

# AMAL

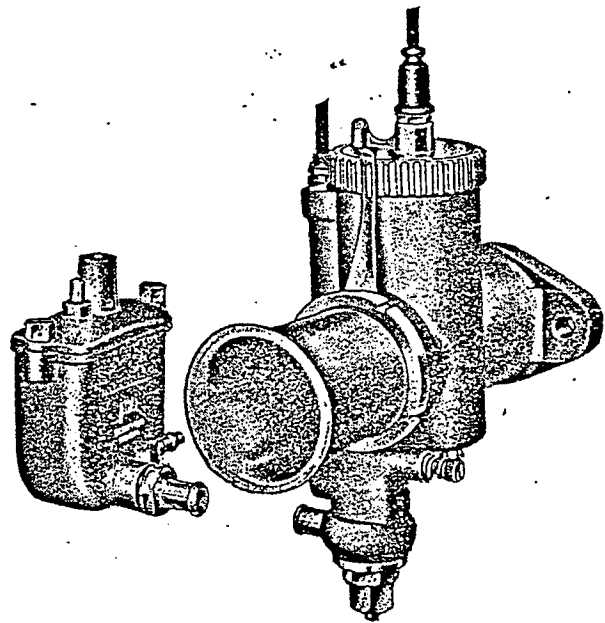
December, 1964.

LIST No. 115/1 (Issue No. 3)

## GP2 CARBURETTORS

THE CARBURETOR 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 use also apply when the Company's products form part of the original equipment of machines purchased new.*

1,000/12/64. W.

Printed in England.

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

'Phone: Birmingham, BIRchfields 4571.  
(P.B.X. 6 lines)

Telegrams: "AMALCARB, 'PHONE,  
BIRMINGHAM."

# THE GRAND PRIX CARBURETTER

## features

### UNOBSTRUCTED BORE

for maximum power at peak R.P.M.

Because the metering needle does not pass through the choke of the Carburetter, the only restriction to flow through the Carburetter 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

for rapid acceleration

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

for accurate depression control

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

for accurate tuning throughout the range

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

to ensure adequate fuel supply

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

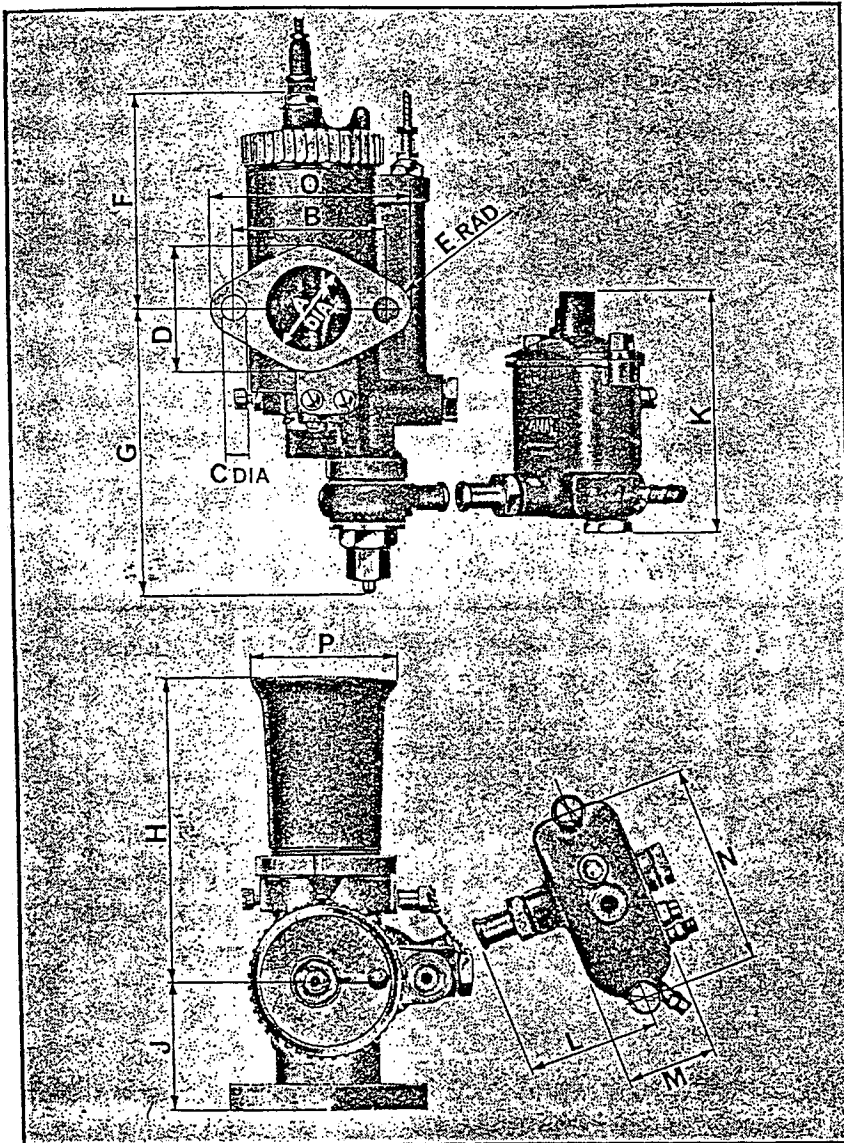
If a rigid float chamber is required our type 302 which is attached to the mixing chamber in the orthodox manner can be supplied. The float chamber can either be upright, or cranked at the angle of the induction port of the engine in question. It is, therefore, necessary when ordering a carburetter incorporating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



# 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	
15GP	1 1/8" to 1 1/2"
10GP	1 1/4" to 1 3/4"
5GP	1 1/16" to 1 1/8"
3GP	—

TYPE	AVAILABLE CROSS BORES A DIA.	B	C	D	E	F	G	H	J	K	L	M	N	O	P
15G.P.	ins. 7/16, 1/2, 1, 1 1/8*	2 ins.	ins. 1 1/2	ins. 1 1/4	ins. 3/4	ins. 2 1/4	ins. 3 1/4	ins. 3 3/4	ins. 1 1/4 or 2 1/4	ins. 3 1/2	ins. 1 1/2	ins. 1 3/4	ins. 2 3/4	ins. 2 3/4	ins. 1 7/8
10G.P.	1 1/16, 1 1/8, 1 1/4, 1 1/2, 1 3/4, 1 7/8, 1 1/2*	2 ins. or 65 mm.	1 1/2	1 1/4	3/4	2 1/4	3 1/4	3 3/4	1 1/4 or 2 1/4	3 1/2	1 1/2	1 3/4	2 3/4	2 3/4	2
5G.P.	1 1/16, 1 1/8, 1 1/4, 1 1/2, 1 3/4, 1 7/8, 1 1/2*	65 mm.	1 1/2	2 1/4	3/4	3 1/4	4 1/4	3 3/4	1 1/4 or 2 1/4	3 1/2	1 1/2	1 3/4	2 3/4	3 1/4	2 1/4
3G.P.	1 1/16, 1 1/8, 1 1/4, 1 1/2*	65 mm.	1 1/2	2 1/4	3/4	3 1/4	4 1/4	3 3/4	2.	3 1/2	1 1/2	1 3/4	2 3/4	3 1/4	2 1/4

\*Straight-through Bore with no swell.



LIST No. 115/2.

April, 1965.

## SPARE PARTS LIST

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

COMPONENT	TYPE 302			TYPE 504		TYPE 510
	RIGID	RIGID	REMOTE	REMOTE		REMOTE
	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.
Float Chamber Complete	302/1	302/10	302/18	504/1	504/2	510/1
Float Chamber Body only ..	302/001	302/001	302/015	504/001	504/001	510/001
Float Chamber Cover complete	302/002	302/002	302/002	504/008	504/008	510/003
Float Chamber Cover Washer	—	—	—	—	—	510/004
Cover Fixing Screws .. ..	302/009	302/009	302/009	302/009	302/009	302/009
Tickler .. .. .	302/010	302/010	302/010	504/007	504/007	14/333
Tickler Spring .. .. .	14/032	14/032	14/032	14/032	14/032	14/032
Tickler Cotter .. .. .	14/033	14/033	14/033	14/033	14/033	14/033
Tickler Washer .. .. .	14/189	14/189	14/189	14/189	14/189	14/189
Float	302/004	—	—	504/005	504/005	—
Float } See note	302/032	—	—	—	—	510/009
Float	302/042	302/042	302/042	—	—	—
Float Needle } below re	14/320	—	—	—	—	510/006
Float Needle } modifica-	302/035	—	—	—	—	—
Float Needle } tion *	302/044	302/044	302/044	302/044	302/044	—
Base Plug and Guide	14/321-2	—	—	—	—	—
Base Plug and Guide	14/322-302/036	—	—	—	—	—
Base Plug and Guide .. ..	302/045-6	302/045-6	302/045-6	—	—	—
Base Plug Washer .. .. .	14/252	14/252	14/252	—	—	—
Banjo (see illustrations, page 3)	as required	as required	14/250	as required	as required	as required
Banjo Nut or Bolt .. .. .	14/255	14/255	14/255	302/043	302/043	510/011
Banjo Washers .. .. .	14/275	14/275	14/275	14/275	14/275	510/012
Petrol Union Nuts .. .. .	14/042	14/042	14/042	14/042	14/042	14/042
Petrol Union Nipples .. ..	14/041	14/041	14/041	14/041	14/041	14/041
Plug Screw .. .. .	14/232	14/232	—	—	—	510/019
Plug Screw Washer .. .. .	14/241	14/241	—	—	—	14/336
Float Chamber Connection ..	—	—	302/071	14/219	302/070	14/219
Float Chamber Con't'n Washer	—	—	14/037	14/336	14/336	14/336
Banjo Connection (for M/ch.)	—	—	302/057	—	—	—
Banjo Connection Washer ..	—	—	14/336	—	—	—
Banjo Nut (Outlet) .. .. .	—	—	302/056	—	—	—
Base Plug and Guide (Excelsior)	302/069-046	302/069-046	302/069-046	—	—	—
Needle Seating Washer .. ..	—	—	—	—	—	14/047
Needle Seating .. .. .	—	—	—	—	—	510/005
Float Hinge Spindle Washer	—	—	—	—	—	116/162
Float Hinge Spindle complete	—	—	—	—	—	510/018
Banjo Bolt Washer .. .. .	—	—	—	—	—	178/035

\*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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PAGE FOUR

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

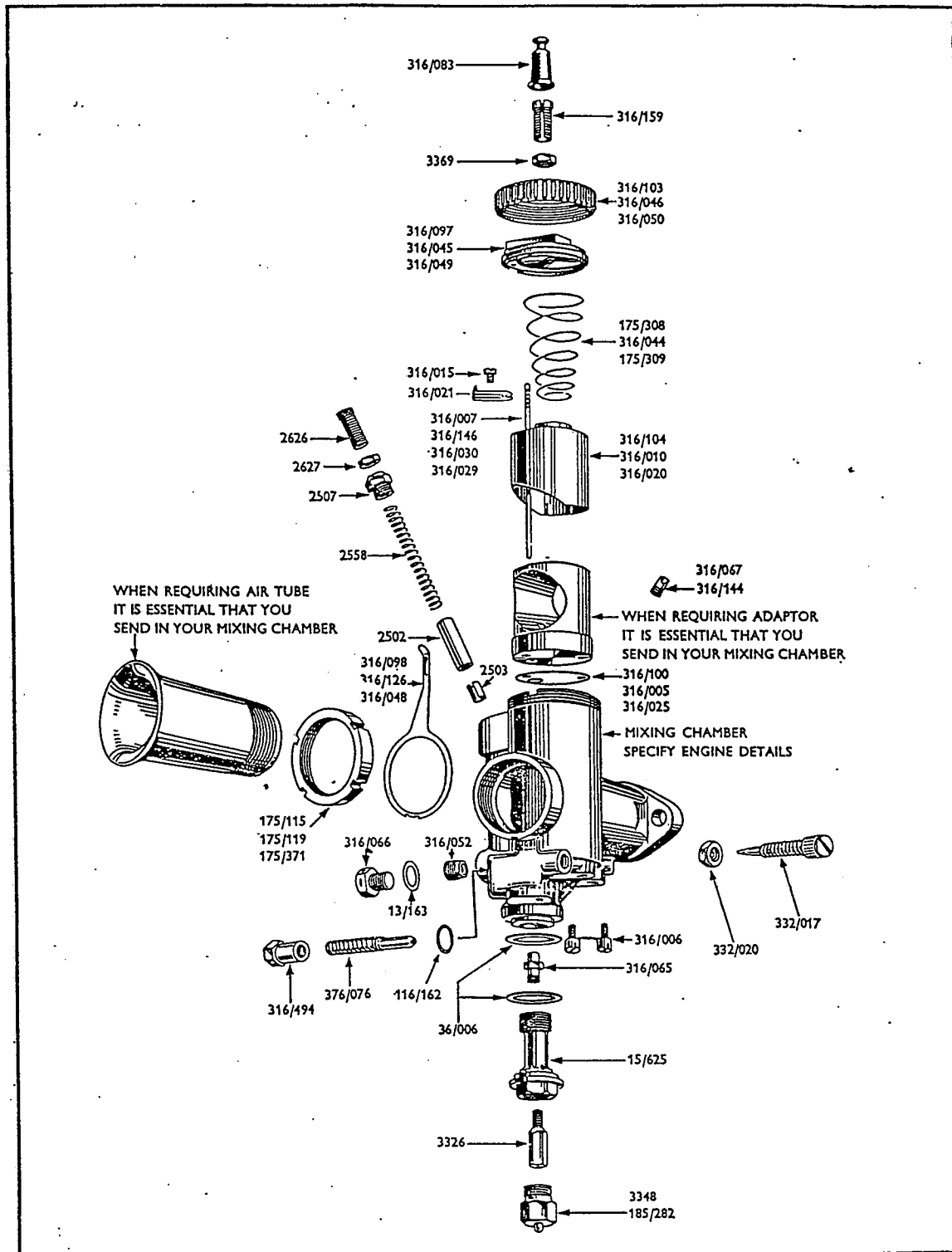
'Phone : Birmingham, BIRchfields 4571.  
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# Float Chambers

Type 510	Type 504	Type 302
		<p>FOR CRANKED FLOAT CHAMBER, PLEASE QUOTE ANGLE OF ARM.</p>
	<p>ALTERNATIVE BANJO CONNECTIONS FOR TYPE 510</p>	<p>ALTERNATIVE BANJO CONNECTIONS FOR TYPES 302 &amp; 504</p>

# G.P.2 Mixing Chamber





April, 1965.

LIST No. 115/2 (Issue No. 4)

## SPARE PARTS FOR

# Type G.P.2 RACING CARBURETTER

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

COMPONENT	For T15GP2	For T10GP2	For T5GP2	For T3GP2
Mixing Chamber Body .. .. .	Specify Engine Details	Specify Engine Details	Specify Engine Details	Specify Engine Details
Mixing Chamber Top .. .. .	316/097	316/045	316/049	316/414
Mixing Chamber Cap .. .. .	316/103	316/046	316/050	316/412
Lock Spring for Mixing Chamber Cap .. .. .	316/098	316/126	316/048	316/402
Adjuster for Throttle Cable .. .. .	316/159	316/159	316/159	316/159
Lock Nut for ditto .. .. .	3369	3369	3369	3369
Throttle Cable Adjuster Sheath .. .. .	316/083	316/083	316/083	316/083
Throttle Valve (Standard) .. .. .	316/104	316/010	316/020	316/413
Throttle Valve, opposite Standard, Twin Carbs. ..	316/185	316/013	316/189	—
Throttle Valve Screwed Nipple .. .. .	5/204	5/204	5/204	5/204
†Throttle Valve Spring .. .. .	175/308	316/458	316/459	316/466
Jet Needle (Standard) .. .. .	316/007	316/007	316/146	316/465
Jet Needle (Weak) .. .. .	316/030	316/030	316/029	316/408
Jet Needle Clip .. .. .	316/021	316/021	316/021	316/021
Jet Needle Clip Screw .. .. .	316/015	316/015	316/015	316/015
*Choke Adaptor (Please state bore size) .. .. .	Not normally supplied separately from M/c. body			
Choke Adaptor Washer .. .. .	316/100	316/005	316/025	316/462
Choke Adaptor Securing Screws .. .. .	316/489	316/489	316/489	316/489
Spray Tube .. .. .	316/067	316/067	316/144	316/144
*Air Tube (Please state bore size when ordering) ..	Not normally supplied separately from M/c. body			
Air Tube Lock Ring .. .. .	175/115	175/119	175/371	316/411
Main Jet .. .. .	3326	3326	3326	3326
Jet Holder .. .. .	15/625	15/625	316/027	316/027
Jet Holder Plug Screw .. .. .	3348	3348	3348	316/028
Jet Holder Plug Screw .. .. .	—	185/282	316/028	—
Needle Jet .. .. .	316/065	316/065	316/065	316/065
Air Valve Cable Adjuster .. .. .	2626	2626	2626	2626
Lock Nut for ditto .. .. .	2627	2627	2627	2627
Air Barrel Top .. .. .	2507	2507	2507	2507
Air Barrel Plug Screw .. .. .	—	—	—	185/280
Air Valve .. .. .	2502	2502	2502	2502
Air Valve Spring .. .. .	2558	2558	2558	2558
Air Valve Nipple Holder .. .. .	2503	2503	2503	2503
Air Valve Nipple .. .. .	2629	2629	2629	2629
Air Jet .. .. .	316/052	316/052	316/052	316/052
Air Jet Plug Screw .. .. .	316/456	316/456	316/456	316/456
Air Jet Plug Screw Washer .. .. .	38/023	38/023	38/023	38/023
Pilot Jet .. .. .	376/076	376/076	376/076	376/076
Pilot Jet Cover Nut .. .. .	316/494	316/494	316/494	316/494
Pilot Cover Nut Washer .. .. .	116/162	116/162	116/162	116/162
Pilot Air Adjuster .. .. .	332/017	332/017	332/017	332/017
Pilot Plug Screws .. .. .	2403	2403	2403	2403
Pilot Air Adjuster Locknut .. .. .	332/020	332/020	332/020	332/020
Pilot Air Connection .. .. .	316/490	316/490	316/490	316/490
Banjo Connection for Remote Float Chamber ..	14/218	14/218	14/218	14/218
Banjo Washer .. .. .	36/006	36/006	36/006	36/006
Outlet Clip .. .. .	27/073	27/072	316/421	316/421
Outlet Clip Screw .. .. .	1962	1962	316/422	316/422
Jet Key .. .. .	244/1397	244/1397	244/1397	244/1397

†When twin carburetters fitted this component is 175/395 for Type 15, 316/406 for Type 10, and 175/396 for Type 5.  
\*These parts are not normally supplied separately as they are machined in position with the mixing chamber body.

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BIRMINGHAM 6, ENGLAND**

Phone: Birmingham, BIRchfields 4571.

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# THE GRAND PRIX CARBURETTER

## features

### UNOBSTRUCTED BORE

for maximum power at peak R.P.M.

Because the metering needle does not pass through the choke of the Carburetter, the only restriction to flow through the Carburetter 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

for rapid acceleration

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

for accurate depression control

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

for accurate tuning throughout the range

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

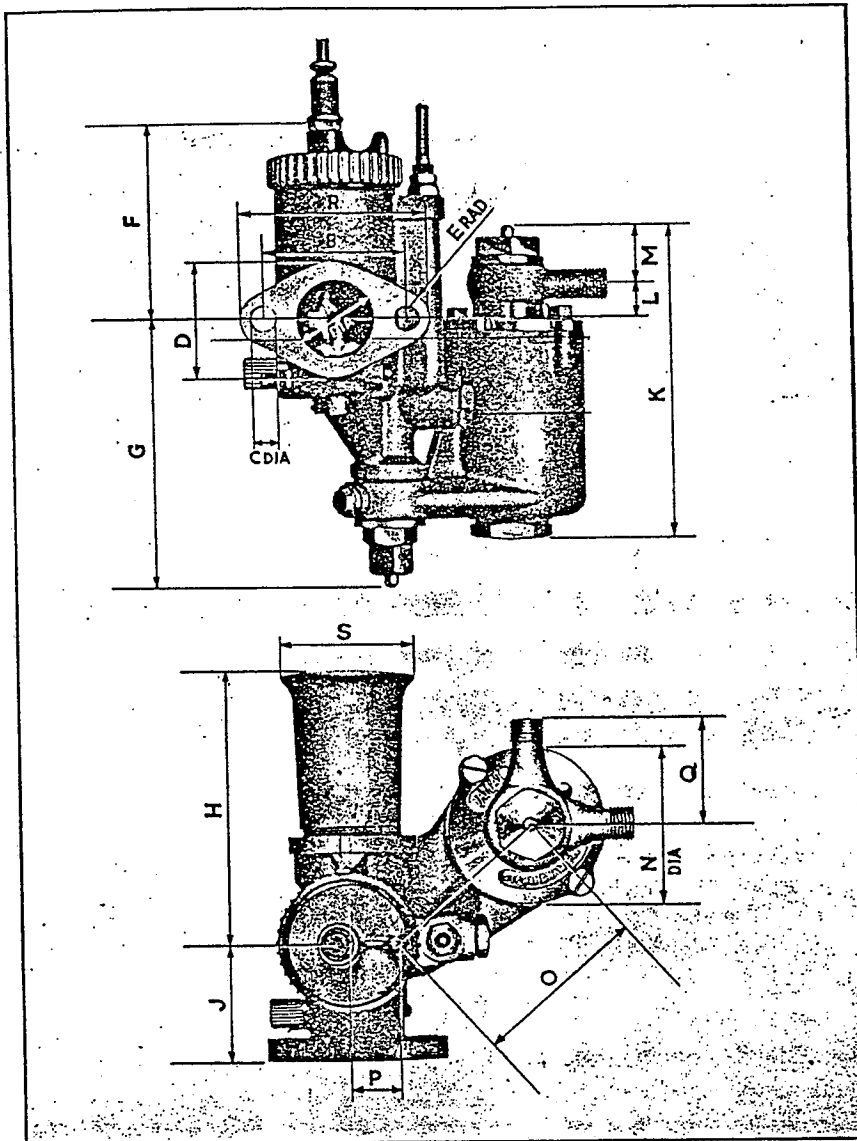
to ensure adequate fuel supply

The float chamber recommended and normally fitted to the current GP carburetter 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 carburetter incorporating a solid mounted float chamber to state the angle of the induction port.

FOR OPERATION AND TUNING INSTRUCTIONS, SEE LIST NO. 104/3.

## 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.

ALTERNATIVE CLIP FITTING	
15GP	1 1/8" to 1 1/4"
10GP	1 1/4" to 1 3/8"
5GP	1 3/8" to 1 1/2"
3GP	—

TYPE	AVAILABLE CROSS BORES A DIA.	B	C	D	E	F	G	H	J	K	L	M	N	O	P	Q	R	S
15G.P.	ins. 7/8, 1 1/8, 1, 1 1/8*	2 ins.	ins. 1 1/2	ins. 1 3/8	ins. 3/4	ins. 2 1/4	ins. 3 7/8	ins. 3 3/4	ins. 1 1/2 or 2 1/2	ins. 4 1/8	ins. 1 1/8	ins. 3 3/4	ins. 2 5/8	ins. 2 7/8	ins. 1 1/2	ins. 1 1/2	ins. 2 1/4	ins. 1 7/8
10G.P.	1 1/8, 1 1/4, 1 1/2, 1 3/8, 1 1/2, 1 3/4*	2 ins. or 65 mm.	ins. 1 1/2	ins. 1 3/8	ins. 3/4	ins. 2 1/8	ins. 3 1/8	ins. 3 3/4	ins. 1 1/2 or 2 1/2	ins. 4 1/8	ins. 1 1/8	ins. 3 3/4	ins. 2 5/8	ins. 2 7/8	ins. 1 1/2	ins. 1 1/2	ins. 2 1/4	ins. 2
5G.P.	1 7/8, 1 1/2, 1 3/4, 1 1/8, 1 1/2, 1 3/4*	65 mm.	ins. 1 1/2	ins. 2 1/8	ins. 3/4	ins. 3 3/8	ins. 4 1/8	ins. 3 3/4	ins. 1 1/2 or 2 1/2	ins. 4 1/8	ins. 1 1/8	ins. 3 3/4	ins. 2 5/8	ins. 2 7/8	ins. 3 3/4	ins. 1 1/2	ins. 3 1/4	ins. 2 1/4
3G.P.	1 1/2, 1 3/4, 1 7/8, 1 1/2*	65 mm.	ins. 1 1/2	ins. 2 1/8	ins. 3/4	ins. 3 1/8	ins. 4 1/8	ins. 3 3/4	ins. 2	ins. 4 1/8	ins. 1 1/8	ins. 3 3/4	ins. 2 5/8	ins. 2 7/8	ins. 3 3/4	ins. 1 1/2	ins. 3 1/4	ins. 2 1/4

\*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 carburetter, 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 carburetter, although we are often asked what is the correct distance between the inlet valve centre line and the centre of the carburetter 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. carburetter 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 carburetter 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 positioning 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 serrations 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 carburetter 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 experiences would appear to require a .1 in. dia. air jet for chokes of up to  $1\frac{1}{8}$  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 carburetter 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. carburetter 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 affectation 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 carburetter 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.,  $1\frac{1}{16}$  in. choke—jet 210

10 G.P.,  $1\frac{1}{32}$  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 carburetter, 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  $\frac{1}{16}$  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 carburetter 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 ILLUSTRATION

## 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.
9. Needle clip.
10. Needle clip retaining screw.
11. Metering needle.
12. Spray tube.
13. Choke adaptor retaining screws.
14. Petrol inlet banjo.
15. Main jet.
16. Mixing chamber cap.
17. Throttle valve return spring.
18. Mixing chamber cap lock-spring.
19. Air tube lock ring.

20. Jet plug.
21. Jet holder.
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 hinge.
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 anti-clockwise 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:  $\left( \frac{\% \text{ increase} \times \text{original jet size}}{100} \right) + \text{original jet size}$

$$\text{namely } \left( \frac{150 \times 300}{100} \right) + 300 = 450 + 300 = 750$$

The answer is, use main jet 750 and the appropriate needle-jet for alcohol fuels as given in a paragraph above.

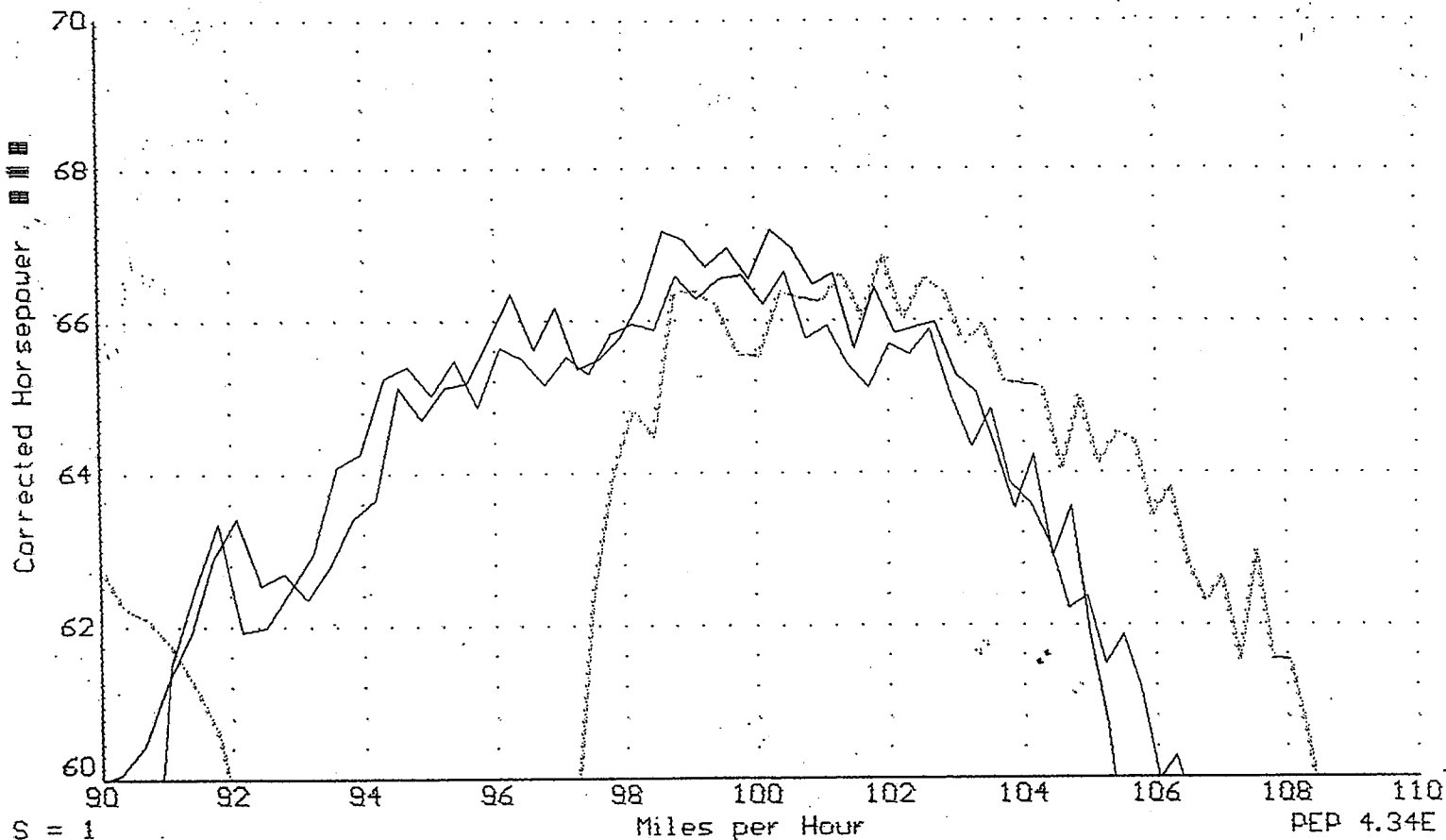
When using alcohol mixtures, the alcohol content of which is not exactly known, "trial and error" will be necessary in finding the correct jet size, in which case it should be remembered that although quite an excessively over-rich mixture can be used on alcohol, the slightest weakness will result in trouble. Therefore, always err on the rich side for the start of the "trial and error" tests. On the other hand, if the exact composi-

tion 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.**

50.156 - NORTON 750 Racer 5th gear CONCORD  
 50.152 - NORTON 750 Racer 5th gear CONCORD  
 50.153 - NORTON 750 Racer 5th gear CONCORD



As measured on DYNOJET'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  
 New Plugs NGK B9EG, .035 .  
 NORRIS 480, Amal Mk II 36mm, 230MJ, 106, 25, 2A1-3  
 55 PIPES, 1.5 VALVE, 5 SPEED, 30 ADVANCE, 103 OCTANE

50.152            81.1 °F    28.18-0.73 in.Hg.    420 ft.    CF=1.05  
 960722           6.75' RW  
 24, 42, 20, 59  
 New Plugs NGK B9EG, .035 .  
 NORRIS 480, Amal Mk II 36mm, 230MJ, 106, 25, 2A1-3  
 55 PIPES, 1.5 VALVE, 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  
 New Plugs NGK B9EG, .035 .  
 NORRIS 480, Amal Mk II 36mm, 230MJ, 106, 25, 2A1-3  
 55 PIPES, 1.5 VALVE, 5 SPEED, 30 ADVANCE, 103 OCTANE

Research in Design, Service to racing.



**ELECTRICAL EQUIPMENT**  
Gold Star 500c.c. Clubmans and Scrambles

Plate Ref. Number.	Model.	Part No.	Description.	Number per set.
23	500 c.c. (Clubmans)	29-9221	Licence holder	1
24	500 c.c. (Clubmans)	65-9164	Rev counter gearbox	1
25	500 c.c. (Clubmans)	67-716	Rev counter gearbox fixing bolt	2
26	500 c.c. (Clubmans)	19-1214	Magdyno	1
27	500 c.c. (Clubmans)	65-9171	Speedo and rev counter mounting plate	1
28	500 c.c. (Clubmans)	29-541	Speedo and rev counter fixing bolt washer (shakeproof)	4
29	500 c.c. (Clubmans)	2-2395	Speedo and rev counter fixing bolt nut	4
30	500 c.c. (Clubmans)	2-443	Speedo and rev counter fixing bolt locknut	4
31	500 c.c. (Clubmans)	2-1462	Speedo and rev counter bracket washer	2
32	500 c.c. (Clubmans)	2-204	Speedo and rev counter bracket screw	2
33	500 c.c. (Clubmans)	65-9111	Speedometer bracket	1
33	500 c.c. (Clubmans)	65-9111	Speedo and rev counter mounting bracket	2
34	500 c.c. (Clubmans)	15-7383	Speedo mounting rubber	4
34	500 c.c. (Clubmans)	15-7383	Rev counter support bracket rubber	4
34	500 c.c. (Clubmans)	15-7383	Speedo and rev counter fixing bolt rubber	3
34	500 c.c. (Clubmans)	27-8560	Speedometer mounting washer	2
35	500 c.c. (Clubmans)	27-8560	Rev counter support bracket washer	2
35	500 c.c. (Clubmans)	27-8560	Speedo and rev counter fixing bolt washer	4
35	500 c.c. (Clubmans)	65-9179	Speedometer bracket bolt	2
36	500 c.c. (Clubmans)	65-9179	Speedometer and rev counter fixing bolt	4
36	500 c.c. (Clubmans)	65-9179	Rev counter bracket fixing bolt	2
37	500 c.c. (Clubmans)	42-9046	Horn	1

**CARBURETTER SETTINGS**

Model	Type	Choke Size (inches)	Main Jet	Throttle Valve No.	Needle Jet	Needle Position
Clubman's 500 c.c.	T3 G.P.	1 $\frac{1}{2}$	350	4	.109	3
Scrambles 500 c.c.	T10 G.P.	1 $\frac{3}{4}$	240	5	.109	3

**PISTON CHART**

Model	Comp. Ratio	PISTONS COMPLETE			COMPRESSION RING (2)			SCRAPER RING		
		Standard	$\frac{1}{2}$ mm. O.S.	1 mm. O.S.	Standard	$\frac{1}{2}$ mm. O.S.	1 mm. O.S.	Standard	$\frac{1}{2}$ mm. O.S.	1 mm. O.S.
500 c.c. G.S. Clubman's	8.0	65-2544	65-2546	65-2548	65-2266 65-1456	65-2267 65-1457	65-2268 65-1458	65-2269 65-2272	65-2270 65-2273	65-2271 65-2274
	8.5	65-2553	65-2555	65-2557	65-2266 65-1456	65-2267 65-1457	65-2268 65-1458	65-2269 65-2272	65-2270 65-2273	65-2271 65-2273
	8.75	65-907	65-909	65-911	65-2266	65-2267	65-2268	65-2269 65-2272	65-2270 65-2273	65-2271 65-2274
500 c.c. G.S. Scrambles	8.75	65-907	65-909	65-911	65-2266	65-2267	65-2268	65-2269 65-2272	65-2270 65-2273	65-2271 65-2274