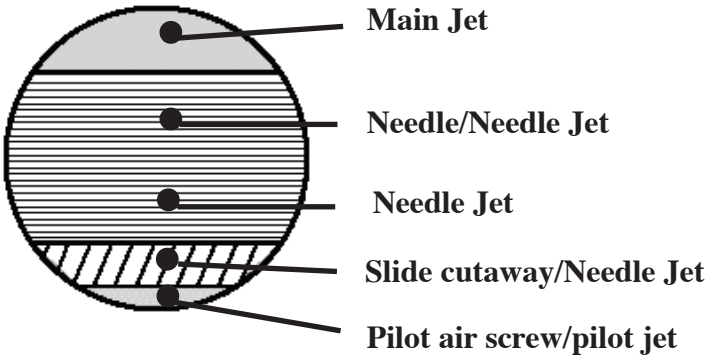
Tuning Your Carburetor

Amal —The Basics (version 5.0 July 2013)

Before you start tuning be sure of the following:

- New plugs, points and condenser (if used) are installed, adjusted, and timing set
- Valves are adjusted and the bike passes a compression test.
- If one is installed, the air cleaner is clean.
- Factory recommended jets are installed and are not worn or damaged.
- The gas cap vent is clear and there are no air leaks in the intake manifold.
- The fuel taps, fuel line, fuel filter and fuel connections will flow enough gasoline.
- **You know how to operate the choke.**



5 Stages of an Amal Concentric Carburetor

Five Stages Of An Amal Carburetor:

Stage one:	Idle to just off idle	Pilot air screw and pilot jet	**To change:** Adjust pilot screw or replace pilot jet
Stage two:	0 to 1/4 Throttle	Slide cutaway #2 Rich to #4 Lean	**To change:** Replace slide - change needle jet
Stage three:	1/8 to 1/3 Throttle	Needle Jet	**To change:** Replace - change needle jet
Stage four:	1/4 to 3/4 Throttle	Needle and Needle jet combination	**To change:** Raise - Lower Needle or replace needle
Stage five:	3/4 to Full Throttle	Main Jet	**To change:** Replace main jet

Too Rich Condition

Float level too high — Raise the float brass needle seat in bowl
Float "sunk" full of gas — replace float
Main jet too large — Install a lower numbered main jet
Slide cutaway too low — Install slide with higher number
Needle jet too large — Install needle jet with smaller number

Wrong needle jet type — Replace needle jet check spec's
Needle clip too low — Raise needle clip to higher groove
Wrong needle - too rich — check motorcycle specifications
Wrong spray tube — replace spray tube with leaner type
Pilot jet too large or missing — install smaller numbered jet

Pilot air screw too far in — turn pilot screw out
Choke on — turn off
Fuel leaking past float needle — replace needle/seat

Too Lean Condition

Float level too low — Lower the float brass needle seat in bowl
Float Bowl gasket surfaced warped - Replace or flaten surface
Main jet too small — Install a higher numbered main jet
Slide cutaway too high — Install slide with lower number
Needle jet too small — Install needle jet with larger number
Needle jet cross drill hole too large — replace needle jet
Wrong needle jet type — Replace needle jet check spec's
Needle clip too high — Lower needle clip to lower groove
Wrong needle - too lean — Check motorcycle specifications
Wrong spray tube — Replace spray tube with richer type
Pilot jet too small or blocked — Install larger numbered jet
Idle pilot gas circuit blocked
Idle circuit spray holes, at back edge of slide blocked
Pilot air screw too far out — Turn screw in
Gas cap vent blocked — Clean out
Fuel flow from tank restricted or blocked
Float bowl vent restricted or blocked — Open vent
Orifice in float needle brass seat too small — Install larger seat
Flow restricted at float needle/seat — Cut slit in bowl to seat

Beyond the Basics

The following apply when you are tuning a worn carburetor:

RICH

Needle jet worn— Replace needle jet (common problem)
Choke plunger leaking (MK1 1/2 & II) Replace choke plunger
Air bleed too small (MKII) — Remove or install larger air bleed

Float needle leaking fuel — Replace needle and/or seat
Slide too tight in body — Slide clearance should be .0035 to .004" clearance in bore

LEAN

Needle jet damaged — Replace jet
Choke plunger body worn (MKII) — Replace carburetor body
Air bleed too large (MKII) — Install smaller air bleed
Float bowl vent blocked — Clear blockage
Float Bowl gasket surface warped — straighten or replace bowl
Float needle seat too small — Check cycle's specifications
Air Leak at float bowl gasket — Replace gasket
Air leak at worn slide or body — Replace or re-sleeve
Air leak at flange or spigot — Replace body
Air leak at balance tube — Repair
Air leak at choke cable hole — Install cable or plug (4/137A)
Pilot Jet blocked - Clean out with #78 Drill

Things to Consider:

• Fuel level will effect the carburetion across the range of the instrument! Set the level before you make any other adjustments!!!!!
• Main jets are the same for all Monobloc, Concentric, MKI 1/2 and MKII carburetors.
• Slides are unique for each model (Monobloc, 600 series MKI, 900 series MKI, etc.) and can vary by size of carburetor.
• Needle jets are unique to each Amal model and application. Needle jets are NOT interchangeable between models of Amal carbs. There are two stroke and four stroke needle jets as well as specific ones for each model.
• Spray tubes are unique for the application 2 stroke, 4 stroke, etc.: Cut straight across or cut at slant or stepped.
• Needles are unique for each model and application. Needles are not generally interchangeable between models or applications.
• Float bowls, with their float needle seat, are unique for each model and vary upon application (gravity fed, side car - fuel pump, alcohol or exotic fuels, etc.).
• Two stroke MKI Concentrics can generally be identified by the removable pilot jet (124/026). Four stroke concentrics have a pilot jet bush (622/107) pressed into airway passage. Two stoke carburetors also have slant cut sparay tube.
• BSA & Triumph used Concentric carbs with removable pilots jets (124/026) in 1968 only. When replacing these early carbs, it is proper to use the later model with the pressed in pilot jet bush. If used, these early BSA & Triumph carbs should also have 622/235 update kit installed.
• Two stroke concentric's spray tube is cut on a slant. Four stroke concentric's have a spray tube cut straight across. Except Triumph BSA triples which are slanted or Norton MKIII which are stepped.

NOTE:

—If your bike is running rich at lower or mid-range throttle openings do not assume, even if you see Amal stamped on the needle jet, that it is the size it claims to be! This applies EVEN IF THE JET IS NEW. Measure ALL needle jets (use CS-0398 measuring standards) before installing them. Very little wear, or being out of tolerance as little as .0005" over the specified size, will cause the motorcycle to run very rich or lean.

—Wear on the straight, portion of the jet needle will have little, if any, effect upon the Air/Fuel mixture. Most Amal Jet Needles measure .0985". Any defect with the straight part of the jet needle will show up at lower throttle openings (closed to 1/4 opening).

—Wear on the tapered portion of the jet needle will have little effect on the mixture and the effect decreases as the needle is raised out of the jet. What I am saying is that unless damaged, clip groove is worn, needle bent or needle taper is severely worn it is not normally necessary to replace the needle.

—As far as wear of the needle and needle jet, the greatest effect on the mixture occurs when the needle jet is worn, and the effect is the greatest when the straight portion of the needle is in the needle jet (around closed to 1/3rd throttle). Any net percentage change in the mixture, as a result of needle jet or needle wear, decreases rapidly as the tapered portion of the needle is raised out of the jet. Worn needle jets effect slow speed running, say up to 30-50 mph or 1/3rd throttle

—To get maximum performance with multiple carbureted motorcycles, it is not uncommon to run different main jets and/or needle settings in each carburetor. Using a main jet one size smaller or larger can cost you several horsepower. The same goes for the jet needle/needle jet settings. Not only will a properly jetted motorcycle be easier to ride, it will have more usable power.

— The design of the needle jet (lengths, internal and external dimensions, location of jet orifices, and air bleeds) effect the mixture the jet will deliver. Needle jets vary from one Amal model to another and from one application to another. They are not all the same, or are they interchangeable!

— Changing the style of spray tube will change the fuel mixture a carburetor will deliver. Amal has three standard spray tubes: straight across, beveled, and stepped. A lot of low end power can be found getting the spray tube correct

— Changing the size of the cross drilled hole in a four stroke needle jet will change how much fuel the needle jet delivers. Making the cross drilled hole larger decreases the flow of fuel through the jet (makes the jet leaner at low throttle openings) and removing, or making it smaller, increases the fuel flow. This has the greatest effect while the straight portion of the jet needle is still in the needle jet. The effect decreases to practically nothing as the needle is raised out of the jet. This is a great tip for those experiencing "megaphonitis."