PLEASE READ BEFORE PROCEEDING

These standard instructions are performed on a standard V Frame. Some bicycle kits require customization, in which additional steps will be provided with your purchase. If you ordered a bicycle engine kit to install on your own bike, we can also provide technical support during your customization process.

If you are new to bicycle engines and bicycle kits, we encourage reading these instructions with time and care. Some mechanical skills are required, so please allow yourself ample time to complete this project.

**Tools Needed:**

- Screwdrivers
- Drill (for only selected kits)
- Allen Wrenches (metric)
- Socket Set (metric)
- Chain Breaker
- Adjustable Wrench
- Shop scissors or Utility Knife
- Tin Snips or Grinder/Dremel
- Grease

**A. Installing Rear Sprocket**

1. If you have a bike with a coaster brake you will first need to remove the brake arm. Use a large pair of channel lock pliers, a vice or a pipe that will fit over the arm to allow enough leverage to loosen the nut that holds the arm. Be careful not to disassemble the entire hub - you only need to remove the arm.
2. Once the arm is removed you'll have a round dust cap that covers that side of the hub. Remove the dust cap, and use a file or grinder to remove just enough material from the inside so that it will not make contact with the sprocket. (see fig 2). Alternatively, some people simply remove the dust cap all together.

![fig. 2](image)

3. Locate these parts:
- sprocket
- 2 rubber rings
- flat backer plates (depending on the kit there are 2 or 3 - total of 9 holes)
- 9 bolts, nuts, washers

![fig. 3](image)
4. Cut only one of the rubber rings directly between 2 of the 9 holes. Place that ring inside the spokes so that it circles the inside of the hub.

*NOTE*  Most bikes need to have the sprocket mounted with the teeth facing closer to the wheel. Some bikes with fatter tires will need the have teeth facing outward. If you are installing a complete bike kit that you purchased from us please see the attached additional instructions.

With the sprocket in the correct position, put all 9 bolts through the holes in the sprocket and then through the uncut rubber ring's 9 holes. Center and place the sprocket and rubber ring on the outside of the hub so that the 9 bolts go evenly through the spokes. Carefully push each bolt through the 9 holes of the inner rubber ring, and then through the holes of the backer plates. Top off each bolt with the appropriate lock washer and lock nut and hand-tighten.

Tighten each nut a little at a time while keeping the sprocket centered. Tighten all 9 of them down in a star or triangle pattern so you get it tightened down evenly. Continue tightening and checking that the sprocket remains centered and true. If you notice that your sprocket is crooked or off center you may need to loosen all nuts and re-center it.

Continue to evenly tighten the nuts and bolts until the rubber rings squish together around the spokes. Ensure sprocket is centered and true and tighten as necessary.
5. for coaster brake wheels:

Reinstall coaster brake arm. Hand tighten the retaining nut that keeps the arm secure and check to make sure the arm clears the bolt heads. If the arm makes contact with the bolt heads you can try tightening all 9 bolts a little more. If that doesn't help then you'll need to bend the brake arm into a bit of a more "Z" shape. (see fig 6b) Use a vice and a hammer, and make small bends until the arm clears and the end lines up with the mounting area on the chain stay.
B. Mounting Engine to Frame:

1. If your bike's downtube is larger than 1.25" diameter you will need to use the universal U-Bolt adapter. This consists of a rectangular steel plate with 4 holes and a u-bolt.
a. begin by removing the 2 studs from the front motor mount. These studs unscrew from the engine block - use vise-grips or a pair of pliers to remove them and discard.

b. Align and center the steel plate adapter onto the front mount. Use the 2 short 6mm screws that came with it to attach the plate to the motor. The wide set of holes that the u-bolt will fit into will usually face forward/up.
2. Mount the engine. Place the rear cupped block onto the seatpost tube. The front mount cup (or plate if installed) will rest on the downtube.

NEVER USE RUBBER BETWEEN THE ENGINE AND THE FRAME! This will create excess vibrations, and it will cause your engine hardware to break. It will also void any warranty, and it can cause serious bodily harm. MOUNT THE ENGINE TO THE BIKE - Metal on Metal!

If necessary, flip the head around 180 degrees to better fit in your bike’s frame. The spark plug can face forward or rearward, it makes no difference. When reinstalling the head, torque the nuts evenly to 120 inch pounds.
Ensure that the rear mount cup is resting as flat as possible on the seatpost tube, and when you're confident with the engine position place the curved bracket onto the rear studs. Then place a washer, a lock washer and a nut on each stud and hand tighten. Repeat for front mount if your downtube is 1.25" diameter or less.

If you are using the universal adapter plate you will now need the u-bolt. Push the u-bolt up, around the downtube and feed each end into one of the holes in the plate. When enough
threads are sticking up through the plate put a washer, a lock washer and a nut on each end of the u-bolt and hand tighten.

3. Continue to evenly tighten the rear mount. Then secure the front mount. Make sure the engine is level before the final tightening.
C. Installing the other components:

1. Install Clutch Lever and Clutch Cable:
   a. Remove the grips from the handlebars. Slide the clutch lever onto the left side handlebar. If the clutch lever is too tight to easily slip on the bar end, you can loosen the clamp-down screw on the lever and very gently use a flat-head screwdriver to pry the opening a little wider. Warming the lever a little first is recommended because bending it in cold conditions can cause it to crack.
Then slip the left hand grip on using a little rubbing alcohol or hairspray to make it slide on easier. Adjust the clutch lever, and secure it in place.

b. Pull the clutch lever inward, and insert the cable end into the holder connected to the lever. The bare cable will slip through the slot in the lever housing, and the silver barrel adjuster needs to be turned so that it's slot lines up as well. When the cable is running straight through the end barrel adjuster you can tighten down the barrel adjuster and slip the cable sheath firmly into the end of the adjuster.

Feed the bigger of the 2 springs onto the end of the cable and over the end of the black cable sheath.

This large spring is a heat shield, and it will protect the cable from touching the hot engine. Then feed the bare end of the cable into and through the screw-in base directly below the carburetor on the rear of the engine. Once the bare cable is pulled through, place the thin spring over the bare cable and slide it to the base.
Then feed the bare cable end through the hole in the clutch arm (or through the clutch cable clamp) and pull it tightly. While pushing the clutch arm inward, tighten the cable clamp screw down.

2. Install the Throttle, Cable and Kill Switch:

Remove the 2 screws that hold the black throttle body/kill switch together. Take care not to lose the nuts on the opposite side.
Thread the one end of the throttle cable into the throttle body housing, and feed the cable end through.

Slide the grip with the throttle sleeve onto the right side bar, and then place the smaller black pieces with the nipple towards the bar.
Mark where the nipple will sit on the bar, and then drill a 1/4” hole at that mark. The nipple will sit in this hole, and it will ensure your throttle assembly doesn’t twist on the bar.

Feed the end of the cable into the slot in the plastic throttle body sleeve. (see fig 20) The cable will run in the groove as the throttle is twisted. Place a bit of grease or oil in the groove now.
With the cable attached, it's time to mount the throttle. Slide the grip on and then put the 2 plastic throttle body pieces together - kill switch on the bottom facing back. Tighten it up with the 2 screws and nuts, and you're all done there.

3. Carburetor installation.

Before you install the carburetor on the manifold, install the cable into the carburetor. Start by unscrewing the top part of the carburetor (#1).

When that's off you'll be able to get to the other 4 pieces inside. If they don't all come out right away just turn the carburetor over and shake gently. Make sure you don't lose anything!!
Now take the other end of the throttle cable and pull the cable out as far as you can. Also, screw in the top part of (#1) all the way. Now feed the cable through the carb top. Next, feed the cable through the spring. You'll have to compress the spring at this point to get the rest of the pieces on. Then put the needle into the center of the slide, followed by the "C washer." Make sure the openings on the C-washer and the C-clip, attached to the needle, both line up with the vertical slot of the round slide.

While compressing the spring to allow as much cable to stick out, hook the end of the cable into the bottom of the slot of the slide. There's a little pocket in there that will hold the cable end, and when it's in there slip the cable through the slot and put the spring into the top of the slide.

Now insert that slide assembly back into the carburetor. Note the brass nipple sticking out of the bottom side of the opening. (See fig 23). This needs to be lined up with the vertical slot in the slide. Make sure the needle goes down into the center hole while inserting the slide with the slot at the brass nipple. DO NOT FORCE IT. It will slip in easily when it is properly aligned. Once the slide is in you can screw on the top. Then twist the throttle back a few times to make sure the slide is moving freely.
Now install the carburetor onto the manifold. Loosen the clamp screw if necessary, and twist the carb back and forth while applying pressure from behind. You need to get the carb onto the manifold all the way so that you don't have any air leaks. (Any air leak at this point will cause the engine to race uncontrollably, and it will damage your engine if not corrected)

While applying pressure to the carb from behind, tighten up the clamp on the carburetor. Make sure the carb is as level as possible at this point.

**Electrical Setup:**

Locate a suitable place on the bike frame to mount the CDI box so that the spark plug wire will reach the spark plug on the engine - and - the blue/black wires from the CDI will reach the blue/black wires from the engine and both kill switch wires.

Mount the CDI box with the supplied screws, nuts and bracket - or use zip ties. If your engine has a white wire DO NOT USE IT. Cap it or tape it, and never allow it to make contact with anything metal.

Connect the blue wire from the engine to the blue wire from the CDI. Do the same with the 2 black wires. Put in wire from the kill switch to blacks, and the other one to blue. It doesn't matter which is which.
**Exhaust:**

Mount your muffler onto the exhaust port. Firmly tighten it, but not all the way. Test to see if your left crank arm clears the exhaust. If the exhaust doesn't clear the crank or it's touching the bike frame you'll need to bend it a little.

*To bend the exhaust:*

REMOVE THE MUFFLER BEFORE BENDING. If you try to bend it attached to the engine you will rip out the exhaust studs. Clamp the exhaust in a vise, protected with wooden blocks, and heat the area to be bent with a torch until it is red hot. Once the metal is hot enough it will bend easily.

ALLOW THE EXHAUST TO COOL before handling. It will remain very hot for a while.

**NOTE:** The exhaust will be VERY HOT when the engine is running, and IT WILL BURN YOU if you touch it. Never touch your muffler or header while the engine is running. Allow several hours for it to cool before touching.

**ALSO NOTE:** Ensure all wiring is kept clear and securely away from the exhaust. The muffler will get VERY HOT when the bike is running, and it will melt the wire’s insulation.

**Fuel Line and Filter:**

Cut the fuel line in half. Put a dab of 2 stroke oil on all 4 ends of the line. Insert the filter as shown (see fig 25). Insert the end of the fuel line connected to the narrow side of the filter to the gas tank Petcock. Put the other end of the fuel line onto the carburetor fitting.
Installing the chain:

Remove the sprocket cover (rear, left side - holds clutch arm). Make sure spark plug is removed, and use a 19mm socket to turn the sprocket clockwise. Take one end of the chain and feed it into the bottom part of the sprocket while turning the sprocket slowly with the wrench. (fig. 26) When the chain is about 8-12" through the top of the sprocket you will need to wrap the other end of the chain around the rear sprocket on the wheel so that the 2 ends meet. Use a zip-tie or a piece of wire to hold the 2 sides together as shown (fig 27). This is where you're going to measure your chain to determine where it needs to be shortened.
You will need to leave 2 thinner ends exposed so that the master link will fit and hold both ends together. Make sure that you will have enough chain to join the 2 ends BEFORE you shorten it. This is VERY important.

When you are sure of the length then remove that pin with your chain break tool. Then insert the master link so that the clip will face outward.

*VERY IMPORTANT*
Master-Link clip must have closed side moving toward the front of the bike when the link is on top. (fig 28)

Install chain tensioner.

The pulley can be flipped around to either side for best alignment. Loosen the nut for the pulley and slide it all the way down. Remove the bottom nut and bolt of the bracket, and put the tensioner on the lower left chainstay tube. Insert the bolt, washers and nut. Position so that the pulley is totally in-line with the chain running between the 2 sprockets. If it is not in line your chain will likely pop off. When it's centered and in-line and you have enough room to move the pulley up to tighten the chain you can tighten the nuts and bolts up. **Use blue loctite on the 2 lower bolts/nuts, and check it often to make sure it stays tight. If you can move the tensioner by hand it is too loose.**

**Allowing the tensioner to loosen up can cause damage and injury to you and your bike. It is your responsibility to check this before each ride**
Insert and tighten your spark plug.

If you have fenders, you will either have to cut or bend your rear fender in order for chain clearance. Use a pair of tin-snips, a Dremel, a small grinder, or a vice to bend/cut the area that is affected by the chain.

** Check all fender mounts and brackets to ensure they are tight before each ride. Use blue loc-tite on all hardware as well.**

Most bike kits do not come with front brakes, but we do suggest adding a front brake. Contact your local bike shop to get the proper size.

Congratulations, your bike is now assembled! Before you fire up the engine please read over these very important points:

**Head Studs:**
Tighten the head nuts in an X pattern after the first hour of riding. Tighten to 10-12 foot pounds. Check head nuts before each ride. Use a bit of blue loctite on them once the engine is broken in.

**Chain:**
Every time the bike is ridden be sure to check that the chain is tight. Adjust the chain tensioner as needed. A loose chain can get jammed in the engine sprocket causing a crash. ALWAYS KEEP
THE CHAIN TIGHT - no more than 1/2" of play up and down. Use a good chain wax or oil on the chain.

Right side gears:
Remove the right side case cover. Put a dab of grease on the gear teeth where they mesh and roll the bike to disburse the grease. Do not over grease. If grease is allowed into the clutch area you will need to disassemble and degrease.

REMEMBER....
It is your responsibility to make sure you can legally ride a motorized bicycle. Check with your DMV and local law enforcement agency for more info.
OBEY ALL TRAFFIC LAWS!
ALWAYS WEAR A HELMET AND PROTECTIVE GEAR!

Gas and Oil Mixing:
This 2 stroke engine runs on a mixture of gasoline and 2 stroke oil. Use any synthetic or semi-synthetic 2 stroke oil.

The first gallon on fuel needs to be a 20:1 ratio for the break-in period.  
**20:1 = 1 gallon gas + 6.4 oz oil.**

After that first gallon switch to 32:1 for the rest of the engine's life.  
**32:1 = 1 gallon gas + 4 oz oil.**

Always use the same brand and type of oil. During the break-in period you do not want to allow the engine to idle much at all. Your engine should be running under load (being ridden) and you should vary your speed a lot. Cruise at half-throttle, and avoid high RPM’s. Limit rides to 1/2 hour at a time during break-in, and allow the engine to cool down completely until you ride it again. **Check all hardware after and before each ride.**

You will probably have a small amount of unburned oil drip from your exhaust - especially during the break-in period. This is totally normal with this 2 stroke engine. Just keep some cardboard or similar material under the tip of the exhaust.

Fuel Petcock:
Also known as the shut off valve. When the lever is turned upward or downward (parallel to the fuel line) the fuel will flow down the line. When the lever is turned so that it is at a 90 degree angle to the fuel line, the fuel will not flow.
1. Open the fuel valve. Small lever pointed down with fuel line is in the open position.
2. Depress the small round cap plunger (tickler button), to prime carburetor. One or
two times is enough.
3. 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.
4. Pull the handlebar clutch lever inward, to disengage the engine from the rear wheel.
5. Pedal (down hill if possible for first start).
6. 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.
7. 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.
8. Adjust choke to the smoothest engine running position.
9. 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.
10. If the rpm needs adjusting, turn the idle adjust screw (top of carburetor) in or out slowly
to obtain the proper idle speed of about 1400 rpm +/- 100 rpm To correctly run the engine in,
do not exceed 20kph or 30 minutes of continual running for the first 500klms during engine
run in. Engine will develop more power after run in.
11. 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: Never leave the tank gas valve in
“open” position” when engine is not running or the bike is in storage.
12. After or before each ride check all mounting fasteners, including head bolts, axle and brakes.
13. Warning: Engine lock up or piston seizure due to improper petrol/oil mixture will occur.
This is the responsibility of the owner/operator to make sure the petrol and oil is mixed correctly.
Clutch not disengaging?

There are 2 things that could be causing this. Both are an easy fix, and be assured that nothing is wrong with your engine.

1) The clutch cable needs to be tightened. Press the clutch lever (on the engine) all the way in with your hand and try rolling the bike. If that frees up the engine and the bike rolls easy then you just need to take out some slack from the line to tighten it up.

2) Some engine’s clutch pads are stuck to the clutch plate when they are brand new. There's nothing wrong with anything if this is the case, it just happens because of the pressure the clutch is under for a few weeks before it gets used – especially in warmer weather.

What you do if this is the case is unscrew the 5 bolts that hold on the tear-drop shaped cover on the right side of the engine. There you'll see a big, round silver or dark plate. While holding in the clutch lever (or having a helper do it) hit that plate firmly with a hammer several times all the way around it. Pull in the clutch lever & let it out several times while doing this. Always hit it with the clutch lever pulled in. Repeat until pads free up from the plate.

OR, you could just take out the spark plug & pedal the bike around while pulling in the clutch over & over. That will eventually free it up. I prefer the hammer method myself.