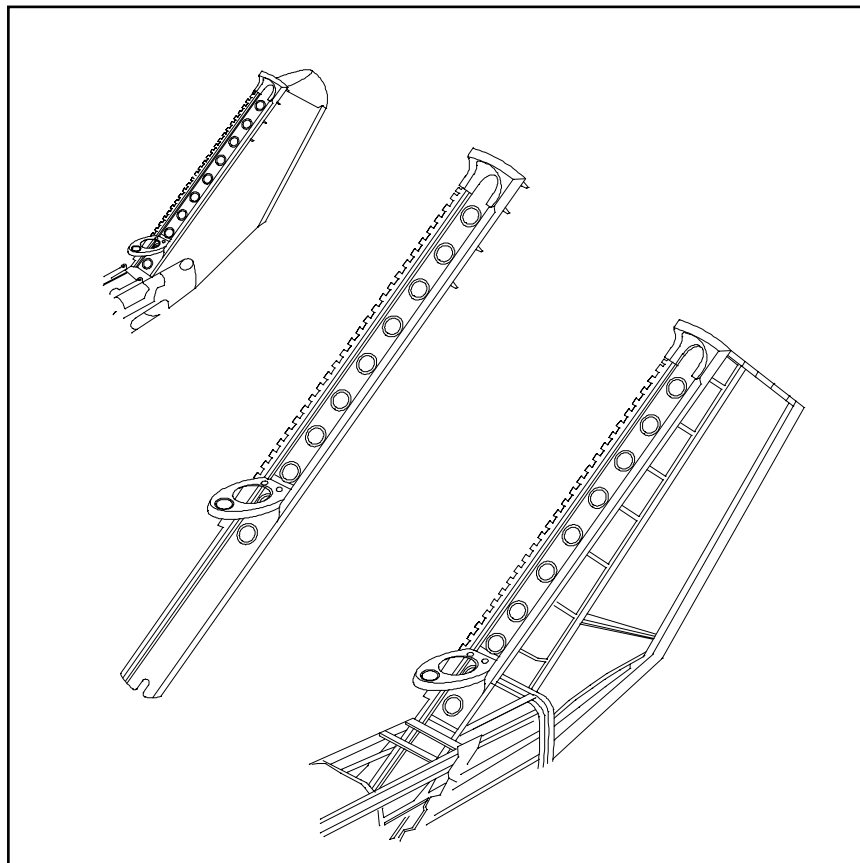


Manual No. GHT-VTF-099-UH1

**VERTICAL FIN SPAR KIT VTF-030-800-001
INSTALLATION INSTRUCTIONS
FOR THE UH-1H, UH-1F, UH-1P AND TH-1F HELICOPTERS**

PATENT PROTECTED



LOG OF REVISIONS

<u>Revision</u>	<u>Description</u>	<u>Pages Revised</u>	<u>Approved By</u>	<u>Date</u>
Initial Release		All	Dennis Halwes	10/27/00
A	Repair / Alignment	8, 10, 31	Dennis Halwes	11/07/00
B	Drawing Rev P/N Listing	All	Dennis Halwes	11/15/00
C	<u>Drawing Rev / P/N Listing / Photo 19</u>	<u>1,2,5,6,7,19,20,28</u>	Dennis Halwes	11/29/00
D	Model Clarification / <u>P/N Listing / Drawing Rev</u>	1-7,9,10 12,16,23,25-31	Dennis Halwes	03/26/01
E	ADD GHTI-S-8802	9		06/05/08

List of Effective Pages

<u>Page #</u>	<u>Revision Letter</u>
<u>3,4,8-18,21-27,29-31</u>	B
<u>1,2,5,6,7,19,20,28</u>	C
1-7,9,10,12,16,23,25-31	D
9	E

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**VERTICAL FIN SPAR VTF-030-800-001
INSTALLATION INSTRUCTIONS
FOR THE UH-1H, UH-1F, UH-1P AND TH-1F
HELICOPTERS**

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APPLICABILITY:

For the purposes of this document only, the term UH-1 represents the Bell manufactured UH-1H, UH-1F, UH-1P and TH-1F helicopters. This GHTI Vertical Fin Installation Kit, PN VTF-030-800-001 is applicable for the replacement of the BHTI Vertical Fin Spar PN 205-030-843 on all UH-1 helicopters.

WARRANTY INFORMATION:

Owners/operators who replace their Vertical Fin Spar Assembly in accordance with this STC installation documentation will be eligible for Global Helicopter Technology, Inc.'s warranty of 1000 hours or one (1) year from installation. This warranty covers all parts supplied in the installation kit from defects in materials or workmanship as delivered. To apply for warranty consideration under this STC, contact Global Helicopter Technology, Inc.

This warranty is voided unless strict adherences to the procedures in this installation manual are followed.

VTF INSTALLATION KIT PARTS LIST:

The GHTI Vertical Fin Spar Installation Kit, PN VTF-030-800-001, consists of the following material:

GHTI Vertical Fin Spar Installation Kit: VTF-030-800-001

<u>Part Number</u>	<u>Nomenclature</u>	<u>Quantity</u>
VTF-030-832-101	Dzus Rail	1
VTF-030-833-101	Bracket, Saddle to Spar	1
VTF-030-841-101	Bracket, Nose Rib, LEFT-HAND	1
VTF-030-841-102	Bracket, Nose Rib, RIGHT-HAND	1
VTF-030-846-101	Spar Assembly, Forward, Vertical Fin	1
VTF-030-860-101	Spacer, Upper Pulley Assembly.	1
VTF-030-861-101	Spacer, Lower Pulley Assembly.	1
VTF-030-862-101	Spacer, Saddle Bracket	1

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INSTALLATION DRAWINGS:

Spar, Forward, Vertical Fin Installation
VTF-030-800-001 Rev D

Dated: 03-26-01

SPAR TOOL:

VTF-030-870 Tool Assembly, spar

1. The GHTI supplied tooling fixture in the installation kit is a “One-Time-Use” spar assembly drill template. This fixture will be used to copy the exact location of the existing fastener holes in the removed UH-1 Spar and transfer them to the new GHTI replacement Spar Assembly. This methodology will allow accurate reproduction of the existing fastener location on the new parts. **This process is Patent Protected.**



All drill bits, straight fluted drill reams, and clamps needed for a standard installation are supplied in the kit.

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PARTS AND TOOLS DELIVERED WITH THE VTF INSTALLATION KIT

The following is a list of all parts and tools that are delivered with the VTF-030-800-001 VTF Installation Kit. The fasteners supplied are usable on a tailboom that has not been modified or previously repaired. Oversized fasteners or fasteners of a different length may be required for a modified tailboom.

<u>Part Number</u>	<u>Nomenclature</u>	<u>Quantity</u>
4237	Bumper	6
AN4-11A	Bolt	2
AN4-7A	Bolt	5
AN3-6A	Bolt	2
AN960PD416	Washer	7
AN960PD10	Washer	4
CR3243-5-08	Rivet	1
CR3243-5-07	Rivet	8
CR3243-5-06	Rivet	4
CR3243-5-05	Rivet	8
CR3243-5-04	Rivet	39
CR3243-5-03	Rivet	80
CR3243-4-09	Rivet	3
CR3243-4-05	Rivet	4
CR3243-4-04	Rivet	70
CR3243-4-03	Rivet	2
CR3242-5-08	Rivet	3
CR3242-4-09	Rivet	4
CR3242-4-03	Rivet	2
CR3213-4-09	Rivet	6
HL86PB8	Collar	1
HL86PB6	Collar	96
HL20PB8-4	Hi-Lok Pin	1
HL20PB6-8	Hi-Lok Pin	29
HL20PB6-7	Hi-Lok Pin	43
HL20PB6-6	Hi-Lok Pin	2
HL20PB6-5	Hi-Lok Pin	10
HL20PB6-4	Hi-Lok Pin	7
HL21PB6-8	Hi-Lok Pin	3
MS21048-3	Nut Plate	5
MS21042L3	Nut	2
MS21042L4	Nut	4
MS21075L4	Nut Plate	3

USE HL 64 OVERSIZE HI LOKS
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<u>Part Number</u>	<u>Nomenclature</u>	<u>Quantity</u>
MS20470AD5-11	Rivet	1
MS20470AD5-8	Rivet	6
MS20470AD5-7	Rivet	22
MS20470AD5-6	Rivet	20
MS20470AD5-5	Rivet	26
MS20470AD5-4	Rivet	20
MS20470AD4-10	Rivet	32
MS20470AD4-9	Rivet	50
MS20470AD4-8	Rivet	16
MS20470AD4-7.5	Rivet	14
MS20470AD4-7	Rivet	13
MS20470AD4-6.5	Rivet	19
MS20470AD4-5	Rivet	102
MS20470AD4-4.5	Rivet	28
MS20470AD4-4	Rivet	22
MS20426AD5-10	Rivet	2
MS20426AD4-11	Rivet	11
MS20426AD4-9	Rivet	4
MS20426AD4-8	Rivet	4
MS20426AD4-5	Rivet	2
MS20426AD3-8	Rivet	2
MS20426AD3-6	Rivet	8
MS20426AD3-4	Rivet	14
MS21266-5T	Cat Track	1
RF5-5	Spacer	10

Regular Drill Bits
(Removal of Spar from Aircraft)

<u>Size</u>	<u>Quantity</u>
40	1
30	4
27	2
21	4
16	1
11	1

1/4 -28 Threaded Drill Bits
(Drilling from Old Spar to Tool)

<u>Size</u>	<u>Quantity</u>
30	4
21	2
11	1

Straight Fluted Drill Reams
(Drilling from Tool to New Spar)

<u>Size</u>	<u>Quantity</u>
30	2
27	2
21	2
11	1
F	1

3-inch "C"-clamp, quantity (2)
2-inch "C"-clamp, quantity (28)

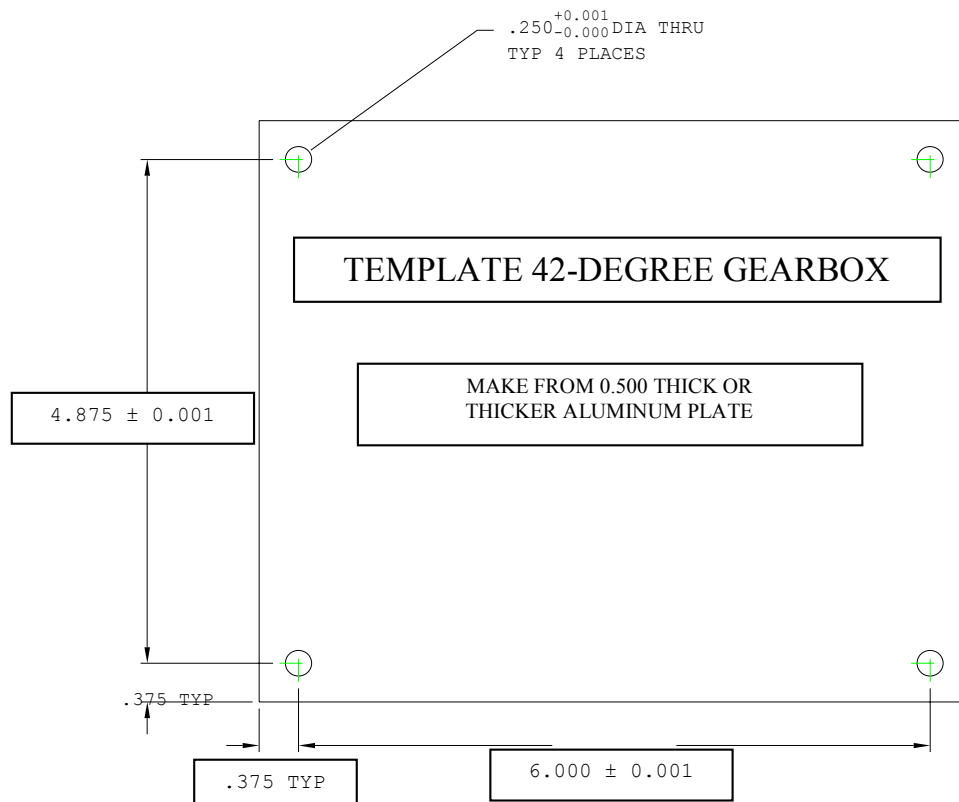
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REQUIRED TOOLS NOT DELIVERED WITH THE VTF INSTALLATION KIT

Other required tools, not supplied with the VTF-030-800-001 Installation Kit are listed below:

1. Standard air drill
2. 90-degree air drill with short offset
3. Rivet gun for pulling cherry rivets
4. Rivet gun for bucking solid rivets
5. Bucking bars, including finger type for limited access bucking.
6. Clecos (#3, #4, #5, #6)
7. Deburr tools
8. Countersink tools
9. Drill guides
10. Drill Press
11. Tailboom Alignment Tooling

Optional tool for 42-degree gearbox alignment.



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CONSUMABLE MATERIALS:

The following material is required to accomplish the 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 is not supplied in the kit.

Reference

ScotchBrite TY-A Abrasive Pad C-407

TT-M261 Keytone Methyl Ethyl Ketone (MEK)

GHTI-S-8802 Sealant (Proseal 890 B2)

Epoxy Polyamide Yellow Paint per MIL-P-23377 or

Zinc Chromate Yellow Primer per TT-P-1757A

WEIGHT AND BALANCE:

Weight (lbs)
+5.2

Moment Arm (inches)
448.6

Moment (inch-pounds)
+2333

REFERENCES:

UH-1 Maintenance Manual for the applicable model
FAA Airworthiness Directive 99-25-12

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PART 1 –GENERAL INSTRUCTIONS:

- 1.0 Replacement of the BHTI Vertical Fin Spar with the GHTI UH-1 Helicopter Vertical Fin Spar Assembly is considered by the Federal Aviation Administration (FAA) a major repair and therefore requires “competent and experienced” personnel. While no unusual skills are required for installation, basic aircraft mechanics may not possess the level of “previous experience” necessary to accomplish this modification with the quality and skill intended. It is recommended that each operator assess the skill level of their “accomplishing personnel” prior to initiating installation of this modification.
- 1.1 Before initiating this Vertical Fin modification, an **evaluation of the tailboom must be made**. The applicable UH-1 Technical Manual, should be used as a guide for determining the general condition of the tailboom. Operators with tailbooms requiring significant rework / repair in the Vertical Fin area, the 42-degree gearbox / saddle area, or 42-degree canted bulkhead, may need to consider sending their tailboom to a UH-1 tailboom fixture for other repairs during installation of this kit. If the tailboom condition dictates that the side skins of the Vertical Fin be replaced, this should be accomplished after the VTF Installation Kit is installed. Field installation of the VTF Assembly is intended for tailbooms that are in generally good, flight worthy condition.
1. Inspect the tailboom for general condition using the appropriate maintenance manual prior to removal of any components.
 2. Assess if the condition of the tailboom is such that field modification is possible.
 3. Some local minor cracking or damage of the tailboom skin, canted bulkhead, or other tailboom structure may be repairable with other FAA approved methods without effecting the spar replacement alignment, and thus not require the tailboom to be installed in a tailboom fixture. Each damaged area will have to be assessed independently. Cracks up to 1 inch in length in the canted bulkhead may be repairable using standard practice procedures. Doublers may not be installed on the forward side of the canted bulkhead in the area of the spar assembly. Contact Global Helicopter Technology, Inc. for information about repairs required concerning any damage that would be considered a major repair by the FAA. Use of oversize fasteners one standard size larger is allowed as long as 1½ hole diameter vs. edge distance is maintained.

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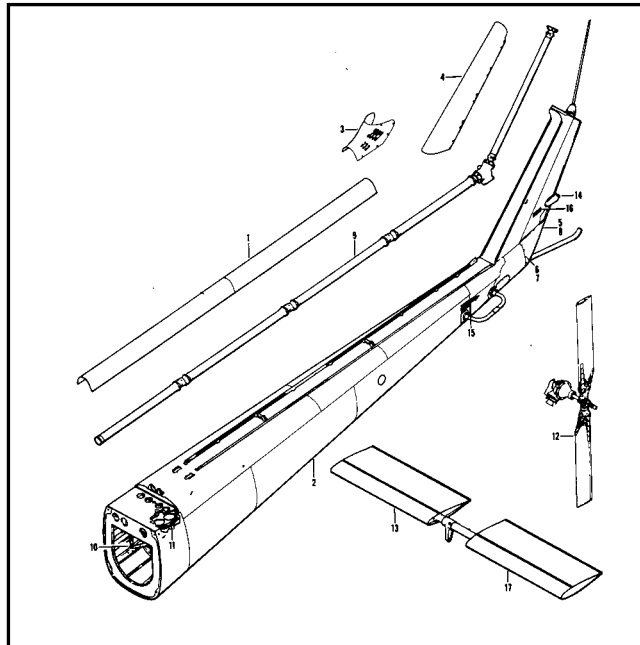
PART 2 – SPAR REMOVAL PROCEDURE:

NOTE:

Carefully read all instructions to be sure that both the order and the method of each step is understood prior to starting the removal of old spar and installation of new spar.

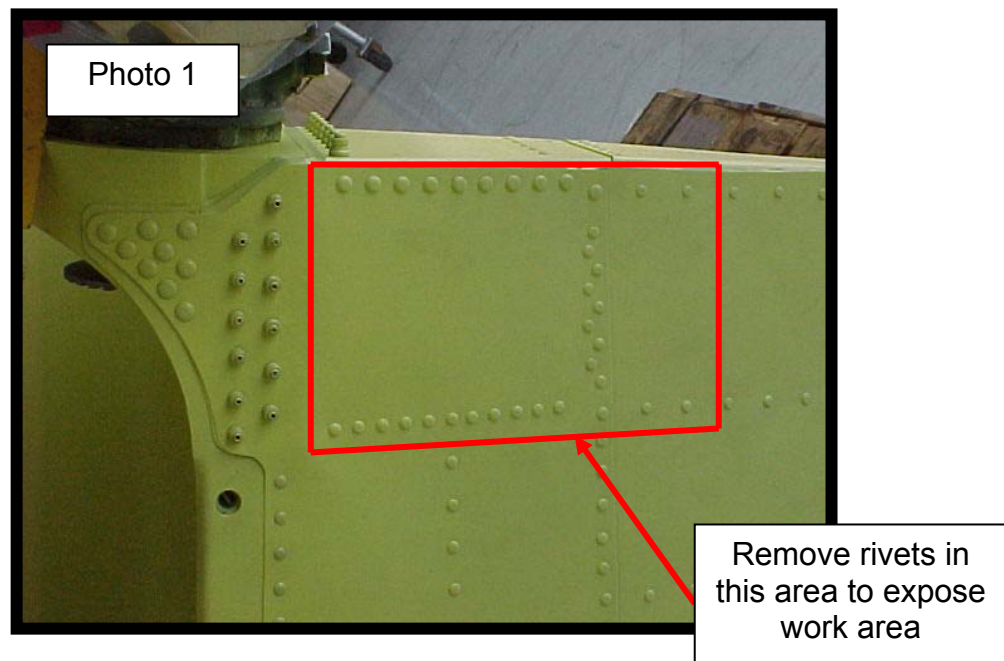
Safely store all hardware and parts removed from the aircraft for reuse with the VTF Assembly. Store the hardware with the parts from which they came. The only parts / hardware to be discarded are: the old spar, rivets, and filler PN 205-031-800-59.

1. The tailboom may be removed from the aircraft and mounted in an acceptable holding fixture, however it is not necessary in order to accomplish this modification.
2. Remove:
 - a. Tail rotor hub and blade assembly
 - b. #4 and #5 tail rotor drive shafts
 - c. Intermediate gearbox
 - d. Tail rotor gearbox
 - e. Anti-torque flight control cablesfrom the aft section of the vertical fin per the maintenance manual.



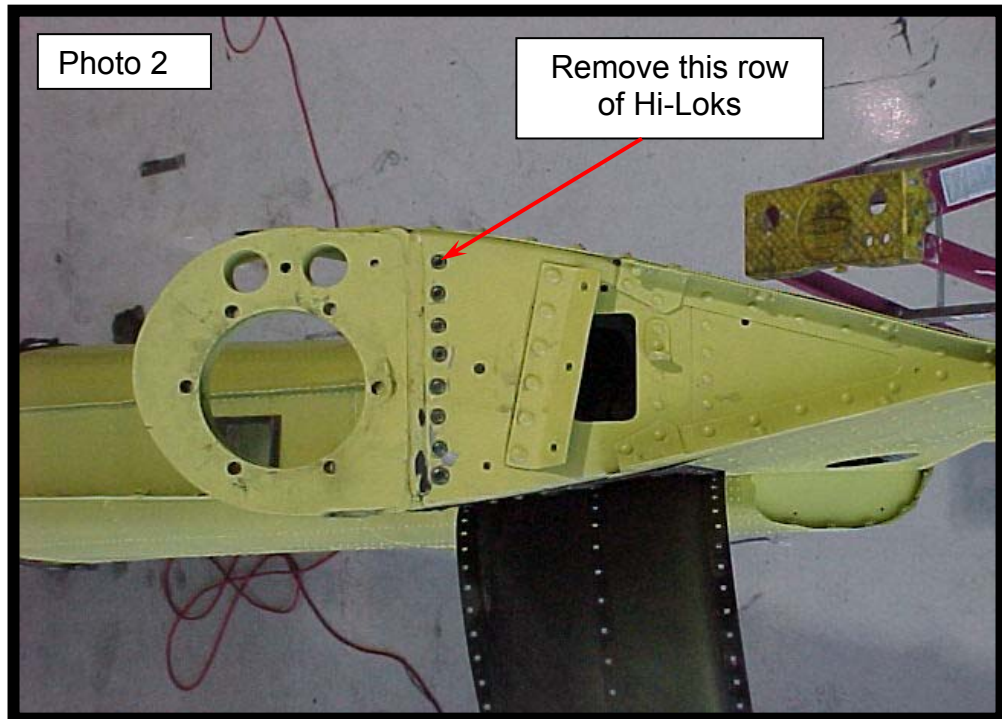
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3. Remove vertical fin drive shaft cover PN 204-030-829-35.
4. Remove aft tail rotor drive shaft cover PN 204-030-813-33.
5. Remove lower aft tailboom access panel PN 204-030-814-455.
6. Remove left side and right side aft tailboom fin covers PN 205-030-899-53S and PN 205-030-899-54S. Store and retain covers.
7. Remove upper antenna mount assembly PN 205-031-835-27 (if installed).
8. Remove tail skid fairing PN 204-031-096-3.
9. Remove tail skid PN 204-030-947-1.
10. Remove wiring on vertical fin and mark locations of nutplates that are in use. Unused nutplates do not have to be installed on the new spar assembly.
11. Remove upper cable pulley assembly PN 204-001-825.
12. Remove CR3213-4 rivets from upper right or left side vertical fin skin. See Photo 1.



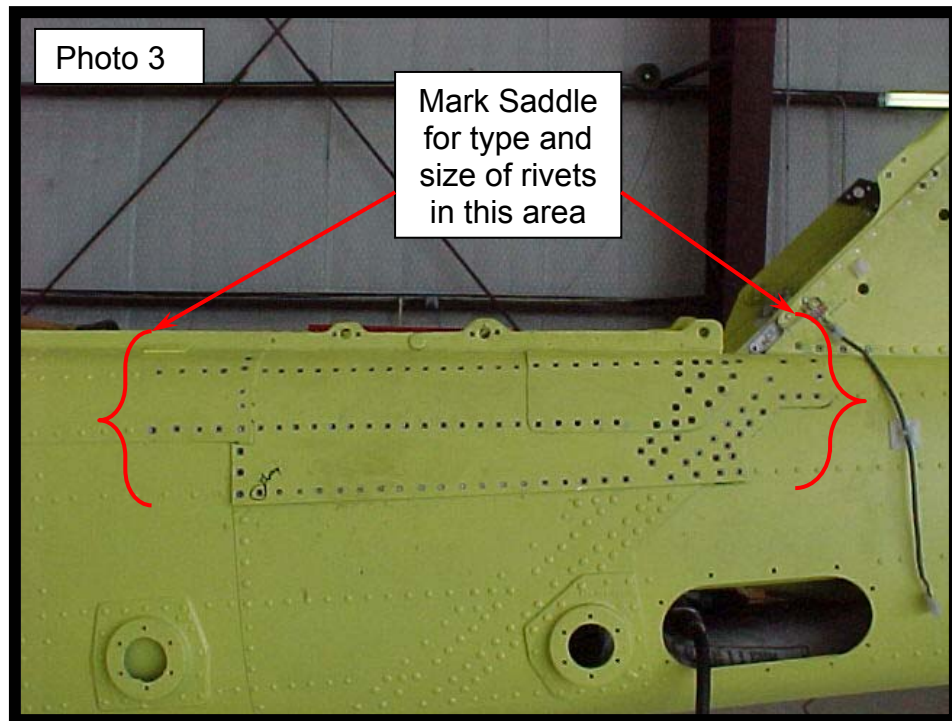
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13. Remove Hi-Loks from 90-degree stiffener PN 205-030-846-275. See Photo 2.

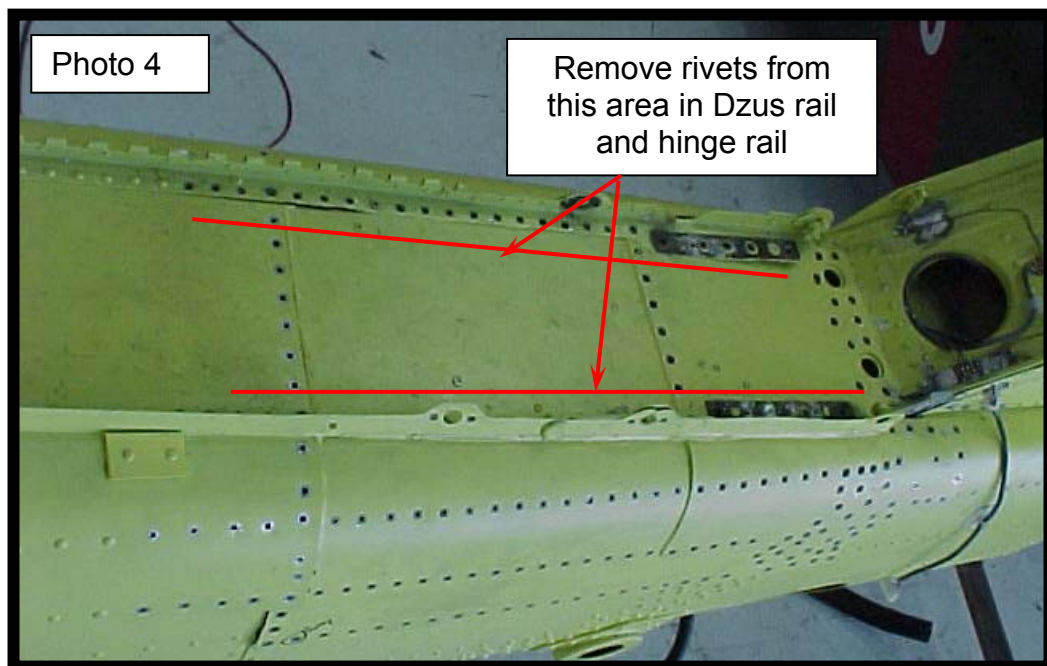


14. Remove vertical fin nose rib PN 204-030-833-235.
15. Identify the 42-degree gearbox shims with a permanent marker as to left side or right side, fwd or aft. Remove attaching rivets and carefully remove the shims from the tailboom. Store for reuse. **Locations and orientation of the shims must be duplicated during re-installation.**
16. Locate and identify rivet type in saddle PN 205-032-800-37 for ease of reinstallation. Mark saddle with rivet type and length. See Photo 3.

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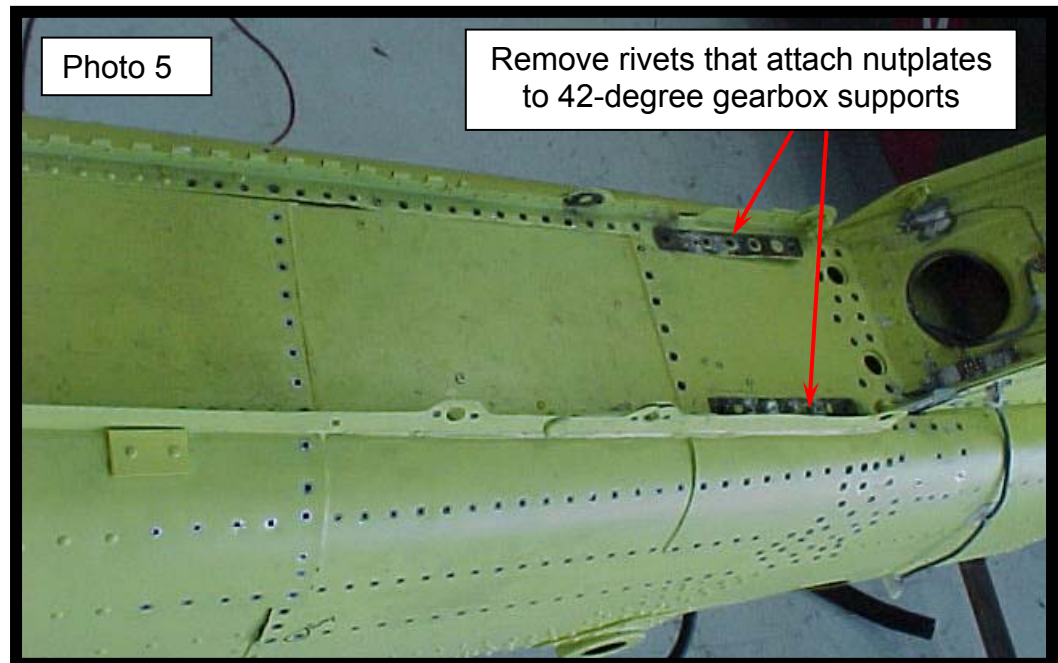


17. Remove enough rivets from the 42-degree tail rotor driveshaft cover dzus rail and hinge rail to be able to remove saddle. See Photo 4.



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18. Remove MS20470AD and CR3213 rivets holding the saddle in place.
19. Remove eight (8) MS20426AD3 rivets that attach the 42-degree nutplates to the saddle. See Photo 5.



20. Remove saddle PN 205-032-800-37S.
21. Remove lower pulley assembly PN 205-001-109.

WARNING NOTE:

Removal of existing rivets must be done carefully in order to preclude enlarging of the rivet holes in the mating parts. Where possible, grind off the rivet head and punch out stem. Damage to the old spar from grinding off rivet heads is not a concern. The old spar will be discarded.

22. Starting at the lower end of the spar, remove MS20470AD rivets.

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23. Do not remove 42-degree support castings PN 205-031-831-2, PN 205-031-832-4, or stiffener from spar at this time.
24. Mark locations of PN 205-030-846-45 doubler and PN 90-009-1 tailrotor tie down loop on the left side and right side outer skins for ease of reinstallation.
25. Remove MS20470AD5 rivets from stiffeners PN 205-030-840-25 at fin stations 59.05, 46.95, 34.66, 22.37, and 10.08. See drawing sheet 2 view C.
26. Retain filler PN 205-030-847-31 from fin station 35.10.
27. Remove MS20470AD4 rivets from left side spar cap angle. Be sure to remove flush rivet at fin station 70.79.
28. Remove MS20470AD6 rivets from left side of 90-degree casting.
29. Remove MS20426AD4 rivets from Dzus fastener bracket on the vertical fin rib.
30. Remove MS20470AD4 rivets from right side spar cap angle. Be sure to remove flush rivet at fin station 70.79.
31. Remove MS20470AD6 rivets from right side 90-degree casting.
32. Remove spar assembly from aircraft.
33. Countersink holes in support casting that were securing nutplates to the 42° gearbox supports and reinstall nutplates to the casting with MS20426AD3 rivets.
34. Reinstall 42-degree gearbox on the support castings. The 42-degree gearbox must remain installed on the support castings to maintain proper alignment until the reinstallation of the support castings on the new spar.

NOTE:

If a 42° gearbox is unavailable, use the appropriate alignment tool listed in the Maintenance Manual, or fabricate a tool using the dimensions of the tool shown on page 8 of this Manual.

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35. Remove sixteen (16) MS20470AD6 rivets holding the 42-degree gearbox support castings to spar (Carefully store in a safe place as an assembly).
36. Remove and store all nutplates from spar.
37. Remove 90-degree gearbox support casting, P/N 204-030-828, from spar. Be careful not to damage rivet holes in spar. Inspect for corrosion on casting.
38. Mark locations and remove five (5) stiffeners PN 205-030-846-19. See drawing sheet 2.
39. Clean proseal from parts using plastic scaper, Scotch Brite grade A and MEK.
40. Inspect exposed structure for any damage such as double holes or skin cracks. Repairs must be performed or damaged parts replaced before continuing on with this installation. Carefully inspect canted bulkhead for elongated holes or damage to the web. If replacement of the canted bulkhead is needed, it will require the use of an approved tailboom overhaul fixture.

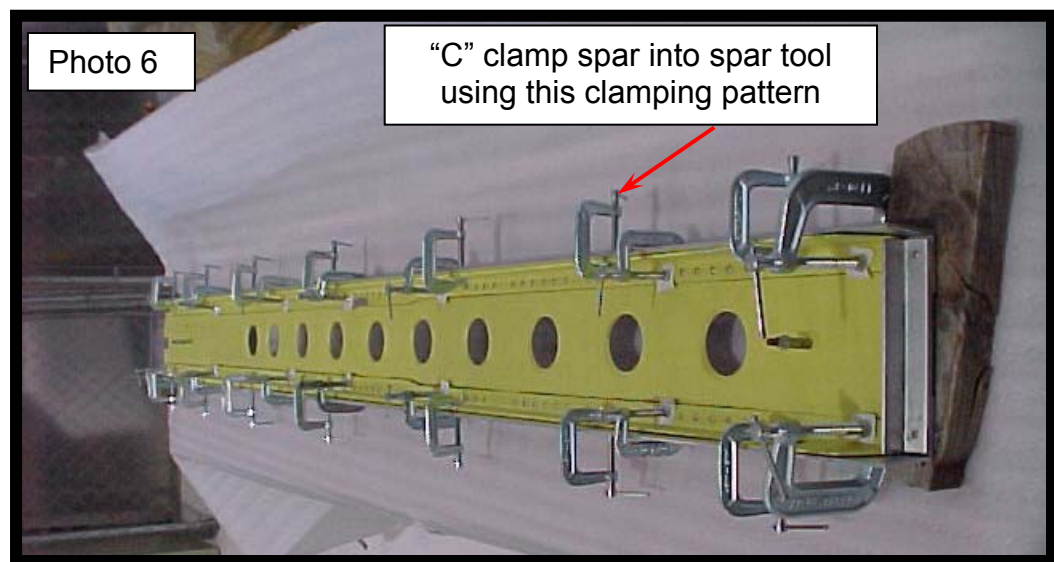
NOTE:

The Straight Fluted Drill Reams are for accurately transferring the hole pattern from the spar tool to the New Spar assembly in a single drill step. These Drill Reams are to be used during the section "PART 3 – MATCH DRILLING AND BENCH ASSEMBLY OF NEW SPAR" only.

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PART 3 – MATCH DRILLING AND BENCH ASSEMBLY OF NEW SPAR

1. Remove all external parts and clean old spar to facilitate installation in spar tool. Sand bottom and outer surfaces of old spar to remove sealant and paint.
2. Place old spar in spar tool PN VTF-030-870. The top end of the old spar must be butted hard against the angle stop in the spar tool. The old spar should lay flat in the spar tool. Verify that no sealant or paint is present that would prevent the old spar from fitting into spar tool properly.
3. Using the 3-inch C-clamps provided with the VTF Installation Kit, clamp the old spar into the spar tool starting at the top. Position clamps to hold spar web flush with the tool. Also, position 2-inch C-clamps to hold spar caps against the vertical angles of the tool. Adjust clamping to optimize the fit of the old spar into the spar tool. Avoid placing the C-clamps over holes or in a position that would interfere with proper drilling. See Photo 6.



CAUTION:

Caution should be taken to insure that holes are back drilled properly. **This is a critical step.** Back drill only through the nutplate holes that are needed.

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HOLE SIZE LIMITS FOR SOLID RIVET, BLIND RIVET, AND HI-LOK FASTENER INSTALLATION

<u>Nominal Size Solid or Blind Rivet</u>	
<u>Rivet Diameter (inch)</u>	<u>Hole Size Min/Max (inch)</u>
1/8 (-4)	0.129/0.132
5/32 (-5)	0.160/0.164
3/16 (-6)	0.192/0.196
1/4 (-8)	0.256/0.261
<u>Oversize Blind Rivet</u>	
<u>Rivet Diameter (inch)</u>	<u>Hole Size Min/Max (inch)</u>
1/8 (-4)	0.143/0.146
5/32 (-5)	0.176/0.180
3/16 (-6)	0.205/0.209
1/4 (-8)	0.271/0.275
<u>Hi-Lok Fasteners</u>	
<u>Shank Diameter(inch)</u>	<u>Reamed Hole Diameter Min/Max (inch)</u>
5/32 Standard **	0.1635/0.1655
3/16 Standard	0.1895/0.1915
3/16 + 1/64 O.S.	0.2026/0.2046
3/16 + 1/32 O.S.	0.2182/0.2202
1/4 Standard	0.2495/0.2515
1/4 + 1/64 O.S.	0.2651/0.2671
1/4 + 1/32 O.S.	0.2807/0.2827

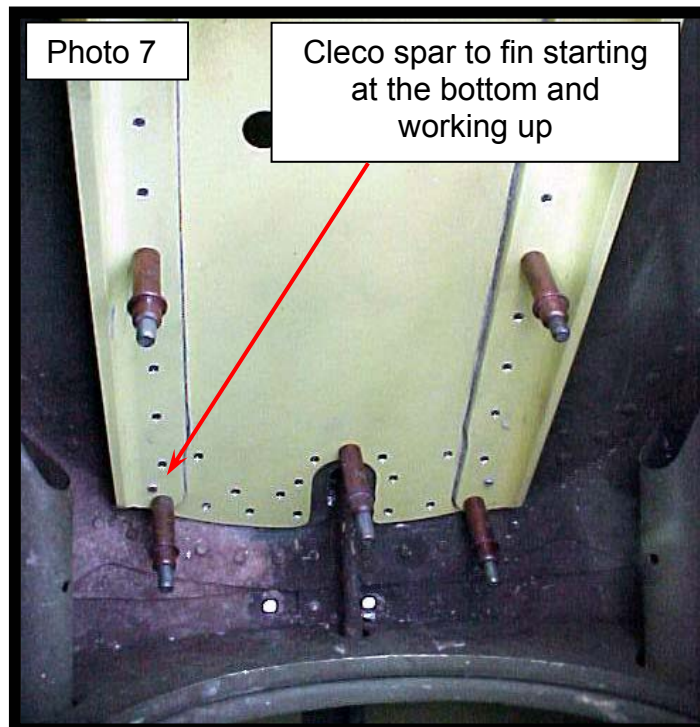
**USE HL 64 OVERSIZE HI LOKS
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** No oversize fastener exists for -5 (5/32 inch diameter) Hi-Lok; use a -6 (3/16 inch diameter) Hi-Lok if an oversize is required.

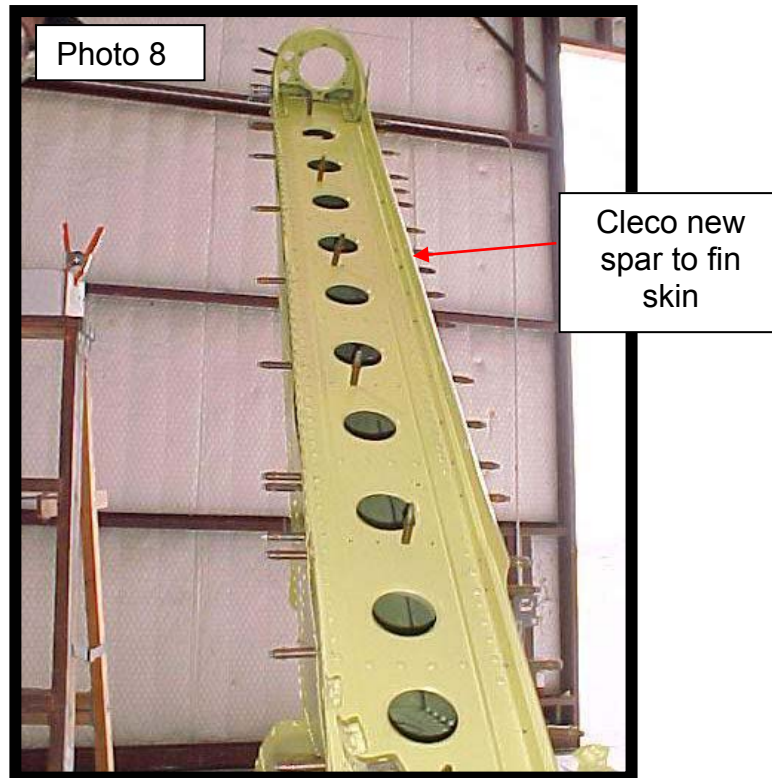
4. Back drill all of the holes in the old spar to the spar tool, except where marked with red tape on the spar tool. Be sure to use the proper drill bit size to back drill each hole. Use the following chart to select drill size. Areas marked in red will be match drilled during final installation. Do NOT back drill holes for nutplates that are no longer required.
5. Deleted

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6. After all holes are back drilled, remove old spar from spar tool and deburr all holes in the spar tool.
7. Place new spar PN VTF-030-846-101 in the spar tool in exactly the same location as the old spar. Install C-clamps in accordance with Photo 6. Use masking tape or suitable substitute on clamps to prevent marring of new spar.
8. Match drill all of the holes from the spar tool to the new spar PN VTF-030-846-101. Use the above table and on page 7 to select the correct Drill Ream bit size. Use the Drill Reams to ream all holes to final hole size.
9. Deleted
10. Remove new spar PN VTF-030-846-101 from spar tool.
11. Deburr all holes in new spar PN VTF-030-846-101.
12. Temporarily install new spar PN VTF-030-846-101 with clecos in tailboom to verify hole alignment and to identify any misdrilled or missing holes. The slot at the bottom of the spar assembly may require trimming to clear rib at the bottom of the tailboom. Maintain 1½ hole diameter edge distance after trimming. See Photos 7 and 8.



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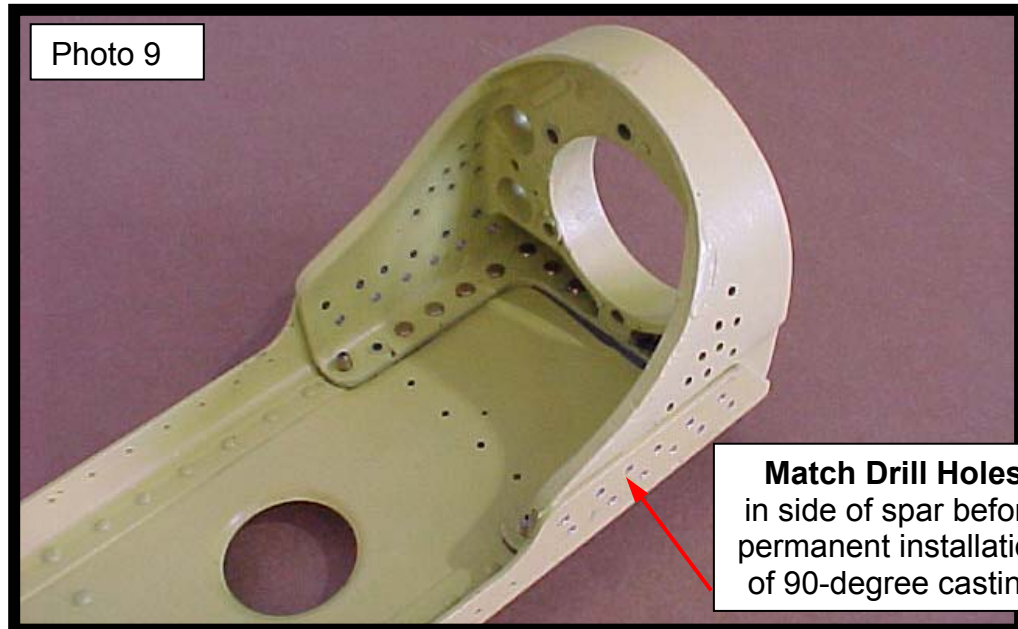
13. Remove spar from tailboom. Correct any misdrilled or missing holes using standard procedures.
14. Install upper pulley bracket center web nutplate on stiffener PN 205-030-846-25 using flush mount MS20426AD3 rivets. Locate from existing holes.
15. Install MS 21075-L4 nutplates using MS20426AD3 at the location of the upper pulley assembly P/N 204-001-825 according to drawing sheet 2.

NOTE:

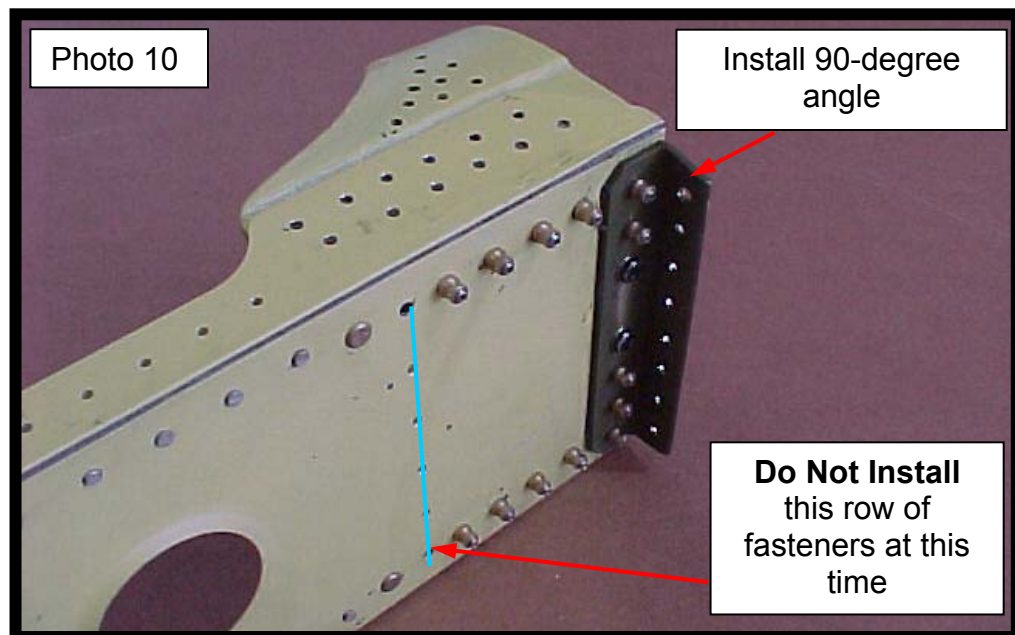
If the old spar did not have nutplates installed for the upper pulley bracket bolts, install nutplates using the upper pulley bracket to temporarily position the nutplates to drill new nutplate holes.

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16. Temporarily install 90° gearbox casting PN 204-030-828 and match drill holes in sides of spar. Remove casting and deburr holes. See Photo 9.

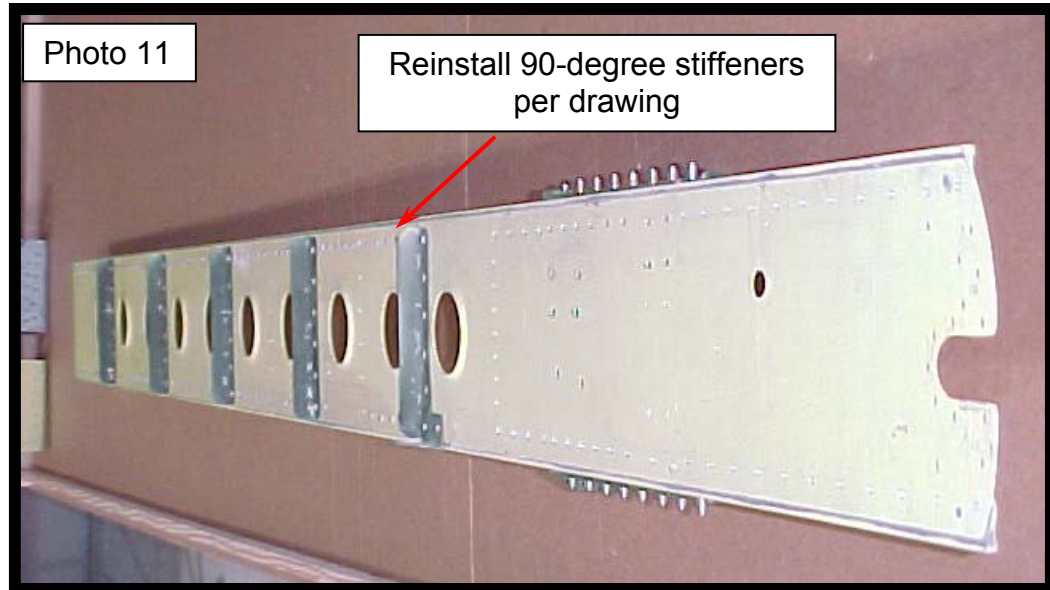


17. Install 90-degree gearbox casting PN 204-030-828 and stiffener PN 205-030-846 to new spar with Hi-Loks and proseal per drawing sheet 2. See Photo 10. Do not install Hi-Loks in sides of spar at this time.

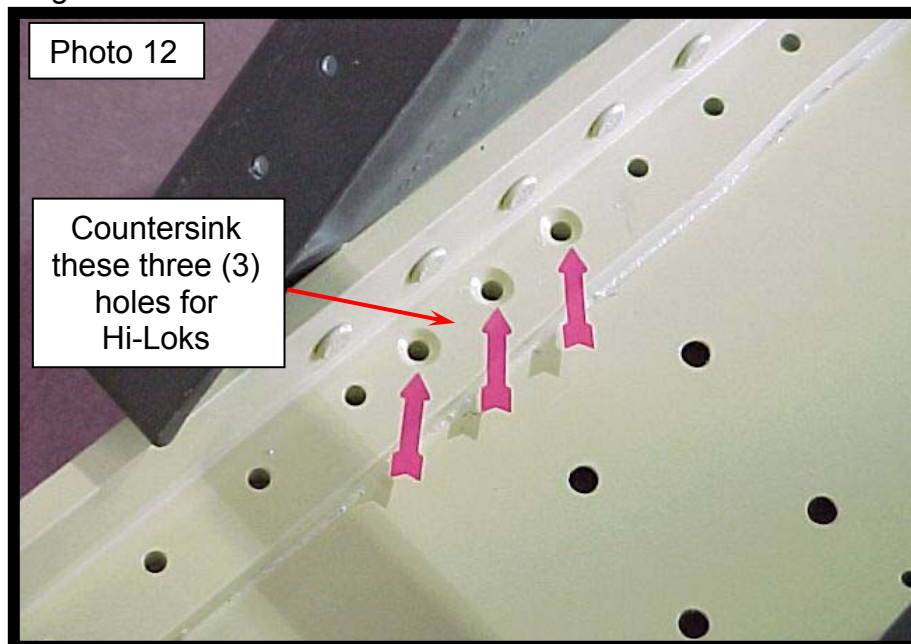


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18. Install five (5) stiffeners PN 205-030-846-19 to spar PN VTF-030-846-101 per drawing sheet 2. See Photo 11.

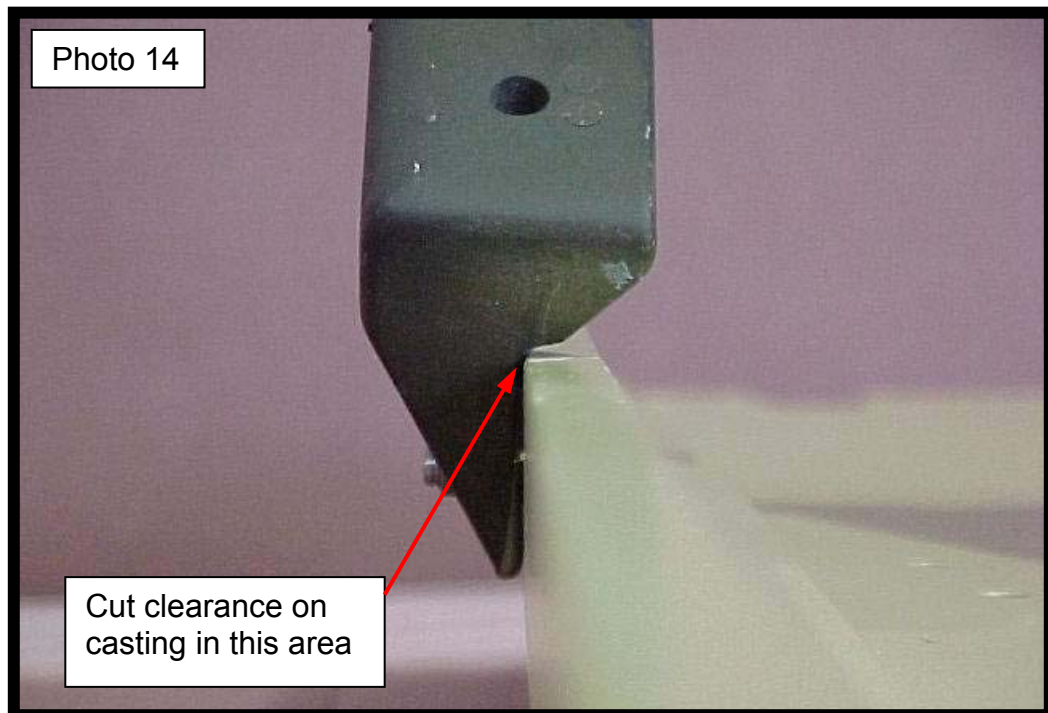
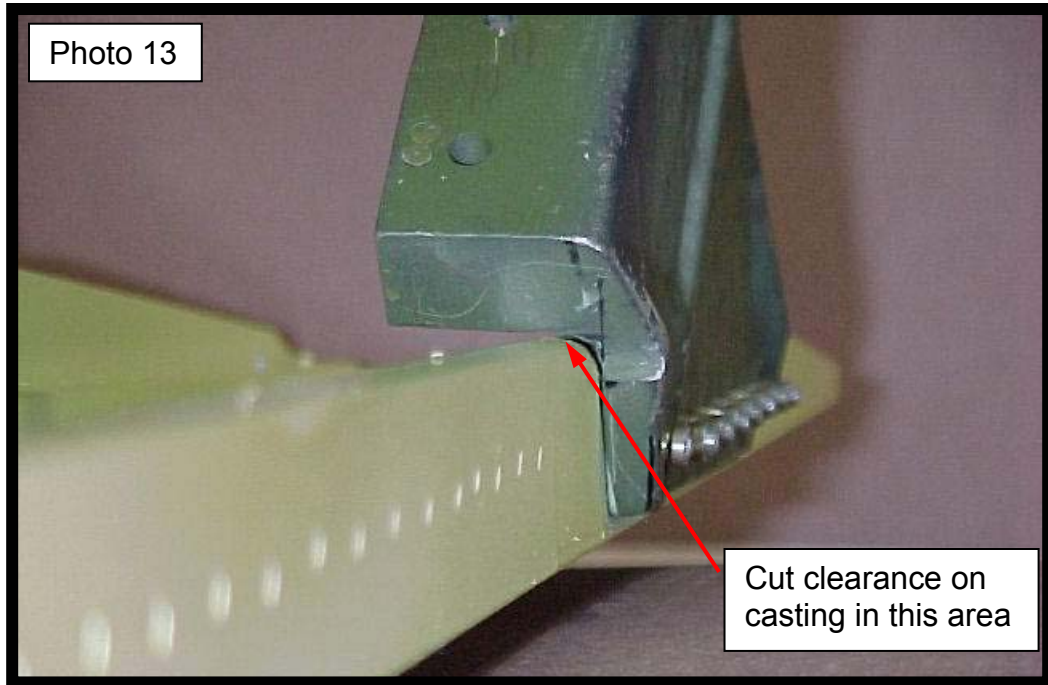


19. Install wiring harness nutplates that were removed from old spar.
20. Counter sink three (3) holes in left side spar for Hi-Lok HL20PB6-8 per drawing sheet 5. See Photo 12.



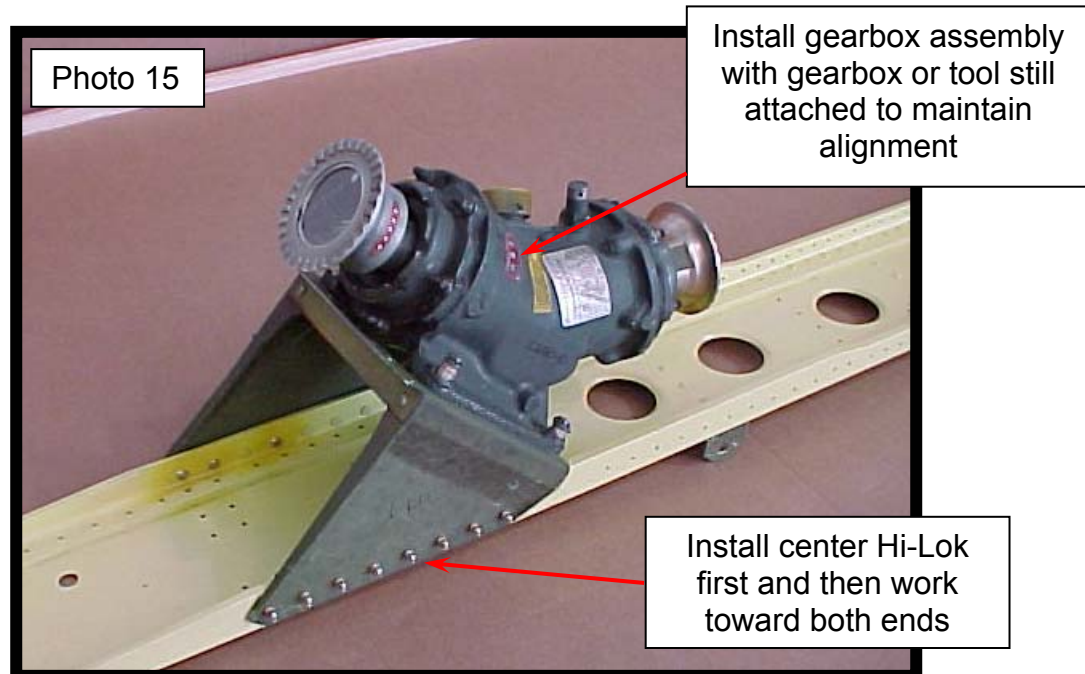
GHTI PROPRIETARY

21. Modify area on 42-degree gearbox support PN 205-031-831-2, and PN 205-031-831-4 per drawing sheet 2 view A & B. See Photos 13 and 14



GHTI PROPRIETARY

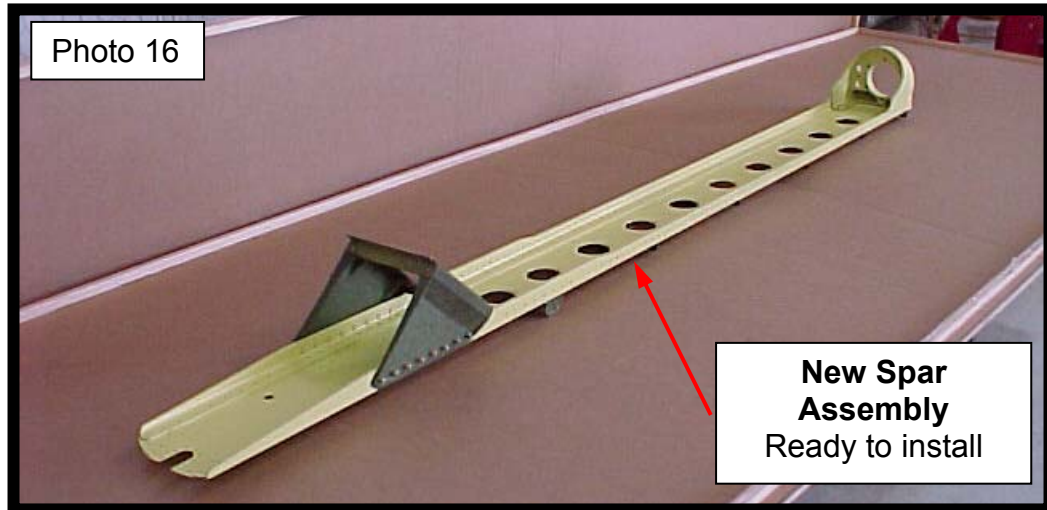
22. Install 42-degree gearbox support assembly, consisting of PN 205-030-801-7 stiffener, support PN 205-031-831, and support PN 205-031-832 with 42-degree gearbox attached. Ream holes for 42-degree gearbox support PN 205-031-831-2, and PN 205-031-831-4 and install Hi-Loks per drawing sheet 2. Insert all Hi-Loks finger tight. Tighten the center Hi-Lok first in each support casting. Tighten the rest of the Hi-Loks moving from the center, out to the edges of the casting. See Photo 15.



23. Remove 42-degree gearbox from support.
24. Clamp Dzus rail PN VTF-030-832-101 to old spar and align camlock holes. Back drill several rivet holes along Dzus rail for proper alignment of Dzus rail. Transfer holes for Dzus fasteners and rubber bumper at this time.
25. Remove Dzus camlocks from old spar.
26. Install new Dzus rail on spar and back drill remaining holes.
27. Reinstall Dzus camlocks in new Dzus rail.
28. Install new rubber bumper PN BHTI 4237 in new Dzus rail.

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PART 4 – SPAR INSTALLATION PROCEDURE: (See Photo 16)



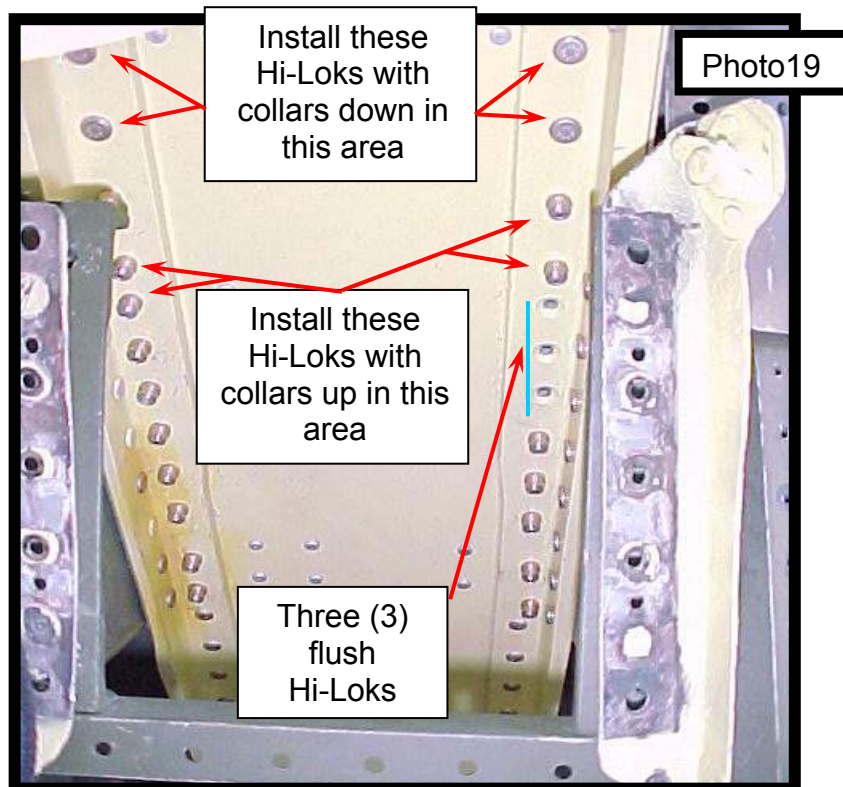
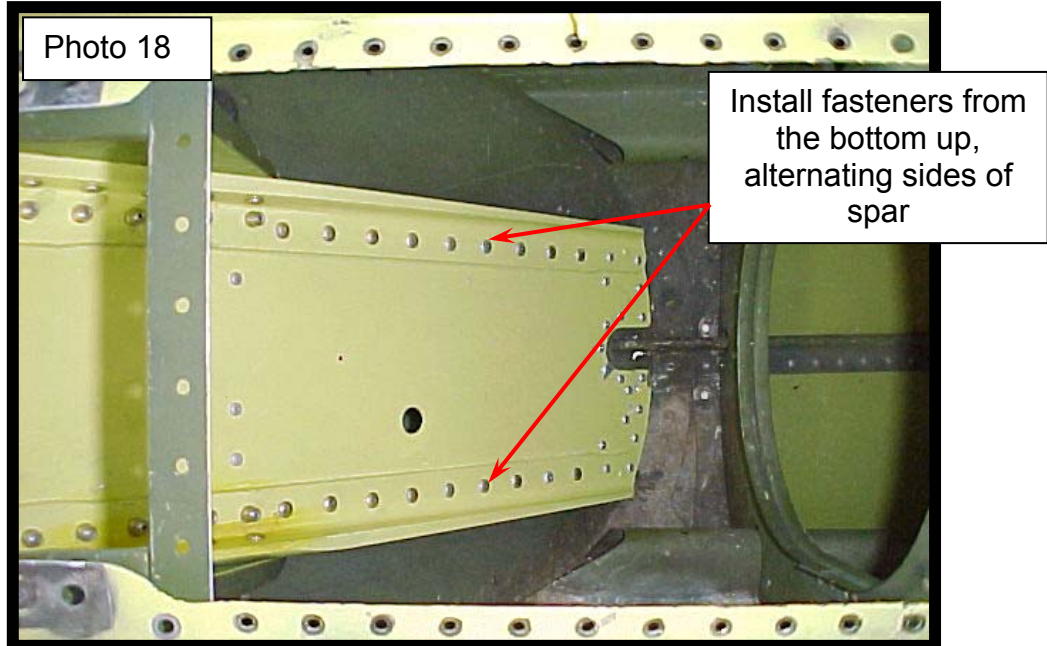
NOTE:

All holes in spar angle caps must be Drill Reamed to final size.

1. Set spar in tailboom and cleco in place starting from the bottom working your way up alternating left side / right side. (Refer back to Photos 7 and 8.)
2. Install lower pulley support PN 205-030-817 and cleco in place per detail "E", drawing sheet 5.
3. Install doubler PN 205-030-846-33 and hinge and cleco in place on right side per drawing sheet 3.
4. Install new dzus rail PN VTF-030-832-101 per drawing sheet 3. Cleco in place.
5. Install bracket PN 205-030-817 to spar per drawing sheet 5 with CR3243-4 rivets.

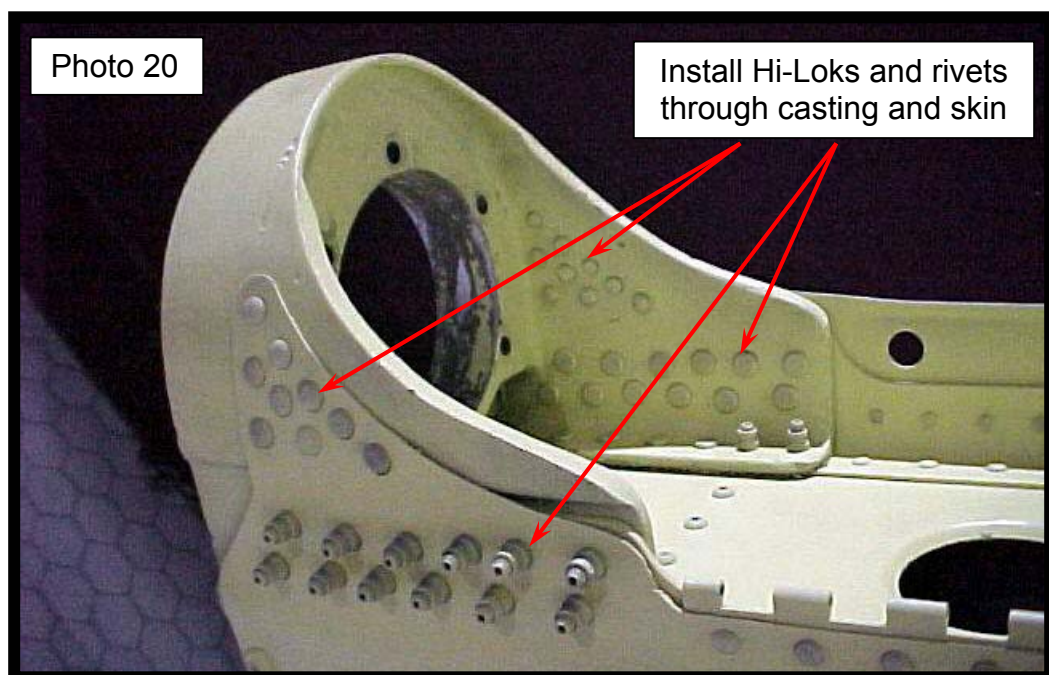
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6. Starting at the bottom of spar, install CR3243-5 rivets per sheet 5. See Photos 18 & 19.



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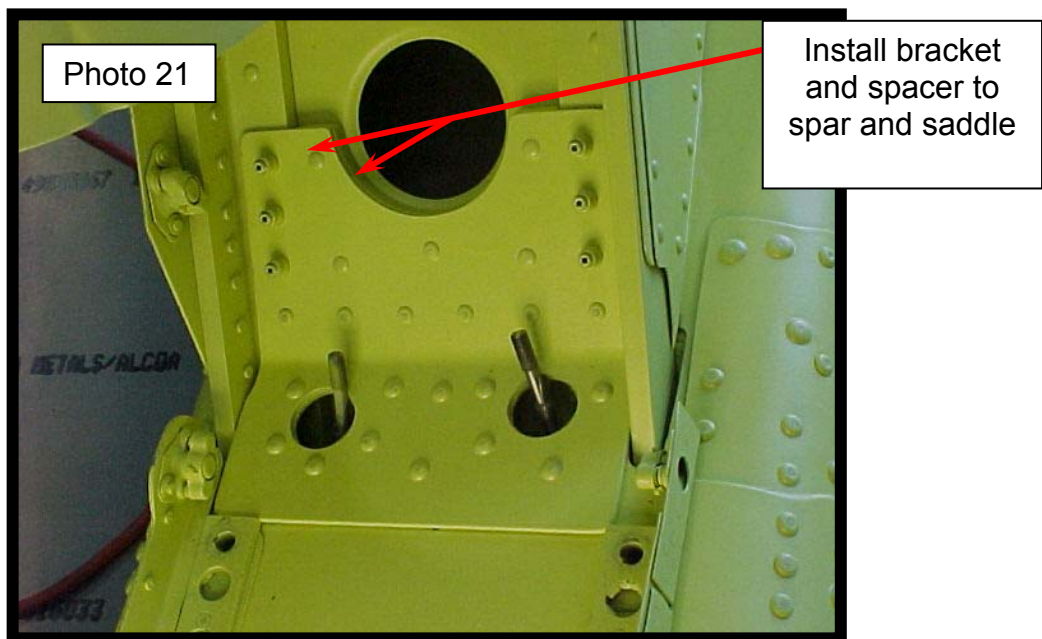
7. Install rivets per drawing sheet 5, detail "E". Hi-Lok working from the bottom up stopping at fin station 70.79 per drawing sheet 5.
8. Install CR3243-5 rivets at fin stations 59.05, 46.95, 35.10, 22.37 and Hi-Lok HL20PB6 at fin station 10.08 per drawing sheet 3.
9. Install seven (7) HL20PB6 Hi-Loks and one (1) HL20PB8 in back of 90-degree gearbox casting stiffener PN 205-030-846-27 per drawing sheet 3.
10. Install CR3243-4 rivets in left side upper vertical tailboom skin per drawing sheet 4, view "C".
11. Starting at fin station 70.79 install MS20470AD4 and MS20426AD4 rivets on left side spar cap, right side spar cap, and outer skin alternating sides as you go up per drawing sheet 4, views "C" and "D".
12. Install all remaining Hi-Loks and rivets in 90-degree gearbox casting per drawing sheet 4. See Photo 20.



**HI-LOK COLLARS MUST
FACE OUTBOARD TO CLEAR
TAILROTOR CHAIN**

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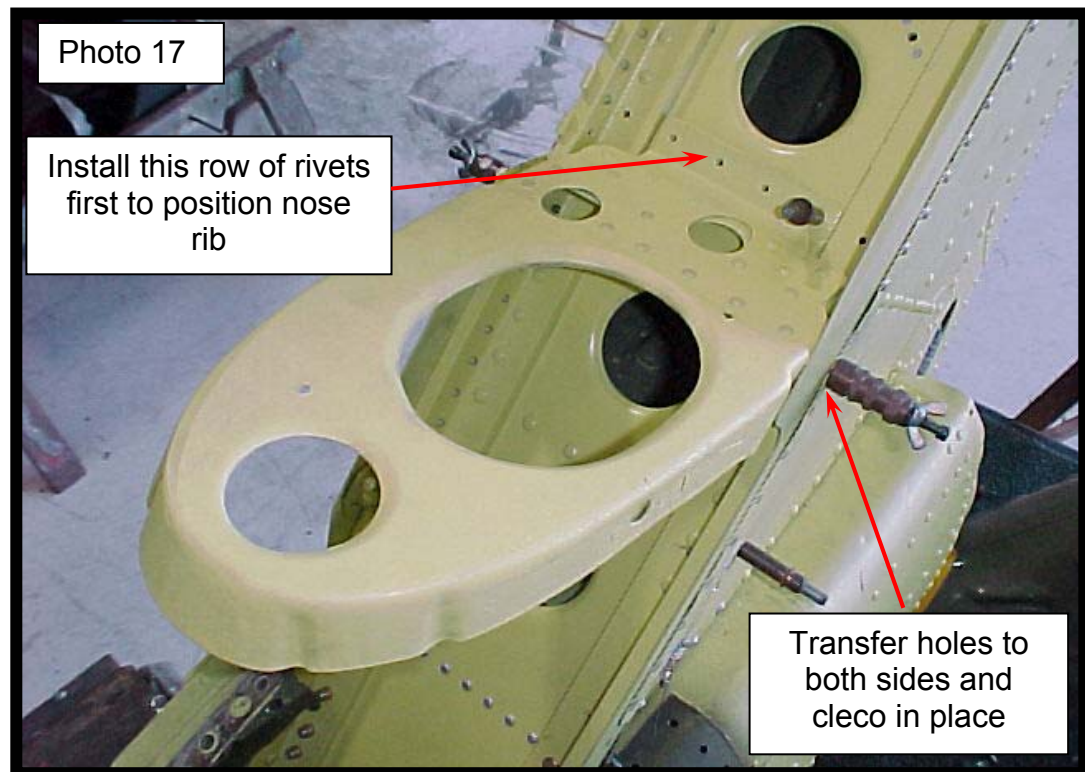
13. Install hardware lower pulley assembly with shim PN VTF-030-861 per drawing sheet 5.
14. Install proseal on outer edge of saddle. Install with clecos.
15. Rivet saddle (per removal marks for type and length of rivets) by prior measurements, and sheet 8.
16. Install drive shaft cover Dzus rails 42-degree gearbox shims as marked during the spar removal process.
17. Match drill bracket PN VTF-030-833-101 and spacer PN VTF-030-862-101, per sheet 7, detail "M" and section "L-L", deburring all holes.
18. Match ream holes in bracket and spacer. Install saddle to spar bracket PN VTF-030-833-101 and spacer PN VTF-030-862-101 using Hi-Loks and rivets per drawing sheet 7. See Photo 21.



19. Modify vertical fin rib PN 204-030-833 per drawing sheet 6.

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20. Install brackets PN VTF-030-841-101 & 102 to vertical fin nose rib PN 204-030-833 per drawing sheet 6.
21. Install vertical fin nose rib per drawing sheet 6. Transfer holes from spar to nose rib bracket PN VTF-030-841-101 and cleco in place. See Photo 17.



22. Prime Polyamide Epoxy as required per MIL-P-23377E.

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23. Reinstall wiring harness.
24. Verify tailboom alignment per the appropriate UH-1 maintenance manual, Chapter 6-166, step "a", tail rotor driveshaft alignment check.
25. Reinstall the following items per the appropriate UH-1 maintenance manual.
 - a.) 90-degree gearbox
 - b.) 42-degree gearbox
 - c.) anti-torque flight control cables
 - d.) #4 and #5 tail rotor drive shafts
 - e.) tail rotor hub and blade assembly
 - f.) vertical fin drive shaft cover
 - g.) 42-degree gearbox cover
 - h.) tail skid
 - i.) lower aft tailboom access panel
 - j.) left side and right side aft tailboom fin covers
 - k.) tail skid fairing
 - l.) upper antenna mount (if previously installed)

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VERTICAL RIB MODIFICATION
SEE DETAIL -F- PAGE 6
VERTICAL RIB INSTALLATION
SEE DETAIL -M- PAGE 7

SPAR ASSEMBLY PRIOR
TO INSTALLATION ON FIN
SEE PAGE 2

HELICOPTER MODELS WITH SHEET METAL FIN INSTALLED:

ASSEMBLY P/N 205-030-899-109
UH-1H, UH-1F, UH-1P, TH-1F, 204B

REV	INCRP. BY	APPR. BY	DATE	DER	DATE	DESCRIPTION
A	JD FINLEY	S. GARDNER	10-31-00			INCORPORATED EO# VTF-001 & VTF-004
B	JD FINLEY	B.A.S.	11-15-00			INCORPORATED EO# VTF-005
C	JD FINLEY	S. GARDNER	11-29-00			CORRECTED HARDWARE CALLOUT, SHT. 2,4
D	LT WHITE	S. GARDNER	03-26-01			INCORPORATED EO# VTF-011 AND REVISED HARDWARE
E	LT WHITE	S. GARDNER	06-06-01			REVISED NOTE 7 & ADDED NOTE 8 TO REFLECT 204B INSTALLATION MANUAL
F	JD FINLEY	<i>[Signature]</i>	<i>[Signature]</i>			SHOW BRACKET ASSY FOR CHAIN DAMPENER INSTALLED ON 204B ONLY, SHT. 3 & 5 INCORPORATED EO# VTF-030-800-EOE1

VTF-030-800-001, SPAR, FORWARD,
VERTICAL FIN INSTALLATION

NOTES:

- DO NOT SCALE DRAWING.
- PARTS REMOVED AND REINSTALLED.
- MAY BE PURCHASED FROM CHERRY A DIVISION OF TEXTRON, INC. SANTA ANA, CA 92707
- WHEN PERFORMING DRILLING, RIVETING OR CUTTING, OPERATIONS, EXERCISE CARE TO PREVENT DAMAGE TO ADJACENT STRUCTURE AND EQUIPMENT.
- FOLLOWING ANY CUTTING OR DRILLING OPERATION, REMOVE ALL BURRS AND METAL PARTICLES, APPLY A THIN COAT OF UNREDUCED ZINC CHROMATE OR EPOXY POLYAMIDE PRIMER TO EXPOSED METAL SURFACES TO ADJACENT STRUCTURE AND EQUIPMENT.
- PAINT AS REQUIRED TO MATCH TAILBOOM
- FOR UH-1H, F, P, & TH-1F, THESE PARTS ARE TO BE INSTALLED IN ACCORDANCE WITH VERTICAL FIN FORWARD SPAR REPLACEMENT INSTALLATION INSTRUCTIONS MANUAL NO. GHT-VTF-099-UH1.
- FOR 204B, THESE PARTS ARE TO BE INSTALLED IN ACCORDANCE WITH VERTICAL FIN FORWARD SPAR REPLACEMENT INSTALLATION INSTRUCTIONS MANUAL NO. GHT-VTF-099-204B.

**GHTI
RELEASED**
Date 4/15/08

3	NAS173885-4	RIVET
2	NAS173885-3	RIVET
A/R	890-B2 (PROSEAL)	PER GHTI-S-8802
10	RF5-5	SPACER
5	MS21048-3	NUT PLATE
4	MS21042L4	NUT
2	MS21042L3	NUT
7	MS21075L4	NUT
1	MS20470AD5-11	RIVET
6	MS20470AD5-8	RIVET
22	MS20470AD5-7	RIVET
20	MS20470AD5-6	RIVET
28	MS20470AD5-5	RIVET
20	MS20470AD5-4	RIVET
32	MS20470AD4-10	RIVET
50	MS20470AD4-9	RIVET
∅	VTF-030-800-001	SPAR, FORWARD, VERTICAL FIN INSTALLATION
-001	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION

REQD.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	REQD.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION
18	MS20470AD4-8	RIVET			
14	MS20470AD4-7.5	RIVET			
13	MS20470AD4-7	RIVET			
19	MS20470AD4-6.5	RIVET			
102	MS20470AD4-5	RIVET			
28	MS20470AD4-4.5	RIVET			
22	MS20470AD4-4	RIVET			
4	MS20426AD4-9	RIVET			
2	MS20426AD5-10	RIVET			
11	MS20426AD4-11	RIVET			
4	MS20426AD4-8	RIVET			
2	MS20426AD4-5	RIVET			
2	MS20426AD3-8	RIVET			
12	MS20426AD3-6	RIVET			
14	MS20426AD3-4	RIVET			
1	HL86PB8	COLLAR (HI-LOC)			
96	HL87PB8	COLLAR (HI-LOC)			
3	HL65PB8-8	PIN (HI-LOC)			
1	HL20PB8-4	PIN (HI-LOC)			
32	HL64PB8-8	PIN (HI-LOC)			
43	HL64PB8-7	PIN (HI-LOC)			
2	HL64PB8-6	PIN (HI-LOC)			
12	HL64PB8-5	PIN (HI-LOC)			
7	HL64PB8-4	PIN (HI-LOC)			
1	CR3243-5-10	RIVET			
1	CR3243-5-08	RIVET			
8	CR3243-5-07	RIVET			
4	CR3243-5-06	RIVET			
8	CR3243-5-05	RIVET			
39	CR3243-5-04	RIVET			
80	CR3243-5-03	RIVET			
3	CR3243-4-09	RIVET			
4	CR3243-4-05	RIVET			
70	CR3243-4-04	RIVET			
2	CR3243-4-03	RIVET			
3	CR3242-5-10	RIVET			
3	CR3242-5-08	RIVET			
4	CR3242-4-09	RIVET			
2	CR3242-4-03	RIVET			
6	CR3213-4-09	RIVET			
11	AN960PD416	WASHER			
4	AN960PD10	WASHER			
2	AN3-6A	BOLT			
2	AN4-11A	BOLT			
5	AN4-7A	BOLT			
1	205-031-832-4	SUPPORT			
1	205-031-831-2	SUPPORT			
1	205-030-846-45	DOUBLER			
1	205-030-846-33	HINGE			
1	205-030-846-31	FILLER			
1	205-030-846-29	BRACKET			
1	205-030-846-27	STIFFENER			
1	205-030-846-21	STIFFENER			
4	205-030-846-19	STIFFENER			
1	205-030-833	NOSE RIB			
1	205-030-801-7	STIFFENER, CONNECT			
1	205-001-109	PULLEY ASSY			
1	204-030-828	FITTING, SUPPORT TAIL ROTOR DRIVE			
1	204-001-825	PULLEY ASSY			
1	BHT1 90-009-1	LOOP, FOOTMAN			
6	BHT1 4237	BUMPER			
1	VTF-030-875-101	SUPPORT, CABLE DAMPENER			
1	VTF-030-862-101	SPACER, SADDLE BRACKET			
1	VTF-030-861-101	SPACER, LOWER PULLEY ASSY.			
1	VTF-030-860-101	SPACER, UPPER PULLEY ASSY.			
1	VTF-030-846-101	SPAR, FORWARD, VERTICAL FIN			
1	VTF-030-841-102	BRACKET, NOSE RIB R/H			
1	VTF-030-841-101	BRACKET, NOSE RIB L/H			
1	VTF-030-833-101	BRACKET, SADDLE TO SPAR			
1	VTF-030-832-101	DZUS RAIL			
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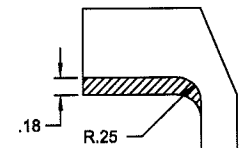
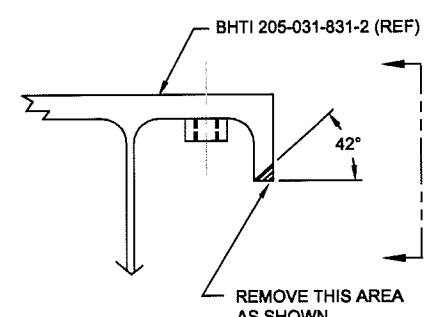
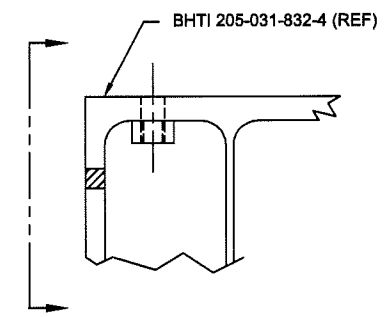
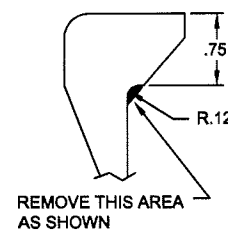
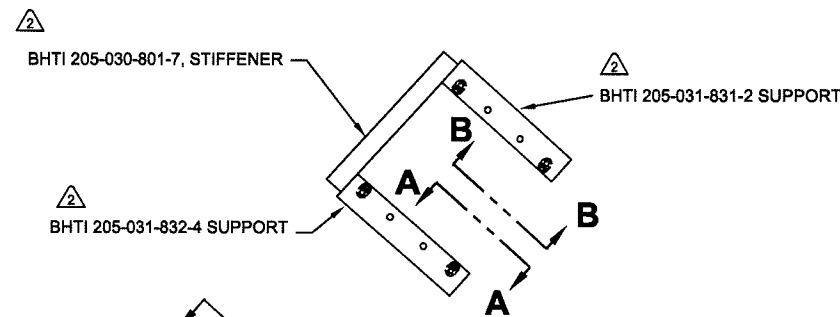
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 UNLESS OTHERWISE SPECIFIED: 1. BREAK ALL SHARP EDGES .002 ± OR .015 ± 2. ALL PALETTE MARK .500

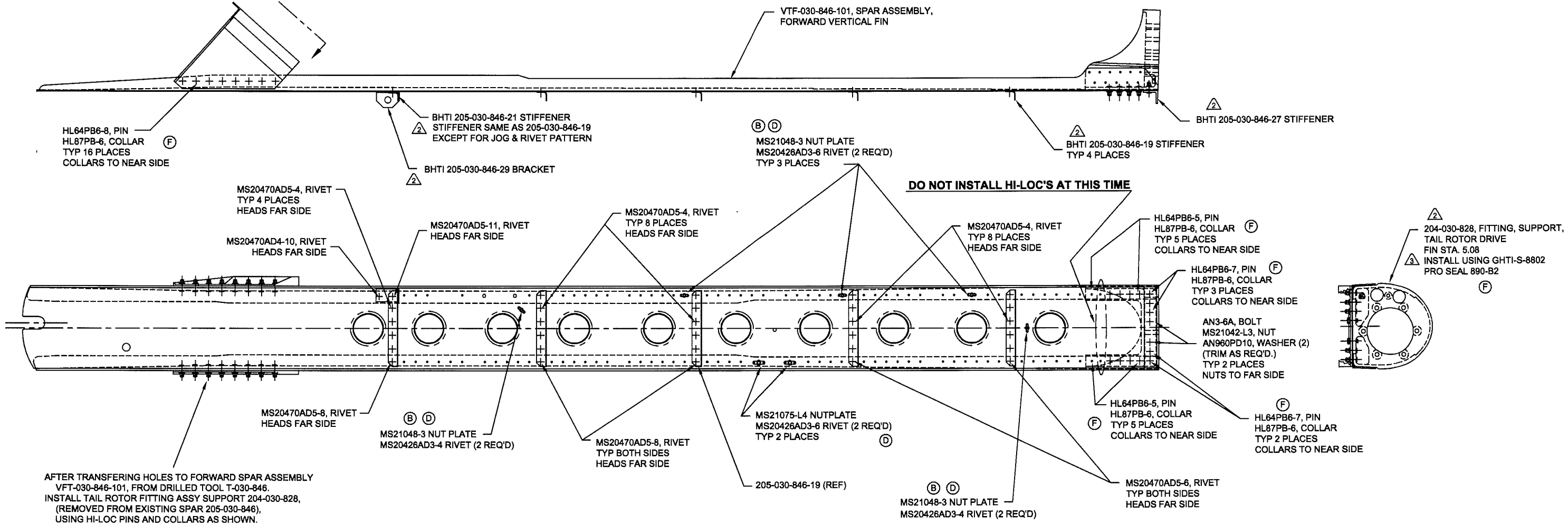
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 REV: F SHEET: 1 OF 9



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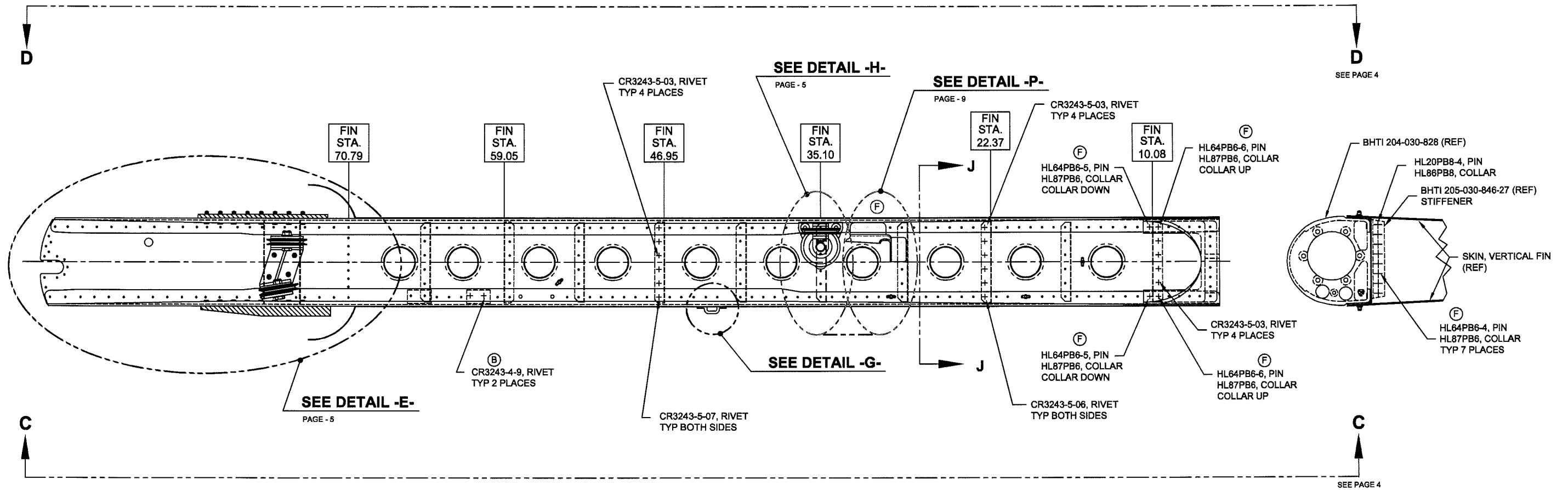


AFTER TRANSFERRING HOLES TO FORWARD SPAR ASSEMBLY VFT-030-846-101, FROM DRILLED TOOL T-030-846, INSTALL TAIL ROTOR FITTING ASSY SUPPORT 204-030-828, (REMOVED FROM EXISTING SPAR 205-030-846), USING HI-LOC PINS AND COLLARS AS SHOWN.
 INSTALL 42° GEAR BOX SUPPORTS CONSISTING OF:
 205-030-801-7 STIFFENER,
 205-031-831 SUPPORT
 (AFTER MODIFICATION SHOWN ABOVE)
 AND 205-031-832 SUPPORT,
 (AFTER MODIFICATION SHOWN ABOVE)
 (REMOVED FROM EXISTING SPAR 205-030-846)
 USING HI-LOC PINS AND COLLARS AS SHOWN.
 INSTALL 42° GEAR BOX SUPPORT AS AN ASSEMBLY,
 WITH GEARBOX SIMULATOR OR GEARBOX INSTALLED
 TO MAINTAIN PROPER ORIENTATION.
 INSTALL BRACKETS 205-030-846-29 AND
 STIFFENERS 205-030-846-19 AND -21 AND -27
 (REMOVED FROM EXISTING SPAR 205-030-846)
 USING FASTENERS CALLED OUT ABOVE.

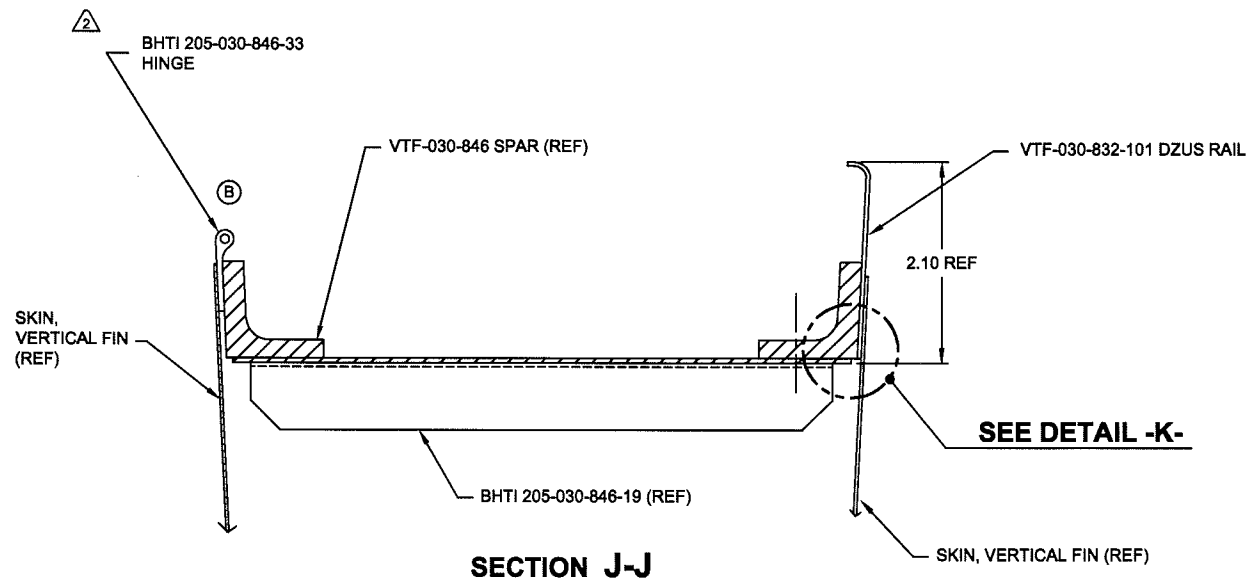
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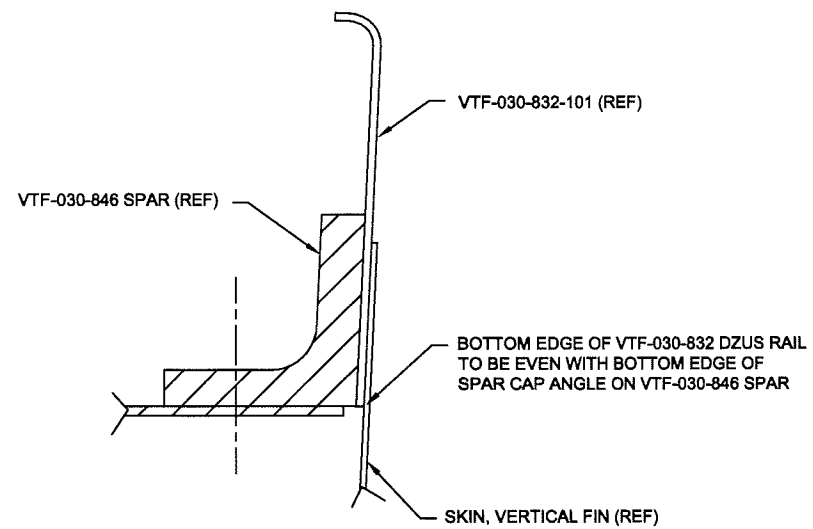
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PROJ. ENGR. S. GARDNER	DATE 10-31-00	DRAWING NUMBER VTF-030-800	REV F	SHEET 2 OF 9



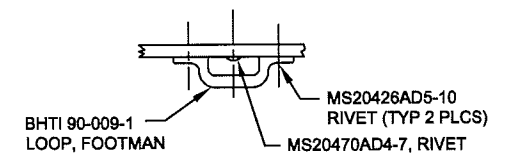
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SECTION J-J

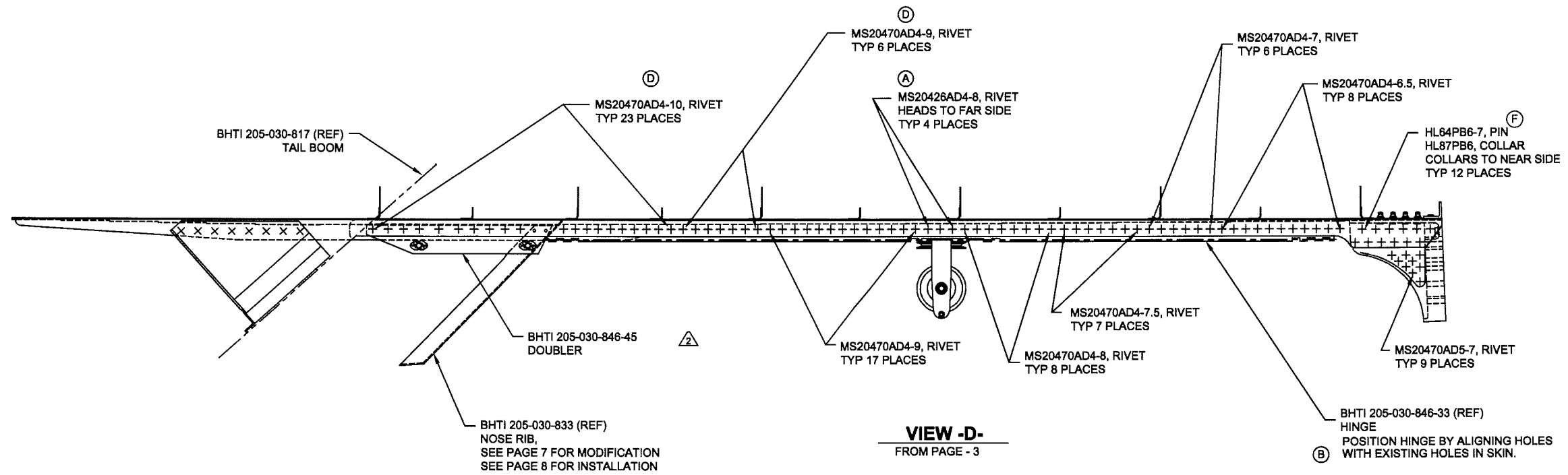


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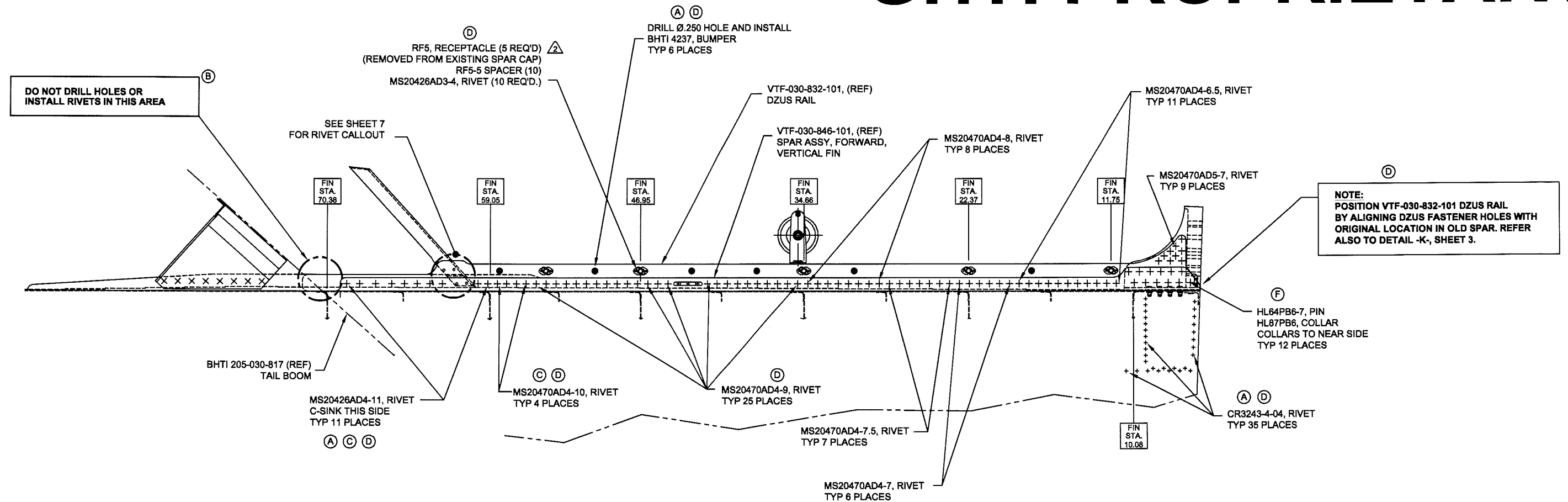
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DER	DATE		



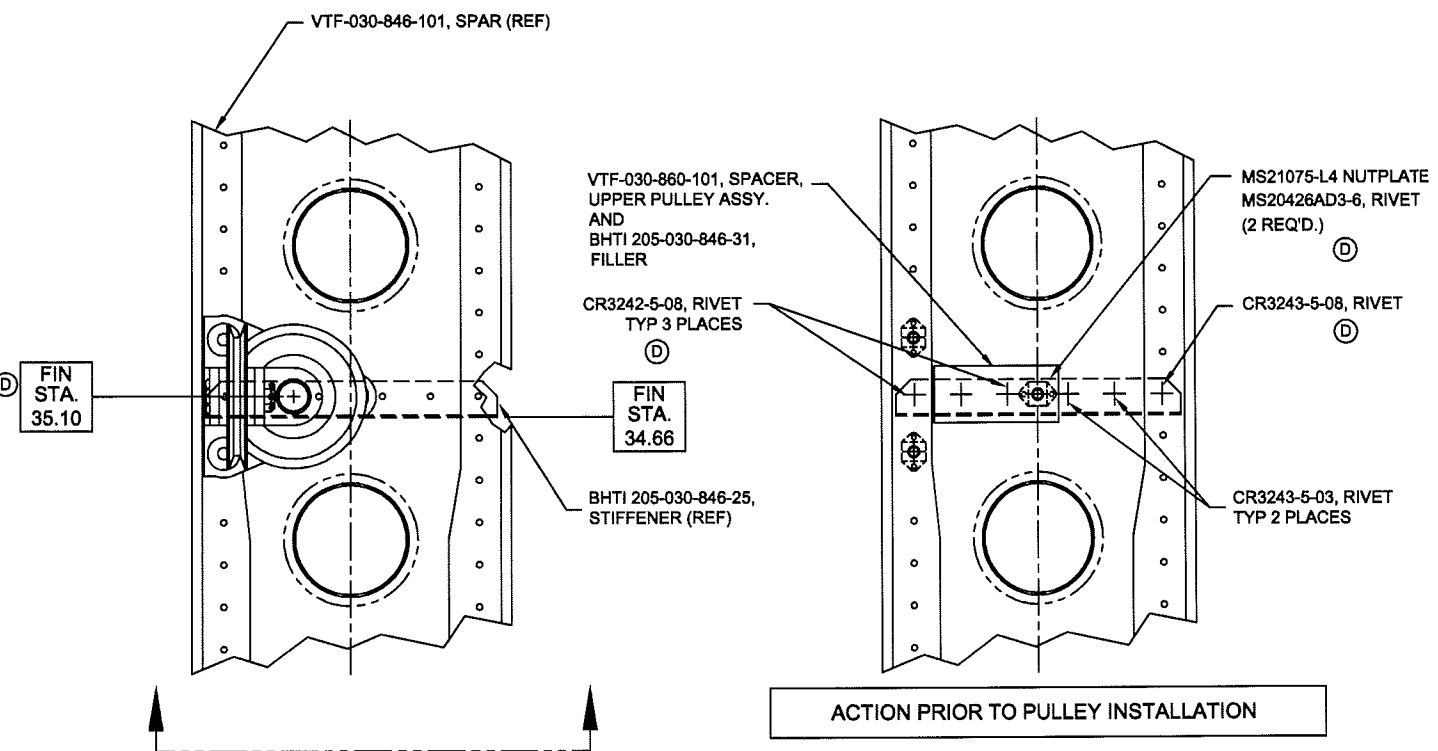
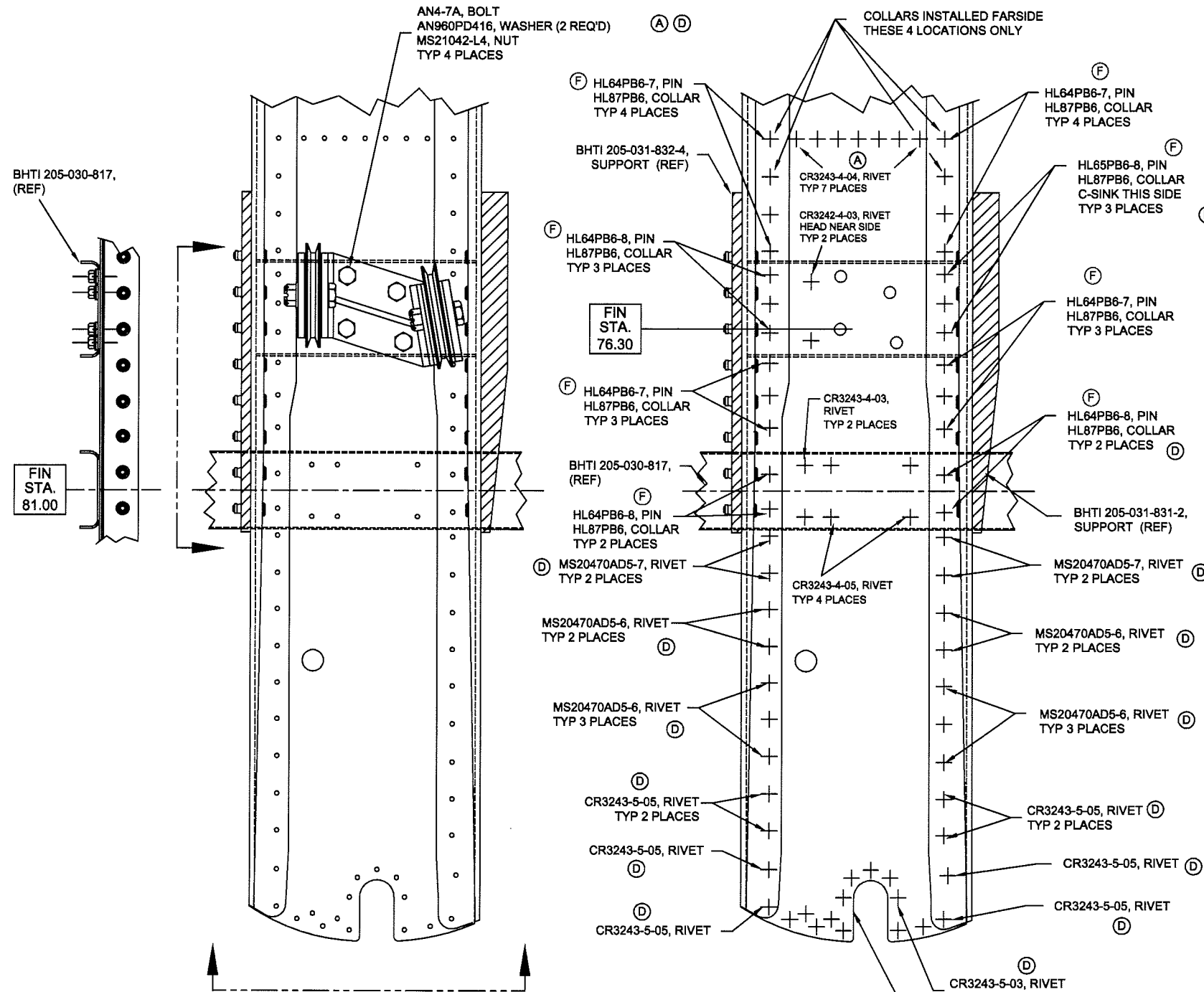
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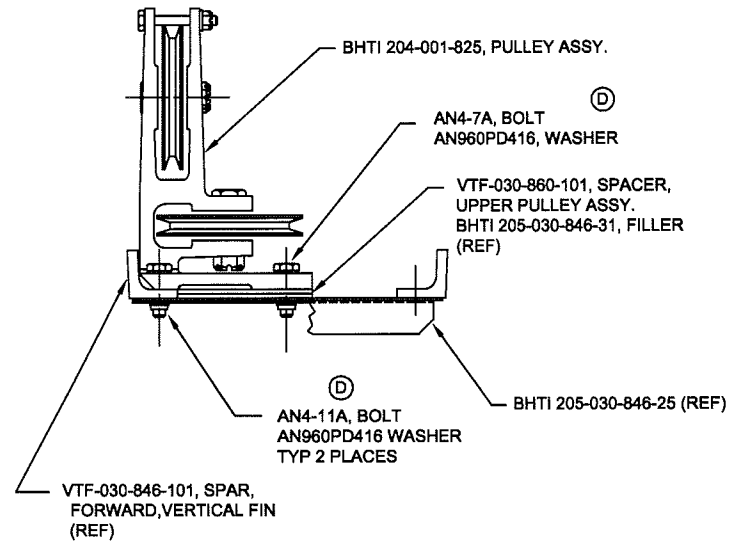


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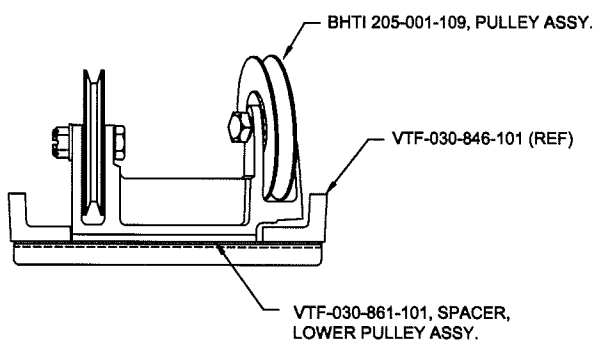
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PROJ. ENG. S. GARDNER	DATE 10-31-00	DRAWING NUMBER		REV F	
DER	DATE	VTF-030-800		SHEET 4 OF 9	



ACTION PRIOR TO PULLEY INSTALLATION



DETAIL -H-
FROM PAGE 3

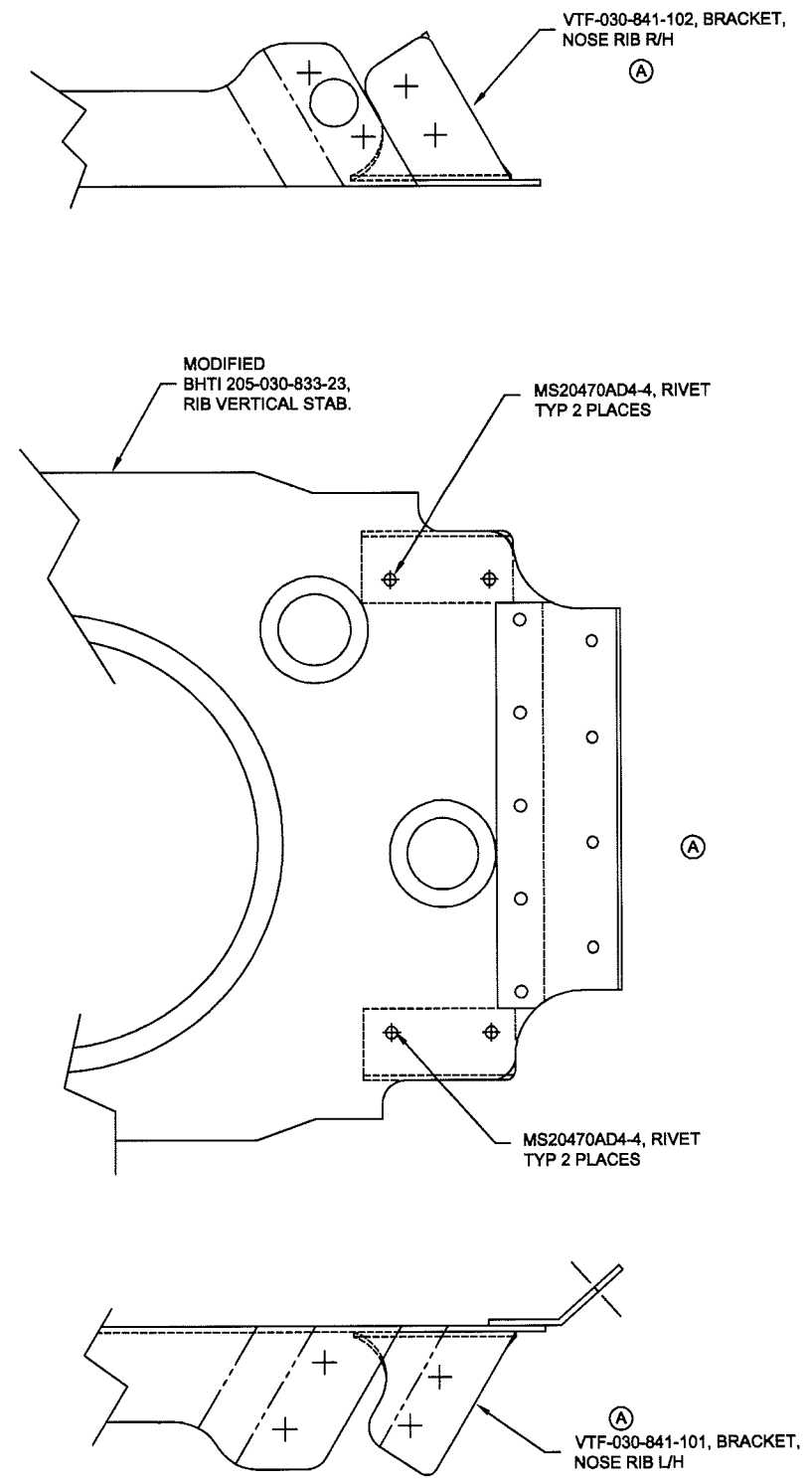
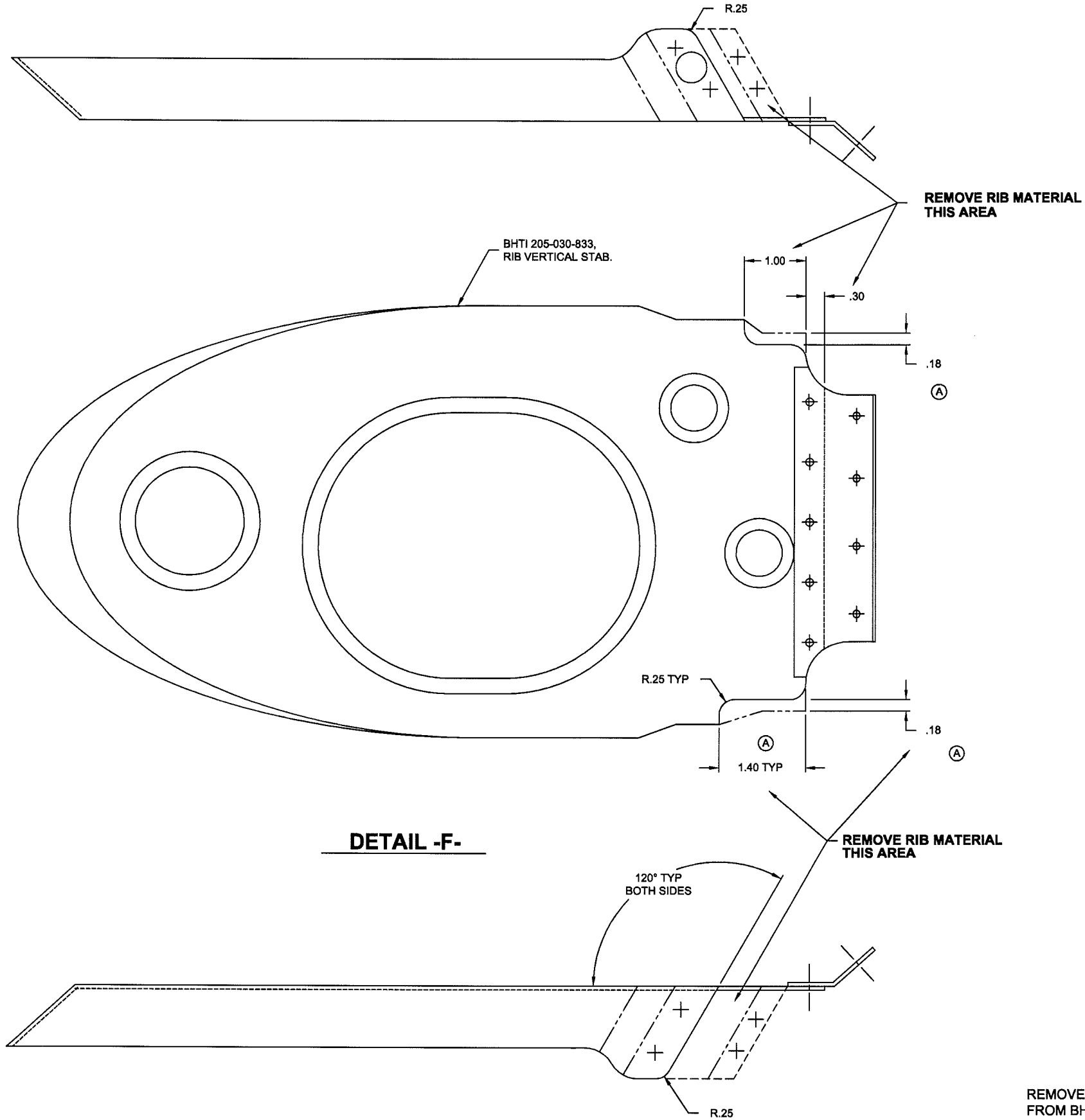


DETAIL -E-
FROM PAGE 3

42° GEAR BOX SUPPORT
DELETED FOR CLARITY

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CHECKED BY		DATE		TITLE		SHEET	
PROJ. ENG. S. GARDNER		DATE 10-31-00		SPAR, FORWARD, VERTICAL FIN INSTALLATION		5 OF 9	
DER		DATE		DRAWING NUMBER		REV F	
				VTF-030-800			



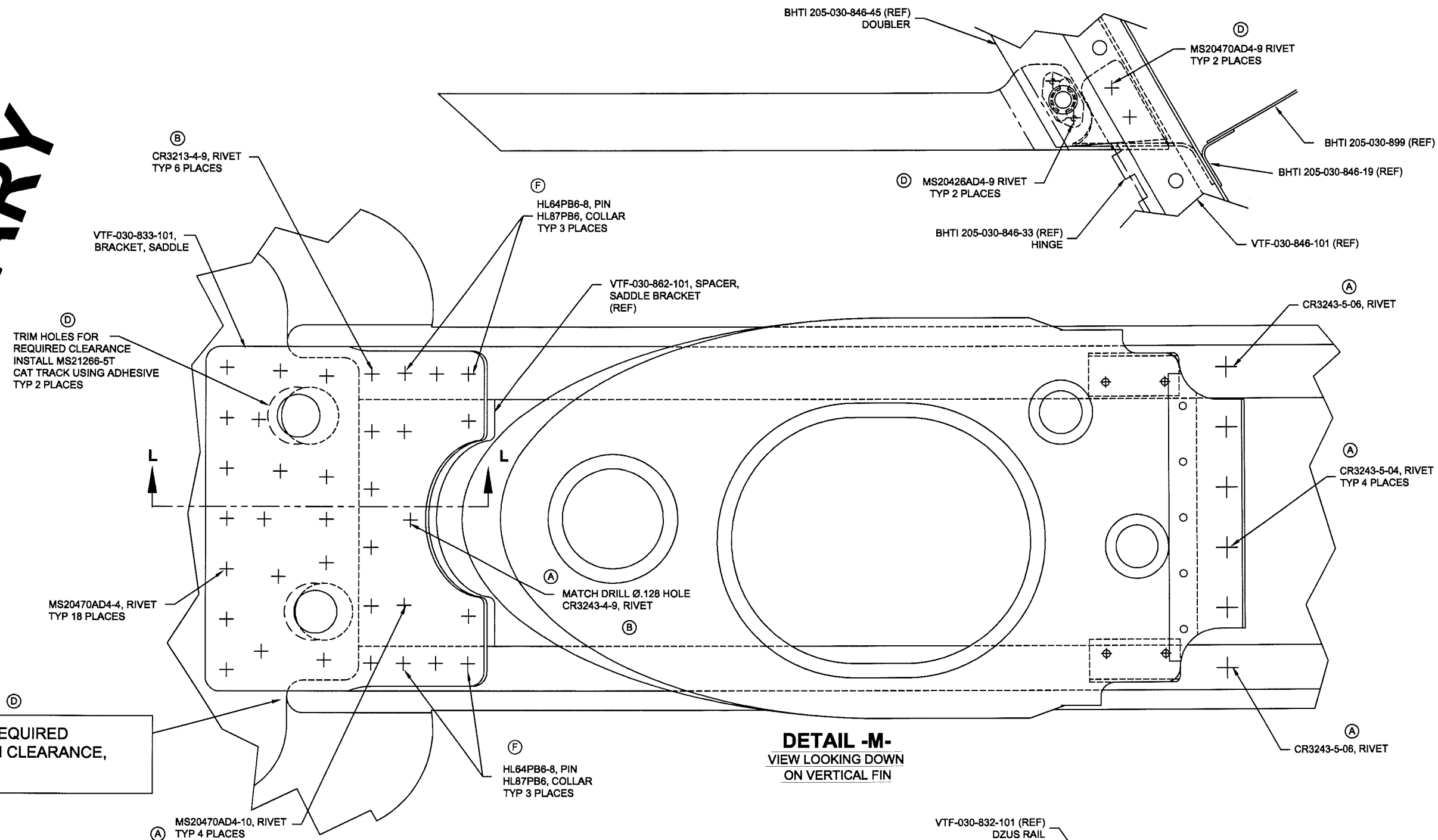
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REMOVE BHTI 205-030-833-23 RIB, VERTICAL STABILIZER FROM BHTI 205-030-846 SPAR ASSY. MODIFY RIB AS SHOWN.

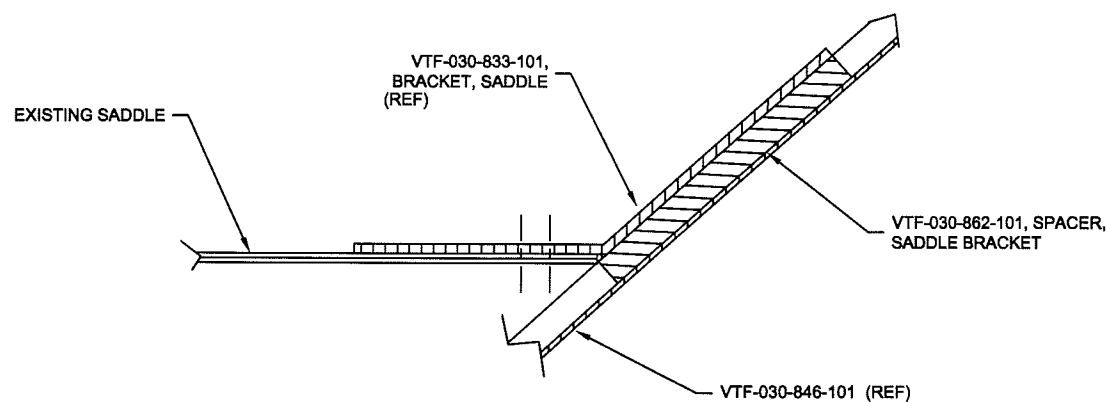
VERTICAL RIB MODIFICATION

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PROJ. ENGR. S. GARDNER	DATE 10-31-00		
DER	DATE		

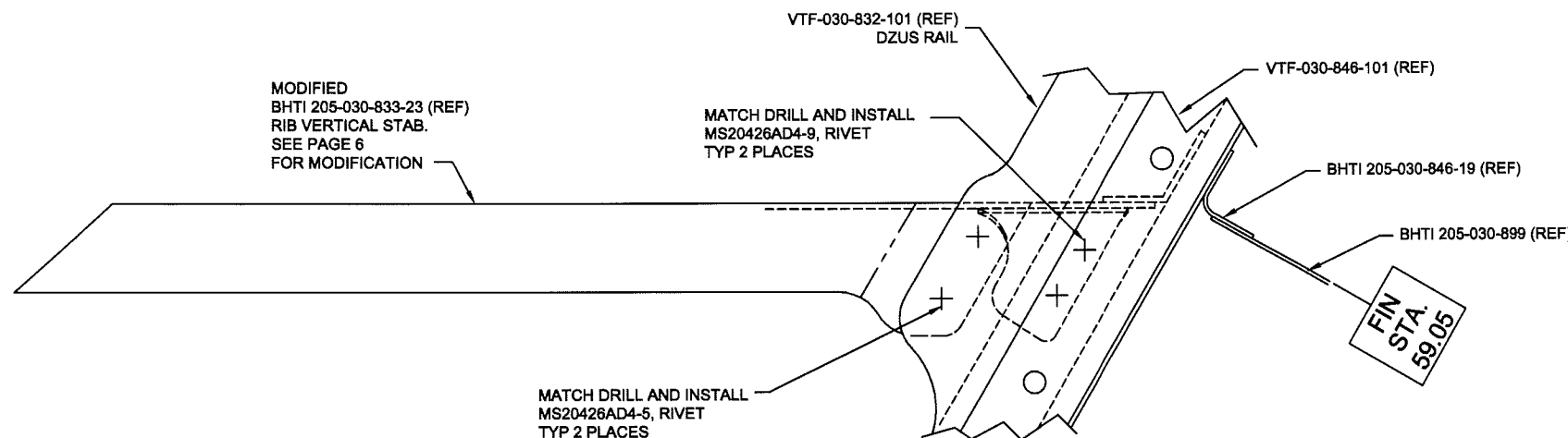
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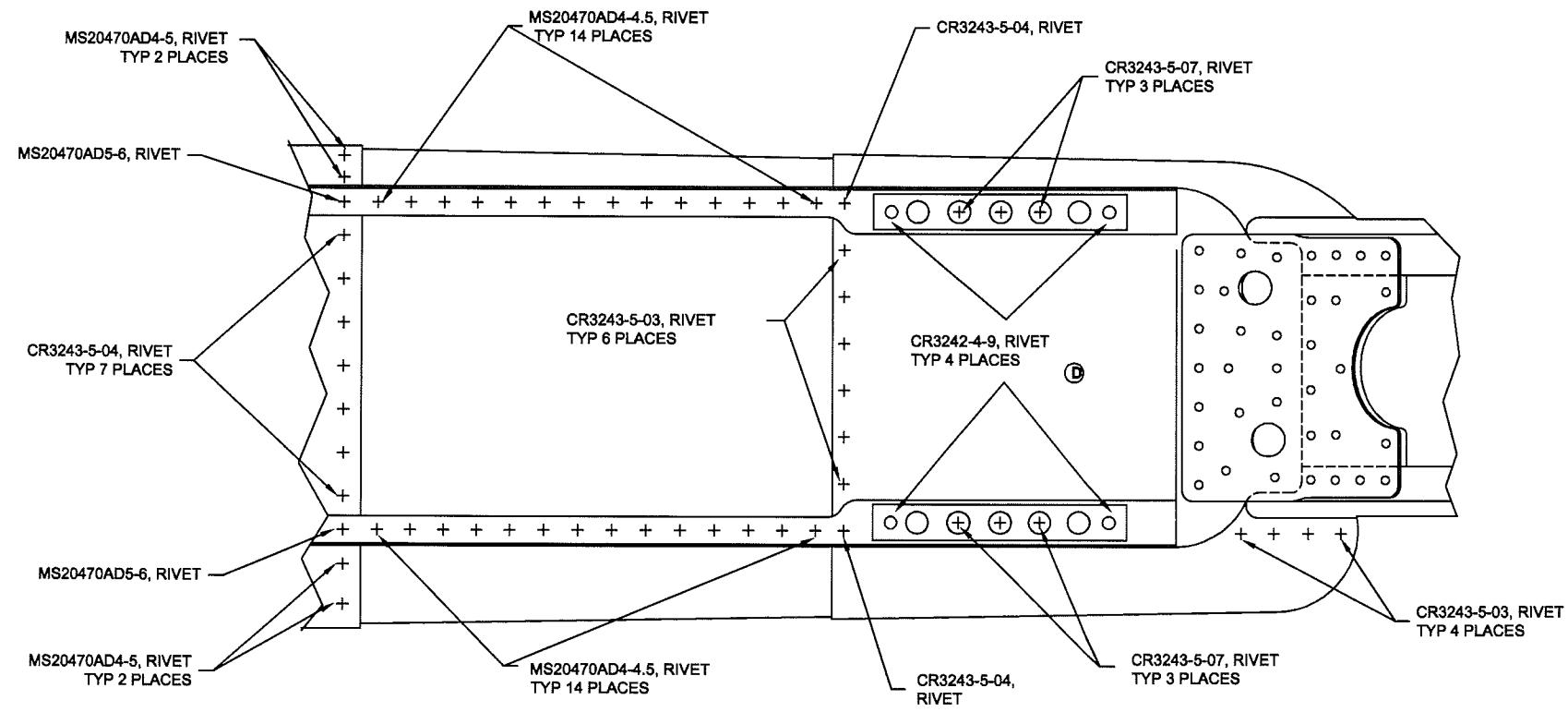
DETAIL -M-
VIEW LOOKING DOWN
ON VERTICAL FIN



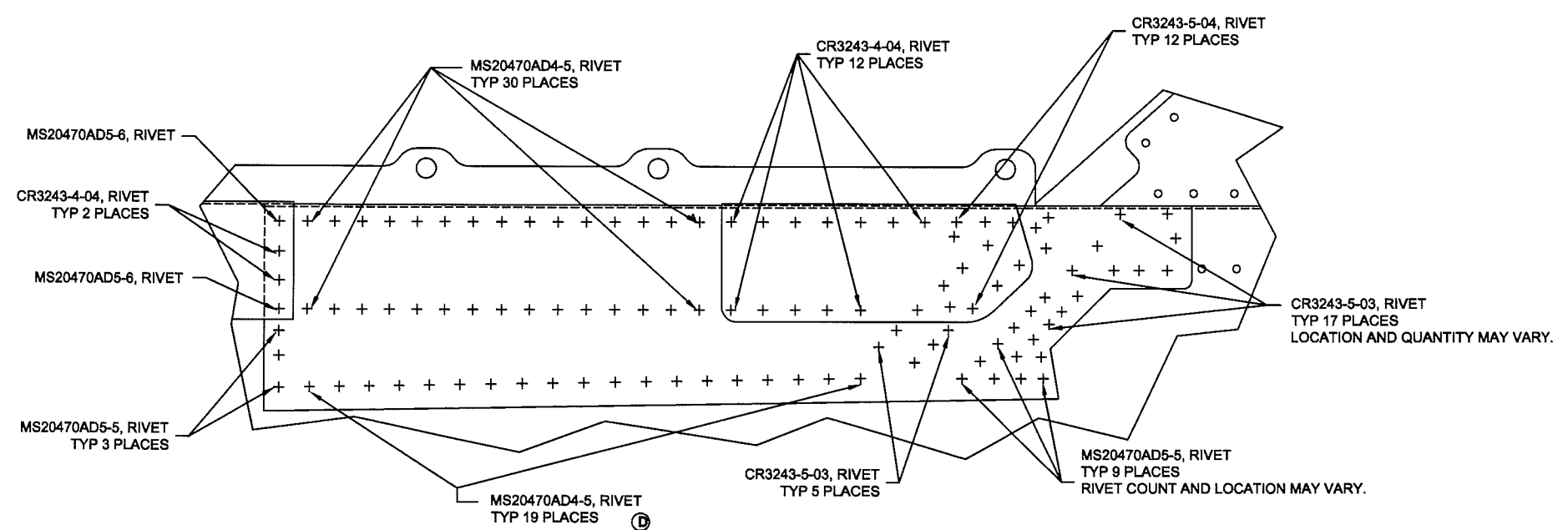
SECTION L-L



DRAWN BY J.D. FINLEY	DATE	 GLOBAL HELICOPTER TECHNOLOGY INC. ARLINGTON, TEXAS	TITLE SPAR, FORWARD VERTICAL FIN INSTALLATION	SCALE 1 = 1
CHECKED BY	DATE		DRAWING NUMBER VTF-030-800	REV F
PROJ. ENG. S. GARDNER	DATE 10-31-00			
DER	DATE			



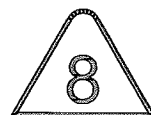
GHTI PROPRIETARY



LEFT SIDE OF TAIL BOOM (SHOWN)
RIGHT SIDE OF TAIL BOOM (TYP)

USE MS20470AD RIVETS FOR THE ASSEMBLY OF SKINS ON TAILBOOM AT LOCATIONS WHERE RIVETS CAN BE BUCKED AND RIVET HOLES HAVE NOT BEEN ENLARGED.

DRAWN BY J.D. FINLEY	DATE	GHTI	GLOBAL HELICOPTER TECHNOLOGY INC.	
CHECKED BY	DATE		ARLINGTON, TEXAS	
PRJL ENGR S. GARDNER	DATE 10-31-00	TITLE SPAR, FORWARD, VERTICAL FIN INSTALLATION	REV F	SCALE 1 = 2 SHEET 8 OF 9
DER	DATE	DRAWING NUMBER VTF-030-800		



MODIFICATION FOR 204B ONLY

205-001-782-102 SUPPORT,
205-001-780 BRACKET AND
205-001-781 DAMPER ASSY
OMITTED FOR CLARITY
(REF)
REMOVE AND MODIFY PER
INSTALLATION INSTRUCTIONS P/N
GHT-VTF-099-204B REV. B
APPENDIX A PARA. 1-9
REINSTALL MODIFIED PART PER
INSTALLATION INSTRUCTIONS P/N
GHT-VTF-099-204B REV. B
APPENDIX A PARA. 10

INSTALL
NAS1738B5-4 RIVET
TYP 3 PLACES

VTF-030-875-101 SUPPORT
CABLE DAMPENER

REMOVE AD RIVETS AND INSTALL
SUPPORT WITH NAS1738B5-3 RIVETS
USING EXISTING RIVET LOCATION

BELL ASSEMBLY P/N 205-001-782 SUPPORT
TO BE MODIFIED

UP

MS20470AD5 RIVETS
TYP 3 PLACES

VTF-030-875-101 SUPPORT
CABLE DAMPENER REF



F

DETAIL -P-

FROM PAGE 3

P/N: 205-001-782-102 SUPPORT ASSEMBLY (CABLE DAMPENER SUPPORT)
THIS MODIFICATION IS ONLY APPLICABLE TO BELL P/N 205-001-782-102 WHEN
INSTALLED ON A GHTI VERTICAL FIN SPAR P/N GHT-VTF-099-204B FOR A
BELL 204B MODEL AIRCRAFT.

GHTI PROPRIETARY

		GLOBAL HELICOPTER TECHNOLOGY INC.	
		ARLINGTON, TEXAS	
TITLE	SPAR, FORWARD, VERTICAL FIN INSTALLATION	SCALE	1 = 1
DRAWING NUMBER	VTF-030-800	REV	F
		SHEET	9 OF 9