BSA SERVICE SHEET No. 701

Revised September 1959

ALL MODELS—USEFUL DATA

Model	C10	C11	C12	C15 Std.	1331	1332	1333	1334	M20
Engine bore ...	63 mm.	63 mm.	63 mm.	67 mm.	71 mm.	71 mm.	85 mm.	85 mm.	82 mm.
Engine stroke ...	80 mm.	80 mm.	80 mm.	70 mm.	88 mm.	88 mm.	88 mm.	88 mm.	94 mm.
Engine capacity ...	249 c.c.	249 c.c.	249 c.c.	249 c.c.	348 c.c.	348 c.c.	499 c.c.	499 c.c.	496 c.c.
Petrol tank capacity	2½ galls.	2½ galls.	2½ galls.	2½ galls.	3 galls.	3 galls.	3 galls.	3 galls.	3 galls.
Oil tank capacity ...	4 pints	4 pints	4 pints	4 pints	4 pints	4 pints	4 pints	4 pints	5 pints
Gearbox capacity ...	*½ pint	*½ pint	½ pint	½ pint	1 pint	1 pint	1 pint	1 pint	1 pint
Tappet clearance cold:									
Inlet	.004″	.003″	.010″	.008″	.003″	.003″	.003″	.003″	.010″
Exhaust	.006″	.003″	.012″	.010″	.003″	.003″	.003″	.003″	.012″
Tyres (front) ...	3.00 - 19	3.00 - 20*	3.00 - 19	3.25 - 17	3.25 - 19	2.75 - 21	3.25 - 19	2.75 - 21	3.25 - 19
Tyres (rear) ...	3.00 - 19	3.00 - 20*	3.00 - 19	3.25 - 17	3.25 - 19	4.00 - 19	3.25 - 19	4.00 - 19	3.25 - 19
Piston ring gap (plain)	.010″	.010″	.010″	.010″	.010″	.010″	.010″	.010″	.010″
Piston ring gap (oil control) ...	.010″	.010″	.010″	.010″	.010″	.010″	.010″	.010″	.010″
Piston ring side clearance	.002″/.004″	.002″/.004″	.002″/.004″	.002″/.004″	.002″/.004″	.002″/.004″	.002″/.004″	.002″/.004″	.002″/.004
Piston clearance bottom of skirt ...	.0045″/.0065″	.0035″/.0055″	.0035″/.0055″	.0025″/.004″	.0040″/.0055″	.0040″/.0055″	.0045″/.0065″	.0045″/.0065″	.0040″/.0060″
Gear ratios:									
Top	6.6	6.6	6.26	5.98	5.6	7.1	5.0	5.6	5.3
3rd			7.64	7.65	7.3	9.2	6.5	7.4	7.0
2nd	9.8	9.8	11.1	10.54	11.1	11.2	10.0	11.5	10.9
1st	14.5	14.5	16.15	15.96	15.9	20.2	14.2	16.8	15.8
Ignition setting (inches before T.D.C.)									
Fully advanced ...				11/32″	7/16″	7/16″	7/16″	7/16″	7/16″
Fully retarded ...	1/32″	1/32″	T.D.C.						
Carburetter:									
Jet	90	80	110		150	150	200	200	170
With air cleaner	90	80	100	140	150	150	170	170	—
Sparking plug:									
C.I. cyl. head ...	L.10	L.10S	L.10S		L.10S	L.10S	L.10S	L.10S	-
Al. alloy cyl. head	N8	-	-	N5		NA8		NA8	N8
Compression ratio	5.1-1	6.5-1	6.5-1	7.25-1	6.5-1	6.5–1	6.8–1	6.8–1	4.9-1
Valve timing—inlet:									
Opens before T.D.C.	25°	25°	34°	26°	25°	25°	25°	25°	25°
Closes after B.D.C.	70°	70°	78°	70	65°	65°	65°	65°	65°
Valve timing exhaust									
Opens before B.D.C.	70°	70°	74°	61½°	65°	65°	65°	65°	65°
Closes after T.D.C.	25°	25°	38°	31½°	25	25°	25°	25°	25°
Distributor points gap	.012″	.012″	.015″	.012″			-	-	-
Magneto points gap					.012″	.012″	.012″	.012″	.012″
Plug points gap ...	.015″ to .018″	.015″ to .018″	.018″ to .020″	.020″ to .025″	.015″ to .018″	.015″ to .018″	.015″ to .018″	.015″ to .018″	.015″ to .018″
Tyre pressures:									
Front (per sq. in.)	20 lb.	20 lb.	18 lb.	16 lb.	16 lb.		16 lb.		17 lb.
Rear (per sq. in.)	28 lb.	28 lb.	26 lb.	22 lb.	20 lb.		17 lb.		22 lb.

For Swinging Arm and other models not listed see appropriate series.

*4 speed Gearbox 1 pint

*3.00 - 19 on later models.

Model	M21	M33	A7 Up to Engine No. ZA7 11192	A7 S.T. Two Carburetters	A7 On and After Engine No. AA7 101.	A7 S/T & S/S On and After Engine No. AA75 101.	A10	R/R and S/R
Engine bore	82mm.	85mm.	62mm.	62mm.	66mm.	66mm.	76mm.	70mm
Engine stroke	112mm.	88mm.	82mm.	82mm.	72.6mm.	72.6mm.	84mm.	81mm
Engine capacity	591c.c.	499c.c.	495c.c.	495c.c.	497c.c.	497c.c.	646c.c.	646c.c.
Petrol tank capacity	3 galls.	3 galls.	3 galls.	3½ galls.	3½ galls.	3½ galls.	4½ galls.	2 or 4 galls
Oil tank capacity	5 pints	5 pints	4 pints	4 pints	4 pints	4 pints	4 pints	5½ pints
Gearbox capacity	1 pint	1 pint	1 pint	1 pint	1 pint	1 pint	1 pint	11 fl. ozs.
Tappet clearance (cold):								
Inlet	.010"	.003"	.015"	.015"	.010"	.008"	.010"	.068"
Exhaust	.012"	.003"	.015"	.015"	.016"	.012"	.016"	.008"
Tyres (front)	3.50×19	3.25×19	3.25×19	3.25×19	3.25×19	3.25×19	3.25×19	
Tyres (rear)	3.50×19	3.50×19	3.50×19	3.50×19	3.50×19	3.50×19	3.50×19	
Piston ring gap (plain)	.010"	.010"	.013"	.013"	.013"	.013"	.013"	
Piston ring gap (oil control)	.010"	.010"	.011"	.011"	.011"	.011"	.011"	
Piston ring side clearance	.002"/.004"	.002"/.004"	.002"/.004"	.002"/.004"	.002"/.001"	.002"/.004"	.002"/.004"	.002"/.004"
Piston clearance bottom of skirt	.0040"/.0060"	.0045"/.0065"	.0030"/.0050"	.0030"/.0050"	.0030"/.0050"	.0030"/.0050"	.0030"/.0050"	.003"/.005"
Gear ratios:						S/T S/S		
Top	5.9	4.8	5.1	5 1	5 1	5.0 5.28	4.42	4 53
3rd	7.8	6.3	6.2	6 2	6 2	6.05 6.38	5 36	5.48
2nd	12.2	9.9	9.0	9 0	9.0	8.8 9.28	7 77	7.96
1st	17.8	14.3	13.2	13 2	13.2	12.9 13.62	11.41	11.68
Ignition setting (inches before T.D.C. fully advanced)	7/16"	7/16"	3/8"	3/8"	5/16"	3/8"	11/32"	3/8"
Carburetter:								
Jet	170	200	—	110		—	—	250
With air cleaner	—	170	140		140	160	170	240
Sparking plug C.I. cyl. head	L.10	L.10S	L.10S	L.10S	L.10S	L.10S	L.10S	NA 10
A.I alloy cyl. head	N8	—			—	—		
Compression ratio	5–1	6.8 1	6 6 1	7–1	6.6–1	7.25 1	6 5 1	R/R 8-1 S/R 8.26–1
Valve timing—inlet:								
Opens before T.D.C.	25°	25°	24°	24°	30°	42°	30°	42°
Closes after B.D.C.	65°	65°	65°	65°	70°	62°	70°	62°
*Valve timing exhaust:								
Opens before B.D.C.	65°	65°	60°	60°	65°	67°	65°	67°
Closes after T.D.C.	25°	25°	21½°	21½°	25°	37°	25°	37°
Distributor points gap	—	—			—			
Magneto points gap	.012"	.012"	.012"	012"	.012"	012"	.012"	.012"
Plug points gap	.015" to .018"	.015" to .018"	.015" to .018"	.015" to .018"	.015" to .018"	.015" to .018"	.015" to .018"	018"/.020"
Tyre pressures:								
Front (per square inch)	16lb.	17lb.	17lb.	17 lb.	17lb.	17lb.	17lb.	17lb.
Rear (per square inch)	18lb.	18lb.	18lb.	18lb	18lb.	18lb	18lb.	19lb.

*NOTE:—Standard A7's after Eng. No. CA7 5232 and Standard A10's after Eng. No. DA10 1647 have the same camshaft as the S/S and R/R machines and valve timing is therefore the same.

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ALL MODELS

WORKSHOP DATA

ENGINE, BUSH AND SHAFT DIAMETERS

(All Dimensions in Inches, after Reaming or Grinding).

	D1	C10, C11	B31, B32	M33 B33, B34	M20, M21	A7 Up to Engine No. ZA7 11102	A7 On and After Engine No. AA7 101	A10
Overhead Rocker Arm		.569 .567 C10 only	.562 .563	.562 .563		.4995 .5005	.4995 .5005	.4995 .5005
Inlet Valve Guide		.313 .314	.313 .314	.3525 .3515	.3525 .3515	.313 .314	.313 .314	.313 .314
Exhaust Valve Guide		.313 .314	.352 .353	.3785 .3795	.3525 .3535	.313 .314	.313 .314	.313 .314
Inlet Tappet Guide		.3125 .3135 C10 only	.3745 .3755	.3745 .3755	.3745 .3755	.3125 .3135		
Exhaust Tappet Guide		.3125 .3135 C10 only	.3745 .3755	.3745 .3755	.3745 .3755	.3125 .3135		
Cam Pinion Bush			.6255 .6245	.6255 .6245	.6255 .6245			
Cam Shaft Bush ...		.687 .688				.7485 .7495	.7485 .7495	.7485 .7495
Idler Pinion Shaft Bush						.7485 .7495	.7485 .7495	.7485 .7495
Idler Pinion Bush			.7505 .7495	.7505 .7495	.7505 .7495	.7485 .7495	.7485 .7495	.7485 .7495
Cam Shaft Bush T/Cover ...		1.0005 .9995						
Crankshaft Bush G/S		.983 .982				1.375 1.3745	1.375 1.3745	1.375 1.3745
Conrod Big End ...			1.7704 1.7702	1.7704 1.7702	1.7704 1.7702	1.4495 1.4500	1.4495 1.4500	1.4495 1.4500
Gudgeon Pin Bush	.4697 .4692	.6255 .625	.7506 .7503	.7506 .7503	.7506 .7503	.6881 .6878	.6881 .6878	.7506 .7503

GEARBOX BUSH DIAMETERS

(All Dimensions in Inches, after Reaming or Grinding)

	D Group	C Group	B Group 1945/48	M Group 1945/48	A Group	B & M 1949 on
Pinion Sleeve	.4975	-	.7505	.8755	.812	.8755
Bush ...	.4965		.7495	.8745	.813	.8745
Layshaft Bush	.501		.687	.687	.687	.687
(Shell) ...	.500		.688	.688	.688	.688
Mainshaft Bush		.751	.687			
(1/Cover) ...		.752	.688	--		-
Layshaft Bush				.687	.7495	.687
(K/S Quadrant)				.688	.7505	.688
Layshaft	-		.8125	.8765	.7495	.8765
1st Gear Bush			.8135	.8755	.7505	.8755
Layshaft		.562		-	-	
Pinion/s Bush		.563				
M/Shaft 3rd			.9375	1.0005		1.0005
L/Shaft 2nd	-		.9385	1.0015	-	1.0015
Gear Bush						
K/S Quadrant		.9995	1.1245		.561	
Bush I/Cover		1.0005	1.1255		.563	
K/S Quadrant		.812	.812	1.187	.7495	1.187
Bush O/Cover	-	.813	.813	1.188	.7505	1.188
Control Shaft			.562	.562		.562
Bush (Shell)			.563	.563	-	.563
Control Shaft	--	.689	--	.562		.562
Bush (I/Cover)	--	.688	--	.563	---	.563
Control Quadrant				.562		.562
Bush (I/Cover)				.563		.563
Pedal Spindle		.7495	.6245	.6245	.467	.6245
Bush (I/Cover)		.7505	.6255	.6255	.468	.6255
Pedal Spindle		.7495	.8745	.8745	.6245	.8745
Bush (O/Cover)	-	.7505	.8755	.8755	.6255	.8755
Speedo Spindle			.218	-	.218	.218
Small Bush			.219	---	.219	.219
Speedo Spindle			.281	---	.281	.281
Long Bush ...	--	-	.282		.282	.282
Clutch Push		.257				
Rod Bush ...		.258		--		

BSA SERVICE SHEET No. 703

October, 1948.
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All Models

WORKSHOP DATA (BEARINGS) 1956

B.S.A. Part No.	Hoffman No.	Skefko No.	Ransome & Marles No.	British Timkin No.	Fischer No.
24 722	RM.9L	CFM7/C2	MRJA.$\frac{7}{8}$		RFM.9
24 724	R.3251L	402454.B	MRJA.25		MFM.25
24 732	325	6305	MJ.25		6305
24 4065	135	6207	LJ.35		6207
24 4217	LS.8	RLS.6	LJ.$\frac{3}{4}$		LS.8
24 6860		2K.1178X 2K.1130NT		1178X 1130.NT	
27 261	MS.9	RM.S7	MJ.$\frac{7}{8}$		MS.9
29 3857	130	6206	LJ.30		6206
29 6211	MS.7	RM.S5	MJ.$\frac{5}{8}$		MS.7
42 5819	120				
65 1388	RMS.11	CRM.9	MRJ.1$\frac{1}{8}$		RMS.11
65 2045	125	6205	LJ.25		6205
65 5883	LS.9	RLS.7	LJ.$\frac{7}{8}$		LS.9
67 670	R.1301L	NFL.30	LRJA.30		NFL.30
89 3022	LS.10	RLS.8	LJ.1		LS.10
89 3023	LS.8	RLS.6	LJ.$\frac{3}{4}$		LS.8
90 10	117	6203	LJ.17		6203
90 11	LS.7	RLS.5	LJ.$\frac{5}{8}$		LS.7
90 12	S.9	EE.8J	KLNJ.$\frac{7}{8}$		EE.8
90 5525	112	6201	LJ.12		6201
90 5559				A.2126	
90 6063	115	6202	LJ.15		6202

LOCATION OF BEARINGS

Model	Crankcase Roller Bearing Driveside	Crankcase Ball Bearing Driveside	Crankcase Roller Bearing Gearside	Crankcase Ball Bearing Gearside	Crankcase Ball Bearing (Small)	Crankcase Ball Bearing (Large)	Gearbox Pinion Sleeve Ball Bearing	Gearbox Mainshaft Ball Bearing	Front Hub Ball Bearing	Rear Hub Ball Bearing	Rear Hub Brake Drum and C/Wheel Ball Bearing
Dandy					90 6063	24 4217	90 6063 (Output shaft)	90 6063 (Input shaft)			
D1, D3 & D5					90 10	24 4217	90 12	90 11	90 5525	90 6063	
D1, D3 (Comp.)									90 5559		
C10L		24 732					29 3857	90 11		90 6063	
C12		24 732					29 3357	90 11	65 5383	90 11 O/S 29 6211 N/S	
1931 S/A	24 724	65 2045	24 722				24 4065	24 4217	89 3022	89 3022	89 3022
1931 S/A (1958)									42 5819	42 5819	89 3022
1932 Comp. Rigid	24 724	65 2045	24 722				24 4065	24 4217	65 5883	65 5883	65 5883
1932/34 Gold Star	65 1338	65 2045	24 722				24 4065	24 4217	65 5883	65 5883	65 5883
1933 S/A	24 724	65 2045	24 722				24 4065	24 4217	89 3022	89 3022	89 3022
1933 S/A (1958)									42 5819	42 5819	89 3022
1934 Comp. Rigid	24 724	65 2045	24 722				24 4065	24 4217	65 5883	65 5883	65 5883
M21 Rigid	24 724	65 2045	24 722	27-261			24 4065	24 4217	65 5883	24 6860 (Tapered Roller)	
M24 Plunger	24 724	65 2045	24 722	27 261			24 4065	24 4217	65 5883	65 5883	89 3022
M33	24 724	65 2045	24-722				24 4065	24 4217	65 5883	65 5883	89 3022
A7 and Shooting Star	67 670						24 4065	24 4217	89 3022	89 3022	89 3022
A7 & S/S (1958)									42 5819	42 5819	89 3022
A10 S/A	67 670						24 4065	24 4217	89 3022	89 3022	89 3022
A10 S/A (1958)									42 5819	42 5819	89 3022
A10 Plunger	67 670						24 4065	24 4217	65 5883	65 5883	89 3022
A10 Road Rocket	67 670						24 4065	24 4217	65 5883	89 3022	89 3022
A10 Super Rocket	67 670						24 4065	24 4217	42 5819	42 5819	89 3022

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All Models

PISTON CLEARANCES

To avoid the possibility of seizure or piston tap, pistons must be fitted with adequate but not excessive clearance.

The following are the recommended total clearances between the bottom of the piston and the cylinder wall.

MODEL			Tolerances
D1			.0027"/.0045"
D3, C15			.0025"/.004"
D5, D7			.003"/.005"
C10, C10L			.0045"/.0065"
C11, C11G, C12			.0035"/.0055"
B31			.004"/.0055"
B31.	(Split skirt)		.0005"/.0016"
B32A			.002"/.004"
BB32.	Gold Star	8 : 1	.003"/.0045"
		6.5 : 1	.004"/.0055"
		7.5 : 1	.002"/.004"
		9 : 1	.003"/.0045"
CB32.	Gold Star	6.5 : 1	.002"/.004"
		8 : 1	.003"/.0045"
		8.5 : 1	.003"/.0045"
		9 : 1	.003"/.0045"
		12.25 : 1	.004"/.0055"
		13 : 1	.004"/.0055"
DB32.	Gold Star	7.25 : 1	.0025"/.004"
		8 : 1	.003"/.0045"
		9 : 1	.003"/.0045"
B33			.0045"/.0065"
B33.	(Split skirt)		.0006"/.00275"
B34A			.0045"/.0065"
BB34.	Gold Star	7.5 : 1 Std.	.0045"/.0065"
		8 : 1	.0025"/.0045"
		9 : 1	.0025"/.0045"
		6.8 : 1	.0045"/.0065"
		11 : 1	.0025"/.0045"
CB34.	Gold Star	7.25 : 1	.003"/.0045"
		8 : 1	.003"/.0045"
		9 : 1	.003"/.0045"
DB34.	Gold Star	8 : 1	.003"/.0045"
DBD34.	Gold Star	8.75 : 1	.003"/.0045"
M20			.004"/.006"
M21			.004"/.006"
M33			.0045"/.0065"
M33.	(Split skirt)		.0006"/.00275"

B.S.A. Service Sheet No. 704 (*continued*)

A7	6.7 : 1	.002"/.004"
(Split skirt) ...	6.7 : 1	.0011"/.0031"
	7.25 : 1	.002"/.004"
(Split skirt) ...	7.25 : 1	.0011"/.0031"
A7. (Star Twin) ...	... ...	.002"/.004"
A7. (Split skirt) ...	(Star Twin and Shooting Star) ...	.0011"/.0031"
A10. (Golden Flash) ...	6.5 : 1	.003"/.0045"
(Split skirt) ...	6.5 : 1	.0025"/.0045"
(Split skirt) ...	7.25 : 1	**.0025"/.0045"**
A10. (Super Flash and Road Rocket).	8 : 1	.003"/.0045"
A7. (Shooting Star) ...	8 : 1 (after Engine No. CA7S.S.4501)	.0035"/.005"
A10. (Golden Flash) ...	7.5 : 1 (after Engine No. DA10-651)	.0035"/.005"
A10. (Super Rocket) ...	8.5 : 1 (after Engine No. CA10R6001)	.004"/.0055"
Dandy 70 ...	7.25 1	.003"/.004"8

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All Models

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PERIODICAL ATTENTIONS.

HUBS. **Every 1,000 miles.**

Inject grease through the nipples located in the centres of the hubs. Do not overdo this, otherwise grease will penetrate to the brake linings and cause ineffective brakes. Three or four strokes of the gun should be ample. Where no grease nipple is provided the bearings should be removed and packed with grease when the machine is in need of complete overhaul.

BRAKE CAM SPINDLES.

Grease sparingly. Two or three strokes of the gun only, or if no grease nipple is provided, apply a few drops of engine oil between the brake arm and the spindle.

SPEEDOMETER DRIVE.

Grease well. Three or four strokes of the gun regularly.

ENGINE OIL. **Every 2,000 miles (except 2-stroke models).**

The oil tank and sump should be drained (preferably when the engine is warm after a longish run), and the tank refilled with fresh oil.

In case of new or re-conditioned engines, the oil should be drained and renewed after the first 250 miles, and again after 1,000 miles.

REAR CHAIN.

Remove the rear chain, clean thoroughly in paraffin, and soak in engine oil or molten grease and graphite.

CONTACT BREAKER (except A and C Group Models).

A very small quantity of thin oil should be injected into the lubrication wick, and the face cam smeared with oil. The wick is accessible after removing the spring contact arm (held by the round-headed screw at the opposite end to the contact point) and is located in the hollow end of the round-headed screw which is revealed when the spring arm is removed.

When replacing the arm, it is important that the small curved backing spring is refitted correctly, i.e., with the bent portion facing outwards.

DYNAMO ARMATURE BUSH (A and C Group Models fitted with lubricator).

A few drops of oil injected through the lubricator are sufficient.

Every 5,000 miles.

Drain the gearbox and refill with new oil up to the level of the filler plug.

Drain the telescopic forks and refill each leg with correct amount of new oil.

In the case of new or re-conditioned gearboxes, change the oil after the first 1,000 miles.

New Machines.

CYLINDER HEAD BOLTS (except B and M O.H.V. engines).

Examine the cylinder head joint daily, and if leakage becomes apparent, tighten the bolts, working diagonally so as to pull the head down evenly. Do not over-tighten otherwise there is a possibility of distortion or bolt stretch.

CYLINDER BASE NUTS (except B and M O.H.V. engines).

There are five of these—one at each of the four corners outside, and one inside the tappet chest on the single cylinder models. A Group Models have eight cylinder base nuts and Model C11 six nuts. Tighten after the first 100 miles.

CYLINDER BARREL AND HEAD FIXING (B and M O.H.V. engines).

The barrel and head are both secured to the crankcase by four long bolts coupled to bushes screwed into the latter. Apply a spanner to the upper hexagon for tightening. These bolts have right-hand threads, and, being inverted, are tightened by turning the spanner to the right.

B.S.A. MOTOR CYCLES LTD.,
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Gold Star and Competition Models

USEFUL DATA

Engine Stroke			88mm.		
Engine Bore			1932	71mm.	1934 85mm.
Engine Capacity			1932	348c.c.	1934 499c.c.
Oil Tank Capacity			5 pints.		
Gearbox Capacity			1 pint.		
Front Fork Capacity (each leg)			⅜ pint (212c.c.)		

Tappet Clearances (cold engine) :

Cam. 65-2420	.003in.	Inlet and Exhaust.
Cams. 65-2434 to 65 2440	.001in.	Inlet and Exhaust.
Cams. 65-2442 to 65 2452	.008in.	Inlet. .010in. Exhaust.
1954 onwards (Clubmans Models)	.006in.	Inlet and Exhaust.

Piston Ring Gap	Top .012in. 2nd and Scraper .010in.
Piston Ring Side Clearance	.0015in.
Piston Clearance (bottom of skirt)	.0025in. – .0045in.
Contact Breaker Gap	.012in.

Ignition Setting B.T.D.C. (fully advanced)

350c.c. Touring, Trials and Scrambles, $\frac{7}{16}$in.
500c.c. Touring and Trials, $\frac{1}{2}$in. Scrambles, $\frac{7}{16}$in

Racing (Clubmans)	$\frac{15}{32}$in.	
Racing (Alcohol)	350c.c., $\frac{3}{8}$in.	500c.c., $\frac{7}{16}$in.
Racing (Petrol Benzol)	350c.c., $\frac{13}{32}$in.	500c.c., $\frac{1}{2}$in.

Sparking Plug	Touring and Trials	Champion NA8.
	Scrambles	Champion NA10 or NA12.
	Racing	Champion NA14.
Carburetter	Trials – Standard	Touring – Standard or T.T.10.
	Scrambles – T.T.10	Racing – T.T.10; T.T.10 R.N. or G.P.

Engine Sprockets available	16, 17, 18, 19, 20 Teeth.
Gearbox Sprockets available	16, 19 Teeth.
Clutch Sprocket	43 Teeth (44 Teeth to Special Order).
Chainwheel Sprocket	42 Teeth.

		Marked.	Top.	3rd.	2nd.	Bottom
Internal Gear Ratios:						
Plunger Frame Models,	Extra Close...	(Ex. Close)	1.0	1.1	1.31	1.78
	Close ...	(Close)	1.0	1.32	1.72	2.48
	Standard ...		1.0	1.32	2.05	2.98
Swinging Arm Frame,	Extra Close...	(R R)	1.0	1.099	1.326	1.929
	Close ...	(Day)	1.0	1.101	1.460	2.124
	Scrambles ...	(Sc)	1.0	1.325	1.754	2.343
	Standard ...	(Std)	1.0	1.210	1.758	2.580
	Wide Ratio...	(Tri)	1.0	1.549	2.339	3.167

Chain Sizes	(Front)	½in. x .305in.
	(Rear)	⅜in. x .250in.

Tyre Sizes	(Front)	Touring and Scrambles, 3.00 x 21; Trials, 2.75 x 21 Racing, 3.00 x 19 or 21
	(Rear)	Touring and Racing, 3.25 x 19 (350c.c.); 3.50 x 19 (500c.c.) Trials and Scrambles, 4.00 x 19.

B.S.A. MOTOR CYCLES LTD.
Service Dept., Birmingham, 11
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BSA SERVICE SHEET No. 708

Reprinted June, 1960

All Models

CARBURATION. Monobloc and Separate Float Chamber Type

How the Carburettor Works

The function of the carburettor is to atomise the petrol and proportion it correctly with the air drawn in through the intake on the induction stroke. The action of the float and needle in the float chamber maintains the level of fuel at the needle jet, and when the engine is stopped and no further fuel is being used the needle valve cuts off the supply.

The twist grip controls, by means of a cable, the position of the throttle slide and the throttle needle and so governs the volume of mixture supplied to the engine.

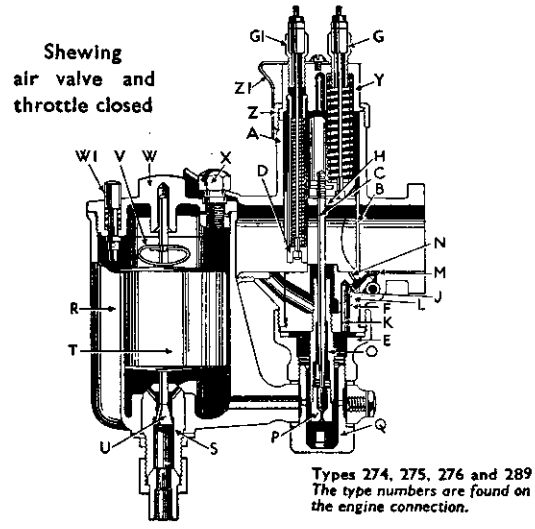
The mixture is correct at all throttle openings, if the carburettor is correctly tuned.

The opening of the throttle brings first into action the mixture supply from the pilot jet, then as it progressively opens, via the pilot by-pass the mixture is augmented from the needle jet. Up to three-quarter throttle this action is controlled by the tapered needle in the needle jet, and from three-quarters onwards the mixture is controlled by the main jet.

The pilot jet 'J', which in the older type of carburettor is embodied in the jet block, has been replaced in the Monobloc carburettor by a detachable jet (9) (Fig. X5) assembled in the carburettor body and sealed by a cover nut.

The main jet does not spray directly into the mixing chamber, but discharges through the needle jet into the primary air chamber and goes from there as a rich petrol/air mixture through the primary air choke into the main air choke.

Although the maintenance and tuning instruction contained in this Service Sheet apply equally well to the Monobloc and separate float chamber types of carburettor, the new instrument has been designed with a view to giving improved performance, and certain constructional changes have been made.



Types 274, 275, 276 and 289
The type numbers are found on the engine connection.

A. Mixing Chamber.
B. Throttle Valve.
C. Jet Needle and Clip above.
D. Air Valve.
E. Mixing Chamber Union Nut.
F. Jet Block.
G. Gl. Cable Adjusters.
H. Jet Block Barrel.
J. Pilot Jet.
K. Passage to Pilot.
L. Pilot Air Passage.
M. Pilot Mixture Outlet.
N. Pilot By-pass.
O. Needle Jet.
P. Main Jet.
Q. Float Chamber Holding Bolt.
R. Float Chamber.
S. Needle Valve Seating.
T. Float.
U. Float Needle Valve.
V. Float Needle Clip.
W. Float Chamber Cover.
Wl. Tickler.
X. Float Chamber Lock Screw
Y. Mixing Chamber Top Cap.
Z. Mixing Chamber Lock Ring.
Zl. Mixing Chamber Security Spring.

Fig. X4. A Sectioned illustration of needle jet carburettor

The float chamber is a drum-shaped reservoir, die cast in one piece with the mixing chamber. The material used being zinc-alloy. The float is designed to pivot instead of rising and falling, as in the separate float chamber type, and as it does so, it impinges on a nylon needle controlling the inflow of fuel.

Variations of up to 20° in the angle of the carburettor when fitted, do not affect the working of the float, therefore it lends itself to use for down draught carburation and is not so greatly effected by the degree of lean when cornering. Access to the float (Fig. X6) is gained by removing a plate held in place by three screws.

Compensation for over-rich mixture which results from snap throttle openings, is provided by bleed holes in the needle jet (Fig. X5). A compensatory air bleed is provided, this is the larger of the two holes at the mouth of the air intake, which leads to the space around the needle jet. (Fig. X5).

The pilot intake is the smaller of the two holes, and operates in conjunction with the detachable pilot jet. (Fig. X5). This pilot mixture is adjusted as before, by an adjusting screw. (Fig. 8a.)

Hints and Tips. Starting from Cold

Flood the carburettor by depressing the tickler and close the air control, set the ignition, say, half retarded. Then open the throttle about $\frac{1}{8}''$, then kick start. If the throttle is too far open, starting will be difficult.

Starting. Engine Hot

Do not flood the carburettor, but it may be found necessary with some engines to close the air lever, set the ignition to half-retarded, the throttle to $\frac{1}{8}''$ open and kick-start. If the carburettor has been flooded and won't start because the mixture is too rich—open the throttle wide and give the engine several turns to clear the richness, then start again with the throttle $\frac{1}{8}''$ open, and air valve wide open. Generally speaking it is not advisable to flood at all when an engine is hot.

Starting, General

By experiment, find out if and when it is necessary to flood, also note the best position for the air lever and the throttle for the easiest starting. Excessive flooding, particularly when the engine is hot, will make starting more difficult. It is necessary only to raise the level of petrol in the float chamber, by depressing the tickler.

STARTING, SINGLE LEVER CARBURETTORS, OPEN THE THROTTLE VERY SLIGHTLY FROM THE IDLING POSITION AND FLOOD THE CARBURETTOR MORE OR LESS ACCORDING TO THE ENGINE BEING COLD OR HOT RESPECTIVELY.

SECTIONAL ILLUSTRATIONS OF CARBURETTORS. Types 375, 376 and 389

(MONOBLOC)

(FOR KEY TO DIAGRAM NUMBERS SEE BELOW.)

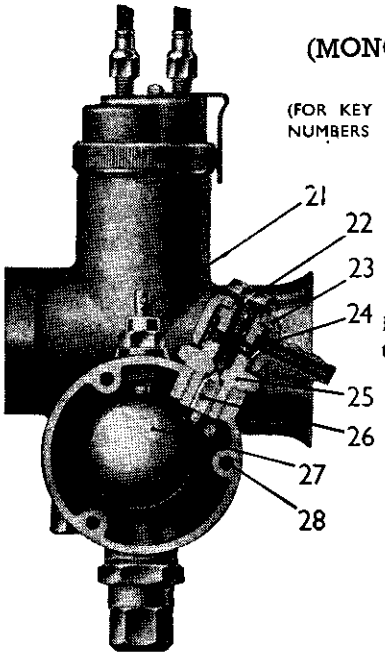


Fig. X6—Section through float chamber

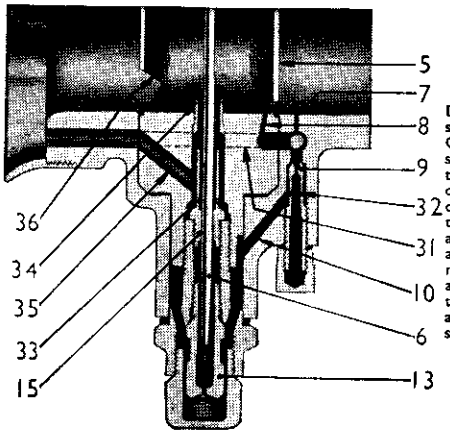


Fig. X5

Diagrammatic section of Carburettor showing only the lower half of the throttle chamber with the throttle a little open—and the internal primary air passages to the main jet and pilot system.

FOR KEY TO DIAGRAM NUMBERS SEE BELOW.

1. Mixing Chamber Top.
2. Mixing Chamber Cap.
3. Carburettor Body.
4. Jet Needle Clip.
5. Throttle Valve.
6. Jet Needle.
7. Pilot outlet.
8. Pilot by-pass.
9. Pilot Jet.
10. Petrol feed to pilot jet.
11. Pilot Jet Cover Nut.
12. Main Jet Cover.
13. Main Jet.
14. Jet Holder.
15. Needle Jet.
16. Jet Block.
17. Air Valve.
18. Mixing Chamber Cap Spring.
19. Cable Adjuster (Air).
20. Cable Adjuster (Throttle).
21. Tickler.
22. Banjo Bolt.
23. Banjo.
24. Filter Gauze.
25. Needle Seating.
26. Needle.
27. Float.
28. Side Cover Screws.
31. Air to pilot jet.
32. Feed holes in pilot jet.
33. Bleed holes in needle jet.
34. Primary Air Choke.
35. Primary air passage.
36. Throttle valve cutaway.

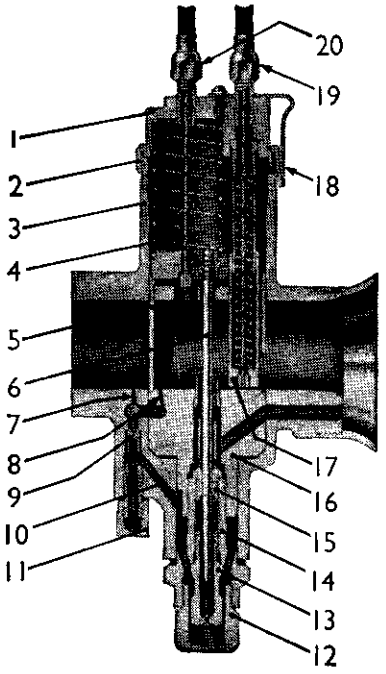


Fig. X7—Section through mixing chamber, showing air valve and throttle closed

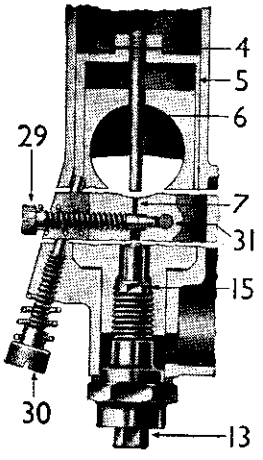


Fig. 8a

30 THROTTLE ADJUSTING SCREW

Set this screw to hold the throttle open sufficiently to keep the engine running when the twist grip is shut off.

29 PILOT AIR ADJUSTING SCREW

This screw regulates the strength of the mixture for 'idling' and for the initial opening of the throttle. The screw controls the depression on the pilot jet by metering the amount of air that mixes with the petrol.

Cable Controls

See that there is a minimum of backlash when the controls are set back and that any movement of the handlebar does not cause the throttle to open; this is done by the adjusters on the top of the carburettor. See that the throttle shuts down freely.

Petrol Feed

Verification. Detach petrol pipe union at the float chamber end; turn on petrol tap momentarily and see that fuel gushes out. Avoid petrol pipes with vertical loops as they cause air locks. Flooding may be due to a worn or bent needle or a leaky float, but nearly all flooding with new machines is due to impurities (grit, fluff, etc.) in the tank—so clean out the float chamber periodically till the trouble ceases. If the trouble persists the tank might be drained, swilled out, etc. Note that if the carburettor, either vertical or horizontal, is flooding with the engine stopped, the overflow from the main jet will not run into the engine but out of the carburettor through a hole at the base of the mixing chamber.

Fixing Carburettor and Air Leaks

Erratic slow running is often caused by air leaks, so verify there are none at the point of attachment to the cylinder or inlet pipe—check by means of oil placed around the joint, if there are leaks the oil will be sucked in, and eliminate by new washers and the equal tightening up of the flange nuts. Also in old machines look out for air leaks caused by a worn throttle or worn inlet valve guides.

Explosions in Exhaust

May be caused by too weak a pilot mixture when the throttle is closed or nearly closed—also, it may be caused by too rich a pilot mixture and an air leak in the exhaust system; the reason in either case is that the mixture has not fired in the cylinder and has fired in the hot silencer. If the explosion occurs when the throttle is fairly wide open the trouble will be ignition—not carburation.

Excessive Petrol Consumption

On a new machine may be due to flooding, caused by impurities from the petrol tank lodging on the float needle seat and so preventing its valve from closing. If the machine has had several years use, flooding may be caused by a worn float needle valve. Also excessive petrol consumption will be apparent if the throttle needle jet 'O' (Fig. X4), or (15) (Fig. X5) has worn; it may be remedied or improved by lowering the needle in the throttle, but if it cannot be, then the only remedy is to get a new needle jet.

Air Filters

These may affect the jet setting, so if one is fitted afterwards to the carburettor the main jet may have to be smaller. If a carburettor is set with an air filter and the engine is run without it, take care not to overheat the engine due to too weak a mixture; testing with the air control will indicate if a larger main jet and higher needle position are required.

Faults

The trouble may not be carburation; if the trouble cannot be remedied by making mixtures richer or weaker with the air control, and you know the petrol feed is good and the carburettor is not flooding, the trouble is elsewhere.

Fault Finding

There are only TWO possible faults in carburation, either RICHNESS of mixture or WEAKNESS of mixture, so in case of trouble decide which is the cause, by:

1. Examining the petrol feed .. { Verify jets and passages are clear; Verify ample flow; Verify there is no flooding
2. Looking for air leaks .. { At the connection to the engine; Or due to leaky inlet valve stems
3. Defective or worn parts .. { As a slack throttle-worn needle jet; The mixing chamber union nut not tightened up, or loose jets

4. TESTING WITH THE AIR CONTROL to see if by richening the mixture the results are better or worse.

Indications of Richness	Indications of Weakness
Black smoke in exhaust.	Spitting in carburettor.
Petrol spraying out of carburettor.	Erratic slow running.
Four strokes, eight-stroking.	Overheating.
Two strokes, four-stroking.	Acceleration poor.
Heavy, lumpy running.	Engine goes better if: Throttle not wide open, or Air Control is partially closed.
Heavy petrol consumption.	? Has air cleaner been removed.
? If the jet block F is not tightened up by washer and nut E richness will be caused through leakage of petrol.	? Jets partially choked up.
? Air cleaner choked up.	Removing the silencer or running with a racing silencer requires a richer setting and large main jet.
? Needle jet worn large.	
Sparking plug sooty.	

Note

Verify correctness of fuel feed, stop air leaks, check over ignition and valve operation and timing. DECIDE BY TEST WHETHER RICHNESS OR WEAKNESS IS THE TROUBLE AND AT WHAT THROTTLE POSITION. See throttle opening diagrams, Fig. X6.

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Sparking plug sooty.	

Note

Verify correctness of fuel feed, stop air leaks, check over ignition and valve operation and timing. DECIDE BY TEST WHETHER RICHNESS OR WEAKNESS IS THE TROUBLE AND AT WHAT THROTTLE POSITION. See throttle opening diagrams, Fig. X6.

Procedure

If at a particular throttle opening you partially close the air control, and the engine goes better, weakness is indicated; or on the other hand the running is worse, richness is indicated. THEN YOU PROCEED TO ADJUST THE APPROPRIATE PART AS INDICATED FOR THAT THROTTLE POSITION.

Fault at Throttle Positions indicated on Fig. X9

To Cure Richness		To Cure Weakness
Fit smaller main jet.	1st	Fit larger main jet.
Screw out pilot air screw.	2nd	Screw pilot air screw in.
Fit a throttle with larger cut-away.	3rd	Fit a throttle with smaller cut-away.
Lower needle one or two grooves.	4th	Raise needle one or two grooves.

Notes

It is not correct to cure a rich mixture at half throttle by fitting a smaller main jet because the main jet may be correct for power at full throttle: the proper thing to do is to lower the needle.

Information on throttle slides and needle position is given in paragraphs (f) and (e) respectively in the next section entitled TUNING.

Changing from standard petrols to special fuels

Such as alcohol mixtures will, with the same setting in the carburettor, certainly cause weakness of mixture and possible damage from overheating.

TUNING

(a) Figs. X8 and 8a are two diagrammatic sections of the carburettor to show:

1. The throttle stop screw.
2. The pilot air screw.

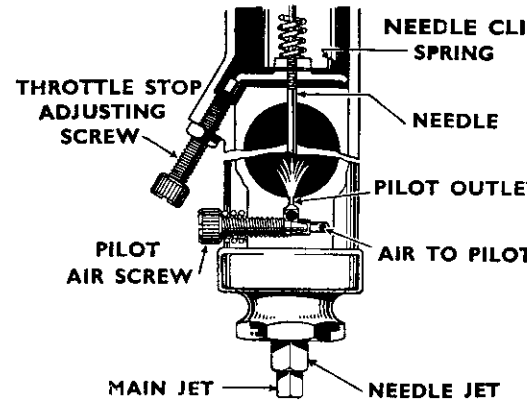


Fig. X8

(b) **Throttle stop screw**

Set this screw to prop the throttle open sufficiently to keep the engine running when the twist grip is shut off.

(c) **Pilot air screw**

This screw regulates the strength of the mixture for 'idling' and for the initial opening of the throttle. The screw controls the suction on the pilot petrol jet by metering the amount of air that mixes with the petrol.

Note. The air for the pilot jet may be admitted internally or externally according to one or other of the designs, but there is no difference in tuning.

(d) **Main Jet**

The main jet controls the petrol supply when the throttle is more than three-quarters open, but at smaller throttle openings although the supply of fuel goes through the main jet, the amount is diminished by the metering effect of the needle in the needle jet.

Each jet is calibrated and numbered so that its exact discharge is known and two jets of the same number are alike.

Never reamer a jet out, get another of the right size

The bigger the number the bigger the jet. Spare jets ARE SEALED.

To get at the main jet, undo the float chamber holding bolt Q (Fig. X4) or Main Jet Cover No. 12 (Fig. X7). The jet is screwed into the needle jet so if the jet is tight, hold the needle jet also carefully with a spanner whilst unscrewing the main jet.

(e) Needle and Needle Jet

The needle is attached to the throttle and being tapered either allows more or less petrol to pass through the needle jets as the throttle is opened or closed throughout the range, except when idling or nearly full throttle. The needle jet is of a defined size and is only altered from standard when using alcohol fuels.

The taper needle position in relation to the throttle opening can be set according to the mixture required by fixing it to the throttle with the needle clip spring in a certain groove (see illustration above), thus either raising or lowering it. Raising the needle richens the mixture and lowering it weakens the mixture at throttle openings from quarter to three-quarter open (see illustration, Fig. X9).

(f) Throttle Valve Cut-away

The atmospheric side of the throttle is cut away to influence the depression on the main fuel supply and thus gives a means of tuning between the pilot and needle jet range of throttle opening. The amount of cut-away is recorded by a number marked on the throttle, viz.: 6/3 means throttle type 6 with No. 3 cut-away; larger cut-aways, say 4 and 5, give weaker mixtures, and 2 and 1 richer mixtures.

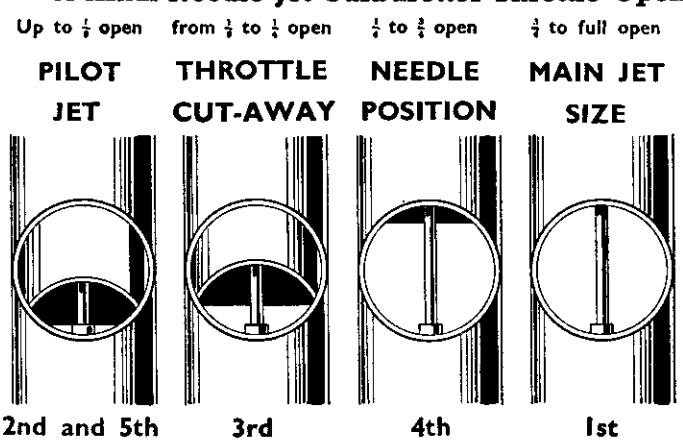
(g) Air Valve

Is used only for starting and running when cold, and for experimenting with, otherwise run with it wide open.

(h) Tickler

A small plunger located in the float chamber lid. When pressed down on the float, the needle valve is pushed off its seat and so 'flooding' is achieved. Flooding temporarily enriches the mixture until the level of the petrol subsides to normal.

Phases of Amal Needle Jet Carburettor Throttle Openings



SEQUENCE OF TUNING

Fig. X9

Sequence of Tuning

Tune up. In the following order only, by so doing you will not upset good results obtained.

Note. The carburettor is automatic throughout the throttle range—the air control should always be wide open except when used for starting or until the engine has warmed up. We assume normal petrols are used.

Read remarks on Fault Finding and Tuning for each tuning device and get the motor going perfectly on a quiet road with a slight up gradient so that on test the engine is pulling.

1st Main Jet with throttle in position

Test the engine for full throttle; if when at full throttle, the power seems better with the throttle less than wide open or with the air valve closed slightly the main jet is too small. If the engine runs 'heavily' the main jet is too large. If testing for speed work note the jet size is rich enough to keep engine cool, and to verify this, examine the sparking plug by taking a fast run, declutching and stopping engine quickly. If the plug body at the end has a bright black appearance, the mixture is correct; if sooty, the mixture is rich; or if a dry grey colour, the mixture is too weak and a larger jet is necessary.

2nd Pilot Jet with throttle in positions 2 and 5

With engine idling too fast with the twist grip shut off and the throttle shut down on to the throttle stop screw, and ignition set for best slow running: (1) Loosen stop screw nut and screw down until engine runs slower and begins to falter, then screw the pilot air screw in or out to make engine run regularly and faster. (2) Now gently lower the throttle stop screw until the engine runs slower and just begins to falter, then lock the nut lightly and begin again to adjust the pilot air screw to get best slow running; if this second adjustment makes engine run too fast, go over the job again a third time. Finally, lock up tight the throttle stop screw nut without disturbing the screw's position.

3rd Throttle Cut-away with throttle in position

If, as you take off from the idling position, there is objectionable spitting from the carburettor, slightly richen the pilot mixture by screwing the air screw in about half a turn, but if this is not effective, screw it back again and fit a throttle with a smaller-cut-away. If the engine jerks under load at this throttle position and there is no spitting, either the throttle needle is much too high or a larger throttle cut-away is required to cure richness.

4th Needle with throttle in position 4

The needle controls a wide range of throttle opening and also the acceleration. Try the needle in as low a position as possible, viz., with the clip in a groove as near the end as possible; if acceleration is poor and with air valve partially closed the results are better, raise the needle by two grooves; if very much better try lowering needle by one groove and leave it where it is best.

Note. If mixture is still too rich with clip in groove No. 1 nearest the end—the Needle Jet probably wants replacement because of wear. The needle itself never wears out.

5th Finally go over the idling again for final touches.

B.S.A. MOTOR CYCLES LTD.
Service Dept., Waverley Works, Birmingham, 10
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ALL MODELS

CARBURATION AT HIGH ALTITUDES

The carburetter settings of all B.S.A. Motor Cycles are designed to give the best all round performance at altitudes of a few thousand feet.

At greater altitudes the air becomes rarefied with the result that the mixture is incorrect.

To overcome this difficulty it is necessary to reduce the size of the main jet, the reduction depending on the altitude at which the machine is mainly used.

The table below shows the percentage of reduction at given altitudes, but it must be emphasised that while the alteration to jet size will correct the mixture, it will not replace the lost power. This can only be corrected by "Blowing" or super-charging.

It may also be advisable to retune the carburetter for smaller throttle openings this should be done in accordance with Service Sheet 708.

Altitude.	Percentage of reduction in jet size.
3,000 feet	5%
6,000 feet	9%
9,000 feet	13%
12,000 feet	17%

B.S.A. MOTOR CYCLES LTD.
Service Dept., Waverley Works, Birmingham, 10.
(PRINTED IN ENGLAND)

BSA SERVICE SHEET No. 708C

Reprinted Jan., 1960

CARBURATION.

"D" Group Models.

A CARBURETTER WITH NEEDLE CONTROLLED SINGLE JET.

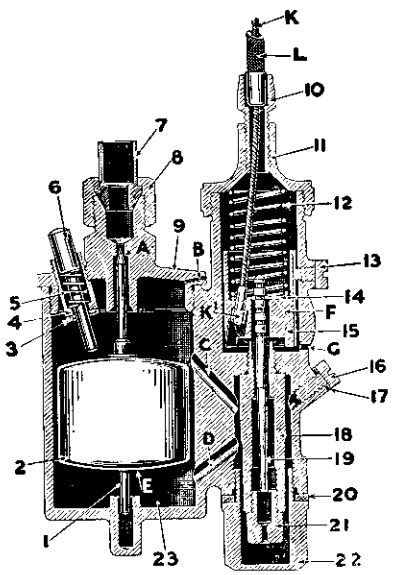

Fig. X13.

This sectioned diagram is taken through the centre of the mixing chamber and float chamber, showing the float and jet and throttle mechanism. The float and needle are shown as one piece as for types 259 and 261, but in type 223 the float needle (1) is separate from the float (2), but is attached thereto by a spring bow fastened to the float at the place marked (E). The cable (K) and its anchoring (K1) are diagrammatic as in practice the cable anchoring is in front of the jet.

HOW IT WORKS.

This Carburetter is designed to suit small engines and to eliminate any difficulty arising out of the use of very small jets. The control is automatic, the hand lever on the bar operating the throttle (15), which in its turn controls the mixture according to the engine speed.

The full power control of the mixture is by the main jet (Fig. 21) feeding the engine through a needle-jet (Fig. 18), in which there is a needle (Fig. 19) The taper on the needle controls the mixture at lesser throttle openings, and the position of the taper in the needle jet, providing a means for richening or weakening the mixture at various throttle positions. The needle is located in the throttle (Fig. 19) by a circular spring clip (Fig. 14) held down by the throttle spring (Fig. 12) and the needle itself is positioned by the particular groove that the clip (Fig. 14) is fixed to.

For idling, the fuel supply is controlled by the parallel portion of the needle (Fig. 19) entering the bore of the needle jet (Fig. 18), the difference in diameter being the jet orifice, which is small —although in case of obstruction or gumming up due to the petrol and oil system, it can be instantly cleared by opening the throttle.

The petrol feed is into the top of the float chamber (Fig. 7) where constant levels are maintained, and the petrol at these levels flows to the main jet (Fig. 21) through a passage D, and air locks are liberated through the passage C, back into the float chamber at the top.

The jets (Figs. 21 and 18) can be got at by undoing jet plug (Fig. 22). The throttle (Fig. 15) and adjustable needle (Fig. 19) can be removed by unscrewing the mixing chamber top (Fig. 11). The throttle is guided by screw (Fig. 13) working in a groove in the throttle, and the slot in the throttle itself enables the cable K to be quickly detached.

The intake of the carburetter may have an air strainer and a strangler for closing off the air only for starting when cold.

CARBURETTER WITH NEEDLE CONTROLLED SINGLE JET.

Names of Parts.

1. Float Needle.
2. Float.
3. Tickler Cotter.
4. Tickler Bush.
5. Tickler Spring.
6. Tickler.
7. Petrol Pipe Union Nipple.
8. Petrol Pipe Union Nut.
9. Float Chamber Cover.
10. Cable Adjuster.
11. Mixing Chamber Top.
12. Throttle Spring.
13. Throttle Valve Location Screw.
14. Jet Needle Clip.
15. Throttle Valve.
16. Feed Hole Screw.
17. Feed Hole Washer.
18. Needle Jet.
19. Jet Needle.
20. Jet Plug Washer.
21. Main Jet.
22. Jet Plug.
23. Float Chamber.

A. Petrol Feed Needle Seat.
B. Air Vent Hole in Float Chamber Cover.
C. Air Release Passage from 1st Chamber into Float Chamber.
D. Petrol Feed Passage from Float Chamber to Main Jet (21).
E. The illustration shows the float and needle as one piece, but if the needle is separate, the float has a spring bow at this point to hold the needle in a groove.
F. The choke bore of the Carburetter, the size of which is specified according to engine size and maximum revs.
G. Drain hole from mixing chamber to liberate any excess petrol due to flooding.
H. Guide groove in the throttle to prevent incorrect assembly.
J. Cutaway of the throttle. There are various cutaways, which are numbered and marked on the bottom of the throttle. The cutaway affects the mixture up to half throttle position.
K. Throttle Cable.
K1. Throttle Cable Nipple.
L. Throttle Cable Outer Cover.

GENERAL MAINTENANCE INSTRUCTIONS.

Keep the float chamber free from impurities, which are the commonest cause of flooding. Otherwise, if flooding takes place, remove the petrol pipe connection from the lid and clean out all the passages. See that the float needle is not bent, nor the float petrol logged. If the needle seating is at fault, rub the needle lightly in by twisting it between the finger and thumb. (Never use any grinding compound.) If the needle itself has a deep groove in it on the taper end, a new needle and float may be necessary. When replacing the float chamber lid, first see that the blunt end of the float needle is in the guide hole at the bottom of the float chamber, and then guide the lid over the taper end of the needle before screwing down. Also see that the tickler works freely and springs back, and that the air hole in the rim of the lid is clear.

If the carburetter is ever removed from the induction pipe, see that it is pushed right home on to the pipe, before locking the ring clip. Never fit the carburetter to a pipe on which it is slack, nor ever drive it in to a tight one. A carburetter should be a good push fit on to the inlet pipe, and should be pushed on true with a screwing motion after having put a little oil on the pipe.

Keep the air intake or gauze free from obstruction and see that the air strangler, if of the knife type fitted into the intake of a carburetter, remains firmly open when opened. If it is inclined to be slack, bend it slightly to stiffen the movement.

If the throttle should become slack after years of use, it should be replaced, otherwise the slow running may be interfered with. Also, if a throttle has become badly worn, it may be advisable also to replace the needle-jet, as this might wear slightly large in diameter through the movement of the needle in the same, thus causing a richer mixture than necessary.

Also bad petrol consumption will be apparent if the throttle needle-jet (Fig. 18) has worn; it may be remedied or improved by lowering the needle in the throttle, but if it cannot be—then the only remedy is to get a new needle-jet.

TRACING FAULTS. ASSUMING ENGINE IN GOOD ORDER AND EXHAUST SYSTEM NOT CHOKED.

1. Assure yourself of ample petrol supply, good compression, clean sparking plug and good spark at the points. Also rectify if flooding and verify complete closing and opening of throttle and air strangler, and that the air intake gauze or filter are clean.

2. Verify carburetter to be clean internally and that jet and passages are clear and that there is no air leak at the fitting of the carburetter to the engine. Also verify that main jet and needle-jet are screwed up firmly.

3. When the above points are in order, there are only two possible faults in carburation—either the mixture is RICH or WEAK, and *you must determine which of the two is causing inefficient running, and at what throttle opening,* so that the carburetter can be tuned correctly. Indications are as follows:—

For Richness.	For Weakness.
Black sooty smoke in exhaust.	"Spitting" in the carburetter.
Petrol spraying out of carburetter.	Erratic slow running.
Two-stroke engine "four-stroking."	Poor acceleration.
Heavy petrol consumption.	Engine runs better at less than full throttle opening.
Sparking plug sooty.	Overheating.
Heavy lumpy running.	Sparking plug dry grey colour around the points.
Four-stroke engines "eight-stroking."	

4. Some causes for above producing:—

Richness.	Weakness.
Punctured float or bent float needle.	Air leaks.
Tickler stuck down.	Petrol supply or jet partially choked.
Needle (19) raised too much.	Too small main jet (21).
Main jet (21) too large or not screwed up.	Needle (19) in top low position.
In old machines, needle-jet (18) worn.	Air gauze or filter been removed.
Air filter choked.	Using petrol with water in it.

5. If engine "idles" better after tickling the float and gives better power with air shutter partially closed, the mixture is weak.

   Idling better with petrol turned off temporarily and no suspicion of spitting when opening throttle quickly when engine is cold—the mixture is Rich.

6. Trouble at half to full throttle is most likely to be connected with the main jet (21) supply. Trouble at quarter to three-quarters throttle opening will be due to needle position. If the power is good, at full throttle, very poor acceleration is the effect of too low a needle position, which can be remedied. Bad slow running will probably be due to air leaks.

HOW TO TUNE UP. (READ PARTS TO TUNE UP WITH)

1. Generally speaking : for power at full throttle the main jet is selected and at other lower throttle positions, the needle is either raised or lowered to richen or weaken the mixture.

2. To tune up precisely throughout the throttle range imagine four throttle positions:—

   *Throttle slightly open as for idling.

   **Throttle about quarter open as for running light.

   ***Throttle from one-quarter to three-quarters open as for general running.

   ****Throttle three-quarter to wide open as for full power.

3. From the preceding paragraph start tuning in this order, having read "Parts to tune up with" and with the engine warmed up:—

   1st. **** Use the smallest main jet (21) that will give full power when running under load on the level If the engine runs slightly better with the throttle not quite wide open, the jet is either just right for economy or on the small side.

   2nd. *** Set the needle (19) position as low as possible in relation to good acceleration and running at half throttle—"spitting" in the carburetter on acceleration means the needle is too low, so try a groove higher.

   3rd ** & *. If the idling mixture at * and the take off at ** are weak—the engine spitting and fading out—use a smaller cutaway throttle, or if the engine runs lumpily on a rich mixture use a larger cutaway.

   4th. Finally, if any alteration has been made to the throttle cutaway it may be necessary to alter the needle position again: putting in a throttle of a smaller cutaway may require the needle lowering by a groove and alternatively a larger cutaway may necessitate raising the needle.

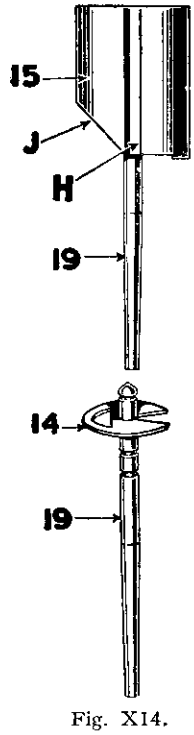

Fig. X14.

PARTS TO TUNE UP WITH.

Main Jet (Fig. 21) with seal. This jet does not control the slow running mixture, but it controls the maximum supply of petrol from half to full throttle positions. This jet is interchangeable with other larger Amal carburetters except for the number stamped on it, which indicates the amount of petrol that will flow through. The bigger the number the bigger the jet, and numbers go up and down in fives. Example, 20, 25, 30, etc. These jets should never be reamed out—the seal on the jet you may purchase is a guarantee of its size.

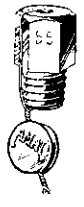
Fig. X15.

Throttle (15). This part is controlled from the handlebar, and from the shut-off to full-open position progressively increases the amount of gas taken into the engine. The slope at J is called the cutaway, and its number is stamped on the bottom. Throttles can be had with different cutaways—the bigger the cutaway and number the weaker the mixture for idling and up to half throttle positions and vice versa. The throttle holds the needle of the needle-jet.

Needle (19) for Needle-Jet (Fig. 18). This works up and down with the throttle and the taper end goes into the needle-jet, so controlling the amount of petrol at different throttle openings. Its position in the throttle and of its taper in the needle-jet is therefore affected by which groove the clip No. 14 is fixed in: the extreme end groove is No. 1, giving the lowest position and the weakest mixture and vice versa, raising the needle richens the mixture. The spring clip (Fig. 14) can be sprung off and on.
The illustration shows clip 14 *in position* 2.

Needle-Jet (Fig. 18), see section. The standard jet is not marked in any way, but can be had in other sized bores on request, which are marked accordingly. If the mixture gets rich at half throttle when the machine is old this needle-jet has probably worn large and should be replaced. (Extreme weakness when idling may be corrected by a larger bore needle-jet, which can be obtained on special application.)

For Tuning with engine running, but cycle stationary.

Air Shutter on the intake of the carburetter. This is to be closed only for starting from cold to reduce the amount of air and to increase the suction on the jet. When tuning, however, the shutter might be used experimentally to indicate if richening the mixture improves matters.

Tickler (Fig. 6), see section. This is for pressing down the float needle off its seat to allow more petrol to come into the float chamber and so raise the petrol level, and consequently richening the mixture.

NOTE. For idling, if excessive richness cannot be cured by a larger cutaway nor will the throttle opening range allow a lower needle position—then change the needle jet for a new one, as the old one may be worn. If weakness prevents idling and cannot be cured by a smaller cutaway throttle and a raised needle position, use a larger bore needle-jet, which will have its bore marked on it.

GENERAL HINTS AND TIPS.

Starting from Cold. Flood the Carburetter by depressing the tickler momentarily three or four times and close the air strangler; set the ignition, say half retarded, then shut the throttle and open it a little, about one-eighth open; then kick-start.

When started, gradually open the throttle to make the engine run faster and when the engine is warmed up, close down again and open the strangler. Should the engine falter either tickle the float chamber again or partially close the strangler until the engine is warm enough to stand the strangler being opened fully.

Starting with Engine Hot. Do not flood the Carburetter nor close the air strangler; set the ignition and close the throttle, then, open it again about one-eighth of its movement and kick-start. If the engine does not start at once, flood slightly or close the strangler and try again. After starting, open the strangler but if this should cause the engine to falter and not respond to opening the throttle, flood the carburetter momentarily.

Starting Generally. Find out by experiment if and how much it is necessary to flood and also the best position for the air strangler on the Carburetter intake.

Usually for easy starting a small throttle opening is desirable and the best position is accompanied by a sucking noise when the engine is being turned over. If this noise cannot be heard, the throttle is probably too wide open and there is, consequently, insufficient "pull" on the starting system.

Given a good engine and a fat spark at the plug, if the engine will not start, the mixture is either too rich or too weak.

Over-richness of the mixture, especially with petroil lubrication, may be caused by overflooding or by the machine being left with the petrol tap turned on and the float chamber flooding. To clear this over-richness open the throttle wide, also the strangler, and turn the engine over several times, then close the throttle and start again. If the engine does not start at once, the sparking plug points may have become damp or oiled up, so remove the plug and dry the points, and whilst it is out, swing the engine over several times before replacing it; then try again without flooding and with strangler open.

Cable Control. See that there is a minimum of backlash when the control is set back and that any movement of the handlebar does not cause the throttle to open; this is done by the adjuster on the top of the carburetter. *See that the throttle shuts down freely.*

Petrol Feed, verification. Detach petrol pipe union at the float chamber end; turn on petrol tap momentarily and see that fuel gushes out. Avoid petrol pipes with vertical loops as they cause air locks. Flooding may be due to a worn or bent needle or a leaky float, but nearly all flooding with new machines is due to impurities (grit, fluff, etc.) in the tank—so clean out the float chamber periodically till the trouble ceases. If the trouble persists, the tank might be drained, swilled out, etc.

Fixing Carburetter and Air Leaks. Erratic slow running is often caused by air leaks, so verify there are none at the point of attachment to the cylinder or inlet pipe—check by means of an oil can and eliminate Also in old machines look out for air leaks caused by a worn throttle (or worn inlet valve guides if a 4-stroke. engine).

Bad Petrol Consumption of a new machine may be due to flooding caused by impurities from the petrol tank lodging on the float needle seat and so prevent its valve from closing. If the machine has had several years' use, flooding may be caused by a worn float needle valve.

Faults. Read Tracing Faults. The trouble may not be carburation; if the trouble cannot be remedied by making mixture richer or weaker and you know the petrol feed is good and the carburetter is not flooding, the trouble is elsewhere.

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B.S.A. MOTOR CYCLES LTD., Service Department,
Waverley Works, Birmingham 10.

BSA SERVICE SHEET No. 709

All Models

October, 1948.
Reprinted Sept., 1959.

FAULT FINDING

No adjustments should be made, or any part tampered with, until the cause of the trouble is known. Otherwise adjustments which are correct may be deranged.

Engine Stops Suddenly.

Petrol shortage in tank, or choked petrol supply pipe or tap.
Choked main jet, or water in float chamber.
Oiled up or fouled sparking plug.
Water on high tension pick-up or on sparking plug.

Engine Fails to Start, or is difficult to start.

Lack of fuel, or insufficient flooding if cold.
Excessive flooding, allowing neat petrol to enter the cylinder.
Oiled sparking plug, or stuck-up valve or valve stem sticky.
Weak valve spring, or valve not seating properly.
Throttle opening too large, or pilot jet choked.
Contact points dirty, or gap incorrect.
Flat battery, if coil ignition, or faulty electrical connections in ignition circuit.

Loss of Power.

Valve, or valves, not seating properly.
Weak valve spring or springs, or sticking valve.
No tappet clearance, or excessive clearance.
Lack of oil in tank.
Brakes adjusted too closely.
Badly fitting or broken piston rings.
Punctured carburetter float.
Incorrect ignition timing.

Engine Overheats.

Lack of proper lubrication.
Weak valve springs, or pitted valve seats.
Worn piston rings, or late ignition setting.
Carburetter setting too weak, or partly choked petrol pipe.

Engine Misses Fire.

Weak valve spring.
Defective or oiled sparking plug, or oil on contact points.
Incorrectly adjusted contact points or tappets.
Faulty condenser.
Defective sparking plug or H.T. cable.
Loose sparking plug terminal.
Carburetter flooding, due to stuck or defective float.
Partly choked main jet.
Choked vent hole in petrol tank filler cap.

Excessive Oil Consumption.

Stoppage, or partial stoppage, in pipe returning oil from engine to tank.
Clogged, or partially clogged, filter in sump, or oil tank.
Badly worn or stuck-up piston rings, causing high pressure in engine crankcase.
High crankcase pressure, caused by release valve (breather) action.
Air leak in dry sump oiling system.
Non-return valve in system not seating.
Ball valve in oil pump stuck on its seat.

B.S.A. MOTOR CYCLES LIMITED, Service Dept., Waverley Works, Birmingham, 10
(PRINTED IN ENGLAND)

BSA SERVICE SHEET No. 710

Oct., 1948
Reprinted June, 1960

All Models
CHAIN ALTERATIONS AND REPAIRS

A chain rarely breaks if it is kept properly lubricated and adjusted. Usually it is worn out long before it reaches breaking point. The rear chain is the most heavily stressed and is therefore the one most likely to give trouble. Spare parts should be carried to enable the rider to carry out a repair on the road with the aid of a chain rivet extractor (see Fig. X7). The front chain will probably be worn out before it requires shortening.

How to use the chain rivet extractor

First press down lever A (Fig. X7) to open the two jaws (B). Insert the link to be removed so that the jaws grip the roller and support the uppermost inner side plate. The punch (C) is then screwed down on to the rivet head until the rivet is forced through the outer plate.

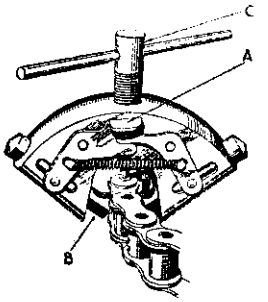

Fig. X7.

To shorten a worn rear chain

After a big mileage, the rear chain may have stretched so that no further adjustment is possible by the usual method. In this case it is possible to shorten the chain by one link or pitch, so increasing its useful life. First remove the single connecting spring link (A) securing the two ends of the chain (Fig. X8). If the chain terminates in two ordinary links as in Fig. X8 (in which case the chain will be of an even number of pitches) extract the third and fourth rivets (B) from the end and replace the detached three pitches by a single connecting link (C). The connection is made with an additional spring link (D). If one end of the chain has a double cranked link (Fig. X9)—in which case the

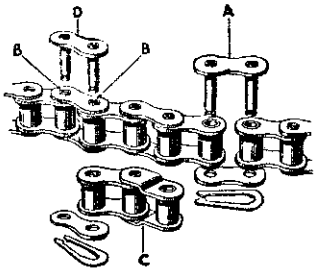

Fig. X8.

chain will have an odd number of pitches—extract the second and third rivets (A), releasing the cranked link unit complete, which can be retained for further use. Replace with one inner link (B) and again connect up with an additional single connecting link (C).

To repair a damaged chain

If a roller or link has been damaged (X, Fig. X9) remove rivets (D), take out the damaged link and replace with one inner link, secured by two single connecting links.

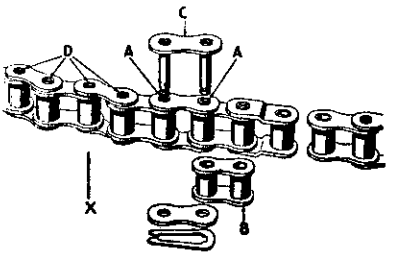

Fig. X9.

It is important that the spring clip fastener should always be put on so that the CLOSED end faces the direction of travel of the chain—i.e., when clip is on top run of chain, closed end is toward front of machine—when clip is on bottom run, closed end is towards rear of machine.

It should be noted that once a rivet has been extracted it must not be used again, so that it is important to check that the correct rivet is being removed before actually removing it. In the case of double cranked links, the complete unit comprises an inner link and the cranked outer link—three rollers in all—and these must never be separated.

Fitting rear chain

To fit a new rear chain, turn wheel until the spring link of the old chain is located on rear sprocket. Disconnect, and allow the lower run to drop down. Join the top run of the old chain to the new chain by means of the connecting link, and then by pulling on the bottom run of the old chain the new one will be carried round gearbox sprocket. Then the old chain can be disconnected and the ends of the new one joined together.

When the rear chain breaks and falls from its sprockets, the new or repaired chain can be replaced without taking off the chainguards. One end of the chain must be fed (from the rear) under the front end of the rear top chainguard on to the gearbox sprocket. A long bladed screwdriver or a piece of stiff wire may assist this operation. When the chain has located on the sprocket teeth, engage a gear and gently turn gearbox over with the kick-starter. This will feed chain round gearbox sprocket. When sufficient length of chain is hanging below sprocket, disengage gear and chain can then be pulled round until both runs can be fed inside rear chainguard and engaged on rear wheel sprocket.

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Revised Mar. 1958.

FRAME REPAIRS

ALL MODELS

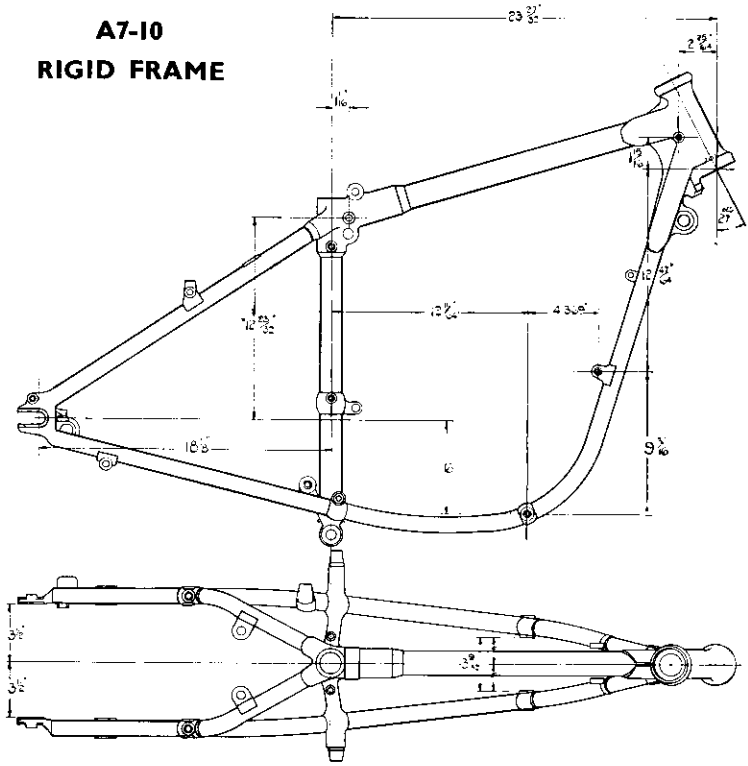
Frame repairs must not be attempted unless adequate workshop facilities are available.

The information given in this sheet is intended for the use of Dealers who are unable to take advantage of the B.S.A. repair service and who have frame repair facilities.

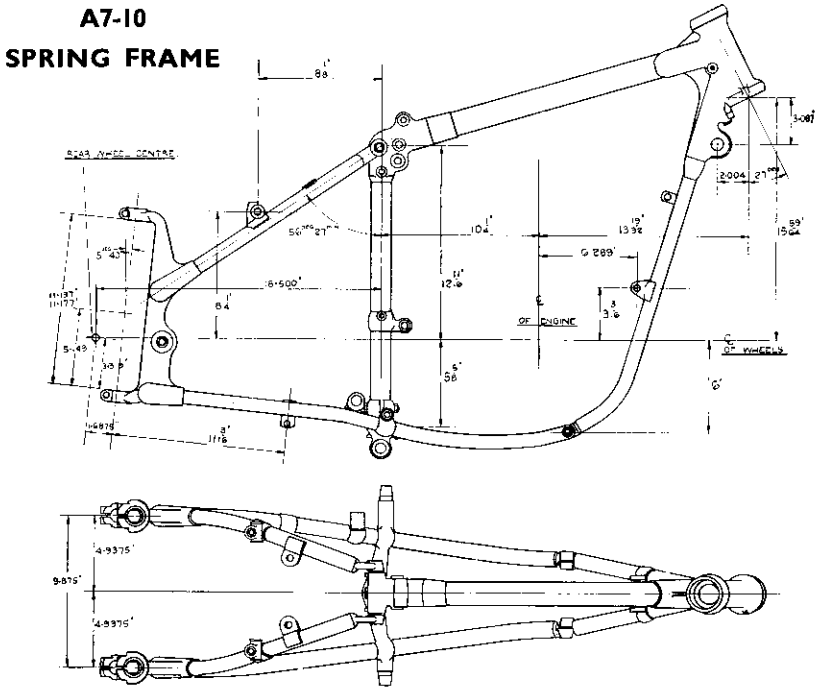
Spotting points to enable frame trueing to be carried out can be determined by making use of the dimensions given.

B.S.A. Motor Cycles Ltd., Birmingham 11.
(PRINTED IN ENGLAND)

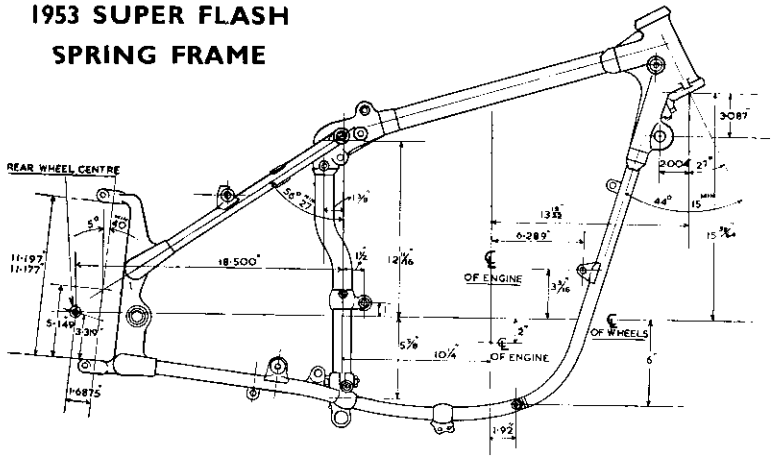
A7-10
RIGID FRAME

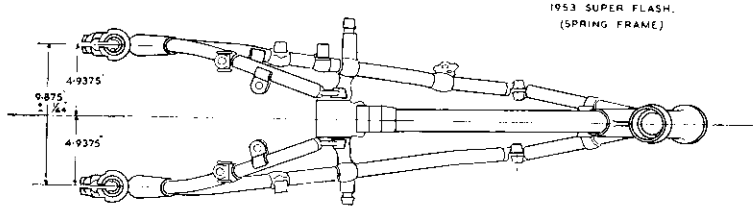


A7-10
SPRING FRAME

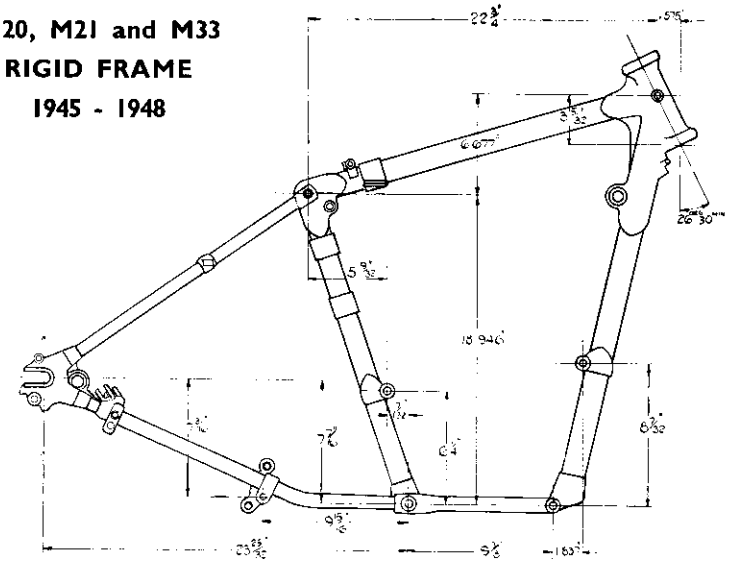


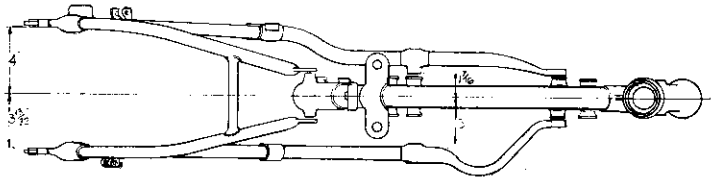
1953 SUPER FLASH
SPRING FRAME



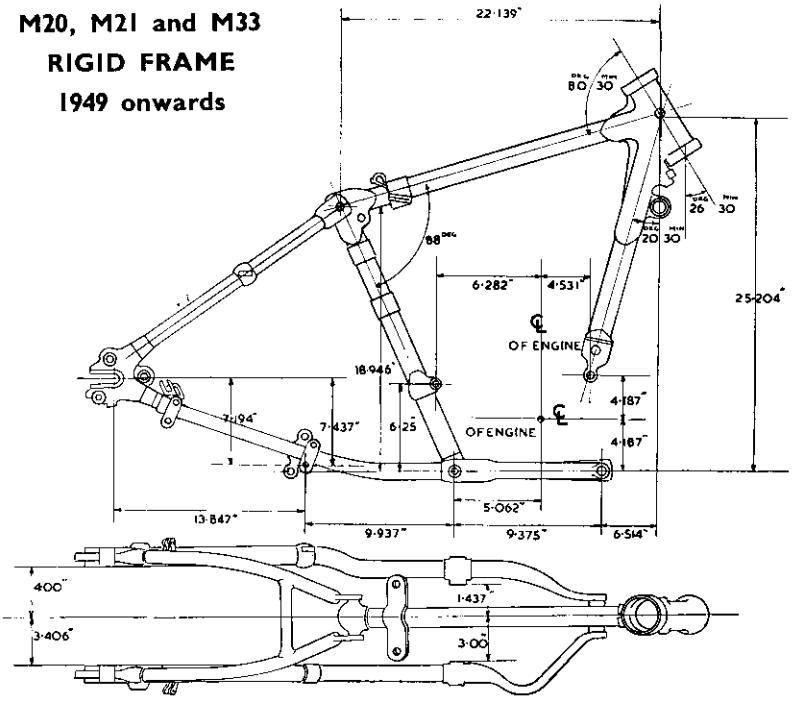


M20, M21 and M33
RIGID FRAME
1945 - 1948

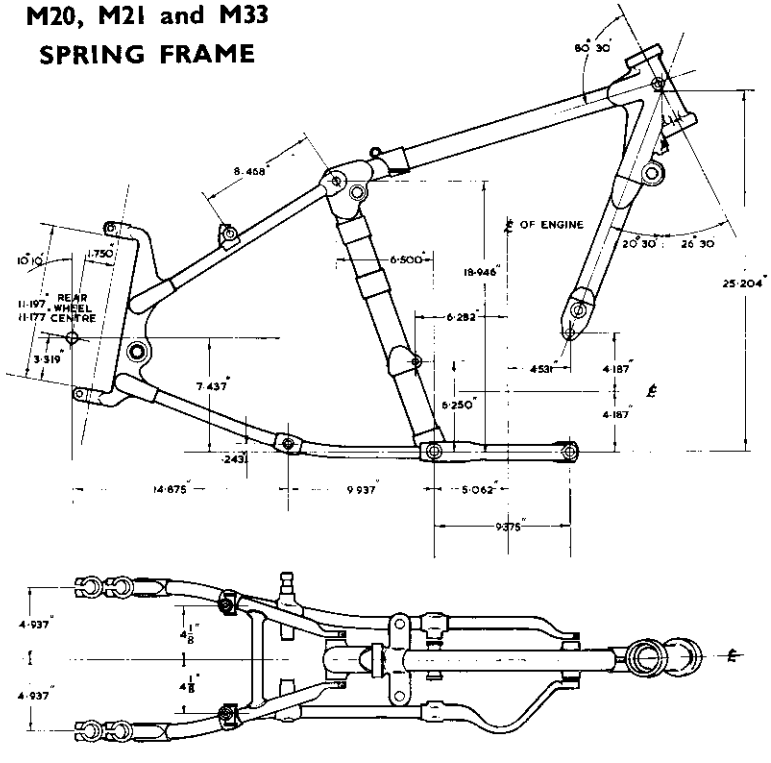




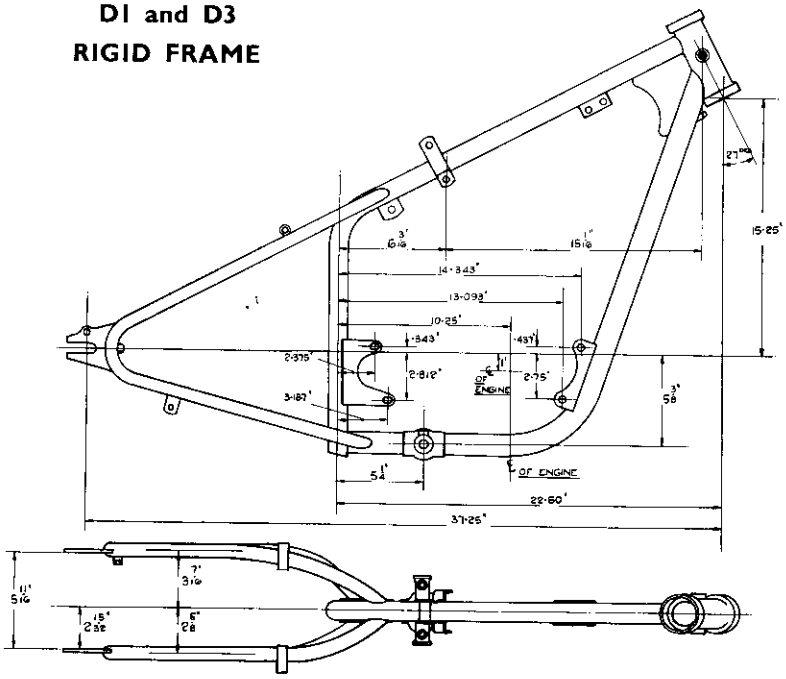
M20, M21 and M33
RIGID FRAME
1949 onwards



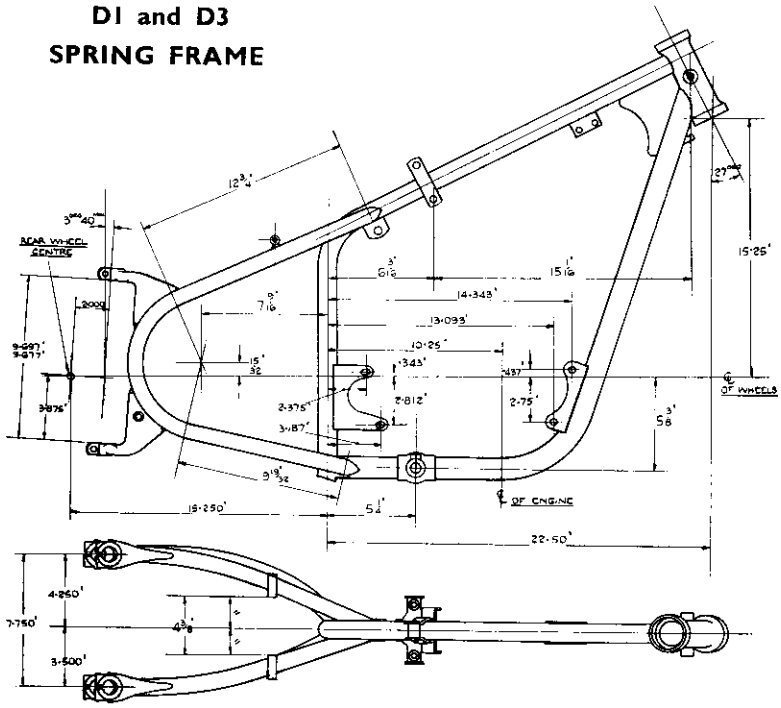
M20, M21 and M33
SPRING FRAME



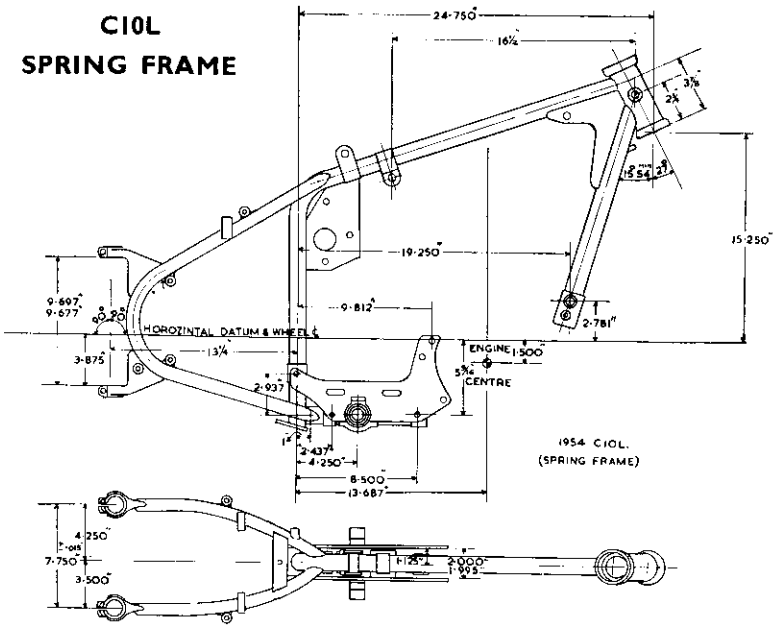
D1 and D3
RIGID FRAME



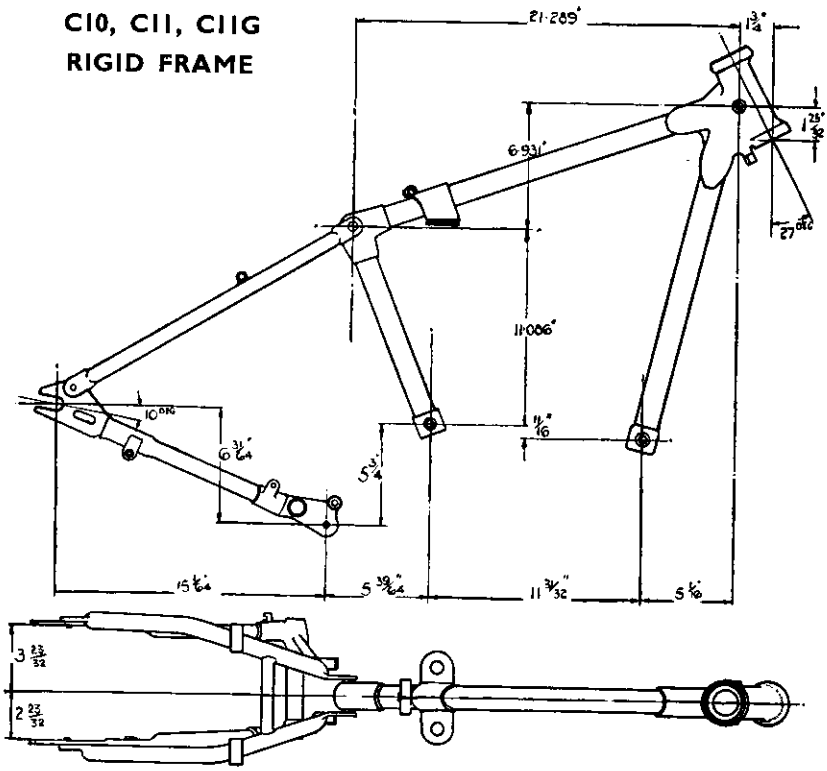
D1 and D3
SPRING FRAME



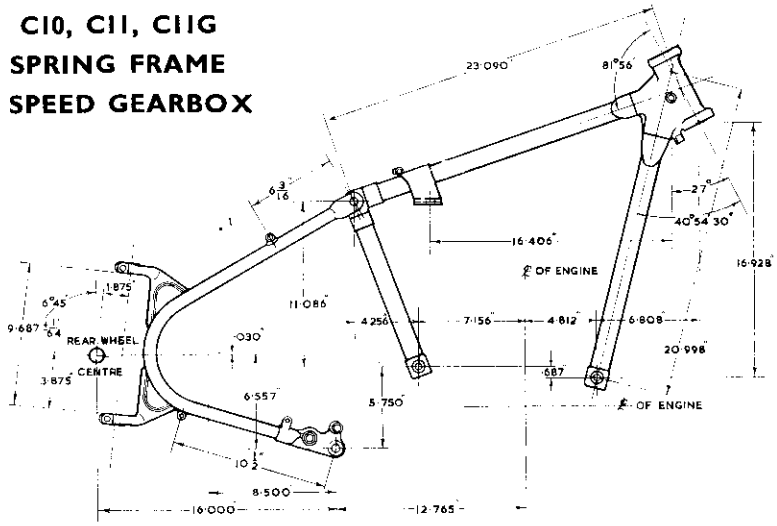
C10L
SPRING FRAME

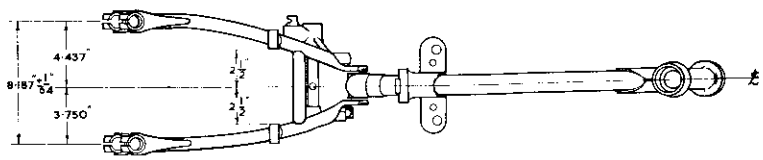


C10, C11, C11G
RIGID FRAME

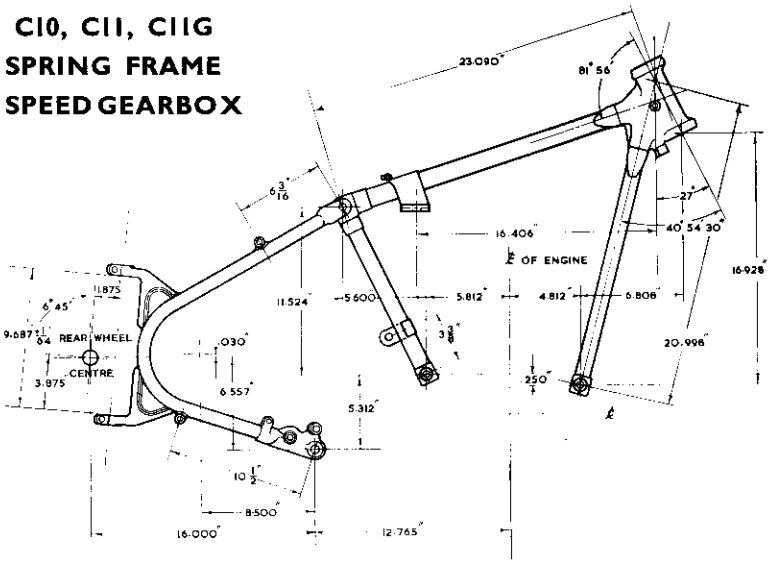


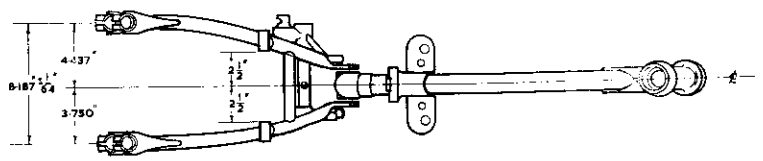
C10, C11, C11G
SPRING FRAME
3 SPEED GEARBOX



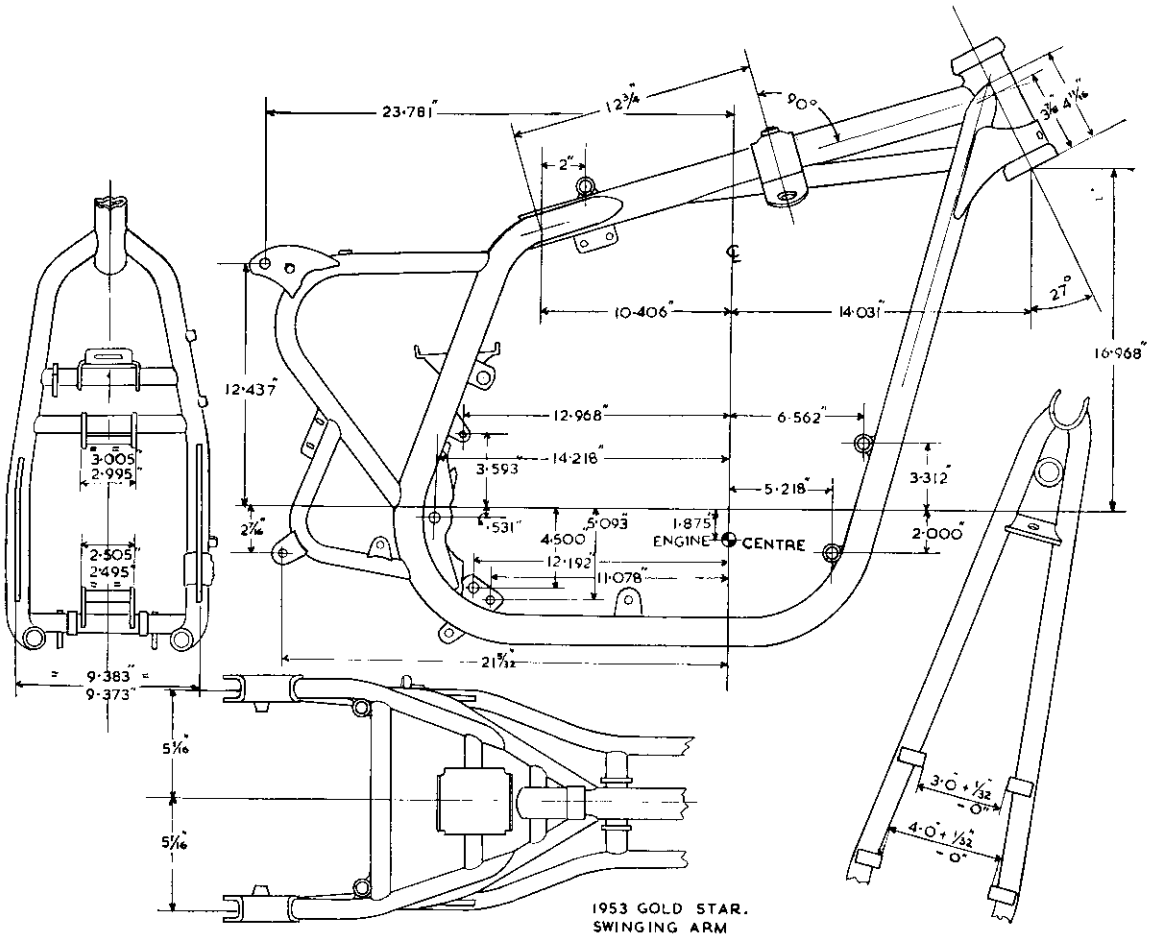


C10, C11, C11G
SPRING FRAME
4 SPEED GEARBOX

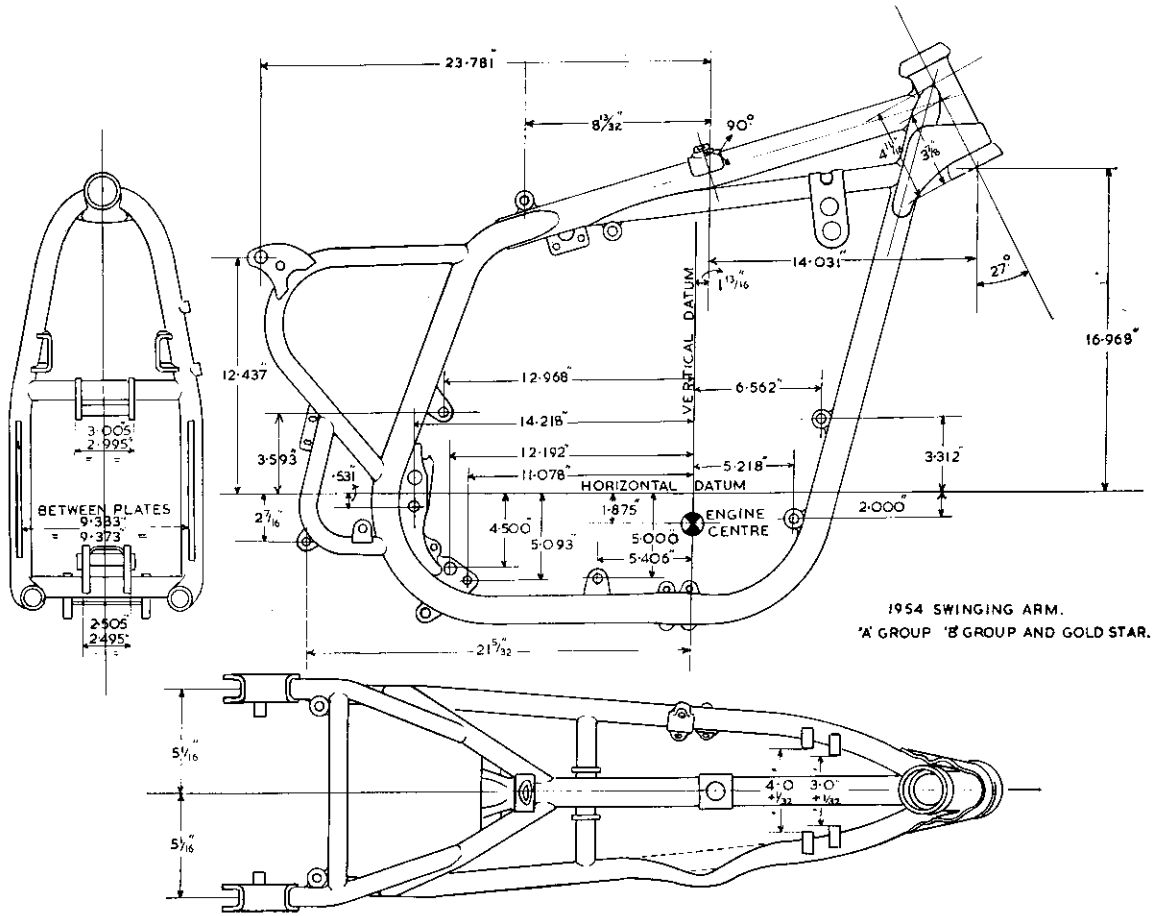




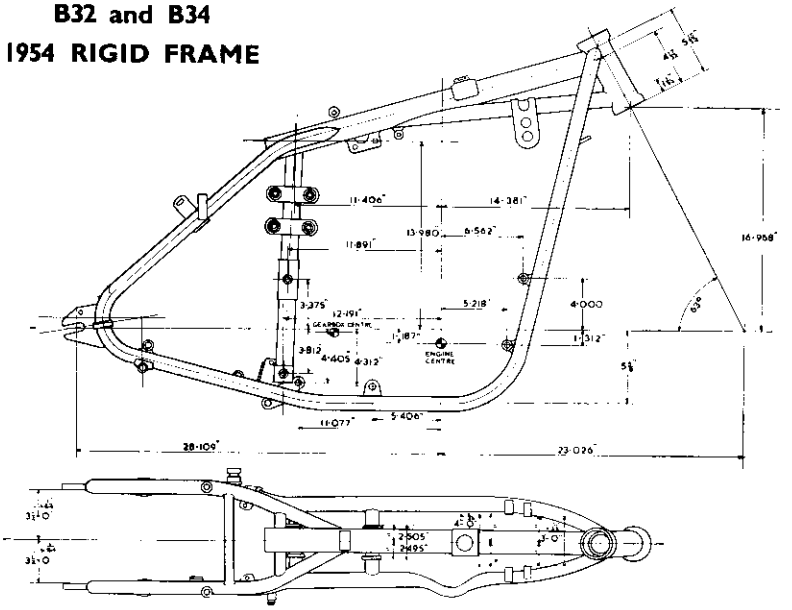
1953 GOLD STAR SWINGING ARM



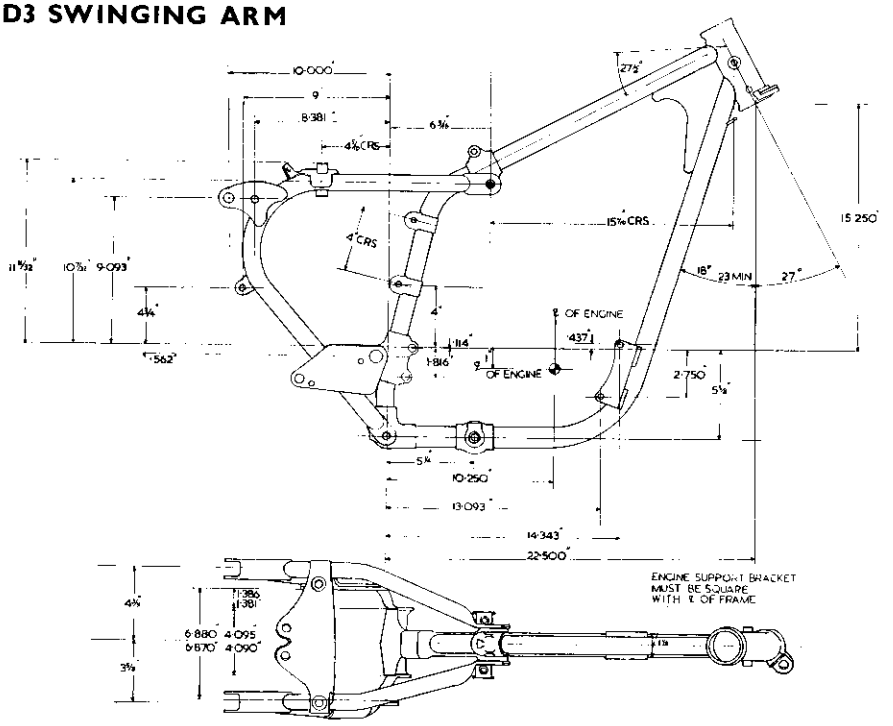
A GROUP, B GROUP and GOLD STAR 1954 SWINGING ARM



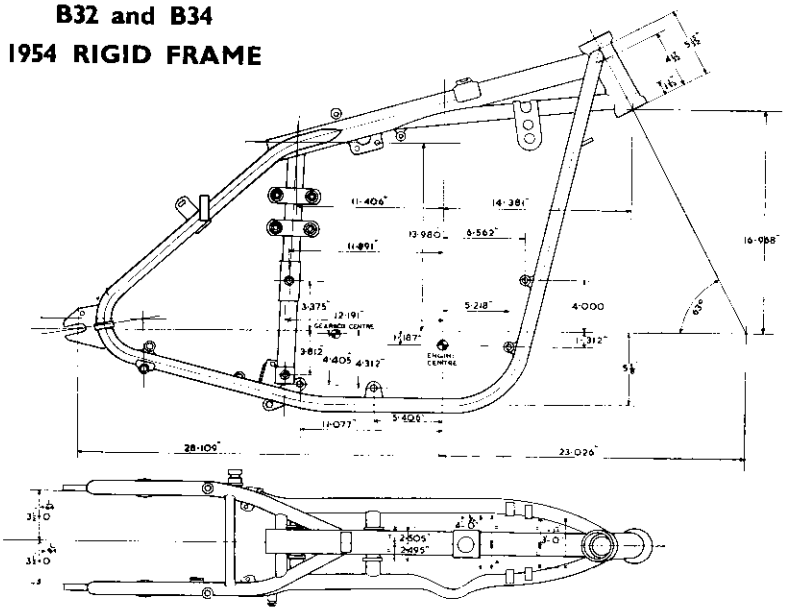
B32 and B34
1954 RIGID FRAME



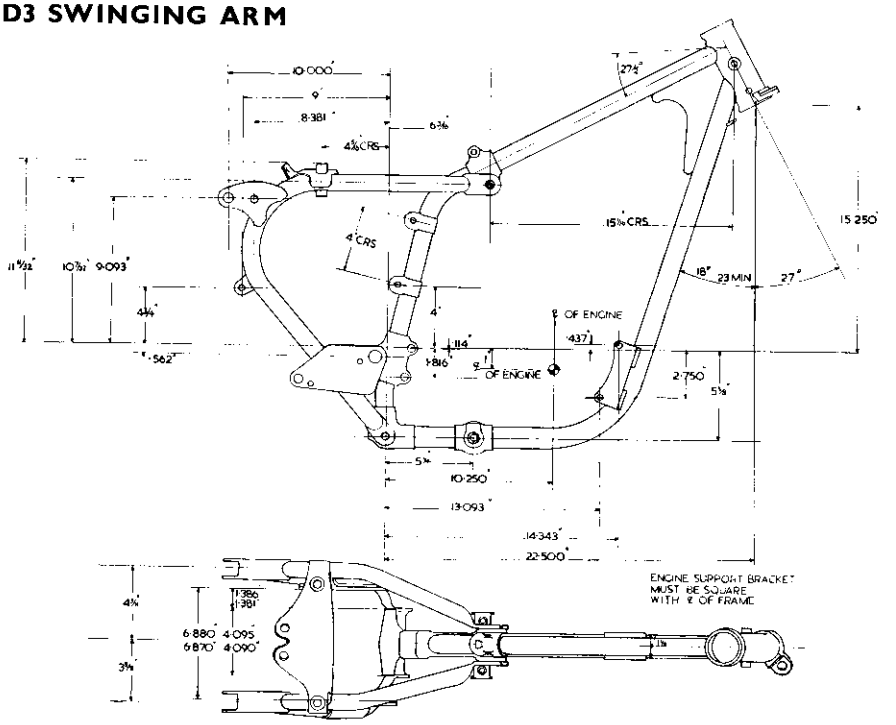
D3 SWINGING ARM



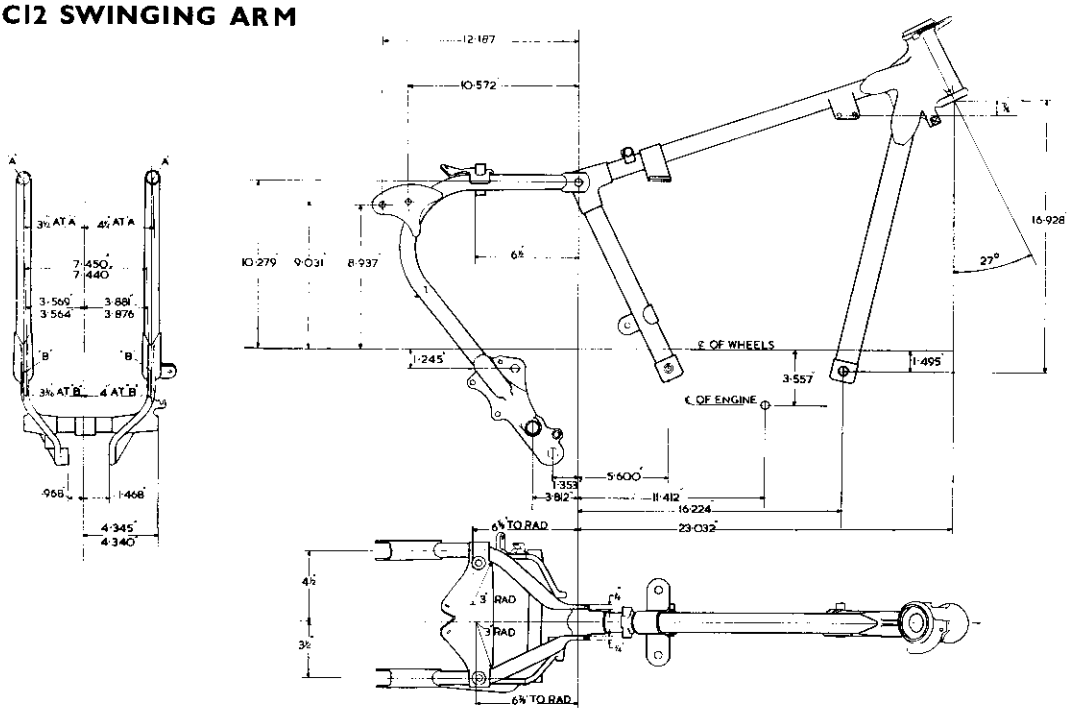
B32 and B34
1954 RIGID FRAME



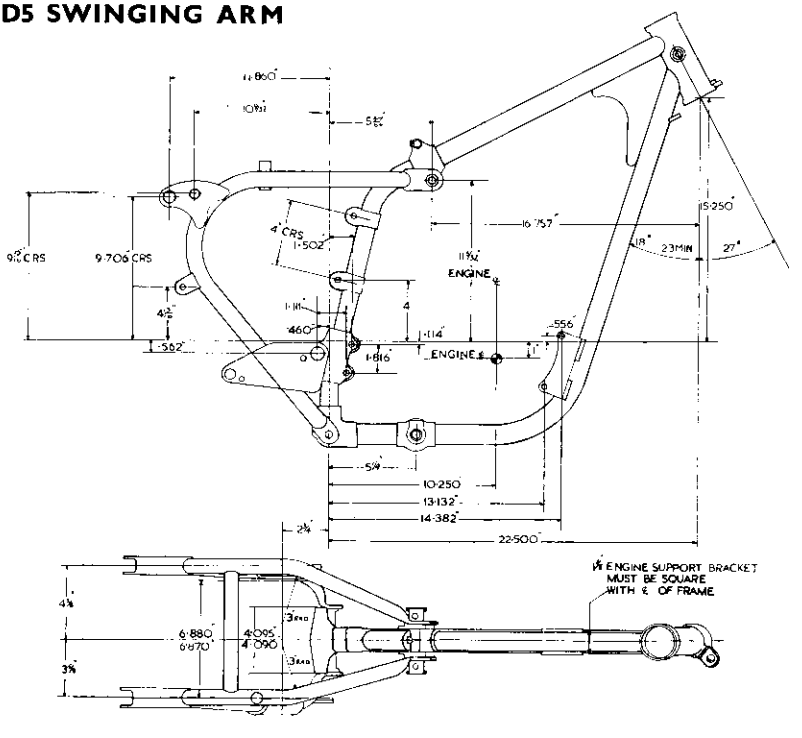
D3 SWINGING ARM



C12 SWINGING ARM



D5 SWINGING ARM



B.S.A. Service Sheet No. 711

Revised Sept. 1958.

SERVICE TOOLS

for all

BSA

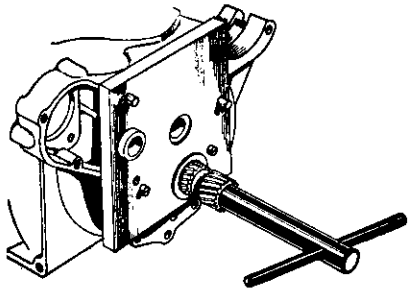
MOTOR CYCLES

1946 to 1958 Inclusive

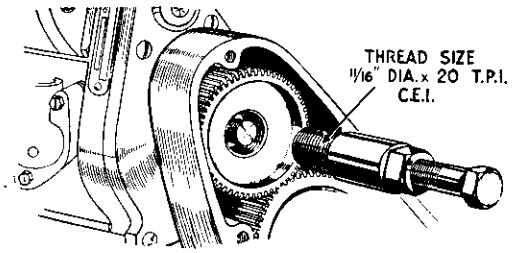
Use in conjunction with
Service Sheet No. 711A

For Details of Models and Prices.

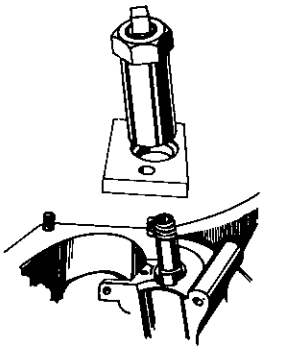
BSA SERVICE SHEET No.711



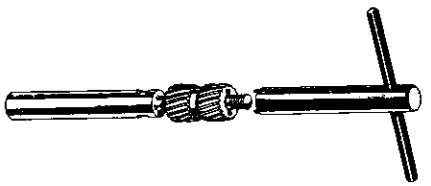
61-3281 Reaming Jig (mainshaft and camshaft gear bushes)
61-3275 Reaming Jig (mainshaft and camshaft gear bushes)



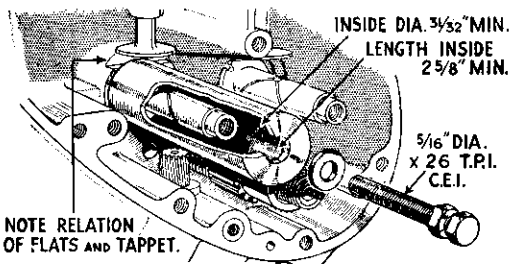
61-1903 Magdyno Driving Pinion Extractor Tool complete.
For Models fitted with Magdyno Lighting Equipment.



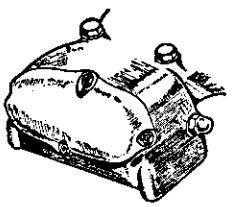
61-3069 Inlet Tappet Guide Extractor

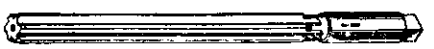


61-3284 Mainshaft Bush Reamer
61-3285 Pilot for Jigs 61-3275
61-3286 Pilot for Jigs 61-3281
61-3287 Shell Reamer Holder
61-3288 Tommy Bar for 61-3287

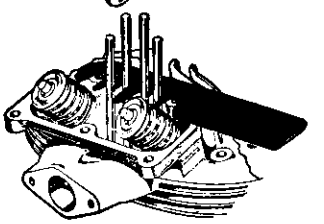


61-691 Cam Pinion Post Extractor

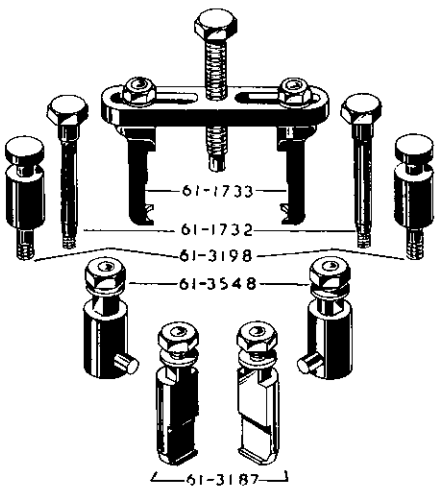




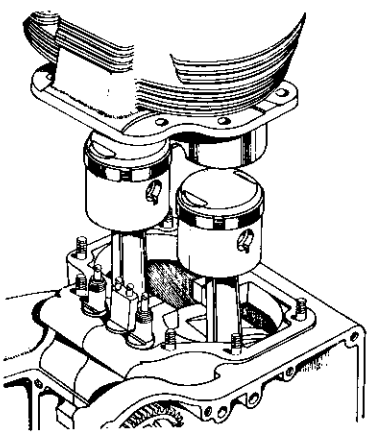
61-3167 Reamer for use with 61-3162 61-3281 and 61-3275



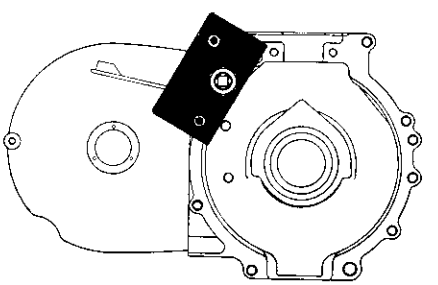
67-9114 Push Rod Assembly Tool



61-3256 Extractor Set Complete

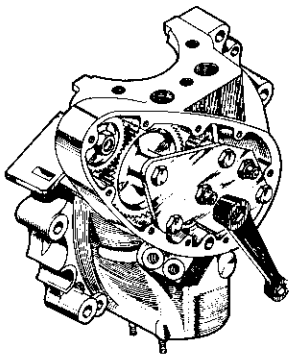


61-3061 Piston Ring Slipper,
61-3334 Piston Ring Slipper,
61-3262 Piston Ring Slipper,
(2 per set)



61-3159 Camshaft Bush Extractor

B.S.A. SERVICE SHEET No. 711—*continued*

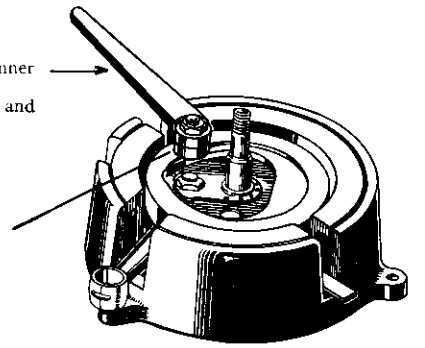


15-832 Mainshaft Nut Spanner

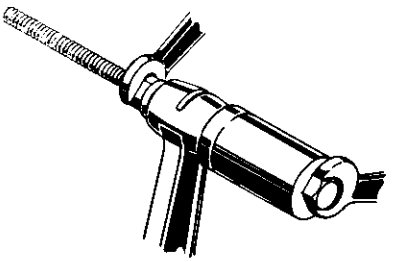
61-1817 Crankpin Nut Spanner

Tool comprises Holder, Locknut and three Sockets

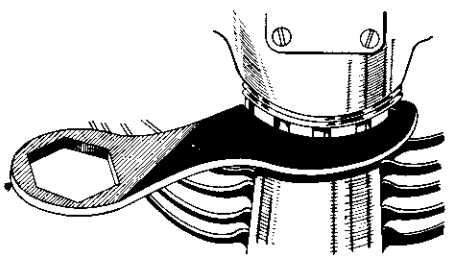
Sockets
for 61-1817
61-1754
61-1755
61-3228



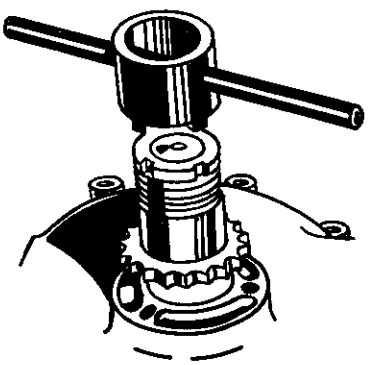
61-1751 Flywheel Bolster
61-1750 „ „ Gauge Rod
61-1747 „ „ Ring
61-1749 „ „ „



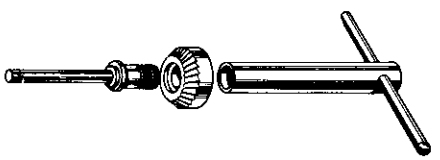
61-658 Gudgeon Pin Bush Extractor comprising Spindle with various size bushes.



65-9243 C Spanner and Fork Top Nut Spanner



61-3220 Cush Drive Nut Tube Spanner



61-3305 Valve Seating Tool complete

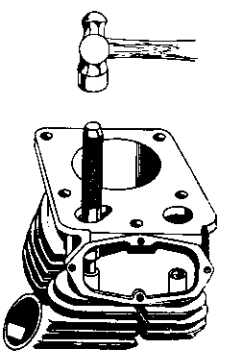
Comprising Tommy Bar 61-3291
Holder 61-3290

Cutters

61-3298	$1\frac{7}{16}'' \times 45° \times 20°$
61-3299	$1\frac{1}{2}'' \times 45° \times 20°$
61-3300	$1\frac{5}{8}'' \times 45° \times 20°$
61-3301	$1\frac{3}{4}'' \times 45° \times 20°$
61-3302	$1\frac{7}{8}'' \times 45° \times 20°$

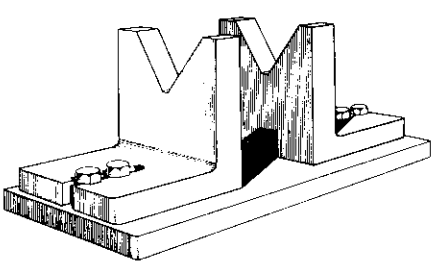
Pilots

61-3293	$\frac{5}{16}''$
61-3294	.350"
61-3295	$\frac{3}{8}''$

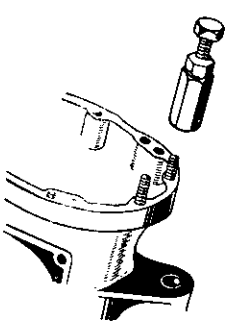


61 3263 61-3264 61 3265 61 3267 61 3268
Valve Guide fitting and extracting punches

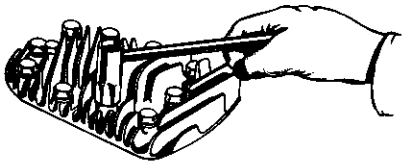
65-9240 Valve Grinding Tool



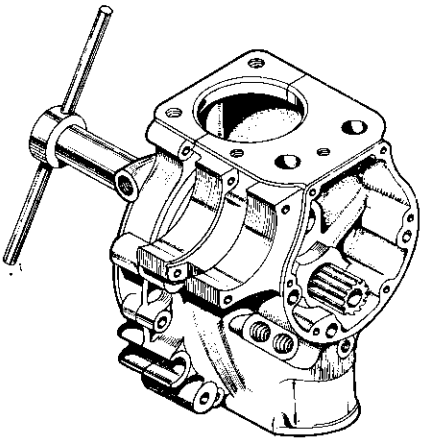
61-692 Vee Block and Base Plate



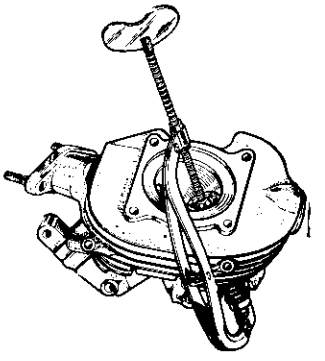
61-699 $\frac{1}{4}''$ C.E.I. Stud Boxes
61-317 $\frac{5}{16}''$ „ „ „
61-545 $\frac{3}{8}''$ „ „ „



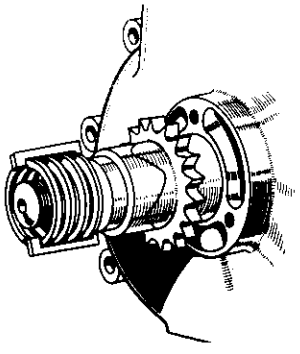
61-3049 Cylinder Head Spanner



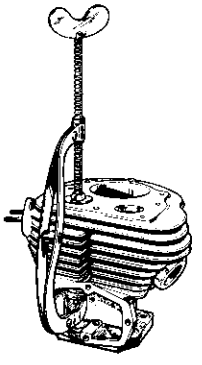
61–1932 Reamer and Holder complete (mainshaft bush)
61–1922 Reamer for 61–1932



61-3340 Valve Spring Compressor with Adaptor
Models M33
"B" Group, "A" Group, and Sunbeam

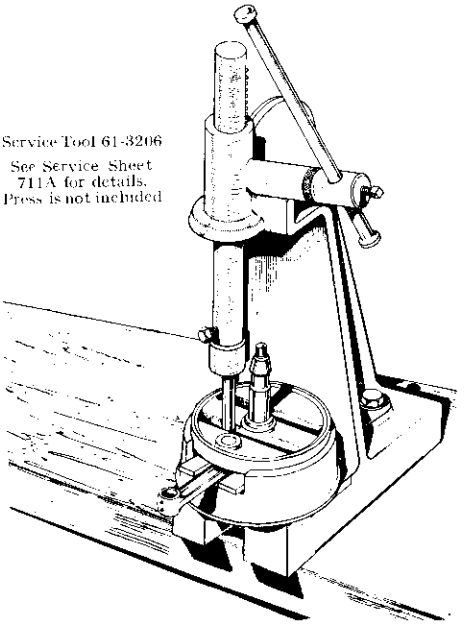


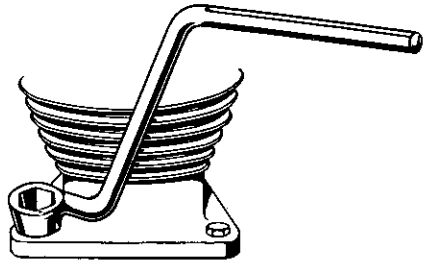
61–1822 Cush Drive Spring Assembly Tool
For holding Spring compressed whilst fitting Lockring.
(2 per set)



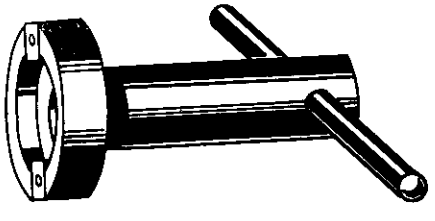
61-3340 Valve Spring Compressor
Models C10, C11, M20, M21
(Use without adaptor)

Service Tool 61-3206
See Service Sheet 711A for details.
Press is not included

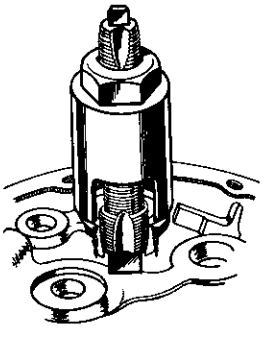




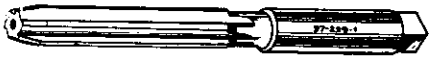
61-3052 Cylinder Base Nut Spanner



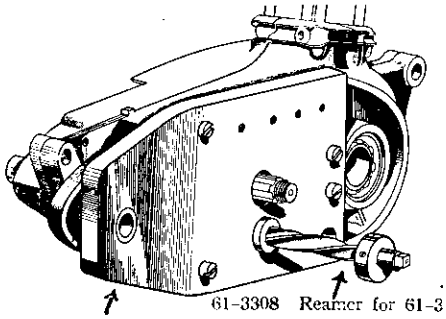
61-3257 Gearbox Sprocket Locknut Spanner,
61-3258 Gearbox Sprocket Locknut Spanner,



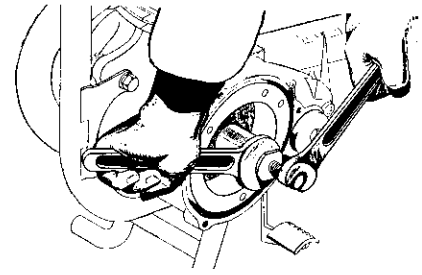
61–3185 Bush Extractor



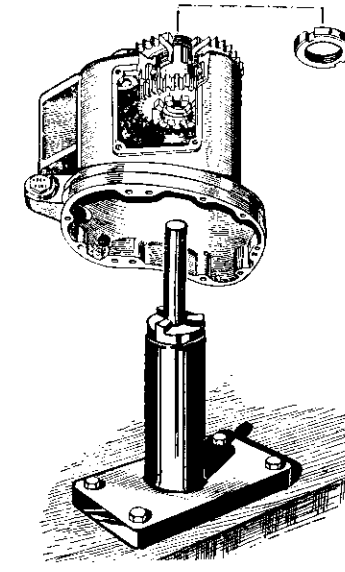
61 3246 Gudgeon Pin Bush Reamer (.4687″)
61–3367 Gudgeon Pin Bush Reamer (.625″)
61-3556 Gudgeon Pin Bush Reamer (.6875″)
61–3366 Gudgeon Pin Bush Reamer (.750″)
61 3580 Gudgeon Pin Bush Reamer (.4375″)
61 3581 Gudgeon Pin Bush Reamer (.5625″)



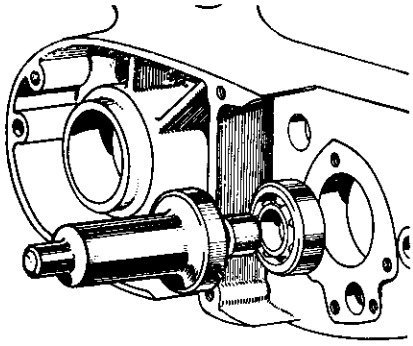
Service Tool 61-3199. 61-3308 Reamer for 61-3199 Line Reaming the Gearbox Bushes



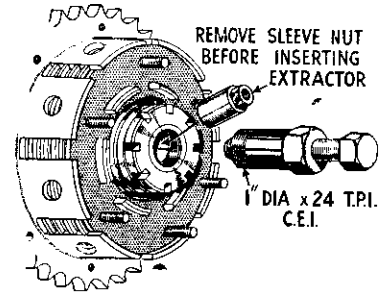
61-3188 Generator Flywheel Removal Tool (Wico Pacy)
90-297 Generator Flywheel Removal Tool (Lucas)



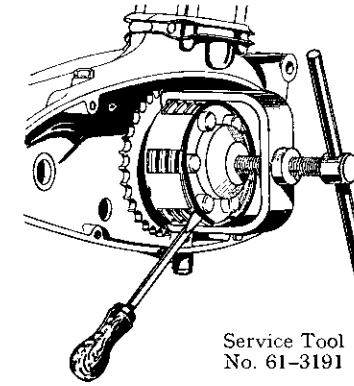
61-3064 Pinion Sleeve Extractor



61-3214 Ballrace Pilot (gearbox pinion bearing)
61-3215 Ballrace Pilot (gearbox mainshaft bearing)

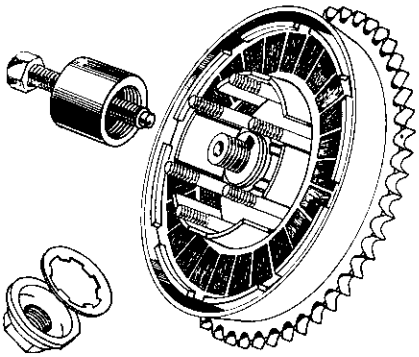


61-1912 Clutch Extractor Tool

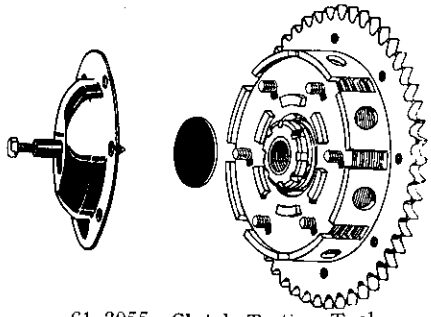


Service Tool No. 61-3191

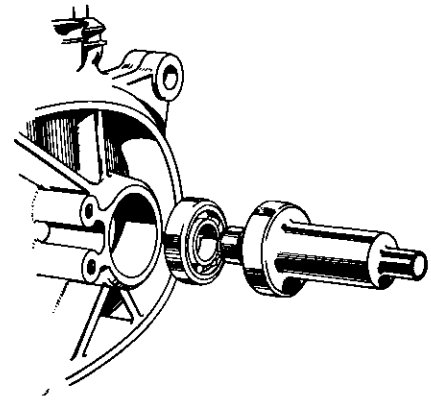
Removing the Clutch Plate Circlip



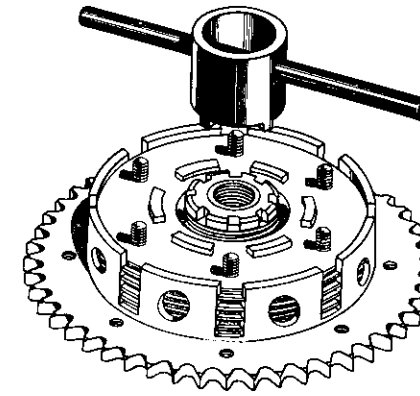
61-3362 Clutch Extractor Tool



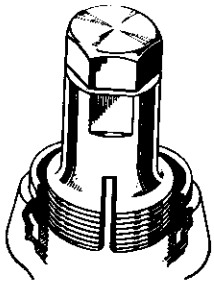
61-3055 Clutch Testing Tool



61-3212 Ballrace Pilot for large engine bearing
61-3213 Ballrace Pilot for small engine bearing

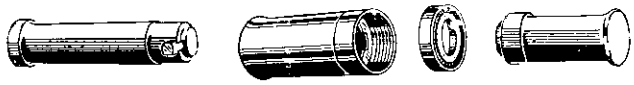


61-1915 Clutch Spring Nut Tube Spanner.



61-3060 Ballrace Extractor (steering head) for all $\frac{5}{16}$" balls

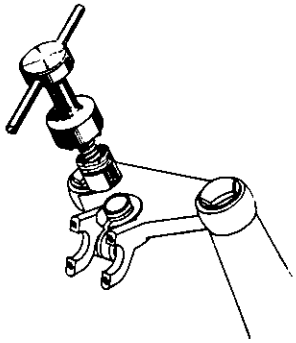
61-3063 Ballrace Extractor (steering head) for all $\frac{1}{4}$" balls



61-3006 Oil Seal Extractor

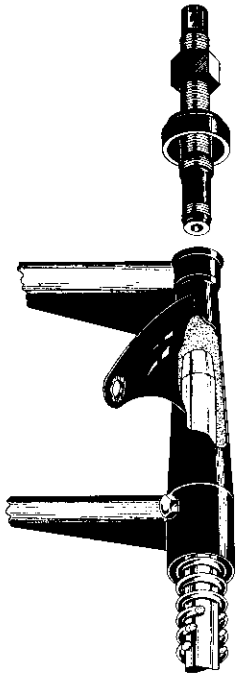
61-3007 Oil Seal Assembly Tool

61-3003 Spanner for Fork Plug Assembly

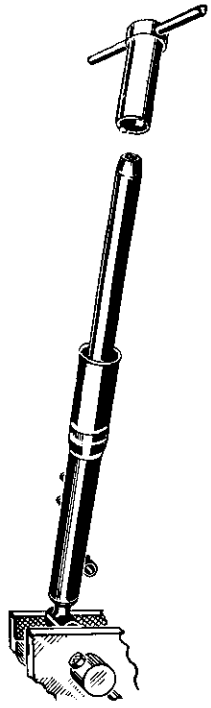


61-3002 Assembly Tool for Adjuster Sleeve

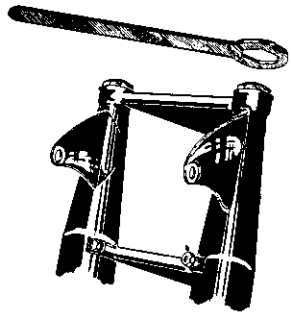
61-3008 Assembly Tool for Adjuster Sleeve



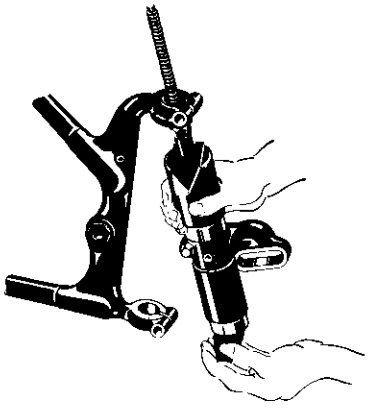
61-3350 Fork Shaft Dismantling and Assembly Tool



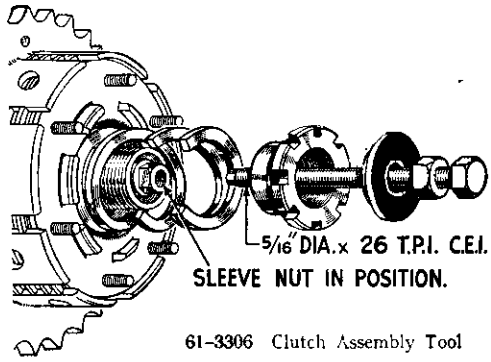
61-3005 Assembly Tool for Oil Seal Holder



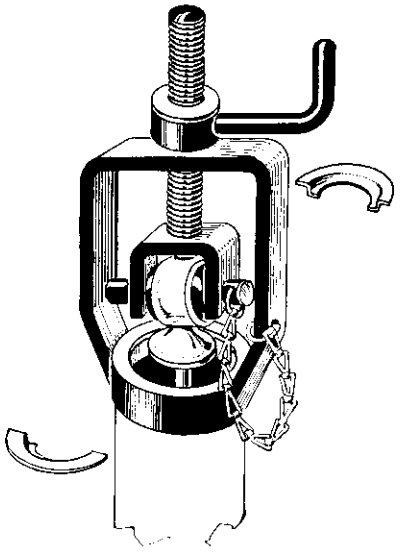
61-3001 Spanner for Fork Top Nut Assembly



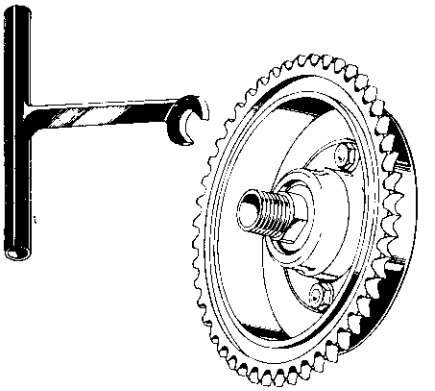
61-3222 Rear Suspension Strip and Assembly Tool



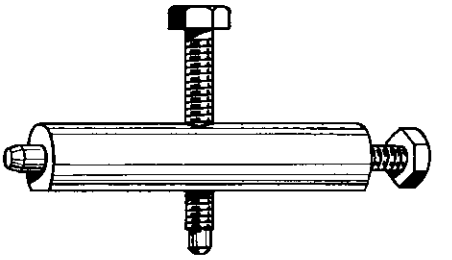
61-3306 Clutch Assembly Tool



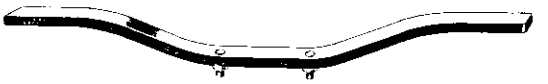
61 3503
Rear Suspension
Dismantling Tool



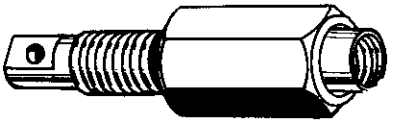
61-3217 Spanner for rear chain sprocket



61-3540 Flywheel Removal Tool



61-3542 Wheel Bearing Nut Peg Spanner



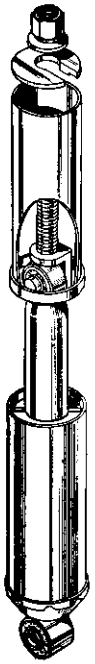
61 3536 Flywheel Assembly Tool

61-705 Spoke Nipple Key. (10 and 12 gauge)

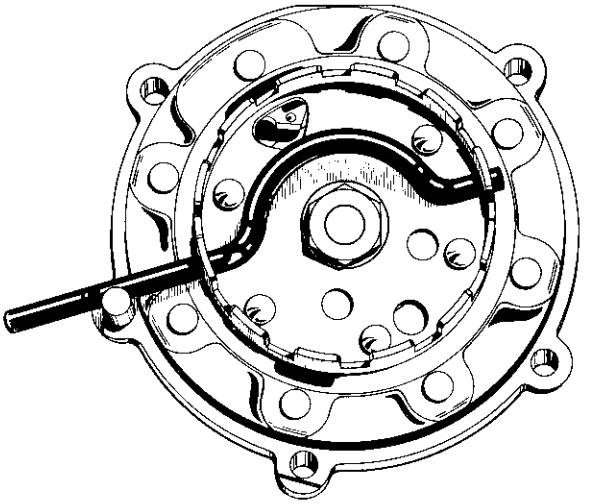
61-773 Spoke Nipple Key (8 and 10 gauge)

61 3552 Starter Ratchet Circlip
Assembly Tool

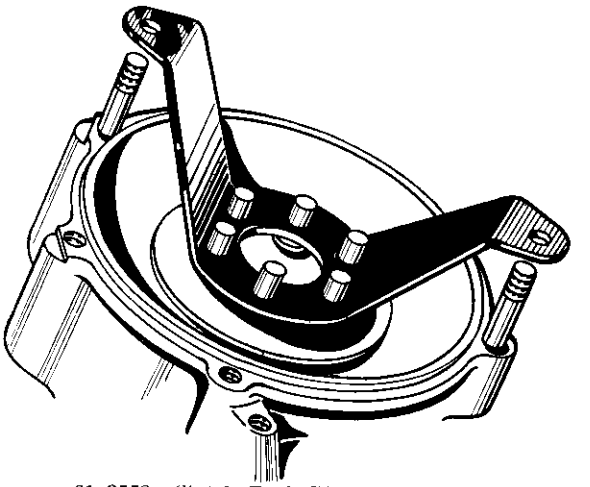
61 3554 Gearbox Sprocket Locking Tool



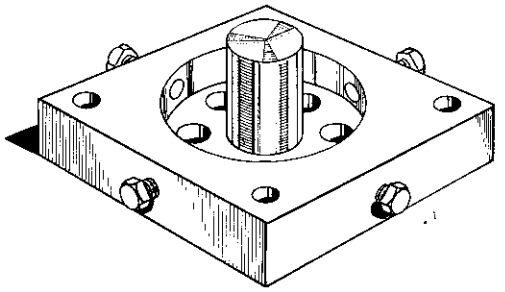
61-3513
Rear Suspension
Dismantling Tool



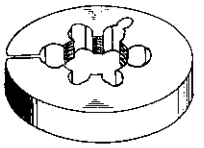
61 3551 Flywheel Locking Tool



61-3553 Clutch Back Plate Locking Tool

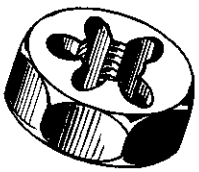


61-3499 Bench Die Holder



61-3483 Die

Tap



Die Nut

Part No.	Description	For
61-3574	Tap and Die Set in wooden case comprising tools listed below except 61-3483	General Workshop use
61-3575	Tap and Die Set in wooden case comprising all tools listed below	General Workshop use

TAPS.

Part No.	Taps.		For
61-3461	3/8" x 19 TPI B.S.P.	(R/H)	Petrol Tap Hole.
61-3462	3/8" x 20 TPI B.S.F.	(L/H)	Sunbeam Dynamo.
61-3463	7/16" x 20 TPI C.E.I.	(R/H)	General.
61-3464	1/2" x 20 TPI C.E.I.	(R/H)	General.
61-3502	9/16" x 20 TPI C.E.I.	(R/H)	General.
61-3465	9/16" x 20 TPI C.E.I.	(L/H)	Front Fork Spindle Hole.
61-3466	5/8" x 20 TPI C.E.I.	(R/H)	General.
61-3467	3/4" x 20 TPI C.E.I.	(R/H)	General.
65-3468	3/4" x 20 TPI B.S.W.	(R/H)	General.
61-3469	3/4" x 12 TPI B.S.F.	(L/H)	Sunbeam Rear Spindle Hole.
61-3470	7/8" x 20 TPI B.S.W.	(R/H)	Rear Suspension Shaft.
61-3471	1-1/16" x 20 TPI C.E.I.	(R/H)	Fork Shaft Top.
61-3472	1 1/8" x 28 TPI B.S.W.	(R/H)	Fork Shaft Bottom.
61-3473	1 1/2" x 20 TPI B.S.W.	(R/H)	Filler Caps.
61-3531	14 mm. x 1.25 mm.	(R/H)	14 mm. Spark Plug Hole
61-3533	1.250" x 20 TPI B.S.W.	(R/H)	Bantam Fork Tube (90-5021)

DIES.

Part No.	Dies.		For
61-3474	7/16" x 20 TPI C.E.I.	(R/H)	General.
61-3475	1/2" x 20 TPI C.E.I.	(R/H)	General.
61-3476	9/16" x 20 TPI C.E.I.	(R/H)	Gearbox Mainshaft.
61-3477	9/16" x 20 TPI C.E.I.	(L/H)	"A" Group Mainshaft.
61-3478	5/8" x 20 TPI C.E.I.	(R/H)	General.
61-3479	3/4" x 20 TPI C.E.I.	(R/H)	General.
61-3480	3/4" x 12 TPI B.S.F.	(L/H)	Sunbeam Rear Spindle.
61-3481	1" x 24 TPI C.E.I.	(R/H)	Fork Stem.
61-3482	1.120" x 24 TPI C.E.I.	(R/H)	Fork Stem.
61-3483	1 5/8" x 28 TPI WHIT.	(R/H)	Fork Sliding Tube Top.
61-3499	Bench Die Holder (for use with 61-3483) ...		

B.S.A. MOTOR CYCLES LTD.
Service Dept., Birmingham 11
Printed in England

B.S.A. Service Sheet No. 711A

Revised Sept., 1958

PRICE LIST

for

SERVICE TOOLS

1946 to 1958 Inclusive

Use in conjunction with Service Sheet No. 711

Part No.	Description	Used on Model	Retail Price Per Unit £ s. d.
15-832	Rear Hub Nut Spanner	A, B, C and M	4 5
61-317	Stud Box 5/16" c.e.i.	General	3 0
61-545	Stud Box 3/8" c.e.i.	General	3 0
61-658	Gudgeon Pin Bush Extractor	All Models	10 6
61-691	Cam Pinion Post Extractor	B and M	4 6
61-692	Flywheel "V" Blocks (used with 61-1821)	B, C and M	2 5 4
61-696	Socket Nut (used with 61-1817)	B, C and M	1 5
61-698	Crankpin Nut Spanner only (used with 61-1817) ...	B, C and M	1 1 0
61-699	Stud Box 1/4" c.e.i.	General	3 0
61-705	Nipple Key (10 and 12 gauge)	General	3 10
61-773	Nipple Key (8 and 10 gauge)	General	3 10
61-1747	Flywheel Bolster Ring	C Group	4 1 3
61-1749	Flywheel Bolster Ring	B and M 500 c.c.	4 1 3
61-1750	Flywheel Bolster Gauge Rod (2 per set)	B, C and M	7 7
61-1751	Flywheel Bolster	B, C and M	3 11 9
61-1754	Crankpin Nut Socket (used with 61-1817)	C Group	8 0
61-1755	Crankpin Nut Socket (used with 61-1817)	B and M	8 0
61-1817	Crankpin Nut Spanner complete	B, C and M	2 7 6
	Comprising:		
	61-696 Socket Nut		1 5
	61-698 Spanner		1 1 0
	61-1754 Socket	C Group	8 0
	61-1755 Socket	B and M	8 0
	61-3228 Socket	Gold Star	9 1

BSA SERVICE TOOLS

Part No.	Description	Used on Model	Per Unit Retail Price £ s. d.
61-1821	"V" Block Base Plate (used with 61-692)	B, C and M	1 10 3
61-1822	Cush Drive Spring Assembly Tool (2 per set) ...	A, B, C and M	4 6
61-1903	Magdyno Drive Pinion Extractor	B and M	3 0
61-1912	Clutch Extractor	M to 1948	6 0
61-1915	Clutch Spring Nut Tube Spanner	M to 1948	4 6
61-1922	Reamer (used with 61 1932) (mainshaft bush) ...	C Group	3 5 0
61-1932	Reamer and Holder complete (used with 61-1922)	C Group	4 4 9
61-3001	Fork Top Nut Spanner (front fork)	A, B, C and M	13 6
61-3002	Adjuster Sleeve Assembly Tool (steering head) ...	B, C and M	12 1
61-3003	Fork Plug Spanner (front fork)	A, B, C and M	13 6
61-3005	Oil Seal Holder Assembly Tool (front fork) ...	A, B, C and M	1 1 2
61-3006	Oil Seal Extractor (front fork)	A, B, C and M	15 1
61-3007	Oil Seal Assembly Tool (front fork)	A, B, C and M	6 0
61-3008	Adjuster Sleeve Assembly Tool (steering head) ...	A7/10, S7/8	12 1
61-3049	Cylinder Head Spanner	M20/21	10 6
61-3052	Cylinder Base Nut Spanner	M20/21	1 1 2
61-3055	Clutch Testing Tool	M to 1948	15 1
61-3060	Steering Head Ballrace Extractor	For 3/16" Balls	8 3
61-3061	Piston Ring Slipper (2 per set)	A7 to 1950	7 6
61-3063	Steering Head Ballrace Extractor	For 1/4" Balls	8 3
61-3064	Pinion Sleeve Extractor	B, C and M	2 11 5
61-3069	Inlet Tappet Guide Extractor	A7 to 1950	7 7
61-3159	Camshaft Bush Extractor	A7, A10	12 8
61-3167	Camshaft Bush Reamer (used with 61-3275/81) ...	A Group	3 0 6
61-3185	Gearbox Bush Extractor	M Group	15 9
61-3188	Flywheel Magneto Removal Tool (Wico Pacy) ...	D1, D3 and D5	6 8
61-3191	Clutch Plate Circlip Removal Tool	D1, D3 and D5	1 10 3
61-3199	Gearbox Bush Line Reaming Plate (used with 61-3205)	D1, D3 and D5	2 1 6
61-3205	Layshaft Bush Reamer only (used with 61-3199) ...	D1, D3 and D5	2 1 11
61-3206	Flywheel Dismantling and Assembly Tool	D1, D3 and D5	3 15 6
	Comprising:—		
	61-3207 Jig Body		
	61-3208(2) Dismantling Bar		
	61-3209 Dismantling Punch		
	61-3210 Assembly Bridge		
	(*Note:*—Press as illustrated is not included).		
61-3212	Ballrace Pilot for large engine bearing	D1, D3 and D5	7 7
61-3213	Ballrace Pilot for small engine bearing	D1, D3 and D5	6 8
61-3214	Ballrace Pilot for gearbox pinion bearing	D1, D3 and D5	7 7
61-3215	Ballrace Pilot for gearbox mainshaft bearing ...	D1, D3 and D5	6 8
61-3217	Spanner for rear wheel sprocket	A7, A10	11 3
61-3220	Tube Spanner for cush drive nut	A, B, C and M	3 6
61-3222	Rear Suspension Strip and Assembly Tool	A, B and M	13 6
61-3228	Crankpin Nut Socket (used with 61-1817)	B32/4 G/S	9 1
61-3246	Reamer Gudgeon Pin Bush	D1, D3	14 6
61-3256	Extractor Set complete	All Models	1 12 7
	Comprising:		
	61-351(1) Plate		
	61-776(1) Bolt		
	61-1732(2) Extractor Leg (A Group cam pinion)		
	61-1733(2) Extractor Leg (engine pinion B, C and M).		
	61-3187(2) Extractor Leg (crankshaft pinion A7/10).		
	61 3198(2) Extractor Leg (engine sprocket etc., D, C and A).		
	61-3548(2) Extractor Leg (Dandy flywheel) ...		

BSA SERVICE TOOLS

Part No.	Description	Used on Model	Retail Price Per Unit £ s. d.
61-3257	Gearbox Sprocket Locknut Spanner	A, B and M	15 1
61-3258	Gearbox Sprocket Locknut Spanner	C	15 1
61-3262	Piston Ring Slipper (2 per set)	A10	6 0
61-3263	Valve Guide Punch (used on B33/34, exhaust and G/Stars with .374 dia. valve stems).		3 0
61-3264	Valve Guide Punch (comprising 61-3265/66 and 61-3307)	C10 In. and Ex.	12 8
61-3265	Valve Guide Punch (B31/32 inlet, A7/10, C11, C12 inlet and exhaust and G/Stars with .310″ dia. valve stems)		6 0
61-3267	Valve Guide Punch (comprising 61-3268/9/70)	M20, M21 In. and Ex.	8 3
61-3268	Valve Guide Punch (B31/32 exhaust, B33/34 inlet and G/Stars with .348″ dia. valve stems)		6 0
61-3275	Mainshaft and Camshaft Bush Reaming Jig	A7 to 1950	2 12 11
61-3281	Mainshaft and Camshaft Bush Reaming Jig	A10, AA7 onwards	2 12 11
61-3284	Reamer (mainshaft used with 61-3275/81)	A7, A10	4 6 2
61-3285	Pilot for 61-3275	A7 to 1950	15 1
61-3286	Pilot for 61-3281	A10, AA7 onwards	15 1
61-3287	Reamer Holder (used with 61-3284)	A7, A10	9 1
61-3290	Valve Seat Cutter Holder	A, B, C and M	5 3
61-3293	Valve Seat Cutter Pilot ($\frac{5}{16}$″)	A, B and C	6 8
61-3294	Valve Seat Cutter Pilot (.350″)	B and M	6 8
61-3295	Valve Seat Cutter Pilot (.375″)	B, and M33	6 8
61-3298	Valve Seat Cutter ($1\frac{7}{16}$″ dia x 45° x 20°)	A7 and C	2 6 2
61-3299	Valve Seat Cutter ($1\frac{1}{2}$″ dia. x 45° x 20°)	A10 and C	2 6 2
61-3300	Valve Seat Cutter ($1\frac{5}{8}$″ dia. x 45° x 20°)	B	2 6 2
61-3301	Valve Seat Cutter ($1\frac{3}{4}$″ dia. x 45° x 20°)	B and M	2 6 2
61-3302	Valve Seat Cutter ($1\frac{7}{8}$″ dia. x 45° x 20°)	B and M	2 6 2
61-3305	Valve Seating Tool complete	A, B, C and M	12 16 2
61-3306	Clutch Assembly Tool	M to 1948	3 0
61-3308	Reamer for 61-3199 (comprising 61-3205 and 61-3309)	D1, and D3	2 8 1
61-3311	Crankshaft Balance Weight (18 ozs., 12 drms.)	A7 1951 onwards	15 1
61-3312	Crankshaft Balance Weight (16 ozs., 14 drms.)	A7 to 1951	15 1
61-3334	Piston Ring Slipper (2 per set)	A7 1951 onwards	6 0
61-3340	Valve Spring Compressor complete	A, B, C and M	1 1 2
61-3350	Front Fork Dismantling and Assembly Tool	A, B, C, M and S7/8	15 1
61-3362	Clutch Extractor Tool	A, B, C and M 1949 onwards	6 8
61-3366	Gudgeon Pin Bush Reamer (.750″)	B, M and A10	1 1 10
61-3367	Gudgeon Pin Bush Reamer (.625″)	C only	1 2 8
61-3487	Valve Guide Assembly Punch	S7 and S8	15 1
61-3497	Crankshaft Balance Weight (19 ozs. 8 drms.)	A10R/R and S/R	13 9
61-3499	Bench Die Holder (used with 61-3483)	A, B, C and M	2 18 6
61-3503	Rear Suspension Dismantling Tool	A and B S/A	1 17 10
61-3513	Rear Suspension Dismantling Tool	C12 and D3 S/A	1 14 4
61-3536	Flywheel Assembly Tool	Dandy	5 6
61-3540	Flywheel Removal Tool	Dandy	6 3
61-3542	Wheel Bearing Nut Peg Spanner	A and B, S/A	10 4
61-3548	Flywheel Removal Tool (2) (used with 61-3256)	Dandy	4 7
61-3551	Flywheel Locking Tool	Dandy	1 2
61-3552	Starter Ratchet Circlip Assembly Tool	Dandy	5 3
61-3553	Clutch Back Plate Locking Tool	Dandy	9 2
61-3554	Gearbox Sprocket Locking Tool	Dandy	5 5
61-3556	Gudgeon Pin Bush Reamer ($\frac{11}{16}$″)	A7	1 17 10
61-3558	Locking Ring Spanner	8″ Brake	11 10
61-3580	Gudgeon Pin Bush Reamer ($\frac{7}{16}$″)	Dandy	1 0 0
61-3581	Gudgeon Pin Bush Reamer ($\frac{9}{16}$″)	D5	1 6 10
65-9240	Valve Grinding Tool	A, B, C and M	1 10
65-9243	Combined "C" and Fork Top Nut spanner	A, B, C and M	1 10
67-9114	Push Rod Assembly Tool	A7/10 1951 onwards	1 5
90-297	Lucas Rotor Removal Tool	D1	1 3

BSA SERVICE TOOLS

Part No.	Description	Used on Models	Retail Price £ s. d.
61-3574	Tap and Die Set in wood case comprising taps and dies listed below except 61-3483	General	23 15 0
61-3575	Tap and Die Set in wood case comprising taps and dies listed below	General	32 7 0

TAPS

Part No.	Taps	Description	Retail Price £ s. d.
61-3461	3/8" x 19 T.P.I. B.S.P. R/H	Petrol Tap Hole	7 7
61-3462	3/8" x 20 T.P.I. B.S.F. L/H	Sunbeam Dynamo	7 7
61-3463	7/16" x 20 T.P.I. C.E.I. R/H	General	13 1
61-3464	1/2" x 20 T.P.I. C.E.I. R/H	General	14 6
61-3502	9/16" x 20 T.P.I. C.E.I. R/H	General	18 7
61-3465	9/16" x 20 T.P.I. C.E.I. L/H	Front Fork Spindle Hole ...	1 0 0
61-3466	5/8" x 20 T.P.I. C.E.I. R/H	General	17 3
61-3467	3/4" x 20 T.P.I. C.E.I. R/H	General	18 7
61-3468	3/4" x 20 T.P.I. B.S.W. R/H	General	18 7
61-3469	3/8" x 12 T.P.I. B.S.F. L/H	Sunbeam Rear Spindle Hole ...	1 0 0
61-3470	7/8" x 20 T.P.I. B.S.W. R/H	Rear Suspension Shaft ...	1 7 6
61-3471	1 1/16" x 20 T.P.I. C.E.I. R/H	Fork Shaft Top	1 5 6
61-3472	1 1/8" x 28 T.P.I. B.S.W. R/H	Fork Shaft	1 14 4
61-3473	1 1/2" x 20 T.P.I. B.S.W. R/H	Filler Cap	2 14 7
61-3531	14 mm. x 1.25 mm. R/H	Spark Plug	1 0 7
61-3533	1.250" x 20 T.P.I. B.S.W. R/H	D1 Fork Tube	1 11 0

DIES

Part No.	Dies	Description	Retail Price £ s. d.
61-3474	7/16" x 20 T.P.I. C.E.I. R/H	General	11 0
61-3475	1/2" x 20 T.P.I. C.E.I. R/H	General	12 4
61-3476	9/16" x 20 T.P.I. C.E.I. R/H	Gearbox Mainshaft	13 9
61-3477	9/16" x 20 T.P.I. C.E.I. L/H	A Group Mainshaft	17 3
61-3478	5/8" x 20 T.P.I. C.E.I. R/H	General	13 9
61-3479	3/4" x 20 T.P.I. C.E.I. R/H	General	18 7
61-3480	3/8" x 12 T.P.I. B.S.F. L/H	Sunbeam Rear Spindle ...	1 2 0
61-3481	1" x 24 T.P.I. C.E.I. R/H	Fork Stem	1 4 1
61-3482	1.120" x 24 T.P.I. C.E.I. R/H	Fork Stem	1 13 9
61-3483	1 7/8" x 28 T.P.I. Whit. R/H ... ... (Used with holder 61-3499)	Fork Sliding Tube Top ...	9 9 1

~~B.S.A. Cycles Ltd., Service Department, Birmingham 11~~

Printed in England. Sept. 1958

B.S.A. Motor Cycles Ltd., Service Department, Birmingham 11

BSA SERVICE SHEET No. 712X

ALL GROUPS

FLYWHEEL BALANCING (STATIC)

Revised and Reprinted October 1956.
Revised May 1958.

Flywheel balancing should not be undertaken except by an expert mechanic, who is fully equipped with the tools described in this Service Sheet.

Unless very great care is exercised, excessive engine vibration may result from any change of balance, and unless extreme care is practised in flywheel drilling, flywheels may be seriously weakened.

All flywheel assemblies are accurately balanced before leaving the Works and there should be no need to re-balance when fitting new big end assemblies unless the difference in weight between the old and new assembly is more than 1 to 1¾ozs.

When a fabricated crankshaft is employed as on the "C", "B" and "M" Group models, the method of flywheel truing is described in Service Sheet No. 607.

The equipment required for balancing is a drilling machine and knife edge rollers (see Fig. X10) which must be set up perfectly horizontal and sufficiently high to allow the flywheels to revolve with the Con Rod hanging.

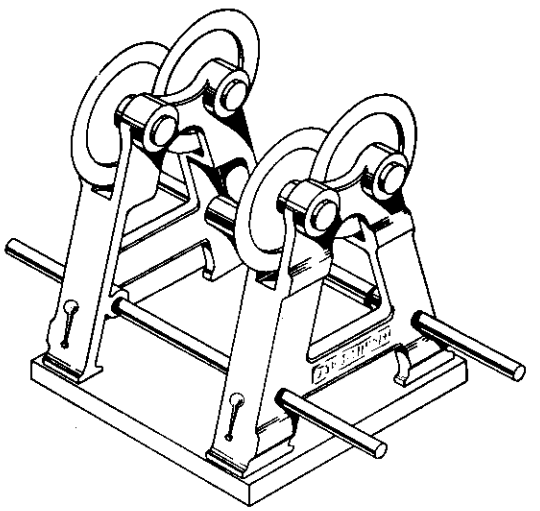
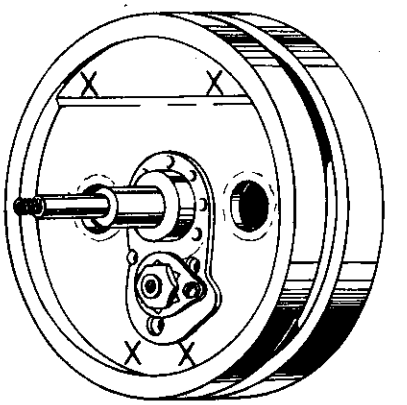


Fig. X10. Knife Edge Rollers.



X, DENOTES SUGGESTED DRILLING POINTS.

Fig. X11. "B" and "M" Group Flywheels.

For balancing purposes a small weight equivalent to part of the reciprocating weight must be attached to the small end of the Con Rod. A table of these weights is given below.

Place the assembly on the knife edges and allow to revolve till it stops, mark the lowest spot with chalk and check again two or three times.

To find the amount of the out-of-balance apply plasticine to the rim of the wheels diametrically opposite the heaviest point until the wheels remain stationary when placed in any position.

The wheels must now be drilled at the heaviest spot to remove metal equal to the weight of plasticine. Care must be taken to drill each wheel equally (see Fig. X11).

BALANCING "A" GROUP FLYWHEELS.

A group flywheels are treated similarly to the single cylinder models except that the Con Rods are not fitted, a balance weight being attached to each crank pin. These are available as Service Tools, 61–3310 for A7, 61–3312 for A7 after Engine No. AA7–101, 61–3311 for A10 and 61–3497 for A10 Road Rocket. New bolts and nuts must be used to secure the flywheel and the ends of the bolts peined over after locking.

Drilling is carried out on the periphery of the flywheel instead of the webs and care must be taken to keep the holes central and not too deep, the maximum depth should not be more than 3/16" (see Fig. X12). It is preferable to start with a smaller diameter hole which can be opened out if necessary, rather than a large diameter to then find that too much metal has been removed.

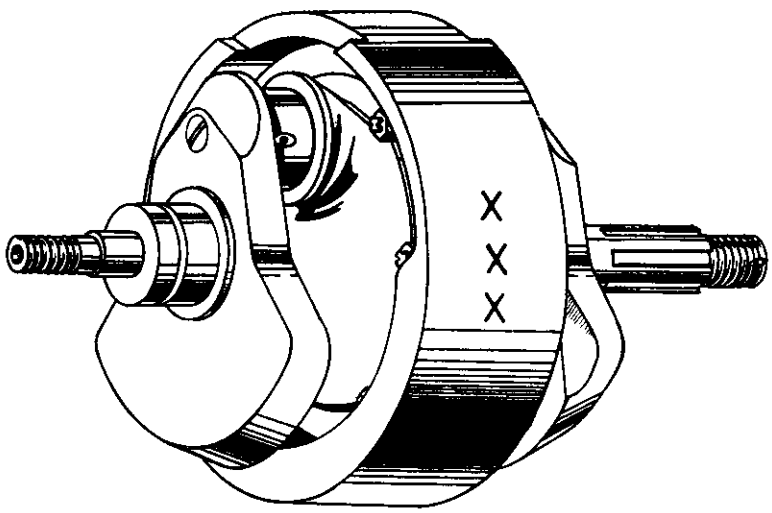


Fig. X12. "A" Group Crankshaft.

Model	Weight attached
A7	2 @ 19 ozs. 10 drams
A7 after AA7–101 ...	2 @ 16 ozs. 12 drams
A10	2 @ 18 ozs. 10 drams
A10 Road Rocket ...	2 @ 19 ozs. 8 drams
C Group	3 ozs. 5 drams
B31	4 ozs. 6 drams
B33 and M33	8 ozs. 8 drams

Model	Weight attached
B32 Competition ...	5 ozs. 4 drams
B34 Competition ...	9 ozs. 9 drams
B32 Gold Star ...	6 ozs. 5 drams
B34 Gold Star ...	11 ozs. 4 drams
M20	7 ozs.
M21	5 ozs. 10 drams

Note:- Service Tool No. 61-3497 should be used on Crankshaft No. 67-1218 which is fitted to the Super Rocket and A10 machines after Eng. No. CA10R-4650 and DA10-101 respectively.

B.S.A. MOTOR CYCLES LIMITED, Service Dept., Birmingham, 11
(PRINTED IN ENGLAND)

BSA SERVICE SHEET No. 713

This sheet supersedes No. 411
Revised Nov., 1958
Reprinted July, 1960

ALL MODELS EXCEPT D GROUP AND C15
DISMANTLING OF STEERING HEAD

Remove the headlamp from the forks after undoing the two retaining bolts, and allow it to hang in a position where it cannot be damaged. If a headlamp cowl is fitted, it should be removed complete with the headlamp.

On later models of the type shown in Fig. C31A the lamp is not removed, but it is necessary to take off the lamp front by unscrewing pin *F* and to disconnect the speedometer cable and the leads to the switch.

Detach the handlebars complete with controls, and lay them on top of the petrol tank, using a piece of rag to protect the enamel. Remove the chromium plated top caps *A* and *B* (Fig. C31). Slacken the pinch bolt *C* and remove the adjusting sleeve *D* or *E*, Fig. C31A. Tap off the fork top yoke by striking it with a mallet underneath its two sides alternately.

The steering column can now be drawn downwards from the head, and the top ballrace removed. Note: If the bearings are dry a means of catching the steel balls should be arranged as they will fall as the column is drawn out.

The cups which remain in the head can be withdrawn by means of extractor No. 61–3060 for "C" Group, and 61–3063 for "A," "M" and "B" Groups. This is screwed firmly into the cup, then extractor and cup are driven out from the opposite end with the aid of a suitable bar.

If the cups and cones are pitted to even a slight degree, they must be replaced, otherwise steering will be adversely affected and will rapidly become worse.

Pitting is invariably due to "hammering" of the balls in their tracks, caused by slack adjustment.

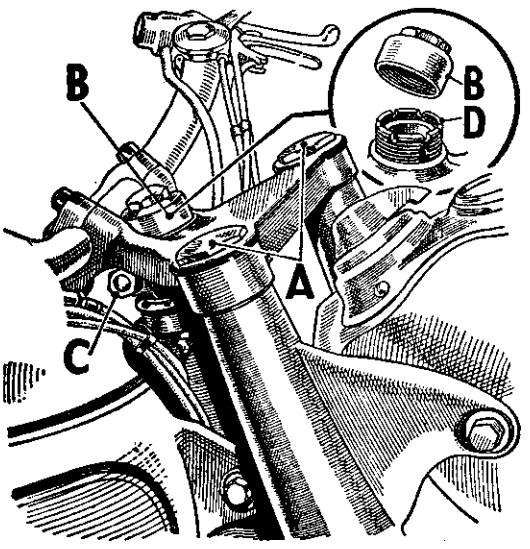


Fig. C31. The front fork and steering head.

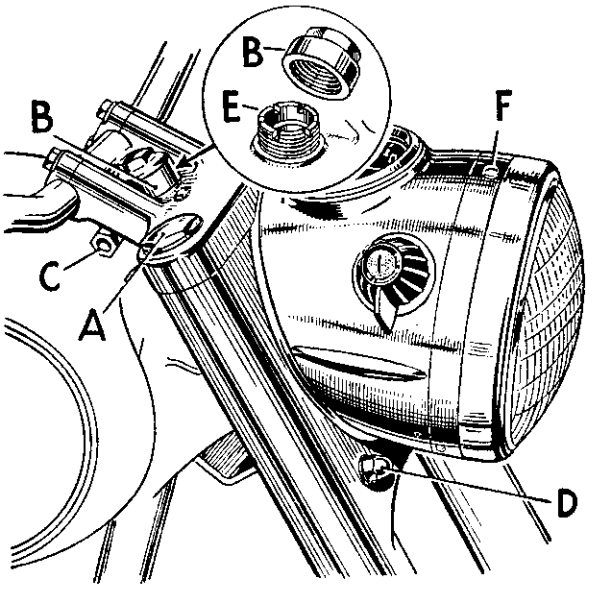


Fig. C31A.

Reassembly of Steering Head

When fitting new ballrace cups make sure that they are driven in squarely and that they are pressed well home. Replace the steering column balls, cone, adjusting sleeve and top-yoke. If any difficulty is experienced in retaining the balls in position, smear the tracks heavily with grease.

Adjust the column so that it turns freely without play and tighten the pinch bolt *C*. Finally replace headlamp and handlebar controls.

B.S.A. MOTOR CYCLES LTD.,
Service Dept., Waverley Works, Birmingham 10.
Printed in England.

SPOKE SIZES.

NOTE.—All Models use Forty Spokes per Wheel except "D" Group which have Thirty-six.

YEAR	MODEL	FRONT							REAR						
		RIM SIZE	LEFT			RIGHT			RIM SIZE	LEFT			RIGHT		
			Length	Gauge	Part Number	Length	Gauge	Part Number		Length	Gauge	Part Number	Length	Gauge	Part Number
1947	C10	WM1-19	8 3/4"	10	24-7012	8 3/4"	10	24-7012	WM1-19	8 3/4"	10	24-7012	6 7/8"	10	24-7014
	C11	WM1-20	9 1/4"	10	24-6912	9 1/16"	10	29-5772	WM2-20	9 1/4"	10	24-6912	7 3/8"	10	65-5873
	B31-B33	WM2-19	8 11/16"	10	65-5872	7 1/2"	10	65-5910	WM2-19	8 5/16"	8/10	65-6072	8 3/4"	10	24-7012
	B32-B34	WM1-21	9 11/16"	10	65-5537	8 5/16"	10	90-5584	WM2-19	8 5/16"	8/10	65-6027	8 3/4"	10	24-7012
	M20-M21 Girder Fork	WM3-19	8 3/4"	10	24-7012	6 3/4"	8/10	24-6899	WM3-19	8 5/8"	8/ 5/16	15-7037	8 3/4"	8	26-6824
	A7	WM2-19	7 23/32"	10/12	67-6008	8 1/16"	10/12	67-6007	WM3-19	7 23/32"	10/12	67-6008	8 1/16"	10/12	67-6007
1948	C10	WM1-19	8 3/4"	10	24-7012	8 3/4"	10	24-7012	WM1-19	8 3/4"	10	24-7012	6 7/8"	10	24-7014
	C11	WM1-20	9 1/4"	10	24-6912	9 1/16"	10	29-5772	WM1-20	9 1/4"	10	24-6912	7 3/8"	10	65-5873
	B31	WM2-19	8 11/16"	10	65-5872	7 1/2"	10	65-5910	WM2-19	8 5/16"	8/10	65-6027	8 3/4"	10	24-7012
	B32	WM1-21	9 11/16"	10	65-5537	8 5/16"	10	29-5846	WM2-19	8 5/16"	8/10	65-6027	8 3/4"	10	24-7012
	B33	WM2-19	8 11/16"	10	65-5872	7 1/2"	10	65-5910	WM2-19	8 5/16"	8/10	65-6027	8 3/4"	10	24-7012
	B34	WM1-21	9 11/16"	10	65-5537	8 5/16"	10	90-5584	WM2-19	8 5/16"	8/10	65-6027	8 3/4"	10	24-7012
	M20-M21 Girder Fork	WM3-19	8 3/4"	10	24-7012	6 3/4"	8/10	24-6899	WM3-19	8 5/8"	8/ 5/16	15-7037	8 3/4"	8	26-6824
	M33-G.F.	WM3-19	8 3/4"	10	24-7012	6 3/4"	8/10	24-6899	WM3-19	8 5/8"	8/ 5/16	15-7037	8 3/4"	8	26-6824
	A7	WM2-19	7 23/32"	10/12	67-6008	8 1/16"	10/12	67-6007	WM3-19	7 23/32"	10/12	67-6008	8 1/16"	10/12	67-6007
1949	D1	WM1-19	8 5/16"	10	90-5584	7 1/8"	10	90-5583	WM1-19	8 5/16"	10	15-7072	8 5/16"	10	29-5846
	D1 Comp	WM1-19	8 5/16"	10	90-5584	7 1/8"	10	90-5583	WM2-19	8 5/16"	10	15-7072	8 5/16"	10	29-5846
	C10	WM1-19	8 3/4"	10	24-7012	8 3/4"	10	24-7012	WM1-19	8 3/4"	10	24-7012	6 7/8"	10	24-7014
	C11	WM1-20	9 1/4"	10	24-6912	9 1/16"	10	29-5772	WM1-20	9 1/4"	10	24-6912	7 3/8"	10	65-5873
	B32-B34 G/S Std. & Spg. Frame	WM1-21	9 11/16"	10	65-5537	8 5/16"	10	90-5584	R	8 5/16"	8/10	65-6027	8 3/4"	10	24-7012
									WM2-19S	7 23/32"	10/12	67-6008	7 23/32"	10/12	67-6008
	B31-B32 Std. & Spg. Frame	WM2-19	8 11/16"	10	65-5872	7 1/2"	10	65-5910	R	8 5/16"	8/10	65-6027	8 3/4"	10	24-7012
									WM2-19S	7 23/32"	10/12	67-6008	7 23/32"	10/12	67-6008
	M20-M21-M33 Tele. Forks	WM2-19	8 11/16"	10	65-5872	7 1/8"	10	65-5910	WM2-19	8 5/8"	8/ 5/16	15-7037	8 5/8"	8	24-6896
	A7 Star Twin Std. & Spg. Frame	WM2-19	8 11/16"	10	65-5872	7 1/2"	10	65-5910	WM2-19	7 23/32"	10/12	67-6008	7 23/32"	10/12	67-6008

BSA SERVICE SHEET No. 714

Printed September, 1956

Revised October, 1957

SPOKE SIZES—*continued.*

YEAR	MODEL	FRONT						REAR					
		RIM SIZE	LEFT			RIGHT			RIM SIZE	LEFT			RIGHT		
			Length	Gauge	Part Number	Length	Gauge	Part Number		Length	Gauge	Part Number	Length	Gauge	Part Number
1950	D1 Std. & Spg. D1 Comp. Spg.	WM1-19	8 5/16"	10	90-5584	7 1/8"	10	90-5583	WM1-19	8 5/16"	10	15-7072	8 5/16"	10	90-5584
	C10	WM1-19	8 3/4"	10	24-7012	8 3/4"	10	24-7012	WM1-19	8 3/4"	10	24-7012	6 7/8"	10	24-7014
	C11	WM1-20	9 1/4"	10	24-6912	9 5/16"	10	29-5772	WM1-20	9 1/4"	10	24-6912	7 3/8"	10	65-5873
	B31-B33 Std. & Spg. Frame	WM2-19	8 11/16"	10	65-5872	7 1/2"	10	65-5910	R	8 5/16"	8/10	65-6027	8 3/4"	10	24-7012
									WM2-19S	7 29/32"	10	65-6302	7 29/32"	10	65-6302
	B32-B34 Comp. Models	WM1-21	9 1/16"	10	65-5537	8 5/16"	10	90-5584	WM2-19	8 5/16"	8/10	65-6027	8 3/4"	10	24-7012
	350 and 500 Scramble & Grass Track Models	Varies to Spec.	9 11/16"	10	65-5537	8 5/16"	10	90-5584	Varies to Spec.	7 29/32"	10	65-6302	7 29/32"	10	65-6302
	350 & 500 O.H.V. Gold Star, Clubmans and Road Racing	Varies to Spec.	9 1/16"	10	65-5926	6 7/8"	10	24-7014	Varies to Spec.	7 29/32"	10	65-6302	7 29/32"	10	65-6302
	M20-M21-M33	WM2-19	8 11/16"	10	65-5872	7 1/2"	10	65-5910	WM3-19	8 3/4"	8/ 5/16	15-7037	8 3/4"	8	24-6896
	A7 Star Twin Rigid & Spg. Frame	WM2-19	8 11/16"	10	65-5872	7 1/2"	10	65-5910	WM3-19	7 31/32"	10	65-6302	7 31/32"	10	65-6302
	A10	WM2-19	8 3/4"	10	67-5545	5 13/16"	10	67-5544	WM3-19	7 29/32"	10	65-6302	7 29/32"	10	65-6302
1951 and 1952 (other models as 1950	C10 Spring Frame	WM1-19	8 3/4"	10	24-7012	8 3/4"	10	24-7012	WM1-19	8 3/4"	10	24-7012	6 7/8"	10	24-7014
	C11 Spring Frame	WM1-20	9 1/4"	10	24-6912	9 5/16"	10	29-5772	WM1-20	9 1/4"	10	24-6912	7 3/8"	10	65-5873
	M20-M21-M33 Spring Frame	WM1-19	8 11/16"	10	65-5872	7 1/2"	10	65-5910	WM2-19	7 31/32"	10	65-6303	7 31/32"	10	65-6302
1953 (other models as 1950/52)	B33-A7-A10 Rigid	WM2-19	8 7/8"	10	67-5545	5 13/16"	10	67-5544	WM2-19	8 3/4"	10	24-7012	8 5/16"	10	65-6027
	B33-A7-A10 Spring	WM2-19	8 7/8"	10	67-5545	5 13/16"	10	67-5544	WM2-19	7 31/32"	10	65-6303	7 29/32"	10	65-6302
	GOLD STAR Clubmans, Road Racing & Touring	WM1-19	8 7/8"	10	67-5545	5 13/16"	10	67-5544	WM2-19	7 31/32"	10	65-6303	7 29/32"	10	65-6302
		WM1-21	9 11/16"	10	67-5537	8 5/16"	10	90-5584	WM2-19	7 31/32"	10	65-6303	7 29/32"	10	65-6302
	B32-B34 Trials	WM1-21	9 1/16"	10	67-5537	8 5/16"	10	90-5584	WM3-19	7 31/32"	10	65-6303	7 31/32"	10	65-6302
	B32-B34 Scrambles	WM1-21	9 1/16"	8	42-5524	8 7/16"	8	31-6015	WM3-19	7 31/32"	10	65-6303	7 31/32"	10	65-6302

SPOKE SIZES—*continued*

YEAR	MODEL	FRONT							REAR						
		RIM SIZE	LEFT			RIGHT			RIM SIZE	LEFT			RIGHT		
			Length	Gauge	Part Number	Length	Gauge	Part Number		Length	Gauge	Part Number	Length	Gauge	Part Number
1954 and 1955	D1–D3 Rigid & Spring	WM1–19	8 5/16"	10	90–5584	7 1/8"	10	90–5583	WM1–19	8 5/16"	10	90–6042	8 5/16"	10	90–5584
	D1–D3 Comp.	WM1–19	8 5/16"	10	90–5584	7"	10	29–5940	WM1–19	8 5/16"	10	90–6042	8 5/16"	10	90–5584
	C10L	WM1–19	8 5/16"	10	90–5584	7"	10	29–5940	WM1–19	8 5/16"	10	90–6042	8 5/16"	10	90–5584
	C11G	WM1–19	8 1/4"	10	24–7012	8 1/4"	10	24–7012	WM1–19	6 7/8"	10	24–7014	8 1/4"	10	24–7012
	C11G (1955) Rigid & Spring	WM1–19	8 1/4"	10	24–7012	7 1/8"	10	65–5910	WM1–19	6 7/8"	10	24–7014	8 1/4"	10	24–7012
	B31–B33 Rigid	WM2–19	8 11/16"	10	65–5872	7 1/2"	10	65–5910	WM2–19	8 5/16"	Butted 8/10	65–6027	8 1/4"	10	24–7012
	B31–B33 Spring	WM2–19	8 11/16"	10	65–5872	7 1/2"	10	65–5910	WM2–19	7 27/32"	10	65–6303	7 29/32"	10	65–6302
	B32–B34 Comp. Rigid	WM1–21	9 11/16"	10	65–5537	8 5/16"	10	90–5584	WM3–19	7 15/32"	10	65–6303	7 19/32"	10	65–6302
	B31 Swinging Arm	WM2–19	8 11/16"	10	65–5872	7 1/2"	10	65–5912	WM2–19	7 15/32"	10	65–6303	7 19/32"	10	65–6302
	B32–B34 Swinging Arm	WM1–21	9 11/16"	10	65–5537	8 5/16"	10	90–5584	WM2–19	7 27/32"	10	65–6303	7 29/32"	10	65–6302
	B33 1954 Swinging Arm	WM2–19	8 7/8"	10	67–5545	5 11/16"	10	67–5544	WM2–19	7 27/32"	10	65 6303	7 29/32"	10	65–6302
	B33 1955 Swinging Arm	WM2–19	8 7/8"	Butted 8/10	67–5606	5 11/16"	10	67–5544	WM2–19	7 27/32"	10	65-6303	7 29/32"	10	65–6302
	GOLD STAR Clubmans, Road Racing & Touring	WM1–19	8 7/8"	10	67–5545	5 11/16"	10	67–5544	WM2–19	7 27/32"	10	65–6303	7 29/32"	10	65–6302
		WM1–21	9 11/16"	10	65–5926	6 5/8"	10	24–7014	WM2–18	7 7/8"	10	42–6011	7 15/16"	10	42–6012
	GOLD STAR Trials	WM1–21	9 11/16"	10	65–5537	8 5/16"	10	90–5584	WM3–19	7 15/32"	10	65–6303	7 19/32"	10	65–6302
	GOLD STAR Scrambles	WM1–21	9 11/16"	8	42–5524	8 7/16"	8	31–6015	WM3–19	7 27/32"	10	65–6303	7 29/32"	10	65–6302
	M20–M21–M33 Rigid	WM2–19	8 11/16"	10	65–5872	7 1/2"	10	65–5910	WM2–19	8 5/8"	Butted 8	15–7037	8 5/8"	Butted 8	24–6896
	M20–M21–M33 Spring	WM2–19	8 11/16"	10	65–5872	7 1/2"	10	65–5910	WM2–19	7 27/32"	10	65–6303	7 29/32"	10	65–6302
	"A" GROUP Plunger & Swinging Arm 1954	WM2–19	8 7/8"	10	67–5545	5 11/16"	10	67–5544	WM2–19	7 27/32"	10	65–6303	7 29/32"	10	65–6302
	"A" GROUP Plunger & Swinging Arm 1955	WM2–19	8 7/8"	Butted 8/10	67–5606	5 11/16"	10	67–5544	WM2–19	7 27/32"	10	65–6303	7 29/32"	10	65–6302

SPOKE SIZES—*continued.*

YEAR	MODEL	FRONT							REAR						
		RIM SIZE	LEFT			RIGHT			RIM SIZE	LEFT			RIGHT		
			Length	Gauge	Part Number	Length	Gauge	Part Number		Length	Gauge	Part Number	Length	Gauge	Part Number
1956/7	D1 Plunger	WM1–19	8 5/16″	10	90–5584	7 1/8″	10	90–5583	WM1–19	8 5/16″	10	90–6042	8 5/16″	10	90–5584
	D3 Swinging Arm	WM1–19	8 5/16″	10	90–5584	7 1/8″	10	90–5583	WM1–19	8 5/16″	10	90–6042	8 5/16″	10	90–5584
	C10L	WM1–19	8 1/4″	10	24–7012	8 1/4″	10	24–7012	WM1–19	8 5/16″	10	90–6042	8 5/16″	10	90–5584
	C12	WM1–19	6 5/8″	10	29–5976	6 5/8″	10	29–5976	WM1–19	7″	10	29–5940	7″	10	29–5940
	B31–B33	WM2–19	6 1/4″	Butted 8/10	42–5635	6 1/4″	Butted 8/10	42–5635	WM2–19	6 1/4″	Butted 8/10	42–5635	6 1/4″	Butted 8/10	42–5635
	GOLD STAR Clubmans, Road Racing & Touring	WM1–19	5 1/8″	10	42–5552	5 1/8″	10	42–5552	WM2–19	7 27/32″	10	65–6303	7 23/32″	10	65–6302
	B32–B34 Comp.	WM1–21	9 11/16″	10	65–5537	8 5/16″	10	90–5584	WM3–19	7 27/32″	10	65–6303	7 23/32″	10	65–6302
	GOLD STAR Scrambles	WM1–21	9 11/16″	8	42–5524	8 7/16″	8	31–6015	WM3–19	7 27/32″	10	65–6303	7 23/32″	10	65–6302
	M21 Rigid	WM2–19	8 7/8″	Butted 8/10	67–5606	5 11/16″	Butted 8/10	66–5560	WM3–19	8 5/8″	Butted 8	15–7037	8 5/8″	Butted 8	24–6896
	M21–M33 Plunger	WM2–19	8 7/8″	Butted 8/10	67–5606	5 11/16″	Butted 8/10	66–5560	WM3–19	7 31/32″	10	65–6303	7 23/32″	10	65–6302
	A7 and Shooting Star	WM2–19	6 1/4″	Butted 8/10	42–5635	6 1/4″	Butted 8/10	42–5635	WM2–19	6 1/4″	Butted 8/10	42–5635	6 1/4″	Butted 8/10	42–5635
	A10 Plunger	WM2–19	8 7/8″	Butted 8/10	67–5606	5 11/16″	Butted 8/10	66–5561	WM2–19	7 31/32″	Butted 8/10	67–6017	7 23/32″	Butted 8/10	67–6016
	A10 and Road Rocket	WM2–19	6 1/4″	Butted 8/10	42–5635	6 1/4″	Butted 8/10	42–5635	WM2–19	6 1/4″	8/10	42–5635	6 1/4″	Butted 8/10	42–5635
	Dandy 70	WM0–15	5 5/8″	12	64–5505	5 5/8″	12	64–5505	WM0–15	5 5/8″	Butted 11/12	64–5507	5 5/8″	Butted 11/12	64–5507