

*Twin XTend™ automatically adjusts for clutch wear, no manual adjustments required*

## Installation and Removal Guide

### ZF Sachs Twin XTend™

### Two plate 15.5\"

### Self-Adjusting Clutch

- 1 Installation (pg. 1-5)
- 2 Bearing Height Setting (pg. 6-7)
- 3 Removal (pg. 8-10)

## Hazard Alert Messages

### ▲ WARNING

To prevent serious eye injury, always wear safe eye protection when you perform vehicle maintenance or service procedures.

### ▲ WARNING

Park the vehicle on a level surface. Block the wheels to prevent the vehicle from moving. Support the vehicle with safety stands. Do not work under a vehicle supported only by jacks. Jacks can slip and fall over. Serious personal injury and damage to components can result.

### ▲ WARNING

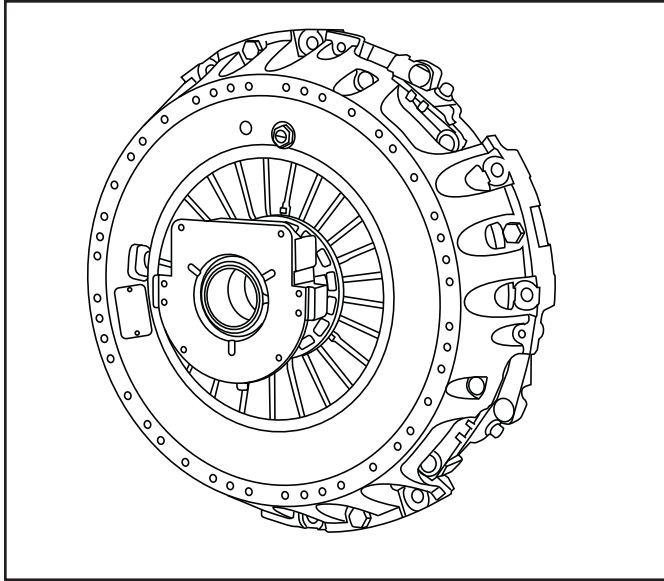
Use a brass or leather mallet for assembly and disassembly procedures. Do not hit steel parts with a steel hammer. Pieces of a part can break off and cause serious personal injury.

### ▲ WARNING

Many clutch linings contain asbestos fibers, a cancer and lung disease hazard. Meritor® and ZF Sachs clutches do not contain asbestos fibers. However, use caution when you handle clutches during maintenance and service procedures, because clutch components, such as facings and buttons, contain non-asbestos material that can cause respiratory tract or eye irritation.

In addition, some experts believe that long-term exposure to non-asbestos material can cause lung, kidney or liver damage; blood disorders; and possibly cancer. Meritor® and ZF Sachs recommends that you use caution to prevent creating dust when you work on clutches that contain non-asbestos materials.

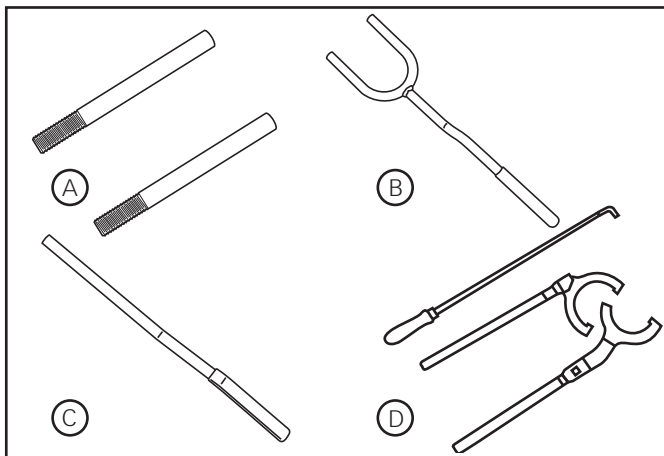
1. If possible, service clutches in an area that is separate from other operations.
2. Always wear an approved respirator for all clutch service procedures, including removal and installation.
3. Do not use compressed air or dry brushing to clean clutch parts or assemblies. Use a cylinder with arm sleeves and a high-efficiency (HEPA) filter that encloses the clutch and vacuums the dust.
4. If a cylinder is not available, carefully clean clutch parts and assemblies in the open air. During disassembly, carefully place all parts on the floor to prevent dust from becoming airborne. Use an industrial vacuum cleaner with a high-efficiency (HEPA) filter to remove dust. After using the vacuum, remove any remaining dust with a rag soaked in water and wrung until nearly dry. Dispose of used rags with care to prevent dust from becoming airborne.
5. Do not use compressed air or dry sweeping to clean the work area. Use an industrial vacuum with a high-efficiency (HEPA) filter and rags soaked in water and wrung until nearly dry. Dispose of used rags with care to prevent dust from becoming airborne.
6. After servicing clutch parts and assemblies, thoroughly wash your hands before you eat or drink. Do not wear work clothes home. Do not shake work clothes after you remove them. Vacuum clothes to help prevent dust from becoming airborne. Launder work clothes separately.



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## Installation Guide ZF Sachs Twin XTend™ Two plate 15.5" Self-Adjusting Clutch

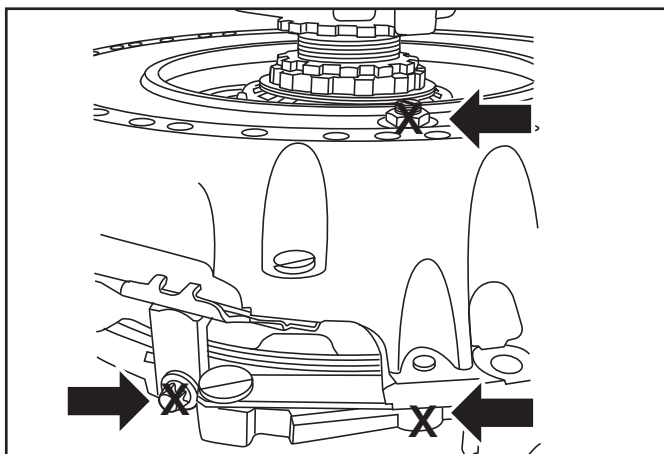
- 1 Mount Clutch Assembly to Flywheel
- 2 Remove Shipping Bolts
- 3 Install Transmission
- 4 Check Clutch Bearing Clearance to Clutch Brake / Linkage
- 5 Lubricate System



### Required Tools, Parts, Equipment

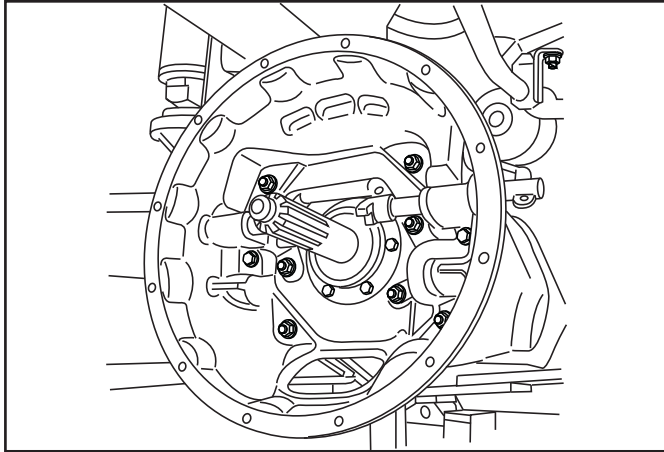
- (A) (2) Guide pins 7/16" x 5"
- (B) (1) 0.530" Clutch Brake gap gage
- (C) (1) 1/8" Fork gap gage
- (D) (1) Twin XTend Adjusting Kit (purchased only through ArvinMeritor™)  
\*(For Mack Vehicles, you will need XTEND WRENCH KIT M)
- (E) (1) Disc hub alignment tool (single shaft or as part of clutch jack "Not Shown)

Tools are available through various tool retailers



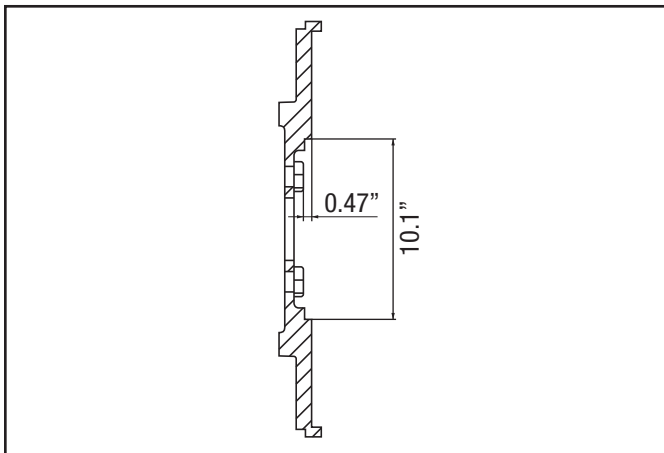
### **!** Important Notes

- Do not tamper with bolts as shown on the left
- Use guide pins for hanging of clutch and for guidance of the transmission to flywheel-housing



## Before Proceeding

- Inspect all mating components of the clutch and the entire clutch actuation system are inspected and replace worn components as needed
- Check: Pilot bearing, Release Yoke, Cross Shaft Bushings, Input Shaft, Input Shaft Bearing Retainer, Clutch Brake, Linkage/Hydraulic Release System
- Check the runout on the outer surface of the flywheel, the bore of the pilot bearing, and the outer surface and bore of the flywheel housing as well as the crank shaft end play to verify that they meet the following specifications:
  - typical runout for the outer surface of the flywheel is .008" (.203mm) on 15.5" clutches
  - the maximum allowable runout for the surface of the bore of the pilot bearing is .005" (.127mm)
  - typically, the maximum allowable runout for the outer surface of the flywheel housing is .008" (.203mm)



Ensure that the maximum torque rating of the clutch fits to the engine peak torque rating!



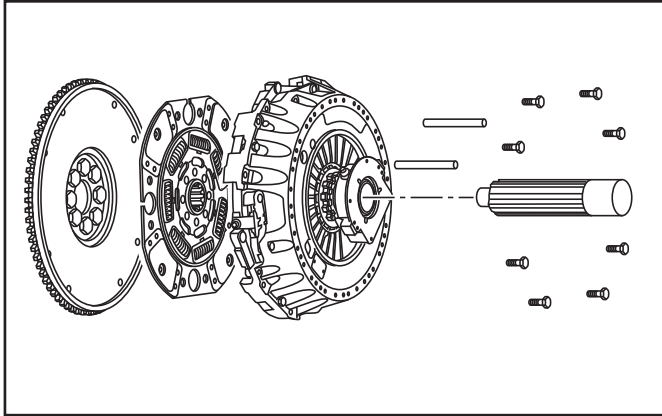
Verify flywheel bore opening is 10.1" (256.5 mm)



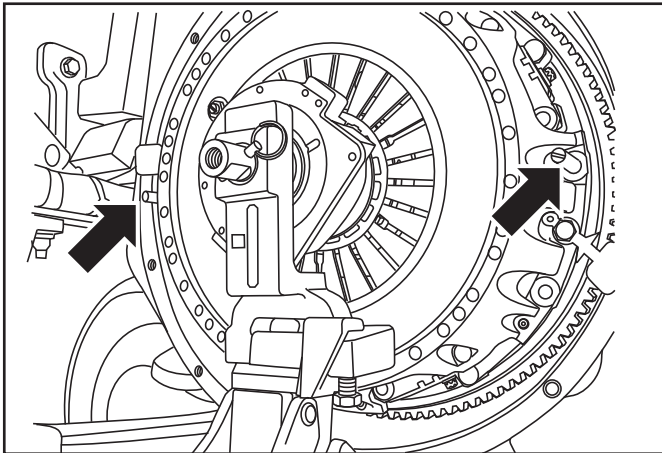
If flywheel is resurfaced, ensure a clearance for the clutch disc damper by checking that the depth of crankshaft bolts to Flywheel surface is a minimum of 0.47" (12 mm)

# Step 1

## Mount Clutch Assembly to Flywheel



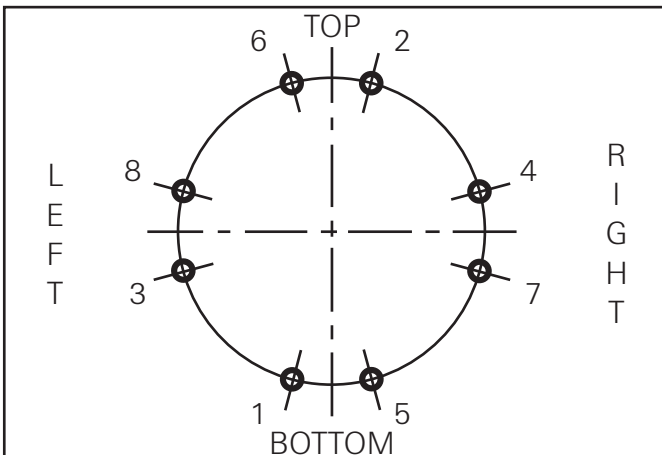
- Check that disc slides freely on input shaft
- Observe Flywheel disc orientation (see inscription on clutch disc plate)



- Insert guide studs to Flywheel at positions #4 and #8
- Place clutch on guide studs

**Note:**

Check that alignment tool is all the way into the pilot bearing!



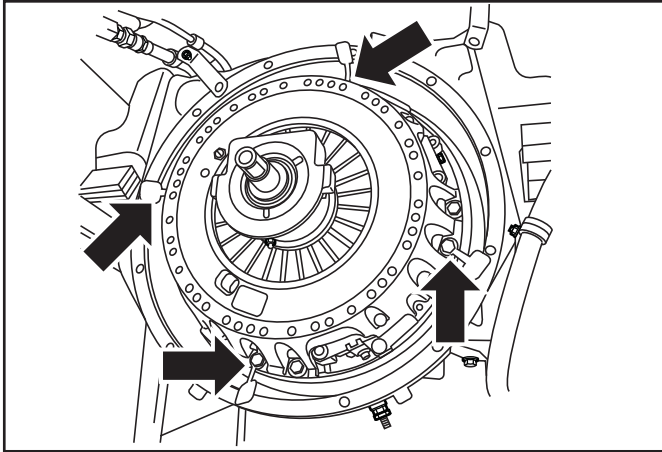
- Hand tighten bolts #1, 2, 3, 5, 6, and 7
- Remove guide studs and hand tighten #4 and 8
- Tighten the (8) cover bolts in criss-cross pattern in the order as shown in the picture Torque bolts to 50 ft.lb. (68Nm)



**Do not remove alignment tool at this stage!**

## Step 2

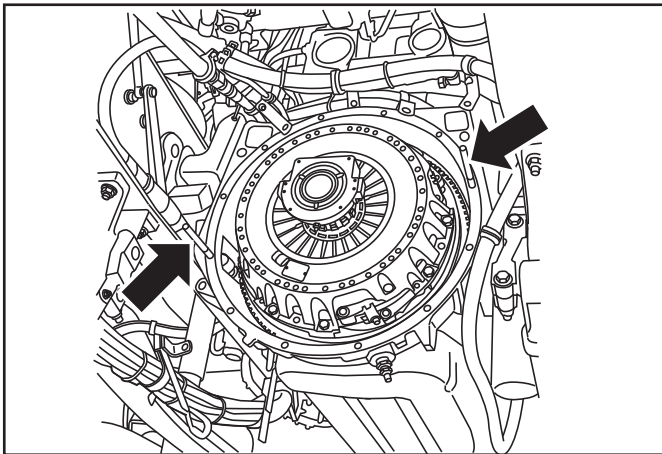
### Remove Shipping Bolts



- Remove (4) shipping bolts (yellow tags)  
7/16 X 1.5" long
- Now remove the alignment tool (**ONLY AFTER REMOVAL OF SHIPPING BOLTS**)

## Step 3

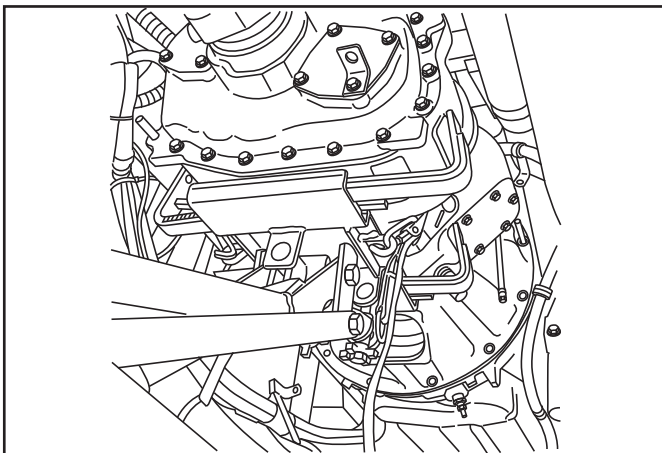
### Install Transmission



- Use guide pins installed in the flywheel housing at 10 & 2 o'clock to align transmission during installation

**Note:**

To ease transmission installation maintain release bearing alignment!



- Check that engine and transmission are aligned

**Note:**

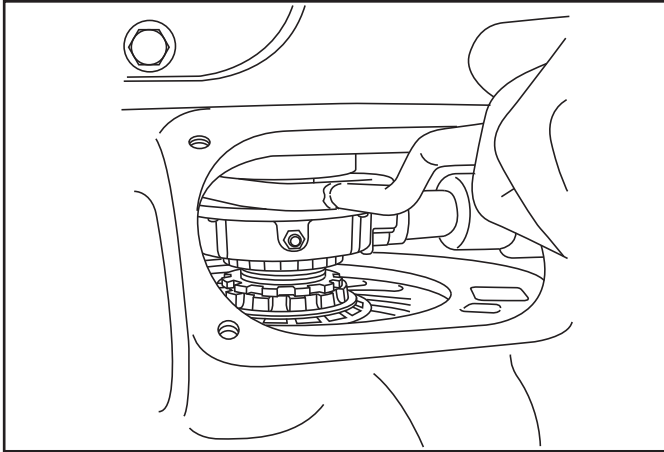
The transmission should slide without force into the disc splines and the pilot bearing



Excessive force installing the transmission may cause damage to the clutch!

## Step 4

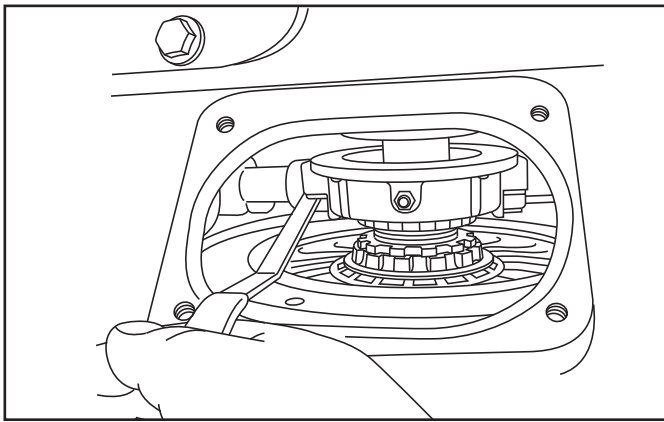
### Check Clutch Bearing Clearance to Clutch Brake/Linkage



After engine start, actuate clutch several times before doing the following:

- **First**, check clutch brake gap is at **.530" ± .030"**

If out of specification refer to bearing adjustment pages 6-7



#### For Mechanical Linkage only

- **Second**, set linkage fork gap to **1/8"**
- If out of specification adjust linkage rod

#### For Hydraulic Actuation only (No Fork Gap is Required)

- Install hydraulic system

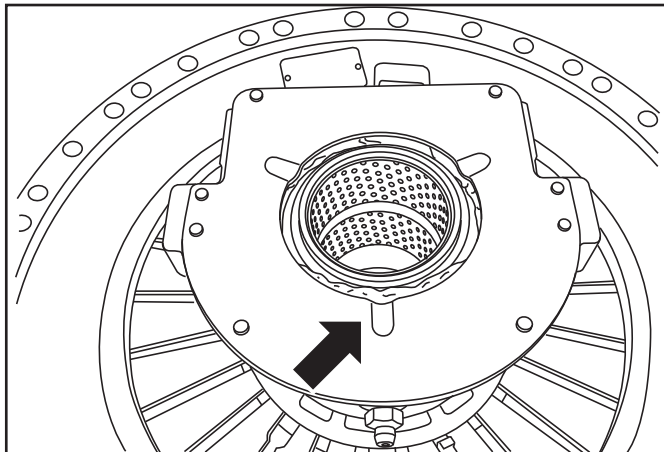
#### Check Clutch Brake Squeeze

- Fully depress clutch pedal and verify that the clutch release bearing contacts clutch brake

## Step 5

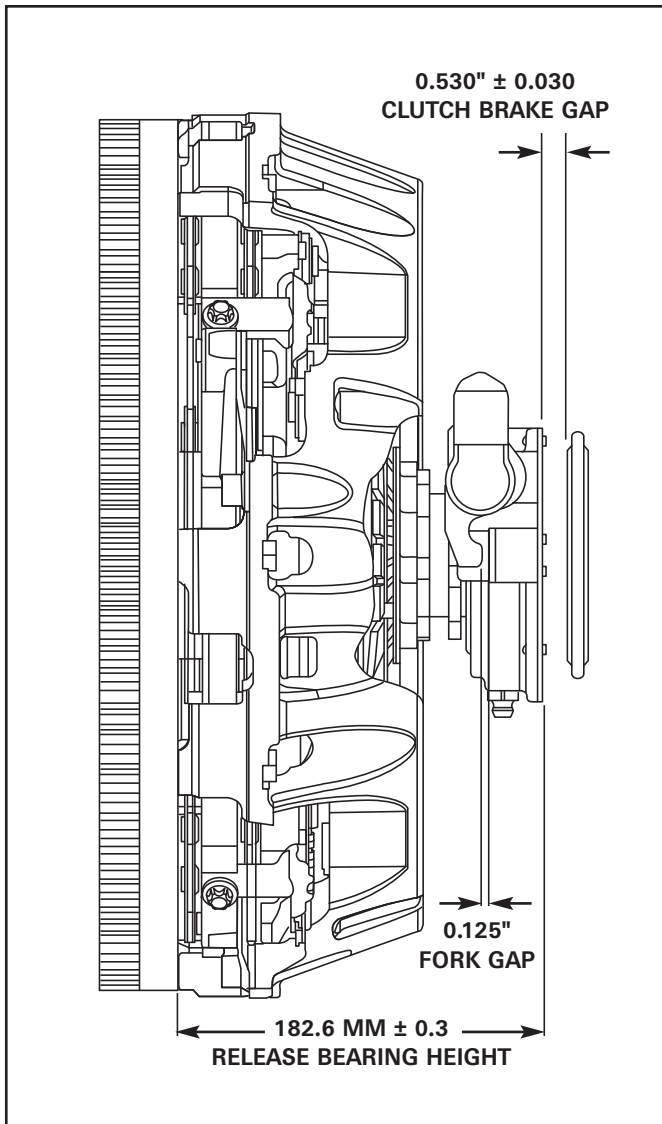
### Lubrication

**MERITOR**<sup>®</sup>  
an **ArvinMeritor** brand



Final step is to prepare Release Bearing for initial in-service period. Make sure that sufficient grease is present, such that it will begin to purge from Housing as additional grease is added. This incidental purge is essential to keep Input Shaft to Bushing sleeve interface properly lubricated.

- Use (Meritor<sup>®</sup> Specification 0-661), Lithium Complex Grease, NLGI Grade #3



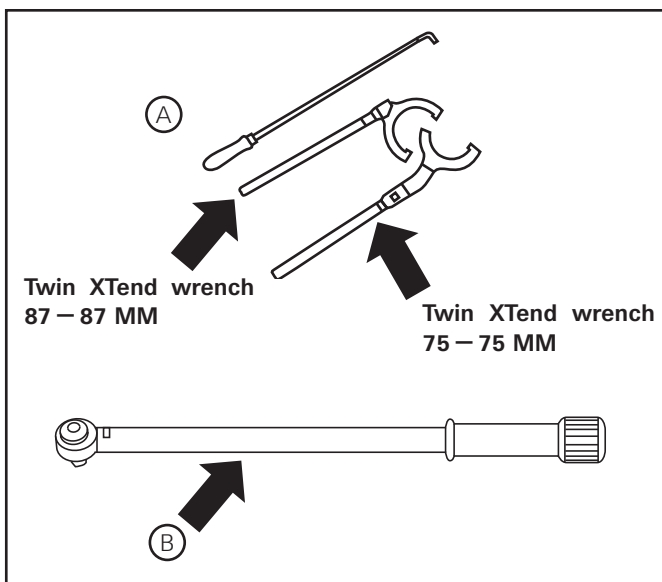
## Bearing Height Setting Guide ZF Sachs Twin XTend™ Two Plate 15.5" Self-Adjusting Clutch

- 1 Loosen Lock Nut
- 2 Adjust Bearing Height
- 3 Tighten Lock Nut to Specified Torque

There are cases when resurfaced flywheels and tolerances in the system require the clutch to be adjusted at initial installation to reach the proper clutch break gap.

**To ensure proper clutch function the locknut has to be tightened to the proper specification (pg. 7, Step 3)**

The following procedure describes the steps involved for how to loosen the locknut, adjusting the bearing height and tighten the locknut with sufficient torque.

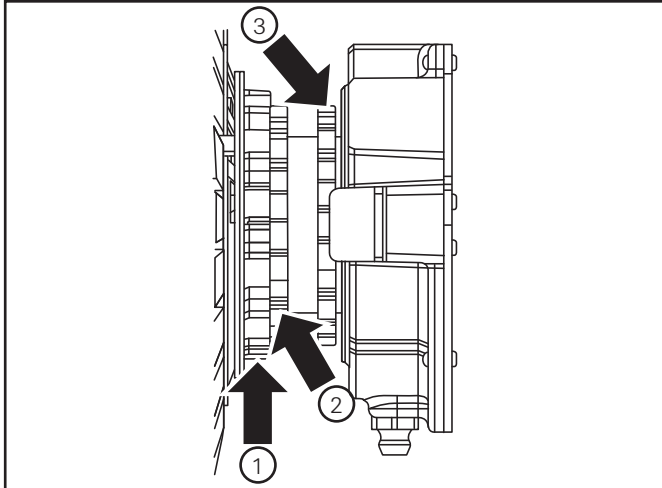


### Required Tools, Parts, Equipment

- (A) Twin XTEND WRENCH 87 (black handle) for nut #1 and Twin XTEND WRENCH 75 (red handle) for nut #2 and adjusting hook. XTEND WRENCH KIT. (For Mack vehicles you will need XTEND WRENCH KIT M)
- (B) Standard 1/2" drive torque wrench

## Step 1

### Loosen Lock Nut #2



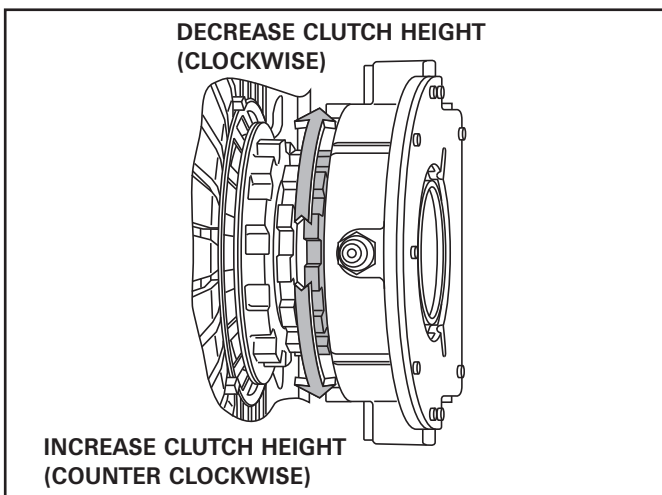
- Secure the clutch pedal in the downward position to gain access to locknuts #1 & #2
- While holding nut #1 with Twin XTend wrench 87, break loose locknut #2 with Twin XTend wrench 75 by turning it COUNTERCLOCKWISE
- Rotate the locknut #2 away from nut #1 by rotating it COUNTERCLOCKWISE

**Note:**

Direction of view is always towards the engine!

## Step 2

### Adjust Bearing Height



**Use the following procedures to achieve a Clutch Brake Gap of 0.530"**

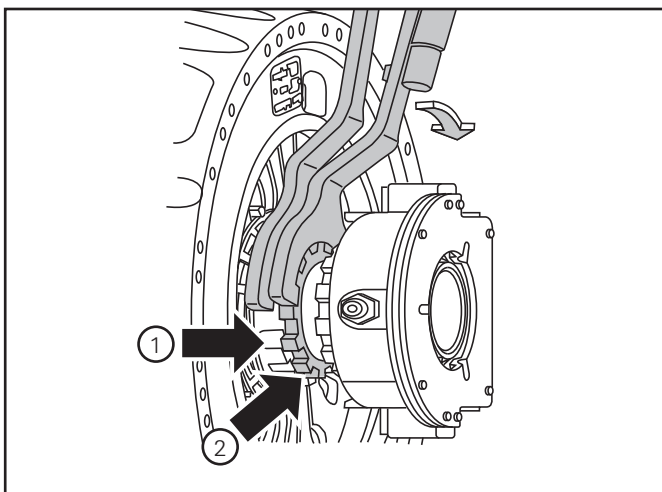
- Release clutch pedal to upward position
- Turn nut #3, which is fixed to the threaded sleeve,
  - COUNTERCLOCKWISE to increase clutch height (clutch brake gap gets smaller)
  - or
  - CLOCKWISE to decrease clutch height (clutch brake gap gets larger)

**Note:**

To aid in turning nut #3 the adjusting hook can be used

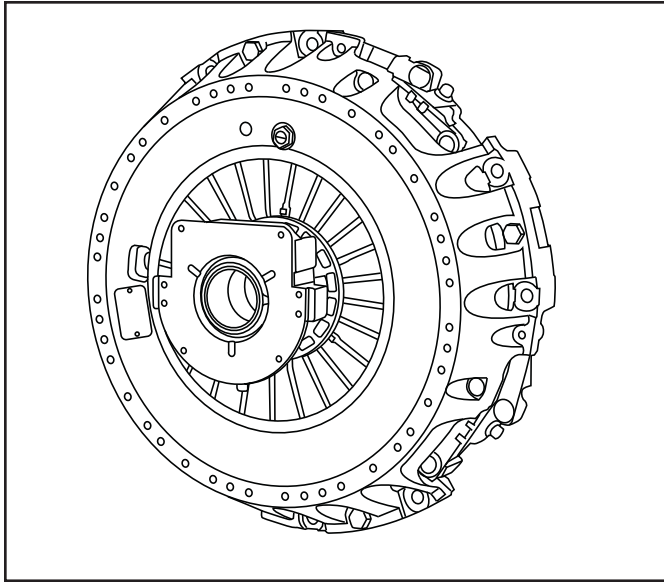
## Step 3

### Tighten Lock Nut #2 to Specified Torque



- **First**, hold nut #1 with Twin XTend wrench 87
- **Second**, torque lock nut #2 CLOCKWISE to the proper torque specification by setting the torque wrench to **50...55 lbft (68...75Nm)** and inserting the preset torque wrench into the square opening on the Twin XTend wrench 75, while securely holding nut #1

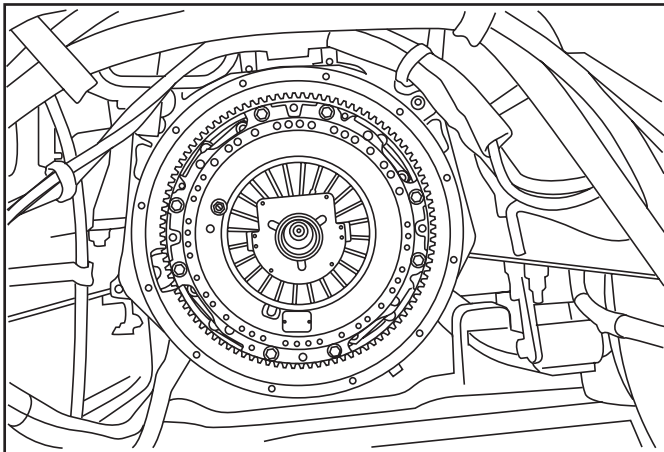




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## Removal Guide ZF Sachs Twin XTend™ Two plate 15.5" Self-Adjusting Clutch

- 1 Insert Alignment Tool
- 2 Install (4) Shipping Bolts
- 3 Removal of Clutch Assembly



### Removal of Flywheel Mounted Twin XTend Clutches

**Removing a Fully Operational Clutch  
to be later Re-Installed  
or  
Removing a Failed Clutch  
for Warranty Claim Evaluation**

**Prior to removing the Clutch Cover housing from the Flywheel, it is essential that the internal self-adjustment mechanism of the Twin XTend clutch is "caged" with 7/16" x 1.5" long shipping bolts. Without correct caging, the clutch will lose its proper adjustment settings and will malfunction upon re-installation and no warranty evaluation/approval can be done. Not following removal instructions will void your warranty!**

The following procedure describes the steps involved for removing an installed Twin XTend clutch from the Flywheel. The procedure begins following Removal of the Transmission. Precautionary steps and care have to be taken with regards to supporting transmission weight and Input shaft alignment during removal, such that no excessive weight or bending forces have been applied to the Clutch and the Clutch Bearing.





