Vegas Carts & PERFORMANCE

Big Block Installation Instructions

1994 - 2008

EZ-GO TXT & MEDALIST

EZ-GO WORKHORSE

ST350

ST-SPORT

(DOES NOT FIT ST480)

For use with:

-Predator 13hp 420cc Engine (PART 2)

Please refer to the Engine Prep Instructions (Part 1) first.

Revised 10/27/2022

DANGEROUS USE WARNING:

Our products are designed to assist with the installation of a different engine into your golf cart as a means of replacement and/or power increase. Before you proceed, you need to be aware of the risks and dangers of modifying your golf cart before using our products:

1. Your cart will be more powerful and achieve higher speeds which are beyond the original design limitations of the golf cart. Golf carts do not have braking systems, suspension systems or safety systems that are intended for use with the additional power and speed you will be adding to them. Serious injury or death can happen as a result of re-powering your golf cart.

2. Your golf cart will create more heat which will cause a higher risk of melting plastic components and an increased risk of fire. It is advised to keep a suitable fire extinguisher on-board your cart.

3. There are many variables that affect how the cart will operate such as carburetor tuning, operating rpm of the engine, engine mounting angle, belt tension, throttle cable tension, etc. Serious injury or death can result if any one of these variables (or others) is set improperly or not maintained. For this reason, we recommend you have an automotive professional complete the installation so they can assure that the entire system is running optimally. Choosing to do it yourself is a significant undertaking which involves risk.

If you choose to proceed with the installation of any of our products, you understand the dangers of modifying your golf cart and have chosen to accept the risk & liability involved.

Tools Needed for Installation:

- (2) 14mm or 9/16” Wrenches (Open-End or Closed)
- Screwdriver Set
- Drill with various drill bits including ¼”
- Socket & Ratchet Set

- Measuring Tape

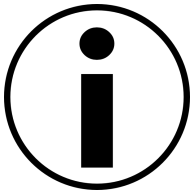
LIFTED CART ADVISORY:

Although lifted carts are common, we develop all of our kits on un-lifted and un-modified carts. There are dozens of lift kit manufacturers and it would be impossible to develop a universal kit that fits all of them. We will do our best to assist with any clearance issues, however, we cannot and will not guarantee fitment for lifted carts.

If you have a lifted cart, we recommend a v-twin engine such as a Predator 22hp or a Briggs Vanguard 23hp. V-twins are a few hundred dollars more but are lightyears better from a performance, reliability, and resale value perspective.

Make sure to read through this ENTIRE guide BEFORE beginning your install!

It is highly recommended to take pictures of your engine bay prior to removing the OEM engine and its components. This will save time if you ever need to revert back to the stock setup.



If you currently have a “Torque Spring” or any spring with extra tension above the OEM specs, installed in your rear (Secondary) drive clutch, you should remove and replace with the factory spring before installing this kit. The extra tension will delay shift out and limit the top speed of your cart. In some cases, it can be as much as 10mph

Please read through the entire instructions prior to starting on your installation. There are many ways to install our kit, depending on the current state of your cart, you may be able to skip some steps or move some around.

NEVER START YOUR ENGINE WITHOUT THE DRIVE BELT INSTALLED! The outer clutch sheave will slam into the inner sheave and damage your clutch. If you want to test your engine or run it without a belt, you must first remove the primary drive clutch.

1994-2008 EZGO TXT / Medalist / Workhorse / ST - Predator 420cc

A. EZGO Cradle w/Anti-Wrap Bracket
   a. 1pc - 5/16" x 18tpi x 1" Carriage Bolt
   b. 1pc - 5/16" x 18tpi Crimp Nut
   c. 1pc - ⅜" Washer
   d. 2pc - ½" x ½" Aluminum Spacer
   e. 1pc - ½" x 13tpi x 3" Hex Flange Bolt
   f. 1pc - ½" x 13tpi x 2" Hex Flange Bolt
   g. 2pc - ½" x 13tpi Locking Nut

B. EZGO Front Cradle Mount
   Lifted:
   h. 2pc - ½-20 Female Heim Joint
   i. 2pc - ½-20 Jam Nut
   j. 1pc - 4" of ½-20 Threaded Rod
   Unlifted:
   A. 1pc - ½-20 Female Heim Joint
   B. 1pc - ½-20 Jam Nut
   C. 1pc - ½-20 Male Heim Joint

C. Raised Motor Plate
   a. 4pc - ⅜ x 16tpi x 1" Carriage Bolts
   b. 4pc - ⅜ x 16tpi Crimp Nuts

D. 420 Muffler
   a. 12" of 1.25" Flex Pipe
   b. 2pcs - Exhaust Clamps
   c. Muffler Support Arm
      a. 2pcs - 5/16" x 18tpi x 1" Hex Bolt
      b. 2pcs - 5/16" Lock Nut
      c. 4pcs - 5/16" Washer
   d. Exhaust Stub
      a. 2pc- ½" x ¼" Spacer
      b. 420cc Exhaust Gasket

E. Tapered Shaft Adapter w/Spacers

F. 47" Drive Belt
G. Fuel Line
H. Air Filter & Billet Adapter
I. Isolator w/Pulse fitting & Reducer

J. 420 Throttle Bracket
   a. 1pcs - 5mmx14mm Phillips Screw
   b. 1ps - 5mm LockNut

K. (2) Dogbones
   a. 4pc - ⅜ x 16tpi x 2" Hex Bolts
   b. 4pc - ⅜" Washer

Options:

1994 - 2001 LIFTED:
2pc - Extended Shift Cable

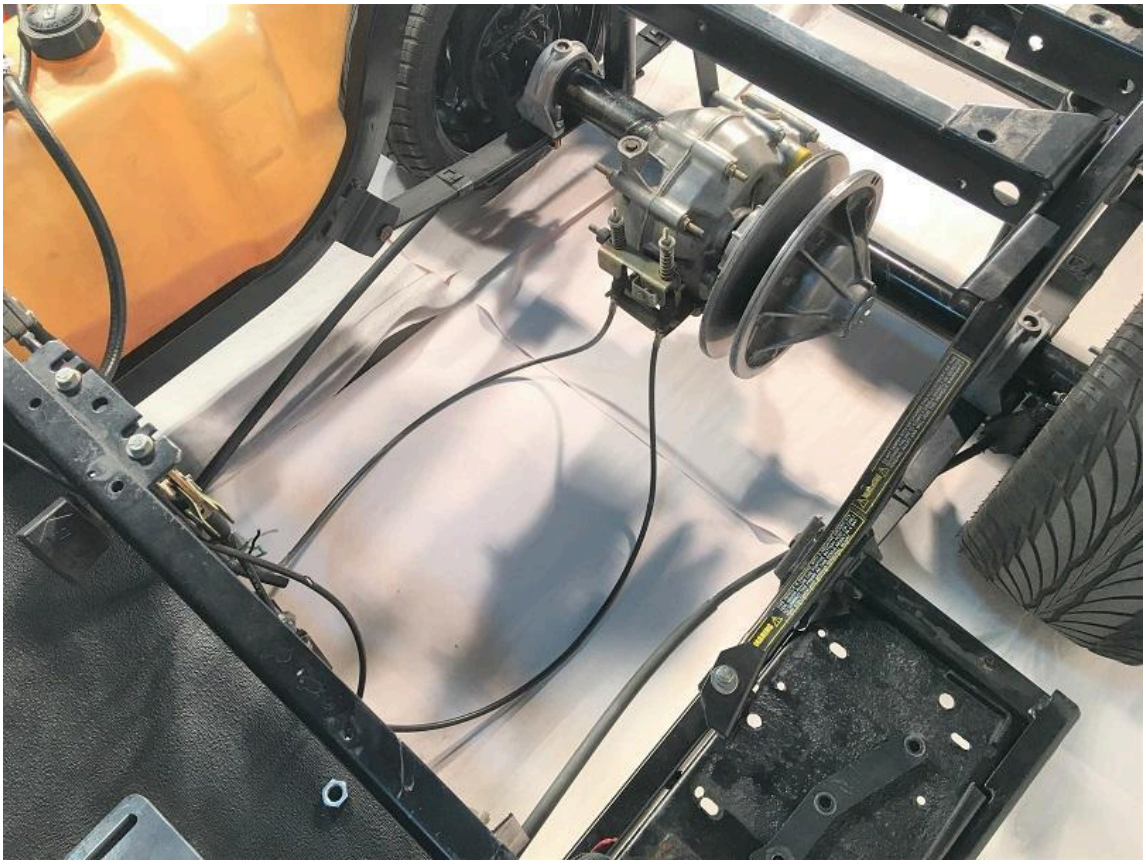
2002 - 2008:
Lower Shifter Relocation Bracket

Kit Picture (Unlifted Version):

Remove the original engine, all original brackets and hardware from the axle, leaving brake and shifter cables attached. In some cases, removing shifter cables will make the installation easier...but keep them attached for now!

Make sure to save the U-Bolts from the rear axle as they will be re-used during your installation.

This instruction guide assumes that your engine bay looks like this :



1994-2001 (Double Shift Cables Shown)

All electrical lines going to the original engine's ignition coil can be bundled together and tucked away or removed from the cart.

It's most convenient to keep the starter/generator wires attached to the starter so there is no chance of a wire mix up during re-connection. You can move the starter with its wires connected out of the way for now.

Pull up your rubber floor to access the throttle box. The red arrow shows the location of the bolt head for the factory front mount bolts.

Install the "Front Cradle Mount" onto the crossmember using your factory hardware and in the factory location. The “U” portion faces the front of the cart. The mount comes with a double heim so you can adjust the angle of your engine cradle. You want your engine to sit relatively level (No more than 15 degrees in either direction).

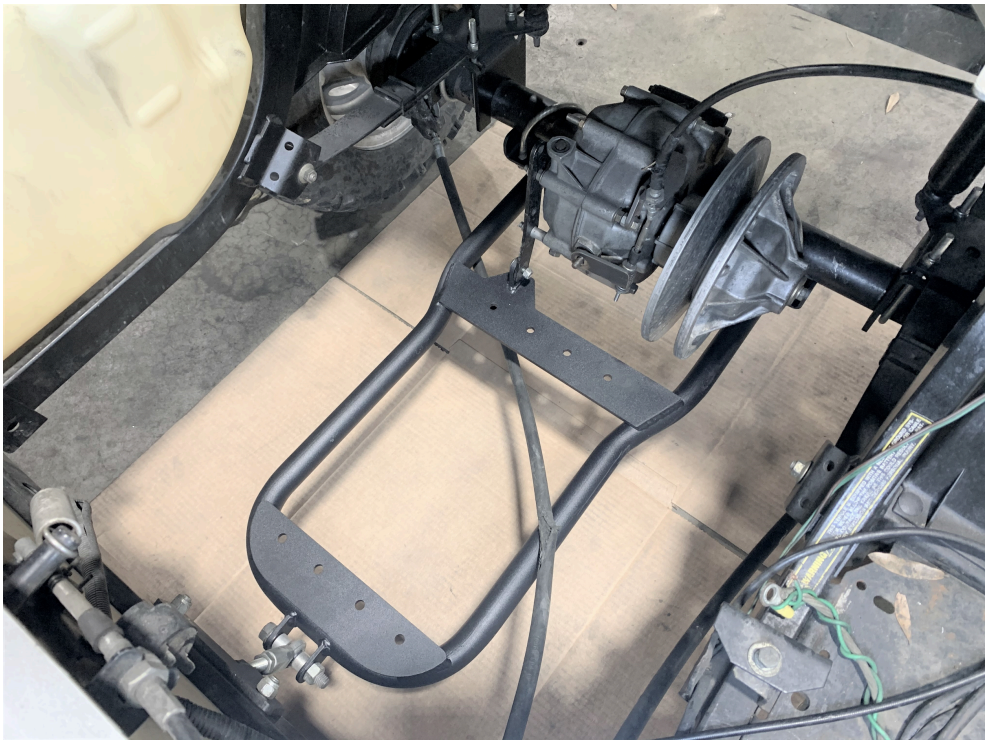
For highly customized carts with a lift larger than 6", you may need a longer threaded rod to get your engine level. Customer Service can get one ordered for you.

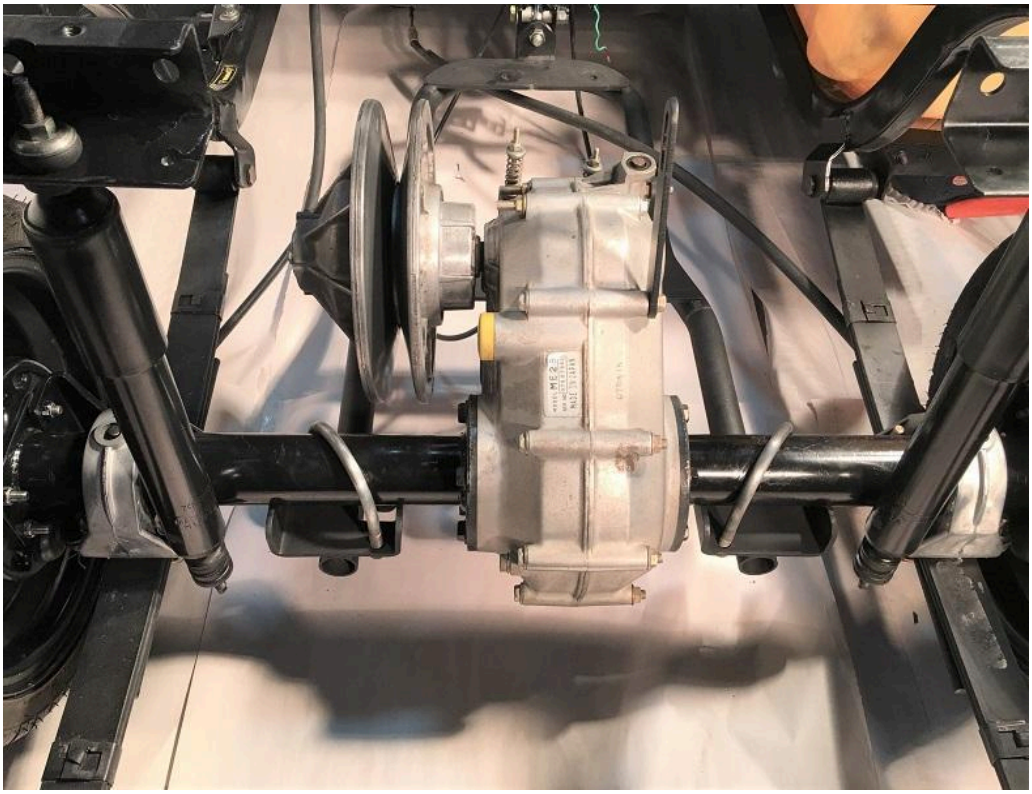
Unlifted carts will have a male heim inside of a female heim.

Lifted Carts will have 2 female heims connected via threaded rod:

Some lifted carts have axles that “sag”. If your cradle is angled towards the ground and the heim joint linkage does not fit, you likely will have to adjust the axle slop by loosening the leaf spring U-bolts and slightly rotating the axle upwards until the cradle is sitting level.

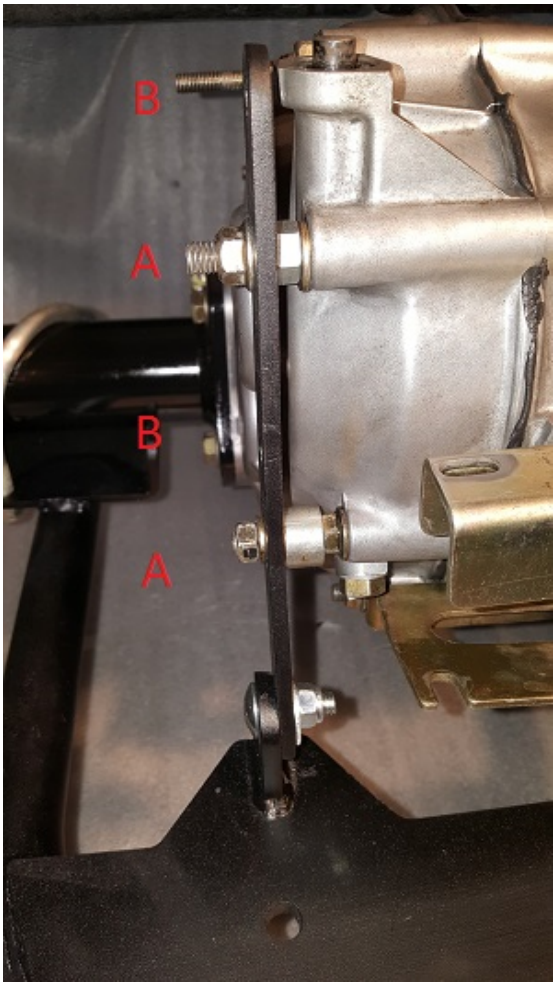
Using the factory hardware and U-Bolts, install the new engine cradle to the rear axle. Leave the U-bolts loose enough to adjust the cradle.

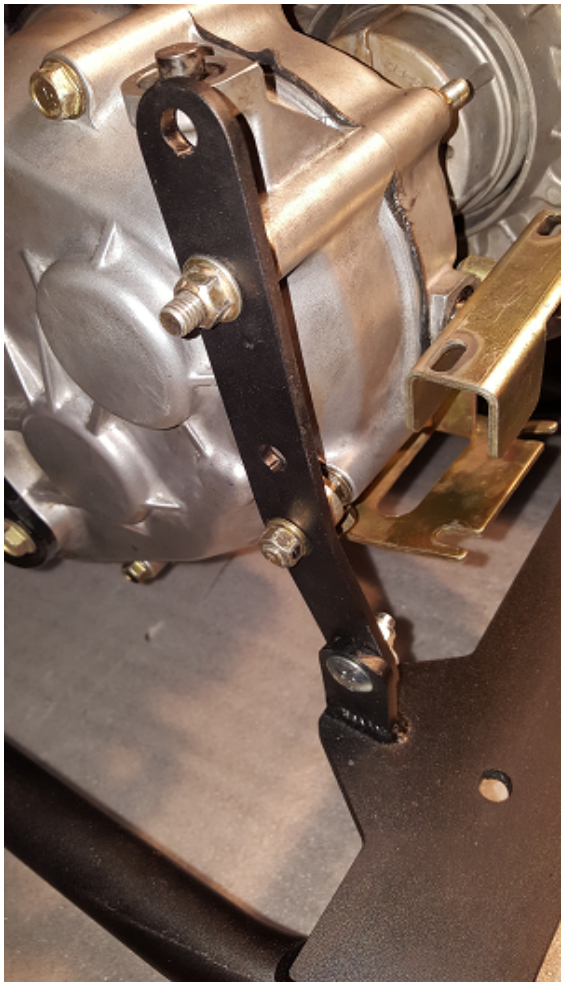




The "Anti-Wrap Bracket" keeps the cradle from moving upwards during acceleration. It is bolted to the cradle with a carriage bolt and has 4 mounting holes in it. 2 of the 4 holes will be used to attach to the rear axle using the factory axle bolts. Holes A are used on EZ-GO TXTs, Holes B are used for EZGO Workhorse and the ST-Series of utility carts from 1999+.

There is a small factory aluminum spacer that goes on the bottom bolt to keep the bracket aligned.





Once you have everything lined up to your satisfaction, tighten all of the hardware.

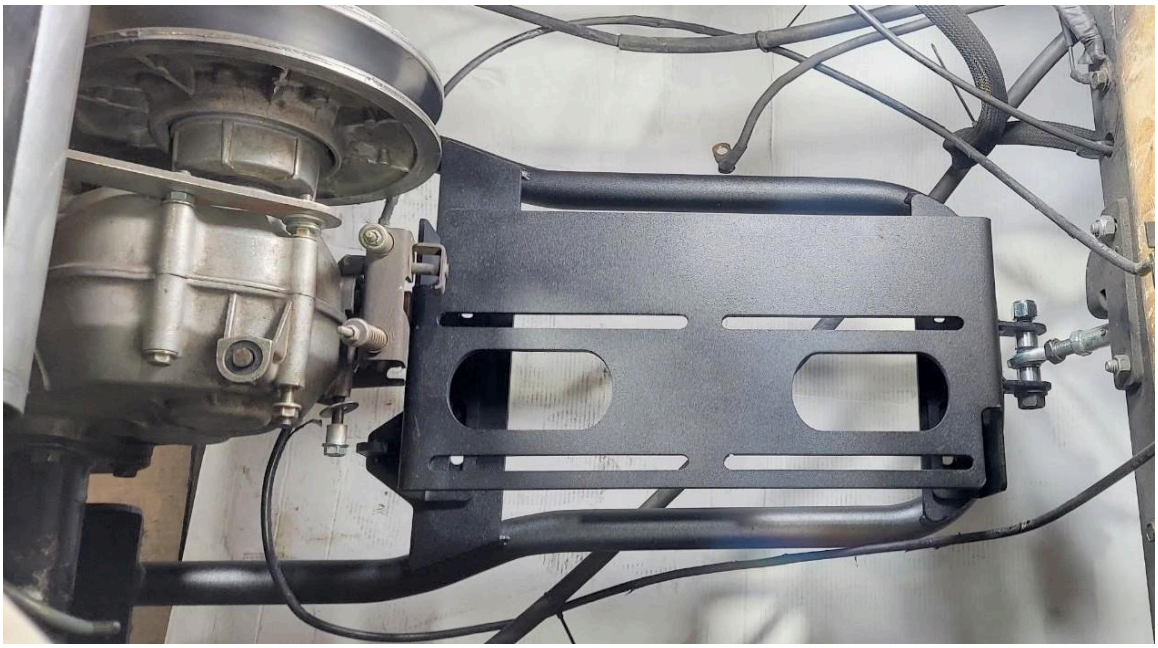
DO NOT USE YOUR CART WITHOUT THIS BRACKET INSTALLED….IT WILL DAMAGE THE REAR AXLE HOUSING!

Once the cradle frame is installed, you will need to attach the engine mount to it. The engine mount is held on by (4) 3/8 x 1" carriage bolts. This allows you to adjust for side to side differences in clutches, engines, and belts without having to use 2 wrenches.

Do not tighten these bolts at this time, just get them snug enough to where you can still move the engine mount into your desired position while installing the engine.

The mount is reversible so if the engine does not line up, you can flip the mount around 180 degrees to get additional side to side adjustment.

NOTE: Be sure to route the brake and shifter cables(2001 and Older) in between the cradle and the engine mount so that it doesn't drag or get caught on anything while driving.



(FOR 2002+ CARTS WITH SINGLE CABLE SHIFTERS ONLY:)

If you have a 2002 or newer EZ-GO, you likely have a single shifter cable setup that comes from the top instead of the dual cables that run under the cradle.

In order for this cable to clear the new engine, you'll need to relocate the factory brackets and re-adjust the shift cable.

The procedure is very straight-forward. Simply remove the old brackets and replace them with the new brackets included with your kit using your existing hardware. The upper bracket is built into the muffler support arm. The lower bracket is shown below.

Our brackets are nearly 2x thicker than the factory ones and customers notice a more rigid feel to their shifter as it no longer flexes.

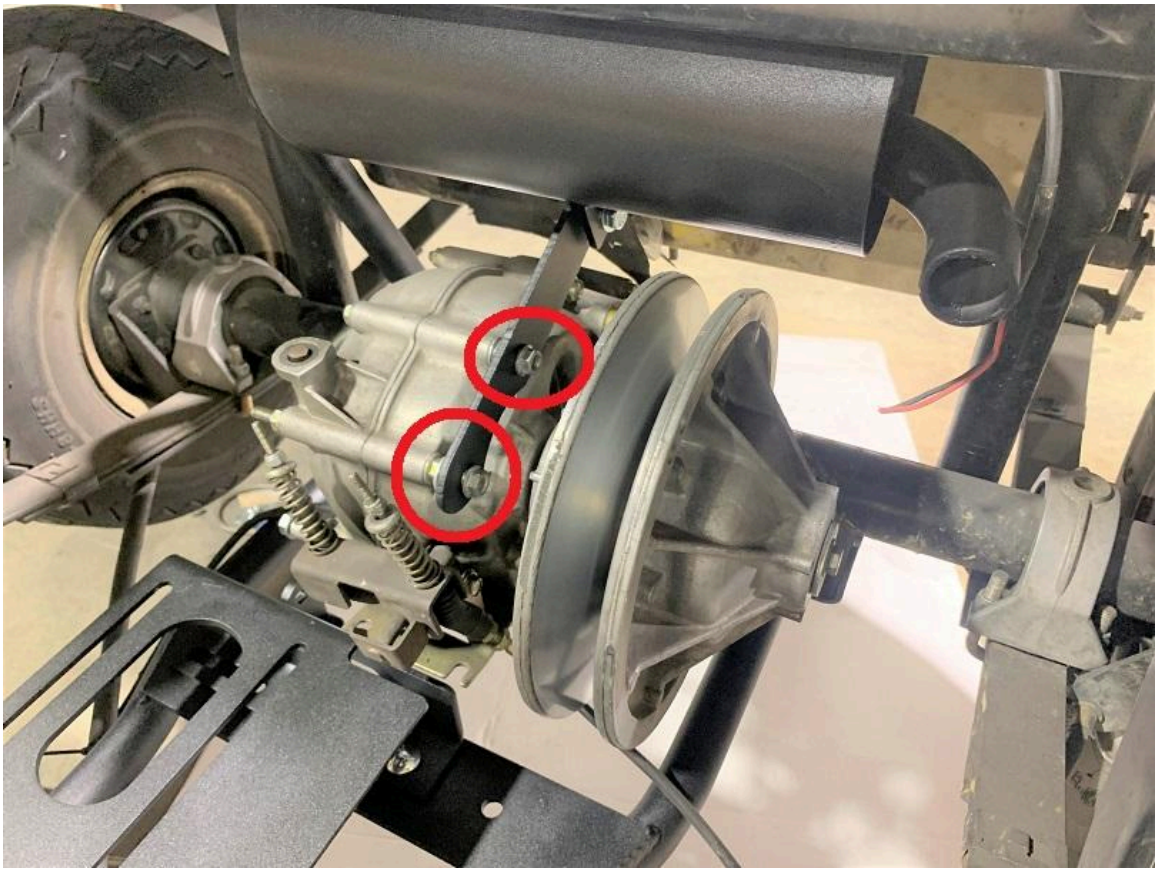
Refer to the EZGO Service Manual for the correct adjustment procedure.

Extended Shift Cables **(1994-2001 - LIFTED CARTS ONLY)**

If you have a lifted cart, your kit comes with longer shift cables. Now is a good time to install them. Installation is the reverse of removal. You will need to make sure shifting is smooth and the cables are properly adjusted before proceeding. Extended Shift cables are NOT needed on Workhorse carts, they have extended cables from the factory, you can re-route them over the top of the cradle if needed for fitment.

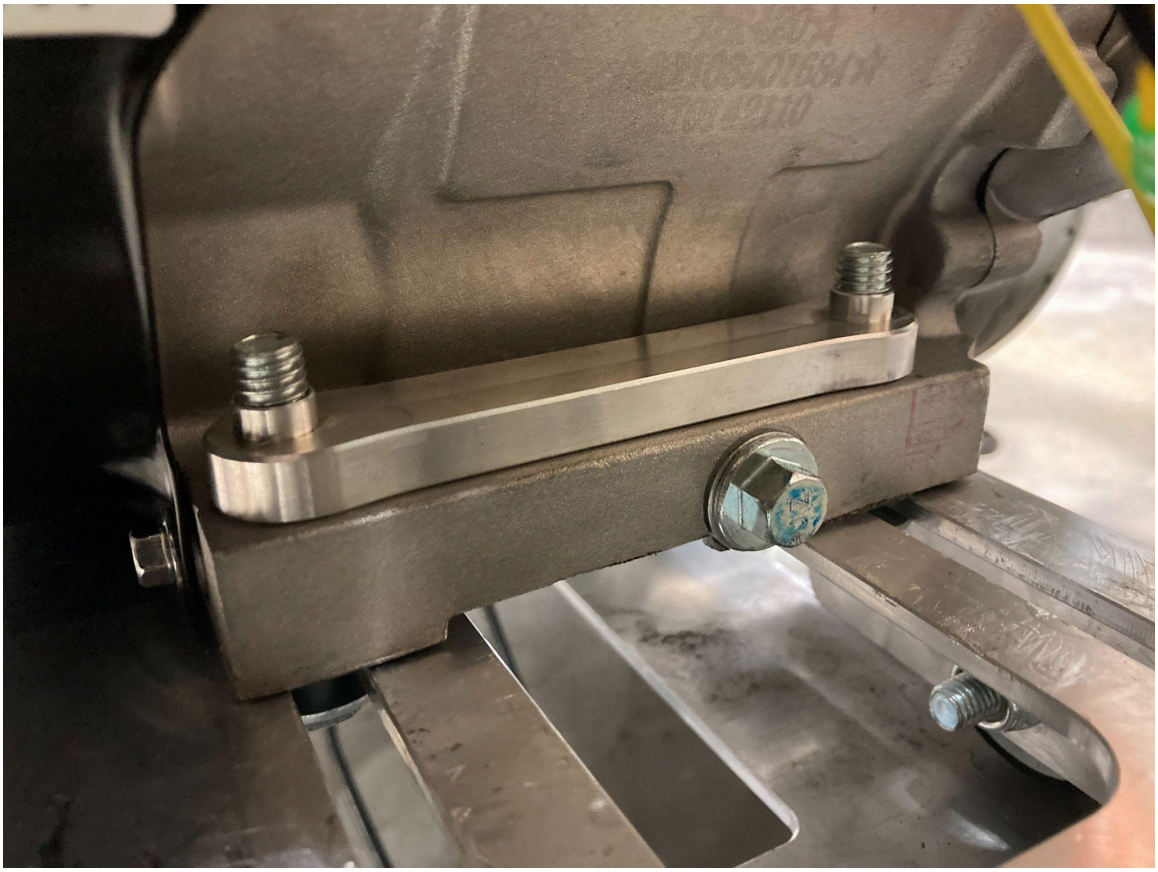
The muffler gets bolted to its support bracket (hardware provided).

The muffler & support assembly then get bolted directly to the transaxle using the existing hardware on the transaxle (circled in red).



It is now time to place the “prepared” engine setup into your engine bay and on top of the engine mount with the valve cover facing the rear axle.

The engine is fastened to the plate using 2 specialized hold downs(front & rear), which we have nicknamed “Dogbones”. These parts allow the installer to loosen the engine and adjust the belt tension...one handed. See pictures below.

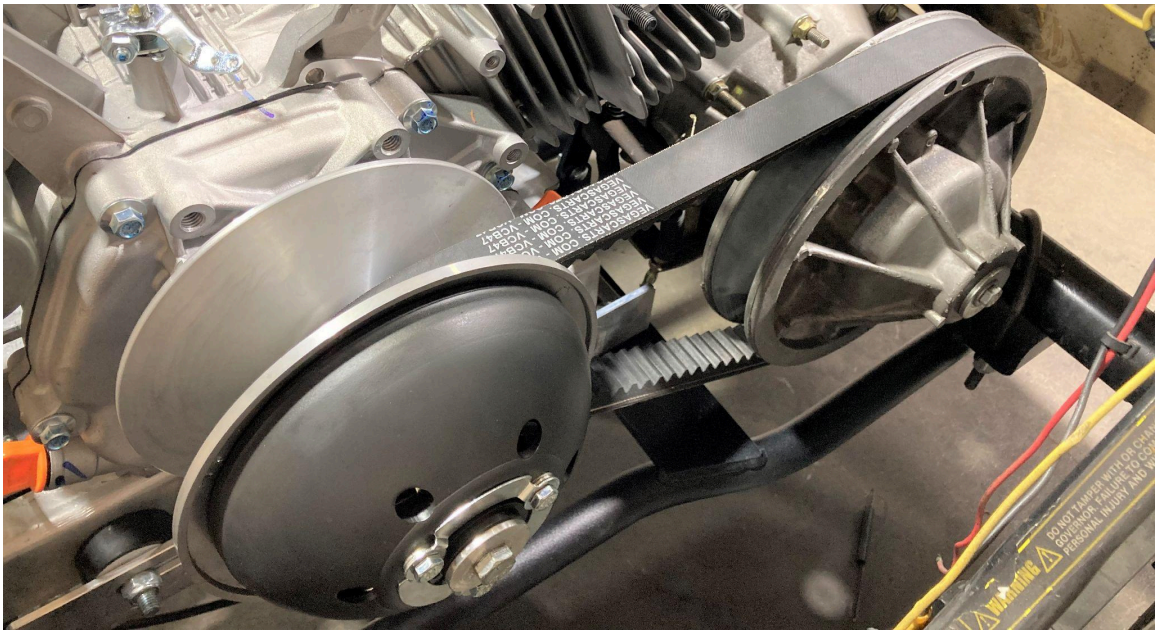


The centers of both clutches need to be lined up by moving the engine mount assembly side to side. If you cannot get the engine over far enough to get the belt straight, you may need to flip the engine mount around 180 degrees to get more adjustment. There is no scientific way to do this other than with your eyes and a straight edge.

Once the drive belt is straight on both clutches, tighten all (4) carriage bolts from engine mount to cradle. This locks the engine from moving side to side.

Adjust your engine so the distance between the centers of both clutches (bolt to bolt) is approximately 12.5”. Belt tension is NOT critical now and will need to be fine tuned after the install is complete, you want it as tight as you can get it while still being able to shift gears with the engine idling.

Tighten the mounting bolts to secure the engine.



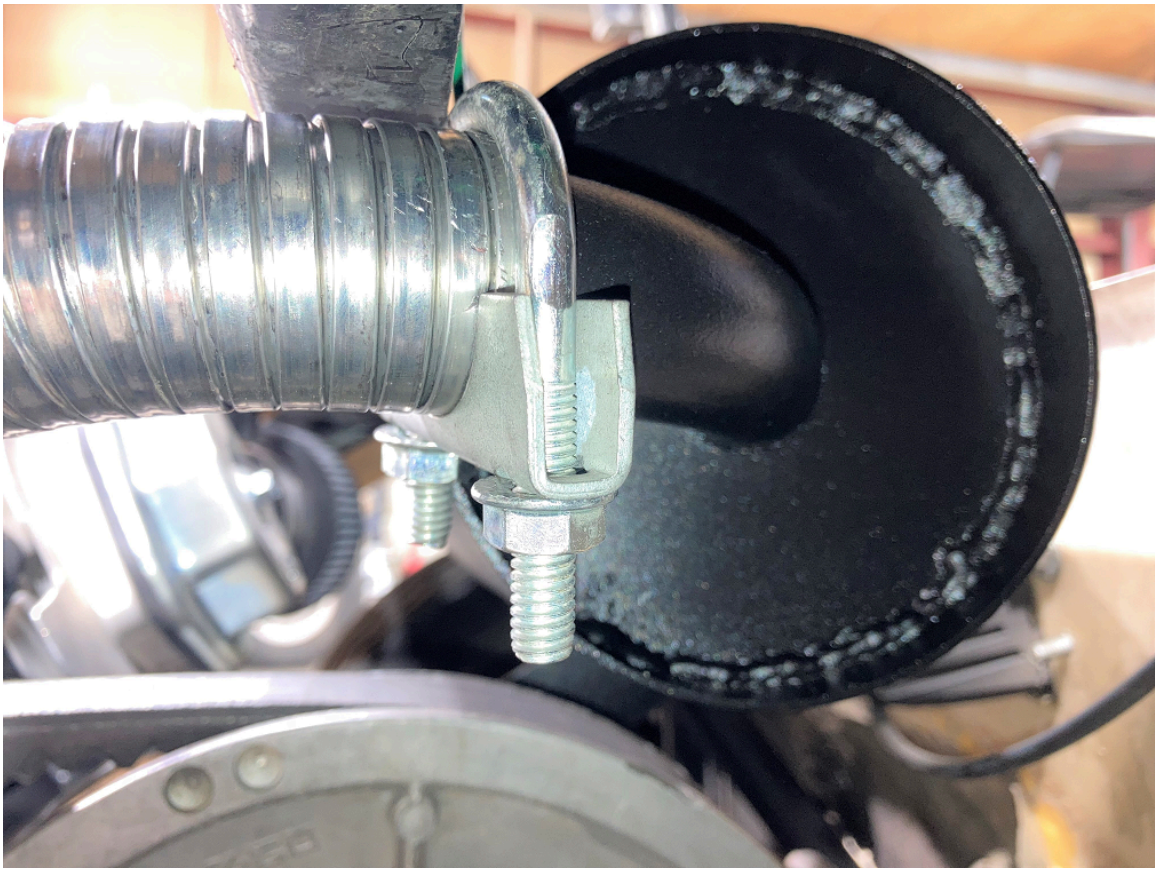
Now that your belt is aligned and the engine is securely mounted, you can install the flex tube that connects the exhaust stub to the muffler inlet.

This tube comes 12” long and will probably need to be trimmed to size.

You will want to find a happy medium with length so you can adjust the belt tension without having to cut the flex tube every time.

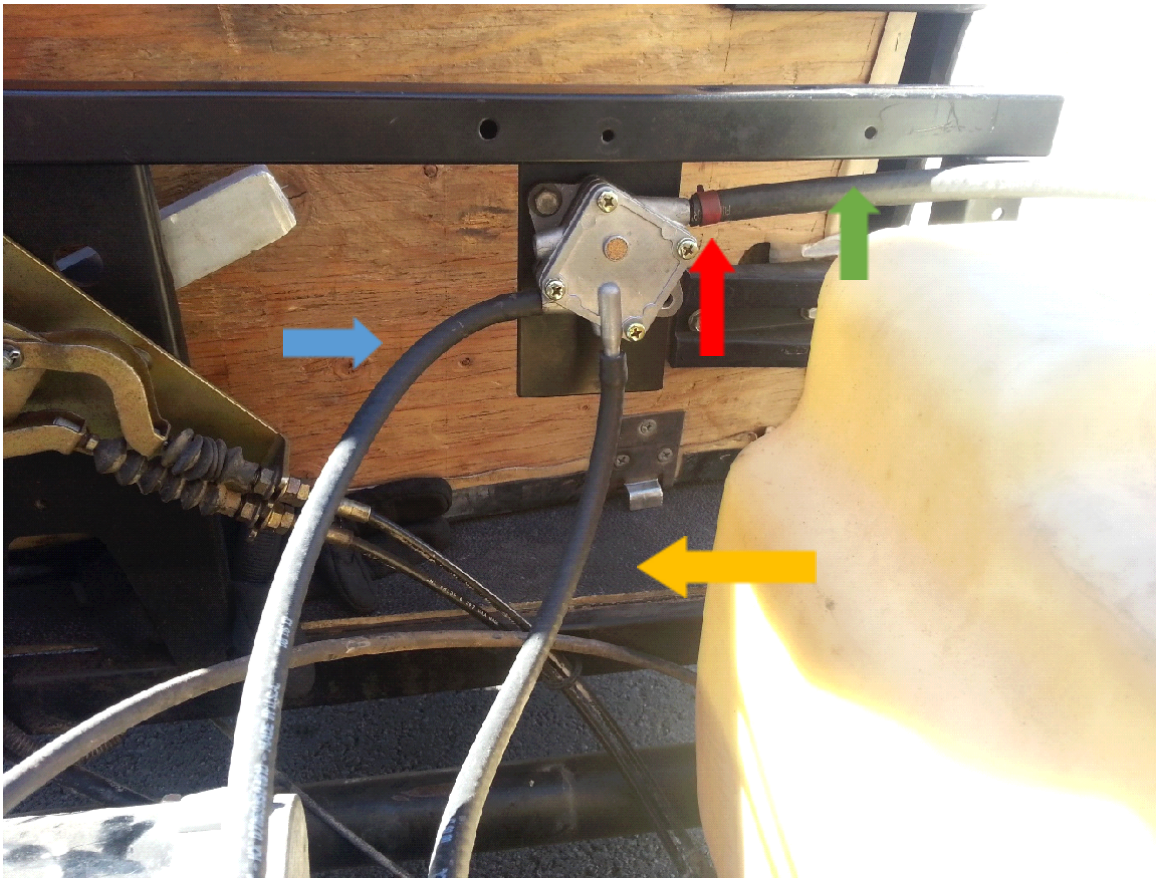
Once you are confident on your flex tube length, install the exhaust clamps as shown.

Be careful not to over tighten as you may crush the tube and cause an exhaust leak.



When setting up your fuel system, make sure the vent screen on the fuel pump is pointed upwards.

(See RED ARROW)



Green Arrow represents the hose from the fuel pump to the gas tank.

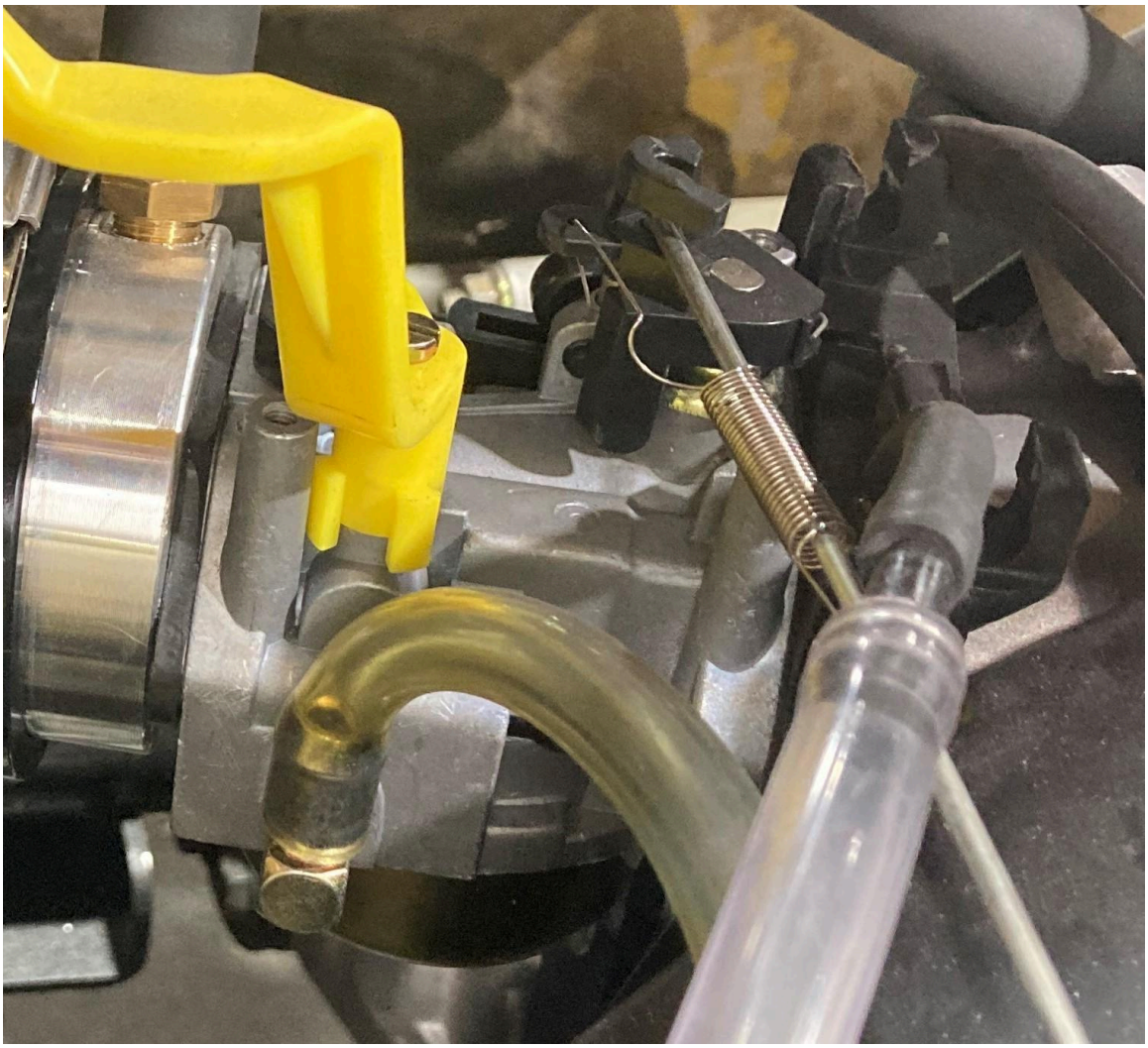
Blue arrow represents the hose from the fuel pump to the carburetor.

Yellow Arrow represents the hose from the fuel pump to the pulse fitting on the top of the engine in-between the carburetor and cylinder head.

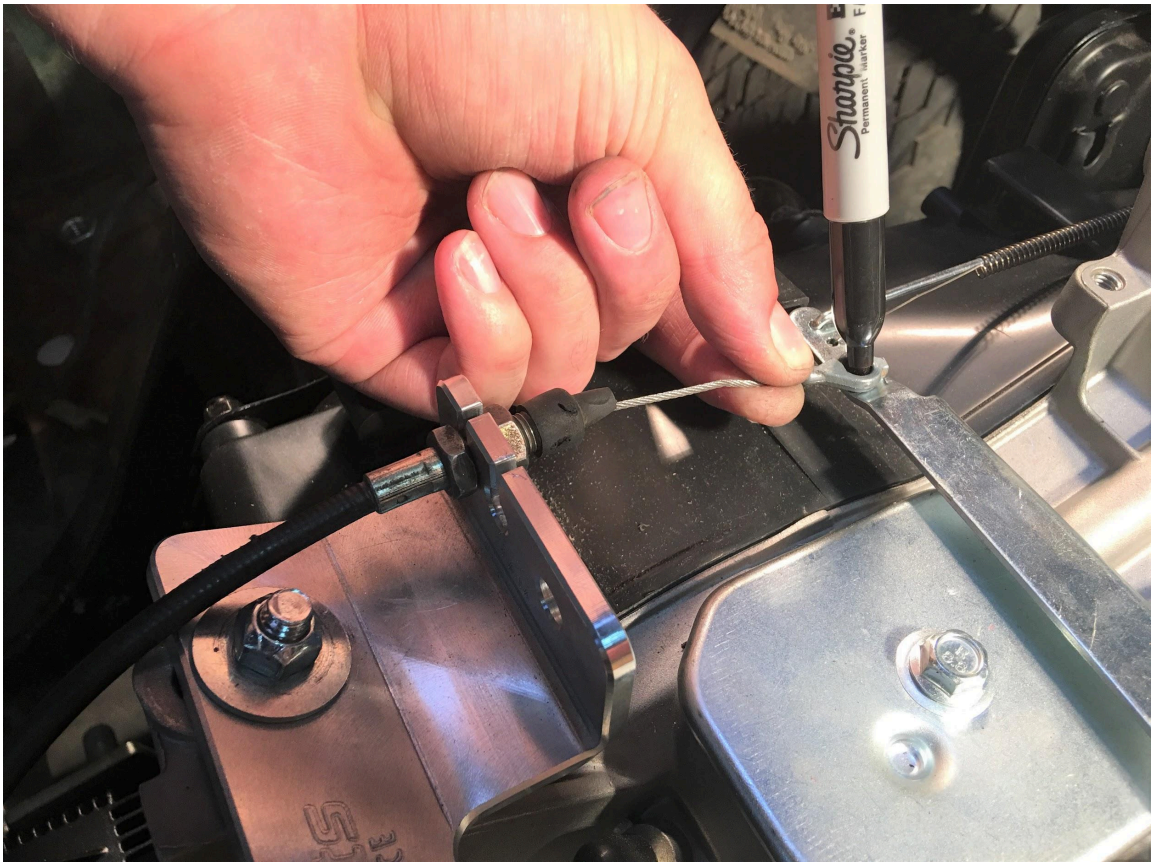
(NOTE: It is Important that all lines fit tightly to their respective fittings, a loose vacuum line from the pulse fitting on the engine can cause all sorts of fuel delivery issues.)

You should use the clear fuel line provided in your kit to replace your old rubber line.

The pulse line coming out of your engine connects directly to the clear line and will attach to the pump as shown on the previous page.



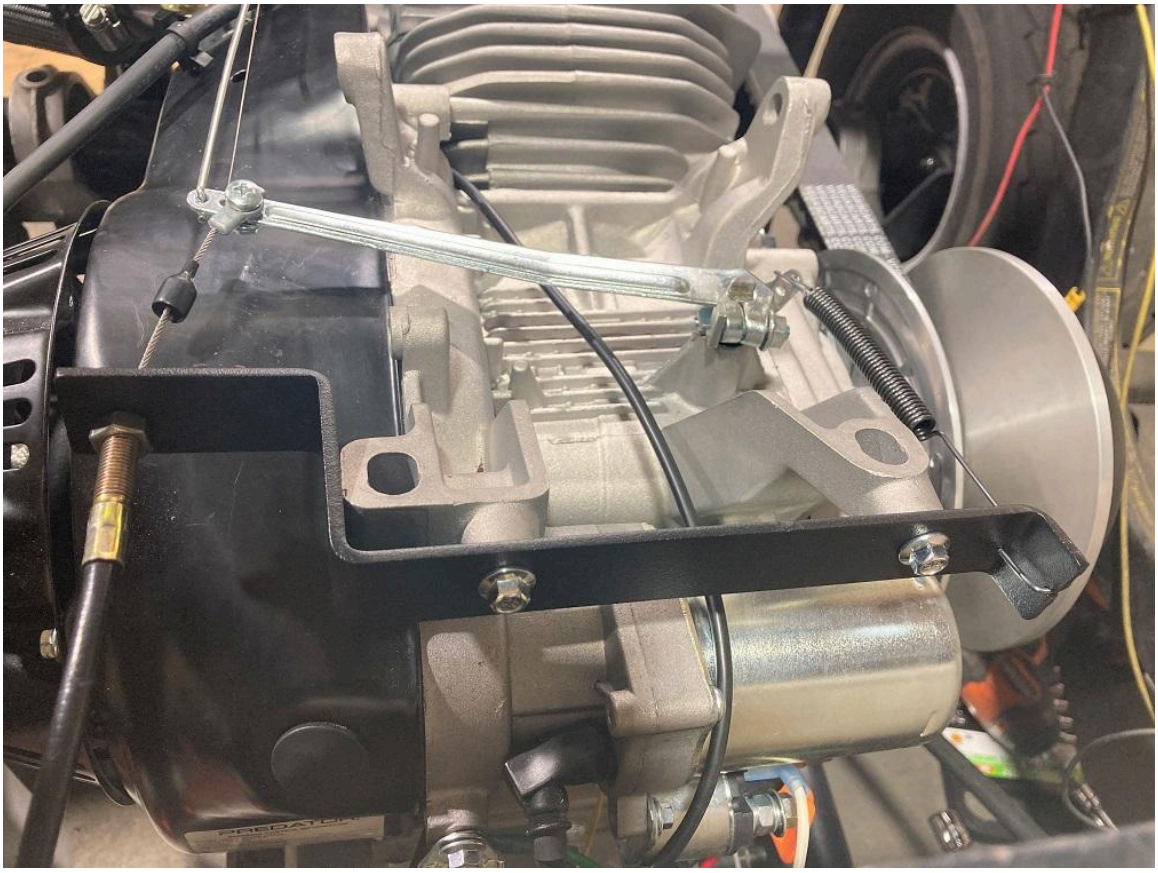
Drill a 1/4” hole through the engines governor arm(silver arm on the very top of the engine) in the location specified in the below picture to accommodate the cable mounting hardware or cable clamp.



The factory eyelet can now be bolted to the governor arm using your factory hardware.

Alternatively, if you have one of the off models without an eyelet on your throttle cable, you can cut off the end of the factory cable and use the provided cable clamp to fasten it. The cable clamp is retained by a C-Clip from the bottom.

Ensure that the throttle is opening fully when the gas pedal is depressed and the cable is not stretching or over-extended. This can easily be adjusted by moving the jam nuts



Electrical & Wiring

The Electrical wiring portion is simply a matter of extending(or using our pre-made wiring harness) the wires from the starter box that you removed from the engine originally and mounting the key switch to the dash **OR** using our Plug-and-Play harness.

There are 2 important aspects to the wiring that you also need to make sure of:

1. Make sure you have a direct ground from the (-) battery terminal to the engine. We chose a random bolt on the top of the engine. You can use the factory grounding cable that came with your cart if it's in good condition.

2. Make sure you have at least a 6ga wire coming from the (+) battery terminal to the starter solenoid. You can use one of the factory Starter/Gen wires, assuming they are in good condition.

If you chose to buy one of our Plug-and-Play harnesses, please download the instructions for it from our website at http://vegascarts.com/help

DON'T FORGET TO FILL THE ENGINE WITH OIL.... If your engine is sitting level, you can rely on the dipstick to tell you when it's full. The engine can be filled from the valve cover using a flexible funnel.

(Jack the rear of your cart up off the ground as a safety precaution before proceeding!)

A tachometer is HIGHLY recommended for fine-tuning and to keep an eye on your engine when driving. We sell a large analog tachometer on our website, you can also use a cheaper digital induction tachometer which can be found online for $15.

First startup may take some time as the fuel pump needs to prime and fill the carburetor with fuel before the engine will fire. Turn the engine over and pulse the gas pedal until it fires. You can use the yellow manual choke if you are in very cold weather.

Once you get the engine to idle, adjust the idle speed screw so your tachometer reads 2000rpm. Let the engine idle at 2000rpm for 10 minutes. During this time, pay close attention to the engine and look for oil and fuel leaks, loose bolts, exhaust leaks, etc.

After 10 minutes, the engine will be at full operating temperature. At this point, you can re-adjust your idle speed screw down until the engine idles at around 1000rpm. Any lower then 1000 and the engine will die on hard stops, higher than 1300 and you will have difficulty shifting with the engine running.

Turn the engine off and verify the key switch is working to kill the engine.

If you are confident that everything is in good running order and the cart is safe to drive, put it back on the ground, start it back up and take it around the block!

Your drive belt tension will need to be adjusted after your belt is broken-in. The belt will stretch from heat and increase in length within an hour of driving.

Your completed installation should look like this: