



Lotus

Elan
Workshop Manual

Part No. X036 T 0327Z

Revised Reprint, October 1974 ©

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NOTE: Lotus Policy is one of continuous product improvement and the right is reserved to alter specifications at any time without prior notice.

Whilst reasonable efforts have been made to ensure that at the time of publishing this manual is correct, the descriptions and illustrations appearing are not binding.

E. & O.E.

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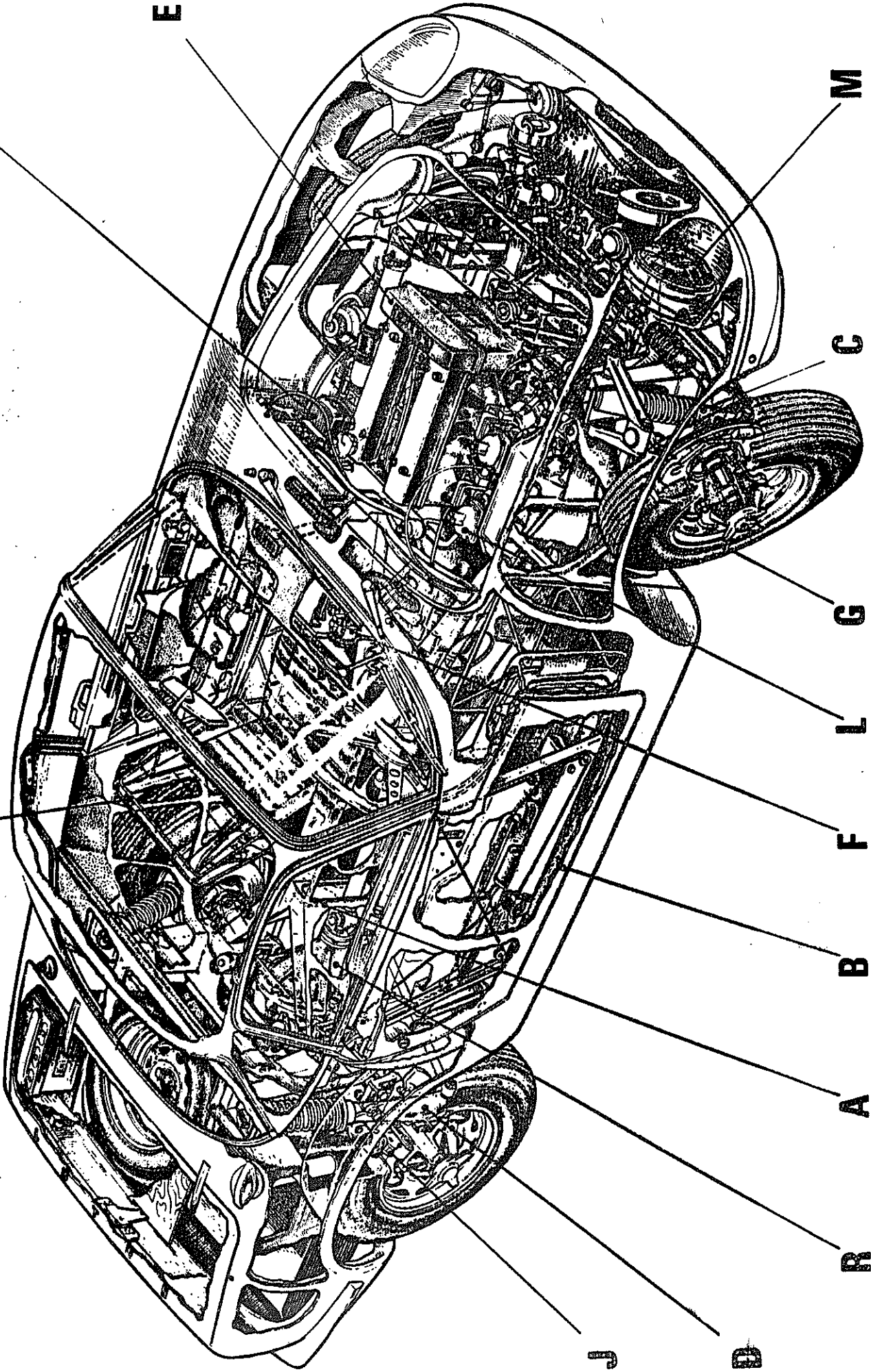
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INTRODUCTION

This Workshop Manual, which is in loose-leaf form for easy amendment, has been compiled to assist Lotus Dealers throughout the world in the efficient repair and maintenance of the Lotus Elan models.

The various units and systems of the vehicle are dealt with in sections which are listed on page 5, each being distinguished by a reference letter, this letter being the same as is used in other service publications (i.e., A = chassis in Parts Lists and in the Labour Schedule). Each section thus referred to opens with a contents page so that any particular operation can be easily located.

Service Information

Design changes, product improvements or changes in procedure subsequent to the publishing of this manual are given in Service/Parts Bulletins which are issued regularly to all authorised Lotus Dealers. Should existing instructions be affected or additional information be needed, new pages to this manual will be issued to Lotus Dealers when convenient.

To ensure the manual is kept up-to-date, write the Bulletin number, the section and page number it affects and the subject matter in the space provided on page 8.

Technical Data

Comprehensive information regarding dimensions, tolerances, weights and torque loading figures of all nuts and bolts are given on page 9 onwards.

Recommended Lubrication and Maintenance

Attention is drawn to Section 'O' of this manual for the Factory approved recommended lubricants and intervals of Periodical Maintenance.

Frost Precautions

Attention is drawn to the recommendations given in Section 'K' (Cooling System) of this manual on the importance of taking proper precautions against damage by frost.

Paint and Body Protection

When work is carried out on any part of the car where damage could be caused to the paint and body, i.e. working on the engine, or removing the windscreen, it is recommended that body protection covers be used.

SECTION CHECK LIST.

The number of pages in each section is correct at :- October, 1974

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SERVICE BULLETIN RECORD

To ensure that the information contained in the manual is up-to-date, Lotus Dealers are asked, when they receive them, to record in the columns below, the bulletin numbers with their subjects and the section and page number affected.

If reference is then made to these columns before turning to the appropriate section, it will be seen immediately if any amendment subsequent to the publishing of the manual, is applicable.

[illegible]

VEHICLE IDENTIFICATION. (Chassis Numbering)

Commencing at the 1st. of January 1970, a new format has been used for Vehicle Identification.

An example of a new chassis number is given below, together with the full identification breakdown.

7001.010001 E	Both chassis and body numbers being the same
7001.	Denotes year and month of manufacture (1970, January)
01	Denotes the production batch
0001	Denotes the chassis number
E	Denotes the model

As there are at present 16 different model types, the following codes will be used for model identification.

Elan STD	Coupe	G.Britain & N. Ireland	A
Elan STD	Coupe	Export	B
Elan STD	Convertible	G.Britain & N.Ireland	C
Elan STD	Convertible	Export	D
Elan S/E	Coupe	G. Britain & N.Ireland	E
Elan S/E	Coupe	Export	F
Elan S/E	Convertible	G.Britain & N.Ireland	G
Elan S/E	Convertible	Export	H
Elan Federal	Coupe	Export	J
Elan Federal	Convertible	Export	K
Elan +2'S'		G. Britain & N.Ireland	L
Elan +2'S'		Export	M
Elan +2'S' Federal		Export	N
Europa		G.Britain & N.Ireland	P
Europa		Export	Q
Europa Federal		Export	R

NOTE:

Commencing at 1st. January 1972, the 'Batch No.' is no longer used.

7201	Denotes year and month of manufacture (1972, January)
0001	Denotes the chassis number
E	Denotes the model

TECHNICAL DATA

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TECHNICAL DATA.

DIMENSIONS.

Wheelbase	84 in. (213.4 cm.)
Track (at wheel hub) :	
Front	47.094 in. (119.6 cm.)
Rear - Series 1,2	48.4375 in. (123 cm.)
- Series 3 onwards	47.06 in. (119.5 cm.)
Overall:	
Length	145 in. (368.3 cm.)
Width	56 in. (142.2 cm.)
Height - Series 1,2	45.25 in. (115 cm.)
- Series 3 onwards:-	
Coupe	46.5 in. (118 cm.)
Convertible	45.5 in. (115.6 cm.)
Ground Clearance (design)	6 in. (15.2 cm.)
Turning Circle - Series 1,2,3	29 ft.6 in. (9m.)
- Series 4	33 ft.6 in. (10.2 m.)
Kerb Weight (unladen):	
Series 1	1410 lbs. (639.5 kg.)
Series 2	1485 lbs. (673.5 kg.)
Series 3:	
Coupe - STD	1520 lbs. (689.5 kg.)
Coupe - S/E	1530 lbs. (694 kg.)
Convertible - STD	1530 lbs. (694 kg.)
Convertible - S/E	1540 lbs. (698.5 kg.)
Series 4 (inc. Sprint):	
Coupe - STD	1540 lbs. (698.5 kg.)
Coupe - S/E	1550 lbs. (703 kg.)
Convertible - STD	1530 lbs. (694 kg.)
Convertible - S/E	1540 lbs. (698.5 kg.)

CAPACITIES

Engine sump (including filter)

Gearbox

Rear Axle

Coolant (with heater)

Fuel - Series 1, 2, 3

- Series 4

7½ pints (4 litres; 9 US pints)

1¾ pints (.99 litres; 2.1 US pints)

2 pints (1.2 litres; 2.4 US pints)

14 pints (7.9 litres; 16.8 US pints)

10 galls. (45 litres; 12 US galls.)

9½ galls. (42 litres; 11 US galls.)

ENGINE

General

Number of cylinders

Capacity

Stroke

Bore - Grade 1

- Grade 2

- Grade 3

- Grade 4

Compression - Ratio

- Pressure (at sea level)

4

95.06 cu. in. (1558 cc.)

2.864 in. (72.746 mm.)

3.2500/3.2503 in. (82.550/82.558 mm.)

3.2503/3.2506 in. (82.558/82.565 mm.)

3.2506/3.2509 in. (82.565/82.573 mm.)

3.2509/3.2512 in. (82.573/82.580 mm.)

9.5 : 1 except Sprint: 10.3 : 1 Sprint

In excess of 160 lbs. sq. in.

(11.248 kg. sq. cm.)

Each cylinder within 20 lbs. sq. in.

(1.406 kg. sq. cm.) of each other

Performance

Max BHP (net) @ r.p.m. - STD.

- S/E

- Sprint

- Sprint Emission

Max Torque @ r.p.m. - except Sprint

- Sprint

- Sprint Emission

90 @ 5,500

93 @ 6,000

126 @ 6,500

113 @ 6,500

108 lbs.ft. (14.931 kg.m.) @ 4,000

113 lbs.ft. (15.622 kg.m.) @ 5,500

104 lbs.ft. (14.378 kg.m.) @ 5,000

Road speed per 1,000 r.p.m. in Top gear:

3.90 : 1 final drive with 5.20 x 13 tyres

3.77 : 1 final drive with 145 x 13 tyres

3.55 : 1 final drive with 145 x 13 tyres

3.77 : 1 final drive with 155 x 13 tyres

3.55 : 1 final drive with 155 x 13 tyres

16.50 m.p.h. (28.55 km.h.)

17.41 m.p.h. (28.01 km.h.)

18.10 m.p.h. (29.13 km.h.)

17.62 m.p.h. (28.35 km.h.)

18.50 m.p.h. (29.77 km.h.)

Cylinder Head

Material	Aluminium	
Gasket	Copper/asbestos	
Cylinder head identification - Small valve	'S' (& Fed. Big valve)	
- Big valve	'N' or 'H' (& S/E Stromberg)	
Cylinder head depth - Small valve	4.638/4.643 in. (11.78/11.79 cm.)	
- Big valve	4.598/4.603 in. (11.68/11.69 cm.)	
Max. permissible metal removal - Small valve	.045 in. (1.14 mm.)	
- Big valve	.010 in. (.254 mm.)	
Valve timing - Inlet opens	22° B.T.D.C.)	26° B.T.D.C.)
- Inlet closes	62° A.B.D.C.)	66° A.B.D.C.) S/E &
- Exhaust opens	62° B.B.D.C.)	66° B.B.D.C.) SPRINT
- Exhaust closes	22° A.T.D.C.)	26° A.T.D.C.)
Angle of valve seats and faces	45°	
Valves:		
Head diameter - Inlet (except Sprint)	1.526/1.530 in. (38.760/38.862 mm.)	
- Inlet (Sprint)	1.560/1.566 in. (39.624/39.776 mm.)	
- Exhaust	1.321/1.325 in. (33.553/33.655 mm.)	
Stem diameter - Inlet	.310/.311 in. (7.874/7.899 mm.)	
- Exhaust	.310/.311 in. (7.874/7.899 mm.)	
Stem clearance in guide - Inlet	.0003/.0023 in. (.007/.058 mm.)	
- Exhaust	.0025/.0030 in. (.063/.076 mm.)	
Clearance (cold) - Inlet	.005/.007 in. (.127/.177 mm.)	
- Exhaust (to Engine 9951)	.006/.008 in. (.152/.203 mm.)	
- Exhaust (from Engine 9952)	.009/.011 in. (.228/.279 mm.)	
Valve springs:		
Type	Dual	
Free Length - Inner	1.130 in. (28.70 mm.)	
- Outer	1.450 in. (36.83 mm.)	
Rate - Inner @ .92 in. (23.4 mm.)	12.4 lbs. (5.6 kg.)	
- Inner @ .58 in. (14.7 mm.)	33.5 lbs. (15.2 kg.)	
- Outer @ 1.17 in. (29.7 mm.)	45 lbs. (20.4 kg.)	
- Outer @ .83 in. (21.1 mm.)	109 lbs. (49.4 kg.)	
Valve guides:		
Internal dia. (to ream after fitting)	.3113/.3123 in. (7.932 mm.)	

Length - Inlet	1.520 in. (38.608 mm.)
- Exhaust	1.480 in. (37.592 mm.)
Fitted height above head	.320 in. (8.128 mm.)

Valve guides

Outside diameter of guide - All engines:

Standard

Inlet & Exhaust

.5000/.5005 in.
(12.700/12.713 mm.)

.001 in. (.0254 mm.) oversize

.5010/.5015 in.
(12.725/12.738 mm.)

.005 in. (.127 mm.) oversize

.5050/.5055 in.
(12.827/12.839 mm.)

.006 in. (.1524 mm.) oversize

.5060/.5065 in.
(12.852/12.865 mm.)

Diameter of bore in cylinder head - All engines:

Standard

.4990/.4995 in.
(12.675/12.687 mm.)

.001 in. (.0254 mm.) oversize

.5000/.5005 in.
(12.700/12.713 mm.)

.005 in. (.127 mm.) oversize

.5040/.5045 in.
(12.802/12.814 mm.)

.006 in. (.1524 mm.) oversize

.5050/.5055 in.
(12.827/12.839 mm.)

Interference fit - All guides - All engines:

.0005/.0015 in.
(.0127/.0381 mm.)

Valve seat inserts

Outside diameter of insert - All engines:

Standard

Inlet

Exhaust

1.6235/1.6245 in. 1.4985/1.4995 in.
(41.237/41.262 mm.) (38.062/38.087 mm.)

.005 in. (.127 mm.) oversize

1.6285/1.6295 in. 1.5035/1.5045 in.
(41.364/41.389 mm.) (38.189/38.214 mm.)

.010 in. (.254 mm.) oversize

1.6335/1.6345 in. 1.5085/1.5095 in.
(41.491/41.516 mm.) (38.316/38.214 mm.)

.015 in. (.381 mm.) oversize

1.6385/1.6395 in. 1.5135/1.5145 in.
(41.618/41.643 mm.) (38.214/38.239 mm.)

Diameter of bore in cylinder head - All engines:

Standard

1.6200/1.6210 in. 1.4950/1.4960 in.
(41.148/41.173 mm.) (37.973/37.998 mm.)

.005 in. (.127 mm.) oversize

1.6250/1.6260 in. 1.5000/1.5010 in.
(41.275/41.300 mm.) (38.100/38.125 mm.)

.010 in. (.254 mm.) oversize

1.6300/1.6310 in. 1.5050/1.5060 in.
(41.402/41.427 mm.) (38.227/38.252 mm.)

.015 in. (.381 mm.) oversize

1.6350/1.6360 in. 1.5100/1.5110 in.
(41.529/41.554 mm.) (38.354/38.379 mm.)

Interference fit - All inserts - All engines:

.0025/.0045 in.
(.521/.114 mm.)

Camshafts:

Journal diameter	1.000/1.0005 in. (25.4/25.413 mm.)
End float	.003/.010 in. (.076/.254 mm.)
Bearings - Number	5
- Type	Steel backed, white metal
- Running clearance	.0005/.002 in. (.013/.050 mm.)

Cam followers:

Bore in head	1.375/1.3756 in. (34.925/34.940 mm.)
Outside diameter	1.3742/1.3745 in. (34.904/34.912 mm.)
Follower to head clearance	.0005/.0014 in. (.013/.036 mm.)

Jackshaft

Bearings - Number	3
- Type	Steel backed, white metal
- Length - Front	.75 in. (19.05 mm.)
- Centre	.64 in. (16.26 mm.)
- Rear	.75 in. (19.05 mm.)
- Running clearance	.001/.002 in. (.025/.050 mm.)
Journal diameter	1.560/1.5605 in. (39.624/39.637 mm.)
End float	.0025/.0075 in. (.063/.190 mm.)

Crankshaft

Balance	Within .2 oz.in. (14.42 gr.cm.)
Diameter - Main journals	2.1255/2.1260 in. (53.987/54.000 mm.)
- Crankpin	1.9370/1.9375 in. (49.199/49.211 mm.)
End float - Dimension	.003/.008 in. (.076/.203 mm.)
- Controlled by	Thrust washers on centre main bearing
Bearings - Number	5
- Type	Steel backed, lead bronze with lead overlay
- Running clearance	.0015/.0030 in. (.038/.076 mm.)
Maximum undersize for regrind	.03 in. (.762 mm.)

Flywheel

Maximum run-out (lateral)	.004 in. (.101 mm.)
Starter ring gear - Run-out - Lateral	.016 in. (.406 mm.)
- Radial	.006 in. (.152 mm.)

Connecting Rod

Type	'H' section
Material	Steel forging
Distance between centres	4.799/4.801 in. (12.19/12.24 cm.)
Bearings - Type	Steel backed, lead bronze with lead overlay
- Running clearance	.0005/.0022 in. (.013/.513 mm.)
- End float on crankpin	.004/.010 in. (.101/.254 mm.)
Small end bore (bushed):	
Grade 'A' (silver)	.8124/.8125 in. (20.635/20.637 mm.)
Grade 'B' (green)	.8125/.8127 in. (20.637/20.642 mm.)

Gudgeon (Piston) Pin

Type	Floating
Location	Circlips
Diameter - Grade 'A'	.8121/.8122 in. (20.627/20.628 mm.)
- Grade 'B'	.8122/.8123 in. (20.628/20.632 mm.)
Class of fit	Finger push fit

Piston

Type	Solid skirt
Material	Tin-plated aluminium alloy
Length	2.687 in. (68.250 mm.)
Compression height	1.536/1.538 in. (39.014/39.065 mm.)
Maximum permissible weight variation per set	4 grammes
Rings - Compression	2
- Oil control	1
Diameter - 'A' type - Grade 1	3.2470/3.2473 in. (82.474/82.481 mm.)
- Grade 2	3.2473/3.2476 in. (82.481/82.489 mm.)
- Grade 3	3.2476/3.2479 in. (82.489/82.497 mm.)
- Grade 4	3.2479/3.2482 in. (82.497/82.504 mm.)
- 'C' type - Grade 1	3.2467/3.2470 in. (82.466/82.474 mm.)
- Grade 2	3.2470/3.2473 in. (82.474/82.481 mm.)
- Grade 3	3.2473/3.2476 in. (82.481/82.489 mm.)
- Grade 4	3.2476/3.2479 in. (82.489/82.497 mm.)

Piston clearance in cylinder bore:

'A' type

'C' type

Gudgeon pin bore offset

Ring gap (fitted) - Compression

- Oil control

Piston ring to groove clearance:

Compression

Oil control

Lubrication System

Pump:

Type

Drive

Inner and outer rotor clearance

Inner and outer rotor float

Outer rotor to housing clearance

Normal pressure (hot)

Filter

FUEL SYSTEM

Pump - Operation

- Pressure

Air cleaner type

Carburettor - Type and number

- Slow running speed

- Settings:

Choke

Main jet

Air corrector jet

Slow running jet

Accelerator pump jet

Accelerator pump stroke

Starter air jet

Starter petrol jet

Emulsion Tube

Needle valve

Air trumpet length

.0027/.0033 in. (.068/.083 mm.)

.0030/.0036 in. (.076/.091 mm.)

.04 in. (1.016 mm.) towards thrust face

.009/.014 in. (.229/.356 mm.)

.010/.020 in. (.254/.508 mm.)

.0016/.0036 in. (.041/.091 mm.)

.0018/.0038 in. (.046/.097 mm.)

Eccentric lobe

Gear on jackshaft

.006 in. (.15 mm.) Maximum

.005 in. (.13 mm.) Maximum

.010 in. (.25 mm.) Maximum

35/40 lbs.in.sq. (2.4/2.8 kg.cm.sq.)

Full Flow (renewable element or
'throw-away' canister)

Lever by eccentric on jackshaft

1.25/2.5 lbs.in.sq. (.087/.176 kg.cm.sq.)

Paper element (dry)

Weber 40 DCOE 18 or, 40 DCOE 31, Two

800/900 r.p.m.

40 DCOE 18

<u>STD.</u>	<u>S/E</u>
30 mm.	32 mm.
115	115
200	150
45 F.9	50 F.8
40	40
10 mm.	10 mm.
100	100
F.5/100	F.5/100
F.11	F.11
1.75	1.75
1.75 in.	1.75 in.
(4.44 cm.)	(4.44 cm.)

- Settings :

40 DCOE 31

	<u>STD.</u>	<u>S/E</u>	<u>SPRINT</u>
Choke	30 mm.	32 mm.	33 mm.
Main jet	115	115	120
Air corrector jet	200	150	155
Slow running jet	50 F.8	50 F.8	50 F.8
Accelerator pump jet	40	40	35
Accelerator pump stroke	10 mm.	10 mm.	10 mm.
Starter air jet	100	100	100
Starter petrol jet	F.5/100	F.5/100	F.5/100
Emulsion tube	F.11	F.11	F.11
Needle valve	1.75	1.75	1.75
Air trumpet length	1.5 in. (3.8 cm.)	1.5 in. (3.8 cm.)	1.5 in. 3.8 cm.)

Carburettor - Type and Number

Zenith-Stromberg 175 CD 2S or 175 CD 2SE, Two

- Settings :

175 CD 2S (non-Emission)

Slow running speed
Needle
Spring Colour
Damper oil

800/900 r.p.m.
B.IY
Natural
SAE 20W/50

- Settings :

175 CD 2SE (Exhaust Emission)

Slow running speed
Needle
Spring Colour
Damper oil

950 r.p.m.
B.IG
Blue/black
SAE 20W/50

IGNITION SYSTEM

Type

Coil and distributor

Firing order

1,3,4,2

No.1 cylinder

Nearest to radiator

Ignition advance control

Fully automatic

Ignition timing (static) :

Weber carburettors ('A' pistons)
Weber carburettors ('C' pistons)
Weber carburettors (Sprint)

12° B.T.D.C.* (40953) & (41189)
10° B.T.D.C.* (40953) & 41189)
12° B.T.D.C.* (41189)

Zenith - Stromberg carburettors
(non Exhaust Emission)

9° B.T.D.C.* (40953)

Zenith - Stromberg carburettors
(Exhaust Emission)

5° B.T.D.C.* (41225)
Lucas LA.12

Coil

Sparkign plugs:

Type - Non Exhaust Emission
- Exhaust Emission

Champion N7Y

Autolite AG .32 (for sustained high
speed driving use Champion N7Y)

Gap - Non Exhaust Emission
- Exhaust Emission

.020/.023 in. (.508/.584 mm.)
.025 in. (.635 mm.)

* The above ignition settings may need SLIGHT alteration to meet local fuel requirements.

Distributor

Type - Non Exhaust Emission
- Exhaust Emission

23 D.4 (early models 25 D.4)

25 D.4

Direction of rotation (from above)

Anti-clockwise

Drive

Gear on jackshaft

Contact breaker gap

.014/.016 in. (.35/.40 mm.)

Contact lever spring tension

18/24 oz. (.51/.68 kg.)

Firing angles

0°, 90°, 180°, 270° ± 1°

Cam dwell angle

60° ± 3°

Despatch No. - Weber carburettors

40953, STD; 41189A, S/E and Sprint

- Zenith-Stromberg carbs.
(Non Exhaust Emission)

40953

- Zenith-Stromberg carbs.
(Exhaust Emission)

41225A

Centrifugal advance - Distributor Despatch No. 40953

crankshaft r.p.m.

crankshaft degrees B.T.D.C. (Add Static Settings)

Below

500

No advance

1,000

5.6

1,500

10.5

2,000

16.0

2,500

16.8

3,000

17.8

3,500

18.6

4,000

19.5

4,500

20.5

5,000

21.0

5,500

22.5

6,000

23.0

6,500

24.0

Maximum advance

Centrifugal advance - Distributor Despatch No. - 41189 or

- 41225 when 5° suction retard capsule fitted.

	<u>crankshaft r.p.m.</u>	<u>crankshaft degrees B.T.D.C. (Add static setting)</u>
Below	1,000	No advance
	1,250	2.4
	1,500	4.6
	1,750	6.8
	2,000	9.2
	2,250	11.6
	2,500	14.0 Maximum advance

COOLING SYSTEM

Type	Centrifugal pump and fan
Radiator cap relief valve pressure	10 lbs.in.sq. (.70 kg.cm.sq.)
Thermostat nominal opening temperature	78°C. (see Section 'K')
Fan belt tension (at longest run)	½ in. (12.7mm.) total up-and-down movement.
Impeller vanes to water pump housing clearance	.020/.030 in. (.508/.762 mm.)

CLUTCH

Make and Type	Borg & Beck, diaphragm spring
Operation	Hydraulic
Driven plate - Diameter	8 in. (20.3 cm.)
- Number of springs	6
Clutch assembly adjustment	See Section 'Q'
Bore of - Master cylinder	5/8 in. (15.87 mm.)
- Slave cylinder	7/8 in. (22.22 mm.)

GEARBOX

Type	4 forward speeds, all synchromesh, & reverse.
Bearings - Mainshaft	Ball
- Countershaft	Rollers
Adjustment - 1st. gear end float	.005/.010 in. (.127/.254 mm.)
- 2nd. gear end float	.005/.010 in. (.127/.254 mm.)
- 3rd. gear end float	.005/.016 in. (.127/.406 mm.)
- Countershaft	.008/.020 in. (.203/.508 mm.)
- Mainshaft end float	.030 in. (.76 mm.) MAX.

<u>Ratios</u>	<u>Semi-close ratio</u>	<u>Close ratio</u>
Top	1.000 : 1	1.000 : 1
3rd.	1.396 : 1	1.230 : 1
2nd.	2.009 : 1	1.636 : 1
1st.	2.972 : 1	2.510 : 1
Reverse	3.324 : 1	2.807 : 1

Speedometer gears:	<u>Driving Gear</u>	<u>Driven Gear</u>
Series 1, 2 and early 3 (3.9 : 1 final drive)	109E 17285B 7 teeth	109E 17322A 25 teeth, Blue
Later Series 3, 4 (3.77 : 1 final drive)	109E 17285B 7 teeth	109E 17322B 24 teeth, Green
Later Series 3, 4 (3.55 : 1 final drive)	109E 17285B 7 teeth	109E 17322 23 teeth, Black
Series 4 with optional Goodyear 'A.70' tyres (3.77 : 1 final drive)	109E 17285B 7 teeth	109E 17322A 25 teeth, Blue
Series 4 with optional Goodyear 'A.70' tyres (3.55 : 1 final drive)	109E 17285B 7 teeth	109E 17322 23 teeth, Black

REAR AXLE

Final drive	Hypoid gear
Bearings - Pinion	Taper rollers
- Differential/crown wheel assembly	Taper rollers
Adjustment - Pinion bearing pre-load	9/11 lbs. in. (.10/.12 kg.m.)
- Crown wheel/pinion backlash	.005/.007 in. (.127/.177 mm.)
Number of teeth - Crown wheel ³³⁻⁴³⁾	³⁴⁾ 3.90 : 1 ³²⁾ 3.777 : 1 3.555 : 1
- Pinion ⁹⁾	⁹⁾

Final drive ratio:

Series 1, 2, early 3	3.90 : 1
Later Series 3 onwards - Standard	3.777 : 1
- Optional	3.555 : 1

Overall ratios:	<u>semi-close</u>	<u>close ratio</u>
With 3.9 : 1 final drive - Top	3.900 : 1	3.900 : 1
(now obsolete) - 3rd.	5.444 : 1	4.797 : 1
- 2nd.	7.835 : 1	6.380 : 1
- 1st.	11.590 : 1	9.789 : 1
- Reverse	12.963 : 1	10.947 : 1
With 3.77 : 1 final drive - Top	3.777 : 1	3.777 : 1
- 3rd.	5.272 : 1	4.645 : 1
- 2nd.	7.587 : 1	6.179 : 1
- 1st.	11.225 : 1	9.480 : 1
- Reverse	12.554 : 1	10.602 : 1
With 3.55 : 1 final drive - Top	3.555 : 1	3.555 : 1
- 3rd.	4.962 : 1	4.372 : 1
- 2nd.	7.142 : 1	5.796 : 1
- 1st.	10.565 : 1	8.923 : 1
- Reverse	11.816 : 1	9.978 : 1

FRONT SUSPENSION

Type	Independent
Spring - Number of coils	19.6
- Wire diameter	.324 in. (8.23 mm.)
- Rate	75 lbs.in. (.865 kg.m.)
- Length - Free*	16.08 in. (40.84 cm.)
- Fitted*	9.22 in. (23.4 cm.)
Front hub end float	.002/.004 in. (.05/.10 mm.)
* Spring, Part No. 26C 010A (see Section 'C')	- Free length 16.75 in. (42.54 cm.) - Fitted length 9.86 in. (25.04 cm.)

STEERING

Type	Rack and pinion
Steering angles:	
Camber - Series 1, 2	Zero to $\frac{1}{2}^{\circ}$ (Positive)
- Series 3 onwards	Zero to 1° (Positive)
Castor - From 26/3001 to 26/3061	7° (Positive)
- From 26/3061 onwards	$3^{\circ} \pm 30'$ (Positive)
Swivel pin (kpl) - All cars	$9^{\circ} \pm 30'$
Toe - in	.1875 in. (4.76 mm.) to .0625 in. (1.6 mm.)
Condition for checking toe - in	6 in. (15.2 cm.) ground clearance at bottom of chassis closing plate (see Section 'C').

REAR SUSPENSION

Type	Independent
Spring - Number of coils	8.7
- Wire diameter	.40 in. (10.16 mm.)
- Length - Free	14.71 in. (37.4 cm.)
- Fitted	8.0 in. (20.3 cm.)
- Rate	67.5 lbs.in. (.777 kg.m.)
Wheel camber	- 1° to Zero (Negative)
Toe - in	.1875 in. (4.76 mm.) to Zero

BRAKES

Make and type	Girling hydraulic (servo optional)
Front Brakes:	
Disc diameter	9.5 in. (24.1 cm.)
Pads material:	
Up to 26/4108	Ferodo DA.4 (26 J 6082)
From 26/4109 - STD	Ferodo DA.4 (36 J 6067)
- S/E	Ferodo DA.6 (36 J 6065)
From 26/4109 - All with brake servo fitted	Ferodo DA.6 (36 J 6065)
Rear brakes:	
Disc diameter	10 in. (25.4 cm.)
Pads material:	
All - STD	Ferodo DA.4 (36 J 6066)
- S/E	Ferodo DA.6 (36 J 6064)
All with brake servo fitted	Ferodo DA.6 (36 J 6064)
Handbrake - Type	Mechanical, on rear only
- Pads material	Don 117 (36 J 6063)
Total disc run out	.004 in. (.10 mm.)

WHEELS AND TYRES

Wheel - Type	Lotus 'bolt-on' or 'knock-on'
- Size - Series 1, 2	4.50 in.
- Series 3 onwards	4½J
Tyres* - Type - All models	Firestone F.100 tubeless
	Goodyear G.800 with tubes
	Dunlop SP. Sport with tubes
Tyres* - Size - Series 1 and 2	5.20 x 13
- Series 3	145 x 13
- Series 4	155 x 13

* NOTE: If inner tubes are fitted, it is essential that these are of the correct type for radial ply tyres.

Tyres - Pressure (cold):

	At speeds BELOW 100 mph (160 kph)	At sustained speeds ABOVE 100 mph (160 kph)
- Front	18 lbs.in.sq. (1.26 kg.cm.sq.)	24 lbs.in.sq. (1.69 kg.cm.sq.)
- Rear	23 lbs.in.sq. (1.60 kg.cm.sq.)	29 lbs.in.sq. (2.04 kg.cm.sq.)

NOTE: It is not necessary to increase the tyre pressures for any reason other than those given.

ELECTRICAL EQUIPMENT**Battery**

Type	Exide 6 VTA 29 L
Capacity @ 20 hr. rating	39 amp.hr.
Voltage and polarity	12 volt positive earth (negative earth from 7895)

Fuses

Quantity	2
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Generator

Type	Lucas C.40
Maximum output	22 amps @ 2250 r.p.m.
Cutting-in speed	1450 r.p.m. Maximum @ 13.0 volts
Field resistance	6.0 ohms.
Brush spring tension	30 ozs. (.85 kg.) Maximum 13 ozs. (.36 kg.) Minimum
Control box type	RB. 106/2 or RB.340

Starters

Type	Lucas M.35 G
Drive	'SB' (inboard)
Brush spring tension	30/34 ozs. (.85/.96 kg.)
Light running current	45 amps. @ 9500/11000 r.p.m.
Lock torque	7.7 lbs.ft. (1.06 kg.) @ 330/350 amps.

Starters (Continued)

Type	Lucas M.35 J
Drive	'SB' (inboard)
Brush tension	See Section 'M.4'
Light running current	65 amps. @ 8000/10000 r.p.m.
Lock torque	7.0 lbs.ft. (.97 kg.m.) @ 350/375 amps.

Alternator (when fitted)

Type	Lucas 17 ACR
Maximum output (hot)	36 amps. @ 6000 r.p.m.
Nominal system voltage	12
Earth polarity	Negative only
Rotation	Clockwise from drive end
Number of poles	12
Stator phases	3
Slip ring brush length (new)	.5 in. (12.7 mm.)
Brush spring tension	7/10 ozs. (.19/.28 kg.) with brush face flush with brush box housing
Rotor winding resistance	4.165 \pm 5% ohms. @ 20° C.
Stator winding resistance	.133 ohms. per phase
Regulating voltage	14.1 to 14.5 volts

Lamp Bulbs (all 12 volt)

Headlamp - RHD	Sealed beam unit (60/45 W)
- LHD	410 (45/40 W)
- France	411 (45/40 W) yellow
- North America	Sealed beam unit
Sidelamp	989 (6 W)
Front and rear indicators	382 (21 W)
Front indicator repeater	256 (3 W festoon)
Stop and tail lamps	380 (21/6 W)
Rear number plate lamp	989 (6 W)

Panel (Instrument) lamps	987 (2.4 W)
Interior lamps - Facia	254 (6 W festoon)
- Roof (Coupe only)	256 (3 W festoon)
Warning lamps	281 (2 W)
Reverse lamps (where fitted)	273 (21 W festoon)

ADDITIONAL INFORMATION

FUEL SYSTEM

Zenith - Stromberg Carburettors Identification:

<u>Emission Type:</u> E26 S710 Front)	Fixed needle B.IG with idle
E26 S711 Rear)	return valve.
G26 S710 Front)	Fixed needle B.IG with addition
G26 S711 Rear)	of throttle edge drilling and
	deletion of idle return valve.

Non-Emission Type

F26 S710 Front)	Fixed needle B.IY with side
F26 S711 Rear)	entry balance pipe.
I26 S710 Front)	Adjustable needle B.IY with
I26 S711 Rear)	side entry balance pipe.
J26 S710 Front)	Adjustable needle B.2AR with
J26 S711 Rear)	overhead balance pipe.

Dellorto Carburettors

Type	<u>Domestic (red spot)</u>
	DHLA 40
Part No. (Identification) - Front	Q026 S 0710W
- Rear	Q026 S 0711W
Colour code	Red

Settings:

Choke	33mm.
Auxiliary venturi	7848 - 1
Main jet	120
Main air corrector	130
Idling jet	50.02
Idling jet holder	7850 - 2 (120)
Pump jet	45*
Starter jet	70
Main emulsion tube	7772 - 5
Starter emulsion tube	7842 - 1.28
Needle valve	150.33
Float assembly	7298 - 01
Air trumpet length	40 mm.

* Use 35 if necessary to improve driving

TORQUE LOADING FIGURES

<u>ENGINE</u>	<u>lbs. ft.</u>	<u>kg. m.</u>
Cylinder Head (tighten cold)	60 - 65	8.29 - 8.98
Cylinder Head to front cover	10 - 15	1.38 - 2.07
Sparking Plugs	24 - 28	3.31 - 3.87
Camshafts - Bearing caps	9	1.24
- Sprockets	25 - 30	3.45 - 4.14
- Cover	7	.96
Crankshaft - Main bearing caps	55 - 60	7.60 - 8.29
- Connecting rod (big ends) caps		
- 'C' type	44 - 46	6.08 - 6.36
- 'L' type	25	3.45
-Pulley	24 - 28	3.31 - 3.87
Flywheel	45 - 50	6.22 - 6.91
Front (timing) cover - 1/4 in. (UNF & UNC)	5 - 7	.69 - .96
- 5/16 in. (UNF & UNC)	10 - 15	1.38 - 2.07
- Back plate to cylinder block	6 - 8	.83 - 1.10
Timing chain tensioner - Sprocket pin	40 - 45	5.53 - 6.22
- Retaining bolt	45 - 50	6.22 - 2.91
- Pivot pin	40 - 45	5.53 - 6.22
Jackshaft - Sprocket	12 - 15	1.65 - 2.07
- Thrust plate	5 - 7	.69 - .96
Oil filter centre bolt	12 - 15	1.65 - 2.07
Oil pump to cylinder block	12 - 15	1.65 - 2.07
Oil sump to cylinder block	6 - 8	.83 - 1.10
Oil sump drain plug	20 - 25	2.76 - 3.45
Fuel pump to cylinder block	12 - 15	1.65 - 2.07
Exhaust manifolds to cylinder head	12 - 15	1.65 - 2.07
Rear oil seal carrier (crankshaft) to cylinder block	12 - 15	1.65 - 2.07
Generator to mounting bracket	15 - 18	2.07 - 2.48
Carburettor trumpet nuts	8	1.10
<u>CLUTCH</u>		
Clutch housing to gearbox	40 - 45	5.53 - 6.22
Clutch assembly to fly wheel	12 - 15	1.65 - 2.07
Fluid pipe nuts	5 - 7	.69 - .96

GEARBOX

	<u>lbs.ft.</u>	<u>kg.m.</u>
Rear extension to gearbox main casing	20 - 25	2.76 - 3.45
Mainshaft nut	20 - 25	2.76 - 3.45
Plugs - Drain	25 - 30	3.45 - 4.14
- Filler/level	25 - 30	3.45 - 4.14

FINAL DRIVE

Differential - Casing to crown wheel	30 - 35	4.14 - 4.83
- Cap retaining bolts	45 - 50	6.22 - 6.91
- Bearing adjusting nuts	12 - 15	1.65 - 2.07
- Housing to carrier	15	2.07
Pinion bearing nut	30 - 35	4.14 - 4.83

FRONT SUSPENSION

Stub axle retaining nut	65 - 75	8.98 - 10.36
Ball joint - To vertical link	38 - 42	5.25 - 5.80
- To upper wishbone	12 - 15	1.65 - 2.07
Lower wishbone - To trunnion*	35	4.83
- To damper	50 - 60	6.91 - 8.29
Inner wishbone retaining nut*	50 - 60	6.91 - 8.29
Caliper mounting plate to hub	22 - 27	3.04 - 3.73
Steering arm to vertical link	22 - 27	3.04 - 3.73
Steering tie-rod ball joint	26 - 28	3.59 - 3.87
Steering column impact clamp	26 - 32	3.59 - 4.42

* Tighten with suspension in static ride condition

REAR SUSPENSION AND DRIVE SHAFTS

Damper retaining nut *	45 - 50	6.22 - 6.91
Rotoflex couplings	35 - 40	4.83 - 5.53
Mountings - Wishbone *	35 - 40	4.83 - 5.53
- Lotacone	22 - 27	3.04 - 3.73
- Differential torque rods	22 - 27	3.04 - 3.73

* Tighten with suspension in static ride condition

<u>HUBS</u>	<u>lbs.ft.</u>	<u>kg.m.</u>
Brake disc to hub	22 - 27	3.04 - 3.73
Front hub spindle nut*	5 - 6	.69 - .83
Rear hub retaining nut	100 - 110	13.82 - 15.20
Wheel nuts (octagonal)	200 - 220	27.65 - 30.42

* Tighten nuts to this torque loading while rotating hub to ensure bedding of taper rollers. Slacken nut one 'flat', then insert split pin.

BRAKE AND CLUTCH HYDRAULIC SYSTEM CONNECTIONS

3/8 in. UNF female (bundy and hose connections)	8 - 10	1.10 - 1.38
3/8 in. UNF male (bundy to master cylinder, multi-ways, etc.)	5 - 7	.69 - .96
7/16 in. UNF male (pressure differential warning valve)	7 - 10.5	.96 - 1.45
3/8 in. bore servo bundy (5/8 in. UNF male)	14 - 21	1.93 - 2.90
Brake hose to banjo	12 - 15	1.65 - 2.07
Stop lamp switch	12 - 15	1.65 - 2.07

Torque Wrenches

Torque wrenches in daily use should be checked at intervals, not exceeding 3 months, to ensure that accuracy is maintained.

GENERAL - NUTS AND BOLTS

1/4 in. UNF and UNC	5 - 7	.69 - .96
5/16 in. UNF and UNC	12 - 15	1.65 - 2.07
3/8 in. UNC	17 - 22	2.35 - 3.04
3/8 in. UNF	22 - 27	3.04 - 3.73
7/16 in. UNC	30 - 35	4.14 - 4.85
7/16 in. UNF	40 - 45	5.53 - 6.22
1/2 in. UNC	45 - 50	6.22 - 6.91
1/2 in. UNF	50 - 60	6.91 - 8.29
9/16 in. UNC	60 - 70	8.29 - 9.68
9/16 in. UNF	65 - 75	8.98 - 10.36
5/8 in. UNC	75 - 85	10.36 - 11.75
5/8 in. UNF	100 - 110	13.82 - 15.20

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