

INSTALLATION INSTRUCTIONS

OT-III 5.50" (140mm) Metallic Racing Clutches



TOPICS COVERED

- A. *Driveline Alignment*
- B. *Flywheel Installation*
- C. *Release Bearing Installation*
- D. *Master Cylinder Selection*
- E. *Clutch Disk Installation*
- F. *Clutch Assembly Installation*
- G. *Pedal Stop Set-up*
- H. *Clutch Maintenance*
- I. *Service/Warranty Information*

A. Driveline Alignment

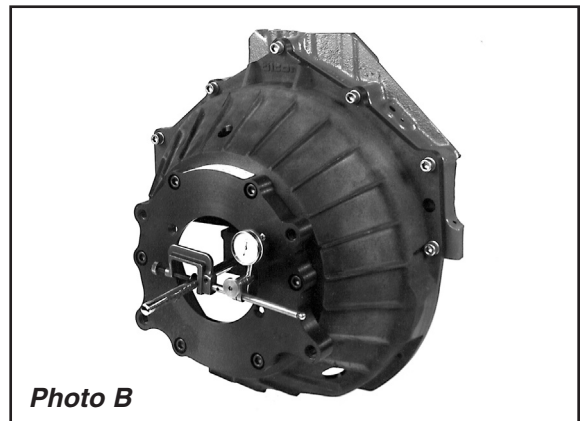
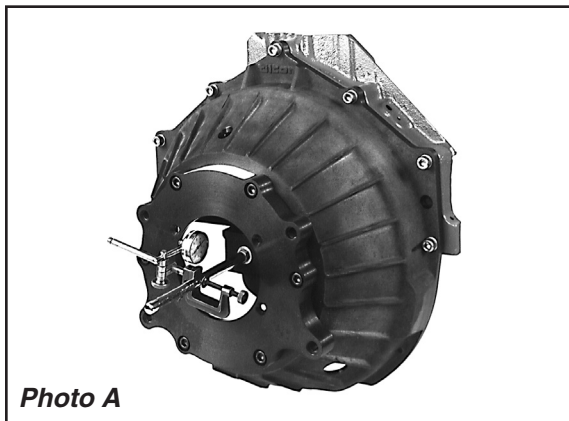
The typical production engine has been made to align the transmission good enough for an OE-size clutch with a single sprung hub disc. These tolerances are not tight enough for a small clutch with solid discs.

The bellhousing must be checked to see if it is both concentric (*Photos A*) and parallel (*Photos 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:

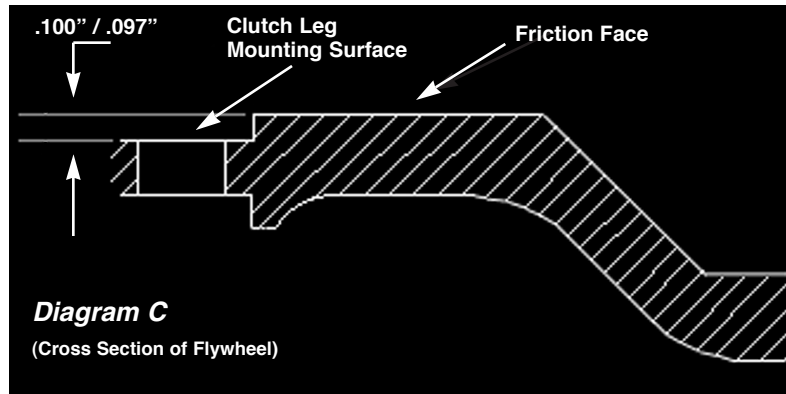
- Hub spline wear
- Cracking of friction discs
- Pilot bearing wear
- Loose or failed disc rivets
- Transmission input shaft and bearing damage



If you know your housing is accurate, you can correct block concentricity by using a Tilton block drilling fixture (P/N 53-100 for Chevy, P/N 53-100F for Ford and P/N 53-100M for Mopar). An out-of-parallel block should have the rear face machined by a competent machine shop.

B. Flywheel Installation

Most metallic racing clutches should be used with a step-type flywheel. This step should be between **.097" 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 **95 lb-ft** of seating torque. Aluminum flywheels will vary with application, but typically require **50 lb-ft** of seating torque. Loctite may be used, but lock washers should not.



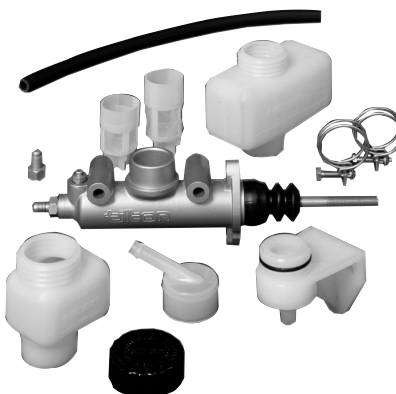
C. Release Bearing Installation

Make sure of the following when installing release bearing:

- A 38mm (1-1/2") contact diameter, radius-faced bearing should be used with this clutch.
- If installing this clutch with a Tilton hydraulic release bearing, follow these procedures:
 - 1) Completely compress the bearing into its hydraulic body. Take all free-play measurements of bearing in this completely retracted state.
 - 2) Free-play from bearing-to-diaphragm fingers must be between **.160"** and **.300"** for a new clutch. This will decrease as the clutch discs wear.
 - 3) Set pedal stop as described in **Section G** of these instructions.
- If installing this clutch with a mechanical linkage, slave-and-fork or Quarter Master bearing assembly, less bearing free-play and more frequent adjustments may be necessary.
- Regardless of bearing type used, do not travel the release bearing more than **.200"** once the bearing contacts the diaphragm fingers. More travel than this will damage the clutch. See **Section G** for information on pedal stops.

D. Master Cylinder Selection

If you are using this clutch with a Tilton hydraulic release bearing (unless in Silver Crown package), it should be used with a **5/8" master cylinder**. Bleed the clutch hydraulics (being careful not to over-stroke the clutch) prior to setting the pedal stop.



5/8" Tilton Master Cylinder Kit
(P/N 74-625U)

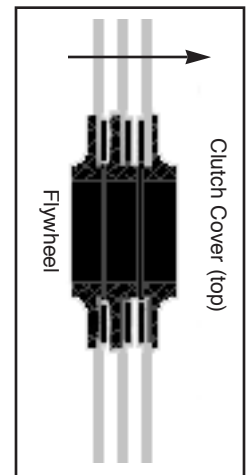
E. Clutch Disc Installation

When installing the pressure and floater plates, be sure to line-up the **painted alignment mark** 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 - Disc packs containing "ABA", "AA", "A" or "F" within the part number:

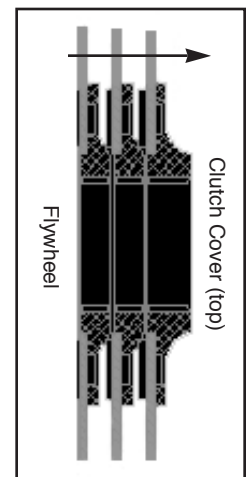
1. Install pressure plate with **raised ring** against diaphragm.
2. Install disc #1 (A or F hub) with **TE logo** on rivet heads towards the flywheel.
3. Install floater plate (two or three disc only).
4. Install disc #2 (A or B hub) with **TE logo** on rivet heads away from the flywheel.
5. Install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



Back-to-Back Packs

Stacked Disc Packs - Disc packs containing "ACCC", "ACC", "AC" within the part number:

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



Stacked Packs

Make sure to check the following:

- Hubs make full contact with input shaft
- There is clearance between the hubs (and rivets)
- There is clearance between the bottom disc and flywheel bolts

F. 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 **22 lb-ft** (lower when using oil or Loctite).
4. The tips of the spring fingers should taper slightly towards the transmission. The spring must not be inverted.
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 bolts in kit form (P/N 95-026 for single plate clutches, P/N 95-005 for two plate clutches and P/N 95-006 for three-plate clutches) for flywheels with through holes.

G. Pedal Stop Set-up

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 rear tires 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. No additional travel or adjustments should be needed. **With a Tilton hydraulic release bearing and a 5/8" bore master cylinder, total master cylinder pushrod travel should be approximately .78".**

H. 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 warping. 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.

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.

I. 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 Goods Authorization (RGA) number is required and will be provided by a Tilton representative.
3. Write the RGA number on the outside of the package and keep a record of this number.
4. Ship the clutch by only UPS or Fed EX to:

Tilton Engineering
25 Easy Street
Buellton CA 93427

DO NOT RETURN THE CLUTCH WITHOUT A RGA #

25 Easy Street • Box 1787 • Buellton, CA 93427 • USA • (805) 688-2353 Fax (805) 688-9407

tiltonENGINEERING INC

98-550M