

**ALERT SERVICE BULLETIN**

**Bell Helicopter** **TEXTRON**

A Subsidiary of Textron Inc.

NO. 407-99-30  
DATE 05-10-99  
PAGE 1 of 14

DATE
REV

**MODELS AFFECTED:** 407

**SUBJECT:** DOOR LATCH BASEPLATE ASSEMBLY 3178-201 AND 3178-202, REPLACEMENT OF.

**HELICOPTERS AFFECTED:** 407 helicopters, S/N 53000 through 53334.  
[Helicopters S/N 53335 and subsequent will have the intent of this bulletin completed prior to delivery.]

**COMPLIANCE:** Within the next 100 hours of flight time after you receive this bulletin, but no later than 31 October 1999

**DESCRIPTION:**

Bell Helicopter has received reports of problems with the doors on the model 407. A welded bushing, part of the baseplate assembly, can become separated after extended repetitive use of the door latch mechanism. Operators were not able to open the door from the internal or external side after this failure.

Bell has also learned that some rod assemblies in the crew doors only were cold worked during manufacture to get a better fit. Cold worked rod assemblies are susceptible to failure, and must be replaced.

This bulletin introduces a better baseplate assembly, new rod assemblies for the crew doors, and gives instructions to install the components on the doors.

**APPROVAL:**

The engineering design aspects of this Alert Service Bulletin are Transport Canada approved.

**MANPOWER:**

Approximately 8.0 man-hours are necessary to accomplish this bulletin. Man-hours are based on hands-on time and can change with the personnel and available facilities.

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**WARRANTY:**

Owners/operators who comply with the instructions given in this bulletin are eligible for a special 100% warranty credit toward the kit specified in the "Required Material" section of this bulletin.

To receive this credit:

1. Customers must order the replacement hardware kit from an approved BHTI spares supply source.
2. Comply with the instructions given in this bulletin and install the listed parts no later than 31 October 1999.
3. The owner/operator must send a completed Malfunction Report (MR) to BHT Warranty Administration within 30 days after the completion of this bulletin. A copy of the BHTI invoice that refers to the hardware kit used to accomplish this bulletin must be attached to the Malfunction Report (MR).

- NOTE -

Customers who comply with the instructions in this bulletin after 31 October 1999 are not eligible for the special warranty credit provisions listed above.

**MATERIAL:**

**Required Material:**

The material that follows is necessary to do this bulletin. You can get the material through your Bell Helicopter Textron Supply Center.

Order **hardware kit CA-407-99-30** that consists of the parts that follow:

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>	<u>QUANTITY</u>
3178-203	BASEPLATE	2
3178-204	BASEPLATE	2
3159-9	SPRING	2
3159-10	SPRING	2
MS24694-C3	SCREW	16
MS24665-151	COTTER PIN	22
3164-219	ROD ASSEMBLY R/H	1
3164-220	ROD ASSEMBLY L/H	1

The following parts are not necessary to complete this bulletin but are available on a limited basis in case of loss or damage of existing parts:

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>	<u>QTY</u>
20912-201	LOCK ASSY	AR
3174-3	BOLT	AR
X5133-18	E-RING	AR

**Consumable Material:**

The following consumable material is necessary to complete this bulletin; however, this material is considered consumable (bench stock) material and may not require ordering, depending on the operators consumable material stock levels. This material can be obtained through your Bell Helicopter Textron Supply Center.

<u>PART NUMBER</u>	<u>NOMENCLATURE</u>	<u>REF. NO.</u>
MIL-S-81733TYI 2.5 OZ	SEALANT	C-392
MIL-S-22473,GRCV50CC	ADHESIVE	C-320 (1)
TT-1735 ISOPROPYL	SOLVENT	C-385 (2)
METHYL ETHYL KETONE	SOLVENT	C-309 (3)

**NOTES:**

1. As an alternate, use LOCTITE 242 or 243
2. Where you cannot use ISOPROPYL, use P-S-661
3. Where you cannot use MEK, use RHO SOLV756 or ACETONE

- NOTE -

The C REFERENCE NO. above is a cross reference to the consumable list found in the Standard Practices Manual.

**SPECIAL TOOLS:**

Not required.

**WEIGHT AND BALANCE:**

Not affected.

**ELECTRICAL LOAD DATA:**

Not affected.

**REFERENCES:**

BHT-407-MM-5, Rev. 4, 16 December 1996.

Chapter 52, Doors and Windows.

BHT-407-MM-3, Rev. 6, 14 April 1998.

Chapter 25, Equipment and Furnishing.

BHT-407-IPB, Rev. 3, 16 December 1996.

Chapter 52, Doors and Windows.

Chapter 25, Equipment and Furnishing.

**PUBLICATIONS AFFECTED:**

BHT-407-MM-5, Rev. 4, 16 December 1996.

Chapter 52, Doors and Windows.

BHT-407-IPB, Rev. 3, 16 December 1996.

Chapter 52, Doors and Windows.

## **ACCOMPLISHMENT INSTRUCTIONS:**

1. Remove the crew door assemblies (refer to BHT-MM, Chapter 52).
  - a. When you remove a door, put it on a workbench to do the modification.
  - b. Make sure you get a good visual knowledge of the door latch mechanism before you disassemble it.

### **CAUTION**

THE PLASTIC DOOR TRIM PANELS ARE HELD WITH VELCRO STRIPS. TO AVOID DAMAGE TO THE PANELS, PULL THE PANELS AWAY FROM THE VELCRO STRIPS WITH CARE, PREFERABLY AT TEMPERATURES ABOVE 50°F (10°C).

2. Refer to BHT-407-MM-3, Chapter 25. Get access to the door latch mechanism. Remove the black plastic cover for the interior handle and the armrest.
3. Remove the screws that hold the plastic trim panels around the windows. Remove the plastic trim.

### **- NOTE -**

Discard all cotter pins and use new ones when you assemble the door latch mechanism. Keep all other hardware for later installation.

4. Loosen jamnut (14, Figure 1). Loosen jamnut (21) to allow free rotation of rod (8) and help removal of the baseplate assembly (18).
5. Loosen bolt (22) almost completely. This will provide more play in the latch system for easy removal.
6. Remove the cotter pin (1), the washer (2), and the pin (3) that attaches the rod (4) to the lower rotary latch (5).
7. Remove the cotter pin (6) and the washer (7), that attach the rod (8) to the exterior handle bellcrank (9) and rod assembly (19).

8. Remove the cotter pin (10), the washer (11), and the pin (12) that attach the link (13) to the rod assembly (19).

- NOTE -

Count the turns when you remove the clevis (15) to make sure of a minimum effort to rig the door latch mechanism during assembly.

9. Remove the rod end clevis (15) from the rod (4).

CAUTION

USE EXTREME CARE TO NOT DAMAGE THE DOOR PAINT AND SKIN.

10. Use a sharp plastic scraper to remove the sealant from around the edge of lock assembly (16) on external side of the door.
11. Loosen the four screws (17) that hold the baseplate assembly (18) to the inside of the door, approximately three turns.
12. Put a piece of wood or other soft material on top of the screws (17) and tap lightly until the baseplate is loose from the sealant. Remove the four screws (17).

- NOTE -

Slide the baseplate assembly backward as far as it will go. Move the rod assembly (4) down. Slide the baseplate assembly forward and while pivoting the assembly, get it out from the door by the access hole.

13. Remove the baseplate assembly (18) with the rods (4 and 8) and the link (13) still attached.

-NOTE-


The replacement of the rod assembly (19) is necessary for the crew doors only.

14. Remove the rod assembly (19) from the crew doors as follows:

- a. Remove the screws (26) and the washers (27) that attach the internal door handle (28) to the door structure.
  - b. Pull out the internal door handle (28) to get access to the rod assembly (19) that is connected to the internal door handle (28).
  - c. Remove the cotter pin (24) and the washer (25). Discard the cotter pin (24).
  - d. Disconnect the rod assembly (19) from the internal door handle (28).
  - e. Use a locally made fixture to measure the length of the rod assembly (19) with the clevis (29) attached.
  - f. Loosen the jamnut (23).
  - g. Remove the clevis (29) and the jamnut (23) from the rod assembly (19).
  - h. Discard the rod assembly (19).
15. Remove the sealant from all faying surfaces with a plastic scraper and cheesecloth that is moist with Isopropyl Alcohol (C-385).
  16. Remove sealant debris from the inner side of the door.
  17. Put the baseplate assembly (18) on the workbench.
  18. Disassemble the baseplate assembly (18) as follows:
    - a. Remove the E-ring (1, Figure 2), the actuation arm (2), and the catch link (3) from the welded bushing (4) on the baseplate (5).


- NOTE -

Do not separate the lock linkage (6), the catch link (3), link (7), and the cam (8). Keep them as an assembly to make sure of a minimum effort at installation. The actuation arm (2) will separate from the assembly.

- b. Heat  the lock assembly (12) to make the loctite sealant soft in the lock barrel body.

- NOTE -

It can be necessary to cut the old spring (13).

- c. Disconnect the spring (13) from the cam (8) and the baseplate (5). Discard spring (13).
  - d. Put the door key in the lock (12) to give leverage while you loosen the bolt (9). Remove the bolt (9) and the washer (10).
  - e. Remove the cam (8) from the lock spindle (11) as an assembly and remove washer (15).
  - f. Remove the jam nut (14) and the lock assembly (12) from the baseplate (5).
  - g. Clean the remaining dry loctite from the lock spindle (11), the lock barrel (12), the jam nut (14), and bolt (9) threads with solvent (C-309).
19. Assemble the new baseplate assembly (5, Figure 2) as follows:
- a. Put the lock assembly (12) in the baseplate so that the pin and hole on the end of the lock spindle (11) are on the same side as the spring (13).
  - b. Put a drop of loctite sealant (C-320) on the lock assembly (12) external threads near the baseplate only.
  - c. Install the jam nut (14) on the lock assembly (12) barrel with the flat side against baseplate (5) and tighten .
  - d. Install one end of the new spring (13) on baseplate (5).
  - e. Install the other end of spring (13) on the cam (8).
  - f. Bend both ends of the spring (13) as shown on Detail A, Figure 2.
  - g. Put the washer (15), the cam (8) and the washer (10) on the lock spindle (11). Make sure the washer (10) engages in cam (8).
  - h. Put a drop of loctite sealant (C-320) on the threads of the bolt (9) and install it on the lock spindle (11).
  - i. Put the door key in the lock (12) to give leverage while you tighten the bolt (9).

- j. Install the catch link (3) and the actuation arm (2) on the welded bushing (4). Install the E-ring (1).

20. Assemble the new rod assembly (19, Figure 1) for the crew doors as follows:

- a. Install the jamnut (23) and the clevis (29) on the new rod assembly (19).
- b. Adjust the new rod assembly to the same length as the initial rod assembly you measured in Step 13. e. and tighten **T** the jamnut (23).
- c. Attach the rod assembly (19) to the internal door handle (28) with the washer (25) and a new cotter pin (24).
- d. Apply a layer of sealant (C-392) to the faying surfaces of the door **S** and the internal door handle (28).
- e. Apply a layer of sealant (C-392) to the screws (26) **S** and tighten **T** to attach the internal door handle (28) to the door structure.

- NOTE -



Put the assembled baseplate in the door location with the rods attached in the same position as the unit was removed. The rods must be oriented slightly down and forward in relation with the top of the door. While the plate assembly is in the door, turn the aft rod (4, Figure 1) so that it goes back in the door recess.

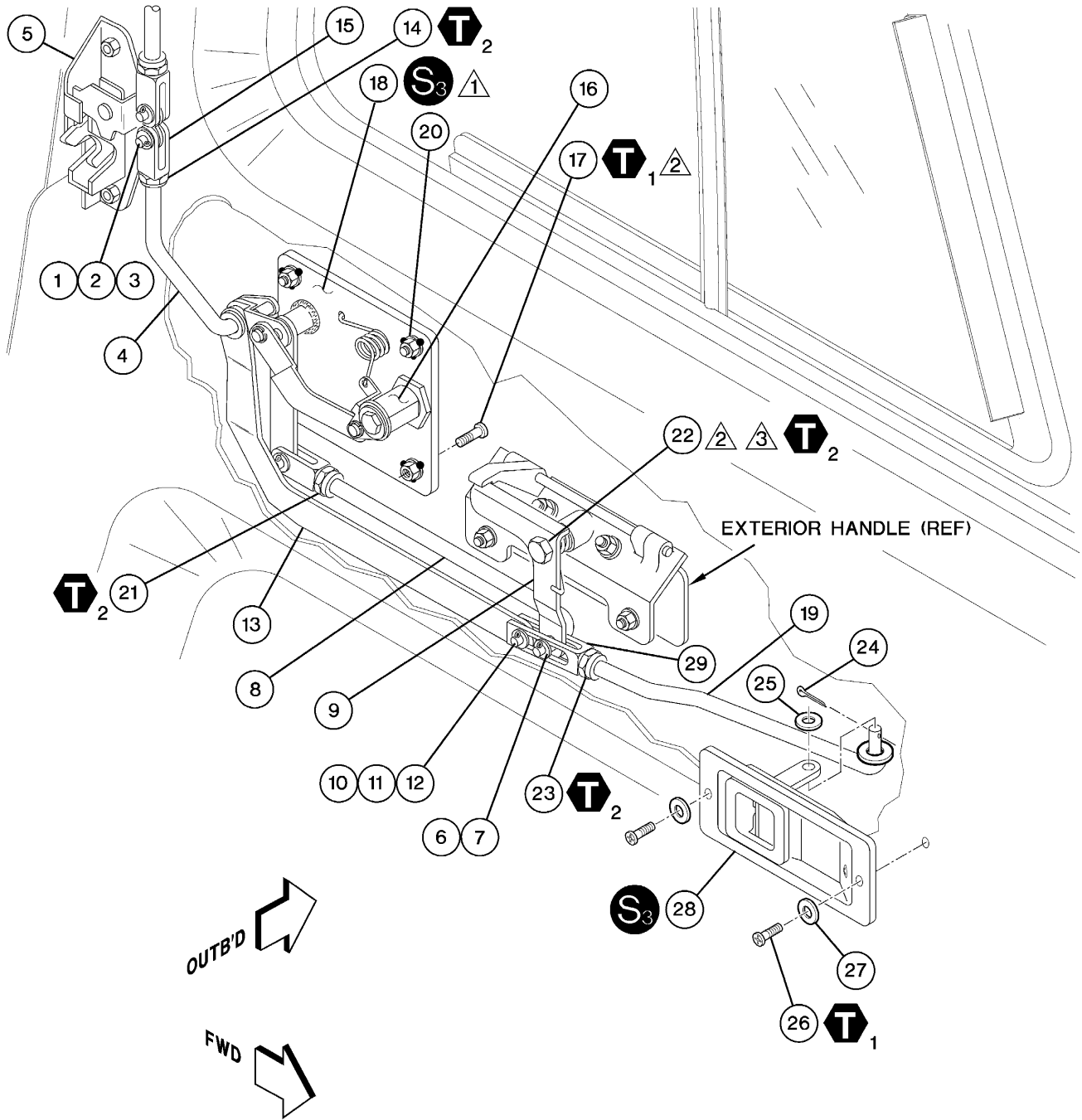
21. Apply a layer of sealant (C-392) to the faying surfaces **S** of the door and baseplates (18, Figure 1).

22. Put the baseplate assembly (18) on the door as follows:

- a. Put a drop of loctite sealant (C-320) on each screw (17) and apply a drop of sealant (C-392) on the countersink holes for the screws (17) on the door.
- b. Tighten **T** the four new screws (17).
- c. Apply a bead of sealant C-392 around the baseplates (18) **S** and around the lock (16) on the external side.

23. Install the clevis (15) on the rod (4). Adjust the clevis (15) with the same number of turns as counted in Step 8.

24. Attach the link (13) to the rod assembly (19) with the pin (12), the washer (11), and the cotter pin (10).
25. Attach the rod (8) to the exterior handle bellcrank (9) and rod assembly (19) with the washer (7) and the cotter pin (6).
26. Apply loctite sealant (C-320) to the threads of bolt (22) and tighten .
27. Attach the rod (4) to the lower rotary latch assembly (5) with the pin (3), the washer (2), and the cotter pin (1).
28. Tighten  the jamnut (14) and (21).
29. Do an operational check of the door latch. Adjust the mechanism as required. Refer to BHT-407-MM-5, Paragraph 52-10.
30. Refer to BHT-407-MM-3, Chapter 25. Install the trim panels, the armrest and the handle cover.
31. Make an entry in the helicopter historical record to show that this Alert Service Bulletin is completed.
32. Make an entry in the record of Alert Service Bulletins in the Maintenance Manual.



RAB00601

Figure 1. Baseplate Assembly – Removal and Installation / LH Shown – RH is typical  
(Sheet 1)

## LEGEND

1. Cotter pin (MS24665-151)
2. Washer (NAS1149C0332R)
3. Pin (MS20392-2C13)
4. Rod assembly (Ref.)
5. Lower rotary latch (Ref.)
6. Cotter pin (MS24665-151)
7. Washer (NAS1149C0332R)
8. Rod assembly (Ref.)
9. Bellcrank, exterior handle (Ref.)
10. Cotter pin (MS24665-151)
11. Washer (NAS1149C0332R)
12. Pin (MS20392-2C7)
13. Link (Ref.)
14. Jamnut (Ref.)
15. Clevis (Ref.)
16. Lock assembly (20912-201)
17. Screw (MS24694C3)
18. Baseplate assembly, old (3178-201/-202)  
Baseplate assembly, new (3178-203/-204)
19. Rod assembly (Ref. for passenger door)  
(3164-219/-220 for crew door)
20. Welded anchor nut (Ref.)
21. Jamnut (Ref.)
22. Bolt (Ref.)
23. Jamnut (Ref.)
24. Cotter pin (MS24665-151)
25. Washer (NAS1149C0332R)
26. Screw (MS27039C0810)
27. Washer (NAS1149CN832R)
28. Interior door handle (Ref.)
29. Clevis (Ref.)



12 to 15 IN-LBS  
(1.36 to 1.70 Nm)



20 TO 30 IN-LBS  
(2.26 TO 3.40 Nm)



SEALANT PER MIL-S-81733 Type 1 (C-392)

## NOTES



Apply sealant to faying surfaces and bead around periphery.

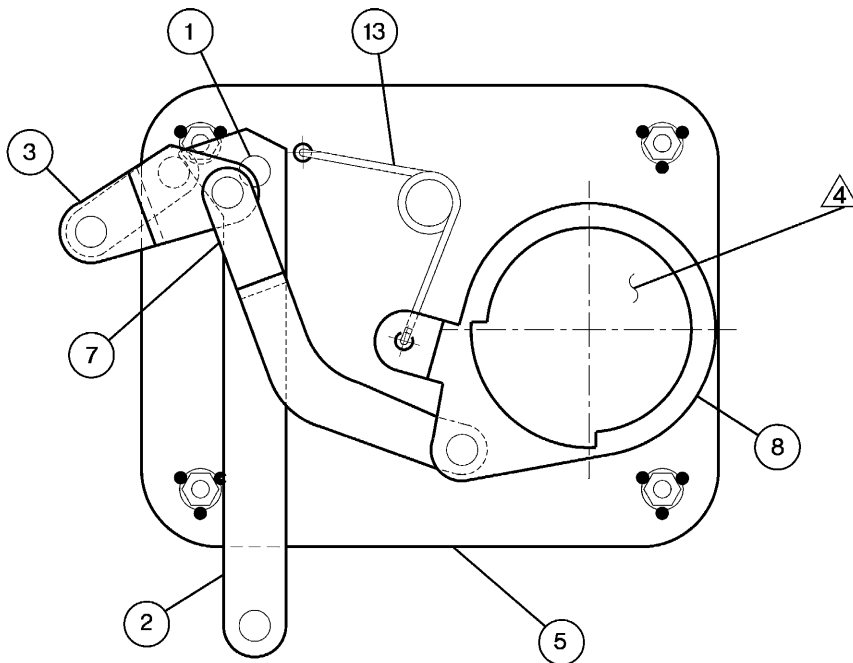
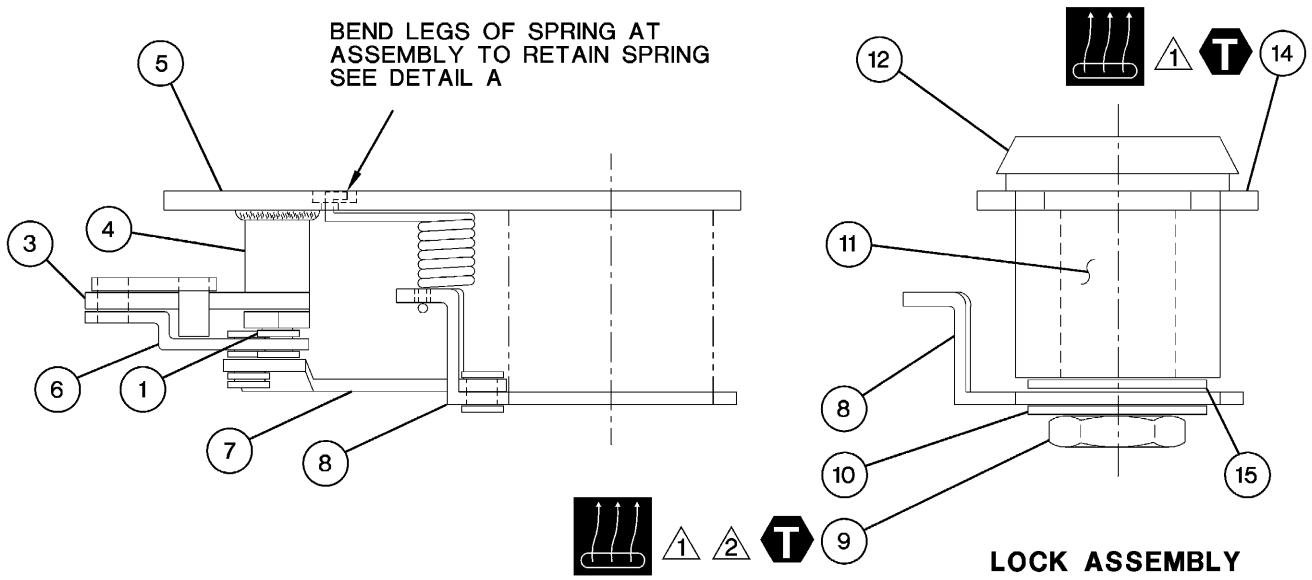


Apply loctite sealant (C-320) on threads.



Ensure free rotation of bellcrank (9). If needed, back off bolt (22) approximately 1/4 turn.

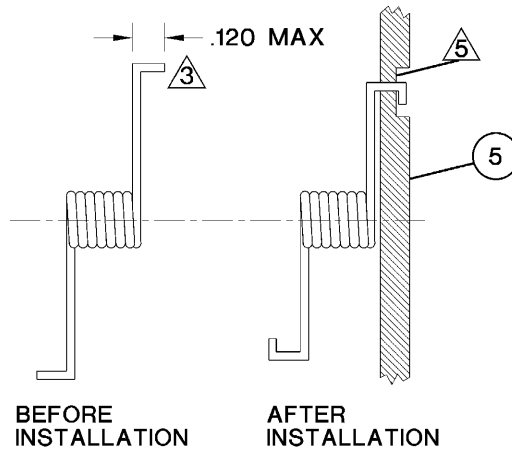
4. Inboard skin omitted for clarity.



**BASEPLATE ASSEMBLY - LOOKING OUTBOARD**

RAB00602

**Figure 2. Baseplate Assembly and Disassembly / LH Shown – RH is typical (Sheet 1)**





**DETAIL A**

**L/H TORSION SPRING 3159-9 SHOWN (R/H WIND)  
R/H TORSION SPRING 3159-10 OPPOSITE (L/H WIND)**

**LEGEND**

- 1. E-Ring (X5133-18)
- 2. Actuation arm (Ref.)
- 3. Catch link (Ref.)
- 4. Welded bushing (Ref.)
- 5. Baseplate (3178-203/-204)
- 6. Lock linkage (Ref.)
- 7. Link (Ref.)
- 8. Cam, lock (Ref.)
- 9. Bolt (3174-3)
- 10. Washer (Ref.)
- 11. Lock spindle (Ref.)
- 12. Lock assembly (20912-201)
- 13. Torsion spring (3159-9/-10)
- 14. Jamnut (Ref.)
- 15. Washer (Ref.)

 20 TO 30 IN-LBS  
(2.26 TO 3.40 Nm)

 HEAT APPLICATION  
180°F (82°C) MAX.  
FOR TWO MINUTES

**NOTES**

- ① Apply loctite sealant (C-320) on treads.
- ② Ensure free rotation of cam (8) at installation. If needed, back off bolt (9) approximately 1/4 turn.
- ③ Cut leg as required to obtain correct length, 2 places.
- ④ Lock assembly not shown for clarity.
- ⑤ At installation, do not apply sealant (C-392) on this area to assure free movement of the spring (13).

RAB00603

**Figure 2. Baseplate Assembly and Disassembly / LH Shown – RH is typical (Sheet 2)**