Bell Helicopter
A Textron Company

TECHNICAL BULLETIN 407-14-109
4 April 2014
Revision A, 16 March 2017

MODEL AFFECTED: **407**

SUBJECT: **AFT ENGINE FIREWALL ASSEMBLY, INSPECTION, REPAIR, AND MODIFICATION OF, FOR ENHANCED STIFFNESS.**

HELICOPTERS AFFECTED: **Serial numbers 53000 through 53887, 53889 through 53900, 53911 through 54299, 54300 and subsequent.**

[Serial number 53888 has been modified at field level and meets the full intent of this bulletin.]

COMPLIANCE: At customer's option.

DESCRIPTION:

Bell Helicopter Textron has received field reports of cracks and fretting marks found on the aft engine firewall assembly. Both of these conditions have been determined to be associated to differential pressure on both sides of the firewall caused by varying ram air pressure in the oil cooler blower compartment. This bulletin provides instructions to inspect, repair as necessary, and modify the aft engine firewall assembly in order to increase clearance between the fuel nozzle hose clamp and the firewall assembly. Compliance with this bulletin will also enhance stiffness and restrict fore and aft movement of the firewall web during dynamic flights.
Revision A of this bulletin has the solid rivets becoming the primary fasteners and the blind as an alternate for this repair and modification. The «helicopters affected» section has been revised to reflect the latest available information.

APPROVAL:

The engineering design aspects of this bulletin are Transport Canada Civil Aviation (TCCA) approved.

CONTACT INFO:

For any questions regarding this bulletin, please contact:

Bell Helicopter Product Support Engineering - Light Helicopters
Tel: 450-437-2862 / 1-800-363-8023 / pselight@bh.com

MANPOWER:

Approximately 12.0 man-hours are required to complete this bulletin. An additional 16.0 man-hours will be required if the oil cooler assembly is removed to access the back side of the firewall assembly. This estimate is based on hands-on time, and may vary with personnel and facilities available.

WARRANTY:

There is no warranty credit applicable for parts or labor associated with this bulletin.

MATERIAL:

Required Material:
The following material is required for the accomplishment of this bulletin and may be obtained through your Bell Helicopter Textron Supply Center.

Part Number	Nomenclature	Qty (Note)
407-704-027-115	Beaded doubler (round)	1 (1)
407-704-027-111	Shim	1 (1)
407-704-027-113	Stiffener	1 (1)
MS20613-3C2-5	Rivet	19 (1,4)
MS20613-3C3	Rivet	34 (1,2,4)
MS20613-3C3	Rivet	38 (2,3,4)
MS20613-3C3-5	Rivet	20 (2,3,4)
MS20613-3C4	Rivet	4 (1,4)

NOTES:

1. These parts can be ordered under kit P/N **407-704-027-107**.
2. Solid rivets can be replaced by blind rivets under NAS1398CFA3A(x) specifications.
3. These additional rivets will have to be ordered separately from kit P/N 407-704-027-107 if the L-shape corner doublers are installed to repair crack(s) in the firewall assembly or as part of the preventive measures against development of future crack(s).
4. Length of rivets may vary from one aircraft to another. The correct length of rivets must be determined at installation.

Consumable Material:
The following material is required to accomplish this bulletin, but may not require ordering, depending on the operator's consumable material stock levels. This material may be obtained through your Bell Helicopter Textron Supply Center.

Part Number	Nomenclature	Qty	Reference *
AMS3374/1	Firewall sealant	1	C-353

* C-XXX numbers refer to the consumables list in BHT-ALL-SPM Standard Practices Manual

SPECIAL TOOLS:

None required.

WEIGHT AND BALANCE:

Not Affected.

ELECTRICAL LOAD DATA:

Not affected.

REFERENCES:

BHT-407-IPB Illustrated Parts Breakdown
BHT-407-MM Maintenance Manual
BHT-ALL-SRM Manual
BHT-ALL-SPM Manual

PUBLICATIONS AFFECTED:

BHT-407-IPB Illustrated Parts Breakdown

ACCOMPLISHMENT INSTRUCTIONS:

1. Prepare the helicopter for maintenance.

2. Open the engine doors and inspect the aft firewall assembly. Pay attention to the recessed section (2, Figure 1) for any signs of fretting with the fuel nozzle hose and/or the shield clamp.

-NOTE-

It is recommended to install the repair beaded doubler (3, Figure 2) regardless if firewall fretting with the fuel nozzle hose clamp has occurred or not.

3. Install the repair beaded doubler (3) as follows;

   a. Mark the position of a 2.25 inch (57.15 mm) diameter circle (Figure 2). If fretting did occur between the recessed section (2) of the firewall assembly and the engine fuel nozzle hose clamp, it is acceptable to center the 2.25 inch (57.15 mm) diameter hole on the existing fretting mark(s).

   b. Cut the hole in the web and deburr the edges.

   c. Center the beaded doubler (3) with the new hole made in the web of the recessed area (2) and drill eight rivet holes.

      (1) Make sure that sufficient edge distance exists for each rivet hole.

      (2) Deburr each hole after the drilling process.

      -NOTE-

      Make sure the doubler (3) is installed on aft side of the firewall assembly.

   d. Coat the faying surfaces of the doubler (3) and the aft face of the firewall recessed area (2) with sealant (C-353). Install the doubler (3) in place on aft side of the firewall with eight rivets (7) wet with sealant (C-353).

4. Inspect the complete firewall assembly for additional damage and cracks. Pay close attention to the two corner radiuses where the recessed area (2, Figure 1) begins in the firewall assembly (Note 2, Figure 1).

   a. If no crack exists, route each corner of the web (1) near the recessed area (2) (Detail C, Figure 2).

   b. If crack(s) originated from the corner radius where the recess area (2) begins, proceed as follows;

      -NOTE-

      It is recommended to install the two repair doublers (9, Figure 2), regardless if there is a crack or not, in the corner radiuses of the recessed pan. The two doublers (9) will provide added stiffness to the firewall assembly and are considered a part of the preventive measures against development of future crack(s) originating from the corner radiuses of the recessed section (2) of the firewall assembly.

-NOTE-

Existing repair doublers that were installed previously by an operator on the firewall assembly may be considered, in lieu of doublers (9), provided the rivet pattern does not interfere with the lateral stiffener (5) and the shim (6) required to comply with this bulletin. For existing rivet hole(s) that interfere with the radius or the flange of the stiffener (5), omit the rivet(s) and plug hole(s) with sealant after installation of the stiffener (5) and the shim (6).

(1) For crack(s) more than 1.5 inches (38.1 mm) long that exist in the web (1) at the corner radius of the recessed section (2), contact Product Support Engineering with details for assistance.

(2) For crack(s) 1.5 inches (38.1 mm) or less that exist in the web (1) at the corner radius of the recessed area (2), proceed as follows;

(a) Inspect the crack with a 10X magnifying glass to determine the length of the crack and mark with a felt pen.

(b) Clean the full length of the crack with a .1875 diameter router bit as seen in procedure 3-6-3, Application “C” of the BHT-ALL-SRM manual.

(3) Clean all burrs and perform again an inspection of the reworked area with a 10X magnifying glass to make sure that the entire crack has been cleaned up.

-NOTE-

Doublers (9) are not procurable from BHT spares and shall be fabricated locally (see details in Figure 3).

(a) Fabricate and position the doublers (9, Figure 2) over the forward face of the firewall assembly lower web (1) and transfer the rivet holes to the web.

(b) Remove the doublers (9) and deburr all the holes in the web (1).

(4) For any other crack(s) that do not emerge from the corner radiuses of the recessed area (2) of the firewall assembly but are located in other areas of the firewall web (1), refer to the repair procedures found in Chapter 3 of the Structural Repair Manual (BHT-ALL-SRM) or contact Product Support Engineering for assistance.

-NOTE-

Existing repair doublers that were installed previously by an operator on the firewall assembly may be considered, in lieu of doublers (9), provided the rivet pattern does not interfere with the lateral stiffener (5) and the shim (6) required to comply with this bulletin. For existing rivet hole(s) that interfere with the radius or the flange of the stiffener (5), omit the rivet(s) and plug hole(s) with sealant after installation of the stiffener (5) and the shim (6). Install the rivets inter-pitched, as required.

5. Install the aft lateral stiffener (5) and the shim (6) as follows;

-NOTE-

The stiffeners (5) and the shim (6) can be fabricated locally per details in Figure 3 or procured directly from BHT approved spares (see Material Section of this bulletin).

-NOTE-

If existing repair doublers exist on the firewall, remove those rivets that will interfere with the installation of the stiffener (5) and the shim (6). For existing rivet hole(s) that interfere with the radius or the flange of the stiffener (5), omit the rivet(s) and plug hole(s) with sealant after installation of the stiffener (5) and the shim (6). Install the rivets inter-pitched, as required.

a. Position the shim (6) and the stiffener (5) on the aft face of the web (1). Make sure it is tight against the lower flange of the recessed area (2).

b. Position the two doublers (9) on the forward face of the web (1) and secure with clecos.

-NOTE-

Adjust the rivet pattern, as required, if the holes will interfere with the routed crack.

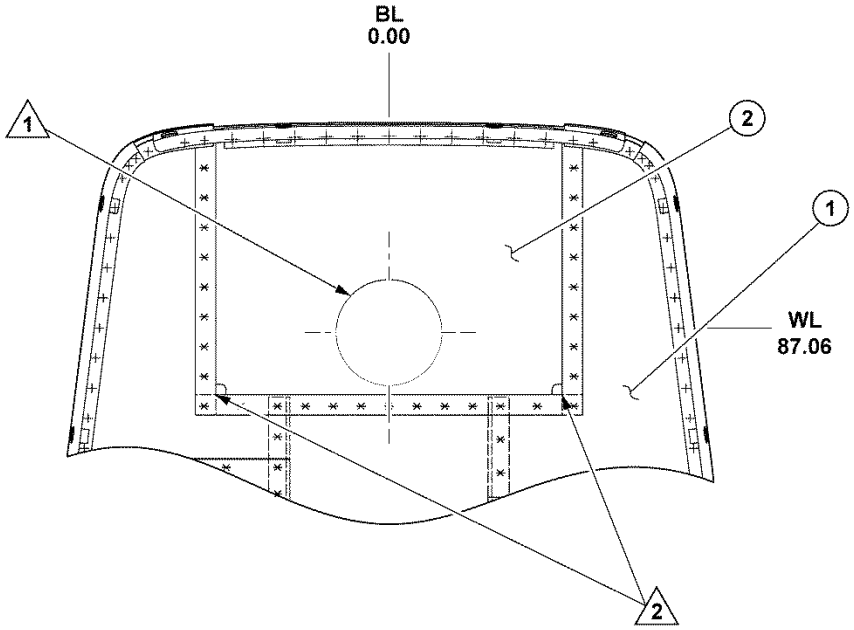
c. Drill all missing rivet holes in the doublers (9) that will be common to the firewall web (1), shim (6), and stiffener (5). For cases where there are existing repair

doublers, transfer the holes from the existing repair doublers(s) to the same mating parts(1, 5, and 6) and drill the remaining holes, as required.

d. Remove the doublers (9), as applicable, shim (6), and stiffener (5). Deburr all the holes.

e. Coat the faying surfaces of the doublers (9), as applicable, stiffener (5) and shim (6) with sealant (C-353). Install in place with wet rivets (4, 7, and 11).

6. Make an entry in the helicopter logbook and historical service records indicating compliance with this Technical Bulletin.



FIREWALL INSTALLATION
VIEW LOOKING AFT

1. Firewall web
2. Recessed area

NOTES

1. Inspect this region in recessed area for possible fretting marks from fuel nozzle hose clamp.
2. Inspect each corner radius of web for possible crack damage.

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Figure 1: Firewall, Inspection of

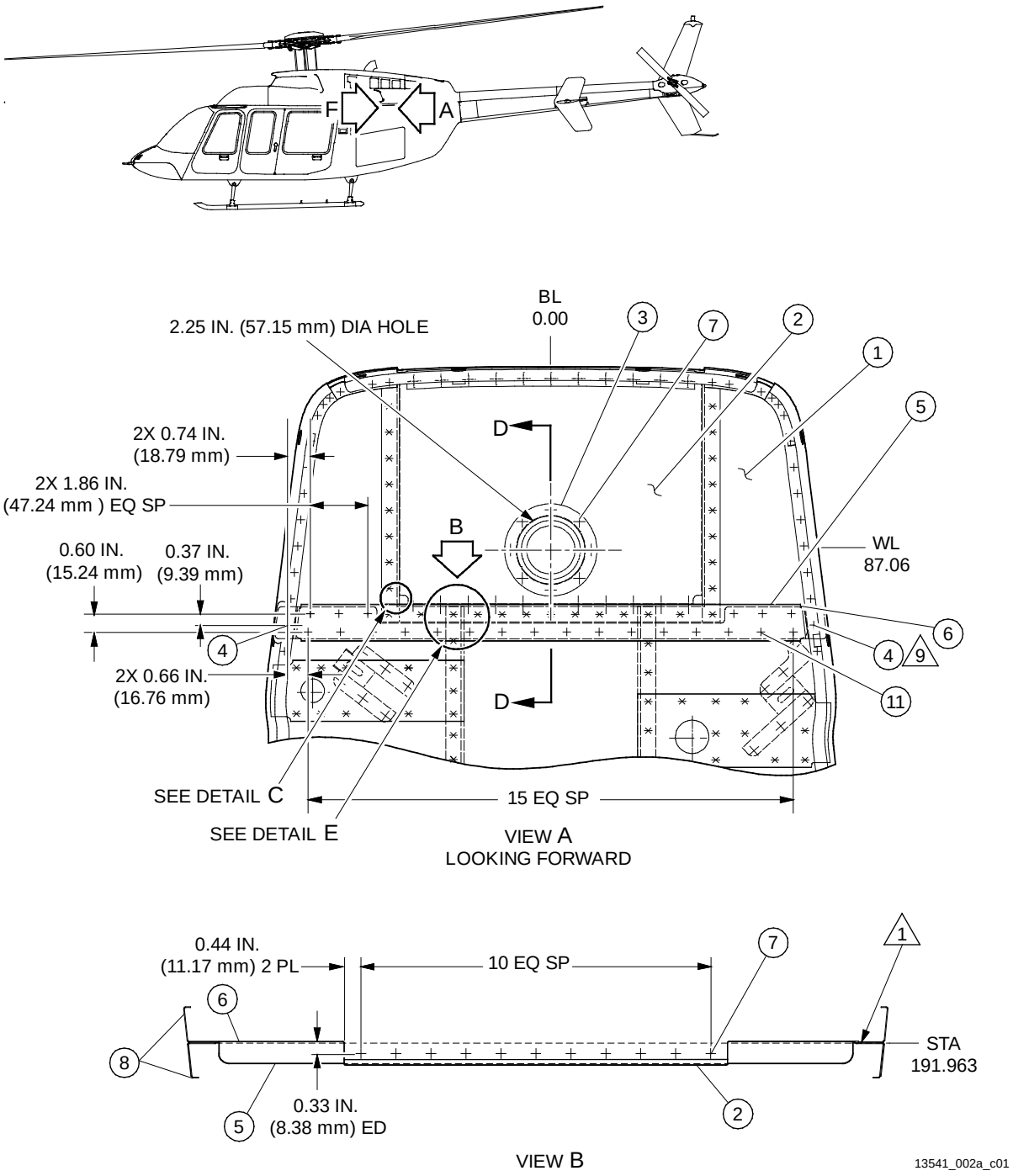

Figure 2: Firewall, Repair and Modification of (Sheet 1 of 4)

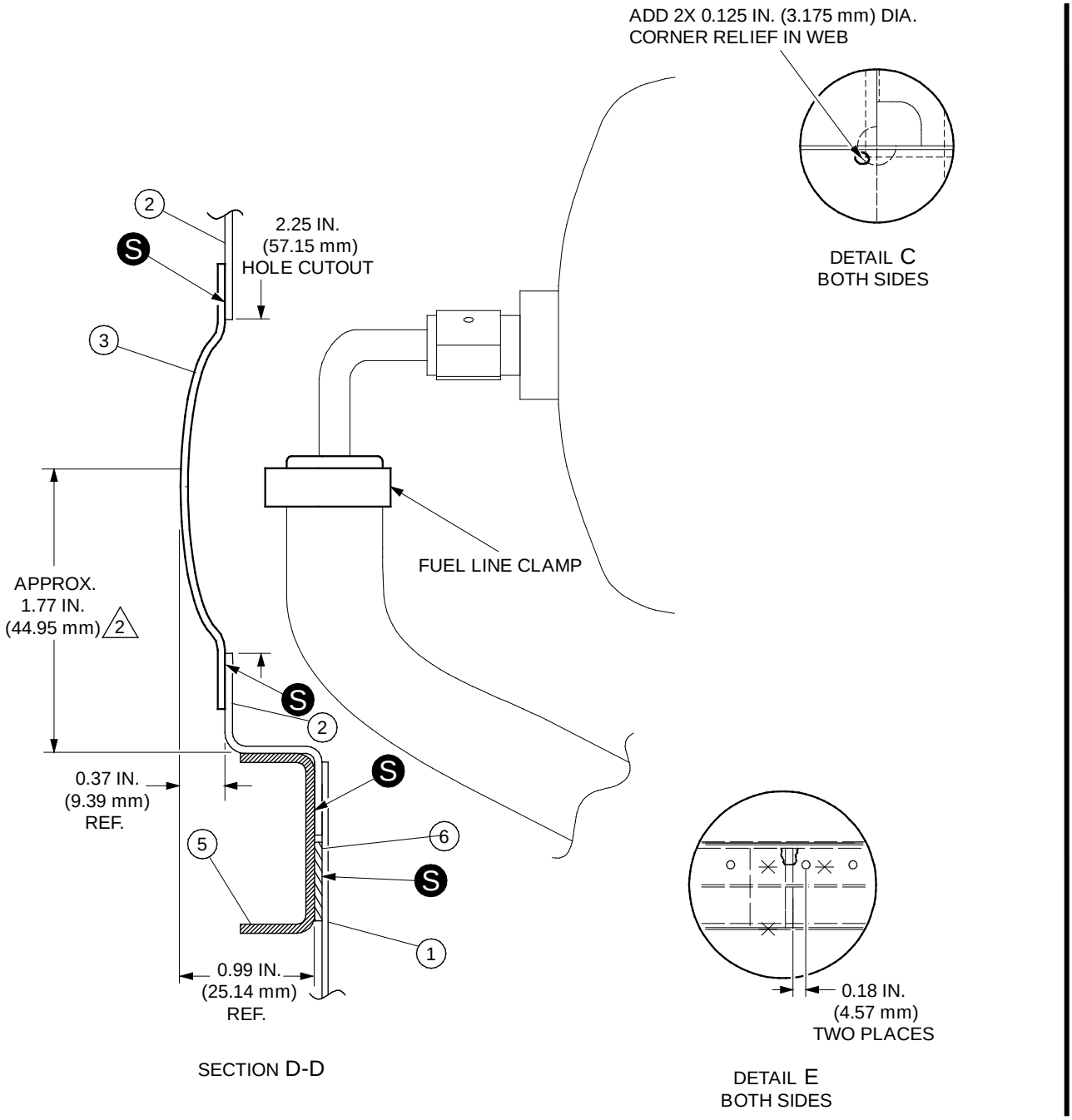

Figure 2: Firewall, Repair and Modification of (Sheet 2 of 4)

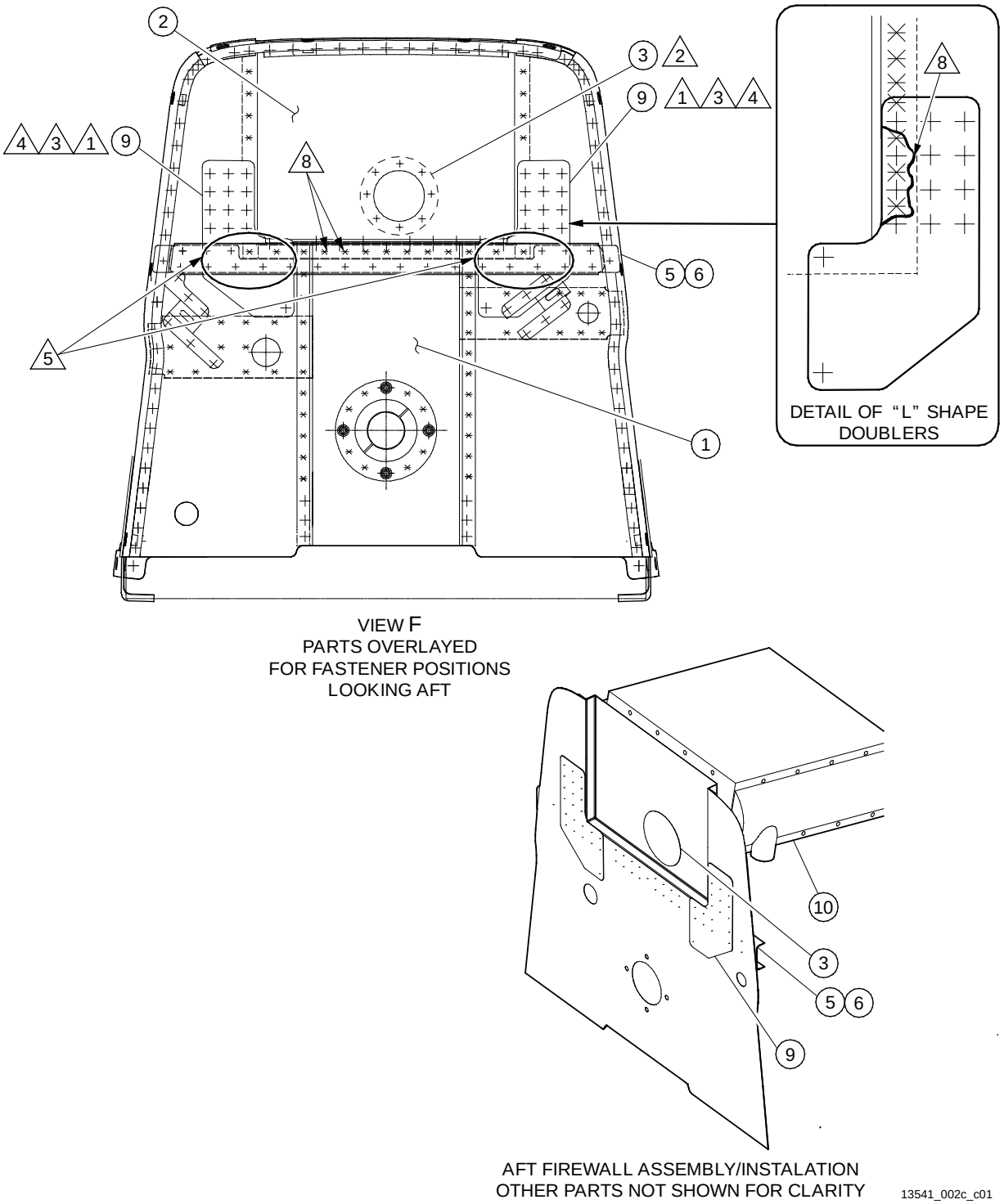

Figure 2: Firewall, Repair and Modification of (Sheet 3 of 4)

1. Web
2. Recessed area
3. Beaded doubler (407-704-027-115)
4. Rivet (MS20613-3C4) (Qty 2) 9
5. Stiffener (407-704-027-113)
6. Shim (407-704-027-111)
7. Rivet (MS20613-3C2-5) (Qty 19)
8. Firewall assembly side channel
9. “L” shape repair doubler
10. Oil cooler assembly (ref)
11. Rivet (MS20613-3C3) (Qty 34)

S SEALANT (C-353)

NOTES

1. Use firewall sealant (C-353) between all faying surfaces.
2. It is permitted to locate cutout centrally for beaded doubler about the point of fretting between the firewall and fuel nozzle hose clip.
3. Match rivet pattern of "L" shape doublers with rivet pattern of stiffener and shim.
4. Install doublers on forward side of firewall web.
5. Adjust rivet pattern in this region so it does not interfere with existing crack.
6. Wet install all rivets wet with sealant (C-353).
7. Fill all gaps and voids with sealant (C-353).
8. Inter-pitch rivets between existing spotwelds. Typical for all affected places.
9. It is permissible to add one additional rivet at the end of stiffener where shown. Keep a minimum edge distance of 2D and keep minimal rivet pitch of 0.400 inch (10.16 mm).

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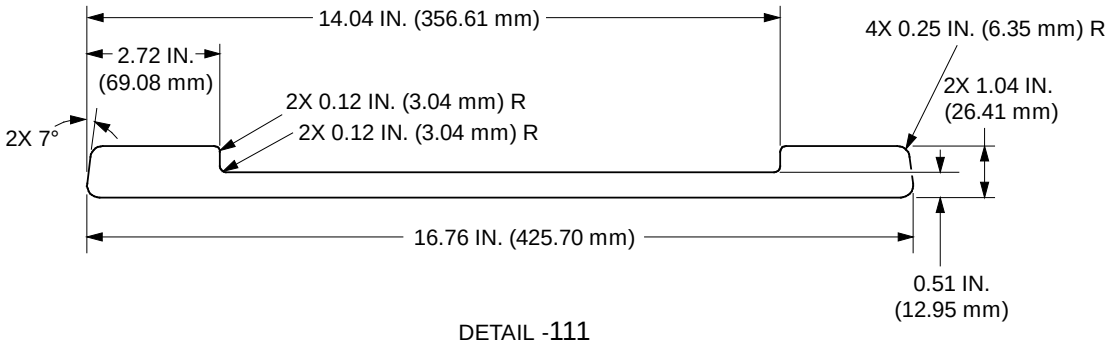
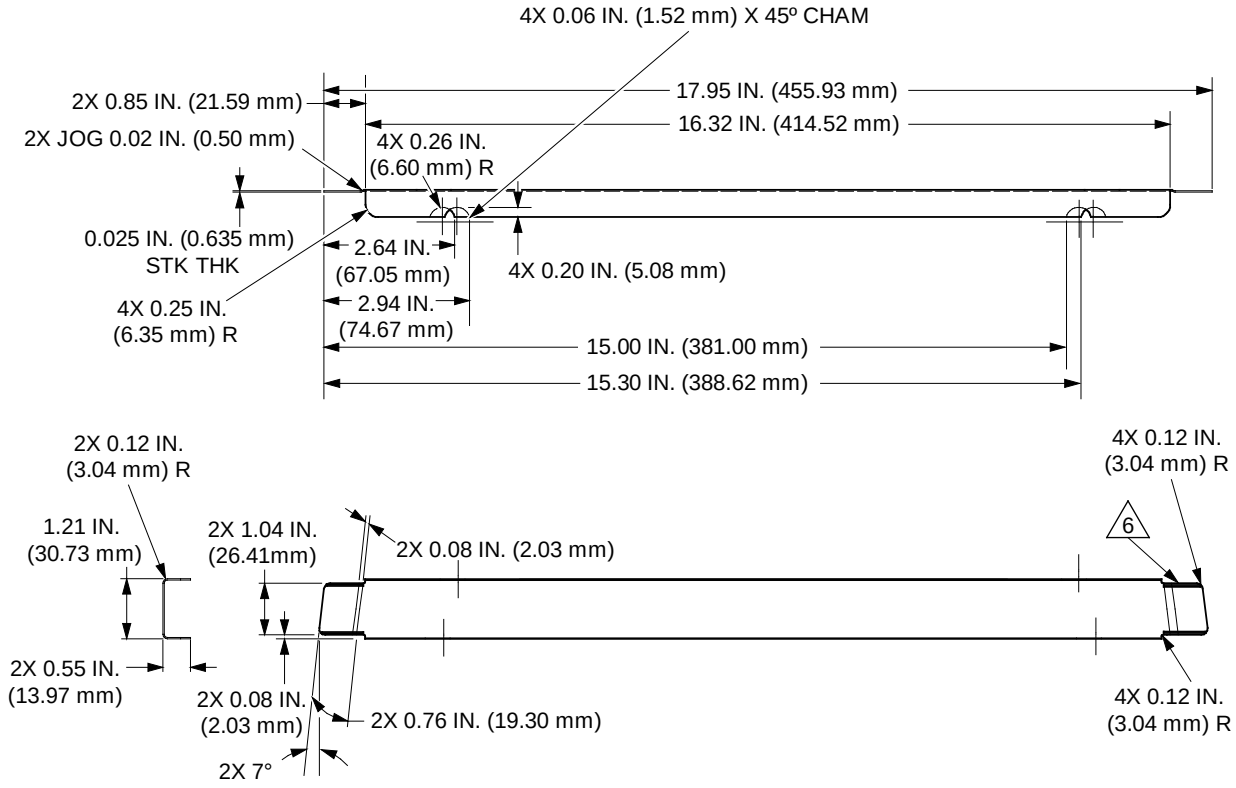
Figure 2: Firewall, Repair and Modification of (Sheet 4 of 4)



DETAIL -111



DETAIL -113

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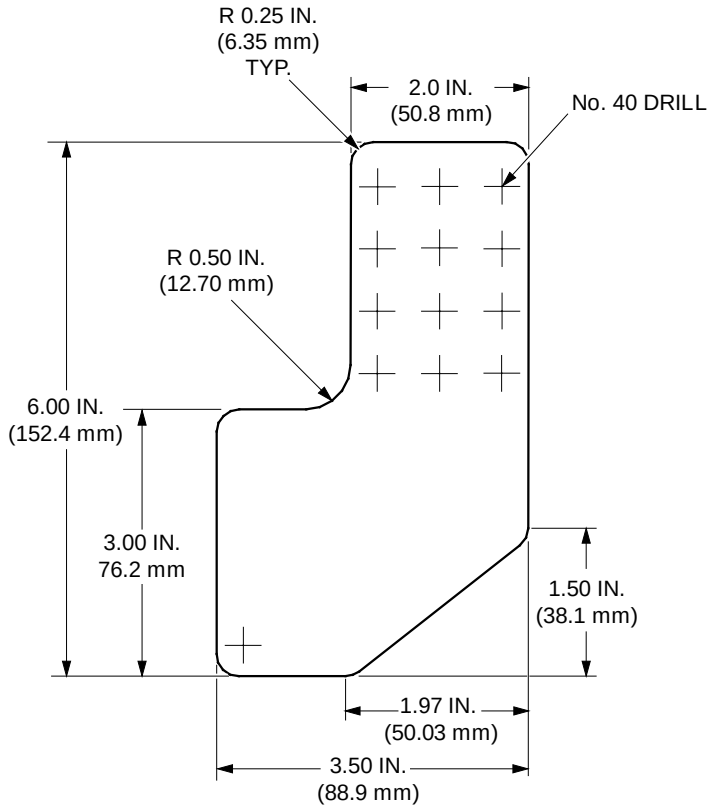
Figure 3: Details of Stiffener, Shim and Doublers (Sheet 1 of 2)



DETAIL OF "L" SHAPE
DOUBLERS

NOTES

1. Order shim -111 from Bell Helicopter Textron spares or make locally, using 301 Cres material, per AMS5517, 1/4 hard, 0.020 inch (0.508 mm) thick.

2. Order stiffener -113 from Bell Helicopter Textron spares or make locally, using 301 Cres material, per AMS5517, 1/4 hard, 0.025 inch (0.635 mm) thick.

3. Make doublers locally (non-procurable from Bell Helicopter Textron spares) using 301 Cres material, per AMS5517, 1/4 hard, 0.020 inch (0.508 mm) thick.

4. All bend radiuses to be 0.16 inch (4.06 mm).

5. Break all sharp edges 0.015 inch (0.381 mm) x 45º or 0.015 inch (0.381 mm) radius.

△6 It is permitted to trim the stiffener in shaded areas to allow clearance with rivets in the firewall. Ensure edge distance of 2D for all rivets passing through the stiffener.

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Figure 3: Details of Stiffener, Shim and Doublers (Sheet 2 of 2)