

## ENGINE DATA

The following data cover all "B" range petrol engines and, except where specifically stated, the details are common throughout the range.

<b>TYPE</b>	.. .. .	Four-stroke, liquid cooled, normally aspirated
<b>NUMBER OF CYLINDERS</b>		
B40	.. .. .	4
B60 and B61	.. .. .	6
B80 and B81	.. .. .	8
<b>MAXIMUM POWER (uninstalled)</b>		
B40	.. .. .	80 B.H.P. } at 3,750 r.p.m.
B60	.. .. .	
B61	.. .. .	130 B.H.P. } at 4,000 r.p.m.
B80	.. .. .	165 B.H.P. } at 3,750 r.p.m.
B81	.. .. .	
B81 SV (6.5:1 compression ratio)	.. .. .	220 B.H.P. } at 4,000 r.p.m.
B81 SV (7.25:1 compression ratio)	.. .. .	
<b>MAXIMUM TORQUE (gross)</b>		
B40	.. .. .	138 lb. ft. (19 kg.m.) at 2,000 r.p.m.
B60	.. .. .	209 lb. ft. (29 kg.m.) at 2,400 r.p.m.
B61	.. .. .	268 lb. ft. (37 kg.m.) at 2,250 r.p.m.
B80	.. .. .	280 lb. ft. (38 kg.m.) at 2,250 r.p.m.
B81	.. .. .	330 lb. ft. (45 kg.m.) at 2,300 r.p.m.
B81 SV (6.5:1 compression ratio)	.. .. .	334 lb. ft. (47 kg.m.) at 2,750 r.p.m.
B81 SV (7.25:1 compression ratio)	.. .. .	354 lb. ft. (49 kg.m.) at 2,500 r.p.m.
<b>*WEIGHT OF ENGINE</b>		
B40	.. .. .	650 lb. (295 kg.) approx.
B60 and B61	.. .. .	825 lb. (374 kg.) approx.
B80	.. .. .	1,000 lb. (454 kg.) approx.
B81	.. .. .	1,010 lb. (459 kg.) approx.
<b>BORE</b>		
B40, B60 and B80	.. .. .	3.5 in. (8.89 cm.)
B61 and B81	.. .. .	3.75 in. (9.52 cm.)
<b>STROKE</b>	.. .. .	4.5 in. (11.43 cm.)
<b>SWEPT VOLUME</b>		
B40	.. .. .	173 cu. in. (2,838 cc.)
B60	.. .. .	260 cu. in. (4,256 cc.)
B61	.. .. .	298 cu. in. (4,887 cc.)
B80	.. .. .	346 cu. in. (5,675 cc.)
B81	.. .. .	398 cu. in. (6,516 cc.)

\*These weights are approximate only and apply to engines carrying similar equipment to that illustrated in Chapter 1, fig. 1 of this manual.

**COMPRESSION RATIO**

<b>B40, B60 and B80</b>	..	..	..	..	..	..	..	..	..	6.4 : 1
<b>B61</b>	..	..	..	..	..	..	..	..	..	7.25 : 1
<b>B81</b>	..	..	..	..	..	..	..	..	..	6.4 : 1
<b>B81 SV</b>	..	..	..	..	..	..	..	..	..	6.5 : 1 or 7.25 : 1

**FIRING ORDER**

<b>B40</b>	..	..	..	..	..	..	..	..	..	1,3,4,2
<b>B60 and B61</b>	..	..	..	..	..	..	..	..	..	1,4,2,6,3,5
<b>B80 and B81</b>	..	..	..	..	..	..	..	..	..	1,6,2,5,8,3,7,4

**DIRECTION OF ROTATION** .. Clockwise—viewed from front of engine (timing gear end)

**VALVES**

**LAYOUT** .. .. . Overhead inlet, side exhaust

**SETTING TIMING** with No. 1 inlet valve rocker clearance set to 0.030 in. (0.75 mm.)

<b>B40, B60, B61 and B80</b>										
<i>Inlet opens</i>	..	..	..	..	..	..	..	..	..	T.D.C. to 2° A.T.D.C.
<b>B81 (camshaft No. RE19087)</b>										
<i>Inlet opens</i>	..	..	..	..	..	..	..	..	..	T.D.C. to 2° A.T.D.C.
<b>B81 (camshaft Nos. UE5028, RE19537, RE25315 and RE23732)</b>										
<i>Inlet opens</i>	..	..	..	..	..	..	..	..	..	4° A.T.D.C. to 6° A.T.D.C.

**RUNNING PHASING** with valve clearances set at normal figures

<b>B40, B60, B61 and B80 (camshaft Nos. RE12402, RE12403, RE13993, RE14784 and RE16704)</b>										
<i>Inlet opens</i>	..	..	..	..	..	..	..	..	..	16° B.T.D.C.
<i>Inlet closes</i>	..	..	..	..	..	..	..	..	..	84° A.B.D.C.
<i>Exhaust opens</i>	..	..	..	..	..	..	..	..	..	53½° B.B.D.C.
<i>Exhaust closes</i>	..	..	..	..	..	..	..	..	..	21½° A.T.D.C.
<b>B40, B60, B61 and B80 (camshaft Nos. RE23729, RE23730 and RE23731)</b>										
<i>Inlet opens</i>	..	..	..	..	..	..	..	..	..	16° B.T.D.C.
<i>Inlet closes</i>	..	..	..	..	..	..	..	..	..	84° A.B.D.C.
<i>Exhaust opens</i>	..	..	..	..	..	..	..	..	..	53½° B.B.D.C.
<i>Exhaust closes</i>	..	..	..	..	..	..	..	..	..	11½° A.T.D.C.
<b>B81 (camshaft No. RE19087)</b>										
<i>Inlet opens</i>	..	..	..	..	..	..	..	..	..	16° B.T.D.C.
<i>Inlet closes</i>	..	..	..	..	..	..	..	..	..	86° A.B.D.C.
<i>Exhaust opens</i>	..	..	..	..	..	..	..	..	..	61° B.B.D.C.
<i>Exhaust closes</i>	..	..	..	..	..	..	..	..	..	42° A.T.D.C.
<b>B81 (camshaft Nos. UE5028, RE19537, RE25315 and RE23732)</b>										
<i>Inlet opens</i>	..	..	..	..	..	..	..	..	..	11° B.T.D.C.
<i>Inlet closes</i>	..	..	..	..	..	..	..	..	..	91° A.B.D.C.
<i>Exhaust opens</i>	..	..	..	..	..	..	..	..	..	55½° B.B.D.C.
<i>Exhaust closes</i>	..	..	..	..	..	..	..	..	..	25° A.T.D.C.

**TAPPET CLEARANCES** (cold)

<b>B40, B60, B61 and B80</b>										
<i>Inlet</i>	..	..	..	..	..	..	..	..	..	0.010 in. (0.25 mm.)
<i>Exhaust</i>	..	..	..	..	..	..	..	..	..	0.015 in. (0.38 mm.)
Engines fitted with positive release exhaust valve rotators										0.025 in. (0.63 mm.)
<b>B81</b>										
<i>Inlet</i>	..	..	..	..	..	..	..	..	..	0.010 in. (0.25 mm.)
<i>Exhaust</i>	..	..	..	..	..	..	..	..	..	0.020 in. (0.50 mm.)
Engines fitted with positive release exhaust valve rotators										0.025 in. (0.63 mm.)

## FUEL SYSTEM

FUEL .. .. . .. . Petroi (see page 5)

### CONSUMPTION (maximum demand)

at 3,000 r.p.m.

B40	..	..	..	..	..	..	5.5 Imp. gall. (6.6 U.S. gall.) per hr.
B60	..	..	..	..	..	..	8.5 Imp. gall. (10.25 U.S. gall.) per hr.
B61	..	..	..	..	..	..	10.5 Imp. gall. (12.6 U.S. gall.) per hr.
B80	..	..	..	..	..	..	11.5 Imp. gall. (13.8 U.S. gall.) per hr.
B81	Mk. 5, 6, 50 and 60	..	..	..	..	..	13.75 Imp. gall. (16.5 U.S. gall.) per hr.
B81	Mk. 7, 8, 70 and 80	..	..	..	..	..	14.125 Imp. gall. (17 U.S. gall.) per hr.
B81	SV	..	..	..	..	..	13.75 Imp. gall. (16.5 U.S. gall.) per hr.

at 3,750 r.p.m.

B40	..	..	..	..	..	..	6.5 Imp. gall. (7.8 U.S. gall.) per hr.
B60	..	..	..	..	..	..	10 Imp. gall. (12.1 U.S. gall.) per hr.
B61	..	..	..	..	..	..	12 Imp. gall. (14.411 U.S. gall.) per hr.
B80	..	..	..	..	..	..	13.5 Imp. gall. (16.25 U.S. gall.) per hr.
B81	Mk. 5, 6, 50 and 60	..	..	..	..	..	16.25 Imp. gall. (19.5 U.S. gall.) per hr.
B81	Mk. 7, 8, 70 and 80	..	..	..	..	..	18.1 Imp. gall. (21.6 U.S. gall.) per hr.
B81	SV	..	..	..	..	..	16.5 Imp. gall. (19.815 U.S. gall.) per hr.

### FUEL PUMP (mechanical waterproof)

B40	..	..	..	..	..	..	AC-Delco Type U
B60	..	..	..	..	..	..	Self-priming Pump P50/1
B80	..	..	..	..	..	..	Self-priming Pump P50/2
B81	(Mk. 5, 6, 50 and 60)	..	..	..	..	..	Self-priming Pump P51/1
B81	(Mk. 7, 8, 70 and 80)	..	..	..	..	..	Self-priming Pump P50/2

FUEL PUMP (electrical non-waterproof) .. .. . SU Twin AUA 19

### CARBURETTOR

B40	Single choke, side-draught	..	..	..	..	..	SOLEX 40 WNHE-2
B60, B80 and B81	(Mk. 5, 6, 50 and 60)	..	..	..	..	..	..
	<i>Twin-throat, down-draught with manual choke</i>	..	..	..	..	..	SOLEX 40 NNIP
	<i>Twin-throat, down-draught with automatic choke</i>	..	..	..	..	..	SOLEX 40 NNIP/3
B61	Side-draught with automatic choke	..	..	..	..	..	Twin SU HD 6
B81	(Mk. 7, 8, 70 and 80)	..	..	..	..	..	..
	<i>Twin-throat down-draught with manual choke</i>	..	..	..	..	..	SOLEX 48 NNIP

## LUBRICATION SYSTEM

OIL SPECIFICATION .. .. . see table, page 6

CAPACITY (wet sump) .. .. . see relevant Operating and Maintenance Handbook

PRESSURE .. .. . 30 lb. per sq. in. at cruising speeds

OIL FILTER (full-flow type with expendable element) .. .. . British Filters Type LF3F  
Tecalmit Type FA2688

### OIL PRESSURE SWITCH

(waterproof)	..	..	..	..	..	..	Smith's Instruments No. 1 Mk. 559 PG
(non-waterproof)	..	..	..	..	..	..	AC-Delco Type 1504807

CIRCULATION .. .. . H.P. to main, connecting rod and camshaft bearings and tappings to auxiliary units. L.P. to valve rockers and wheelcase.

## IGNITION SYSTEM

<b>TYPE</b>	.. .. .	Coil and distributor—positive or negative earth— 12 or 24 volt non-waterproof or 24 volt waterproof and screened.
<b>TIMING</b>	.. .. .	T.D.C. to 2° A.T.D.C.
<b>DISTRIBUTOR (24 volt waterproof and screened complete with harness)</b>		
<b>B40</b>	.. .. .	four cylinder { Lucas No. 1 Mk. 2 AC-Delco No. 1 Mk. 2/1
<b>B60 and B61</b>	.. .. .	six cylinder { Lucas No. 1 Mk. 2 AC-Delco No. 1 Mk. 2/1
<b>B80 and B81</b>	.. .. .	eight cylinder { Lucas No. 1 Mk. 2 AC-Delco No. 1 Mk. 2/1
<b>DISTRIBUTOR (12 and 24 volt non-waterproof)</b>		
<b>B80 and B81</b>	.. .. .	Lucas DU8A
<b>COIL (24 volt waterproof and screened)</b>		
	.. .. .	Lucas No. 1 Mk. 2 AC-Delco No. 1 Mk. 2/1
<b>COIL (12 and 24 volt non-waterproof)</b>		
	.. .. .	Lucas HA12 Delco-Remy DRH 5012
<b>IGNITION FILTER (waterproof engines only)</b>		
	.. .. .	E.M.I. No. 1 Mk. 2
<b>IGNITION JUNCTION BOX (24 volt waterproof)</b>		
	.. .. .	C.A.V. No. 1 Mk. 2 W5868/21
<b>SPARKING PLUGS</b>		
<b>Screened</b>	.. .. .	gap 0.015 in. Lodge SRL.14PC Champion RSN-13-PX1
<b>Unscreened</b>	.. .. .	gap 0.025 in. Champion N-8 Lodge CLNP-X

## COOLANT SYSTEM

<b>RECOMMENDED COOLANT</b>	.. .. .	see table, page 6
<b>CAPACITY</b>	.. .. .	see equipment handbook
<b>PUMP</b>	.. .. .	Centrifugal vane type, belt driven
<b>THERMOSTAT</b>	.. .. .	Smiths Instruments Type X30065

## STARTER MOTOR

<b>24 volt waterproof</b>	.. .. .	C.A.V. No. 1 Mk. 2/1 C.A.V. No. 1 Mk. 3/1 C.A.V. MS. 524-2 Simms No. 1 Mk. 2 Simms No. 1 Mk. 3 Bosch BNG 4/24 CR 305
<b>24 volt non-waterproof</b>	.. .. .	C.A.V. RR524-1
<b>12 volt, non-waterproof</b>	.. .. .	Simms 512SGR104B Simms 512 SGR. 105B

## DYNAMO

<b>24 volt waterproof and screened</b>		
<b>G12—single-speed—12 amp. output</b>	.. .. .	C.A.V. No. 1 Mk. 2/1 Simms No. 1 Mk. 2
<b>G25—two-speed—25 amp. output</b>	.. .. .	C.A.V. No. 2 Mk. 2 B.T.H. No. 2 Mk. 1

**24 volt non-waterproof**

8 amp. output	..	..	..	..	..	..	..	C.A.V. D5L24A/54TX
12 amp. output	..	..	..	..	..	..	..	C.A.V. D5LF24A/23TX
12 amp. output	..	..	..	..	..	..	..	Simms 524/DG1/DRX/3
25 amp. output	..	..	..	..	..	..	..	C.A.V. H5524/44

**12 volt non-waterproof**

13 amp. output	..	..	..	..	..	..	..	C.A.V. 512-30
24 amp. output	..	..	..	..	..	..	..	Lucas RA.5
30 amp. output	..	..	..	..	..	..	..	Lucas C47
30 amp. output	..	..	..	..	..	..	..	C.A.V. H5512/22
35 amp. output	..	..	..	..	..	..	..	Lucas C48

**ALTERNATOR**

**12 volt system**

67 amp nominal output	..	..	..	..	..	..	..	Scintilla DD2/2/12V 67A
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**24 volt system**

40-150 amp. output	..	..	..	..	..	..	..	C.A.V. AC 8 C.A.V. AC 8D 641
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**CLUTCH**

<b>B40</b> Single dry-plate 10 in.	..	..	..	..	..	..	..	Borg and Beck BB 10/51C/TT
Rockford single-plate 10 in.	..	..	..	..	..	..	..	Borg and Beck
<b>B60</b> Single dry-plate 11 in.	..	..	..	..	..	..	..	Borg and Beck BB11/70C/TT
Rockford single-plate 11½ in.	..	..	..	..	..	..	..	Borg and Beck
<b>B61</b> Twin-dry-plate 11 in.	..	..	..	..	..	..	..	Borg and Beck BB11/49B
<b>B80</b> Twin-dry-plate 11 in.	..	..	..	..	..	..	..	Borg and Beck BB11/49A/TT
Rockford single-plate 11½ in.	..	..	..	..	..	..	..	Borg and Beck
Twin-dry-plate 12 in.	..	..	..	..	..	..	..	Borg and Beck BB12/153A
<b>B81</b> Twin-dry-plate 11 in.	..	..	..	..	..	..	..	Borg and Beck BB11/124
Rockford single-plate 11½ in.	..	..	..	..	..	..	..	Borg and Beck
Twin-dry-plate 12 in.	..	..	..	..	..	..	..	Borg and Beck BB12/153A

**MECHANICAL GOVERNOR**

Single-speed	..	..	..	..	..	..	..	Iso-Speedic Type 556
Two-speed	..	..	..	..	..	..	..	Iso-Speedic Type 577
All-speed	..	..	..	..	..	..	..	Iso-Speedic Type 574/1
Variable-speed	..	..	..	..	..	..	..	Iso-Speedic Type 589

**FUELS, LUBRICANTS, COOLANT AND OTHER MATERIALS**

MATERIAL	APPLICATION	BRAND OR SPECIFICATION	MANUFACTURER
<b>Fuel</b> Atmospheric temperatures above minus 15°C. (—5°F.) <b>B40, B60, B80, B81 and B81 SV</b> (6.5:1 compression ratio)		Petrol of 80 octane (research method) minimum rating 2 star rating where applicable	
<b>B61 and B81 SV</b> (7.25:1 compression ratio)		Petrol of 86 octane (research method) minimum rating 2 star rating where applicable	

**FUELS, LUBRICANTS, COOLANT AND OTHER MATERIALS (continued)**

MATERIAL	APPLICATION	BRAND OR SPECIFICATION	MANUFACTURER
<p><i>Atmospheric temperatures below minus 15°C. (—5°F.)</i> <b>All engines</b></p> <p><b>Oil</b></p> <p><i>Atmospheric temperatures above 32°C. (89°F.)</i> <i>Atmospheric temperatures between 32° and —5°C. (89° and 23°F.)</i> <i>Atmospheric temperatures between —5°C. and 15°C. (23°F and 5°F)</i></p>	<p>Engine crankcase</p>	<p>MT. 80C Fuel qualified to British Specification DEF.2401 or American Specification MIL-O-3056 Amdt. 1 Type C or equivalent winter grade fuel</p> <p>S.A.E. 50 } S.A.E. 30 } S.A.E. 10 }</p>	<p>For general use—oil qualified to U.S. Specification MIL-L-2104A or MIL-O-2104</p> <p>For Fire Service Appliances—oil qualified to U.S. Specification 2104B Supplement 1 is preferred</p> <p>Where applicable—OMD oils qualified to British Specification DEF.2101A</p>
<p><i>Atmospheric temperatures below —15°C. (5°F.)</i></p> <p><b>Grease</b></p>	<p>Control linkage, all-speed governor and air cleaner oil bath</p> <p>Coolant pump, wheelcase oil seals, control linkage bearings and Simms starter motor nose end bearing</p> <p>C.A.V. starter motor end bearing</p> <p>Assembly of electrical wiring in conduits (screened equipment only)</p>	<p>Arctic oil qualified to U.S. Specification Mil-O-10295</p> <p>Oil as used in crankcase</p> <p>Aero shell grease 6 or equivalent specifications by other manufacturers</p> <p>Tellus (OM13)</p> <p>Silicone Compound MS4.</p>	<p>Shell</p> <p>Shell</p> <p>Midlands Silicones Limited</p>
<p><b>Coolant</b></p>	<p></p>	<p>Ethylene Glycol to Specification D.T.D. 779 or BS.3150 Type A and clean water (see Chapter 5, Section 21)</p>	<p></p>
<p><b>Inhibitors</b></p>	<p>See Chapter 7 Storage and Transit for details.</p>	<p></p>	<p></p>
<p><b>Cleaning agent</b></p>	<p>Coolant system</p>	<p>Lissapol N.</p>	<p>I.C.I. Limited</p>

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