TRIUMPH TR4

WORKSHOP MANUAL

PART NUMBER 510322

Issued by the

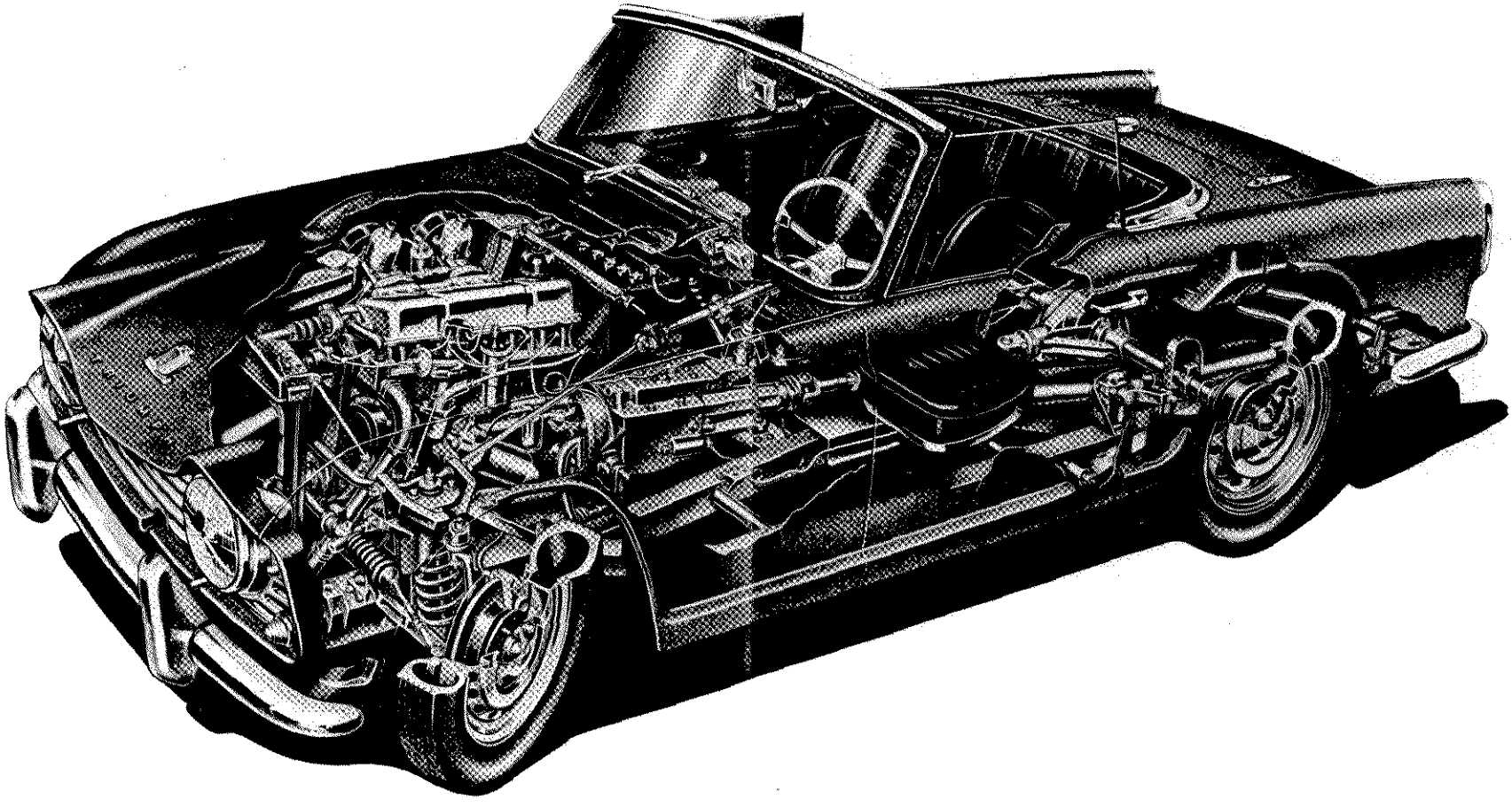
SERVICE DIVISION

STANDARD-TRIUMPH SALES LIMITED

A member of the Leyland Motors Group

COVENTRY ENGLAND

Cut-away view of the Triumph TR4



Cut-away view of the Triumph TR4

INTRODUCTION

This Workshop Manual, which is in loose-leaf form, has been compiled to assist Standard-Triumph Distributors and Dealers throughout the world in the efficient repair and maintenance of Triumph TR4 models from Commission Number (Chassis Number) CT. 1.

The information most frequently required is given in the preliminary pages and includes:—the Introduction, General Specification, Unit reference numbers, Vehicle dimensions, Nut tightening torques, Special tools, Recommended lubricants, Jacking system and a short glossary of part names and alternatives.

Whilst retaining the same grouping system used for Service Information Sheets and previous Workshop Manuals, this book, the first of a new series, introduces an additional group having the designation "0". This describes the position and function of the instruments and controls. Recommendations are also given for "running in", together with detailed working instructions for carrying out the "Customer Preparation Service", periodical lubrication, and regular maintenance operations listed on the back of vouchers contained in the Maintenance Voucher Booklet accompanying each new vehicle. A lubrication chart is provided at the end of the section.

Dismantling, assembly and adjustment procedures for the complete vehicle are divided into six groups numbered one to six. Each deals with one major unit and associated parts, except group six, which deals exclusively with the electrical system. Each group is preceded by a detailed specification and dimensions.

Special Tools

The use of special tools mentioned in the text, contributes to an efficient and profitable repair. Some operations are, in fact, impracticable without their use, particularly those, for example, which deal with the assembly of the differential unit. Distributors are therefore urged to check their tools and order those necessary.

Numbering Pages and Section

The running headline, at the top of the page, names each section within a group. For example, group one contains four sections, namely : Engine, Cooling, Fuel and Exhaust Systems, these being numbered 1 to 4 respectively.

The group number is shown at the top outer edge of each page and is followed by a decimal point.

Each section number is placed after the decimal point following the group number.

Two numerals placed after the section number are used to identify the pages which comprise a particular section, thus page 5 of the cooling section would appear 1·205.

Service Information and Amendment Procedure

Design modifications, changes in procedure and notice of amendment subsequent to the preparation of this manual are given in Service Information Sheets which are issued regularly to all authorised dealers. Should existing instructions be affected or additional information be warranted, new pages will be included with each consecutively numbered notice of amendment. This will also give details of the pages and groups affected. See page 21.

To ensure that this manual is kept up to date, Distributors and Dealers are advised to write the amendment number, the page number and the group number in the space provided on the page preceding Group "0" as the amended pages of text are inserted. Any gaps in the sequence of amendment numbers will then be readily apparent and immediate action can be taken to obtain the missing sheets.

Schedule of Repair Operations

The operations listed in the "Schedule of Repair Operation Times" refer to those described in this manual. The time set against each operation in the schedule is evolved by performing the actual operations on a standard vehicle using special tools where stated. The "Schedule of Repair Operation Times", for use with this manual, is issued as a separate publication and may be obtained from the Spares Division under Part Number 511225.

GENERAL SPECIFICATION

Engine

Number of cylinders	4	
Bore of cylinders	3·386″	86 mm.
(Special Order)	3·268″	83 mm.
Stroke of crankshaft	3·622″	92 mm.
Piston area	36·0 sq. in.	232 sq. cm.
(Special Order)	33·5 sq. in.	216 sq. cm.
Cubic capacity	130·5 cu. in.	2138 c.c.
(Special Order)	121·5 cu. in.	1991 c.c.
Compression ratio	9 : 1	
Valve rocker clearances—inlet and exhaust	0·010″ (cold)	0·254 mm.
Valve timing with valve rocker clearances set at 0·0165″ (0·42 mm.)	Inlet and exhaust valves to be equally open at T.D.C. on the exhaust stroke.	

Performance Data (Engine)

Nett	100 B.H.P. at 4,600 r.p.m. Torque 1,520 lb in. at 3,350 r.p.m. (Equivalent to 147 lb/sq. in. B.M.E.P.).
(Special Order)	100 B.H.P. at 5,000 r.p.m. Torque 1,410 lb in. at 3,000 r.p.m. (Equivalent to 145 lb/sq. in. B.M.E.P.).
Piston speed at 100 m.p.h. (top gear)	2,850 ft/min. at 4,800 r.p.m. (3·7 : 1 axle).

Lubrication (Engine)

Type of pump	Hobourn-Eaton eccentric rotor.	
Oil filter	Purolator ; A.C. Delco ; Tecalemit full flow (replaceable element).	
Release pressure	70 lb/sq. in.	4·921 kg/sq. cm.

Ignition System

Contact breaker gap	0·015″	0·4 mm.
Spark plugs—Type	Lodge CNY (Normal road use). „ HN (High speed touring). „ 2HN (Competition use). „ CN (Low octane fuel).	
Gap	0·025″	0·64 mm.
Firing order	1 : 3 : 4 : 2.	
Ignition timing	4° B.T.D.C. (Basic setting).	

Cooling System

Circulation	Pump.	
Water pump type	Impeller — incorporating by-pass.	
Temperature control	Thermostat. Opening temperature. 70°C (158°F) Fully open at 85°C (185°F)	
Radiator	Pressurised—finned vertical flat tubes—extended header tank.	
Filler cap	A.C. type.	
— pressure	4 lb/sq. in.	0·28 kg/sq. cm.

Fuel System

Fuel tank	Non-pressure type mounted over rear axle.	
Carburettors	Twin S.U. H6. Needle size — SM.	
Air cleaners	Wire gauze type.	
Fuel pump — type	A.C. mechanical with filter and sediment bowl.	
— operating pressure	1¼ - 2½ lb./sq. in.	

Clutch

Type	Borg & Beck 9″ single dry plate.
Operation	Hydraulic.
Adjustment	Push rod at slave cylinder.

Gearbox

Type	4 forward speeds and reverse. Synchromesh on all forward gears.
Control	Centre floor-mounted remote control.

Rear Axle

Type	Hypoid bevel gears ; semi-floating axle shafts. Tapered roller bearings.
Ratio	3·7 or 4·1 : 1.

Gear Ratios

	Overdrive Top	Top	Overdrive 3rd	3rd	Overdrive 2nd	2nd	1st	Rev.
Gearbox Ratios	0·82	1·0	1·09	1·325	1·65	2·01	3·139	3·223
3·7 : 1 Axle								
Overall Ratios	3·034	3·7	4·02	4·9	6·1	7·44	11·61	11·93
4·1 : 1 Axle								
Overall Ratios	3·36	4·1	4·46	5·44	6·76	8·24	12·87	13·21

Brakes

System	Girling hydraulic. Front — Caliper disc. Rear — Drum (leading and trailing shoes).
Adjustment	Rear brakes only (1 adjuster each wheel).
Dimensions	Rear shoes : 9″ × 1¾″ (22·86 × 4·45 cm.).

TYRE PRESSURE DATA

TYRE PRESSURES

OPERATING CONDITIONS	Goodyear Allweather Rib and Dunlop Gold Seal		Goodyear Allweather Rib Nylon and Dunlop Gold Seal Nylon		Goodyear Motorway Special and Dunlop Road Speed R.S.5		Goodyear D.F.S. (165—380) and Michelin (165/15X)	
	5·50/5·90-15		5·50/5·90-15		5·50/5·90-15		(165/15X)	
	Lbs. per sq. in.		Lbs. per sq. in.		Lbs. per sq. in.		Lbs. per sq. in.	
	Front	Rear	Front	Rear	Front	Rear	Front	Rear
Normal motoring with sustained speeds limited to 85 m.p.h.	20	24	20	24	20	24	24	32
Fast motoring on Motorways and similar roads with sustained speeds up to 100 m.p.h.	26	30	20	24	20	24	24	32
High speed tuning with speeds regularly in excess of 100 m.p.h.	Not recommended		26	30	20	24	24	32

Suspension

Front	Independent suspension with wishbones top and bottom. Patented bottom bush and top ball joint swivels. Coil springs controlled by telescopic dampers. Taper roller hub bearings.
Rear	Wide semi-elliptic springs, controlled by piston type dampers.

Steering

Type	Rack and pinion unit. Telescopic steering column.	
Caster angle	3°	
Camber angle	2° Static laden.	
King pin inclination	7°	
Front wheel alignment	Parallel to $\frac{1}{8}$″ (3·18 mm.) toe-in. Parallel to $\frac{1}{16}$″ (1·59 mm.) toe-in if fitted with Goodyear D.F.S. or Michelin X tyres.	
Turning circle	33′ 0″	10 metres.

Chassis Data

Wheelbase	7′ 4″	2·236 metres.
Track : Front (Disc wheels)	4′ 1″	1·245 metres.
Rear (Disc wheels)	4′ 0″	1·220 metres.
Front (Wire wheels)	4′ 2″	1·270 metres.
Rear (Wire wheels)	4′ 1″	1·245 metres.
Ground clearance (Static laden)	6″	15·24 cm.

Exterior Dimensions

Overall length	12′ 10″	391 cm.
,, width	4′ 9½″	146 cm.
,, height	4′ 2″	127 cm.

Weight

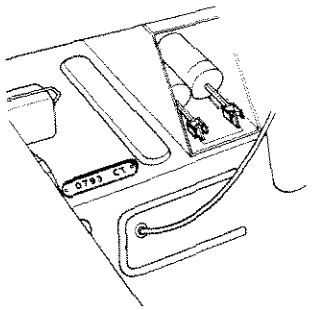
Dry (excluding extra equipment)	2128 lb.	965 kg.
Complete (including fuel, oil, water and tools)	2240 lb.	1015 kg.

Capacities	Imperial	U.S.	Metric
Engine — from dry	11 pints	13·2 pints	6·25 litres
Drain and refill	10 pints	12 pints	5·7 litres
Gearbox	1½ pints	1·8 pints	0·8 litres
With overdrive from dry	3½ pints	4·2 pints	2·0 litres
Drain and refill	2¾ pints	3·3 pints	1·6 litres
Rear axle	1½ pints	1·8 pints	0·8 litres
Water capacity of cooling system	13 pints	15·7 pints	7·39 litres
With heater fitted	14 pints	16·8 pints	8·0 litres
Fuel capacity	11¾ galls.	14 galls.	53·5 litres

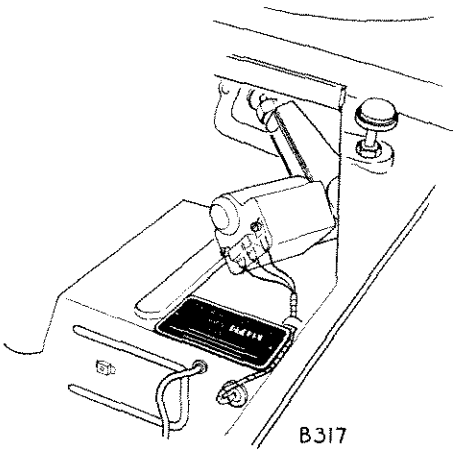
Electrical System

Battery	12 volt, 51 amps. hr.
Control box	Model RB.106-2.
Generator	Model C40-1.

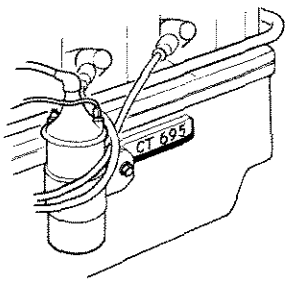
LOCATION OF COMMISSION AND UNIT NUMBERS



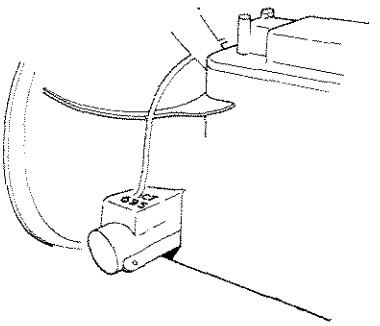
The Body Number is located on the R.H. side of the Scuttle Panel.



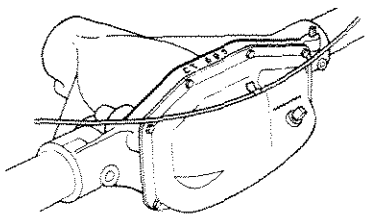
The Commission Number (Chassis Number) is located on the Scuttle Panel adjacent to the windscreen wiper motor and may be seen by lifting the bonnet.



The Engine Serial Number is stamped on the L.H. side of the Cylinder Block.



The Gearbox Serial Number is stamped on the L.H. side of the Clutch Housing.

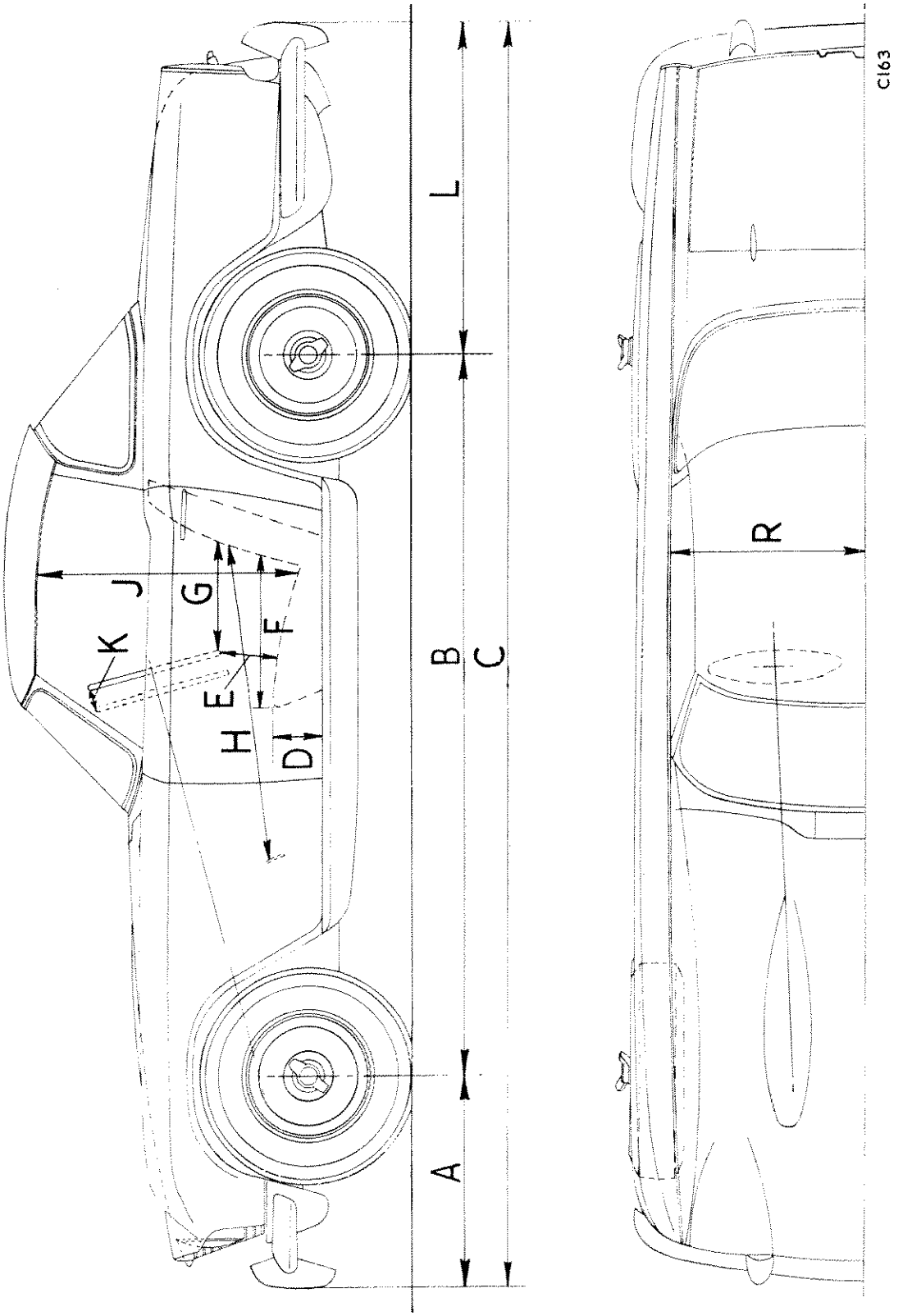


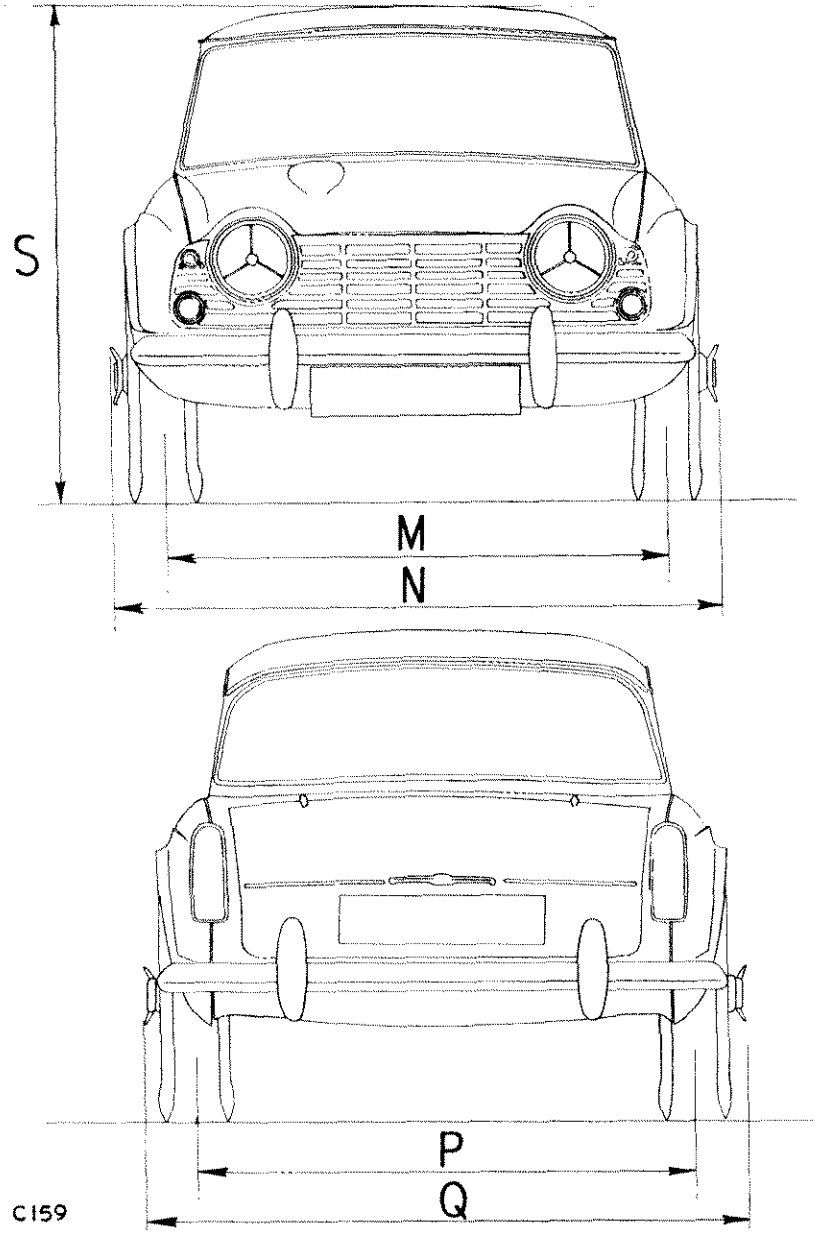
The Rear Axle Serial Number is stamped on the face of the Hypoid Housing Flange.

IMPORTANT

In all communications relating to Service or Spares, please quote the Commission Number (Chassis Number).

VEHICLE DIMENSIONS





VEHICLE DIMENSIONS

		inches	centimetres
A	... ...	25·5	66·77
B	... ...	88·0	223·52
C	... ...	154·0	391·16
D	... ...	5·5	13·97
E	... ...	6·5	16·51
F	... ...	20·0	52·07
G	(min.)	14·0	35·56
	(max.)	21·5	54·61
H	(min.)	36·5	92·71
	(max.)	44·0	111·76
J	... ...	35·0	88·90
K	... ...	2·0	5·08
L	... ...	40·5	102·87
M	... ...	50·13	127·32
N	... ...	57·25	145·37
P	... ...	49·75	126·37
Q	... ...	60·0	152·40
R	... ...	25·0	63·5
S	... ...	50·0	127·00

NUT TIGHTENING TORQUES

OPERATION	DESCRIPTION	SPECIFIED TORQUES lbs. ft.	Kgm.
ENGINE			
Cylinder Head	½″ U.N.F. & B.N.C. Stud	100 - 105	13·826 - 14·520
Connecting Rod Caps	7/16″ U.N.F. Bolt	55 - 60	7·604 - 8·293
Clutch Attachment	5/16″ × 18 U.N.C. Setscrew	20	2·765
Camshaft Bearing to Block Front	5/16″ N.C. Setscrew	16 - 18	2·212 - 2·489
Camshaft Bearing to Block Rear	5/16″ U.N.F. Setscrew	12 - 14	1·659 - 1·936
Dynamo Bracket to Block	5/16″ × 18 U.N.C. Setscrew	16 - 18	2·212 - 2·489
Dynamo to Bracket and Pedestal	5/16″ × 24 U.N.F. Bolt	16 - 18	2·212 - 2·489
Distributor Mounting	½″ N.F. & N.C. Stud	8 - 10	1·106 - 1·383
Dynamo Adjusting Link to Water Pump Body	5/16″ U.N.C. Bolt	16 - 18	2·212 - 2·489
	5/16″ U.N.C. Setscrew		
End Plate Attachment	5/16″ × 18 U.N.C. Bolt	14 - 16	1·936 - 2·212
Engine Plate and Timing Cover Front	5/16″ N.F. & U.N.C. Stud	12 - 14	1·659 - 1·936
Flywheel Attachment to Crankshaft	⅜″ × 24 N.F. Setscrew	42 - 46	5·807 - 6·360
Fan Attachment	5/16″ U.N.F. Bolt	16 - 18	2·212 - 2·489
Manifold Attachment	⅜″ N.C. Stud	22 - 24	3·042 - 3·318
Manifold Inlet and Exhaust	5/16″ × 24 U.N.F. Stud	12 - 14	1·659 - 1·936
Main Bearing Caps	½″ U.N.C. Setscrew	85 - 90	11·752 - 12·443
Oil Pump Attachment	5/16″ N.F. & N.C. Stud	12 - 14	1·659 - 1·936
Oil Seal Attachment (Rear)	¼″ × 20 U.N.C. Setscrew	8 - 10	1·106 - 1·383
Oil Filter Attachment	5/16″ U.N.C. Bolts	22 - 24	3·042 - 3·318
	5/16″ N.F. & N.C. Stud		
Oil Gallery Plugs	7/16″ × 14 U.N.C. Setscrew	32 - 36	4·424 - 4·977
	⅜″ × 16 U.N.C. Setscrew	24 - 26	3·318 - 3·595
Petrol Pump Attachment	5/16″ N.F. & N.C. Stud	12 - 14	1·659 - 1·936
Pulley to Water Pump Spindle	5/16″ 24 U.N.F. Simmonds Nyloc Nut	16 - 18	2·212 - 2·489
Pulley and Extension to Hub	¼″ U.N.F. Bolt	8 - 10	1·106 - 1·383
Rocker Cover	5/16″ N.F. & N.C. Stud	2	0·276
Rocker Pedestal	⅜″ U.N.F. & U.N.C. Stud	24 - 26	3·318 - 3·595
Sump Attachment	5/16″ × 18 U.N.F. Setscrew	18 - 20	2·489 - 2·765
Starter Motor (Attachment)	⅜″ × 24 N.F. Bolt	26 - 28	3·595 - 3·871
Timing Cover	5/16″ × 18 & 24 N.C. Setscrew	14 - 16	1·936 - 2·212
Timing Chain Wheel to Camshaft	5/16″ × 18 N.C. Setscrew	24 - 26	3·318 - 3·595
Thermostat Assembly to Cylinder Head	5/16″ × 24 U.N.C. Bolts	16 - 18	2·212 - 2·489
Thermostat Housing	5/16″ U.N.F.	12 - 14	1·659 - 1·936
Water Pump Attachment	⅜″ × 16 U.N.C. Bolts	26 - 28	3·595 - 3·871
Water Pump Body	⅜″ N.F. & N.C. Stud	26 - 28	3·595 - 3·871
Flywheel Ring Gear Attachment	5/16″ U.N.F. × 1·25″ Bolt	16 - 18	2·212 - 2·489
GEARBOX			
Extension to Gearbox	5/16″ × 18 U.N.C. Bolt	14 - 16	1·936 - 2·212
	5/16″ × 18 U.N.C. Setscrew	14 - 16	1·936 - 2·212
Gearbox to Engine Attachment	5/16″ N.F. & N.C. Setscrew	8 - 10	1·106 - 1·383
Selector Fork Attachment	5/16″ U.N.F. Taper Setscrew	8 - 10	1·106 - 1·383
Front Cover to Gearbox	5/16″ × 18 N.C. Setscrew	14 - 16	1·936 - 2·212
Propeller Shaft Flange to Mainshaft	¾″ × 16 N.F. Slotted Nut	80 - 120	11·060 - 16·590
Top Cover to Gearbox	5/16″ N.C. Setscrew	14 - 16	1·936 - 2·212
	5/16″ U.N.C. Bolt	14 - 16	1·936 - 2·212
Mounting Rear to Gearbox Extension	½″ × 20 U.N.F. Bolt	50 - 55	6·913 - 7·604
REAR AXLE			
Bearing Caps to Housing	⅜″ × 24 Setscrew	34 - 36	4·701 - 4·977
Backing Plate Attachment	⅜″ × 24 Setscrew	26 - 28	3·595 - 3·871
Crown Wheel to Differential Case	⅜″ × 24 U.N.F.	35 - 40	4·839 - 5·530
Hypoid Pinion Flange	⅝″ × 18 U.N.F.	85 - 100	11·752 - 13·826
Hub to Axle Shaft	⅝″ × 18 U.N.F. Nut Slotted	125 - 145	17·282 - 20·047
Rear Cover Attachment	5/16″ × 24 U.N.F. Setscrew	16 - 18	2·212 - 2·489

NUT TIGHTENING TORQUES—continued

OPERATION	DESCRIPTION	SPECIFIED TORQUES lbs. ft.	Kgm.
FRONT SUSPENSION			
Back Plate and Tie Rod Levers to Vertical Link	$\frac{3}{8}$" × 24 U.N.F. Setscrew and Bolts	24 - 26	3·318 - 3·595
Ball Pin to Vertical Link	$\frac{1}{2}$" × 20 U.N.F. Nut Slotted	55 - 65	7·604 - 8·987
Front Hub to Stub Axle	$\frac{1}{2}$" × 20 U.N.F. Nut Slotted	See group 4	
Lower Fulcrum Bracket to Chassis	$\frac{5}{16}$" × 24 U.N.F. Setscrew	16 - 18	2·212 - 2·489
Stub Axle to Vertical Link	$\frac{1}{2}$" × 20 U.N.F. Stub Axle Thread	55 - 60	7·604 - 8·295
Lower Wishbone to Fulcrum Pin	$\frac{7}{16}$" × 20 U.N.F. Nyloc Nut	26 - 28	3·595 - 3·871
Spring Pad to Wishbone	$\frac{3}{8}$" × 24 U.N.F. Stud		
	$\frac{3}{8}$" × 24 U.N.F. Bolt	26 - 28	3·595 - 3·871
Top Wishbone to Fulcrum Pin	$\frac{7}{16}$" × 20 U.N.F. Nut Slotted	26 - 40	3·595 - 5·530
Top Inner Fulcrum Pin to Chassis	$\frac{3}{8}$" × 24 U.N.F. Bolt		
	$\frac{3}{8}$" × 24 U.N.F. Setscrew	26 - 28	3·595 - 3·871
Outer Tie Rod to Levers	$\frac{3}{8}$" × 24 U.N.F. Simmonds Nyloc Nut	26 - 28	3·595 - 3·871
Lower Wishbones to Vertical Link Trunnion	$\frac{7}{16}$" U.N.F. Slotted Nut	See group 4	
Hub Extension Studs for Wire Wheel Attachment	$\frac{7}{16}$" N.F. Stud	65	8·987
Brake Disc Attachment	$\frac{3}{8}$" N.F. Bolt	32 - 35	4·424 - 4·839
Caliper Attachment	$\frac{7}{16}$" N.F. Bolt	50 - 55	6·913 - 7·604
Brake Pad Retaining Plate Bolts	$\frac{1}{4}$" N.F. Bolt	5 - 6	0·691 - 0·830
REAR SUSPENSION			
Rear Road Spring	$\frac{3}{4}$" Centre Bolt	30 - 35	4·148 - 4·839
Road Spring to Rear Axle	$\frac{3}{8}$" × 24 U.N.F. Clip Nyloc Nut	28 - 30	3·871 - 4·148
Shock Absorber to Frame Bracket	$\frac{3}{8}$" × 24 U.N.F. Setscrew		
	$\frac{3}{8}$" × 24 U.N.F. Nyloc	26 - 28	3·595 - 3·871
Spring Shackle (Nut to Pin)	$\frac{3}{8}$" × 24 U.N.F. Nut Shackle Pin	26 - 28	3·595 - 3·871
Spring Front End to Frame	$\frac{1}{2}$" × 20 U.N.F. Bolt	28 - 30	3·871 - 4·148
CHASSIS			
Gearbox Mounting to Crossmember	$\frac{7}{16}$" U.N.F. Studs	35 - 40	4·839 - 4·530
Gearbox Mounting Crossmember to Chassis	$\frac{3}{8}$" U.N.F. × $\frac{3}{8}$" Bolts	26 - 28	3·595 - 3·871
Body Mounting Extension to Chassis	$\frac{5}{16}$" U.N.F. × $\frac{5}{8}$" Bolts	18 - 20	2·489 - 2·765
Front Cross Tube to Suspension Turrets	$\frac{3}{8}$" U.N.F. × $\frac{3}{4}$" Bolts	26 - 28	3·595 - 3·871
STEERING UNIT			
Steering Unit to Chassis	$\frac{5}{16}$" N.F. 'U' Bolts	12 - 14	1·659 - 1·936
Steering Column Coupling	$\frac{5}{16}$" N.F. Bolts	12 - 14	1·659 - 1·936
Adaptor Column Coupling Unit	$\frac{1}{4}$" N.F. Bolt	6 - 8	·8295 - 1·106
BODY COMPONENTS			
Seat to Runner Attachment	$\frac{1}{4}$" U.N.F.	5 - 6	·6913 - ·8295
MISCELLANEOUS			
Wheel Studs and Nuts	$\frac{7}{16}$" U.N.F.	45 - 55	6·221 - 7·604

SPECIAL TOOLS

The following special tools, recommended for the efficient servicing of Standard-Triumph vehicles, should be ordered direct from Messrs. V. L. Churchill and Company Limited, Great South West Road, Bedfont, Feltham, Middlesex, England.

Engine Tools		
S.138	Cylinder Sleeve Retainers	Desirable
60A	Valve Guide Remover and Replacer (Main Tool)	Desirable
S.60A-2	Valve Guide Remover and Replacer (Adaptors)	Desirable
6056	Valve Seat Insert Cutter	Desirable
MFS.6056-1	Valve Seat Insert Cutter (Adaptors)	Desirable
MFS.6056-2	Valve Seat Insert Cutter (Adaptors)	Desirable
316.X	Valve Seat Cutter Handle	Desirable
316-10	Pilot	Desirable
316-12	Pilot	Desirable
317-22	Cutter 45°, 1⅜″ dia.	Desirable
317-25	Cutter 45°, 1 $\frac{9}{16}$″ dia.	Desirable
317.T-22	Cutter 15°, 1⅜″ dia.	Desirable
317.T-25	Cutter 15°, 1 $\frac{9}{16}$″ dia.	Desirable
317.P-22	Cutter 75°, 1⅜″ dia.	Desirable
317.P-25	Cutter 75°, 1 $\frac{9}{16}$″ dia.	Desirable
6118	Valve Spring Compressor	Desirable
6118-1	Valve Spring Compressor (Adaptor)	Desirable
335	Connecting Rod Aligning Jig	Essential
336	Master Multi-purpose Connecting Rod Arbor	Essential
S.336-2	Arbor Adaptor (2·2325″)	Essential
30A	Bending Bar	Desirable
MFS.127	Water Pump Impeller Remover and Replacer (Adaptors)	Desirable
6312	Universal Pulley Puller	Desirable
20SM. FT.6201	Small End Bush Remover and Replacer	Desirable
6200A	Adjustable Small End Bush Reaming Fixture	Desirable
20SM. FT.6200B	Set of Reamers	Desirable
32	Camshaft Bushes Remover and Replacer (Main Tool)	Essential
S.32-1	Camshaft Bushes Remover and Replacer (Adaptors)	Essential
550	Oil Seal Driver Handle	Desirable
4316F	Fuel Pump Wrench	Desirable
20SM.99	Spark Plug Wrench	Desirable
450	Stud Extractor	Desirable
Clutch and Gearbox Tools		
99A	Clutch Assembly Fixture	Essential
20S.72	Clutch Plate Centraliser	Desirable
S.4221A	Multi-purpose Hand Press	Essential
20SM.90	Propeller Shaft Flange Holder	Desirable
20S.63	Gearbox Extension Remover	Desirable
4235	Axle Shaft Remover (Main Tool)	Essential
S.4235A-2	Constant Pinion Shaft Remover (Adaptor)	Essential
20SM.69	Mainshaft Circlip Remover	Desirable
20SM.46	Circlip Installer	Desirable
20SM.76	Gearbox Countershaft Assembly Pilot	Desirable
S.4221-3	Constant Pinion Bearing Removing and Replacing Adaptors	Desirable
20SM.73A	Gearbox Front Cover Oil Seal Driver	Desirable
20SM.47	Gearbox Front Oil Seal Installer	Desirable
7065	2-way Circlip Pliers	Desirable
S.314	Mainshaft Ball Bearing Replacer	Essential
S.4221A-15	Mainshaft Ball Race Remover	Essential

Overdrive Tools

L.188	Hydraulic Test Equipment	Essential
L.176A	Drive Shaft Oil Seal Remover (Adaptor)	Essential
7657	Mainshaft Oil Seal Remover	Essential
L.177A	Drive Shaft Oil Seal Replacer Cone Clutch and Spring Thrust Housing Dismantling Tool	Essential
L.178	Freewheel Assembly Ring	Essential
L.179	Piston Ring Fitting Tool, 1⅛" dia.	Essential
L.181	Accumulator "O" Ring Replacer	Essential
L.182	Accumulator Piston Housing Remover	Essential
L.183	Pump Barrel Remover	Essential
L.184	Pump Barrel Replacer	Essential
L.185A	Dummy Drive Shaft	Essential
L.180	Piston Ring Fitting Tool, 1⅜" dia.	Essential
L.186	Mainshaft Bearing Replacer	Essential
L.187	Annulus and Tail Shaft Bearing Remover and Replacer	Essential
L.190A	Tail Shaft End Float Gauge	Essential

Rear Axle Tools

M.86A	Hub Remover	Essential
S.4235A-3	Half Shaft Remover (Adaptor)	Essential
S.4221-2	Half Shaft Bearing Remover (Taper Roller Bearing Type—Adaptors)	Desirable
20S.92	Half Shaft Bearing and Rear Hub Oil Seal Driver	Desirable
S.101	Differential Case Spreader	Essential
S.103	Differential Bearing Removal Ring	Essential
TS.1	Pinion Head Bearing Inner Cone Remover/Replacer	Essential
M.100A	Pinion Oil Seal Replacer (Adaptor)	Desirable
M.84	Pinion Bearing Setting Gauge	Essential
20SM.98	Pre-load Tester	Essential
20SM.90	Propeller Shaft Flange Holder	Desirable

Front Suspension and Steering Tools

S.3600	Steering Wheel Remover	Essential
S.160	Tie Rod Ball Joint Separator	Desirable
S.166	Vertical Link Ball Joint Separator	Desirable
S.112	I.F.S. Coil Spring Compressor	Essential
S.112-1	I.F.S. Coil Spring Compressor (Adaptor)	Essential

RECOMMENDED LUBRICANTS—HOME MARKETS

Component		Mobil	Shell	Esso	B.P.	Castrol	Duckham's	Regent
ENGINE SUMP*		Mobiloil Arctic or Mobiloil Special	Shell X-100 20W or X-100 Multigrade 10W/30	Esso Extra Motor Oil 20W/30	Energol Motor Oil 20W or Visco Static	Castrolite	Duckham's Nol Twenty or Duckham's Q5500	Havoline 20/20W or Havoline Special 10W/30
UPPER CYLINDER LUBRICANT		Mobil Upperlube	Shell U.C.L.	Esso U.C.L.	Energol U.C.L.	Castrollo	Duckham's Adcoids	Regent U.C.L.
CARBURETTOR DASHPOTS	SUMMER	Mobiloil A	X-100 30	Esso Extra Motor Oil 30	Energol Motor Oil 30	Castrol XL	Nol "Thirty"	Havoline 30
	WINTER	Mobiloil Arctic	X-100 20W	Esso Extra Motor Oil 20W	Energol Motor Oil 20W	Castrolite	Nol "Twenty"	Havoline 20/20W
GEARBOX AND OVERDRIVE REAR AXLE		Mobilube GX.90	Shell Spirax 90 E.P.	Esso Gear Oil GP.90	Energol E.P. S.A.E. 90	Castrol Hypoy	Duckham's Hypoid 90	Universal Thuban 90
STEERING UNIT GREASE GUN		Mobilgrease M.P.	Shell Retinax A	Esso Multi-Purpose Grease H	Energrease L.2	Castrolease L.M.	Duckham's LB.10	Marfak Multipurpose 2
OIL CAN		Mobil Handy Oil	Shell X-100 20W	Esso Handy Oil	Energol S.A.E. 20W	Everyman Oil	Duckham's General Purpose Oil	Havoline 20/20W
REAR ROAD SPRINGS		OLD REAR AXLE OR ENGINE OIL						
BRAKE CABLES		Mobilgrease M.P.	Shell Retinax A	Esso Multi-Purpose Grease H	Energrease L.2	Castrolease Brake Cable Grease	Duckham's Keenol K.G.16	Marfak Multipurpose 2
CLUTCH AND BRAKE RESERVOIRS		CASTROL GIRLING BRAKE AND CLUTCH FLUID			WHERE THE PROPRIETARY BRAND IS NOT AVAILABLE, OTHER FLUIDS WHICH MEET THE S.A.E. 70 R.3 SPECIFICATION MAY BE USED.			
		*Where circuit or other severe competitions are contemplated it is advisable to use oils of high viscosity in view of the increased temperature encountered.						
ANTI-FREEZE SOLUTIONS		Mobil Permazone	Shell Anti-freeze	Esso Anti-freeze	B.P. Anti-freeze	Castrol Anti-freeze	Duckham's Anti-freeze	Smith's Bluecol

The grades listed are not in the order of preference

RECOMMENDED LUBRICANTS—OVERSEAS COUNTRIES

Component		Mobil	Shell	Esso	B.P.	Castrol	Duckham's	Caltex Texaco	S.A.E. & A.P.I. Designation
ENGINE * SUMP	Air Temp. °F. Over 70°	MOBILOIL SPECIAL — Mobiloil A.F.	X-100 Multigrade 20W/40 or X-100 40	Esso Extra Motor Oil 20W/40 or Esso Motor Oil 40	VISCO STATIC — Energol Motor Oil 40	Castrol XXL	Q20-50 — Duckham's Nol "Forty"	Havoline 40 or Havoline Special 20W/40	S.A.E. 40 M.M.
	40° to 70°	Mobiloil A	X-100 MULTIGRADE 10W/30 — Shell X-100 30	ESSO EXTRA MOTOR OIL 10W/33 — Esso Motor Oil 30	Energol Motor Oil 30	Castrol XL	Q5500 — Duckham's Nol "Thirty"	HAVOLINE SPECIAL 10W/30 — Havoline 30	S.A.E. 30 M.M.
	10° to 40°	Mobiloil Arctic	Shell X-100 20W	Esso Motor Oil 20	Energol Motor Oil 20W	Castrolite	Duckham's Nol "Twenty"	Havoline 20/20W	S.A.E. 20W M.M.
	Below 10°	Mobiloil 10W	Shell X-100 10W	Esso Motor Oil 10W	Energol Motor Oil 10W	Castrol Z	Duckham's Nol "Ten"	Havoline 10W	S.A.E. 10W M.M.
UPPER CYLINDER LUBRICANT		Mobil Upper-lube	Shell Donax U	Esso Upper Motor Lubricant	Energol U.C.L.	Castrollo	Duckham's Adcoids	Upper Cylinder Lubricant	
CARBURETTOR DASHPOTS		USE APPROPRIATE CURRENT SINGLE GRADE ENGINE OIL							
GEARBOX	Over 30°	Mobilube GX.90	Shell Spirax 90 E.P.	Esso Gear Oil G.P.90	Energol E.P. S.A.E. 90	Castrol Hypoy	Duckham's Hypoid 90	Universal Thuban 90	G.L.4 Hypoid 90
REAR AXLE	Below 30°	Mobilube GX.80	Shell Spirax 80 E.P.	Esso Gear Oil G.P.80	Energol E.P. S.A.E. 80	Castrol Hypoy Light	Duckham's Hypoid 80	Universal Thuban 80	G.L.4 Hypoid 80
STEERING UNIT GREASE GUN		Mobilgrease M.P.	Shell Retinax A	Esso Multi-Purpose Grease H	Energrease L2	Castrolease L.M.	Duckham's L.B.10	Marfak Multipurpose 2	
OIL CAN		Mobil Handy Oil	Shell X-100 20W	Handy Oil	Energol Motor Oil S.A.E. 20W	Everyman Oil	Duckham's General Purpose Oil	Home Lubricant	
REAR ROAD SPRINGS		OLD REAR AXLE OR ENGINE OIL							
BRAKE CABLES		Mobilgrease M.P.	Shell Retinax A	Esso Multi-Purpose Grease H	Energrease L.2	Castrolease Brake Cable Grease	Duckham's Keenol KG 16	Marfak Multipurpose 2	
CLUTCH AND BRAKE RESERVOIRS		CASTROL GIRLING BRAKE AND CLUTCH FLUID			WHERE THE PROPRIETARY BRAND IS NOT AVAILABLE OTHER FLUIDS WHICH MEET THE S.A.E.70 R3 SPECIFICATION MAY BE USED.				

* Where circuit or other severe competitions are contemplated it is advisable to use oils of high viscosity in view of the increased oil temperature encountered.

ANTI-FREEZE SOLUTIONS	B.P. Anti-frost	Mobil Permazone	Shell Anti-freeze	Esso Anti-freeze	Castrol Anti-freeze	Duckham's Anti-freeze	Smith's Bluecol

The grades listed are not in the order of preference

Jacking (Fig. 3)

Using the jack provided in the tool kit, raise either side of the vehicle for road wheel removal, as follows :—

1. Ensure that the handbrake is applied and one of the wheels remaining on the ground is chocked.
2. Lift the floor covering adjacent to the door sill and remove the rubber grommet from the aperture in the floor panel.
3. Lower the jack through the aperture and engage the jack lug with the slotted bracket on the chassis frame.
4. Using the ratchet jack handle included in the tool kit, rotate the hexagonal shank of the jack clockwise to raise the vehicle.
5. To lower the jack, reverse the position of the ratchet handle and turn it counter-clockwise.

Front End (Fig. 1)

When raising the front end for servicing, place a hydraulically operated trolley jack under the front crossmember centrally between the front wheels, and place chassis stands under the chassis side members rearward of the front suspension.

Rear End (Fig. 2)

Raise the rear end using a trolley jack under the centre of the rear axle and place chassis stands under the chassis side members forward of the rear springs.

Towing

One or two methods of towing may be employed when moving the car.

(a) A towing ambulance, which may be placed under the front crossmember, or under the rear axle, depending upon the tow required.
(b) A towing rope secured to the front cross-member.

NOTE : Do NOT jack up or tow the vehicle using the radiator cradle.

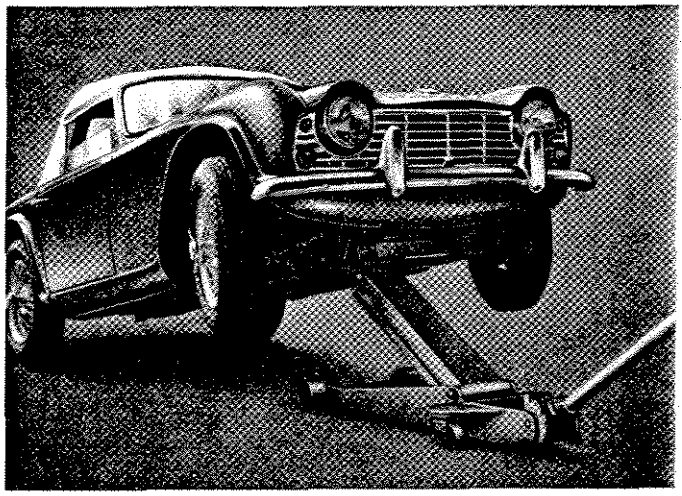


Fig. 1. Using an hydraulic trolley jack under the front cross-member

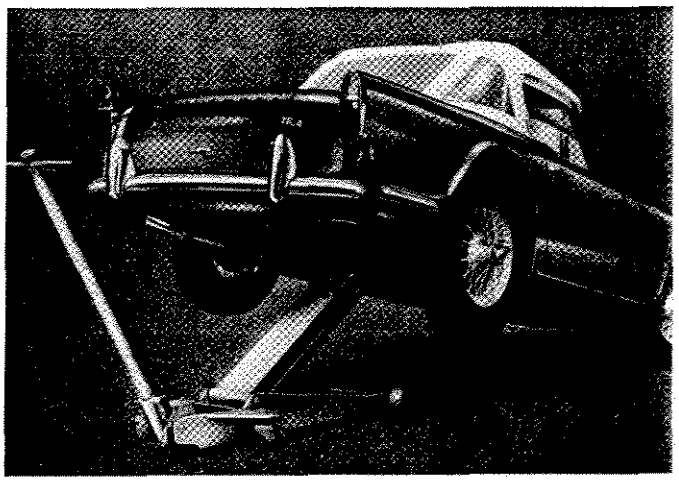


Fig. 2. Jacking under the rear axle

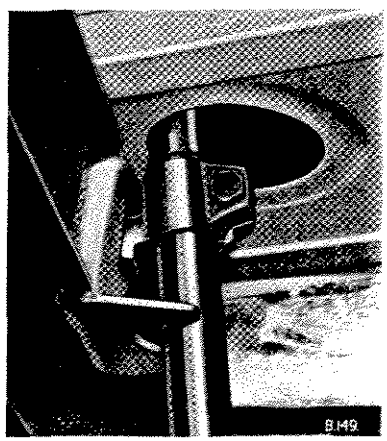


Fig. 3. The car jack located in the chassis lifting bracket

GLOSSARY OF PART NAMES AND ALTERNATIVES

ENGINE ..	**Gudgeon Pin**	Piston pin. Small-end pin. Wrist pin.
	Inlet Valve	Intake valve.
	Piston Oil Control Ring ..	Piston scraper ring.
	Induction Manifold	Inlet manifold. Intake manifold.
	Oil Sump	Oil pan. Oil reservoir. Sump tray.
	Core Plug	Expansion plug. Welch plug. Sealing disc.
	Dipstick	Oil dipper rod. Oil level gauge rod. Oil level indicator.
	Silencer	Muffler, expansion box, diffuser.
FUEL	**Carburettor Choke**	Carburettor Venturi.
	Slow Running Jet	Low speed jet. Idler jet.
	Volume Control Screw	Idling mixture screw.
	Fuel Pump	Petrol Pump. Fuel lift pump.
	Air Cleaner	Air silencer, muffler.
	Fuel Tank	Petrol tank.
	Accelerator	Throttle.
CLUTCH ..	**Clutch Release Bearing** ..	Throwout bearing. Thrust bearing.
	Clutch Lining	Disc facing. Friction ring.
	Spigot Bearing	Clutch pilot bearing.
	Clutch Housing	Bell housing.
GEARBOX ..		Transmission.
	Gear Lever	Change speed lever, gearshift lever.
	Selector Fork	Change speed fork. Shift fork.
	Input Shaft	Constant motion shaft. First motion shaft, drive gear. First reduction pinion. Main drive pinion. Clutch shaft. Clutch gear.
	Countershaft	Layshaft.
	Synchro Cone	Synchronizing ring.
	Reverse Idler Gear	Reverse Pinion.
REAR AXLE ..		Final Drive Unit.
	Crown Wheel	Ring gear, final drive gear, spiral drive gear.
	Bevel Pinion	Small pinion, spiral drive pinion.
	'U' Bolts	Spring clips.
	Axle Shaft	Half-shaft. Hub driving shaft. Jack driving shaft.
	Differential Gear	Sun wheel.
	Differential Pinion	Planet wheel.
ELECTRICAL ..	**Generator**	Dynamo.
	Control Box	Cut-out, voltage regulator, voltage control, circuit breaker.
	Capacitor	Condenser.
	Interior Light	Dome lamp.
	Lens	Glass
	Head Lamp Rim	Head lamp surround. Head lamp moulding.
	Direction Indicators	Signal lamps, flashers.
	Micrometer Adjustment ..	Octane selector.
	Rear Lamps	Tail lamps.

GLOSSARY OF PART NAMES AND ALTERNATIVES — continued

STEERING	**Drop Arm**	Pitman arm.
	Rocker Shaft	Pitman shaft. Drop arm shaft.
	Swivel Pin	Pivot pin. King pin. Steering pin.
	Stub Axle	Swivel axle.
	Track Rod	Cross tube. Tie rod.
	Draglink	Side tube. Steering connecting rod.
	Steering Column	Steering gear shaft.
	Steering Column Bearing	Mast jacket bearing.
	Steering Arm	Steering knuckle arm.
	Starter Tube	Control tube.
BRAKES	**Master Cylinder**	Main cylinder.
	Brake Shoe Lining	Brake shoe facing.
BODY	**Bonnet**	Hood.
	Luggage Locker	Boot. Luggage compartment.
	Luggage Locker Lid	Boot lid. Rear deck.
	Mudguards	Quarter panels. Fenders. Mud wings. Wings.
	Roof	Canopy.
	Nave Plate	Wheel disc. Hub cap.
	Finishing Strip	Moulding. Chromed strip.
	Windscreen	Windshield.
	Rear Window	Rear windscreen. Rear windshield. Backlight.
	Quarter Vent	(N.D.V.). No draught ventilator

Abbreviations
L.H.S. — Left-hand side (viewed from driver's seat).
R.H.S. — Right-hand side (viewed from driver's seat)

GENERAL SPECIFICATION

The general specification for the TR.4A is the same as that for the TR.4 except where listed below:

Performance Data (Engine)

Nett	104 B.H.P. at 4,700 r.p.m. Torque 1,590 lb. in. at 3,000 r.p.m. (Equivalent to 154 lb/sq. in. B.M.E.P.).
Piston Speed at 100 m.p.h. (top gear)	2,898 ft/min. at 4,800 r.p.m.

Cooling System

Radiator	Pressurised—finned vertical flat tubes. No-loss system.

Fuel System

Carburettors	Twin Stromberg 175 C.D. Horizontal. Needle size—2E up to CTC 54939. 2H from CTC 54940.
Air Cleaners	Replaceable paper elements.

Clutch

Type	Borg & Beck Diaphragm spring type, 8½″ diameter.

Rear Axle

Type	Hypoid bevel gears, taper roller bearings.
Live axle	Semi-floating axle shafts, three-piece casing.
I.R.S.	Final-drive unit rubber mounted.
Ratio	3·7 or 4·1 : 1.

TYRE PRESSURE DATA

TYRE PRESSURES

TYRE	Revs./Mile at 30 m.p.h.	ROLLING RADIUS Inches	Independent rear suspension vehicles		Rigid rear axle vehicles	
			PRESSURE—lbs/sq. in. Front	Rear	PRESSURE—lbs/sq. in. Front	Rear
Goodyear 6.95 × 15 G.P.	820	12·3	17	21	19	23
Dunlop 165/6.5 × 15 S.P.	820	12·3	24	28	24	28
Michelin 165 × 15 'X'	808	12·48	17	21	17	25

NOTE: The tyre pressures given in the above table are suitable for speeds up to 110 m.p.h. Where cars are to be used for racing, consult the respective Tyre Company regarding the need for tyres of full racing construction.

Suspension

Front	Low periodicity independent suspension system. Patented bottom bush and top ball-joint swivels. Coil springs controlled by telescopic dampers. Taper roller hub bearings.
Rear—Live axle	Wide semi-elliptic springs, controlled by piston dampers.
I.R.S.	Semi-trailing arm independent suspension with coil springs controlled by piston dampers. Mounted onto frame through rubber-bushed pivots and with rubber insulation of spring.

Steering

Type	Rack and pinion unit. Telescopic steering column.
Castor Angle	2°40′ ± ½°
Camber Angle	0° ± ½°
Kingpin inclination	9° ± ¾°
Front wheel alignment	Parallel to 1/16″ (1·59 mm.) toe-in.
Turning circle	33′ 0″ — 10 metres.

Chassis Data

Wheelbase	7′ 4″	223·6 cm.
Track: Front—Disc Wheels	4′ 1″	124·5 cm.
Track: Front—Disc Wheels	4′ 1″	124·5 cm.
Wire Wheels	4′ 1¾″	126·3 cm.
Rear—		
I.R.S. Disc Wheels	4′ 0½″	123·2 cm.
Wire Wheels	4′ 1¼″	125·1 cm.
Live Axle Disc Wheels	4′ 0″	122·0 cm.
Wire Wheels	4′ 0¾″	123·9 cm.
Ground Clearance (Static laden)	6″	15·24 cm.

Exterior Dimensions

Overall length	13′ 0″	396 cm.
” width	4′ 10″	147 cm.
” height (unladen)		
Hood erect	4′ 2″	127 cm.
Top of screen	3′ 10″	117 cm.
Hood folded and screen removed	3′ 4″	102 cm.

Capacities

	Imperial	U.S.	Metric
Water capacity of cooling system	10 pints	12 pints	5·7 litres
with heater fitted	11 pints	13·2 pints	6·25 litres

NUT TIGHTENING TORQUES

The nut tightening torques for the TR.4A are as those for the TR.4 with the addition of those listed below:

OPERATION	DESCRIPTION	SPECIFIED TORQUES lbs. ft.	Kg.m.
REAR AXLE			
Crown Wheel to Differential Case	$\frac{3}{8}$" × 24 U.N.F. Bolt	40 - 45	5·530 - 6·221
Rear Cover Attachment	$\frac{5}{16}$" × 24 U.N.F. Setscrew	18 - 20	2·489 - 2·765
Inner Driving Flange to Inner Axle	$\frac{5}{8}$" × 18 U.N.F. Nyloc nut	100 - 110	13·826 - 15·209
Mounting Plate to Hypoid Housing Rear	$\frac{3}{8}$" × 24 U.N.F. Stud	26 - 28	3·595 - 3·871
Mounting Plate to Hypoid Housing Front	$\frac{3}{8}$" × 24 U.N.F. Bolt	35	4·839
Oil Seal Housing to Hypoid Housing	$\frac{5}{16}$" × 24 U.N.F. Setscrew	16 - 18	2·212 - 2·489
REAR SUSPENSION (Live Axle)			
Front Spring Eye to Brackets	$\frac{5}{8}$" × 18 U.N.F. Bolt	28 - 30	3·871 - 4·148
Front Spring Eye Brackets to Frame	$\frac{3}{8}$" × 24 U.N.F. Bolt	28 - 30	3·871 - 4·148
Damper to Frame Brackets	$\frac{7}{16}$" × 20 U.N.F. Setscrew	55 - 60	7·604 - 8·293
Spring to Axle 'U' Bolts	$\frac{3}{8}$" × 24 U.N.F. 'U' Bolt	26 - 28	3·595- 3·871
Damper Link Attachment	$\frac{7}{16}$" × 20 U.N.F.	40 - 45	5·530 - 6·221
	$\frac{3}{8}$" × 24 U.N.F. Link	18 - 20	2·489 - 2·765
Bump Rubber Attachments	$\frac{3}{8}$" × 24 U.N.F.	18 - 20	2·489 - 2·765
Extension Studs for Wire Wheels	$\frac{7}{16}$" × 20 U.N.F. Stud	65	8·987
Wheel Attachment	$\frac{7}{16}$" × 20 U.N.F. Nut	55 - 60	7·604 - 8·293
REAR SUSPENSION (I.R.S.)			
Damper to Frame Mounting Brackets	$\frac{7}{16}$" × 20 U.N.F. Setscrew	55 - 60	7·604 - 8·293
Damper Link Attachment	$\frac{3}{8}$" × 24 U.N.F. Link	18 - 20	2·489 - 2·765
Inner Driving Flange to Rear Hub and Axle Shaft	$\frac{3}{8}$" × 24 U.N.F. Bolt	28 - 30	3·871 - 4·148
Rear Hub Assembly	$\frac{5}{8}$" × 18 U.N.F. Stub Axle	100 - 110	13·826 - 15·209
Trailing Arm to Mounting Bracket	$\frac{7}{16}$" × 20 U.N.F. Bolt	45 - 50	6·221 - 6·913
Trailing Arm Mounting Brackets to Frame	$\frac{3}{8}$" × 24 U.N.F. Bolt	28 - 30	3·871 - 4·148
Trailing Arm to Brake Back Plate	$\frac{5}{16}$" × 24 U.N.F. Stud	12 - 14	1·652 - 1·936

SPECIAL TOOLS

The special tools required for the TR.4A are the same as those for the TR.4 with the addition of those listed below:

SUSPENSION

S.112A	I.F.S. Coil Spring Compressor
S.112A—1A	I.F.S. Coil Spring Compressor Adaptor

REAR AXLE

S.101—1	Differential Case Spreader Adaptors
S.317	Rear Hub Adjusting Nut Wrench
S.318	Halfshaft Assembly Holding Jig.
S.4221A—16	Outer Hub Taper Bearing Remover/Replacer Adaptor.

TRIUMPH TR4

WORKSHOP MANUAL

GROUP 0

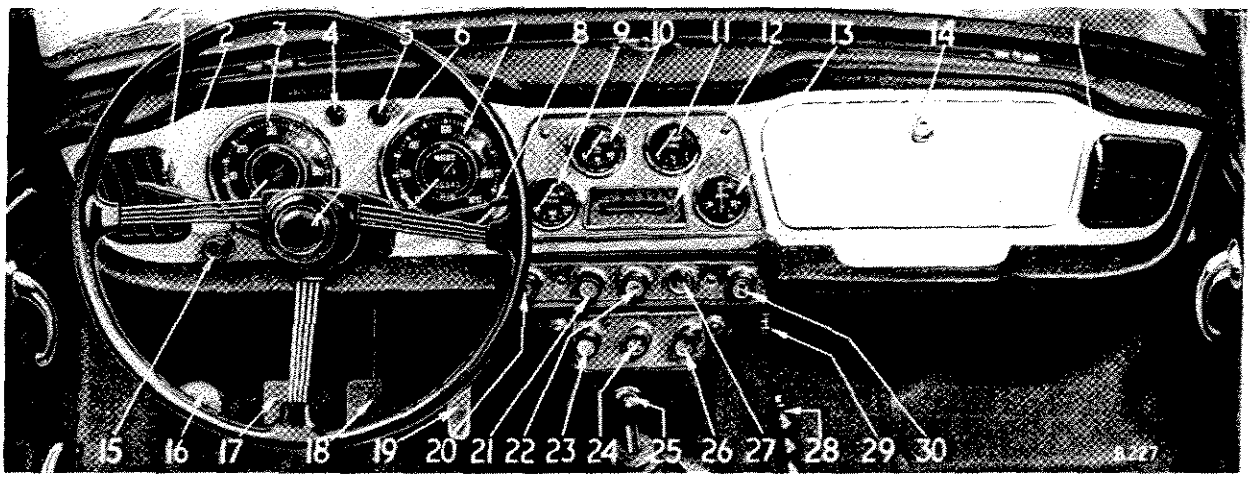
Comprising:

TR4 WORKSHOP MANUAL

GROUP 0

CONTENTS

INSTRUMENTS



1 Fresh air vent controls
2 Overdrive switch (Special Accessory)
3 Tachometer
4 Turn signal indicator
5 Ignition warning light
6 Horn button
7 Speedometer
8 Turn signal control
9 Water temperature gauge
10 Oil pressure gauge
11 Fuel gauge
12 Ash tray
13 Ammeter
14 Facia locker
15 Panel illumination rheostat
16 Headlamp dipper switch
17 Clutch pedal
18 Brake pedal
19 Accelerator pedal
20 Parking and headlamp switch
21 Windscreen washer control
22 Windscreen wiper switch
23 Heat control
24 Heater blower switch
25 Gear shift lever,
26 Heat distribution control
27 Ignition/Starter switch
28 Handbrake lever
29 Scuttle ventilator control
30 Choke control

Fig. 1. Arrangement of Instruments, Switches and Controls (L.H.D.)

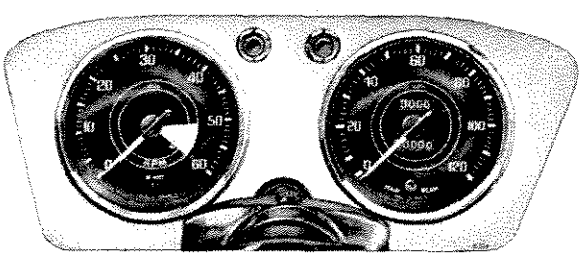


Fig. 2. Tachometer (left) and Speedometer (right) L.H.D.

Viewed left to right from the driving position, each instrument and indicator within the left-hand group performs the following function :—

Tachometer

The tachometer, which is the large instrument on the left, indicates the engine speed in revolutions per minute and is calibrated in divisions of 100, extending to 6,000. The speed range within the red segment is subject to special precautions. These are given on page 0·108.

Turn Signal Indicator

The green flashing indicator monitor light, at the right-hand side of the tachometer, glows intermittently when the direction control is operated and the ignition is switched on. See "Turn Signal Control" on page 0·105.

Ignition Warning Light

The small red warning light at the left of the speedometer glows when the ignition is switched on and is extinguished when the engine is accelerated. If the indicator glows when driving, this indicates an electrical fault which should be traced and rectified without delay.

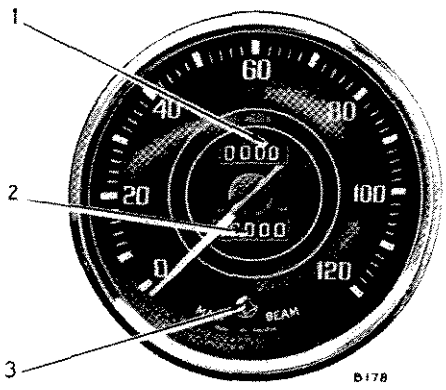
Speedometer

The speedometer indicates the road speed of the vehicle in miles per hour and is calibrated in divisions of 2, extending to 120.

The figures within the aperture above the centre of the dial may be used to record individual journeys, provided that the figures are re-set to zero at the beginning. This is achieved by pushing up and turning anti-clockwise the knob which extends downwards from behind the instrument.

The figures within the aperture below the centre of the dial show the total mileage of the vehicle and may be used as a guide for periodic lubrication and maintenance.

The High Beam indicator near the bottom of the dial glows only when the headlamp main beams are in use. When the dipper switch is operated the indicator is extinguished.



1 Trip indicator
2 Total mileage indicator
3 High beam indicator

Fig. 3. Speedometer

Tachometer and Speedometer Illumination

Illumination of the tachometer and speedometer is controlled by a switch at the left side of the tachometer. Turn the switch knob clockwise to switch on, and further clockwise to dim the illumination. Turn fully anti-clockwise to switch off.

Water Temperature Gauge

The gauge is calibrated in degrees Fahrenheit and indicates the temperature of water leaving the cylinder head. The normal operating temperature is reached when the needle registers in the central sector of the dial.

Oil Pressure Gauge

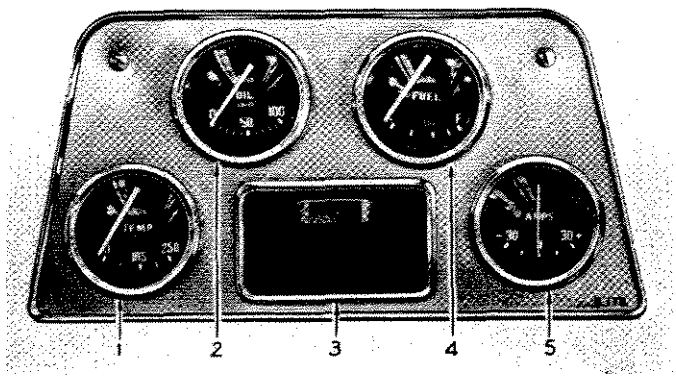
Calibrated in lbs. per sq. in., the oil gauge registers the pressure of oil fed to the bearings. At speeds exceeding 30 m.p.h., when the oil is hot, the gauge needle should register between 65 and 75. A low pressure is normal when idling or running at a lower speed.

Fuel Gauge

The fuel gauge is calibrated relative to the fuel tank and registers the approximate contents only. When the ignition is switched on the needle moves slowly across its scale, taking up to one minute to reach a true reading. The needle then maintains a steady reading regardless of vehicle movement.

Ammeter

The ammeter is calibrated in amperes and indicates the rate of battery charge and discharge. The charging rate is indicated when the pointer moves to the right-hand side of "zero", and discharge, by movement to the left.



1 Water temperature gauge
2 Oil pressure gauge
3 Ashtray
4 Fuel contents gauge
5 Ammeter

Fig. 4. Centre instrument group

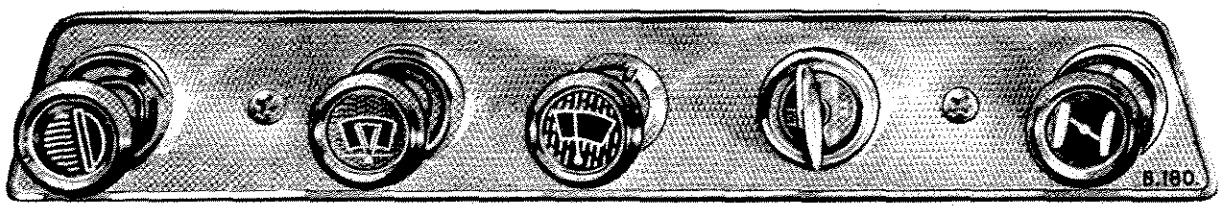


Fig. 5. Upper Central Controls

Lighting Switch

Mounted on the central switch panel and identified by a "Headlamp" sign, the lighting switch is on the extreme left. Pull this out to the first position to illuminate the side, rear, number plate and centre instrument panel lights. In addition to these, twist the switch slightly clockwise and pull out to the second position to illuminate the headlamps. See "Dipper Switch".

Windscreen Washer

The windscreen washer control, on the right of the lighting switch, should be used in conjunction with the windscreen wiper. Operate by pushing the control to spray clean fluid on to the screen as the wiper blades disperse the mud. If the washer has remained unused for some time, depress the control a few times to charge the system.

Windscreen Wiper

The windscreen wiper switch is located in the centre of the panel and to the left of the ignition switch. Pull the switch knob to operate, and push to switch off, when the wipers will automatically return to the parked position at the base of the windscreen. The wipers can only be operated when the ignition switch is turned to the "ignition" or auxiliary positions.

Choke Control

The choke control is located on the extreme right of the panel and is used to enrich the fuel mixture for easier starting from cold. The control should not be used if the engine is warm, and may not be necessary in warm climates.

Ignition and Starter Switch

Operated by a separate key, the combined ignition and starter switch has four positions. These are : 1, "Off", in which position the key may be withdrawn ; 2, "Ignition"; 3, Start ; 4, Auxiliary. (See Fig. 6).

With the key in the "Off" position (vertical), turn the key clockwise to switch on the ignition and auxiliary circuits.

To operate the starter motor, turn the key further clockwise against spring pressure and when the engine fires, release the key, which will return to the "Ignition" position. If the engine has failed to start, wait until the starter motor has come to rest before returning the key to the "Start" position.

To select "Auxiliary" turn the key anti-clockwise from the vertical position. This will enable, for example, the radio to be used with the ignition switched off and, since the key must be withdrawn from the switch to lock the vehicle, accessories cannot continue to function.

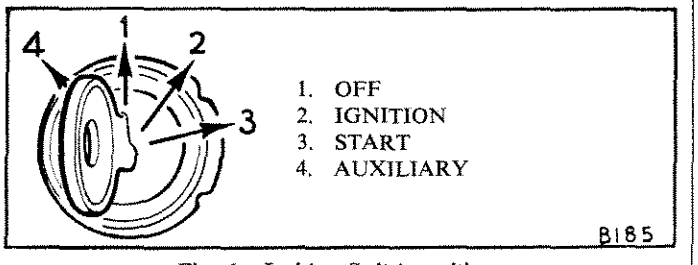


Fig. 6. Ignition Switch positions

Headlamp Dipper Switch

A foot operated dipper switch, located on the toe-board to the left of the clutch pedal, enables the driver to quickly lower his headlamp beams whilst maintaining full control of the steering and other hand controls.

When the headlamps are illuminated, see lighting switch on page 0·104, the main beams may be lowered by pressing the dipper switch and releasing it. To return to the main beam position, again press the dipper switch and release it. The main beam position is indicated by a red warning light near the bottom of the speedometer dial.

Horns

Operate the horns by pressing the button in the centre of the steering wheel.

Overdrive Control

When an overdrive is fitted, the control is mounted on the right-hand side of the steering column cowl. Move the lever down to engage overdrive, and up to release it. Before using the control, see "Recommended speed limits" on page 0·108.

Turn Signal Control

The turn signal lamps are controlled by a lever mounted on the left-hand side of the steering column cowl. Before making a right-hand turn, move the lever upwards. Move it downwards before turning left. When either left- or right-hand turn signal lamps are operating, this is indicated by the intermittent flashing of a green indicator light on the facia.

Clutch, Brake and Accelerator Pedals

These are conventional items which do not need further explanation.

Gear Shift Lever

All forward gears have synchromesh engagement. See Fig. 10 for the gear shift positions. Reverse is engaged by moving the gear shift lever to the right, lifting it and then moving it rearwards.

Handbrake

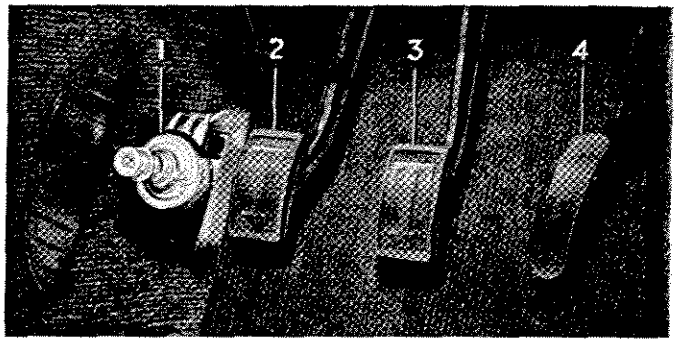
To apply the rear wheel brakes, pull the handbrake lever and retain it in position by pressing the button on top of the lever. Release the handbrake by pulling it slightly rearwards to free the pawl, then allow the lever to move forward to the "OFF" position.

Seat Adjustment

The driver's and passenger's seats are adjustable for leg reach by lifting the lever at the outer side of each seat and sliding the seat to the desired position, allowing the lever to re-engage in the nearest adjustment notch. The passenger's seat backrest hinges forward to provide access to the rear compartment. Do not forget to move the driver's seat forward before lowering or raising the "Soft Top". See group 5.

Radio Controls

For operating instructions see the radio leaflet provided with the set. This is protected against electrical damage by a 5 amp. fuse housed in the main lead union.



1 Headlamp dipper switch 2 Clutch pedal
3 Footbrake 4 Accelerator pedal

Fig. 7. Foot controls

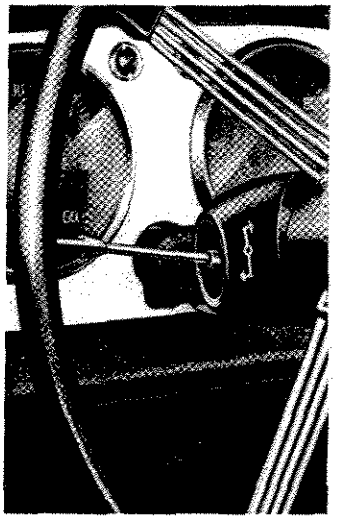


Fig. 8. Turn signal control

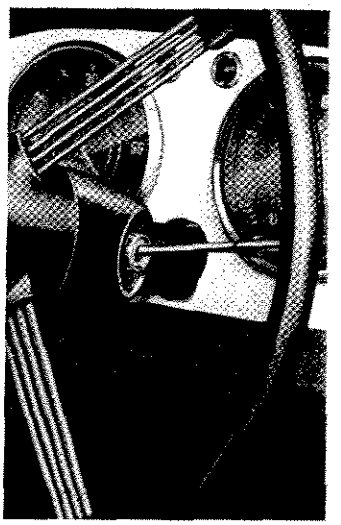


Fig. 9. Overdrive control

Fig. 10. Change speed lever positions

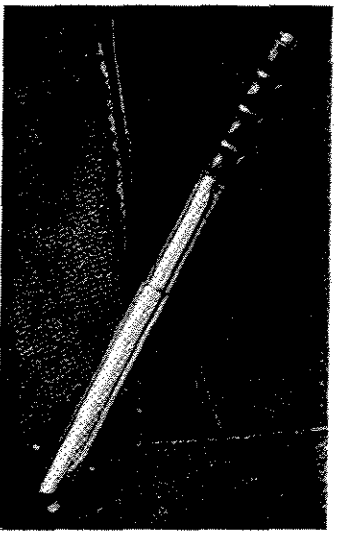
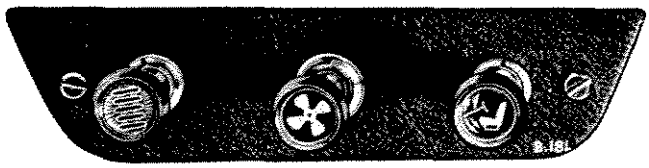


Fig. 11. Handbrake lever



Left—Heater control Centre—Blower switch Right—Distribution control
Fig. 12. Heater controls

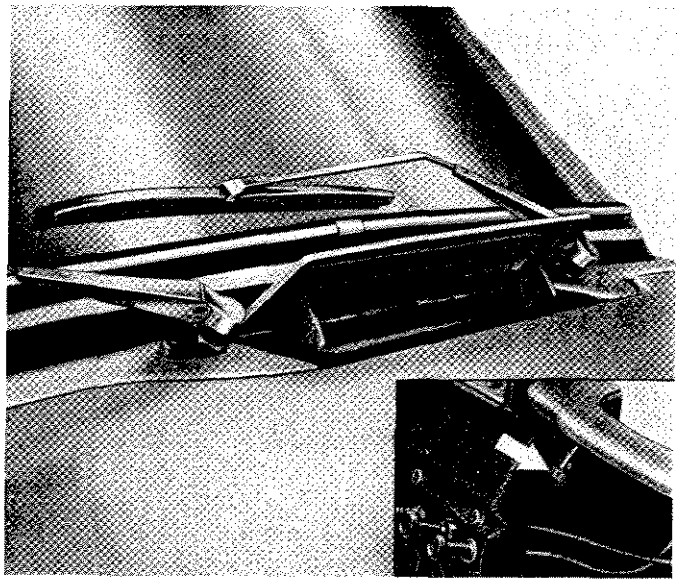


Fig. 13. Scuttle ventilator and control shown on inset

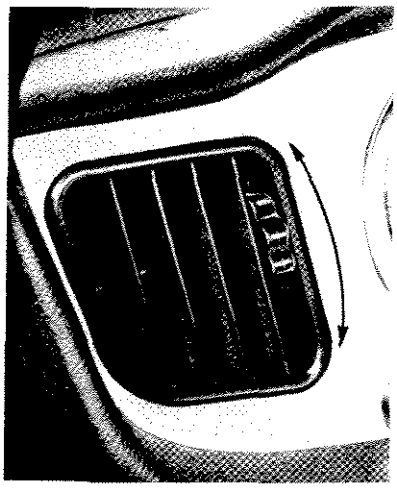


Fig. 14. Facia vent control

HEATING AND VENTILATION

The heater is designed to heat and distribute incoming fresh air, or if dust and exhaust fumes are being admitted, the heater may be used to recirculate air already in the vehicle.

Fresh air is admitted to the heater duct through the open scuttle ventilator. This is opened by pulling the ventilator lever rearwards and closed by pushing it forwards.

When the scuttle ventilator is closed, air is drawn in through the open facia vents and recirculated by the heater unit. The facia vents are opened by turning the handwheel, at the side of each vent, forward.

When the scuttle ventilator is open, cool fresh air is blown out of the open facia vents and may be directed up or down, or may be cut-off by adjusting the handwheel. There is no provision for heating the air blown from the facia vents.

The degree of heat given out by the heater unit is controlled by the left-hand control on the heater control panel. Pull the control fully out for maximum heat, or push it fully in for cold. Intermediate positions give varying degrees of heat.

The blower switch on the centre of the panel controls a motor-driven fan which stimulates the flow of fresh air from outside when the vehicle is stationary, and boosts the air circulation when the vehicle is moving. The blower is operated by pulling the control to switch on, and pushing it to switch off.

The distribution of warmed air is effected by the right-hand control. Pulling the control fully out directs air to the interior of the vehicle. Pushing the control fully in directs air to the windscreen only. Intermediate positions direct air to the screen and interior in varying proportions.

LOCKS

Locks and Keys

Two sets of keys are provided, one for operating the ignition switch and door locks, and the other for locking the facia locker and luggage compartment.

Facia Locker (Fig. 15)

The facia cubby box may be unlocked by turning the key a quarter turn clockwise and opened by depressing the locking barrel and pulling on the lipped plate.

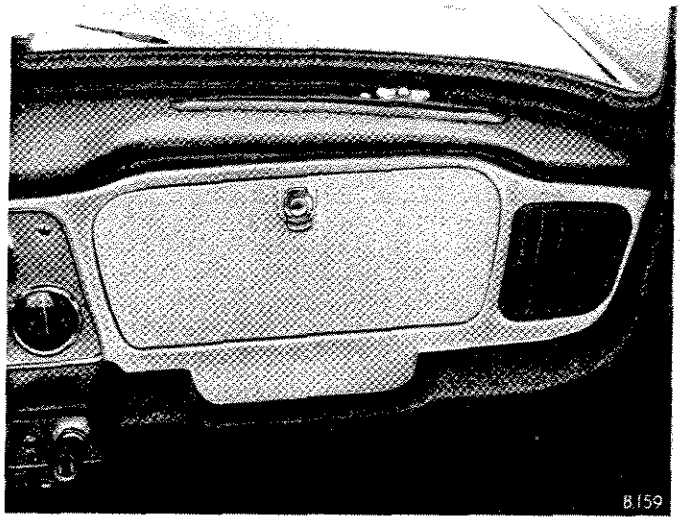


Fig. 15. Facia locker

Luggage Compartment (Fig. 16)

To open the luggage compartment lid, turn the unlocked handle counter-clockwise to a vertical position and raise the lid to its limit before engaging the stay in the slot provided.

To close the lid, raise it slightly to release the stay which can then be engaged in its rubber retainer on the boot lid support assembly. Lower the lid and turn the handle, which may be locked by turning the key a half turn counter-clockwise.

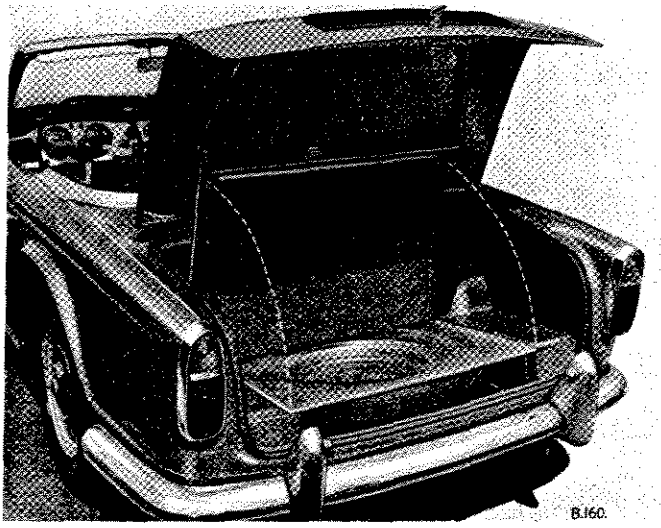


Fig. 16. Luggage locker showing hinged spare wheel cover

Fuel Filler Cap (Fig. 17)

The fuel filler cap, located forward of the luggage locker lid, is opened by depressing a small lever at the side of the cap. Press the cap to close.

Bonnet Release

To open the bonnet, pull the control situated below the right-hand side of the facia. The bonnet will rise sufficiently to enable the fingers to be inserted under the rear edge to raise it to a near vertical position, where it will be supported by a stay. Disengage the stay from its recess before closing the bonnet.

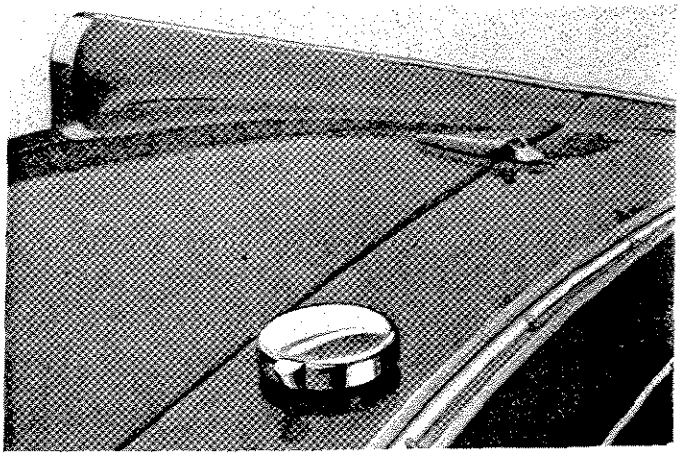


Fig. 17. Fuel filler cap

Door Locks

Either door may be locked from inside or outside irrespective of which door was last used as an exit. The mechanism automatically prevents the inside handle being set in the locked position whilst the door is open. This eliminates the possibility of being locked out of the car in the event of the key being inadvertently left inside.

RUNNING-IN FROM NEW

Running-in

The importance of correct running-in cannot be too strongly emphasized, for during the first 500 miles of motoring, the working surfaces of a new engine are bedding down. Power and performance will improve only if during this vital period the engine receives careful treatment.

Whilst no specific speeds are recommended during the running-in period, avoid placing heavy loads upon the engine, such as using full throttle at low speeds or when the engine is cold. Running-in should be progressive and no harm will result from the engine being allowed to "rev." fairly fast provided that it is thoroughly warm and not pulling hard. Always select a lower gear if necessary to relieve the engine of load.

Full power should not be used until at least 500 miles have been covered and even then, it should be used only for short periods at a time. These periods can be extended as the engine becomes more responsive.

After 1,000 miles running, the engine can be considered as fully run-in.

To prevent possible damage to a valve seat as the metal stabilizes during the running-in period, valve grinding is recommended early in the life of the engine.

Recommended Speed Limits

Avoid over-revving, particularly in the lower gears. The driver is advised not to drive the car continuously at engine speeds above 4,500 r.p.m. in any gear. However, whilst accelerating through the gears it is permissible to attain 5,000 r.p.m. for short periods, this speed being indicated by a red segment on the tachometer.

When an overdrive is fitted, do not change from overdrive to normal 3rd or 2nd gears at engine speed exceeding 3,500 r.p.m., otherwise damage may result from "over-revving".

SUPPLEMENT TO GROUP "0" SECTION 1.

The instruments, switches and controls used in TR.4A models are mounted in a walnut facia. They are similarly positioned and function as those described for TR.4 models, except for the following details:-

Panel Illumination Rheostat

The panel illumination rheostat switch (item 15, Fig. 1) is positioned in place of the lighting switch (item 20, Fig. 1).

Windscreen Wiper Switch

The windscreen wipers have two speeds, these being controlled by a two-position pull switch positioned as item 22, Fig. 1. When the switch is pulled to its first position, the wipers operate at fast speed, when the switch is pulled to its second position, the wipers operate at slow speed.

Handbrake

The handbrake has been re-positioned and is mounted on the propeller shaft tunnel.

Recommended Speed Limits

The recommended speed limits stated on page 0·108 apply to TR.4 models. The following figures apply to TR.4A models.

Avoid over-revving, particularly in the lower gears. The driver is advised not to drive the car continuously at engine speeds above 5,000 r.p.m. in any gear. However, whilst accelerating through the gears it is permissible to attain 5,500 r.p.m. for short periods, these speeds being indicated by the beginning and the end of the red segment on the tachometer.

When an overdrive is fitted, do not change from overdrive to normal 3rd or 2nd gears at engine speed exceeding 4,500 r.p.m., otherwise damage may result from "over-revving".

Suggested minimum engagement speeds are:—

Top gear	40 m.p.h.
Third gear	30 m.p.h.

Maximum disengagement speeds are:—

	3·7 AXLE	4·1 AXLE
Top gear	At driver's discretion	At driver's discretion
3rd gear	82 m.p.h.	74 m.p.h.
2nd gear	54 m.p.h.	49 m.p.h.

The above disengagement speeds correspond approximately to peak revs. in normal gear. Disengagement of the O/D at speeds higher than those stated may cause damage from "over-revving".

CUSTOMER PREPARATION SERVICE

Commission Number..... *Engine Number*..... *Date* .....

Owner's Name.....

Address..... *Registration Number*..... *Speedometer Reading*.....

Every precaution has been taken at the factory to ensure that the car reaches the customer in the best possible condition. A few preparatory operations remain, however, which in the best interests of all, must be carefully carried out by the selling Distributor or Dealer before the car is handed to the customer.

Details of the preparation service are as follows :—

MECHANICAL

- ☐ 1. Check cooling system for leaks and top up radiator level as necessary.
- ☐ 2. Check carburettors and petrol system for leaks.
- ☐ 3. Check brake/clutch master cylinders fluid level and top up as necessary.
- ☐ 4. Check and adjust tyre pressures.

ELECTRICAL

- ☐ 1. Top up battery with distilled water as necessary.
- ☐ 2. Check windscreen wiper operation.
- ☐ 3. Check operation of horn.
- ☐ 4. Check all instruments for operation.
- ☐ 5. Check flasher operation.
- ☐ 6. Check lamps for operation.

LUBRICATION

- ☐ 1. Check engine for correct oil level.

COACH

- ☐ 1. Fit front carpets and retainer strips.

GENERAL FINISH

- ☐ 1. Examine paintwork, touching-up as necessary.
- ☐ 2. Check interior trim and seats for cleanliness and seat slide(s) for correct operation.
- ☐ 3. Remove all masking tape and anti-corrosive preparation from chromium plating.
- ☐ 4. Wash and polish car, examine for leaks.
- ☐ 5. Check tool kit and that all literature is present.

ROAD TEST

- ☐ 1. Test car on road.

IMPORTANT

To avoid possible errors, mark the appropriate square as each operation is completed and record on the back of this form any points requiring special attention.

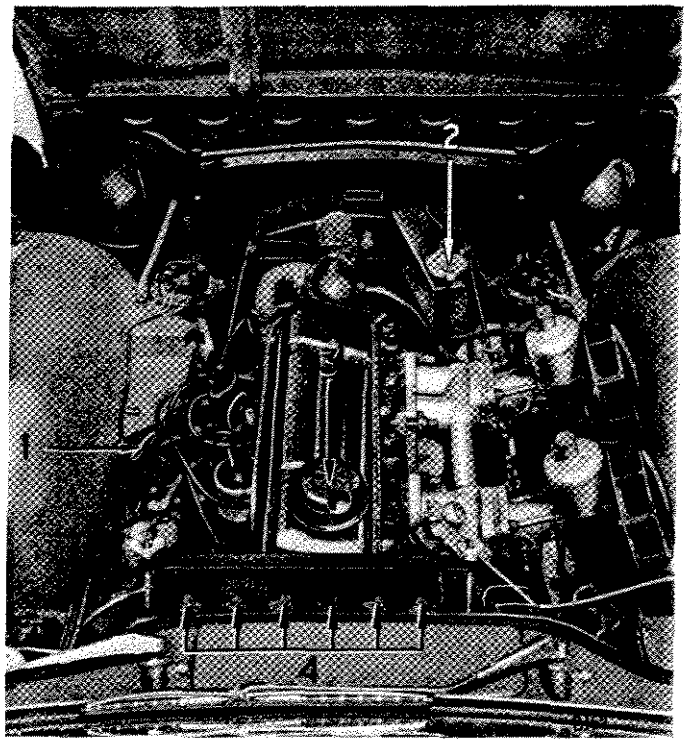


Fig. 1. Under Bonnet View

DAILY ATTENTION

Engine

Daily, or every 250 miles (500 km.), withdraw the dipstick (1), wipe clean and push fully home before withdrawing it for reading ; if the reading corresponds with the lower mark, 4 pints (4·8 U.S.A.) (2·27 litres) will be required for topping up via the cap (3).

Radiator

Top up the radiator with clean rain water until the level is one inch below the filler neck. This will allow for expansion of the coolant as the engine warms up and is particularly important if an anti-freeze mixture is being used, since the expansion allowance will prevent unnecessary loss of fluid and consequent dilution as further topping up takes place.

CAUTION If the engine is hot, turn the filler cap (2) a half-turn and allow pressure to be fully released before completely removing it.

WEEKLY ATTENTION

Tyres

Adjust the tyre pressures in accordance with conditions and pressure schedules given on page 5. Additional information is given in group 3.

Battery

Examine the level of the electrolyte in the cells and, if necessary, add distilled water via the plugs (4), Fig. 1, to bring the level up to the top of the separators.

Examine the battery terminals and, if necessary, clean and coat them with petroleum jelly. Wipe away any foreign matter or moisture from the top of the battery and ensure that the connections and fixings are clean and tight.

IMPORTANT
Never use a naked light when examining the battery, as the mixture of oxygen and hydrogen given off by the battery can be dangerously explosive.

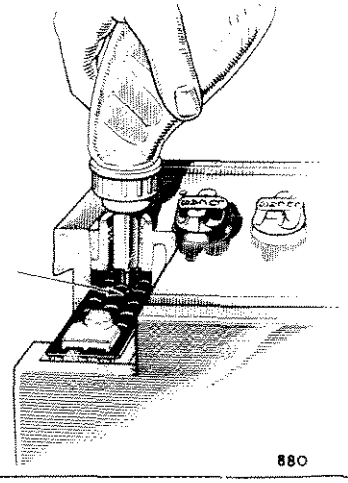


Fig. 2. Topping up the battery cells

880

500 MILES (FREE SERVICE)

Many of the components, including gaskets, bolts and studs, inevitably settle down during the first 500 miles (1,000 km.) of use. Therefore, at the completion of this mileage, the vehicle should receive the following attention :—

1. Thoroughly lubricate all chassis points, door hinges, luggage locker and bonnet hinges, locks and striker plates, pedal pivots, throttle controls, handbrake cable and rear hubs.

2. Change oil in engine, gearbox and rear axle.

3. Examine and top up if necessary :—
   (a) Water level in radiator.
   (b) Electrolyte level in battery.
   (c) Hydraulic fluid levels in brake and clutch systems.
   (d) S.U. Carburettor dashpots (if fitted).

4. Tighten all nuts where required, particularly those securing the cylinder head, exhaust manifold, exhaust pipe and silencer attachments, steering unit, tie-rods and levers, differential unit, universal couplings, rear springs and body mountings.

5. Check oil filter attachments for tightness.

6. Check and if necessary adjust :—
   (a) Ignition timing.
   (b) Fan belt.
   (c) Carburettor and controls for slow running.
   (d) Front wheel track alignment.
   (e) Front hubs, wheel nuts and tyre pressures.
   (f) Valve clearances.
   (g) Ignition distributor and sparking plug points.

7. Clean the air filter and fuel pump bowl.

8. Adjust brakes and clutch if required.

9. Check operation of all electrical equipment and focus headlamps.

10. Clean battery terminals, smear with petroleum jelly and check battery mounting but do not over-tighten holding down clamps.

11. Check and tighten starter and generator attachment bolts and terminals.

12. Check all hydraulic pipe connections for tightness and all flexible hoses for clearance.

13. Road test car and report any defects.

14. Wipe clean door handles, controls and windscreen.

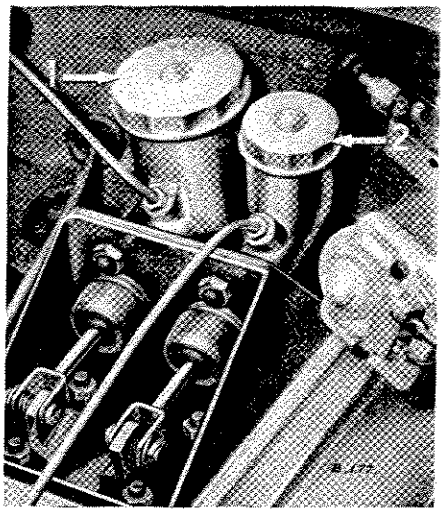


Fig. 3.
1 Brake master cylinder.
2 Clutch master cylinder.

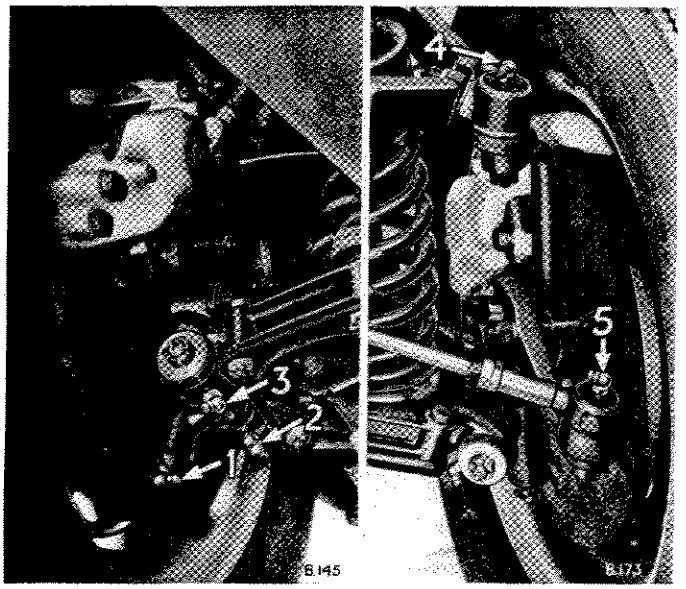


Fig. 4. Steering and Front Suspension Greasing Points

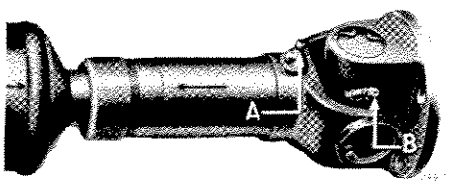


Fig. 5. Propeller Shaft Greasing Points

EVERY 1,500 MILES

Engine Compartment

1. Check the levels and if necessary top up the engine oil sump and radiator header tank.
2. Wipe the master cylinder caps clean, remove them and check the fluid level in the clutch and brake master cylinder reservoirs. If necessary, top up the fluid until it is level with the arrow on the side of the reservoirs. Ensure that the breather hole in each cap is unobstructed before refitting the caps to the master cylinders.

NOTE. As the brake pads wear, the level of fluid in the master cylinder falls. The addition of fluid to compensate for pad wear is unnecessary. Should the level have fallen appreciably, check the condition of the pads. If their condition is satisfactory, establish the cause of loss and rectify the defect immediately. Refer to group 3, "Bleeding the Brake and Clutch Hydraulic System".

Car Hoisted

1. **Front Suspension and Steering Tie Rods**—take the weight off the front suspension by jacking up the front of the chassis until the road wheels are clear of the ground. Using good quality grease, pressure lubricate the nipples 1-5 on both sides of the vehicle. Wipe away all surplus grease to prevent contamination of the disc brakes and tyres.

NOTE. The inner ends of the upper and lower wishbones are mounted on nylon bushes which sometimes develop a pronounced squeak when dry. This can be rectified by occasionally forcing each rubber dust seal to one side and injecting a few drops of thin oil.

2. **Propeller Shaft**—Apply the grease gun to nipples A and B.
3. **Gearbox and Rear Axle**—Check each unit for leakage. Rectify and replenish lubricant if required.

Car on Ground

1. **Tyre pressure**—Adjust (See page 5).
2. Check tightness of road wheel nuts.
3. Wipe clean door handles, steering wheel, gear lever, handbrake lever and windscreen.

3,000 MILES

At 3,000 mile intervals, carry out the work listed under 1,500 miles and the following additional work:—

Change Engine Oil

For average driving conditions, defined below, drain the oil sump by removing the plug shown arrowed, refit the plug and refill with the appropriate grade of oil at the end of each 3,000 mile period. This period should be reduced for unfavourable conditions or may be extended for those more favourable.

Favourable	Long distance journeys with little or no engine idling, on well-surfaced roads, reasonably free from dust.
Average	Medium length journeys on well-surfaced roads with a small proportion of stop/start operation.
Unfavourable	Either of the following:—
	(a) Operating during cold weather, especially when frequent engine idling is involved.
	(b) Extremely dusty conditions.

If the vehicle is used for competition or sustained high speed work, use of higher viscosity oils is advised because of the increased oil temperature. Additives which dilute the oil or impair its efficiency must not be used.

An upper cylinder lubricant, mixed with the fuel in the proportions given on the container, may be used with advantage throughout the life of the vehicle, particularly during the running-in period and when the weather is wintry.

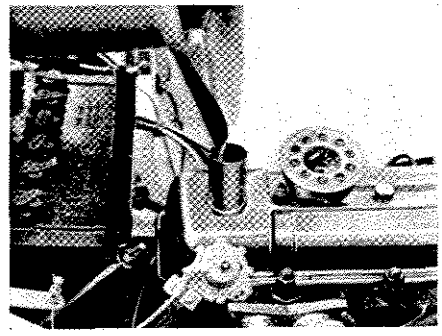


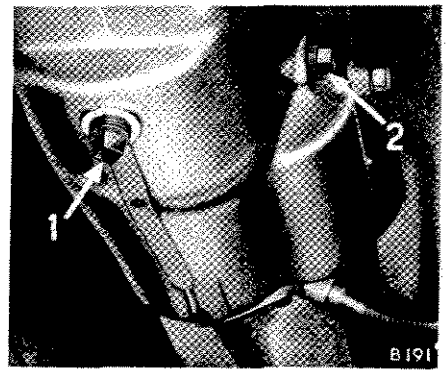
Fig. 6.
Engine oil filter

Fig. 7.
Engine sump drain plug

Top-up Gearbox

With the vehicle standing on level ground, remove the oil level plug (2) and, using a suitable dispenser such as a pump type oil can with flexible nozzle, filled with an extreme pressure (Hypoid) lubricant, top up the gearbox until the oil is level with the bottom of the filler plug threads.

Allow surplus oil to drain away before refitting the level plug and wiping clean. Avoid overfilling as this may result in the oil leaking into the clutch housing with consequent ill-effects to the clutch facings.



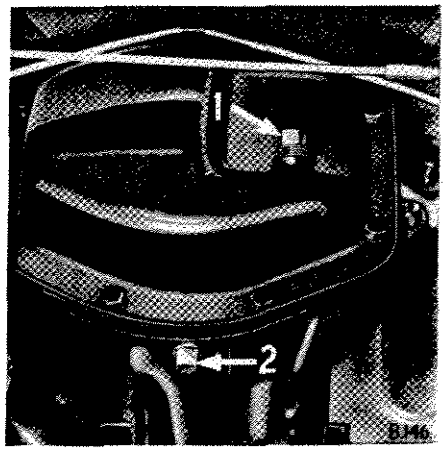
1 Drain plug.
2 Filler plug.

Fig. 8.
Gearbox drain and filler plugs

Top-up Rear Axle

Remove the oil level plug (1) and, using the same dispenser as used for topping-up the gearbox, and the same oil, i.e., extreme pressure (Hypoid) lubricant, top up the rear axle until the oil is level with the bottom of the filler plug threads.

Allow surplus oil to drain away before refitting the level plug and wiping clean. Avoid overfilling and if an excessive amount of oil is required, check for leakage around the driving flange seal and rear cover.



1 Filler plug.
2 Drain plug.

Fig. 9.
Rear Axle drain and filler plugs

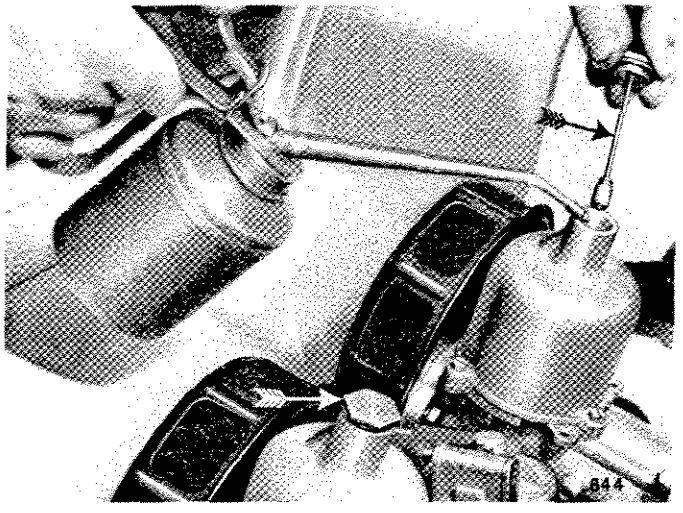
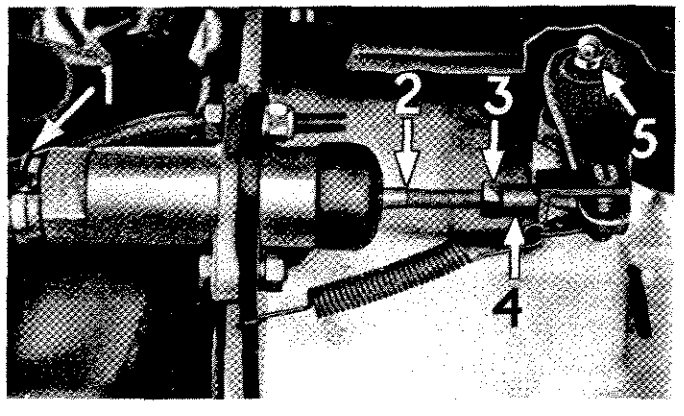
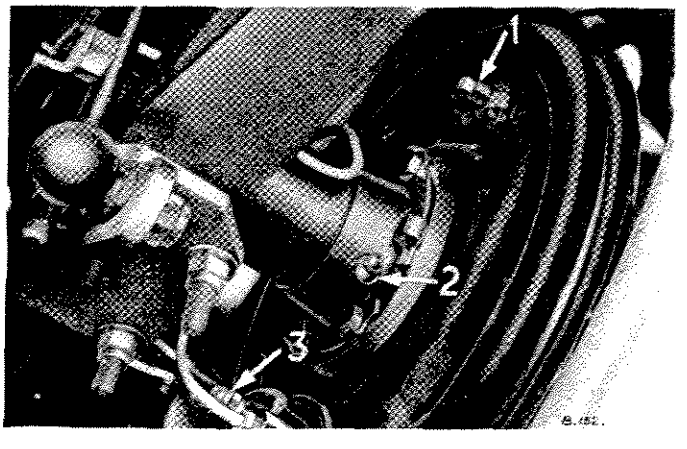


Fig. 10. Filling Carburettor Dashpots



1 Bleed nipple
2 Adjusting rod
3 Locknut
4 Clevis
5 Cross-shaft greaser

Fig. 11. Clutch Linkage



1 Brake adjuster
2 Hub greaser
3 Bleed nipple

Fig. 12. Rear Hub and Backing Plate

Carburettor Dash Pots

Unscrew the hexagon plug from the top of each carburettor and withdraw the plug and damper assembly. Top up the damper chambers with the current grade of engine oil. The oil level is correct when, utilizing the damper as a dipstick, its threaded plug is $\frac{1}{4}$″ (6·3 mm.) above the dash pots when resistance is felt. Refit the damper and hexagonal plug. Using an oil can, apply oil to the throttle and choke control linkages.

Clutch Adjustment

Check, and if necessary, adjust the clearance between the clutch operating piston and the push rod (2). The correct clearance is 0·1″ (2·5 mm.). To adjust :—

1. Slacken the nut (3) and unscrew the push rod (2) until all clearance between the push rod and the cupped end of the operating piston (inside slave cylinder) is taken up.
2. Adjust the position of the locknut (3) until a feeler gauge of 0·1″ (2·5 mm.) thickness may be inserted between the locknut face and the clevis fork (4).
3. Without disturbing the locknut on the push rod, screw the push rod into the clevis until the nut contacts the clevis face, then lock up the nut (3).

Front Brake Adjustment

The disc brakes, fitted to the front wheels, are self-adjusting and should only need replacement shoe pads when the linings are reduced to approximately $\frac{1}{8}$″ (3 mm.) thickness.

Rear Brake Adjustment

Check the travel of the foot brake and hand brake.

Each rear brake is provided with a smaller adjuster, (1), Fig. 12, which is positioned on the brake backing plate, above the axle case, and accessible with the road wheel removed. To adjust the shoes, turn the adjuster clockwise until the shoes are hard against the drum ; then slacken the adjuster by one notch. If the drum is not free to rotate slacken the adjuster still further.

Hand Brake Adjustment

Adjustment of the rear brake shoes automatically re-adjusts the hand brake mechanism.

6,000 MILES

At 6,000 mile intervals, carry out the work listed under 3,000 miles and the following additional work:—

Ignition Distributor

Release the clips and remove the distributor cap and rotor arm. Detach the contact breaker points and clean their contact faces with a fine carborundum stone. If all trace of pitting cannot be removed, fit new contacts. Using a small screwdriver in the slot (2), adjust the moving contact so that when the contact heel is on the peak of the cam a 0·015″ (0·38 mm.) feeler gauge may be inserted between the contact faces (7); then tighten the screw (8).

Apply a few drops of thin oil around the edge of the screw (3) to lubricate the cam bearings and distributor spindle. Place a single drop of clean engine oil on the pivot (6). Smear the cam (4) with engine oil. A squeak may occur when the cam is dry.

Refit the rotor arm and ensure that the distributor cap is clean and the central carbon brush is free in its housing. Refit the cap and secure it to the distributor.

Sparking Plugs

Remove the sparking plugs for cleaning and re-set the gaps to 0·025″ (0·63 mm.). Clean the ceramic insulators and examine them for cracks or other damage likely to cause "H.T." tracking. Test the plugs before refitting and renew those which are suspect.

Water Pump

Apply a grease gun to the grease nipple and inject grease until it exudes from a hole in the side of the pump.

Fuel Pump Bowl

Clean the sediment bowl as follows:—

Disconnect the fuel pipe (1) from the suction side of the pump and to prevent loss of fuel, fit a tapered rubber or wood plug into the pipe bore ($\frac{1}{4}$ I.D.). (0·63 mm.). Alternatively, attach one end of a length of rubber tube over the end of the fuel pipe and tie the opposite end of the tube above the fuel tank level.

Unscrew the stirrup nut (2) under the bowl, swing the stirrup to one side and remove the bowl. Swill out the sediment bowl and wipe it clean.

To avoid damaging the glass sediment bowl when refitting it, tighten the stirrup nut only sufficiently to ensure a fuel-tight joint. Reconnect the fuel pipe and prime the carburettors.

Air Cleaners

Remove and wash the air cleaners in fuel. Soak the gauzes in engine oil and allow to drain before wiping them clean. When refitting the cleaners, ensure that the holes above the carburettor flange setscrew holes are correctly aligned with corresponding holes in the air cleaner and gaskets. (See Fig. 16).

If the engine is operating under dusty conditions, clean the filters more frequently.

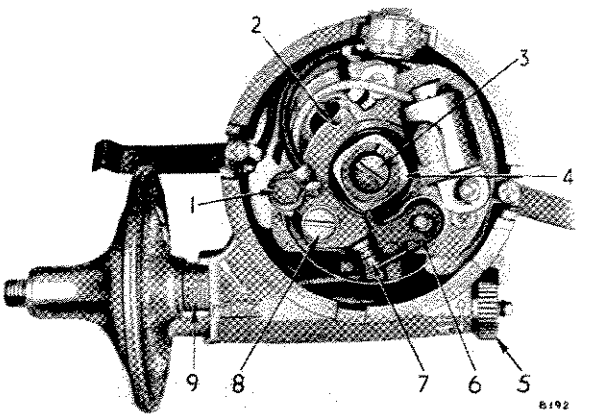


Fig. 13. Ignition Distributor

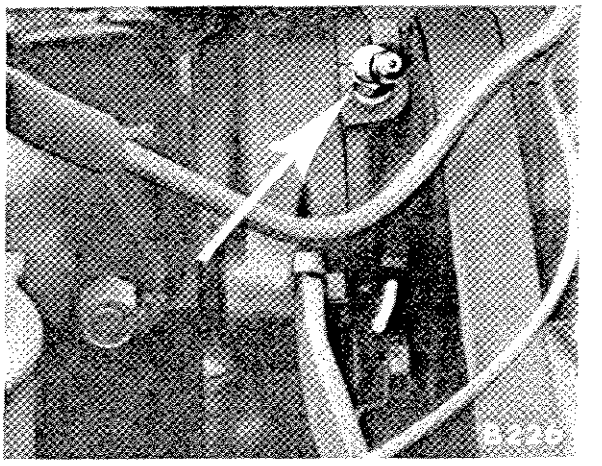


Fig. 14. Water Pump Greaser

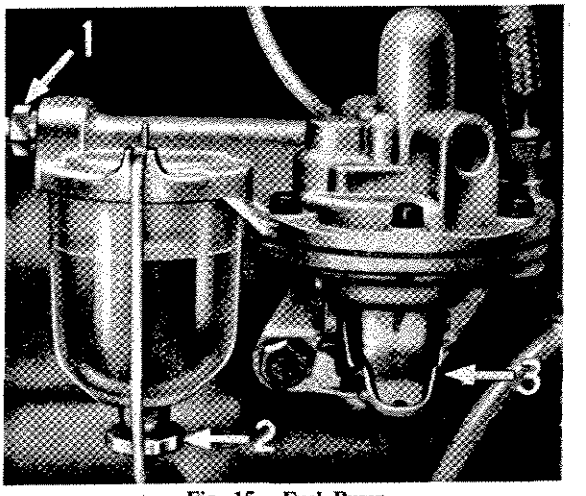


Fig. 15. Fuel Pump

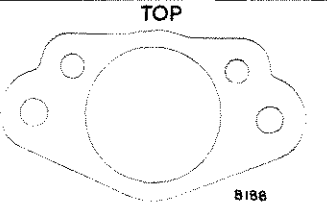
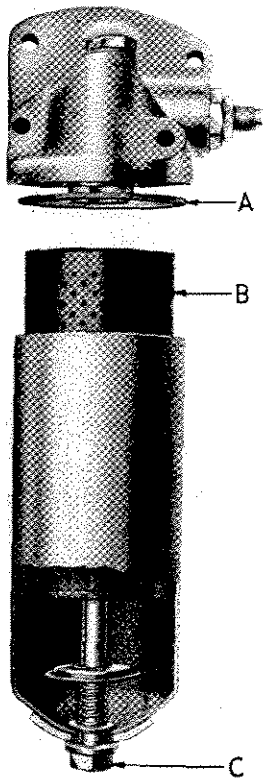


Fig. 16. Air cleaner flange



A. Washer.
B. Element.
C. Securing bolt.

Fig. 17.
Oil Filter

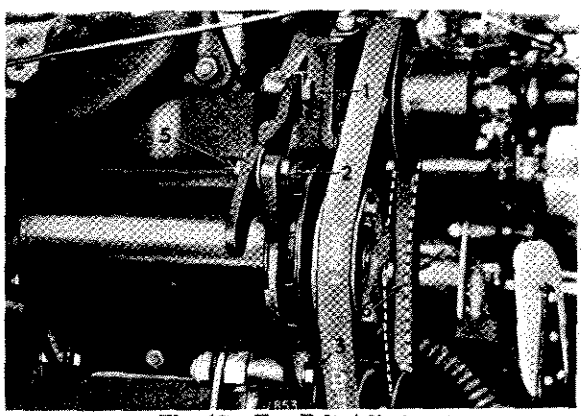


Fig. 18. Fan Belt Adjustment

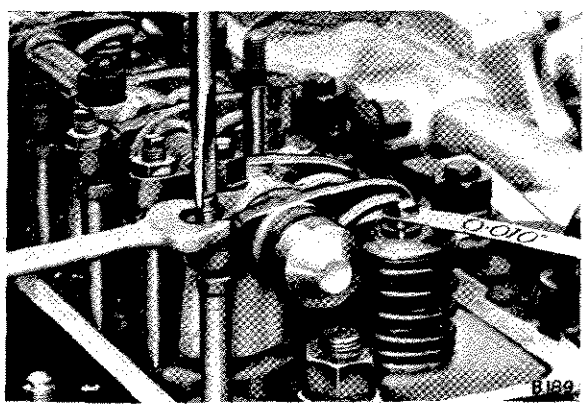


Fig. 19. Adjusting Valve Rocker Clearances

Oil Filter Element (Fig. 17)

To renew the element, unscrew the securing bolt 'C', remove the container and withdraw the element. Wash the container to remove foreign matter trapped by the filter and discard the old washer 'A', replacing it by a new one each time the element is renewed.

When re-assembling the container and a new element, ensure that the washer 'A' is correctly positioned in its groove in the filter body. Do not tighten the bolt 'C' more than is necessary to effect an oil-tight joint.

Before restarting the engine, make sure that the sump is filled to the correct level with clean fresh oil.

Fan Belt Tension (Fig. 18)

The fan belt should be sufficiently tight to drive the generator without unduly loading the bearings.

Adjust the belt by slackening the adjusting bolt (5) and the generator pivots (3 and 4). Pivot the generator until the belt can be moved $\frac{3}{4}$" to 1" (19 to 25 mm.) at its longest run (6). Maintaining the generator in this position, securely tighten the adjusting bolt and the two pivots.

Generator

Use an oil can to pour a few drops of engine oil through the hole in the centre of the rear end cap.

Oil Filler Cap (Fig. 1)

Remove and swill the cap (3) in fuel, allow to drain before refitting.

Valve Rocker Clearances (Fig. 19)

Check and, if necessary, adjust the inlet and exhaust valve clearances to 0·010" (0·25 mm.) when cold. These settings, which are correct for all operating conditions, are obtained as follows:—

1. Turn the crankshaft until No. 1 push rod has reached its highest point, then rotate the crankshaft a further complete revolution.
2. To adjust No. 1 rocker, slacken the locknut and insert a 0·010" (0·25 mm.) feeler gauge between the rocker and valve stem. Turn the adjuster with a screwdriver until slight resistance is felt as the gauge is moved across the valve stem; then re-tighten the locknut.
3. After tightening the locknut, re-check the clearance and, if satisfactory, deal with the remaining rockers in a similar manner, ensuring that each rocker is correctly positioned before attempting to adjust it.

Rear Hub Bearings (Fig. 12)

Lubricate the rear hub bearings by applying the grease gun and giving 5 strokes to a nipple (2) situated behind the rear brake backing plate.

Front Hub Bearings (Fig. 20)

Adjust the front hub bearings as follows :

Remove the split pin, tighten the hub nut until slight resistance to hub rotation is felt ; then slacken off the nut by one-half flat and insert the split pin through one of the two holes provided.

De-Dust Rear Brake Linings (Fig. 21)

Jack up the rear of the car and remove both road wheels and brake drums. Examine the brake linings for wear and freedom from oil or grease. Renew worn or contaminated linings.

Using a high pressure air line, or a foot pump, blow all loose dust from the mechanism and, using a clean dry cloth, wipe the dust from the inside of the drums. Avoid touching the braking surfaces with greasy hands.

Refit the brake drums and road wheels, re-adjust the brakes and remove the jack.

Interchange Road Wheels (Fig. 22)

Uneven tyre wear may be caused by road conditions, traffic conditions, driving methods and certain features of design which are essential to the control, steering and driving of a vehicle. Close attention to inflation pressures and the mechanical condition of the vehicle will not always prevent irregular wear. It is therefore recommended that front tyres be interchanged with rear tyres at least every 3,000 miles. Diagonal interchanging between near front and off rear and between off front and near rear provides the most satisfactory first change because it reverses the direction of rotation.

Subsequent interchanging of front and rear tyres should be as indicated by the appearance of the tyres, with the object of keeping the wear of all tyres even and uniform.

When interchanging the wheels, examine each tyre and remove flints or other road matter which may have become embedded in the tread. Remove oil or grease with a petrol- (gasoline)- moistened cloth.

Adjust all tyres to the correct pressure. (See page 5).

Overdrive Filter

If an overdrive is fitted, unscrew the large knurled drain plug under the overdrive unit and withdraw the gauze filter for cleaning. Refit the filter and tighten the drain plug.

Replenish the unit with oil, and after a short run using the overdrive, re-check and adjust the oil level if necessary.

The same oil is used both for the overdrive unit and the gearbox, an internal transfer hole allows oil to flow from the gearbox into the overdrive unit until a common level is attained. *Do not use additives ; their use may be detrimental to the proper operation of the unit.*

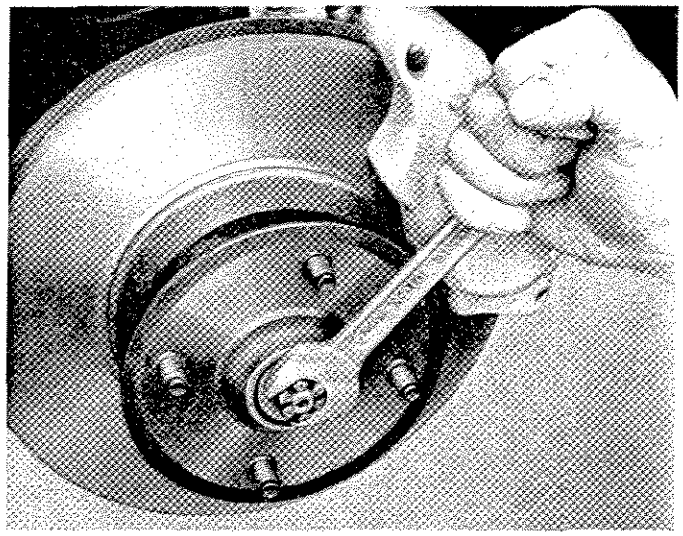


Fig. 20. Adjusting the front hubs

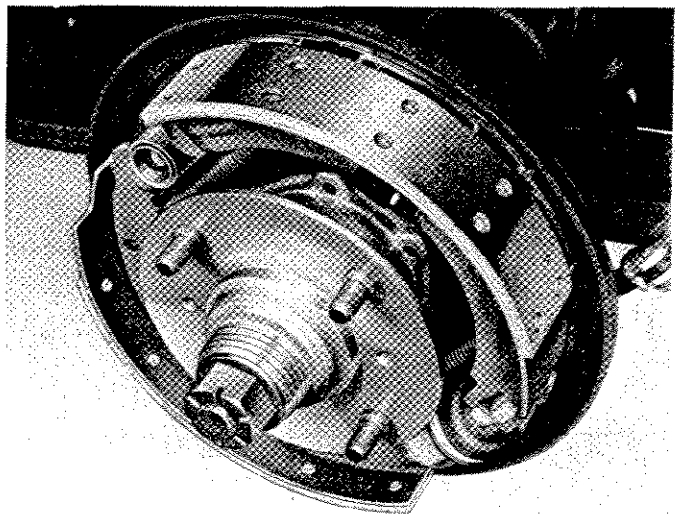


Fig. 21. Rear wheel brakes

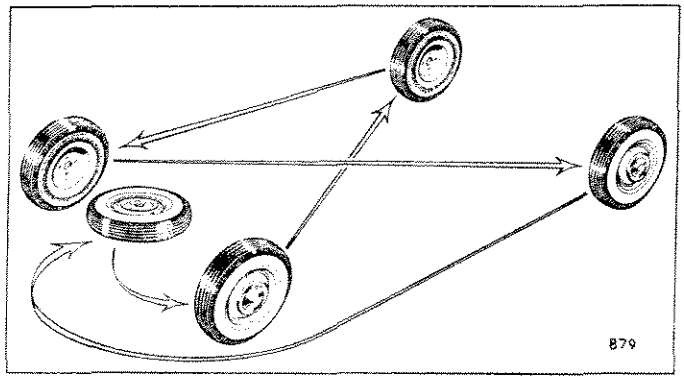


Fig. 22. Diagram of wheel interchanging

Fig. 23. Clutch Cross-shaft Grease Nipple

Clutch Cross Shaft Bearings (Fig. 23)

Inject a small amount of grease through a nipple located at each end of the clutch cross shaft and accessible from beneath the vehicle.

Clutch and Brake Pedal Bearings

Use an oil can to lubricate the clutch and brake pedal bearings and their linkages. These are accessible from within the driving compartment.

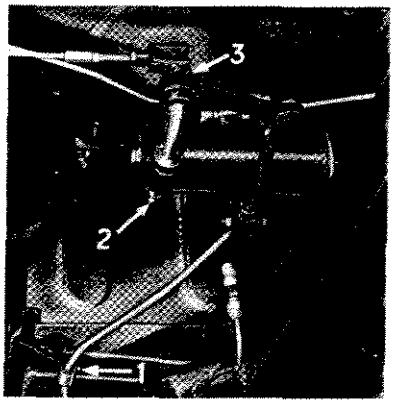


Fig. 24. Handbrake Cable and Compensator Grease Nipples

Hand Brake Cable Conduit (Fig. 24)

Inject grease through a nipple (1) on the hand brake conduit until grease exudes from both ends of the conduit. During winter months, frequent greasing at this point will prevent a frozen hand brake cable.

Hand Brake Compensator (Fig. 24)

Inject grease through two nipples (2 and 3) on the hand brake compensator. Apply oil to all pivot pins.

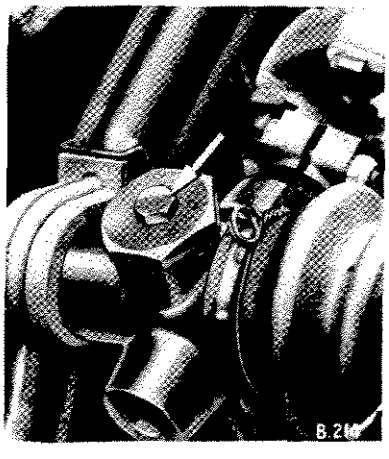


Fig. 25. Steering Unit Filler

Steering Unit

Remove a sealing plug from the top of the steering unit and replace it by a grease nipple. Apply the grease gun and give 5 strokes only. Remove the nipple and refit the plug. Over-greasing can cause damage to the rubber bellows.

Check the tightness of all bolts and nuts, particularly the front and rear suspension, the steering and the wheel nuts.

12,000 MILES

At 12,000 mile intervals, carry out the work listed under 6,000 miles, and the following additional work:—

Front Hub Lubrication (Fig. 26)

If the car is being used for competition work, re-pack the front hubs with grease every 12,000 miles. This period may be extended to 24,000 miles for normal use.

To pack the hubs with grease:—

Jack up the front of the car and remove one front road wheel. Without disturbing the hydraulic pipe unions, unscrew the caliper securing bolts (1) and lift the caliper from the disc, tying it to a convenient point to prevent it hanging by the attached hydraulic pipe. Note the number of shims fitted between the caliper and vertical link.

When wire-spoked wheels are fitted, remove the splined hub extensions by detaching the nuts shown on Fig. 27.

To remove the hub grease cap, screw the No. 10 A.F. setscrew provided in the tool kit into the tapped hole in the grease cap.

Withdraw the split pin and remove the slotted nut and "D" washer. Detach the hub assembly and outer race from the stub axle. Wash all trace of grease from the hub and bearings. Pack the hub and bearings with new grease, working it well into the rollers.

Re-assemble the hub and races to the stub axle, securing them with the "D" washer and slotted nut. Spin the hub and tighten the nut until resistance is felt to hub rotation, then slacken off the nut one-half flat and fit a new split pin. Re-assemble the brake caliper unit to the vertical link, refitting any shims removed during dismantling. Re-assemble the splined hub extension (if fitted). Refit the road wheel and lower the jack. See "Warning" on page 3·401.

Repeat the above operations with the opposite wheel hub.

Sparking Plugs (Fig. 28)

Renew the sparking plugs at 12,000 miles. When replacing the plugs, make sure that they are the correct type and the gaps are set to 0·025". The types recommended are given on page 4.

Re-connect the plug leads as shown.

Gearbox Oil Change

Drain and refill the gearbox. See page 0·205.

Rear Axle Oil Change

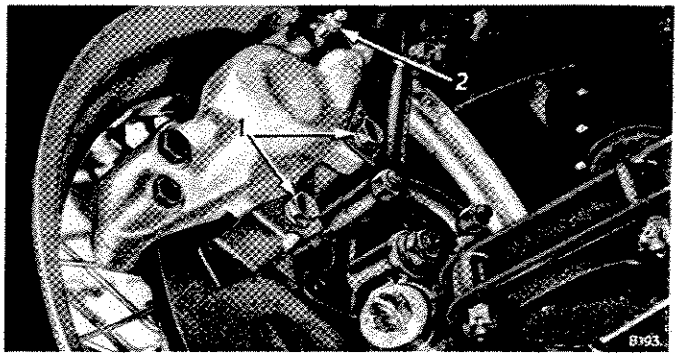
Drain and refill the rear axle. See page 0·205.

Rear Road Springs

Periodically, relieve the weight of the vehicle from the rear springs and apply oil to the spring leaves with a brush or spray. Ensure that the oil penetrates between the spring leaves, but avoid contaminating the rubber bushes at the end of the spring.

Hydraulic Dampers

Remove the plugs from the rear dampers and top up with Armstrong Shock Absorber Fluid to the level of the bottom of the plug hole. Take care to prevent foreign matter falling into the damper. Refit the plugs to the damper.



1 Caliper attachments 2 Bleed nipple

Fig. 26. Disc Brake Caliper

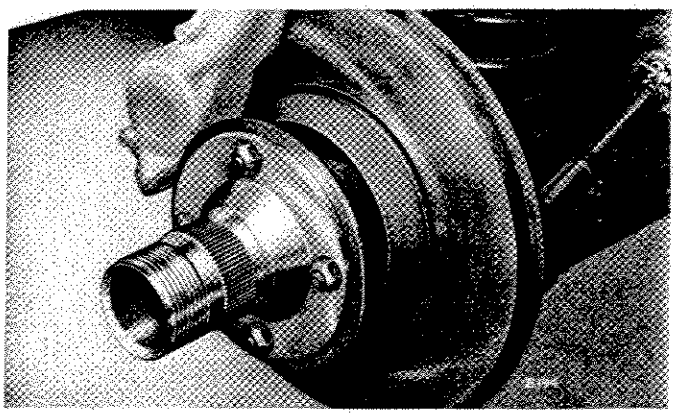


Fig. 27. Wire Wheel Nut Extension

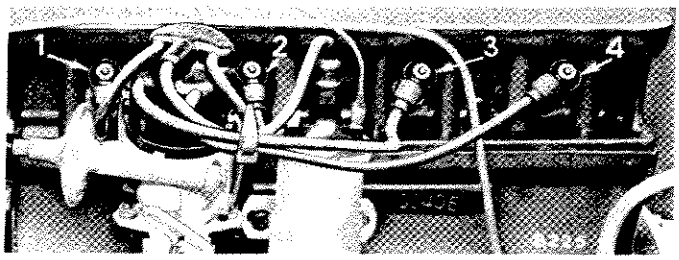


Fig. 28. Arrangement of H.T. Cables

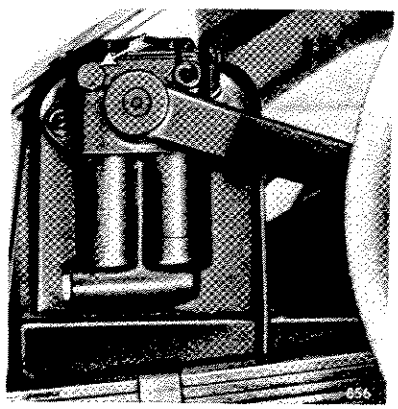
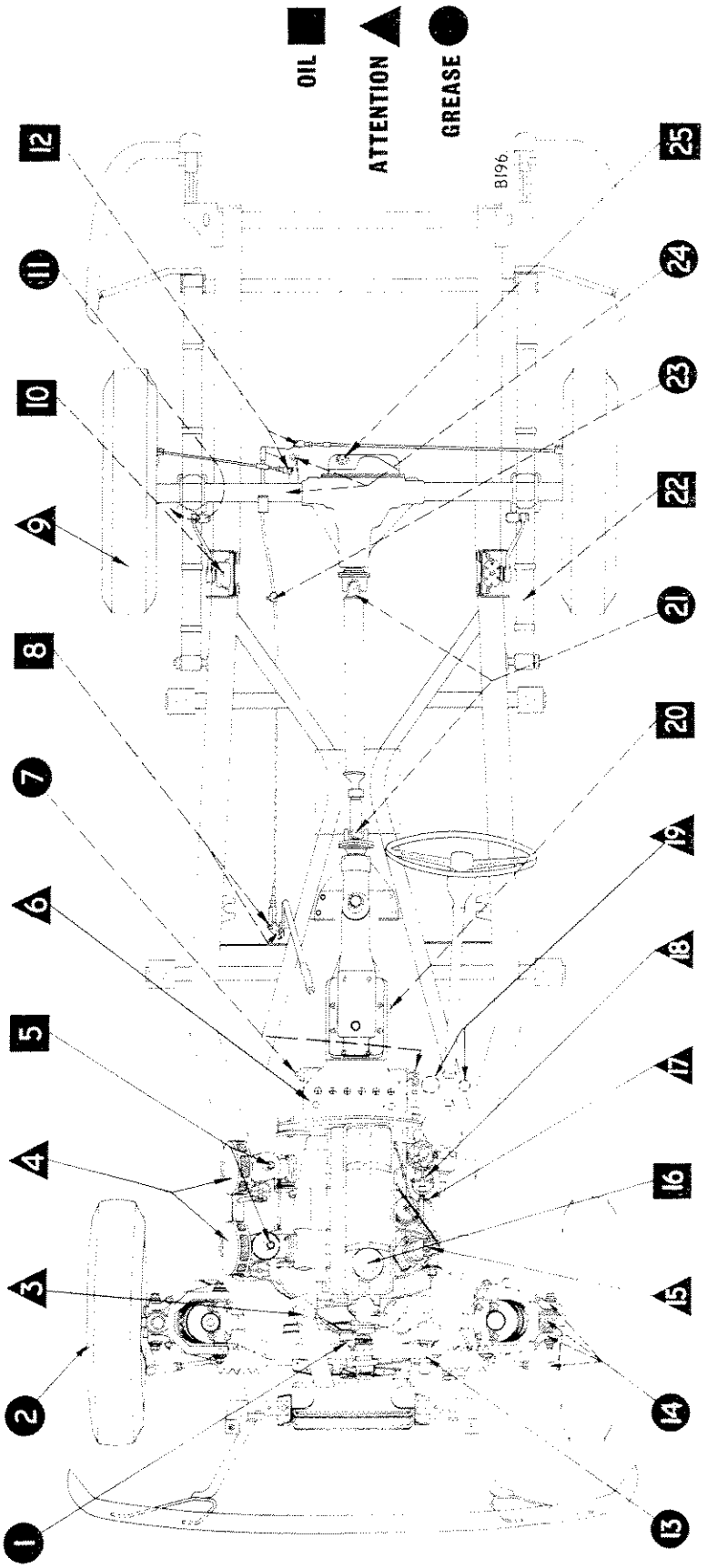


Fig. 29. Rear Damper Filler Plug


OIL
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Ref.	Items	Details	Page Ref.	Mileage Intervals
9	Tyre Pressures and Wheel Interchanging		0·202 0·209	Weekly
3	Radiator Water Level	Top up	0·202	Weekly
6	Battery	Top up	0·202	Weekly
14	Steering Swivels (4 nipples)	Grease Gun	0·204	1,500
14	Steering — Outer Tie Rod Ball Joints (4 nipples)	Grease Gun	0·204	1,500
	Steering — Slave Drop Arm Pivot	Grease Gun	0·204	1,500
14	Lower Wishbone Outer Bushes (4 nipples)	Grease Gun	0·204	1,500
21	Propeller Shaft — Splines (1 nipple)	Three or Four Strokes Gun	0·204	1,500
	Propeller Shaft — Universal Joints (2 nipples)	Three or Four Strokes Gun	0·204	1,500
19	Hydraulic Brake and Clutch Reservoirs	Top up Fluid Level	0·204	1,500
5	Carburettor Dashpots and Control Linkages	Oil as Recommended Oil Can	0·206	3,000
16	Engine 250 Miles	Top up Oil Level Drain and Refill with New Oil	0·204 0·205	3,000
20	Gearbox	Top up Oil Level	0·205	3,000
23	Handbrake — Cable (1 nipple)	Grease Gun	0·210	6,000
24	Handbrake — Compensator (2 nipples)	Grease Gun	0·210	6,000
7	Clutch Cross Shaft Bearings (2 nipples)	Grease Gun	0·210	6,000
1	Engine Water Pump (1 nipple)	Grease Gun	0·207	6,000
11	Hubs—Rear (2 nipples)	Grease Gun	0·209	6,000
15	Ignition Distributor	Oil Can	0·207	6,000
8	Handbrake Lever	Oil Can	0·210	6,000
	Door Locks, Hinges, Bonnet Safety-Catch, Boot and Wheel Locks	Oil Can		6,000
	Generator	Oil Can	0·208	6,000
	Oil Filler Cap	Wash	0·208	6,000
25	Rear Axle	Drain and Refill with New Oil	0·205	6,000
13	Steering Unit	Grease Five Strokes	0·210	6,000
4	Air Cleaners	Oil as Recommended	0·207	6,000
17	Oil Filter	Renew Cartridge	0·208	6,000
18	Fuel Pump	Clean out Filter Bowl	0·207	6,000
2	Hubs—Front	Remove and Re-pack	0·211	12,000 or 24,000
10	Rear Dampers	Top up	0·211	12,000
20	Gearbox	Drain and Refill with New Oil	0·211	12,000
22	Rear Road Springs	Clean and Oil	0·211	12,000

SUPPLEMENT TO GROUP "0" SECTION 2.

Experience and design improvements incorporated in TR.4A models have permitted servicing intervals and operations to be revised. The revised schedules, which apply to TR.4A models are listed below.

SCHEDULE OF OPERATIONS RELATING TO "FREE SERVICE"

At the completion of 1,000 miles (1,600 km.) or as near to this figure as possible, perform the following operations:

ENGINE
Coolant—Check level
Sump—Drain and refill
Cylinder head—Check tightness
Carburettor—Top up carburettor dash pots and adjust engine idling speed
Accelerator control linkage and pedal fulcrum—Oil
Fan belt—Adjust tension
Valves—Adjust clearances
Mounting bolts—Check tightness
Manifolds—Check tightness
Oil filter—Check for oil leaks
Fuel pump—Clean filter

CLUTCH AND CONTROLS
Pedal pivot bushes—Lubricate
Master cylinder—Top up
Hydraulic pipes—Check for leakage

TRANSMISSION
Gearbox, Overdrive—Check level and top up
Rear axle—Check level and top up
Universal joint coupling bolts—Check tightness

STEERING AND SUSPENSION
Lower steering swivels—Lubricate
Wheel alignment—Check by condition of tyre tread
Steering unit attachments and "U" bolts—Check for tightness
Tie rods and levers—Check for tightness

BRAKES AND CONTROLS
Handbrake cable and linkage—Lubricate
Hydraulic pipes—Check for leaks, chafing and for hose clearance
Master cylinder—Check level and top up
Pedal pivot bush—Lubricate
Brake shoes and handbrake cable—Adjust as necessary

ELECTRICAL EQUIPMENT
Battery—Check and adjust level
Check charging rate
Dynamo and starter motor—Check fixing bolts for tightness
Distributor—Lubricate and adjust points
Headlamp—Check alignment and adjust if required
Lights, heater, screen washer, wipers and warning equipment—Check operation

WHEELS AND TYRES
Wheel nuts—Check tightness
Tyres—Check and adjust pressures

BODY
Door strikers, locks and hinges—Oil and check operation
Body mounting bolts—Check tightness
Door handles, controls and windshield—Wipe clean
Road test—Test vehicle on road

SCHEDULE OF OPERATIONS RELATING TO "A" VOUCHERS

Carry out the following operations every 6,000 miles (10,000 km.) or every six months, whichever is the earlier.

ENGINE
Sump—Drain and refill
Air cleaner—Remove element, clean and replace
Carburettor dash-pots—Top up
Carburettor idling controls—Adjust
Accelerator controls and pedal fulcrum—Oil
Fan belt—Adjust tension
Valves—Adjust clearances

CLUTCH AND CONTROLS
Pedal pivot bushes—Lubricate
Hydraulic pipes—Check for leakage

TRANSMISSION
Propeller shaft—Lubricate (if nipples are provided)

STEERING AND SUSPENSION
Upper steering swivels—Lubricate
Lower steering swivels—Lubricate
Wheel alignment (Front and Rear independent suspension models)—Check by condition of tyre tread

BRAKES AND CONTROLS
Handbrake cable and linkage—Lubricate
Hydraulic pipes—Check for leaks, chafing and hose clearance
Pedal pivot bushes—Lubricate
Brakes—Adjust shoes

ELECTRICAL EQUIPMENT
Distributor—Lubricate and adjust points
Sparking plugs—Clean, re-set gaps, test and refit
Lights, heater, screen washer, wipers and warning equipment—Check operation

WHEELS AND TYRES
Wheel nuts—Check for tightness
Tyres—Check and adjust tyre pressures

BODY
Door strikers, locks and hinges—Oil and check operation
Door handles, controls and windshield—Wipe clean
Test vehicle on road

SCHEDULE OF OPERATIONS RELATING TO "B" VOUCHERS

Every 12,000 miles (20,000 km.) or every twelve months, whichever is the earlier, carry out the work listed for "A" vouchers and perform the following additional operations:

ENGINE
Oil filter—Renew
Fuel pump—Clean the filter and sediment chamber
Exhaust system—Examine and report condition
Crankcase breather valve—Dismantle, clean and re-assemble. Ensure breather hole in oil filler cap is free from obstruction
Water pump—Grease

TRANSMISSION
Gearbox, Overdrive—Check level and top up
Rear axle—Check level and top up
Universal joint coupling bolts—Check tightness

STEERING AND SUSPENSION
Steering unit attachments and "U" bolts—Check tightness
Tie rods and levers—Check tightness
Steering unit—Grease

BRAKES AND CONTROLS
Brake drums and caliper pads—Remove, de-dust and examine brake shoes, pads, drums, and wheel cylinders

ELECTRICAL EQUIPMENT
Generator—Lubricate rear bearing
Sparking plugs—Renew

WHEELS AND TYRES
Front hubs—Check and adjust if necessary
Rear hubs (fitted with Live axle)—Lubricate
Test vehicle on road

TRIUMPH TR4

WORKSHOP MANUAL

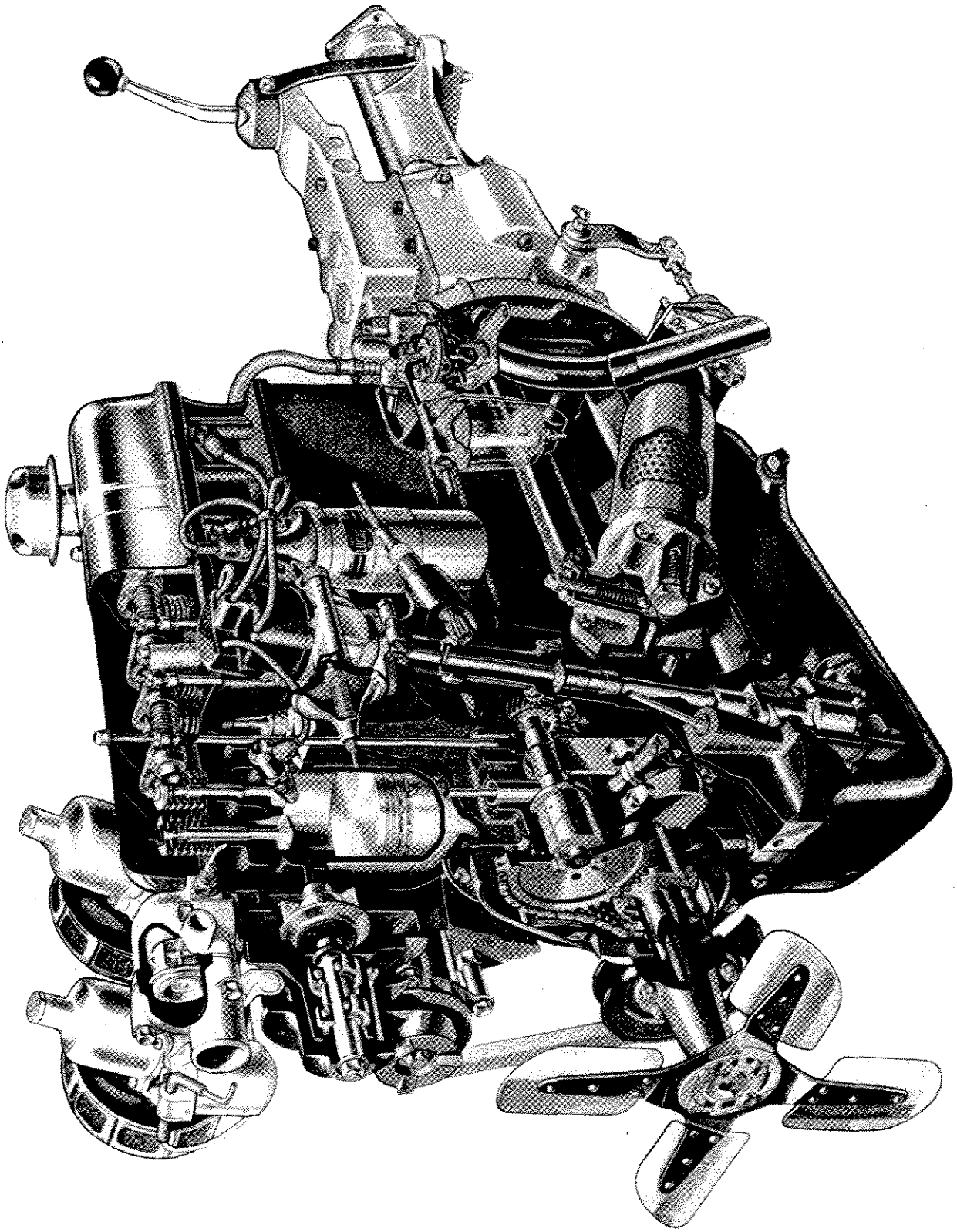
GROUP 1

Comprising:

TR4 WORKSHOP MANUAL

GROUP 1

CONTENTS



Dimensions and Tolerances

Parts and Description	ins.	mm.	Remarks
CYLINDER BLOCK			
Block bore in liners	3·6245 — 3·6260	(92·062 — 92·1004)	
PISTON AND CYLINDER LINERS			

GRADING DIMENSIONS FOR STANDARD BORE SIZE ONLY (Fig. 33)

GRADE	F		G		H	
	mm.	ins.	mm.	ins.	mm.	ins.
Cylinder Liner Bore ..	85·997 85·989	3·3857 3·3854	86·007 85·999	3·3861 3·3858	86·017 86·009	3·3865 3·3862
Major Top Dia. 'BB' ..	85·870 85·860	3·3807 3·3803	85·880 85·870	3·3811 3·3807	85·890 85·880	3·3815 3·3811
Major Bottom Dia. 'AA'	85·908 85·898	3·3822 3·3818	85·918 85·908	3·3826 3·3822	85·928 85·918	3·3830 3·3826

Number of rings			2 compression, 1 scraper
Ring groove width :			
Top	0·0635 — 0·0645	(1·6129 — 1·638)	
Centre	0·0635 — 0·0645	(1·6129 — 1·638)	
Scraper	0·1572 — 0·1582	(3·993 — 4·018)	
Piston pin bore	0·87505 — 0·87530	(22·226 — 22·233)	
Piston removal			From top of block
PISTON PIN			
Length	2·916 — 2·920	(74·06 — 74·168)	
Diameter	0·87485 — 0·87510	(22·187 — 22·227)	
Clearance in piston	0·00005 — 0·00045	(0·00127 — 0·01029)	
PISTON RINGS			
Width :			
Top	0·0615 — 0·0625	(1·562 — 1·5875)	
Centre	0·0615 — 0·0625	(1·562 — 1·5875)	
Scraper	0·1552 — 0·1562	(3·942 — 3·967)	
Ring to groove clearance, all rings :			
Mfg.	0·0010 — 0·0030	(0·0254 — 0·0762)	
Wear limit	0·0038	(0·0965)	
Gaps (in position) all rings ..	0·010 — 0·015	(0·254 — 0·381)	
VALVE SPRINGS			
No. of Springs per valve :			
Inlet	2		
Exhaust	3		
Free length :			
Auxiliary inner (Exhaust only)	1·55 — 1·57	(39·37 — 39·878)	
Inner	1·88 — 1·90	(47·752 — 48·360)	
Outer	1·94 — 1·96	(49·276 — 49·784)	
Valve clearance (cold) :			
Inlet and Exhaust	0·010	(·254)	

Dimensions and Tolerances

Parts and Description	ins.	mm.	Remarks
CONNECTING RODS			
Type	Big end offset, will pass through liner bore		
Length (centre to centre)	6·248 — 6·252	(158·7 — 158·8)	
Big end — Bore	2·2327 — 2·2335	(55·91 — 56·73)	
— Width	1·1775 — 1·1795	(29·90 — 29·96)	
Big end bearing clearances :			
Mfg.	0·0028 — 0·0040	(0·071 — 0·1016)	
Wear limit	0·005	(0·127)	
Big end bearing width	0·965 — 0·975	(24·511 — 24·765)	
Small end bearing bore when reamed	0·8742 — 0·8758	(22·208 — 22·252)	
Width	1·070 — 1·090	(27·318 — 27·686)	
Connecting rod end float, on crankpin	0·007 — 0·014	(·1778 — ·3556)	
Undersize big end bearings available	0·010, 0·020, 0·030	(·254, ·508, ·762)	
Max. connecting rod bend and twist	0·002	(·0508)	
CRANKSHAFT			
Crankpin diameter	2·0861 — 2·0866	(52·9689 — 52·9964)	
Crankpin width	1·1865 — 1·1915	(30·1971 — 30·3241)	
Main journal diameter	2·4790 — 2·4795	(62·966 — 62·9793)	
Undersize main bearings available	0·010, 0·020, 0·030,	(·254, ·508, ·762)	
Main journal length :			
Front	1·776 — 1·786	(45·1104 — 45·3644)	
Centre	1·7498 — 1·7507	(44·4549 — 44·4678)	
Rear	1·808 — 1·818	(45·9232 — 46·1772)	
Main bearing wall thickness	0·0720 — 0·07225	(1·8288 — 1·83400)	
Main bearing housing dia.	2·6250 — 2·6255	(66·675 — 66·6877)	
Main bearing clearance :			
Mfg.	0·0015 — 0·0025	(·0381 — ·0635)	
Wear limit	0·0031	(·0787)	
Crankshaft end float	0·004 — 0·006 (desirable)	(·1016 — ·1524)	
Mfg.	0·0048 — 0·0117	(·12192 — ·28118)	
Wear limit	0·015	(·381)	
OIL PUMP			
Outer Rotor :			
External diameter	1·5965 — 1·5975	(40·5511 — 40·5765)	
Housing internal diameter	1·603 — 1·604	(40·7162 — 40·7416)	
Depth of rotor	1·4985 — 1·4995	(38·0619 — 38·0873)	
Housing depth	1·500 — 1·501	(38·1 — 38·1254)	
Inner Rotor :			
Major diameter	1·171 — 1·172	(29·7434 — 29·7688)	
Minor diameter	0·729 — 0·731	(18·5166 — 18·5674)	
Rotor depth	1·4985 — 1·4995	(38·0619 — 38·0873)	
Spindle diameter	0·4980 — 0·4985	(12·6492 — 12·6619)	
Bore in housing for spindle	0·4995 — 0·5010	(12·6873 — 12·7254)	
Spindle clearance in housing	0·001 — 0·003	(·0254 — ·0762)	

Parts and Description	ins.	mm.
CAMSHAFT		
Number of bearings	4	
Front journal diameter	1·871 — 1·872	(47·5234 — 47·5488)
Centre intermediate and rear journal diameter	1·7153 — 1·7158	(43·637 — 43·6624)
Front bearing length	1·870 — 1·872	(47·4984 — 47·5488)
Centre and rear bearing length	1·190 — 1·210	(30·226 — 30·734)
Intermediate bearing length	0·740 — 0·760	(18·796 — 19·304)
Journal length :		
Front	1·8760 — 1·8775	(47·6304 — 47·6685)
Centre	1·115 — 1·135	(28·321 — 28·829)
Intermediate	0·740 — 0·760	(18·796 — 19·304)
Rear	1·3025 — 1·3225	(33·0835 — 33·5915)
Front bearing internal dia.	1·8748 — 1·8757	(47·7199 — 47·7428)
Centre, intermediate and rear bearing internal diameter	1·71725 — 1·71825	(43·61815 — 43·64355)
Clearance between front bearing and journal :		
Mfg.	0·0028 — 0·0047	(·07112 — ·11938)
Wear limit	0·0059	(·14986)
Clearance between centre, intermediate, rear bearings and journals :		
Mfg.	0·0015 — 0·0029	(·0381 — 0·766)
Wear limit	0·0037	(·09398)
Cam. lift (max.)	0·260	(6·604)
Camshaft end float	0·0040 — 0·0075	(·1016 — ·1905)
TAPPETS		
Length	1·969 — 1·971	(49·8069 — 49·8119)
Stem diameter	0·9367 — 0·9371	(23·7922 — 23·8023)
Block bore for tappet	0·9373 — 0·9380	(23·8074 — 23·8252)
Clearance in block — Mfg.	0·0002 — 0·0013	(·00508 — ·03302)
— Wear limit	0·0016	(·04064)
VALVES		
Head diameter — Inlet	1·558 — 1·562	(49·5732 — 49·6748)
— Exhaust	1·299 — 1·303	(32·9955 — 33·0962)
Angle of seat (Valves)	45°	
Angle of seat (Cylinder Head)	44½°	
Valve stem diameter :		
Inlet	0·310 — 0·311	(7·864 — 7·8994)
Exhaust	0·3705 — 0·3715	(9·4107 — 9·4361)
Valve guide bore :		
Inlet	0·312 — 0·313	(7·9248 — 7·9502)
Exhaust	0·3745 — 0·3755	(9·1523 — 9·5377)
Stem to guide clearance :		
Inlet — Mfg.	0·001 — 0·003	(·0254 — ·0762)
— Wear limit	0·0038	(·0965)
Exhaust — Mfg.	0·003 — 0·005	(·0762 — ·127)
Exhaust — Mfg.	0·003 — 0·005	(·0762 — ·127)
— Wear limit	0·0063	(·16002)

VALVE SEAT INSERTS

Refer to page 1·125 for details

ENGINE DETAILS (Fixed Parts)

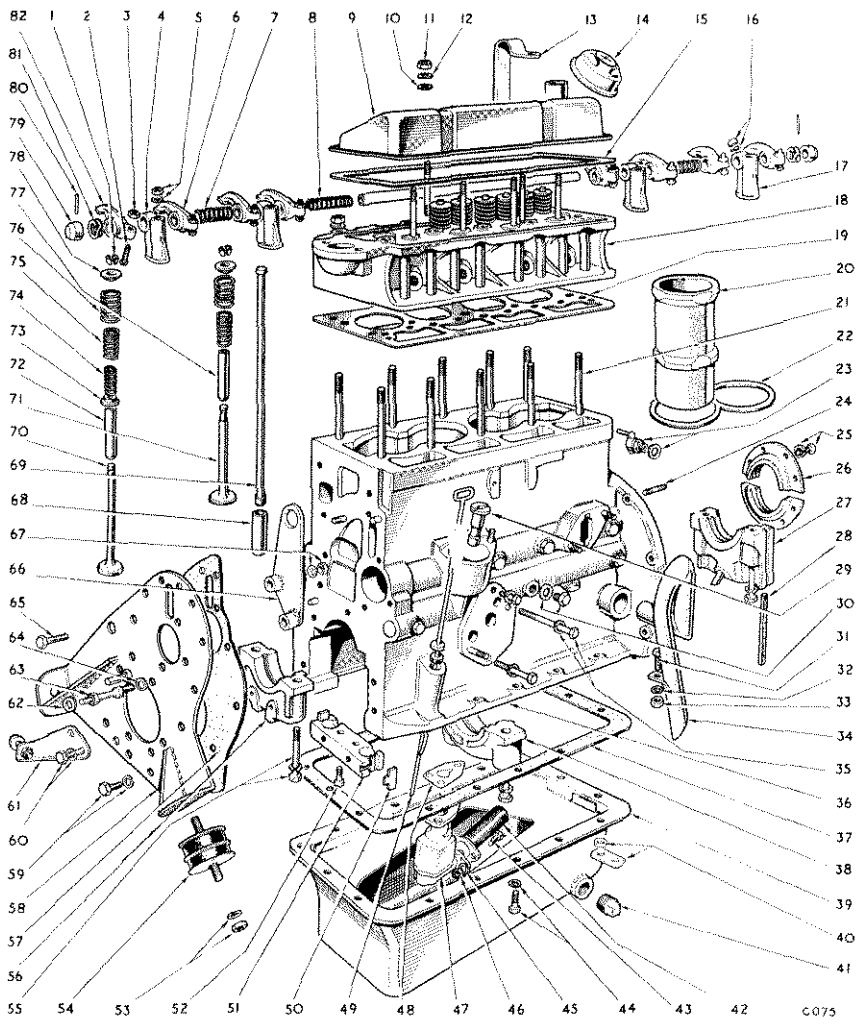


Fig. 1. Engine Details (Fixed parts)

Key to Fig. 1

1 Split collets
2 Adjusting screw
3 Nut
4 Rocker pedestal
5 Nut and spring washer
6 Rocker, R.H.
7 Spring
8 Spring—centre
9 Rocker cover
10 Fibre washer
11 Nyloc nut
12 Plain washer
13 Lifting eye
14 Filler cap
15 Rocker cover gasket
16 Screw and shakeproof washer
17 Rear rocker pedestal
18 Cylinder head
19 Cylinder head gasket
20 Cylinder liner
21 Cylinder head stud
22 Liner gasket
23 Drain tap and fibre washer
24 Stud
25 Setscrew and spring washer
26 Rear oil seal
27 Rear main bearing cap
28 Sealing felt
29 Distributor drive gear bush
30 Oil gallery plug and copper washer
31 Setscrew
32 Spring washer
33 Nut
34 Breather pipe
35 Oil filter attachment bolt and spring washer
36 Cylinder block
37 Sump gasket
38 Centre main bearing cap
39 Sump
40 Breather pipe bracket and distance piece
41 Sump plug
42 Oil pump filter gauze
43 Bolt
44 Setscrew and spring washer
45 Spring washer
46 Nut
47 Oil pump
48 Oil pump gasket
49 Dipstick
50 Sealing piece
51 Front sealing block
52 Screw
53 Nut and spring washer
54 Engine mounting
55 Main bearing cap bolt and spring washer
56 Front main bearing cap
57 Gasket
58 Front bearer plate
59 Setscrew and spring washer
60 Setscrew and spring washer
61 Torque reaction arm and buffer
62 Fibre washer
63 Shouldered stud
64 Spring washer
65 Bolt
66 Lifting eye
67 Nut and spring washer
68 Tappet
69 Pushrod
70 Exhaust valve
71 Inlet valve
72 Exhaust valve guide
73 Collar
74 Auxiliary valve spring
75 Inner valve spring
76 Outer valve spring
77 Inlet valve guide
78 Valve collar
79 Rocker shaft end cap
80 Mills pin
81 Spring
82 Rocker, L.H.

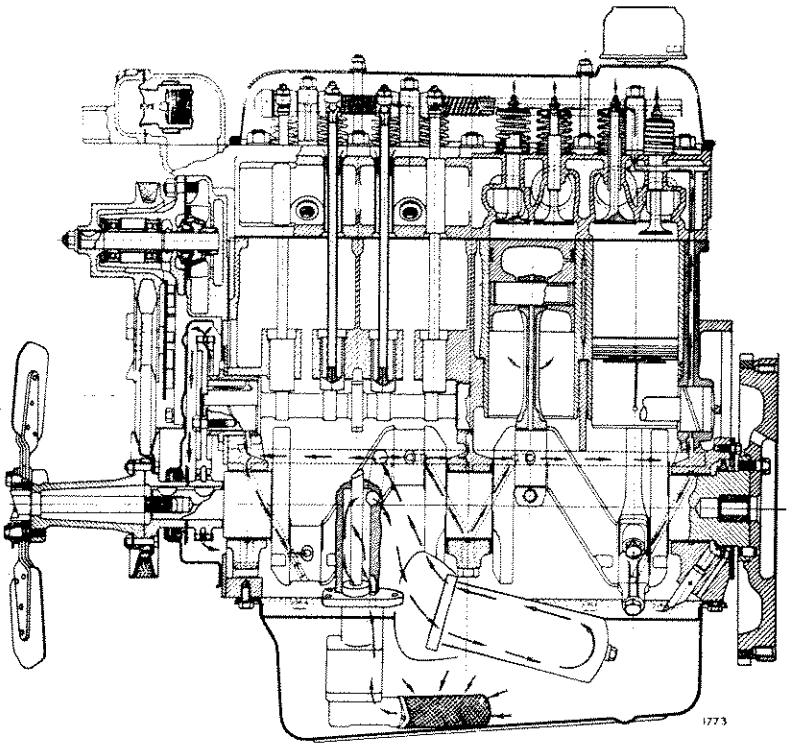


Fig. 2. Oil circulation (side view)

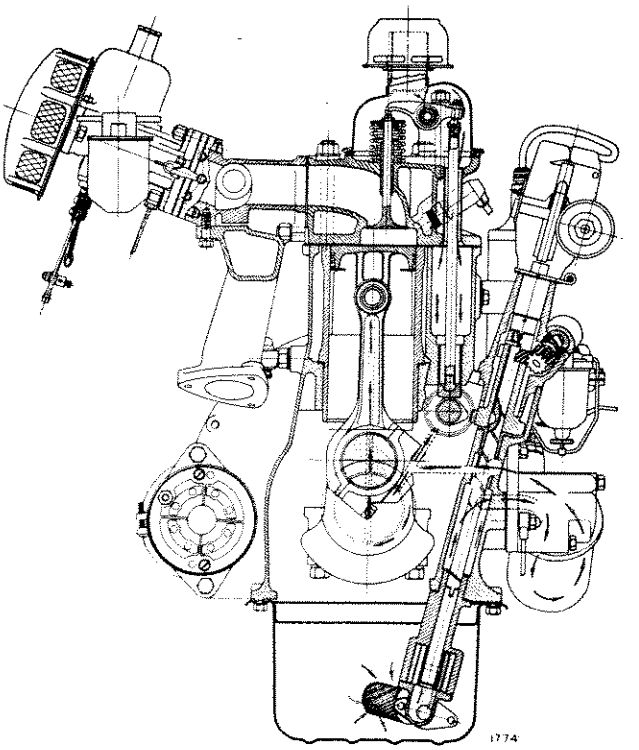


Fig. 3. Oil circulation (end view)

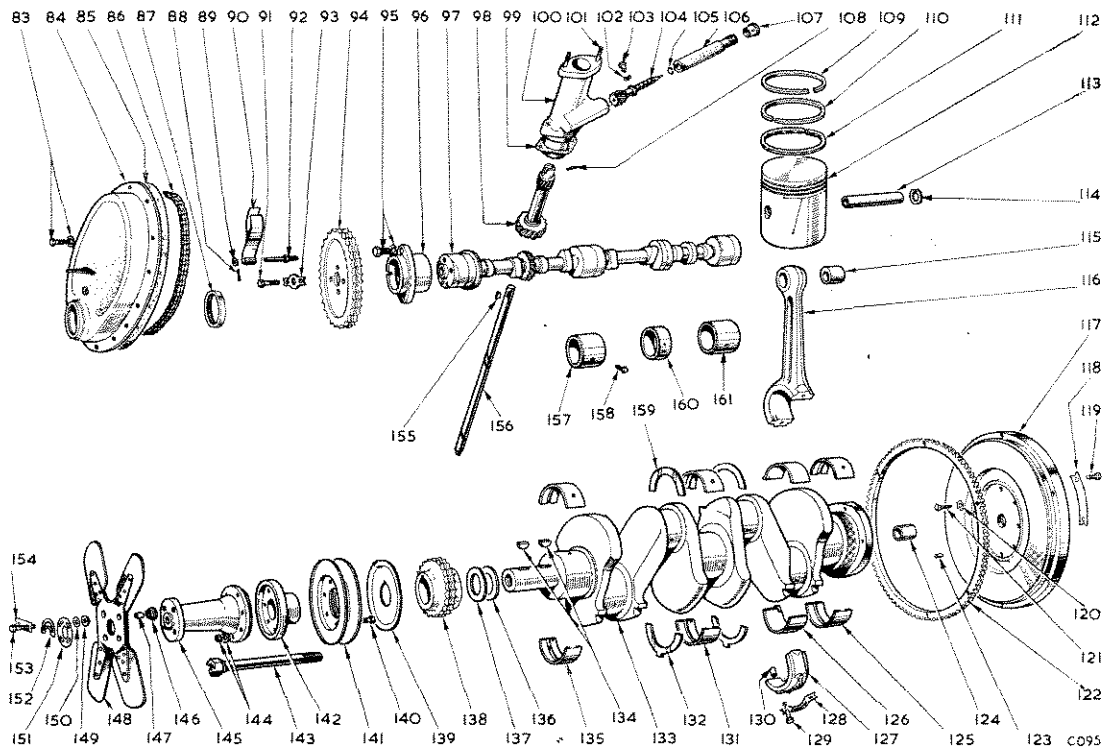
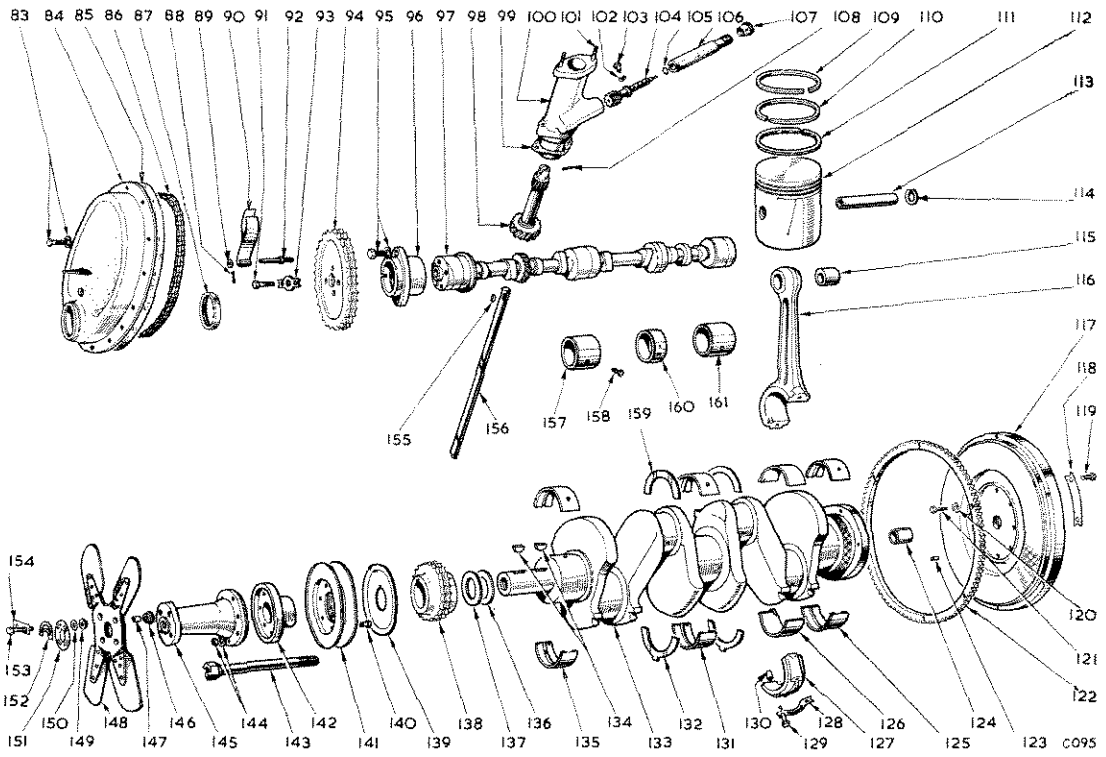


Fig. 4. Engine Details (Moving parts)

Key to Fig. 4

83 Bolt and spring washer
84 Timing cover
85 Gasket
86 Timing chain
87 Oil seal
88 Split pin
89 Washer
90 Tensioner blade
91 Bolt
92 Tensioner pin
93 Lockplate
94 Camshaft sprocket
95 Bolt and spring washer
96 Front camshaft bearing
97 Camshaft
98 Distributor drive gear
99 Gasket
100 Distributor pedestal
101 Stud
102 Spring washer
103 Peg bolt
104 Tachometer drive gear
105 Rubber 'O' ring
106 Drive gear housing
107 Cap
108 Mills pin
109 Compression ring (taper)
110 Compression ring (parallel)
111 Oil control ring
112 Piston
113 Gudgeon pin
114 Circlip
115 Gudgeon pin bush
116 Connecting rod
117 Flywheel
118 Lockplate
119 Bolt
120 Tab washer
121 Bolt
122 Starter ring gear
123 Dowel
124 Spigot bearing
125 Rear main bearing shell
126 Con-rod bearing shell
127 Con-rod cap
128 Lockplate
129 Con-rod bolt
130 Dowel
131 Centre main bearing shell
132 Lower thrust washer
133 Crankshaft
134 Woodruffe keys
135 Front main bearing shell
136 Shim washer 0·004" (0·1 mm.)
137 Shim washer 0·006" (0·15 mm.)
138 Crankshaft sprocket
139 Oil thrower disc
140 Bolt
141 Pulley
142 Pulley hub
143 Starting handle dog bolt
144 Washer and nut
145 Fan extension
146 Rubber bush
147 Distance tube
148 Fan
149 Rubber bush
150 Plain washer
151 Plate
152 Balancer
153 Bolt
154 Lockplate
155 Woodruffe key
156 Oil pump drive shaft
157 Intermediate front camshaft bearing
158 Peg bolt
159 Upper thrust washer
160 Intermediate rear camshaft bearing
161 Rear camshaft bearing

ENGINE DETAILS (Moving Parts)



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114 Circlip
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116 Connecting rod
117 Flywheel
118 Lockplate
119 Bolt
120 Tab washer
121 Bolt
122 Starter ring gear
123 Dowel
124 Spigot bearing
125 Rear main bearing shell
126 Con-rod bearing shell
127 Con-rod cap
128 Lockplate
129 Con-rod bolt
130 Dowel
131 Centre main bearing shell
132 Lower thrust washer
133 Crankshaft
134 Woodruffe keys
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136 Shim washer 0·004" (0·1 mm.)
137 Shim washer 0·006" (0·15 mm.)
138 Crankshaft sprocket
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149 Rubber bush
150 Plain washer
151 Plate
152 Balancer
153 Bolt
154 Lockplate
155 Woodruffe key
156 Oil pump drive shaft
157 Intermediate front camshaft bearing
158 Peg bolt
159 Upper thrust washer
160 Intermediate rear camshaft bearing
161 Rear camshaft bearing

ENGINE AND GEARBOX REMOVAL

Remove the battery and drain the cooling system, engine and gearbox.

Refer to Fig. 5 and disconnect :

— oil pressure pipe (6).
— fuel pipe (5).
— tachometer drive cable (7).
— fuel pipe (2).
— vacuum pipe (8).
— coil S.W. cable (4).
— temperature transmitter cable (3).
— horns (1).
— fan belt.
— engine earthing strap. (Not shown).

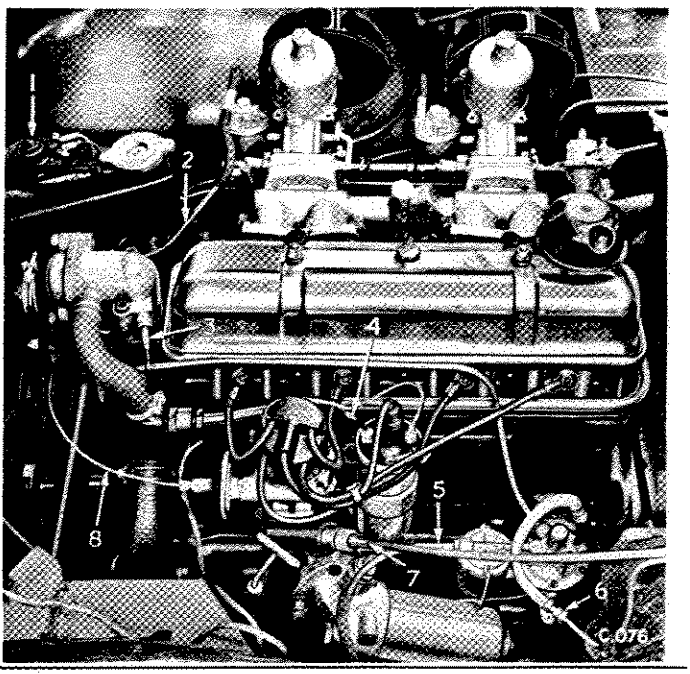

Fig. 5. Left-hand view of Engine

Refer to Fig. 6 and disconnect :

— heater valve control (12).
— hoses (13) and (14).
— mixture control cable (10).
— accelerator rod (11) and remove the carburettors (9).
— exhaust pipe flange (not shown).

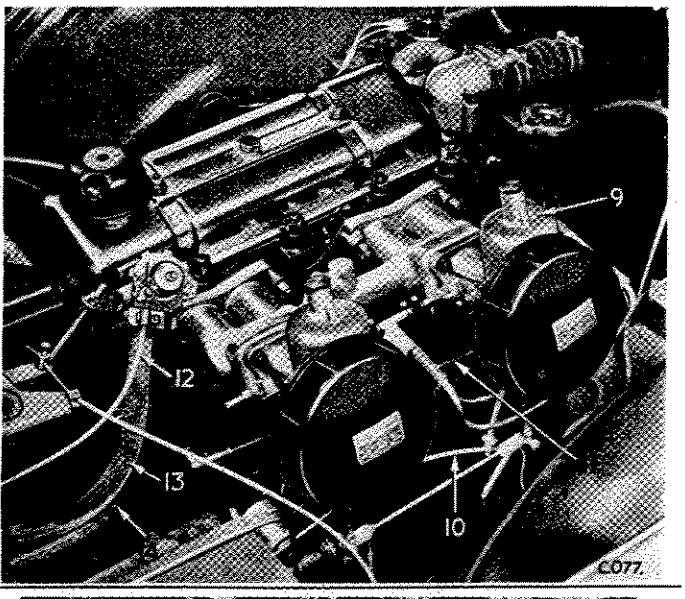

Fig. 6. Right-hand view of Engine

Referring to Fig. 7 :

— remove the coupling bolt (1).
— release two 'U' bolts (2).
— move the steering unit (3) as far forward as possible.
— remove the front cross tube (4).

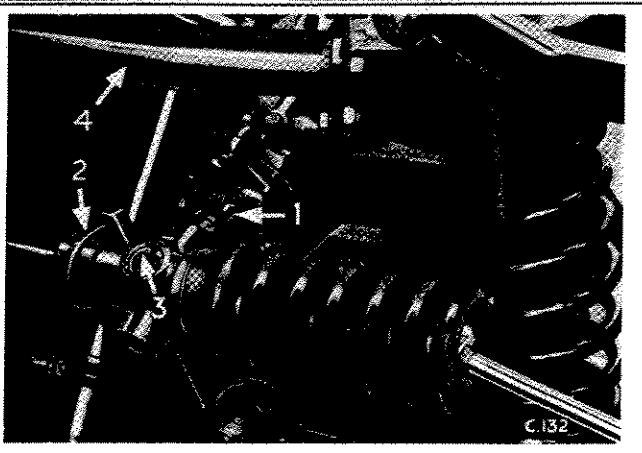

Fig. 7. Steering unit attachment