

MOTOR TRADER Service Data No. 220

MORRIS MINOR (SERIES II)

Manufacturers : Morris Motors, Ltd., Cowley, Oxford.

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THIS version of the smallest of the current Morris range of vehicles now in production results from standardization following the merging of the Austin and Nuffield groups. Originally the Minor was introduced in 1950 and powered by a four cylinder sidevalve engine, whereas the present model has the standardized B.M.C. engine, clutch and gearbox unit.

Various modifications have been made since introduction and a list of the major ones is to be found in the table of engineering changes. Important among these is redesign of the swivel pin assembly, which is now manufactured fitted with a bush, thrust washer and sealing ring all of which are renewable. This modification is standard production from the chassis number given onwards, and chassis prior to this may be similarly fitted with these parts when overhaul becomes necessary. The new "A" type rear axle described herein is now standard on production models of Series II, but some cars will have been produced with former type semi-floating hypoid axle and for dismantling and overhaul procedure of this unit see Trader Service Data No. 167.

On the date of publication the 1955 model is announced, which is mechanically similar to the early models, but has a restyled radiator grille and instrument panel, details of which appear on this page.

Identification is by car, model, and engine numbers which are stamped on identification plates. One of these, carrying car and model number, is fixed on the off side of the dash panel beneath the bonnet. Engine number is stamped on a disc attached to cylinder block casting.

Screwed components are being manufactured with Unified screw threads and nuts in increasing numbers and the general standardization classification scheme facilitates identification. It should be noted that nuts, bolts and screws, etc., marked as such are not interchangeable with B.S.F. or Whitworth threaded units, although for all practical purposes the U.N.F. thread is interchangeable with the A.N.F. thread. In cases of doubt care should be taken to see that screwed components are assembled as they were dismantled.

Special tools listed in these pages are designed to speed up operations of overhaul and many of these tools will be found to suit other vehicles in the range. Similarity of use to which these tools can be put on other vehicles is clearly marked in the tabular information.



Left is the 1955 model announced on day of publication, distinguishable from the earlier model (right) with vertically-slotted grille. Two-door and four-door saloons, and a tourer, all basically similar in conception, are produced

ENGINE

Mounting

At front, bonded rubber blocks bolted to lugs on front engine plate and to brackets on body extensions. At rear, gearbox extension housing passes through inverted U-shaped rubber block, located by flange on housing. Block fits into shaped channel in propeller shaft tunnel integral with body floor. Strap with retainer bolted across bottom holds mounting up in position. All bolts should be tightened fully.

Removal

Engine may be withdrawn with or without gearbox but radiator and grille must be removed in either case. Secure bonnet in fully open position, drain coolant and disconnect all pipes, wires and controls including heater connections if fitted. Remove carburetter and air cleaner. Remove four setbolts and spring washers fixing radiator to grille and lift out radiator and also grille surround attached to wings and frame (3 2BA nuts beneath wing). Disconnect and withdraw clutch operating rod and speedo cable end from gearbox, detach rear of propeller shaft. Uncouple engine steady cable and cylinder head steady on later models. Take weight of engine on sling, supporting lifting brackets on rocker cover, and remove front mounting brackets with rubber blocks and take off rear mounting retainer and strap. Remove

front carpet and felt, also gearbox cover plate and three set-bolts securing gear lever and take out lever. Lower rear of power unit and detach cross-members; unit may then be raised and manoeuvred forward clear of car.

Crankshaft

Three main bearings, thin wall steel-backed, white metal-lined located by tabs. End float controlled by split thrust washers recessed either side of centre main bearing and retained by tabs in cap. Fit with oil grooves to crankshaft, no hand fitting permissible.

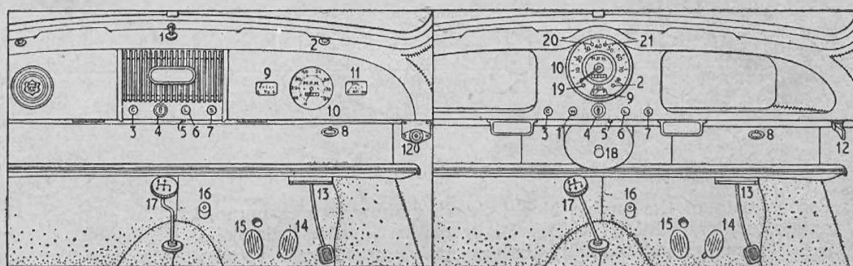
Main bearings cannot be changed with engine in place, as rear cap cannot be detached without removal of rear engine plate, but thrust washers can be renewed. Oil intake strainer and suction tube assembly (union screwed into bottom face of crankcase) must be removed completely before centre bearing cap can be removed.

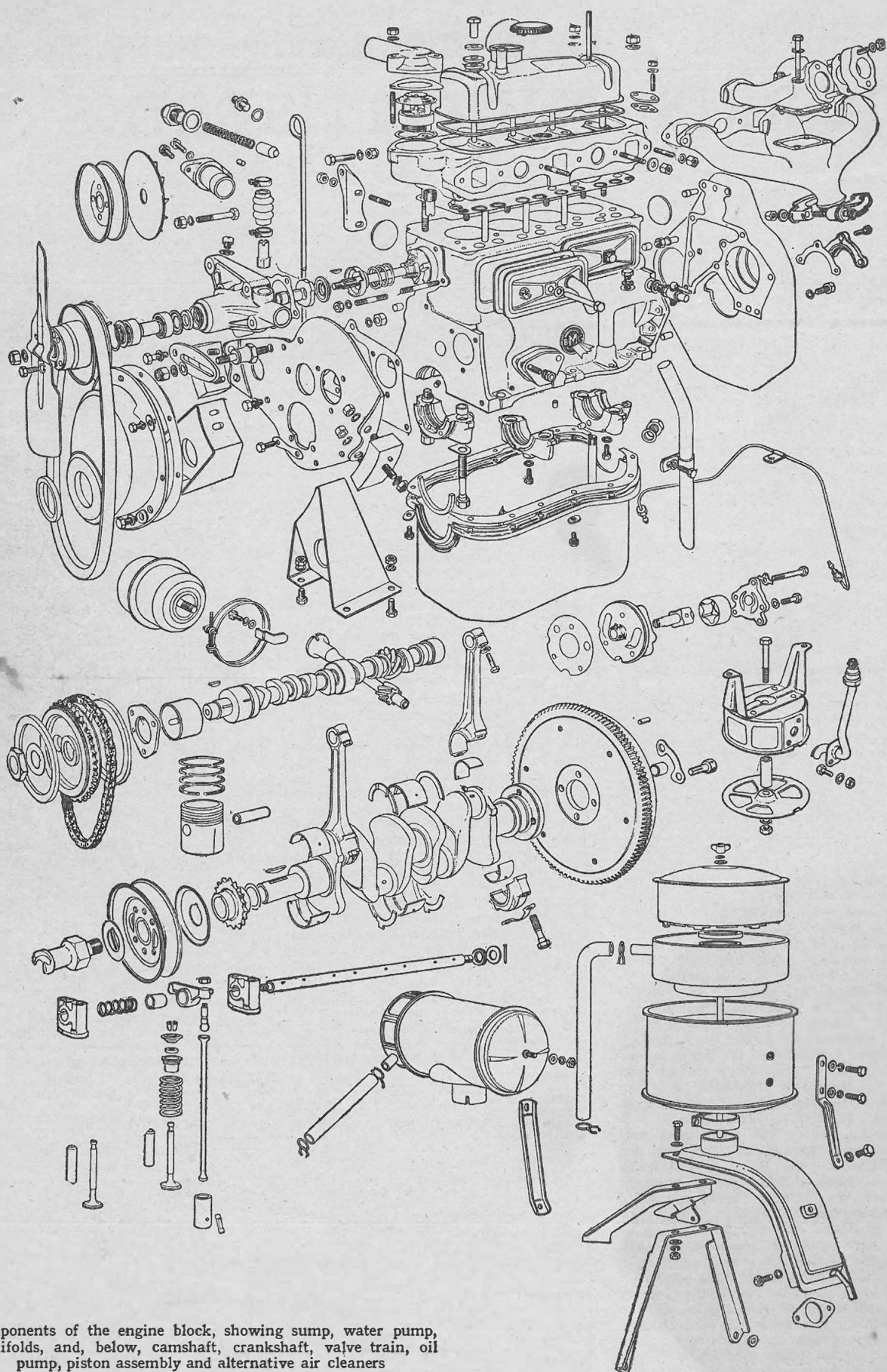
Flywheel, with shrunk-on starter ring gear, spigoted on rear flange of crankshaft and retained by four equally spaced setscrews. Oil-impregnated spigot bearing bush pressed into end of shaft.

Timing sprocket and pulley hub, with oil thrower between, pressed on front end of crankshaft, sharing special flat Woodruff key, and retained by hand starter dog setscrew. Sprocket fits with longer boss to rear, with shims behind for alignment. Pulley hub passes through felt sealing ring in timing cover. Tighten starter dog setscrew until, with crankshaft at T.D.C. 1 & 4, jaws are at "20 past 10."

INSTRUMENTS AND CONTROLS (Earlier models, left, latest model, right)

- | | | |
|---------------------------------|--|---|
| 1. Screenwiper switch. | centre of bonnet opening to be pushed down.) | 15. Clutch pedal. |
| 2. Ignition warning light. | 9. Fuel gauge. | 16. Dipper switch. |
| 3. Mixture control. | 10. Speedometer | 17. Gear lever, showing gear positions. |
| 4. Ignition switch. | 11. Oil pressure gauge. | 18. Heater control. |
| 5. Panel light switch. | 12. Trafficator switch. | 19. Oil pressure warning light. |
| 6. Lighting switch. | 13. Accelerator. | 20. Flasher warning light. |
| 7. Starter switch. | 14. Brake pedal. | 21. Main beam warning light. |
| 8. Bonnet lock (safety catch in | | |





Components of the engine block, showing sump, water pump, manifolds, and, below, camshaft, crankshaft, valve train, oil pump, piston assembly and alternative air cleaners

ENGINEERING CHANGES	
CHASSIS	Chassis No. Home and Export
8x43 rear axle introduced replacing 7x37 axle ...	170883
Crown wheel bolts increased to 3/4 in dia Wheel bolts with larger hexagon (.705in/.710in) introduced ...	182745
Improved relay shaft for clutch introduced (R.H.D. only) ...	184472
Rubber boots introduced on steering ball joints* ...	184760
1/2 in dia clutch rod fitted ...	198690
Suppressors introduced on ignition wiring ...	205839
Larger glass channels and rubbers introduced to improve seal ...	205850
Modified exhaust assembly introduced ...	210866
Slung roof lining introduced ...	220001
Modified rear springs introduced	216484
Introduction of "Basic" and "De Luxe" models ...	221803
Introduction of wheel studs and nuts in lieu of bolts ...	228267
Modified swivel pin assemblies ...	228267
Improved shock absorbers fitted	240671
Engine steady cable introduced	264013
* Approx. 23/3/53	
ENGINE	Engine No.
Modified oil pump drive ...	693
Introduction of modified carburettor and manifold distance-piece ...	926
Introduction of gudgeon pin clamping screw with larger head ...	926
Oil release valve spring modified to give lower pressure ...	926
Timing arrow and timing mark on pulley introduced ...	4025
Chamfered compression ring introduced in 2nd ring groove ...	1859
Improved water pump pulley introduced	12684
New flywheel starter ring mounting ...	29644
Gearbox rear dust cover discontinued	Gearbox 6363
Introduction of distributor with high lift cam ...	45023
Spark plug gap modified to .020in-.022in	56578
Speedo cable with 3/4 in x 26 T.P.I. at gearbox introduced ...	58088
Dustproof carburettor introduced	61601
Modified 1st and 2nd speed synchromesh fitted ...	Gearbox 9176
"Super Seal" introduced in water pump ...	72610
Modified clutch drive plate introduced ...	83161
Burman oil pump introduced as alternative to Hobourn-Eaton ...	83314
New locking plates for rocker shaft introduced ...	88347
Modified flywheel dowels introduced ...	93798
SPECIAL TOOLS	
ENGINE:	Part No.
Crankshaft gear and pulley replacer and front cover locator	GT 138
Valve rocker bush remover and replacer	GT 148
Valve seat cutter set in box	301075*
Valve grinder (suction) ...	66893
TRANSMISSION:	
Front and rear hub drawer (Universal) BSF ...	A.J.A. 5019†
(superseded)	68822*
Front and rear bush drawer (conversion to UNF) ...	A.J.A. 5022
(superseded)	301209*
Axle shaft drawer (BSF) (1st type axle only) ...	68823‡
Axle shaft drawer (UNF) (1st type axle only) ...	301203*
Rear axle pinion inner race fitting and withdrawal tool ...	301224*
Clutch plate aligning tool ...	GT 139
Universal clutch gauge plate	A.J.A. 5010
Rear axle pinion positioning fixture (with mandrel) (1st axle only) ...	39879
Rear axle pinion positioning fixture (standardized "A" axle only) ...	A.J.A. 4004
Axle pre-load check tool ...	68839
Pinion outer race withdrawal tool	301587
Dummy layshaft ...	GT 141
Synchromesh assembly ring ...	GT 144
* Also fit Morris Six.	
† Use with A.J.A. 5022, 2 UNF.	
A.J.A. 5025 1/2 BSF.	
A.J.A. 5033 1/2 UNF.	
‡ Early type only.	

Rear main bearing cap forms lower half of oil collector trough round return thread on shaft. Upper half detachable, retained by three setscrews. If detached, upper half must be refitted so that it butts on cap after cap has been tightened fully.

Connecting Rods

Big ends thin wall, steel-backed, white metal-lined shells, located by tabs. No hand fitting permissible. Rods split diagonally, cap and rod stamped on same side.

Big ends are offset. Fit Nos. 1 and 3 with larger boss to rear, 2 to 4 to front. Oil bleed hole on longer side of big end must go to off side, away from camshaft.

Gudgeon pins cotter-clamped in small ends, clamp towards camshaft.

Pistons

Aluminium alloy, T-slot, anodized, with dished crown.

Pistons are supplied in five size gradings for selective assembly, rising in .0003in steps. Grade numbers 1 to 5 stamped in diamond with "front" on piston crown. Grade number must correspond with number stamped on top of cylinder block alongside bore.

Top compression ring plain, second ring has taper face and must be fitted with side marked "TOP" upwards. On some engines parallel second rings were fitted. These should be replaced by taper rings.

Big ends will pass through bores, but pistons will not pass crank throws. Remove and assemble through top.

Camshaft

Single roller endless chain drive. Camshaft sprocket, with synthetic rubber tensioner rings (renewable) in grooves on either side of teeth, spigoted on camshaft, keyed with Woodruff key and retained by nut. No alternative fitting for valve timing. Sprockets must be removed and assembled together.

Camshaft runs in three bearings in crankcase. Front bearing has white metal-lined steel bush, pressed in. Others direct. End float controlled by thrust plate trapped between sprocket and shoulder on shaft, and bolted to front face of crankcase.

Dot punched timing marks on sprockets must be together when chain is fitted, with No. 1 piston at T.D.C. on compression stroke.

Valves

Overhead, not interchangeable. Inlet larger than exhaust. Split cone cotter fixing, single springs. Cotter retained by spring clips. Rubber sealing rings with retainers on valve stems below collars.

Valve guides plain, no shoulder, non-interchangeable. Inlet guides are longer, exhaust guides counter-bored at bottom and countersunk at top. Press in both types until they project 1/8 in from spot face of spring seat.

ENGINE DATA			
No. of cylinders ...	...	...	4
Bore x stroke: mm ...	...	...	58 x 78
...	...	...	2.28 x 3.0in
Capacity: c.c. in ...	...	...	800
...	...	...	49
R.A.C. rated h.p. ...	...	...	7.75
Max. b.h.p. at r.p.m. ...	...	...	30 at 4,800
Max torque at r.p.m. ...	...	...	40lb/ft at 2,200
Compression ratio ...	...	...	7.2:1
CRANKSHAFT AND CON. RODS			
Diameter ...	Main Bearings 1.7505in	Crankpins 1.4379in	
Length ...	1.395in	1.068in	
Running clearance: main bearings ...	...	...	.001-.002in
big ends ...	...	...	.0006in-.0016in
End float: main bearings ...	...	...	.002in
big ends ...	...	...	.008in
Undersizes: main ...	...	...	.020-.040in
big ends ...	...	...	.020-.040in
Con. rod centres ...	...	...	5.75in
No. of teeth on starter ring gear/pinion ...	...	...	104/9
PISTONS AND RINGS			
Clearance (skirt): top ...	...	...	.0021-.0039in
bottom ...	...	...	.0006-.0024in
Oversizes ...	...	...	.010-.020-.030-.040in
Weight without rings or pin ...	...	...	5 oz 12 dr ± 2 dr
Gudgeon pin: diameter ...	...	...	.562in
fit in piston ...	...	...	Floating
fit in con. rod ...	...	...	cotter clamped
Compression height ...	...	...	1.416-1.421in
		Compression	Oil Control
No. of rings ...	...	3	1
Gap ...	...	.006-.011in	.006-.011in
Side clearance in grooves ...	...	.0015-.0035in	.0015-.0035in
Width of rings ...	...	.069-.070in	.124in
CAMSHAFT			
No. of bearings ...	...	...	3
Bearing journal: diameter ...	...	...	1.652in
length ...	...	...	1 1/2 in
Bearing clearance ...	...	...	Front: .001in-.002in
	...	...	Centre and rear: .0012-.0027in
End float ...	...	...	Nil
Timing chain: pitch ...	...	...	2 1/2 in
No. of links ...	...	...	82
VALVES			
		Inlet	Exhaust
Head diameter ...	...	1.093-1.098in	1.000-1.005in
Stem diameter ...	...	.2793-.2798in	.2793-.2798in
Face-angle ...	...	45°	45°
Spring length: free ...	...	...	1 1/2 in
fitted ...	...	...	1 19/64in
at load ...	...	...	37 1/2 lb ± 2 lb

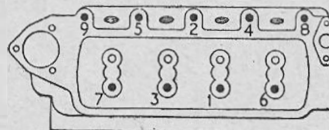


Diagram showing order of tightening of cylinder head nuts (see "Nut Tightening Torque Data")

BALL AND ROLLER BEARING DATA				
	Part No.	Int. dia. x	Ext. dia.	Type
*Front hubs, inner ...	127925	1 1/2 in	2 in	SR Radial
*Front hubs, outer ...	139289	1 1/2 in	1 7/8 in	SR Radial
*Cons. mesh pinion ...	X15625	1 in	2 1/2 in	SR Radial w. Groove
Mainshaft rear ...	X15625	1 in	2 1/2 in	SR Radial w. Groove
Mainshaft extension ...	QA11033	25mm	52mm	SR Radial
Bevel pinion front ...	100478	1 in	2 1/2 in	Taper roller
Bevel pinion rear ...	100418	1 in	2 1/2 in	Taper roller
Differential ...	101608	35mm	72mm	SR Radial
Rear hubs ...	101434	1 1/2 in	2 1/2 in	SR Radial
*Car No. 228267 onwards				
Front hubs, inner ...	2A4147	1 1/2 in	2 in	Controlled width
Front hubs, outer ...	2A4148	1 1/2 in	1 7/8 in	Controlled width

Tappet and Rockers

Plain barrel tappets sliding directly in crankcase. Access through opening in side.

Bushed rockers, all interchangeable, on shaft carried in four pillars. Shaft located by grubscrew in No. 1 pillar, which is drilled for oil feed through drillings in head and cylinder block. Pair of rockers for each cylinder located on either side of pillar, separating springs between rockers of adjacent cylinders.

Push rods can be removed singly after adjustment has been slackened right off. Inner rockers can be pulled aside against separating springs, but end rockers must be taken off after removal of split pin, plain washer and double coil spring washer.

Lubrication

Hobourn-Eaton eccentric rotor pump spigoted in recess in rear face of cylinder block and driven by pin and slotted shaft from rear end of camshaft. Some engines fitted with Burman pump; pumps not interchangeable without changing retaining studs.

Engine must be removed from car for removal of pump. Cylindrical gauze intake strainer in sump, carried on bracket between centre and rear main bearing caps and flange-bolted to suction pipe, upper end of which is retained by union nut screwed into bottom face of crankcase.

Oil delivered through drillings to gallery on off side of crankcase, and to bypass filter (Purolator type MF6100, AC type SA) screwed into crankcase and retained by clamp.

Non-adjustable spring-loaded plunger relief valve on off side of crankcase below distributor. Remove distributor for access.

Cooling System

Pump and fan. Non-adjustable thermostat in water outlet port on cylinder head. Pump has spring-loaded carbon and rubber seal.

Adjust fan belt by swinging dynamo until there is 1 in movement either way on vertical run of belt.

TRANSMISSION

Clutch

Borg & Beck single dry plate. Sintered carbon thrust release bearing.

Only external adjustment is on front end of pedal pull rod, to give $\frac{3}{4}$ in free movement at pedal pad.

Access to clutch for service after removal of gearbox.

Gearbox

Four speed. Synchromesh on 2nd, 3rd and top gears. Central lever. Propeller shaft sliding joint on mainshaft.

To remove gearbox, remove distributor cap, disconnect exhaust pipe and heater connections (if fitted) to allow engine to drop (detach heater tap from rear of cylinder head). Remove gear lever (three setscrews in bell-housing cover). Raise rear of car on axle stands. Disconnect speedo drive, clutch link and cross-shaft, and rear end of propeller shaft (also engine steadies on later models). Support rear of sump on jack, and detach rear mounting strap. Lower engine until gearbox can be drawn straight back, and take out bell-housing flange bolts and setscrews (including starter bolts).

To dismantle gearbox, remove clutch operating fork and release bearing. Detach front cover, noting shims in bearing location. Extract speedo drive pinion and remove rear extension housing, noting shims in bearing location. Detach side cover and pick out 1st/2nd and 3rd/top selector springs and plungers. Take out plug nearest front in bottom of box retaining reverse selector spring and plunger. Take out selector fork

setscrews, and draw rods out one at a time, catching interlock plunger and balls recessed in walls of box. Lift out forks.

Drive out layshaft spindle either way, allowing cluster to fall to bottom of box. Draw out primary shaft with spigot bush and ball bearing, drifting from inside if necessary. Tap out mainshaft assembly to rear with ball bearing and housing (spigoted in rear of box). Take out reverse spindle locking setscrew and drive spindle out to rear. Lift out bushed idler gear and layshaft cluster with thrust washers.

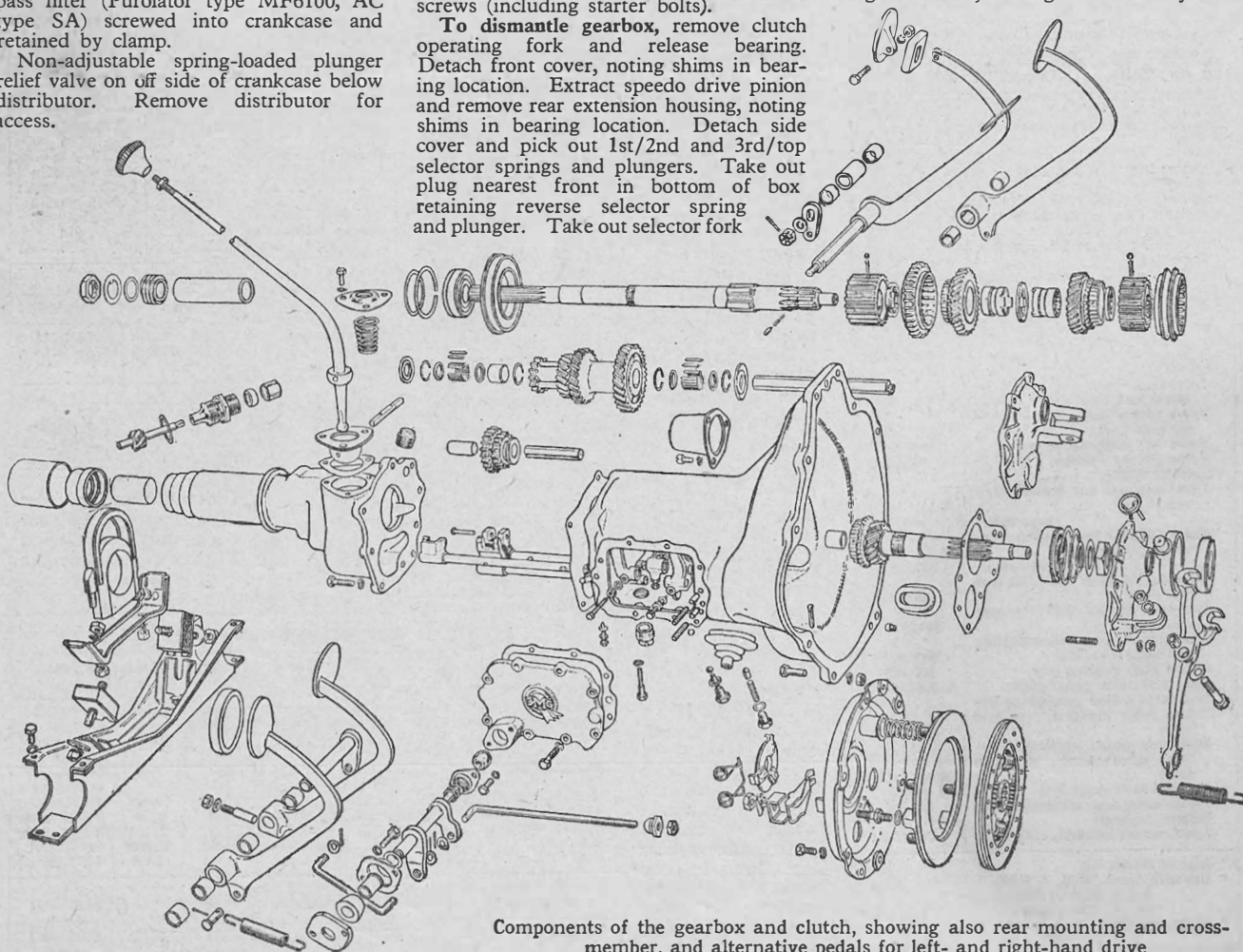
Layshaft cluster runs on needle rollers retained in bore by L-section retaining rings and spring rings. Rollers will not drop out.

To dismantle mainshaft assembly, slide off top/3rd gear synchro assembly. Depress plunger locating splined thrust washer inside 3rd gear cone, turn washer and slide off, releasing 3rd and 2nd gears with bushes, thrust washer between, splined thrust washer behind 2nd gear, and 2nd synchro assembly with sliding 1st gear. Undo shaft nut, releasing speedo drive gear and long distance-piece. Press shaft out of ball bearing and bearing out of housing.

Primary shaft ball bearing (same as mainshaft bearing) retained on shaft by nut with right-hand thread.

To reassemble gearbox, reverse dismantling procedure, noting following points:—

Layshaft cluster: Push inner spring rings into bore, making sure that they bed



Components of the gearbox and clutch, showing also rear mounting and cross-member, and alternative pedals for left- and right-hand drive

securely, insert short distance-piece in rear end, then insert inner retainer and feed 20 rollers into each end, using lay-shaft spindle as guide. Fit outer retainers and spring rings. Lower cluster into gearbox with large front and small rear thrust washers, and locate with thin rod so that large gear is clear of primary shaft when it is entered. Thrust washers available in thicknesses of .123-.124in, .1255-.1265in, .1275-.1285in and .130-.131in to take up end float.

Mainshaft: Press on ball bearing in housing (spring ring and flange on housing to rear), and fit distance-piece, speedo drive gear and nut.

Slide on 2nd gear synchro assembly with sliding 1st gear (three locating balls and springs are all on one side), followed by large splined thrust washer, 2nd gear and bush (plain bore) with dogs to front. Locate centre thrust washer on dogs of bush, and slide on 3rd gear bush (splined bore) so that dogs locate in spaces in centre washer. Insert spring and plunger in shaft, and fit 3rd gear and splined thrust washer. Depress plunger through hole in 3rd gear cone and turn washer to lock. Slide on top/3rd synchro assembly, which has three balls and springs equally spaced.

When inserting selector rods, note that two interlock balls fit in cross-drillings, one between top/3rd and reverse, one between 1st/2nd and reverse, just behind selector locating springs and plungers. Short plunger, rounded at both ends, fits in cross-drilling between top/3rd and 1st/2nd rods in rear wall of box.

When fitting front cover and rear extension housing, refit shims as found in bearing locations. These shims need changing only if new cover or housing is fitted, in which depth of bearing location varies. Shims are available in three thicknesses, .004in, .006in, and .010in.

Rear extension housing bushed for propeller shaft sliding sleeve yoke, with oil seal at rear forming assembly with dust cover fitting over end of housing. To renew seal, drift off dust cover after weakening lips of three indentations with hacksaw (later models have no dust cover). Seal assembly retained in same way can be drifted straight off. Both seal and dust cover are scrapped after removal. Secure new seal by pinching into groove in three places, making sure that it is held true while being clinched.

Propeller Shaft

Hardy Spicer needle roller bearing universal joints, series 0500. Nipples for lubrication of joints. Sliding joint, yoke integral with sleeve, on gearbox mainshaft.

Rear Axle

Three quarter floating hypoid bevel, banjo type, rear cover welded to casing. Apart from attention to hubs and half shafts, axle cannot be overhauled without use of full range of tools listed. Replacement axles are available as units and should be used when possible.

To remove axle raise rear of car, remove roadwheels, release hand brake and disconnect brake hose at union on underside of car floor.

Remove brake cable housings at anchorages on spring brackets, disconnecting cables and taking out clevis pins securing yokes to actuating levers on back plates of brake drums. Support axle on stand or trolley jack, unscrew U bolt nuts and lock-nuts, remove spring clamp and damper bracket plates. Release and remove

damper arms from body. Mark propeller shaft coupling flanges and disconnect shaft from driving flange, supporting rear end of shaft. Remove rear shackle nuts and plates and lower rear ends of springs to the ground. Withdraw axle from car. Refitting is reverse of above process, but it will be necessary to bleed brakes. Connect brake cables before releasing weight of axle as cable tightens when weight is off springs.

Half-shafts (interchangeable) upset at outer ends to form flanges which register on wheel studs on hub flanges. Hubs run on ball bearings retained on axle tube ends by nuts with tab-washers. Lipped oil seal in hub behind bearing (lip to bearing). If shaft is withdrawn, note paper gasket behind flange.

Bevel pinion shaft runs in taper roller bearings. Outer races pressed into final drive housing. Distance-piece between inner races, which are nipped up by driving flange nut. Shims between distance-piece and front bearing (.003in and .005in available) regulate preload on bearings, which should give 8-10 lb/in drag (plus 3 lb/in if oil seal is in position) when driving flange nut is tightened to 150 lb/ft. Adjustment for pinion mesh by distance piece.

Crown wheel spigoted on one-piece differential cage and retained by six setscrews. Differential side bevel gears run directly in cage, planet pinions have spherical washers.

Differential assembly carried in semi-thrust ball bearings in split housings. Thrust side of bearings must face outwards. Shims between differential cage and inner races of bearings for mesh adjustment. Adjust so that the crown wheel is just free without play, and backlash is as etched on rear face of crown wheel, then add .002in shims to each side bearing to give .004in preload. Differential assembly should then be light push fit in housing.

CHASSIS

Brakes

Lockheed hydraulic. Two leading shoe front brakes with separate cylinder to each shoe. Rear brakes have single floating cylinder incorporating bell-crank for hand-brake operation through separate cables in conduits to lever lying horizontally between steers.

Micram adjuster on each wheel cylinder, with slotted head reached through holes in drum and wheel. Turn adjuster clockwise until shoe touches drum, then back off one notch. Note two adjusters on each front wheel.

Handbrake cables have adjusting nuts at base of hand lever, but these should never be touched unless cables have stretched severely. Brake shoes must be adjusted before cables are taken up. Make sure that cable nuts are properly bedded on trunnions after adjustment.

Rear Springs

Semi-elliptic. Loose rubber shackle and anchorage bushes (all interchangeable). Shackle pins and anchorage bolts shouldered, tighten fully. Anchorage bolts have heads drilled for peg spanner, and are inserted from inner side of bracket. *Shackle pins and anchorage bolts must be tightened with car in static laden position.*

Front Suspension

Independent torsion bar, shock absorber controlled. Suspension on the Series II Minor is identical with that employed on

CHASSIS DATA			
CLUTCH			
Make ... ..	...	Borg & Beck	6 $\frac{1}{2}$ in. s.d.p.
Type ... ..	...	6	Blue
Springs: no. ... ..	...	1.58in	4
colour ... ..	...	Black	
Centre springs: no. ... ..	...	.130-.120in	6.28-6.22in
colour ... ..	...	4.26-4.25in	
Lining: thickness ... ..	...	
dia. ext. ... ..	...	
dia. int. ... ..	...	
GEARBOX			
Type ... ..	...	Synchromesh	
No. of speeds ... ..	...	4	
Final ratios:		7/37 axle	8/43 axle
1st ... ..	...	21.618	21.985
2nd ... ..	...	13.69	13.909
3rd ... ..	...	8.88	9.029
4th ... ..	...	5.286	5.375
Rev. ... ..	...	27.38	27.81
PROPELLER SHAFT			
Make ... ..	...	Hardy Spicer	
Type ... ..	...	Needle roller U.J.	
FINAL DRIVE			
Type ... ..	...	Hypoid $\frac{1}{2}$ -floating	
Crownwheel/bevel pinion teeth		7/37 or 8/43	
BRAKES			
Type ... ..	...	Lockheed hydraulic	
Drum diameter ... ..	...	7in	
Lining: length ... ..	...	6.54in	
width ... ..	...	1.22in	
thickness ... ..	...	1.98in	
No. of rivets per shoe ... ..	...	10	
SPRINGS			
Length (eye centres, laden) ... ..	...	Rear	44in
Width ... ..	...	1 $\frac{1}{2}$ in	
Thickness ... ..	...	7in	
No. of leaves ... ..	...	5 $\frac{1}{2}$	
Free camber (length) ... ..	...	3.5in	
Loaded camber (length) ... ..	...	.28in neg	
SHOCK ABSORBERS			
Make ... ..	...	Armstrong	
Type ... ..	...	double acting piston	
Service ... ..	...	Top up	
STEERING BOX			
Make ... ..	...	Morris	
Type ... ..	...	Rack and pinion	
Adjustments: pinion end float ... ..	...	thrust washer	
rack end float ... ..	...	shims on dampers	
mesh ... ..	...	shims on dampers	
FRONT-END SERVICE DATA			
Castor ... ..	...	3°	
Camber ... ..	...	N:1	
King pin inclination ... ..	...	8 $\frac{1}{2}$ °	
Toe-in ... ..	...	3/32in	
No. of turns lock to lock ... ..	...	2 $\frac{1}{2}$	
Adjustments: castor ... ..	...	screwed pivot	
camber ... ..	...	
toe-in ... ..	...	screwed tie rod ends	

earlier model and readers are referred to *Trader Service Data* 167 for full details of overhaul and dismantling. Data tables of steering geometry are listed in these pages.

Steering Gear

Rack and pinion. Inner ends of short track rods attached to ends of rack by ball joints covered by concertina gaiters and lubricated from steering gear.

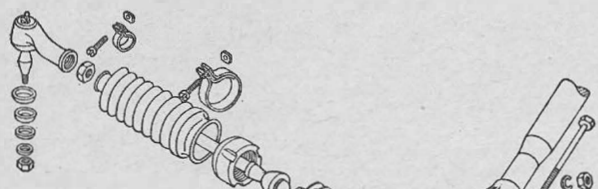
Shock Absorbers

Front and rear: Armstrong DAS8, double-acting piston-type hydraulic. No adjustment.

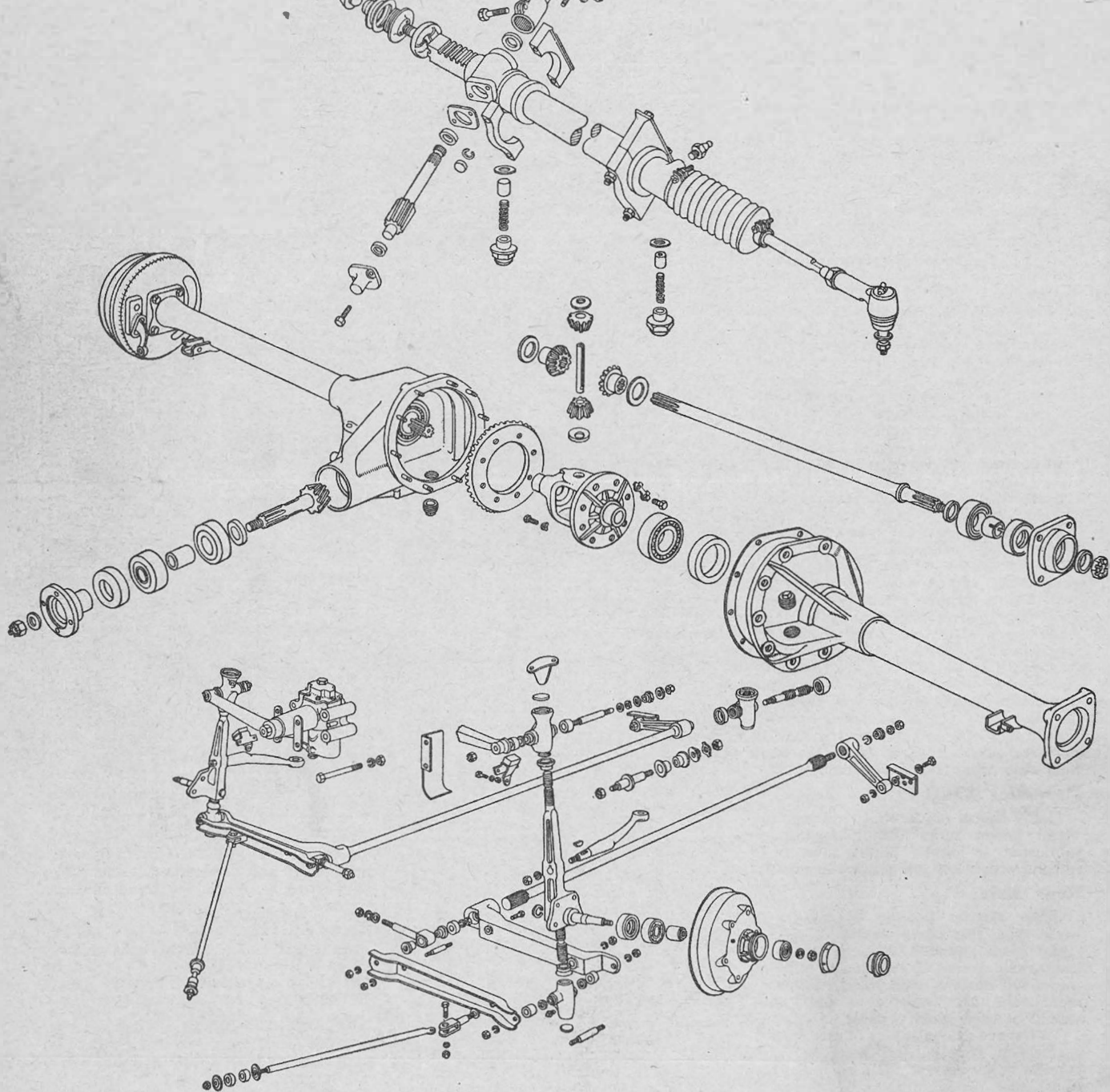
Front shock absorbers can be topped up in place after cleaning, but rear *must* be removed.

Trailer Attachment

No provision made for towing, as bumper bracket mountings are not designed for additional loads, and cannot easily be modified.

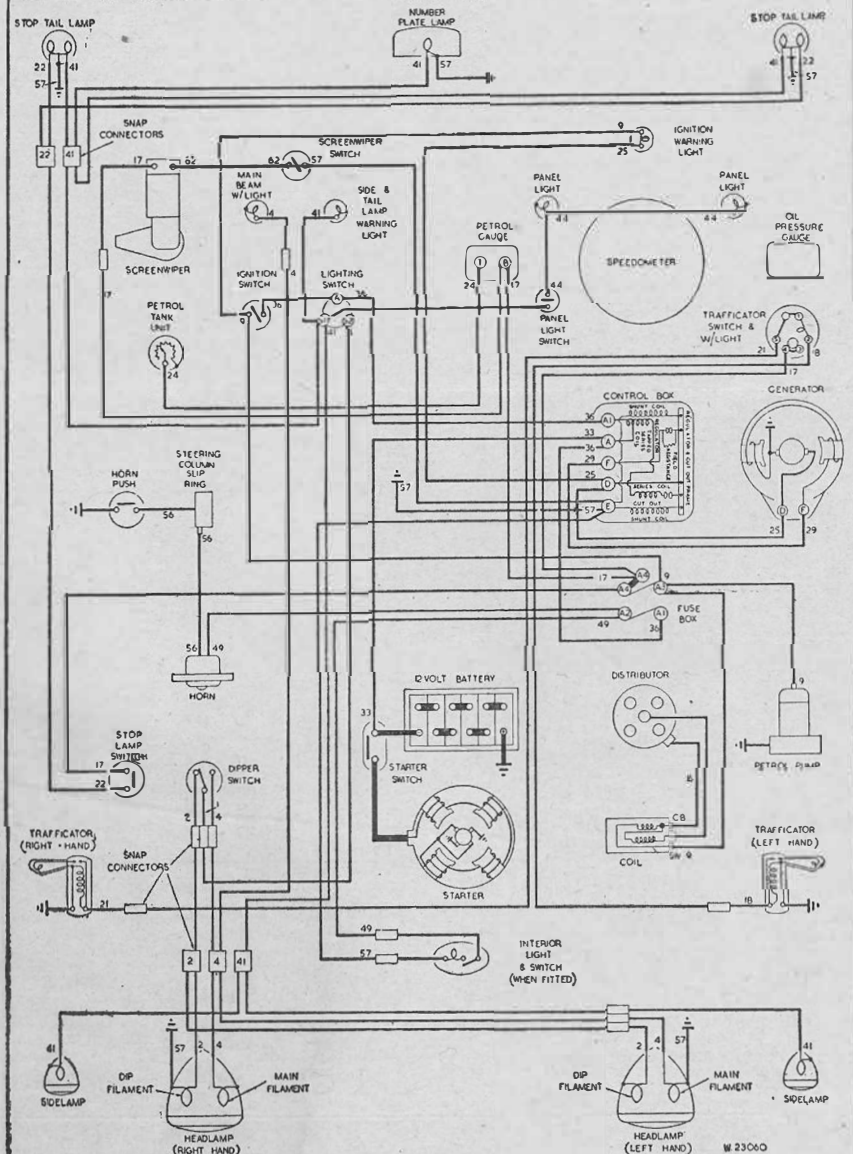


Below : Components of the steering gear. Note secondary damper which can be fitted at support end of rack to eliminate rattle on worn units. Centre : Rear axle, showing components of the differential and half-shaft mounting. The later standardised "A" type axle is similar but makes use of a banjo type axle casing with retaining yokes for the differential assembly bearings



Front suspension shown on the left as it is mounted in position ; and on the right in its component parts. Note later type of screwed top pivot mounting

TUNE-UP DATA			
Firing order	1-3-4-2	Cam angle	60°
Tapet clearance, hot:		Contact spring tension	20—24 oz
inlet ... ..	.011in	Contact set No.	420196
exhaust ... ..	.011in	Contact breaker gap ... ..	.014—.016in
Valve timing: inlet opens	5° BTDC	Condenser: capacity ... ..	.2mf
inlet closes	45° ABCD	min. insulation	3 meg ohms
exhaust opens	40° BBDC	Plugs: make	Champion
exhaust closes	10° ATDC	type	NA-8
No. of flywheel teeth	104	size	14mm
Standard ignition timing	2° BTDC	gap ... ..	.020in—.022in
Location of timing mark	Marks on crankshaft pulley and timing chain cover	Carburettor: make	S.U.
		type	H-I
Distributor: type and service No.	D.M.2/40299	Settings: Choke	30° semi d.d.
Advance range (crank. deg.):		fixed 1½in	fixed 1½in
centrif.	Max. range 20°-24°	G G (std)	G G (std)
vacuum	22°-26°	Needle Fuel level	fixed
Advance starts (crank r.p.m.)	400—600	Air cleaner: make	AC 7222474
Max. advance (crank r.p.m.)	500	type	Oil wet*
		Fuel pump: make	S.U.
		type	L
		pressure	½lb
		*Export—Oil bath	AC 7222402



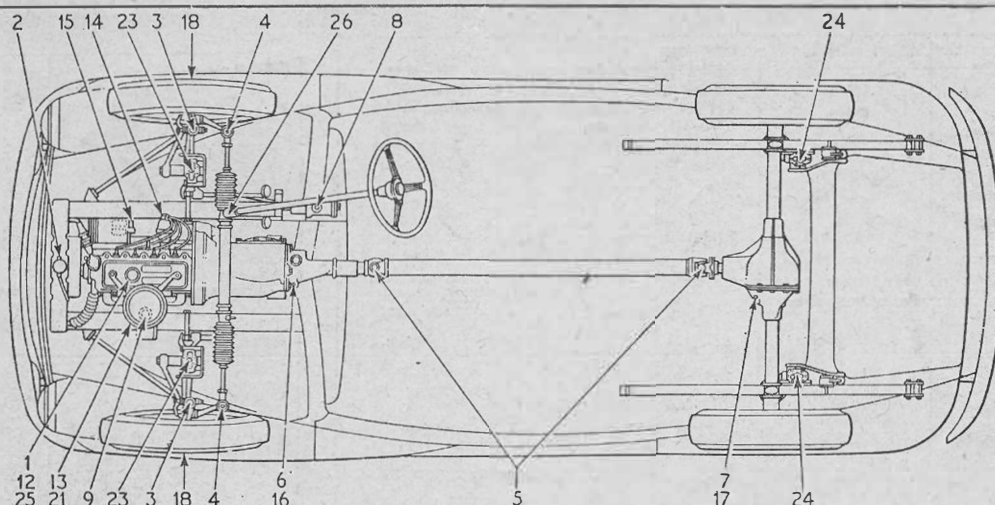
COLOUR CODE															
1 BLUE	9 WHITE	17 GREEN	25 YELLOW	33 BROWN	41 RED	49 PURPLE	57 BLACK	1 BLUE	9 WHITE	17 GREEN	25 YELLOW	33 BROWN	41 RED	49 PURPLE	57 BLACK
2 RED	10 RED	18 RED	26 RED	34 RED	42 RED	50 RED	58 RED	2 RED	10 RED	18 RED	26 RED	34 RED	42 RED	50 RED	58 RED
3 WHITE	11 WHITE	19 WHITE	27 WHITE	35 WHITE	43 WHITE	51 WHITE	59 WHITE	3 WHITE	11 WHITE	19 WHITE	27 WHITE	35 WHITE	43 WHITE	51 WHITE	59 WHITE
4 YELLOW	12 YELLOW	20 YELLOW	28 YELLOW	36 YELLOW	44 YELLOW	52 YELLOW	60 YELLOW	4 YELLOW	12 YELLOW	20 YELLOW	28 YELLOW	36 YELLOW	44 YELLOW	52 YELLOW	60 YELLOW
5 GREEN	13 GREEN	21 GREEN	29 GREEN	37 GREEN	45 GREEN	53 GREEN	61 GREEN	5 GREEN	13 GREEN	21 GREEN	29 GREEN	37 GREEN	45 GREEN	53 GREEN	61 GREEN
6 PURPLE	14 PURPLE	22 PURPLE	30 PURPLE	38 PURPLE	46 PURPLE	54 PURPLE	62 PURPLE	6 PURPLE	14 PURPLE	22 PURPLE	30 PURPLE	38 PURPLE	46 PURPLE	54 PURPLE	62 PURPLE
7 BROWN	15 BROWN	23 BROWN	31 BROWN	39 BROWN	47 BROWN	55 BROWN	63 BROWN	7 BROWN	15 BROWN	23 BROWN	31 BROWN	39 BROWN	47 BROWN	55 BROWN	63 BROWN
8 BLACK	16 BLACK	24 BLACK	32 BLACK	40 BLACK	48 BLACK	56 BLACK	64 BLACK	8 BLACK	16 BLACK	24 BLACK	32 BLACK	40 BLACK	48 BLACK	56 BLACK	64 BLACK

Wiring diagram by permission of Joseph Lucas, Ltd.

ELECTRICAL TEST DATA	
Battery	Lucas
model	GT.W 7A/2
voltage	12
no. of plates per cell	7
capacity	38 ah
Spec. gravity: up to 80° F	1.280-1.300
80°-100° F	1.250-1.270
Over 100° F	1.220-1.240
Dynamo	C39 PV/2
model	22258A
service no.	Anticlock
rotation (comm. end)	13 v @ 1,050-1,200 r.p.m.
cut-in volts at r.p.m.	19 amps @ 2,000-2,100 r.p.m. and 13.5 volts
output amps at r.p.m.	6.2 ohms
brush tension	22-25 oz
field resistance	
brush tension	
Control box	RB 106/1
model	37138
service no.	12.7-13.3
cut-out: cut-in voltage	9-10
cut-out voltage	15.9-16.5
regulator voltage: 10°C (50°C)	15.6-16.2
(open circuit) 20°C (68°F)	15.3-15.9
30°C (86°F)	15.0-15.6
40°C (104°F)	
Starter	M35G/1
model	25022
service no.	Anticlock
rotation (comm. end)	9.3lb/ft @ 370-390
lock torque (lb/ft-amps-volts)	amps and 7.7-7.3 v.
torque at 1,000 r.p.m.	4.9lb/ft @ 250-270 amps and 9.3-8.9 volts
brush tension	15-25 oz
Coil	Q12
model	45020
service no.	2.7 amp
stall current	
running current at 1,000 r.p.m.	1 amp

ADDITIONAL ELECTRICAL DATA		
Lucas Equipment		
	Model	Service No.
Headlamps: R.H.D.	F700	51336
L.H.D.	F700	51337
U.S.A.	F700	51343
Europe (not France)	F700	51339
France	F700	51341
Side lamps: standard	489	52139
flasher, U.S.A. only	488	52162
Stop/tail lamps: standard	471	53288
Number plate lamp	467/1	53101
Panel light switch	10	31140
Starter switch	ST 19/2	76123
Lighting switch	PPG 1	31126
Ignition switch	S45	31287
Screenwiper switch	PS15	31217
Trafficator switch	SD84	31190
Flasher Switch	TPS1	31250
Trafficators	SF80	54049 (2-door)
Flasher unit	FL3	35003
Flasher relay	DB10	33117
Screenwiper	CRT15	75151
Fuse box (2-35amp Fuses)	SF6	033239
Horns: high note (U.K.)	HF1235	069399
low note (U.S.A.)	WT614	69011
low note (low note)		69012
high note		

BULBS				
	Lucas No.	Voltage	Wattage	Cap
Headlamps: dip left	354	12	42/36	Prefocus
dip right	301	12	36/36	Prefocus
vertical dip	370	12	45/40	Prefocus
Side lamps: standard	222	12	4	MCC
flasher	380	12		SBC
Stop/tail lamps: standard	380	12	21/6	SBC
Number plate lamp	222	12	4	MCC
Reversing lamp				
Fog lamp				
Ignition	970	2.5	0.5	MES
Trafficator	987	12	2.2	MES
Warning lamp	987	12	2.2	MES
Panel lamps	987	12	2.2	MES
Trafficators	256	12	2	Festoon



KEY TO MAINTENANCE DIAGRAM

EVERY 250 MILES

1. Engine sump } Top up
2. Radiator

EVERY 500 MILES

3. Steering ball joints (2)
4. King pin bearings (4)
5. Propeller shaft universal joints (2) } Grease gun

EVERY 1,000 MILES

6. Gearbox
7. Rear axle
8. Brake fluid reservoir
9. Carburettor dashpot
10. Battery
11. Door locks and hinges—Oil can } Top up

EVERY 3,000 MILES

12. Engine sump—Drain and refill
13. Air cleaner (export)—Clean and refill oil bath

14. Distributor—Oil shaft bearing, auto advance and contact breaker
15. Dynamo—Refill with h.m.p. grease (later models—oil can)

EVERY 6,000 MILES

16. Gearbox } Drain and refill
17. Rear axle }
18. Front wheel hubs—Remove caps, add grease and replace
19. Carburettor filter } Remove and clean
20. Petrol pump filter }
21. Air silencer (home)—Clean in petrol and dry
22. Trafficators—Oil bearing pins
23. Front shock absorbers—Clean and Top up
24. Rear shock absorbers—Remove, clean, and top up

EVERY 12,000 MILES

25. Engine sump—Remove and clean pump intake strainer
26. Steering box—Oil gun 10 strokes

Note: Replace external oil filter every 6,000 miles

FILL-UP DATA

		Litres
Engine sump	6½ pt	5.7
Gearbox	2½ pt	1.3
Rear axle	1½ pt	.85
Cooling system	9½ pt	5.5
Fuel tank	5 gall	22.7
Tyre pressures: front	22	
rear*	22	

* Fully loaded with 5 passengers and luggage 24½ sq in.

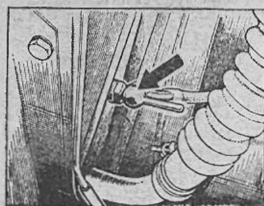
NUT TIGHTENING TORQUE DATA

	Bolt Size	Torque lb/ft
Cylinder head stud nuts	¾ in	40
Main bearing stud nuts	¾ in	65
Connecting rod big end bolts	¾ in	33
Flywheel bolts	¾ in	50
Crown wheel retaining nuts	¾ in	45

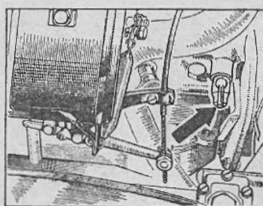
GENERAL DATA

Wheelbase	7ft 2in
Track: front	4ft 2½in
rear	4ft 2½in
Turning circle: R.H.	33ft 1in
L.H.	32ft 11in
Ground clearance	6½in
Tyre size: front	5.0J-14in
rear	5.00-14in
Overall length	12ft 4in
Overall width	5ft 1in
Overall height	5ft 0in
Weight (dry) s/n. 4-door	16 cwt

DRAINING POINTS



Left: Radiator drain tap on near side of bottom tank. Right: Cylinder block drain tap on near side at rear below manifolds. System is pressurized, remove cap slowly.



RECOMMENDED LUBRICANTS

		Duckham's	Wakefield	Anglo American	Vacuum	Shell	B.P. Energol	Filtrate	Sternol
Engine, Oil bath air cleaner	Above 32°F ...	NOL30	Castrol XL	Essolube 30	Mobiloil A	X-100 30	Energol SAE 30	Medium Filtrate 30	WW 30
	32°-0°F ...	NOL20	Castrolite	Essolube 20	Mobiloil Artic	X-100 20/20W	Energol SAE 20	Zero Filtrate 20	WW 20
	Below 0°F ...	NOL10	Castrol Z	Essolube 10	Mobiloil 10W	X-100 10W	Energol SAE 10	Sub Zero Filtrate 10	WW 10
Gearbox, Rear axle, Steering gearbox	Above 10°F ...	Hypoid 90	Castrol Hypoy	Esso Expee Compound 90	Mobilube GX90	Spirax EP90	Energol EP SAE 90	Hypoid Filtrate 90	Ambrolineum EP 90
	Below 10°F ...	Hypoid 80	Castrol Hypoy 80	Esso Expee Compound 80	Mobilube GX80	Spirax EP80	Energol EP SAE 80	Hypoid Filtrate 80	Ambrolineum EP 80
Wheel hubs, Fan bearings		IRB Grease or LB. 10 Grease	Castrolcase Heavy	Esso Bearing Grease	Mobil Hub Grease	Retinax A	Energrease C3	Super Lithium Filtrate Grease	Ambroline LHT Grease
Chassis nipples, Dynamo, Cables, Control joints		KG16 Grease or I.B. 10 Grease	Castrolcase Medium	Esso Pressure Gun Grease	Mobilgrease No. 2 or 4	Retinax A	Energrease C1	Super Lithium Filtrate Grease	Ambroline LHT Grease
Brake Fluid		Lockheed Orange.							