JAGUAR SERVICE MANUAL 1946—1948

Jaguar

SERVICE MANUAL

FOR

ALL MODELS

1946—1948

ISSUED BY JAGUAR CARS LTD., COVENTRY

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FOR
ALL MODELS
1946 — 1948

ENGINE NUMBERS

	RIGHT HAND DRIVE	LEFT HAND DRIVE
1½ Litre	K.B. 1001 Onwards	K.B. 6750 Onwards
2½ Litre	1 to 17 and P.18 Onwards	Prefix P.L.
3½ Litre	1 to 25 and S.26 Onwards	Prefix S.L.

CHASSIS NUMBERS

RIGHT HAND DRIVE	SALOON	COUPE
1½ Litre	410001 Onwards	
2½ Litre	510001 Onwards	517001 Onwards
3½ Litre	610001 Onwards	617001 Onwards
LEFT HAND DRIVE	**SALOON**	**COUPE**
1½ Litre	430001 Onwards	
2½ Litre	530001 Onwards	537001 Onwards
3½ Litre	630001 Onwards	637001 Onwards

JAGUAR CARS LIMITED, COVENTRY, ENGLAND

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Coventry 62677 (Private Branch Exchange)

Telegraphic Address :
Jaguar Coventry Telex 31/622
Code : Bentley's 2nd

ALL MODELS 1946–1948

ENGINE

	1½ Litre	2½ Litre	3½ Litre
General.			
Type	O.H.V.	O.H.V.	O.H.V.
Number of cylinders	4	6	6
R.A.C. rating	13.23	19.84	25.01
Brake horse power	65 @ 4,600 r.p.m.	102 @ 4,600 r.p.m.	125 @ 4,250 r.p.m.
Maximum torque	97 lbs. ft.	136 lbs. ft.	184 lbs. ft.
Compression ratio	6.8 : 1	7.3 : 1	6.75 : 1
Bore	73 mm.	73 mm.	82 mm.
Stroke	106 mm.	106 mm.	110 mm.
Firing order	1 3 4 2	1 5 3 6 2 4	1 5 3 6 2 4
Cylinder capacity (piston displacement)	1775.8 c.c.	2663.7 c.c.	3485.5 c.c.
Cylinder Block.			
Material	Chromium iron	Chromium iron	Chromium iron
Cylinder bores—Nominal	2⅞″	2⅞″	82 mm.
Machined	2⅞″ +.0005″ −.00025″	2⅞″ +.0005″ −.00025″	82 mm. +.0005″ −.00025″
Oversizes (all)	.005″, .010″, .015″, .020″, .030″, .040″		
Bore size for fitting cylinder liners	3.030″ to 3.031″	3.030″ to 3.031″	3.347″ to 3.348″
Bore for main bearing	2⅝″ +.0005″ −.0000″	2⅝″ +.0005″ −.0000″	2⅝″ +.0005″ −.0000″
Bore for inlet and exhaust valve guide	⅝″ +.001″ −.000″	⅝″ +.001″ −.000″	⅝″ +.001″ −.000″
Valve seat angle	30°	30°	30°
Valve seat width in cylinder block (maximum)	1/16″	3/32″	1/16″
Seat depth in cylinder block	1/32″	3/64″	1/32″
Port size—Inlet	1 11/32″	1 5/16″	1⅜″
Exhaust	1 3/16″	1 3/16″	1 5/16″
Cylinder Liners (when fitted)			
Overall length	6.880″ to 6.865″	6.880″ to 6.865″	7.270″ to 7.255″
Outside diameter	3.034″ to 3.033″	3.034″ to 3.033″	3.351″ to 3.350″
Interference fit	.002″ to .004″	.002″ to .004″	.002″ to .004″
Outside diameter of "lead in"	3.030″	3.030″	3.346″
Size of bore, honed after assembly into block	2⅞″ +.0005″ −.00025″	2⅞″ +.0005″ −.00025″	82 mm. +.0005″ −.00025″
Cylinder Head.			
Material	Cast iron	Cast iron	Cast iron
Crankshaft.			
Number of main bearings	3	7	7
Main bearing journal diameter	2.479″ +.0005″ −.0000″	2.479″ +.0005″ −.0000″	2.479″ +.0005″ −.0000″
Undersizes (all)	.020″	.030″	.040″
Main bearing journal length—Front (all)		1⅝″	
Centre	1¾″	1⅝″	1⅜″
Intermediate	—	1 1/16″	1 1/16″
Rear	1¾″	1¾″	1¾″
Crankpin diameter	1.894″ +.0005″ −.0003″	1.894″ +.0005″ −.0003″	2.086″ +.0006″ −.0000″
Undersizes (all)		.020″, .030″, .040″	
Crankpin length	1 3/16″ +.0007″ −.0002″	1 3/16″ +.0007″ −.0002″	1 3/16″ +.0007″ −.0002″
Thrust taken (all)		At rear journal	
Thrust washer thickness	3/32″	3/32″	3/32″
End float	.006″	.006″	.006″
Main Bearings.			
Type	White metal, thin steel shell		
Length—Centre and front	1¾″, 1⅝″	1⅜″, 1⅝″	1⅜″, 1⅝″

	1½ Litre	2½ Litre	3½ Litre
ENGINE, Main Bearings—*contd.*			
Intermediate	—	1 1/16″	1 1/16″
Rear	1⅜″	1¾″	1¾″
Clearance on internal diameter	.001″ to .0025″	.001″ to .0025″	.001″ to .0025″
Undersizes (all)		.020″, .030″, .040″	
Connecting Rods.			
Length—Centre to centre	7.75″	7.75″	7.75″
Big end—Bore size	2″ +.0000″ −.0005″	2″ +.0000″ −.0005″	2.2327″ 2.2335″
Bore width	1⅜″	1⅜″	1⅜″
Big end bearing	White metal, thin steel shell		
Diameter of bore	1.896″ to 1.895″	1.896″ to 1.895″	2.0885″ to 2.0872″
Clearance on vertical distance	.001″ to .0025″	.001″ to .0025″	.001″ to .0025″
Clearance on horizontal distance (con. rod)	.006″ to .00875″	.006″ to .00875″	.006″ to .00875″
Small end—Bore size rod	.802″	—	—
Bore size bush	¾″	¾″	⅞″
Width	15/16″	15/16″	15/16″
Pistons.			
Type	Aeroflex	Aerolite	Aerolite
Diameter of skirt	2.8729″ to 2.8718″	2.8726″ to 2.8715″	3.2256″ to 3.2245″
Oversizes	.005″, .010″, .015″, .020″, .030″, .040″		
Ring land top	2.859″ to 2.857″	2.859″ to 2.857″	3.211″ to 3.209″
Ring land, intermediate	2.8635″ to 2.8625″	2.8655″ to 2.8645″	3.216″ to 3.215″
Gudgeon pin hole	.7503″ to .75005″	.7503″ to .75005″	.8755″ to .87505″
Piston clearance in bore	.0028″ to .0034″	.0028″ to .0034″	.0031″ to .0037″
Piston Rings.			
Quantity—Compression	2	2	2
Scraper	2	1	1
Nominal diameter (all rings)	2⅞″	2⅞″	82 mm.
Width—Compression	.0625″ to .0615″	.0937″ to .0927″	.0621″ to .0615″
Scraper	.156″ to .155″	.187″ to .186″	.187″ to .186″
Clearance in groove—Compression (all)		.001″ to .003″	
Scraper (all)		.001″ to .003″	
Thickness—Compression	.117″ to .109″	.103″ to .095″	.129″ to .123″
Scraper	.113″ to .105″	.125″ to .117″	.113″ to .105″
Gap fitted (all rings)		.003″ to .007″	
Width of scraper groove	.093″	.112″	.112″
Depth of scraper groove	.021″	.024″	.021″
Gudgeon Pins.			
Type	Fully floating Circlip	Fully floating End pads	Fully floating End pads
Length	2.540″	2.665″	2.992″
Inner diameter	15/32″	15/32″	19/32″
Outer diameter	.7501″ to .74985″	.7501″ to .74985″	.8751″ to .87485″
Core hardness	32 tons	32 tons	32 tons
Fit in connecting rod small end, steel rod	Push fit	Push fit	Push fit
2½ and 3½ litre light alloy rod		Push fit at 100° F.	
Clearance in piston (all)		Push fit at 70° F.	
Retained in connecting rod	No	No	No
Valves.			
Head diameter—Inlet	1 15/32″	1 15/32″	1 21/32″
Exhaust	1 11/32″	1 11/32″	1 15/32″
Stem diameter	5/16″	5/16″	5/16″
Stem clearance in—Guide inlet	.002″ to .004″	.002″ to .004″	.002″ to .004″
Guide exhaust	.003″ to .005″	.003″ to .005″	.003″ to .005″
Total length of valve	4 15/16″	5 43/64″	5 23/32″
Amount of lift	5/16″	5/16″	5/16″
Inlet valve opens, B.T.D.C.	10°	16°	16°
Inlet valve closes, A.B.D.C.	50°	56°	56°
Exhaust valve opens, B.B.D.C.	50°	56°	56°
Exhaust valve closes, A.T.D.C.	10°	16°	16°

ENGINE—*contd.*

Valve Springs.	1½ Litre	2½ Litre	3½ Litre
Free Length—Inner (all)		2.35″	
Outer (all)		2 17/32″	
Minimum working length—Inner (all)		1.47″	
Outer (all)		1.53″	
To exert—Inner (all)		46 lbs.	
Outer (all)		66 lbs.	
Solid length not to exceed—Inner (all)		1.42″	
Outer (all)		1.48″	
Internal diameter—Inner (all)		.684″	
Outer (all)		1.062″	
Rate—Inner, initial (all)		48.5 lbs./in.	
Inner, final (all)		78 lbs./in.	
Outer, initial (all)		62 lbs./in.	
Outer, final (all)		94 lbs./in.	
Number of free coils—Inner (all)		10½	
Outer (all)		7½	
Valve Guides.			
Length—Inlet	2½″	3¼″	3¼″
Exhaust	2 7/8″	3¼″	3¼″
Outside diameter	5/8″	5/8″	5/8″
Inside diameter	5/16″	5/16″	5/16″
Interference fit (all)		.0005″ to .002″	
Tappets.			
Total length	2½″	2¼″	2¼″
Total diameter	1 5/32″	1 5/32″	1 5/32″
Tappet clearance warm—Inlet	.015″	.012″	.012″
Exhaust	.018″	.015″	.015″
Special tappet clearance for checking valve timing	.020″	.020″	.020″
Camshaft.			
Number of journals	4	5	5
Journal diameter—Front	1½″	1½″	1½″
Centre	1 23/32″	1¾″	1¾″
Intermediate	—	1¾″	1¾″
Rear	1 23/32″	1 9/16″	1 9/16″
Journal length—Front	1½″	1 13/16″	1 13/16″
Centre	11/16″	13/16″	13/16″
Intermediate	—	13/16″	13/16″
Rear	23/32″	1 7/32″	1 7/32″
Thrust taken (all)		Front end	
Thrust plate thickness	.2″	.2″	.2″
Camshaft Bearings.			
Number of bearings	4	5	5
Type front (all)		Cast iron	
Centre, intermediate, rear		White metal, thin steel shell	
Length—Front	1½″	1 13/16″	1 13/16″
Centre	11/16″	13/16″	13/16″
Intermediate	—	13/16″	13/16″
Rear	11/16″	1 5/32″	1 5/32″
Finished size (line bore after assembly except front)—			
Front	1½″ +.0007″ −.0002″	1½″ +.0007″ −.0002″	1½″ +.0007″ −.0002″
Centre	1 23/32″ +.0007″ −.0002″	1¾″ +.0007″ −.0002″	1¾″ +.0007″ −.0002″
Intermediate	—	1¾″ +.0007″ −.0002″	1¾″ +.0007″ −.0002″
Rear	1 23/32″ +.0007″ −.0002″	1 9/16″ +.0007″ −.0002″	1 9/16″ +.0007″ −.0002″
Bearing clearance (all)		.002″ to .0045″	

ENGINE—*contd.*

Timing Chain and Wheels.	1½ Litre	2½ Litre	3½ Litre
Chain type (all flat back endless)	Single	Duplex	Duplex
Pitch	3/8″	3/8″	3/8″
Number of pitches	58	58	58
Crankshaft timing wheel, teeth	21	21	21
Camshaft timing wheel, teeth	42	42	42
Lubricating System.			
Type (all)		Forced feed	
Pressure, lbs. per sq. in., hot (all)		40 to 60	
Sump capacity	12 pints	20 pints	20 pints
Oil pump type (all)		Gear	
Driving shaft—Overall length	7 13/16″	20 5/8″	12 1/16″
Overall diameter	½″	½″	½″
Driving wheel—Length	1″	1¾″	1¾″
Overall diameter	1.2″	1.4″	1.4″
Pitch centre diameter	1″	1.2″	1.2″
Number of teeth	10	12	12
Idler wheel pin—Overall length	1 23/32″	3″	3″
Diameter	½″	½″	½″
Idler wheel—Length	1″	1¾″	1¾″
Overall diameter	1.2″	1.4″	1.4″
Pitch, centre diameter	1″	1.2″	1.2″
Bore diameter	½″	½″	½″
Number of teeth	10	12	12
Spiral driven gear (integral with shaft)—			
Overall length	1 9/16″	1 5/16″	1 5/16″
Overall diameter	1.168″	1.168″	1.168″
Pitch, centre diameter	1.0257″	1.0257″	1.0257″
Bore diameter	½″	½″	½″
Clearance between end of gears and cover not to exceed	.006″	.006″	.006″
Oil pressure release valve spring—			
Free length (all)		2 9/64″	
Fitted length (all)		1.45″	
Section (all)		17 S.W.G. (.056″)	
External diameter (all)		.456″	
Number of free coils (all)		18	
Rate per inch (all)		11.7 lbs. inch	
Pressure at fitted length (all)		8 lbs.	

COOLING SYSTEM

Total capacity	20 pints	28 pints	26 pints
Radiator core—Type	Film	Film	Film
Thickness	58 mm.	84 mm.	84 mm.
Water pump—Type (all)		Centrifugal	
Drive (all)		Fan belt	
Fan—Number of blades	4 (export 6)	6	6
Overall diameter	12¼″	15″	15″
Fan belt—Angle of 'V'	32°	32°	32°
Fan pulley—Diameter of fan boss	4¼″	4¼″	4¼″

FUEL SYSTEM

Petrol tank—Total capacity	14 galls.	14 galls.	14 galls.
Petrol measured by		Electrical gauge	
Petrol pump—Make	A.C. Sphinx	S.U.	S.U.
Operated by	Camshaft	Electrical	Electrical
Pressure	1.25 to 2 lbs.	.75 lbs. per sq. in.	suction 4 ft. head

CARBURETTORS

	1½ Litre	2½ Litre	3½ Litre
Type	S.U. Single	S.U. Twin	S.U. Twin
Needle Size—Right hand drive	F.A.	D.S.	D.Y.
Left hand drive	F.A.	R.3	F.L.
Jet size (all)		.090″ ± .002″	
Float weight (all)		350 to 370 grains	

CLUTCH

Make (all)		Borg and Beck	
Model	9A.6—G	9A.6	10A.6
Outside diameter	8⅞″	8⅞″	9⅞″
Type (all)		Dry single plate	
Clutch pedal adjustment (all)		Adjusting screw and locknut	
Clutch release bearing (all)		Carbon	

GEARBOX

Type (all)		Synchromesh 2nd, 3rd and top	
Gearbox ratios, double helical—			
Top speed	1	1	1
Third speed	1.45	1.345	1.345
Second speed	2.43	1.935	1.935
First speed	3.95	3.375	3.375
Reverse	3.95	3.375	3.375
Bearings—Clutch shaft—In crank flange	Hoffman A.597	A.597	A.597
In gearbox casing	Hoffman R.L.S. 12½	R.140L	R.140L
Mainshaft—Front	Phosphor bronze	Bronze	Bronze
Intermediate	Hoffman R.L.S. H	R.M.S. 12½	R.M.S. 12½
Rear	Hoffman M.S. 10	M.S. 12	M.S. 12
3rd speed gear on mainshaft		Phosphor bronze	
Layshaft—Front	Phosphor bronze	Needle rollers	
Rear	Phosphor bronze	Needle rollers	
Gearbox ratios, single helical—			
Top speed	—	1	1
Third speed	—	1.367	1.367
Second speed	—	1.982	1.982
First speed	—	3.375	3.375
Reverse	—	3.375	3.375
Bearings—Clutch shaft—In crank flange	—	Hoffman A.597	A.597
In gearbox casing	—	Hoffman 340K	340K
Mainshaft—Front	—	Roller	
Intermediate	—	Hoffman 12½K	12½K
Rear	—	Hoffman M.S. 12	M.S. 12
3rd speed gear on mainshaft	—	Needle rollers	
Layshaft—Front	—	Needle rollers	
Rear	—	Needle rollers	
Reverse shaft (all)		Stationary	
Reverse gear (all)		Phosphor bronze	
Layshaft end float (all)		.002″ to .004″	
Mainshaft end float (all)		.006″	
Gearbox mounting (all)		Unit construction	
Oil capacity	2 pints	2½ pints	2½ pints

FRONT AXLE

Type (all)		Reverse Elliot	
Hub bearings (all)		Taper roller	
Bearing adjustment (all)		Nut	
Swivel pin fit in swivel pin bushes (all)		.0001″ to .0017″ clearance	
Swivel pin fit in axle beam bosses (all)		.0003″ clear to .0006″ interference	
Swivel pin bushes fit in stub axle bosses (all)		Force	
Swivel pin angle	8½°	7½°	7½°
Caster angle	4½°	3°	3°
Toe in	⅛″	⅛″	⅛″

FRONT AXLE—*contd.*

	1½ Litre	2½ Litre	3½ Litre
Track—Front	4′ 4″	4′ 6″	4′ 6″
Rear	4′ 7″	4′ 8″	4′ 8″
Ground clearance	7″	7″	7″
Camber	2°	2½°	2½°

REAR AXLE

Type (all)		Hypoid, semi-floating	
Final drive (all)		Hypoid, spiral bevel	
Housing (all)		Integral with axle tubes	
Bevel pinion carrier (all)		Tapered rollers	
Differential (all)		Bevel	
Axle ratio	4.875	4.55	4.27
Rear axle oil capacity	2½ pints	3 pints	3 pints

ROAD SPRINGS

Front.			
Number of leaves	10	11	11
Width	1¾″	2″	2″
Depth	1⅝″	1.98″	1.98″
Laden centres	32″	37″	37″
Rear.			
Number of leaves	9	10	10
Width	1¾″	1¾″	1¾″
Depth	1¾″	2 1/16″	2 1/16″
Laden centres	42″	42″	42″

STEERING

Type (all)		Burman-Douglas worm and nut	
Number of threads, worm and nut	4	4	4
Diameter of steering wheel	18″	18″	18″
End float of inner column	—	—	—
End thrust of inner column (all)		Thrust race top of column	
Adjustment (all)		Top of column	
Clearance, rocker shaft in bushes (all)		.0005″ to .002″	
Fit of rocker shaft bushes in bore (all)		Force fit	

ELECTRICAL SYSTEM

Battery—Type, 12 volt	50 amp.-hour	63 amp.-hour	63 amp.-hour
Dynamo—Make (all)		Lucas	
Model	C.45 Y.V.3	C.45 P.V.3	C.45 P.V.
Type	G.C.24–0	L.1–1	L.1–1
Voltage	12	12	12
Ratio of dynamo speed over engine speed	1 : 28	1 : 28	1 : 28
Starter Motor.			
Make (all)		Lucas	
Model	M.418 G.O.	M.418 G.	M.45 G.
Force required to lift brush (all)		32 to 40 ozs.	
Ignition			
Distributor—Make (all)		Lucas	
Type	D.K.Y. 4A.	D.X.A. 6A.	D.X.A. 6A.
Contact breaker gap (all)		.010″ to .012″	
Firing order	1 3 4 2	1 5 3 6 2 4	1 5 3 6 2 4
Timing	5° before T.D.C.	10° before T.D.C.	10° before T.D.C.
Coil—Make (all)		Lucas	
Type	Q.12	B.R.12	B.R.12
Sparking plugs—Size	14 mm.	14 mm.	14 mm.
Gap at points	.020″ to .025″	.020″ to .025″	.020″ to .025″
Make (all)		Champion	
Type	L.10 S.	Up to Eng. No. P.200 L.10 S. P.201 onwards N.A.8	L.10 S.

(On later engines L.10 S. replaced by L.10 and N.A.8 by N.8)

Component	Vacuum	Wakefield Patent Castrol	Shell	Essolube	Prices
Engine—Winter and Summer ..	Mobiloil "A"	"XL"	Double Shell	Essolube 30	Motorine M
Gearbox	Moboloil "A"	"XL"	Double Shell	Essolube 30	Motorine M
Front axle swivels, steering joints, front spring eyes, propeller shaft needle bearings, steering box ..	Mobilube "C"	ST	Shell Spirax	Essolube Gear Oil Heavy	Motorine Battersea A
Rear axle	Mobilube "GX"	Castrol Hi-press Light	Shell Spirax E.P.90	Essoleum Expee 90	Motorine Hypoid
Water pump, fan, propeller shaft, spline, wheel hubs (grease gun), rear brake swinging lever ..	Mobilgrease No. 4	Castrolease Heavy	Shell Retinax R.B.	Esso Grease	Belmoline C
Small control joints and oil cups (oil can). Brake linkage.. ..	Mobiloil "A"	"XL"	Double Shell	Essolube 30	Motorine M
Upper cylinder lubricant ..	Mobil Upper Cylinder Lubricant	Wakefield Castrollo	Shell Donax U	Essolube 20	Motorine UCL

UPPER CYLINDER LUBRICATION—We recommend the use of an upper cylinder lubricant until the engine is thoroughly "run-in." This lubricant is suitable for mixing with the petrol and is thus drawn into the combustion chamber through the carburettor. It is a valuable lubricant for use in cold weather.

OIL AND WATER CAPACITY

Oil capacity	3½ Litre	2½ Litre	1½ Litre
	pints	pints	pints
Engine	20	20	12
Gearbox	2½	2½	2
Rear axle	3	3	2½
Steering box	1	1	½
	galls.	galls.	galls.
Water capacity of radiator and engine	3¼	3½	2½
	pints	pints	pints
Amount of anti-freeze glycerine to use in Winter	5¼	5½	4

CORRECT TYRE PRESSURES

Model	Inflation pressure (lbs. per sq. in.) Front	Rear	Tyres
2½ litre Jaguar Saloon	28	30	5.50×18
3½ litre Jaguar Saloon	28	30	5.50×18 (Fort)
2½ litre Jaguar Coupe	28	30	5.50×18
3½ litre Jaguar Coupe	28	30	5.50×18 (Fort)
1½ litre Jaguar Saloon	28	28	5.25×18

DESCRIPTION.

The principle of the carburettor is a variable choke which is operated by means of a sliding piston, to which is attached a tapered needle valve. The piston is raised and lowered in proportion to the variation in pressure in the induction manifold. As the piston is raised, the tapered needle valve opens, metering the fuel in the proportion required by the engine. The jet in which the needle works is a fixed size. The needle graduation is very carefully settled on the test bench to suit the particular type of engine. It will therefore be seen that it is inadvisable to change the needle supplied by the makers, except in cases where the needle has been damaged, and then it must be changed for another of the same type. The type of needle will be found stamped on the thick end.

OPERATION No. 2.

CARBURETTORS. TO REMOVE.

2½ and 3½ Litre.

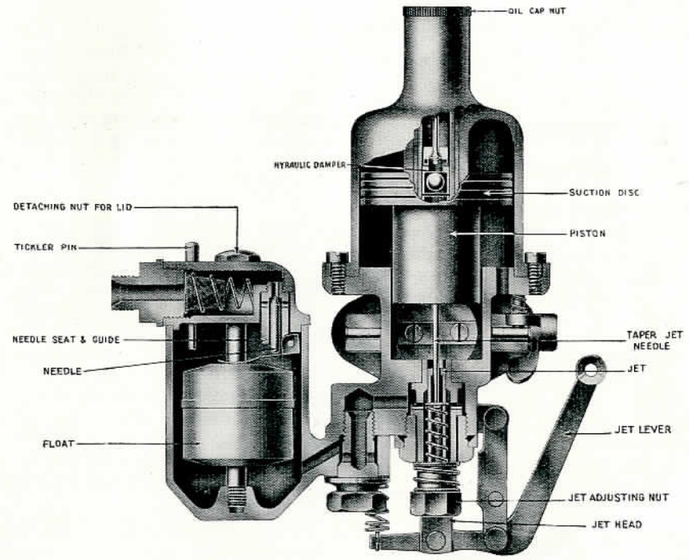
Remove air silencers complete with adaptor.

Disconnect throttle link arm and return spring.

Disconnect hand throttle control and both wires from self start carburettor solenoid switch.

Disconnect petrol feed pipe at union on flexible pipe, and unions at float chambers.

Remove carburettor flange mounting nuts and self start carburettor pipe union from cylinder block. Withdraw carburettors.



CARBURETTOR, 1½ LITRE. PLATE 1

OPERATION No. 1.

CARBURETTOR. TO REMOVE. 1½ Litre.

Remove air silencer complete with elbow.

N.B.: On later models the air silencer is clamped to the water manifold studs, and the elbow joined to the silencer by a rubber hose.

In this case remove the two bolts securing the elbow to the carburettor flange and withdraw the elbow only.

Disconnect throttle link arm and return spring.

Disconnect hand throttle control cable and choke (jet) control cable.

Disconnect petrol feed pipe from float chamber.

Remove nuts securing carburettor to manifold. Withdraw carburettor.

OPERATION No. 3.

CARBURETTORS. TO DISMANTLE.

Remove carburettor/s.

Remove oil filler cap complete with hydraulic piston damper. (Damper not fitted to 2½ litre.)

Remove fixing screws and withdraw dash pot.

Remove nut securing float chamber cap. Remove cap and float.

Remove nut securing float chamber to carburettor body.

Withdraw float chamber.

Remove choke (jet) control assembly. (1½ litre only.)

Remove jet seat from base of carburettor.

OPERATION No. 4.

HYDRAULIC PISTON DAMPER. DESCRIPTION.

Fitted to 1½ and 3½ Litre Only.

This is located in the hollow piston rod and attached to the oil cap nut.
It consists of a plunger with a one-way valve and its function is to give a slightly enriched mixture by preventing the piston rising too quickly when the accelerator is snapped open.
The only attention necessary is to keep this supplied with engine oil of the recommended grade. Indication that the oil chamber requires filling is given when spitting back is experienced when the throttle is opened quickly.

N.B.: On 2½ litre models the brass cap nut should be removed and the piston spindle lubricated with thin oil.

OPERATION No. 5.

JET. TO CENTRE.

If the piston is lifted by hand it should fall freely and hit the jet bridge with a slight click. If it does not, it means (excepting instances where the piston is sticking due to excessive deposit in the suction chamber or around the piston) that the needle is catching on the side of the jet, this upsets the whole carburation and should be remedied by re-centring the jet on the needle.

To do this :—

1. Re-position the needle approximately $\frac{1}{16}$" lower (further out) than normal and replace suction chamber and piston.
2. Screw the jet adjusting nut up to its topmost position. (Remove dome nuts to gain access to adjusting nuts on 2½ and 3½ litre.)
3. Slacken off the large hexagon jet screw about one-third to half a turn.
4. After removing oiler brass cap in top of suction chamber, gently push piston rod downwards ; this will position the jet exactly central with needle.
5. Tighten up hexagon jet screw.
6. Return needle to normal position. Then replace suction chamber and piston. It will then be necessary to lower jet adjusting nut to the best position for slow running. Do this tuning when engine is warm.

After adjusting the idling in this way, the dome nut on the 2½ and 3½ litre should be replaced. (Ensure that dome nut washers are not mislaid.)

OPERATION No. 6.

AUXILIARY STARTING CARBURETTOR. DESCRIPTION.

This consists of an auxiliary jet (C) controlled by a tapered needle (Q), and fed from the main float-chamber (A). Fuel emerging from this jet passes upwards between the shank (D) of the needle and the bore formed in the body through which this passes. Air at the same time enters through the passage (P) and mixes with the jet discharge. The emulsion thus formed is mixed with a further supply of air which passes downwards between a clearance provided between the disc (N) fixed to the needle shank (D) and the core surrounding this disc. The assembly comprising the disc and needle can move vertically and is normally spring-loaded upwards by means of the spring (E). The mixture thus formed passes between valve (H) and its seating, and is drawn through the tube (O) into the induction pipe of the engine. It will thus be seen that an additional amount of mixture is drawn directly into the induction pipe irrespective of the main throttle position, and serves to provide the starting mixture, and also to enrich the mixture generally, so long as the device is in action. The movable parts (N) and (D) are normally held in the position shown in the diagram, thus when the engine is first started and the suction created in the induction pipe by means of the starter is low, a rich mixture will be provided since the tapered needle (Q) will be withdrawn from the jet. Immediately the engine starts a high degree of suction will be obtained in the induction pipe and consequently a strong flow through the auxiliary carburettor. The high velocity of air passing between the disc (N) and the bore surrounding this will be sufficient to draw the assembly downwards against the action of the spring, and the needle (Q) will therefore enter the jet (C) to a greater extent and diminish the effective orifice of this, thus under these conditions only a moderate enrichment will be provided. In this way, an excess of petrol, which will otherwise be obtained under these conditions will be avoided. Immediately the throttle is opened, however, the induction pipe depression will be diminished and thus the velocity of air past the disc will fall and so permit the assembly to rise again and provide a greater discharge from the jet. The valve (H) is held off its seating by means of a solenoid (J) which raises the iron core (I) to which the valve disc is attached, thus so long as a current is flowing through the solenoid this valve will be opened and the auxiliary carburettor will be in action.

The current is provided for the solenoid in the following manner :—

Electrical Connections. One lead is taken from the ignition switch to one of the terminals (K) and the other terminal is connected to a thermostatic switch situated in the water outlet pipe from the cylinder head. This switch is so arranged that when the engine is cold a circuit is provided from the terminal (K) to earth. Immediately the water attains a temperature pre-determined by the setting of the thermostat, the points will open and no return circuit will then be provided. The circuit through the solenoid thus having been broken, the core (I) will be released and valve (H) will return to its seating, thus putting the whole device out of action.

OPERATION No. 7.

SETTING OF AUXILIARY CARBURETTOR.

The only adjustment provided consists in setting the stop screw (F) which limits the movement of the needle (D). Screwing this down weakens, screwing it up strengthens, the idling mixture. The engine having been allowed to attain its normal working temperature, the auxiliary carburettor should be brought into action by short circuiting the thermostatic switch. A convenient means of doing this is to make contact between the terminal in the centre of the switch and the body of the switch by means of a screwdriver. Having done this the throttle should be momentarily flicked open, thus releasing the valve (H), and bringing the auxiliary carburettor into action. The stop screw should now be adjusted upwards to an extent just short of that which will make the engine run unevenly ; in other words, the engine should be given the strongest mixture possible, upon which it will fire on all its cylinders.

If on the next occasion upon which the engine is started from cold difficulty is experienced, the stop screw should be unscrewed by a further amount of about half a turn.

OPERATION No. 8.

CARBURETTOR/S. TO TUNE

Important. It is useless to carry out adjustments at the carburettor/s unless the engine itself is in good tune. (See Operation No. 35.)

Before attempting to tune the carburettor/s the engine must be warmed up to its normal running temperature. There are only two ways in which the carburettor/s may be adjusted. They are :

(a) The amount of throttle opening for slow running.

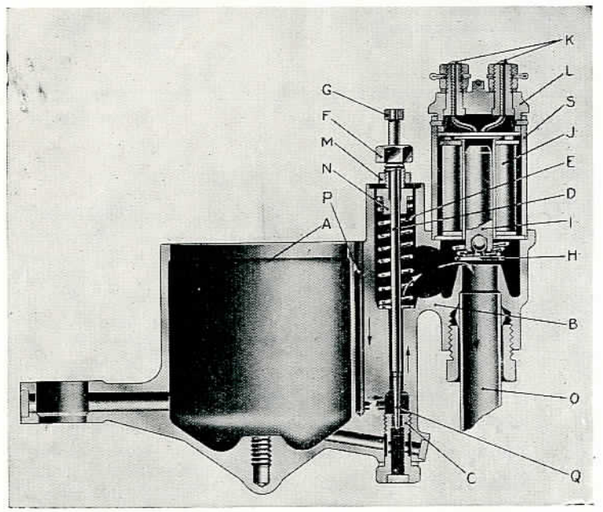
(b) The mixture strength at this position.

In the case of the 1½ litre, set the slow running speed by adjustment of the throttle stop screw to 400 r.p.m. with the mixture set as rich as possible consistent with even slow running, when the exhaust beat should be regular and even.

For the 2½ and 3½ litre models, slacken off one of the clamp screws on the flexible throttle connection to disconnect the two throttles.

Set both carburettors to suck equally by adjustment of the throttle stop screws at 450 r.p.m. Set the mixture at each carburettor as rich as possible consistent with even slow running, when the hiss of the intake should be the same on each and the exhaust beat regular and even.

When adjustments are complete, re-clamp the bolt on the flexible throttle couplings.



AUXILIARY STARTING CARBURETTOR 2½ and 3½ LITRE. PLATE 2.

Carburettor Jet Needles.

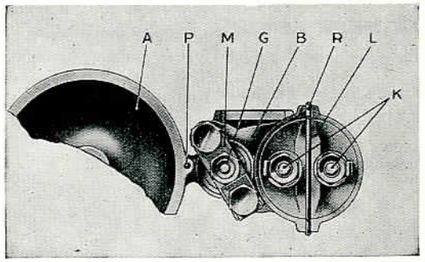
Right-Hand Drive. 1½ litre, FA. 2½ litre, DS. 3½ litre, DY.

Left-Hand Drive. 1½ litre, FA. 2½ litre, R.3. 3½ litre, FL.

Starter Jet Needles.

2½ litre ... 45/8. 3½ litre .. 65/8

These markings will be found on the circumference of the thimble below the disc on the needle and on the needle itself.



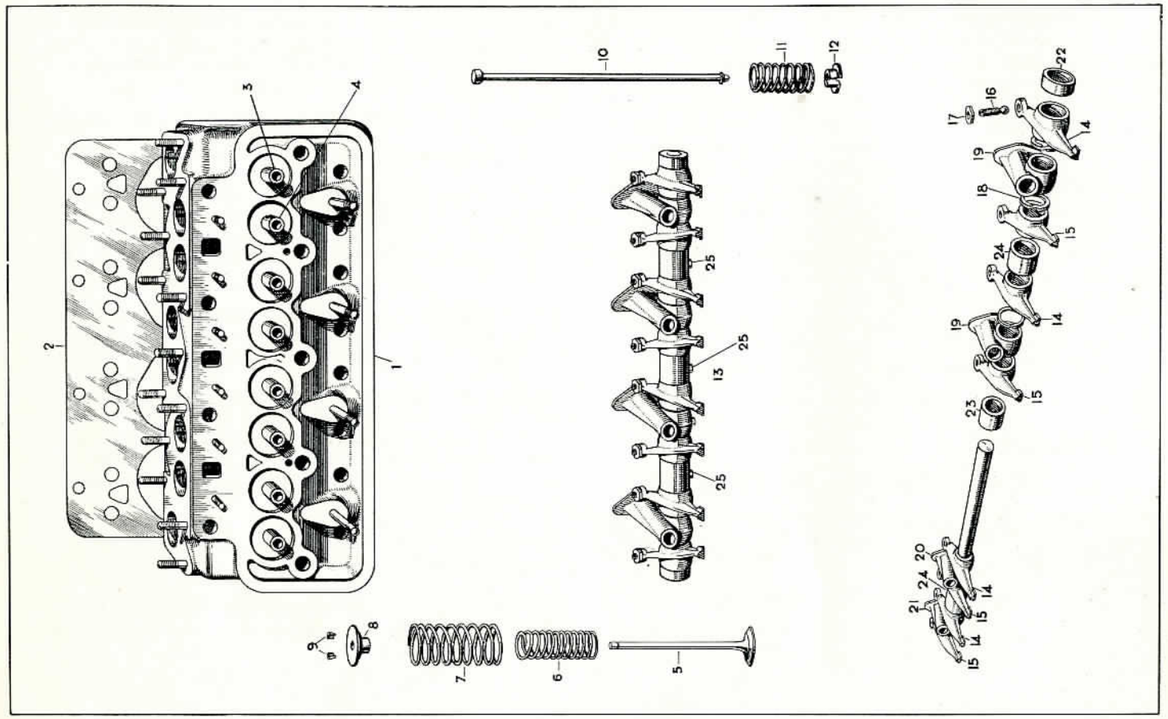


PLATE 3. CYLINDER HEAD, 1½ LITRE.

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Spring, for Push Rod	11	Piece, Distance, Centre	23
		Piece, Distance, between Rockers	24
		Screw, Locking	25

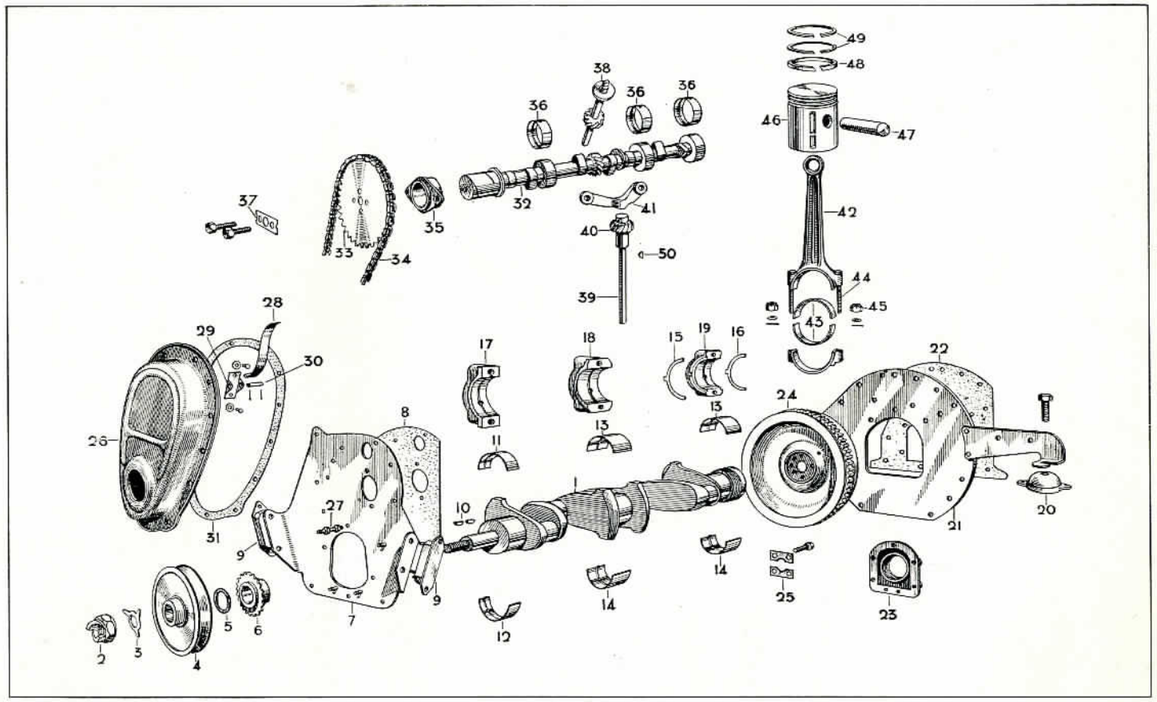

PLATE 4. ENGINE DETAIL, 1½ LITRE.

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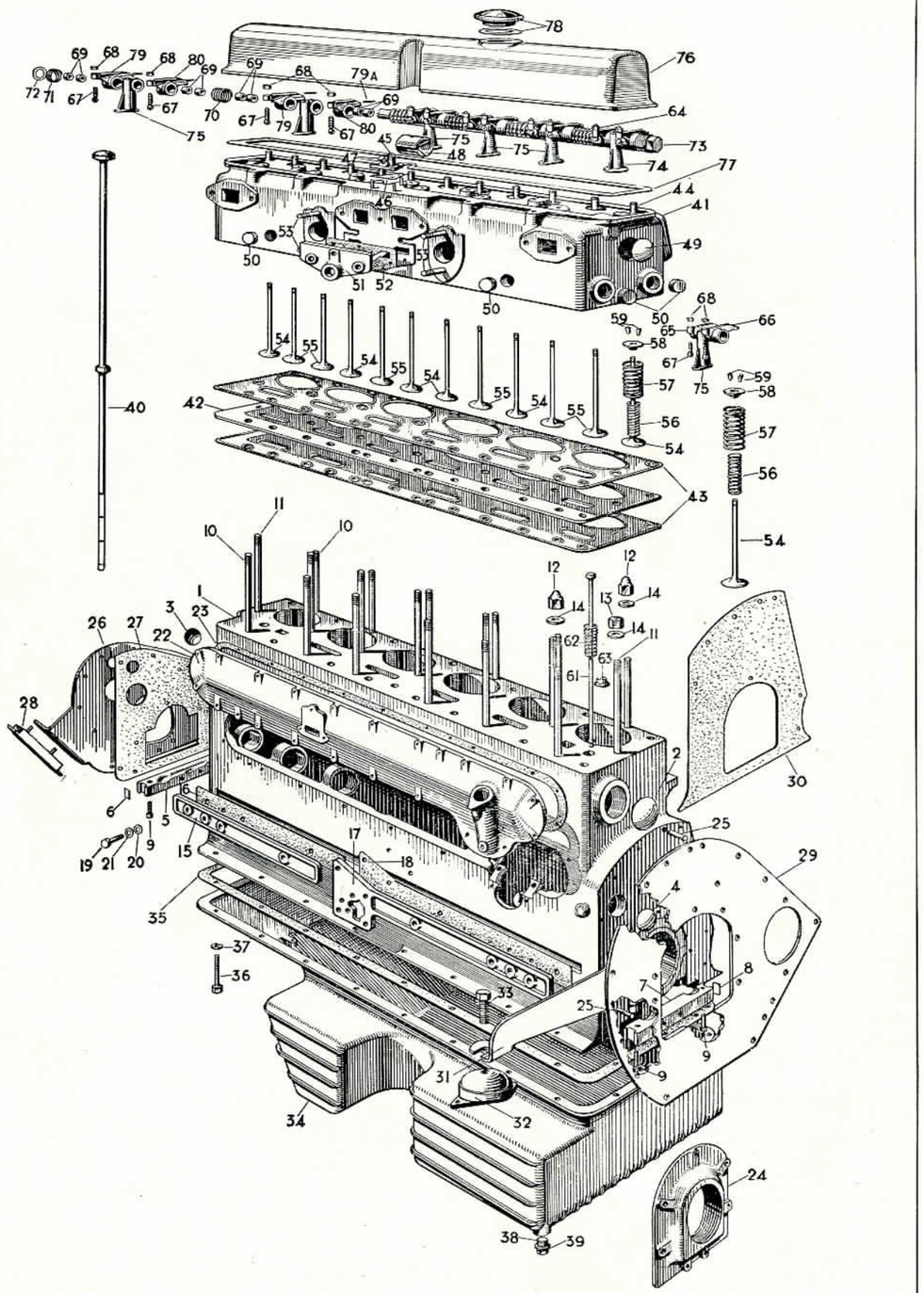

PLATE 5. CYLINDER BLOCK AND HEAD, 2½ LITRE.

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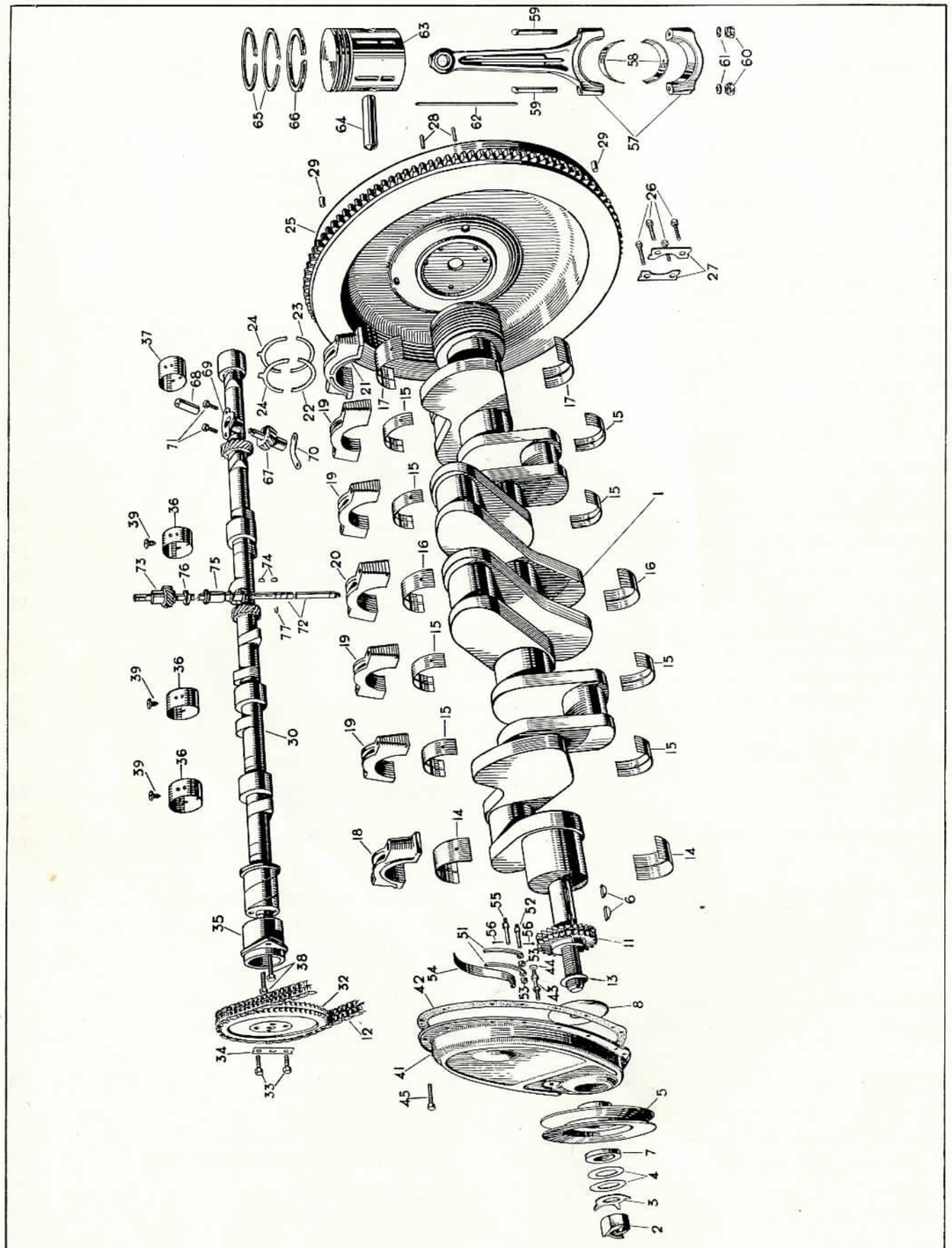

PLATE 6. ENGINE DETAIL, 2½ LITRE.

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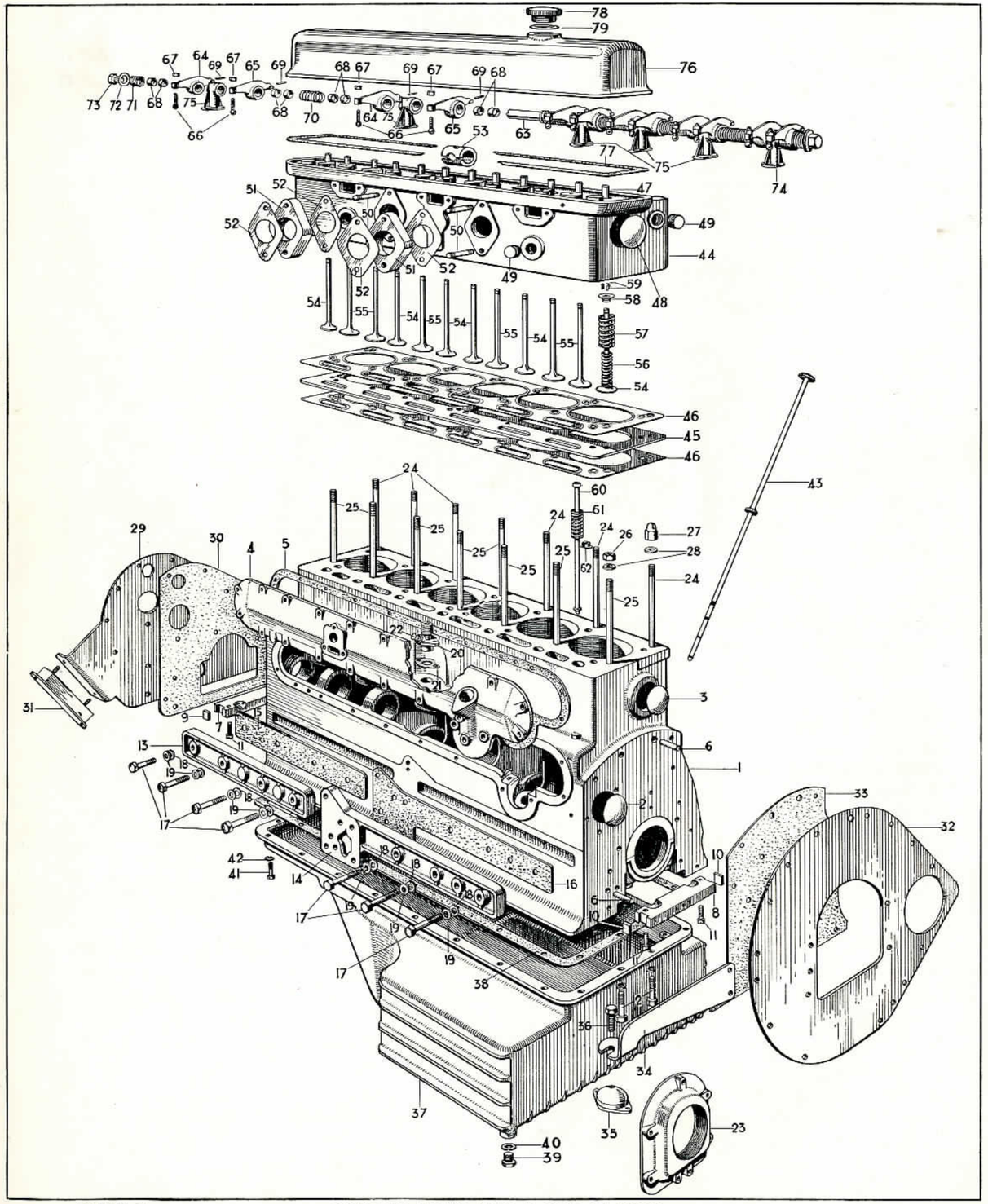

PLATE 7. CYLINDER HEAD AND BLOCK, 3½ LITRE.

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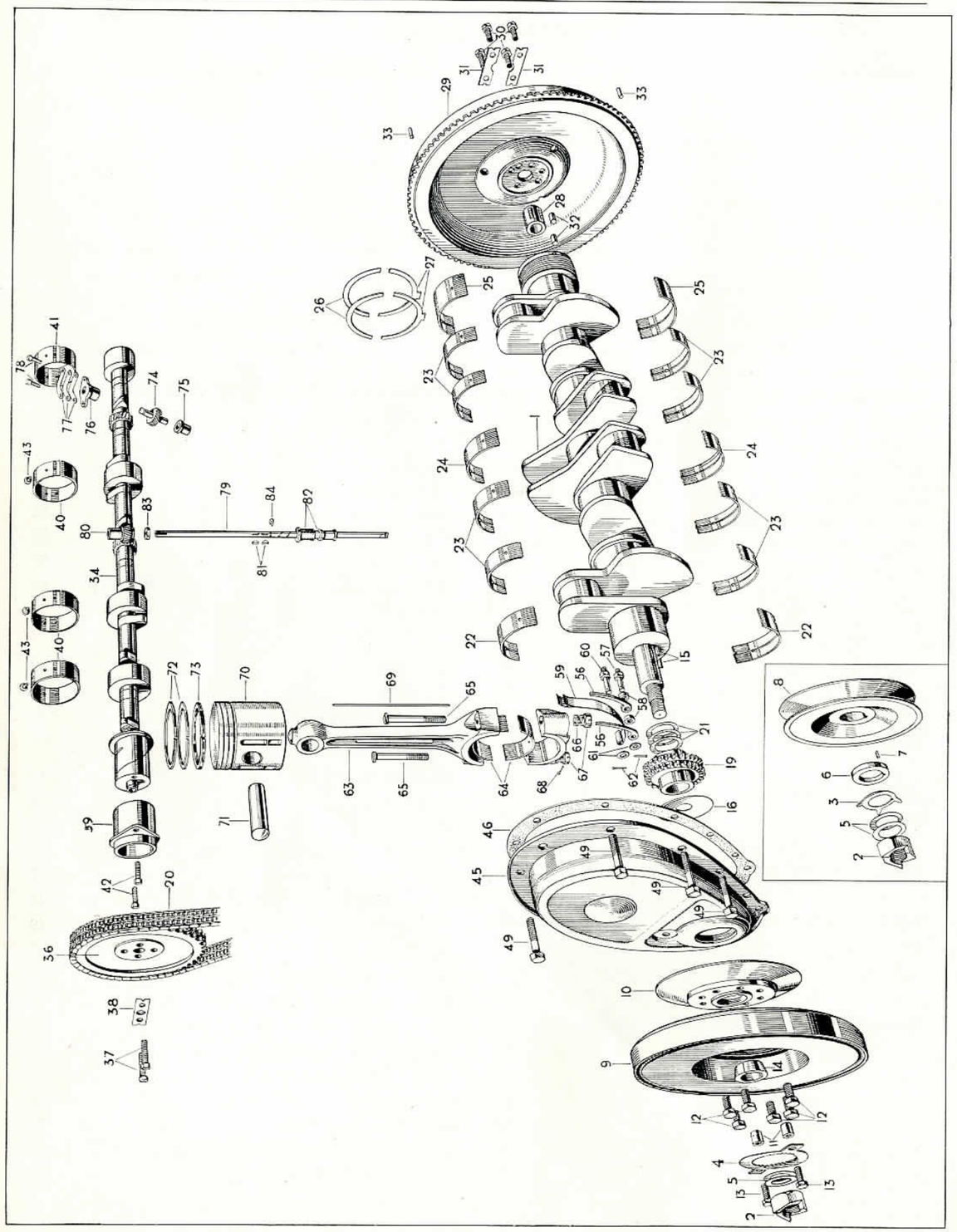

PLATE 8. ENGINE DETAIL, 3½ LITRE.

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OPERATION No. 9.

ENGINE. TO REMOVE.

Remove gearbox. (Operation No. 37, includes No. 102.)
Remove radiator complete. (Operation No. 55.)
Remove dynamo. (Operation No. 33.)
Disconnect all pipes, wires and controls.
Take off nuts holding offside front mounting to engine.
Take weight of engine on slings, behind front engine plate and round flywheel.
Detach nearside front mounting from chassis frame.
Lift engine up and slightly forward until clear of wings.

OPERATION No. 10.

ENGINE. TO DISMANTLE COMPLETELY.

Remove engine. (Operation No. 9.)
Remove rocker gear. (Operation No. 21.)
Remove carburettor/s. (Operation No. 1, 1½ litre.)
(Operation No. 2, 2½/3½ litre.)
Remove sparking plugs and rocker gear oil feed pipe from rear of cylinder head.
Remove revolution counter bracket (2½ litre only).
Remove water pump. (Operation No. 23.)
Remove distributor. (Operation No. 18.)
Remove coil. (Other than left-hand drive models.)
Remove tappet blocks and push rods. (Operation No. 22.)
Remove revolution counter bracket. (3½ litre only.)
Remove revolution counter shaft. (2½ and 3½ litre only.)
Remove distributor drive shaft and oil pump drive shaft.
Remove thermostat and by-pass hose.
Remove cylinder head nuts and lift head.
Dismantle cylinder head. (Operation No. 34.)
Remove oil filter complete. (Operation No. 26.)
Remove timing chain and wheels. (Operation No. 13.)
Remove camshaft. (Operation No. 17.)
Remove clutch and flywheel. (Operation Nos. 76 and 78.)
Remove cylinder head studs. Reverse engine and support on top face of cylinder block.
Remove sump. Remove front and rear bearer plates.
Remove oil pump. (Operation No. 29.)
Remove front and rear sealing blocks.
Remove main line bearing caps.
Remove connecting rod caps and lift out crankshaft.
Withdraw pistons and connecting rods.

OPERATION No. 11.

ENGINE. TO OVERHAUL.

Dismantle engine completely. (Operation No. 10, includes No. 9.)
Thoroughly clean and degrease all parts, preferably by immersing in a degreaser.

Cylinder Block. Examine for any flaws or cracks in the casting and check the top face of the cylinder block and face of cylinder head for truth.

Reboring is recommended when the bore wear exceeds .006". Oversize pistons are available +.005", +.010", +.015", +.020", +.030", +.040".

Reboring beyond the limit of .030" is not recommended, and when the bores will not clean out at .030", liners and standard size pistons (available from the Factory) should be fitted. Piston clearance should be: 1½/2½ litre .0028" — .0034", and 3½ litre .0031" — .0037".

Following reboring and thorough cleaning, the crankcase interior should be painted with heat and oil resisting paint.

Crankshaft. Regrinding of the journals should be carried out when wear in excess of .003" is found. Undersize main line and big end bearings are available in the following undersizes: .020", .030", .040".

Grinding beyond the limit of .040" is not recommended and under such circumstances a new crankshaft should be obtained.

Crankshaft bearing clearance: .001" — .0025".

N.B.: New thrust washers should be used and it should be noted that if standard washers do not obtain the correct end float, additional washers are available. Crankshaft end float .006".

Always check bearing nip on main line and connecting rod journals before assembly (.002").

Ensure that all oil passages in the crankshaft are clear before refitting.

Connecting Rods. Reconditioned connecting rods are obtainable on an exchange basis and it is recommended that this service be utilised whenever overhauls are undertaken.

N.B.: It should be noted that bearings are of the precision shell type and under no circumstances should these be hand scraped or the bearing caps filed.

Reconditioned connecting rods are balanced in sets.

The little ends of the duralumin connecting rods on 2½ and 3½ litre engines are not bushed.

Steel rods with bushed little ends are used on 1½ litre engines. New bushes are pressed into the rods and broached to size.

The alignment of the connecting rods should be checked by use of a connecting rod alignment jig.

Set the connecting rod if necessary.

Pistons. The removal and fitting of gudgeon pins should be carried out by immersing the piston, gudgeon pin and connecting rod little end in a bath of warm oil.

When the piston and little end have reached a sufficient temperature, the gudgeon pin can be pushed into position.

1½ and 2½ litre pistons must be fitted upwards into the bore, since the connecting rods will not pass through the bores.

3½ litre pistons must be fitted by passing the connecting rods down the bore, since the pistons will not pass the crankshaft when in position.

Flywheel. If the starter gear is badly worn a replacement flywheel should be used. Particular note should be taken to ensure that the flywheel is a sound fit on the crankshaft boss, that the dowel pins are a good fit and that new flywheel mounting bolts and tab washers are used on assembly.

If the original flywheel is to be used again, the starter teeth should be trimmed with a file, and the flywheel clutch face faced up by grinding. Under these circumstances the flywheel should be assembled rotated one quarter of a turn from the original position to present fresh starter gear teeth to the starter motor pinion wheel.

N.B.: Two types of flywheel dowels are used as follows:

(a) The dowels are pressed into the crankshaft boss and engage in blind holes in the flywheel.

(b) The flywheel dowels are driven through the flywheel into the crankshaft boss. Positive retention of the dowels is obtained by the mounting bolt lock washers fitted over the dowels.

Clutch. Reconditioned clutch assemblies are obtainable on an exchange basis and it is recommended that this service be utilised whenever overhauls are undertaken.

If a reconditioned assembly is not fitted, ensure that the floating plate friction lining is not worn and is free from grease, that damper springs and thrust springs are sound and the carbon release bearing is not worn.

N.B.: The clutch and flywheel must be in a state of static balance as an assembly. Assemble the clutch unit to the flywheel and mount the assembly on a mandrel. Set up the mandrel with flywheel and clutch mounted on parallel knife edges when it will be found that varying positions of clutch to flywheel assembly will give different conditions of balance.

Select the position giving the best state of balance, marking this position clearly. If necessary, drill balance holes in rim of the clutch body.

On first assembly, 2½ and 3½ litre clutch and flywheels are balanced and doweled, the mating point being marked with the letter "B."

Camshaft. It is unlikely, except after very high mileages, to find wear in the camshaft and camshaft bushes. It should be noted that if the bushes are renewed these must be line bored in the cylinder block. Camshaft end float .003".

Check distributor and oil pump drive gears for wear and renew if necessary.

Valve Gear. Tappets and tappet blocks should be examined and renewed if worn. Test push rods for truth. Check rocker arms and rebush if necessary, note that each arm is drilled and has a felt wick inserted, the hole being sealed by a blob of solder. Renew felt wicks. Replace adjusting screws and lock nuts if necessary. Renew rocker shaft if worn. Valve springs and push rod return springs showing signs of fatigue should be replaced.

Valves should be a good fit in guides and the faces reground to an angle of 30°. Valve guides can be driven upwards using a suitable drift as illustrated in Section O, "Tools and Equipment."

N.B.: When refitting, the valve guides should be driven in from the top of the cylinder head, until the guide protrudes ⅞" above the face of the valve spring recess.

Timing Chain. If the chain shows signs of stretching or wear, a new one should be fitted. If the chain is replaced it is also essential to replace the crankshaft and camshaft sprockets, and the chain tensioner. If a new chain is fitted to worn sprockets, rapid wear of all components in the assembly will occur.

Water pump. Reconditioned water pumps are available on an exchange basis.

If the existing water pump is to be overhauled the impellor spindle bushes, carbon sealing gland and fan spindle bearings should be examined and renewed if necessary.

Fuel Pump. Reconditioned fuel pumps are available on an exchange basis and it is recommended that this service is utilised, since special equipment is required to satisfactorily overhaul these units.

Oil Pump. Examine for wear and renew such parts or the pump body, as necessary.

Carburettor. Other than stripping and cleaning, overhaul is not recommended and if wear is found, advantage should be taken of the Factory reconditioned carburettor scheme on an exchange basis.

Distributor. It is recommended that a Factory reconditioned distributor be fitted, available on an exchange basis. If not, the automatic advance mechanism should be checked for free movement, the points dressed and accurately set. If the rotor pick-up arm is corroded this should be renewed. Replace plug leads if insulation is cracked or oil soaked.

Oil Filter Assembly. Dismantle the assembly, thoroughly clean and fit a new element.

Remove oil pressure release valve and check all parts. If the plunger and seat are pitted, fit new parts, renew the spring if fatigued. Replacement release valve assemblies are available and are recommended in favour of renewal of parts.

Thermostat. Reconditioned thermostats are available on an exchange basis and it is recommended that a reconditioned unit be fitted when overhauls are undertaken.

Fan Belt and Fan Pulleys. Check for wear on pulley driving faces and deterioration of belt, and renew if necessary.

Crankshaft Vibration Damper. (3½ litre only from Engine No. S.1200.) Check for wear of pulley flange and deterioration of damper rubber.

OPERATION No. 12.

PISTON. TO REMOVE.

On $1\frac{1}{2}$ and $2\frac{1}{2}$ litre models the pistons must be withdrawn downwards since the big ends will not pass through the cylinder bores. It is not necessary to remove the cylinder head.

The procedure is as follows :—

Pull piston and connecting rod down until clear of bore and tilt.

Hold piston along crank web and turn crankshaft, withdrawing piston at the same time.

On $3\frac{1}{2}$ litre models the connecting rods can be withdrawn upwards through the bores, following removal of big end bolts and cylinder head.

OPERATION No. 13.

TIMING CHAIN. TO REMOVE AND REFIT.

Remove radiator complete. (Operation No. 55.)
Support the engine.

Release engine stabiliser and front mountings. Lift engine until crankshaft pulley clears front cross member. Remove fan belt, starter dog, locking plate, fan pulley and timing cover.

N.B.: Crankshaft Vibration Damper fitted to $3\frac{1}{2}$ litre, from Engine No. S.1200. (Operation No. 16, includes Remove Engine, Operation No. 9.)

The timing chain assembly consists of crankshaft chain wheel, camshaft chain wheel, timing chain, and timing chain tensioner. The $1\frac{1}{2}$ litre has a single chain, the $2\frac{1}{2}$ and $3\frac{1}{2}$ litre a duplex chain.

The crankshaft chain wheel is keyed in position, and the camshaft chain wheel bolted to the camshaft.

The spring blade of the $1\frac{1}{2}$ litre tensioner is carried on a bracket rivetted to the timing cover and on the $2\frac{1}{2}$ and $3\frac{1}{2}$ litre two fingers are held in contact with the duplex chain by a spring blade mounted on a stud on the front bearer plate.

N.B.: When refitting timing cover ensure that fibre washer is in position on the central bolt supporting the cover, otherwise oil leakage will take place at this point.

Before removing camshaft sprocket, note should be taken of timing marks to facilitate assembly.

If when re-setting the timing it is found that with the wheels in position it is not possible to get the timing sufficiently accurate, one tooth movement of the chain giving too great a correction ; the camshaft wheel, which is driven by two dowels, should be removed and replaced with the other two holes in the wheel on the dowels, which will set the wheel half a tooth out from its original position.

If this is still not correct, the wheel may be reversed, which owing to the manner of drilling, will give two further positions making an adjustment to a quarter of a tooth.

When checking valve timing, tappet clearances should be set at .020". Afterwards re-set to recommended clearance.

The timing cover should be replaced in the following manner to ensure correct oil retention and quiet running. First replace the timing cover with the securing screws just "holding," then place a drop of oil on the inside of the crankshaft pulley, and fit pulley on crank, but with the driving key removed. The pulley will not rotate by hand freely if it rubs on the hole in the timing cover, in which case tap the sides of the cover until it is possible to "spin" the pulley, and then tighten the securing screws. If these precautions are not taken, oil leakage at this point may be experienced.

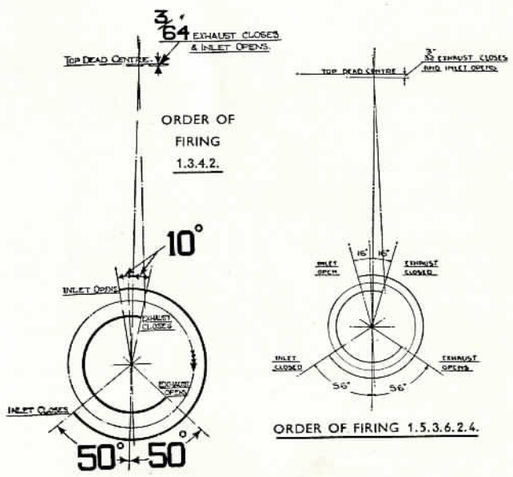
It is advisable to re-check for pulley freedom after tightening the screws, to make sure that the cover has not moved in the process. Finally, fit the pulley key and tighten up the crankshaft nut.

OPERATION No. 14.

VALVE TIMING. TO SET.

Set valve clearance to .020" when setting timing.
No. 1 cylinder is at the rear, that is, the flywheel end.

$1\frac{1}{2}$ litre. $2\frac{1}{2}$ and $3\frac{1}{2}$ litre.



OPERATION No. 15.

IGNITION TIMING. TO SET.

$1\frac{1}{2}$ litre.
The ignition should be set to fire 5° before T.D.C. with the manual control, if fitted, set at full advance. This may require slight alteration when tested on the road.

$2\frac{1}{2}$ and $3\frac{1}{2}$ litre.
The ignition should be set to fire 10° before T.D.C. with the manual control, if fitted, set at full advance. This may require slight alteration when tested on the road.

N.B.: From the following engine numbers it will be found that the ignition manual control is replaced by a micrometer adjustment at the distributor.

$1\frac{1}{2}$ litre. Engine No. KB.4252E.
$2\frac{1}{2}$ litre. Engine No. P.619.
$3\frac{1}{2}$ litre. Engine No. S.1502.
and on all Left-Hand Drive cars.

With this type, set the ignition timing with the micrometer adjustment in the neutral position, that is, with the datum line in the centre of the scale.

On both types ensure that the distributor automatic advance is in the retard position before making the setting.

OPERATION No. 16.

CRANKSHAFT VIBRATION DAMPER. TO REMOVE.

$3\frac{1}{2}$ Litre only, from Engine No. S.1200.

Remove engine. (Operation No. 9.)

Remove two studs securing starting handle dog lock plate.

Remove starting handle dog.

Remove six studs securing rubber loaded half of damper.

Remove rear half of pulley by fitting a suitable tube over end of crankshaft and tapping sharply. (This releases the split cone and allows the pulley to be withdrawn.)

OPERATION No. 17.

CAMSHAFT. TO REMOVE.

Remove timing chain. (Operation No. 13, includes No. 55.)

Remove rocker gear. (Operation No. 21.)

Remove distributor and drive gear. (Operations No. 19 and No. 20, $1\frac{1}{2}$, $2\frac{1}{2}$ and $3\frac{1}{2}$ litre.)

Petrol pump on $1\frac{1}{2}$ litre models. (Operation No. 25)

Remove push rods and tappet blocks. (Operation No. 22.)

Remove bolts securing camshaft front bearing.

Withdraw bearing complete with camshaft.

N.B.: When refitting permissible end float is .003" to .006".

OPERATION No. 18.

DISTRIBUTOR. TO REMOVE.

Remove dowel bolt in adaptor.

Slacken base plate clamp bolts.

Withdraw distributor.

N.B.: To centralise distributor on $1\frac{1}{2}$ litre models. Slacken the two adaptor bolts, turn engine and tighten bolts.

Should it be necessary to remove adaptor for shimming purposes, do not turn engine with adaptor removed or damage to drive gears and camshaft may result.

It is essential to allow .003" clearance between base of adaptor and face of distributor drive gear by correct shimming of the adaptor. The clearance can be checked with a pair of long-nosed pliers engaging the drive gear through the adaptor plate. If this clearance is not allowed damage to the drive gear and camshaft will result. Ignition manual control replaced by micrometer adjustment at distributor from $1\frac{1}{2}$ litre Engine No. KB.4252, $2\frac{1}{2}$ litre P.619, $3\frac{1}{2}$ litre S.1502 onwards and all left-hand drive models.

OPERATION No. 19.

DISTRIBUTOR DRIVE GEAR. TO REMOVE.

$1\frac{1}{2}$ Litre.

Remove distributor. (Operation No. 18.)

Remove dynamo. (Operation No. 33.)

Remove petrol pump. (Operation No. 25.)

Remove tappet cover plate, slacken tappet block bolts disclosed, ease blocks apart. Turn drive gear upwards and out.

N.B.: When renewing drive gear, it is essential to allow .003" clearance between base of adaptor and face of distributor drive gear by correct shimming of the adaptor. The clearance can be checked with a pair of long-nosed pliers engaging the drive gear through the adaptor plate. If this clearance is not allowed, damage to the drive gear and camshaft will result.

OPERATION No. 20.

DISTRIBUTOR DRIVE GEAR. TO REMOVE.

$2\frac{1}{2}$ and $3\frac{1}{2}$ Litre.

Remove distributor. (Operation No. 18.)

Remove dynamo. (Operation No. 33.)

Remove carburettors. (Operation No. 2.)

Remove tappet cover plate and drive gear thrust plate and shims now disclosed.

Withdraw gear upwards and out.

When refitting, allow .006" end float.

OPERATION No. 21.

ROCKER GEAR. TO REMOVE.

Remove air silencer. (On $1\frac{1}{2}$ litre and left-hand drive $2\frac{1}{2}$ and $3\frac{1}{2}$ litre.)

Remove rocker cover.

Remove nuts securing gear to cylinder head.

Lift off rocker gear complete.

N.B.: To control lubrication of the rocker pads and valve guides, each arm is drilled and a small felt wick inserted. This hole being sealed by a blob of solder.
Should an excess of oil pass the rockers and valve guides causing oiling up of plugs or excessive oil consumption, the wicks should be renewed.

OPERATION No. 22.

PUSH RODS AND TAPPET BLOCKS. TO REMOVE.

Remove rocker gear. (Operation No. 21.)

Remove dynamo. (Operation No. 33.)

Remove distributor. (Operation No. 18.)

Remove carburettors. (On $2\frac{1}{2}$ and $3\frac{1}{2}$ litre only.)

Remove tappet cover plate and bolts securing tappet blocks now disclosed.

Remove distributor drive gear.

$1\frac{1}{2}$ litre (Operation No. 19.)
$2\frac{1}{2}$ and $3\frac{1}{2}$ litre (Operation No. 20)

Withdraw push rods out of tappets with tool described in Section O, "Tools and Equipment, and remove tappet blocks complete. Failing the availability of this tool the rods can be withdrawn with cords tied to the push rod cups.

Remove push rods, springs and cups.

N.B.: On $1\frac{1}{2}$ and $2\frac{1}{2}$ litre models, tappet block bolts are not interchangeable, the centre bolts being longer. If incorrectly fitted, severe damage will be caused to cylinders and pistons.

On $2\frac{1}{2}$ and $3\frac{1}{2}$ litre models, remove revolution counter drive shaft before withdrawing centre tappet block as follows :—

Remove tappet block bolts. Lift revolution counter drive gear thrust plate. Slide drive gear up shaft. Remove circlip and two locating keys. Withdraw shaft upwards.

OPERATION No. 23.

WATER PUMP. TO REMOVE.

Remove bonnet and radiator complete. (Operations Nos. 81 and 55.)

Remove fan belt, radiator water hose, disconnect by-pass hose.

Remove five bolts securing pump to cylinder block.

Remove pump complete with fan.

N.B.: It is advisable when refitting pump to insert a coil of lead wire under the bolt heads to create a seal against water leakage.

The pump may be removed without displacing the radiator, but in practice it will be found that the operation described is more convenient.

OPERATION No. 24.

WATER PUMP. TO DISMANTLE.

Withdraw countersunk screws and remove back plate. ($1\frac{1}{2}$ litre only.) (Bolts on $2\frac{1}{2}$ and $3\frac{1}{2}$ litre.)

Drive out pin retaining driving dog on front of shaft.

Remove dog and spring.

Withdraw shaft with impellor and conical faced collar to rear.

N.B.: Collar is pinned to shaft and dogged to impellor. Shaft runs in bronze bushes in housing.

Pulley runs on two ball bearings, the assembly being pressed on to the housing with felt oil retaining washers front and rear.

Water seal is maintained by a carbon gland which requires no lubrication.

OPERATION No. 25.

PETROL PUMP. TO REMOVE. $1\frac{1}{2}$ Litre.

Disconnect revolution counter drive adaptor at dynamo.

Disconnect inlet and outlet petrol pipes.

Remove two bolts securing pump to engine.

Lift out pump.

N.B.: When replacing care should be taken to ensure that pump operating arm is seated correctly on face of camshaft.

OPERATION No. 26.

OIL FILTER ASSEMBLY. TO REMOVE.

Remove four mounting bolts securing assembly to cylinder block.

Remove assembly complete.

N.B.: New gaskets must always be used when replacing.

OPERATION No. 27.

OIL FILTER ASSEMBLY. TO SERVICE.

Slacken bolt securing canister to body.

Withdraw canister complete with element.

When re-assembling renew rubber sealing ring on top of canister if this is distorted or damaged.

N.B.: It has been found that with present day fuels, certain fractions remain unburned and contaminate the lubricating oil, inducing a tendency to sludge formation, which has the effect of choking the oil filter element. We therefore recommend, while the present conditions exist, that the filter element shall be cleaned every 2,500 miles and renewed at 5,000 miles.

OPERATION No. 28.

OIL PRESSURE. TO ADJUST.

On right-hand drive the oil pressure release valve is incorporated in the oil filter assembly body attached to the cylinder block. On left-hand drive the release valve is incorporated in the adaptor attached to the cylinder block, the filter body being bolted to the stabiliser arm and connected to the adaptor by flexible pipes. (See Plates 28 and 29.)

Remove dome nut and washer, slacken lock nut.

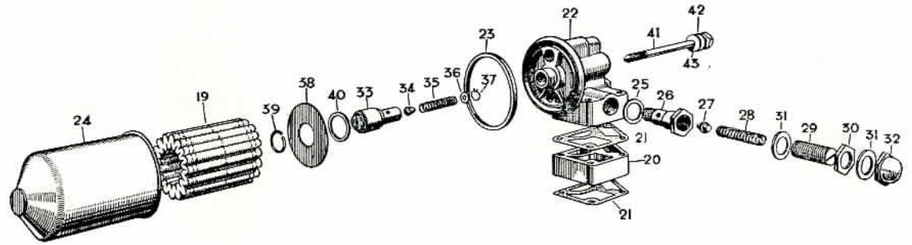
Carry out adjustment at the screw now disclosed. Rotating this clockwise increases, and anti-clockwise decreases, the oil pressure.

N.B.: Due to the setting of the by-pass valve incorporated in the filter assembly, blocking of the oil filter element will cause a fall in oil pressure and the possibility of a fluctuating reading on the oil pressure gauge.

Satisfactory oil pressures are as follows :—

$1\frac{1}{2}$ litre. 40—60 lbs. per sq. inch @ 2,500 r.p.m.
$2\frac{1}{2}$ litre. 40—60 lbs. per sq. inch @ 2,500 r.p.m.
$3\frac{1}{2}$ litre. 40—60 lbs. per sq. inch @ 2,500 r.p.m.

When the engine is at normal operating temperature.



OIL FILTER ASSEMBLY, $1\frac{1}{2}$ LITRE. PLATE 9.

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OIL CLEANER.

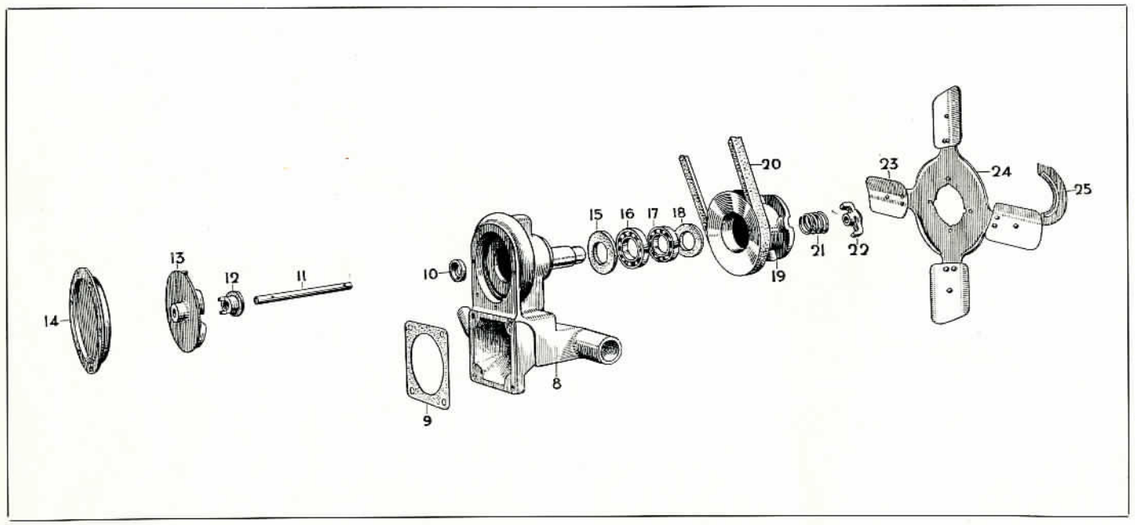

PLATE 10. WATER PUMP ASSEMBLY, 1½ LITRE.

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WATER PUMP, COMPLETE.

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Spindle	11	Piece, Driving	22
Piece, Driving, for Rotor	12		
Impellor	13	**FAN BLADE ASSEMBLY.**	
Plate, Cover, on Body	14	Belt, Fan Driving	20
Washer, Felt, Front, $1\frac{9}{16}$" dia.	15	Blade, Fan	23
Bearing, Ball (Hoffman S.10)	16	Centre (Fan)	24
Bearing, Ball (Hoffman S.9)	17	Piece, Balance	25

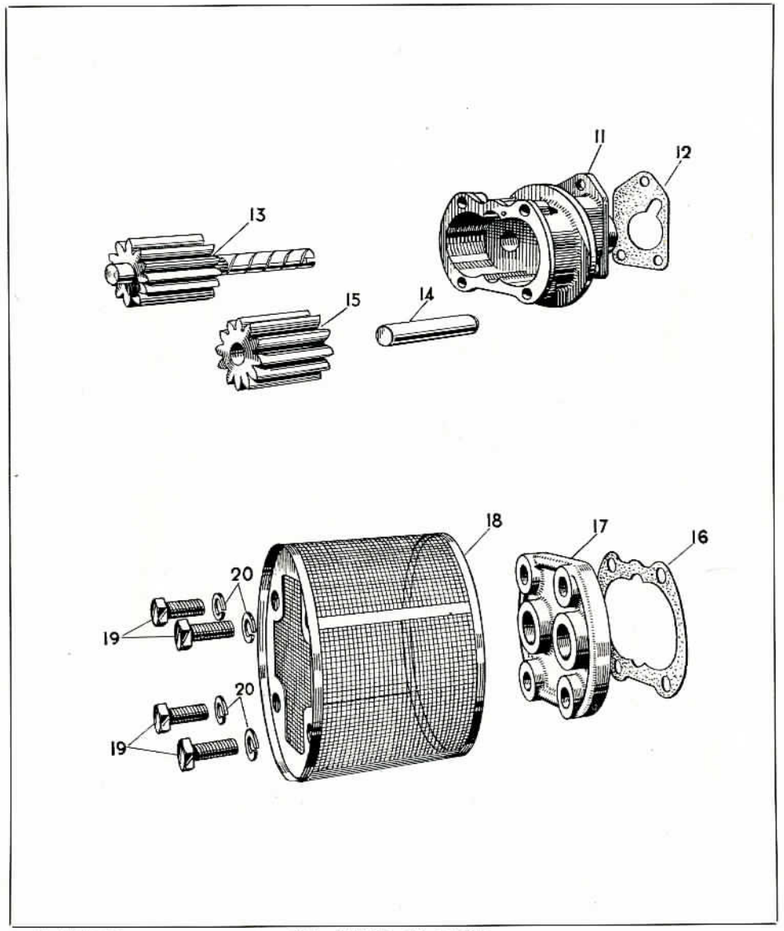

PLATE 11. OIL PUMP, 2½ LITRE.

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Screw, Set, securing Filter and Cover to Body	19
Washer, Spring	20

OPERATION No. 29.

OIL PUMP. TO REMOVE.

Remove sump.

Remove three bolts securing pump to cylinder block.

Withdraw pump complete.

OPERATION No. 30.

OIL PUMP. TO DISMANTLE.

Remove four bolts passing through filter into body of pump.

Remove filter, end plate and pump gears.

OPERATION No. 31.

FAN BELT. TO REMOVE.

On $2\frac{1}{2}$ and $3\frac{1}{2}$ litre models release dynamo and swing towards cylinder block to release fan belt for removal.

On $1\frac{1}{2}$ litre models it is also necessary to remove radiator bottom hose to withdraw belt.

N.B.: It is important to ensure that when fitting the belt, due to its construction, that this is not stretched over the pulleys other than by hand.

If a tool is used to lever the belt on or off, rupture will occur.

OPERATION No. 32.

FAN BELT. TO ADJUST.

Slacken mounting bolts and adjusting bolt on top of dynamo.

Lever dynamo until tension is just obtained.

Tighten adjusting bolt and mounting bolts.

N.B.: Undue tension will create heavy wear of belt, pulleys and dynamo bearings.

OPERATION No. 33.

DYNAMO. TO REMOVE.

Disconnect wiring.

Remove adjusting bolt and two securing bolts under dynamo.

Remove belt from pulley and withdraw dynamo.

N.B.: When replacing, care should be taken to replace the distance piece on the front securing bolt.

It is essential to replace the dynamo wires in the correct terminals as follows :—

Terminal F. Green and Black wire. (In some cases Green.)

Terminal D. Yellow wire.

OPERATION No. 34.

DECARBONISING AND GRINDING VALVES.

Remove bonnet. (Operation No. 81.)

Drain radiator and block (drain plug, or tap on later $2\frac{1}{2}$ and $3\frac{1}{2}$ litre cars, in block will be found on offside of engine.)

Disconnect carburettor controls.

Remove top water hose, remove rocker cover, rocker gear, disconnect rocker feed oil pipe, petrol feed pipe and on $2\frac{1}{2}$ litre models, disconnect revolution counter cable, and wire from carburettor solenoid to petrol pump on $2\frac{1}{2}$ and $3\frac{1}{2}$ litre.

Disconnect plug leads and remove sparking plugs.

Remove cylinder head nuts, disconnect radiator block tie rods and disconnect exhaust down pipes.

Lift off cylinder head.

When head is off, remove exhaust, manifolds and carburettors. On $1\frac{1}{2}$ litre remove inlet manifold (This is most important.)

Remove valve springs and valves ; it is advisable in all cases to re-face valve seats and valves before grinding in seats.

Valves will be found to be numbered and should be replaced in correct order, number one being to the rear of the engine.

On $2\frac{1}{2}$ and $3\frac{1}{2}$ litre models the cylinder head is fitted with a venturi tube and the induction blanks should be removed and the induction system thoroughly cleaned.

New blanks must be fitted when re-assembling.

It will be found that a compression plate is fitted on the following engines.

$3\frac{1}{2}$ litre : Engine Nos. 1 to 25 ; Engine No. S.36 and subs.
$2\frac{1}{2}$ litre : Engine Nos. 1 to 17 ; Engine Nos. P.18 to P.200.
$1\frac{1}{2}$ litre : Engine Nos. KB. 1001E to KB.3098E, and KB.4983 onwards.

Also all Export Models.

New cylinder head gaskets should always be used and when fitting, jointing compound should only be used around water apertures.

N.B.: Corrujoint cylinder head gaskets are marked to indicate correct fitting ; however it is advantageous to offer up the gasket before fitting to ensure that the apertures in the gasket coincide with the cylinder block water passages.

When a compression plate is fitted it is necessary to use two Corrujoints, one above and one below the plate.

OPERATION No. 35.

ENGINE TUNING.

1. General Tuning Instructions.

Before commencing any engine adjustment, run the engine until a water temperature of approximately 65—70°C. is recorded, and using the starting handle check that all compressions are good. If one or more compressions are weak it will most probably be due to poor valve seatings, when the cylinder head must be removed and the valves and seats refaced and reground.

Assuming that the compressions are good, remove the rocker cover, and check that all valve springs are intact, and adjust the tappet clearances, these being :—

$1\frac{1}{2}$ litre.	.015" Inlet.
	.018" Exhaust.
$2\frac{1}{2}$ and $3\frac{1}{2}$ litre.	.012" Inlet.
	.015" Exhaust.

To Carry Out Adjustments.

N.B.: In all cases set tappets with engine hot. No. 1 cylinder is at the rear, that is, the flywheel end.

To obtain accurate settings, each valve should be adjusted with the tappet on the back of the cam.

This is achieved as follows :—

For $1\frac{1}{2}$ litre Engines. Turn engine by starting handle, and :

Set No. 1 Cylinder Inlet with No. 4 Cylinder Inlet fully open.
Set No. 3 Cylinder Inlet with No. 2 Cylinder Inlet fully open.
Set No. 4 Cylinder Inlet with No. 1 Cylinder Inlet fully open.
Set No. 2 Cylinder Inlet with No. 3 Cylinder Inlet fully open.
Set No. 1 Cylinder Exhaust with No. 4 Cylinder Exhaust fully open.
Set No. 3 Cylinder Exhaust with No. 2 Cylinder Exhaust fully open.
Set No. 4 Cylinder Exhaust with No. 1 Cylinder Exhaust fully open.
Set No. 2 Cylinder Exhaust with No. 3 Cylinder Exhaust fully open.

Firing order : 1 3 4 2

For $2\frac{1}{2}$ and $3\frac{1}{2}$ litre Engines. Turn engine by starting handle, and :

Set No. 1 Cylinder Inlet with No. 6 Cylinder Inlet fully open.
Set No. 5 Cylinder Inlet with No. 2 Cylinder Inlet fully open.
Set No. 3 Cylinder Inlet with No. 4 Cylinder Inlet fully open.
Set No. 6 Cylinder Inlet with No. 1 Cylinder Inlet fully open.
Set No. 2 Cylinder Inlet with No. 5 Cylinder Inlet fully open.
Set No. 4 Cylinder Inlet with No. 3 Cylinder Inlet fully open.
Set No. 1 Cylinder Exhaust with No. 6 Cylinder Exhaust fully open.
Set No. 5 Cylinder Exhaust with No. 2 Cylinder Exhaust fully open.
Set No. 3 Cylinder Exhaust with No. 4 Cylinder Exhaust fully open.
Set No. 6 Cylinder Exhaust with No. 1 Cylinder Exhaust fully open.
Set No. 2 Cylinder Exhaust with No. 5 Cylinder Exhaust fully open.
Set No. 4 Cylinder Exhaust with No. 3 Cylinder Exhaust fully open.

Firing order : 1 5 3 6 2 4

2. Remove, Clean, Adjust, Test and Refit Sparking Plugs.

Champion L.10.S Sparking Plugs are used on $1\frac{1}{2}$ and $3\frac{1}{2}$ litre engines, and on $2\frac{1}{2}$ litre engines up to and including No. P.200. On $2\frac{1}{2}$ litre engines from P.200 Champion N.A.8 long-reach Sparking Plugs are used.

N.B.: Later engines are fitted with softer plugs L.10 in place of L.10.S and N.8 in place of N.A.8.

Plugs should be cleaned by sand blasting ; points set to .025" (all models) and tested, using Champion plug cleaning and testing equipment.

3. Clean and Adjust Distributor.

(i) Remove distributor head, check centre brush and segments.

(ii) Check operation of automatic advance, and lubricate spindle.

(iii) Clean and adjust contact breaker points to .012". Place a spot of oil or light grease on distributor cam.

(iv) Refit head and check tightness of all H.T. and L.T. connections on distributor and coil.

(v) Check that manual advance and retard control operates correctly, if fitted. (See Note, paragraph 6.)

N.B.: Ensure that there is no lift in the distributor. Should the distributor adaptor dowel bolt which retains the distributor work loose, the distributor will rise and fall with fluctuations in engine revolutions, upsetting ignition timing.

4. Clean and Check Petrol Pumps.

(One A.C. Mechanical on $1\frac{1}{2}$ litre ; one S.U. Electric on $2\frac{1}{2}$ litre, and two S.U. Electric on $3\frac{1}{2}$ litre.)

(a) **$1\frac{1}{2}$ litre A.C. Pump.** Remove filter dome and gauze, clean and refit.

(b) **For S.U. Pump.** Remove filter at base of pump body, clean and refit.

For $3\frac{1}{2}$ litre models, test operation of both pumps.

5. Clean and Adjust Carburettors.

(i) Remove air silencer(s) and adaptor pipe. Thoroughly clean air silencer gauze cleaning elements.

(ii) Test free operation of carburettor piston(s) by lifting with finger and noting clean drop.

(iii) Check correct jet needle fitted :—

Right-hand Drive. $1\frac{1}{2}$ litre—F.A. $2\frac{1}{2}$ litre—D.S. $3\frac{1}{2}$ litre—D.Y.

Left-hand Drive. $1\frac{1}{2}$ litre—F.A. $2\frac{1}{2}$ litre—R.3. $3\frac{1}{2}$ litre—F.L.

N.B.: The boss of the needle should be fitted flush with the base of the piston.

(iv) The clearance between piston and dash pot is not measured mechanically but by air leak. Test the piston drop, which should be 4 to 6 seconds, as follows :—

Hold the piston inverted in the right hand with a finger over the air hole. With the left hand push the dash pot on to the piston as far as it will go. Allow the dash pot to fall, noting the time taken, which should be as mentioned above, 4 to 6 seconds.

Wipe out (do not use metal polish) dash pot, piston and spindle, and refit. Insert the recommended grade of engine oil in spindle chamber.

Note : $1\frac{1}{2}$ and $3\frac{1}{2}$ litre models have hydraulic piston dampers, and oil level in spindle chamber

must be checked frequently. Absence of oil will cause weakness of mixture on acceleration and poor performance. The correct level of oil is to the top of the hollow piston spindle chamber.

(v) Remove carburettor petrol pipe unions, remove and clean petrol filters and refit.

(vi) Check the petrol level in the float chamber as follows :—

With the float chamber cap removed and held inverted, it should be just possible to pass a $\frac{3}{8}$" bar (or shank of a $\frac{3}{8}$" drill) under the needle valve operating fork when the needle is on its seating.

(vii) Lubricate throttle controls and check free operation and full travel.

On $1\frac{1}{2}$ litre models check free and full travel of choke (jet) control.

(viii) Run engine to obtain water temperature of approximately 65°C. and for :—

(a) **$1\frac{1}{2}$ litre.**—set slow running speed to 400 r.p.m. with mixture set as rich as possible, consistent with even slow running, when the exhaust beat should be regular and even.

(b) **$2\frac{1}{2}$ and $3\frac{1}{2}$ litre**—set both carburettors to suck equally at slow running speed of 450 r.p.m. Set mixture as rich as possible consistent with even slow running, when the exhaust beat should be regular and even.

Check operation of thermostatically operated starter carburettor by shorting carburettor thermostat connection in water uptake manifold to earth and flicking throttle open when engine should run at approximately 1,200 r.p.m. without excessive hunting.

Mixture setting of starter carburettor is adjusted by rotating nut surrounding primer valve, turning nut anti-clockwise enriches and clockwise weakens the mixture.

If difficult starting from cold is experienced in the form of the engine starting but failing to keep running, test with the engine stone cold, and adjust mixture setting by turning the hexagon nut in an anti-clockwise direction until the engine runs steadily without excessive hunting. The self-starting carburettor should cut out at 35°C.

Starter Jet Needles.

$2\frac{1}{2}$ litre ... 45/8. $3\frac{1}{2}$ litre ... 65/8.

These markings will be found on the circumference of the thimble below the disc on the needle and on the needle itself.

6. Test Car on road and set fixed setting of ignition timing on distributor, so that with manual control fully advanced, the engine will just pink on full throttle under load at 2,000 r.p.m.

N.B. : From the following engine numbers it will be found that the ignition manual control is replaced by a micrometer adjustment at the distributor.

This setting should, of course, be made at the micrometer adjustment.

$1\frac{1}{2}$ litre. Engine No. KB.4252.
$2\frac{1}{2}$ litre. Engine No. P.619.
$3\frac{1}{2}$ litre. Engine No. S.1502 onwards.
and on all Left Hand Drive cars.

Correct operation of radiator thermostat should be checked, as if the engine runs too cool, ignition setting and performance will be affected.

Quick warm up should be noted.
Normal running temperature 65° to 80°C.

OPERATION No. 36.

FROST PRECAUTIONS.

In view of the possibility of some water being left in the engine cooling system or car heater by only part drainage, and the possible freezing of the radiator water when the car is in motion prior to the opening of the thermostat, the use of anti-freeze mixture throughout the winter months is strongly recommended on current Jaguar models.

In the event of anti-freeze mixture not being used, the following points should be noted :—

(1) Draining the radiator does not drain the cylinder block.

(2) To drain the cylinder block, it is necessary to remove the hexagonal plug (drain tap on later $2\frac{1}{2}$ and $3\frac{1}{2}$ litre engines) on the offside rear of the block, at the same time draining the radiator by use of the drain tap.

(3) When radiator and cylinder block have been drained, water is still present in the car heater ($1\frac{1}{2}$ litre Special Equipment, and $2\frac{1}{2}$ and $3\frac{1}{2}$ litre models).

(4) No drainage system was fitted for the car heater on early production models, but a drain passage with hexagonal drain plug is now being introduced at the front end of the base of the heater cover.

$1\frac{1}{2}$ LITRE	Chassis No. 410001 onwards Chassis No. 430001 onwards	Double helical.
$2\frac{1}{2}$ LITRE	Chassis Nos. 510001—510880, excluding 510859 and 510860 (individual cars)	Double helical.
	Chassis No. 510881 onwards, also chassis numbers 510859 and 510860 (individual cars) Also all Saloon Left-Hand Drive chassis number 530001 onwards. Coupés chassis number 517001 onwards	Single helical. S.H. Series.
$3\frac{1}{2}$ LITRE	Chassis Nos. 610001—612040	Double helical.
	Chassis No. 612041 onwards Also all Saloon Left-Hand Drive chassis number 630001 onwards. Coupés chassis number 617001 onwards	Single helical. S.H. Series.

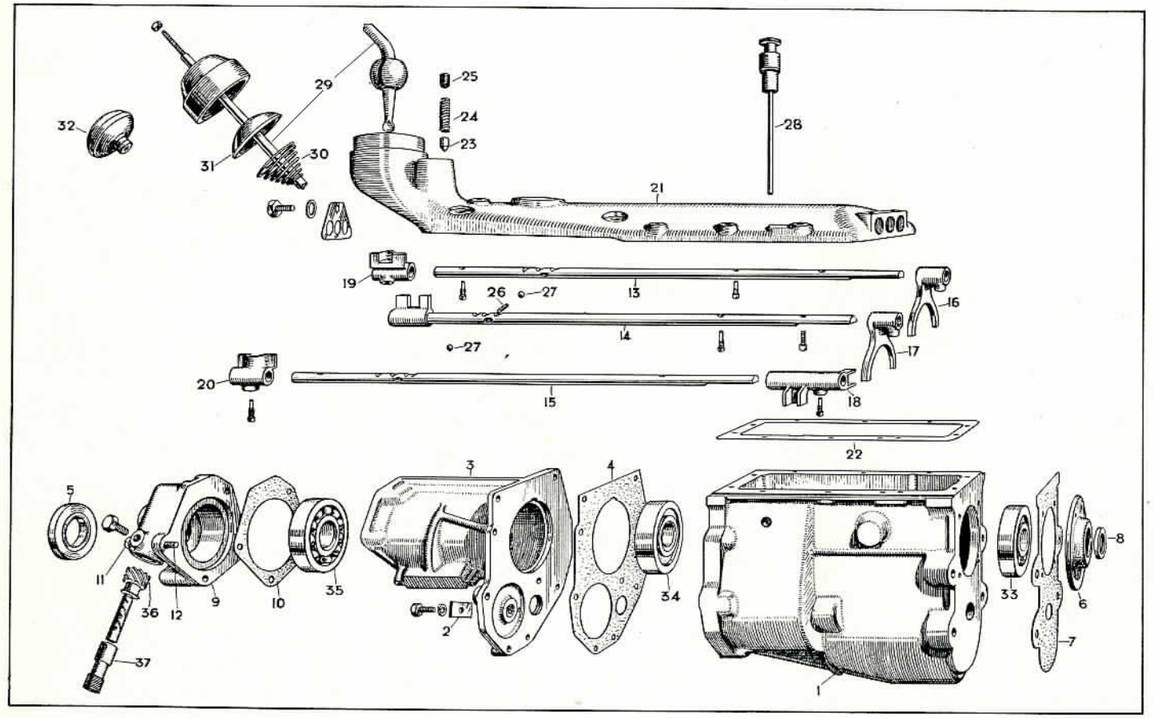

PLATE 12. 1½ LITRE GEARBOX. CASE AND REMOTE CONTROL.

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Bearing, Roller, for Constant Pinion Shaft	33
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Washer	4
REAR END COVER FOR GEARBOX	9
Seal, Oil	5
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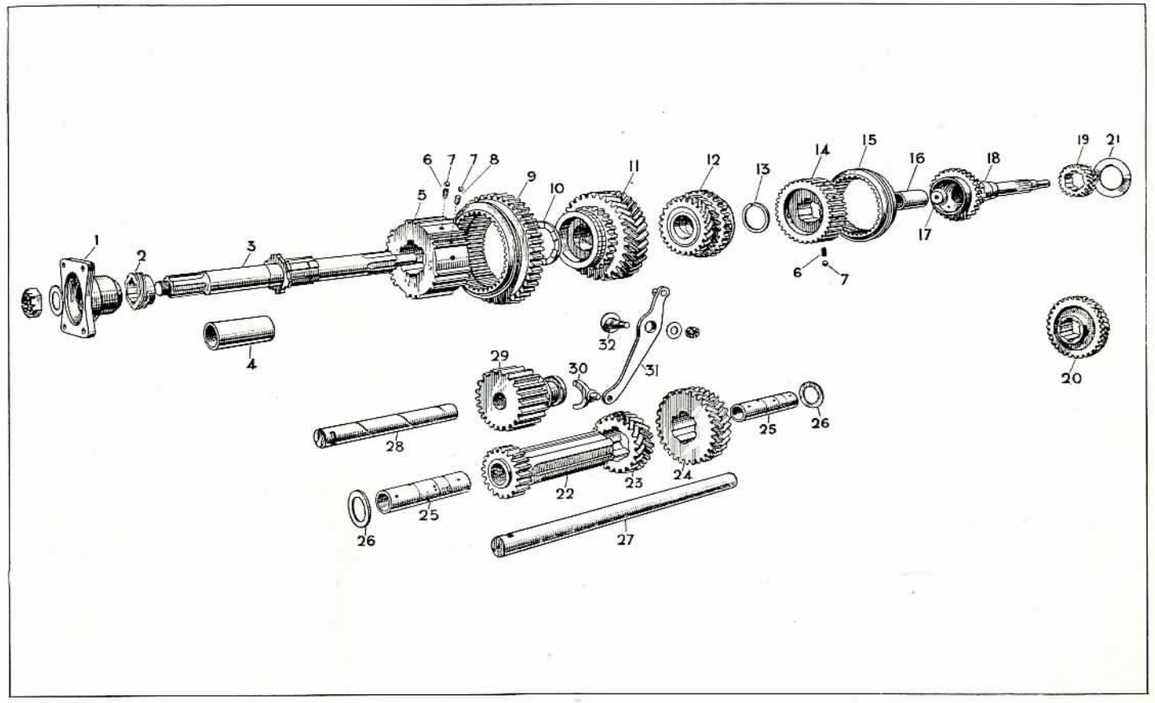

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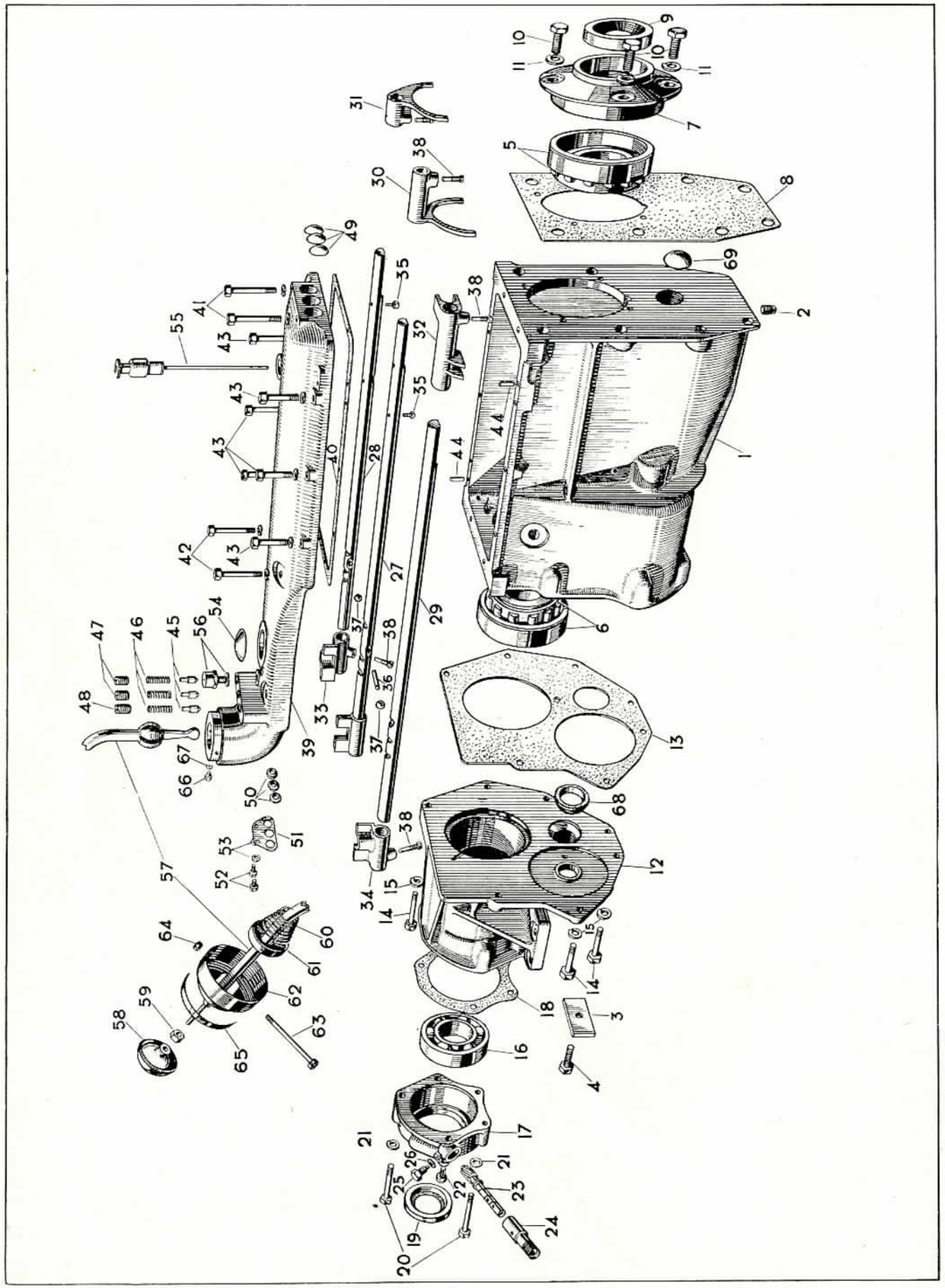

PLATE 14. $2\frac{1}{2}$ AND $3\frac{1}{2}$ LITRE DOUBLE HELICAL GEARBOX. CASE AND REMOTE CONTROL.

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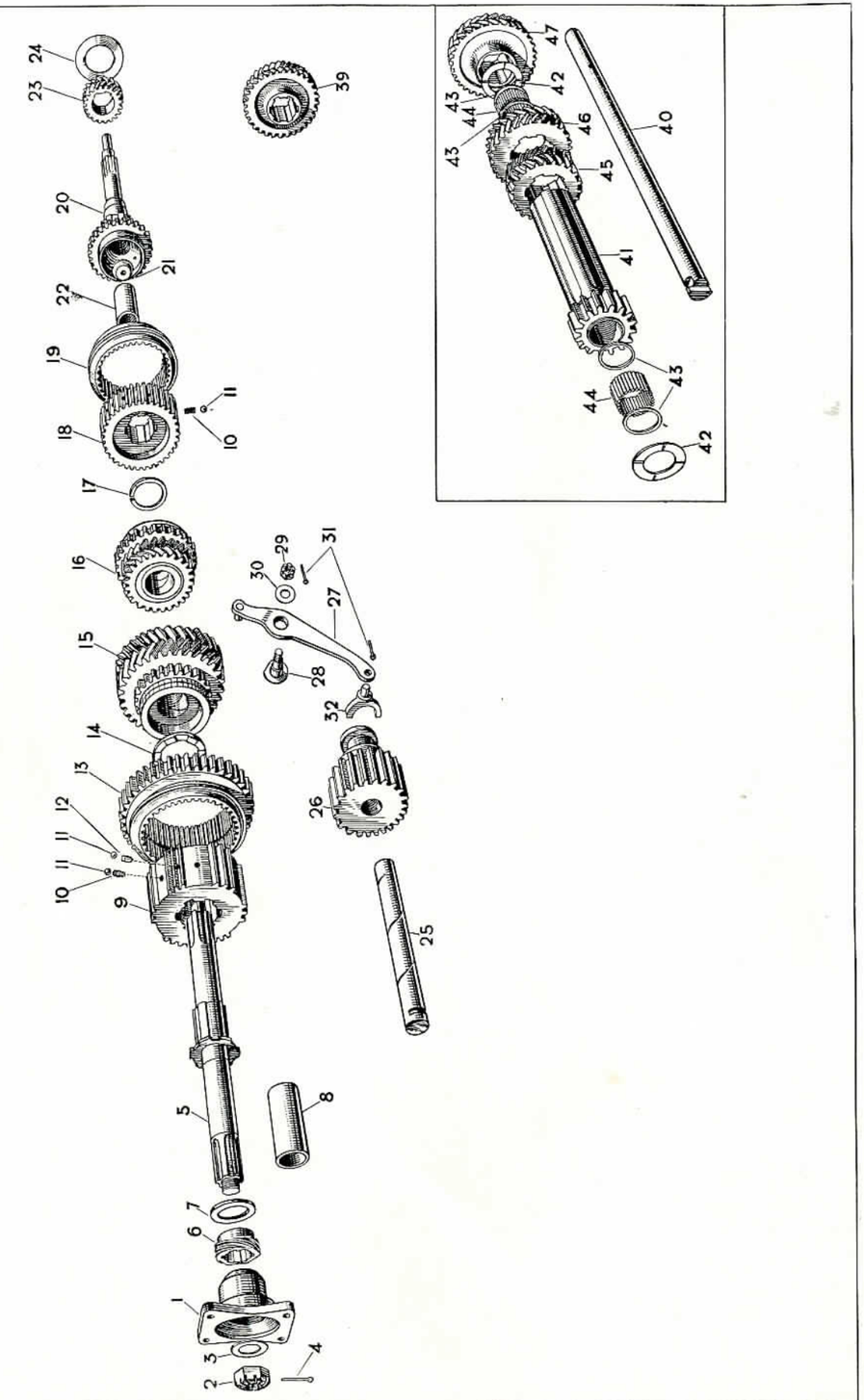

PLATE 15. $2\frac{1}{2}$ AND $3\frac{1}{2}$ LITRE DOUBLE HELICAL GEARBOX. GEARS.

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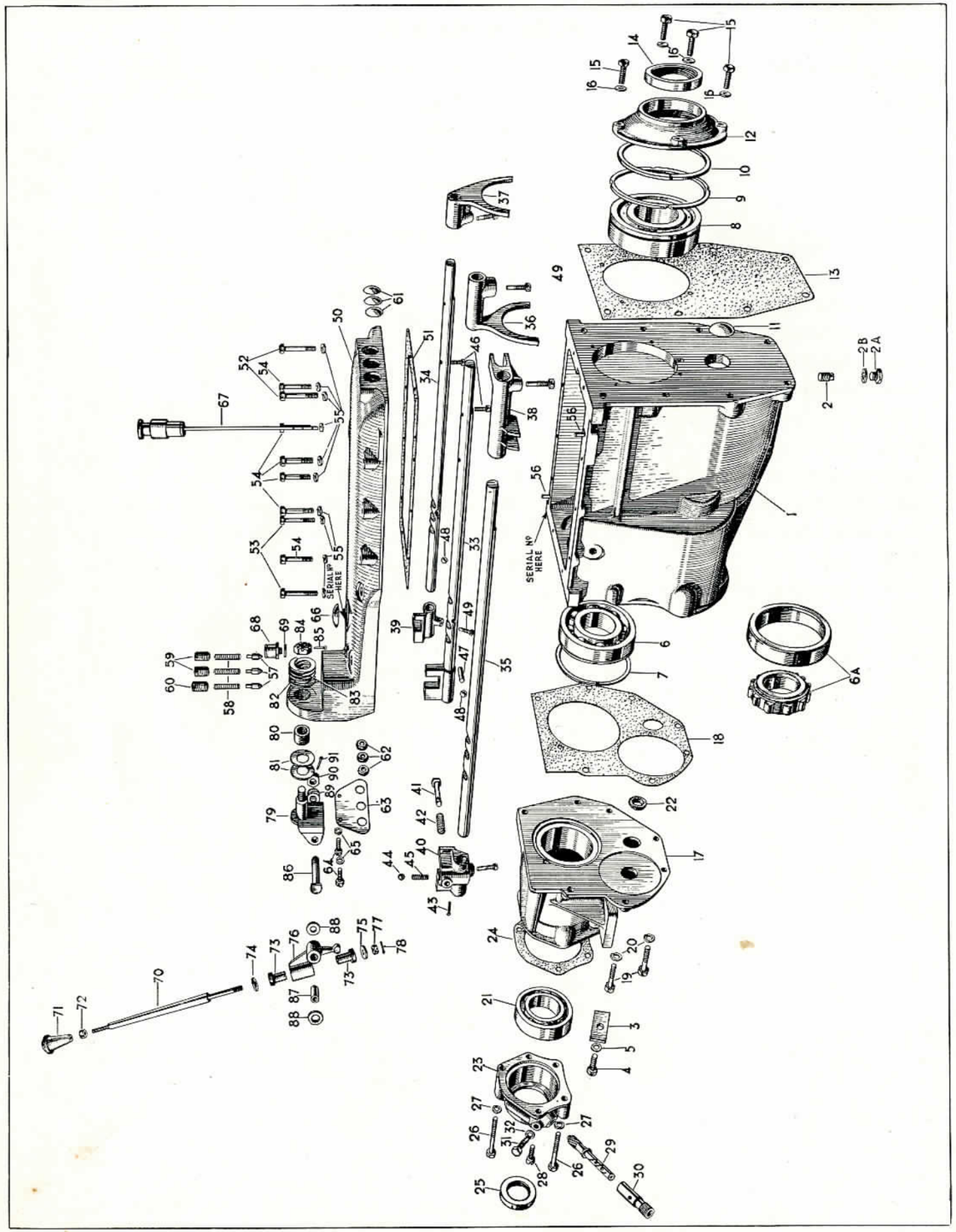

PLATE 16. $2\frac{1}{2}$ AND $3\frac{1}{2}$ LITRE SINGLE HELICAL GEARBOX. CASE AND REMOTE CONTROL

INDEX TO PLATE 16.

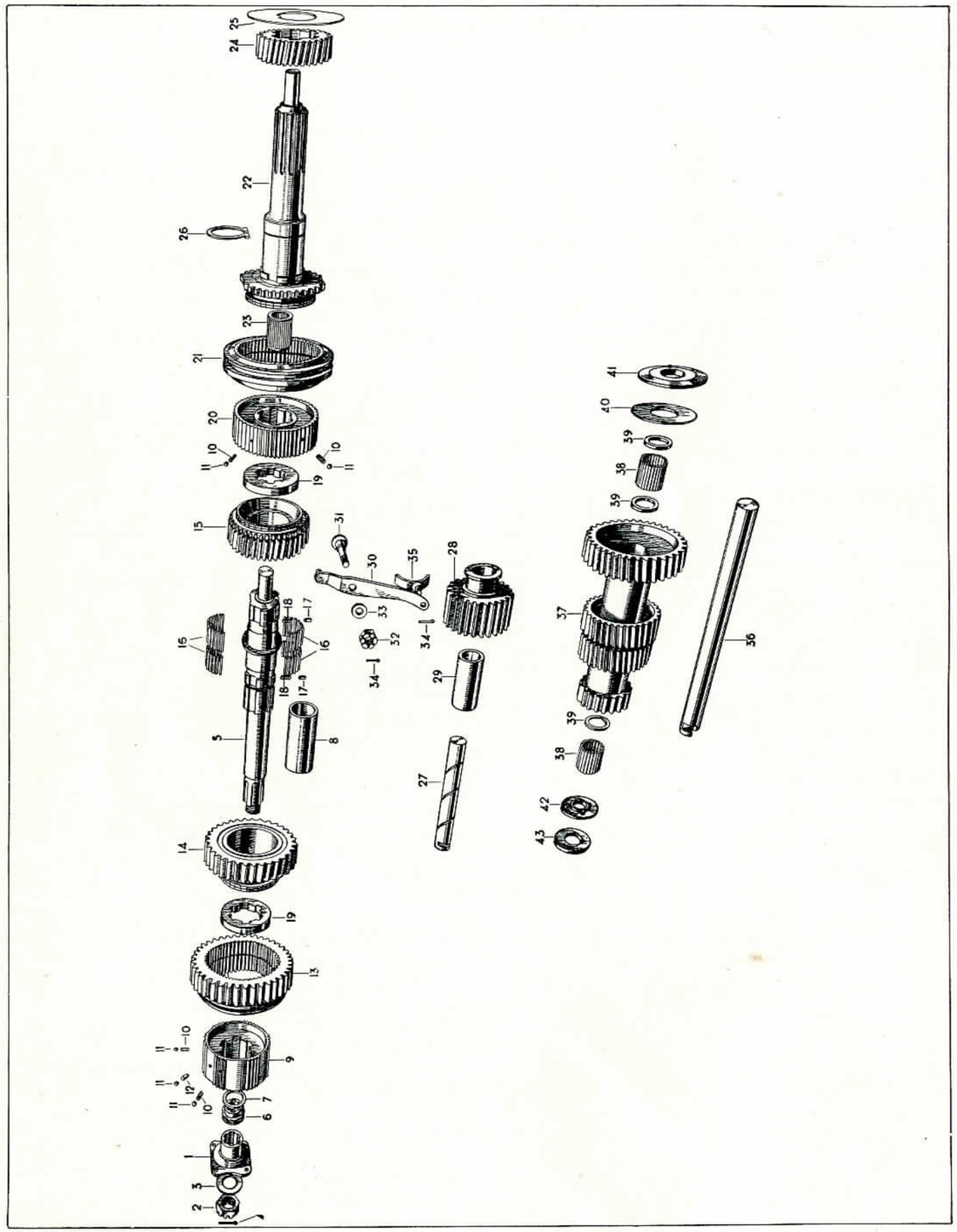

PLATE 17. 2½ AND 3½ LITRE SINGLE HELICAL GEARBOX. GEARS.

INDEX TO PLATE 17.

OPERATION No. 37.

GEARBOX. TO REMOVE AND REFIT.

Disconnect battery.

Remove front seats, carpets, gearbox cowl, toeboards and front floorboards. (Operation No. 102.)

Disconnect reverse light wiring from remote control.

Disconnect front end of propellor shaft and gearbox rear mountings situated below gearbox extension.

Disconnect engine stabiliser mounting.

It is advisable to dismount exhaust down pipes and heater hoses at floating dash, to avoid strain when the engine is raised.

Jack up engine under rear end of crankcase sump to take weight, interposing suitable packing to prevent sump damage.

Remove starter motor. (Operations Nos. 79 and 80.)

Remove bell housing flange bolts.

Draw off gearbox and lift out through door.

N.B.: On reassembly, it is necessary to ensure that the gearbox is correctly aligned with the engine or jumping out of top gear may be experienced. To effect alignment, operate the clutch pedal approximately twelve times with top gear engaged, before fully tightening the clutch bell housing and gearbox mounting bolts.

To refit, reverse the above operations.

OPERATION No. 38.

GEARBOX. TO DISMANTLE.

Withdraw dipstick, remove bolts and lift off top cover and remote control assembly. Remove clutch bell housing.

Engage top and first gears to lock box, remove driving flange nut and draw off flange.

Remove speedometer drive gear locking screw and withdraw bearing and driven gear.

Remove rear end cover set screws and draw off end cover. Note special short set screw passing through speedometer drive housing.

Draw off extension complete with counter shaft, reverse shaft and mainshaft rear ball bearing. This allows counter shaft gears to rest at the bottom of the box and out of engagement with the mainshaft gears.

Remove set screws and withdraw front end cover.

Drive mainshaft back by tapping constant pinion shaft until outer race of rear roller bearing is free and inner race can be drawn off shaft.

N.B.: On single helical boxes it is necessary to draw the complete ball bearing off the shaft.

Drive mainshaft forward to drive out constant pinion shaft with roller bearing (single helical ball bearing) and constant pinion bush and thrust button. (Single helical needle rollers, thrust button not fitted.)

Lift out mainshaft assembly through top of box.

Lift out counter shaft gears consisting of first gear pinion with second, third and top gears splined to shaft. (On Single Helical, cluster assembly.) Remove reverse gear wheel.

N.B.: On $1\frac{1}{2}$ litre shaft runs on six floating bronze bushes, and on $2\frac{1}{2}$ and $3\frac{1}{2}$ litre double helical and single helical on needle roller bearings. Thrust washers are fitted at either end of the counter shaft.

Dismantle mainshaft by pulling off top and third synchromesh unit complete, extract circlip and remove third and second gears, thrust washer and second gear synchro unit with sliding first gear.

N.B.: Third and second gears are bushed but these bushes are not serviced separately.

The constant pinion gear is pressed on to the shaft behind the inner race of the roller bearing (single helical ball bearing) with oil thrower between, and secured by splines on $1\frac{1}{2}$ litre and $2\frac{1}{2}/3\frac{1}{2}$ litre single helical boxes. On $2\frac{1}{2}$ and $3\frac{1}{2}$ litre double helical, the gear is keyed to the shaft.

N.B.: As $1\frac{1}{2}$ litre gear is splined to shaft, ensure that oil holes in gear line up with holes in shaft.

On $2\frac{1}{2}$ and $3\frac{1}{2}$ litre double helical, gear is keyed to shaft and the oil holes automatically line up.

On $2\frac{1}{2}$ and $3\frac{1}{2}$ litre single helical, gear is splined to shaft and oil holes should be lined up. Gear, oil thrower and ball bearing are located by a circlip which must be extracted before dismantling the constant pinion shaft assembly.

Remove reverse gear operating fork assembly.

OPERATION No. 39.

GEARBOX. TO REASSEMBLE.

Press inner race and rollers of front mainshaft bearing on to shaft. (Single helical ball bearing.)

Assemble first gear and second gear synchromesh unit, ensuring that interlock ball and plunger are in place in drilling which goes right through the sleeve.

N.B.: If sliding gear has been removed from sleeve, note that on reassembly this hole must be in line with cut away internal spline in rear of first gear.

Ball goes next to gear, plunger with round end to shaft.

There are six synchronising balls and six springs in both second gear, and third and top synchromesh sleeves. Insert spring first followed by ball.

Slide new thrust washer on to shaft, flat face to front, followed by second and third gears, securing them in position with the circlip.

Test second and third gears for end float, which must not exceed .002".

Slide on third and top synchromesh unit, longer centre boss to front, followed by inner race and rollers of front bearing. (Single helical ball bearing.)

Fit reverse gear fork assembly and mount reverse gear in fork. Tap in reverse gear spindle and check clearance of bush on shaft, which should be .0015".

Lower counter shaft gears and thrust washers into box through the top and insert a thin rod to locate cluster in place.

Insert mainshaft assembly into box through top, offer up constant pinion shaft with thrust button and bush inserted (single helical needle rollers with thrust taken by circlip on constant pinion shaft) fitting it on the mainshaft.

Tap in the front and rear roller bearing outer races, internal flange outwards in both cases. (Single helical, ball bearing.)

Ensure that countershaft gears mesh correctly with mainshaft gears, insert countershaft spindle from rear so that slot at rear end lines up with locking plate.

N.B.: Since second gear is free to slide on countershaft splines, on double helical boxes, when meshing countershaft and mainshaft gears it is possible to get second gear out of phase by half its width, which will result in broken teeth in service.

Apply a smear of grease to the mainshaft gear, rotate the gears and observe the marking obtained as a check on correct meshing.

Fit mainshaft distance piece with shims, if any, washer and speedometer drive gear.

Fit extension and rear ball bearing together with new countershaft felt washer. Fit counter and reverse shaft locking plate.

Fit new mainshaft oil seal to extension cover, lip of oil seal to interior of gearbox.

Assemble extension cover, speedometer driven gear and mainshaft driving flange.

Fit new oil seal to front cover, lip of oil seal to interior of gearbox. Fit front cover ensuring that collar and circlip are in position on single helical boxes.

The front cover must be fitted with the oil return passage at the bottom. Fit a new joint to the front face of the gearbox case and ensure that the oil return passage is cut in the joint.

N.B.: When front and rear covers are tight, test constant pinion shaft and mainshaft for end float, which should be .002".

Absence of float means that rollers are bearing on internal flange of outer race. Increase float of constant pinion shaft by adding paper washers under front cover. Increase mainshaft float by adding shims between distance piece and inner race of rear bearing.

Refit bell housing, six set screws on $1\frac{1}{2}$ litre, eight set screws on all $2\frac{1}{2}$ and $3\frac{1}{2}$ litre boxes. Note that on the latter there are two short screws which are fitted at the bottom.

OPERATION No. 40.

REMOTE CONTROL ASSEMBLY. TO DISMANTLE.

Remove $\frac{1}{4}$" set screw and bolt passing through the spring retaining cover of the change speed lever assembly, and withdraw change speed lever.

On single helical boxes withdraw cross bolt through pivot jaw and remove change speed lever.

Release selector forks and stop screw at front end of centre rod, that is, first and second gear rod.

Break locking wire and remove selector rod grub screws, springs and plungers.

Draw out selector rods to rear, one at a time, releasing interlocking balls in cross drilling below plunger holes.

N.B.: Ensure that interlock plunger in centre rod is not lost.

Rods are sealed at the change speed lever end by a plate retaining felt washers and at the forward end by welch washers.

Selectors on outer rods are detachable but need not be disturbed.

Reassembly is the reverse of the above procedure.

OPERATION No. 41.

GEARBOX OIL SEALS. TO RENEW.

Remove gearbox. (Operation No. 37.)

The mainshaft is sealed at the rear end by an oil seal fitted in the extension cover, which can be removed with the gearbox in position.

Remove driving flange, speedometer driven gear and draw off end cover.

Renew seal, lip of oil seal to interior of gearbox, and reassemble.

The front of the gearbox is sealed by an oil seal situated in the front end cover. Remove set screws and withdraw cover.

Renew seal, lip of oil seal to interior of gearbox, and reassemble.

N.B.: Ensure that the cover is refitted correctly, that is, with the oil groove at the bottom.

Leakage of oil from the countershaft is prevented by a welch washer at the forward end and by a felt washer at the rear. To renew felt washer, remove end cover, counter and reverse shaft locking plate and draw off extension.

Fit new felt washer and reassemble.

N.B.: Oil retention at the selector rods in the remote control is obtained by felt washers surrounding the rods and retained by a plate under the change speed lever tower. The rods are sealed at the forward end by welch washers.

OPERATION No. 42.

GEARBOX. TO OVERHAUL.

Remove gearbox. (Operation No. 37.)

Dismantle gearbox. (Operation No. 38.)

Thoroughly clean all parts for examination.

Examine gearbox casing for flaws or cracks, particularly at the reverse gear lever fulcrum lug and at all bosses.

Ensure that machined faces are free from burrs and paint the interior with oil resisting paint.

Examine bearings and renew those showing signs of wear at the balls, rollers or races.

Check all gears for wear, noting that all teeth are sound, are not pitted on the working faces and that case hardening is not flaking. Always renew gears in pairs.

Check for wear on synchromesh dogs and wear on clutch splines of constant pinion shaft.

N.B.: If the constant pinion shaft synchromesh dogs and operating sleeve show any signs of wear, it is desirable to renew these, since if they take up a new position on assembly, it is possible that jumping out of top gear may be experienced.

Assemble synchromesh units and ensure the operating sleeve is not bottoming on the synchromesh sleeve. If bottoming is experienced, renew synchromesh sleeve.

Grind in the synchromesh cones using fine grinding paste until the two mating faces are bedded together and a good bite is obtained when they are in engagement.

Always renew mainshaft thrust washer and circlip and constant pinion shaft thrust button and bushes. (Needle rollers on single helical.) Renew oil seals and countershaft felt washer.

On $1\frac{1}{2}$ litre check that countershaft bushes are free on shaft. Assemble countershaft gears, place in box and insert countershaft to ensure that bore of gears is in alignment with holes in box and extension. When carrying out this check, ensure that countershaft thrust washers are in position.

Dismantle remote control assembly. (Operation No. 40.)

Examine operating rods, balls, plungers and selector forks and renew if worn. Renew interlocking balls and plunger if necessary.

Examine change speed lever and renew if working parts are worn. On single helical boxes note that change speed lever rubber bushes are serviced separately.

Renew selector rod felt washers retained by a plate under the tower of the remote control.

Assemble the box as described in Operation No. 39, ensuring that the clearances recommended are maintained.

Build up the remote control assembly and fit this to the box, secured by two set screws only.

Check that the gears are free and meshing correctly by engaging each gear individually, removing remote control and ensuring that gear is travelling fully into engagement. In the case of top and third gears, the travel from neutral into engagement should be the same distance for each gear.

If the above conditions are not obtained, it is possible that a selector fork is bent and this should be checked on a surface plate. If bent this may be straightened or renewed.

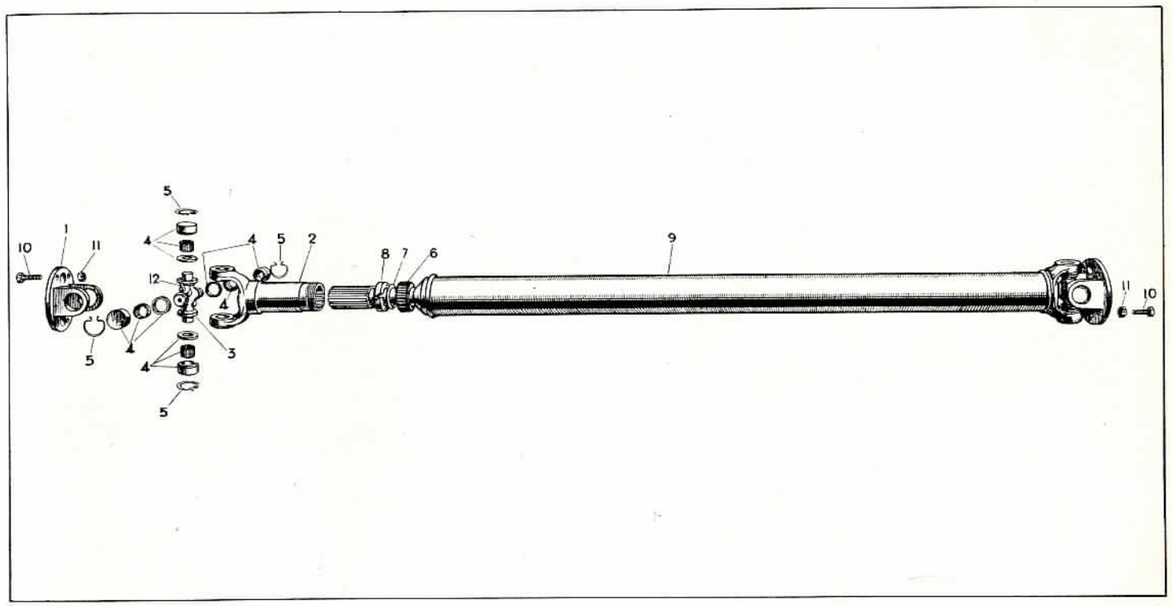

PLATE 18. PROPELLOR SHAFT, $1\frac{1}{2}$ LITRE.

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PROPELLOR SHAFT COMPLETE.

Yoke, Flange	1	Washer, Steel	7
Yoke, Sleeve Assembly	2	Washer, Felt	8
Journal	3	Shaft, Tubular, Assembly	9
Bearing, Needle, Assembly	4	Bolt, $\frac{3}{8}$" B.S.F. x $1\frac{3}{32}$"	10
Ring, Snap, Assembly	5	Nut, Slotted, $\frac{3}{8}$" B.S.F.	11
Cap, Dust	6	Nipple, Grease (Tecalemit H.A.39)	12

OPERATION No. 43.

PROPELLOR SHAFT. TO REMOVE.

Remove change speed lever knob and gearbox cowl.

Remove split pins and four nuts from front yoke.

Remove split pins and four nuts from rear yoke.

Withdraw shaft to rear.

N.B.: When re-fitting, check that the flange faces of the yokes are free from burrs.

OPERATION No. 44.

PROPELLOR SHAFT. UNIVERSAL JOINTS. TO REMOVE AND REPLACE.

Remove snap rings from grooves and tap yoke ears until needle bearings emerge.

Repeat until all bearings are free.

When re-assembling always fit new journals with new needle bearings. Ensure that needles are not disturbed during assembly.

N.B.: If splines or yokes are worn a replacement shaft should be fitted and the displaced shaft returned for reconditioning.

It should be noted that lubrication nipples are fitted at both universal joints as well as at the splined joint. The former should be lubricated with gear oil and the latter grease.

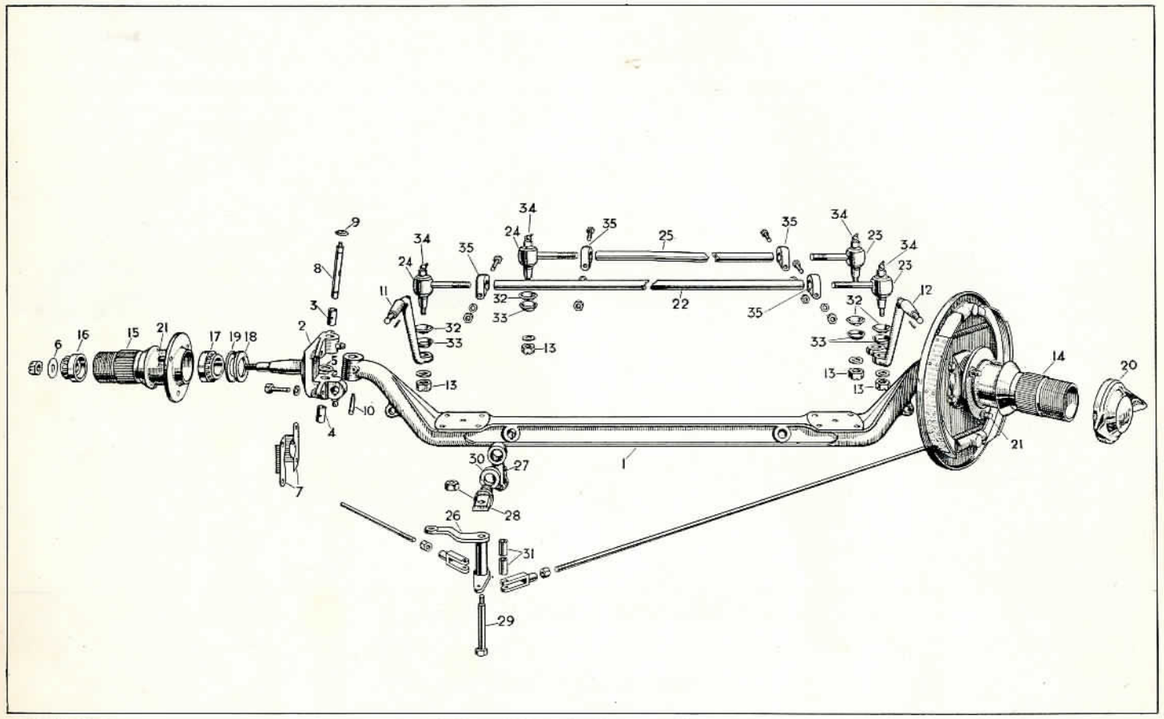

PLATE 19. FRONT AXLE ASSEMBLY, 1½ LITRE.

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FRONT AXLE BEAM	1
Axle, Stub, O.S.	2
Bush, top of Stub Axle	3
Bush, bottom of Stub Axle	4
Washer, for bottom Stub Axle Bush	5
Washer "D" for Stub Axle	6
Plate, Cover, for Stub Axle, R.H.	7
Pin, Swivel	8
Cover, Dust, for Swivel Pin	9
Cotter, for Swivel Pin	10
Lever, Tie Rod, O.S.	11
Lever, Tie Rod and Steering, N.S.	12
Nut, Slotted, 7/16" B.S.F.	13
Hub, Front, N.S.	14
Hub, Front, O.S.	15
Bearing, Hub, Outer	16
Bearing, Hub, Inner	17
Washer, Felt, for Hub	18
Plate, Cover, for Inner Hub	19
Cap, Hub, N.S. (Chromium Plated)	20
Stud, for Brake Drum	21
FRONT BRAKE BALANCE LEVER.	
Lever, Compensating, Assembly	26
Support for Balance Lever	27
Eyebolt	28
Bolt	29
Washer (Felt)	30
Bush	31
TRACK ROD ASSEMBLY, COMPLETE.	
Rod, only	22
End of Track Rod, L.H. (complete with Ball Sockets)	23
End of Track Rod, R.H. (complete with Ball Sockets)	24
Plate, Oil Retaining	32
Washer, Oil Retaining (rubber)	33
Nipple, Grease	34
Clamp	35
STEERING CONNECTING TUBE	25
End of Connecting Tube, L.H. (complete with Ball Sockets)	23
End of Connecting Tube, R.H. (complete with Ball Sockets)	24
Plate, Oil Retaining	32
Washer, Oil Retaining (rubber)	33
Nipple, Grease	34
Clamp	35

OPERATION No. 45.

AXLE FRONT. COMPLETE UNIT. TO REMOVE.

Jack up front axle and place blocks under chassis frame, remove front wheels.

Disconnect brake rod (pedal to front axle) at front compensator.

Disconnect shock absorber link arms from front axle beam.

Disconnect ball pin from steering column drop arm.

Remove road spring "U" bolts. Remove axle.

OPERATION No. 46.

STEERING TRACK. TO ADJUST.

Release the clamp bolts on either end of the track rod.

Rotate the track rod tube until the front wheels have a toe-in of ⅛".

N.B.: It is desirable to make this adjustment using an optical track setting gauge.

OPERATION No. 47.

HUBS FRONT. TO ADJUST.

Jack up front of car and remove wheels.

Check hubs for end float. (.010"—.020".)

Remove split pin from castellated nut.

Tighten nut until solid resistence is felt, slacken nut half a turn.

Recheck hubs for end float.

Relock with new split pin. Replace wheels.

N.B.: Hub bearings are of taper roller construction and on no account must they be adjusted too tightly or severe damage may be caused.

OPERATION No. 48.

HUBS FRONT. TO REMOVE.

Jack up car and remove wheels.

Remove nuts securing brake drum to hub and hub grease nipple.

Release brake adjuster and withdraw drum.

Remove split pin from castellated nut, remove nut and withdraw hub.

N.B.: If hub is tight, this can be removed with a drawer. Should it be required to remove the outer Timken member of either ball race, these may be pressed out of the hub without difficulty.

OPERATION No. 49.

SWIVEL PINS. TO REMOVE.

Remove hubs. (Operation No. 48.)

Remove brake shoe assembly by pulling one shoe off the expander and adjuster boxes.

Remove four bolts securing brake back plate to stub axle flange.

Remove brake cross rods from front compensator and withdraw back plates.

Remove nut and drive out taper cotter retaining swivel pin in axle beam eye.

Drive swivel pin out upwards with a suitable copper drift.

N.B.: On 2½ and 3½ litre models a small plate is secured under the swivel pin by two countersunk screws and must be removed before driving out the pin.

OPERATION No. 50.

SWIVEL PIN BUSHES. TO REMOVE AND REFIT.

Remove front hubs. (Operation No. 48.)

Disconnect steering drag link from drop arm by removing nut and driving out ball pin.

Remove nuts on tie rod levers and remove levers from stub axles.

N.B.: These are a taper fit and can easily be removed if tight by tapping round taper recess with a light hammer.

Remove swivel pins (Operation No. 49) and stub axles.

Press out swivel pin bushes using a suitable drift.

Press in replacement bushes. Ensure that greaser holes line up with greasers in stub axle.

Reamer bushes in position.

N.B.: It is advisable to fit new swivel pins and thrust washers (races in the case of 2½ and 3½ litre) when renewing bushes.

Swivel pins should always be checked in the axle beam eyes, and must be a drive fit. Should wear have taken place, .008" oversize swivel pins are available.

Always check and reset the steering track after any of the above operations have been carried out. (Operation No. 46.)

OPERATION No. 51.

STEERING LOCK STOPS. TO ADJUST.

Steering lock control is provided by lugs forged on the axle beam. These stops may be reduced by filing or built up by welding. To avoid the necessity for welding, Steering Lock Stop, Part. No. C.1405, is available and is fitted under the swivel pin cotter nut.

FRONT AXLE DATA.

	Castor Angle	Wheel Camber	Pivot Pin Inclination	Toe in.
1½ Litre ...	4½°	2°	8½°	⅛"
2½ Litre ...	3°	2½°	7½°	⅛"
3½ Litre ...	3°	2½°	7½°	⅛"

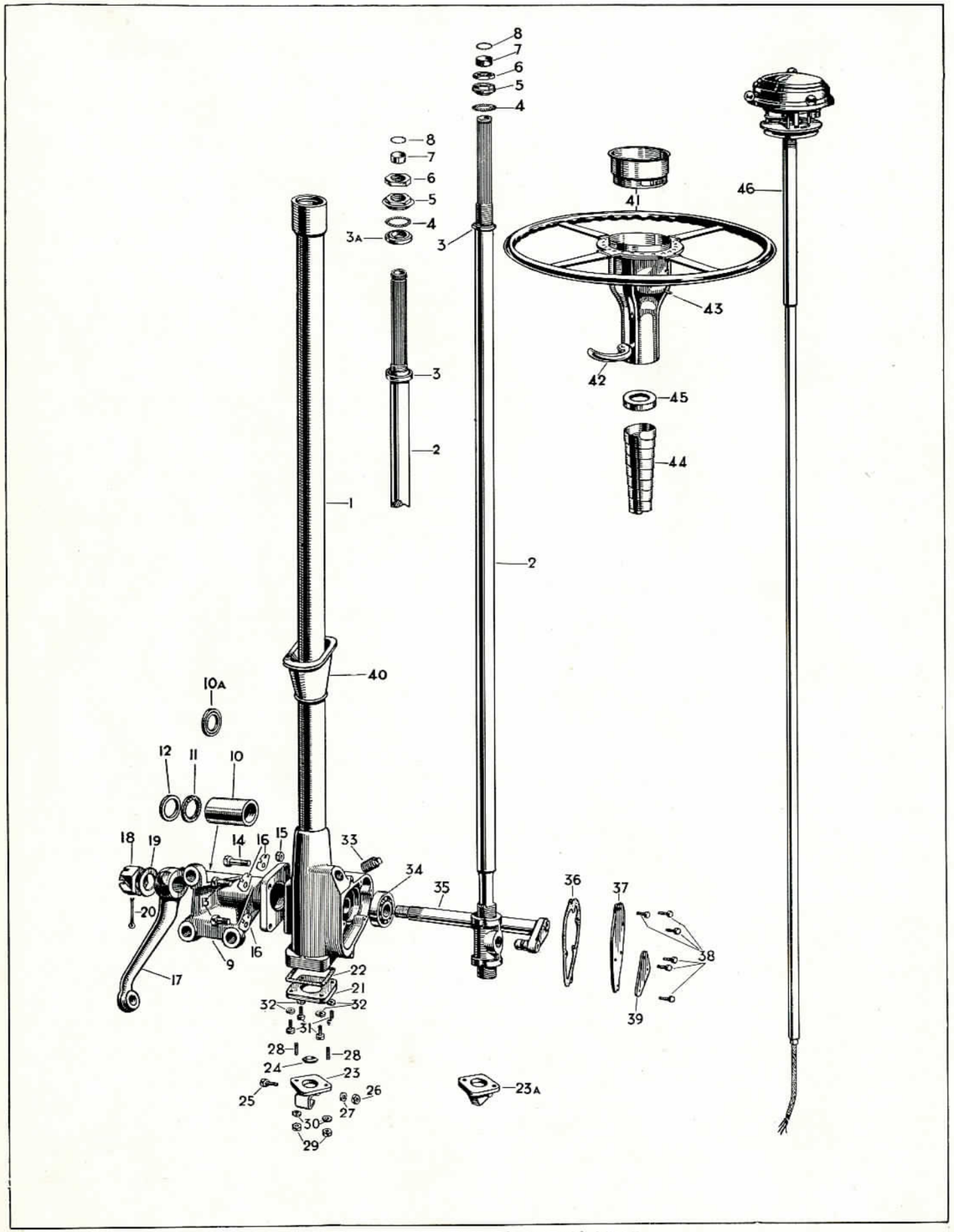

PLATE 20. STEERING ASSEMBLY, 2½ AND 3½ LITRE.

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OPERATION No. 52.

STEERING ASSEMBLY. TO REMOVE.

Remove manette control and steering wheel. (Operation No. 139.)

Release ignition manual control cable from bottom of column. (Replaced by micrometer adjustment on Distributor and not fitted after Engine Nos. KB.4252, 1½ litre; P.619, 2½ litre; S.1502, 3½ litre.)

Release facia board. (Operation No. 112.)

Remove steering drop arm.

The column is secured to the chassis frame by three bolts through the feet of the steering box.

One of these will be found to be adjustable; only the two non-adjustable bolts should be removed.

Remove the outside nut securing the column to the adjustable bolt.

Disconnect securing bolt from clip on column top fixing bracket.

N.B.: (On 1½ litre cars also remove carburettor and disconnect exhaust down pipe at manifold.)

Remove column by lifting at box, lowering column tube to lowest position, slowly rotate column, lifting forward and upward. The column will then clear the front wing and radiator shell passing over the offside headlamp.

OPERATION No. 53.

STEERING COLUMN. TO ADJUST.

There is only one adjustment which can be made to the Burman-Douglas steering gear. This is to the ball race at the top of the column, which controls end float of the inner column.

To effect adjustment, release the steering wheel "C" clamp and slide the wheel to the limit of its upward travel, exposing the ball race lock nut and adjusting nut.

Release the lock nut and turn the adjustable nut until tightness is felt. Slacken back approximately one-eighth of a turn and tighten lock nut.

The necessity for adjustment is normally indicated by a light knocking being heard when the steering wheel is moved backward and forward with the car at rest.

OPERATION No. 54.

STEERING COLUMN. TO DISMANTLE.

Remove the steering assembly. (Operation No. 52.)

Remove the lock nut, adjusting nut and balls from the top race.

Remove the inner column by unscrewing from the steering assembly.

Remove the screws holding the end plate in position on the end of the box, and the screws holding down the top cover plate.

Remove the drop arm by unscrewing the lock nut and draw the drop arm from the splines on the rocker shaft.

Remove the rocker shaft complete with ball peg through the cover plate.

Withdraw the main nut from the steering housing.

When reassembling to the chassis, it is important to note that the drop arm is fitted in the correct position.

To do this, disconnect the drop arm from the steering assembly proper, and set the front wheels in approximately the straight ahead position.

Turn the steering wheel until it can be turned no further in one direction and then turn carefully in the opposite direction, counting the number of complete turns, until it comes to a stop at the other end.

Commence from one of these stops and take the wheel back half the complete number of turns available, bringing the steering into the central position.

With the gear in central position, set the front wheels pointing slightly to the left of the straight ahead position and fix the drop arm at the six o'clock position on its serrations on the rocker shaft.

When the steering assembly is remounted, the steering should be correctly aligned and the dash brackets should not be tightened until after the steering box is firmly secured to the chassis and the adjustable bolt passing through the column bracket is correctly tensioned.

Adjust the dash bracket and adjustable bolt so that the column is not strained in any direction, either sideways, or up, or down, otherwise stiffness in steering will result, together with undue wear of the moving parts.

Important. Use only gear oil to lubricate steering box. (See Recommended Lubricants, page 16.)

From the following chassis numbers, steering units with a lower ratio are used. Servicing is as described above.

2½ litre ... ... Chassis No. 511047 onward.
3½ litre ... ... Chassis No. 612302 onward.
All Left-Hand Drive 2½ and 3½ litre cars.

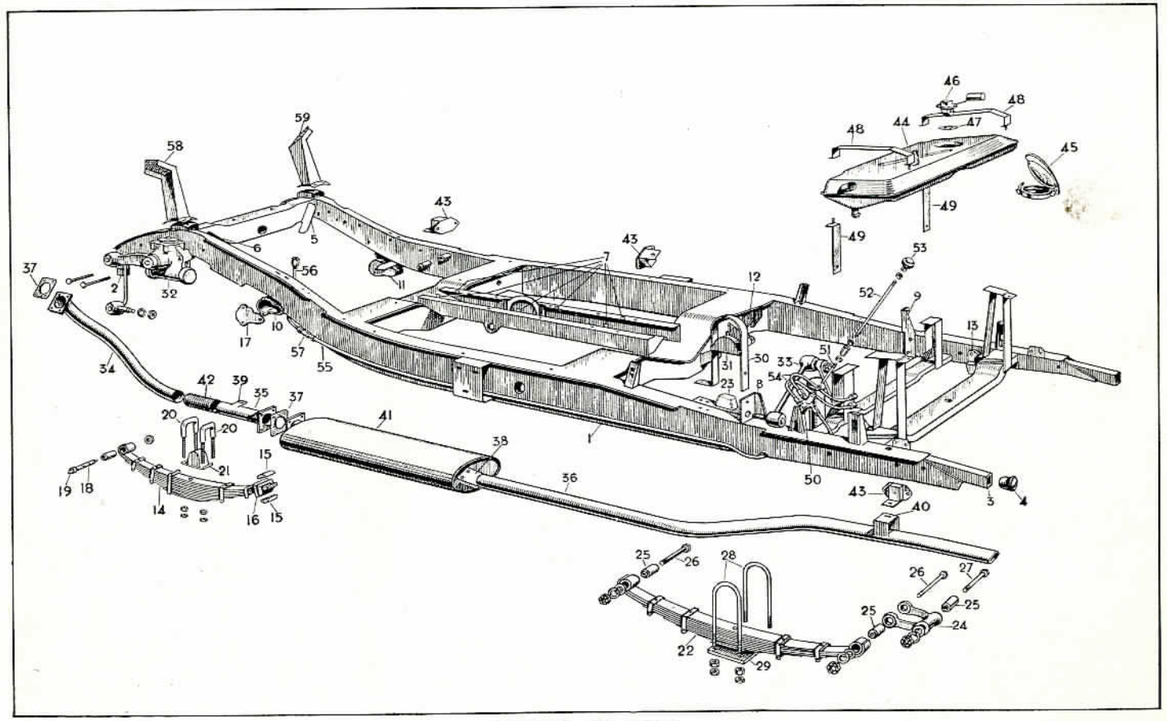

PLATE 21. CHASSIS. 1½ LITRE.

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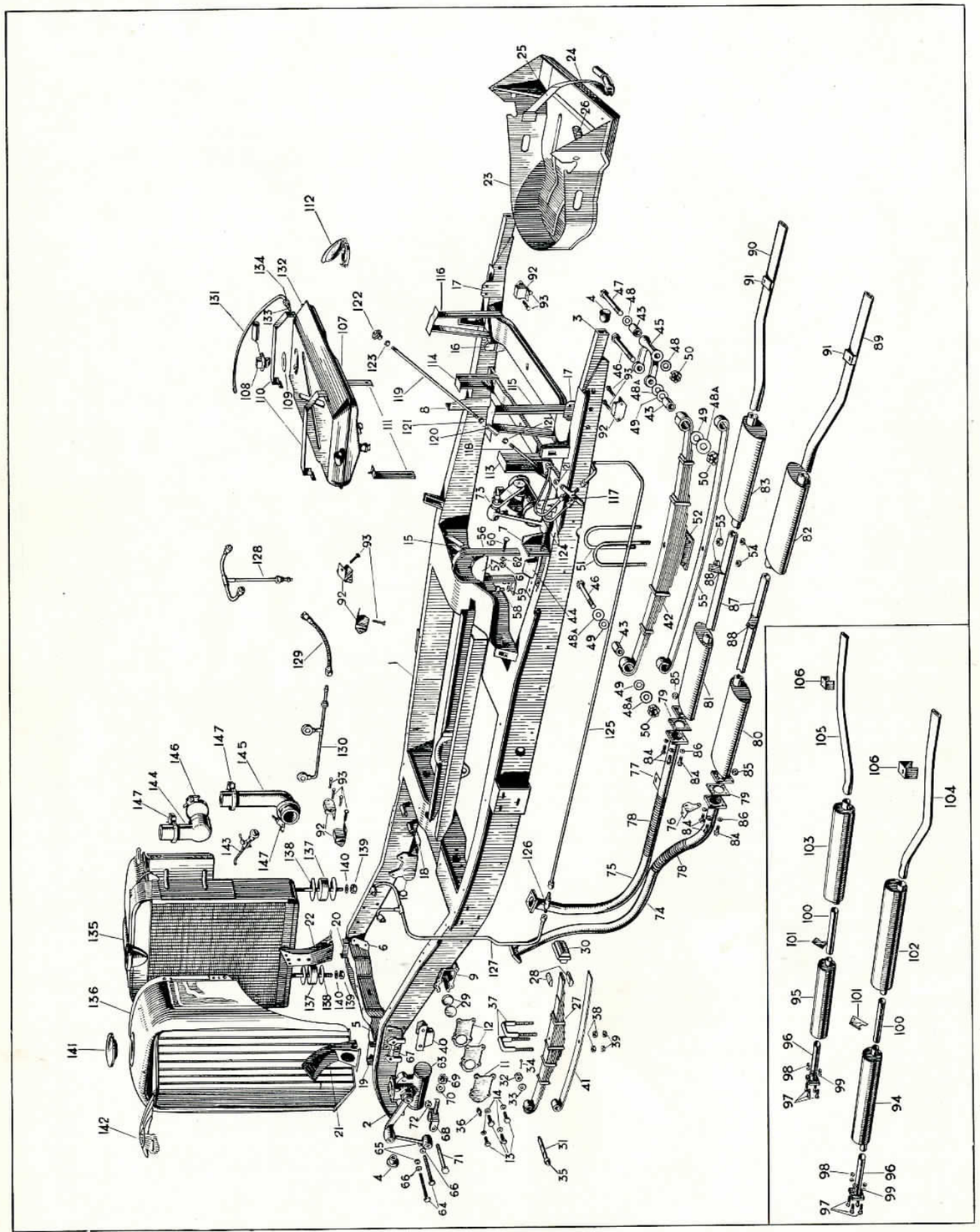

PLATE 22. CHASSIS. 2½ AND 3½ LITRE.

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INDEX TO PLATE 22.—*contd.*

OPERATION No. 55.

RADIATOR BLOCK AND SHELL. TO REMOVE AND REFIT.

Remove bonnet. (Operation No. 81.)
Disconnect stays from header tank.
Remove four nuts from bolts securing shell to front apron.
Remove two nuts from studs securing block to chassis front cross member.
Remove water hoses and lift off radiator complete.
When fitting ensure that rubber distance pads are in position on radiator mounting studs and tighten the nuts until the rubbers are just nipped.

OPERATION No. 56.

SHOCK ABSORBER FRONT. TO REMOVE.

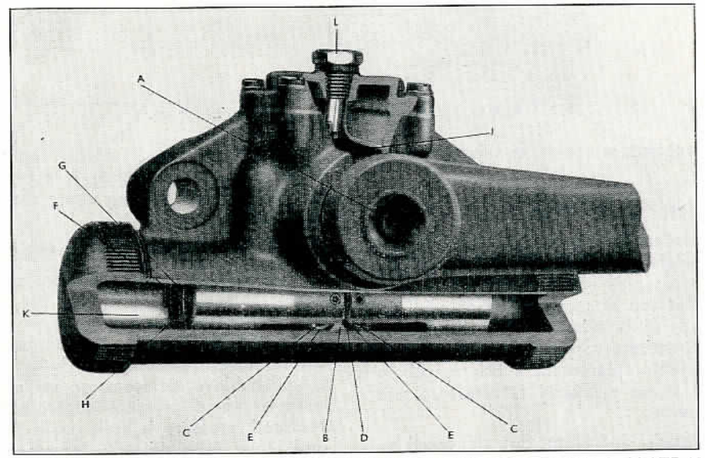
Jack up car under axle beam and remove road wheels.
Remove bolts securing body of shock absorber to chassis frame.
Disconnect link arm jaw secured through front axle beam. Withdraw shock absorber.
N.B. : It is essential to ensure that air is not present in the shock absorber movement, therefore before fitting, operate the arm several times until even pressure is obtained throughout the full travel.

OPERATION No. 57.

SHOCK ABSORBER REAR. TO REMOVE.

Jack up car under rear axle differential centre and remove road wheels.
Remove rear locker inspection board secured by two countersunk screws.
Remove bolts securing body of shock absorber to rear axle.
Remove nut securing link arm to chassis frame. Withdraw shock absorber.
N.B. : It is essential to ensure that air is not present in the shock absorber movement, therefore before fitting operate the arm several times until even pressure is obtained throughout the full travel.

Girling front shock absorbers are of the double-acting type, that is, equal resistance is given in both directions. Rear shock absorbers are differential-acting, that is, more resistance is given on rebound than on bound.
The construction of the double- and differential-acting types is illustrated in Plate 23, and the description is as follows :—
Mounted on the rocker shaft A on tightly fitting serrations, the rocker B converts the rotary motion of the shaft to the reciprocating motion of the pistons through the hardened surfaces C C. The pistons are co-axial, but separated by the division D ; the springs E E flexibly join the two pistons. Any wear on the faces C C is thus taken up automatically. It will be seen that the thrust from the rocker is taken direct on the piston, without passing it through the springs.
In the outer ends of the pistons a circular valve plate F is fitted. This carries on its inner seating the pressure valve G, which is arranged to open when the predetermined pressure is reached. On the outer seating of the plate F, a recuperator valve H permits the fluid to flow freely from the recuperator chamber J to the pressure chamber K. There is also a small orifice in the outer end of the piston which allows a small flow of fluid to pass from the high-pressure chambers to the recuperator chamber. This is referred to as the "bleed," and it controls the resistance at speeds lower than that which is required to open the pressure valve G.
The filler plug L is positioned to give the correct fluid-level. This is obtained by pouring in fluid until it overflows.
The operation on the car is as follows :—
When the body and axle are forced towards each other (road springs compressing), motion is transmitted by the connecting link and lever arm to the rocker shaft, which rotates and causes lateral movement of the pistons, let us say, to the left. At the commencement of the stroke resistance is offered dependent on the pressure required to force the fluid in the left-hand pressure chamber, through the bleed in the piston, to the recuperator chamber. As the axle speed (and therefore piston speed) increases, the pressure or resistance builds up according to the hydraulic law, the limit being reached when the pressure valve G opens. During this



GIRLING DOUBLE-ACTING AND DIFFERENTIAL-ACTING PISTON TYPES. PLATE 23.

stroke the recuperator valve H in the right-hand piston opens and allows free flow of fluid from the recuperator chamber to the pressure chamber, thus ensuring that it is kept completely full of fluid. Movement to the right follows the same cycle.

The " bleed " and the tension of the pressure valves G are accurately calibrated during manufacture, so as to be of the correct value for the car to which they are to be fitted. No further adjustment is required or provided for.

In the double-acting type, the bleed and pressure-valve values are the same in both pistons ; in the differential-acting type the bleed and/or pressure-valve values are lower on the side which takes the compression of the road spring than on the recoil side.

The lever arm is a force-fit on the shaft serrations, and the end of the shaft is "staked" in three places to retain the lever longitudinally. The connecting link is bushed with special torsion rubbers which form silent, oil-less, flexible bearings.

To Test for Efficiency.

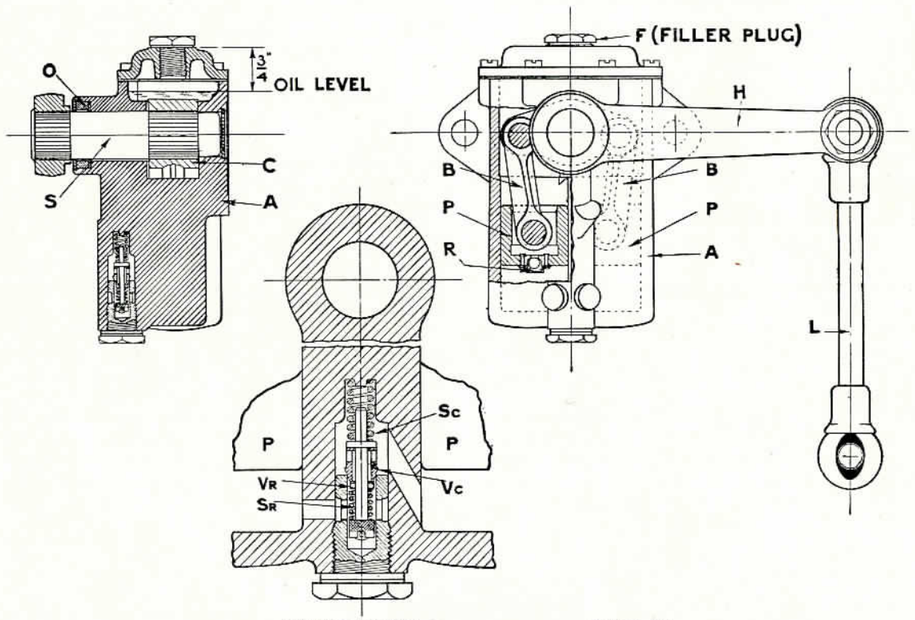
Place in vice and move arm up and down through full stroke. If lost movement or knock is found, carefully clean off all dirt (this is vitally important) from vicinity of filler plug situated at top of shock absorber. Fill up with Girling Piston type oil, moving the arm through its full travel in both directions to expel all air. If lost movement still is present replacement shock absorbers should be fitted and those displaced returned to the Works for reconditioning.

On certain Export Models, and some cars delivered to the home market, Armstrong shock absorbers are fitted. The removal and refitting of these is as described in Operations Nos. 56 and 57.

The construction and operation is as follows :—

Detail Construction of Armstrong Shock Absorber.

This can be followed by reference to the drawing. The body A and link L are bolted to the car frame and axle. As the axle moves relative to the frame (which movement is allowed by the car spring) arm H is moved up and down, and since it is splined to spindle S the spindle is rotated. The spindle is in turn splined to crank assembly C, which is connected to the two pistons P (in which are mounted recuperating valves R) by means of connecting rods B. Thus relative movement between the axle and frame causes pressure to be built up in one cylinder or the other. The cylinders are connected by suitable drillings in the body to the valve chamber. The shock absorber is filled to within $\frac{3}{4}$" of the top through filler plug F. Thus all the mechanism is submerged in oil. Oil is prevented from leaking along the spindle by means of oil seal O.



VALVE DETAILS PLATE 24.

Valve Operation.

To accomplish general dampening of the car spring a small " bleed " is built into the valve. This operates both on compression (axle moving up) and on rebound (axle moving down). As bumps become more severe on compression, pressure built up in the left-hand cylinder blows compression valve Vc off its seat at a predetermined pressure controlled by spring Sc. On rebound, pressure is built up in the right-hand cylinder and blows rebound valve Vr off its seat at a predetermined pressure controlled by spring Sr. It will be clear that by suitable selection of springs any range of blow off from zero to the maximum rating of the shock absorber can be attained independently on compression and rebound. The valving may further be arranged with a thermostatic cartridge which automatically maintains the correct settings despite change in oil viscosity over a wide temperature range.

To test for efficiency proceed as above but note that Armstrong Super (Thin) Shock Absorber oil must be used and level must be $\frac{3}{4}$" below filler plug orifice.

OPERATION No. 58.

ROAD SPRINGS FRONT. TO REMOVE AND REFIT.

Jack up the car under axle beam, and place blocks under the chassis frame at rear of spring trunnion housings.

Lower jack until weight is taken by blocks, but retain jack under axle beam.

Remove trunnion housing side plates, and spring " U " bolts.

Remove shackle pin securing eye of spring to chassis frame.

Lower axle and lift spring upwards and sideways.

When refitting springs, care should be taken to have the correct amount of side play in the trunnions. This is obtained by means of shims behind the cover plate and should be from .004" to .012".

OPERATION No. 59.

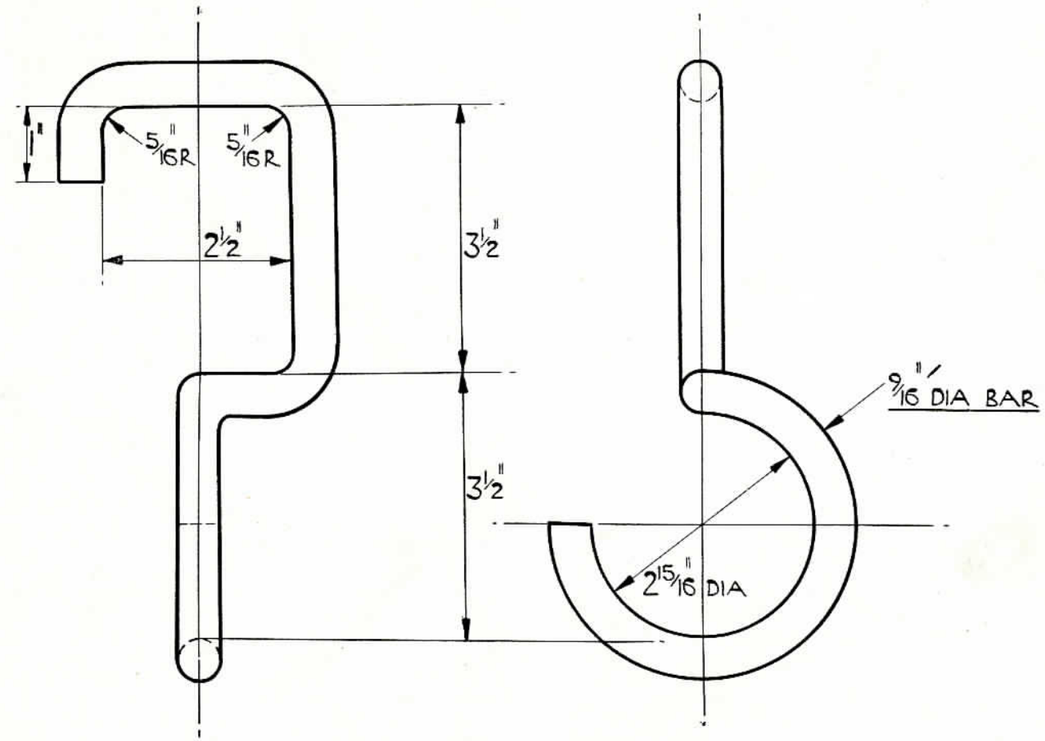
ROAD SPRINGS REAR. TO REMOVE AND REFIT.

Removal and refitting of rear springs is most readily carried out if the tool described below is used. (Plate 25.)

With this tool to hand, the operation is as follows :—

1. Jack up the rear of the car, preferably with the car on a lift.
2. Remove both rear wheels and raise the car to a height convenient for operating on the rear springs.
3. Remove the spring shackle bolt nuts and " U " bolts.
4. Engage the spring removal tool at the rear of the spring clip immediately in front of the rear shackle. Place a crowbar under the chassis frame and engage it in the eye of the spring removal tool when, with the spring under tension, the rear shackle pin can be withdrawn.
5. Following removal of the front anchor bolt, the spring can now be withdrawn.

Assembly is, of course, the reverse of the above procedure.



SPRING REMOVAL TOOL. PLATE 25.

Road Spring Data.

1½ Litre.

Part No.	Remarks	Free Camber	Laden Camber	Load at lbs.	+ or −
Front 3229	L.H.D. and R.H.D.	2 29/32″	¼″ negative	700	5%
Rear C.195	L.H.D. and R.H.D.	4 13/16″	¼″ negative	770	5%

2½ Litre.

Front 1335	L.H.D. and R.H.D.	3 9/16″	0″	830	5%
Rear 1334	R.H.D. only, Chassis No. 510001 to 510583	4 5/8″	⅜″ negative	850	5%
Rear C.1957	R.H.D. only, Chassis No. 510584 to 511076	4 7/8″	⅛″ negative	925	3%
Rear C.2116	R.H.D., Chassis No. 511077 and subs., also all L.H.D. Chassis No. 530001 onwards. All Coupés.	4 3/8″	⅝″ negative	925	3%

3½ Litre.

Front 1335	L.H.D. and R.H.D.	3 9/16″	0″	830	5%
Rear 1334	R.H.D. only, Chassis No. 610001 to 611351	4 5/8″	⅜″ negative	850	5%
Rear C.1957	R.H.D. only, Chassis No. 611352 to 612348	4 7/8″	⅛″ negative	925	3%
Rear C.2116	R.H.D., Chassis No. 612349 and subs., also all L.H.D. Chassis No. 630001 onwards. All Coupés.	4 3/8″	⅝″ negative	925	3%

L.H.D. = Left-Hand Drive. R.H.D. = Right-Hand Drive.

OPERATION No. 60.

PETROL PUMP. TO SERVICE. 1½ Litre.

An A.C. Mechanical Type Pump is fitted which draws petrol from the rear tank and feeds to the carburettor.

Reference to the diagram and the following notes will give a good idea of the way in which the pump works.

By revolving shaft (G) the eccentric (H) will lift rocker arm (D), which is pivoted at (E) and which pulls the pull rod (F), together with diaphragm (A) downward against spring pressure (C), thus creating a vacuum in pump chamber (M).

Fuel from the rear tank will enter at (J) into sediment chamber (K) and through filter gauze (L) and suction valve (N) into pump chamber (M). On the return stroke, spring pressure (C) pushes diaphragm (A) upward, forcing fuel from chamber (M) through pressure valve (O) and opening (P) into the carburettor.

When the carburettor bowl is filled the float in the float chamber will shut off the inlet needle valve, thus creating a pressure in pump chamber (M). This pressure will hold diaphragm (A) downwards against the spring pressure (C) and it will remain in this position until the carburettor requires further fuel and the needle valve opens. The rocker arm (D) is in two pieces, the outer operating the inner one by making contact at (R) and the movement of the eccentric (H) is absorbed by this "break" when fuel is not required.

Spring (S) is merely for the purpose of keeping rocker arm (D) in constant contact with eccentric (H) to eliminate noise.

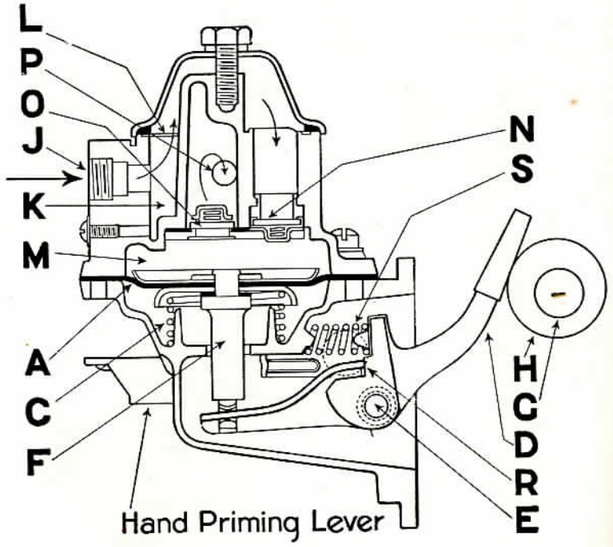


PLATE 26.

Service Hints.

If the pump fails to supply petrol to the carburettor, the following points should be attended to:

First, check the petrol tank to make sure that the petrol is available. If the level is low, operate the reserve tap.

If the pump still fails to supply petrol, this is probably due to a leaking connection or, possibly, a cracked pipe.

Check all unions and examine the pipes, particularly at any acute bends. Another possible source of trouble is a loose filter cover on the top of the pump. Remove the top cover by undoing the set screw in the top, examine the cork gasket and make sure that this lies flat on its seat and is not broken or unduly compressed. Remove the filter screen and clean.

If attention to these points fails to cure the complaint, it is advisable to take the pump to an A.C. Service Station for examination.

Leakage of Fuel at Edge of Diaphragm. This is due to the cover screws having become loose. These should be carefully tightened down alternately, giving each screw a quarter of a turn until they are all fairly tight. Do not disassemble the pump body.

In cases where a new diaphragm or any major service has to be carried out on the pump, we recommend this to be done at a Service Station, where equipment for dealing with this matter is available.

It is important that when the cover of the pump is replaced the pull rod shall be at the top of its stroke, in order to ensure sufficient flexing of the diaphragm to allow the full working stroke of the pump.

OPERATION No. 61.

PETROL TANK. TO REMOVE.

Remove rear locker floor boards. (Part of Operation No. 97.)

Disconnect petrol pipe lines at tank feeding reserve tap.

Disconnect air vent pipe at offside of tank.

Disconnect petrol gauge wire from top of tank.

Remove bolts securing straps to chassis brackets.

Ease tank towards front of car and remove straps.

Lift tank upwards and backwards and withdraw through boot aperture.

OPERATION No. 62.

PETROL TANK RESERVE SUPPLY. TO SERVICE.

The petrol tank is situated under the rear locker floorboards and has two petrol outlets both of which feed to the petrol tap located on the nearside rear chassis side member.

Situated in the petrol tank is a baffle plate offset to the nearside and the two outlet pipes draw one from either side of this baffle.

When the reserve petrol tap control knob is pushed in, petrol is drawn from the main petrol supply only, that is, the offside of the baffle. When the supply is exhausted and the control knob is pulled out petrol is drawn from the reserve supply, that is, the nearside of the baffle.

The two outlet pipes draw petrol through gauze filters situated in wells in the base of the tank. These filters may be removed for servicing, or the tank may be drained, by unscrewing the brass hexagon caps sealing the wells.

OPERATION No. 63.

EXHAUST SYSTEM. DESCRIPTION.

The single exhaust system on the 1½ litre has one silencer only. (A few early models have two silencers.)

The twin exhaust systems on the 2½ and 3½ litre have two silencers in each system.

The down pipes incorporate flexible tubing sections to allow for engine movement.

The exhausts are carried by brackets suspended from rubber mountings on the chassis frame. These are three in number for each system, situated one immediately in front of the front silencer, one on the intermediate pipe and one on the tail pipe.

When welding in new silencers or pipes it is necessary to ensure that the system is correctly aligned before the weld is applied. The system should therefore be offered up and marked before the welding operation is undertaken.

OPERATION No. 64.

SPEEDOMETER CABLE. TO REMOVE AND REPLACE.

Remove change-speed lever knob, carpets, gearbox cowl and offside toeboard.

Remove offside dash casing screws and ease casing downwards.

Disconnect cable unions from instrument and gearbox drive.

Tie a length of cord to instrument end and withdraw cable through cut-away in chassis main cross member upwards into car.

Replacement is the reverse of the above procedure, utilising the cord to guide the cable into position.

N.B.: A rubber grommet, Part No. C.976, is available for fitment to the 1″ hole in the chassis main cross member to support the speedometer cable.

OPERATION No. 65.

REVOLUTION COUNTER CABLE. TO REMOVE.

Remove two screws securing dash inspection plate.

Disconnect cable at instrument end.

Disconnect cable at drive end and withdraw into engine compartment.

N.B.: If the inner cable is allowed to run dry in the outer cable or if the cable is positioned with sharp bends, noise will be transmitted to the instrument. In such cases remove, dismantle and grease the cable throughout its entire length and ensure that no sharp bends are present when refitting.

OPERATION No. 66.

WHEELS AND TYRES. CARE OF.

The road wheels should be ocasionally examined for loose spokes and if found these should be tightened with a suitable key.

After a considerable mileage if a number of spokes are found to be loose or broken it is recommended that faulty wheels be replaced by factory reconditioned ones. An allowance is made against the displaced wheel.

When wheels are removed and replaced it is essential to thoroughly clean the hubs and liberally smear with light grease. This facilitates subsequent removal and ensures that the wheels are bedded dead tight on the hubs. Should this action not be carried out the wheels will work on the hubs, causing premature wear; the necessity for tightening will be made apparent by a metallic click heard on taking up the drive in low gears and reverse.

It is important that the front wheels and tyres are in correct balance. If this is not so, premature tyre wear may occur and road shocks may be transmitted through the steering assembly.

It may be found that the tyres are fitted with a rubber patch inside the casing. This patch is associated with the balance of the tyre and should under no circumstances be removed. These balance patches should not be confused with tyre gaiters, to which they are somewhat similar in appearance. White spots may be visible in the neighbourhood of the cover bead and coloured spots on the underside of the tube. These are also associated with tyre balance, and on re-fitting care should be taken to ensure that the white spots on the cover coincide with the coloured spots on the tube.

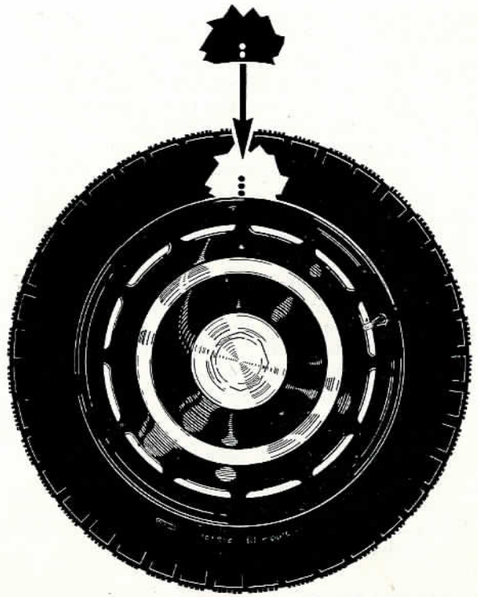


PLATE 27. BALANCE SPOTS. ALL MODELS.

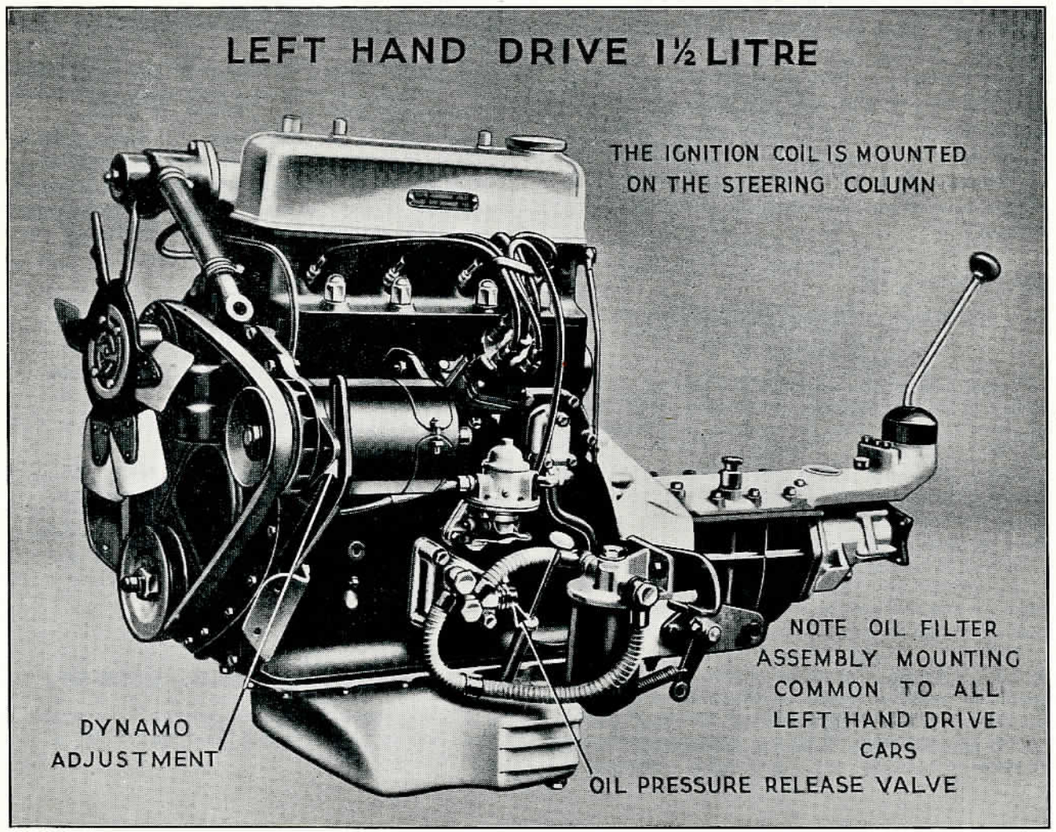


PLATE 28.

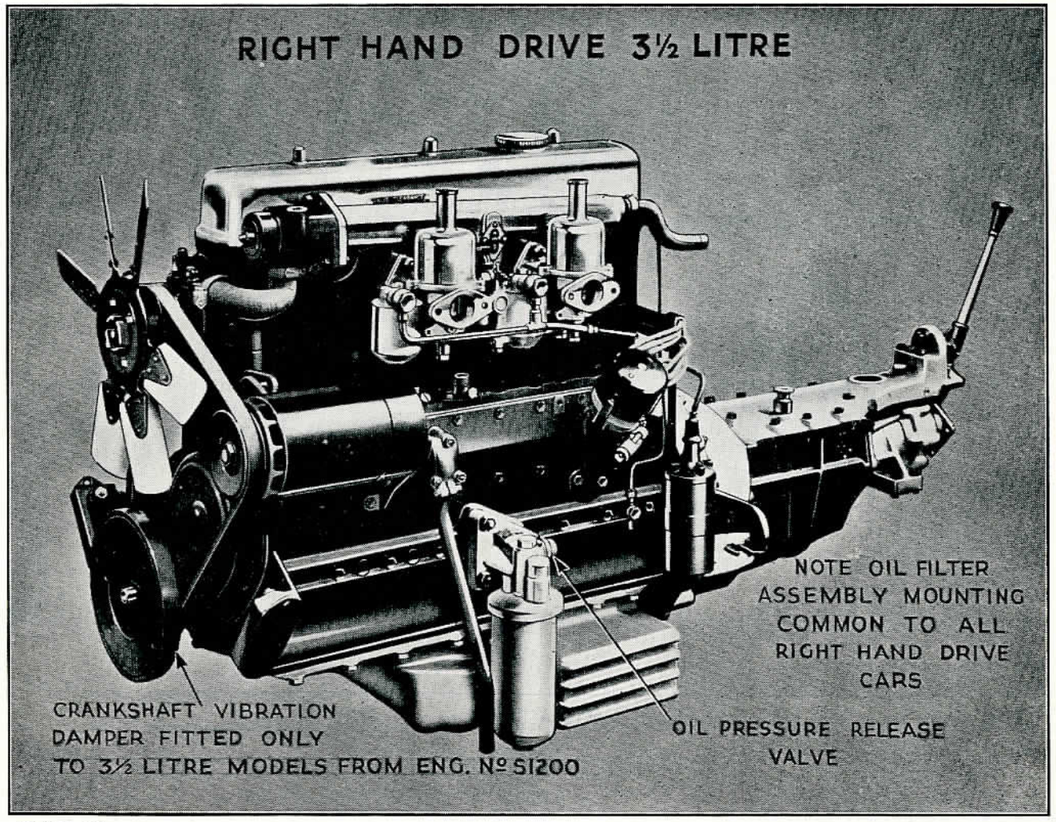


PLATE 29.

Left-Hand Drive Models.

The servicing of Left-Hand Drive cars should present no difficulties if the appropriate operations for Right-Hand Drive models described in the manual are followed.

The chief differences of the Left-Hand Drive cars are as follows :—

1.	Steering Assembly.	Located on left.
2.	Facia Board.	Designed to accept L.H. Steering Assembly.
3.	Oil Filter Assembly.	Mounted on engine stabiliser arm and connected to cylinder block by flexible pipes.
4.	Coil.	Mounted on Steering Column.
5.	Air Silencers ($2\frac{1}{2}$ and $3\frac{1}{2}$ litre).	Converted to single silencer mounted on Rocker Cover.
6.	Electrical Wiring.	Modified to feed L.H. controls.
7.	Throttle linkage.	Modified to accept L.H. accelerator pedal.
8.	Brake linkage.	Modified to accept L.H. pedal control.
9.	Clutch linkage.	Mounted on left. Throw-out stop not fitted.
10.	Dynamo Fixing Bracket ($1\frac{1}{2}$ litre models only).	Adjustment modified to clear steering column.
11.	Body.	Steering column aperture in floating dash re-position. Floorboards and carpets modified for L.H. controls.

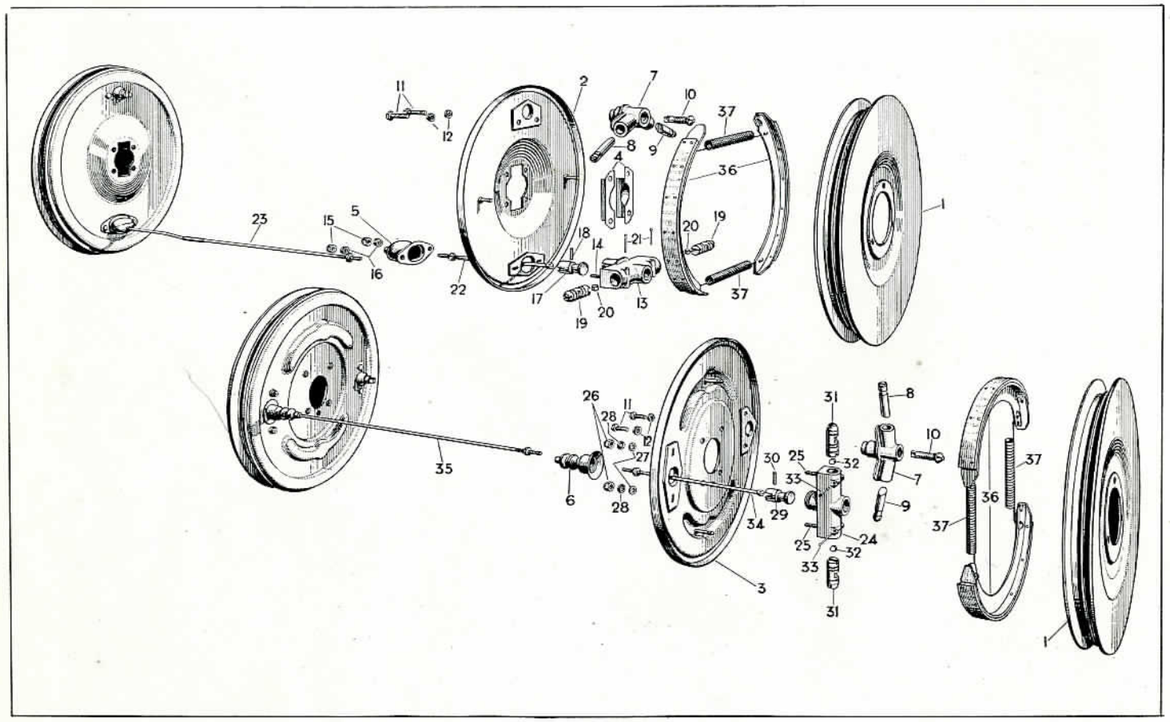


PLATE 30. BRAKES. SHOE ASSEMBLIES, 1½ LITRE.

INDEX TO PLATE 30.

BRAKE DRUM, FRONT AND REAR 1

ANCHOR PLATES.

Plate, Anchor, Front (complete with Brake Shoe Stops) 2
Plate, Anchor, Rear O.S. (complete with Brake Shoe Stops) 3
Catcher, Oil, on Front Anchor Plates 4
Cover, Dust, Assembly, Front 5
Cover, Dust, Rear 6

ADJUSTER UNIT ASSEMBLY.

Housing 7
Plunger, R.H. 8
Plunger, L.H. 9
Cone 10
Bolt, Set, securing Adjuster Unit 11
Washer, under Bolt 12

EXPANDER UNIT ASSEMBLY, FRONT O.S.

Housing 13
Stud 14
Nut (Simmonds) 15
Washer (Thackeray) 16
Cone 17
Pin, securing Cone to Operating Rod 18
Plunger 19
Roller 20
Pin, Split, retaining Plunger 21
Rod, Operating, O.S. 22
Rod, Operating, N.S. 23

EXPANDER UNIT ASSEMBLY, REAR, O.S.

Housing 24
Stud 25
Nut (Simmonds) 26
Washer (Plain) 27
Washer (Thackeray) 28
Cone 29
Pin, securing Cone to Operating Rod 30
Plunger 31
Roller 32
Pin, Split, retaining Plunger 33
Rod, Operating, O.S. 34
Rod, Operating, N.S. 35

BRAKE SHOE ASSEMBLY 36
Spring, Return 37

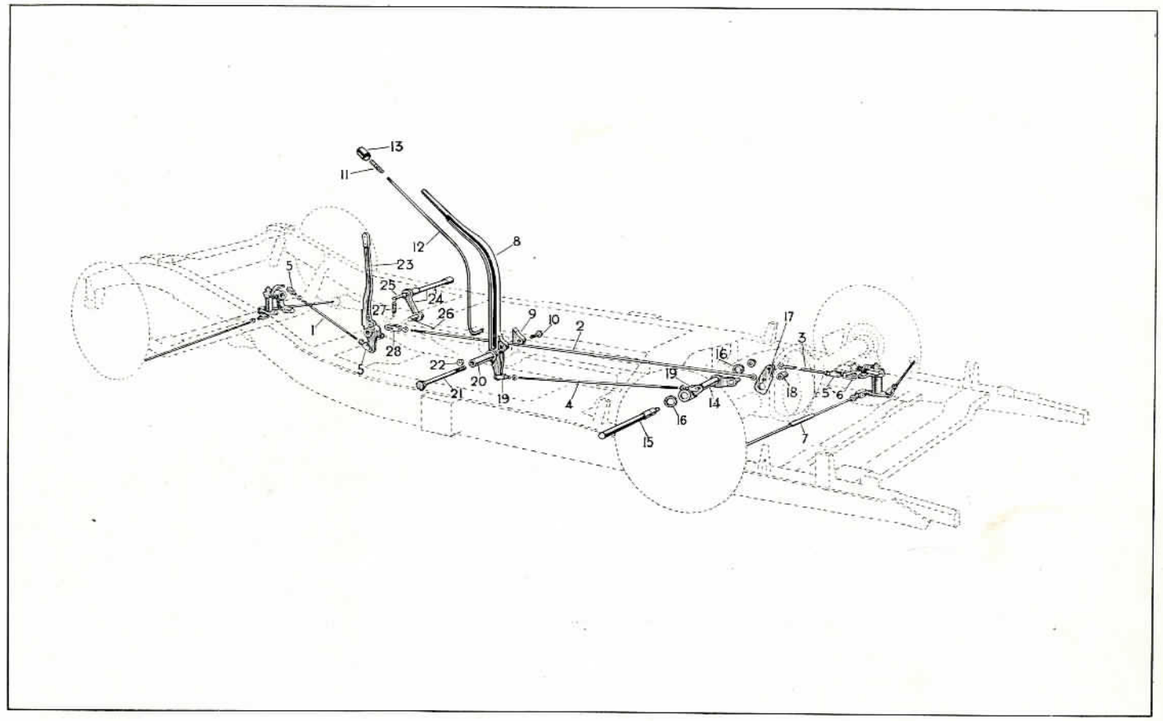


PLATE 31. BRAKE LINKAGE, 1½ LITRE.

INDEX TO PLATE 31.

BRAKE PULL RODS.

Rod, Front, on Brake Pedal 1
Rod, Centre, on Brake Pedal 2
Rod, Rear, on Swinging Lever 3
Rod, on Handbrake Lever 4
Fork-End 5
Fork, Universal 6
Sleeve (Rubber) for Rear Brake Rod 7

HANDBRAKE LEVER 8
Pawl for Handbrake 9
Pin for Pawl 10
Spring for Pawl 11
Rod, Locking 12
Knob, for Locking Rod 13
Shaft for Handbrake 14
Rod, Support, through Shaft 15
Washer (Felt) at end of Shaft 16
Lever, Swinging, Assembly 17
Bearing in Swinging Lever 18
Fork-end on Handbrake Pull Rod 19
Tube, Supporting Handbrake Lever 20
Bolt for Supporting Tube 21
Nut for Support Tube Bolt 22

BRAKE PEDAL 23
Lever, Compensating 24
Pin, Anchor, for Spring 25
Pin, Fulcrum 26
Spring 27
Fork (Sliding) on Main Pull Rod to Brake Pedal 28

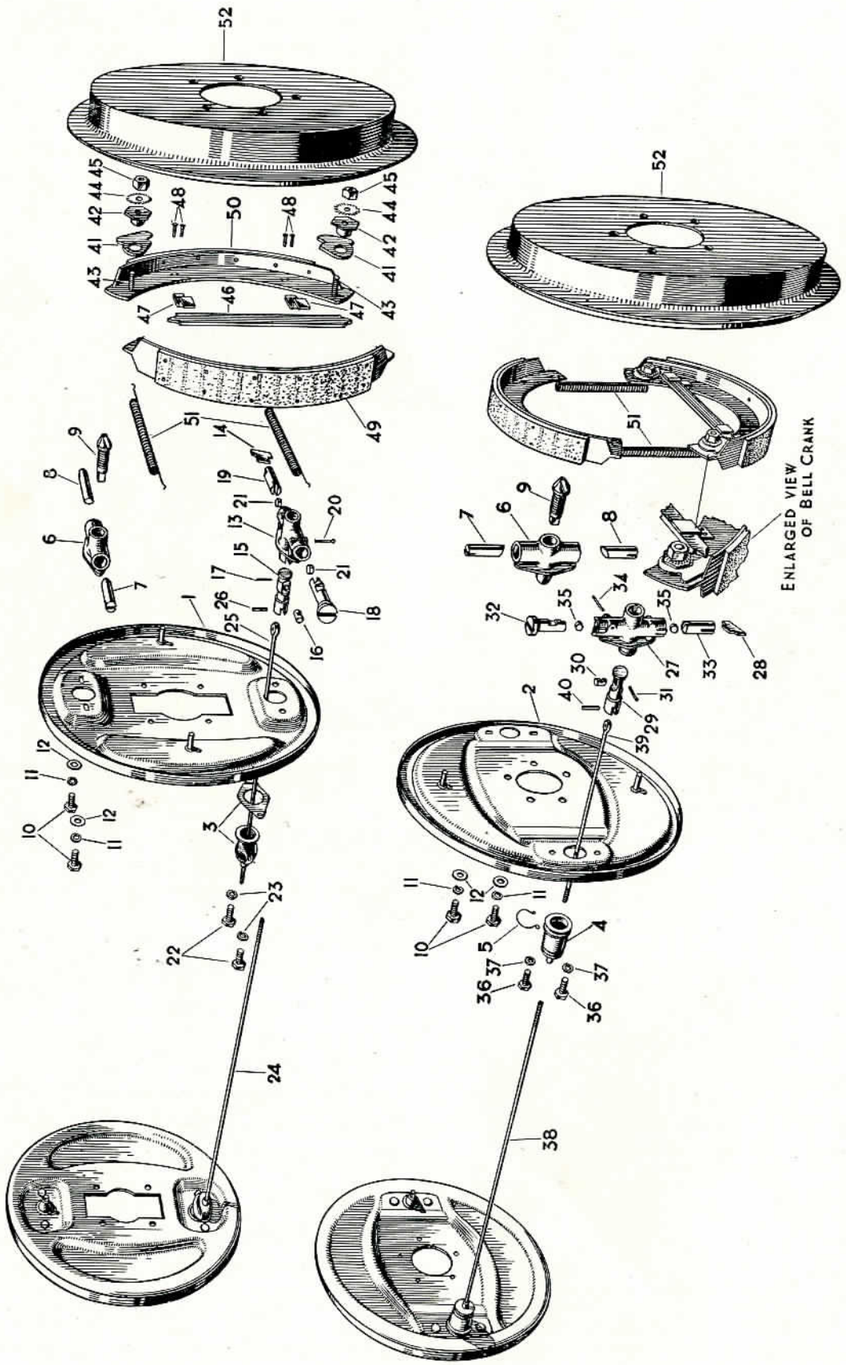


PLATE 32. BRAKE SHOE ASSEMBLIES. TWO LEADING SHOE. 2½ AND 3½ LITRE.

INDEX TO PLATE 32.

OPERATION No. 67.

BRAKES. TO ADJUST.

Jack up the car.

Turn the adjuster as far as it will go in a clockwise direction. Use a spanner of normal length and do not use force.

Unscrew two clicks. Spin wheel to check for free rotation.

N.B. : When linings are new, turn back adjuster approximately four clicks ; the linings are likely to swell during the bedding-in process. We strongly recommend the use of factory reconditioned shoes, since a special type zinc bonded lining is used and, in addition, the shoes are ground after the linings are rivetted in position.

It is not possible to successfully remove grease from the linings, and in such cases brake shoes should be replaced.

Always re-centralise shoes on 2½ and 3½ litre 2 L.S. type when adjusting.

OPERATION No. 68.

BRAKES. TO CENTRALISE.

On 1½ litre models the brakes are self-centralising by virtue of the fact that the expander housing floats on the brake back plate.

To centralise, make one firm application of the brake pedal.

On 2½ and 3½ litre models, Two Leading Shoes Brakes are used, which are not self-centralising.

Slacken the two bolts securing the adjuster housing to the back plate, turn the adjuster clockwise as far as it will go to centralise the shoes in the drum and tighten the adjuster housing bolts.

Release adjuster two clicks, when brakes should be free.

N.B. : Adjustment of Two Leading Shoe push rods is generally unnecessary until high mileages have been covered.

When the brakes are in the " off " position there should be just perceptible end float in the push rods.

Adjustment is carried out by slackening bell crank nuts and spring washer. Rotate the hexagon headed eccentrics until the required end float is obtained. Replace and tighten nuts and washers. Re-centralise and adjust brakes following assembly.

OPERATION No. 69.

BRAKES. TO OVERHAUL.

Jack up car and remove road wheels.

Remove nuts securing drums, front hub grease nipples and withdraw drums.

Remove the shoe assemblies by levering one shoe end from out of the expander tappet, lift forward clear of housing and release. Withdraw the other end of the shoe in a similar manner from the adjuster tappet, lift forward and release. The tension being now taken off the springs, disengage the other shoe and remove the whole assembly.

Remove two bolts and withdraw expander unit.

Dismantling of the 1½ litre expander unit is straight-forward, following removal of split pins. On 2½ and 3½ litre remove split pin and withdraw first shoe tappet, knock out contact plate to remove second shoe tappet.

Remove two bolts and withdraw adjuster unit. Dismantling is straight-forward.

Thoroughly clean all parts and ensure that all moving parts are a free fit.

N.B. : When assembling, ensure that adjuster and expander unit mounting bolts are not bottoming in the housing. (Studs on 1½ litre expander unit.) Place a spot of grease on the tip of each shoe locating peg situated on the brake back plates.

Thoroughly lubricate expander and adjuster units with Girling brake grease.

Remove clevis pins from front and rear compensators.

Remove split pin and lock nut from compensator through bolt. Withdraw through bolt. (Right-hand thread.) Screw eyebolt out of axle bracket. Fit a new felt washer, well lubricated, to the eyebolt and ensure through bolt is free in the compensator and well lubricated before assembly.

Examine brake pedal linkage and rear brake swinging assembly for freedom of movement.

Lubricate all moving parts, examine and renew any worn clevis pins.

N.B. : It should be observed that clevis pins are a free fit and should not be condemned unless wear is apparent.

The linkage is fully compensating and once this is correctly set there should be no need for adjustment.

When it is found necessary to make an adjustment to the operating rods, the following instructions, in conjunction with the diagram, should be carefully followed. The pedal is the fully floating type, which eliminates the frictional resistance of the loaded pivot. The apparent pivot link on the brake pedal only serves to carry the weight of the pedal and linkage, and is not used as a reaction point. It is essential, therefore, that the correct positioning, and the method of adjustment, are closely adhered to. Plate 33.

1. Starting at the front axle, remove the drums and make sure that the expander cones are coming fully out, that is, the face of the cone comes at least flush with its housing.
2. Now adjust the front rods to such a length that the operating pin for the pull rod will come 1" max. ⅞" min. in front of the horizontal (see diagram). Carry out the same operation on the back brake pivot and rods, except that the dimension should be 1¼" max. 1⅛" min. to the rear of the horizontal.
3. Obtain a steel disc $1\frac{0}{16}$" diameter with a ⅜" diameter hole. This is slid on to the brake stop pin, as shown in the sketch. The front pull rod is now put on and adjusted to such a position that the top bolt of the pedal pad fixing is positioned 3⅜" behind the pivot of the brake supporting link.
4. Now check the position of the swinging lever on the third cross member. The centre of the operating pin should be 1" behind the vertical with the brakes off and the rear rod should be adjusted so that this position is obtained. Make sure that the hand brake striking pin is quite clear of the lever while the adjustment is being made. The main rod can now be fitted and adjusted at the front end to the required length. It is most important that the dimensions and settings of the pedal and levers are adhered to closely, otherwise the effectiveness of the system is entirely lost. When the adjustment is finished, do not forget to remove the adjustment disc from behind the pedal, and re-check clevis pins to make certain all split pins are in position.

N.B. : When brakes are being overhauled it is advisable to check that the road springs "U" bolts are tight.

Brake testing must be carried out with tyres at the correct pressures. These are :—

1½ litre Saloon. Front 28 lbs. per sq. in. Rear 28 lbs. per sq. in.

2½ and 3½ litre Saloon and Coupé. Front 28 lbs. per sq. in. Rear 30 lbs. per sq. in.

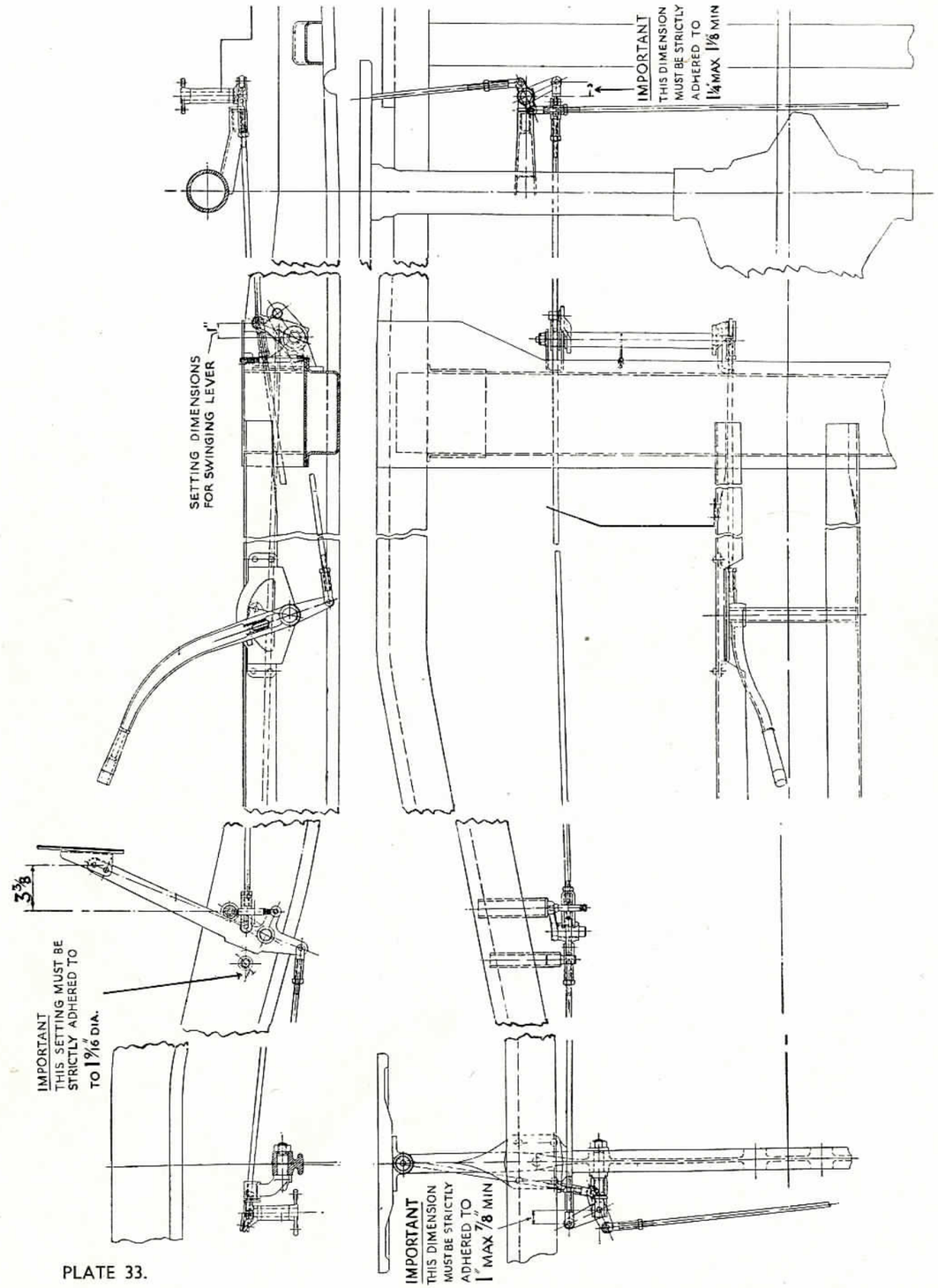


PLATE 33.

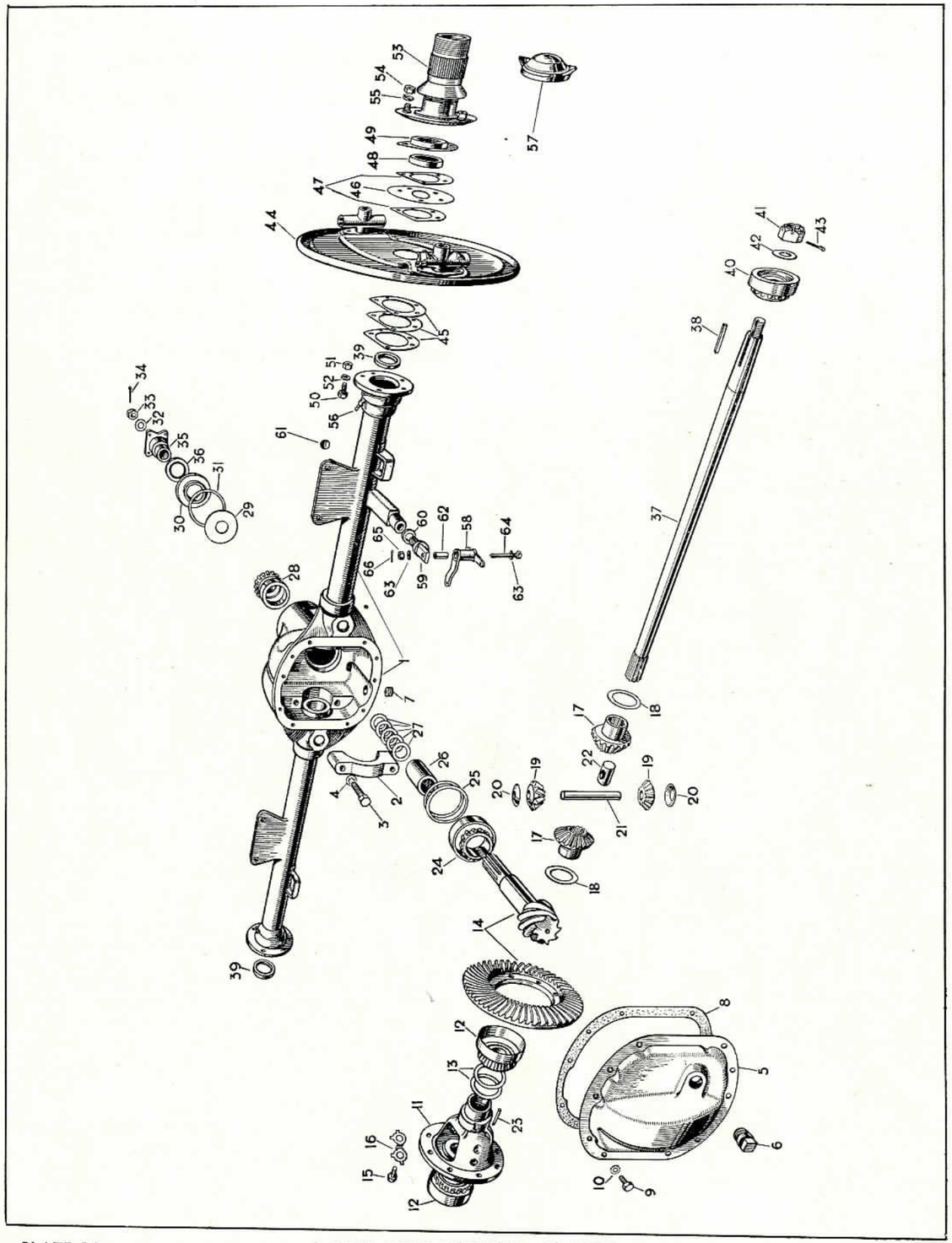


PLATE 34. REAR AXLE ASSEMBLY. 2½ LITRE.

INDEX TO PLATE 34.

OPERATION No. 70.

REAR AXLE. TO REMOVE.

Jack up car. Place blocks under Chassis Frame and remove road wheels.

Remove brake drums and draw off hubs.

Disconnect brake rods, remove brake back plates.

Remove rebound check straps. Disconnect shock absorbers and rear end of propellor shaft ($2\frac{1}{2}$ and $3\frac{1}{2}$ litre models, remove one exhaust system).

Remove spring " U " bolts.

Lift axle upwards and over road springs, until one end is clear of spring, then lower to floor and withdraw from under car.

N.B. : Always check end float on axle shafts when re-assembling (.001" to .005").
Always lap hubs on Axle Shaft tapers when hubs have been removed.

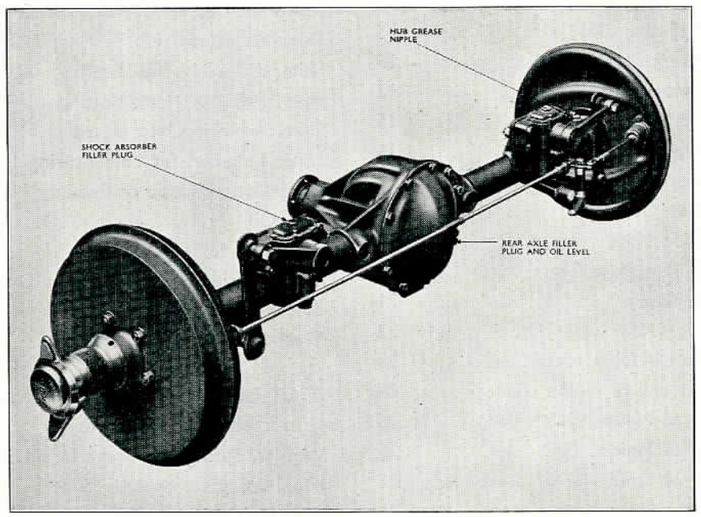


PLATE 35. REAR AXLE ASSEMBLY

Part No.	Model	Type	Ratio
3HA/001/3	$1\frac{1}{2}$ litre	3HA(23)	4.88 — 1
2HA/001/1	$2\frac{1}{2}$ litre	2HA(41)	4.55 — 1
2HA/001/2	$3\frac{1}{2}$ litre	2HA(41)	4.27 — 1

General.

The Rear Axle Assembly, Plate 34, is of the hypoid, semi-floating type with shim adjustment for all bearings and for the meshing of the driving gear and pinion. The Axle Shafts are splined at the inner ends to engage splines in the differential side gears. The outer ends of the shafts are provided with tapers and keys for attaching the rear wheel hubs. The wheels are each supported on a taper roller bearing pressed on to the axle shaft and the side thrust from the wheels is transferred from one shaft to the other by a thrust block straddling the differential pinion mate shaft. A cover on the rear of the gear carrier housing permits inspection and flushing of the differential assembly without dismantling the axle. The axle gear ratio is stamped on a plate attached to the assembly by one of the rear cover screws. The axle serial number is stamped on the top of the gear carrier casting on the width of the metal forming the facing for the rear cover.

OPERATION No. 71.

LUBRICATION.

For the lubrication of the hypoid driving gears it is necessary to use an S.C.L. type of E.P. (extreme pressure) hypoid lubricant conforming to the S.A.E.90 specification. Use lubricant from approved sources only as listed on page 16. Do not at any time mix various brands of hypoid lubricants. Should there be any doubt concerning the brand of lubricant previously used, drain and flush the axle with a flushing oil or light engine oil before filling with the new lubricant. Do not use paraffin for flushing. Check the level of the lubricant every 2,500 miles. The axle should be drained and refilled to the bottom level of the filler plug hole every 10,000 miles.

Lubricant capacity—
Type 3HA(23) $2\frac{1}{2}$ pints $1\frac{1}{2}$ litre.
2HA(41) 3 pints $2\frac{1}{2}$ and $3\frac{1}{2}$ litre.

The wheel bearings are each lubricated by a grease nipple located in the axle tube housing adjacent to the brake back plate. Where on the top side of the housing a vent hole is provided, the greasing operation should be continued until grease appears at this hole, indicating that the chamber is full. Do not overfill. The bearings should be lubricated with a good bearing grease every 5,000 miles.

OPERATION No. 72.

AXLE SHAFTS. REMOVAL AND REPLACEMENT.

To remove the axle shaft, remove the road wheel and the axle shaft nut and washer. Withdraw the rear hub with a drawer and before dismantling further check the axle shaft end play with a dial indicator as shewn in Plate 36. The recommended tolerance ranges from .001" to .005" and the end play is controlled by shims located between the brake back plate and the axle tube flange. Shims are available in thicknesses of .003", .005", .010" and .030". Remove the brake back plate retaining bolts, the outer oil seal assembly, the wheel bearing retaining plate (if fitted) and the brake back plate, taking care of the wheel bearing adjusting shims. The axle shaft with its taper roller bearing may now be withdrawn with a puller and the axle shaft oil seal which is pressed inside the axle tube can be examined. Withdraw the oil seal and replace if necessary.

Axle Shaft. End Play.

To replace the axle shaft, after lubricating the wheel bearing with a good bearing grease, install the axle shaft with the taper roller bearing cone and then the bearing cup. Add or subtract adjusting shims to obtain the correct axle shaft end play of .001" to .005" which will be just perceptible by hand (adding shims increases end play, subtracting shims decreases end play). Remove or install approximately an equal number of shims at each end of the axle so as to retain the axle shafts in a central position. Examine the hub oil seal and replace if necessary. Fit the brake back plate and centralise the hub oil seal. When re-installing fit new paper gaskets on either side of the bearing retaining plate, or if a retaining plate is not fitted, between the brake back plate and the oil seal assembly to prevent oil leaking into the brake drum.

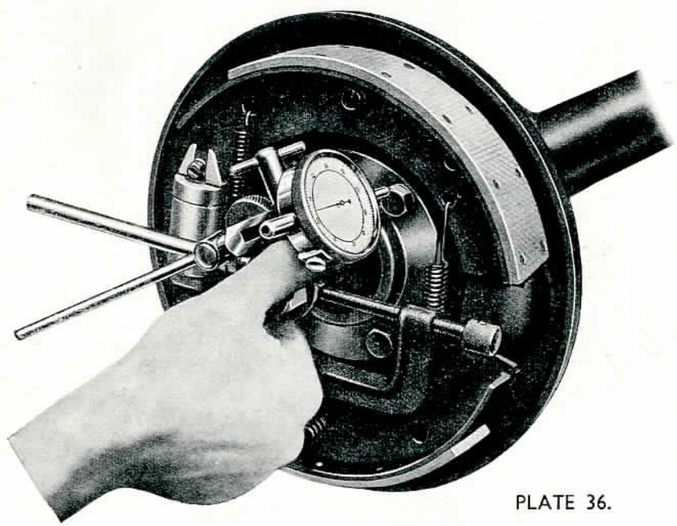


PLATE 36.

OPERATION No. 73.

DIFFERENTIAL. REMOVAL AND DISASSEMBLY.

Drain the lubricant from the gear carrier housing and remove the gear carrier rear cover flushing out the unit thoroughly so that the parts can be carefully inspected.

Remove both axle shafts as detailed in the foregoing operation. Remove the four bolts which hold the differential bearing cap, and using two pry bars, one on each side of the differential case opening, pry out the differential assembly, Plate 37. The differential bearing caps and the gear carrier gasket surface are marked during production and when re-assembling the bearing caps be sure that the position of the numerals correspond, Plate 37.

Remove the universal joint companion flange with a puller and press the pinion out of the forward bearing.

The pinion having been freed from its front bearing can now be removed from the axle housing.

Note : Keep all shims intact.

Drive the front bearing cup and oil seal assembly out of the housing and if a damaged rear bearing cup is to be replaced, or if the pinion setting is to be changed, the rear bearing cup must be driven from the housing, care being taken of the shims which are fitted between the bearing cup and the housing abutment face. Remove the ring gear from the differential case by bending down

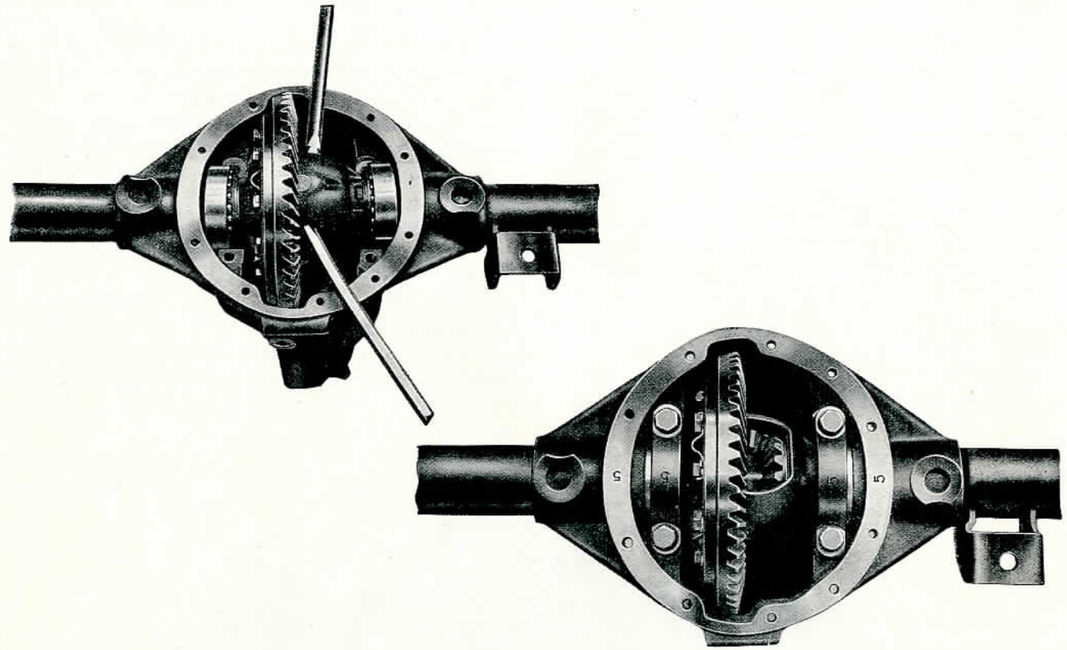


PLATE 37. DIFFERENTIAL

the locking tabs and removing the mounting screws. Drive out the pinion mate shaft locking pin, which is secured in place by peening the case, and remove the pinion mate shaft. Take out the axle shaft spacer, and by rotating the gears by hand until the pinions are opposite the openings in the differential case, remove the differential gears and the thrust washers which are fitted behind them. If the ring gear setting is to be altered, it will be necessary to remove the differential bearing with a drawer to gain access to the shims located between the bearing and the abutment face on the differential case.

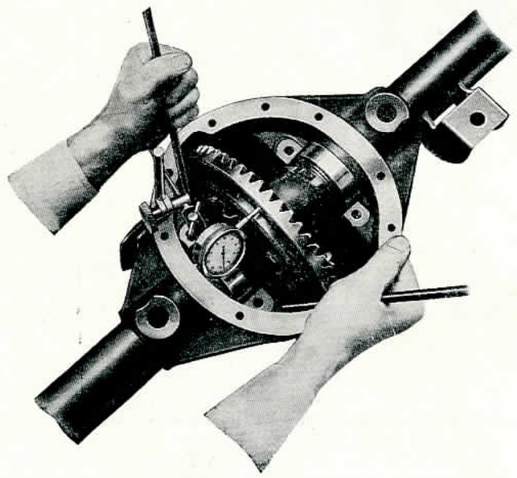


PLATE 38. DIFFERENTIAL ASSEMBLY

OPERATION No. 74.

DIFFERENTIAL. ASSEMBLY.

Reassemble the internal parts of the differential and install the pinion mate shaft lock pin. Using a punch, peen some of the metal of the differential case over the end of the lock pin to prevent it working loose. The ring gear and differential case contacting surfaces should be cleaned and examined for burrs before the ring gear is fitted. When reinstalling the ring gear on the differential case align the attaching bolt holes in the ring gear with those in the case and tap the ring gear on the case with a lead hammer. Insert the ring gear set screws with new locking straps and tighten them uniformly. Then bend the locking tabs around the screw heads to prevent their working loose.

Install the differential bearings without shims on the differential case, making sure that the bearing cones and cups and the housings are perfectly clean. Place the differential assembly with the bearing cups in their housing in the gear carrier. Install a dial indicator in the gear carrier with the button against the ring gear back face and, inserting two screw drivers between the

housing and the bearing cup, move the differential assembly to one side of the case as shewn in Plate 38. Then after setting the indicator at zero move the assembly to the other side and record the indicator reading. This reading plus .008″ preload denotes the total thickness of shims to be used in the installation of the differential bearings. Remove the differential assembly from the gear carrier and, if it has been removed, re-install the pinion front bearing cup. Also re-install the original pinion adjusting shims and the pinion rear bearing cup. Using an arbor press and a length of tube, press the rear bearing cone on the pinion, the tube contacting the inner race only and not the roller retainer.

OPERATION No. 75.

RING GEAR AND PINION ADJUSTMENT.

The rear axle pinion should be adjusted properly before further rear axle assembly is attempted. The ground end of the pinion is marked with the correct pinion setting, Plate 39. This marking may be zero (0), a minus (—), or a plus (+). When properly adjusted a pinion marked zero (0) will be at the zero cone setting distance from the centre line of the gear; a pinion marked plus two (+2) should be adjusted to the nominal cone setting distance, plus .002″, and a pinion marked minus two (—2) to cone setting distance minus .002″ (see Plate 39).

The Zero Cone Setting Distance for the various Salisbury Axles are as follows :—

Type 3HA(23) 2.250″ $1\frac{1}{2}$ litre.
2HA(41) 2.750″ $2\frac{1}{2}$ and $3\frac{1}{2}$ litre.

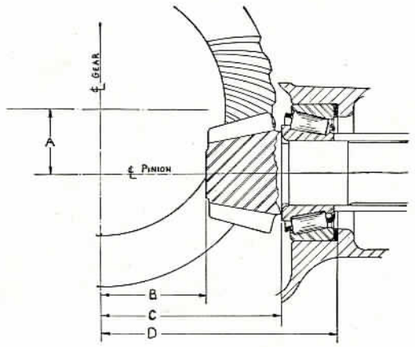
Thus for a pinion marked minus two (—2) the distance from the centre of the ring gear to the face of the pinion for the 3HA(23) should be 2.248″, and for a pinion marked plus three (+3) the cone setting distance for this type would be 2.253″.

Place the pinion with the rear bearing cone in the gear carrier and adjust the pinion to the correct setting distance by means of shims between the rear bearing cup and the housing. The pinion adjusting shims are available in thicknesses of .003″, .005″ and .010″. Install the pinion bearing spacer and the original bearing adjusting shims on the pinion. Then install the pinion front bearing cone, companion flange, washer and nut. The pinion oil slinger and oil seal should not be installed until the pinion bearing adjusting procedure has been completed.

Tighten the companion flange nut and test the pinion bearing adjustment. The pinion should have no end play and should afford a slight drag or resistance to turning. Add or remove shims to obtain the proper adjustment.

Being sure that the bearing cones and cups and the housings are perfectly clean, again place the differential assembly with the bearing cups in the housing. Install a dial indicator on the housing with the button against the ring gear back face and inserting two screwdrivers between the housing and the bearing cup, move the differential case and ring gear away from the pinion until the opposite bearing cup is seated against the housing. Then, after setting the indicator at zero, move the differential assembly towards the pinion until the ring gear contacts the pinion deep in mesh. The indicator reading now obtained (clearance between ring gear and pinion) minus .005″ denotes the thickness of shims to be placed between the differential case and the bearing cone on the ring gear side of the differential. The quantity of shims inserted on the ring gear side of the differential case should then be subtracted from the total indicator reading. (Operation No. 74.) Insert a thickness of shims equal to this amount plus .008″ for preload on the opposite side of the differential.

To simplify the differential and ring gear adjustment procedure we give the following example. Assume the total indicator reading to be .080″. This figure plus .008″ for the recommended preload equals .088″ which denotes the total thickness of shims to be used. Assuming the clearance between the ring gear and the pinion to be .042″, subtract .005″ (the approximate backlash) from this .042″ clearance. The .037″ difference



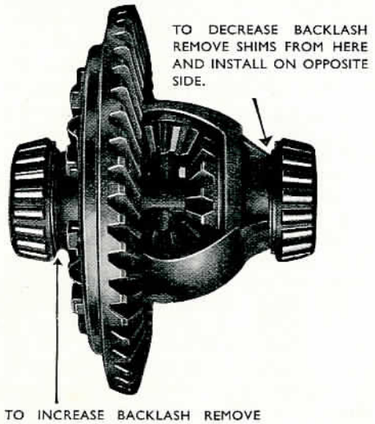
MODEL	PINION DROP A	ZERO CONE SETTING B	MOUNTING DISTANCE C	C/L to BRG. HOUSING D
3HA(23)	1.375″	2.250″	3.937″	5.130″ 5.120″
2HA(41)	1.750″	2.750″	4.625″	5.818″ 5.808″

PLATE 39. RING GEAR AND PINION ADJUSTMENT

denotes the thickness of shims to be placed between the differential case and the bearing cone on the ring gear side of the differential. Then subtract the thickness of shims inserted on the ring gear side of the differential case from .088" and the .051" difference denotes the thickness of shims to be inserted on the opposite side of the case.

To facilitate installation of the differential assembly, cock the bearing cups and tap them lightly into position with a lead hammer. When reinstalling the bearing caps be sure the position of the numerals marked on the gear carrier housing face and the caps correspond (see Plate 37.)

Mount a dial indicator on the gear carrier with the button against one of the ring gear teeth as nearly in line with the tooth travel as possible. Move the ring gear by hand to check the backlash which should be between .003" and .006", Plate 41. If the backlash is not in accordance with specifications transfer the necessary number of shims from one side of the



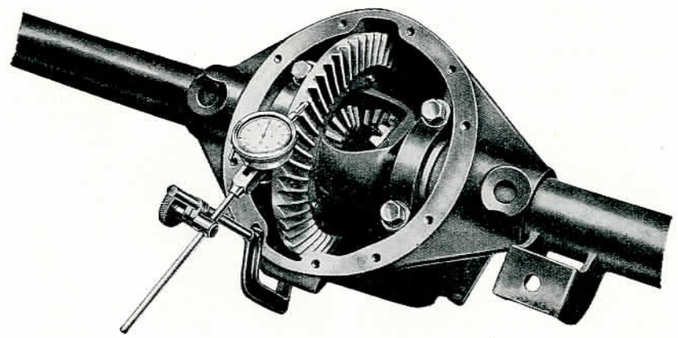


PLATE 40 DIFFERENTIAL ADJUSTMENTS PLATE 41.

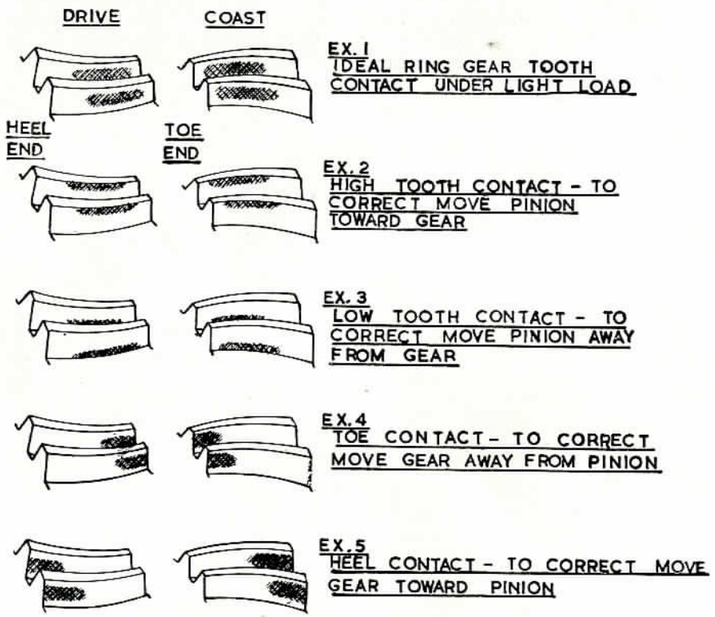


PLATE 42. CROWN WHEEL AND PINION. TOOTH CONTACT

differential case to the other to obtain the desired setting, Plate 40. Backlash will be changed approximately two-thirds of the thickness of shims transferred.

After setting the backlash to the required figure, use a small brush to paint eight or ten of the ring gear teeth with a mixture of ground red lead and engine oil. Move the painted ring gear teeth over the pinion until a good impression of the tooth contact is obtained.

The resulting impressions should be similar to the first example given in Plate 42.

If the tooth contact is high on the gear teeth, as shewn in the second example, the pinion should be moved towards the gear by adding shims between the rear bearing cup and the housing, and adding the same thickness of shims between the pinion bearing spacer, or the shoulder of the pinion shaft, and the forward bearing cone.

If the tooth contact is low on the gear, as in Example 3, the pinion should be moved away from the gear by removing shims from between the rear bearing cup and the housing and removing the same thickness of shims from between the pinion bearing spacer or the shoulder of the pinion and the forward bearing cone.

If the tooth contact is decidedly towards the toe or small end of the tooth as in Example 4, Plate 42, the gear should be moved away from the pinion by removing shims from the ring gear side of the differential case and adding the same thickness of shims to the opposite side.

If the tooth contact is on the heel or large end of the teeth, as shewn in Example 5, Plate 42, the gear should be moved towards the pinion by removing shims from the side of the differential case opposite to the ring gear and adding the same thickness of shims on the ring gear side.

It must be remembered that in making adjustments to correct a heel or toe contact that the backlash limits of from .003" to .006" must be maintained. A reduction of the backlash within the above limits may correct an extreme heel contact while an increase of backlash may correct an extreme toe contact. Moving the ring gear .005" will change the backlash approximately .0035" while moving the pinion .005" will change the backlash about .001". Ordinarily it will not be desirable to move the pinion when making a backlash correction as the movement of the ring gear has a much greater effect upon the backlash. Moving the gear out changes the bearing towards the heel and slightly raises the bearing.

Moving the pinion out raises the bearing on the face of the tooth and slightly towards the heel.

After removing the companion flange install the oil slinger, oil seal gasket and the oil seal, Plate 43. Replace the companion flange and tighten ; install both axle shafts, bearings and cups. Then install the rear cover using a new gasket and fill the housing with the correct amount of approved hypoid lubricant.

Lubrication.

It is most important that approved Hypoid Oils only are used. The oils marketed by the following Companies under their respective trade names are recommended as suitable for Salisbury Hypoid Axles :—

Anglo-American Oil Co. Ltd.		Essoleum EXPEE Compound 90.
Price's Lubricants Ltd.	...	Motorine Hypoid.
Shell-Mex and B.P. Ltd.	...	Spirax E.P. 90.
Vacuum Oil Co. Ltd.	...	Mobilube GX.
C. C. Wakefield & Co. Ltd.		Castrol Hipress.

PLATE 43. PINION SHAFT OIL SEAL

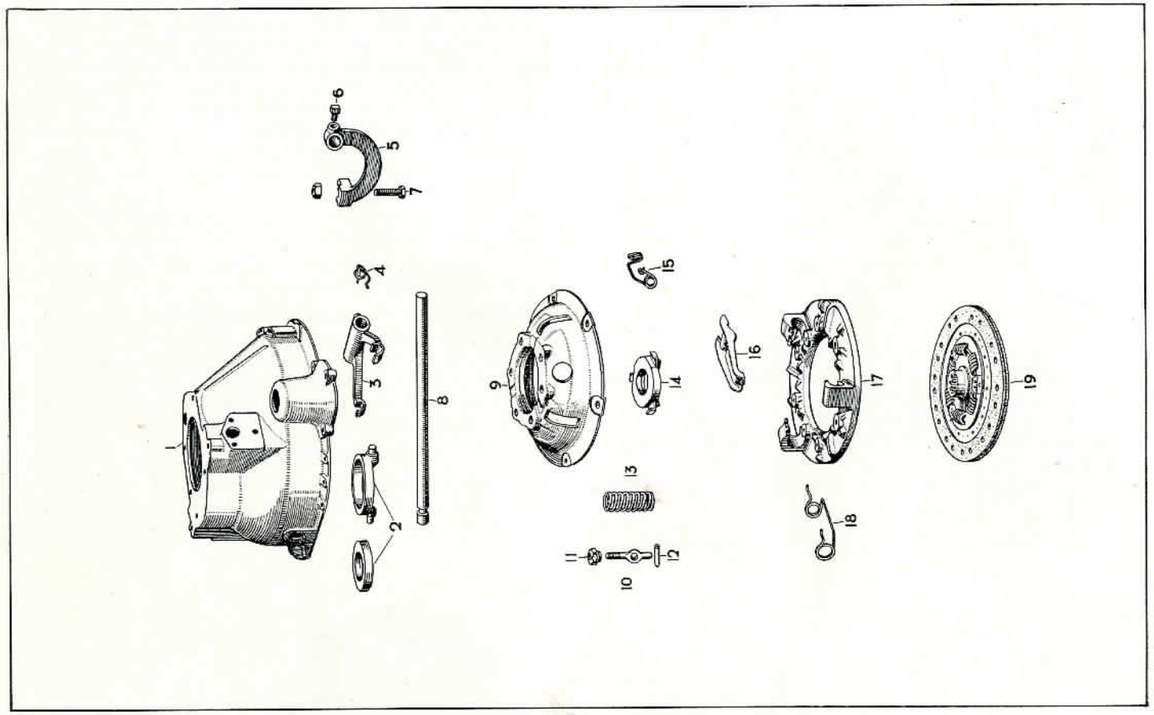


PLATE 44. CLUTCH, 1½ LITRE.

INDEX TO PLATE 44.

CLUTCH UNIT.

Housing, Bell	1	Nut, for Eyebolt	11
Bearing, Release and Cup Assembly	2	Pin (Toggle) on Release Lever	12
Fork, Operating Clutch	3	Spring, Thrust	13
Retainer, Release Bearing	4	Plate, Release Lever	14
Lever, Clutch Operating	5	Spring, Anti-Rattle	15
Pin, securing Release Lever	6	Lever, Release	16
Screw, Adjusting, on Operating Lever	7	Plate, Pressure	17
Shaft, Clutch Operating	8	Retainer, Release Lever	18
Cover	9	Plate, Driven, Assembly	19
Eyebolt	10		

OPERATION No. 76.

CLUTCH UNIT. TO REMOVE.

Remove gearbox complete with bell housing. (Operation No. 37, includes 102.)

Remove bolts securing clutch to flywheel.

Withdraw clutch unit.

N.B. : It is important to maintain the balance of flywheel and clutch when re-assembling. The balance marks "B" (on 2½ and 3½ litre only) should coincide. On some models two ¼" dowels are used, to locate the clutch body on the flywheel.

OPERATION No. 77.

CLUTCH. TO ADJUST.

Adjustment of the clearance between the release bearing and release plate is brought about by adjustment of the screw on the operating lever, this clearance being measured at the clutch pedal pad.

Release adjusting screw lock nut.

Rotate adjusting screw until ⅞" to 1" free pedal travel is obtained. Tighten lock nut.

The amount of clutch throw-out is controlled by an adjustable stop mounted on the top of the starter motor housing. (This stop is not fitted on Left-Hand Drive models.)

Release stop screw lock nut.

Rotate stop screw until clutch pedal just clears floorboards when fully depressed. Tighten lock nut.

N.B. : The rake of the clutch pedal lever in the free position can be adjusted by rotating the adjusting screw, following release of the lock nut, situated on the clutch pedal boss.

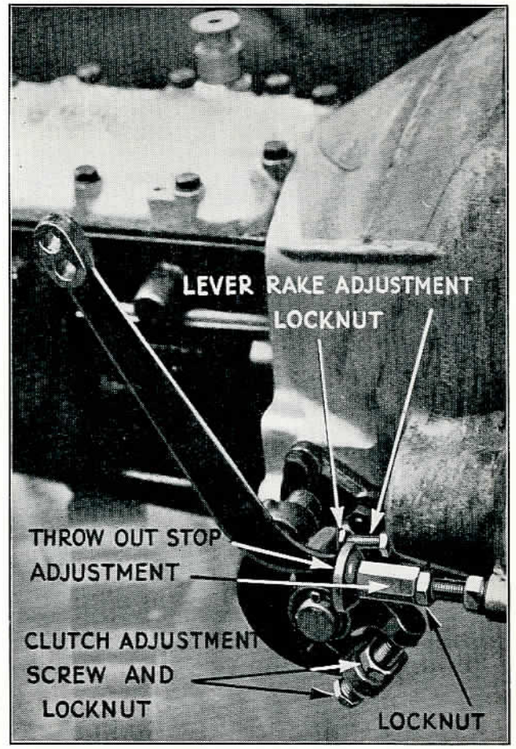


PLATE 45.

Clutch Spring Data.

Model.	Thrust Springs.					Damper Springs.
	Load (lbs.)	Outside Diameter	Approximate Free Length	Wire Diameter	Colour	Colour
1½ litre.	90/100 @ 1.688"	1.140"	2.44"	.156"	Orange	White
2½ litre.	135/145 @ 1.688"	1.140"	2.68"	.160"	Yellow	Dull Red and Blue Grey
3½ litre.	120/130 @ 1.688"	1.140"	2.68"	.156"	Cream	Bright Red

OPERATION No. 78.

FLYWHEEL. TO REMOVE.

Remove clutch. (Operation No. 76, includes No. 37 and No. 102.)

Remove four bolts and lock plates securing flywheel to crankshaft.

Gently lever flywheel off.

N.B.: On 2½ litre Engine Nos. P.18—P.600 inclusive, flywheel Part No. C.605 is used with starter motor Part No. 25506/A, Model M.418G, Type GC.30.

From Engine No. P.601 onwards flywheel Part No. C.605/1 is used with starter motor Part No. 255721, Model M.418G, Type L.1—0.

On later type engines the flywheel dowels are driven through open holes in the flywheel to effect location on the crankshaft and are then positively retained by the flywheel mounting bolt lock plates.

Special care is necessary, due to the tight fit of this form of assembly, not to drop the flywheel during removal, and it is recommended that a ⅜" bar is inserted in the clutch spigot bearing to avoid this possibility.

When assembling, the flywheel should be located on the crankshaft boss and the dowel pins driven home before the mounting bolts and lock plates are fitted.

OPERATION No. 79.

STARTER MOTOR. TO REMOVE. 1½ Litre.

Remove air silencer and carburettor.
Disconnect exhaust down pipe.
Disconnect starter leads.
Remove starter fixing bolts.
Withdraw starter towards radiator and upwards over steering column.

OPERATION No. 80.

STARTER MOTOR. TO REMOVE. 2½ and 3½ Litres.

Disconnect rear exhaust down pipe.
Disconnect starter leads.
Remove starter fixing bolts and withdraw starter.

Starter Motor Data.

1½ litre.	Torque	15.5 lbs./ft. at 7 to 7.5 volts.
	Number of pinion teeth ...	11.
	Type of drive ...	Lucas "S" type.
2½ litre.	Torque	15.5 lbs./ft. at 7 to 7.5 volts.
	Number of pinion teeth ...	11.
	Type of drive ...	Lucas "S" type.
3½ litre.	Torque	22 lbs./ft. at 6.5 to 7 volts.
	Number of pinion teeth ...	10.
	Type of drive ...	Lucas "S" type.

GENERAL CONSTRUCTION.

The body is constructed from steel pressings which are welded together to form a complete shell of immense strength.

The size and location of these steel pressings is indicated in Plates 46 and 47.

It will be appreciated that when panels have been seriously damaged by impact to an extent that precludes a satisfactory panel beating repair, then the damaged section can be cut out and a new panel welded in position.

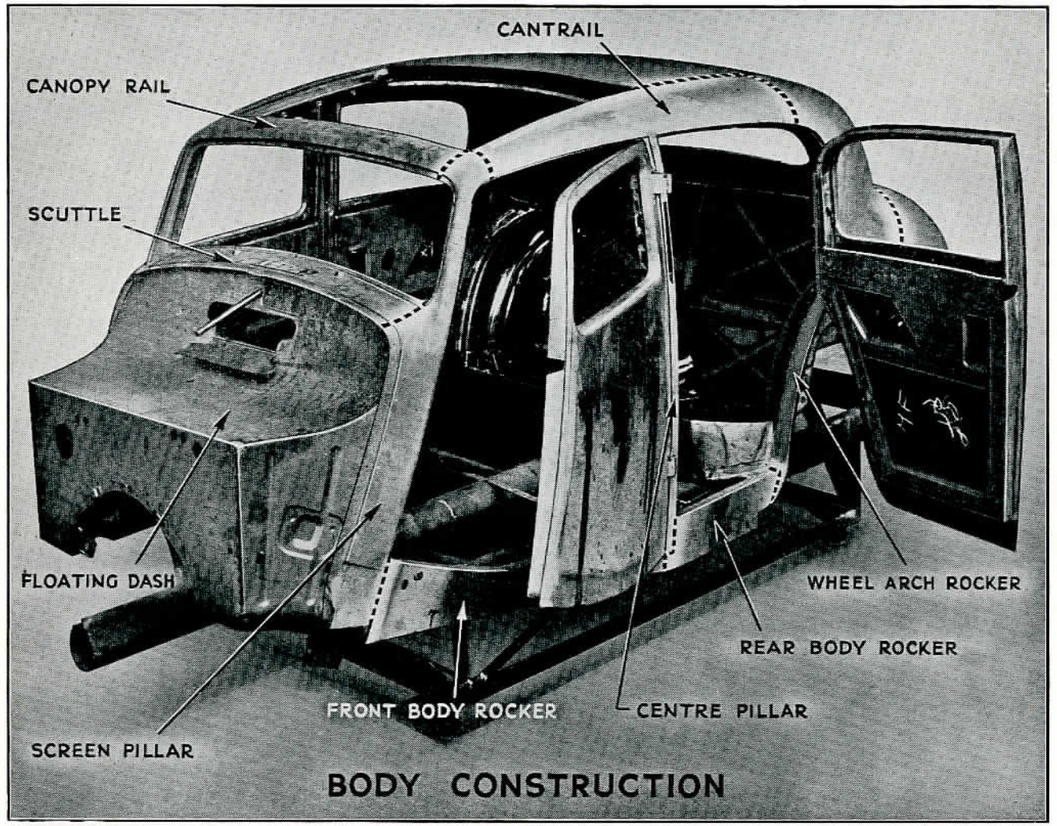


PLATE 46.

OPERATION No. 81.

BONNET. TO REMOVE.

Release side catches and rest both side panels on dash.
Remove two screws from bonnet centre strip front "T" piece.
Raise front of bonnet and slide off rear "T" piece.

OPERATION No. 82.

BONNET. TO DISMANTLE.

Place bonnet upright on the ground, scuttle end down, and withdraw one half from the other.

The centre strip can now be pulled clear.
Push the side panel hinge rods out with a suitable rod used as a punch.

OPERATION No. 83.

RADIATOR SHELL. TO REMOVE.

Remove bonnet and radiator cap.
Remove four base mounting bolts situated under the front apron.
Remove bonnet tape from radiator shell and block.
Remove two bolts from each side securing shell to radiator block.
Lift shell upwards and off.

OPERATION No. 84.

BUMPER ASSEMBLY, FRONT. TO REMOVE.
1½ Litre.

Remove both chrome dome nuts from bumper main bolts.

Support fog lamps (S.E. Models), and withdraw bumper complete.

OPERATION No. 86.

BUMPER ASSEMBLY, REAR. TO REMOVE.
1½ Litre (S.E.), 2½ and 3½ Litre.

Withdraw two rear bumper red reflectors. (Split stem fitting.)

Remove bumper bar mounting studs with suitable Allen key. ($\frac{5}{16}$".)

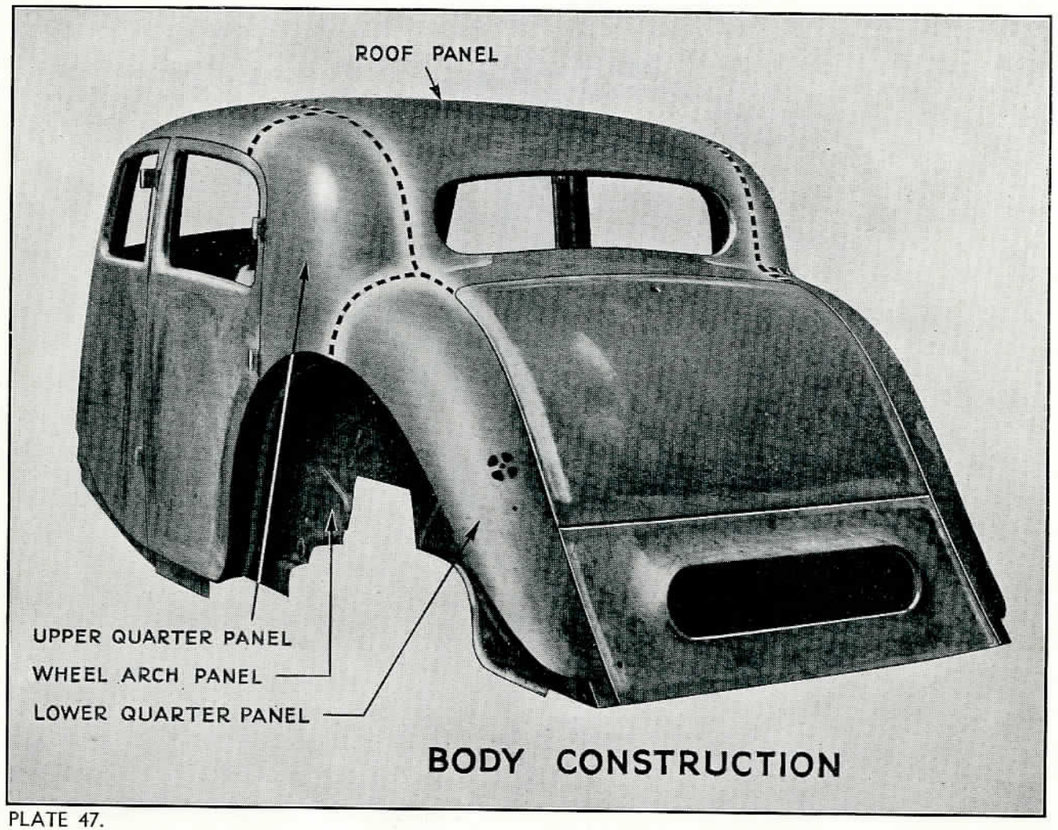


PLATE 47.

OPERATION No. 85.

BUMPER ASSEMBLY, FRONT. TO REMOVE.
2½ and 3½ Litre.

Remove one nut under each end of the bumper, securing bar to stabiliser blades. Remove bumper complete with lead balance weights.

Withdraw the two rubber grommets covering stabiliser main bolts.

Remove stabiliser bolt nuts, remove number plate bracket, support fog lamps, and withdraw stabiliser.

The main bolts can now be unscrewed from the chassis dumb iron brackets.

N.B.: The bumper is adjustable for height by loosening the two bolts which secure the mounting brackets to the chassis frame (either side). The brackets can then be tapped into the desired position.

OPERATION No. 87.

WING, FRONT. TO REMOVE.

Remove bonnet, radiator shell, headlamp, fog lamp, front bumper assembly and disconnect side lamp wiring.

Remove wing mounting bolts and headlamp mounting bracket bolts which pass through wing stay brackets.

Release wing tie rod. Remove wing.

N.B.: Remove front rocker fillet, and dash side casing, to gain access to four wing mounting bolts.

OPERATION No. 88.

STEPBEADS AND RUBBERS. TO REMOVE.

The stepbead rubbers are pressed into the channel of the stepbead and are easily withdrawn and replaced.

The stepbeads are pop riveted to the stepboards.

Remove rubbers and chip through the rivets with a flat cold chisel inserted between the stepbead and stepboard. If care is taken the cellulose will not be damaged.

Alternatively the rivets may be drilled out.

OPERATION No. 89.

DOOR. TO REMOVE.

Remove screw from check strap rod and insert loop of wire to prevent check strap falling into pillar for rear doors and door shell for front doors.

Support door, knock hinge pins upward and out. Remove door.

OPERATION No. 90.

DOOR. TO STRIP.

Remove eleven screws from window surround capping and withdraw capping inwards.

Remove interior handle and window winder handle by pressing in escutcheon plates, and ejecting cotter pins.

Remove velvet from top of facia capping and three screws now disclosed. Withdraw capping upwards.

N.B.: In the case of front doors, first remove no-draught-ventilator window winder, secured by three screws to capping.

Remove door casing secured by spring clips. (Front door casings are located by arm rest support bracket screws, and one self-tapping screw located under door pocket. Rear door casings by two screws disclosed on removal of door facia capping.)

On later models the door casings are retained by steel runners which form part of the door shell. This fitting is recognisable by absence of the self-tapping screw under the front door pocket. Location of fronts is by

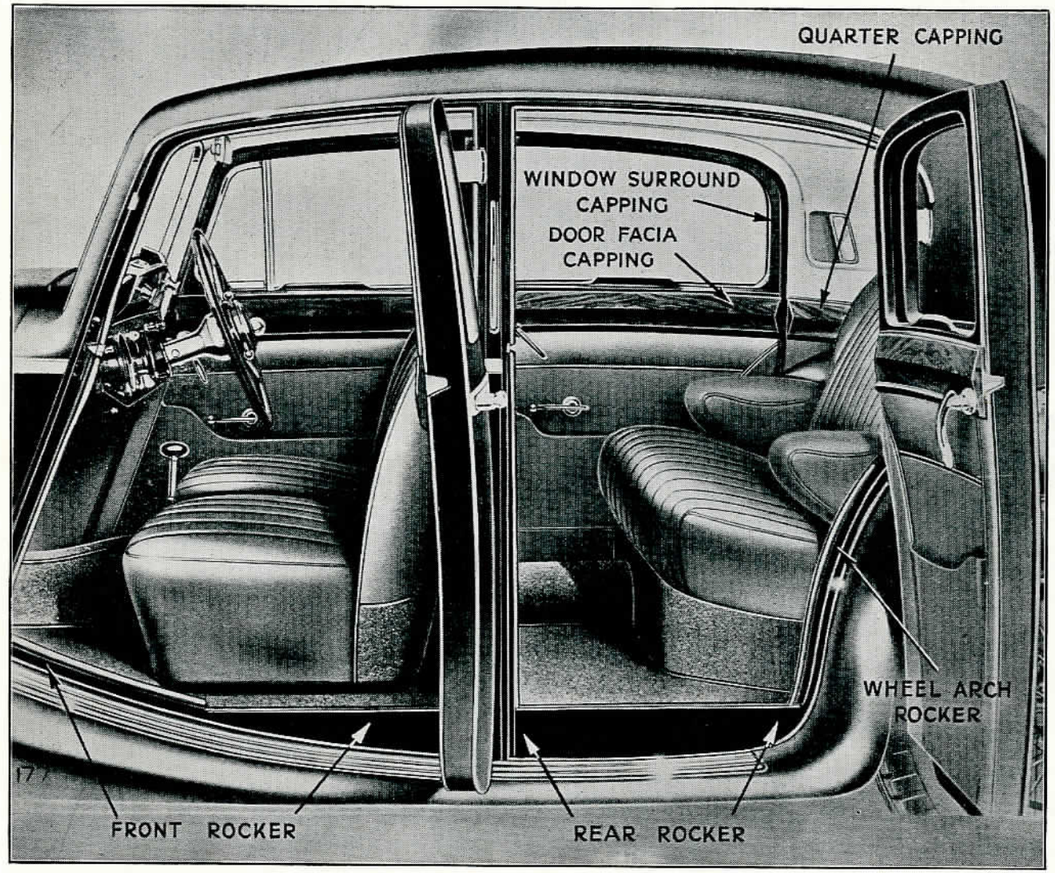


PLATE 48. BODY INTERIOR

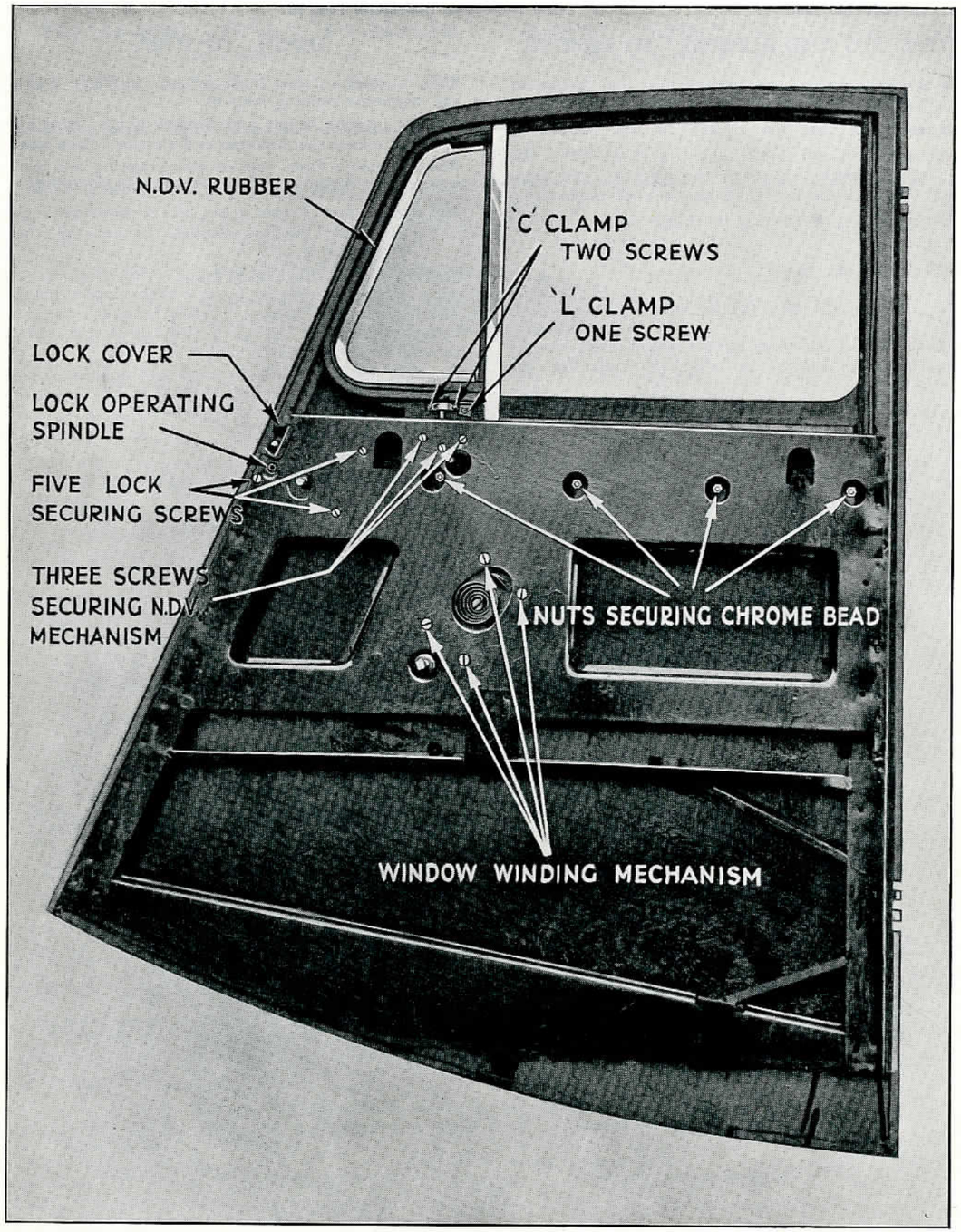


PLATE 49. DOOR SHELL

means of arm rest support bracket screws and two screws at the top of the casing. Location of rears by two screws at top of casing.

With this type of casing, removal is as follows :—Insert a piece of flat bar behind the centre of the casing to spring the casing clear of the window winder handle shaft and tap the casing forward off the rails.

Remove screw from split end of lock operating spindle.

Remove five nuts securing chrome bead and withdraw bead and handle complete outwards.

Remove three screws and withdraw the chrome plated lock cover plate.

Remove five screws securing lock to door frame and drop lock through aperture below.

Front Doors only. (Remove three screws securing no-draught-ventilator operating mechanism, two screws from "C" clamp on spindle and one screw from "L" clamp, withdraw N.D.V. rubber and remove five screws from rubber channel. Remove N.D.V. window complete. Remove two screws from top of chrome glass channel, one from centre and one nut from base and withdraw glass channel.)

Release four screws from window winding mechanism and slide operating lever off window frame.

Remove screws from glass felt channels and withdraw window upwards and inwards.

OPERATION No. 91.

DOOR. TO ADJUST.

There should be approximately $\frac{3}{32}$" equal clearance between the outside edges of the door shells and the door apertures.

The leading edge of the door shell should be slightly recessed behind the screen pillar for fronts and the centre pillar for rears.

The door shells and door apertures are accurately jigged in production and little difficulty should be experienced in carrying out adjustments if the following points are observed.

1. The leading edge of the door shell can be adjusted to a position slightly recessed behind the screen pillar or centre pillar by slackening the four dovetail mounting screws and tapping the dovetail to the position which retains the door at the required adjustment. The rubber buffers should then be adjusted to give light pressure on the door. (Shave off rubber to decrease, fit new buffers to increase.)
2. The door hinges are adjustable to a limited extent both in the supporting pillar and in the door frame. Slacken the mounting screws and tap the hinge in the required direction. This will give adjustment bodily of the horizontal or top and bottom edge.
3. To obtain adjustment of the vertical edges, that is, to move the door forward or backward in the frame, it is necessary to open or close the hinges. The hinges may be opened in situ by endeavouring to close the door with a suitable piece of hardwood inserted in the V of the hinge. To close the hinges it is necessary to remove the door and the hinges. Place the hinge flat on a solid block and close with a hammer.
   It will be appreciated that the door can be moved bodily by adjustment to both hinges. The top portion of the door is governed by the top hinge and the bottom portion by the bottom hinge and thus a clearance at either the top or the bottom of the vertical edges can be dealt with separately.
4. Further adjustment of the horizontal edge of the doors can be obtained by movement of the rear of the body on the two mountings situated at the front and rear of the wheel arch panel.

Slight lifting of the body on the mountings creates greater clearance between door frame edge and aperture at a point above the N.D.V. windows. Lowering of the body decreases the clearance. A similar adjustment can be made by loosening the mounting bolts under the centre pillar and raising or lowering the body at this point. In certain cases a combination of the last two described operations may be necessary to effect satisfactory adjustment.

N.B. : A final check should be made for clearance with the door closed by inserting a piece of celluloid from inside the car between the door shell and aperture. Clearance should be present round the whole door aperture.

OPERATION No. 92.

DOOR HANDLE, EXTERIOR. TO REMOVE.

Partly strip door. (Operation No. 90.)

Remove five nuts securing chrome bead and withdraw bead and handle complete outwards.

OPERATION No. 93.

DOOR HANDLE, LOCKING BARREL. TO REMOVE.

Remove door handle. (Operation No. 92 includes Operation No. 90.)

Remove split pin and barrel cover plate.

Eject cotter pin and extract barrel.

OPERATION No. 94.

DOOR DOVETAIL. TO REMOVE.

Remove four screws and withdraw dovetail.

N.B. : The dovetail mounting holes have clearance and allow lateral and vertical adjustment of the dovetail.

OPERATION No. 95.

BOOT LID. TO REMOVE.

Disconnect wiring to tool locker lid light at the lamp and withdraw wires from tool tray and boot lid.

Remove three screws from each side of boot lid hinge arm and withdraw lid.

N.B.: When fitted, remove screws fixing metal strip retaining dust excluder fabric.

OPERATION No. 96.

BOOT LID. TO STRIP.

Disconnect tool locker light. (Operation No. 146.)

Remove fourteen screws from tool tray and withdraw tray and back piece.

Remove tool tray light switch complete.

Remove tool tray lid by extracting six hinge mounting screws.

It is not essential to dismantle the boot lid to remove the locking handle. This is removed by turning the handle to the open position and removing the two mounting screws.

OPERATION No. 97.

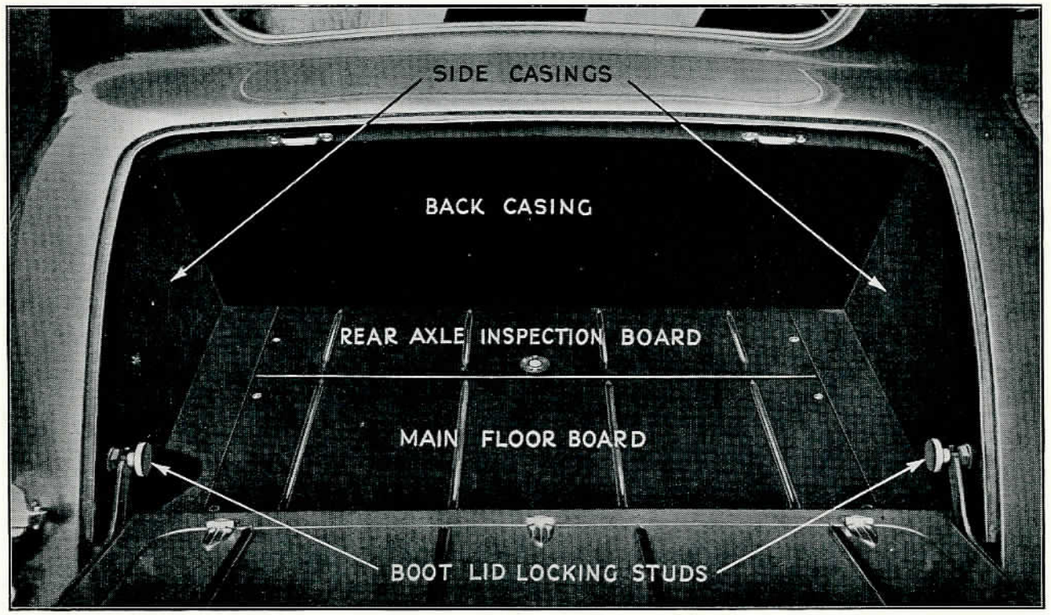
BOOT INTERIOR. TO DISMANTLE.

Remove both boot lid locking studs ($\frac{7}{16}$" hexagon nuts).

Remove rear axle inspection board secured by two screws, and main floor board secured by seven screws.

Withdraw self-tapping screws and remove side and back casings.

BOOT LID PLATE 50.



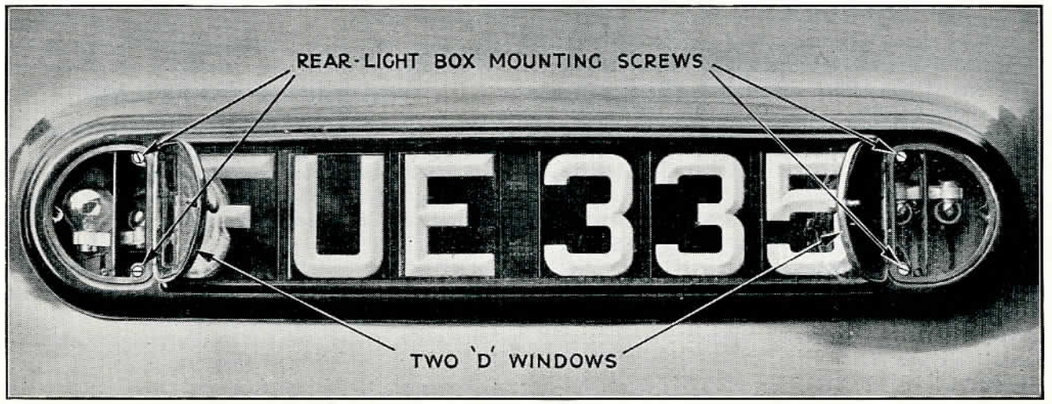
BOOT INTERIOR PLATE 51.

OPERATION No. 98.

REAR LIGHT BOX. TO REMOVE.

Release screw securing each of the "D" windows.

Remove four screws securing box to tail panel, and lift box clear to disconnect wiring. Remove box.



REAR LIGHT BOX PLATE 52

OPERATION No. 99.

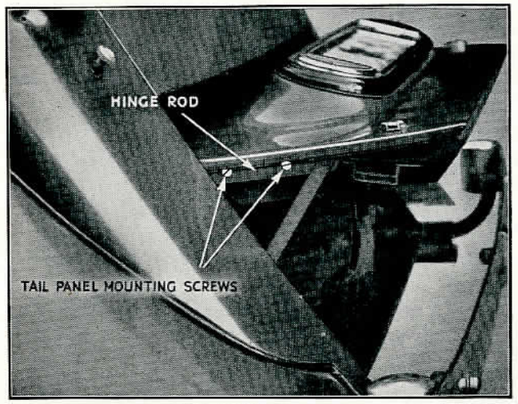
TAIL PANEL. TO REMOVE.

Remove rear light box. (Operation No. 98.)

Disconnect earth wire from back of panel.

Open panel. Withdraw two screws each side passing through hinge rods and remove panel.

N.B.: When fitted, remove screws fixing metal strip retaining dust excluder fabric.



TAIL PANEL PLATE 53

OPERATION No. 100.

ROOF SLIDE. TO REMOVE AND FIT.

Open the roof slide 3" to 4".

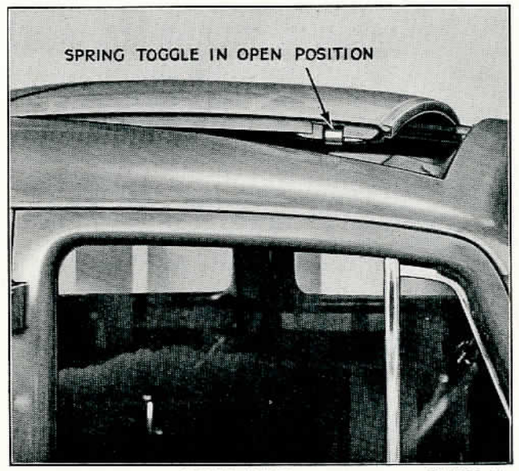
Approximately 3" from the leading edge and $\frac{3}{8}$" from the valance of the roof slide there is a small hole covered by the roof lining material. Feel around this area with a pointed tool until engagement with the hole is made.

A sharp tap upwards and outwards with the tool at an angle of 45° will release the spring toggle.

When this operation has been carried out at both sides, the slide can be raised clear of the front set of rails and withdrawn forward for removal.

To refit ensure both toggles are in the open position. Offer up the slide, ensuring that both rear feet engage on the rear rails.

With the slide approximately 3" to 4" open, insert a small packing piece under one toggle (that is, on the outside edge of the front rail—a screwdriver blade is suitable) and strike the slide above the toggle to effect engagement. Repeat for the other toggle.



ROOF SLIDE PLATE 54.

OPERATION No. 101.

SPARE WHEEL TRAY. TO REMOVE.

Remove rear bumper blade (Operation No. 86) and spare wheel.

Remove two screws securing tray to second rear cross member and two screws securing to rear cross member.

Remove one $\frac{1}{4}$" bolt either side securing tray to petrol tank mounting bracket.

Disconnect rear light box wiring at connectors.

Withdraw tray.

OPERATION No. 102.

SEATS, CARPETS, TOE AND FLOORBOARDS. TO REMOVE.

Raise seats to highest point on vertical adjustment (does not apply to $1\frac{1}{2}$ litre—Standard Equipment.)

Remove one cheese-headed screw from each seat runner passing at right angles through the centre of the runner.

Release the seat catch and slide backwards off the runners. Remove seats through rear doors.

Remove brake and clutch pedal pads and disconnect accelerator rod from pedal.

Remove screws securing seat runners to floor boards and lift carpets which are secured by a combination of tacks, spring clips and press studs.

Unscrew change speed lever knob, remove gearbox cowl first, toe boards next and floor boards last. (Fixed by metal thread screws.)

OPERATION No. 103.

REAR LIGHT. TO REMOVE.

From inside the body remove sixteen chrome plated screws passing through rear light flange. Press rear light inwards to remove.

OPERATION No. 104.

REAR LIGHT. TO REGLAZE.

Remove rear light. (Operation No. 103.)

Split frame by withdrawing four countersunk screws from each side.

Remove glass and thoroughly clean frame channel of old glazing rubber.

Cut off sufficient glazing rubber for one half of frame.

Warm replacement glazing rubber and lightly moisten on both sides with thin oil.

Apply the rubber, so treated, to the new glass and firmly draw on one half of the frame.

Repeat for other half of frame and replace countersunk screws. Trim off excess rubber.

OPERATION No. 105.

WINDSCREEN. TO REMOVE.

Release both safety catches and open windscreen to fullest extent.

Release operating chain from screen frame by removing two chrome-plated dome nuts.

Release screen frame from hinges by removing two chrome-plated $\frac{1}{4}$" bolts and two $\frac{3}{16}$" snap-headed screws.

Withdraw screen.

OPERATION No. 106.

WINDSCREEN. TO REGLAZE.

Remove screen. (Operation No. 105.)

Remove windscreen surround rubber. Split frame by withdrawing two countersunk screws passing through screen catch peg brackets at each side.

Remove glass and thoroughly clean frame channel of old glazing rubbers.

Cut off sufficient glazing rubber for one half of frame.

Warm replacement glazing rubber and lightly moisten on both sides with thin oil.

Apply the rubber, so treated, to the new glass and firmly draw on one half of the frame.

Repeat for other half of frame and replace countersunk screws. Trim off excess rubber.

OPERATION No. 107.

WINDSCREEN SURROUND RUBBER. TO REMOVE AND REFIT.

The surround rubber is a press fit in the channel running round the outside edge of the windscreen frame.

The rubber is jointed at the base of the screen and should be pulled out of the channel starting at the joint.

When refitting start at the centre point of the base of the screen and work round to the start point. It is an advantage to lightly moisten the lip of the rubber with thin oil to facilitate entry into the channel.

Seal the rubber joint with a spot of Bostic sealing compound.

Situated on the back of the flange of the windscreen frame is a strip of sorbo rubber. This is secured in position by Bostic sealing compound. To renew, strip off the old rubber, thoroughly clean the flange of the windscreen frame and fit a new rubber using Bostic sealing compound.

OPERATION No. 108.

SQUAB. TO REMOVE.

Dismantle boot interior. (Operation No. 97.)

Remove eight screws disclosed, which pass through rear boot panel into squab frame.

Remove rear seat cushion and rear squab.

OPERATION No. 109.

REAR BLIND. TO REMOVE.

Release ring from blind cord and withdraw cord to rear. If headlining is to remain in position, thread a length of free cord through the headlining when withdrawing the blind cord to facilitate refitting.

Remove rear seat squab. (Operation No. 108, includes Operation No. 97.)

Remove fixing screws securing blind to rear squab.

OPERATION No. 110.

ARM RESTS, REAR. TO REMOVE.

Remove squab. (Operation No. 108, includes Operation No. 97.)

Release two $\frac{1}{4}$" bolts situated in each rear wheel arch and passing up into arm rests. Untack leather from quarter fillets and withdraw arm rests.

OPERATION No. 111.

DASH CASING. TO REMOVE.

Remove the centre casing followed by the two outer casings by withdrawing the appropriate screws.

If an "H.M.V." Radiomobile car radio is fitted, this must be removed before the dash casing is taken out.

Proceed as follows:

Disconnect the bayonet joint on the nearside in which the fuse protecting the radio is situated.

Extract the aerial jack plug from the offside. Remove two fixing screws located under the lip of the facia board, and slide the radio forward six inches. The jack connector from the power pack can now be extracted, after the removal of two screws passing through the connector, and the radio withdrawn.

OPERATION No. 112.

FACIA BOARD. TO RELEASE.

Remove dash casing complete. (Operation No. 111.)

Remove mannette control and steering wheel. (Operation No. 139.)

Open screen to fullest extent and remove windscreen wiper knobs, windscreen winder handle and scuttle vent knob.

Release hand throttle control cable at throttle linkage or operating cross shaft. (On $1\frac{1}{2}$ litre also release choke control cable at carburettor.)

Remove heater rheostat switch and heater warning light assembly without disconnecting wiring.

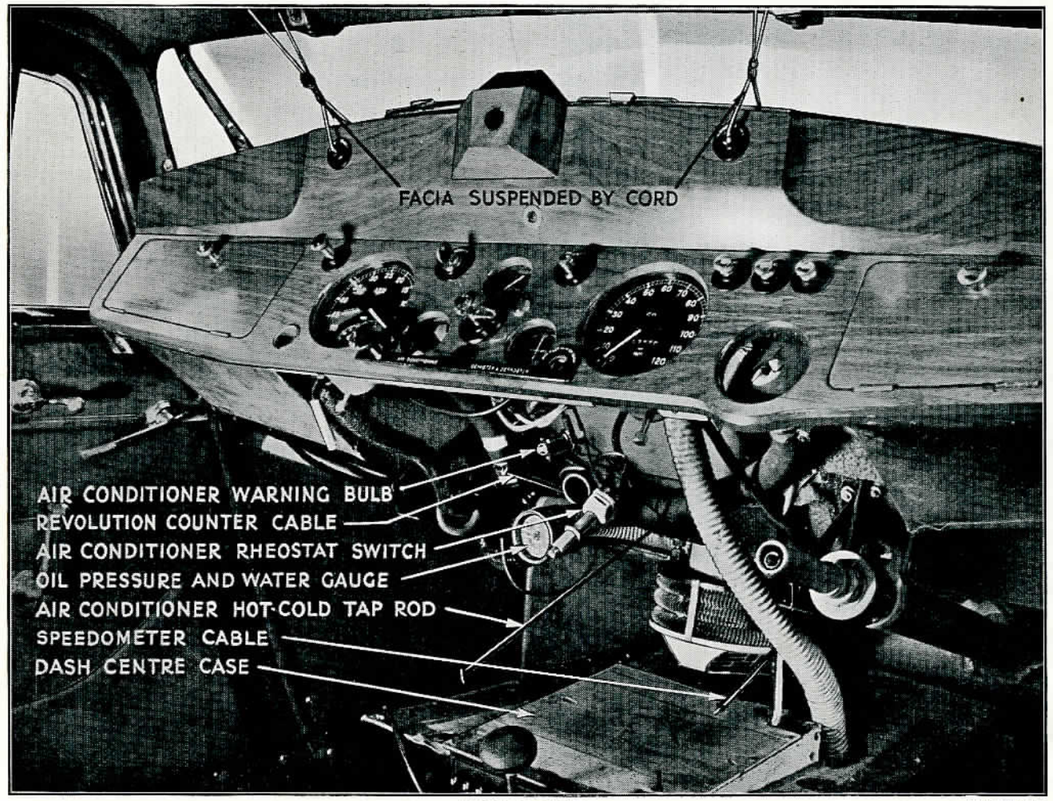
Remove combined oil pressure and water temperature gauge without disconnecting unions.

Disconnect speedometer and revolution counter cables.

Remove six screws from bottom channel of windscreen aperture and two $\frac{1}{4}$" bolts securing instrument carrier to dash brackets.

The facia board can now be tied through the wiper spindle holes to the sun visor brackets in a convenient position to give access to all components in rear.

N.B.: When refitting ensure that the water control cock rod engages with the facia board knob.



FACIA BOARD PLATE 55.

OPERATION No. 113.

FACIA BOARD. TO REMOVE.

Release facia board. (Operation No. 112, includes Operations Nos. 111 and 139.)

Disconnect panel loom from junction box and two air conditioning motor wires from rheostat switch and warning light bulb holder respectively.

Remove facia.

OPERATION No. 114.

POLISHED WOOD CAPPINGS. CENTRE PILLAR. TO REMOVE.

Remove two chrome-plated screws from centre pillar fillet and withdraw fillet.

Remove one screw now disclosed on bottom of lower capping and draw capping downwards and off.

Remove one screw now disclosed on bottom of upper capping and draw capping downwards and off.

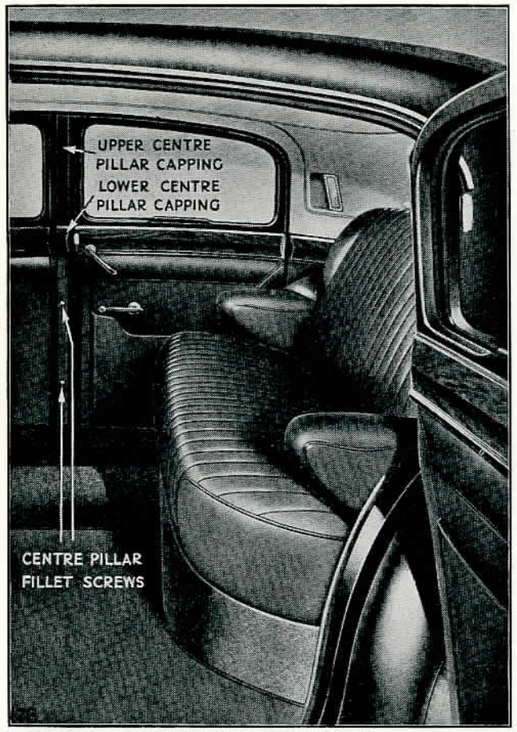


PLATE 56. CENTRE PILLAR CAPPINGS

OPERATION No. 115.

POLISHED WOOD CAPPING. REAR QUARTER. TO REMOVE.

Remove rear squab. (Operation No. 108, includes Operation No. 97.)

Remove one screw disclosed and slide capping to rear and off.

OPERATION No. 116.

CHROME BEAD SCUTTLE. TO REMOVE.

Release facia board. (Operation No. 112, includes Operations Nos. 111 and 139.)

Remove two nuts and withdraw bead.

OPERATION No. 117.

CHROME BEAD. CENTRE PILLAR. TO REMOVE.

Remove lower centre pillar capping only. (Operation No. 114.)

Remove one nut and withdraw bead.

OPERATION No. 118.

CHROME BEAD. REAR QUARTER. TO REMOVE.

Remove rear quarter polished wood capping. (Operation No. 115, includes Operations Nos. 108 and 97.)

Release quarter trimming fillet secured by tacks, disconnect interior light wiring and withdraw fillet.

Remove two nuts and withdraw bead.

OPERATION No. 119.

CHROME DRIP BEAD. TO REMOVE.

Open front and rear doors and remove twenty-two screws securing flange of drip bead to door apertures.

Remove drip bead.

OPERATION No. 120.

BODY MOUNTING BOLTS. SALOON, LOCATION.

The body is supported by eight mountings, four on each slide, which are situated as follows :—

Cluster of three $\frac{3}{8}$" bolts at base of screen pillar.
Cluster of three $\frac{3}{8}$" bolts under centre pillar.
One $\frac{1}{2}$" bolt at front of rear wheel arch panel.
One $\frac{1}{2}$" bolt at rear of rear wheel arch panel.

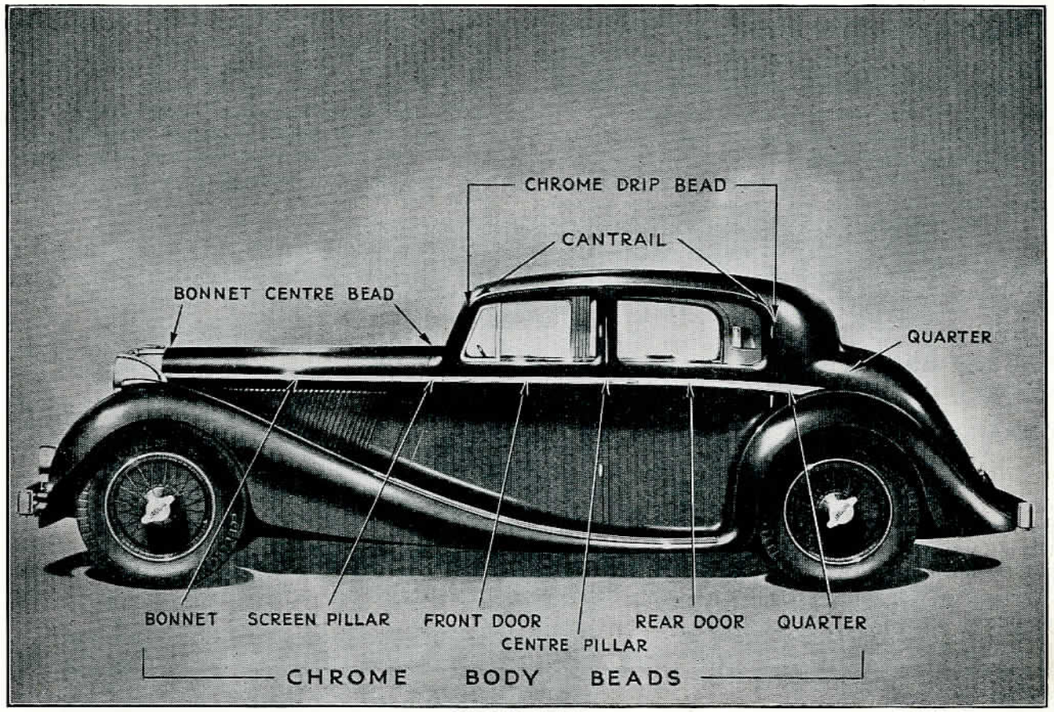
(See Plate 58.)

OPERATION No. 121.

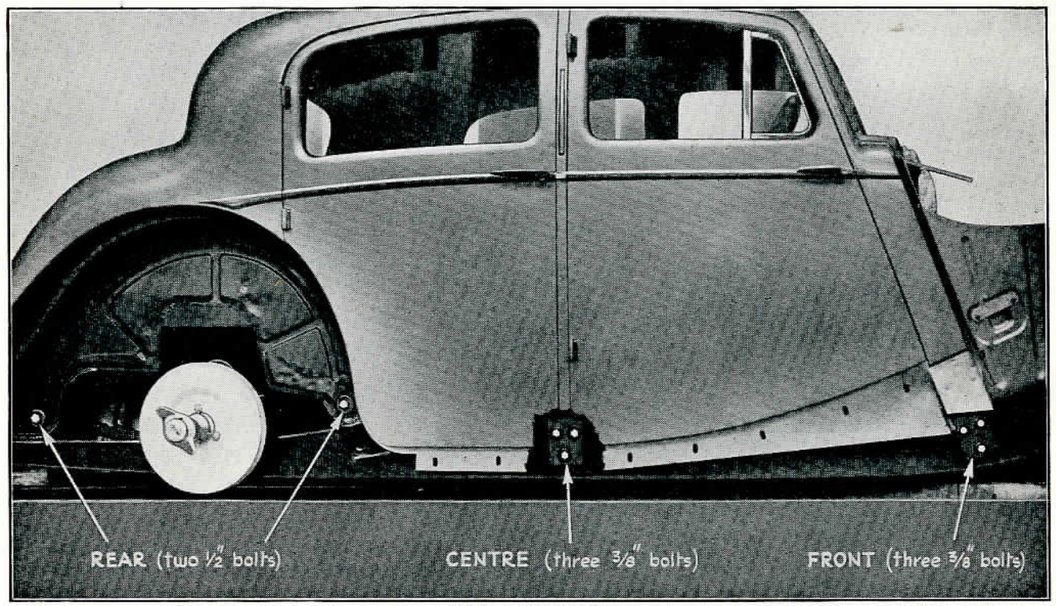
BODY MOUNTING BOLTS. DROP HEAD COUPE. LOCATION.

The body is supported by eight mountings, four on each side, which are situated as follows :—

Cluster of three $\frac{3}{8}$" bolts at base of screen pillar.
Cluster of four $\frac{5}{16}$" bolts at base of door pillar.
One $\frac{1}{2}$" bolt at front of rear wheel arch panel.
One $\frac{1}{2}$" bolt at rear of rear wheel arch panel.



CHROME BEADS PLATE 57.



BODY MOUNTINGS PLATE 58.

OPERATION No. 122.

DRAIN TUBES, SUN ROOF. TO SERVICE.

Water is carried away from the sun roof aperture by four rubber drain tubes situated in the corners of the roof tray.

The front tubes pass down inside the screen pillars and discharge at the front body mountings.

The rear drain tubes pass along the cantrails, over the top of the wheel arches and discharge at the bottom of the rear quarters.

OPERATION No. 123.

DRAIN TUBES, SCUTTLE VENT. TO SERVICE.

Water is carried away by two rubber drain tubes.

These carry water from the side of the scuttle vent, and discharge at the front body mountings.

OPERATION No. 124.

WHEEL DISCS. TO FIT.

Attach the bolts to the aluminium carrier and place in position on the outer end of the hub of the wheel, taking care that the arrow on the carrier comes in a position opposite the tyre valve.

The bore of the carrier should be a neat fit on the protruding portion of the hub shell.

Make sure that the carrier lies flush against the spokes and in such a position that the bolts pass through the spaces formed by the angles of the spokes in a straight line from front to back.

The inner disc and steel retaining ring are next placed in position and the nipples threaded on to the bolts.

Screw the nipples down evenly in turn and see that the retaining ring is central on the hub flange.

When nearly home the upturned inner edge of the retaining ring should be lightly tapped down on to the hub flange and the nipples given a final turn with the screwdriver.

Now screw one end of the Ace-Schrader Valve Extension to the stem of the tyre valve and it will be found that the bend of the extension allows the free end to be located in its housing on the aluminium carrier.

The extension, now being in position, should be tightly screwed down on the valve stem with pliers.

The outer disc may now be placed into position with the outer end of the valve extension coming through the hole provided.

The disc is now secured by the screwed locking ring.

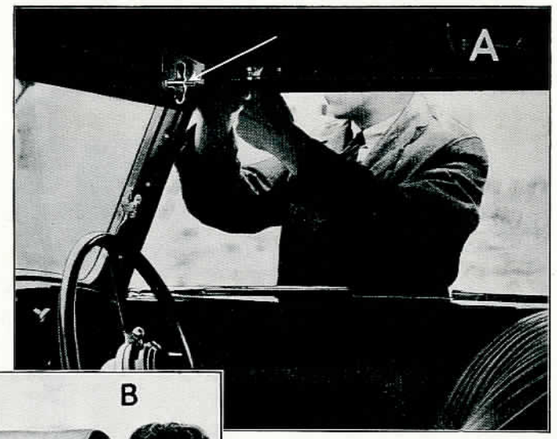
It will be found an advantage to put a little oil or grease on the threads of the locking rings before use ; this will ensure easy removal.

Do not use a hammer to tighten up ; hand pressure when using the key spanner is quite sufficient.

Three holes for engagement with the pip of the spanner are provided in the locking ring, but in tightening the ring care must be taken to avoid fouling the Schrader Valve Cap with the spanner.

Next place fibre washer over protruding end of the extension, and screw down metal washer with key provided.

Screw on the collar and cap, and the operation is complete.



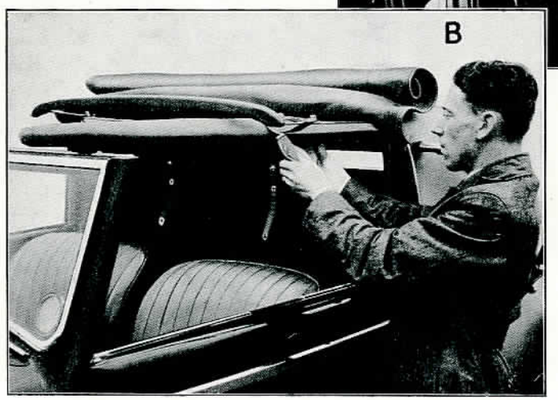


PLATE 59.

OPERATION No. 125.

LOWERING THE HEAD. DROP HEAD COUPE.

(See Plates 59 and 60.)

Release side rails (cantrails) by means of thumb catch as shewn.

Whilst holding the catch open, strike the cantrail smartly with the palm of the hand.

This will free it from the dovetail joint which secures it to the canopy rail.

Do not yet push cantrails right back.

Slacken wing nuts. Lift front portion of head from the screen.

Roll the fabric round the canopy rail—roll under, not over, and place it temporarily on rear portion of head.

Next, draw the fabric protector sleeves on to the cantrails and secure with press fasteners. Sheaths must be positioned so that press fasteners are to the rear.

Now push the cantrails right back, noticing that the nearside rail is in front of the offside rail, and secure with straps.

N.B. : The front portion of the head fabric must be rolled as tightly as possible and must lie on top of the curved head stick. On no account should the fabric be allowed to drop behind the head stick.

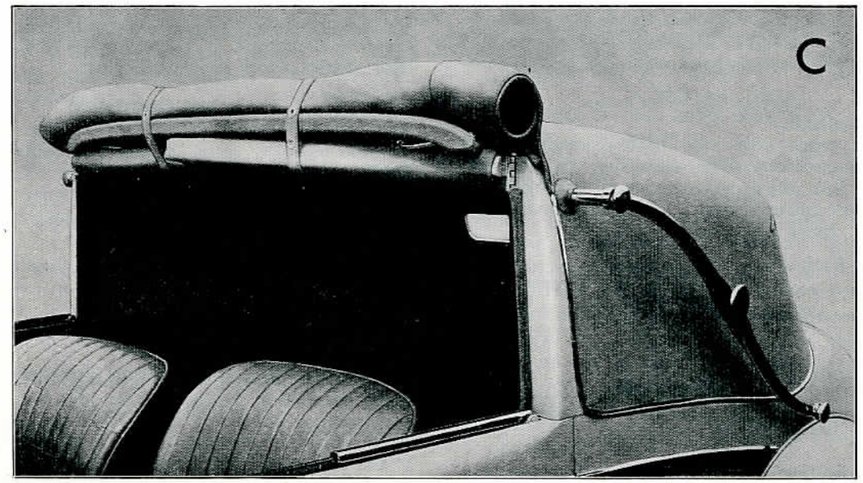
Break the outside knuckle joints, lower the head into position and fit envelope.

OPERATION No. 126.

RAISING THE HEAD. DROP HEAD COUPE.

To raise the head it is merely necessary to reverse the foregoing operations, the sequence being as follows :—

Raise the rear portion to upright position and tighten outside knuckle joints.



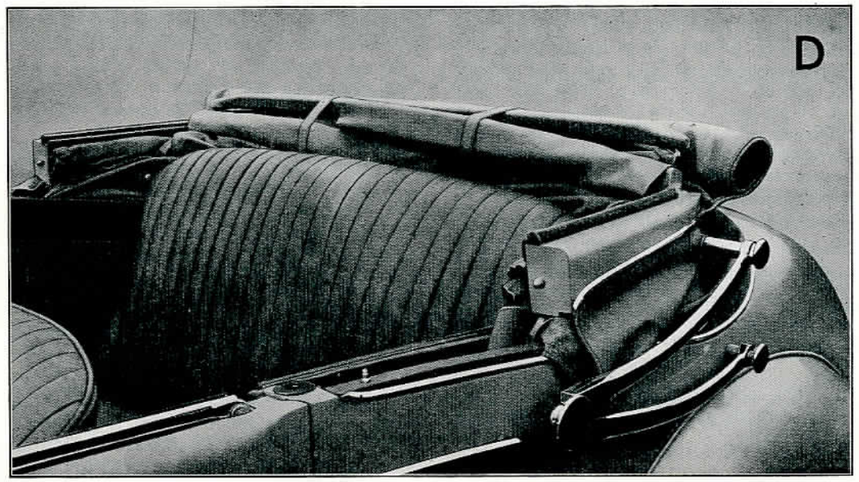


PLATE 60.

Release straps, unroll head and secure canopy rail to top of screen. (See that canopy rail is well down on screen before tightening wing nuts.)

Swing cantrails forward and lock into canopy rail. See that the thumb catches lie flush, indicating that rails are properly locked.

STANDARD ON 2½ AND 3½ LITRE MODELS INCLUDED IN SPECIAL EQUIPMENT ON THE 1½ LITRE MODEL.

OPERATING INSTRUCTIONS.

UNIT NOT IN USE.

In conditions when the use of the unit is not required, the following operations should be carried out :

1. Close scuttle vent.
2. Close heater doors.
3. Turn rheostat switch to " OFF."
4. Turn water control knob to " COLD."

UNIT IN USE.

1. For mild warmth.

On occasions when only mild heat is required and demisting is unnecessary, turn the water control knob to " HOT." This will provide moderate warmth without running the heater motor. The heater doors may be opened or closed as required.

2. For warm fresh air.

1. Turn water control knob to " HOT."
2. Turn rheostat switch to " ON."
3. Open heater doors.
4. Open scuttle vent.

On completing these operations, the rheostat switch may be used to adjust the speed of the motor, thus giving the amount of warm air required.

3. For warm recirculated air.

In conditions of heavy rain when water may enter scuttle vent, proceed as in foregoing paragraph but keep scuttle vent closed.

4. For defrosting.

Proceed as in paragraphs 2 or 3 when defrosting will be automatic.

5. For demisting.

(a) For summer and for quick demisting when outside air temperature is considerably lower than temperature inside car proceed as follows :

1. Turn water control knob to " COLD."
2. Turn rheostat switch to " ON."
3. Open heater doors.
4. Open scuttle vent.

The rheostat switch may be used to adjust the speed of the motor to give the amount of cool air required to effect demisting.

(b) In winter, when continuous demisting is required, proceed as in paragraphs 2 and 3, when demisting will be automatic.

6. For cold fresh air.

1. Turn water control knob to " COLD."
2. Turn rheostat switch to " ON."
3. Open heater doors.
4. Open scuttle vent.

The rheostat switch may be used to adjust the speed of the motor thus giving the amount of cold air required.

In warm weather a small amount of cool fresh air is circulated when the scuttle vent and heater doors are open, without the motor running.

Note : When starting and driving away with engine cold in misting conditions, proceed as in paragraph 6. If hot or cold air is not required inside the car when demister or defroster is in use, the heater doors should be closed.

Frost Precautions.

Very Important. Draining the radiator and cylinder block in frosty weather will not clear the heater unit of water which may freeze and cause damage. The use of anti-freeze mixture is therefore essential, except on later heaters which have drain plugs.

General Description.

Plate 62 shows the general installation of the unit demister nozzles, water piping, and controls. It also includes an electrical wiring diagram.

The detailed construction of the C.B. Unit is illustrated on Plate 61 and the following notes indicate the working of the unit.

A small electric motor (12 volts) operating from the battery is built into the unit and a fan is fitted to each end of the motor. Both fans draw air into the periphery of the unit and through the heating coil, warming the air in the process.

The front fan discharges part of this warmed air through the two doors on the front of the unit and into the car, the back fan which runs in the volute casing discharges air through suitably disposed pipes to nozzles situated at the base of the windscreen.

The heating coil consists of Clayton Still high efficiency wire wound tubing. This coil is connected up to the engine cooling system, and the hot water is circulated through the coil by the engine water pump.

OPERATION No. 127.

CLEANING.

(1) The demister nozzles (Plate 62 viewed from "A") must not be allowed to become choked otherwise there will be no air flow over the windscreen and consequently no demisting.

(2) The fresh air inlet gauze (Plate 62 viewed from "B") under the scuttle ventilator must be kept free from choking otherwise the efficiency of the unit will be affected due to lack of air volume delivered to the unit.

(3) With continuous service dust may collect on the copper wire wound tubes, and to keep the unit working at full efficiency it should be periodically cleaned. To state an exact period is not possible as conditions of service vary, but inspection by the individual owner will soon determine this period.

Method of Cleaning.

It is not necessary to remove the unit from the car for the purpose of cleaning as access can be obtained to the coil surfaces by the following method.

(1) Remove plate "S" complete with cover "T" by taking out 13 screws marked "R" (Plate 62).

(2) Remove heater front cover "V" and fan cowl by taking off the three spring clips marked " U."

(3) Remove front fan which is secured by means of a grub screw to the motor spindle.

(4) Apply a fine jet of compressed air to the inside of the heating coil and remove deposit of dust with a brush.

If due to the continued use of dirty water in the cooling system the heating tubes become partially choked, it will be necessary to completely dismantle the unit, remove the heating coil and clean out with hot soda water. The coil should then be flushed out with clean water.

For instructions for complete dismantling of heating unit see later paragraphs.

After cleaning, assemble to Plate 61 and note particularly the following points :—

(1) Fit fan in correct position and with the boss towards the front.

(2) Replace fan cowl and front cover, the cowl is shown in its correct position to fan on Plate 61.

(3) Replace the three spring clips and distance plates.

OPERATION No. 128.

MOTOR MAINTENANCE.

General Description.

These motors, which are of the ordinary shunt wound type, have only one place where wear is likely to take place, namely, the brushes.

Bearings.

The bearings are of the self-alignable porous bronze type and are impregnated with a special oil suitable for high temperatures before leaving the factory. An oil soaked pad is also fitted in each bearing housing to provide lubricant for a considerable period of use.

Brushes.

These are of the copper morganite type and are set at an angle to the commutator to ensure quiet running. If for any reason the brushes are removed they must be replaced in exactly the same position, otherwise noise and faulty operation of the motor will result. NO lubricant is required for the brushes.

Causes of Failure.

If the motor fails to start or runs unsatisfactorily when switched on the cause may be either in the electric supply or the motor itself. The procedure to be adopted in case of failure is as follows :—

(1) Electric Supply.

This must give 12 volts at the terminals of the motor when switched on. A voltmeter connected across the motor terminals will verify this. It is essential that the voltage be checked in this way and any fault rectified before proceeding further.

(2) Motor.

Noisy running or squeaking of the motor is an indication of need of lubrication and to do this the motor must be removed from the heater.

To remove the motor, it will be necessary to take out the complete heater from the car. To do this proceed as follows : (See Plate 62.)

(1) Drain the cooling system.
(2) Uncouple the water connections " HC."
(3) Uncouple the demister pipe " D."
(4) Disconnect the two wires marked " W."
(5) Remove the plate "S" and cover "T" by taking out 13 screws marked " R."
(6) Remove the two nuts " N."
(7) Withdraw the unit.

To obtain access to motor, dismantle the unit in the following order : (See Plate 61.)

(1) Unscrew the two fixing bolts "A" from brackets " B."
(2) Take out the two spring clips " C."
(3) Remove volute " D."
(4) Slack off grubscrew "E" and withdraw fan " F."
(5) Take off three spring clips " G."
(6) Remove front cover "H" and cowl " J."
(7) Slack off grubscrew "K" and withdraw fan " L."
(8) Remove three screws "M" and withdraw motor "N" with leads " O."

When withdrawing motor, see that the rubber bushes and washers are not lost.

A more or less temporary cure of bearing noise may be effected by running the motor with the shaft vertical and allowing a small amount of car engine winter oil to run down the shaft into the bearing, the process being repeated for the other end.

If the noise still persists or if the operation is sluggish, the motor should be dismantled and atended to in the following manner : (See Plate 63.)

Unscrew the brush caps (20) and remove the brushes (9) and springs (18) taking special note of their positions so that they can be replaced in exactly the same way when reassembled. The best way to do this is to scratch two different marks on the flat face of the aluminium end cover (1), one opposite each brush holder (7). Then withdraw the brushes (9) one at a time and lightly scratch corresponding marks on the faces nearest the respective marks on the end cover.

Next remove the two body fixing screws (22) and detach the end cover (1) clear of the armature (12).

The armature can then be withdrawn, care being taken not to lose the packing shims (34 and 35) on the two ends of the shaft, or to strain the connecting leads.

Remove carbon dust from the interior of motor, taking care to avoid straining or bending the field coil leads sharply during the process. Also clean carbon dust from commutator slots with a sharpened match stick. If necessary clean armature shaft with a dry rag.

The bearings (3) should not need cleaning but if there is a black sticky deposit on the running surfaces it should be removed by means of a dry rag. Cleaning fluid must not be used.

As a special oil is used for the bearings during the manufacture it is not advisable to relubricate unless the felt pads (4) are completely dry. To test this, press each pad with a clean match stick and if oil appears on it no lubrication is necessary. If the pads are dry add a few drops of good quality medium car engine oil.

To reassemble the motor, smear the armature shaft (12) lightly at both ends with a good quality medium car engine oil and fit the armature in the motor body (2).

Then replace the aluminium end cover (1), taking care to see that the field coils (16) are out of contact with the armature and are not pinched in the bracket joint.

Tighten the main fixing screws (22) and verify that the armature rotates freely.

If the brushes (9) are less than $\frac{3}{16}$" long they should be renewed, care being taken in any case to see that they slide freely in the brush holder (7).

The brushes must be replaced in exactly the same position as before and if new brushes are fitted, care should be taken to see that they are fitted correspondingly. Failure to observe these precautions will lead to noisy and inefficient operation.

When the brush cap (20) is removed and the brush is in contact with the commutator, the brush spring (18) should extend approximately $\frac{1}{2}$" beyond the brush holder to give the correct brush pressure. Also each brush (9) should slide freely in its holder (7).

The final operation in reassembling the motor is to screw the brush cap (20) in place.

It is advisable to test the motor by connecting the leads to an electric supply of the correct voltage before replacing it in the heater. It is only necessary to use one fan for this test.

OPERATION No. 129.

TO REASSEMBLE THE UNIT.

Proceed in the following order. (See Plate 61.)

(1) Replace motor "N" by means of the three fixing screws "M" not forgetting to replace rubber bushes "Q" and washers " P."

(2) Refit fan "L" with the boss to the front, the spindle should project about $\frac{1}{8}$".

(3) Tighten grubscrew " K."

(4) Replace cowl "J" and front cover "H" (note the relative position of cowl to fan).

(5) Insert distance pieces "R" one at a time starting from the one opposite the water pipes " S."

(6) Fit spring clips "G" over distance pieces in the same order.

(7) Replace fan "F" with the boss towards the motor, the correct position of the fan is with the boss flush with the end of the motor spindle.

(8) Tighten grubscrew " E."

(9) Replace volute "D" in its correct position, with the locating pegs "T" in the slots provided.

(10) Insert one nut and one spring clip "C" into each bracket "B" and screw in the fixing bolt "A" finger tight.

(11) Lock the bolt tightly in position with nut " U."

With the unit completely assembled connect up to a battery and run the motor to ensure that the fans are running true without fouling before replacing the unit in the car.

OPERATION No. 130.

TO REFIT UNIT INTO CAR.

(See Plate 62.)

(1) Fix the unit in position with the bolts through the support brackets. Adjust nuts "N1" until the unit is square and the front cover "V" is in the correct position relative to cover " T."

(2) Securely tighten nuts " N."

(3) Replace plate "S" and cover "T" and fix in position with screws " R."

(4) Couple motor leads " W."

(5) Connect demister pipe " D."

(6) Replace hose pipes " HC " on to the unit water connections.

(7) Refill the cooling system. **Note :** the water control tap should be OPEN when the system is being filled.

To obtain water circulation through the unit after refilling the cooling system, run the engine for a few minutes and then " rev up " once or twice to clear the air from the unit. Then top up the radiator to the correct level.

Summer Working.

In summer fresh air may be circulated through the unit without being heated providing the water control is turned to the " OFF " position, and the scuttle ventilator is opened.

Rheostat Control.

The rheostat is a combined switch and resistance. From " OFF " it switches direct to " ON " and the motor is then running full speed, i.e., no resistance in the circuit. If reduced heat is required the rheostat is turned further round, thus putting a resistance in the circuit and consequently reducing the speed of the motor.

OPERATION No. 131.

LOCATING FAULTS IN HEATING SYSTEM.

(A) Fan not running.

This is a sign of electrical trouble and the wiring to the motor should first be examined for a break or a poor connection. If no fault is found in the wiring connections, it will be necessary to remove the motor for examination as explained under motor maintenance.

(B) Insufficient air flow from unit.

This may be caused by :—

(1) Choked air inlet gauze under scuttle ventilator. This is corrected by cleaning.

(2) Fan running at less than its normal speed. This may be due to insufficient voltage to the motor through poor electrical connections, which should be checked with a voltmeter. If the voltage is correct, slow running may be caused by lack of lubricant to the motor bearings. (See Motor Maintenance.)

(C) Insufficient heat output.

The cause of this may be due to :—

(1) Low radiator temperature, in which case blanking of the radiator will increase the radiator temperature.

(2) Insufficient water flow through unit.

This can be determined by feeling the flow and return pipes to the unit. With the correct flow of water no appreciable difference in temperature in the two pipes should be observed, but if there is a marked difference in temperature when the fans are switched on and the engine running at a reasonable speed, insufficient flow is indicated. The most usual cause of this trouble is a faulty engine water thermostat, and it is recommended that the thermostat element is removed for examination. The valve of the thermostat should be closed at atmospheric temperature and should open when immersed in hot water, and if the valve fails to do this it will be necessary to obtain and fit a new thermostatic valve.

(3) Water control valve not working.

If rotation of the water control knob on the facia board does not open and close the cock the most likely cause will be that the operating pin on the water control valve has sheared.

Spares.

In ordering spare parts, the appropriate part numbers as given on Plate 61 and 63 should always be quoted.

A recommended list of spares is given below.

(1) Air conditioning units complete.

(2) Fan motors complete.

(3) Brushes for fan motor.

(4) Brush springs.

ITEM	DESCRIPTION	NUMBER OFF	PART No.
A	FIXING BOLT	2	CT2485C
C	VOLUTE SPRING CLIP	2	CT2565
D	VOLUTE	1	CT2503
E	GRUB SCREW	1	SF317/10B
F	DEMISTER FAN	1	CT2493/1
G	SPRING CLIP	3	CT2508/1
H	FRONT COVER COMPLETE	1	ST1627/2
J	FAN COWL	1	CT2500
K	GRUB SCREW	1	SF317/10B
L	HEATER FAN	1	CT2504/1
M	MOTOR SCREWS	3	SF178/3H
N	MOTOR WITH LEADS	1	CT2516/1
P	CAPS FOR BUSHES	6	CT2517B
Q	RUBBER BUSHES	6	CT2517A
R	DISTANCE PIECE	3	CT3065
U	NUTS	8	SF459/3X
V	HEATING ELEMENT	1	CT2583
W	WASHERS	4	SF2/32X
X	BACK PLATE	1	ST1626/2
Y	DOOR HANDLE	2	CT2507
Z	SCREW FOR HANDLE	4	SF246/4X
AA	SPRING WASHERS	4	CT2521A
AB	FELT PAD	1	CT3065
AC	TERMINAL TAG	1	CT3033A
AD	TERMINAL TAG	1	CT3059B

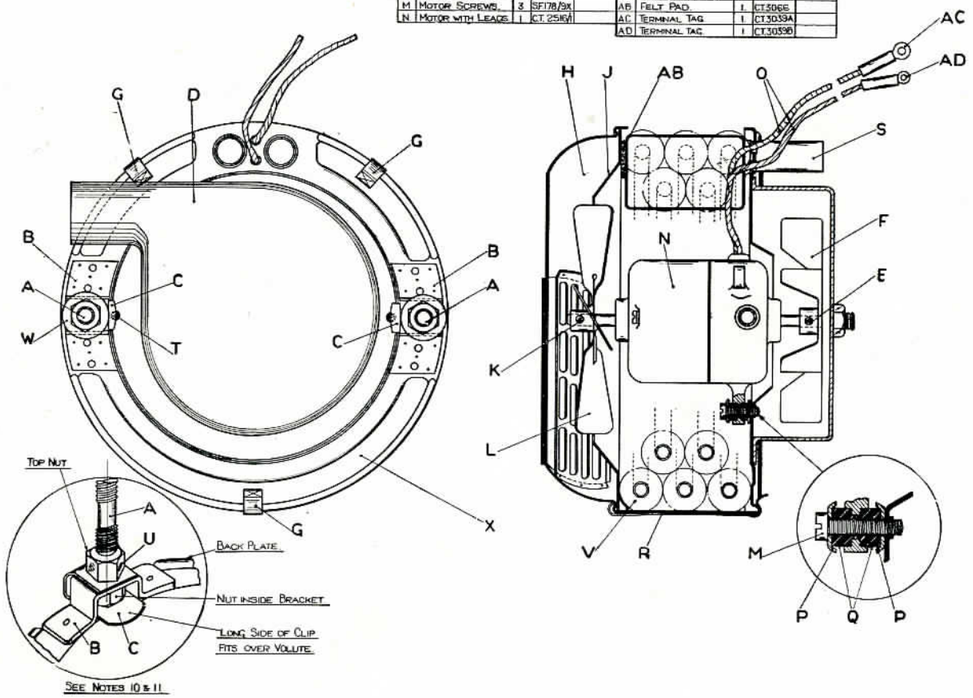


PLATE 61. AIR CONDITIONING UNIT

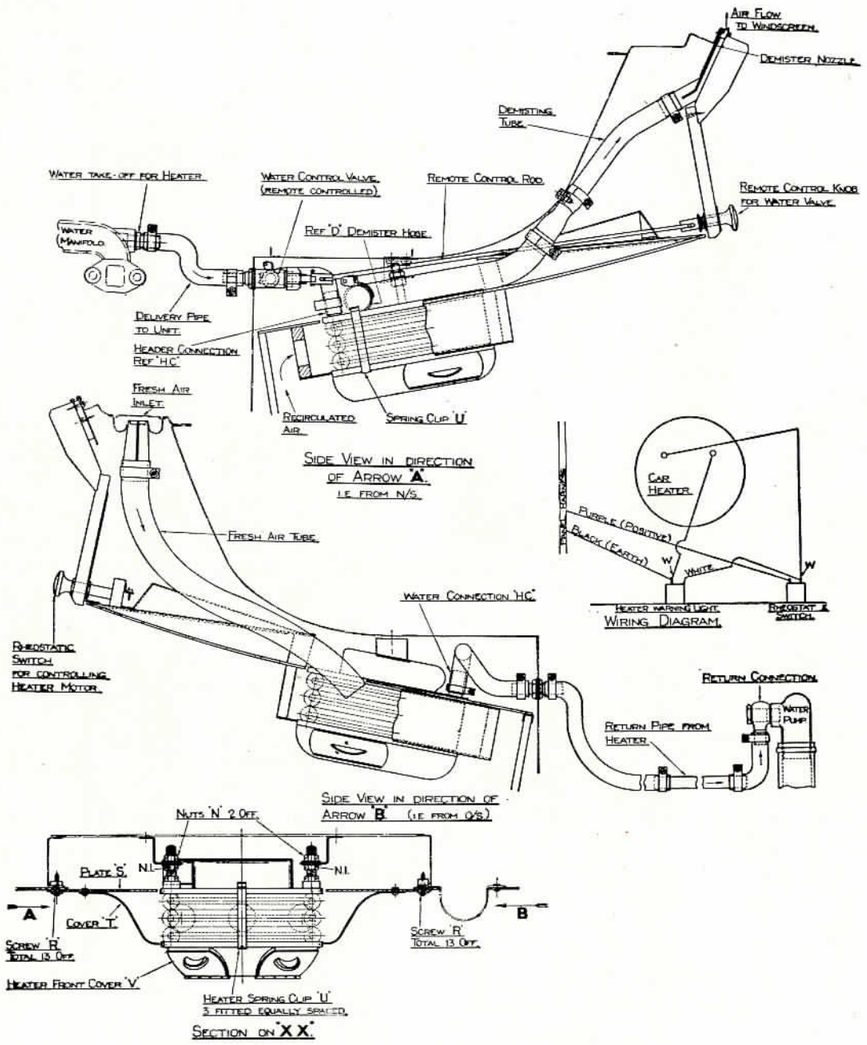
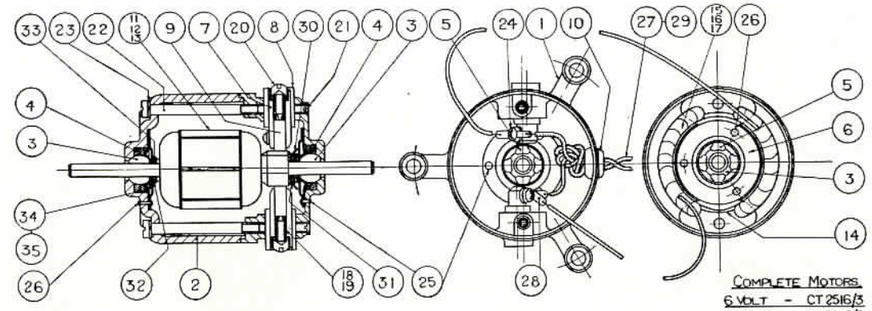


PLATE 62. AIR CONDITIONING INSTALLATION



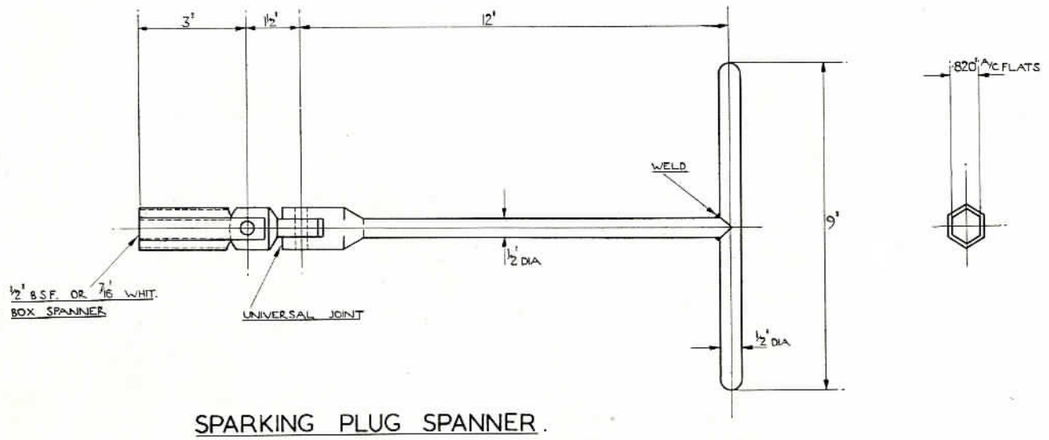
COMPLETE MOTORS.
6 VOLT - CT.2516/3
12 VOLT - CT.2516/2
24 VOLT - CT.2516/4

ITEM	DESCRIPTION	PER SET	CLAYTON PART Nº	KLAXON PART Nº
1	BRUSHGEAR END COVER	1	CT.2516/2A	FZ.1
2	BODY	1	CT.2516/2C	FZ.20.
3	BEARING	2	CT.2516/2D	FZ.40
4	OIL FELT	2	CT.2516/2E	FZ.42
5	RETAINING PLATE FOR BEARING	2	CT.2516/2F	FZ.44
6	EXCESS OIL TRAP	2	CT.2516/2G	FZ.48
7	BRUSH HOLDER	2	CT.2516/2H	FZ.100
8	INSULATION FOR BRUSH HOLDER.	2	CT.2516/2J	FZ.104
9	BRUSH	2	CT.2516/2K	FZ.115
10	CABLE BUSH	1	CT.2516/2L	FZ.140
11	COMPLETE ARMATURE - 6 VOLT	1	CT.2516/3M	FZ.321.GA
12	COMPLETE ARMATURE - 12 VOLT	1	CT.2516/2M	FZ.321.GA
13	COMPLETE ARMATURE - 24 VOLT	1	CT.2516/4M	FZ.321.GA
14	FIELD COIL CLIP.	2	CT.2516/2N	FZ.343
15	FIELD COIL - 6 VOLT	1PR	CT.2516/3P	FZ.350
16	FIELD COIL - 12 VOLT	1PR	CT.2516/2P	FZ.350
17	FIELD COIL - 24 VOLT	1PR	CT.2516/4P	FZ.350
18	BRUSH SPRING	2	CT.2516/2Q	KMU.211
19	BRUSH SPRING WITH PIGTAIL - 6 VOLT ONLY	2	CT.2516/3Q	FZ.107
20	BRUSH CAP.	2	CT.2516/2R	KMU.526
21	GRUB SCREW FOR LOCATING BRUSH HOLDER	2	CT.2516/2S	303.C.S.F
22	FIXING SCREW	2	CT.2516/2T	330.C.S.
23	SPRING WASHER FOR FIXING SCREW	2	CT.2516/2Z	X.1221
24	LEAD SCREW FOR BRUSH HOLDER	2	CT.2516/2V	X.191.
25	RIVET FOR RETAINER PLATE (BRUSH GEAR END)	3	CT.2516/AA	FR.16.
26	RIVET FOR RETAINER PLATE (BODY END)	3	CT.2516/AB	X.887
27	24" MOTOR LEAD	2	CT.2516/AC	-
28	SOLDER TAG	4	CT.2516/AD	SW.90
29	RUBBER SLEEVE (ON FABRIC LEADS ONLY)	2	CT.2516/AE	L.R.825
30	OIL THROW	1	CT.2516/AF	F.Z.52
31	OIL THROW SPACER	1	CT.2516/AG	X.2065
32	CUP FOR FELT SPACER	2	CT.2516/AH	FZ.56
33	FELT SPACER	2	CT.2516/2Y	X.1099
34	SHIM FOR SPACING (.005" THICK)	AS REQD	CT.2516/2W	X.915
35	SHIM FOR SPACING (.010" THICK)	AS REQD	CT.2516/2X	X.925

PLATE 63. FAN MOTOR FOR AIR CONDITIONING UNIT

The servicing of Jaguar cars can be carried out without the use of special tools and the operations described in the manual will be found quite practicable with such tools and equipment as are available in a well equipped workshop.

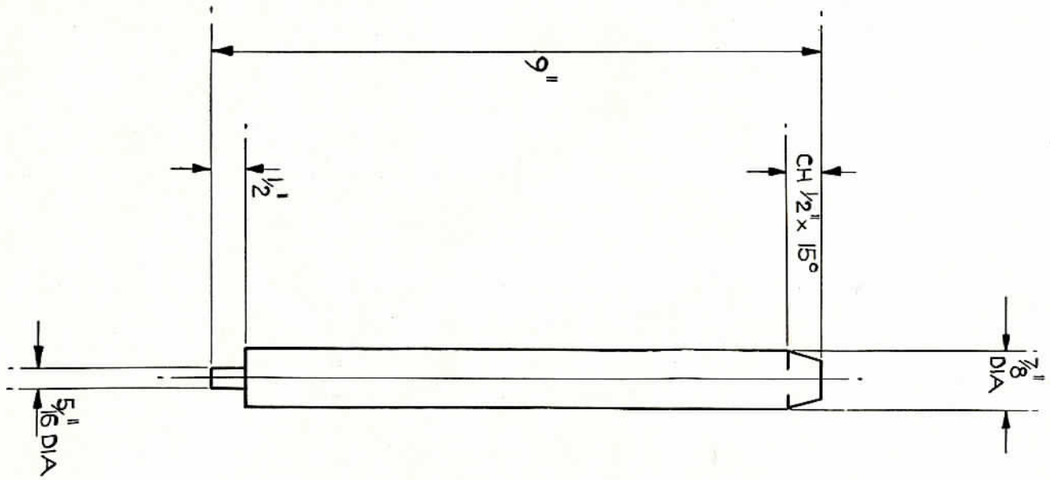
Certain operations can however be more speedily effected using the tools detailed in the following illustrations, and it is recommended that where servicing of a number of cars is carried out these tools be made up and utilised during the appropriate operation.



SPARKING PLUG SPANNER.

MATL :- M.S.

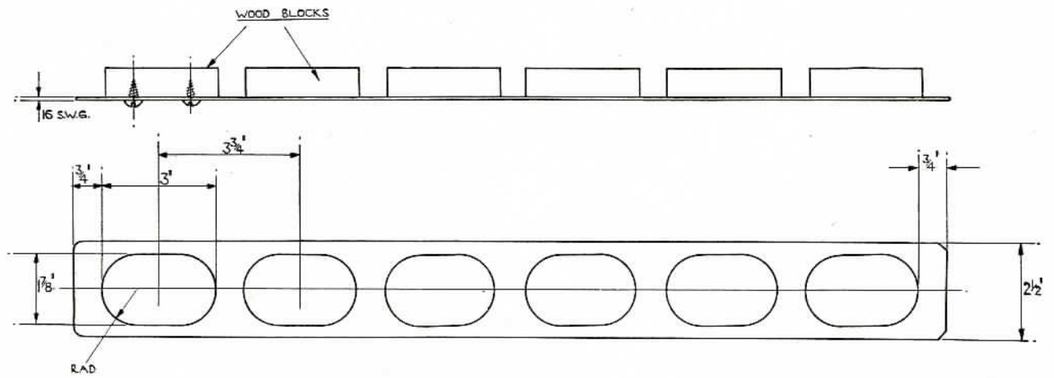
PLATE 64.



VALVE GUIDE DRIFT.

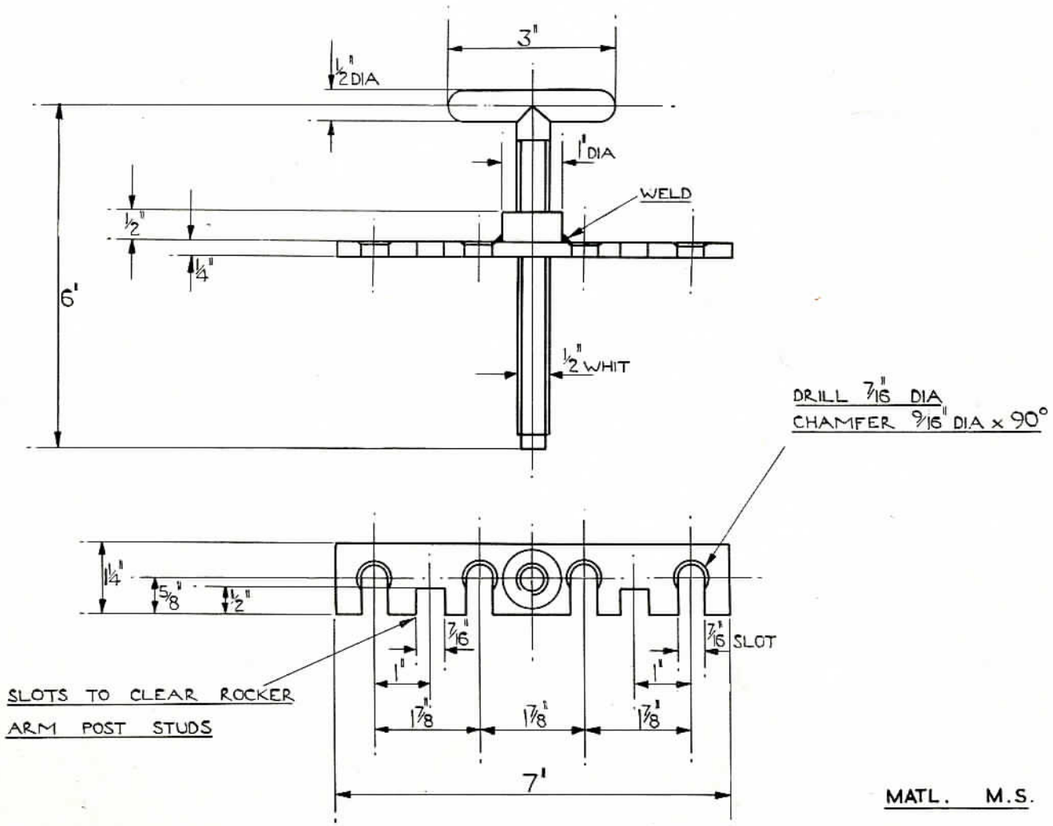
MATERIAL :- SILVER STEEL. TOUGHEN.

PLATE 65.



COMBUSTION CHAMBER BLOCKS - VALVE REMOVAL & FITTING

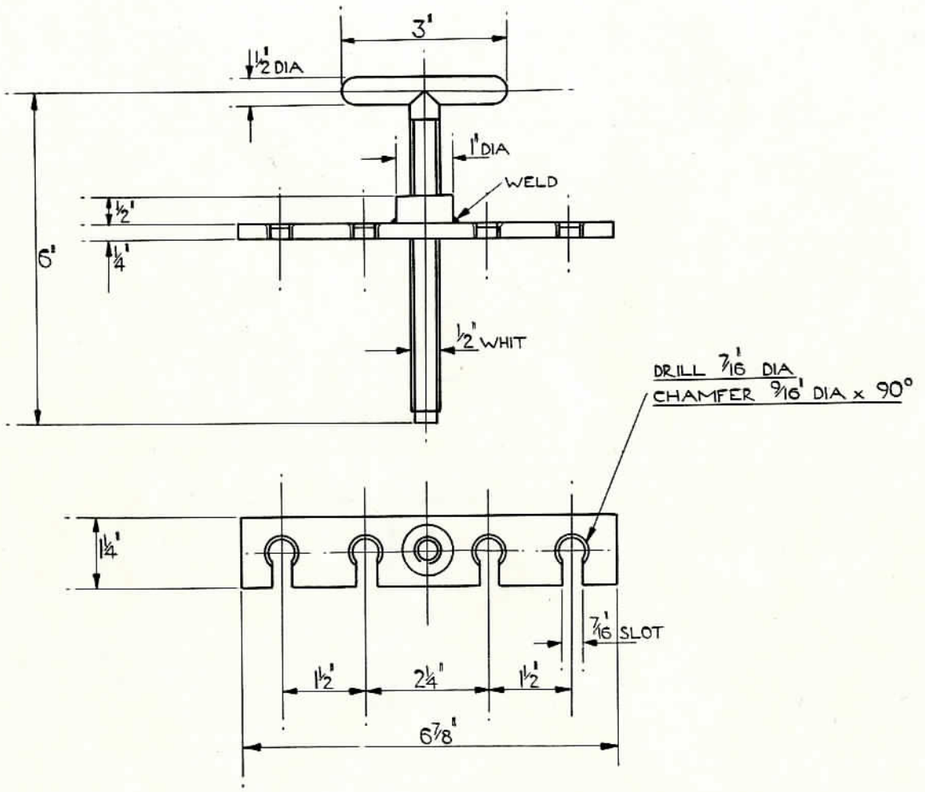
PLATE 66.



MATL. M.S.

PUSH ROD LIFTING TOOL 1½ LITRE

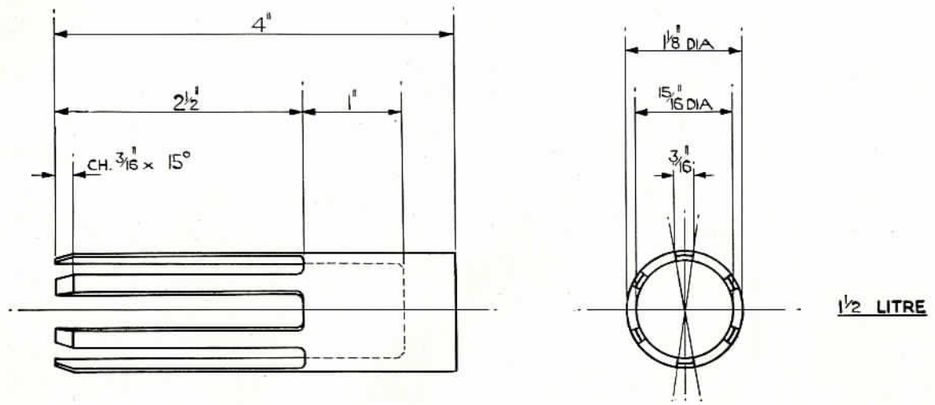
PLATE 67.

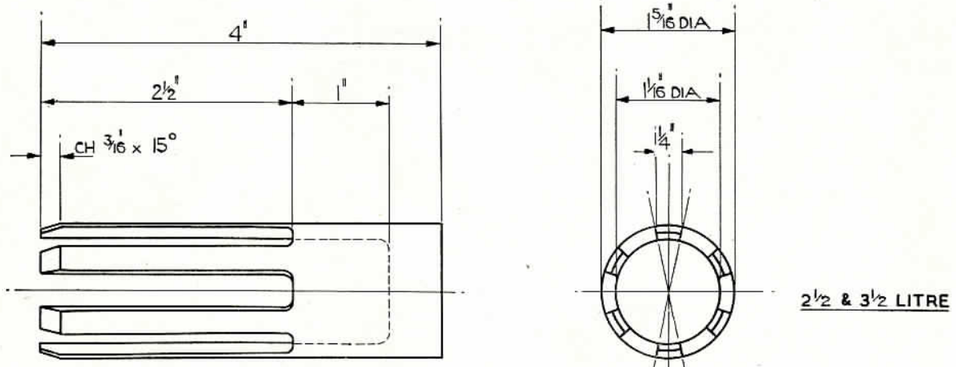


PUSH ROD LIFTING TOOL 2½ & 3½ LITRE

MATL :- M.S.

PLATE 68.

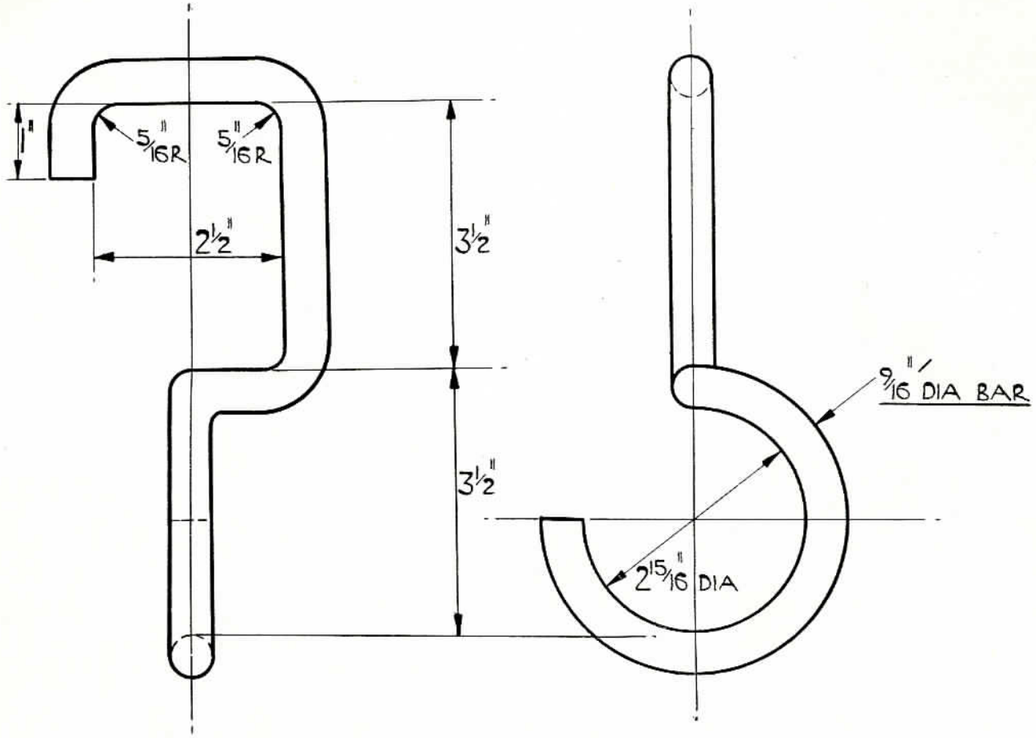




GEARBOX MAINSHAFT CIRCLIP EXTRACTOR.

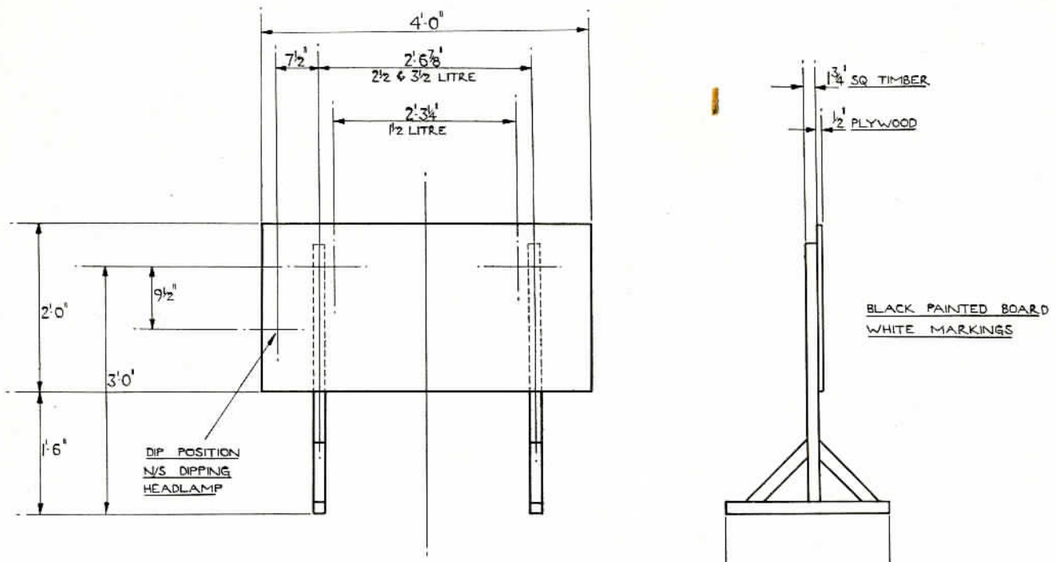
MATERIAL :- COLLET STEEL HDN & GRD

PLATE 69.



REAR SPRING REMOVAL TOOL.

PLATE 70. See Operation No. 59.



HEADLAMP TRACKING BOARD

PLATE 71. See Operation No. 159.

REAR HUB DRAWER.

Hub drawers, one suitable for 1½ litre models and one for both 2½ and 3½ litre, are available against an order placed with Jaguar Cars Ltd., Spares Department.

TOOL KIT.

The Standard Tool Kit issued with the various models is as follows :—

1 Budget Lock Key.
1 Hydraulic Oil Gun.
1 Copper and Rawhide Hammer.
1 Starting Handle.
1 Valve Extractor (Tyre).
1 Jack.
1 Jack Handle.
1 Adjustable Spanner.
1 Oil Can.
1 Pair of Pliers.
1 Pump and Connection.
1 Open-Ended Spanner, ⅛" and 3/16" Whit.
1 Open-Ended Spanner, 5/16" and ⅜" B.S.F.
1 Open-Ended Spanner, 7/16" and ½" B.S.F.
2 Tyre Levers.
1 Distributor Screwdriver.
1 Feeler Gauge.
1 Box Spanner, 3/16" and ¼" B.S.F.
1 Box Spanner, 5/16" and ⅜" B.S.F.
1 Box Spanner, 7/16" and ½" B.S.F. (1½ litre only).
1 Box Spanner, ½" B.S.F. (Sparking Plug) (2½ and 3½ litre only).
1 Box Spanner, 7/16" × 9/16" B.S.F. (2½ and 3½ litre only)
1 Long Tommy Bar.
1 Short Tommy Bar.
1 Screwdriver.
1 Box Spanner (Rear Axle).
1 Nozzle.

Whilst instructions for servicing and dismantling the various units of the electrical equipment are given in the following paragraphs, it should be pointed out that whenever possible work of this description should be carried out at one of Messrs. Lucas's Service Stations, or the part returned to the Factory against the issue of a replacement unit. Furthermore, it should be appreciated that in the event of trouble arising and the owner desiring to make a claim for free replacement, it is essential that the unit in question should not be dismantled in any way before its return to the manufacturers.

BATTERY.

It is essential for the satisfactory working of the electrical equipment that the battery be maintained in a first-class condition, the following maintenance operations being necessary :—

Once a fortnight, top up the six cells of the battery with distilled water till the level of acid in the cells is $\frac{1}{8}$" above the top of the separators. Do not fill above this point. For this purpose distilled water is essential. Under no circumstances should ordinary tap water be employed. Rainwater also is generally unsuitable unless it is caught direct in a non-metallic container.

Ensure that the ventilating holes in the filler plugs are not obstructed and that the rubber sealing washers are fitted to the plugs.

Care should be taken that the terminals are kept tight and clean.

The battery, particularly the top, near the terminals and cell connectors, should be kept clean. For this purpose liquid ammonia can be used to remove corrosion and neutralise acid.

The rods securing the battery to the platform on the floating dash should be kept lightly smeared with vaseline.

Storage. In the event of it being necessary to store the battery for some considerable time, the electrolyte should not be emptied from the cells as this will allow sulphation to take place. To store a battery, it should first be fully charged and then given a slow recharge at intervals of three months.

DYNAMO.

The dynamo is of the compensated voltage control type, operating in conjunction with a regulator unit which varies dynamo output in accordance with the demand on the battery and the state of charge of the battery.

The bearings supporting the dynamo armature should be lubricated sparingly, at intervals of approximately ten thousand miles. It is also advisable to examine the commutator and brushes periodically, and to clean the commutator if necessary.

In cleaning a commutator it is important that emery cloth should not be used. The most satisfactory method is to use one of the pumice sticks specially prepared for this purpose, but if this is not available, glasspaper will be found to be a fairly satisfactory substitute. Grease or dirt may be removed with a cloth moistened in petrol.

Brushes. It is most important that the brushes should operate freely in their carriers.

If the brushes have worn extensively and replacements are fitted, it is usually advisable to test the spring tensions, as they may have been overheated by use with worn brushes, and will as a result have lost their strength.

DYNAMO BRUSH SPRING TENSIONS.

$1\frac{1}{2}$ litre. (Model C.45/YV)	15 to 25 ozs.
$2\frac{1}{2}$ and $3\frac{1}{2}$ litre. (Model C.45/PV) ...	30 to 40 ozs.
$2\frac{1}{2}$ and $3\frac{1}{2}$ litre. (Model C.45/ZV) ...	36 to 44 ozs.

When new brushes are fitted, the bedding of these brushes to the commutator is accomplished by the use of special pumice sticks on the commutator. The powder clings to the commutator and in the segments and satisfactorily beds the brushes to the commutator. After the commutator stick has been used, the dynamo should be left running for approximately five minutes with the brush cover removed. The remaining powder should then be blown away.

Commutator. After extensive use the segments or bars of the commutator will have worn. It then becomes necessary to cut back the mica insulator fitted between each commutator bar. This should be done with extreme care, use being made of a parallel-sided saw.

As special equipment is really necessary, it is recommended that this should only be undertaken by a fully qualified electrician possessing the equipment. To gain access to the commutator for this treatment it will be necessary to dismantle the dynamo, as described in Operation No. 132.

OPERATION No. 132.

DYNAMO. TO DISMANTLE AND REBUILD.

Disconnect dynamo wires, terminal F, green and black wire (in some cases green), terminal D, yellow wire.

Remove dynamo from engine. (Operation No. 33.)

Remove fan pulley.

Slacken bolt and slide inspection cover clear.

Remove two bolts passing from end to end of the unit.

Remove brushes from holders.

Carefully withdraw commutator end complete with brush gear.

Disconnect field coil wires.

The armature complete with front end plate can now be withdrawn.

In rebuilding the unit, replace the brushes last, that is, after the commutator is in position.

From the following body numbers, dynamo model C.45/ZV Type G.86 is used. Observe that ammeter model BM.4 Type L.54 must be used with this type dynamo.

Body No. B.9981 onwards.	R.H. and L.H. Drive Saloons.
Body No. C.1156 onwards.	R.H. and L.H. Drive Coupés.
Body No. DH.1017 onwards.	R.H. and L.H. Drive Coupés.

Maintenance and service is as described, except that the commutator cover band is dispensed with, and replaced by ventilating holes in the body of the dynamo. Connections are made by jack plugs, yellow wire to "D" and yellow and green wire to " F."

STARTER MOTOR.

The attention required to this unit is very similar to that required by the dynamo, although it will be appreciated that it will not be necessary to attend to this except at very long intervals.

In the case of the starter motor a tendency to blacken the commutator will be noticed. This is inevitable. As the occasion arises, the commutator should be cleaned, using a commutator stick as for the dynamo.

It should be noted that starter commutator micas should under no circumstances be under-cut.

Starter Drive. The starter engages in the flywheel through a special pinion operating on a spiral.

It is important that this pinion or its spiral should not be lubricated in any way, and it should be examined periodically to make sure that it is clean and free from oil, as if oil and dirt are allowed to coagulate, the engagement of this pinion in the flywheel may become spasmodic.

To prevent the pinion from rolling forward and catching the flywheel, a light spring is fitted in front of the sliding pinion, i.e., between the pinion and the starter motor. If any noise is heard from the part, particularly when the brakes are applied, it indicates that this spring should be replaced.

In the event of the starter motor pinion becoming jammed in the starter gear, this can be freed by removing the small cover held over the forward end of the armature spindle by two small screws. This will reveal a square shank, and it should be turned in a clockwise direction to release the pinion.

OPERATION No. 133.

STARTER MOTOR. TO DISMANTLE AND REBUILD.

Remove starter. (Operations Nos. 79 and 80.)

Slacken bolt and slide inspection cover clear.

Remove brushes from holders.

Remove two through bolts and withdraw armature and pinion assembly.

Remove solenoid switch.

Disconnect field coil leads and withdraw commutator end bracket.

Reassembly is the reverse of the above procedure.

OPERATION No. 134.

STARTER MOTOR DRIVE. TO DISMANTLE.

Remove starter. (Operations Nos. 79 and 80.)

Remove split pin from castellated nut and unscrew nut. (Left hand thread.)

Remove starter pinion and springs.

Lubrication. The cap held by two small screws at the forward end of the armature spindle is filled with grease during erection, and it is unlikely that this will require further attention except at very infrequent intervals.

If the starter should become noisy, particularly after the car has started, whilst the starter revolutions are dying down, it is an indication that grease is required at this point and the cap should be removed.

The rear bearing for the starter armature is packed with lubricant during erection and does not require attention.

IGNITION SYSTEM.

The ignition system consists of the distributor, coil and sparking plugs. The maintenance of these is as follows : always bearing in mind that cleanliness of all parts is essential for efficient operation.

DISTRIBUTOR.

General Maintenance. The following points in the general maintenance of the distributor will ensure satisfactory running.

Cleaning of Points. When the engine has been in use for some considerable period, an examination of the contact breaker points on the distributor will reveal that whilst a crater has formed at one point, a corresponding tip or point is built up on the opposite point.

To clean the distributor points and at the same time to ensure that there is no undue wastage of material, the point with the crater should not be touched. The tip formed on the other point should be lightly ground off on an oil stone.

Lubrication. Upon removing the distributor cap and the rotor, it will be seen that the cam gear is hollow and that the distributor shaft is extended through the cam. To prevent seizure, every 5,000 miles oil should be applied to the head of the shaft, which is capped by a set screw and which should not be removed. Oil passes this screw to lubricate the cam bearing.

The automatic advance mechanism situated under the contact breaker base should be lubricated by dropping a few spots of thin oil past the cam aperture on to the advance mechanism.

N.B. : If seizure or sluggishness occurs at the automatic gear, engine performance will be seriously affected. Under these circumstances, remove the two screws in the rim of the contact breaker base and withdraw the base. Thoroughly clean and lubricate the advance mechanism.

At 5,000 mile intervals place a spot of oil on the contact breaker pivot and apply a smear of light grease on the cam faces.

OPERATION No. 135.

CONTACT BREAKER POINTS. TO ADJUST.

Remove distributor cap and rotor.

Turn the engine with the starting handle until the heel of the contact breaker pivot is bearing against the highest point of a cam lobe.

Slacken the two screws holding the fixed contact plate and adjust until the gap between the points measures ·012".

Tighten screws and recheck.

The bakelite distributor cover should be maintained in a clean condition. Oil or dirt may cause surface leakage or tracking with consequent misfiring. Ensure that the H.T. lead carbon brush is in sound condition and a free fit in its holder.

COIL.

The coil requires very little attention. It is, however, important that surface leakage between the terminals should be prevented by keeping the top of the coil quite clean. All terminals and connections must be clean and tight.

SPARKING PLUGS.

These should be kept clean externally at all times, since dirty porcelain insulators can cause "tracking" and misfiring.

Plugs should be cleaned by sand blasting and tested using Champion testing and cleaning equipment. Gaps should be accurately set to ·025".

REGULATOR AND FUSE BOX.

The RJF.91 voltage regulator unit is accurately set at manufacture and sealed. It is recommended that this unit should only be serviced by one of Messrs. Lucas's Service Stations, or by a competent electrician.

The fuse box contains five 25 amp. fuses in circuit and five spares ; the circuits serviced by the various fuses are as follows :—

One fuse, "AUX. A." Interior lights. (Air conditioner motor up to 1½ litre chassis 411918, 2½ litre chassis 510430, 3½ litre chassis 610745.)

Two fuses, "AUX. B." Petrol gauge, trafficators, horns, windscreen wipers, stop light. (Air conditioner motor after above chassis numbers.)

One fuse, "S. AND T." Side lamps, tail lamps, reverse lamp.

One fuse, "H." Head lamps. (Later 2½ and 3½ litre have 35 amp. fuse.)

The cigar lighter is serviced by a separate 35 amp. fuse housed in a small fuse box under the regulator unit.

The electric clock, panel lights and fog lamps do not have fuses incorporated in the circuits.

Up to 1½ litre chassis No. 411918, 2½ litre chassis No. 510430, 3½ litre chassis No. 610745, fog lamps are wired through "AUX. B."

An additional 6 amp. fuse, and one spare, is incorporated in all dipping head lamp dipper solenoid circuits.

N.B. : Panel lights are only obtained when side lights are switched on.

From the following body numbers, regulator model 95/2 Type L.4 is used.

Body No. B.9981 onwards.	R.H. and L.H. Drive Saloons.
Body No. C.1156 onwards.	R.H. and L.H. Drive Coupés.
Body No. DH.1017 onwards.	R.H. and L.H. Drive Coupés.

With this regulator and fuse box, six fuses are in circuit with four spares. The circuits serviced by the various fuses are as follows :—

Regulator Box.

1 35 amp. fuse "AUX. IGN."—Trafficators, petrol gauge, windscreen wipers, stop light, air conditioner motor.

1 35 amp. fuse "AUX."—Interior lights, horns.

Fuse Box.

The fuses lie parallel to the centre line of the car, and dealing first with the fuse next to the bonnet side panel and working towards the centre line of the car, these are :—

1 35 amp. fuse—Head lamps.
1 35 amp. fuse—Fog lamps.
1 35 amp. fuse—Side and tail lamps.
1 35 amp. fuse—Cigar lighter.

OPERATION No. 136.

INSTRUMENTS AND GAUGES. TO REMOVE FROM FACIA.

These instructions apply to all facia board instruments, that is, speedometer, revolution counter, combined oil pressure and water temperature gauge, ammeter and petrol gauge.

Remove appropriate section of dash casing.

Release connections to instrument.

Release clips securing instrument to panel carrier.

Withdraw instrument.

N.B. : It will be found advantageous to open the inspection door on the floating dash when carrying out this operation.

OPERATION No. 137.

INSTRUMENT PANEL AND WARNING LIGHT BULBS. TO REMOVE.

Remove appropriate section of dash casing.

The facia instruments are illuminated by four 6 watt bulbs carried in holders attached to the instrument carrier, and situated one on either side of the speedometer and revolution counter clocks.

Rotate bulb holder out of instrument carrier spring clips and unscrew bulbs.

The ignition circuit, air conditioner motor and trafficators each have a 2·4 watt warning bulb in circuit.

Pull the bulb holders out of the spring clips and unscrew bulbs.

OPERATION No. 138.

PANEL SWITCHES. TO REMOVE FROM FACIA.

The lighting switch, air conditioner switch, ignition switch, and starter push switch are removed as described for instruments. (Operation No. 136.)

To remove the fog lamp, interior lamp and panel light switches it is necessary to release the facia board to gain access to the switch mountings and wiring connections. (Operation No. 112.)

N.B. : Operation of fog lamps, air conditioner, starter motor, trafficators and horns only obtained when the ignition is switched on. On 1½ litre chassis 411919 onwards, 2½ litre chassis 510431 onwards, 3½ litre chassis 610746 onwards.

OPERATION No. 139.

MANETTE CONTROL AND STEERING WHEEL. TO REMOVE AND REFIT.

Set the front road wheels in the straight ahead position when it will be found that the split portion of the steering wheel hub is facing downwards.

It is essential to replace the wheel in this position or the self-cancelling of the trafficators will not occur evenly on either side of the straight ahead position.

Disconnect manette control wiring from junction box situated on base of steering column (5 wires). (Export models 7 wires.)

Remove two countersunk grub screws situated in steering wheel hub which locate manette control head.

Withdraw manette control complete with column wiring harness. (If fouling occurs rotate steering wheel to clear cancelling pegs.)

Remove steering wheel "C" clamp and circlip on top of splined portion of inner column. Remove wheel.

N.B. : Care is necessary when replacing to ensure that the key and keyway of the control and stator tube are not damaged by force.

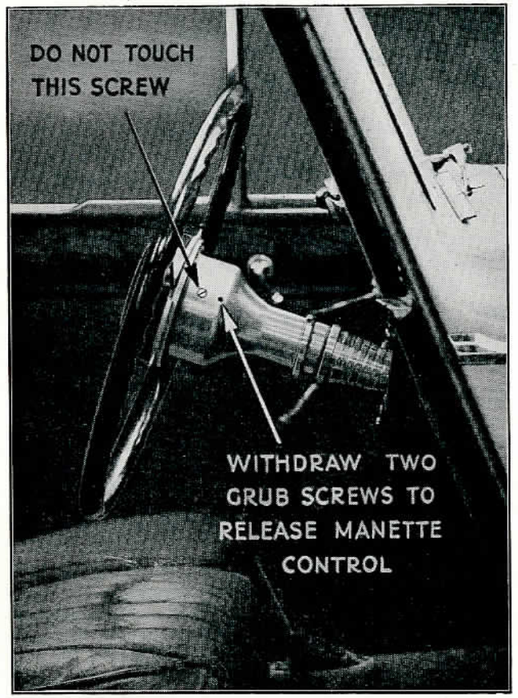


PLATE 72.

From the following body numbers, the junction box on the base of the steering column is replaced by a jack socket junction box situated on the wing valance. Connections from steering column harness and main chassis harness are made to this junction box by jack plugs.

Body No. B.9981 onwards.	R.H. and L.H. Drive Saloons.
Body No. C.1156 onwards.	R.H. and L.H. Drive Coupés.
Body No. DH.1017 onwards.	R.H. and L.H. Drive Coupés.

OPERATION No. 140.

TIME CLOCK. TO REGULATE.

An electric time clock is incorporated in the revolution counter instrument.

Open the inspection door on the floating dash.

A small screw surrounded by a calibrated ring will be seen at the base of the revolution counter instrument.

Adjustment is effected at the screw which should be rotated clockwise to retard and anti-clockwise to advance the clock speed.

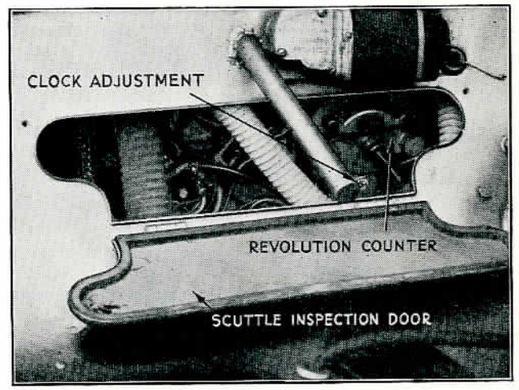


PLATE 73.

OPERATION No. 141.

TRAFFICATOR. TO REMOVE.

Remove centre pillar cappings. (Operation No. 114.)

Disconnect wiring, remove two screws and withdraw trafficator into car.

OPERATION No. 142.

TRAFFICATOR ARM. TO CHANGE BULB.

Switch on the ignition.

Raise trafficator arm by operating the steering column control and retaining the arm in the up position, switch off the ignition.

Remove the small screw in the end of the arm and withdraw the chrome cover plate.

The festoon bulb can now be slid out of the arm.

When replacing ensure that the feet of the cover plate engage with the slots on the inside of the spindle bearing.

N.B.: If the bulb is serviceable but does not light, this may be due to faulty bulb contact.

Lightly rubbing the contact surface with a piece of fine glass-paper will normally produce results.

The catch pin should be occasionally lubricated when the arm is in the up position, with a drop of thin oil.

OPERATION No. 143.

PETROL GAUGE TANK UNIT. TO REMOVE.

Remove rear locker floor boards. (Operation No. 97.)

Disconnect wire.

Remove six cheese-headed screws and withdraw unit.

N.B.: When refitting it is necessary to ensure that the float is free to rise and fall through it full travel without fouling the well situated in the petrol tank. Remove the three screws securing the cover plate, remove cover plate and observe that when the unit is in position that the resistance arms travel freely from one end of the resistance to the other, indicating that the float is free.

OPERATION No. 144.

REAR LIGHT BOX. TO SERVICE.

There are four bulbs in the rear light box, located in pairs at either end.

The tail lamps are the two inner bulbs, that on the extreme left the reverse lamp bulb, and on the right the stop lamp bulb.

Open the appropriate "D" window by withdrawing the chrome screw and remove the bulb from the bayonet holder.

Removal of the box complete is described in Operation No. 98.

OPERATION No. 145.

REVERSE LAMP AND STOP LAMP SWITCHES. TO SERVICE.

The reverse lamp switch is situated on top of the gearbox remote control. When reverse gear is engaged the switch is closed and current is supplied through the side and tail lamp circuit. Operation of the reverse light is therefore only obtained when side lights are on.

Remove change speed lever knob and gearbox cowl to gain access to switch.

The stop light switch is carried on a bracket immediately in front of the brake pedal. The switch closes when the foot brake is applied.

OPERATION No. 146.

TOOL TRAY LIGHT AND SWITCH. TO SERVICE.

The tool compartment is illuminated when the lid is opened and the side lights are on; the control switch being situated under the heel of the tool tray lid.

To gain access to the festoon bulb and lamp connections remove two screws and withdraw chrome rim and plastic cover.

To remove the switch withdraw fourteen screws from the tool tray and lift out tray and back piece.

Remove two screws securing switch to boot lid and withdraw backwards and down.

OPERATION No. 147.

INTERIOR LIGHTS. TO REMOVE.

Spring the plastic lamp cover out of the securing clips.

Remove the two outer screws and draw the lamp into the car to release wiring connections.

OPERATION No. 148.

HORN, TRAFFICATOR AND DIPPER CONTROLS. TO SERVICE.

These three controls are carried in the manette head.

To remove manette control head, see Operation No. 139.

OPERATION No. 149.

WINDSCREEN WIPER MECHANISM. TO SERVICE.

The windscreen wiper motor is accessibly mounted on the floating dash.

Servicing of this unit is a specialist's job and apart from occasionally placing a spot of thin oil through the lubricators attention is not recommended, other than by a Lucas Service Station.

To gain access to the drive and linkage it is necessary to release the facia board. (Operation No. 112.)

N.B.: If jamming of the mechanism is experienced the flexible drive should be examined to ensure that this is not running out of alignment. The connecting linkage should be checked for freedom of operation.

OPERATION No. 150.

PETROL PUMP. TO SERVICE.
S.U. (TYPE "L").

A single pump is fitted on the $2\frac{1}{2}$ litre models and two pumps on the $3\frac{1}{2}$ litre models.

The pump consists of three main assemblies—the body, the magnet assembly and the contact breaker. The body is composed of a hollow brass stamping "A" into the bottom of which the filter "B" is screwed. The inlet union "C" is screwed in at an angle on one side. The outlet union "D" which is screwed into the top, tightens

down on to the delivery valve cage "E", which is clamped between two fibre washers "F" and "G". In the top of the cage is the delivery valve, a thin brass disc "H" held in position by a spring clip "I", the suction valve "K" being a similar disc resting on a seating machined in the body. Holes connect the space between the valves to the pumping chamber, which is a shallow depression on the forward face of the body. This space is closed by a diaphragm assembly "L", which is clamped at the outside between the magnet housing "M" and the body, and in the centre between a brass plate "K1" and the steel armature "O". A bronze rod "P" is screwed through the centre of this and passes through the magnet core to the contact breaker, which is located at the far end.

outer rocker "U1" is fitted with a tungsten point which makes contact with a further tungsten point of a spring blade "V". This spring blade is connected to one end of the coil and the other end of the coil is connected to the terminal "W". A spring "S1" is interposed between the armature and the end plate of the coil.

A short length of flexible wire is connected to the outer rocker and to one of the screws which hold the bakelite moulding on to the magnet housing, in order to ensure a good earth. In the case of double pole pumps this wire is taken to a further terminal and the rocker mechanism is insulated by fibre bushes. Two fibre bushes are in any case fitted to one of the spindles of the "throw over" mechanism of all pumps in order to silence the operation of the contact breaker.

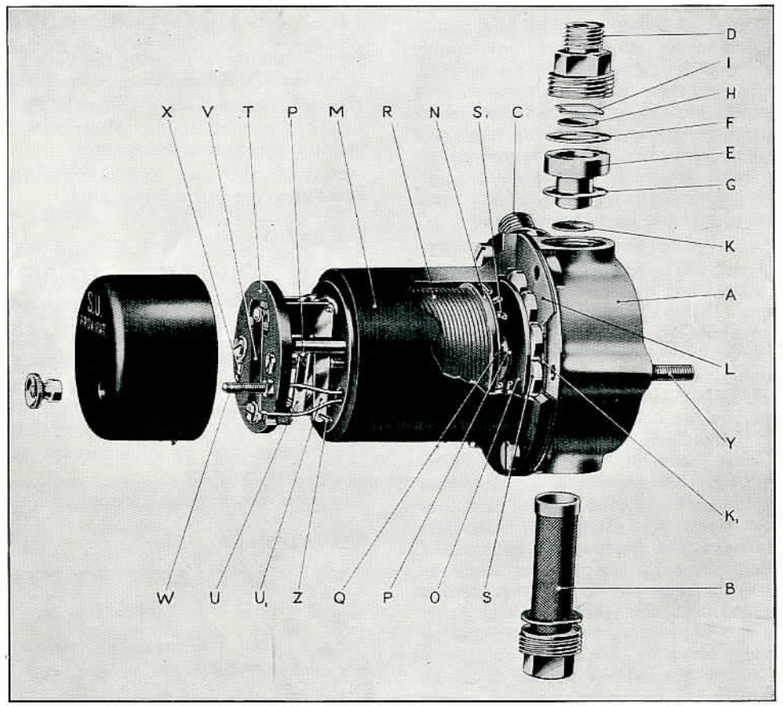


PLATE 74.

The magnet consists of a cast iron pot having an iron core "Q", on which is wound a coil of copper wire which energises the magnet. Between the magnet housing and the armature are fitted eleven spherical edged brass rollers "S". These locate the armature centrally within the magnet at all times and allow absolute freedom of movement in a longitudinal direction.

The contact breaker consists of a small bakelite moulding carrying two rockers, "U" and "U1", which are both hinged to the moulding at one end and are connected together at the top end by two small springs arranged to give a "throw over" action. A trunnion is fitted into the centre of the inner rocker and the bronze rod "P" connected to the armature is screwed into this. The

The action of the pump is as follows. When the pump is at rest the outer rocker lies in the outer position and the tungsten points are in contact. The current passes from the terminal, through the coil, back to the blade, through the points and to earth, thus energising the magnet and attracting the armature. This comes forward, bringing the diaphragm with it and sucking petrol through the suction valve into the pumping chamber. When the armature has advanced nearly to the end of its stroke the "throw over" mechanism operates, and the outer rocker flies back, separating the points and breaking the circuit. The spring "S1" then pushes the armature and diaphragm back, forcing petrol through the delivery valve at a rate determined by the requirements of the engine. As soon as the armature

gets near the end of this stroke the "throw over" mechanism again operates, the points again make contact, and the cycle of operation is repeated.

The spring blade rests against a small projection on the bakelite moulding, and it should be so set that when the points are in contact it is deflected back from the moulding. The width of the gap at the points is of no importance.

If the magnet is removed from the body for any reason, care should be taken that the rollers "S" do not drop out. If the armature and centre rod have been unscrewed it will be necessary to reset these. In order to do this the magnet should be held in the left hand and the first finger used to hold the spring blade out of contact with the rocker. The armature should be screwed in as far as possible and should then be screwed back gradually and pressed in and out until it is found that when it is pushed in the "throw over" mechanism operates. It should then be turned back a further four holes. The setting is now correct. The six screws which hold the magnet to the body may then be screwed into place, but before tightening these down the hinge pin "Z", on which both rockers pivot, should be pulled out, thus allowing the inner rocker and the armature and diaphragm assembly to move further back. The screws may now be tightened and the hinge pin replaced.

In the unlikely event of trouble, disconnect the lead from the terminal and strike against the body of the pump to see if it sparks and therefore if any current is available in the wire. If there is no current the trouble must be looked for elsewhere. If the current is there, remove the bakelite cover and touch the terminal with the lead. If nothing happens and the points are in contact and a spark cannot be struck off the terminal it is probable that there is some dirt on the points. If, on the other hand, the points are not in contact, look to see if the tips of the inner rocker "U" are in contact with the magnet housing. If they are not it indicates that the armature has not gone right back. To cure this, loosen the six screws which hold the magnet housing to the body; make sure that the diaphragm is not sticking to the magnet housing by passing a penknife down the side of it and remove the hinge pin "Z". The six screws may then be tightened up again, when it will probably be found that the tips of the inner rocker are making contact with the magnet housing. If they are not, it will be necessary to remove the whole magnet assembly, dismantle it and see if any foreign matter has caused a jam.

If the pump becomes noisy, look for an air leak on the suction side. To do this, first of all make sure that the filter and inlet union are tight, and also see that there is sufficient petrol in the tank. If this does not cure it, it is probable that the leak is somewhere in the pipe line, and the simplest way to test for this is to replace the suction pipe with a short length of piping and let the pump suck petrol out of a can. If the pump functions satisfactorily under these conditions the fault must be elsewhere. If the pump goes on beating without delivering any petrol, it is probable that a piece of dirt has lodged under one of the valves. This may be removed by unscrewing the top union from the body and lifting the valve cage out. If the pump struggles to pump and gets very hot, it is probable that there is an obstruction somewhere in the pipe line or the filter may require cleaning.

The operation and servicing of the self-starting carburettor thermostat switch and solenoid are described in Operation No. 6.

OPERATION No. 151.

HORNS. TO REMOVE.

Remove the screw securing the horn dome cover. Withdraw to disconnect horn wiring.

The horns are mounted under the front apron and attached to the chassis front tie rod by a one bolt fixing.

OPERATION No. 152.

HORNS. TO ADJUST.

Remove the screw securing the horn dome cover. Withdraw cover and disconnect horn wiring.

A pair of contacts are situated under the cover, one fixed and one adjustable. Slacken the adjustable contact lock nut and rotate the contact.

Increasing the gap produces a higher pitch and decreasing the gap a lower pitch.

OPERATION No. 153.

FOG LAMPS. TO REMOVE.

(Not fitted to 1½ Litre Standard Saloon.)

The fog lamps are mounted on brackets which are in turn secured under the front bumper main bolt nuts.

Release screw at bottom of lamp rim and withdraw rim and reflector assembly by gently pulling from the bottom of the rim forward and upwards.

The wiring may be disconnected at the connectors behind the reflector.

The lamp mounting bolt is located inside the shell.

OPERATION No. 154.

SIDE LAMP. TO REMOVE.

1½ Litre.

Remove small screw securing rim and withdraw rim and glass complete.

Disconnect wiring from lamp clips and withdraw wiring downwards.

Remove two hexagon headed bolts situated under wing and passing into lamp shell.

Remove lamp.

OPERATION No. 155.

SIDE LAMP. TO SERVICE.

2½ and 3½ Litre.

The lamp shell is an integral part of the wing.

Spring the side lamp rim and glass out of the two securing clips when access can be gained to the bulb and wiring connections.

N.B.: Connectors are inserted in side lamp wiring under front wings.

OPERATION No. 156.

HEAD LAMP. TO REMOVE.

1½ Litre Standard Saloon.

Withdraw "T" headed spring clip securing base of lamp rim.

Gently withdraw rim by pulling from the bottom of the rim forward and upwards.

Remove cork sealing ring and small screw located at top of reflector rim.

Rotate reflector rim until the two "O"s coincide when the reflector can be withdrawn and the wiring disconnected. Withdraw wiring down through wing.

Remove the three nuts located under the wing which secure the head lamp mounting bracket.

Withdraw lamp shell and mounting bracket complete.

N.B.: The base bolt of the lamp screws into the mounting bracket. Release clamp and rotate to remove.

OPERATION No. 157.

HEAD LAMP. TO REMOVE.

1½ Litre Special Equipment.

Release knurled screw situated at base of lamp rim.

Gently withdraw head lamp rim and reflector assembly by pulling gently from the bottom forward and upwards.

Disconnect wiring and remove rim and reflector assembly.

Withdraw wires through lamp shell and remove base mounting nut situated inside shell.

Remove lamp.

N.B.: If erratic operation of a dipping head lamp is experienced this may be due to fouling between the wires and the dipping reflector. Reposition the wires so that these are clear of the reflector and head lamp mounting bolt.

OPERATION No. 158.

HEAD LAMP. TO REMOVE.

2½ and 3½ Litre.

Release screw situated at top of lamp rim.

Lower rim and reflector downwards on hinge.

Disconnect wiring and withdraw downwards. Remove base mounting nut situated inside shell.

Remove lamp.

N.B.: Dirty or badly mating contacts will cause erratic operation of the dipping mechanism.

Do not operate the dipper while the lamp is open.

OPERATION No. 159.

HEAD LAMPS. TO TRACK.

The car must be on level ground and unladen.

Position the board illustrated in Section O, "Tools and Equipment," at right angles and twelve feet in front of the car, the centre line of the car cutting the centre line of the board.

Slacken the head lamp base mounting nuts (clamp on 1½ litre Standard Saloon) and position the lamps so that the centre points of the projected light beam is on the appropriate cross on the board.

Tighten the lamp mounting nuts and recheck.

OPERATION No. 160.

LAMPS. TO FOCUS.

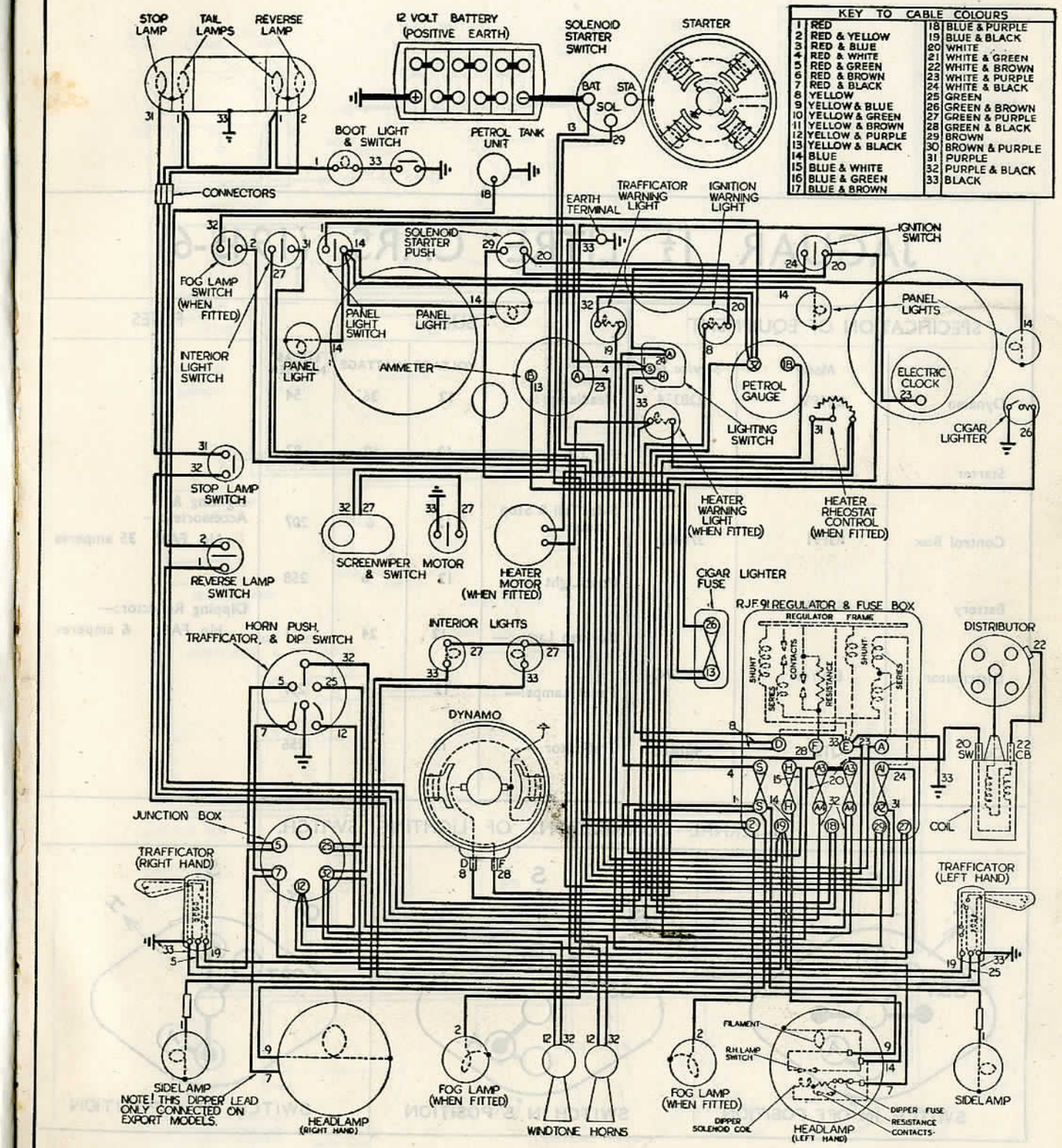
Head lamps and fog lamps may be focussed by sliding the bulb in the holder.

Remove the lamp front as described in the appropriate operation for lamp removal.

Slacken the small clamp bolt securing the bulb holder in the reflector and slide the bulb into the required position. Reclamp.

Sliding the bulb toward the lamp glass gives a spot beam and towards the reflector a diffused beam.

Model	Model Identification	Diagram No.
	1½ Litre.	
R.H.D.	Chassis No. 410001—411918.	W.70441
R.H.D.	Chassis No. 411919 onwards.	W.70441–1
L.H.D.	Chassis No. 430001 onwards.	W.72401
R.H.D. (Home)	Body No. B.9981 onwards.	W.75061
R.H.D. (Export)	Body No. B.9981 onwards.	W.75062
L.H.D.	Body No. B.9981 onwards.	W.74981
	2½ and 3½ Litre.	
R.H.D.	Chassis No. 510001—510430. Chassis No. 610001—610745.	W.70440
R.H.D.	Chassis No. 510431 onwards. Chassis No. 610746 onwards.	W.70440–1
L.H.D.	Chassis No. 530001 onwards. Chassis No. 630001 onwards.	W.72400 W.72400
R.H.D. (Home)	Saloon, Body No. B.9981 onwards. Coupé, Body No. C.1156 onwards.	W.75060
R.H.D. (Export)	Saloon, Body No. B.9981 onwards. Coupé, Body No. C.1156 onwards.	W.75063
L.H.D.	Saloon, Body No. B.9981 onwards. Coupé, Body No. C.1156 onwards.	W.74980



WIRING DIAGRAM
No. W70441

Internal connections shown dotted. Numbers indicate cable identification colours. See key above.

FOR SPECIFICATION OF EQUIPMENT, BULB SIZES, ETC., SEE OVERLEAF

ISSUED
APRIL, 1946

LUCAS 12v. ELECTRICAL EQUIPMENT

AS FITTED TO

JAGUAR 1½ LITRE CARS (1945-6)

D/88/L

Printed in England

JAGUAR 1½ LITRE CARS (1945-6)

SPECIFICATION OF EQUIPMENT

	Model	Service No.
Dynamo	C45PV	228334
Starter	M418G	255986
Control Box	RJF91	37036A
Battery	SLTW11A	
Distributor	DKY4A	40057C
Coil	Q12	401612

BULBS.

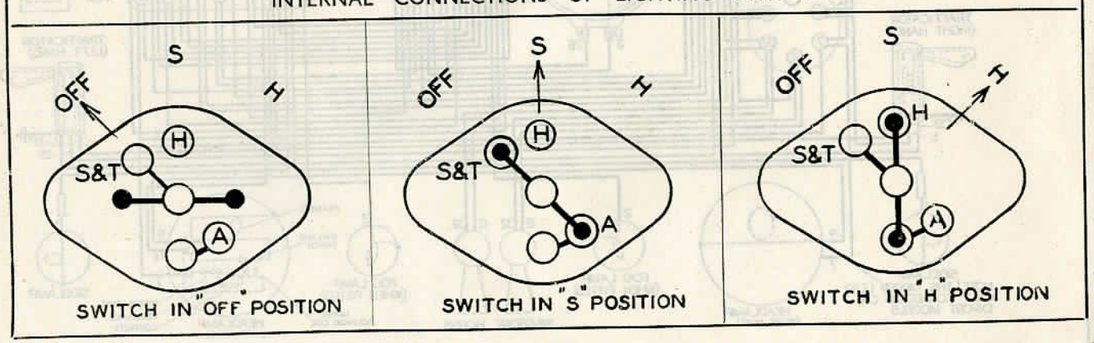
	VOLTAGE	WATTAGE	LUCAS NUMBER
Headlamps:—	12	36	54
Fog Lamps:—	12	60	87
Side, Tail & Stop Lamps:—	12	6	207
Boot Light :—	12	6	258
Reverse Lamp :—	12	24	1
Panel Lamps:—	12	6	207
Trafficator :—	12	3	256

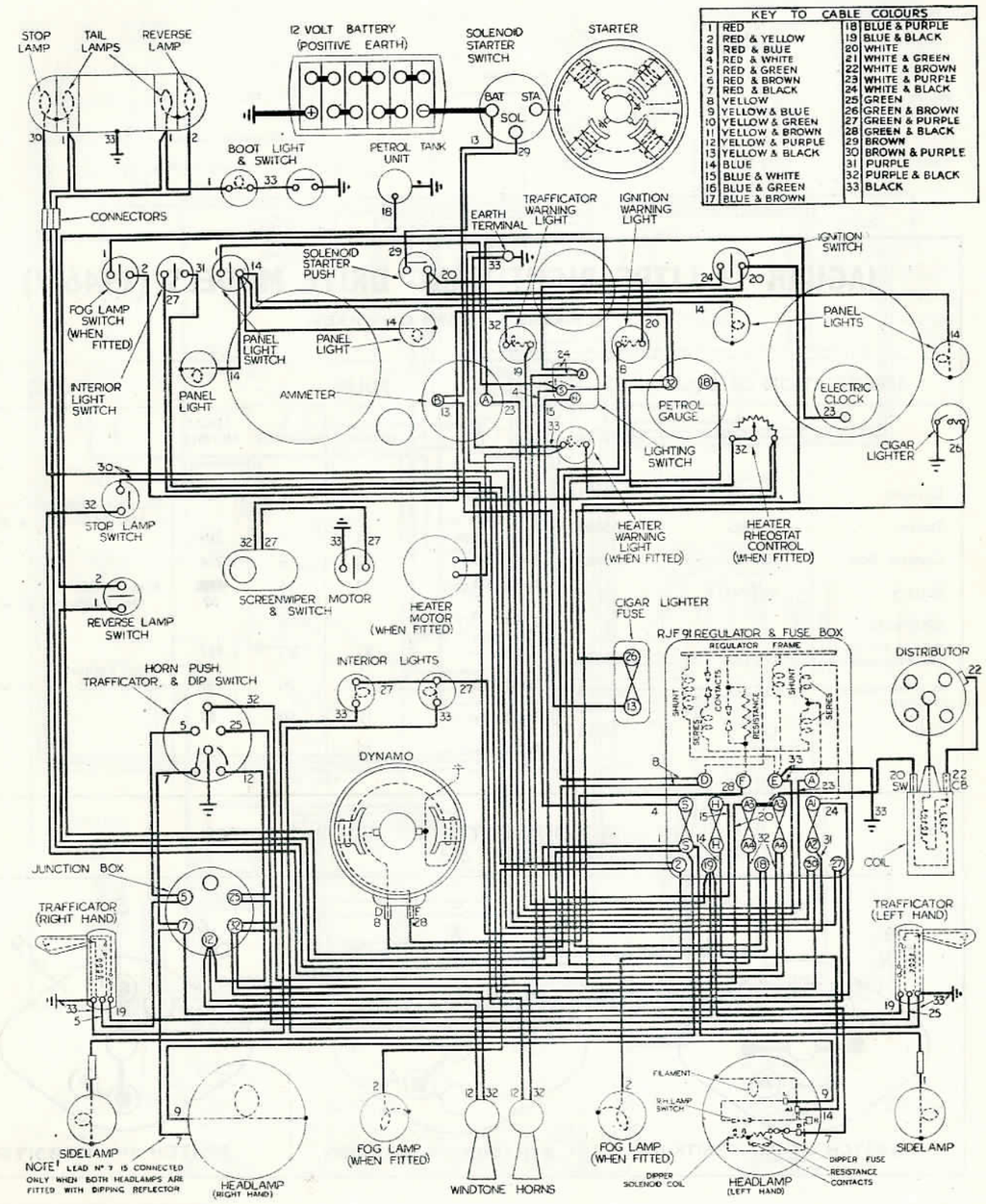
FUSES

Lighting & Accessories:—
No. FA35 35 amperes

Dipping Reflector:—
No. FA6 6 amperes

INTERNAL CONNECTIONS OF LIGHTING SWITCH.





WIRING DIAGRAM
No. W70441-2

Internal connections shown dotted. Numbers indicate cable identification colours. See key above.

FOR SPECIFICATION OF EQUIPMENT, BULB SIZES ETC. SEE OVERLEAF.

RE-PRINTED OCTOBER, 1954

LUCAS 12v. ELECTRICAL EQUIPMENT

AS FITTED TO

JAGUAR 1½ LITRE RIGHT HAND DRIVE MODELS (1946-7)

(CHASSIS No. 411919 ONWARDS)

B/1054/L

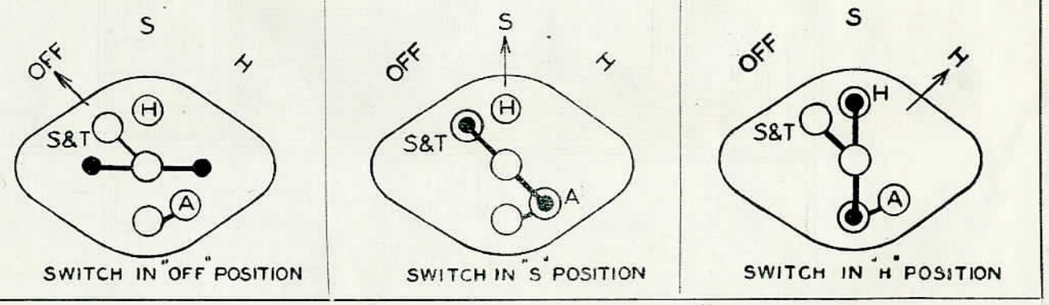
Printed in England

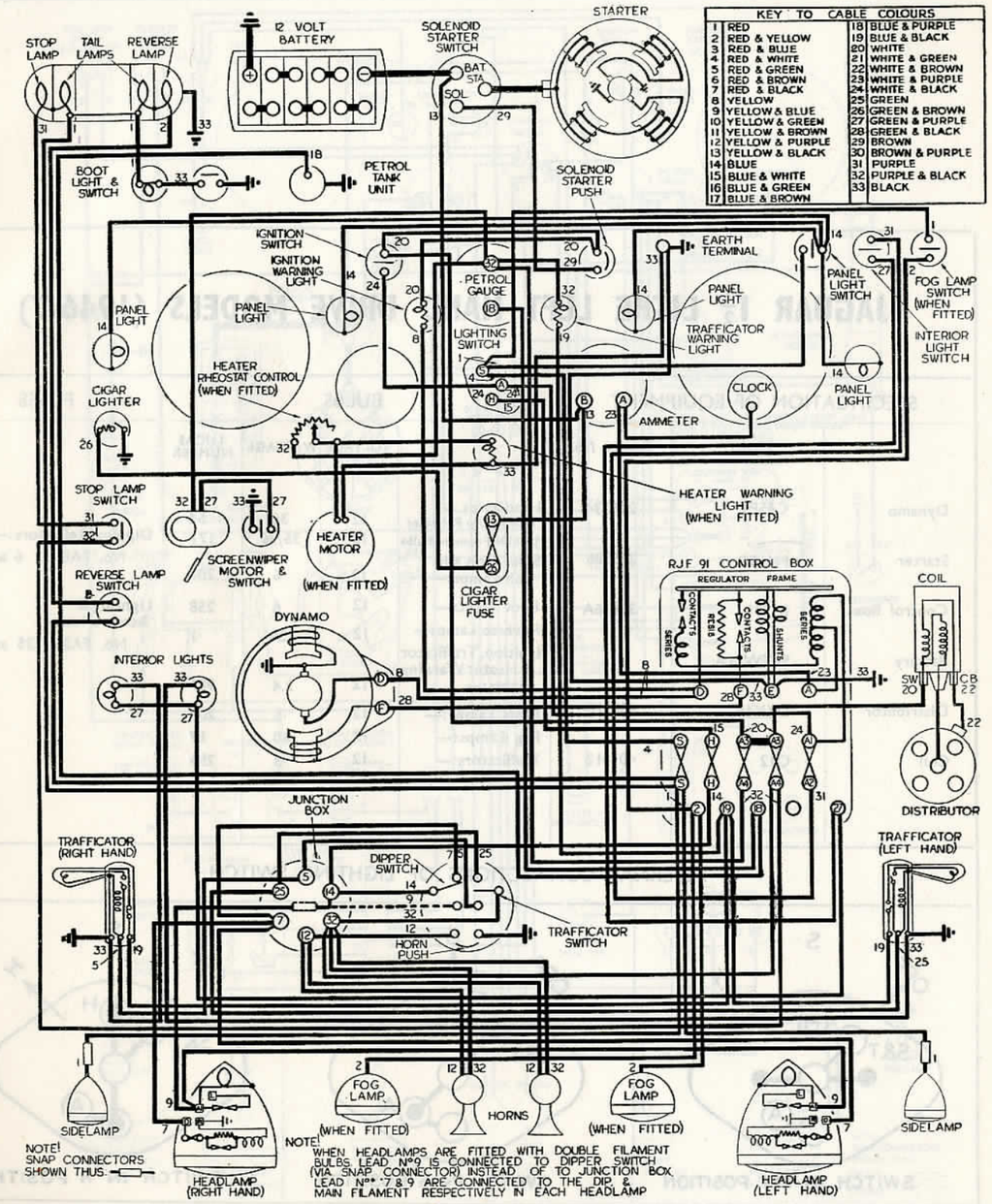
JAGUAR 1½ LITRE RIGHT HAND DRIVE MODELS (1946-7)

(CHASSIS No. 411919 ONWARDS)

SPECIFICATION OF EQUIPMENT			BULBS				FUSES
	Model	*Service No.*		VOLTAGE	WATTAGE	LUCAS NUMBER	
Dynamo	C45YV	22452	Headlamps :—	12	36	57	Dipping Reflectors :— No. FA6 6 amperes
Starter	M418G	255986	Side, Stop and Tail Lamps :—	12	6	207	
Control Box	RJF91	37036A	Boot Light :—	12	6	258	
Battery	SLTW11A		Reverse Lamp :—	12	36	■ 57	Accessories:— No. FA25 25 amperes
Distributor			Ignition, Trafficator & Heater Warning Lights :—	12	2·2	987	
Without Micrometer Adjustment	DKY4A	40057E					Cigar Lighter:— No. FA35 35 amperes
With Micrometer Adjustment	DKY4A	40091B	Panel Lamps :—	12	2·2	987	
Coil	Q12	45020	Fog Lamps :—	12	60	87	
			Trafficators :—	12	3	256	

INTERNAL CONNECTIONS OF LIGHTING SWITCH





WIRING DIAGRAM
No. W72401

Numbers indicate cable identification colours. See key above.

FOR SPECIFICATION OF EQUIPMENT, BULB SIZES ETC. SEE OVERLEAF.

ISSUED
APRIL, 1947

LUCAS 12v. ELECTRICAL EQUIPMENT

AS FITTED TO

JAGUAR 1½ LITRE LEFT HAND DRIVE MODELS (1946-7)

F/88/L

Printed in England

JAGUAR 1½ LITRE LEFT HAND DRIVE MODELS (1946-7)

SPECIFICATION OF EQUIPMENT

	Model	Service No.
Dynamo	C45PV	228334
Starter	M418G	255986
Control Box	RJF91	37036A
Battery	SLTW11A	
Distributor	DKY4A	40091B
Coil	Q12	401612

BULBS

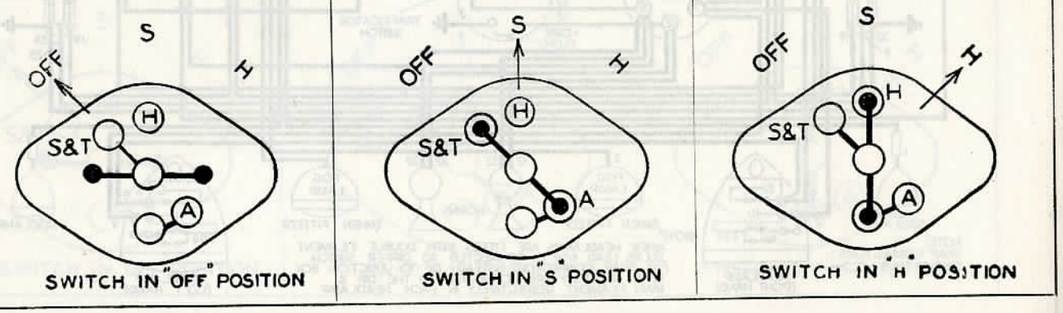
	VOLTAGE	WATTAGE	LUCAS NUMBER
Headlamps :— Double Dip Reflector	12	36	54
Double Filament Bulbs	12	36/36	171
Side, Stop and Tail Lamps:—	12	6	207
Boot Light:—	12	6	258
Reverse Lamp:—	12	24	1
Ignition, Trafficator & Heater Warning Lights:—	12	2.4	987
Panel Lamps:—	12	6	207
Fog Lamps:—	12	60	87
Trafficators:—	12	3	256

FUSES

Dipping Reflectors:—
No. FA6 6 amperes

Lighting & Accessories:—
No. FA35 35 amperes

INTERNAL CONNECTIONS OF LIGHTING SWITCH

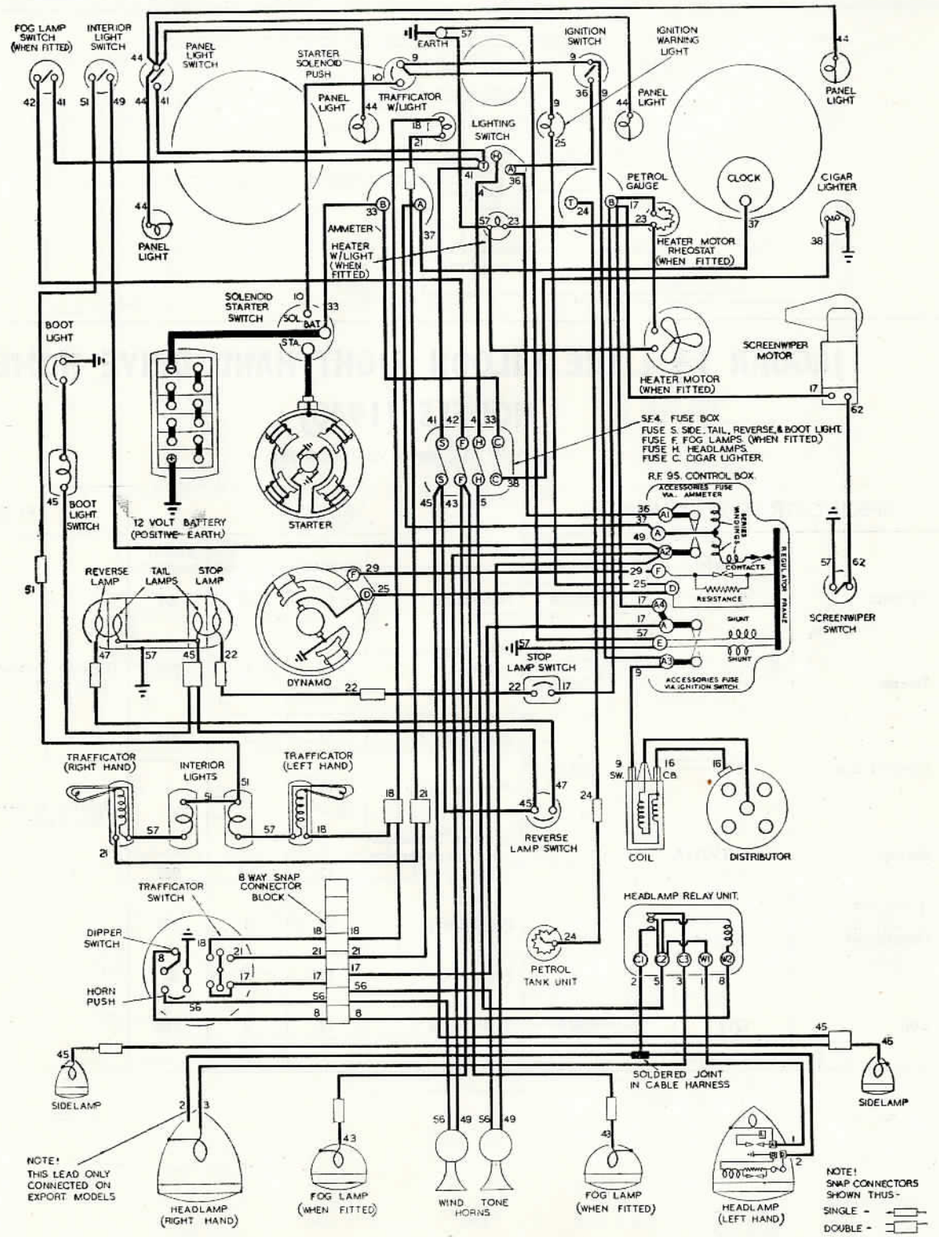


SWITCH IN "OFF" POSITION | SWITCH IN "S" POSITION | SWITCH IN "H" POSITION

LUCAS ELECTRICAL EQUIPMENT

JAGUAR 1½ LITRE SALOON RIGHT HAND DRIVE HOME MODELS (1948)

(BODY No. B9981 ONWARDS)



KEY TO CABLE COLOURS

1 BLUE	14 WHITE with PURPLE	27 YELLOW with BLUE	40 BROWN with BLACK
2 BLUE with RED	15 WHITE with BROWN	28 YELLOW with WHITE	41 RED
3 BLUE with YELLOW	16 WHITE with BLACK	29 YELLOW with GREEN	42 RED with YELLOW
4 BLUE with WHITE	17 GREEN	30 YELLOW with PURPLE	43 RED with BLUE
5 BLUE with GREEN	18 GREEN with RED	31 YELLOW with BROWN	44 RED with WHITE
6 BLUE with PURPLE	19 GREEN with YELLOW	32 YELLOW with BLACK	45 RED with GREEN
7 BLUE with BROWN	20 GREEN with BLUE	33 BROWN	46 RED with PURPLE
8 BLUE with BLACK	21 GREEN with WHITE	34 BROWN with RED	47 RED with BROWN
9 WHITE	22 GREEN with PURPLE	35 BROWN with YELLOW	48 RED with BLACK
10 WHITE with RED	23 GREEN with BROWN	36 BROWN with BLUE	49 PURPLE
11 WHITE with YELLOW	24 GREEN with BLACK	37 BROWN with WHITE	50 PURPLE with RED
12 WHITE with BLUE	25 YELLOW	38 BROWN with GREEN	51 PURPLE with YELLOW
13 WHITE with GREEN	26 YELLOW with RED	39 BROWN with PURPLE	52 PURPLE with BLUE

53 PURPLE with WHITE	WIRING DIAGRAM	
54 PURPLE with GREEN	No. W75061	
55 PURPLE with BROWN	12 VOLT	
56 PURPLE with BLACK		
57 BLACK		
58 BLACK with RED		
59 BLACK with YELLOW		
60 BLACK with BLUE		
61 BLACK with WHITE		
62 BLACK with GREEN		
63 BLACK with PURPLE		
64 BLACK with BROWN		

ISSUED: MAY 1948

E/152/L

NUMBERS INDICATE CABLE IDENTIFICATION COLOURS, SEE KEY ABOVE

FOR SPECIFICATION OF EQUIPMENT SEE OVERLEAF

Printed in England

JAGUAR 1½ LITRE SALOON RIGHT HAND DRIVE HOME MODELS (1948)

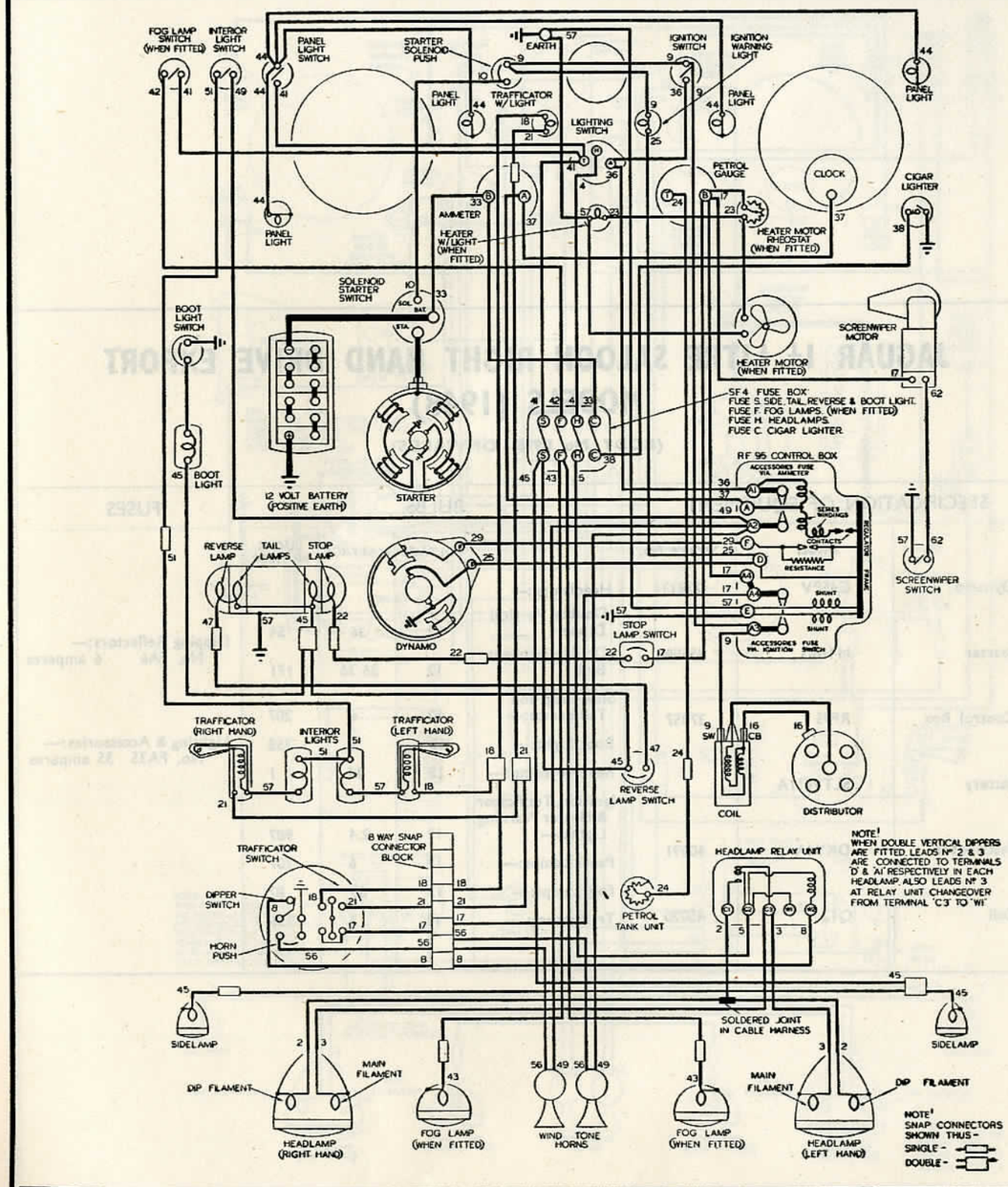
(BODY No. B9981 ONWARDS)

SPECIFICATION OF EQUIPMENT			BULBS				FUSES
	Model	*Service No.*		VOLTAGE	WATTAGE	LUCAS NUMBER	
Dynamo	C45PV	228334	Headlamps :—	12	36	54	
Starter	M418G	255986	Side, Stop & Tail Lamps :—	12	6	207	Dipping Reflector :— No. FA6 6 amperes
Control Box	RF95	37057	Boot Light :—	12	6	258	
Battery	SLTW11A		Reverse Lamp :—	12	24	1	Lighting & Accessories :— No. FA35 35 amperes
Distributor	DKY4A	40091	Ignition, Trafficator & Heater Warning Lights :—	12	2·4	987	
Coil	Q12	45020	Panel Lamps :—	12	6	207	
			Fog Lamps :—	12	60	87	
			Trafficators :—	12	3	256	

LUCAS
ELECTRICAL EQUIPMENT

JAGUAR 1½ LITRE SALOON RIGHT HAND DRIVE EXPORT MODELS (1948)

(BODY No. B9981 ONWARDS)



KEY TO CABLE COLOURS

1 BLUE	14 WHITE with PURPLE	27 YELLOW with BLUE	40 BROWN with BLACK	53 PURPLE with WHITE
2 BLUE with RED	15 WHITE with BROWN	28 YELLOW with WHITE	41 RED	54 PURPLE with GREEN
3 BLUE with YELLOW	16 WHITE with BLACK	29 YELLOW with GREEN	42 RED with YELLOW	55 PURPLE with BROWN
4 BLUE with WHITE	17 GREEN	30 YELLOW with PURPLE	43 RED with BLUE	56 PURPLE with BLACK
5 BLUE with GREEN	18 GREEN with RED	31 YELLOW with BROWN	44 RED with WHITE	57 BLACK
6 BLUE with PURPLE	19 GREEN with YELLOW	32 YELLOW with BLACK	45 RED with GREEN	58 BLACK with RED
7 BLUE with BROWN	20 GREEN with BLUE	33 BROWN	46 RED with PURPLE	59 BLACK with YELLOW
8 BLUE with BLACK	21 GREEN with WHITE	34 BROWN with RED	47 RED with BROWN	60 BLACK with BLUE
9 WHITE	22 GREEN with PURPLE	35 BROWN with YELLOW	48 RED with BLACK	61 BLACK with WHITE
10 WHITE with RED	23 GREEN with BROWN	36 BROWN with BLUE	49 PURPLE	62 BLACK with GREEN
11 WHITE with YELLOW	24 GREEN with BLACK	37 BROWN with WHITE	50 PURPLE with RED	63 BLACK with PURPLE
12 WHITE with BLUE	25 YELLOW	38 BROWN with GREEN	51 PURPLE with YELLOW	64 BLACK with BROWN
13 WHITE with GREEN	26 YELLOW with RED	39 BROWN with PURPLE	52 PURPLE with BLUE	

WIRING DIAGRAM

No. W75062

12 VOLT.

ISSUED:
MAY 1948

F/6911

NUMBERS INDICATE CABLE IDENTIFICATION COLOURS, SEE KEY ABOVE.

FOR SPECIFICATION OF EQUIPMENT SEE OVERLEAF.

JAGUAR 1½ LITRE SALOON RIGHT HAND DRIVE EXPORT MODELS (1948)

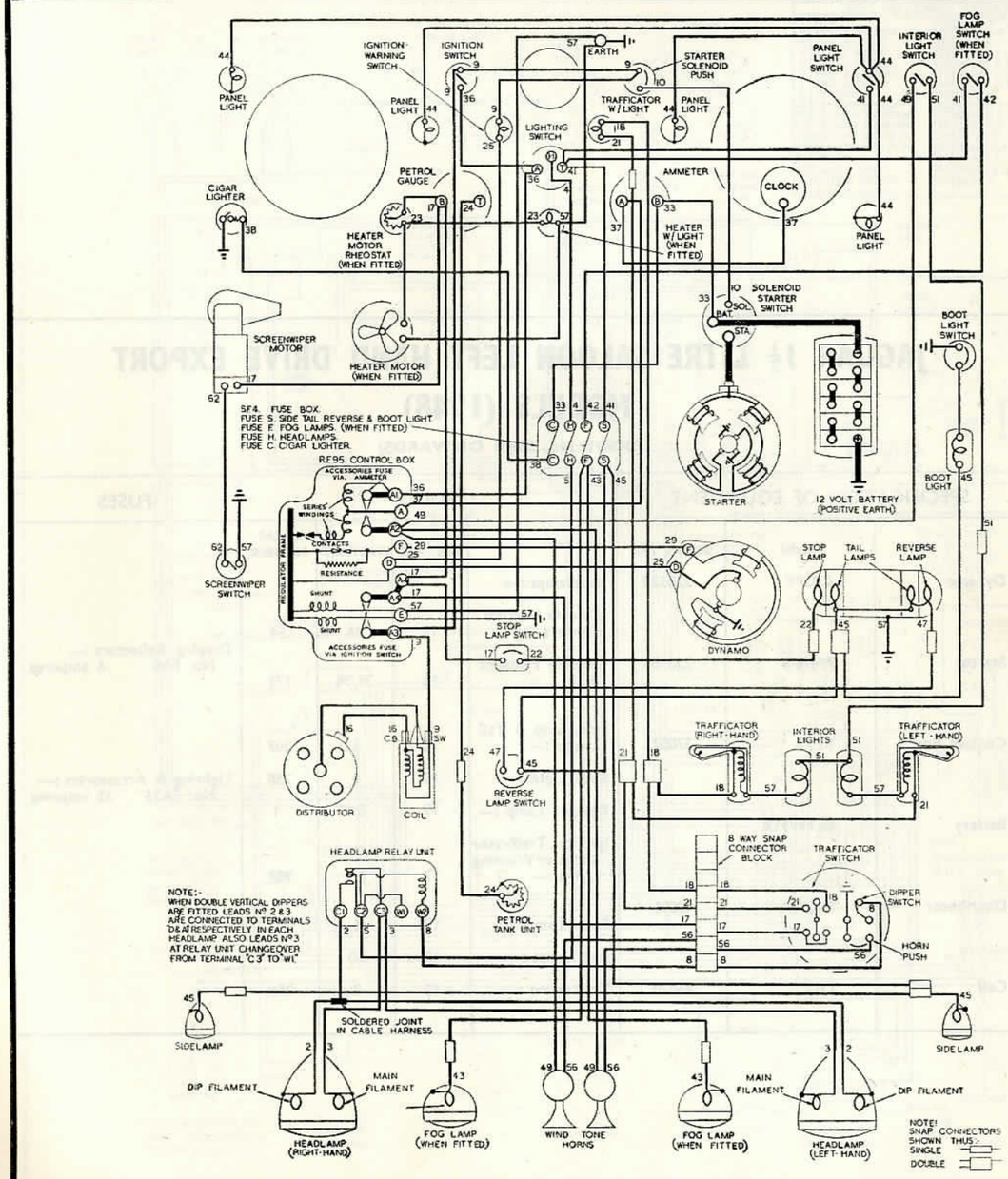
(BODY No B9981 ONWARDS)

SPECIFICATION OF EQUIPMENT			BULBS.				FUSES
	Model	*Service No.*		VOLTAGE	WATTAGE	LUCAS NUMBER	
Dynamo	C45PV	228334	Headlamps:—				
			Double Vertical Dippers	12	36	54	Dipping Reflectors:— No. FA6 6 amperes
Starter	M418G	255986	Double Filament Bulb	12	36/36	171	
			Side, Stop and Tail Lamps:—	12	6	207	
Control Box	RF95	37057	Boot Light:—	12	6	258	Lighting & Accessories:— No. FA35 35 amperes
			Reverse Lamp:—	12	24	1	
Battery	SLTW11A		Ignition, Trafficator & Heater Warning Lights:—	12	2.4	987	
Distributor	DKY4A	40091	Panel Lamps:—	12	6	207	
			Fog Lamps:—	12	60	87	
Coil	Q12	45020	Trafficators:—	12	3	256	

LUCAS ELECTRICAL EQUIPMENT

JAGUAR 1½ LITRE SALOON LEFT HAND DRIVE EXPORT MODELS (1948

(BODY No. B9981 ONWARDS)



KEY TO CABLE COLOURS

1 BLUE	15 WHITE with BROWN	28 YELLOW with WHITE	41 RED	54 PURPLE with GREEN
2 BLUE with RED	16 WHITE with BLACK	29 YELLOW with GREEN	42 RED with YELLOW	55 PURPLE with BROWN
3 BLUE with YELLOW	17 GREEN	30 YELLOW with PURPLE	43 RED with BLUE	56 PURPLE with BLACK
4 BLUE with WHITE	18 GREEN with RED	31 YELLOW with BROWN	44 RED with WHITE	57 BLACK
5 BLUE with GREEN	19 GREEN with YELLOW	32 YELLOW with BLACK	45 RED with GREEN	58 BLACK with RED
6 BLUE with PURPLE	20 GREEN with BLUE	33 BROWN	46 RED with PURPLE	59 BLACK with YELLOW
7 BLUE with BROWN	21 GREEN with WHITE	34 BROWN with RED	47 RED with BROWN	60 BLACK with BLUE
8 BLUE with BLACK	22 GREEN with PURPLE	35 BROWN with YELLOW	48 RED with BLACK	61 BLACK with WHITE
9 WHITE	23 GREEN with BROWN	36 BROWN with BLUE	49 PURPLE	62 BLACK with GREEN
10 WHITE with RED	24 GREEN with BLACK	37 BROWN with WHITE	50 PURPLE with RED	63 BLACK with PURPLE
11 WHITE with YELLOW	25 YELLOW	38 BROWN with GREEN	51 PURPLE with YELLOW	64 BLACK with BROWN
12 WHITE with BLUE	26 YELLOW with RED	39 BROWN with PURPLE	52 PURPLE with BLUE	65 DARK GREEN
13 WHITE with GREEN	27 YELLOW with BLUE	40 BROWN with BLACK	53 PURPLE with WHITE	66 LIGHT GREEN
14 WHITE with PURPLE				

WIRING DIAGRAM

No. W74981

12-VOLT

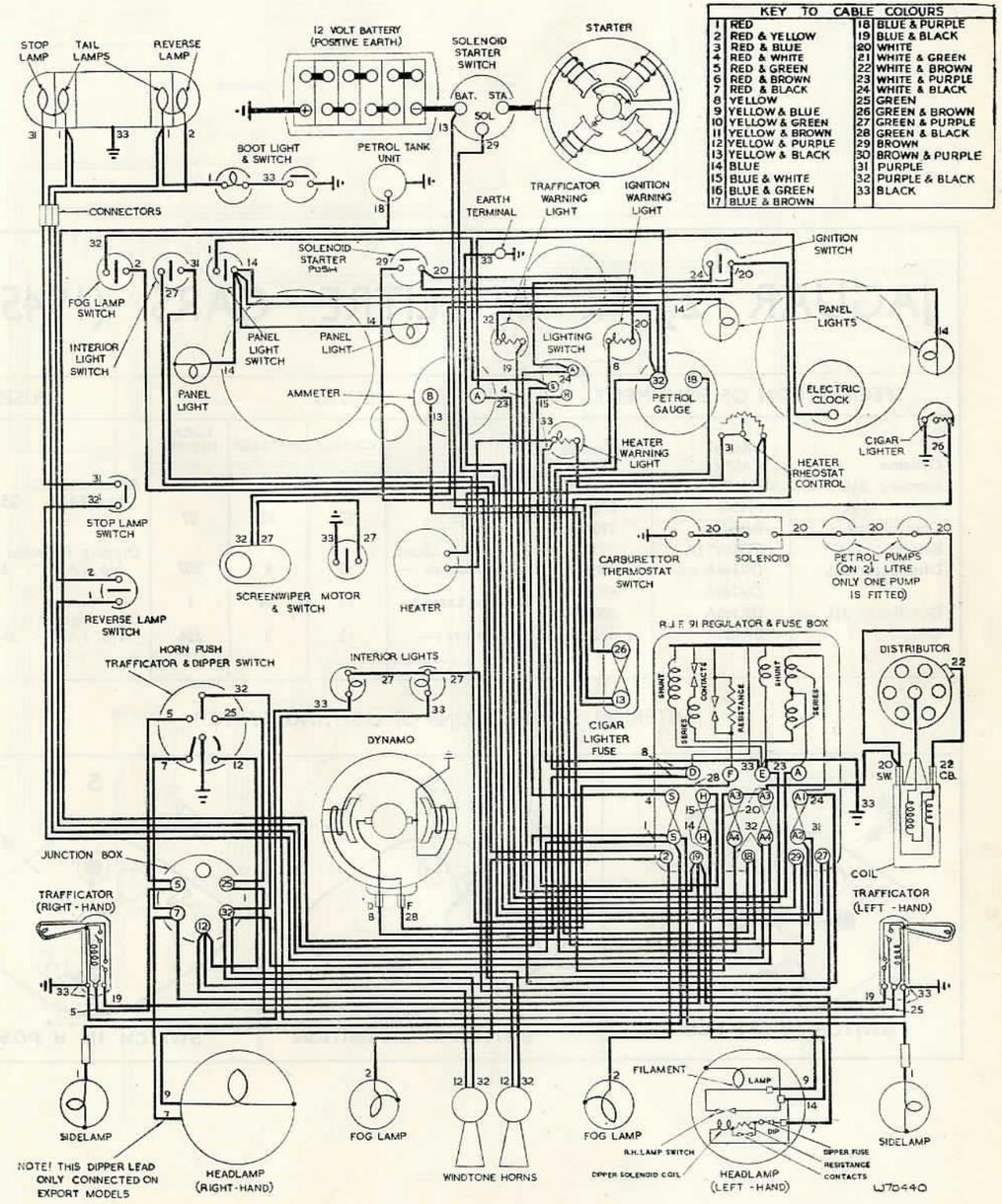
ISSUED:
MAY 1948

NUMBERS INDICATE CABLE IDENTIFICATION COLOURS, SEE KEY ABOVE
FOR SPECIFICATION OF EQUIPMENT SEE OVERLEAF

JAGUAR 1½ LITRE SALOON LEFT HAND DRIVE EXPORT MODELS (1948)

(BODY No. B9981 ONWARDS)

SPECIFICATION OF EQUIPMENT			BULBS				FUSES
	Model	*Service No.*		VOLTAGE	WATTAGE	LUCAS NUMBER	
Dynamo	C45PV	228334	Headlamps :—				
			Double Vertical Dippers	12	36	54	Dipping Reflectors :— No. FA6 6 amperes
Starter	M418G	255986	Double Filament Bulb	12	36/36	171	
			Side, Stop & Tail Lamps :—	12	6	207	
Control Box	RF95	37057	Boot Light :—	12	6	258	Lighting & Accessories :— No. FA35 35 amperes
			Reverse Lamp :—	12	24	1	
Battery	SLTW11A		Ignition, Trafficator & Heater Warning Lights :—	12	2·4	987	
Distributor	DKY4A	40091	Panel Lamps :—	12	6	207	
			Fog Lamps :—	12	60	87	
Coil	Q12	45020	Trafficators :—	12	3	256	



WIRING DIAGRAM
No. W70440

Internal connections shown dotted. Numbers indicate cable identification colours. See key above.
FOR SPECIFICATION OF EQUIPMENT, BULB SIZES, ETC., SEE OVERLEAF

ISSUED
APRIL, 194

LUCAS 12v. ELECTRICAL EQUIPMENT

AS FITTED TO

JAGUAR 2½ & 3½ LITRE CARS (1945-6)

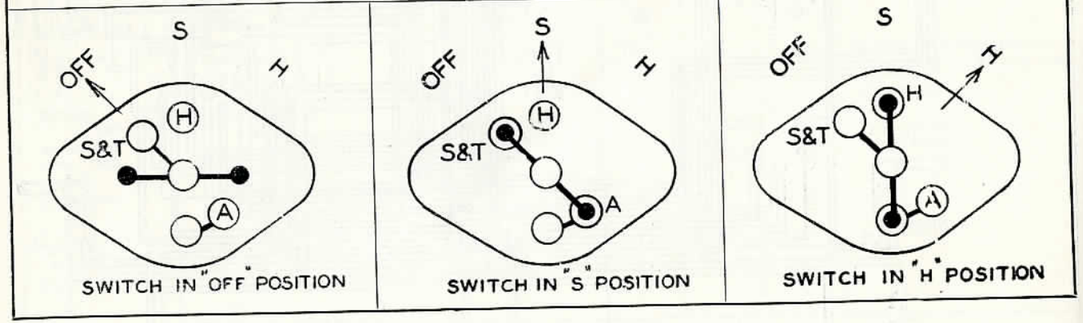
D/452/L

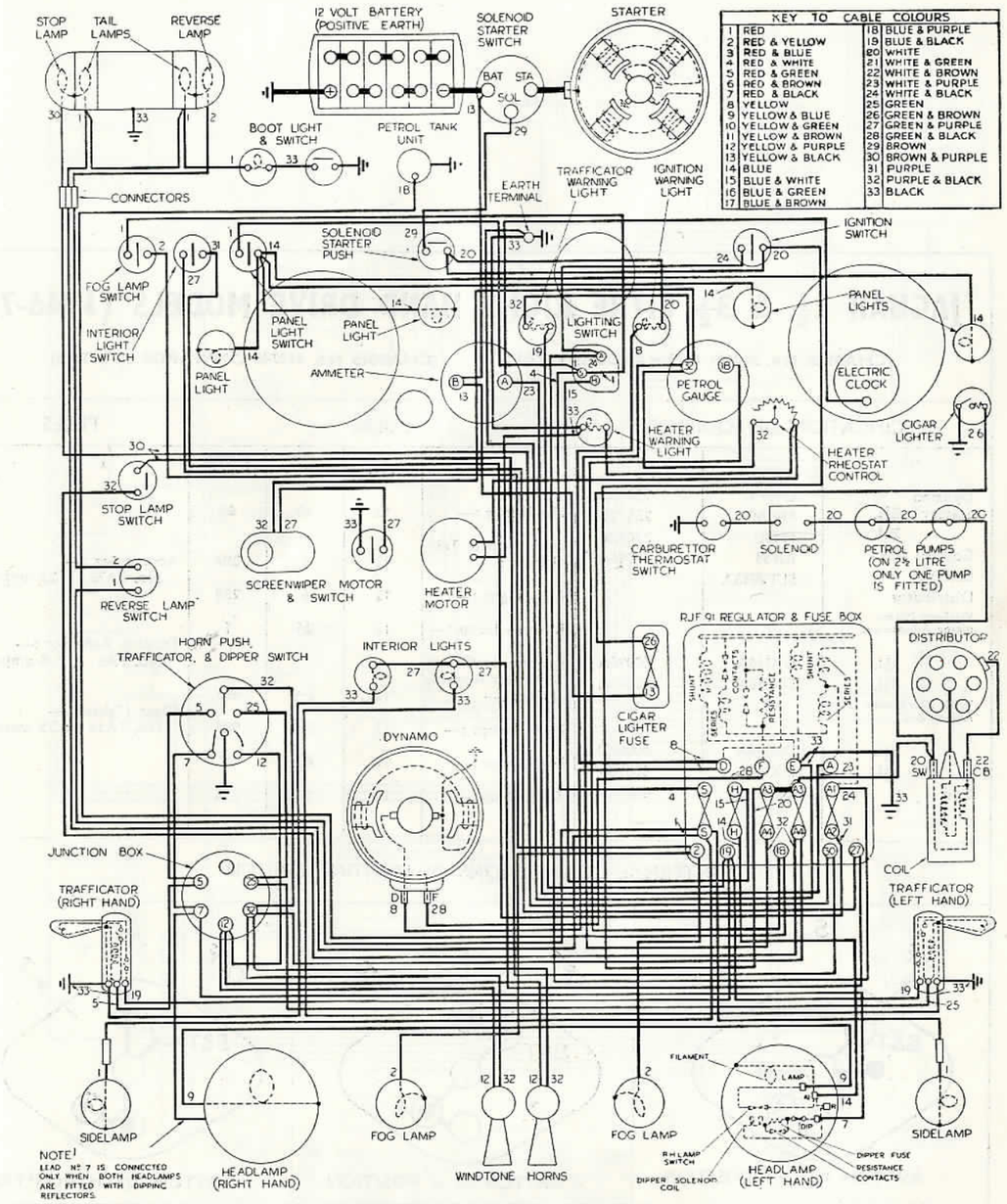
Printed in England

JAGUAR $2\frac{1}{2}$ & $3\frac{1}{2}$ LITRE CARS (1945-6)

SPECIFICATION OF EQUIPMENT			BULBS				FUSES
	Model	*Service No.*		VOLTAGE	WATTAGE	LUCAS NUMBER	
Dynamo	C45PV	238186	Headlamps :—	12	60	60	Accessories :— No. FA25 25 amperes
Starter : $2\frac{1}{2}$L	M418G	255721	Fog Lamps :—	12	60	87	
$3\frac{1}{2}$L	M45G	270401	Side, Stop, Boot & Tail Lamps :—	12	6	207	Dipping Reflector :— No. FA6 6 amperes
Control Box	RJF91	37046A	Reverse Lamp :—	12	24	1	
Battery	STXW11A		Trafficators :—	12	3	256	Cigar Lighter :— No. FA35 35 amperes
Distributor $2\frac{1}{2}$L	DKH6A or DXH6A	40066A 40096A					
Distributor $3\frac{1}{2}$L	DKH6A	40080A					
Coil	BR12	402029					

INTERNAL CONNECTIONS OF LIGHTING SWITCH





WIRING DIAGRAM
No. W70440-1

Internal connections shown dotted. Numbers indicate cable identification colours. See key above.
FOR SPECIFICATION OF EQUIPMENT, BULB SIZES, ETC., SEE OVERLEAF

ISSUED
APRIL, 1947

LUCAS 12v. ELECTRICAL EQUIPMENT

AS FITTED TO

JAGUAR $2\frac{1}{2}$ & $3\frac{1}{2}$ LITRE RIGHT HAND DRIVE MODELS (1946-7)

(CHASSIS No. 510431 ONWARDS $2\frac{1}{2}$ LITRE) **(CHASSIS No. 610746 ONWARDS $3\frac{1}{2}$ LITRE)**

E/152/L

Printed in England

JAGUAR 2½ & 3½ LITRE RIGHT HAND DRIVE MODELS (1946-7)

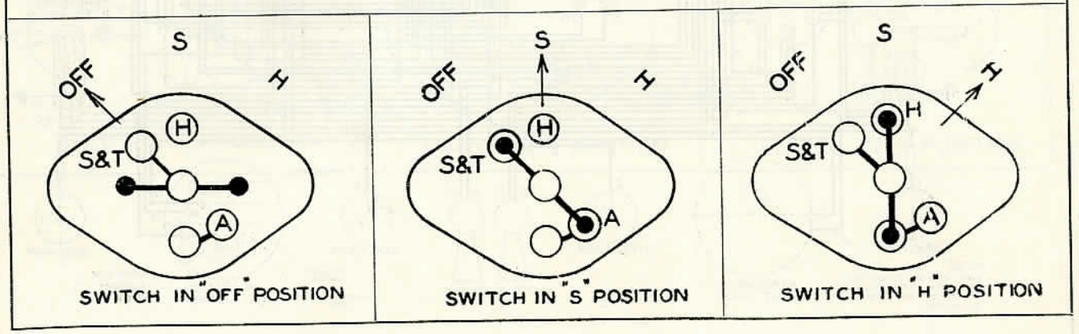
(CHASSIS No. 510431 ONWARDS 2½ LITRE) **(CHASSIS No. 610746 ONWARDS 3½ LITRE)**

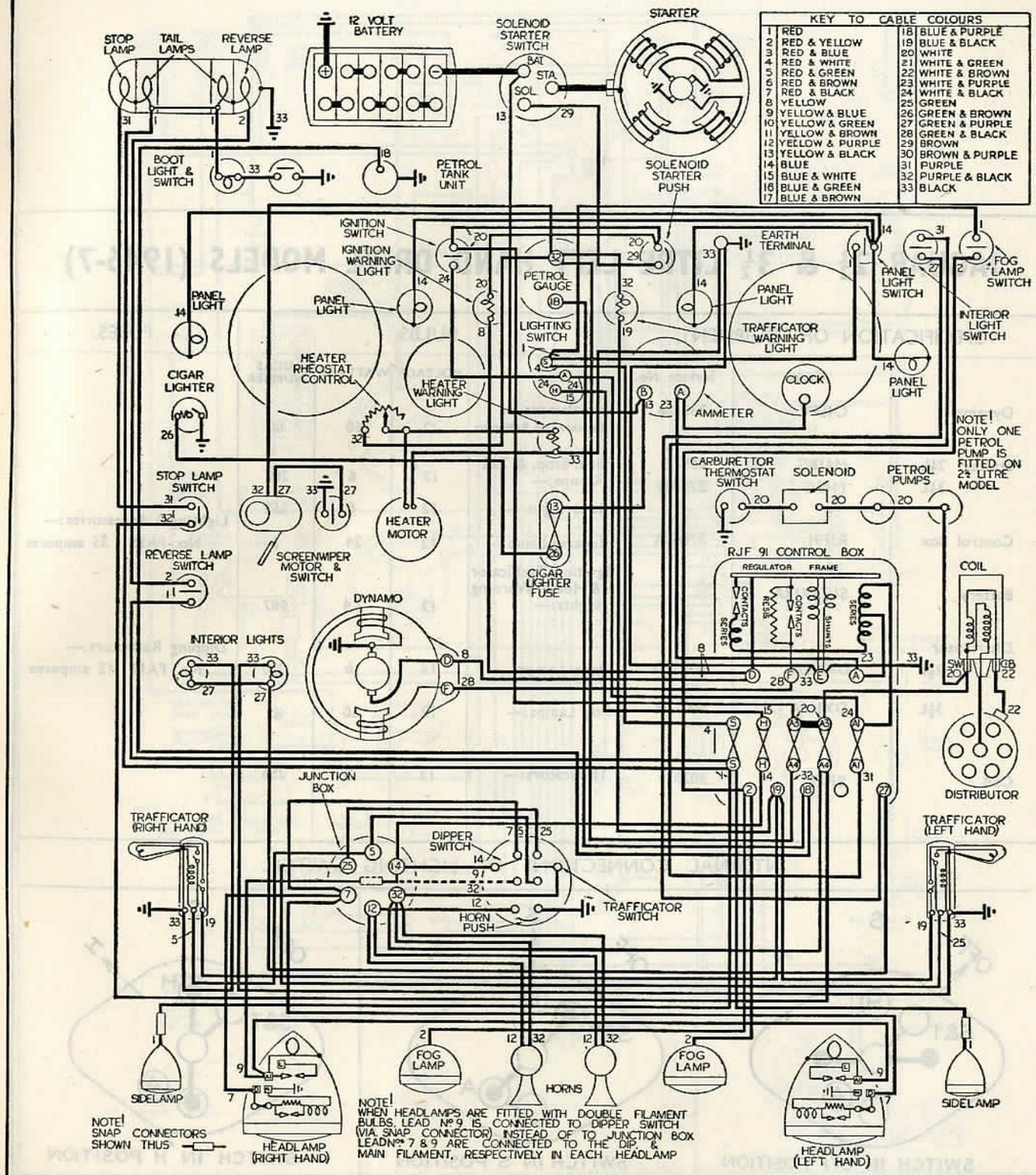
SPECIFICATION OF EQUIPMENT	Model	Service No.
Dynamo	C45PV	238186
Starter : 2½L	M418G	255721
3½L	M45G	270401
Control Box	RJF91	37046A
Battery	SLTW13A	
Distributor		
Without Micrometer Adjustment		
2½L	DXH6A	40096A
3½L	DXH6A	40080A
With Micrometer Adjustment		
2½L	DXH6A	40092D
3½L	DXH6A	40093B
Coil	BR12	402029

BULBS	VOLTAGE	WATTAGE	LUCAS NUMBER
Headlamps :—	12	60	60
Side, Stop & Tail Lamps :—	12	6	207
Boot Light :—	12	6	258
Reverse Lamp :—	12	24	1
Ignition, Trafficator & Heater Warning Lights :—	12	2·4	987
Panel Lamps :—	12	2·4	987
Fog Lamps :—	12	60	87
Trafficators :—	12	3	256

FUSES	
Accessories :— No. FA25	25 amperes
Dipping Reflector :— No. FA6	6 amperes
Cigar Lighter :— No. FA35	35 amperes

INTERNAL CONNECTIONS OF LIGHTING SWITCH





WIRING DIAGRAM
No. W72400

Internal connections shown dotted. Numbers indicate cable identification colours. See key above.

FOR SPECIFICATION OF EQUIPMENT, BULB SIZES ETC. SEE OVERLEAF.

ISSUED APRIL, 1947

LUCAS 12v. ELECTRICAL EQUIPMENT

AS FITTED TO

JAGUAR 2½ & 3½ LITRE LEFT HAND DRIVE MODELS (1946-7)

F/88/L

Printed in England

JAGUAR 2½ & 3½ LITRE LEFT HAND DRIVE MODELS (1946-7)

SPECIFICATION OF EQUIPMENT.	Model	Service No.
Dynamo	C45PV	238186
Starter 2½L	M418G	255721
3½L	M45G	270401
Control Box	RJF91	37046A
Battery	SLTW13A	
Distributor 2½L	DXH6A	40092D
3½L	DXH6A	40093B
Coil	BR12	402029

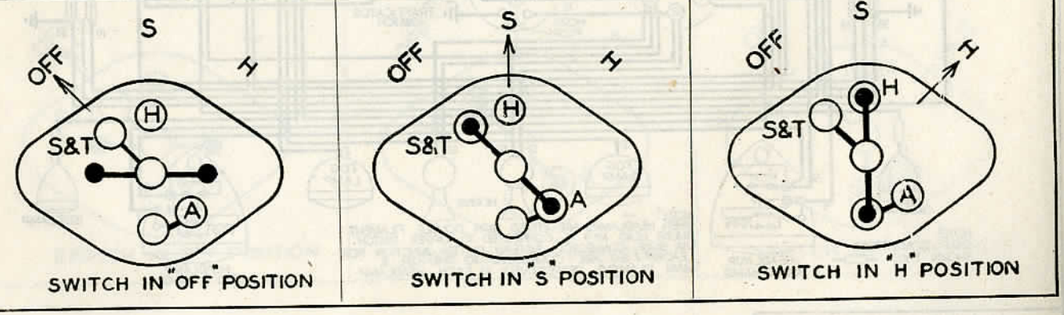
BULBS	VOLTAGE	WATTAGE	LUCAS NUMBER
Headlamps:— Double Dip Reflector	12	60	60
Side, Stop, & Tail Lamps:—	12	6	207
Boot Light:—	12	6	258
Reverse Lamp.—	12	24	1
Ignition, Trafficator & Heater Warning Lights:—	12	2.4	987
Panel Lamps:—	12	6	207
Fog Lamps:—	12	60	87
Trafficators:—	12	3	256

FUSES

Lighting & Accessories:—
No. FA35 35 amperes

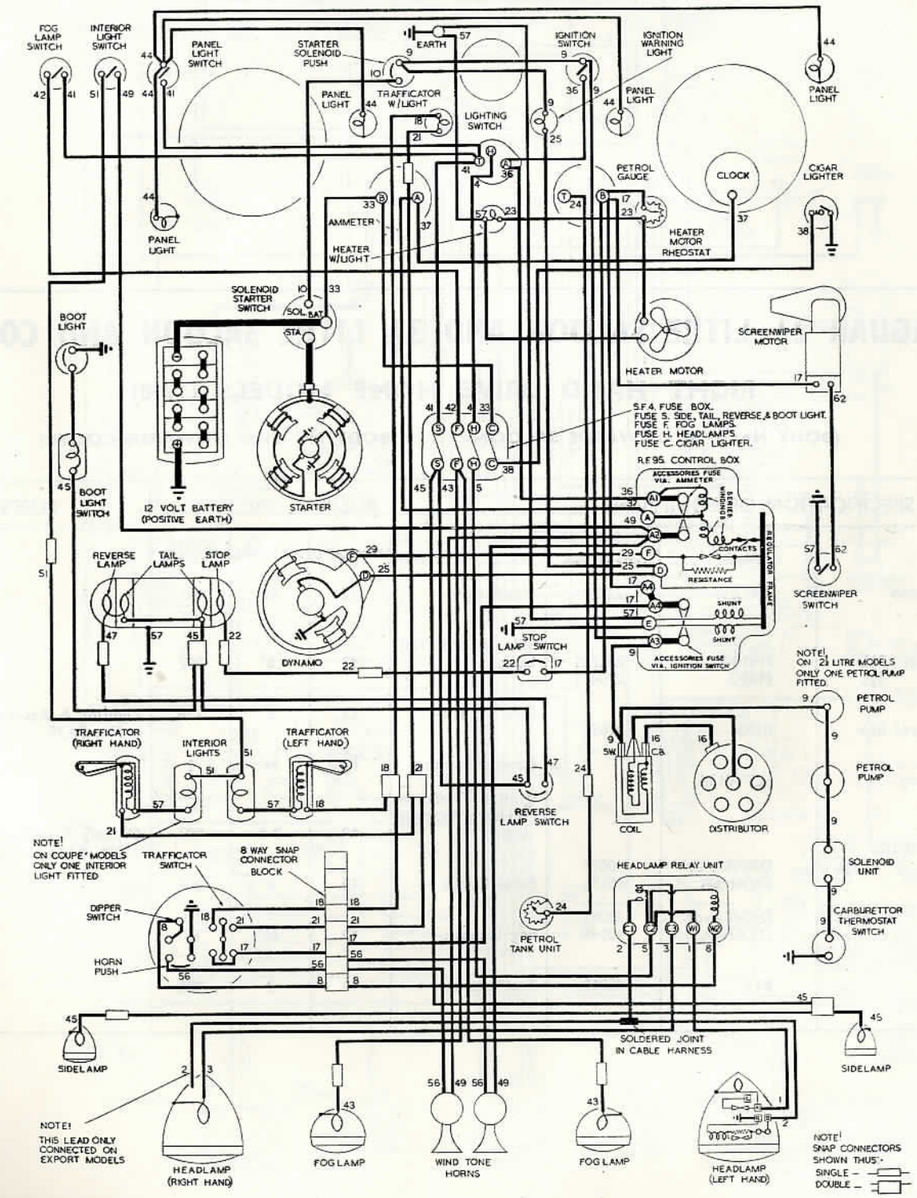
Dipping Reflectors:—
No. FA12 12 amperes

INTERNAL CONNECTIONS OF LIGHTING SWITCH.



LUCAS
ELECTRICAL EQUIPMENT

JAGUAR 2½ LITRE SALOON & 3½ LITRE SALOON & COUPE
RIGHT HAND DRIVE HOME MODELS (1948)
(BODY No. B9981 ONWARDS SALOON)
(BODY No. C1156 ONWARDS COUPE)



KEY TO CABLE COLOURS

1 BLUE	14 WHITE with PURPLE	27 YELLOW with BLUE	40 BROWN with BLACK	53 PURPLE with WHITE
2 BLUE with RED	15 WHITE with BROWN	28 YELLOW with WHITE	41 RED	54 PURPLE with GREEN
3 BLUE with YELLOW	16 WHITE with BLACK	29 YELLOW with GREEN	42 RED with YELLOW	55 PURPLE with BROWN
4 BLUE with WHITE	17 GREEN	30 YELLOW with PURPLE	43 RED with BLUE	56 PURPLE with BLACK
5 BLUE with GREEN	18 GREEN with RED	31 YELLOW with BROWN	44 RED with WHITE	57 BLACK
6 BLUE with PURPLE	19 GREEN with YELLOW	32 YELLOW with BLACK	45 RED with GREEN	58 BLACK with RED
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10 WHITE with RED	23 GREEN with BROWN	36 BROWN with BLUE	49 PURPLE	62 BLACK with GREEN
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12 WHITE with BLUE	25 YELLOW	38 BROWN with GREEN	51 PURPLE with YELLOW	64 BLACK with BROWN
13 WHITE with GREEN	26 YELLOW with RED	39 BROWN with PURPLE	52 PURPLE with BLUE	

WIRING DIAGRAM
No. W7506
12 VOLT

ISSUED:
MAY 1948

E/152/L

NUMBERS INDICATE CABLE IDENTIFICATION COLOURS, SEE KEY ABOVE
FOR SPECIFICATION OF EQUIPMENT SEE OVERLEAF

Printed in England

JAGUAR 2½ LITRE SALOON AND 3½ LITRE SALOON AND COUPE

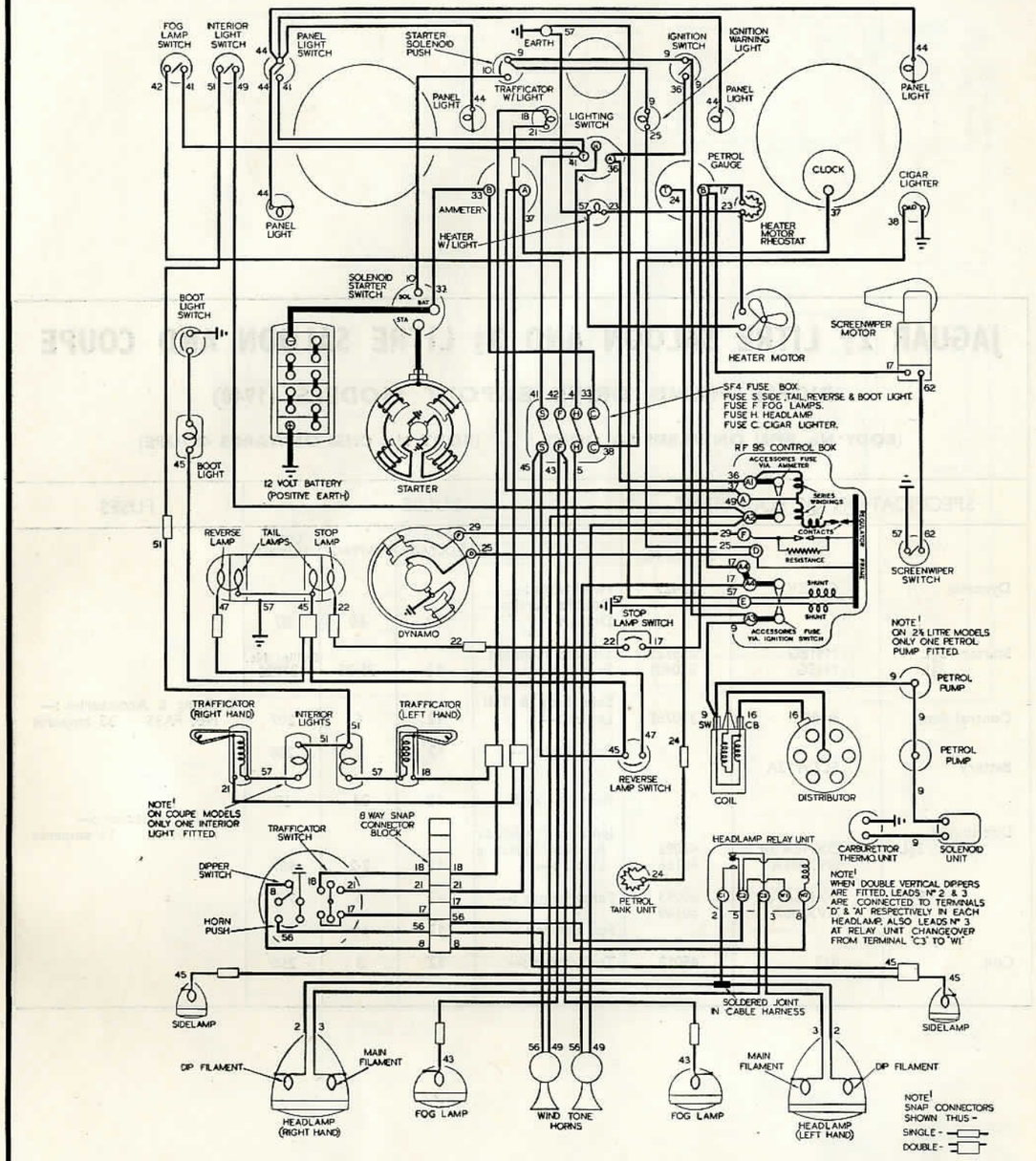
RIGHT HAND DRIVE HOME MODELS (1948)

(BODY No. B9981 ONWARDS SALOON) **(BODY No. C1156 ONWARDS COUPE)**

SPECIFICATION OF EQUIPMENT			BULBS				FUSES
	Model	*Service No.*		VOLTAGE	WATTAGE	LUCAS NUMBER	
Dynamo	C45ZV	22429	Headlamps :—	12	60	60	
Starter 2½L	M418G	255721	Side, Stop & Tail Lamps :—	12	6	207	
3½L	M45G	270401					
			Boot Light :—	12	6	258	Lighting & Accessories :—
Control Box	RF95	37057					No. FA35 35 amperes
			Reverse Lamp :—	12	24	1	
Battery	SLTW13A		Ignition, Trafficator & Heater Warning Lights :—	12	2·4	987	Dipping Reflector :—
							No. FA12 12 amperes
Distributor							
2½L	DXH6A or DVXH6A	40092 40156	Panel Lamps :—	12	6	207	
3½L	DXH6A or DVXH6A	40093 40149	Fog Lamps :—	12	60	87	
Coil	B12	45012	Trafficators :—	12	3	256	

LUCAS
ELECTRICAL EQUIPMENT

JAGUAR 2½ LITRE SALOON & 3½ LITRE SALOON & COUPE
RIGHT HAND DRIVE EXPORT MODELS (1948)
(BODY No. B9981 ONWARDS SALOON)
(BODY No. C1156 ONWARDS COUPE)



KEY TO CABLE COLOURS

1 BLUE	14 WHITE with PURPLE	27 YELLOW with BLUE	40 BROWN with BLACK	53 PURPLE with WHITE
2 BLUE with RED	15 WHITE with BROWN	28 YELLOW with WHITE	41 RED	54 PURPLE with GREEN
3 BLUE with YELLOW	16 WHITE with BLACK	29 YELLOW with GREEN	42 RED with YELLOW	55 PURPLE with BROWN
4 BLUE with WHITE	17 GREEN	30 YELLOW with PURPLE	43 RED with BLUE	56 PURPLE with BLACK
5 BLUE with GREEN	18 GREEN with RED	31 YELLOW with BROWN	44 RED with WHITE	57 BLACK
6 BLUE with PURPLE	19 GREEN with YELLOW	32 YELLOW with BLACK	45 RED with GREEN	58 BLACK with RED
7 BLUE with BROWN	20 GREEN with BLUE	33 BROWN	46 RED with PURPLE	59 BLACK with YELLOW
8 BLUE with BLACK	21 GREEN with WHITE	34 BROWN with RED	47 RED with BROWN	60 BLACK with BLUE
9 WHITE	22 GREEN with PURPLE	35 BROWN with YELLOW	48 RED with BLACK	61 BLACK with WHITE
10 WHITE with RED	23 GREEN with BROWN	36 BROWN with BLUE	49 PURPLE	62 BLACK with GREEN
11 WHITE with YELLOW	24 GREEN with BLACK	37 BROWN with WHITE	50 PURPLE with RED	63 BLACK with PURPLE
12 WHITE with BLUE	25 YELLOW	38 BROWN with GREEN	51 PURPLE with YELLOW	64 BLACK with BROWN
13 WHITE with GREEN	26 YELLOW with RED	39 BROWN with PURPLE	52 PURPLE with BLUE	

WIRING DIAGRAM
No. W75063-
12 VOLT

ISSUED:
MAY 1948

D/654/L

NUMBERS INDICATE CABLE IDENTIFICATION COLOURS, SEE KEY ABOVE
FOR SPECIFICATION OF EQUIPMENT SEE OVERLEAF

Printed in England

JAGUAR 2½ LITRE SALOON AND 3½ LITRE SALOON AND COUPE

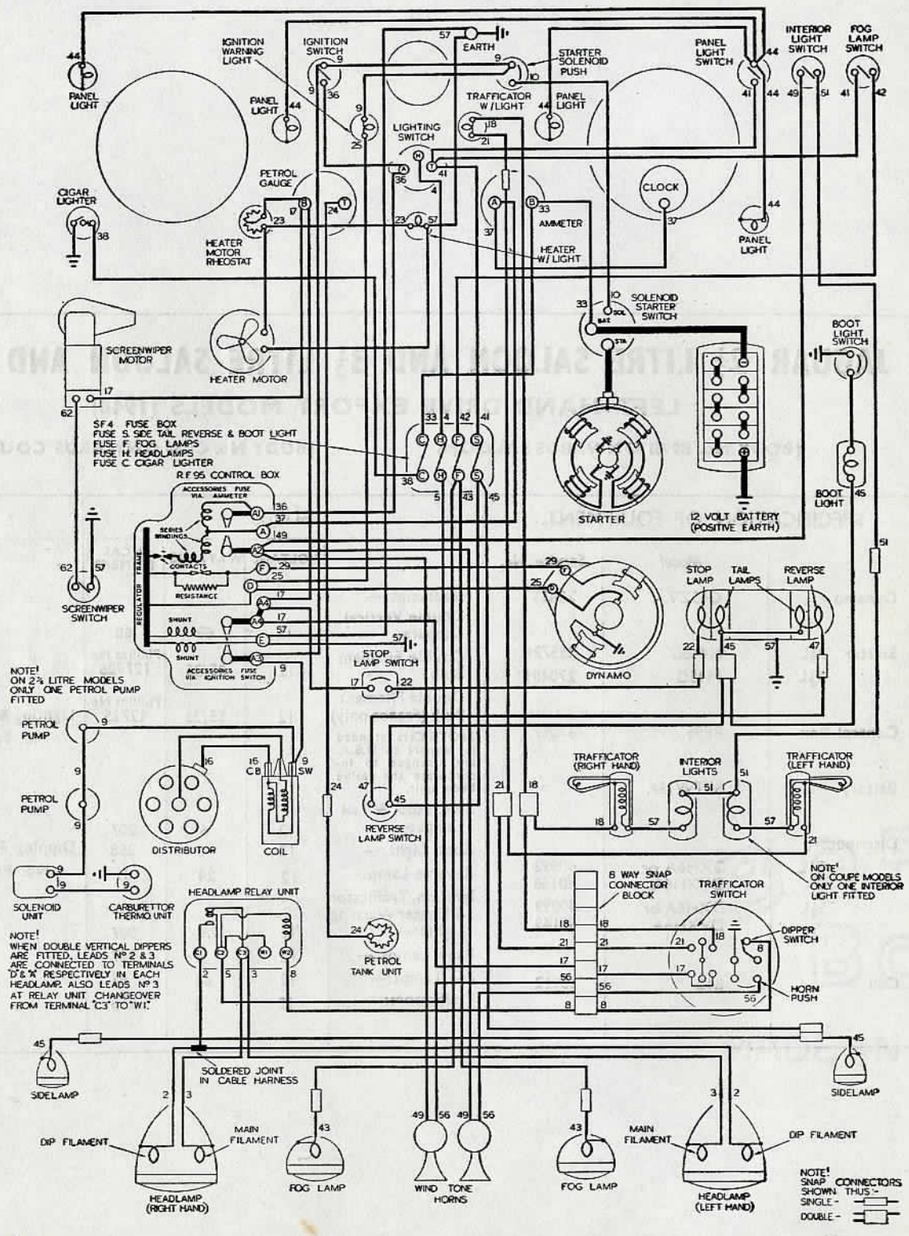
RIGHT HAND DRIVE EXPORT MODELS (1948)

(BODY No. B9981 ONWARDS SALOON) **(BODY No. C1156 ONWARDS COUPE)**

SPECIFICATION OF EQUIPMENT			BULBS				FUSES
	Model	*Service No.*		VOLTAGE	WATTAGE	LUCAS NUMBER	
Dynamo	C45ZV	22429	Headlamps :— Double Vertical Dippers	12	60	87	
Starter 2½L	M418G	255721	Double Filament Bulb	12	35/35	Phillips No. 127926	
3½L	M45G	270401					
Control Box	RF95	37076E	Side, Stop & Tail Lamps :—	12	6	207	Lighting & Accessories :— No. FA35 35 amperes
Battery	SLTW13A		Boot Light :—	12	6	258	
			Reverse Lamp:—	12	36	57	Dipping Reflector :— No. FA12 12 amperes
Distributor 2½L	DXH6A or DVXH6A	40092 40156	Ignition, Trafficator & Heater Warning Lights :—	12	2·2	987	
3½L	DXH6A or DVXH6A	40093 40149	Panel Lamps :—	12	6	207	
			Fog Lamps :—	12	60	87	
Coil	B12	45012	Trafficators :—	12	3	256	

LUCAS
ELECTRICAL EQUIPMENT

JAGUAR 2½ LITRE SALOON & 3½ LITRE SALOON & COU
LEFT HAND DRIVE EXPORT MODELS (1948)
(BODY No. B9981 ONWARDS SALOON)
(BODY No. C1156 ONWARDS COUPE)



KEY TO CABLE COLOURS

1 BLUE	14 WHITE with PURPLE	27 YELLOW with BLUE	40 BROWN with BLACK	53 PURPLE with WHITE
2 BLUE with RED	15 WHITE with BROWN	28 YELLOW with WHITE	41 RED	54 PURPLE with GREEN
3 BLUE with YELLOW	16 WHITE with BLACK	29 YELLOW with GREEN	42 RED with YELLOW	55 PURPLE with BROWN
4 BLUE with WHITE	17 GREEN	30 YELLOW with PURPLE	43 RED with BLUE	56 PURPLE with BLACK
5 BLUE with GREEN	18 GREEN with RED	31 YELLOW with BROWN	44 RED with WHITE	57 BLACK
6 BLUE with PURPLE	19 GREEN with YELLOW	32 YELLOW with BLACK	45 RED with GREEN	58 BLACK with RED
7 BLUE with BROWN	20 GREEN with BLUE	33 BROWN	46 RED with PURPLE	59 BLACK with YELLOW
8 BLUE with BLACK	21 GREEN with WHITE	34 BROWN with RED	47 RED with BROWN	60 BLACK with BLUE
9 WHITE	22 GREEN with PURPLE	35 BROWN with YELLOW	48 RED with BLACK	61 BLACK with WHITE
10 WHITE with RED	23 GREEN with BROWN	36 BROWN with BLUE	49 PURPLE	62 BLACK with GREEN
11 WHITE with YELLOW	24 GREEN with BLACK	37 BROWN with WHITE	50 PURPLE with RED	63 BLACK with PURPLE
12 WHITE with BLUE	25 YELLOW	38 BROWN with GREEN	51 PURPLE with YELLOW	64 BLACK with BROWN
13 WHITE with GREEN	26 YELLOW with RED	39 BROWN with PURPLE	52 PURPLE with BLUE	

WIRING DIAGRAM

No. W74980

12 VOLT.

ISSUED:
MAY 1948

NUMBERS INDICATE CABLE IDENTIFICATION COLOURS, SEE KEY ABOVE.

FOR SPECIFICATION OF EQUIPMENT SEE OVERLEAF.

JAGUAR 2½ LITRE SALOON AND 3½ LITRE SALOON AND COUPE

LEFT HAND DRIVE EXPORT MODELS (1948)

(BODY No. B9981 ONWARDS SALOON) (BODY No. C1156 ONWARDS COUPE)

SPECIFICATION OF EQUIPMENT.

	Model	Service No.
Dynamo	C45ZV	22429
Starter 2½L	M418G	255721
3½L	M45G	270401
Control Box	RF95	37057
Battery	SLTW13A	
Distributor		
2½L	DXH6A or DVXH6A	40092 40156
3½L	DXH6A or DVXH6A	40093 40149
Coil	B12	45012

BULBS

	VOLTAGE	WATTAGE	LUCAS NUMBER
Headlamps:—			
Double Vertical Dippers	12	60	60
Double Filament Bulb	12	35/35	Phillips No. 127926
Double Filament Bulb (France only)	12	35/35	Phillips No. 12725
NOTE Cars intended for export to U.S.A. are arranged to incorporate the sealed beam unit.			
Side, Stop, & Tail Lamps:—	12	6	207
Boot Light:—	12	6	258
Reverse Lamp:—	12	24	1
Ignition, Trafficator & Heater Warning Lights:—	12	2.4	987
Panel Lamps:—	12	6	207
Fog Lamps:—	12	60	87
Trafficators:—	12	3	256

FUSES

Lighting & Accessories:—
No. FA35 35 amperes

Dipping Reflectors:—
No. FA12 12 amperes

Printed in England by Adams Bros. & Shardlow Ltd., Leicester