

Subaru WRX/STI Clutch Package

DESCRIPTION

Tilton's Subaru WRX/STI clutch packages are designed to offer increased torque and reduced rotating mass. In addition, these clutch packages include a concentric hydraulic release bearing assembly that eliminates the stock external slave cylinder and related linkage. The clutch provides high torque capacity that enables you to "up the boost," while it's reduced rotating mass results in increased horsepower to the wheels. The hydraulic release bearing self-adjusts for clutch wear and provides great pedal feel.

Note: This instruction sheet is designed to supplement the general instructions sheets supplied with the individual components of the clutch package.

INSTALLATION

FLYWHEEL

1. Install flywheel onto engine. Torque OEM flywheel-to-crankshaft bolts to factory specification.

CLUTCH DISCS

2. Install clutch discs into the clutch. For Carbon/Carbon clutches, orient the clutch hub as shown in **Diagram 1**. For Cerametallic clutches, align hubs as shown in **Diagram 2**. Be sure to align discs with an alignment tool or spare input shaft.

CLUTCH

3. Mount clutch onto the flywheel with the supplied aircraft grade hardware. Torque hardware to **18 lb-ft** using oil or thread locking compound. The tips of the spring fingers should taper slightly towards the transmission. The spring must not be inverted.
4. Test fit the transmission to the engine to confirm that there is no interference between the clutch's spring retaining hardware and the inside of the transmission case. There should be **.075"** of clearance, but due to variations in transmission castings the clearance may be decreased. If there is interference, you may have to grind the tips of the spring retaining screws to be flush with the nuts and/or grind some material from the transmission case.

HYDRAULIC RELEASE BEARING ASSEMBLY

1. Remove the existing Original Equipment (OE) slave cylinder, fork arm and release bearing from the transmission.
2. Tighten the two AN3 male-to-male hydraulic fittings into the two ports of the hydraulic release bearing assembly. Do not use any thread sealing compound, as the fitting seal on the taper and not the threads.
3. Thoroughly clean off the pilot tube (the tube around the input shaft on which the original release bearing would slide) removing all dirt and grease.
4. Test fit the hydraulic release bearing (HRB) assembly onto the transmission's pilot tube to ensure it is sitting flat and parallel. Due to variations in transmission castings, the HRB may not sit flat. You can check if it is sitting flat by placing a bubble level across the top of the release bearing.

Note: Flatness can be corrected by:

5-speed transmissions: Grinding/sanding the casting imperfections on the pilot tube.

6-speed transmissions: Grinding the heads of the four bolts flat.

5. Place a small bead of high temperature RTV silicone around the pilot tube $\frac{1}{2}$ " – 1" from its base. This will help to hold the hydraulic release bearing assembly in place once it is installed.
6. The base of the hydraulic release bearing assembly has a flat side. This is for clearance reasons. Rotate the assembly until the flat side is approximately parallel with the ground. The relief cut on the underside of the base is there for clearance of a rib in the transmission case. Slide the assembly all of the way onto the pilot tube making sure that the flat side and the relief cut on the bottom clear their respective transmission protrusions.
7. Once installed in the transmission, the two ports of the hydraulic release bearing should be located 15° off vertical. The port on the left side (looking into the transmission from the engine end) is the port used for the bleed line. The port on the right is for the line that routes to the master cylinder.

Diagram 1

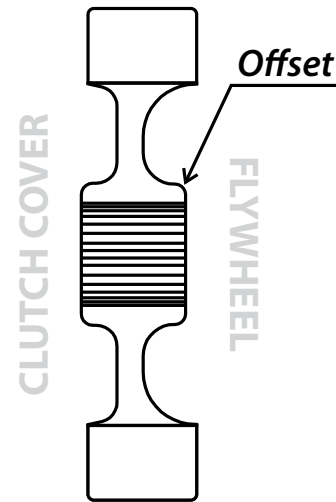
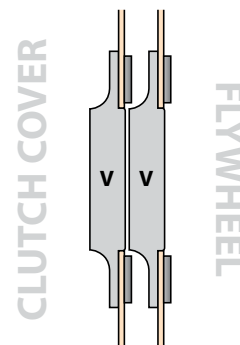


Diagram 2



V = Solid, 8 rivet, outer (.375" thick)

HYDRAULIC LINES

1. Determine the length of hydraulic line you will need to run to the master cylinder and the length you will require for a bleed line.
2. Utilizing the 90" long piece of AN3 steel braided line provided with the kit, cut the line to the needed lengths.
3. Complete the lines using the supplied fittings. See Figure 2 for details on installing the fittings onto the lines.
4. Connect the bleed line to the port on the left side of the hydraulic release bearing assembly. Route the bleed line outside of the transmission/bellhousing for easy access.
5. Connect the supply line to the port on the right side of the hydraulic release bearing assembly and connect to the master cylinder.
6. Route both lines clear of heat sources such as the exhaust system and/or turbo. Also, make sure that the lines will stay clear of the clutch and flywheel.

MASTER CYLINDER SELECTION

The master cylinder bore diameter size has a large influence on the operation of the clutch. Its selection is often a matter of personal preference. If the bore size is too small it will require an excessive amount of pedal travel or may not disengage the clutch at all. If the bore size is too large it will be too hard to push the clutch pedal and pedal stroke will be short.

In general, a $\frac{3}{4}$ " bore master cylinder is recommended for use with Tilton 7.25" clutches. The stock WRX/STI master cylinder has an $11/16$ " bore diameter. This master cylinder is suitable for use with the Tilton 7.25" carbon clutch, since the carbon plates do not warp. A $\frac{3}{4}$ " bore master cylinder is recommended for use with the cerametallic and hybrid clutches, as more fluid volume displacement is required to compensate for clutch plate warpage from use.

Titan Motorsports (407.277.8423) offers $\frac{3}{4}$ " bore master cylinder kit for the WRX/STI.

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:

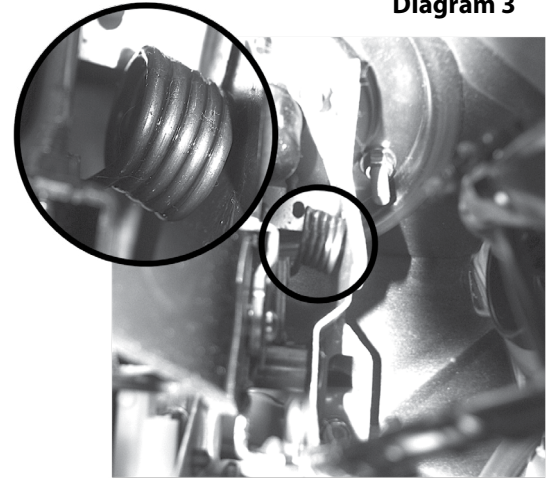
1. Lift the drive wheels off the ground and support the car on jack stands.
2. With the engine off, place the gearbox in first gear and have someone attempt to rotate the drive wheels.
3. Depress the clutch pedal slowly until the clutch disengages and the drive wheels can be rotated.
4. Adjust pedal 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.



Scan to watch a video on Clutch Pedal Stop: How to Set a Clutch Pedal Stop or visit www.tiltonracing.com/technical/technical-videos/



Diagram 3



NOTE: Mitsubishi EVO VIII spring shown for example only.

"HELPER" SPRING REMOVAL

Remove the "helper/over-center" spring from the clutch pedal assembly as shown in Figure 3. This spring is designed to help overcome the resistance of the stock clutch's diaphragm spring, making clutch disengagement easier (less effort). This spring is not needed for use with the Tilton clutch package, due to the supplied hydraulic release bearing assembly.

Diagram 4

