



SERVICE DIRECTIVE BULLETIN

SERVICE DIRECTIVE BULLETIN NO. T-036
Revision 1

DATE: December 12, 2023

1. SUBJECT: Drive System Flex Packs

2. MODEL: TH-28, 480, and 480B

3. EFFECTIVITY: All Serial Numbers

4. BACKGROUND:

At the time of the initial release of this Service Directive Bulletin (SDB), Enstrom discovered that some flex packs (ECD4024-1) used in the main rotor drive system do not meet the required specifications. A flex pack consists of eight stacked elements (or plates) designed to permit flexing of the drive system shaft. The sub-standard flex packs contained only six elements.

This SDB requires a one time inspection of the two flex packs for the required eight elements.

Technical aspects of this SDB were coordinated with the FAA at the time of the original issue in 2009.

Revision 1 removed a reference to SDB T-017 (data is presented in WAD T-001 Revision 1), updated paragraph 6, Special Tools List, and updated the nomenclature for the text pertaining to ECD4024-1.

5. COMPLIANCE:

Within ten hours, inspect the flex packs in accordance with paragraph 5.1 to determine if they have the correct number of elements.

Any flex packs with fewer than eight elements must be replaced prior to the next flight in accordance with paragraph 5.2.

5.1 PLATE INSPECTION:

NOTE

**Perform all maintenance IAW the TH-28/480 Series
Maintenance Manual.**

5.1 INSPECTION:

- A. Count the number of elements in each flex pack. There are two flex packs: one on the drive system assembly (forward) and the second is on the lower pulley assembly (aft). Refer to Figure 1. Each flex pack must contain eight (8) elements.

Any of the three following methods may be used.

1) Use a borescope or a magnifying glass with a suitable light source and count the number of elements in each flex pack.

2) Use a bright light source and a high resolution digital camera and photograph the flex packs. View the pictures on the camera or download the pictures to a suitable computer software program and count the number of elements.

3) Fabricate a gage having a 0.110" wide slotted opening. Align the slot of the gage with the edge of the flex pack. If the flex pack fits in the slot, the pack contains fewer than eight elements. If the flex pack does not fit in the slot, the flex pack contains eight elements

- B. If there are eight elements per flex pack, no further action is required.
- C. If a flex pack contains fewer than eight elements, the flex pack must be removed and replaced in accordance with paragraph 5.2.
- D. Contact Enstrom Product Support with the results of the flex pack inspections.

5.2. REPLACEMENT:

NOTE

Perform all maintenance IAW the TH-28/480 Series Maintenance Manual.

NOTE

Install a cable tie or piece of lock wire through one of the bolt holes in the forward and aft flex packs to keep the elements properly oriented.

NOTE

Do not remove the lower pulley assembly if replacing the forward flex pack only.

- A. Replace the flex pack(s) with a set of eight elements IAW TH-28/480 Series Maintenance Manual paragraphs 11-19 and 11-20. If the aft flex pack is replaced, the lower pulley assembly must be removed from the aircraft.

CAUTION

Ensure that the three spacers used on each side of the flex pack (forward side or aft side) are of equal thickness. If the thickness of the spacers is not equal while performing the alignment, the lower drive system alignment will not be correct.

- B. Reinstall the lower pulley assembly if it was removed from the aircraft and prepare the lower drive system for alignment IAW paragraph 11-17, A, steps 11 through 13.
- C. Check the alignment of the lower pulley assembly to the upper pulley assembly IAW with paragraph 11-17, B. Adjust the lower pulley assembly as required for alignment.
- D. Check the alignment of the engine (power output shaft) and lower pulley assembly IAW paragraph 11-17, C. Adjust the engine shimming and lower pulley assembly tie rods as required for alignment.
- E. Check the alignment of the oil cooler blower assembly to the lower pulley assembly IAW paragraph 11-17, D. Adjust the shimming of the bearing housings and position of the bearing housing supports as required for alignment.
- F. When the lower drive system alignment is completed, reassemble the lower drive system and the aircraft IAW paragraph 11-17, E.

NOTE

Work Aid Document T-001 is attached for reference help.

5.3. PARTS:

ECD4024-1 (QTY 1, if replacing one flex pack; QTY 2, if replacing both flex packs)

Refer to Figures 6-8, 7-4, 7-5, 11-5 in the TH-28/480 Series Illustrated Parts Catalog as required.

6. SPECIAL TOOLS:

Tool Number	Description
T-0139-1	Belt Tension Tool
T-0141	Drive Pulley Alignment Tool
T-0166-11	Oil Cooler Shaft Alignment Coupling

7. MAN-HOURS:

Inspection - 30 minutes

Replacement - 3 hours if the lower pulley assembly is not removed; up to 16 hours if the lower pulley assembly is removed.

8. WARRANTY:

Per Enstrom Helicopter Warranty policy. (Note, the original flex packs must be returned for warranty.)

9. WEIGHT CHANGE:

None

10. LOG BOOK ENTRY:

Enter compliance with this SDB in the aircraft maintenance records.

11. REPETITIVE INSPECTIONS:

None

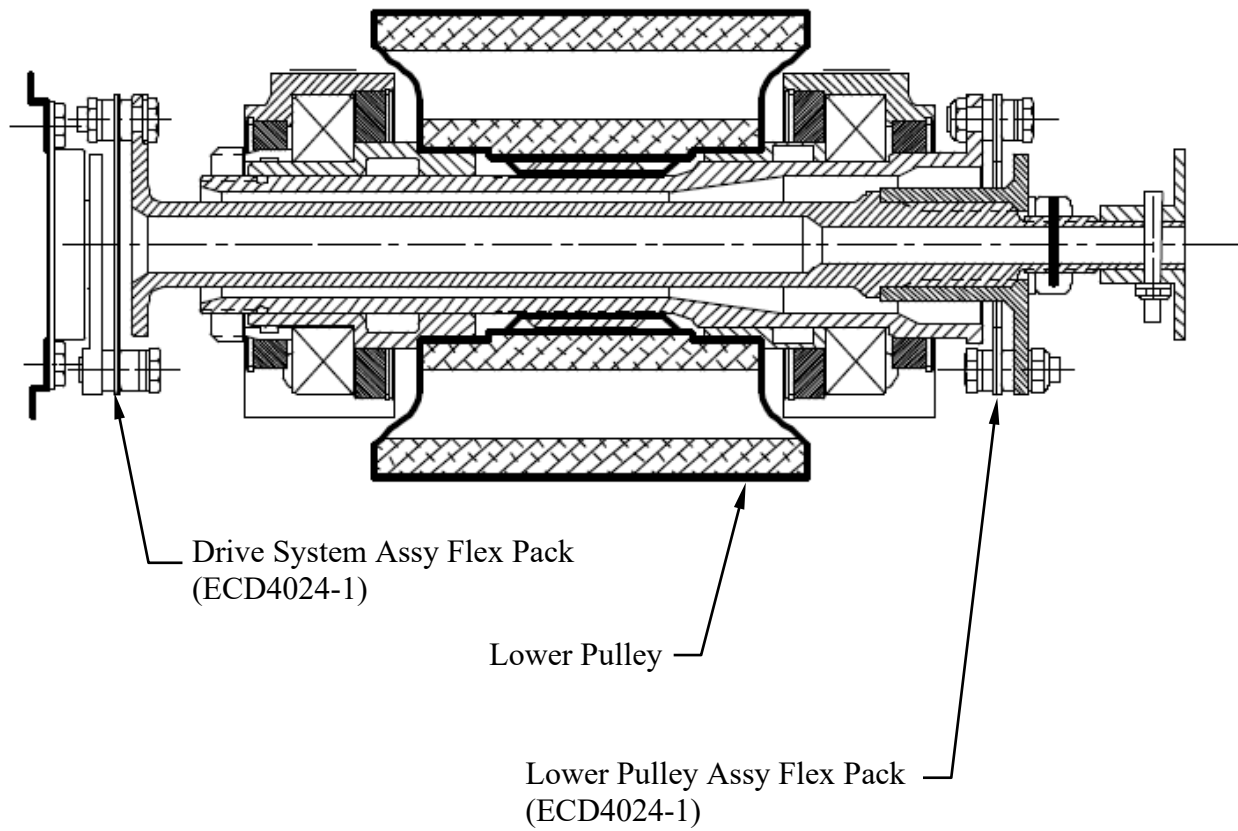


Figure 1.



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Aligning the TH-28/480 Series Lower Drive System

1. Purpose:

1. The purpose of this document is to provide additional reference information for aligning the lower drive system in the TH-28/480 Series helicopters. Use this document as additional reference information for the TH-28/480 Series Maintenance Manual instructions.

2. Preparation for Alignment (Refer to paragraph 11-17, A):

1. Disconnect the engine ignition harness from the exciter box and remove the exciter box. The ignition harness can be damaged if it is connected to the exciter box when the exciter box is not installed on its mounts.
2. If the lower pulley assembly is not installed in the aircraft, disassemble the aft coupling and reassemble it for alignment on the bench before installing the lower pulley assembly in the aircraft.
3. When reassembling the aft coupling for alignment, all three spacers on the front side of the flex pack must be of equal thickness, and all three spacers on the aft side of the flex pack must be of equal thickness (See Figure 1).
4. Depending on the measuring tools used to determine the flange spacing for axial alignment, use thinner spacers (of equal thickness) on one side of the aft flex pack to move the power output shaft flange and the lower pulley drive shaft flange closer together. Use thicker spacers to move the flanges farther apart.
5. Disconnect the tie rods from the lower pulley assembly (See Figure 2).

3. Upper and Lower Pulley Alignment (Refer to paragraph 11-17,B):

1. Using a combination square and a piece of chalk, mark an indexing line across the belt for checking belt tension during the tension and alignment procedure. Do not put the indexing line near the part number/serial number markings.
2. Rotate the pulley system a minimum of one complete belt rotation after making a tension adjustment before checking belt tension.
3. Belt tension range is 1,750 - 2,500 pounds (Refer to paragraph 11-29,E). Tension on the front side of the belt must be within ± 250 pounds of the aft side.
4. Ensure the alignment tool is contacting the upper pulley and lower pulley (See Figures 3 and 4).

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4. Power Output Shaft to Lower Pulley Drive Shaft Alignment (Refer to paragraph 11-17,C):

1. The lower pulley system is a pendulum and movement is in an arc.
2. Acceptable alignment is achieved when the bolt can be threaded into the power output shaft flange using finger pressure (See Figures 5 and 6).
3. The engine hangs from the engine mounts. The vertical position of the engine is changed by adjusting the shim thickness between the pylon mounts (bi-pod on the left side and tri-pod on the right side) and the mounts installed on the engine (See Figures 7 and 8). The upper engine mount will support the weight of the engine; however, the purpose of the mount is to maintain the parallel alignment of the engine to the main rotor transmission and the lower pulley drive system.
4. When adjusting the engine position, loosen the nut and jam nut on the top engine mount enough to allow the engine to drop approximately .060 inches before loosening the side mounts (See Figure 9).
5. Adjust the shimming on the bi-pod mount (left side) before adjusting the tri-pod mount. Push on the engine fire pan in the area of the droop compensator bracket to help get the mount bolt installed or removed. Once the shims and the mount bolt are reinstalled, tighten the mount bolt assembly and then loosen one or two turns of the nut - the tri-pod mount does not allow much movement of the engine; loosening the bi-pod mount helps when adjusting the shimming on the tri-pod mount.
6. When the shimming is correct, torque the side mount bolt assemblies. Turn the top engine mount nut until it contacts the top pylon mount and then tighten one more flat. Tighten the jam nut against the mount nut and lock wire to the nuts to the engine mount (See Figure 9).
7. Use both tie rods when adjusting the lateral alignment of the lower pulley drive shaft to the power output shaft. Once the bolt can be threaded into the power output shaft, fine adjustments can be made with the help of a second person. As the bolt is slowly being threaded into the power output shaft, the second person slight adjusts the front tie rod as required for the bolt to freely thread into the power output shaft (See Figures 10 and 11).
8. Axial alignment between the power output shaft and the lower pulley drive shaft is obtained by adjusting the aft tie rod. Use feeler gauges, telescoping gauges, gauge blocks, or other measuring device to determine the distance between the flanges at the 9 o'clock and 3 o'clock positions (See Figure 10 for 9 o'clock position; 3 o'clock position opposite).

5. Oil Cooler Blower Shaft Alignment (Refer to paragraph 11-17,D):

1. Install the intermediate drive shaft onto the end of the lower pulley assembly using the T-0166 - Alignment Spacer(special tool) instead of the flex pack assembly (See Figures 12, 13, 14, 15, and 16).
2. The slots on the bearing housing supports may be elongated if more lateral adjustment is required for alignment (See Figure 18).
3. The tolerance for the distance between the flange faces ($\leq .005$ inches) is the same for the lateral position and vertical position.

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4. Adjust the position of the blower shroud as required after completing the oil cooler blower shaft alignment.
6. Lower Drive System Reassembly (Refer to paragraph 11-17,E):
 1. Reassembly the lower pulley aft coupling using .250 inch spacers, P/N 4130521-25, between the flex pack and the flanges of the hub and the pulley shaft (See Figure 17).
 2. Determine the spacer thickness required between the forward flex pack and the flanges on the shafts using the following formula:

Flange Distance minus Flex Pack Thickness

2

3. Measure the flange distance with the flanges aligned at the 9 o'clock position.
4. The spacers, P/N 4130521-XX, are available in thicknesses between .090 to .250 inch in .020 inch increments. AN960C516L washers (.016 inch thick - nominal) may be used as required for additional shimming between the flanges and the flex pack. If required, install the washers between the shaft flange and the spacer; do not install the washers between the spacer and the flex pack.

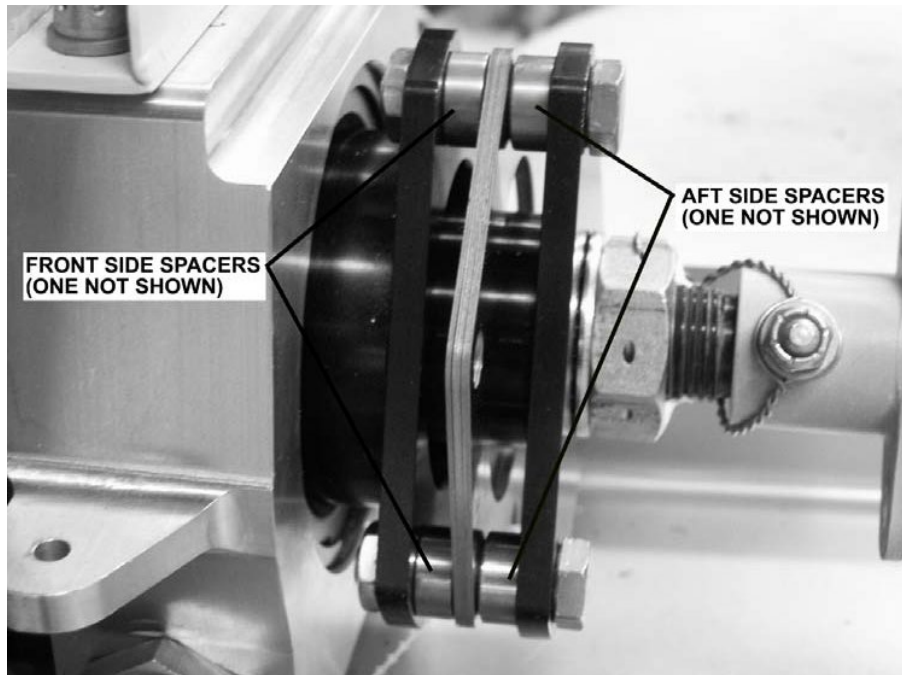


Figure 1 - Aft Coupling Assembled for Alignment

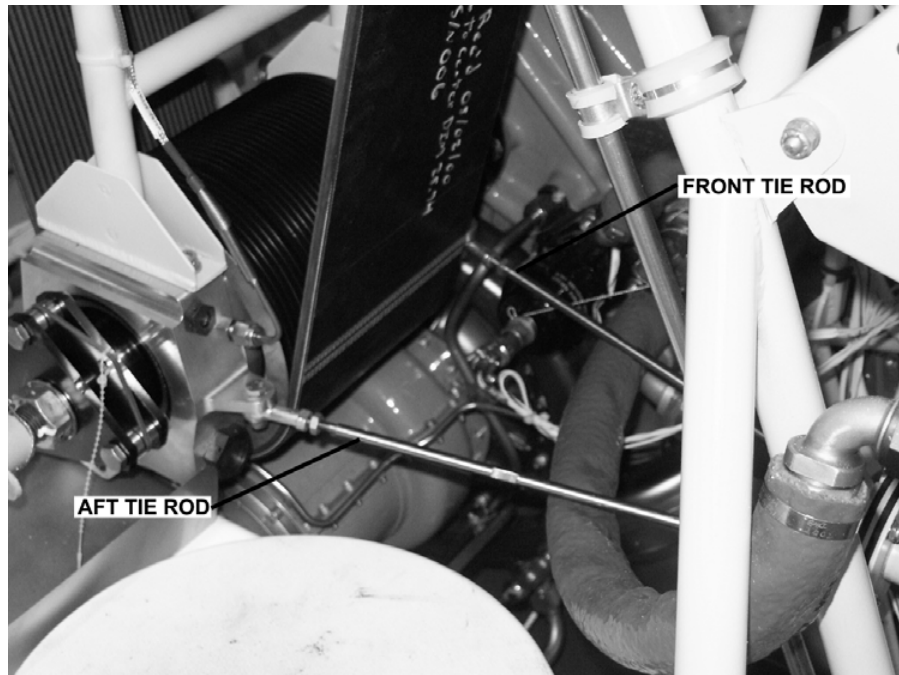


Figure 2 - Lower Pulley Tie Rods

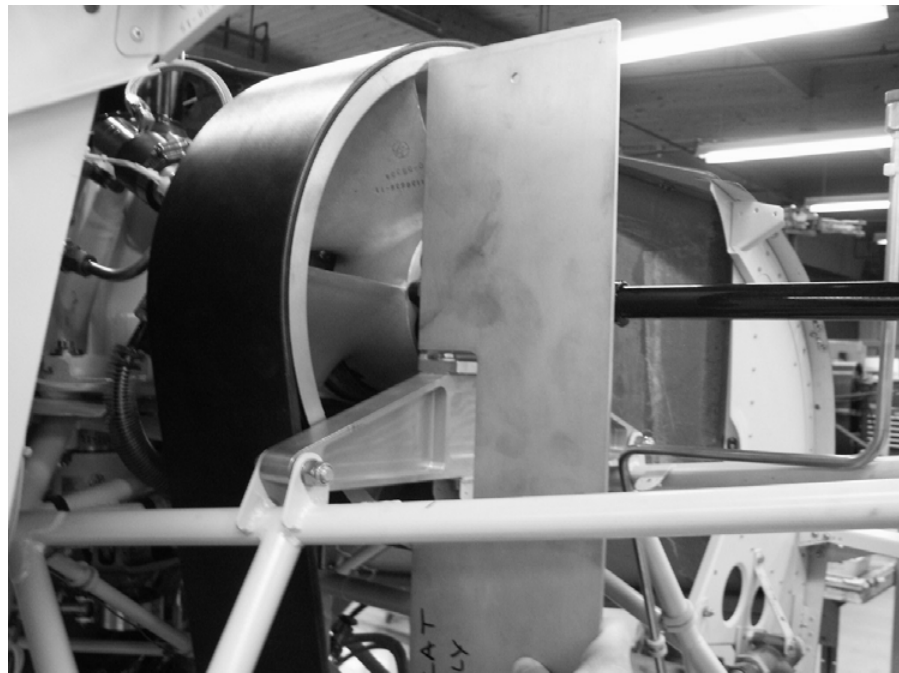


Figure 3 - Alignment Tool at Upper Pulley



Figure 4 - Alignment Tool at Lower Pulley



Figure 5 - Engine to Lower Pulley Alignment (Engine Low)



Figure 6 – Engine to Lower Pulley Alignment (Aligned)

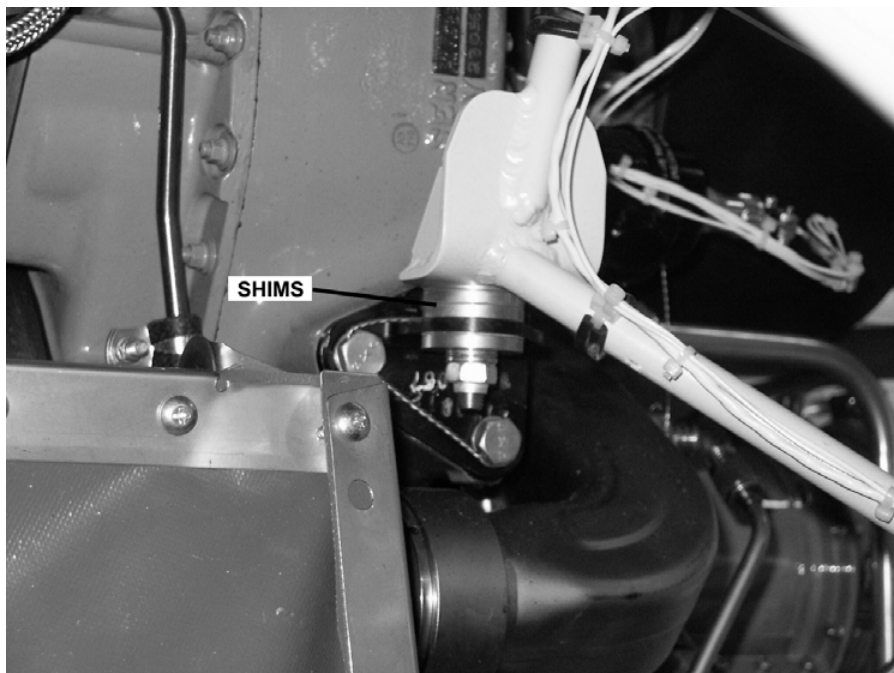


Figure 7 - Engine Bi-Pod Mount

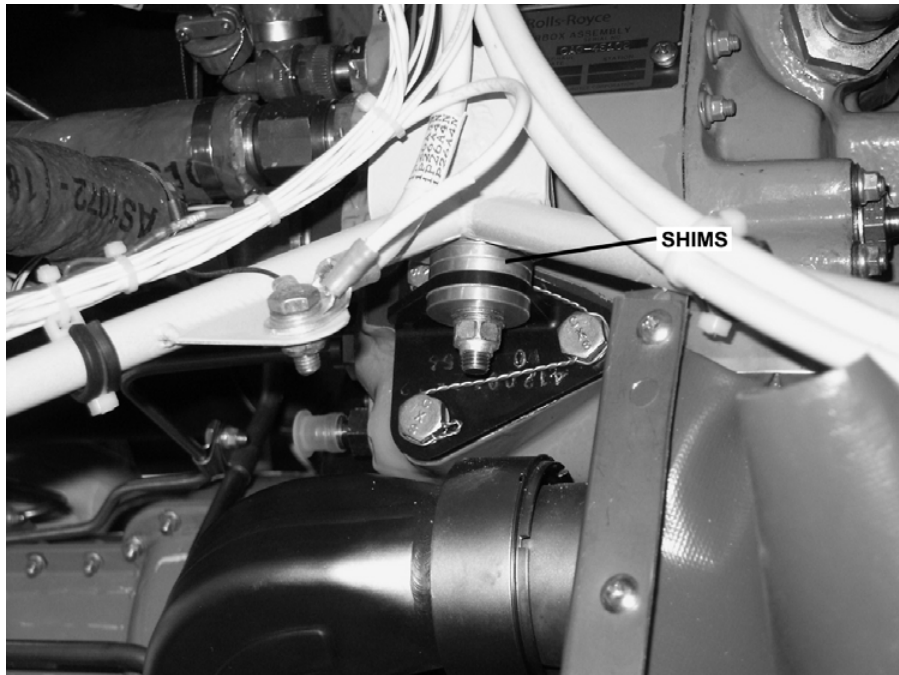


Figure 8 - Engine Tri-Pod Mount



Figure 9 - Engine Upper Mount

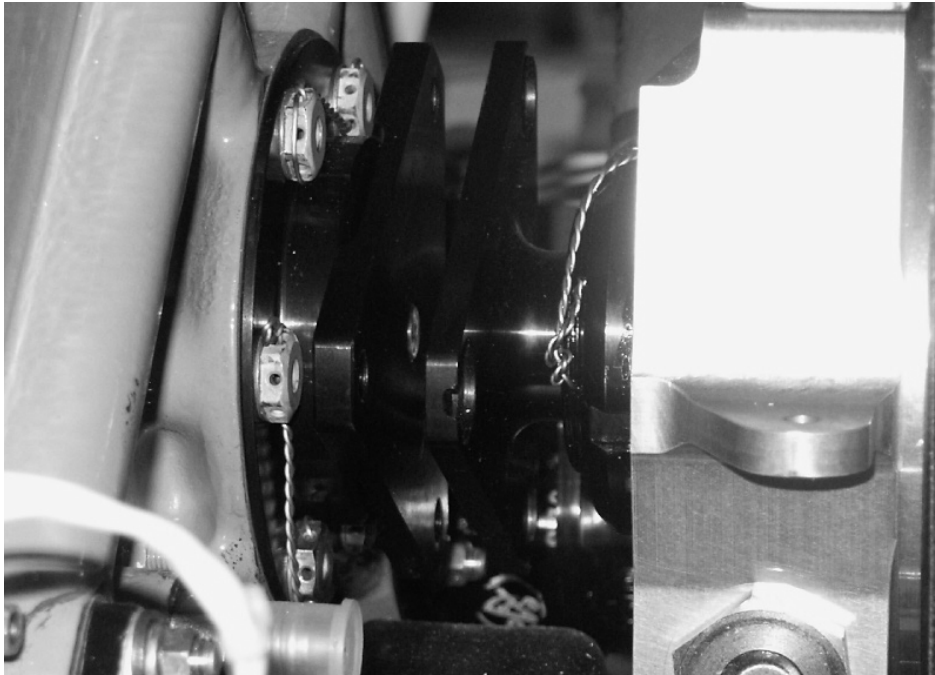


Figure 10 - Flange Position for Lateral and Axial Alignment Check



Figure 11 - Lateral Alignment (Aligned)

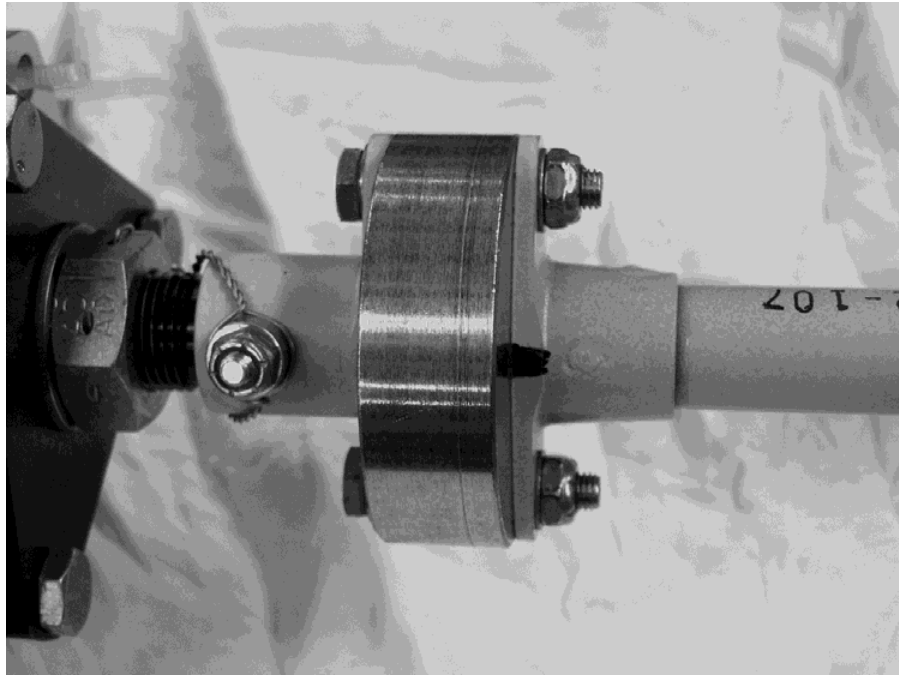
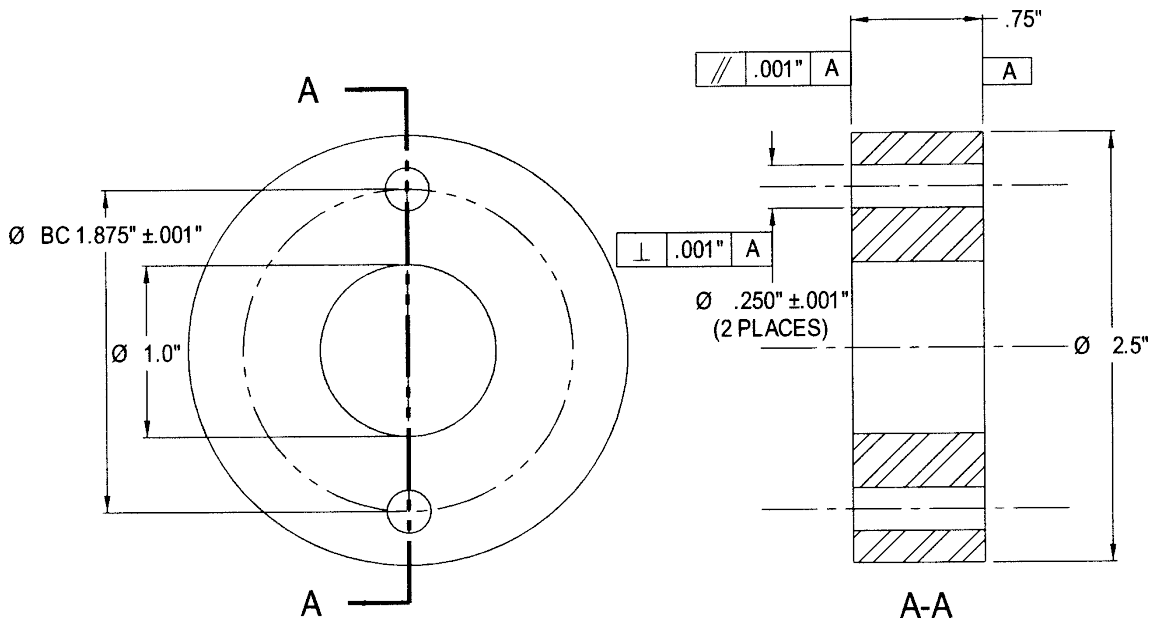


Figure 12 - Intermediate Shaft Installed with T-0166-11, Alignment Spacer



Notes:

- 1. Make from steel or aluminum.
- 2. Break all sharp edges.

Figure 13 - T-0166-11, Alignment Spacer



(Note vertical misalignment)

Figure 14 - Oil Cooler Blower Forward Mount

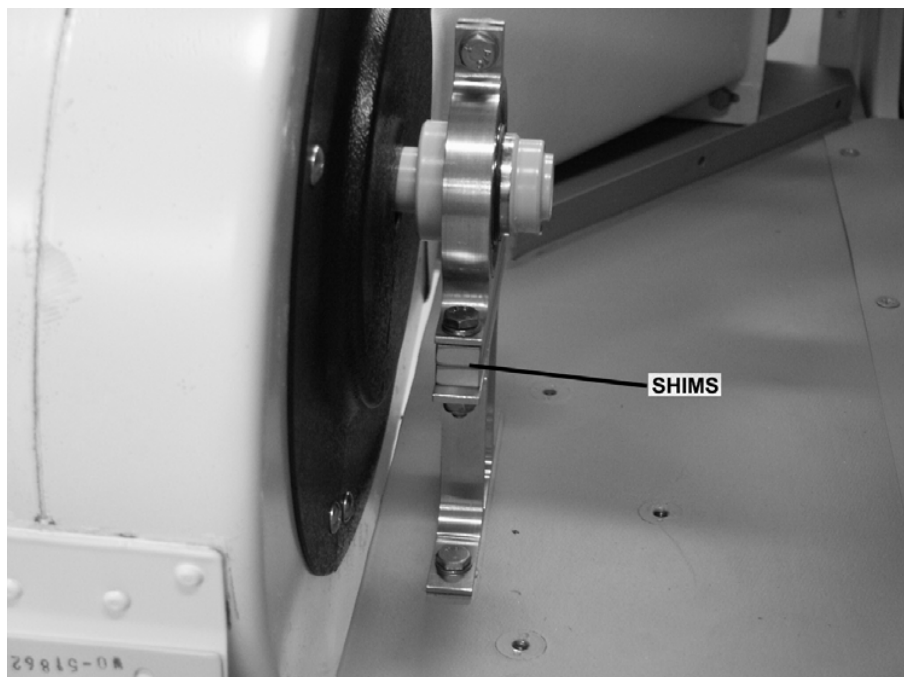


Figure 15 - Oil Cooler Blower Aft Mount

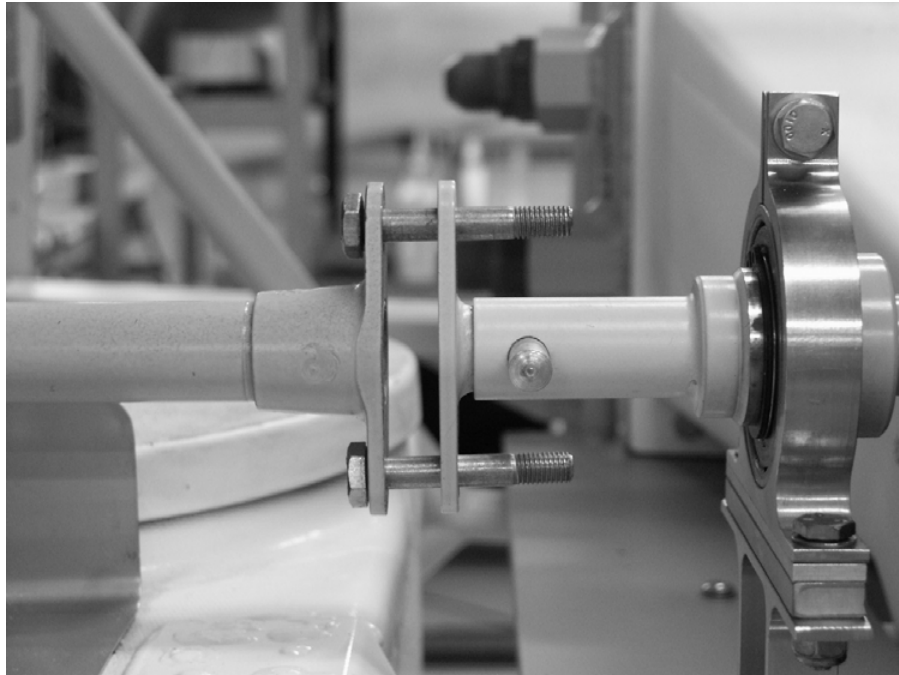


Figure 16 - Oil Cooler Blower Shaft Vertically Aligned

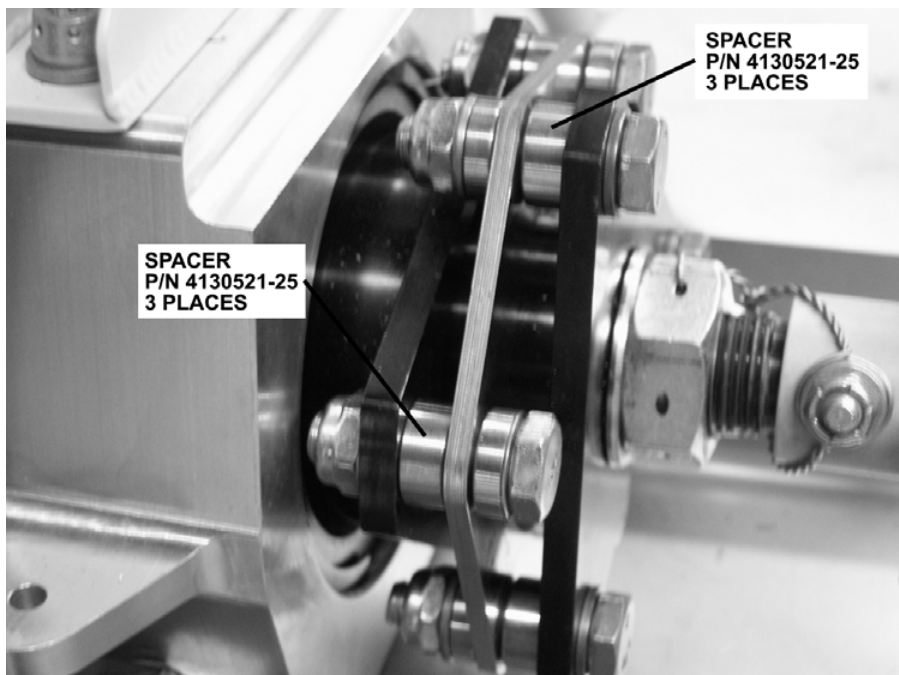


Figure 17 - Aft Coupling Normal Installation

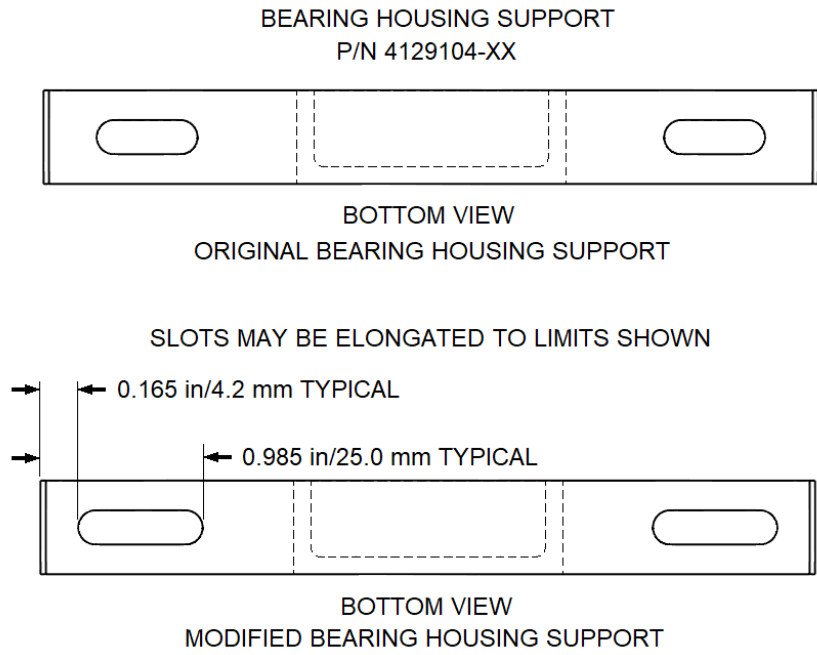


Figure 18 - Elongation Limits of Oil Cooler Bearing Housing Supports