GP2 CARBURETTERS

THE CARBURETTER OF RECORDS AND SUCCESSES

FOR USE WITH ALL GRADES OF RACING FUELS.

GUARANTEE.—The Company take all possible reasonable care in the manufacture and the quality of their products. Purchasers are informed that, any part proved to be defective in manufacture or quality, and returned to the works within six months of its purchase new, will be replaced. The Company must respectfully point out however, that its responsibility and that of its agents, stockists and dealers, is limited to this Guarantee, and that they cannot, under any circumstances, be held responsible for any loss or for any contingent or resulting liability arising through any defect. These conditions of sale and will also apply when the Company's products form part of the original equipment of machines purchased new.

1,000/12/64. W.

AMAL LTD., HOLDFORD ROAD, WITTON, BIRMINGHAM 6, ENGLAND

Phone: Birmingham, Birchfields 4571.
(F.B.X. 6 lines)

Telegram: "AMALCARB, "PHONE, BIRMINGHAM.""
LIST No. 115/1

THE GRAND PRIX CARBURETTER

features

UNOBFECTED BORE

Because the metering needle does not pass through the choke of the Carburettor, the only restriction to flow through the Carburettor when the throttle valve is fully open, is a small one caused by the protrusion of the spray tube, and this is overcome by a slight swell in the choke at this point. A taper returns the bore to its nominal diameter on the engine side of the throttle valve.

SHORT MIXTURE TRACT

Although the needle does not obstruct the choke, it is positioned within the throttle valve diameter, and this results in a very short tract for the mixture to traverse from the needle jet to the choke. The benefit of this is felt in rapid and consistent acceleration throughout the range, and where megaphone exhausts are used an additional advantage is cleaner entry onto the megaphone at lower R.P.M. than with previous types of racing Carburettors.

PRIMARY AIR JET

The quantity of primary air that atomises the fuel issuing from the needle jet, is controlled by making it pass through a drilled bush. Its effect is that of a depression control for the main jet, and while the air jet as fitted by the factory with due regard to the bore size of the Carburettor would normally be left unaltered, it could be changed for one of different size for special purpose tuning. It may, therefore, be regarded as an additional tuning factor in exceptional circumstances.

FIVE TUNING FACTORS

The established Amal principles are followed by incorporating:

- Easily changeable main jet controlling the fuel supply at full throttle;
- Changeable needle and needle jet and adjustable needle position for control at smaller throttle openings;
- Changeable throttle valve of which the amount of cutaway controls the mixture at still smaller throttle openings;
- Pilot Air Adjusting Screw for controlling the mixture strength for idling. The fuel being supplied by a pilot jet.

By using these tuning factors in the proper sequence, it is possible to obtain clean and consistent carburation at all throttle openings, with excellent progression throughout.

FLOAT CHAMBERS

The float chamber recommended and normally fitted to the current GP2 carburettor is a remotely mounted type 510 and is of bottom feed design incorporating a lever type operated float.

If a rigid float chamber is required our type 302 which is attached to the mixing chamber in the orthodox manner can be supplied. The float chamber can either be upright, or cranked at the angle of the induction port of the engine in question. It is, therefore, necessary when ordering a carburettor incorporating a solid mounted float chamber to state the angle of the induction port.

For Operation and Tuning Instructions, see List No. 115/3.
For Spare Parts see List No. 115/2.
LIST No. 115/1

HOW TO ORDER.

When deciding on the correct choke size of a racing carburettor required for a particular engine, the main controlling factors to be considered are the engine capacity, peak R.P.M. and the inlet port diameter. Therefore when ordering, give as much of the following information as possible, so that a carburettor of correct size can be supplied with a suitable setting.

Make and capacity of engine.
Inlet Port diameter.
Peak R.P.M.
Compression Ratio.
Fuel to be used.
Dimension required from Mixing Chamber centre-line to face of flange (1½" or 2½").
Whether remote or rigid float chamber required. If rigid, then state angle of inclination up to maximum of 20°, or Vertical.
Whether single or double Banjo required. If double, state whether 90° or 180°.
Whether cables required. If so, state lengths.
Whether controls required. If so, state type and handlebar diameter.
Whether any tuning spares required.

G.P. TUNING SPARES.

<table>
<thead>
<tr>
<th>DESCRIPTION OF PART</th>
<th>15 G.P.2</th>
<th>10 G.P.2</th>
<th>5 G.P.2</th>
<th>3°G.P.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Throttle Valves, cutaway 3 to 8</td>
<td>316/104</td>
<td>316/010</td>
<td>316/020</td>
<td>316/413</td>
</tr>
<tr>
<td>Main Jets</td>
<td>3326</td>
<td>3326</td>
<td>3326</td>
<td>3326</td>
</tr>
<tr>
<td>Needle Jets, -107&quot;, -109&quot;, or -125&quot; dia.</td>
<td>316/065</td>
<td>316/065</td>
<td>316/065</td>
<td>316/065</td>
</tr>
<tr>
<td>Air Jets, -10&quot;, or -125&quot; dia.</td>
<td>316/052</td>
<td>316/052</td>
<td>316/052</td>
<td>316/052</td>
</tr>
<tr>
<td>Metering Needles, Standard</td>
<td>316/007</td>
<td>316/007</td>
<td>316/146</td>
<td>316/465</td>
</tr>
<tr>
<td>Metering Needles, Weak</td>
<td>316/030</td>
<td>316/030</td>
<td>316/029</td>
<td>316/408</td>
</tr>
<tr>
<td>Pilot Jets</td>
<td>376/076</td>
<td>376/076</td>
<td>376/076</td>
<td>376/076</td>
</tr>
</tbody>
</table>

For full range of Spare Parts, see List No. 115/2.

OTHER AMAL RACING PRODUCTS.

- Positive Stop Racing Twist Grip, ¼" Short, Type 10 G.P. and Type 15 G.P. 
- Positive Stop Racing Twist Grip, ¼" Long, Type 3 G.P. and Type 5 G.P.
- Positive Stop Racing Twist Grip, ¼" Short, Double Rotor, ¾" Short
- Positive Stop Racing Twist Grip, Double Rotor, ¾" Long

- Dummy Grips to match, ¼" Short
- Dummy Grips to match, ¼" Long
- Dummy Grips to match, ¾" Short
- Dummy Grips to match, ¾" Long

- Single Lever Air Control, opening inwards on R.H. Bar, ¼"
- Single Lever Air Control, opening inwards on R.H. Bar, ¾"
- Single Lever Magneto Control, opening inwards on L.H. Bar, ¼"
- Single Lever Magneto Control, opening inwards on L.H. Bar, ¾"

- Light Alloy Racing Control Lever with Self Locking Fingertip Adjuster
- Front Brake or Clutch suitable for ¼" or ¾" Dia. Bars

- Junction Box for operating two cables from one control
- Mid-way Cable Adjuster
- Throttle or Air Cable

Type No.
364/1
364/2
364/4
313/1
16/069
16/074
16/040
16/039
12/161
12/163
12/171
12/173
509
244/104
3792/3/4
LIST No. 115/1

DIMENSIONS AND SPECIFICATIONS.

MATERIAL.

Light metal Mixing Chamber and Float Chamber Bodies.

FINISH.

Bodies sprayed with durable and attractive metallic lacquer. Mixing Chamber Cap, plated and polished.

LOCKING DEVICES.

Spring blade'lock to engage with serrations in Mixing Chamber Cap. Banjo Bolt, Jet Base Nut, Choke Adaptor Holding Screws, Float Chamber Cover, Fixing Screws and Float Hinge Spindle Head are drilled for lock wires.

### ALTERNATIVE CLIP FITTING

<table>
<thead>
<tr>
<th>TYPE</th>
<th>AVAILABLE CROSS BORES A DIA.</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
<th>K</th>
<th>L</th>
<th>M</th>
<th>N</th>
<th>O</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>15G.P.</td>
<td>3/4, 1, 1 1/4*</td>
<td>2 ins.</td>
<td>ins.</td>
<td>ins.</td>
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<tr>
<td>10G.P.</td>
<td>1 1/2, 1 1/2, 1 1/2, 1 1/2, 1 1/2, 1 1/2*</td>
<td>2 ins. or 65 mm.</td>
<td>1 1/8</td>
<td>1 1/8</td>
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<tr>
<td>5G.P.</td>
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<td>65 mm.</td>
<td>1 1/8</td>
<td>1 1/8</td>
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<tr>
<td>3G.P.</td>
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*Straight-through Bore with no swell.
### SPARE PARTS LIST

**FOR TYPE 302 RIGID AND TYPES 504 AND 510 REMOTE FLOAT CHAMBERS**

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>RIGID</th>
<th>TYPE 302</th>
<th>REMOTE</th>
<th>TYPE 504</th>
<th>REMOTE</th>
<th>TYPE 510</th>
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<tr>
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<td>Part No.</td>
<td>Part No.</td>
<td>Part No.</td>
<td>Part No.</td>
<td>Part No.</td>
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<tr>
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<td>302/10</td>
<td>302/18</td>
<td>504/1</td>
<td>504/2</td>
<td>510/1</td>
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<td>Float Chamber Body only</td>
<td>302/001</td>
<td>302/001</td>
<td>302/015</td>
<td>504/001</td>
<td>504/001</td>
<td>510/001</td>
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<tr>
<td>Float Chamber Cover complete</td>
<td>302/002</td>
<td>302/002</td>
<td>302/002</td>
<td>504/008</td>
<td>504/008</td>
<td>510/003</td>
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<td>Float Chamber Cover Washer</td>
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<tr>
<td>Cover Fixing Screws</td>
<td>302/009</td>
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<td>302/008</td>
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<tr>
<td>Float Needle</td>
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<td>Float Needle (modifica-</td>
<td>302/044</td>
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<td>Base Plug and Guide - modification</td>
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<td>Base Plug and Guide</td>
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<td>14/252</td>
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<tr>
<td>Banjo (see illustrations, page 3)</td>
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<td>as required</td>
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<tr>
<td>Banjo Nut or Bolt</td>
<td>14/255</td>
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<td>14/255</td>
<td>302/043</td>
<td>302/043</td>
<td>510/011</td>
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<td>Plug Screw</td>
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<td>510/019</td>
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<td>Plug Screw Washer</td>
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<tr>
<td>Float Chamber Connection</td>
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<td>Float Chamber Con'tn Washer</td>
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<td>Banjo Connection (for M/ch.)</td>
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<td>Banjo Nut (Outlet)</td>
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<tr>
<td>Base Plug and Guide (Excelsior)</td>
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<tr>
<td>Needle Seating Washer</td>
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<td>Needle Seating</td>
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<td>510/005</td>
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<td>Float Hinge Spindle Washer</td>
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<td>Float Hinge Spindle complete</td>
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<tr>
<td>Banjo Bolt Washer</td>
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<td></td>
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<td>178/035</td>
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</tbody>
</table>

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*Original part numbers 302/004, 14/320, 14/321-2, were modified to 302/032, 302/035, 14/322-302/036 since when a further modification was made, i.e., 302/042, 302/044, 302/045-6.

We suggest that parts prior to the last modification should be replaced as an assembly so bringing the float chamber to the latest setting.

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**GUARANTEE**—The Company take all possible reasonable care in the manufacture and the quality of their products. Purchasers are informed that any part proved to be defective in manufacture or quality, and returned to the works within six months of its purchase now, will be replaced. The Company must respectfully point out however, that its responsibility and that of its agents, stockists and dealers, is limited to this Guarantee, and that they cannot, under any circumstances, be held responsible for any loss or for any contingent or resulting liability arising through any defect. These conditions of sale and use also apply when the Company's products form part of the original equipment of machines purchased new.

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*Phone: Birmingham, Birchfields 4571.*

*Telegram: "AMALCARB, PHONE, BIRMINGHAM."

*Printed in England. 1,000/4/85.*
### Float Chambers

#### Type 510

- 510/003
- 510/002
- 510/005
- 510/006
- 510/007
- 510/008
- 179016
- 179015
- 179014
- 179013

#### Type 504

- 504/001
- 504/002
- 504/003
- 504/004
- 504/005
- 504/006
- 504/007
- 504/008

#### Type 302

- 302/000
- 302/001
- 302/002
- 302/003
- 302/004
- 302/005
- 302/006

**Alternative Banjo Connections for Types 510 & 504**

For Crankcase Float Chamber, please quote angle of arm.
### SPARE PARTS FOR

**Type G.P.2 RACING CARBURETTER**

(With TYPE 302 RIGID & TYPES 504 & 510 REMOTE FLOAT CHAMBERS)

<table>
<thead>
<tr>
<th>COMPONENT</th>
<th>For T15GP2</th>
<th>For T10GP2</th>
<th>For T5GP2</th>
<th>For T3GP2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixing Chamber Body</td>
<td>Specify</td>
<td>Specify</td>
<td>Specify</td>
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<tr>
<td>Mixing Chamber Top</td>
<td>316/097</td>
<td>316/096</td>
<td>316/049</td>
<td>316/414</td>
</tr>
<tr>
<td>Mixing Chamber Cap</td>
<td>316/103</td>
<td>316/046</td>
<td>316/050</td>
<td>316/412</td>
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<tr>
<td>Lock Spring for Mixing Chamber Cap</td>
<td>316/088</td>
<td>316/126</td>
<td>316/048</td>
<td>316/402</td>
</tr>
<tr>
<td>Adjuster for Throttle Cable</td>
<td>316/169</td>
<td>316/169</td>
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<td>316/169</td>
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<tr>
<td>Lock Nut for ditto</td>
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<tr>
<td>Throttle Cable Adjustable Sheath</td>
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<td>316/104</td>
<td>316/010</td>
<td>316/020</td>
<td>316/413</td>
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<tr>
<td>Throttle Valve, opposite Standard, Twin Carbs.</td>
<td>5/204</td>
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<tr>
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<td>316/007</td>
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<td>316/146</td>
<td>316/465</td>
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<tr>
<td>Jet Needle (Standard)</td>
<td>316/020</td>
<td>316/030</td>
<td>316/029</td>
<td>316/408</td>
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<td>Jet Needle (Weak)</td>
<td>316/021</td>
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<td>Jet Needle Clip</td>
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<td>316/100</td>
<td>316/005</td>
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<td>316/489</td>
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<tr>
<td>Choke Adaptor Securing Screws</td>
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<td>316/422</td>
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</tbody>
</table>

*When twin carburetters fitted this component is 175/205 for Type 15, 316/404 for Type 10, and 316/398 for Type 9.

*These parts are not normally supplied separately as they are machined in position with the mixing chamber body.

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AMAL LTD., HOLDFORD ROAD, WITTON, BIRMINGHAM 6, ENGLAND

Phone: Birmingham, BIRCHfields 4571. Telegrams: "AMALCARB, PHONE BIRCH."
THE GRAND PRIX CARBURETTER features

UNOBSERVED BORE

Because the metering needle does not pass through the choke of the Carburettor, the only restriction to flow through the Carburettor when the throttle valve is fully open, is a small one caused by the protrusion of the spray tube, and this is overcome by a slight swell in the choke at this point. A taper returns the bore to its nominal diameter on the engine side of the throttle valve.

SHORT MIXTURE TRACT

Although the needle does not obstruct the choke, it is positioned within the throttle valve diameter, and this results in a very short tract for the mixture to traverse from the needle jet to the choke. The benefit of this is felt in rapid and consistent acceleration throughout the range, and where megaphone exhausts are used an additional advantage is cleaner entry onto the megaphone at lower R.P.M. than with previous types of racing Carburetters.

PRIMARY AIR JET

The quantity of primary air that atomises the fuel issuing from the needle jet, is controlled by making it pass through a drilled bush. Its effect is that of a depression control for the main jet, and while the air jet as fitted by the factory with due regard to the bore size of the Carburetter would normally be left unaltered, it could be changed for one of different size for special purpose tuning. It may, therefore, be regarded as an additional tuning factor in exceptional circumstances.

FIVE TUNING FACTORS

The established Amal principles are followed by incorporating:

- Easily changeable main jet controlling the fuel supply at full throttle;
- Changeable needle and needle jet and adjustable needle position for control at smaller throttle openings;
- Changeable throttle valve of which the amount of cutaway controls the mixture at still smaller throttle openings;
- A taper needle for independent control of the fuel supply to the pilot jet to control the mixture strength for idling.

By using these tuning factors in the proper sequence, it is possible to obtain clean and consistent carburation at all throttle openings, with excellent progression throughout.

LARGE CAPACITY FLOAT CHAMBERS

The float chamber recommended and normally fitted to the current GP carburettor is a remotely mounted type 504, its design gives a central column of fuel which is undisturbed by swirl or vibration. The large headed needle and needle seating enables a flow of 10 gallons per hour to be maintained.

If a rigid float chamber is required our type 302 which is attached to the mixing chamber in the orthodox manner can be supplied. The float chamber can either be upright, or cranked at the angle of the induction port of the engine in question. It is, therefore, necessary when ordering a carburettor incorporating a solid mounted float chamber to state the angle of the induction port.

FOR OPERATING AND TUNING INSTRUCTIONS, SEE LIST No. 104/3.
LIST No. 104/1

DIMENSIONS AND SPECIFICATIONS.

MATERIAL.

Light metal Mixing Chamber and Float Chamber Bodies.

FINISH.

Bodies sprayed with durable and attractive metallic lacquer. Float Chamber Cover, polished light alloy. Mixing Chamber Cap, plated and polished.

LOCKING DEVICES.

Spring blade lock to engage with serrations in Mixing Chamber Cap. Banjo Nut, Jet Base Nut, Choke Adaptor Holding Screws, and Float Chamber Cover Fixing Screws are drilled for lock wires.

<table>
<thead>
<tr>
<th>Type</th>
<th>Available Cross Bore A Dia.</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
<th>K</th>
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<th>P</th>
<th>Q</th>
<th>R</th>
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<tr>
<td>15G.P.</td>
<td>$\frac{3}{8}$, $\frac{1}{2}$, 1</td>
<td>2 ins.</td>
<td>ins.</td>
<td>ins.</td>
<td>ins.</td>
<td>ins.</td>
<td>ins.</td>
<td>ins.</td>
<td>ins.</td>
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<td>ins.</td>
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<td>10G.P.</td>
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<td>ins.</td>
<td>ins.</td>
<td>ins.</td>
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</tr>
<tr>
<td>8G.P.</td>
<td>$\frac{1}{8}$, $\frac{3}{8}$, $\frac{1}{4}$, $\frac{1}{8}$</td>
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<td>ins.</td>
<td>ins.</td>
<td>ins.</td>
<td>ins.</td>
<td>ins.</td>
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<td>ins.</td>
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<tr>
<td>3G.P.</td>
<td>$\frac{1}{8}$, $\frac{1}{4}$</td>
<td>65 mm.</td>
<td>ins.</td>
<td>ins.</td>
<td>ins.</td>
<td>ins.</td>
<td>ins.</td>
<td>ins.</td>
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<td>ins.</td>
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</tr>
</tbody>
</table>

*Straight-through Bore with no swell.
smallest diameter in the mixing chamber which
is of moment.

Naturally, when deciding on the choke size of
a racing carburettor, the peak r.p.m. of the engine
is the main controlling factor in conjunction, of
course, with the inlet port diameter on the engine
in question.

Fitting
Regarding fitting the carburettor, although we
are often asked what is the correct distance
between the inlet valve centre line and the centre
of the carburettor mixing chamber, this is not a
figure which can be laid down in hard and fast
manner, as it varies enormously from one engine
to another. Broadly speaking, a distance of
between 7 in. to 9 in. probably represents a fair
mean dimension.

Flange fitting is standardised with the G.P.
carburettor to eliminate as much as possible the
worry of air leaks which may persist with clip
fitting instruments.

Float Chambers
The float chamber recommended and normally
fitted to the current G.P.2 carburettor is a
remotely mounted type 510 and is of bottom
feed design incorporating a lever type operated
float.

Petrol Level
The petrol level in the type 510 float chamber is
.640 in. below the cover joint and is marked with
a raised line on the outside of the body. In position-
ing the float chamber this line should be on
a level with the lowest point of the circular scribe
mark on the air jet plug (3).

Locking Devices
A spring blade locking device (18) held in place
by the air tube lock ring (19) engages with serr-
atings on the mixing chamber cap (16), which
positively prevents unscrewing due to vibration.
The jet plug (20), banjo bolt (43), plug screw (42),
jet block holding screws (13), float chamber cover
screws (46), and the float/hinge spindle head (not
illustrated) are drilled to enable them to be lock-

wired up.

Tuning (General)
The tuning sequence of the G.P.2 carburettor
follows the well established Amal principles, inasmuch as there is a main jet (15) controlling
the fuel supply at full throttle. a needle jet (1),
the emission from which is controlled by the
position of a taper needle (11), and at the lower
throttle openings by the cut-away of the throttle
valve (23), a detachable pilot jet (24) and a pilot
air adjusting screw (27) controlling the mixture
strength for idling; an air jet (2) controls the
amount of air which primarily atomises the fuel
as it comes out of the needle jet (1) before going
into the spray tube (12) and thence to the heart
of the choke.

This latter air jet (2) is a form of depression
control for the main jet and from normal ex-
periences would appear to require a .1 in. dia.
air jet for chokes of up to 1.1/8 in. and .125 in.
dia. for choke sizes in excess of this figure.

Normally speaking, this air jet would be fitted
by the factory when the carburettor was supplied
and would not be considered a likely component
to change, but remembering that the main jet
depression can be increased by fitting a smaller
air jet, it may sometimes, for special purpose
tuning, be found an asset to try a larger or smaller
air jet.

The needle control covers a range of the
throttle opening from about one-third throttle
up to seven-eighths throttle opening. The needle
grooves in the G.P. needle will be found to
number five instead of seven as previously on the
T.T. instruments, due to the fact that the needle
control of the G.P. carburettor is rather more
sensitive than on other types. Two types of
needle (11) are available, a standard taper needle
and a much weaker taper needle.

The standard taper needle is known as the
G.P. needle: the weaker taper needle is known
as the G.P.6 needle.
The weaker needle is usually fitted except where alcohol fuel is concerned.

**Main Jet**
Always bear in mind, that whatever the type of needle used, or the position in which it is fitted, there will be no affection of the main jet (15). This should be arrived at by fitting the jet which gives the best possible power on the bench or, on the other hand, the highest possible r.p.m. on the road, and once this has been obtained, under no circumstances should it be altered.

The main jet (15) can be very readily removed by taking off the hexagon cap (20) at the base of the carburettor mixing chamber. The jet size is marked on the side of these jets, and represents the flow in c.c. per minute on Amal calibrating machines. These jets are made in 10 c.c. increments, that is, for instance—250, 260, 270, etc. —up to and including 600, when, after this, 20 c.c. increments become standard up to 1,000. Over 1,000 increments are of 100 c.c.

For rough guidance, therefore, the following jet sizes should be approximately correct for the choke sizes in question:—

using 80 octane or petrol benzol fuel
10 G.P., 1 1/8 in. choke—jet 210
10 G.P., 1 2/8 in. choke—jet 260
with of course, the intermediary choke sizes, using a proportionate sized jet.

The rest of the throttle range should then be dealt with absolutely individually in steps by means of the needle adjustment, throttle valve cut-away alteration and pilot adjustment, with a possible check on the air jet fitted.

The throttle valve (23) which surrounds the choke adaptor (22) in the carburettor, controls with its leading edge the velocity of air entering the throttle bore and consequently the depression on the spray tube at lower throttle openings with a diminishing effect up to point where the cut-away disappears from the cross bore.

The trailing edge of the throttle valve, of course, controls the volume of mixture passing to the engine.

These throttle valves can be supplied with various cut-aways from No. 3 up to No. 8, each number varying in its cut-away on the air intake side by 1/16 in. Low numbers provide richer mixture than high numbers.

The needle jet (1), which is of stainless steel to prevent wear, has been found for best all-round usage on petrol or petrol benzol to require a diameter of .107 in. For choke sizes in the type T.15.G.P.2 range, over this a needle jet of .109 in. diameter is necessary. For alcohol fuel, of course, larger needle jets are necessary.

**Pilot System**
This gives a supply of metered fuel through a detachable pilot jet (24), which mixes with air regulated by the pilot air adjusting screw (27) and passes into the mixing chamber through a small hole on the engine side of the throttle slide.

Compensation on this G.P.2 carburettor is obtained through the medium of the primary air which passes through a slot (4) in the mixing chamber and then, via the air jet (2) previously mentioned, atomises the liquid fuel passing from the needle jet (1).

As the engine supply increases or decreases at a given throttle opening with a varying load, so compensation will take place.
KEY TO SECTIONED

Mixing Chamber
1. Needle jet.
2. Air jet.
3. Air jet plug.
4. Primary air slot.
5. Air valve cable adjuster locknut.
6. Air valve cable adjuster.
7. Throttle cable adjuster.
8. Throttle cable adjuster locknut.
10. Needle clip retaining screw.
11. Metering needle.
13. Choke adaptor retaining screws.
15. Main jet.
16. Mixing chamber cap.
17. Throttle valve return spring.
18. Mixing chamber cap lock-spring.
19. Air tube lock ring.

ILLUSTRATION
22. Choke adaptor.
23. Throttle valve.
24. Pilot jet.
25. Pilot jet cover nut.
26. Pilot jet cover nut washer.
27. Pilot air adjusting screw.
28. Pilot air adjuster locknut.

Float Chamber
40. Petrol outlet connection.
41. Float and hinges.
42. Plug screw.
43. Petrol inlet banjo bolt.
44. Petrol inlet banjo.
45. Float needle.
46. Float chamber cover screws.
47. Tickler.

TUNING SEQUENCE

To get carburation for any stated fuel when the choke bore is correct for the peak revs of the engine and the correct needle jet for the fuel to be used, the procedure is simple. Start off with an assumed setting, and then tune as follows. There are four phases:

(1) Main jet for power at full throttle;
(2) Pilot air adjuster for idling;
(3) Throttle cut-away for "take off" from the pilot jet;
(4) Needle position for snappy mixture at quarter to three-quarter throttle; then final idling adjustment of the pilot jet.

Always tune in this order, then any alteration will not upset a correct phase.

Sequence of Tuning
(1) Main jet size.
(2) Pilot adjustment.
(3) Throttle valve cut-aw.

(4) Needle position.

(1) Main Jet Size
This should be determined first: the smallest jet which gives the greatest maximum speed should be selected, keeping in mind the safety factor for cooling. (The air lever should be fully open during these tests.)

(2) Pilot Adjustment
Before attempting to set the pilot air adjuster the engine should be at its normal running temperature, otherwise a faulty adjustment is possible, which will upset the correct selection of the throttle valve. The pilot air adjuster is rotated clockwise to richen the mixture and anticlockwise to weaken it. Adjust this very gradually until a satisfactory tick-over is obtained, then reset locknut but take care that the achievement of too slow a tick-over—that is, slower than is actually necessary—does not lead to a "spot" which may cause stalling when the throttle is very slightly open.
(3) Throttle Cut-away
Having set the pilot air adjuster, open up the throttle progressively and note positions where, if at all, the exhaust note becomes irregular. If this is noticed, leave the throttle open at this position and close the air lever slightly; this will indicate whether the spot is rich or weak. If it is a rich spot, fit a throttle valve with more cut-away on the air intake side (or vice versa if weak).

(4) Jet Needle Position
Tuning sequence 2 and 3 will affect carburation up to somewhere over one-quarter throttle, after which the jet needle, which is suspended from the throttle valve, comes into action and when the throttle is opened further and tests are again made for rich or weak spots, as previously outlined, the needle can be raised to richen or lowered to weaken the mixture, whichever may be found necessary. With these adjustments correctly made, and the main jet size settled, a perfectly progressive mixture will be obtainable from tick-over to full throttle. The jet needles are interchangeable in 10G.P.2 carburetters.

ALCOHOL FUELS
Concerning alcohol fuels, the G.P.2 range of carburetters function perfectly satisfactorily on any alcohol blend up to and including straight methanol. It will be necessary to fit a .125 in. diameter needle jet (1) for any alcohol content over 50%. With this larger needle jet a standard taper needle (11) should be used, which means for the type 10G.P.2 a needle marked G.P. is required. An approximately correct needle position will be No. 4 that is: the fourth groove from the top of the needle.

Regarding main jet sizes, these have to be increased in the following proportions, taking the basic size as that used for 80 octane fuel or petrol benzol.

STRAIGHT METHANOL—increase the basic jet size by 150%.
J.A.P. RACING FUEL—increase the basic jet size by 150%.
ESSO No. 1 FUEL—increase the basic jet size by 150%.
ESSO No. 2 FUEL—increase the basic jet size by 120%.
ESSO No. 3 FUEL—increase the basic jet size by 130%.
SHELL A.M.M. FUEL—increase the basic jet size by 150%.
SHELL A.M.1 FUEL—increase the basic jet size by 140%.
SHELL A.M.8 FUEL—increase the basic jet size by 120%.
SHELL A.M.9 FUEL—increase the basic jet size by 100%.
SHELL A.M.12 FUEL—increase the basic jet size by 50%.

NOTE:—When calculating the jet size on the basis of the jet size used for petrol/benzol mixtures—the per cent increase must be added to the original jet size and the total is the new size to be used for the particular fuel. Example: if a jet No. 300 was used for petrol/benzol and it was decided to change over to methanol, which requires an increase of 150% adding to the original jet size 300.

Calculate this way: \[ \left( \frac{\% \text{ increase} \times \text{original jet size}}{100} \right) + \text{jet size} \]

namely: \[ \left( \frac{150 \times 300}{100} \right) + 300 = 450 + 300 = 750 \]
The answer is, use main jet 750 and the appropriate needle-jet for alcohol fuels as given in a paragraph above.

When using alcohol mixtures, the alcohol content of which is not exactly known, "trial and error" will be necessary in finding the correct jet size, in which case it should be remembered that although quite an excessively over-rich mixture can be used on alcohol, the slightest weakness will result in trouble. Therefore, always err on the rich side for the start of the "trial and error" tests. On the other hand, if the exact composition of the fuel should be known and you get in touch with the Technical Department, Amal Ltd., Holdford Road, Witton, Birmingham 6, they will be able to give you a fairly close approximation of the jet size required for the alcohol mixture in question.

Normally, when changing over from petrol to alcohol on the G.P. range of instruments, no alteration will be necessary to the air jets fitted.

ALCOHOL FUELS MUST NOT BE USED IN FIBRE-GLASS FUEL TANKS.
As measured on DYNOMETER'S MODEL 100 DYNAMOMETER

50.156 75.4°F 29.08-0.44 in.Hg. 420 ft. CF=1.02
960722 6.75' RW
24, 42, 20, 59
Neu Plugs NGK B9EG, .035.
NORRIS 480, Amal Mk II 36mm, 230MJ, 106, 25, 2A1-3
55 PIPES, 1.5 VALUE, 5 SPEED, 30 ADVANCE, 103 OCTANE

50.152 81.1°F 29.18-0.75 in.Hg. 420 ft. CF=1.05
960722 6.75' RW
24, 42, 20, 59
Neu Plugs NGK B9EG, .035.
NORRIS 480, Amal Mk II 36mm, 230MJ, 106, 25, 2A1-3
55 PIPES, 1.5 VALUE, 5 SPEED, 30 ADVANCE, 103 OCTANE

50.153 90.5°F 29.29-0.73 in.Hg. 420 ft. CF=1.04
960722 6.75' RW
24, 42, 20, 59
Neu Plugs NGK B9EG, .035.
NORRIS 480, Amal Mk II 36mm, 230MJ, 106, 25, 2A1-3
55 PIPES, 1.5 VALUE, 5 SPEED, 30 ADVANCE, 103 OCTANE

Research in Design, Service to racing.
**Plate 16—continued**

**ELECTRICAL EQUIPMENT**

Gold Star 500 c.c. Clubmans and Scrambles

<table>
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<tr>
<th>Plate Ref. Number</th>
<th>Model</th>
<th>Part No.</th>
<th>Description</th>
<th>Number per set</th>
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<td>500 c.c. (Clubmans)</td>
<td>29-9221</td>
<td>Licence holder</td>
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<td>19-1214</td>
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<td>29-541</td>
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<td>500 c.c. (Clubmans)</td>
<td>2-2395</td>
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<td>2-1462</td>
<td>Speedo and rev counter bracket washer</td>
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<td>32</td>
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<td>2-204</td>
<td>Speedo and rev counter bracket screw</td>
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<td>33</td>
<td>500 c.c. (Clubmans)</td>
<td>65-9111</td>
<td>Speedometer bracket</td>
<td>1</td>
</tr>
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<td>34</td>
<td>500 c.c. (Clubmans)</td>
<td>65-9111</td>
<td>Speedo and rev counter mounting bracket</td>
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</tr>
<tr>
<td>35</td>
<td>500 c.c. (Clubmans)</td>
<td>15-7383</td>
<td>Speedo mounting rubber</td>
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</tr>
<tr>
<td>36</td>
<td>500 c.c. (Clubmans)</td>
<td>15-7383</td>
<td>Rev counter support bracket rubber</td>
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<tr>
<td>37</td>
<td>500 c.c. (Clubmans)</td>
<td>15-7383</td>
<td>Speedo and rev counter fixing bolt rubber</td>
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</tr>
<tr>
<td>38</td>
<td>500 c.c. (Clubmans)</td>
<td>27-8560</td>
<td>Speedometer mounting washer</td>
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</tr>
<tr>
<td>39</td>
<td>500 c.c. (Clubmans)</td>
<td>27-8560</td>
<td>Rev counter support bracket washer</td>
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<td>Speedo and rev counter fixing bolt washer</td>
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<td>41</td>
<td>500 c.c. (Clubmans)</td>
<td>65-9179</td>
<td>Speedometer bracket bolt</td>
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<td>42</td>
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<td>65-9179</td>
<td>Speedometer and rev counter fixing bolt</td>
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<tr>
<td>43</td>
<td>500 c.c. (Clubmans)</td>
<td>65-9179</td>
<td>Rev counter bracket fixing bolt</td>
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**CARBURETTER SETTINGS**

<table>
<thead>
<tr>
<th>Model</th>
<th>Type</th>
<th>Choke Size (inch)</th>
<th>Main Jet</th>
<th>Throttle Valve No.</th>
<th>Needle Jet</th>
<th>Needle Position</th>
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<tbody>
<tr>
<td>Clubman’s 500 c.c.</td>
<td>T3 G.P.</td>
<td>1 1/2</td>
<td>350</td>
<td>4</td>
<td>.109</td>
<td>3</td>
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<tr>
<td>Scrambles 500 c.c.</td>
<td>T10 G.P.</td>
<td>1 1/4</td>
<td>240</td>
<td>5</td>
<td>.109</td>
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**PISTON CHART**

<table>
<thead>
<tr>
<th>Model</th>
<th>Comp. Ratio</th>
<th>PISTONS COMPLETE</th>
<th>COMPRESSION RING (2)</th>
<th>SCRAPER RING</th>
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</thead>
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<tr>
<td></td>
<td></td>
<td>1 mm. O.S.</td>
<td>1 mm. O.S.</td>
<td>1 mm. O.S.</td>
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