7 Carburettor: checking the settings

1 The various jet sizes, throttle valve cutaway and needle position are predetermined by the manufacturer and should not require modification. Check with the specifications list at the beginning of this Chapter if there is any doubt about the types fitted. If a change appears necessary it can often be attributed to a developing engine fault unconnected with the carburettor. Although carburettors do wear in service, this process occurs slowly over an extended length of time and hence wear of the carburettor is unlikely to cause sudden or extreme malfunction. If a fault does occur check first other main systems, in which a fault may give similar symptoms, before proceeding with carburettor examination or modification.
2 Where non-standard items, such as exhaust systems or air filters, have been fitted to a machine, some alterations to carburation may be required. Arriving at the correct settings often requires trial and error, a method which demands skill borne of previous experience. In many cases the manufacturer of the non-standard equipment will be able to advise on correct carburation changes.
3 As a rough guide, up to $\frac{1}{8}$ throttle is controlled by the pilot jet, $\frac{1}{8}$ to $\frac{1}{4}$ by the throttle valve cutaway, $\frac{1}{4}$ to $\frac{3}{4}$ throttle by the needle position and from $\frac{3}{4}$ to full by the size of the main jet. These are only approximate divisions, which are by no means clear cut. There is a certain amount of overlap between the various stages.
4 If alterations to the carburation must be made, always err on the side of a slightly rich mixture. A weak mixture will cause the engine to overheat which, particularly on two-stroke engines, may cause engine seizure. Reference to the chapter on the ignition system will show how, after some experience has been gained, the condition of the spark plug electrodes can be interpreted as a reliable guide to mixture strength.

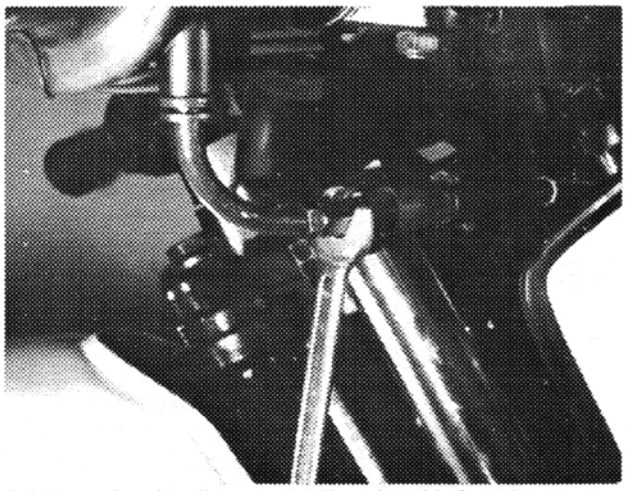
7.1 Check carefully before altering carburettor settings from specification

8 Carburettor: adjustment

1 Before any dismantling or adjustment is undertaken, eliminate all other possible causes of running problems, checking in particular the spark plug, ignition timing, air cleaner and the exhaust. Checking and cleaning these items as appropriate will often resolve a mysterious flat spot or misfire.
2 The first step in carburettor adjustment is to ensure that the jet sizes, needle position and float height are correct, which will require the removal and dismantling of the carburettors as described in Sections 5 and 6 of this Chapter.
3 If the carburettor has been removed for the purpose of checking jet sizes, the float level should be measured at the same time. It is unlikely that once this is set up correctly there will be a significant amount of variation, unless the float needle or seat have worn. These should be checked and renewed, if necessary, as described in Section 6.
4 Remove the float bowl from the carburettor body, if this has not already been done, and very carefully peel away the float chamber gasket. Check that the gasket surface of the carburettor body is clean and smooth once the gasket is removed. Hold the carburettor body so that the venturi is now vertical with the air filter side upwards and the floats are hanging from their pivot pin. Carefully tilt the carburettor to an angle of about 60 – 70° from the vertical so that the tang of the float pivot is resting firmly on the float needle and the float valve is therefore closed, but also so that the spring-loaded pin set in the float needle itself is not compressed. Measure the distance between the gasket face and the bottom of one float with an accurate ruler or a vernier caliper; the distance should be 21 mm (0.83 in). A tolerance of 1 mm (0.04 in) above or below the set figure is allowed, but the more accurate the setting is, the better the engine's performance, reliability and economy will be.
5 If adjustment is required, remove the float assembly and bend by a very small amount the small tang which acts on the float needle pin. Reassemble the float and measure the height again. Repeat the process until the measurement is correct, then check that the other float is exactly the same height as the first. Bend the pivot very carefully and gently if any difference is found between the heights of the two floats.
6 When the jet sizes have been checked and reset as necessary, reassemble the carburettor and refit it to the machine as described in Sections 5 and 6 of this Chapter.
7 Start the engine and allow it to warm up to normal operating temperature, preferably by taking the machine on a short journey. Stop the engine and screw the pilot mixture screw in until it seats lightly, then unscrew it by the number of turns shown in the Specifications Section for the particular model. Start the engine and set the machine to its specified idle speed by rotating the throttle stop screw as necessary. Note that on DT125 LC models the idle speed should be regarded as the slowest speed at which the engine will tick over smoothly and reliably. Try turning the pilot mixture screw inwards by about $\frac{1}{4}$ turn at a time, noting its effect on the idling speed, then repeat the process, this time turning the screw outwards.
8 The pilot mixture screw should be set in the position which gives the fastest consistent tickover. The tickover speed may be reduced further, if necessary, by unscrewing the throttle stop screw the required amount. Check that the engine does not falter and stop after the throttle twistgrip has been opened and closed a few times.
9 Throttle cable adjustment should be checked at regular intervals and after any work is done to the carburettor, oil pump or to the cable itself. The amount of free play specified for the throttle cable is 4 – 7 mm ($\frac{1}{8}$ – $\frac{1}{4}$ approx) measured at the inner flange of the twistgrip rubber. To measure this, use a piece of chalk or some paint to mark both the twistgrip rubber at its inner flange, and the twistgrip drum. These two marks will provide a convenient reference point for future adjustment. Carefully open the throttle by rotating the twistgrip rubber in the usual way until all the free play in the cable has been taken up. Measure the distance around the circumference of the drum between the static mark on the drum and the mark that has moved with the twistgrip rubber. If this distance is more or less than the specified amount the cable must be adjusted.
10 On RD125 LC models, check first that excessive play is not present in the lower throttle cable, between the junction box and the carburettor top. This is difficult to check as the adjusting nut is crimped on to the end of the cable at the carburettor top and the check must be made, therefore, at the junction box. Turn the adjusting nut as necessary so that all but the slightest trace of free play is eliminated from the lower throttle cable, and

then use the adjuster below the twistgrip to provide the correct amount of free play at the twistgrip itself. Fully open and close the throttle several times to settle the cables, then check that the adjustment has remained the same, resetting it if necessary. If correct, tighten the adjuster locknuts and slide the rubber sleeve back over the adjuster. Remember that on this model, any alteration made to the throttle cable will affect the adjustment of the oil pump cable. The oil pump cable setting must be checked, therefore, as described in the relevant part of Section 19 of this Chapter before the machine is used on the road.

11 On DT125 LC models the procedure for adjusting the throttle cable is slightly different. If the self-adjusting junction box is operating correctly, all free play will be eliminated automatically from the lower cables. Throttle cable adjustment is made, therefore, at the adjuster below the twistgrip. Rotate the adjuster as necessary to provide the correct amount of free play at the twistgrip itself, then fully open and close the throttle several times to settle the cables. Check that the adjustment has remained the same, resetting it if necessary. If correct, tighten the adjuster locknut and slide the rubber sleeve back over the adjuster. Note that while the adjustment of the throttle cable does not affect the oil pump cable on DT125 LC models, it is recommended that the opportunity be taken to check that the oil pump cable is operating correctly as described in the relevant part of Section 19 of this Chapter. If any fault is found the self-adjusting junction box must be checked as described in Section 20 of this Chapter.



8.8 Use twistgrip adjuster to set throttle cable free play

9 Reed valve induction system: mode of operation

1 Of the various systems of controlling the induction cycle of a two-stroke engine, Yamaha has chosen to adopt the reed valve, a device which permits precise control of the incoming mixture, allowing more favourable port timing to give improved torque and power outputs. The reed valve assembly comprises a wedge-shaped die-cast aluminium alloy valve case mounted in the inlet tract. The valve case has rectangular ports which are closed off by flexible stainless steel reeds. The reeds seal against a heat and oil resistant synthetic rubber gasket which is bonded to the valve case. A special shaped valve stopped, made from cold rolled stainless steel plate, controls the extent of movement of the valve reeds.

2 As the piston ascends in the cylinder, a partial vacuum is formed beneath the cylinder in the crankcase. This allows atmospheric pressure to force the valve open, and a fresh charge of petrol/air mixture flows past the valve and into the crankcase. As the pressure differential becomes equalised, the valves close, and the incoming charge is then trapped. The charge of mixture in the cylinder is by this time fully compressed, and ignition takes place driving the piston downwards. The descending piston eventually uncovers the exhaust port and the hot exhaust gases, still under a certain amount of pressure, are discharged into the exhaust system. At this stage the reed valve, in conjunction with the 7th, or auxiliary scavenging port, performs a secondary function; as the hot exhaust gases rush out of the exhaust port a momentary depression is created in the cylinder, this allows the valve to open once more, but this time the incoming mixture enters directly into the cylinder via the 7th port and completes the expulsion of the now inert burnt gasses. This ensures that the cylinder is filled with the maximum possible combustion mixture. The charge of combustion mixture which has been compressed in the crankcase is released into the cylinder via the transfer ports, and the piston again ascends to close the various ports and begin compression. The reed valves open once more as another partial vacuum is created in the crankcase, and the cycle of induction thus repeats.It will be noted that no direct mechanical operation of the valve takes place, the pressure differential being the sole controlling factor.

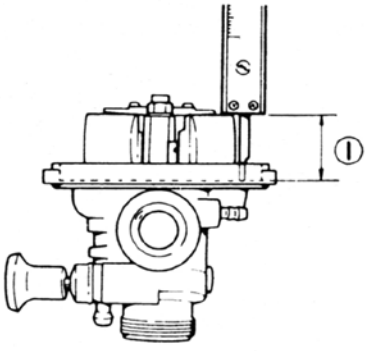


Fig. 3.4 Measuring the float height

1 21 ± 1.0 mm (0.83 ± 0.04 in)

10 Reed valves: removal, examination and renovation

1 The reed valve assembly is a precision component, and as such should not be dismantled unnecessarily. The valves are located in the inlet tract, covered by the carburettor flange.

2 Remove the carburettor as described in Section 5 of this Chapter thus exposing the four bolts retaining the inlet stub and the reed valve assembly to the cylinder. After removing these bolts, the assembly can be carefully lifted away.

3 The valves can now be washed in clean petrol to facilitate further examination. They should be handled with great care, and on no account dropped. The stainless steel reeds should be inspected for signs of cracking or fatigue, and if suspect, should be renewed. Remember that any part of the assembly which breaks off in service will almost certainly be drawn into the engine, causing extensive damage. Make a quick check of the state of the assembly by putting the carburettor side to the lips