

# ***INSTRUCTIONS FOR INSTALLATION OF THE CH-3 LONGBELT DRIVE UNIT TO AN ENGINE***

## **WARNING**

- **Never reach hands or other body parts in or near moving parts!**
- **Maintain a safe distance from any fixed or moving propeller!**
- **Prior to beginning any work on your project, turn off the main battery switch and/or remove the battery terminals and ignition keys!**
- **Some parts are heavier. The unit components weigh between 20 lbs. - 60 lbs. Take necessary precautions to avoid injury when preparing to, or when installing the drive unit. Always have a co-worker or assistant available to help.**

**If you have any questions or need technical assistance,  
Contact Customer Service at 866-679-4200.**

Century Drive Systems Inc.  
687 Bucktail Road  
Franklin, PA 16323

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## 17 STEPS

- Step 1:** Check the top of the engine block bellhousing for an attachment hole. Some blocks have a top center hole drilled. If no hole is drilled, place the main case over the engine dowels and use a 7/16" transfer punch to, center punch a location to drill a hole. Drill 1" deep with a 5/16" drill and tap with a 3/8"-16 tap. It is recommended to clean out the other holes with the tap as well.
- Step 2:** Be sure that the end of your crank shaft pilot area is clean and free of rust and burs. Also, some engines have a dowel pin in the crankshaft to align the flywheel. This pin must not extend through the flywheel more than 1/16" or it will interfere with the bolt heads of the Drive Unit's lower assembly. You may either grind the dowel pin flush, or drive it back toward the engine.
- Step 3:** In most cases the Generation 5 Flex Plate on a 2:1 or 2.3:1 ratio Drive Unit will bolt directly to your flywheel without drilling new holes. However, when you use other unit ratios or engines, you may have to drill the new pattern into your flywheel. In such cases, contact your dealer or manufacturer and a pattern and centering hub will be supplied for your use to drill the flywheel as needed.
- Step 4:** Put a thin film of grease into the pilot area of the crankshaft then slide the lower assembly stub shaft into the end of the crankshaft. This is a close fit so you may need to lightly tap the end of the shaft with a leather or rubber mallet. **DO NOT USE A STEEL HAMMER OR EXCESSIVE FORCE.** If the fit is too tight, use a piece of emery cloth to polish out the pilot area of the crankshaft. Clean, re-grease and try again. After inserting the stub into the crankshaft, use the (6) fine thread bolts, washers, flange nuts and spacers provided to attach the flexplate to the flywheel. The spacers are placed between the flywheel and the flexplate. Place a washer on the bolt and install the bolt through from the Drive Unit side with the flange nut being on the engine side. Although the nuts are a locking style, it is recommended loctite material be used on each of the (6) bolts. Only lightly snug the (6) bolts at this time making certain, you don't bow the two plates together. The plates must not be forced together, preloaded or bent in any way when tightening.
- Step 5:** Sprinkle some baby powder on the teeth of the Drive Unit belt, then place the belt on the lower pulley. The powder will help the upper pulley to slide under the belt for assembly.
- Step 6:** Mount the main case using the (3) 1-1/2" long and (4) 2" long 3/8" -16 L9 Hex head cap screws and lock washers provided in the hardware package. Apply loctite to the threads and torque to thirty-five (35) pounds. **WARNING: DO NOT SUBSTITUTE A LESSER QUALITY MOUNTING BOLT THAN THE CAP SCREWS PROVIDED.** Minimum requirement is a coated Grade 8, however we provide L9-PLATED fastener.
- Step 7:** Mount the rear lower bearing plate and rear mounting bracket over the dowel pins with the hardware provided. Be sure to use Loctite on the fasteners and torque to 25 pounds.

**Step 8:** Mount the lower bearing (SFC24 or SFC24TC) with (4) each 3/8"-16 - 2" long cap screws and lock washers. Torque to 25 pounds. Do not tighten the bearing set screws or lock ring at this time. It is recommended to use a thin film of rust inhibitor or "never seize" material on the small end of the shaft prior to installing the lower bearing.

**Step 9:** Bolt the upper half of the main housing together over the dowel pinned position. If your unit is a 2.3 to 1, you must install 1/2" spacer plate over the dowels and use 1/2" longer hardware provided with the 2.3 to 1 drive unit.

**Step 10:** Roll your engine through by hand about 4 or 5 revolutions by hand, be sure to protect the belt from being damaged, then finish tightening the (6) bolts on the flexplate and flywheel. Torque then to 35 pounds.

**Step 11:** Hold the Long Belt in position with (3) wood dowels provided through the rear holes in the upper case section with the belt held up so you can slide the upper assembly pulley under the belt. To do this, you should be sure that the bearing holder flange has the short side down as it is an eccentric to give you slack on the belt to assemble. The (3) wood dowels should slide out as the pulley goes under the belt. After the pulley is under the belt, you must pick up on the entire upper assembly to get the flange lip into the bore of the case. Then, rotate the bearing flange clockwise to tighten the belt. Temporarily put in (4) 3/8" - 16 x 1 1/2 cap screws. Before rotating look in from the bottom with a flash light to visually inspect that the belt is somewhat centered on the upper pulley. Then rotate the engine a few revolutions by hand without starting the engine, to center the belt. Check the belt tension by feeling the amount of belt deflection. The belt should be snug but not drum tight. If your belt is too tight, you may experience premature belt, pulley or bearing wear. Readjust to proper tension, then put all (9) 3/8" - 16 X 1 1/2" cap screws with lock washers, then rotate through again and recheck.

**Note: Some belt rumble at 500-750 RPM is normal and the belt will tighten a little more as the unit warms up. If you hear the belt whine it is most likely too tight.**

**Step 12:** If you are using the SFC-24TC style bearing, you must tighten the lock ring around the split portion of the inner race of the lower bearing and again re-tighten after a few hours of drive unit operation. If you are using the standard set-screw bearing (SFC-24), take out the set screw and with the bearing in place, reach through the set screw hole with a drill and drill bit to make (2) dimples for the set screws to lock into.

**Step 13:** Install the (2) belt roller idler assemblies into each side of the main housing. Torque 3/8" cap screws to 25 lbs.

**Step 14:** All drive units are shipped pre-greases. However, after the first hour of operation, give the upper (2) grease fittings (2) pumps of grease only. Then, give the grease fitting on the lower bearing (2) pumps of grease as well as (2) pumps on each idler roller.

**Note: Grease the (3) main bearing fittings with only two (2) pumps of grease every 15 hours of operation. Over greasing at one time can push out dust and grease seals. Grease the roller idler bearings every (5) hours of operation with (2) pumps of high temperature grease.**

**Step 15:** The rear mounts of the drive unit main case should be sandwiched between neoprene. This is accomplished with a long 9/16" Grade 8 bolt, a large flat washer and a 3/8" thick neoprene pad being installed from the top. A 1-1/2" thick neoprene pad should be directly under the Drive Unit case between the case and the engine stand. Under the engine stand, use another 1-1/2" thick

neoprene pad, large flat washer, lock washer and a 9/16" lock nut (or use (2) nuts to jam nut secure). You will need a total of (3) neoprene pads per each bolt for the rear mounts being a total of 6 pads. If you are using the extra rear mount on the long belt system, you will need a total of 12 Neoprene Pads. Century Drive Systems Inc., does not supply this hardware or neoprene pads for the rear mounts since so many different mounting frameworks are used. Remember for proper alignment that the 1-½" thick neoprene pad under the drive unit will compress approximately 1/4" to 1/2". This compression will vary depending upon the density of the neoprene pads being used. We suggest using medium to stiff neoprene pads.

**Step 16:** After 5-10 hours of operation, it is recommended all drive unit bolts be re-torque and verify that the lower bearing set screws or ring clamp is still tight.

**IMPORTANT NOTICE:**

**Step 17:** Some boat builders are using a dynafocal mounting system, and with this system they are not using the secondary rear mounting bracket. In either mounting system, a brace must be placed from the upper case housing to the front of the engine heads with a standard mounting system, or attached to the framework with the Dynafocal mounting system. This will keep the drive unit mounted and braced intricately to the engine. Due to high bending moment stresses developed with the propeller at 41.8 inches above the center of the engine crank shaft, this support brace is critically important and must be properly in place to operate the drive unit safely.

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DRIVE UNIT	AVAILABLE RATIOS
CH-2	2 TO 1
CH-3	1.774 TO 1; 2 TO 1; 2.3 TO 1
CH-3 COUNTER ROTATOR - INPUT RATIOS	1.774 TO 1; 2 TO 1; 2.3 TO 1
CH-3 LONGBELT	2 TO 1; 2.3 TO 1
BRIGGS MINI DRIVE	1.65 TO 1; 2 TO 1