



SERVICE DIRECTIVE BULLETIN

SERVICE DIRECTIVE BULLETIN 0080
Supercedes S.I.L. 132
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DATE: October 18, 1989

1. SUBJECT: Tail Rotor Drive Flex Couplings Mandatory Upgrade to (7) Plate Coupling, Inspection & Service Life
2. MODELS: All Models Equipped With Tail Rotor Flex Plate Couplings
3. EFFECTIVITY: Prior To The Next 25 Hour Inspection
4. BACKGROUND:

Several instances of distortion of the tail rotor drive flex couplings have been reported by field maintenance personnel. Physical examination of returned tail rotor drive coupling flex packs and re-inspection of high time couplings used on test vehicles has shown that some distortion is typical of this installation. Enstrom has previously identified the permissible limits of this distortion in Service Information Letter 132.

Subsequent field reports have been reported where the (5) plate flex couplings have failed resulting in emergency landing of the aircraft. The subject coupling has been redesigned and tested and a (7) plate version is now available as a direct replacement for the (5) plate coupling. The new coupling minimizes distortion and new standards for permissible deformation are provided herein.

5. COMPLIANCE:

- 5.1 Prior to or at the next 100 hour inspection or within the next 90 days, which ever comes first, change the (5) plate flex coupling to (7) plate flex coupling. Enstrom Kit number 28-01041-1 includes all parts necessary to make the change. Two kits are required per aircraft.

NOTE: The replacement beveled washers for the (7) plate flex pack are .010 inch thinner than beveled washers for the (5) plate flex pack, consequently a direct exchange should not require any additional shimming.

- 5.2 Upon removal of the (5) flex coupling, inspect the condition of the flanges which hold the flex pack. They must be flat within .010 inch as shown in Figure 1. Any flanges which are deformed beyond this limit must be replaced before further flight.

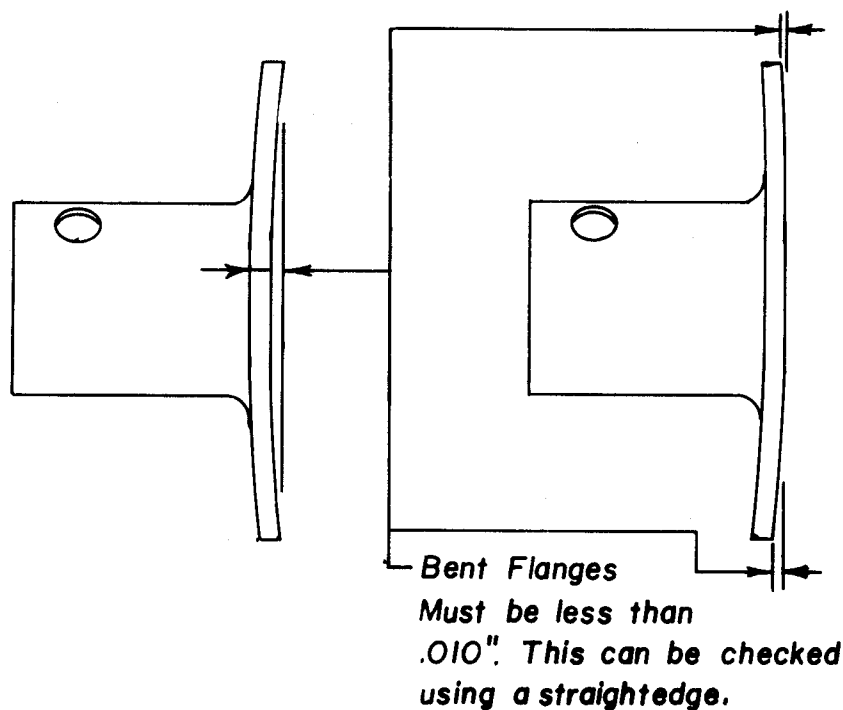
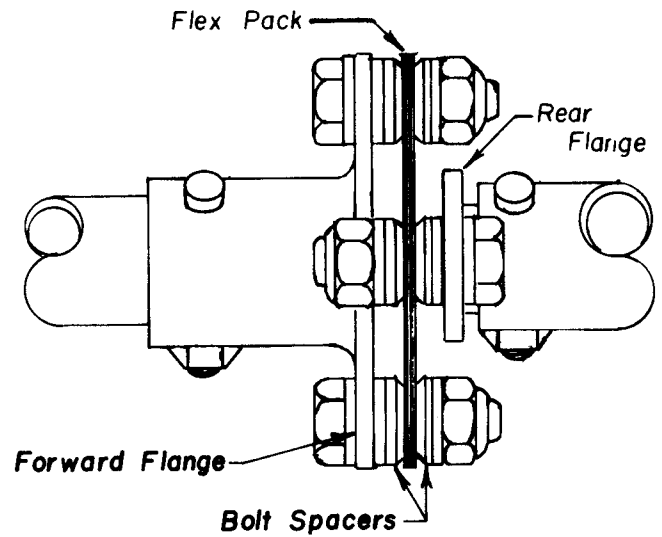
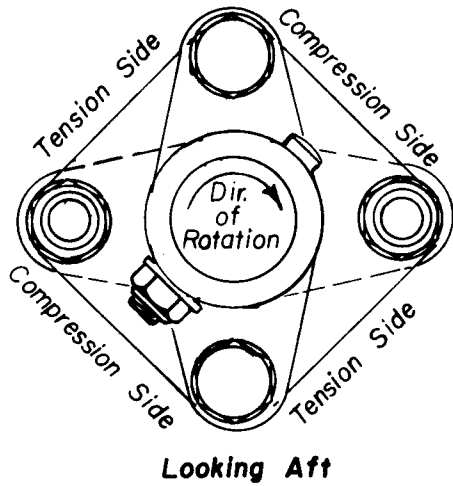
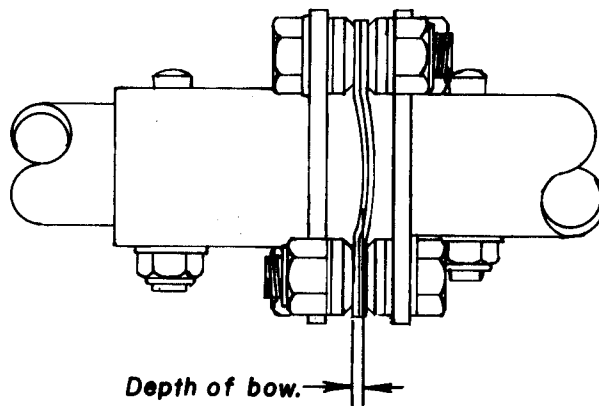


Figure 1-Acceptable Limits for Bent Flanges

6. SPECIAL TOOLS:
Good straightedge and feeler gauge.
7. MAN HOURS REQUIRED:
Approximately two hours for disassembly, inspection, and reassembly.
8. WARRANTY:
No labor warranty, however Enstrom offers a special price on the (7) flex plate kit # 28-01041-1 when used as a replacement for a (5) flex plate coupling.
9. WEIGHT CHANGE:
No appreciable weight change.
10. LOG BOOK ENTRY:
Log inspection and parts change as noted in text.
11. REPETITIVE INSPECTION:
At each subsequent 100 hour inspection or upon indications of coupling deformation, inspect the couplings per the following criteria to insure continued airworthiness.
12. INSPECTION CRITERIA:
 - 12.1 Figure 1 shows a tail rotor driveshaft coupling installation with the tension and compression sides labeled. There are two types of flex pack distortion which are typically encountered and which are allowable IF THEY ARE WITHIN THE LIMITS LISTED BELOW. The first type of flex pack distortion typically encountered is a simple bow of the plates as shown in Figure 2. This distortion is allowable only as long as the coupling meets the following requirements:
 - 12.1.1 The bow, as measured in Figure 2, is less than .040 inch deep on the compression side and less than .020 inch deep on the tension side.



**Tail Rotor Drive Shaft Coupling Installation.
Rear coupling shown; forward coupling similar.
NOTE: Tie-wraps eliminated for clarity.**



Depth of bow. →
**Must be less than .040" on compression
side and less than .020" on tension side.
Plates may be bowed in either direction.**

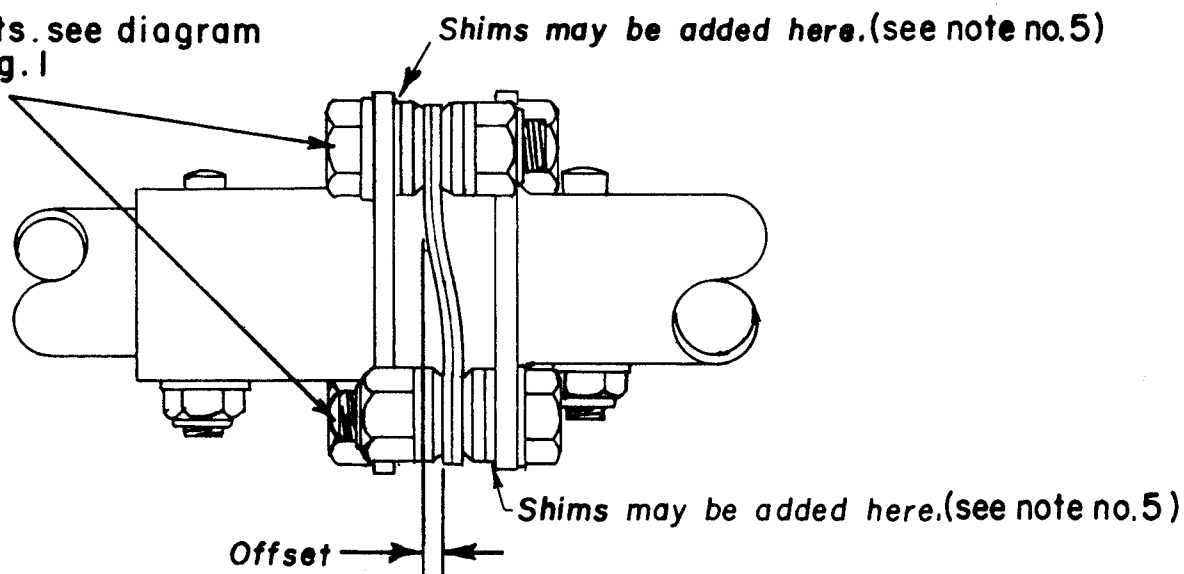
**Figure 2 - Acceptable Limits of Bowed Flex Packs.
NOTE: Tie-wraps eliminated for clarity.**

12.2 The second type of flex pack distortion typically encountered is an offset bend as shown in Figure 3. (Note that the bend in Figure 3 has been exaggerated for clarity.) This type of distortion usually occurs because the coupling halves are not running parallel with each other. This type of distortion is allowable only as long as the flex pack meets the following requirements:

- 12.2.1 The offset is less than .015 inch as shown in Figure 3.
- 12.2.2 The maximum difference in offset from side to side (one pair of bolts to the other pair) is less than .007 in.
- 12.2.3 The maximum allowable shim thickness is .072 in. not including beveled washers.

NOTE: The replacement of the (5) plate coupling with the (7) plate coupling requires a thinner set of beveled washers which are included with Enstrom Kit # 28-01041-1.

One pair bolts. see diagram on page 2 fig. 1



Must be less than .015" on both sides(see note no. 4). When the flex pack is replaced, shims may be added at the bolt spacers as indicated to align the new flex pack.

Torque bolts to 75 in. lbs.

CAUTION: Do not add shims or washers between the flex pack and the beveled washers.

Figure. 3- Acceptable Limits of Flex Packs with Offset Bends.
NOTE: Tie-wraps eliminated for clarity.

12.3 Whether the distortion described in the preceding paragraphs is present or not, the couplings are unserviceable at any time any of the following conditions exist:

- 12.3.1 Plates have kinks or sharp bends.
- 12.3.2 Separations or spaces occur between any of the plates.
- 12.3.3 Non-uniform or non-fair bends.
- 12.3.4 Cracked or broken plates.
- 12.3.5 Elongated bolt holes.
- 12.3.6 Kinks or deformation adjacent to the bolt spacers.

GENERAL SERVICE INFORMATION

The alignment of the tail rotor flex couplings is a very important factor in achieving the full service life of the flex pack. Large offsets on the tension side of the pack usually indicate improper spacing of the coupling sections (see Figure 3), and will promote premature distortion or degradation of the flex pack. When installing the flex pack, shimming should be equally distributed between both couplings so far as practical. A service life for the flex pack has been established to insure component integrity. The flex packs must be replaced after 1200 hours of service with new flex packs. This time limit coincides with the TBO's of the main and tail rotor gearboxes to reduce unnecessary down time. Shimming washers made from .005 & .010 thick shim stock are available from the Enstrom Helicopter Corporation.