

# FORD POPULAR (1961 Series)

Manufacturers : Ford Motor Co., Ltd., Dagenham, Essex

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**T**HIS model was originally introduced in its present form in 1959. At that time there was a re-arrangement of name classification in the "small-car" range produced by the Ford concern and with the introduction of the entirely new Anglia model the new Popular was, in reality, a modified Anglia of the old series. It is some considerable time since we have produced an article in this service data series which dealt with the small Ford cars, and although the early Anglia was so covered, more than five years have elapsed since this time and for this reason we are presenting this article which features the latest developments and servicing techniques connected with these cars.

Present production models are two-door saloons of Unitary body construction. Coil spring independent suspension is used at the front, and semi-elliptic springing is fitted to the rear. Orthodox transmission with open propeller shaft is used to take the drive from the three-speed gearbox to the three-quarter floating hypoid bevel geared rear axle. One of the most noticeable changes to the engine, from the servicing angle, is that adjustable tappets are provided. Otherwise, the engine is similar in general construction to the familiar 1172 c.c. side-valve unit which has been used on Ford cars for some years. In this application, power output is quoted as 36bhp at 4,500 rpm, working at a compression ratio of 7.0:1.

Car numbers and serial numbers bearing the series prefix 100E are to be found stamped on the near side of the cylinder block close to the oil filler tube. Chassis numbers, which are the same as engine numbers are to be found on the offside suspension unit upper mounting.

Names of makers of proprietary parts and components are not mentioned, to avoid confusion. Most of them are well known but in many cases the components are modified to Ford requirements and cannot be serviced with standard replacement parts. For this reason, the Ford Motor Co. require that all components should be serviced through their own organization.

Special tools designed to speed up some repair operations are marketed by V. L. Churchill & Co., Ltd., Great South West Road, Bedfont, Nr. Feltham, Middx, and carried by all Ford dealers. These tools are of great assistance and in a number of cases save costly dismantling. A comprehensive list of the essential basic and modified tools is set out in these pages. All threads and hexagons are of the Unified form, except on a few proprietary parts.



**DISTINGUISHING FEATURES.** The car is a two-door, four-light saloon. Headlamps, together with sidelamps are recessed into front wings, the cowling colour matching body paint. Chrome bumper bar plates are fitted front and rear. "Popular" Motif appears in chrome lettering on the front of the bonnet.

## ENGINE

### Mounting

At front, brackets bolted to either side of engine, crankcase rest on rubber blocks bonded to studs and bolted to front suspension cross member.

At rear bonded rubber blocks sandwiched and bolted between semi-circular channel section detachable cross member, and complete assembly rigidly bolted to gearbox extension housing.

### Removal

Engine can be removed with or without gearbox.

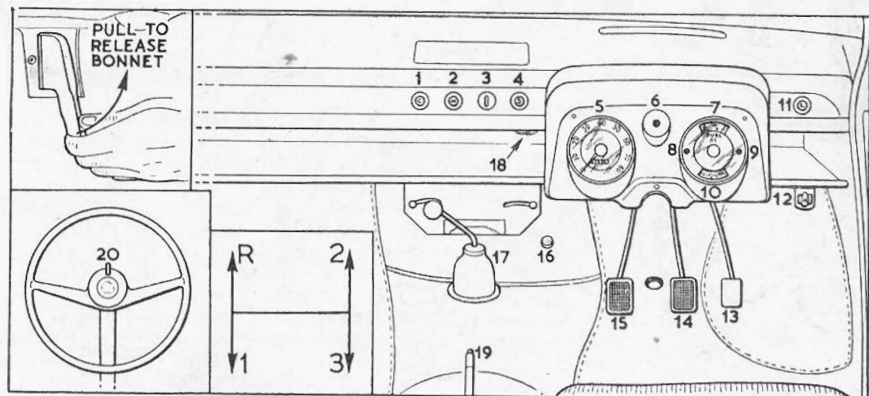
### To Remove Without Gearbox

Take off bonnet, drain radiator, disconnect all pipes and wires, controls,

battery and wires to starter motor. Disconnect exhaust pipe at manifold joint take off radiator air deflector and remove radiator. Fit lifting eyebolt to No. 3 sparking plug hole. Remove front mounting nuts and two nuts to cross member on near side. Take weight of engine, remove carpet inside car and take out rubber cover and floor plate around gear lever. Undo two top flywheel housing bolts and locate jack under gearbox. Remove remaining flywheel housing bolts. Raise jack to support gearbox and remove engine splash shield. Withdraw engine forwards and then upwards clear of car.

### To Remove Engine With Gearbox

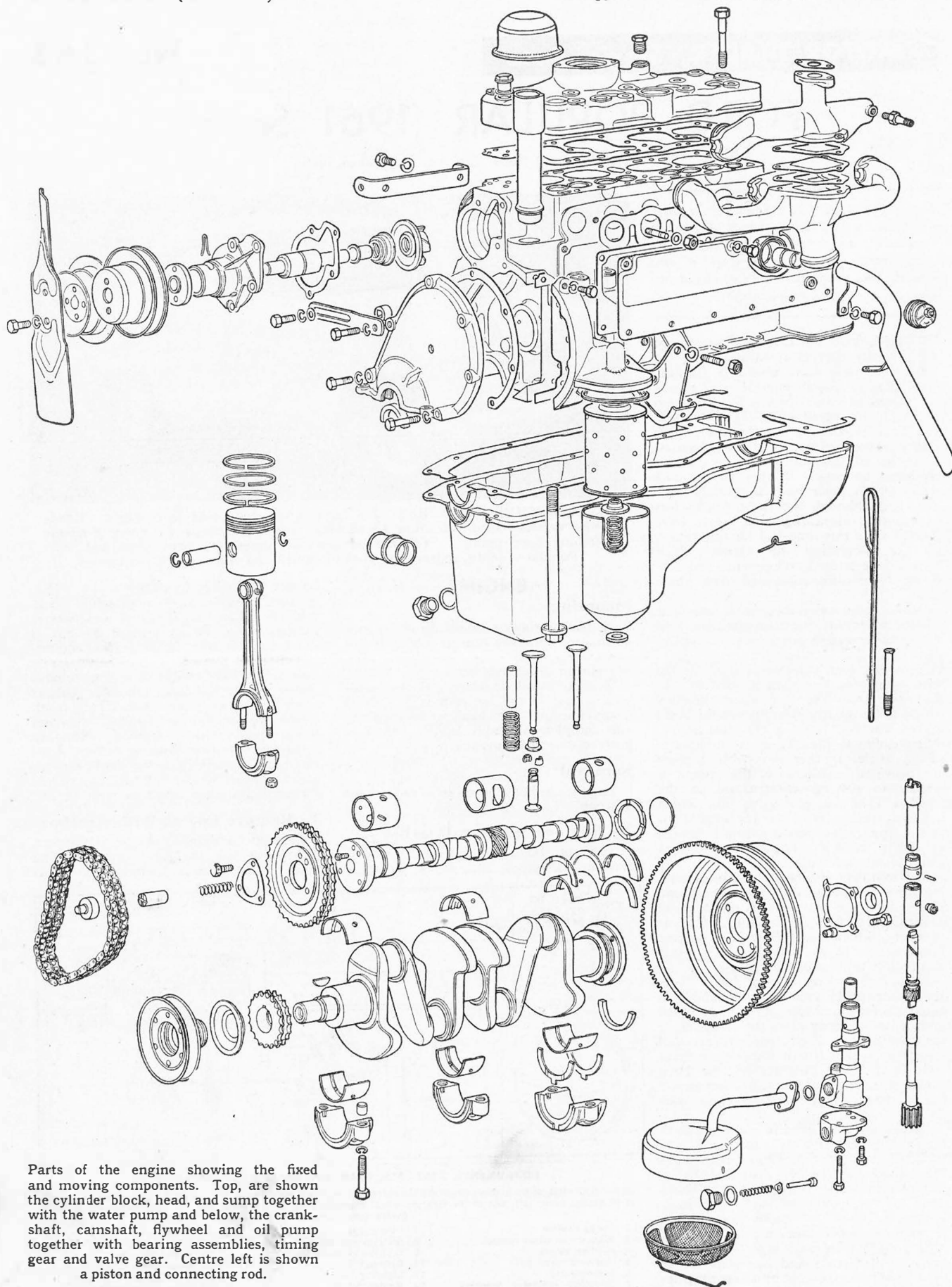
Proceed as detailed above but attach lifting eye bolt to No. 1 sparking plug hole. Remove rear mounting to cross



INSTRUMENTS, CONTROLS, GEAR POSITIONS, AND BONNET LOCK.

Insets, upper left, show in more detail the bonnet release handle fitted beneath and behind the dash panel as indicated at 18 above, below left; site of the steering wheel mounted control, and inner left, the operative positions of the centre mounted gear lever.

- |                                     |                              |                                |
|-------------------------------------|------------------------------|--------------------------------|
| 1. Choke control                    | 7. Fuel gauge                | 14. Brake pedal                |
| 2. Windscreen wiper control         | 8. Oil pressure warning lamp | 15. Clutch pedal               |
| 3. Ignition switch                  | 9. Ignition warning lamp     | 16. Dipper switch              |
| 4. Starter control (pull)           | 10. Gear positions           | 17. Gear lever                 |
| 5. Speedometer                      | 11. Lighting switch          | 18. Bonnet release interior    |
| 6. Direction indicator warning lamp | 12. Heater switch            | 19. Hand-brake lever           |
|                                     | 13. Accelerator              | 20. Direction indicator switch |



Parts of the engine showing the fixed and moving components. Top, are shown the cylinder block, head, and sump together with the water pump and below, the crankshaft, camshaft, flywheel and oil pump together with bearing assemblies, timing gear and valve gear. Centre left is shown a piston and connecting rod.

SPECIAL TOOLS	
	Part No.
<b>WHEELS AND HUBS :</b>	
Rear hub remover ...	P1007
Rear hub bearing sleeve remover ...	P1022
Front hub bearing cups removers and replacer (main tool) ...	PT1024
Oil seal driver handle ...	550
<b>FRONT AXLE AND STEERING:</b>	
Track control arm outer ball joint spring compressor ...	P3015
Steering column adjusting nut wrench ...	P3043
<b>REAR AXLE:</b>	
Differential cone remover and pinion bearing inner cone remover and replacer (main tool) ...	CP4000
Differential bearing cone remover (adaptors) ...	P4000-10
Pinion bearing cone remover and replacer (adaptors) ...	P4000-25
Pinion assembly remover (main tool) ...	CPT4014
Pinion assembly remover (adaptor) Drive pinion oil seal remover and replacer (use with 550 handle) ...	P4027
Drive pinion flange holder ...	P4028
Drive pinion bearing preload gauge ...	CP4030
Drive pinion preload gauge (adaptor) Axle housing bearing cup replacer ...	P4030-1
Rear axle oil seal replacer ...	P4033
<b>SPRINGS, FRONT SUSPENSION AND FRAME:</b>	
Front spring compressor ...	P5008
Front suspension unit upper support pad ...	P5011
Suspension unit upper mounting sleeve and driver ...	P5014
Front suspension upper guide seat wrench ...	P5017
<b>ENGINE:</b>	
Gudgeon pin remover and replacer (main tool) ...	P6018
Camshaft bush remover and replacer (adaptors) ...	P6031
Camshaft bush remover and replacer (adaptors) ...	P6031-1
Crankshaft gear replacer ...	P6032
<b>CLUTCH AND GEARBOX:</b>	
Transmission extension bearing remover and replacer ...	P7038
Main drive gear oil seal replacer Mainshaft bearing remover and replacer ...	P7042
Mainshaft oil seal replacer ...	P7044
Flywheel bearing remover (main tool) Collet for use with 7600 main tool ...	P7062
Mainshaft oil seal remover Mainshaft oil seal remover adaptor ...	7600
	CPT7600-3
	7657
	P7657-4

NUT TIGHTENING TORQUE DATA	
ENGINE	lb ft
Con. rod (main nut) ...	20-25
Con. rod (locknut) ...	2½-3
Main bearing bolt ...	55-60
Cylinder head bolt ...	65-70
Flywheel nut ...	21-23
<b>GEARBOX</b>	
Pressure plate—flywheel ...	12-15
Main drive gear bearing retainer to gear case ...	12-15
Gear change housing to gear case ...	12-15
Transmission extension to gear case ...	20-25
Speedo. gear bearing to extension housing ...	20-25
<b>REAR AXLE</b>	
Driving gear to differential case bolts ...	15-18
Universal joint coupling flange nuts ...	15-18
Drive pinion oil seal retainer to axle housing bolts ...	20-25
Drive pinion bearing locknut ...	70-80
Axle housing bolts ...	20-25
<b>BRAKES</b>	
Brake plate locknuts ...	15-18
<b>STEERING</b>	
Stabilizer bar attachment foot U bolts ...	15-18
Steering spindle arm bolts ...	30-35
Track control arm outer bushing nut ...	50-60
Drop arm nut ...	75-85
Steering wheel nut ...	20-25
<b>FRONT SUSPENSION</b>	
Upper support nuts ...	15-18
Thrust bearing retaining nut ...	45-55
<b>WHEELS</b>	
Wheel nuts ...	50-55

member nuts. Take out gear lever and cap.

Jack up rear end of car and fit stands. Disconnect and remove propeller shaft, and disconnect speedometer cable drive from gearbox. Slacken clutch operating cylinder clamp bolt and remove cylinder. Remove stands from rear of car. Take off engine splash shield and manoeuvre engine and gearbox unit forwards and upwards clear of car.

### Crankshaft

Three main bearings. Thin steel-backed white metal-lined shells located by tabs in caps. End float controlled by split thrust washers recessed either side of rear main bearing and located by tabs in cap. No hand fitting permissible, but bearings may be changed without removing crankshaft employing special tool A/E6331AB. Before removing front and centre bearing caps, which are dowel located, ensure that they are replaced as dismantled, as these two caps though indistinguishable, are not interchangeable and must not be fitted the wrong way round.

Flywheel, with shrunk-on ring gear, spigoted on rear flange of crankshaft, located by one dowel and retained by four setscrews with lock plate. Oil impregnated bronze clutch spigot bush pressed into flywheel.

Timing sprocket, flat face with timing mark to front, and fan pulley keyed on front end of shaft by single Woodruff key and retained by setscrew and large washer in end of shaft (no provision for hand starting). Pulley hub passes through seal in timing case cover.

Rear oil seals, renewable, fit in hemispherical grooves in rear face of sump and block. Composition sump gasket and cork inserts around rear main bearing fitted.

### Connecting Rods

Big ends direct white metalled. Replacements supplied machined to size. No hand fitting permissible. Caps must not be filed to take up wear. Small ends bronze bushed for fully floating gudgeon pin, retained by circlips in piston. Do not attempt to service bushes, as these are not serviced separately.

Replacement rods available with undersize big end bearings of .010, .015, .020, .030 and .040in and standard gudgeon pin bush; or with above undersizes of bearing and .004in undersize gudgeon pin bush.

Rods retained on crankshaft by non-renewable studs with nuts and thin locknuts (see Nut Tightening Torque Data).

### Pistons

Aluminium alloy, split skirt cam ground. Fully floating gudgeon pin located by circlips. Test fit of piston in bore with .0015in feeler ¼in wide, 9in long, on side opposite split. Feeler should need 8-11 lb pull to extract, measured with spring balance. Two compression rings and one scraper ring fitted above gudgeon pin.

Fit with split to camshaft (near) side. Remove and assemble piston and con rod through top, big end will pass through bores.

### Camshaft

Duplex endless double row roller chain drive taken on sprocket spigoted to camshaft located by dowel and retained by three setscrews. Camshaft runs in three

ENGINE DATA	
<b>General:</b>	
Type ...	S.V.
No. of cylinders ...	4
Bore × stroke: mm ...	63.5 × 92.5
in ...	2.5 × 3.64
Capacity: c.c. ...	1172
cu in ...	71.55
R.A.C. rated h.p. ...	10
Max. b.h.p. at r.p.m. ...	36 @ 4500
Max. torque at r.p.m. ...	53 lbft @ 2500
Compression ratio ...	7.0 : 1

CRANKSHAFT AND CON. RODS				
Diameter ...	Main Bearings			Crankpins
	Front	Centre	Rear	
	2.001-2.0015in	1.698-1.699in		
Length (in)	1.615-1.6358	1.310-1.314	2.003-2.006	1.001-1.005
<b>Running clearance:</b>				
main bearings ...				.0015in (max)
big ends ...				.005-.002in
End float: main bearings ...				.002-.011in
big ends ...				.004-.010in
Undersizes: mains ...				.010, .020, .030in
big-ends ...				.010, .015, .020, .030, .040in.
No. of teeth on starter ring gear/ pinion ...				100/9

PISTONS AND RINGS		
Clearance (skirt) ...		8-11 lb pull on .0015in feeler ¼in wide
Oversizes ...		.0025, .005-.010, .020-.030in
Gudgeon pin: diameter ...		.6876, .6879in
fit in piston ...		Nil to .0002in selective
fit in con. rod ...		fully floating
	Compression	Oil Control
No. of rings ...	2	1
Gap: top ...	.007-.012in	.007-.012in
centre ...	.008-.014in	
Side clearance in grooves ...	.0015-.003in	.001-.0025in
Width of rings: top ...	.076-.0765in	
centre ...	.093-.0935in	.1545-.155in

CAMSHAFT			
Bearing journal: diameter ...	1.560-1.5605in		
	Front	Centre	Rear
length ...	1.63in	1.62in	1.25in
Bearing clearance			.001-.002in controlled by spring
End float ...			¼in
Timing chain: pitch ...			52
No. of links ...			

VALVES		
	Inlet	Exhaust
Head diameter ...	1.15-1.16in	1.05-1.06in
Stem diameter ...	.3095-.3105in	.3086-.3096in
Face-angle ...	45° 15'	45° 15'
Spring length: free ...		1.98in
Valve closed: fitted ...		1.83in
at load ...		20-26.5lb

white metal steel backed bushes. Centre bearing formed around helical drive gear for oil pump and distributor. No hand fitting permissible, endfloat controlled by spring-loaded plunger in end of shaft bearing on hardened thrust button in timing cover. Bronze thrust ring behind flange on shaft. Fit with inner radius towards flange.

## Valves

Side by side, non-interchangeable, inlet larger than exhaust, and stem diameters slightly different. Valves retained by split cone cotters beneath cone shaped spring retainer. Plain guides, pressed into block and removed by special tool A/ET6510A.B. Single valve springs fitted.

## Tappets

Mushroom tappets working directly in cylinder block. Remove camshaft to extract tappets.

Provision for adjustment by self-locking tappet screw. Threaded adjuster studs are self locking. Clearance may be set in normal position if at variance from stated tolerances.

## Lubrication

Gear pump in sump. Integral drive housing spigoted in crankcase and flange-bolted. Skew driving gear on separate short shaft with dogs at each end, running in tubular housing which is an easy fit in crankcase and is located by dowel pressed into cylinder block, with hole tapped for extraction. When refitting pump and drive shaft, position so that when ignition timing is set for No. 1 cylinder firing, larger of two "D"s formed by offset driving dog of distributor faces No. 2 cylinder sparking plug.

Circular gauze intake filter with sheet metal surround flange bolted to intake pipe of pump. Oil is delivered through hollow drive housing to open-sided gallery cast in side of crankcase and enclosed by tappet cover.

External bypass oil filter with renewable element fitted on rear side of crankcase. Non-adjustable spring-loaded plunger relief valve fitted to oil pump direct. Oil-pressure switch fitted, con-

trolling dash warning light. Lamp cuts out at 5-7 lb/sq in pressure.

## Ignition

Coil. Distributor has centrifugal control, and is spigoted in cylinder head. Clamp plate retained by round-headed screw, and slotted for fine adjustment of timing. Boss is cast on cylinder head for fixing screw. Plain and spring washer should also be fitted under screw head.

## Cooling System

Pump, fan and thermostat. Pump housing is cast integral with cylinder block and additional temperance control is obtained through thermostat positioned in water outlet pipe from cylinder head. Adjust tension of fan belt by swinging dynamo until there is  $\frac{1}{2}$  in free play of belt midway between fan pulley and crankshaft drive pulley.

# TRANSMISSION

## Clutch

Single dry plate, ball thrust release bearing sealed with lubricant and operated hydraulically from slave cylinder. Running adjustment provided by movement of operating cylinder in its bracket. Correct clearance established when end of release arm has to and fro movement of 1/10 in. Unhook retracting spring before adjusting.

Access to clutch for service after removal of gearbox. Pressure plate serviced as assembly only.

## Gearbox

Three-speed synchromesh on top and second gear. When topping up gearbox fill to level of filler plug on offside of box. Unless special spout is available, it is easier to remove lever by unscrewing ball cap and pour oil into lever turret, ensuring that lever is in neutral position.

## To Remove Gearbox

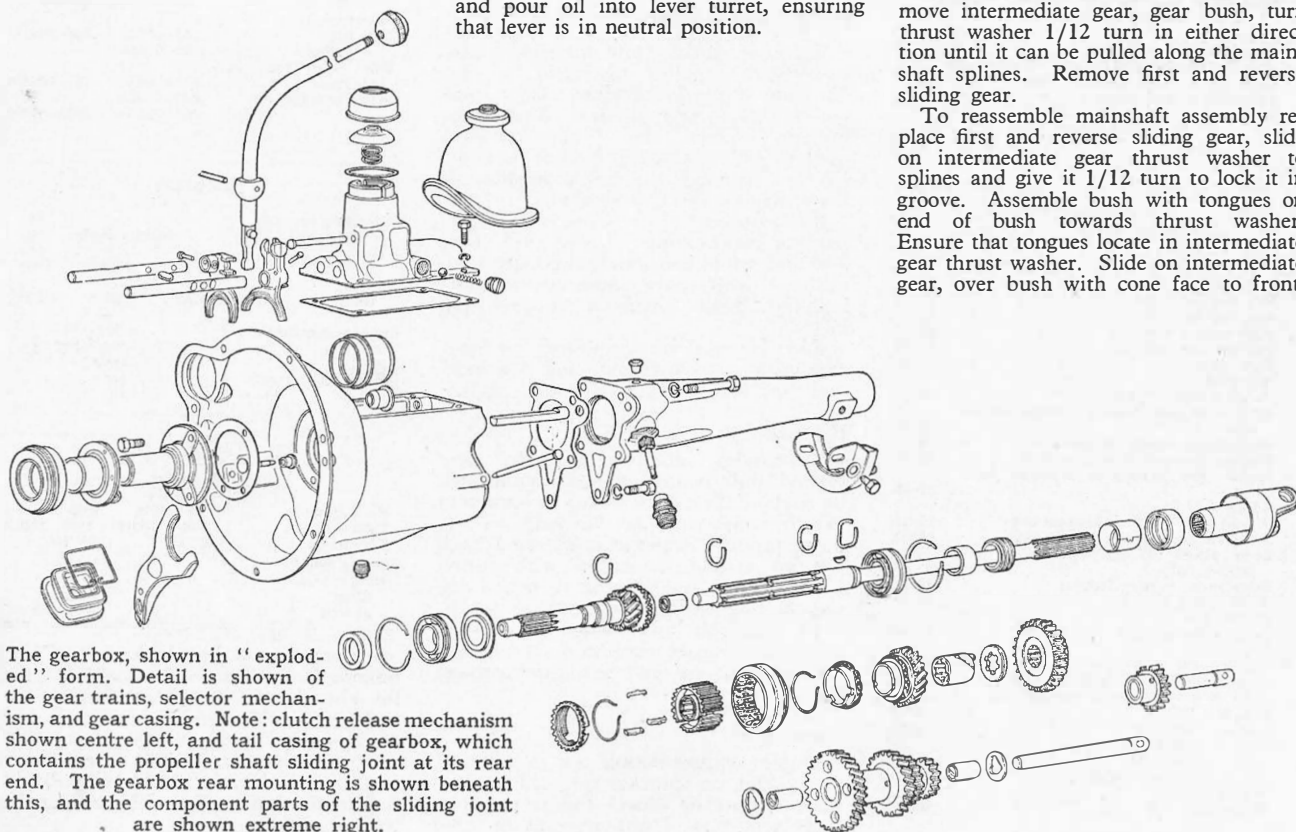
Box may be removed with or without engine as detailed in engine section. Open type propeller shaft facilitates removal separately, without engine. Remove gearbox rear mountings. Remove clutch release fork mechanism complete with bearing and sleeve which is flange-bolted to rear of bell housing, detach clutch operating cylinder and leave hanging on pipe. Remove gearbox, by taking off eight bell-housing to engine setscrews.

## To Dismantle Gearbox

Remove bell housing, take out speedometer drive cap and pinion, and rear extension housing together with rear oil seal. Pull primary shaft forward, and pull mainshaft to rear as far as possible. Remove circlip, synchromesh unit can then be lifted off front of mainshaft. Draw rear ball bearing off mainshaft after removal of circlip, speedometer drive gear, key and spacer, and lift out mainshaft assembly through top of box. Remove spring ring locating primary shaft ball bearing on shaft (do not disturb spring ring round outer race of bearing). Push bearing back into housing and drive shaft through to inside. Bearing can then be pushed out. To extract spigot bush from primary shaft, tap bush and screw in bolt with sleeve of larger diameter than bush, which will be pulled out. Synchromesh unit should not be dismantled unless special fixture is available for replacing two springs and three blocker plates. Remove layshaft and reverse retainer pin and drive out layshaft spindle to rear, taking care to support cluster as spindle is removed. Lift out bushed cluster. Drive out reverse spindle to rear with bent drift, and lift out bushed cluster. If cluster bushes are renewed, they must be reamed.

To dismantle mainshaft assembly, remove intermediate gear, gear bush, turn thrust washer 1/12 turn in either direction until it can be pulled along the mainshaft splines. Remove first and reverse sliding gear.

To reassemble mainshaft replace first and reverse sliding gear, slide on intermediate gear thrust washer to splines and give it 1/12 turn to lock it in groove. Assemble bush with tongues on end of bush towards thrust washer. Ensure that tongues locate in intermediate gear thrust washer. Slide on intermediate gear, over bush with cone face to front.



The gearbox, shown in "exploded" form. Detail is shown of the gear trains, selector mechanism, and gear casing. Note: clutch release mechanism shown centre left, and tail casing of gearbox, which contains the propeller shaft sliding joint at its rear end. The gearbox rear mounting is shown beneath this, and the component parts of the sliding joint are shown extreme right.



## To Assemble Gearbox

Insert plain end of layshaft spindle in box. Stick thrust washers on both ends of layshaft cluster with thick grease and lower cluster carefully into box, pushing spindle in and taking care that thrust washers are in position. Drive spindle home ensuring that hole for retainer pin lines up with retainer pin hole in gearbox housing. Insert reverse gear cluster with boss to front and drive in spindle from rear so that retainer pin holes are lined up.

Insert mainshaft assembly in top of box with rear end projecting through rear bearing hole. Insert primary shaft in same way. Assemble synchromesh unit on front end of mainshaft with projecting boss of inner hub to front.

Place thin dished oil thrower on primary shaft with dished part to front, and press on primary shaft ball bearing (outer spring ring to front) until spring ring can be inserted in shaft groove.

Press rear ball bearing on to mainshaft with outer spring ring to rear. Replace speedo drive gear spacer, key and gear together with snap ring, replace clutch release fork, bearing and dust cover. Refit rear extension housing and speedo driving gear. Replace selectors and selector mechanism in reverse order of dismantling, if assembly has been dismantled, and replace gear lever when box is assembled in car.

When gearbox has been installed in car and filled with oil, it should be topped up after running as some oil runs into extension housing and does not drain back.

## Propeller Shaft

Needle roller bearing universal joints. Nipples for lubrication of joints. No external sliding joints as front yoke end slides in gearbox.

## Rear Axle

Three-quarter floating spiral bevel drive. Axle casing split vertically near centre line, differential and bevel pinion assembly carried on offside half.

To remove axle assembly jack up rear of car and disconnect propeller shaft from flange. Take off handbrake cables at equalizer, undo brake fluid pipe and insert plug. Disconnect rear shock absorbers, remove road wheels, and remove handbrake cable from axle housing. Remove U bolts and draw axle out to rear of car, leaving road springs in situ.

To remove shafts draw off hubs, split axle casing at centre flange, draw out differential and shaft assembly and remove crown wheel from differential cage.

Bevel pinion carried in taper roller bearings located in axle housing with distance-piece between outer races, and retained by propeller shaft flange. Bearings adjusted by self locking nut and washer on bevel pinion shaft. Adjusting nut should be tightened to give a pre-load of 8-12in/lb without oil seal. This can be checked by spring balance hooked to arm.

Differential assembly carried in taper roller bearings, outer races pressed into axle housings. No adjustment for bearings or mesh. Mating faces of housings are machined to close limits after bearing races have been pressed in. Backlash between crown wheel and bevel pinion should be .006-.008in.

## CHASSIS

### Brakes

Hydraulic. Two leading shoe front brakes with separate wheel cylinder for each shoe. Snail cam adjustment for front brakes. Tighten each adjuster until shoe is binding, then back off until free. Rear brakes have square-ended adjusters, tighten and back off until free. Car must be jacked up for each wheel to be adjusted.

Handbrake operates on rear wheels through cable in conduit, thence through equalizer and cable through yoke equalizer to brake plate.

To take up slack in handbrake cables tighten rear brake adjusters fully, then tighten cables by nut and locknut on short rod between brake and equalizer. Re-adjust rear brakes.

### Rear Springs

Semi-elliptic. Loose rubber shackle bushes, bonded rubber anchorage bushes. Tighten all bolts fully with car in static laden position.

Rubber inserts in tips of three main leaves.

### Front Suspension

Independent, coil springs. Telescopic shock absorbers form structural part of suspension units, being located at top in caged ball bearings mounted in rubber bushes located in top of wheel arches, and at bottom in ball joints at outer ends of lower links. Anti-roll bar, joined to outer ends of lower links by rubber bushes, gives fore-and-aft location and takes brake reaction stresses.

To remove suspension unit on one side, fit spring clips with car in normal position (special clips fit over six coils in pairs, and lock together for safety). Jack up under cross-member and remove wheel. Undo stub axle nut, and pull off brake drum and hub together with bearings. Undo four nuts holding grease baffle and brake backplate to lower end of suspension unit. Backplate can be supported on one side to save disconnecting brake-fluid pipe providing brake pedal is not operated. Disconnect brake rod, anti-roll bar and lower link front suspension unit. Take off three nuts on top of wheel arch, and drop out suspension unit.

To dismantle suspension unit, undo large nut holding thrust bearings and rubber mounting unit on piston rod (special spanner holds rod by slotted top while undoing nut). Draw off bearing assembly, and lift off upper spring seat, spring, and lower spring seat.

Shock absorber can be dismantled if special spanner is available for undoing upper guide, which is screwed and peened into tube.

Springs are graded by rate into two grades, indicated by one or two marks on one end of spring, two marks indicating stronger spring. Springs on each side must be of same grade. Note that ends of springs are not ground flat, but locate in recesses in spring seats. Lower seat welded to suspension unit casing.

Bonded rubber bush assemblies, fitted into inner ends of lower links, mounted on pins passing through front cross-member. Assembly retained on pin with self locking nuts.

Special bush remover and replacer allows lower link inner bushes to be changed without dismantling outer ends.

Front suspension cross-member, carrying lower link assembly, is bolted to body

CHASSIS DATA			
Clutch Make	...	...	Ford
Type	...	...	sdp
Springs: no.	...	...	6
Centre springs: no.	...	...	4
Linings: thickness	...	...	.132-.142in
dia. ext.	...	...	7.38in
dia. int.	...	...	4.5in
GEARBOX			
No. of speeds	...	...	3
Final ratios: 1st	...	...	17.25 : 1
2nd	...	...	8.89 : 1
3rd	...	...	4.429 : 1
Rev.	...	...	21.22 : 1
FINAL DRIVE			
Type	...	...	3-floating sb drive
Crown wheel/bevel pinion teeth	...	...	31/7
BRAKES			
Type	...	...	2 LS front, L & T rear
Drum diameter	...	...	8in
Lining: length	...	...	7.32in
width	...	...	1.25in
thickness	...	...	$\frac{3}{8}$ - $\frac{1}{2}$ in
No. of rivets per shoe	...	...	10

SPRINGS		
	Front	Rear
Length (eye centres, laden)	—	42in/485-515lb load
Free length (coil)	14.22	—
Width (or dia. of coil)	3.873	1.53in
No. of leaves (or coils)	10.33	7
Free camber	—	4.95in
Loaded test height (length, coil) at load	8.09 @ 466-514lb	1.80in @ 485-515lb

SHOCK ABSORBERS	
Type	double acting telescopic front and rear
Service	Front — service Rear — replacement

STEERING BOX	
Type	Worm and ball peg shims
Adjustments: column end float	cross shaft end float
mesh	spring loaded thrust screw

FRONT-END SERVICE DATA	
Castor	1°-2° 30'
Camber	0° 45'-2° 15'
King pin inclination	3° 30'-5°
Toe-in	$\frac{1}{8}$ - $\frac{1}{4}$ in
No. of turns lock to lock	2
Adjustments: castor	Nil
camber	Threaded sleeves and clamp
toe-in	

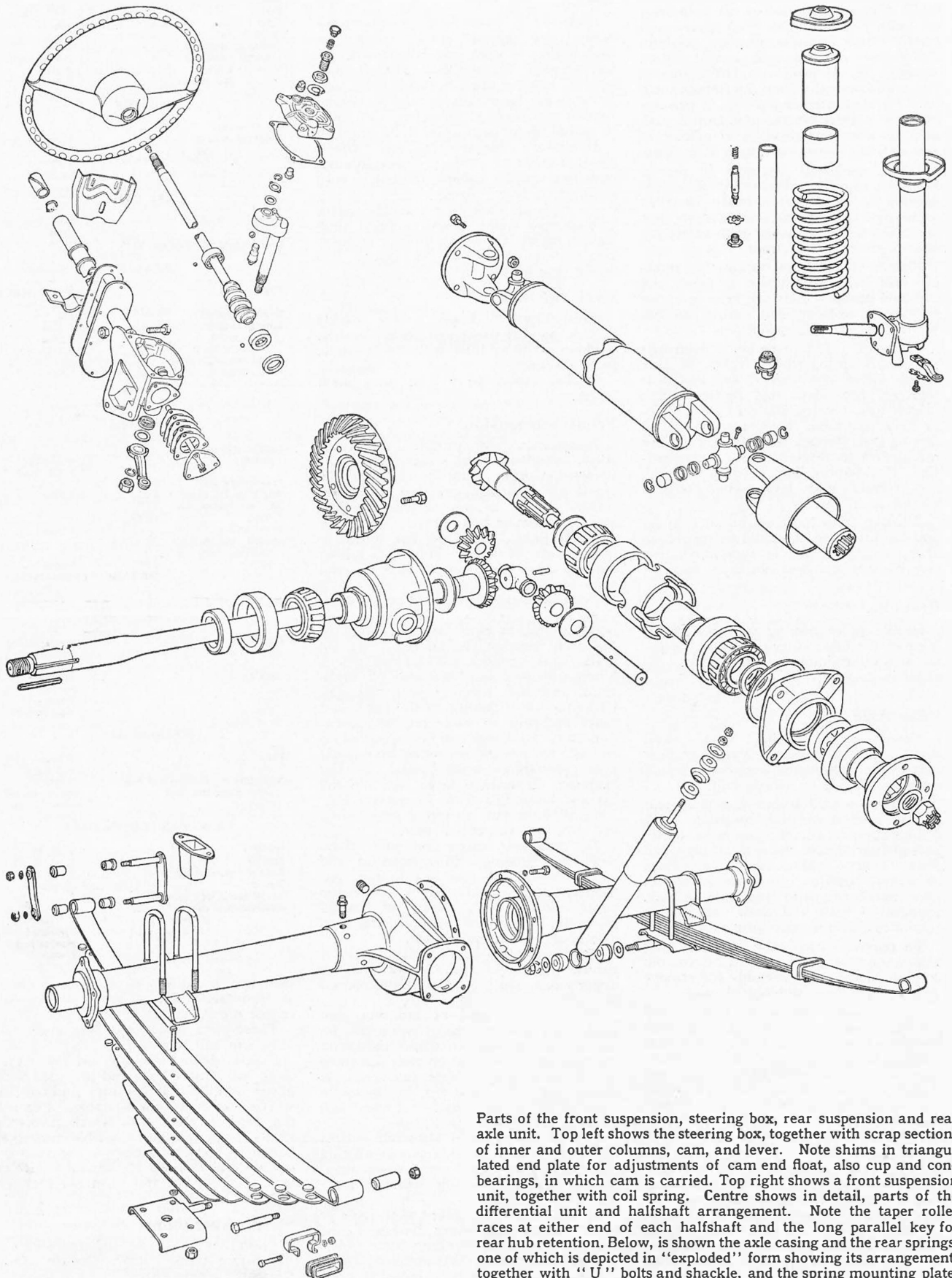
shell, but should only be detached in event of front end damage, as it also carries engine mountings.

Three-piece track rod supported by drop arm and relay arm.

Centre section of track rod has lubricated ball joint at each end provided with grease nipples. Relay arm end carries screwed bush and pin assembly. Tapered pin fixed in relay arm, which pivots in identical screwed bush assembly in bracket bolted to body. Bushes are threaded on outside and retained by cap nuts. Relay arm, and bracket and bush are serviced only as assemblies.

### Shock Absorbers

Front: Telescopic incorporated in suspension units. Rear: Double acting telescopic piston type.



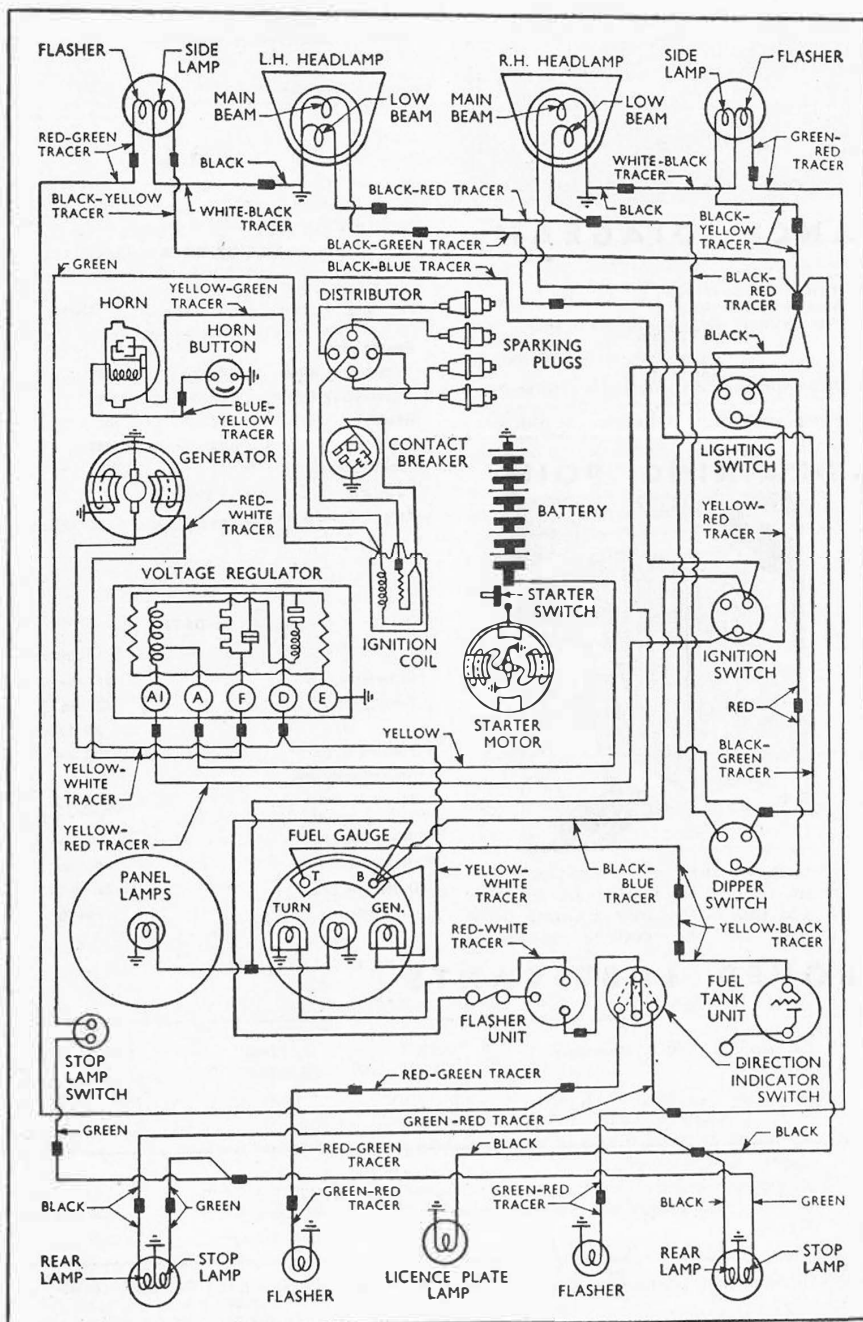
Parts of the front suspension, steering box, rear suspension and rear axle unit. Top left shows the steering box, together with scrap sections of inner and outer columns, cam, and lever. Note shims in triangulated end plate for adjustments of cam end float, also cup and cone bearings, in which cam is carried. Top right shows a front suspension unit, together with coil spring. Centre shows in detail, parts of the differential unit and halfshaft arrangement. Note the taper roller races at either end of each halfshaft and the long parallel key for rear hub retention. Below, is shown the axle casing and the rear springs, one of which is depicted in "exploded" form showing its arrangement, together with "U" bolts and shackle, and the spring mounting plate.

## TUNE-UP DATA

Firing order ... ..	1-2-4-3	Carburettor: type ... ..	down draught
Tappet clearance (cold): inlet ...	.0115-.013in	Settings: choke ... ..	21 mm
exhaust ...	.0115-.013in	main jet ... ..	110
Valve timing: inlet opens ...	3° 30' BTDC	starter jet ... ..	120
inlet closes ...	56° 30' ABDC	main air bleed ... ..	160
exhaust opens ...	47° 30' BBDC	idling jet ... ..	50
exhaust closes ...	12° 30' ATDC	idling air bleed ... ..	1.2 mm.
Ignition timing (initial advance) ...	5° BTDC	starter air jets ... ..	5.0 mm
Location of timing mark ... ..	Cylinder front cover and c/shaft pulley (grooves)	Air cleaner: type ... ..	dry gauze
Plugs: make ... ..	Champion	no. ... ..	9600
type ... ..	L10	Fuel pump: type ... ..	Mech.
size ... ..	14 mm	pressure ... ..	1½-2lb/sq in
gap ... ..	.025in		

## ELECTRICAL TEST DATA

Battery:	
model ... ..	100E-10655-A
voltage ... ..	12
no. of plates/cell ... ..	7
capacity @ 20 hr rate ... ..	40 ah
Spec. gravity: at 70°F ... ..	1.270-1.285
Dynamo:	
model ... ..	2 brush shunt wound
regulation ... ..	C V C
service No. ... ..	EOTA-10000-C
rotation (comm. end) ... ..	Anticlockwise
cut-in volts at r.p.m. ... ..	12.7-13.3 v at 837 crank r.p.m.
regulated output volts ... ..	15.6-16 at 68°F
max. output ... ..	240 watts
max. charging rate ... ..	20 amps
regulator voltage:	
10°C (50°F) ... ..	15.7-16.1
20°C (68°F) ... ..	15.6-16.0
30°C (86°F) ... ..	15.5-15.9
Starter:	
service No. ... ..	EOTA-11001-B
rotation (comm. end) ... ..	Anticlockwise
lock torque ... ..	9½ lb/ft
ampere draw at lock torque ... ..	375
Coil:	
service No. ... ..	100E 12024
resistance at 63°F:	
primary ... ..	4-4.4 ohms
secondary ... ..	7000-8000 ohms
Distributor:	
type and service No. ... ..	Single CB 12100
advance range (crank deg) centrif. ... ..	14°
advance starts (crank r.p.m.) ... ..	1000
max. advance (crank r.p.m.) ... ..	3800
contact spring tension ... ..	18-22 oz
contact location gap ... ..	.014-.016in
condenser capacity ... ..	.18-.23 mf



## BULBS

	Voltage	Wattage	Cap
Headlamps: vertical dip	12	42/36 (U.K.)	Prefocus
	12	36/36 (Export)	Prefocus
	12	45/35 (Export)	Prefocus
Side lamps: standard and flasher	12	18/6	D.B.C.
Stop/tail lamps: standard	12	18/6	D.B.C.
flasher ...	12	18	D.B.C.
Number plate lamp	12	6	S.B.C.
Ignition warning lamp ...	12	2.2	M.B.C.
Panel lamps ...	12	2.2	M.B.C.
Interior lamp ...	12	6	Festoon
Beam and flasher warning lamps ...	12	2.2	M.B.C.

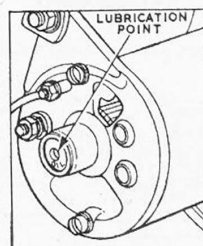
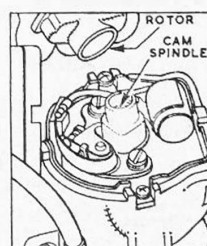


Diagram showing lubrication point on the generator. See also p. viii.



Distributor unit, with cap removed to reveal rotor and cam spindle.

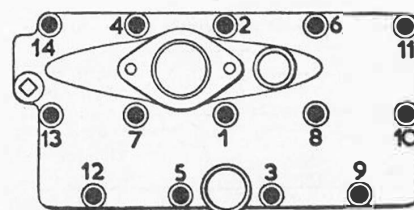
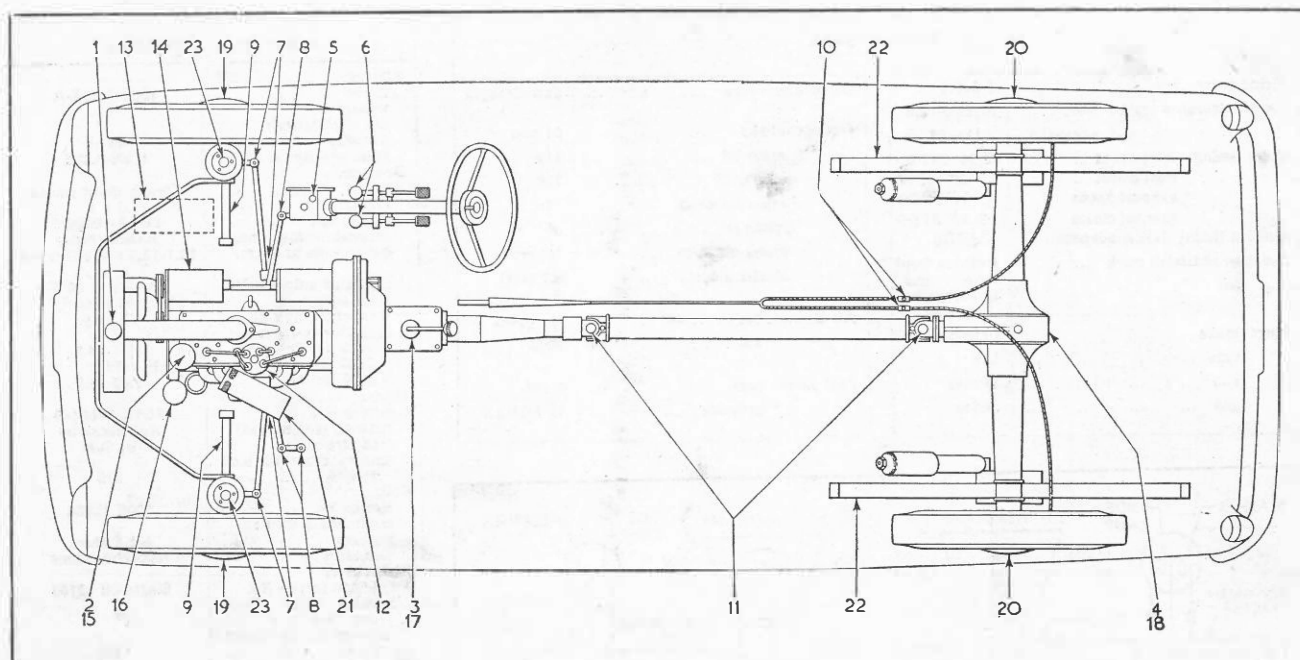


Diagram of cylinder head showing order of tightening cylinder head stud nuts. See also table of "Nut Tightening Torque Data."



## KEY TO MAINTENANCE DIAGRAM

### DAILY

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

### EVERY 1,000 MILES

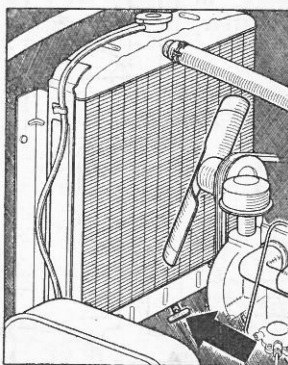
3. Gearbox ... ..
  4. Rear axle ... ..
  5. Steering box ... ..
  6. Brake and clutch fluid reservoir ... ..
  7. Steering ball joints ... ..
  8. Relay arm and pivots ... ..
  9. Track control arm pivots ... ..
  10. Handbrake cable on rear axle ... ..
  11. Propeller shaft universal joints—oil gun
  12. Distributor—two drops of engine oil to cam spindle, oil governor weights and smear cam with petroleum jelly
  13. Battery—check electrolyte level and top up ( $\frac{1}{4}$  in above separators)
- } check and top up
- } grease gun

### EVERY 5,000 MILES

14. Generator—few drops of engine oil through hole in rear bearing boss
15. Engine sump—drain and refill, wash breather cap in petrol, dip in engine oil and refit
16. Engine oil filter element—renew
17. Gearbox } drain and refill
18. Rear axle }

19. Front hub bearings } repack with grease
20. Rear hub bearings }
21. Air cleaner—clean gauze end in petrol, wash thoroughly, dip gauze end in engine oil, shake out surplus and refit
22. Rear springs—spray or brush with penetrating oil
23. Front suspension units—top up with shock absorber fluid

## DRAINING POINT



Above is shown the radiator matrix draining point. Access to this is from above or below and this is the only draining point provided for the cooling system.

### FILL-UP DATA

	Pints	Litres
Engine sump:		
(including filter) ...	4½	2.56
(excluding filter) ...	3½	1.98
Gearbox ...	1½	.95
Rear axle ...	1½	.852
Cooling system ...	12	6.82
Fuel tank ...	7 galls	31.82
Tyre pressures: front } rear }	24 lb/sq in	1.687 kg/cm²

### GENERAL DATA

Wheelbase ...	7ft 3in
Track: front ...	4ft 0in
rear ...	3ft 11½in
Turning circle ...	34ft 6in
Ground clearance ...	7in
Tyre size: front } rear }	5.20-13
Overall length ...	12ft 5½in
Overall width ...	5ft 0½in
Overall height ...	4ft 10½in
Kerb weight ...	1708 lb.

## APPROVED LUBRICANTS

	Duckhams	Castrol	B.P. Energol	Shell	Mobil	Vigzol
Engine: Summer and winter	NOL 20	Castrolite	Energol SAE 20W	X-100 20/20W	Mobiloil Arctic	New D.20
Gearbox: steering box ...	NOL EP 80 Transmission Oil	Castrol Hypoy Light	Energol EP SAE 80	Spirax 80 EP	Mobilube GX 80	Hyex 80
Rear axle ... ..	NOL EP 90 Transmission Oil	Castrol Hypoy	Energol EP SAE 90	Spirax 90 EP	Mobilube GX 90	Hyex 90

Note: In addition to the above, the appropriate grades of lubricating oils produced by Esso Petroleum Co. Ltd., and Regent Oil Co. Ltd., are also approved.