POWER PACK
Engine Drives

ECOCYCLE
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About the Big Block PowerPack…

Thank-you for purchasing the Big Block PowerPack engine bracket kit! The PowerPack is designed to provide an engineered mounting solution for the 390-500cc Honda GX/Predator style engines and the 40 series reverse gearbox and CVT Belt Drive transmission.

All the hardware you will need to mount your engine and gearbox to the PowerPack bracket is included with the kit. Gearbox and clutch kits will provide you with other hardware needed to fully assembly your engine drive. Engines, clutch kits and gearboxes can be found at various retailers across North America and from the affiliate links found at www.ecocycle.ca

Your reverse gearbox and engine installation just took a big step forward with the Big Block PowerPack!

The PowerPack bracket brings this engine/gearbox combo together with the proven Comet style 40 Series CVT clutch kit. It uses the stock #203785 belt that is found in most of these clutch kits. The Big Block PowerPack maintains the same clutch spacing as the backing plate that is included with some CVT clutch kits. The CVT backing plate will not be required when using the Big Block PowerPack bracket kit.

For the electric start guys, the Big Block PowerPack also offers an optional battery tray kit designed for the YTX14-BS battery. This kit positions the battery right under the electric starter for a nice and tidy installation. You can shorten the cable leads for reduced electrical resistance and a cleaner installation if you want to.

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 cradles, axle bearing carrier brackets and disc brake kits using common and inexpensive Yamaha Banshee brake parts from Amazon.

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

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 <u>you</u> and your drive system! Make sure your PowerPack is rigidly secured when assembling and servicing your drive unit!

Watch out for sharp edges!

Proper Installation and guarding of hazardous stuff is up to you! You are responsible for how you install and use your PowerPack Engine Drive!

Big Block PowerPack Assembly Instructions:

1.) **Clean and prepare:** Your bracket for a coat of paint if it comes unpainted. It's easier to do this now before you put it all together. Let it dry before your start the assembly!

2.) **Collect your parts**: A Big Block GX class single cylinder engine, 40 series reverse gearbox, 40 series CVT clutch kit and a Big Block PowerPack bracket kit.

3.) **Gearbox Installation:** Install your 40 series reverse gearbox by placing it into the cavity of the PowerPack bracket. Insert a 3/8" X 5-1/2" bolt thru the PowerPack bracket from the clutch side plate and insert one of the six included spacers. Push the bolt thru the gearbox and insert another spacer. Push the bolt thru the opposite side plate and loosely thread on a 3/8" nut. Repeat this process for all three of the gearbox thru bolts. Keep the bolt heads on the clutch side plate of the PowerPack.

4.) There are two more metric bolts that will thread directly into the gearbox casting near the drive sprocket. These bolts are included in your gearbox parts kit. Thread these into the gearbox, but do not tighten anything yet!

1.) Install the final 3/8" X 5-1/2" bolt and compression tube into the hole found behind the gearbox case. Thread on another nut and tighten those fasteners down!

2.) This bolt can be later used to mount a tensioner assembly, using 3/8" Rod end (not included). You will have to modify the compression tube by cutting it into two 1-15/16" pieces to accommodate the rod end if you choose to do this.

3.) **Your reverse gearbox is now mounted to the PowerPack bracket!** Now is a good time to fill up your gearbox with oil. Fill the gearbox with GL5 gear oil. You can fill your gearbox up to the fill port. (800ml) 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 you have your shifter handle mounted and your shift cables routed.

4.) **Engine Installation:** Before you mount your engine, you may have to clearance the oil drain plug on the valve cover side of the engine, if your engine has one. You can replace this with a low profile allen head bolt (M12 X 1.5) or simply ensure the bolt is tight and grind the head down leaving a small shoulder on the bolt head. You will need to do this to create clearance to your gearbox. Some engines do not have an oil drain plug on this side, such as the Predator 459. If so, no further action would be required. You can now place your engine on the PowerPack bracket. Loosely bolt the engine to the engine plate with the included 3/8" X 1.75" bolts. Don't forget to use a washer on the bolt head and a Nylon Flange nut under the engine plate. There are (4) bolts. DO NOT TIGHTEN YET! You will need to align your engine after you install your CVT clutch kit.

5.) **Driven Clutch Installation (Large diameter pulley that goes on the gearbox)**

Slide on your secondary clutch with the spring basket facing the gearbox. You must ensure you have the correct spring and cam position on your secondary. A reverse wound spring is required and is the standard clutch configuration. If you find your clutch is quickly opening, it likely means your cam position is opposite of what it should be, and you will need to modify your secondary clutch.
No spacers are required between the secondary clutch and gearbox. However, you will need the large shaft spacer that comes with your gearbox kit. Place this on the gearbox input shaft after you install your secondary clutch. Install the washer and retaining nut that is included with your gearbox kit.
Tighten with a 24 mm or 15/16" socket.

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

Slide the inner clutch sheave over the engine shaft, (no spacers required). Align the keyway with the keyway on the engine shaft.

Place the remaining clutch components on the engine shaft.

Insert the thick, keyed and stepped washer, that is supplied with your CVT clutch kit and secure with the appropriate bolt and lock washer. Most engines use a 3/8-24 X fine thread bolt and washer, not included with this kit. Your engine may be different. Ensure you have the correct bolt before tightening or damage to your crankshaft will occur.

Tighten your clutch bolt down and get ready to install your belt.

7.) **Belt installation:**

Place the belt over the primary clutch and pull it over the secondary. Start at the top of the secondary clutch and work your way around the secondary pulley until the belt is installed. You may find spreading the secondary sheaves will allow the belt to drop down into the pulley reducing the effort required to install.

8.) **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 the primary clutch. Move your engine to align the clutches and when everything looks aligned and your belt is centered across both pulleys, and the center to center distance is approximately 8-3/16". Once aligned, bolt that engine down!

You have now installed all 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 generally mounted to a frame constructed from rectangular, square or round steel tubing and is usually located at, or near, the bottom and back of the vehicle. Your project may be different! The PowerPack engine drive will adjust to your axle using the 4 slots cut into the bracket side plates. These slots allows you to slide your PowerPack relative to your drive axle for proper chain adjustment. The PowerPack bracket will mount with 2 or 4 bolts spaced 12" on center. You can mount the bracket with a bolt at each of the 4 slots or a long bolt across two slots. A compression tube or other structure is needed to prevent the bracket ears from bending inward when tightening the bolts if using a single bolt across the slots. A compression tube can be made from ½" dia X .062"wall X 4.38" wide tubing. If mounting to a tubular frame or plate, you can fabricate 4 brackets from angle Iron or flat bar with a 3/8" hole, spaced approximately 5/8" from the plate for 1/8" clearance to your PowerPack bracket. Weld or secure these mounts to your structure. Be creative and take your time to think about locations, clearances, chain alignment and how it will drive and adjust to your axle.

As always, please reach out if you need any advice! Good luck with your project!

Thank you for choosing the PowerPack engine drive!