



9/2/2026

Congratulations! You have just purchased the finest and only gear drive on the market for your Gen3 Hemi. This unit is made of quality components sourced from Italy and right here in the United States. With proper installation, this gear drive will out last and out perform any other cam timing device available. Please read the instructions fully before starting installation and then follow these instructions precisely. We recommend the install of the gear drive be done with the engine out of the vehicle, but it can be accomplished with the engine installed. With either choice it is recommended to rotate the engine to T.D.C. before installing any parts.

What's in the kit?

- Top Gear
- Idler Gear Assembly
- Lower Crank Gear
- Oil Pump Drive
- Thrust Bearing Set
- Cam Stud Kit
- Idler to block bolts (M6)
- Gear Clearance Paper

The first step in installing the gear drive is to install the idler gear assembly. Inspect the 4 mounting points of the block for imperfections or burrs that might keep the idler mounting plate from sitting flat against the 4 surfaces (previously used for the chain tensioner and chain guide). Ensure the surfaces and threaded holes are clean and oil free. It is recommended to immerse the idler gear assembly and completely cover with

engine oil to fill the idler bearing. The bearing is a very close fit that provides a stiff connection between the top and bottom gear. Then loosen the adjuster lock nut so the adjuster screw can be rotated easily by hand. Make sure it is screwed into the idler mounting plate as far as possible, so it allows easy installation of the mounting plate bolts (included). (If the adjuster is too long to fit inside of the block cast surface trim the length down in 1/8" increments until the 4 M6 bolts can be installed.) Place the idler assembly over the mounting locations as shown in *Figure 1*. Install all 4 M6 X 1.0 bolts dry and finger tight, leaving the assembly loose enough to shift around the oversize mounting holes.

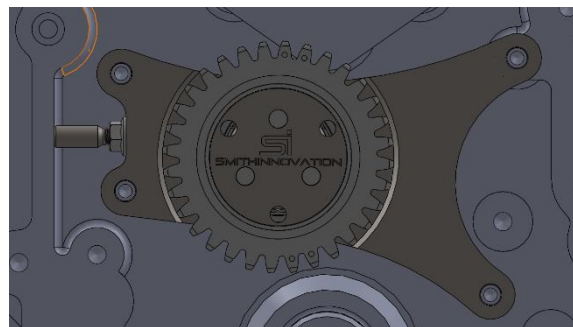


Figure 1

The second step is installing the upper cam gear. Its installation is like an OEM phaser as it simply locates on the pin with a center fastener. Install the thrust bearing assembly as washer, bearing, washer and use some lithium grease if necessary to hold the stack up in place. (See *Figure 2*)

Our upper gear comes “pin” ready if the customer determines they wish to add drive pins to the camshaft for added insurance to the friction driven cam interface. This is optional and to be determined by the installer/builder. Smith Innovation makes a drill fixture/pinning kit with everything necessary to locate and install the pins into the camshaft. The camshaft needs to be removed from the engine to perform this task and this is where it needs to be done if desired. (Complete instructions come with the pinning kit)

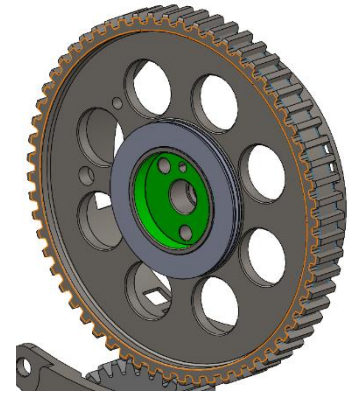


Figure 2

Next is to clean the face of the camshaft, face of the gear that will interface the cam and the threaded cam bolt hole. These surfaces should be solvent cleaned and will provide the best path toward a successful installation. Clean the included cam stud and apply red Loctite to the coarse threaded end and thread into the camshaft. Tighten until snug with the 5mm hex in the end of the stud. Then locate the upper gear over the 4mm cam locating pin. This is done while aligning the timing marks as shown in *Figure 3*. Simply align the mark on the cam gear between the two dots of the idler gear while the other 2 dot set is approximately in the 5 o'clock position. Now install the cam washer. Apply the included CMD lubricant to the flange of the 12pt nut and a couple drops of red loctite to the threaded stud (see *Figure 4*) then install the nut to the cam stud. Secure the upper gear from rotating and torque the nut to 110 ft-lb.

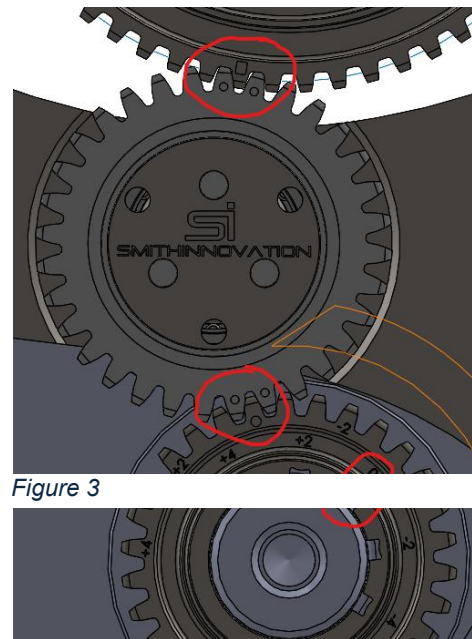


Figure 3

Now install the crank gear. With the key and tooth markings visible from the front, there are options for straight up 0, advance or retard 2 degrees or advance or retard 4 degrees. The engine builder must make the appropriate choice for the combination. The installation for straight up 0 (not advanced or retarded cam timing) is to align the keyway marked “0” with the crank key and align the two dots of the idler gear to straddle the crank gear marked “0” while placing the tail of the gear clearance paper between the meshed teeth. Timing this system is easy. To advance the cam timing 2 degrees, use the +2 marked crank key

while nesting the +2 marked tooth between the idler gear dots. Use this methodology with all 5 positions.

Gear lash that is too tight will overload and overheat the idler bearing causing failure. Use a dial indicator to set the gear lash. The lash should be .006 to .008 on the idler gear for iron blocks and .002 to .004" on aluminum blocks. When proper lash is obtained, tighten the M6 locknut on the idler gear assembly adjuster. This will hold the correct lash while the mounting bolts are removed one at a time to apply Loctite.

To finish up installation, remove one bolt at a time from the idler mounting plate and add blue Loctite then reinstall, but leave the bolts loose enough to not restrict movement of the plate assembly. After all 4 screws have Loctite applied torque the mounting screws to 12 Nm (106 in-lb) .

