

# Motor Trader

SERVICE DATA NO. 427

## AUSTIN-HEALEY 3000 (Mk. III)

Manufacturers : B.M.C. Ltd., Longbridge, Birmingham

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**S**INCE our last article in this series, which featured the larger Austin-Healey car, many changes have taken place. Various development phases have been reached and the car has been fitted with several different carburation systems and, more recently, altered transmission. For these reasons we feel that it would serve the more useful purpose to devote this article to a specific model, rather than to attempt to cover two or more of the later series of Austin-Healey 3000 cars in this form.

Basically the car is a two-door, two seater sports model, but this series (BJ 8) incorporates occasional seats at the rear. Also fitted on this model are winding windows and quarter lights, which distinguish its appearance from predecessors in the range. Power is provided by the familiar B.M.C. "C"-type engine, of almost exactly 3-litres swept volume capacity, overhead valves, and working at a compression ratio of 9:1.

Transmission of the drive is taken through a diaphragm spring clutch to a four-speed gearbox, with synchromesh on the upper three ratios. Overdrive is an optional fitment, and when specified is of Laycock de-Normanville pattern and design, comparing in detail with that described in Service Supplement No. 226/C1. Readers are referred to this publication for full information regarding overhaul and service procedures of this unit. The drive is taken from the output shaft of the gearbox, or overdrive as the case may be, via a short universally jointed propeller shaft to the hypoid bevel drive gear of the three-quarter-floating rear axle, and by the half-shafts to the rear road wheels.

Braking is by an hydraulic disc/drum layout, and a servo is standard equipment on this model. Front brakes are of the calliper and disc design, rear brakes of the conventional leading and trailing shoe pattern.

Suspension is independent at the front, effected through coil springs and wishbone links. The upper links of this arrangement are formed by the arms of the double-acting hydraulic dampers. Rear suspension is by semi-elliptic leaf springs, which are damped by double-acting hydraulic shock absorbers.

Steering is by cam and peg type unit, and it should be noted that the ball joints fitted in the linkage layout on this chassis series are of the nylon seated pattern, and require no maintenance.

Identification of vehicles follows customary B.M.C. pattern, and is by car and engine numbers. The car number is to be found stamped on a plate, which is mounted on the bulkhead under the bonnet. Engine numbers are stamped on a metal plate, which is fixed to the left-hand side of the cylinder block. Other major components are num-

**DISTINGUISHING FEATURES.** Latest versions of this model are identified by quarter lights and winding windows fitted to doors. External styling follows the lines of previous models closely, but with improvements to trim and decoration

bered also, the gearbox number is stamped on the right-hand side of the gearcasing and the rear axle number is stamped on the rear of the axle tube, on the left-hand side, adjacent to the rebound rubber. It is essential that the car and engine numbers are quoted when referring to the manufacturers, or when ordering spare parts, together with any other unit numbers, which may be relevant to the inquiry.

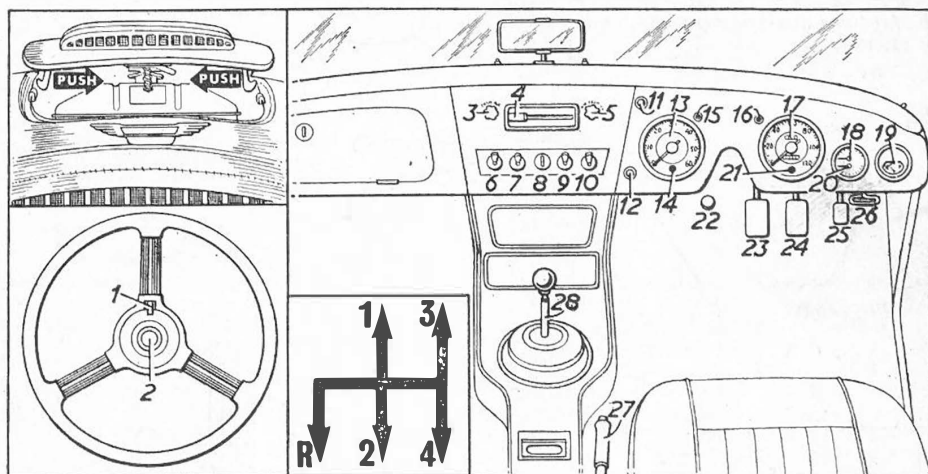
A range of special tools for speeding up many repair operations is marketed by the vehicle manufacturers through their dealer/distributorship network, and a list of those considered to be the more essential is included in these pages.

Threads and hexagons are, in the main, of the Unified thread series pattern and form, but in cases of doubt, it is always preferable to replace threaded parts as they were dismantled, taking care to renew those parts with stretched or damaged threads.

### ENGINE

#### Mounting

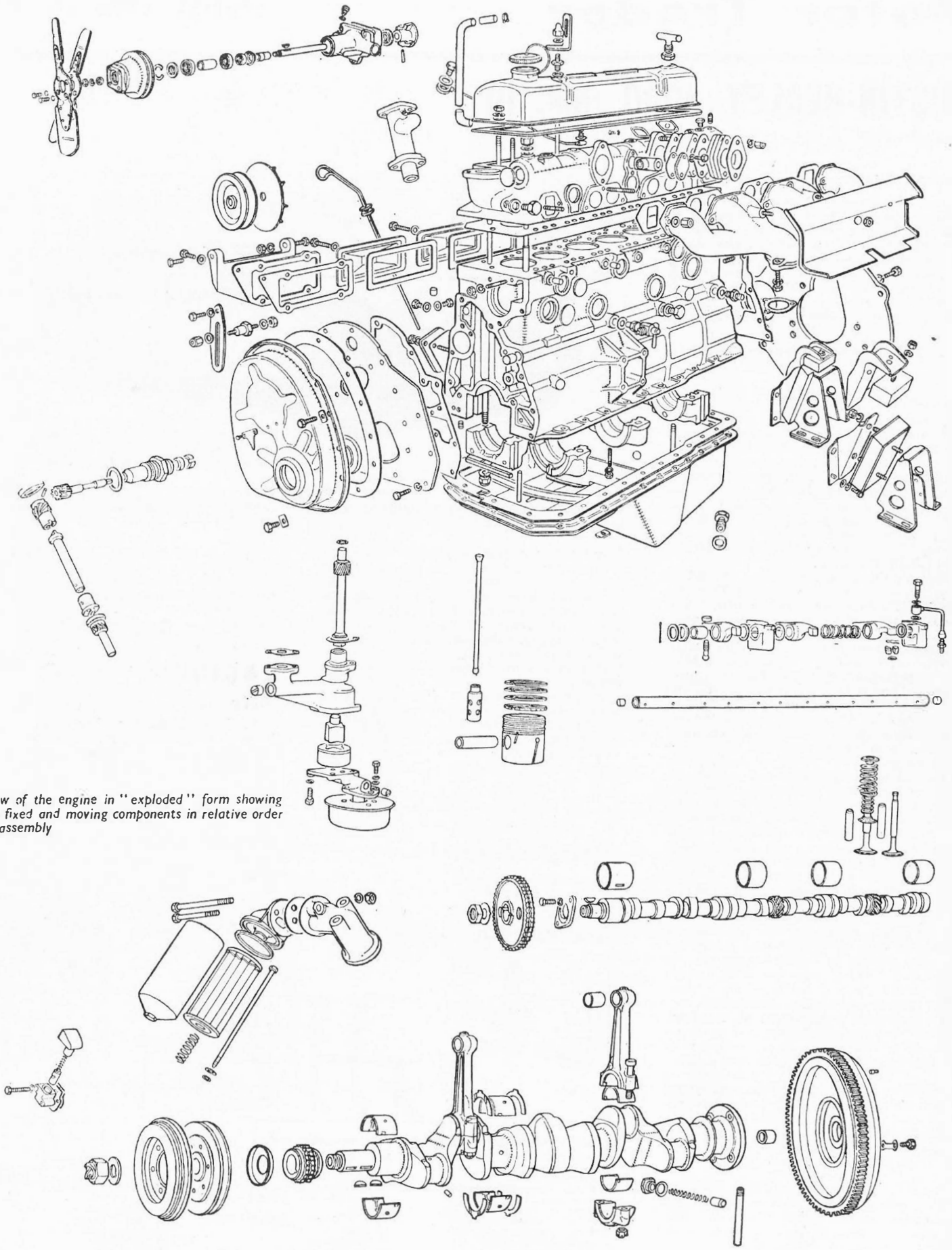
At front, bonded rubber blocks bolted between bracket extensions from bosses on engine, and to feet bolted to box-type bracket welded to chassis side member. Additional



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

- |   |   |                                       |
|---|---|---------------------------------------|
| 1. Direction indicator switch                   | 11. Choke control                         | 20. Water temp. gauge                 |
| 2. Horn push                                    | 12. Screenwasher control                  | 21. Headlamps main beam warning light |
| 3. Air control knob                             | 13. Engine r.p.m. indicator               | 22. Headlamps dip switch              |
| 4. Heater blower motor switch and temp. control | 14. Ignition warning light                | 23. Clutch pedal                      |
| 5. Heater air control                           | 15. L/h direction indicator warning light | 24. Brake pedal                       |
| 6. Overdrive switch                             | 16. R/h direction indicator warning light | 25. Accelerator pedal                 |
| 7. Screenwiper switch                           | 17. Speedometer                           | 26. Bonnet lock control               |
| 8. Ignition/starter switch                      | 18. Oil pressure gauge                    | 27. Handbrake                         |
| 9. Panel lights switch                          | 19. Fuel gauge                            | 28. Gearlever                         |
| 10. Lighting switch                             |   |                                       |

Inset upper, outer left: shows method of releasing the bonnet safety catches, below outer left: the siting of the steering wheel mounted controls, and inner left: the operative positions of the centre mounted gearlever



View of the engine in "exploded" form showing the fixed and moving components in relative order of assembly

GENERAL DATA	
Wheelbase	7ft 7 <sup>3</sup> / <sub>8</sub> in
Track: front	4ft 0 <sup>3</sup> / <sub>8</sub> in
rear	4ft 2in
Turning circle	35ft 7in
Ground clearance	4 <sup>3</sup> / <sub>8</sub> in
Tyre size: front	5.90-15
rear	
Overall length	13ft 1 <sup>1</sup> / <sub>2</sub> in
Overall width	5ft 0in
Overall height (hood raised)	4ft 2 <sup>3</sup> / <sub>8</sub> in
Weight (dry)	2,380lb

SERVICE TOOLS	
Description	Part No.
<b>ENGINE</b>	
Crankshaft gear and pulley remover	18G2
Crankshaft pulley replacer	18G16
Crankshaft gear replacer	18G16
Valve rocker bush remover and replacer	18G21
Valve seat cutter and pilot handle	18G27
Valve seat cutting tool fibre box	18G27B
Valve seat finishing cutter—exhaust	18G28
Valve seat glaze breaker—exhaust	18G28A
Valve seat finishing cutter—inlet	18G30
Valve seat glaze breaker—inlet	18G30A
Valve seat narrowing cutter—top—inlet	18G30B
Valve seat narrowing cutter—bottom—inlet and exhaust	18G30C
Piston ring compressor	18G55A
Oil pump release valve grinding in tool	18G59
Valve seat cutter pilot	18G174D
Cylinder head spanner	18G545
<b>TRANSMISSION</b>	
Bevel pinion setting gauge	18G191
Differential bearing setting gauge	18G191A
Bevel pinion bearing pre-load gauge	18G207
Bevel pinion bearing outer race remover	18G264
Bevel pinion bearing outer race remover adaptor	18G264D
Adaptor for above	18G264H
<b>REAR AXLE AND REAR SUSPENSION</b>	
Bevel pinion inner race remover and replacer	18G285
Rear hub remover	18G304
Rear hub remover bolt adaptors (3)	18G304B
Rear hub remover thrust pad	18G304K
<b>STEERING</b>	
Steering arm remover	18G75A
Steering ball joint separator	18G125

NUT TIGHTENING TORQUE DATA	
	lb. in
Cylinder head stud nuts	900
Main bearing nuts	900
Con-rod set screws	600
Front mounting plate screws	200
Rear mounting plate screws	600
Flywheel bolts	600
Rocker shaft bracket nuts	300-324
Diff. bearing cap nuts	780
Crown wheel bolts	680
Pinion bearing nut	1,680
Steering wheel nut	492

right-angle brackets bolted up with inner brackets fitted on engine bosses, and carry smaller bonded rubber blocks at top (at right-angles to side mounting rubbers).

At rear, bonded rubber blocks are bolted up between either gearbox or overdrive extension casing and to frame member. Tighten all bolts and nuts fully.

**Removal**

Engine, gearbox (and/or overdrive) are best removed as unit. If gearbox is left in chassis, it may be difficult to reassemble engine.

Detach bonnet from hinges. Disconnect fan and remove radiator core (two bolts each side to wing valances). Disconnect all pipes, wires and controls, including rev. counter drive on near side, and remove carburettors, oil filter and distributor. Take weight of engine on slings behind front engine plate and below rear of bell-housing, or on lifting eyes on engine rocker cover, so that engine can be tilted sharply.

Remove metal cover over propeller shaft front joint, and detach gearbox cowl (Phillips screws to floor) and vertical scuttle plate. Disconnect overdrive wiring from solenoid and switches on off side of gearbox also speedometer drive cable. Disconnect clutch slave cylinder from bell housing and front

end of propeller shaft. Take out rear mounting setscrews, setpins and front mounting bracket bolts to chassis. Power unit complete with gearbox and/or overdrive can then be lifted out through bonnet opening.

**Crankshaft**

Four main bearings, thin-wall, steel-backed white-metal lined, lead-indium plated located by tabs in bearing caps. End float controlled by split thrust washers recessed either side of No. 2 bearing. Lower halves of thrust washers located and retained by tabs in bearing cap. Fit with oil grooves towards crank throws. No hand fitting permissible. Nos. 2 & 3 main bearing shells may be removed without removal of crankshaft; engine must be removed to change front and rear main bearings. Flywheel spigot mounted and flange bolted to crankshaft by nuts and bolts. Renewable bush pressed into crankshaft end, shrunk on starter ring gear fitted. Timing sprocket keyed to front end of crankshaft by Woodruff key; aligning shim abuts against inner boss of sprocket.

Renewable felt oil seal fitted into timing case cover. Dynamo and water pump drive pulley keyed to crankshaft by outer of two Woodruff keys. Oil thrower fitted between timing sprocket and pulley, torsional vibration damper in front, assembly retained by starter dog nut screw.

Sump sealing effected by composition type gasket around flange. Square section seal fitted to front and rear main bearing caps together with cylindrical plugs.

**Connecting Rods**

Big end bearings offset, thin-wall bearings steel backed, white metal lined, lead indium plated, located by tabs in caps and connecting rods. No hand fitting permissible. Big ends of H-section rods split horizontally for removal with piston through bores from top of engine. Gudgeon pins retained in small ends by clamp bolts and retained by circlips in piston bosses. Tighten con-rod nuts to torque figures specified.

**Pistons**

Aluminium alloy, "T"-slotted, with dished crowns. Oversizes available as in table of piston data; oversize dimensions marked on piston crowns. Gudgeon pin bores offset <sup>1</sup>/<sub>8</sub>in towards thrust side of pistons. Reassemble with slot in piston to non-thrust, i.e., near-side, fully floating gudgeon pins.

Top compression ring plain, second and third taper faced, and slotted scraper oil control ring all fitted above gudgeon pin.

Remove pistons with con-rods through cylinder bores, after removal of sump, etc., to gain access to con-rod bolts.

**Camshaft**

Double row roller, endless chain drive. Spring-loaded slipper type tensioner fitted to front engine plate by two bolts and secured with locking wire. Tensioner is secured for removal of timing chain by insertion of <sup>1</sup>/<sub>8</sub>in Allen key in tensioner body base after removal of plug cover, and engaging key in hole in base of cylinder helix.

Camshaft runs in four steel-backed white-metal lined bushes pressed into crankcase block. End float controlled by thrust plate locating on spigot on front end of shaft. When refitting timing chain and gears, set crankshaft and camshaft with keyways at approximately TDC when viewed from front. With "short" part of chain, when chain is doubled and bright links are together on right-hand side, engage camshaft sprocket tooth marked "T" with top bright link and crankshaft sprocket tooth marked with dimple with other bright link. Press on sprockets retaining their positions relative to their respective shafts.

ENGINE DATA		
<b>General</b>		
Type	29K	
No. of cylinders	6	
Bore x stroke: mm	83.34 x 88.9	
in	3.281 x 3.50	
Capacity: c.c.	2,912	
cu in	177.7	
Max. b.m.s.p. at r.p.m.	142lb/sq in at 2,700	
Max. torque at r.p.m.	167lb. ft at 2,700	
Compression ratio	9 : 1	
<b>CRANKSHAFT AND CON. RODS</b>		
	Main Bearings	Crankpins
Diameter	2.3742-2.3747in	2.0000-2.0005in
Length	1.495-1.505in	—
Running clearance: main bearings	.0013-.0028in	
big ends	.002-.0035in	
End float: main bearings	.0025-.0055in	
big ends	.005-.009in	
Undersizes	.010, .020in	
Con. rod centres	6.601-6.60in	
No. of teeth on starter gear/pinion	106/10	

PISTONS AND RINGS		
Clearance (skirt) top	.0032-.0043in	
bottom	.0010-.0016in	
Oversizes	+.010, .020, .030 .040in	
Weight without rings or pin	15oz 10dr	
Gudgeon pin: diameter	.8748-.8750in	
fit in piston	push fit	
fit in con. rod	floating	
	Compression	Oil Control
No. of rings	3	1
Gap	.009-.014in	.009-.014in
Side clearance in grooves	.0015-.0035in	.0015-.0035in
Width of rings	.125-.138in	.125-.138in

CAMSHAFT				
	No. 1	No. 2	No. 3	No. 4
Bearing journal diameter (in)	1.7887-1.7892	1.7687-1.7692	1.7487-1.7492	1.7287-1.7292
length (in)	1.50	1.187	1.187	1.25
Bearing clearance	.001-.002in			
End float	.003-.006in			
Timing chain: pitch	.375in			
No. of links	62			
VALVES				
	Inlet		Exhaust	
Head diameter	1.750-1.745in		1.562-1.557in	
Stem diameter	.341-.342in		.341-.342in	
Face-angle	45°		45°	
Seat face width	.091-.097in		.198-.217in	
	Inner		Outer	
Spring length: free	1.969in		2.047in	
fitted	1.504in		1.594in	
at load	26lb		55.7lb	

**Valves**

Overhead, non-interchangeable, inlet larger and of different face angle than exhaust. Split cone cotter fixing, retained by spring clips. Rubber sealing rings with retainer on valve stems below collars. Valve guides plain, chamfered at each end, no shoulder, non-interchangeable; exhaust guides counterbored at lower ends, and both types countersunk at top. Guides should be driven out and new

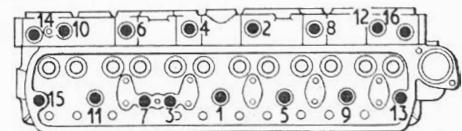


Diagram showing order of tightening cylinder head stud nuts. See also table of "Nut Tightening Torque Data" this page

guides inserted from top until upper ends project  $\frac{1}{8}$  in from machined surface of spring seat.

### Tappets and Rockers

Shouldered barrel tappets sliding direct in crankcase. Access through plates in crankcase. Bushed rockers all interchangeable work on hollow shaft carried in six pillars mounted on cylinder head. Oil is fed to rocker shaft from drillings in head and piped to No. 4 shaft pillar whence oil is delivered to each rocker through shaft drillings. Pairs of rockers for each cylinder are located either side of mounting pillars, separating springs between rockers of adjacent cylinders.

Push rods can be removed after adjustment has been slackened right off. Inner rockers can be pulled aside against separate springs. End rockers may be taken off after removal of split pin, plain washer and double-coil spring washer. Note: Valve springs must be compressed before rockers can be pulled aside.

### Lubrication

Gear type pump spigoted and flange bolted to bottom face and towards rear of crankcase, driven by slotted shaft and skew gear from rear of two gears of camshaft. Pump may be removed after taking off sump and pick-up strainer and three securing nuts. Oil pump cover gears, and driving shaft may be removed after taking out four bolts securing endplate and strainer flange pipe to pump body. Gauze intake strainer in sump.

Normal running pressure is 50 lb/sq in ( $3.52 \text{ kg/cm}^2$ ) and 20 lb/sq in ( $1.4 \text{ kg/cm}^2$ ) should be shown when engine is idling.

### Cooling System

Pump, fan non-adjustable bellows type thermostat retained in water outlet elbow in cylinder head. Pump spindle runs in two ball bearings and has renewable seal. Adjust fan belt until there is  $\frac{1}{2}$  in movement either way in vertical run of belt.

## TRANSMISSION

### Clutch

On later cars from Eng. No. 29F/4898, a diaphragm clutch is fitted. This unit is hydraulically operated by slave cylinder from master cylinder.

Access to clutch unit for service is obtained after removal of gearbox. No provision for pedal adjustment in service.

### Gearbox

Four-speed, synchromesh on upper three ratios, central, remote control lever fitted. Overdrive, of Laycock de-Normanville pattern, fitted as optional equipment, is operative on 3rd and top gears. For full constructional details of this unit, readers are referred to Service Supplement No. 226/C1.

### To Remove Gearbox and Overdrive

Gearbox and/or overdrive unit may be removed from chassis separately from engine, or engine/gearbox and overdrive may be removed as detailed in engine "removal" section. Complete power unit/gearbox removal is to be preferred.

### To Dismantle Gearbox

With gearbox on bench or in suitable cradle, unscrew eight short bolts and one long bolt and remove bellhousing complete with clutch operating mechanism. Take off drive gear bearing plain and spring plates. Remove oil level indicator from gearbox top cover, unscrew and remove 12 bolts, and take off cover. Note that two cover securing screws nearest gearchange lever turret are longer than rest, and ensure that detent springs (three) positioned in gearbox casing under cover front edge are preserved.

To remove change speed lever from top cover, release circlip, washer and conical spring from lever turret. With small dia. punch drive two roll pins in turn into the  $\frac{1}{8}$  in holes on each side of lever turret. This will

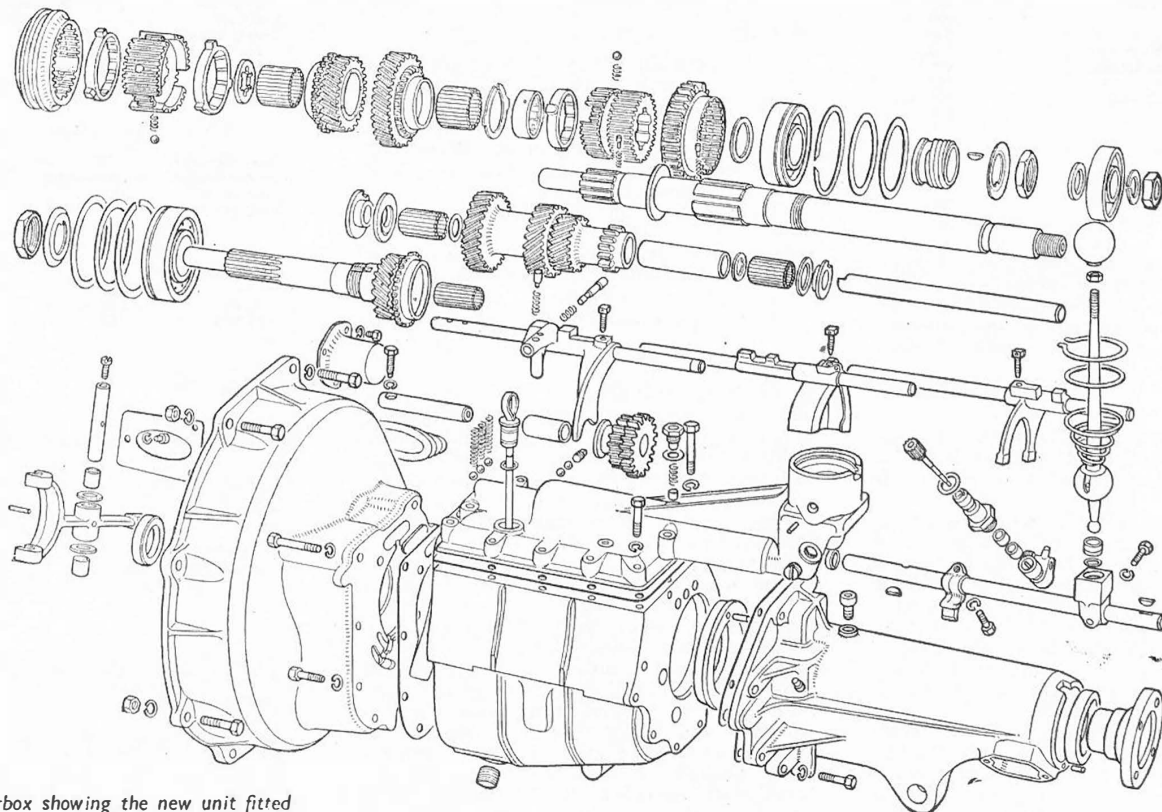
cause them to move into bore of lever ball, lift out lever and retrieve roll pins from ball end. Remove three detent springs, cut locking wire and remove striking fork retaining screws. Hold shifter shafts in neutral position (preventing interlock balls from operating) and withdraw 3rd and 4th speed shifter shaft, retrieving detent ball. Withdraw remaining shifter shafts, similarly preserving detent balls, and two interlock balls located between shafts at front end of casing.

To remove reverse selector plunger from reverse striking fork, extract split pin, releasing plunger and spring which, in turn will release a detent plunger and spring.

Undo and remove propeller shaft flange nut (tool no. 18G34A) to prevent flange from turning, and withdraw flange from gearbox mainshaft splines. Unscrew speedometer pinion housing from gearbox extension casing, and remove it complete with pinion. Unscrew eight bolts, and take off rear extension casing from gearbox main casing, and withdraw mainshaft bearing plain and spring washers.

If gearbox is fitted with overdrive, unscrew eight nuts securing adaptor plate to rear of gearbox. Do not disturb joint between adaptor plate and overdrive, pull both away from gearbox and over mainshaft. Slide overdrive oil pump cam off mainshaft, exposing bearing distance collar and circlip, which may be left *in situ*. If, when dismantling mainshaft assembly, it is required to remove mainshaft bearing from shaft, it will be necessary to withdraw circlip and distance collar first. Unscrew reverse idler gear shaft locating screw, withdraw shaft and lift out reverse idler gear. Push layshaft forwards, and remove it from front of gearbox casing, lowering laygear onto bottom of casing.

Mark position of locating peg on mainshaft bearing relative to gearbox casing, so that on reassembly peg may be correctly aligned to locate in hole provided for it in rear extension, or in overdrive adaptor plate. Withdraw mainshaft assembly complete from gearbox from rear, for further dismantling if required. Extract 18 needle roller bearings from rear of drive gear, and with suitable



Parts of the gearbox showing the new unit fitted to this series of cars, with detail of the gearcasing, gear trains together with the selector mechanism

brass drift, drive out bearing forwards from its housing, and draw drive gear assembly from front of gearbox casing. Lift out laygear and thrust washers.

**To Dismantle Mainshaft**

Remove items in following order: slide off top/3rd gear hub and interceptors from forward end. Depress plunger locating 3rd gear locking plate, rotate plate to line up splines, and slide off shaft. Extract plunger and spring and slide off 3rd speed gear with 32 rollers. Remove the small circlip retaining rear bearing to the mainshaft and press off bearing complete with locating plate and spacer. Slide off 1st/2nd speed hub, 2nd speed interceptor and 1st gear rearwards from shaft. If 1st gear is withdrawn from its hub take care to preserve balls and springs located in radial drillings in hub. Depress 2nd gear locking collar plunger and rotate collar to line up splines; slide collar from shaft and extract two halves of 2nd gear washer, retaining spring and plunger. Take off 2nd speed gear, together with 33 rollers. To dismantle primary shaft assembly, turn up lock-tab, unscrew nut and remove bearing.

**To Reassemble Gearbox**

Reverse dismantling procedure, noting following points. Fit spacer to laygear unit, with washer positioned at each end. Smear needle rollers with thick grease, and insert them in ends of laygear unit (23 each end). Assemble layshaft front and rear thrust washers and plates, position them in gearbox, tags engaging in grooves in gearcasing. Place laygear in box. Assemble drive gear and bearing, together with needle rollers and insert in box. Fit mainshaft assembly from rear end of box ensuring that sliding dog and interceptors are in position on 3rd/4th synchronizing hub. Align mainshaft bearing housing locating peg with marks made on gearbox casing when unit was dismantled, press bearing into position. Lift laygear unit in position, insert layshaft from front end of box, lining up thrust washers and needle rollers. Insert reverse idler gear. With non-overdrive box, fit mainshaft bearing plain and spring plates, with the plain plate against bearing. Bolt gearbox rear extension into position, ensuring that rear bearing washer is in position on mainshaft. Screw in speedo pinion and housing. Push propeller shaft flange onto mainshaft splines, securing it with nut and washer (tool no. 18G34A).

Insert the three gear striking forks in position. Replace reverse gear shifter shaft, securing it to reverse gear striking fork, making sure that dowelled end of locating screw engages with hole in shaft. Place shifter shaft interlock ball in position between reverse gear and 1st/2nd speed shifter shaft bores, at front of gearbox casing. With reverse striking fork in neutral position, insert 1st and 2nd speed shifter shaft, noting that shaft has an interlock pin. Fit fork locating screw, place second interlock ball in position, between 1st and 2nd speed gear and 3rd and 4th gear and the 3rd and 4th speed gear shifter shaft bores.

With 1st and 2nd speed gear striking fork in neutral position, insert 3rd/4th gear shifter shaft, and fit fork locating screw. Tighten all three fork locating screws and secure with new locking wire. Refit change speed lever to gearbox top cover, and place shifter shaft detent balls into respective bores, refit top cover, locating remote control selector rod arm in striking forks, refit oil level indicator.

Turn layshaft so that stepped end engages groove in bellhousing. Position drive gear bearing plain and spring plates in recess in rear face of bellhousing (plain plate to bearing), and refit bellhousing to gearbox, ensuring that oil seal on primary shaft splines is not damaged.

**Rear Axle**

Three-quarter floating hypoid bevel drive, rear cover welded to banjo-type housing.

To remove axle unit from car, jack up and support chassis frame side members on stands and remove rear wheels. Undo four self-locking nuts and remove bolts securing propeller shaft and pinion flanges. Disconnect handbrake cable from axle tubes by unscrewing it from link on balance lever and nut from outer casing to axle. Detach brake fluid pipes at unions and shock absorbers from links on mounting brackets. Remove self-locking nuts from "U" bolts, preserve fibre pad between axle and springs for replacement. Disconnect anti-sway bar, and with axle free, shock absorber connecting links. Remove rubber block between axle and N/S chassis frame. Axle unit may then be drawn out to off side.

Differential unit and axle should not be serviced without stock of distance-pieces and gauges. Replacement units available.

**CHASSIS**

**Brakes**

Girling hydraulic servo-assisted. Calliper and disc arrangement on front wheels, leading and trailing shoe drum brakes at rear. Front brakes are self-adjusting. Rear brake cylinders carry also wedge expanders operated by centre positioned handbrake through cable from compensator on axle.

To renew front disc brake pads, jack up car and remove road wheels. Take off spring clips locking pad retaining pins in position and take out pads. Push piston assemblies back, with suitable lever, insert new pads, refit retaining pins and spring clips.

Square ended adjusters for rear brakes. Tighten and back off two clicks, then apply brake hard to centralize shoes. No need to jack up rear wheels.

No separate adjustment for handbrake.

**Rear Springs**

Semi-elliptic. Three zinc interleaves between upper leaves. Silentbloc bushes in spring eyes. Frame shackles brackets have flanged bronze bushes, and pins are shouldered. Nut and spring washer fit on outside, self-locking nut on inside.

Lateral link anchored in rubber between chassis frame on off side and axle bracket on near side.

**Front Suspension**

Independent. Coil springs and double wishbone links. Inner ends of upper links pivoted on shock absorbers. Outer ends of upper links and inner ends of lower links rubber bushed. Outer ends of lower links have screwed bushes. Anti-roll bar linked to brackets bolted to front arms of lower links with spring plates.

Hubs run on taper roller self-adjusting bearings. Inner races separated by cast-iron distance-piece. Lipped oil seal pressed in behind inner bearing, lip to bearing. Tighten stub axle nuts fully (40-70lb. ft).

Relay arm shaft pivoted in bracket attached to chassis frame by three set-screws inserted from outside. Shaft has flange at top, fitting in recess, and works in two plain bushes. Retaining cap flange-bolted to top of bracket with joint washer.

Steering ball points are nylon seat, sealed-for-life pattern. No maintenance required. Joints on side sections are integral with tubes.

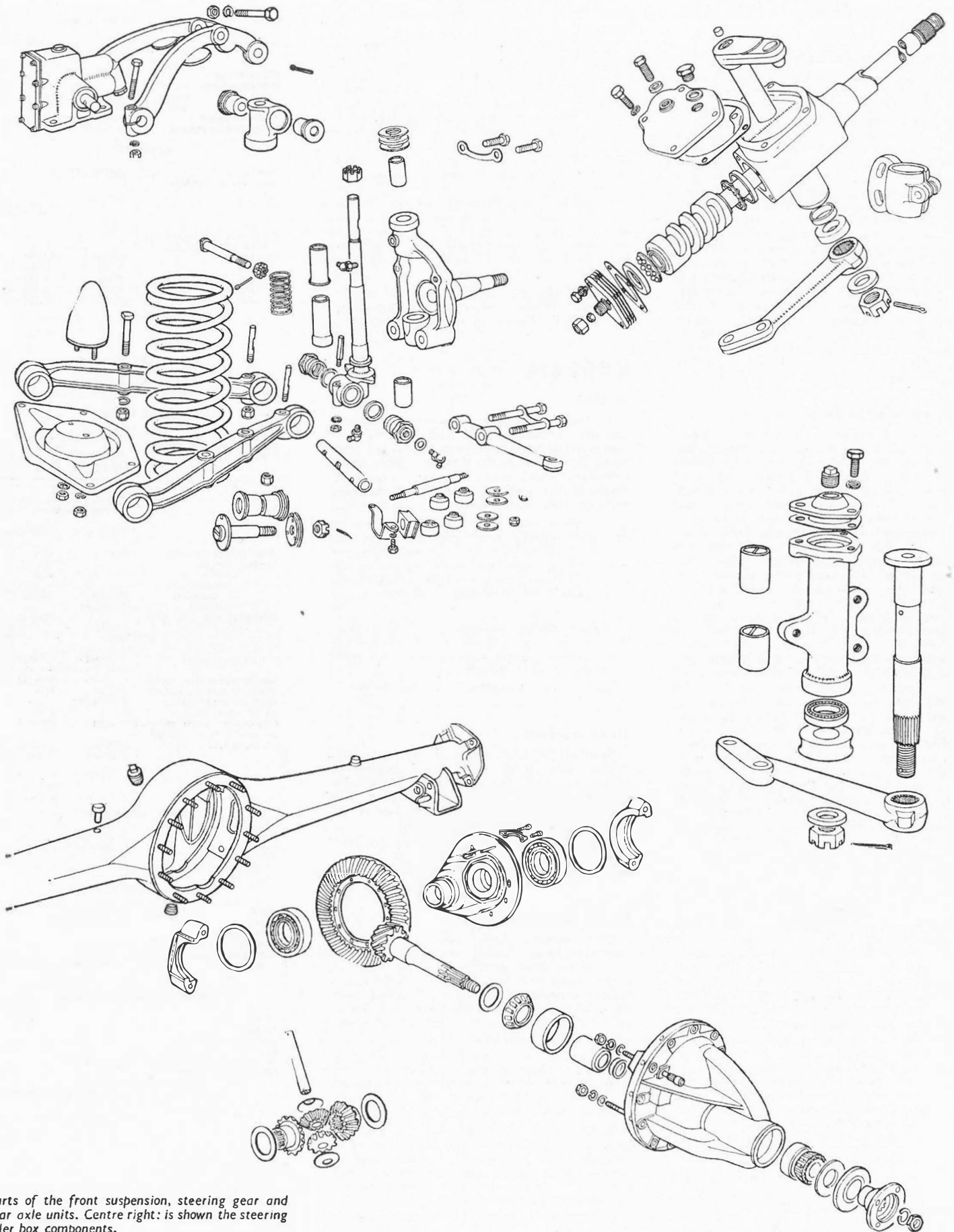
CHASSIS DATA		
Clutch Make	Borg & Beck	
Type	From Eng. No. 29F/4898 diaphragm	
Diameter: no	9in	
Damper springs: no.	6	
colour load	maroon/lf. green	
Facing material	110-120lb. wound yarn	
Clutch release bearing	Graphite (MY3D)	
GEARBOX		
Type	synchronesh	
No. of forward speeds	4	
		From Eng. No. 11342
Final ratios (Standard box with 3.545 : 1 axle)		
1st	10.386 : 1	10.209 : 1
2nd	7.877 : 1	7.302 : 1
3rd	4.640 : 1	4.743 : 1
4th	3.545 : 1	3.545 : 1
Rev.	13.400 : 1	13.127 : 1

PROPELLER SHAFT		
Make	Hardy Spicer	
Type	Needle roller brg. U.J.	
FINAL DRIVE		
Type	½-floating hypoid bevel	
Grownwheel/bevel pinion teeth: std.	39/11	
o'drive	43/11	
BRAKES		
Type	Girling hydraulic	
	Front (disc)	Rear (drum)
Drum or disc diameter	11½in	11in
Lining: length	—	10.53in
width	—	2½in
(or disc pad) thickness	13/32in.	.187in
pad area	4.25sq. in	—
Frictional area (rear only)	—	95sq. in
SPRINGS		
	Front	Rear
Length (eye centres, laden)	—	36 ± ¼in
Width (or wire dia. of coils)	.531in	1½in
Mean dia. of coil springs	4.125in	—
No. of leaves (or coils)	7	7
Free camber (length, coil)	11.82in	4in
Loaded camber (length, coil) at load	7.375in@ 1040lb	½ ± ¼in neg.

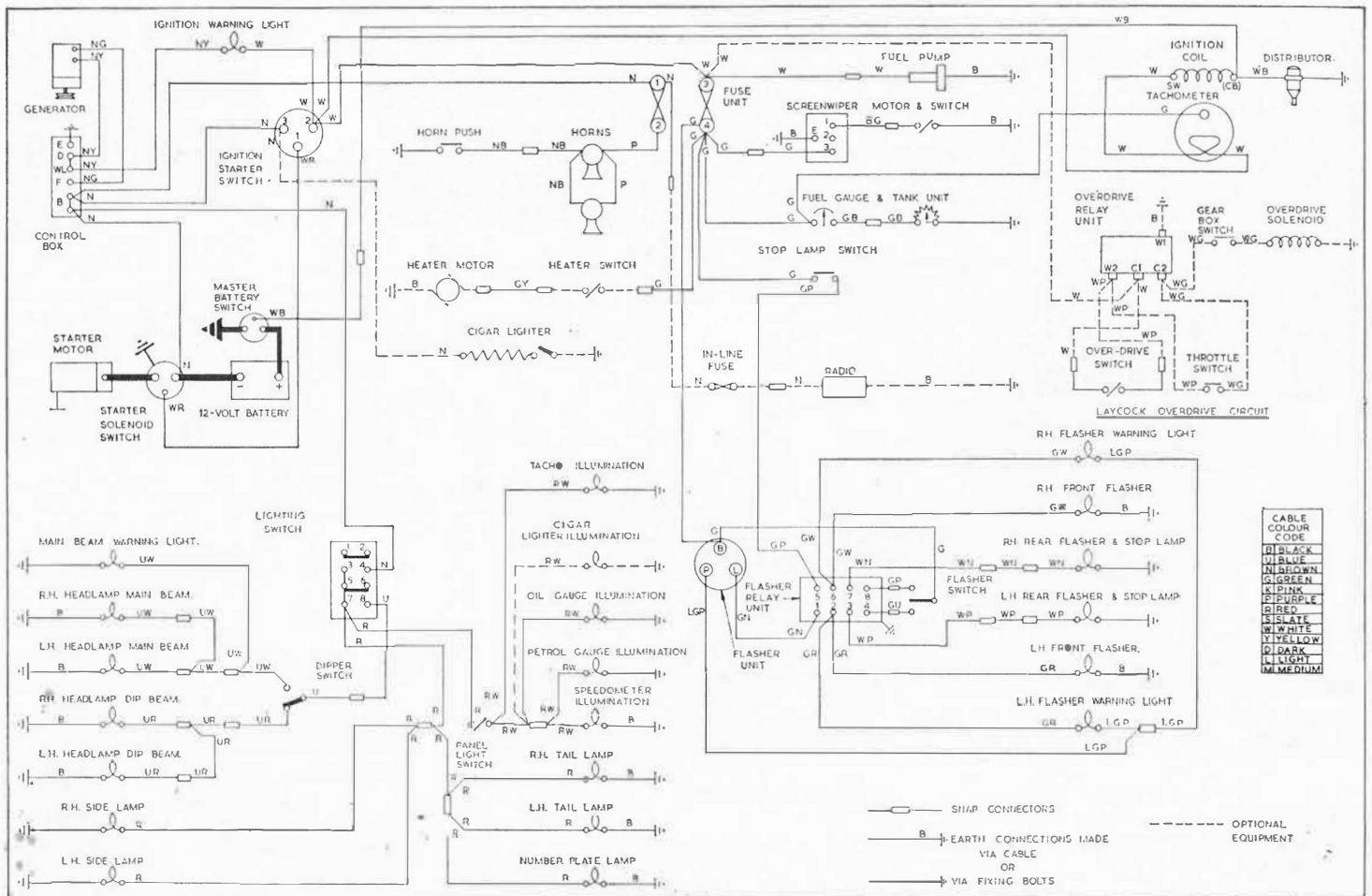
SHOCK ABSORBERS	
Make	Armstrong
Type	lever hydraulic
Service	replacement
STEERING BOX	
Make	Cam Gears
Type	cam and peg
Adjustments: column end float	shims grubscrew and locknut
cross shaft end float	
mesh	
FRONT-END SERVICE DATA	
Castor	2°
Camber	1°
King pin inclination	6½°
Toe-in	1-¼in
No. of turns lock to lock	2½ (approx.)
Adjustments: castor	Nil
camber	
toe-in	
	screwed track rod ends

**Steering Gear**

Bishop cam and lever. Provision made for adjustment of inner column and cam end float by shims between lower ball race cup and cover plate; mesh of peg in cam adjusted by grub screw and locknut in top cover.



Parts of the front suspension, steering gear and rear axle units. Centre right: is shown the steering idler box components.



Wiring diagram by permission of Joseph Lucas Ltd.,

LUCAS EQUIPMENT	
<b>*BATTERY</b>	
Model BT9A	
<b>GENERATOR</b>	
Model C42	Part No 22900
<b>CONTROL BOX</b>	
Model RB340	Part No 37331
<b>STARTING MOTOR</b>	
Model M418G	Part No 25578
Drive S-Type Inboard	
<b>DISTRIBUTOR</b>	
Model 25D6	Part No 40966
Max. centrifugal advance (crank degrees) 34-38 at 3,200 rev./min.	
No advance below 300 r.p.m.	
Centrifugal advance springs. Part No 54416660	
Max. vacuum advance (crank degrees) 14°-18° at 15in Hg	
No advance below 2½in Hg.	
<b>IGNITION COIL</b>	
Model HA12	Part No 45102
Primary resistance 3.0-3.5 ohms	
Running current at 1,000 r.p.m. 1.0 amp.	
<b>WINDSCREEN WIPER</b>	
Model DR3A	Part No 75456
<b>HORN(S)</b>	
Model 9H	Part No(s) 54068008
	High Note
	Part No(s) 54068009
	Low Note
Type: Windtone	
Current consumption 3.0-3.5 amp. (per horn)	
<b>FLASHER UNIT</b>	
Model FL5	Part No 35020
<b>FUSE UNIT</b>	
Model 4FJ	
Fuse ratings 35 amp.	
35 amp.	

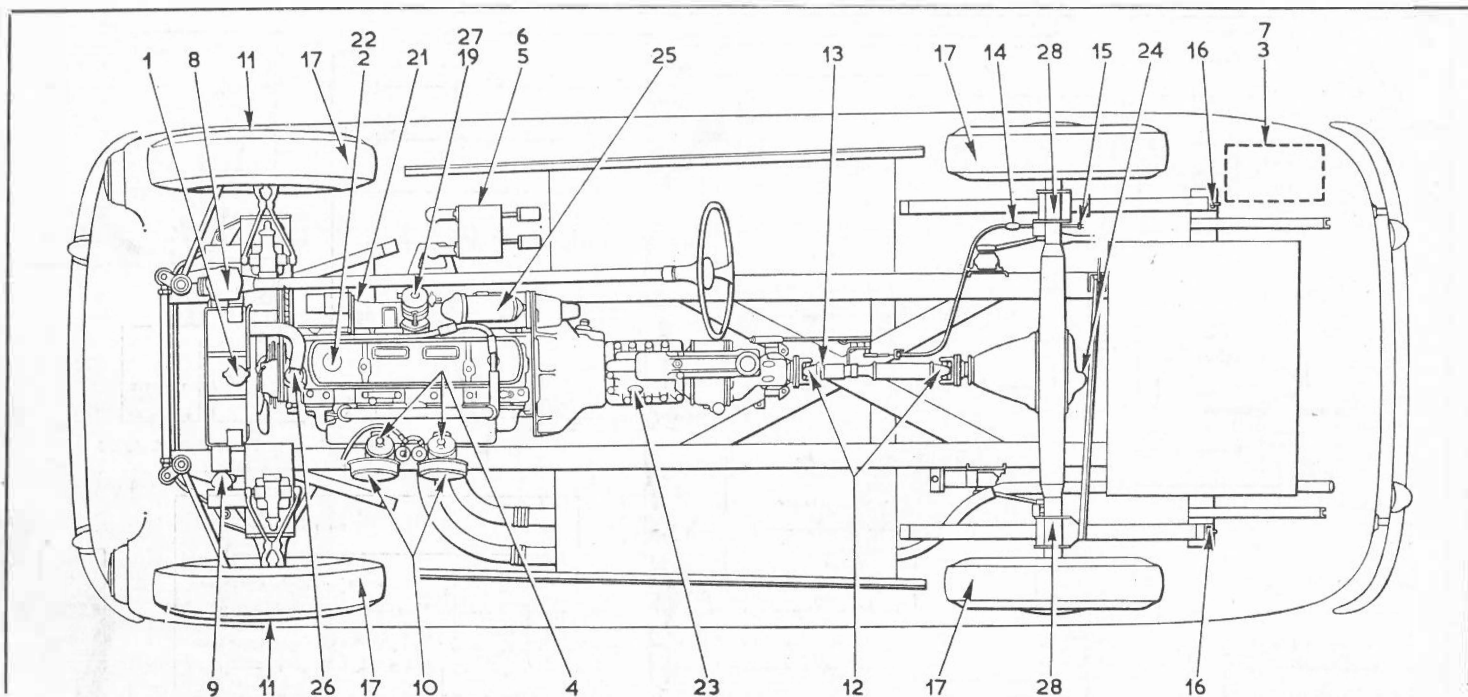
ADDENDA		
Component	Model	Part No.
Battery (dry charged export)	BTZ9A	
Steering column control (Fixed column)	CC1	33517
Reflex reflector (Export Germany & Sweden)	RER14	57C83
Starter solenoid switch (Earlier fitment)	2ST	76464

Sundry Equipment	Model	Part No.
Suppressor (U.K. & Germany)	WS5	78106
*Reflex reflectors	RER25	57125
Flasher relay	DB10	33117
Switches	Model	Part No.
Ignition/starter	476A	31973
*Starter solenoid	2ST	76471
Lighting	57SA	31837
Dip	103SA	34536
Stop light	HL2	31882
Panel light	65SA	31828
Wiper	57SA	34426
*Steering column control (adjustable column)	CC1	32984

Lamps	Model	Part No	Bulb		
			Lucas No	Wattage	Cap
Head (Home)	F700	51956	414	50/40	BPF
Head (LHD Dip Right)	F700	51966	355	42/36	BPF
Head (Export U.S.A. and Canada)	F700	58626	—	—	—
Head (Export France)	F700	58291	411	45/40	Unified European
Head (Export Sweden)	F700	58463	410	45/40	Unified European
Head (Export Europe)	F700	58290	410	45/40	Unified European
*Side/flasher	594	52338	380	6/21	SBC
Rear flasher	594	53564	380	6/21	SBC
Number plate	467	53836	989	6	MCC
Ignition warning (bulbholder)	—	319408	987	2.2	MES
Main beam warning (bulbholder)	—	319408	987	2.2	MES
Flasher warning (bulbholder)	—	63511	C87	2.2	MES

\*See also Addenda

ADDENDA					
Lamp	Model	Part No.	Bulb		
			Lucas No.	Wattage	Cap
Side (Export: Germany & Sweden)	594	52391	207	6	SCC
Front flasher (Germany & Sweden)	594	52337	382	21	SCC



**KEY TO MAINTENANCE DIAGRAM**

**DAILY**

- 1. Radiator } check and top up
- 2. Engine sump }

**WEEKLY**

- 3. Battery—check and top up

**EVERY 3,000 MILES**

- 4. Carburettor piston dampers
- 5. Clutch supply tank
- 6. Brake supply tank } check and top up
- 7. Battery
- 8. Steering box
- 9. Steering idler box
- 10. Carburettor air cleaners—clean and re-oil
- 11. Brakes—check and adjust, inspect disc pads
- 12. Propeller shaft universal joints
- 13. Propeller shaft sliding joint
- 14. Handbrake cable } grease gun
- 15. Handbrake compensator
- 16. Rear spring shackles
- 17. Tyre pressures—check

**EVERY 6,000 MILES (as for 3,000 miles plus following)**

- 18. Valve rocker clearances—adjust
- 19. Distributor—oil shaft bearing, auto. advance mechanism smear cam with grease
- 20. Front wheel alignment—check
- 21. Dynamo end bearing—oil can
- 22. Engine sump—drain and refill
- 23. Gearbox } check and top up
- 24. Rear axle }
- 25. Engine oil filter element—renew

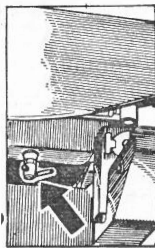
**EVERY 9,000 MILES (as for 3,000 miles)**  
**EVERY 12,000 MILES (as for 6,000 miles plus following)**

- 26. Water pump—lubricate sparingly with grease
- 27. Distributor drive shaft—half turn of grease cap
- 28. Rear road spring seat bolts—check for tightness

\* Not shown on diagram.

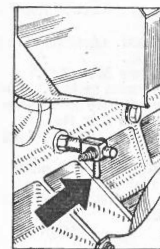
TUNE-UP DATA	
<b>Firing order</b>	1-5-3-6-2-4
<b>Tappet clearance (cold):</b> inlet	.012in
exhaust	.012in
<b>Valve timing:</b> inlet opens	16° BTDC
inlet closes	56° ABDC
exhaust opens	51° BBDC
exhaust closes	21° ATDC
<b>Standard ignition timing</b>	10° BTDC
<b>Location of timing mark</b>	crankshaft pulley and pointer
<b>Plugs:</b> make	Champion
type	UN 12V
size	14mm
gap	.024-.026in
<b>Carburettor:</b> make	S.U. (twin)
type	HD8
jet size	UH
<b>Air cleaner:</b> make	Burgess or Cooper
type	oil wet
<b>Fuel pump:</b> make	S.U.
type	electric-LCS
pressure	2-2½lb/sq in

	FILL-UP DATA	
	Pints	Litres
Engine sump (including filter)	12½	7.25
Gearbox	5½	3.27
Overdrive	1½	.76
Rear axle	3	1.7
Cooling system	19	10.78
Fuel tank	12 galls.	54.6
Tyre pressures: front	20lb/sq in	1.41kg/cm <sup>2</sup>
rear	25lb/sq in	1.76kg/cm <sup>2</sup>



**DRAINING POINTS**

Left: shows the radiator matrix draining point, access from beneath, and right: the cylinder block drain tap. Both taps should be opened fully, when draining and flushing out the system, prior to, and after the use of anti-freeze



**RECOMMENDED LUBRICANTS**

	CASTROL	ESSO	B.P.	DUCKHAM'S	MOBIL	SHELL	FILTRATE	STERNOL
<b>Engine: All temperatures above 0°F (°18C), and Gearbox</b>	Castrolite	Extra Motor Oil	Energol Visco-Static	Q5500	Mobiloil Special	X-100 Multigrade 10W/30	10W/30 Multigrade	Multiplic
<b>Rear axle and steering and idler box (a)</b>	Castrol Hypoy	Gear Oil GP 90	Energol SAE 90EP	Hypoid 90	Mobilube GX 90	Spirax 90 EP	Hypoid Gear 90	Ambroteum EP 90
<b>Water pump and Grease points</b>	Castrolase LM	Multi-purpose Grease H	Energrease L2	L.B. 10 Grease	Mobilgrease MP	Rctinax A	Super Lithium Grease	Ambroline LHT
<b>Oil can. SU carb dashpot</b>	Castrolite	Extra Motor Oil	Energol Visco-Static	Q5500	Mobiloil Special	X-100 Multigrade 10W/30	10W/30 Multigrade	Multiplic
<b>Upper cylinder lubricant</b>	Castrollo	Upper Cylinder Lubricant	Energol UCL	Adcoyl Liquid	Uppertube	Upper Cylinder Lubricant	Petroyl	Magikoyl

(a) Rear axle and steering: For temperature below 10°F use SAE 80 Hypoid lubricant. Hydraulic brakes and clutch: Girling Crimson Brake Fluid. Shock absorbers: Armstrong Super (thin) Shock Absorber Fluid.

Note: MULTIGRADE OILS. In addition to the above recommendations, is approved the use of multigrade oil produced by the companies shown, for all climatic temperatures unless the engine is old or worn.