



Installation Instructions

6000-Series Hydraulic Release Bearing



The Tilton hydraulic release bearing assembly is self-adjusting once proper set-height has been accomplished. The bearing will always be in contact with the pressure plate fingers, but not under constant load or preloaded. When the clutch pedal is released the bearing will only return to the point of contact. There will not be a "gap" between the bearing and pressure plate fingers.

New style sealed bearings are considered constant-contact, unlike bearings that required servicing thru a zerk fitting or the required gap to keep from wearing out.

No additional return springs or helper springs are required or recommended for this bearing assembly.

The piston of this assembly has .700" of available stroke.

When used with a master cylinder system designed to utilize full stroke of the clutch pedal... a pedal stop is not required.

If your pressure plate has counterweights retained by a wire you will have inconsistent clutch release and increased pedal pressure at higher RPMs. 3-finger pressure plates and mechanical release diaphragm pressure plates require more travel and may also have more pressure. These types of pressure are not recommended. Contact Modern Driveline for technical assistance.

FREE PLAY AND HEIGHT ADJUSTMENT

These instructions assume your transmission has a conventional guide-tube/bearing retainer that will support the installation of the Tilton bearing assembly and adjustable collar.

1. Disconnect and remove any existing mechanical clutch linkage, fork, and mechanical throw-out bearing.
2. With the flywheel, clutch (with disk) and bell housing installed and torqued on the engine... measure the distance from the bell housing transmission mounting surface to the fingers on the pressure plate. Measure accurately within .005". Record this distance as "Dimension A". See Diagram 1 below.



Diagram 1 – Dimension A = _____

3. If your transmission was separately purchased from MDL, or not from MDL, you may need to relive the casting steps for the Tilton bearing to seat back far enough, to accommodate clutch height.
4. Relive the casting bumps as needed as follows:

Sand the casting on the transmission to allow room for a deep well socket.

Relieve 2-3 threads below the sanded surface to accommodate the non-threaded portion of the stud.

Install the stud with medium strength loc-tite.

Trim the stud to the back of the bearing surface when fully compressed, after height adjustment.



Shown is 2-3 threads relieved in sanded surface.

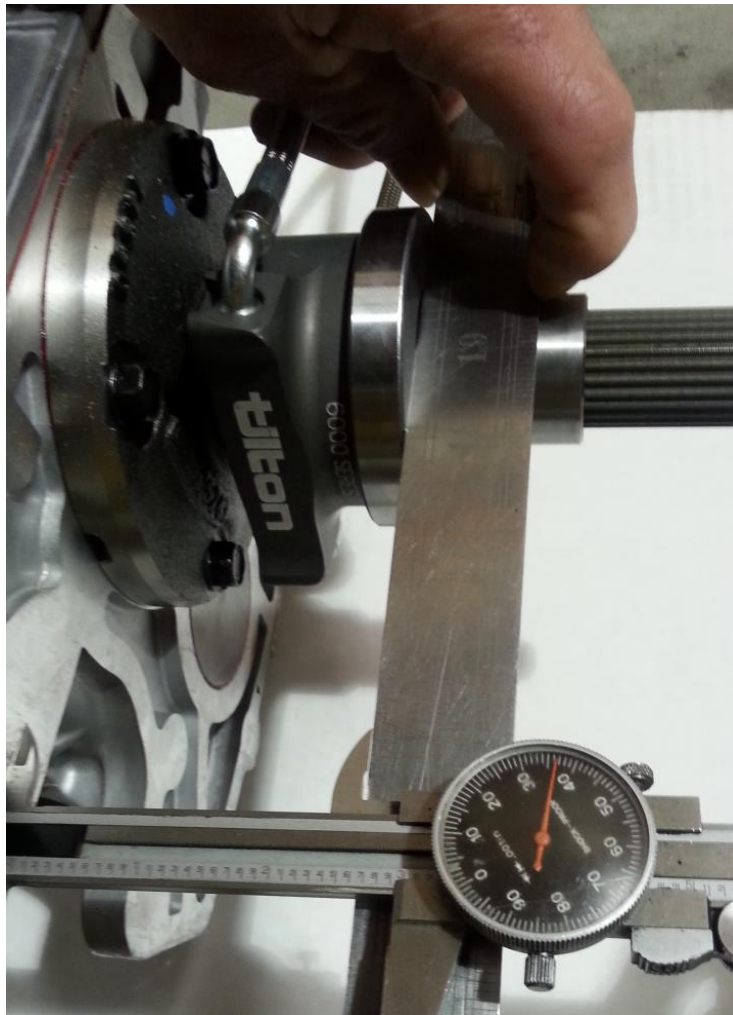


Stud before sanding casting tabs



Stud after sanding casting tabs

5. Install the non-threaded collar with internal bevel facing the transmission.
6. Apply a thin film of lube/grease on the o-ring in the Tilton collar and the transmission guide tube. Push the bearing assembly with collar onto the guide tube until it seats.
7. Subtract .125" from Dimension A. This will be the installed height of the bearing assembly from the face of the release bearing to the face of the transmission (with the bearing and piston completely compressed into the hydraulic base). This will be "Dimension B" in Diagram 2 below.



Sample picture for dimensioning only.

Diagram 2 – Dimension A _____ - .125 = _____ Dimension B

Note: Do not use shown dimensions – display purposes only.

8. Rotate the Tilton bearing assembly on the threaded collar until the required height is achieved.
9. The set-up gap of .125" is required for new clutches. This allows the clutch pressure plate fingers to rise as the disk wears/wears-in.
10. If you are unable to achieve a .125" set-up gap... contact Modern Driveline for assistance and/or additional parts such as spacer plates, adapters, and extended pilot bushings.
11. Remove one of the lower bearing retainer bolts and locate the supplied anti-rotation stud within the ear located on the bearing housing. Install the stud using removable Loctite or silicone sealant and torque to no more than 16 ft/lbs.

Note: you may remove the bearing assembly with collar to perform this step, making sure to re-install the bearing without rotating the collar.

12. **Cut the end of the anti-rotation stud so it does not touch the bearing or protrude beyond the face of the bearing with the bearing adjusted and completely compressed. This will avoid any interference with the clutch.**
13. The hydraulic lines have been installed to the bearing body at the factory. They are designed to rotate to accommodate the installation. Do not remove lines to install transmission.
- 14.
15. Double check your bearing to clutch clearance is .125" (tolerance +/- .025").

Clutch Stack-Height Check

While the next statement does not apply to the bearing directly... it is a perfect time to mention this important step.

Transmission Stack-up/Clearance Checks – Make sure the pilot tip penetrates the pilot bearing or pilot bushing by at least ¾ of the way on the smallest surface. EX: a pilot bushing that is ½" thick, you want at least 3/8" surface of the pilot tip touching. It is okay to completely penetrate a bushing or bearing. There should be at least 1/16" clearance between the pilot bearing/bushing and the (next step) splines of the input shaft. Make sure there is 1/8" (.125") gap between the guide tube and the clutch disk. No gap will result in catastrophic failure. There must be room for the disk to wear and "room for release" when the pressure plate is released.

DRIVETRAIN ASSEMBLY

Install the transmission. Carefully route both lines through either the release fork window or holes that have been drilled or exist to accommodate the lines.

16. Ensure the hydraulic lines do not interfere with the clutch or flywheel rotation. Additional "P-clamps" or zip-ties may be used to secure the lines clear from the rotating mass.

MASTER CYLINDER SELECTION

17. Master cylinder size is determined by the amount of travel required to release the clutch. For example, a 3-finger clutch typically requires 1/2" of travel to release as compared to a modern diaphragm style clutch requiring only 3/8"-7/16" of travel.

This is the first thing to know.

18. Next, measure the amount of stroke available on your clutch pedal, where the master cylinder will attach.
19. These two measurements will determine the bore size required on the master cylinder.

Here are the volume displacement requirements for the Tilton bearing assembly:

Travel	Volume (cu/in)
0.4"	0.483
0.45"	0.543

Modern DriveLine has established known master cylinder relationships required for clutch type and travel limitations.

HYDRAULIC LINES

This bearing is supplied with two identical lines installed for the supply and bleed ports. Both lines are sized AN-4 and should only be used with AN type fittings. It is important that whichever line is on the bottom is used as the supply line (connected to the master cylinder) and whichever line is on top is used as the bleeder.

20. Attach the supply line to the master cylinder using your choice of rigid or flexible line. If using a Tilton master cylinder (which have AN-3 outlets) you will need a AN-3 male to AN-4 male adapter (such as Earl's part number 963243).
21. Attach the supplied bleed adapter and bleed fitting to the bleed line.

HYDRAULIC RELEASE BEARING BLEEDING

22. Tilton release bearings are DOT3 or DOT 4 brake fluid compatible. Do not use DOT 5 silicone based, or high temperature resistant brake fluids designed for more than 550°F as some brands will cause the seals to swell.
23. Follow the manufactures installation requirements for the master cylinder to perform bleeding operations. Additional fluid limitations may apply.

SETTING THE CLUTCH PEDAL STOP

A pedal stop is only required for two reasons:

24. If the volume of the master cylinder being used is greater than needed to release the clutch.
25. If the travel of the clutch pedal is greater than the master cylinder travel-this will prevent damaging the master cylinder.

RELEASE CHECK

If you do have to set a pedal stop:

26. Lift the drive wheels off the ground and support the car on jack stands.
27. With the engine off, put the transmission into 1st gear and have someone attempt to rotate the drive wheels.
28. Depress the clutch pedal slowly until the clutch disengages and the drive wheel can be rotated. Do not push it any further.

29. Note the clutch pedal position at this point. Adjust the pedal stop bolt to allow an additional 1/4"-1/2" of pedal pad travel.

MAINTENANCE – Transmission Removed

Spin the bearing race and check how it feels. If it has a higher than normal resistance or has a slightly notchy feel, replace the bearing. The replacement bearing is Tilton part number 62-618.

Protect the piston from damage while removed from the body.

Remove the piston assembly and check for any scoring in the bore or on the piston surface. Wipe the piston and orange wiper seal before installing.

You may find that the piston is not dry. This could be the rubber grease used when installing the new seal at the factory. Do not mistake this for brake fluid.

If the seals need to be replaced, the seal kit is Tilton part number 62-905. Specific instructions are supplied with the replacement seal kit.