

# Compressor Clutch Replacement Procedure

P-1411  
819-0361

Installation Instructions



 **Warner**<sup>®</sup>  
Electric

An Altra Industrial Motion Company

**World Clutch with Unidamp®  
Armature Assembly for Ford FX-15  
and FS-10 Compressors and all  
Denso Models with 30mm bearing fit.**

**⚠ WARNING** Keep fingers, hands and other body parts and loose clothing away from rotating components.

**⚠ WARNING** Failure to follow these instructions may result in product damage, equipment damage, and serious or fatal injury to personnel.

**Compressor Clutch Removal**

**Note:** Do not pound on the clutch, compressor or Unidamp as damage will result to components.

**Step 1. Diagnose Clutch Failure**

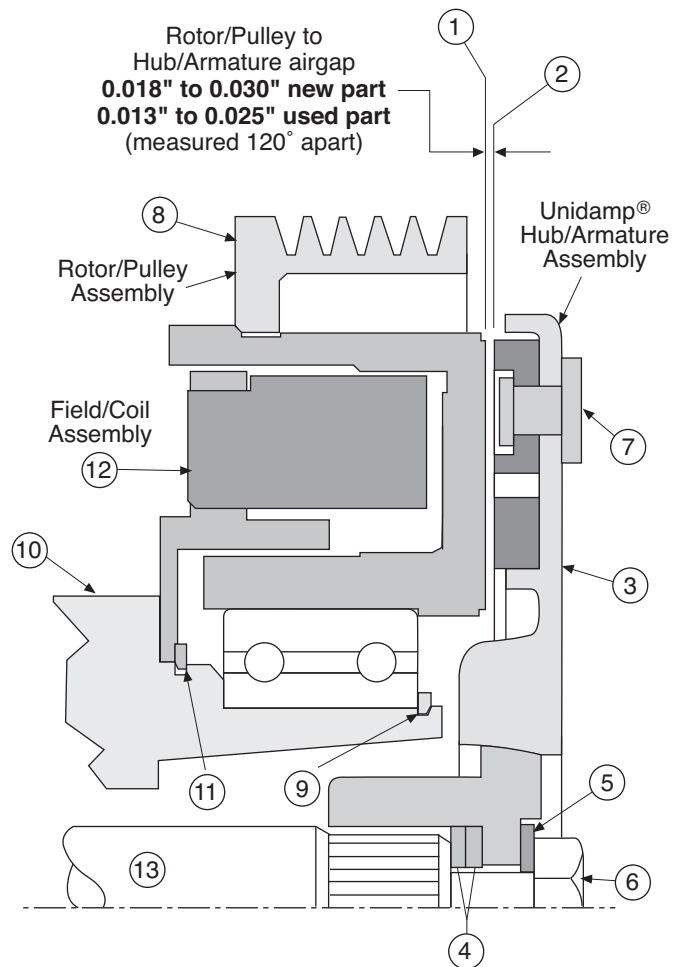
Most compressor clutch failures are a direct result of items external to the clutch. These can include compressor failure, electrical problems, or oil contamination. **Before installing a new clutch, determine what caused the old clutch to fail and fix the problem.**

If the clutch is replaced without fixing the cause of the clutch failure, the new clutch may fail in the same manner as the old clutch.

Please refer to Warner Electric's "Air Conditioning Clutch Troubleshooting Guide," form number P-1011, and the appropriate manufacturer's A/C service manuals.

**Step 2. Removing Hub/Armature Assembly (3)**

- A. Remove shaft bolt (6).
- B. Remove washer (5).
- C. Remove hub/armature (3) by hand. World Clutch has an 8mm threaded hole to use as a jack screw for removal.
- D. Remove shims (4) from the hub/armature assembly. The number of shims can vary.



**(Figure 1) Clutch Components**

### Step 3. Removing Rotor/Pulley Assembly (8)

- A. Remove rotor/pulley snap ring (9).
- B. Slide rotor/pulley assembly (8) off the compressor nose (10). If rotor/pulley assembly is hot it will not slide, **do not force**. Allow the clutch to cool and then proceed.

### Step 4a. Removing Field Coil Assembly (12) for all compressors except Ford FX-15 & FS-10

- A. Separate electrical connection and, if applicable, remove clutch wire retaining clip from the compressor.
- B. Remove field coil snap ring (11) retaining the field coil.
- C. Remove the ground screw on the compressor, if used.
- D. Slide the field coil (12) off the compressor housing.

### Step 4b. Removing Field Coil Assembly (12) for Ford FX-15 & FS-10 only. (Refer to Figure 5 for actual field configuration.)

- A. Separate electrical connection at the field.
- B. Insert two pry tools between the rear of the field shell (12) and the compressor housing. These tools should be spaced 180 degrees apart. Do not locate pry tool on terminal connector.
- C. Gently pry the field coil (12) off the compressor housing.

### Installing Clutch on Compressor

Replace the complete clutch to ensure full performance is achieved and warranty requirements are met.

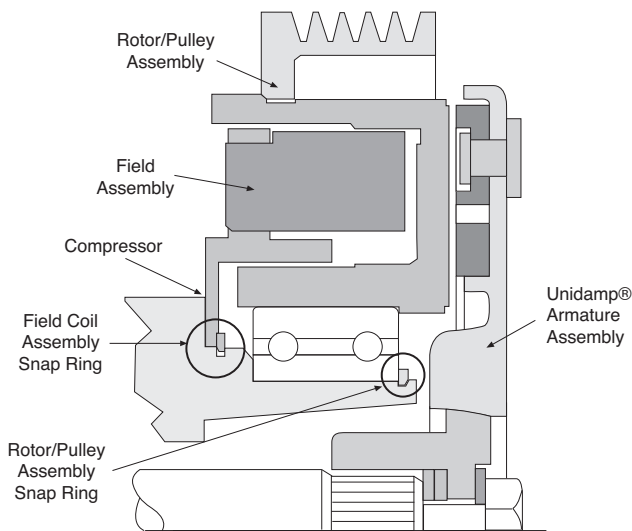
#### Step 1. Compressor Preparation

- A. Clean compressor nose of all dirt, grease and debris. Check for evidence of oil leakage from compressor front seal and through bolts. Repair or replace compressor as appropriate.
- B. Check mounting surfaces (10) for nicks, burrs and scratches. (See Figure 1) Smooth with a file or emery cloth if necessary. If severe wear that affects field pilot or rotor bearing fit is evident, the compressor must be replaced.
- C. Check the electrical system to ensure that the voltage available to the clutch is 10.8 volts minimum.

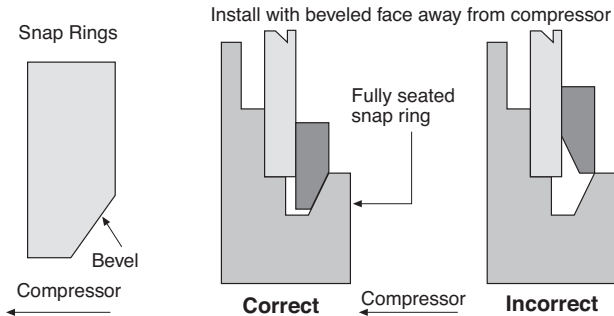
#### Step 2A. Installing the Field Coil (12) for all fields except Ford FX-15 & FS-10

**Note:** Failure to install snap rings per these instructions can be verified and will void the compressor clutch warranty.

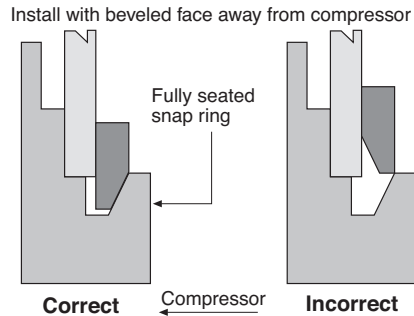
- A. Align the anti-rotation pin in the back plate of the field coil (12) with the hole in the compressor housing. Guide the field coil assembly into the installed position. Make sure that the leadwires are routed directly to the retaining clip on top of the compressor, if applicable.
- B. With snap ring pliers, spread the field coil snap ring (11) and insert it into the groove on the compressor nose. (See Figure 2) To assure assembly retention, the ring bevel must face away from the compressor. (See Figures 3 and 4)



(Figure 2) Location of Clutch Snap Rings



(Figure 3)  
Snap Ring  
Bevel

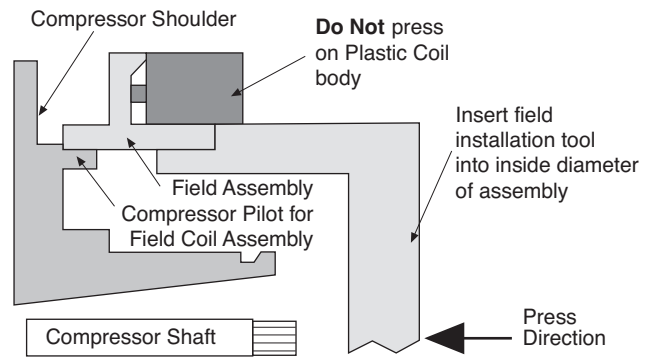


(Figure 4)  
Correct and Incorrect  
Installation

C. Verify that the snap ring is fully seated in the groove around its circumference to assure assembly retention. (See Figure 4)

D. Attach ground lead, if used, to the compressor housing and tighten screw.

E. Proceed to Step 3.



(Figure 5) Ford FX-15 & FS-10 Field Installation

**Step 2B. Installing the Field Coil (12) for all Ford FX-15 & FS-10 fields**

- A. Stand the compressor on end with the nose pointing up. Position the field assembly (12) such that the field shell starts to overlap the compressor nose field mounting surface. Ensure the electrical connector aligns with original connector position before continuing.
- B. Insert the field installation tool into the inside diameter of the shell. (See Figure 5)
- C. Visually check to ensure the field is positioned squarely. Press the field assembly onto the field mounting surface until it bottoms on the compressor shoulder.

### Step 3. Installing the Rotor/Pulley Assembly (8)

**Note:** Do not mar the rotor/pulley or hub/armature drive surfaces. Prevent any oil or grease from contaminating the friction surfaces.

- A. Install the rotor/pulley assembly (8) onto the compressor (10). If the rotor/pulley does not slide easily, check the compressor nose for nicks or burrs and remove them. If the rotor/pulley still does not slide on easily, rock the rotor/pulley back and forth by hand until it slides completely onto the compressor (10).
- B. Make sure there is no interference between the field assembly (12) or leadwires and the rotor/pulley (8).
- C. With snap ring pliers, spread the rotor/pulley snap ring (9) and insert it into the groove on the compressor nose per Figure 1. To assure assembly retention, the ring bevel must face away from the compressor.  
(See Figures 3 and 4)
- D. Verify that the snap ring is fully seated in the groove around the circumference to assure assembly retention. (See Figure 4)

### Step 4. Installing the Unidamp® Hub/Armature Assembly (3)

**Note:** Do not insert screwdrivers between the hub/armature and the rotor/pulley to remove hub/armature as they will damage the clutch.

- A. Slide the Unidamp Armature assembly (3) onto the compressor shaft (13).
- B. Set the rotor/pulley (1) to hub/armature (2) airgap to **.018 to .030 inches** by adding or removing shims (4). Measure using a feeler gauge at 3 locations 120 degrees apart.  
(See Figure 1) Should a used clutch be installed, set the rotor/pulley (1) to hub/armature (2) airgap to .013 to .025 inches.
- C. Install washer (5) and retainer bolt (6).  
Torque to 155 in. lb.

**Note:** As the shims may compress when retainer bolt (6) is tightened, recheck airgap at three rivet locations (7).

### Step 5. Clutch Assembly Check

- A. Rotate the clutch and check for rubbing or interference.
- B. Reinstall belts per manufacturer's service manual. Do not over tighten.
- C. Recheck airgap at 3 or 4 points for clutch rubbing. Airgap to be **.018 to .030 inches**.
- D. **Important:** Burnish as follows. Run the clutch at 2500 to 3000 RPM. Cycle the clutch ON and OFF at a rate of 10 to 15 times per minute for a total of 50 cycles minimum. This will assist in bringing the clutch up to operating torque capacity.

**▲CAUTION** Cycle the clutch using the controls inside the car or electrical system damage could result.

# Warranty

Warner Electric LLC warrants that it will repair or replace (whichever it deems advisable) any product manufactured and sold by it which proves to be defective in material or workmanship within a period of one (1) year from the date of original purchase for consumer, commercial or industrial use.

This warranty extends only to the original purchaser and is not transferable or assignable without Warner Electric LLC's prior consent.

Warranty service can be obtained in the U.S.A. by returning any defective product, transportation charges prepaid, to the appropriate Warner Electric LLC factory. Additional warranty information may be obtained by writing the Customer Satisfaction Department, Warner Electric LLC, 449 Gardner Street, South Beloit, Illinois 61080, or by calling 815-389-3771.

A purchase receipt or other proof of original purchase will be required before warranty service is rendered. If found defective under the terms of this warranty, repair or replacement will be made, without charge, together with a refund for transportation costs. If found not to be defective, you will be notified and, with your consent, the item will be repaired or replaced and returned to you at your expense.

This warranty covers normal use and does not cover damage or defect which results from alteration, accident, neglect, or improper installation, operation, or maintenance.

Some states do not allow limitation on how long an implied warranty lasts, so the above limitation may not apply to you.

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## **Changes in Dimensions and Specifications**

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**Warner Electric LLC**  
31 Industrial Park Road • New Hartford, CT 06057  
815-389-3771 • Fax: 815-389-2582  
[www.warnerelectric.com](http://www.warnerelectric.com)