

JAWA 05 SCOOTER

Concessionaire: *Industria (London) Ltd., 248*

Holloway Road, London, N.7.

USEFUL DATA

Engine: single cylinder, two-stroke with alloy cylinder and cast iron liner. Bore, 38mm. Stroke, 44mm. Capacity, 49.9cc. Standard cylinder diameter, A, 38.00 + 0.006mm. B, 38.006 + 0.005mm. C, 38.001 + 0.005mm.

Compression ratio: 7.5 to 1.

Piston: three rings pegged. Standard piston diameter, A, 37.94mm. B, 37.95mm. C, 37.96mm. All plus and minus 0.01mm. Ring gap, 0.2mm (0.008in).

Ignition: AC generator with permanent magnet mounted on the crankshaft. Contact breaker gap, 0.4mm (0.016in). Ignition point, 2.7 (7/64in) to 3mm (3/16in) before top dead centre.

Bearings: ball bearings for crankshaft and gearbox mainshaft, plain bushes for layshaft. Dimensions: crankshaft bearings, 6302. Gearbox mainshaft bearings, 6004/6202.

Sparking plug: PAL 14-7 RZ.

Carburettor: Jikov 2915 PS. Main jet, 60. Idling jet, 38 or 40. Choke diameter, 15mm.

Gearbox: three speed with foot change and kick starter. Gear ratios: 1st, 28.99 to 1; 2nd, 15.21 to 1; top, 10.28 to 1.

Clutch: two plate running in oil.

Chains: primary drive, 3/8in by 3/16in, 44 links. Final drive, 12.7mm by 5.21mm. 109 plus 1 links.

Brakes: drum diameter, both wheels, 125mm (4.92in). Width of linings, 20mm (.787in).

Tyre sizes: 2.75in by 16in front and rear.

Suspension: telescopic front fork, travel, 3.54in. Swinging arm rear, travel, 3.346in.

Fuel tank: capacity, 1.21 gallons.

Headlamp: two-filament bulb, 6V/15/15W. Rear stop lamp, 6V/6W/18W.

ENGINE MAINTENANCE

Removal of engine from frame: lift up the seat and take out the three screws from the hinge, remove the seat. Unlock the lock at the base of the front cover, pull up the cover from the rear of the lock until the hook at the top in the front is disengaged; lift the cover away. Unscrew the two nuts on the top of the main body where the seat was supported, two on either side at the base of the main body (or rear cover as it is sometimes called) attaching it to the footboards and the single screw attaching the front of the cover to the frame. Disconnect the rear light lead at the bakelite terminal block above the engine, lift the cover clear. Remove six screws from the footboards, they have nuts and spring washers, take out the three screws from the right hand engine cover which encloses the clutch. The cover will hang down on the end of the clutch cable which may, of course, be disconnected if desired.

Disconnect the leads to the generator, part the driving chain, remove the air cleaner, take off the top of the carburettor and tie the cable and throttle slide and needle out of the way. Detach the exhaust pipe at the cylinder flange, undo the nuts, withdraw the four engine mounting bolts and ease the engine from its position.

Much of the work which will now be described, dealing with the engine, may, of course, be done without having to remove the unit from the frame. Such items as decarbonising, piston servicing, ignition timing and contact point adjustment, clutch dismantling and even the changing of oil seals may all be tackled with the engine in position.

Dismantling the engine: There is a very useful tool available, No. P1 which may be used for holding the engine while dismantling is being done; it is a great time saver and eliminates a lot of awkward lifting.

Remove the nuts and washers holding down the carburettor air intake to the cylinder, withdraw the carburettor assembly together with the gasket below the flange. If preferred, the carburettor may be removed before taking the engine from the frame though it is not quite so accessible. Detach the sparking plug lead and the plug and take off the four nuts and washers securing the cylinder head. Slide off the head from the four long studs and follow it with the cylinder barrel. There is no cylinder head gasket, but a gasket is used at the cylinder base. Remove the circlips and, using tool No. N7, press out the gudgeon pin from the piston. Some models have needle roller bearings in the small ends with a washer on either side of the connecting rod; others have a plain bush. Obviously, care must be taken when removing the piston to ensure that the needle rollers and washers, if fitted, are not lost.

Now remove the six screws and the long bolt at the rear, holding the left hand engine or clutch cover in position. During this operation, with tool No. P1 in use, the engine will be on its side with the clutch cover uppermost. The case will have a considerable quantity of oil in it so have a tray below the engine so that the holding tool may be swivelled over, carrying the engine with it emptying the oil out of the case. This is quicker than draining the oil through the drain hole provided. Note that the clutch cover has a paper gasket.

Compress the clutch springs by means of tool No. N62 having five holes. With a screwdriver, prise the circlips retaining the springs from their grooves and note that beneath the circlips are washers which must be preserved for re-use when assembling. Lift the clutch pressure plate and straighten the tab of the lock washer beneath the central nut. Prevent the clutch from rotating by holding it with tool No. N51 placed between the driving and driven sprocket teeth, remove the central nut beneath which is a spring washer; lever the complete clutch from the splines (or use extractor N9) and the clutch will come away bringing with it the chain which may be slipped off the engine shaft sprocket. Release the nut and spring washer from the engine sprocket and withdraw the latter by means of extractor N9.

Take out the six crankcase screws from inside the clutch housing, they are all of the same size. Three shorter ones from the outside of the housing must be removed and two more medium length ones from the front of the case by the cylinder orifice. Remove, too, the stop screw which passes through the gear change mechanism into the left hand half of

the crankcase. Fit extractor tool N3 to the crankcase making sure that the two hand screws are directly above the engine and gearbox mainshafts. Anchor the tool firmly and screw down alternately on the hand screws so pressing down on the shafts and separating the crankcase halves. Release the remaining screw holding the gear change mechanism, withdraw the guide rod from the selector fork, and the selector fork together with all gears, gearbox mainshaft and layshaft may be taken out. Should it be desired to dismantle the gear change mechanism, remove the circlip from the end of the pivot pin and the components will separate.

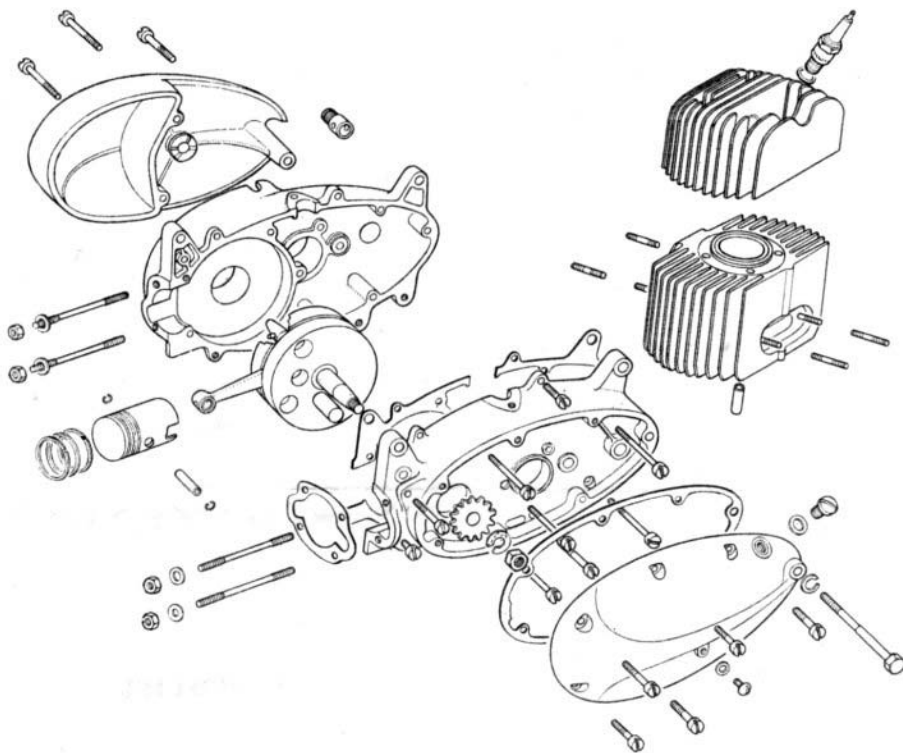
Turn the engine over and take out the two screws holding the stator of the generator in place, lift the stator clear. Remove the central screw, lift away the cam and, with tool N44 or with any fairly long 8mm screw screwed into the central screw hole, pull the rotor from the engine shaft. Place the rotor in the stator to guard against demagnetisation. Knock back the tab of the lock washer below the nut holding the final drive sprocket to the driving gear with hub. Remove the nut and with a flat washer on the end of the hub to avoid damage to the latter, extract the sprocket from the splines with tool N9. There is a spacer and a plug and seal through which the clutch operating rod passes, do not damage these parts. The driving gear with its hub may now be removed from the gearbox.

Tools F1 or N4 may be used for pressing the crankshaft from the right hand half of the case. On removing the kick starter lever, the shaft and spring may be withdrawn.

By pressing out the crank pin the crankshaft may be parted in order to renew the big end bearing, but unless the necessary equipment is available for the matching of the various parts and for the final truing-up of the assembled crankshaft, it will be advisable to fit a complete replacement crankshaft and connecting rod assembly.

There is an extractor, N12 which may be used for the removal of the oil seals from the crankcase. They may be removed and replaced without these aids, but care must be exercised when inserting the new seals, which should be immersed in oil before fitting, to see that they are driven into their housings squarely and are flush all round with the outer face of the crankcase.

Removal of the bearings may be made easier if the crankcase halves are heated to a temperature of approximately 176°F. If tool N16 is not available for withdrawing the bearings, they may be driven out carefully with a suitable drift. First remove the circlip and then press out the bearing from the circlip groove side; do not drift the bearing across the groove. Should the gearbox layshaft bushes be badly worn, they may be driven out with a drift having the same diameter as the outside diameter of the bushes. After fitting, new bushes should be reamed to 11mm diameter, plus 0.0027mm, minus 0.0000mm. Having fitted the new bushes, the ball bearings may be replaced. Heat the case as already mentioned, put in the circlips and press the bearings up to them. Follow them with the oil seals as mentioned above.



Jawa 05 two-stroke air-cooled engine with inverted scavenging

REBUILDING THE ENGINE

Assembling the engine: Mount the right hand half of the crankcase on the assembly stand P1 and assemble the driving gear with hub and final drive sprocket; put on the lock washer, tighten the nut and bend over a tab of the lock washer. Put in the crankshaft by inserting the shaft which carries the generator rotor through the bearing. Put into position the gear change mechanism so that the extending arm rests in the recess formed for it in one of the screw bosses in the crankcase. Engage neutral position, that is with the plunger in the second notch of the quadrant, secure the gear change mechanism to the case by means of the fixing screw.

Put in the layshaft and add to it the second gear. Place the selector fork in the groove around the layshaft second gear and put in the second gear on the mainshaft with the pegs towards the holes in the driving gear and the fork engaging the groove. Insert the mainshaft into second gear until the splines are properly engaged. Slide the first gear (which carries also the kick starter gear) on to the layshaft and follow it with the thrust washer. Insert the guide rod through the selector fork so that the end of the rod having the reduced diameter points towards the left hand side of the engine. Put on a new crankcase gasket, assemble the kick starter quadrant and spring on to the shaft if they have been dismantled, insert the shaft into its housing with the end of the spring engaging the hole in the crankcase, put on the kick starter lever and turn the shaft against the spring as far as it will go. Hold this position and replace the left hand half of the crankcase; when it is home, test the kick starter to make sure the quadrant comes up against the stop when the lever is released. Insert all the crankcase screws, then put in the one which anchors the gear change mechanism to the case.

Clutch: On to the clutch back plate put one of the two cork insert plates which also form the clutch sprocket. Follow this with a steel plate then the other cork insert plate. Put the chain over the clutch and engine shaft sprockets and place both sprockets over their respective shafts. The engine shaft sprocket is fixed by a spring washer and nut and the clutch securing nut has a tab washer. By any convenient means, jam the drive sprocket on the other side of the engine to prevent rotation while the clutch nut is being tightened. A tube spanner placed between the sprocket teeth of the clutch and engine shaft sprockets will prevent rotation while the engine shaft sprocket is tightened. Do not forget to bend over the tab of the lock washer on the clutch nut. Put on the pressure plate, insert the spring cups and springs and

put the washers over the ends of the clutch studs. Depress the clutch springs and insert the retaining circlips into the grooves at the ends of the studs. Put on a new gasket and replace the clutch cover.

Turn the engine over, put the locating peg for the generator rotor in its hole in the engine shaft and, carefully, slide on the rotor. Make sure, if a new peg is being fitted, that it is not too long to prevent the rotor from being true on the shaft. Replace the cam and fix it with the central screw. Put on the stator complete with the back plate, condenser and contact breaker and secure it to the crankcase by means of the two flat clamps and screws. Ignition timing and the setting of the contact breaker are dealt with later.

Replace the piston if it has been removed. Carbon will have been cleared from the crown and ring grooves and the old rings may be replaced provided that they show no signs of undue wear and that the piston reveals no marks of compression leakage. The piston ring gap should not exceed 0.8mm and the gap in a new ring should be 0.2mm. Measure it by placing the ring squarely in the cylinder bore, pushing it into the cylinder with the base of the piston, test the gap with a feeler gauge. There will be no difficulty in fitting new rings, but the risk of breakage is eliminated by the use of special tool N49 which is a tapered sleeve over which the rings are guided into their grooves. If the small end of the connecting rod has needle rollers, hold the needles in the rod with grease, place the washers on either side of the small end and, using tool N7, press in the gudgeon pin carefully after having heated the piston to a temperature of 176°F. Fit the circlips to retain the gudgeon pin.

Use a new cylinder base gasket, slide on the cylinder, making sure that the piston rings are positioned correctly with the gaps at the pegs in the piston. Fit the cylinder head, replace the nuts and washers.

Ignition timing: With the piston at top dead centre, the contact points should be fully open at 0.4mm (0.016in). To adjust the points, if necessary, slacken the screw retaining the plate carrying the fixed contact and move the plate until the desired gap is obtained with the cam holding the point at its highest position; retighten the screw. Move the engine anti-clockwise until the piston is 2.7 to 3.0mm (7/64in) before T.D.C. In this position the points should be just breaking.

To time the ignition, slacken the two clamp screws which secure the stator and turn the latter anti-clockwise to advance the ignition or clockwise to retard it. When the clamp screws have been retightened, check the ignition advance point and the gap at the points. It will be noticed that the contact breaker is carried on a back plate which is held to the stator by two screws passing through slots in the

back plate. On no account should these be interfered with, but should they be removed inadvertently, and the back plate disturbed, it must be returned at once to its original position which is denoted by scribed marks across the plate and the stator; line these marks up and retighten the screws. If it becomes necessary to dismantle the contact breaker in order to renew the points or, say, the spring, take careful note of the positions of the small spring washers, plain washers and insulating pieces so that they may be assembled in the correct order.

CARBURETTER

This is held by two screws to the induction stub and there is a gasket at the flange. The top cap carries a cable adjuster of the normal type and unscrewing the cap releases the throttle slide, spring and needle. The position of the needle during the running-in period is in the third groove from the top and after running-in it can be put back to the second groove from the top. Screwed into the right hand side of the carburetter are the main jet, farthest from the engine, the pilot or idling jet nearest to the engine and between them the spring-loaded throttle stop screw. The float chamber lid which contains the float needle seating and tickler, is held on by two screws; there is no gasket for the lid. Fitted to the air intake is the air cleaner and silencer held by one screw and a locknut. The cleaning element is reached by removing the clamp and rubber ring when the end cover is freed.

SILENCER

By removing the nut from the central rod protruding through the end piece, the latter may be withdrawn and the baffle pulled clear of the silencer body. It should be cleared of any carbon and also, the welded-in baffle should be similarly treated.

WHEELS

Removal of front wheel: take off the nut and washer from the wheel spindle and withdraw the spindle. Ease the back plate pin from its anchorage, tip the machine on its side slightly and withdraw the wheel. As it comes away, it will separate itself from the brake back plate which, complete with shoes will hang down on the end of the cable. The cable passes through the rim of the back plate and is attached to the operating lever behind the shoes, the lever being in one piece with the brake cam. It has a return spring in addition to the two return springs for the shoes.

Rear wheel: undo the spindle nut and knock out the spindle. Free the cable from the clip on the swinging arm, release the brake anchor fork, pull the wheel off the drive pegs on the chain wheel, remove the wheel leaving the back plate and shoes on the cable as in the case of the front wheel.

Wheel bearings: remove the dished metal cover which is held by three countersunk screws to the wheel hub. Prise out the oil seals from either side of the hub and, from the brake side, remove the Seeger circlip. Extract the bearings with tool N16 and remove the spacer between the bearings. Both the hubs are to be dealt with in the same way. When rebuilding, put in the left hand bearing and circlip, follow it with the oil seal, pack the hub with grease, put in the spacer, the right hand bearing and oil seal and replace the cover plate.

Rear sprocket: with wheel removal, this has been left at the end of the swinging arm and it may be removed by disconnecting the speedometer drive cable and taking off the large hexagon nut outside the swinging arm. Now remove the speedometer drive which comprises the speedometer gearbox with the worm and bush in the lower part of the housing and the gear and oil seal in the main body; these are readily accessible in the event of their requiring attention. Tap the sprocket hub from the bearing and remove the latter, withdraw the oil seal, take out the circlip and with tool N16 extract the bearing away from the circlip groove, not over it. At the back of the sprocket are three rubber blocks to absorb transmission shocks and they should be renewed if their condition has deteriorated. Although it may be easier to fit a new chain wheel complete when the sprocket teeth are worn, the six rivets retaining the sprocket ring may be driven out and a new ring riveted in its place.

STEERING HEAD AND FORKS

Work on these items is facilitated by first removing the headlamp and its cowl—see a later paragraph. The steering head is mounted in the normal way in cup and cone ball bearings, the upper cup being beneath the top steering lug or crown which is in the form of a flat, triangular plate with three holes. Above this lug are an adjusting nut and locknut for taking up bearing play. The arms of this top lug accommodate the upper ends of the fork legs which are secured to it by a screwed ring which carries the scroll or quick screw to which the upper end of the fork spring is screwed. The arms of the lower steering lug embrace the fork legs and are clamped to them by clamp screws, washers and nuts. To remove the fork legs from the steering lugs, slacken or remove the clamp screws, remove the upper screwed rings, remove the front mudguard and withdraw the fork legs; it is assumed that the wheel has already been removed. To dismantle one of the fork plungers and gain access to the spring, there is no need to remove the legs from the steering head lugs. Simply unclamp the gaiter from the bottom plunger and turn the plunger anti-clockwise until the spring is unscrewed from the top scroll. Assemble the parts in the reverse order after having greased them thoroughly.

REAR SUSPENSION

With the saddle, front and rear covers out of the way, each spring unit is detached by removing the top and bottom pivot bolts securing the shock absorbers to the frame and the swinging arm. To dismantle the shock absorber, the top cover of it must be pressed down away from the top pivot which is screwed to the central rod, far enough to permit the removal of the locking peg from the pivot and to get a spanner on to the flats formed on the upper end of the central rod.

A rather elaborate special tool is available which is a combination of tools N11, N16 and N10. These can be arranged together to compress the spring so that the peg can be removed and, with the spanner on the rod to stop it turning, the top pivot can be unscrewed from the rod. This will free the top cover, spring, rubber buffer below it and the bottom cover. From the lower cylinder of the shock absorber unscrew the internal parts and withdraw them; empty any oil from the lower cylinder. Undo the bottom nut from the central rod thus releasing the plunger with its sleeve, washer and stop. Push out the two small pins which secure the top clamping screw in the long sealing bush over the central rod, pull out the clamping screw. Below the clamping screw is a small spring and in the lower part of the sealing bush is a buffer. Above the clamping screw is a nylon ring or two rubber rings. If there is any leakage, the nylon or the rubber rings should be replaced with new ones when rebuilding. Heat the nylon ring in oil at a temperature of approximately 300°F. The top and bottom pivots have rubber inserts with inner steel liners.

Rebuilding is straightforward but before fitting the plunger assembly into the lower cylinder, do not forget to replenish the latter with 30cc of damper oil.

Two people can dismantle the shock absorber without the aid of special tools, one to grasp the top cover and depress the spring by pressing downwards with the lower cylinder resting on the bench while the other applies the spanner to the central rod and removes the top pivot.

Except in the case of accident, it is unlikely that the swinging arm will need to be dismantled. Everything must be removed from the frame as a press will be needed to press the hinge pin out of the bushes. A press will have to be used also to press out the inner bushes from the rubber sleeves. In order to assemble the bushes, put the rubber sleeve in the eye of the swinging arm. Make a lead pin which will socket into the metal bush and which, from an outside diameter equal to the outside diameter of the bush, tapers to a point like a bullet. Fit this lead pin into the bush, smear the bush with liquid cement, push the point of the lead pin fitted in the bush into the rubber sleeve and press the bush into the rubber in the eye of the swinging arm. During this process, the eye of the swinging arm should be supported on a bed which will prevent the rubber sleeve from being pushed out of the eye, but which has a hole in it large enough to permit the passage of the lead pin.

When both bushes are fitted, press in the hinge pin passing it through the bushes and the ends of the two tie rods which slope up to the rear part of the frame and are secured by sleeve nuts.

REMOVING HANDLEBARS

Remove the front frame cover as described under "Removal of engine . . ." Take off the right hand crankcase cover and disconnect the throttle control cable at the carburetter end. This is done by unscrewing the carburetter top, pulling out the throttle slide and slipping the cable nipple from the slide while compressing the spring. Disconnect the front brake and clutch cables from the handlebar levers, undo the screw below the headlamp rim, tilt the headlamp upwards and remove it. Disconnect the speedometer drive cable from the speedometer head. There is a red lead from the choke coil which is fitted to the inner side of the headlamp cowl, this will have to be unsoldered. Unscrew the two screws holding the dip switch to the cowl and disconnect the leads from the electric horn. Unscrew the hexagon-headed spindle on top of the handlebar clip and when it has been raised a few turns, tap it downwards to release the expander cone within the handlebar stem; lift and twist the bars to and fro to free them from the steering stem, bringing leads and cables with them. Take out the two screws which fix the cowling and lift it clear.

In replacing, thread the leads and cables through their grommets, insert the handlebar stem to the required height, tighten the spindle making sure it screws well into the expander cone. Refit the lamp cowl to the front fork, connect the speedometer, clutch and brake cables, re-solder the red lead to the choke coil, connect the green leads to the horn and the blue ones to the headlamp, refit the dip switch and the headlamp parts, connect the carburetter cable and put back the engine cover with the three screws.

After such work as this it may be necessary to reset the headlamp beam. Draw a horizontal line on a wall at the same height from the ground as the centre of the headlamp. With the headlamp front ten yards from and facing this line, the dipped beam should be from 4 to 6in below the line and the main beam not more than 2in above or 4in below the line, machine on level ground and rider seated. Set the beam by means of the screw on top of the lamp.

CABLES

Speedo drive: remove the front cover as was done when removing the handlebars; take out the headlamp from its cowl and unscrew the knurled nut from the speedometer head. Pull out the cable together with its rubber grommet towards the engine. Remove the cable clip from the right hand swinging arm; it may be necessary also to remove the chain guard. Unscrew the knurled nut from the speedometer gearbox at the rear wheel and the drive cable will be free. A broken inner cable of the flexible speedometer drive may be removed and replaced simply by removing the headlamp, releasing the knurled nuts at either end of the cable, withdrawing the inner wire and inserting a new one, well greased.

Throttle cable and twist grip: again remove the front cover and headlamp. Disconnect the throttle cable from the throttle slide in the carburetter as already described. Slacken the two screws securing the retention cap at the front of the twist grip and turn the grip until a screwdriver may be thrust into the hole in the twist grip to release the screw retaining the plug in the handlebar; withdraw the grip and the plug. Release the cable from the sliding member and from the retention cap.

To refit, thread the new cable through the handlebar and into the lamp cowl, fit the retention cap with the cable in the groove and attach the cable end to the sliding member which must be located in the groove in the handlebar. Thread the other end of the inner cable through the adjuster on the carburetter top and pull on the cable so that the sliding member in the twist grip comes up against the retention cap; fit the throttle slide and spring, replace the slide in the carburetter and screw on the top cap. Put on the twist grip and secure the handlebar plug by means of the screw through the hole in the grip, secure the retention cap with its rear screw and adjust the action of the twist grip as required by means of the front screw.

Clutch cable and adjustment: with front cover and headlamp removed, disconnect the cable at the handlebar end, remove the right hand engine cover — three screws — screw in the cable adjuster at this point and detach the cable from the lever which works within the engine cover. After replacing the cable, the clutch will need adjustment.

The clutch is operated by a quick thread screw having balls in the thread groove to maintain ease of movement. There is also a ball at the end of this screw which bears against the end of the clutch push rod which passes through the gearbox mainshaft. In the centre of the right hand engine cover is a screw with a locknut. Slacken the nut and the screw to increase free movement between the ball at the end of the operating screw and the clutch push rod. Screw the adjusting screw inwards to decrease the amount of play. Cable stretch resulting in too much play at the handlebar lever may be taken up by means of the cable adjuster below the engine cover.

Brake cables: the front brake cable is released at the handlebar in the same way as the clutch cable was removed. For the rear brake, release the cable by unscrewing the screw securing it to the footboard. In both instances the wheel will have to be removed in order to remove the brake back plate to gain access to the operating lever to which the cable is attached—see paragraph dealing with rear wheel maintenance.

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Wiring diagram

