

## Installing the Geared Drives PSRU for Chevrolet Engines

Your PSRU (Transmission) is provided to you with the clutch and flywheel unit already assembled. This is mostly for ease of shipping and so that you will see how the pieces fit together. You will need to disassemble the clutch and flywheel assembly so that you can properly install it onto your engine. Once you have disassembled the clutch and flywheel, be sure you that you have all of the parts and supplies listed below before you get started.

Be sure to purchase and have available:

- 1 Tube Loc-Tite or other thread lock liquid
- 2 Quarts of 85-140 non synthetic anti-foaming gear lube labeled for fill up-not just for top off

**DO NOT USE A SYNTHETIC OIL**

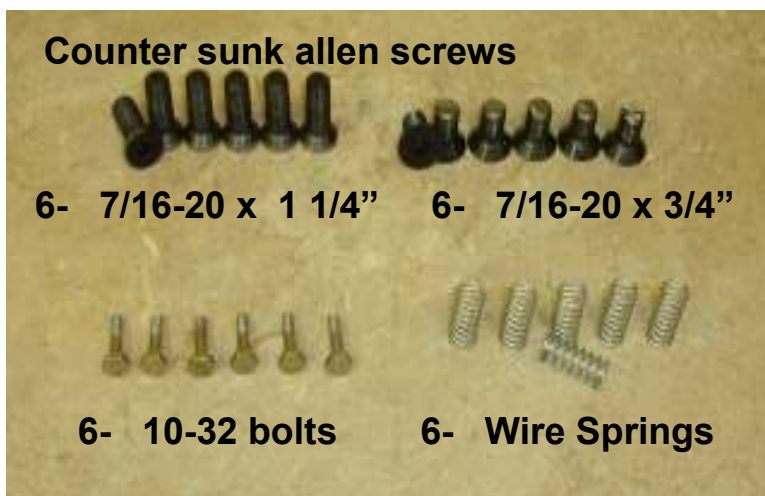
Supplied with your shipment:

- 2 5/16 x 2" temporary alignment bolts with nuts (for ease of assembly)
- 6 Counter sunk allen screws 7/16-20 x 3/4"
- 6 Counter sunk allen screws 7/16-20 1 1/4" \*
- 6 10-32 bolts for retaining the counter weights \*
- 6 Wire springs \*
- 2 Two piece dowel pins with bolts and nuts
- 1 Bronze pilot bushing for crankshaft
- 1 Tool to install pilot bushing
- 6 3/8-18 x 1 1/4 bolts and washers



**Two piece dowel pins**

\* These three items are included as part of the clutch and flywheel assembly and will not be found shipped separately with the above mentioned items. You will find them once you have disassembled the clutch and flywheel in order to install your PSRU. Complete instructions are included here.



**Counter sunk allen screws**

6- 7/16-20 x 1 1/4"      6- 7/16-20 x 3/4"

6- 10-32 bolts      6- Wire Springs



**Tool**

**Bushing**

## Prepare the engine block:

Remove the two dowel pins from the transmission flange of the engine block and replace them with the longer half two piece dowel provided. Tap the half of the dowel into the here will be provided two different short sections of this dowel, use the smooth, or knurled ones, whichever one fits more snugly in your engine block. (The threaded half goes in the block)

Tap this half of the pin, with a soft hammer, into the holes all the way so that the washer is flush with the surface. Remove the bolt and washer.

Check the face of the flange for burrs etc. that would keep the assembly from fitting together properly. Your clutch and flywheel will be shipped assembled, but you will need to disassemble it in order to install your PSRU. In the event that you need a memory jog once you have taken it apart, the proper way to reassemble the unit is as follows:



## Assembling the Clutch and Flywheel:

Using a small amount of Loc-Tite thread lock on each screw, mount the flywheel on the crankshaft flange using the short counter-sunk allen screws provided, and torque them to 35-40 ft. lbs.

**Remove the bearing** inside the end of the crankshaft and replace it using the pilot bushing



provided with your PSRU, taking care not to damage the bushing. Be sure that the radius side of the bushing is facing outward. **Use only the bronze bushing provided. DO NOT be tempted to replace this bushing with a roller bearing or use the bearing already in the engine. It will NOT be compatible with the input shaft and could cause gauling of the input shaft and possible failure of the unit.**

Plug the six (6) small wire springs into the flywheel into the small counter sunk holes in the face of the flywheel – just outside the diameter of the clutch disc.

Mount the clutch plate onto the flywheel with the raised hub of the clutch to the outside. Note that there are corresponding counter-sunk holes in the pressure plate for the springs to fit onto once the pressure plate is installed.

Now, use the two temporary 5/16" bolts and nuts through the two of the holes on opposite sides of the disc, to temporarily compress the springs and hold the assembly together while you install the L shaped brackets. Tighten the temporary bolt (do not use thread locker on temporary bolts) until the clutch plate and the flywheel fit together snugly.



Using a small amount of Loc-Tite thread lock on each screw, screw the 7/16 allen screws through the back side of the flywheel to mount the L shaped brackets, and torque to 30 ft. lbs. being sure that the L shaped bracket fits well into the corresponding countersunk portion of the flywheel. Remove the two 5/16" bolts that you used to temporarily hold the assembly together. You are now you are ready to install the counter weights.



There are six (6) counter-weights that fit between the two (2) rollers with the tapered ramp facing outward. As soon as you place each one in its proper place, and using a small amount of Loc-Tite thread locker, put the 10-32 small bolts in the tapped holes to keep them in place and torque to 5 ft. lbs. The bolts act as a stop so that the counterweights will not fall off and they are not intended to tighten down the counterweights at all, so do not think that you need to add washers or anything else to secure the counterweights.



They must be able to move freely. The automatic clutch is now assembled and ready for use.

## Install PSRU onto the Engine Block:

Plug the PSRU input shaft through the clutch disc and into the pilot bushing. Be sure that the gear case and the engine flange fit together without any standoff between the two. It may be necessary to rotate the propeller flange a bit in order to have everything line up properly. The engine flange and gear case should fit snugly together without any space between them.



This unit fits all Chevrolet engines built since 1955, however the LS series has a slightly different bolt arrangement on the transmission flange of the engine. On the LS engines, you will notice that GM has omitted one of the side bolts and added a bolt at the top of the block. Our PSRU is set up so that you can install a bolt through it and into the engine block if you wish. Either way, whether you use this bolt hole or not, you will need to use the o ring that is taped into position on the rear of the PSRU case so that it does not leak oil. Whether you use this bolt or not is optional, but you must use the o ring at this location.

If you choose to install this bolt: the cross shaft must be removed from the PSRU case which means you must first remove the oil pump and small oil lines. In order to remove the shaft, simply press on it from the prop governor side and it will slide out using minimal force. Note: there are two spacers in the housing that are made of tubing, which maintains the shaft in proper position in the case. Be sure to reinstall the spacers in their original position, as they are different lengths. You must also remove the fuel pump cover at the top of the PSRU which is held in place by two allen screws. From the backside of the case, you can see that there is a hole where the bolt will fit through the case and into the engine block. This is a tight fit and could take a bit of patience. You may need to modify an allen wrench in order to tighten this bolt.

To reinstall the cross shaft: reinsert the shaft through the prop governor side. You will see that there are different sized square drives on either end of the shaft. The small one is placed toward the oil pump side of the case. Simply slide it in place, do not force it, you may need to turn the prop shaft back and forth a bit for the gear for it to settle into place. Be sure that the spacers are placed on the ends of the shaft as you reinstall it. You will notice that on the oil pump shaft there is a square collar for the drive. (fits the oil pump and the shaft) Be sure they are plugged together as you bolt the oil pump back onto the PSRU. On the other end, there is a larger square drive, and a twelve point socket. Plug the twelve point socket on the square drive, and install your prop governor.



Place each of the six (6) 3/8" bolts provided into the six (6) holes in the case and into the engine block, and just to finger tight. Move the PSRU case around slightly to be sure that there is no bind and that the PSRU rotates freely. Tighten the six flange bolts. Then, removing them one at a

time, use a small amount of Loc-Tite thread locker, retighten each bolt and torque to 20 ft. lbs. If you are using an LS series Chevrolet engine, we furnish the starter with the PSRU since the flywheel is a different size diameter and a stock starter will not work.

## Install Prop Governor:

The prop governor boss will have a spacer inside of the bolted on cover, which you will need to remove prior to installing your prop governor onto the unit. Bolt the prop governor on to the PSRU being sure that you use the proper gasket. It will have a built-in screen so it is easy to identify. The raised portion of the screen will be facing outward when installed properly.

**If you choose to use a fixed pitch prop, contact Geared Drive for further instructions. There may be an additional component needed for your application in order to use a constant pitch prop.**

Your PSRU will be shipped to you with the oil supply line to the prop governor already installed onto one of the two ports on the top of the PSRU case. Two ports are supplied so that the unit will work for you whether your prop governor turns clockwise or counterclockwise. In the event that your prop governor does not cycle upon test run, simply disconnect the prop governor oil supply line, plug the hole, and connect the oil line the remaining port on the top of the PSRU case. There will be a small orifice in the fitting of line that supplies the prop governor lubrication. Pay attention that you do not lose it if you ever need to change the oil line or move the oil line to the second port on the top of the PSRU.



## If You Use a Mechanical Fuel Pump:

If you use a mechanical fuel pump, a Lycoming diaphragm pump will fit. There are two options, low pressure, which will accommodate carburetors, or high pressure. The high-pressure pump will put out 24 lbs. There is a ball bearing that the fuel pump arm contacts in the top of the PSRU that precludes any wear on either arm or shaft. Tighten bolts using a small amount of Loc-Tite thread locker. Snug bolts down, taking care not to over tighten.

## Add lubricant:

Since we are not allowed to ship through most carriers with lube already installed, you will need to remove the oil filter, fill it full of lube, then reinstall it back onto the oil pump. Remove the ½-inch pipe plug in the face of the gearbox and pour in two (2) quarts of 85-140 *non-synthetic* gear oil, or until the gear lube overflows from the oil filler port, then replace the plug. **Check the fluid following operation to make sure that it is clear. If it is milky or cloudy, you will need to add some anti foaming agent to the fluid in order to stop the fluid from foaming up.**

Foaming will cause the gears and components to not get proper lubrication and that will cause overheating, noisy operation and wear of your unit.

**IMPORTANT:****DO NOT SUBSTITUTE A SYNTHETIC OIL.**

**Use only 85-140 gear lube labeled for initial fill up- not just top off.** *We cannot stress this enough – we have done extensive tests and this is the best lube for the application.*



Unfortunately, we are not allowed to ship your unit with oil in it, or even in the box in new containers, so we must rely on you to use the proper lubricant. Be sure that the gear lube that contains an anti-foaming additive, and that it is labeled for initial fill up- and not just for top off. If you use a different kind of lubricant you will do so at your own risk. Use of a lubricant other than what is recommended may void the warranty offered by Geared Drives.

**If You Wish to Use an Oil Cooler:**

Connect the oil cooler between the reservoir of the PSRU and the oil pump on the intake side, which is the larger of two ports. Connect the oil filter outlet to the prop governor intake port, which is on the top of the PSRU in the countersunk portion of the case. The other port on the top of the case is connected to the port on the side of the propeller flange housing. This completes your system.

**Mount the propeller:**

Now you can install the propeller, being sure that the “O” ring in the prop hub is in good condition. Oil the “O” ring lightly before assembly to the prop shaft. Torque the prop shaft to the manufacturers’ recommended values, usually 60-70 ft/lbs for ½-inch bolts.

**Customer Support:**

You may reprint this installation manual at any time by going to our website at [www.GearedDrives.com](http://www.GearedDrives.com) and downloading the installation manual in pdf format.

If you have any difficulty at all with any of the installation instructions, or need any clarification, please call Bud Warren at (936) 827-5126 or email [Bud@GearedDrives.com](mailto:Bud@GearedDrives.com).

We are committed to the success of your automotive conversion with our Geared Drive PSRU, so please do not hesitate to call with any questions that you may have. In addition, if any portion of these instructions are not completely clear to you, please let me know by emailing your comments or suggestions to [Bud@GearedDrives.com](mailto:Bud@GearedDrives.com) .

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