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COA-281110 "POWERSHIFT XMT" 2-SPEED MARINE TRANSMISSION

Congratulations on your purchase of a Coan "Powershift XMT" 2-Speed marine transmission. This transmission is designed to provide a reduction range to help the boat plane faster as well as help low speed maneuvering by reducing prop speed. Power shifting into high gear will produce equal or better top speed than single speed units. These transmissions have 1.80:1 reduction in low gear, 1:1 in high gear, and 1.61:1 reduction in reverse. Powershift XMT transmissions are capable of withstanding up to 2000 horsepower.

*****Accurate installation is critical to insure proper function and longevity of the transmission*****

INSTALLATION:

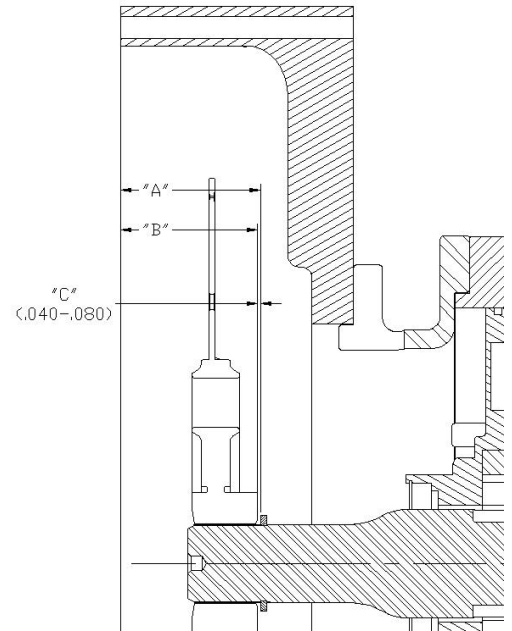
1. **FLUID:** Coan Engineering requires the use of AMSOIL Synthetic Powershift (CTG) SAE 10W fluid in this transmission. Amsoil fluid will provide the best performance while maintaining proper lubrication of the transmission. AMSOIL Powershift fluid is available from Coan Engineering in 5 gallon containers. Failure to use the proper fluid will void product warranty.
2. Make sure to use the dipstick and tube that is pre-installed in the transmission. Maintaining proper fluid level is critical to the operation of your transmission. Failure to maintain proper fluid level can lead to early if not immediate failure of your transmission. The transmission is equipped with a special deep sump oil pan with rear pick-up. This design ensures plenty of oil is available during takeoff, while also holding the oil low in the sump to reduce windage for greater top speed.
3. The transmission must be coupled to the engine with a damper assembly (spring or viscous type). Never directly couple the input shaft of the transmission to the crankshaft without a damper assembly. This could lead to premature transmission failure. Inspect damper assembly for cracks around all mounting holes, and/or broken springs.
4. Make sure block dowel pins are long enough to fully engage in the bellhousing dowel pin holes to insure proper alignment. This is especially important when there is a mid plate between the engine and transmission. Longer dowel pins for most applications are available from Coan Engineering. When using a Dual Cooler bellhousing, the left side cooler is limited in size to 7 plates. A taller cooler will interfere with the transmission case and/or shift linkage.
5. Prior to installing the transmission on the engine, measurements must be taken to determine the amount of floating clearance the input shaft will have when installed. Depending on the type of bellhousing being used, Coan Engineering offers (2) lengths of input shafts. The longer shaft used for Borg Warner replacement installations has a snap ring on the shaft which stops against the damper assy. The shorter shaft used for new XMT installations has a step rear of the splines which stops against the damper assy. The method to determine clearance is the same regardless of shaft type.
6. When installed, the input shaft must have 0.040"-0.080" of floating clearance front to back. This can be measured by:
 - a. Install the bellhousing to the transmission
 - b. Push the input shaft fully into the transmission
 - c. Lay a straight edge across the bellhousing surface that mates to the engine/midplate
 - d. Take a depth measurement (using either a Depth Micrometer or Calipers) from the bellhousing face to the front edge of the mechanical stop on the shaft. Typical measurement (Long or Short Shaft): 2.420". Call This Dimension "A".
 - e. Lay a straight edge across the rear face of the splined damper hub
 - f. Take a depth measurement from the bellhousing face of the block (with mid engine plate installed) to the rear face of the splined damper hub. Typical measurement: 2.360". Call This Dimension "B".

$$\text{"A"} - \text{"B"} = \text{"C"}$$

"C" must be 0.040" to 0.080"

- g. Multiple engine installations must verify this for each engine/transmission combination. Failure to accurately clearance the input shaft will cause transmission failure. If Dimension "C" is over 0.080" a spacer must be installed around the shaft, between the damper and shaft stop. If Dimension "C" is less than 0.040" the splined damper hub must be shortened the appropriate amount.
7. The input shaft splines must be properly aligned with the damper splines as the transmission is guided onto the engine. **Do not** force bell housing onto the engine by tightening the bellhousing bolts! Install **ALL** available bellhousing bolts.

8. Connect the transmission cooler fittings to a 7 plate or equivalent water cooled heat exchanger. Plumbing to the cooler should be -6AN or equivalent. The port thread in the case is ¼ NPT. Use caution when installing case fittings, over tightening can result in cracking the transmission case. If you are replacing an existing transmission, install a new transmission cooler. Failure to remove existing debris from coolers and lines will cause faulty operation and premature transmission failure. Failure to install a new transmission cooler will void product warranty. If for any reason the cooler must be by-passed, the inlet and outlet ports of the transmission must be connected together with a looped line. Never operate the transmission for extended periods without a functioning cooler.
9. Connect the transmission vent fitting (top right) to a vented overflow container. Coan Engineering offers transmission mounted overflow containers.
10. Connect the transmissions output flange to the boat's driveshaft.
11. Connect the transmission shift linkage to the boat's shifter using a Morse cable. If your boat is equipped with a Livorsi shifter, we recommend attaching the cable to the farthest point from center on the shifter. The shift pattern of the transmission as viewed from front to rear on the transmission with the shift arm pointing down is: Neutral (optional Park)-Reverse-Neutral-Low-Direct. Adjust cable in the middle neutral position.
12. Upon completing installation of the transmission pour 10 quarts of AMSOIL Powershift 10W synthetic fluid into the transmission. Start the engine(s) with the shifter in the Neutral position, and then put the transmission(s) into Low, High, and Reverse positions. With the shifter in the neutral position with the engine(s) running verify the fluid level by reading the dipstick. If needed, add fluid until the transmission reaches the full mark on the dipstick.



OPERATION:

1. **SHIFT PATTERN:** Neutral(optional Park)-Reverse-Neutral-Low-High
2. **REVERSE:** This gear is meant for low speed maneuvering only. The transmission operates at reduced capacity in reverse to provide smooth engagement when toggling between gears for docking and/or loading on a trailer.
3. **LOW RPM DRIVING:** Low gear in the transmission will reduce the speed of the prop by 45% to make harboring the boat easier.
4. **POWER STARTS:** While Low range assists in slow speed driving, it can also help your boat reach plane quicker. The gear reduction gives your engine a mechanical advantage over the prop allowing engine speed to increase faster. In many cases it even allows for larger or more aggressive props to be installed. Output torque is increased by 80% in low gear.
5. **DIRECT DRIVE:** As the transmission's name implies, it may be power shifted from Low Range into Direct Drive. Direct provides a 1:1 coupling of the engine and transmission for maximum TOP SPEED.
6. **Direct to Low Downshift:** Engine speed must be below 2500 RPM prior to downshifting the transmission from Direct to Low Range.
7. **PARK:** If it is necessary to idle engines for warm-up or other reasons, an optional park feature is available. It is common to experience a slow prop rotation when in the neutral position. Park is a mechanical feature which locks the transmission's output. If your transmission is equipped with the optional "Park" feature it must only be engaged with the engine SHUT OFF. NEVER engage park with the engine running, this can cause damage to the transmission. You may shift out of park with the engine running. For transmissions not equipped with optional "Park" that position in the shift pattern serves as an additional "Neutral".

If you have any questions regarding the proper installation and/or operation of a Coan Engineering product, please call (765) 456-3957. You may also fax us at (765) 456-3960, or e-mail at coan@coanracing.com.

Warranty

Coan Engineering offers a limited warranty covering "Powershift XMT" transmissions for one year from the original date of purchase to be free from flaws in material and craftsmanship. The warranty is non-transferable. Under no circumstances will Coan Engineering extend its warranty to products which have been abused, misused, or incorrectly installed. Disassembly of any product by means other than a Coan Engineering technician will void any potential warranty. All warranty claims must be accompanied by the original invoice and are subject to the approval of Coan Engineering.

The above stated warranty **does not include** any shipping charges or labor charges for installation or removal of any Coan Engineering product.

Liability

In no manner, neither written nor implied, does Coan Engineering accept liability for consequential or incidental damages to person or property resulting from the use or misuse of its products. Product failure occurring within the stipulations of the warranty policy will be dealt with explicitly under those particular guidelines.