

# Motor Trader

# SERVICE DATA No. 438

## M.G. MIDGET Mk. II

Manufacturers : B.M.C. Ltd., Cowley, Oxford

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**DISTINGUISHING FEATURES:** Swivelling quarter lights and wind-up windows identify the Mark II cars in latest form, although styling in general follows the lines of previous models

**P**RODUCED under the overall aegis of the British Motor Corporation, the M.G. Midget is now in Mk. II form. It differs from the preceding model in a number of ways, and readers will recall that late Mk. I versions of these cars were fitted with the 1,098, c.c. engine and disc brakes on front wheels. These components are, of course, standard fittings on current Mk. II cars.

It is evident from the construction of the car that many of the mechanical units are similar to those in use on other models in the B.M.C. range, but as is the custom,

these units are specifically adapted for this model.

The engine is of familiar design and construction, has four cylinders with overhead valves, and

there is the option of either 8.1:1 or 8.9:1 compression ratio. Drive is transmitted through a single dry plate hydraulically operated clutch to a four-speed synchromesh gearbox, and by short open tubular propeller shaft to the hypoid bevel reduction gear contained within the three-quarter floating rear axle. Front suspension is of the coil spring and wishbone link pattern, with hydraulic shock absorbers. Rear suspension is effected through semi-elliptic leaf springs and lever-arm hydraulic dampers.

Steering is by rack and pinion which, of course, combines the advantages of direct action with compactness of installation, each end of the rack being attached to the steering arms of each front suspension unit by short track rods.

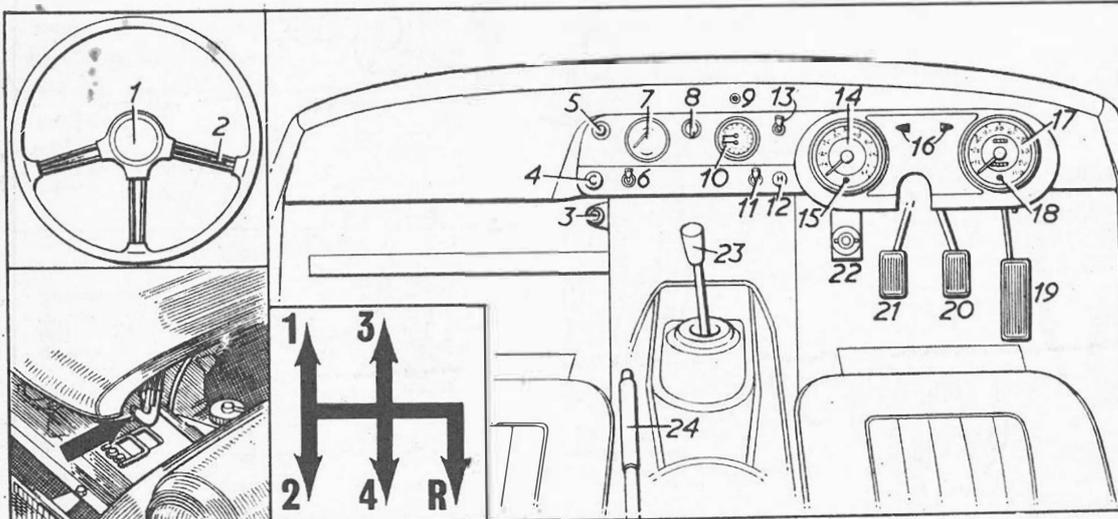
Vehicles are identified in the customary B.M.C. manner. Engine numbers are stamped on a plate which is secured to the right-hand side of the cylinder block, above the dynamo and below No. 1 sparking plug. The car (chassis) number is stamped on a plate which is secured to the inner wheel arch valance and is visible on lifting the bonnet. It is essential that all the letters and numbers which make up the car serial number are quoted when corresponding with the vehicle manufacturers, or when ordering spare parts.

Threads and hexagons are, in the main, of the United thread series pattern and form, and are marked as such. These parts are not interchangeable with threaded parts of any other thread series apart from A.N.F. threaded parts.

### INSTRUMENTS, CONTROLS, GEAR POSITIONS AND BONNET LOCK

Inset upper left: shows the siting of the steering column mounted controls. Lower outer left: the operation of the bonnet release mechanism. Lower inner left: the operative positions of the centre mounted gearlever

- |                               |  |                             |
|-------------------------------|--|-----------------------------|
| 1. Horn push                  | 9. Lubrication warning light           | 17. Speedometer             |
| 2. Direction indicator switch | 10. Oil pressure/water temp. gauge     | 18. Main beam warning light |
| 3. Bonnet release             | 11. Panel lights switch                | 19. Accelerator             |
| 4. Choke control              | 12. Heater switch                      | 20. Brake pedal             |
| 5. Windscreen washer          | 13. Lighting switch                    | 21. Clutch pedal            |
| 6. Windscreen wiper switch    | 14. Tachometer                         | 22. Headlamps dip switch    |
| 7. Fuel gauge                 | 15. Ignition warning light             | 23. Gearlever               |
| 8. Ignition/starter switch    | 16. Direction indicator warning lights | 24. Handbrake               |



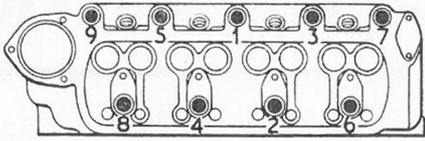
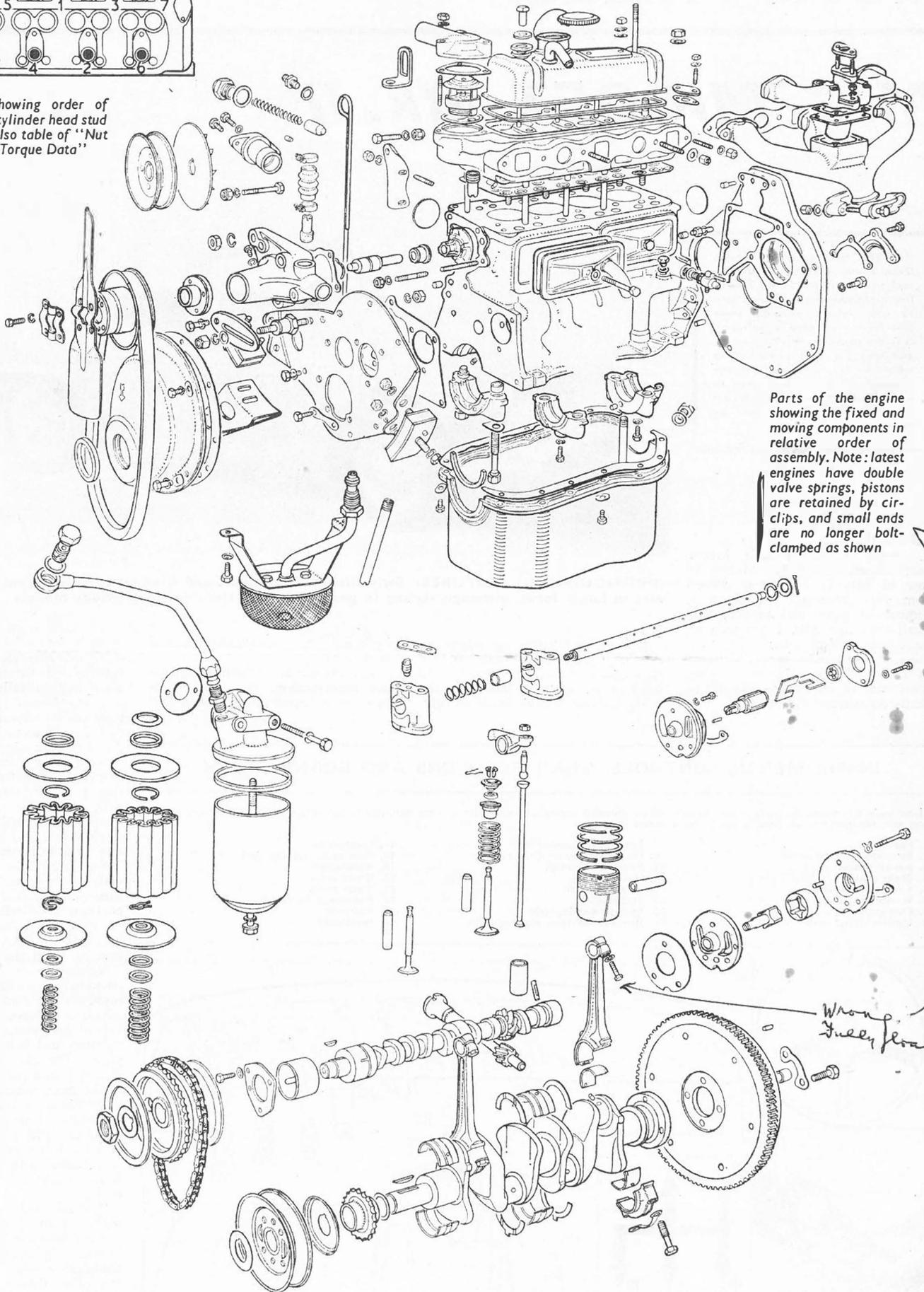


Diagram showing order of tightening cylinder head stud nuts. See also table of "Nut Tightening Torque Data"



Parts of the engine showing the fixed and moving components in relative order of assembly. Note: latest engines have double valve springs, pistons are retained by circlips, and small ends are no longer bolt-clamped as shown

Wrong Fully floater pin

Special tools for use in repair operations are available from the vehicle manufacturers, or through their distributive network. A list of those considered to be the more essential to efficient repair work is set out in these pages.

## ENGINE

### Mounting

At front, shaped bonded rubber blocks are bolted to lugs on front engine plate and to brackets on body extensions. At rear, bonded rubber blocks are bolted up between abutment pads on either side of gearbox extension housing and cradle brackets. All bolts should be tightened fully.

### Removal

Engine may be removed with or without gearbox with almost equal facility. To remove with gearbox, as a unit, proceed as follows: Remove bonnet from its hinges, drain cooling system, disconnect and remove top and bottom water hoses; remove four bolts (two each side) from radiator mounting flange and lift out radiator core. Disconnect battery and all other electrical leads to engine unit or ancillary components, together with all pipes, wires and controls; remove distributor cap. Release exhaust pipe from manifold and support stay from bellhousing. Remove self-tapping screws around gearbox cover plate, remove securing screws and anti-rattle cap, spring and plunger, and take off with gear lever. Unscrew and remove speedometer drive cable at gearbox end. Disconnect propeller shaft and remove com-

plete. Support gearbox on trolley jack and remove four gearbox cross-member mounting setbolts (two from inside car). Detach cross-member from gearbox. Remove two clutch slave cylinder mounting setbolts on bellhousing and tie up unit out of way.

Arrange sling of lifting tackle around engine unit so that it will assume a near vertical angle (fan uppermost) when lifted. Remove front mounting nuts from bolts and take weight of engine/gearbox unit on hoist. Lift unit up and out of car, manœuvring trolley jack forward at the same time to provide support for gearbox. To remove engine *without* gearbox, proceed as above and note following items. Remove filter bowl and starter motor from right-hand rear of cylinder block. Take weight of gearbox on suitable jack and remove setscrews securing gearbox to engine crankcase. Remove left-hand front engine mounting complete with bracket and right-hand front engine mounting rubber together with front exhaust down pipe support bracket from its fixing on gearbox bellhousing. Take weight of assembly with suitable equipment, and remove engine from vehicle.

### Crankshaft

Three main bearings, thin wall steel-backed, lead-indium-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

*in situ*. 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 setscrew. Sprocket fits with longer boss to rear, with shims behind for alignment. Pulley hub passes through felt sealing ring in timing cover. Tighten crankshaft sprocket securing setscrew fully.

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, lead indium 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 and 4 to front. Oil bleed hole on longer side of big end must go to offside, away from camshaft.

Gudgeon pins, fully floating, retained in piston bosses by circlips.

### Pistons

Aluminium alloy, anodized finish, with flat crown.

Pistons are supplied in five size gradings for selective assembly, rising in .003in 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 and third rings taper faced and must be fitted with sides marked "TOP" upwards. These rings, together with oil control ring are all fitted above gudgeon pin.

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 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, double springs. Cotters retained by spring clips. Rubber sealing rings with retainers on valve stems below collars.

ENGINE DATA		
General Type	10 CG	
No. of cylinders	4	
Bore x stroke: mm	84.58 x 83.72	
in	2.543 x 3.296	
Capacity: c.c.	1098	
cu. in	67	
Compression ratio	8.9:1 or 8.1:1	
CRANKSHAFT AND CON. RODS		
	Main Bearings	Crankpins
Diameter	1.7505-1.7510in	1.8254-1.8259in
Length	1 1/8 in	1.068-1.072in
Running clearance: main bearings	.001-.0025in	
big ends	.001-.0025in	
End float: main bearings	.002-.003in	
big ends	.008-.012in	
Undersizes	.010, .020, .030, .040in.	
Con. rod centres	5.748-5.742in.	
No. of teeth on starter ring gear/pinion	104/9	

PISTONS AND RINGS		
Clearance (skirt):	{ bottom .0005-.0011in top .0021-.0037in	
Oversizes	.010, .020in	
Weight without rings or pin	Not quoted	
Gudgeon pin: diameter	.6244-.6246in	
fit in piston	hand push fit	
fit in con. rod	fully floating	
	Compression	Oil Control
No. of rings	3	1
Gap (fitted)	.007-.012in	.007-.012in
Side clearance in grooves	.002-.004in	.0015-.0035in
Width of rings		
Top	.062-.0625in	
2nd and 3rd	.0615-.0625in	.124-.125in

SPECIAL TOOLS		Part No.
<b>ENGINE</b>		
Puller		18G2
Valve spring compressor		18G45
Oil pump relief valve grinding-in tool		18G69
Crankshaft gear/pulley/prop. shaft flange replacer		18G138
Valve rocker bush remover and replacer		18G148
Torque wrench (30-140lb. ft.)		18G372
<b>CLUTCH &amp; GEAR BOX</b>		
Clutch assembly gauging fixture		18G99A
Clutch centraliser		18G139
Bearing and oil seal replacer (basic tool)		18G134
Oil seal replacer adaptor		18G134L
Rear oil seal remover (basic tool)		18G389
Rear oil seal remover (adaptor)		18G389A
Oil seal clinching tool		18G488
<b>REAR AXLE</b>		
Hub oil seal replacer		18G14
Diff. bearing remover (basic tool)		18G47C
Diff. bearing remover (adaptor)		18G47M
Bearing and oil seal replacer (basic tool)		18G134
Hub replacer/adaptor		18G134Q
Front and rear hub remover (basic tool)		18G304
(bolts)		18G304F
(thrust pad)		18G304H
Bevel pinion bearing outer race remover (basic tool)		18G264
remover (adaptor)		18G264D
remover (adaptor)		18G264E
Bevel pinion bearing inner race remover/replacer		18G285
Bevel pinion setting gauge		18G191
Diff. bearing gauge		18G191A
<b>FRONT SUSPENSION</b>		
Assembly fixture		18G253
Hub assembly remover (basic tool)		18G8
Inner race remover adaptor		18G8P
Front spring compressor		18G153
Front and rear hub remover		18G146

CAMSHAFT			
	Front	Centre	Rear
Bearing journal: diameter (in.)	1.665	1.622	1.372
	1.666	1.63	1.373
Bearing clearance	.001-.002in		
End float	.003-.007in		
Timing chain: pitch	1 1/2		
no. of links	52		

VALVES		
	Inlet	Exhaust
Head diameter	1.151-1.156in	1.00-1.005in
Stem diameter	.2793-.2798in	.2788-.2793in
Face-angle	45°	45°
	Inner	Outer
Spring length: free	1.672in	1.75in
	fitted	1.179in
at load (valve shut)	18lb	52lb

GENERAL DATA	
Wheelbase	6ft 8in
Track: front (disc or wire wheels)	3ft 9 1/2 in
rear (wire wheels)*	3ft 9 1/2 in
Turning circle (approx.)	31 1/2 ft
Ground clearance	5in
Tyre size: front	5.20-13
rear	
Overall length	11ft 5 1/2 in
Overall width (disc wheels)†	4ft 6 1/2 in
Overall height	4ft 1 1/2 in
Weight (dry)	1490 lb.
* Disc wheels—3ft 8 1/2 in	
† Wire wheels—4ft 8 1/2 in.	

Valve guides plain, no shoulder, non-interchangeable. Inlet guides are longer, exhaust guides countersunk at bottom and countersunk at top. Press in both types until they project  $\frac{3}{32}$  in from spot face of spring seat.

### Tappets 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 grub screw 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 spring between rockers of adjacent cylinders.

Note: either pressed steel or forged rockers may be used. Forged rockers may be rebushed, but no attempt must be made to rebush those of the pressed steel type.

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 or concentric 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.

Oil delivered through drillings to gallery on off side of crankcase, and to full flow filter 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  $\frac{1}{2}$  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, remote control. Propeller shaft sliding joint on mainshaft.

To dismantle gearbox, remove drain plug and speedo drive pinion and bush. Take off clutch arm dust seal, and unhood withdrawal arm pivot bolt. Take off nut and washer, unscrew bolt and take out lever.

Unscrew eight nuts, remove remote control casing from rear extension; unscrew nine bolts and remove extension, manoeuvring control lever from selector preserving bearing packing washer as faces are separated. Remove seven nuts and washers and take off front cover. 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.

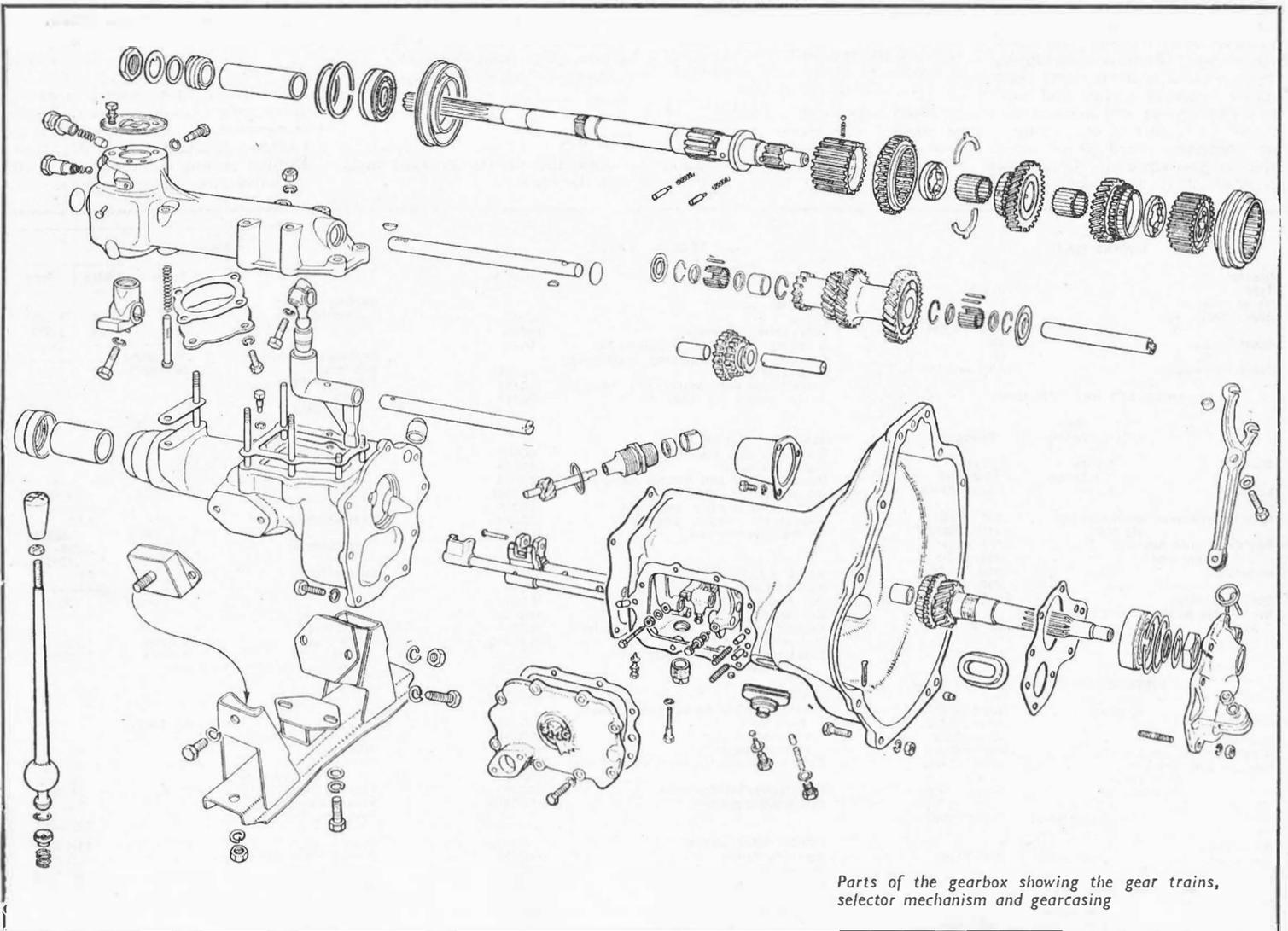
Drive out layshaft spindle either

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 full 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 caged needle rollers, thrust washers at outer ends, see note below. 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 speed gear with needle roller bearings. Thrust washer behind on shaft.

From opposite end of shaft, take off securing nut, lockwasher, speedo drive gear and distance piece. Remove ball bearing journal, complete with its housing and drift bearing out of housing. Draw 1st gear and synchro assembly off the shaft. Depress spring loader plunger, which locks rear splined ring at end of 3rd motion shaft. Lift out both halves of the washer provided for the splined ring. Slide 2nd gear off shaft, preserving needle roller bearings.



Parts of the gearbox showing the gear trains, selector mechanism and gearcasing

NUT TIGHTENING TORQUE DATA	
	lb. ft.
Cylinder head stud nuts	40
Main bearing set screws	60
Con. rod bolts	35
Flywheel securing bolts	40
Steering wheel nut	40
Rear damper bolts	25
Front hub nuts	25-85
Disc/hub	40-45
Front swivel hub/calliper	45-50

BALL AND ROLLER BEARING DATA		
	Int. dia., Ext. dia., Width (in or mm)	Type
<b>GEARBOX</b>		
Primary shaft (front)	} 1 x 2 1/4 x { .623in .625in	B
Mainshaft (rear)		
<b>REAR AXLE</b>		
Pinion (front)	1 x 2 1/2 x 3/8 in	TR
(rear)	1 x 2.6785 x .688in	TR
Diff. side bearings	35 x 72 x 17mm	TR
Hubs	35 x 72 x 17mm	TR
<b>FRONT AXLE</b>		
Hubs (inner)	25 x 52 x 15 mm	TR
(outer)	17 x 47 x 14 mm	TR

CHASSIS DATA	
<b>CLUTCH</b>	
Make	Borg & Beck
Type	7 1/2 in s.d.p.
Springs: no.	6
colour	red
Centre springs: no.	4
colour	maroon/lt. green
Linings: thickness	.13in.
dia. ext.	7 1/2 in.
dia. int.	5in.

GEARBOX	
Type	synchronesh
No. of forward speeds	4
Final ratios: 1st	13.504 : 1
2nd	8.085 : 1
3rd	5.726 : 1
4th	4.22 : 1
Rev.	17.320 : 1

PROPELLER SHAFT	
Make	Hardy Spicer
Type	Needle roller brg. U.J.
Diameter	1 1/2 in
Length between centres	26 1/2 in

FINAL DRIVE	
Type	3/4-floating hypoid
Crownwheel/bevel pinion teeth	38/9

BRAKES		
	Front	Rear
Type	disc	drum
Disc or drum diameter	8.25in	7in
Lining: length	—	6.68in
width	—	1.25in
pad area (total)	18 sq. in	—
thickness	—	.187in
min. pad thickness	1/16 in	—
material	Ferodo DA3	Ferodo AM8

SPRINGS		
	Front	Rear
Width (or dia. of coils)	3.625in	1 1/2 in
No. of leaves (or coils)	7	5
Free camber (length, coil)	9.4in	4.437in
Working load	750lb	375lb

SHOCK ABSORBERS	
Make	B.M.C.
Type	lever/arm
Service	top up

STEERING BOX	
Make	B.M.C.
Type	rack and pinion
Adjustments: pinion end float	thrust washer
rack end float	shims on damper
mesh	

FRONT-END SERVICE DATA	
Castor	3°
Camber	1/2°
King pin inclination	6 1/2°
Toe-in	0-1/2
No. of turns lock to lock	2 1/2
Adjustments: castor	} nil
camber	
toe-in	
	screwed track rod ends

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

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

**Layshaft cluster:** Push inner spring rings into bore, making sure that they bed securely, insert short distance-piece in rear end, then insert inner retainer caged rollers into each end, using layshaft 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, .125-.126in, .127-.128in and .130-131in to obtain correct end float of .001-.003in.

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

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-drillings 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.

### Propeller Shaft

Hardy Spicer needle roller bearing universal joints. 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 special tools. Replacement axles are available as units and should be used when possible.

To remove axle raise rear of car, remove road wheels, release hand brake. Take off downpipe, exhaust pipe and silencer. With jack in position under differential unit, release check straps at body connections. Undo damper linkages and disconnect each suspension upper link from rear axle bracket. Remove brake cable at adjustment point. Mark propeller shaft coupling flanges and remove shaft. Disconnect hydraulic brake pipe at main union, forward of differential housing. Remove "U" bolt securing nuts. Take weight of axle on jack and remove spring shackle pins. Lower axle unit away and clear of car. Refitting is reverse of above process.

Distance piece and shims between pinion bearings. Shims (.003 and .005in) to give 8-10 lb/in in preload drag (plus 3 lb/in if oil seal is fitted) when flange nut is tightened to 140 lb/in. Adjustment for pinion mesh by distance piece. Shims between differential cogs and inner bearings to give backlash etched on rear face of crown wheel. Add .002in shims each side to give preload.

## CHASSIS

### Brakes

Lockheed hydraulic. Disc front brakes with caliper containing two pads to each disc. Rear brakes have single floating expander unit incorporating bellcrank for both hand and foot brake operation.

No adjustment provided for front brakes, apart from renewal of pads. To renew pads, jack up car and remove road wheels. Depress pad retaining springs, with draw retaining split pins. Remove springs, take out friction pads and anti-squeak shims from caliper; using long-nosed pliers if necessary. Fit new pads and reverse dismantling process. Check brake fluid level and hydraulic operation.

Handbrake operates on rear wheels only, through a cable to the compensator mechanism. From this point pull to the rear brake expanders is by transverse rods which are non-adjustable. Provision for adjustment is on threaded end of outer cable at attachment point on underside of diff. casing. To adjust, rear brake shoes should be locked by wheel adjustment to drums and the hand control applied slightly (one notch on lever ratchet). Cable slackness, if then present, may be removed by adjusting sleeve nut of cable at compensator. Correct wheel adjustment should then be restored, with handbrake lever fully released. Brake shoes must be adjusted before any attempt is made to reset the hand linkage.

### Semi Springs

Semi-elliptic leaf springs, plates of different thicknesses, see data tables.

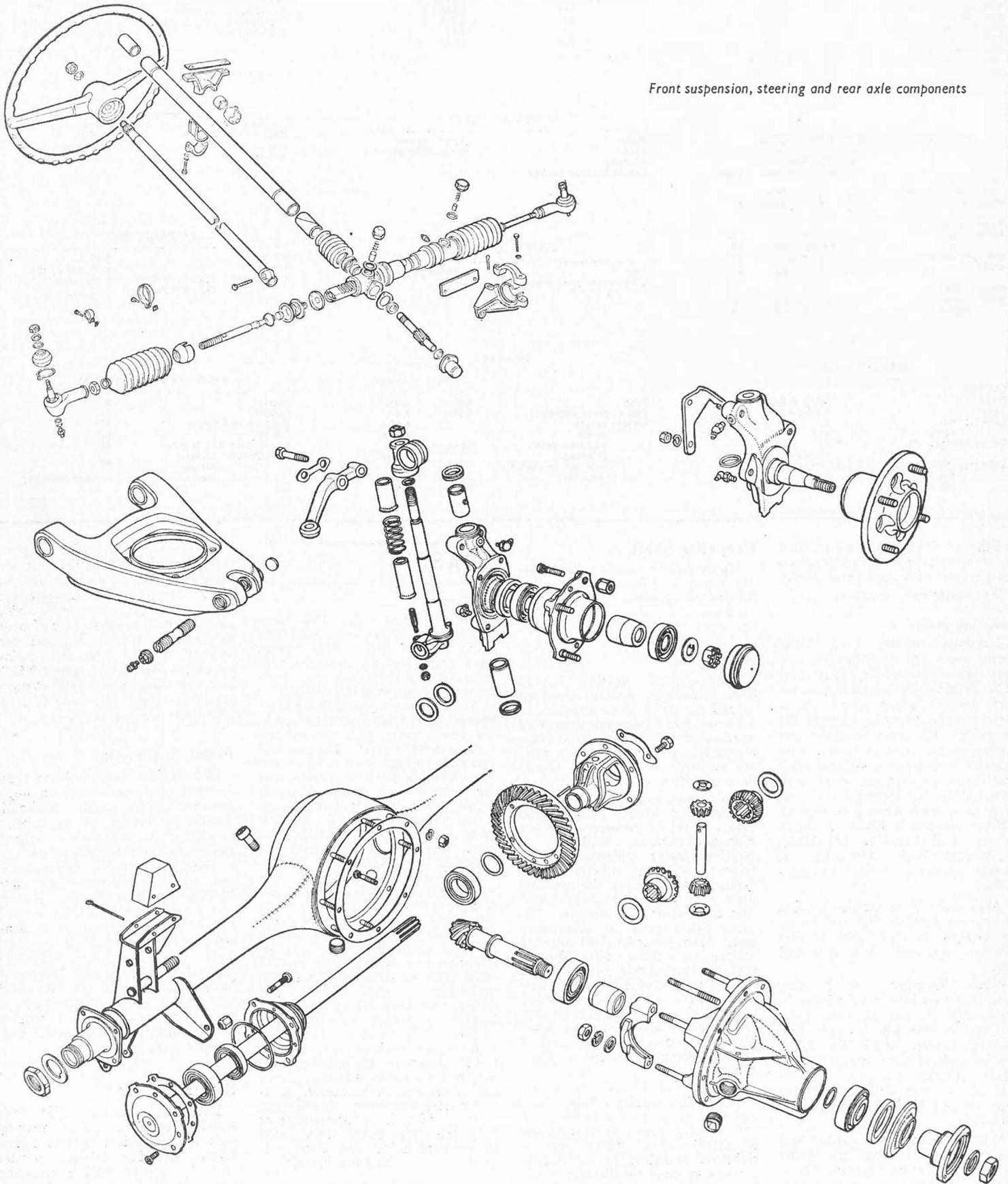
To remove, raise vehicle by placing jack under differential unit and support body. Take out shackle pins. Springs may be removed after removal of setscrews securing part anchor bracket to rear of body foot-well, and from beneath car, removal of part bracket securing setscrews, together with four "U"-bolt securing nuts and damper anchorage plate. Refitting is a reversal of above process.

### Front Suspension

Coil spring and wishbone type. In each symmetrical unit, a single armed double-acting hydraulic damper is bolted to its support bracket at its upper end. Arm of damper is towards front of car and is secured to swivel pin trunnion link by a fulcrum pin and Metalastik rubber bushes. Bottom end of swivel pin is secured to outer end of lower links by a fulcrum block, cotter pinned in position. Inner arms of lower links are secured to brackets by Metalastik bushes and fulcrum pins. Rebound rubbers are fitted to bottom of coil spring top bracket and a smaller rebound rubber is fitted under each damper arm.

### Steering Gear

Rack and pinion. Tie rods attached to each end of steering rack by ball joints operate swivel arms. Steering wheel operates splined, toothed pinion engaging with rack gear. Pinion end play is removed by adjustment of shims beneath pinion tail end bearings. Backlash of gears controlled by damper pad in rack mechanism.



Front suspension, steering and rear axle components

**TUNE-UP DATA**

<b>Firing order</b>	1-3-4-2	<b>Settings: choke</b>	(semi d.d.)
<b>Tapet clearance (cold): inlet</b>	.012in	<b>main jet</b>	1jin
<b>exhaust</b>	.012in	<b>Needles: standard</b>	.090in
<b>Valve timing*: inlet opens</b>	5° BTDC	<b>rich</b>	AN
<b>inlet closes</b>	45° ABDC	<b>weak</b>	GA
<b>exhaust opens</b>	51° BBDC	<b>Piston spring colour</b>	H8
<b>exhaust closes</b>	21° ATDC	<b>Air cleaner: make</b>	blue
<b>Standard ignition timing: (high comp)</b>	5° BTDC	<b>type</b>	AC
<b>(low comp)</b>	3°-5° BTDC	<b>Fuel pump: make</b>	Paper element
<b>Location of timing mark</b>	C/shaft pulley and pointer	<b>type</b>	S.U.
<b>Plugs: make</b>	Champion	<b>pressure</b>	Electric AUF
<b>type</b>	N5		2½-3 lb/sq. in
<b>size</b>	14 mm		
<b>gap</b>	.024-.028in		
<b>Carburettor: make</b>	S.U.		
<b>type</b>	H.82		

\*With valve clearances set at .021 in, for checking purposes only.

**LUCAS EQUIPMENT**

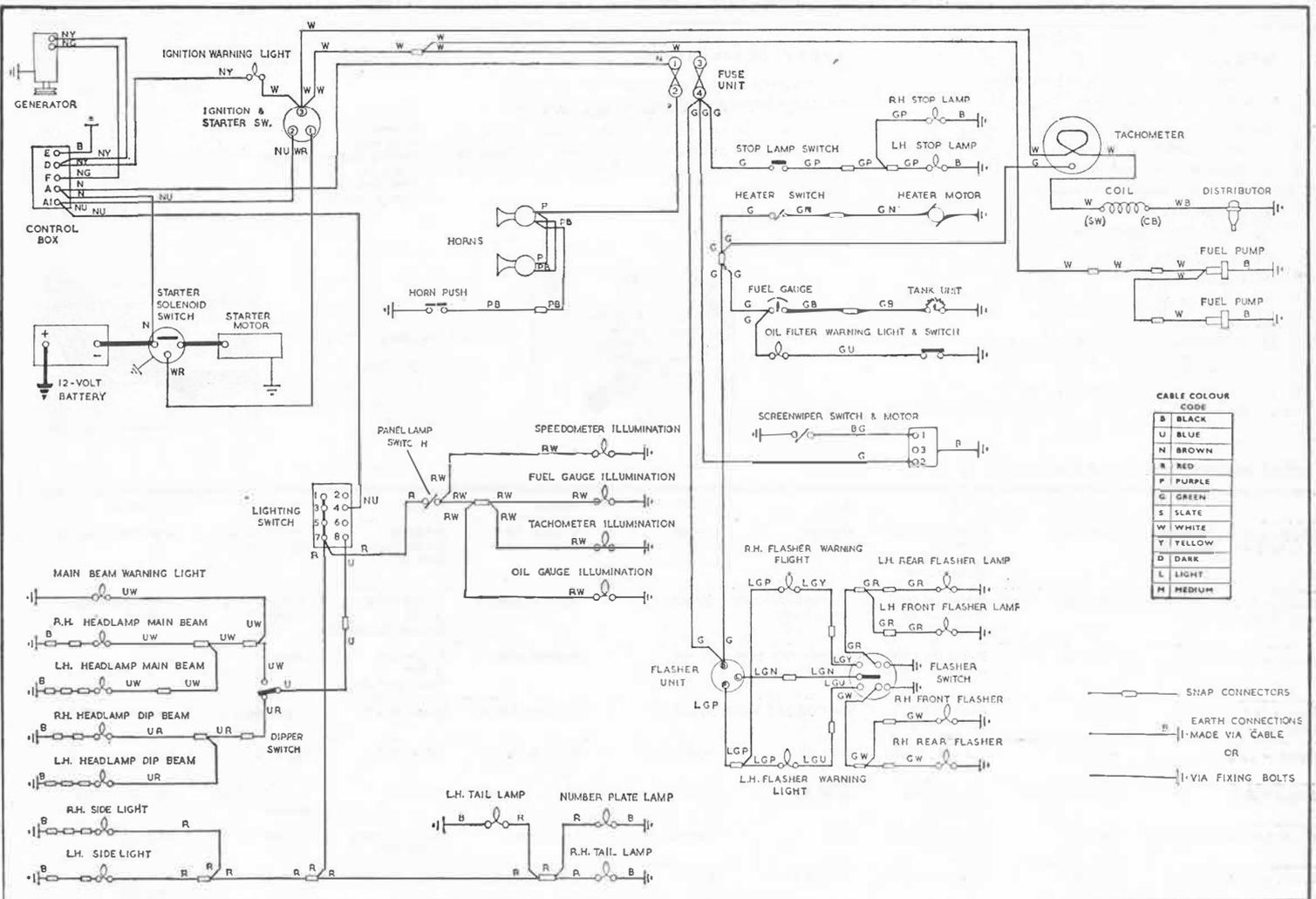
<b>Model N9</b>	<b>GENERATOR</b>	
<b>Model C40</b>	<b>CONTROL BOX</b>	Part No. 22742
<b>Model RB106-2</b>	<b>STARTING MOTOR</b>	Part No. 37290
<b>Model M35G-1</b>	<b>DISTRIBUTOR</b>	Part No. 25079
<b>Drive 'SB' Inboard</b>		
<b>Model 25D4</b>	<b>IGNITION COIL</b>	Part No. 40919
<b>Max. centrifugal advance (crank degrees)</b>	30-34 at 6,000 rev./min.	
<b>No advance below</b>	660 r.p.m.	
<b>Centrifugal advance springs</b>	Part No. 54415809	
<b>Max. vacuum advance (crank degrees)</b>	18-22 at 22in Hg.	
<b>No advance below</b>	2in. Hg.	
<b>Model LA12</b>	<b>WINDSCREEN WIPER</b>	Part No. 45113
<b>Primary resistance</b>	3.0-3.4 ohms	
<b>Running current at 1,000 r.p.m.</b>	1.0 amp.	
<b>Model DR3A</b>	<b>FLASHER UNIT</b>	Part No. 75452
<b>HORN(S)</b>		
<b>Model 9H</b>	<b>FUSE UNIT</b>	Part No. (s) 54068080 (High note) 54068081 (Low note)
<b>Low note optional</b>		
<b>Type: Windtone</b>		
<b>Current consumption</b>	3.0-3.5 amp. (per horn)	
<b>Model FL5</b>	<b>FLASHER UNIT</b>	Part No. 35020
<b>Model 4FJ</b>	<b>FUSE UNIT</b>	
<b>Fuse ratings</b>	35 amp./35 amp.	

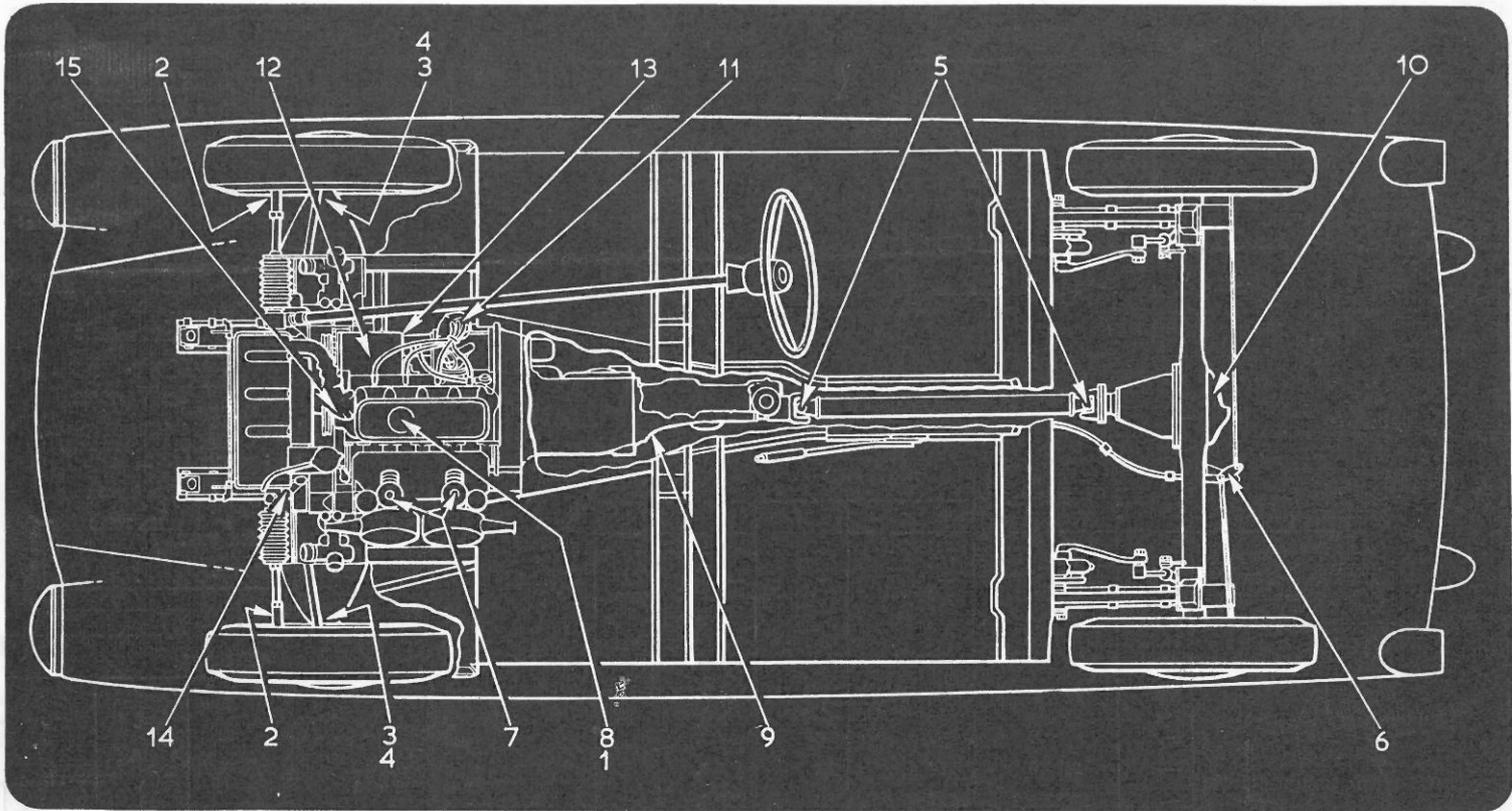
\*See also Addenda.

Lamps	Model	Part No.	BULB OR SEALED		BEAM UNIT
			Lucas No.	Wattage	Cap
Head (RHD, dip left)	F700	58903	54521872	80,45	S.B.U.
Head (LHD, dip right)	F700	58839	355	42/36	B.P.F. LHD
Head (export U.S.A. & Canada)	F700	59193			
Head (export Europe)	F700	58840	410	45/40	Unified European
Head (export France)	F700	58841	411	45/40	Unified European
Head (export Sweden)	F700	58842	410	45/40	Unified European
Fog (optional)	SFT576	55128	323	48	Unified European
*Side/flasher	584	{ 52507RH } { 52506LH }	989 side 382 flasher	6 21	M.C.G.
Stop tail	676	53915	380 stop/tail	8/21	S.C.C.
*Rear flasher			382 flasher	21	S.C.C.
Number plate	467	53836	989	6	M.C.G.
Panel (bulbholder only)		554734	987	2.2	M.E.S.
Ignition warning (bulbholder only)			987	2.2	M.E.S.
Main beam warning (bulbholder only)		54944812	987	2.2	M.E.S.
Flasher warning	WL13	38177	987	2.2	M.E.S.
Oil warning (filter)	WL15	38189	281	2	'Peanut'

**SWITCHES**

Ignition/starter	47SA	31973
Lighting	57SA	31837
Foglamp (optional)	57SA	31837
*Direction indicator	85SA	34864
Dip	103SA	34536
Stop light	25H	34542
Panel light	57SA	34426
Wiper	57SA	34426
Steering column control	CC5	33626
		Midget II





### KEY TO MAINTENANCE DIAGRAM

**WEEKLY**

1. Engine sump—check and top up

**EVERY 3,000 MILES**

- 2. Steering tie-rod ball joints
- 3. Swivel axles
- 4. Suspension lower joints
- 5. Propeller shaft universal joints
- 6. Handbrake cable
- 7. Carburettor piston dampers—top up

} grease gun

**EVERY 6,000 MILES**

- 8. Engine sump—drain and refill
- 9. Gearbox } check and top up
- 10. Rear axle }
- 11. Distributor—oil shaft bearing, auto. advance mechanism, and contact breaker pivot, smear cam with grease
- 12. Engine oil filter element—renew
- 13. Dynamo—few drops engine oil to commutator end-bearing

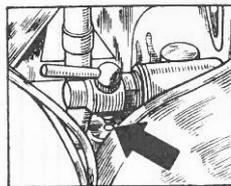
**EVERY 12,000 MILES**

- 14. Steering rack—grease gun (10 strokes only)
- 15. Water pump—remove plug and add grease

N.B.—Oil change period recommended above is applicable when Multi-grade oils are used. Monograde or single viscosity oils should be changed at 3,000 mile intervals.

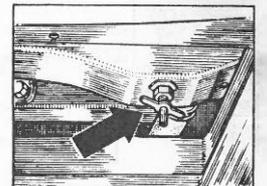
**FILL-UP DATA**

	Pints	Litres
Engine sump (inc. filter)	6½	3.7
Gearbox	2½	1.3
Rear axle	1½	.85
Cooling system (without heater)	10	5.68
Fuel tank	6 galls.	27.3
Tyre pressures: front	18lb/sq. in	1.27kg/cm <sup>2</sup>
rear	20lb/sq. in	1.41kg/cm <sup>2</sup>



**DRAINING POINTS**

Left: shows the cylinder block drain tap, and right; the radiator matrix drain tap



**RECOMMENDED LUBRICANTS**

	CASTROL	ESSO	B.P.	DUCKHAM'S	MOBIL	SHELL	FILTRATE	STERNOL
Engine and Gearbox, down to 50°C (41°F)	Castrol XL	Extra Motor Oil 20W/40 Motor Oil 40/50 Motor Oil 40	Energol SAE40	Q20/50	Mobiloil AF+ Mobiloil BB	X-100 40 X-100 Multi, 20W/40	Filtrate Heavy Filtrate 20W/40	WW Multigrade 40
Between 5°C -12°C (41° to 10°F)	Castrolite	Motor Oil 20W/30 Motor Oil 20 Extra Motor Oil	Energol SAE 20W Visco Static	Q.5500	Mobiloil Special	X-100 20W X-100 Multigrade 10W/30	Filtrate 10W/30 Filtrate Zero	WW Multigrade 10W/40
Below -12°C (10°F)	Castrol Z	Motor Oil 10W Motor Oil 5W/50	Energol SAE 10W Visco Static	Q.5500	Mobiloil 10W	X-100 10W X-100 MuHi 10W/30	Filtrate Sub Zero 10W	WW10
Rear axle and steering down to -12°C (10°F)	Hypoy	Gear Oil GP, 90/140 or GP90	Gear Oil SAE 90EP	Hypoid 90	Mobilube GX 90	Spirax 90 EP	Hypoid Gear 90	Ambrolem EP 90
Below -12°C (10°F)	Hypoy Light	Gear Oil GP80	Gear Oil SAE 80EP	Hypoid 80	Mobilube GX80	Spirax 80EP	Hypoid Gear 80	Ambrolem EP80
Grease Points	Castrol LM	Multipurpose Grease H	Energrease L2	L.B. 10 Grease	Mobilgrease MP	Retinax A	Super Lithium Grease	Sternoline LMT
Upper cylinder lubrication	Castrollo	Upper Cylinder Lubricant	UCL	Adcoid Liquid	Upperlube	Upper Cylinder Lubricant	Petrole	Magikyl
Oilcan and carburettor	Castrolite	Extra Motor Oil	Visco Static	Q.5500	Mobiloil Special	Super Motor Oil	10W/30	WW Multigrade 10W/40