

9000-Series Hydraulic Release Bearing

DESCRIPTION

Tilton's 9000 series hydraulic release bearing is a compact assembly that is adaptable for many different applications. The bearing is self-adjusting for clutch wear maintaining "near zero" clearance at all times. There is no extra return spring that pulls the piston back to the bottomed position. In this respect, the piston works like the piston in a disc brake caliper, returning only as far as forced. This is why with a Tilton hydraulic release bearing assembly the clutch pedal feel does not change with clutch wear allowing the driver to make more consistent shifts.

Note: The ports are -3AN that can accept straight or banjo fittings with either a tapered seat or crush washer.

Note: If you need to take any measurements for clearance purposes fully compress the piston. It is now partially extended.

INSTALLATION

There are a few different ways that the assembly can be mounted depending on the particular part number and application. It is important to know that both ports are identical. It does not matter which port you use for the bleed port or the fill port. Position the assembly in one of the two positions shown in **Proper Bleed Port** diagram to set up proper bleed orientation.

1. In many applications the assembly and adapter bolt in place of the existing pilot tube or in place of the original hydraulic release bearing.
2. For custom applications where you will make your own adapter see Figure 1 for the mounting configuration. The two holes in the base are sized for both 1/4" and 6 mm fasteners. You will want to locate (center) the assembly using the inner diameter of the base. If there is an existing pilot tube it must be removed or trimmed to below the top of the hydraulic release bearing base. Make sure that the adapter allows the HRB to be installed in one of the two positions shown in the **Proper Bleed Port** diagram for correct bleed port set up.

If you are installing this assembly into a known application where the bearing clearance and mounting configuration have already been determined proceed to the **Hydraulic Lines** section.

PROPER BLEED PORT SET UP.

Position in one of two orientations for proper bleed port set up.

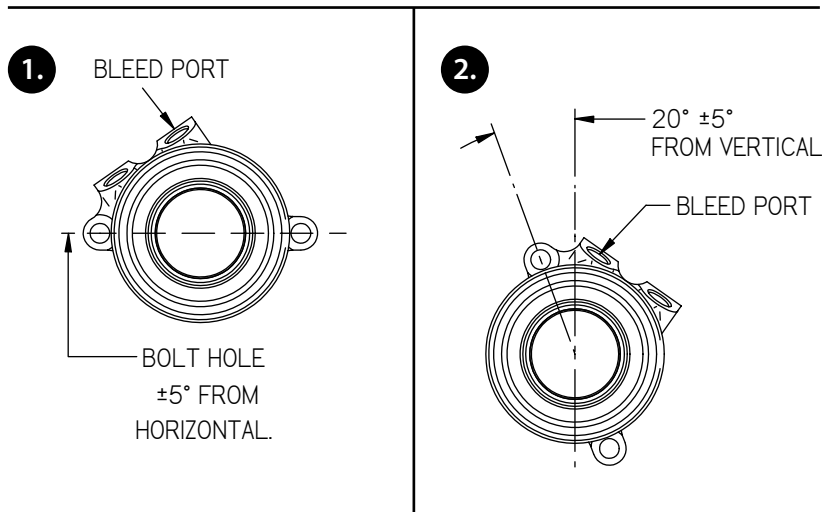
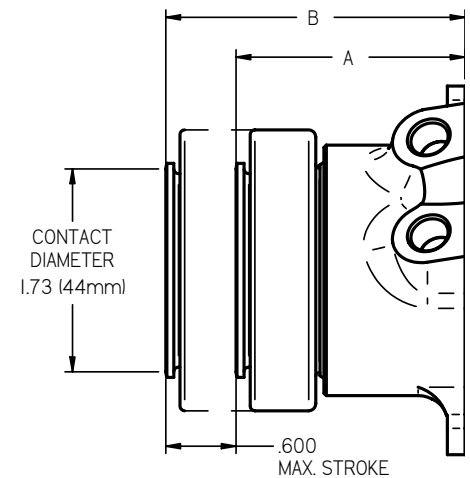
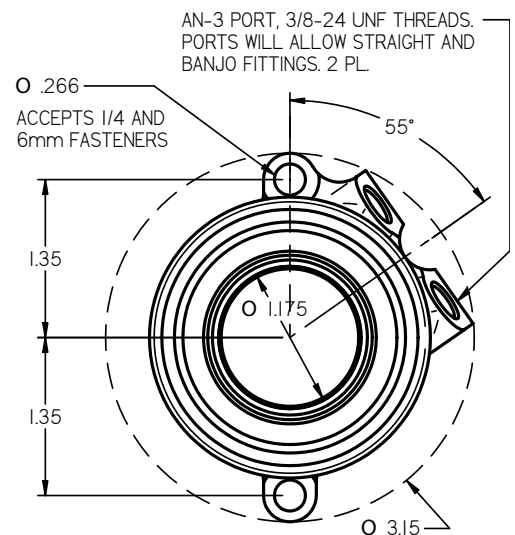


Figure 1



PART NUMBER	SET UP HEIGHT "A"	EXTENDED HEIGHT "B"
61-9002	1.95	2.55
61-9012	2.02	2.67

MEASURING BEARING CLEARANCE

For new applications with unknown clearance

1. Install the flywheel and new clutch assembly as explained in their instructions. Worn friction discs 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 2. This is the distance from the engine/transmission housing interface to the top of the hydraulic release bearing with the piston fully retracted.
4. Measure the distance "B" shown in Figure 3. This is the distance from the engine/transmission housing interface to tips of the spring fingers on the clutch.
5. $C=A-B$. This is your bearing clearance. It should be in the range of .170 to .230" for Tilton 5.5" and 7.25" clutches and .150" to .230" for The Tilton 4.5" clutch. 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.

HYDRAULIC LINES

Some assemblies include hydraulic lines. Cut braided line to length and attach fittings.

1. The ports are -3AN (3/8-24). Depending on the assembly part number the fittings could be -3AN male or -3AN banjo style. The male fittings are made to seal on the taper and not the threads. Do not use pipe tape or other sealants on any of the fittings.
2. The port coming out of 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. Also make sure that the lines will stay clear of the clutch and flywheel.

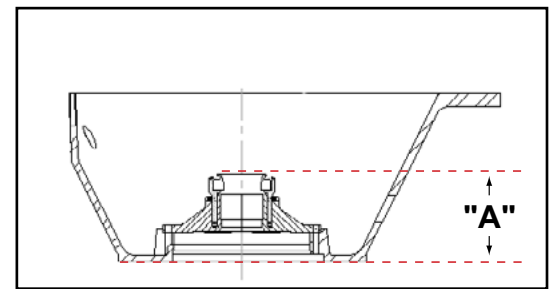
MASTER CYLINDER SELECTION AND PRIMING

1. The 9000 Series is intended to be used with a 5/8" master cylinder and a Tilton 7.25" Clutch. A 7/10" master cylinder can also be used. It will take a greater force at the pedal and require less stroke to release the clutch.
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.

HYDRAULIC RELEASE BEARING BLEEDING

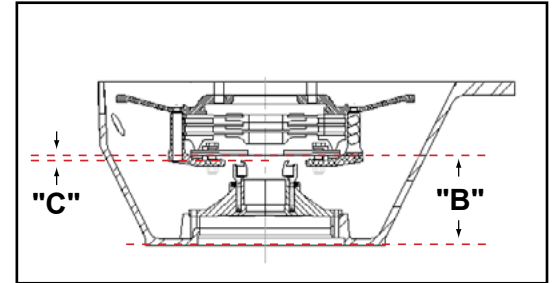
1. Fill the master cylinder reservoir with DOT 3 or DOT 4 compatible fluid.
2. Open the bleed screw for the hydraulic release bearing.
3. Take the clutch pedal to full stroke.
4. Close the bleed screw after fluid stops flowing out.
5. Let the pedal return to its natural position and leave it there for at least 3 seconds.
6. Repeat steps 3 through 5 until the emerging fluid is free of air.
7. Do not stoke the pedal again until the pedal positive stop has been set.

Figure 2



Distance from spring fingers to housing mounting

Figure 3



Distance from engine mounting surface to top of bearing

Figure 3

CLUTCH PEDAL STOP

A positive clutch pedal stop must be used to prevent over-stroking the hydraulic release bearing piston and the clutch. For access reasons, in many cars it is not easy to determine how far the master cylinder is being stroked.

The method listed below provides a very effective method for adjusting the pedal stop:

1. Lift the drive wheels off the ground and support the car on jack stands.
2. With the engine off, place the gearbox in first gear and have someone attempt to rotate the drive wheels.
3. Depress the clutch pedal slowly until the clutch disengages and the drive wheels can be rotated.
4. Adjust pedal stop to allow another 1/4" of pedal travel. This should provide clean release of the clutch. Do not stroke the pedal any further than this point throughout this procedure, otherwise you will over-stroke the clutch.

MAINTENANCE

A few basic procedures will help to ensure that your hydraulic release assembly will provide a long and dependable life.

1. Spin the bearing race and check how it feels. If it has a higher than normal resistance or feels rough, replace the bearing.
2. The piston can be removed and replaced without breaking the hydraulic seal or requiring bleeding. Periodically, remove the piston and check for any scores in the bore or on the piston surface. Wipe the piston and orange dust wiper seal before reinstalling. You may find that the piston is not dry. This could be the rubber grease used when installing the new seal. Do not mistake this for brake fluid.
3. If the seal needs replacing, order Tilton's replacement seal kit (P/N 62-905). Instructions and the correct installation grease are included in the kit. We also recommend the use of a seal installation tool (P/N 96-002) to prevent damaging the seal during installation.

SERVICE INFORMATION

1. Contact Tilton's Repair Department (805-688-2353) and describe the problem or the service that is required.
2. If the bearing assembly needs to be sent in, a Returned Merchandise Authorization (RMA) number is required and will be provided by a Tilton representative.
3. Write the RMA number on the outside of the package and ship to:

Tilton Engineering
25 Easy Street
Buellton CA 93427

