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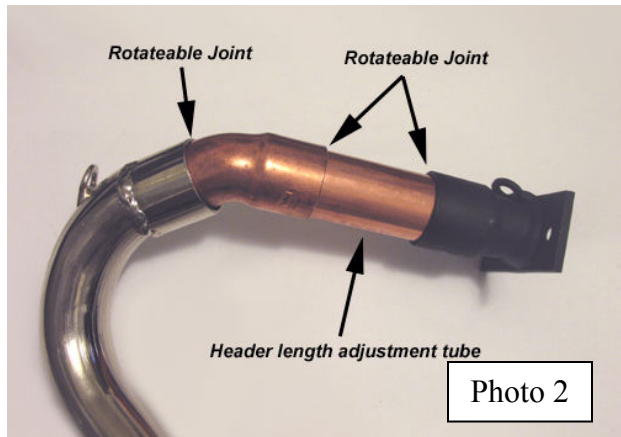
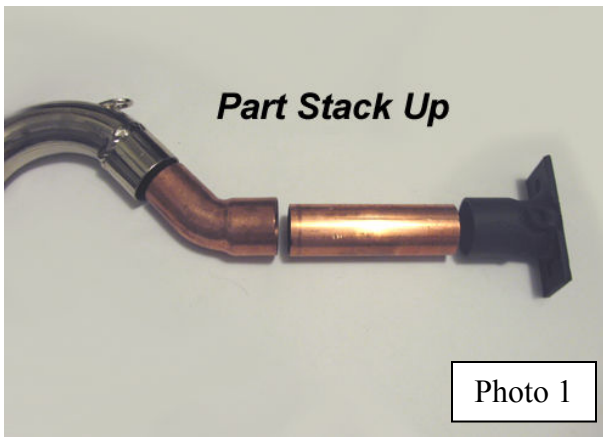
These instructions are simply a guideline and some modifications and even extra parts may be required.

Prior to installation you should have your engine tuned properly. This is done primarily by tuning your carburetor. The best way to ensure that it is tuned correctly is by checking your spark plug. This is discussed in Section 2.

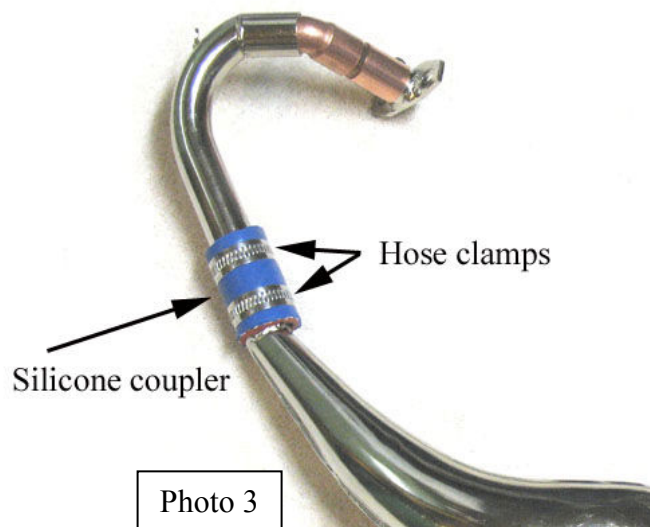
Section 1

Tuned Pipe Installation

1. Remove old pipe
2. Install new header onto engine. No need to tighten it all the way, we are just test fitting at this point.
3. Assemble the fittings in the order as seen in photo 1 with the end result appearing in photo 2



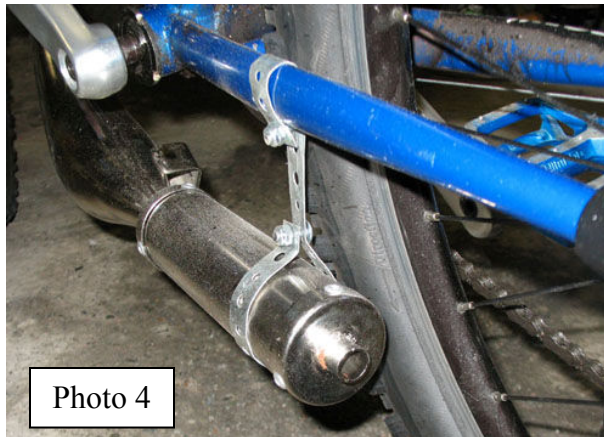
4. Check the weld at the start of the expansion chamber. Remove any excess weld material with a moto tool.
5. Assemble the "J" pipe section to the expansion chamber using the large silicone coupler and the 2 hose clamps as shown in photo 3. Some material removal may be required to get the sections to mate. Ensure that they fit tight though. Silicone tubing can withstand tremendous heat but will deteriorate over time when exposed to hot exhaust gasses. Periodic replacement of the silicone coupler may be required.



6. Now the fun part, trying to make it fit your bike. By rotating the pipe around the various joints, attempt to find a position that the pipe fits without hitting your pedals, chain or tire. There are three joints that can be

rotated, the exhaust header to 45 degree elbow, the 45 degree elbow to the pipe and at the silicone coupler. Twisting the pipe at these three locations should allow you to fit the pipe.

7. Once a suitable position is obtained it is now time to find a location to support the back half of the pipe. This may take some creativity but this is one method that works. Holding the pipe in the position that you like, find a spot on your frame that lines up directly over the center of the pipe.
8. Use the strapping material along with the supplied nuts and bolts to strap the pipe in place as shown in photo 4



9. Proper selection of the holes for the mounting bolts is critical. You want to select ones that will actually clamp the strap around the frame and muffler so that it will not slip or twist. Pre-bending the strap to fit the frame and muffler helps find the correct holes.

Note: This mounting method may not work for your bike. There are many other options to mount the pipe. Some fabricate a bracket out of aluminum or steel and use the kickstand hole in the frame and the welded mount on the pipe. Some mount their pipe up as seen in photos 7 and 8. This requires purchasing an additional 45 degree copper fitting. Additional hardware is included in the kit to assist with some of the alternate mounting methods.

Here are some other mounting options.



10. Once your rear hanger has been fabricated, install the spring to connect the header assembly together. We recommend that you file or moto tool the edges of the rings where the spring clips on. These sharp edges can cut the spring due to vibration. You have 2 options, you can place the exhaust header with the welded ring on top or on the bottom. Try both and see which holds your pipe better. If you mount the spring on top you will want to use only one, see photo 9. If you mount it on the bottom you can try only one or you can try using both by having each one go around the pipe and meet back at the ring on the other pipe. See photo 11 for an example.
11. Remove the pipe from the bike.
12. Remove the header from the engine.
13. Test fit your exhaust gasket to the engine, cut the opening to exactly match the opening of the exhaust port on the engine. This is best done with a moto tool and sanding or grinding drum.
14. Now use the exhaust gasket as a template to match the exhaust header on the pipe. Try and make a smooth transition. This is best done with a moto tool and sanding or grinding drum.
15. Install the gasket and header and tighten to the engine, exhaust gasket sealer can be used alone or along with the gasket.
16. Attach the pipe to the header using the supplied spring and attach your rear hanger.

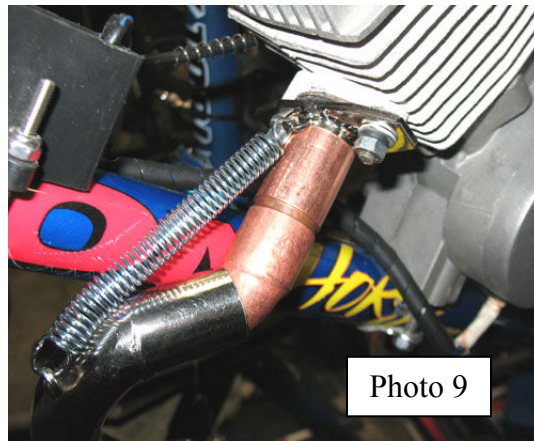


Photo 9

Note: You will have 3 small pieces of tubing left over. These are used to seal the joints at the header to keep any oil from seeping from the joints. We recommend you complete Section 2 before doing this.



Photo 10

Finished Installation

Section 2

Carb tuning

Now that you have the pipe installed we will need to get a reading on your spark plug to see how it affected your mixture.

To correctly check a plug, bring your engine up to operating temperature, 5 minutes of running should do it. Run your bike at full throttle for between 1/8 and a 1/4 mile. It may be best to do this on a slight incline if you fear over revving your engine. At the end of the run kill the engine while still at full throttle. Let the engine cool and remove your plug.

How does it look, black and oily, a chocolate tan color, or white?

If it is a chocolate tan color you are fine.

Here is an example of a plug from a properly tuned mixture.



If it is darker and oilier than this you are running rich, in other words you have too much fuel for the amount of air your engine is getting. Your first option is to lower the needle on your carb slide. Raise the e clip up one notch and test again. Repeat if necessary. If you find yourself on the top notch and it is still rich you will have to get a smaller main jet or fill and re-drill the one you have. To fill and re-drill requires carefully soldering up the hole in your jet and drilling it out with a smaller diameter drill. Be very careful to use only proper bits. One thousandths of an inch can be a huge difference on a jet.

If your plug is lighter than this you will need to increase the amount of fuel getting into your engine. Your first step is to raise the needle. Lower your e clip one notch and test again. Repeat until the chocolate tan color is achieved. If adjusting the needle does not get you to the correct plug color you will need to increase your jet size. This can be done by re-drilling your jet or purchasing a larger one. Just to stress again one thousandth of an inch makes a big difference.

Section 3

Pipe tuning

Now that your carb is tuned correctly, your engine should be running very good. To get the last bit of extra power that the tuned pipe has to offer you will want to adjust the length of the exhaust

header. Tuning is a bit of a personal thing and unless you have a dyno only you will be able to feel what you and your bike need.

How does it ride now? Does it have good torque, but doesn't seem to keep pulling at higher rpm's? Does it keep pulling in the higher rpm's but you would like more torque or pull at the lower rpm's?

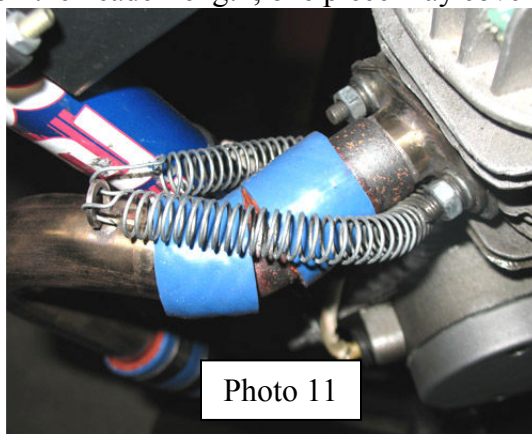
The length of the pipe in the stock configuration is longer than it needs to be in most cases. If you would like to increase the power in the upper rpm range you will need to shorten your header length. This is done by removing and shortening the section of straight pipe between the exhaust header and the 45 degree fitting. Remove $\frac{1}{4}$ inch sections at a time and retest. Continue shortening this header until you get what you are looking for.

A word of caution, these engines only produce so much power. You cannot expect to just keep shortening the header length and it will continue to rev higher. There is a point where the port timing of the engine just will not allow it to rev any higher and on these motors is probably a good thing or we would blow them up.

Another tip, the smaller 49cc engine is designed to rev higher and will therefore want a shorter pipe, however to maximize the lack of torque of the smaller engine you will want to leave it a little long. The opposite is true for the 69cc engine. It has a lot of torque so you will be tempted to shorten the pipe to get it to rev higher, again there are limits. It may be better to tune it for maximum torque and then adjust your gearing accordingly.

Gearing also plays a large roll in tuning. Finding the right gear ratio in conjunction with your engines power band will also make a big difference.

Now that you have completed your tuning we recommend that you remove the spring at the header and install the 3 small pieces of tubing over the joints at the header. These pieces are tight and take some pressure to get them on. It is recommended to use soapy water to assist in sliding them onto the pipe. It is also a good idea to wear gloves as the pieces of pipe can be sharp. It is easiest to put one piece on the end of the chrome pipe, one on the large side of the 45 degree elbow and one piece on the large fitting on the exhaust manifold, reassemble the pipe and slide the tubing over the joints. If you end up going very short on the header length, one piece may cover 2 of the joints as seen below.



It is a good idea to retighten the hose clamps at the silicone coupler after a few runs to ensure it does not slip off.

If you have access to a welder, feel free to weld up the joint where the silicone coupler is. Be sure that it remains in alignment. We do not recommend that you weld or braise the copper fittings. They can become weakened and lose their strength and you will also lose the ability to tune your pipe by altering the header length.