

HOW TO TUNE.

First of all it must be understood that the bore of the carburetter (20) has been approved by the manufacturers of the engine as a suitable bore, and then it is for the individual rider to tune up for racing conditions and the fuel at his disposal, also it is understood that the fuel shall be straight petrol or of the petrol-benzol type. (If the carburetter is to be fed with alcohol fuels read special note on the subject). When tuning the carburetter it is assumed that the float chamber is working correctly and is not flooding, and what the rider has to do is to ensure a correct mixture at all throttle positions. There can be under these conditions only two faults in carburation—either the mixture is weak, or the mixture is rich, and it must be known at what throttle positions this richness or weakness is apparent. The symptoms of richness are :—

1. Sooty sparking plug.
2. Black smoke in the exhaust and tendency to eight stroke.
3. Running becomes much worse when the primary air valve is lowered, etc.

The symptoms of weakness are :—

1. Spitting in the carburetter.
2. Over-heating.
3. Engine pulls better if the primary air valve is lowered, etc.

It is to be noted that the mixture may be rich or weak at a certain throttle position but correct at another throttle position ; for example :—it might be correct at half throttle, but weak at full throttle, and so for the sake of facility in tuning we mention 4 phases of throttle opening as follows, and indicate in each phase how the mixture may be corrected.

If the throttle is almost closed as for idling, the mixture strength can be adjusted by the pilot screw (67) as seen in section C. Screw the knurled head anti-clockwise to richen the mixture, and clockwise to weaken it.

If the throttle is $\frac{1}{4}$ th to $\frac{1}{2}$ open, weakness can be cured by a smaller cut-away on the atmospheric side of the throttle (7), and richness cured by a larger cut-away. The numbers of the cut-aways are marked on the top of the throttle, a No. 6 cut-away giving a weaker mixture than a No. 5 cut-away.

The numbers in brackets in the text refer to index numbers on the section illustrations on page 2.

EXAMPLE OF CARBURETTER SETTINGS for petrol and petrol-benzol mixtures (approximate only).

| Engine Capacity per cylinder | Carb. Type | Choke Bore, inches | Choke Bore, m/m. | Main Jet | Throttle Valve Cut-away | Needle Position | Needle Jet |
|------------------------------|------------|---------------------|------------------|----------|-------------------------|-----------------|------------|
| 500 c.c. | 10 R.N. | 1 $\frac{3}{16}$ " | 30.16 | 600 | 6 | 4 | 109 |
| 350 c.c. | 10 R.N. | 1 $\frac{3}{32}$ " | 27.78 | 500 | 6 | 4 | 109 |
| 250 c.c. | 15 R.N. | 1 $\frac{15}{16}$ " | 23.81 | 300 | 5 | 4 | 109 |

ALCOHOL MIXTURES CANNOT BE USED WITH THIS TYPE OF R.N. CARBURETTER.

If alcohol mixtures have to be used, see T.T. carburetter list 374 series.
or G.P. " " 469 "

- 3 If the throttle is about half open, the setting of the needle (29) as seen in section B, can be adjusted in relation to the throttle. **Weakness of mixture may be cured by raising the needle in relation to the throttle position.** This is done by pressing out the spring (31) and lifting the needle one or two notches. The effect of this is to withdraw the taper needle slightly in the needle-jet (55), so offering less restriction to the flow of fuel. **Richness at approximately half throttle can be cured by lowering the needle.** The specification of needle position is counted from the top needle groove :— For example, if the needle position 4 is recommended the clip should be in the 4th groove from the top.
- 4 If the throttle is nearly wide open or wide open, it is very important to have the mixture rich enough at full throttle to avoid the engine overheating. The control of the mixture strength at this throttle position is by the main jet (50), which can be got at by removing cap (49). Each jet is numbered, and the bigger the number the bigger the jet. The jets are graded in tens. When selecting a suitable size main jet for speed at full throttle, the air control, as previously stated, must be wide open, but if it is found that with the air valve (58) nearly closed the engine runs better, it is an indication that the jet number should be 3 or 4 sizes larger.

SEQUENCE OF TUNING.

- 1st Determine the **main jet** size with the primary air valve wide open to obtain maximum power at full throttle.
- 2nd. Adjust the **pilot jet** to steady regular slow running.
- 3rd. Determine the correctness of the **throttle cut-away** by opening the throttle very slightly to see that it "takes off" from the pilot jet on to the main jet needle position.
- 4th. Determine the **needle position** in relation to the throttle opening at about half throttle.
- 5th. Run over the setting again to see that the 4 phases blend together, and make final adjustments, noting that once having determined the main jet size this should not be altered.