

## OT-II 7.25" (185mm) Metallic Racing Clutches

The typical production engine has been made to align the transmission good enough for an OE-size clutch with a single sprung hub disc. These tolerances are not tight enough for a small clutch with solid discs.

### DRIVELINE ALIGNMENT

The bellhousing must be checked to see if it is both concentric (Photo A) and parallel (Photo B) while bolted to the engine. This is easily checked with a dial indicator mounted to the bare crankshaft.

*Maximum out-of-concentricity is .010" and maximum out-of-parallel is .010".*

The following may occur if driveline alignment is not correct:

- Hub spline wear • Cracking of friction discs
- Pilot bearing wear • Loose or failed disc rivets
- Transmission input shaft and bearing damage

If you know your housing is accurate, you can correct block concentricity by using a block drilling fixture. An out-of-parallel block should have the rear face machined by a competent machine shop.

### FLYWHEEL INSTALLATION

Most metallic racing clutches should be used with a step-type flywheel. This step should be between .098" and .100" tall (Diagram C). Most Tilton flywheels are designed to have the bolts installed from the engine side before bolting the flywheel to the crankshaft. A retaining lip is used to keep the bolt heads from turning. Crankshaft bolts must be tightened to manufacturer's specified torque when installing flywheel. Typically, Tilton steel flywheels with 7/16" bolts require 75 lb-ft with thread locking compound.

### RELEASE BEARING INSTALLATION

Make sure of the following when installing release bearing:

- A 44mm (1 $\frac{3}{4}$ ") contact diameter, radius-faced bearing should be used with this clutch. A 52mm radius-faced bearing can be used, but clutch engagement will be quicker and pedal effort will increase.

- If installing this clutch with a Tilton hydraulic release bearing, follow these procedures:

1. Completely compress the piston/bearing into its hydraulic body. Take all release bearing clearance measurements in this completely retracted state.
2. Clearance from bearing-to-diaphragm fingers must be between .170" and .230" for a new clutch. Clearance will decrease as the clutch discs wear.
3. Set pedal stop as described in the **Pedal Stop Setup** section.

- If installing this clutch with a mechanical linkage, slave-and-fork or many non-Tilton bearing assemblies, less bearing free-play and more frequent adjustments may be necessary.
- Regardless of bearing type used, do not travel the release bearing more than .250" once the bearing contacts the diaphragm fingers. More travel than this will damage the clutch. See the **Pedal Stop Setup** section for information on pedal stops.

### MASTER CYLINDER SELECTION

If you are using this clutch with a Tilton hydraulic release bearing, it should be used with a 3/4" master cylinder. Bleed the clutch hydraulics (being careful not to over-stroke the clutch) prior to setting the pedal stop.

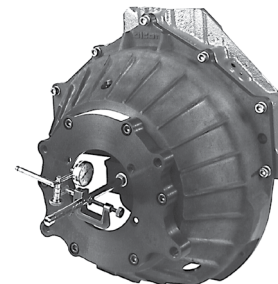


Photo A

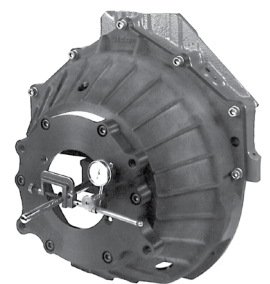
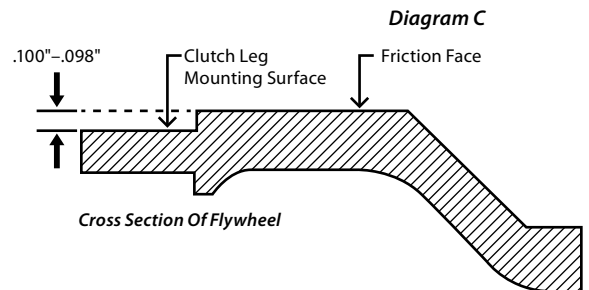


Photo B



Cross Section Of Flywheel

See all Tilton master cylinder kits at [tiltonracing.com](http://tiltonracing.com)



3/4" Tilton 75-Series Kit - (P/N 75-750U)

## CLUTCH DISC INSTALLATION

When installing the pressure and floater plates, be sure to align the painted alignment marks found on each plate and one clutch leg. This is how the clutch was balanced at the factory and will also make sure the plates are always installed in the same direction.

Install the plates and discs in to the clutch in the following manner;

### BACK-TO-BACK DISC PACKS

Contains "V", "W", "VV", "VTV" or "A", "F", "AA", or "ABA" in the part #.

1. Install pressure plate with raised ring against diaphragm.
2. Install disc #1 (A, F, V, or W hub) with TE logo on rivet heads towards the flywheel.
3. Install floater plate (two or three disc only).
4. Install disc #2 (A, B, V, or T hub) with TE logo on rivet heads away from the flywheel.
5. Install floater plate (three disc only).
6. Install disc #3 (A or V hub) with TE logo on rivet heads away from the flywheel.

### STACKED DISC PACKS

Contains "VR", "VRR", "VRRR" or "AC", "ACC", or "ACCC" in the part #.

1. Install pressure plate with raised ring against diaphragm.
2. Install disc #1 (A or V hub) with TE logo on rivet heads towards the flywheel.
3. Install floater plate (two, three or four disc only).
4. Install disc #2 (C or R hub) with TE logo on rivet heads towards the flywheel.
5. Install floater plate (three or four disc only).
6. Install disc #3 (C or R hub) with TE logo on rivet heads towards the flywheel.
7. Install floater plate (four disc only).
8. Install disc #4 (C or R hub) with TE logo on rivet heads towards the flywheel.

## CLUTCH ASSEMBLY INSTALLATION

Now that the clutch is assembled with discs, install it onto the engine as follows:

1. Slide clutch over the mounting bolts and make sure the heads of the bolts are secure against flywheel lip. Start aircraft-type washers and nuts onto each bolt by hand.
2. Align discs with an alignment tool or a spare input shaft.
3. Tighten the six bolts in a criss-cross pattern, half-of-a-turn at a time until bottomed. Torque the nuts to 18 lb-ft using thread locking compound.
4. The tips of the spring fingers should taper slightly towards the transmission. The spring must not be inverted toward clutch.
5. Install the bellhousing and transmission. Do not let the clutch support the weight of the transmission while installing.

**Note:** Use only aircraft grade hardware (AN or NAS) when installing this clutch. Tilton offers a wide range of clutch-to-flywheel bolt kits.

Visit [www.tiltonracing.com](http://www.tiltonracing.com) for further information.

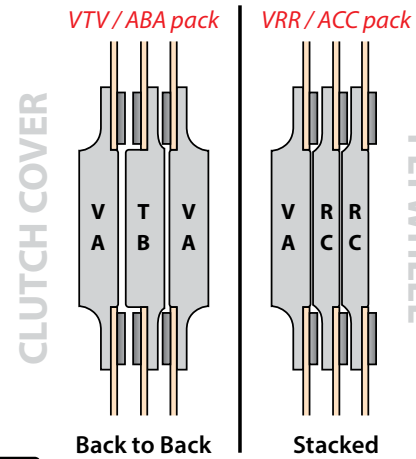
## PEDAL STOP SETUP

This clutch must be used with a positive stop on the clutch pedal to prevent over-stroking. Below is an easy means of setting the stop once the drivetrain is in place:

1. Support the rear of the car on jack stands.
2. With the engine off and the car in gear, slowly depress the clutch pedal until the drive wheels just barely break free.
3. Give the pedal an additional .25" of travel (measured at the foot pad) and lock the pedal stop in place. This will allow the clutch to cleanly release itself without damage.
4. The theoretical maximum master cylinder stroke with the recommended master cylinder size is .730" (18.5 mm) assuming .040" cut-off port travel.



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



Scan to watch a video on Tilton OT-Series Metallic Clutches: Inspecting Tilton Metallic Clutch for Maintenance or visit [www.tiltonracing.com/technical/technical-videos/](http://www.tiltonracing.com/technical/technical-videos/)

## MAINTENANCE

**Discs:** Clutch discs start new at .104" thick. Discs should be replaced when total pack wears .030". This means the individual disc thickness should not be less than:

• **Single disc = .074" • Two disc = .089"**

• **Three disc = .094" • Four disc = .097"**

*The friction material used on these discs is extremely wear resistant. It will typically wear quickly for the first .002" of disc thickness, and then wear dramatically slower after that.*

**Pressure Plate and Floaters:** Check the plates periodically for warpage. This warping is caused by heat put into the clutch during engagement. Check warping with a straightedge and feeler gauge. Maximum allowable warpage is .008" in any plate. Pressure Plates can be resurfaced to a minimum thickness of .525". Floaters should never be resurfaced. Be sure to align the balance marks when reinstalling the plates. After installing the plates in the cover, rotate them until they contact the thrust buttons on one side, and use a .006" feeler gage between the thrust buttons and the plates. This is the minimum clearance for proper clutch release.

**Diaphragm Springs:** The spring should be replaced periodically or if the clutch has been over-stroked. The spring in this clutch can only be replaced by an authorized Tilton clutch rebuild center.

## SERVICE / WARRANTY INFORMATION

**If your clutch requires service, please follow these procedures:**

1. Contact Tilton at (805-688-2353) and describe the problem or the service that is required.
2. If the clutch needs to be sent in, a Returned Material 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 keep a record of this number.
4. Ship the clutch by UPS or Fed EX **only**.

**Do not return the clutch without an RMA #**