CHARTS AVAILABLE IN THIS SERIES

No. P1 DECARBONISATION, ADJUSTMENTS AND SIMPLE REPLACEMENTS.

No. P2 REMOVING THE ENGINE/GEARBOX UNIT AND COMPLETE DISMANTLING.

No. P3 REBUILDING AND REPLACING THE UNIT.

No. P4 FRONT FORK, STEERING AND WHEELS.

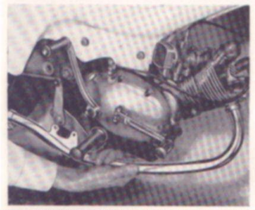
No. P5 AUTOMOTIVE UNIT REPLACEMENT PARTS

ARIEL SERVICE CHART

Adjustments and Simple Replacements

Pixie

No. P1



1

PRELIMINARIES

In order to remove the cylinder head, it is first necessary to take off the carburettor. Make sure the petrol tap is in the "off" position, and slacken the carburettor pinch bolt. The carburettor can now be pulled off its mounting stub and tied back out of the way.

The exhaust pipe and silencer can be removed together after taking off the nuts and bolts securing the silencer to the frame.

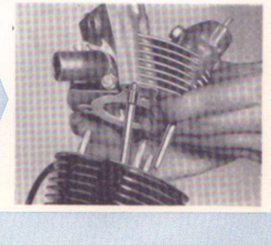
REMOVAL OF CYLINDER HEAD AND BARREL

It is advisable at this point to loosen the sparking plug and remove the two rocker covers. Turn the engine until both rockers are free and loosen off the rocker adjusting screws.

After taking off the three securing nuts and washers the cylinder head may be jarred free from the barrel and lifted clear together with one push rod, leaving the other push rod with the barrel.

Care must be taken during this operation to avoid trapping the push rods between the head and barrel.

When the remaining push rod has been removed the barrel may be lifted off and placed aside. Steady the piston as the barrel is removed to prevent its falling against the crankcase mouth.

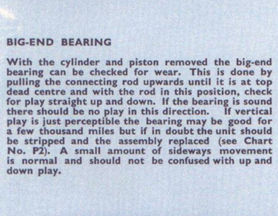


2

3

REMOVAL OF PISTON

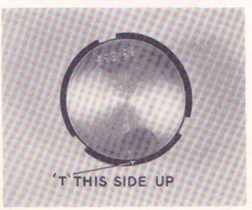
The piston and piston rings are now exposed. Normally it should not be necessary to remove the piston but if for some reason this is desirable, first remove the circlip from one end of the gudgeon pin. Use a pair of small-nosed pliers or the tang end of a file then, holding the piston firmly in the hand tap the gudgeon pin out from the other side. If it is too tight to move, it can be released by warming the piston with a rag soaked in hot water and wrung out. The inside of the piston skirt should be marked to ensure that the piston can be replaced the same way round.



4

BIG-END BEARING

With the cylinder and piston removed the big-end bearing can be checked for wear. This is done by pulling the connecting rod upwards until it is at top dead centre and with the rod in this position, check for play straight up and down. If the bearing is sound there should be no play in this direction. If vertical play is just perceptible the bearing may be good for a few thousand miles but if in doubt the unit should be stripped and the assembly replaced (see Chart No. P2). A small amount of sideways movement is normal and should not be confused with up and down play.



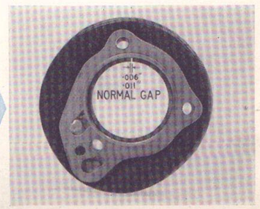
5

PISTON RINGS

The piston carries two compression rings and an oil control ring. The lower compression ring is tapered and must always be replaced so that the letter "T" or word "Top" etched on the side of the ring is uppermost.

All three piston rings should be a free sliding fit in their grooves.

Carbon build-up in the grooves can cause the rings to become tight, in which case they must be removed and the carbon scraped from the grooves. An ideal tool for this is a piece of old piston ring, but care must be taken not to remove any metal from the piston.



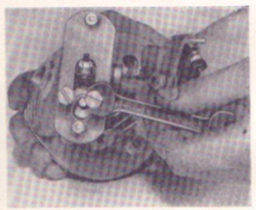
6

RING GAPS

If the piston rings are worn there will be loss of compression, loss of power and an increase in oil consumption.

To ascertain if the rings are worn it is necessary to measure the ring gaps. This is done by carefully removing the ring from the piston and placing it in the cylinder barrel, preferably at the lower end, it is then squared up by inserting the piston and the gap is then measured with feeler gauges.

The standard gap is .006—.011 in. and a slight increase could be ignored, but a gap of over .020 in. would require new rings to be fitted.

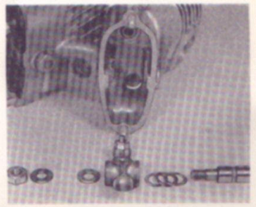


7

ATTENTION TO CYLINDER HEAD — REMOVAL OF VALVES

In order to remove the valves from the cylinder head the valve spring should first be compressed using Service Tool 61-3723. If the valve to be removed is held on its seat during this operation the split collets holding it will be released and they and the valve can be removed. If the collets stick to the spring cap so that the valve opens as the spring is compressed, they can be released by gently tapping the valve back on to its seat.

The free length of the valve springs should be 1.175 in. If they have shortened by more than 1/16 in. they should be replaced. The valves are not interchangeable, the inlet having the larger head and the letters "In." stamped on it, whilst the exhaust has the letters "Exh." stamped on its head.



8

REMOVAL OF ROCKER ASSEMBLIES

The rocker assemblies need not be disturbed unless it is necessary to renew any parts, or unless the valve guides are to be changed in which case the rocker should be removed to prevent accidental damage.

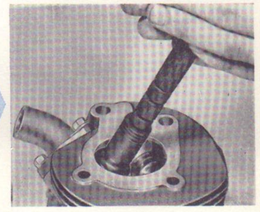
The rocker spindle nut and fibre washers must be removed, after which the spindles can be gently tapped out of the cylinder head using a suitable drift. This releases the rockers and washers on either side. Note the order of the washers for reassembly. If difficulty is experienced in removing the rocker spindles due to their being a tight fit in the head, they can be eased by heating the head in boiling water. The rockers and spindles should not be interchanged and should be reassembled to the same valve chamber from which they came.

9

VALVE GUIDES AND SEATS

The cylinder head should be heated in boiling water and the valve guides drifted out from the direction of the combustion chamber. For this operation the head should be supported on a wooden block in which two holes have been drilled to accommodate the rocker cover studs. A suitable drift for this operation is Service Tool 61-3737. Replacement guides should be fitted with new circlips and drifted in from the opposite direction until the circlips rest against the head, which should again be heated.

If the valve seats in the head are deeply pitted, or when new guides have been fitted, the seats should be re-cut with Service Tool 61-4087. Alternatively the head should be taken to the nearest dealer who has the necessary equipment.



10

VALVE GRINDING

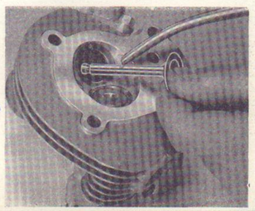
Carbon should be removed from the combustion chamber and ports using a soft scraper. Take care not to scratch the soft aluminium of the head or damage the valve seats.

If the seating areas on the valves and head are not deeply pitted, the valve may be reground in the head. Smear a small amount of valve grinding paste on the seat of the valve and place it in its guide. Using Service Tool 61-3735 hold the valve on its seat and rotate it backwards and forwards a small amount at a time. Periodically lift the valve off its seat and rotate it by a small amount before repeating the procedure until the seating areas provide a uniform matt finish. All traces of grinding paste must be removed with petrol.

11

REASSEMBLY OF PISTON

After removing all traces of carbon from its crown refit the piston the same way round as before, with the gudgeon pin lightly smeared with engine oil. A new circlip should be used and care taken to ensure that it is seated properly. The correctly gapped piston rings should be oiled and positioned in their respective grooves (see Section 5). Rotate the rings so that their gaps lie at approximately 120° intervals.

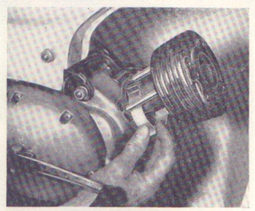


12

VALVE GEAR

Dealing with each valve assembly in turn the spring seating washer, spring and spring cap should be lightly oiled and placed in position. The spring can now be compressed using the compressor tool. Lightly oil the valve stem and insert the valve into its guide. Position the collets around the valve stem holding them in place by means of a blob of grease. Release the valve spring.

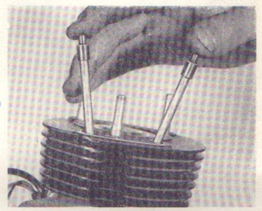
A new sealing ring should be fitted to each rocker spindle and the components lightly oiled. The three thin washers fit on one side of the rocker, the spring washer being the middle one, the thick washer fits on the other side nearest the securing nut which is fitted with a fibre washer and should be tightened firmly.



13

CYLINDER BARREL

The cylinder barrel can now be replaced. The cylinder base gasket should be smeared on both sides with a small amount of jointing compound and positioned against the joint face of the barrel. Smear the bore with clean engine oil and lower the barrel gently over the piston. Make sure that the rings are compressed into their grooves and not trapped by the barrel as it slides over them. The operation is made easier if Service Tool 61-3744 is used to clamp the piston rings. The service tool can be removed when the barrel is lowered far enough to cover the piston rings.



14

CYLINDER HEAD

Lightly smear the ends of the push rods with oil and replace them in the barrel. Note they are fitted with their plain ends downwards. Turn the engine until they are both in their lowest position and withdraw one, placing it against its rocker in the cylinder head. Position the head gasket on top of the barrel and lower the head together with the one push rod on to the barrel.

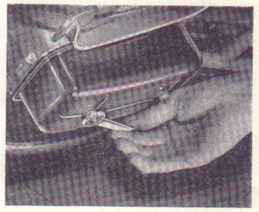
Make sure that the rockers are free and fit the head securing nuts and washers, tightening the nuts evenly.

Set the rocker clearances as detailed and refit the sparking plug, carburettor, exhaust pipe and rocker covers.

15

ROCKER CLEARANCE ADJUSTMENT

Checking or adjustment of the rocker clearances should only be carried out with the engine cold. Take off the rocker covers and the sparking plug, and turn the engine until the piston is at top dead centre of the firing stroke. In this position both valves should be closed and a gap of .003 in. should exist between the rockers and the ends of the valve stems. The gap should be checked by the insertion of the special feeler gauge supplied in the tool kit. The gauge should be a sliding fit between the valve stem and the rocker adjusting screw when the gap is correct. Adjust the gap by slackening the hexagonal locknut and screwing the square-headed adjuster in or out as required. Always tighten up the locknut before re-checking the setting.



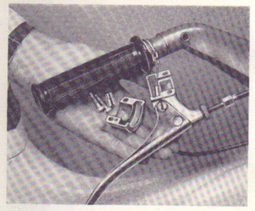
16

OIL CHANGE

The oil should be drained and renewed after the first 250 miles, again at 500, and then periodically every 2,000 miles.

To drain the oil, first place a tray or similar receptacle under the sump, then holding the sump in place, remove the two mounting nuts and fibre washers. Lower the sump, taking care not to damage its cork washer, and allow the oil to drain. Take off the two nuts and washers holding the filter plate, and withdraw the plste.

Wash the filter and the interior of the sump thoroughly in petrol and then allow all traces of this to evaporate before reassembly. When refitting the filter ensure that the oil feed pipe passes through the grommet in the filter plate. Do not over-tighten the sump securing nuts. Refill the sump with clean oil, to the level shown on the dipstick. The correct viscosity of oil is S.A.E. 20.



17

THROTTLE CABLE REPLACEMENT

To replace a throttle cable first unscrew and remove the two screws on the handlebar twist-grip control, take off the top half of the control and remove the cable nipple and cable stop.

Slacken off the pinch bolt on the carburettor and slide the carburettor off its stub. Unscrew the two screws on top of the mixing chamber and pull out the slide.

Compress the spring with the fingers and slip the cable nipple down and out of the throttle slide.

Replacement is in the reverse order, care being taken not to displace the needle clip.

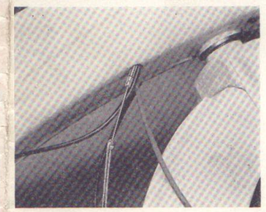
18

REFITTING TO SLIDE

Extract the cable from the carburettor components and replace the old cable by the new one. Attach the upper end of the new cable to the lower end of the old and use the old cable to draw the new one through the frame.

Connect the new cable at its lower end, ensuring that the circlip locating the throttle needle is seated correctly. Note that the throttle cable should pass inside the loop of the circlip.

Reassembly of the twist-grip is straightforward and is the reverse of the dismantling procedure. Leave the fitting of the split sleeve until the twist-grip is assembled, and finally re-adjust the cable tensioner to eliminate excessive slack in the control.



19

CLUTCH CABLE REPLACEMENT

Slacken off the clutch cable adjuster until the cable can be disengaged from the operating lever on the right-hand side of the engine unit. With the resulting slack in the inner cable pull the outer cable away from the handlebar lever. Pivot the cable forwards clear of the lever body, so that the cable nipple can be pressed downwards out of the lever.

Lay the replacement cable in position on the machine, this is best achieved by tying a length of cord to the end of the old cable being removed, and using this to guide the new cable into position, through the frame.

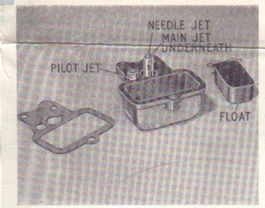
Reconnection of the cable nipples is the reverse of the dismantling procedure. Finally set the cable adjuster to give a free movement of ½ in. at the tip of the handlebar lever.

20

FRONT BRAKE CABLE

Apart from its connection at the lower end the replacement of the front brake cable is very similar to that of the clutch cable. Slacken off the outer cable adjuster until the nipple at the lower end of the cable can be disengaged from the brake operating lever on the brake-plate.

Remove the old cable and lay the replacement cable in position on the machine. Connect the cable at the handlebar end, then at its lower end and finally set the cable adjuster for satisfactory operation.



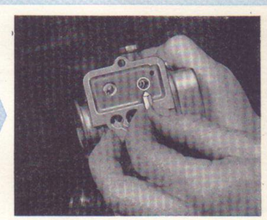
21

DISMANTLING THE CARBURETTOR

Turn off the fuel supply at the tap and remove the hexagon-headed bolt just below the tap. Remove the banjo union with its fibre washers and the filter gauze. The float chamber is held by two screws on top and one underneath the joint, take out the screws and remove the float chamber and float.

Both needle and main jets are screwed into the top of the float chamber and can be removed for cleaning in the normal manner, but, care should be taken to use spanners which are a good fit.

The nylon float needle fits into an orifice in the underside of the mixing chamber and is always fitted with the point upwards.



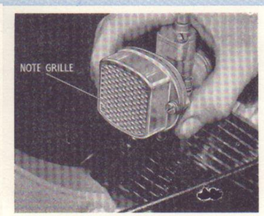
22

CARBURETTOR JETS

If there is the slightest sign of wear on the needle seating it should be replaced. When replacing the float chamber see that the gasket is in good condition, the needle in position, and the float is correctly seated.

Do not use excessive force when screwing in the jets.

Unless it is absolutely necessary do not disturb the throttle stop screw—which is the horizontal one—or the slow-running adjustment screw—the vertical one—as this would entail completely resetting the carburettor, a job which must only be done when the engine is at its normal working temperature.



23

AIR CLEANER

The air cleaner is retained on the air intake by two 3/16 in. screws with shakeproof washers, as it cannot be dismantled, it should be washed thoroughly in petrol and left to drain.

When replacing see that it is fitted so that water will drain off the gauze at the front of the filter and not into the filter.

Before replacing the carburettor on its stub see that the "O" ring is in position inside the choke tube and is in good condition.

Cylinder bore size	...	38.9 mm.
Stroke	...	42 mm.
Capacity	...	49.9 c.c.
Compression ratio	...	8.8 : 1
Ignition timing ...	...	.135 in. (3.429 mm.) or 30° B.T.D.C.
Spark plug ...	...	Champion Z10
Spark plug gap ...	...	.020 in. (.508 mm.)
Contact breaker gap	...	.012 in. (.304 mm.)
Valve timing:		
inlet opens ...	...	35° B.T.D.C.
inlet closes ...	...	53° A.B.D.C.
exhaust opens	...	60° B.B.D.C.
exhaust closes	...	32° A.T.D.C.

Gear ratios:		overall	internal
top	...	11.19	1.0
3rd	...	14.74	1.318
2nd	...	23.4	2.059
bottom	...	33.4	2.985
Primary gear ratio	...	3.33 : 1	
Sump capacity ...	...	1¼ pints or 1½ pints dry	
Oil grade ...	...	S.A.E. 20 or 20/30 Winter and Summer.	
Gearbox capacity	...	¾ pint	

Ariel Motors Limited, Armoury Road, Birmingham, 11

Printed December 1963

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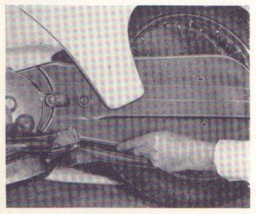
ARIEL SERVICE CHART

Removing the Engine Gearbox-Unit and Complete Dismantling

Pixie No. P2



1

EXHAUST SYSTEM

Take out the two $\frac{1}{2}$ in. diameter bolts and nuts each side the right-hand footrest. Pull the bracket away from the footrest and ease the exhaust pipe out of the cylinder head.

Remove the two Phillips head screws at the rear of the chainguard and the single nut and dished washer at the front end. Take the chainguard away.

Remove the rear chain and disconnect the generator leads at the couplings, these can be pulled out of the frame from just behind the cylinder barrel.

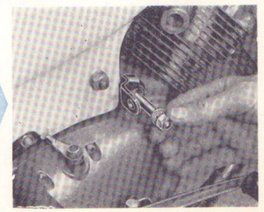
Apply a suitable spanner to the nut on the clutch lever spindle, turn clockwise and remove the cable nipple from the lever.

ENGINE MOUNTING

Slacken the pinch bolt on the carburettor, pull the carburettor off its stub and tie back out of the way.

Place a suitable receptacle under the sump to catch the oil, remove the sump nuts and washers, drain the oil then replace the sump temporarily.

The unit is retained by three studs with nuts and washers, one behind the cylinder barrel, one above the gearbox sprocket and one just above the sump at the rear. Place a suitable box under the sump, remove the nuts and washer from the left-hand side and take the studs away from the right-hand side. The unit can now be removed.



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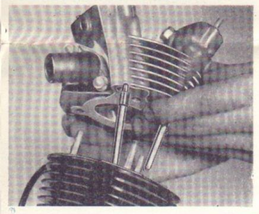


3

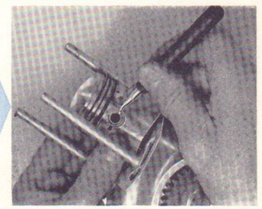
CYLINDER HEAD AND BARREL

Unscrew and remove the sparking plug, turn the crankshaft, by means of the kickstart pedal, until both rocker arms are free and take off the three cylinder head nuts.

The head joint can usually be broken by tapping with a hide mallet on the exhaust port.

Lift the head until the push rods are exposed then lift one push rod with the head leaving the other rod in the cylinder barrel. Lift out the other push rod.

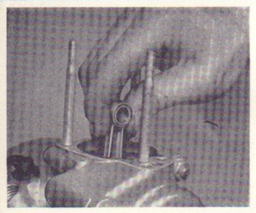
The cylinder barrel can now be removed, but care must be taken to support the piston as it emerges from the barrel.



4

REMOVAL OF PISTON

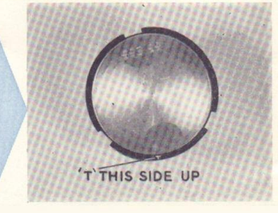
The piston and piston rings are now exposed. Normally it should not be necessary to remove the piston but if for some reason this is desirable, first remove the circlip from one end of the gudgeon pin. Use a pair of small-nosed pliers or the tang end of a file then, holding the piston firmly in the hand tap the gudgeon pin out from the other side. If it is too tight to move, it can be released by warming the piston with a rag soaked in hot water and wrung out. The inside of the piston skirt should be marked to ensure that the piston can be replaced the same way round.



5

BIG-END BEARING

With the cylinder and piston removed the big-end bearing can be checked for wear. This is done by pulling the connecting rod upwards until it is at top dead centre and with the rod in this position, check for play straight up and down. If the bearing is sound there should be no play in this direction. If vertical play is only just perceptible the bearing may be good for a few thousand miles but if in doubt the unit should be stripped and the assembly replaced. A small amount of sideways movement is normal and should not be confused with up and down play.



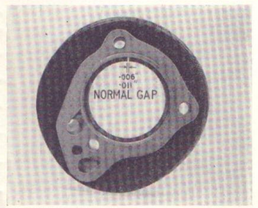
6

PISTON RINGS

The piston carries two compression rings and an oil control ring. The lower compression ring is tapered and must always be replaced so that the letter "T" or word "Top" etched on the side of the ring is uppermost.

All three piston rings should be a free sliding fit in their grooves.

Excessive carbon build-up in the grooves can cause the rings to become tight, in which case they must be removed and the carbon scraped from the grooves. An ideal tool for this is a piece of old piston ring, but care must be taken not to remove any metal from the piston. Any bright streaks or stained or scored patches on the peripheries of the rings indicate that they should be replaced.



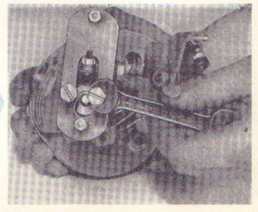
7

RING GAPS

If the piston rings are worn there will be loss of compression, loss of power and an increase in oil consumption.

To ascertain if the rings are worn it is necessary to measure the ring gaps. This is done by carefully removing the ring from the piston and placing it in the cylinder barrel, preferably at the lower end, it is then squared up by inserting the piston and measuring the gap with feeler gauges.

The standard gap is .006—.011 in. and a slight increase could be ignored, but a gap of over .020 in. would require new rings to be fitted.

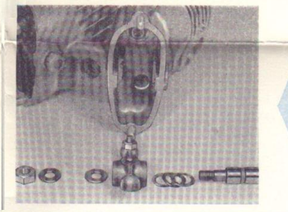


8

ATTENTION TO CYLINDER HEAD — REMOVAL OF VALVES

In order to remove the valves from the cylinder head the valve spring should first be compressed using Service Tool 61-3723. If the valve to be removed is held on its seat during this operation the split collets holding it will be released and they and the valve can be removed. If the collets stick to the spring cap so that the valve opens as the spring is compressed, they can be released by gently tapping the valve back on to its seat.

The free length of the valve springs should be 1.175 in. If they have shortened by more than 1/16 in. they should be replaced. The valves are not interchangeable, the inlet having the larger head and the letters "In." stamped on it, whilst the exhaust has the letters "Exh." stamped on its head.



9

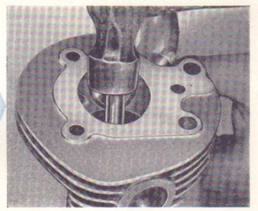
ROCKER ASSEMBLIES

The rockers need not be disturbed unless it is necessary to renew parts such as the rockers due to ovality of the bores, or, if the valve guides are to be changed, in which case the rocker should be removed to avoid accidental damage.

The rocker spindle nut and fibre washer must be removed, after which the spindle can be gently tapped out of the head using a soft metal drift.

Before completely removing the spindle take careful note of the position of the various washers to ensure correct reassembly.

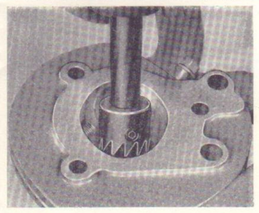
If the rocker spindles are tight, heat the head in hot water. Avoid interchanging parts between spindles.



10

VALVE GUIDES

The cylinder head should be heated in boiling water and the valve guides drifted out from the direction of the combustion chamber. For this operation the head should be supported on a wooden block in which two holes have been drilled to accommodate the rocker cover studs. A suitable drift for this operation is Service Tool 61-3737. Replacement guides should be fitted with new circlips and drifted in from the opposite direction until the circlips rest against the head, which should again be heated.



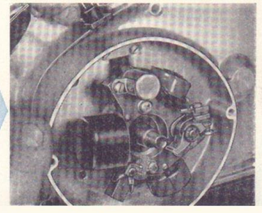
11

VALVE SEATS

If the valve seats in the head are deeply pitted, or when new guides have been fitted, the seats should be re-cut with Service Tool 61-4087. Alternatively the head should be taken to the nearest dealer who has the necessary equipment.

Similarly if the valves are deeply pitted they should be re-faced or replaced before being lightly ground-in.

Excessive grinding-in by hand should not be indulged in as this tends to cause "pocketing".



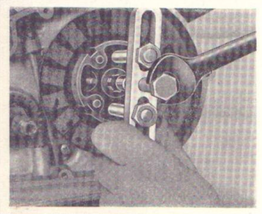
12

REMOVAL OF PRIMARY DRIVE COVER

Remove the generator cover on the left-hand side of the unit. Hold the crankshaft by inserting a rod through the connecting rod eye to rest on strips of wood over the crankcase mouth. Remove the flywheel nut and spring washer and use Service Tool 61-3727 to pull the flywheel off its taper. Take out the key.

The stator is held by two Phillips-headed screws passing through slotted holes. It is not necessary to remove the stator, although in some cases it may have to be rotated slightly for the cover securing screws to be removed. In this case the original position of the stator should be marked by a line scribed on it, pointing to one of the screws.

Use a hide mallet to tap the cover free when its securing screws are removed.



13

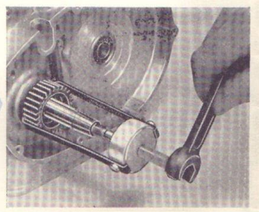
CLUTCH AND PRIMARY DRIVE

Unscrew the clutch spring screws and remove the springs and cups with the clutch outer plate. Do not lose the clutch operating key and hair-spring which are now released.

The outer driven pinion can now be pulled off, followed by the lined plate and inner pinion.

Bend back the tab washer behind the clutch centre nut and remove the nut. The centre can be prevented from rotating by engaging top gear and holding the gearbox sprocket in a length of old chain, its ends gripped in a vice.

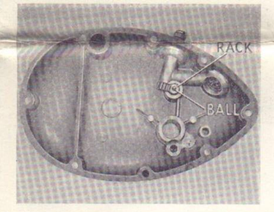
Pull off the centre using Service Tool 61-3721, being careful not to lose the split ring released from behind it.



14

PRIMARY DRIVE PINION

To remove, bend back the three tabs on the lockwasher and unscrew the nut which has a normal right-hand thread. Usually the pinion is a push-fit on the shaft but, if it is tight, it can be removed with Service Tool 61-3728.



15

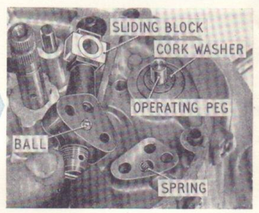
REMOVAL OF TIMING SIDE OUTER COVER

Take off the gearchange and kickstarter pedals, remove the eight Phillips-headed screws from around its edges and pull the outer cover off, leaving the kickstarter and gearchange quadrants in place. Note the lengths of the screws taken from the various points. Take care not to lose the small rack and ball which operate the clutch.

The clutch push rod is in two halves with a ball between the two. These can now be extracted from the mainshaft.

Pull off the kickstarter spring and remove the dowels from behind and below the quadrant. Note that the latter carries a loose bush. Take off the quadrant.

The footchange return spring can now be prised off its locating pin and removed together with its stop-plate and distance washer.

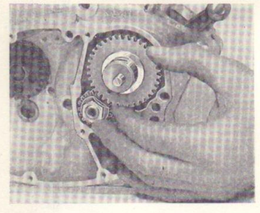


16

OIL PUMP AND INNER TIMING COVER

The oil pump is secured by two Phillips-headed screws which pass through the inner timing cover into the offside crankcase half. After these have been unscrewed the oil pump may be taken off complete with its plunger and nylon operating block. As its joint with the timing case is broken, the non-return valve ball and spring are released. Take care not to lose these and store them in a safe place. If the spring remains in its hole in the timing case it should be brought out with a piece of wire. Take off the small cork washer from the oil pump driving peg.

After the two Phillips-headed screws in the centre of the cover have been removed, the cover can be pulled off together with the gearbox cluster, selector quadrant and cam-plate.



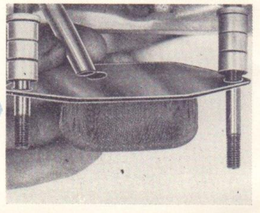
17

TIMING GEARS

With the inner timing cover removed the camshaft and wheel can be removed and the cam followers withdrawn. The cams and followers should be examined for wear or scoring, if the peaks of the cams are worn down the valve opening is affected and the efficiency of the engine reduced.

To remove the crankshaft pinion bend back the tab washer and unscrew the locknut which has a normal right-hand thread. Note the timing marks on both wheels.

The pinion can be removed with Service Tool 61-3733.



18

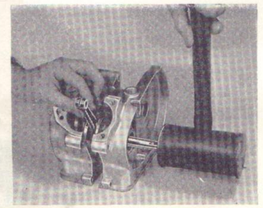
SUMP AND OIL FILTER

Take off the two self-locking nuts holding the sump, remove the fibre washers and sump. Make sure that the fibre washers are fit for further use and if the gsakets are at all damaged they should be replaced.

The self-locking nuts should be tight on the screw threads, if not replace them.

Note the position of the distance piece and if the studs are to be removed note that the longer stud is fitted at the rear.

Clear any sludge from the sump, wash the filter in petrol and allow to drain before refitting.



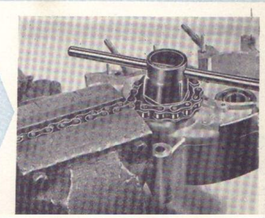
19

SPLITTING THE CRANKCASE HALVES

Remove the 5/16 in. bolt from the front of the cylinder base and the two Phillips-headed screws, one behind the cylinder, the other just above and in front of the sump, and three screws around drive-side shaft.

Take off the nuts and washers from the remaining three studs inside the sump and tap the halves apart using a hide mallet.

The crankshaft may stay in either half but can be tapped free again using a hide mallet.

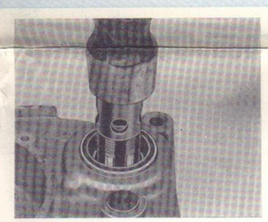


20

MAINSHAFT OIL SEAL

There is an oil seal fitted behind the gearbox final drive sprocket and if there has been leakage at this point it is an indication that the seal has deteriorated and needs replacing.

To change the seal it will be necessary to remove the sprocket and the mainshaft pinion sleeve as described in the next paragraph when the seal can be removed and replaced from the sprocket side. If, however, there is no sign of wear or leakage, there is no need to disturb the sprocket or pinion sleeve.

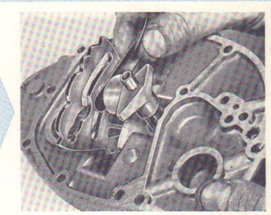


21

REMOVAL OF GEARBOX SPROCKET AND SLEEVE PINION

The gearbox sprocket can be taken off after its securing nut and tab washer are removed. Bend back the tab washer, and, holding the sprocket in a length of old chain with its ends clamped in a vice, unscrew the nut. Note that this has a left-hand thread and therefore unscrews in a clockwise direction.

The sleeve can now be tapped out of its bearing into the gearbox case. Take care not to apply force to the small bush protuding from the end of the sleeve, or this may be driven into the sleeve and subsequently fail to complete the primary drive oil seal. If possible a tubular drift should be used.



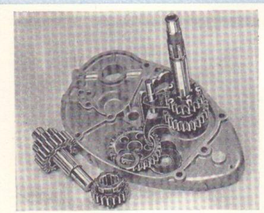
22

GEARBOX CLUSTER

Pull off the selector quadrant spring and stop-plate and drive out the peg.

Push the quadrant spindle through the cover after disengaging the pawls with the blade of a knife or similar tool. The pawls should be quite free in the quadrant without excessive twist and the teeth must be unbroken and sharp.

If there is wear on the teeth of the pawls then there will most probably be wear on the cam-plate as well.



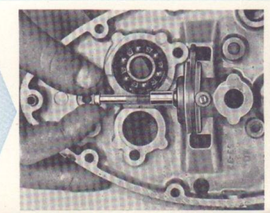
23

LAYSHAFT

The layshaft and its gears can now be removed from the cover. Note the thrust washer between the first gear and the sliding dog and the larger washer fitted between the first gear and the cover.

Pull out the selector fork shaft and remove the forks, these are interchangeable but, if they are being refitted it is advisable to replace them in the same positions.

The forks should be polished on the friction faces without scoring or signs of overheating such as "blueing". If there has been any tendency to slip out of gear, there will be wear on either the sliding dogs, selector forks, camplate or quadrant pawls.



24

GEARBOX CAM-PLATE AND MAINSHAFT

The gearbox cam-plate can be removed after its pivot pin is taken out. It is locked in the casing by a grub screw which should be slackened off. The pin is threaded internally and can be pulled out using one of the timing screws.

The mainshaft, still assembled to the inner timing cover, should be held in a soft-jawed vice. Bend back the tab washer on the securing nut and remove the nut. Take off the kickstarter ratchet components, noting their relative positions for assembly purposes.

The shaft can now be driven out of its bearing using a hide mallet.

Ariel Motors Limited, Armoury Road, Birmingham, 11
Printed January 1964

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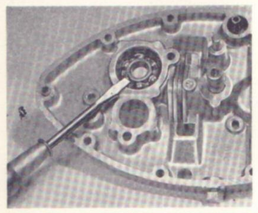
ARIEL SERVICE CHART

Rebuilding and Replacing the Engine Gear-box Unit

Pixie No. P3



1

BEARINGS AND OIL SEALS

For the removal and refitting of journal bearings, the bearing housings should first be heated either in an oven or in boiling water, and the bearings then driven in or out with suitable drifts or extractors.

Note that the gearbox mainshaft bearing in the inner timing cover is secured by a circlip which must be removed before the bearing itself can be pressed out of its housing. A new circlip should be fitted after this has been done.

The need to replace a bearing is shown if up and down play exists in it, or if it rotates roughly. A plain bearing should be renewed if its surfaces become deeply scored.

When replacing oil seals, there is no need to heat the housings, but care must be taken to ensure that they are replaced the same way round as before.

FINAL DRIVE SPROCKET

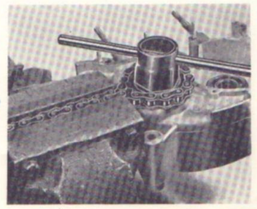
The final drive sprocket and pinion sleeve assembly must be built up before the crankcase halves are bolted together.

After ensuring that the main bearing and oil seal are satisfactory, lightly oil the outer surface of the pinion sleeve, hold it square to the bearing and press firmly home.

Oil the sleeve portion of the sprocket, press gently into position and secure with a new tab washer and the securing nut. Remember that the nut has a left-hand thread and must therefore be tightened anti-clockwise.

Prevent the assembly turning by holding the sprocket with a length of old chain gripped in the vice.

Turn the tab washer over the nut after tightening.



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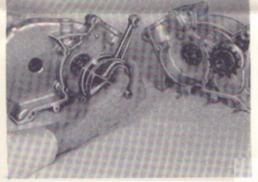


3

CRANKSHAFT

The crankshaft assembly requires special equipment and specialised knowledge to dismantle and re-assemble. It is therefore wiser for the inexperienced to use a factory reconditioned unit, which can be obtained from any bona fide dealer, if say the big-end requires replacement.

When the crankshaft is assembled into the crank-case it is locked to the drive-side by the primary driving gear and there is no need for shimming to control end float.

CRANKCASE HALVES

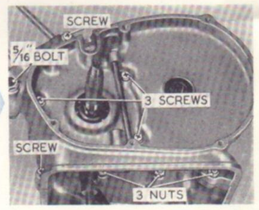
Clean both joint faces with petrol and remove all traces of old jointing.

Lubricate the timing-side main bearing with clean engine oil and using a force-feed oil can, lubricate the big-end bearing via the hole in the timing-side main-shaft.

The crankshaft can now be assembled into the timing-side crankcase half.

Smear the joint faces of both crankcase halves with jointing compound and allow this to dry for a few minutes. Lubricate the drive-side main bearing with engine oil and tap the two halves together with a hide mallet.

Refit the three crankcase screws in the primary drive case, noting that they are fitted with spring washers, tighten them evenly together with the other Phillips-headed screws and the 5/16 in. bolt.



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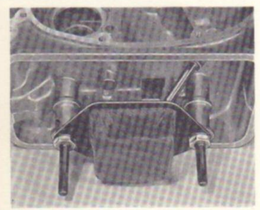


5

SUMP AND OIL FILTER

Reassembly of the sump can now be carried out. Clean the filter with petrol if necessary and allow it to dry. Refit the two distance pieces on the sump mounting studs, followed by the filter plate and its nuts and washers. Ensure that the feed pipeline passes through the grommet in the filter plate.

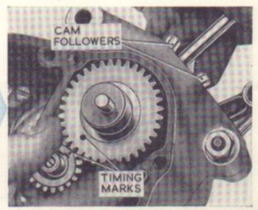
Replace the cork sump gasket if this has hardened or been damaged and fit the sump with its shallow end to the front. Do not omit the fibre washers under-neath the sump securing nuts or leakage of oil is likely.

TIMING GEARS

The crankshaft timing pinion can now be replaced. Ensure that the key is in position, press the pinion right home, fit a new tab washer and secure the nut finally bending back the tab washer to lock the nut.

Lightly oil the cam followers and insert them in their respective positions in the crankcase, oil the camshaft and holding the followers in their upper-most positions, insert the cam wheel at the same time carefully matching the two timing dots to each other.

In the illustration the crankshaft nut and tab washer have been left off for clarity.



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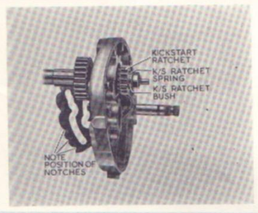


7

GEARBOX FITTINGS

If the mainshaft has been separated from the inner timing cover, it can now be tapped back into its bearing. Refit the kickstarter ratchet components and use a new tab washer to lock the securing nut.

When replacing the gearbox cam-plate note that the three closely spaced notches should be in the lower half of the plate as it is possible for the plate to be replaced the wrong way up. Do not forget to tighten the pivot pin grub screw securely.

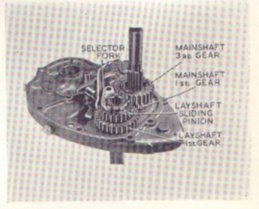
The cam-plate spring is held on to the rear face of the gearbox housing by two hexagon-headed screws. If these have been removed for renewal of the spring, a new tab washer should be fitted and bent over them.

LAYSHAFT

Oil the kickstarter quadrant and refit it in the inner timing cover. Mount the quadrant in a soft-jawed vice so that the cover is horizontal.

All the various gears etc. should now be lightly smeared with oil.

Place the layshaft first gear pinion spacer in its recess in the cover, followed by the pinion and the small thick spacing washer, its chamfered face upper-most. The layshaft sliding pinion with its selector fork can now be fitted, the fork to engage in the cam track nearest to the cover.



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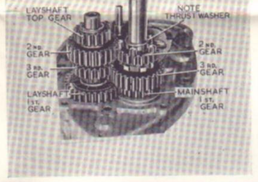


9

MAINSHAFT

The mainshaft sliding pinion is fitted against the mainshaft fixed gears, and its selector fork engages in the remaining cam track.

Mount the layshaft so that its splines engage and insert the selector fork shaft into its hole in the cover.

The remaining small distance washer fits on the mainshaft after the mainshaft sliding pinion.

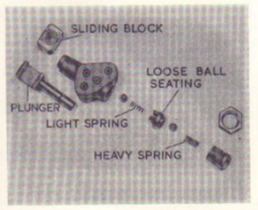
Finally fit the selector quadrant using a knife blade to hold its pawls out of engagement with the cam-plate until it is fully home. Refit the small peg in the quadrant shaft so that equal lengths project on either side.

TIMING COVER

A new gasket, having jointing compound on one side only, should be used at the timing cover joint. Lightly oil the camshaft bearing, crankcase layshaft bush and pinion sleeve, and holding the complete gear cluster and timing cover assembly, feed the mainshaft into the pinion sleeve bearing in the crankcase half. Engage the layshaft in its bearing and gently tap the case home, using a hide mallet.

Refit the two Phillips-headed screws and spring washers in the centre of the timing case, noting that the longer one fits to the rear.

10



11

OIL PUMP

The oil pump should not be dismantled unless it is known to be worn or defective.

Check the fit of the plunger in the body of the pump, if there is ovality both parts will require replacement.

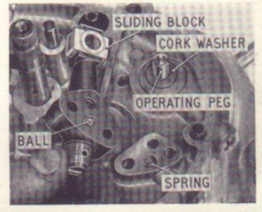
To dismantle the rest of the pump slacken the locknut at the base and carefully remove the plug, this will release the two 3/16 in. diameter steel balls, two springs and the loose ball seating.

After cleaning to remove any accumulation of sludge, place one ball into the body of the pump, next place the lighter of the two springs in position then the loose ball seating, slotted end first, next the second ball, then the heavier spring and finally the screwed plug. Screw the plug right home and secure the locknut.

OIL PUMP MOUNTING

All traces of old jointing should be removed and care taken to prevent debris from this finding its way into the pump. The new gasket should be positioned against the pump with a very thin even layer of jointing com-pound in between. The non-return valve spring should be positioned in the middle lower hole of the pump mounting. The corresponding hole in the pump body forms the seating for the valve ball, and must be clean and free from traces of jointing compound. Hold the ball on to its seating with a very small blob of light grease.

Lightly oil the pump operating peg and position the thin cork washer and nylon block on it. Make sure that the plunger is oiled and slides freely in the pump body. Mount the pump in position and tighten the two securing screws firmly and evenly.



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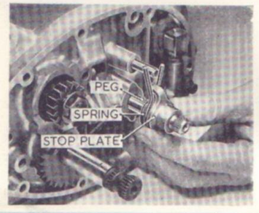


13

FOOTCHANGE

The footchange return spring and stop plate can now be assembled on to the footchange spindle.

Make sure that the peg which passes through the spindle is equally spaced then press both spring and stop plate over the spindle so that the ends of the spring engage either side of the peg as shown.

The gasket used between the inner and outer covers should be cemented to the outer cover.

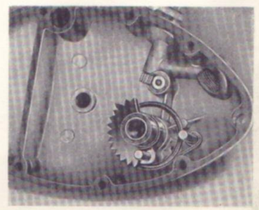
There are also two hexagon-headed bolts and one grub screw on the outer edge of the cover.

The lower one is the drain screw, the small bolt is for testing the pump delivery and the grub screw is to blank off the engine breather drilling. All these should be kept tight.

REPLACING THE COVER

Check that the clutch operating rack and ball are in position in the outer cover, press the one end of the kickstarter return spring into the back of the quadrant, slide the quadrant into the cover until the spring eye is engaged over the peg farthest from the spindle, turn the quadrant to tension the spring then press the quadrant home and against its stop.

Slide the cover over the footchange spindle and tap gently home, securing with the eight cover screws. These are of various lengths and care is required to ensure that they are correctly positioned.



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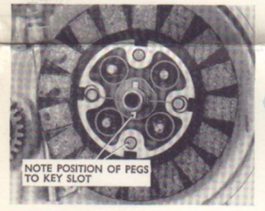


15

CLUTCH AND PRIMARY DRIVE

Refit the crankshaft pinion recessed side outwards. Use a new tab washer to secure its nut, which should be firmly tightened.

The two halves of the split ring which fits behind the clutch centre should be held in position by a blob of grease and the centre refitted so that the slot in the mainshaft lines up with two of the four outer pegs. Securely tighten the centre nut and lock with a new tab washer. The two driven gears with the lined plate in between, can now be fitted.

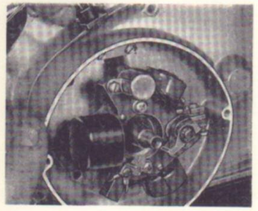
CLUTCH OPERATING KEY

Grease the clutch push rod components and place them in position in the mainshaft. Locate the ends of the small hairspring over two of the outer pegs of the clutch centre so that the middle of the spring is dished outwards to hold the operating key, which can now be fitted.

Of the two recesses at 90 degrees to each other in the centre of the clutch outer plate, only one is deep enough to accommodate the operating key. The plate should therefore be fitted so that the key rests in this deep recess.

The clutch springs and caps can now be fitted and the screws tightened down fully.

16



17

PRIMARY COVER AND FLYWHEEL

A new gasket should be smeared with jointing com-pound and positioned against the cover. The bearings in the cover should be lightly oiled, and the cover tapped into position. Take care—as this is done—that the rubber grommet holding the lighting leads is correctly located and not trapped between the joint faces.

The cover is held by seven Phillips-headed screws, three of them situated in the flywheel housing having spring washers. Tighten all seven screws securely.

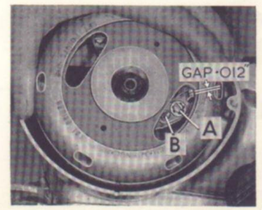
STATOR PLATE

Re-position the stator if this has been disturbed, and check that its mounting bolts are tight.

Refit the flywheel Woodruff key and locate the fly-wheel on its taper.

Tighten its securing nut firmly on to the spring washer.

Check the contact breaker gap by turning the crank-shaft until the points are fully open then set them to .012 in. by slackening off screw (A) and turning screw (B) to left or right as necessary. Do not omit to secure screw (A) after checking the gap. Refit the outer cover.



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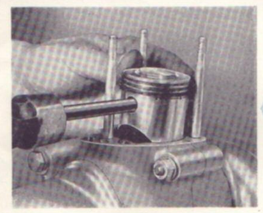


19

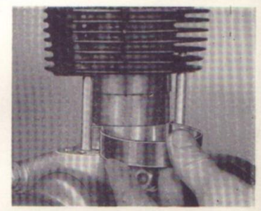
REPLACING THE PISTON

After removing all carbon from the ring grooves and refitting or replacing the piston rings, warm the piston, lightly oil the gudgeon pin and replace the piston on the connecting rod the same way round as before. Fit a new circlip and ensure that it is well down in its groove, a loose circlip can result in a badly scored cylinder barrel. Place a new base washer in position on the cylinder using jointing compound, lightly oil the piston rings, position the gaps at 120 degrees and clamp the rings with slipper part number 61-3744.

CYLINDER BARREL

Apply clean fresh oil to the cylinder barrel and slide it over the piston until the slipper has been pressed down clear of the rings, take away the slipper and press the barrel well down on to the crankcase.

Place both push rods in the cylinder barrel and revolve the crankshaft until the piston is at the top of its stroke and both push rods are at the same height. In this position both valves would be closed.



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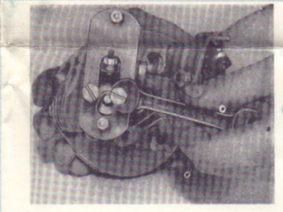


21

VALVE ASSEMBLY

After removing all carbon from the cylinder head and grinding-in the valves, deal with each valve in turn. Oil the valve stem, place it in its guide and replace the spring seating washer, spring and spring cap. Compress the spring with tool number 61-3723, apply a dab of grease to the inside of the collets and place them in position on the valve stem ensuring that they are correctly seated.

Remove the spring compressor carefully to avoid displacing the collets and repeat for the other valve.

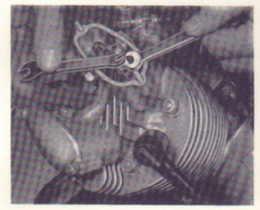
Replace the rocker gear ensuring that the various washers are correctly positioned as shown in illustration No. 8, Chart No. P.1.

REPLACING THE HEAD

Leave the rocker adjusting screws loose, pick up the head, place the other push rod in position in the head and holding it against its rocker, lower the rod and head over the barrel and studs.

Secure the assembly with the three holding down nuts and plain washers screwing each nut down an equal amount to avoid distortion. The long extension nut passes through the fins on the opposite side to the spark plug.

Adjust the tappets to .003 in. using the special feeler gauge provided in the tool kit and replace the rocker covers, using new cover gaskets if necessary.



22

23

REPLACING THE UNIT

Support the unit with a suitable box under the sump and replace one of the three mounting studs loosely. Swing the unit into position and replace the other two studs.

Tighten all three studs securely and reconnect the generator leads at the couplings pushing these back into the frame afterwards.

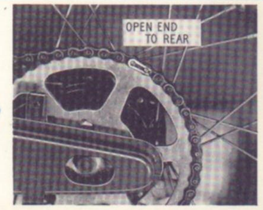
Replace the carburettor on its stub, ensuring that the "O" ring is in position inside the choke tube.

Replace the sparking plug and high-tension lead.

FINISHING OFF

Slide the rear chain over the final drive sprocket and replace the connecting link with the open end of the clip towards the rear. Adjust as necessary. Replace the chainguard securing with the long stud and cupped washers at the front and two screws at the rear. If the clutch operating arm has been disturbed it should be replaced on the splined spindle so that it makes an angle of 90 degrees with the cable when the clutch is withdrawn.

Reconnect the clutch cable, adjusting as necessary, and replace the exhaust system. Do not forget to refill the sump and gearbox with S.A.E. 20 oil before starting the engine.



24

CHARTS AVAILABLE IN THIS SERIES

No. P1 DECARBONISATION, ADJUSTMENTS AND SIMPLE REPLACEMENTS.

No. P2 REMOVING THE ENGINE/GEARBOX UNIT AND COMPLETE DISMANTLING.

No. P3 REBUILDING AND REPLACING THE ENGINE/GEARBOX UNIT.

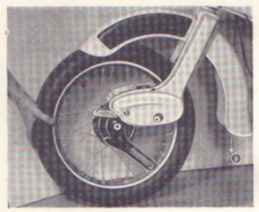
No. P4 FRONT FORK, STEERING AND WHEELS.

No. P5 AUTOMOTIVE UNIT REPLACEMENT PARTS

ARIEL SERVICE CHART *Pixie*

FRONT FORK, STEERING and WHEELS

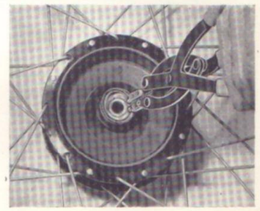
No. P4



1

FRONT WHEEL REMOVAL

Slacken off the front brake cable adjustment and disconnect the cable at its lower end. Remove the two rubber plugs covering the wheel spindle ends. The spindle has a locking nut and washer at the brake end and these should now be removed. Support the wheel and withdraw the spindle, taking care not to lose the washer fitted behind its head. Slide the wheel backwards clear of the links and free the brakeplate anchor by lowering the wheel until the enlarged end of the anchor slot can be passed over the locating stud in the fork leg. If a speedometer is fitted its drive gearbox can now be disengaged and left suspended by its cable. The wheel complete with brake assembly can now be rolled forwards clear of the machine.

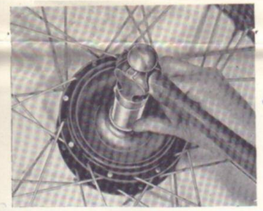


2

REMOVAL OF FRONT WHEEL BEARINGS

The wheel bearings are of the ball journal type. The hubs are packed with grease on assembly and no further attention should be required for long periods.

Separate the brake assembly from the wheel and prise off the dust cap from the brake drum side of the hub. Remove the felt washer fitted behind it. The circlip which holds the bearing in place can now be seen. Release this using a pair of circlip pliers and remove the thin steel washer from behind it. The bearing can now be driven out with a suitable drift after displacing the centre tube. Take out the seating washer fitted behind it and the distance piece fitted between the bearings. The remaining bearing can be driven out of the hub after the dust cap and distance piece from that side are removed.



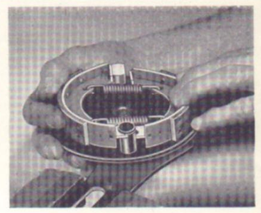
3

REPLACEMENT OF FRONT WHEEL BEARING

Remove all traces of old grease from the interior of the hub and refit the brake-side bearing seating washer. Grease the bearing with new grease and press it in position using a suitable drift. Refit the thin steel washer and fit a new circlip. See that the circlip is bedded correctly in its groove.

Renew the oil retaining felt washer if this appears to be damaged and tap the dust cap squarely back on to its seating.

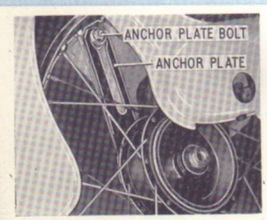
The hub can now be packed with grease until it is approximately one-third full. This is best done by smearing the bearing spacer with the required amount of grease before assembling it into the hub. After refitting the spacer grease the remaining bearing and tap it into its housing until it rests against the spacer. Finally refit the dust cap and external distance piece.



4

ATTENTION TO BRAKES

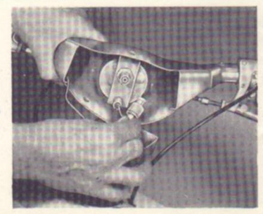
The front and rear brakes are similar in construction and the dismantling procedure is the same in each case. To remove the brake shoes lay the brakeplate flat on a bench and lever the shoes outwards and upwards, starting at the pivot pin as illustrated. They can then be drawn over and free of the cam and fulcrum pin. The brake linings should be replaced before they wear down to the level of the rivets or their action may scour the brake drum and cause loss of efficiency and squealing of the brake. Exchange brake shoes, correctly fitted with new linings, are available from Ariel dealers.



5

REPLACEMENT OF FRONT WHEEL

Assemble the brakeplate to the wheel hub and position the assembly between the fork legs. If a speedometer is fitted locate its gearbox on the end of the hub ensuring that its driving dogs are correctly engaged. Locate the brakeplate anchor, raise the wheel and slide it forwards between the trailing links. Line up the spindle holes and insert the spindle from the side opposite to the brake. Tighten the spindle nut securely and replace the rubber plugs at the spindle ends. Reconnect the brake control and re-adjust the cable.

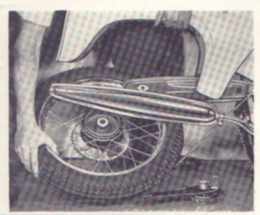


6

SPEEDOMETER HEAD AND CABLE

To replace a speedometer cable unscrew the knurled thimble at the wheel end, release the clutch cable nipple—engine end—and the throttle cable at the carburettor. Draw the cables up until the speedometer cable thimble can be drawn through the lower hole in frame. Pull the cable and grommet out of the upper hole in frame. Take out the three bolts holding the handlebar and lift the bar sufficient to obtain access to the upper end of the cable. Unscrew the large thimble and remove the cable.

The speedometer head can also be removed at this stage if necessary. Unscrew the large hexagon nut underneath the head and remove the "U" shaped bracket when the head can be lifted out from above the handlebar. Replacement of both parts is simply the reverse of dismantling.



7

REAR WHEEL REMOVAL

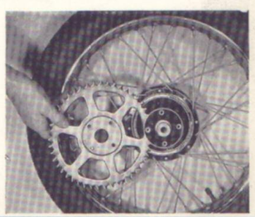
Release the rear chainguard by unscrewing the two small bolts to the rear of the guard and the long bolt passing through the rear fork to the front of the guard.

Rotate the rear wheel until the chain connecting link is exposed and remove the link. Run the chain off the rear wheel sprocket.

Disconnect the rear brake by unscrewing the adjusting screw to the limit of its thread. Take the pivot pin out of the brake lever to prevent loss.

Remove the rubber plugs covering the ends of the wheel spindle and remove the spindle locknut from the brake side. Withdraw the spindle.

The wheel is now released and if lowered the brake assembly can be removed, and also the distance piece from the opposite side of the hub. The wheel can easily be removed if the machine is leaned to one side on the centre stand.



8

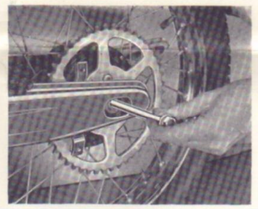
REAR WHEEL SPROCKET

The rear sprocket is attached to a flange on the wheel hub by four bolts fitted with washers and self-locking nuts. Should the sprocket have to be removed for any reason, note on reassembly that it should be fitted so that its recessed side mates with the flange on the hub. The small heads of the securing bolts must face outwards to clear the forks. New nuts must be used and tightened down diagonally, a small amount at a time.

REAR WHEEL BEARINGS

The construction of the rear hub is very similar to that of the front, except that the dust cap and felt washer are fitted on the brake side, and the opposite side has no seal.

The methods of removal and replacement of the bearings, and repacking of the hub with grease, are however the same as for the front.



9

REPLACEMENT OF REAR WHEEL

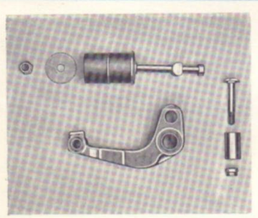
Place the rear wheel between the rear forks and locate the brake assembly in the hub. Fit the alloy distance piece to the chainwheel side. Locate the brakeplate anchor against the stud in the fork end and raise the whole assembly into position. Line up the spindle holes and insert the spindle from the chainwheel side. Refit the chain before tightening up the spindle locknut and check the tension. Adjust this if necessary by means of the cycle-type adjusters fitted at the rear of the forks, taking care to screw up the adjusters by equal amounts on either side, to preserve the alignment of the wheels. With the machine on its centre stand and the rear wheel off the ground, the total up and down movement of the chain should be 1½ in. to 1¾ in. measured at the centre of the chain run.

After tightening the spindle locknut fit the rubber plugs at the spindle ends and also the chainguard. Reconnect the rear brake and adjust as necessary.

10

REMOVAL OF FRONT SUSPENSION

With the front wheel removed, take out the small rubber plugs from the extreme front of the suspension housings, and the small buffers from the top of the housings. Dealing with each side in turn, unscrew the self-locking nut from the centre rod passing through the rubber springs and withdraw the rod. If it is tight it can be partly withdrawn by levering the link upwards, causing the rubbers to slide along it. As the rod is withdrawn the rubbers and distance washers will be released. Note their order for reassembly purposes. Next take out the pivot bolt and withdraw the link rearwards pivoting it upwards at the same time. Take care not to lose the swivel pin from the link or the distance tube, which can now be slipped out of the nylon bushes.

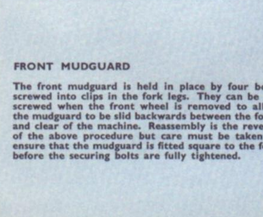


11

REASSEMBLY OF FRONT SUSPENSION

Replacement nylon bushes should be cemented in position by an impact type adhesive. Fill the annular space between the bushes with molybdenum disulphide grease and fit the distance tube.

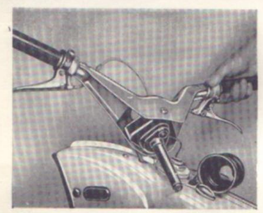
Lightly smear the swivel pin with grease and position it in its eye in the link, which can then be returned to the fork leg. Line up the pivot bolt holes and insert the bolt from the outside of the fork. Tighten the nut securely. Fit the centre rod, making sure that its head rests against the flat on the swivel pin. Assemble the rubber springs and fit the self-locking nut. The nut should be tightened until ⅛ in. of thread protudes behind it. Finally refit the small rubber plugs and buffers to the suspension housing.



12

FRONT MUDGUARD

The front mudguard is held in place by four bolts screwed into clips in the fork legs. They can be unscrewed when the front wheel is removed to allow the mudguard to be slid backwards between the forks and clear of the machine. Reassembly is the reverse of the above procedure but care must be taken to ensure that the mudguard is fitted square to the fork before the securing bolts are fully tightened.



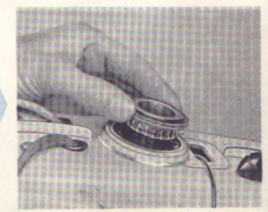
13

REMOVING HANDLEBARS

If the handlebars are to be removed completely from the machine the control cables must be disconnected. When a speedometer is fitted proceed as detailed in paragraph 6, after disconnecting the clutch, front brake and throttle cables by removing the levers and twist-grip from the handlebar. If no speedometer is fitted then it is only necessary to remove the "Pixie" badge disconnect the cables as previously mentioned, unscrew the bolt below the badge a few turns and give its head a sharp blow with hammer and punch.

This will release the handlebar stem when the complete assembly and the plastic gaiter can be removed.

Alternatively proceed as detailed in paragraph 6, then lay the bars on a piece of cloth spread over the frame without disconnecting the cables.

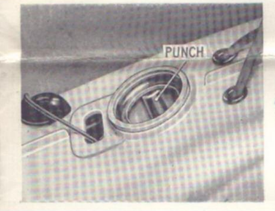


14

REMOVAL OF FRONT FORKS

After removing the handlebars and handlebar stem support the forks on a block of wood or similar item and remove the two nuts from the top of the steering column. Note that the top one is a locknut.

Remove the dust cap and lift off the top cone. The ball bearings from the upper race can now be extracted. If any fall into the head tube they can be retrieved at a later stage. The forks may now be lowered clear of the frame but as this operation is performed the balls will be released from the steering head lower race, and some provision should be made for catching them. The balls of the two races should if possible be kept separate and returned to their original races on assembly.



15

REPLACEMENT OF CUPS AND CONES

If the steering head bearings are incorrectly adjusted, pitting of the cups and cones, and excessive wear of the balls may take place. Should any of these symptoms be apparent all the components of the affected bearing must be replaced. New ball bearings should never be used with old.

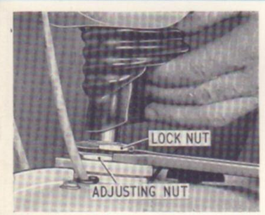
The upper bearing cone is removed when the fork is dismantled and lower one can be prised off its seating by a screwdriver or similar tool. The two bearing cups are press-fits in the head tube and can be extracted by the use of a hammer and suitable drift. New cups and the housings should be perfectly clean and care taken to ensure that the cups remain square to their housings and are driven fully home. Make sure that the lower cone also sits squarely on its seating on the fork.

16

REASSEMBLY OF FRONT FORK

Thoroughly clean the bearing races and balls and use clean grease to attach the twenty balls of the upper race to the cup in the head tube. Similarly attach the twenty balls of the lower race to the fork cone.

Carefully feed the steering head up into the head tube, keeping the forks pointing straight ahead. Support the forks in position and replace the upper cone followed by the dust cap and head race adjusting and locknuts.

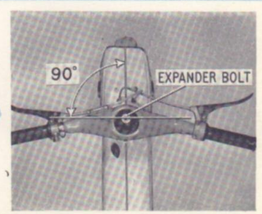


17

ADJUSTMENT OF STEERING HEAD BEARINGS

Slackness in the steering head bearings can be felt if the forks are raised clear of the ground and alternatively pushed backwards and pulled forwards. The play can be felt between the fork and the lower race cup in the frame.

If the handlebars are in position the head race adjusting nuts can be reached by pushing back the plastic gaiter around the handlebar stem. Slacken off the top locking nut and tighten the lower nut until the play disppears. Holding the lower nut in this position then retighten the top nut to lock the adjustment. The bearings should rotate freely in any position without tight or slack spots. These indicate wear in the bearings which should be checked.



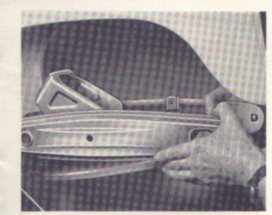
18

REPLACEMENT OF THE HANDLEBARS

Replacement of the handlebars is straightforward and is the reverse of the removal procedure.

The height of the handlebars is adjustable within the limit that the handlebar stem must protude at least 1½ in. into the steering head. To give this condition the lowest part of the handlebar pressing should not be more than 3 in. above the steering head race dust cap.

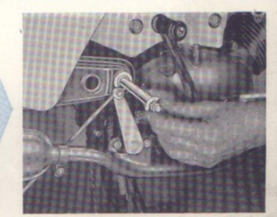
Tighten the handlebar centre bolt securely after setting the relative directions of the handlebar and front wheel.



19

REMOVAL OF REAR FORK

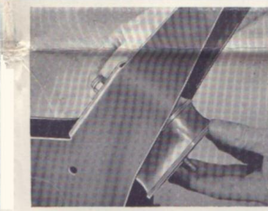
The rear fork can be removed from the machine without disturbing the engine plates. Remove the wheel as previously described and remove the self-locking nut and large washers from one end of the fork pivot pin. Drive out the pin using a suitable drift. Take off the nut and washer securing the rubber suspension unit to the fork and draw the fork rearwards clear of the engine plates. The liners can be taken out of the nylon bushes and the bearings examined for wear.



20

REPLACEMENT OF REAR FORK

Replacement nylon bushes should be secured in place in the fork by an impact adhesive. On assembly the bushes and liners should be lubricated with molybdenum disulphide grease. Position the fork over the engine plates and insert the liners into the bushes. Line up the holes in the liners with those in the plates and insert the pivot pin. Tighten the pivot pin nuts securely. Finally reconnect the suspension unit to the fork and replace the wheel.

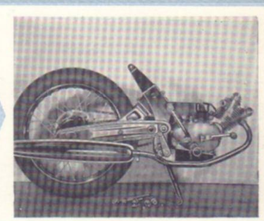


21

REAR SUSPENSION UNIT

To gain access to the nut securing the unit to the engine plate mounting, it is necessary either to remove the petrol tank, or separate the frame from the engine plate assembly. Since removal of the tank means draining it, the latter operation is considered to be the quickest.

It is also necessary to remove the swinging arm pivot so that the arm can be dropped slightly to enable the suspension unit to be taken away.



22

REMOVAL OF ENGINE PLATES

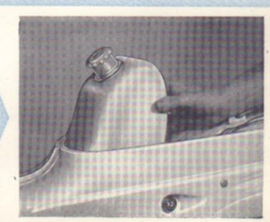
The engine plates complete with engine, rear fork, rear wheel, etc. can be removed from the frame as a unit. The plates are held to the frame by three studs, two situated above the engine and a third fitted with domed nuts behind and above the other two.

Disconnect the clutch cable and lighting leads from the engine and pull the carburettor off its stud. Support the frame in position and withdraw the securing studs. Note that as the rearmost stud is removed, two distance pieces will be released from inside the mudguard and also the centre distance piece if the petrol tank mounting bracket bolts are not in place. The frame can now be lifted clear of the engine plate assembly which will be left supported by the rear wheel and centre stand.

23

REPLACEMENT OF ENGINE PLATES

Lower the frame over the engine plate assembly until it is in approximately the correct position. Line up the two front stud holes in the frame with those in the plates, and insert the studs. Fit the rearmost stud, positioning the distance pieces as the stud is inserted. Replace the large washers and domed nuts on the rearmost stud, and the smaller washers and plain nuts on the others. Tighten the nuts securely. Finally reconnect the clutch and throttle cables, the lighting leads and the petrol pipe.



24

PETROL TANK

The petrol tank is rubber mounted in the frame at three points. Before attempting to remove the tank it should first be drained of petrol and the feed pipe pulled off its stub. Remove the two bolts holding the tank to its rear support plate under the seat, and the two nuts and bolts holding the plate to the frame. Remove the plate and the remaining tank securing bolt. The tank can now be lifted upwards out of the frame.

Refitting the tank is the reverse of the removal procedure. The securing bolts can be fully tightened as they are fitted with shoulders to prevent the complete compression of the rubber sleeves.

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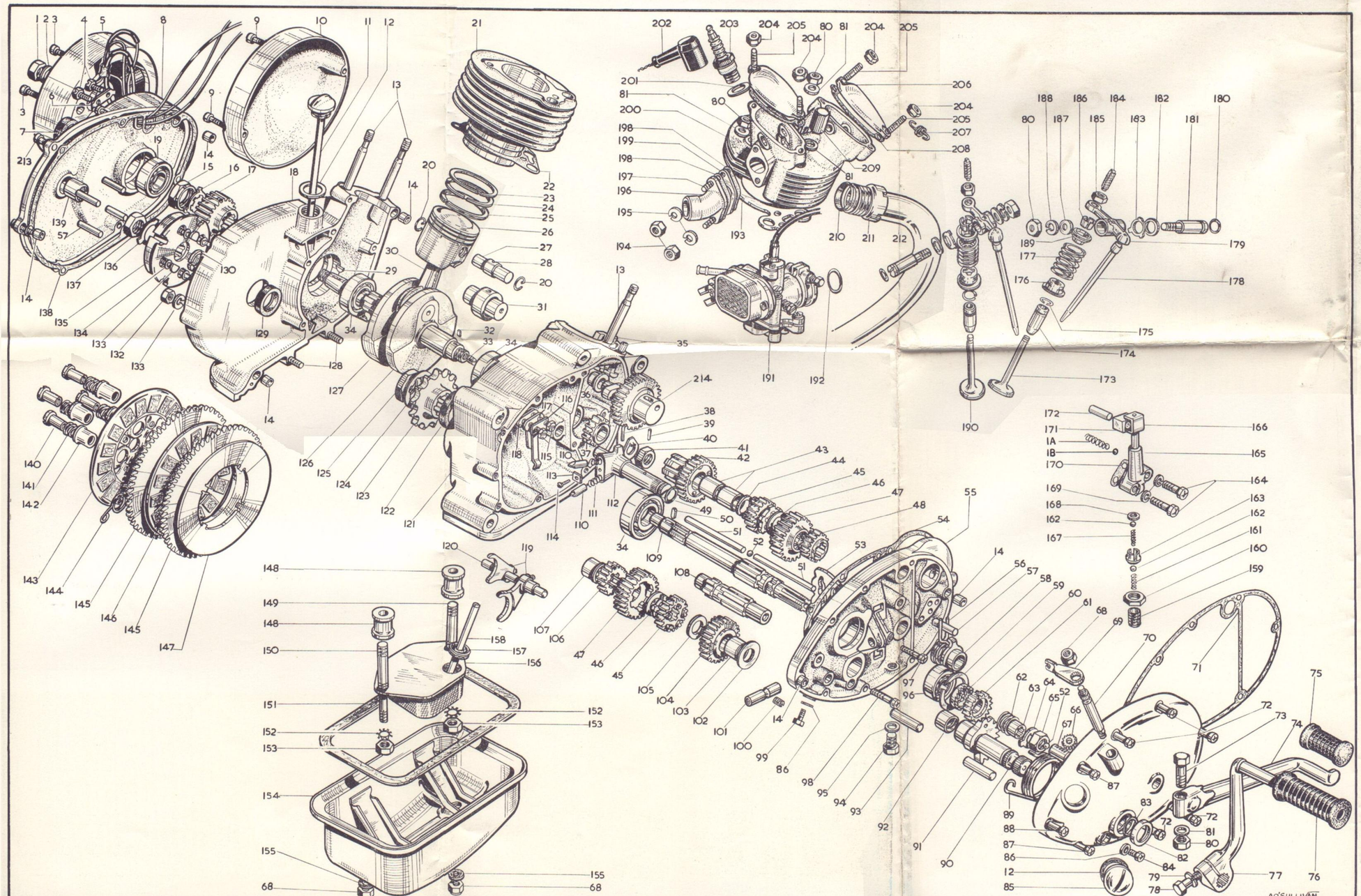

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21	1 49 53-0020 (75 c.c.)	91	1 06 53-3031	164	1 03 40-0436
	2 49 53-0251 (50 c.c.)	92	1 10 53-3085	165	1 22 53-0225
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24	1 12 53-0122 (75 c.c.)	96	1 34 90-5525	169	4 01 29-3319
	1 12 53-0186 (50 c.c.)	97	1 02 53-0060	170	1 01 53-0228
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41	1 08 42-4717	117	1 10 53-3046	190	1 25 53-0219
42	1 40 53-3013	118	1 05 53-3047	191	19-7079 (50 c.c.)
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44	1 12 53-3098	120	1 09 53-3055	192	19-4408
45	1 35 53-3017	*121	53-0009	193	1 06 53-0178 (75 c.c.)
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48	1 26 53-3018		1 33 53-3024 (75 c.c.)	195	4 01 02-1462
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52	4 01 40-3071	127	1 44 53-0086 (50 c.c.)	198	1 01 53-0169
53	1 24 53-3095		1 44 53-0083 (75 c.c.)	199	1 06 53-0198
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67	1 13 53-3143	141	1 08 53-3252		1 42 46-1401 (50 c.c.)
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Printed in England, January 1964

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