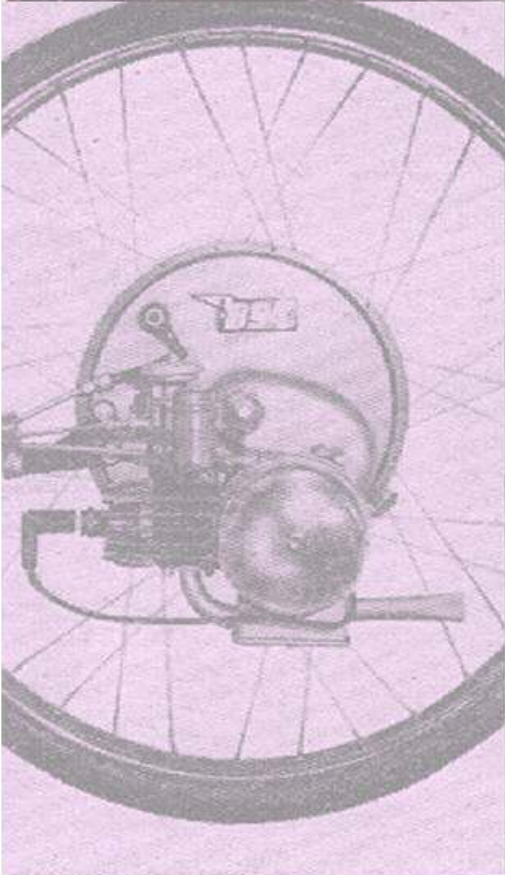


IceniCAM Information Service



Cycle**master**

THE MAGIC WHEEL THAT WINGS YOUR HEEL



WORKSHOP MANUAL

PRICE

Seven Shillings and Sixpence

Published by

CYCLEMASTER LIMITED

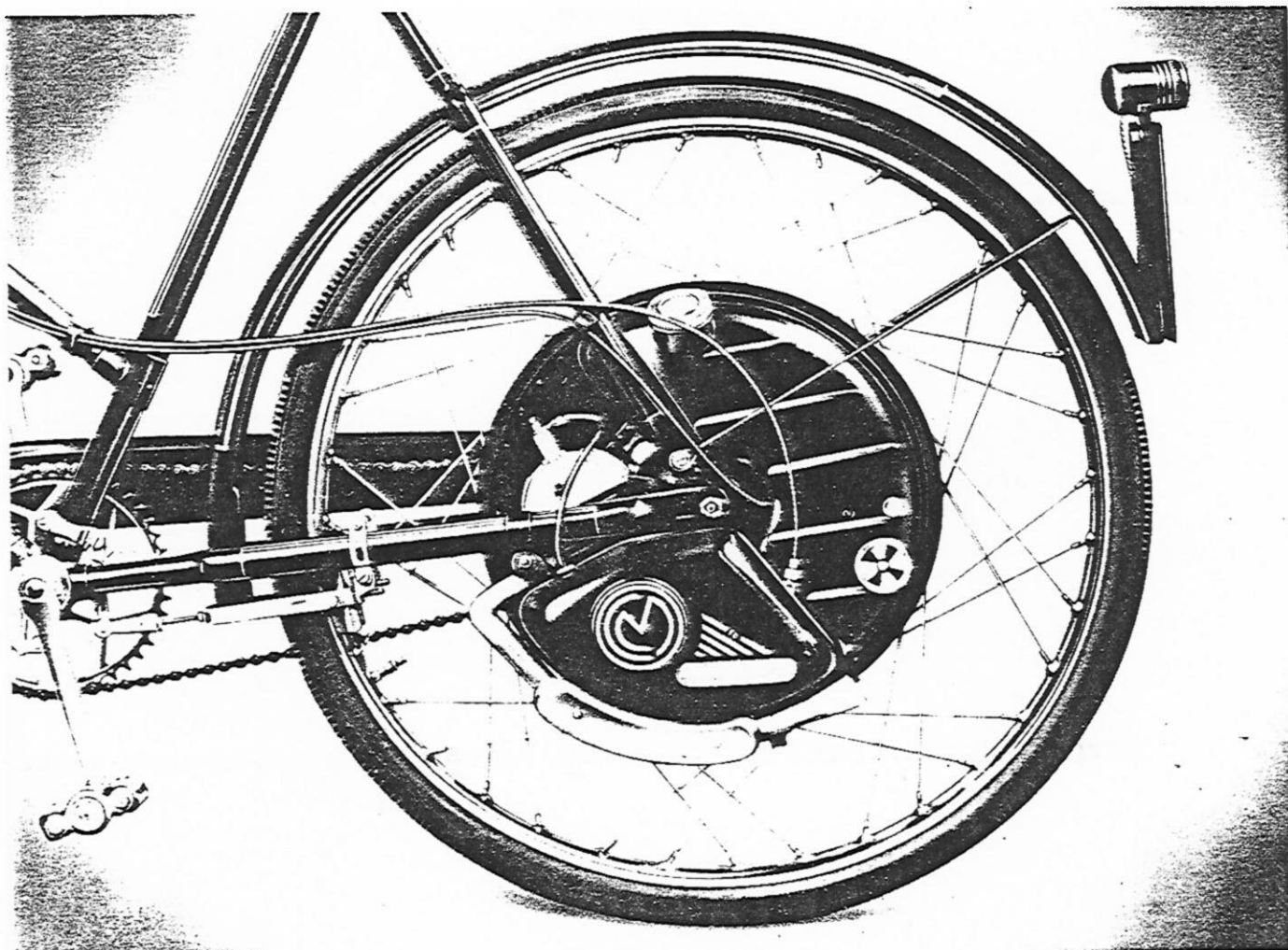
38A ST. GEORGE'S DRIVE, VICTORIA, LONDON, S.W.1.

Telephone: VICToria 6312/3/4/5

FIRST REVISED EDITION

WORKSHOP MANUAL

2



GENERAL DATA

Size of wheel	26-in. by 1½-in.	Carburetter	Amal.
Engine	Two-stroke.	Fuel consumption	300 m.p.g.
Engine No.	Stamped on underside of casting above exhaust fishtail.	Clutch	Single plate, operating in sealed oil bath.
Bore	32 mm.	Clutch free travel	¼-in. measured at tip of control lever.
Stroke	32 mm.	Clutch chamber lubricant	S.A.E. 140.
Capacity	25.7 cc.	Correct amount of oil for clutch chamber.	50 cc. i.e. Petrol filler cap full.
R.A.C. Rating25 h.p.	<i>Note: When filling an empty clutch chamber, the petrol cap should be used as a measure, since it holds exactly the right quantity. It is most important NOT to overfill.</i>	
Developed brake h.p.	0.6 (approx).	Maximum speed	20-25 m.p.h.
Engine speed	4500 r.p.m. at 20 m.p.h.	Ratio, engine-clutch	3.2 : 1.
Fuel Mixture	"Petroil" (1 in 25)	Ratio, clutch-wheel	5.6 : 1.
Engine oil	S.A.E. 20.	Ratio, overall	18 : 1.
Fuel tank capacity	2½ pints (approx.).	Transmission	Chains
Ignition	Wico-Pacy Flywheel magneto FW1132 OR FW1104Z.	Climbing capacity (without pedalling)	6-7% (approx.).
Spark Plug	K.L.G. 14 mm. Type F.50.	Additional weight of Cyclemaster Wheel	20 lbs. (approx.).
Plug gap018-in. to .020-in.		
Contact breaker gap018-in.		

FOREWORD

The Cyclomaster is a complete and self-contained two-stroke power unit, integral with a specially built back wheel.

The engine itself does not revolve, but is located by lug and bracket to the left-hand horizontal fork. The primary drive, from crankshaft to clutch shaft, is by a completely enclosed chain, running constantly in an oil bath.

A secondary chain carries the drive from clutch shaft to a sprocket mounted parallel with the sprocket driven by the pedal chain.

In other words, while the engine and all accessories remain stationary in relation to the wheel, the drum, to which the spokes are fixed, revolves.

OUR SERVICE POLICY

The Cyclomaster engine has been described as being "built like a watch". In some ways this is true, for the object of the designers was to pack into the smallest space possible an engine that would function efficiently and indefinitely with the minimum of attention.

From time to time, however, service will be required, either routine attention such as decarbonising, or repairs as a result of accident or misuse.

It is the policy of Cyclomaster Ltd. to direct all such work to the authorised Dealer. In every way we shall urge

the owner not to tinker with his Cyclomaster any more than he would try to repair his own watch.

We are sure we can look to you to back us up by giving very good service, prompt service, willing service—at the right price.

So far as price is concerned, we have endeavoured in this manual to give details of as many time and labour saving devices as possible. Shortly we hope to offer all necessary special tools at very attractive prices, but until then, any tools shown in this manual can be made up should occasion arise.

IMPORTANCE OF CLEANLINESS

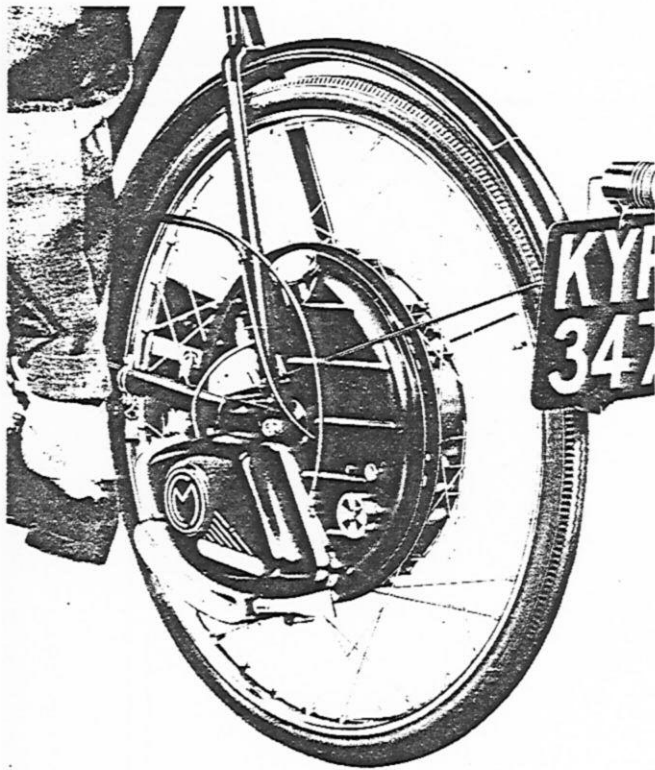
Most Dealers are setting aside a section of their workshops solely for the servicing and repair of Cyclomaster wheels.

We urge that all precautions should be taken to keep that area as clean as possible, with white walls and, if possible, a floor treated to keep down dust.

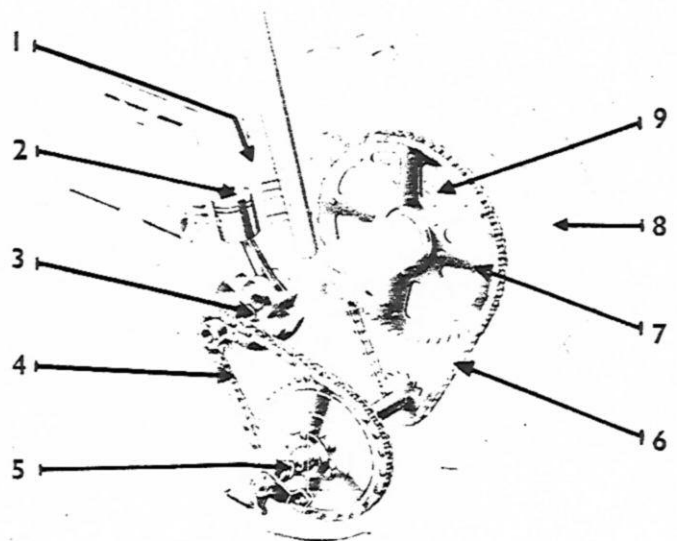
Such cleanliness, apart from being valuable in itself, will encourage your mechanics to take greater care to protect from grit and dirt the engines upon which they are working.

It will also serve to make your Cyclomaster Section a show place which you will be proud to show to people, and which will attract more work.

HOW IT WORKS



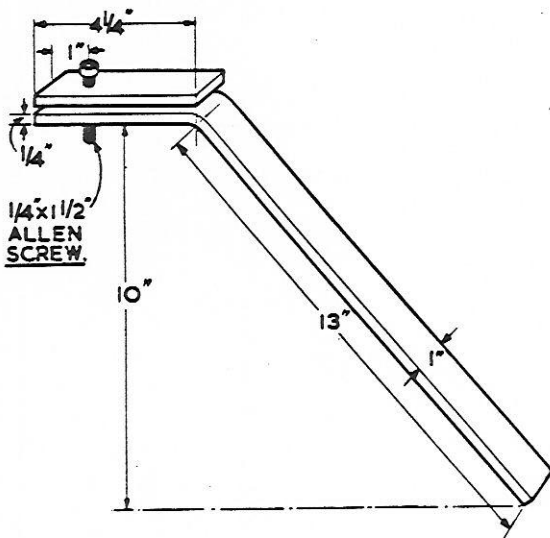
This photograph shows the Cyclomaster wheel close-up, and gives an excellent idea of the compactness of the engine.



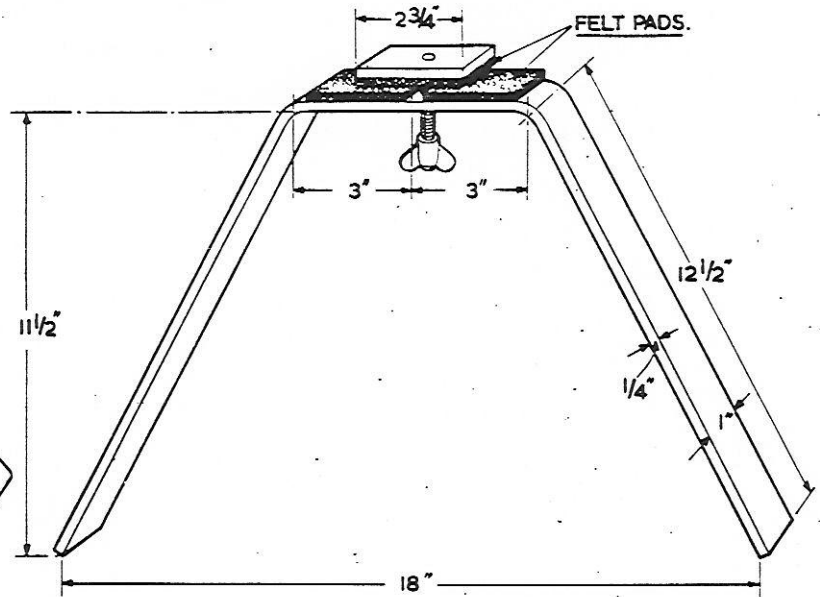
(1) Cylinder remains stationary. (2) Piston goes up and down. (3) 3-bearing crankshaft revolves. (4) Chain drive to clutch. (5) Clutch operating mechanism. (6) Chain drive to main sprocket. (7) Main sprocket. (8) Wheel drum revolves. (9) Cycle chain from pedals.

SOME USEFUL EQUIPMENT

SINGLE PROP STAND.



DOUBLE PROP STAND.



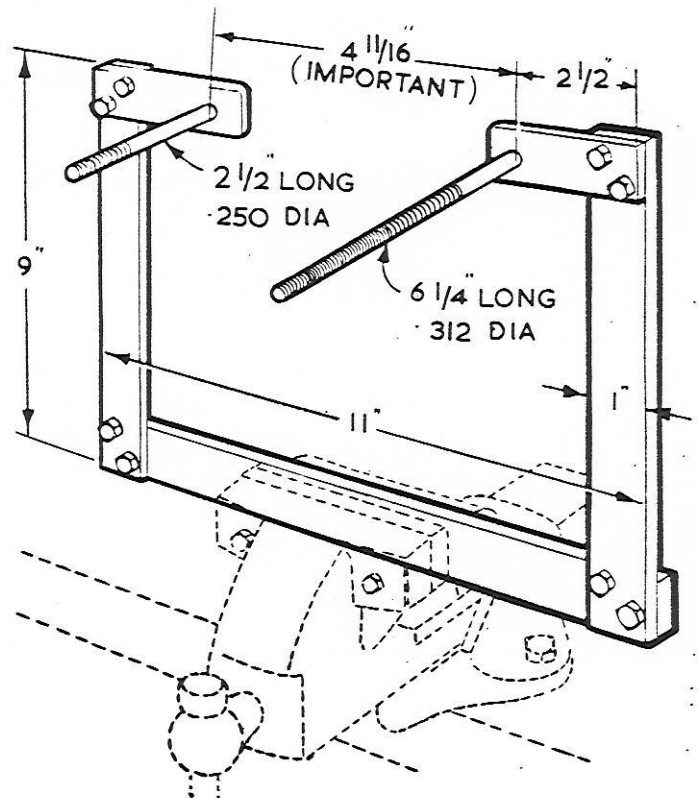
Either of the two stands illustrated above may easily be made, and the double prop stand will serve two purposes :—

- (i) It will support the machine while the Cyclomaster wheel is being removed.
- (ii) It will hold the machine while the wheel is out.

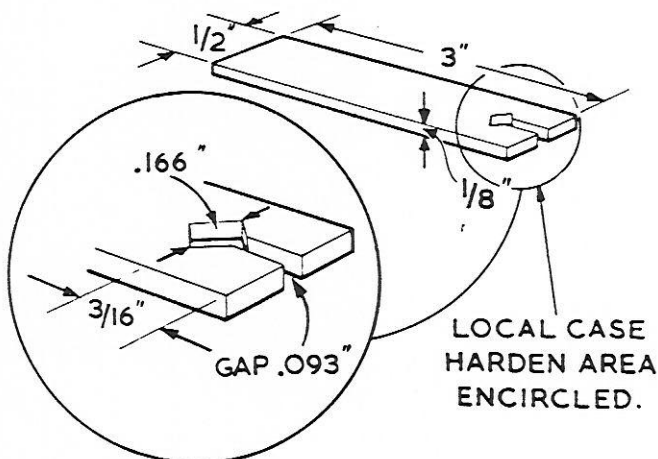
Without such a stand, you would have cycles flopping about all over the place, looking unsightly and being damaged.

Only a few pieces of angle iron are required.

ENGINE STAND



SPOKE NUT SPANNER.



MATERIAL: MILD STEEL
(LOCALLY CASE-HARDENED)

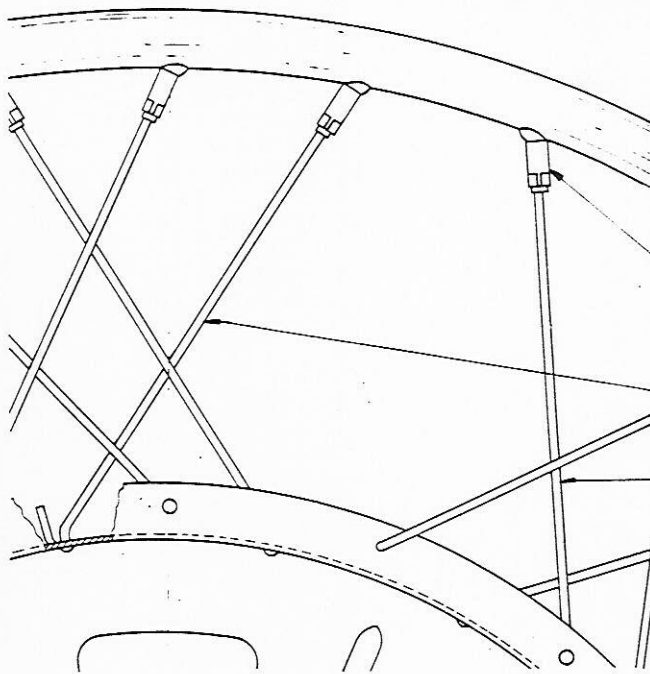
The simple tool illustrated above can easily be made, and will prove very useful for adjusting the spokes of the wheel.

(See important notes on page 9.)

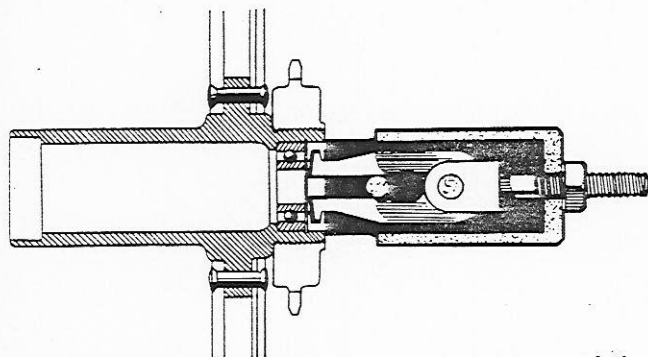
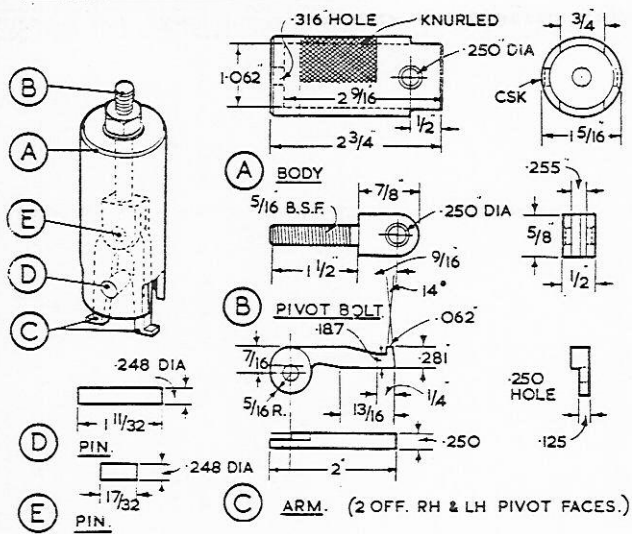
The straightforward framework shown in this illustration is absolutely essential for dismantling and reassembling the engine.

Without it, makeshift methods must be used : spindles will be clamped in vices, and so on.

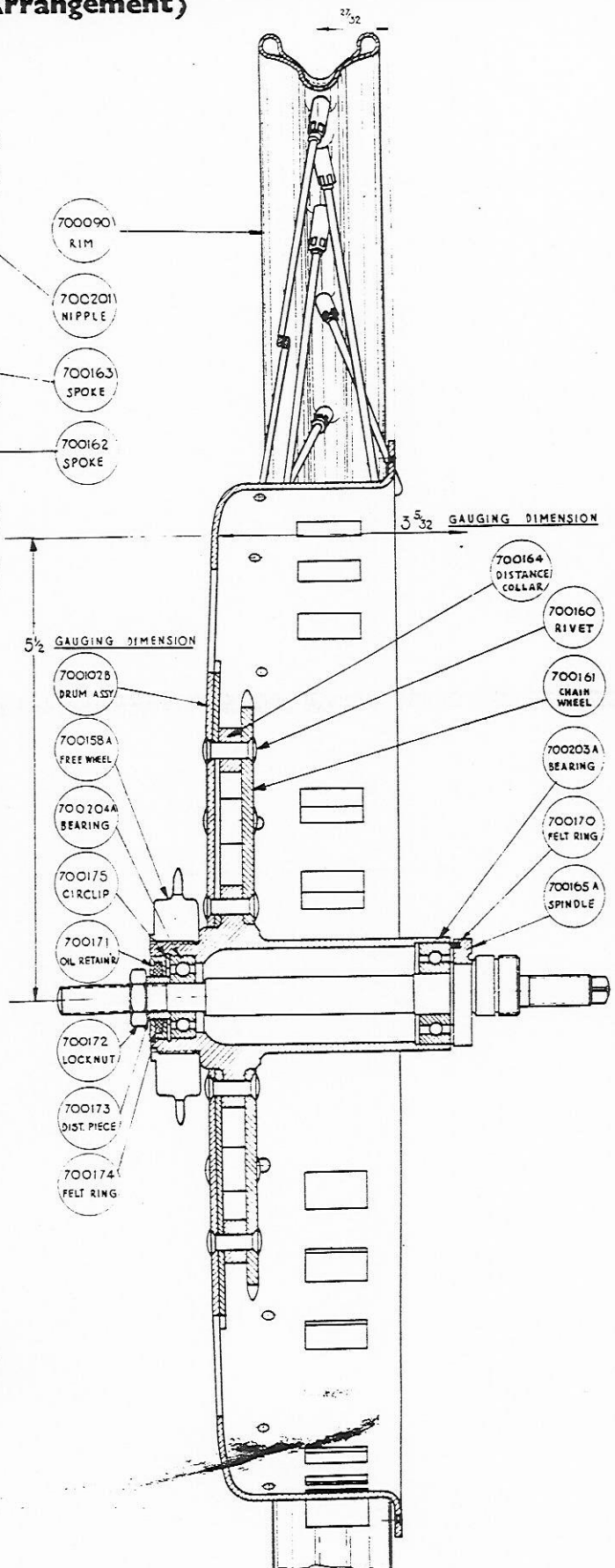
(General Arrangement)



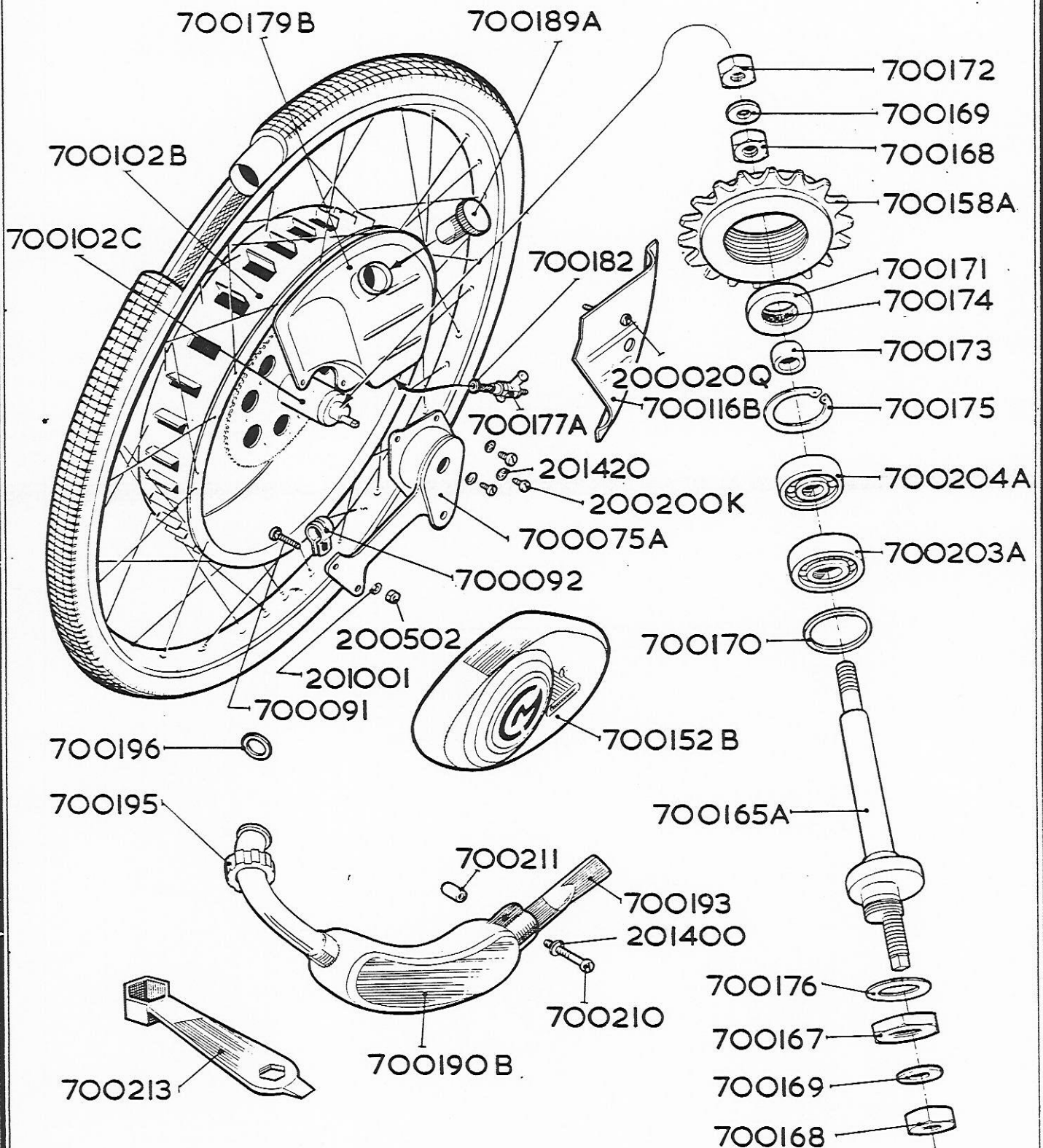
OIL RETAINER EXTRACTOR.



A working drawing for the tool to remove the oil retainer ring (700171) from the wheel spindle—and the tool in use.

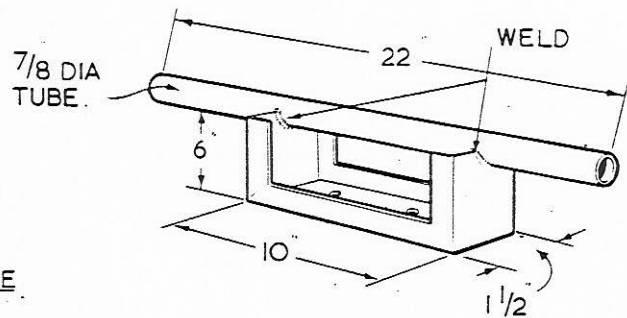
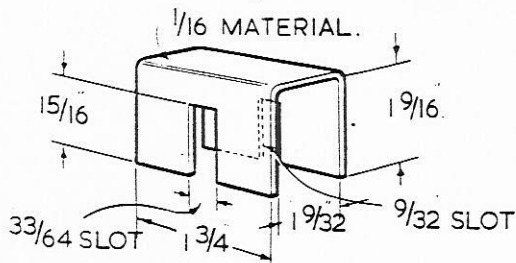


WHEEL AND SPINDLE (Exploded)



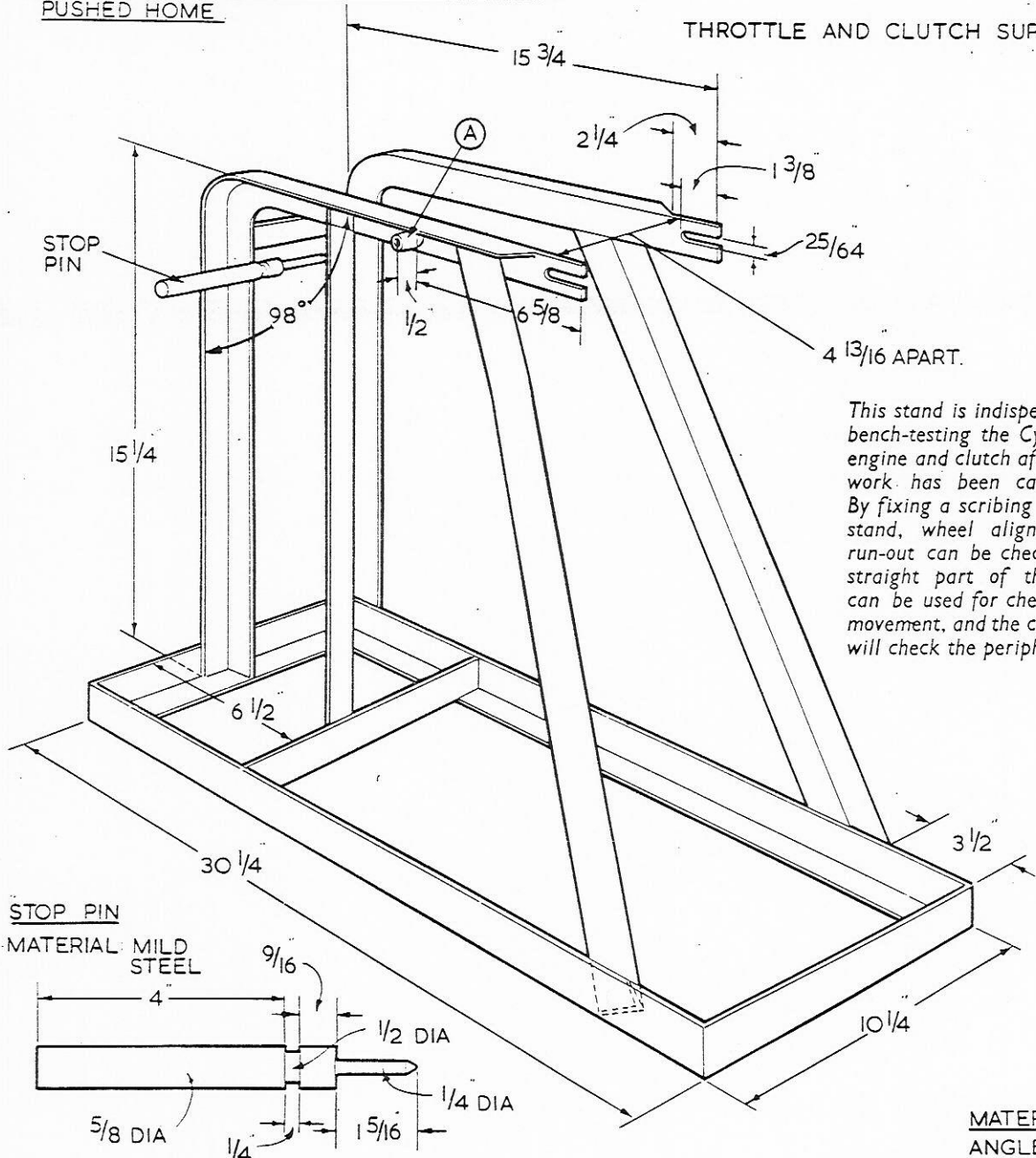
WHEEL TESTING AND RUNNING RIG

(WELDED OR RIVETED CONSTRUCTION)



TO BE PLACED ON FRAME AT (A) TO HOLD CYCLE ENGINE IN POSITION AFTER STOP PIN IS PUSHED HOME

THROTTLE AND CLUTCH SUPPORT

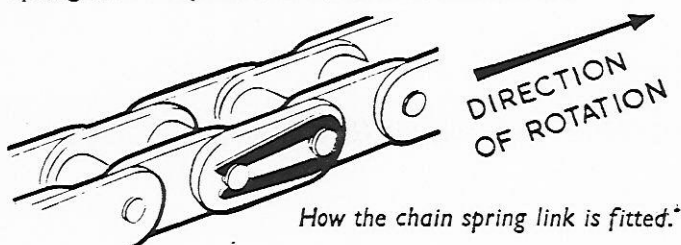


This stand is indispensable for bench-testing the Cyclomaster engine and clutch after service work has been carried out. By fixing a scribing tool to the stand, wheel alignment and run-out can be checked. The straight part of the scriber can be used for checking side movement, and the curved part will check the periphery.

MATERIAL
ANGLE IRON
1 3/4 x 1 3/4 x 3/16

TO REMOVE WHEEL

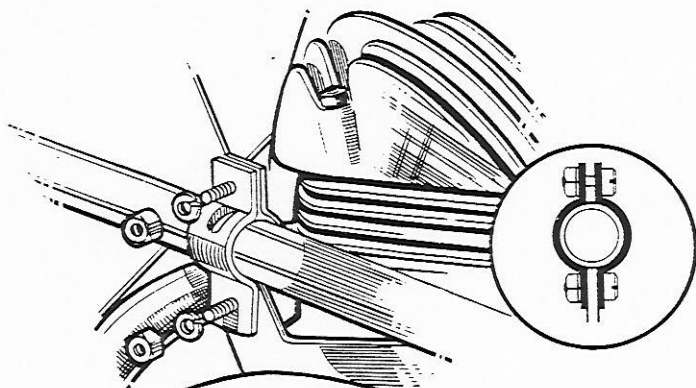
1. Stand cycle on prop stand.
2. Remove brake blocks or spring open brakes.
3. Release mudguard stays.
4. Free throttle control cable. Pull on free end of wire where it emerges from cable and release the end with the eye, from the slot in which it rests.
5. Remove clutch cable in a similar manner to the throttle cable. To do this it may be necessary to slacken the clutch adjustment.
6. Remove rubber straps that hold both cables to frame.
7. Disconnect lead from spark plug.
8. Remove chain from pedal sprocket by taking out spring link: replace link as soon as chain is off.



9. Slacken off clip (700092) which locates engine to frame. Slide clip along fork out of the way, and replace bolt, nut and washer in position.
10. Slacken hub spindle nut on each side until wheel is comfortably slack, with ample free play, but do not remove nuts. Rock wheel free of frame, and remove.

TO FIT WHEEL

1. Offer up wheel until it is roughly in position between forks.
2. Re-fit chain, making sure spring link is correctly assembled. If of open limb type, head should face in direction of drive.
3. Replace adjusters (if fitted).
4. Make sure serrated washer each side is *outside* slotted fork.
- 5.* Slide bracket back along frame, and connect to lug on Cyclomaster engine. Feed bolt in from back, fit spring washer and nut on thread, but do not tighten.



The correct fitting of the engine locating bracket is most important.

6. Adjust tension of chain from pedal sprocket to wheel sprocket. The chain should be tighter than on an ordinary cycle. Total movement, up and down, of lower length of chain, should be no more than $\frac{1}{4}$ in.
7. Check wheel for alignment between forks.
8. Tighten hub nuts.
9. Re-check tension of chain.
10. Finally tighten nut of bolt securing lug to bracket.
11. Reconnect mudguard stays.
12. Reconnect clutch and throttle control cables.
13. Reconnect spark plug lead.

* If a new wheel is being fitted for the first time, the clip will be found bolted to the lug on the engine, shaped to fit forks of "D" section. If forks have a different section, fit packing as necessary. It is a good idea to put one turn of insulating tape around fork to protect the enamel.

The bolt is fed through from the inside. Then the nut (with a spring washer under it) is started on the end of the bolt which emerges from the slot.

FREE WHEEL LUBRICATION

It is advisable to inspect the free wheel whenever a Cyclomaster comes in for service. Normally this piece of mechanism is in operation for only a low percentage of the time a cycle is in use—only, in fact, when the owner is not pedalling. With Cyclomaster, however, it is in use most of the time; since the owner pedals very seldom.

It may be removed by using a small drift in the two slots alternately. The thread is *right hand*.

WHEEL ALIGNMENT

To avoid undue tyre wear it is essential to see that the wheel is kept in alignment.

This may best be checked by mounting the wheel in the "running" stand, and using a scribe as suggested. The straight end serves to check the sides of the tyre: the curved end is used for the periphery.

If adjustment is necessary, carry out by trueing wheel in the usual way.

SPOKE ADJUSTMENT

The simplest and most effective way of checking spokes for tightness is to tap them lightly with a screwdriver. There should be a light metallic ring: a dull sound indicates slackness.

In no circumstances should spokes ever be tightened without first removing outer cover, tube and tape. Without this precaution, the heads of the spokes tightened may be made to project into the tube and puncture it in several places.

A useful tool for tightening the spokes, which may be made up quite easily, is illustrated on page 5.

When the tightening has been done a careful examination of the inside of the rim should be made, and any spoke which is "proud" of its nut should be filed down before tape, tube and cover are replaced.

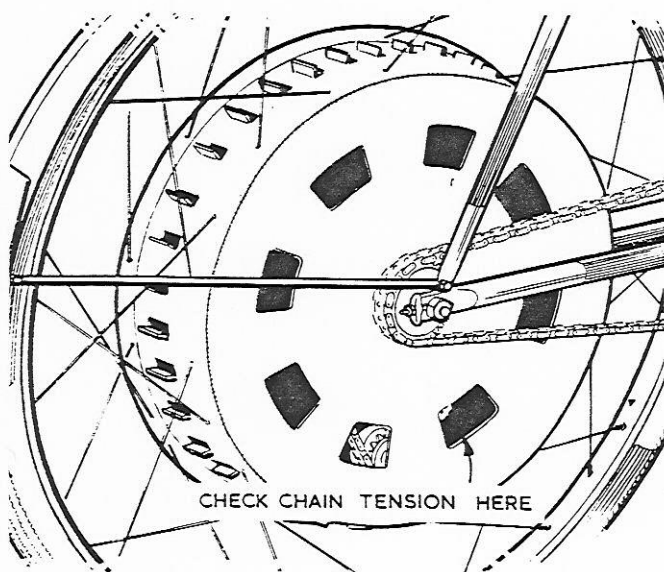
WHEEL BEARINGS

Wheel bearings are packed with grease during assembly, and should not require attention. They should, however, be checked from time to time, and always when the engine is removed from the wheel for any reason. Should undue wear be suspected, proceed as follows :—

1. Remove engine from wheel (if not already out).
2. Ascertain which bearing is faulty by checking freedom of movement of spindle each end.
3. If 700203A, first remove lock nut (700172) and distance piece (700173) from spindle.
4. Press out spindle (700165A). The Ballrace should come with it.
5. Remove faulty race by tapping it off.
6. Examine felt ring (700170) ; fit new one if necessary.
7. Press on new bearing.
8. Press spindle into hub housing.
9. Replace distance piece.
10. Replace lock nut.

* * * *

11. If bearing 700204A is faulty :—
 12. Remove Lock nut (700172) and (700173) distance piece.
 13. Press out spindle (700165A).
 14. Pull out felt ring (700174).
 15. Remove oil retainer ring (700171) using special tool illustrated.
 16. Remove circlip (700175) with round-nosed pliers.
 17. Tap out bearing (700204A) from other end.
 18. Fit new bearing. Replace circlip (700175).
- Fit new oil retainer ring (700171) if necessary.
Fit new felt ring (700174) if necessary.
Replace spindle (700165A). Re-fit distance piece (700173) and lock nut (700172). Replace engine.



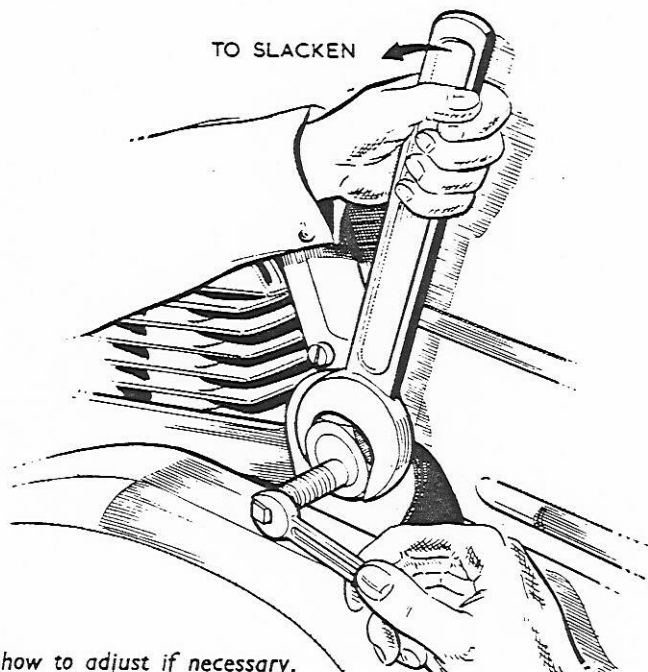
Where to check the tension of the chain from clutch to drum, and how to adjust if necessary.

FIRST SERVICE

After a Cyclomaster has covered approximately 150 miles, it must be given an initial free servicing as set out in the Dealer Agreement.

This service is as follows :—

- | | Page |
|---|------|
| 1. Inspect level of oil in clutch chamber. Top up if necessary. Do not overfill. | 14 |
| 2. Inspect and adjust clutch. | 14 |
| 3. Check cylinder head, engine mounting and exhaust bolts. Tighten if necessary | 28 |
| 4. Check contact breaker points. Adjust if necessary | 16 |
| 5. Check chain from clutch to drum. Remove wheel and undo large hexagon nut. Place spanner on square end of hub spindle and adjust to allow not more than $\frac{1}{8}$ in. total slack in chain. Hold hub spindle firm, tighten large hexagon nut, recheck adjustment. | 10 |
| 6. Check wheel for alignment. For this purpose use a scribe, using the straight end for the sides and the curved end for the periphery. Do not tighten spokes without first removing cover, tube and tape, or the tube may be damaged. If any spoke end is proud of the nut after tightening, file level. Refit wheel | 9 |
| 7. Inspect sparking plug. Adjust points if necessary. Examine all surfaces of plug which are exposed in combustion chamber; they should be light brown colour.
If dark; mixture is too rich or too oily. If mixture too rich, see page | 12 |
| If surfaces are covered with pearl-like formations, engine is running too hot, and spark is probably too far retarded. Correct timing as described on page | 16 |
| 8. Tighten exhaust cylinder nut (700195) with engine hot. | |



ENGINE

GENERAL DESCRIPTION

The Cyclemaster has a two-stroke engine of exclusive design. Crankcase, block and head are separate castings, so closely finished that only one gasket is used—between crankcase and cylinder barrel.

Connecting rod and crankshaft are serviced as a unit and must always be removed and replaced as a unit. In no circumstances should any attempt be made to separate these parts.

The crankshaft is carried in three main bearings, and is straddle mounted.

Lubrication is by petroil (1 in 25).

METHOD OF OPERATION

The mixture produced by the carburetter (which also contains the engine lubricant) is fed to a port in the gas-tight crankcase, the entry being controlled by the disc valve illustrated. This valve requires no adjustment, and is not likely to wear or go wrong.

All other valves are merely ports in the castings opened and closed at the right moments by the reciprocal movements of the piston.

As the piston rises, it compresses the mixture in the combustion chamber above it, and at the same time

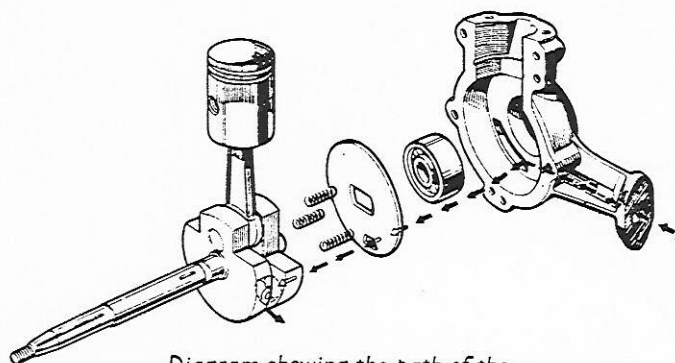


Diagram showing the path of the gas through the disc valve.

creates a depression in the gas-tight crankcase below it. The disc valve is then in the open position, so that the depression causes a fresh charge of gas to enter the crankcase.

When the mixture in the combustion chamber is fired, the piston is driven down on the power stroke, and as it descends it uncovers the exhaust port in the cylinder wall.

The disc valve in the crankcase is now closed, and as the downward movement of the piston continues, so the fresh charge below it is compressed, and the pressure forces it, through passages in the casting, from below the piston to the combustion chamber above it, when the cycle of operation is repeated.

It will be noted that the piston does not follow the conventional two-stroke design, but has a slightly convex top. The roof of the combustion chamber and the piston top form a symmetrical shape, making for much more efficient combustion and therefore improved performance and economy.

CARBURETTER

GENERAL DESCRIPTION

The engine speed is controlled by the carburetter throttle which is operated by a single lever on the handlebar. On the inlet of the carburetter there is an air filter with a strangler shutter which should be open except for starting from cold.

The lubrication of the engine is effected by oil being mixed with the petrol so that the carburetter produces a mixture of petrol, oil and air.

The Amal carburetter is of robust and efficient design, and requires no routine maintenance. It is set, at the factory, to give the maximum performance with economy, but simple adjustments are provided should there be evidence of a mixture that is either too weak or too rich.

The carburetter consists mainly of three parts :—

1. The float chamber containing a float and needle.
2. The mixing chamber containing a piston throttle, throttle needle, a needle-jet and a main jet which screws into the lower end of the needle-jet and so controls the maximum supply.
3. An air filter with strangler shutter.

The float chamber is bolted to the mixing chamber and a petrol tight joint is made by a gasket ; a filter gauze is also inserted between the two.

METHOD OF OPERATION

The petrol tank contains a filter, and fuel flows through this by gravity to the carburetter float chamber, where a needle valve maintains the correct level in the conventional way.

The fuel is again filtered as it passes from float chamber to jet chamber.

The depression set up in the crankcase when the piston rises causes air to rush in through the air cleaner, and over the top of the jet, where its passage induces a fine spray of liquid fuel which, mixing with the air, forms the explosive mixture.

When the throttle control lever on the cycle handle-bar is progressively opened, the control wire lifts a spring loaded piston throttle to increase the air passage through the carburetter.

Whilst the main jet controls the maximum supply of fuel, this amount is modified until the throttle is wide open, by a taper needle passing through the throttle and being held in the throttle by a spring ; this taper needle works in the needle jet and its function is to limit the supply of petrol until the throttle is wide open.

The position of the needle in the throttle affects the mixture.

Five grooves are cut into the top, or thick, end of this tapered needle. A copper clip is sprung into one of these grooves, and controls the depth to which the needle is allowed to go down into the needle jet, and thus regulates the intake of fuel.

On initial setting, the copper clip is located in the middle groove, and it should not be changed unless there is definite evidence that the mixture is wrong. If the clip is put into the groove nearest the end of the needle, the mixture will be weaker but if put into the groove farthest from the end the mixture will be richer.

POSSIBLE FAULTS

Flooding. Most often caused by dirt or impurities in the fuel lodging in the needle seating, so preventing the valve closing. A bent needle will cause flooding. A most rare occurrence would be a punctured float that had become petrol-logged.

Has the float needle slipped out of the float clip?

Too rich a mixture (smoky exhaust) can be caused by flooding or a loose needle jet or main jet, or the shutter of the air filter not being opened wide.

Too weak a mixture can be caused by an obstruction to the flow of fuel by choked filters or a choked main jet. Water getting into the fuel supply can produce this also.

TO REMOVE CARBURETTER

1. Push fuel tap to "off" position.
2. Unscrew and remove air cleaner.
3. Remove single screw and take off carburetter cover.
4. Remove flexible fuel pipe from tank to carburetter.
5. Loosen screw clip where fuel pipe to crankcase joins carburetter and lift carburetter free, with cable still connected.

TO INSPECT FLOAT

1. Take off top of float chamber by removing two screws.
2. Remove hexagon nut at lowest point of chamber.
3. Remove gasket.
4. Remove banjo.
5. Remove gasket.
6. Now simply press down the needle gently but firmly till it springs out of the wires on the float: then pull out from the underside.
7. Thoroughly clean. Fit new float if necessary.

To re-assemble, reverse this procedure, being particularly careful to see that retaining wires on top of float are correctly located in groove in needle.

Note.—Banjo union has an interior groove, allowing petrol to pass through. It must be replaced at right angles to wheel drum.

TO CLEAN JET

1. With special CM spanner remove hexagon nut at lowest point of mixing chamber.
2. Unscrew jet, using same tool.
3. Apply air line and blow through.

To re-assemble, reverse the procedure. The jet should never be cleaned with wire.

TO CLEAN FILTER

Note.—The fuel filter is located between mixing chamber and float chamber.

1. Remove the two nuts on the flange of the mixing chamber.
2. Break joint between mixing chamber and float chamber.
3. Remove gasket and gauze filter.
4. Wash filter in petrol.

To replace, reverse these operations. Be sure the gasket is not damaged.

TO ADJUST MIXTURE

1. Unscrew knurled cap where the control cable enters mixing chamber.
2. Lift out spring-loaded piston and tapered needle.
3. Free end of control wire from first handle-bar lever, and then from slot in piston (wire simply fits into slot, and is held by a nipple on the end, which pushes into a recess in the throttle).
4. Remove needle complete with spring.
5. On the upper (thick), end of the tapered needle will be seen five circular grooves. A copper clip fits into the centre one, and locates the needle in the carburetter piston. If the copper clip is not in the centre groove, the setting has been altered since the carburetter left the makers.

MIXTURE TOO RICH

Move copper clip to upper groove. This will allow the tapered needle to sink further into the needle jet, and so restrict the flow of fuel.

MIXTURE TOO WEAK

Move copper clip to lower groove. This will prevent the tapered needle going down so far into the jet tube, and so permit a greater flow of fuel.

TO REASSEMBLE

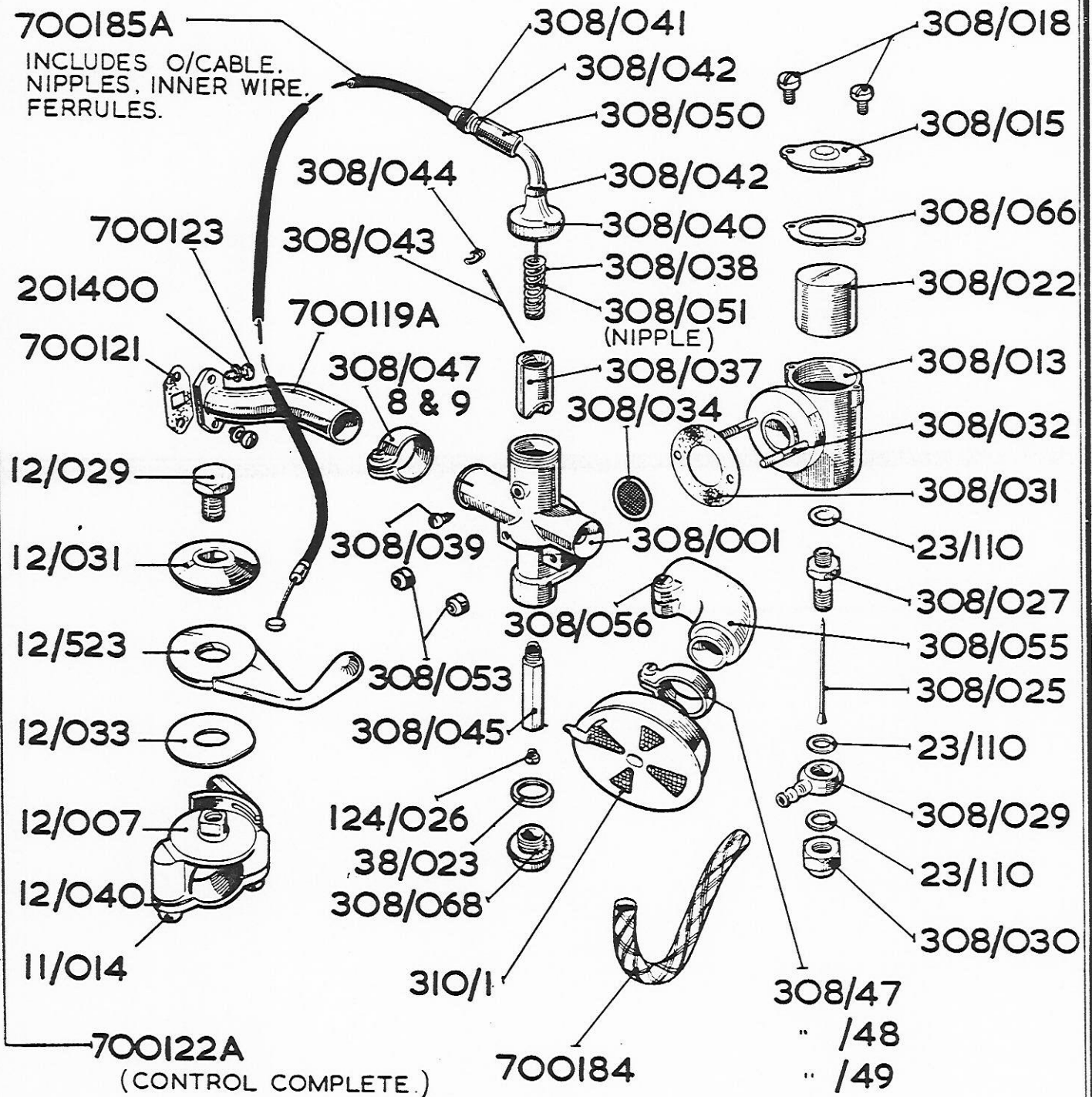
1. Place the long taper end of the needle into the deep recess in the throttle and it will hang there on the clip.
2. Place coil spring round the wire.
3. Locate the wire in slot in piston and pull the nipple into the recess in the throttle. See that the coil spring fits into the throttle and holds the needle clip down.
4. Offer up piston to mixing chamber.

IMPORTANT

On the outside of the mixing chamber will be seen a small grub screw, the other end of which stands slightly proud inside the mixing chamber. This proud end mates with the vertical groove in the piston and locates it.

5. Replace knurled cap and refit the wire into the control lever.

THE AMAL CARBURETTOR



CLUTCH

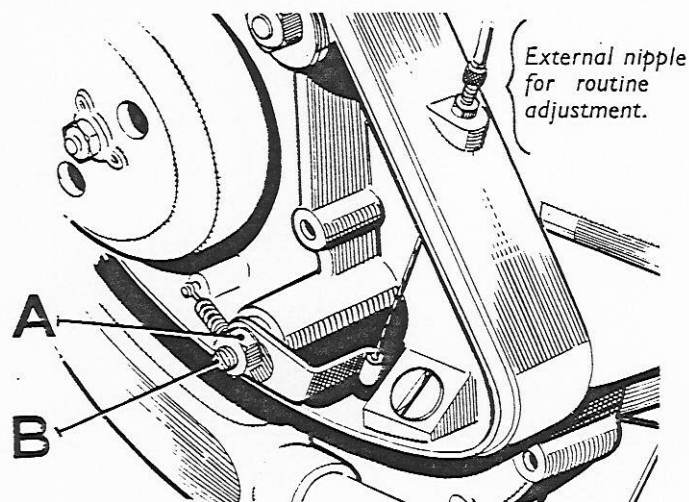
A single plate wet clutch embodying cork segments is fitted. It operates constantly in an oil bath, the level of which must be inspected once every three months. This may be done, and the clutch may also be adjusted, without removing the wheel. When correctly adjusted there should be $\frac{1}{4}$ -in. free travel at the tip of the control lever on the handlebar.

1. Remove front engine cover (the "CM" plate) which is held by one screw only.
2. In the right-hand lower corner of the casting now revealed will be seen a taper plug with a screwdriver slot in it. Remove this plug.
3. The lubricant should just cover the lower part of the chain (50 c.c. i.e. Petrol filler cap full). It is most important not to overfill, or you will get complaints of oil being thrown out. Use Castrol D or any other good brand of gear oil (S.A.E. 140).
4. Replace taper plug.
5. Replace engine cover.

ADJUSTMENT

1. The primary adjustment is provided where the control cable enters the casting. Slacken lock nut, and screw adjuster upwards to reduce the free travel: downwards to increase it. When sufficient adjustment can no longer be obtained in this way, proceed as follows:—
2. Remove front engine cover (the "CM" plate which is held by one screw only).
3. The clutch operating rocker, to which the Bowden wire is attached, will now be revealed.
4. Hold adjuster (B) with screwdriver while slackening locknut (A) with spanner.
5. To obtain greater disengagement, turn adjuster to RIGHT ("screw up").
6. To obtain less disengagement, turn adjuster to LEFT ("unscrew").
7. Hold adjuster with screwdriver and tighten locknut.
8. Check free travel at handlebar control.
9. Replace engine cover.

If an owner reports faulty operation of clutch, it must be dismantled and inspected. See pages 18 and 21.



Routine adjustment of the clutch is carried out by means of the external nipple. When sufficient adjustment can no longer be obtained this way, you remove the "CM" cover, slacken the lock nut A, and turn the screw B.

DECARBONISING

The decarbonising of the Cyclemaster engine is a straightforward operation, but it cannot be done without removing the engine from the wheel, as both head and cylinder barrel foul the wheel drum.

To remove engine, see operations 1 to 10, page 18.

Lift cylinder head by removing three nuts and washers.

NOTE.—There is no cylinder head gasket.

Scrape carbon away from head, and lightly polish with fine emery cloth dipped in paraffin.

Scrape carbon from top of the piston and from inside top of cylinder beyond limit of piston travel. Bring piston to lowest position and scrape out exhaust port. Apply airline, to blow fragments of carbon away, and lightly polish as with cylinder head.

To clean the piston ring grooves, the cylinder barrel must be removed.

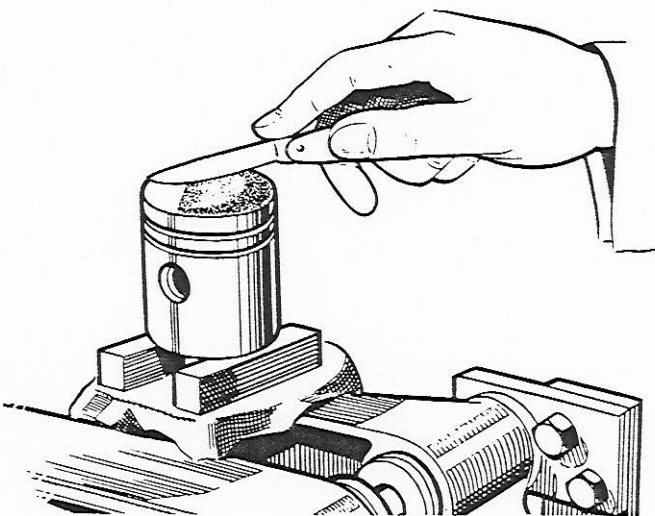
Using two nuts on each stud (for locking purposes) remove studs with spanner and lift off barrel. **IMPORTANT:** Lift barrel straight up: do not attempt to twist it, or there will be a serious risk of breaking the piston rings. **NOTE:** There is a paper gasket between barrel and crankcase. A new one will be required.

Clean away carbon from the three ports by using a curved scraper. Inlet ports may be relatively clean, but exhaust port tends to become badly clogged after prolonged running.

It is important to remove carbon from the piston ring grooves. The rings are delicate, and must be eased off by using shims, evenly spaced around the piston. The crankcase should be packed with rag while cleaning the grooves, to keep out carbon.

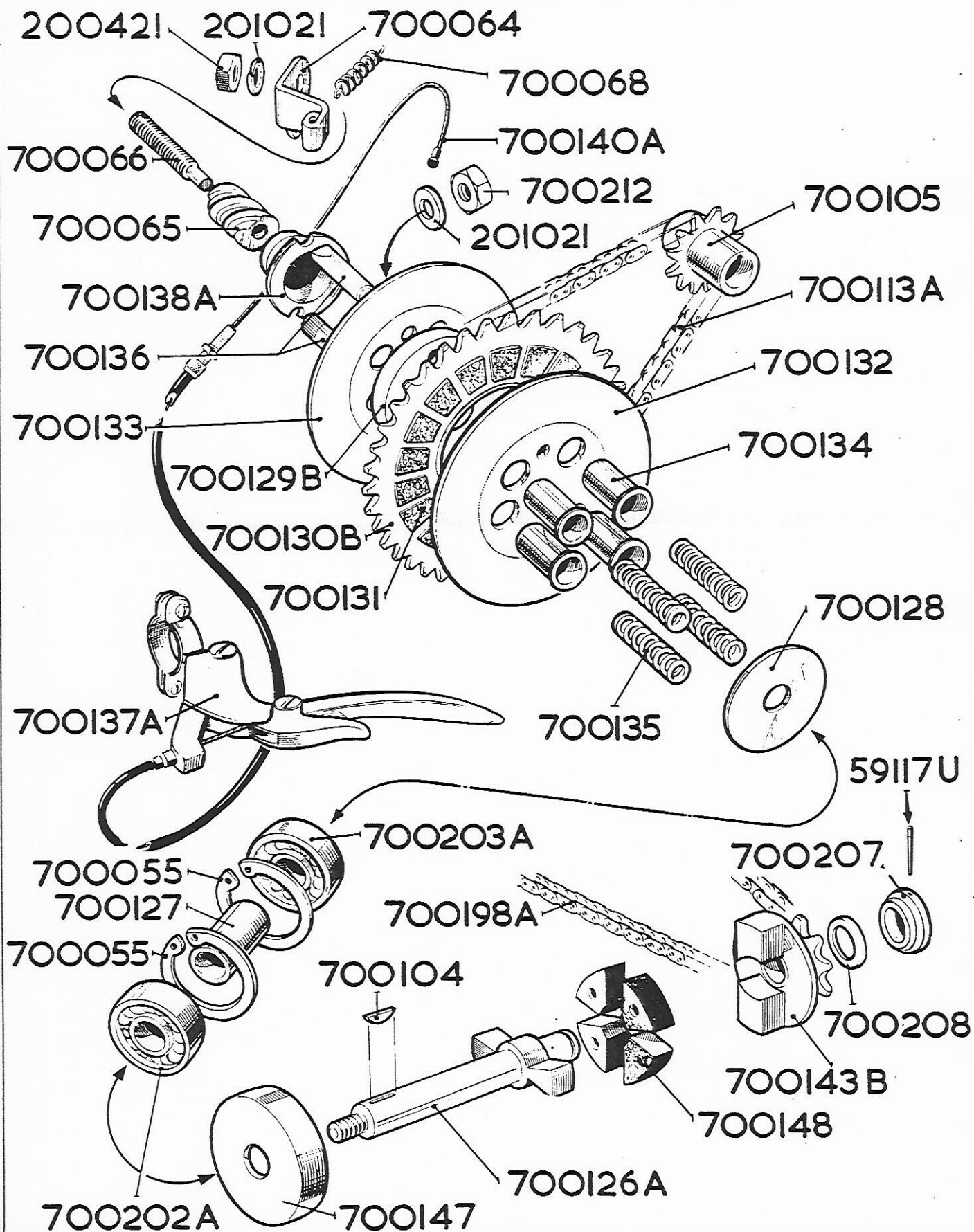
It is a good idea to put metal supports across on top of the rags, and lower the piston down until it rests on them. This will steady it.

When refitting rings, make sure that they are correctly located, with the gap of each fitting over the small projection in each groove.



When decarbonising, the top of the crankcase should be protected with rag, and the piston supported on two pieces of metal as shown.

CLUTCH AND CONTROLS



IGNITION

GENERAL DESCRIPTION

Ignition is by Bantamag flywheel magneto, which may be examined and serviced simply by removing the front "CM" engine cover held by one screw. The complete assembly consists of two main parts:—

- (a) The Rotor-flywheel, which is balanced statically,
- (b) The Stator.

Upon the Stator is mounted the condenser, coil and contact breaker.

All normal service work can be carried out through holes in the rotor, without removing the wheel.

If condenser or coil have to be replaced, the rotor must be removed as described later.

LUBRICATION

An oiled wick rests upon the eccentric spindle, the cam of which operates the moving arm of the contact breaker. This wick requires one drop of thin oil every five or six hundred miles, or every three months. Turn the rotor until the wick can be seen, and apply the oil by oil-can. Do not over-oil. Two or three drops are sufficient.

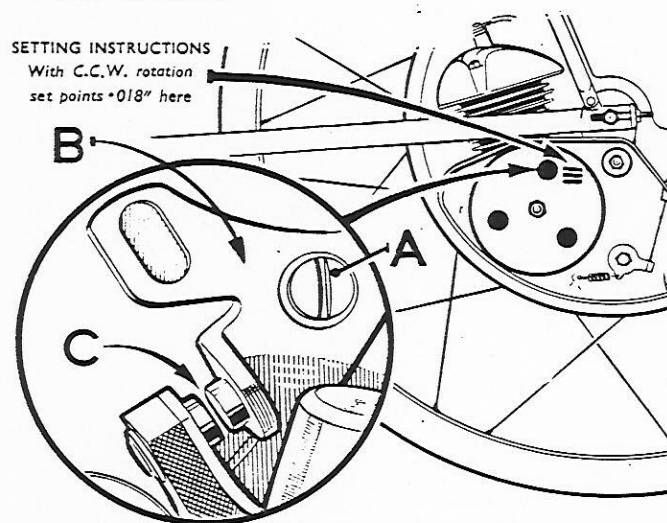
CONTACT BREAKER

1. Turn the rotor until the hole on top is the one with the gap setting instructions beside it. The points will then be fully open, and adjustment can be carried out through that hole.
2. Slacken locking screw.
3. With a screwdriver, move arm which is normally fixed, until gap is right. Should be .018 when fully open. When correct tighten locking screw and re-check.

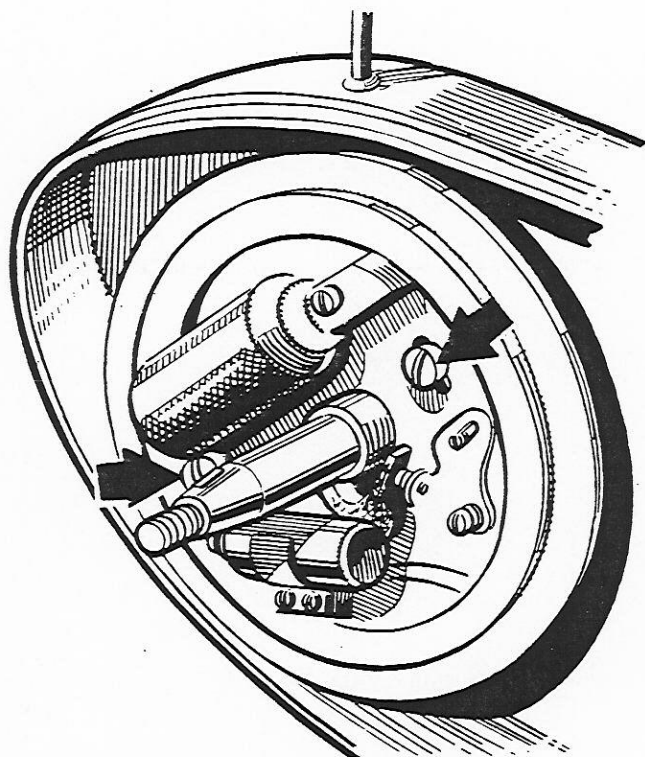
IGNITION TIMING

1. The contact points should just start to open at 24° before T.D.C. i.e. between $\frac{7}{8}$ " and 1" measured on the rim of the flywheel.
2. Turn rotor until elongated slots at top and bottom of stator can be seen.
3. Slacken both screws.
4. To advance spark, turn stator in a clockwise direction.
5. To retard spark, turn stator anti-clockwise.
6. Tighten screws.

SETTING INSTRUCTIONS
With C.C.W. rotation
set points .018" here



How to inspect and adjust the contact breaker points. To adjust the points; slacken screw A and move the plate B as necessary to open or close the points C. When correct tighten A and recheck.



Arrows show elongated slots for timing adjustment. Both casting and stator should be marked before screws are slackened.

POSSIBLE FAULTS

If there is no spark, we recommend that you adopt the following "trouble-shooting" sequence of operations:—

1. Examine sparking plug, without removing wheel or plug, for:—
 - (a) fitting of terminal;
 - (b) moisture on insulator, or lead.
 - (c) tightness in head: if it is slack, earthing will be poor.
 - (d) soundness of lead.

Correct any faults, and test for spark.

2. If still no spark, examine junction of lead with coil. To do this remove the engine cover bearing "CM" symbol, rotor (page 19) and flywheel back plate assembly. Take out two screws holding the clamp through which the lead enters the housing. The end of wire emerging from the coil should penetrate in between the strands of the lead. If joint is faulty, re-make, fitting new lead if necessary. The fibre or plastic sleeve should only be refitted over the joint after correct connection has been made. Replace clamp securely.

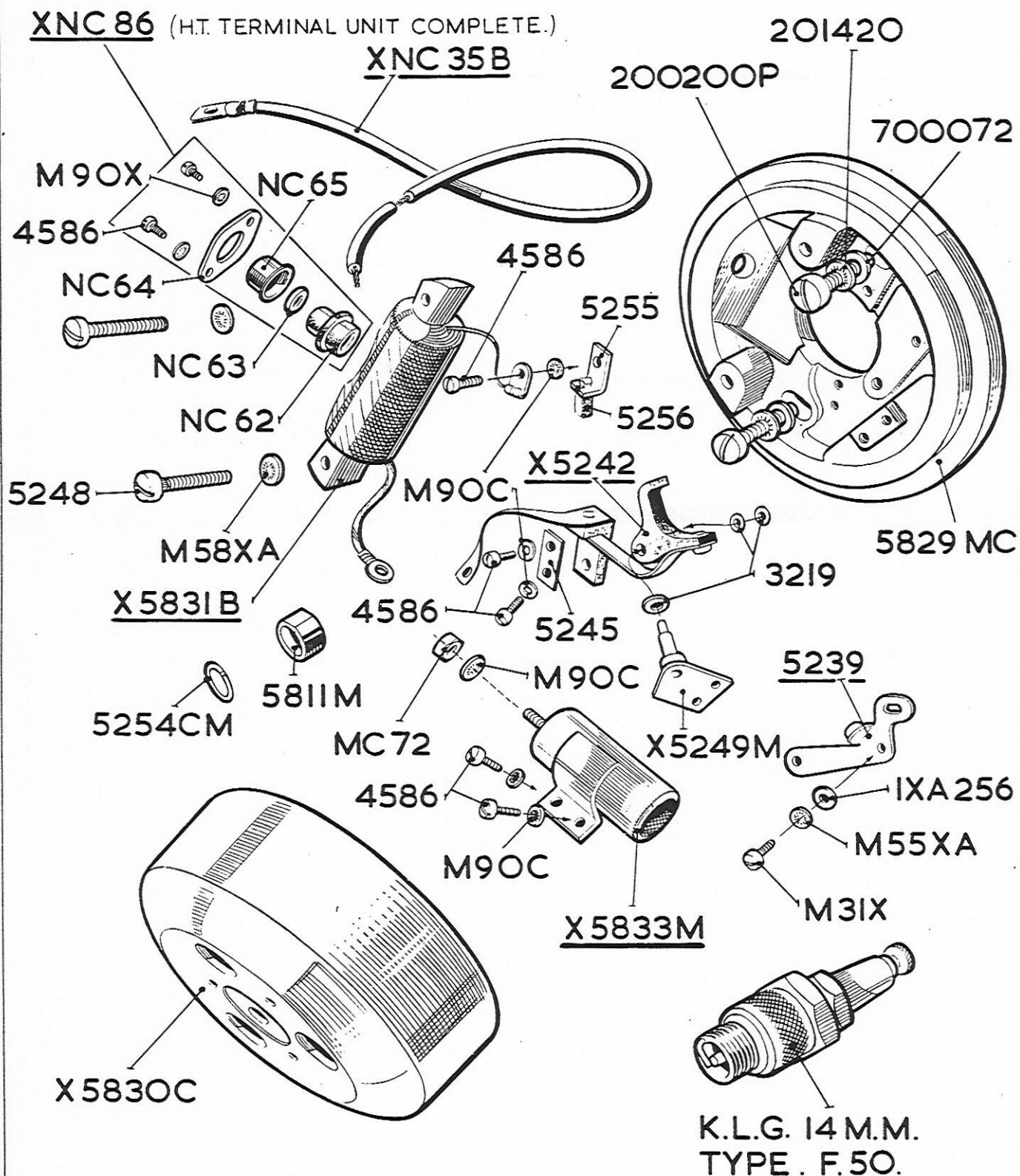
3. Examine contact breaker arm for sticking on fulcrum pin.

4. Examine contact breaker points for cleanliness, pitting, wear, gap (should be .018-in. when fully open).

5. If still no spark, check condenser on Crypton or similar equipment. Fit new condenser if necessary.

6. If all is in order, the trouble must be in the coil, and we recommend that a new stator complete be fitted.

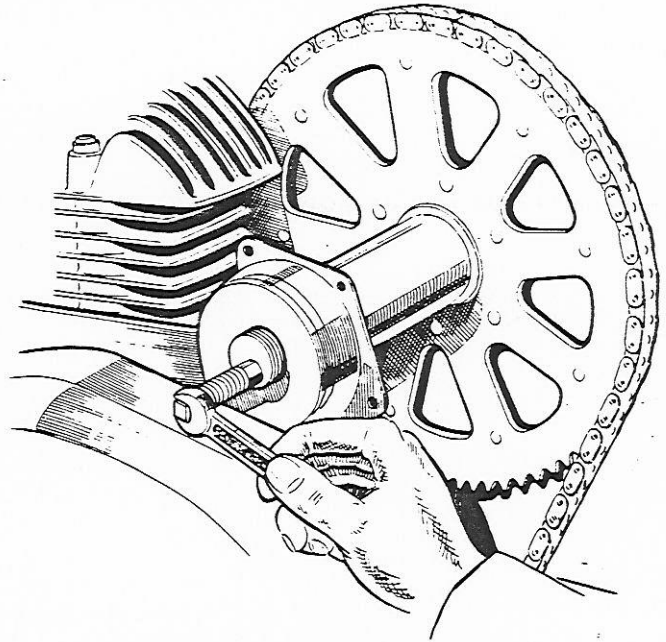
WICO-PACY "BANTAMAG"



PART NUMBERS UNDERLINED ARE
SUPPLIED IN THE WICO-PACY SPARES
KIT - WHICH SAVES MONEY.

TO REMOVE THE ENGINE

1. Remove wheel from cycle.
2. Unscrew air filter.
3. Remove carburetter cover plate (700116B) by removing screw (200070Q).
4. With petrol tap in "off" position, disconnect flexible pipe (700184) from carburetter.
5. Remove petrol tank by removing three screws (200200K) and three spring washers (201400) and replace screws and washers in tapped holes in suspension bracket.
6. Drain tank.
7. Unscrew large hexagon nut (700167) and plain washer from hub spindle.
8. Turn square end of hub spindle until spindle is at lowest point of eccentric, as shown in illustration (this slackens chain from clutch shaft to drum).
9. Withdraw engine, lifting it clear of chain.
10. Remove engine suspension bolts and place engine in special fitment illustrated.
11. Thoroughly clean inside of drum.
12. Examine chain and large sprocket, for wear. This is unlikely to be apparent, but should signs be revealed the parts should be renewed.
13. Inspect wheel bearings (see page 10).

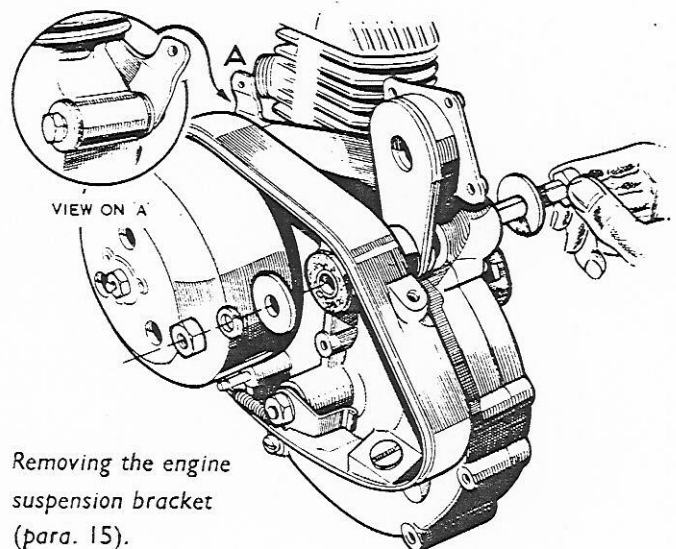


Turning the spindle to remove chain (para. 8).

TO DISMANTLE THE ENGINE

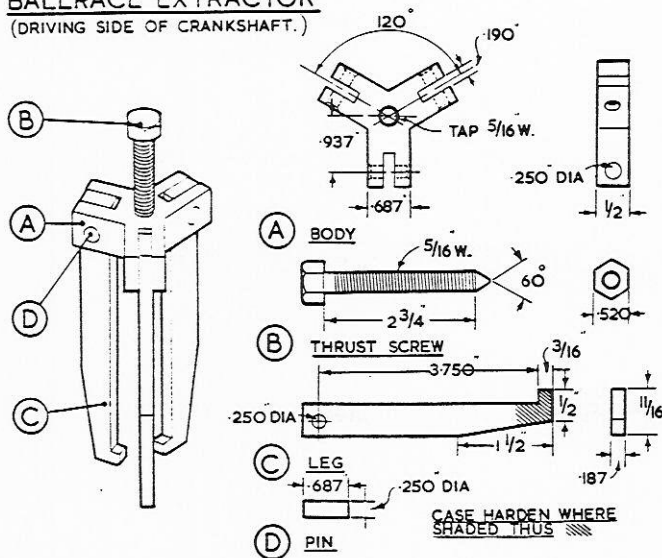
14. Remove engine cover plate (with "CM" symbol).
15. Remove engine suspension bracket (700075A) by taking out one main bolt (700079) and one small bolt (700084) with washers. Replace bolts and washers in suspension bracket after this has been removed.
16. Remove carburetter, induction pipe (700119A) and gasket by undoing two set screws, with spring washers, securing induction pipe flange to engine casting.
17. Free clutch cable (700137A) by releasing cable from operating bracket (700064).
18. Unscrew clutch adjuster locknut (200421) spring washer (201021) bracket (700064); withdraw 2-start screw (700065) together with setting screw (700066) from casting.
19. With a "C" spanner as supplied in cycle tool kits, slacken ring nut (700195) securing exhaust to assembly. Remove, with copper asbestos washer.
20. Take out screw and distance piece holding exhaust tail pipe. When exhaust system is free, replace screw and distance piece in casting.
21. Undo nut (200421) from end of crankshaft spindle. Remove with spring washer, (201021). The special tool illustrated, which may easily be improvised, is found useful for holding the magneto rotor while slackening the nut.
22. Withdraw rotor with extractor made or adapted as illustrated. Screw in the three screws until the bite is felt, then turn key.
23. Remove Woodruff key from crankshaft.
24. Remove two setscrews (200200P) washers (700072) and spring washers (201420) securing stator, and withdraw stator, pulling spark plug lead and grommet (700058) through hole in casting. (Grommet must be removed, as lead terminal will not pass through it.)
25. If no work is to be done on magneto, replace rotor over stator to maintain magnetic flux.

26. With the fingers, remove circlip which retains cam on crankshaft.
27. Withdraw cam. NOTE: There is no separate key: it is integral with the cam.
28. Undo and take out tapered filler plug from clutch chamber. Drain off lubricant: replace plug.
29. To remove the clutch housing casting (700059A) the outer casting extractor illustrated is required. First, remove 6 setscrews (700056) (there are no washers) —4 inside the chamber, 2 out. There are also two locating dowels, one free; one blind: the free one (just below the tapered filler plug) must be tapped out. Then screw the threads of the extractor into the tapped holes from which you withdrew the set-screws holding the stator (operation 24).



Removing the engine suspension bracket (para. 15).

BALLRACE EXTRACTOR (DRIVING SIDE OF CRANKSHAFT.)



An extractor for the ball-race on the driving side of the crankshaft (para. 31). See page 23 for other applications.

ENGINE DISMANTLING (cont. from p. 18)

Next apply a spanner to the extractor; withdraw the casting. While doing this, watch that the clutch end thrust assembly (700138A) does not fall.

30. Lift away clutch end thrust assembly.

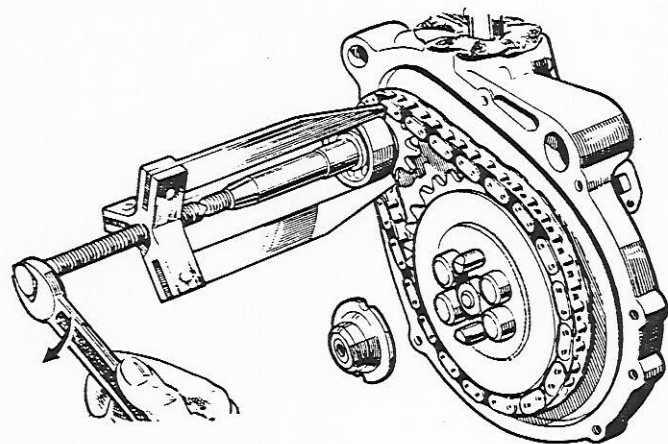
31. Using special tool illustrated, withdraw ball race (700203A) from end of crankshaft.

32. Undo clutch retaining locknut (200421) and spring washer (201021) using box spanner.

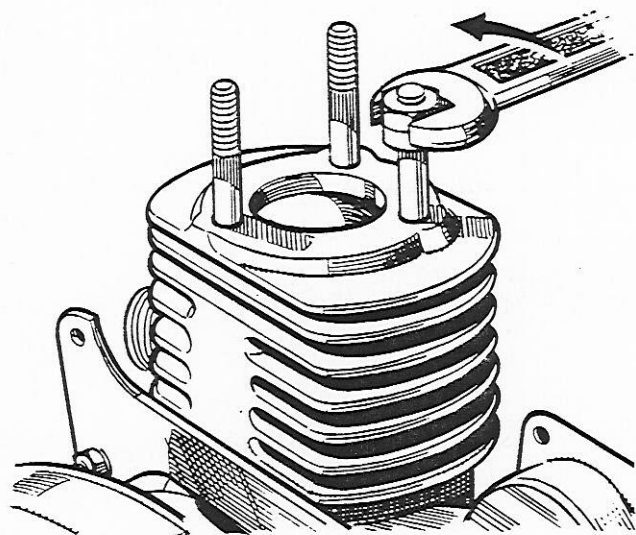
33. Ease off clutch assembly, crankshaft sprocket and chain (which is endless and therefore cannot be removed by undoing a link). Extreme care must be exercised not to lose the two Woodruff keys (one on crankshaft; one on clutch spindle) or the four small springs or spring caps inserted in the face (inner) of the clutch plate.

34. Remove clutch thrust plate (700128).

35. Keeping everything scrupulously clean, examine clutch faces and corks for wear. Fit new parts as



The ball-race extractor illustrated at top of column in use (para. 31).



Cylinder studs may be removed by using two nuts as shown (para. 41).

necessary. Should new corks be fitted, these must be accurately surfaced, be true with each side of the clutch wheel, and equidistant.

36. Stand clutch springs (700135) on surface plate and check for relative height, as uneven-ness will cause clutch slip. In the event of uneven-ness, fit 4 new springs—do not replace one or two only.

37. Replace clutch assembly *without chain* back on to clutch shaft, and check for truth. Faulty alignment will cause clutch slip. If out of truth, fit new chain wheel or cork inserts.

38. Check fit of clutch hob inside brass bearing ring. There should be no play at all. If any is felt, renew both hob and centre plate assembly.

39. Take out spark plug.

40. Lift cylinder head—3 nuts and washers. For de-carbonising instructions, see page 14.

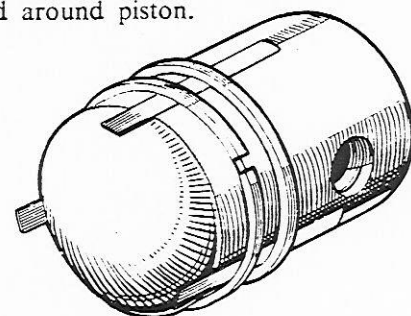
41. To remove cylinder barrel, use two nuts on each stud (for locking purposes) and remove studs with spanner. In lifting off cylinder barrel, do not twist or you may break the piston rings.

NOTE: There is a paper gasket between barrel and crankcase. This should always be discarded and a new one fitted.

42. With round-nosed pliers, take out two circlips (each end of gudgeon pin) and press out gudgeon pin with special tool illustrated.

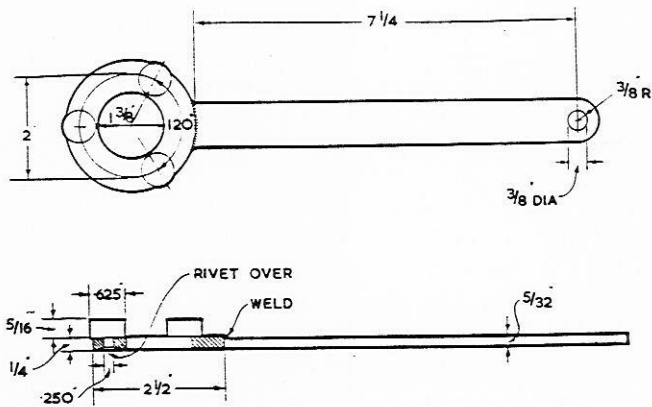
43. Lift piston free.

44. To remove rings, ease off with shims of metal under rings, evenly spaced around piston.



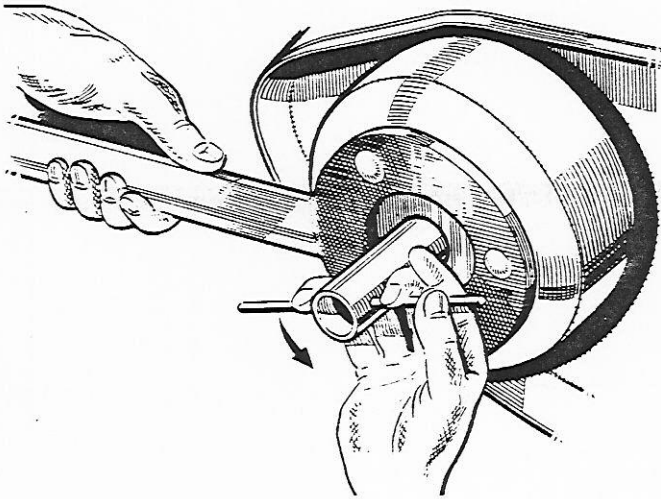
Easing off the piston rings by using shims of metal (para. 44).

MAGNETO ROTOR STEADY



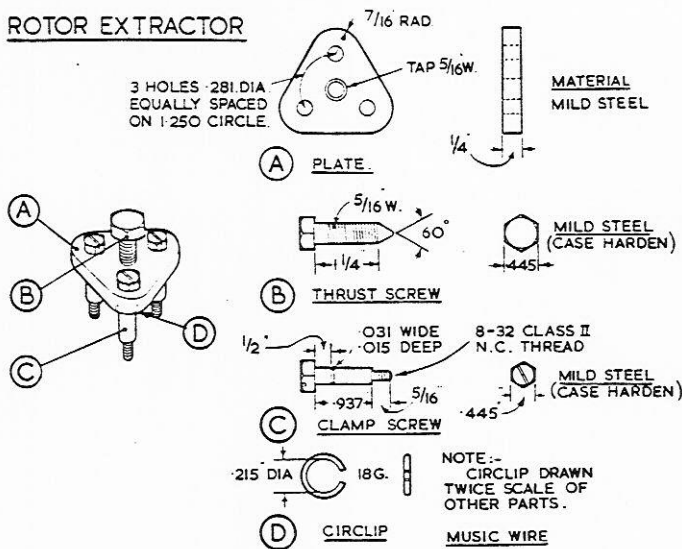
MATERIALS. BSS. 1449. EN 2. 1/4 OR 1/2 HARD.

For holding the rotor still when removing nut from end of crankshaft spindle (para. 21).

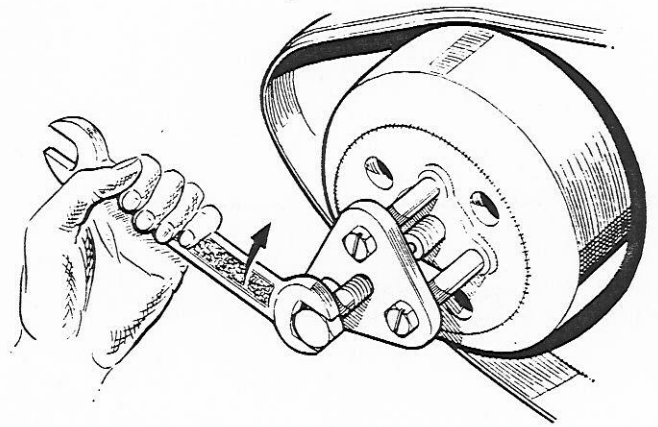


The rotor steady in use (para. 21).

ROTOR EXTRACTOR

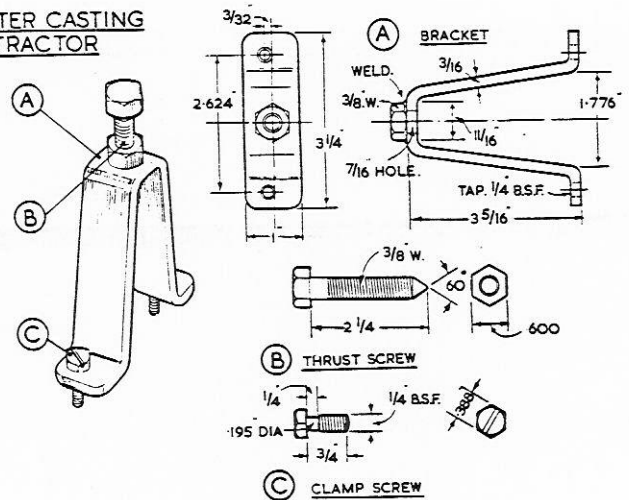


Working drawing of tool for removing rotor (para. 22).

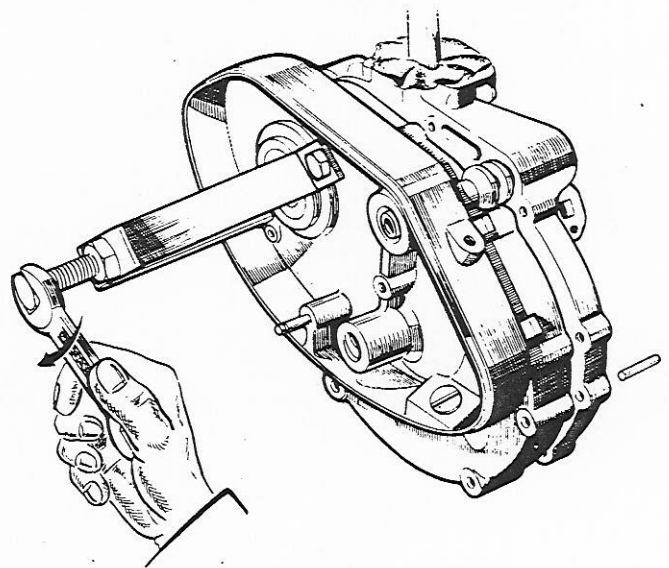


The rotor extractor in use (para. 22).

OUTER CASTING EXTRACTOR

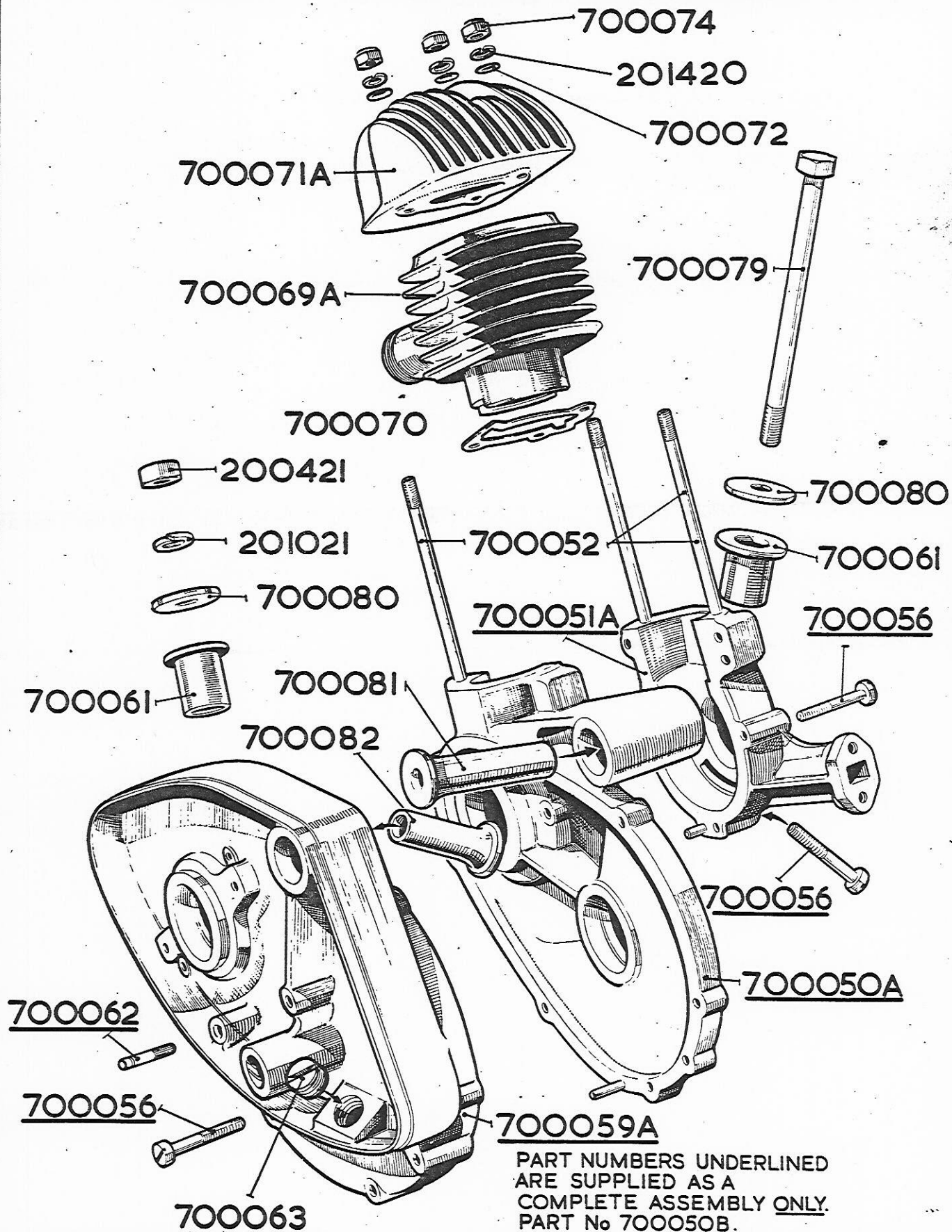


Working drawing of extractor for outer casting (clutch housing—para. 29).



The outer casting extractor in use (para. 29).

CYLINDER AND CRANKCASE



45. Take out five set bolts securing inner housing (700051A). With blow lamp or Bunsen burner apply heat evenly round main bearing—just under boiling point is hot enough. Lever casting free with screwdriver—no special tool can be used for this operation. Great care must be exercised to avoid damaging any part of the crankcase assembly.

46. Place a piece of metal .281-in. in thickness between cheeks of crankshaft. Put two other pieces of metal across casting faces either side of crankshaft: Place in press and press out.

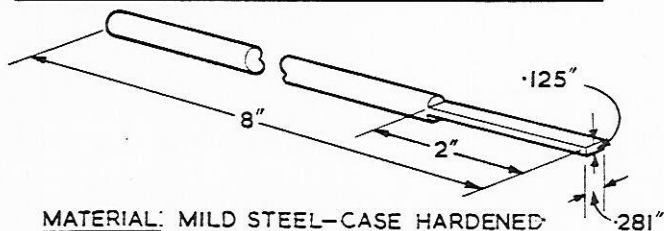
47. Draw ball race from crankshaft, using special tool illustrated.

48. Remove disc valve, being careful not to lose the three springs behind it. If disc is scored or worn, scrap it and fit a new one.

IMPORTANT: Crankshaft and connecting rod are serviced as an assembly, which must never be dismantled. In the unlikely event of trouble, fit a new assembly complete. To disconnect piston, remove circlips and press out gudgeon pin in the usual way or by making up the special tool illustrated.

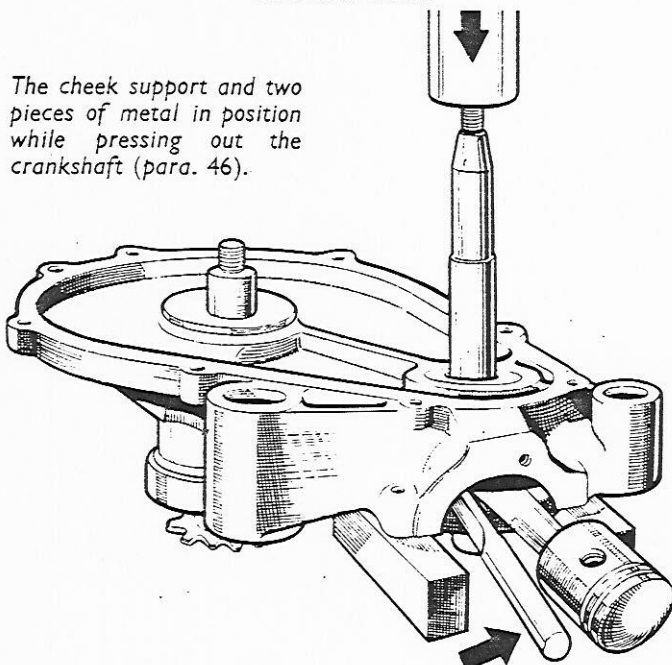
49. The crankcase gas and oil seal must be perfectly sound. To test, insert the crankshaft sprocket: If no resistance is felt, a new seal is required. Remove circlip with round-nosed pliers, and tap out old seal. The new one should be well oiled before fitting. Replace circlip.

CRANKSHAFT CHEEK SUPPORT



MATERIAL: MILD STEEL—CASE HARDENED AT TONGUE END ONLY.

The purpose of this support is described in para. 46 and illustrated below.



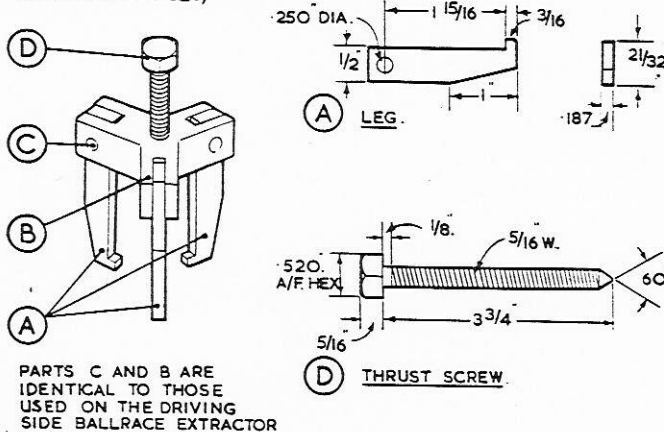
50. Press clutch spindle through housing. One ball race, with a distance piece, will come away with the spindle, and may be withdrawn by using the tool illustrated.

51. Remove two circlips and press the other bearing from the casting.

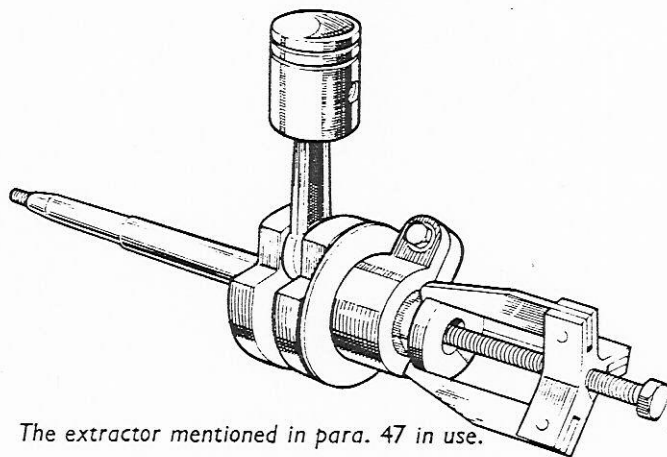
52. Remove drive housing and examine rubber segments which give the cushioned drive: renew if there are signs of deterioration (tip segments slightly to lead in).

BALLRACE EXTRACTOR.

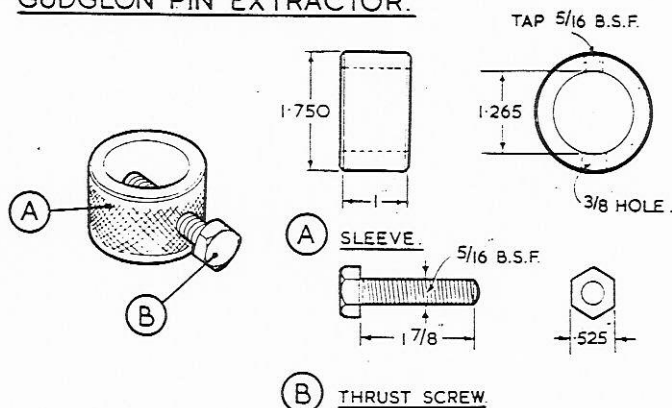
(CRANKCASE SIDE.)



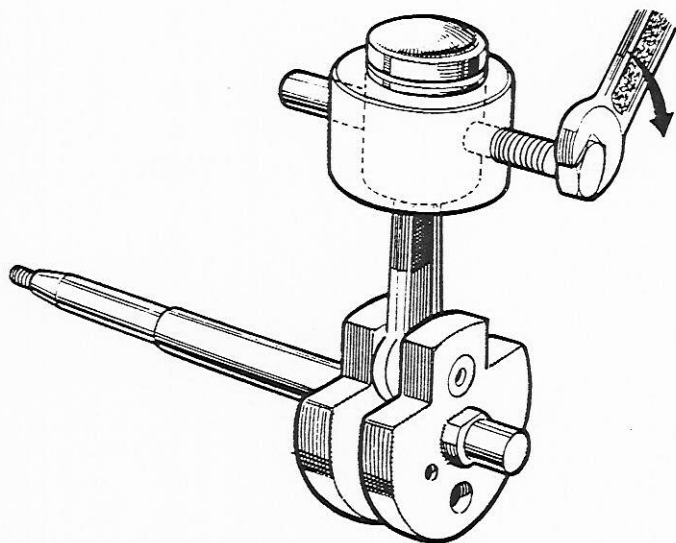
How to make the extractor for the crankcase side of the crankshaft (para. 47).



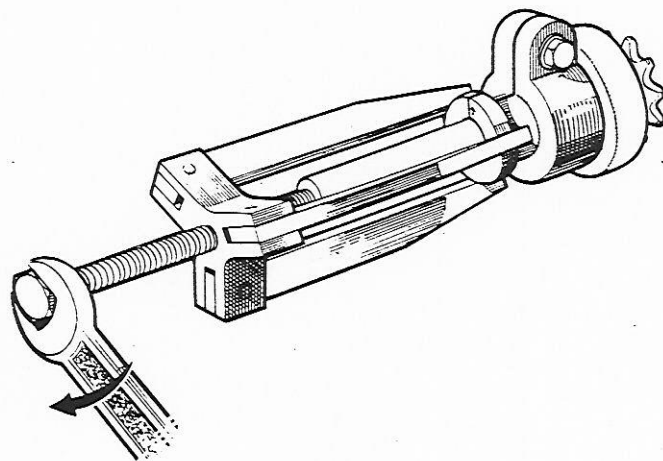
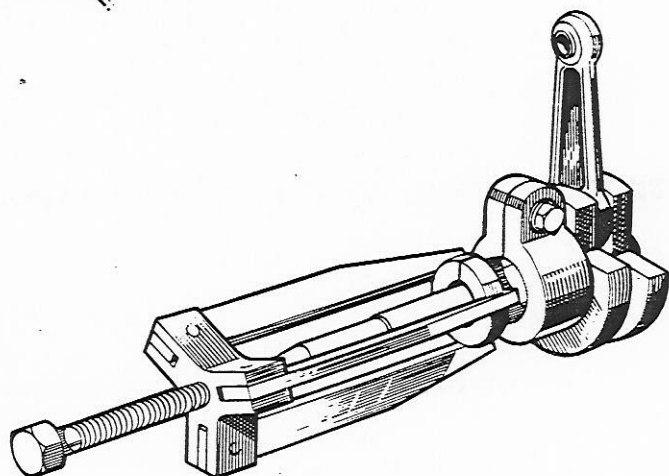
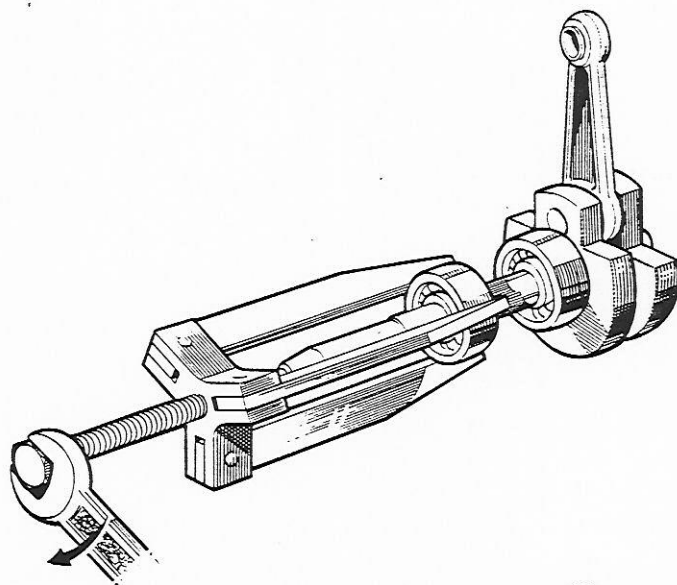
GUDGEON PIN EXTRACTOR.



This extractor is only required when it is necessary to remove piston from con-rod (see page 23).

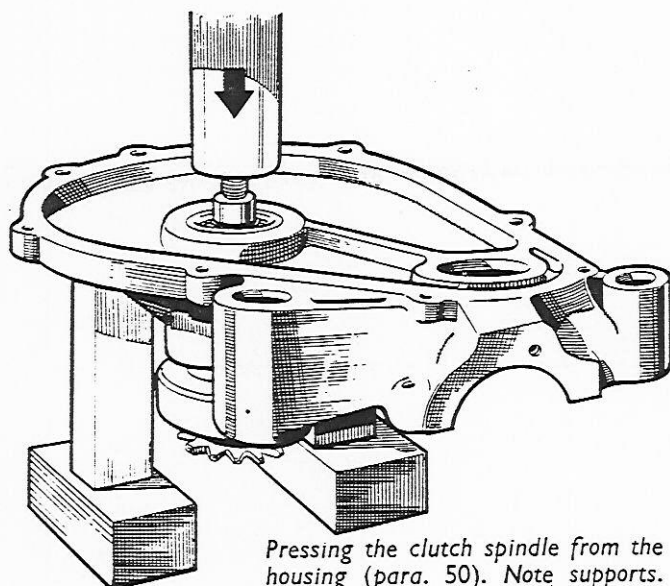


The gudgeon pin extractor (see page 22) in use.



BALL RACE EXTRACTOR. IN USE

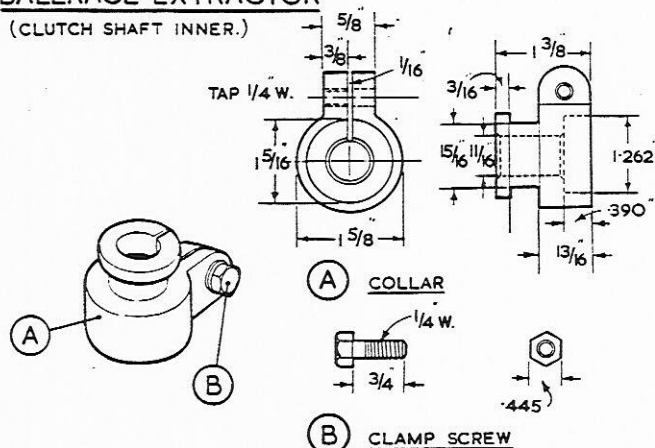
The three illustrations above show other uses of the extractor for which working drawings are given on page 21. The top two show the withdrawal of the two remaining crankshaft bearings: the lower one the clutch shaft outer bearing (should it come away with the spindle—otherwise it is pressed out.)



Pressing the clutch spindle from the housing (para. 50). Note supports.

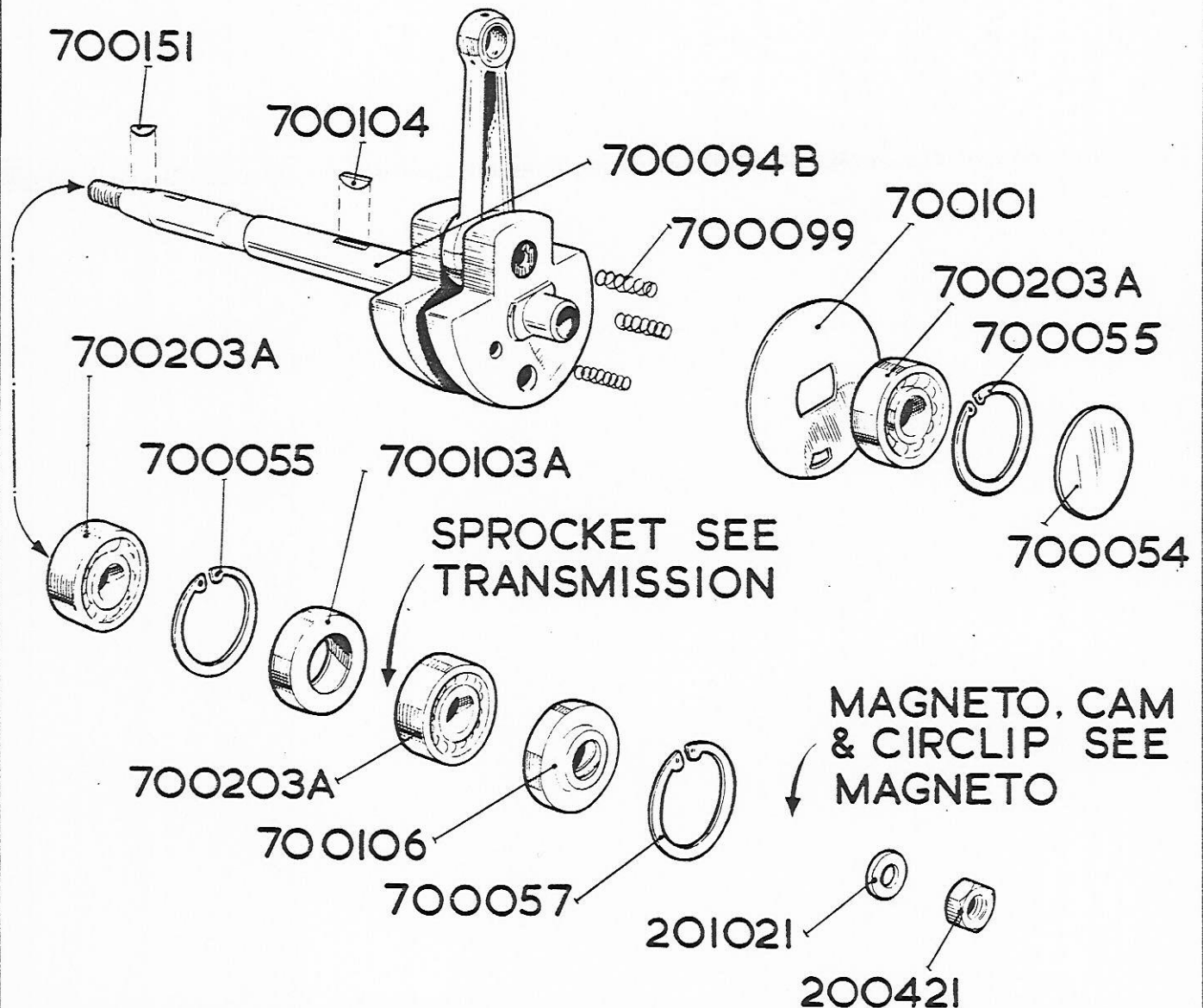
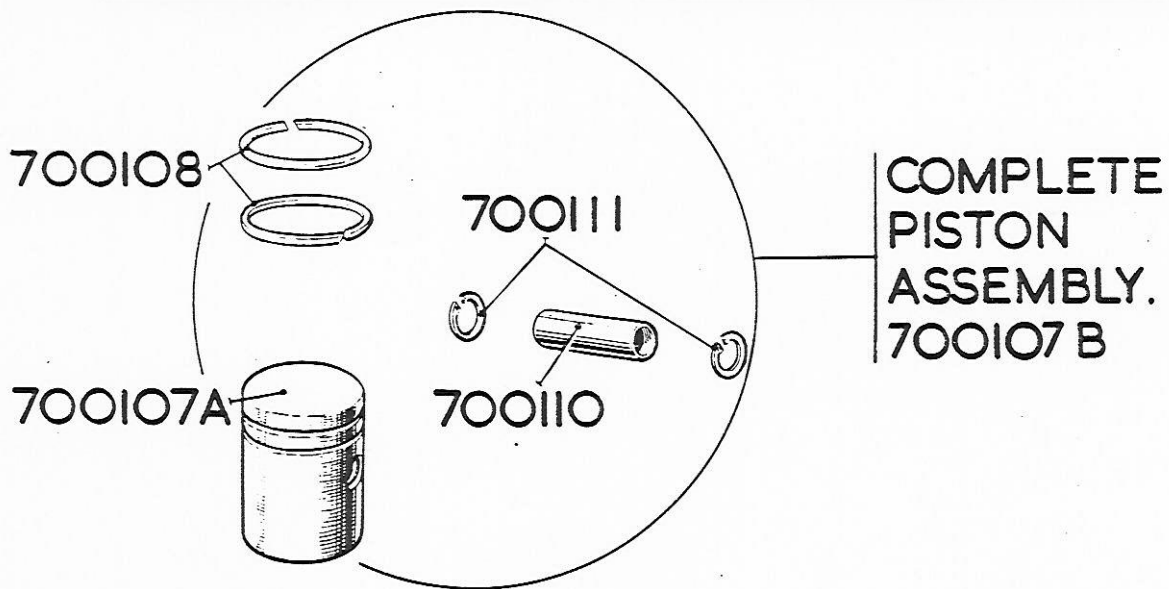
BALLRACE EXTRACTOR

(CLUTCH SHAFT INNER.)



Extractor for removing ball-race which comes away with clutch shaft (para. 50).

PISTON, CON-ROD AND CRANKSHAFT



RE-BUILDING THE ENGINE

(PRELIMINARY NOTES)

PISTON CLEARANCE

The piston of the Cyclemaster is tapered towards the top, to allow for the greater expansion at the top caused by its proximity to the burning gases. Clearance should be .004-in. at crown and .002-in. at bottom of skirt.

If wear has taken place, we do not recommend re-boring or honing, as special equipment is required for this delicate operation. A new cylinder barrel and piston should be fitted.

PISTON RING GAPS

New pistons are serviced complete with rings. Should you have to replace a broken ring in service, the gap should be .006-in.

To check, insert the ring in the cylinder barrel, and press square with skirt of piston. Insert feeler gauge.

It is important to remember that each piston ring is located by means of a small peg in the groove, which mates the gap of the ring.

LITTLE END

There should be slight end play only, in the little end. If re-bushing is indicated, press out old bush and fit new one. Drill three oil holes to correspond with those in the little end. Clean off all rough edges and burrs, and ream out to give a clearance of approximately .0005-in.

ASSEMBLING PISTON

The only safe way to assemble piston and con-rod is to warm the piston by dropping it into hot water. Any attempts at inserting gudgeon pin by using pilots and

drifts may lead to serious damage.

CASTINGS

(a) It is of the utmost importance that every part should be scrupulously clean.

(b) It will be necessary to warm the various castings.

For this purpose there is nothing better than a supply of boiling water, in which each casting may be immersed at the appropriate moment. This will raise it to exactly the right temperature, and the heat will evaporate the water as soon as the casting is withdrawn.

GAS AND OIL SEAL

There is an oil and gas seal in the crankcase outer case, behind the short end of the crankshaft. There should be no need to remove this ever, but should it be damaged or removed accidentally, a new one must be fitted with extreme care.

Before fitting, support the *smaller* circular recess in the inner face of the casting: this is important. Without this support (or with support for the larger recess only) the casting may be distorted.

The seal is convex, and drops into the casting easily. It is advisable to apply a good sealing compound before inserting, taking care not to use any excess which would find its way into the main bearing.

Using a dolly with a face less concave than the seal is convex, tap lightly so that the metal of the seal bites into the softer metal of the casting.

As an additional precaution, stake with a $\frac{1}{16}$ -in. stake at four equally spaced points.

RE-BUILDING THE ENGINE

(See Preliminary Notes on Page 25)

1. If piston has been removed, reassemble to con-rod as described on page 25.

2. Put three springs (700099) into recesses in crankshaft cheek.

3. Lightly oil disc valve (700101) and fit on to rectangular shoulder on short end of crankshaft. Make sure that disc moves freely.

IMPORTANT: The hole in the disc must correspond with the hole in the cheek. If disc is new, either face may go towards crankshaft. If the old one is being replaced, it must go back as it came off (markings will show which way).

4. Using a metal distance piece .281-in. thick between cheeks of crankshaft, press lightly-oiled bearing (700203A) on to short end of shaft, against disc valve.

5. Still using distance piece, press similar bearing (lightly oiled) on to long end of crankshaft. Crankshaft, rod and piston assembly is now complete.

6. Fit three circlips (700055) in casting (one in bore for crankshaft; two in bore for clutch spindle).

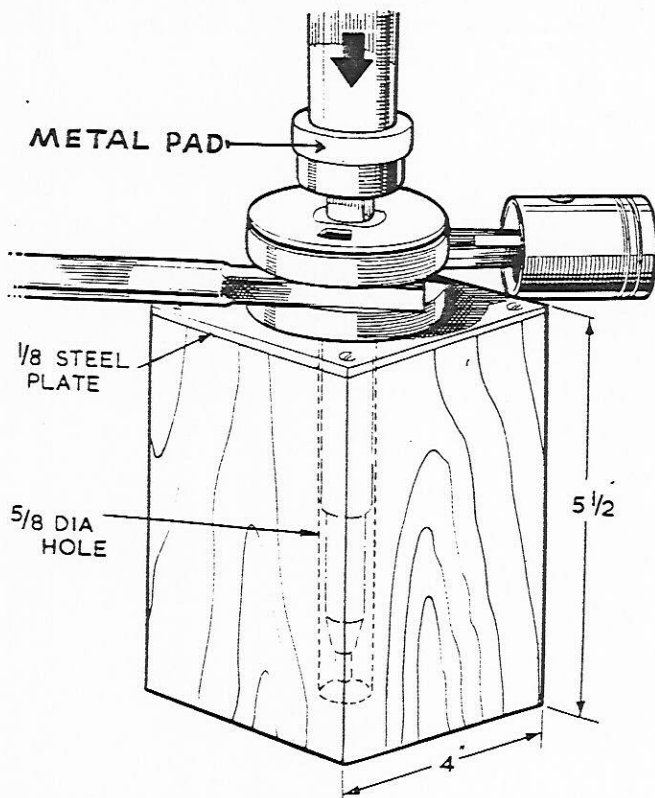
7. Warm inner crankcase casting (700050A) in boiling water. It is advisable to warm it thoroughly, and to carry out operations 8 to 12 inclusive as quickly as possible, as once any part has been fitted, *the casting must not be again immersed in water.* **NOTE:** If resilient engine mounting bushes are in position, they will not be damaged, as they are heat-proof, oil proof and petrol proof.

8. If drive housing (700147) and ball race (700202A) have been removed from clutch spindle (700126A), replace the four rubbers (700148) and re-assemble. Lightly oil bearing. The oil shield side of the bearing must face the drive housing.

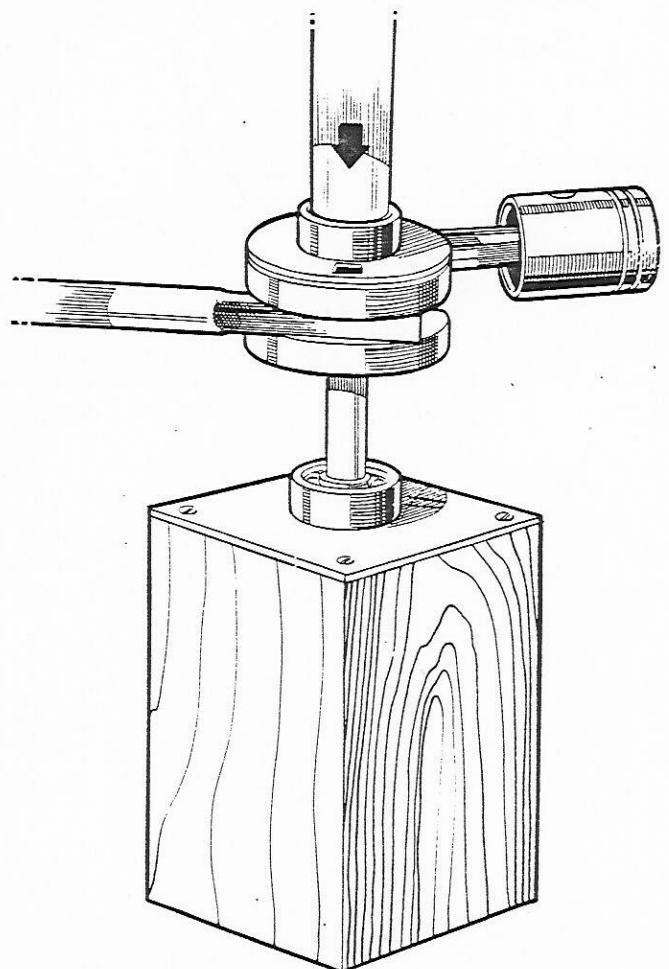
9. Press clutch spindle assembly into casting.

10. Turn over casting and fit distance piece (700127) to clutch spindle.

11. Lightly oil second bearing (700203A) and press into casting on to other end of clutch spindle.



Supporting crankshaft while pressing bearing on to short end of shaft (above—para. 4) and long end (right—para. 5). Note use of cheek support illustrated on page 22 for both jobs.



12. The crankshaft assembly must now be fitted, and the cheek support (page 22) must again be used. The inner face of the casting should be located on stout metal supports, one each side of crankshaft, and pressure applied to the short end of the crankshaft.

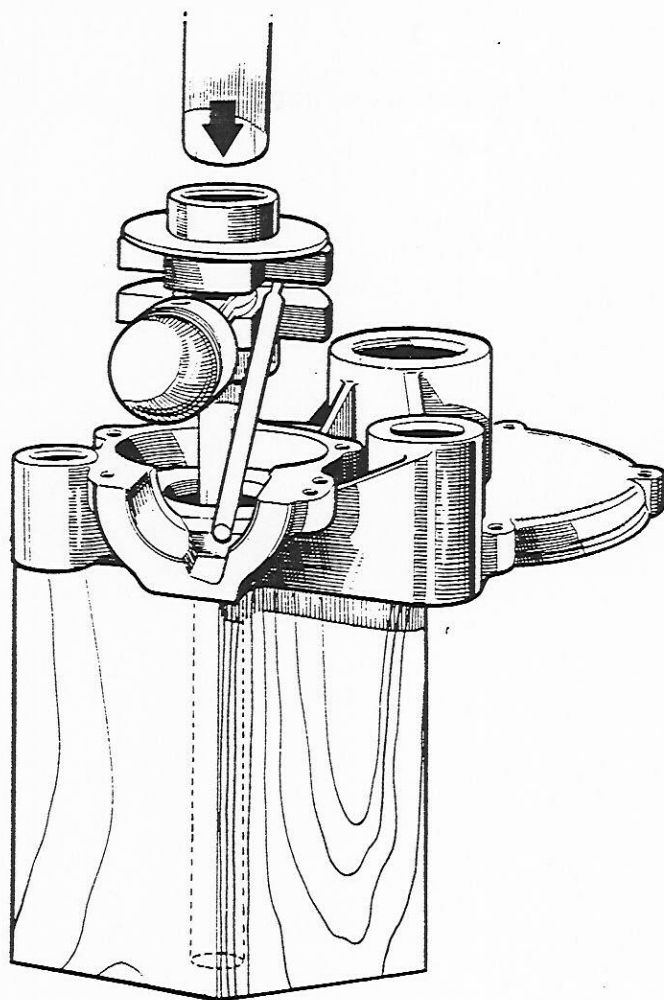
IMPORTANT: Make sure that the piston is in the recess formed by the half chamber, to avoid damage to con-rod. When crankshaft assembly is home, remove from press, but leave "screwdriver" support between cheeks.

13. If oil seal (700103A) was removed, press into crankcase over long end of crankshaft while casting is still warm—open end faces inwards, and oil seal should be pressed down to circlip.

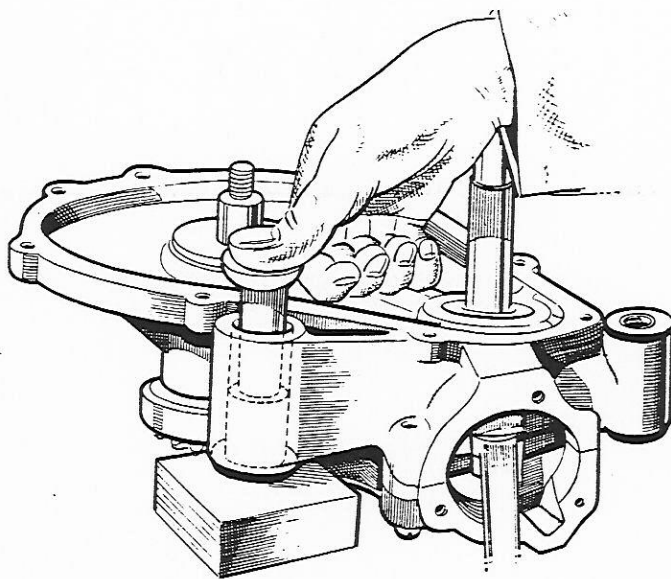
14. Apply a good sealing compound lightly and evenly to mating faces of castings.

15. With "screwdriver" distance piece still in position between cheeks of crankshaft, fit small casting (700051A) over dowels; insert 5 screws (700056) and tighten. There are no washers.

IMPORTANT: The distance piece may now be removed from between cheeks of crankshaft.



Pressing in the crankshaft assembly (para. 12). Note that cheek support is again required.



Replacing engine mounting bushes (para. 16).

16. If resilient engine mounting bushes were removed they should now be re-fitted, complete with metal sleeves. The flanges of the metal sleeves face one another between the two larger castings—with space to take the mounting bracket later.

17. Put assembly into engine stand (see page 5) and place in vice.

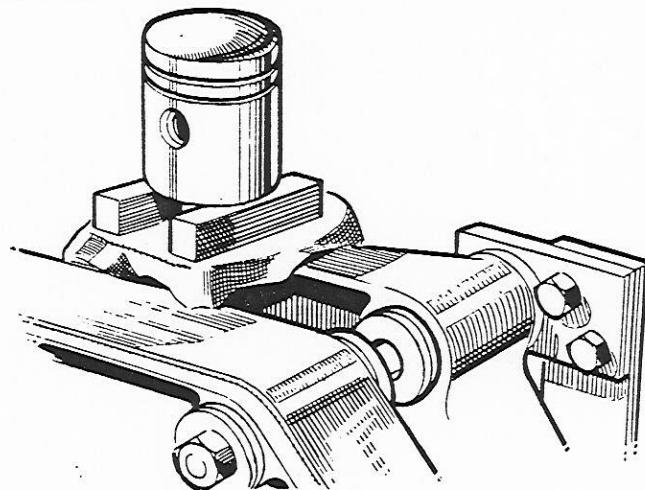
18. Oil disc valve and con-rod big end very lightly: excessive oil applied at this stage will cause smoke for a considerable period after the machine is in use again.

19. Take new gasket (700070), lightly smear with grease to hold it in position, and place on crankcase.

20. Place metal support each side of con-rod and lower piston until it rests on supports.

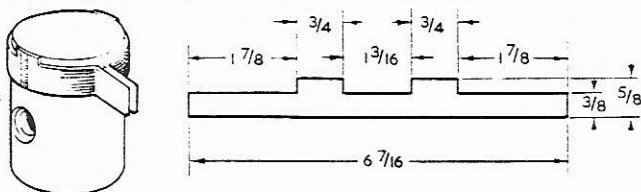
21. Lightly oil piston rings and bottom of cylinder barrel (700069A).

22. Make sure gaps in piston rings mate with pegs in grooves.



Supporting piston while fitting rings.

PISTON RING ASSEMBLING CLAMP



CLAMP IN POSITION. MATERIAL, BRASS OR MILD STEEL STRIP
1/32" THICK.

This simple clamp will save endless bother.

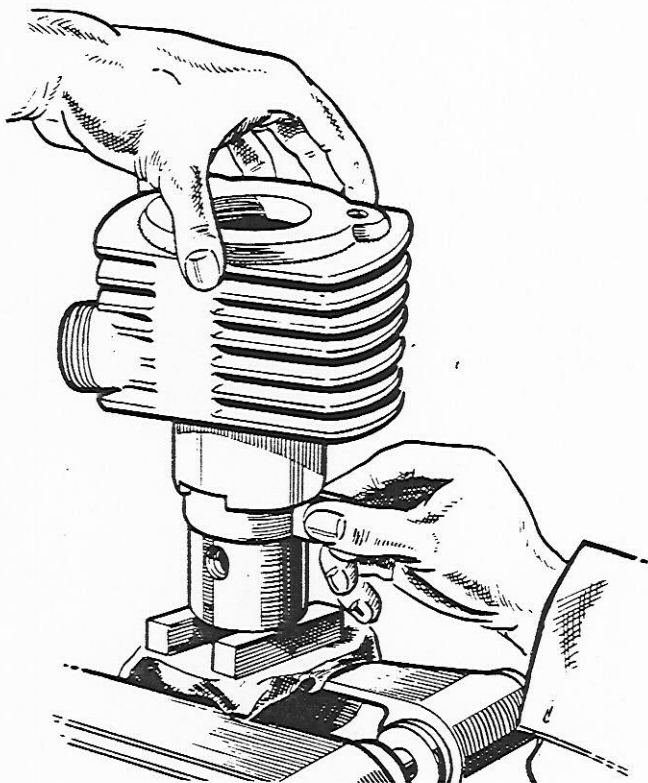
23. With $\frac{1}{2}$ -in. strip of metal, compress rings and lower cylinder barrel over piston, with exhaust port to left. Owing to the shape of the skirt, when the cylinder is down a certain distance the ring compressor will no longer be effective, but a small screwdriver will provide the slight pressure necessary to compress the rings the very slight amount now required. The cylinder barrel must be pushed straight on and not "wriggled."

24. Remove metal supports, and press barrel home.

25. Insert three studs (700052). Run down by hand, and then, using nut and lock nut, tighten with box spanner.

26. Drop on cylinder head (700071). NOTE: There is no gasket at this joint, and sealing compound should be used. Fit three washers (700072) and three nuts (700074). Tighten evenly.

27. Fit spark plug. Test for compression. If there is leakage at the cylinder head face this must be trued up by scraping and lapping.



The piston ring assembling clamp in use.

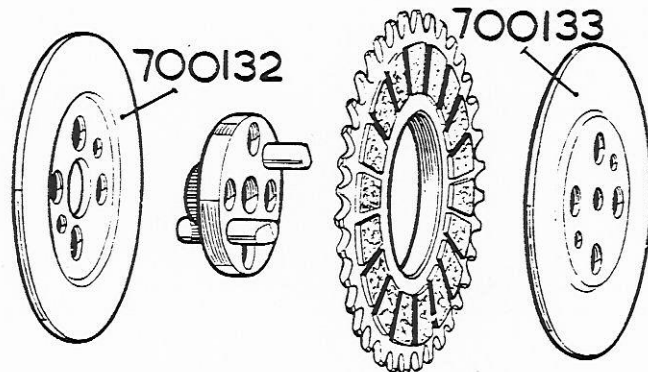
28. Loosen spark plug, but leave it in position to keep out dirt and grit.

29. Lightly oil crankshaft and Woodruffe key (700104) and insert key.

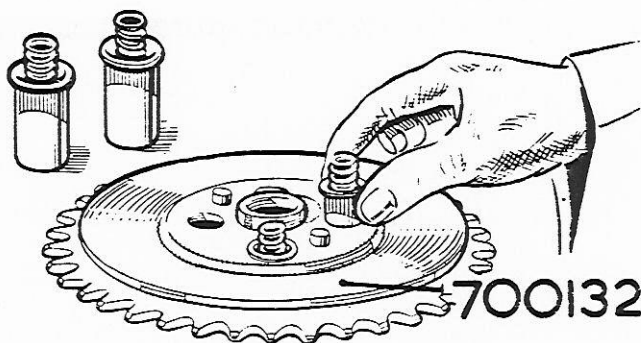
30. Fit sprocket (700105) to crankshaft.

31. Lightly oil clutch spindle (700126A) and fit thrust plate (700128) with central shoulder towards ball race.

32. Fit Woodruffe key (700104) to clutch spindle.



An exploded view of the clutch (paras. 33 to 37).



Assembling clutch springs and cups (para. 37).

33. Take clutch plate (700132) with large hole in centre and hold with convex side downwards.

34. Take clutch hob (700129B) and insert short ends of pins into holes in plate.

35. Fit clutch chain wheel with cork segments (700130B) over long ends of pins. Plate may go either way.

36. Take clutch plate (700133) with small hole in centre, and fit with convex side uppermost.

37. Turn this assembly over and insert four spring cups (700134) and four springs (700135) as illustrated.

38. Fit primary chain (700113A) to clutch sprocket.

39. Pull crankshaft sprocket out slightly (but not far enough to disengage with Woodruffe key) and fit chain to this sprocket and clutch assembly on to clutch spindle simultaneously.

40. Fit washer and special thin lock nut to clutch spindle. Tighten nut with box spanner.

41. Apply a light touch of grease to clutch end thrust assembly (700138A). The purpose of the grease is merely to hold the assembly while the next casting is being fitted.

42. Warm clutch housing casting (700059A).

43. Press in, from outer side of casing, screwed oil seal (700106).

44. Fit circlip (700057), same side of casting.

45. Press in ball race (700203A) from other side.

46. Fit resilient bush (700061) and metal sleeve (700082) into clutch housing outer casting. Metal sleeve goes inwards.

47. Insert clutch operating 2-start screw (700065) and fit adjusting screw (700066).

48. Drop clutch operating bracket (700064) on to flats on 2-start screw. Secure with spring washer (201021) and lock nut (200421).

49. Ensure that oil seal which is staked in behind clutch control nut (700065), is still in position.

50. Apply sealing compound to casting faces.

51. Remove assembly from framework held in vice.

52. Check that clutch thrust assembly (held by grease—see 41) is still in position.

53. Insert free dowel, and using a circular metal support on the only machined surface left exposed, place assembly in press with long end of crankshaft uppermost. Using blind dowel as a guide, position casting 700059A, but before pressing home insert engine suspension bracket (700075A). Press home casting and replace assembly in frame in vice.

54. Tap home dowel (using small punch) and secure casting with six screws (700056). Tighten in staggered fashion: there are no washers. Wipe away surplus jointing compound.

55. Take out spark plug, temporarily fit nut to end of crankshaft, and turn it until keyway is uppermost. Replace spark plug.

56. Lightly oil crankshaft and fit magneto cam (which has a peg to locate in keyway: the pegged end goes on last.)

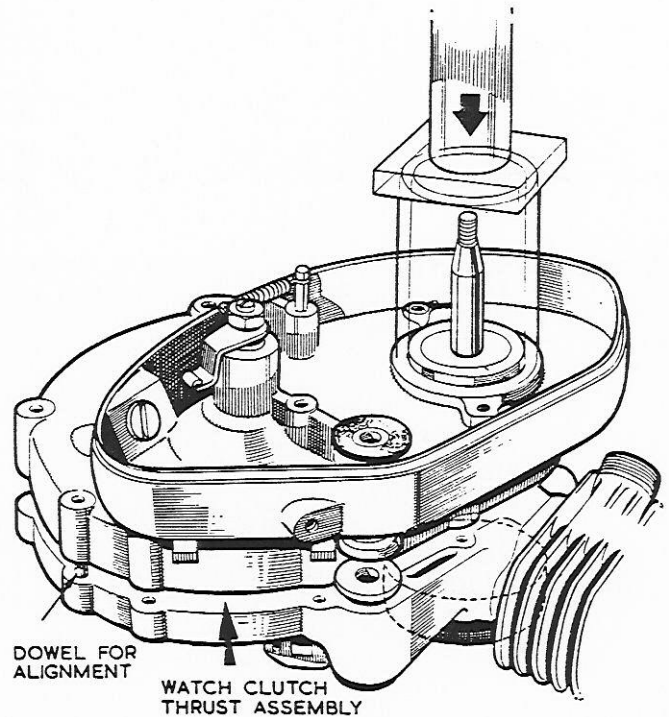
57. Press "D" circlip into retaining channel in crankshaft: the D section can register in groove either side.

58. Take Woodruff key and make sure it is a fairly tight fit in the slot: if necessary, put slight burrs on the curved edge, as it is most important that this key does not move during operation 63.

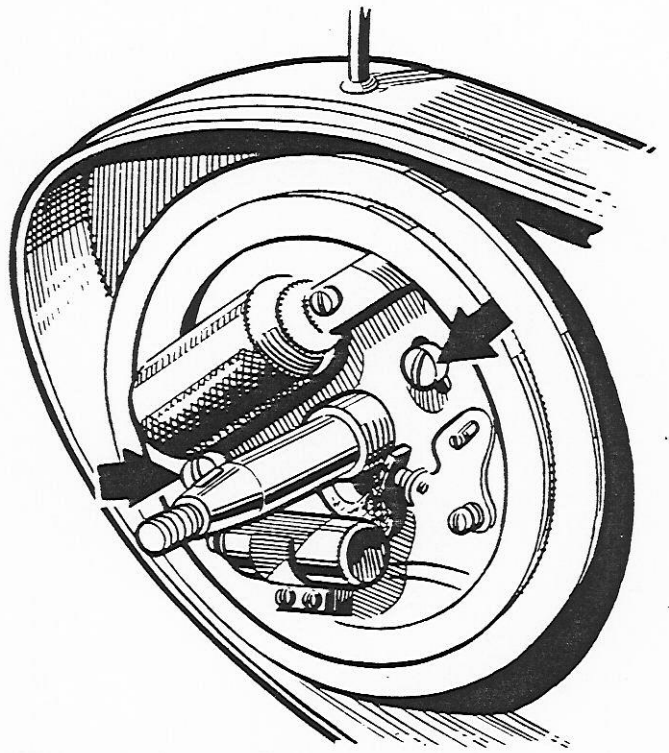
59. Take magneto stator, and feed the plug lead through hole in casting—pushing grommet (700058) into casting at the same time.

60. Position stator on locating spigot of casting. Be sure that lubricating wick is so placed that it *trails* on the cam. Apply one drop of oil to wick.

61. Insert two screws (200200P) with two spring washers (201470) and two plain washers (700072) through elon-



Pressing clutch housing on to main assembly (para. 53).



When assembling the flywheel magneto, the screws should be central in the elongated holes (para. 61).

gated holes in stator into tapped holes in casting. Screws should be central in elongated holes. Tighten screws. (See page 16 for further adjustments).

62. Check contact breaker points (remove spark plug

and put nut on end of crankshaft to turn). Replace plug.

63. Clean inside of rotor—using air line if necessary—and fit to crankshaft.

IMPORTANT: Great care must be exercised to ensure that the Woodruff key does not move, or the coil may be badly damaged. Hence the precaution advised in operation 58. It is advisable to use an inspection lamp and watch this key through the hole in the rotor.

64. Assemble rotor with spring washer (201021) and nut (200421). If necessary hold rotor with special tool illustrated on page 19.

65. Remove spark plug, connect lead: lay plug on cylinder head and test for spark by twisting rotor. Replace plug.

66. Insert clutch cable (700140A) through hole in casting, and screw in adjuster as far as possible. (This makes maximum adjustment at this point available.)

67. With screwdriver, turn adjuster so that clutch operating bracket (700064) is in a convenient position, and connect up cable and pull-off spring (700068). Leave final adjustment until engine is on wheel.

68. Thoroughly clean exhaust system and fishtail, and blow through with air line.

69. Fit exhaust system (700190B) to cylinder barrel with copper asbestos washer (700196) and nut (700195). Leave slack.

70. Assemble exhaust system to casting by means of screw (700210), spring washer (201400) and distance piece (700211).

71. Tighten exhaust system all round. Recheck with engine hot.

72. Remove engine from engine stand in vice.

73. Insert bolt (700079) with washer (700080) each end through bushes of engine suspension bracket (put into position in operation 53). Put spring washer (201021) on threaded end and start nut (200421). Leave slack.

74. Insert bolt (700084) with spring washer (201420) under head at small end of suspension bracket. Plain washer (700086) goes between mounting and suspension bracket. Bracket has tapped lug into which bolt must be tightened—right home.

75. Tighten other end of suspension bracket.

76. Fit flanged induction pipe (700119A) to crankcase with gasket (700121), two spring washers (201400) and two screws (700123).

77. Move the cam adjuster in the Cyclemaster wheel so that spindle is at lowest point (i.e. slackest chain position, as for removal of engine).

78. Place endless chain (700198A) on sprocket of drum.

79. Offer engine to wheel spindle and feed on slowly, picking up chain on clutch sprocket at same time.

80. Fit plain washer and large hexagon nut (700167).

81. Hold square end of spindle with spanner, and tighten hexagon nut as far as possible. Then slacken off sufficiently to adjust chain by turning spindle to move eccentric. There should be a total movement of $\frac{1}{2}$ -in. When correct, tighten hexagon nut (still holding spindle) and then re-check tension.

82. Fit petrol tank with three screws (200200K) and three spring washers (201400). Screws go into tapped holes in suspension bracket. Check that tank does not foul drum.

83. Fit carburettor to induction pipe. A perfect fit here is essential. Should it foul the petrol tank, slacken tank mounting screws and adjust: if necessary the holes in the tank flange may be elongated.

84. Fit flexible pipe (700184) from tank to carburettor. Make sure banjo nipple is at right angles to drum.

85. Fit carburettor cover plate (700116B) with screw (200020O).

86. Fit air cleaner.

87. Connect clutch and throttle controls to bar on running stand.

88. Adjust clutch (see page 14).

89. Remove tapered filling plug and add clutch chamber lubricant, using the petrol filler cap as a measure. This chamber *must not* be overfilled.

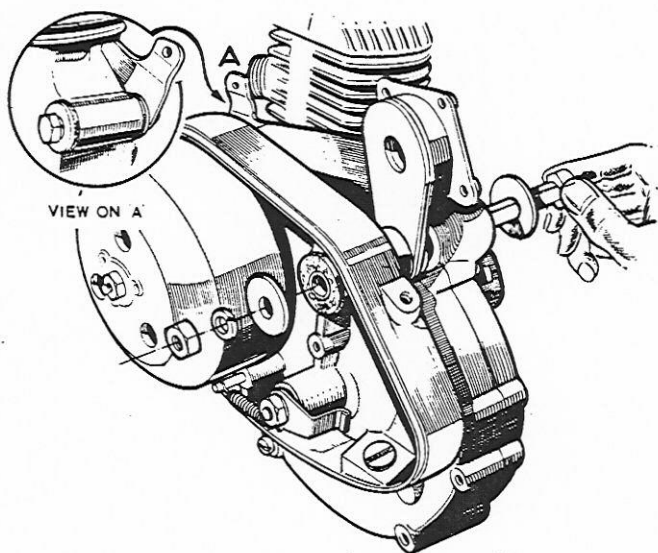
90. Put small supply of petrol in tank and start engine.

91. Check action of clutch.

92. Stop engine and fit "CM" plate.

93. Fit wheel to cycle.

94. Road test.



Assembling the engine suspension bracket (para. 73-74)

INDEX

	Page		Page
Alignment, Wheel	9	EXTRACTORS	
Bearings, Wheel	10	Ballrace (clutch shaft)	23
CARBURETTER		Ballrace (crankshaft)	22
Adjustments	12	Gudgeon pin	22, 23
Exploded drawing	13	Oil retainer (wheel)	6
Faults	12	Outer casting	19
Filter	12	Rotor	19
Float	12	First Free Service	10
General description	11	Free wheel lubrication	9
Jet	12	Gas and oil seal	25
Method of Operation	11	General arrangement, engine	Inside Back Cover
Mixture	12	General arrangement, wheel & spindle	6
Possible faults	12	Gudgeon pin extractor	22
CLUTCH		IGNITION	
Adjustment	14	Adjustment	16
Chain adjustment	10	Exploded drawing	17
Exploded drawing	15	Faults	16
Free travel	14	General description	16
General description	14	Lubrication	16
Oil level	14	Rotor extractor	19
Crankshaft cheek support	22	Rotor steady	19
Cycle stands	5	Timing	16
Cylinder and crankcase	20	Oil and gas seal	25
Decarbonising	14	Oil retainer extractor	6
ENGINE		Outer casting extractor	19
Cylinder and crankcase	20	Piston rings, assembling	25
Dismantling	18	Piston rings, gaps	25
Gas and oil seal	25	Piston rings, removal	21
General description	11	Rotor extractor	19
Little end	25	Rotor steady	19
Location	9	Spoke adjustment	9
Method of operation	4, 11	Spoke spanner	5
Piston, assembling	25	Technical Details	3
Piston clearance	25	WHEEL	
Piston, con-rod, crankshaft	24	Alignment	9
Piston ring gaps	25	Bearings	10
Piston ring assembly	28	Exploded diagram	7
Piston ring removal	21	Fitting	9
Removing	18	Freewheel lubrication	9
Stand	5	General arrangement	6
EXPLODED DIAGRAMS		Oil retainer extractor	6
Carburetter	13	Removing	9
Clutch	15	Spoke adjustment	9
Cylinder and crankcase	20	Spoke spanner	5
Ignition	17	Testing rig	8
Piston, con-rod, crankshaft	24		
Wheel assembly	6		