POWERTRAIN TECHNOLOGY
RACING CLUTCHES & DRIVETRAIN PRODUCTS

Hydro-MAX

# Drop-in Hydraulic Clutch Release Bearing
# INSTALLATION INSTRUCTIONS

Thank you for purchasing a ***PowerTrain Technology*** (PTT) ***Hydro-MAX*** Hydraulic Release Bearing (HRB). Hydro-MAX is a high performance hydraulic clutch release bearing with a positive return spring built into it. It will work with all manufacturers' small diameter multi-disc automotive racing clutches that use a flat diaphragm spring. (No large diameter (10.5") street clutches with radiused spring fingers!) It is designed to operate with 5/8" or 3/4" master cylinders. Reading & following these instructions will ensure that you get maximum performance from this highly engineered product.

**Quick instructions are in bold.** A more detailed explanation of that step follows.

**Check box contents for missing parts.** You should have a Hydro-MAX HRB and the installation hardware pictured (see Figure 1).

Fig. 1: Hydro-MAX HRB & Installation Kit

**Install washers & anti-spin stud** onto transmission bearing retainer. Your Hydro-MAX slips onto the front bearing retainer (snout) of your transmission. The Hydro-MAX is not bolted down in any way. To keep it from spinning you need to replace one of the bolts that hold the snout on with an anti-spin stud. At the same time, to give the Hydro-MAX a firm place to push against, install the supplied washers on the other 3 bolts (using either 5/16" or 3/8" depending on your transmission's bolt size).

The bolt heads need to be approximately .800" tall when measured from the top of the bolt head, to the transmission face (see Figure 2). Between 2 & 4 washers are usually needed to get to this height. Ensure that you have the same number of washers under all four bolts. To keep the Hydro-MAX from spinning, you must select the proper size anti-spin stud (either 5/16" or 3/8", depending on your transmission's bolt size), and install it in place of one of the stock bolts. PTT recommends the use of an anaerobic thread locking compound such as Loctite® on all bolts. **NOTE:** Some transmissions do not have equally spaced bolt locations. Make sure that you install the anti-spin stud on one of the three bolts that are <u>not rotated out of the equally spaced positions</u> (see Figure 3). ***<u>Set up your spare transmission now, as well!</u>*** Hydro-MAX installation kits are available separately for this purpose. Ask for part number RH7111.

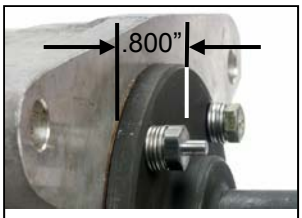


Fig. 2: Bolt w/ shims

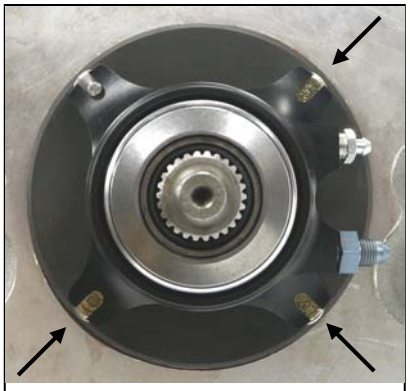

Fig. 3: Bolts centered under Hydro-MAX legs

**Double check for proper washer installation height.** To ensure that the washers and anti-spin stud are correctly installed do the following:

1. Set the Hydro-MAX in place over the transmission snout
2. Check to see that it's four legs sit evenly on the bolt heads
3. Verify that the anti-spin stud engages the slot on any one of the Hydro-MAX legs
4. Add washers if the legs do not contact the bolt heads
5. Change the anti-spin stud location if at least three of the four legs are not sitting exactly on the center of the bolt heads (See Figure 3).

**Release Bearing Clearance.** Your Hydro-MAX has a positive return spring on the hydraulic piston. This means that every time you engage the clutch (let your foot completely off the clutch pedal) the Hydro-MAX fully retracts away from the clutch spring fingers. This positively ensures that there is no residual hydraulic pressure partially releasing your clutch (potentially causing it to slip). You also need to keep in mind that as the clutch disc(s) wear, the clutch spring fingers come up, (towards the transmission) decreasing this clearance. To make sure that the clutch does not get partially released, as normal clutch wear occurs, you have to have clearance between the release bearing and the clutch spring fingers. This clearance is referred to as clutch release clearance, or backlash. PTT recommends .090" to .125" of clearance for proper clutch operation, and long life. Some drivers adjust the clearance for less (or sometimes more) clearance, based on personal driving preference.

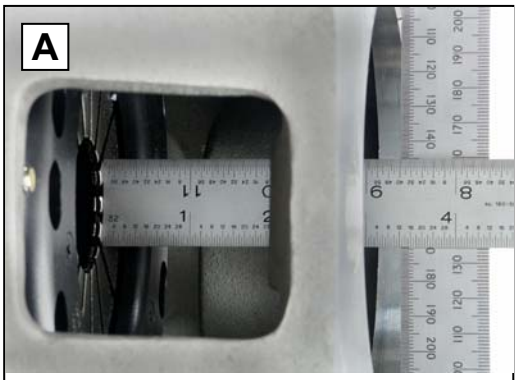


Fig. 4: Clutch set-up height: The distance from the transmission face of the bellhousing to the spring fingers of the clutch.

**Measure for the proper clutch release clearance.** After properly installing the flywheel, clutch, and bellhousing, using a straight edge, and a precision measuring device, take the following measurements and record the numbers in the space provided below.

A.)_____Clutch set-up height: (see Figure 4)

B.) -_____Hydro-MAX set-up height: (see Figure 5).

C.) - .125" Allow for the recommended .125" release bearing clearance.

_____TOTAL: Line A, less line B less line C. This is the height of the shims you will need to insert under the bearing of your Hydro-MAX in order to achieve the recommended .090" to .125" release bearing clearance.

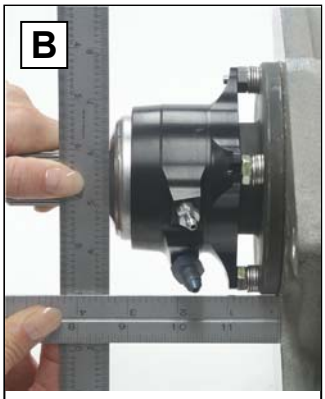


Fig 5: Hydro-MAX set-up height: The distance from the front of the bearing to the face of the transmission.

**Install shims for proper clutch release clearance.** Your Hydro-MAX comes with ten silver 1/16" thick shims, and one 1/32" thick black shim. Assemble the correct combination of shims that closely matches the shim height needed, as calculated above. Push the bearing & sleeve assembly out of the Hydro-MAX, & install the shims over the sleeve, then push the sleeve back into the piston (see Figure 6).

Fig. 6: Install shims over sleeve

**Install Hydraulic lines & bleed.** PTT recommends a high quality dash 3, stainless steel braided, Teflon® lined, supply line. Straight ends crimped in place on both ends are preferred for reliability, and best fluid flow. Premium quality supply lines in various lengths are available from PTT. Hydro-MAX is designed to operate with a 5/8" or a 3/4" master cylinder. Install the hydraulic supply line onto your hydro-MAX after routing it through the access hole in your bellhousing, and bleed the air out of the system. If you have a remote bleeder line kit, you should install it now, and route both lines out of the bellhousing. (The remote bleeder kit consists of a short extension line which allows you to bleed the clutch release hydraulic system from outside the bellhousing.)

NOTE: The hydraulic seals in your Hydro-MAX are intended for use with DOT 3 or DOT 4 brake fluid only. DO NOT USE DOT 5 OR ANY SILICONE BASED BRAKE FLUIDS.

**Install the transmission.** When installing the transmission, check to ensure that the Hydro-MAX has one leg engaged on the anti-spin stud. After the transmission is in place, you should be able to move the Hydro-MAX back & forth in the bellhousing by the amount of release clearance you have shimmed to. (.090" to .125") If you cannot move the Hydro-MAX back & forth, check your shim heights & readjust as needed. Disengage the clutch using the clutch pedal to check for proper release. Your Hydro-MAX is now successfully installed. PTT highly recommends the use of a positive stop on your clutch pedal to limit travel to just what is needed for proper clutch release. This prevents possible damage to the clutch & Hydro-MAX caused by over-stroking. It also allows quicker shifting.

**Maintenance.** Check the release clearance whenever you inspect your clutch, and adjust as needed. The release clearance will decrease as the clutch pack wears. This is normal, and should be periodically checked. With reasonable care, your Hydro-MAX Release Bearing is designed to last many seasons of racing.

Good Luck & Good Racing!

IF IN DOUBT, PLEASE CHECK WITH YOUR DEALER OR ***POWERTRAIN TECHNOLOGY*** FOR FURTHER ADVICE!
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POWERTRAIN TECHNOLOGY
RACING CLUTCHES & DRIVETRAIN PRODUCTS
355 Point Court Ph: 847.458.2323
Algonquin, IL 60102 Fax: 847.458.2324