amps
CARBURETTER	
Make/type	Zenith 36IV
Choke diameter	27 mm
Main jet	125
Compensating (enrichment) jet	150
Pump jet	65 (short stroke, outer hole)
Needle valve	1.75

2¼ litre 4-cylinder Diesel models

ENGINE	
Type	In line four cylinder four stroke, overhead valves.
Capacity	2286 cm^3 (139,5 in^3).
Compression ratio	23.0:1
Firing order	1–3–4–2
Idling speed	590 ± 20 rev/min.
Injection timing	15° BTDC
Timing marks	
Valve timing inlet and exhaust	On engine flywheel and timing gears.
Injection timing	On engine flywheel and pump flange.
INJECTORS	
Make/type	CAV Pintaux
Nozzle size	BDNO/SPC 6209
Opening pressure	135 Atm
HEATER PLUGS	
Make/type	KLG GF 210/T or Champion AG45
DISTRIBUTOR PUMP	
Make/type	C.A.V. type DPA
Direction of rotation	Clockwise, viewed from drive end
Maximum speed setting (sealed)	4,200 engine rev/min

2.6 litre 6-cylinder Petrol models

ENGINE	
Type	In line six cylinder four stroke, inlet–overhead valves exhaust–side valves
Capacity	2625 cm^3 (160.3 in^3)
Compression ratio	
Standard	7.8:1 **(Engine number commencing 941.....)**
Optional	7.0:1 **(Engine number commencing 944.....)**
Firing order	1–5–3–6–2–4
Compression pressure	
7.8:1 compression ratio	11,95 to 12,3 kgf.cm^2 (170 to 175 lbf. in^2).
7.0:1 compression ratio	9,84 kgf.cm^2 (140 lbf. in^2).
Idling speed	500 rev/min
Fast idle setting	1000 to 1200 rev/min.
Ignition timing, static and dynamic	
7.8·1 compression ratio	2° ATDC when using 90 octane fuel 6° ATDC when using 85 octane fuel 2° BTDC when using 83 octane fuel TDC when using 80 octane fuel
7.0:1 compression ratio	
Timing marks	On crankshaft pulley
Valve clearance	
Inlet	0,15 mm (0.006 in.) engine hot
Exhaust	0,25 mm (0.010 in.) engine hot or cold
DISTRIBUTOR	
Make/type	Lucas 25D6
Rotation of rotor	Anti-clockwise
Centrifugal advance	

Decelerating check with vacuum unit disconnected.

Crankshaft angle	Engine rev/min
30° to 34°	4000
26° to 28°	3000
18° to 24°	1800
10° to 16°	1400
4° to 8°	800
0° to 4°	600
No advance below	400

Vacuum advance	
Starts	165 mm (6.5 in.) Hg.
Finishes	635 mm (25.0 in.) Hg.
SPARKING PLUGS	
Make/type	Champion N5 (7.8:1 and 7.0:1 compression ratio)
Gap	0,75 to 0,80 mm (0.029 to 0.032 in.).
IGNITION COIL	
Make/type	Lucas HA12
Primary resistance at 20°C(68°F)	3.0 to 3.5 ohms
Consumption–ignition on at engine idle speed	1.5 amps
CARBURETTER	Zenith-Stromberg 175CD-SE
Choke diameter	41,275 mm (1.625 in.).
Metering needle	B18362.Z/4J
Air valve return spring	B18277.Z
Needle valve	B18353.Z 1,75 mm
Fast idle interconnection setting	1,1 mm or No. 57 drill at edge of throttle.
Float height	16 mm to 17 mm (0.629 in. to 0.669 in.).

	kgf.m	lbf.ft.
Engine—2¼ litre 4-cylinder		
Connecting rod cap nuts	3,5	25
Main bearing cap blots:		
Petrol engines	11,5	85
Diesel engines	13,8	100
Cylinder head bolts:		
Petrol engines		
5/16 in. UNF	2,4	18
1/2 in. UNF	8,9	65
Diesel engines		
5/16 in. UNF	2,4	18
1/2 in. UNF	12,5	90
Rocker shaft bolts		
Petrol engines		
5/16 in. UNF	2,4	18
1/2 in. UNF	8,9	65
Diesel engines		
5/16 in. UNF	2,4	18
1/2 in. UNF	12,5	90
Starter dog:		
Petrol engines	20,5	150
Diesel engines	27,6	200
Flywheel bolts	8,5 to 9,0	60 to 65
Engine—2.6 litre 6-cylinder Petrol		
Connecting rod cap nuts	2,8	20
Main bearing cap bolts	10,4	75
Cylinder head bolts		
3/8 in. (9,5 mm approximately) diameter	4,0	30
7/16 in. (11 mm approximately) diameter	7,0	50
Starter dog:	27,65	200
Flywheel bolts	8.5 to 9,0	60 to 65
Fuel system		
2¼ litre 4-cylinder Diesel		
Injector nuts	0,8 to 1,0	6 to 8
Manifold and exhaust system		
2¼ litre 4-cylinder Petrol		
Induction manifold to exhaust manifold nuts	2,3	17
Clutch		
Clutch cover bolts	3,0 to 3,5	22 to 25
Gearbox		
Output drive flange nut	11,75	85
Layshaft bolt	8,5	60
Rear axle and final drive		
Hub driving flange bolts	3,9	28
Salisbury type axles:		
Differential case bolts	9,1 to 10,4	66 to 75
**Crownwheel bolts	13 to 14,5	95 to 105**
Differential bearing cap bolts	12,9 to 14,5	93 to 105
Differential cover bolts	2,8 to 3,5	20 to 25

continued

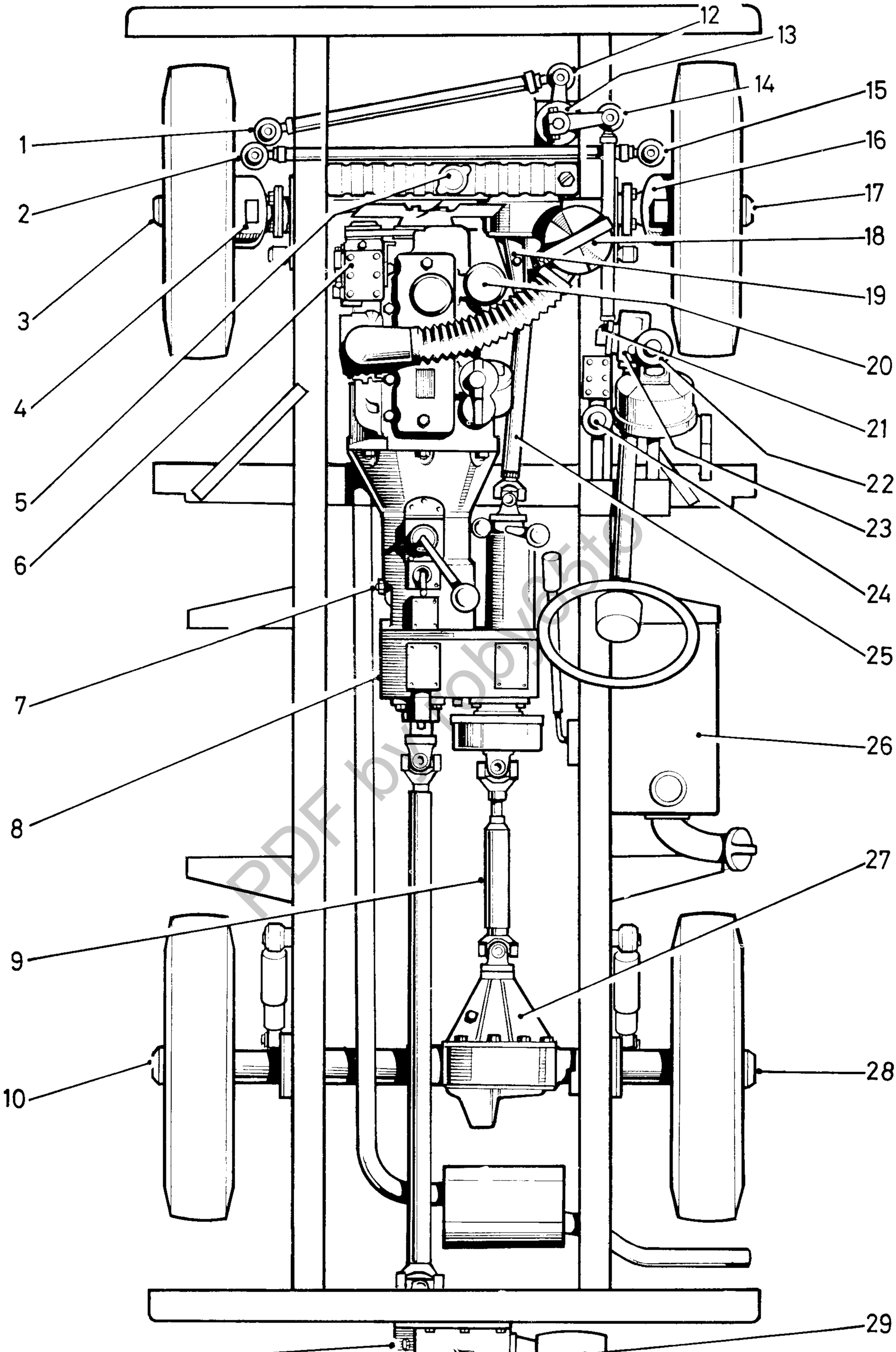
TORQUE WRENCH SETTINGS

	Kgf.m	lbf.ft.
Rover type axles		
Bevel pinion driving flange nut	11,75	85
Crownwheel bolts		
** 0.390 in (10 mm approximately) diameter)	4,8	35**
0.375 in (9.5 mm approximately) diameter)		
Differential bearing cap bolts	8,3	60
Hub driving flange nut	1,4 to 2,0	10 to 15
Front axle and final drive		
Hub driving flange bolts	3,9	28
Hub driving flange nut	1,4 to 2,0	10 to 15
Bevel pinion driving flange nut	11,75	85
Crownwheel bolts		
0.390 in. (10 mm approximately) diameter	6,2	45
0.375 in. (9.5 mm approximately) diameter	4,8	35
Differential bearing cap bolts	8,3	60
Steering		
Steering wheel nut	5,4	40
Ball joint nuts	4,0	30
Relay lever pinch bolts	7,6	55
** Steering box to support bracket bolts	7,0 to 8,5	50 to 60
Steering box support bracket to chassis bolts	2,0	15
Steering box drop arm nut	8,5 to 11,0	60 to 80
Brakes		
Wheel cylinder bleed nipple	0,5 to 0,8	4 to 6
Master cylinder to servo nuts	2,2 to 2,6	16 to 19
Tipping valve retainer (Dual system master cylinder)	4,9 to 6,2	35 to 45
Brake failure switch end pipe union	2,2	16
Brake failure switch unit to housing	2,2	16
Brake failure switch unit to housing	17,28 kgf.cm	15 lbf.in.
Fluid reservoir to master cylinder bolt (single line servo)	2,8 to 3,5	20 to 25
Fluid reservoir to master cylinder screws (dual line servo models)	0,3 to 0,4	2 to 3
Servo assembly securing nuts	1,2	9
Windscreen wipers and washers		
Wiper blade drive adaptor bolts	0,34 (34 kgf.cm)	2.5 (30 lbf.in.)
Electrical equipment		
Alternator shaft nut	3,5 to 4,2	25 to 30
Heater plugs (diesel)	3,4	25
Starter motor		
Petrol models		
Starter through bolts	1,0	8
Diesel models		
Solenoid to starter nuts	0,62	4.5
Solenoid outer terminal nuts	0,41	3
Starter yoke terminal outer nut	0,2	1.5
Starter through bolts	1,1	8
Starter earth stud nut	0,82	6
Eccentric pivot pin locknut	2,2	16

CAPACITIES

The following capacity figures are approximate and are provided as a guide only. All oil levels must be set using the dipstick or level plug, as applicable.

Component	Litres	Imperial unit	US unit
Engine sump oil, 4-cylinder	6,0	11 pints	13 pints
Engine sump oil, 6-cylinder	6,8	12 pints	14 pints
Extra when refilling after fitting new filter, 4-cylinder	0,85	1.5 pints	1.8 pints
Extra when refilling after fitting new filter, 6-cylinder	0,5	1 pint	1.2 pints
Air cleaner oil, 4-cylinder	0,85	1.5 pints	1.8 pints
Air cleaner oil, 6-cylinder	0,5	1 pint	1.2 pints
Main gearbox oil	1,5	2.5 pints	3 pints
Transfer box oil	2,5	4.5 pints	5.5 pints
** Rear differential (Standard)	1,75	3 pints	3.5 pints
Front differential (Standard)	1,75	3 pints	3.5 pints
Rear differential (ENV type **)	1,4	2.5 pints	3.5 pints
Front differential (ENV type **)	1,4	2.5 pints	3.5 pints
Rear differential: Salisbury 8HA	2,5	4.5 pints	5.5 pints
Swivel pin housing oil (each)	0,5	1 pint	1.2 pints
** Fuel tank, 4-cylinder models except Station Wagon**	45	10 gallons	12 gallons
Fuel tank, 6-cylinder models except Station Wagon	50	11 gallons	13 gallons
** Fuel tank, 4-cylinder and 6-cylinder Station Wagon models **	73	16 gallons	19 gallons
Cooling system, 4-cylinder Petrol models	8,1	14.25 pints	17.1 pints
Cooling system, 6-cylinder Petrol models	11,2	20 pints	24 pints
Cooling system, Diesel models	7,8	13.75 pints	16.5 pints
Hydraulic front winch, supply tank	20,0	4.5 gallons	7.5 gallons
Hydraulic front winch, gearbox	1,0	2 pints	2.4 pints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Recommended lubricants and fluids

These recommendations apply to temperate climates where operation temperatures are above –10°C (14°F).
Information on recommended lubricants for use under extreme winter conditions can be obtained from the Rover Company Limited, Technical Service Department, or a Rover Distributor or Dealer.

Lubricants marked with an asterisk (*) are multi-grade oils suitable for all temperature ranges.

DIAGRAM NUMBER	COMPONENTS	SAE	BP	CASTROL	DUCKHAM'S	ESSO	MOBIL	TEXACO/ CALTEX	SHELL
	PETROL MODELS		**						
20	Engine	20W	*BP Super Visco-Static 20-50 **	*Castrol GTX	Duckham's Q20-50 Motor Oil	Uniflo or Esso Motor Oil 20W	Mobiloil Super or Mobiloil Special 20W-50	Havoline 20W-50	*Shell Super Oil
18	Air cleaner								
6	Governor								
	DIESEL MODELS								
20	Engine	20W	BP Vanellus 20W	Castrol CRI.20	Duckham's Fleetol HDX 20 or Q20-50	Essolube HDX 20W	Delvac 1120 or Delvac 1220	Ursa Oil Heavy Duty 20-20W	Shell Rotella S or T 20/20W
18	Air cleaner								
7	Main gearbox								
8	Transfer box								
19	Front differential								
27	Rear differential								
16	Swivel housing, RH	90EP	BP Gear Oil SAE 90 EP	Castrol Hypoy	Duckham's Hypoid 90	Esso Gear Oil GP 90/140	Mobilube GX 90	Multigear Lubricant EP 90	Spirax 90 EP
4	Swivel housing, LH								
23	Steering box								
13	Steering relay								
11	Rear power take-off								
29	Pulley unit								
12	Drag link ball joint, RH								
1	Drag link ball joint, LH								
15	Track rod ball joint, RH								
2	Track rod ball joint, LH								
14	Longitudinal arm ball joint, front								
21	Longitudinal arm ball joint, rear								
17	Front hub, RH		BP Energrease L2	Castrol LM Grease	Duckham's LB10 Grease	Esso Multi-purpose Grease H	Mobilgrease MP or Mobilgrease Super	Marfak All-purpose	Retinax A or Darina AX
3	Front hub, LH								
28	Rear hub, RH								
10	Rear hub, LH								
25	Front propeller shaft								
9	Rear propeller shaft								
5	Radiator (anti-freeze solution)		Bp Anti-Frost	Castrol Anti-freeze	'Standard' Anti-Freeze	Esso Anti-Freeze	Mobil Permazone	P.T. Anti-Freeze	Shell Anti-Freeze
24	Clutch fluid reservoir		Bluecol and Prestone or any anti-freeze solution conforming to British Standard B.S. 3151 or 3152						
22	Brake fluid reservoir		Castrol Girling Brake and Clutch Fluid 'Crimson'. Specification J. 1703						

26	Fuel Tank	**2¼ litre Petrol models** 7.0:1 compression ratio: 90 octane with 6° BTDC ignition timing 83 octane with 3° BTDC ignition timing 75 octane with TDC ignition timing 8.0:1 compression ratio: 90 octane with TDC ignition timing 85 octane with 3° ATDC ignition timing
		2.6 litre Petrol models 7.0:1 compression ratio 83 octane with 2° BTDC ignition timing 80 octane with TDC ignition timing 78 octane with 2° ATDC ignition timing 7.8:1 compression ratio: 90 octane with 2° ATDC ignition timing 85 octane with 6° ATDC ignition timing
		2¼ litre Diesel models Diesel fuel (D.E.R.V.)

MAINTENANCE

Summary Chart

Routine Maintenance Operations

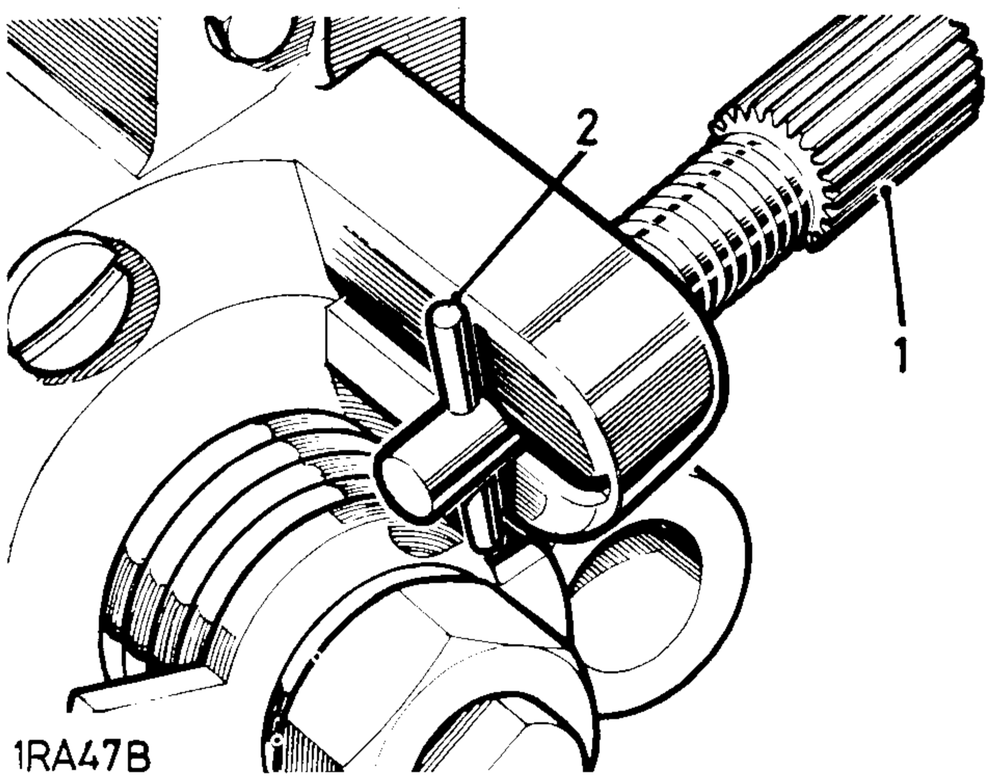
SUMMARY

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 30.000 km (18,000 miles) or eighteen months. The fluid should also be changed before touring in mountainous areas if not done in the previous nine months. Use only Castrol Girling Crimson Brake Fluid, Specification J1703 from sealed tins.
   Renew all rubber seals in the complete brake system and all hydraulic hoses every 60.000 km (36,000 miles) or 3 years. Drain the brake fluid reservoir and flush the system. Refill with the correct fluid.
6. Owners are under a legal obligation to maintain all exterior lights in good working order; this also applies to headlamp beam setting, which should be checked at regular intervals by a Rover Distributor or Dealer.

Cold start unit

1. On the cold start unit fitted to the carburetter on 6 cylinder models there is a spring-loaded pin.
2. For use in ambient temperatures down to – 18°C (0°F) the pin should be pushed in and located as illustrated to reduce movement of the starter valve; this avoids over-richness on cold start.
3. Below – 18°C (0°F) the pin should be turned so that it is in the slot in the retaining lug.

NOTE: The sequence of operations under the headings, Engine compartment, Underbody, Passenger compartment, Exterior and Road test will enable the work to be carried out in the most efficient manner.



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

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

		10.10.03	10.10.06	10.10.12	10.10.24
			3 9 15 21		
		1,000 mile	27 33 39	6 18 30	12 24 36
		(1.500 km)	45 miles/	42 miles/	48 miles/
		Free	months	months	months
		Service	5 15 25	10 30 50	20 40 60
			35 45 50	70 km	80 km
			60 75 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*	*	*	*	*
Clean fuel pump sediment bowl, 4 cylinder petrol		*			*
Change fuel filter element, 6 cylinder petrol					*
Replace engine flame trap, 6 cylinder petrol					*
Lubricate accelerator linkage and check operation, 6 cylinder petrol		*		*	*
Check/top-up carburetter piston damper, 6 cylinder petrol: 12 mm (0.5 in.) from top of tube		*		*	*
Check/adjust carburetter mixture and slow running, 6 cylinder petrol		*		*	*
Lubricate accelerator linkage and check operation, diesel models		*		*	*
Check/adjust injectors, diesel models		*			*
Empty/clean and refill oil bath air cleaner. Capacity: 0,85 litres (1.5 Imperial pints)	*LUB*	*			*
Check/adjust, if necessary report condition of distributor contact points. Gap: 0,35 to 0,40 mm (0.014 to 0.016 in.)		*		*	*
Check/adjust, if necessary 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: 0,75 to 0,80 mm (0.029 to 0.032 in.)				*	
Replace spark plugs: Gap: 0,70 to 0,80 mm (0.029 to 0.032 in.) 4 cylinder 8.0:1 compression ratio: Champion UN12Y. 7.0:1 compression ratio: **Champion N8** 6 cylinder 7.8:1 and 7.0:1 compression ratio: Champion N5					*
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, when fitted: 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/tighten cylinder head bolts, diesel models: Torque: 0.5 in. UNF–12,5 mkg (90 lb ft) 0.312 in. UNF–2,4 mkg (18 lb ft)		*			
Check/adjust tappet clearance: 4 cylinder petrol and diesel: Inlet and exhaust: 0,25 mm (0.010 in.) engine hot 6 cylinder petrol: 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 4 cylinder petrol: 8,0:1 compression ratio: TDC (90 octane fuel) 3° ATDC (85 octane fuel) 7,0:1 compression ratio (optional): 6° BTDC (90 octane fuel) 3° BTDC (83 octane fuel) TDC (75 octane fuel) 6 cylinder petrol: 7.8:1 compression ratio: 2° ATDC (90 octane fuel) 6° ATDC (85 octane fuel) 7,0:1 compression ratio: (optional): 2° BTDC (83 octane fuel) TDC (80 octane fuel) 2° ATDC (78 octane fuel)		*		*	*
Check engine oil level	*LUB*		*		
Lubricate accelerator linkage and check operation, 4 cylinder petrol		*		*	*
Check/ajust carburetter mixture and slow running, 4 cylinder petrol		*		*	*
Renew fuel filter element, diesel models					*

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

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

		10.10.03	10.10.06	10.10.12	10.10.24
		1,000 mile (1.500 km) Free Service	3 9 15 21 27 33 39 45 miles/ months 5 15 25 35 45 50 60 75 km	6 18 30 42 miles/ months 10 30 50 70 km	12 24 36 48 miles/ 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 of front differential	*LUB*			*	*
Drain front differential oil and refill, also every 40.000 km (24,000 miles) Capacity: Standard: 1,75 litres (3 Imperial pints). ENV: 1,4 litres (2.5 Imperial pints)	*LUB*	*			Every 40km(24m)
Check/top-up oil level of swivel pin housings	*LUB*			*	*
Drain swivel pin housings and refill, also every 40,000 km (24,000 miles). Capacity: 0,5 litre (1 Imperial pint)	*LUB*	*			Every 40km(24m)
Drain engine oil and refill. Capacity: 4 cyl: 6,0 litres (11 imperial pints). 6 cyl: 6,8 litres (12 Imperial pints)	*LUB*	*		*	*
Renew oil filter element	*LUB*			*	*
Drain flywheel housing when drain plug is fitted			*	*	*
Drain/dismantle and clean fuel sedimenter, diesel models		*			*
Check/top-up oil level of main and transfer gearbox	*LUB*			*	*
Drain main and transfer gearbox oils and refill, also every 40.000 km (24,000 miles) Capacities: Main gearbox: 1,5 litres (2.5 Imperial pints). Transfer gearbox: 2,5 litres (4.5 Imperial pints)	*LUB*	*			Every 40km(24m)
Lubricate handbrake linkage	*LUB*			*	*
Lubricate propellor shafts	*LUB*	*		*	*
Lubricate front propeller shaft sealed sliding joint every 40.000 km (24,000 miles)					Every 40km(24m)
Check/top-up oil level of rear differential	*LUB*			*	*
Drain rear differential oil and refill, also every 40.000 km (24,000 miles). Capacity: 2,5 litres (4.5 Imperial pints)	*LUB*	*			Every 40km(24m)
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, chafing, 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 door locks, window controls, safety catches, bonnet catch etc. and lubricate		*		*	*
EXTERIOR Inspect/report brake linings 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 oil level 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.		*	*	*	*

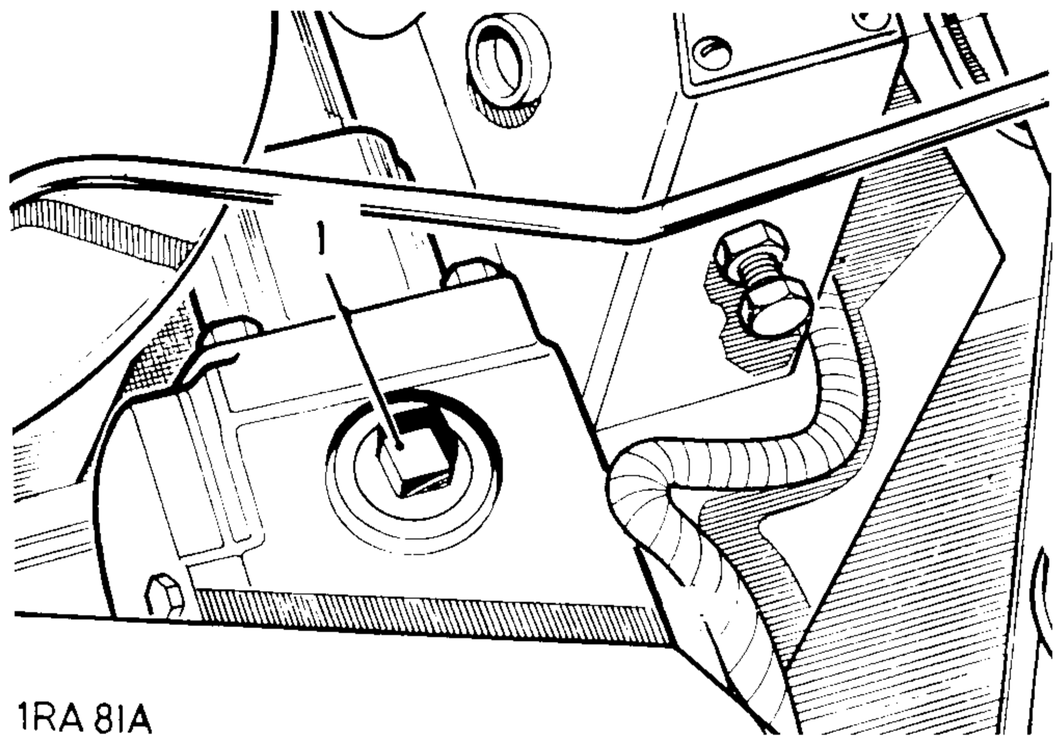
Engine Compartment

Every Maintenance Inspection

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

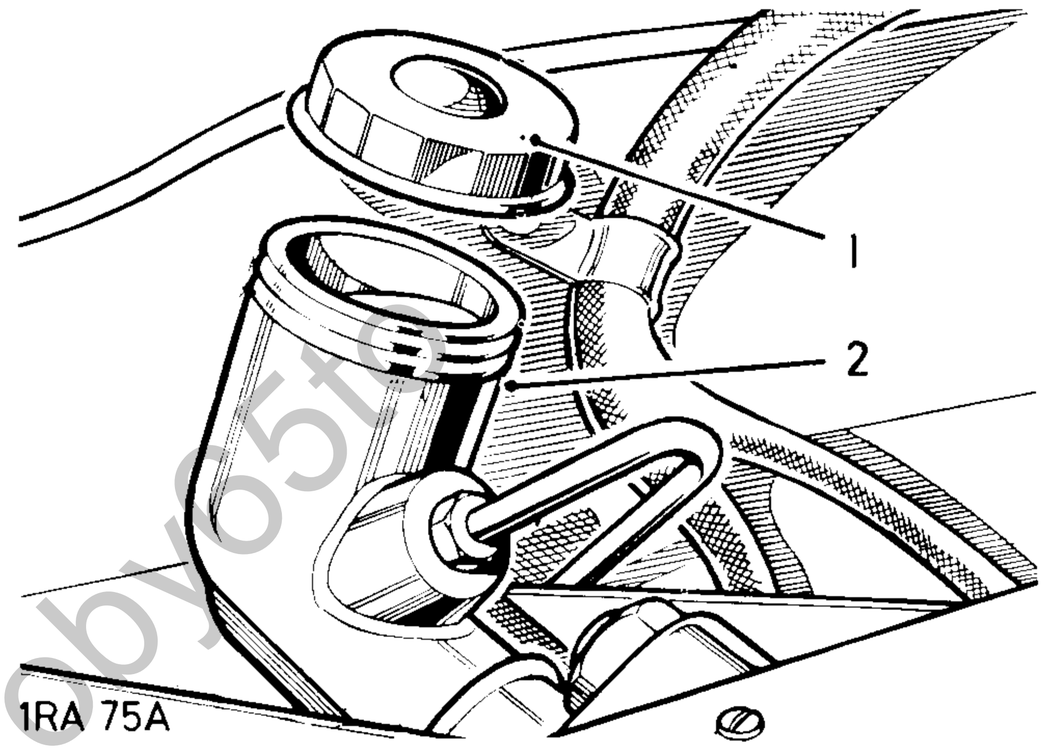
Steering box oil level—At free service 1.500 km (1,000 miles) and thereafter every 20.000 km (12,000 miles) or 12 months.

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 5.000 km (3,000 miles) or 3 months.

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



Clutch fluid reservoir—Every maintenance Inspection.

1. Check fluid level in reservoir by removing cap.
2. Top up if necessary to bottom of filler neck.

Use Castrol Girling Brake and Clutch Fluid 'Crimson' (Specification J. 1703).

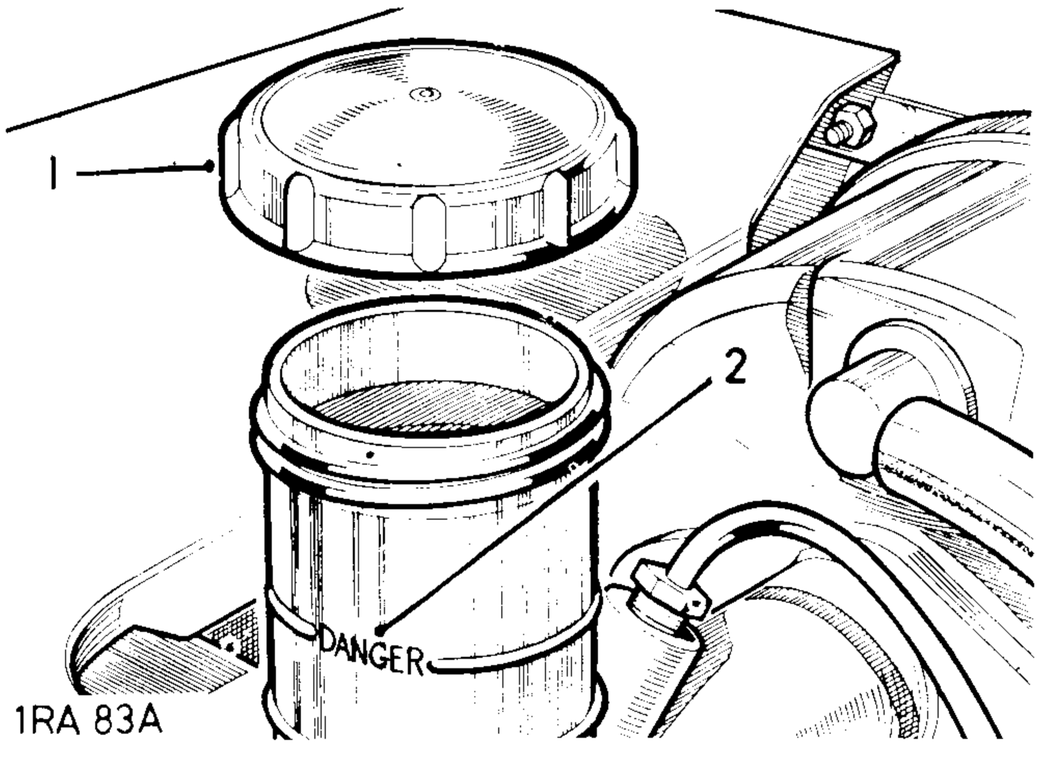
If significant topping-up is required, check for leaks at master cylinder, slave cylinder and connecting pipe.

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

1. Check fluid level in brake reservoir by removing cap.
2. Top up if necessary to level mark on reservoir.

Use Castrol Girling Brake and Clutch Fluid 'Crimson' (Specification J. 1703).

If significant topping-up is required, check master cylinder, wheel cylinders and brake pipes for leakage; any leakage must be rectified immediately.



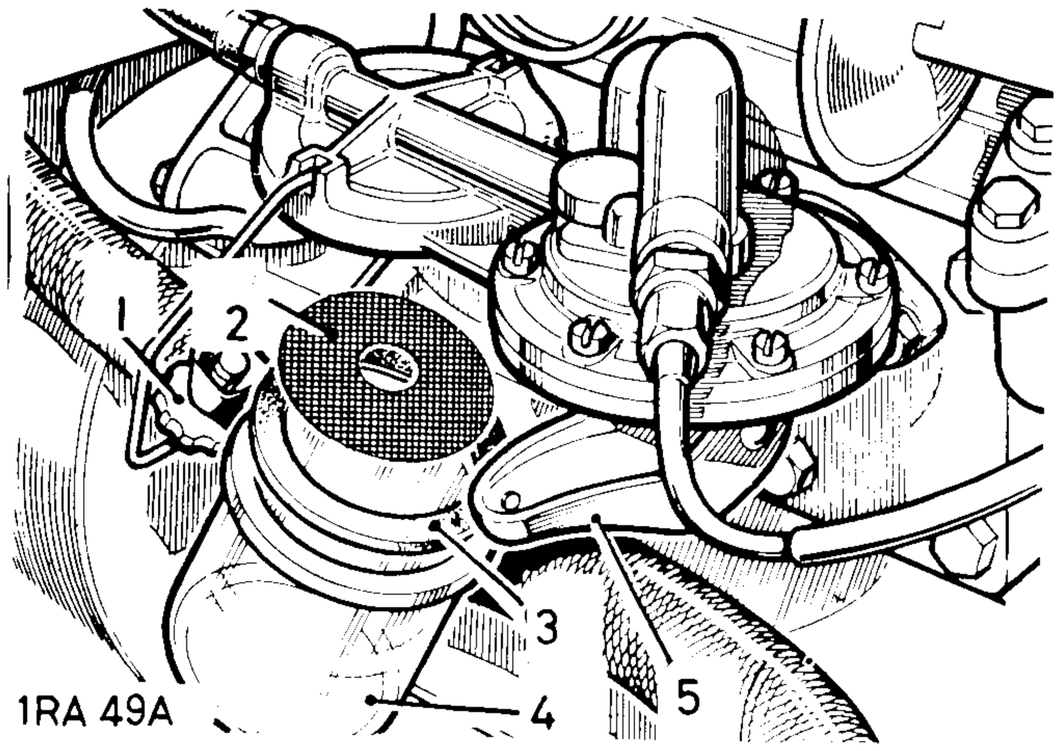
Engine Compartment

Fuel sediment bowl, 4 cylinder petrol models—At free service 1.500 km (1,000 miles) and thereafter every 20.000 km (12,000 miles) or 12 months.

The fuel sediment bowl, located on the right-hand side of the engine provides additional filtration between the pump and carburetter.

Clean as follows:

1. Remove the bowl by slackening the thumb screw and swinging the retainer to one side.
2. Remove and clean the filter gauze in clean petrol.
3. Ensure that the sealing washer is in good condition.
4. Replace gauze and refit the bowl.
5. Prime the pump by operating the hand lever.

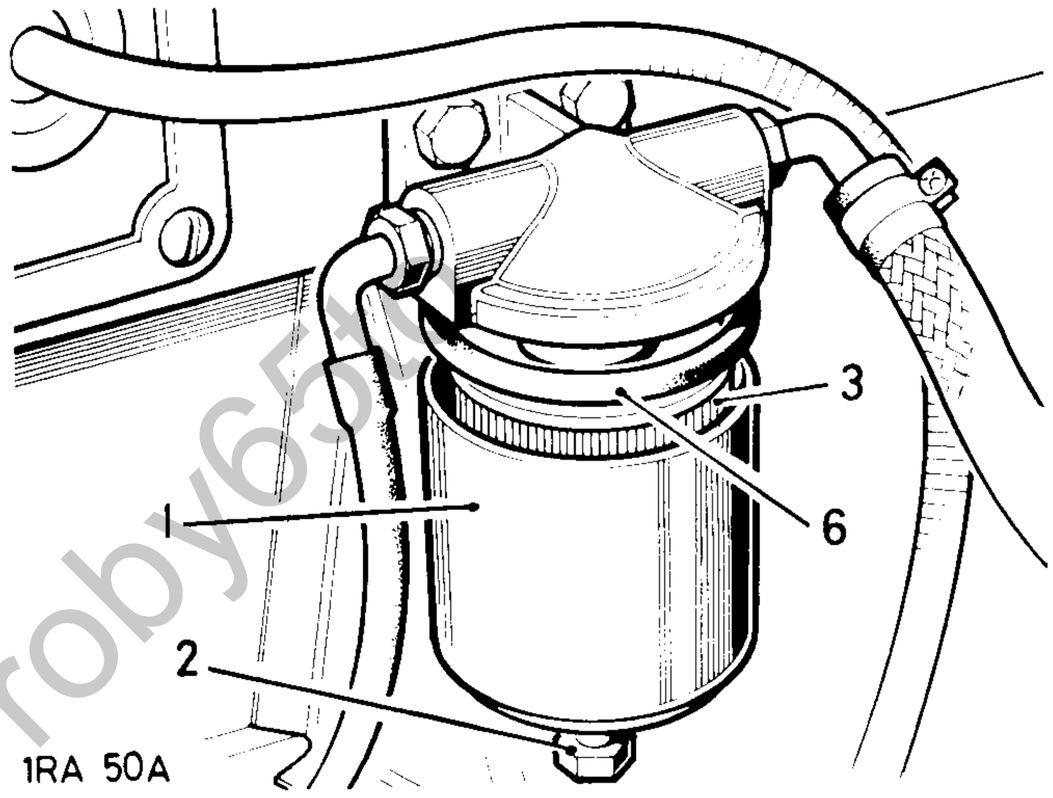


Fuel filter element, 6 cylinder models—Every 20.000 km (12,000 miles) or 12 months.

The fuel filter element, located on the dash at the right-hand side of the engine compartment, provides additional filtration between pump and carburetter.

Replace element as follows:

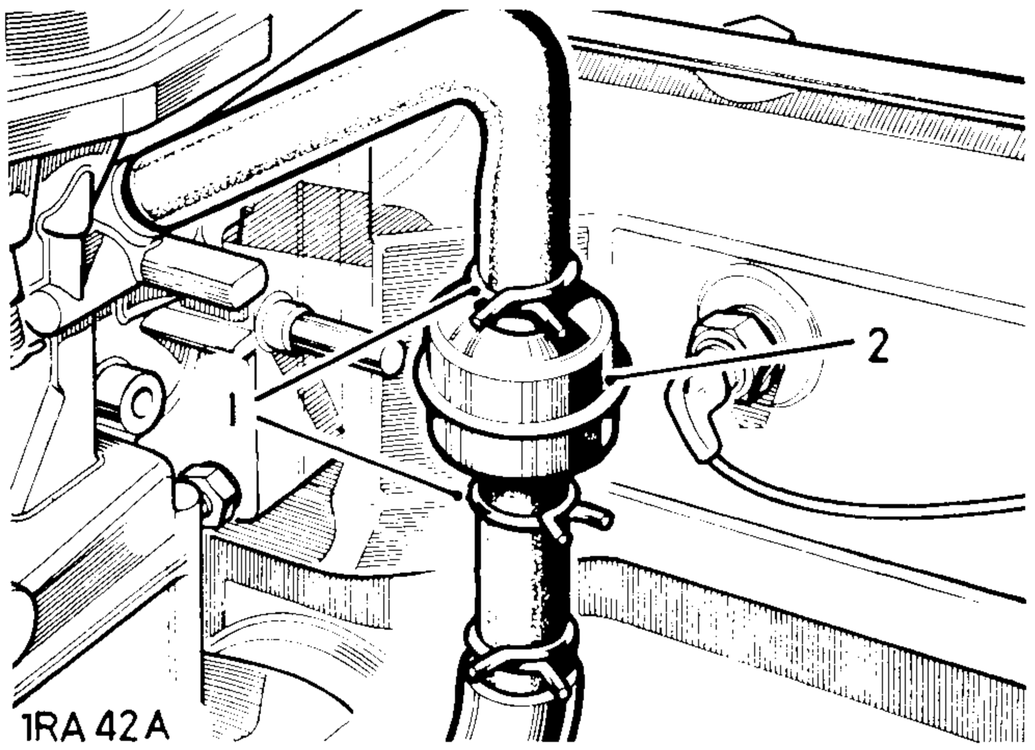
1. Support element holder.
2. Unsrew the special bolt at bottom of filter. The element holder can now be removed.
3. Remove and discard the used element.
4. Thoroughly clean the element holder in petrol.
5. If necessary renew the upper and lower centre seals and also the seal for the centre bolt.
6. 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.



Crankcase emission control, flame-trap type (as applicable)—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 carburetter if necessary.

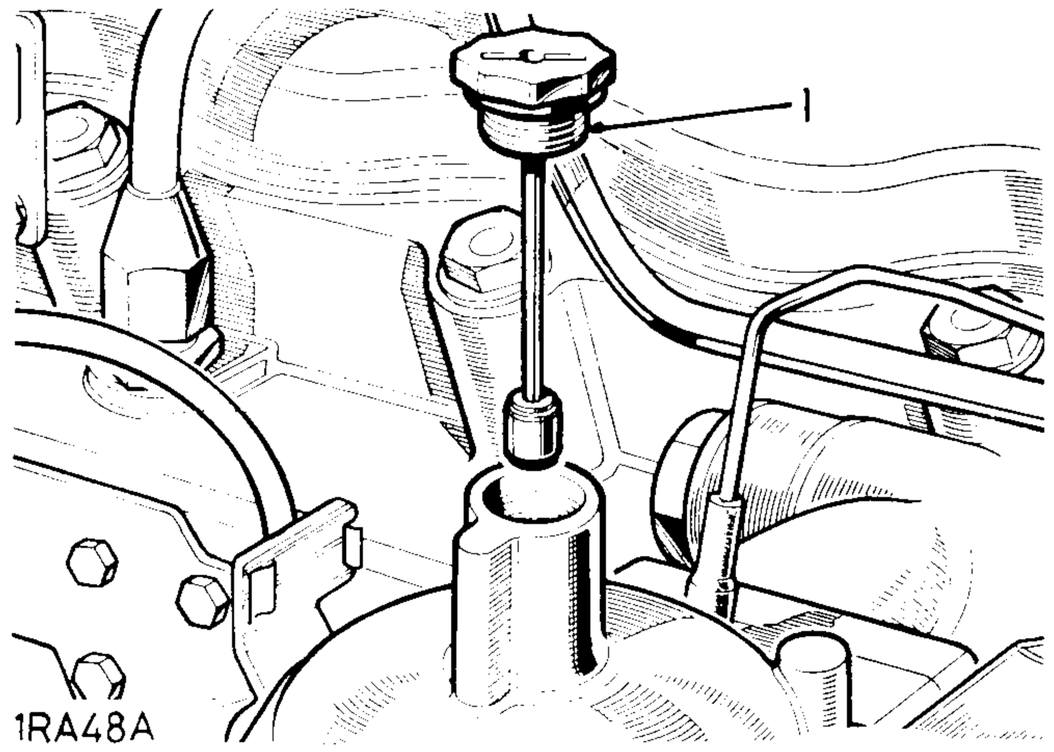


Engine Compartment

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.

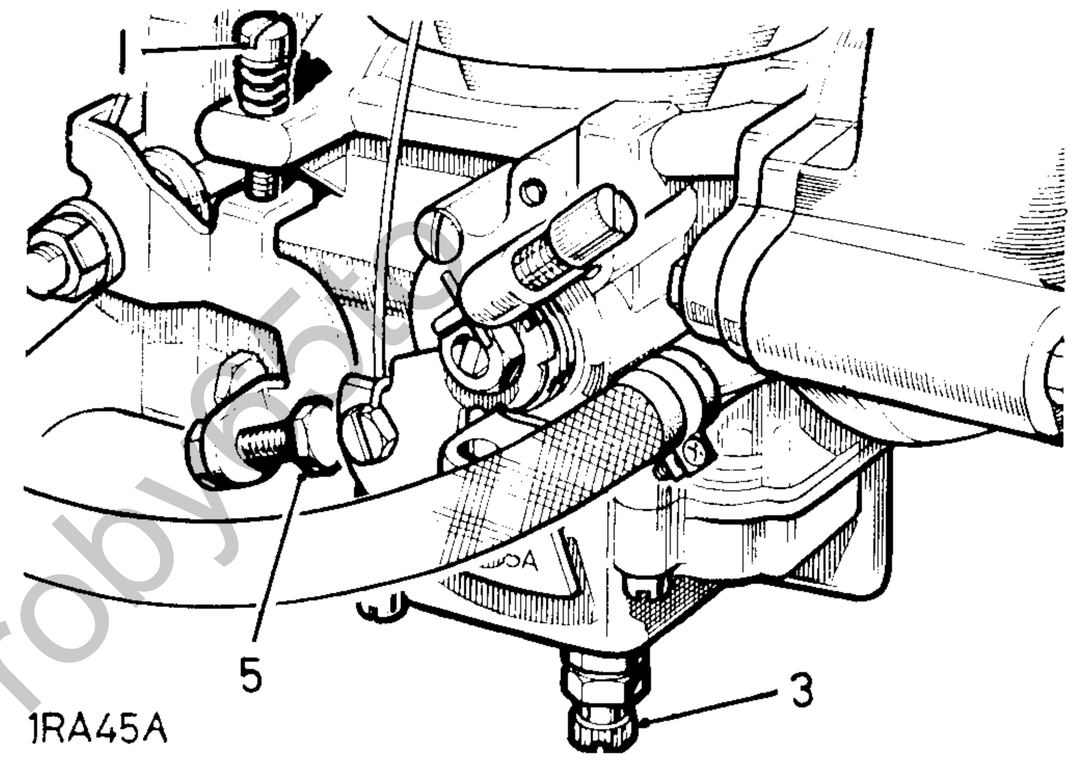
1. Prior to carburetter adjustments, lubricate the accelerator linkage using clean engine oil paying particular attention to accelerator cross shaft bearings and ball joint sockets on the control rods.
2. Check the linkage for correct operation and ensure that there is no tendency to stick.

   Badly worn parts should be replaced as soon as possible.



Carburetter 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.

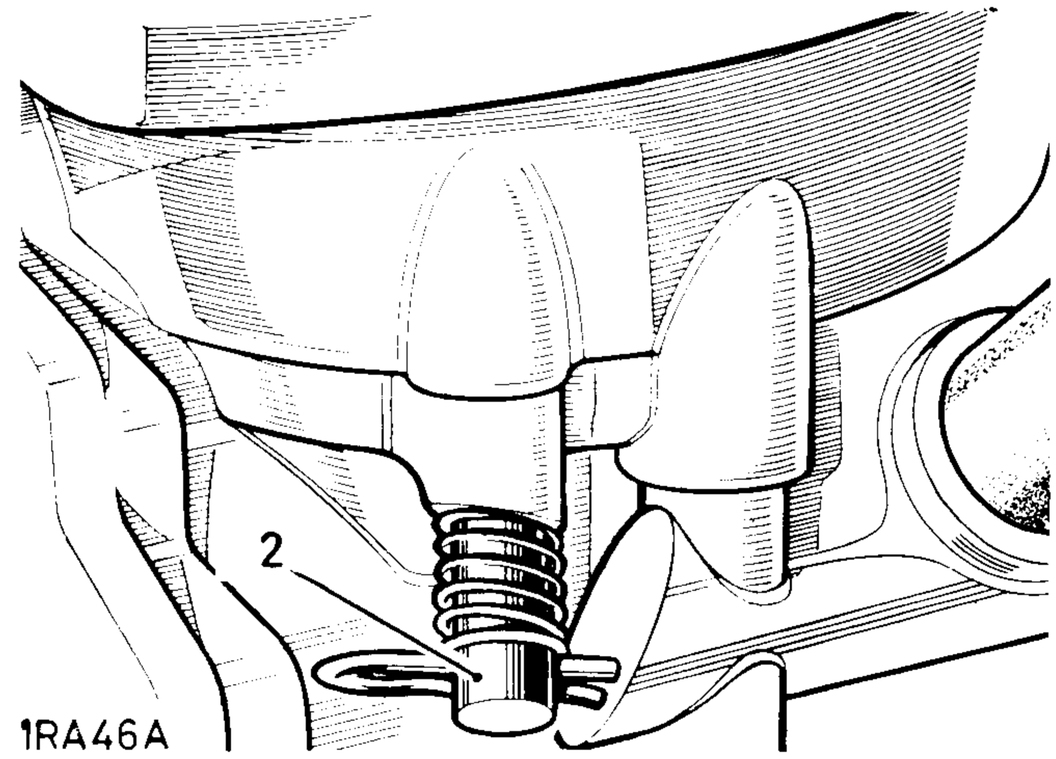
1. Unscrew the cap on top of the suction chamber, withdraw cap and hydraulic damper, replenish the damper reservoir as necessary with SAE 20 oil to within about 12 mm (0.5 in.) from the top of the tube. Then replace cap and hydraulic damper.



Carburetter slow-running adjustment–At free service 1.500 km (1,000 miles) and thereafter every 10.000 km (6,000 miles) or 6 months. 6 cylinder models.

1. Run the engine until normal operating temperature is obtained. If necessary adjust slow-run screw to give the correct idling speed.
2. Lift the carburetter piston approximately 1 mm (0.031 in.) by means of the lift pin situated on the right of the carburetter body. There is approximately 5 mm (0.187 in.) free movement of the lift pin before it contacts the piston.
3. If the engine speeds up immediately the mixture is too rich and the jet admustment screw must be turned anti-clockwise, thus weakening the mixture; if the engine stops immediately, the mixture is too weak and the jet adjustment screw should be turned clockwise to enrich the mixture.

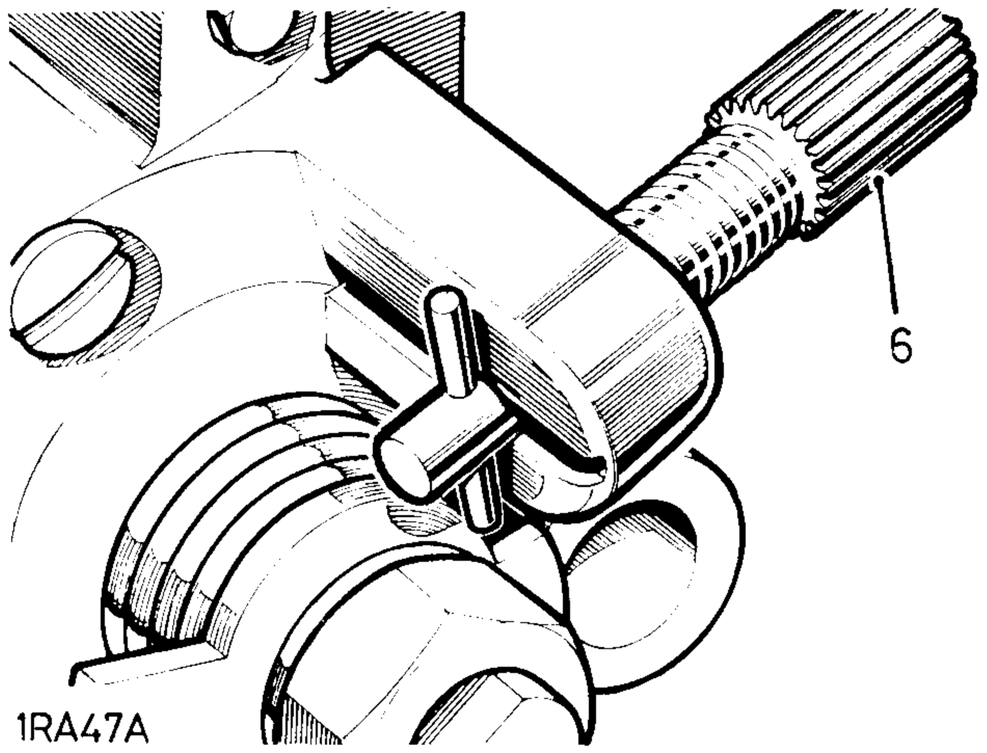
   If the engine just falters and then continues to run evenly the adjustment is correct.
4. Finally adjust the slow-run screw to get a smooth idling speed.
5. The fast idle screw should not require adjustment.



Engine Compartment

6. For starting at temperatures down to–18°C (0°F) push and turn the spring-loaded choke adjustment screw so that the peg is at right-angles to the slot as illustrated. Leave in this position.

   When starting at temperatures below – 18°C (0°F) turn the screw until peg is recessed in slot.



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

1. Lubricate the accelerator linkage using clean engine oil paying particular attention to accelerator cross shaft brackets, bell crank bushes 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.

Fuel and injection system, diesel models

Absolute cleanliness is essential when handling any part of the fuel injection system.

The fuel system comprises the fuel tank, pipe lines, sediment bowl filter, mechanically operated pump, paper element type filter, injectors and injector pump. It is most important that the system be kept clean and free from leaks.

Fuel injectors–At free service 1.500 km (1,000 miles) and thereafter check every 20.000 km (12,000 miles) or 12 months.

Absolute cleanliness is essential when handling fuel injectors

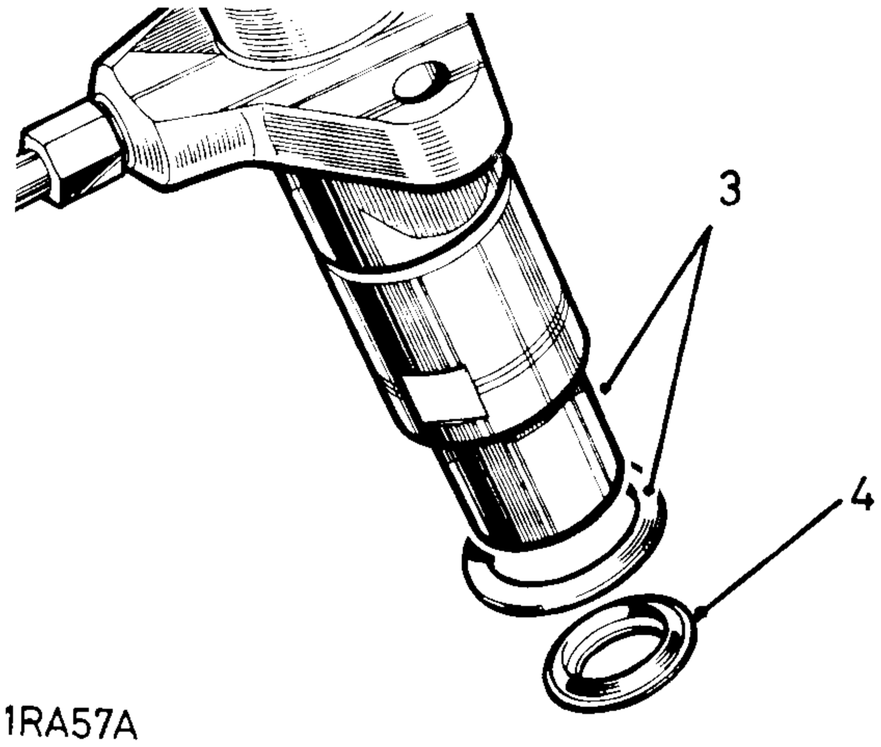
Nozzle holders and nozzles should not be dismantled unless proper testing and re-setting facilities are available. If a nozzle is found to be faulty, replace the complete unit.

The injectors are located in the top of the cylinder head on the right-hand side. Injectors may be removed for checking and adjustment as follows:

1. Disconnect the spill pipe at T-piece and slacken banjo bolts at nozzles. The feed pipes must be removed from the injectors and the pump, these pipes should be free at both ends; on no account must the pipes be bent to clear the union on the injector.
2. Remove flange securing nuts.

Engine compartment

3. Lift out the injectors complete with spill pipe and copper washers.
4. Remove the steel washers from inside the injector holes.
5. Fit spill pipe to new injectors, ensuring that no foreign matter is present. Do not fully tighten banjo bolts at this stage.
6. Fit assembly of injectors and spill pipe to cylinder head, taking great care not to damage nozzle and also ensure that both new copper washer and steel washer are fitted. The steel washer must be fitted with the 'u' of the corrugation downwards.
7. Refit flange securing nuts.
8. Tighten each nut alternately an equal amount to ensure that the injector goes into position evenly. The nuts must be tightened only to a torque of 0,8-1,0 mkg (6-8 lb ft). Alternatively, a ½ in. AF open-ended spanner of not more than 100 mm (4 in.) in length can be used. Failure to carry out the above precautions when replacing injectors may result in nozzle distortion, giving rise to rough and uneven running. Finally, tighten spill pipe banjo bolts.



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Checking nozzles in engine, diesel models

The first symptoms of nozzle trouble usually come under one or more of the following headings:

(a) Cylinder knock
(b) Engine overheating
(c) Loss of power
(d) Smoky exhaust (black)
(e) Increased fuel consumption.

To check the nozzles, proceed as follows:

1. With the engine running, release the fuel feed pipe union on each nozzle in turn.
2. If the injector being checked has been operating properly, there will be a distinct reduction in engine speed accompanied by obvious roughness, but a faulty injector will make less reduction to engine speed when its fuel pipe is loosened.
3. Do not assume, however, that the nozzles are the only cause of the trouble, as faulty valve timing, leaking valves, incorrect pump timing, dirty filters, etc., may all cause similar trouble.

Engine compartment

Adjusting injectors, diesel models.

4. The use of a test pump is essential when adjusting injectors; we strongly recommend therefore, that adjustment to injectors be carried out by a **Rover** Distributor or Dealer or CAV Agent.
5. Great care should be taken to prevent the hands getting into contact with the spray, as the working pressure will cause the fuel to penetrate the skin with ease.

Heater plugs, diesel models

6. The heater plugs do not require any maintenance. However, if at any time when the heater plug is used, the warning light glows very brightly, a short circuit in the system is indicated. No light will indicate an open circuit. This should receive attention at a Rover Distributor or Dealer.
7. Great care must be taken not to twist the centre terminal when removing heater plug leads.

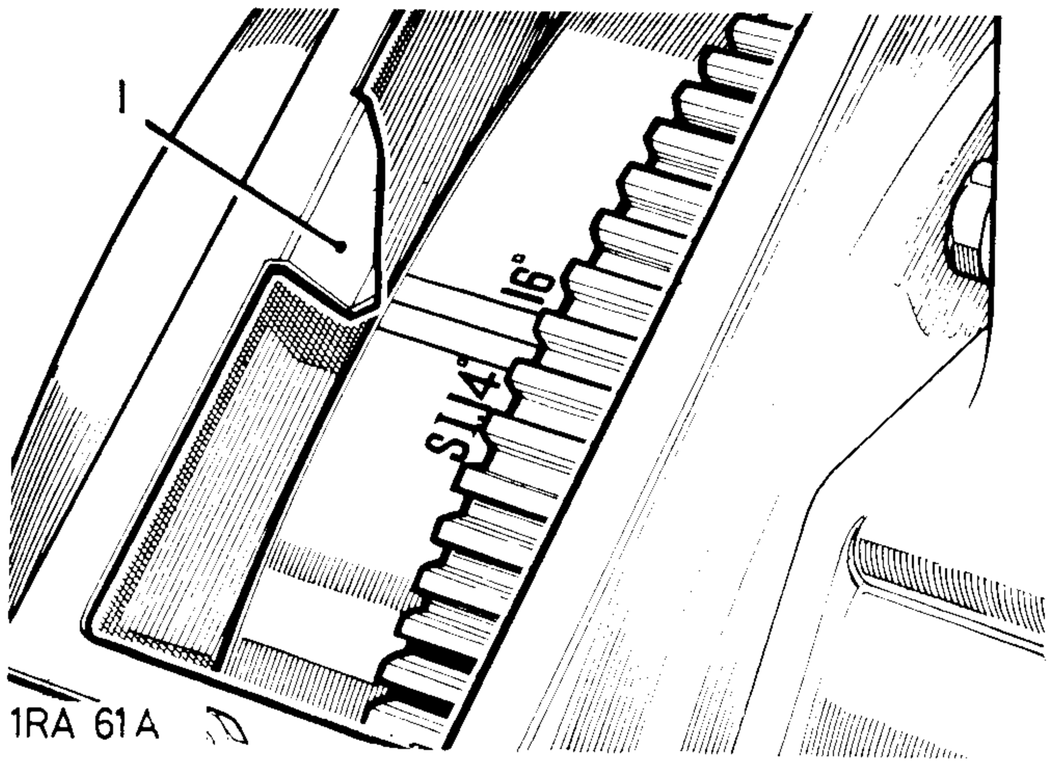
Distributor pump, diesel models.

This unit is correctly set on leaving the factory and requires no further adjustment. It is lubricated by the diesel fuel and does not require any maintenance in this respect.

Should any trouble be experienced with the distributor pump, consult a **CAV Agent.**

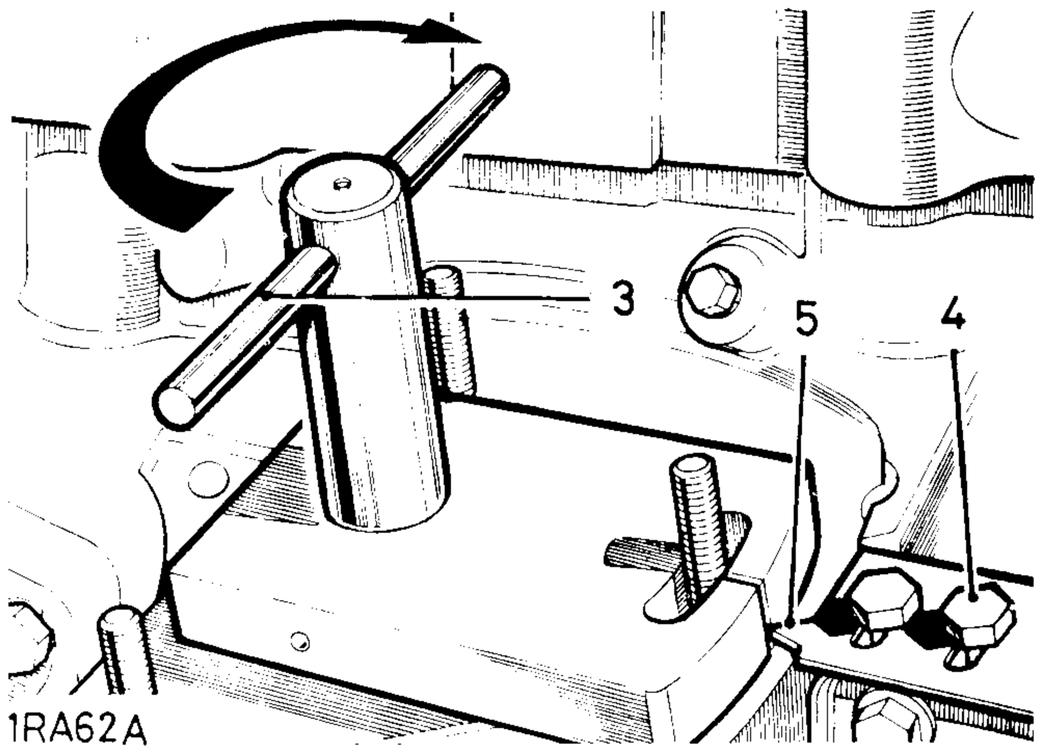
If for any reason the distributor pump has been removed, it must be refitted and timed as follows:

1. Turn the crankshaft in the direction of rotation until both valves of number one cylinder are closed and the piston is ascending the bore on the compression stroke. Continue to turn the crankshaft slowly until the pointer is midway between the 14° and 16° marks, that is 15° before top dead centre. This must be done carefully. If the flywheel is inadvertently turned too far and the timing mark goes past the pointer, do not turn the flywheel back, but repeat the above operation. Ensure that a correct line of vision is taken when lining up the timing marks. An incorrect line of vision can result in the timing being 1° to 2° out.
2. The master spline on the driving gear should now be approximately 20° from the centre line of the engine measured from the front end, that is, at the 4 o'clock position.



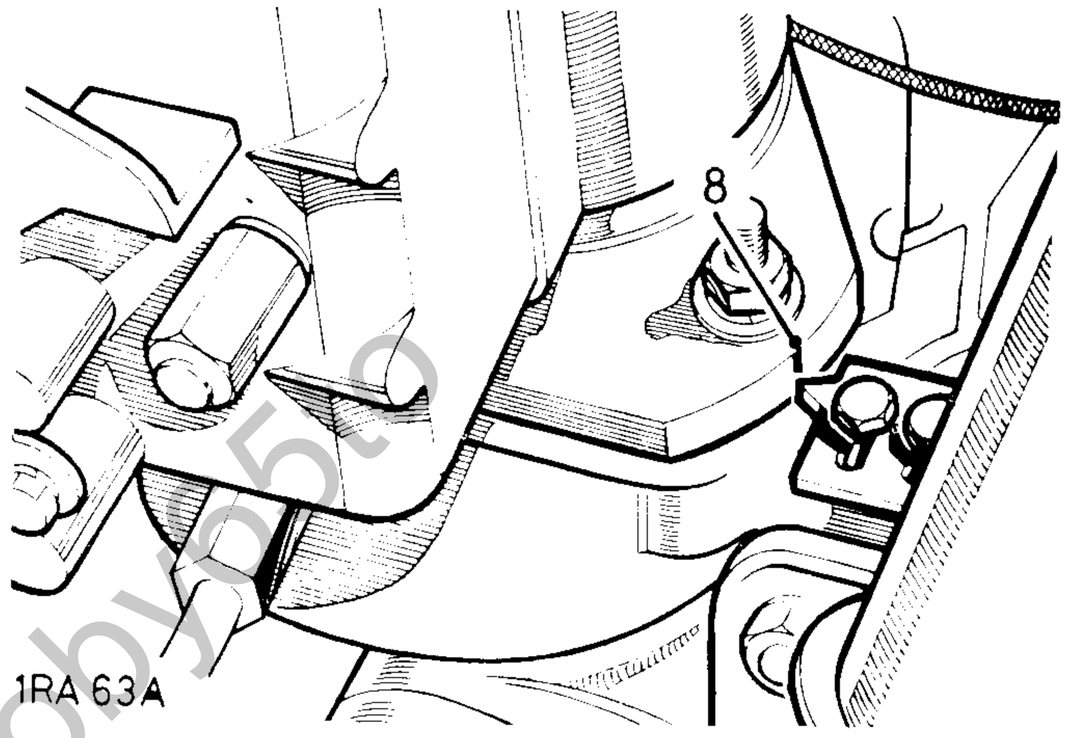
Engine compartment

3. Insert the timing gauge, Part Number 605863, into the driving gear, then twist gauge in a clockwise direction to take up backlash and any wear in the gears.
4. Hold in this position, then, if necessary, slacken off bolts retaining timing pointer on side of cylinder block.
5. Adjust pointer so that it coincides with the line on timing gauge, as illustrated.
6. Remove timing gauge.
7. Rotate driving gear on distributor pump so that master spline lines up with master spline on driving gear.
8. Then offer pump to engine, ensuring that the timing mark on the pump flange coincides with the timing pointer.



When the distributor pump is timed as detailed above, that is, with the timing pointer on the engine altered to take up backlash and wear on the gears, it ensures that optimum distributor pump timing is achieved.

Should there be any fall-off of power during the life of the engine, retiming the distributor pump to take up gear wear could well make a significant improvement to engine performance, providing the engine is generally in good condition.



Priming the fuel system, diesel models.

A– When the paper element filter is changed the system must be primed as follows:

1. Do not attempt to start the engine hoping to draw the fuel through in this way, otherwise the full priming procedure will be necessary.
2. Slacken the bleed pipe on the top of the filter.
3. Operate the hand priming lever on the mechanical pump until fuel free from bubbles emerges.
4. Tighten the bleed pipe.
5. Operate the hand priming lever once or twice to clear the last bubbles of air into the filter bleed pipe.
6. Start engine in normal way and check for leaks.

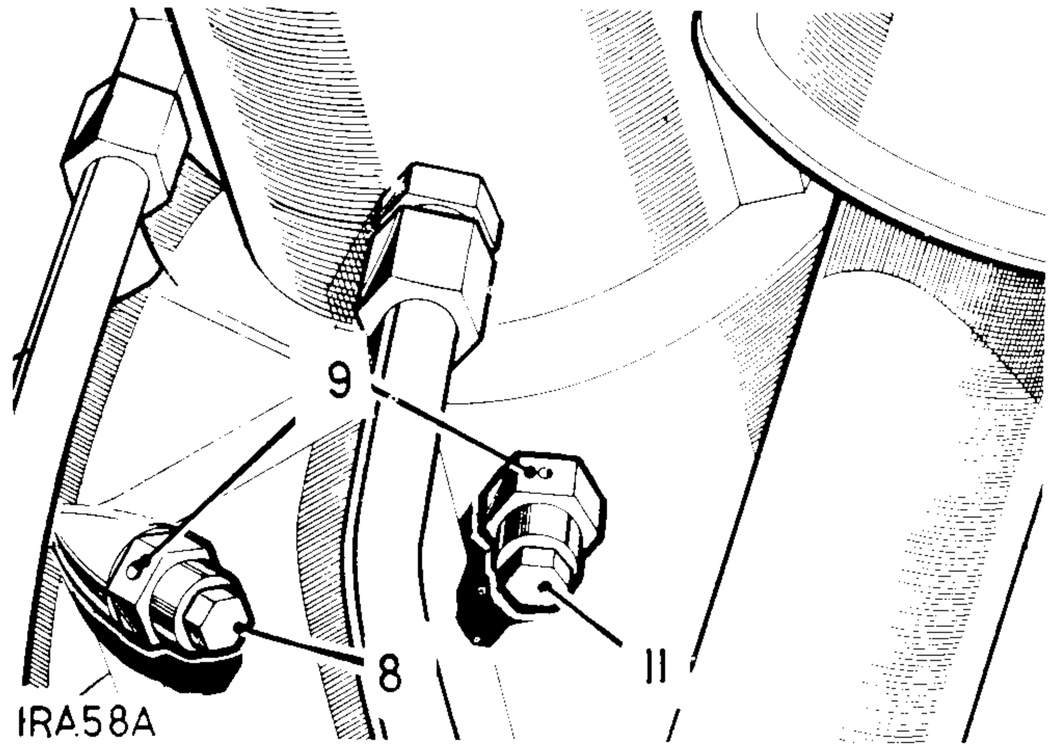
Engine compartment

B– When fuel system has been completely emptied proceed as follows:

7. Carry out previous operations 1 to 5 inclusive.

Engine compartment

8. Release air vent screw on distributor body.
9. Operate the fuel pump hand priming lever until fuel free of air emerges from the aperture.
10. Re-tighten the air vent screw.
11. To ensure that all air is exhausted from the pump it may also be necessary to slacken air vent screw in the distributor control cover and repeat items 9 and 10.
12. Start the engine in the normal way and check for leaks.



C– When distributor pump only has been drained it is only necessary to carry out operations 8 to 12 inclusive.

Always ensure that fuel pump lever is on the bottom of the operating cam when priming the fuel system, otherwise maximum movement of the priming lever will not be obtained.

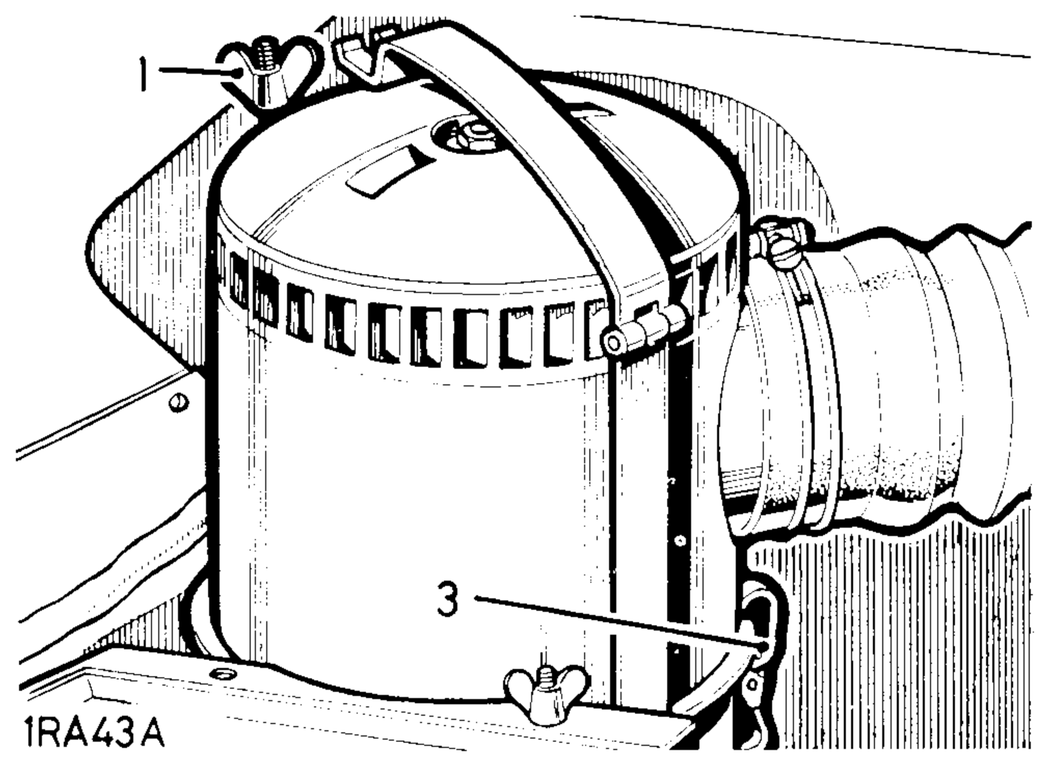
Air cleaner All models–At free service 1.500 km (1,000 miles) and thereafter every 20.000 km (12.000 miles) or 12 months.

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 carburetter 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 0,85 litre (1.5 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.

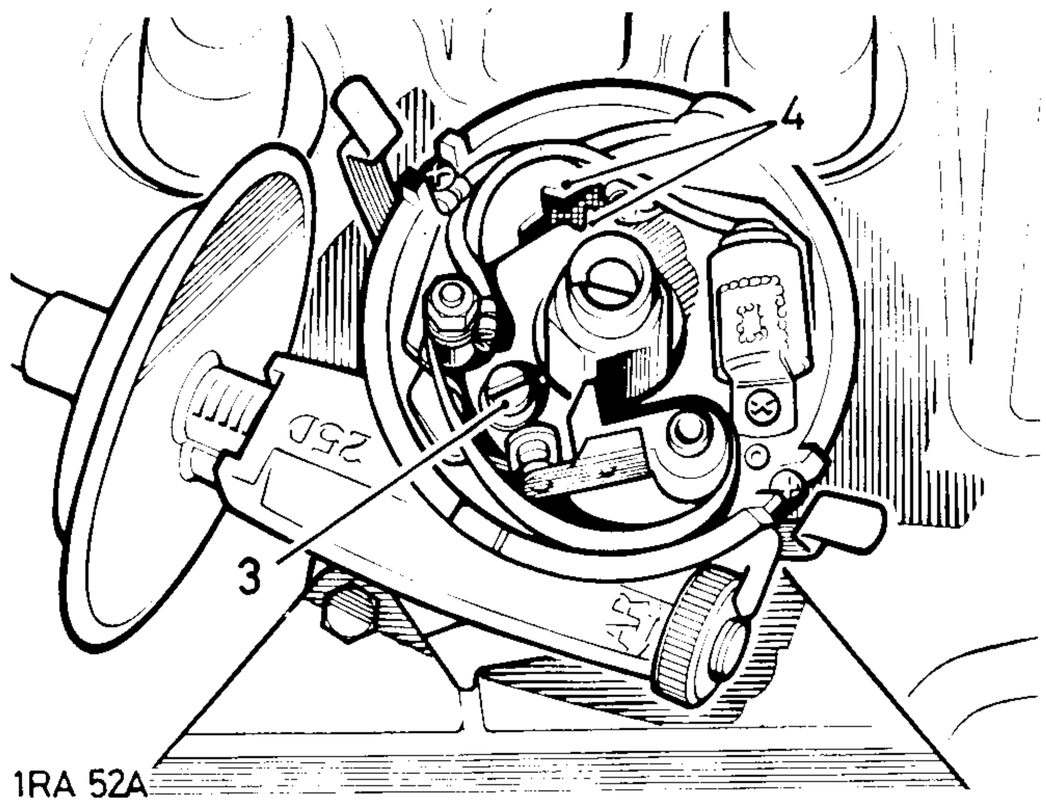


Engine compartment

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. Petrol models.

Check and adjust the contact points clearance as follows.

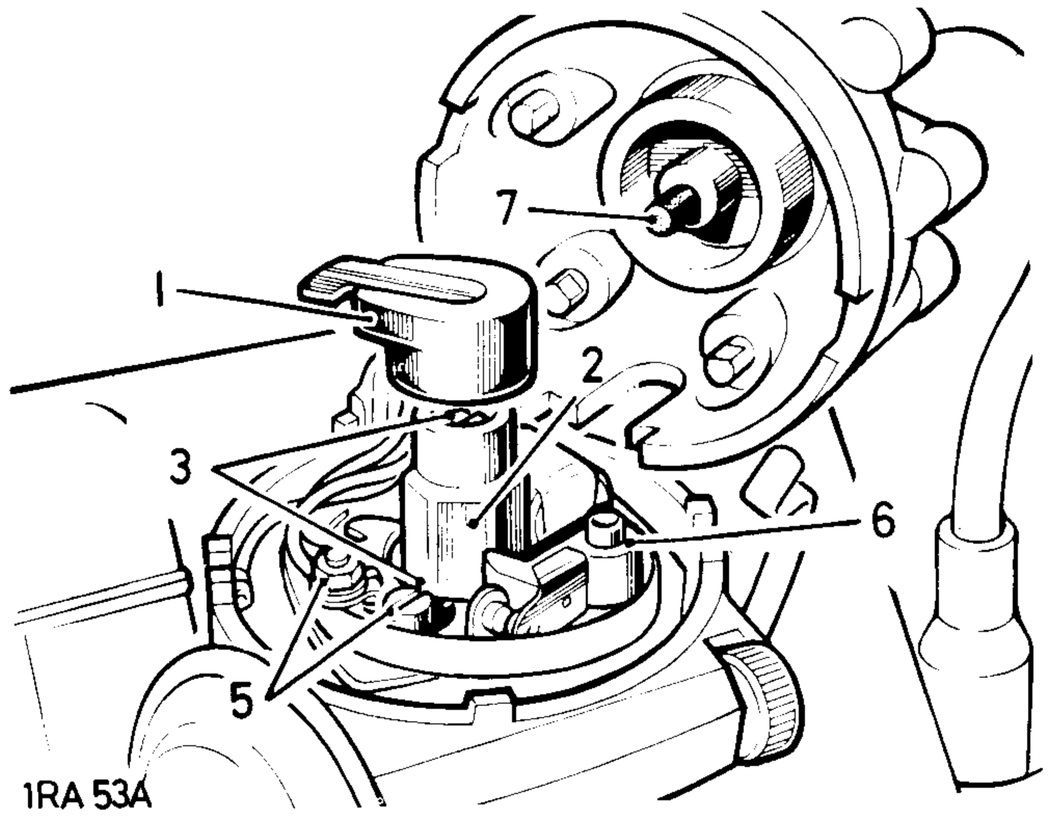
1. Remove the distributor cap and rotor arm; then turn the engine, using the starting handle, until the contacts are fully open.
2. The clearance should be 0,35 to 0,40 mm (0.014 to 0.016 in.) with the feeler gauge a sliding fit between the contacts
3. If necessary, slacken the screw which secures the 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. Petrol models.

Lubricate as follows:

1. Remove the distributor cap and rotor arm.
2. Lightly smear the cam with clean engine oil.
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 nut on the terminal block and lift off the spring and 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 smear of grease to 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.

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.

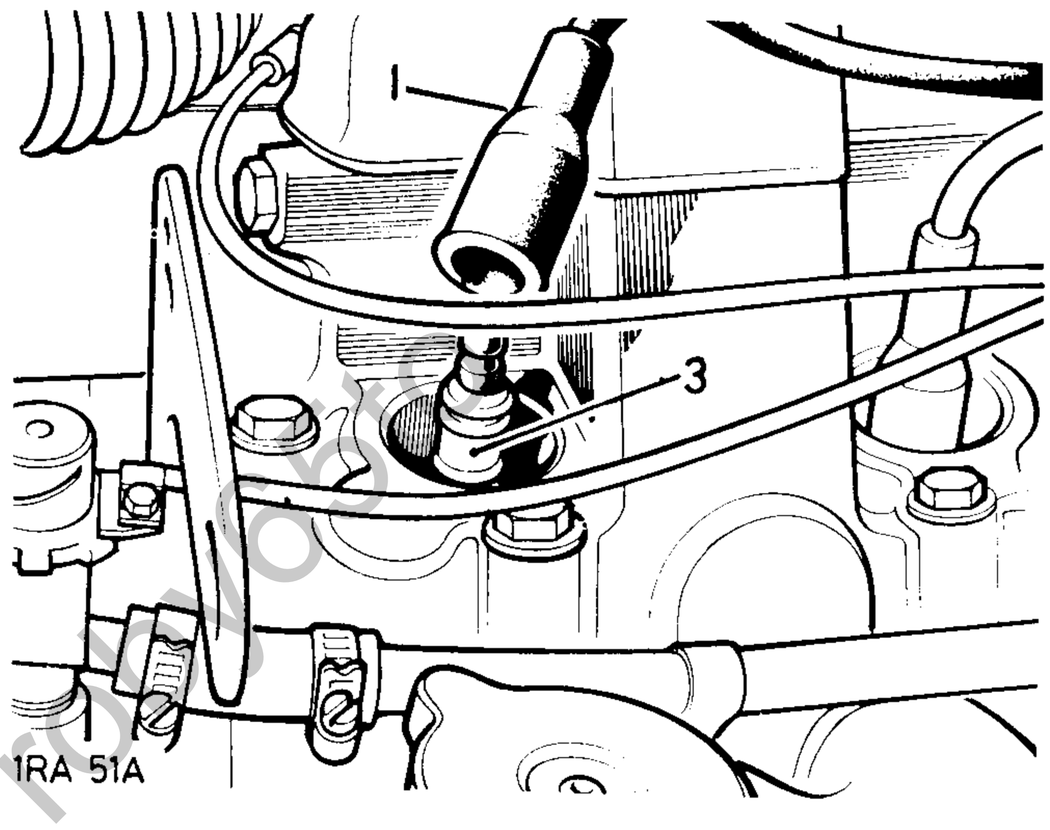
Sparking plugs–Check every 10.000 km (6,000 miles); or 6 months, replace every 20.000 km (12,000 miles) or 12 months. Petrol models.

1. The sparking plugs are fitted with plastic covers.
2. To gain access to the plugs for cleaning and gap-setting, pull up 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 0,75 to 0,80 mm (0.029 to 0.032 in.) and replace.

It is important that only the recommended sparking plugs are used for replacements:

4-cylinder models 8.0:1, use Champion UN12Y
7.0:1, (optional), use Champion N8

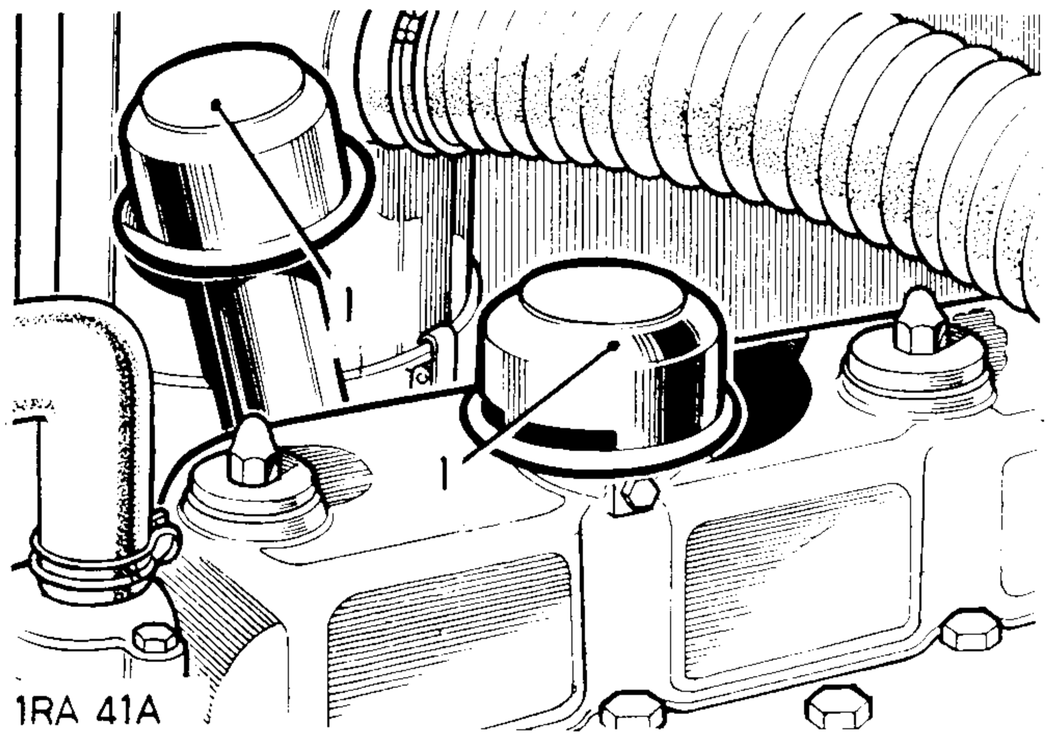
6-cylinder models, use Champion N5.



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

Clean as follows:

1. Remove the filters.
2. Wash the gauze thoroughly by swilling the units in petrol.
3. Re-wet the gauzes by dipping in clean engine oil and shake off the surplus; 4-cylinder models, replace the engine breather filter with the slot facing forward and the oil filler filter with the slot facing the rear of the vehicle.
4. Models with sealed engine breather system. 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 bonnet at the front right-hand side.

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.

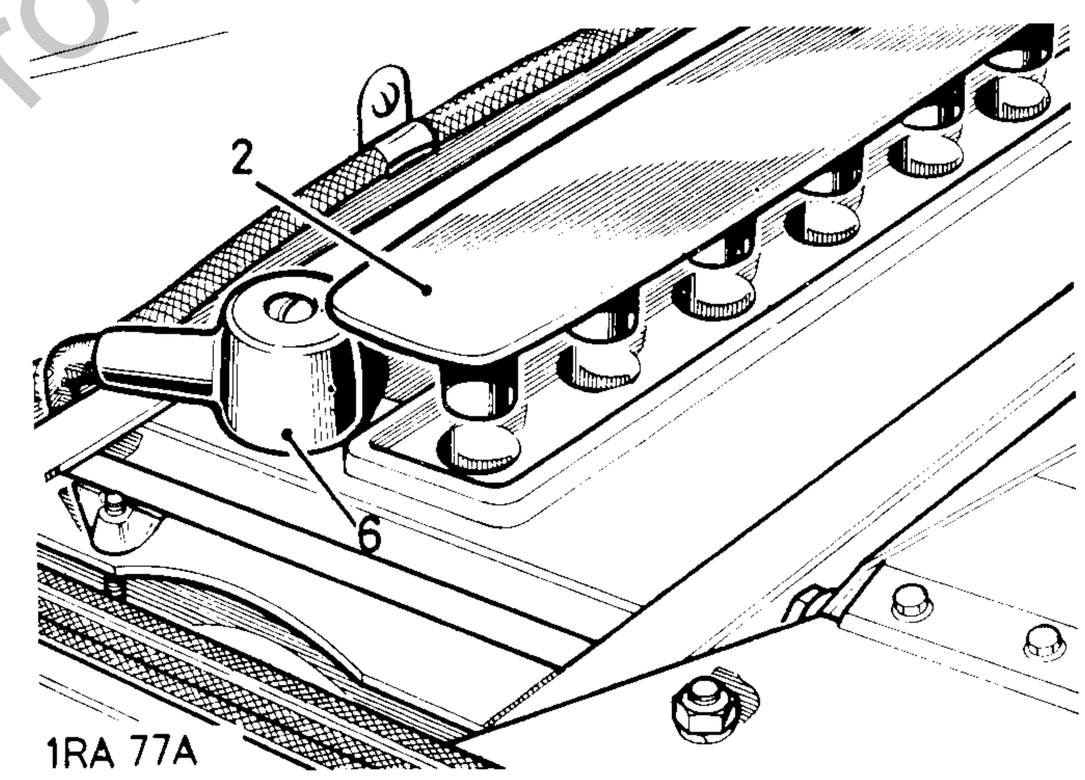
Tropical climate above 26.5°C (80°F) as commissioned for service, fully charged 1.210 to 1.230 specific gravity.

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 semi-conductor 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.

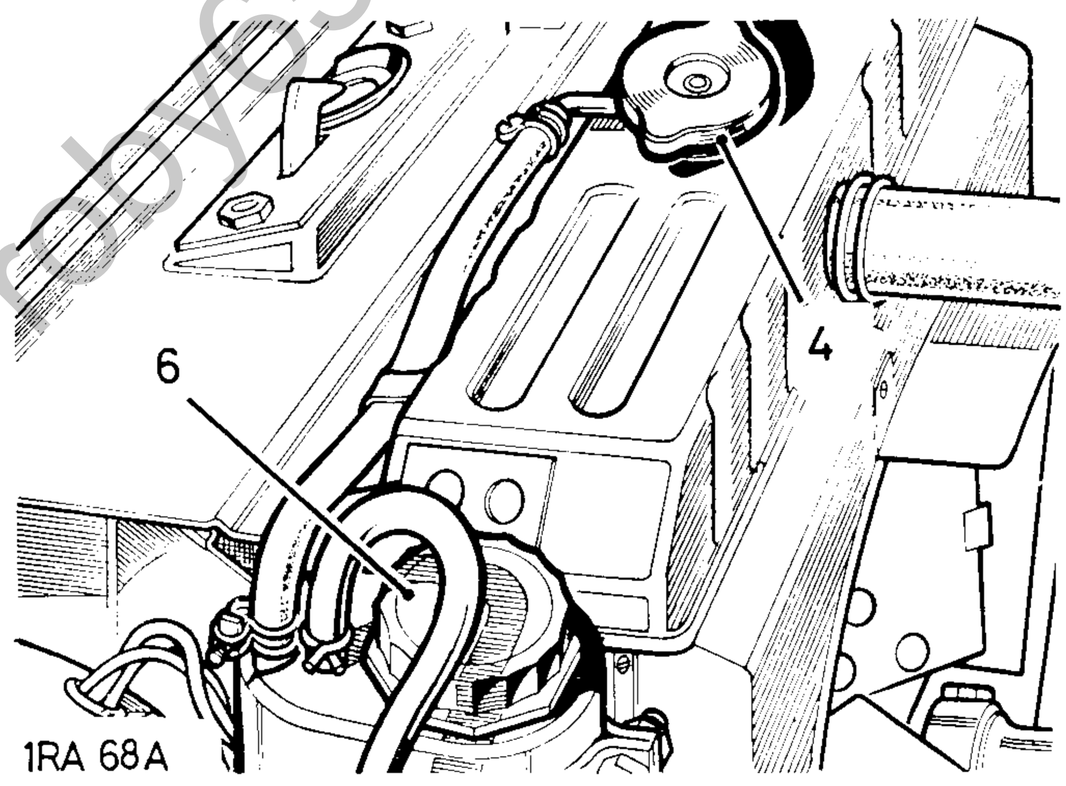
Diesel models

2. Never run the engine without water, not even for a very brief period, otherwise the injectors may be seriously damaged. This is due to the very high rate of heat transfer in the region of the injector nozzles.

All models

3. The cooling system is pressurised and care must be taken when removing the radiator filler cap, especially when the engine is hot.
4. 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.
5. When replacing the filler cap, it is important that it is tightened down fully, not just to the first stop. Failure to tighten the filler cap properly may result in water loss, with possible damage to the engine through overheating.
6. All models have a semi-sealed cooling system, that is, an overflow bottle attached to the left-hand side of the radiator.
7. 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.
8. 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

In cold weather, when the temperature may drop to or below freezing point, precautions must be taken to prevent freezing of the water in the cooling system.

As a thermostat is fitted in the system, it is possible for the radiator block to freeze in cold weather even though the engine running temperature is quite high; for this reason, the use of an anti-freezing mixture is essential.

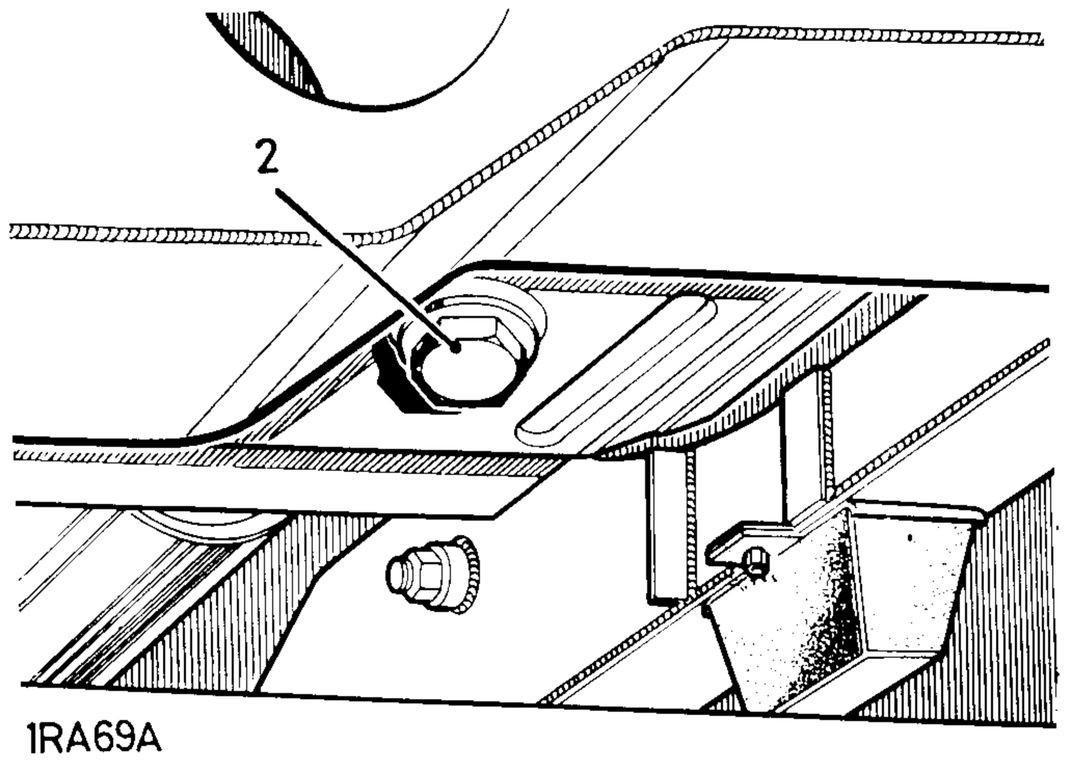
Only anti-freeze solutions conforming to British Standard No. 3151 or 3152 must be used. Prestone, although it does not conform to either Standard, is also suitable.

When the temperature is between 0°C and minus 18° C (32°F and 0°F), use one part of anti-freeze to three parts of water.

Proceed as follows:

1. Ensure that the cooling system is leak-proof; anti-freeze solutions are far more 'searching' at joints than water.
2. Drain and flush the system. Drain plug under radiator at right-hand side.
3. Drain tap for cylinder block 4-cylinder at left-hand side of engine adjacent to dipstick. 6-cylinder at right-hand side of engine adjacent to engine breather.
4. Pour in approximately 4,5 litres (one gallon) of water, add solution, then top up with water to within 12 to 19 mm (0.5 to 0.75 in.) below bottom of filler neck.
5. Run the engine to ensure a good circulation of the mixture.

During the winter months in Britain Land-Rovers leaving the Rover factory have the cooling system filled with 33⅓% of anti-freeze mixture. This gives protection against frost down to minus 32°C (minus 25°F). Cars so filled can be identified by the blue label affixed to the right-hand side of the windscreen and a blue label tied to the engine.



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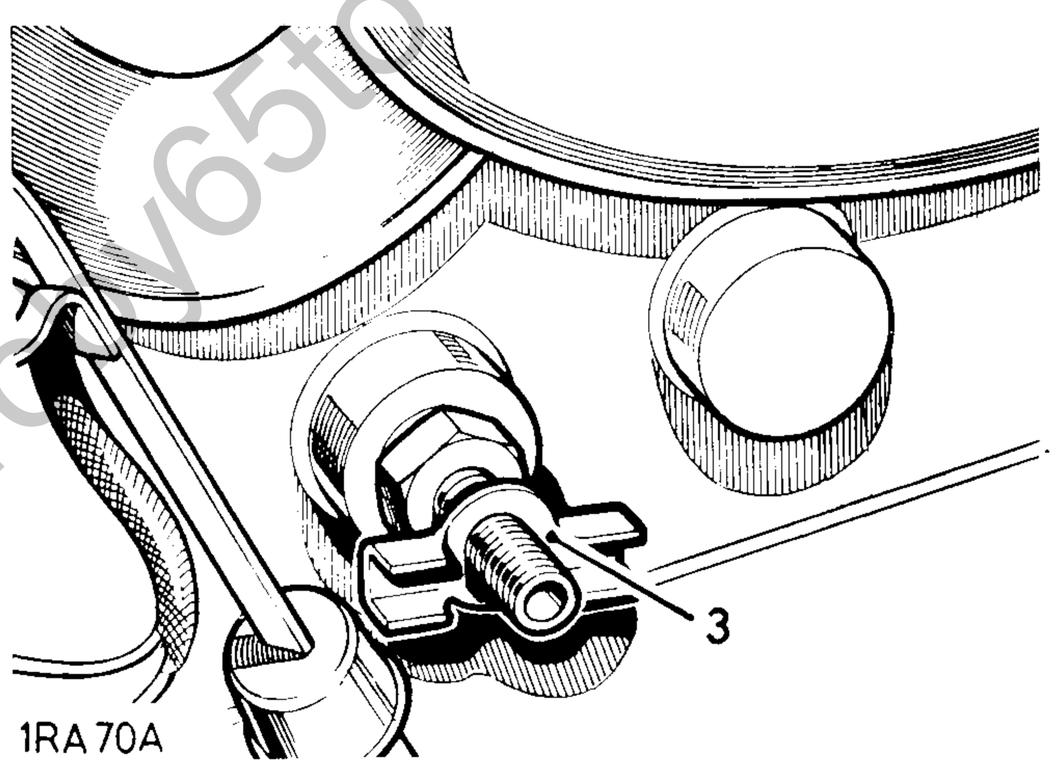
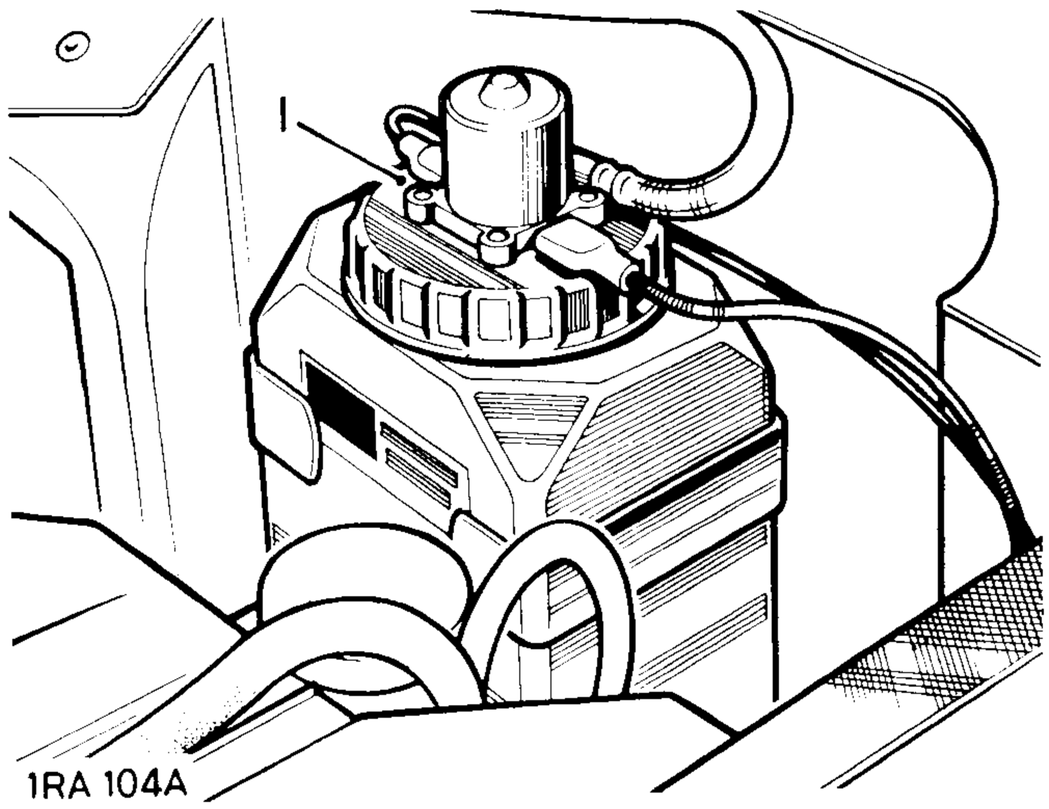


1RA 70A

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

The windscreen washer reservoir, (optional equipment in some counties), is located on the right-hand bulkhead.

1. Remove reservoir cap by turning anti-clockwise.
2. Top up reservoir to within approximately 25 mm (1 in.) below bottom of filler neck.
3. Use Clearalex windscreen washer powder in the bottle; this will remove mud, flies and road film.
4. In cold weather, to prevent freezing of the water, add 'Isopropyl Alcohol'. Do NOT use methylated spirits, which has a detrimental effect on the screenwasher impeller.



1RA 104A

Engine compartment

Fan belt adjustment–At free service 1.500 km (1,000 miles) and thereafter every 5.000 km (3,000 miles) or 3 months.

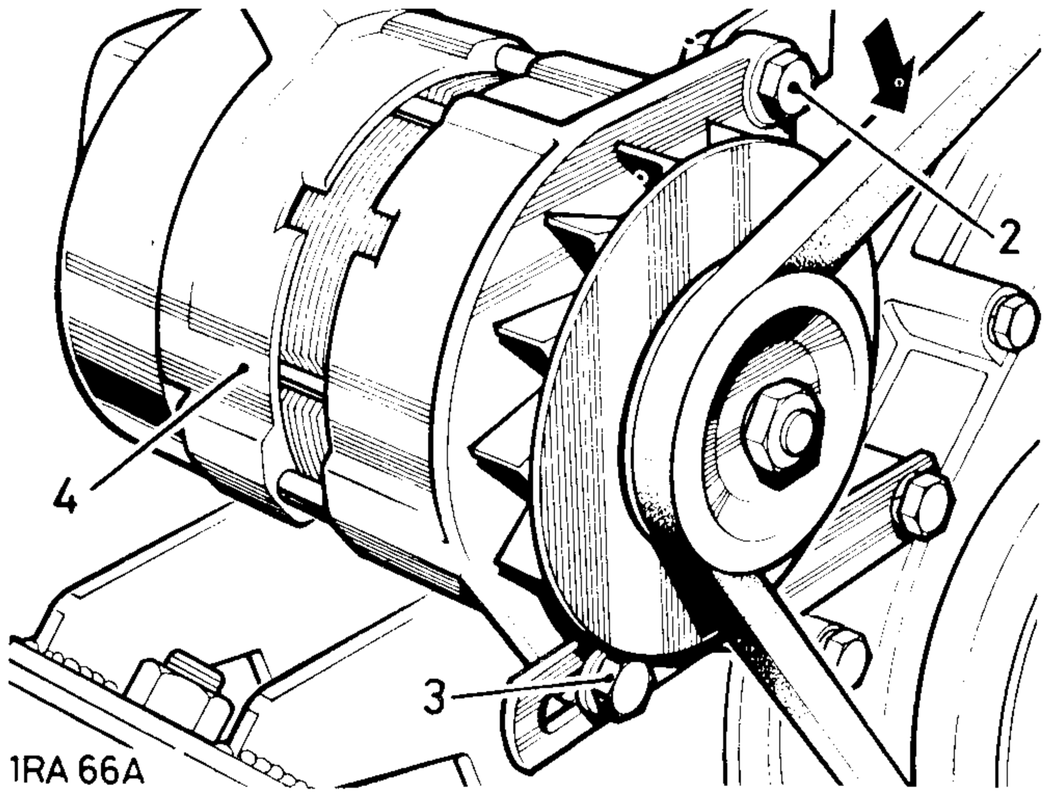
4 cylinder models:

1. Check by thumb pressure between the fan and crankshaft pulleys. Movement should be 6,3 to 9,5 mm (0.25 to 0.375 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.

6 cylinder models:

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



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

Check security of engine mountings; rectify as necessary.

Cylinder head bolts, diesel models–At free service 1.500 km (1,000 miles) only.

Check, if necessary tighten cylinder head bolts; engine hot.

Torque:

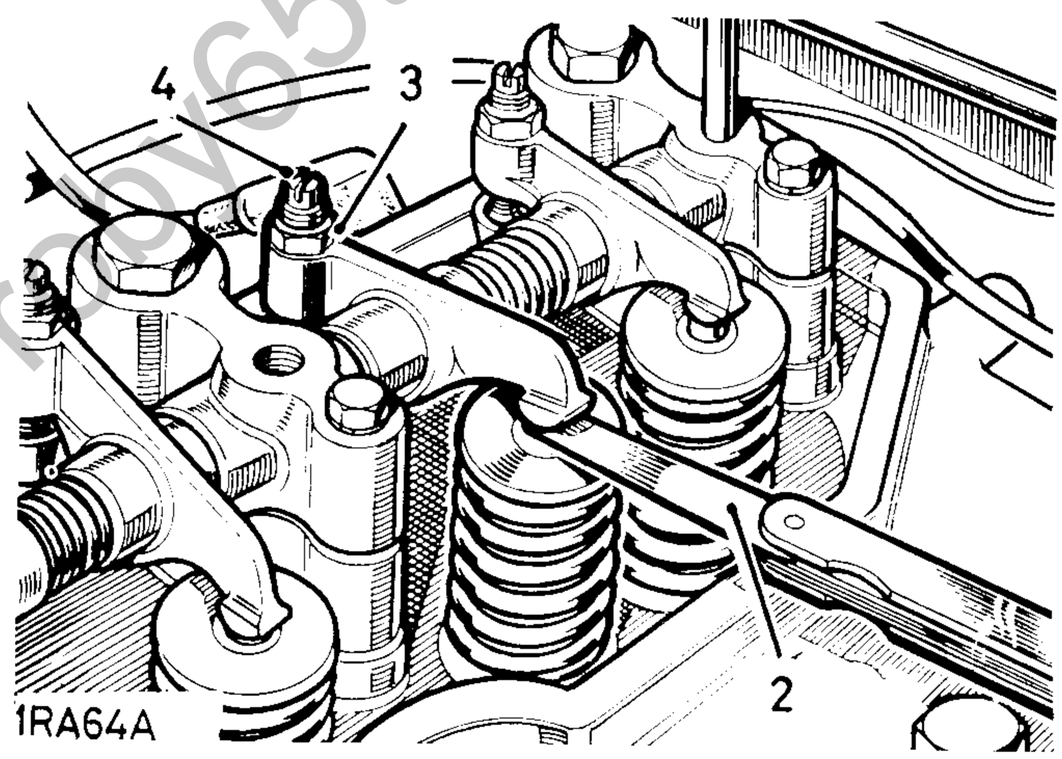
0.5 in. UNF bolts–12,5 mkg (90 lb ft).
0.312 in. UNF bolts–214 mkg (18 lb ft).

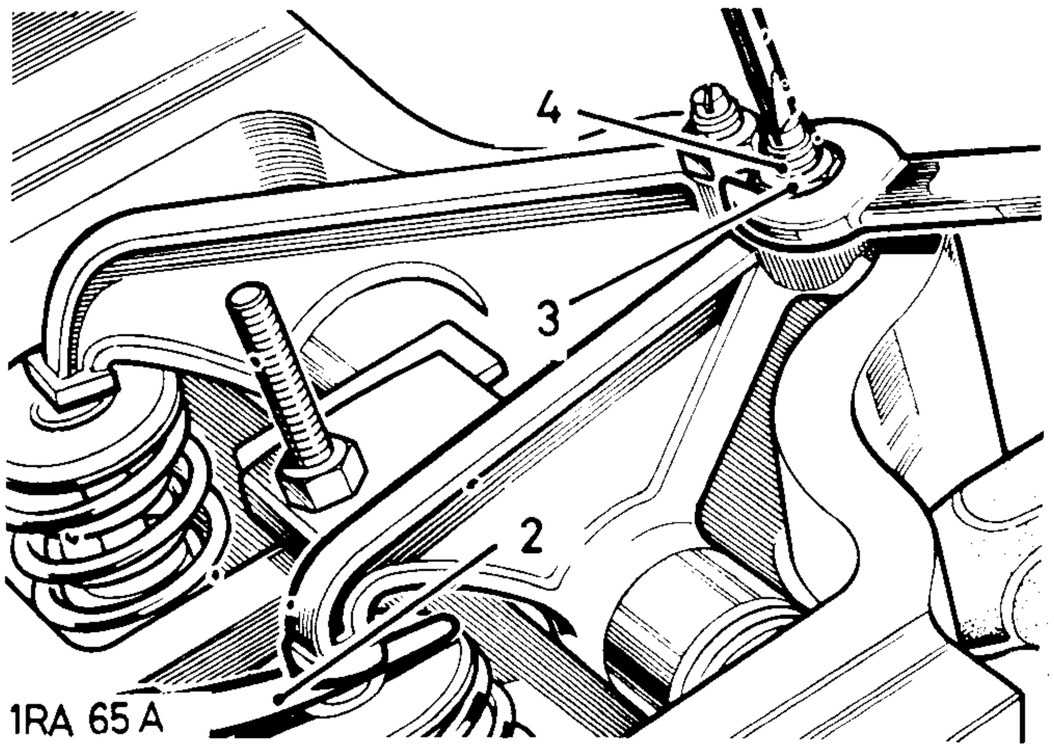
Tappet adjustment–Every 20.000 km (12,000 miles) or 12 months.

The correct clearance is: 4-cylinder models, inlet and exhaust, 0,25 mm (0.010 in.) engine hot. 6-cylinder models, 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.

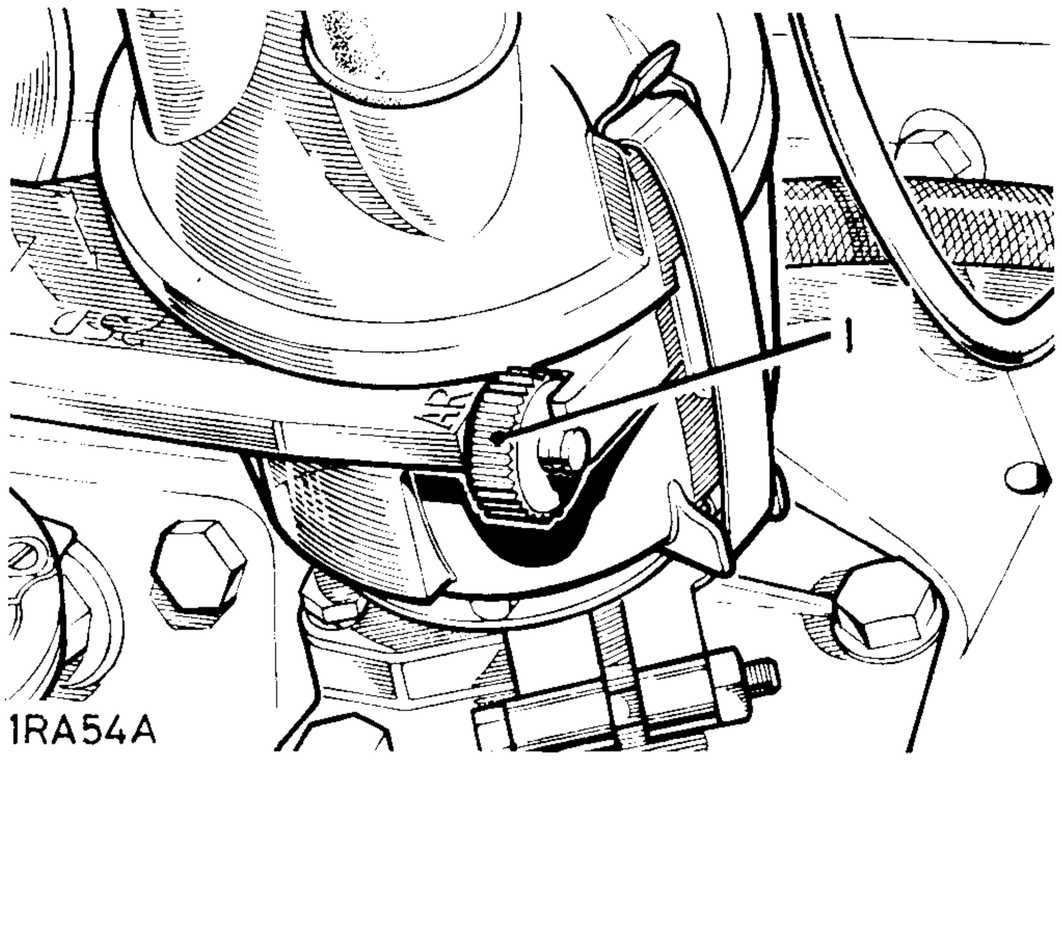




Engine compartment

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. In addition to automatic timing advance and retard mechanism, the distributor incorporates an adjuster screw known as the octane selector.
2. This is a vernier adjustment attached to the distributor, fitted with a sliding portion controlled by an adjusting screw. The body of the distributor is marked R (Retard) and A (Advance) to indicate direction of turn.
3. Should pinking develop as a result of the need for decarbonising, the control can be retarded a little by turning the screw in a clockwise direction. Do not forget to return it to the original position after decarbonising.
4. In certain countries very low grade fuel is supplied, in which case it may be necessary to adjust the octane selector to avoid pinking, even with a clean engine.
5. Should the distributor have been disturbed, the ignition timing must be reset as follows:
6. Set the contact breaker point gap to 0,35 to 0,40 mm (0.014 to 0.016 in.) with the points fully open.

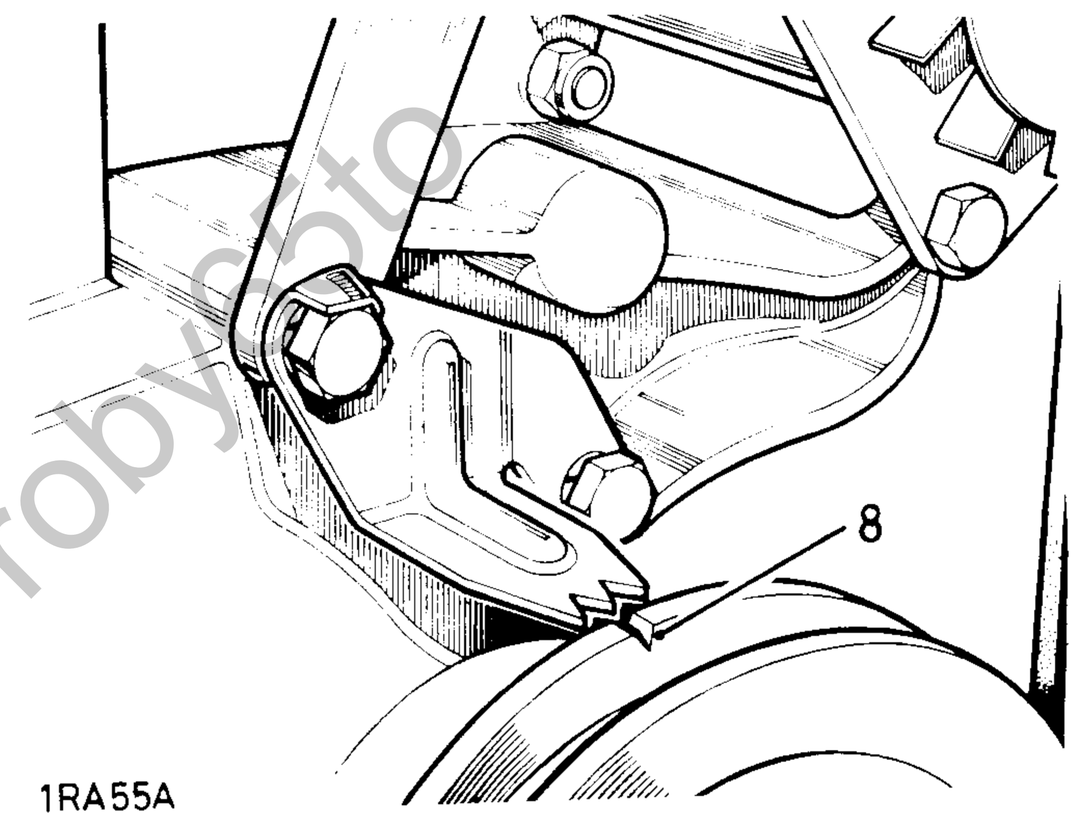


2¼ litre petrol models:

7. The timing pointer represent 6° BTDC, 3° BTDC and TDC respectively.
8. Rotate the engine until the mark on the crankshaft pulley is in line with the pointer as follows:

8.0:1 compression ratio	
TDC when using 90 octane fuel	United
3° ATDC* when using 85 octane fuel	Kingdom
7.0:1 compression ratio (optional)	use two-star
3° BTDC when using 83 octane fuel	grade fuel
TDC when using 75 octane fuel	

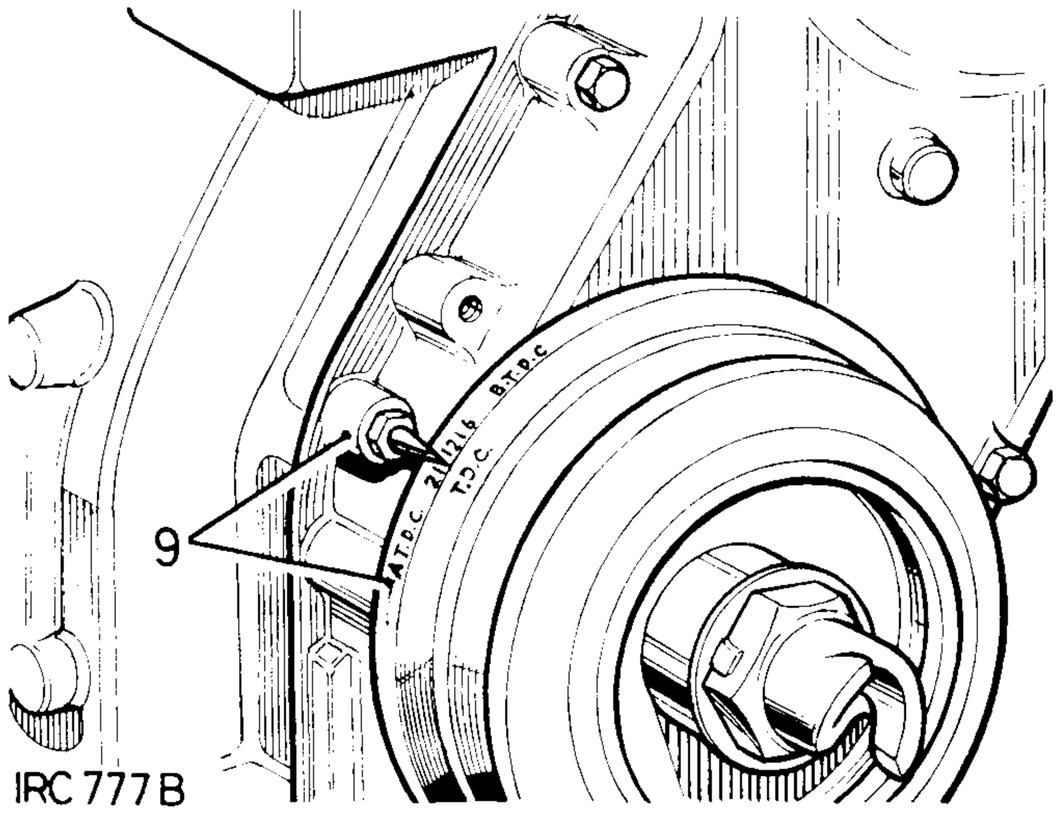
* Estimate this poition on pulley



2.6 litre 6-cylinder models:

9. Rotate the engine until the appropriate mark on the crankshaft pulley is in line with the pointer as follows:

7.8:1 compression ratio	
2° ATDC when using 90 octane fuel	United
7.0:1 compression ratio (optional)	Kingdom
2° BTDC when using 83 octane fuel	use two-star
TDC when using 80 octane fuel	grade fuel
2° ATDC when using 78 octane fuel	



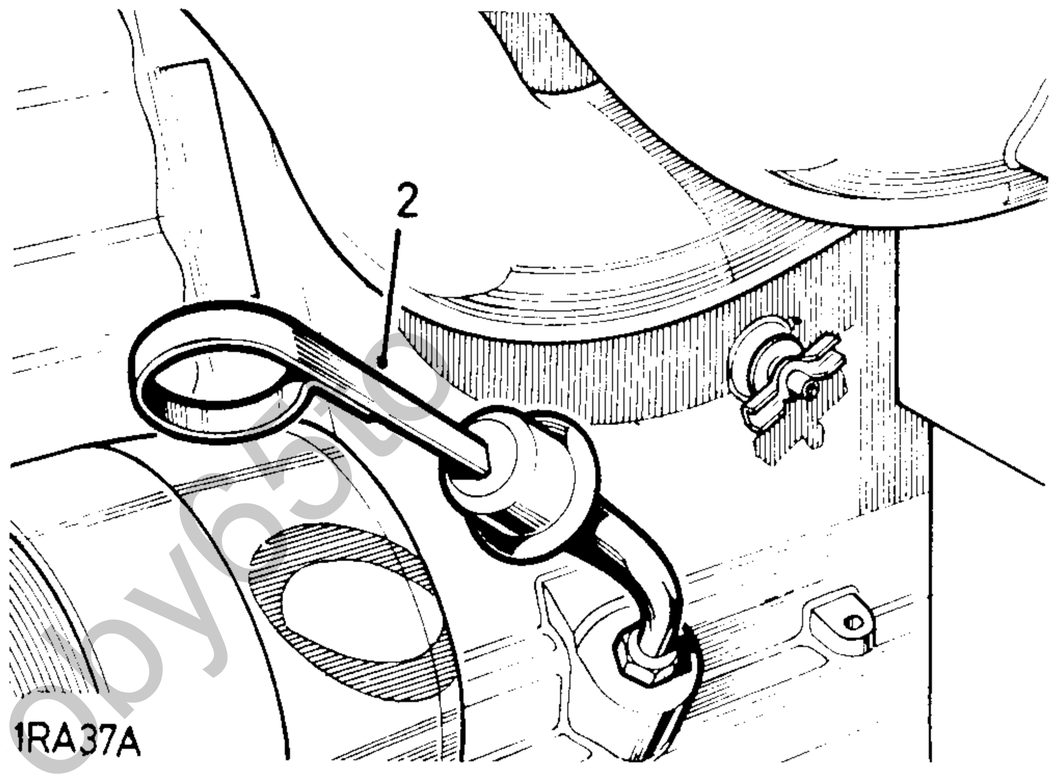
Engine compartment

10. The distributor rotor will now correspond with No. 1 cylinder high tension lead terminal.
11. Set the octane selector so that the fourth line from the left-hand side of the calibrated slide is against the face of the distributor body casing.
12. 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. All models.

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. The oil level dipstick on 4-cylinder models carries three marks: 'H', 'L' and 'MIN L'. Under normal circumstances the oil level should not be allowed to fall below the minimum level mark 'MIN L'.
4. 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.



Accelerator linkage, 4-cylinder petrol models–At free service 1.500 km (1,000 miles) and thereafter every 10.000 km (6,000 miles) or 6 months.

1. Lubricate the accelerator linkage using clean engine oil paying particular attention to accelerator cross shaft brackets, bell crank bushes 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.

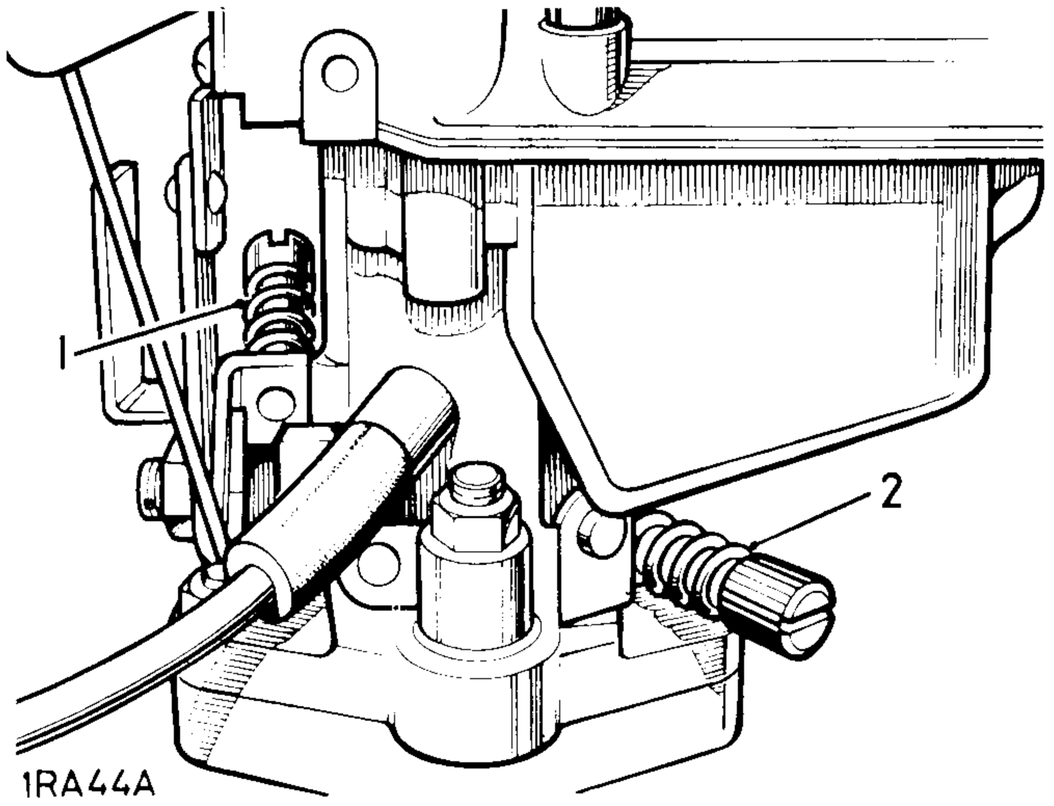
Engine compartment

Carburetter slow-running adjustment–At free service 1.500 km (1,000 miles) and thereafter every 10.000 km (6,000 miles) or 6 months. 4-cylinder Petrol models.

The only adjustments provided at the carburetter are a throttle stop screw and a volume control screw.

Should the carburetter require adjustment for any reason, proceed as follows:

1. Run the engine until normal operating temperature is obtained. If necessary adjust the throttle stop screw to give the correct idling speed.
2. Adjust the volume control screw so that the engine will idle evenly with no tendency to stall on snap closure of the throttle.
3. Check that, as the throttle is opened slowly, there is a clear positive acceleration of the engine speed.
4. Finally, it may be necessary to readjust the throttle stop screw to give a satisfactory idle speed.



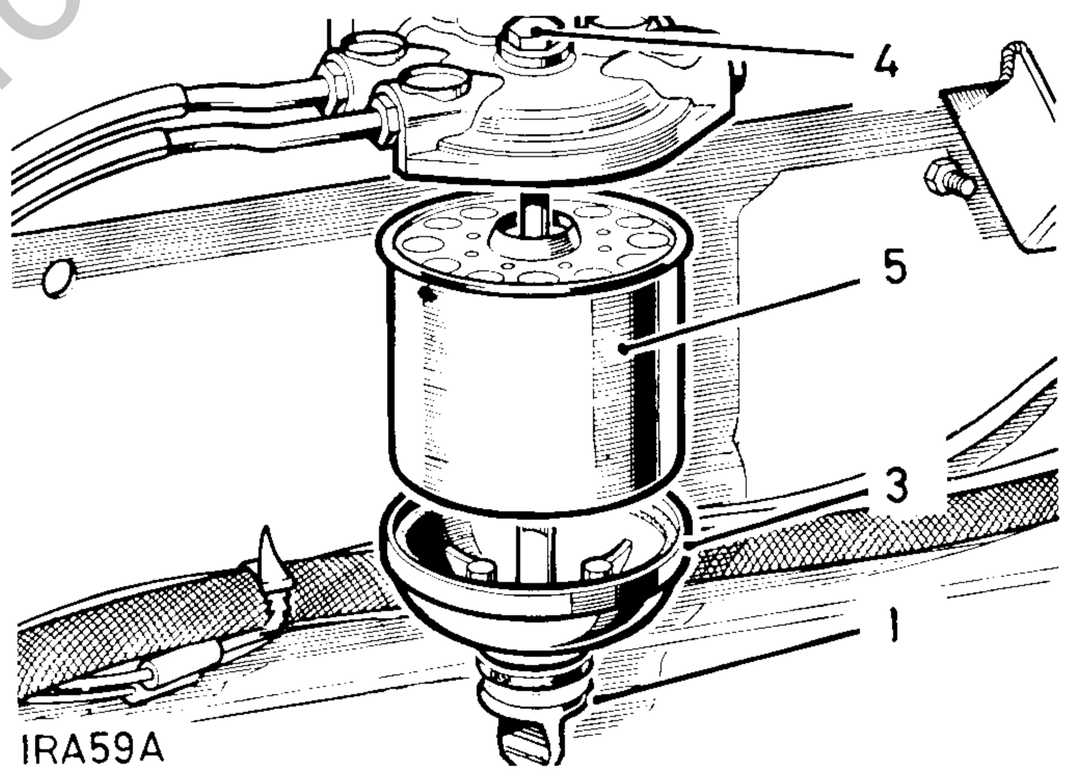
Fuel filter, paper element type, Diesel models– Every month, drain off water; Every 20.000 km (12,000 miles) or 12 months, change filter element.

Drain off water as follows:

1. Slacken off drain plug to allow water to run out.
2. When pure diesel fuel is emitted, tighten drain plug.

Change filter element as follows: In some instances it may be advantageous to remove the complete unit before attempting to change the filter element.

3. Support element holder.
4. Unscrew the special bolt on the top of the filter, the element holder can now be removed.
5. Remove and discard the used element.
6. Wash the element holder in petrol or fuel oil.
7. If necessary renew both the large rubber washer and the small rubber washer in the filter top, also renew the large rubber washer in the element holder.
8. Push the new element on to the filter top spigot with the perforated holes in the element to the top.
9. Fit the element holder to the bottom of the element, and secure with the special bolt.
10. Prime the system and check for fuel leaks.



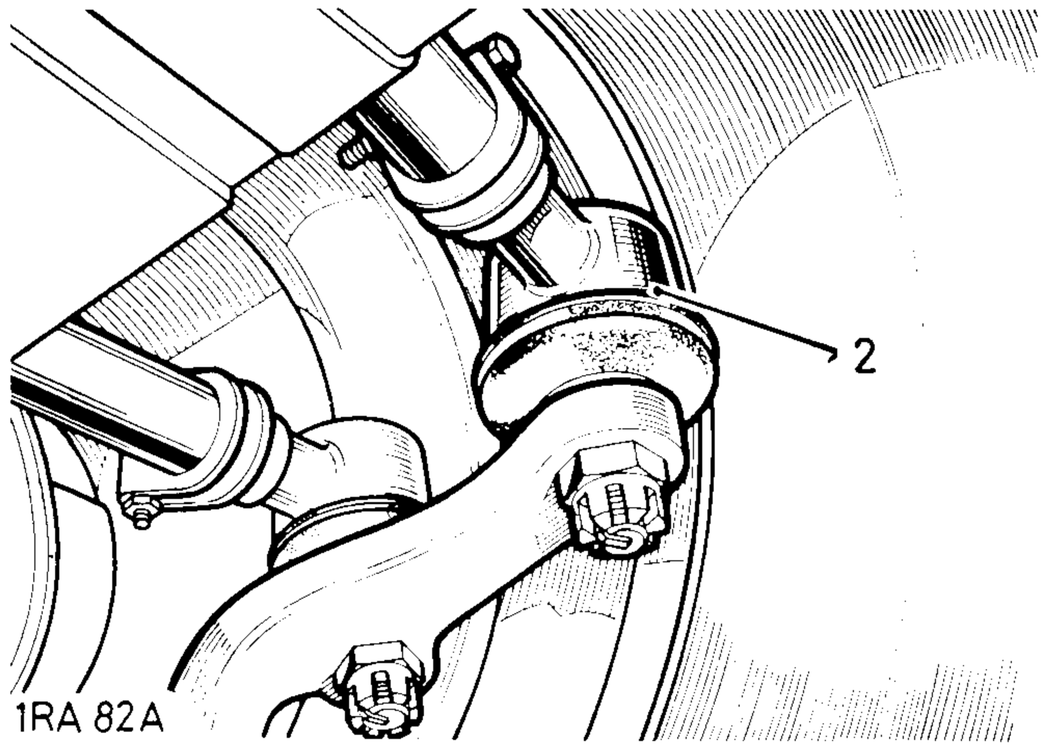
Underbody

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.



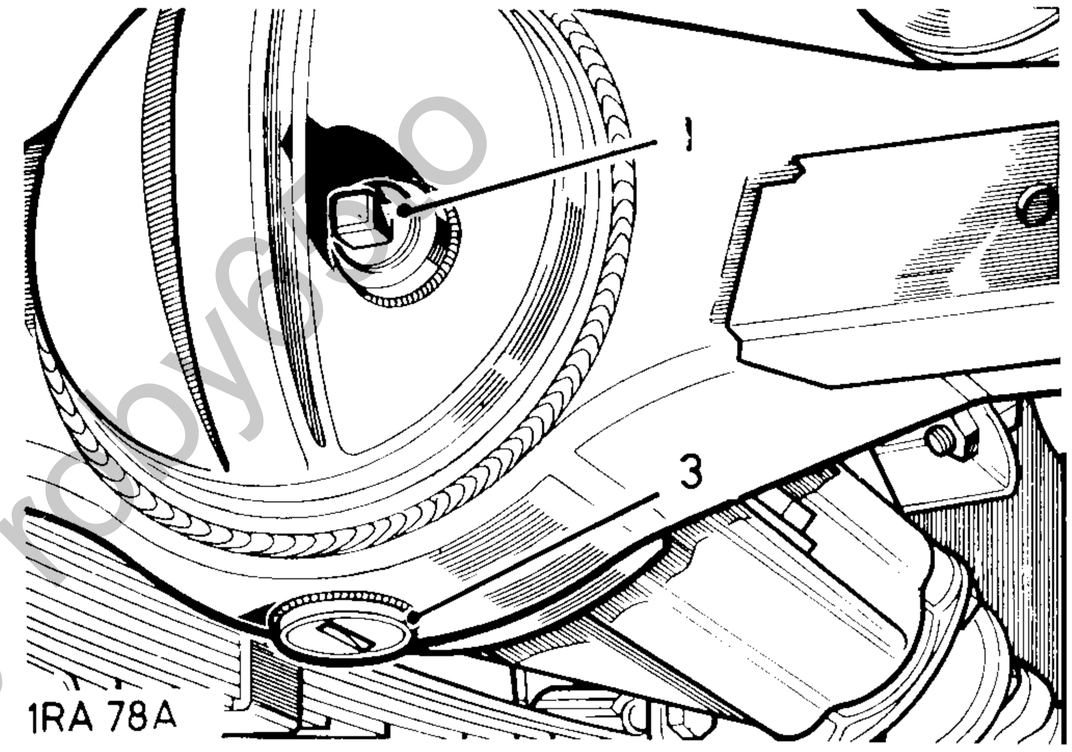
Front differential oil level–Every 10.000 km (6,000 miles) or 6 months.

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 40.000 km (24,000 miles) or 24 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:
   Rover type axles–1,75 litres (3 Imperial pints) 3.5 US pints.
   ENV type axles–1,4 litres (2,5 Imperial pints) 3 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.



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 40.000 km (24,000 miles) or 24 months.

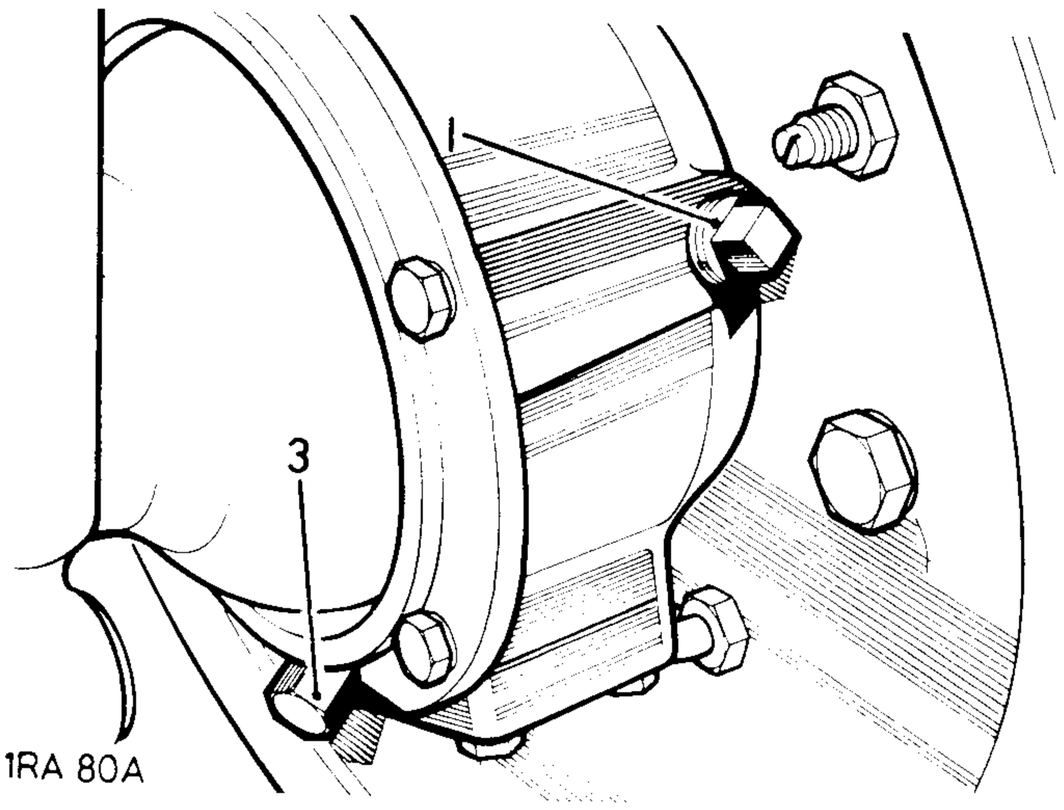
To change the swivel pin housing oil, proceed as follows:

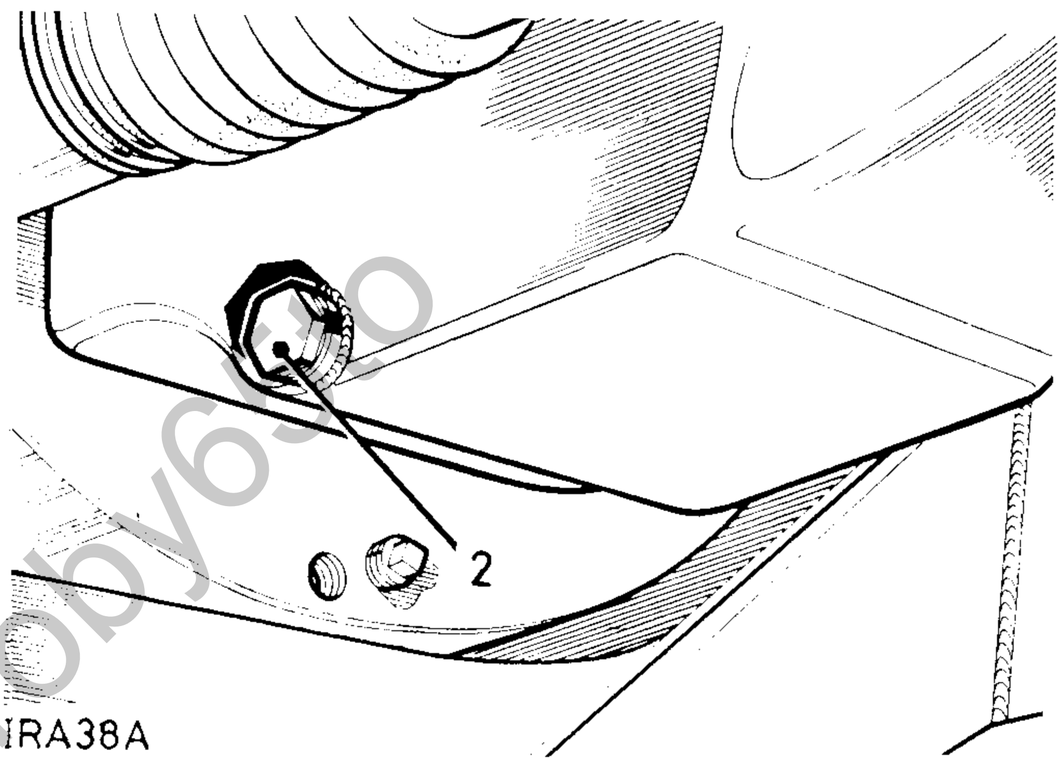
3. Immediately after a run, when the oil is warm, remove the drain plug from the bottom of each housing; allow the oil to drain away completely and replace the plugs. Refill with oil of the correct grade through the filler-level plug holes; the capacity of each housing is approximately 0,5 litre (1 Imperial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

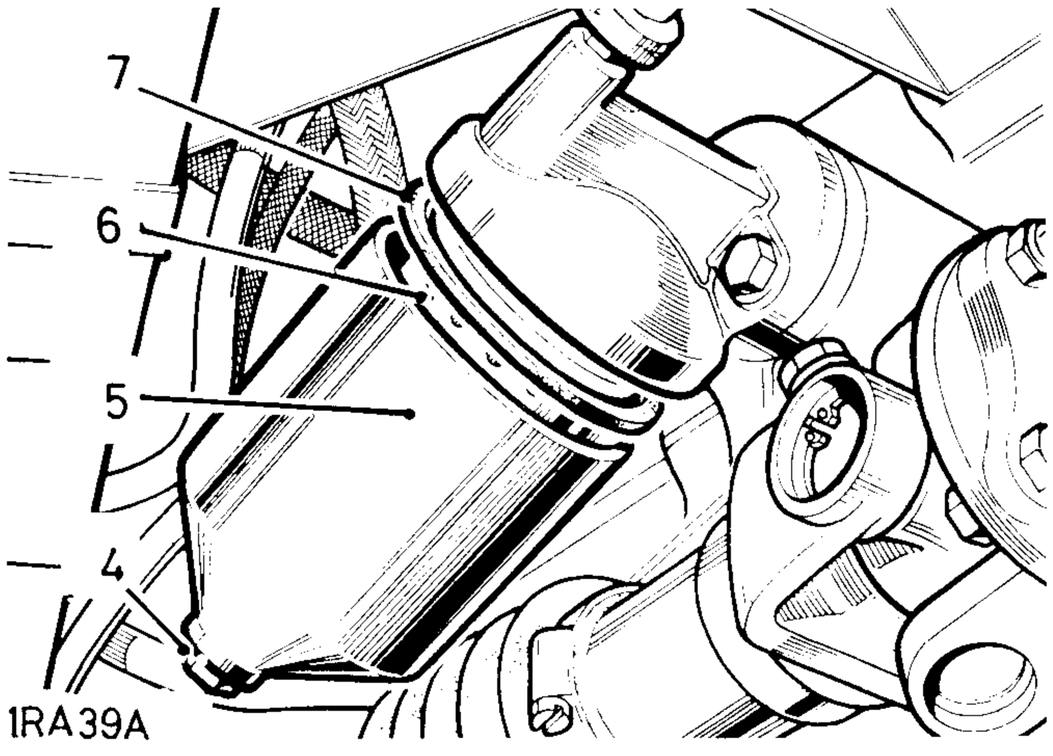
Engine oil changes and filter replacement. Oil changes--At free service 1.500 km (1,000 miles) and thereafter every 10.000 km (6,000 miles) or 6 months. **Filter replacment** – Every 10.000 km (6,000 miles) or 6 months.

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 right-hand side of engine on 4-cylinder models, left-hand side on 6-cylinder models.
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.

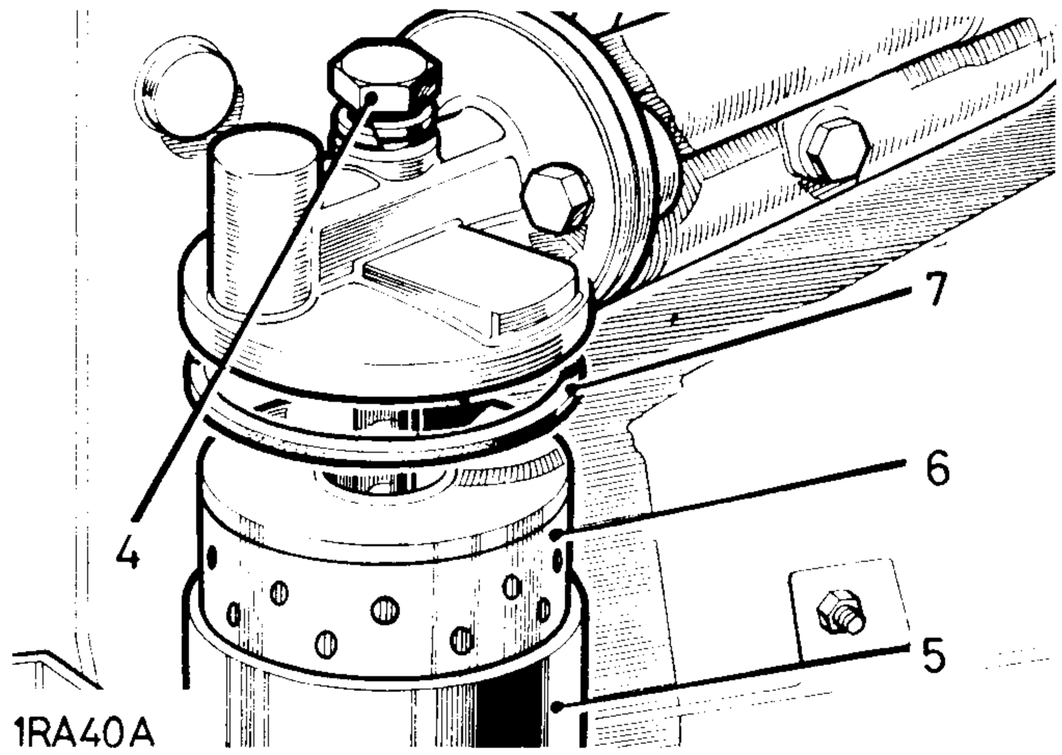






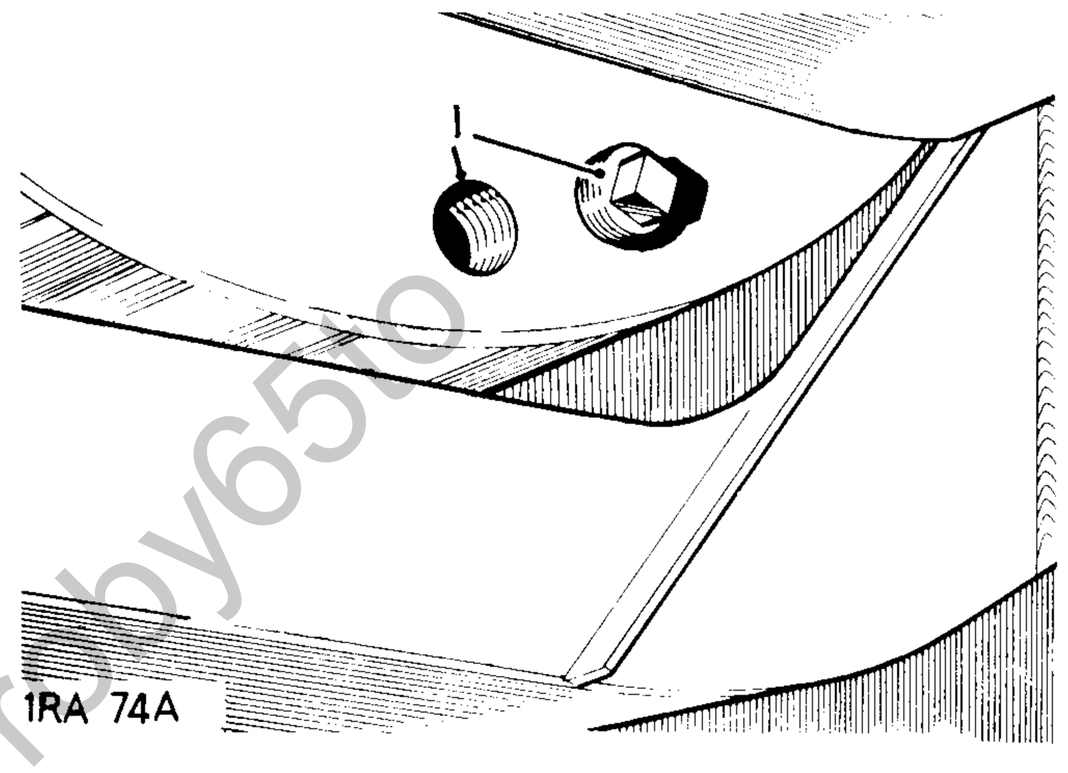
Underbody

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: 4-cylinder models: 6,0 litres (11 Imperial pints) 12 US pints; 6-cylinder models: 5,5 litres (10 Imperial pints) 11 US pints.
12. Run engine and check for oil leaks at filter and drain plug.



Flywheel housing drain plug—Every 5.000 km (3,000 miles) or 3 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.

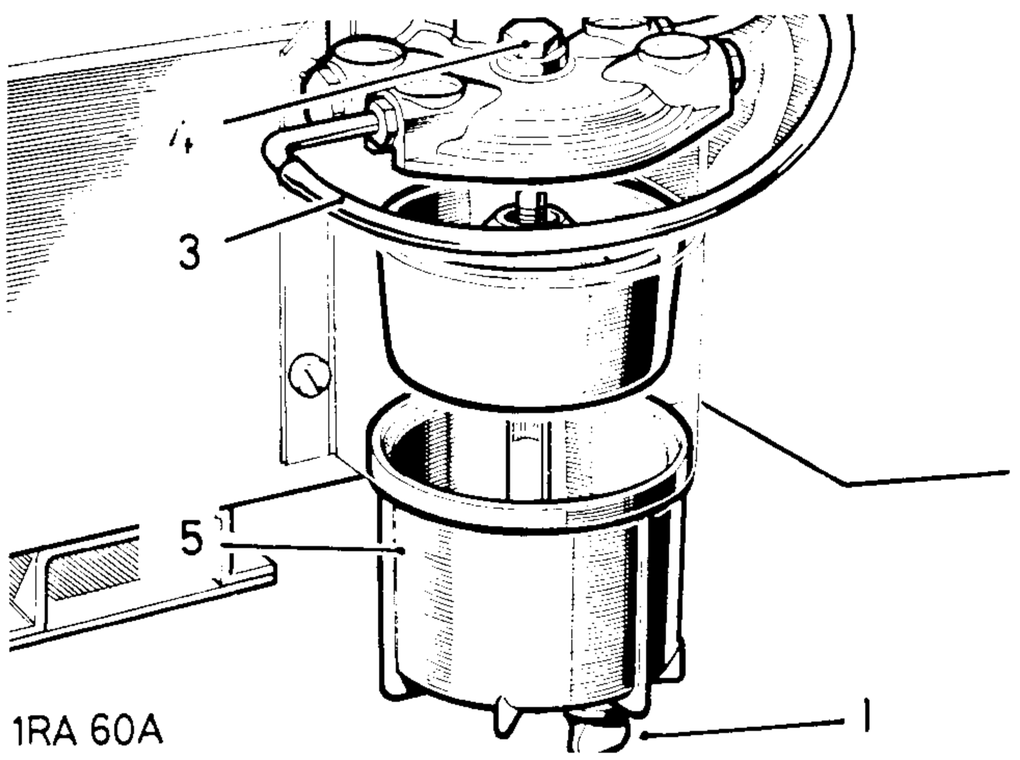


Fuel sedimenter. Diesel models—Every month, drain off water. At free service 1.500 km (1,000 miles) and thereafter every 20.000 km (12,000 miles) or 12 months, dismantle and clean.

The sedimenter increases the working life of the fuel filter by removing the larger droplets of water and larger particles of foreign matter from the fuel.

Drain off water as follows:

1. Slacken off drain plug to allow water to run out.
2. When pure diesel fuel is emitted, tighten drain plug. Dismantle and clean as detailed below:
3. Disconnect fuel inlet pipe at sedimenter and raise pipe above level of fuel tank to prevent draining from tank. Support in this position.
4. Support sedimenter bowl and unscrew bolt on top of unit.
5. The lower bowl and element can now be removed.
6. Clean all parts in petrol.
7. Fit new oil seals and reverse removal procedure.
8. Slacken off the drain plug, when pure diesel fuel runs out tighten plug. Start engine and check for air leaks.



Underbody

Fuel pump 6-cylinder petrol models.

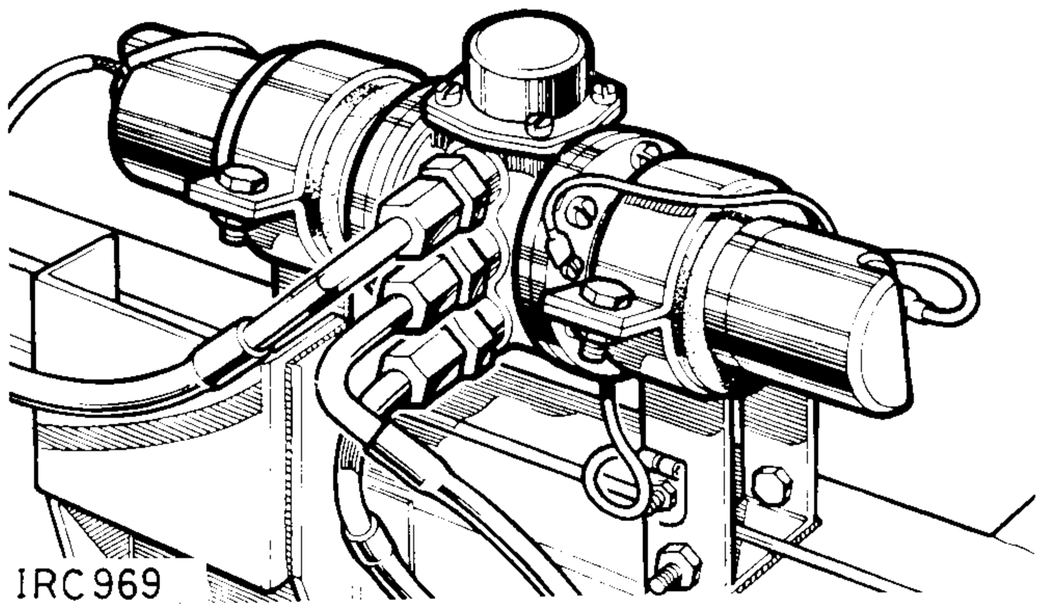
A dual fuel pump is fitted at the right-hand chassis side member.

On vehicles with one fuel tank both pumps will operate immediately the ignition is switched on, so filling the carburetter for easy starting.

With twin tank installations the pump connections are such that the primary and secondary pumps draw on the main and additional fuel tank respectively.

The secondary pump should be used once a week for a few miles driving to ensure that it is kept in good condition.

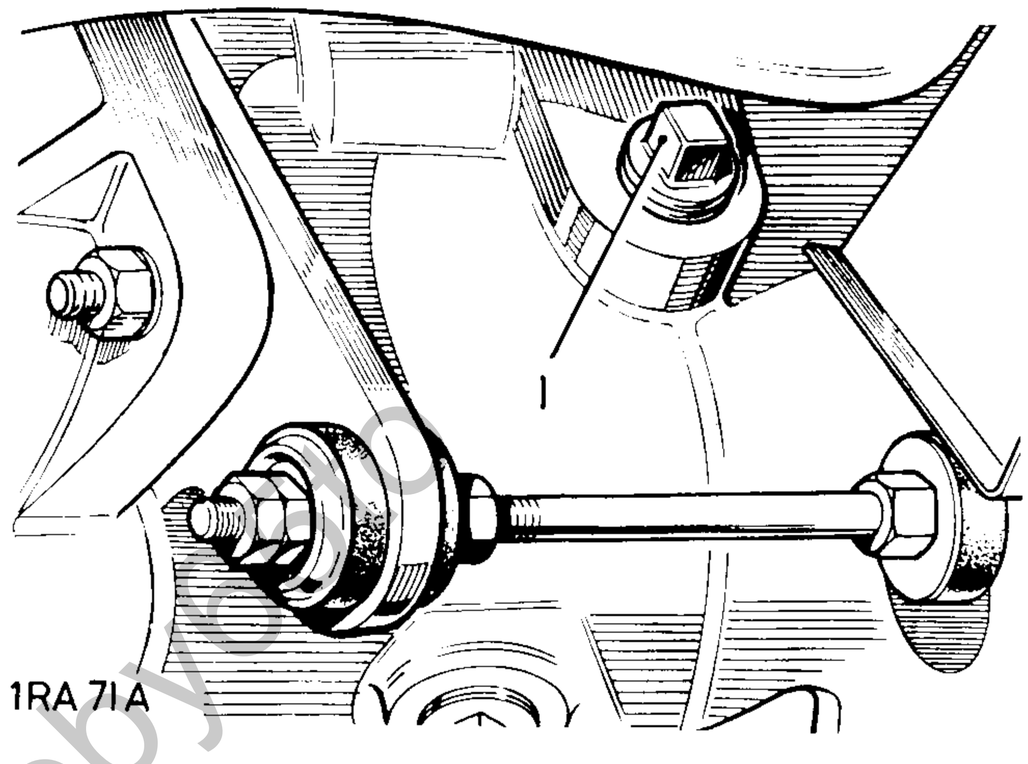
The change-over switch is situated on the heelboard.



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.

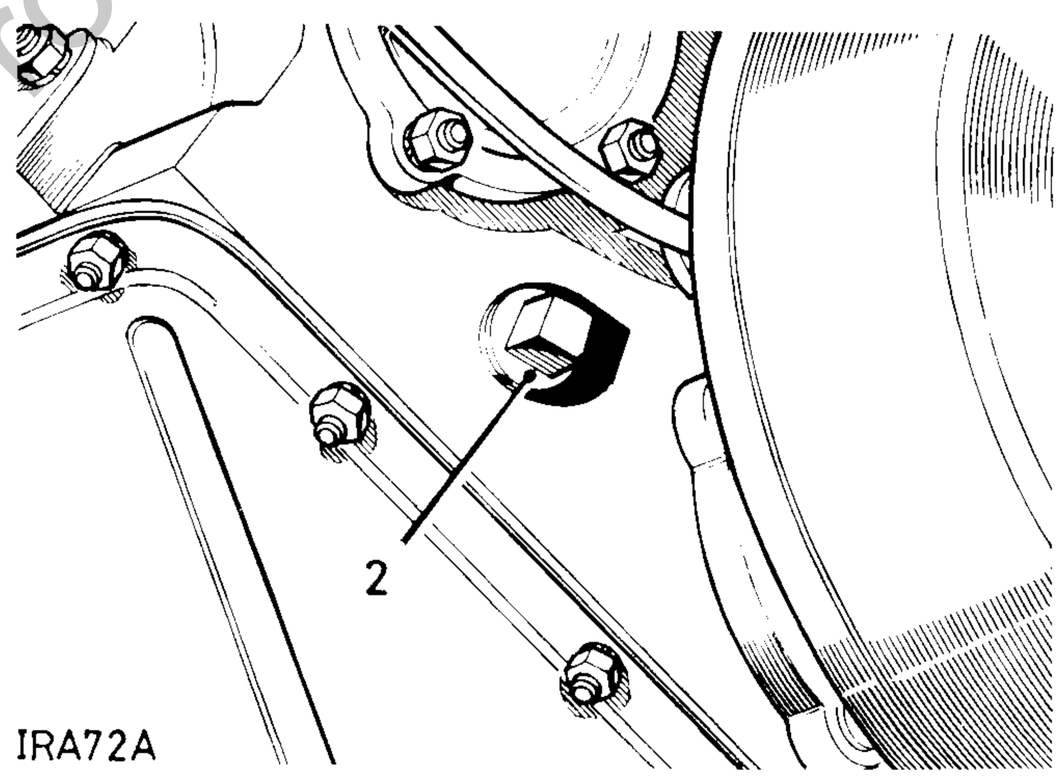
1. The main gearbox and clutch withdrawal mechanism are lubricated as one unit. Check oil level and top up if necessary to the bottom of the filler-level plug hole.
2. If significant topping up is required check for oil leaks at drain and filler plugs, all joint faces and through drain hole in bell housing.



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.



Underbody

Main gearbox oil changes–At free service 1.500 km (1,000 miles) and thereafter every 40.000 km (24,000 miles) or 24 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.

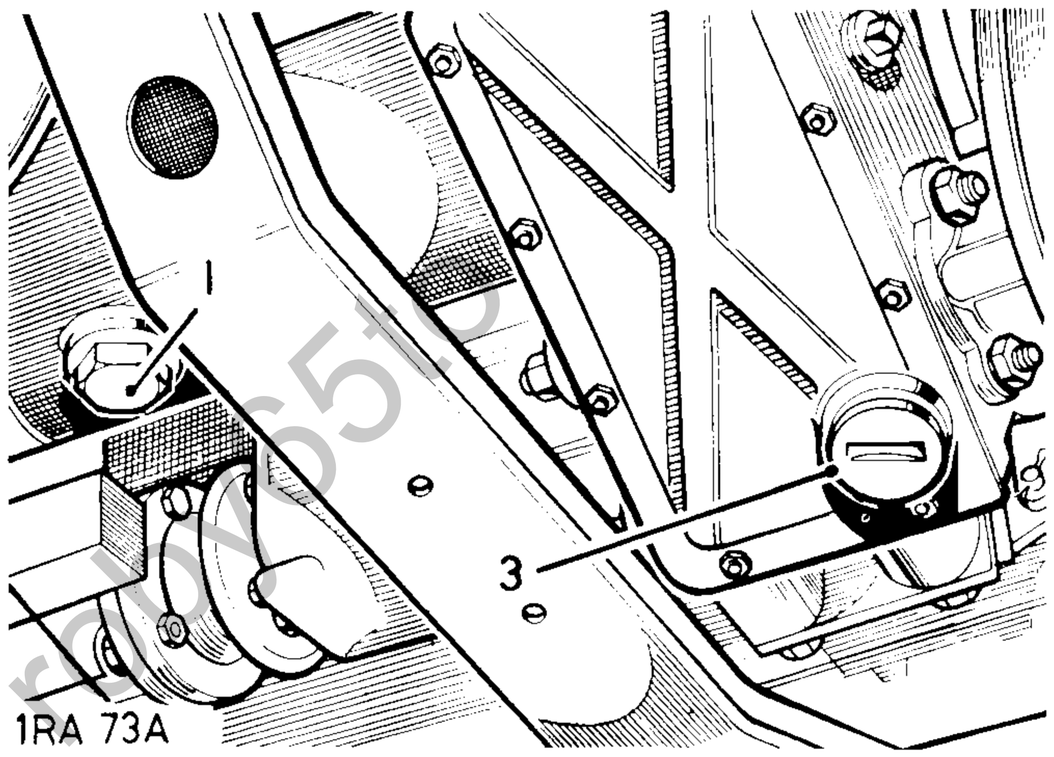
Transfer box oil changes–At free service 1.500 km (1,000 miles) and thereafter every 40.000 km (24,000 miles) or 24 months.

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.



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

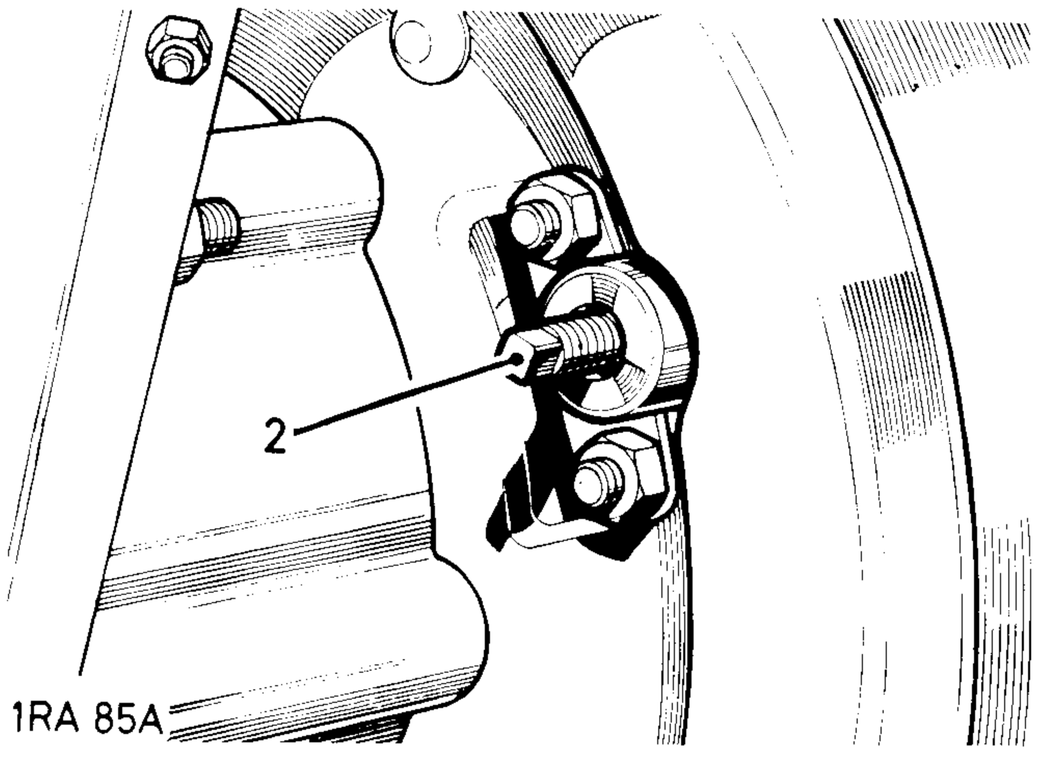
The handbrake operates a mechanical brake unit mounted on the output shaft from the transfer box.

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:

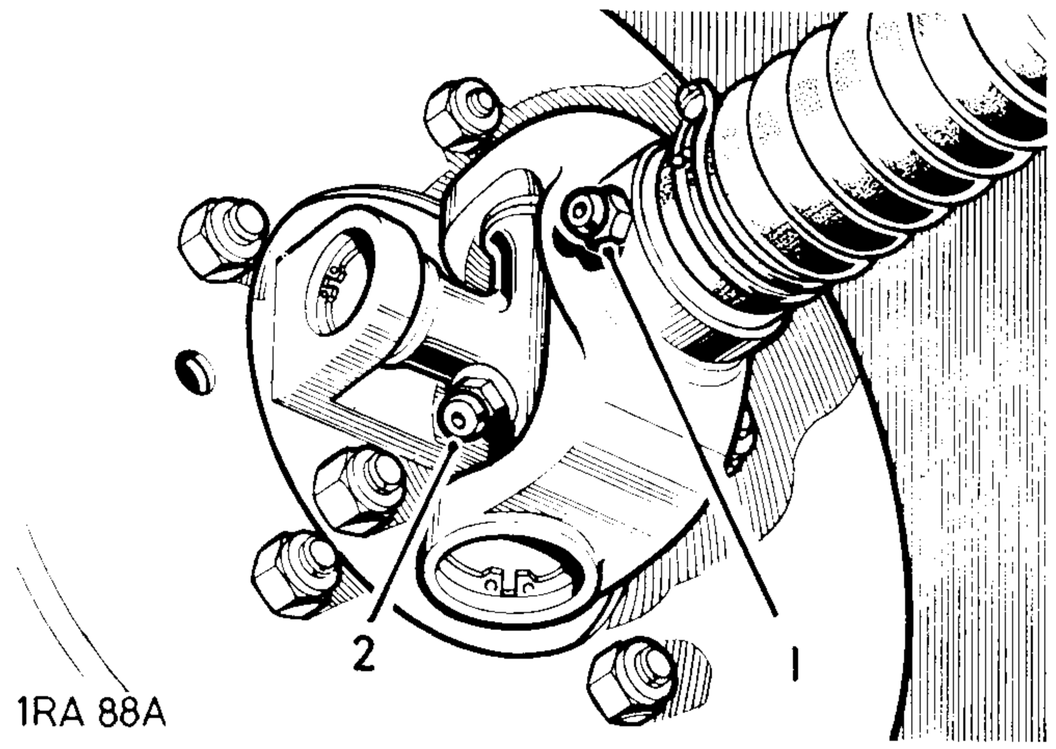
1. Release the hand brake. The adjuster protrudes from the front of the brake backplate.
2. During rotation of the adjuster a click will be felt and heard at each quarter revolution. Rotate adjuster in a clockwise direction until the brake shoes contact the drum. Then unscrew the adjuster two clicks 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 one of the recommended greases 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 40.000 km (24,000 miles) or 24 months.

Lubricate the sliding spline on the front propeller shaft, with one of the recommended greases, 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.

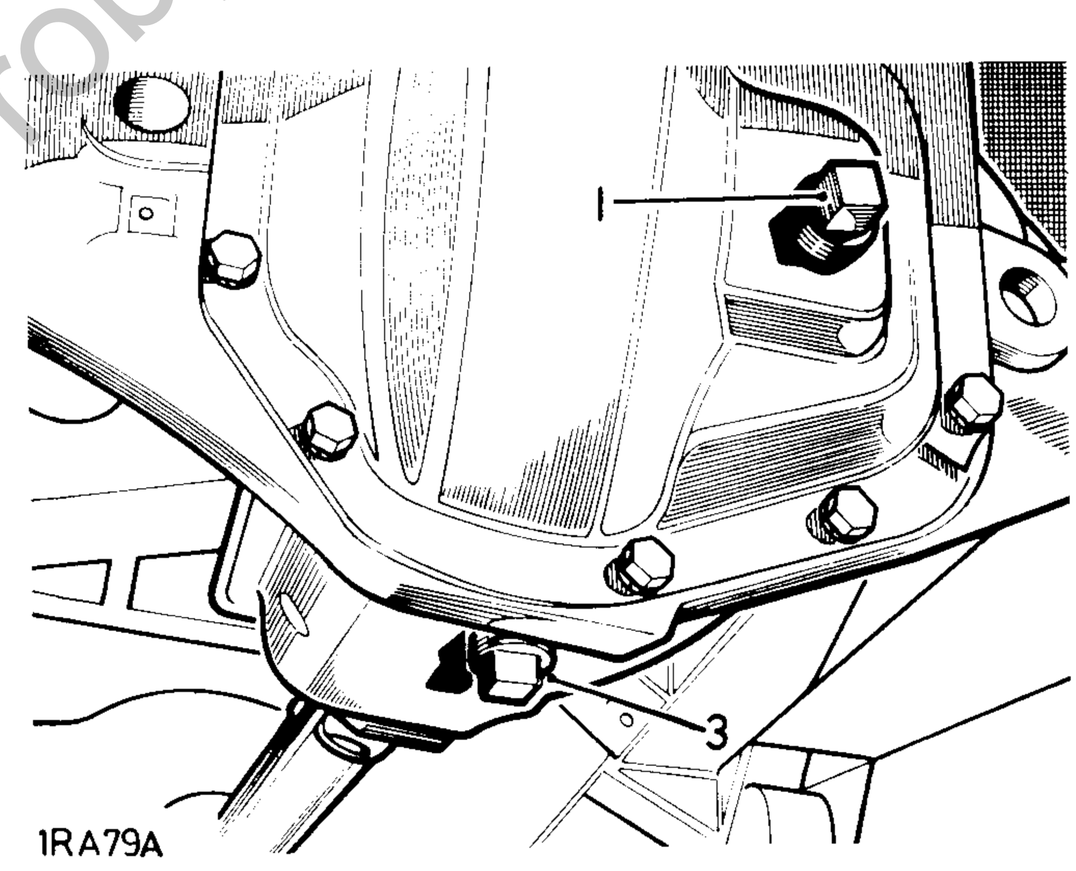
Rear differential oil level—Every 10.000 km (6,000 miles) or 6 months.

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 40.000 km (24,000 miles) or 24 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: 2,5 litres (4.5 Imperial pints) 5.4 US pints.



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 5.000 km (3,000 miles) or 3 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.

Passenger compartment

Foot and handbrake–Every 5.000 km (3,000 miles) or 3 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 5.000 km (3,000 miles) or 3 months.

7. Check all seat fixings for security and examine condition of safety harness. Safety harness which have been used in an accident or are frayed or cut, must be replaced.
8. Check rear view mirror(s) 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 catch etc; apply a few spots of oil as necessary.

Exterior

Wheel brake adjustment–Every 5.000 km (3,000 miles) or 3 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.

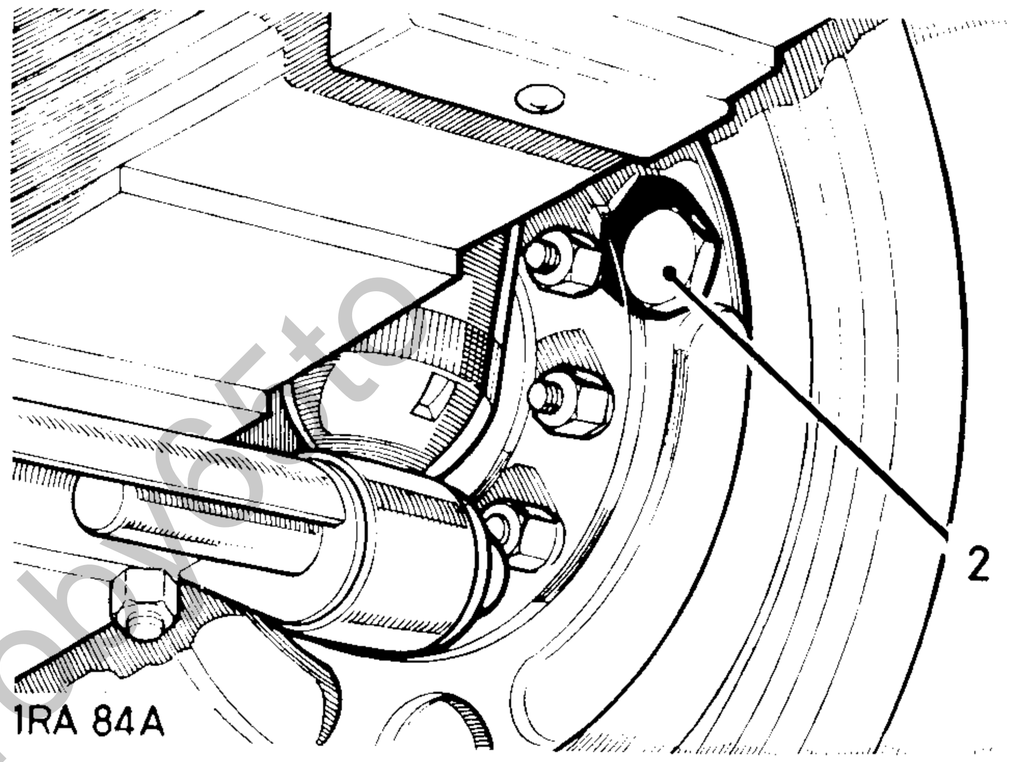
Proceed as follows:

88 Models

1. Jack up each wheel in turn.
2. On the back face of the brake anchor plate will be found a hexagon adjustment bolt which operates a snail cam bearing on the leading shoe. Only one of these is fitted to each wheel brake unit, thereby providing single-point adjustment.
3. Spin the wheel and rotate the adjuster bolt until the brake shoe contacts the drum, then ease the adjuster until the wheel again rotates freely.
4. Repeat for the other three wheels.

109 Models

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

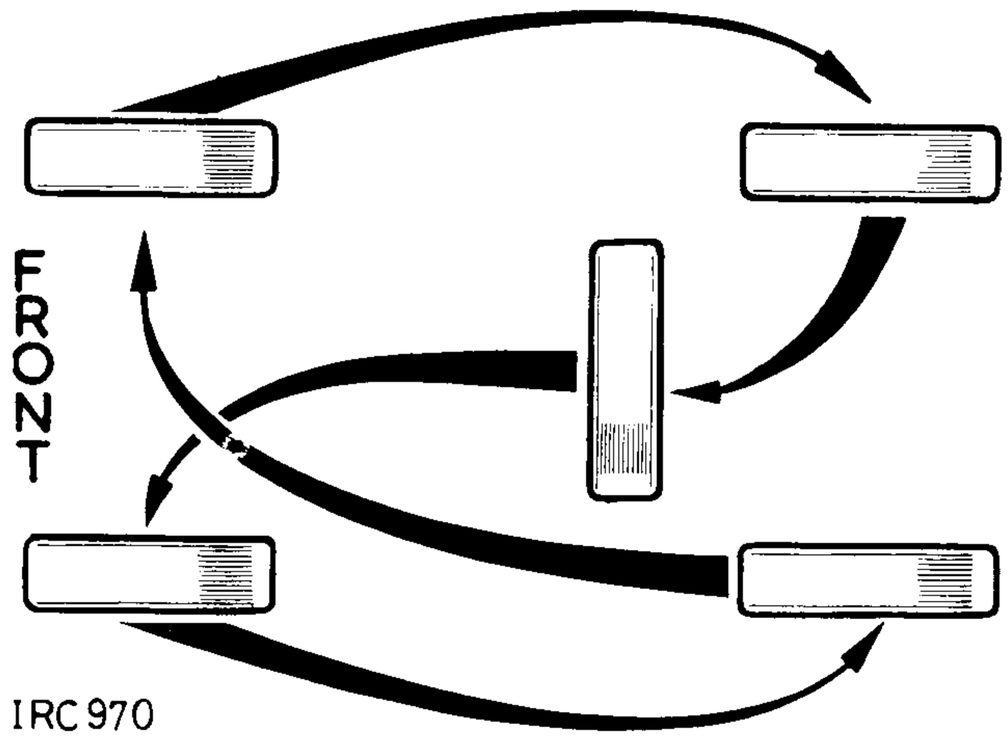


Note: The rear brake shoes should be adjusted individually to obtain the best results.

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.



Warning: Do not touch the outer ring of nuts on divided type wheels, (optional equipment) unless the wheel is removed and the tyre fully deflated, or severe personal injury may result.

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.

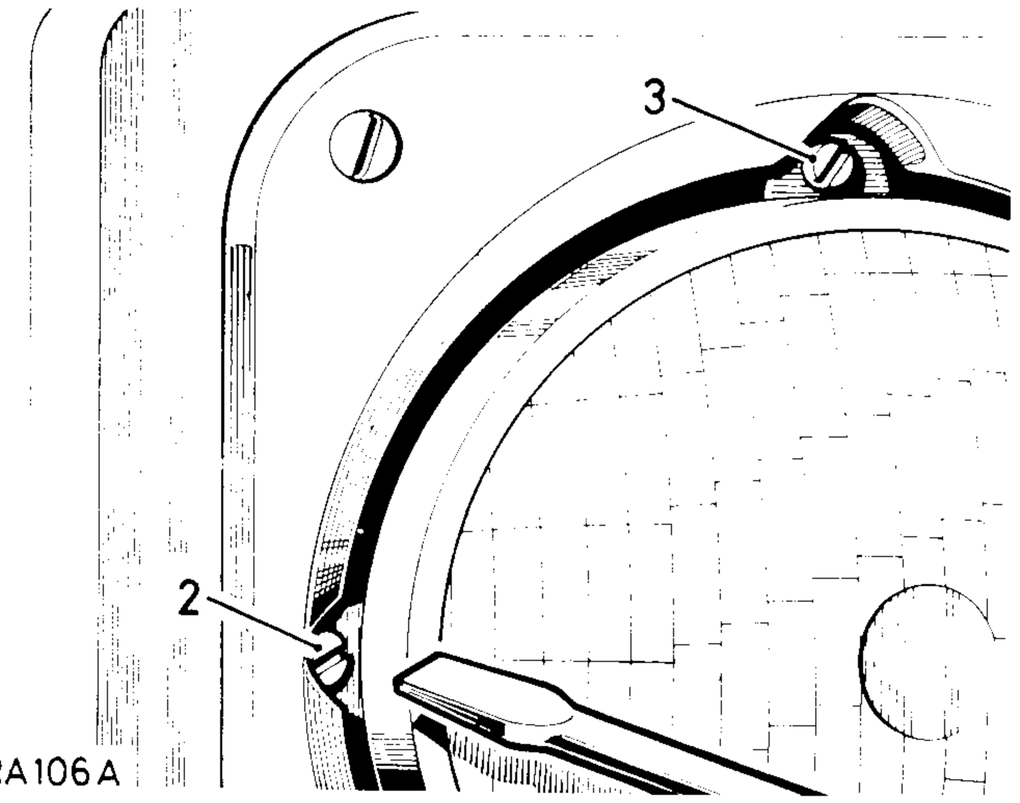
Model		Normal				Emergency soft			
		Load under 250 kg (550 lb.)		Load over 250 kg (550 lb.)		Load under 250 kg (550 lb.)		Load over 250 kg (550 lb.)	
88 models		Front	Rear	Front	Rear	Front	Rear	Front	Rear
6.00 6.50 and 7.00 x 16.00	kg/cm^2	1.8	1.8	1.8	2.1	1.1	1.1	1.1	1.4
	lb/sq in.	25	25	25	30	15	15	15	20
	bars	1.72	1.72	1.72	2.07	1.03	1.03	1.03	1.38
7.50 x 16.00	kg/cm^2	1.8	1.8	1.8	2.1	0.8	0.8	0.8	1.4
	lb/sq in.	25	25	25	30	12	12	12	20
	bars	1.72	1.72	1.72	2.07	0.83	0.83	0.83	1.38
109 models									
	kg/cm^2	1.8	1.8	1.8	2.5	1.1	1.1	1.1	1.8
	lb/sq in.	25	25	25	36	15	15	15	26
	bars	1.72	1.72	1.72	2.48	1.03	1.03	1.03	1.79
Michelin 7.50 x 16.00 XY	kg/cm^2	1.8	1.8	1.8	3.0	1.1	1.1	1.1	2.5
	lb/sq in.	25	25	25	42	15	15	15	35
	bars	1.72	1.72	1.72	2.89	1.03	1.03	1.03	2.41
9.00 x 16.00	kg/cm^2	1.4	1.4	1.4	2.1	0.7	0.7	0.7	1.4
	lb/sq in.	20	20	20	30	10	10	10	20
	bars	1.38	1.38	1.38	2.07	0.7	0.7	0.7	1.38

1. Whenever possible check with the tyres cold as the pressure is about 0,1 kg/cm^2 (2 lb/sq in.) 0,14 bars 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 0,05 to 0,20 kg/cm^2 (1 to 3 lb/sq in.) 0,07 to 0,21 bars 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 an offence to run tyres when the tread pattern of the tyre does not have a depth of at least 1 mm throughout at least threequarters of the breadth of of the tread and round the entire outer circumference of the tyre.
9. 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.

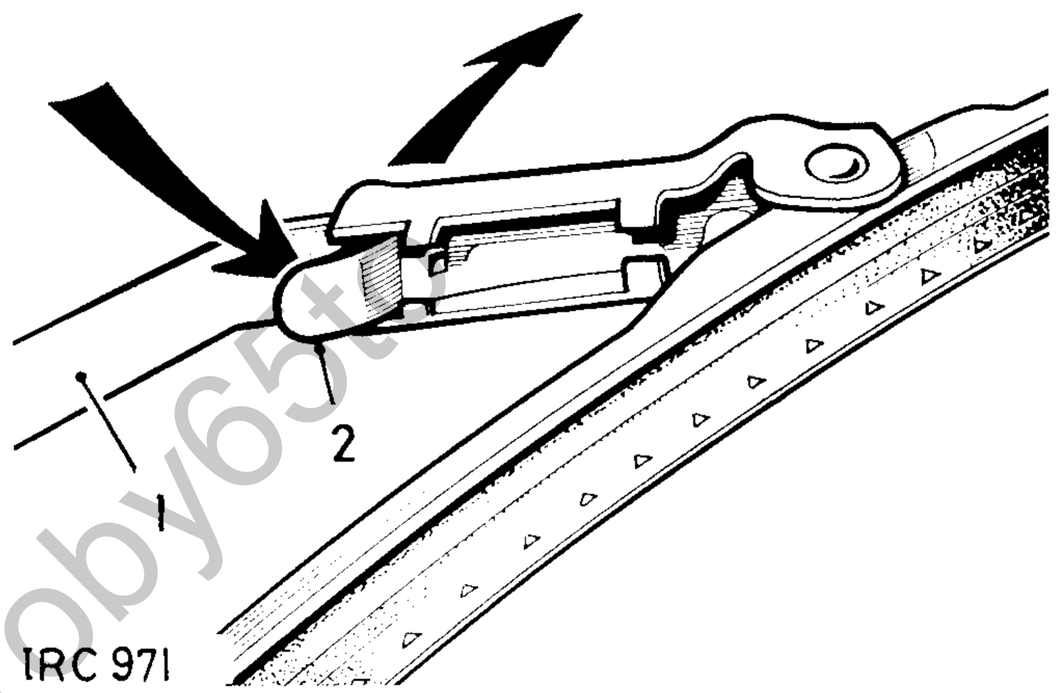
1. This operation requires special equipment and should be carried out by a Rover Distributor or Dealer.
2. In an emergency each headlamp can be adjusted by means of a headlamp horizontal adjusting screw.
3. The headlamp vertical adjusting screw.
   The adjusting screws are accessible through slots in the headlamp bezel.



Windscreen wiper blades–Check, if necessary replace every 5.000 km (3,000 miles) or 3 months.

Examine condition of wiper blades, replace as necessary:

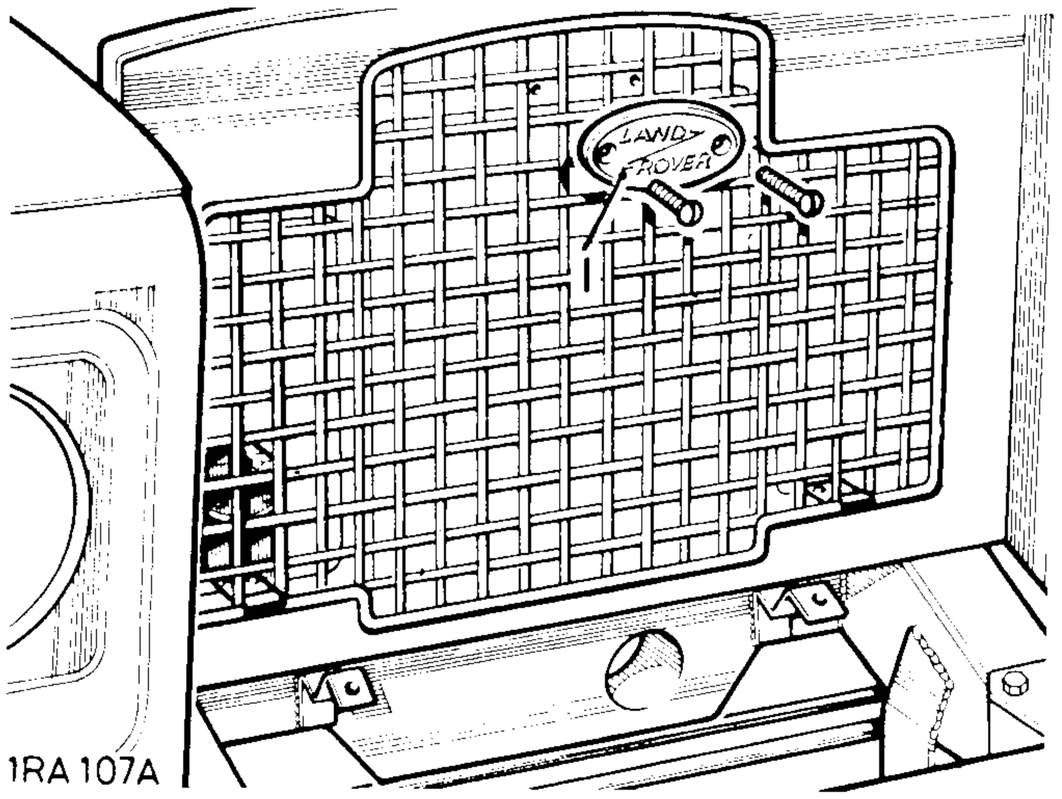
1. Full wiper arm forward.
2. Lift spring clip and withdraw blade from wiper arm.
3. To fit new blade reverse removal procedure.



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

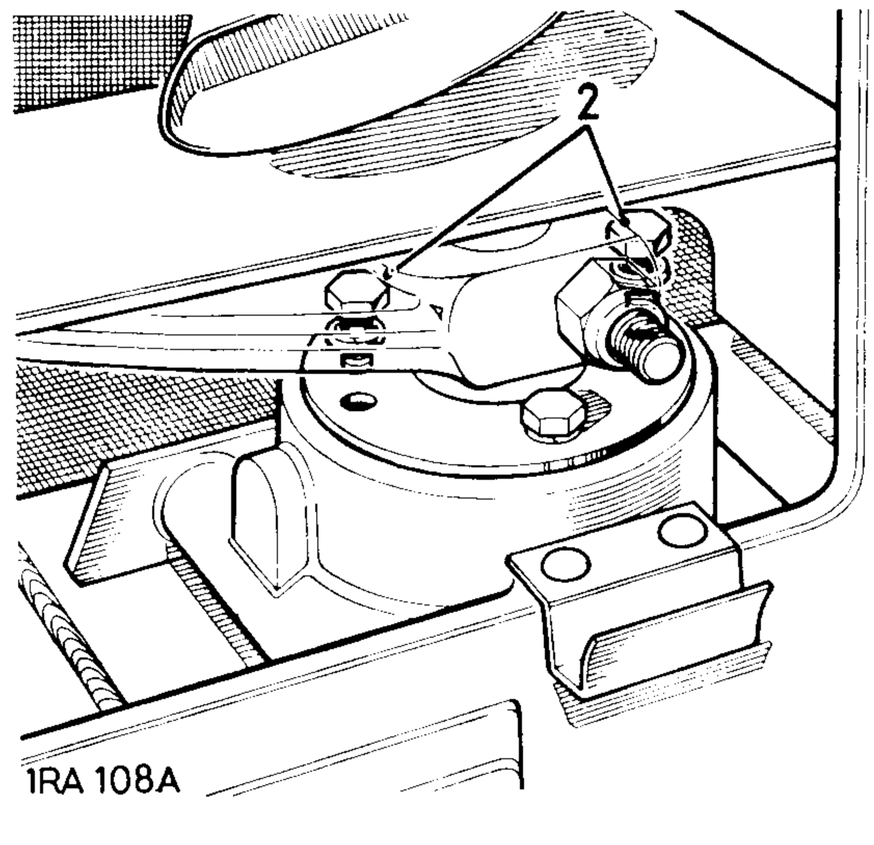
Check oil level and top-up if necessary until the oil is visible at the base of the filler and breather holes. If significant topping-up is required, check joints for leakage and fit new joint washers as necessary. To check oil level and top up, proceed as follows:

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 an oil filler (the other acting as a breather hole) fill the relay unit with the correct grade of lubricating oil to the bottom of the filler hole.



Exterior

4. Whilst filling, it is probable that oil 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 oil to find its way to the main chamber. Wait a few moments until the breather hole is clear of oil, then continue filling.
5. As the unit fills up, air is forced out usually in the form of an oil 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 oil 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.



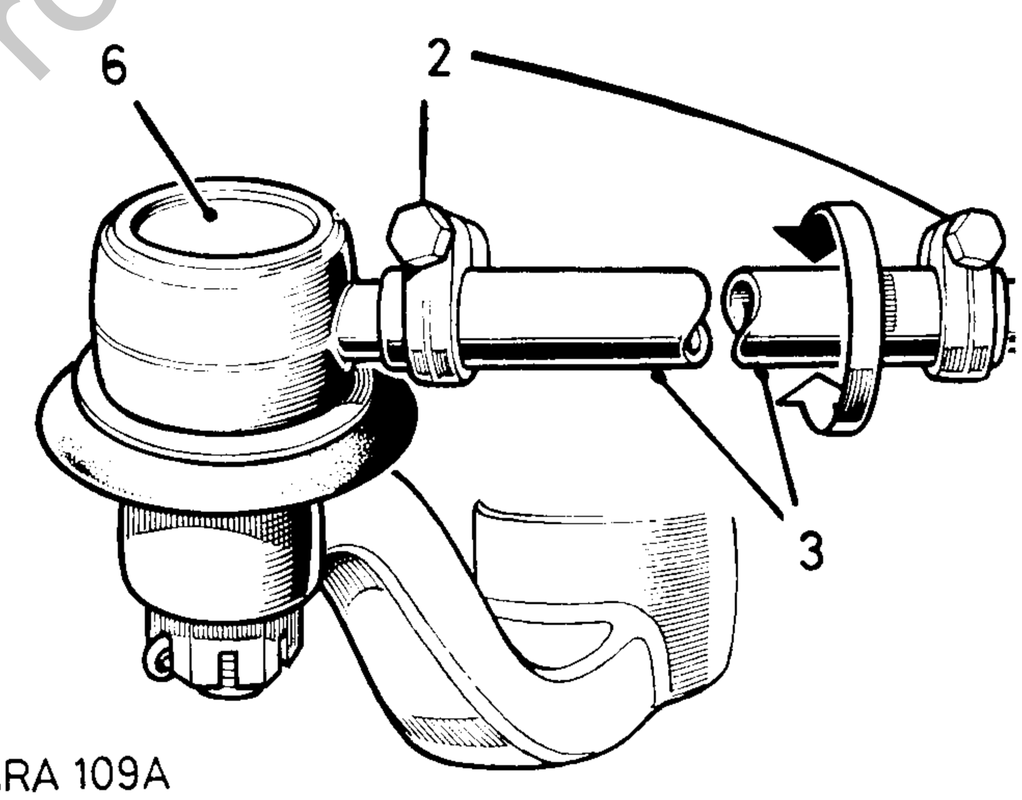
Wheel alignment–At free service 1.500 km (1,000 miles) and thereafter every 10.000 km (6,000 miles) or 6 months.

Special equipment is required to check wheel alignment and this work should be carried out by a Rover Distributor or Dealer.

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.



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.

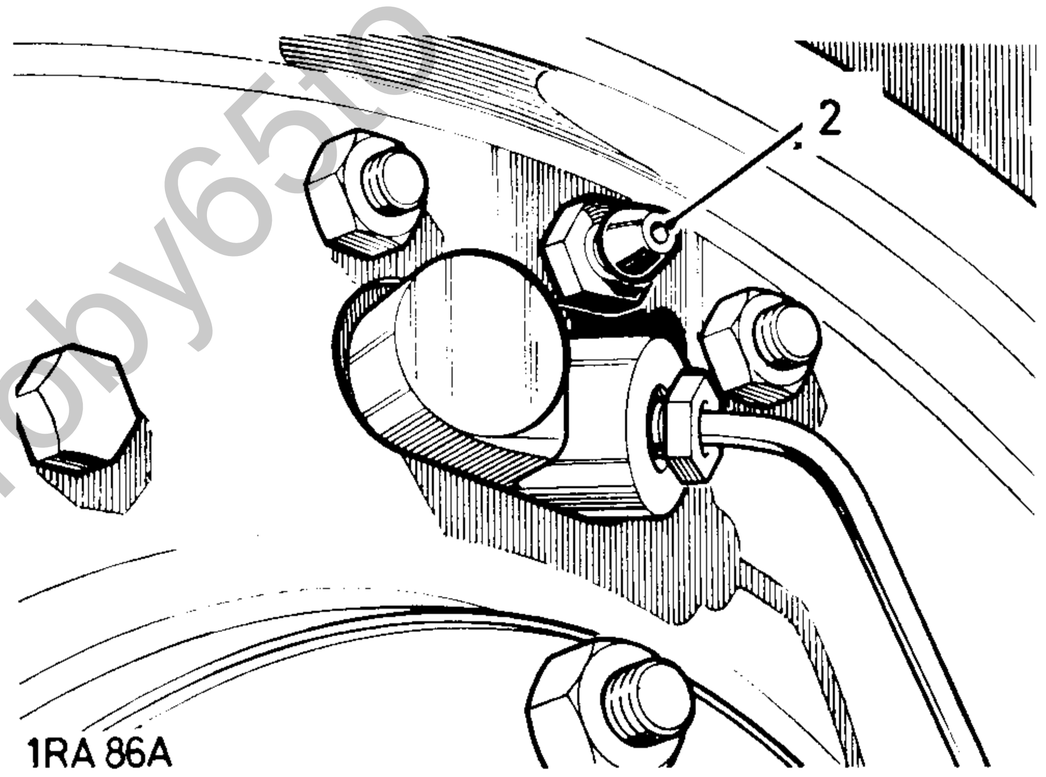
Preventive Maintenance

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 30.000 km (18,000 miles) or 18 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 30.000 km (18,000 miles) or eighteen months. It should also be changed before touring in mountainous areas, if not done in the previous nine months. Use only Castrol Girling Brake and Clutch Fluid 'Crimson' (Specification J. 1703) from sealed tins.

Rubber seals in brake system—Every 60.000 km (36,000 miles) or 36 months.

Renew all rubber seals in master cylinder, wheel cylinders and servo unit where applicable. This should be done every three years if mileage travelled is less than 60.000 km (36,000 miles). Refill with correct fluid, that is, Castrol Girling Brake and Clutch Fluid 'Crimson' (Specification J. 1703).