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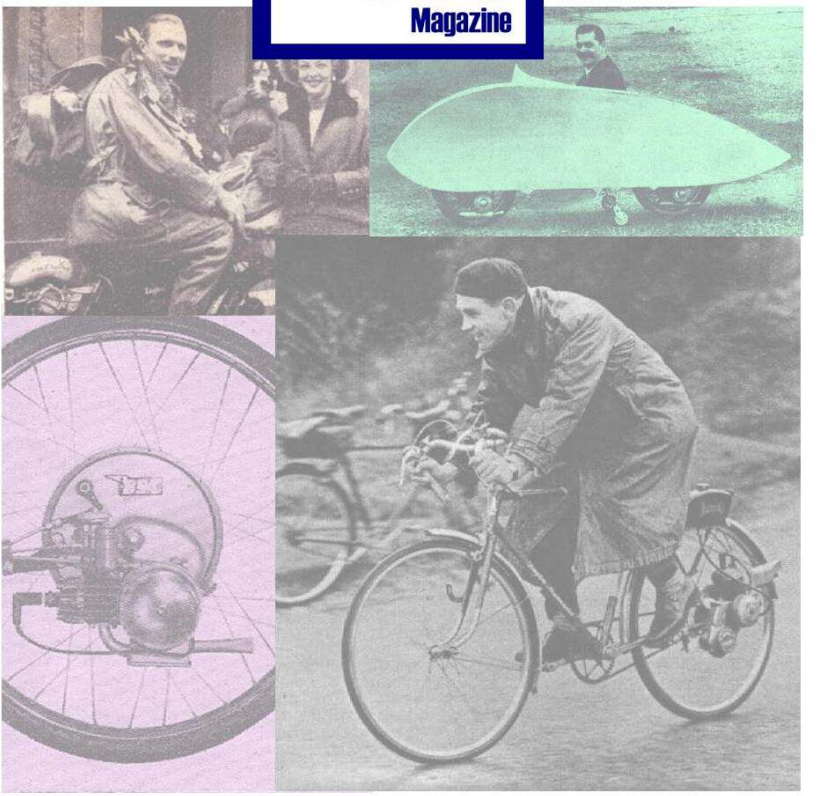

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# RALEIGH

# MOPED

## SERVICE MANUAL

# THE SERVICE MANUAL OF THE RALEIGH MOPED

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RALEIGH

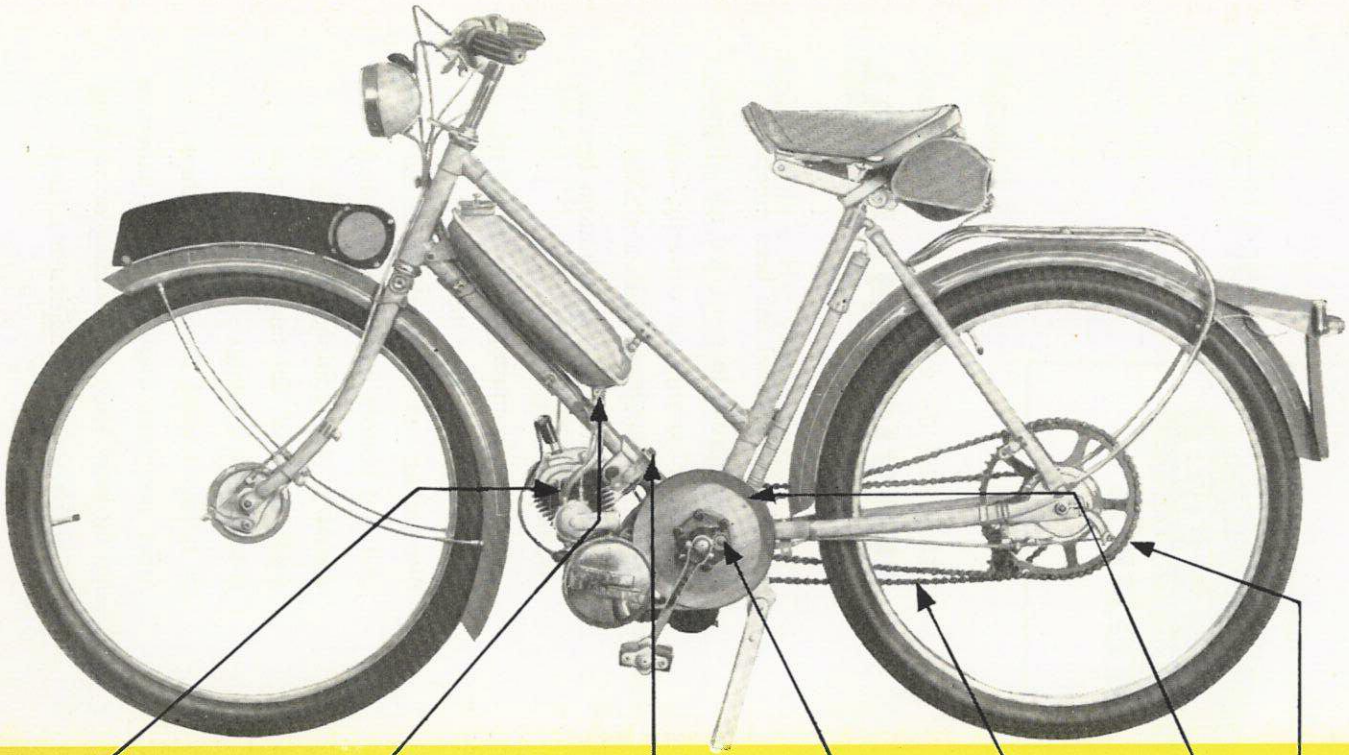
MOPED

# SERVICE MANUAL

This Service Manual has been compiled in an endeavour to assist Raleigh Moped Dealers in carrying out correctly, with the aid of the special tools available, repairs to the engine unit, bottom bracket, electrical system, etc.

We have attempted, with the aid of illustrations, to show the complete dismantling and re-assembling of the power unit and bottom bracket countershaft assembly. In addition, and purely as a guide, a list of 'flat rate' repair times is separately available ; it should be borne in mind however, that these times have been assessed without allowance having been made for cleaning or working on below average condition machines.

## *NEARSIDE PHOTOGRAPH OF THE RALEIGH MOPED* (*LESS FAIRINGS*)



## *OFF SIDE PHOTOGRAPH OF THE RALEIGH MOPED* (*LESS FAIRINGS*)

# TECHNICAL DATA

| | |
|---|---|
| **ENGINE** | Single cylinder two-stroke with twin transfer ports and flat-topped piston. Aluminium alloy cylinder-head and crankcase. Close grained cast-iron cylinder barrel, aluminium-alloy piston with chrome top ring. Plain lower ring. |
| **LUBRICATION** | Petroil. |
| **CYLINDER BORE** | 38 millimetres (1·496 in.) (1·4955 in. min.—1·4965 in. max.). |
| **STROKE** | 44 millimetres (1·732 in.). |
| **CAPACITY** | 49·9 cubic centimetres (3·04 cubic in.). |
| **COMPRESSION RATIO** | 6·2 to 1. |
| **MAXIMUM B.H.P.** | 1·3 B.H.P. at 4,300 R.P.M. |
| **DECOMPRESSOR VALVE SPRING** | ·425 in. free length. |
| **PISTON CLEARANCE** | Top max. : ·0078 in. Min. : ·0061 in.<br>Bottom of skirt max. : ·003 in. Min. : ·0014 in. |
| **PISTON RING GAP** | Min. : ·007 in. |
| **CRANKSHAFT DETAILS** | Mainshaft diameter at needle bearing position : Max. dia. : ·5909 in. Min. dia. : ·5906 in.<br>Crank pin diameter : Max. dia. : ·8267 in. Min. dia. : ·8265 in. |
| **CONNECTING ROD** | Big end eye : Max. dia. : 1·2208 in. Min. dia. : 1·2205 in. |
| **BIG END ROLLERS** | 5 mm. by 5 mm.—16 off. |
| **IGNITION** | Lucas 7 F1. Flywheel magneto contact breaker gap : ·015 in. (permissible ·014/·016 in.). |
| **SPARK PLUG** | Lodge H.N. or Champion L.5J (gap ·020 in.). Lodge H.H.14 Plug recommended for hard driving conditions. |
| **IGNITION ADVANCE** | $\frac{5}{32}$ in. (·156 in.) before top dead centre (B.T.D.C.). |
| **CARBURETTOR** | Amal type 385/1, with enrichment device for cold starting. Combined air silencer and filter. Normal jet size : 40. |
| **OVERALL GEAR RATIO** | 15 to 1. |

| | |
|---|---|
| **DRIVING BELT** | Fenner A26 or A26R or Goodyear V480. |
| **PEDAL GEAR RATIO** | 1 to 1·6 or 41·6 in. |
| **FUEL TANK CAPACITY** | $6\frac{1}{2}$ pints including reserve $\frac{1}{3}$ pint. |
| **SADDLE HEIGHT** | 33 in. (lowest position). |
| **MAXIMUM WIDTH** | 23 in. |
| **OVERALL HEIGHT** | 38 in. |
| **OVERALL LENGTH** | 72 in. |
| **WHEEL BASE** | $44\frac{1}{2}$ in. |
| **WEIGHT** | 84 lb. |
| **RIMS, DUNLOP** | Type : Endrick, front, 32 hole, 14 gauge steel.<br>Endrick, rear, 40 hole, 14 gauge steel.<br>Size : 26 by 2·00 FA.<br>Rim circumference : 1,755 mm. |
| **TYRES, DUNLOP** | 26 in. by 2·00 in. (1,755 mm. rim). |
| **SPOKES** | Front left : 14 S.W.G. (·080 in.), $10\frac{3}{16}$ in. length 16 off each.<br>Front right : 14 S.W.G. (·080 in.), $10\frac{1}{2}$ in. length 16 off each.<br>Rear right : Single butted 12/14 S.W.G., $10\frac{11}{32}$ in. length—20 off.<br>Rear left : Single butted 12/14 S.W.G., $10\frac{11}{32}$ in. length—20 off. |
| **FRONT BRAKE** | Sturmey-Archer BFC internal expanding cable operated. |
| **REAR BRAKE** | Sturmey-Archer BRM internal expanding cable operated. |
| **LIGHTING HEADLAMP** | Lucas MCH 64. |
| **BULBS** | Headlamp : Main, Lucas 386-6V 15W/15W<br>Pilot, Lucas 974-3·5V., ·15 amp. |
| **TAIL LAMP** | Lucas L590. |
| **BULB** | Lucas 990-6V. 3W. |
| **STAND-BY LIGHTING BATTERIES** | Drydex T.20 or T.21.<br>Ever-Ready U2 or LPU 2.<br>Ray-O-Vac 2 LP. |

# ADJUSTING DRIVING BELT

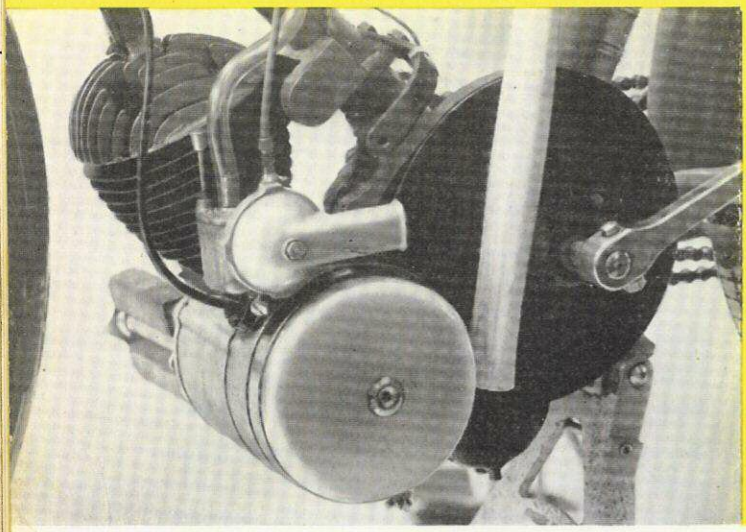


FIG. 1
**Method of levering engine forward.**

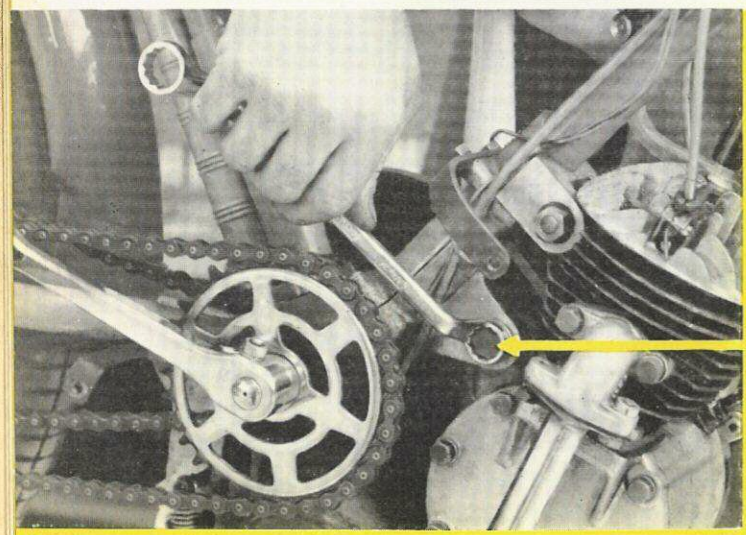


FIG. 2
**Tightening engine clamp bolt, whilst levering engine forward to tighten belt.**

Lower engine mounting bolt.

# REMOVAL AND REFITTING OF POWER UNIT

## REMOVAL

**Special tools required :—NONE.**

1. Place machine on centre stand.
2. Take off fairings by removing the seven fixing screws.
3. Ensure petrol tap is closed and disconnect petrol pipe.
4. Disconnect "snap-on" connector from generator wire.
5. Disconnect decompressor cable at cylinder head, by unhooking solderless nipple from anchor plate located on cylinder head.
6. Unscrew knurled carburettor mixing-chamber cover and withdraw throttle valve and needle. Care should be taken not to damage throttle valve and needle.
7. Unscrew carburettor securing-clip and remove carburettor.
8. Loosen lower engine-mounting bolt and swing engine rearwards to its fullest extent. The driving belt can now be removed from the bottom bracket pulley.
9. Now remove the top and bottom engine-mounting bolts. (Note : a flat steel washer is fitted on the lower bolt between the slotted engine-mounting lug and the lower lug on the engine-mounting bracket.)
10. The engine should now be cleaned before any further dismantling takes place, taking care not to allow any dirt or cleaning fluid to enter the inlet port.

## REFITTING

This is carried out in the reverse order of removal from the frame. After refitting it is essential to check the driving pulley alignment as follows :—

Before tightening the lower engine-mounting bolt, swing the engine rearwards until the crankshaft driving pulley mates with the bottom bracket pulley. Any misalignment can be corrected by loosening the four mounting-bracket clamp bolts and slightly turning the bracket round the frame as required. Afterwards, tighten driving belt (see Figs. 1 & 2) to its fullest extent.

Finally tighten lower engine-mounting bolt.

# DISMANTLING THE POWER UNIT AFTER REMOVAL FROM THE FRAME

**Special tools required :—**

**MS 1 Crankcase Jig.***
**MS 2 Crankshaft Removal Adapter.**
**MS 4 Adapter Nut.**
**MS 8 Flywheel Extractor.**
**MS 9 Pulley Extractor.**
**MS11 Dowel Extractor.**
**MS12 Piston Stop.**
**MS13 Gudgeon Pin Tool internal and external circlip pliers.**

***MS1 Crankcase jig comprises**
**MS22 Jig Base Plate.**
**MS31 Jig Top Plate.**
**MS36 Assembly & Removal Bolt.**
**MS34 Bearing Support Sleeve.**
**MS35 Bearing Support Sleeve Locknut.**
**MS30 (2 off) Nuts.**

1. Remove exhaust system complete by removing the two bolts holding the exhaust elbow to the cylinder, and the nut and bolt holding the silencer to the crankcase.
2. Remove spark plug cover and unscrew spark plug from cylinder head.
3. Remove flywheel-cover clip and prise off cover.
4. Screw into the cylinder head spark plug hole piston stop tool MS12 and gently rotate engine in anti-clockwise direction with flywheel facing towards you (see Fig. 3) until piston comes into contact with piston stop.
5. Remove flywheel retaining nut—R.H. thread—(see Fig. 3) and washer, using a $\frac{1}{4}$ in. B.S.F. cranked ring spanner or box spanner. Screw crankshaft thread protector on to the end of the crankshaft.
6. Withdraw flywheel by screwing extractor tool MS8 into the flywheel hub. Tighten extractor bolt and withdraw the flywheel (see Fig. 4).
7. Prise out locating key from crankshaft with a screwdriver.
8. Remove the four crankcase bolts situated at the front of the crankcase (see Fig. 5) and, using dowel extractor MS11, remove the two dowels from bolts numbered 1 & 4 in illustration. This releases the crankcase spacer and magneto housing.

FIG. 3
**Undoing flywheel retaining nut with piston stop tool in position.**

Piston stop tool MS12

Flywheel retaining nut.

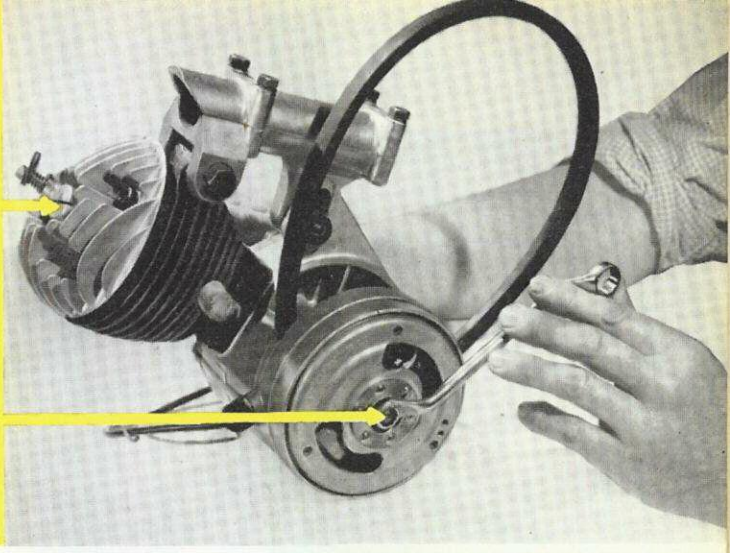


FIG. 4
**Withdrawing flywheel using flywheel extractor tool MS8.**

Flywheel extractor tool MS8.

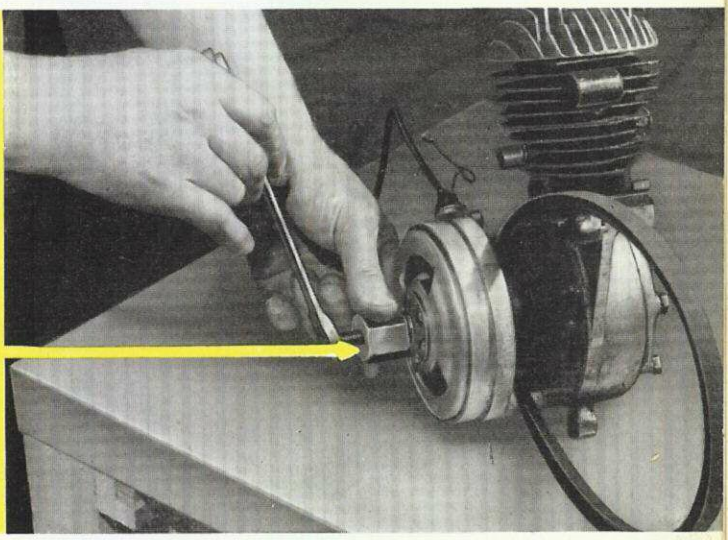
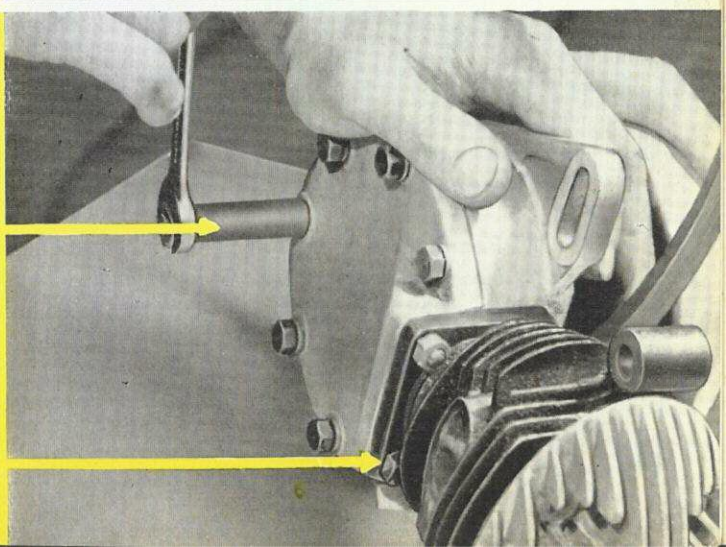


FIG. 5
**Removing crankcase dowel using dowel extractor MS11.**

No. 4 Bolt.

(Slightly obscured) No. 1 Bolt.



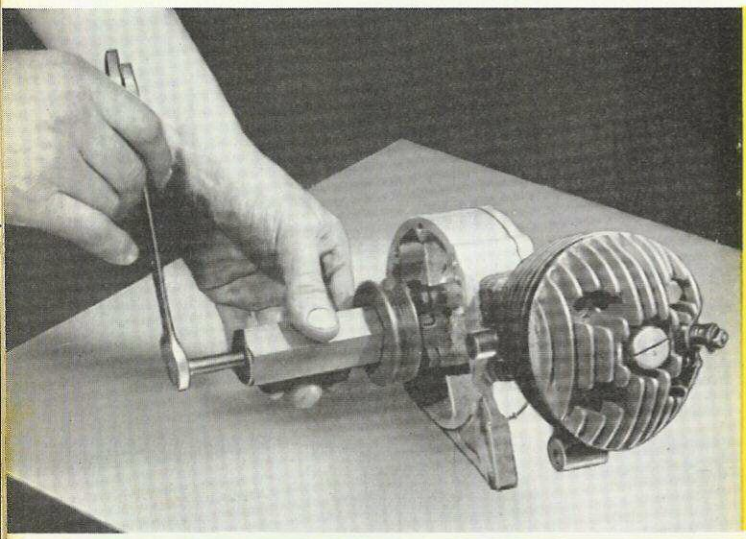


FIG. 6
**Removing crankshaft pulley using crankshaft pulley extractor MS9.**

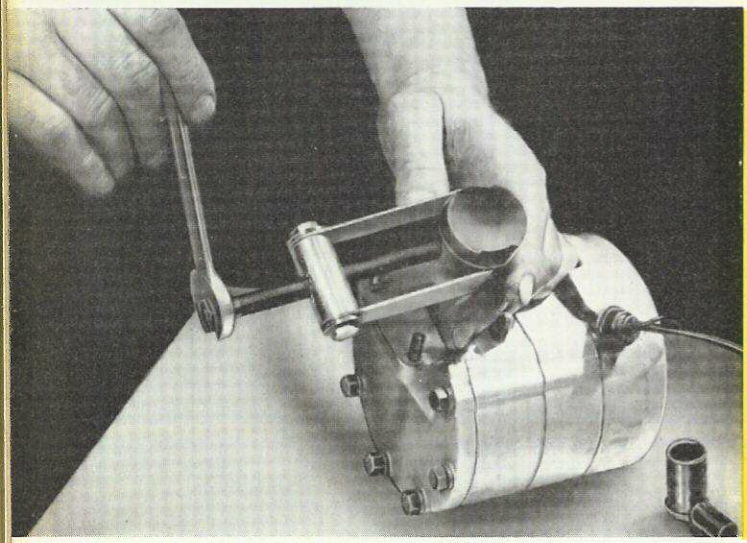


FIG. 7
**Removing gudgeon pin using gudgeon pin removal and assembling tool MS13.**

9. Remove pulley retaining circlip from crankshaft, using external circlip pliers. Screw adapter-nut MS4 on to the end of the crankshaft and, using crankshaft-pulley extractor MS9, withdraw the pulley (see Fig. 6).

10. Remove four $\frac{1}{4}$ in. B.S.F. bolts and spring washers which retain crankshaft needle bearing housing and oil seal. Now withdraw housing from crankcase. The housing may require tapping round slightly with a soft metal drift to free the joint face from the jointing compound. Care must be taken during this operation, due to the housing being cast iron and consequently subject to breakages.

11. The crankshaft oil seal can now be prised out of the housing with a screwdriver or similar tool, great care being taken not to score the housing when doing so. Once removed, *the oil seal should not be used again.*

12. To remove crankshaft needle roller bearing, drive bearing out of the housing with a suitable drift. *Under no circumstances should the bearing be used again after being removed from the housing.*

13. Using a $\frac{1}{4}$ in. B.S.F. box spanner, remove the four cylinder-head retaining bolts and lift off cylinder head.

14. Unscrew decompressor valve nut and spring retaining-plate, and remove spring and decompressor valve.

15. Remove four $\frac{1}{4}$ in. B.S.F. nuts and spring washers from cylinder base and lift cylinder carefully off crankcase and piston.

16. Remove gudgeon-pin circlips with internal circlip pliers and using gudgeon-pin assembly and removal tool MS13, with the adapter supplied placed in the end of the gudgeon pin, push out the gudgeon pin and remove piston from connecting rod (see Fig. 7).

N.B.—At this stage a suitable mark should be made on the piston crown to ensure that when and if it is replaced, it is refitted in its original position.

17. Carefully remove the two piston rings. The top ring, which is chrome, must only be fitted one way, i.e., with the bevelled edge facing upwards. It is recommended that both piston rings be carefully retained in their correct relative fitting positions if it is intended to refit them.

18. Remove the three remaining crankcase bolts, washers, spring and plain and pull crankcase cover off the two dowels. Remove dowels from crankcase.

19. Remove crankshaft circlip and using crankcase jig MS1 (see Fig. 8) proceed as follows :—

"Place base plate in vice and bolt crankcase to it, using four $\frac{1}{4}$ in. B.S.F. bolts, removed in operation No. 10. Mount the jig top plate in position and locate the crankshaft removal adapter MS2 against the outer ring of the crankcase journal ball-bearing. Screw the removal bolt MS36 into the top plate until it holds the removal adapter firmly against the ball race; now screw the bearing support sleeve MS34 into the base plate and the adapter nut MS4 on to the end of the crankshaft and, using the crankshaft pulley extractor as shown in Fig. 8, press the crankshaft out of the bearing."

20. To remove the connecting rod from the crankshaft, remove the big end retaining-plate screw, the retaining plate and 16 rollers. The connecting rod can now be removed from the crankshaft. If it is intended to refit the original connecting rod, a distinguishing mark should be made on one side of it to ensure that it is refitted in its original position.

21. If the crankshaft bearing is to be removed from the crankcase (the condition of the bearing can be ascertained without removal, but once removed it *must* be replaced by a new bearing) proceed as follows :—

"Using a scraper, carefully remove the thin lip of aluminium which is rolled over the outer ring of the bearing (see Fig. 9), heat the crankcase to a temperature of approximately 200°C (a simple method of applying the heat is to place the crankcase on a piece of sheet metal, approximately 6 in. square, over a lighted gas-ring and heat until the required temperature is reached) and mount in the base plate as shown in Fig. 10. Screw the bearing support-sleeve MS34 into the pulley extractor MS9 and lock in position with bearing support-sleeve locknut MS35. Now screw the support sleeve into the base plate until it comes up against the bearing and, using a spanner as shown in Fig. 10, press the bearing out of the housing."

22. If it is desired to remove the magneto stator plate, this can be done by removing the two fixing screws which secure it to the aluminium housing. It is suggested that before removal a pencil or similar mark be made on the stator plate and on the housing to mark their relative positions for reassembly.

FIG. 8
Removing crankshaft from crankcase using crankcase jig MS1, including removal Bolt MS36, bearing support sleeve MS34, adapter MS2, adapter nut MS4 and MS9 crankshaft pulley extractor.

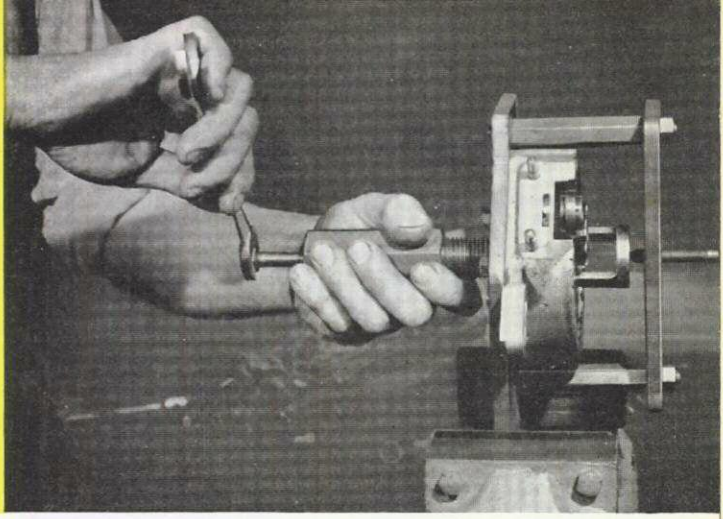


FIG. 9
Removing the thin lip of aluminium from the main bearing housing using a scraper.

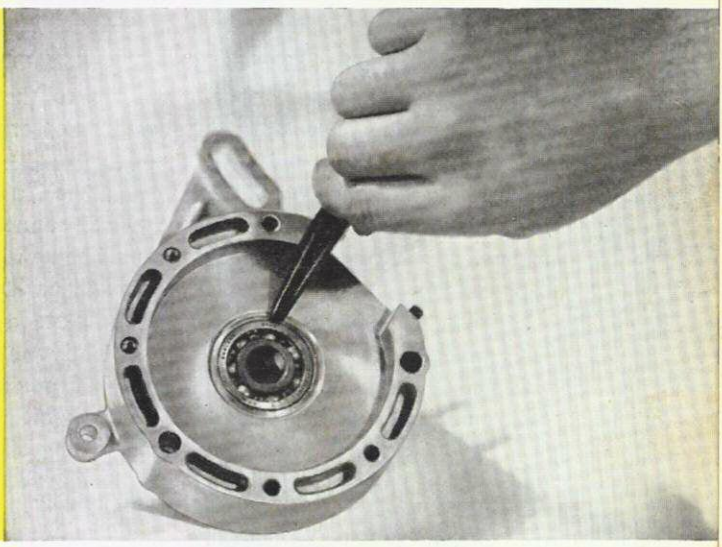
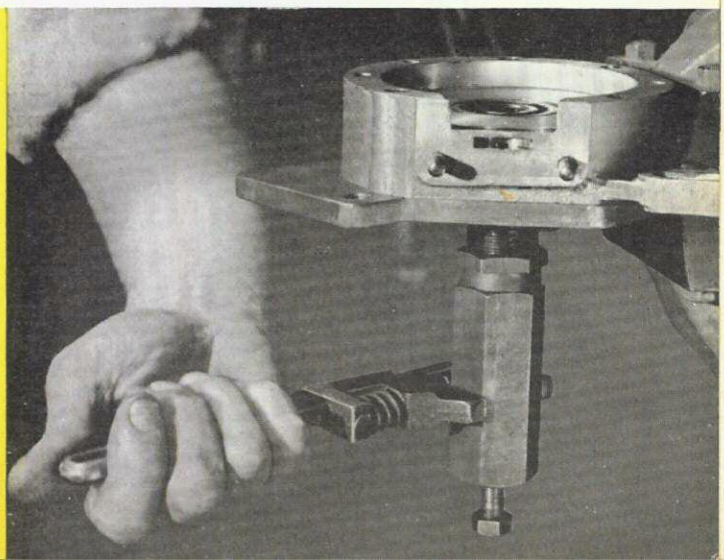


FIG. 10
Removing main journal bearing from crankcase using base plate MS32, bearing support sleeve MS34, locknut MS35 and pulley extractor MS9



# REASSEMBLING THE POWER UNIT

Special tools required :— **MS 1 Crankcase Jig Complete.**
**MS 3 Crankcase Assembly Adapter.**
**MS 6 Bearing Rolling-in Tool.**
**MS 7 Oil Seal Fitting Tool.**
**MS10 Crankshaft Pulley Assembling Tool.**
**MS12 Piston Stop.**
**MS13 Gudgeon Pin Tool.**
**MS14 Needle Roller Bearing Assembling Tool.**
**MS15 Engine Mounting Bush Tool.**

1. REFITTING CONNECTING ROD TO CRANKSHAFT.

Before refitting original connecting rod to the crankshaft, check connecting rod for alignment and wear, also crankshaft, crank pin and rollers.

Holding the crankshaft vertical in a vice, assemble the sixteen rollers around the crank pin, and place connecting rod over the rollers. (If the original connecting rod is being used, ensure that it is replaced in its original position in accordance with the marking made when dismantling.) Place roller retaining-plate in position and secure with fixing screw, which will protrude slightly through the crank. The protruding thread of the screw should be punched over as a precaution against it becoming loose. Lightly oil after assembly.

2. FITTING NEW MAIN JOURNAL BALL-BEARING.

Ensure that the crankcase is perfectly clean and heat to a temperature of 180°C. (A simple method of applying the heat is to place the crankcase on a piece of sheet metal approximately 6 in. square over a lighted gas ring and heat until the required temperature is reached.) The new bearing can now quite easily be dropped into the crankcase housing, which should be left to cool gradually to avoid distortion. Now mount the crankcase in the crankcase jig MS1, as shown in Fig. 11, and with the crankcase bearing rolling-in tool MS6 mounted (also as shown in Fig. 11), apply slight pressure to the centre bolt and rotate the tool several times with the aid of a spanner applied to the square drive nut on the tool ; this will result in the edge of the bearing housing being turned over and so retaining the bearing.

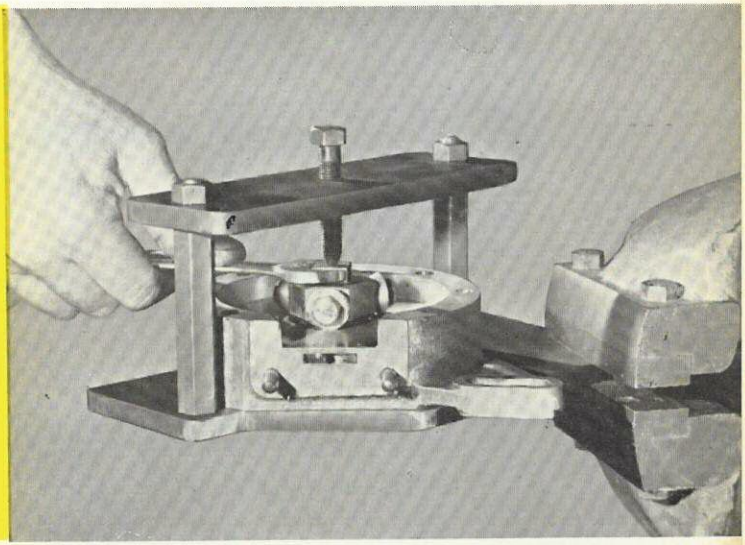


FIG. 11
**Rolling in the crankcase main bearing lip using bearing Rolling in tool MS6.**

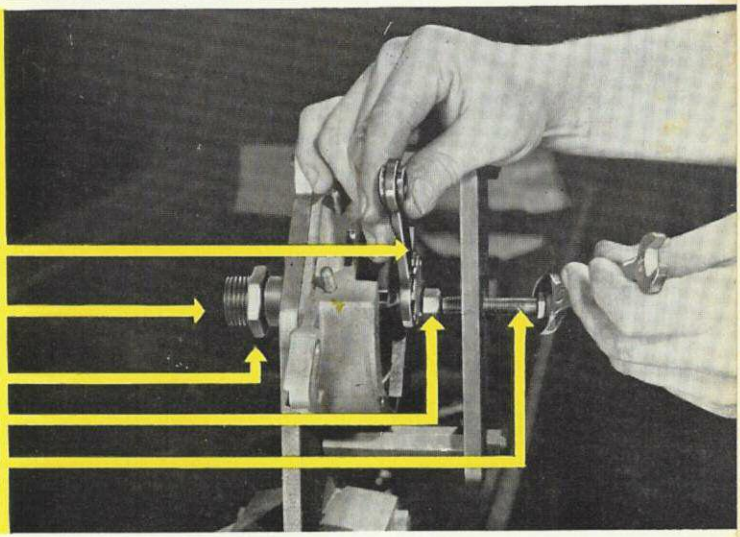



FIG. 12
**Fitting the crankshaft into the crankcase using crankcase jig MS1, bearing support sleeve MS4, locknut MS35, adapter MS3 and centre bolt MS36.**

3. FITTING THE CRANKSHAFT INTO THE CRANKCASE.

With the crankcase mounted in crankcase jig MS1 as shown in Fig. 12, screw in bearing support-sleeve MS34 from the back of the mounting plate until it comes into contact with the bearing ; lock the support sleeve in position, using locknut MS35. Place the crankshaft through the inner ring of the journal ball-bearing, locate

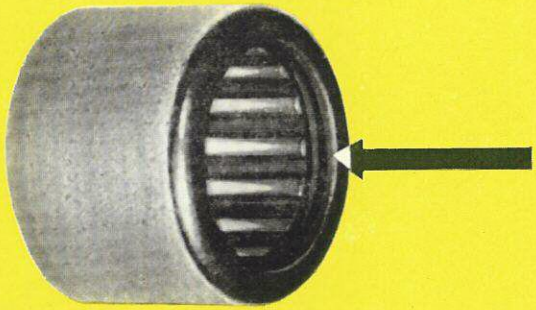


FIG. 13
Thick edge of needle bearing shell.

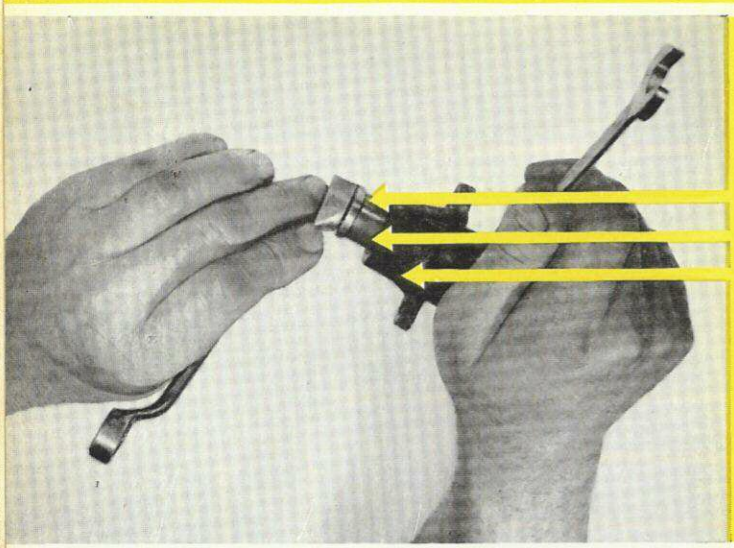
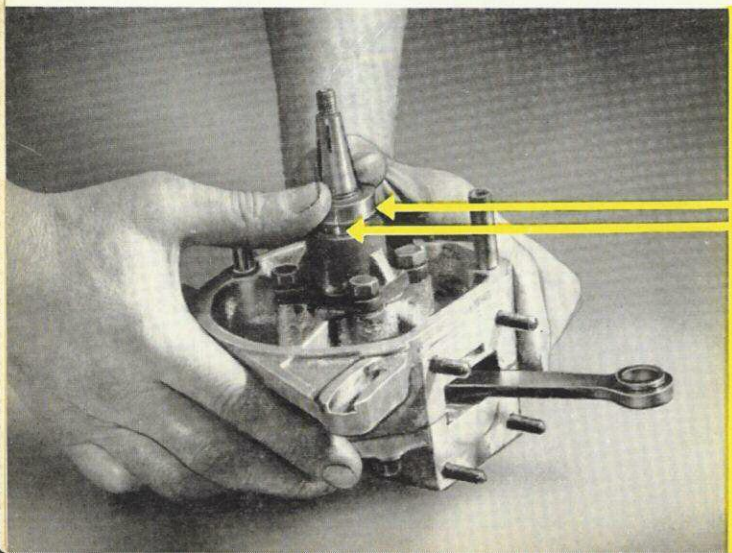


FIG. 14
**Fitting new caged needle roller bearing to bearing retainer using special tool MS14.**

Bush—part of tool MS14.

Needle roller bearing.

Bearing retainer.



Oil seal fitting tool MS7.

Oil seal.

FIG. 15
**Pressing crankcase oil seal into crankcase using oil seal fitting tool MS7. 1st operation.**

connecting rod in top dead-centre position and position adapter MS3. Mount the top plate also, as shown in Fig. 12, and apply pressure with the centre bolt MS36 to press the crankshaft into the bearing inner ring. Remove crankcase from jig and fit external circlip to crankshaft.

4. FITTING NEW NEEDLE ROLLER BEARING IN BEARING RETAINER.
Special Notes :—

It is most important that the bearing should be fitted with the manufacturer's identification markings facing outwards. It will be observed that the ends of the metal bearing-shell are of different thicknesses and where no identification marks are visible the end with the greater thickness must face outwards (see Fig. 13).

Using tool MS14 (see Fig. 14) draw the bearing into the housing with the identification markings on the cage facing outwards.

5. REPLACING NEEDLE ROLLER-BEARING RETAINER

Carefully clean the bearing retainer joint face and crankcase joint face, and apply jointing cement to both faces. (Particular care must be taken to prevent jointing cement from entering the oil feed hole situated in the body of the retainer.) Place a new gasket in position on the bearing retainer, lightly oil the needle roller-bearing and gently press the retainer into the housing, ensuring that the oil hole in the bearing retainer is facing upwards. The four $\frac{1}{4}$ in. B.S.F. bolts and spring washers should now be replaced and evenly tightened down.

6. FITTING CRANKSHAFT OIL SEAL.

Lightly oil the inner face of the oil seal and place it on oil seal fitting-tool MS7 (when the seal is placed on the fitting tool, the lip on the seal should face outwards). Carefully slide tool and seal over the crankshaft until the seal commences to enter the bearing retainer (see Fig. 15). Now with a suitable piece of metal tube placed over the shaft and mating with the tool (see Fig. 16), gently drive the seal into position until its outer edge is *flush with the retainer*. The fitting tool can now be withdrawn.

7. FITTING THE DRIVING PULLEY AND BELT.

Using special tool MS10, proceed as follows :—

Locate the pulley on the crankshaft driving flats, screw assembly stud from special tool MS10 on to the end of the crankshaft and place sleeve of tool MS10 against the face of the pulley, then screw special nut from tool MS10 on to the stud and tighten down (see Fig. 17).

Fit external circlip and driving belt.

8. REFITTING CRANKCASE COVER.

Carefully clean crankcase cover, joint faces and apply jointing cement to both. Insert the two dowels into the crankcase and position a new crankcase gasket on the crankcase face. Locate crankcase cover on the two dowels and replace the three short $\frac{1}{4}$ in. B.S.F. bolts, spring and plain washers. At this stage do not finally tighten these three bolts. Now position the aluminium distance piece and magneto housing on the dowels, then replace and tighten the four $\frac{1}{4}$ in. B.S.F. long bolts, spring and plain washers.

Finally retighten evenly all the crankcase bolts and trim off the gasket if it projects over the crankcase top face.

9. REFITTING PISTON.

If the original piston is being used it is important that it be refitted in its correct relative position. The mark made on the piston crown when dismantling will act as a guide and ensure correct reassembling.

Heat the piston to approximately 100°C (boiling water will do), then using gudgeon pin assembly tool MS13 (see Fig. 18) push the gudgeon pin into the piston. (An adapter is supplied with tool MS13 which locates in the end of the gudgeon pin to prevent any damage to the pin during fitting.) Lightly oil small end bush.

Using a pair of internal circlip pliers, carefully fit the gudgeon-pin circlips. After fitting always check to ensure that the circlips are correctly located in their respective grooves.

10. REFITTING PISTON RINGS.

NOTE :—It is recommended that the piston rings should be replaced by new ones if the piston ring gap exceeds ·016 in. when measured in the lower or unworn portion of the cylinder bore. The lower compression ring should be fitted first, and if the original ring is being used it should be fitted in the same relative position as removed. The chrome ring must always be fitted in the top groove with the bevelled edge facing upwards. New chrome rings are marked 'Top' on the side which must face upwards.

11. REFITTING CYLINDER.

Using a new cylinder-base gasket evenly coated on both sides with jointing cement, place in position on crankcase.

Arrange the piston rings on the piston so that the stepped ends

FIG. 16
**Fitting crankcase oil seal using oil seal fitting tool MS7.**

Driving the oil seal into position with hammer and metal tube.

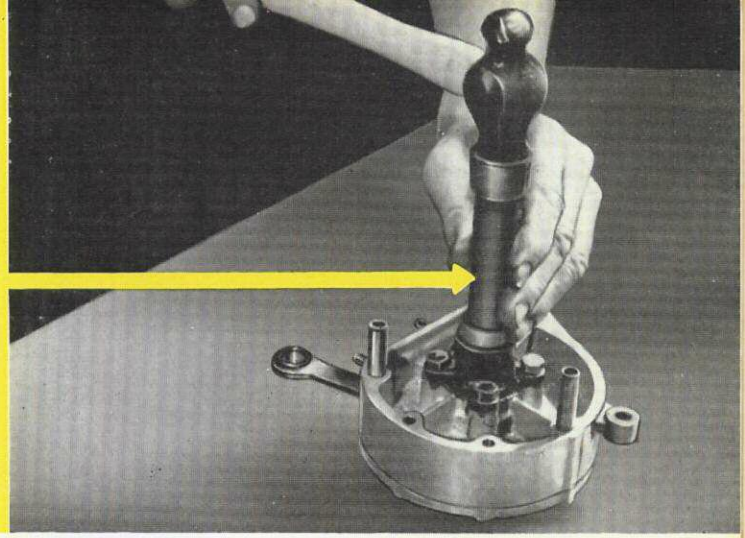


FIG. 17
**Refitting crankshaft pulley using crankshaft pulley assembling tool MS10.**

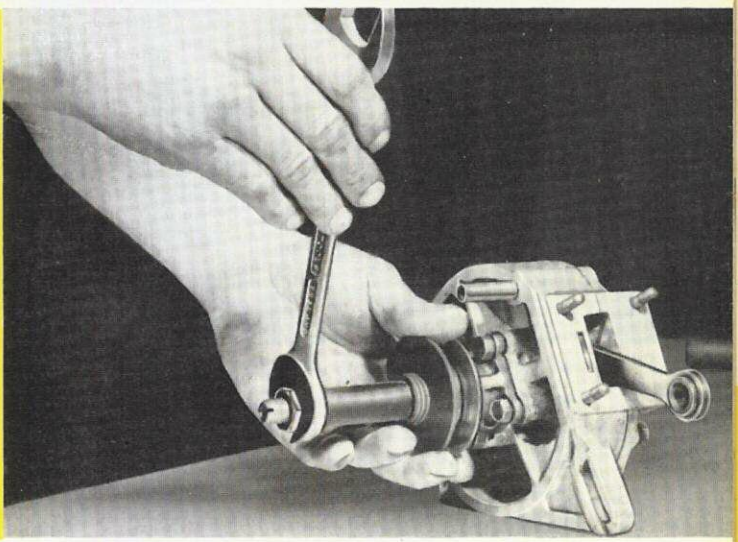


FIG. 18
**Refitting gudgeon pin to piston using gudgeon pin assembling tool MS13.**

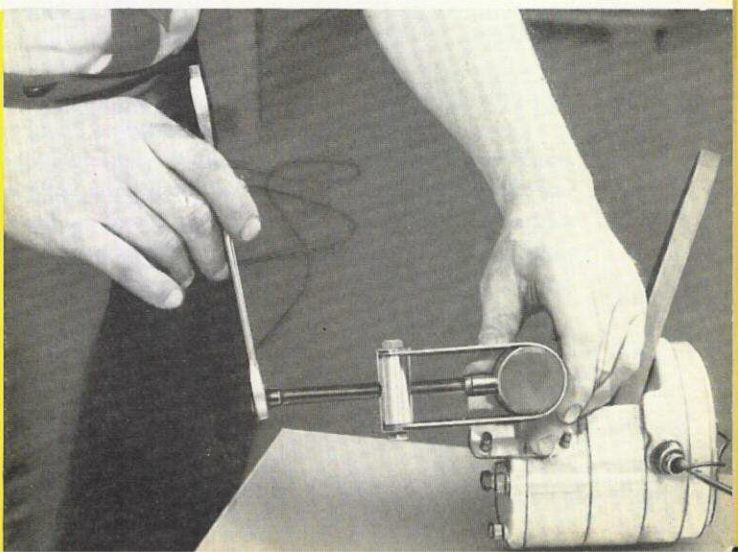


FIG. 19
**Fitting piston into cylinder.**

locate with the pegs in the piston-ring grooves. Clean and lightly oil cylinder bore, and while compressing the piston rings with the fingers gently slide the cylinder over the piston (see Fig. 19). A large taper is machined at the bottom of the cylinder bore to facilitate this operation.

Locate cylinder base over the crankcase studs, fit spring washers and $\frac{1}{4}$ in. B.S.F. nuts to studs and evenly tighten.

12. REFITTING DECOMPRESSOR VALVE.

Carefully remove all carbon from inside the valve port and the valve stem.

NOTE :—If the valve seating shows any sign of burning, as opposed to slight pitting, it should be replaced by a new valve.

Using a fine grinding paste, lightly grind in the valve until a matt surface is obtained on the valve seating and cylinder head seat.

Thoroughly remove all traces of grinding paste by washing in petrol, then examine the valve spring for strength, and if in doubt regarding its condition replace with a new one. The original free length of the spring is ·425 in. Insert the valve into the cylinder-head valve seat, locate spring and screw down anchor plate. Finally tighten down valve stem lock-nut.

13. REFITTING CYLINDER HEAD.

**Always use a new Gasket when refitting Cylinder Head.**

Clean the head face and the top face of the cylinder. Place the new gasket in position on top of the cylinder.

**Do not use Jointing Cement on the Cylinder Head Gasket.**

Carefully position cylinder head on the cylinder with the decompressor valve on the offside of the engine. Replace the four $\frac{1}{4}$ in. B.S.F. bolts, plain and spring washers, and evenly tighten down.

14. REFITTING MAGNETO STATOR PLATE.

Thoroughly clean the inside of the magneto housing and the stator plate. Thread the high-tension and lighting wire leads through the aperture in the housing.

Using the markings made on the stator plate and housing when dismantling, line up with each other, replace fixing screws and washers, and tighten. Thread the high-tension and lighting leads through the rubber grommet and locate over boss on magneto housing.

NOTE :—The only method of altering the ignition timing is to slacken off the two stator-plate fixing screws and move the plate—in an anti-clockwise direction to retard, and clockwise to advance, the timing (see Fig. 21 on page 25 on ignition timing).

15. REFITTING THE MAGNETO FLYWHEEL.

Carefully position the driving key in the crankshaft. Ensure that the flywheel and taper hub are perfectly clean and lightly smear the cam with H.M.P. Grease. Line up the key with the keyway in the hub and gently press the flywheel on to the shaft. After positioning the flywheel on the shaft, it is advisable to check that the key has not been pushed out of the keyway and this can be ascertained by inserting a piece of wire through the visible portion of the keyway in the flywheel hub. If the key is correctly positioned it will not be possible to insert the wire down the keyway. Afterwards replace washer and nut.

Screw piston-stop tool MS12 into cylinder head and gently rotate in a clockwise position until the piston comes into contact with the

piston stop. Using a $\frac{1}{4}$ in. B.S.F. box spanner or cranked ring spanner, finally tighten the securing nut and remove piston-stop tool.

After the flywheel is replaced, the contact-breaker gap should be adjusted to ·015 in. opening gap. Refit flywheel cover and fixing band, replace the spark plug, setting the gap at ·020 in. Screw spark plug suppressor cover on the H.T. lead and reconnect to spark plug.

16. REFITTING SILENCING SYSTEM.

It is most important that the silencing system is clean internally before re-fitting and in the event of the system being badly choked with carbon after long service, it is recommended that the system be cleaned by boiling in a hot solution of caustic soda ; afterwards, rinse thoroughly in clean water and repaint the system with cylinder black.

The Exhaust pipe and elbow should be loosely assembled before mounting on the engine, using a new gasket between the exhaust pipe flange and the elbow. Next, also using a new gasket between the elbow and the cylinder, bolt the complete assembly to the cylinder and fit $\frac{1}{4}$ in. B.S.F. nut, bolt and washers to the silencer fixing lug situated beneath the crankcase. After adjusting for position, finally tighten all bolts.

17. FITTING NEW METALASTIK BUSHES TO ENGINE MOUNTING BRACKET.

Using special tool MS15, the old bush can be removed and the new bush replaced, as shown in Fig. 20, using the same tool. When fitted the bush should protrude $\frac{1}{16}$ in. either side of the bracket lug.

18. TIMING THE IGNITION.

It is important to ensure that the contact breaker gap is set at ·015 in. before attempting to check or reset the ignition timing. To reset the gap, slacken the fixed contact-plate securing-screw, and insert the blade of a screwdriver between the two cast projections on the stator base plate and the notch in the fixed contact plate. Twist the screwdriver clockwise or anti-clockwise until the gauge is a sliding fit between the contacts. Retighten the screw and recheck the gap. The ignition timing for the Sturmey-Archer engine when run on any grade of fuel is $\frac{5}{32}$ in. (·156 in.) before top dead centre. A mark is provided on the magneto housing and also on the flywheel and when these two marks are in line the piston is at the $\frac{5}{32}$ in. before top dead centre position (see Fig. 21).

If the timing is correct it will be possible to insert a one-and-a-half thousandth of an inch (·0015 in.) feeler-gauge between the contacts (sliding fit) when the marks on housing and flywheel coincide. If

FIG. 20
**Fitting Metalastik bush to engine mounting bracket using special tool MS15.**

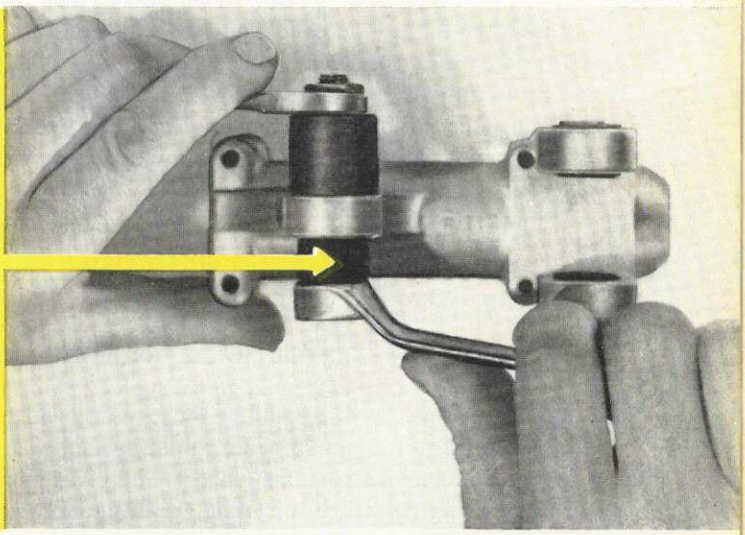
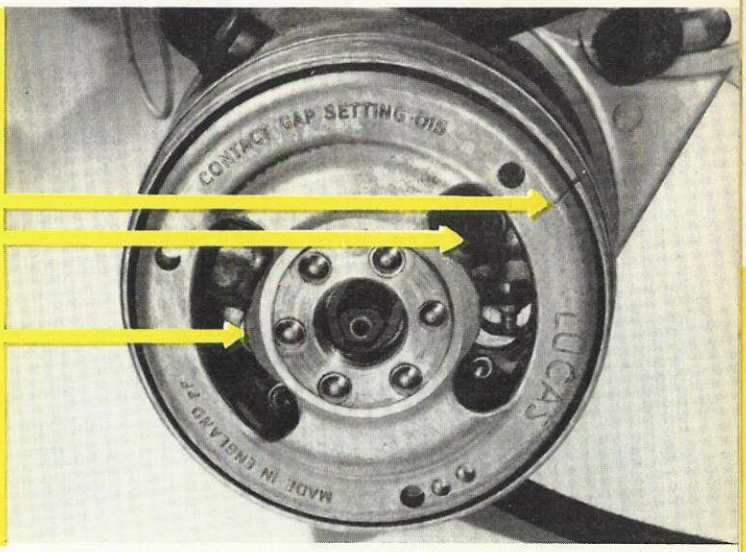



FIG. 21
**Ignition timing marks.**

When these marks are in line the piston is in the $\frac{5}{32}$" B.T.D.C. position.

To make any alterations to the ignition timing loosen the two screws and move the stator plate in an anti-clockwise direction to retard and a clockwise direction to advance the timing.




this is not the case, adjustments can be made by slackening the stator plate fixing screws and moving the stator plate in the desired direction of rotation until the correct setting is obtained. Move in anti-clockwise direction to retard and clockwise to advance the settings ; e.g., if, with the marks lined up, the gap is greater than $1\frac{1}{2}$ thousandth of

an inch the ignition is over-advanced and the stator plate will have to be moved in an anti-clockwise direction until the gap measures $1\frac{1}{2}$ thousandth of an inch, but if the contacts have not commenced opening, the timing is retarded and it will be necessary to move the stator plate in a clockwise direction until the contact gap measures $1\frac{1}{2}$ thousandth of an inch.

Finally tighten stator plate fixing-screws and re-check gap.

## 19. DISMANTLING THE BOTTOM BRACKET.

**Special tool required :—EXTERNAL CIRCLIP PLIERS.**

Remove fairings and, assuming the engine is fitted in the frame, slacken off lower engine-bracket mounting bolt (see paragraph 8 in Engine Removal instructions, page 9) and pivot engine rearwards to enable driving belt to be prised off the driving pulley. Remove both crank cotter pins, L.H. crank, R.H. crank, chain wheel and chain. The bottom bracket is now ready for dismantling.

NOTE :—When driving out cotters it is essential to support the underside of the crank with a heavy hammer or similar object. If this precaution is not taken damage to the Needle Roller Bearings will occur.

Remove the left-hand bottom bracket axle circlip. This will enable the bottom bracket axle to be withdrawn and the thrust washer removed. Slide the driving pulley off the driving shaft. Prise out the driving sprocket spring ring from the driving shaft and gently tap off the driving sprocket. If the sprocket is a very tight fit it will be necessary to support the end of the driving shaft, using a copper hammer or wooden block while the sprocket is tapped off.

After sprocket removal, the drive shaft, complete with a spacer, sprocket and spring ring, can be withdrawn from the bottom bracket sleeve and the dust excluder removed if necessary (see note). The bottom bracket sleeve is located in the frame bottom bracket by a location pin which is situated under the bracket and facing rearwards. After this has been unscrewed the sleeve can be withdrawn.

To remove needle roller-bearings from driving shaft and bottom bracket sleeve, use a hammer and drift. After removal, the bearings should not under any circumstances ever be used again. To remove the driving pin from the pulley housing, pull out until it is clear of the housing. The steel ball will then be ejected and the spring can be removed with a piece of wire.

### Re Dust Excluder

NOTE :—Unless it is apparent that the dust excluder needs replacing it need not be removed from the bottom bracket sleeve.

20. RE-ASSEMBLING BOTTOM BRACKET (inc. fitting of new needle roller bearings).

**Special tools required :— MS18 Bottom Bracket Bearing Assembly Tool.**
**MS19 Driving Shaft Bearing Assembly Tool.**
**MS20 Driving Shaft Spring Ring Tool.**
**MS21 Driving Pin Ball and Spring Assembly Tool.**
**External Circlip Pliers.**

*Fitting new Needle Roller Bearings to Driving Shaft.*

NOTE:—It is important that the bearings be fitted to the driving shaft with the bearing cage face which carries the identification markings facing outwards.

Thoroughly clean the driving shaft and using special tool MS19 draw the new caged bearings into the shaft until the bearing cage faces are flush with the ends of the shaft (see Fig. 22).

*Fitting new Needle Roller Bearings to Bottom Bracket Sleeve.*

NOTE :—It is not essential for the bottom bracket sleeve to be removed in order to fit new needle bearings and the following procedure should be followed whether or not the sleeve has been removed.

Thoroughly clean the sleeve and using special tool MS18 draw

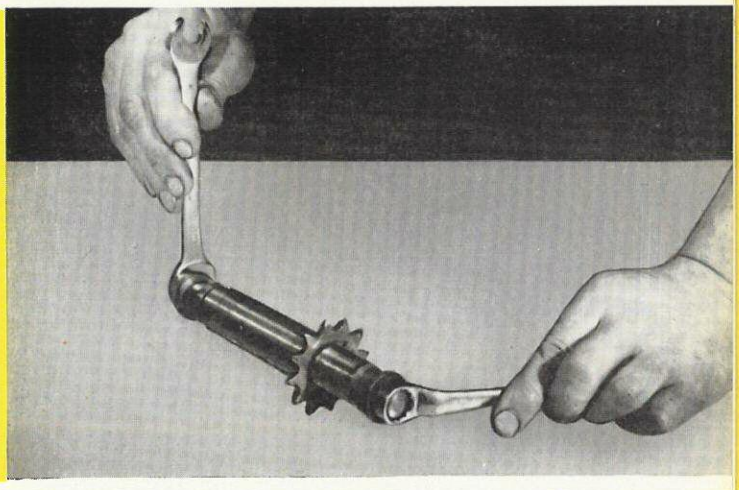


**FIG. 22**
**Refitting caged needle roller bearings to driving shaft using driving shaft bearing assembling tool MS19.**

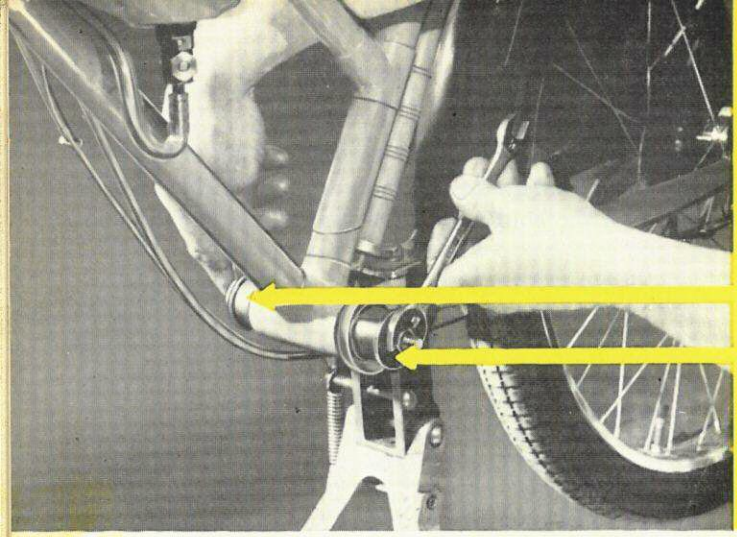


FIG. 23
**Fitting new caged needle roller bearings to bottom bracket sleeve using special tool MS18.**

Needle roller bearing.

Needle roller bearing fitting tool bush.

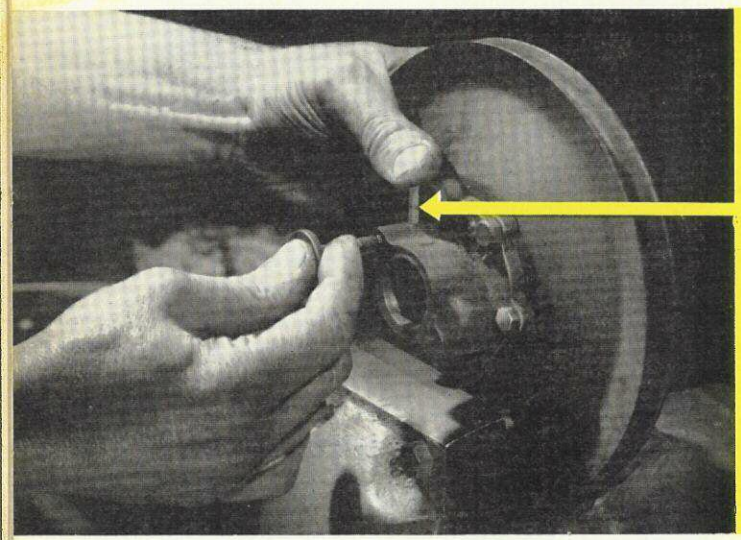


FIG. 24
**Fitting driving pin into pulley assembly using driving pin ball and spring assembling tool MS21.**

Ball and spring assembling pin MS48.

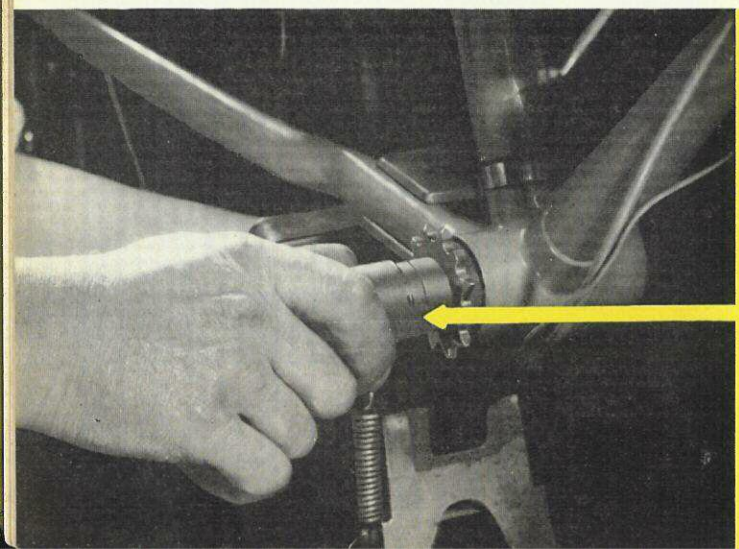


FIG. 25
**Fitting spring ring to driving shaft using special tool MS20.**

Spring ring.

the caged bearings into the shaft until the bearing cage faces are flush with the end faces of the sleeve (see Fig. 23).

*Fitting Driving Pin into Pulley Assembly.*

Using special tool MS21 (driving pin and ball assembly tool) and working from the back face of the pulley, proceed as follows :—

Pass the special tool guide-pin (with the recessed end facing away from you) through the driving-pin hole in the pulley boss which houses the ball and spring. First insert the spring and then the ball through the hole and using the remaining $\frac{3}{32}$in. diameter pin MS48 (see Fig. 24) depress the ball and spring. Now push the driving pin into the hole in the pulley boss until it pushes up against the recess in the end of the guide pin, gradually increase the pressure on the driving pin and at the same time withdraw the pin which is pressing the ball down. This will enable the driving pin to be pushed right home.

*Re-assembly of drive Shaft and Bottom Bracket Parts into the Bottom Bracket.*

If the dust excluder has been removed, commence reassembly by pressing the excluder back on to the bottom bracket sleeve. Now fit the spare sprocket (this serves as a location for the driving pin when engaged) and spring ring to the driving shaft, then pass it through the bottom bracket sleeve, fit the spacer and drive sprocket and, using the spring-ring fitting tool MS20 (see Fig. 25), fit the driving-sprocket retaining-spring ring. Lightly grease the hub of the pulley and fit on to the driving shaft, insert the pedal axle through the driving shaft, fit a thrust washer at each end and replace circlips. Replace the cranks and cotters and finally liberally inject grease through the nipples with a grease gun, using the brand recommended.

DISMANTLING FRONT HUB.

Remove the left-hand locknut, the plain washer, the notched cone adjusting washer and the brake-plate complete with shoes. Now take off the brake-plate spacing washer, unscrew the left-hand adjustable cone and lift out the ball cage. The spindle can now be withdrawn from the right hand side of the hub.

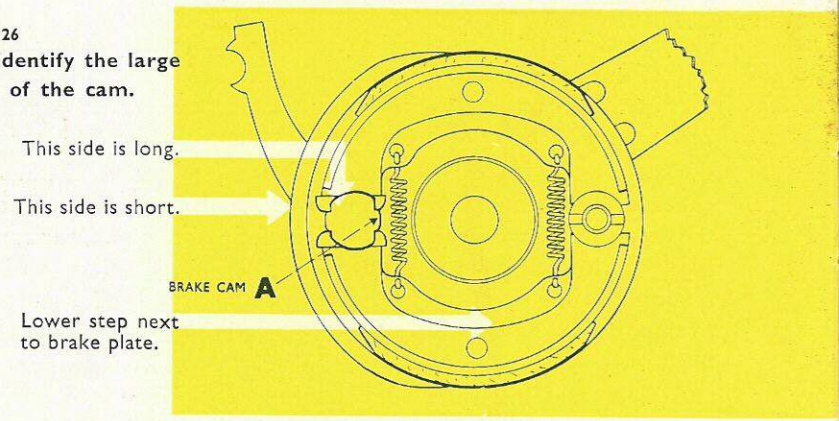
Providing the right-hand fixed cone and the spindle are in good condition the cone need not be removed from the axle. The channel section dust-cap on the right-hand side of the hub is a press fit and can be prised out with a wide screwdriver, allowing the ball cage to be removed. Both cups are part of the hub shell and if either is worn a new hub shell must be fitted.

If the brake shoes are to be removed from the brake plate, unscrew the nut which secures the brake cam-lever and pull the lever off the squared end of the cam. Unscrew the fulcrum and the brake shoes complete with springs, brake shoes, end-caps, cam and fulcrum pin can now be removed.

RE-ASSEMBLING BRAKE SHOES ON BRAKE PLATE-FRONT HUB.

To allow both brake shoes to be applied evenly the brake operating-cam is slightly offset and if not correctly fitted, it will allow only one shoe to operate, with consequent loss of braking efficiency. It is also important to ensure that the section of the brake shoes which carries the 'pull-off' spring holes fits next to the brake plate (see Fig. 26). The diagram illustrates the correct assembling of the brake shoes and the positioning of the brake operating-cam.

FIG. 26
**To identify the large side of the cam.**




**Viewed from the end (as shown) the cam is unsymmetrical, enabling the long side of the cam A to be easily identified.**

REAR HUB.

The same procedure is adopted for dismantling and re-assembling the rear hub as for the front hub, except that a nut and washer replaces the cable or wire guide fitted on the outside of the brake plate.

RE-ASSEMBLING THE FRONT HUB.

Apply a small quantity of grease to the hub cups and place the ball cage in the right-hand cup with the ring of the ball retainer-cage facing outwards. Press in the dust cap with the recess facing outwards, pass the spindle complete with the right-hand cone and locknut

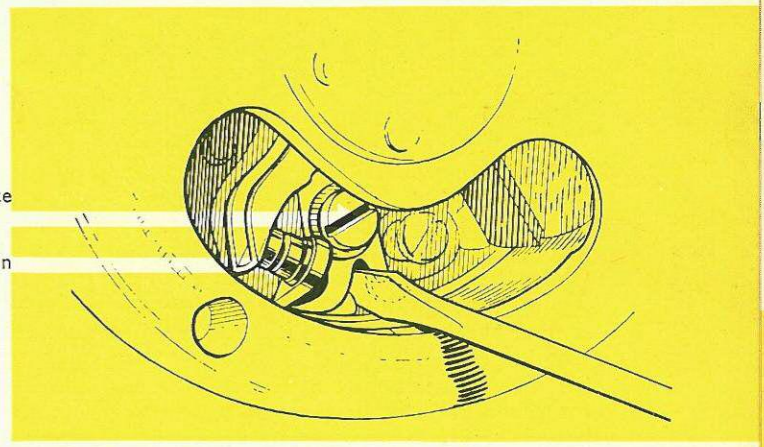
through the hub shell from the right-hand side, fit the ball cage into the left-hand cup with the ring of the ball retainer facing outwards, and screw the left-hand cone and spacing washer on to the spindle. Replace the brake plate complete with shoes over the end of the left-hand cone, replace the flat washer and notched cone adjusting washer, screw it up finger-tight and then slacken off half a turn. Now fit the plain washer and locknut with the shoulder facing outwards, check the cones for tightness, and if necessary re-adjust.

LUCAS MAGNETO ALTERNATOR MODEL 7H1.

*Checking and adjusting the contact breaker gap.*

To check the gap turn the engine by rotating the flywheel until the contact breaker contacts can be seen through the flywheel inspection windows to be fully open. In this position the gap should measure ·015 in. (·014 in.-·016 in. is permissible): if it does not, then the gap must be reset.

FIG. 27




To reset the gap, slacken the fixed contact plate securing-screw (see Fig. 27) and insert the blade of a screwdriver between the two cast projections on the stator base plate and the notch in the fixed contact plate. Twist the screwdriver clockwise or anti-clockwise until the gauge is a sliding fit between the contacts. Re-tighten the screw and re-check the gap.

A lubricator felt is provided for lubrication of the flywheel contact-breaker cam. The lubricator is carried on a spring which is sprung into a recess in the stator laminations. It can be released for withdrawal or prepared for insertion, by compressing the looped end of the carrier spring.

# LOCATION AND REMEDY OF FAULTS

## on the 7F1 flywheel magneto alternator as fitted to the Raleigh 'Moped'

The following is our recommended procedure for a systematic examination to locate and remedy the more common faults which may develop through lack of attention to the equipment or damage to the wiring. A systematic procedure is essential, otherwise considerable time may be wasted before the cause of the trouble is disclosed.

If, after carrying out these tests. the cause of the trouble is not found, it is advisable to get in touch with the nearest Lucas Service Depot or Agent.

# COMMON FAULTS

### IGNITION

ENGINE WILL NOT START

(a) Remove the H.T. lead from the sparking plug terminal and hold the cable end about $\frac{1}{8}$ in. away from some metal part of the engine while the engine is slowly turning over. (This can be done by operating the pedals by hand with the decompressor valve released and while the machine is on the centre stand.) If the spark jumps the gap regularly the ignition equipment is functioning correctly. Proceed to remove sparking plug and if necessary clean and reset gap to ·020 in. Check fuel supply, etc.

(b) If sparks do not occur in test (a), remove the flywheel and check for a fault in the ignition primary winding by connecting a flashlamp battery and bulb in series with it. Connect battery earthing one side to the engine and connecting the other to the main capacitor terminal making sure that the contact points are open.

NOTE : A simple method of ensuring that the contacts are open is to insert a piece of paper between the two contacts (see Fig. 28). If the bulb lights the winding continuity is satisfactory. Examine the contact points, if necessary clean the contacts and adjust the gap setting, this should be ·015 in. Check the capacitor by substitution.

(c) If after carrying out these checks the ignition system is still inoperative, have it examined by a Lucas Service Depot or Agent.

ENGINE MISFIRES.

(a) Examine the contacts, if necessary clean and reset the gap.

(b) Remove the sparking plug, rest it on the cylinder head and observe if a spark occurs at the plug points when the engine is turned. If

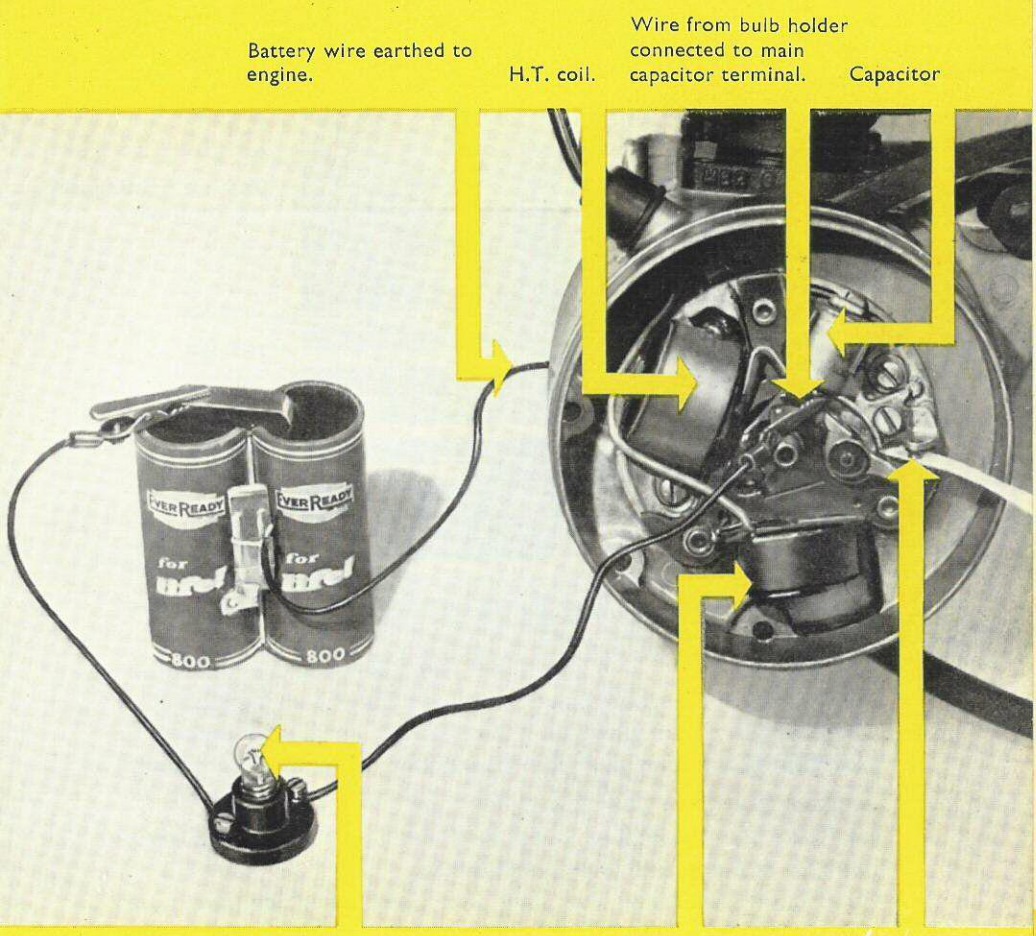



**FIG. 28**
**Testing H.T. coil primary wiring for continuity.**

necessary clean and adjust the gap. Check H.T. cable and replace if it shows signs of deterioration or cracking. Check capacitor by substitution.

(c) If sparking is regular at the plug when tested as described in (b), the trouble is probably due to engine defects, and the carburettor supply, etc., must be examined.

(d) If after carrving out these checks the engine still misfires, have it examined by a Lucas Service Depot or Agent.

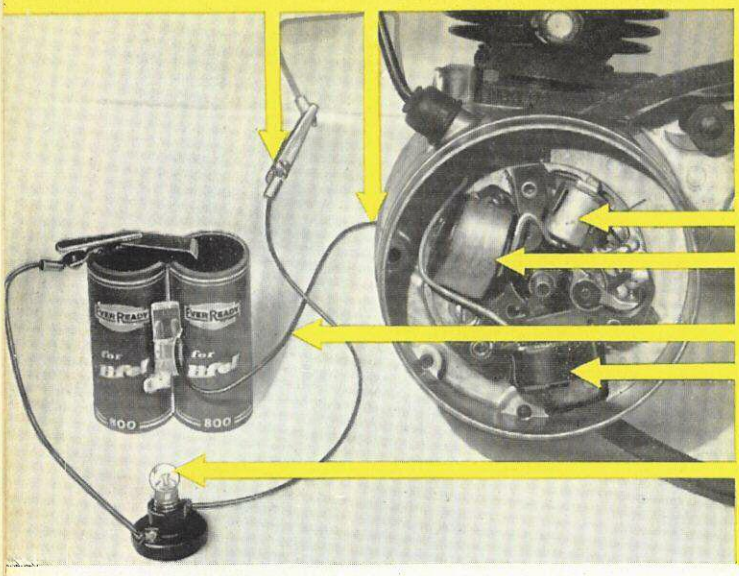



**FIG. 29**
**Testing lighting coil for continuity.**

## LIGHTING

PARKING BULB FAILS TO LIGHT.

(a) Check that the lighting switch is in 'Park' position. Check parking bulb and dry battery by substitution.

(b) If parking bulb does not light after checking as described in (a) using a wiring diagram for reference, check wiring and switch connections.

FAILURE OF LIGHTS (*Engine running*).

(a) This can be the result of blown bulb(s). Check by substitution of both headlamp and tail-lamp bulb together. Otherwise, if headlamp bulb is defective the tail lamp bulb will blow due to overloading. Operate dip switch in order to check that both headlamp filaments are satisfactory.

(b) If after checking as described in (a) the bulbs still do not light with the engine running, proceed to check generating coil as follows—

1. Connect a test lamp, consisting of a spare headlamp and tail-lamp bulb connected in *parallel* to give an 18 watt load across the main (Grey) lead from the generator and a convenient point on the engine. With the engine running at little more than half throttle the bulbs should light to full brilliancy.

2. If after carrying out the test described in (1) the test bulbs light, proceed to check each stage of the circuit from generator to lighting switch, referring to the wiring diagram, for open-circuits (breakages, etc.) should any of these faults exist, bulb will not light. Also check for bad connections, etc., if bulbs do not show full brilliancy. Check continuity of generating coil with flashlamp battery and parking bulb in series and connected across the main generator lead and a convenient point on the engine. Bulb should light if coil is satisfactory (see Fig. 29).
3. If after carrying out the above checks the head and tail lights do not function have the machine examined by a Lucas Depot or Agent.

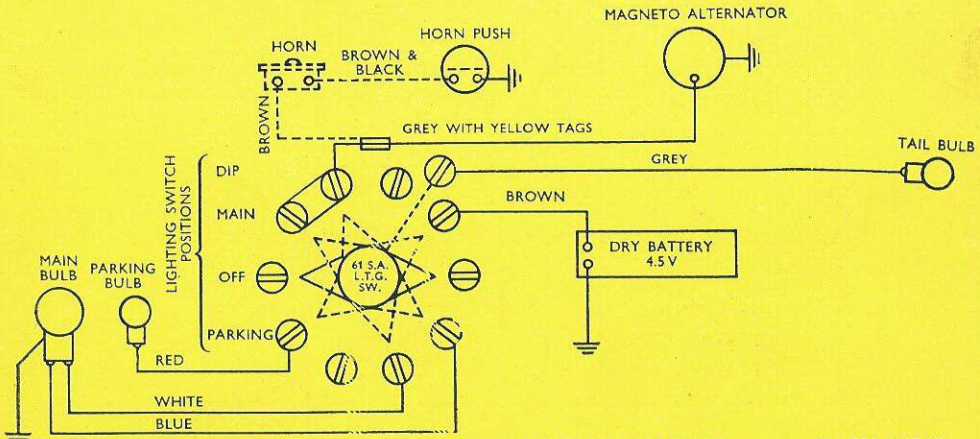
LIGHT FLICKER (*engine running*).

Examine wiring for loose or dirty connections, or short circuits caused by faulty cable insulation. Rectify as necessary.

HEADLAMP ILLUMINATION INSUFFICIENT.

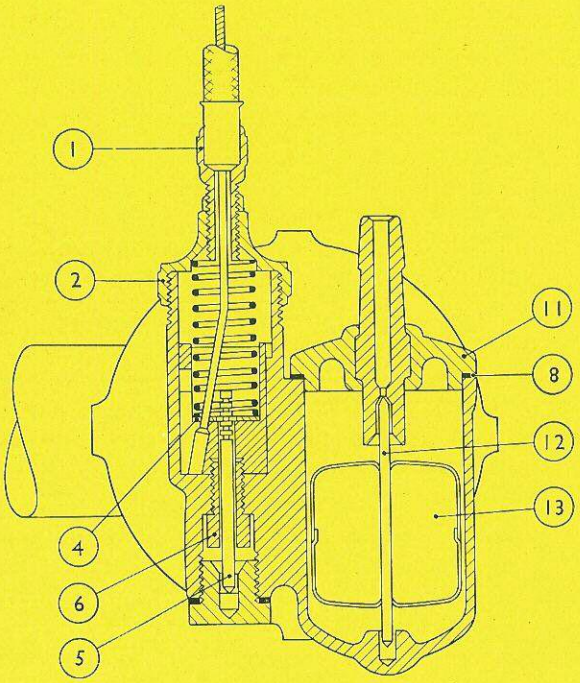
Check for discoloured bulbs or sagged filaments, replace bulbs if necessary. Check the reflector ; if tarnished or discoloured it should be replaced, as aluminised reflectors should not be cleaned or polished in any way whatsoever.

## RALEIGH MOPED WIRING DIAGRAM




MAIN BULB 6 VOLTS 15/15 WATT ... ... No. 386 LUCAS
PARKING BULB 3·5 VOLTS 0·15 AMP. ... No. 974 LUCAS
TAIL BULB 6 VOLTS 3 WATT ... ... No. 990 LUCAS

# HINTS AND TIPS FOR AMAL CARBURETTOR TYPE 385




*For key to numbers see below.*

**Section through float chamber**

KEY TO ILLUSTRATION NUMBERS

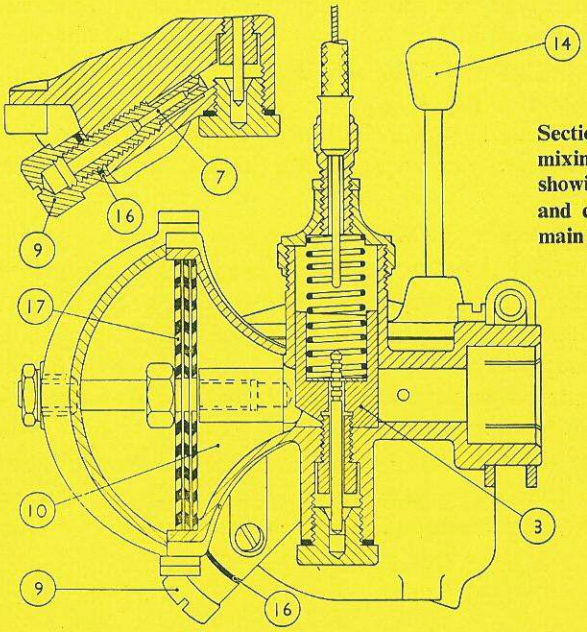
A. Throttle Valve Cut-away.
1. Cable Adjuster.
2. Mixing Chamber Top.
3. Throttle Valve.
4 Jet Needle Clip.
5 Jet Needle.
6. Needle Jet.
7. Main Jet.
8. Float Chamber Cover.
9. Main Jet Cover Nut.
10. Main Air Intake.
11. Float Chamber Cover.
12. Float Needle.
13. Float.
14. Starting Needle.
15. Starting Chamber.
16. Main Jet Cover Nut Washer.
17. Air Filter Elements.

HOW CARBURETTOR WORKS

The float chamber maintains a constant level of fuel at the jet and cuts off the supply when the engine stops. On fuel flowing from the float chamber the float (13) falls, and its needle (12) coming away from its seating allows fresh fuel to enter. Depression caused by movement of the engine piston causes, via the throttle opening, air to flow into the main air intake (10) and fuel to flow through the needle jet (6) into the cross bore and mix with the incoming air, forming a fuel/air mixture.

Correct fuel/air proportions for various throttle openings are governed by : the size of the main jet (7) which controls the amount of fuel fed to the needle jet (6) at $\frac{3}{4}$ to full-open throttle ; the taper of the jet needle (5) which, operating in the needle jet (6), controls the amount of fuel fed at lesser openings ; the parallel portion of the jet needle (5) which, on entering the bore of the needle jet (6), and in conjunction with the amount of cutaway on the throttle valve (3), controls the idling mixture ; the Starting Chamber (15) from which fuel is fed direct to the carburettor bore on the engine side of the throttle valve (3) via a well, formed by a division wall in the float chamber. Sufficient fuel for cold starting is allowed to fill the well by raising the needle (14) in its cover.

*For key to numbers see opposite.*




**Section through mixing chamber showing air intake and cross bore with main jet sectional view.**

STARTING INSTRUCTIONS.

Follow the instructions regarding recommendations about type of fuel or mixture to be used.

*Starting engine from cold.*

Raise needle in the top of the float chamber for 3 to 4 seconds, thus allowing starting chamber to fill with fuel, set throttle valve about $\frac{1}{4}$ open, start engine, and when engine is running regularly throttle down to idling speed. No further operation of the starting needle should be necessary.

*Starting when engine is warm.*

The starting chamber needle should not be raised, thus keeping the chamber empty of fuel. In both cases the throttle should be slightly opened and the engine started.

MAINTENANCE.

*Removing and fixing carburettor.*

If the carburettor is removed from the induction pipe, see that on re-fixing it is pushed right home on the pipe before locking the clip. Never fit the carburettor to a pipe on which it is slack, nor ever drive it on to a tight one. The carburettor 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. Erratic slow running can be caused if there are air leaks at the point of attachment of the carburettor to the cylinder.

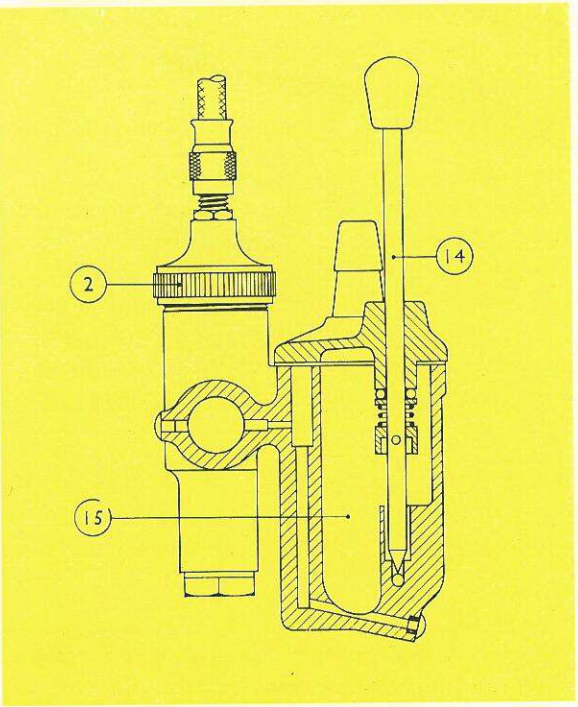
Before tightening the clip always make sure that the carburettor is set in a vertical position when the machine is off the centre stand.

*Dismantling when inspecting or tuning.*

The float chamber, float or its needle may be inspected by removing the float chamber cover (11), which is secured by two screws, the float and needle can then be lifted out.

Ensure when replacing the cover that the joint washer (8) is undamaged, and the starting and float needles enter their respective seatings correctly.

The throttle valve complete with jet needle and attached to the cable can be withdrawn from the carburettor after the knurled mixing chamber top (2) has been unscrewed.




**Section through starting chamber.**

*For key to numbers see page 36.*

To separate the throttle valve and jet needle from the cable, release the cable at the control end and push the inner cable forward until the nipple in the throttle valve clears its hole, then withdraw the cable through the slot in the throttle valve, the nipple passing through the hole at the extreme end of the slot. On re-assembling pass the nipple through this hole via the inside of the throttle valve, ensure that the portion of the jet needle clip (4) that falls in towards the jet needle is opposite the cable slot in the throttle valve, and then draw the cable forward until the nipple will pass over the end of the throttle valve and sink into its hole. On putting back this throttle valve assembly into the body, see that the key in the carburettor body engages the key-way opposite the cable slot in the throttle valve, and that the jet needle is entering the needle jet, before attempting to push the assembly home. Access to the main jet is by removing the main jet cover nut (9). When replacing the main jet take care not to overtighten.

*Fuel Feed.*

Ensure that the fuel tap and pipe are kept clear.

*Float Chamber.*

Ensure that there is no continual flooding of the float chamber.

*Excessive Fuel Consumption.*

This may be due to continual flooding of the float chamber ; check that the float needle is not worn or bent, that the float is not leaking, that no impurities have got into the float chamber and lodged on the float needle seating. Nearly all flooding with new machines is due to impurities (grit, fluff, etc.) in the fuel tank—so clean out the float chamber periodically until the trouble ceases. If the trouble persists, the fuel tank may be drained, swilled out, etc.

*Cable Controls.*

See that the cable control fully opens and closes the throttle valve (3), a cable adjuster (1) with locknut is provided in the top of the carburettor and can be adjusted until correct movement is obtained.

*Air Filter Elements.*

(17) should be kept free from obstruction. Periodically these should be removed and washed in petrol, then dipped in thin oil and allowed to drain, and replaced in carburettor.

*Faulty Mixtures, its signs and causes.*

There are only two possible faults in carburation, either richness or weakness of mixture.

INDICATIONS OF :—

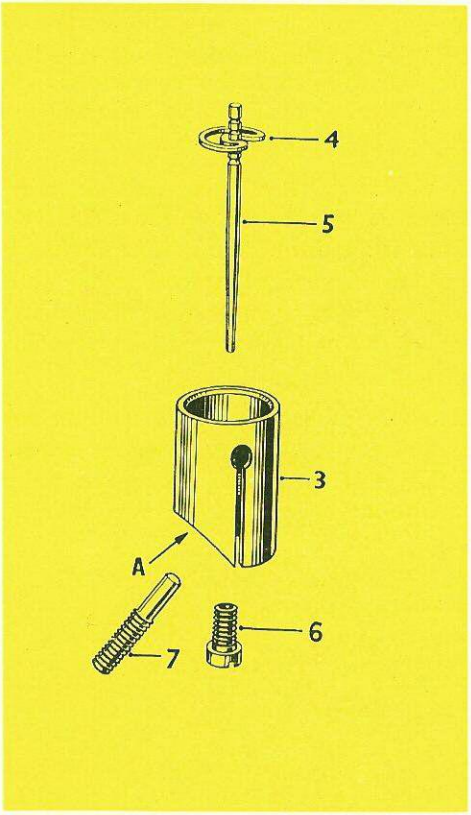
| *Richness.* | *Weakness.* |
|---|---|
| Black smoke in exhaust. | Spitting back in carburettor. |
| Petrol spraying out of carburettor. | Erratic slow running. |
| Two stroke engines, fourstroking. | Poor acceleration. |
| Heavy, lumpy running. | Engine goes better if :— |
| Sparking plug sooty. | Throttle valve is not wide open, or if starting chamber is kept supplied with fuel. |

If richness or weakness is present, check if caused by :—

1. Petrol feed. Check that the main jet, needle jet and passages are clear and that there is

ample flow of fuel. Ensure that the air vent from air intake to float chamber is unobstructed. Check there is no flooding of the float chamber.

2. Air leaks. At the connection of the carburettor to the engine.
3. Defective or worn parts. As a loose fitting throttle valve, worn needle jet, or loose needle jet or main jet.
4. Air filter elements obstructed.
5. Carburettor not correctly adjusted. See Adjustment or Tuning, page 42.




**Parts with which the carburettor is adjusted or tuned.**

*For key to numbers see page 36*

*The Main Jet.* (7)

Each main jet is calibrated and numbered so that its exact discharge is known. Two main jets of the same number are alike, never reamer a main jet out, get another one of the right size, the larger the number the greater the flow.

*The Throttle Valve.* (3)

The slope at (A) is called the cutaway, and its number is stamped on the bottom.

*The Jet Needle.* (5)

The jet needle is positioned in the throttle valve by the jet needle clip (4). The top of the jet needle is grooved and by springing the clip off and springing it on again in another groove the position of the jet needle in the throttle valve is altered, either being raised or lowered.

ADJUSTMENT OR TUNING OF CARBURETTOR.

A certain amount of adjustment is provided for on the carburettor to ensure that a correct mixture is obtained. The correct mixture is one that is neither too rich nor too weak. See that there are no faults as outlined in 'Maintenance' as these would affect the correct functioning and adjustment of the carburettor. Check that the ignition, timing, etc., is functioning correctly.

Carburettors as supplied by the maker should not require any adjustment, but for special conditions should only require adjustment to the jet needle. To richen, raise the needle. To weaken, lower needle.

# RALEIGH MOPED
# FAULT TRACING CHART

## (1) ENGINE FAILS TO START FROM COLD

| | Possible Causes | Suggested Remedy |
|---|---|---|
| *A.* | *No Fuel.* | Open petrol tap or switch over to reserve supply and refill tank if necessary. |
| *B.* | *Enrichment pin has not been operated.* | Lift pin for approximately 3 to 4 seconds. |
| *C.* | *Carburettor jet blocked.* | Remove, clean and replace. |
| *D.* | *Fouled spark plug.* | Clean or replace with new one. |
| *E.* | *Weak spark at plug electrode.* | Check ignition contacts for cleanliness and correct gap (·015 in.). |
| *F.* | *Carburettor float chamber feed hole blocked.* | Remove Float Chamber top and clear hole. |

## (2) ENGINE STARTS BUT RUNS FOR SHORT PERIODS ONLY

| | | |
|---|---|---|
| *A.* | *Shortage of Fuel.* | Check quantity of fuel in tank. If low, switch to reserve supply. |
| *B.* | *Petrol pipe blocked.* | Pull fuel pipe away from carburettor top, turn tap to 'on' position and observe flow. If flow is restricted remove tap from tank, clean filter and replace. |
| *C.* | *Water in carburettor.* | Remove carburettor, dismantle, clean thoroughly and refit. |
| *D.* | *Spark plug oily or sooty.* | Clean or replace with recommended brand of new plug. |

## RALEIGH MOPED FAULT TRACING CHART—Cont.

### (3) ENGINE RUNS BUT LACKS POWER

| | | |
|---|---|---|
| *A.* | *Jet partially blocked.* | Remove, clean and replace. |
| *B.* | *Spark plug incandescent due to wrong type of plug or weak mixture. (Symptoms: Engine tends to 'tighten' up and emits tinkling metallic sound).* | Unless correct plug already fitted, change to one with recommended heat value. Check carburettor main jet for correct size. |
| *C.* | *Carburettor air filter blocked.* | Remove, clean and replace. |
| *D.* | *Leaking decompressor valve.* | Check cable for free play, remove valve and re-grind. |
| *E.* | *Magneto contact breaker gap too small.* | Re-adjust to correct setting (·015 in.). |
| *F.* | *Exhaust system blocked with carbon.* | Clean silencer and exhaust pipe internally. |
| *G.* | *Exhaust port in cylinder partially blocked with carbon.* | Remove carbon. |

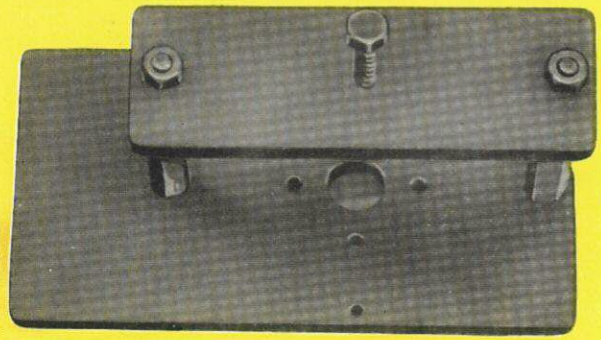
### (4) ENGINE "FOUR STROKES" BADLY

The symptoms are change of exhaust note to half the normal "tempo", usually accompanied by loss of power.

| | **Possible Causes** | **Suggested Remedy** |
|---|---|---|
| *A.* | *Carburettor flooding.* | Clean out carburettor, ensure needle is seating correctly and float is not punctured. |
| *B.* | *Carburettor jet loose.* | Remove jet-cap nut and retighten jet. |
| *C.* | *Enrichment pin not seating correctly.* | Remove carburettor top, examine seating on pin and carburettor. If damaged replace with new parts. |
| *D.* | *Main jet too large.* | Replace with smaller jet. |
| *E.* | *Throttle valve needle too high.* | Lower needle. |

## (5) ENGINE APPEARS TO RUN WELL BUT FAILS TO PROPEL MACHINE SATISFACTORILY

| | | |
|---|---|---|
| *A.* | *Drive belt slipping.* | Re-tighten. |
| *B.* | *Chains too tight causing loss of power.* | Re-adjust. |
| *C.* | *Wheel bearings too tight.* | Re-adjust. |
| *D.* | *Brakes binding.* | Re-adjust. |



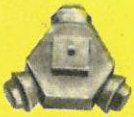
MS 1

Screwed Sleeve MS 34 and Locknut MS 35 (Part of MS 1)

MS 2

MS 3

MS 4



MS 6

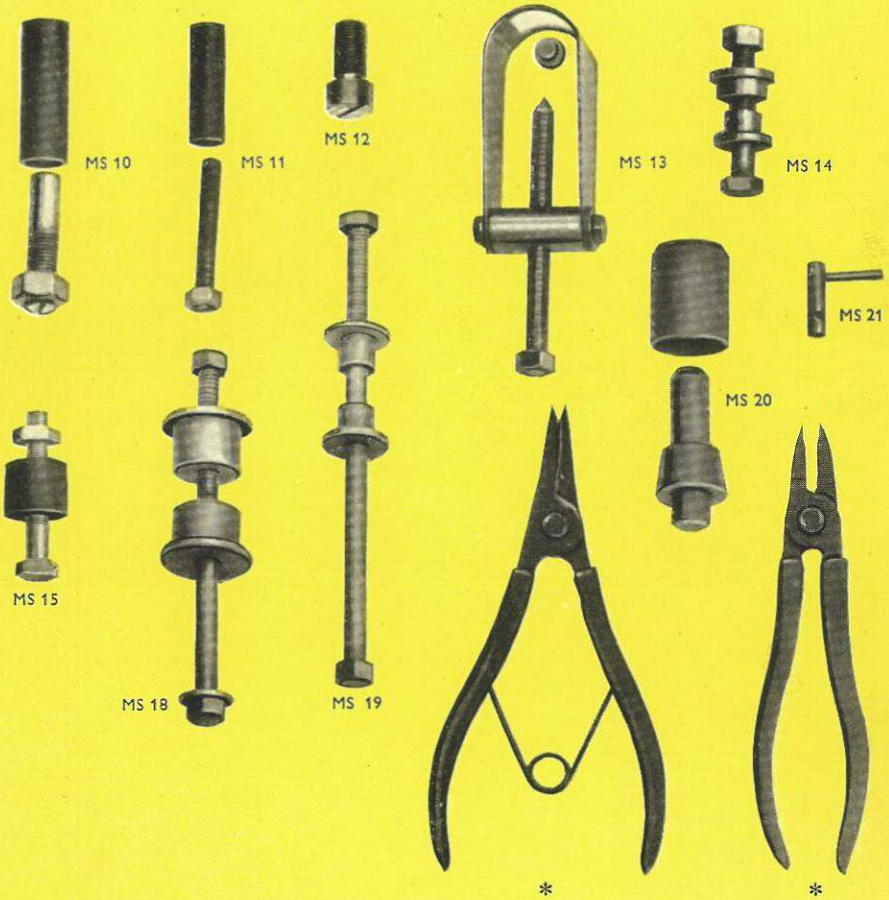
MS 7

MS 8

MS 9

## SPECIAL SERVICE TOOLS

| PART NO. | DESCRIPTION |
|---|---|
| MS1 | Crankshaft Jig. |
| MS2 | Crankshaft Removal Adaptor. |
| MS3 | Crankshaft Assembly Adaptor. |
| MS4 | Crankshaft Thread Adaptor Nut. |
| MS6 | Crankshaft Bearing Rolling-in Tool. |
| MS7 | Oil Seal Assembly Tool. |
| MS8 | Flywheel Extractor. |
| MS9 | Crankshaft Pulley Extractor. |




| | |
|---|---|
| MS10 | Crankshaft Pulley Assembly Tool. |
| MS11 | Crankcase Dowel Extractor. |
| MS12 | Piston Stop. |
| MS13 | Gudgeon Pin Assembly and Removal Tool. |
| MS14 | Engine Needle Bearing Assembly Tool. |
| MS15 | Engine Mounting Bush Tool. |
| MS18 | Bottom Bracket Sleeve Bearing Assembly Tool. |
| MS19 | Driving Shaft Bearing Assembly Tool. |
| MS20 | Driving Shaft Spring Ring Assembly Tool. |
| MS21 | Driving Pin Ball and Spring Assembly Tool. |
| * | Circlip Pliers not available from *Raleigh Industries Ltd.* |

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