

BMC (AUST.) PTY. LIMITED



SERVICE TRAINING NOTES

AUSTIN FREEWAY

WOLSELEY 24/80

GENERAL DATA

TP 658/2

GENERAL DATA.

ENGINE.

Type	24 Y
Number of cylinders	6
Bore	3.00"
Stroke	3.50"
Capacity	2433 c.c.
Firing order	1.5.3.6.2.4
Compression ratio	7.7:1
Capacity of combustion chamber (valves fitted)	38.7 - 39.7 cc
Valve operation	Over Head by Push Rod.
B.H.P.	80 at 4350 RPM (Gross)
R.A.C. rating	21.6 H.P.
B.M.E.P.	125 lb/sq. in (gross) at 1650 rpm
Torque	123 lbs ft (gross) at 1650 rpm
Cooling system	Pump and 8 bladed fan
Radiator Pressure	13 p.s.i.
Oversize bores	Plus .010", .020", .030", .040"

CRANKSHAFT.

Main journal diameter	2.1255"/2.126"(10 micro in finish)
Standard Undersizes	.010", .020", .030", .040"
Oil Return Thread Dia. 2.2615"/ 2.2625"	(Clearance .0085"/.010" diametral)
Crankpin journal diameter	1.8759"/1.8764"
Standard Undersizes	.010", .020", .030", .040"

MAIN BEARINGS.

Tunnel bore	2.271"/2.2715"
Number	4
Material	Steel backed lead bronze, tin plated
Length	1.125"
End Clearance	.002"/.006"
End Thrust Taken on	No.3 Main Bearing

Crankshaft Endfloat .002"/.0037"

CONNECTING RODS.

Length between centres 6.498"/6.502"
Tunnel Bore 2.0210"/2.0215"
Big-end Bearing Material Steel backed lead bronze
tin plated.
Bearing side clearance 008"/012"
Bearing clearance. .001"/.0027"
Bearing bore size 1.8774" to 1.8786"

PISTONS.

Type 4 Ring (One oil ring below gudgeon pin) (Aluminium Alloy Tin plated)

Clearances:

Bottom of skirt .0001"/.0011"
Top of skirt .0003"/.0011"
Oversizes +.010" +.020" +.030" +
+.040"

<u>GRADE.</u>	<u>PISTON DIA.</u>	<u>BORE DIA.</u>
P	2,9993 in.	3,000 in.
	2,9997 in.	3,0004 in.
Q	2,9997 in.	3,0004 in.
	3,0001 in.	3,0008 in.
R	3,0001 in.	3,0008 in.
	3,0005 in.	3,0012 in.
S	3,0005 in.	3,0012 in.
	3,0009 in.	3,0016 in.

For replacements in service, only Grades Q and S will be supplied.

PISTON RINGS.

Top Ring	Torsional chrome, compression
2nd Ring	Stepped compression
Width	.0775/.0780"
Thickness	.140"/.150"
Fitted Gap	.008"/.016"
Clearance in groove.	.002"/.0035"
Oil Control Rings(3rd & 4th)	Slotted scraper type(4th Ring below Gudgeon)
Width	.1860"/.1865"
Thickness	.129"/.139"
Fitted Gap	.008"/.016"
Clearance in groove	.0015"/.003"

GUDGEON PIN.

Type	Clamped in Rod
Fit in piston	.0001"/.0003" clearance
Fit in connecting rod	.0002"/+.0006" "
Diameter (outer)	.6869"/.6872"

VALVES & VALVE GEAR.

Valves.

Seat Angle:	Inlet	45°
	Exhaust	45°
Head Dia.	Inlet	1.370"/.1.375"
	Exhaust	1.182"/1.187"
Stem Dia.	Inlet	.3422"/.3427"
	Exhaust	.3417"/.34225"
Seat Width	Inlet	1/16"
	Exhaust	1/8"

Valve stem to guide clearance:

Inlet	.0015"/.0025"
Exhaust	.002"/.003"

Valve rocker clearance:

Running .015"

for Valve Timing .021"

Valve Timing markings Dimples on timing wheels

Chain pitch and number of pitches $\frac{3}{8}$ ", 52 pitches

Inlet valve	Opens	T.D.C. with .021" valve rocker clearance (for timing check only)
	Closes	50° ABDC)
Exhaust "	Opens	35° BBDC) Not for checking purposes, nominal only.
	Closes	15° ATDC)

VALVE GUIDES.

Length:	Inlet	1 7/8"
	Exhaust	2-13/64"
Diameter:	Inlet Outside	.5635"/.5640"
	Inside	.34425"/.34475" after assembly
	Exhaust Outside	.5635"/.5640"
	Inside	.34425"/.34472 after assembly
Fitted height above head		.625" above machined surface of valve spring seat + or - 1/64"

VALVE SPRINGS.

Free length		2-1/32"
Fitted length		1-17/32"
Number of working coils		4 1/2
Pressure:	Valve open	131 lbs
	Valve closed	79 ± 2 lbs.

TAPPETS.

Type		Spherical base -barrel type
Diameter		.81125"/.81175"
Length		2.293"/2.303"

ROCKERS:

Bore of rocker arms		.7485"/.7495"
Rocker ratio		1.43:1
Bush diameter		.6255"/.626"

CAMSHAFT.

Journal Dia.	No.1	1.84375"/1.84425"
	No.2	1.78875"/1.78925"

CAMSHAFT.....Cont'd.

Journal Dia. No.3 1.72875"/1.72925"
No.4 1.62275"/1.62325"
End Float .003"/.007"
Bearing. Number and Type 4 thin wall steel backed white metal
Tunnel Bore Dia. No.1 1.970"/1.971"
No.2 1.915"/1.916"
No.3 1.855"/1.856"
No.4 1.749"/1.750"
Clearance .001"/.002"

COMPRESSION PRESSURE 130-150 psi

FLYWHEEL & STARTER RING.

Number of teeth on starter ring 120
Flywheel outside diameter 10.823"/10.826"
Starter ring inside diameter 10.779"/10.782"
Starter ring to flywheel interference .041"/.047"
'Run-Out' of flywheel on assembly Zero to .003" on clutch friction face at 4" radius from centre
Maximum thickness of metal to be removed during 'skimming' .0625"

ENGINE LUBRICATION SYSTEM.

Oil Pump.

Type Hobourn Eaton HE 4920
Spindle diameter .498"/.4985" Hole bore .500" - .501"
Number of teeth on driving shaft 9
Clearance between rotor lobes .0005" - .005"
End-Float of pump rotors .001" - .0025"
Flow Rate 6.48 galls/min at 2000 RPM

Oil Filter.

Type GUD Full flow Z24 Paper element throw away type.
NOTE. Oil Filter to be replaced first 3000 mile Service by GUD Z23 and replaced every other 6000 miles.

Oil Filter.....Cont'd

Capacity 1 Pint *1 1/2 pints*

Oil Pressure.

Normal running 40 lbs/sq. in hot

Idling (minimum) 10 lbs/sq. in hot

Oil pressure relief valve.

Relief pressure valve operate 50 lbs/sq. in.

Diameter of relief valve .609"/.611"

Relief valve seat angle
(included) 60°

Spring free length 2-55/64"

Spring fitted length 2-5/32"

Load to compress spring to
fitted length 13-14 lbs

IGNITION SYSTEM.

Spark Plugs Champion N5

Size 14 Mm 3/4" reach

Plug Gap .025"

Ignition Coil.

Type LA12

(Current Consumption approx) 1.00 AMP

Running 2 AMP

Stall 3.75 AMP

Distributor Type LUCAS 25D6 (Roller Cam Type)

Contact Breaker gap .014"/.016"

Cam Dwell 36° ± 3°

Distributor Centrifugal Advance

14°	-	16°	at 2100 RPM)	
8°	-	10°	at 1100 RPM)	Distributor
5°	-	7°	at 600 RPM)	Speeds at
No advance below 200-300 RPM)	angles

Vacuum advance Commences at 3" of mercury
Finishes at 9" of mercury
width 7-9° advance (distributor
angle)

Timing Static 3° BTDC

COOLING SYSTEM.

Type 13 psi Pressurized radiator, Pump
and fan assisted.

Thermostat setting 80° C 176° F

Water Pump Vane type-combined spindle with one
piece bearing.

Clearance Pump Body and Vane .020"/.030"

FUEL SYSTEM.

Carburettor.

Type Zenith 34 VN, Internally vented.

Choke 29 Mm

Jets.

Main 120

Compensating 90

Slow running 55

Full throttle bleed 1.5

Part throttle bleed 2.5

Pump 7-070 - 500

Slow running plug 50

Slow running feed .6

Slow running outlet .9

Needle seat 1.75 Mm x 1.6 Mm Washer

Fuel Level 22.5 Mm from top of float bowl with
float in position and bowl removed.

FUEL PUMP.

Make and Type SU Electric - SP type

Delivery rate 10 Gall per Hour (Min)

Suction Head 2' (approx.)

Economy 110
87

8° TDA

Delivery Head with pipe bore $\frac{1}{4}$ " 4'0" (approx)

CLUTCH.

Make and Type	Borg & Beck-Diaphragm Spring Type DS/G
Diameter	8 $\frac{1}{2}$ "
Facing Material	Wound yarn Raybestos WR7
Pressure springs	Diaphragm type spring
Damper springs	6
Colour	Red and Violet
Total Friction Area) (Linings are Borg & Beck 5/108 refer BAI for details)
Thickness of friction linings)	
Release bearing	Carbon Graphite

GEARBOX.

Type	3 Speed, Synchromesh on 2nd and Top
Gear Control	Lever on steering column
Type of Gears	All Helical, except Reverse

Gear Ratios.

1st speed	3.09:1
2nd speed	1.62:1
Top	Direct
Reverse	3.67:1

Layshaft Bearings.

Type	Bronze Bushes
Quantity	Two
Material	Split steel backed bronze
Dimensions	Finished bore in laygear .7519" .7524"

Mainshaft spigot needle rollers

Quantity	18
Dimensions	28 mm x 3mm

Mainshaft rear ball bearing:

Make	R & M
Type	M J 1 $\frac{1}{8}$ "

Size 2-13/16 x 1 1/8 x 13/16

First motion shaft ball bearing.

Make R & M

Type LJ 1 3/8 G111

Size 3" OD 1 3/8 x 11/16 with spring ring

PROPELLER SHAFT.

Type Tubular, sliding yoke

Make of joints Mechanics.

REAR AXLE.

Type 3/4 floating

Final drive HYPOID

Teeth on crown wheel 43

Teeth on pinion 11

Ratio 3.91:1

Overall ratios:

1st 12.08:1

2nd 6.33

Top 3.91:1

Reverse 14.35

Road speeds at 1,000 r.p.m.

1st 5.65

2nd 11.5

Top 18.51 mph

Pinion bearing preload 15 to 25 lbs/in (without seal)

Pinion bearing preload 20 to 30 lbs/in (with seal)

Shim thickness .004", .005", .006", .010"

Differential bearing packing collars .128" to .146", in .001" increments

Pinion Head Washer .119" to .131" in .001" increments

Carrier bearing nip .004"

Crown wheel run-out .002" max

Backlash .005"/.007" as marked on Crown wheel

REAR SUSPENSION.

	<u>Saloon</u>	<u>Station Wagon</u>
Length between eye laden	44" + $\frac{1}{8}$ "	
Deflection at full bump	7 $\frac{1}{2}$ "	
Loaded camber	.94 NEG.	.94 NEG.
No. of leaves	6 (5 x .250" 1 x .1875"	7 (4 x .250" 3 x .219"
Load	625 lbs + 20 lbs	800 + 24 lbs.

FRONT SUSPENSION.

Total no of coils	9
No. of effective coils	7 $\frac{1}{2}$
Wire Dia.	.582
Rate	300 \pm 15 lbs/in
Free length	12.07"
fitted length	7.75"
Load at fitted length	1295 + 35 lbs

HUB BEARINGS.

Inner - Ball Journal Size	R & M 14 LJT 1 $\frac{1}{4}$ " x 2 $\frac{3}{4}$ " x 11/16 in.
Outer - Ball Journal Size	R & M MJT $\frac{3}{4}$ " x 2 x 11/16 in.
King Pin Thrust Bearing	Oilite washers between two stainless steel washers
King Pin Diameter - Top	.68625"/.68675"
- Bottom	.8..25"/.81175"

SHOCK ABSORBERS.

Make	Armstrong
<u>Front.</u>	
Blow-off - Rebound	1800 in/lbs + 150 in/lbs @ 160°/Sec at 64° F
- Compression	650 in/lbs + 100 in/lbs
Time setting - Rebound	375in/lbs + 50 in/lbs @ 14° per sec.
- Compression	375in/lbs + 50 in/lbs @ 14° per sec.

Shock Absorbers.....Cont'd.

Rear

Blow-off	- Rebound	1650 in/lbs	\pm	165 in/lbs @ 179.5°
		per sec.		
	- Compression	650 in/lbs	\pm	65 in/lbs @ 179.5°
		per sec.		
Time setting	- Rebound	250 in/lbs	\pm	50 in/lbs @ 15.52°
		per sec.		
	- Compression	250 in/lbs	\pm	50 in/lbs @ 15.52°
		per sec.		

STEERING.

Type	Cam Gear PQM
Ratio	17 $\frac{1}{2}$ /15/17 $\frac{1}{2}$:1
Lock to lock	2.8 Turns
Bearing Adjustment	Shims
Steering Wheel diameter	17"
Turning circle	R.H. Lock 36'10" L.H. Lock 36'6"
Track toe-in	Zero to $\frac{1}{8}$ " toe-in
Castor Angle	1 $\frac{1}{2}$ °
Camber Angle	$\frac{3}{4}$ ° to 1°
King pin inclination	6 $\frac{1}{2}$ °

BRAKES.

Make	Girling Hydraulic (Front & Rear)
Front	2 Leading Shoes
Rear	1 Leading shoe & 1 Trailing Shoe
Pedal free movement	$\frac{1}{8}$ "
Handbrake	Mechanical Rear Wheels only
Drum Diameter	9"
Total Frictional Area	146.5 sq. ins
Lining Dimensions: (Front Mintex M35	8.6 x 2.5 in.
Rear (Mintex M35)	8.7 x 1.75 in.

ELECTRICAL.

Battery.

Type	Lucas 12 BT 68
Voltage	12 Volt, Positive Earth
No. of Plates per cell	9
Ampere Hours	68 at 20 hour rate

Generator.

Type	Lucas C40/1
Voltage	12 Volt, Positive Earth
No. of Plates per cell	9
Ampere Hours	68 at 20 hour rate

Generator.

Type	Lucas C40/1
Cutting in Speed	1250 to 1450 Generator R.P.M.
Maximum Output	22 Amps at 2250 RPM 13.5 Gen.Volts and a resistance load of 0.61 Ohms.
BRUSH Spring Tension.	13 to 30 ozs.
Field Resistance	6.0 Ohms.

Starter Motor.

Type	Lucas M35G/1
Lock Torque	9.3 lb/ft at 370 to 390 Amps at 7.7 to 7.3 Volts. At 1000 RPM 4.9 lb/ft 250 Amps at 9.3 to 8.9 volts.
Brush Spring Tension	30 to 40 ozs
Light Running Current	45 Amps at 850 to 1000 RPM

CONTROL BOX.

Type	Lucas RB106/2
<u>Cut-Out</u>	
Cut in voltage	12.7 to 13.3 volts.

Drop off voltage 8.5 to 11.0 volts
Reverse current 3.0 to 5.0 amps.

Voltage Regulator.

Open Circuit Setting at 68°F (20°C) 16.0 16.6 volts.

For every 18°F (10°C) above 68°F (20°C) Subtract .3 volt
" " 18°F (10°C) below 68°F (20°C) add .3 volt

Fuse Unit.

Type Lucas 4FJ
Fuses One 50 Amp. One 35 Amp. Plus 1 spare of each.

Windscreen Wiper.

Type Lucas DR3A 12 Volt. Self switching 45-50 wipes per minute. 2.7 - 3.4 amps light running.

Replacement Globes. (all 12 volt)

Headlamp 50/40 watt
Front Parking Lights 6 watt
Stop/Tail Lights 21/6 watt
Front and Rear Flashing Lights 21 watts
Flasher Warning light 1.5 watt
Number plate light 6 watt
Roof Light 5 watt
Panel and Warning lights 3 watt

FLASHER UNIT.

Lucas FL5

WHEELS AND TYRES.

Tyres 5.90 x 14 x 4 ply Tubeless
Size (wheel) 14 x 4½ J
Pressure 24 P.S. 1 Front and Rear

CAPACITIES.

Engine sump (including filter)	9 $\frac{3}{4}$ pints
Gearbox	5 pints
Rear Axle	2 $\frac{1}{4}$ pints
Cooling system	Wolseley 14 $\frac{3}{4}$ pints, Freeway 13 $\frac{3}{4}$ pints
Fuel Tank.	10 galls.

TORQUE WRENCH SETTINGS.

Cylinder head set bolts	40 lbs/ft.
Main bearing nuts	70 "
Connecting rod set screws	35 "
Clutch assembly to flywheel	16 "
Flywheel securing Bolts	35 "
Rocker Shaft	16 "
Rear engine plate	30 "
Gudgeon pin	25 "
Manifold	16 "
Water Pump	16 "
Bellhousing	16 "
Crown wheel to diff.	55-60 "
Diff. carrier bearing cap nuts	60-65 "
Pinion nut	140 "
Road wheel nuts.	40 "
Steering ball pin end nuts	30 and then to next split pin hole.

GENERAL DIMENSIONS.

Wheelbase	100-3/16"
Overall length	178.75"
" width	63.5"
" height	59.75"
Ground clearance	6.25"

General Dimensions.....Cont'd

Track:	Front	50 1/2"
	Rear	51-3/8"
<u>GENERAL DIMENSIONS</u>		
Wheelbase	100-3/16"	
Overall length	178-7/8"	
width	62-7/8"	
height	29-7/8"	
Ground clearance	6-1/2"	
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