TECH. TIPS cont.

your degree wheel will indicate exact T.D.C., and no B.S. and no guess work. You can now remove the T.D.C. tool and proceed with the timing of the engine. Note that in the future you need not go through this again. Merely affix degree wheel, do the thumb trick, then insert the plug, turn the wheel till it stops, and bump it back and forth a couple of times to loosen the carbon on the piston top. With piston top resting on the T.D.C. tool, reposition degree wheel to show previously noted number of degrees B.T.D.C. You can now remove T.D.C. tool and proceed with ignition timing. At this point, I might inject that if you're eligible for Retread Status or otherwise forgetful - at least some of use have an excuse - etch the degree number on the T.D.C. tool with a prick punch or similar sharp instrument and the next time you won't have to go through the forward reverse stuff again.

While we don't have time for lengthy theoretical explanations, a little might be in the offing. If one stops the piston at a certain number of degrees before T.D.C. and measures, there would be a specific distance before the piston reached the top - say one inch for 25 degrees. That same distance after T.D.C. would equate to the same number of degrees with the same measurement. T.D.C. is the central point between when the piston stops going up and when it starts going down. There is usually a couple of degrees of crankshaft rotation with no piston movement. This is where you can get loused up and be off a little in your static timing. It follows that T.D.C. is the point midway between these two measurements.

Now lets talk about making these little goodies and the cost which is the best part. To begin with, we need the degree wheel which most Ducati freaks already have. Mine is a Webco, which cost around $6.00. If no cycle shops in the area have one and the Japs probably won't as they aren't used in timing most of those bikes, try local auto speed shops, etc. This is the only piece that can't be obtained at the well-stocked hardware store.

We'll need the following:

One old 14 M.M. ½ in. reach spark plug; one 5/16 in. socket head bolt 1½ in. long and a nut to fit. Note that socket head bolts are invariably standard thread; one 3/8 in. x 2 in. socket head bolt and nut. Note that this nut must be 9/16 in. in size and be of high quality and not your mail order junk hardware. A good rule of thumb is if your hardware dealer has hex head bolts with heads like these then the nuts will probably be good quality also; one 1/8 in. roll or split pin; one metric bolt 8 M.M. x 70 M.M., two 5/16 in. flat washers, one 8 M.M. nut, one 1/4 in. diameter x 2 in. galvanized or plain steel pipe nipple; one piece of .035 or approximate x 3/4 in. wide x 5 in. long aluminum.

First lets construct the T.D.C. tool from the old spark plug. Secure spark plug in a vise with top of plug facing outwards. You will note a rounded shoulder between the hex of the plug and the porcelain. We want to remove this shoulder with a hacksaw. Saw through the shoulder until blade contacts porcelain. Each time this happens, rotate plug in the vise one flat. When completely around the plug, the shoulder should fall off. Now turn the plug around so the ground electrode faces outwards and with the saw, remove electrode.

You should be able to drive the center electrode out of the spark plug from the firing end with a 3/16 in. drift. Wrap a shop towel around the punch if it requires more than a light tap as the porcelain might shatter. Now file or carefully grind to smooth out the ends that were previously cut with the saw. The 5/16 in. x 1½ in. bolt now comes into play. I used an old Bosch plug and it required reaming of the hole before the bolt would go through. This can be done with a hand reamer or 5/16 in. drill bit. Next we need to file or grind down the 5/16 inch nut. If a person has a drill mounted grinder or a bench grinder, this is easy. If not, it only requires a little more patience. What we are trying to do is grind down a hex nut until it is round and approximately the same diameter as the end of the spark plug which protrudes beyond the end of the threads. This is a diameter of .440 and can be measured accurately enough with a Japanese micrometer (small crescent wrench). The grinding can be done by tightening against the plug before grinding, or by grinding down on the bolt first. If done on the spark plug, be careful of the threads. Before completely tightening the nut, which should now be round, onto the bolt which is now installed through the plug, attempt to install the plug in the spark plug hole. If it doesn't go in, don't force it as you may have to grind it smaller. The last step is to grind the end of the bolt to a rounded tip so it won't nick the piston. Try to do this accurately by doing a little at a time and turning in a circular motion while grinding.

This becomes important when again installing plug in the cylinder and perhaps not torquing quite the same.

Next lets make the tool to remove the clutch cover plug to install the degree wheel. I expect many of you to say, "Hell, just use a bolt with a 9/16 in. head and a pair of vise grips." Fine, that works just as good, but for the guy who wants everything up to snuff, this only requires ten minutes. Locate the 3/8 in. allen bolt previously called out, tighten nut on the bolt all the way. Now, with the allen wrench in the head of the allen bolt, affix the allen wrench in the vise with the nut facing upwards. You'll find an 8 M.M. allen wrench will fit the american bolt snugly. With socket and torque wrench, tighten to rated capacity of bolt, which is 54 F.T. Lbs. (Allen head bolts are the strongest available). That's probably why they are used in a Ducati. Now cut off remainder of bolt protruding beyond nut.

Hope you've got a quality hacksaw blade! Now with the bolt on a flat surface, (anvil portion of the vise or concrete floor), carefully mark for the center of one of the flats on the nut. Now we will drill straight through the nut with a 1/8 in. drill bit. This is best done in a drill-press with slow speed to keep from wallowing the hole and in the interest of accuracy.

In any event use a new or sharp bit and oil before starting to drill, if big hand drill; this assures that you won't have to stop to lube the drill. After drilling the hole, drive the roll pin through the nut and cut off excess. Now file lightly to smooth the end of the bolt previously cut off and the roll pin ends. This completes the plug removal tool.

Find the piece of aluminum. You could use a piece of aluminum can and a pair of old scissors if you don't have a pair of metal shears. Trace this on the aluminum and then drill 1/4 in. hole first, then cut out to pattern. The dotted line is for a 90° head. Also, the last 1/8 in. or so on the pointed end can be bent down the first time its put on the bike.

The remaining pieces are to be used to affix the degree wheel to the crankshaft. Use a washer on either side of the degree wheel, then slip the pipe nipple over the bolt and install the nut. This assures that nothing can fall in the clutch housing during installation. With the nut hand tight, the degree wheel can be installed using the wheel to spin it into the end of the crankshaft. The pointer fastens to the clutch housing bolt most accessible to the degree wheel.

You will find that excluding the degree wheel, the cost of all items to be not more than $3.00.

Happy Timing
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