



Small Block PowerPack Installation Instructions...

Thank-you for purchasing the 212 PowerPack engine drive bracket kit! The 212 PowerPack is designed as an engineered mounting solution for the 196-224 cc Honda GX/Predator style engines and the 30 series reverse gearbox and clutch kits that can be found on Amazon.

All the hardware you will need to mount your engine and gearbox is included with your Powerpack bracket kit. Engines and drivetrain components, such as clutch kits and gearboxes can be found at various retailers across North America and from the affiliate links found on our website: www.ecocycle.ca

Your reverse gearbox and engine installation just took a big step forward with the small block 212 PowerPack bracket kit!

The PowerPack bracket kit brings this engine and gearbox combo together with the proven Comet style 30 Series CVT clutch kit. It uses the stock #203589 or #669 belt found in most clutch kits. The 212 PowerPack maintains the same clutch spacing as the CVT backing plate, usually supplied with these clutch kits. The CVT backing plate is not required when using the reverse gearbox, however you can still use the backing plate with the PowerPack bracket even if you do not have a reverse gearbox. The CVT backing plate casting fits right into the cavity where the gearbox would go and positions the clutches in a similar vertical orientation so you can always upgrade to the gearbox later. This backing plate may need modification for chain clearance.

If you chose the PowerPack Deluxe, you could upgrade this bracket with popular options like a battery mount and jackshaft kit. The jackshaft kit provides an additional 3:1 gear reduction, expanding your gearing options. For the electric start guys, the battery mount kit is designed for the YTX9-BS battery. This kit positions the battery right under the electric starter and the battery cable leads can be shortened for reduced electrical resistance and makes for a tidy installation.

The PowerPack drive unit can be built independently of your vehicle, and when finished, you will have a gas powered, reversible, continuously variable, belt driven, engine drive module, ready to power your project!

Be sure to check www.ecocycle.ca for new products that are designed to expand the versatility of your PowerPack engine drive, such as engine frames, axle bearing brackets and brake kits.

Please subscribe to our YouTube Channel: **EcoCycle Vehicles** for more info.

<https://www.youtube.com/channel/UCYr79KsvEDfoVvWcuXSUI4Q>



Be Careful! Your PowerPack engine drive will be top heavy and can tip over! This can cause damage to you and your drive system! Make sure your PowerPack is solid and secured when assembling and servicing your drive unit!

Watch out for sharp edges!

Proper Installation, use, and guarding of hazardous stuff like moving parts and hot exhaust is up to you! You are responsible for how you install and use your PowerPack Engine Drive! Ecocycle.ca assumes no liability for any damages.

212 Small Block PowerPack Assembly Instructions:

- 1.) **Collect your parts:** A 212cc class engine, 30 series reverse gearbox, 30 Series CVT clutch kit and a PowerPack engine bracket and hardware kit.
- 2.) **Gearbox Installation:** Install your reverse gearbox by flipping the PowerPack bracket upside down onto the engine plate. Place the gearbox, with the shaft side out and position the gearbox with the holes aligned and flush with the cut out in the Powerpack side plate. Insert the (3) 5/16" X 5" bolts thru the PowerPack clutch side plate and thru the gearbox mounting holes. Keep the bolt heads on the clutch side plate of the PowerPack. Press the bolts thru the side plate until they are flush with the opposite side of the gearbox and then insert the three included spacers between the gearbox and shifter side plate of the PowerPack. Once aligned, continue to press the (3) bolts thru the PowerPack bracket and tighten everything down with the included nylock nuts using a 1/2" wrench or socket. Your reverse gearbox is now mounted to the PowerPack bracket! Flip it back over. Now is a good time to fill up your gearbox with oil. Fill the gearbox before you put on your engine, or you will have a hard time accessing the fill port. Fill with 250ml of GL5 gear oil. (Tip: you can use a marine style lower unit oil pump to fill up your gearbox thru the drain port if you forget to fill it, or when you change your oil later). Fill the gearbox up to the filler neck. If you over fill it, don't worry, it will just come out the vent tube. This tube is included with your reverse gearbox kit. You can now install your shift bracketry, cable rotor, cables and shifter. Keep everything nice and loose for final adjustment of your shifter mechanism. You will have to adjust everything to ensure smooth and positive shifting once your shifter is mounted and your cables are routed.

3.) **Engine Installation:** Place your engine on the PowerPack bracket, align and loosely bolt the engine to the engine plate with the included 5/16" X 1.75" bolts. Don't forget to use a washer on the bolt head and a nylon flange nut under the engine plate. Start the thread on the nuts, but DO NOT TIGHTEN YET! You will need to align your engine after you install your CVT clutch kit.

4.) **Secondary Clutch Installation (Large diameter pulley that goes on the gearbox)**

Rotate the gearbox shaft with the keyway at the 12 o'clock position. This way your key will not fall out! Place the keystone that is included with your clutch kit in the keyway on the gearbox shaft and slide the secondary clutch on to the gearbox shaft. The spring and ramp tower will face outward.

No spacers will be required between the secondary clutch and gearbox.

Install a washer and the large secondary clutch retaining nut. Tighten with a 24 mm or 15/16" socket.

(Please note: Some of the Chinese secondary clutches are slightly undersized and may not fit the gearbox shaft! If your secondary clutch does not fit, try another unit or try boring out the clutch bore to 5/8". Do not turn down or sand the gearbox shaft.

5.) **Primary Drive Clutch Installation (Small diameter pulley, goes on engine)**

Slide the inner clutch sheave over the engine shaft, (no spacers required). Align the built-in key with the keyway on the engine shaft. Once installed, place the brass bushing over the inner sheave.

Install the belt with the flat side towards the engine! Note: the 30 series belt is asymmetrical, meaning one edge is flat, the other side has a taper. Make sure the flat side of the belt is towards the engine and matches with the flat side of both pulleys.

Place the remaining primary clutch components on the engine shaft, ensure the end of the splined hub has the two machined flats facing out. Ensure the corresponding features on the clutch bell cover are aligned with those flats before proceeding to install your retaining hardware.

Install the heavy keyed and stepped clutch retainer washer, that is supplied with your CVT clutch kit. Secure the primary clutch with the appropriate bolt and lock washer. Most engines use a 5/16-24 X 1.5" fine thread bolt. Your application may be different. Ensure you are using the proper bolt for your engine and that it will tighten down sufficiently to secure your clutch. The wrong bolt will cause damage to your engine crankshaft and will risk clutch separation potentially causing you bodily harm. Tighten your clutch bolt down and proceed to align your clutches.

Clutch Alignment.

With your engine, gearbox and CVT clutches now installed, find a straight edge and place this behind your clutch sheaves. Ensure the straight edge rests squarely across the backside of both clutch sheaves. Your clutch center to center distance should be between 6.625" and 6.6875". (It is possible to positively adjust your center to center by placing washers under your engine base). Adjust your engine position and when you have properly aligned your clutches, bolt that engine down!

You have now installed the main components of your PowerPack engine drive!

Your PowerPack drive unit is now ready to be installed in your vehicle, however mounting the PowerPack Engine drive to your project will require some custom fabrication by you!

Here are some suggestions for mounting the PowerPack Drive unit to your project.

The PowerPack is usually mounted to a frame constructed from plate, rectangular, square or round tubing located at, or near, the bottom of a vehicle. The PowerPack engine drive is adjustable to your axle and features built-in mounting slots. These slots are spaced 8" apart (Lite) or 12" apart (Deluxe). The slots allow the PowerPack drive unit to adjust to your axle for proper drive chain tension adjustment.

The PowerPack can be mounted using these or other methods:

- 1.) Cross bolted to a 1"x 3" rectangular tube using ½" spacers, 4 required. (Frames and spacers are not included) Spacers can be fabricated from bar stock, washers or tubing. Ensure the overall mounting width is no greater than 4.03" across for proper clamping. The PowerPack bracket should fit over and sandwich this section by tightening the mounting bolts. Your PowerPack kit includes 2X 3/8" X 5" mounting bolts and nuts for mounting in this fashion.
- 2.) Tab Mounted: Mounting tabs or angle brackets with 3/8" holes can be welded to a frame structure of your choosing. Ensure you place the brackets at the ends of each slot so the PowerPack can slide and adjust to your axle. Use appropriate mounting hardware and ensure your PowerPack engine drive is secured to your application. Before welding brackets to your frame, verify the PowerPack is aligned and square to your frame and axle and you have chain clearance.

Good luck with your project! I can't wait to see what you build with your PowerPack engine drive! -Arne