

### Service Bulletin

- Service Bulletin:** SB EC135-302; Eurocopter EC135 Air Conditioner Compressor Bearing, Pulley, and Spline Shaft Change.
- Subject:** Removal and replacement of the compressor bearing, pulley, and spline shaft.
- Date:** 30, October 2006, Rev N/C
- Applicability:** Eurocopter Helicopter model EC135 Equipped with the Air Comm Corporation EC135-200 Dual Forward Evaporator Air Conditioning System.
- Reference:**
1. FAA / STC # SR00565DE, Eurocopter Helicopter EC135 Air Conditioning System.
  2. EC135-300 Compressor Installation Drawing.
  3. EC135-302 Compressor Installation Drawing.
  4. EC135-3002 Compressor Mount Assy. Drawing.
  5. EC135-3008 Bearing Cover Assy. Drawing
  6. EC135-3010 Bearing Retainer Assy. Drawing.
- Compliance:** On completion of SB EC135-300 Compressor Bearing Inspection, this Service Bulletin shall be complied with depending on the condition of the Compressor Bearings. If corrosion / rust is noted on the compressor bearings surface during the inspection, this Bulletin must be complied with in the next 25 hours of operation.

#### **I. Discussion:**

Operators in the field have noted corrosion / rust on the upper bearing assembly of the EC135 air conditioner Compressor Drive Assembly. This corrosion / rust maybe an indication the upper bearing may have experienced contamination from water collecting on the upper exposed surface of the bearing seal.

#### **II. Approval:**

Technical aspects of this Service Bulletin are FAA / DER approved.

#### **III. Purpose:**

The purpose of this bulletin is to replace the compressor drive bearings and spline drive assembly components which have become corroded / rusted due to water contamination.

**IV. Bill of Materials:**

**Parts to be Removed:**

Item	Part Number	Description	Quantity
1	MS24665-423	Cotter Key	1
2	ES33100-2	Bearing	2
3	EC135-3030-1	Spline Shaft	1
4	EC135-3030-2	Sleeve	1
5	EC135-3010-14	Pulley	1
6	EC135-3010-17	Washer	1
7	EC135-3010-18	Pin	1
8	ES39120-1	O-ring	1

**Parts to be Installed:**

Item	Part Number	Description	Quantity
1	EC135-3008-1	Bearing Cover	1
2	MS24665-423	Cotter Key	1
3	ES33100-3	Bearing	2
4	EC135-3060-2	Spline Shaft	1
5	EC135-3060-1	Sleeve	1
6	EC135-3050-4	Pulley	1
7	EC135-3010-17	Washer	1
8	EC135-3010-18	Pin	1
9	EC135-3056-1	Key	1
10	ES39120-1	O-ring	1

Please contact the Air Comm Corporation Service Department to obtain these parts.  
Phone 303-440-4075, Fax 303-440-6355, E-Mail [info@aircommcorp.com](mailto:info@aircommcorp.com)

**V. Accomplishment Instructions:**

**CAUTION**

It is recommended that the battery and external power be disconnected before starting work.

**NOTE**

It will not be necessary to discharge the refrigerant from the air conditioner system to accomplish this Service Bulletin.

**Removal:**

1. Remove the upper aircraft cowlings to access the air conditioner compressor & mount assembly, which is mounted to the drive pad on the aft side of the main transmission housing.
2. Cut the safety wire that secures the MS509-8 Jam Nut to the EC135-3020-1 Compressor Adjustment Assy., and loosen nut. (See figure 1-1)
3. Loosen the four (4), AN6-21A bolts that secure the base of the EC135-3040-1 Compressor Assembly to the top of the Compressor mount (See figure 1-2)
4. Turn the 412AC-3016-16 Belt Tensioning Bolt counterclockwise to loosen the belt tension. This will allow for the removal of the compressor drive belt. (See figure 1-1)
5. Remove the four (4), AN3-7A bolts & NAS1149F0332P Washers which attach the EC135-3010-2 Bearing Retainer Assy. to the Upper compressor mount assembly. (See figure 1-2)
6. Remove the nine (9), AN3-7A Bolts & NAS1149F0332P Washers from the upper compressor mount assembly. (See figure 1-2)
7. Remove the two (2), MS21042L4 Nuts & NAS1149F0432P Washers from the aft outboard support studs. (See figure 1-2)

**NOTE**

The upper section of the air conditioner compressor & mount can now be carefully lifted up and supported as to allow access to the EC135-3002-1 Lower Mount Assembly.

**CAUTION**

Support and secure the air conditioner compressor assembly as not to allow it to cause any damage to the compressor, compressor mount, or aircraft components.

8. Remove the ES35135-1 compressor drive belt.

**NOTE**

The compressor drive belt is an on condition item. If the belt has no exposed fibers, cracks, glazing, or shows no signs of obvious wear and tear, it is permissible to retain and reinstall this part. We do recommend that the belt be changed every 1000 hours to insure the continued airworthiness of this part. If necessary a new belt may be purchased through Air Comm Corporations Service Department.

9. Remove the four (4) existing nuts and washers from the transmission mounted studs at the base of the compressor drive pulley assembly. (Note: retain these parts for the reinstallation of the EC135-3002-1 lower compressor mount assembly.

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Removal continued:

10. Gently tap "up" on the bottom of the EC135-3002-1 lower compressor mount using a rubber mallet to remove the lower mount from the main transmission.

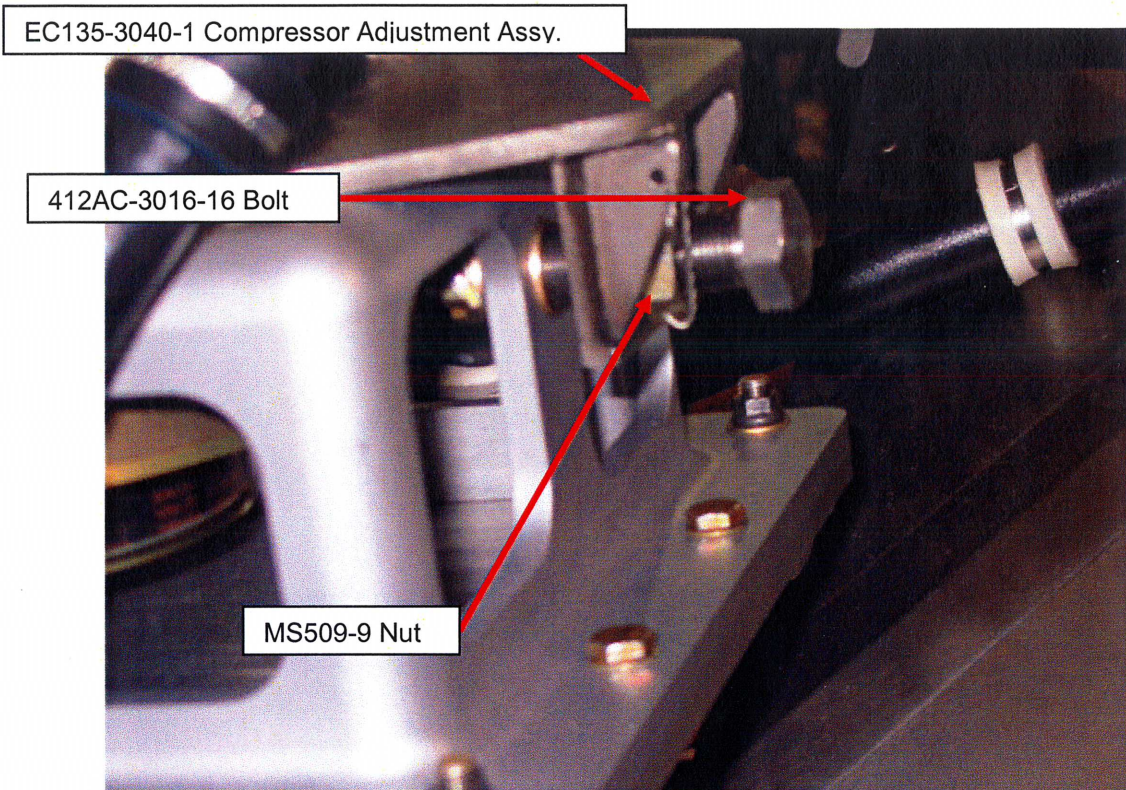


Figure 1-1

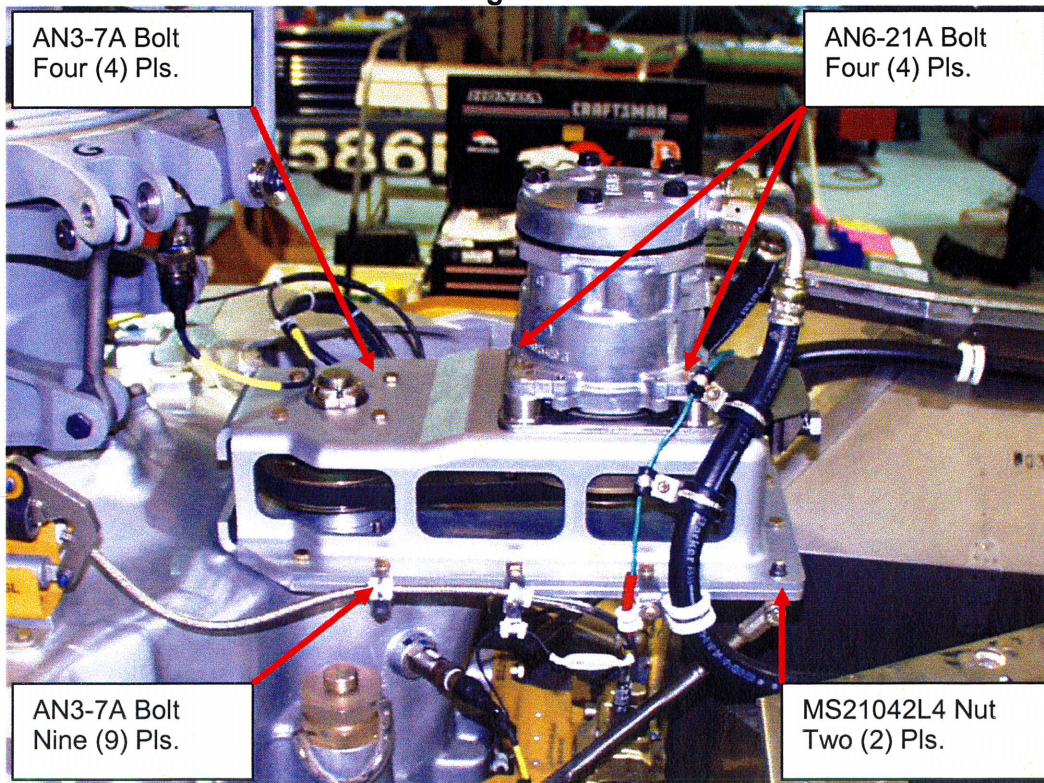
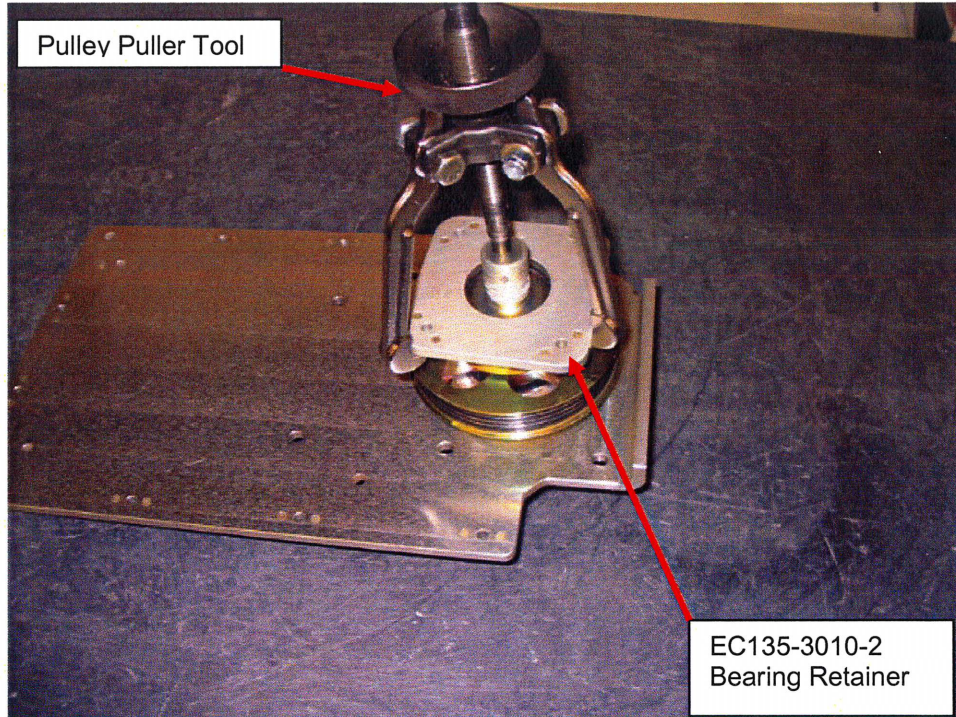


Figure 1-2



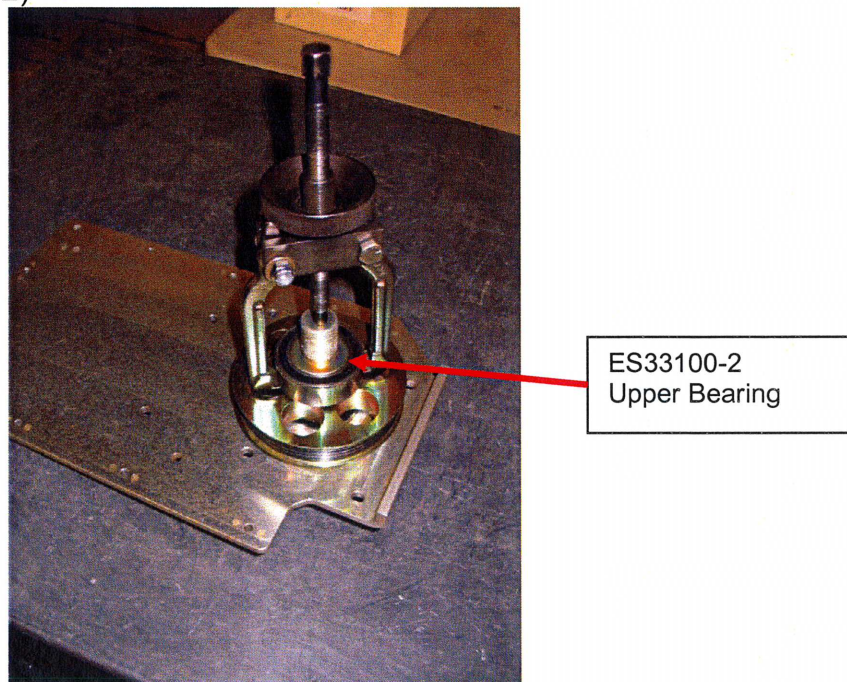
**Disassembly of the EC135-3002-1 Assembly:**

1. Remove the MS24665-423 Cotter Pin, and AN310-14 Nut from the top of the EC135-3030-2 Sleeve. (Note: Retain the AN310-14 nut for reinstallation purposes.)
2. Remove the EC135-3010-2 Bearing retainer using a pulley puller. (See Figure 2-1)



**Figure 2-1**

3. Remove the upper ES33100-2 Bearing from the EC135-3030-2 Sleeve using a pulley puller tool. (See Figure 2-2)



**Figure 2-2**

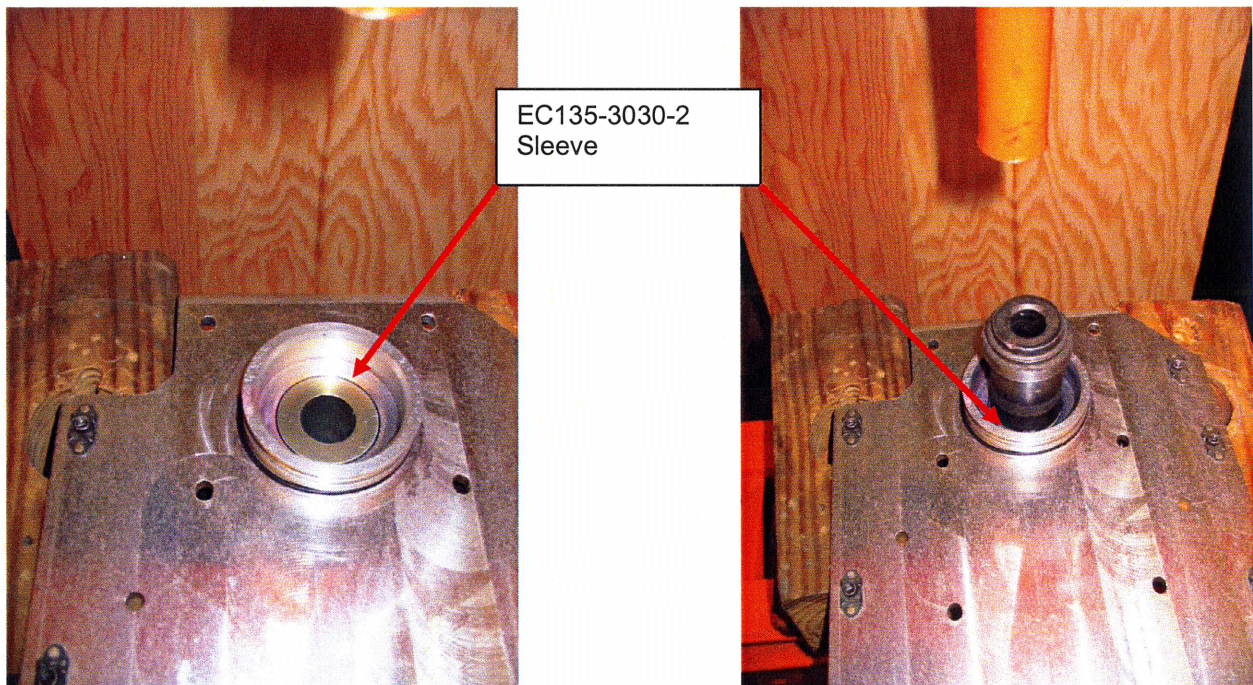


4. Once the upper ES33100-2 Bearing has been removed from the EC135-3030-2 Sleeve, you will be able to remove the EC135-3010-18 Pin and the EC135-3030-1 Spline Shaft from the Sleeve by pushing the pin out of the sleeve assembly.

5. With the use of a bearing press you can now remove the lower ES33100-2 Bearing, EC135-3030-2 Sleeve, and EC135-3010-14 Pulley from the EC135-3002-1 Lower Mount Assy. It will be necessary to turn the Lower Mount upside down to press the bearing, sleeve and pulley out of the mount. (See Figure 2-3)

**CAUTION**

It is important to insure the EC135-3002-1 Lower Mount Assembly is supported while pressing the lower bearing, sleeve, and pulley out of the mount.



**Figure 2-3**

6. Remove the ES39120-1 O-ring from the EC135-3002-1 Lower Mount.

**Reassembly of the EC135-3002-1 Assembly:**

**NOTE**

Clean the EC135-3002-1 Lower Mount, and EC135-3010-2 Bearing Retainer using Denatured Alcohol. Parts should be free of any dirt, corrosion, and oil prior to reassembly.

Continued



Reassembly of the EC135-3002-1 Assembly continued:

1. Using a bearing press, Install the ES33100-3 Lower Bearing on the EC135-3060-1 Sleeve. (See Figure 3-1)

**NOTE**

Insure that the bearings inner and outer races are supported properly while pressing the bearing onto the sleeve to prevent any damage to the bearing assembly. The bearing should turn freely, with no binding allowed.



**Figure 3-1**

2. Using a bearing press, Install the ES33100-3 Lower Bearing & EC135-3060-1 Sleeve into the existing EC135-3002-1 Lower Mount Assy.

**CAUTION**

The installation of the ES33100-3 Lower Bearing into the EC135-3002-1 Lower Mount Assy. should be done to insure the bearing does not cause any damage to the I.D. of the bearing cup portion of the lower mount.

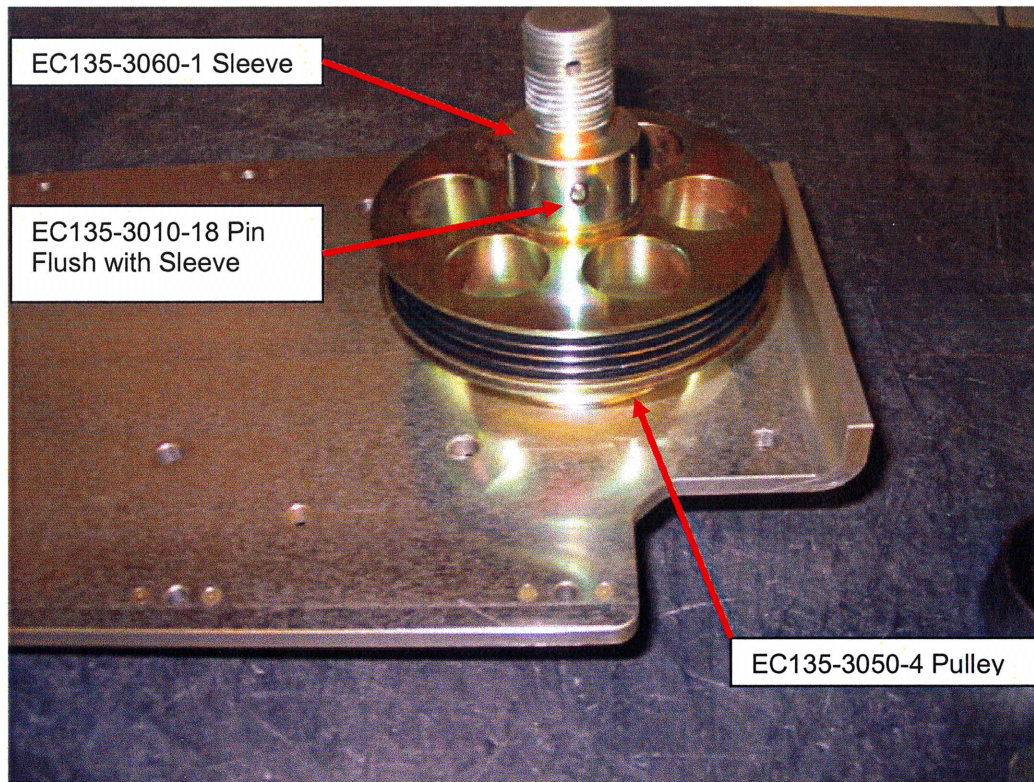
3. Install the EC135-3050-4 Pulley, and EC135-3056-1 Key onto the EC135-3060-1 Sleeve. (See Figure 3-3)

4. Install the EC135-3060-2 Spline Shaft through the bottom opening in the EC135-3060-1 Sleeve and secure in place by inserting the EC135-3010-18 Pin through the side of the sleeve above the EC135-3050-4 Pulley.

**NOTE**

Prior to installation of the upper ES33100-3 Bearing, insure that the EC135-3010-18 Pin is flush with both sides of the EC135-3060-1 Sleeve. (See figure 3-2)

Reassembly of the EC135-3002-1 Assembly continued:



**Figure 3-2**

5. Using a bearing press, Install the ES33100-3 Upper Bearing on the EC135-3060-1 Sleeve.
6. Install EC135-3010-17 Washer, AN310-14 Nut, and MS24665-423 Cotter Key. Hand tighten the nut, plus one castellation, and install the cotter key.
7. Using a bearing press, reinstall the EC135-3010-2 Bearing Retainer on the ES33100-3 Upper bearing

**CAUTION**

The installation of the ES33100-3 Upper Bearing into the EC135-3010-2 Bearing Retainer should be done to insure the bearing does not cause any damage to the I.D. of the bearing cup portion of the bearing retainer.

8. Install ES39120-1 O-ring in the O-ring groove on the base of the EC135-3002-1 Lower mount Assy.



### **Reassembly & Installation:**

1. Reinstall the EC135-3002-1 Lower Mount Assembly on the main transmission accessory drive pad. Reinstall existing nuts and washers on the transmission studs, and torque to 30 to 40 inch lbs..

#### **CAUTION**

During the installation of the lower mount assembly, insure that the ES39120-1 O-ring is not pinched or damaged.

2. Reinstall the upper section of the compressor mount back onto the lower section. Insure that the ES35135-1 compressor drive belt is installed around the drive pulley prior to continuing with the reassembly of this component.

3. Reinstall the two (2), MS21042L4 Nuts & NAS1149F0432P Washers on the aft outboard support studs, and torque nuts to 30 to 40 inch lbs. (See Figure 3-3)

4. Reinstall the nine (9), AN3-7A Bolts & NAS1149F0332P Washers in the upper compressor mount assembly, and torque to 20 to 25 inch lbs.

5. Reinstall the four (4), AN3-7A Bolts, NAS1149F0332P Washers, and the new EC135-3008-1 Bearing Cover on to the upper compressor mount assembly, apply Pro-seal 870 or equivalent to both faying surfaces, and torque to 20 to 25 inch lbs.

6. Reinstall the Compressor drive belt on both the Compressor and Compressor Drive Pulleys, then re-tension the belt using the 412AC-3016-16 bolt. Turning the bolt clockwise to tension the belt.

#### **NOTE**

Proper belt tension is important to insure a long belt service life and to avoid excessive loads on the compressor, and bearing assemblies.

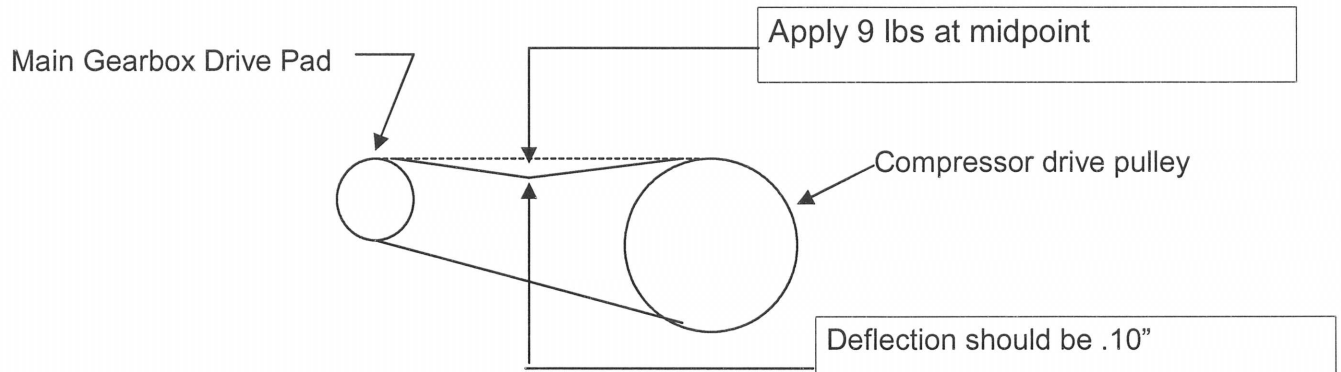
A. The correct belt tension for the belt is 9 lbs. This can be achieved with the aid of a **belt tensioning tool** (Kent-Moore® BT-33-73F Belt Tension Gauge or Equivalent).

(This is the preferred method of obtaining proper belt tensioning)

B. An alternate method is to observe a .10" belt deflection when 9 lbs of force is applied at the midpoint of the belt.

Continued

Reassembly & Installation continued:



**NOTE**

The belt tension should be checked, and re-adjusted, if necessary after the first two hours of operation for a newly installed belt.

6. Once the belt tension is achieved, torque the four (4), AN6-21A bolts that secure the base of the EC135-3040-1 Compressor Assembly to the top of the Compressor mount, 160 to 190 inch lbs.
7. Torque the MS509-8 Jam Nut 40 - 58 ft. lbs, and re-safety using MS20995C-32 Safety Wire.
8. Reinstall the cowlings I/A/W the EC135 Aircraft Maintenance Manual

**Weight and Balance:**

There is no change to the weight and balance required for the removal and replacement of the parts contained in this service bulletin.

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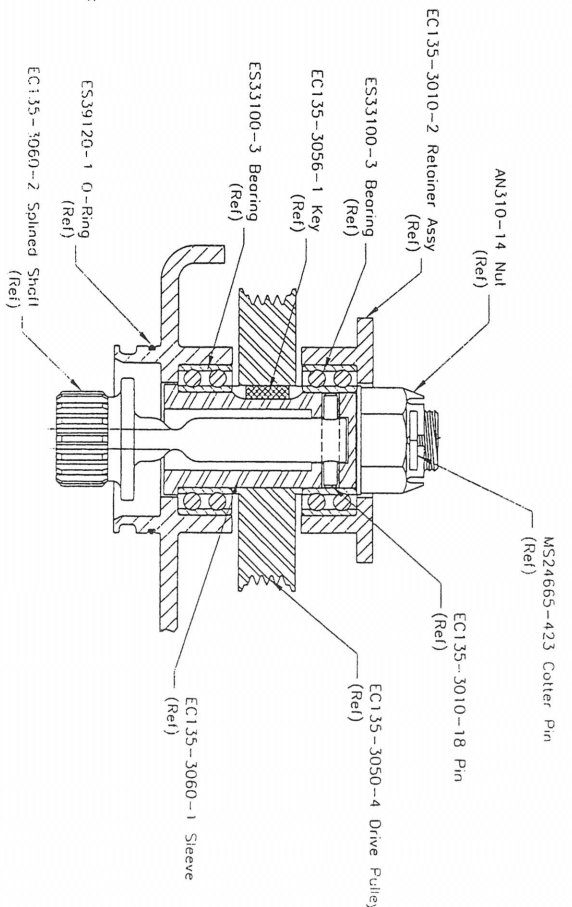
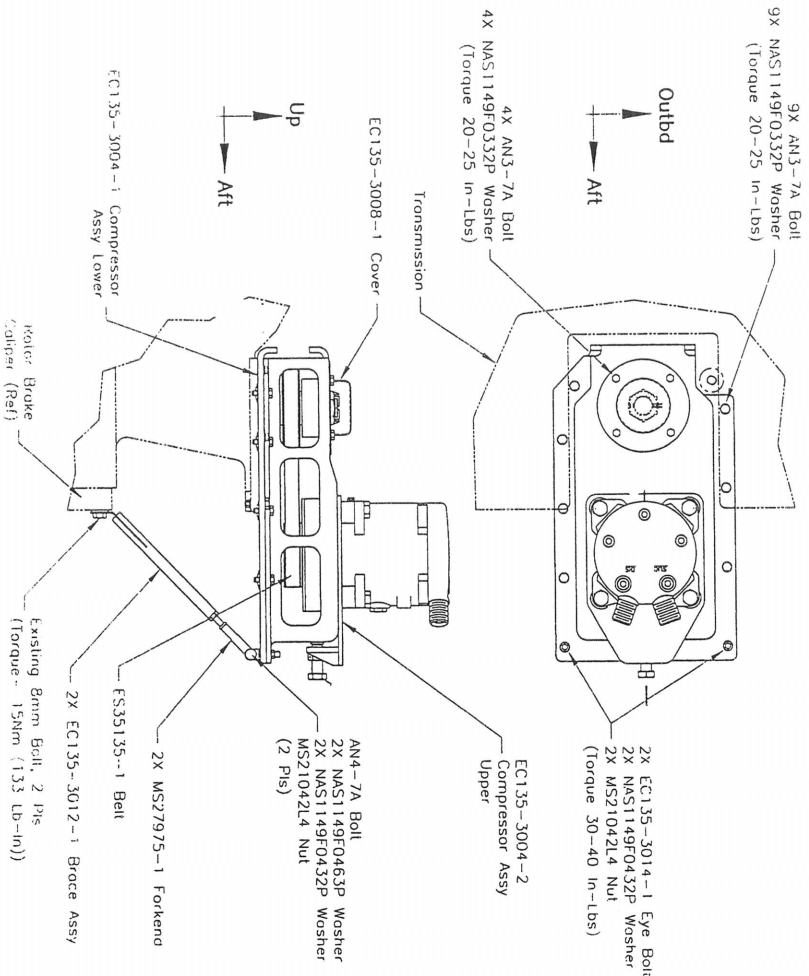


Figure 3-3 Compressor Installation & Compressor Drive Pulley Build Up (side view)