

Moped Hospital Racing
*Installation of performance
parts*

MANUAL



Tecnigas Extreme Super 9



These pages are to help the shop/person installing the parts that we sell. It is a general explanation of the installation/tuning procedures needed to have the product perform as expected. **Make sure the bike is fully derestricted before installing these parts.**

Exhaust & Clutch

When installing a performance exhaust it is absolutely *critical* that the roller weights be changed. These are usually supplied with the exhaust system. This allows the engine to be in the engine rpm band it needs, to be efficient. Some brands of bikes such as the Yamaha Vino and Zuma the clutch springs must be upgraded also. A typical symptom of having the wrong roller weight is that acceleration will be weak up to 20-25 mph and then start pulling strong. Symptoms like this are the rollers are *too heavy* and need to be 1 gram lighter. Clutch springs affect the *initial take off* only. The first 10 feet of movement is controlled by the clutch. Either an aftermarket clutch can be used or the original clutch springs can be replaced with stiffer ones that allow the clutch to engage at higher rpm's. Sometimes the clutch shoes are so heavy from the factory that the only choice is the aftermarket unit. The ETON and CPI brand is a perfect example of this. Rider weight also affects the rollers that should be used. The ones from Tecnigas are based on the average rider of 150 pounds. For every 50 pounds of rider weight the required rollers may need to be varied by 1/2 gram. Rollers are a **tuning aid** and the "golden" weight varies.

Carburetion jetting should not need to be changed if just the exhaust /clutch are replaced. If installing a larger cylinder kit it is critical that more fuel is supplied. Never install a larger cylinder kit without changing the jetting/carburetor also.

When installing an exhaust always mount to the exhaust flange first (loosely) then to the rear mounting bracket. Everything should be aligned first *then* tightened. Some minor fitting might be required but is rare. If brackets do not line up it is possible they are reversed.

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To install the rollers remove the clutch cover. With the cover removed squeeze the belt to get some belt slack. Using an impact wrench remove the front variator nut. Remove the outer variator half. Slide the belt off the shaft and out of the way. Now slide the inner half with the back plate off the shaft. Remove the rear back plate and you will now see the rollers. Pay attention that the 3 plastic guides do not fall off the rear plate. Now replace the rollers with the ones supplied and assemble in reverse order.

With all the different brands out there today some share a common engine design. ***It does not mean it is the same engine.*** Again the Vino and New style Zuma share common parts but the drive belts, reed blocks and engine cases are different. To get the correct parts call and confirm the model and brand.

Cylinder

Replacing a cylinder is not that difficult. It is more time consuming than actual physical labor. Removing the engine panels/plastic is a good idea for the extra room to work in. For most air cooled engines it is a matter of removing the exhaust and then the fan cover and air shroud surrounding the cylinder. Pay attention to any hose, cable or electrical routing before removing. I can not stress enough to take notes as you disassemble the components.

With the above components removed you will see (4) nuts holding the cylinder on to the engine block. Take these off paying attention to any washers that might be underneath. Lightly tap the cylinder to loosen the base gasket and slide off the engine. The piston and ring assembly will remain. To remove the piston you will need a small needle nose pliers. Block the engine case with a clean rag so nothing can fall inside the engine. Using the needle nose pliers gently pry the piston clip out of the groove. With it removed push the pin from the other side using a small screwdriver and remove the piston from the rod. Be careful of the wrist pin bearing falling out and getting lost. Make sure the gasket surface is clean for the new assembly. Old gasket material can be removed easily by using a razor blade.

Install the ring /rings on the piston and install one of the piston clips. Confirm that the wristpin bearing is in place. Position the piston [any window/s on the piston skirt should face up. If the top of the piston is marked EX make sure it faces the exhaust port] and slide the wrist pin through. Install the other piston clip. **Make sure the open ends of the clips are facing straight up towards the very top of the piston.** Visually check to make sure they are seated in the grooves and not bent out of round. If they are, replace them!! **They will certainly come out if deformed.**

Install the base gasket and make sure it is positioned correctly on the lower engine case. Position the piston ring/s so the open ends are centered on the locating pin of the piston. If out of position the cylinder will not slide on. The cylinder should be lightly oiled with 2 stroke oil and while squeezing the ring/s with your thumb and middle finger gently slide the cylinder on with a rocking motion. If you have trouble, check the pistons ring position again!!! **Never force the cylinder!!!**

With the cylinder now fully down install the head gasket and cylinder head. Torque the cylinder nuts down to the suggested setting (generally 1.4-1.7 kg). Install the fan shroud and cover in reverse order.

Use NGK B8 range for cast iron cylinders
Use B9 range for aluminum cylinders
For the first tank use 50:1 premix

Carburetor & Jetting

This section is primarily for the Dellorto and Arreche carburetors. Installing the larger displacement cylinder requires more fuel. Most stock carburetors do not have the fuel metering flexibility for the lower throttle ranges. As a general rule either of the above two carbs should be used when installing a cylinder kit. The low speed jet and needle taper are made for this type of engine modification. The only tuning left on your end is the

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main jet and slide needle position. Idle and air mix varies but the fuel/air should be $\frac{3}{4}$ to 1-1/2. Idle is adjusted to original manufacturer's recommendations.

Installing the carburetor is trickier as sometimes modification is needed to be done to the original throttle cable. Most of the time it is a straight exchange with the original. Before installing the new carburetor check your main jet size and the slide needle position. Write this down for a reference point.

Attach the air filter assembly and crank the bike over for 2-3 seconds. Most bikes use a vacuum valve and it takes a full minute for the fuel to fill the float bowl of the carb. Hold the throttle at $\frac{1}{8}$ and try to start the bike. When the bike starts adjust the idle first. Set the fuel/mix at $\frac{3}{4}$ turn.

Let the engine idle for 10-15 minutes!!!

Start your testing for plug readings (porcelain insulator) at *1/8 throttle first!* Make sure the engine is at full temperature when doing this. After $\frac{1}{4}$ mile kill the engine while still holding the throttle at that position. Stop the bike and remove the plug. It should be a cardboard brown. If gray turn the mix screw in $\frac{1}{8}$ turn and test again. When you get the correct color then you have finished adjusting the air/fuel screw. Now it is time to check the needle setting. Run the bike at the $\frac{1}{4}$ to $\frac{1}{2}$ throttle position. Again, if the plug is gray or white raise the needle by setting the clip 1 notch lower. If the plug is black lower the needle by raising the clip position 1 notch. Final test is $\frac{3}{4}$ to full throttle. The fuel is delivered in this range by the **main** jet. If gray or white increase the main jet size by a minimum of 2 sizes i.e.: if you have an 80 installed go to an 84. Test again until correct color is reached. Pay attention to any engine noises during testing. Pinging or knocking is a sign of not enough fuel. **Shut the engine off immediately!** When jetting is completed keep a log of the model, slide needle positions and main jet. Each next job will now be easier and faster. Always jet richer (more fuel) for safety. Temperature and humidity change daily and this will give a safe margin.

Holes in the piston is not enough fuel period! Seizure is caused by lack of fuel and or oil! Make sure that the oil pump is synchronized to open at the same time as the throttle side and indexes to the full open



Open seat and remove the (2) rear luggage box bolts. The (2) cap nuts at the bottom of the box. There is also a large Philips screw underneath the seat hinge. Remove the oil cap and rubber washer. underneath.



move the seat bucket. Look at the really neat engine layout!

Now is the time to start taking notes!



Remove the spark plug cap. Remove the rear fan cover screw near the intake manifold. Disconnect the oil pump cable.



Remove the (1) 8mm exhaust bolt and loosen the other. Remove the 6mm fender bolt.

Remove both 6mm exhaust cap nuts. Then while holding the exhaust firmly take out the last 8mm bolt and remove the exhaust.



Locate and remove the (3) 6mm fan cover bolts.



Remove the fan cover.



Make sure the oil pump cable and spark plug cap is disconnected. Double check that the left rear air should bolt has been removed.





Remove the air shroud.



Loosen the (4) cylinder studs and lightly tap the cylinder to loosen the base gasket.



Completely unscrew the (4) 7mm cylinder studs and remove the studs, cylinder head and head gasket.



Remove the cylinder carefully avoiding any material from falling into the crankcase.

Place a rag or paper towel in the crank case. Remove 1 of the wrist pin circlips and push the wrist pin out and remove the piston assembly.



Looking at the piston I can tell this bike was not broken in properly. Bad customer! See the carbon build up below the 2nd ring? That is caused by blow by because the rings had not seated before our bad customer started doing speed runs.



Today, we are going to put on a really neat AIRSAL 47.6mm 73 cc cylinder!



Here is a different view of the cylinder kit. Note the single ring piston.





Push the new wrist pin into the bosses just shy of the groove for installing the circlip. Then install the left hand circlip first. Then remove the wrist pin. Note the arrow on the top of the piston faces towards the exhaust.



Make sure the circlip is in the exact position shown so there is no chance of the clip coming out at high rpm.



Install the ring on the piston so the ends are aligned with the retaining pin as shown.



Make sure the base gasket surface is clean and with a clean towel in the crankcase install the piston on the rod. Install the other circlip exactly the same way as the one before.

Align the base gasket with the cylinder base and use 2 studs to hold the gasket in place. With the piston ring aligned to the retaining pin. Squeeze the ring to compress and slowly slide the cylinder down. Line up the cylinder to the crankcase threads using the (2) studs and push down so the cylinder weight holds the gasket in place.



Remove the 2 studs and slide them through the cylinder head and head gasket using the same as above procedure. Torque all four studs to 1.4-1.7 kg. Tighten slowly and evenly in an X pattern. Install the air shroud. **For Cobra Airsal cylinders add (2) 7mm washers to each stud to compensate for the different cylinder/head dimensions.**



Install the oil pump cable. Make sure the lock nut is secure!



Check for smooth operation of the oil pump. Make sure the pump moves at the same time as the throttle slide and that the index marks are aligned at full throttle. Now reinstall the fan cover and the exhaust. Note the rubber grommet for the harness is installed correctly in the air shroud near the exhaust.





Loosen the clamp from the carb to the airbox.



Remove the two (2) 6mm bolts holding the air box to the engine case.



Squeeze the clamp with 2 fingers and remove the air inlet pipe from the air box.



Remove the air box.

Locate and remove the (2) 6mm nuts holding the carb to the intake manifold. Note the location of the nylon spacer with the O-ring as it is directional



Slide the carburetor back and unplug the drain hose from the bottom of the bowl.



Rotate the carb and remove the (2) screws holding the float bowl.



Remove the float bowl being very careful not to bend the float level adjustment! Note the location of the main and low speed jets. The main is in the center. They are about to get larger!





Unscrew the low speed jet and drill out with the neat jet drill I got here.

Please note that this is not always possible depending on carburetor design. This is a special application for low speed driving on our congested city streets in Key West.



Unscrew the main jet and do the same with the main jet or use (1) size larger for extra insurance. Now reinstall in reverse order.

Congratulations you have just done your own cylinder kit!!!

These are the steps for the Kymco Cobra Racer model. These basics still apply regardless of the brand of machine. We cannot be responsible for any omissions in this manual due to manufacturers changes in production. **Remember these parts are for off road use only!** We certainly hope this is helpful and appreciate any feed back.

If any questions please call us.



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