Motor Trader **SERVICE DATA No. 454**

Ford Transit Truck

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

INTRODUCED during the past two years, the Transit series is completely new to the Ford commercial vehicle range. There are six different classifications, which are designated V10, V20, V30, V40, V50 and V60, and these codes relate to nominal payload capacities, which vary from 12-35cwt. There is a choice of engines, either 1.7- or 2-litre petrol units, which are of the V-4 cylinder configuration or the Perkins 4.108 or 4/99 diesel engines. Transmission is through a four-speed gearbox, and power from the engine is taken to this component through a single dry plate diaphragm clutch.

There are two types of rear axle. One, which is used on the V10-V30 series is a single rear wheel unit and that for the V40-V60 is a twin rear wheel unit. Suspension front and rear is entirely orthodox being composed of a solid "I"-section axle and leaf springs at the front and similar but larger capacity leaf springing at the rear.

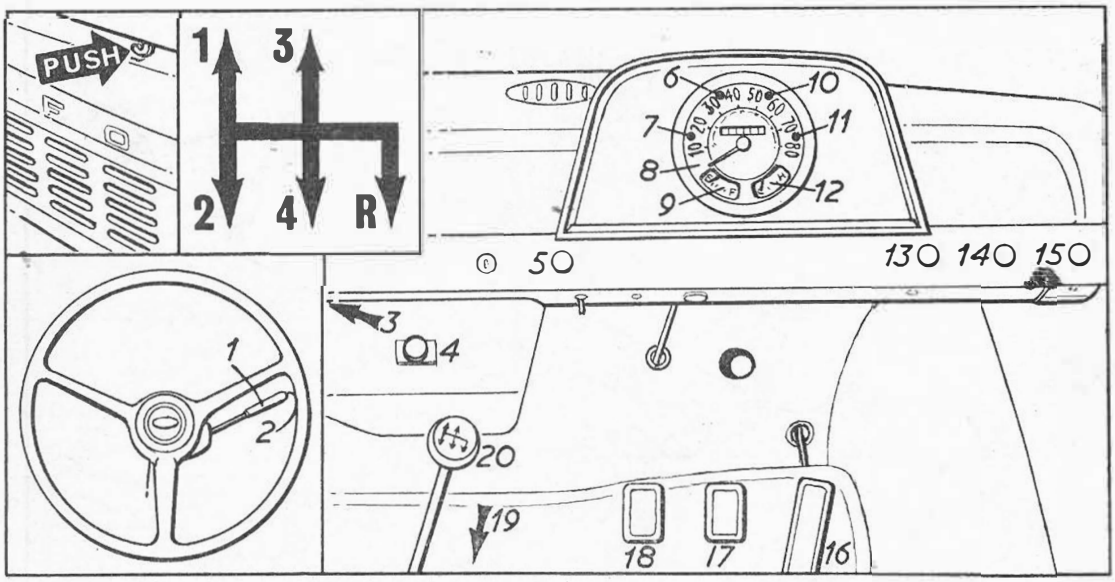
For the purposes of this article, and to avoid confusion brought about by constant cross-reference, the 12-cwt V10 petrol-engined vehicle will be dealt with. For most practical purposes, the other vehicles of the range are broadly similar, but with the differences as detailed previously.

Vehicles are identified in the customary Ford manner, and the relevant "Build-Code" symbols and letters are to be found stamped on a plate which is attached to the dash panel and which is visible on lifting the bonnet. Petrol engines are also serial numbered, and these numbers are stamped on the top face of the right-hand engine mounting pad. It is essential that all these letters and numbers are quoted when referring to the manufacturers, or when ordering spare parts.

The names of makers of proprietary components are not mentioned in order to avoid confusion. Most of them are well known, but in many cases, the components have been modified to suit Ford specification requirements and therefore, they cannot be serviced or replaced with any except Ford replacement parts. For this reason, the Ford Motor Co., Ltd., insist that all components be serviced through their own organization via the U.K. main dealer network.

Special tools for use in general repair and overhaul work are manufactured and marketed by V. L. Churchill & Co., Ltd., London Road, Daventry, Northants. The full range of tools which is classified as "essential" is carried by all Ford main dealers.

Threads and hexagons are of the Unified thread series pattern and form. In this context and indeed as a general rule it should be noted that all threaded parts which show signs of fatigue or damage should be renewed on reassembly of the component involved.

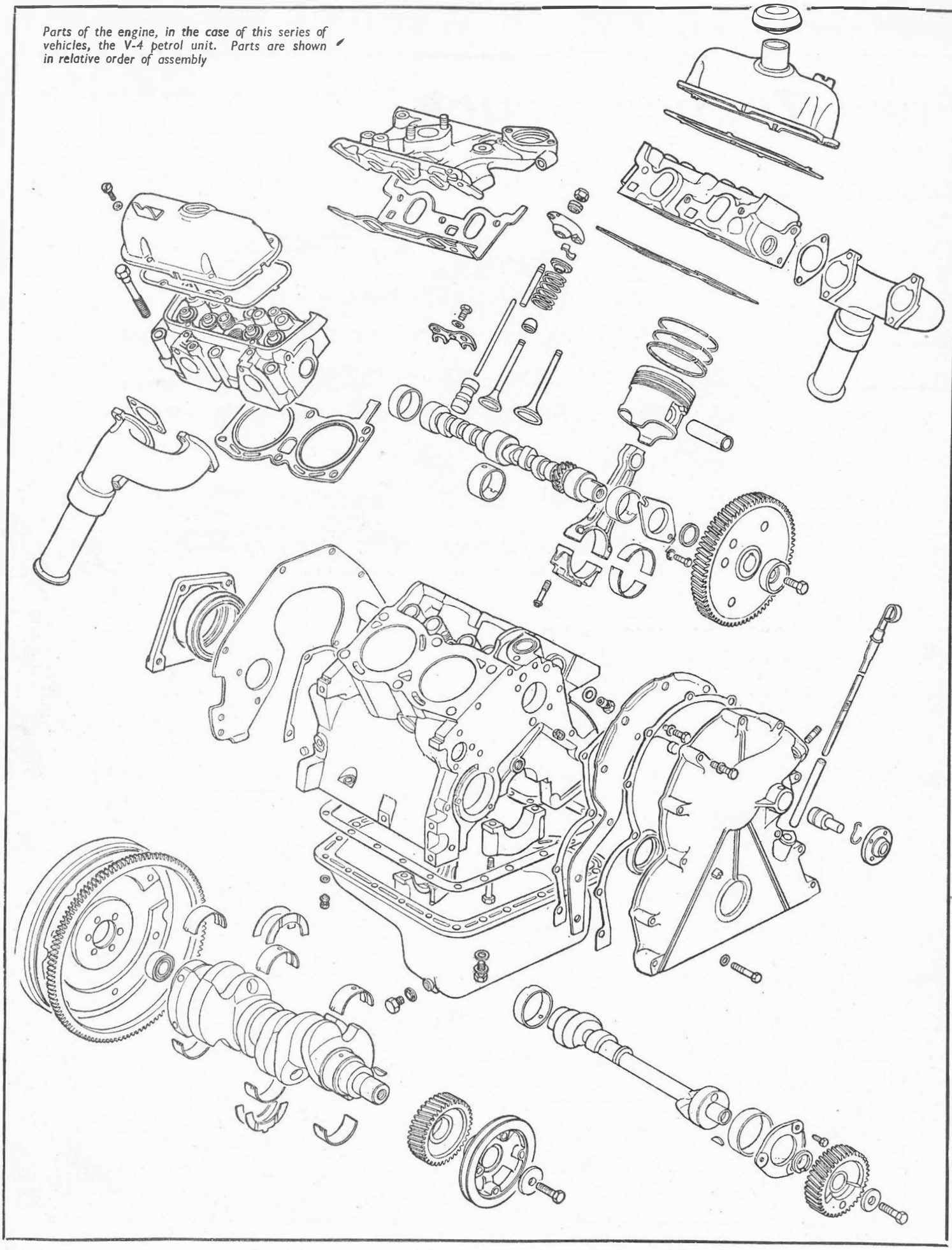


INSTRUMENTS, CONTROLS, GEAR POSITIONS AND BONNET LOCK

1. Direction indicator/light control
2. Horn switch
3. Bonnet release
4. Windscreen washer control
5. Choke control
6. Direction indicator warning light
7. Oil pressure warning light
8. Speedometer
9. Fuel gauge
10. Main beam warning light
11. Alternator/ignition warning light
12. Water temperature gauge
13. Windscreen wiper control
14. Ignition/starter switch
15. Lighting switch
16. Accelerator
17. Brake pedal
18. Clutch pedal
19. Handbrake
20. Gearlever

Insets upper left: show the method of operating the bonnet safety catch, and the operative positions of the gearlever. Inset lower left: shows the siting of the steering column mounted control

Parts of the engine, in the case of this series of vehicles, the V-4 petrol unit. Parts are shown in relative order of assembly



ENGINE

Mounting

At front, bonded rubber mountings are bolted up to brackets which are, in turn, bolted up to either side of crankcase and to abutment brackets on cross-member. At rear, engine/gearbox unit is flange-bolted to frame extensions; flange is on underside of gearbox extension and rubber mounting is sandwiched between.

Tighten all bolts fully when assembling mountings.

Removal

To remove engine unit, take off bonnet, drain cooling system, preserve anti-freeze if present in coolant. Disconnect battery, and remove radiator matrix after first having removed top and bottom water hoses. Take off air cleaner, disconnect heater hoses and valve cable. Disconnect and/or remove as may be necessary, all pipes, wires and controls to engine unit from ancillary components. Remove generator and mounting brackets, take off fan belt.

Jack up vehicle and fit stands, remove clutch housing bolts and flywheel cover. Take off engine external oil filter, remove starter motor. Take off exhaust manifolds. With gearbox supported on jack, fit lifting eyes to cylinder heads and take weight of engine with suitable tackle. Undo engine mounting brackets, release clutch slave cylinder and tie up out of way, manoeuvre engine unit up and out of car.

Crankshaft

On both 1.7- and 2-litre engines, crankshafts run in three main bearings, with steel backed, aluminium/tin or steel-backed copper/lead bearing liners. Liners are in two halves, lower one is plain and upper one incorporates oil feed hole and groove. Under no circumstances must liners be fitted incorrectly, or interchanged, or bearing failure will occur. Each liner is tongued for groove location in block and bearing cap respectively. Tongues and grooves to be together on same side to fully locate liners.

Crankshaft thrust and end-float controlled by thrust washers located in recesses either side of centre main bearing. These washers are steel, faced with aluminium/tin or copper/lead, fabricated in two halves, lower half has tag which locates in slot in bearing cap. Oversize washers, .0025, .005, .0075, and .010in., are available.

Rear oil seal is pressed into aluminium carrier and bolted to cylinder block rear face runs on periphery of flywheel mounting flange. When fitting carrier, seal must be aligned concentrically with crankshaft to avoid oil leaks. Similarly, front seal must also be aligned. Crankshaft gear, with timing mark, pressed onto front end of crankshaft, located by key, followed by cast iron crankshaft pulley, also located by key but retained by centre bolt and washer. Pulley incorporates balance weight equal to that contained within the flywheel, pulley marked for ignition timing and this mark to be aligned with corresponding mark on front cover timing pointer before fitting distributor or when checking ignition timing.

Balance shafts for both sizes of engine are of cast iron, located in right-hand side of cylinder block and run in two stepped diameter steel-backed white metal bushes. Similar bushes available in service, pre-finished to size. To replace bushes, drive out with suitable mandrel and when refitting, use special "replacer" tool, ensure that oil holes are lined up.

Shaft retained by sintered iron thrust plate bolted to cylinder block front face and located between rear face of gear and front face of bearing journal. Spacer is fitted between gear hub and bearing journal, chamfer on spacer to journal. Shaft gear (cast iron) located on shaft by Woodruff key, retained by centre bolt and washer. Part of balance shaft weight incorporated in this gear. Care must be taken to see that shaft assembly is correctly phased with crankshaft, timing mark on balance shaft gear should be lined up with corresponding mark on crankshaft gear during assembly.

Connecting Rods

"H"-section steel forgings, big ends split horizontally, caps retained by bolts and located by dowels. Rods have oil squirt holes to supply oil to thrust sides of cylinder bores. Bearing liners steel-backed, aluminium/tin, or copper/lead lined, and located by taps in rods and caps.

Gudgeon pins interference fit in small ends. Pins may be removed cold, and refitted after first heating small ends to 450-600 deg. F. Con rods are numbered for identity and location. Always replace rods and caps as mated pairs and in correct original locations.

Pistons

Aluminium alloy, solid skirt, autothermic, combustion chambers and valve recesses machined in piston crowns. Different pistons used in each capacity engine, in 1.7-litre unit, "long" pistons are used and in 2.0-litre engines "short" pistons are used, which have a deeper combustion chamber bowl than those specified for the 1.7-litre engine.

Pistons of both types are graded with cylinder bores. Grade numbers are marked on piston crowns in manufacture and cylinder bore grade numbers are stamped on push rod side of each cylinder block adjacent to top face. Grade numbers provided to establish a datum clearance of .0008-0014in between piston and cylinder bore at a point level with gudgeon pin. Correct fit of piston in cylinder is established when a pull of 5-8lb is required to extract .0025in feeler strip ½in wide from between an inverted piston in cylinder bore, both of which are in "new" condition.

Three rings fitted, two compression and one scraper. Upper compression ring is chrome plated on periphery and has a barrel-shaped edge. Lower compression ring is bevelled internally on upper face and has molybdenum coating on periphery as well as being phosphate coated. Latest type externally stepped. Oil control scraper ring is slotted. When fitting, ensure that rings are correctly located and fitted right way up. Oversize pistons available as in "Pistons and Rings" table.

Pistons marked "F" on crowns, this and similar marks on con. rods to be facing same way, i.e. to front of engine when assembling. Easiest to remove cylinder block for piston and con. rod removal or replacement.

Camshaft

Single camshaft located in "V" of cylinder block, driven by fibre gear meshing directly with crankshaft gear and operates valves in both banks of cylinders. Shaft runs in three steel-backed, white-metal lined bushes. Skew gear, for distributor and oil pump drive is machined integral with shaft and is located behind front bearing

ENGINE DATA

General Type		ohv 80° "V"
No. of cylinders		4
Bore × stroke: mm		93.67 × 60.35*
in		3.6878 × 2.378*
Capacity: c.c.	1.7-litre	1664
	2.0-litre	1996
cu in	1.7-litre	101.5
	2.0-litre	121.8
Max. b.h.p. at r.p.m.	1.7-litre	73-4750
	2.0-litre	85.5-4750
Max. torque at r.p.m.	1.7-litre	91 lb. ft-3000
	2.0-litre	114 lb. ft-2750
Compression ratio		7.7 : 1

* 2.0-litre-72.415mm (2.851in)

SPECIAL TOOLS

	Part No.
ENGINE	
Crankshaft gear replacer	CP6023A
Crankshaft pulley remover	CP6041
Valve guide reamer	P8056—015
Valve guide reamer	P6056-030
Valve spring compressor (main tool)	6118
Crankshaft front and rear oil seal remover	CP6145
Engine lifting eyes	CP6146
Crankshaft rear oil seal alignment	CP6147
Rocker stud reamer	CP6148
Piston pin remover/replacer	CP6149
Valve seat narrowing cutter—inlet and exhaust	FMC-317P-26 60°
CLUTCH	
Disc locator	CP112A
Pilot bearing remover (maintool)	7600
Pilot bearing remover adaptor	CP7600-6
Pilot bearing replacer	CP7123

NUT TIGHTENING TORQUE DATA

	lb.ft
Main bearings	55-60
Big ends	25-30
Flywheel bolts	45-50
Rocker cover screws	2½-3½
Manifold bolts	12-15
Sump	6-8

CAMSHAFT

	Front	Inter	Rear
Bearing journal: diameter (in)	1.8735-1.8745	1.8137-1.8145	1.7537-1.7545
length (in)	.84	1.06	.84
Bearing clearance		.0026-.0008in	
End float		.003-.007in	

VALVES

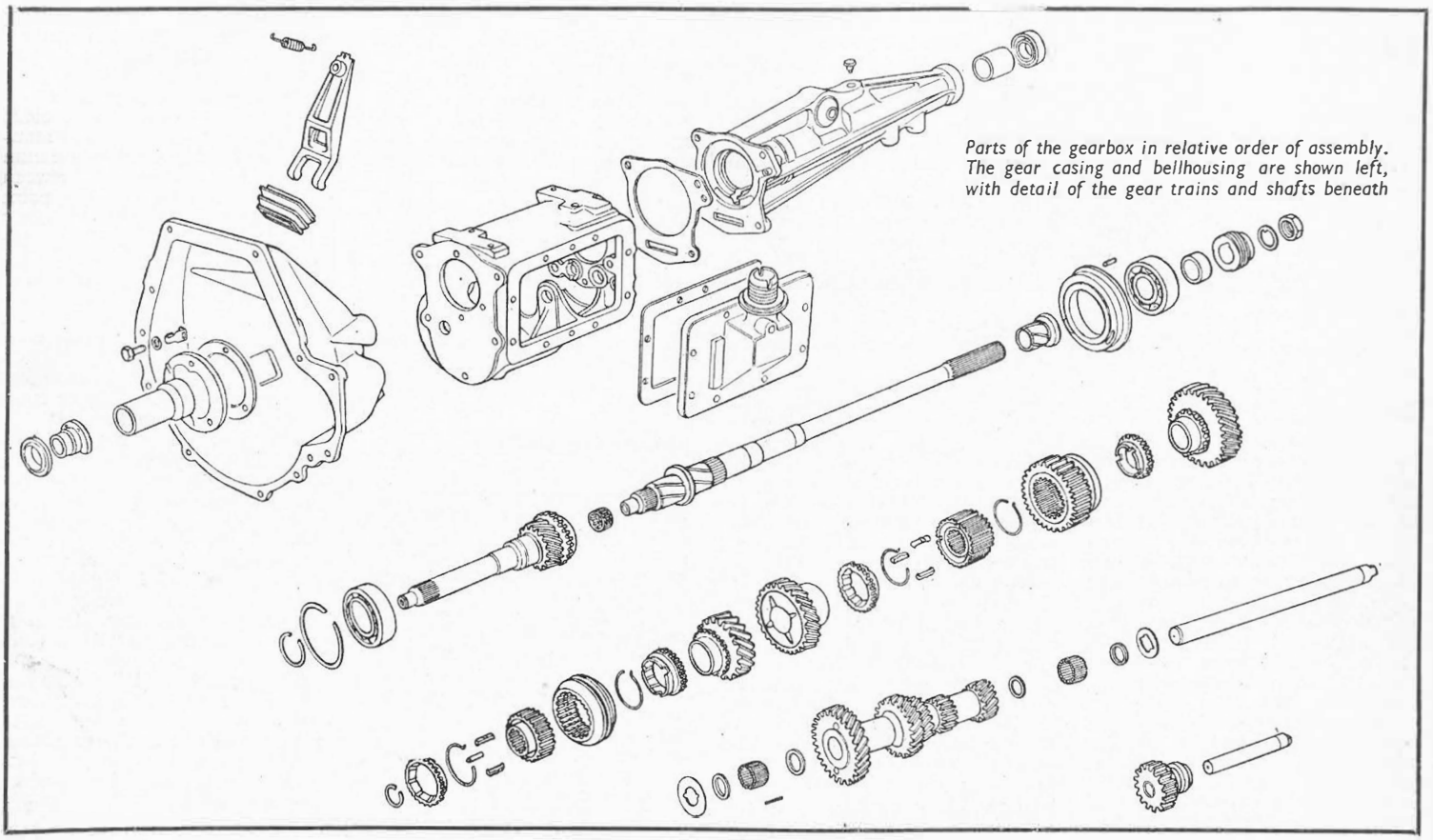
	Inlet	Exhaust
Head diameter	1.592-1.602in	1.428-1.438in
Stem diameter	.3095-.3105	.3086-.3096in
Face-angle	45°	45°
Springs: free length	2.208in	
diameter	1.324-1.348in	
no. of coils	6.75	
wire dia.	.167-.169in	
load (valve shut)	59½-69½lb	

PISTONS AND RINGS

Clearance (skirt)		.002-.0026in
Oversizes		.0025, .005, .015, .030, .045, .060in
Weight without rings or pin:		
1.7-litre		608-612 gr.
2.0-litre		563-567 gr.
Gudgeon pin: diameter		.9370-9373in
fit in piston		.0003-.0005in (clear)
fit in con. rod		.0008-.0015in (interf)
	Compression	Oil Control
No. of rings	2	1
Gap	.010-020in	.010-.015in
Side clearance in grooves: upper	.002-.0035in	.001-.003in
lower	.002-.004in	
Width of rings	.077-.078in	.1855-.1865in

CRANKSHAFT AND CON. RODS

	Main Bearings			Crankpins
Diameter	2.5006-2.5014in			2.3764-2.3756in
	Front	Inter	Rear	
Length (in)	.95-1.00	1.059-1.061	1.06-1.09	.838-.842
Running clearance: main bearings			.0026in	
big ends			not quoted	
End float: crankshaft			.003-.011in	
big ends			.004-.010in	
Balance shaft end-float			.010-.015in	
Undersizes			.002, .010, .020, .030, .040in	
Con. rod centres			5.641-5.643in	



Parts of the gearbox in relative order of assembly. The gear casing and bellhousing are shown left, with detail of the gear trains and shafts beneath

journal. An eccentric, retained by camshaft gear securing bolt, operates fuel lift pump, which is mounted on front cover. End thrust taken by thrust plate located between camshaft gear hub and front bearing journal. Early type thrust plate is made of sintered iron and is bolted to cylinder block front face. Latest type is cast iron, with countersunk holes for Phillip's screw fixing.

Camshaft drive gear marked for correct replacement relative to crankshaft drive gear and balance shaft drive gear.

Replacement bushes available in service are prefinished and presized. Bushes also available which are .020in oversize on O/D. If replacement of one bush appears advisable, better to replace all three to preserve exactitude of camshaft alignment.

Valves

Overhead, in line, inlet larger than exhaust. Valve heads are concave and faces have 45deg. seat angle. Inlet valve heads have diffused aluminium coating to increase surface resistance to high temperature oxidation. Under no circumstances should the faces of these inlet valves be ground, or "lapped." If valve faces show wear, or pitting, they should be replaced and seats re-cut, or seats may be lapped using dummy valves. Exhaust valves may be reground providing edge thickness is not reduced to $\frac{1}{32}$in, or below. Seat width of $\frac{1}{16}$-$\frac{3}{32}$in is permissible. Valves are available with oversize stems: .003, .005 and 0.30in. Stems are phosphate coated.

Valves retained by close coil springs and secured by cotters, same type springs for both inlet and exhaust valves. Hardened steel retainer fitted to each valve stem end, and umbrella type oil seals fitted beneath retainers.

Tappets and Rockers

Hollow cast alloy iron tappets, with detachable push rod seats, work in crankcase direct. Oil holes are drilled in annular groove around tappet body for oil supply to tappet interior. Double groove type tappet. Oil flows through drilling in tappet seat to push rods and to rocker arms. Push rods made of hardened steel with spherical ends are tubular for oil supply to rockers. Sintered iron guide plate fitted to cylinder heads to preserve push rods alignment. Prior to fitting push rods to engine check that maximum run-out of rods is within .010in T.I.R.

Rocker arms individually mounted on studs pressed into cylinder head, and pivot on case hardened sintered iron spherically faced fulcrum seats, retained by self-locking nuts, which provide requisite measure of adjustment variation to obtain valve clearances. When fitting oversize rocker studs, new guide plate with oversize stud holes must also be fitted. These o/s guide plates are marked with letter "B" .003in, and letter "C" for .015in o/s holes.

Lubrication

Gear driven eccentric bi-rotor, or sliding vane pumps mounted in crankcase on left-hand side of engine driven by hexagonal shaft from distributor drive gear. Oil from sump is drawn through gauze screen into pump via inlet pipe. Pressure in system controlled by plunger relief valve incorporated in pump unit. From oil pump, supply is fed to full flow cartridge oil filter on left-hand side of engine, and thence to the main gallery situated immediately below camshaft.

Pressure switch for oil pressure warning light fitted in circuit and indicates low pressure of 5-7p.s.i., at which point switch cuts in and dash warning light is extinguished.

Cooling

Pump and fan thermostat included.

System is pressurized and pump is bolted to right-hand side of engine below generator (or alternator). Two or four-bladed fan may be found to be fitted. Circulation of coolant is from radiator matrix base, through pump, into right-hand bank of cylinders, from rear of right-hand bank coolant flows to left-hand bank. Coolant holes in cylinder heads are graduated in size for even flow rate to cylinder heads.

Wax type thermostat fitted. Adjust fan belt until there is $\frac{1}{4}$in slack in longest run of belt.

TRANSMISSION

Clutch

Single dry plate, diaphragm spring. Release mechanism mechanically operated by two connecting rods and equaliser bar.

Provision for adjustment in service made on threaded portion of clutch release arm/equaliser bar connecting rod. Clearance at this point should be adjusted to .06in, which is equivalent to $\frac{3}{4}$in free play at the clutch pedal. Access to clutch for service after removal of gearbox and bellhousing. Clutch pressure plate and centre plate are serviced as assemblies only.

Gearbox

Four-speed, constant mesh type, all forward gears have synchromesh engagement. Centre change-speed lever operates selector rods and forks direct.

To Remove Gearbox

Drain oil, and remove crosshead screws which retain gearlever cover plate and take out plate. Remove gearlever. Jack up vehicle and fit supporting stands front and rear. Mark drive shaft pinion and coupling flange for correct replacement and take out drive shaft after having removed securing self-locking nuts. Undo clutch return spring and clutch rod relay lever from clutch fork. Disconnect speedo cable from extension housing and remove starter motor from bellhousing, and remove lower dust cover plate. Undo and remove nearside exhaust manifold/silencer pipe and disconnect relay lever support from extension housing bolts. Support engine on jack and remove gearbox rear support bolt. Release earth strap and undo remainder of bellhousing bolts and draw out gearbox and bellhousing complete.

To Dismantle Gearbox

With gearbox on bench or mounted upright in suitable stand, first remove clutch operating mechanism.

Remove release bearing and arm assembly secured by retaining spring, place assembly to one side. Take off bellhousing by removing four bolts and lockwashers securing

PROPELLER SHAFT	
Type	open tubular needle roller brg u.j.

FINAL DRIVE	
Type	¾-floating hypoid
Crownwheel/bevel pinion teeth	37/9 (4.11 : 1)

GEARBOX	
Type	synchromesh
No. of forward speeds	4
Gear ratios: 1st	4.412 : 1
2nd	2.353 : 1
3rd	1.505 : 1
4th	1 : 1
Rev	4.667 : 1

BRAKES		
Type	hydraulic	
	Front	Rear
Drum diameter	9in	9in
Lining: length	8.60in	8.60in
width	2.75in	1.75in
thickness	.19in	.19in
area	47.4 sq in	30.0 sq in

CHASSIS DATA	
Clutch	
Type	sdp diaphragm
Release arm free travel	.06in
Linings: thickness	.115-.125in
dia. ext.	8.5in
dia. int.	5.75in
friction area	61.60 sq in

SPRINGS		
	Front	Rear
Length (eye centres, laden)	47.25in	46.0in
Width	2.36in	2.36in
No. of leaves	3	5
Deflection rate	200 lb/in	168 lb/in

it to gearcase. Drive out clutch release arm fulcrum pin if necessary.

Take off gear lever housing by removing four bolts and lockwashers securing it to extension housing. If reverse relay lever is to be removed, invert housing, tap firmly on hard wood to remove retaining dowel and withdraw lever. Remove gearbox top cover plate—four bolts and lockwashers, taking care to preserve selector shaft locating springs which are located in cover plate end flange. Take out selector shaft springs and balls and with gearbox in neutral, remove locking wire from selector bolt heads, unscrew square-head taper bolts securing selector forks to shafts. Draw out 3rd/4th selector shaft to rear, supporting sleeve for 3rd/4th shaft, then take out sleeve.

Partially withdraw 1st/2nd gear selector shaft, remove floating pin from cross drilling at forward end, rotate shaft through 90° and withdraw it from casing. Withdraw reverse selector shaft to rear, rotating through 90° clockwise to prevent it fouling extension housing. Lift off selector forks. Preserve interlock plungers. Remove extension housing by undoing five securing bolts and lock-washers, remove speedometer drive gear and gear bearing from extension housing and draw off extension housing. Mark sandwich plate and gearcase to facilitate alignment of dowel and locating hole in sandwich plate. With brass drift, free layshaft at bellhousing end and drive out layshaft with dummy shaft, allow laygear cluster to rest on casing bottom. Withdraw complete mainshaft assembly to rear, note that top gear blocker ring will be loose on main drive gear, and should be removed. Also caged needle roller bearing from drive gear internal bore. Remove primary shaft bearing retainer, three bolts and lockwashers, detach bearing circlip and press out gear and bearing into box. Take out laygear and two thrust washers. Note needle rollers (20 each end). Draw out reverse idler shaft.

Note: Mainshaft bearing, sandwich plate, 1st/2nd gear synchronized and 2nd gear *cannot* be pressed off mainshaft together as $\frac{3}{16}$in dia. steel ball fitted to mainshaft will foul 2nd gear synchro-hub bore.

To Assemble Gearbox

Reverse process of dismantling noting following points: Mainshaft: Scribe lines on bush flange to line up with keyway, and on speedo hole line to 1st/2nd gear synchro hub splines. Fit 2nd gear to mainshaft, dog teeth to rear. Locate blocker ring on cone face of 2nd gear. Assemble 1st/2nd gear synchro unit. If new unit is used, slide synchro sleeve (reverse mainshaft gear) off its hub. Fit synchro sleeve over hub, mating marks aligned. Locate blocker bars in slots in hub. Fit blocker bar spring, note D.O.R. of spring. Fit other spring to opposite face of synchro unit, tag to locate in same blocker bar, spring running in other direction. Leave spring ends free. Locate 1st/2nd gear synchronizer on mainshaft, selector fork groove to rear. Fit blocker ring in 1st/2nd gear synchronizer. Fit steel ball in mainshaft; hardened steel bush in 1st gear, shoulder away from 1st gear dog teeth. Fit assembly to mainshaft, dog teeth to blocker ring, and 1st/2nd gear synchronizer. Line up ball with bush keyway. Fit sandwich plate on mainshaft, dowel hole to rear, fit mainshaft bearing. Retain steel bush in place, locate adaptor (Tool No. P.4000-31A) over bearing, insert assembly and fit slave ring (Tool No. 370) on press bed. Note: cut-outs of 2nd gear blocker ring line up with blocker bars of 1st/2nd gear synchronizer, also line up mating marks and press bearing on to shaft. Tighten nut to torque of 20-25lb. ft.

Assemble main drive gear (later models). Position main drive gear bearing on gear, external circlip groove away from gear, and press on bearing. Fit smaller diameter circlip in groove provided in main drive gear shaft. Reassemble layshaft and retaining washers, and locate 20 needle rollers in each recess at layshaft ends. Place layshaft in bottom of box. Locate thrust washers each end of laygear, tongues locate in recesses provided. Fit main drive gear to box, followed by circlip and drive gear bearing retainer. Install reverse idler gear and shaft. Fit caged needle roller bearing to counterbore of main drive gear, do not use grease. Position a blocker ring over taper face of top gear and gasket over rear face of gearbox. Offer up and assemble mainshaft assembly, fit layshaft. Fit extension housing. Further assembly is reversal of dismantling process already described.

Rear Axle

Hypoid bevel drive, three-quarter floating axle shafts, cover welded to banjo casing, final drive assembly detachable. Complete axle assembly may be removed for service as follows: jack up vehicle and place stands beneath frame side members forward of rear springs. Remove road wheels and support axle. Scribe mating marks and remove drive shaft from pinion flange. Disconnect hydraulic line at flexible connection on car body, and fit blanking plug on end of flex pipe to prevent fluid loss. Remove split pin and clevis pin securing handbrake cable to brake operating link at each rear brake backplate. Disconnect shock absorber links from brackets at rear of axle casing. Unit may then be passed out, after removal of spring clip self-locking nuts, spring locating plates, retainers and insulators which are fitted above and below road springs.

Half-shafts upset at outer end to form flange on which hub bearing housing carrying wheel studs, registers. Inner ends splined in differential side-bevel gears.

Hubs run on ball bearings pressed into housings, with lipped oil seals (lip to bearing) behind. Bearings retained on axle tube ends by ring-nuts and tab-washers. Flange hub passes through lipped oil seal in housing.

Bevel pinion shaft runs in taper roller bearings, outer races pressed into final drive housing. Collapsible spacer between inner races, which are nipped up by driving flange nut.

Bearings should be adjusted to give 12-15lb. in preload with oil seal fitted.

Pinion mesh adjustment by shim between pinion and inner race of rear bearing. Shims available in ten thicknesses in .006in steps from 0.1506 to 0.1600in.

Crown wheel spigoted on one-piece differential cage and retained by eight self-locking setscrews. Differential side bevel gears have flat thrust washers behind, planet bevel pinions have spherical thrust washers.

Differential assembly carried in taper roller bearings in split housings, with ring-nuts for bearing and mesh adjustments. Bearing caps have hollow dowels. Tighten ring-nuts to spread bearing housings .005-.007in overall (special fixture advisable for checking spread), then turn both ring-nuts equally to adjust mesh for .005-.007in backlash.

CHASSIS

Brakes

Lockheed hydraulic, servo available as a production option. Two leading shoe front brakes. Leading and trailing shoe rear brakes, with fixed adjuster unit. There is provision for mechanical operation, effected through handbrake lever, cables and compensator.

To adjust front brakes, jack up vehicle and fit stands. With brake drums cold, turn each wheel cylinder square-headed adjuster clockwise until shoe is in firm contact with drum. Back off adjuster until each shoe is just clear of drum, and each drum turns freely without binding. To adjust rear brakes, chock front wheels and fit support stands to rear of vehicle. Release handbrake, and with drums cold, turn each square-headed adjuster clockwise until brake shoes are in firm contact with drums. Back off each adjuster until shoes are just clear of each drum.

Adjustment described above automatically adjusts hand brake to some extent, but provision is made for taking up cable slack on adjusting rod which is adjacent to No. 3 cross-member. Adjustment of handbrake is correct when both rear brake assemblies are locked after handbrake has been applied 5-7 "clicks."

Front and Rear Springs

Semi-elliptic leaf springs, rubber bushes provided at shackle points. Telescopic hydraulic shock absorbers fitted as standard.

Front Axle

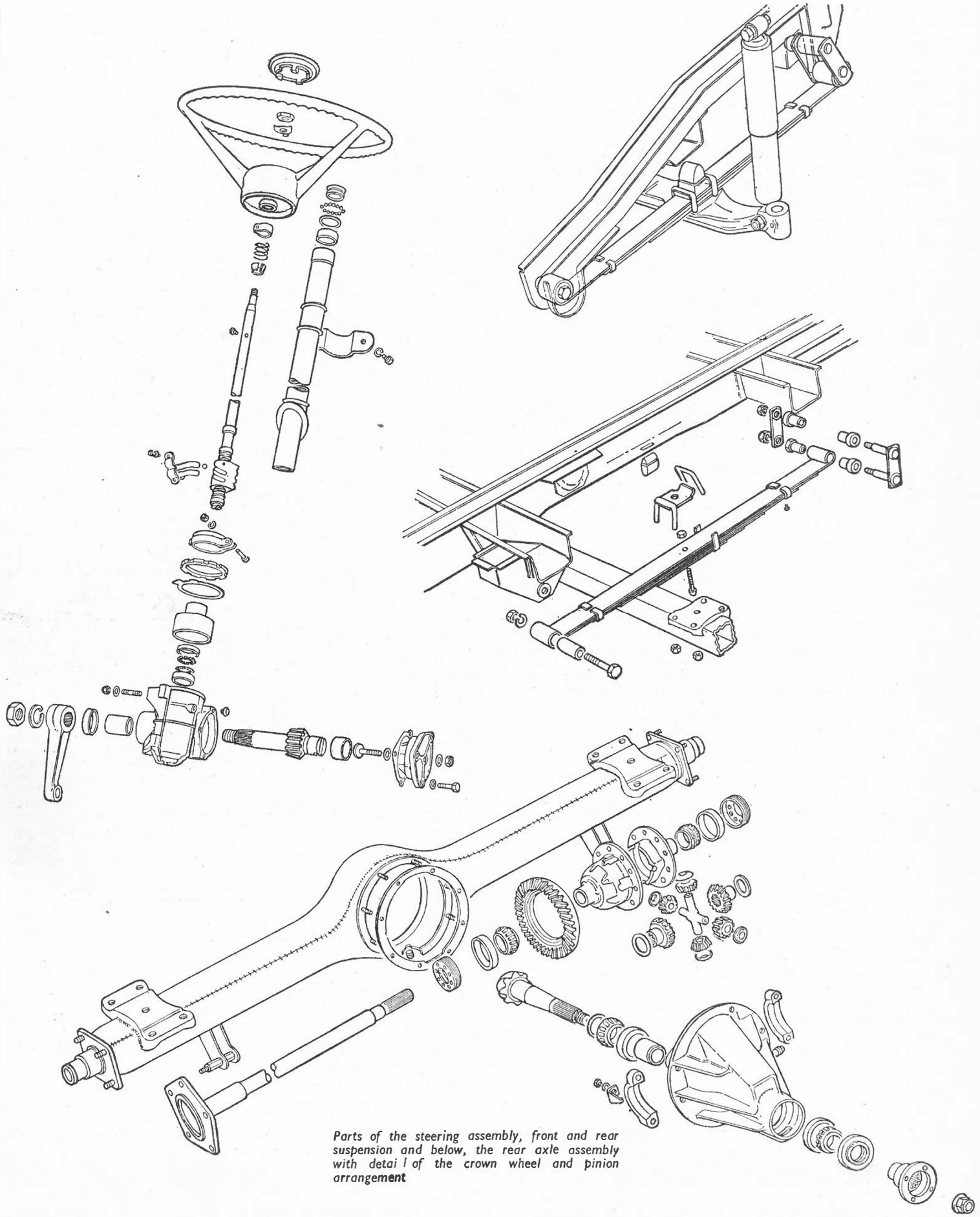
"I"-section forging, Elliot pattern, stub axles, bushed top and bottom carried on king pins cottered in beam, assembly carried on semi-elliptic leaf springs.

Steering arms bolted to stub axle assemblies, track rod fitted between each, and drag link is cranked to rear of axle beam. Telescopic shock absorbers each side is mounted between bracket on underside of body and bolt located in axle forging.

Hubs run on taper roller bearings, and are retained by nuts, adjusting nut retainers and split pins. Nuts should be tightened to 17-25lb. ft torque, and backed off $\frac{1}{6}$-$\frac{1}{3}$ turn to give end float.

Steering

Worm and nut, with nut of recirculatory ball pattern. Worm shaft pre-load should be 3.5-6lb. in, and total pre-load, i.e., worm shaft pre-load plus mesh load should be 14/17.4lb. in. Sector shaft adjusting screw shims available in .001in steps from .062-.069in.



Parts of the steering assembly, front and rear suspension and below, the rear axle assembly with detai l of the crown wheel and pinion arrangement

TUNE-UP DATA

Firing order	1(R) 3(L) 4(L) 2(R)	
Tappet clearance (hot) inlet	.010in	
exhaust	.018in	
Valve timing: inlet opens	20° BTDC	
inlet closes	58° ABDC	
exhaust opens	62° BBDC	
exhaust closes	14° ATDC	
Standard ignition timing	4° BTDC	
Location of timing mark	c/shaft pulley and pointer	
Plugs: make	Autolite	
type	AG 22A	
size	14mm	
gap	.023-.027in	
Carburettor: make	Zenith 36IV	
type	downdraught	
	1.7 litre	2.0 litre
Settings: choke	28mm	29mm
main jet	92	102
slow-running jet	55	55
compensating jet	117	127
fuel enrichment jet	110	80
accelerator pump jet	55	55
part throttle air bleed	2.6	2.6
Air cleaner: type	paper element	
Fuel pump: type	mech.	
pressure	2¾-4¼ psi	

STEERING BOX

Type	Worm and nut
Adjustments: column end float	nil
cross shaft end float / mesh	grubscrew and nut

FRONT-END SERVICE DATA

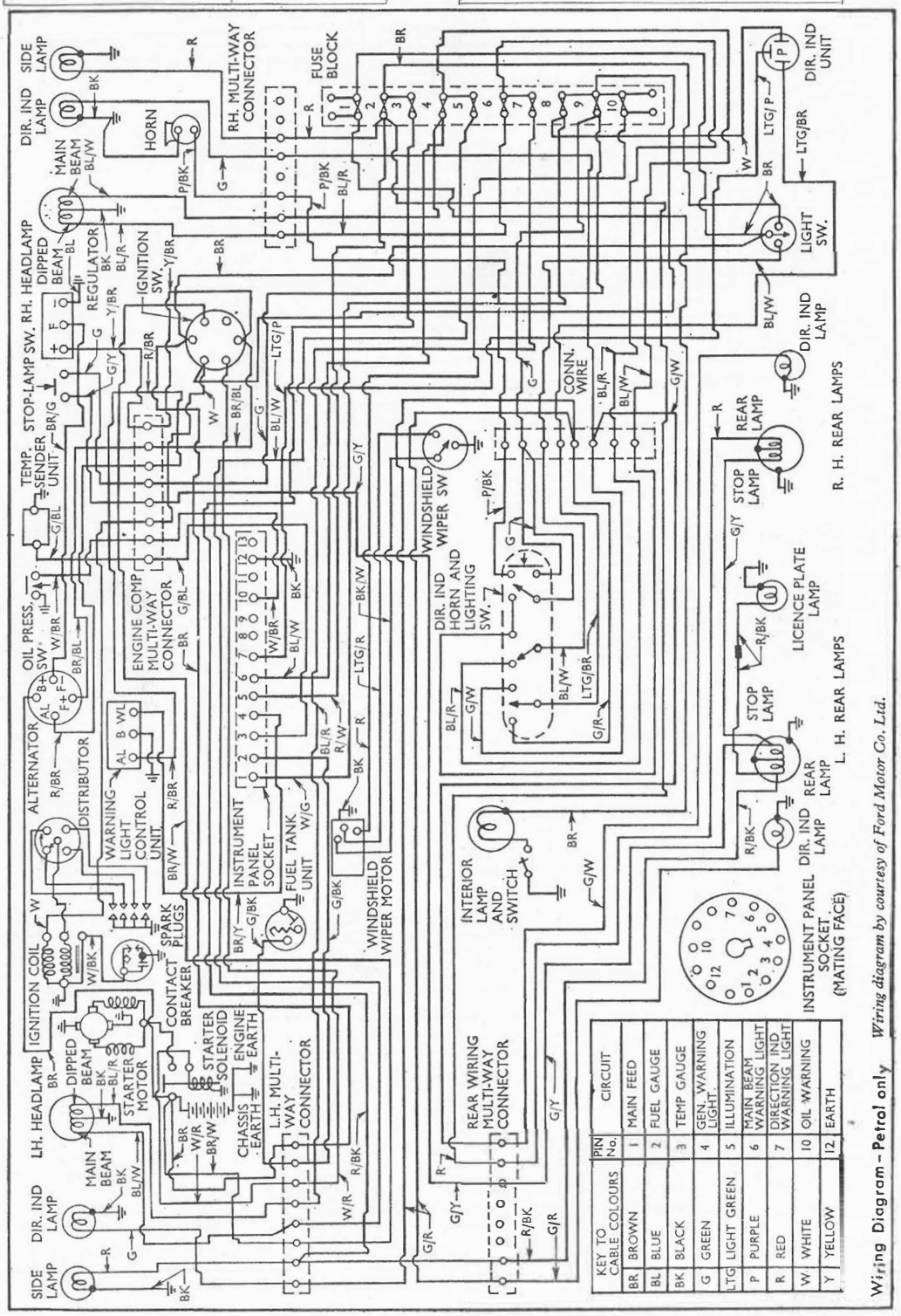
Castor	5¾°-3¼°
Camber	0°-1°
King pin inclination	4½°-5½°
Toe-in	.09-.15in
No. of turns lock to lock	not quoted
Adjustments: castor	nil
camber	
toe-in	screwed track rod ends

SHOCK ABSORBERS

Type	telescopic double-acting
Service	replacement

ELECTRICAL EQUIPMENT

BATTERY	
Voltage	12
Capacity (amp. hr.)	
Petrol—standard	38
—option	57
Diesel—standard	72
—option	2 × 72
Specific gravity charged	1.275 to 1.290
Electrolyte capacity—	
38 amp. hr.	5½ imp pts.
57 amp. hr.	7 imp pts.
72 amp hr.	8 imp pts.
COIL	
Type	12 volt oil filled
Resistance at 20°C (68°F)—	
Primary	4.0 to 4.4 ohms
Secondary	7000 to 8000 ohms
DISTRIBUTOR	
Type	Single contact breaker points
Drive	Skew gear from camshaft
Static advance	6° before T.D.C.
Breaker arm spring tension	18 to 22 oz
Contact breaker points gap	0.014 to 0.016 in
Cam dwell angle	57° to 63°
Condenser capacity (microfarads)	0.18 to 0.22
ALTERNATOR	
Type	Lucas II A.C.
Nominal voltage	12
Nominal D.C. output	43 amps
Resistance of field coil at 68°F (20°C)	3.8 ohms
Stator phases	3
Stator connection	Star
Number of rotor poles	8
Number of field coils	1
Slip-ring brushes:	
Length new	0.625 in.
Replace at	0.156 in.
Brush spring tests:	
Load at 25/32 in.	4.5 oz.
Load at 13/32in	7.5-8.5oz.
Tightening torques:	
Brushbox screws	10 lb. in
Diode heat sink fixings	25 lb. in
Alternator through bolts	45 to 50 lb.
STARTER MOTOR	
Type	12 volt, 4-pole
Number of brushes	4 (2 earthed)
Ampere draw—zero r.p.m.	340 amps at 7.4 volts
—1,000 r.p.m.	245 amps at 8.7 volts
Lock torque	6.4 lb. ft.
Number of teeth on ring gear	121
Number of teeth on pinion	9
Gear ratio	13.44 : 1
Commutator end bearing brush	
Length	0.495 to 0.505in
Inside diameter (assembled in end plate)	0.4995 to 0.5005in
Outside diameter	0.6235 to 0.6245in
Drive end bearing brush:	
Length	0.68875 to 0.71875in
Inside diameter (assembled in end plate)	0.7495 to 0.7505in
Outside diameter	0.812 to 0.813in



Wiring Diagram - Petrol only *Wiring diagram by courtesy of Ford Motor Co. Ltd.*

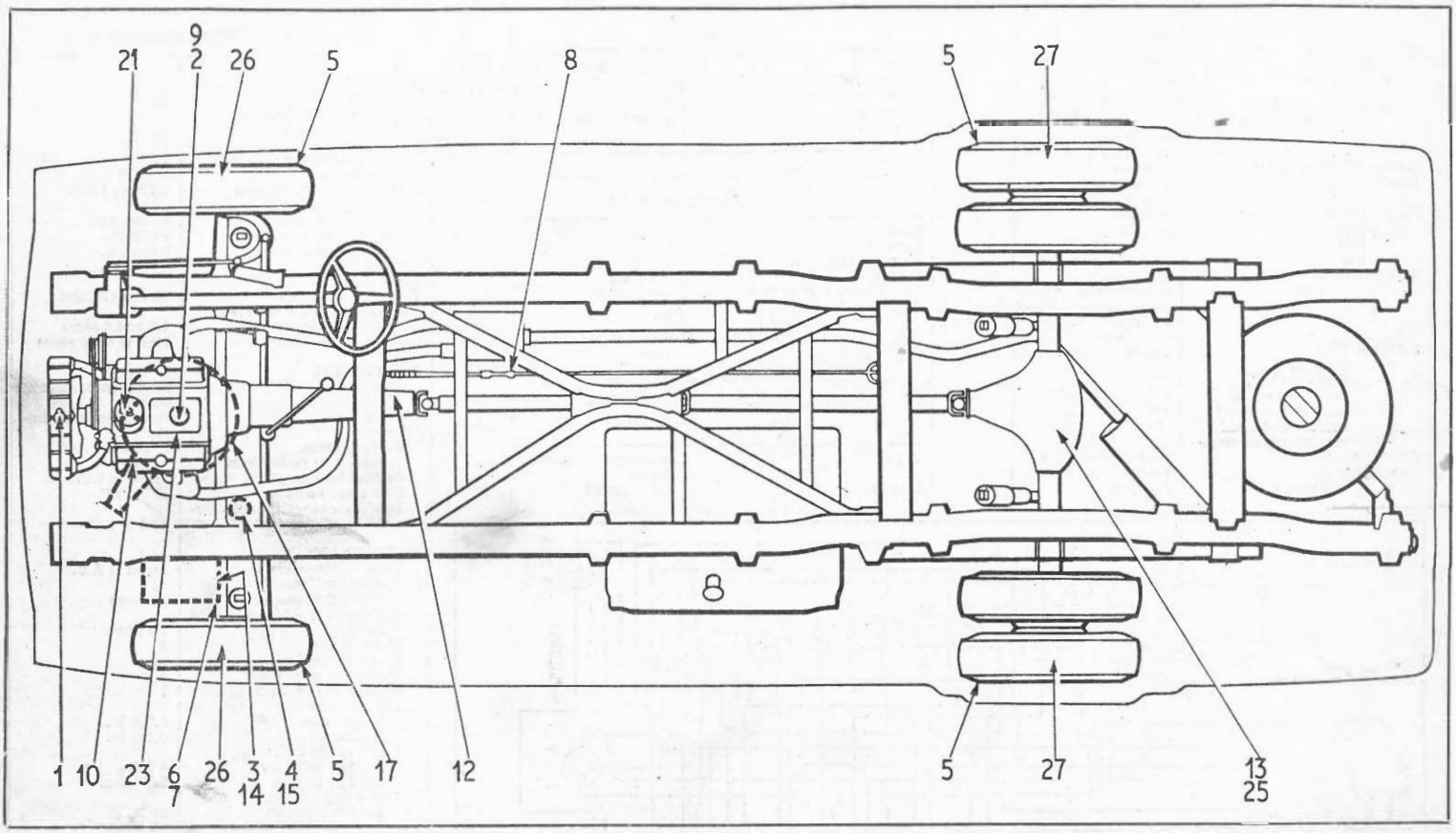
VACUUM ADVANCE CHARACTERISTICS
(On Deceleration)

1.8 and 2.0 litre low compression engines

Vacuum (Inches of Mercury)	Degrees Advance (Distributor)
20	5° -7°
14	4½°-6½°
10	3° -5°
8	2° -4°
6	½°-2½°
4	No advance

LIGHT BULBS

Description	Quantity	Wattage
Sealed beam units	2	60/45
Side light	2	6
Front direction indicator	2	24
Rear direction indicator	2	24
Rear and stop light	2	6/24
Rear number plate light	1	6
Interior light	1	6
Instrument panel lights and warning lights	6	2.2



KEY TO MAINTENANCE DIAGRAM

DAILY
1. **Radiator** } check levels
2. **Engine sump** }

WEEKLY
3. **Battery** } check levels
4. **Brake fluid reservoir** }
5. **Tyre pressures**—check and adjust as necessary

EVERY 5,000 MILES
6. **Chassis lubricators** } apply high pressure gun filled with lithium-based grease
7. **Spindle bodies** }
8. **Handbrake linkage**—oil can
9. **Engine sump**—drain and refill
10. **Engine oil filter element**—renew
*11. **Crankcase vent valve**—clean in petrol and refit
12. **Gearbox** } check and top up
13. **Rear axle** }
14. **Battery** }
15. **Brake fluid reservoir** }
*16. **Valve rocker clearances**—check and adjust
17. **Air cleaner**—clean element
*18. **Clutch** } check and adjust
*19. **Brakes** }
*20. **Fan belt adjustment** }
21. **Distributor**—oil shaft bearing, auto advance mechanism and contact breaker pivot, smear cam with grease. Clean and reset contact points
*22. **Sparking plugs**—clean and reset
23. **Carburettor**—clean and reset
*24. **Door locks, hinges, linkages etc.**—oil can

EVERY 15,000 MILES (as for 5,000 miles plus following)
25. **Rear axle**—check and top up
26. **Front wheel bearings**—strip, clean and repack with grease
27. **Rear wheel bearings**—check and adjust

*—Not shown on diagram.

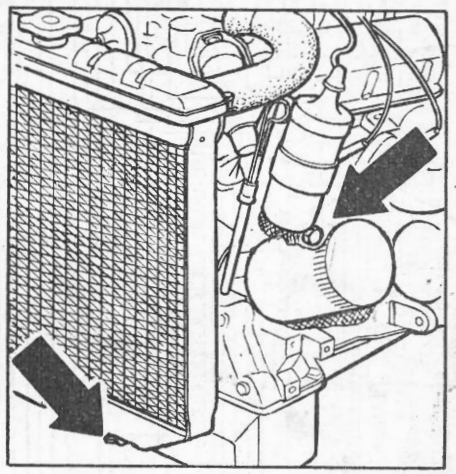
FILL-UP DATA

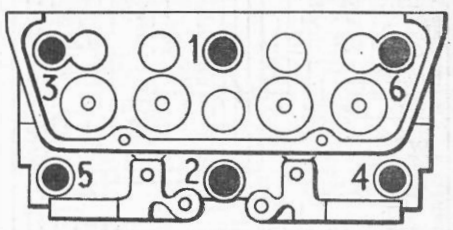
	Pints	Litres
Engine sump	8	4.6
Gearbox	4½	2.6
Rear axle	3¾	2.2
Cooling system (petrol engine and heater)	12½	7.1
Fuel tank	9¼ galls.	42
Tyre pressure: front (size 6.70—14)	30 psi	2.11 kg/cm²
rear	36 psi	2.53 kg/cm²

The two draining points are shown here. One tap is located in the base of the radiator matrix and the other, a hexagon-headed plug, is located beneath the ignition coil and adjacent to the oil filter housing

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

DRAINING POINTS





APPROVED LUBRICANTS

	Duckham's	Castrol	Esso	Shell	Mobil	Amoco	B.P.
Engine: Summer and winter	NOL 20 or Q5500	Castrolite	Extra Motor Oil	Super Motor Oil or X-100 20W	Mobiloil Arctic or Mobiloil Special	Super Permalube 10W/30 or Permalube 20W/20	Energol SAE 20W or Visco-static
Gearbox	NOL EP 80	Castrol Hypoy Light	Gear Oil GP 80	Spirax 80 EP	Mobilube GX 80	Vigzol Hypx 80	Gear Oil SAE 80EP
Rear Axle	Hypoid 90	Castrol Hypoy	Gear Oil GP 90/140	Spirax 90 EP	Mobilube GX 90	Vigzol Vitapoid 90	Gear Oil SAE 90 EP

Approved lubricants of similar grades and SAE ratings are also supplied by Regent Oil Co. Ltd. and Petrofina (Gt. Britain) Ltd.

Printed in Great Britain by Cornwall Press, Paris Garden, London, S.E.1.