

Service Letter

Service Letter: No. 345

Subject: Replacement of Bell 412 Air Conditioner Compressor Speed Reducer Bearing Replacement.

Date: 6 June, 2003, Revised 08-25-03.

Applicability: Bell Helicopter Model 412 equipped with ACC Air Conditioner system.

Reference: F.A.A. / S.T.C. SR00066DE

Compliance: At the discretion of the operator, recommended time before replacement for the bearing is 1000 hours of aircraft operation. A 100 hour bearing inspection cycle has also been added to the Service Manual (Document 412AC-208M).

Background: A new 100 hour inspection and 1000 hour recommended replacement cycle has been incorporated for the speed reducer bearing. (See Service Manual 412AC-208M, Revision 5). This document provides instructions for bearing replacement.

Replacement of the speed reducer bearing requires replacement of the aluminum speed reducer pulley by a stainless steel pulley (see SL 344).

Approval: The Technical aspects of this Service Letter are FAA approved.

Bill of Materials of Item to be **removed**:

Item	Part Number	Description / Nomenclature	Remove
1	35BD219VV	Bearing	1

Bill of Materials of item to be **Installed**:

Item	Part Number	Description / Nomenclature	Install
1	35BD219DUM	Bearing	1

Contact the ACC Service Department to obtain the parts listed above to complete this Service Letter at:
Phone 303-440-4075, or Fax 303-440-6355.

I. Removal:

1. Remove upper transmission cowling to gain access to the air conditioner Compressor, Mount, and Speed Reducer assembly.
2. Remove the top Compressor Drive Belts by loosening the Compressor Belt Tensioning link located on the top of the Compressor Mount Assy.

NOTE

It will be necessary to loosen the Compressor Mounting bolts to allow the compressor to pivot during this process.

3. Remove the bottom Compressor Drive Belt by loosening the four AN6C-10A Bolts, and the Speed Reducer Belt Tensioning bolt 412AC-3016-16 on the top of the Compressor Mount Assy.

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Removal Continued:

NOTE

It is not necessary to disconnect the Driveshaft, or remove the lower belt from the aircraft.

4. Remove the cotter pin and the AN320-6 Nut at the bottom of the 412AC-3016-16 Bolt. Remove the AN960-616 Washers located between the Speed Reducer Assy. and the bottom of the Compressor Mount (see figure 2).

CAUTION

Support the Speed Reducer Pulley / Shaft Assembly prior to removal of attaching hardware, as this part is heavy and may cause damage to the aircraft, or driveshaft if dropped.

5. Remove the four AN6C-10A Bolts from the face of the Speed Reducer Pulley / Shaft Assembly, and remove the assembly from the aircraft (figure 2).
6. Remove MS21043-6 Nut from AN6C-10A Bolt in center of the Speed Reducer assembly (figure 1).
7. Remove AN6C-10A Bolt, 412AC-3036-13 Bevel Washer, 412AC-3036-14 Retainer Plate (figure 1).
8. Remove N5000-218PP Snap Ring from Speed Reducer Shaft.
9. Remove 412AC-3016-4 Pulley Assembly from the Speed Reducer Shaft.

NOTE

A pulley removal tool will be required to remove the pulley from the shaft.

10. Remove N5000-218PP Snap Ring from face of Pulley assembly.
11. Remove 35BD219VV Bearing, by pressing the bearing from the opposite side of the pulley from which the N5000-218PP Snap Ring was removed.

Inspection of Speed Reducer Shaft:

1. Visually inspect the bearing surface of the Speed Reducer Shaft, and the interior portion of the pulley and bearing mating surfaces for signs of corrosion, galling, pitting, or evidence that the bearing has spun on the Shaft portion of this assembly.

NOTE

Minor corrosion can be removed with the use of fine steel wool, crocus cloth, or equivalent. Evidence of galling, pitting, or the bearing having spun on the shaft may require the replacement of this part.

Installation / Replacement:

1. Install new 35BD219DUM Bearing into the pulley, re-install the N5000-218PP Snap Ring, and re-install the 412AC-3016-4 Pulley Assembly on the to the Speed Reducer Shaft (figure 3).

NOTE

To aid in the installation of the Speed Reducer Pulley to the Speed Reducer Shaft, It is recommended that you place the Speed Reducer Shaft in dry ice for approximately 20 minutes, while warming the Speed Reducer Pulley to no more than 120° F. This should allow the new pulley to be installed with the least amount of effort.

2. Re-install the N5000-218PP Snap Ring on the Speed Reducer Shaft.

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Installation / Replacement (continued)

3. Reinstall the AN6C-10A Bolt, 412AC-3036-14 Retainer Plate, 412AC-3036-13 Bevel Washer, and MS21043-6 Nut on the Speed Reducer Shaft, and torque the MS21043-6 Nut to 95 – 110 In-lbs.
4. Reinstall the four AN6C-10A Bolts through the slots in the Speed Reducer Shaft assembly, into the Nutplates located in the Compressor Mount (figure 4).

NOTE

Tighten these four bolts only finger tight at this point of the installation, as this will allow for movement of the Speed Reducer Assembly during the belt tensioning process.

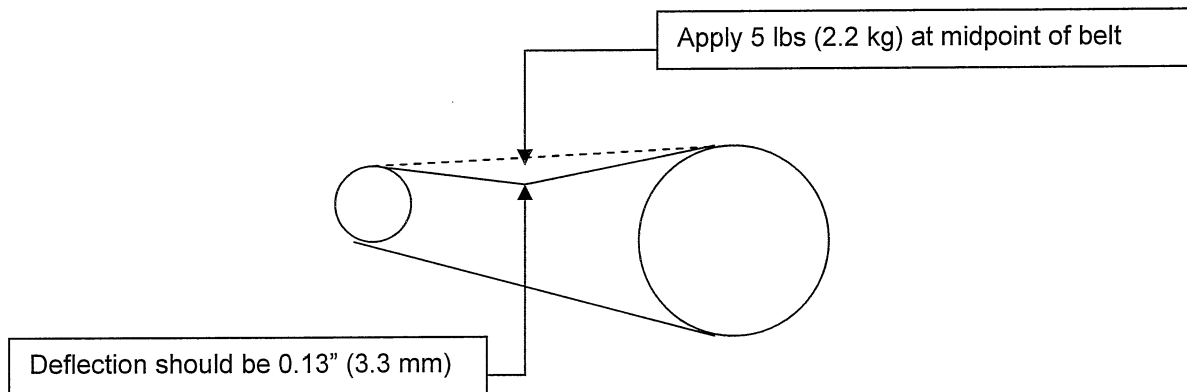
5. Reinstall the two AN960-616 Washers between the top of the Speed Reducer Assy. and the bottom of the Compressor Mount, reinstall the AN320-6 Nut, and AN380-3-3 Cotter Pin in the bottom of the 412AC-3016-16 Bolt. (figure 2).
6. Reinstall the lower drive belt on the Drive Pulley and to the inner race of the Speed Reducer Pulley. Using the 412AC-3016-16 Bolt tension the belt to 61 lbs of tension.

Tension Lower Drive Belt by turning the Belt Tensioning Bolt Counter-clockwise. Utilizing a Belt Tensioning Gauge, tension belt to 55 lbs, or use the alternate method by applying 5 lbs (2.2 kg.) of pressure to the midpoint of the belt and tension until a 0.13" (3.3 mm) deflection is observed.

NOTE

This same tensioning procedure applies for both the upper and lower drive belts.

Use of a commercially available belt tension gage is recommended. This gage can be ordered from the ACC Customer Service Department for \$159 USD.



7. Torque the four AN6C-10A Bolts in the face of the Speed Reducer Assy. to 95 – 110 in-lbs.
8. Tighten the MS509-8 Jam Nut on the 412AC-3016-16 bolt, and safety using .032 safety wire.
9. Reinstall the upper drive belt on the outer race of the Speed Reducer pulley, and the outer race of the Compressor Pulley. Using the Belt Tension Link located on the top of the compressor, tension the belt to 61 lbs. of tension. Safety the Belt Tension Link using .032 safety wire.

The belt tensioning procedures presented by step 6 (above) is applicable to the upper belt.

10. Re-torque the nuts (2 Pls) on the Compressor & Compressor Mounting attachment hardware to 95 – 110 inch lbs.
11. Perform a maintenance operational check (MOC) of the system, and re-install the upper transmission cowlings.

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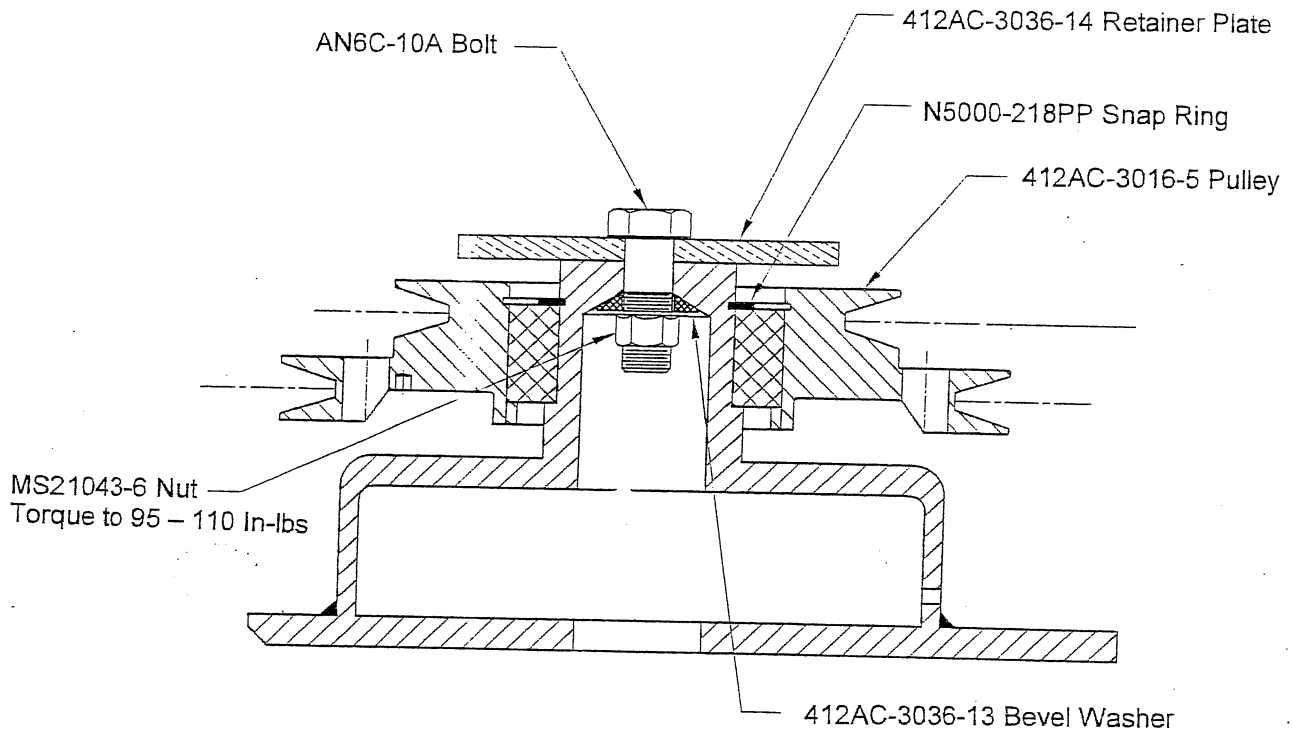


Figure 1, 412 Air Conditioner
Speed Reducer Assembly

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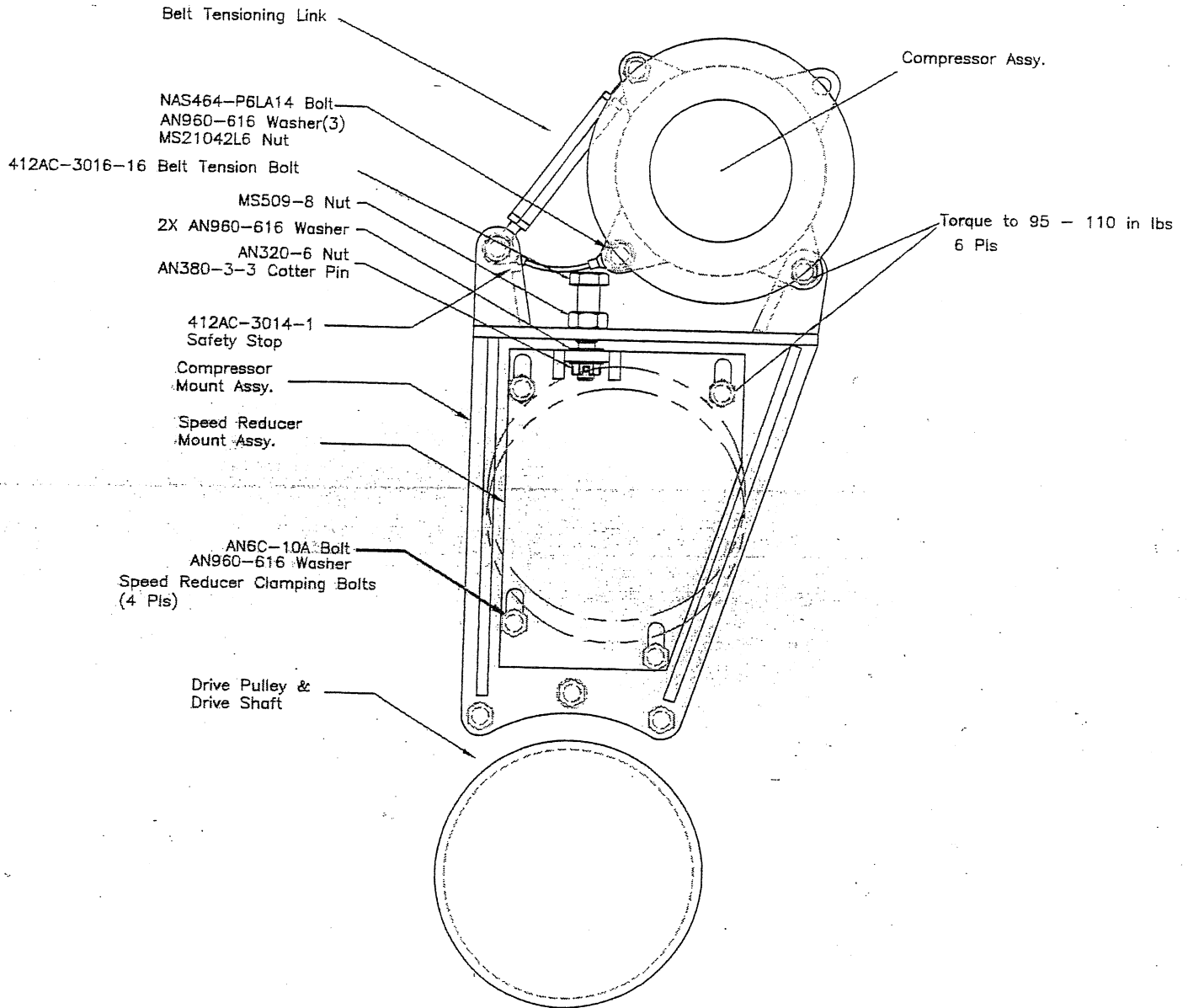


Figure 2, 412 Air Conditioner
Compressor Mount and Speed Reducer Assembly

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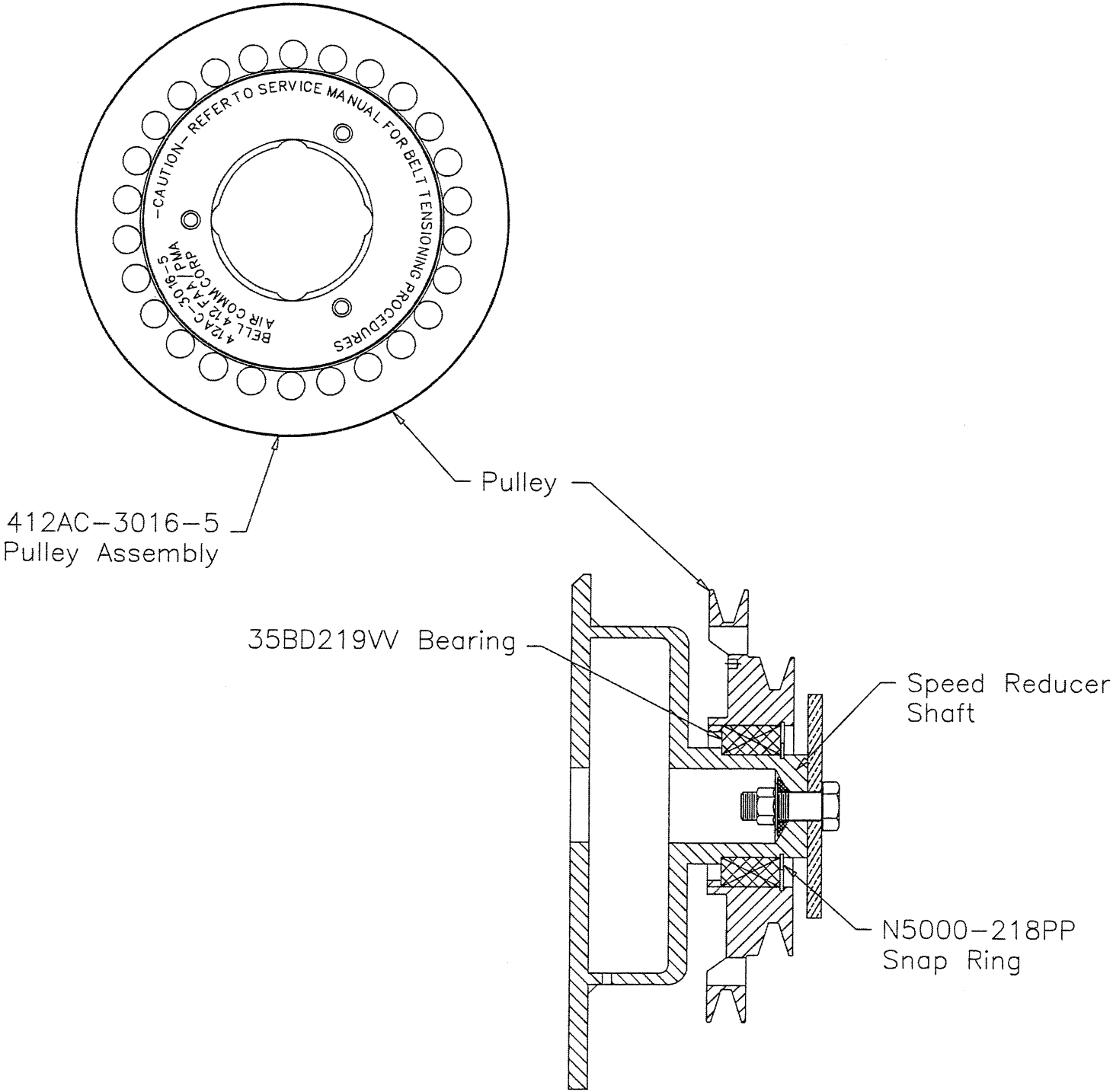


Figure 3 412 Speed Reducer Pulley and Bearing Assembly

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