

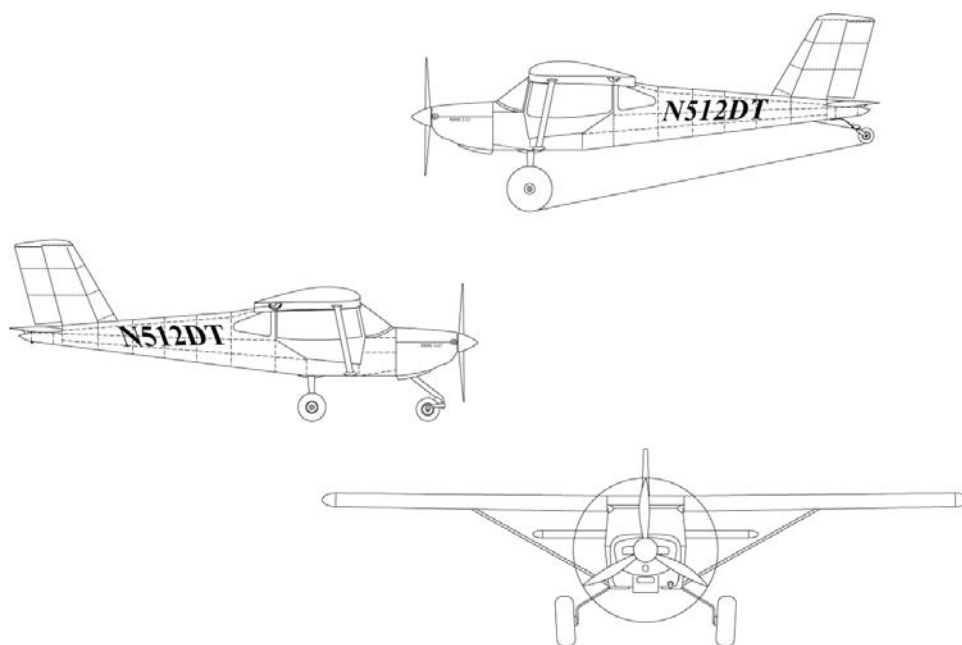
RANS

AIRCRAFT



S-21 OUTBOUND

FIGURES MANUAL

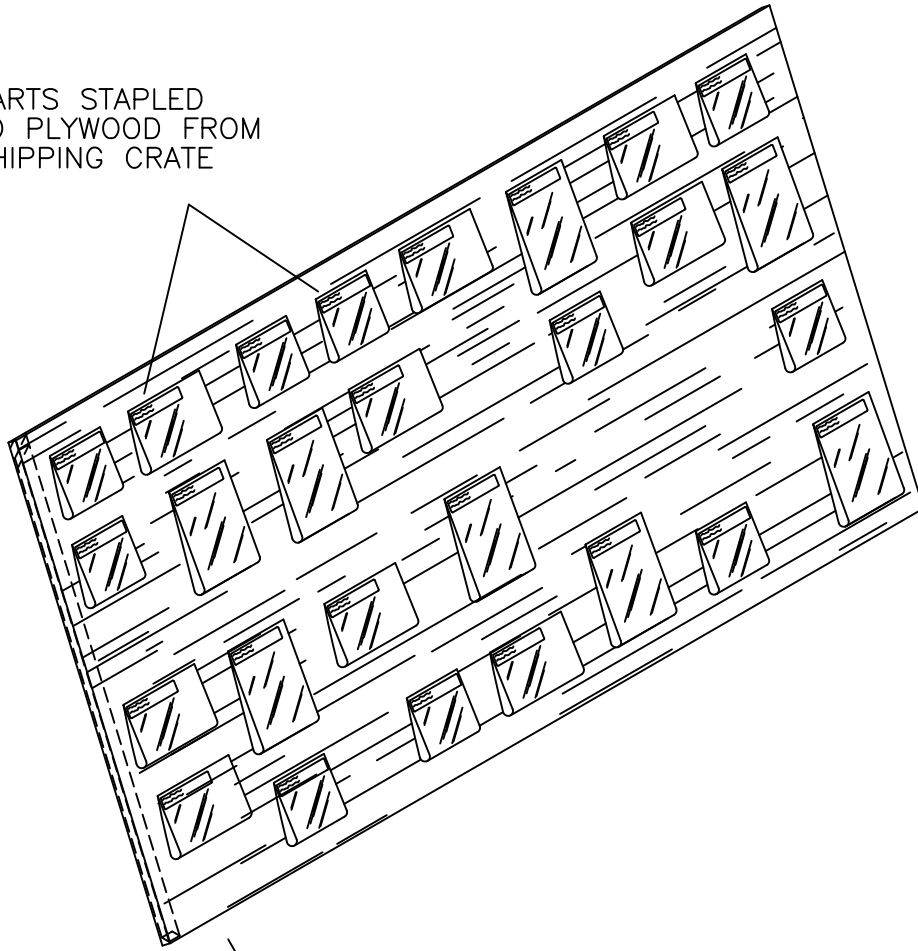


Serial Number: _____

Registration Number: _____

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RANS DESIGNS
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WWW.RANS.COM

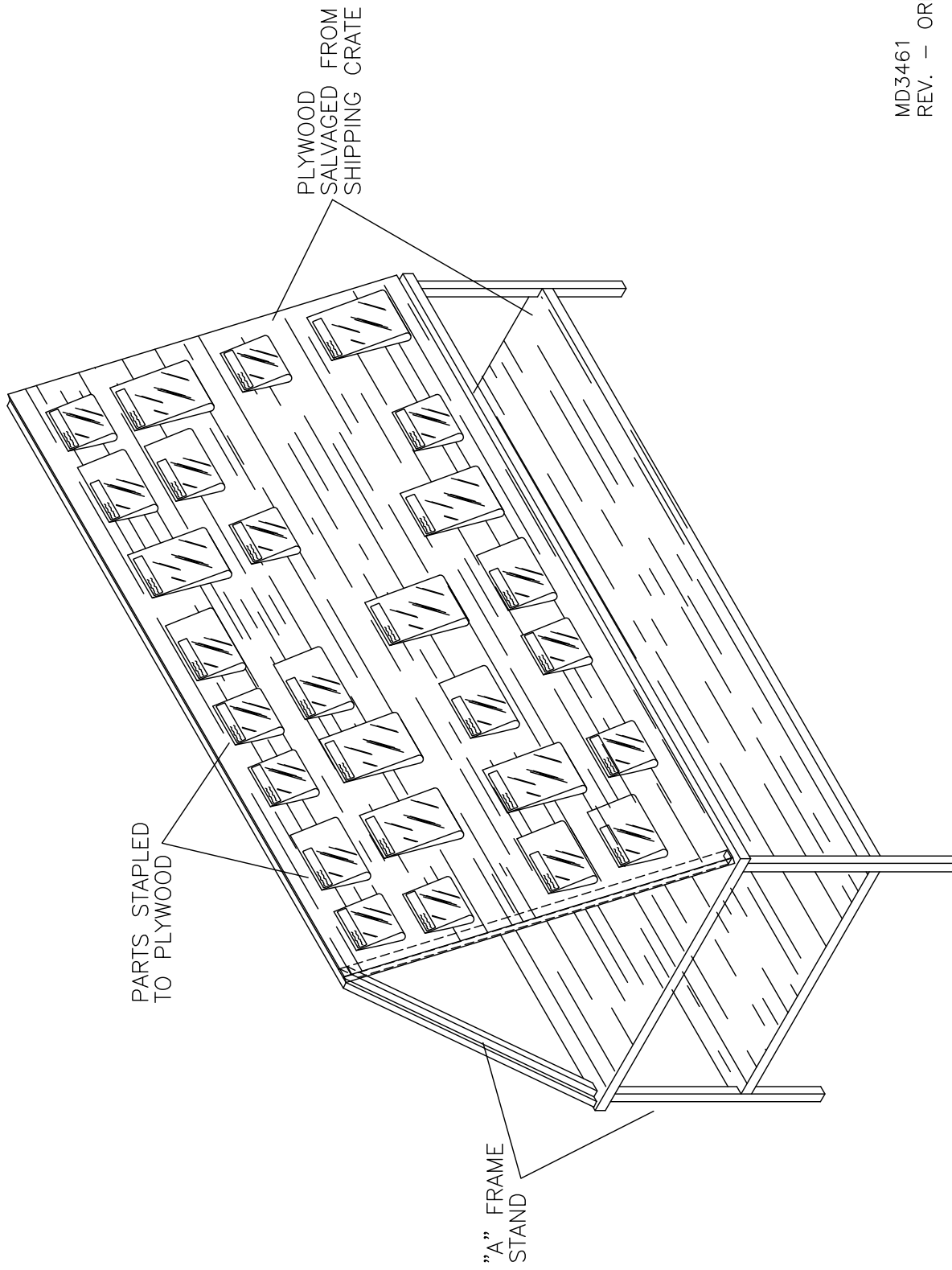
PARTS STAPLED
TO PLYWOOD FROM
SHIPPING CRATE



NAIL BOARD TO
SHOP WALL

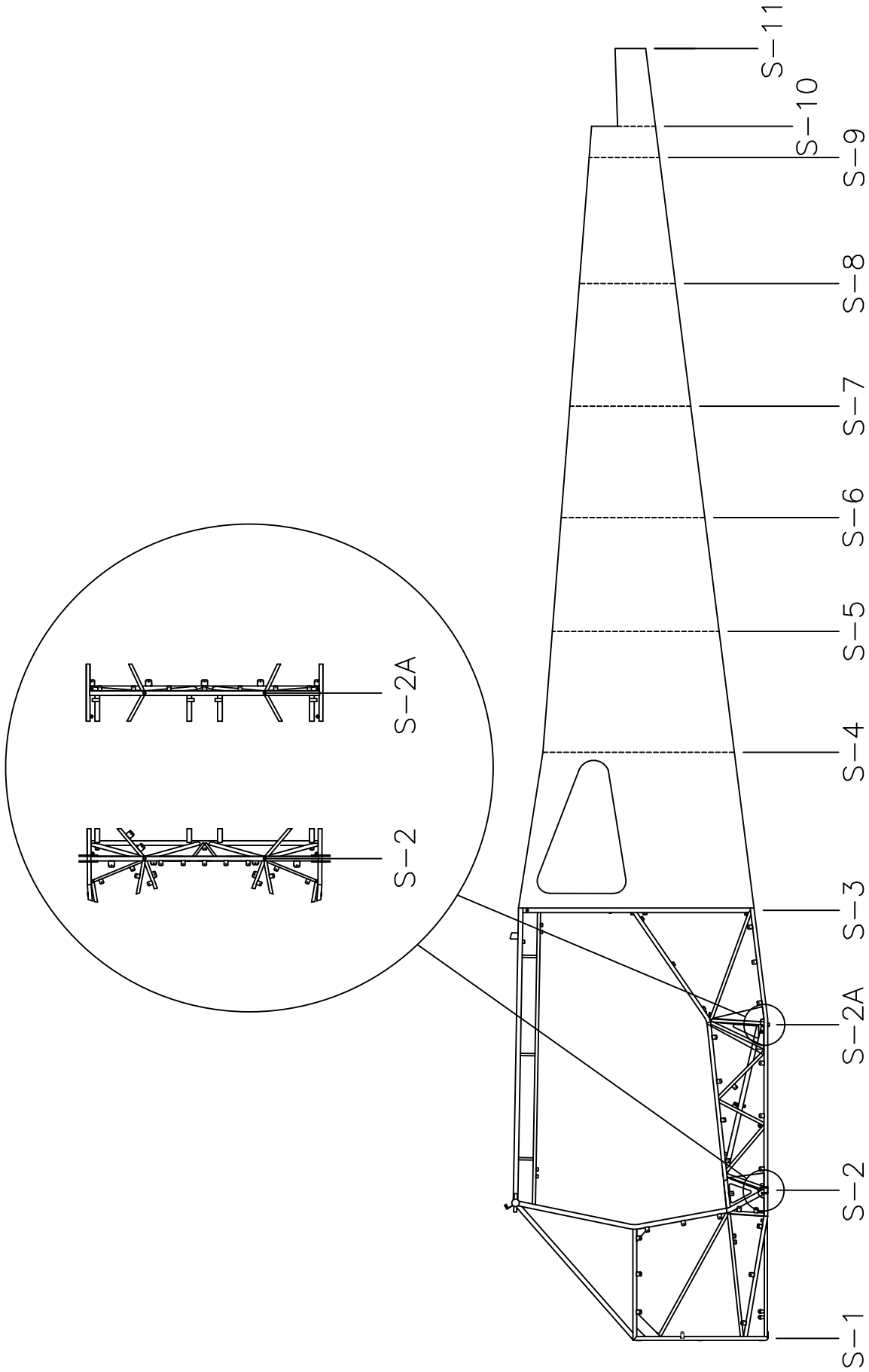
MD4363

**RANS S-21 OUTBOUND
PARTS ORGANIZATION
FIGURE 00-01**



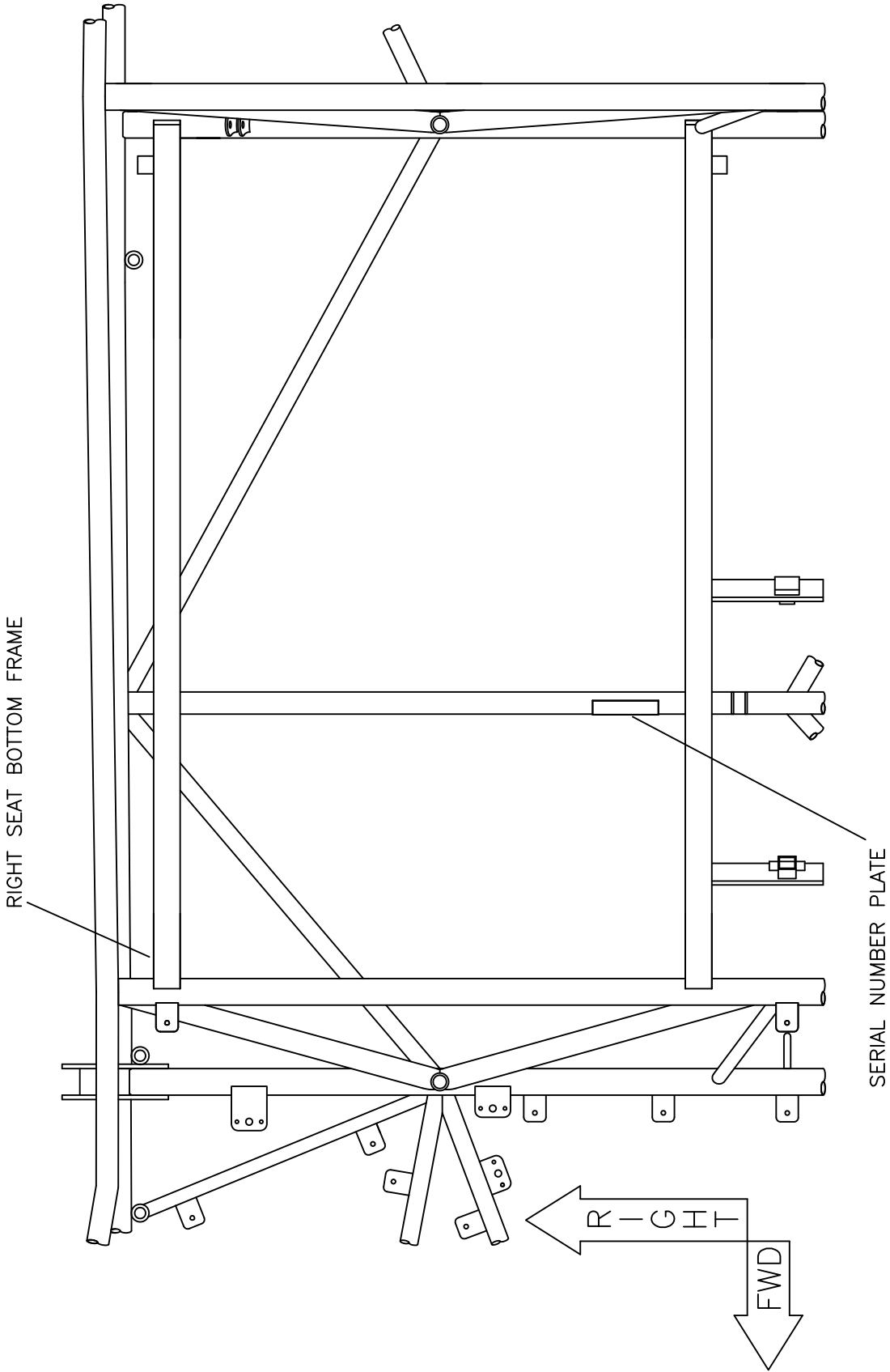
MD3461
REV. - ORIG

**RAMS S-21 OUTBOUND
PARTS INVENTORY "A" FRAME
FIGURE 00-01A**



RRR S-21 OUTBOUND
 FUSELAGE STATION IDENTIFICATION
 FIGURE 00-02

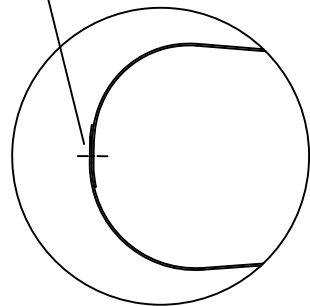
MD5601



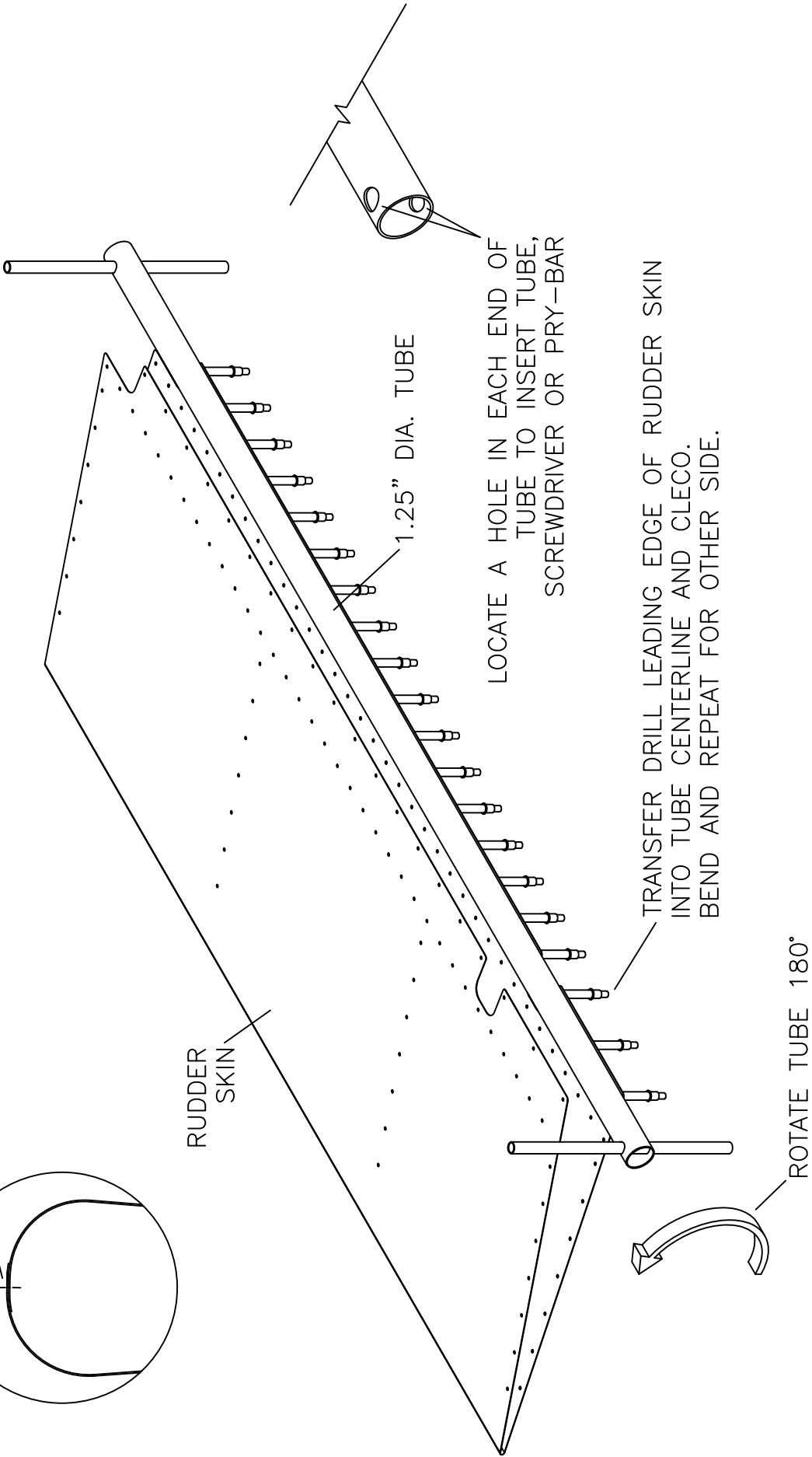
MD5602
REV. - ORIG

RAMROB S-21 OUTBOUND
SERIAL NUMBER PLATE LOCATION
FIGURE 00-03

BEND BOTH SIDES TOWARD EACH OTHER.
ALIGN LEADING EDGE RIVET HOLES.



RUDDER
SKIN



1.25" DIA. TUBE

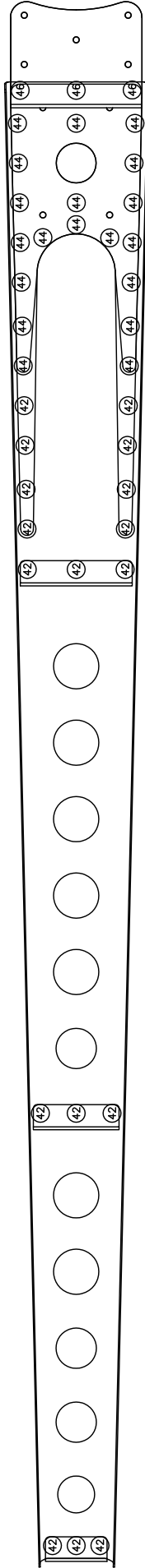
LOCATE A HOLE IN EACH END OF
TUBE TO INSERT TUBE,
SCREWDRIVER OR PRY-BAR

TRANSFER DRILL LEADING EDGE OF RUDDER SKIN
INTO TUBE CENTERLINE AND CLECO.
BEND AND REPEAT FOR OTHER SIDE.

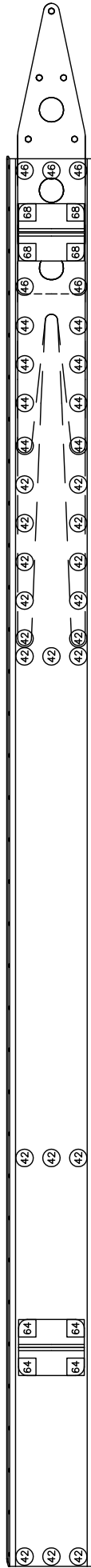
ROTATE TUBE 180°

RAMS S-21 OUTBOUND
RUDDER SKIN FORMING
FIGURE 02-01

FWD SPAR ASSEMBLY



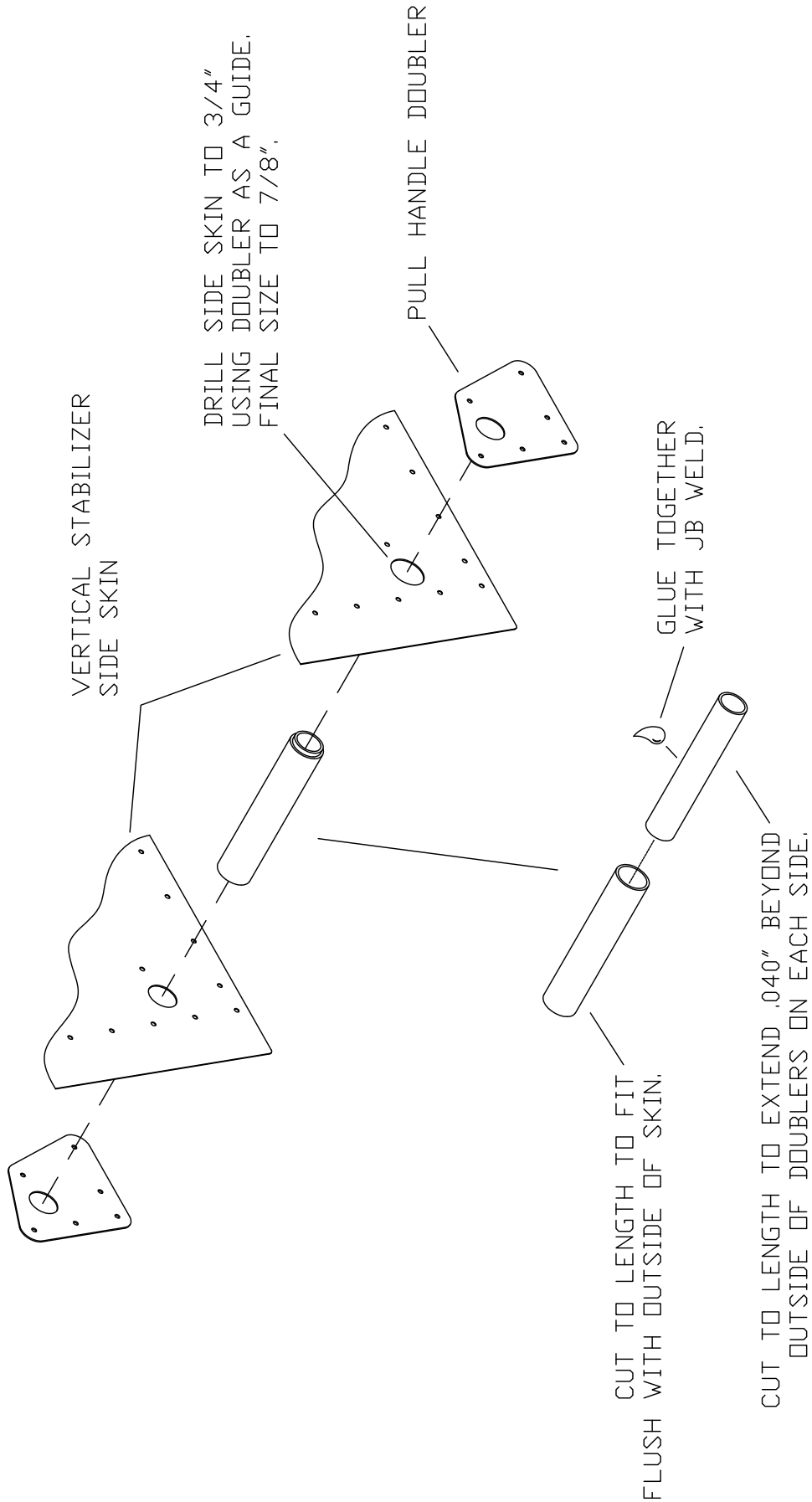
AFT SPAR ASSEMBLY



RIVET LEGEND	
6X	CCPQ-6X
42	AAPQ-4X

RRR S-21 OUTBOUND
 VERTICAL STABILIZER SPAR RIVETING
 FIGURE 003-03

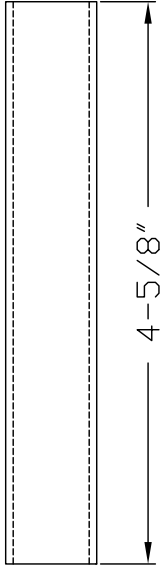
MD5654
 REV. A



MD5651
REV. A

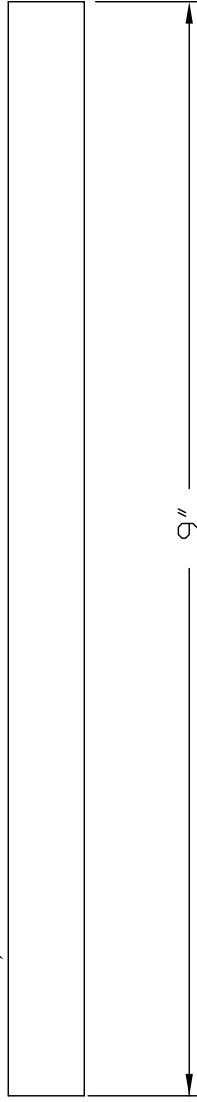
RRAMES S-21 OUTBOUND
PULL HANDLE - VERTICAL STAB INSTALLATION
FIGURE 003-04

KAAC0106-2



4-5/8"

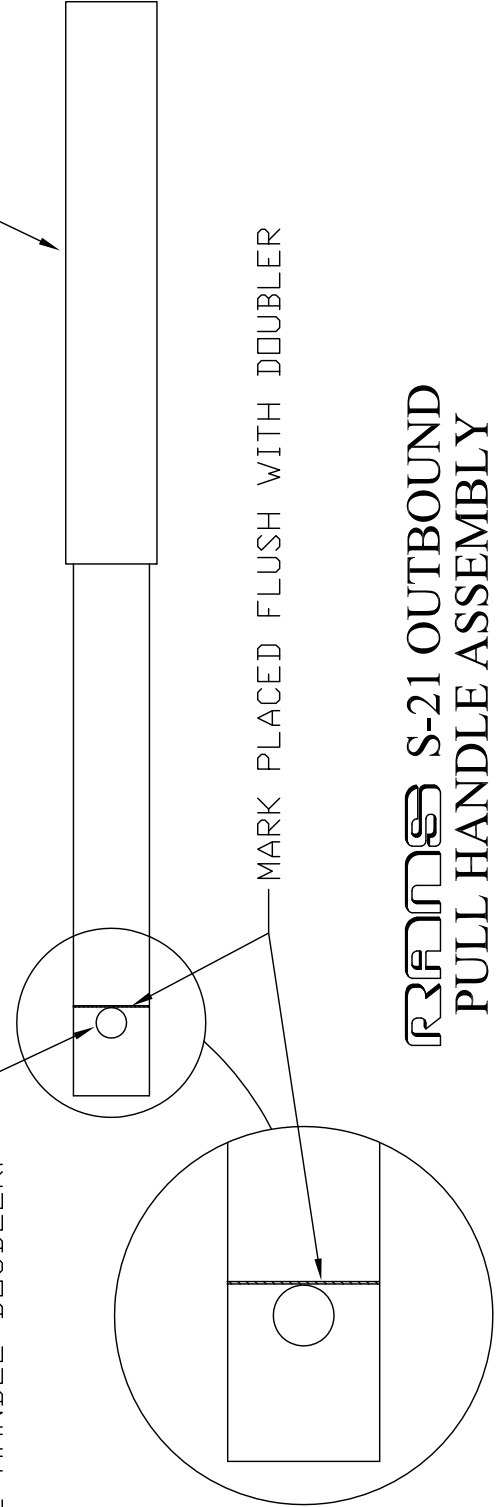
KAAC0106-1



9"

DRILL 1/4"
 (ONE SIDE ONLY)
 HOLE SHOULD LINE
 UP WITH OUTER SIDE
 OF PULL HANDLE DOUBLER.

GLUE IN PLACE
 WITH JB WELD

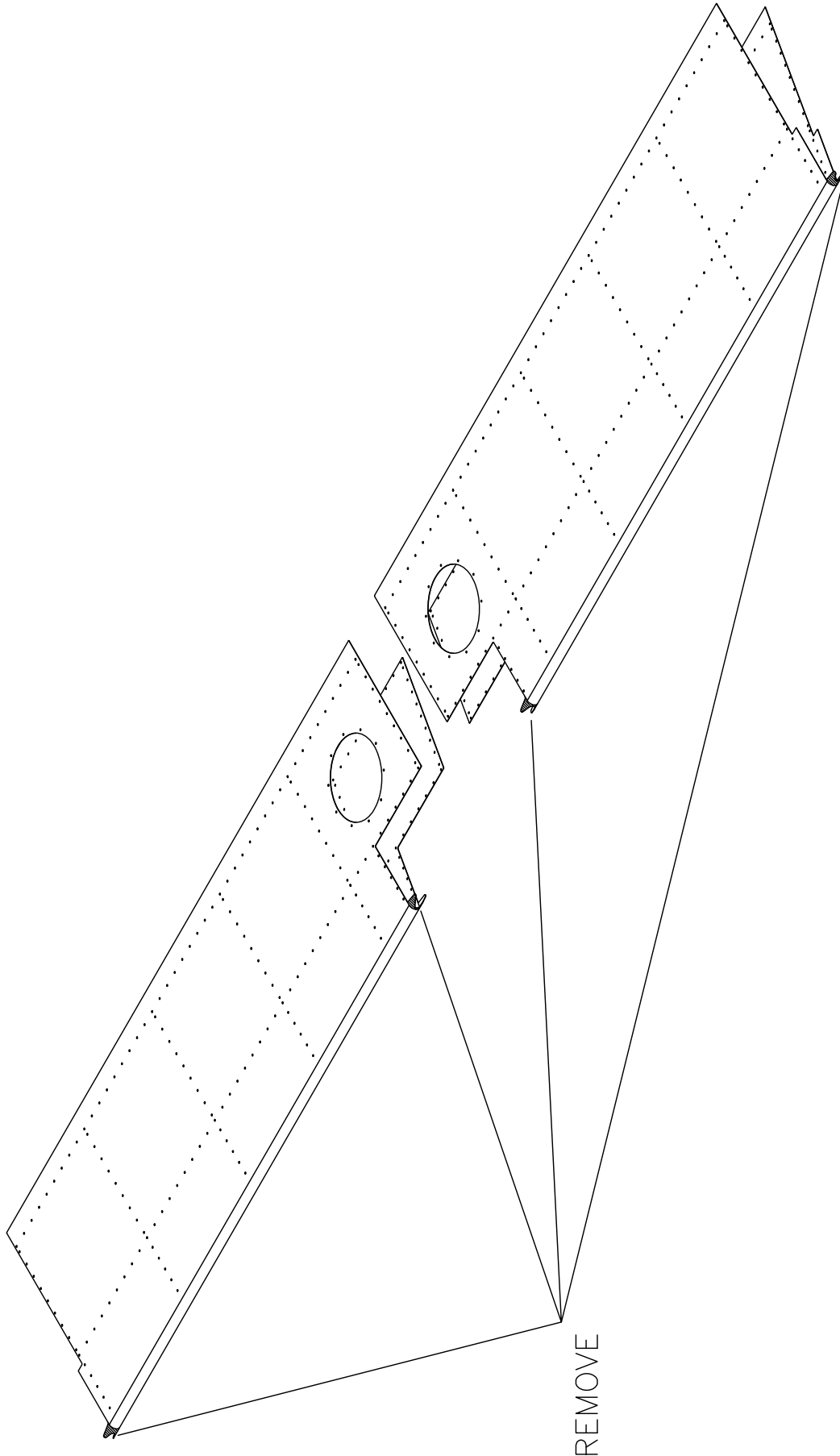


MARK PLACED FLUSH WITH DOUBLER

MD5651
 REV. - ORIG

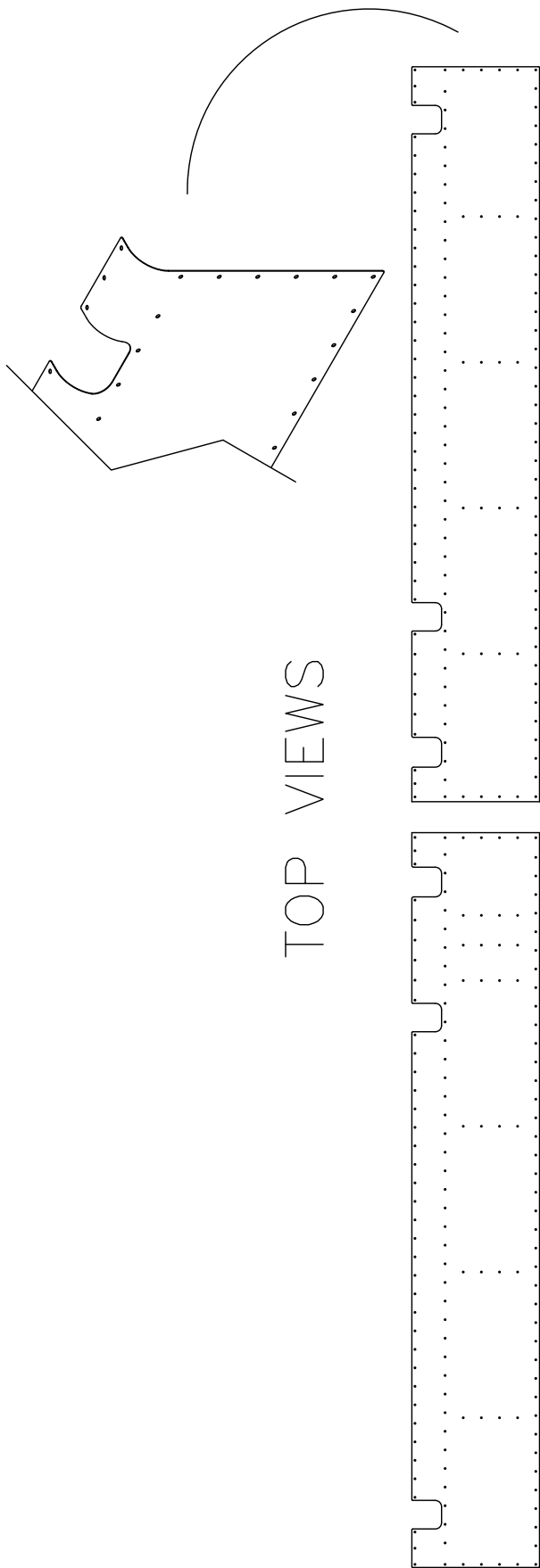
**RAMS S-21 OUTBOUND
 PULL HANDLE ASSEMBLY**

FIGURE 003-05

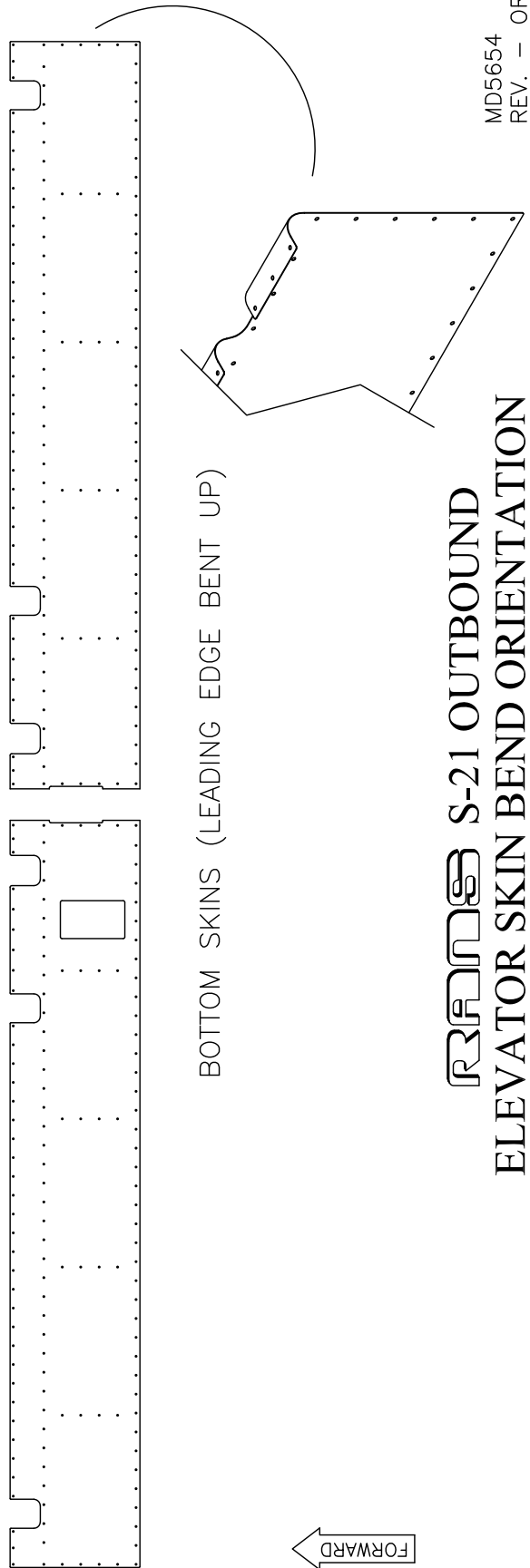


RFA S-21 OUTBOUND
HORIZONTAL SKIN MODIFICATION
FIGURE 04-01

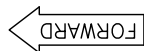
MD5654
REV. - A



TOP SKINS (LEADING EDGE BENT DOWN)

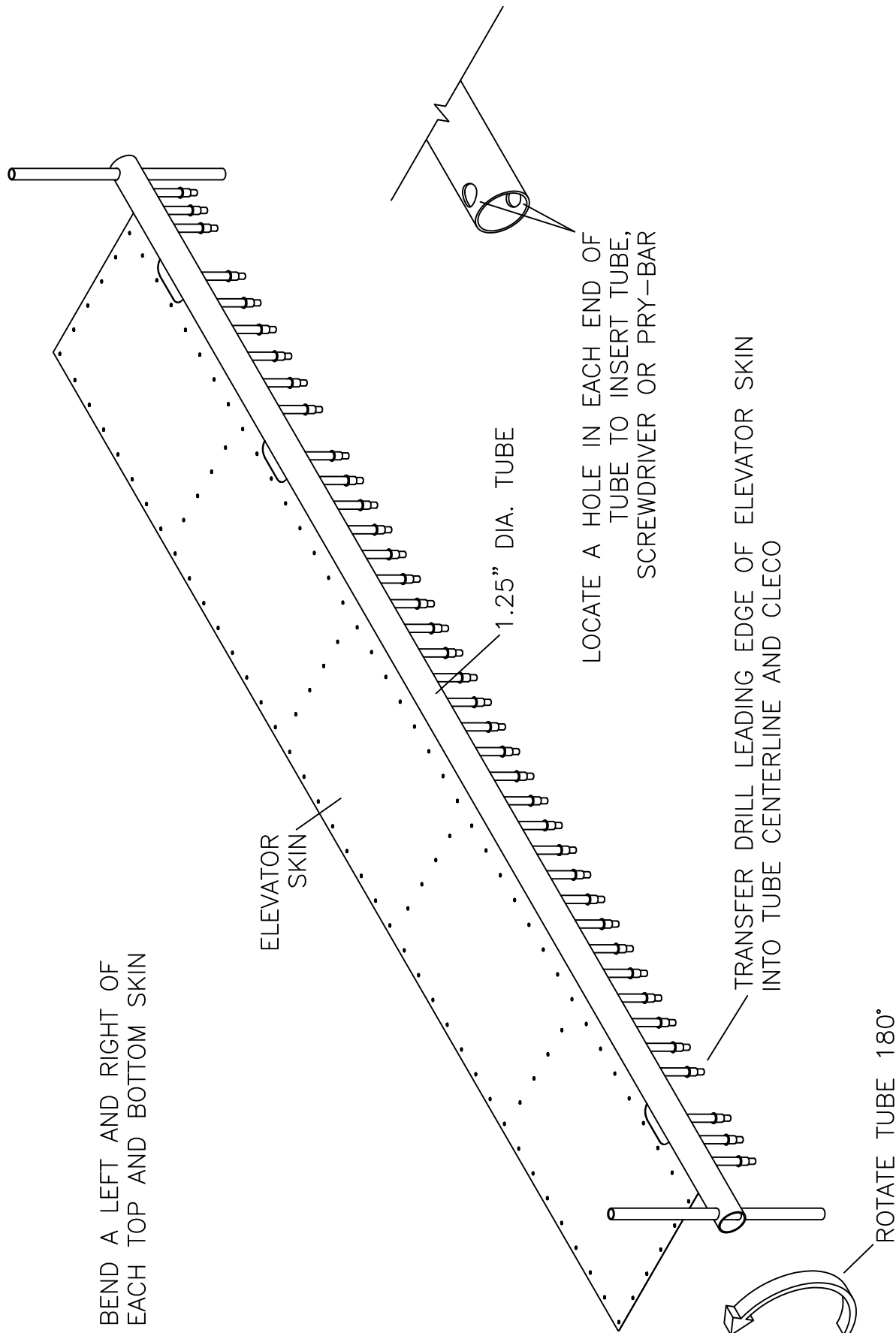


BOTTOM SKINS (LEADING EDGE BENT UP)



RRAMES S-21 OUTBOUND
ELEVATOR SKIN BEND ORIENTATION
FIGURE 05-01

MD5654
 REV. - ORIG



BEND A LEFT AND RIGHT OF EACH TOP AND BOTTOM SKIN

ELEVATOR SKIN

1.25" DIA. TUBE

LOCATE A HOLE IN EACH END OF TUBE TO INSERT TUBE, SCREWDRIVER OR PRY-BAR

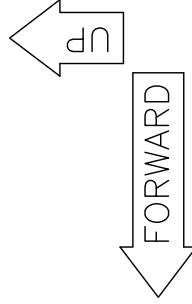
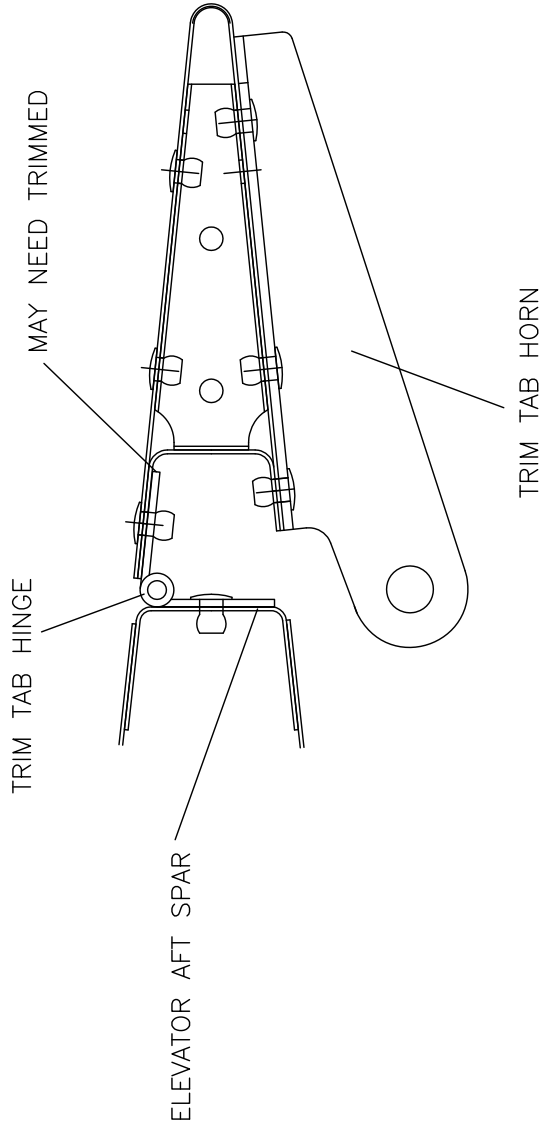
TRANSFER DRILL LEADING EDGE OF ELEVATOR SKIN INTO TUBE CENTERLINE AND CLECO

ROTATE TUBE 180°

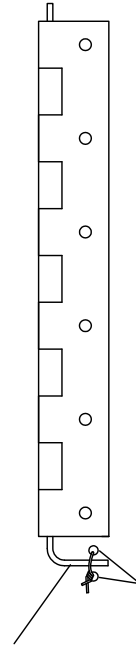
RAMSES S-21 OUTBOUND
ELEVATOR SKIN FORMING
FIGURE 05-01A

MD5654
 REV. - ORIG

TOP OF TRIM TAB SKIN FLUSH WITH
ELEVATOR TOP SKIN



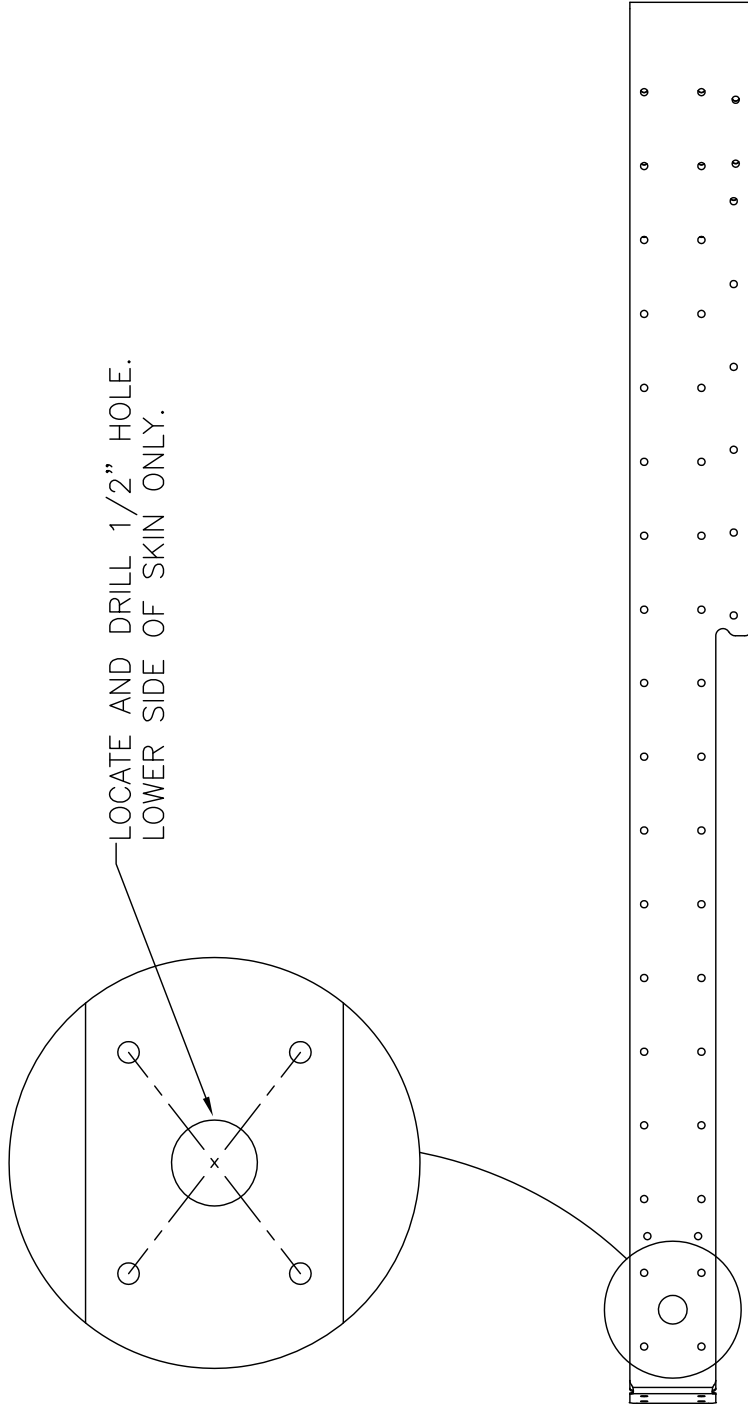
BEND 90°
SAFETY WIRE IN PLACE



DRILL (2) #40 HOLES

RAMS S-21 OUTBOUND ELEVATOR TRIM TAB HINGE FABRICATION FIGURE 05-02

MD5654
REV. - ORIG



LOWER SIDE OF LEFT HAND ELEVATOR TIP SKIN SHOWN FOR REFERENCE



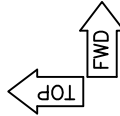
RAFANES S-21 OUTBOUND
ELEVATOR TIP SKIN - BALANCE HOLE DRILLING
FIGURE 005-03

MD5654
 REV. - ORIG

FWD SPAR FWD ATTACH DOUBLER

FWD SPAR AFT ATTACH DOUBLER

FWD SPAR TRUSS DOUBLER



DO NOT BOLT YET

AFT SPAR TRUSS DOUBLER

AFT SPAR ATTACH DOUBLER

MD5650
REV. B

ROOT RIB ATTACH ANGLE LOCATION

RIB ATTACH LOCATION

FWD SPAR AFT ATTACH DOUBLER

TRANSFER DRILL THRU 3/8"

RIB ATTACH LOCATION

RIB ATTACH LOCATION

RIB ATTACH LOCATION

RIB ATTACH LOCATION

RIB ATTACH LOCATION

RIB ATTACH LOCATION

RIB ATTACH LOCATION

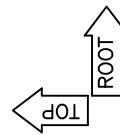
RIB ATTACH LOCATION

RIB ATTACH LOCATION

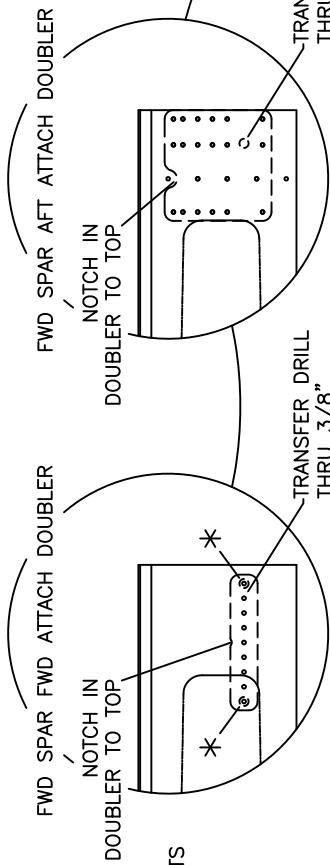
RIB ATTACH LOCATION

DO NOT RIVET YET

AFT SPAR TRUSS DOUBLER

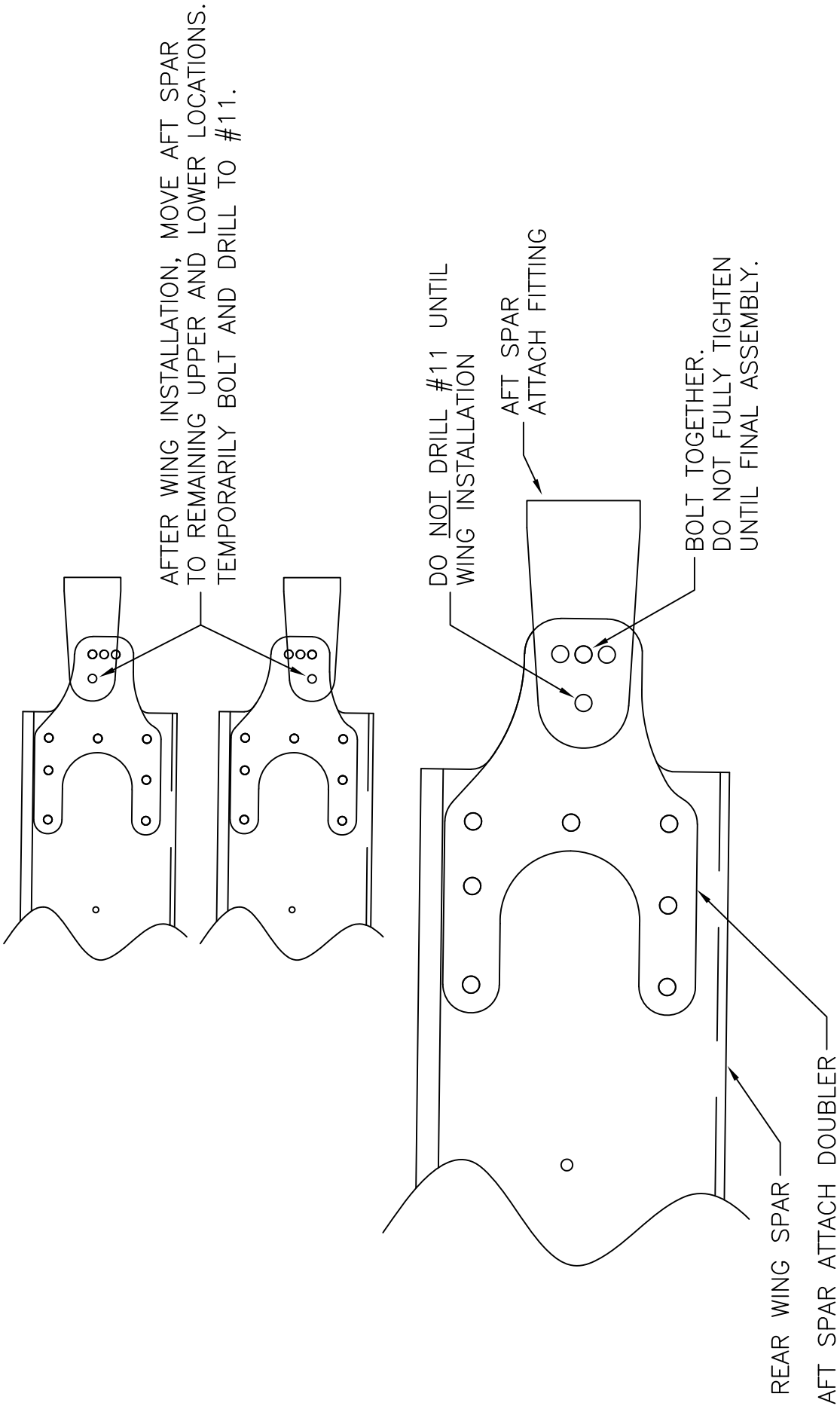


LEFT HAND SPARS SHOWN
(VIEWED FROM AFT SIDE)



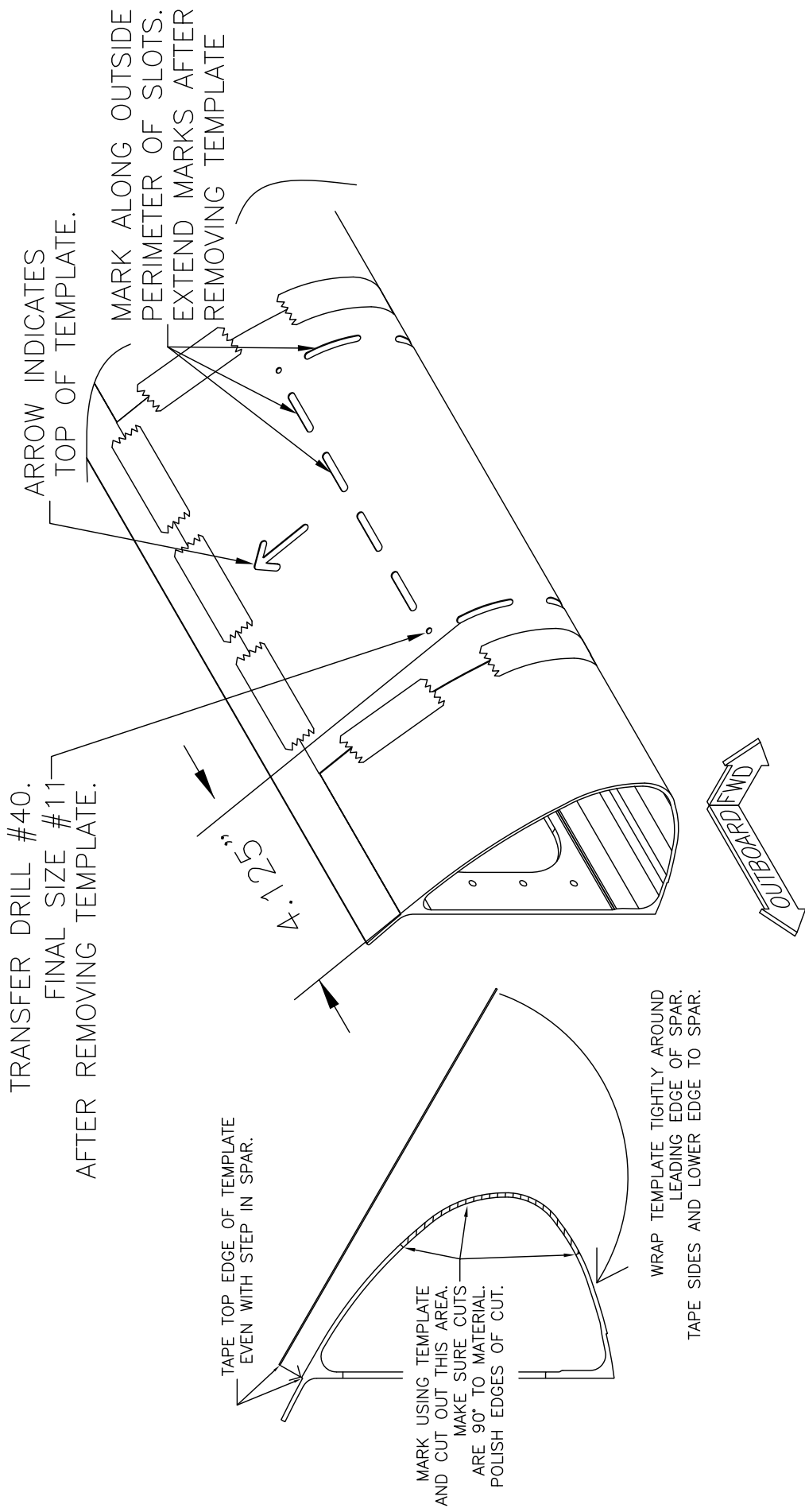
* END HOLES IN DOUBLER USE SHORTER RIVETS DUE TO RECESSED POCKET WHICH ALLOWS FUSELAGE CARRY-THRU T-BONE TO CLEAR INBOARD RIVET DURING INSTALLATION

RRF S-21 OUTBOUND 141 WING - SPAR ORIENTATION FIGURE 06-01



MD5650
REV. A

RRF S-21 OUTBOUND
REAR WING SPAR ATTACHMENT
FIGURE 06-01A1

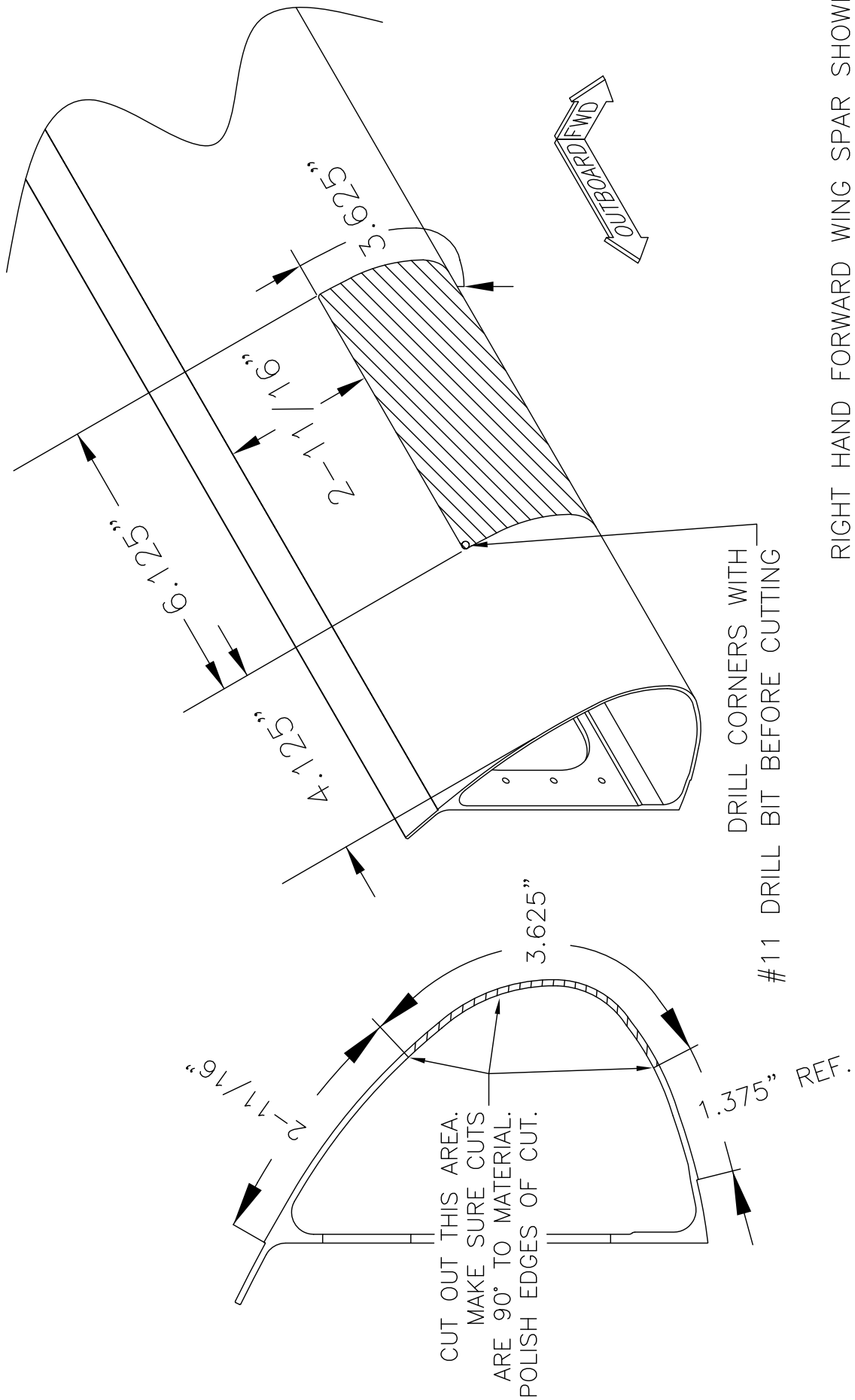


RIGHT HAND FORWARD WING SPAR SHOWN

09/11/2018

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REV. - ORIG

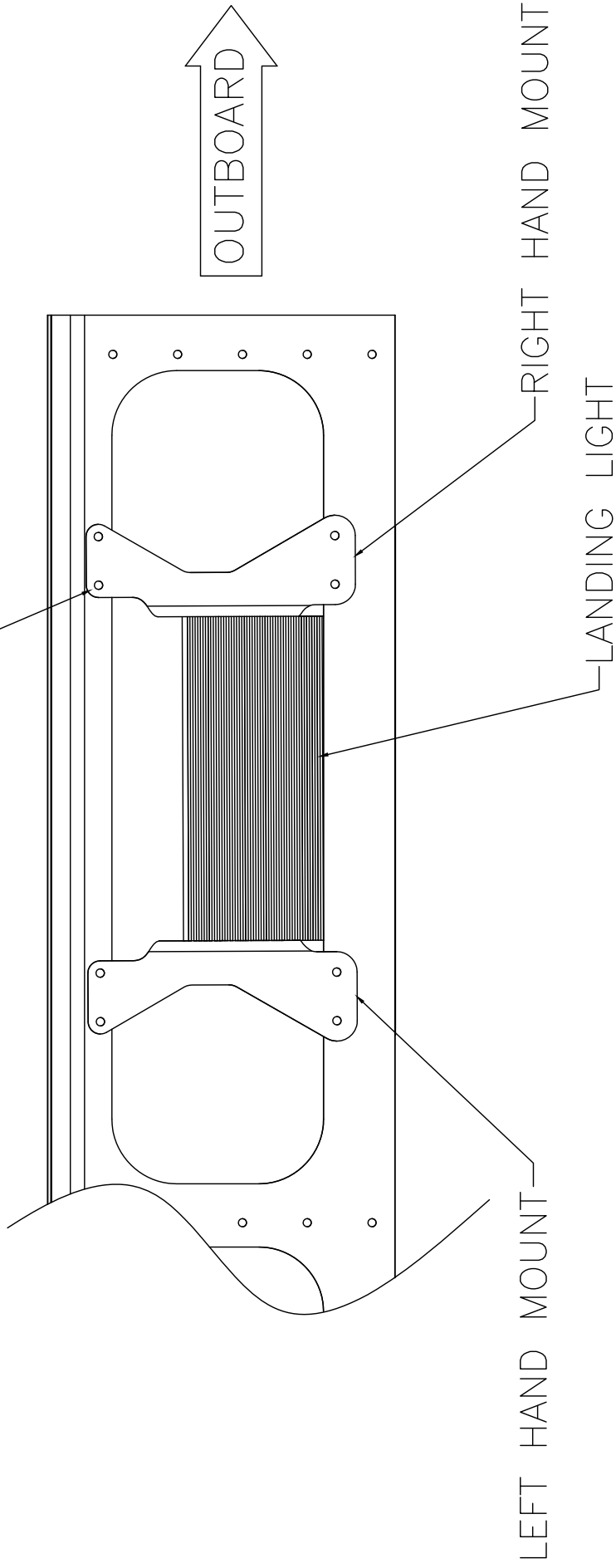
RRANES S-21 OUTBOUND
141 WING - LANDING LIGHT - SPAR MODIFICATION
FIGURE 06-01A



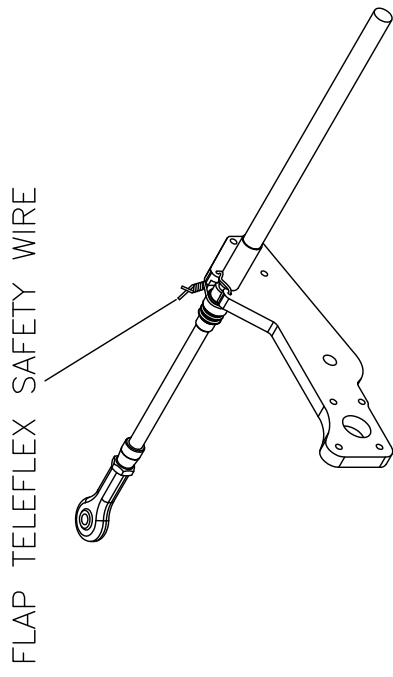
RIGHT HAND FORWARD WING SPAR SHOWN

RAYTHEON S-21 OUTBOUND
141 WING - LANDING LIGHT - SPAR MODIFICATION
FIGURE 06-01B

ASSEMBLE LANDING LIGHT TO MOUNTS.
CENTER LANDING LIGHT IN SPAR OPENING.
TRANSFER DRILL #30 (8 PLACES)
THROUGH MOUNTS.

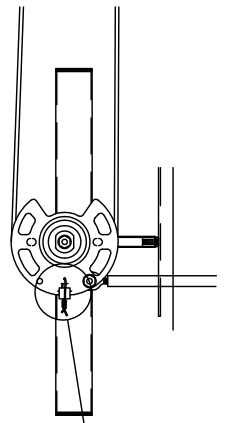


AFT SIDE OF RIGHT HAND FWD SPAR SHOWN



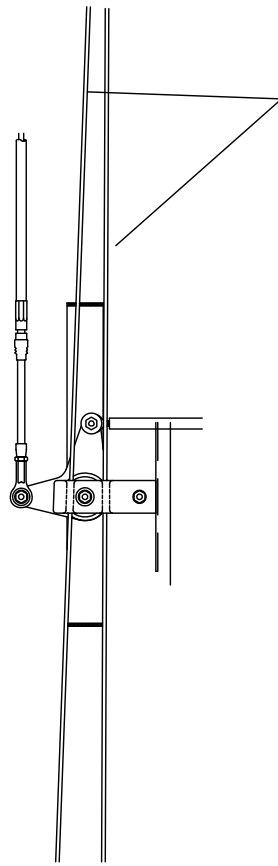
FLAP TELEFLEX SAFETY WIRE

AILERON BELLCRANK ASSEMBLY



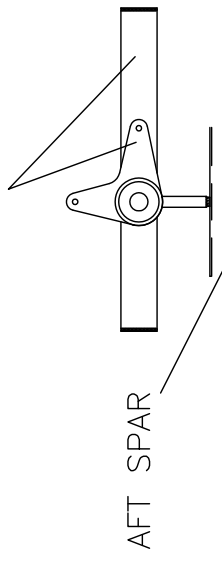
SAFETY WIRE

FLAP BELLCRANK ASSEMBLY



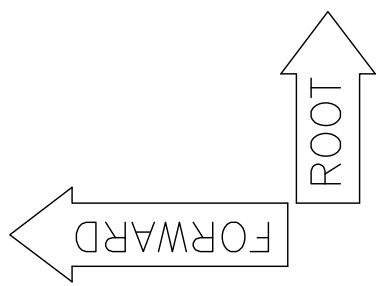
AILERON CABLES

LONG ARMS TOGETHER



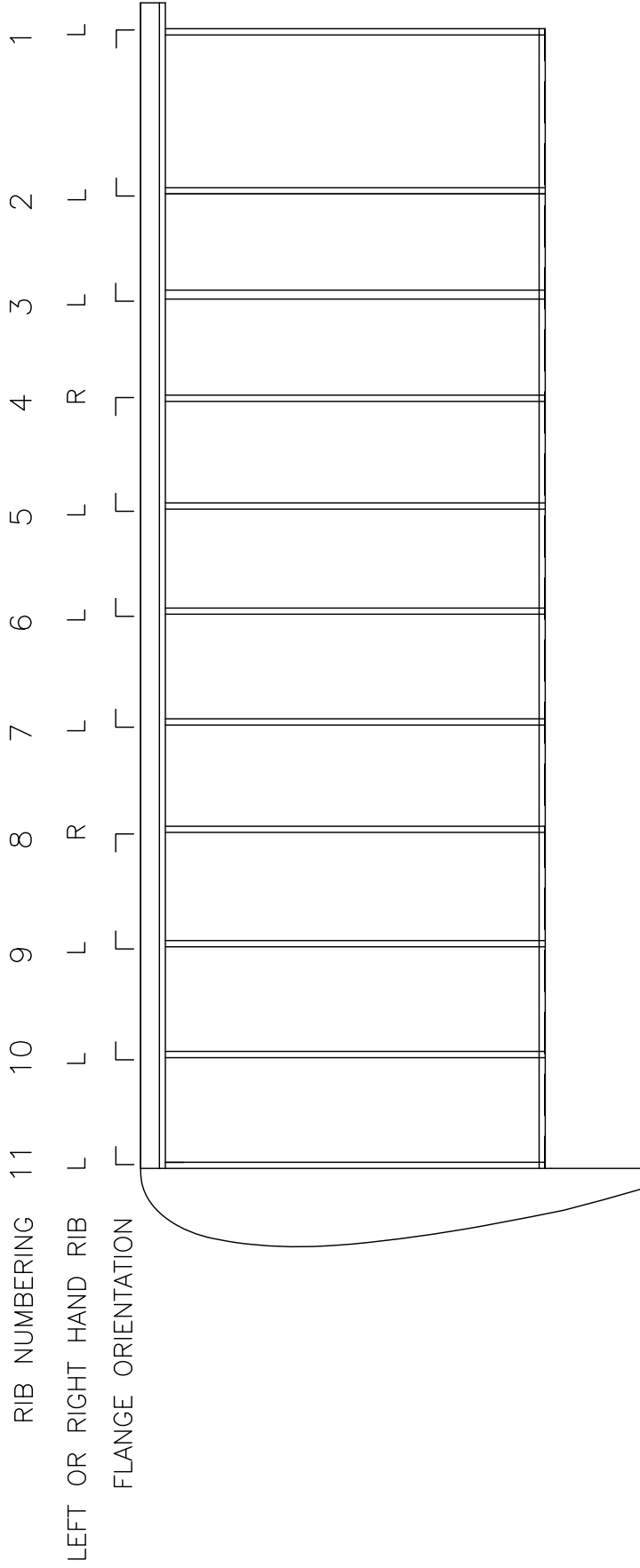
AFT SPAR

FLAP BELLCRANK ORIENTATION

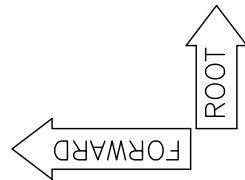


MD5650
REV. - ORIG

RAMS S-21 OUTBOUND
141 WING - BELLCRANK ASSEMBLY
FIGURE 06-02

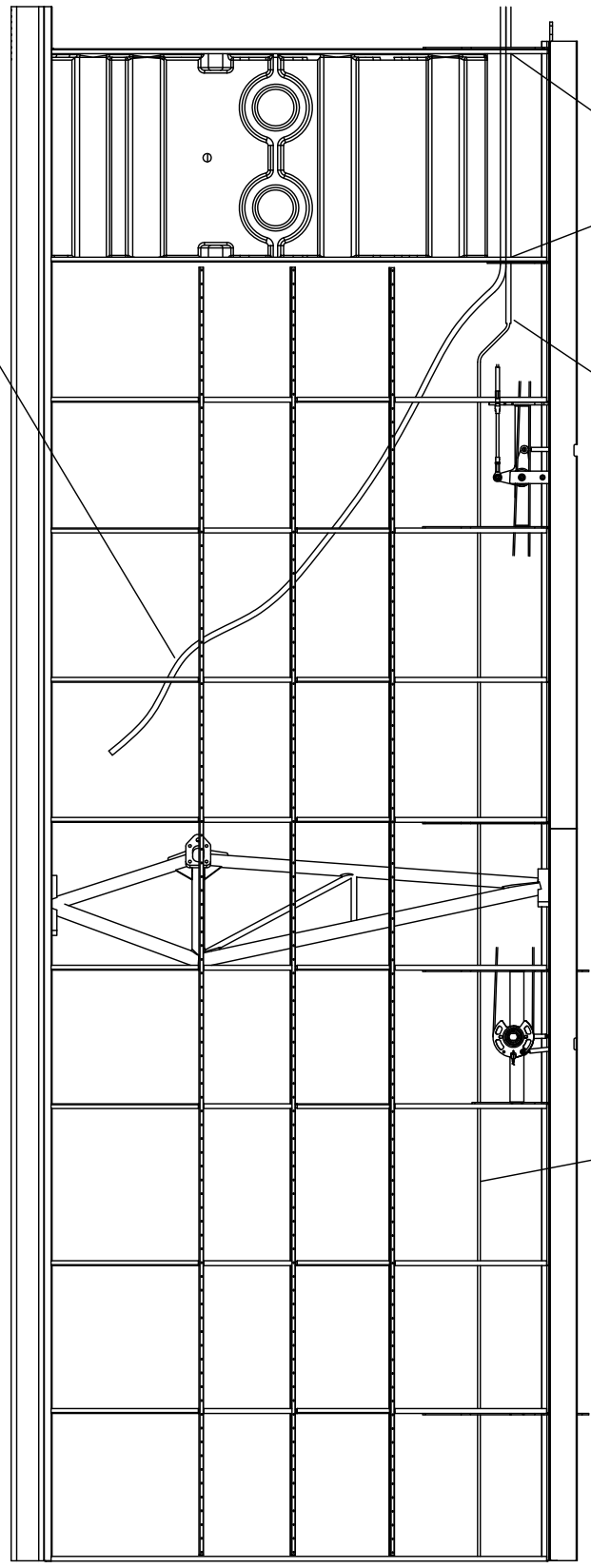
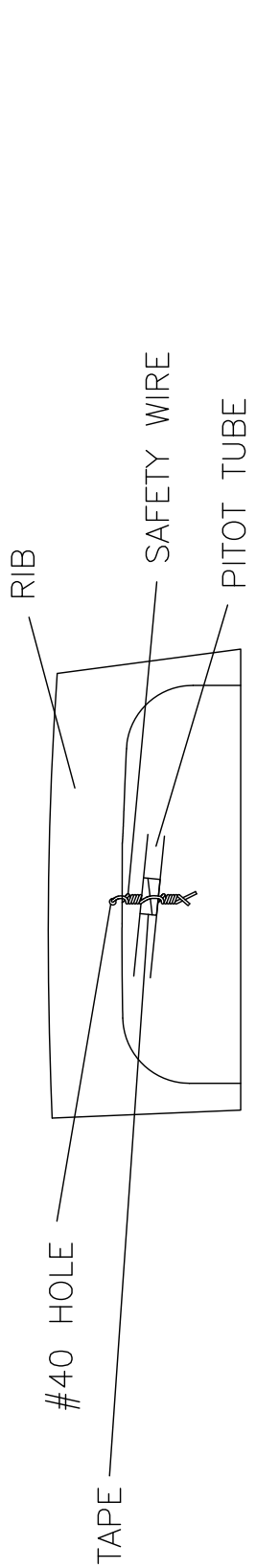


LEFT-HAND WING SHOWN
 (RIGHT-HAND WING IS A MIRROR IMAGE)



MD5650
 REV. - ORIG

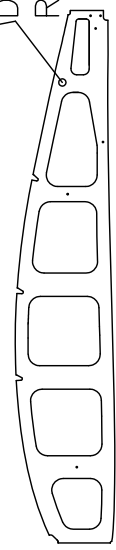
RAMS S-21 OUTBOUND
141 WING - RIB ORIENTATION
FIGURE 06-03



USE SERRATED GROMMET STRIP
ON HOLES IN RIBS

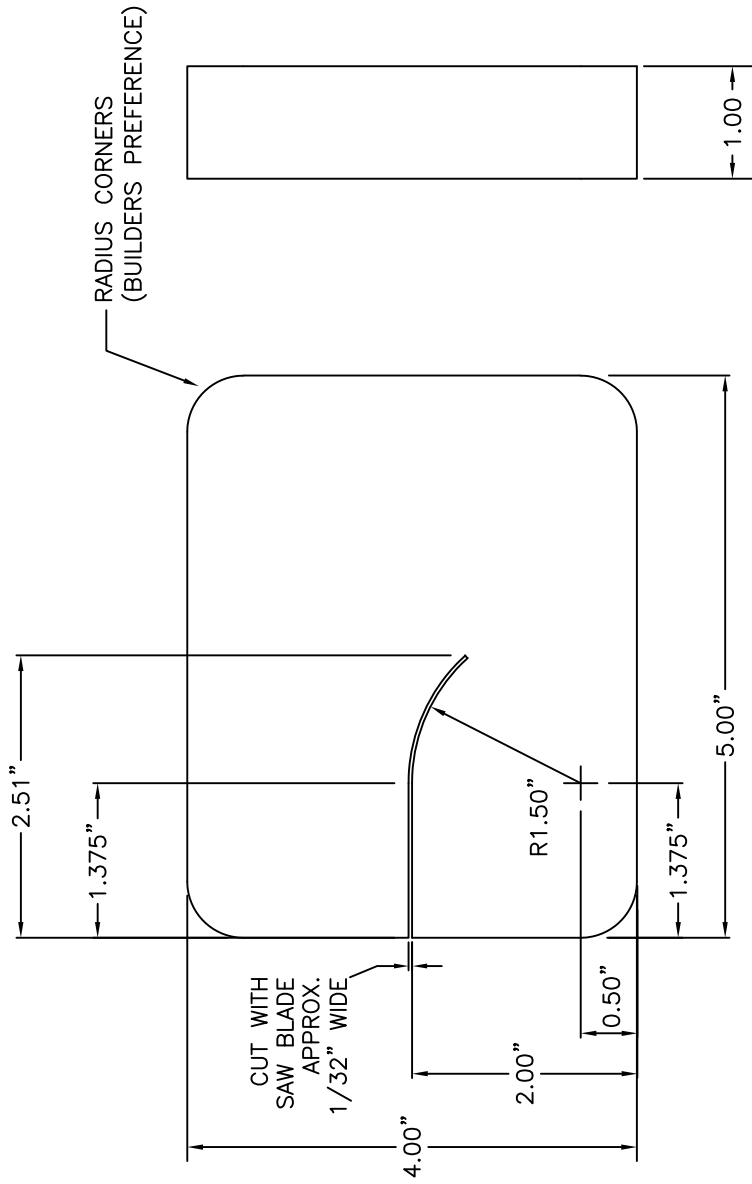
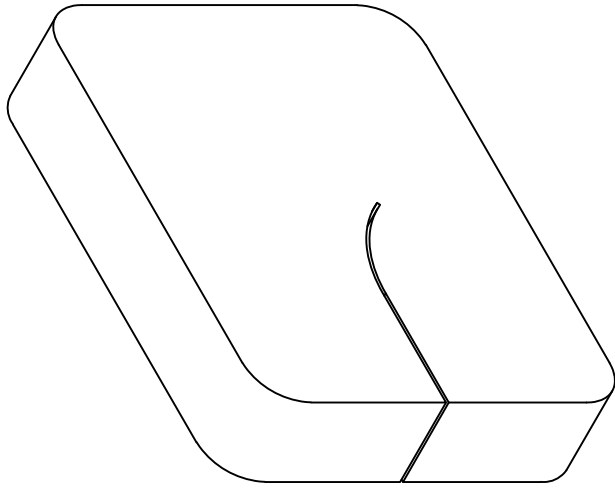
USE WIRE LOOM FROM HERE
INBOARD TO TERMINATION

DRILL 5/8" FOR GROMMET.
RUN WIRES HERE



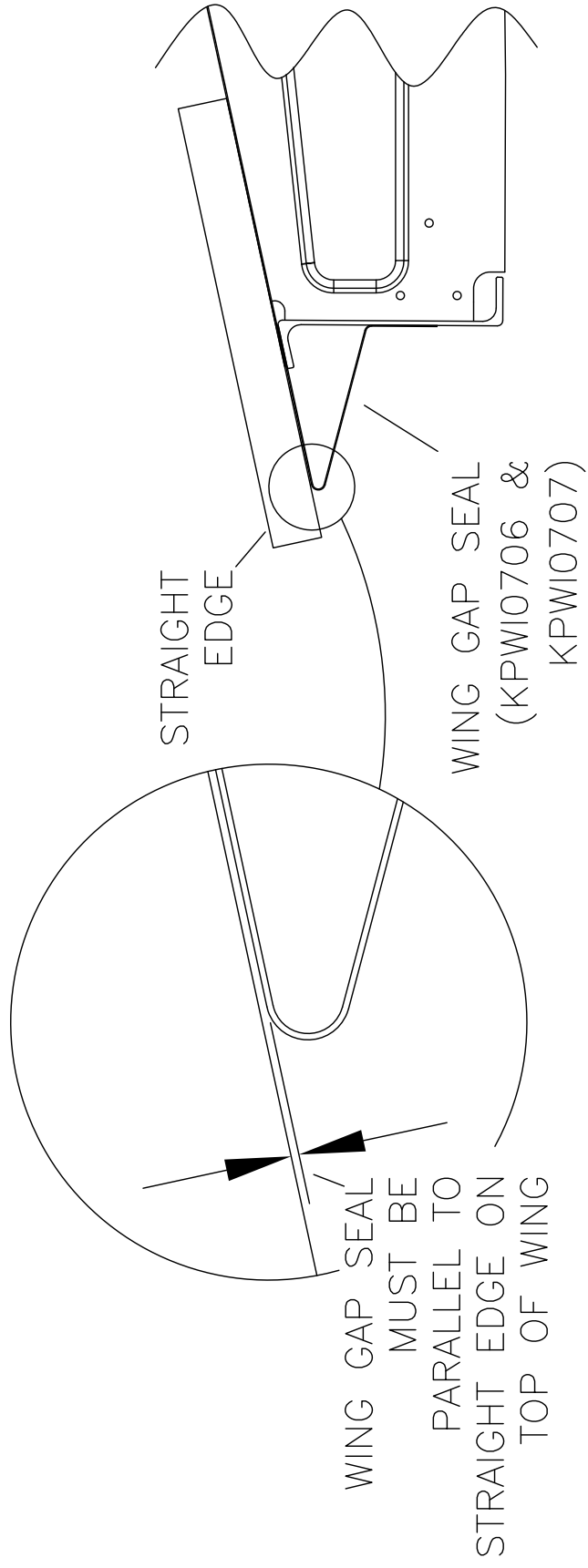
MD5650
REV. A

RAMS S-21 OUTBOUND
141 WING - WIRING & PITOT LINE ROUTING
FIGURE 06-04



MD5650
REV. - ORIG

RRR S-21 OUTBOUND
WING SKIN LEADING EDGE FORMING TOOL
FIGURE 06-04A



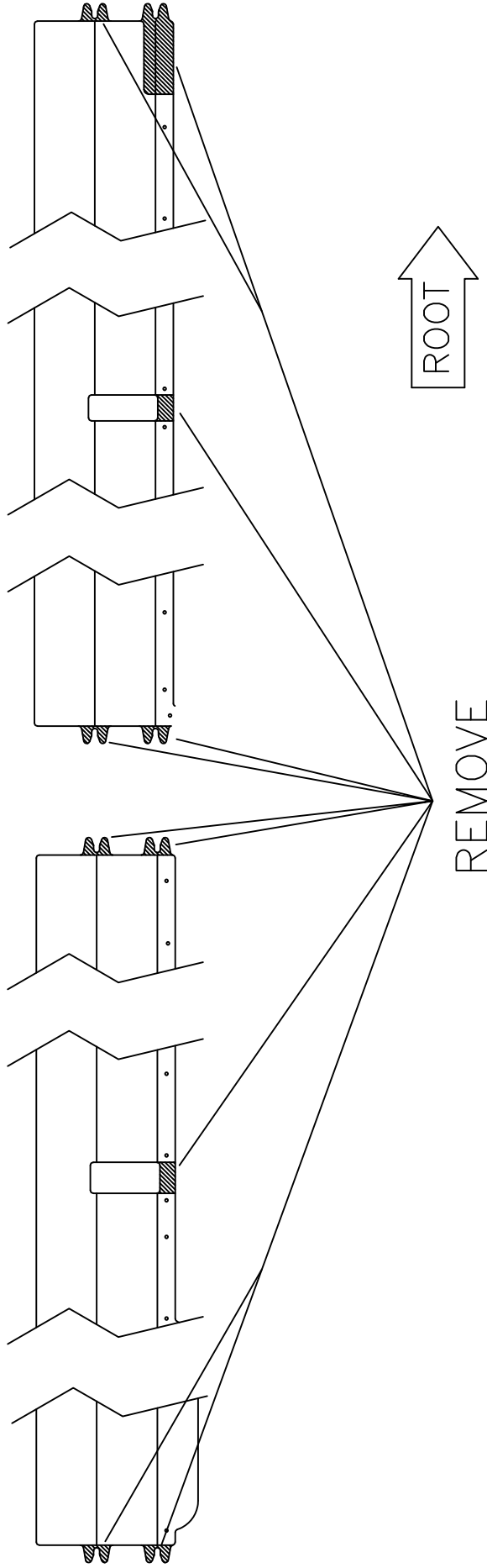
MD5650
REV. A

RRR S-21 OUTBOUND
 141 WING - CONFIRMING WING GAP SEAL PROFILE
 FIGURE 06-05

WING GAP SEALS SHOWN UN-BENT FOR CLARITY

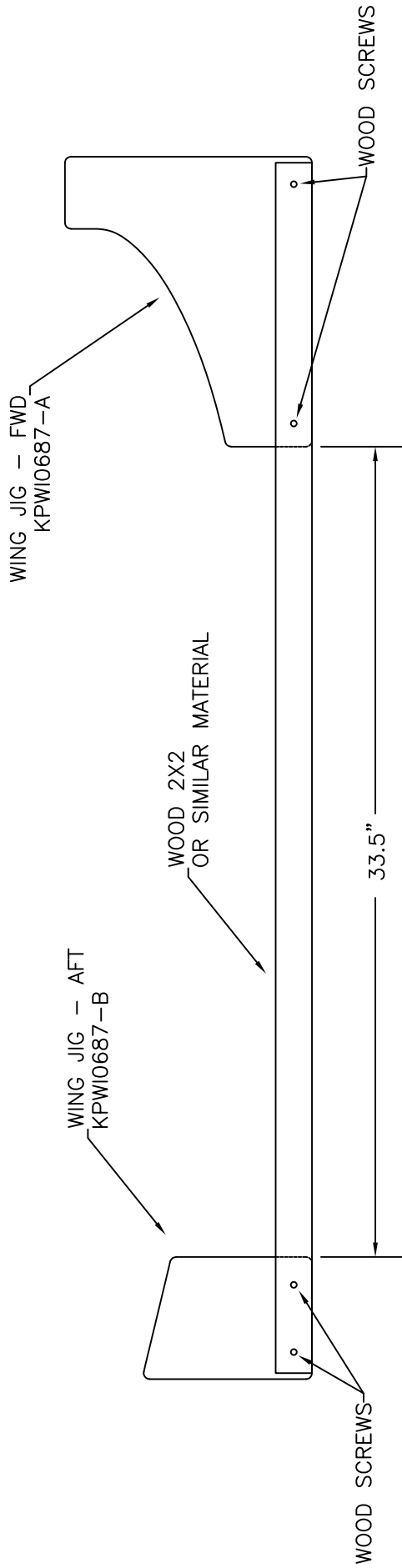
KPW10707

KPW10706



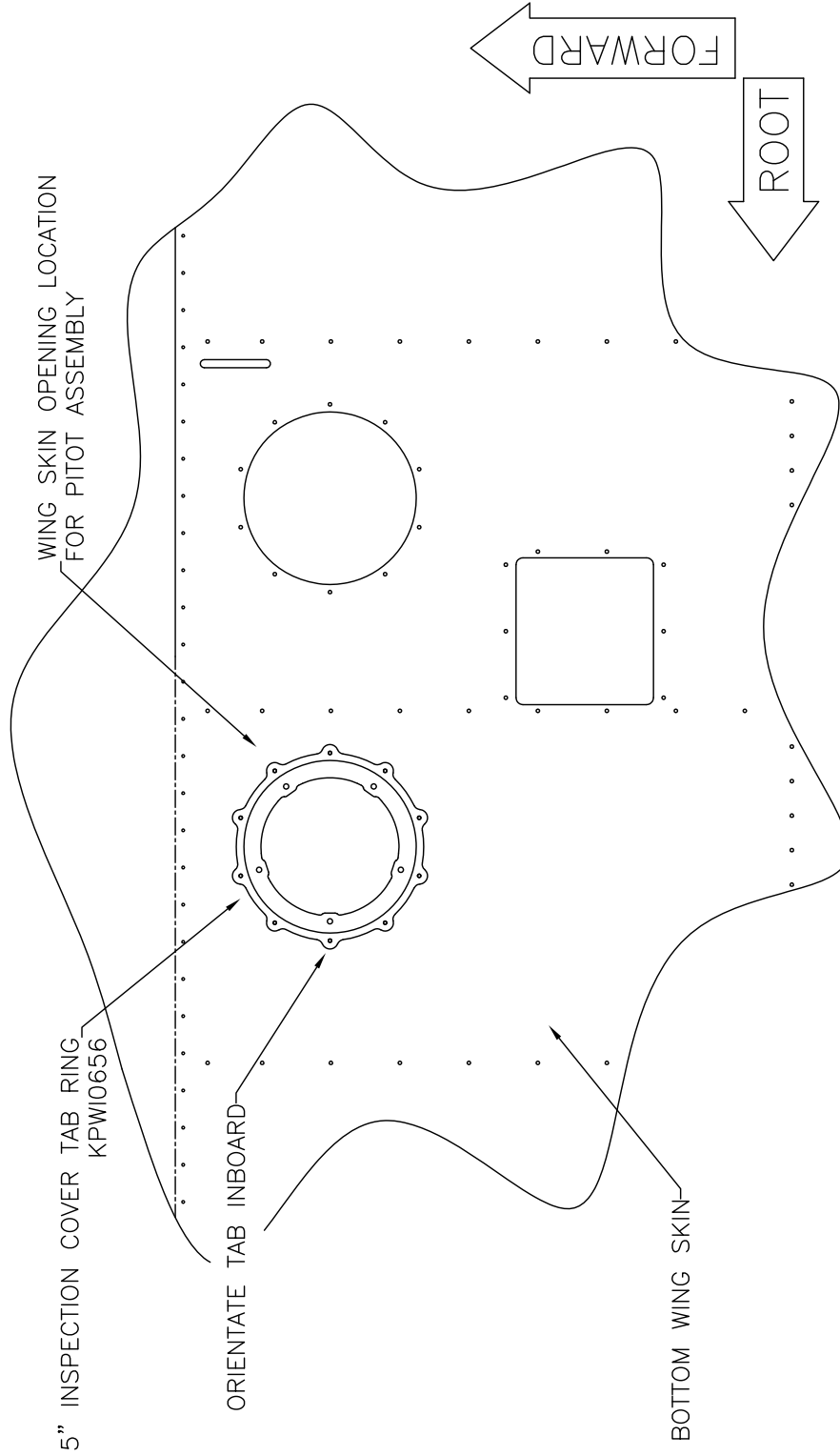
MD5650
REV. A

RRR S-21 OUTBOUND
141 WING - GAP SEAL MODIFICATION
FIGURE 06-05A



MD5650
REV. - ORIG

RAFORD S-21 OUTBOUND
141 WING - WING JIG ASSEMBLY
FIGURE 06-06



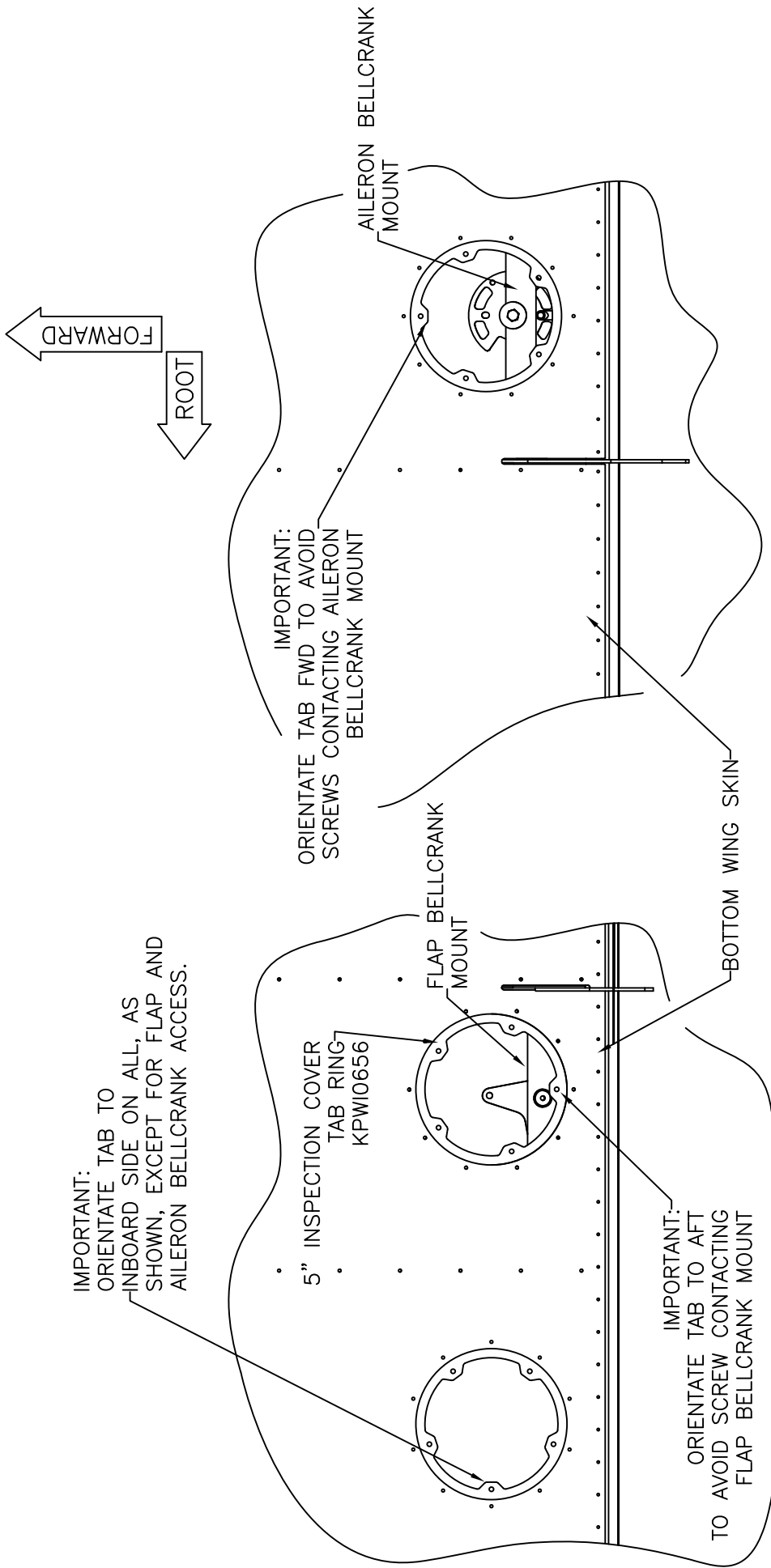
MD5650
REV. - ORIG

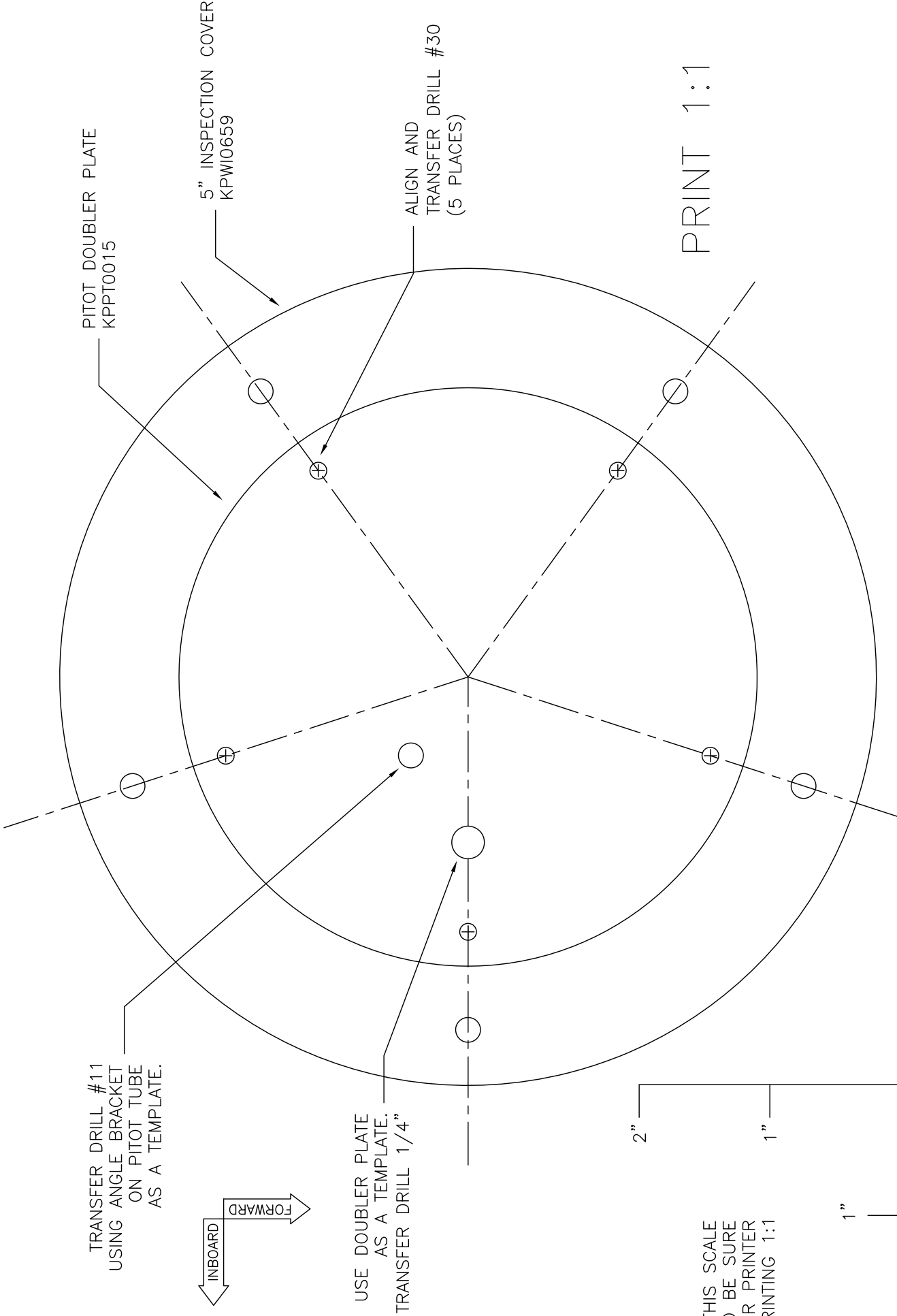
RRR S-21 OUTBOUND
141 WING - PITOT MOUNT RING ORIENTATION
FIGURE 06-07

RAMS S-21 OUTBOUND

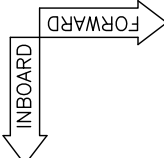
141 WING - 5" TAB RING ORIENTATION

FIGURE 06-07A

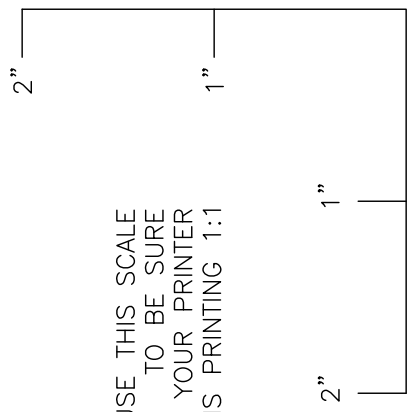




TRANSFER DRILL #11
USING ANGLE BRACKET
ON PITOT TUBE
AS A TEMPLATE.



USE DOUBLER PLATE
AS A TEMPLATE.
TRANSFER DRILL 1/4"

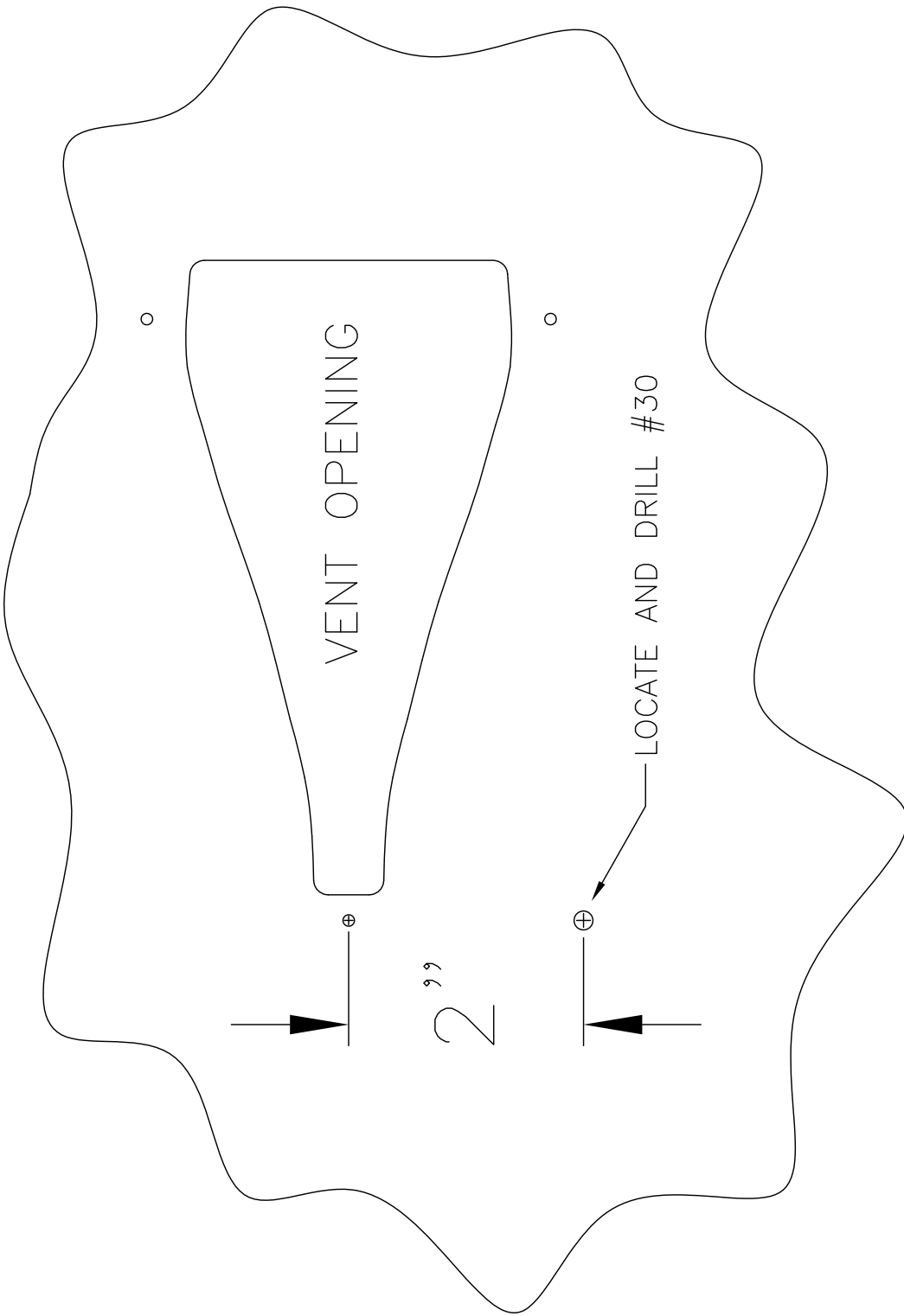


USE THIS SCALE
TO BE SURE
YOUR PRINTER
IS PRINTING 1:1

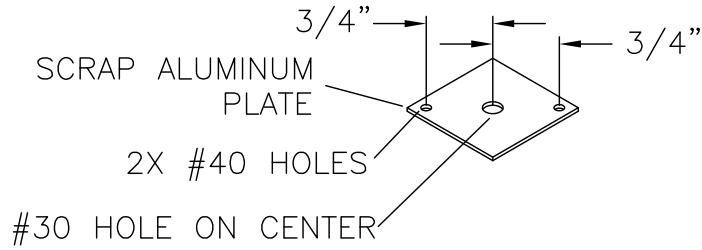
PRINT 1:1

MD5650
REV. - ORIG

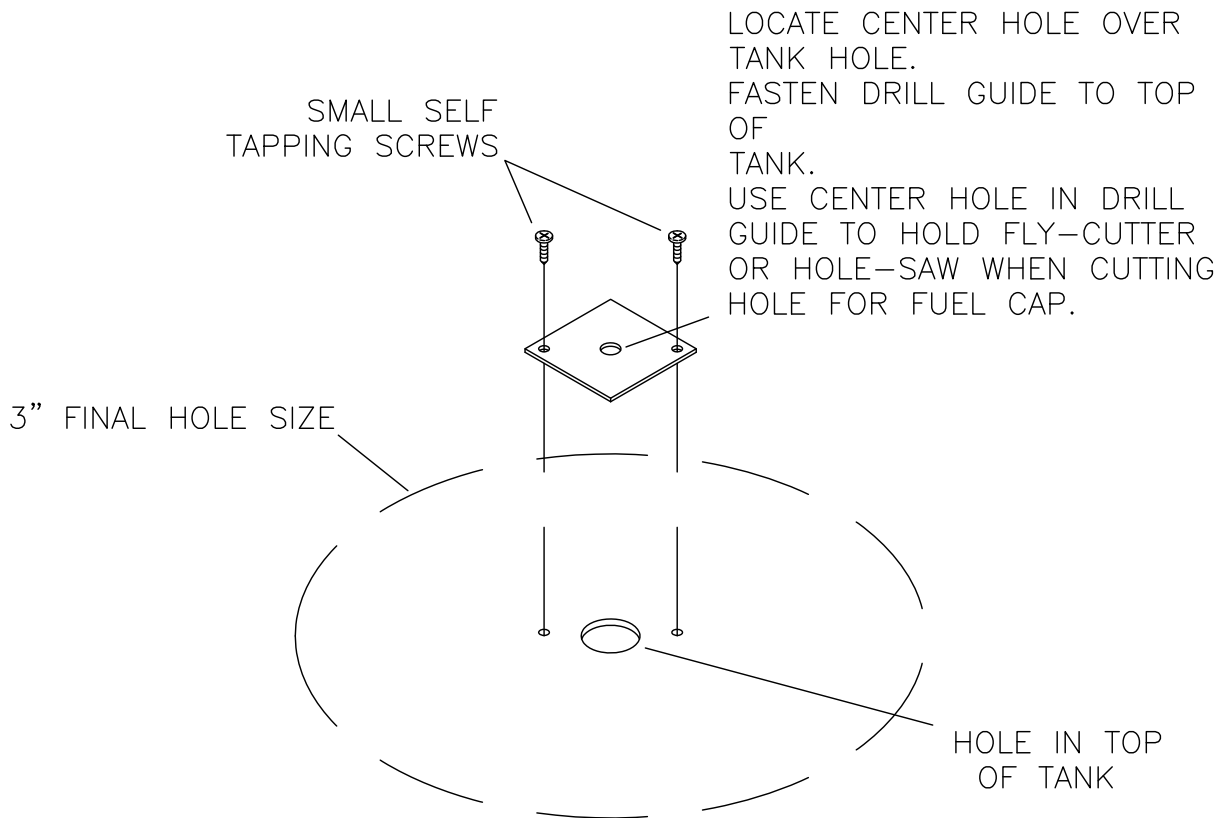
RAMS S-21 OUTBOUND
PITOT MOUNT PLATE MODIFICATION
FIGURE 06-08



RRR S-21 OUTBOUND
STATIC - FUSELAGE LOCATION
FIGURE 06-09



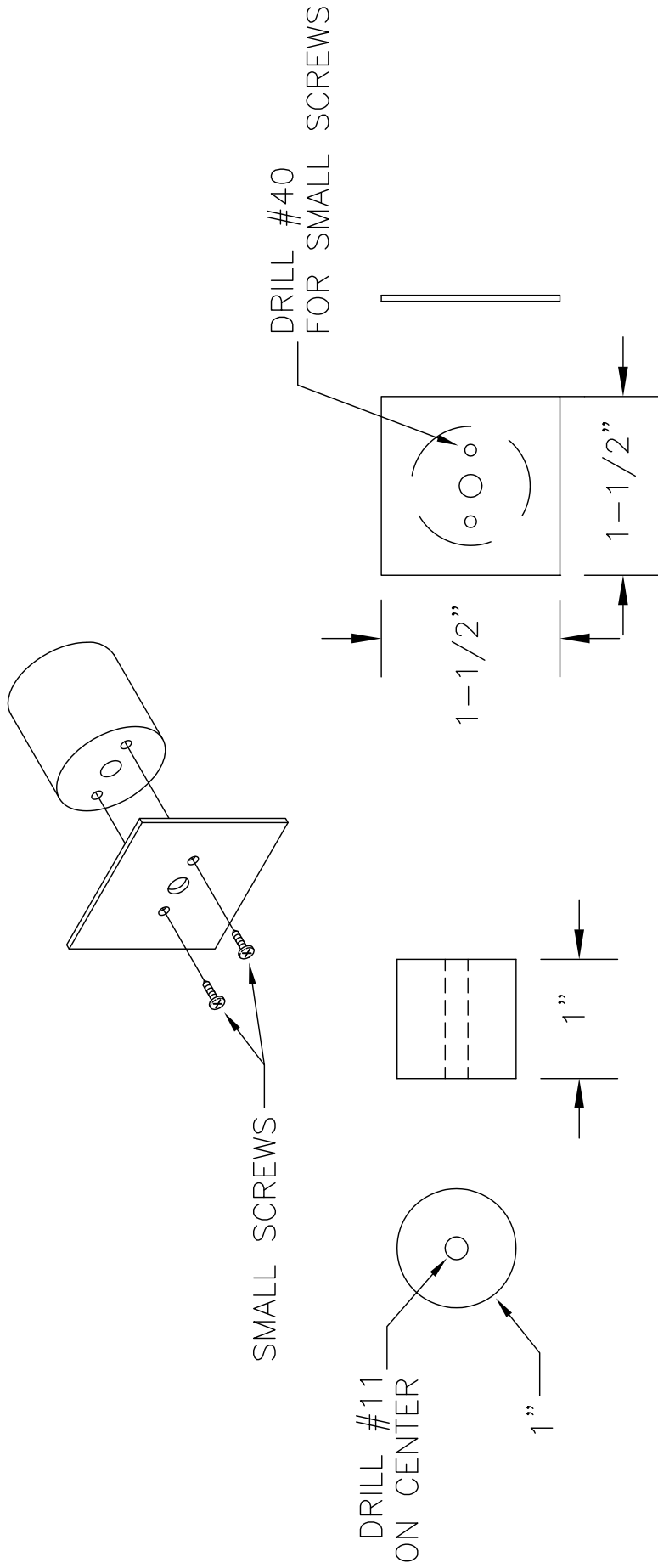
FABRICATE DRILL GUIDE



MD5650
REV. - ORIG

**RAMS S-21 OUTBOUND
FUEL CAP HOLE DRILL GUIDE
FIGURE 06-11**

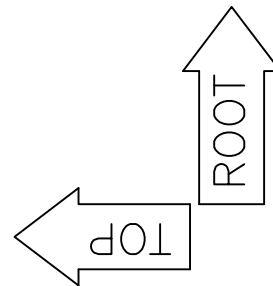
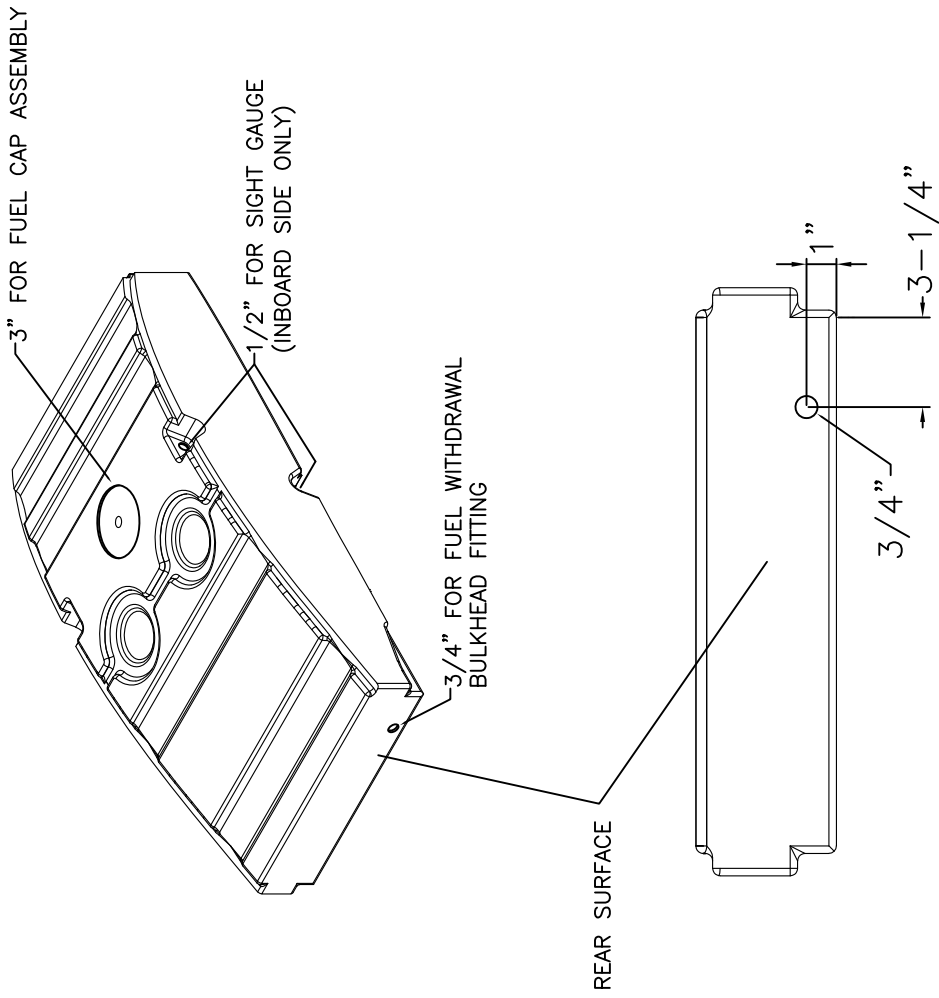
09/11/2018



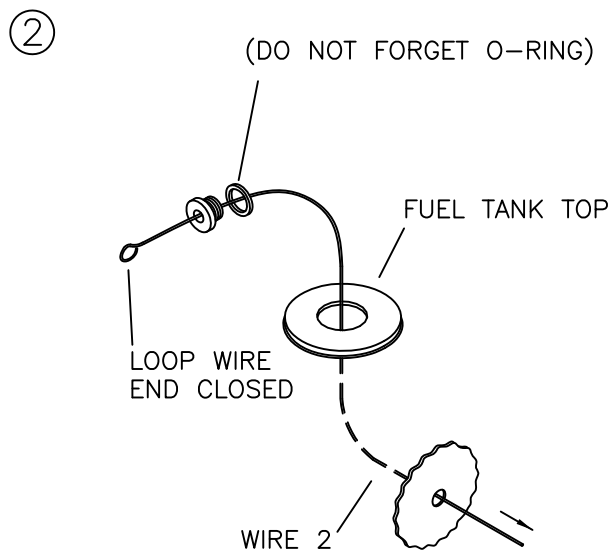
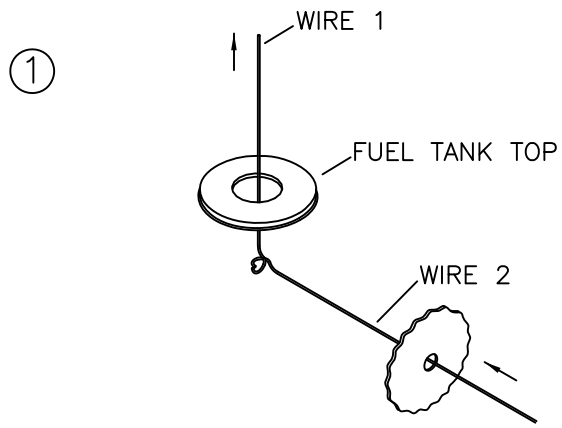
FABRICATE FROM
1" WOOD DOWEL

FABRICATE FROM
THIN ALUMINUM,
LEXAN OR
OTHER MATERIAL

RRR S-21 OUTBOUND
SIGHT GAUGE LOCATION TOOL
FIGURE 06-12



RAMS S-21 OUTBOUND
141 WING - FUEL TANK HOLE LOCATIONS
FIGURE 06-13



③ INSTALL RUBBER WASHER, STEEL WASHER, LOCTITE, AND NUT.

④ REMOVE WIRE.

**RANS S-21 OUTBOUND
FUEL TANK FITTING INSTALLATION
FIGURE 06-14**

MD5650

Figure-A

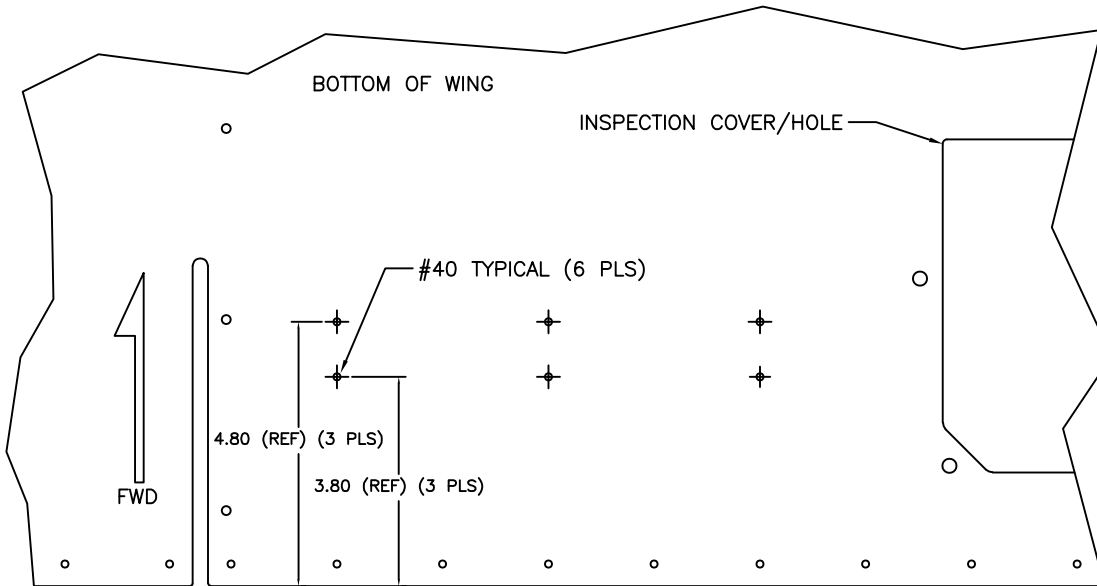
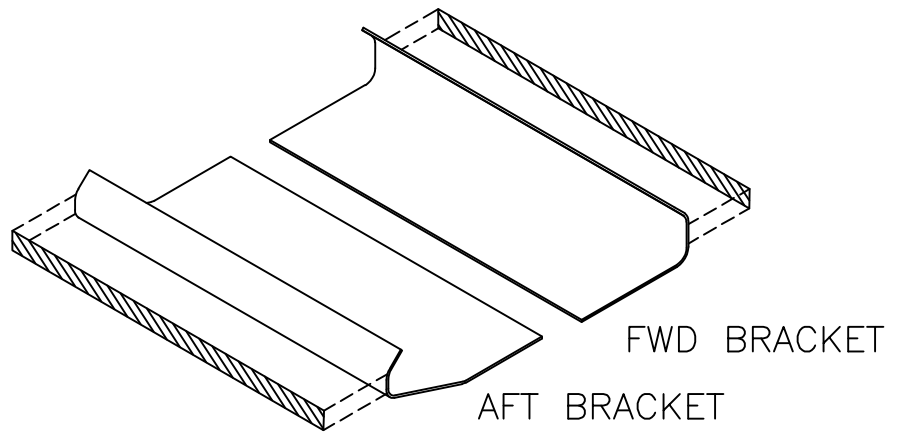


Figure-B

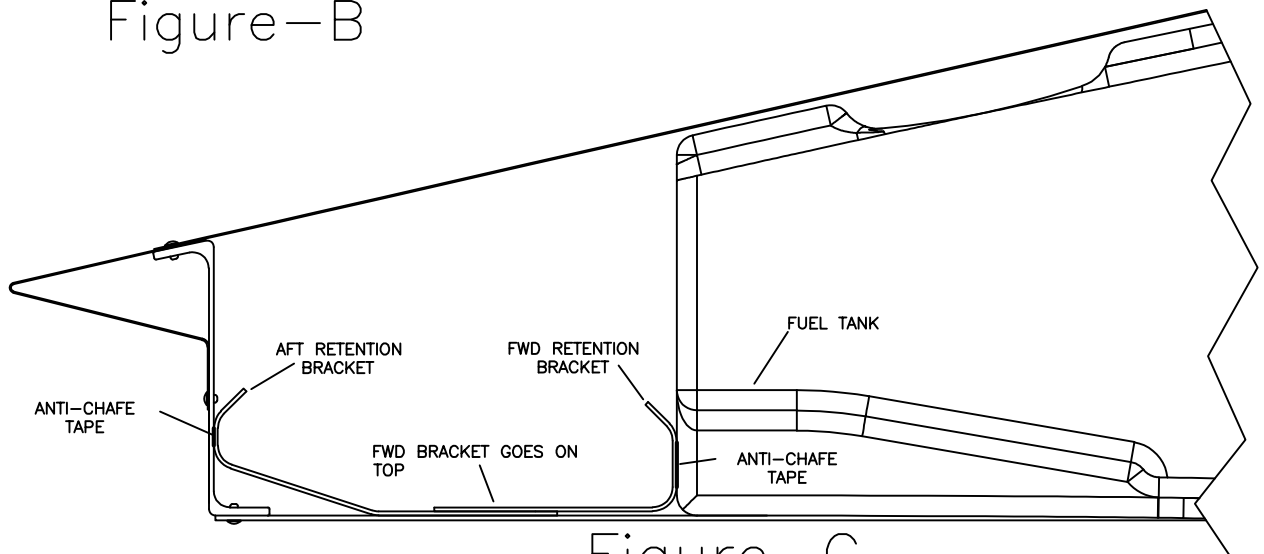
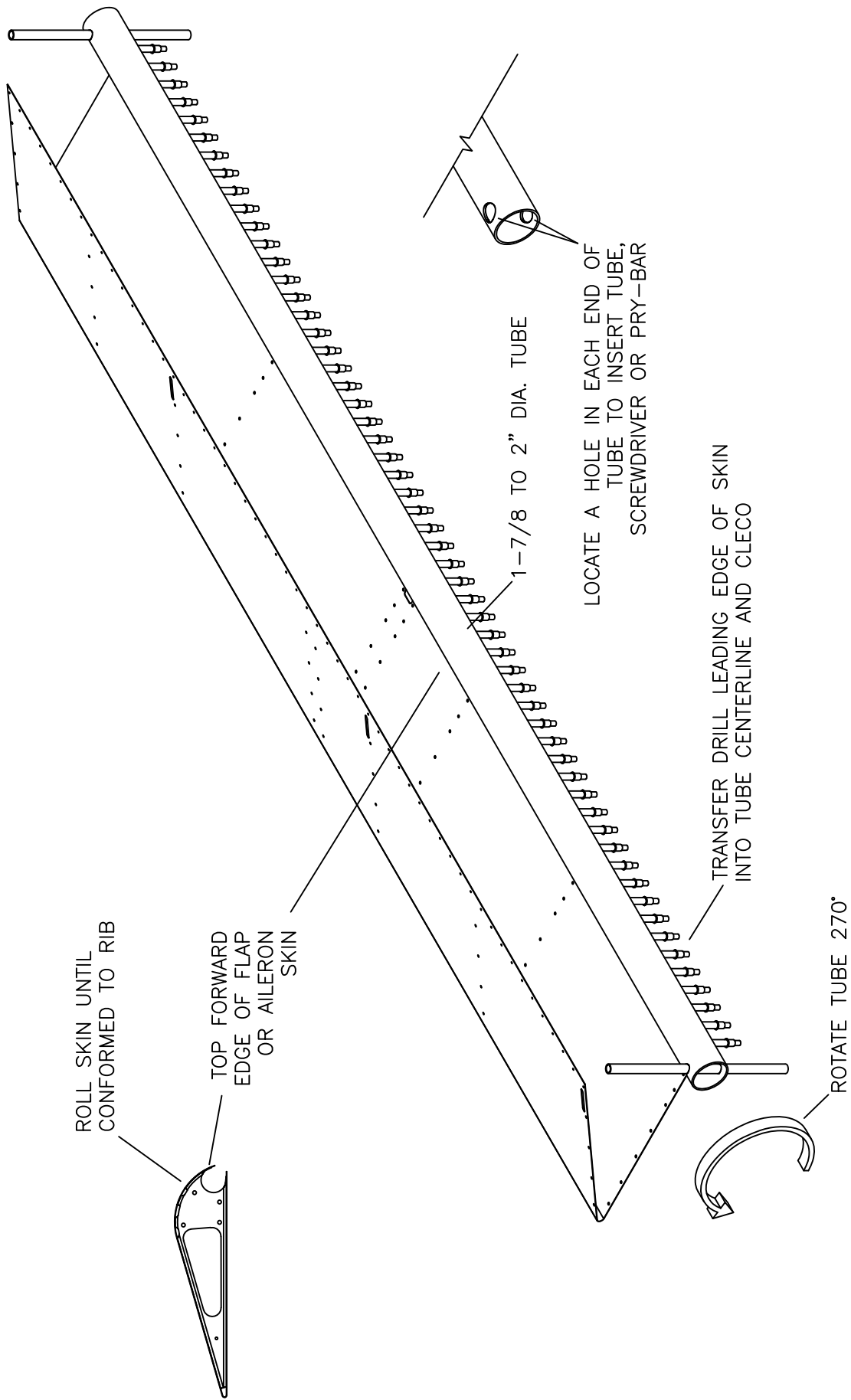


Figure-C

**RANS S-21 OUTBOUND
FUEL TANK RETENTION BRACKET
FIGURE 06-14A**

MD5650



ROLL SKIN UNTIL
CONFORMED TO RIB

TOP FORWARD
EDGE OF FLAP
OR AILERON
SKIN

1-7/8 TO 2" DIA. TUBE

LOCATE A HOLE IN EACH END OF
TUBE TO INSERT TUBE,
SCREWDRIVER OR PRY-BAR

TRANSFER DRILL LEADING EDGE OF SKIN
INTO TUBE CENTERLINE AND CLECO

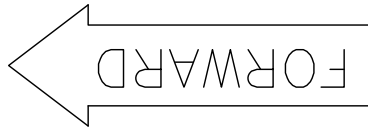
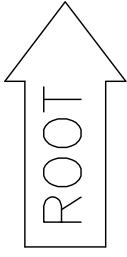
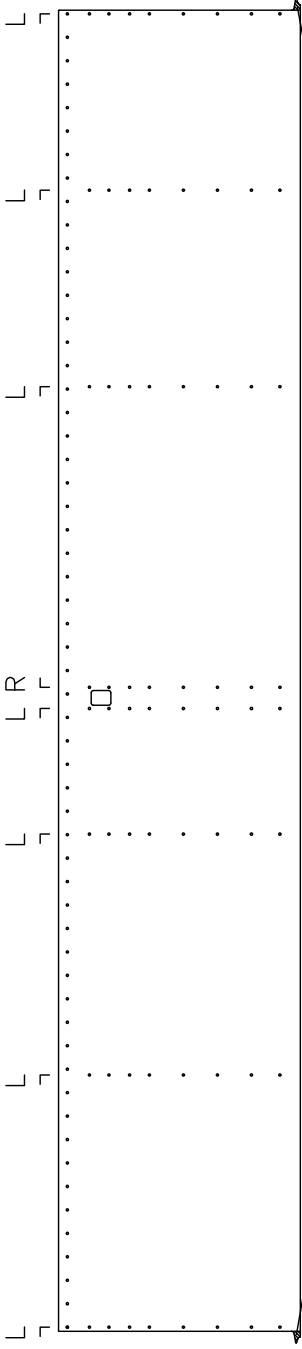
ROTATE TUBE 270°

**RAMS S-21 OUTBOUND
FLAP & AILERON SKIN FORMING
FIGURE 06-14B**

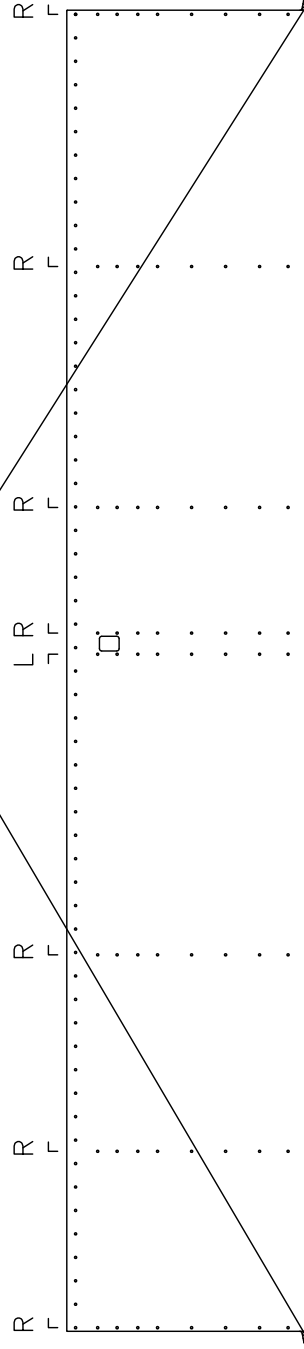
MD5654
REV. - ORIG

LEFT FLAP
TOP VIEW

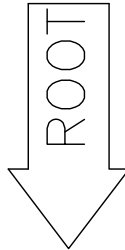
ACTION RIBS



REMOVE



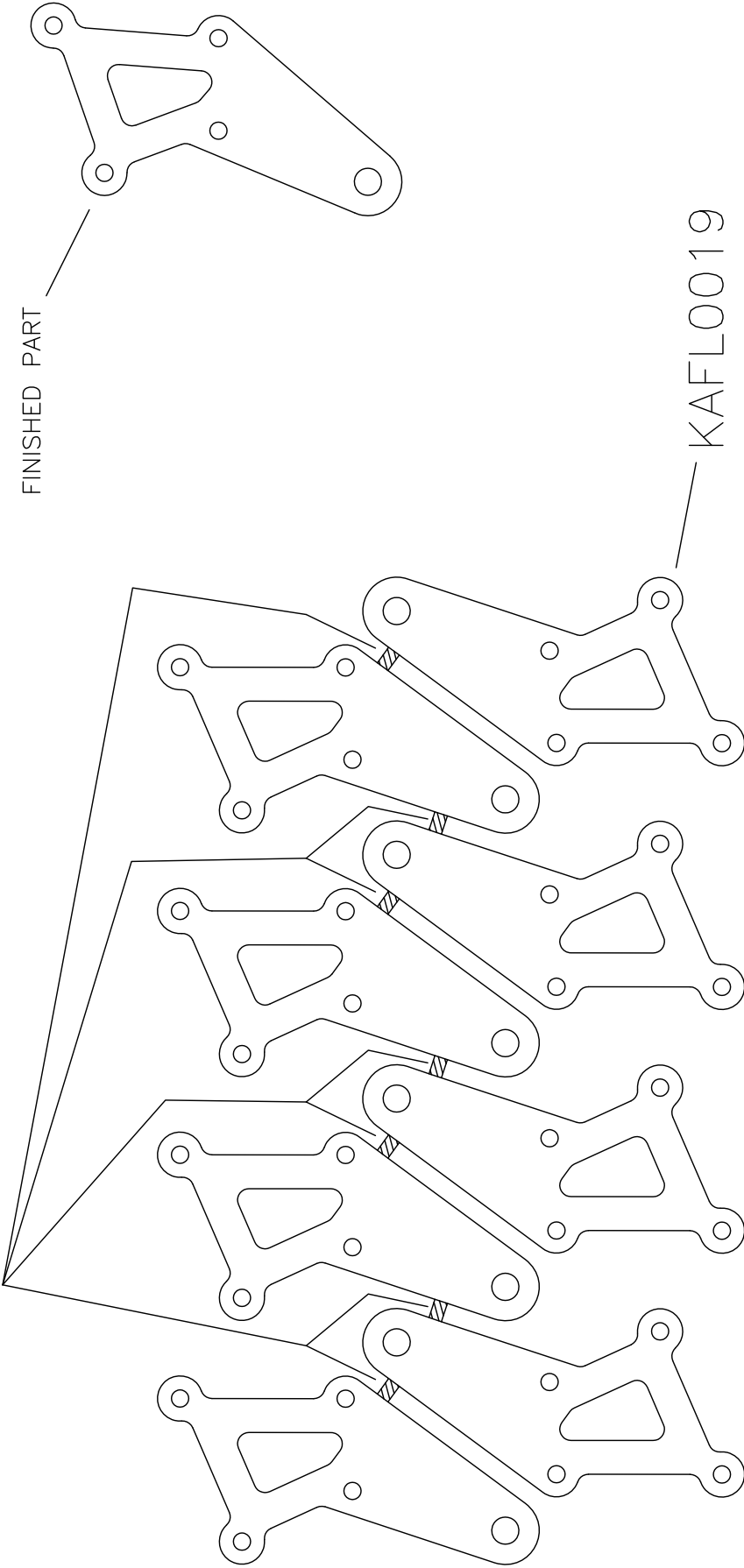
RIGHT FLAP
TOP VIEW



MD5650
REV. - ORIG

RRR S-21 OUTBOUND
141 WING - FLAP ORIENTATION
FIGURE 06-15

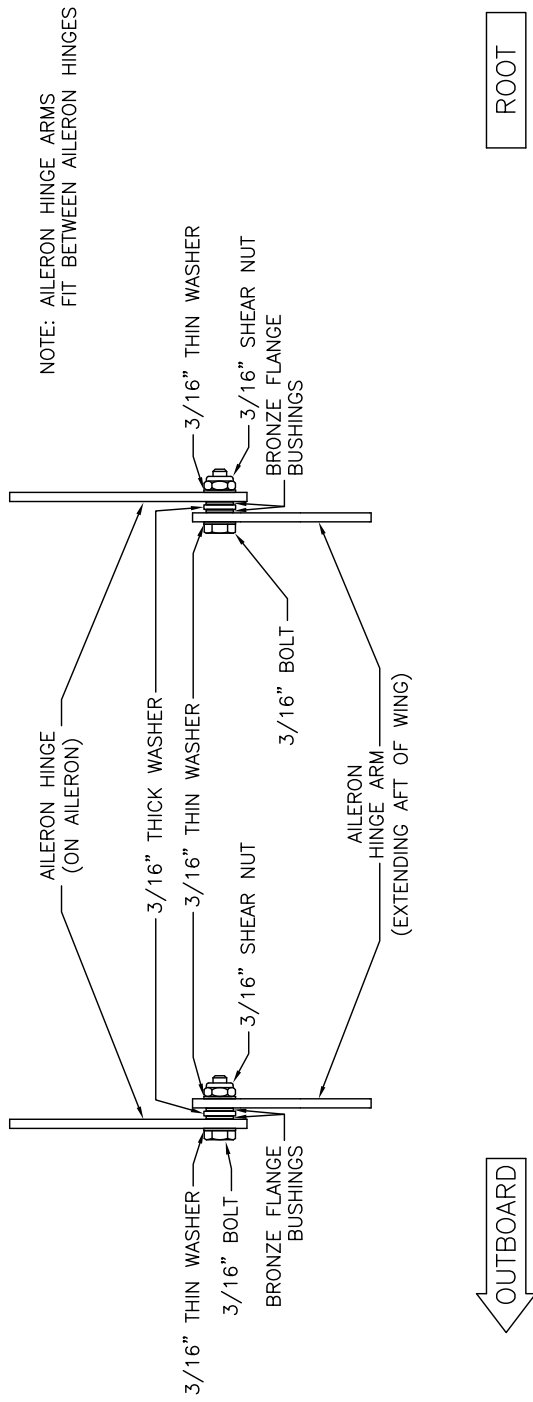
REMOVE ATTACHMENT TABS
TO MAKE 8 INDIVIDUAL PARTS



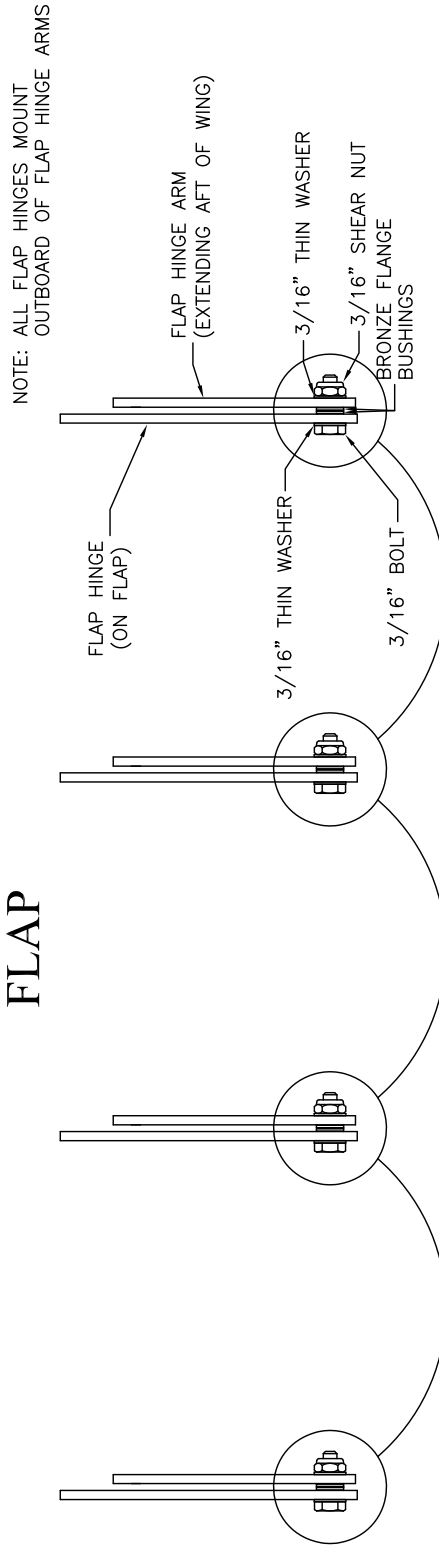
MD5650
REV. - ORIG

RRMS S-21 OUTBOUND
141 WING - FLAP HINGE - PART ASSEMBLY MODIFICATION
FIGURE 06-15A

AILERON

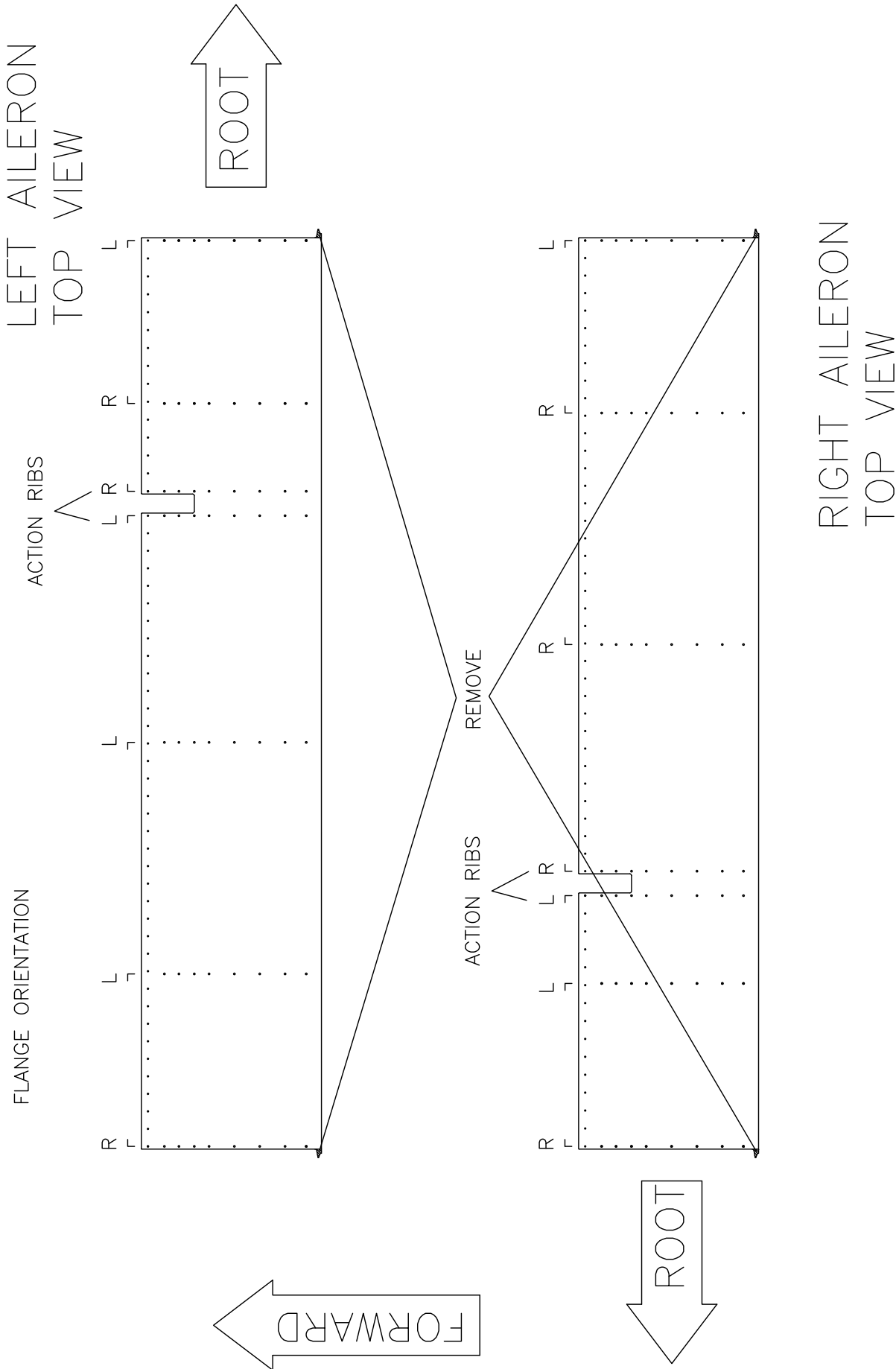


FLAP



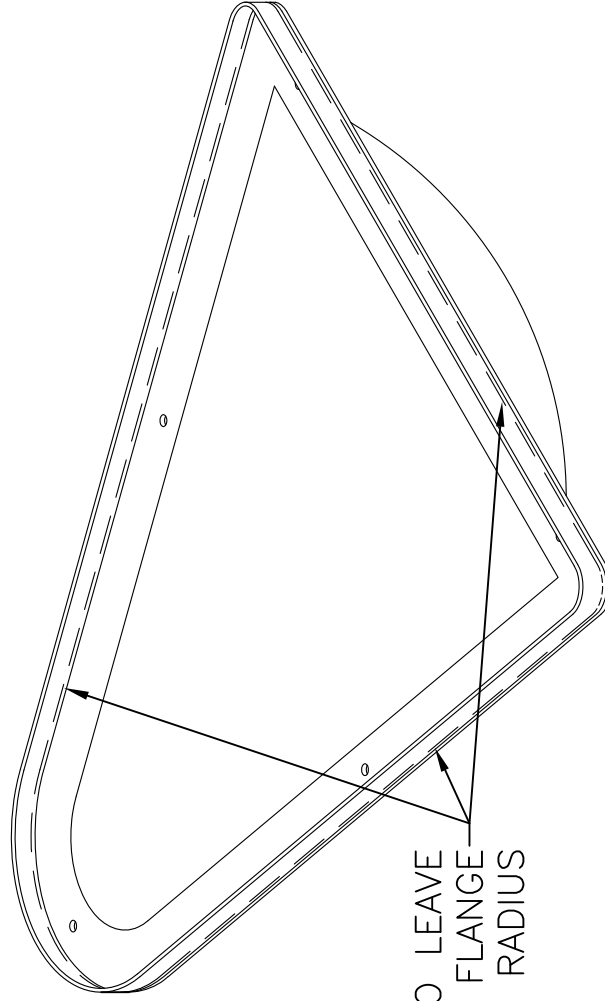
MD5650
REV. A

RAMS S-21 OUTBOUND
141 WING - TYPICAL AILERON/FLAP HINGE ASSEMBLY
FIGURE 06-16



MD5650
REV. - ORIG

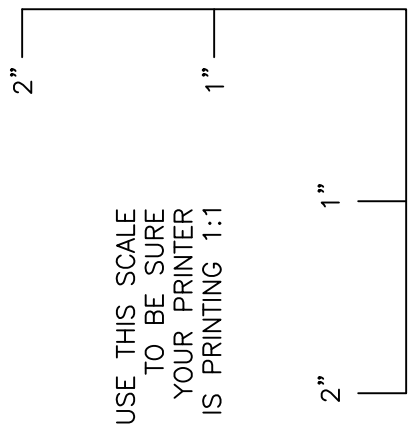
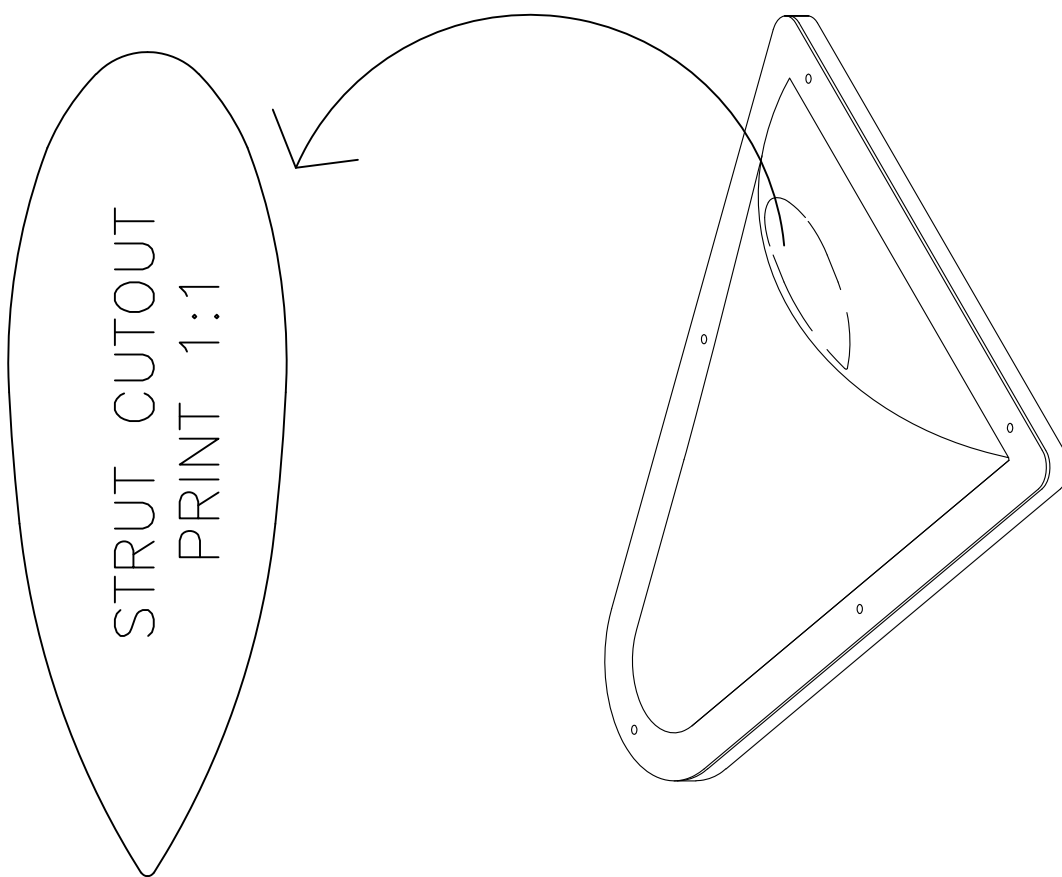
RRRMS S-21 OUTBOUND
141 WING - AILERON ORIENTATION
FIGURE 06-17



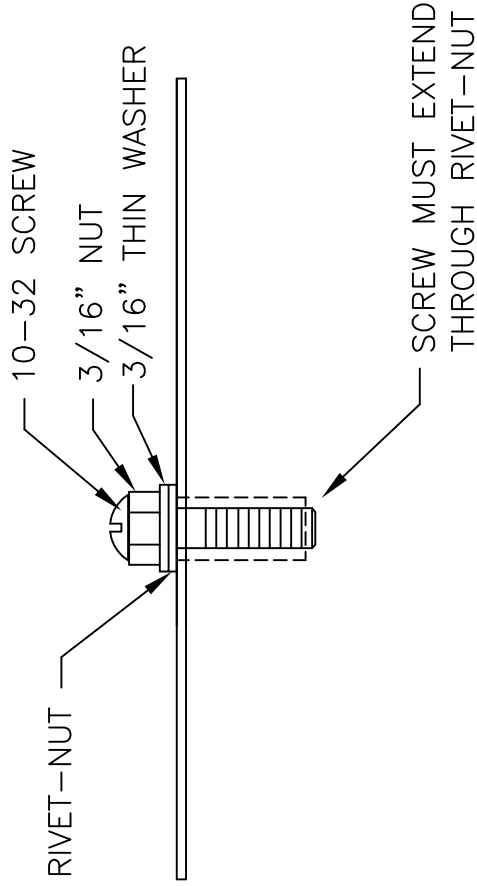
TRIM TO LEAVE
A SMALL FLANGE
JUST BEYOND RADIUS

MD5650
REV. - ORIG

RRAD S-21 OUTBOUND
UPPER LIFT STRUT FAIRING TRIMMING
FIGURE 06-18



RRAMES S-21 OUTBOUND
LIFT STRUT CUT-OUT TEMPLATE
FIGURE 06-19



PROCEDURE BELOW MAY BE USED WHEN A RIVET-NUT PULLER IS NOT AVAILABLE.

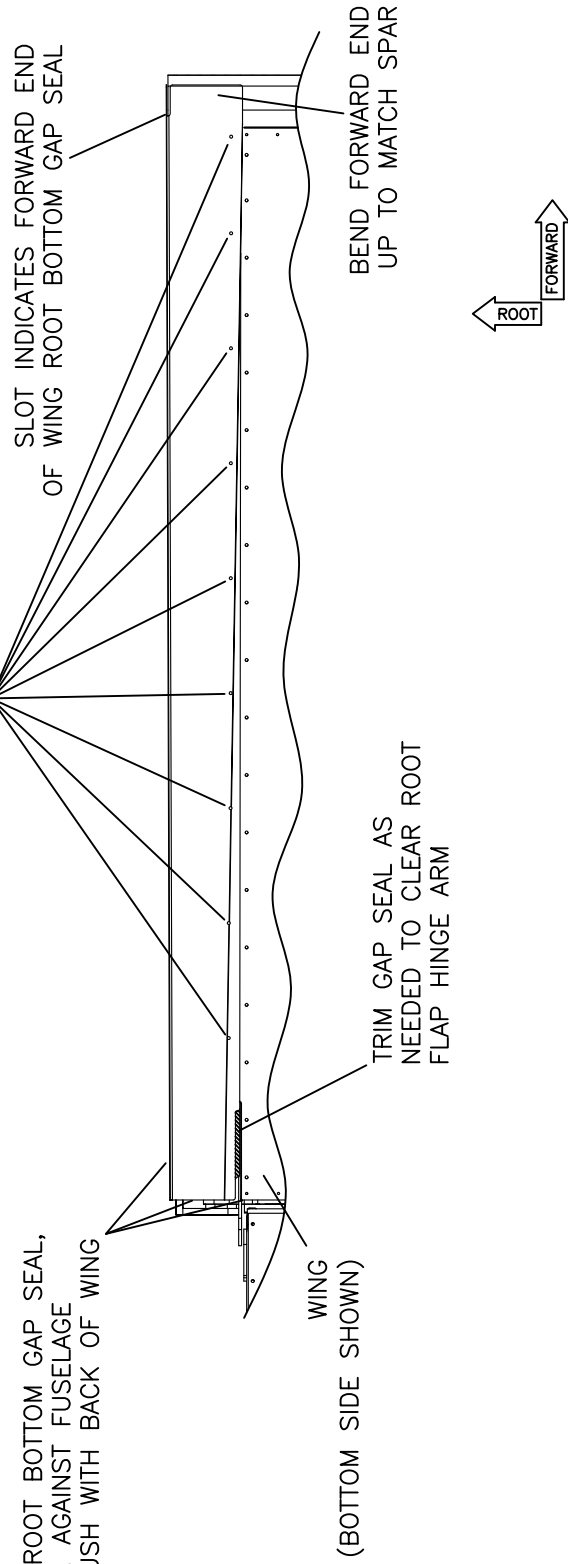
1. FINGER TIGHTEN NUT AND RIVET-NUT ONTO SCREW.
2. INSERT RIVET-NUT INTO 1/4" HOLE.
3. TURN NUT 3 COMPLETE TURNS CLOCKWISE WHILE HOLDING SCREW STATIONARY.
4. BACK NUT OFF 1/2 TURN AND REMOVE SCREW.

RAMS S-21 OUTBOUND
 RIVET-NUT INSTALLATION
 FIGURE 06-20

MD343
 REV. - ORIG

2. TRANSFER DRILL #30 THROUGH GAP SEAL. REMOVE GAP SEAL. DRILL WING BOTTOM SKIN TO #11 AND INSTALL TINNEMANS APPLY FOAM TAPE TO ROOT OF GAP SEAL AND INSTALL GAP SEAL WITH #8 PAN HEAD SCREWS.

1. LOCATE WING ROOT BOTTOM GAP SEAL, FLANGE DOWN, AGAINST FUSELAGE TUBE AND FLUSH WITH BACK OF WING BOTTOM SKIN.



RAMS S-21 OUTBOUND
WING ROOT BOTTOM GAP SEAL INSTALLATION
FIGURE 06I-19

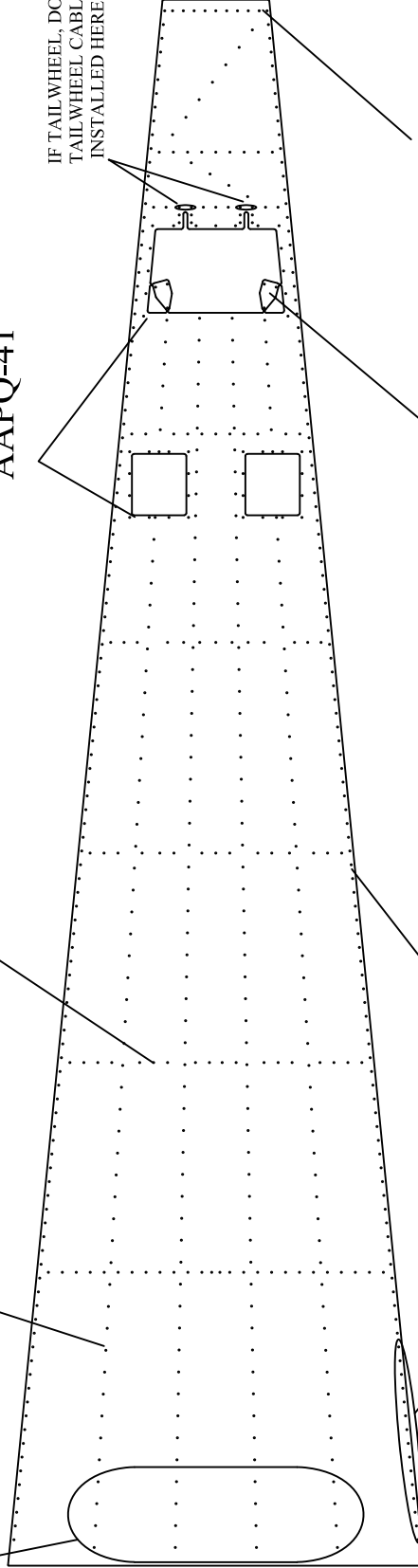
DO NOT RIVET
UNTIL ATTACHED
TO CAGE AND
SPACER STRIPS
IN PLACE

ALL STRINGERS
1691-0410 AVEX

S-4 TO S-10 BULKHEADS
AAPQ-41

INSPECTION PANEL TAB RINGS
AAPQ-41

IF TAIL WHEEL, DO NOT RIVET.
TAIL WHEEL CABLE PULLEY IS
INSTALLED HERE



S-11 BULKHEAD
AAPQ-42

REMOVE AND DEBURR
SLOT COVERS

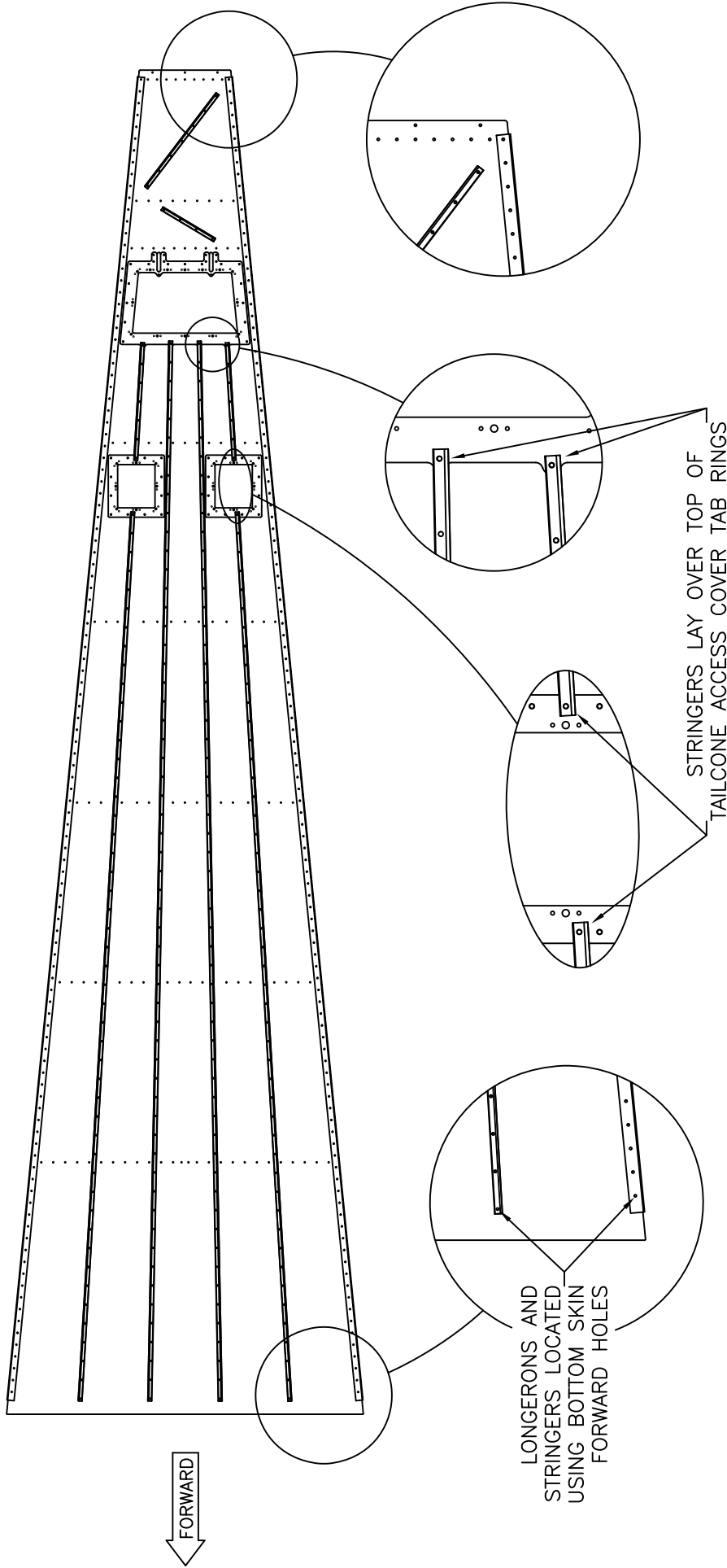
LONGERONS
AAPQ-42
AAPQ-43

VIEWED FROM UPPER SIDE

MD5654
REV. A

RRR S-21 OUTBOUND
TAILCONE BOTTOM SKIN RIVET SCHEDULE
FIGURE 07-01

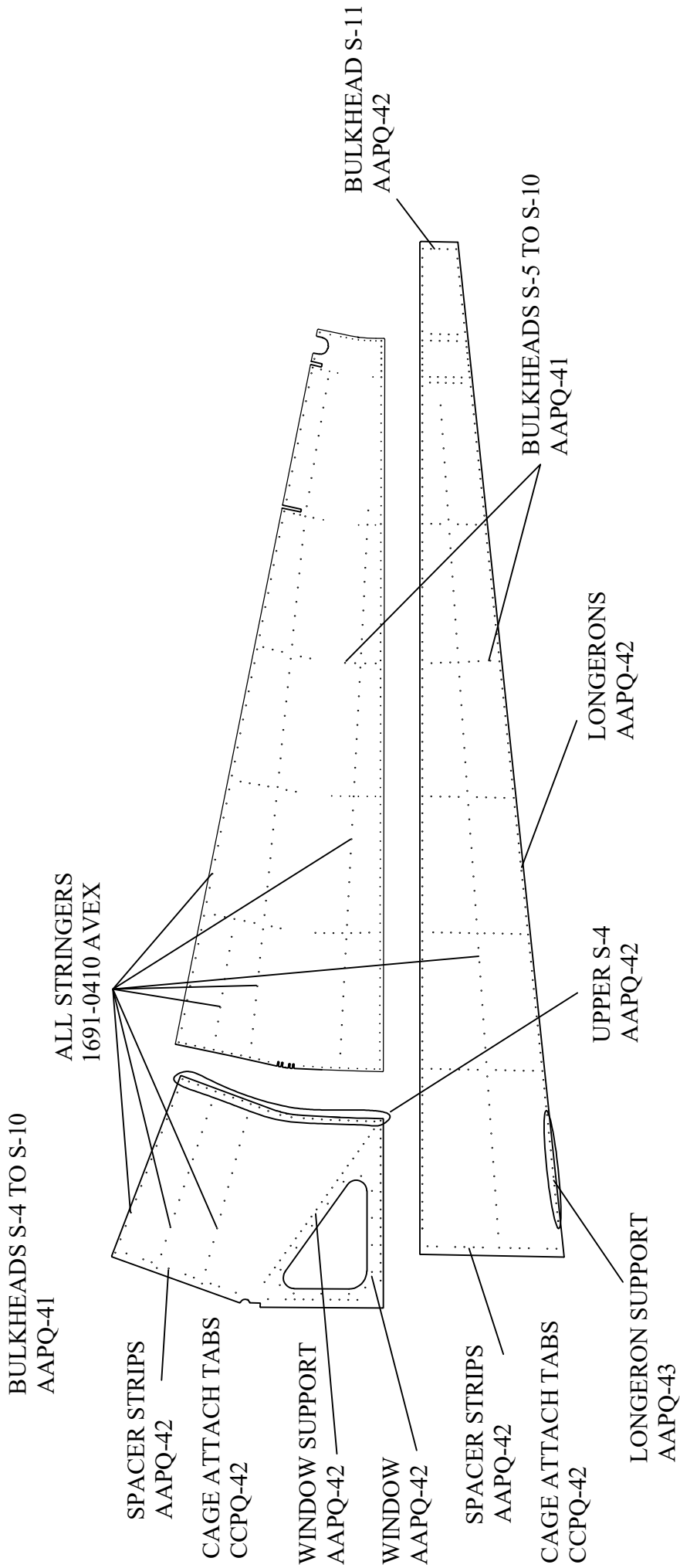
POSITION LONGERONS AND STRINGERS AS SHOWN



VIEWED FROM UPPER SIDE

MD5654
REV. - ORIG

RAMS S-21 OUTBOUND
TAILCONE BOTTOM SKIN LONGERON / STRINGER DETAIL
FIGURE 07-01A

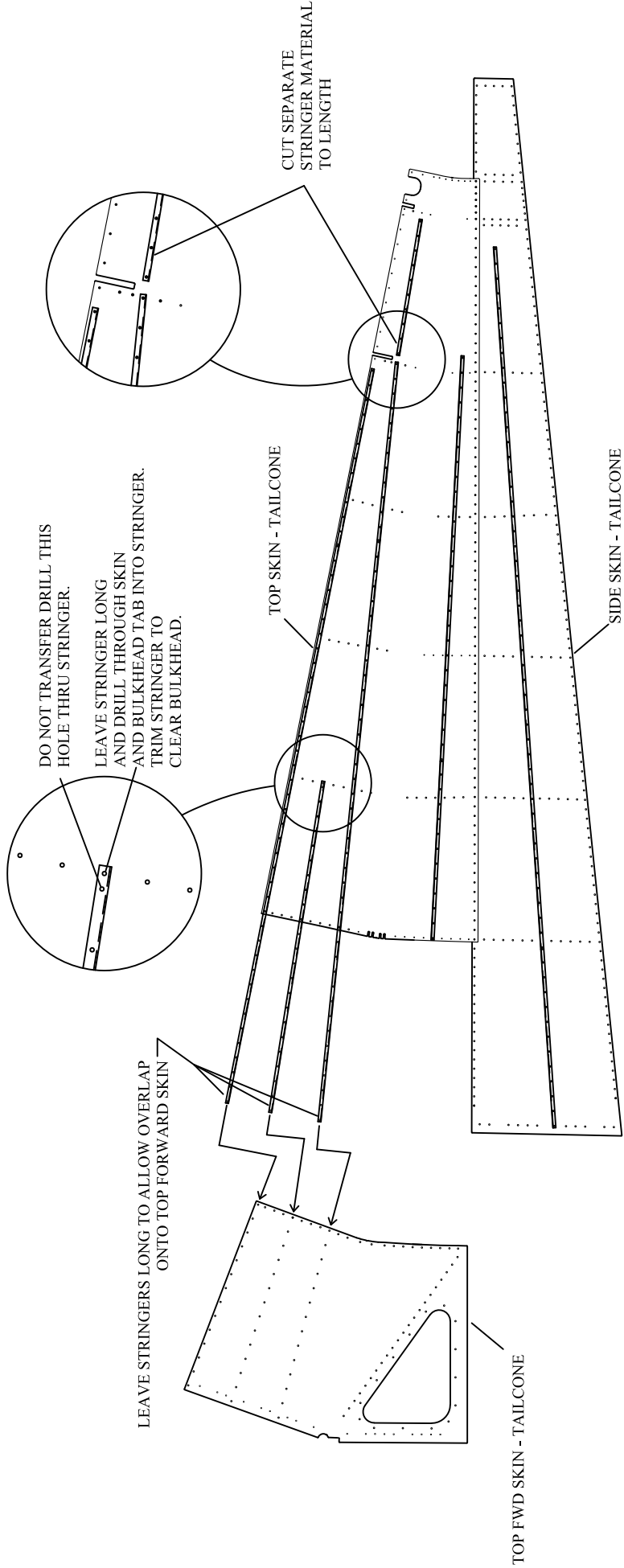


NOTE: SOME HOLES SHOWN
ARE DRILLED BY BUILDER



MD5654
REV. D

RAMS S-21 OUTBOUND
TAILCONE SIDE/TOP RIVET SCHEDULE
FIGURE 07-02

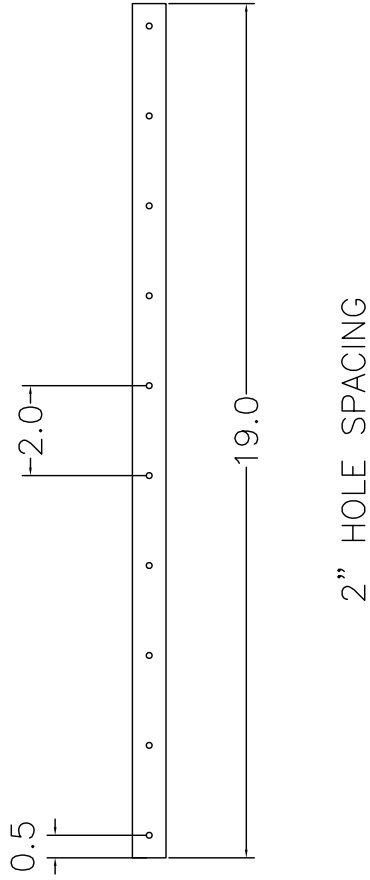


MD5654
REV. A

RRR S-21 OUTBOUND
TOP & SIDE STRINGER DETAIL
FIGURE 07-02A



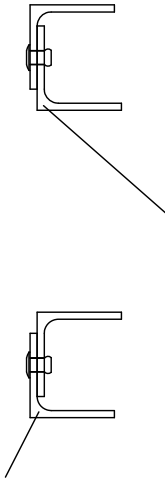
FABRICATE FROM KPFU0748



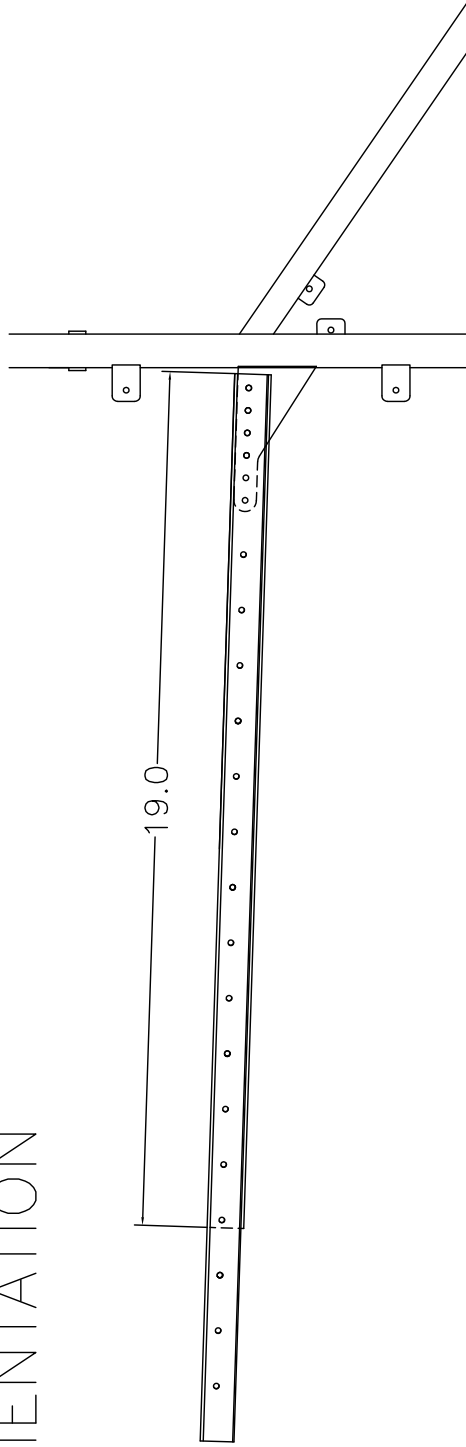
LEFT

RIGHT

MIDDLE LONGERON



SUPPORT
ORIENTATION



STATION 3

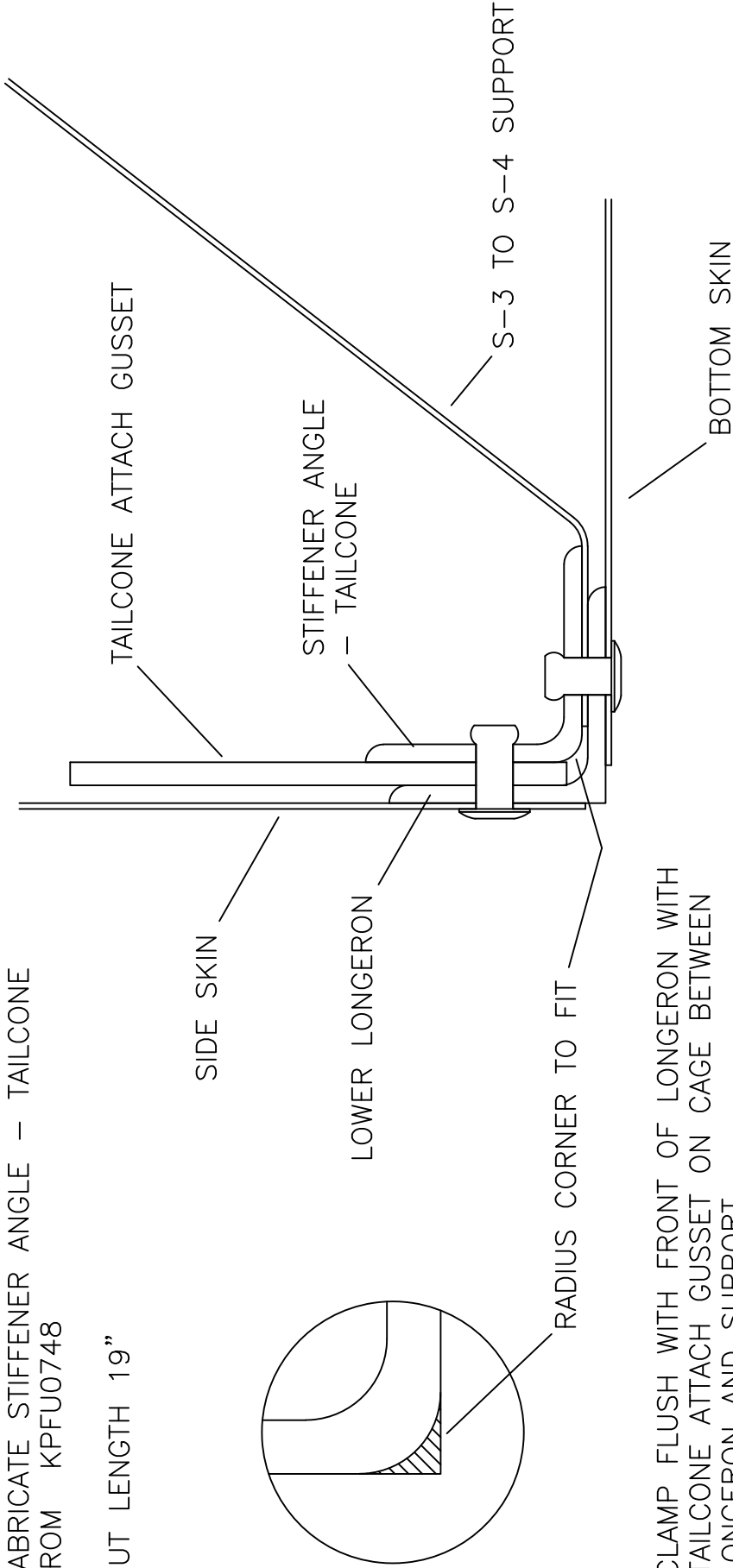


MD5654
REV. - ORIG

RRAMES S-21 OUTBOUND
MIDDLE LONGERON SUPPORT FABRICATION
FIGURE 07-03

FABRICATE STIFFENER ANGLE - TAILCONE
FROM KPFU0748

CUT LENGTH 19"



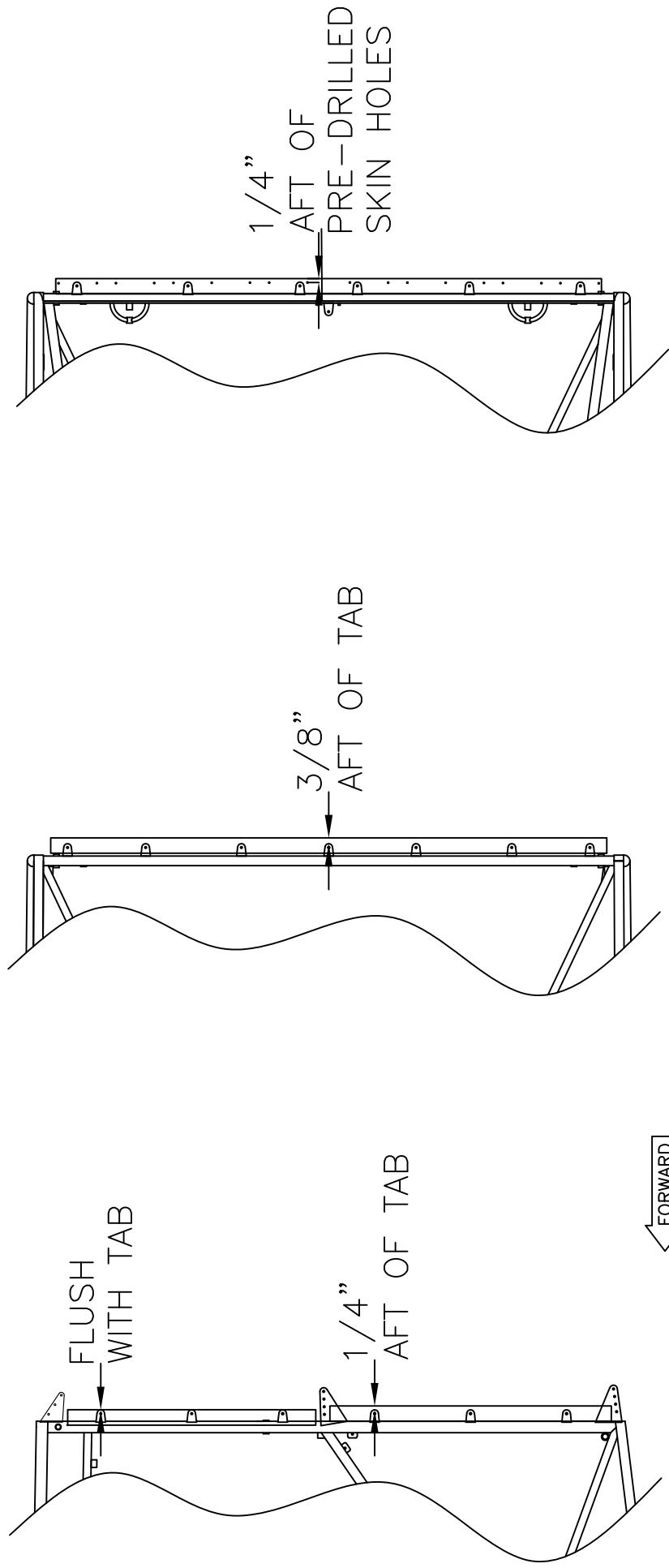
CLAMP FLUSH WITH FRONT OF LONGERON WITH
TAILCONE ATTACH GUSSET ON GAGE BETWEEN
LONGERON AND SUPPORT.

ALSO, CLAMP TIGHT TO LOWER LONGERON AFT OF
TAILCONE ATTACH GUSSET.

TRANSFER DRILL FROM SKIN/LONGERON

MD5654
REV. A

RAMS S-21 OUTBOUND
STIFFENER ANGLE - TAILCONE FABRICATION AND INSTALLATION
FIGURE 07-04



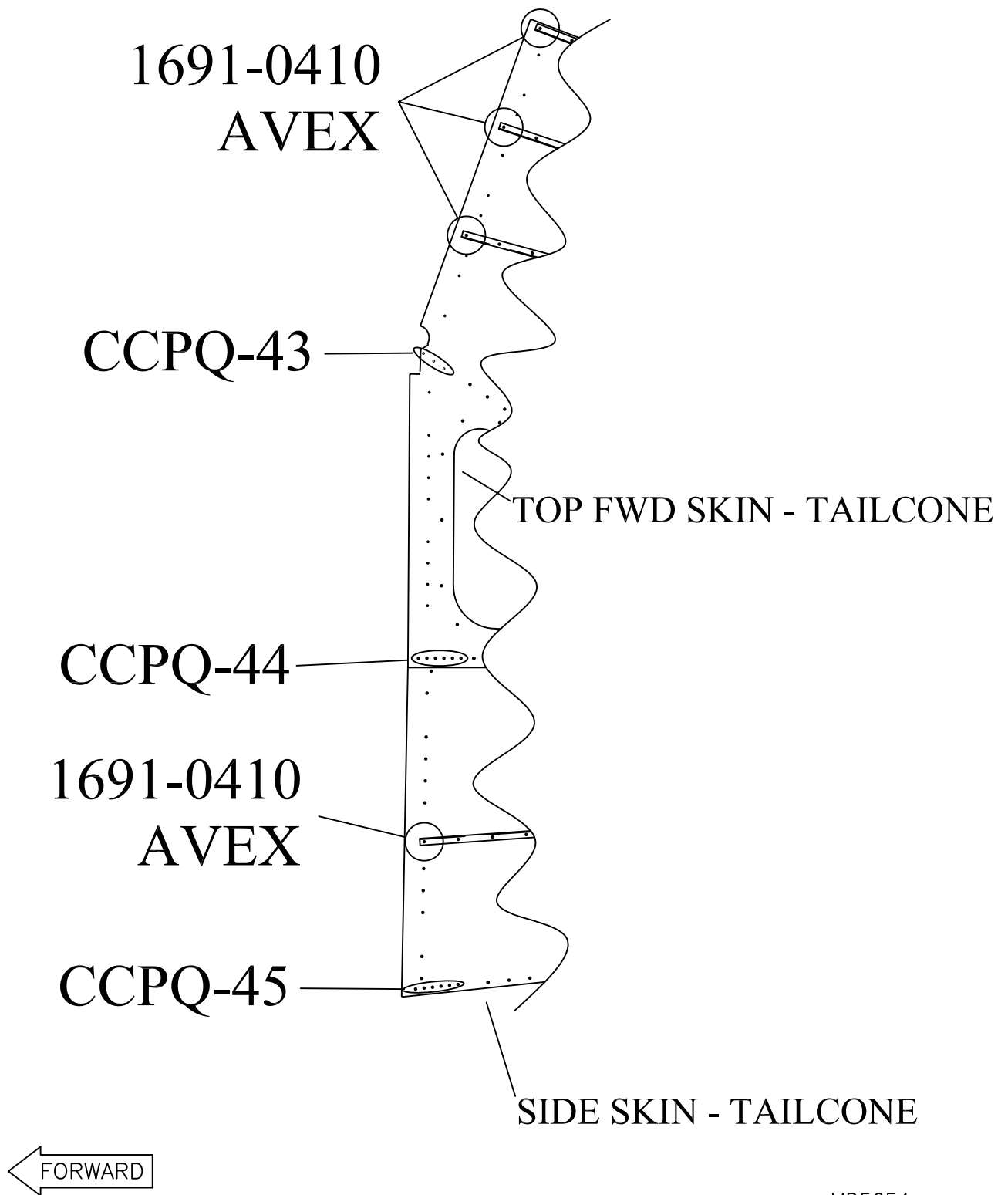
TOP

BOTTOM

SIDE

MD5654
REV. - ORIG

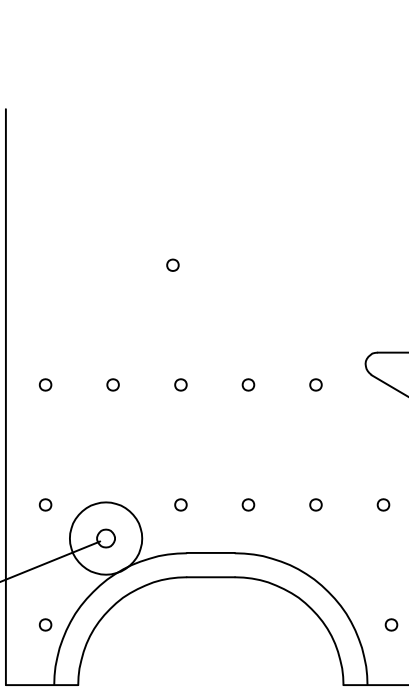
RAVEN S-21 OUTBOUND
TAILCONE SPACER STRIP DETAIL
FIGURE 07-04A



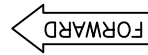
MD5654
REV. A

RANS S-21 OUTBOUND
SIDE AND TOP FWD TAILCONE RIVET DETAIL
FIGURE 07-04B

DRILL TO 13/16" FOR RUDDER CABLE
INSERT GROMMET



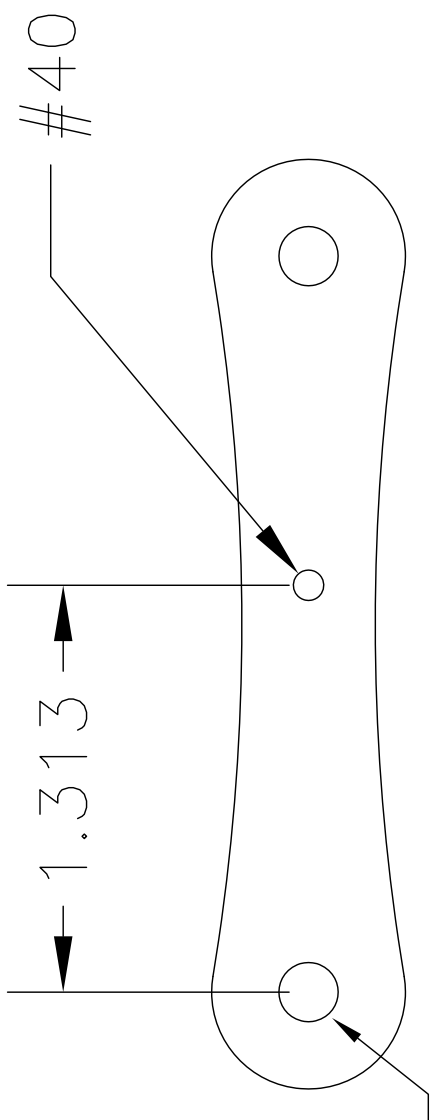
STATION 4 BULKHEAD
KPFU0707



09/11/2018

RAMSES S-21 OUTBOUND
STATION 4 RUDDER CABLE GUIDE
FIGURE 07-05

MD5654
REV. - ORIG

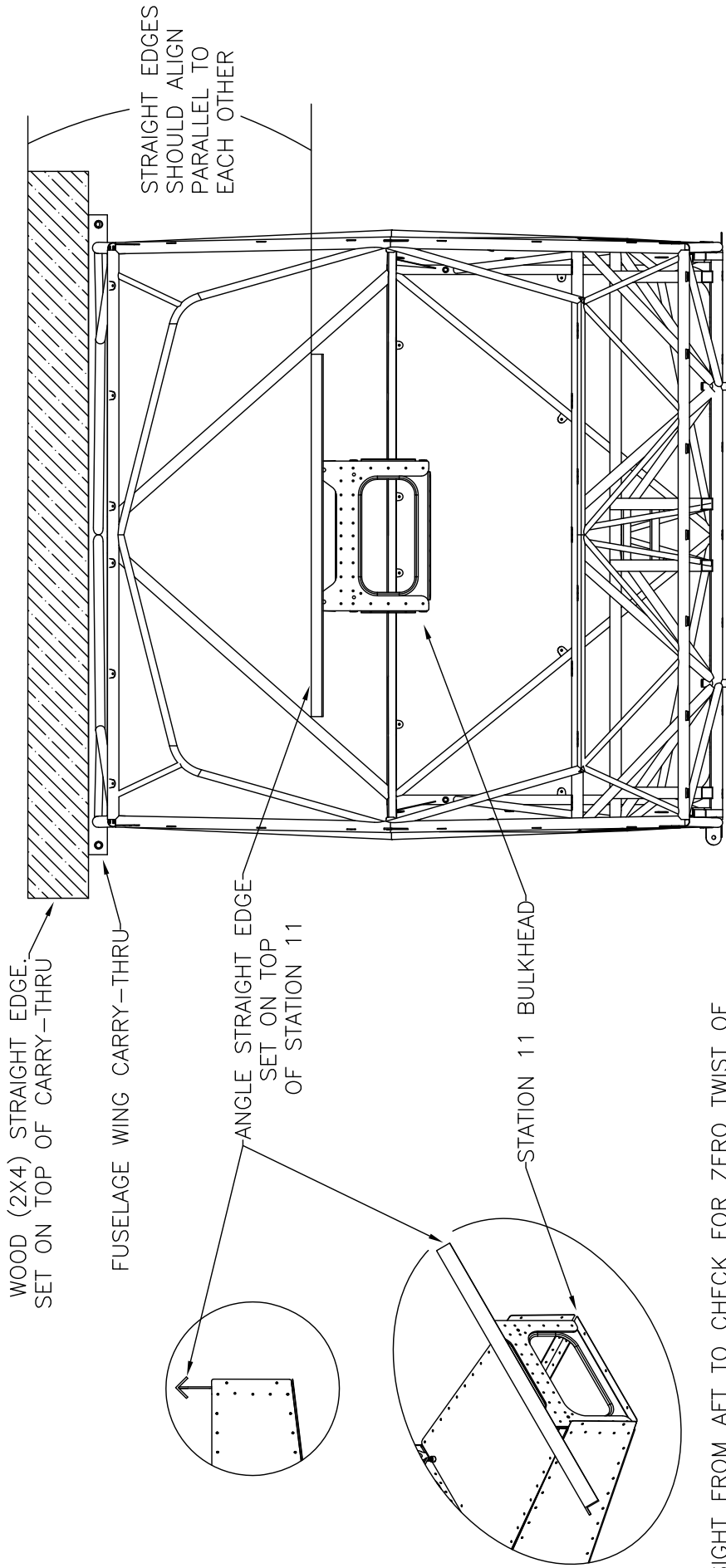


PULLEY ATTACHES
HERE

LOCATE AND DRILL #40

INSERT APPROPRIATE COTTER PIN TO
RETAIN CABLE IN PULLEY

RRR S-21 OUTBOUND
STATION 8 - TAILDRAGGER - TANG MODIFICATION
FIGURE 07-06



SIGHT FROM AFT TO CHECK FOR ZERO TWIST OF
TAILCONE IN RELATION TO FUSELAGE WING CARRY-THRU

ONLY STATION 11 BULKHEAD
AND FUSELAGE SHOWN FOR CLARITY

AFT VIEW

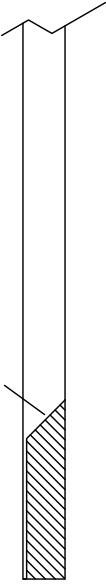
MD5654
REV. - ORIG

RRR S-21 OUTBOUND
TAILCONE ALIGNMENT
FIGURE 07-06A

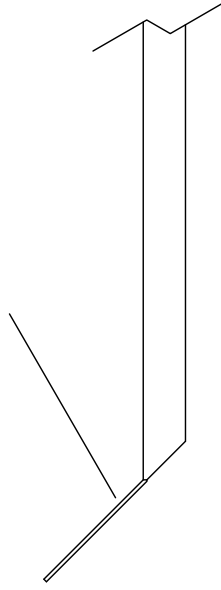
FABRICATE FROM KPFU0748

CUT LENGTH 33.5"

MATCH ANGLE ON FUSELAGE AND MARK TO LEAVE A 2.5" TANG WHEN FINISHED REMOVE MATERIAL AND LEAVE TANG IN PLACE



FILE ALL CORNERS BEFORE BENDING TO PREVENT CRACKING AT BEND LINE BEND TO MATCH FUSELAGE (CLAMP TANG IN VICE, BEND TO DESIRED ANGLE)



TEST FIT

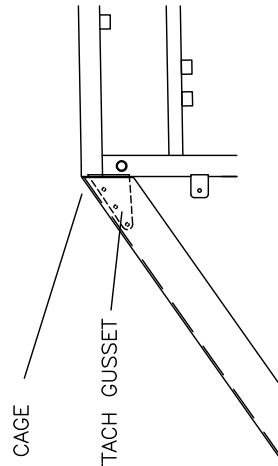
CLAMP IN PLACE WITH FLAT FACE FLUSH WITH BULKHEAD MARK AND TRIM TO TOP ATTACH GUSSET ON CAGE

CLAMP BACK IN PLACE WITH THE ANGLE RESTING ON THE OUTSIDE OF THE ATTACH GUSSET

DRILL (3) HOLES IN TANG AND RIVET IN PLACE

ALIGN TOP EDGE WITH TOP OF CAGE

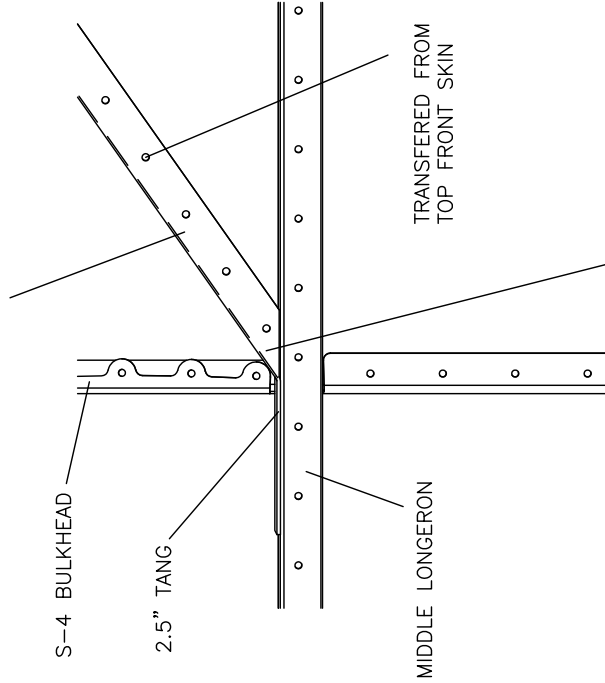
TRANSFER DRILL FROM THE TOP ATTACH GUSSET



STATION 3

MD5654
REV. - ORIG

SIDE FLUSH WITH SIDE SKIN
FLANGE ON TOP POINTING INWARDS

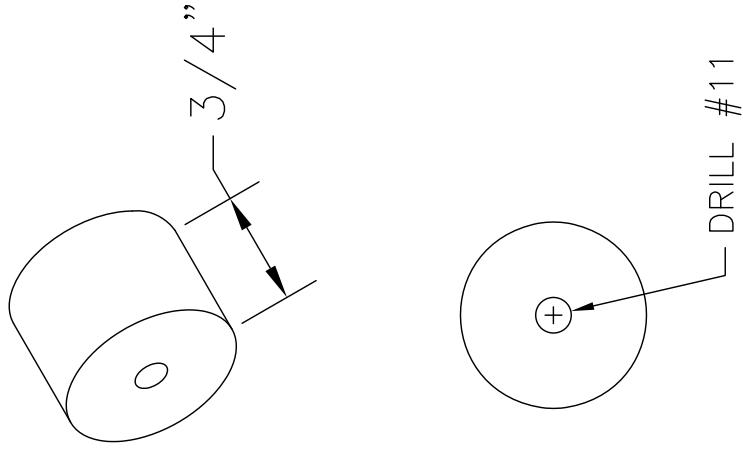


TANG SLIDES THROUGH BULKHEAD WITH LONGERON.
SLIDE FORWARD JUST ENOUGH TO PREVENT WINDOW SUPPORT FROM OVERLAPPING THE FLANGE ON S-4 BULKHEAD



RAMS S-21 OUTBOUND WINDOW SUPPORT FABRICATION FIGURE 07-07

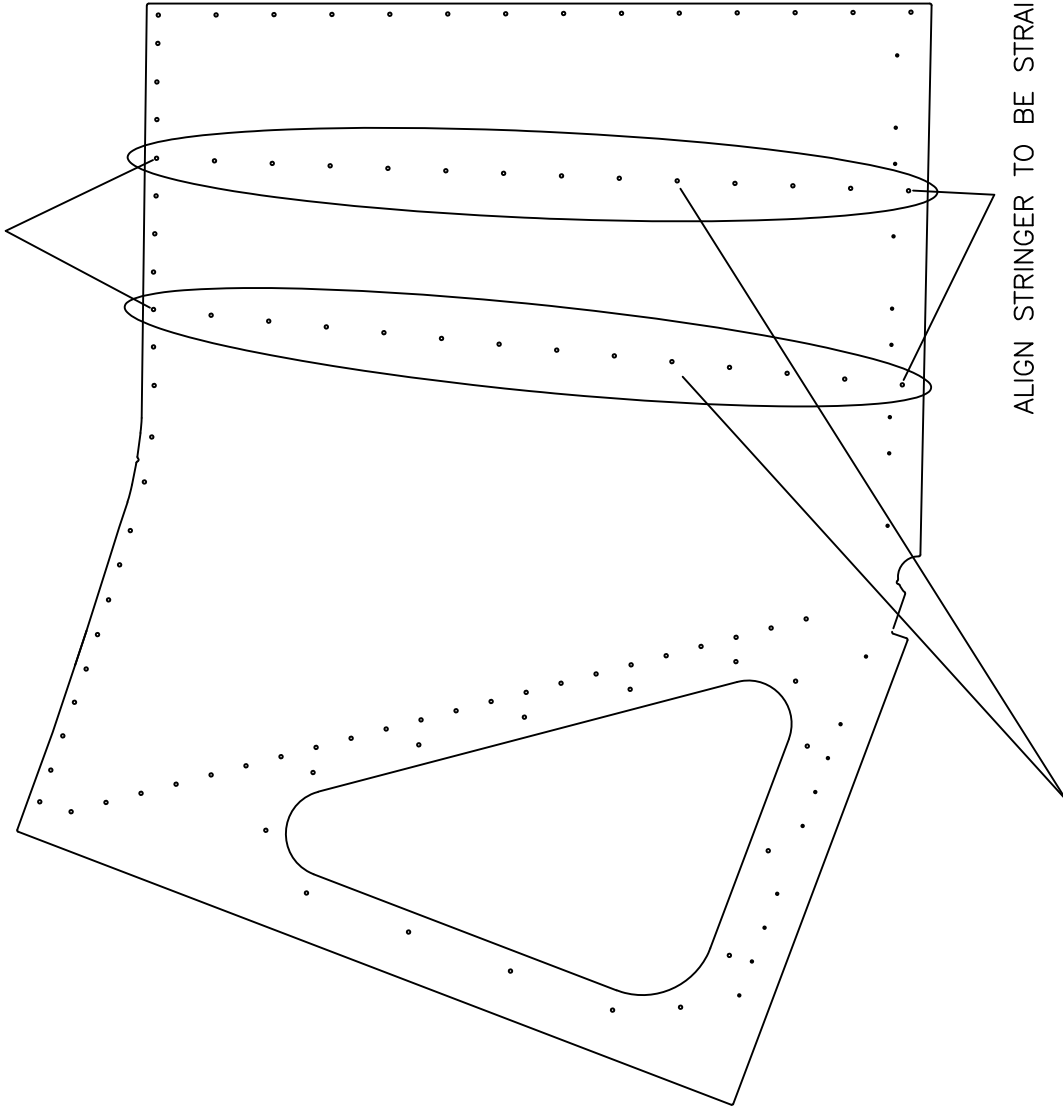
FABRICATE 2 SPACERS
FROM PROVIDED SPACER MATERIAL



MD5593
REV. - ORIG

RAMSES S-21 OUTBOUND
STATION 4 CLOSEOUT SPACER FABRICATION
FIGURE 07-07A

CLECO STRINGER TO THIS HOLE

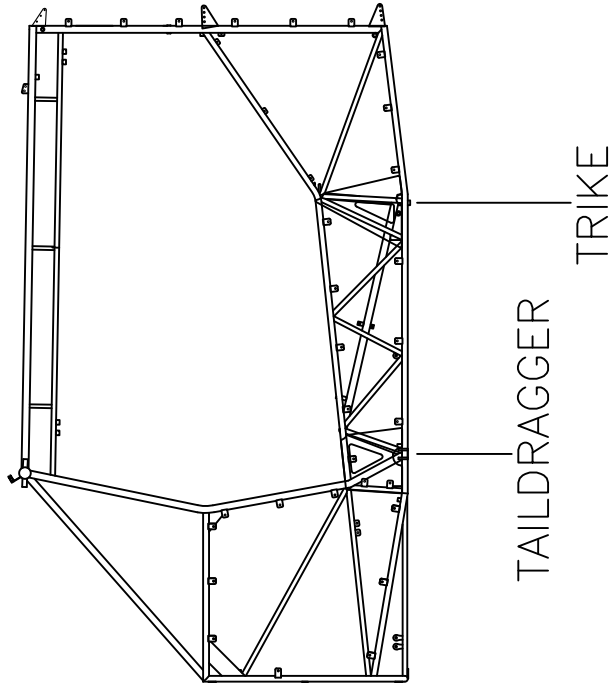
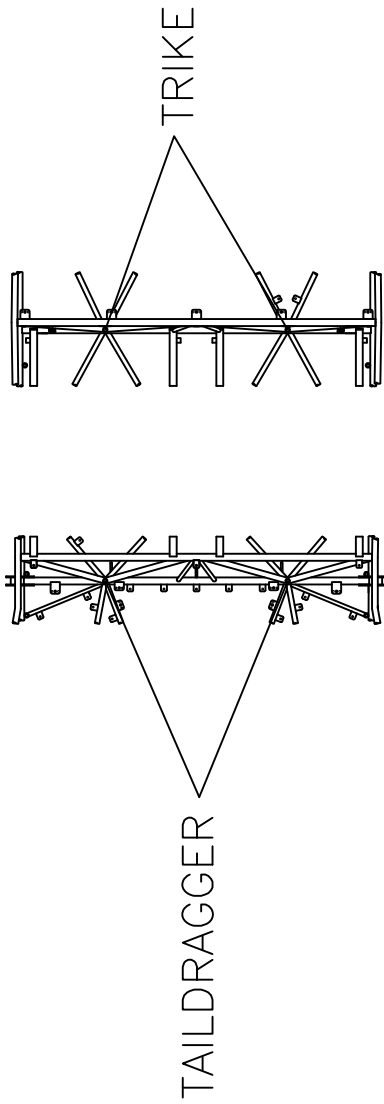


ALIGN STRINGER TO BE STRAIGHT. TRIM 1/4" PAST LAST HOLE.

TRANSFER DRILL FROM STRINGER TO SKIN

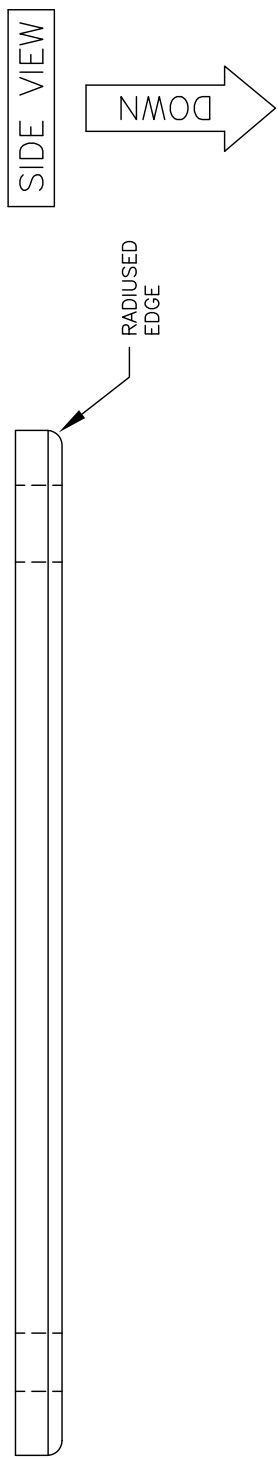
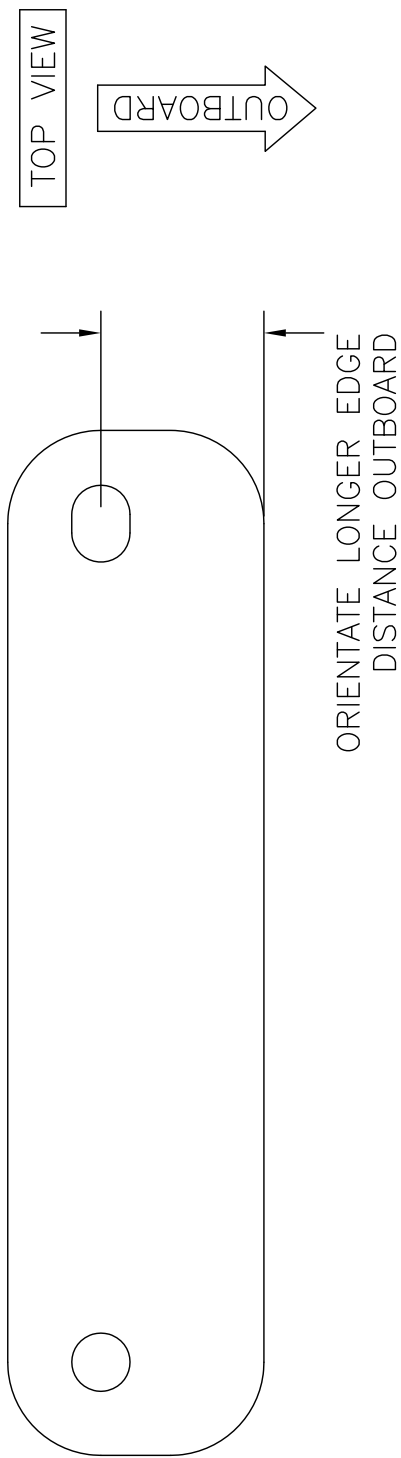
RAMS S-21 OUTBOUND
TOP FRONT SKIN STRINGERS
FIGURE 07-08

MD5654
REV. A



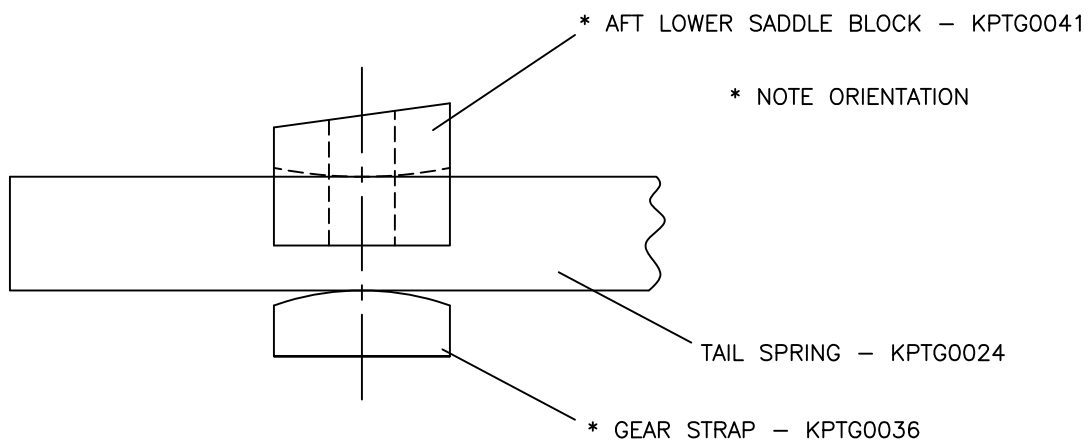
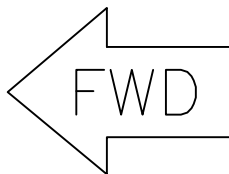
RRR S-21 OUTBOUND
 MAIN LANDING GEAR LOCATIONS
 FIGURE 08-04

MD5603
 REV. - ORIG



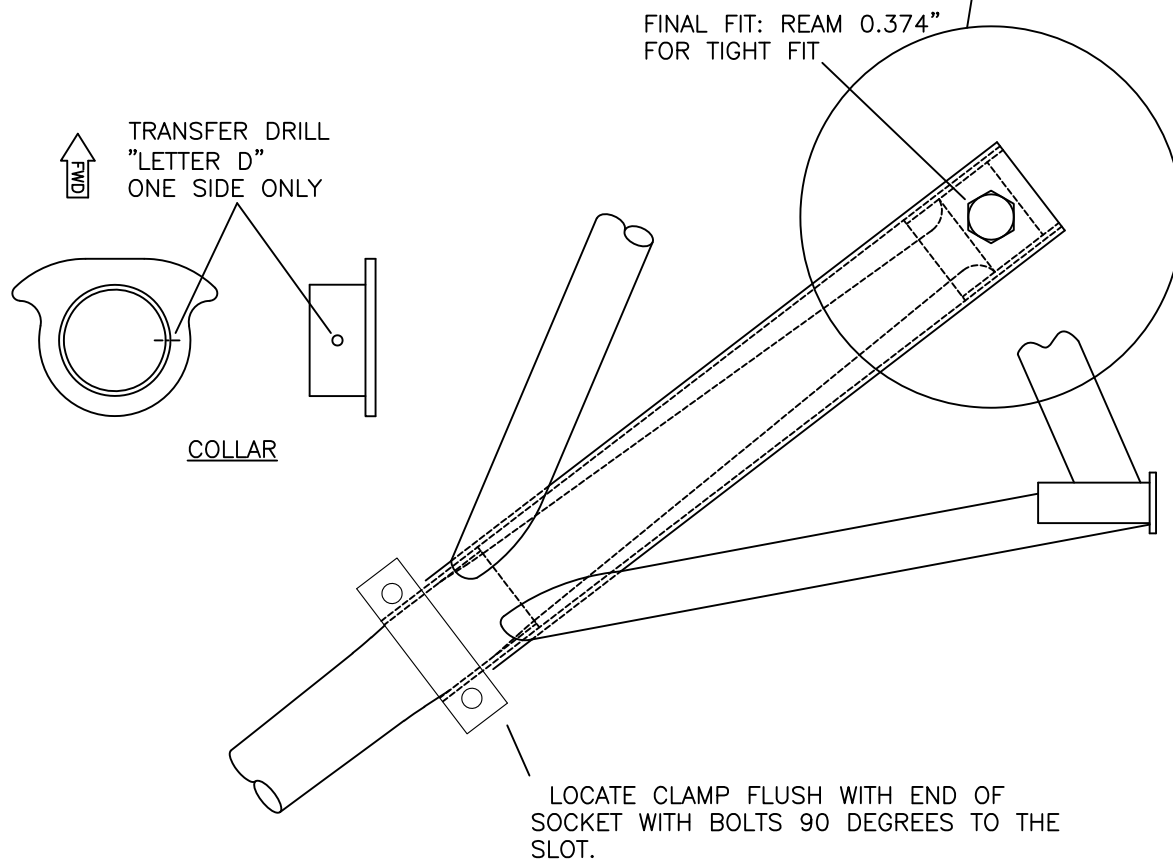
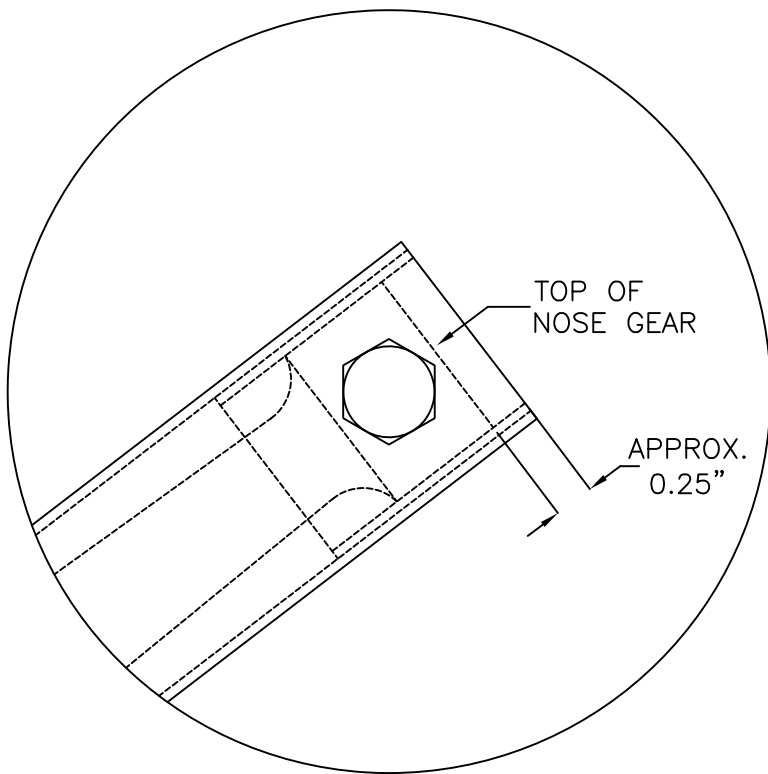
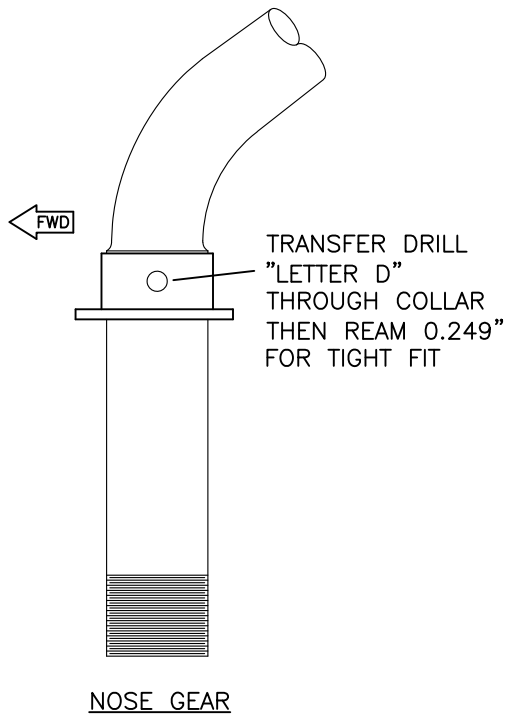
MD5600
REV. - ORIG

RAMS S-21 OUTBOUND
TOP MAIN GEAR CLAMP PLATE ORIENTATION
FIGURE 08-05



MD5054
REV. - ORIG

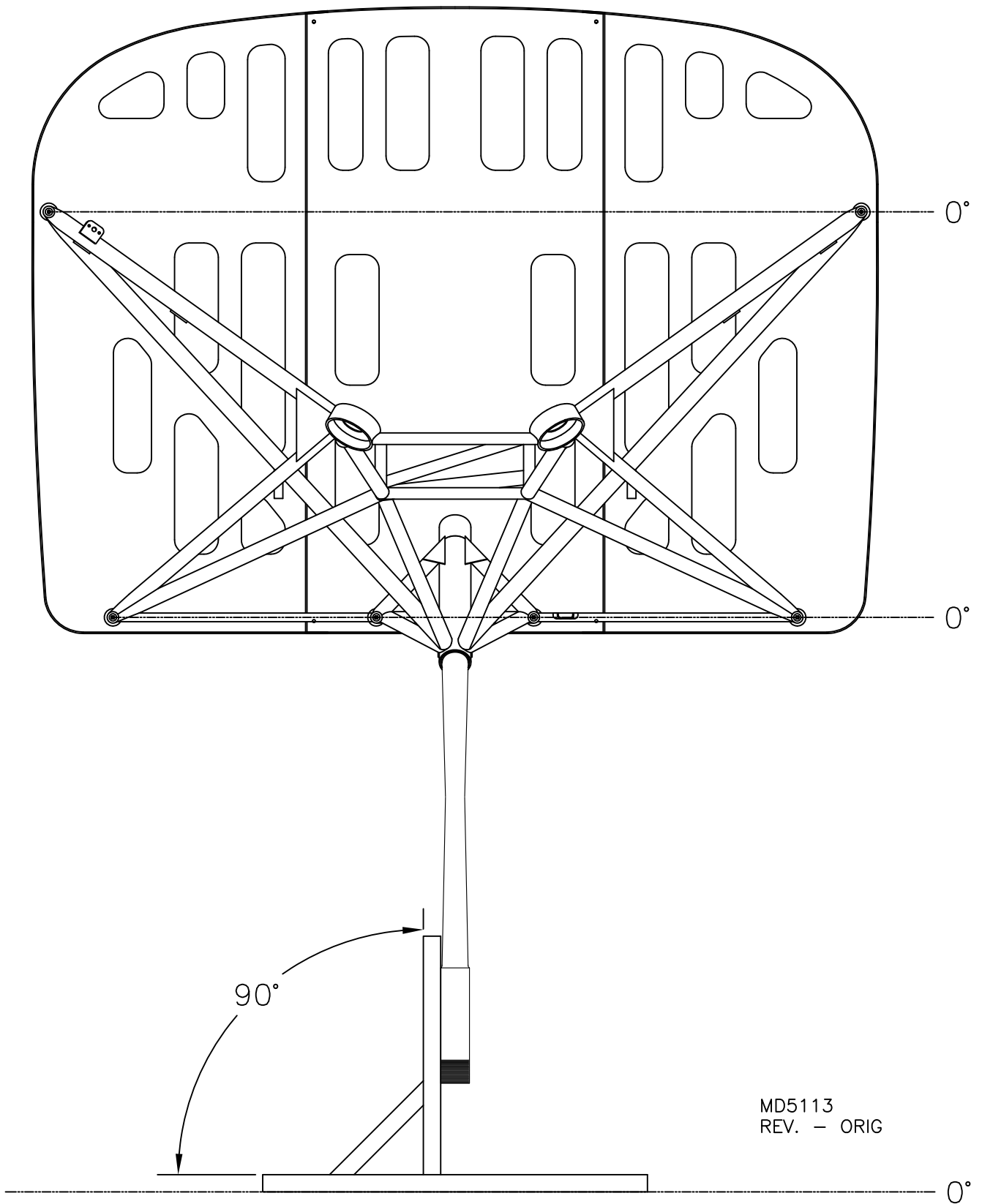
**RAMS S-21 OUTBOUND
TAIL SPRING INSTALLATION
FIGURE 08A-02**



**RANS S-21 OUTBOUND
NOSE GEAR INSTALLATION
FIGURE 08A-10**

MD5112
REV.1(2.02.22)

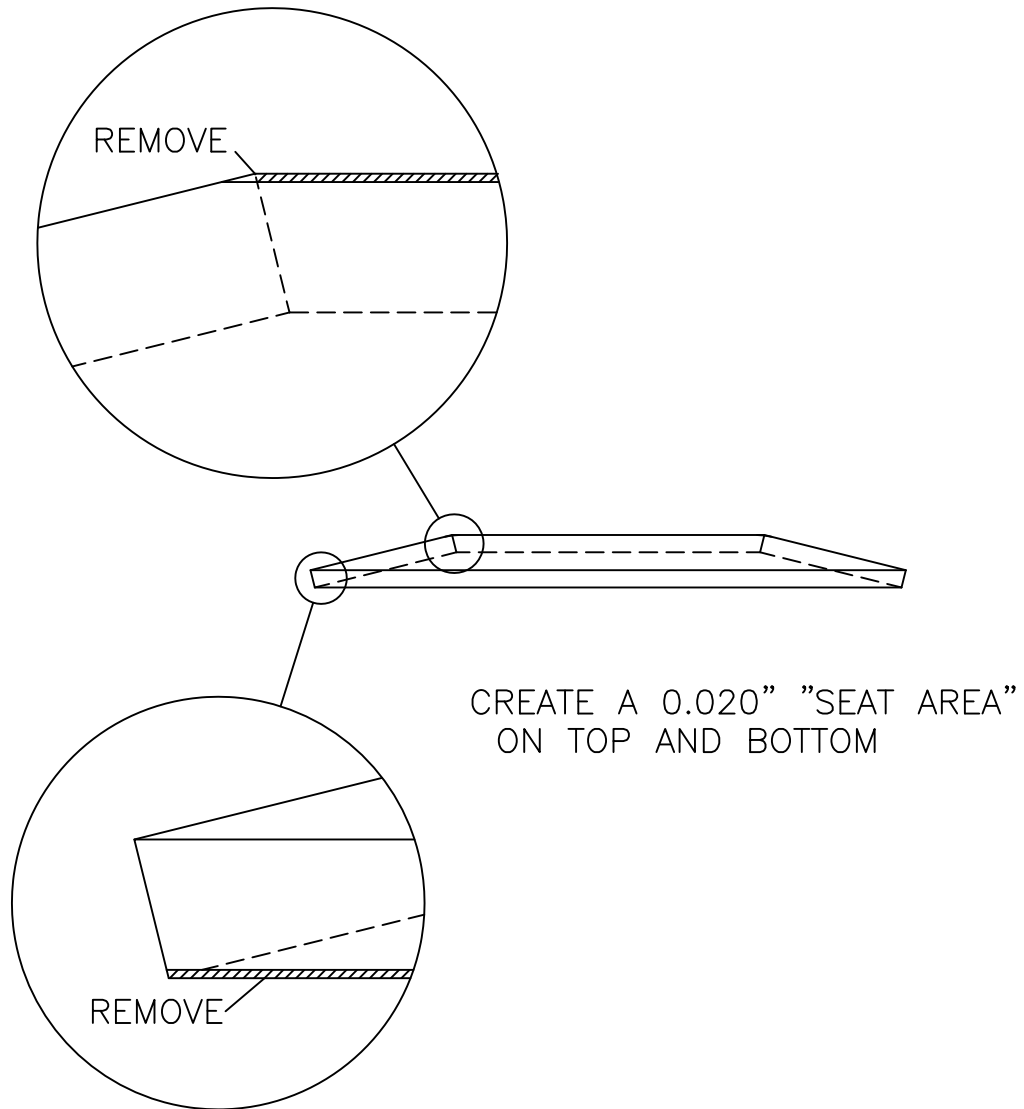
09/11/2018



MD5113
REV. - ORIG

RAMS S-21 OUTBOUND
NOSE GEAR ALIGNMENT
FIGURE 08A-12

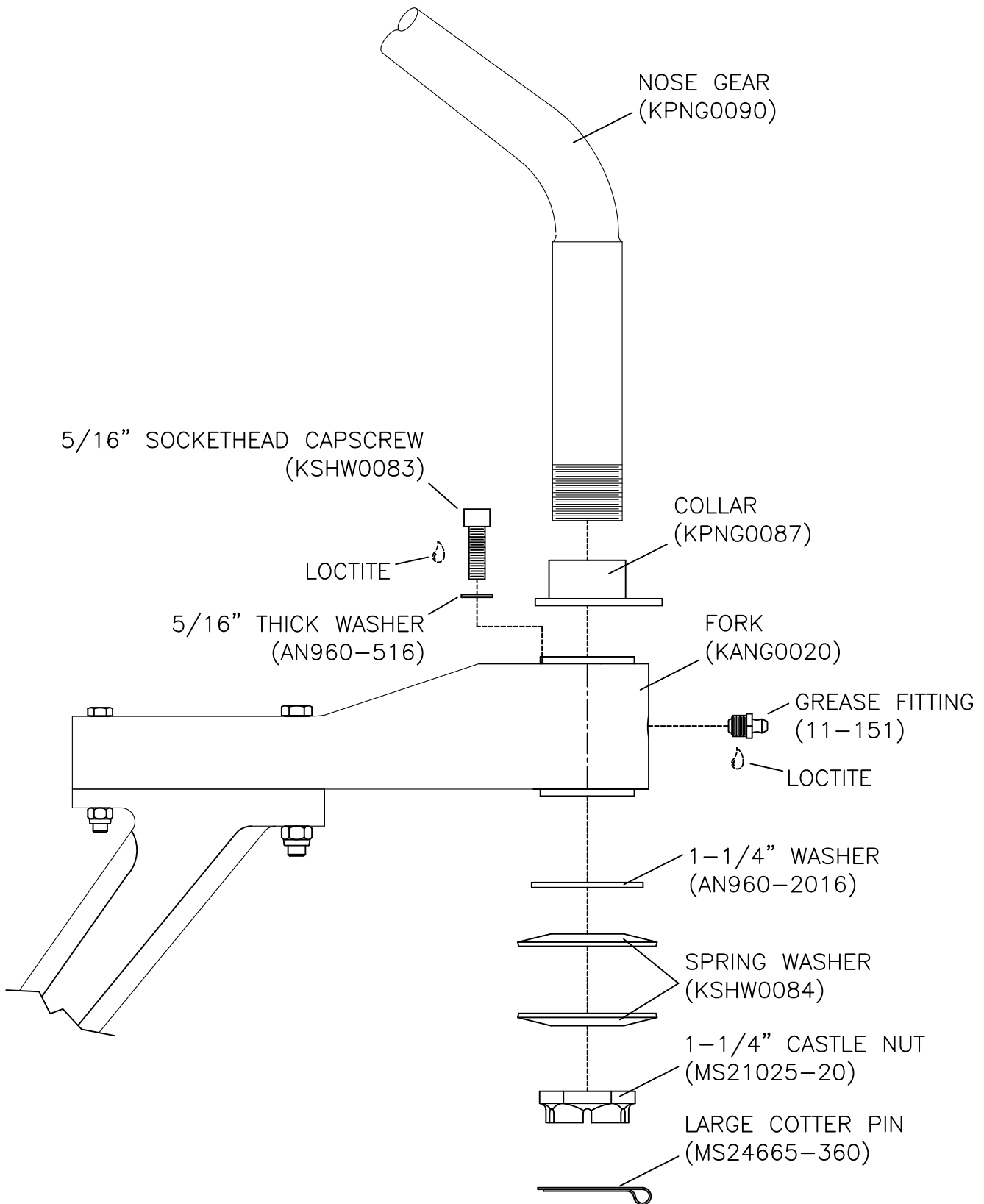
09/11/2018



**RANS S-21 OUTBOUND
SPRING WASHER MODIFICATION
FIGURE 08A-20**

MD5220
REV. - ORIG

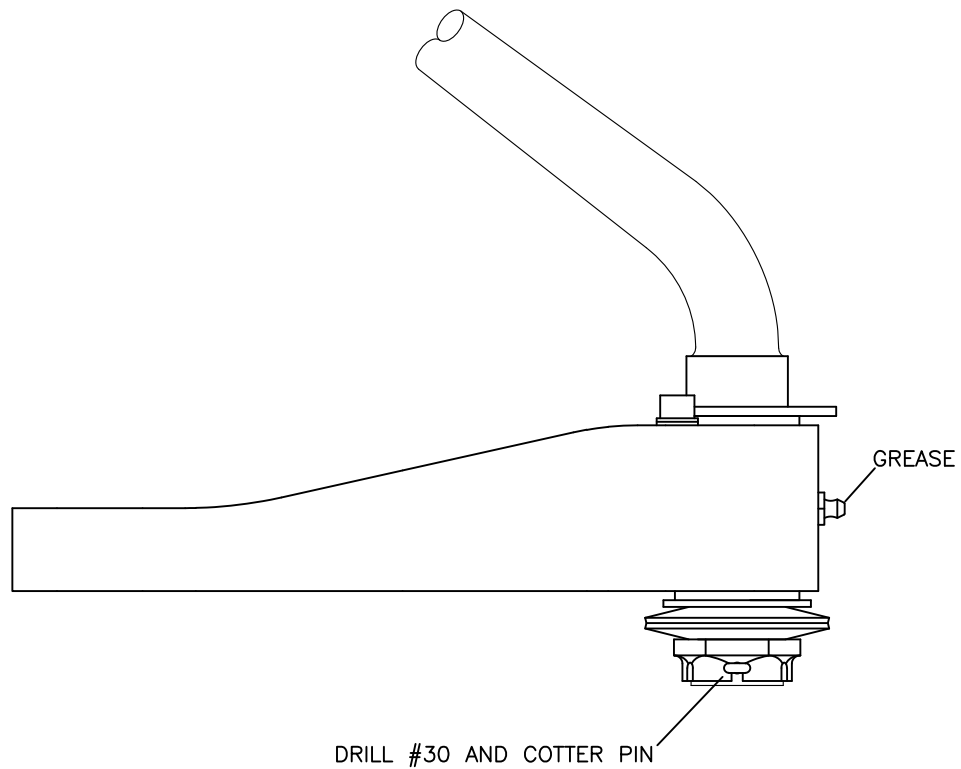
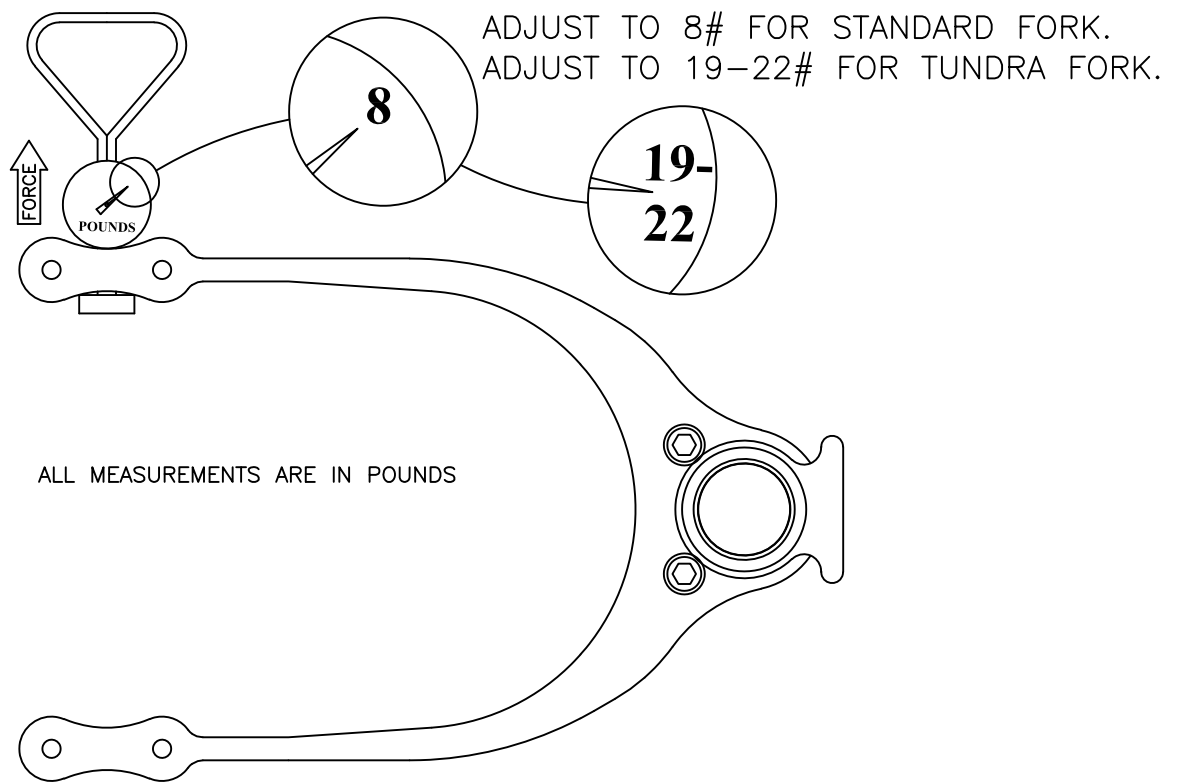
09/11/2018



MD5086
REV.-B(2.02.22)

**RAMS S-21 OUTBOUND
NOSE GEAR/FORK INSTALLATION
FIGURE 08A-21**

09/11/2018



**RANS S-21 OUTBOUND
FORK TENSION ADJUSTMENT
FIGURE 08A-22**

MD5111
REV. - ORIG

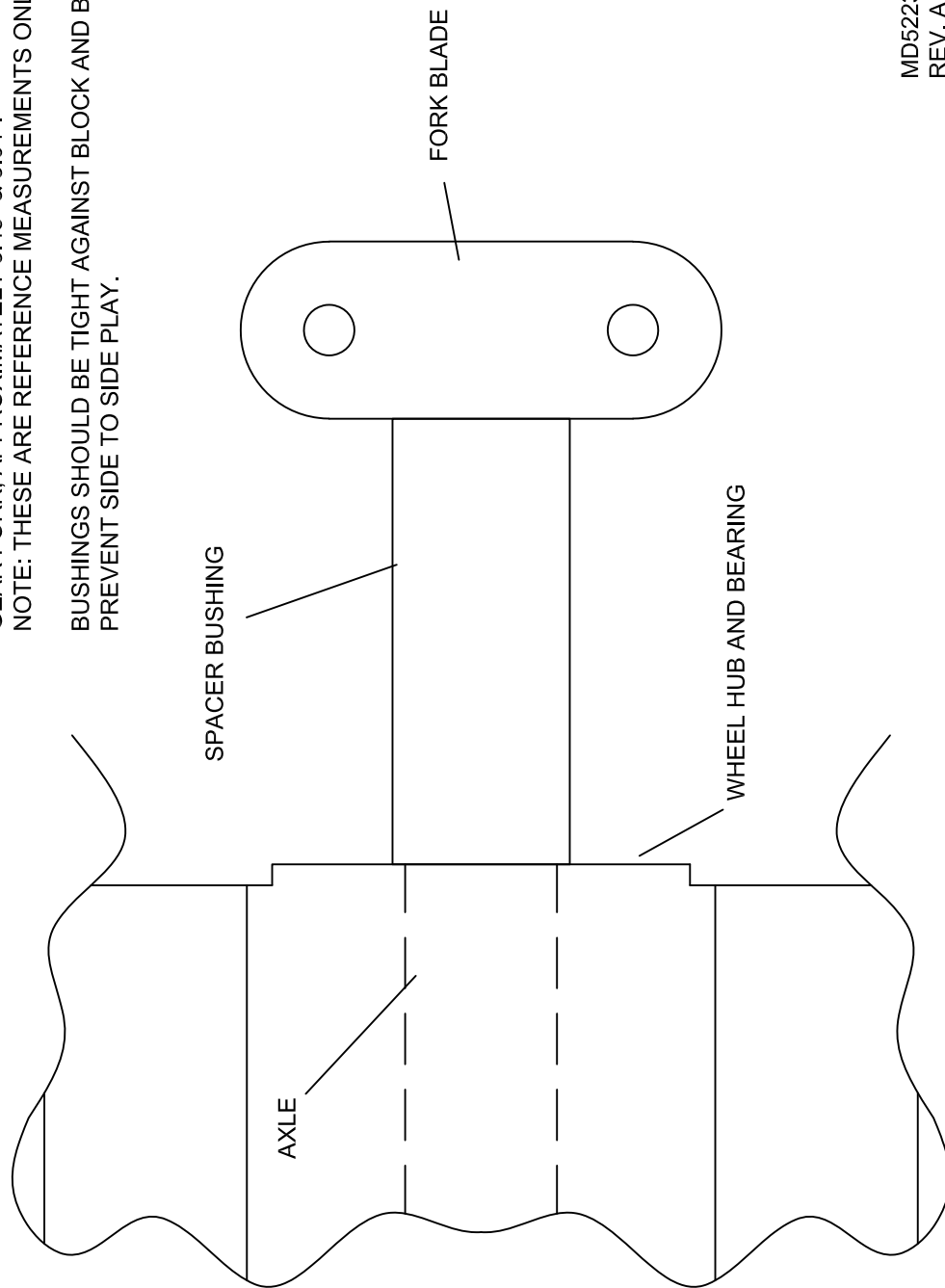
09/11/2018

NOTE: MEASURE DISTANCE BETWEEN BEARING AND AXLE BLOCK ON EACH SIDE.

CUT SPACER BUSHING TO CENTER WHEEL BETWEEN ARMS OF NOSE GEAR FORK, APPROXIMATELY 3.45" & 3.04".

NOTE: THESE ARE REFERENCE MEASUREMENTS ONLY.

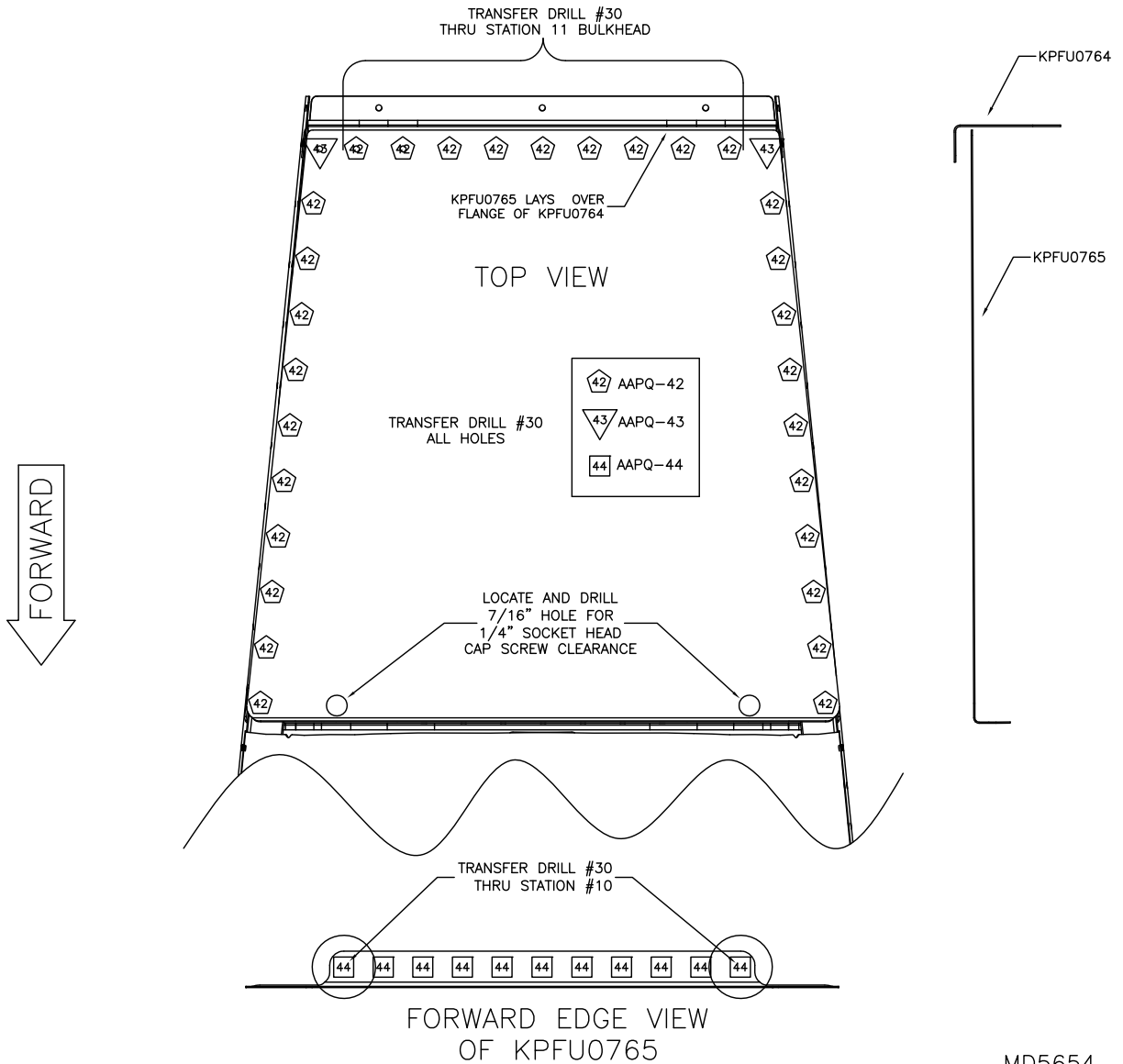
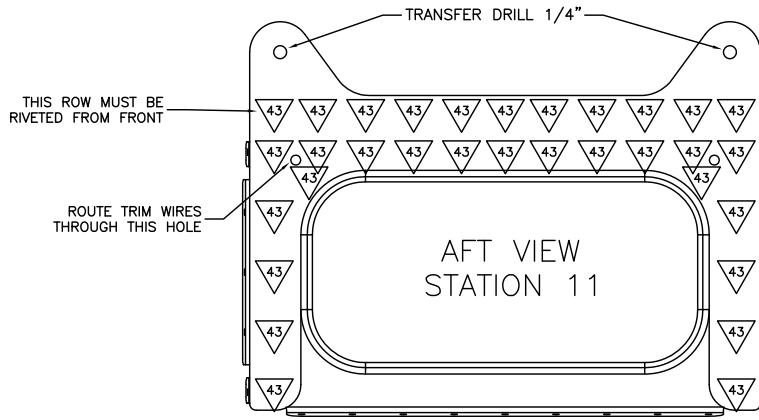
BUSHINGS SHOULD BE TIGHT AGAINST BLOCK AND BEARING TO PREVENT SIDE TO SIDE PLAY.



ONE SIDE SHOWN
FOR CLARITY

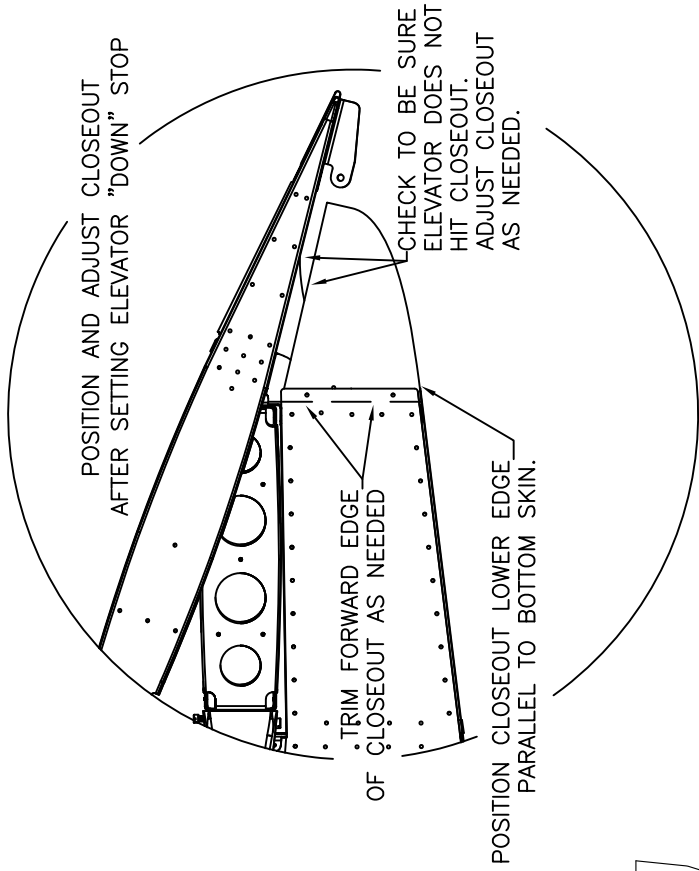
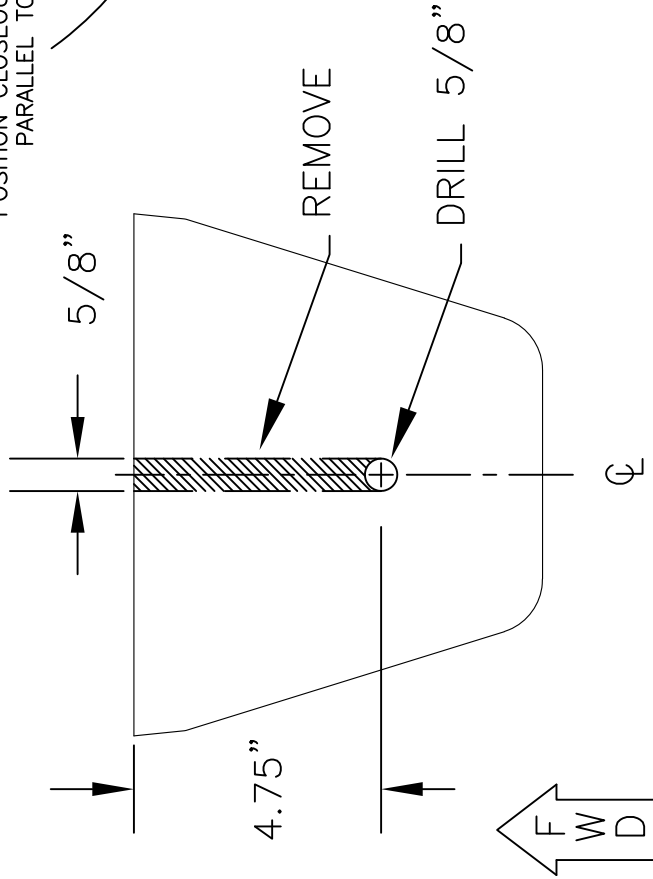
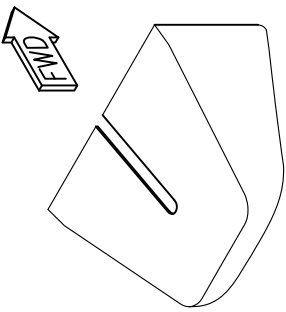
MD5223
REV. A

RRAMES S-21 OUTBOUND
NOSE WHEEL SPACER BUSHING MODIFICATION
FIGURE 08A-25



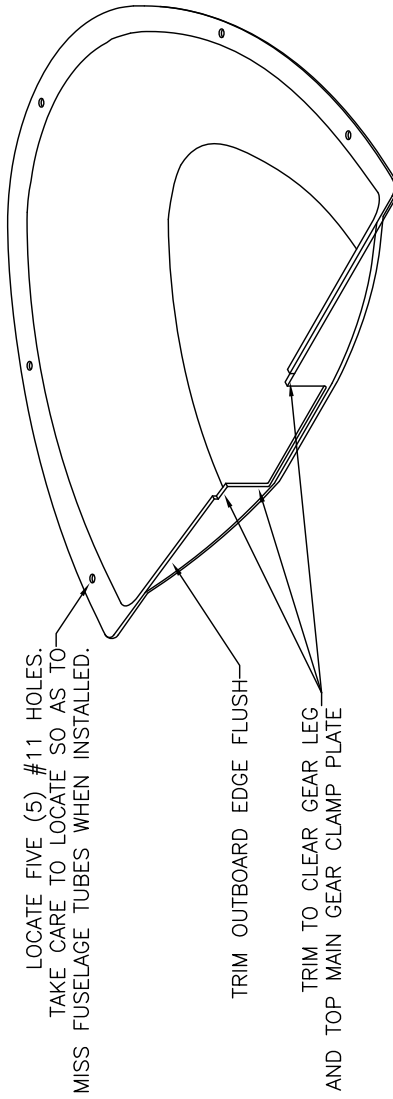
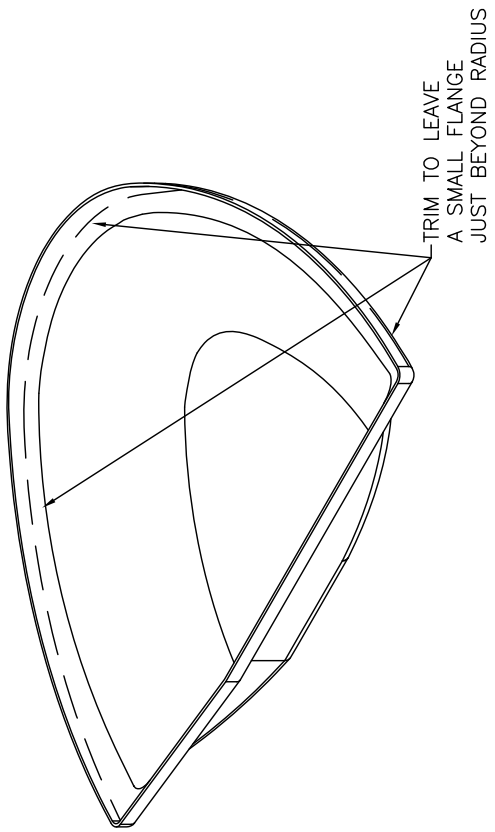
MD5654
REV. - ORIG

**RAMS S-21 OUTBOUND
STATION 10/11 CLOSEOUT DETAIL
FIGURE 08A-31A**



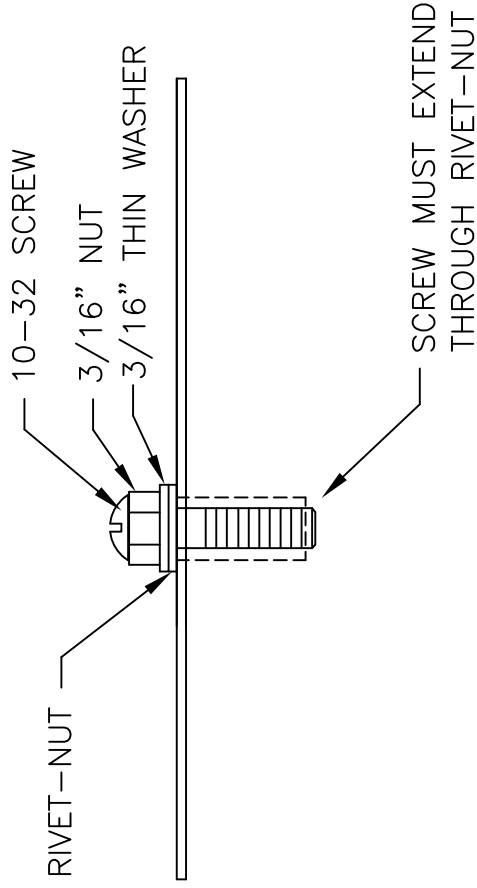
RRR S-21 OUTBOUND
 TAILCONE AFT CLOSEOUT MODIFICATION
 FIGURE 08A-32

MD5654
 REV. A



MD5654
REV. - ORIG

**RAMS S-21 OUTBOUND
BELLY FAIRING TRIMMING
FIGURE 08B-01**

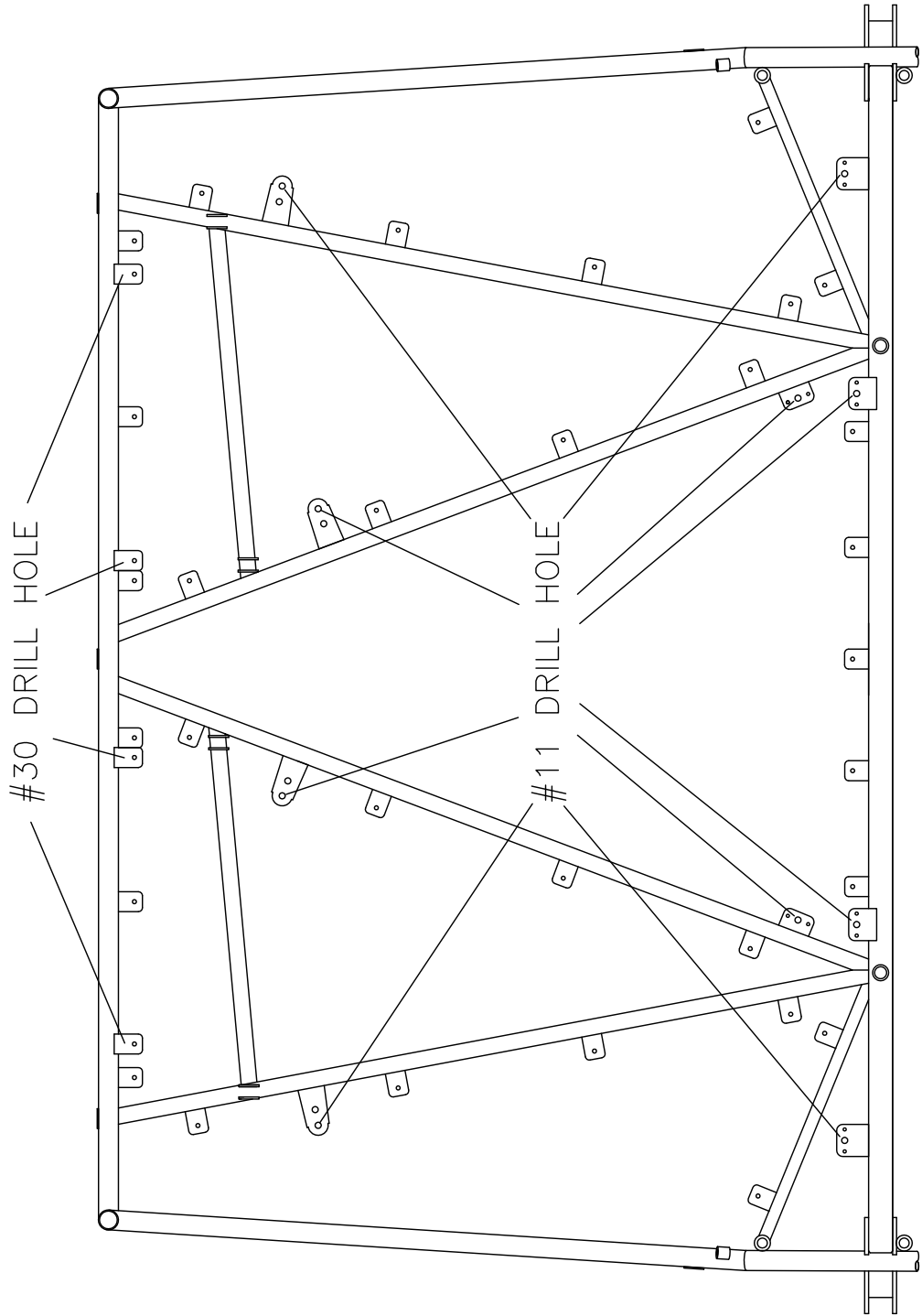


PROCEDURE BELOW MAY BE USED WHEN A RIVET-NUT PULLER IS NOT AVAILABLE.

1. FINGER TIGHTEN NUT AND RIVET-NUT ONTO SCREW.
2. INSERT RIVET-NUT INTO 1/4" HOLE.
3. TURN NUT 3 COMPLETE TURNS CLOCKWISE WHILE HOLDING SCREW STATIONARY.
4. BACK NUT OFF 1/2 TURN AND REMOVE SCREW.

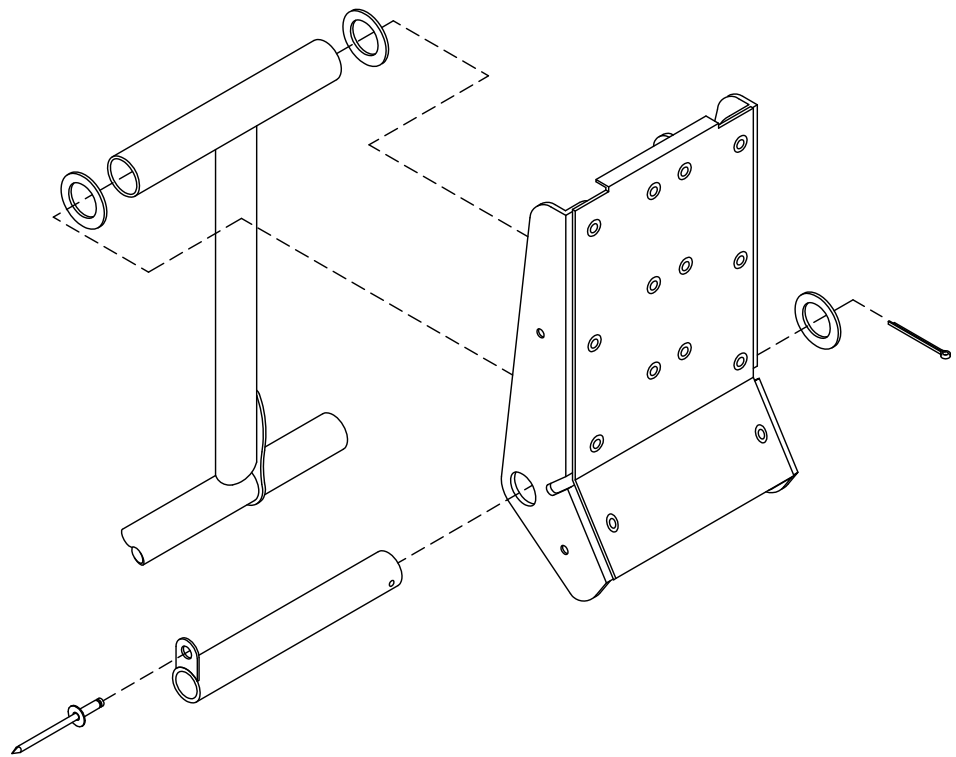
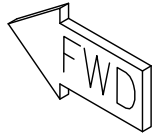
RAMS S-21 OUTBOUND
RIVET-NUT INSTALLATION
FIGURE 08B-06

MD343
 REV. - ORIG



MD5604
REV. - ORIG

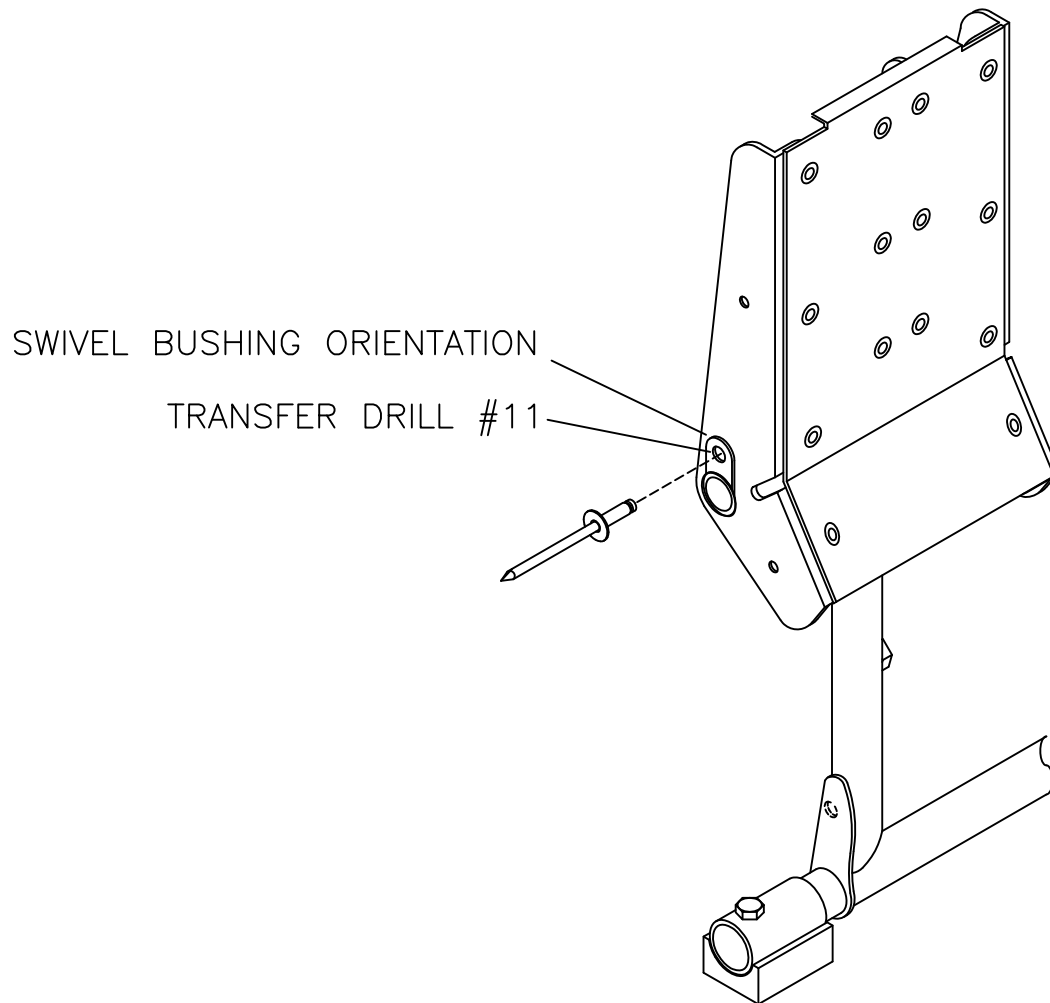
RAMS S-21 OUTBOUND
FLOORBOARD DRILL SCHEDULE
FIGURE 09-01



MD2266
REV. - ORIG

**RANS S-21 OUTBOUND
TOE PEDAL INSTALLATION
FIGURE 09A-02**

09/11/2018

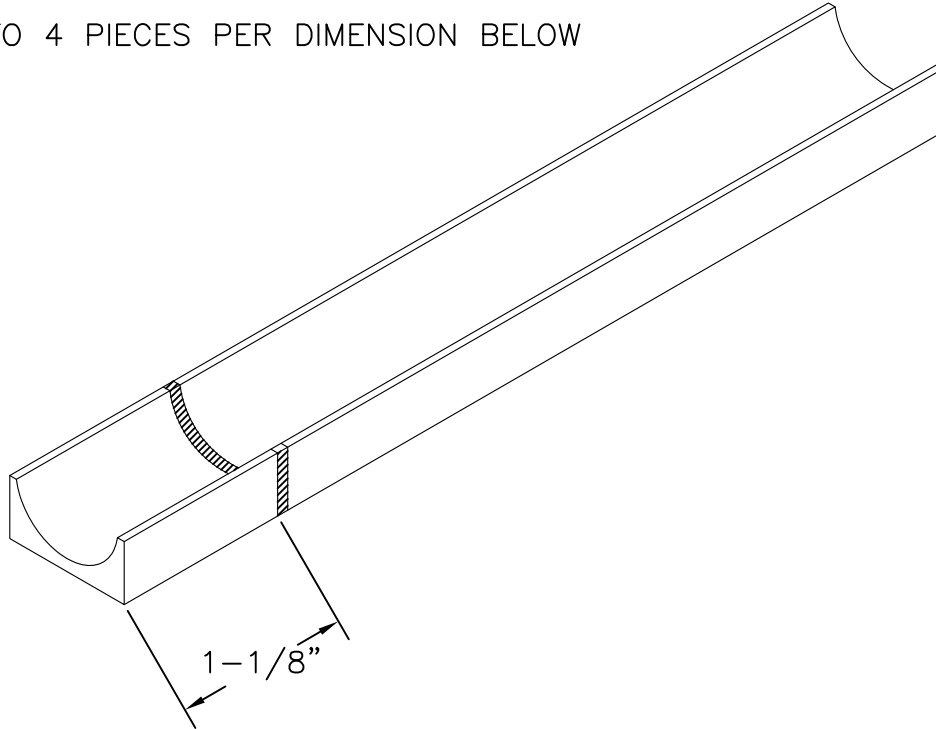


MD2267
REV. - ORIG

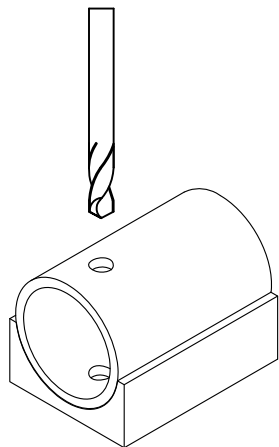
**RAMS S-21 OUTBOUND
TOE PEDAL INSTALLATION
FIGURE 09A-03**

09/11/2018

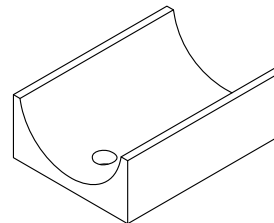
CUT PART INTO 4 PIECES PER DIMENSION BELOW



ALIGN END OF CUT BRAKE SADDLE WITH END OF RUDDER PEDAL BUSHING. USING A DRILL PRESS, DRILL #11 THROUGH BUSHING



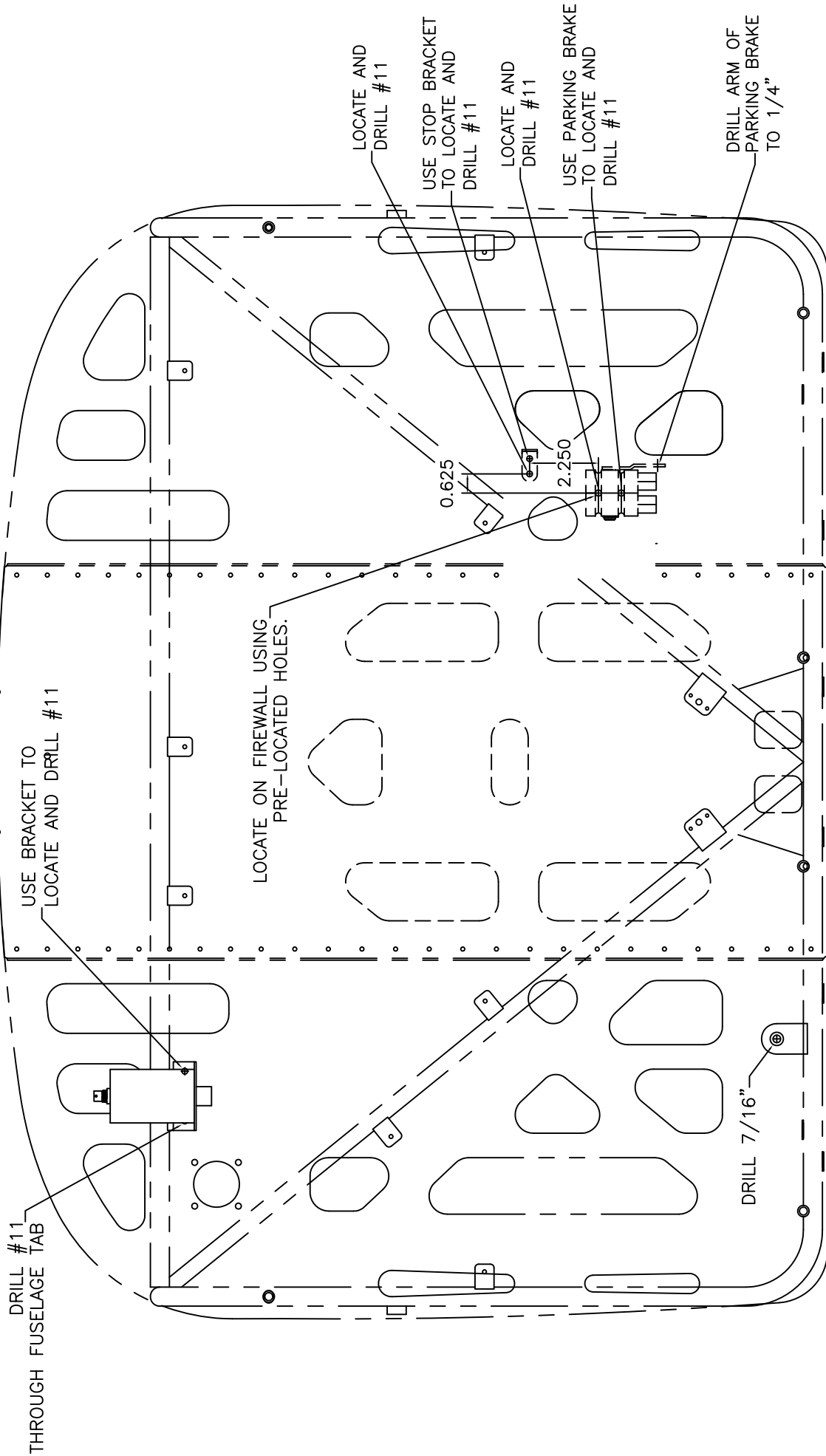
FINISHED PART



MD2267
REV. - ORIG

**RAMS S-21 OUTBOUND
BRAKE SADDLE MODIFICATION
FIGURE 09A-05**

09/11/2018



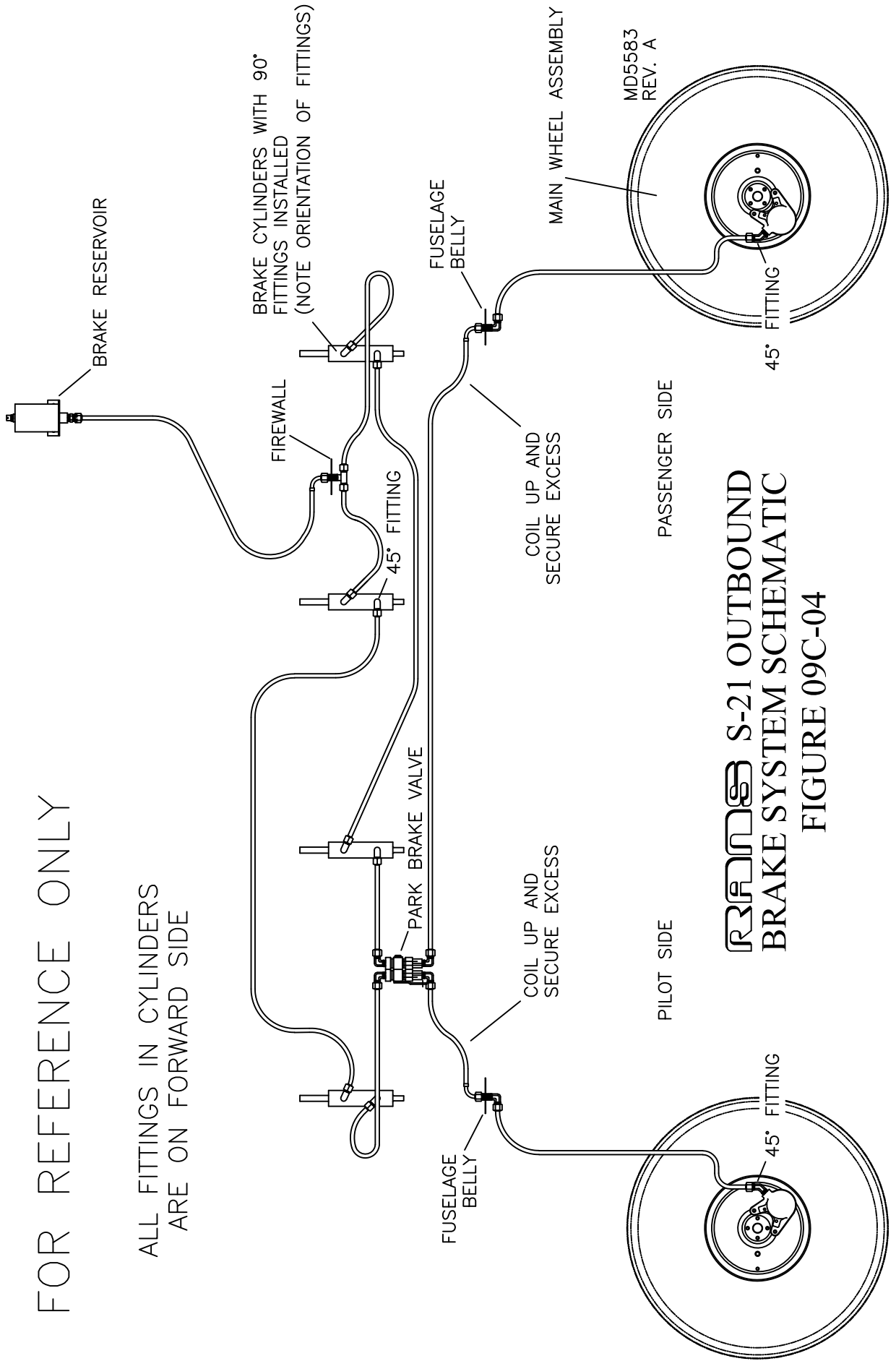
MD5575
REV. - ORIG

VIEWED FROM FRONT

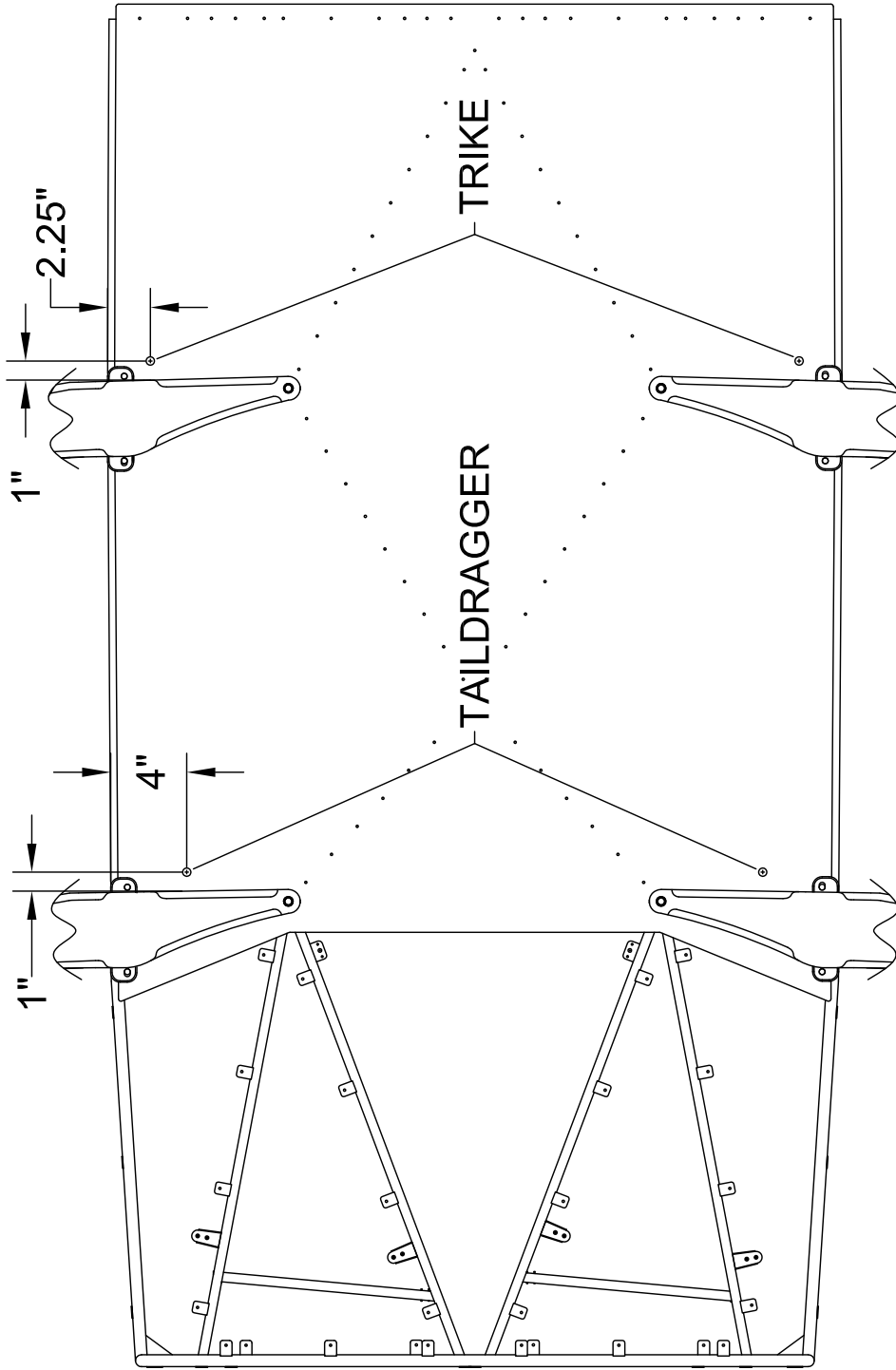
RRR S-21 OUTBOUND
 FIREWALL MODIFICATION FOR HYDRAULIC BRAKE INSTALL
 FIGURE 09C-03

NOT TO SCALE
FOR REFERENCE ONLY

ALL FITTINGS IN CYLINDERS
ARE ON FORWARD SIDE



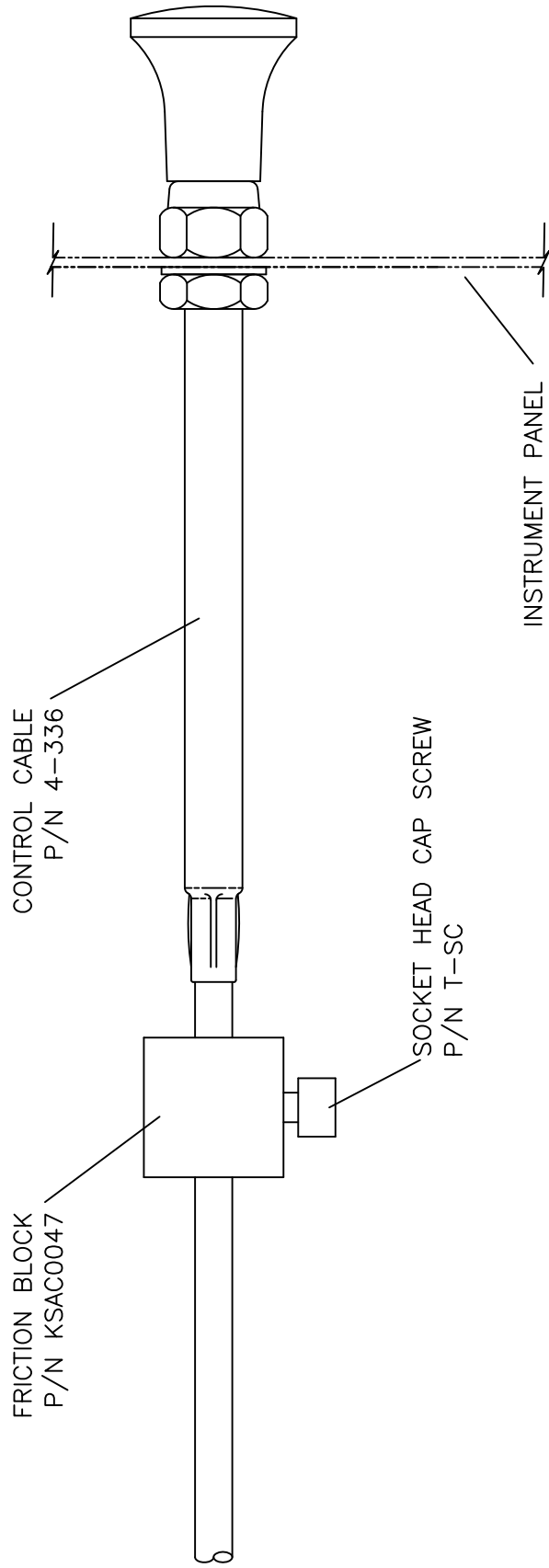
**RAMBS S-21 OUTBOUND
BRAKE SYSTEM SCHEMATIC
FIGURE 09C-04**



DRILL APPROPRIATE
LOCATIONS TO 7/16"

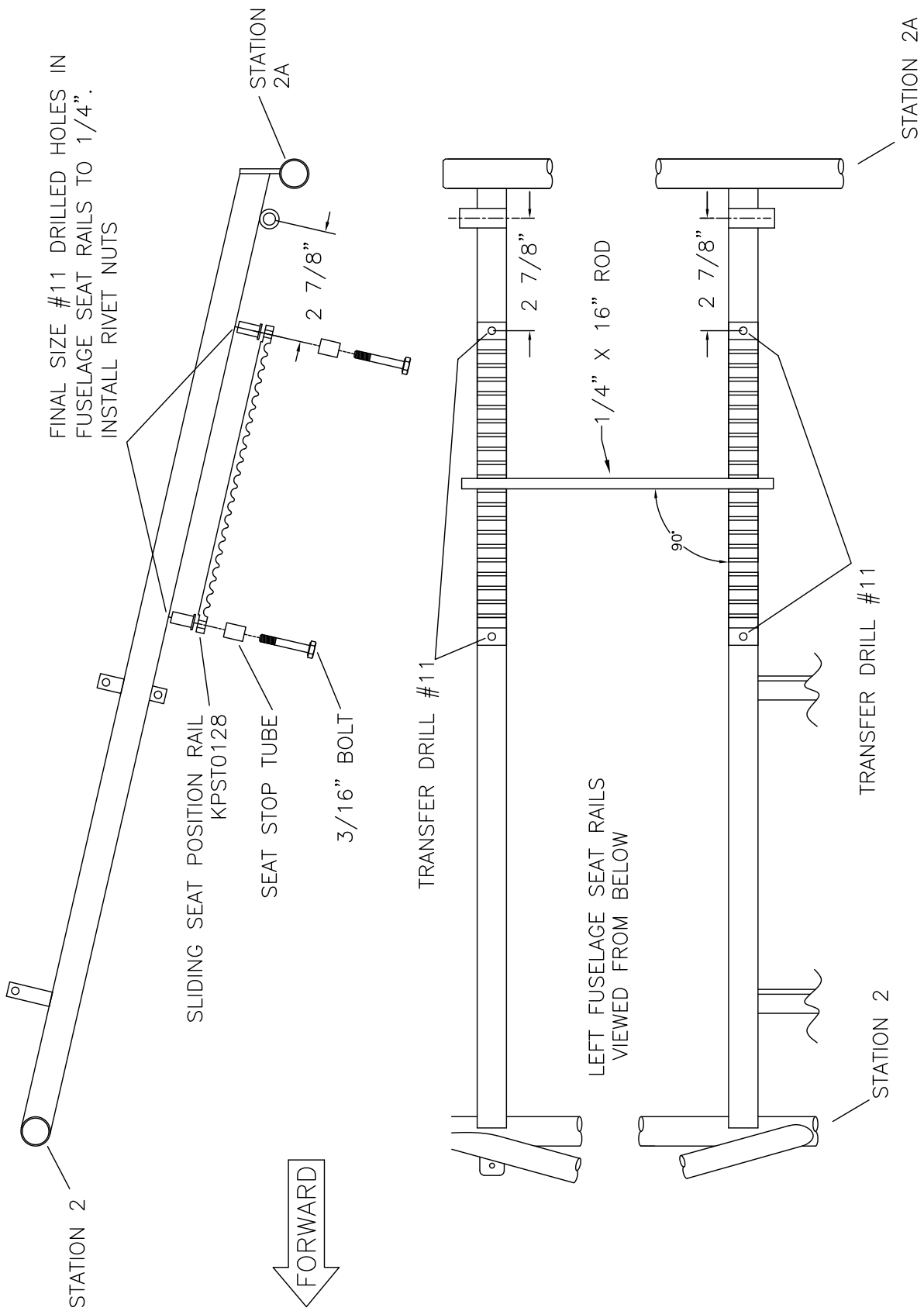
MD5587
REV. -ORIG

RAFMS S-21 OUTBOUND
BRAKE LINE EXIT LOCATION
FIGURE 09C-08



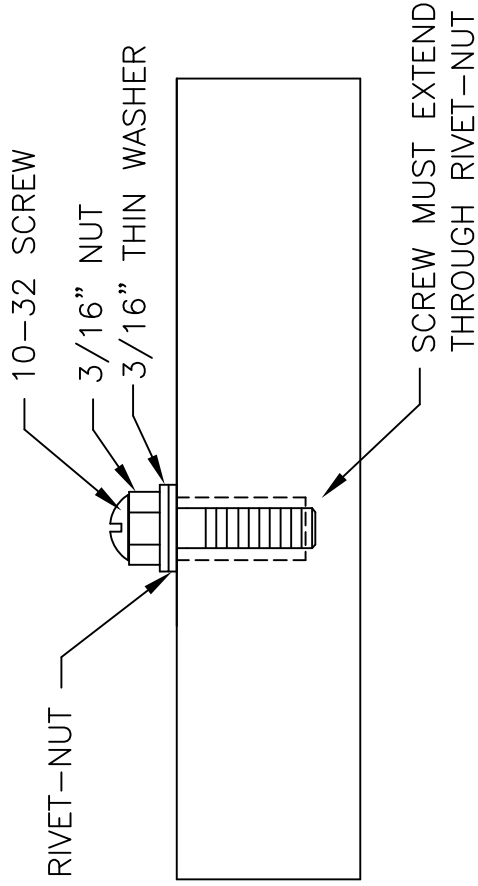
MD4423
REV. - ORIG

RAMS S-21 OUTBOUND
CONTROL CABLE INSTALLATION
FIGURE 09C-12



MD5615
REV. - ORIG

RRR S-21 OUTBOUND
SLIDING SEAT POSITION RAIL LOCATION
FIGURE 09D-01

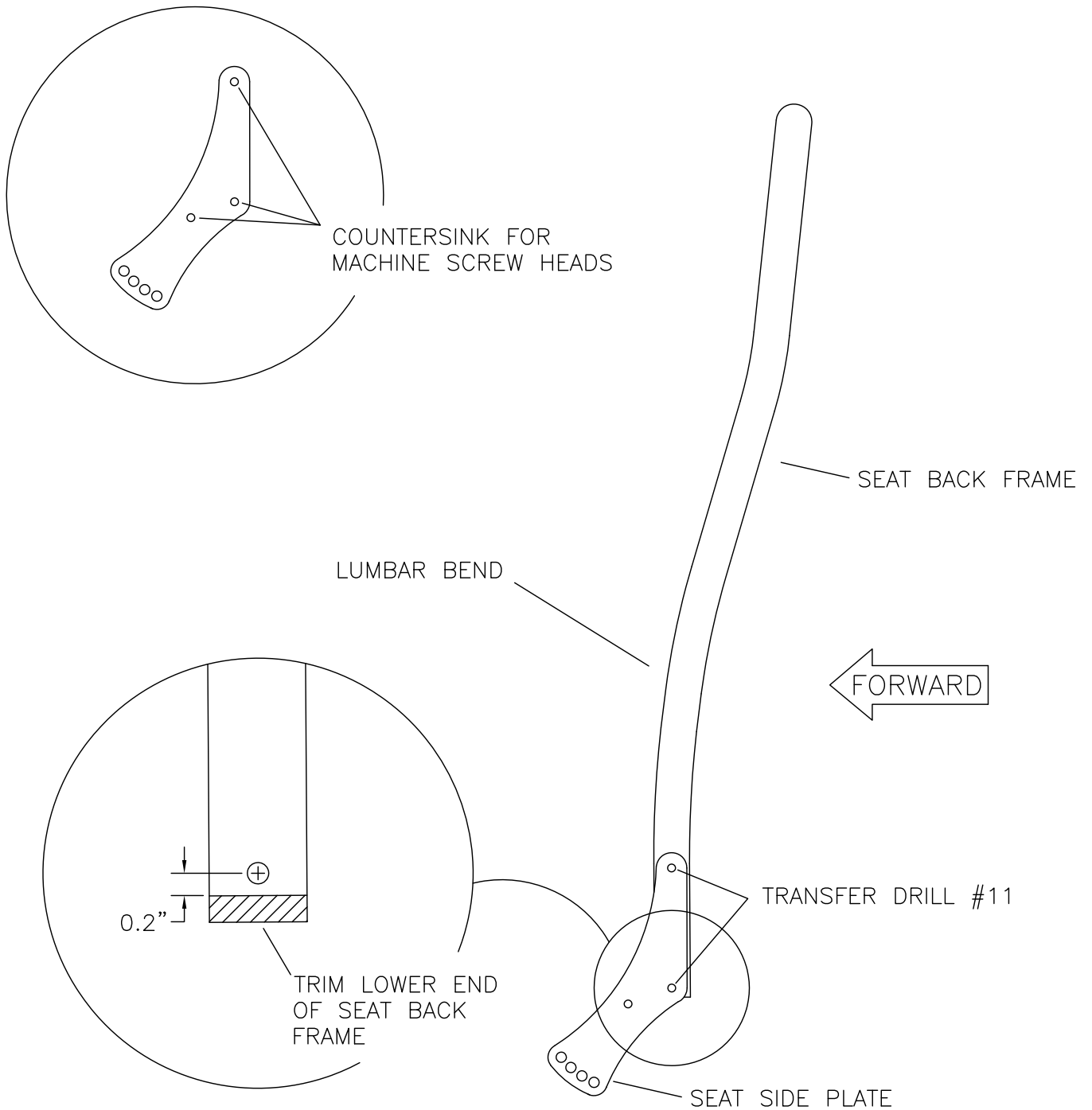


PROCEDURE BELOW MAY BE USED WHEN A RIVET-NUT PULLER IS NOT AVAILABLE.

1. FINGER TIGHTEN NUT AND RIVET-NUT ONTO SCREW.
2. INSERT RIVET-NUT INTO 1/4" HOLE.
3. TURN NUT 3 COMPLETE TURNS CLOCKWISE WHILE HOLDING SCREW STATIONARY.
4. BACK NUT OFF 1/2 TURN AND REMOVE SCREW.

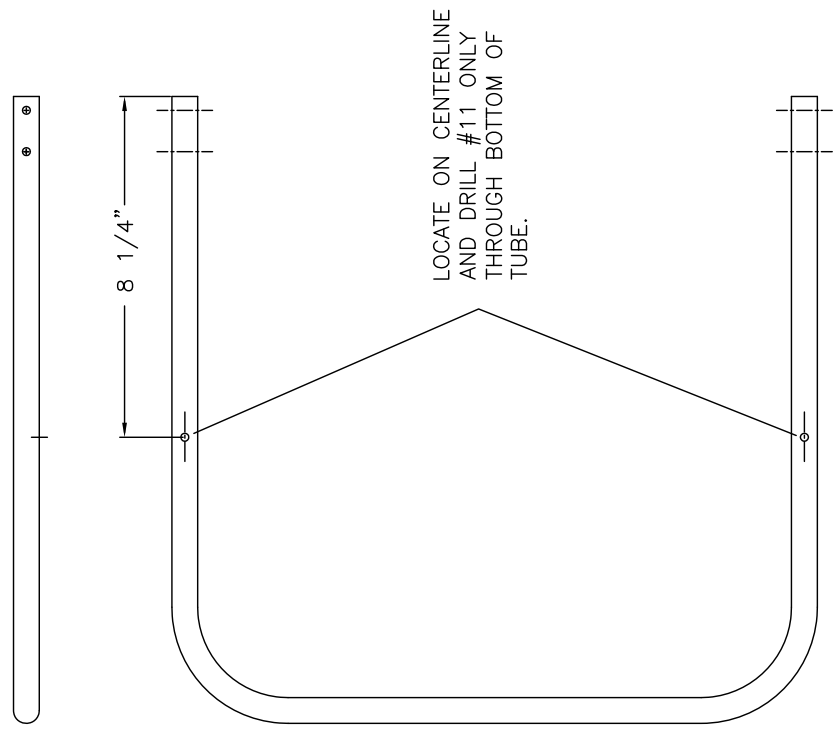
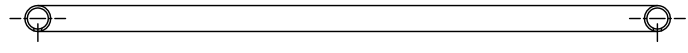
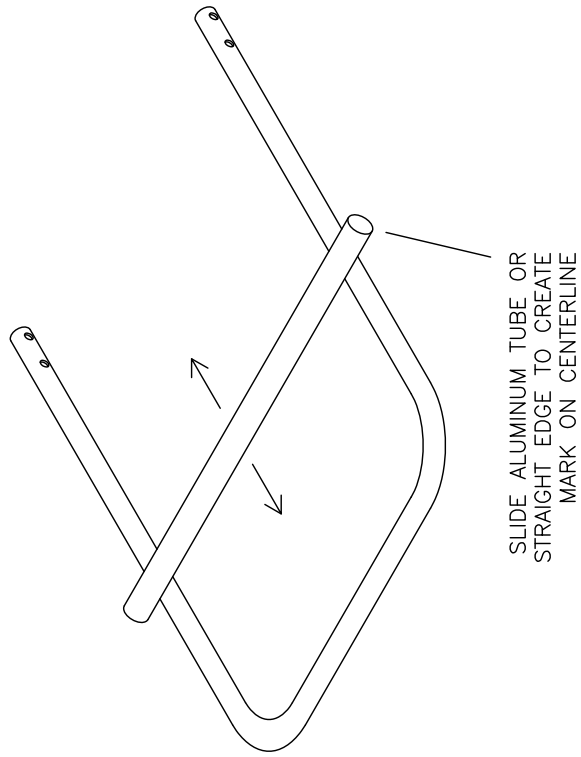
RAMS S-21 OUTBOUND
 RIVET-NUT INSTALLATION
 FIGURE 09D-02

MD343
 REV. - ORIG

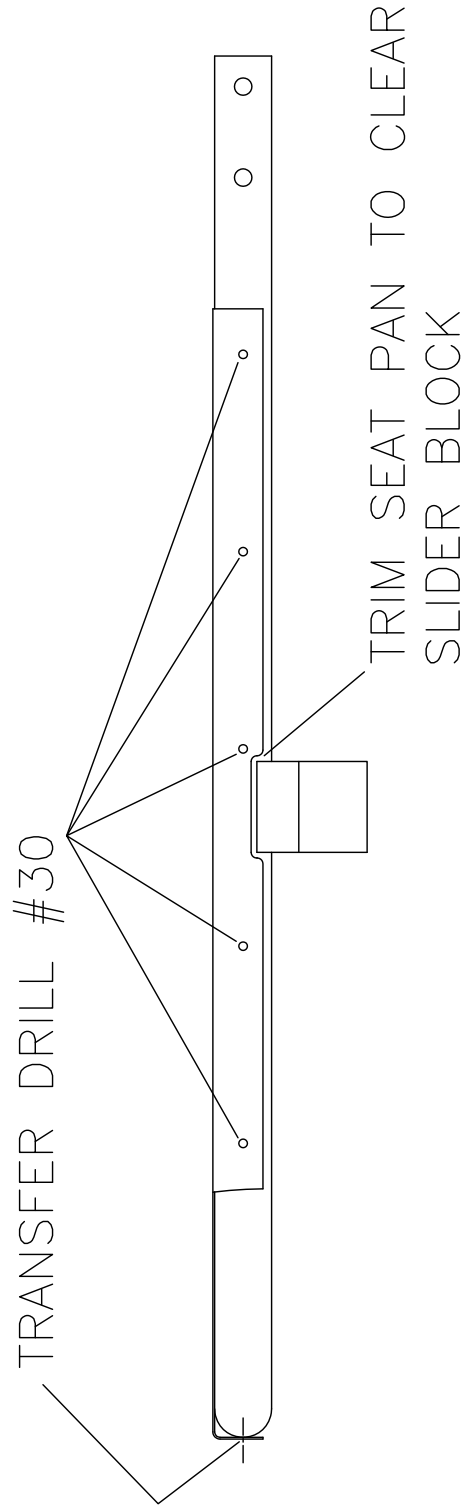
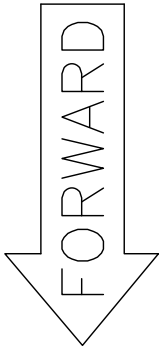


RANS S-21 OUTBOUND
SEAT BACK ORIENTATION
FIGURE 09D-04

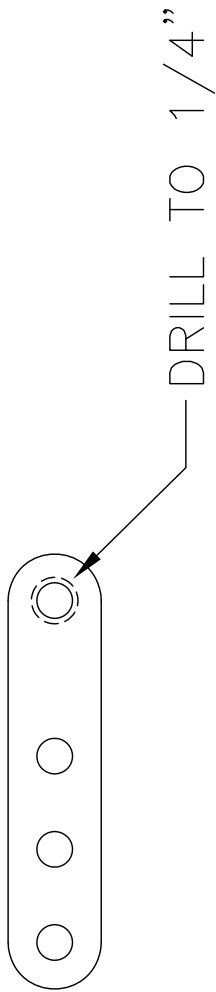
MD5534
 REV. - ORIG



RRR S-21 OUTBOUND
SLIDING SEAT BOTTOM FRAME MODIFICATION
FIGURE 09D-05



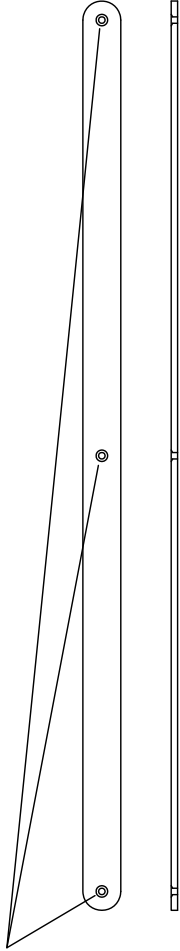
RAMS S-21 OUTBOUND
SEAT BOTTOM PAN INSTALLATION
FIGURE 09D-06



MD5614
REV. - ORIG

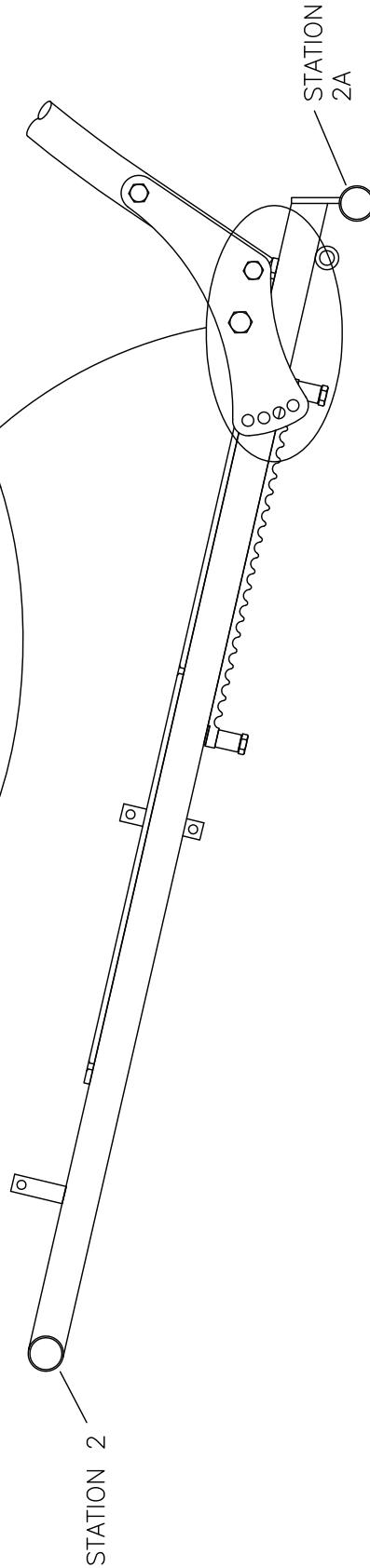
**RAMS S-21 OUTBOUND
MULTI-HOLE TANG MODIFICATION
FIGURE 09D-08**

COUNTER SINK (120°) TO ALLOW
FLUSH STAINLESS STEEL RIVETS TO
SET FLUSH WITH TOP SURFACE

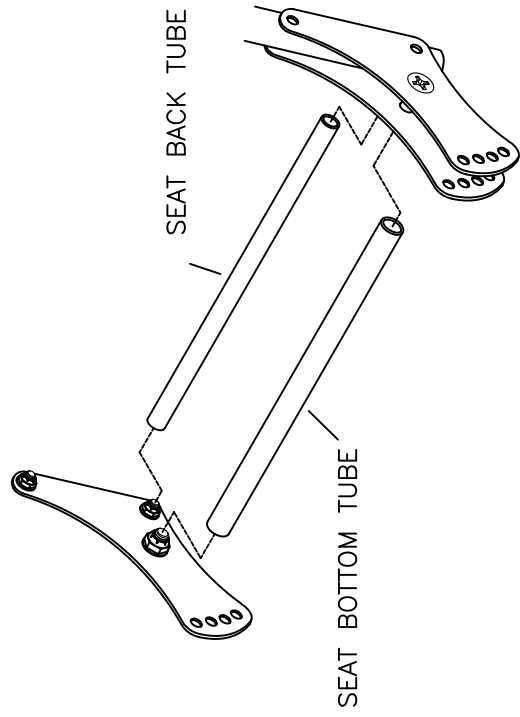


LOCATE 1/4" QUICK PIN IN LOWER HOLE IN
SIDE PLATE. SLIDE SEAT ALL WAY BACK.
QUICK PIN SHOULD DROP INTO AFT MOST
POSITION IN LOWER RAIL.

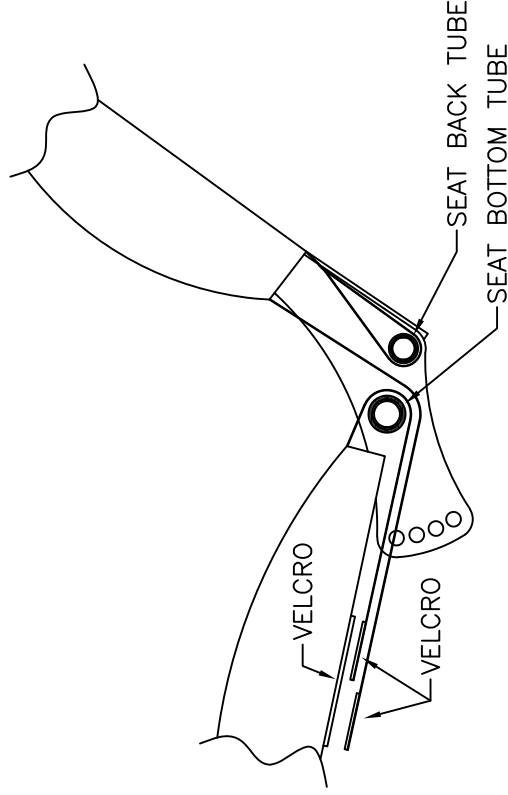
LOCATE RAIL PLATE
CENTERED ON TOP OF
SEAT RAIL WITH THE BACK
EDGE FLUSH WITH THE
FWD EDGE OF THE SEAT
BELT BUSHING.
TRANSFER DRILL AND
FLUSH RIVET. BACK EDGE
OF SEAT SHOULD REST
ON RAIL PLATE.



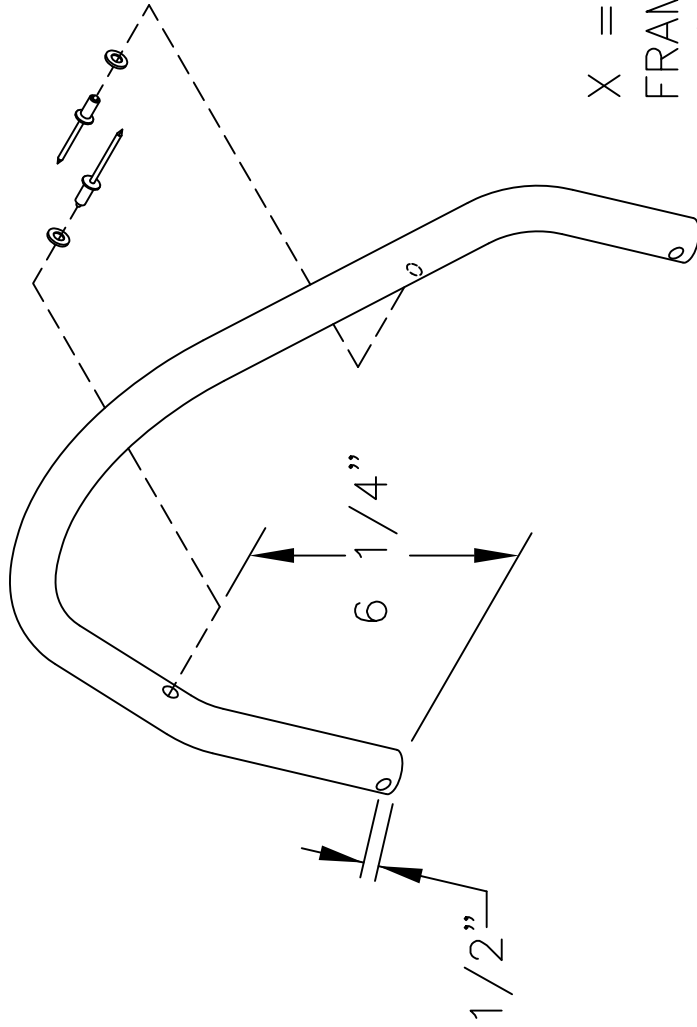
RAMS S-21 OUTBOUND
SLIDING SEAT RAIL PLATE LOCATION
FIGURE 09D-12



SEAT TUBE PLACEMENT



SEAT FLAP ROUTING



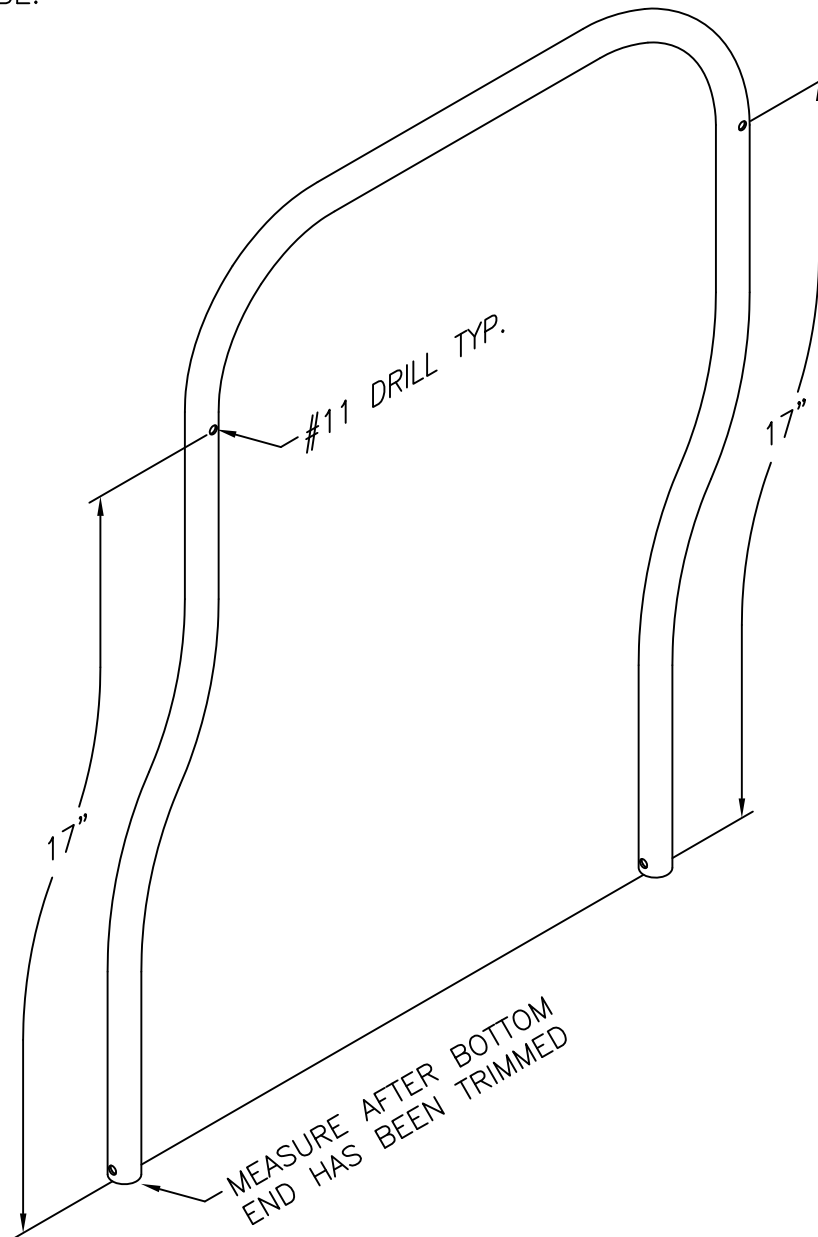
X = WIDTH OF HEADREST
 FRAME AT RIVET (BUTTON)
 LOCATION AFTER
 INSTALLATION ON SEAT BACK.

RAMS S-21 OUTBOUND
 OPTIONAL HEADREST - DRILLING
 FIGURE 09D-24

MD5109
 REV. - ORIG



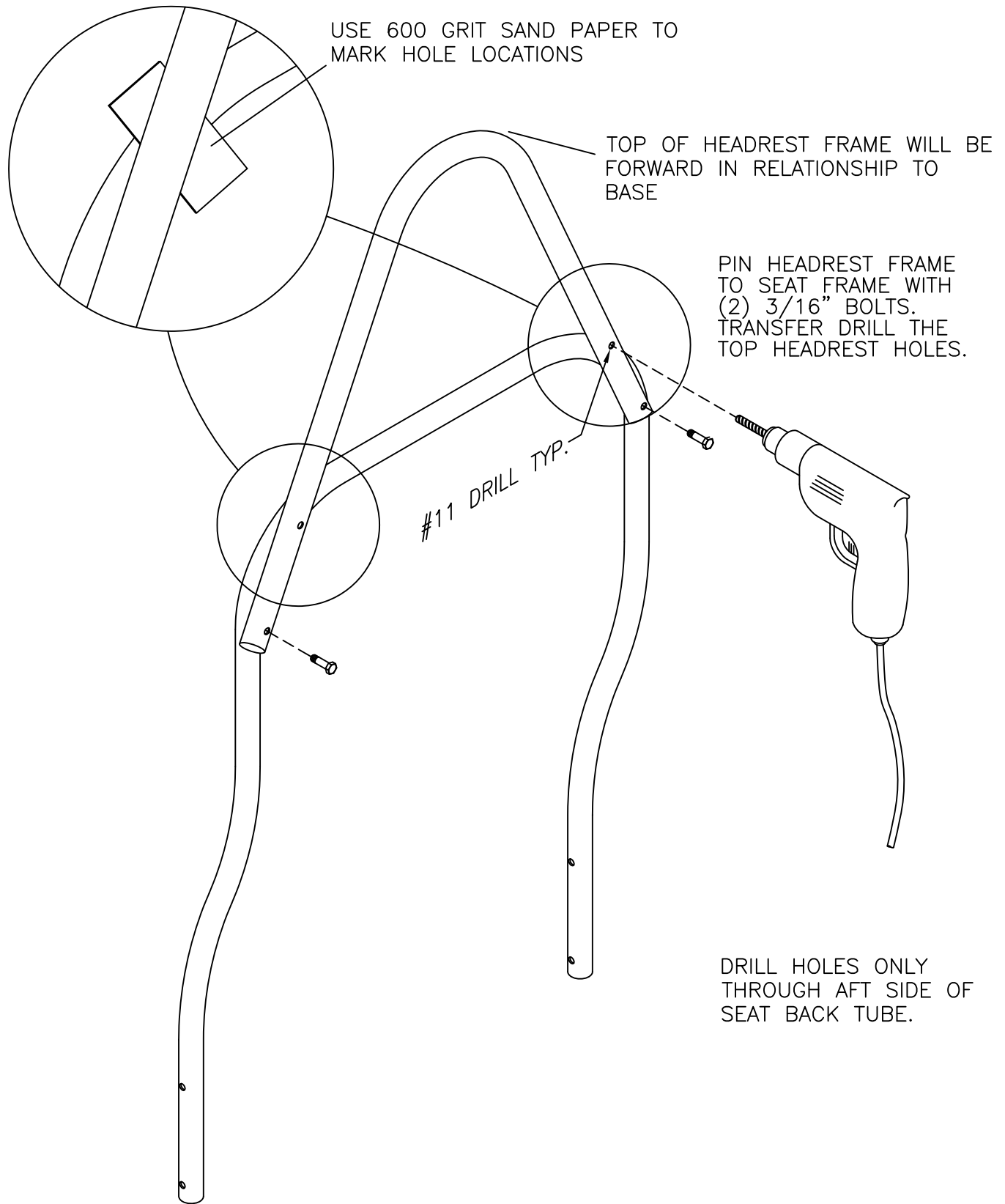
DRILL HOLES ONLY
THROUGH AFT SIDE OF
TUBE.



**RANS S-21 OUTBOUND
SEAT BACK FRAME DRILLING
FIGURE 09D-25**

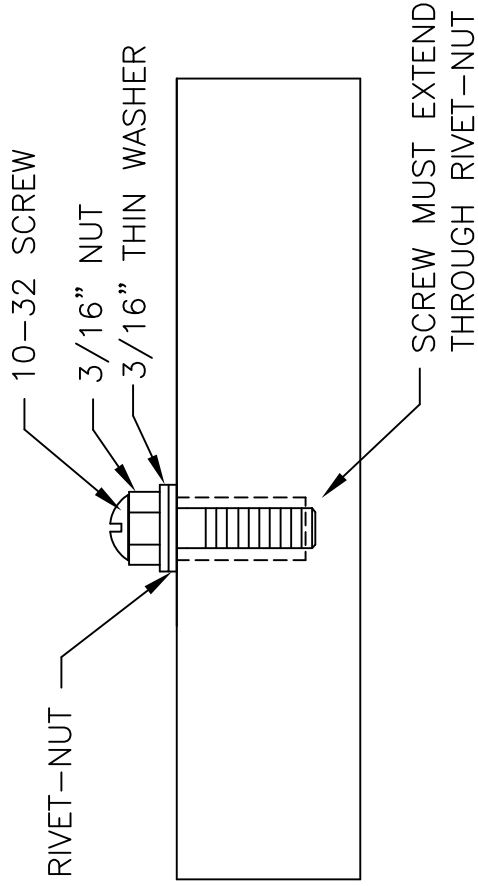
MD5109
REV. — ORIG

09/11/2018



MD5109
REV. - ORIG

RANS S-21OUTBOUND
SEAT HEADREST TO SEAT BACK FRAME DRILLING
FIGURE 09D-26



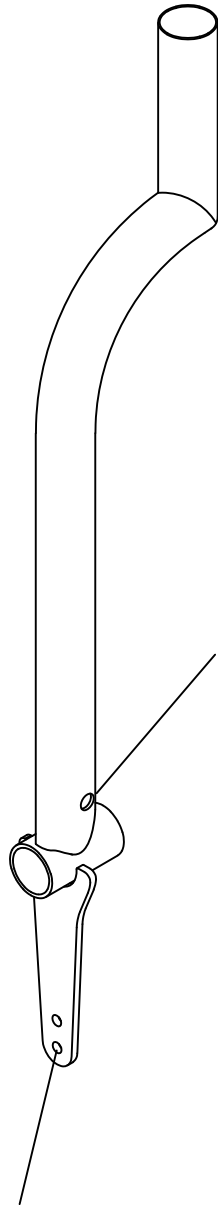
PROCEDURE BELOW MAY BE USED WHEN A RIVET-NUT PULLER IS NOT AVAILABLE.

1. FINGER TIGHTEN NUT AND RIVET-NUT ONTO SCREW.
2. INSERT RIVET-NUT INTO 1/4" HOLE.
3. TURN NUT 3 COMPLETE TURNS CLOCKWISE WHILE HOLDING SCREW STATIONARY.
4. BACK NUT OFF 1/2 TURN AND REMOVE SCREW.

RAMS S-21 OUTBOUND
 RIVET-NUT INSTALLATION
 FIGURE 09D-27

MD343
 REV. - ORIG

RIGHT SIDE

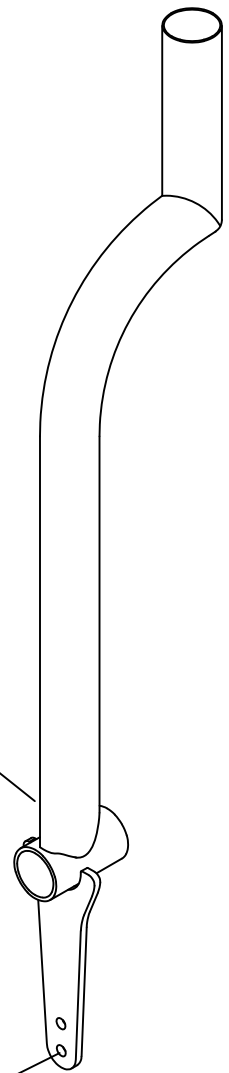


DRILL 1/4" HOLE
ON INBOARD SIDE FOR
PUSH TO TALK WIRES.
DRILL TO 5/16" IF
INSTALLING OPTIONAL
PASSENGER SEAT
ELECTRIC ELEVATOR TRIM.

DRILL 5/16" HOLE
ON INBOARD SIDE
FOR TRIM AND
PUSH TO TALK WIRES

DRILL LOWER HOLE
OF CONTROL STICK
TO 1/4"

LEFT SIDE



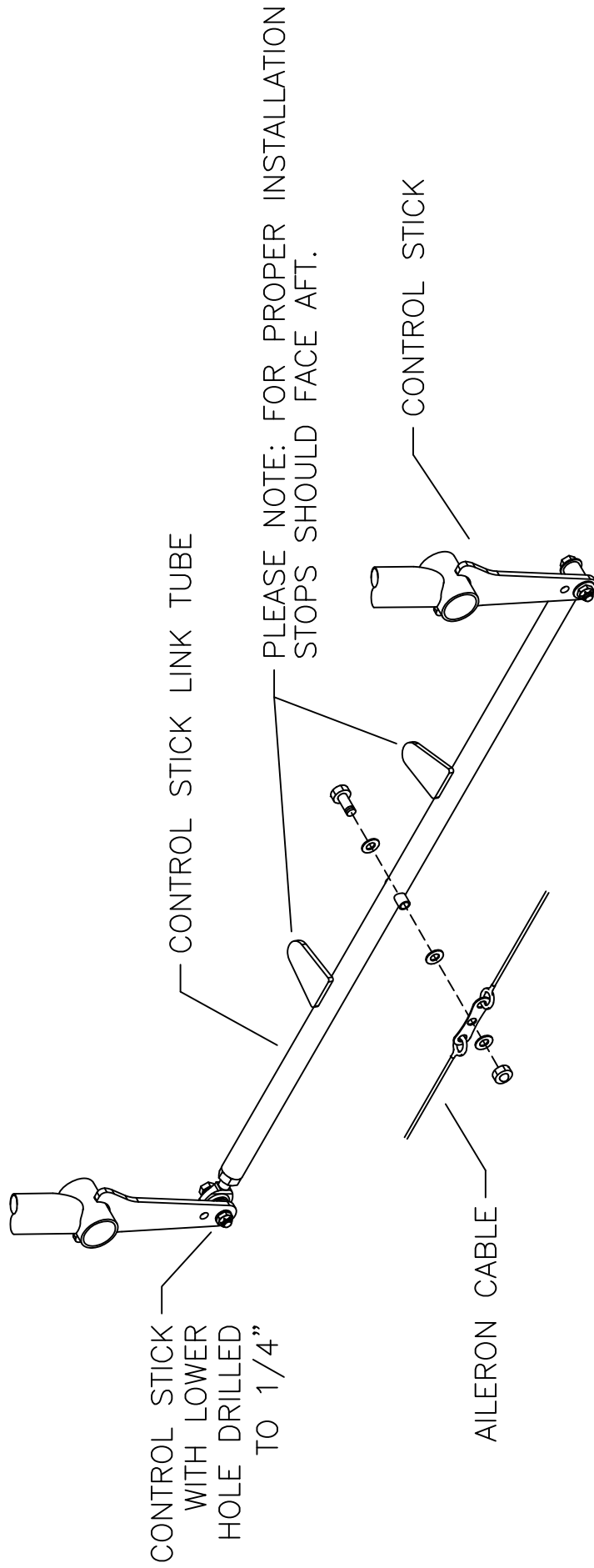
DO NOT DRILL OUT

MD510
REV. A

**RANS S-21 OUTBOUND
CONTROL STICK MODIFICATION**

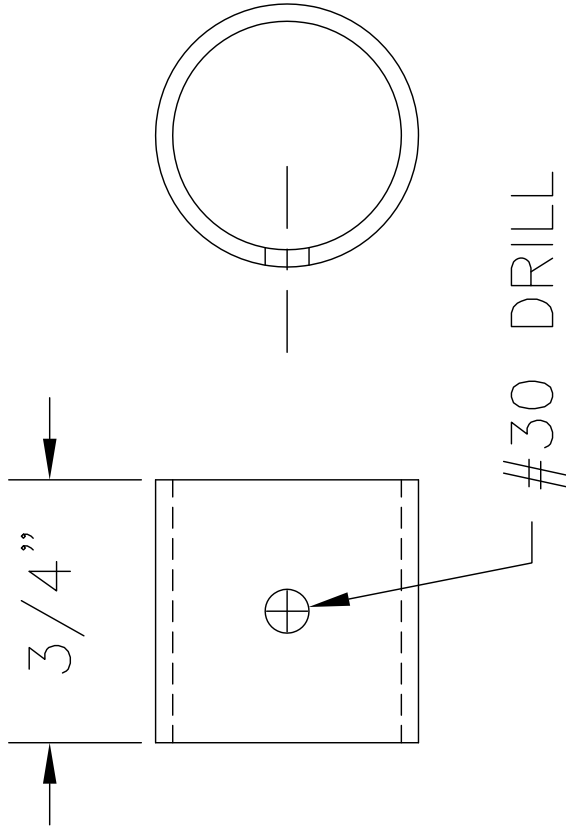
FIGURE 10-02

09/11/2018



MD510
REV. - ORIG

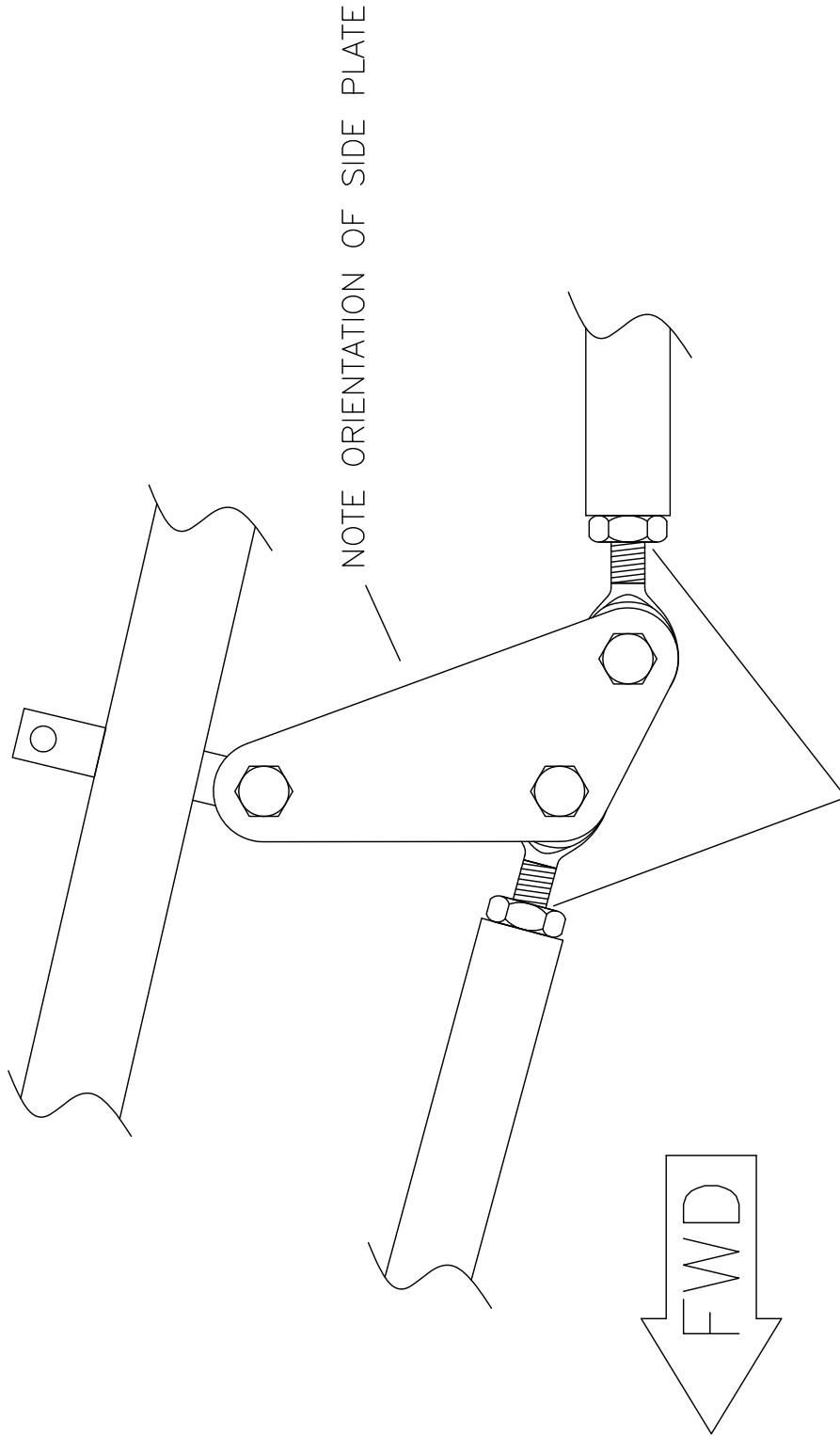
**RAMROB S-21 OUTBOUND
CONTROL STICK LINK TUBE
FIGURE 10-05**



FABRICATE QTY: 2

MD3650
REV. - ORIG

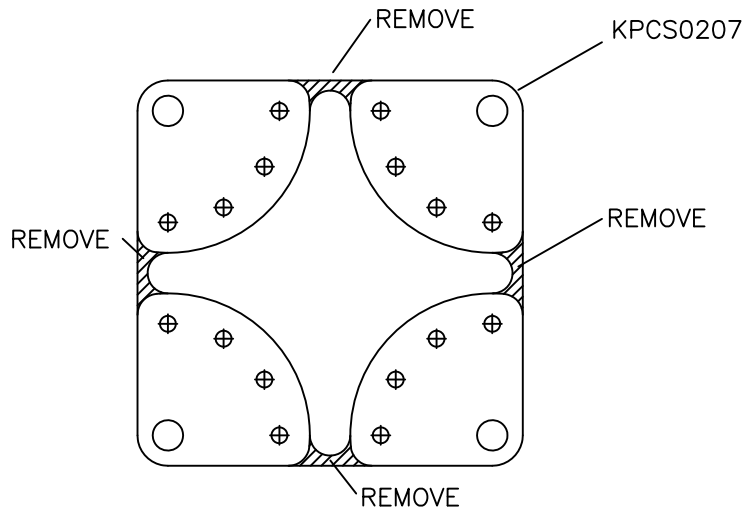
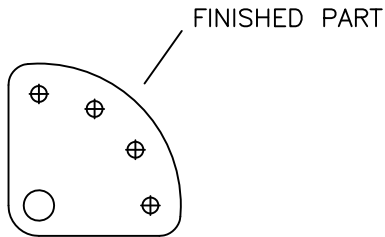
RAMSES S-21 OUTBOUND
ALUMINUM STOP SLEEVE FABRICATION
FIGURE 10A-02



ROD ENDS MUST ENGAGE
 AT LEAST 10 FULL THREADS INTO
 PUSH-PULL TUBES

MD3650
 REV. - ORIG

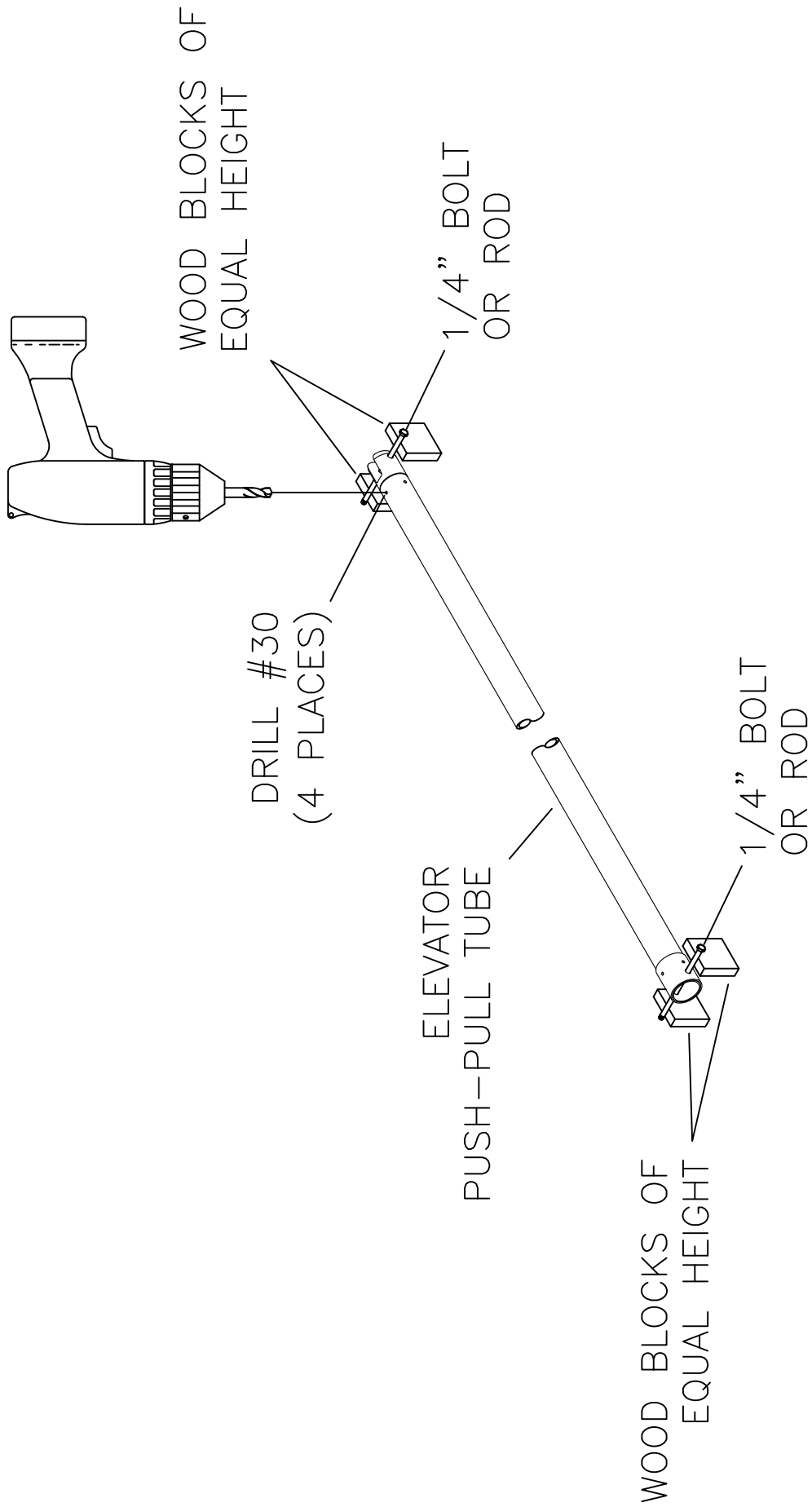
**RRR S-21 OUTBOUND
 SIDE PLATE INSTALLATION
 FIGURE 10A-03**



REMOVE SHADED AREA, MAKES 4 PARTS

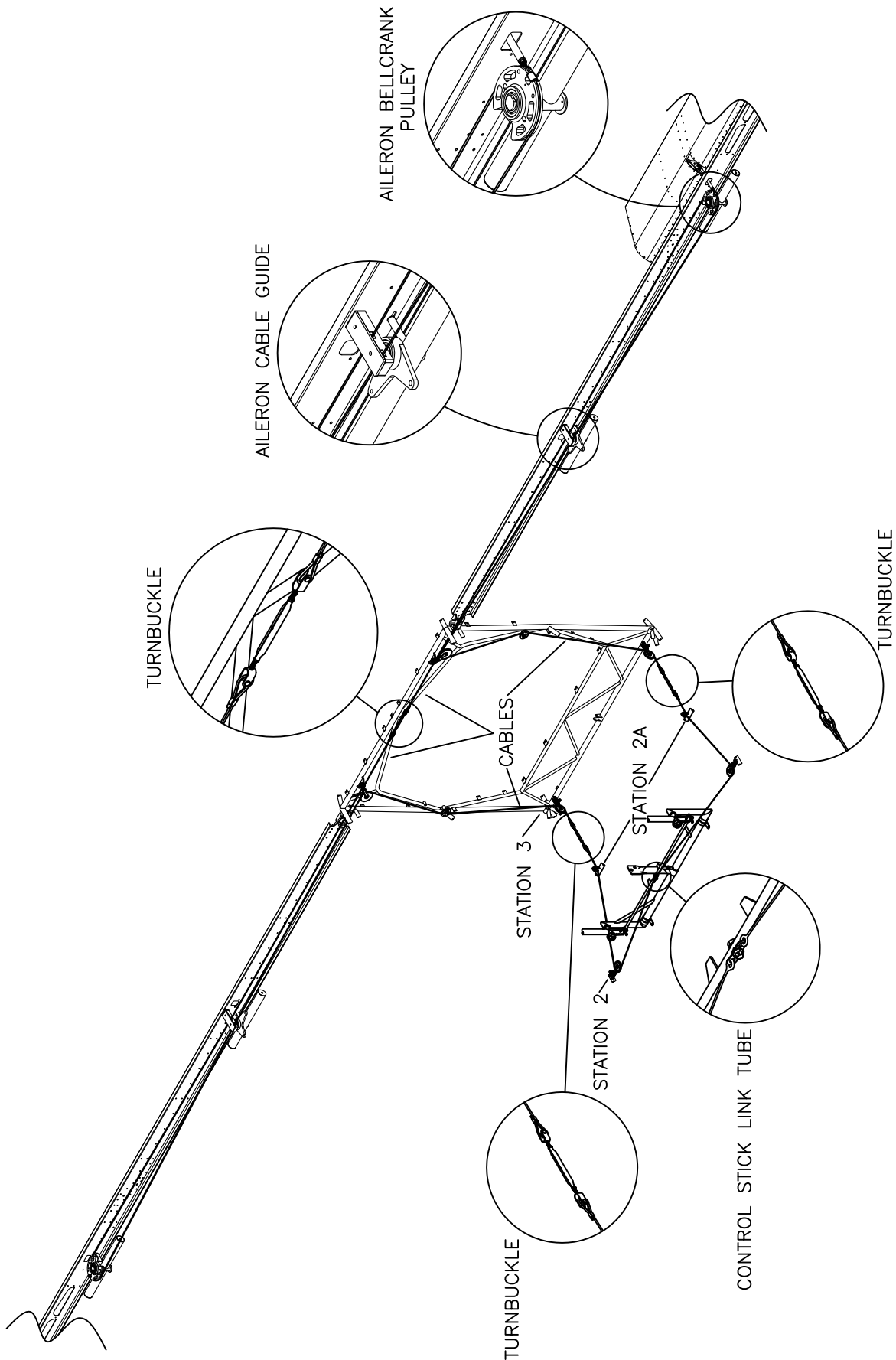
MD4390
REV. - ORIG

**RANS S-21 OUTBOUND
CABLE KEEPER MODIFICATION
FIGURE 10A-05**



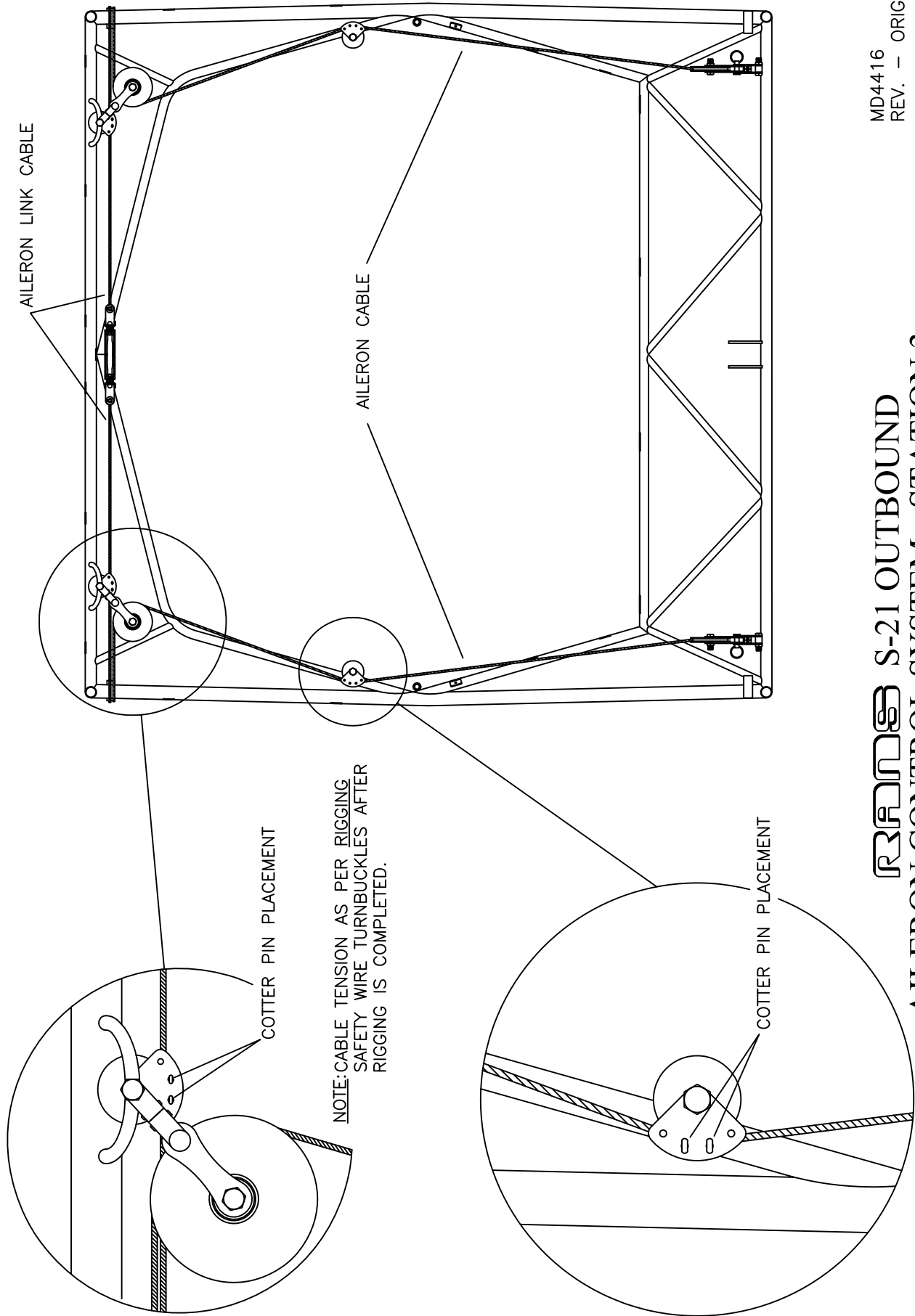
MD565
REV. - ORIG

RAMBO S-21 OUTBOUND
ELEVATOR PUSH-PULL TUBE FITTING ORIENTATION
FIGURE 10B-04



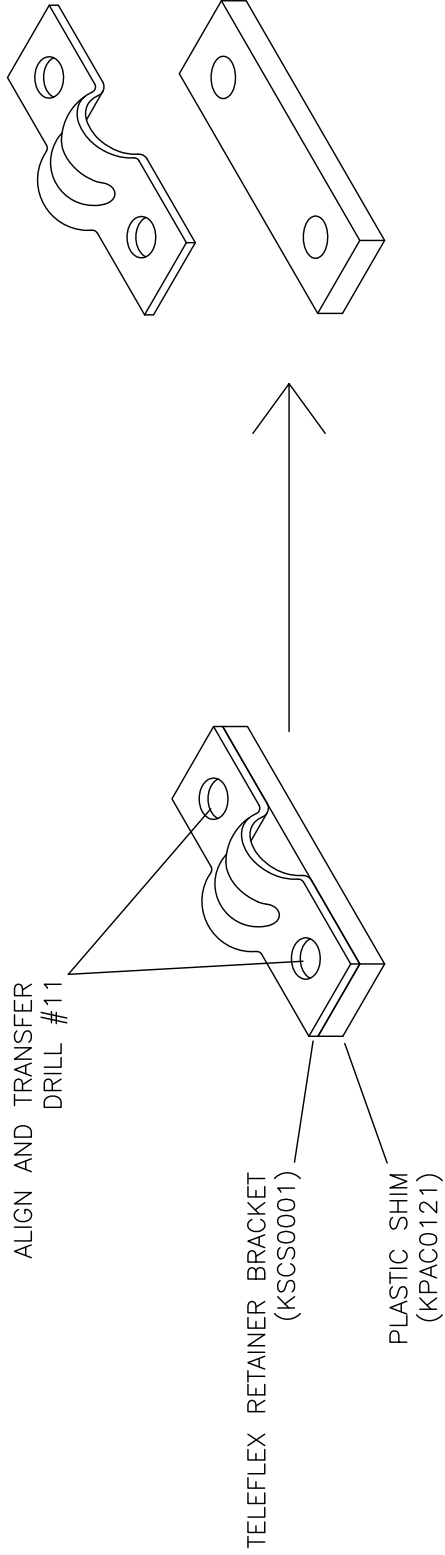
MD4415
REV. - ORIG

RAVEN S-21 OUTBOUND
 AILERON CONTROL SYSTEM OVERVIEW
 FIGURE 10C-06



MD4416
REV. - ORIG

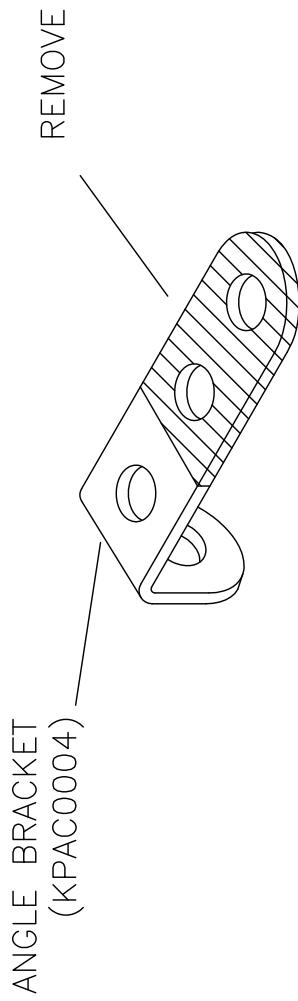
RAMBS S-21 OUTBOUND
AILERON CONTROL SYSTEM - STATION 3
FIGURE 10C-07



MODIFY 2 PLASTIC SHIMS

MD5617
REV. - ORIG

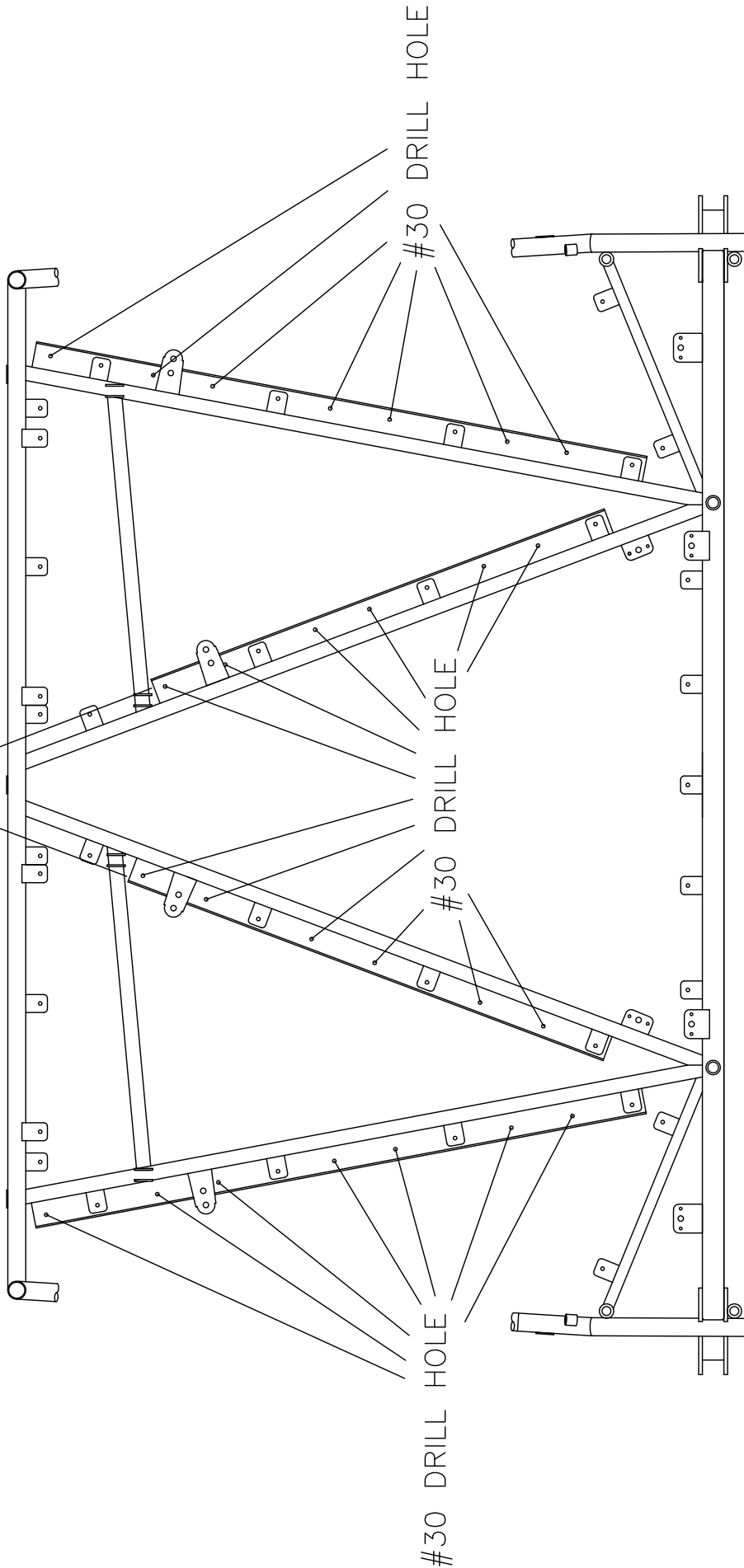
RRAMES S-21 OUTBOUND
FLAP LEVER PLASTIC SHIM MODIFICATION
FIGURE 10D-08



MD5617
REV. - ORIG

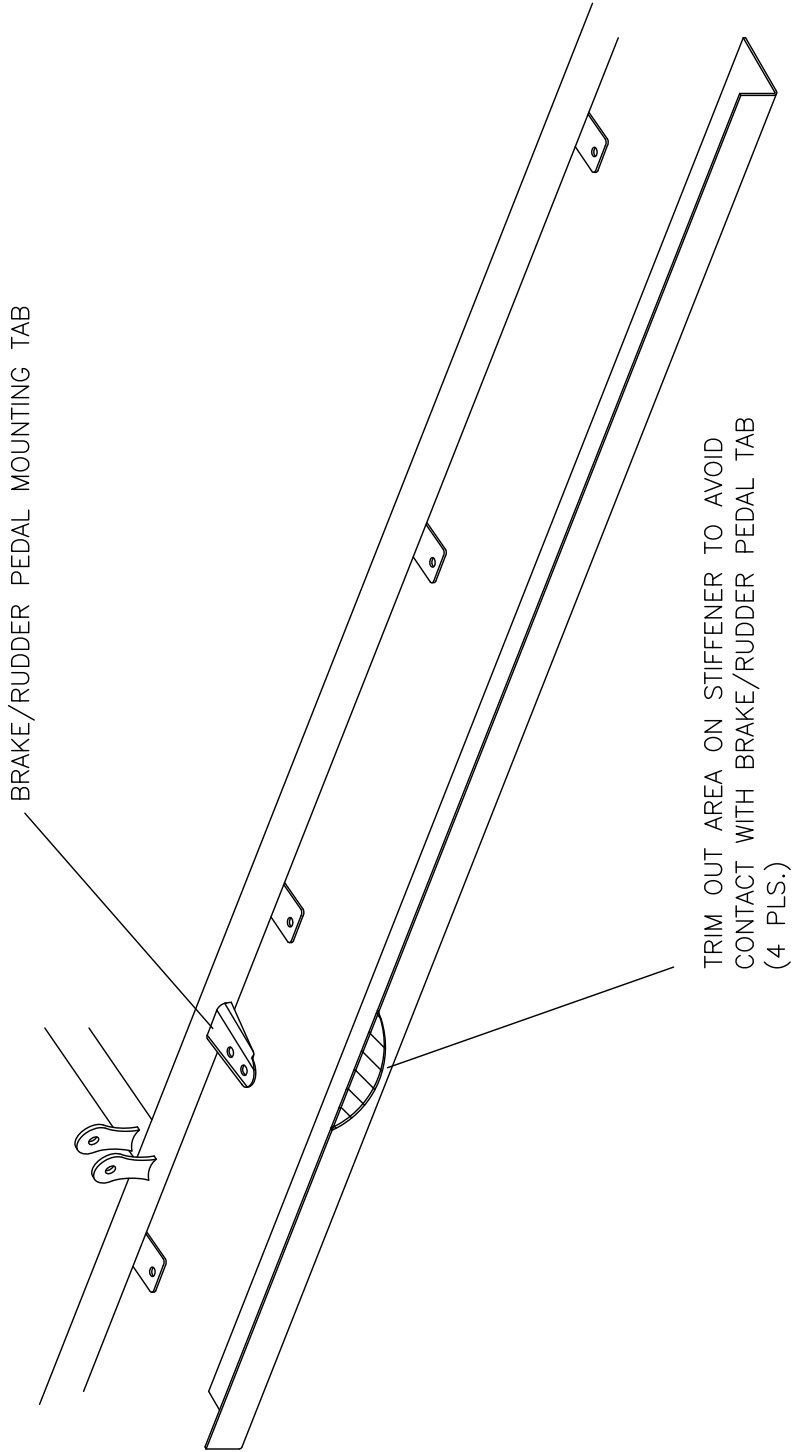
RRRMS S-21 OUTBOUND
ANGLE BRACKET MODIFICATION
FIGURE 10D-09

TRIM STIFFENER LENGTH TO
CLEAR FUSELAGE TUBES



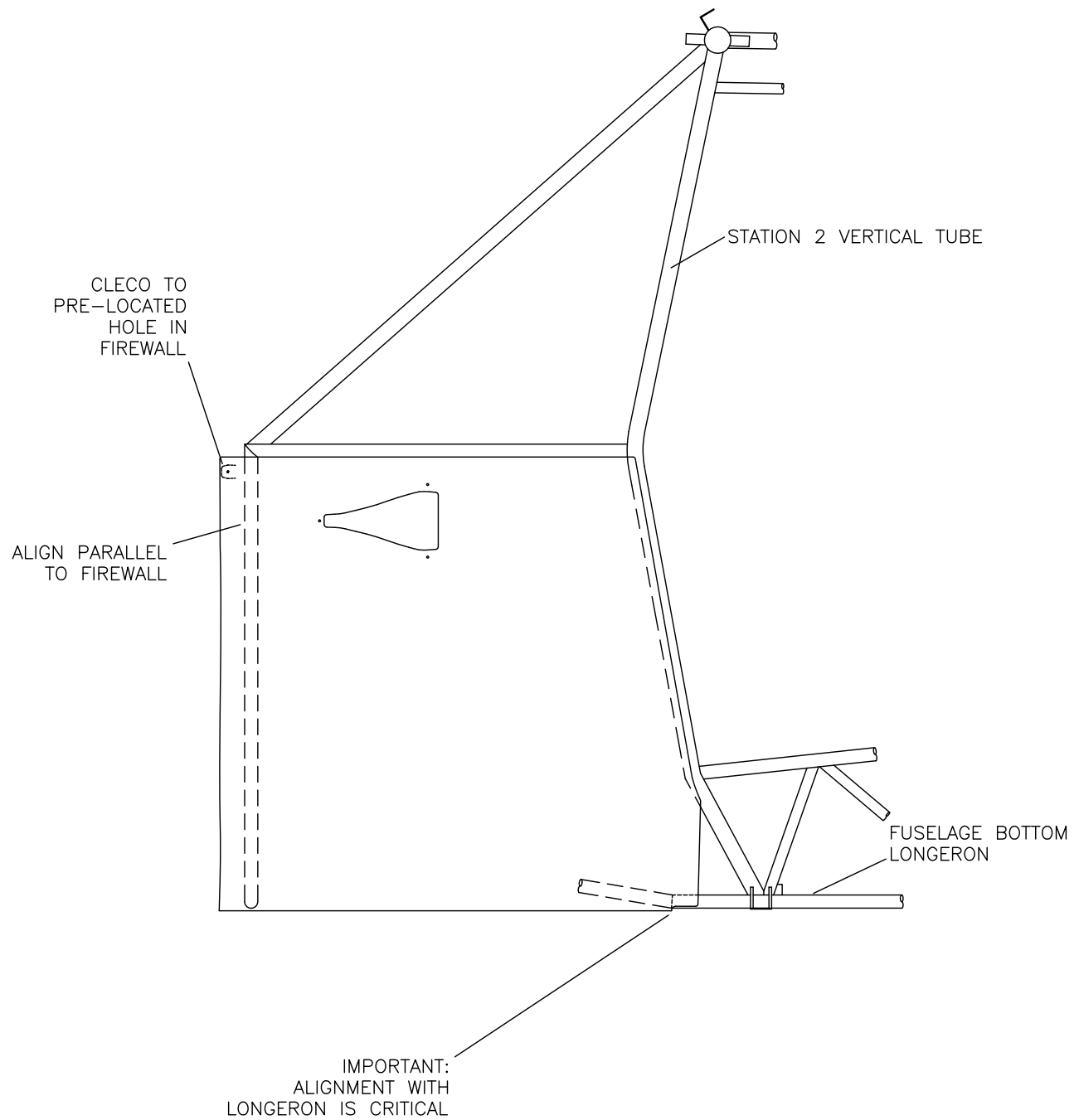
MD5606
REV. - ORIG

RAMS S-21 OUTBOUND
BOOT COWL STIFFENER LOCATION
FIGURE 10E-07



MD5605
REV. - ORIG

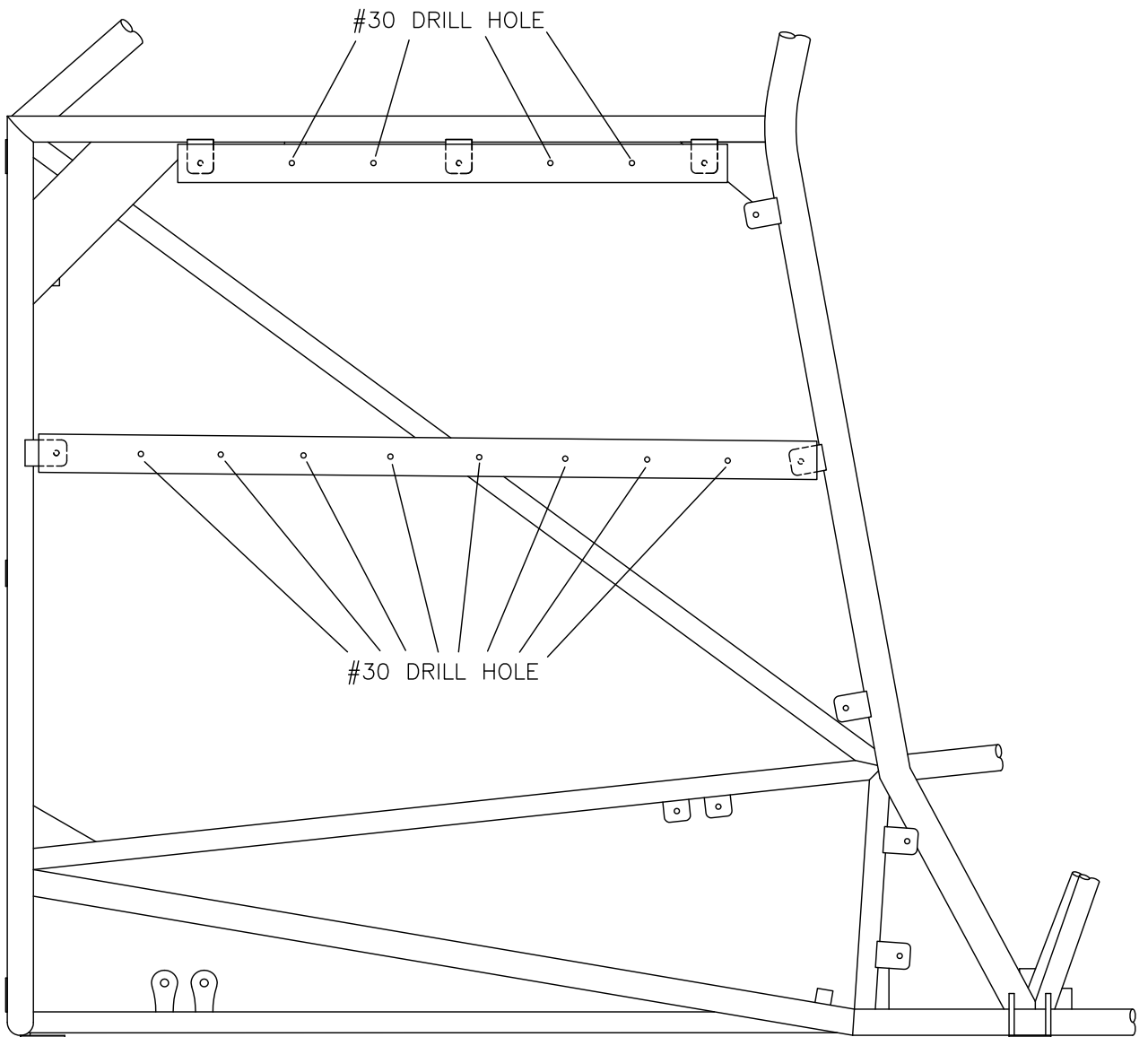
**RAMBO S-21 OUTBOUND
BOOT COWL STIFFENER TRIMMING
FIGURE 10E-08**



MD5607
REV. - ORIG

**RANS S-21 OUTBOUND
SIDE BOOT COWL INSTALLATION
FIGURE 10E-11**

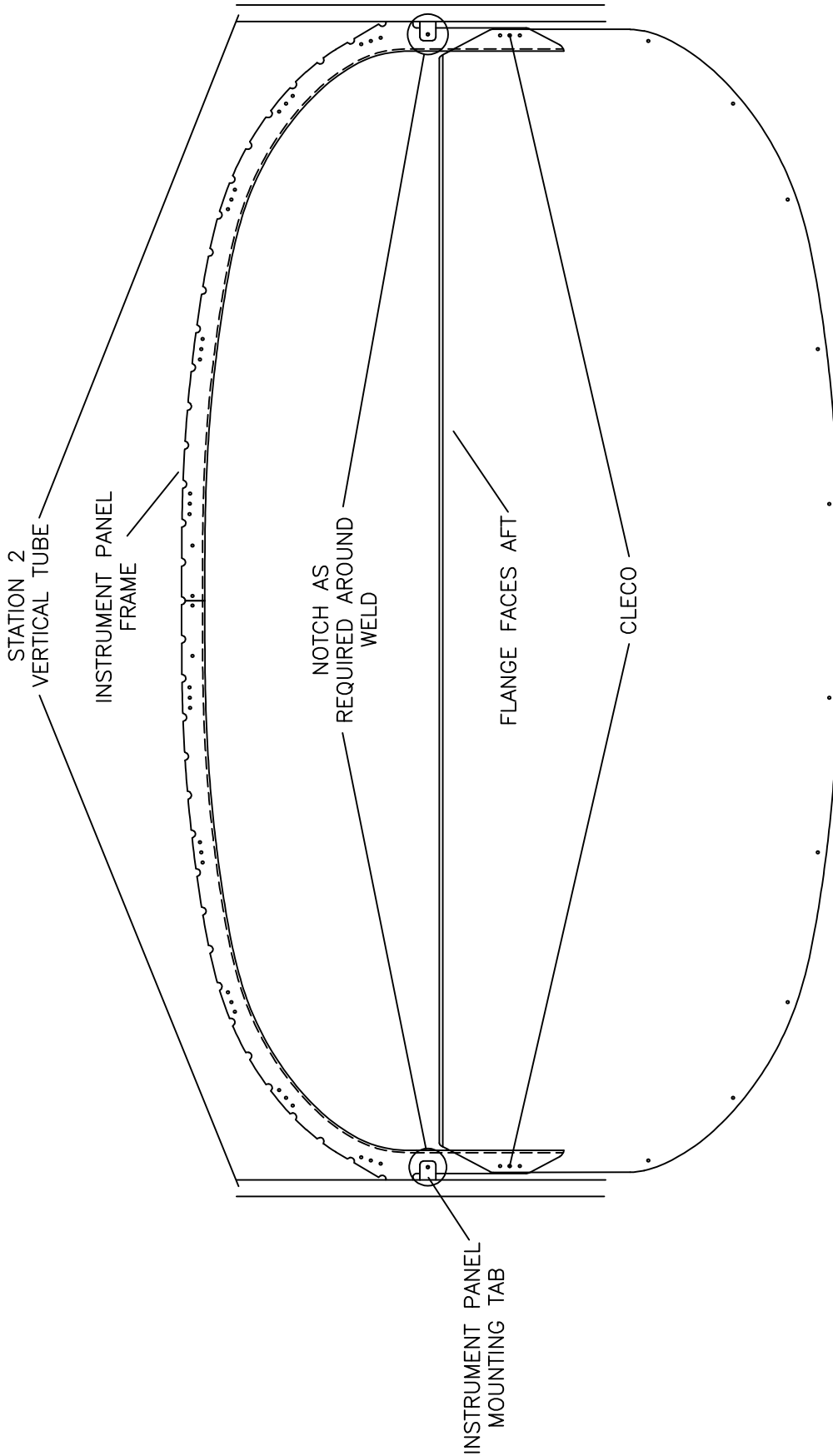
09/11/2018



MD5608
REV. - ORIG

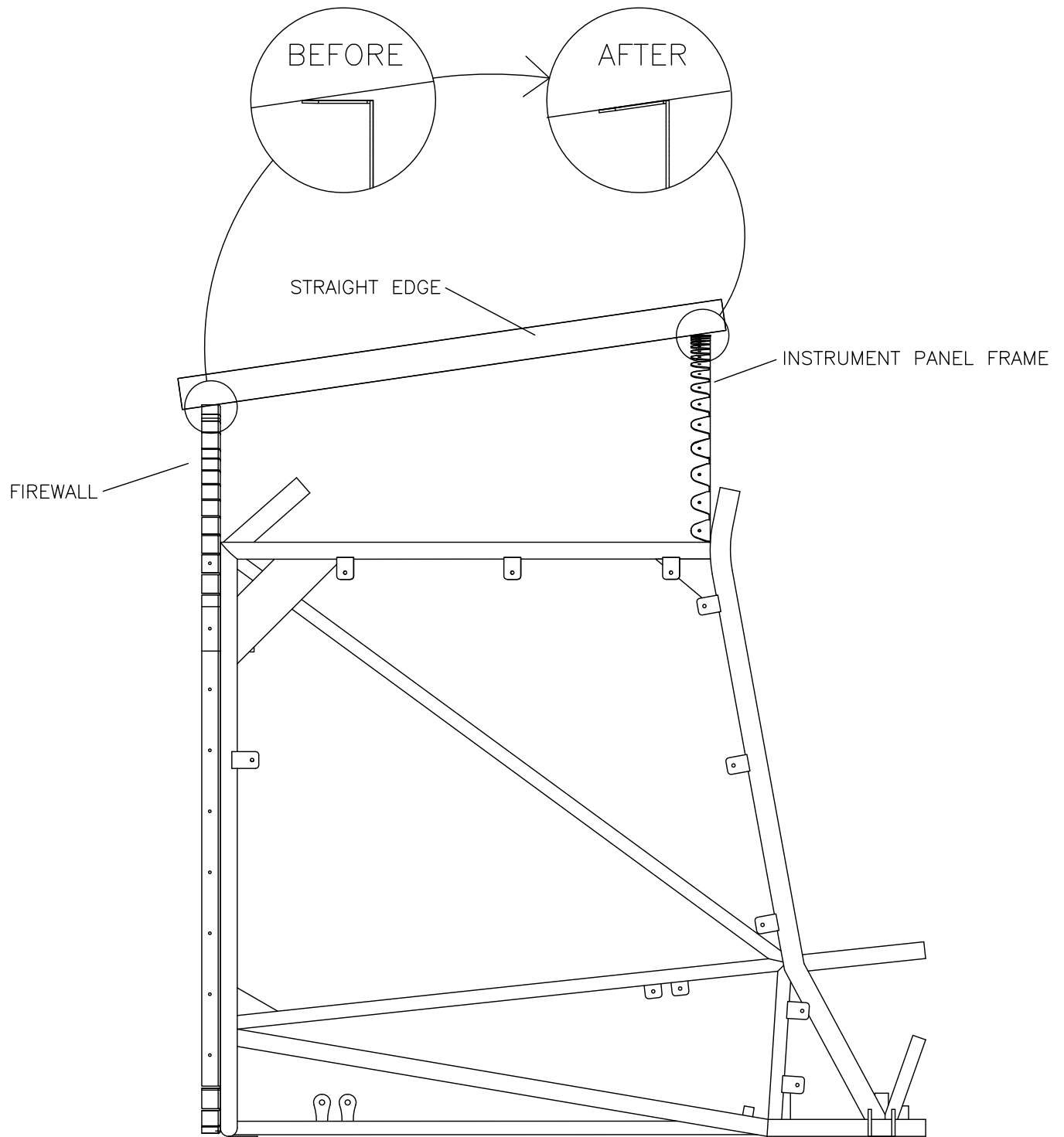
**RANS S-21 OUTBOUND
SIDE BOOT COWL STIFFENER LOCATION
FIGURE 10E-13**

09/11/2018



MD5609
REV. - ORIG

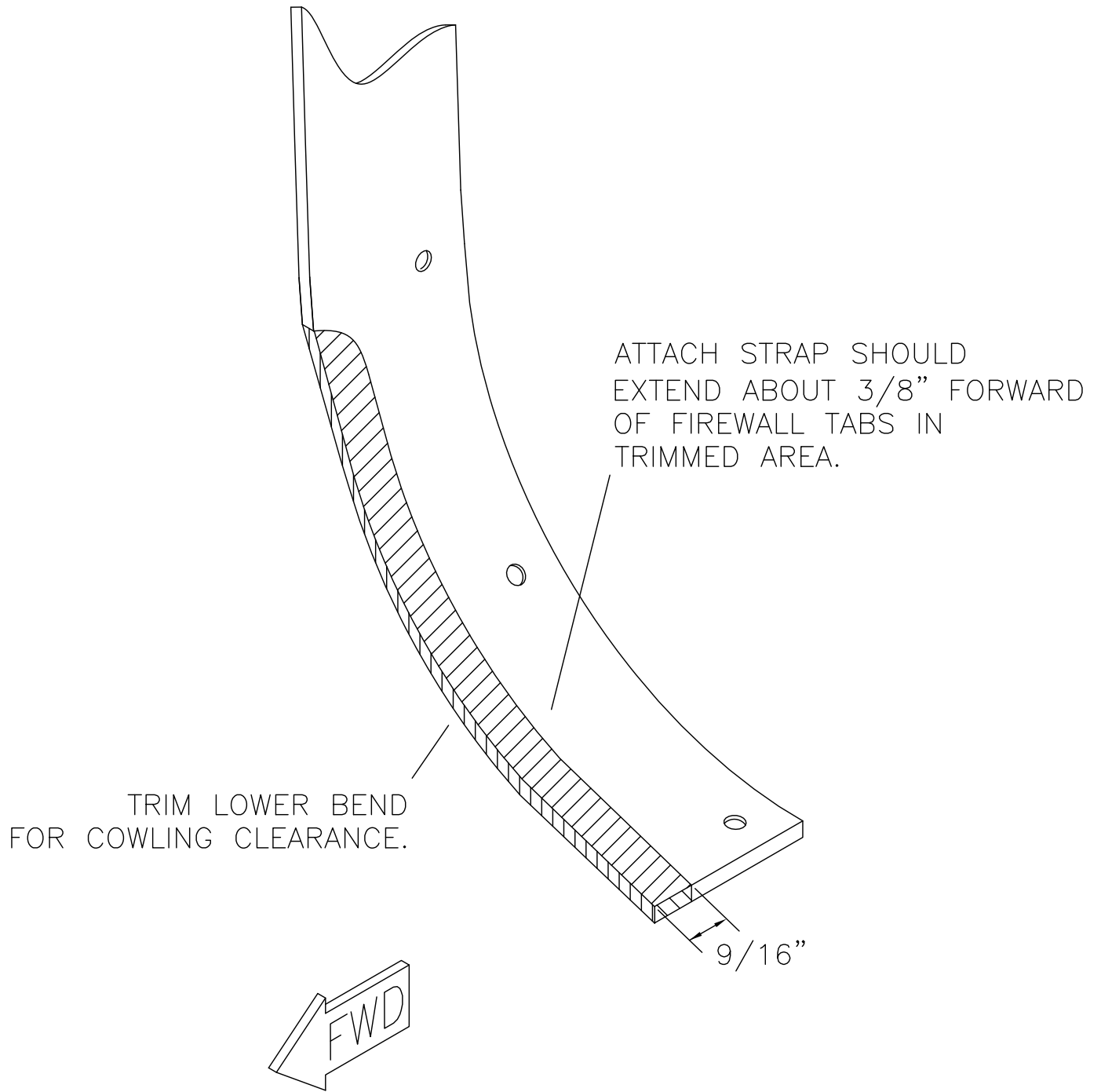
RRR S-21 OUTBOUND
INSTRUMENT PANEL INSTALLATION - BOOT COWL
FIGURE 10E-18



MD5610
 REV. - ORIG

**RANS S-21 OUTBOUND
 TAB ALIGNMENT
 FIGURE 10E-19**

09/11/2018



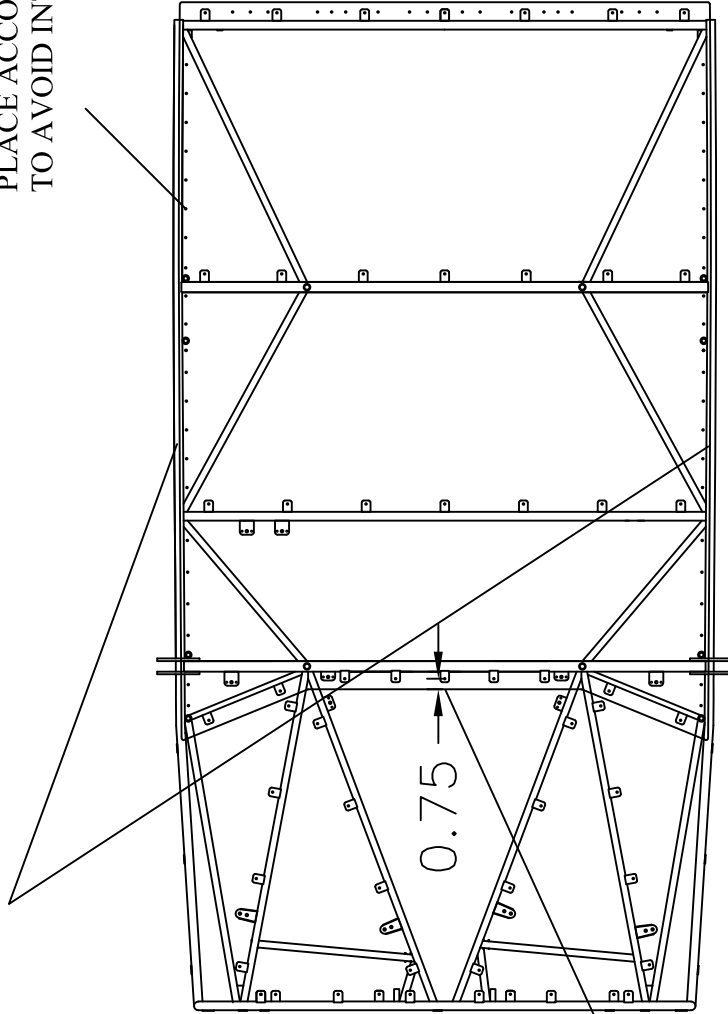
MD5611
REV. - ORIG

**RANS S-21 OUTBOUND
COWLING ATTACH STRAP TRIMMING
FIGURE 10E-29**

09/11/2018

LOCATE AND DRILL #30
2" SPACING THROUGH SIDE SKINS
PLACE ACCORDINGLY
TO AVOID INTERFERENCE

CENTER BETWEEN SIDE TUBES

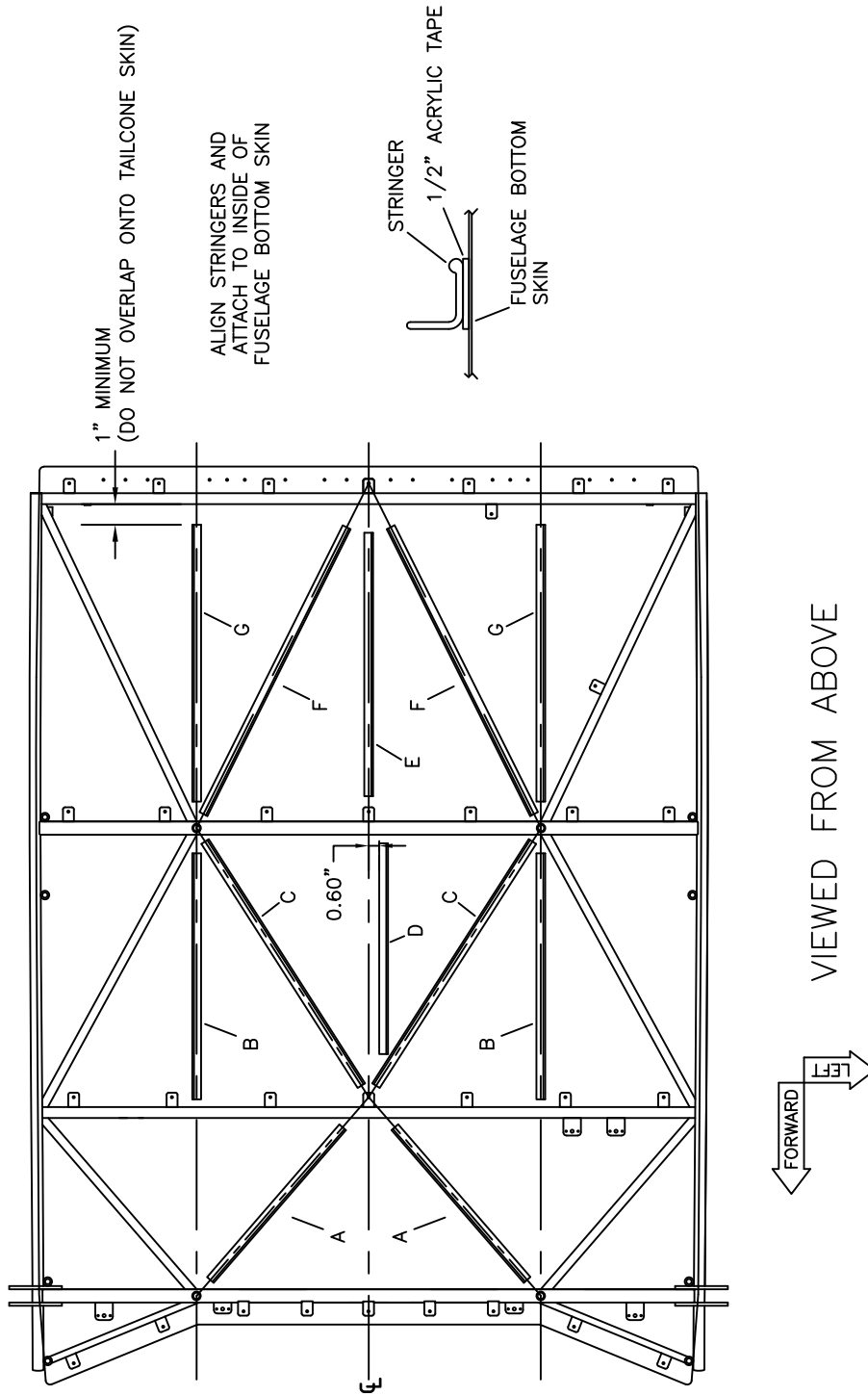


POSITION FORWARD EDGE
3/4" FORWARD OF
CENTER TAB HOLE



MD5654
REV. A

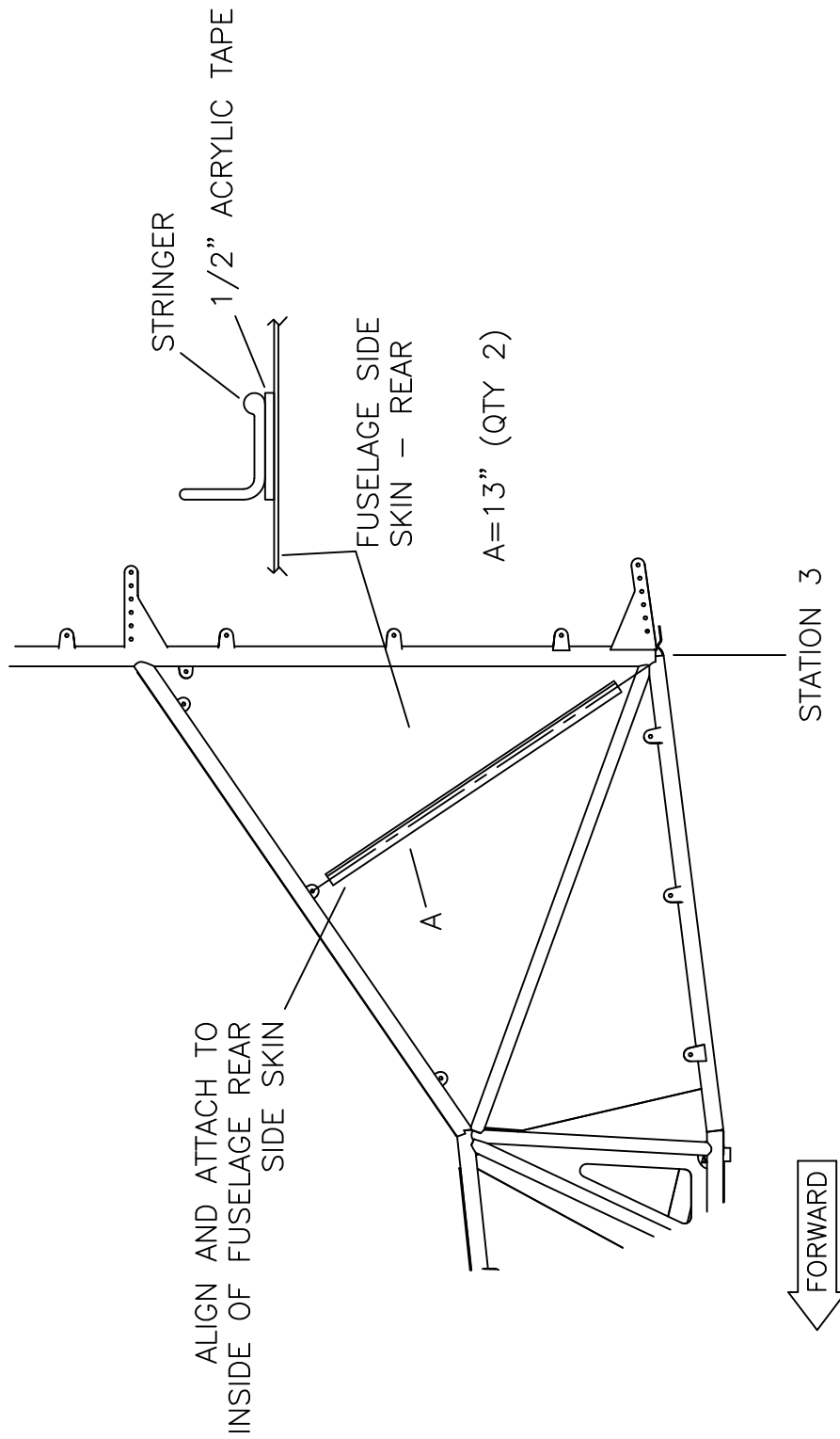
RR-108 S-21 OUTBOUND
FUSELAGE BOTTOM SKIN ORIENTATION
FIGURE 10E-30



- A=11.5" (QTY 2)
- B=14.0" (QTY 2)
- C=16.5" (QTY 2)
- D=12.0" (QTY 1)
- E=15.0" (QTY 1)
- F=18.25" (QTY 2)
- G=15.75" (QTY 2)

STRINGER "D" MUST BE OFFSET TO CLEAR CONTROL STICK BELLCRANK PLATES

RAN S-21
FUSELAGE BOTTOM SKIN STRINGER LOCATION
FIGURE 10E-30A

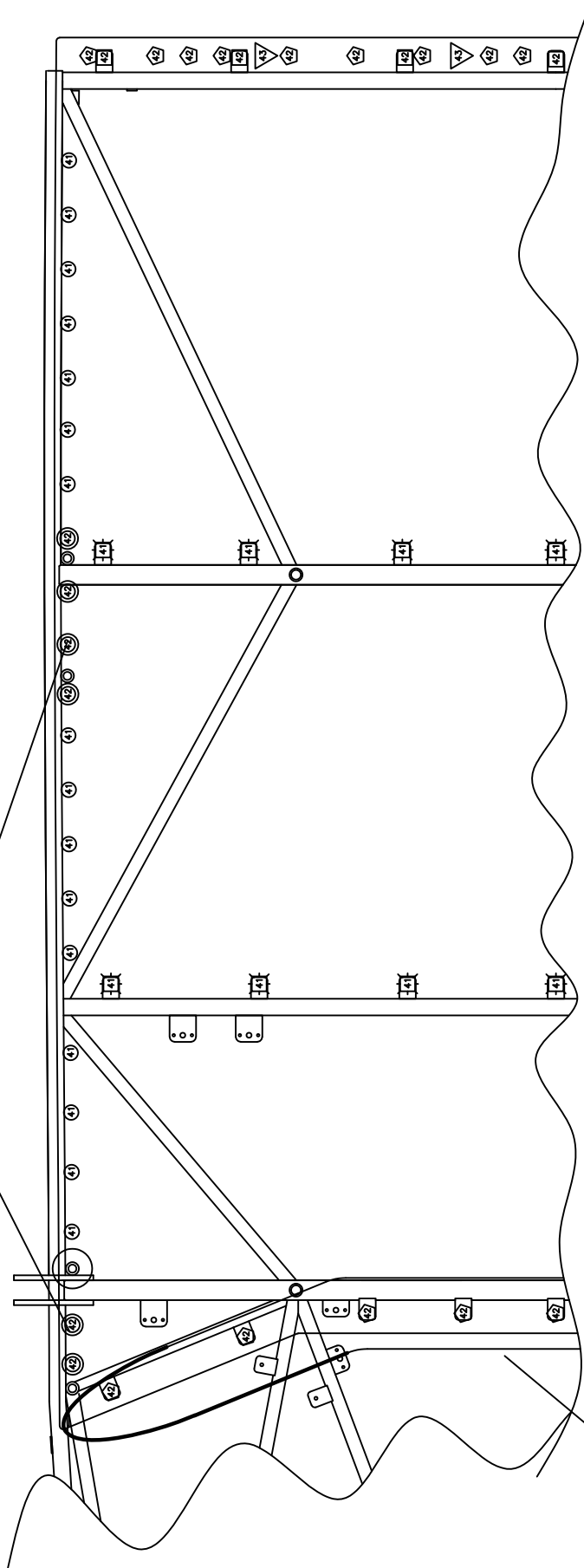


RAAF S-21 OUTBOUND
FUSELAGE REAR SIDE SKIN STRINGER
FIGURE 10E-30B

MD5654
 REV. - ORIG

FLUSH RIVETS REQUIRED UNDER
TOP MAIN GEAR CLAMP PLATE LOCATIONS

ONLY LOWER RH SIDE
SHOWN FOR CLARITY



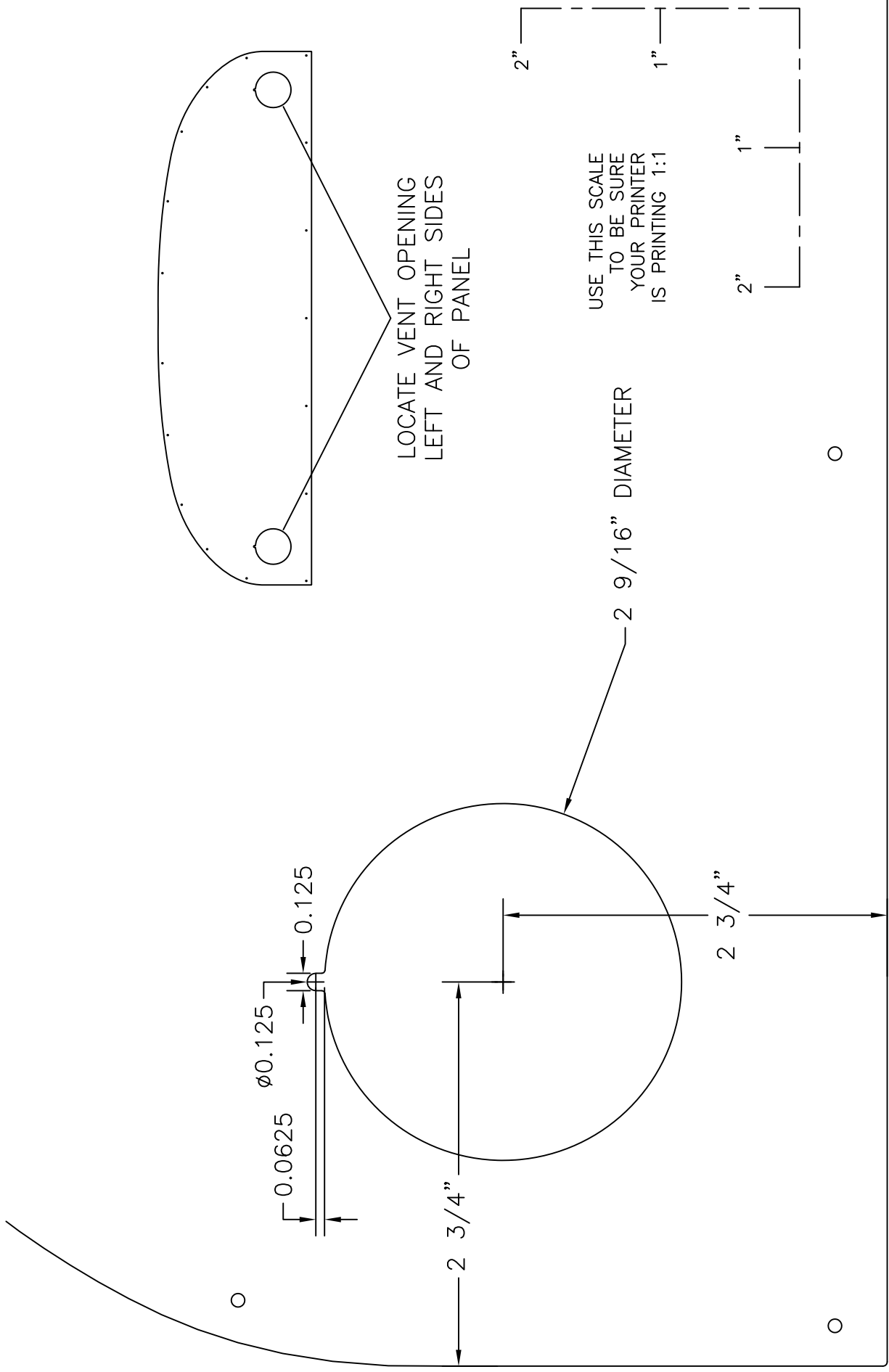
	CCPQ-41
	CCPQ-42
	AFPQ-41
	AFPQ-42
	AFPQ-43
	AACQ-42

DO NOT RIVET FORWARD EDGE
UNTIL BOOT COWL INSTALLATION



RAMS S-21 OUTBOUND
FUSELAGE BOTTOM SKIN RIVET SCHEDULE
FIGURE 10E-31

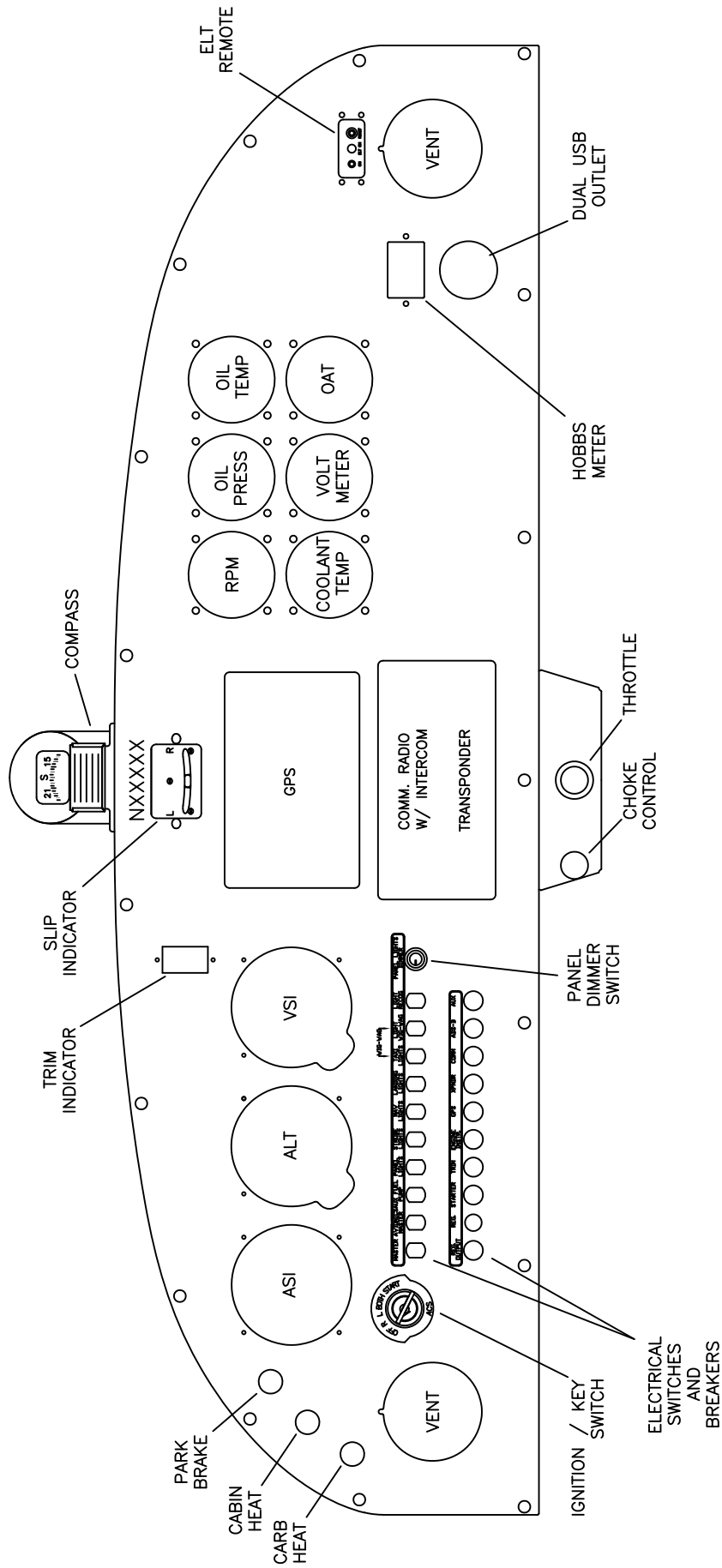
MD5654
REV. A



PLOT 1:1

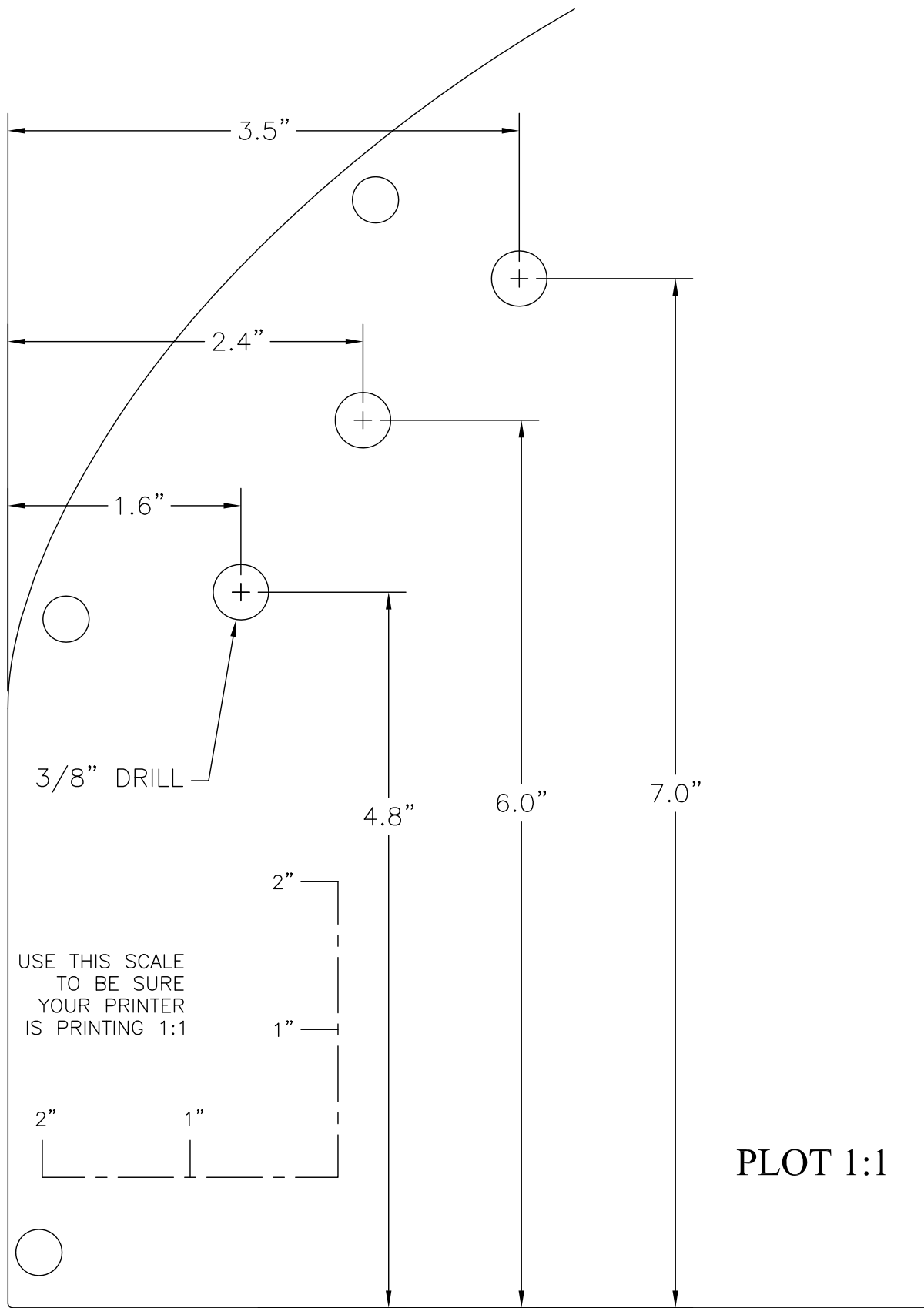
MD5618
REV. - ORIG

RAMOS S-21 OUTBOUND
VENT SYSTEM - INSTRUMENT PANEL MODIFICATION
FIGURE 10E-37



MD5618
REV. - ORIG

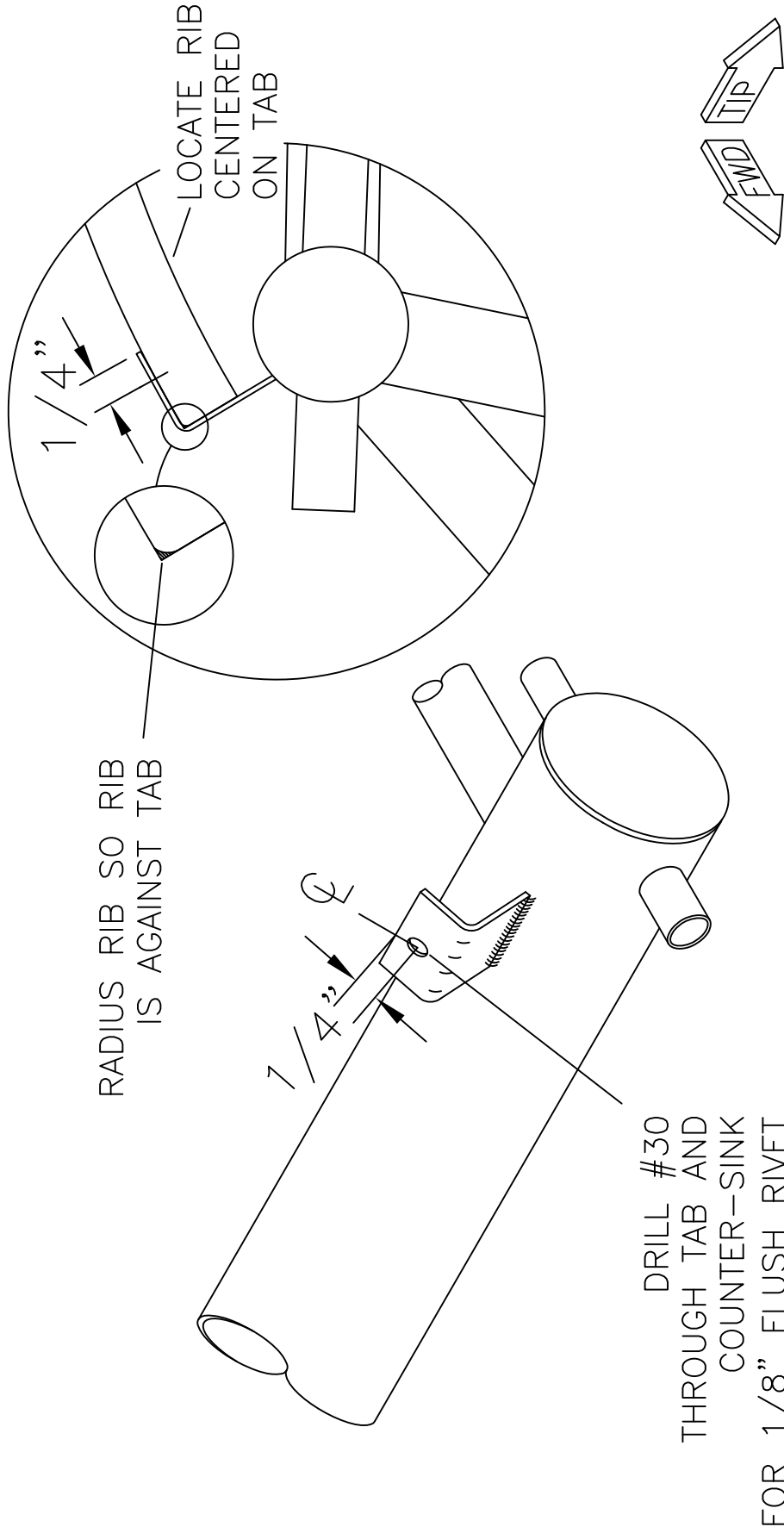
RAMP S-21 OUTBOUND
SAMPLE ANALOG INSTRUMENT PANEL LAYOUT
FIGURE 10F-01



MD5618
REV. - ORIG

**RAMS S-21 OUTBOUND
CONTROL CABLE - INSTRUMENT PANEL
FIGURE 10F-02**

09/11/2018

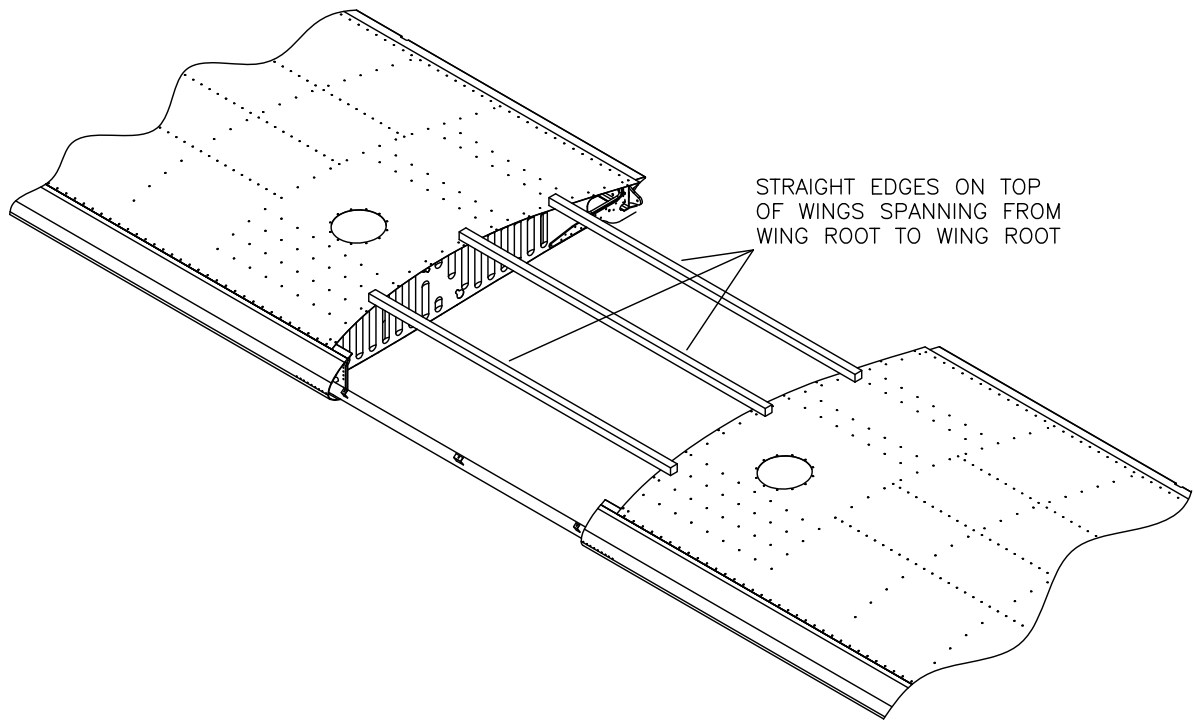


DRILL #30
THROUGH TAB AND
COUNTER-SINK
FOR 1/8" FLUSH RIVET

NOTE: LOCATE AND DRILL FOR
ALL 3 TABS ON CARRY-THRU

MD4408
REV. - ORIG

RAMS S-21 OUTBOUND
WINDSHIELD MOUNTING TAB MODIFICATION
FIGURE 10G-02

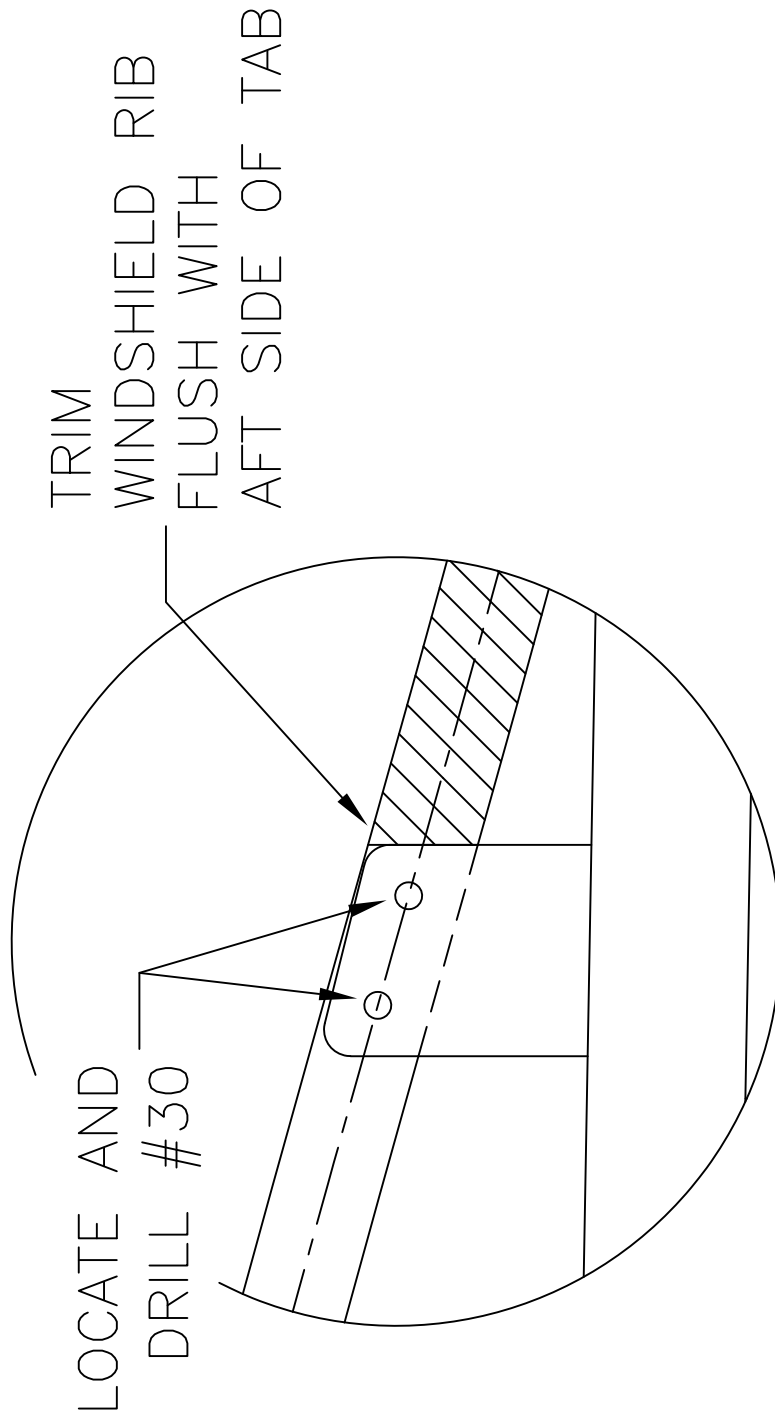


MD3354
REV. - ORIG

**RANS S-21 OUTBOUND
RIB HEIGHT ADJUSTMENT - FUSELAGE
FIGURE 10G-03**

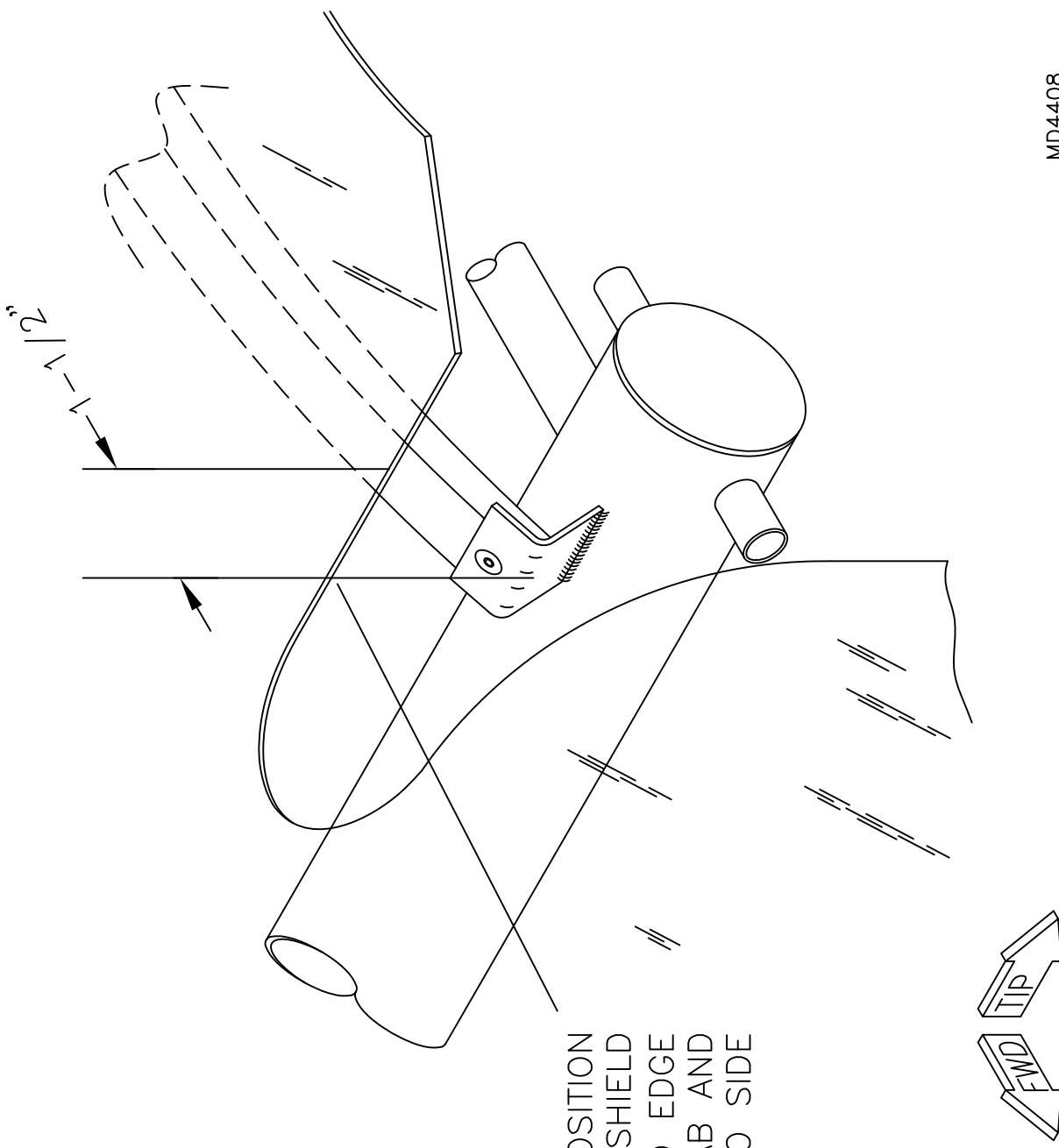
09/11/2018

RIB MOUNTS TO OUTBOARD
SIDE OF ATTACH TAB



MD2580
REV. A

RAAF S-21 OUTBOUND
OUTER WINDSHIELD RIB - AFT ATTACH DETAIL
FIGURE 10G-06



POSITION
 FWD. EDGE OF WINDSHIELD
 1-1/2" AFT OF FWD EDGE
 OF TAB AND
 CENTERED SIDE TO SIDE

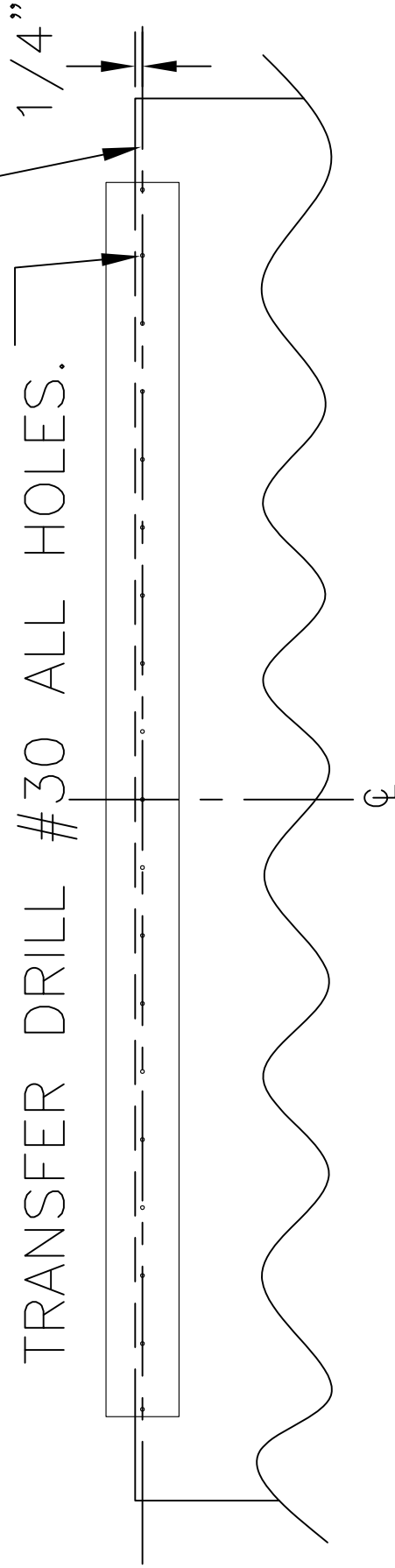
MD4408
 REV. - ORIG

RRR S-21 OUTBOUND
 WINDSHIELD LOCATION
 FIGURE 10G-09



1. MARK LINE ON SKYLIGHT

2. USE MATING STRIP AS GUIDE.
TRANSFER DRILL #30 ALL HOLES.



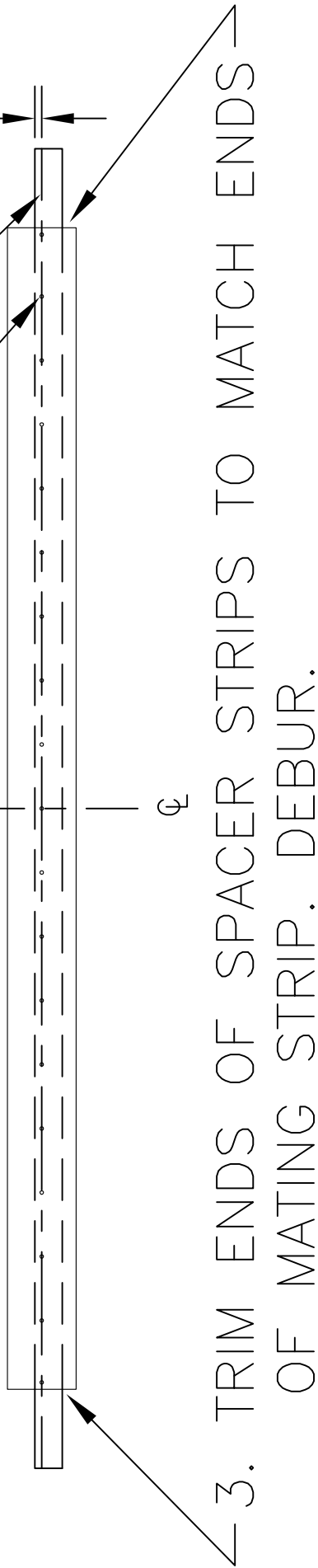
3. REMOVE MATING STRIP.
TRANSFER DRILL ONLY
SKYLIGHT HOLES TO #28. DEBUR.

MD4408
REV. - ORIG

RAMS S-21 OUTBOUND
SKYLIGHT DRILLING
FIGURE 10G-10

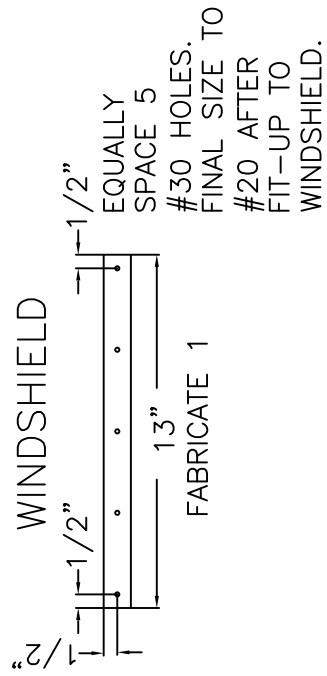
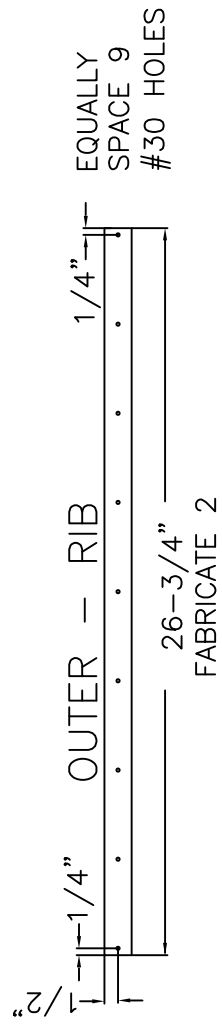
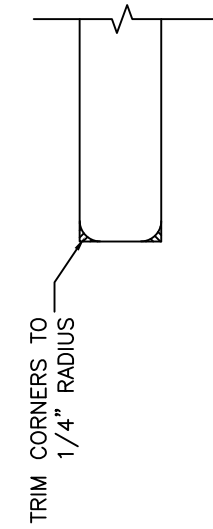
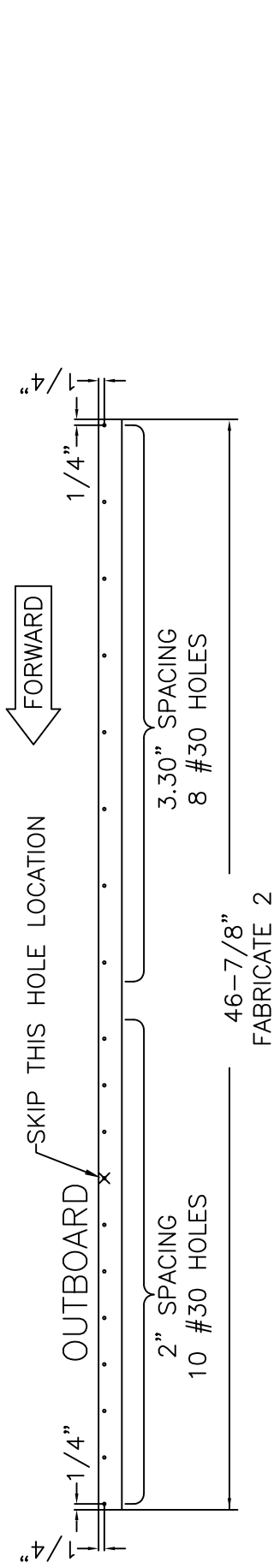
1. MARK LINE ON BOTH SKYLIGHT
SPACER STRIPS

2. USE MATING STRIP AS GUIDE.
TRANSFER DRILL #30 ALL HOLES.



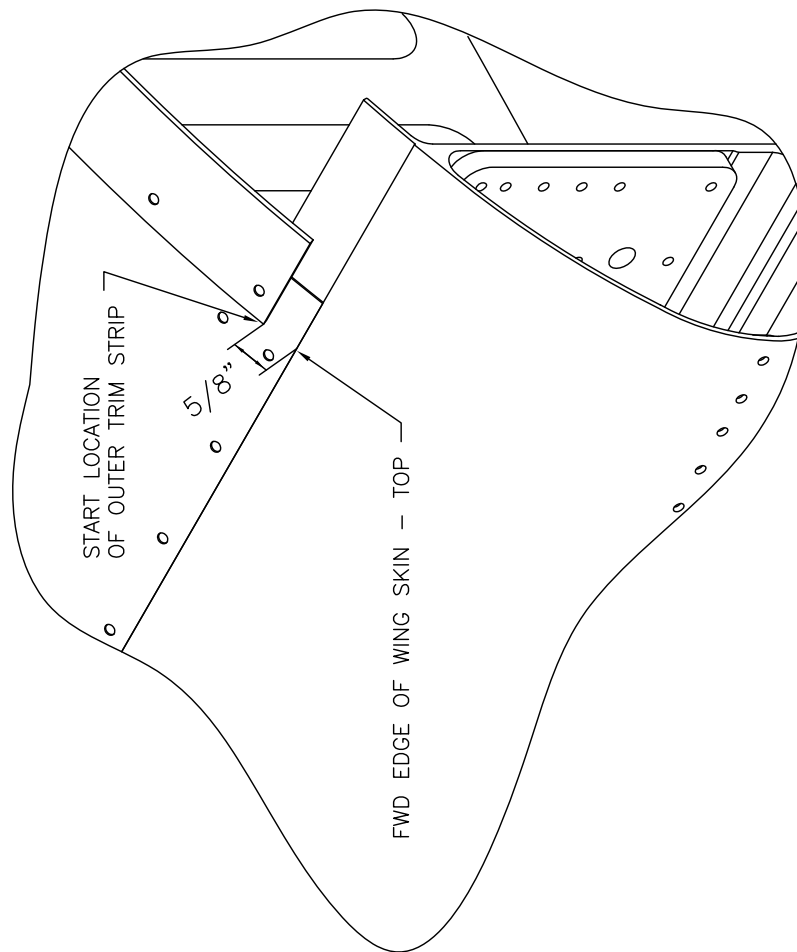
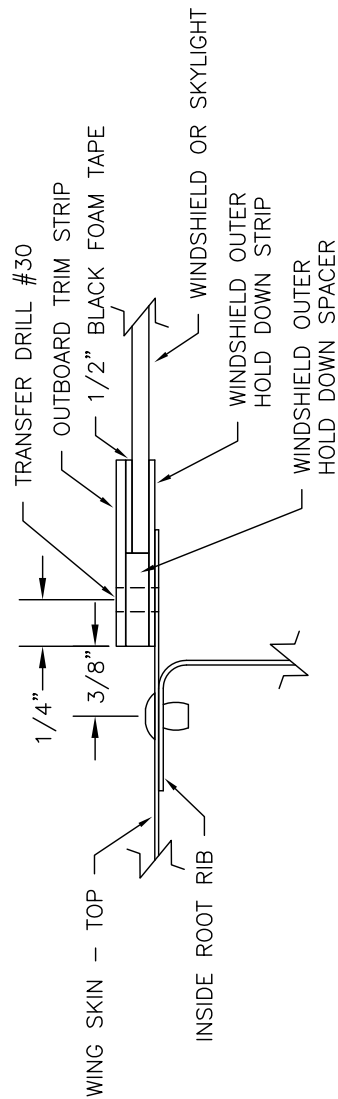
MD4408
REV. - ORIG

RAMS S-21 OUTBOUND
SKYLIGHT SPACER STRIP DRILLING
FIGURE 10G-10A



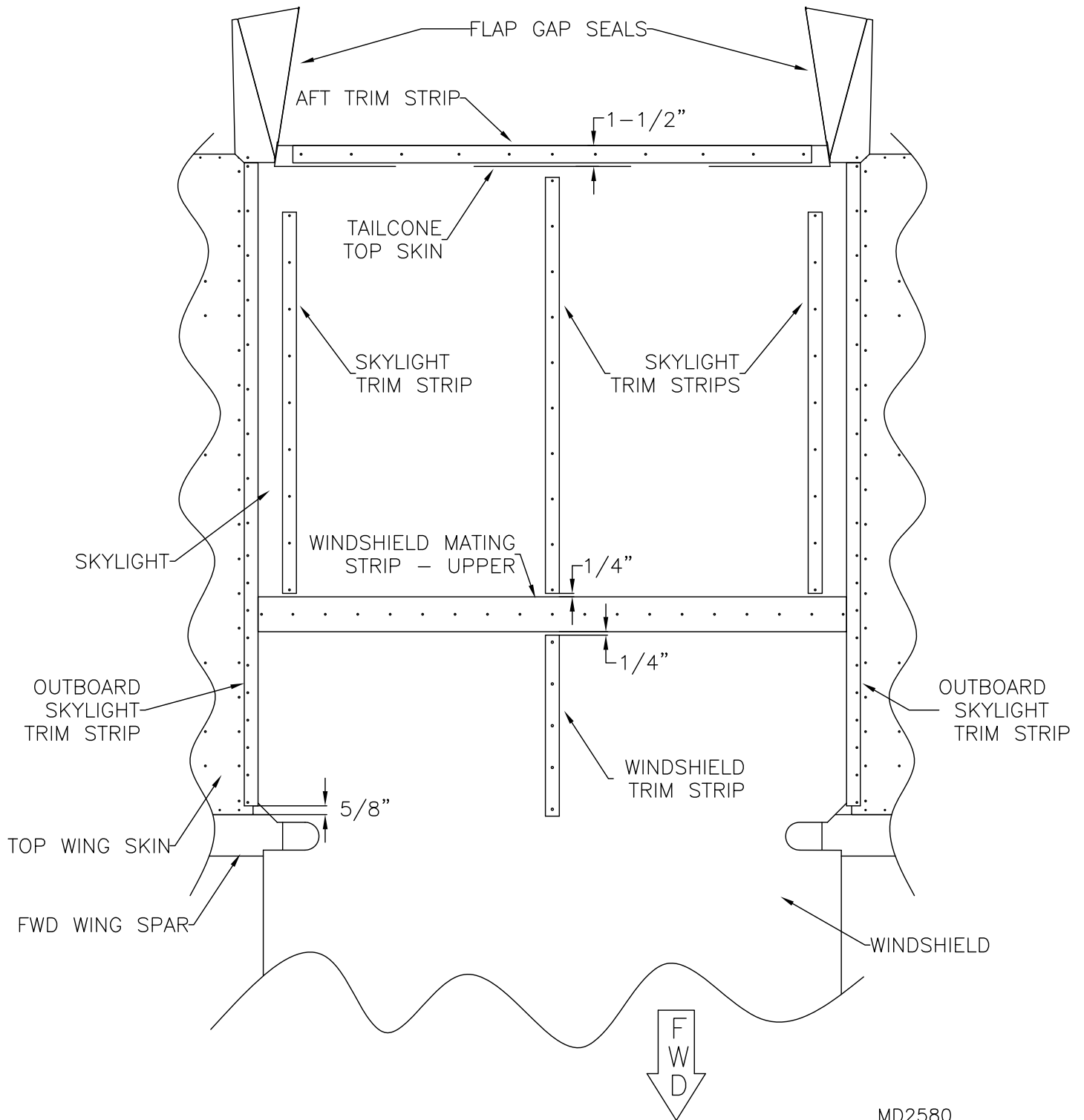
MD5002
REV. A

RAMS S-21 OUTBOUND
SKYLIGHT & WINDSHIELD TRIM STRIP MODIFICATION
FIGURE 10G-11



MD2580
REV. - ORIG

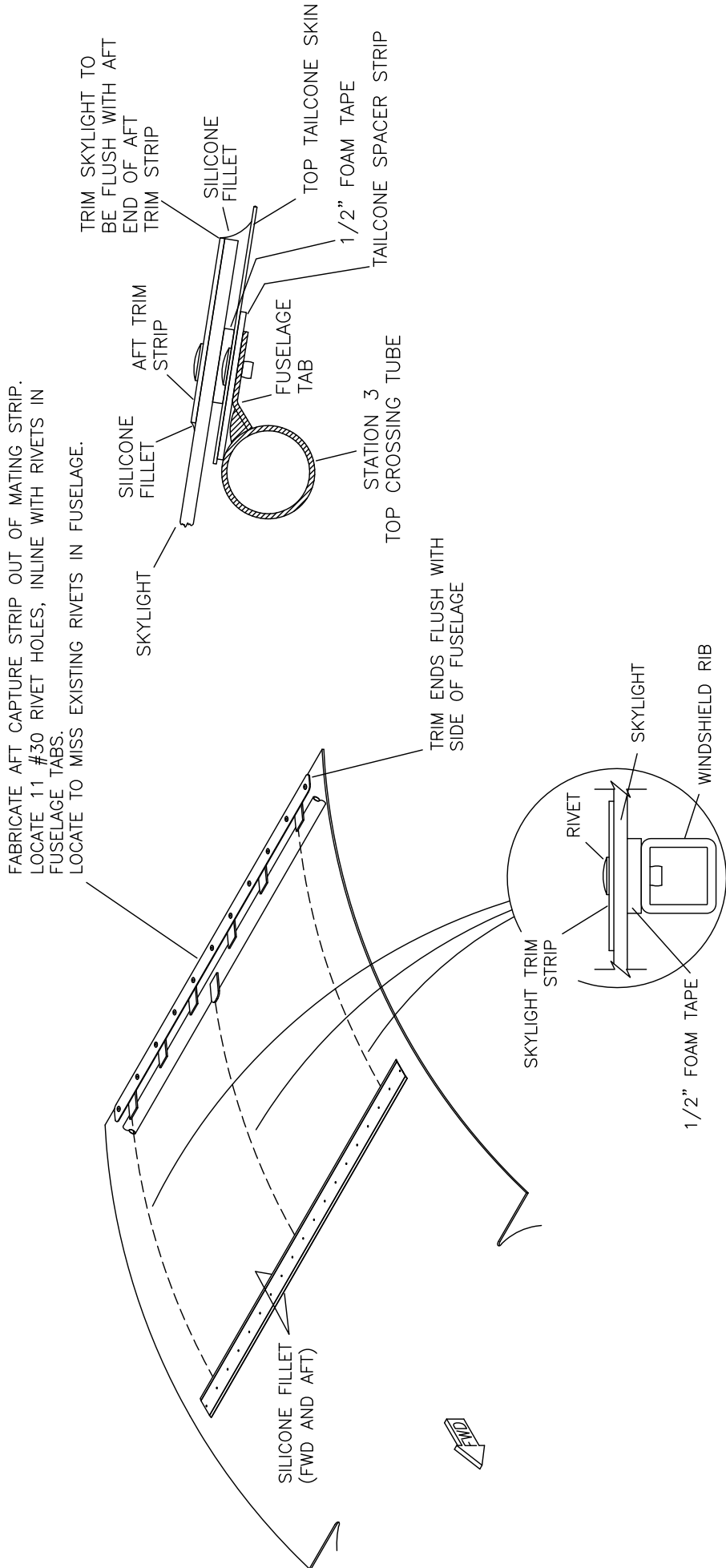
RRR S-21 OUTBOUND
 OUTERBOARD TRIM STRIP LOCATION
 FIGURE 10G-12



MD2580
REV. - ORIG

**RAMS S-21 OUTBOUND
WINDSHIELD & SKYLIGHT - TOP VIEW
FIGURE 10G-17**

09/11/2018



FABRICATE AFT CAPTURE STRIP OUT OF MATING STRIP.
 LOCATE 11 #30 RIVET HOLES, INLINE WITH RIVETS IN
 FUSELAGE TABS.
 LOCATE TO MISS EXISTING RIVETS IN FUSELAGE.

TRIM SKYLIGHT TO
 BE FLUSH WITH AFT
 END OF AFT
 TRIM STRIP

SKYLIGHT

SILICONE
 FILLET

AFT TRIM
 STRIP

SILICONE
 FILLET

FUSELAGE
 TAB

1/2" FOAM TAPE

TAILCONE SPACER STRIP

TOP TAILCONE SKIN

STATION 3
 TOP CROSSING TUBE

TRIM ENDS FLUSH WITH
 SIDE OF FUSELAGE

SKYLIGHT TRIM
 STRIP

RIVET

SKYLIGHT

WINDSHIELD RIB

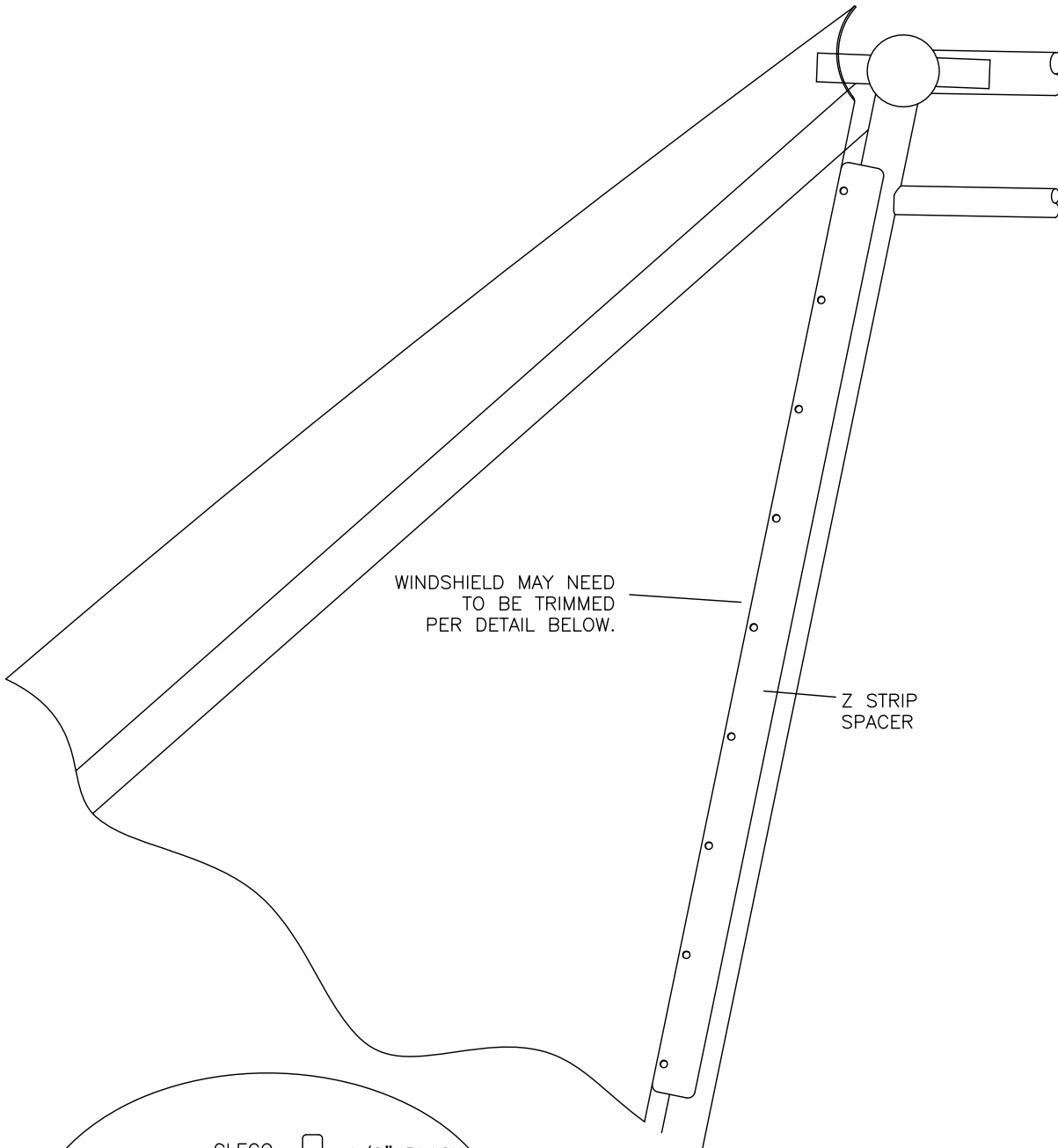
1/2" FOAM TAPE

SILICONE FILLET
 (FWD AND AFT)



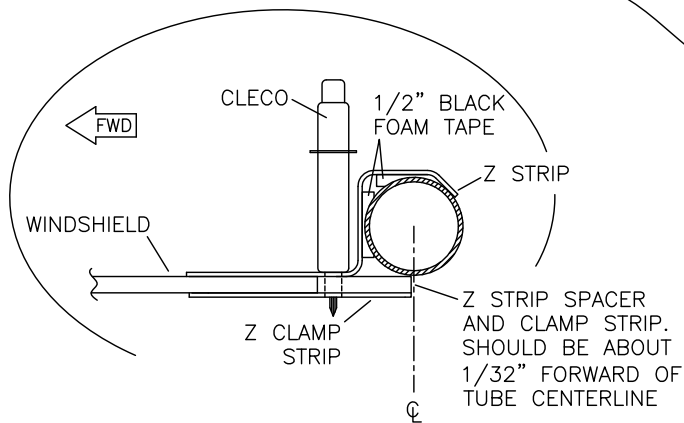
MD2580
 REV. - ORIG

RRR S-21 OUTBOUND
 WINDSHIELD - TOP DETAIL
 FIGURE 10G-19



WINDSHIELD MAY NEED
TO BE TRIMMED
PER DETAIL BELOW.

Z STRIP
SPACER

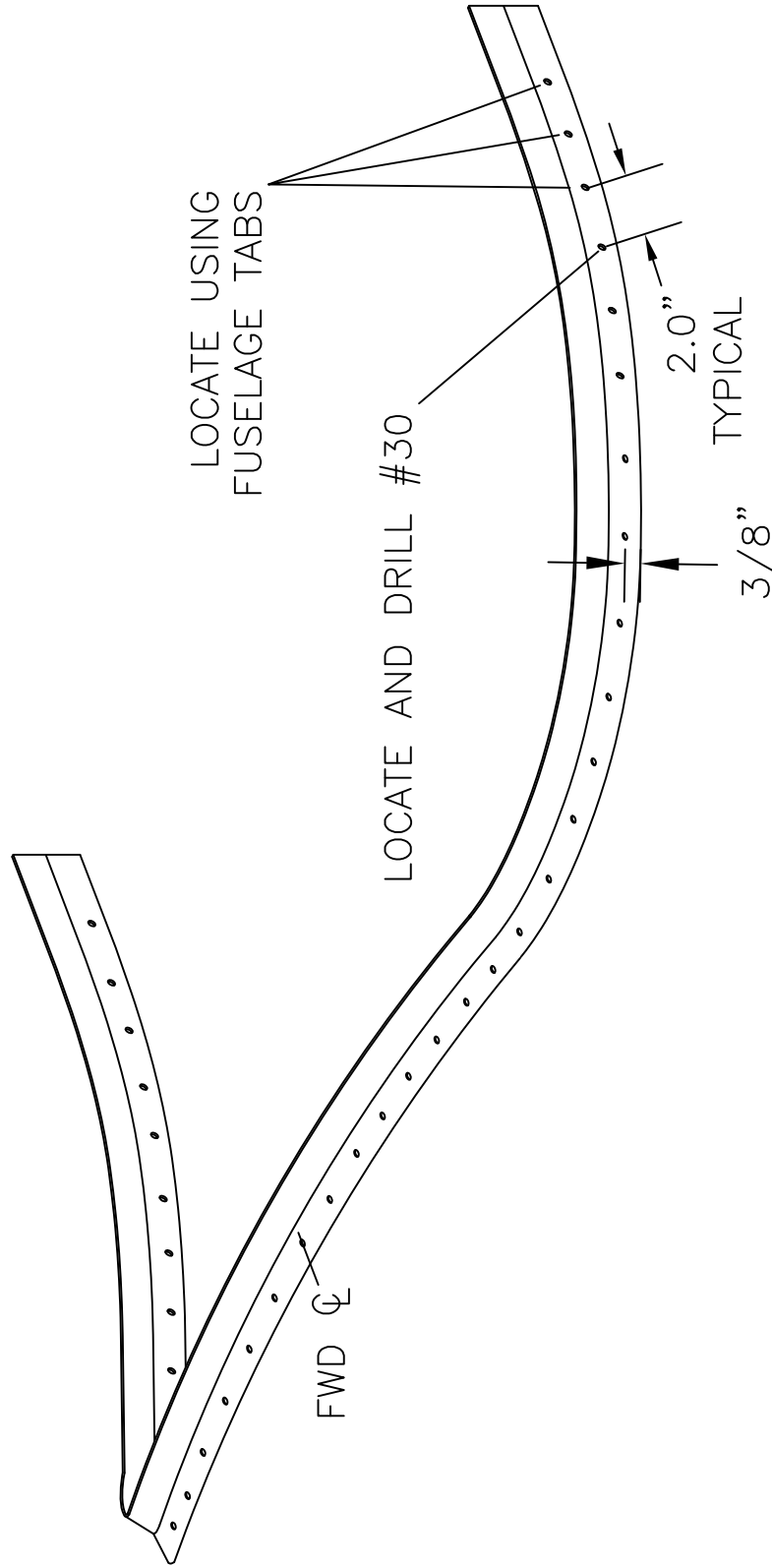


CLECO THE Z STRIP (KPWS0070), Z CLAMP STRIP (KPWS0068) AND THE Z STRIP SPACER (KPWS0069) TOGETHER AFT OF WINDSHIELD. Z STRIP SPACER SHOULD ALIGN FLUSH WITH AFT OF WINDSHIELD.

MD1428
REV. - ORIG

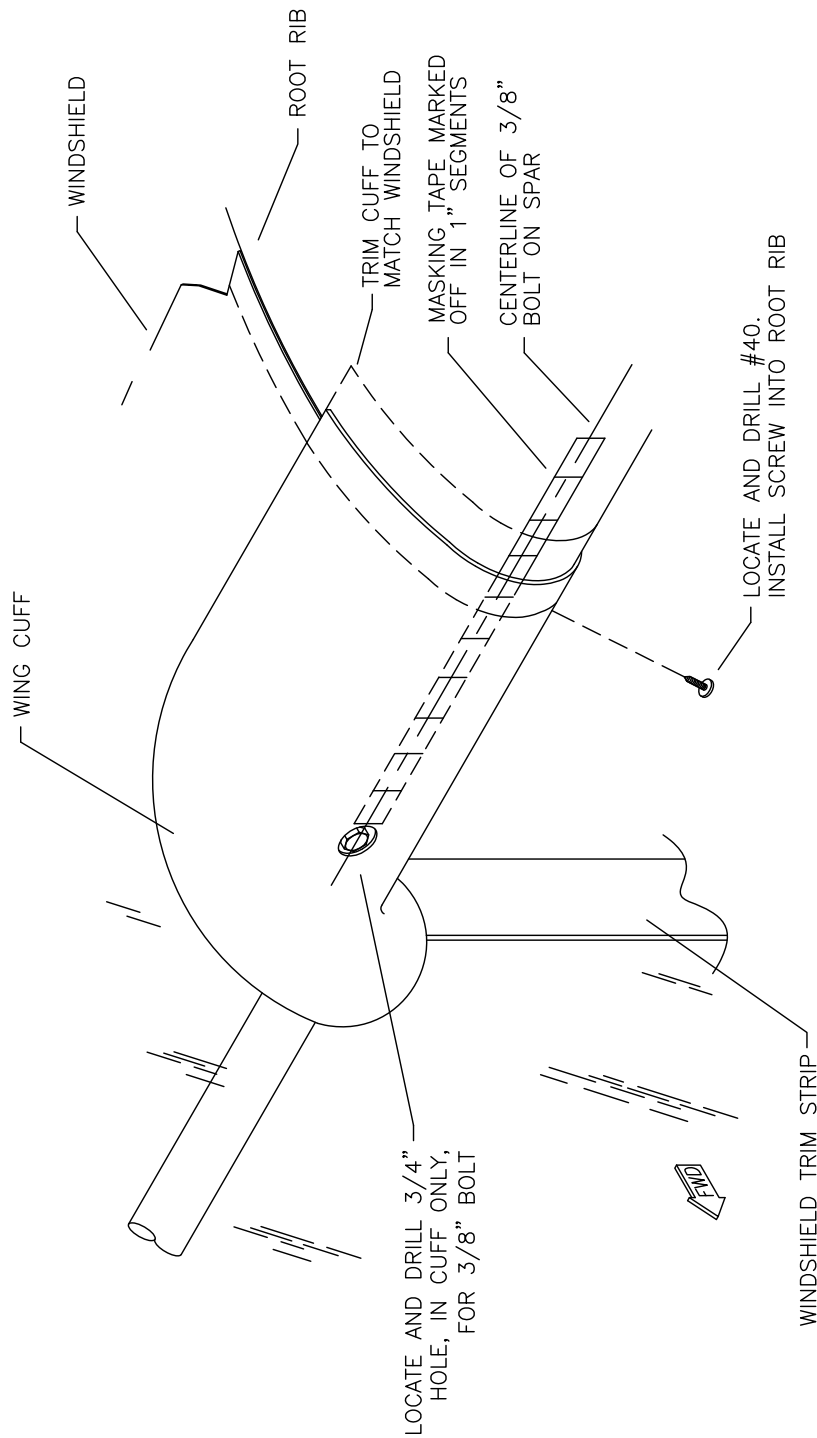
**RANS S-21 OUTBOUND
WINDSHIELD SIDE FIT-UP
FIGURE 10G-20**

09/11/2018



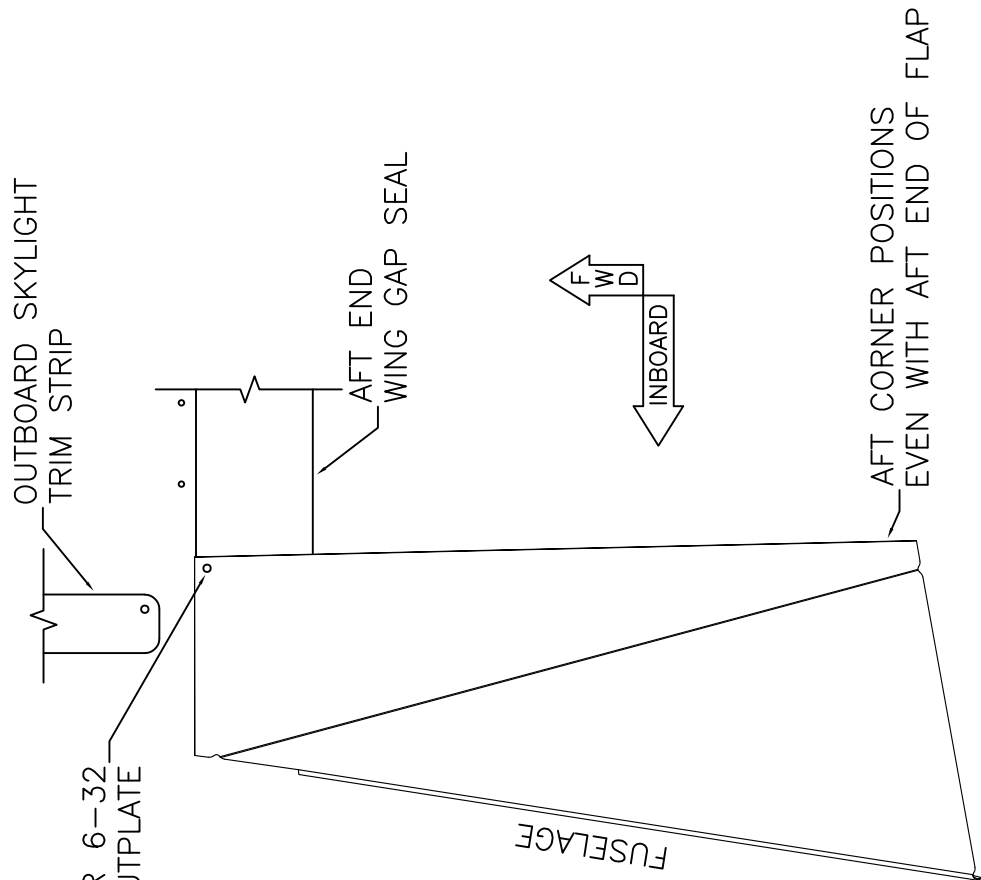
MD4408
REV. - ORIG

RRR S-21 OUTBOUND
WINDSHIELD HOLD DOWN STRIP DRILLING
FIGURE 10G-23



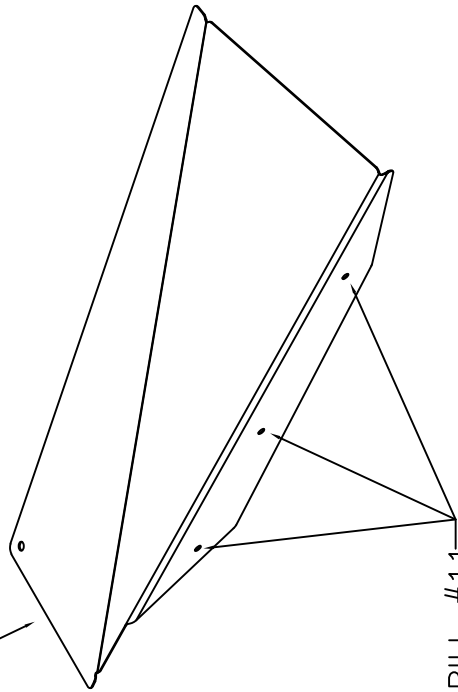
MD571
REV. - ORIG

**RRR S-21 OUTBOUND
WING CUFF INSTALLATION
FIGURE 10G-37**



LOCATE #20 HOLE FOR 6-32 PAN HEAD SCREW WITH NUTPLATE

FORWARD EDGE LAYS ON TOP OF SKYLIGHT

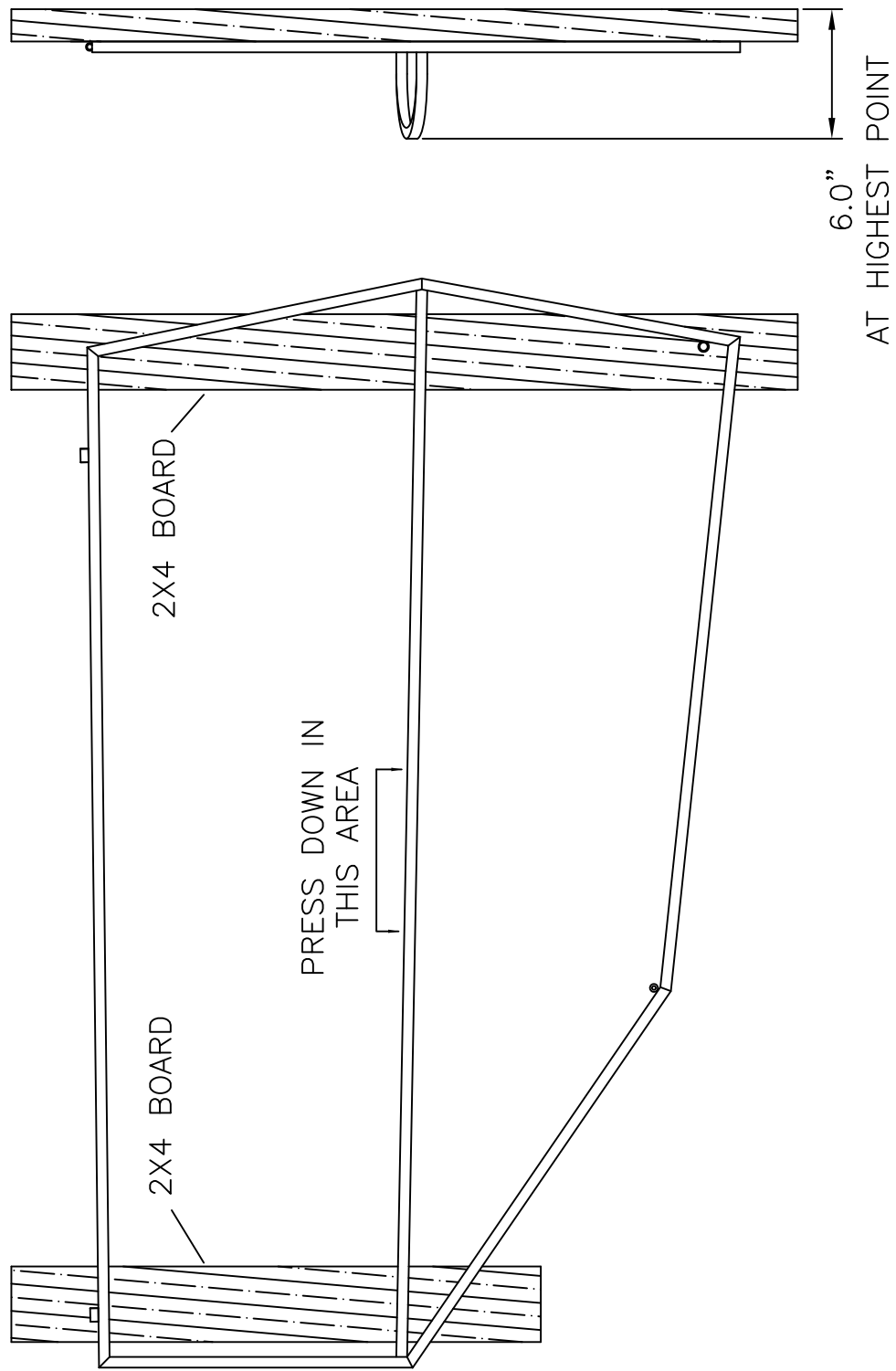


TRANSFER DRILL #11 WHEN SATISFIED WITH FIT TO FUSELAGE. INSTALL NUT PLATES TO FUSELAGE.

REFER TO 141 WING - ROOT SEAL INSTALLATION FOR PARTS LISTING

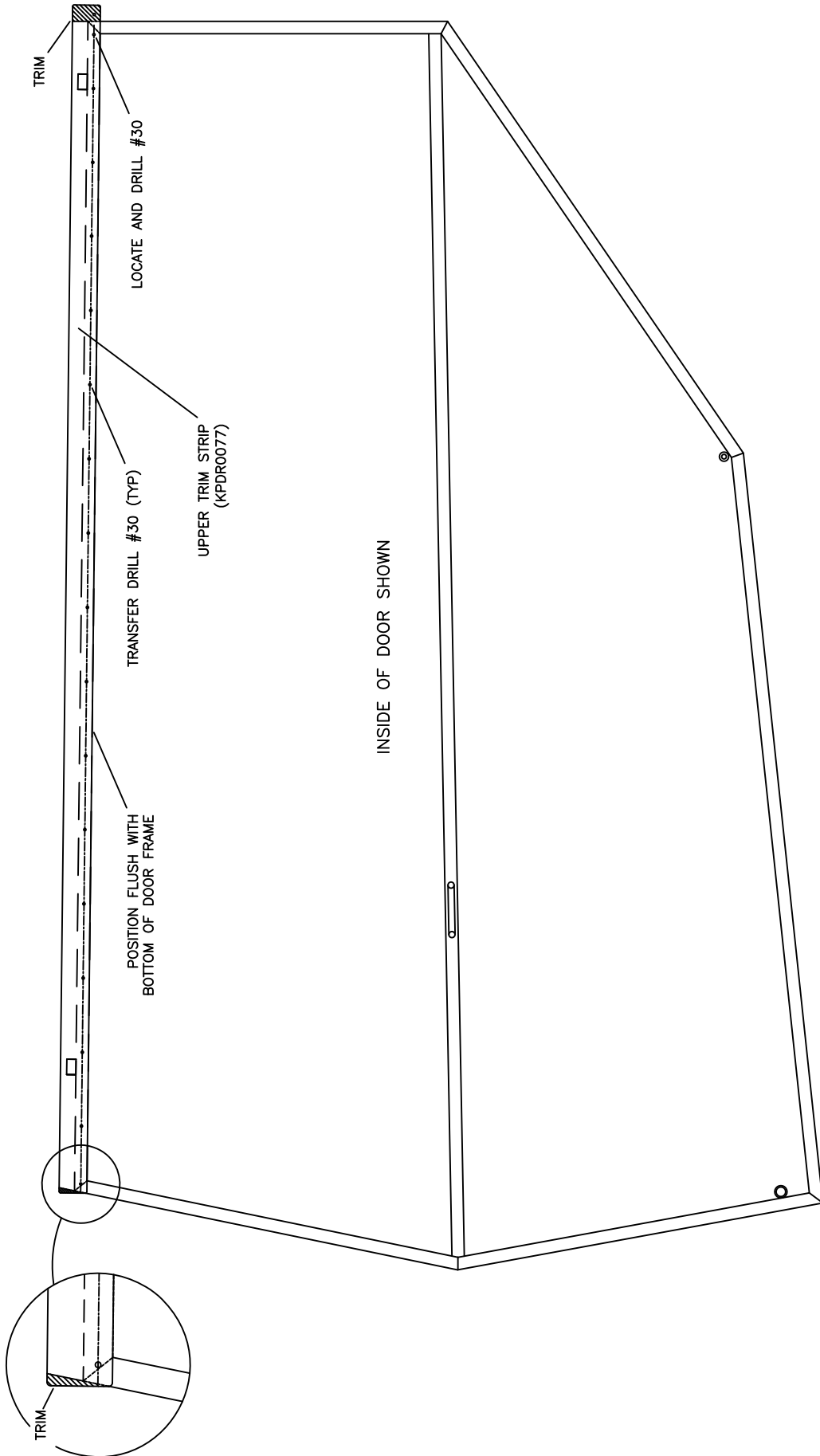
MD5083
REV. B

**RAMRO S-21 OUTBOUND
FLAP GAP SEAL MODIFICATION
FIGURE 10G-45**



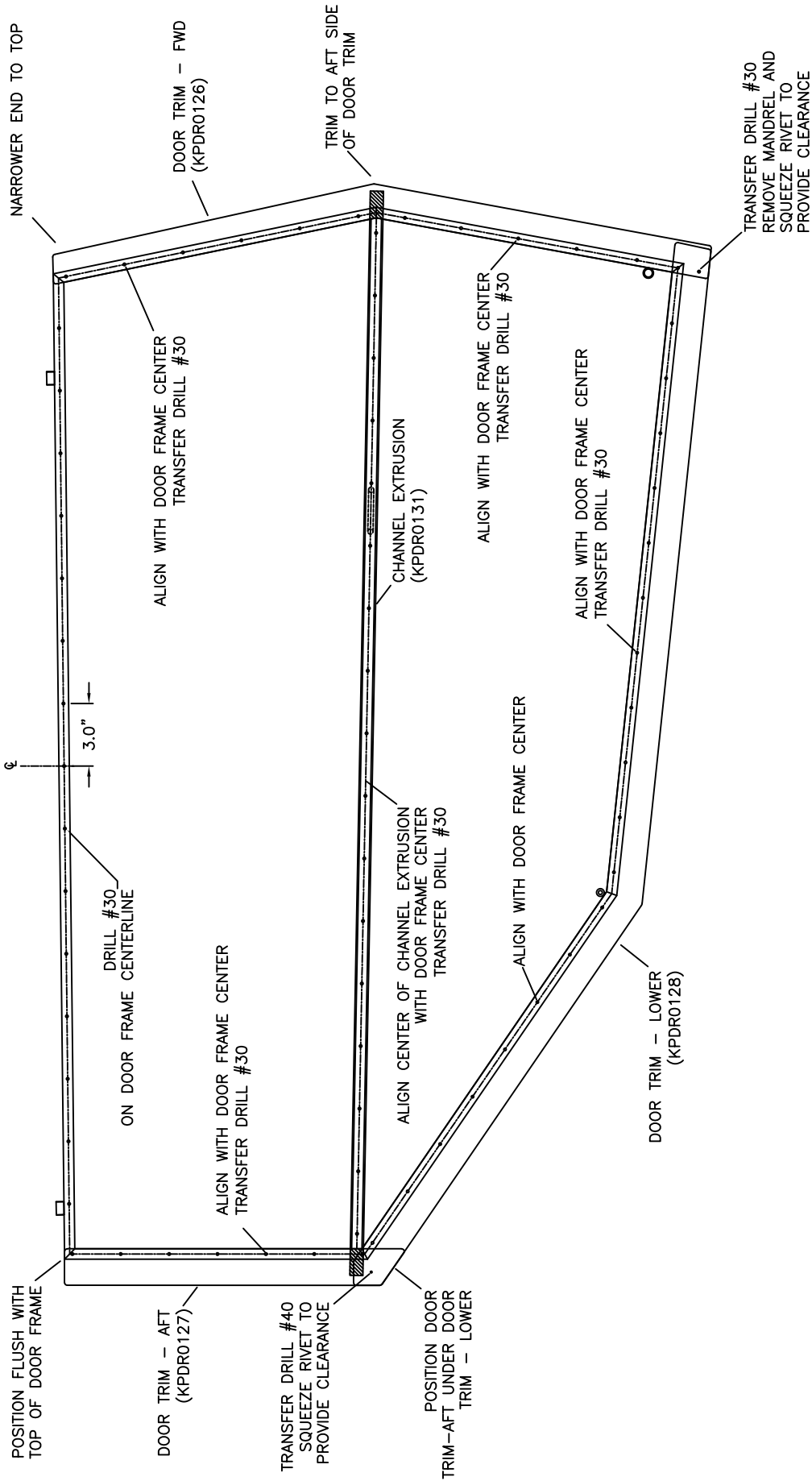
MD5621
REV. A

**RRR S-21 OUTBOUND
DOOR FRAME CHECK
FIGURE 10H-01**



MD5621
REV. A

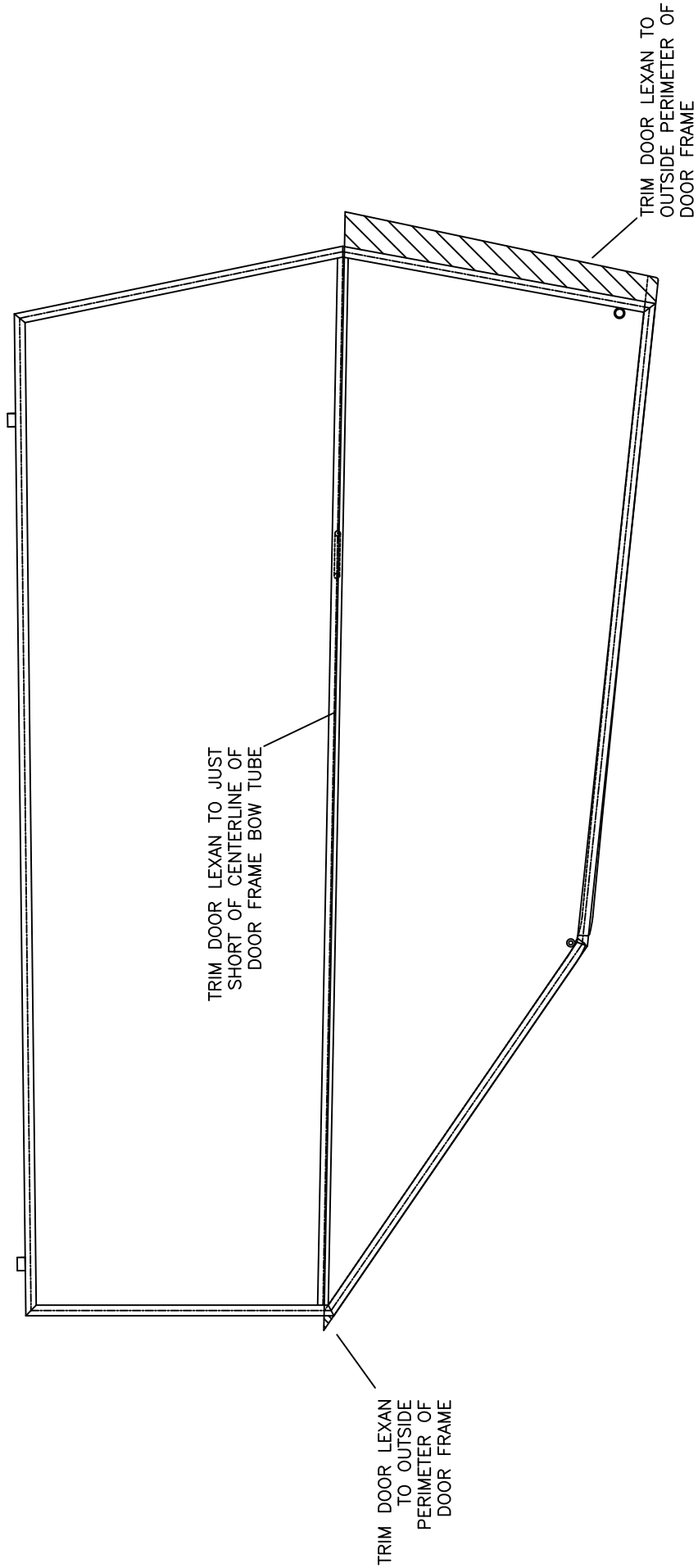
RAMPS S-21 OUTBOUND
UPPER TRIM STRIP MODIFICATION
FIGURE 10H-03



MD5621
REV. A

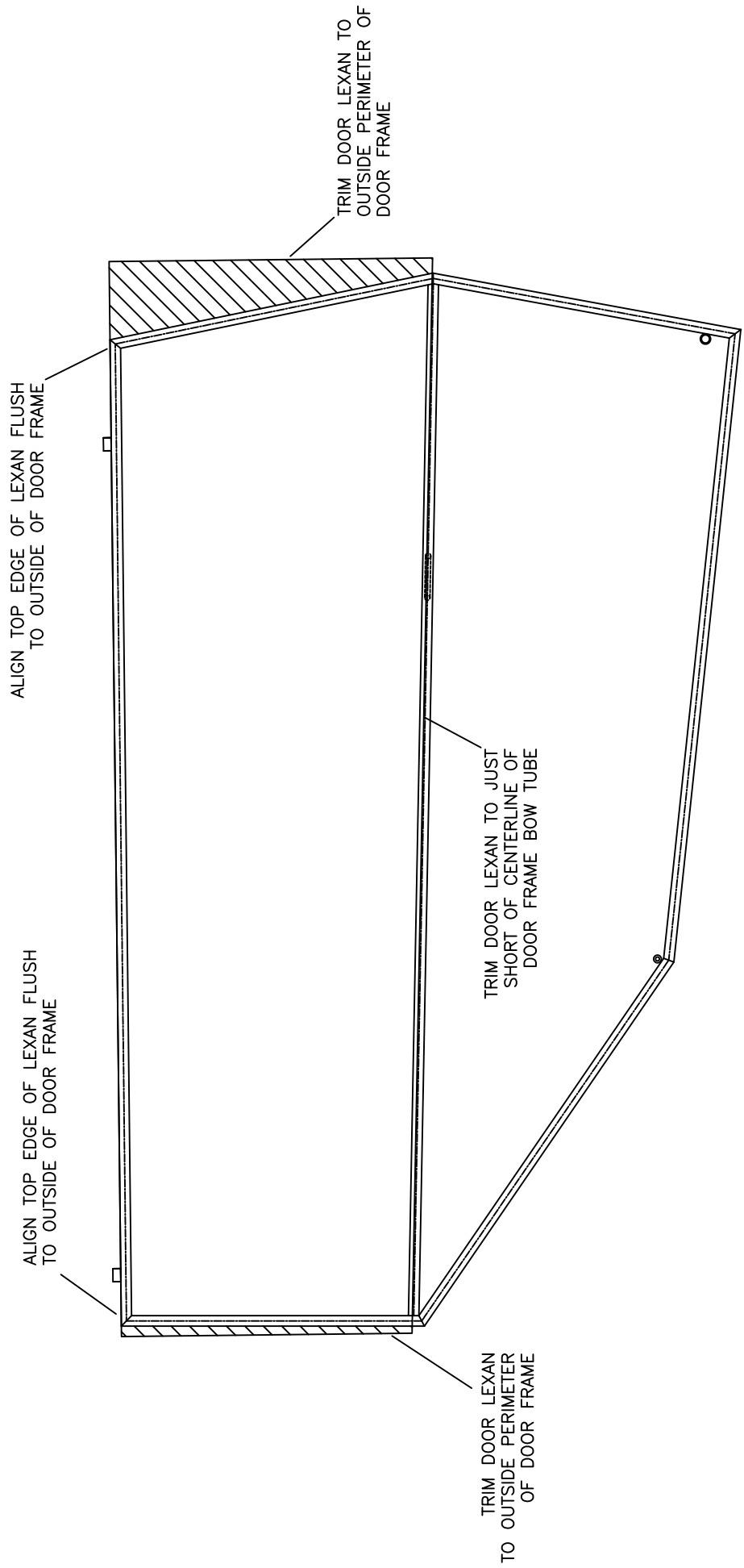
**RRR S-21 OUTBOUND
DOOR TRIM ASSEMBLY
FIGURE 10H-04**

09/11/2018



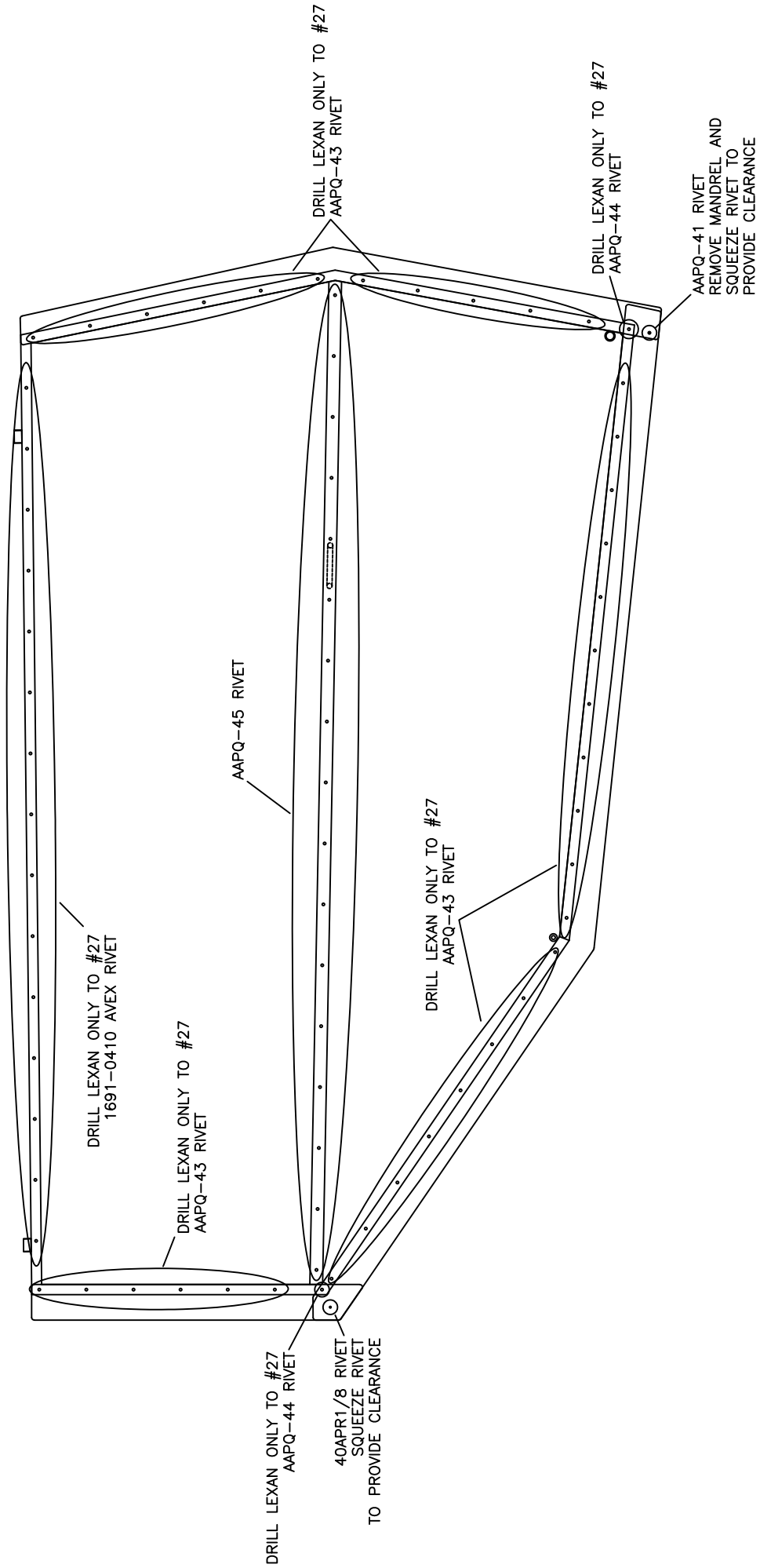
MD5621
REV. A

RAMBO S-21 OUTBOUND
LOWER DOOR LEXAN TRIMMING
FIGURE 10H-13



MD5621
REV. A

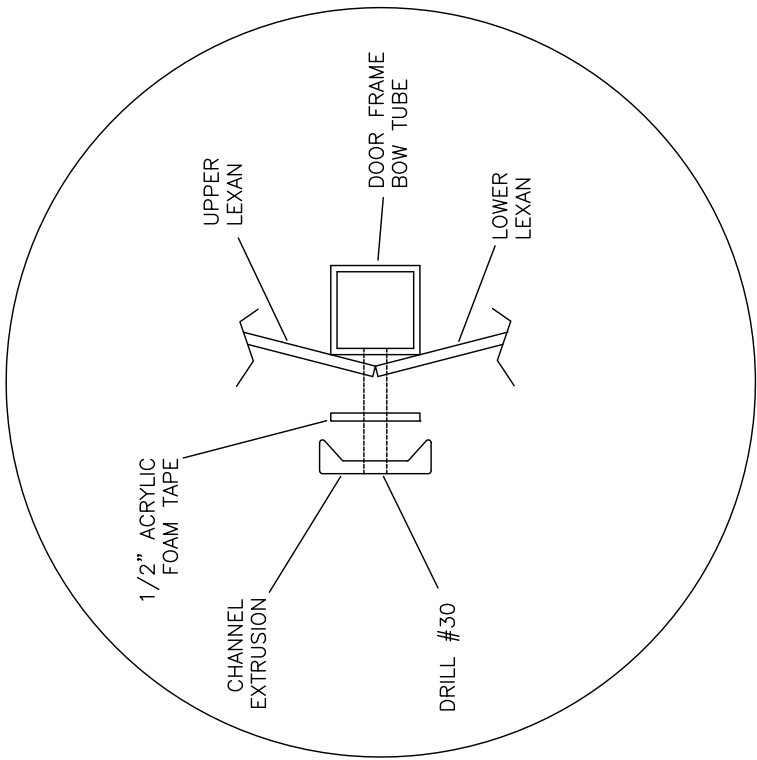
RAMBO S-21 OUTBOUND
UPPER DOOR LEXAN TRIMMING
FIGURE 10H-14



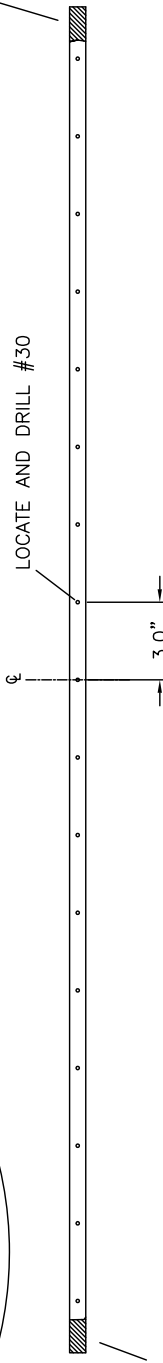
MD5621
REV. A

RRR S-21 OUTBOUND
DOOR RIVETING
FIGURE 10H-17

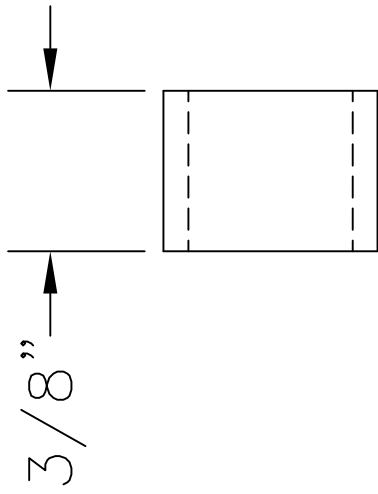
09/11/2018



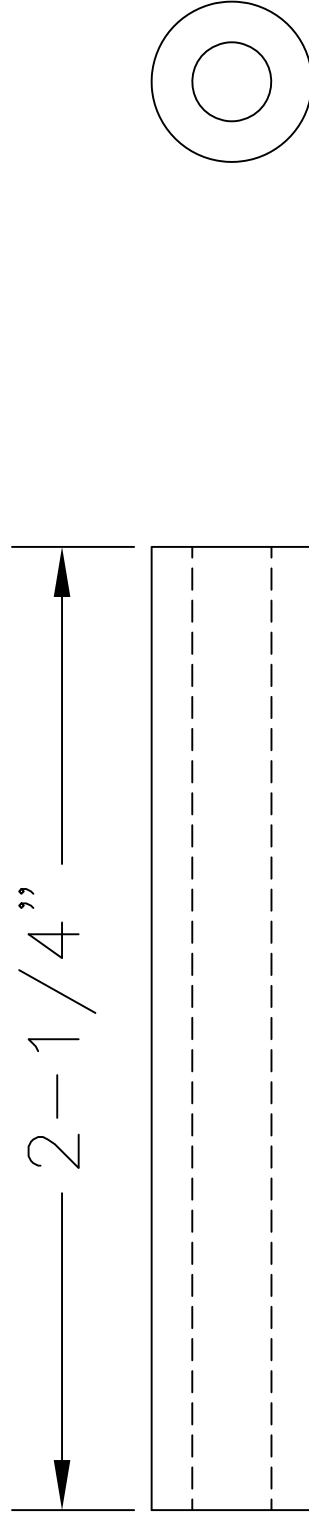
TRIM FWD EDGE TO MATCH
AFT EDGE OF DOOR TRIM



RAFANES S-21 OUTBOUND
CHANNEL EXTRUSION MODIFICATION
FIGURE 10H-18



DOOR SPACER BUSHING
 (FABRICATE 2 FROM KPAC0278)



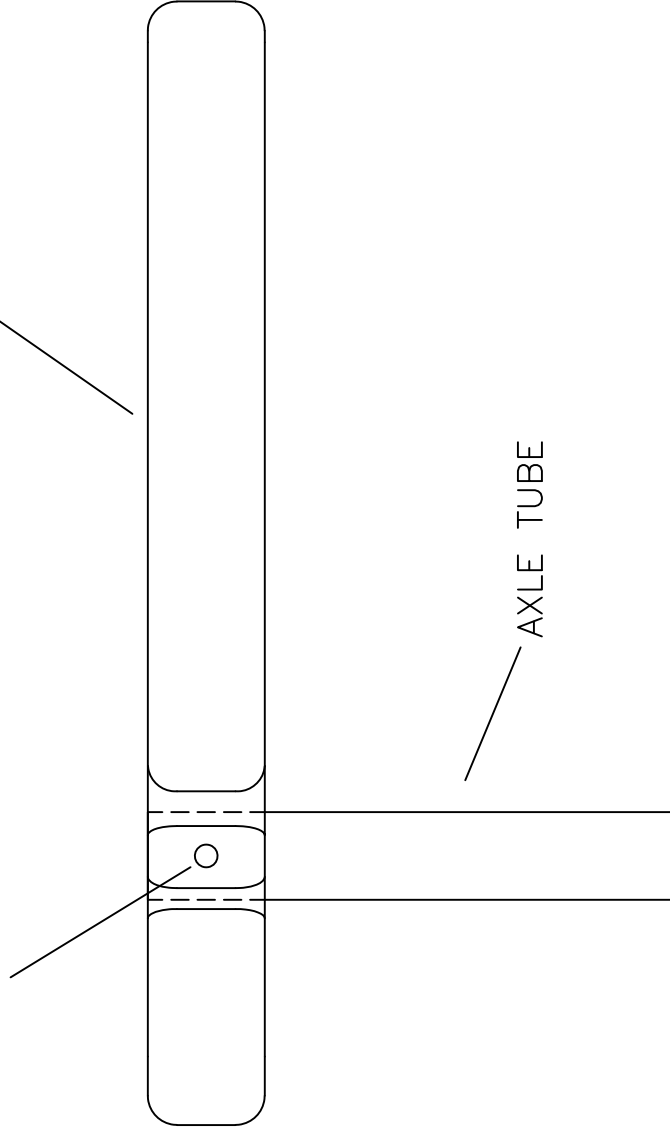
AXLE TUBE
 (FABRICATE 2 FROM KPST0132)

MD3650
 REV. A

RAMBO S-21 OUTBOUND
 DOOR SPACER BUSHING & AXLE TUBE FABRICATION
 FIGURE 10H-24

INSERT AXLE TUBE INTO INNER
DOOR HANDLE UNTIL FLUSH.
TRANSFER DRILL HANDLE #40 FROM
BOTH SIDES.
FINAL SIZE DRILL TO 1/8".
INSTALL ROLL PIN

INNER DOOR HANDLE

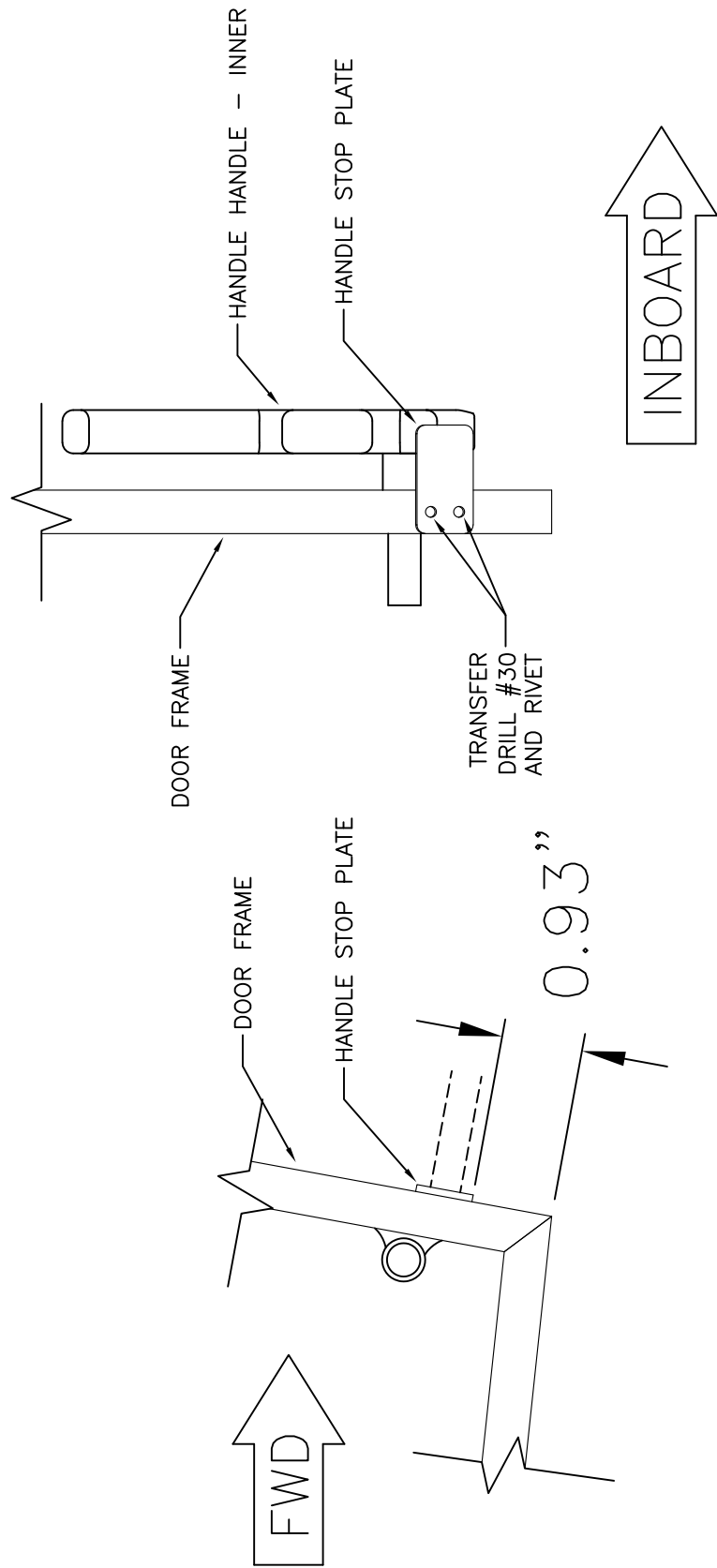


AXLE TUBE

MD4404
REV. - ORIG

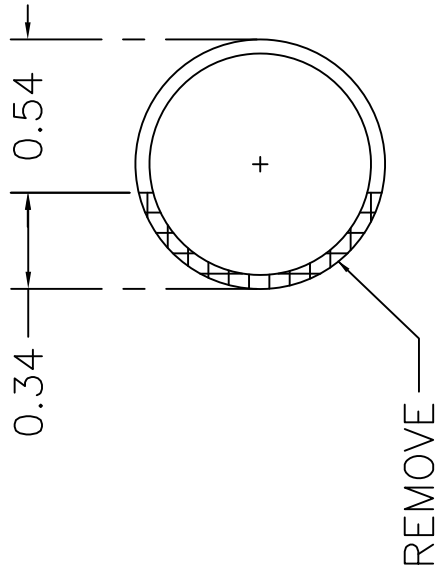
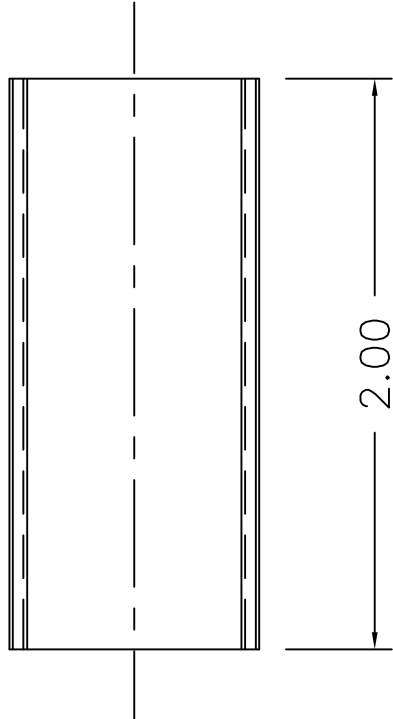
09/11/2018

RAMS S-21 OUTBOUND
INNER DOOR HANDLE DETAIL
FIGURE 10H-24A



MD5621
REV. B

RRR S-21 OUTBOUND
DOOR STOP PLATE LOCATION
FIGURE 10H-25



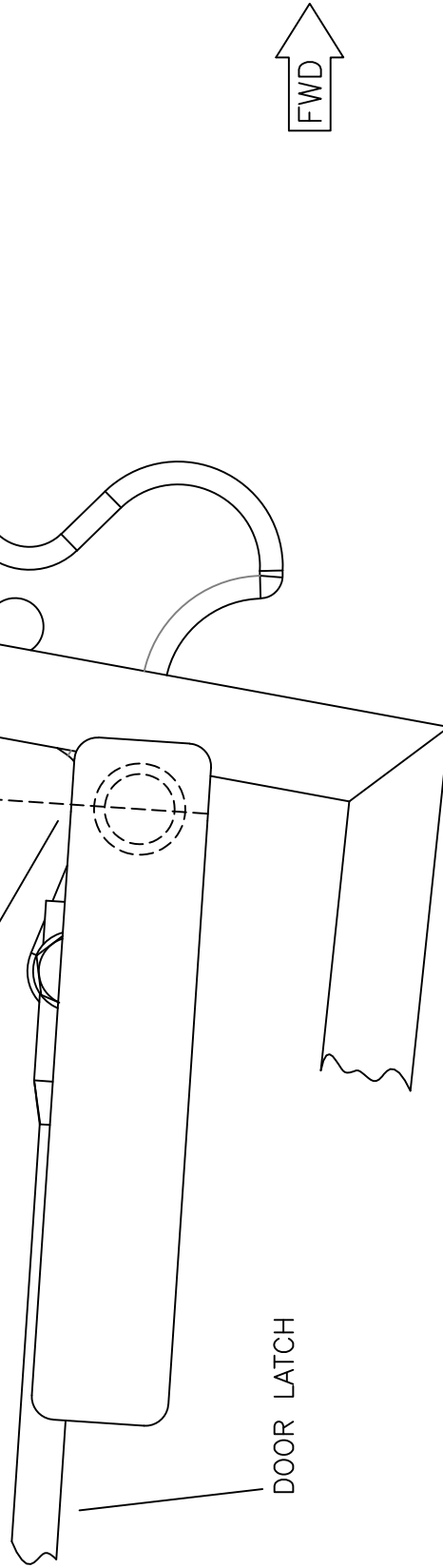
MD5621
REV. - ORIG

RAMS S-21 OUTBOUND
DOOR LATCH STRIKER PLATE MODIFICATION
FIGURE 10H-30

WITH INNER DOOR HANDLE IN "CLOSED" POSITION, ALIGN OUTER DOOR HANDLE WITH DOOR LATCH. MAKE SURE DOOR IS TIGHT AGAINST FRAME AND INNER HANDLE IS TIGHT AGAINST STRIKER PLATE.

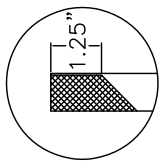
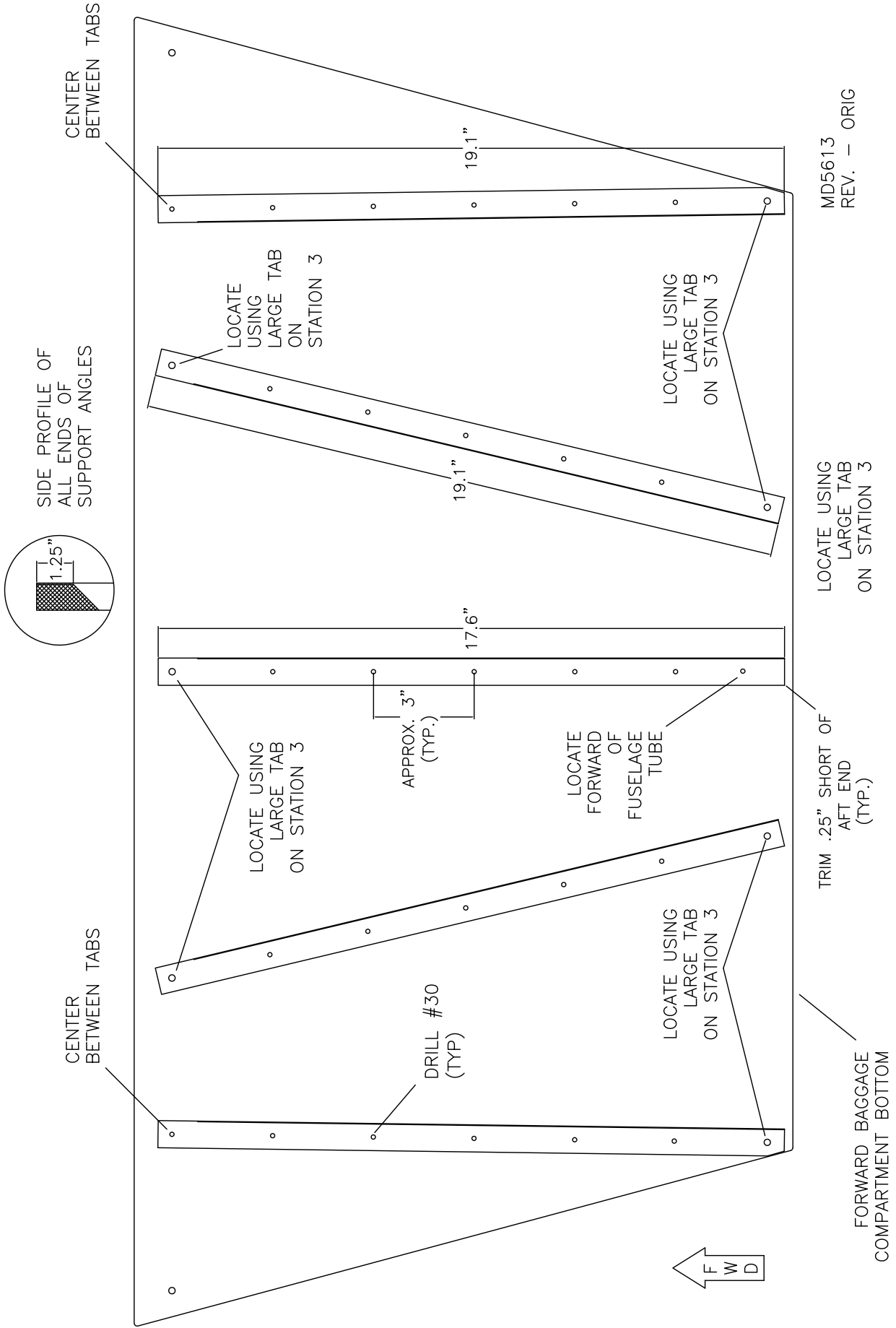
DRILL #40 THROUGH PRE-DRILLED TOP AND BOTTOM HOLES IN OUTER DOOR HANDLE.

FINAL SIZE DRILL TO 1/8".
INSTALL ROLL PIN.



MD4404
REV. A

RAMS S-21 OUTBOUND
OUTER DOOR HANDLE DETAIL
FIGURE 10H-32



SIDE PROFILE OF ALL ENDS OF SUPPORT ANGLES

CENTER BETWEEN TABS

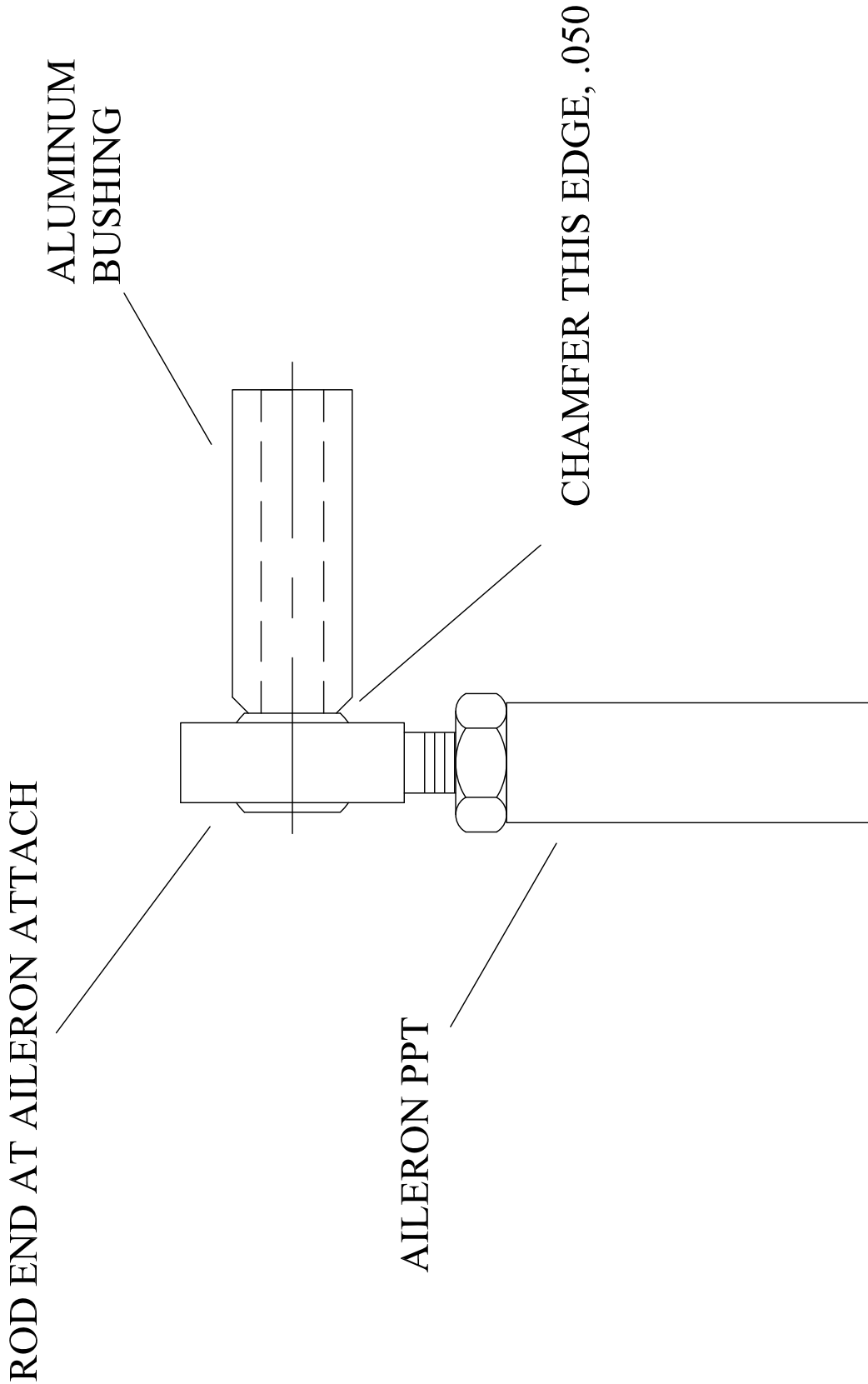
CENTER BETWEEN TABS

DRILL #30 (TYP)

APPROX. 3" (TYP.)

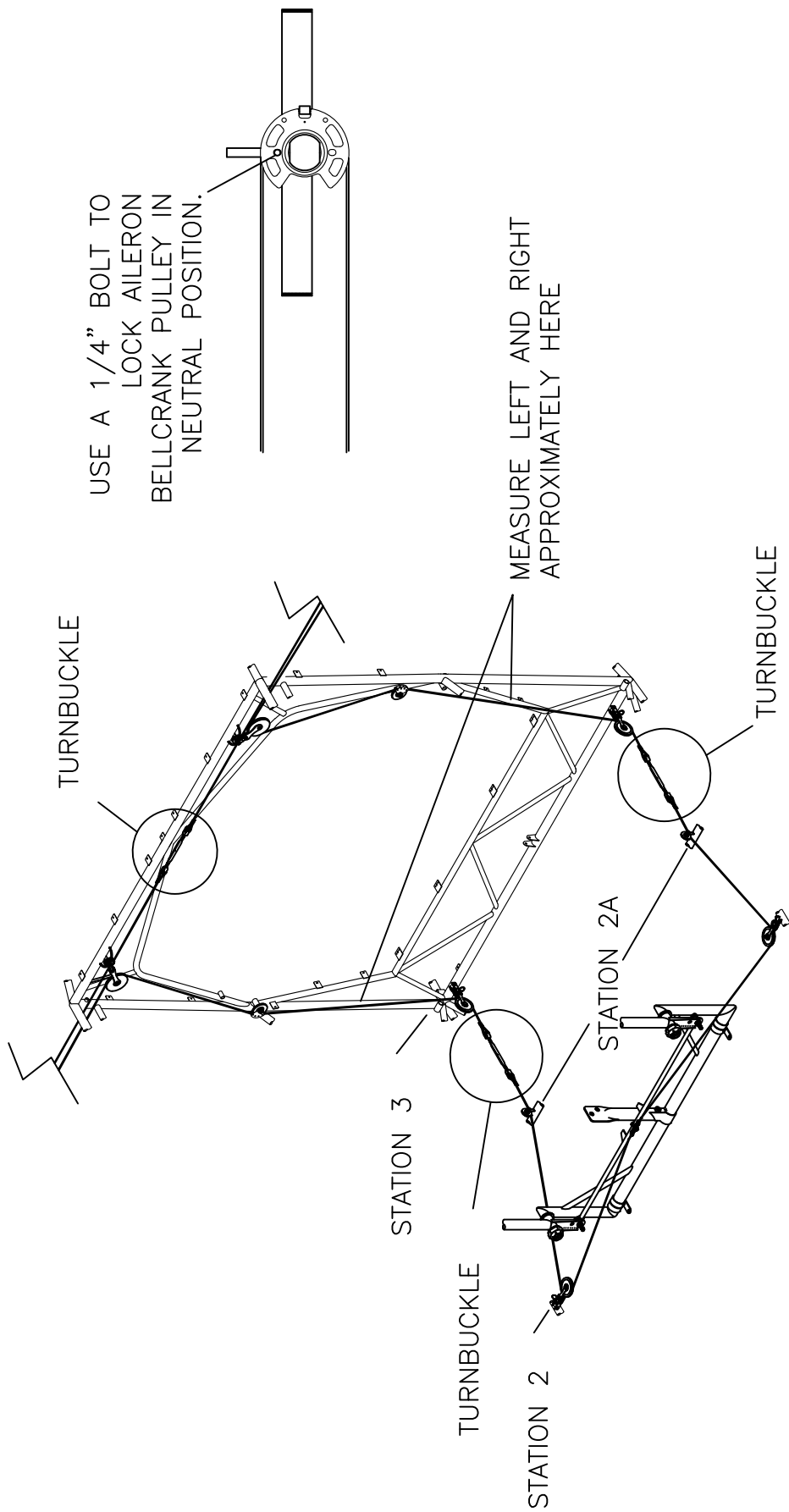
MD5613
REV. - ORIG

RRMS S-21 OUTBOUND
FORWARD BAGGAGE COMPARTMENT - BOTTOM
FIGURE 10I-03



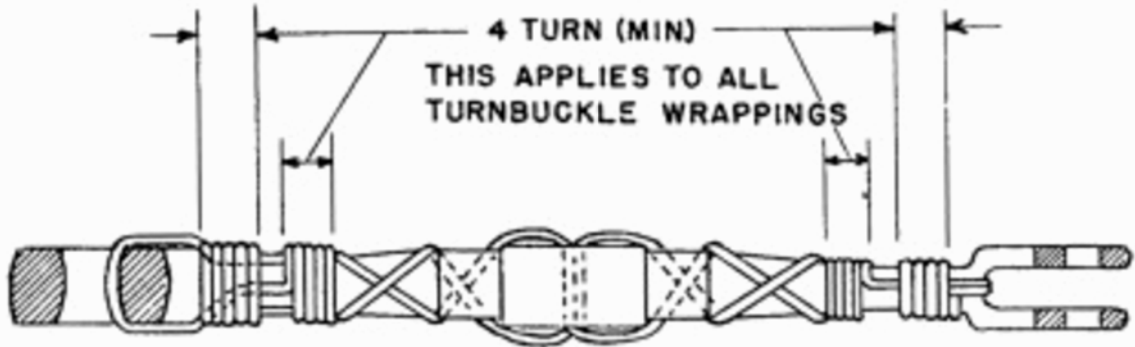
RRANES S-21 OUTBOUND
AILERON PPT BUSHING MODIFICATION
FIGURE 12A-03

CENTER FORWARD CONTROL STICK (AILERON NEUTRAL) AND FIX IN THIS POSITION.
 ADJUST AILERON CABLE LENGTH AND CABLE TENSION AND CHECK THAT BOTH AILERON
 BELL CRANKS ARE IN NEUTRAL POSITION (VISUAL INSPECTION) WITH STICK CENTERED.
 ADJUST CABLE TENSION TO 20-25 LB. - 0.0 + 5 LBS (2 PLS)

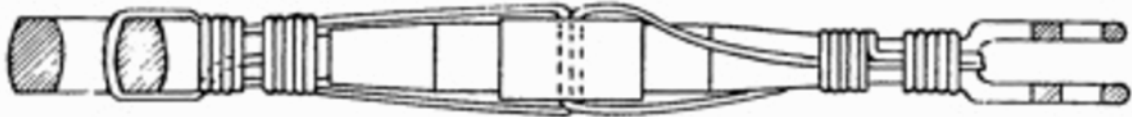


MD4427
 REV. - ORIG

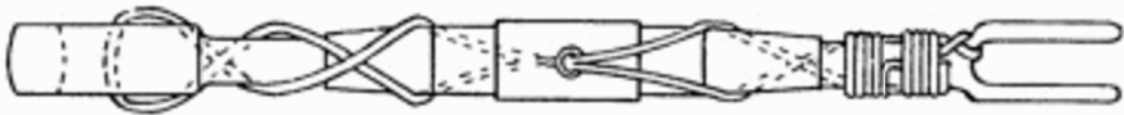
RAVEN S-21 OUTBOUND
 AILERON RIGGING
 FIGURE 12A-03A



(A) DOUBLE WRAP (SPIRAL)



(B) DOUBLE WRAP



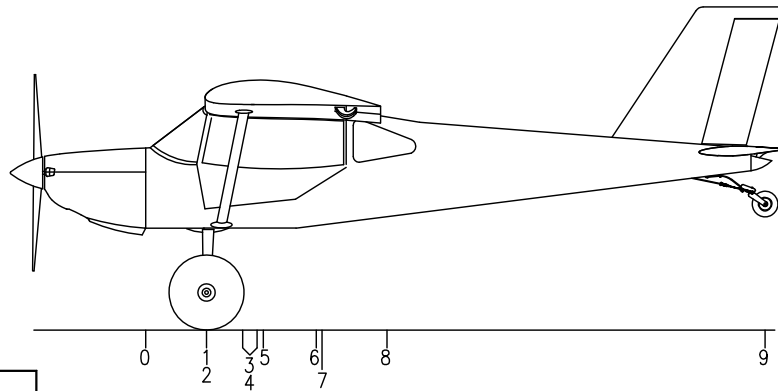
(C) SINGLE WRAP (SPIRAL)



(D) SINGLE WRAP

**RANS S-21 OUTBOUND
TURNBUCKLE SAFETY WIRE
FIGURE 12A-04**

MD4427
REV. - ORIG



N _____	
DATE WEIGHED	
ENGINE TYPE	ROTAX 912ULS
C.G. CONDITION	
EMPTY WEIGHT	lbs.
GROSS WT. ROTAX 912ULS	1320 lbs.
GROSS WT. TITAN X-340	1800 lbs.

RANS S-21 OUTBOUND (Taildragger)

ACCEPTABLE C.G. 31.72" TO 41.92" FROM DATUM 0.
 DATUM = FRONT OF FIREWALL; AIRCRAFT IN
 LEVEL ATTITUDE. (LEVEL REFERENCE 90° TO
 FUSELAGE AFT DOOR FRAME)

#	ITEM	WEIGHT	ARM	MOMENT
1	MAIN - RH	380	22.0"	8360
2	MAIN - LH	380	22.0"	8360
3	PILOT	200	37.0"	7400
4	PASSENGER	0	37.0	0
5	FUEL - WINGS	258	41.7"	10758.6
6	FUEL - HEADER TANK *	16.5	60.0"	990
7	BAGGAGE - FWD **	0	60.5"	0
8	BAGGAGE - AFT ***	0	84.5"	0
9	TAILWHEEL	83	210.0"	17430
TOTAL=		1317.5	TOTAL=	53298.6

range 34.5" to 39.5"
 range 34.5" to 39.5"
 MAX. 43 GALLON

$$\frac{\text{TOTAL MOMENTS}}{\text{TOTAL WEIGHT}} = \text{C.G.} \quad \frac{53298.6}{1317.5} = 40.45"$$

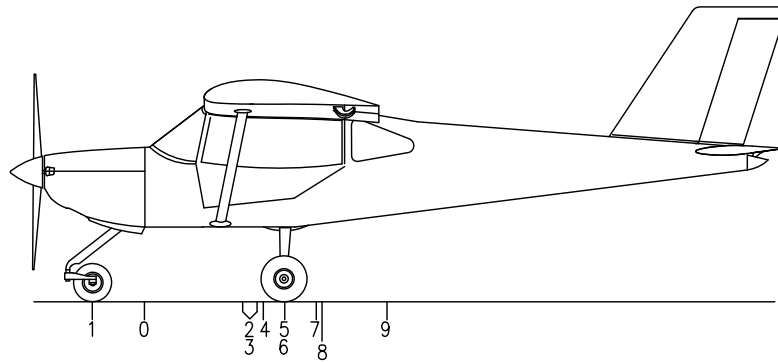
* ROTAX 912ULS - MAXIMUM 2.75 GALLON
 TITAN X-340 - MAXIMUM 6.9 GALLON

** ROTAX 912ULS - MAXIMUM OF 50 LBS IS ALLOWED FWD OF STATION 3.
 TITAN X-340 - MAXIMUM OF 113 LBS IS ALLOWED FWD OF STATION 3.

*** ROTAX 912ULS - MAXIMUM OF 30 LBS IS ALLOWED AFT OF STATION 3.
 TITAN X-340 - MAXIMUM OF 67 LBS IS ALLOWED AFT OF STATION 3.

**RANS S-21 OUTBOUND
 EXAMPLE - WEIGHT & BALANCE
 STANDARD RANS TAILWHEEL
 FIGURE 13-01**

MD5655
 REV. - ORIG



N _____	
DATE WEIGHED	
ENGINE TYPE	ROTAX 912ULS
C.G. CONDITION	
EMPTY WEIGHT	lbs.
GROSS WT. ROTAX 912ULS	1320 lbs.
GROSS WT. TITAN X-340	1800 lbs.

RANS S-21 OUTBOUND (Trike)

ACCEPTABLE C.G. 31.72" TO 41.92" FROM DATUM 0.
 DATUM = FRONT OF FIREWALL; AIRCRAFT IN
 LEVEL ATTITUDE. (LEVEL REFERENCE 90° TO
 FUSELAGE AFT DOOR FRAME)

#	ITEM	WEIGHT	ARM	MOMENT
1	NOSE WHEEL	120	-17"	-2040
2	PILOT	200	37"	7400
3	PASSENGER	0	37"	0
4	FUEL - WINGS	258	41.7"	10758.6
5	MAIN - RH	360	49.1"	17676
6	MAIN - LH	360	49.1"	17676
7	FUEL - HEADER TANK *	16.5	60.0"	990
8	BAGGAGE - FWD **	0	60.5"	0
9	BAGGAGE - AFT ***	0	84.5"	0
TOTAL=		1314.5	TOTAL=	52460.6

range 34.5" to 39.5"

range 34.5" to 39.5"

MAX. 4.3 GALLON

$$\frac{\text{TOTAL MOMENTS}}{\text{TOTAL WEIGHT}} = \text{C.G.}$$

$$\frac{52460.6}{1314.5} = 39.91"$$

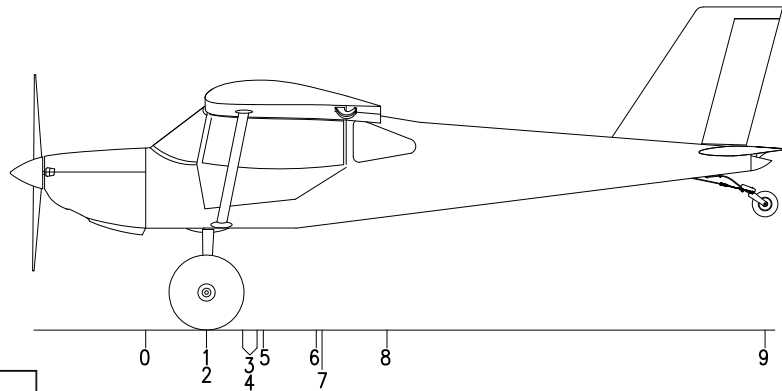
* ROTAX 912ULS - MAXIMUM 2.75 GALLON
 TITAN X-340 - MAXIMUM 6.9 GALLON

** ROTAX 912ULS - MAXIMUM OF 50 LBS IS ALLOWED FWD OF STATION 3.
 TITAN X-340 - MAXIMUM OF 113 LBS IS ALLOWED FWD OF STATION 3.

*** ROTAX 912ULS - MAXIMUM OF 30 LBS IS ALLOWED AFT OF STATION 3.
 TITAN X-340 - MAXIMUM OF 67 LBS IS ALLOWED AFT OF STATION 3.

RANS S-21 OUTBOUND
 EXAMPLE - WEIGHT & BALANCE
 TRIKE
 FIGURE 13-01A

MD5655
 REV. - ORIG



N _____	
DATE WEIGHED	
ENGINE TYPE	
C.G. CONDITION	
EMPTY WEIGHT	lbs.
GROSS WT. ROTAX 912ULS	1320 lbs.
GROSS WT. TITAN X-340	1800 lbs.

RANS S-21 OUTBOUND (Taildragger)

ACCEPTABLE C.G. 31.72" TO 41.92" FROM DATUM 0.
 DATUM = FRONT OF FIREWALL; AIRCRAFT IN
 LEVEL ATTITUDE. (LEVEL REFERENCE 90° TO
 FUSELAGE AFT DOOR FRAME)

#	ITEM	WEIGHT	ARM	MOMENT
1	MAIN - RH		22.0"	
2	MAIN - LH		22.0"	
3	PILOT		37.0"	
4	PASSENGER		37.0	
5	FUEL - WINGS		41.7"	
6	FUEL - HEADER TANK *		60.0"	
7	BAGGAGE - FWD **		60.5"	
8	BAGGAGE - AFT ***		84.5"	
9	TAILWHEEL		210.0"	
TOTAL=			TOTAL=	

range 34.5" to 39.5"
 range 34.5" to 39.5"
 MAX. 43 GALLON

$$\frac{\text{TOTAL MOMENTS}}{\text{TOTAL WEIGHT}} = \text{C.G.} \quad \text{_____} =$$

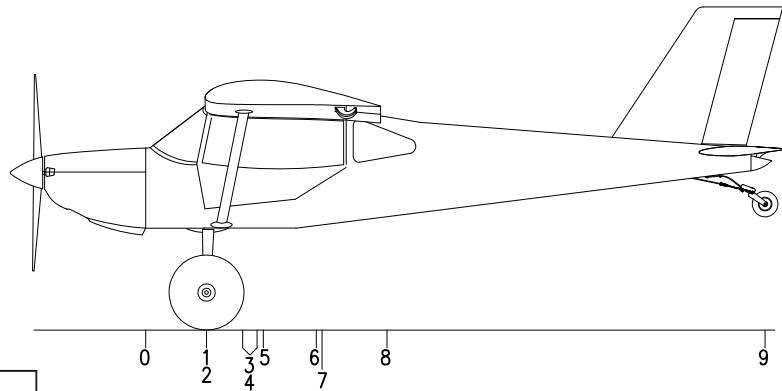
* ROTAX 912ULS - MAXIMUM 2.75 GALLON
 TITAN X-340 - MAXIMUM 6.9 GALLON

** ROTAX 912ULS - MAXIMUM OF 50 LBS IS ALLOWED FWD OF STATION 3.
 TITAN X-340 - MAXIMUM OF 113 LBS IS ALLOWED FWD OF STATION 3.

*** ROTAX 912ULS - MAXIMUM OF 30 LBS IS ALLOWED AFT OF STATION 3.
 TITAN X-340 - MAXIMUM OF 67 LBS IS ALLOWED AFT OF STATION 3.

**RANS S-21 OUTBOUND
 WEIGHT & BALANCE
 STANDARD RANS TAILWHEEL
 FIGURE 13-02**

MD5655
 REV. - ORIG



N _____	
DATE WEIGHED	
ENGINE TYPE	
C.G. CONDITION	
EMPTY WEIGHT	lbs.
GROSS WT. ROTAX 912ULS	1320 lbs.
GROSS WT. TITAN X-340	1800 lbs.

RANS S-21 OUTBOUND (Taildragger)

ACCEPTABLE C.G. 31.72" TO 41.92" FROM DATUM 0.
 DATUM = FRONT OF FIREWALL; AIRCRAFT IN
 LEVEL ATTITUDE. (LEVEL REFERENCE 90° TO
 FUSELAGE AFT DOOR FRAME)

#	ITEM	WEIGHT	ARM	MOMENT
1	MAIN - RH		22.0"	
2	MAIN - LH		22.0"	
3	PILOT		37.0"	
4	PASSENGER		37.0	
5	FUEL - WINGS		41.7"	
6	FUEL - HEADER TANK *		60.0"	
7	BAGGAGE - FWD **		60.5"	
8	BAGGAGE - AFT ***		84.5"	
9	TAILWHEEL		210.4"	
TOTAL=			TOTAL=	

range 34.5" to 39.5"
 range 34.5" to 39.5"
 MAX. 43 GALLON

$$\frac{\text{TOTAL MOMENTS}}{\text{TOTAL WEIGHT}} = \text{C.G.} \quad \text{_____} =$$

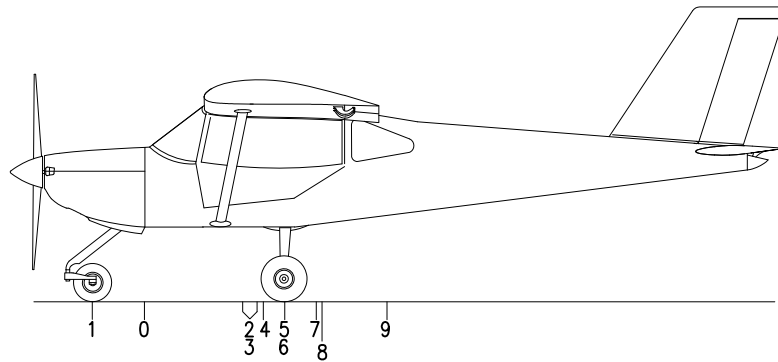
* ROTAX 912ULS - MAXIMUM 2.75 GALLON
 TITAN X-340 - MAXIMUM 6.9 GALLON

** ROTAX 912ULS - MAXIMUM OF 50 LBS IS ALLOWED FWD OF STATION 3.
 TITAN X-340 - MAXIMUM OF 113 LBS IS ALLOWED FWD OF STATION 3.

*** ROTAX 912ULS - MAXIMUM OF 30 LBS IS ALLOWED AFT OF STATION 3.
 TITAN X-340 - MAXIMUM OF 67 LBS IS ALLOWED AFT OF STATION 3.

**RANS S-21 OUTBOUND
 WEIGHT & BALANCE
 OPTIONAL 10" TAILWHEEL
 FIGURE 13-02A**

MD5655
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N _____	
DATE WEIGHED	
ENGINE TYPE	
C.G. CONDITION	
EMPTY WEIGHT	lbs.
GROSS WT. ROTAX 912ULS	1320 lbs.
GROSS WT. TITAN X-340	1800 lbs.

RANS S-21 OUTBOUND (Trike)

ACCEPTABLE C.G. 31.72" TO 41.92" FROM DATUM 0.
 DATUM = FRONT OF FIREWALL; AIRCRAFT IN
 LEVEL ATTITUDE. (LEVEL REFERENCE 90° TO
 FUSELAGE AFT DOOR FRAME)

#	ITEM	WEIGHT	ARM	MOMENT
1	NOSE WHEEL		-17"	
2	PILOT		37"	
3	PASSENGER		37"	
4	FUEL - WINGS		41.7"	
5	MAIN - RH		49.1"	
6	MAIN - LH		49.1"	
7	FUEL - HEADER TANK *		60.0"	
8	BAGGAGE - FWD **		60.5"	
9	BAGGAGE - AFT ***		84.5"	
TOTAL=			TOTAL=	

range 34.5" to 39.5"
 range 34.5" to 39.5"
 MAX. 43 GALLON

$$\frac{\text{TOTAL MOMENTS}}{\text{TOTAL WEIGHT}} = \text{C.G.} \quad \text{_____} =$$

* ROTAX 912ULS - MAXIMUM 2.75 GALLON
 TITAN X-340 - MAXIMUM 6.9 GALLON

** ROTAX 912ULS - MAXIMUM OF 50 LBS IS ALLOWED FWD OF STATION 3.
 TITAN X-340 - MAXIMUM OF 113 LBS IS ALLOWED FWD OF STATION 3.

*** ROTAX 912ULS - MAXIMUM OF 30 LBS IS ALLOWED AFT OF STATION 3.
 TITAN X-340 - MAXIMUM OF 67 LBS IS ALLOWED AFT OF STATION 3.

**RANS S-21 OUTBOUND
 WEIGHT & BALANCE
 TRIKE
 FIGURE 13-03**

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SAMPLE WEIGHT AND BALANCE RECORD

(CONTINUOUS HISTORY OF CHANGES IN STRUCTURE OR EQUIPMENT AFFECTING WEIGHT AND BALANCE)

N NUMBER:		AIRCRAFT SERIAL NUMBER:					PAGE NUMBER:			
DATE	DESCRIPTION OF ARTICLE OR MODIFICATION	WEIGHT CHANGE						RUNNING BASIC EMPTY WEIGHT		
		ADDED (+)			REMOVED (-)					
		WEIGHT	ARM	MOMENT	WEIGHT	ARM	MOMENT			
	AS BUILT									

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RAMRO S-21 OUTBOUND WEIGHT & BALANCE RECORD FIGURE 13-04