

# The Norton Carburetor

By Alan Goldwater revised 8/12/03

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The Amal Concentric carburetor was standard equipment on all Nortons from 1967 on. All models were physically similar, with internal details varying to suit the tuning requirements of different engines. When replacing a carburetor these details must be carefully matched to the specific application. Refer to the chart at the end of this article for the details. In addition, your machine may have a combination which works better than the stock settings, so carefully note the jet sizes, needle clip position, throttle cutaway number, and carb body number stamping when disassembling. Art Sirota points out that the 68 Commando carbs had a separate #25 pilot jet, a tiny brass piece screwed into the carb body, while all the later ones relied on a drilled orifice even though they all have the tapped hole for the jet.

Both 30 mm (type 930) and 32 mm. (type 932) bores were used at times on both the 750 and 850 motors. In addition, two types of spray tubes were fitted over the years. This is the brass tube which projects up into the center of the bore. Later 850's had a notch cut off the inside surface of this tube. A previous Notice article suggested that this part can be replaced, but I have found this to be difficult in most cases as it is hard pressed into the body. It is important to use the correct type for your bike, as the non-notched type can cause a midrange "flat spot" if used on an 850 motor (thanks to Ken Armann for this tip). The main slide needles also came in two basic types, and the carb with the cutaway spray tube should have a needle with four rings around the top, while the 750 needles had only two or three (I forget which). I'm not referring here to the spring clip grooves, but rather the shallower identification grooves at the very top of the needle.

If your bike is running ok, with no plug fouling, overheating or missing, you don't need to remove your carburetors for spring servicing. All you really need to do is lube the cables and check screws and bolts for tightness. Take a look at the fuel hoses and replace any that look brittle. Pay special attention to the short piece between the float bowls, as it may have been neglected when the outer pieces were last replaced. If it looks bad, remove both banjo bolts and both petcock nuts, and lift the whole hose assembly away in one piece.

While you have the hoses off, it might be a good idea to remove the float bowls. You will need a stubby phillips head driver, and you may need to grind or file a bit of the tip off this to get a good bite on the screws. They are really what is called Pozidrive, and the cross slots don't go as deep as Phillips screws. Clean out the float bowls and inspect the float needles. If they are the plastic type, replace them with new rubber-tipped brass ones.

Replace the float bowl gaskets and check that the new ones don't foul the float assembly. You can cut away a little bit of the gasket just inside of the float pivot pin to prevent this (thanks to Phil Radford for this tip). Before replacing the float bowls check the size of your main jet and write it down for future reference. Also check the jet holder for tightness. If it comes loose, your bike will run very lean, with missing and overheating likely.

Replace the short hose section with a new piece exactly the same length. This is important, as 1/8" more or less can make it really hard to get the plastic fittings back on and the bolts in. When reinstalling the upper ends, hold the petcock body with an adjustable wrench as you tighten the hose fittings. Turn on the petcocks and wait a while to check for leaks before starting the motor.

If your bike has been slowly losing its performance edge, you should first check ignition timing and valve adjustment before diving into carb inspection. Typical symptoms from worn carbs are unstable idle, hot running, poor gas mileage, and neutral-throttle miss. If you are still unsatisfied after setting the easy things right, remove both carbs with manifolds from the motor. You will need a 7/32 hex key with about 3/8" removed from the short end to do this. Block the intake ports with rags to prevent entry of foreign objects. Remove the top screws from each carb, and the slide assemblies, still attached to the cables.

The most common problem with Amals is wear, and this isn't easy to judge by eye. Often the slides will show

shiny and uneven spots, and still be perfectly serviceable. Much of the wear will be in the carb body, down where the end of the slide would be at cruising throttle, around 1/4 open. If you insert the slide back in the body to this position, you can judge the wear by feel. Move the slide around a bit and you will quickly find any loose spot. If there is more than 20 thou or so (a matchbook cover) side play, it's time for a rebuild.

There are several reputable shops that bore out the bodies and either insert a sleeve or provide an oversize slide with proper fit. New old stock Amal parts are still available, with slides costing \$20 (OldBritts) and bodies around \$60 (BritishOnly). (You can also buy new Amal MKII concentrics which are being made in Spain I think. Or convert to a single Mikuni for around the same price.) Also replace the slide needles and jets as they wear fast when the slides are loose. The main jets are probably ok. Inspect the throttle cables and replace them if the adjusters are stripped or the ferrules cracked.

I won't go into the details of carb adjustment as this is covered well in the INOA Tech Digest, which you should have if you work on your bike at all. Order this excellent book for \$20 from the INOA's Bracebridge St. Depot c/o Jim Evans, 304 May Ave., Glen Ellyn IL 60137.

Here are the stock carb settings for Norton twins using Concentric carbs. **All models use a .106 needle jet, except the P11 and 650SS which used .107.** Remember that if you have less restrictive exhaust components, especially reverse cones on 74-75 850s, you will want a larger size main jet and/or richer needle. This info is copied from Roy Bacon's book "Norton Twin Restoration".

| YEAR  | MODEL   | TYPE*     | MAIN JET | PILOT JET** | SLIDE TYPE | NEEDLE POSITION*** |
|-------|---|-----------|----------|-------------|------------|--------------------|
| 67-68 | Atlas   | 930/7-8   | 220      | 25          | 2          | 2                  |
| 67-68 | 650SS   | 930/?     | 280      | 25          | 3          | 2                  |
| 67-68 | P-11  | 930/7-8   | 250      | 25          | 3          | ?                  |
| 68    | Commando  | 930/26-27 | 220      | 25          | 3          | 2                  |
| 69    | Commando  | 930/30-31 | 220      | 25          | 3          | 2                  |
| 70    | Commando  | 930/46-47 | 220      | 25          | 3          | 2                  |
| 71-72 | Commando  | 930/68-69 | 220      | 25          | 3          | 2                  |
| 72    | Combat  | 932/19-20 | 220      | 25          | 3          | 1                  |
| 73    | 750   | 930/82-83 | 220      | 25          | 3          | 2                  |
| 73    | Combat  | 932/26-27 | 230      | 25          | 3          | 1                  |
| 73-74 | 850 (with reversed cones)                                     | 932/29-30 | 260      | 25          | 3.5        | 2                  |
| 73-74 | 850 (with black caps)   | 932/31-32 | 230      | 25          | 3.5        | 2 or 3             |
| 74    | 850 (with Interstate pipes? This set up looks too rich to me) | 932/35-36 | 260      | 25          | 3.5        | 3                  |
| 74    | 850   | 932/33-34 | 220      | 25          | 3.5        | 2                  |
| 75    | 850   | 932/33-34 | 230      | 25          | 3.5        | 1 or 2             |

**Notes:**

\*Number stampings: 930/7-8 means that left and right 30mm carbs will be stamped R930/7 and L930/8

\*\*Where fitted most Commandos omitted this part.

\*\*\*Top groove is position 1 and is leanest.

## SPRAY TUBES AND SLIDE NEEDLE VARIATIONS

The following notes from an Amal manual were contributed by Steve Shiver:

...grooves referred to are at the top of the needle, above the clip grooves

2 grooved needle = PN 622/124 = 4 stroke

...used w 622/124 needle jet and 622/124 jet holder [600 series]

3 grooved needle = 2 stroke use w 622/079 jet, 622/080 jet holder

4 grooved needle = 928/104, 4 stroke developed for 850 Nortons.

...used with stepped spray tube 928/107

Spray tubes

622/074 = 4 stroke, Cut Straight across

622/075 - 2 stroke, Cut at slight angle from opposite side

622/123 = Trident, Cut at angle from mid point

928/107 = Norton MKIII special, stepped.

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