GENERAL DATA

MODEL T120—BONNEVILLE

LUBRICATION SYSTEM

OIL PUMP

Body material	Brass
Bore diameter: Feed	·40675/·40625 in.
Scavenge	·4877/·4872 in.
Plunger diameter: Feed	·40615/·40585 in.
Scavenge	·4872/·4869 in.
Valve spring length	$\frac{1}{2}$ in.
Ball diameter	$\frac{7}{32}$ in.
Aluminium crosshead width	·497/·498 in.
Working clearance in plunger heads	·0015/·0045 in.

OIL PRESSURE RELEASE VALVE

Piston diameter	·5605/·5610 in.
Working clearance	·001/·002 in.
Pressure release operates	60 lb./sq. in. (4·22 kg./sq. cm)
Spring length	$1\frac{17}{32}$ ins.
Load at $1\frac{9}{16}$ in.	$12/12\frac{1}{2}$ lbs.
Rate	37 lb./ins.

OIL PRESSURE

Normal running	65/80 lb./sq. in.
Idling	20/25 lb./sq. in.

OIL PRESSURE SWITCH

Operating pressure	7/11 lb./sq. in.

ENGINE

BASIC DETAILS

Bore and stroke	71×82 mm.
Bore and stroke	2·795×3·228 in.
Cubic capacity	649 c.c. (40 cu. in.)
Compression ratio	9:1
Power output (B.H.P. @ R.P.M.)	47 @ 6,700

CRANKSHAFT

Crankshaft Type	Forged two throw crank with bolt-on flywheel. Located by the timing side main bearing
Main bearing (drive side) size and type	$21\frac{3}{16}\times1\frac{1}{8}\times\frac{13}{16}$ in. Single lipped roller bearing
Main bearing, (timing side) size and type	$2\frac{13}{16}\times1\frac{1}{8}\times\frac{13}{16}$ in. Ball Journal
Main bearing journal dia.	1·1247/1·1250 in.
Main bearing housing dia.	2·8095/2·8110 in.
Big end journal dia.	1·6235/1·6240 in.
Min. regrind dia.	1·6035/1·6040 in.
Crankshaft end float	·003/·017 in.
Balance factor	85% (using 689 gramme weights)

CONNECTING RODS

Length (centres)	6·499/6·501 in.
Big end bearings—type	Steel backed white metal
Bearing side clearance	·012/·016 in.
Bearing diametral clearance	·0005/·0020 in.

GUDGEON PIN

Material	High tensile steel
Fit in small end bush	·0005/·0012 in. clearance
Diameter	·6882/·6885 in.
Length	2·151/2·156 in.

SMALL END BUSH

Material	Phosphor bronze
Outer dia.	·8140/·8145 in.
Length	1·030/1·031 in.
Finished bore dia.	·6890/·6894 in.

T120 BONNEVILLE—(cont)

CYLINDER BLOCK

Material	Cast iron
Bore size	2·7948/2·7953 in.
Maximum oversize	2·8348/2·8353 in.
Tappet guide block housing diameter	·9990/·9985 in.

CYLINDER HEAD

Material	D.T.D. 424 Aluminium
Inlet port size	$1\frac{3}{16}$ in. dia. tapering to $1\frac{1}{8}$ in.
Exhaust port size	$1\frac{1}{8}$ in. dia.
Valve seatings:	
Type	Cast-in
Material	Cast iron

VALVES

Stem diameter: Inlet	·3095/·3100 in.
Exhaust	·3090/·3095 in.
Head diameter: Inlet	1·592/1·596 in.
Exhaust	1·434/1·440 in.
Exhaust valve material	21/4NS

VALVE GUIDES

Material	Aluminium—Bronze
Bore diameter (Inlet and exhaust)	·3127/·3137 in.
Outside diameter (Inlet and exhaust)	·5005/·5010 in.
Length: Inlet	$1\frac{31}{32}$ in.
Exhaust	$2\frac{11}{64}$ in.

VALVE SPRINGS (RED SPOT INNER) (GREEN SPOT OUTER)

	Outer	Inner
Free length	$1\frac{1}{2}$ in.	$1\frac{17}{32}$ in.
Total number of coils	$5\frac{1}{2}$	$7\frac{1}{4}$

	Inlet	Exhaust
Total fitted load:		
Valve open	143 lbs.	155 lbs.
Valve closed	75 lbs.	87 lbs.
Fitted length (valve closed):		
Inner	$1\frac{3}{16}$ in.	$1\frac{1}{8}$ in.
Outer	$1\frac{7}{32}$ in.	$1\frac{5}{32}$ in.

VALVE TIMING

Set all tappet clearances @ ·020 in. (·5 mm.) for checking

Inlet opens	34° before top centre
Inlet closes	55° after bottom centre
Exhaust opens	55° before bottom centre
Exhaust closes	34° after top centre

ROCKERS

Material	High tensile steel forging
Bore diameter	·5002/·5012 in.
Rocker spindle diameter	·4990/·4995 in.
Tappet clearance (cold): Inlet	·002 in. (·05 mm.)
Exhaust	·004 in. (·10 mm.)

CAMSHAFTS

Journal diameter: Left	·8100/·8105 in.
Right	·8730/·8735 in.
Diametral clearance: Left	·0010/·0025 in.
Right	·0005/·0020 in.
End float	·013/·020 in.
Cam lift: Inlet and exhaust	·314 in.
Base circle diameter	·812 in.

TAPPETS

Material	High tensile steel body—Stellite tip
Tip radius	1·125 in.
Tappet diameter	·3110/·3115 in.
Clearance in guide block	·0005/·0015 in.

T120 BONNEVILLE—(cont)

TAPPET GUIDE BLOCK

Diameter of bores	·3120/·3125 in.
Outside diameter	1·0000/·9995 in.
Interference fit in cylinder block	·0005/·0015 in.

CAMSHAFT BEARING BUSHES

Material	High density sintered bronze
Bore diameter (fitted): Left	·8125/·8135 in.
Right	·874/·875 in.
Outside diameter: Left	1·0010/1·0015 in.
Right	1·126/1·127 in.
Length: Left inlet	1·104/1·114 in.
Left exhaust	·932/·942 in.
Right inlet and exhaust	1·010/1·020 in.
Interference fit in crankcase: Left	·001/·002 in.
Right	·0010/·0025 in.

TIMING GEARS

Inlet and exhaust camshaft pinions:

No. of teeth	50
Interference fit on camshaft	·000/·001 in.

Intermediate timing gear:

No. of teeth	47
Bore diameter	·5618/·5625 in.

Intermediate timing gear bush:

Material	Phosphor bronze
Outside diameter	·5635/·5640 in.
Bore diameter	·4990/·4995 in.
Length	·6775/·6825 in.
Working clearance on spindle	·0005/·0015 in.

Intermediate wheel spindle:

Diameter	.4980/.4985 in.
Interference fit in crankcase	.0005/.0015 in.

Crankshaft pinion:

No. of teeth	25
Fit on crankshaft	+·0003/—·0005 in.

IGNITION TIMING

Crankshaft position (B.T.D.C.)

Static timing	14°
Fully advanced	38°

Piston position (B.T.D.C.)

Static timing	·060 in. (1·5 mm.)
Fully advanced	·415 in. (10·4 mm.)

Advance range:

Contact breaker	12°
Crankshaft	24°

CONTACT BREAKER

Gap setting	·014–·016 in. (·35–·40 mm.)
Fully advanced at	2,000 r.p.m.

SPARKING PLUG

Type	Champion N3
Gap setting	·025 in. (·635 mm.)
Thread size	14 mm. × ¾ in. reach

T120 BONNEVILLE—(cont)

PISTONS

Material	Aluminium Alloy—diecasting
Clearance: Top of skirt	·0106/·0085 in.
Bottom of skirt	·0061/·0046 in.
Gudgeon pin hole dia.	·6882/·6886 in.

PISTON RINGS

Material	Cast iron
Compression rings (tapered):	
Width	·0615/·0625 in.
Thickness	·092/·100 in.
Fitted gap	·010/·014 in.
Clearance in groove	·001/·003 in.
Oil control ring:	
Width	·092/·100 in.
Thickness	·124/·125 in.
Fitted gap	·010/·014 in.
Clearance in groove	·0005/·0025 in.

FUEL SYSTEM

	Concentric float
Twin Carburetters	
Amal type	R930/9 and L930/10
Main jet size	220
Needle jet size	·106
Needle type	STD
Needle position	2
Throttle valve:	
Type	$2\frac{1}{2}$
Return spring free length	$2\frac{1}{2}$ in.
Carburetter nominal bore size	30 mm.
Air cleaner type (where fitted)	Filter cloth and metal gauze

TRANSMISSION

CLUTCH DETAILS

Type	Multiplate with integral shock absorber
No. of plates: Driving (bonded)	6
Driven (plain)	6
Pressure springs:	
Number	3
Free length	$1\frac{3}{16}$ in.
No. of working coils	$9\frac{1}{2}$
Spring rate	113 lbs./in.
Approximate fitted load	62 lbs.
Bearing rollers:	
Number	20
Diameter	·2495/·2500 in.
Length	·231/·236 in.
Clutch hub bearing diameter	1·3733/1·3743 in.
Clutch sprocket bore diameter	1·8745/1·8755 in.
Thrust washer thickness	·052/·054 in.
Engine sprocket teeth	29
Clutch sprocket teeth	58
Chain details	Duplex endless—$\frac{3}{8}$ in. pitch × 84 links

CLUTCH OPERATING MECHANISM

Conical spring:	
Number of working coils	2
Free length	$\frac{13}{32}$ in.
Diameter of balls	$\frac{3}{8}$ in.
Clutch operating rod:	
Diameter of rod	$\frac{7}{32}$ in.
Length of rod	11·822/11·812 in.

T120 BONNEVILLE—(cont)

GEARBOX

RATIOS

Internal ratios (Std.) 4th (Top)	1·00 : 1
3rd	1·24 : 1
2nd	1·69 : 1
1st (Bottom)	2·44 : 1

	Solo	Sidecar
Overall ratios: 4th (Top)	4·84	5·41
3rd	6·00	6·71
2nd	8·17	9·15
1st (Bottom)	11·8	13·4
Engine R.P.M. @ 10 M.P.H. in 4th (Top) gear	648	725
Gearbox sprocket teeth	19	17

GEAR DETAILS

Mainshaft high gear:	
Bore diameter (bush fitted)	·8135/·8145 in.
Working clearance on shaft	·0032/·0047 in.
Bush length	$2\frac{19}{32}$ in.
Layshaft low gear:	
Bore diameter (bush fitted)	·8135/·8145 in.
Working clearance on shaft	·0025/·0045 in.

GEARBOX SHAFTS

Mainshaft:	
Left end diameter	·8098/·8103 in.
Right end diameter	·7494/·7498 in.
Length	$11\frac{19}{64}$ in.
Layshaft:	
Left end diameter	·6845/·6850 in.
Right end diameter	·6845/·6850 in.
Length	$6\frac{31}{64}$ in.
Camplate plunger spring:	
Free length	$2\frac{1}{2}$ in.
No. of working coils	22
Spring rate	5·6 lb./in.

BEARINGS

High gear bearing	$1\frac{1}{4} \times 2\frac{1}{2} \times \frac{5}{8}$ in. Ball Journal
Mainshaft bearing	$\frac{3}{4} \times 1\frac{7}{8} \times \frac{9}{16}$ in. Ball Journal
Layshaft bearing (left)	$\frac{11}{16} \times \frac{7}{8} \times \frac{3}{4}$ in. Needle Roller
Layshaft bearing (right)	$\frac{11}{16} \times \frac{7}{8} \times \frac{3}{4}$ in. Needle Roller

KICKSTART OPERATING MECHANISM

Bush bore diameter	·751/·752 in.
Spindle working clearance in bush	·003/·005 in.
Ratchet spring free length	$\frac{1}{2}$ in.

GEARCHANGE MECHANISM

Plungers:	
Outer diameter	·4315/·4320 in.
Working clearance in bore	·0005/·0015 in.
Plunger springs:	
No. of working coils	12
Free length	$1\frac{1}{4}$ in.
Inner bush bore diameter	·6245/·6255 in.
Clearance on shaft	·0007/·0032 in.
Outer bush bore diameter	·7495/·7505 in.
Clearance on shaft	·0005/·0025 in.
Quadrant return springs:	
No. of working coils	$9\frac{1}{2}$
Free length	$1\frac{3}{4}$ ins.

T120 BONNEVILLE—(cont)

FRAME AND ATTACHMENT DETAILS

HEAD RACES

No. of balls: Top	20
Bottom	20
Ball diameter	$\frac{1}{4}$ in.

SWINGING FORK

Bush type	Pre-sized, steel-backed—phosphor bronze
Bush bore diameter	1·4460/1·4470 in.
Sleeve diameter	1·4445/1·4450 in.
Distance between fork ends	$7\frac{1}{2}$ in.

REAR SUSPENSION

Type	Swinging fork controlled by combined coil spring/hydraulic damper units
Spring details:	
Fitted length	8 in.
Free length	$8\frac{9}{16}$ in.
Mean coil diameter	$1\frac{3}{4}$ in.
Spring rate	145 lbs./in.
Colour code	Blue/yellow
Load at fitted length	38 lb.

WHEELS, BRAKES AND TYRES

WHEELS

Rim size: Front and rear	WM2-19 FrontWM2-18 rear
Type: Front	Spoke—single cross lacing
Rear	Spoke—double cross lacing
Spoke details: Front: Left side	20 off 8/10 SWG butted $5\frac{5}{8}$ in. U.H. straight
Right side	10 off 8/10 SWG butted $4\frac{25}{32}$ in. U. H. 78° head
Right side	10 off 8/10 SWG butted $4\frac{7}{8}$ in. U.H. 100° head
Rear: Left side	20 off 8/10 SWG butted $7\frac{9}{16}$ in. U.H. 90° head
Right side	20 off 8/10 SWG butted $7\frac{7}{8}$ ih. U.H. 90° head

WHEEL BEARINGS

Front and rear, dimensions and type	20×47×14 mm.—Ball Journal
Front and rear, spindle diameter (at bearing journals)	·7862/·7867 in.

STANDARD REAR WHEEL

Bolt size for detachable sprocket	$\frac{1}{4}$ in. dia. × $\frac{13}{16}$ in. U.H. × 26 C.E.I.
Number of bolts	8

Q.D. REAR WHEEL

Bearing type	$\frac{3}{4}\times1\frac{7}{8}\times\frac{9}{16}$ in. Ball Journal
Bearing sleeve: journal diameter	·7500/·7495 in.
Brake drum bearing	$\frac{7}{8}\times2\times\frac{9}{16}$ in. Ball Journal
Bearing sleeve: journal diameter	·8745/·8740 in.
Bearing housing: internal diameter	1·9890/1·9980 in.

REAR WHEEL DRIVE

Gearbox sprocket	See "Gearbox"
Rear wheel sprocket teeth	46
Chain details:	
No. of links: Solo	104
Sidecar	103
Pitch	$\frac{5}{8}$ in.
Width	$\frac{3}{8}$ in.
Speedometer drive gearbox ratio	2:1
Speedometer cable length	65 ins.

T120 BONNEVILLE—(cont)

BRAKES

Type	Internal expanding twin leading shoes
Drum Diameter: Front	8 in. ± .002 in.
Rear	7 in. ± .002 in.
Lining thickness: Front	·183/·193 in.
Rear	·177/·187 in.
Lining area: Front	24·4 sq. in.
Rear	14·6 sq. in.
Pre-set length of adjustable cam lever rod	6½ in. between centres

TYRES

Size: Front	3·25×19 in.
Rear	3·50×18 in.
Tyre pressure: Front	24 lb./sq. in. (1·685 Kg/sq. cm.)
Rear	24 lb./sq. in. (1·685 kg/sq. cm.)

FRONT FORKS

TELESCOPIC FORK

Type	Telescopic—Shuttle valve damping	
Spring details:	Solo	Sidecar
Free length	9¾ in.	9¾ in.
No. working coils	12½	15½
Spring rate	26½ lb. in.	32½ lb. in.
Gauge	6 SWG	5 SWG
Colour code	Yellow/blue	Yellow/green
Damper sleeve		
Length	2⅛ in.	
Internal diameter	1·387—1·393 in.	
Material	Black polypropylene	

	Top bush	Bottom bush
Bush details:		
Length	1 in.	·870/·875 in.
Outer diameter	1·498/1·499 in.	1·4935/1·4945 in.
Inner diameter	1·3065/1·3075 in.	1·2485/1·2495 in.

Stanchion diameter	1·3025/1·3030 in.
Working clearance in top bush	·0035/·0050 in.
Bleed holes	8 holes $\frac{3}{16}$ in. dia.
Fork leg bore diameter	1·498/1·500 in.
Working clearance of bottom bush	·0035/·0065 in.
Shuttle valve:	
Outer diameter (large)	1·018/1·016 in.
Outer diameter (small)	0·875/0·874 in.

ELECTRICAL SYSTEM

ELECTRICAL EQUIPMENT

Battery type (12v.)	PUZ 5A
Rectifier type	2DS 506
Alternator type	RM.19
Horn type (12v.)	6H

Bulbs:	No.	Type
Headlight (L/H dip)	414	50/40 watts—pre-focus
Parking light	989	6 watts—MCC
Stop and tail light	380	6/21 watts—offset pin
Speedometer light	987	3 watts—MES
Ignition warning light	281	2 watts (BA 7S)
High beam indicator light	281	2 watts (BA 7S)

Zener diode type	ZD 715
Coil type (2 off)	MA12 (12v.) 2 off or later, 17M12 (12v.) 2 off
Contact breaker type	6CA
Fuse rating	35 amp.

T120 BONNEVILLE—(cont)

GENERAL

CAPACITIES

Fuel tank	4 gall. (4·8 U.S. galls., 18 litres)
Oil tank	6 pint (7¼ U.S. pints, 3 litres)
Gearbox	⅞ pint (500 c.c.)
Primary chaincase	⅝ pint (350 c.c.)
Telescopic fork legs	⅓ pint (200 c.c.)

BASIC DIMENSIONS

Wheel base	55 in. (140 cm.)
Overall length	84 in. (214 cm.)
Overall width	27½ in. (70 cm.)
Overall height	38 in. (97 cm.)
Ground clearance	5 in. (13 cm.)

WEIGHTS

Unladen weight	365 lb. (166 kgm.)
Engine unit (dry)	130 lb. (59 kgm.)

TORQUE WRENCH SETTINGS (DRY)

Flywheel bolts	33 lb. ft. (4·6 kg.m.)
Conn. rod bolts	28 lb. ft. (3·9 kg.m.)
Crankcase junction bolts	13 lb. ft. (1·8 kg.m.)
Crankcase junction studs	20 lb. ft. (2·8 kg.m.)
Cylinder block nuts	35 lb. ft. (4.8 kg.m.)
Cylinder head bolts (⅜ in. dia.)	18 lb. ft. (2·49 kg.m.)
Cylinder head bolt (5/16 in. dia.)	15 lb. ft. (2·1 kg.m.)
Rocker box nuts	5 lb. ft. (·7 kg.m.)
Rocker box bolts	5 lb. ft. (·7 kg.m.)
Rocker spindle domed nuts	22 lb. ft. (3·0 kg.m.)
Oil pump nuts	5 lb. ft. (·7 kg.m.)
Kickstart ratchet pinion nut	45 lb. ft. (6·3 kg.m.)
Clutch centre nut	50 lb. ft. (7 kg.m.)
Rotor fixing nut	30 lb. ft. (4·1 kg.m.)
Stator fixing nuts	20 lb. ft. (2·8 kg.m.)
Primary cover domed nuts	10 lb. ft. (1·4 kg.m.)
Headlamp pivot bolts	10 lb. ft. (1·4 kg.m.)
Headrace sleeve nut pinch bolt	15 lb. ft. (2·1 kg.m.)
Stanchion pinch bolts	25 lb. ft. (3·5 kg.m.)
Front wheel spindle cap bolts	25 lb. ft. (3·5 kg.m.)
Rear brake drum to hub bolts	15 lb. ft. (2·1 kg.m.)
Brake cam spindle nuts	20 lb. ft. (2·8 kg.m.)
Zener diode fixing nut	1,5 lb. ft. (·21 kg.m.)
Fork cap nut	80 lb. ft. (11·1 kg.m.)