

# INSTALLATION INSTRUCTIONS

## 1600-Series Hydraulic Release Bearing

The Tilton 1600-Series hydraulic release bearing is the first assembly that has both a positive stop and built-in self-adjusting capabilities. When used with matching Tilton components it bolts directly into place with no shimming required. Its self-adjusting characteristic compensates for clutch wear and provides a consistent clutch engagement position. The positive stop eliminates the possibility of over-stroking and damaging the clutch without the need for a positive stop at the pedal.

### As Received:

1. The fittings and ports are -3AN. Select your lines accordingly.
2. If you need to take any measurements for clearance purposes fully compress the piston. It is now partially extended.

### A) Installation

1. Cut the pilot tube off of the transmission input shaft bearing retainer if it is still in place. You will need to remove the bearing retainer from the transmission to do this. This is an absolute must for the assembly to function properly. Failure to do so will damage the clutch and bearing.
2. Position the assembly on its mounting posts in the housing with one port towards the top (bleed port) and the other port pointed toward the left side of the car (inlet/master cylinder port).
3. Bolt the assembly into position. Use one flat washer under the bolt head and one under the nut. The bolts come in from the transmission side through the housing and then through the hydraulic assembly. **Torque to 72 in-lbs.** The bearing clearance has already been designed into the system. If you are using the normal Tilton housing, clutch, and flywheel the clearance will be proper as long as you have the standard Crankshaft offset. Table 1 lists the standard crankshaft offsets for the different engines. Should your crankshaft offset from the back of the block fall outside of the listed range you will need to adjust the bearing position by an amount equal to the difference from nominal crankshaft offset. A way to double-check your figures is to follow the bearing clearance procedure listed in part C.

### B) Measuring Bearing Clearance

1. Install the flywheel and new clutch assembly as explained in their instructions. Used parts will generate false readings.
2. Press with a firm and even force to make sure that the piston in the hydraulic release bearing is fully retracted.
3. Measure the distance "A" as shown in **Figure 1**. This is the distance from the transmission mating face on the back of the housing to the end of the bearing. The hydraulic release bearing assembly needs only to be set (does not have to be fastened) in place when taking this measurement.
4. Bolt the housing onto the engine and measure the distance "B" shown in **Figure 2**. This is the distance from the transmission mating face on the back of the housing to the tips of the spring fingers on the clutch. This measurement is much easier to make without the hydraulic release bearing mounted to the housing.
5.  $C=B-A$ . This is your bearing clearance. It should be in the range of .180" to .220". This will allow the full wear range of the clutch. If the clearance is outside of this range you will need to modify the position of the hydraulic release bearing assembly. This should not be required as long as you are using standard Tilton components.



Table 1

Crankshaft Offset	
Dodge	.565 ± .010
Ford	.260 ± .010
GM	.700 ± .010
Toyota	.496 ± .010

Figure 1

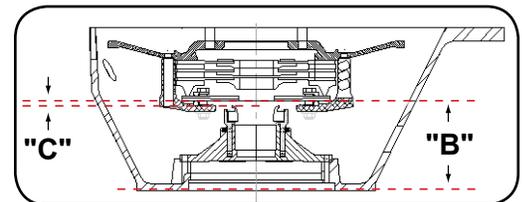


Figure 2

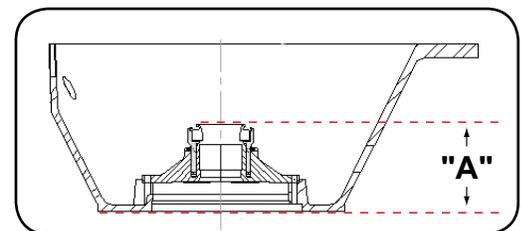


Table 1

Engine	Clutch	Hydraulic Assembly	Piston	Bearing	Seal Kit	Height	Stroke
Ford/Chevy	66-XX3HG	61-1602	62-1641	62-031*	62-905	2.22"	.45"
Ford/Chevy	66-XX2UGG	61-1622	62-1633	62-031*	62-905	2.45"	.50"
Dodge/Toyota	66-XX3HG	61-1612	62-1631	62-031*	62-905	2.18"	.45"
Dodge/Toyota	66-XX2UGG	61-1632	62-1634	62-031*	62-905	2.41"	.50"

\* Bearings are available in discounted packs of 20 (P/N 62-031-20)

### C) Hydraulic Lines

1. The ports and fittings are -3AN. These fittings are made to seal on the taper and not the threads. Do not use pipe tape or other sealants.
2. The port coming out the top must be connected to the bleed line. Route the bleed line outside of the housing for easy access.
3. The other port connects to the master cylinder.
4. Route both lines clear of heat sources such as the exhaust system.

### D) Master Cylinder Selection and Priming

1. A .75" (3/4") or .70" (7/10") bore master cylinder must be used with the Tilton 7.25" clutch. The .75" requires a shorter stroke while the .70" requires less force at the pedal and provides better modulation.
2. Fill the master cylinder with a DOT 3 or DOT 4 compatible fluid. DOT 5 (silicone-based) fluids are not compatible with the seals. Special high temperature fluids are not required and usually shorten the seal life.
3. Have a port or bleed fitting open at the master cylinder and depress the pedal.
4. Close the master cylinder port and bleed screw and let the pedal return.
5. Repeat steps 3 and 4 until the emerging fluid is free of air.

### E) Hydraulic Release Bearing Bleeding

1. Fill the master cylinder reservoir with DOT 3 or DOT 4 compatible fluid.
2. Take the clutch pedal to full stroke.
3. Open the bleed screw for the hydraulic release bearing.
4. Close the bleed screw after fluid stops flowing out.
5. Let the pedal return to its natural position and leave it there for at least 3 seconds.
6. Repeat steps 3 through 5 until the emerging fluid is free of air.

### F) Using the System

There are three critical pedal positions as seen in **Figure 3**. First the driver presses the pedal to the fully depressed position. The driver then lets up on the pedal until the point of engagement is found. Once the driver's foot is removed from the pedal it is in the relaxed position. The relaxed position will not change. The engagement position will not change because of clutch wear, but can move slightly closer to the floor if the clutch plates warp from heat requiring more stroke to release the clutch. The fully depressed position will move closer to the floor with clutch wear. Some drivers are sensitive to only the engagement position. Others are sensitive to how far the engagement position is from the fully depressed position and this distance will change with clutch wear. For such drivers a positive stop at the pedal can be used to keep this distance consistent. The positive stop can be adjusted to match the desires of the driver without having to worry about overstroking the hydraulic release bearing.

### G) Periodic Maintenance

1. Spin the bearing race and check how it feels. If it has higher than normal resistance, feels dry, or feels notchy replace the bearing. Remove the wave spring clip to remove the bearing. It is best to have a regularly scheduled interval of bearing replacement or repacking. Do not fill more than 30% with grease.
2. Periodically remove the piston and check for scores in the bore. Removing the piston first requires removal of the positive stop. Tool part number 62-1690 is available from Tilton to make this job easier. The positive stop unscrews with standard right hand threads. The piston can then be pulled all of the way out. Check for scores on the piston and in the base. Scored pistons and bases must be replaced. They will not score unless there has been dirt contamination.
3. A seal kit (62-905) consists of the black hydraulic seal and an orange wiper. During replacement remove the orange wiper first. The hydraulic seal can be removed by blocking off one port and applying air pressure to the other port to push the seal out of the groove. Wear safety glasses, use low pressure, and point the seal's exit path away from you.
4. Use rubber grease when installing the new pressure seal to prevent seal damage. The flat side of the seal must contact the bottom of the piston. Install the orange wiper, followed by the reinstallation of the piston.
5. Reinstall the positive stop and torque it to 15 lb-ft. **Do not over tighten.**
6. Reinstall the bearing and retaining wave spring clip.

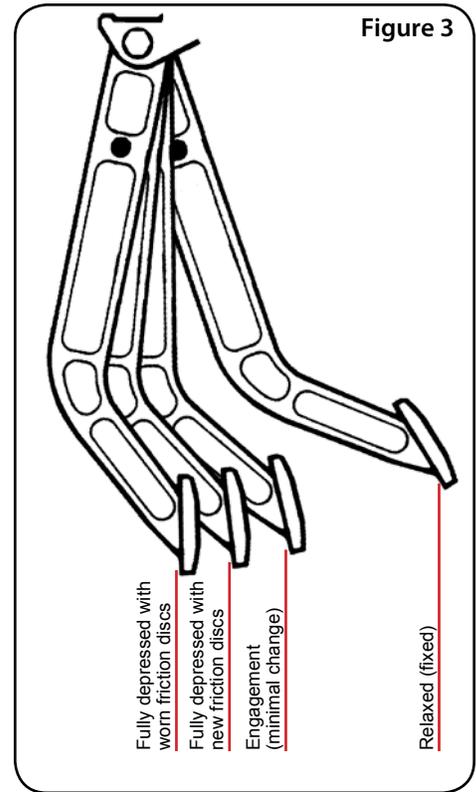


Figure 3

### H) Replacement Components

Description	Part Number
Tool, Remove and install positive stop	62-1690

For additional replacement parts see Table 1.