

SERVICE CHARTS IN THIS GROUP COVER THE FOLLOWING

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SERVICE CHART

DECARBONISING AND SIMPLE SERVICE TASKS



250 STAR AND 350 STAR MODELS

250 Star	Model C15
350 Star Trials	Model C15T
250 Star Scrambles	Model C15S
250 Sports Star	Model C15SS
350 Star	Model B40

1 PREPARATION

It will facilitate this work if the dual seat and petrol tank are removed. Take off the seat which is attached to the frame by the top bolts of the rear suspension units and clipped to a cross tube at the front. Turn off the petrol tap and detach the petrol pipe by unscrewing the union nut. The tank is secured by a single bolt which passes through a rubber sleeve in the centre of the tank. Remove the rubber cap on the tank top, unscrew the nut, and withdraw the tank leaving the bolt in the frame. Disconnect the exhaust lifter cable (if fitted) and the engine steady bracket from the frame. Remove the rubber air cleaner connection and carburetter.

7 RE-SEATING VALVES

Using tool number 11465-9240 rotate the valve backwards and forwards maintaining a steady pressure, every few strokes lifting the valve from its seat and turning to a new position. Continue until the face shows a smooth surface all round with no dark spots. It is most important that valves are ground-in on their correct seats, for this reason both valves are marked, one 'IN' and the other 'EX'. After grinding remove all traces of compound from both valve face and seating, and smear the stems with clean engine oil. If the valve seats in the head require re-cutting, use Service Tools number 83661-3293 pilot, 85561-3300 cutter.

13 REPLACING THE HEAD

Replace the push rod tube in position alongside the cylinder barrel (250 c.c. models) apply a little grease to the lower ends of the push rods and place the rods in position on the tappets. Refit the rocker box to the cylinder head leaving off the inspection covers, and slacken off the rocker adjusting screws. Place the head in position over the studs, locate the outer push rod in the inlet rocker (rear) and the inner push rod on exhaust rocker (front). Screw on the four cylinder head nuts and washers and tighten down firmly and evenly. Check that the push rods are correctly fitted and replace the inspection covers and washers. Securely tighten the two nuts on the crankcase immediately below the cylinder base and check over the rocker box units.

19 REMOVAL OF PRIMARY CHAIN COVER

If for any reason, the generator, clutch or primary chain require attention, the outer half of the primary chaincase must be removed. First take off the footrest, which is fitted to a taper shaft and will require a sharp blow to free it after its fixing nut has been removed. This nut has a left-hand thread and unscrew by turning in a clockwise direction. Take out all the screws round the edge of the case, and place a receptacle below it to catch the oil which will be released following the slackening of the screws. If the brake pedal is depressed, the cover can then be withdrawn.

Model	Piston position before T.D.C.	
	Degrees	Inches
All C15 and B40	11.4 (F.R.)	1/16

F.R.—Fully Retarded

If the ignition setting is incorrect with the piston set as above, slacken the clip screw and rotate the contact breaker housing gently until the points are just about to open. Retighten the clip screw and re-check the adjustment.

2 REMOVING THE CYLINDER HEAD & VALVES

The exhaust pipe can be removed after the finned collar has been slackened, and the bolts securing the pipe to the frame released. Take off the oil feed pipe to the rocker spindles and remove the sparking plug. Remove the two 5/16-in. nuts holding the engine steady bracket to the rocker box, revolve the engine to set the piston at T.D.C. on the compression stroke, i.e. with both valves closed, and take off the four nuts (H) holding the cylinder head and barrel. With the rocker box in position on the head raise the head until it clears the fixing studs, rotate the whole assembly about the push rods to clear the frame tube, and lift off.

8 FITTING NEW GUIDES

When new guides are to be fitted, the old ones can be driven out with Service Tool number 83261-3265 from inside the combustion chamber and new ones fitted with the same punch from above. Before driving in the new guides on C15 models, make sure that the circlips are a good fit. Valve seats in the head must always be re-cut when new guides are fitted to ensure that the seat is concentric with the guide bore. **REMOVING THE CYLINDER BARREL** Slacken off the two nuts on the crankcase at the base of the cylinder and slide the cylinder off, steadying the piston as it emerges from the barrel. Cover the crankcase mouth with clean rag to prevent dust and grit falling in.

14 TAPPET ADJUSTMENT

Rotate the engine forward until the inlet valve is just closed and the push rod is free to rotate and set the exhaust valve clearance by screwing the adjuster pin B in or out, then retighten the locknut securely without moving the pin. Rotate the engine forward again until the exhaust valve clearance is just taken up but before the valve starts to open, and set the inlet valve clearance. Check both settings after the locknuts have been tightened to make sure that they have not altered. **Tappet Clearances**
C15 and B40 ... Inlet .008 in., Exhaust .010 in.
C15T and C15S ... Inlet .004 in., Exhaust .004 in.
Note—After engine numbers C15T-1251 and C15S-2112 tappet clearance is the same as models C15 and B40.

15 STEADY STAY

Replace the engine steady bracket over the two thin 5/16 in. nuts, screw on the thick 3/16 in. nuts and spring washers and tighten securely, re-connect the steady stay to the frame. Finally replace the tappet inspection covers, sparking plug, high-tension lead, carburetter, air cleaner connection, petrol tank, petrol pipe, dual seat and exhaust valve lifter cable (when fitted).

20 CLUTCH ADJUSTMENT

Provision is made for cable adjustment by a knurled adjuster at the handlebar end. This is for fine adjustment of the cable only. The main clutch adjustment consists of a screw pin (F) and locknut (G) mounted on the clutch pressure plate. These are accessible after removal of the inspection cover (H). Slacken off the handlebar adjuster and pressure plate screw locknut. Screw in the adjuster screw until all free motion has been taken up. (Do not use force). Slacken back half a turn and retighten the locknut. Re-adjust the cable.

3 ROCKER BOX

Take the push rods out of the tube and, on 250 c.c. remove the tube. There are sealing rings at each end, and if there has been any sign of leakage the seals should be replaced. Now take off the two thin nuts on the steady stay studs and the seven 1/4-in. nuts holding the rocker box to the head, unscrew the two circular inspection covers, remove the cover above the push rod tube by unscrewing the centre bolt, and lift the rocker box from the head. There should be no need to disturb the rockers unless it is known that they require attention. Carefully remove the head gasket.

9 PISTON RINGS

The gudgeon pin is located by means of wire circlips which must be removed with the tang of a file or similar tool. Warm the piston and withdraw the gudgeon pin, thus freeing the piston, and immediately after its removal mark the inside of the piston so that it may be reassembled in its original position. If inspection of the piston rings shows that they are stuck, prise them out very carefully, and clean them. Remove any carbon from the grooves and rings, but before replacing, check them in the cylinder for gap. If the gaps are excessive, new rings having gaps of between .009-in. and .013-in. when in position must be fitted.

16 CONTACT BREAKER

The contact breaker is exposed by removal of the cover after pressing aside the spring clip, or removing the centre screw, whichever type is fitted. The gap between the points when they are fully open should be .015 in. Rotate the engine slowly until the rocker is on the peak of the cam then check the gap at (B) with the aid of feeler gauges. If the gap is incorrect, slacken the screw (D) and move the plate until the adjustment is correct, then retighten the screw and re-check the adjustment. Do not allow oil or grease to find its way on to the contact breaker points which should always be clean and dry.

22 IGNITION TIMING C15T AND C15S

The two models are timed by a different method due to the "Energy Transfer" ignition system. This system is sensitive in operation and the following instructions should be strictly followed for the best results. Set the contact breaker gap to .015 in. Bring the piston to the top of the bore on the compression stroke. Rotate the engine backwards so that the piston descends about 1/4 in. before bringing the rotor into the position shown. This ensures the backlash is taken up in the gears. With the rotor in this position the contact breaker points should be just about to open. Check and if necessary correct by turning the contact breaker housing.

24 OIL CHANGING AND FILTERS

This should be done immediately after running, when the oil is warm. Disconnect the oil pipe union nut (A), at the base of the tank and collect the old oil in a suitable receptacle. **FILTERS** Remove the filters for cleaning when changing the oil. After releasing the oil pipe at (A), unscrew the hexagon plug (B), which carries the filter in the tank, and wash thoroughly in petrol. Refill with the correct grade of oil. The pump filter can be withdrawn after removing the crankcase cover plate, it should be thoroughly washed with petrol, dried and replaced. The oil pump is extremely reliable and should not be disturbed. It is held in position by three bolts, the two outer bolts hold the sections of the pump together.

4 REMOVING CARBON

It is not necessary or desirable to remove the cylinder barrel unless it is suspected that the piston or its rings are the cause of some trouble. Scrape all carbon from cylinder head and ports and from the top of the piston, finally polishing with fine emery cloth. Take care not to damage the valve seats. Remove all traces of loose carbon and dust. Rotate the engine so that the piston descends to allow removal of dust from the upper cylinder walls.

10 BIG-END BEARING

At this stage it is advisable to check the big-end bearing for wear. Turn the engine until the piston is at the top of its stroke, and resting one hand on the side of the crankcase mouth, hold the connecting rod between fingers and thumb, and feel for up and down play. It should be remembered that, even though there may be a little play present it will not necessarily mean sudden failure of the bearing, though it will inevitably become worse. Where play seems excessive, and big-end noise has been noticed with the engine running, the engine should be completely dismantled, and a new big-end assembly fitted.

11 ASSEMBLY AFTER DECARBONISING

Replace the valves and springs in the cylinder head, making sure that the valves are assembled on the seats from which they were removed, and take care to see that the split collars are seated correctly in their grooves in the valve stems — a dab of grease on the stem will assist this operation. Pour a little oil into the crankcase, and smear the cylinder walls liberally with oil. See that the cylinder base washer is in good condition — if damaged, replace, otherwise oil leaks will develop. Turn the engine until the crankshaft is a little past bottom dead centre.

17 ADVANCE AND RETARD MECHANISM

The timing is automatically advanced and retarded by means of a governor mechanism below the contact breaker. Therefore, when the engine is stationary the timing is fully retarded and this is the normal condition for checking the ignition timing. As the engine speed increases the ignition timing is steadily advanced until it is fully advanced at normal road speed. Inspect the mechanism and make sure that the weights move freely. Oil the bearing pins with a few drops of light oil. Do not over-lubricate. Whenever the ignition timing requires checking the contact breaker gap should be verified and, if necessary, re-adjusted. (Opening the points advances the timing, closing them retards the timing).

23 PRIMARY CHAIN

The unit construction of the engine and gearbox allows the use of fixed centres between clutch and engine sprockets, so that a pre-stretched endless chain of the duplex type is fitted. A spring link connection is not provided, and adjustment of the chain is usually unnecessary. The only maintenance required, is to ensure a satisfactory oil level in the chaincase. On machines fitted with a slipper type of primary chain adjuster there should be no play in the chain, but it must not be taut. The slipper can be adjusted when the two lower generator retaining nuts are slackened.

5 VALVE SPRINGS

Compress the valve springs with Service Tool 84061-3340 and remove the split cotters and springs. Take out the valves. After a period of several thousand miles, valve springs tend to lose their efficiency due to heat, and as their cost is relatively low, it is a good policy to renew them at this stage rather than dismantle specially for this purpose at a later date. The correct free length is inner 1 1/2-in., outer 2 1/32-in. for C15, C15T and B40, 1 1/2-in. and 1.670-in. respectively for the C15S.

18 IGNITION TIMING (C15 AND B40)

Remove the sparking plug from the cylinder head and insert a slim rod through the hole so that the piston position can be determined. Rotate the engine until it is at top dead centre on the compression stroke. At this point both valves will be closed; if they are not, rotate the engine through one revolution. The engine is most easily rotated by engaging top gear and turning the rear wheel. Keep the rod as vertical as possible. Rotate the engine backwards until the piston is in the position indicated in the Table, when the contact breaker points should be just about to open.

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6 GRINDING-IN VALVES

Valve grinding should only be carried out where the pitting is not deep. If deep pit marks are evident the valve should be refaced on a machine, as grinding-in would only cause wear of the seats and the valve may become pocketed. Clean all carbon off the valve and from the stem underneath the head, being careful not to damage the face or the portion of the stem which moves in the valve guide. Smear a small quantity of grinding compound — obtainable from any garage — over the valve face and return it to its seat.

12 REPLACING THE BARREL

Position the piston rings so that the gaps are at 120° to each other. Compress the rings with slipper number 81461-3482, apply a coating of clean engine oil to the cylinder bore and slide the barrel over the piston removing the compressor after the rings have entered the bore. Always cover the mouth of the crankcase with clean rag in case one of the rings is broken. If the compressor is not available, each ring must be compressed with the fingers, this increases the danger of breakage.

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