OPERATING & MAINTENANCE MANUAL

FOR THE

BROCKHOUSE

INDUSTRIAL "SPRYT" ENGINE

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Manufactured by

BROCKHOUSE ENGINEERING (SOUTHPORT) LTD.

CROSSENS
SOUTHPORT
ENGLAND

Printed in England

OPERATING AND MAINTENANCE MANUAL

for

THE "SPRYT" INDUSTRIAL ENGINE

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This book has been prepared for the information and guidance of all owners of a "SPRYT" engine.

Each engine has been carefully tested and adjusted before it leaves the Factory, and will operate efficiently and economically for long periods.

The book is divided into three sections :—

(1) General information regarding the principle of operation and design.

(2) Running instructions.

(3) Spares List.

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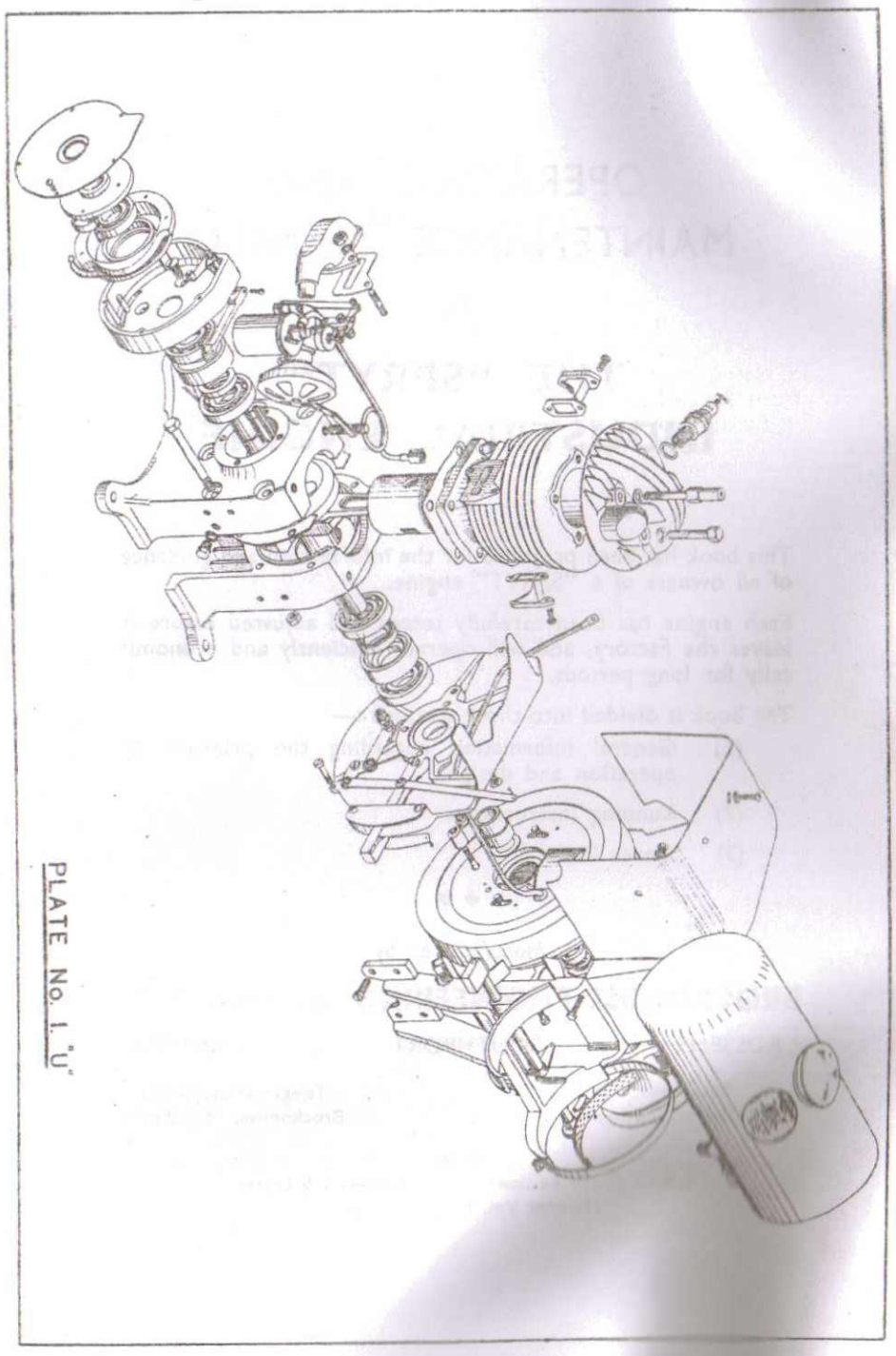
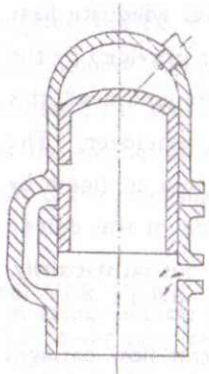


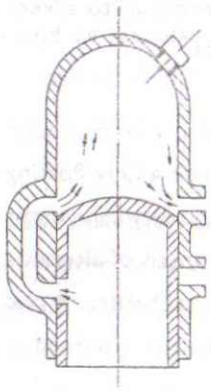
PLATE No. 1. "U"

GENERAL INFORMATION

The engine is a single cylinder air-cooled two-stroke of 125 c.c. or 90 c.c. nominal capacity.

The two-stroke cycle, as the name suggests, has two strokes to a working cycle. In the first stroke the piston compresses the charge of air and fuel into the clearance space where it is ignited. During this stroke a fresh charge of air and fuel is drawn into the crankcase from the carburetter. In the second, or working, stroke the piston is forced downward by the pressure generated by the burning gases. Just before the end of this stroke the exhaust ports are uncovered in the wall of the cylinder by the downward moving piston, allowing the burnt gases to escape. At the same time the transfer ports are uncovered to allow the fresh charge already partially compressed in the crankcase, to be transferred to the cylinder. The new charge of air and fuel is prevented from escaping back through the carburetter by the skirt of the piston covering the inlet. The inlet port is therefore open only towards the top of the stroke and the exhaust port towards the bottom of the stroke.





This type of engine has several advantages over the usual type of four-stroke engine. The chief being :—

1. One working stroke to each revolution instead of one working stroke to every two revolutions as in the four-stroke engine. This gives a more even torque and allows the two-stroke engine to be made much smaller than a four-stroke engine of corresponding horsepower.
2. There are no valves, the only moving parts being the piston, connecting rod and crankshaft. The engine is therefore very simple in construction and reliable in operation.
3. Lubrication is simpler, more reliable and efficient.

GENERAL DESCRIPTION OF ENGINE

With a volumetric capacity of either 125 c.c. or 98 c.c. this two-stroke engine is probably one of the most efficient of its type. The excellent power output obtained is due to the admirable arrangement for gas flow and turbulence, resulting from the design of cylinder ports. A deep finned cylinder barrel of cast iron in conjunction with an aluminium alloy junk head also deeply finned, gives adequate heat radiation. Combustion takes place in the chamber provided by the convex dome of the piston and concave space in the junk head, this permits the high compression ratio of 6.6:1 to be employed. The resulting high temperature on the piston is kept to a minimum by passing the cool transfer gases over the underside of the domed crown. To enable this arrangement to be carried out satisfactorily, the aluminium alloy piston has a long skirt with transfer ports in the walls ; these are connected with integrally cast flow passages in the cylinder itself. Shaped deflector blocks fitted to the cylinder transfer passages give efficient gas turbulence in addition to a very effective scavenging action to expel exhaust gases.

The high-grade forged steel connecting rod, hardened and ground in the bores, is mounted to the piston gudgeon pin on a fully floating phosphor bronze bush. The other end is ground to form the outer race of the fabricated big end roller bearing, composed of alternate steel and phosphor bronze rollers running on the hardened and ground crank pin. The high tensile steel crankshaft is mounted in

four ball bearings two to each side carried in the crankcase. This arrangement gives very accurate alignment, supports the shaft against flexure, and makes for long life under severe working conditions. The crank pin is a press fit in the crank disc on the magneto side and a slide fit on the power take off side. The crankcase is of very robust construction and consists of two aluminium alloy castings bolted together on the centre line of the cylinder. The crankcase is provided with lugs or feet which give a secure and orthodox mounting for this type of engine. The volumetric capacity of the crankcase, always of importance with two-stroke petrol engines, has been carefully calculated. Since the crankcase is the intermediate receptacle for the next charge of gaseous fuel the moving parts therein are always subjected to the oil mist provided by the engine oil in the fuel mixture. Oil seals are fitted on each side of the crankshaft to prevent loss of gas from the crankcase.

POWER TAKE OFF.

The power take off side of the crankshaft is tapped $\frac{1}{4}$" B.S.F. and is fitted with a recessed washer B.E.S. 1331, a shakeproof washer and a $\frac{1}{4}$" B.S.F. setscrew $\frac{5}{8}$" long. The power drive pulley or sprocket should be manufactured to protrude approximately 1/16" over the end of the shaft. The exhaust port is fitted with two $\frac{1}{4}$" B.S.F. bolts $1\frac{1}{8}$" long and two spring washers.

THE GOVERNOR.

The Governor is of the centrifugal type and gives very close speed control which can be adjusted within a small range by means of the adjusting nut provided on the counterbalance spring. The engine is usually supplied for a standard speed range of 2,200 to 2,400 r.p.m.

LUBRICATION.

Lubrication of the engine proper is by the petroil system—twenty parts of petrol and one part of oil, which should be well mixed before filling the tank. Never pour the oil directly into the petrol in the tank. If the engine has been stationary for several days the tank should be well stirred to ensure a good oil distribution throughout the petrol. The oil mist is carried with the petrol through the carburetter into the crankcase where it lubricates all the moving parts. It will be seen that while the engine is running, the oil mist is retained and no further lubrication of this part of the engine is required.

The correct oil to use for the engine is :—

Castrol XXL.
or Triple Shell
,, Motorine B de luxe
,, Mobiloil D
,, Essolube 40

Please note that detergent oils must not be used in this engine.

IGNITION.

The ignition system consists of a flywheel magneto Wico Pacy type FW. 10072 running at engine speed and a 14 mm. sparking plug KLG. FE/70. The flywheel incorporates a cooling fan, the air discharge of which is directed against the cylinder fins, particularly in the region of the exhaust port, to maintain as uniform a cylinder temperature as possible. The rotation of flywheel is clockwise and when fully advanced the spark should be timed to occur 3/16" before top dead centre.

CARBURETTER.

The carburetter is the type Amal 259/082 with a normal jet size of 60.

RUNNING INSTRUCTIONS

To start the engine—

1. Stir the tank to ensure an even oil distribution in the petrol.

2. Open the petrol tap.

3. Flood the carburetter by turning the knob marked FLOOD anti-clockwise until the fuel is seen to drip from the bottom of the carburetter.

4. Close the choke which retricts the flow of air through the carburetter. This is done by the lever on the air filter.

5. Set the control lever to the position marked START.

6. Wind the starter rope around the starter pulley with the knot in the pulley notch. Pull the rope with a quick steady pull. When the engine picks up, open the choke slowly giving the engine time to warm up.

7. Move the control lever to the position marked RUN.

8. If, when starting, the engine is still warm there is no need either to use the choke or to flood the carburetter.

9. Before stopping the engine cut off the petrol supply and allow the egnine to run until the carburetter is emptied. This is not necessary when the engine is in constant use, just move the control lever to position mark STOP.

ADJUSTMENTS

Locating and rectifying possible faults.

1. **Failure to start.**

(a) No petrol.

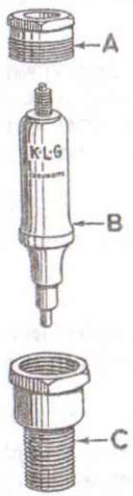
Flood the carburetter by turning the knob marked "FLOOD" anti-clockwise or by depressing the plunger 14/031, plate 8. If the fuel is seen to drip from the bottom of the carburetter, petrol is flowing from the tank to the jet 4/042, plate 8. If no petrol appears clean out :—

(i) the filter and petrol tap.

(ii) the pipe from the tank to the carburetter.

(iii) the float chamber of the carburetter ensuring that no dirt is preventing the needle from dropping or settling properly. Unscrew the plug 259/071, plate 8, and clean the jet 4/042, plate 8.

(b) Faulty ignition due to a defective plug or to dirty magneto contact points. Remove the plug, replace the high tension lead and hold the plug sideways in contact with the cylinder head, rotate the engine. If a blue spark of fair intensity occurs the ignition system is satisfactory. If no spark occurs, remove the high tension lead and hold the end of it about $\frac{1}{8}$" from the cylinder head and rotate the engine. If a spark occurs the plug is faulty and should be cleaned as follows :



Unscrew the gland nut A and remove the centre electrode B, clean this electrode with a petrol-soaked rag to remove any oil or carbon deposits. The body C should be scraped with a penknife or a small file and washed in petrol. Re-assemble the plug, reset the spark gap to the correct amount .020" by bending the outside electrode. Never bend the central electrode. Test as before.

If no spark is observed from the high tension lead, check the magneto contact points. If they are dirty clean with petrol. Ensure they are opening to the correct gap of .018"—.020". The gauge should just slide between the points when they are fully open.

(c) WRONG MIXTURE.

The mixture is either too strong or too weak. If the carburetter has already been flooded the cause is most probably too strong a mixture. To correct this remove the drain plug BES. 889, plate 4, in the crankcase portion, empty out any liquid and replace the plug.

2. **Falling off in performance.**

Raise the needle 259/070, plate 8, *i.e.*, move spring clip 161/054, plate 8, to a lower groove. This gives a richer mixture.

3. **Excessive petrol consumption.**

Lower the needle 259/070, plate 8, *i.e.*, move spring clip 161/054, plate 8, to a higher groove. This gives a weaker mixture.

NOTE.—The spring clip is normally engaged with the second groove from the top and the standard jet is No. 60. If the adjustment of the needle does not produce the required results, then it may be that the jet has worn and a new one is required.

4 **Erratic running.**

This may be due to several causes :—

(i) too rich a mixture

or

(ii) too weak a mixture. Correct as before

and

(iii) the spark occurs too early or too late. Check the timing of the engine.

TIMING AND MAGNETO.

To inspect the contact breaker for correct operation, remove the flywheel inspection cover held by two screws, and observe the points opening by slowly turning the engine. The piston should be 3/16" before top dead centre when the contact points just break. The gap between the points should be checked with a feeler gauge of .018"—.020" when fully open. If this requires adjusting, loosen the screw No. 1085, plate 9, and turn the eccentric headed screw marked X on plate 9, till the gap is correct. Re-tighten the screw No. 1085, plate 9, to lock. The timing can only be altered by means of the advance and retard mechanisms connected to the control lever, no internal adjustment is provided.

DECARBONISING.

When the engine has been used for a considerable period of time, about 100 hours, an appreciable amount of carbon will have formed in the clearance space in the cylinder head under the piston rings and in the ports of the cylinder. This carbon deposit greatly reduces the efficiency of the engine and must be removed.

The engine should be stripped as follows :—

1. Turn petrol off.

2. Unscrew the petrol pipe nut, Plate 7, and remove the pipe from the tap.

3. Loosen the petrol tank straps BES. 2256, plate 7, held by 2BA nuts and bolts, and remove the tank BES. 2203, plate 7. Be careful, if the tank is full, not to spill any liquid through the small vent hole in the cap.

4. Disconnect the magneto lead from the spark plug.

5. Remove the spark plug.

6. Remove the engine cover BES. 2202, plate 6, held by two 2BA. screws at the top, one 2BA. screw at the side and four 2BA. screws around the bottom.

7. Remove the starting pulley BES. 2246, plate 6, held by three $\frac{1}{4}$" Whitworth screws accessible through holes in the pulley.

8. Remove the split pin holding BES. 2271, plate 6, to BES. 2248, plate 7.

9. Remove the air filter held by the clip to carburetter, plate 8.

10. Remove the $\frac{1}{4}$" B.S.F. screws holding the petrol tank support BES. 2204, plate 7. Ease the support forward and remove the petrol pipe BES. 2257, plate 7, held by the nut 221041, plate 8. Remove the support BES. 2204, plate 7.

11. Remove the 4BA. screw holding the governor lever BES. 2230, plate 5, to lever BES. 2247, plate 8.

12. Loosen the bolt 4/048 and remove carburetter.

13. Remove the flywheel locking nut BES. 917, plate 6, and the tab washer BES. 2234, plate 6.

14. Pull the flywheel Y2572B, plate 9. Remove the washer BES. 2232, plate 9, and key BES. 2233, plate 4.

15. Remove the cam 2176, plate 9.

16. Remove the condenser 2144, plate 9, held by two screws 1100, plate 9, to uncover screw BES. 2276, plate 9 and 6. Remove screw link B.E.S. 2276, plate 6 and 9. which holds coupling BES. 2765, plate 6. There is a nut at the back of the magneto body on the screw.

17. Remove the two screws BES. 2281, plate 6 and 9, holding magneto back plate. Withdraw the magneto back plate.

18. Remove the adapter plate BES. 2214, plate 6, held by one screw $\frac{1}{4}$" BSF. and BES. 874, 3 off.

19. Remove the cylinder head BES. 904 held by BES. 901 and BES. 2282, plate 2.

20. Remove the cylinder BES. 2280, plate 2, held by four nuts BES. 900, plate 2.

21 Remove the circlips BES. 826, plate 4, and gudgeon pin BES. 826, plate 4.

Scrape the carbon from :—

(i) The inside of the cylinder head.

(ii) the walls of the ports in the cylinder.

(iii) the top of the piston.

(iv) the grooves in the piston for the rings if the rings are to be replaced by new ones.

An old knife makes an excellent scraper for this work. Great care MUST be taken not to damage the metal or the sealing faces, this is very important in the case of the cylinder head and piston as they are made of aluminium alloy which scratches easily. Polish the faces of the deflector blocks after removing the carbon from them. Re-assemble in the following order :—

(i) Fit the induction stub and deflector blocks in the cylinder. The deflector blocks MUST be replaced in the same position as they were before being removed.

(ii) If the piston rings have been removed fit them to the piston taking care not to expand them more than is necessary.

(iii) Replace the piston on the connecting rod BES. 834, plate 4, and push in the gudgeon pin. Replace the circlips.

(iv) There is a stop pin in the grooves of the piston to prevent the rings rotating and the ring must be so positioned that the small gap left when closed, coincides with the pin. After the rings have been positioned, gently slide the cylinder on to the piston. A chamfer on the bore of the cylinder guides the piston in and closes the piston rings up as the piston advances. If necessary the piston rings may be compressed by the end of the fingers to ensure easy assembly.

(v) Replace the nuts BES. 900, plate 4, and tighten the cylinder down. Fit the cylinder head and screw down.

(vi) Then reassemble in the reverse order to dismantling.

NOTE.—Each time the engine is decarbonised remove the five screws 4BA. holding governor cover BES. 2245, plate 5, the circlip and the governor centre BES. 2240. (Two 2BA. screws can be used as an extractor by screwing into the centre and levering under the heads). Place 2 or 3 drops of a good thin oil into the Hoffmann S.8 governor bearing and reassemble.

STRIPPING.

Instructions are given here for stripping and reassembling the engine, but it should be emphasised that this action should only be undertaken if absolutely necessary. The engine is assembled and checked before it leaves the Factory and will run for sustained periods with complete satisfaction.

The Engine should be stripped as follows :—

1. Turn petrol off.
2. Unscrew the petrol pipe nut, BES. 2257, plate 7, and remove the pipe from the tap.
3. Loosen the petrol tank straps BES. 2256, plate 7, held by 2BA. nuts and bolts, and remove the tank BES. 2203, plate 7. Be careful, if the tank is full, not to spill any liquid through the small vent hole in the cap.
4. Disconnect the magneto lead from the spark plug.
5. Remove the spark plug.
6. Remove the engine cover BES. 2202, plate 6, held by two 2BA. screws at the top, one 2BA. screw at the side and four 2BA. screws around the bottom.
7. Remove the starting pulley BES. 2246, plate 6, held by three $\frac{1}{4}$" Whitworth screws accessible through holes in the pulley.
8. Remove the split pin holding BES. 2271, plate 6, to BES. 2248, plate 7.
9. Remove the air filter held by the clip to carburetter, plate 8.
10. Remove the $\frac{1}{4}$" B.S.F. screws holding the petrol tank support BES. 2204, plate 7. Ease the support forward and remove the petrol pipe BES. 2257, plate 7, held by the nut 221041, plate 8. Remove the support BES. 2204, plate 7.
11. Remove the 4BA. screw holding the governor lever BES. 2230, plate 5, to lever BES. 2247, plate 8.
12. Loosen the bolt 4/048 and remove carburetter.
13. Remove five screws 4BA. holding the governor cover BES. 2245, plate 5, and remove the circlip.
14. Remove the governor centre BES. 2240, plate 5. Two 2BA screws can be used as an extractor by screwing into the centre and levering under the heads.
15. Remove the key BES. 2243, plate 4.
16. Remove the outer governor BES. 2235, plate 5, using two 2BA. screws as before. Take care not to damage the governor spring BES. 2236, plate 5.
17. Remove the governor case BES. 2215, plate 5, held by four $\frac{1}{4}$" B.S.F. screws.

18. Remove the flywheel locking nut BES. 917, plate 6, and the tab washer BES. 2234, plate 6.

19. Pull the flywheel Y2572B, plate 9. Remove the washer BES. 2232, plate 9, and key BES. 2233, plate 4.

20. Remove the cam 2176, plate 9.

21. Remove the condenser 2144, plate 9, held by two screw 1100, plate 9, to uncover screw BES. 2276, plate 9 and 6. Remove screw link BES. 2276, plate 6 and 9, which holds coupling BES. 2765, plate 6. There is a nut at the back of the magneto body on the screw.

22. Remove the two screws BES. 2281, plate 6 and 9, holding the magneto back plate. Withdraw the magneto back plate.

23. Remove the adapter plate BES. 2214, plate 6, held by one screw $\frac{1}{4}$" BSF. and BES. 874, 3 off.

24. Remove the cylinder head BES. 904 held by BES. 901 and BES. 2282, plate 2.

25. Remove the cylinder BES. 2280, plate 2, held by four nuts BES. 900, plate 2.

26. Remove the circlips BES. 826, plate 4, and gudgeon pin BES. 826, plate 4.

27. Remove the bolts BES. 2219, plate 3, holding the crankcase halves together. Pull cases BES. 2210 and BES. 2211, plate 3, apart. The crankpin BES. 2212, plate 4, will pull out of one side of the crank taking the conn. rod BES. 834, with it.

TO RE-ASSEMBLE THE ENGINE.

Reverse the procedure used to dismantle. Faces which have been sealed either with gaskets or sealing compound must be sealed again with any proprietary sealing compound. The engine must be carefully re-timed ; read the instructions given previously under the heading "Timing and Magneto."

HOW TO ORDER SPARE PARTS

If when ordering spare parts you will follow the instructions given below, it will enable our Service Department to give you a quicker and better service. These requirements are essential.

1. State the full serial number of the engine, including the letters appearing both before and after the number.

2. Give the description (or name) and the number of the part.

3. State the quantity required.

4. State how we are to despatch, *i.e.*, by Air Mail, Passenger Train, etc. Give your full address.

5. Send cash with order for the parts required, together with sufficient money to cover the cost of despatch by the service requested in item 4.

NOTE.—In some cases it may be necessary for us to supply additional related parts especially if the part ordered is obsolete.

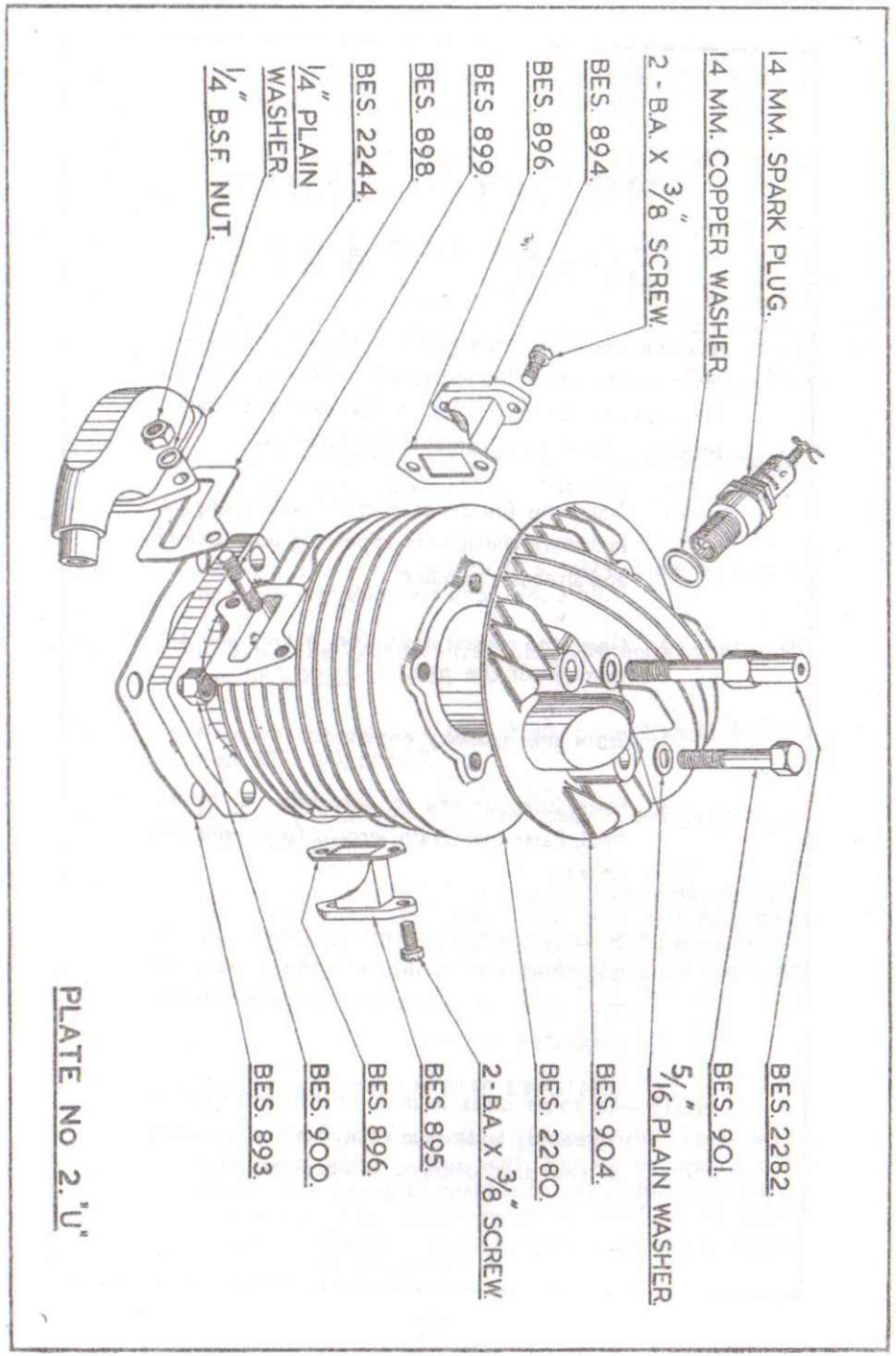


PLATE No. 2. "U"

CYLINDER

Plate No. 2.

Item.	Description	No. Off
BES. 893	Joint washer—cylinder base	1
BES. 894	Transfer block. Bottom	1
BES. 895	„ „ Top	1
BES. 896	Joint Washer—transfer block	2
BES. 898	„ „ carb.—inlet stud	1
BES. 899	Stud...	2
BES. 900	Nut—cylinder barrel	4
BES. 901	Bolt—cylinder head	2
BES. 904	Cylinder head	1
2244	Stub—carburetter inlet	1
2280	Cylinder barrel	1
2282	Bolt—cylinder head	2
	14 mm. Spark plug, K.L.G. FE70	1
	2BA. x 3/8" long screw	4
	1/4" B.S.F. nut	2
	1/4" plain washer	2
	5/16" plain washer	4
	1/4" B.S.F. bolt (exhaust side), 1 1/8" long ...	2
	1/4" Spring washer (exhaust side)	2

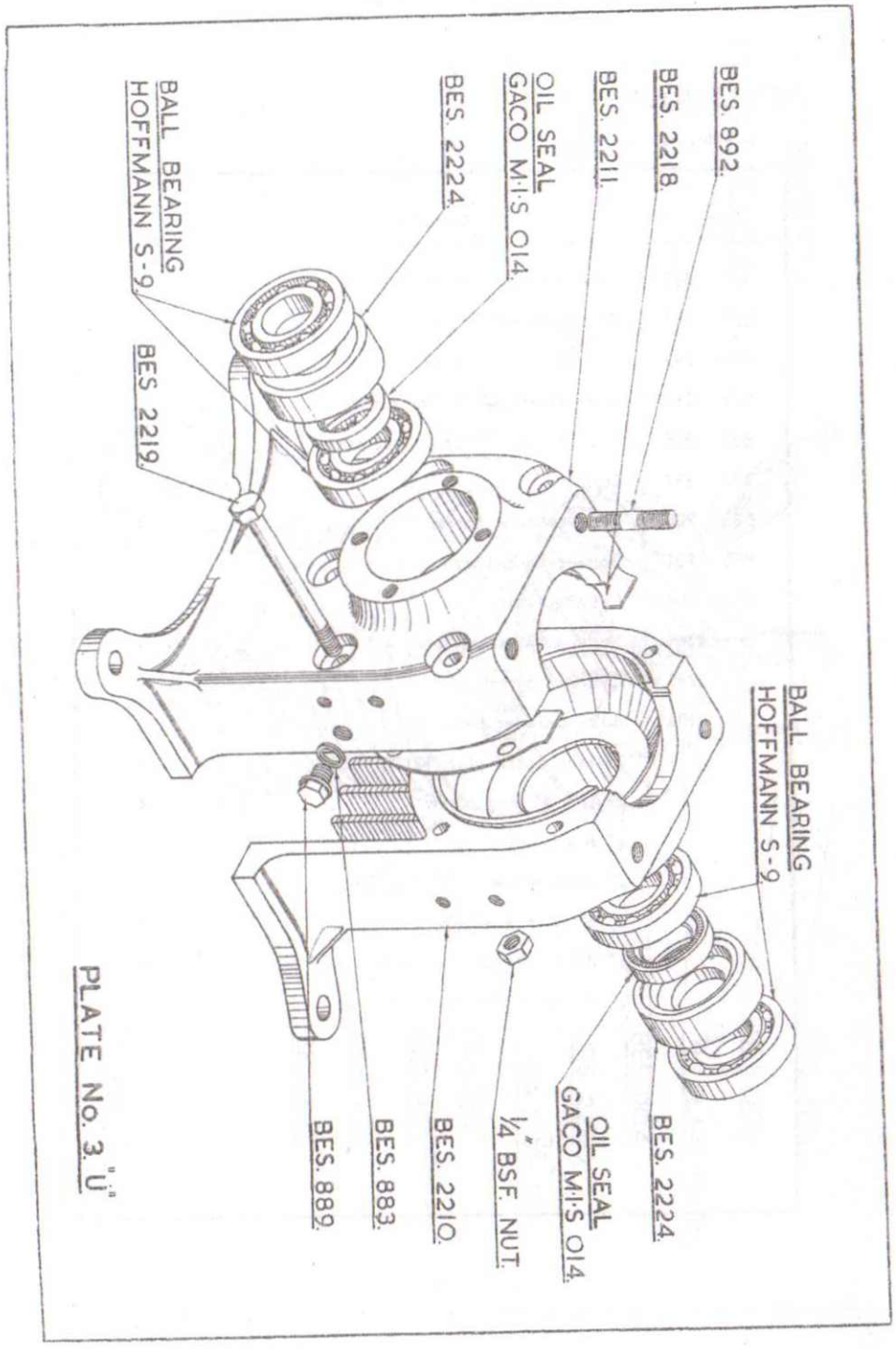
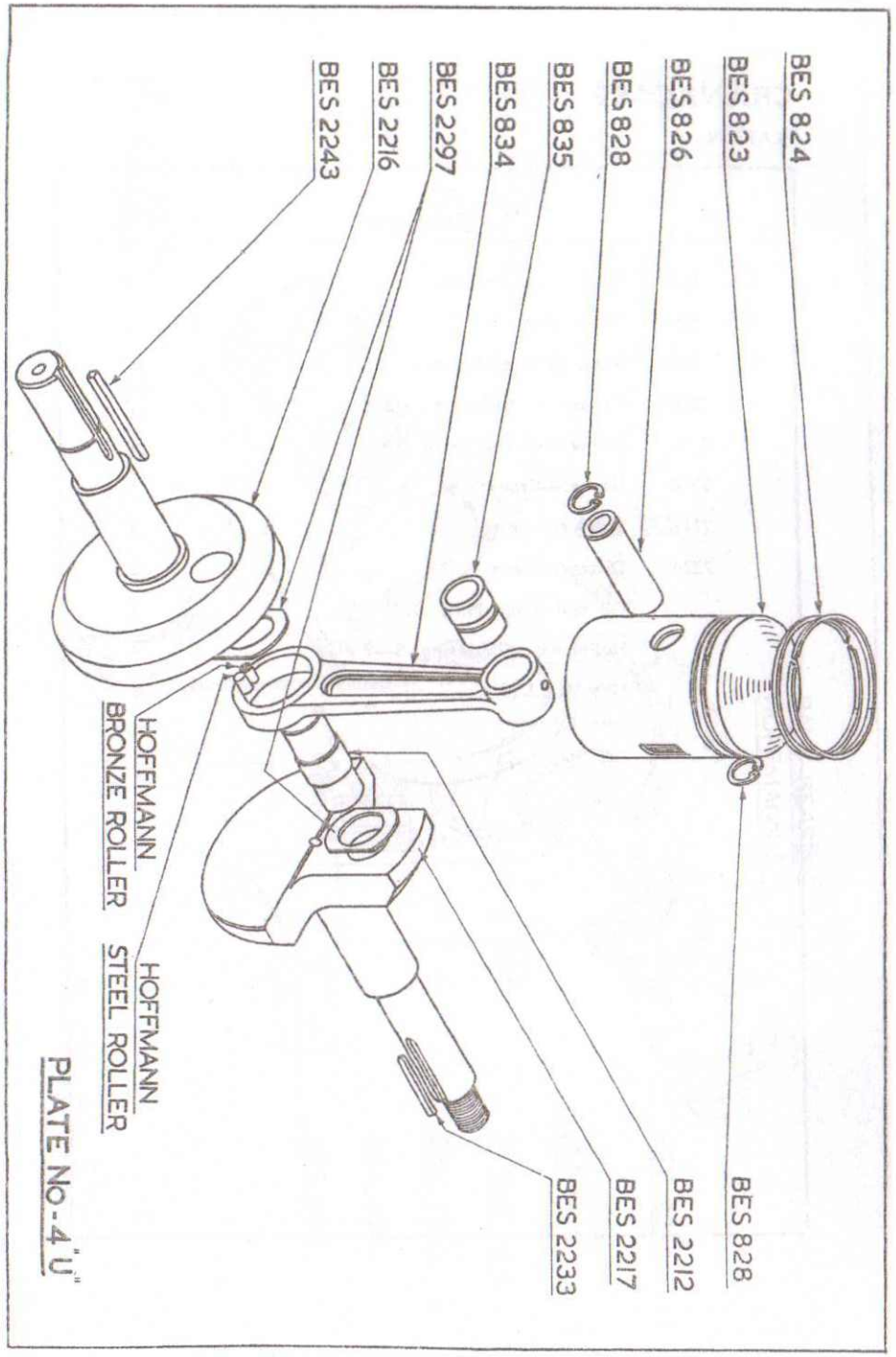


PLATE No. 3. "U"

CRANKCASE

PLATE No. 3.

Item	Description	No. Off
BES. 883	Washer—drain plug	1
BES. 889	Drain plug	1
BES. 892	Stud, cylinder barrel	4
2210	Crankcase, half-timing side	1
2211	Crankcase—half drive side	1
2218	Gasket—Crankcase	1
2219	Bolt—crankcase	5
2224	Distance piece	2
	Oil seal, Gaco M.I.S. 014	2
	Hoffmann ball bearing, S—9	4
	Nut ¼" B.S.F.	5



PISTON AND CRANK

PLATE No. 4.

Item	Description	No. Off
BES. 823	Piston	1
BES. 824	Piston Rings	2
BES. 826	Gudgeon Pin	1
BES. 828	Circlip	2
BES. 834	Connecting Rod	1
BES. 835	Bush—small end	1
2212	Crankpin	1
2216	Crankshaft—Drive side	1
2217	Crankcase—Timing side	1
2233	Key	1
2243	Drive Key	1
2297	Check Washer—crankshaft	2
	Hoffmann bronze rollers	8
	Hoffmann steel rollers	8
	Not shown in Plate 4.—	
BES. 1331	Recessed Washer	1
	¼" B.S.F. set screw ⅜" long	1
	Shakeproof washer	1

GOVERNOR

PLATE No. 5.

Item	Description	No. Off
BES. 2215	Governor Housing	1
BES. 2225	Lever—short—complete	1
BES. 2230	Lever—long	1
BES. 2231	Spring	1
BES. 2235	Governor rim	1
BES. 2236	Spring—Governor	1
BES. 2237	Anchorage—Spring	1
BES. 2238	Strip—dust excluder	1
BES. 2240	Rotor—Governor	1
BES. 2241	Weight—Governor	2
BES. 2242	Shouldered screw	2
BES. 2245	Cover plate	1
	4BA. x 3/16" screw	1
	4BA. x 3/8" screw	6
	2BA. Philidas nut CPP/1	1
	4BA. Washer	1
	1/4" B.S.F. x 5/8" screw countersunk	4
	Ball-bearing Hoffmann S8	1
	3/4" External Seeger Circlip	

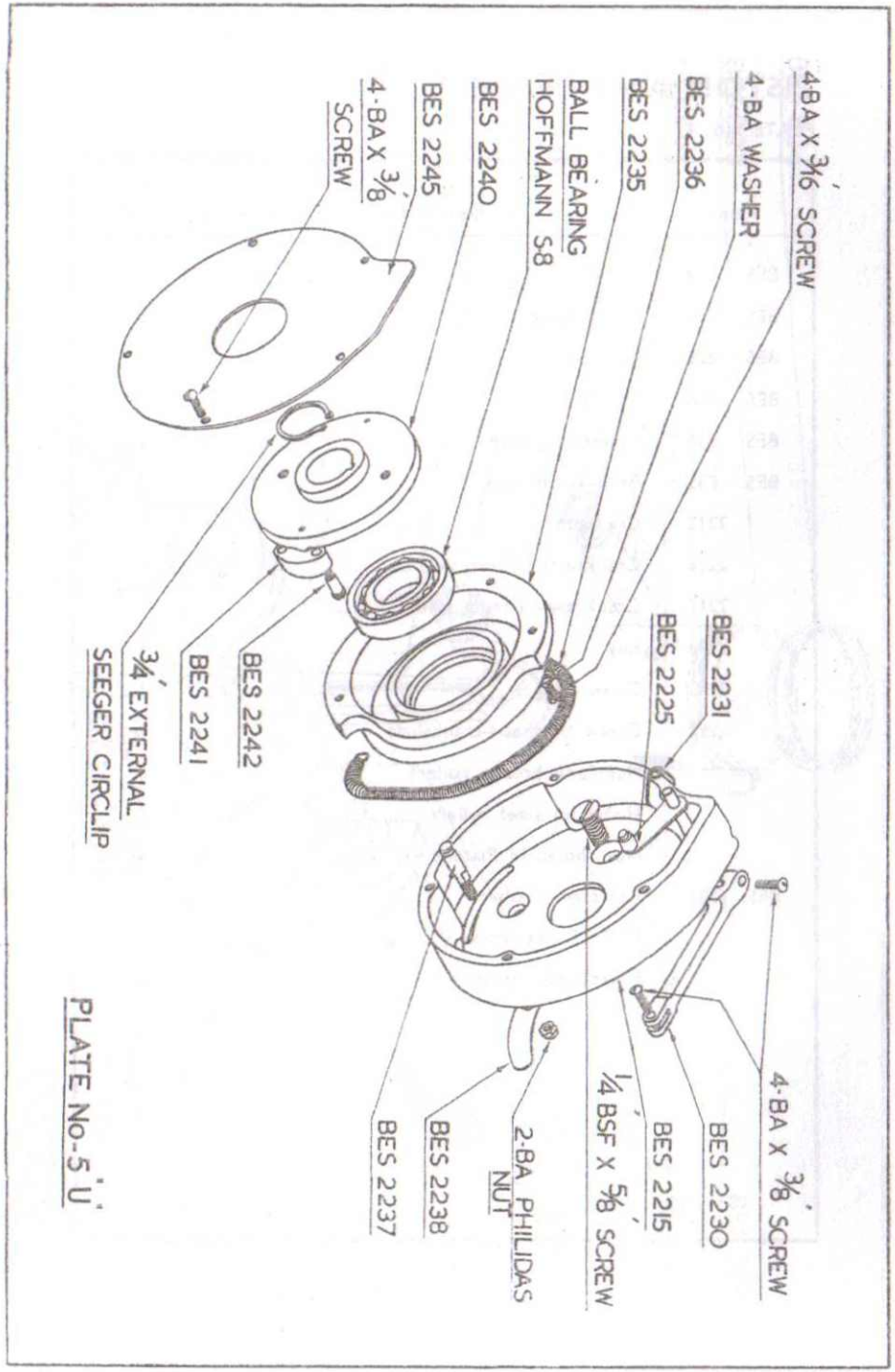


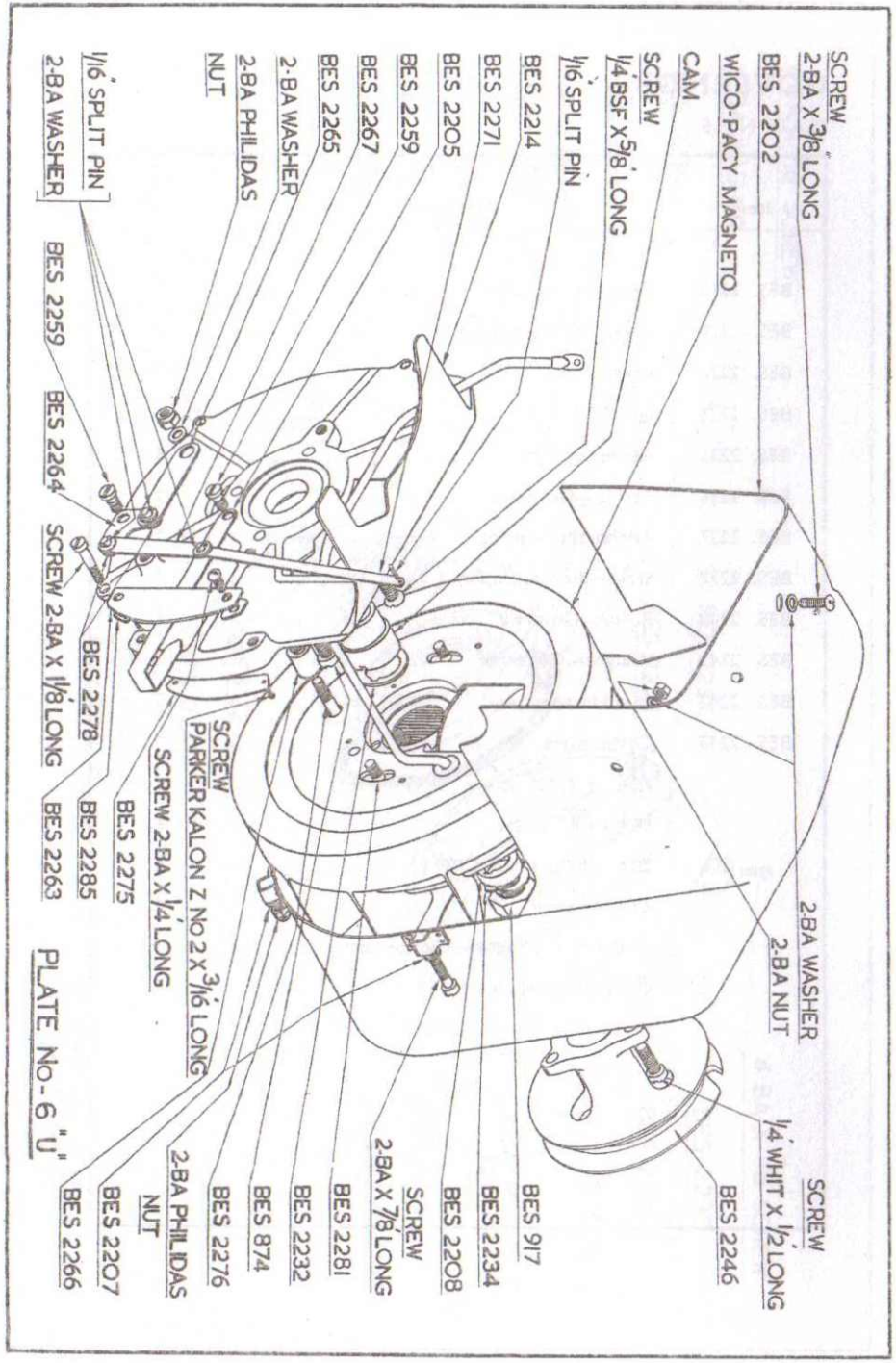
PLATE No-5 'U'

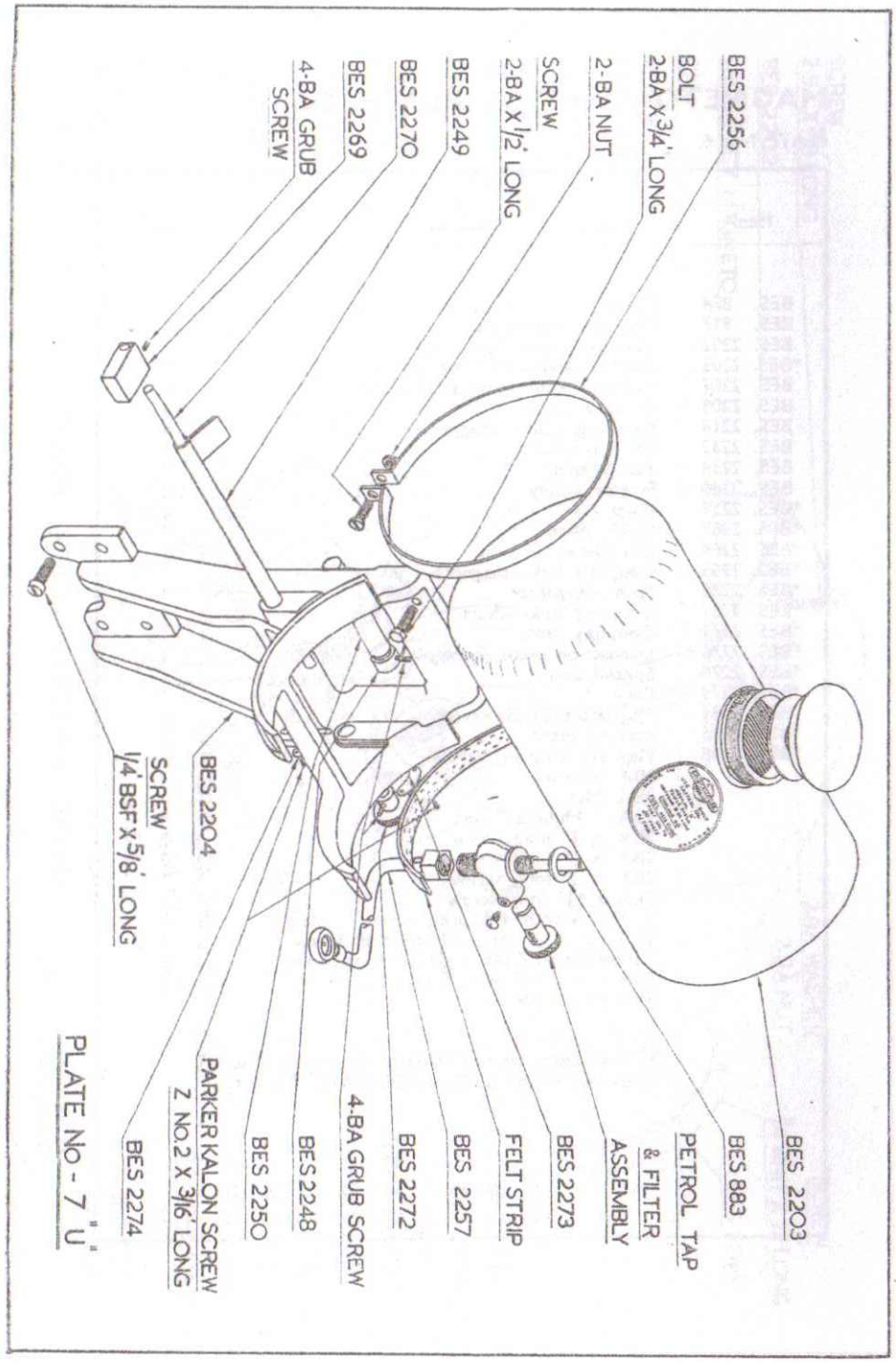
MAGNETO ADAPTOR PLATE, &c.

PLATE No. 6.

Item	Description	No. Off
BES. 874	Screw	3
BES. 917	Magneto locking nut	1
BES. 2202	Fan casing complete	1
*BES. 2205	Control lever—throttle	1
BES. 2207	Washer—Fan casing attachment	4
BES. 2208	Distance collar	1
BES. 2214	Mounting plate—magneto	1
BES. 2232	Spacing Washer	1
BES. 2234	Tab Washer	1
BES. 2246	Starter pulley	1
*BES. 2259	Pivot Pin	2
*BES. 2263	Guide plate	1
*BES. 2264	Cranklever	1
*BES. 2265	Coupling link—magneto	1
*BES. 2266	Stud—magneto	1
*BES. 2267	Coupling link—short	1
*BES. 2271	Coupling link	1
*BES. 2275	Instruction plate (control)	1
*BES. 2276	Special bolt	1
*BES. 2278	Pin	2
BES. 2281	Magneto securing screw	2
*BES. 2285	Packing piece	2
*BES. 2298	Magneto securing screw	2
	2BA. Washer	7
	2BA. Nut	1
	2BA. " Philidas " nut	4
*	2BA. x ¼" long screw	2
	2BA. x 5/16" long screw	2
	2BA. x ⅜" long screw	1
	2BA x 1⅛" long screw	3
	¼" Whitworth x ½" long screw	3
	¼" B.S.F. x ⅝" long countersunk screw ...	1
	Parker Kalon Z No. 2 x 3/16" long screw ...	2
*	Split Pin, 1/16" x ½" L.G.	3
	Split Pin, 1/16"	

* These items are not fitted to the engine when installed in the B.M.B. 'HOE-MATE' Tractor.





TANK, &c.

PLATE No. 7.

Item	Description	No. Off
BES. 883	Washer	1
BES. 2203	Petrol tank—complete	1
BES. 2204	Support—petrol tank	1
BES. 2248	Coupling lever—complete	1
*BES. 2249	Cross-shaft—complete	1
*BES. 2250	Spacer tube	1
BES. 2256	Strap petrol tank	2
BES. 2257	Petrol pipe—complete	1
*BES. 2269	Tickler lever	1
*BES. 2270	Cross-shaft	1
*BES. 2272	Knob	1
*BES. 2273	Instruction plate (Flood)	1
BES. 2274	Instruction plate (Choke)	1
*BES. 2299	Screw	1
	4BA. Grub-screw x ¼" long	2
	2BA. Round head screw ½" long	2
	2BA. Bolt x ¾" long	1
	2BA. Nut	2
	¼" B.S.F. x ⅝" long hexagonal head screw ...	4
	Parker Kalon "Z" No. 2 x 3/16" long ...	4
	Felt strip	2
	Petrol tap and filter, Ewarts No. 504 ...	1
	* These items are not fitted to the engine when installed in the B.M.B. 'HOE-MATE' Tractor.	

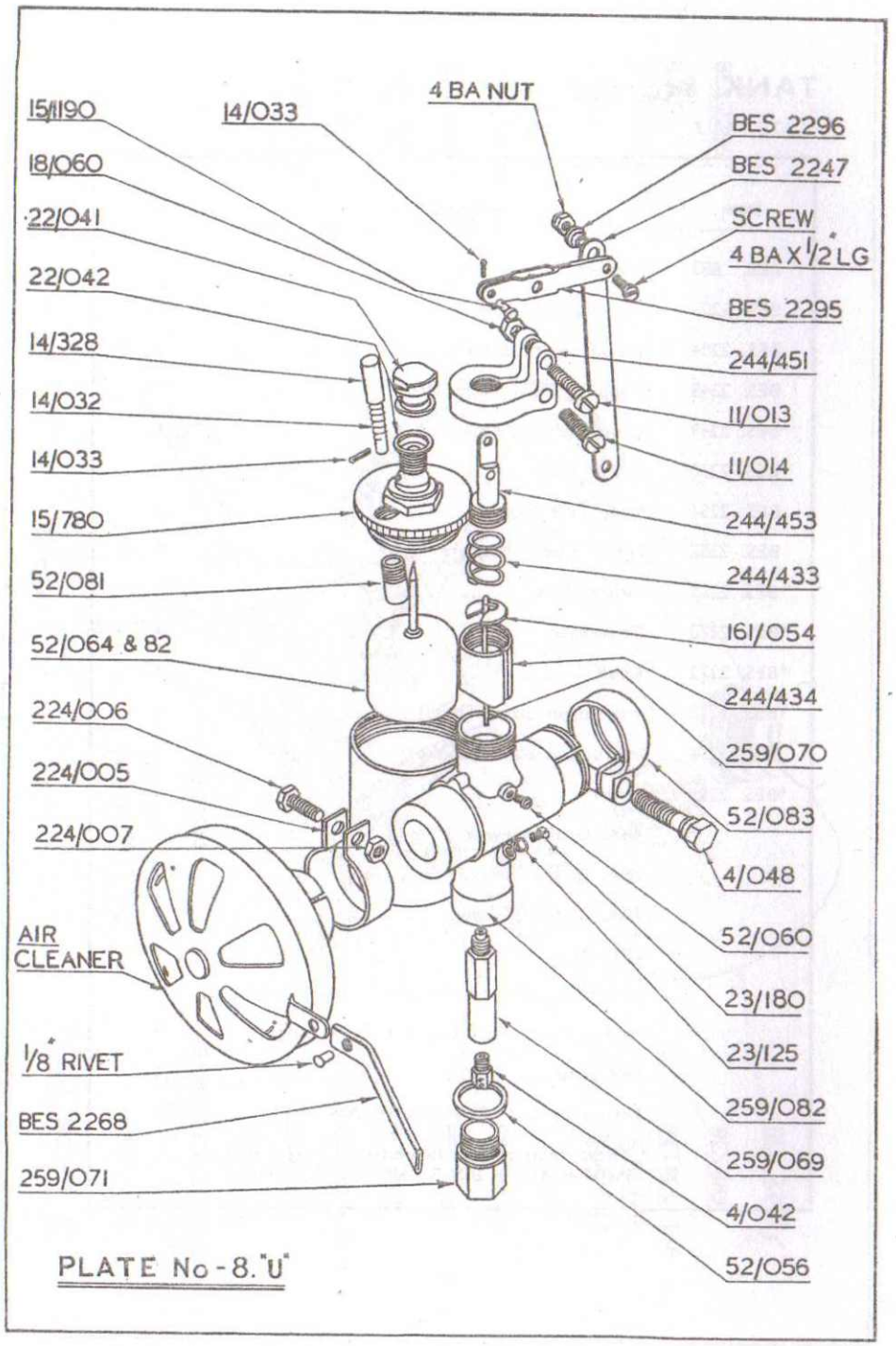


PLATE No-8."U"

CARBURETTER, Type 258/082.

PLATE No. 8.

Item	Description	No. Off
259/082	Carburetter	1
4/042	Main jet	1
4/048	Outer clip screw	1
11/013	Lever screw	1
11/014	Lever locking screw	1
14/032	Float chamber tickler spring	1
14/033	Float chamber tickler cotter	1
14/328	Float chamber tickler	1
15/780	Float chamber cover	1
15/1190	Lever pin	1
18/060	Lever locking nut	1
22/041	Special nut...	1
22/042	Fibre washer	2
23/125	Washer for plug screw	1
23/180	Plug screw	1
52/056	Jet plug washer	1
52/060	Valve location screw	1
52/064 & 82	Float and needle	1
52/081	Float chamber cover bush	1
52/083	Outlet clip	1
161/054	Needle clip	1
224/005	Air cleaner clip	1
224/006	Air cleaner clip screw	1
224/007	Air cleaner clip nut	1
244/433	Throttle valve spring	1
244/434	Trottle valve adjusting sleeve	1
244/451	Trottle control casting	1
244/453	Throttle valve adjusting screw	1
259/069	Needle jet	1
259/070	Jet needle	1
259/071	Jet plug	1
259/082	Mixing chamber body	1
	Air cleaner Amal type 224/16	1
BES. 2247	Coupling link	1
BES. 2268	Lever	1
BES. 2295	Carburetter lever	1
BES. 2296	Washer	1
	Screw 4BA. x ½" 1g. cheese head	1
	4BA. nut. Simmonds BP.1	1
	Rivet Round head ⅛" dia. x 3/16" long	1

MAGNETO

PLATE No. 9.

Item	Description	No. Off
BES. 2232	Spring washer	1
BES. 2266	Stud, magneto	1
BES. 2276	Special bolt	1
BES. 2298	Magneto securing screw...	2
	2BA. "Philidas" nut	1
	2BA. washer	1
Y2572B	Flywheel	1
J12976	Flywheel inspection cover	1
1KA22	Flywheel inspection cover screw	2
M55XA	Flywheel inspection cover screw lock washer	2
X2138	Stator plate unit	1
2176	Breaker cam	1
2179	Lead wire bushing	1
X2215	Lead wire group	1
X2156	Coil assembly	1
Z2153	Coil gasket	1
X2143	Core group	1
2157	Core screw	2
IKA362	Core screw lock washer	2
X2186	Condenser group	1
1100	Condenser clamp screw	2
M90X	Condenser clamp screw lock washer ...	2
M71XA	Condenser connection nut	1
M52X	Condenser connection lock washer	1
X2151	Breaker arm group	1
2145	Breaker arm spring	1
2357	Breaker arm spacer	1
2357	Breaker arm clamp washer	1
2300	Breaker arm lock	1
1085	Breaker arm screw	1
M58X	Breaker plate clamp screw lock washer ...	1
2194	Breaker plate clamp screw washer	1
2144	Breaker plate	1
2196	Breaker connection strip	1
A248XB	Fixed contact	1
M34X	Fixed contact insulating bushing	1
IXA862	Fixed contact insulating washer	2
IXA256	Fixed contact washer	2
M55XA	Fixed contact lock washer	1
M73X	Fixed contact nut	1
X2146	Breaker plate group	1
	Consisting of— ...2144, 2196, A248XB, M-34X, IXA862, IXA-256, M-55XA, M-73X