

MOPED BICYCLE ENGINE KIT INSTALLATION



Note: Mechanical aptitude and ability is required to perform this installation. Many “do it yourself” backyard mechanics will find this project rewarding. However, installation is sometimes best done by a professional mechanic. A rewarding joy and challenge can be found in designing a custom installation of your own. As with all motorized bikes it is essential that the front and rear wheels have good brakes to ensure safe operation. Front wheels with disc brakes are a good option and may be obtained at most bicycle shops. Break in your engine slowly with a rich oil / gas mix of 16 to 18 parts oil to one part gas in the first tank full. Remember, a quality installation and engine break in with the right oil mix is paramount to safe usage and long term satisfaction. Have fun and good luck on your motorized project !

General Information:

Obey all traffic regulations. Always wear a helmet while riding. Remember that you are riding a motorized bicycle and other traffic may not be able to see you. Never operate your motorized bicycle on a pedestrian through way or sidewalk while the engine is operating. Never unsafely operate your motorized bicycle.

Before Installation

The two most critical steps in installing the kit are:

- 1) Positioning the engine in the frame
- 2) Installing and aligning the sprocket on the rear wheel.

Proper alignment of the engine and sprocket will have beneficial effects on the balance, vibration dampening and ultimate power of your ride. All the other parts of the kit will fit wherever your particular setup allows.

Affixing the Engine

Position your engine as low in the center triangle of your bike frame as it will go.



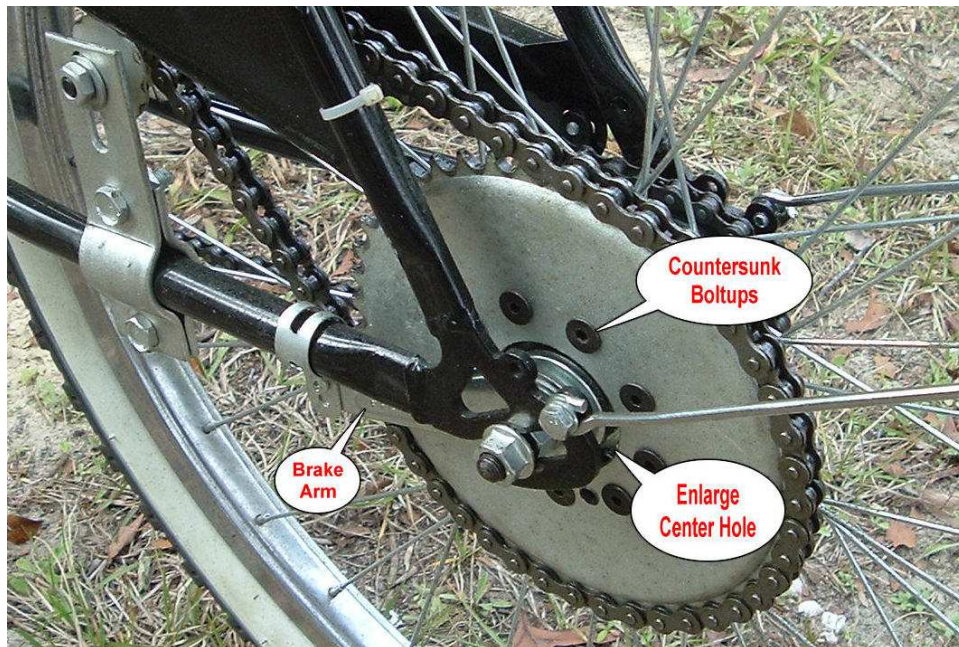
Knock or grind off any water bottle fixtures that interfere with either motor mount. If the front down-tube is larger than the front motor mount, fabricate a supplemental front motor mount similar to the one in the picture below – then bolt up both motor mounts taking care not to over-tighten any bolts.



Install & Align the Sprocket

Make one cut thru one of the fiber sprocket mounting rings – between holes. Insert the cut ring inside of the spokes; run the 9 bolts thru the sprocket (convex side out) and the outer fiber ring; then weave the 9 bolts between and thru the spokes, thru the inner (cut) ring, thru the 3 metal retaining segments – finally bolting it all up with a nut and lock-washer on each bolt inside the rear wheel. Three important things: 1) Position the sprocket with the convex side facing outward; 2) Pay particular attention to accurately center the sprocket about the rear wheel axle; and 3) Spin the rear wheel and use a lead pencil to detect any wobble in the sprocket – tighten the bolts where the pencil touched the sprocket – until you're satisfied that your sprocket is as well aligned as it can be.

If, by chance, you're working with a coaster brake (old fashioned foot brake), you'll have to rework your sprocket to accommodate a larger rear wheel bearing housing and the coaster brake arm. A machinist was asked to countersink the 9 sprocket bolt holes and drill out the center hole to make my hookup work. Replace the kit's 9 bolts with flat-head bolts in order to clear the brake arm. (see the picture below).



Hookup the Drive Chain

Take your chain and feed one end of it up into the top side of the little drive sprocket housing in the back of the engine. Use a screwdriver to turn the sprocket and feed the chain up, over and back out the bottom of the housing. Mount the chain idler fixture about where you see it in the photo. Start with the idler set as low as possible – then place the chain over the idler and rear sprocket - bring the ends together to see just how many links need to be removed to make the chain reasonably tight (max $\frac{1}{4}$ inch deflection). Put a bread tie thru the link where you'll break the chain (so you won't lose your place). A chainbreaker tool is ideal – but a hammer and a sturdy finishing nail can punch out the little pin to “break” the chain. When installing the repair link, position the gap in the slip-on keeper to the rear. Now adjust your idler upward just enough to establish the proper deflection. You should have space left to adjust for chain stretching later.



Fuel System & Carburetor

Screw the fuel filter and shut off valve into the rear of the gas tank. It's a good idea to buy a cheap fuel filter and install it in the fuel line close to the tank. Mount the tank on the top crossbar of your bike, taking care again to not over-tighten any bolting. Assemble the needle, spring, keepers, slide and cable in the carburetor – insert the slide in the carburetor housing, rotating it until it meets its groove and fully drops in place. Hookup the throttle twist grip – the carburetor slide should raise almost an inch while the grip twists about a half a turn. You can take the slack in your throttle cable off by taping the grip end gap and applying heat shrink tubing to firm up the hookup. Install the carburetor on the intake manifold. Measure, cut and install the fuel line.



THROTTLE with kill switch:

Kill switch; one wire goes to white wire from engine and the other to frame grd.



Drill small hole in handle bar for pin lock.



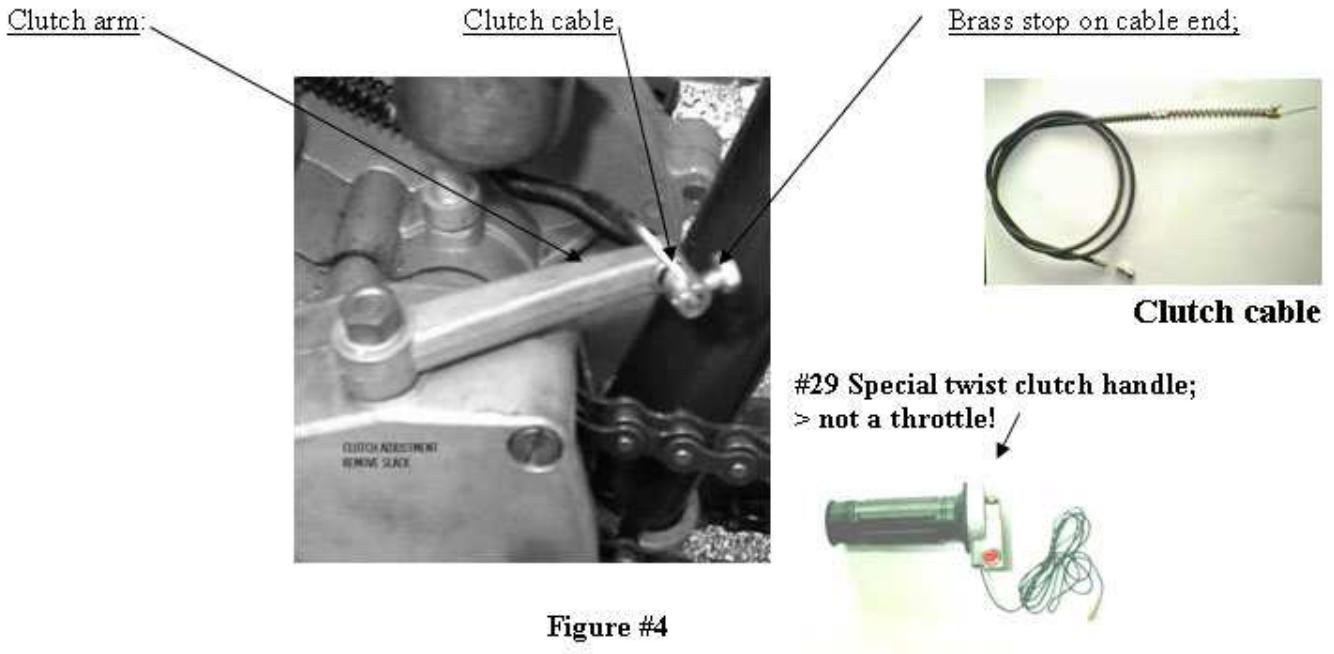
Ignition & Electrics

Mount the Kill Switch and Ignition module where their wires will reach those coming from the engine (again – don't over-tighten things). Hook up the two black wires coming from the ignition module and the engine. Hookup the green/blue wire from the ignition module with the blue wire from the engine – AND the black/red wire from the kill switch (mounted up on the handlebar by the throttle). The other black wire from the throttle kill switch will need to connect to the frame of the bicycle for a ground. Install the spark plug and the plug wire (unscrew and discard the little cap on the top of the plug).

The white wire coming from the engine is the electrical output of the motor's generator: 7.5 volts at 0.5 amp. DO NOT hookup the white wire to anything other than whatever electrical gadget(s) you may have. Remember that exceeding 3.75 watts (7.5V x 0.5@) will kill the engine – so be sparing with your electrical demands.

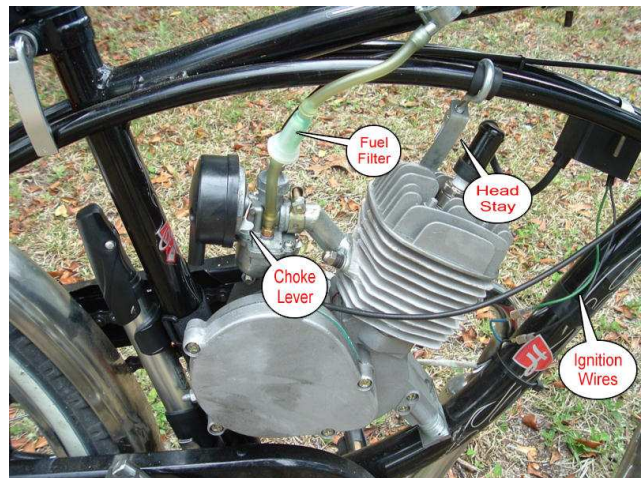
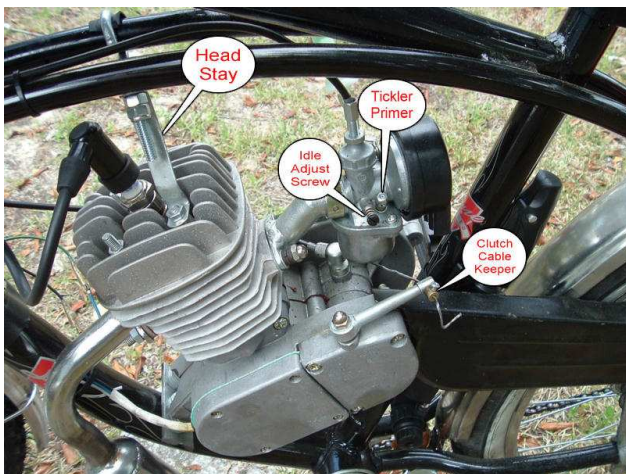
Clutch

Mount the clutch lever up near the left handlebar grip. Feed the cable down to the cable keeper below the carburetor and then thru one of the big springs and thru the clutch actuator. Pull the cable tight, wrench the clutch actuator inward and affix the little brass cable keeper. Test and adjust the clutch activation as necessary.



Gentlemen (ladies) – START YOUR ENGINES!

Turn the fuel on, press the little spring-loaded tickler on the left side of the carburetor until gas bubbles up and out (this primes the carburetor), raise the choke lever up (at least 1/2 way) – apply the clutch and pedal out into the wide world – release the clutch and watch your motor spring to life – adjust the choke as necessary to smooth out the performance – usually takes only a minute or two to smoothen out.



Hints, Tips & Tricks

Mix your fuel at 16-to-1 for the first break-in period of approximately 200 kilometers. That amounts to 8 oz of 2-cycle oil per gallon of regular gas. After the break-in period, back out to 20-to-1 (6.4 oz oil per gallon of gas). Try to stay under 20 mph (32Kph) during early break-in.

The drive chain sometimes tends to ride up on the teeth of the sprocket – the chrome plating takes up space – so touch the tips and sides of the sprocket teeth with a file – this lets the drive chain settle quietly onto the sprocket. Check EVERY nut and bolt on your bike for tightness – your bike will have lots of vibrations. Whenever possible use lockwashers, Loctite or Nylok nuts on your boltups.

The biggest performance boost will be to remove the baffle from the exhaust pipe and then drill 2 small holes in the long skinny pipe about an inch and a half from the end closest to the outlet. This will increase the noise level a tad, but the horse power increase will be dramatic! For max horse power increase, simple cut the pipe about an inch to 2 inches from the outlet and then replacem, or drill one hole, replace and then ride and see how much noise is increased vs. power gained. You can then drill another hole to increase the power and, as you do, decide if you have enough power vs. the increase in noise.

Credits

These installation instructions have been prepared and presented by Gunnar, a customer of PowerKing. Revisions, additions and changes have been made accordingly by PowerKing for the reproduction and use of those installation the Moped Bicycle Kit.

MAINTENANCE SECTION:

1. How to Adjust Clutch if signs of slipping or squealing are encountered :

- A) Disengage clutch by pulling handle bar clutch lever inward and lock into catch lock.
- B) Remove right side engine clutch cover and remove small locking screw on center *Clutch Adjust Nut.
- C) Pull clutch arm on left rear engine inward. Back off *Clutch Adjust Nut ¼ turn counterclockwise.
- D) Release handlebar clutch lever and check for slight 1/16" free-play on engine clutch arm.
- E) Readjust *Clutch Adjust Nut as required to get required 1/6" clutch arm free play.
- F) Tighten *Clutch Adjust Nut on clutch plate clockwise until just snug.
- G) Then re-install small locking screw in outer edge of *Clutch Adjust Nut .
- H) Good idea to place a small gob of grease at gear mesh area. Use grease sparingly! Then replace cover.
- I) Squirt light grade oil down clutch cable sheathing to reduce friction and make for easy lever pull.



*Clutch Adjust Nut and Lock screw



Cutch Cover removed:

#2. Carburetor

After every 5 hours of operation check the adjustment of the mixture screw by rotating screw clockwise until seated and then rotate screw 4½ turns back counterclockwise. Depending on dusty riding conditions, clean air filter every 5 to 20 hours of operation by removing the filter cover to access the screen and element. Wash element with a degreasing agent such as Simple Green™ or Purple Stuff™. Be sure element is completely dry before re-assembly. **IMPORTANT:** If engine runs poorly clean tank shut off valve filter.

#3. Spark Plug

Remove spark plug and inspect for excess carbon build up. Clean, re-gap to .028- .034 of an inch if necessary. Check plug after every 20 hours of operation. New spark plugs are available from your selling dealer. Be careful using aftermarket spark plugs as heat range and threads differ greatly. The spark plug model : NGKB5HS can be used.

#4. Exhaust system

Excessive periods of low speed operation, idling or leaving fuel petcock in the “on” position during shut

down periods may cause the pipe and muffler to become clogged with unburned fuel.

#5.Chain

Every time bike is ridden check the tension of the drive chain by:

- A) Rolling to bicycle forward to remove slack from the bottom of the chain.
- B) Find the center and push downward on the top of chain while measuring the deflection.
- C) Tighten chain if deflection is more than ½ inch.

#6.Head Bolts Tighten all fasteners after each 10 hours of operation. Most important to check Cylinder head bolts : Tighten in a X pattern to 8 to 9 ft/lb. for 48cc 55cc; 12 ft/lb for 70cc 80cc engines using a torque wrench. A two piece cylinder and head design engine requires head bolts be kept tight.

Important: Check head bolts before each and every long ride, vibration can cause them to loosen and blow a head gasket. Caution: Do not over torque or head bolts may break off. (Twisted or broken head bolts due to over tightening is not covered by warranty.)

#7.Right side gears:Remove cover plate and keep small amount of heavy grease on gear train. Do not over grease as leaks will occur and also may adversely affect clutch operation. Regular greasing if required will help reduce gear wear and keep gear train quiet.

#8.Left side drive: Routinely pack grease in the shaft hole behind 10T drive sprocket and also in cover bushing hole. This will also help deduce noise. Make sure drive sprocket nut remains tight.

1. IMPORTANT: PLEASE READ: Gas and Oil Mixture for Fuel ratio

The engine is a 2 cycle design, therefore, a gasoline/oil mixture is necessary. During the break-in period (1st 4 tanks of fuel, the ratio is 18 to 20 parts gasoline to 1 part 2 cycle oil. After the break-in period, the ratio is increased to 20 to 25 parts gasoline to 1 part oil. The engine crankshaft bearings are lubricated from the oil in the gas mix. A rich break in oil mixture ensures bearings will not cease during engine break in period.

!WARNING! Remember safety first: Wipe up any spilled fuel. NEVER fuel a hot engine or smoke while fueling. This could result in sudden fire, personal injury. Always move your motorized bike at least 10 feet from any fueling area before attempting to start it. Never leave the tank fuel cap off after fueling as rain water will contaminate the fuel and cause engine failure.

- 2. Open the fuel valve. Small lever pointed down with fuel line is in the open position.
- 3. Depress the small round cap plunger, (Tickle button), to prime carburetor. Located on left side of the carburetor next to the idle adjust screw. One or two times is enough.
- 4. **Lift choke lever to the upward position.** This is the small lever on the right side of the carburetor.

All the way Up the choke is on. All the way Down the choke is off. Move progressively downward to off position during engine warm up period.

Starting procedure for Lever Friction Clutch Models:

1. Pull the handlebar clutch lever inward, to disengage the engine from the rear wheel.
2. Pedal; (down hill if possible for first start) A mid frame bike wheel stand is helpful to start the engine in place.
3. Let out the clutch lever all the way out and continuing to pedal. The result is a direct engine hook up with the rear wheel via chain and sprocket and the engine will now start spinning, Pedal until motor starts. Accelerate slowly at first.
4. **Twist throttle to increase speed, reverse twist throttle to decrease speed. To stop, disengage clutch and apply brakes. To accelerate, pedal and release clutch while opening throttle.**
5. Adjust choke to the smoothest engine running position.
6. **After warm up push choke lever all the way down.** If engine races too fast, or too slow, pull clutch lever and lock in the notched catch, stop and adjust engine rpm.
7. If the rpm needs adjusting, turn the idle adjust screw (left side of carburetor) in or out slowly to obtain the proper idle speed of about 1400 rpm +/- 100 rpm To correctly break the engine in, Do not exceed 15 mph or 30 min. continual running for the first 50 miles during engine brake in. **Engine will develop more power after break in.**
8. To stop the engine, push Kill switch and turn off gas valve at tank. Turning off the gas will prevent fuel from being siphoned from tank. **Warning Note:** Never leave the tank gas valve in “open” position” when engine is not running or the bike is in storage.
9. After or before each ride check all mounting fasteners, including head bolts, axle and brakes.
10. **Warning Note:** Engine lock up or piston seizure due to improper gas / oil mixture will not be covered by factory warranty. This the responsibility of the owner / operator to make sure the gas and oil is mixed correctly.