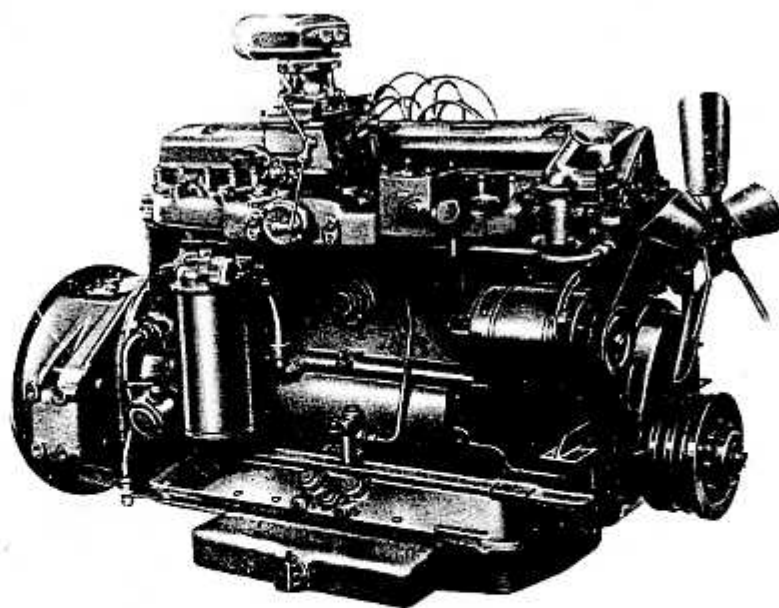


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Workshop Manual
for
'B' RANGE
PETROL ENGINES



T.S.D. PUBLICATION 702

ENGINE DATA

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

TYPE Four-stroke, liquid cooled, normally aspirated

NUMBER OF CYLINDERS

B40	4
B60 and B61	6
B80 and B81	8

MAXIMUM POWER (uninstalled)

B40	80 B.H.P.	} at 3,750 r.p.m.
B60	130 B.H.P.	
B61	168 B.H.P.	at 4,000 r.p.m.
B80	165 B.H.P.	} at 3,750 r.p.m.
B81	195 B.H.P.	
B81 SV (6.5:1 compression ratio)	220 B.H.P.	} at 4,000 r.p.m.
B81 SV (7.25:1 compression ratio)	235 B.H.P.	

MAXIMUM TORQUE (gross)

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.

***WEIGHT OF ENGINE**

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.

BORE

B40, B60 and B80	3.5 in. (8.89 cm.)
B61 and B81	3.75 in. (9.52 cm.)

STROKE

4.5 in. (11.43 cm.)

SWEPT VOLUME

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.

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T.S.D. 702 ENGINE DATA

COMPRESSION RATIO

B40, B60 and B80	6.4 : 1
B61	7.25 : 1
B81	6.4 : 1
B81 SV 6.5 : 1 or 7.25 : 1

FIRING ORDER

B40	1,3,4,2
B60 and B61	1,4,2,6,3,5
B80 and B81	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.)

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

RUNNING PHASING with valve clearances set at normal figures

B40, B60, B61 and B80 (camshaft Nos. RE12402, RE12403, RE13993, RE14784 and RE16704)	
<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.
B40, B60, B61 and B80 (camshaft Nos. RE23729, RE23730 and RE23731)	
<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.
B81 (camshaft No. RE19087)	
<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.
B81 (camshaft Nos. UE5028, RE19537, RE25315 and RE23732)	
<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)

B40, B60, B61 and B80	
<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.)
B81	
<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 Petrol (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.
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.

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.
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.

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-draft* SOLEX 40 WNHEO-2
B60, B80 and B81 (Mk. 5, 6, 50 and 60)
Twin-throat, down-draft with manual choke SOLEX 40 NNIP
Twin-throat, down-draft with automatic choke SOLEX 40 NNIP/3
B81 (MK. 7, 8, 70 and 80)
Twin-throat down-draft with manual choke 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
Tecalemit 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

TYPE	Coil and distributor—positive or negative earth— 12 or 24 volt non-waterproof or 24 volt waterproof and screened
TIMING	T.D.C. to 2° A.T.D.C.
DISTRIBUTOR (24 volt waterproof and screened complete with harness)	
B40	four cylinder } Lucas No. 1 Mk. 2 AC-Delco No. 1 Mk. 2/1
B60	six cylinder } Lucas No. 1 Mk. 2 AC-Delco No. 1 Mk. 2/1
B80 and 81	eight cylinder } Lucas No. 1 Mk. 2 AC-Delco No. 1 Mk. 2/1
DISTRIBUTOR (12 and 24 volt non-waterproof)	
B80 and B81	Lucas DU8A
ROTOR ARM (non-waterproof engines)	Lucas 42250
COIL (24 volt waterproof and screened)	Lucas No. 1 Mk. 2 AC-Delco No. 1 Mk.2/1
COIL (12 and 24 volt non-waterproof)	Lucas HA12 Delco-Remy DRH. 5012
IGNITION FILTER (waterproof engines only)	E.M.I. No. 1 Mk. 2
IGNITION JUNCTION BOX (24 volt waterproof)	C.A.V. No. 1 Mk. 2 W5868/21
SPARKING PLUGS	
Screened	gap 0.015 in. Lodge SRL.14PC Champion RSN-13-PXI
Unscreened	gap 0.025 in. Champion N-8 Lodge CLNP-X

COOLANT SYSTEM

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

STARTER MOTOR

24 volt waterproof	C.A.V. No. 1 Mk. 2/1 C.A.V. MS. 524-2 Simms No. 1 Mk. 2
24 volt non-waterproof	C.A.V. RR524-1
12 volt, non-waterproof	Simms 512SGR104B Simms 512 SGR. 105B

DYNAMO

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

FUELS, LUBRICANTS, COOLANT AND OTHER MATERIALS (continued)

MATERIAL	APPLICATION	BRAND OR SPECIFICATION	MANUFACTURER
<p>Atmospheric temperatures below minus 15°C. (-5°F.) All engines</p> <p>Oil</p> <p>Atmospheric temperatures above 32°C. (89°F.)</p> <p>Atmospheric temperatures between 32° and -5°C. (89° and 23°F.)</p> <p>Atmospheric temperatures between -5°C. and 15°C. (23°F and 5°F)</p> <p>Atmospheric temperatures below - 15°C. (5°F.)</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>Control linkage, all-speed governor and air cleaner oil bath</p>	<p>Arctic oil qualified to U.S. Specification Mil-O-10295</p>	
	<p>Grease</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>Oil as used in crankcase</p> <p>Aero shell grease 6 or equivalent specifications by other manufacturers</p> <p>Tellus (OM13)</p>	<p>Shell</p> <p>Shell</p>
	<p>Coolant</p>	<p>Silicone Compound MS4.</p>	<p>Midlands Silicones Limited</p>
	<p>Inhibitors</p> <p>See Chapter 7 Storage and Transit for details.</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>Cleaning agent</p> <p>Coolant system</p>	<p>Lissapol N.</p>	<p>I.C.I. Limited</p>