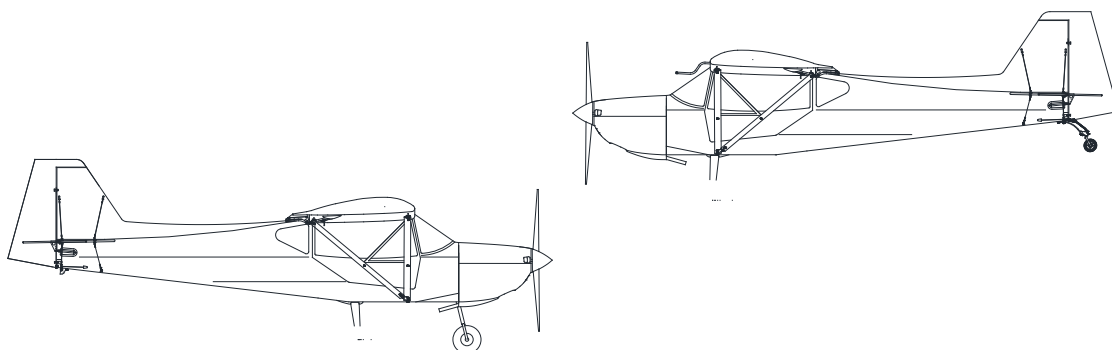




RANS

S-20 RAVEN

FIGURES MANUAL



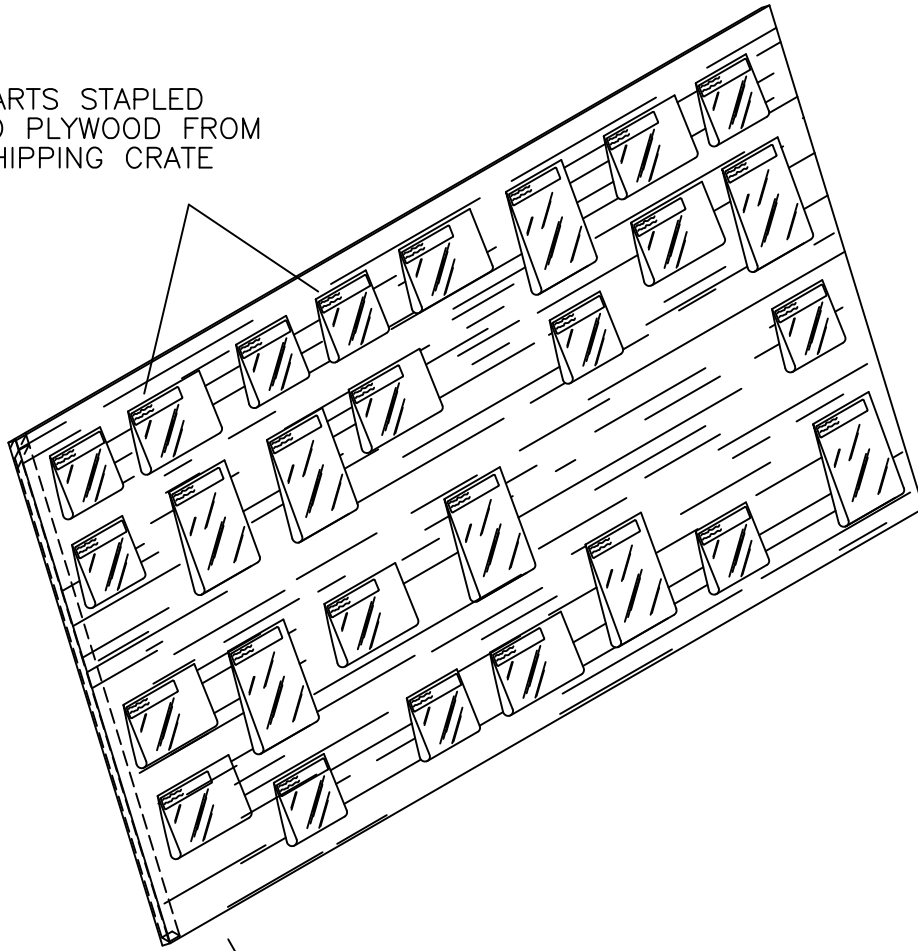
Serial Number:

Registration Number:

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4600 HWY 183 Alt
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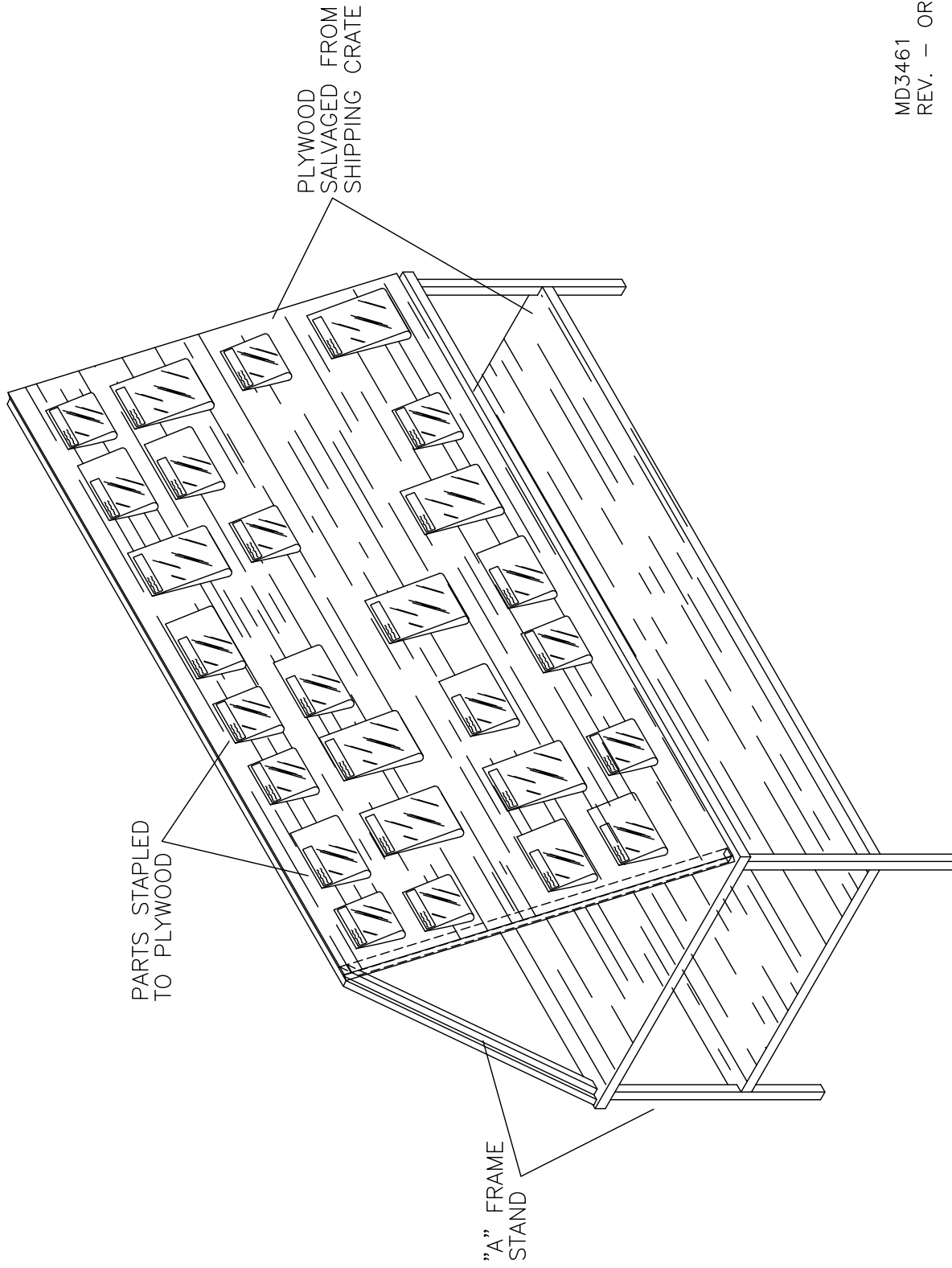
PARTS STAPLED
TO PLYWOOD FROM
SHIPPING CRATE



NAIL BOARD TO
SHOP WALL

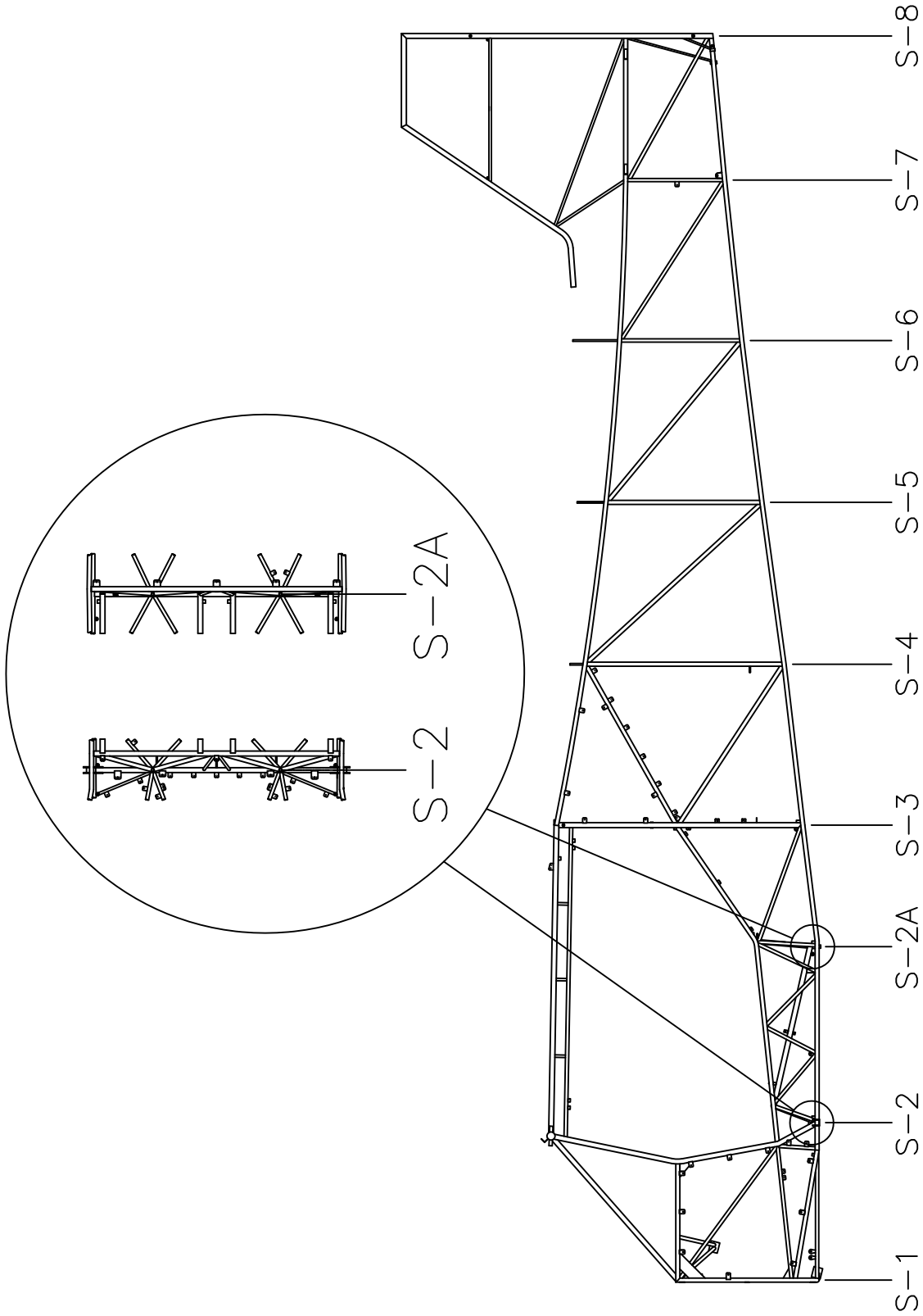
MD4363

RANS S-20 RAVEN
PARTS ORGANIZATION
FIGURE 00-01

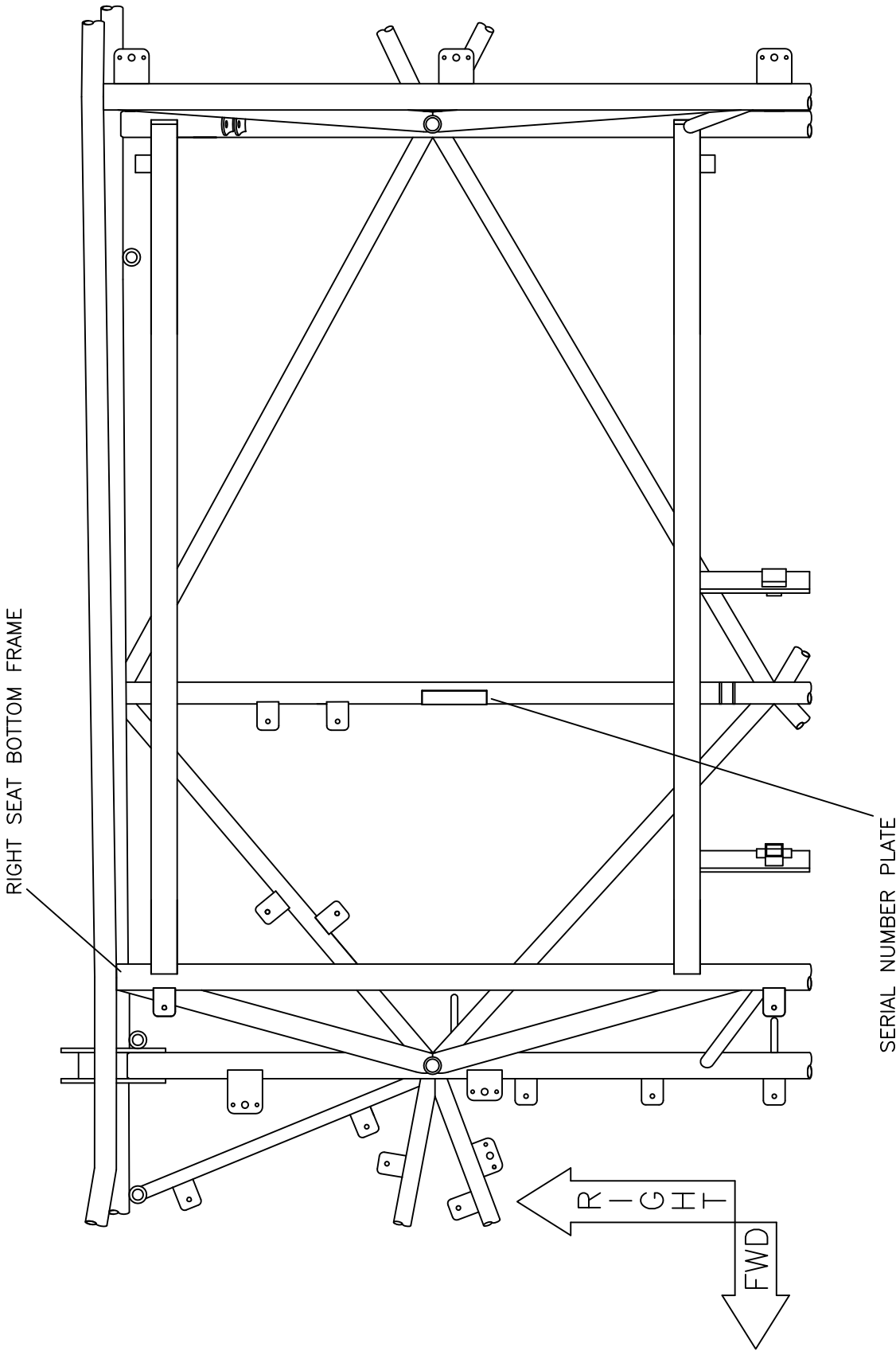


MD3461
 REV. - ORIG

RAMS S-20 RAVEN
 PARTS INVENTORY "A" FRAME
 FIGURE 00-01A

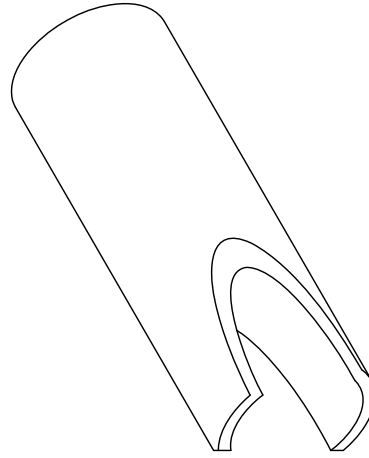
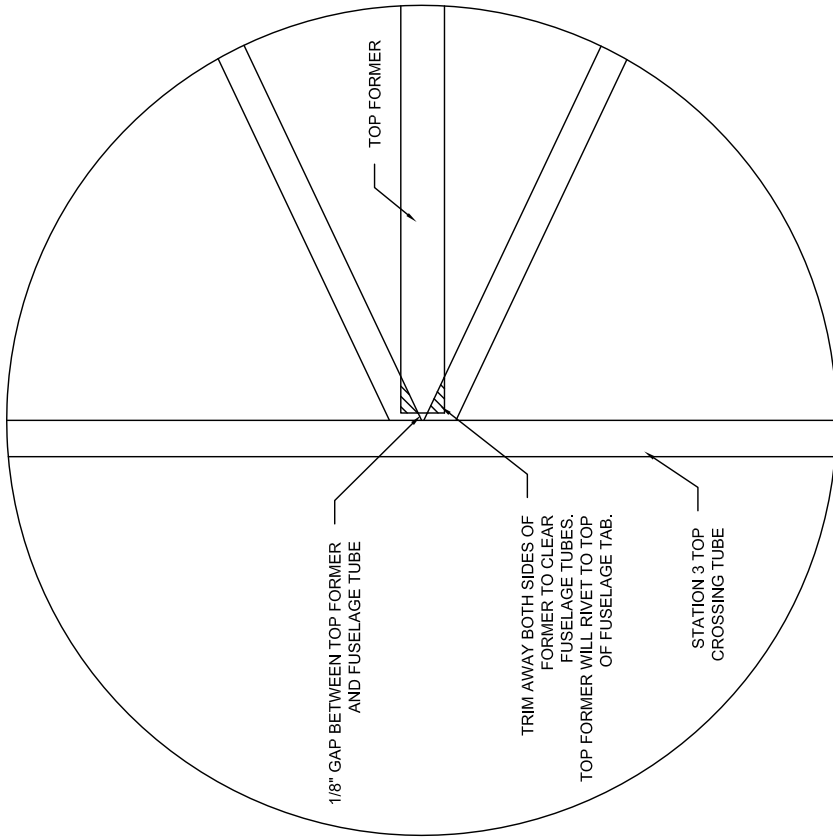


RAM S-20 RAVEN MD5601
 FUSELAGE STATION IDENTIFICATION
 FIGURE 00-02



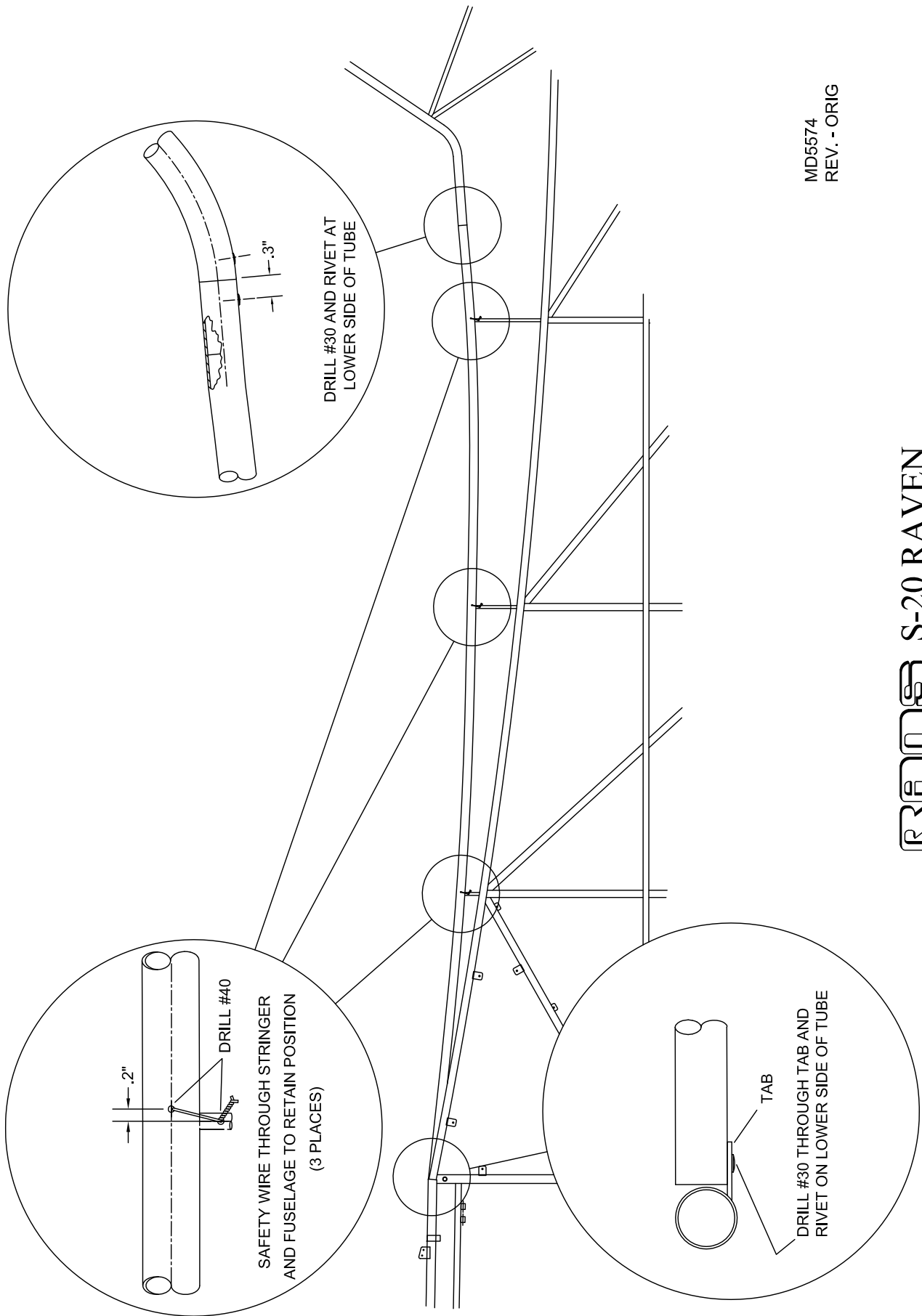
MD5602

RAVEN S-20 RAVEN
SERIAL NUMBER PLATE LOCATION
FIGURE 00-03



MD5574
REV. - ORIG

RAVEN S-20 RAVEN
TOP FORMER MODIFICATION
FIGURE 01-01

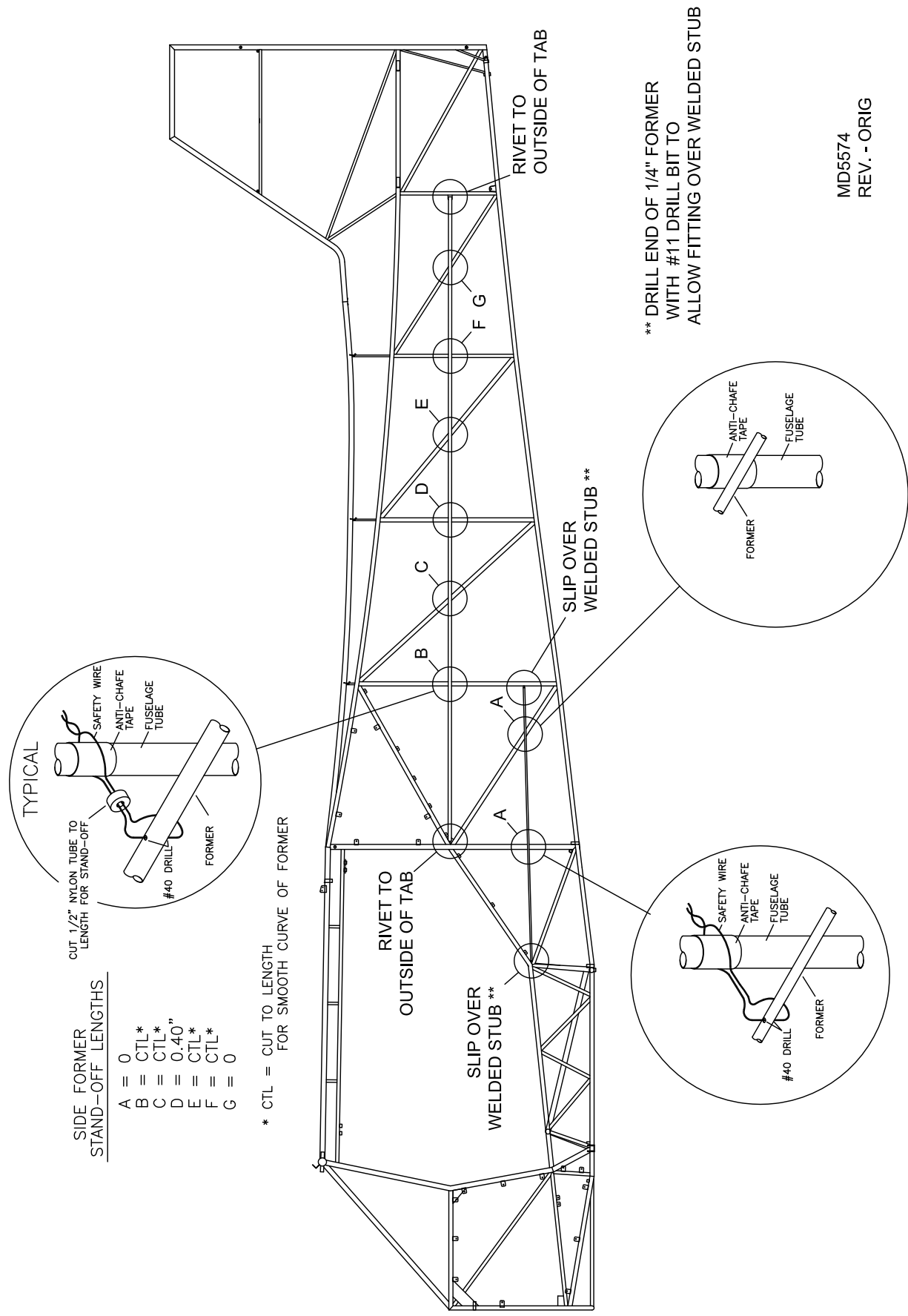


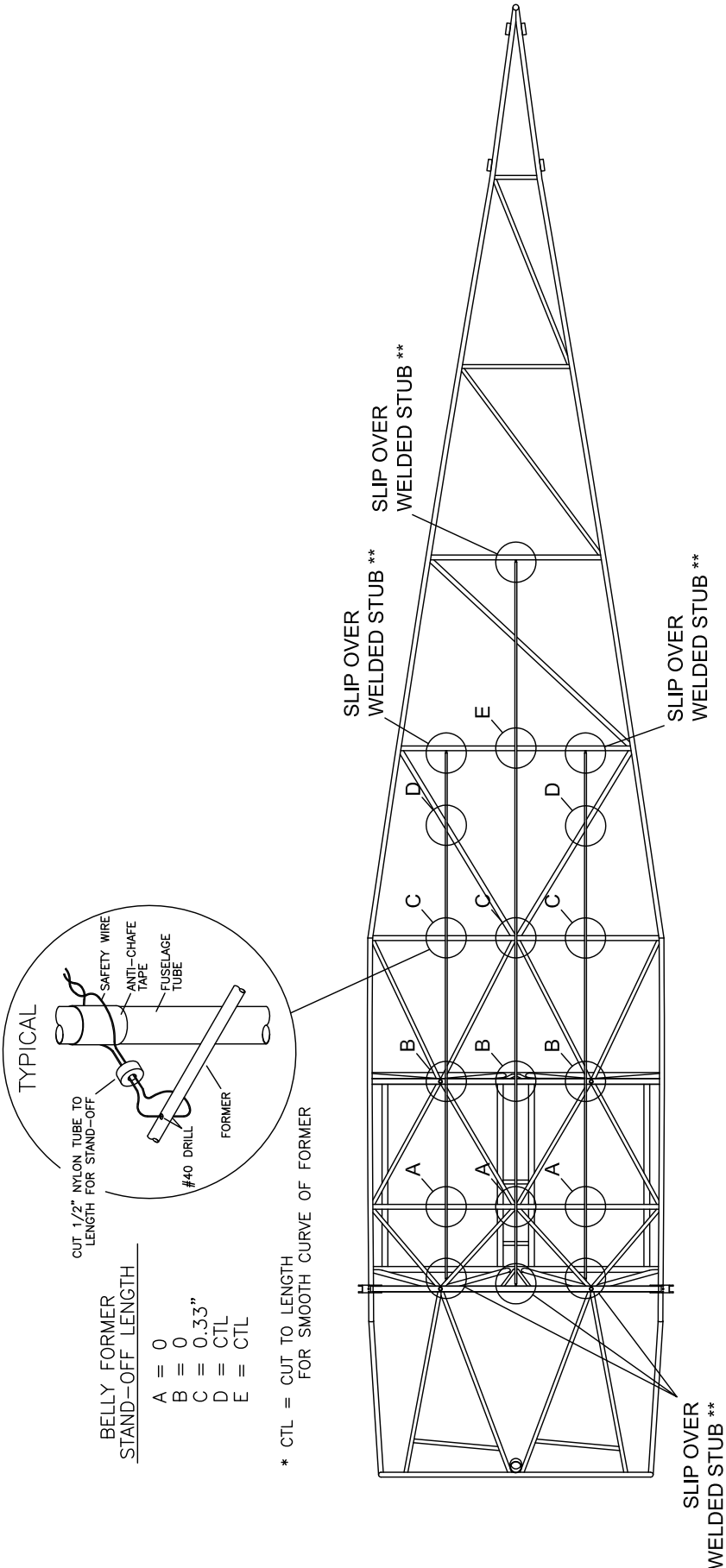
MD5574
REV. - ORIG

RRR S-20 RAVEN
TOP FORMER ATTACHMENT
FIGURE 01-04

RAVEN S-20 RAVEN
SIDE FORMER ATTACHMENT
FIGURE 01-08

MD5574
 REV. - ORIG



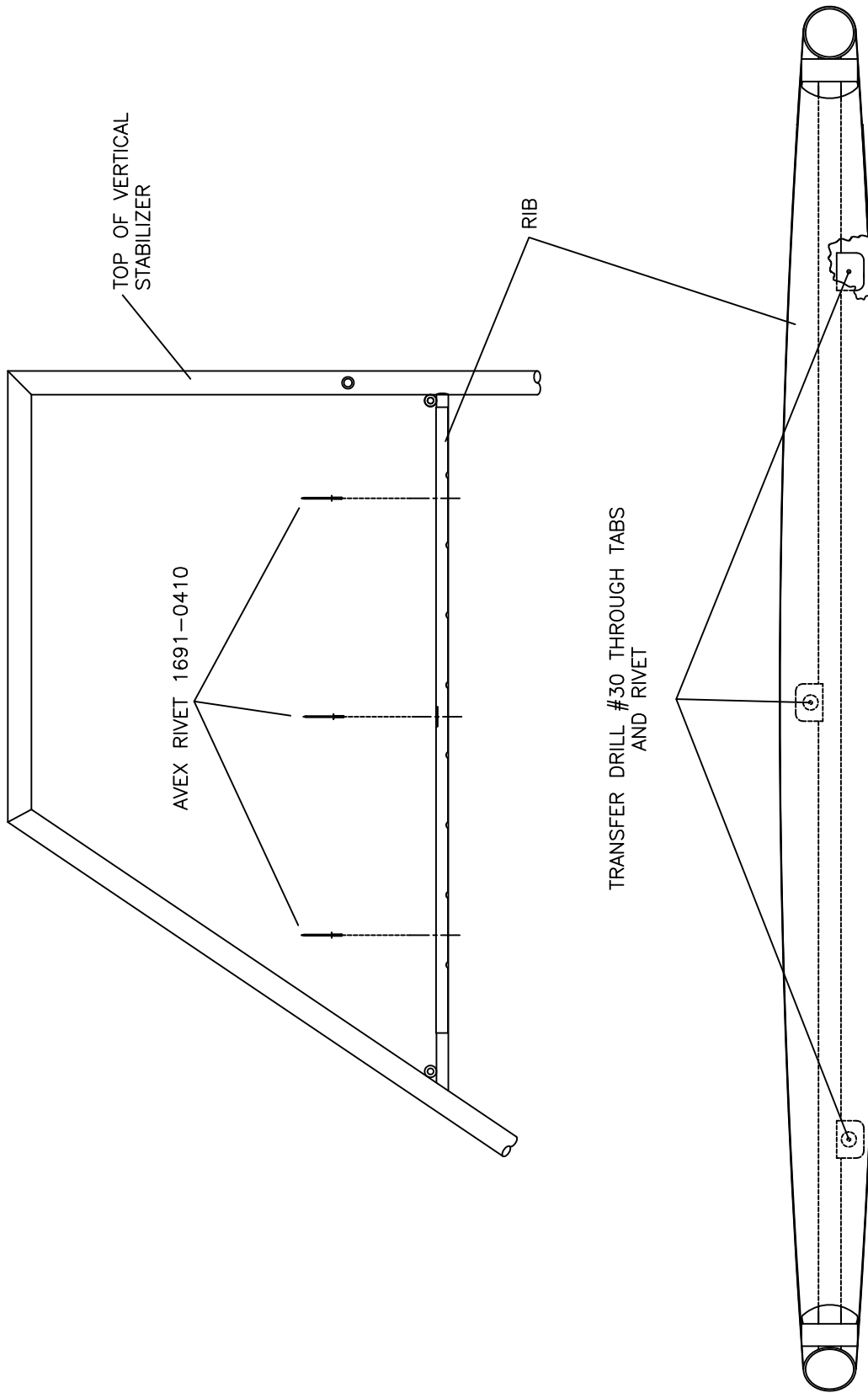


** DRILL END OF 1/4" FORMER WITH #11 DRILL BIT TO ALLOW FITTING OVER WELDED STUB

MD5574
REV. - ORIG

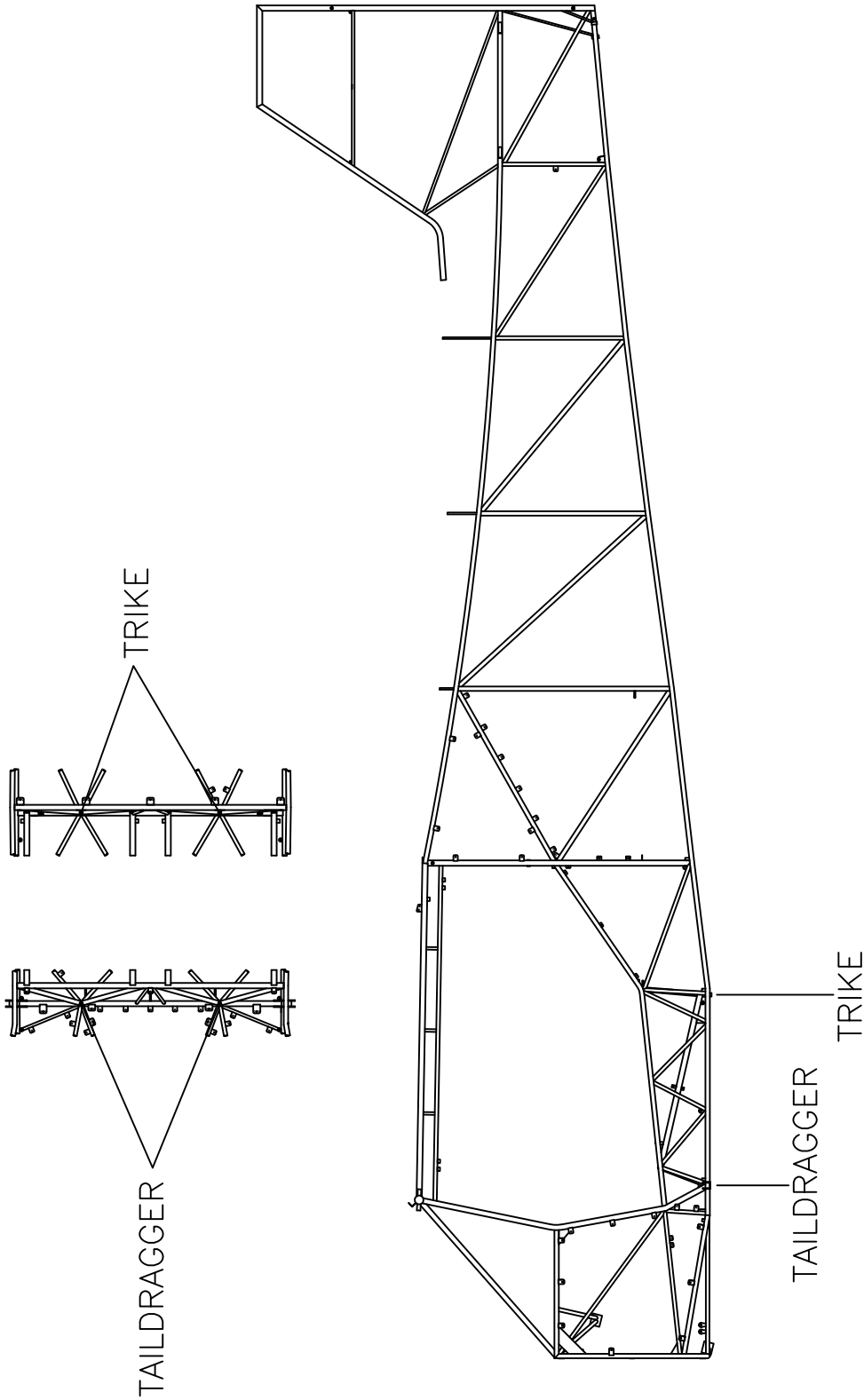
09/01/2013

RRR S-20 RAVEN
BELLY FORMER ATTACHMENT
FIGURE 01-15



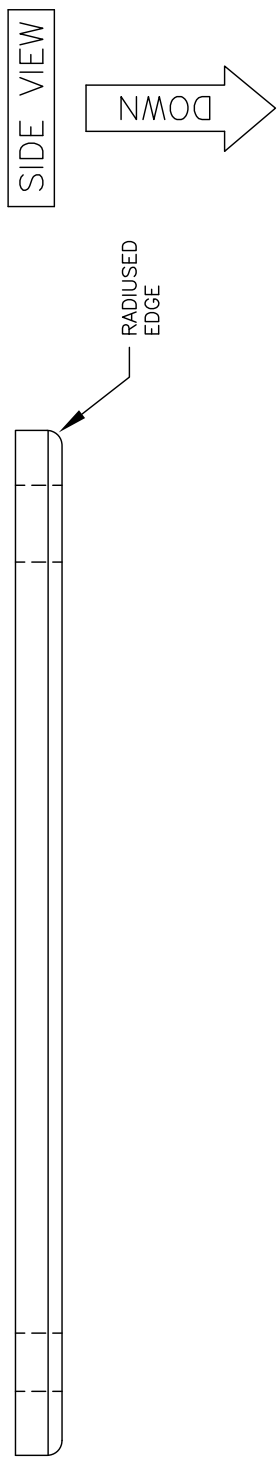
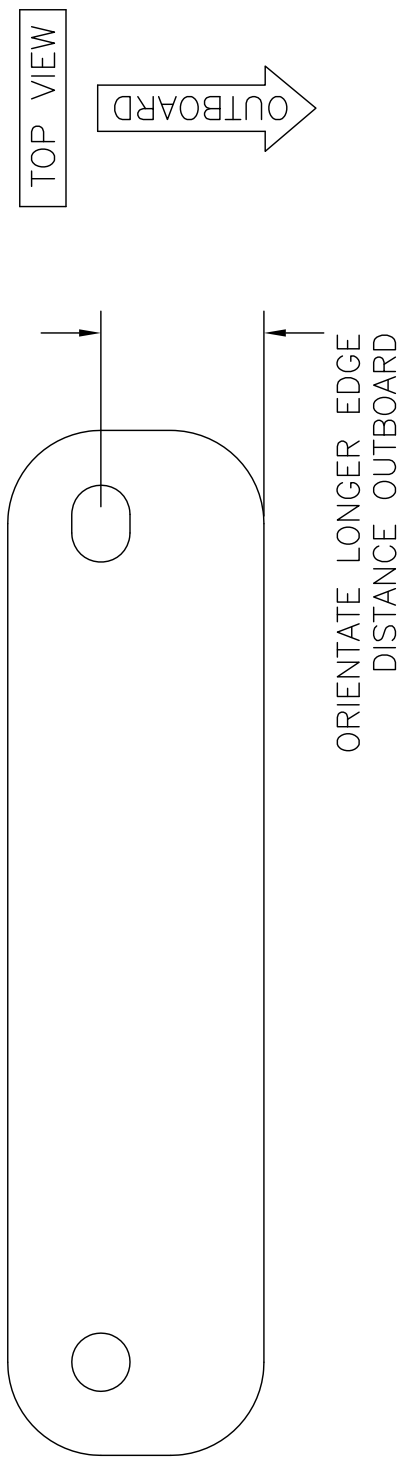
MD4282

RAVEN S-20 RAVEN
VERTICAL STABILIZER RIB
FIGURE 01-19



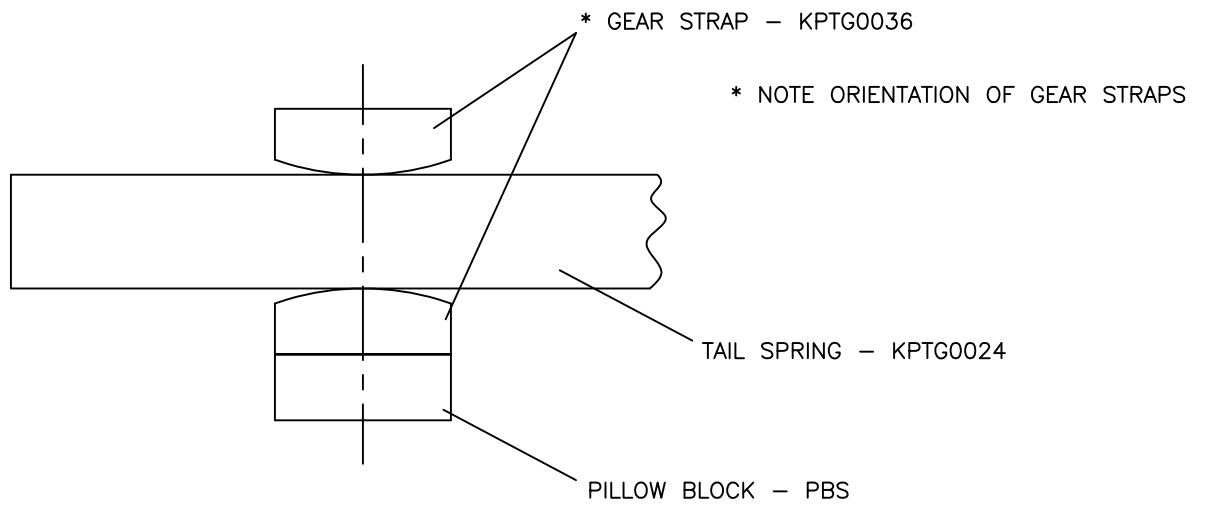
MD5603

RAVEN S-20 RAVEN
 MAIN LANDING GEAR LOCATIONS
 FIGURE 01A-04



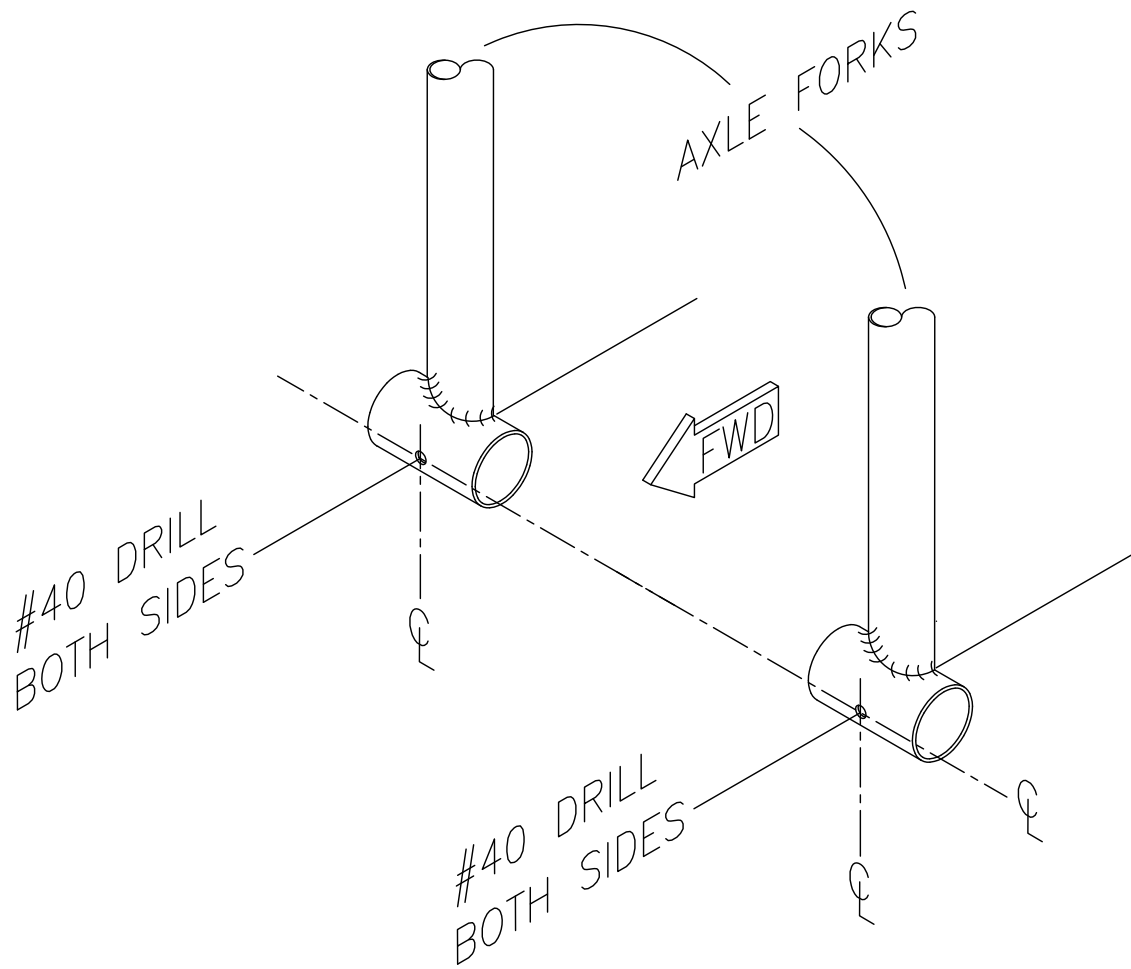
MD5600
REV. - ORIG

RRR S-20 RAVEN
TOP MAIN GEAR CLAMP PLATE ORIENTATION
FIGURE 01A-05



MD5054

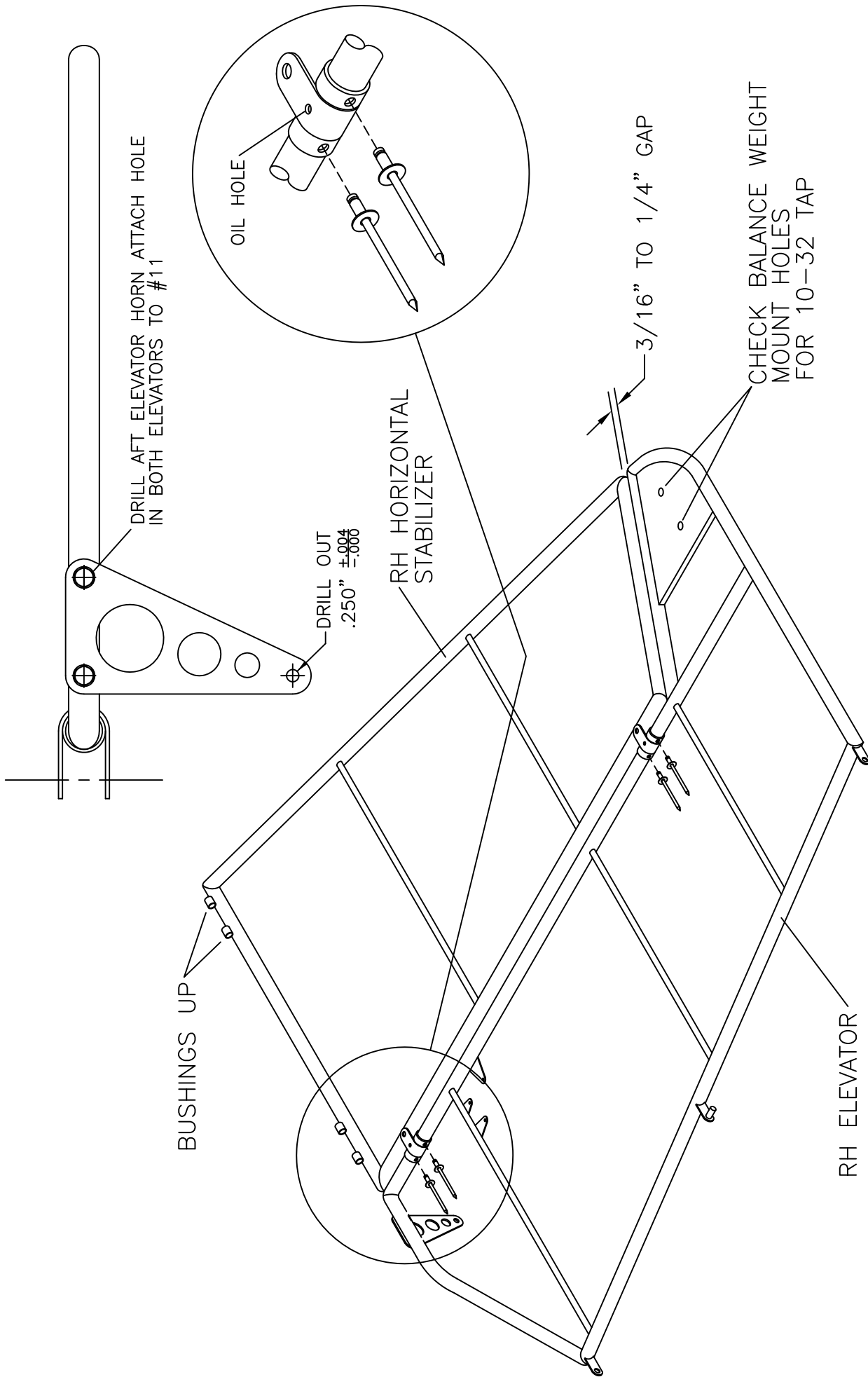
RANS S-20 RAVEN
TAIL SPRING INSTALLATION
FIGURE 01B-02



MD2958
REV. - ORIG

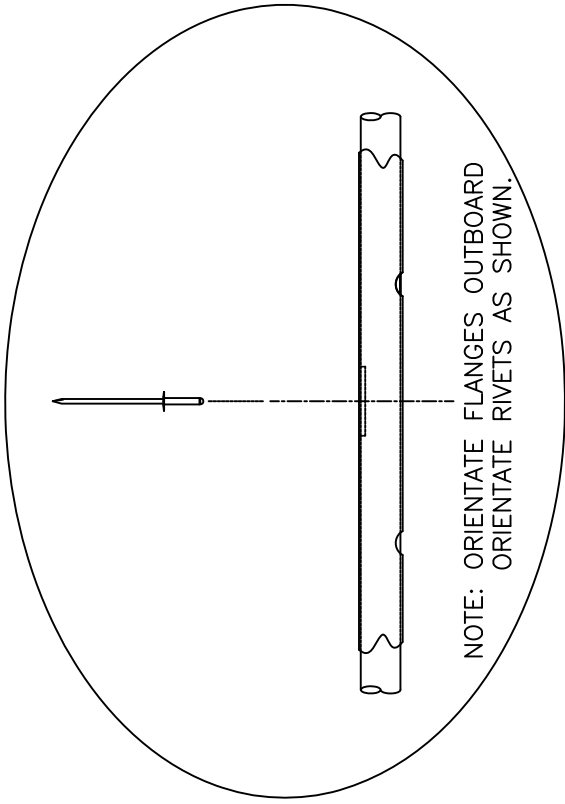
RANS S-20 RAVEN
NOSE GEAR FORK DRILLING
FIGURE 01B-12

09/01/2013



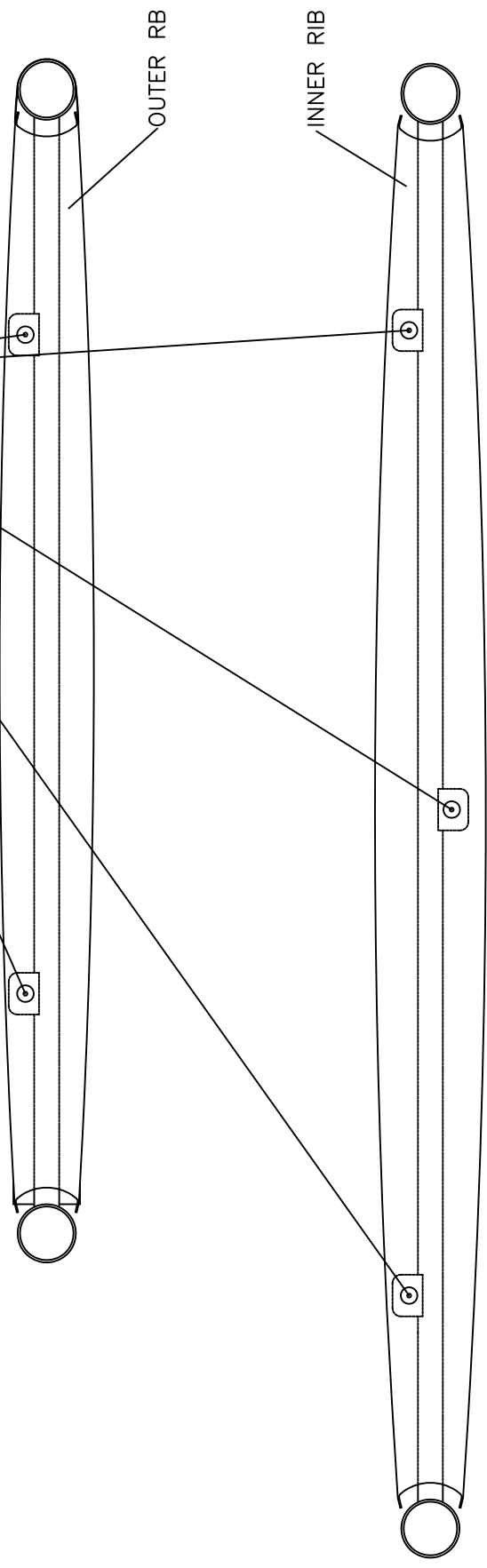
MD4286

RAMS S-20 RAVEN
ELEVATOR HINGE ALIGNMENT
FIGURE 01C-05



NOTE: ORIENTATE FLANGES OUTBOARD
ORIENTATE RIVETS AS SHOWN.

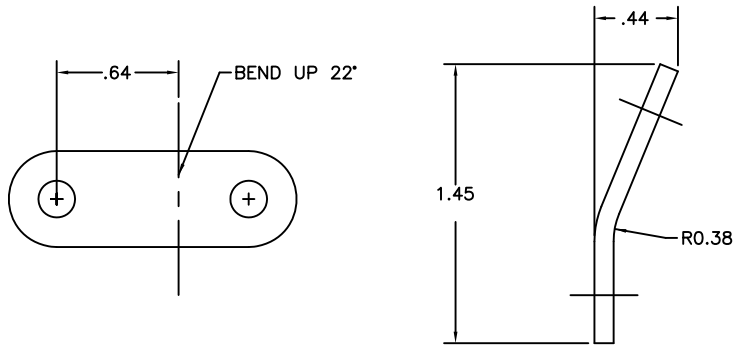
TRANSFER DRILL #30 THROUGH TABS



MD4285

RAVEN S-20 RAVEN
HORIZONTAL STABILIZER RIBS
FIGURE 01C-09

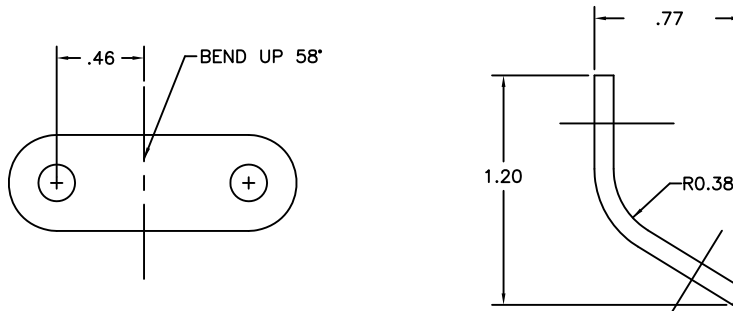
1:1



BEND PROFILE

ATTACH TANG
HORIZONTAL STABILIZER BOTTOM
MAKE (6)

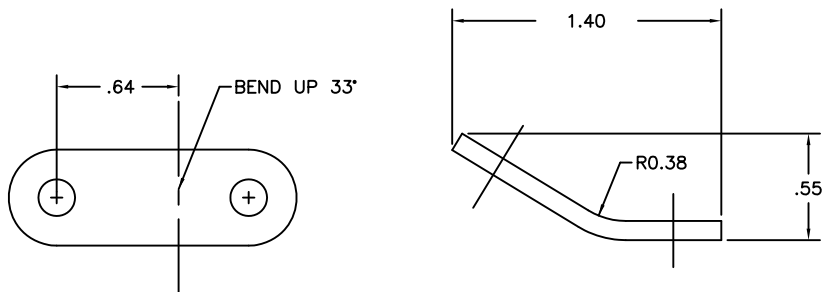
1:1



BEND PROFILE

ATTACH TANG
VERTICAL STABILIZER
MAKE (4)

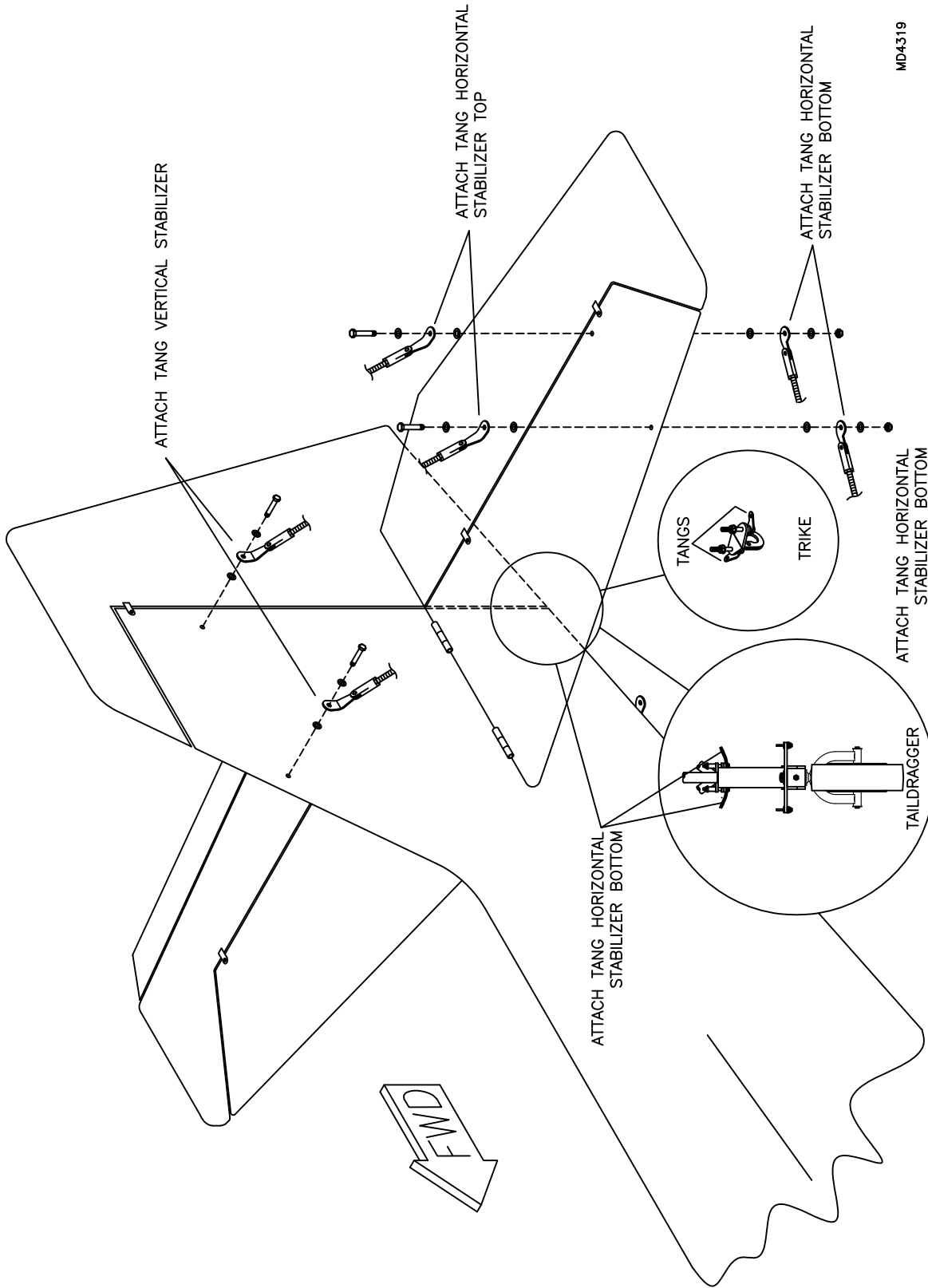
1:1



ATTACH TANG
HORIZONTAL STABILIZER TOP
MAKE (4)

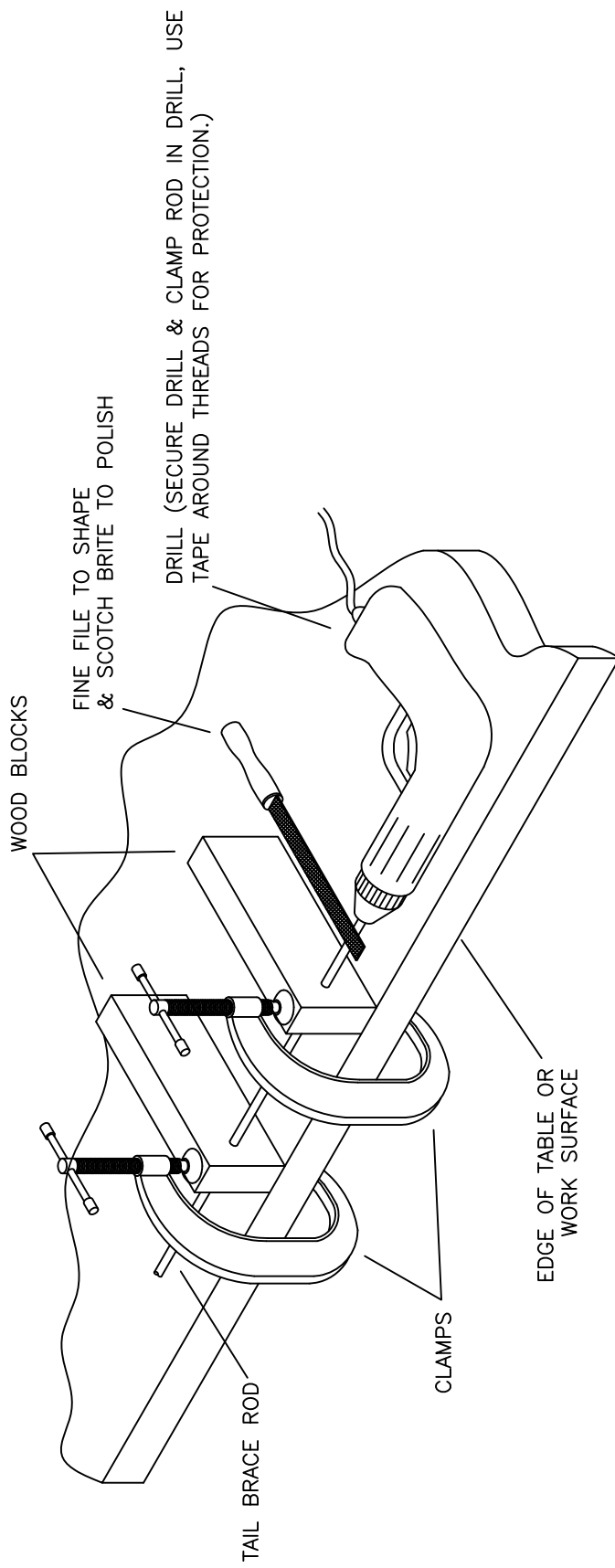
MD4313

RANS S-20 RAVEN
MODIFIED TANGS FOR TAIL BRACE ROD ATTACH
FIGURE 01C-12

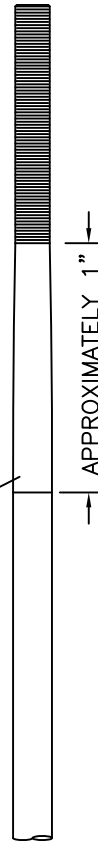


MD4319

RAMS S-20 RAVEN
TANG LOCATIONS FOR TAIL BRACE RODS
FIGURE 01C-13



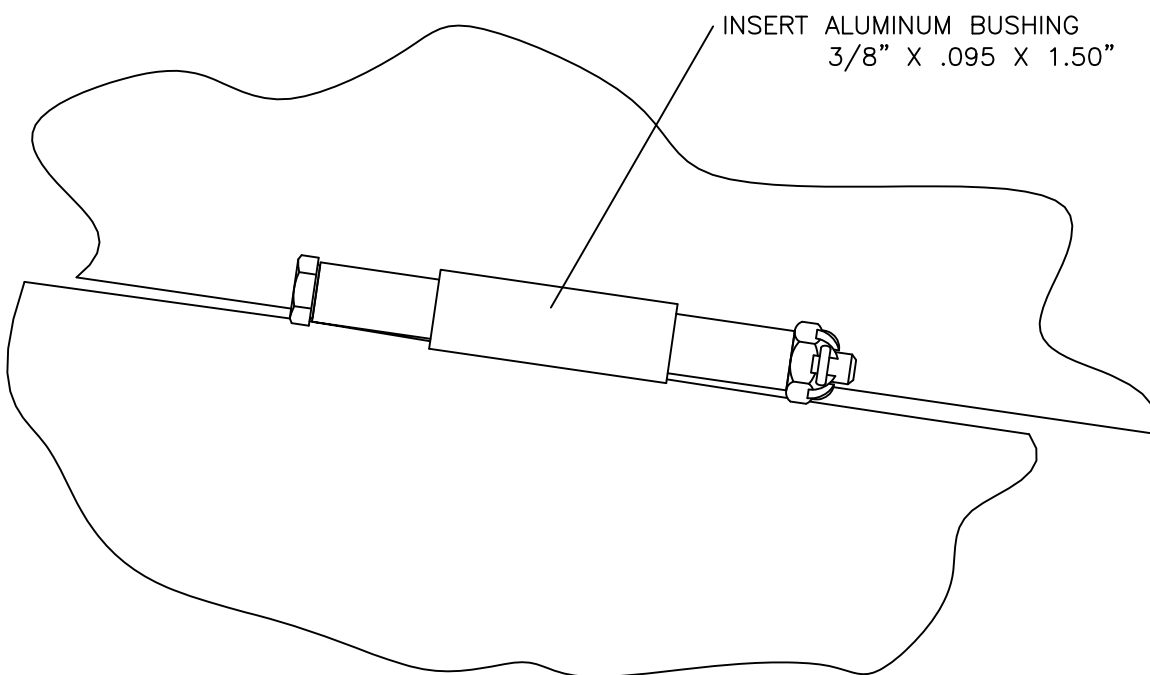
SMOOTH TRANSITION AREA FROM FULL DIA. TO THREAD DIA. - NO ABRUPT CHANGES IN CROSS SECTION.



APPROXIMATELY 1"

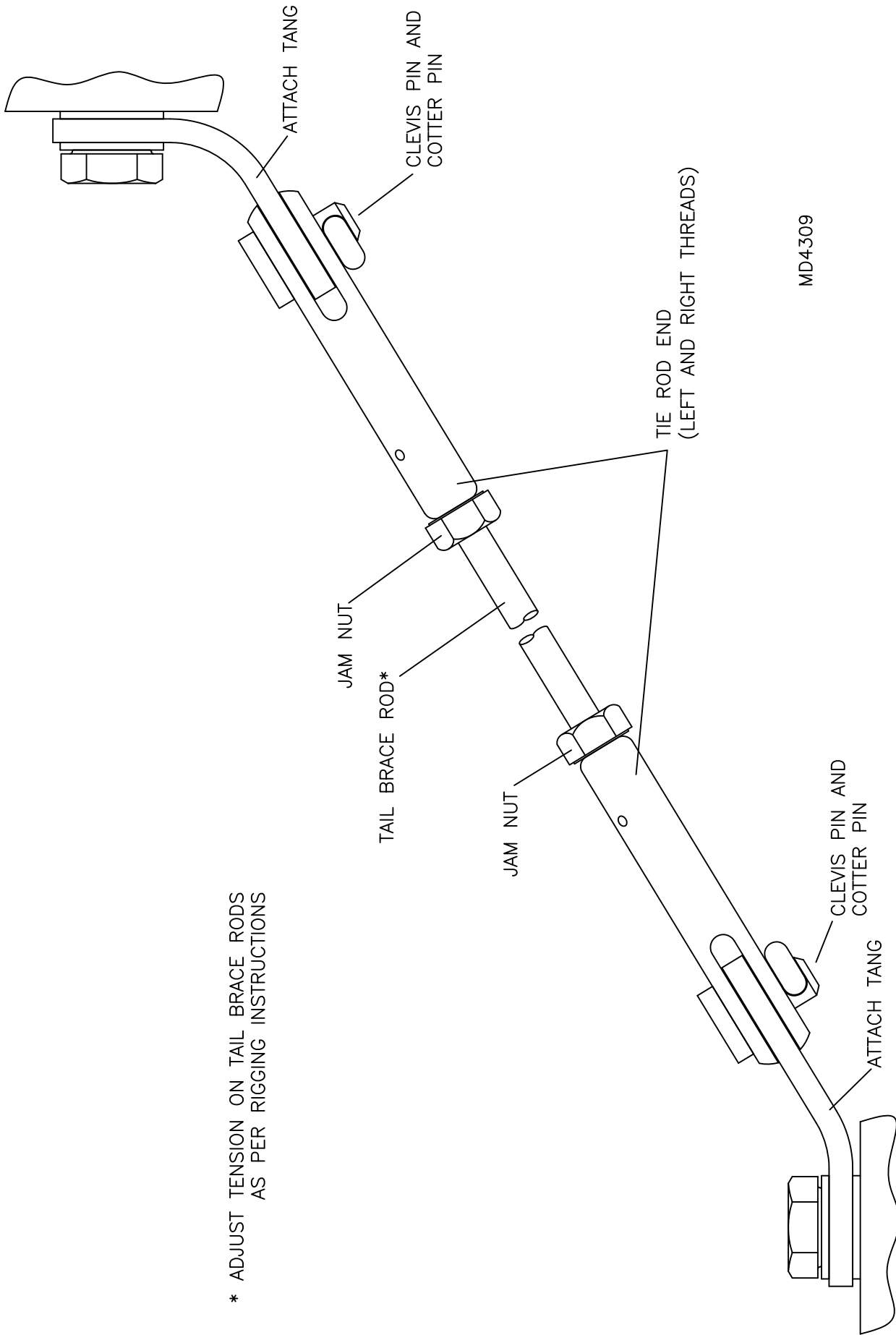
MD4464

RAVEN S-20 RAVEN
TAIL BRACE ROD MODIFICATION
FIGURE 01C-14



MD4308

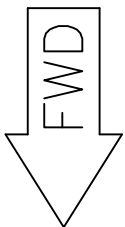
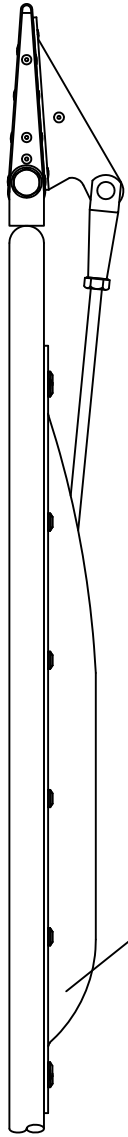
RANS S-20 RAVEN
HORIZONTAL TAIL TO FUSELAGE ATTACH
FIGURE 01C-15



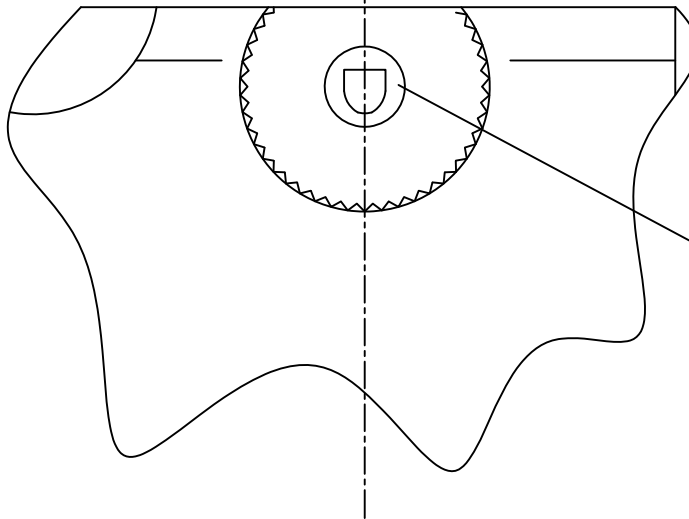
MD4309

* ADJUST TENSION ON TAIL BRACE RODS AS PER RIGGING INSTRUCTIONS

RAVEN S-20 RAVEN
 HORIZONTAL TAIL BRACING (TYPICAL)
 FIGURE 01C-17

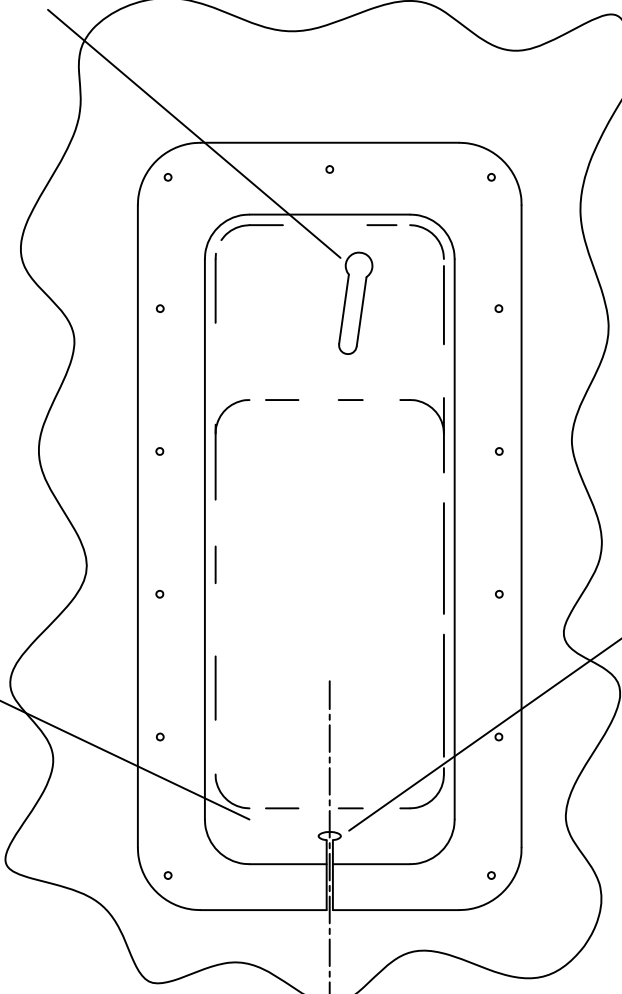


ROUND PART OF FAIRING IS FORWARD.



SERVO WIRING EXIT
ON HORIZONTAL STAB
(SEAPLANE GROMMET)

SERVO PUSH-ROD EXIT
LOCATE HOLE TO ALLOW
FULL SERVO TRAVEL EACH
WAY. (USE 1:1 TEMPLATE)



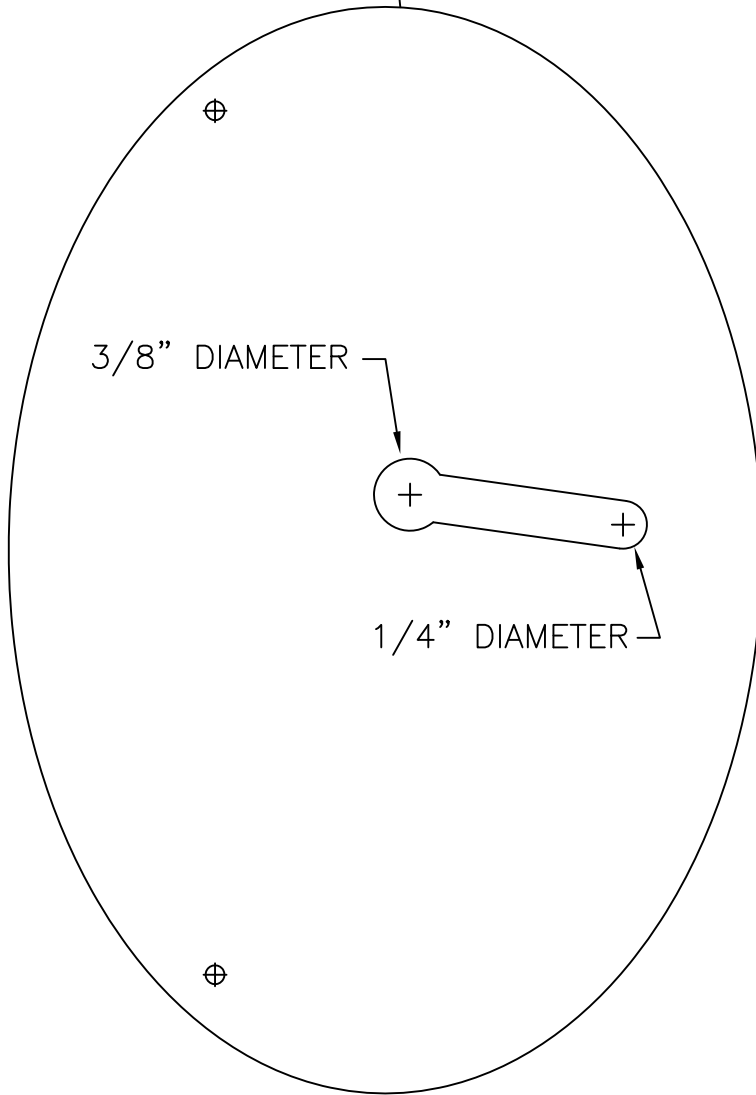
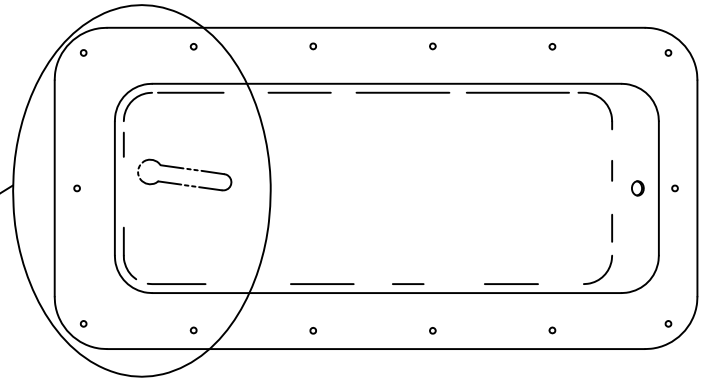
SERVO WIRING EXIT

LOCATE AND DRILL 1/4" FOR BEST FIT WITH SERVO WIRING
AND SEAPLANE GROMMET ON HORIZONTAL STABILIZER.
SLOT FAIRING IF DESIRED FOR EASY REMOVAL.
INSTALL RUBBER GROMMET IN FINAL INSTALLATION.

RAVEN S-20 RAVEN
INSTALLATION OF TRIM EXIT FAIRING
FIGURE 01C-27

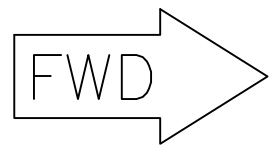
MD4316

USE 1:1 TEMPLATE TO
LOCATE CUT-OUT AS SHOWN



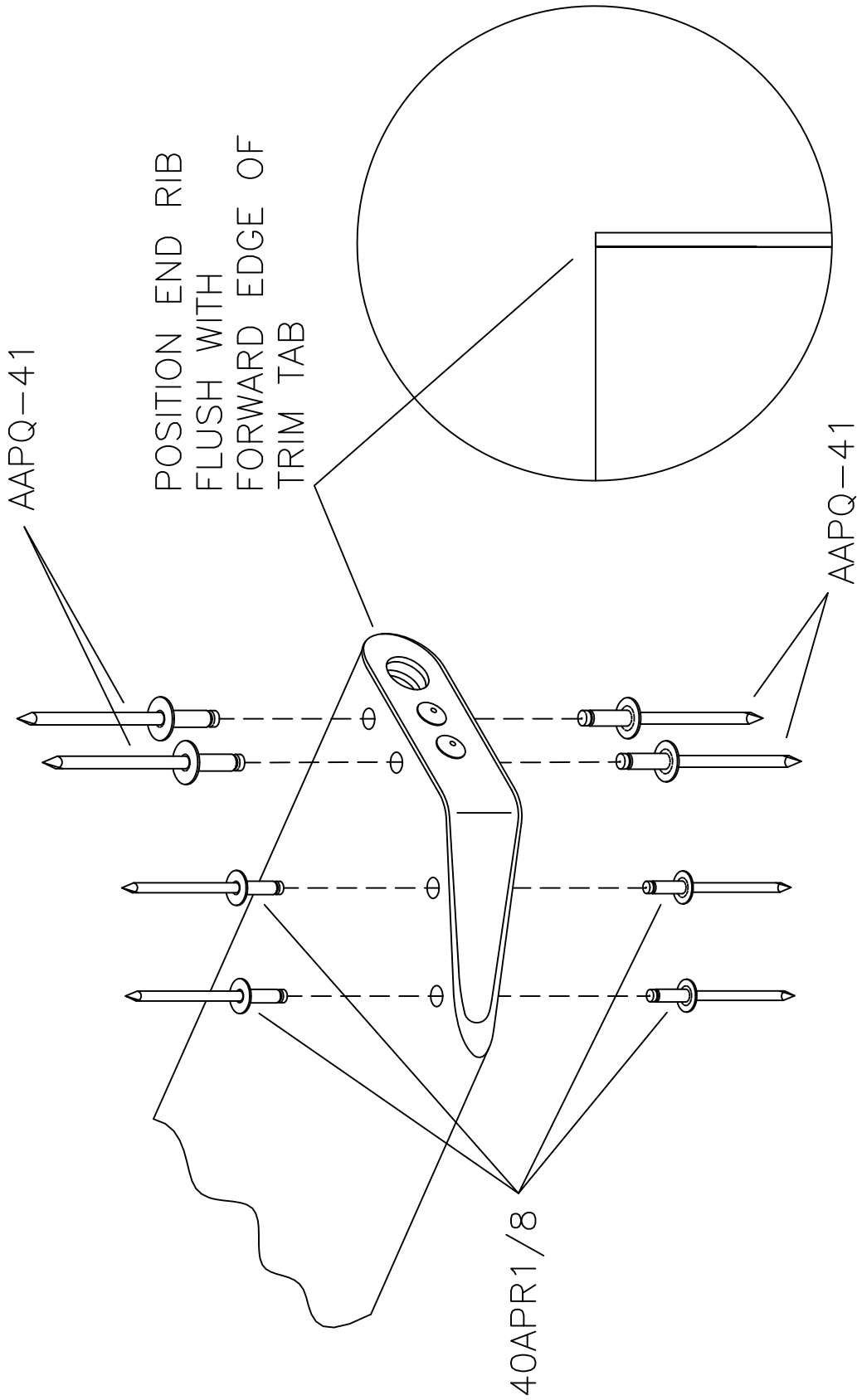
1:1 TEMPLATE

MD4487



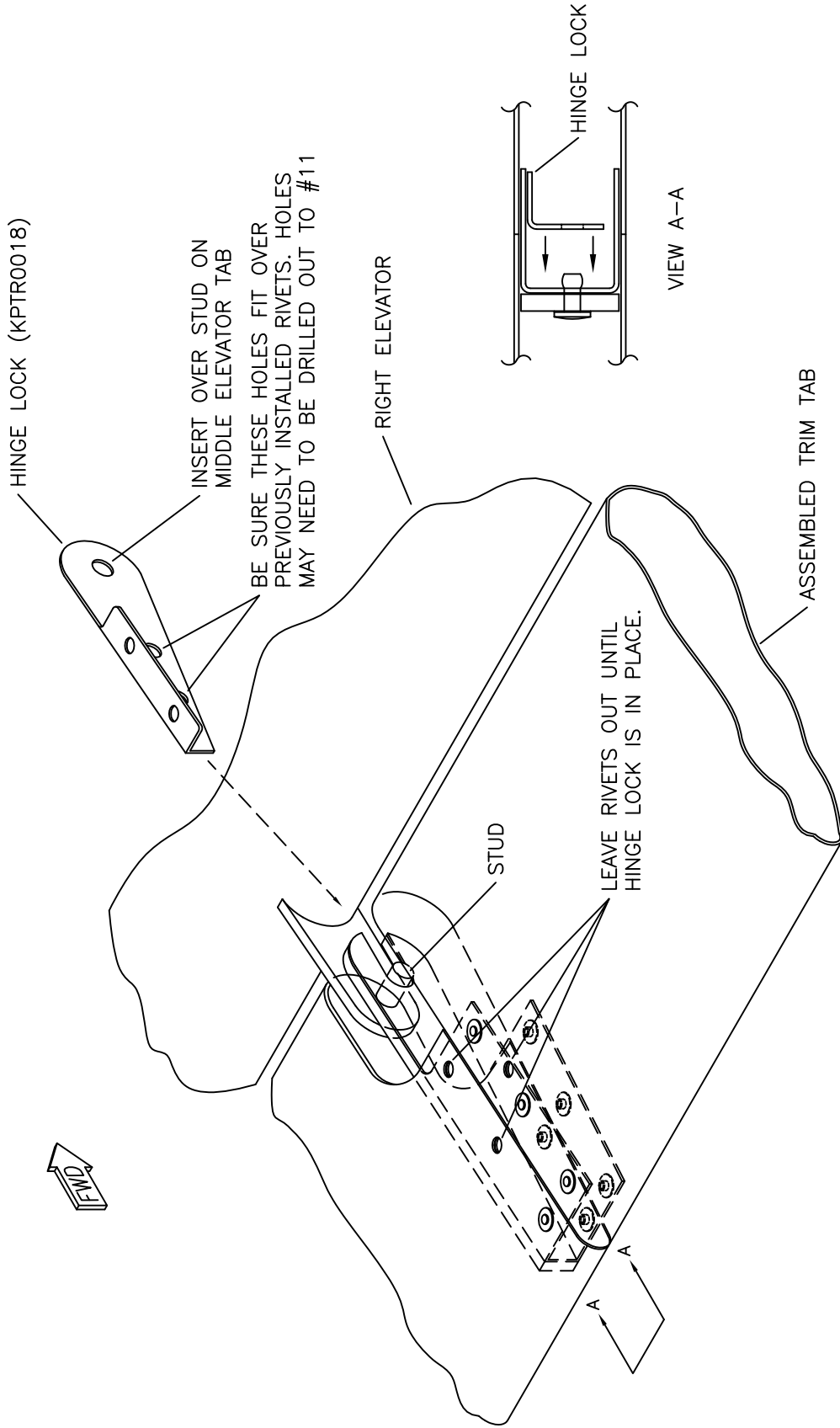
RANS S-20 RAVEN
TRIM EXIT FAIRING - SERVO PUSH-ROD EXIT
FIGURE 01C-31

09/01/2013



MD4306

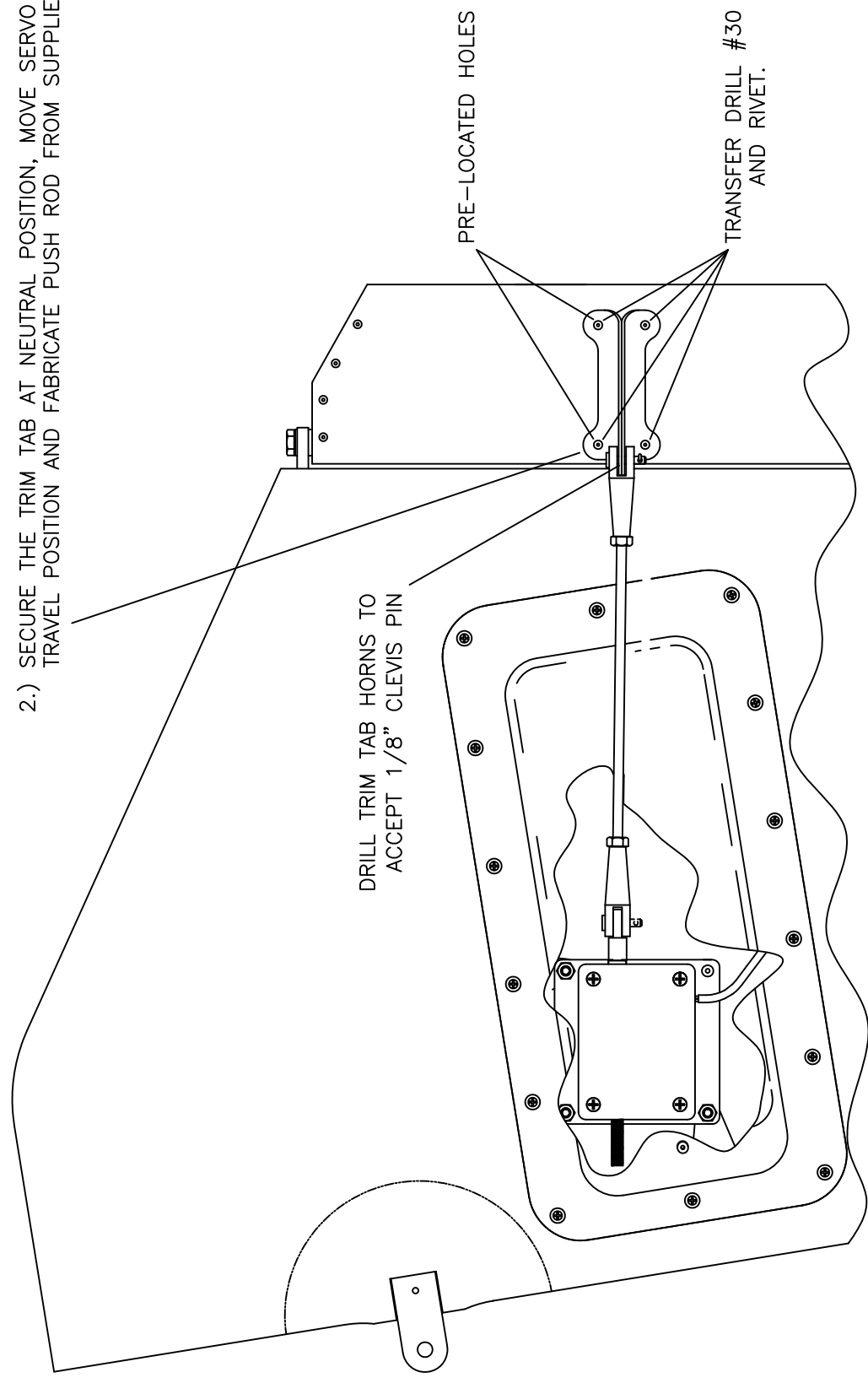
RAVEN S-20 RAVEN
TRIM TAB AND RIBS
FIGURE 01D-04



MD4297

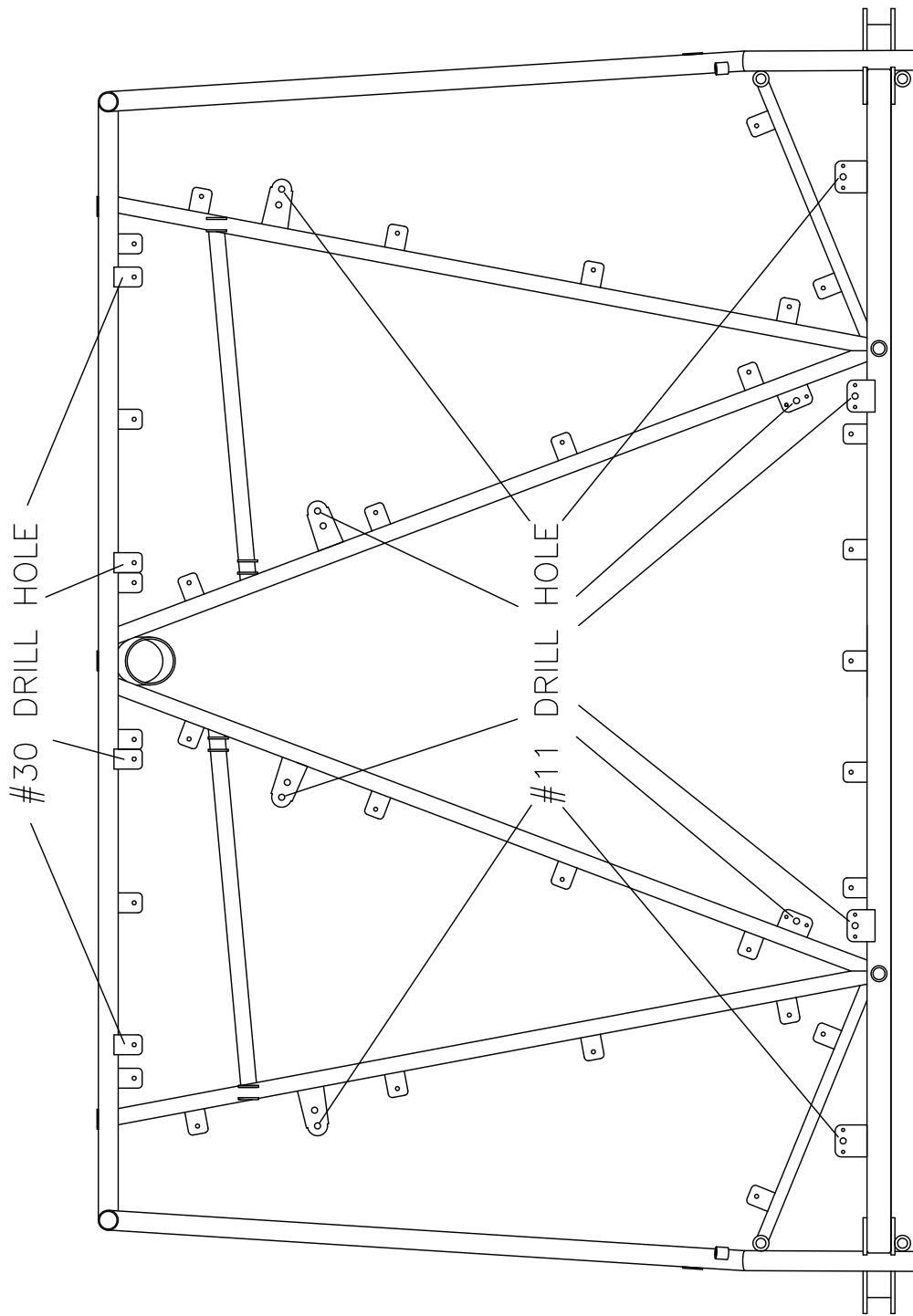
RAMS S-20 RAVEN
TRIM TAB CENTER RIB AND HINGE LOCK
FIGURE 01D-08

- 1.) LOCATE TRIM TAB HORNS USING TWO (2) PRE-LOCATED HOLES IN INBOARD TRIM TAB. TRANSFER DRILL ALL HOLES #30 AND RIVET.
- 2.) SECURE THE TRIM TAB AT NEUTRAL POSITION, MOVE SERVO TO HALF TRAVEL POSITION AND FABRICATE PUSH ROD FROM SUPPLIED MATERIAL.



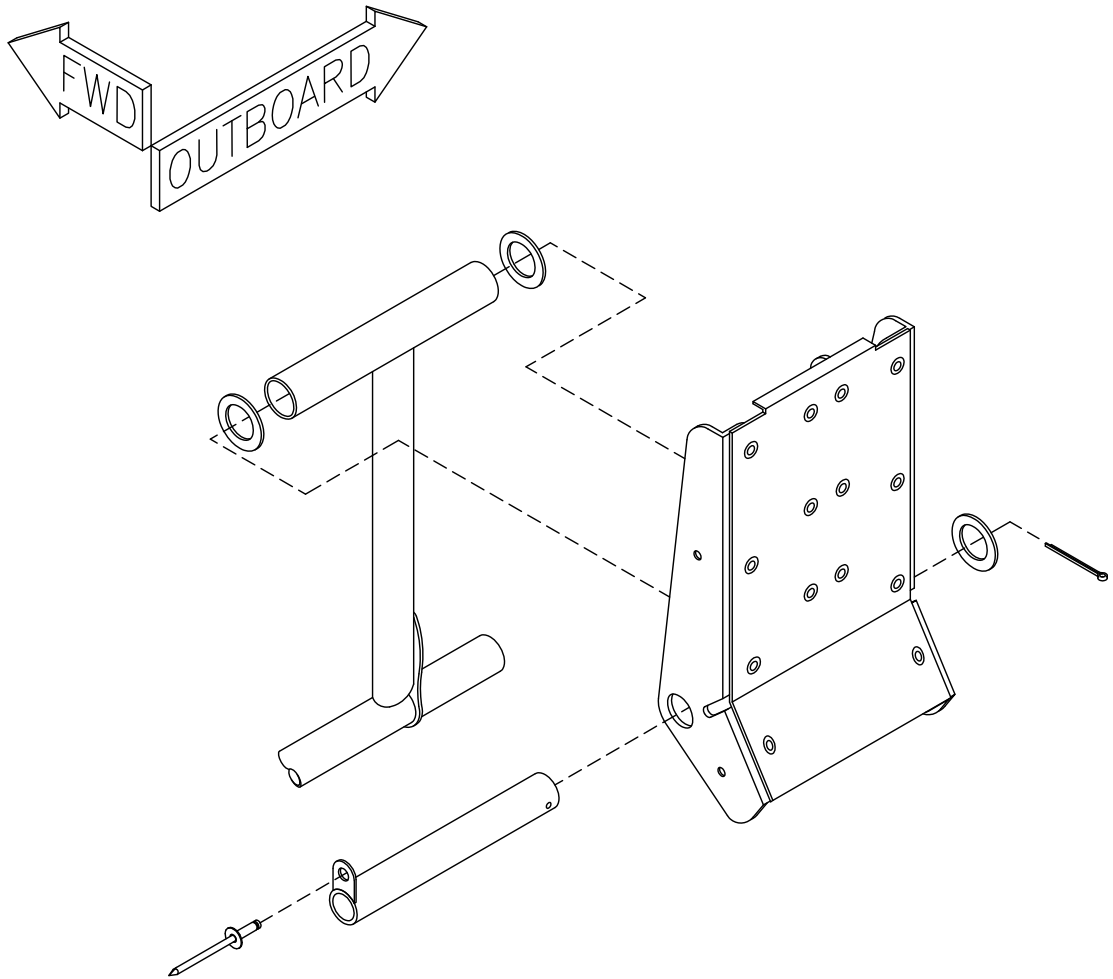
MD4317

RAMS S-20 RAVEN
 TRIM TAB HORN INSTALLATION
 FIGURE 01D-18



MD5604
REV. - ORIG

RAVEN S-20 RAVEN
FLOORBOARD DRILL SCHEDULE
FIGURE 01E-01

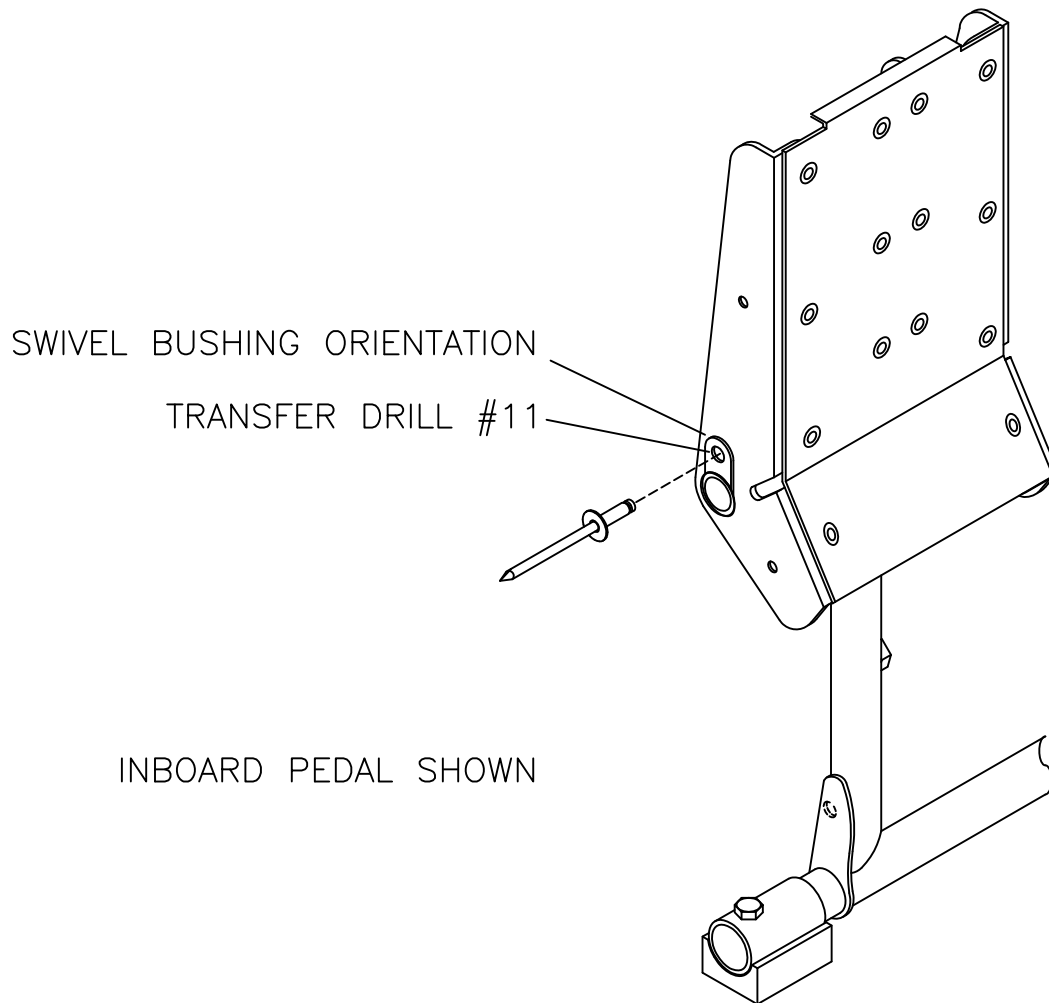


OUTBOARD PEDAL SHOWN

RANS S-20 RAVEN
RUDDER PEDAL INSTALLATION
FIGURE 01F-02

MD2266

09/01/2013

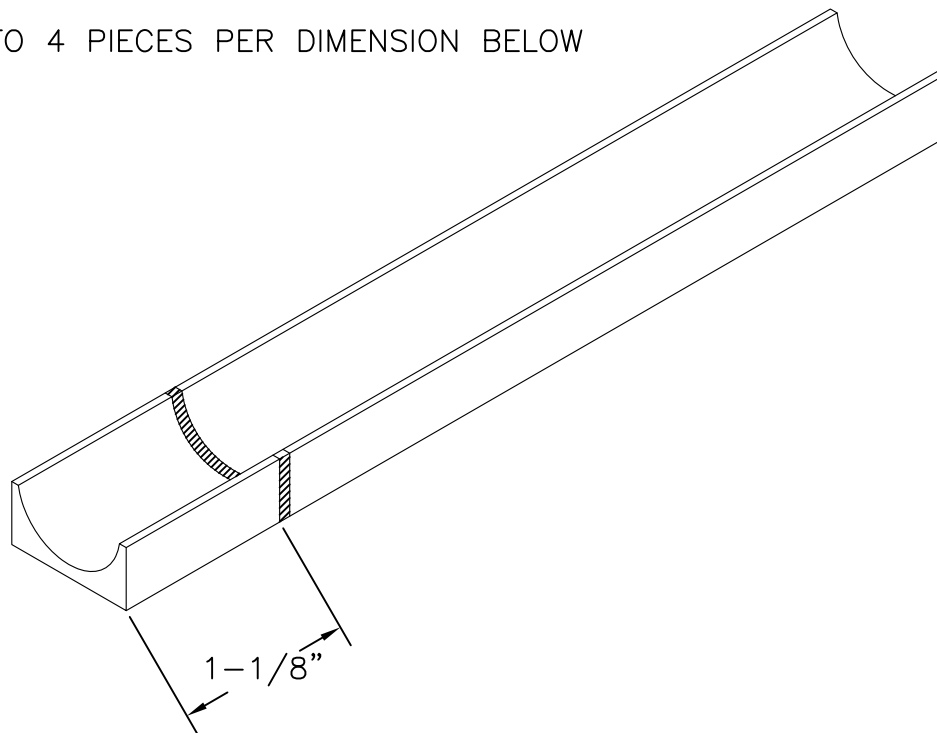


RANS S-20 RAVEN
RUDDER PEDAL INSTALLATION
FIGURE 01F-03

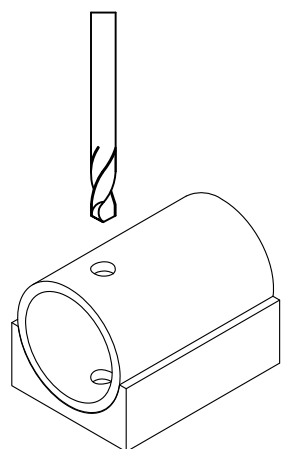
MD2267

09/01/2013

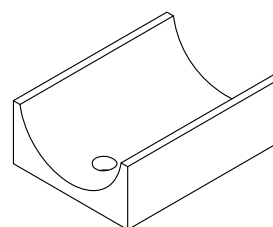
CUT PART INTO 4 PIECES PER DIMENSION BELOW



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



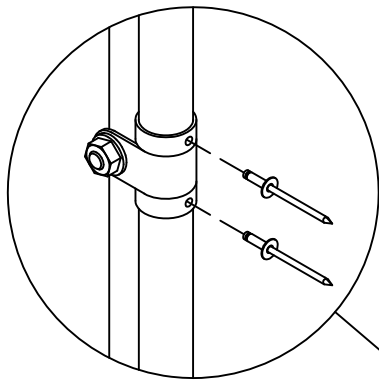
FINISHED PART



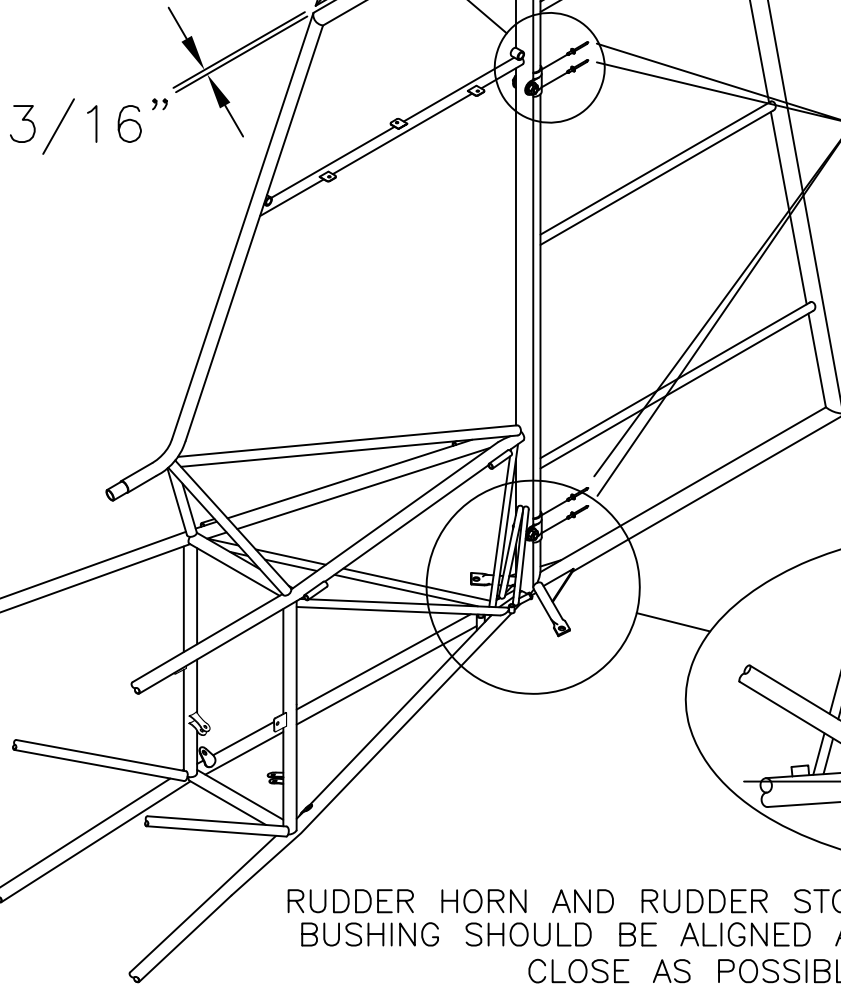
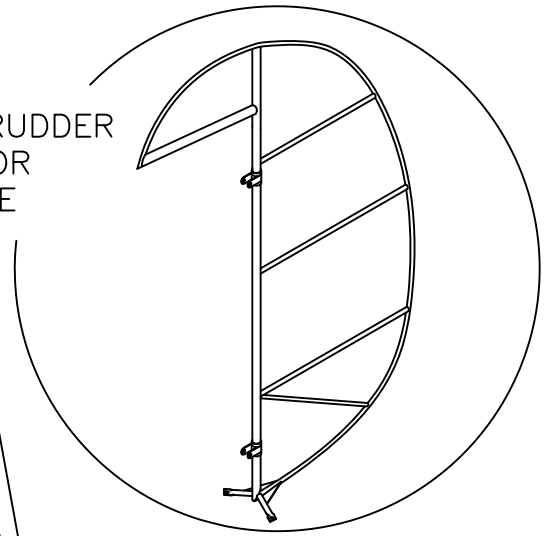
RANS S-20 RAVEN
BRAKE SADDLE MODIFICATION
FIGURE 01F-05

MD2267

09/01/2013



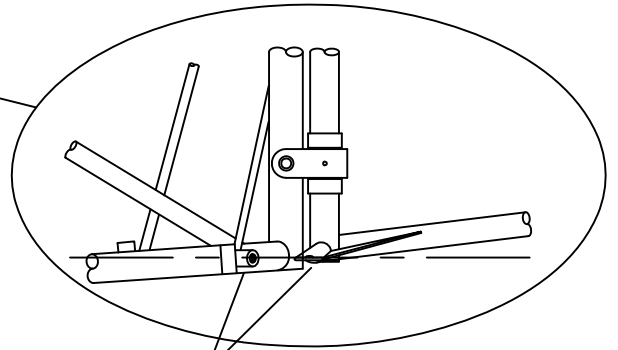
CLASSIC RUDDER
SHOWN FOR
REFERENCE



3/16"

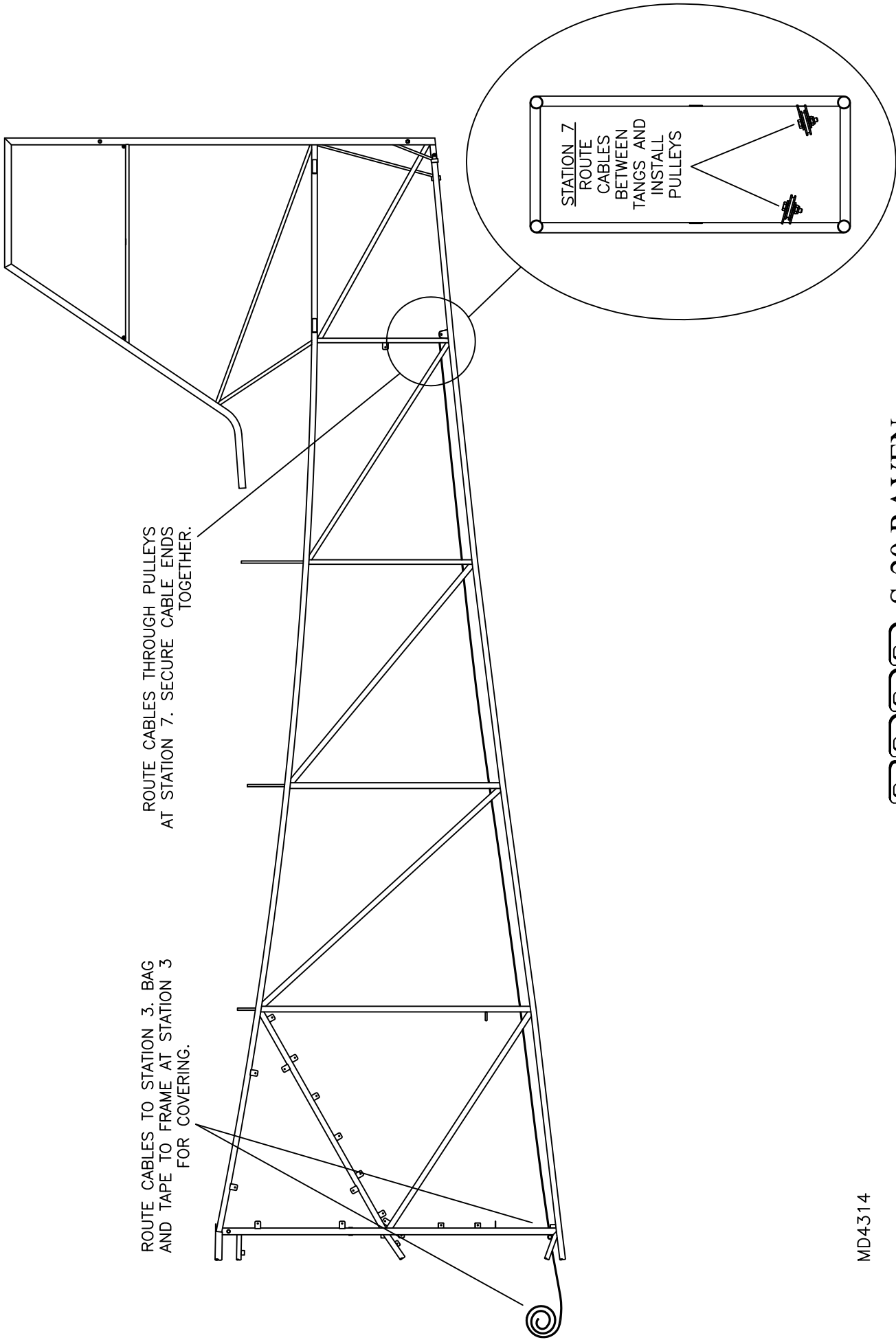
INSTALL RIVETS INTO
RETAINING COLLARS
ON INTERIOR SIDE
OF RUDDER.

RUDDER HORN AND RUDDER STOP
BUSHING SHOULD BE ALIGNED AS
CLOSE AS POSSIBLE



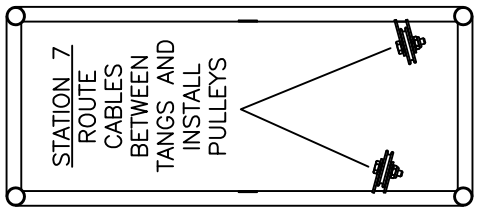
MD4294

RANS S-20 RAVEN
RUDDER HINGE ALIGNMENT
FIGURE 01G-01



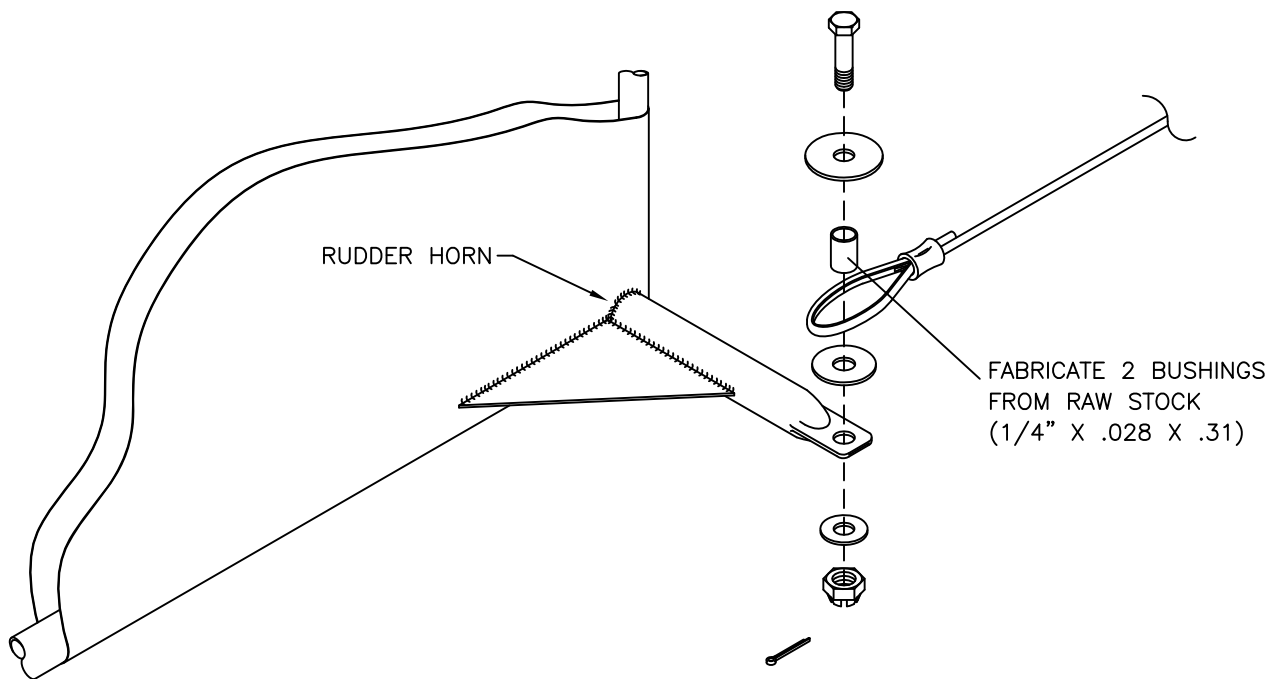
ROUTE CABLES TO STATION 3. BAG AND TAPE TO FRAME AT STATION 3 FOR COVERING.

ROUTE CABLES THROUGH PULLEYS AT STATION 7. SECURE CABLE ENDS TOGETHER.



MD4314

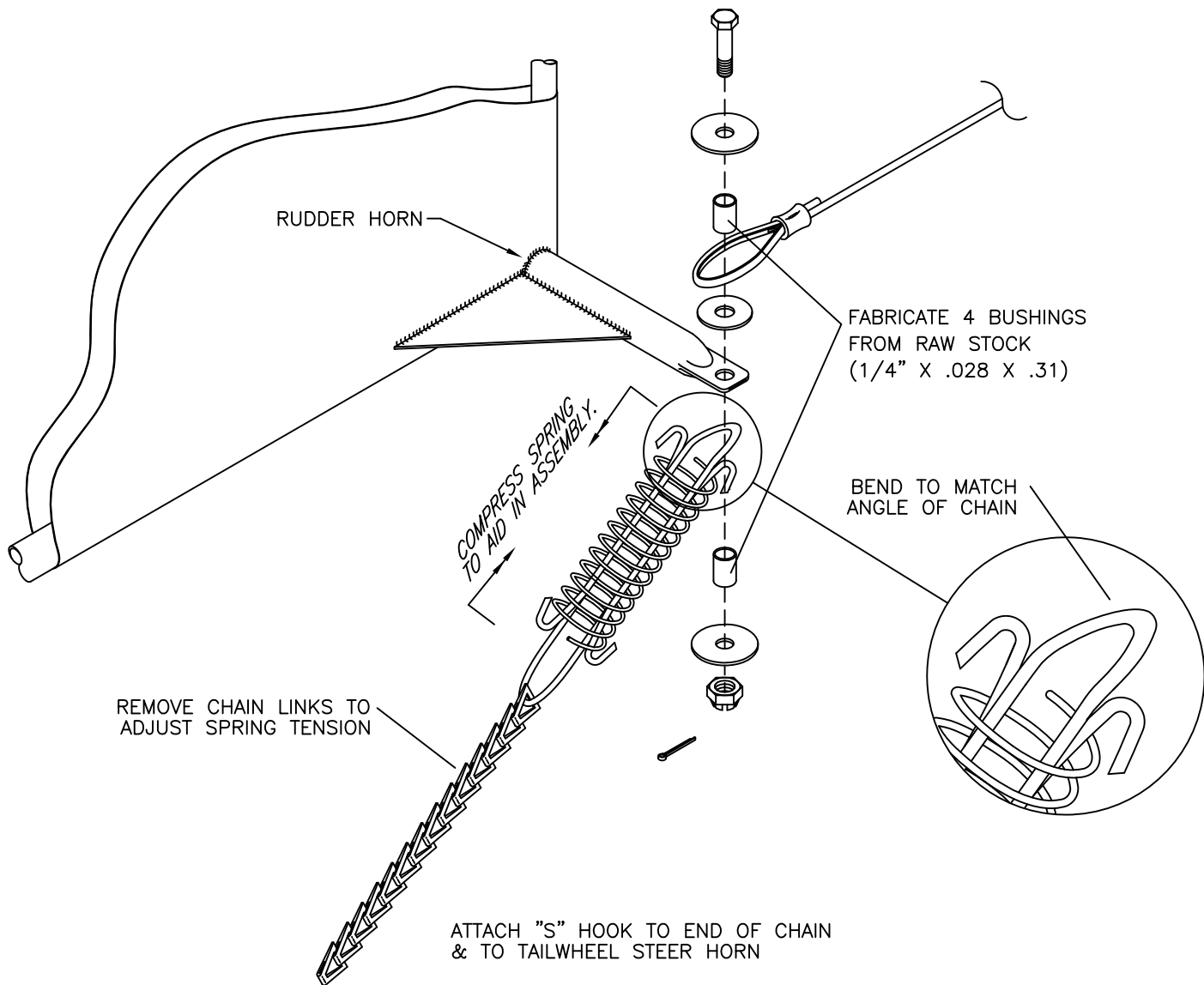
RAMS S-20 RAVEN
INSTALL RUDDER CABLES FOR COVERING
FIGURE 01G-05



MD4287

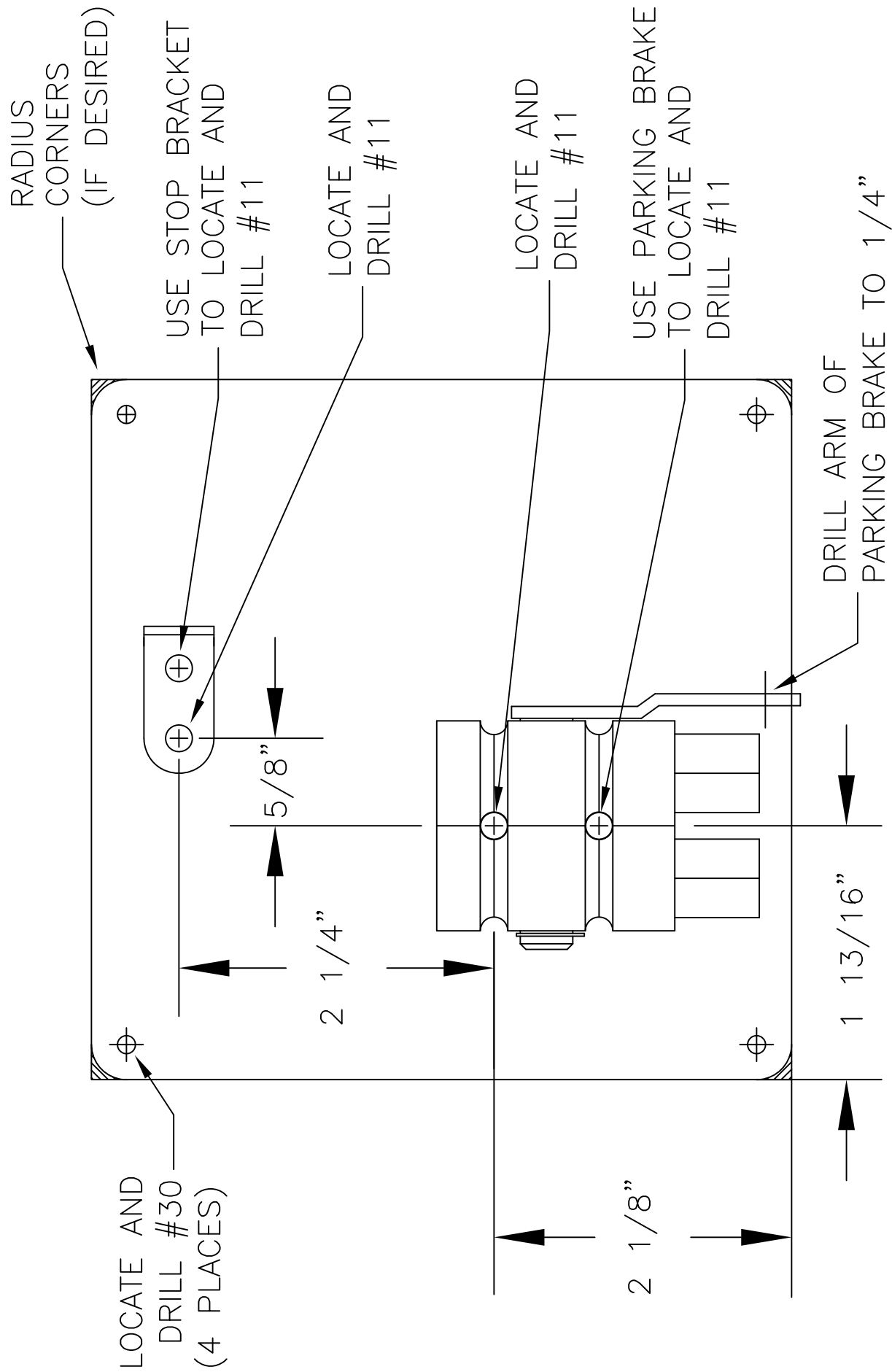
RANS S-20 RAVEN
TRIKE - RUDDER CABLE TO RUDDER ATTACH
FIGURE 01G-11

09/01/2013



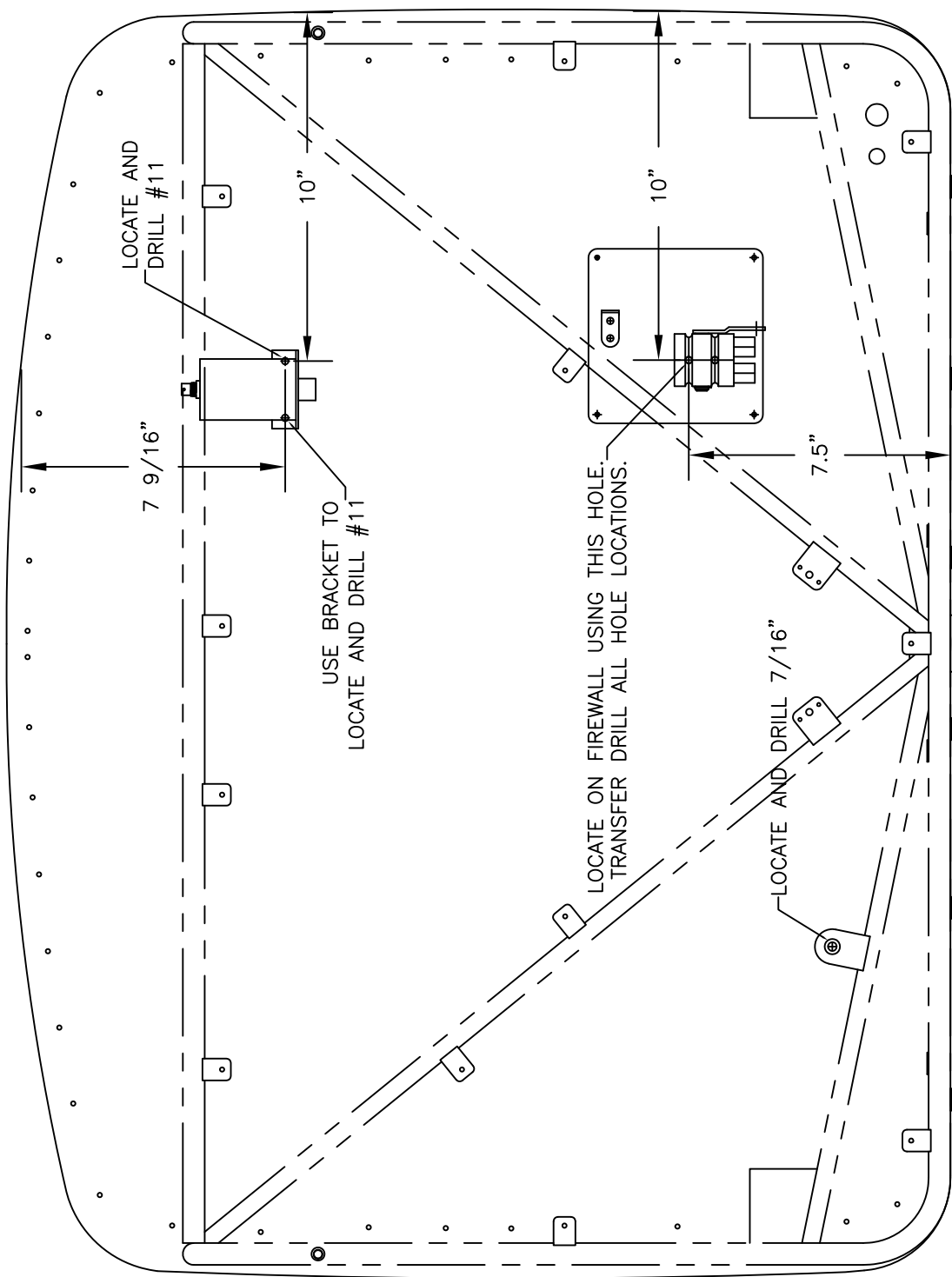
MD4287

RANS S-20 RAVEN
TAILDRAGGER - RUDDER CABLE TO RUDDER ATTACH
FIGURE 01G-12



MD5575
REV. - ORIG

RAMBO S-20 RAVEN
PARK BRAKE BACKING PLATE MODIFICATION
FIGURE 01H-02

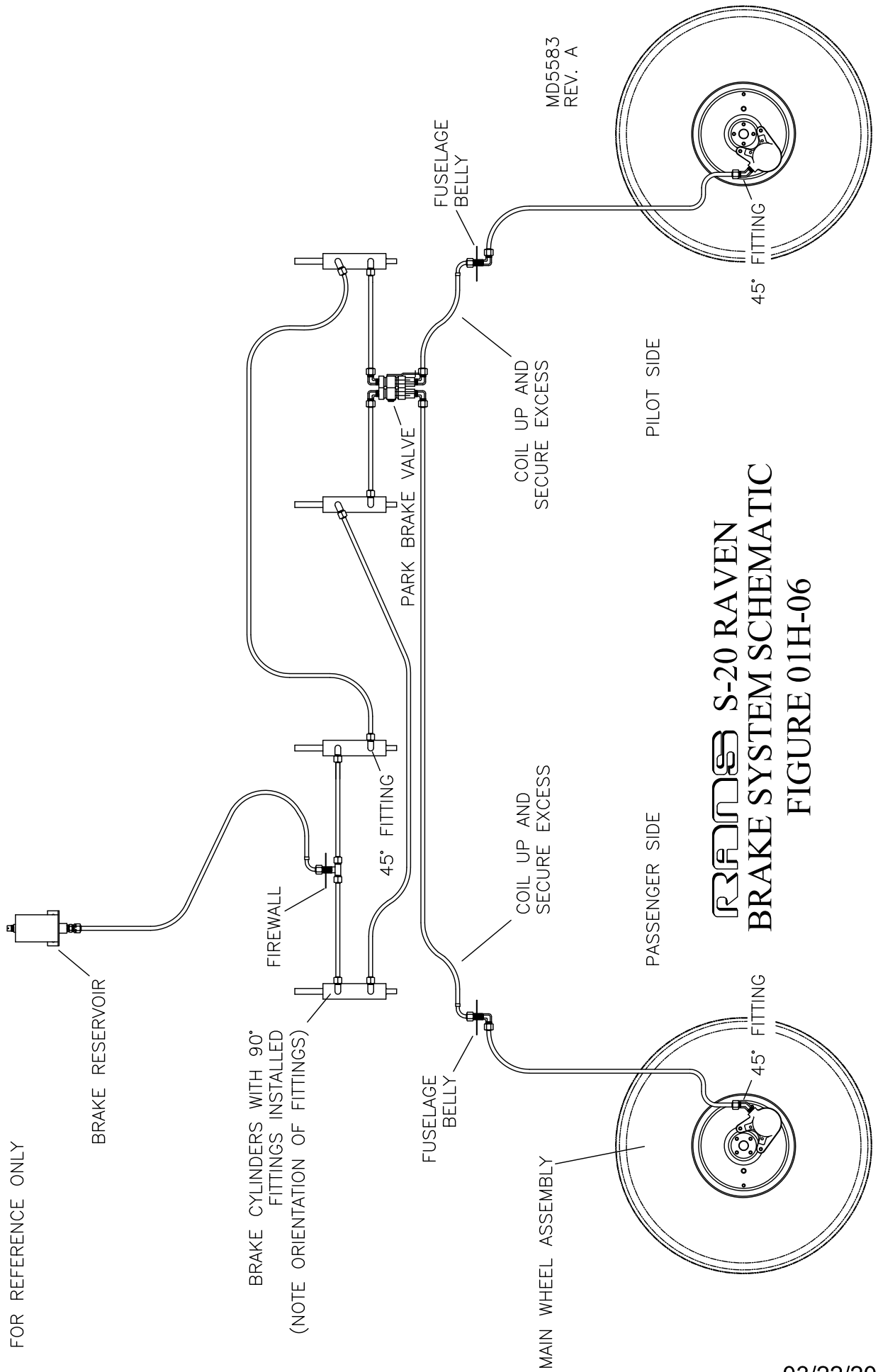


VIEWED FROM FRONT

MD5575
REV. -- ORIG

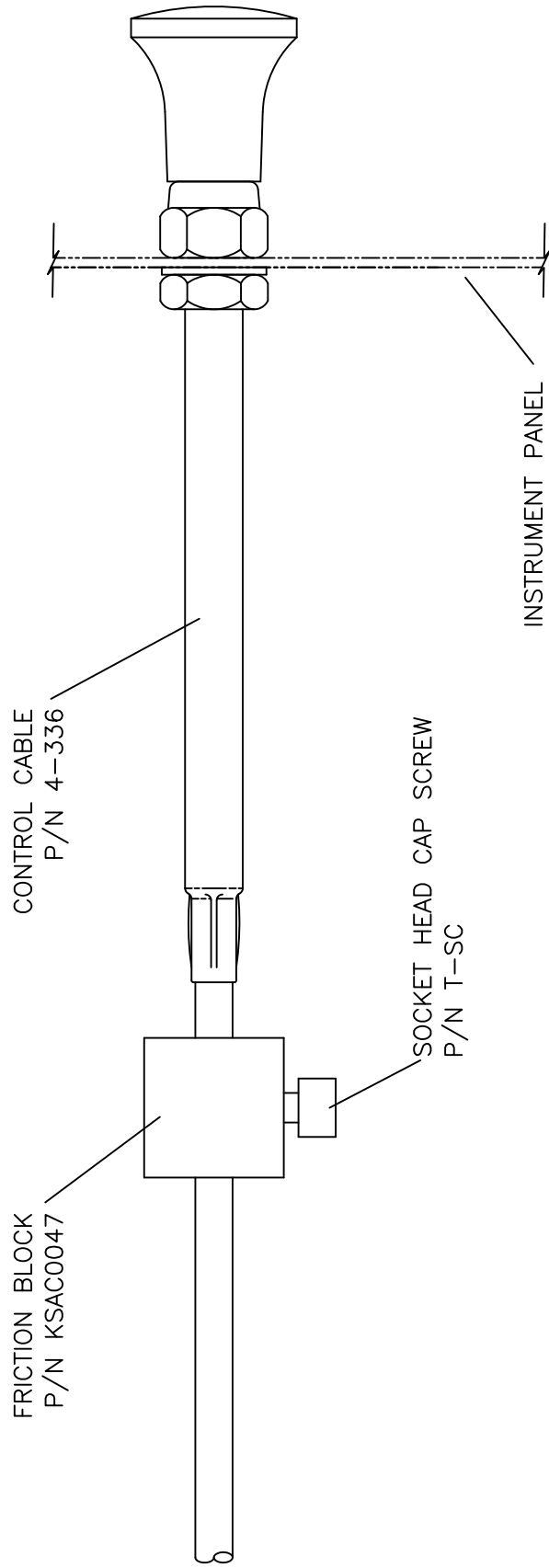
RAVEN S-20 RAVEN
FIREWALL MODIFICATION FOR HYDRAULIC BRAKE INSTALL
FIGURE 01H-03

NOT TO SCALE
FOR REFERENCE ONLY



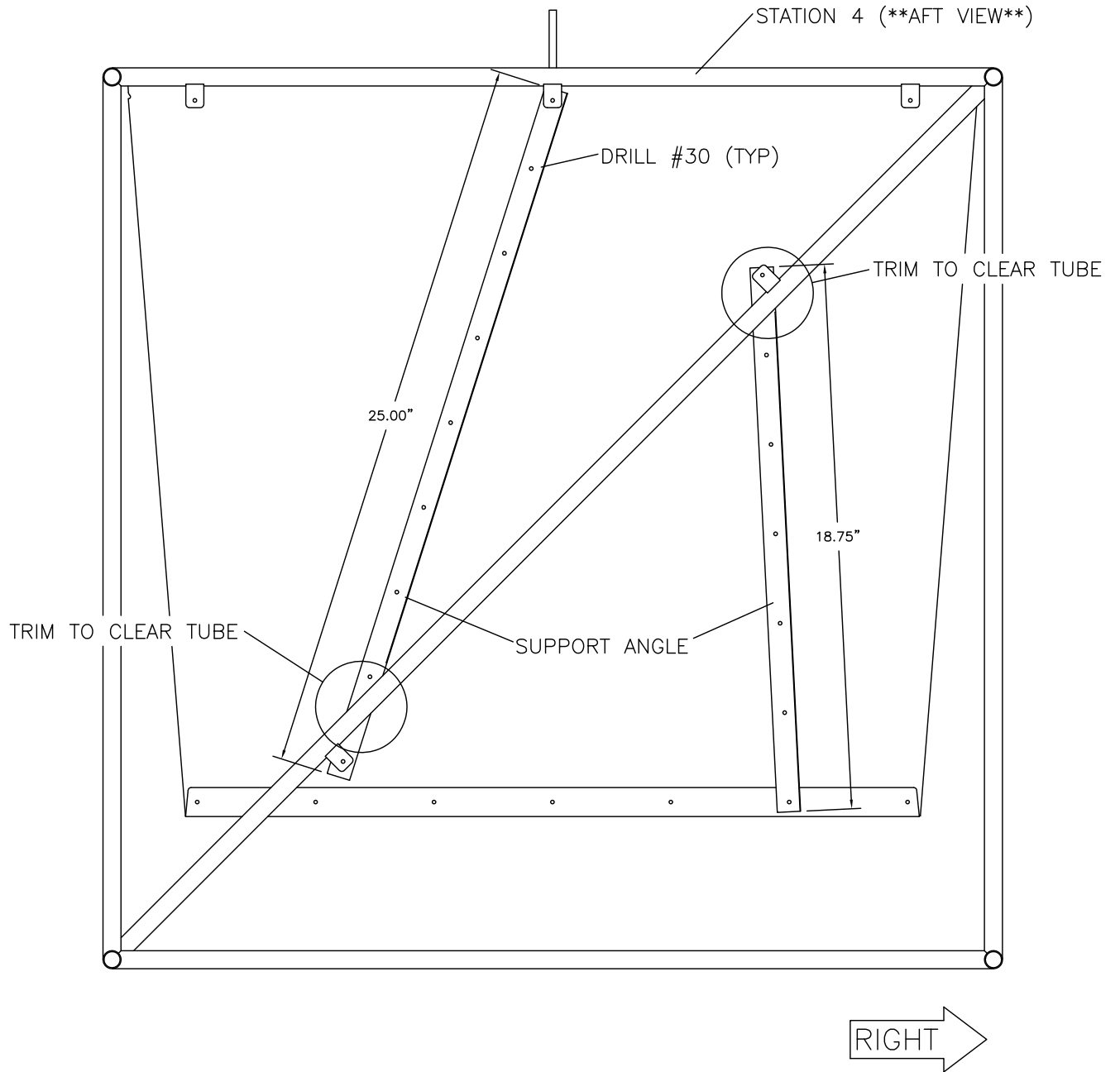
MD5583
REV. A

RAVEN S-20 RAVEN
BRAKE SYSTEM SCHEMATIC
FIGURE 01H-06



MD4423
REV. - ORIG

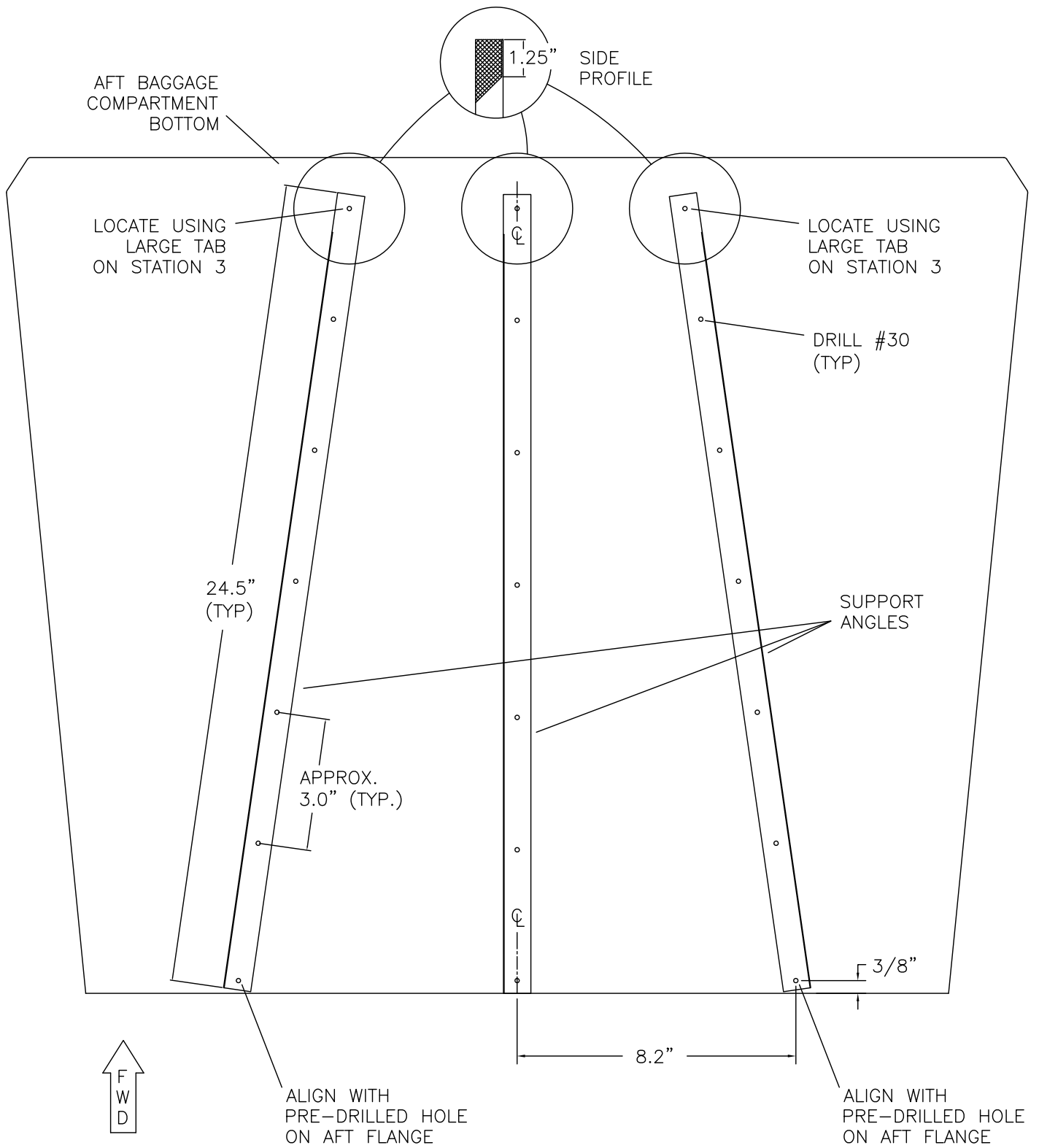
RAMS S-20 RAVEN
CONTROL CABLE INSTALLATION
FIGURE 01H-14



MD5612
REV. B

RANS S-20 RAVEN
AFT BAGGAGE COMPARTMENT - STATION 4
FIGURE 01I-07

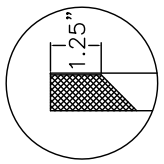
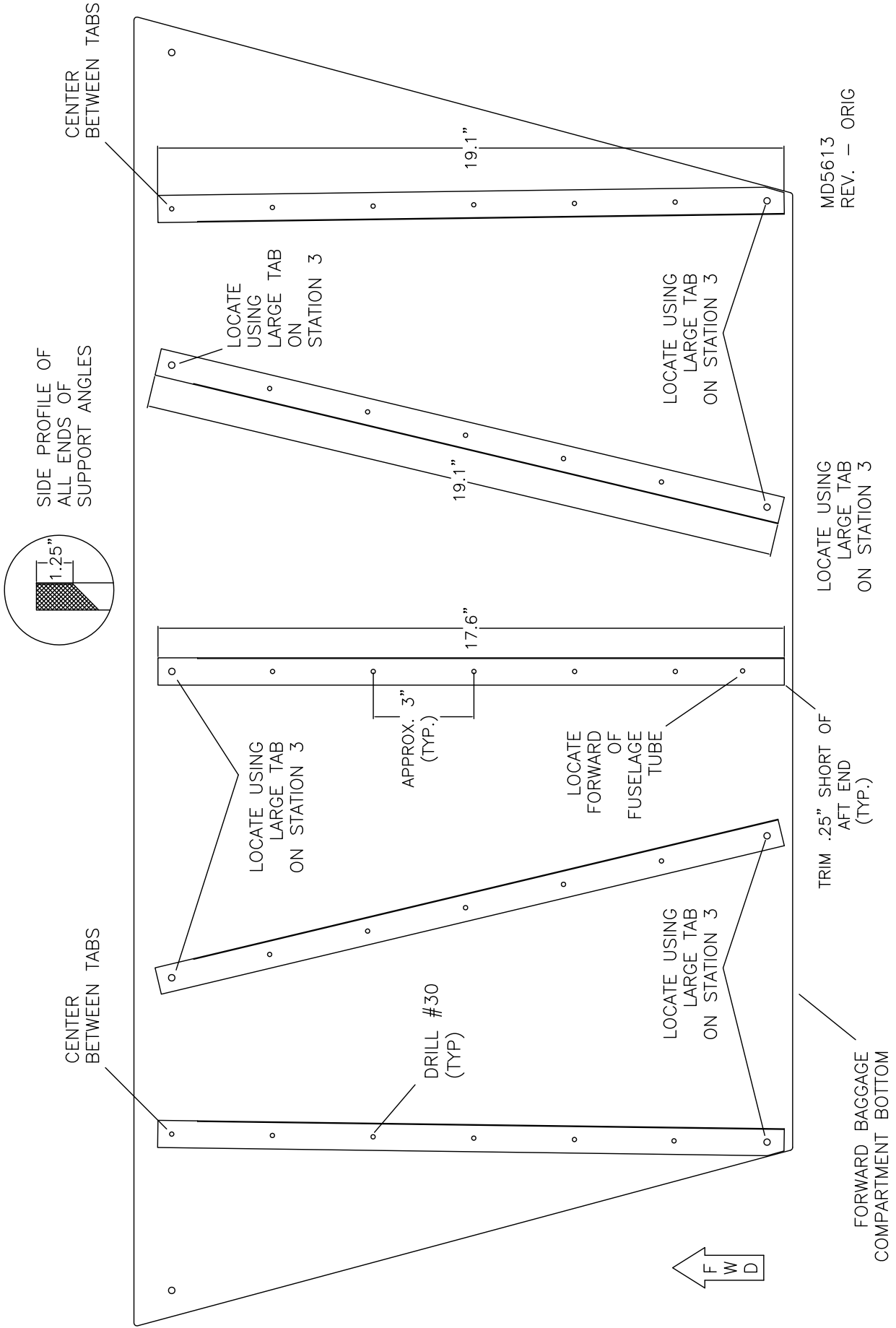
09/01/2013



MD5613
REV. B

RANS S-20 RAVEN
AFT BAGGAGE COMPARTMENT - BOTTOM
FIGURE 01I-07A

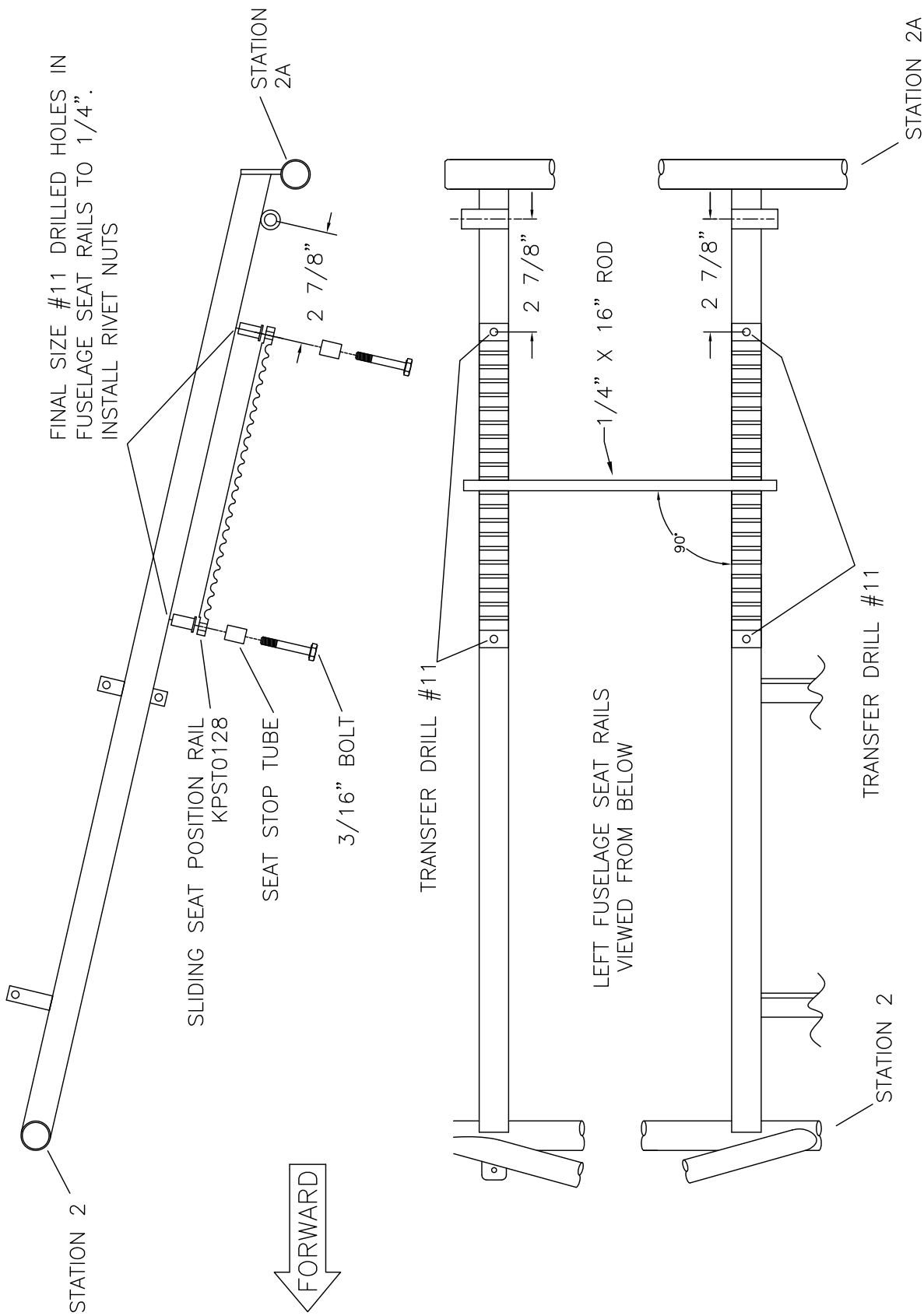
09/01/2013



SIDE PROFILE OF ALL ENDS OF SUPPORT ANGLES

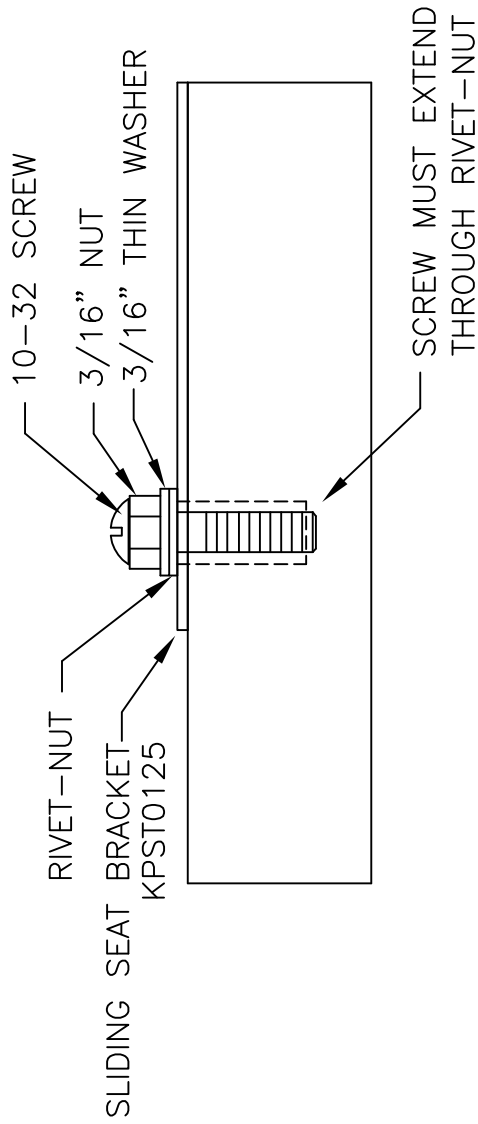
MD5613
REV. - ORIG

RAVEN S-20 RAVEN
FORWARD BAGGAGE COMPARTMENT - BOTTOM
FIGURE 01I-12



MD5615
REV. A

RAVEN S-20 RAVEN
SLIDING SEAT POSITION RAIL LOCATION
FIGURE 01J-01

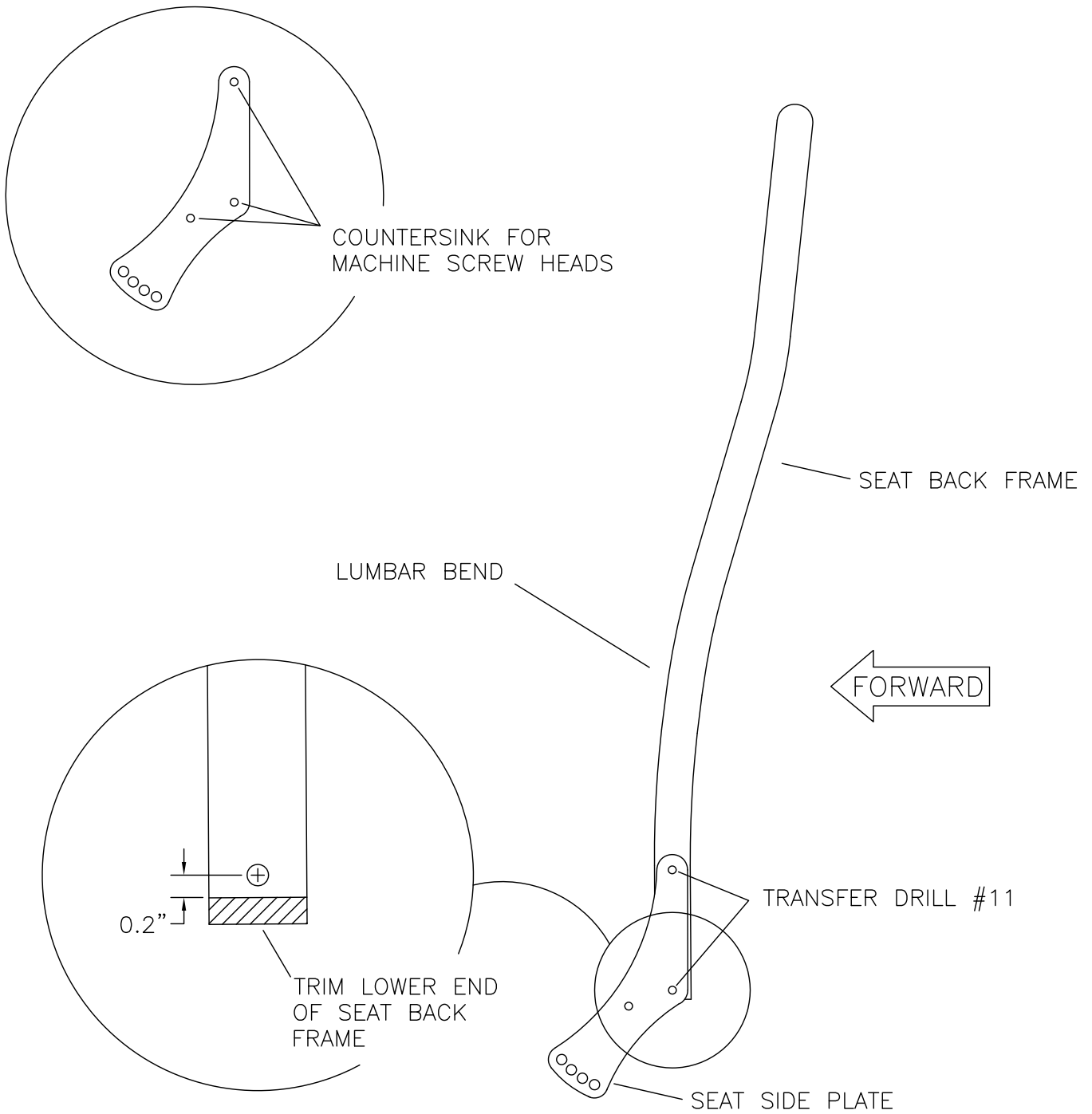


PROCEDURE BELOW MAY BE USED WHEN A RIVET-NUT PULLER IS NOT AVAILABLE.

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.

RRR S-20 RAVEN
 RIVET-NUT INSTALLATION
 FIGURE 01J-02

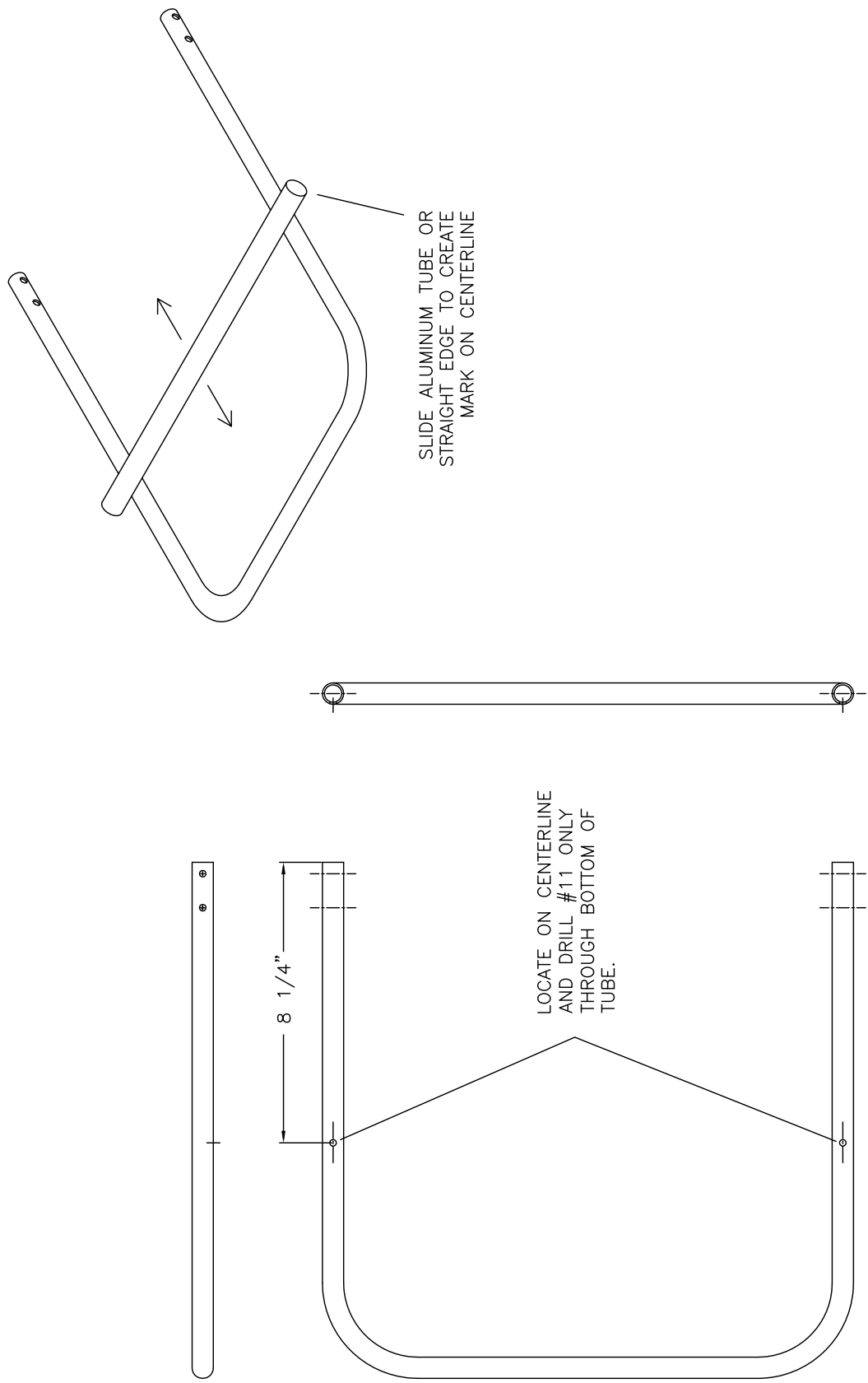
MD343



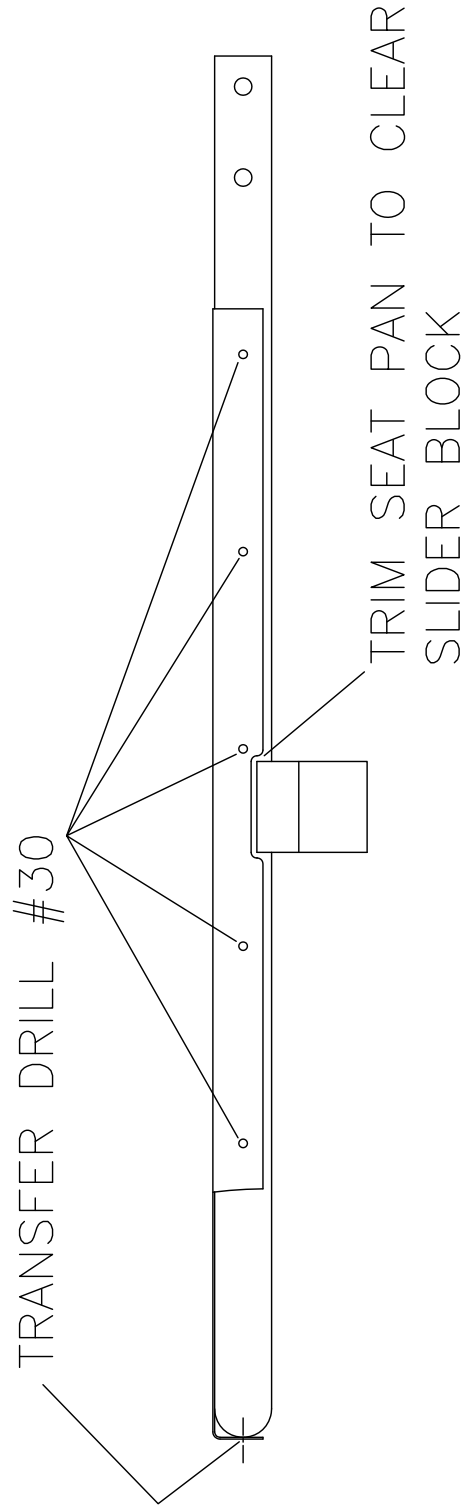
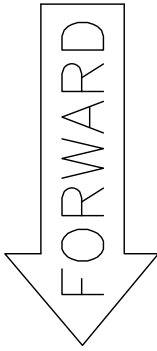
RANS S-20 RAVEN
SEAT BACK ORIENTATION
FIGURE 01J-04

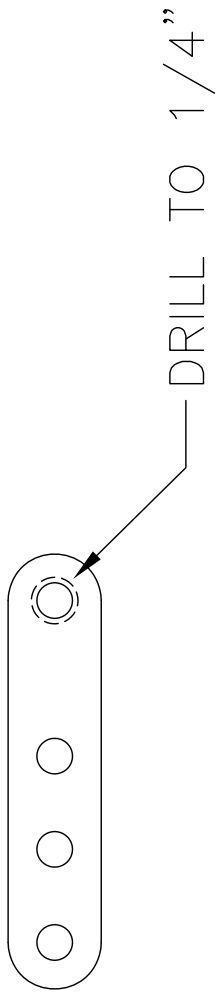
MD5534
 REV. A

04/01/2015



RRR S-20 RAVEN
SLIDING SEAT BOTTOM FRAME MODIFICATION
FIGURE 01J-05

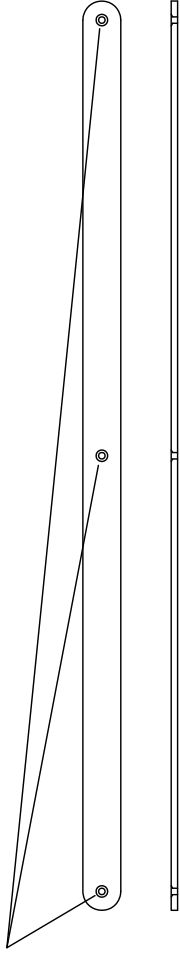




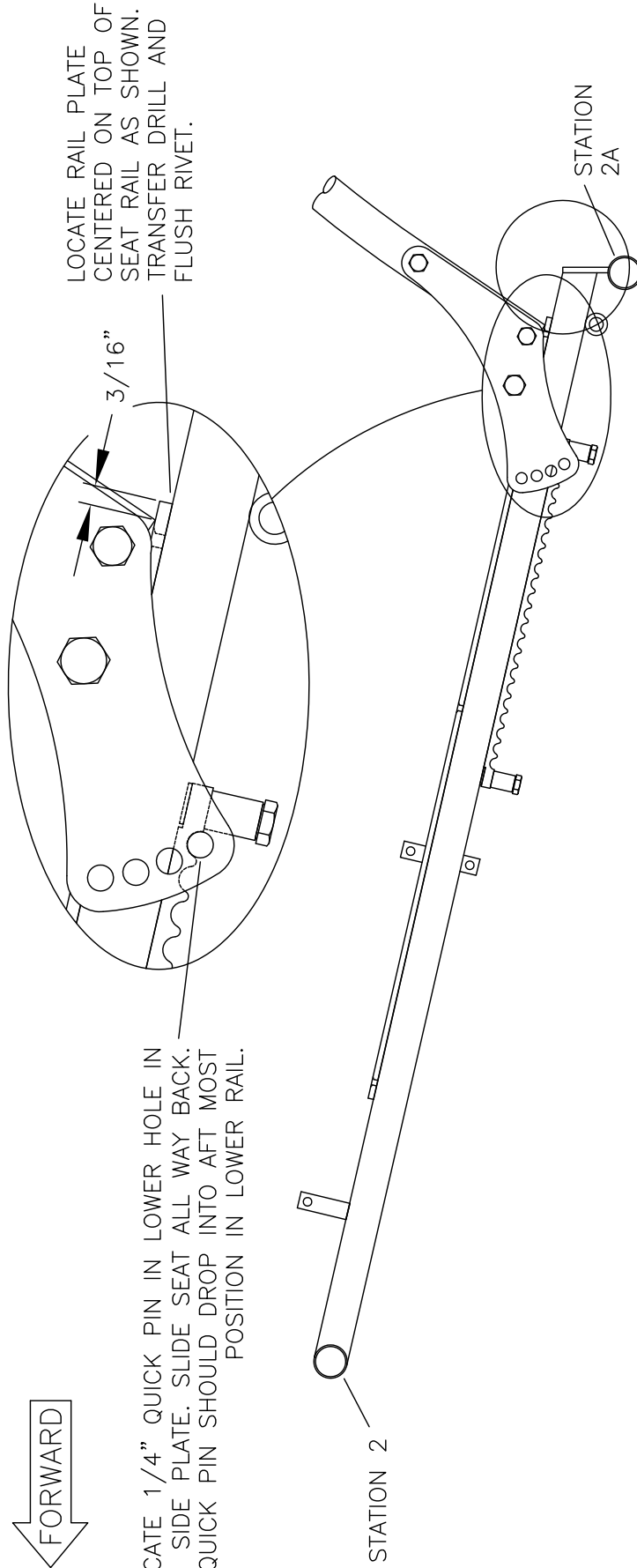
MD5614
REV. - ORIG

RAVEN S-20 RAVEN
MULTI-HOLE TANG MODIFICATION
FIGURE 01J-08

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

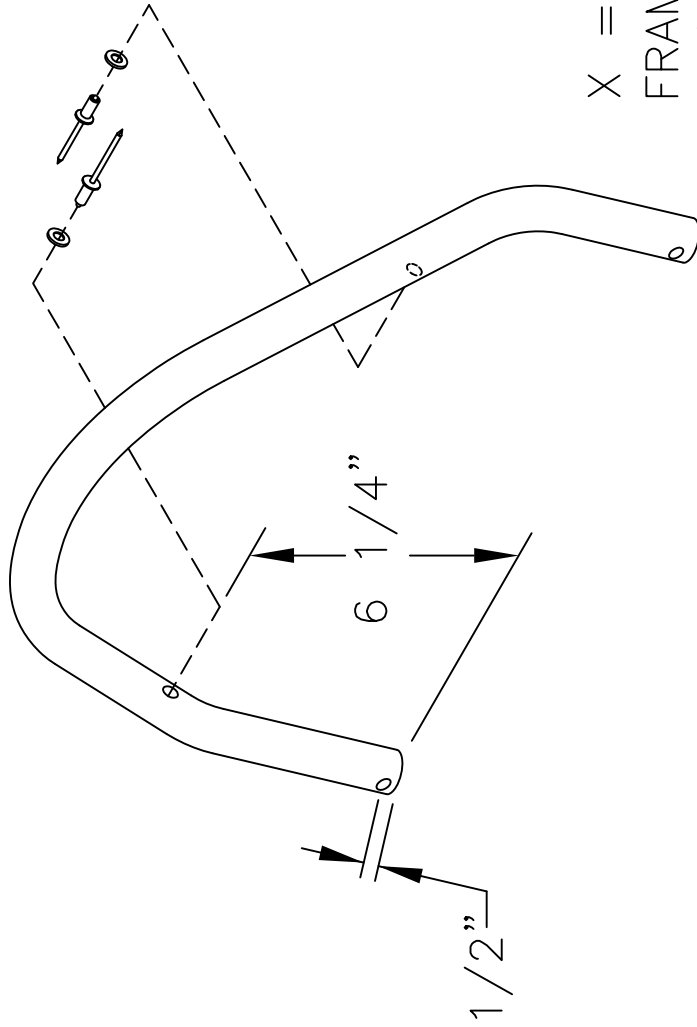


LOCATE 1/4" QUICK PIN IN LOWER HOLE IN
SIDE PLATE. SLIDE SEAT ALL WAY BACK.
QUICK PIN SHOULD DROP INTO AFT MOST
POSITION IN LOWER RAIL.



MD5615

RAVEN S-20 RAVEN
SLIDING SEAT RAIL PLATE LOCATION
FIGURE 01J-12



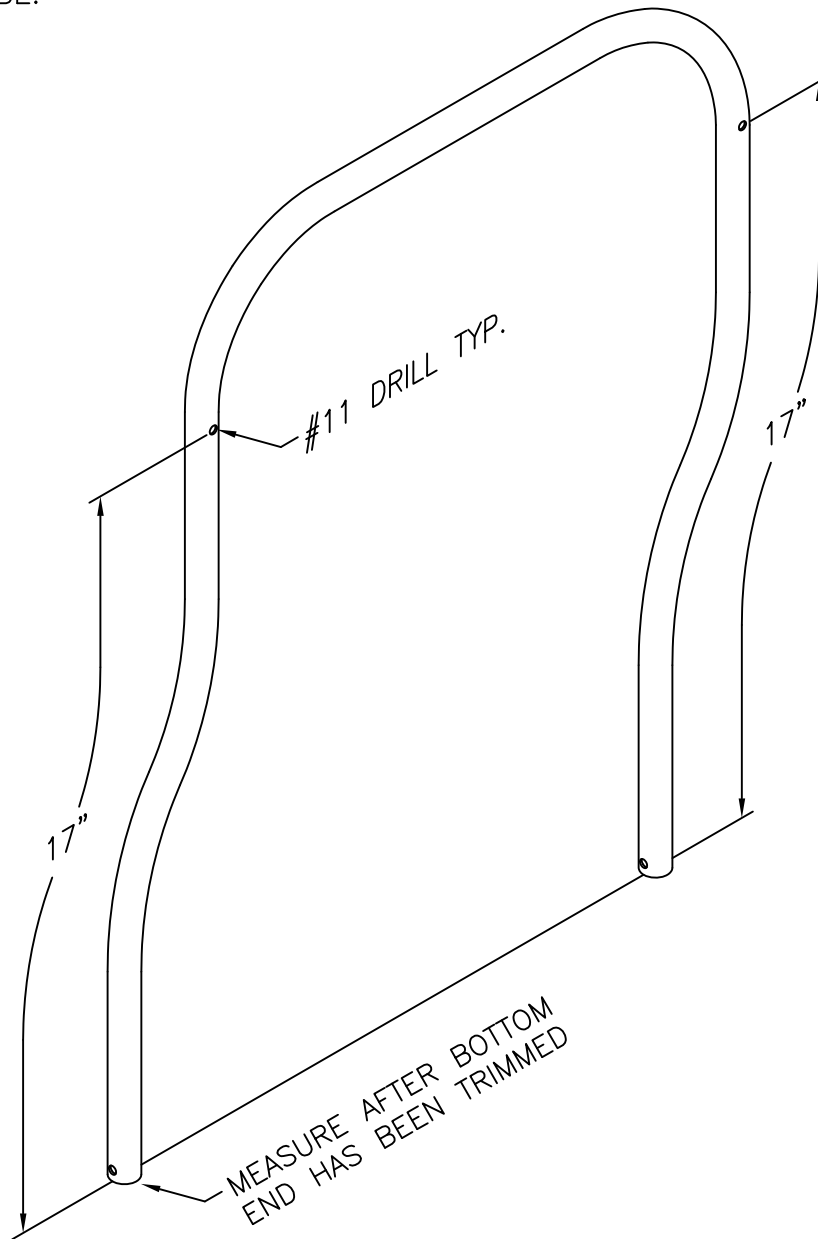
X = WIDTH OF HEADREST
 FRAME AT RIVET (BUTTON)
 LOCATION AFTER
 INSTALLATION ON SEAT BACK.

MD5109

RAMS S-20 RAVEN
 OPTIONAL HEADREST - DRILLING
 FIGURE 01J-24



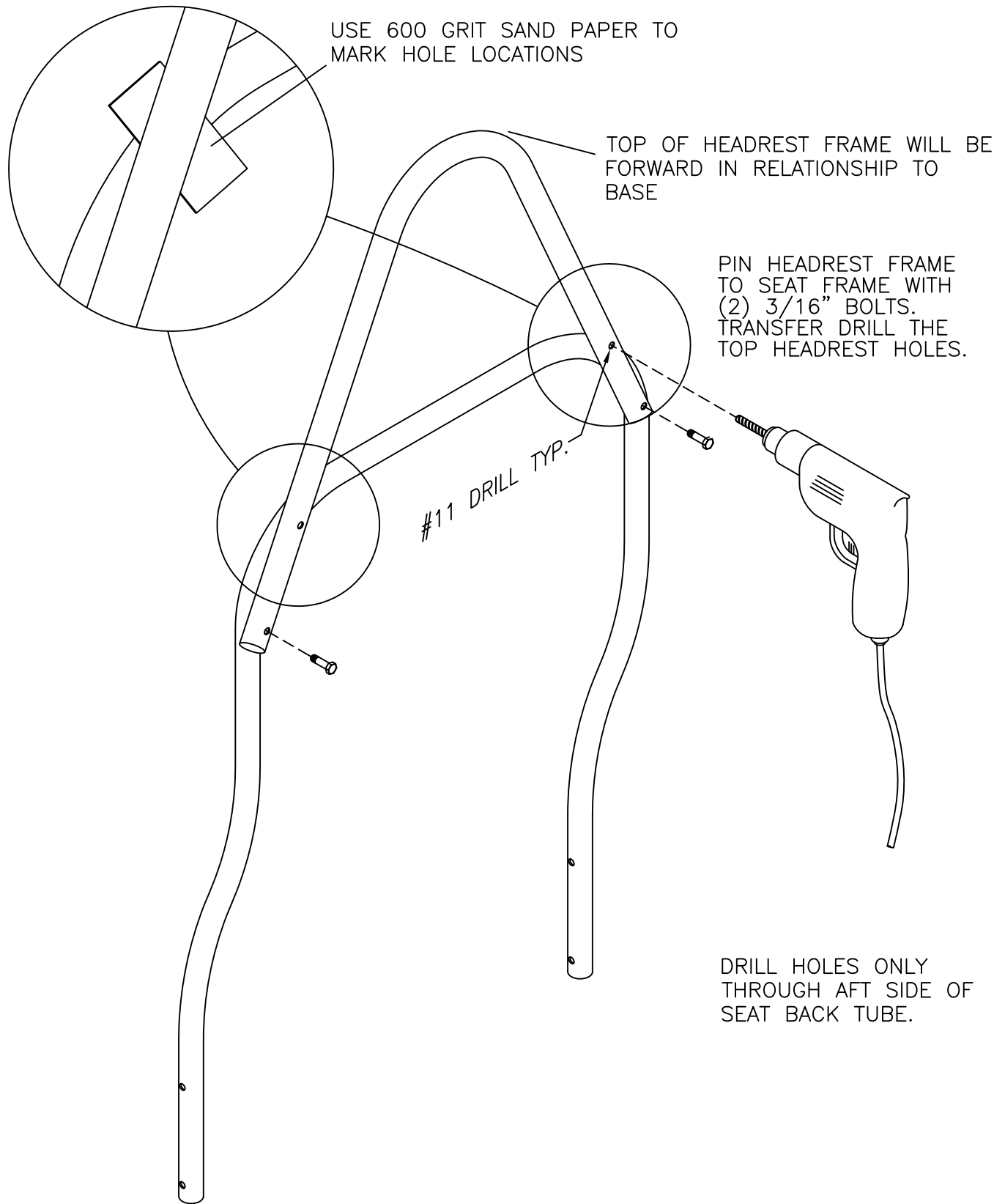
DRILL HOLES ONLY
THROUGH AFT SIDE OF
TUBE.



RANS S-20 RAVEN
SEAT BACK FRAME DRILLING
FIGURE 01J-25

MD5109

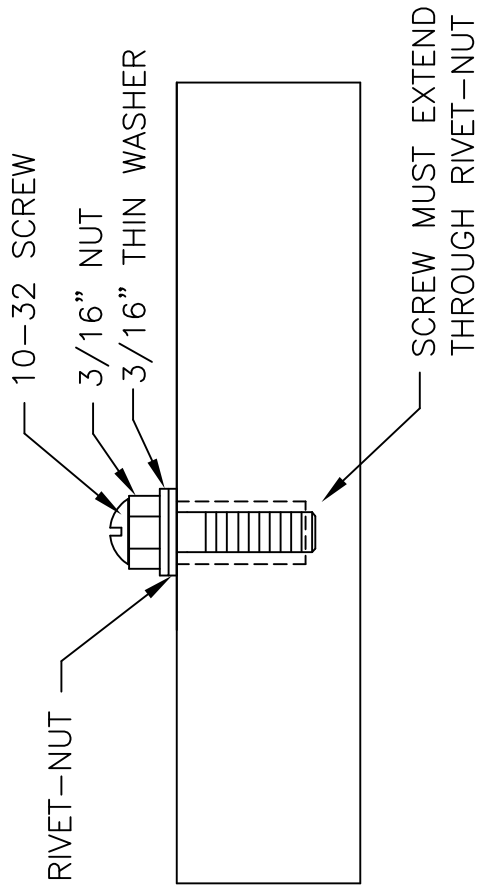
04/01/2015



MD5109

RANS S-20 RAVEN
SEAT HEADREST TO SEAT BACK FRAME DRILLING
FIGURE 01J-26

04/01/2015

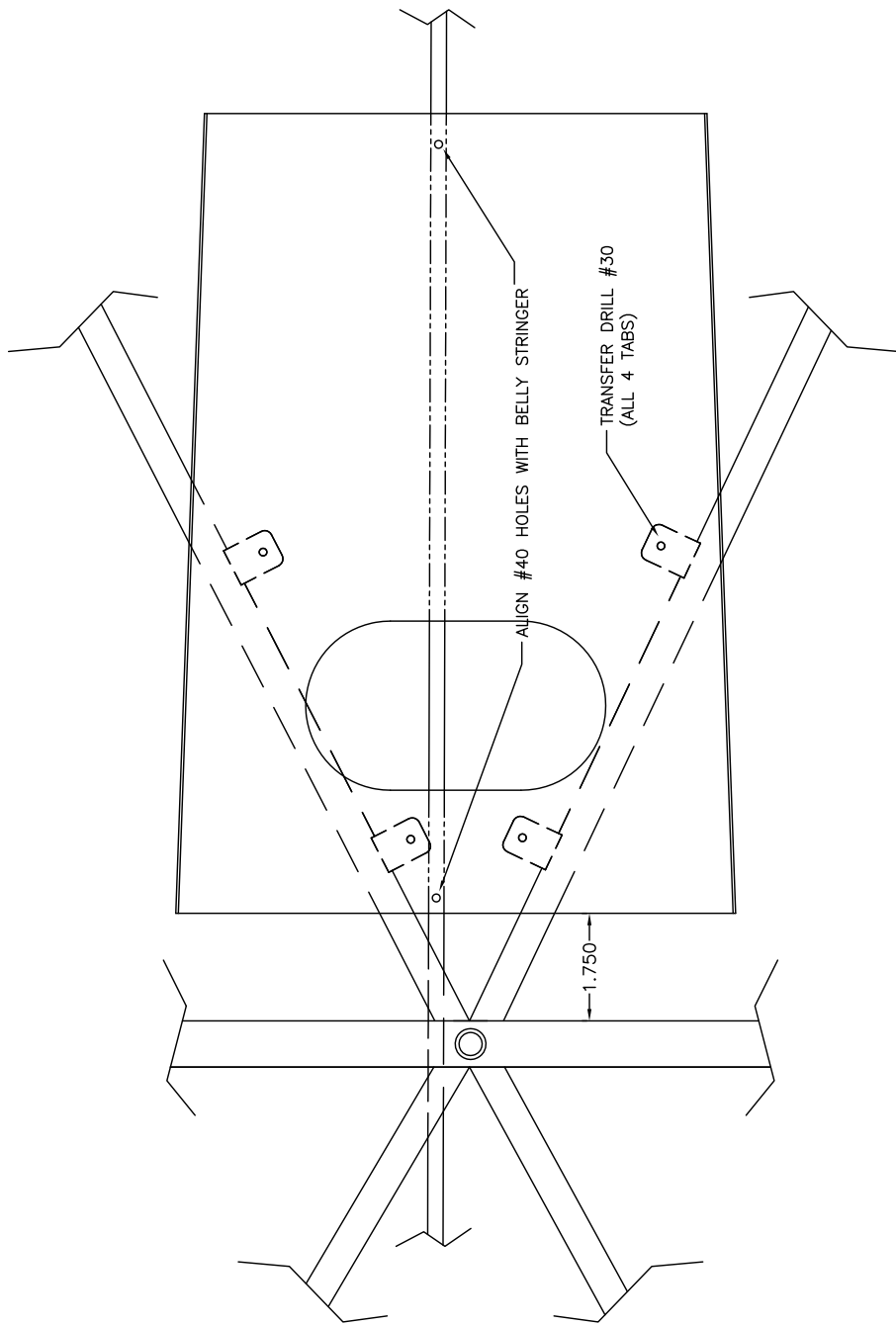


PROCEDURE BELOW MAY BE USED WHEN A RIVET-NUT PULLER IS NOT AVAILABLE.

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.

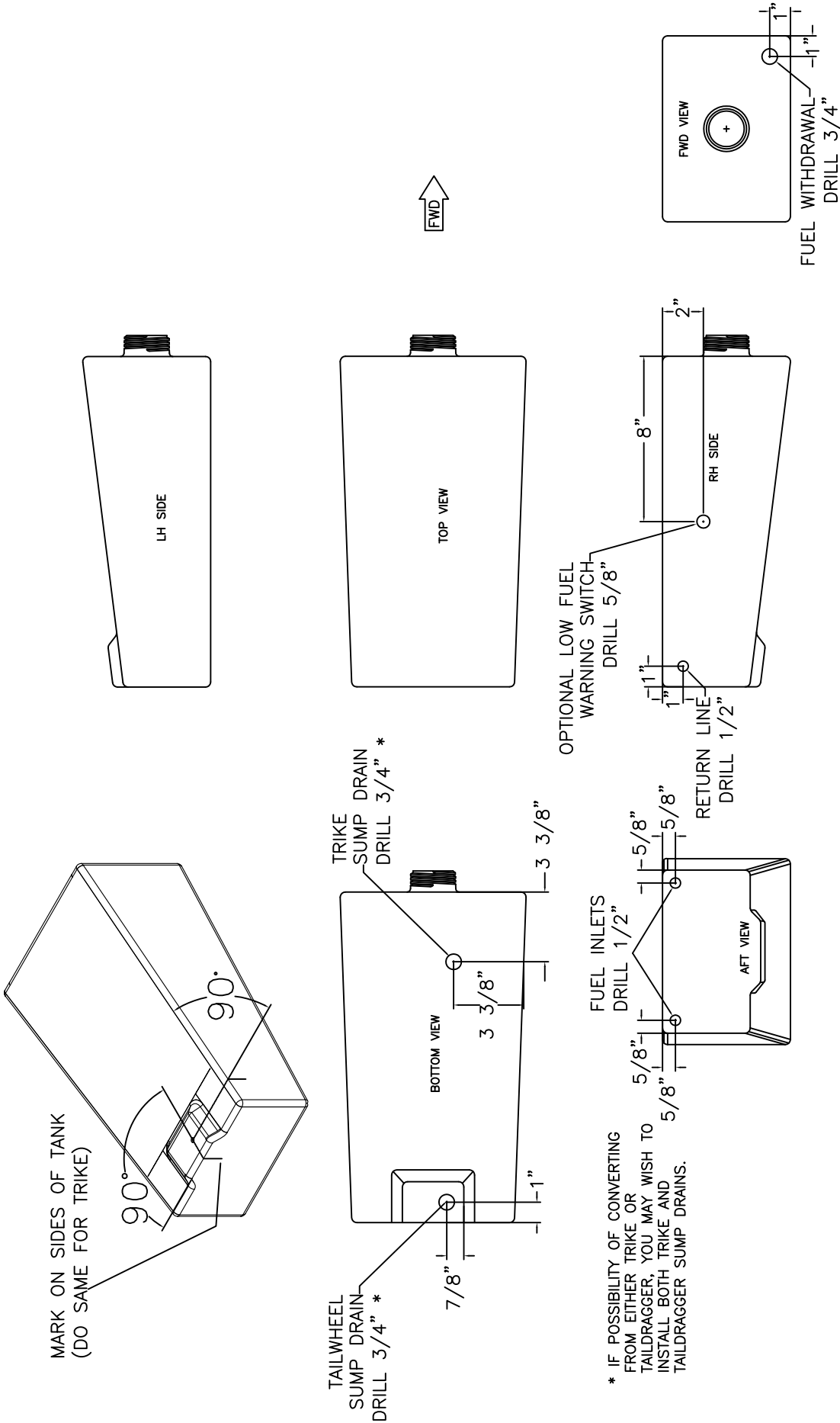
RAMS S-20 RAVEN
 RIVET-NUT INSTALLATION
 FIGURE 01J-27

MD343



MD5616
 REV. A

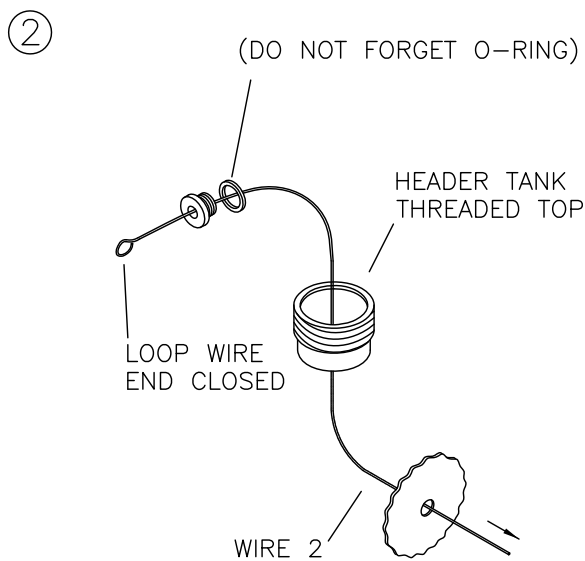
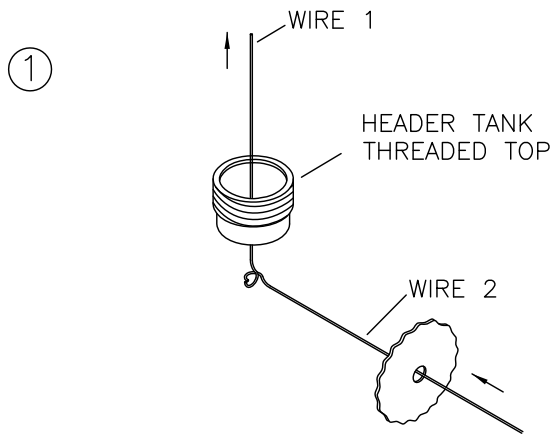
**RAVEN S-20 RAVEN
 HEADER TANK MOUNT
 FIGURE 01K-01**



* IF POSSIBILITY OF CONVERTING FROM EITHER TRIKE OR TAILDRAGGER, YOU MAY WISH TO INSTALL BOTH TRIKE AND TAILDRAGGER SUMP DRAINS.

RAVEN S-20 RAVEN
2.75 GALLON HEADER TANK MODIFICATION
FIGURE 01K-02

MD2861
 REV. B

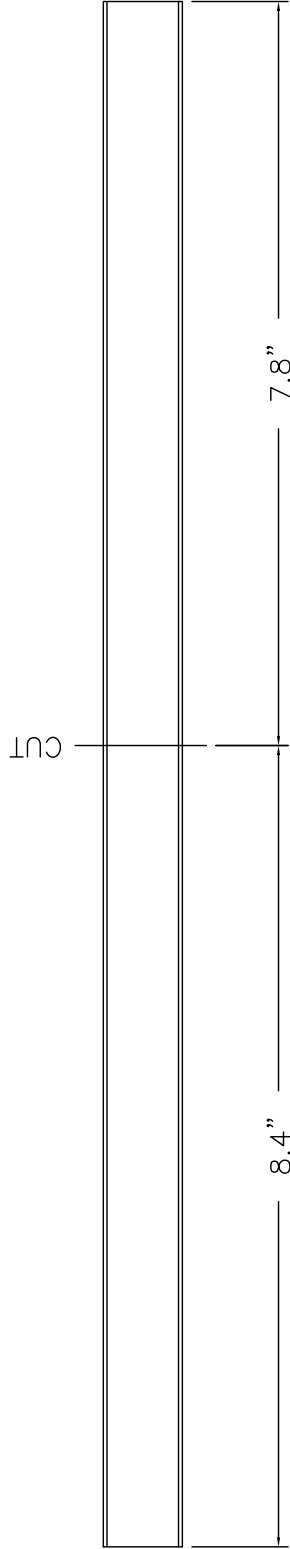
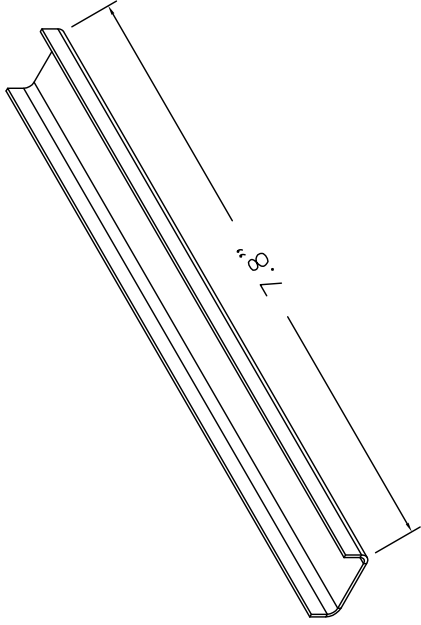
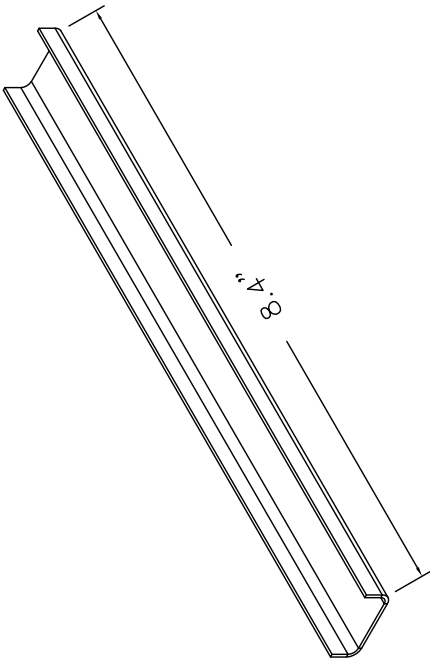


③ INSTALL RUBBER WASHER, STEEL WASHER, LOCTITE, AND NUT.

④ REMOVE WIRE.

RANS S-20 RAVEN
HEADER TANK FITTING INSTALLATION
FIGURE 01K-03

MD4832



CUT TO INDICATED LENGTHS

MD5616

RAMPS S-20 RAVEN
HEADER TANK MOUNT CHANNEL MODIFICATION
FIGURE 01K-08

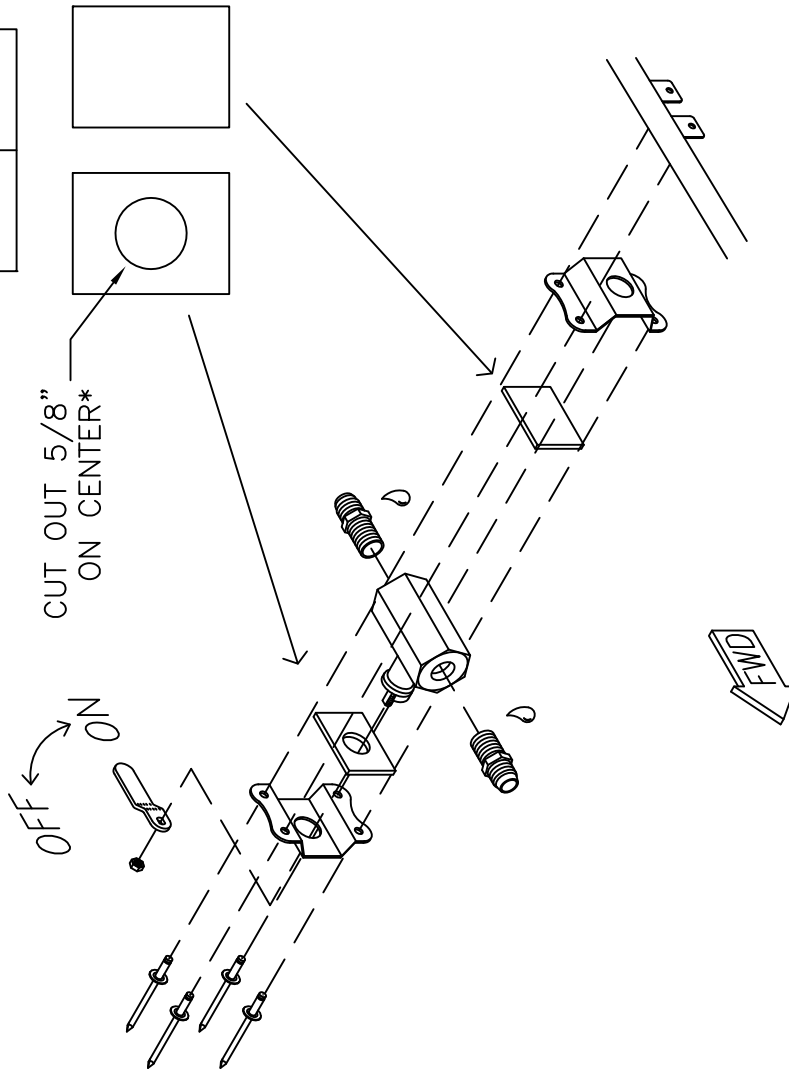
FUEL VALVE
SILICONE PAD
(KPF50106)

CUT INTO 2 PIECES
ON CENTERLINE

OFF ←
ON →

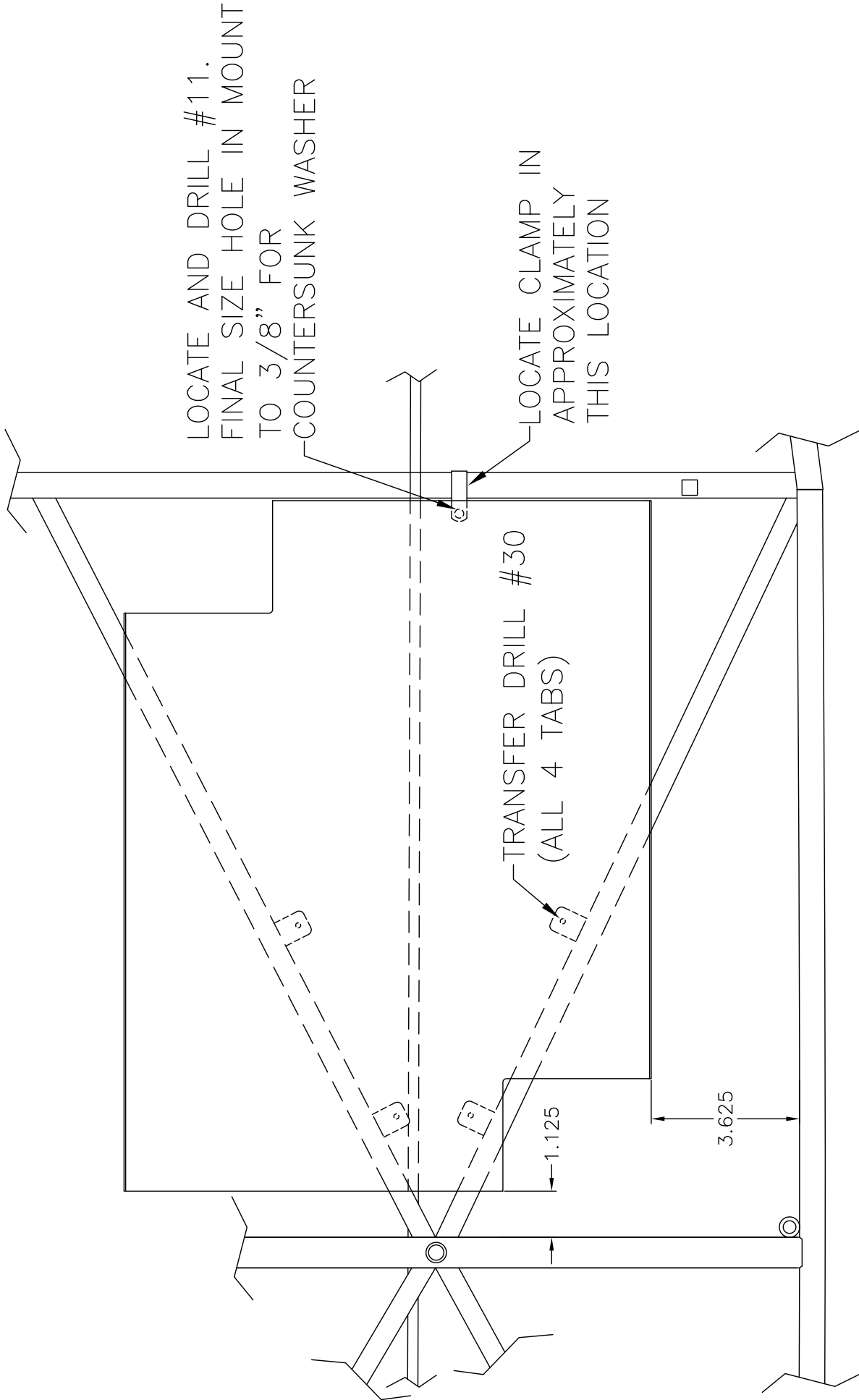
CUT OUT 5/8"
ON CENTER*

* HINT: USE A 5/8" TUBE
SHARPENED ON INSIDE AS
A PUNCH TO CUT HOLE.



MD4388
REV. A

RAVEN S-20 RAVEN
FUEL VALVE MOUNTING
FIGURE 01K-09

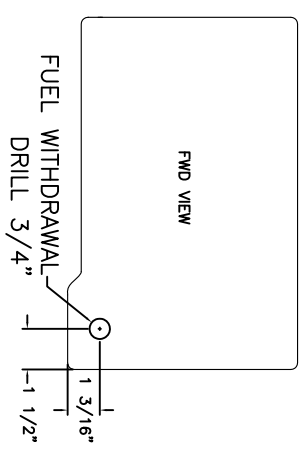
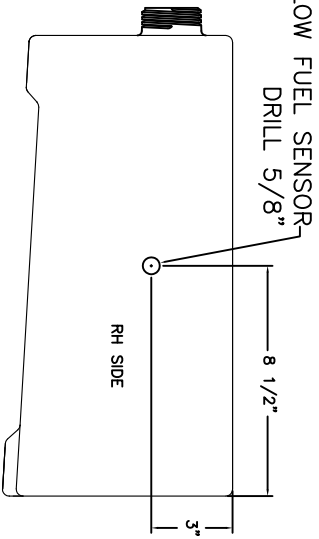
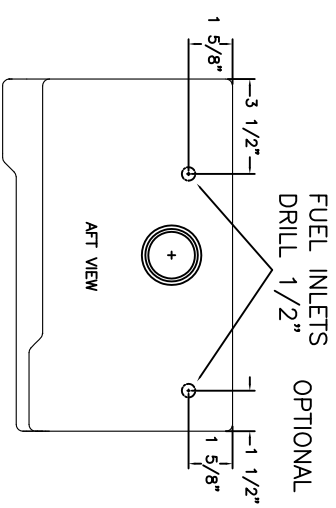
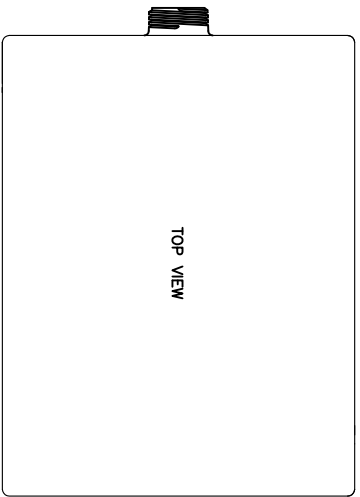
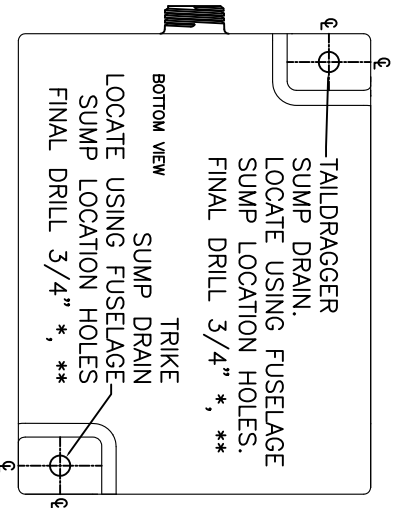
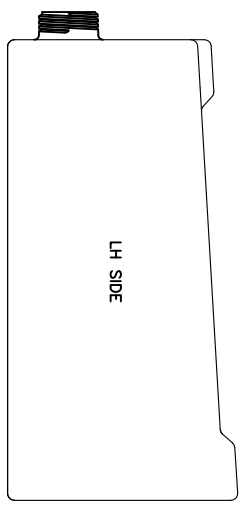


MD5616

RAVEN S-20 RAVEN
OPTIONAL 6.9 GALLON HEADER TANK MOUNT
FIGURE 01K-22

* IF POSSIBILITY OF CONVERTING FROM EITHER TRIKE OR TAILDRAGGER, YOU MAY WISH TO INSTALL BOTH TRIKE AND TAILDRAGGER SUMP DRAINS.

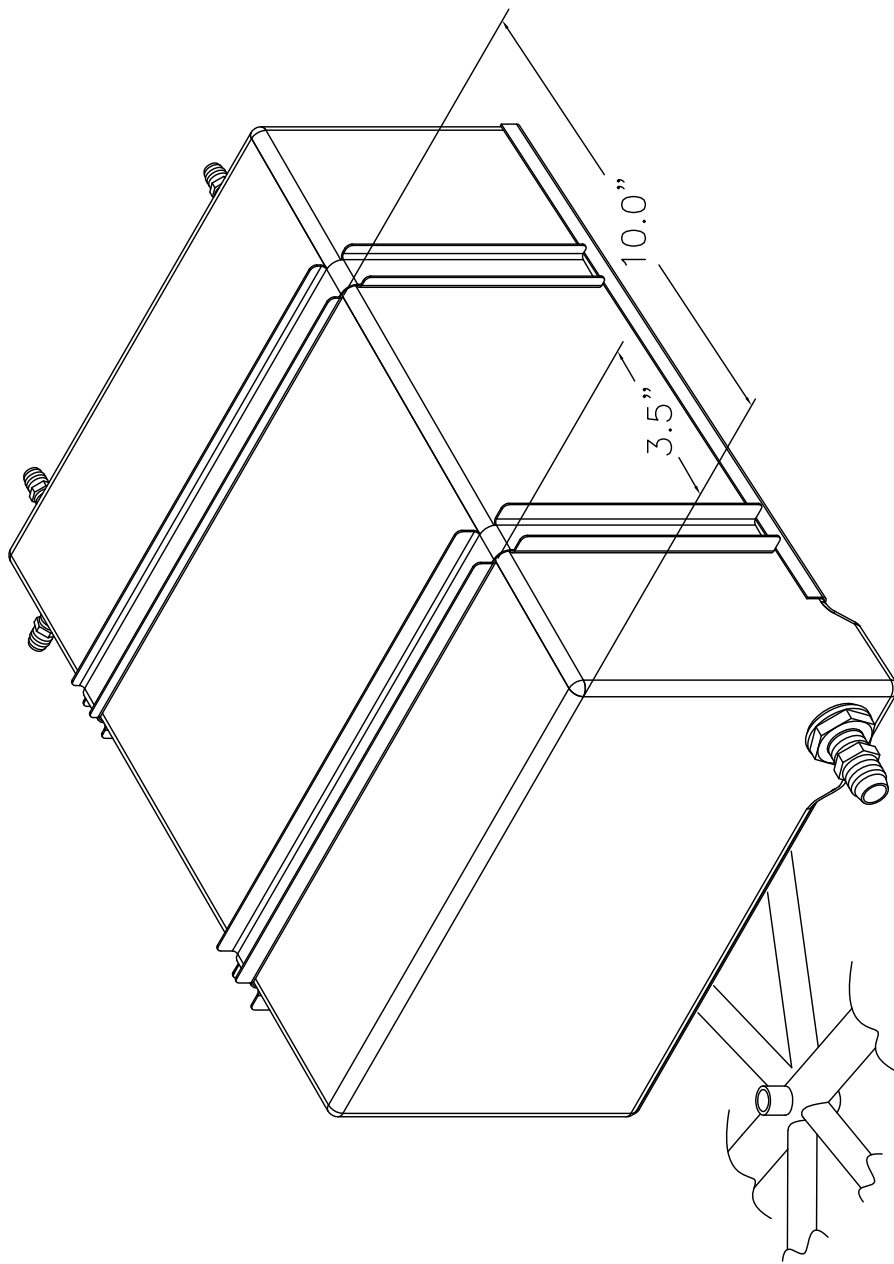
** SUMP DRAIN SHOULD BE LOCATED IN APPROXIMATELY THIS AREA WHEN FINAL DRILLED AND INSTALLED.



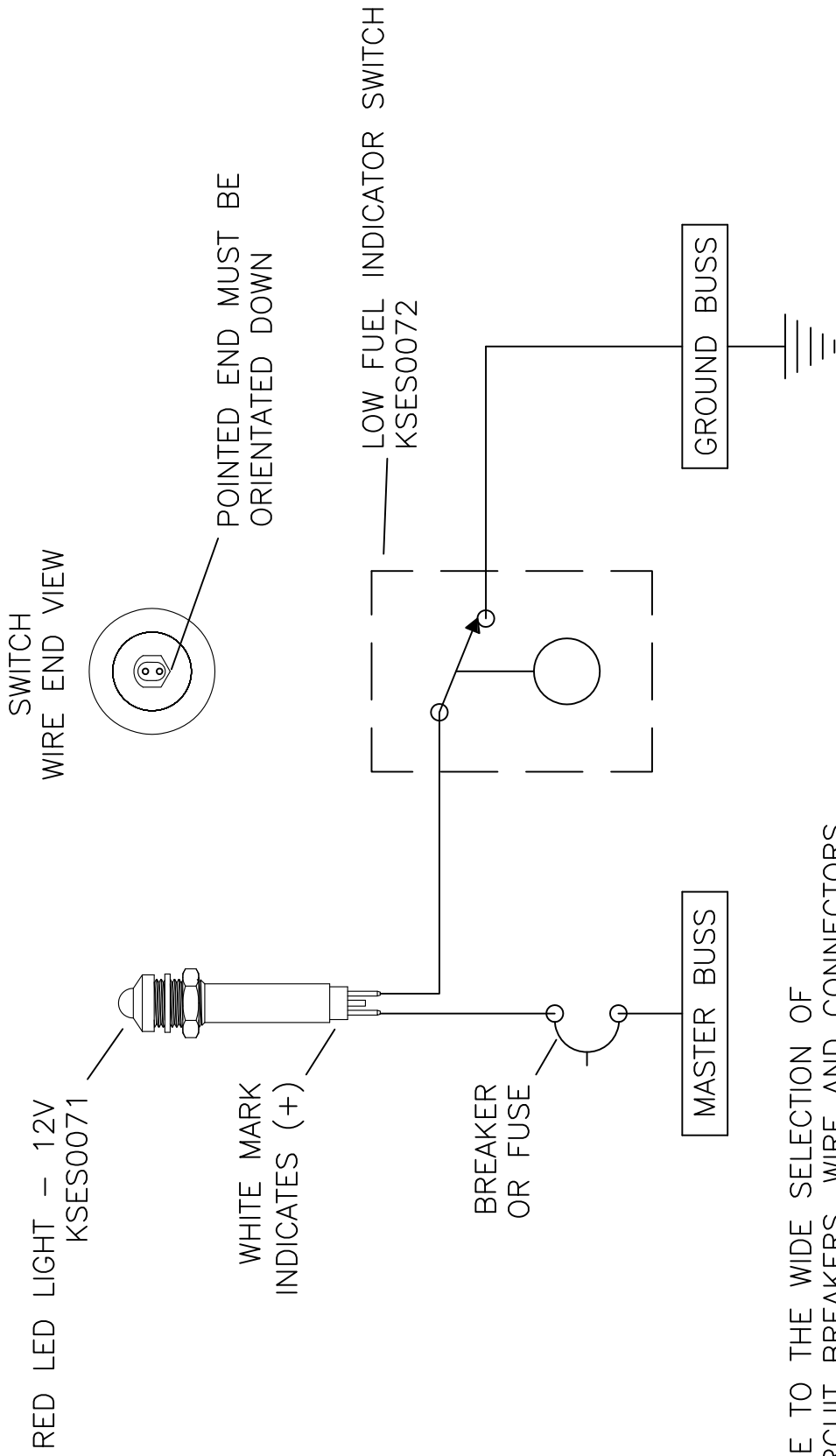
REDUNDANT S-20 RAVEN

OPTIONAL 6.9 GALLON HEADER TANK MODIFICATION
FIGURE 01K-23

MD2861
REV. B

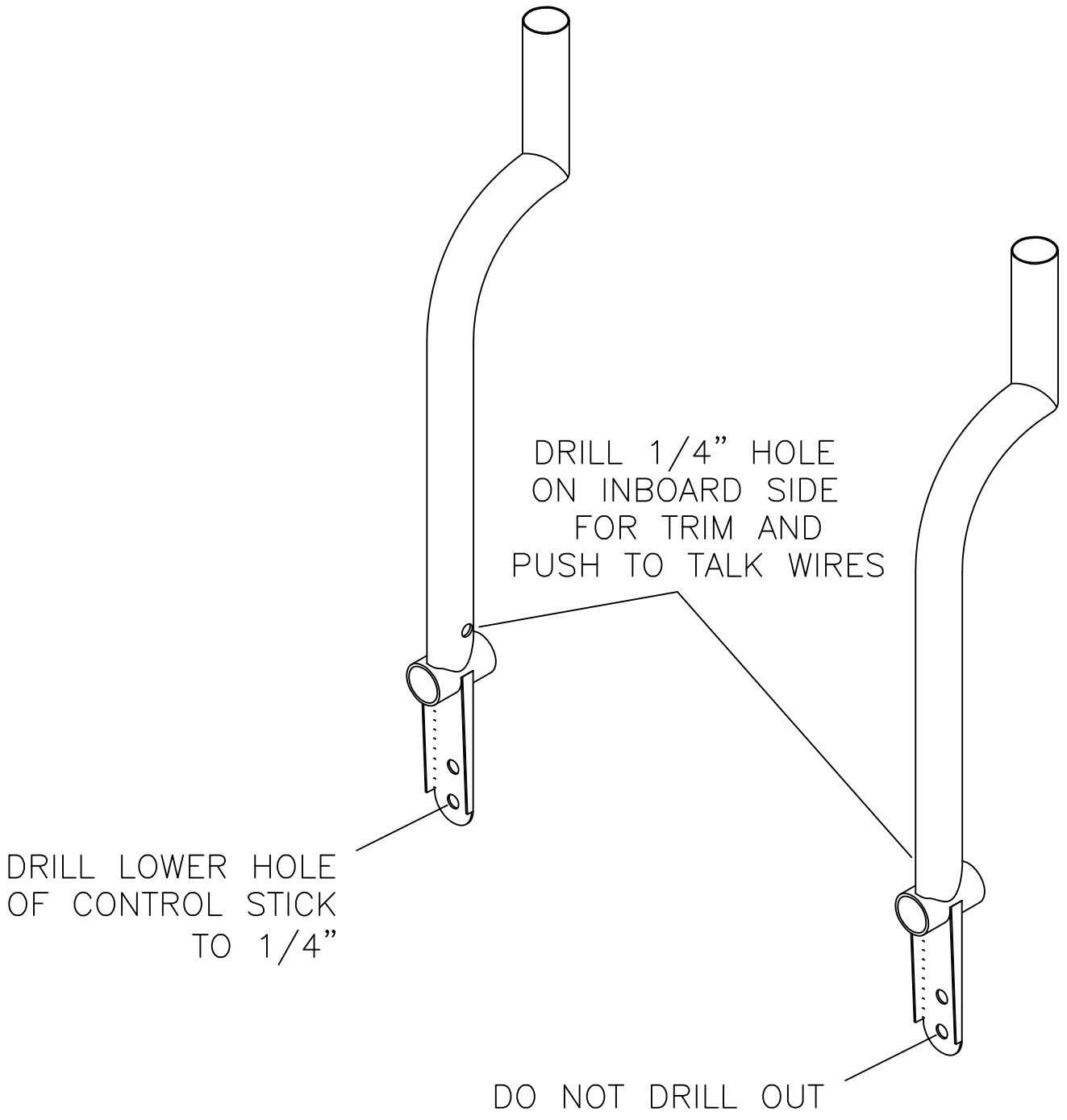


RAMS S-20 RAVEN
OPTIONAL 6.9 GALLON HEADER TANK
MOUNT CHANNEL LOCATION
FIGURE 01K-29



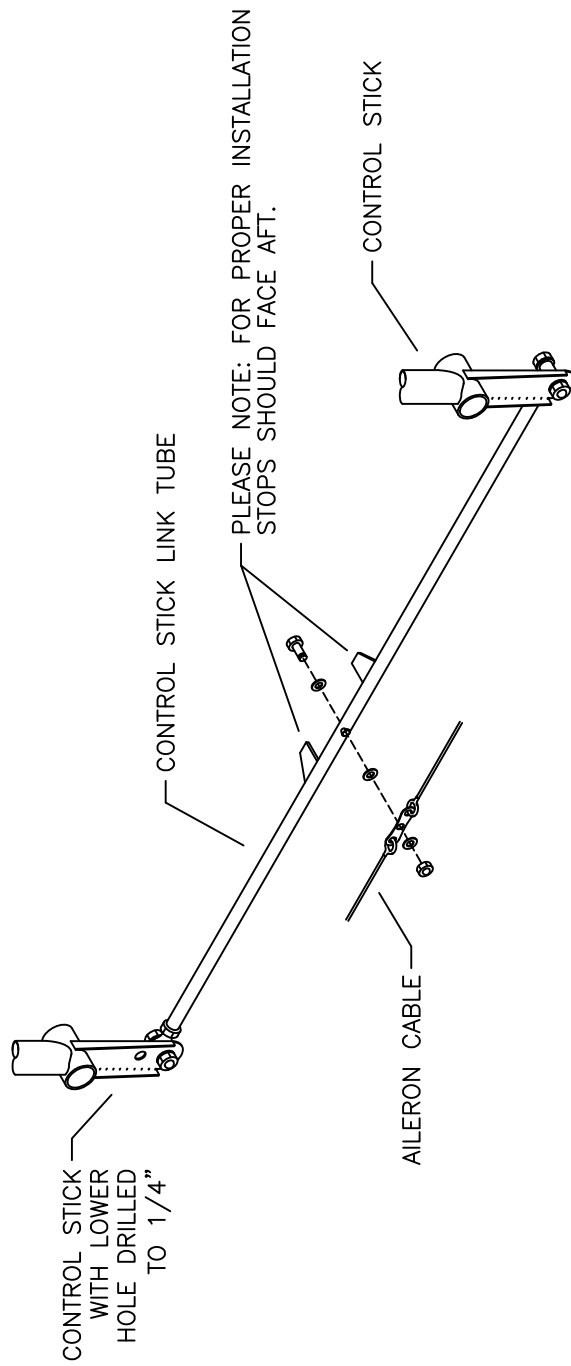
DUE TO THE WIDE SELECTION OF
CIRCUIT BREAKERS, WIRE AND CONNECTORS
WHICH MAY BE USED TO CUSTOMIZE YOUR
AIRCRAFT. THESE ITEMS ARE "BUILDER SUPPLIED"

RAVEN S-20 RAVEN
LOW FUEL WARNING SYSTEM WIRING
FIGURE 01K-34



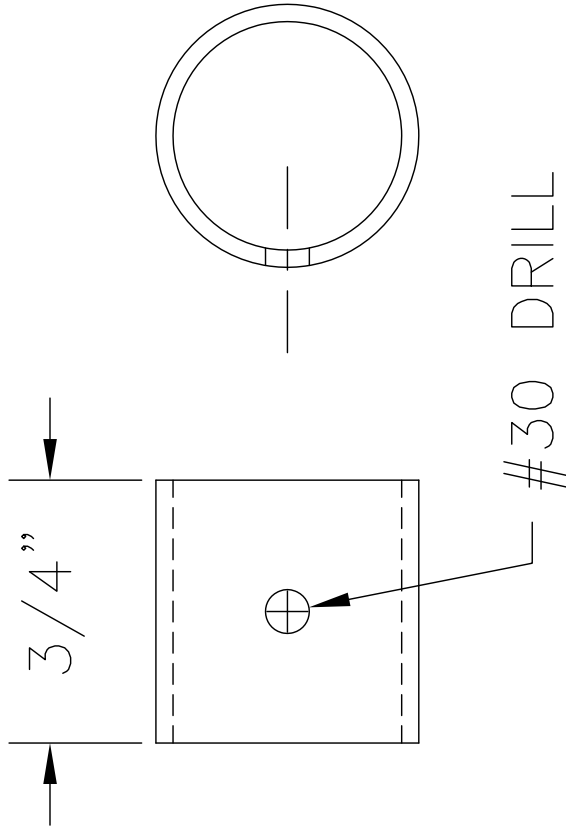
MD510
REV. - ORIG

RANS S-20 RAVEN
CONTROL STICK MODIFICATION
FIGURE 02-02



MD510
REV. - ORIG

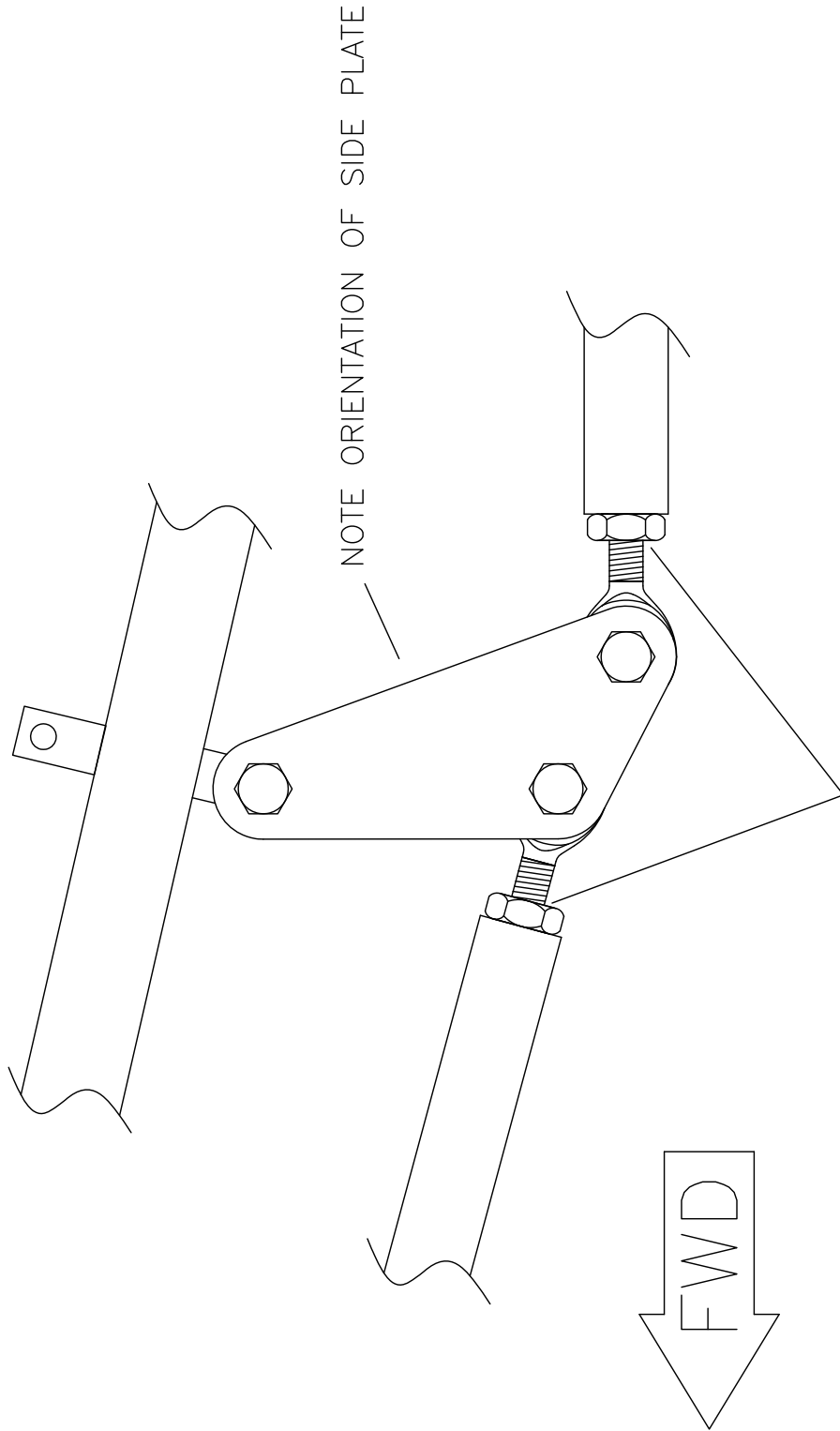
RAVEN S-20 RAVEN
CONTROL STICK LINK TUBE
FIGURE 02-05



FABRICATE 2

MD3650
REV. - ORIG

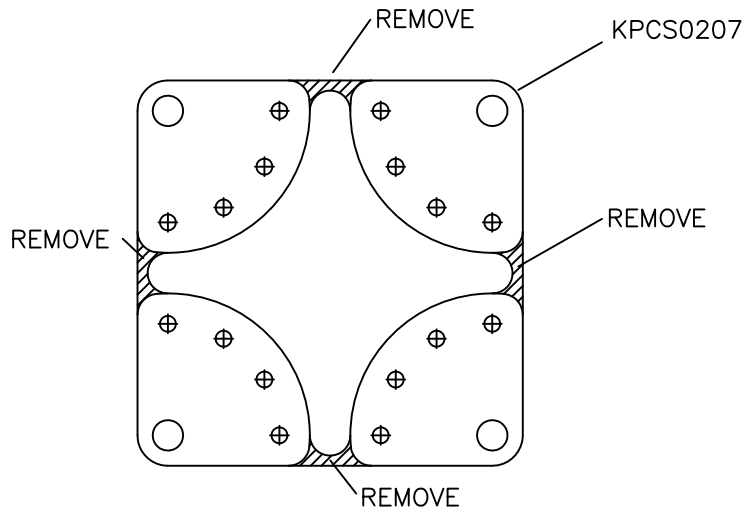
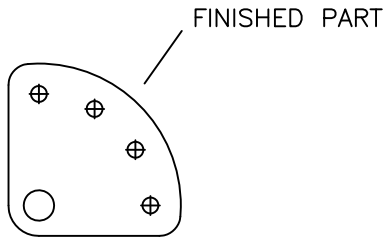
RAMS S-20 RAVEN
ALUMINUM STOP SLEEVE FABRICATION
FIGURE 02A-02



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

MD3650
 REV. - ORIG

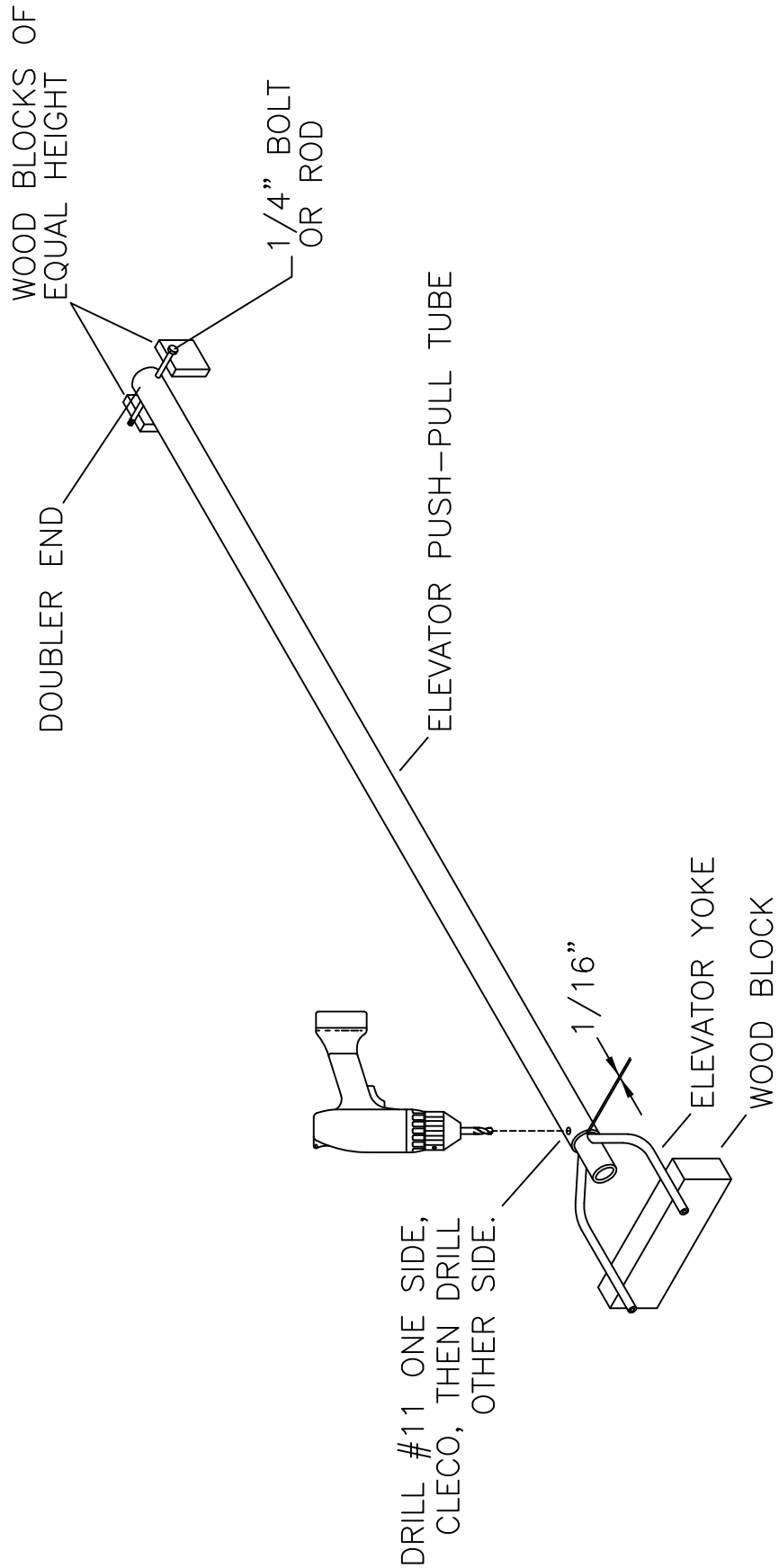
RAMMS S-20 RAVEN
SIDE PLATE INSTALLATION
FIGURE 02A-03



REMOVE SHADED AREA, MAKES 4 PARTS

MD4390

RANS S-20 RAVEN
CABLE KEEPER MODIFICATION
FIGURE 02A-05

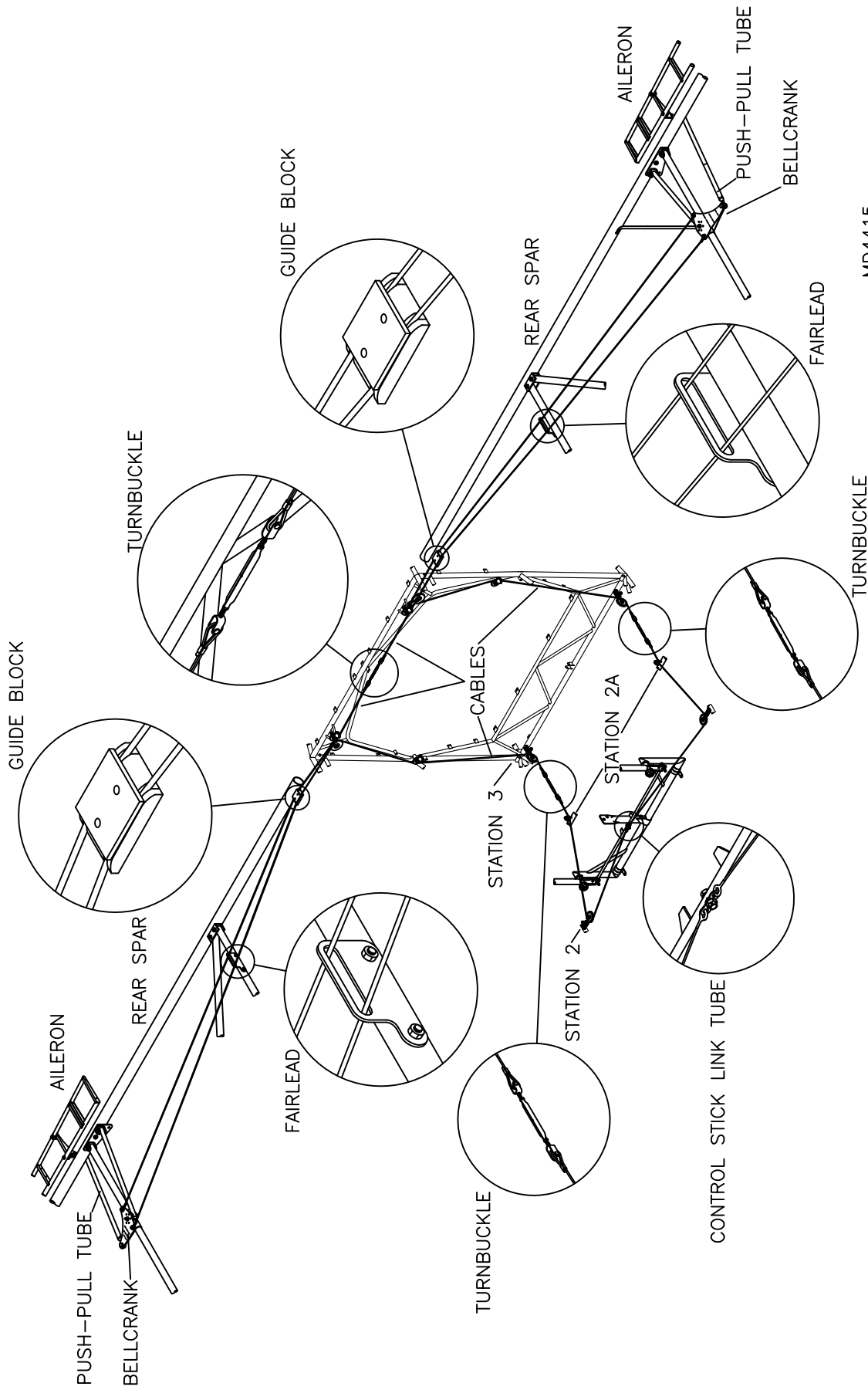


DRILL #11 ONE SIDE,
CLECO, THEN DRILL
OTHER SIDE.

1/16"

MD565
REV. - ORIG

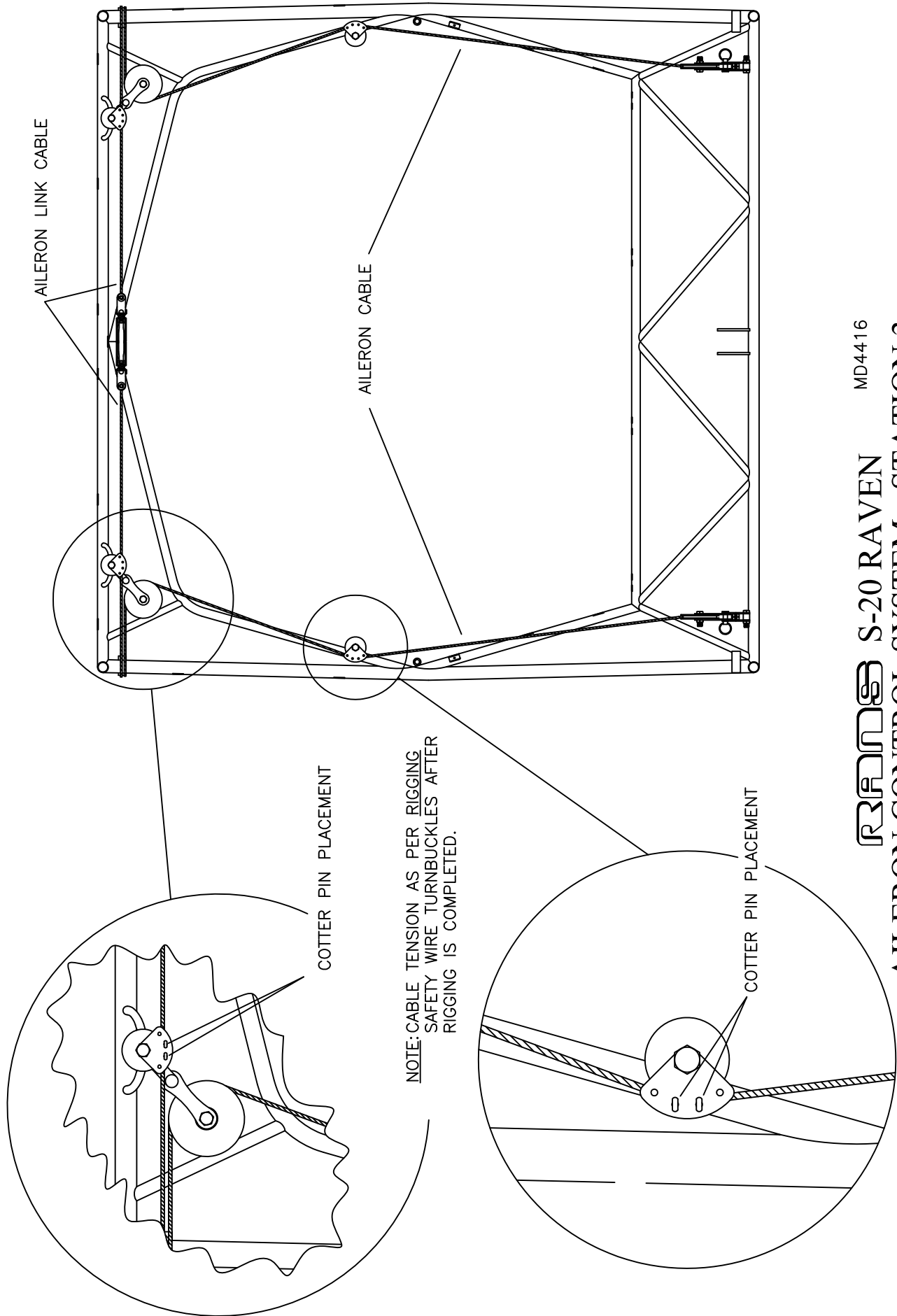
RAVEN S-20 RAVEN
ELEVATOR YOKE ORIENTATION
FIGURE 02B-05



MD4415

TURNBUCKLE

RAVEN S-20 RAVEN
AILERON CONTROL SYSTEM OVERVIEW
FIGURE 02C-06

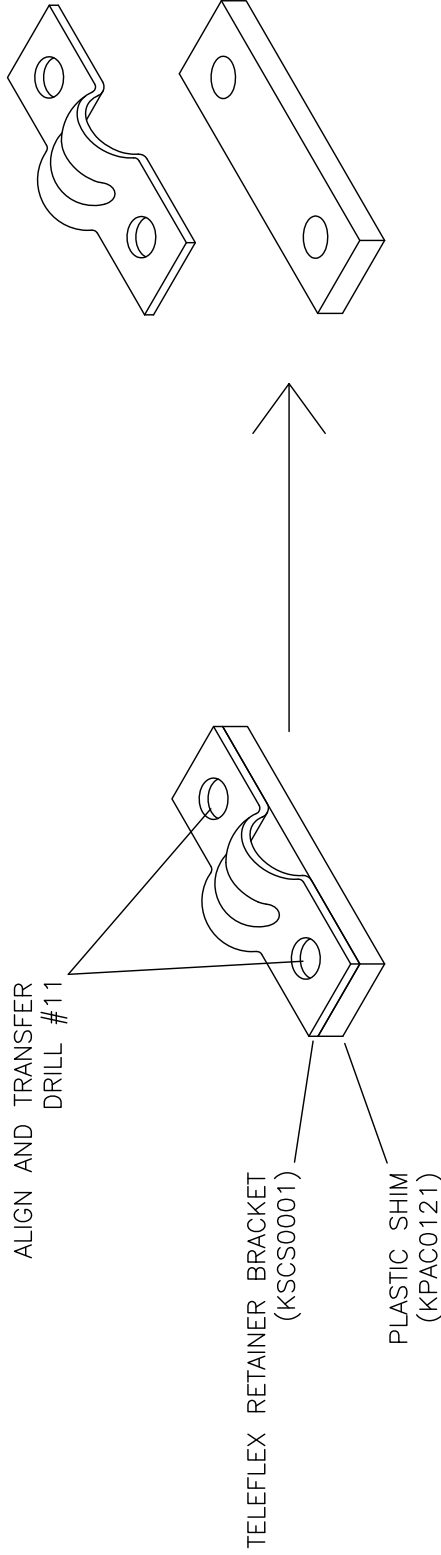


MD4416

RAMROD S-20 RAVEN

AILERON CONTROL SYSTEM - STATION 3

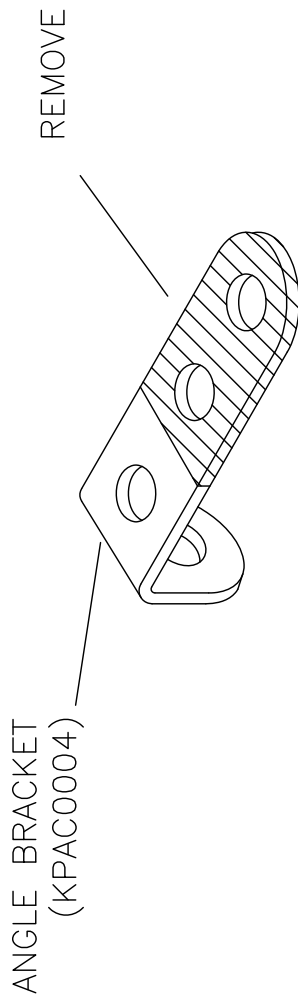
FIGURE 02C-07



MODIFY 2 PLASTIC SHIMS

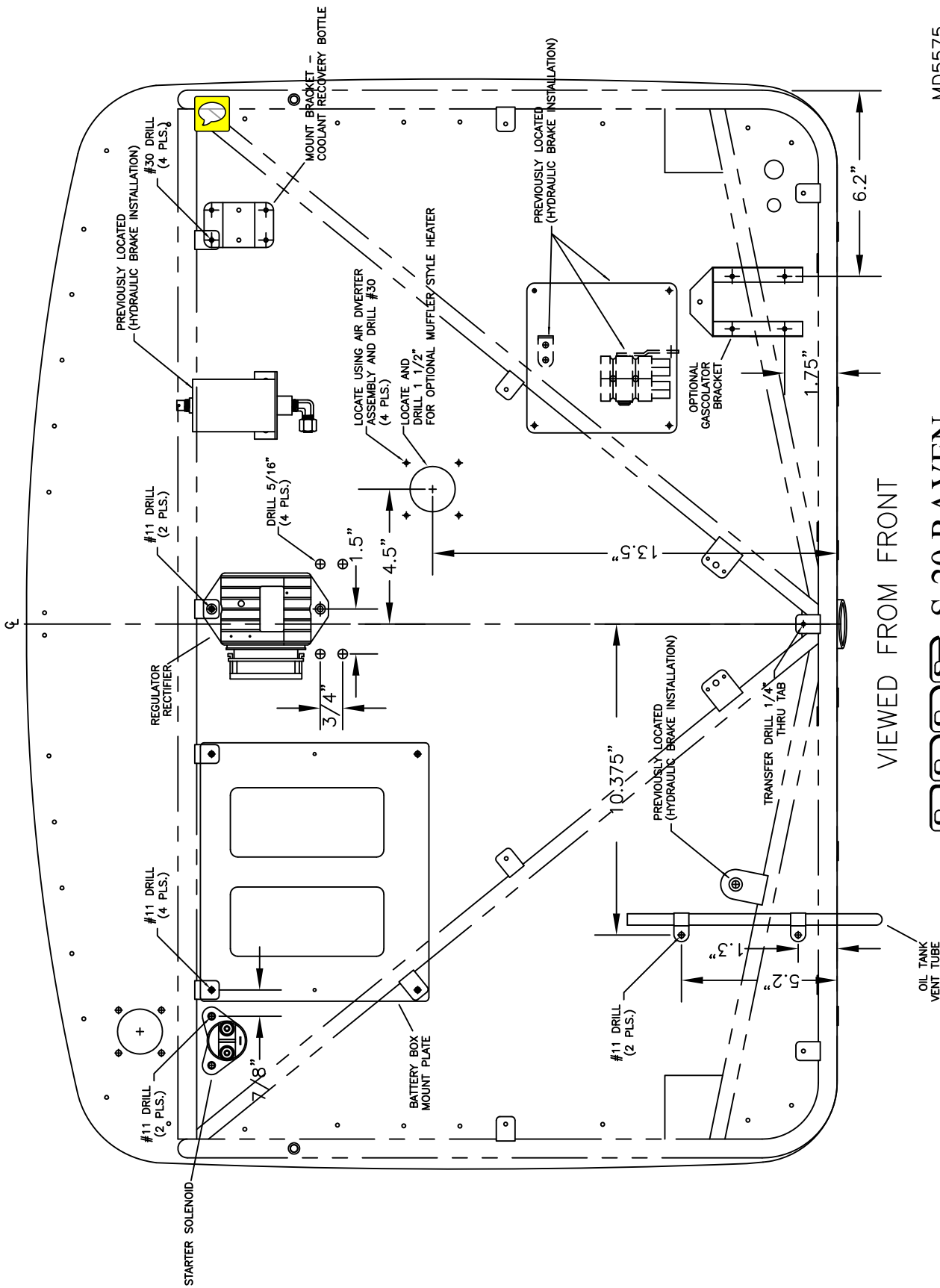
MD5617
REV. - ORIG

RRR S-20 RAVEN
FLAP LEVER PLASTIC SHIM MODIFICATION
FIGURE 02D-08



MD5617
REV. - ORIG

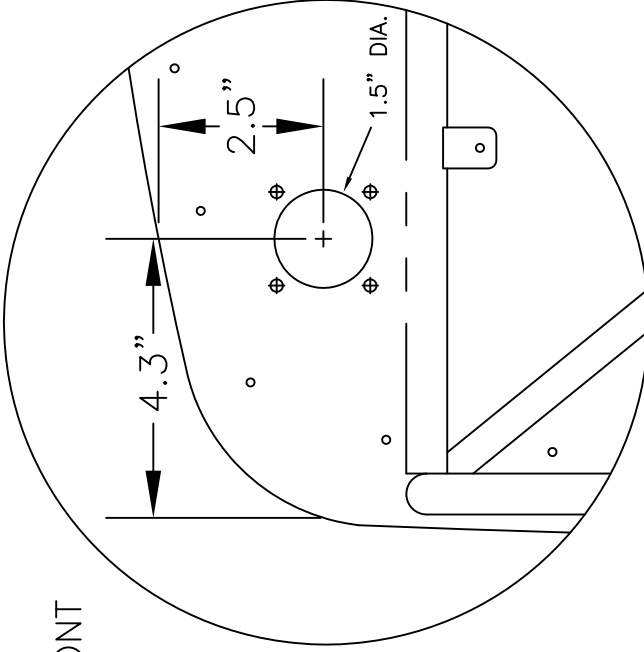
RRMS S-20 RAVEN
ANGLE BRACKET MODIFICATION
FIGURE 02D-09



MD5575
REV. - ORIG

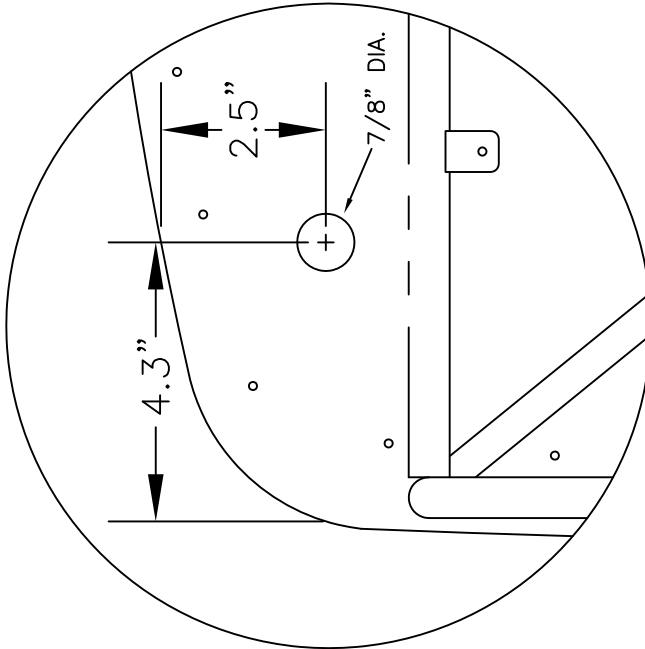
RAMS S-20 RAVEN
ROTAX 912ULS
FIREWALL MODIFICATION
FIGURE 03A-02

VIEWED FROM FRONT



AMP CPC 24-PIN
TYPE CONNECTOR

OR



7/8" GROMMET
(MS35489-17)

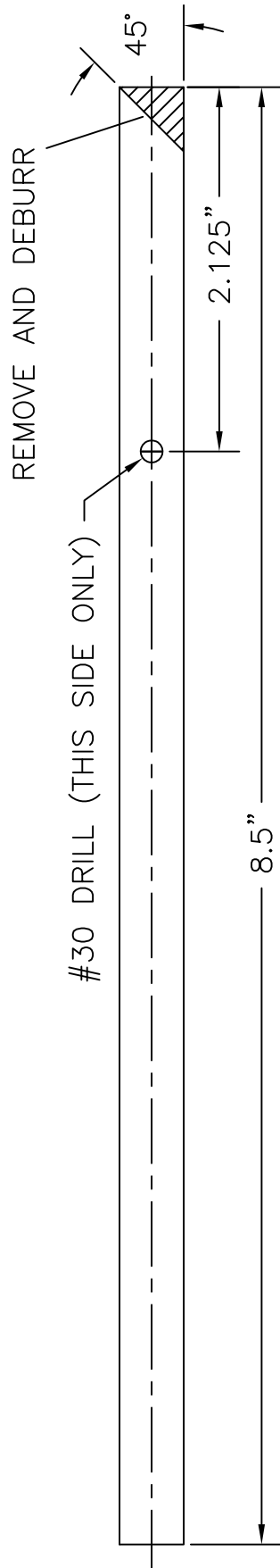
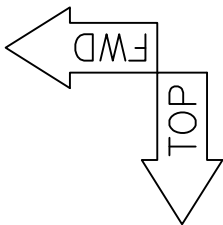
DESCRIPTION	CONTACT ARRANGEMENT	AMP P/N
STANDARD SEX - SQUARE FLANGE RECEPTACLE	23-24	206838-1
STANDARD SEX - PLUG	23-24	206837-1
DESCRIPTION	SHELL SIZE	AMP P/N
CONNECTOR CABLE CLAMP	23	206138-1

DESCRIPTION	WIRE SIZE RANGE	AMP P/N
PIN	26-24 AWG	1-68107
SOCKET	26-24 AWG	1-68109
PIN	24-20 AWG	1-68103
SOCKET	24-20 AWG	1-68105
PIN	18-16 AWG	1-66099
SOCKET	18-16 AWG	1-68101
PIN	14 AWG	1-66361-1
SOCKET	14 AWG	1-66360-1
PIN	SOLDER TAB	202236-3
SOCKET	SOLDER TAB	202237-3

RAMCO S-20 RAVEN
ROTAX 912ULS

FIREWALL ELECTRICAL WIRE PASS-THRU
FIGURE 03A-03

MD5575
REV. - ORIG

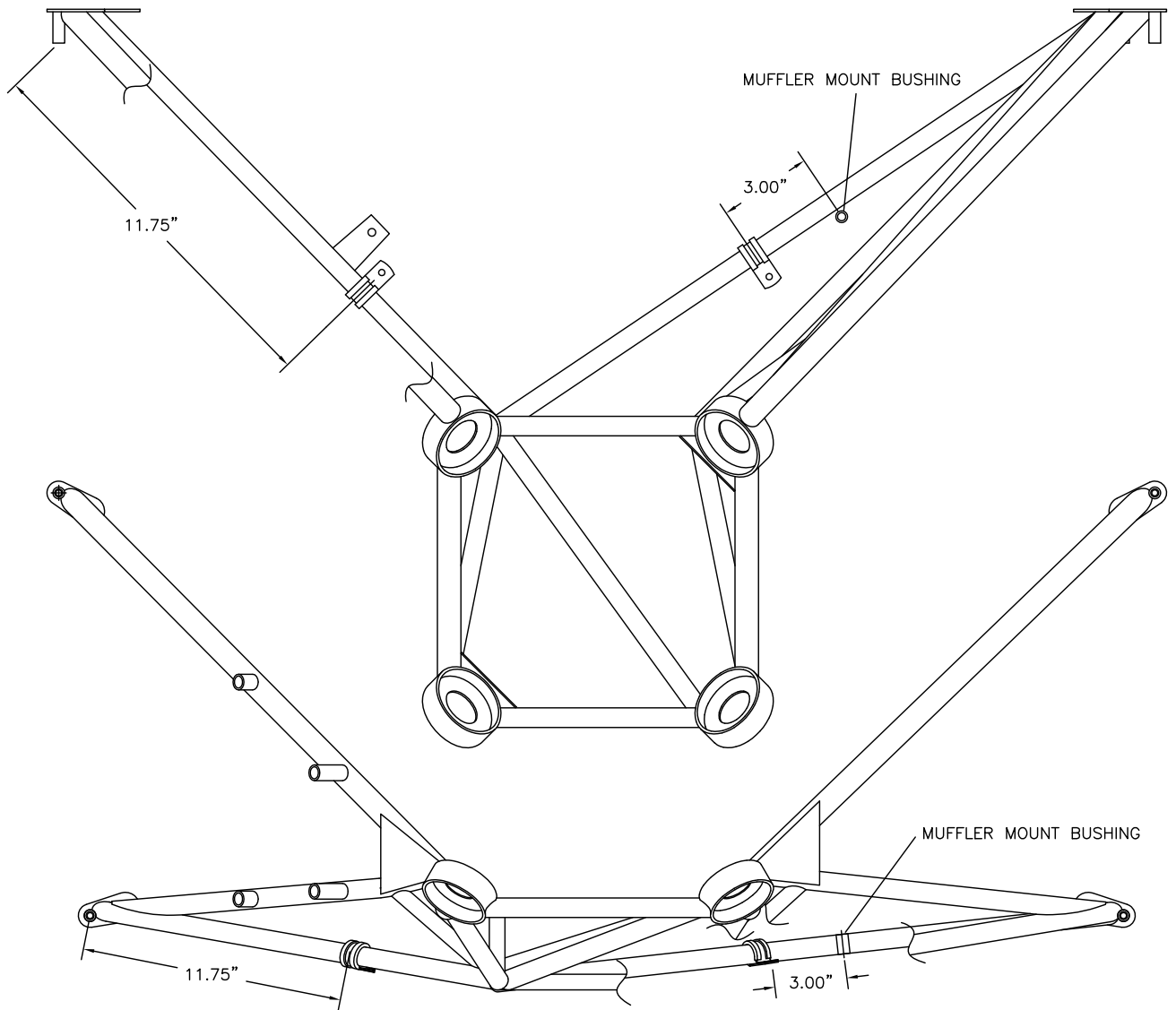


OIL TANK VENT TUBE (.375" X .058" TUBING) - MAKE 1

FABRICATE FROM RAW STOCK

RRR S-20 RAVEN
ROTAX 912ULS
OIL TANK BREATHER TUBE
FIGURE 03A-05

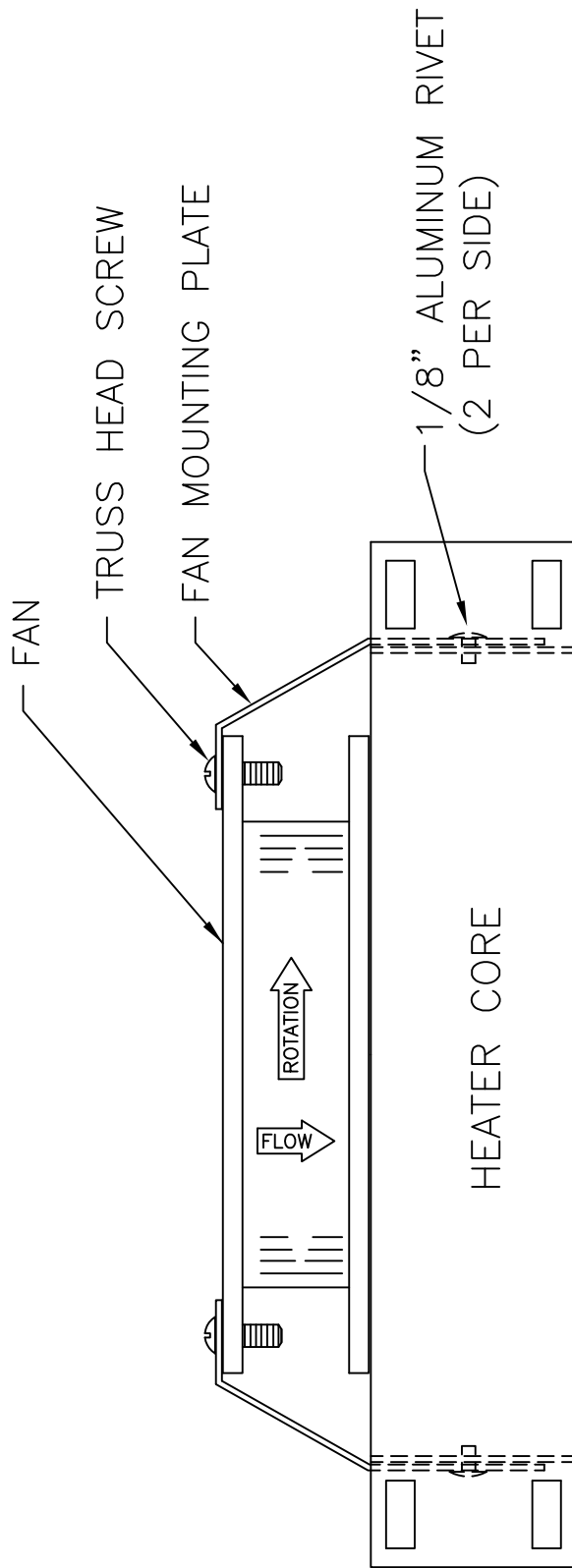
MD4421



MD5623
 REV. - ORIG

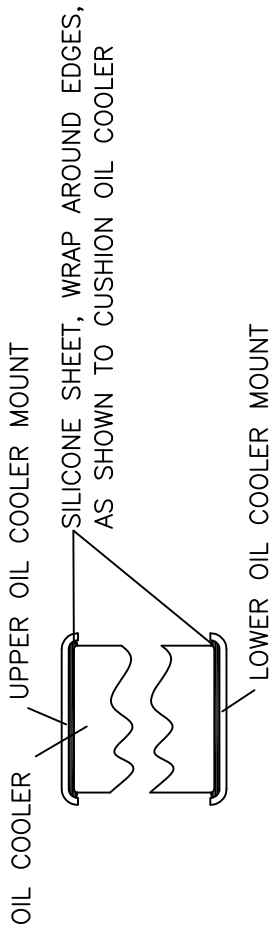
RANS S-20 RAVEN
ROTAX 912ULS
RADIATOR CUSHION CLAMP MOUNTING
FIGURE 03C-05

09/01/2013

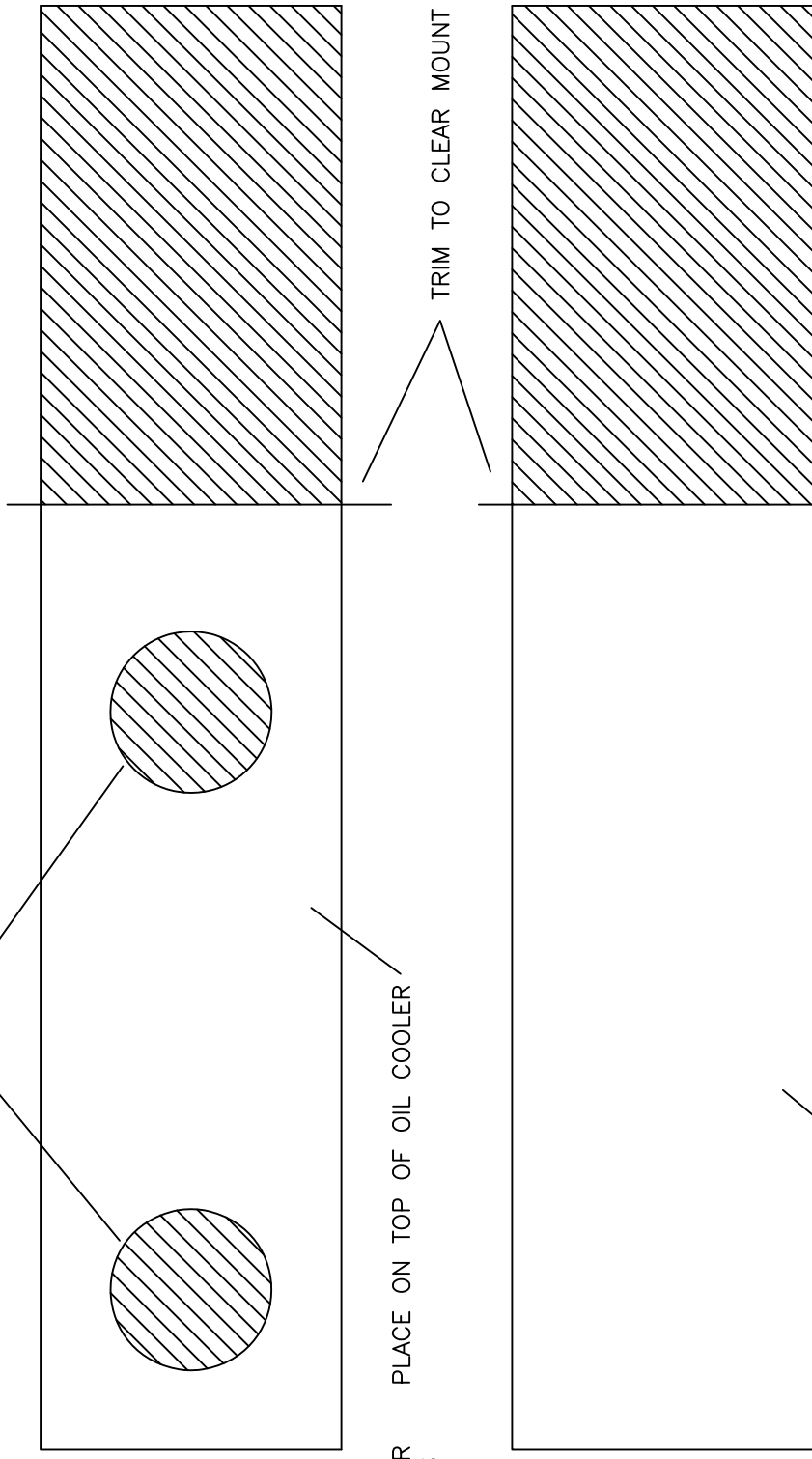


MD434
 REV. - ORIG

RRR S-20 RAVEN
 ROTAX 912ULS
 HEATER CORE ASSEMBLY
 FIGURE 03C-19

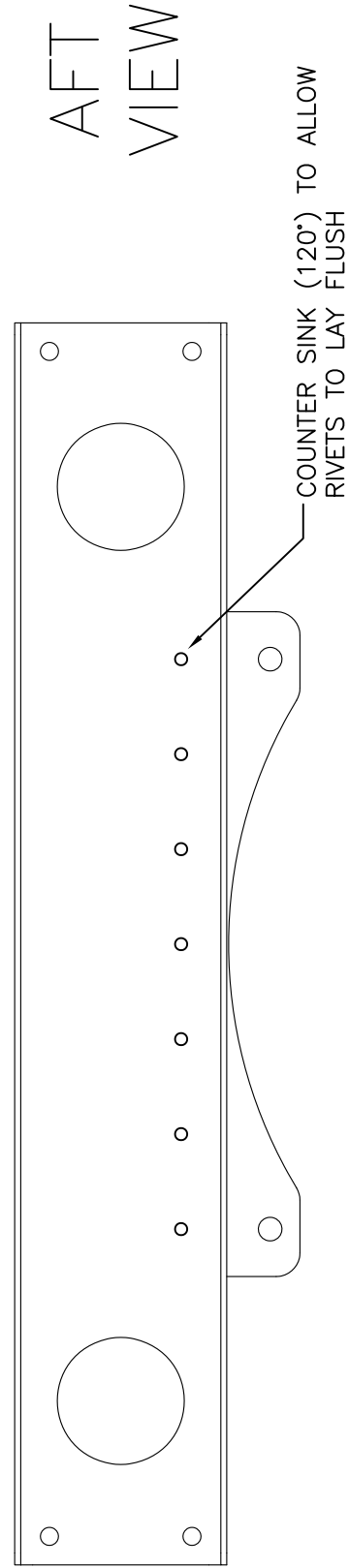
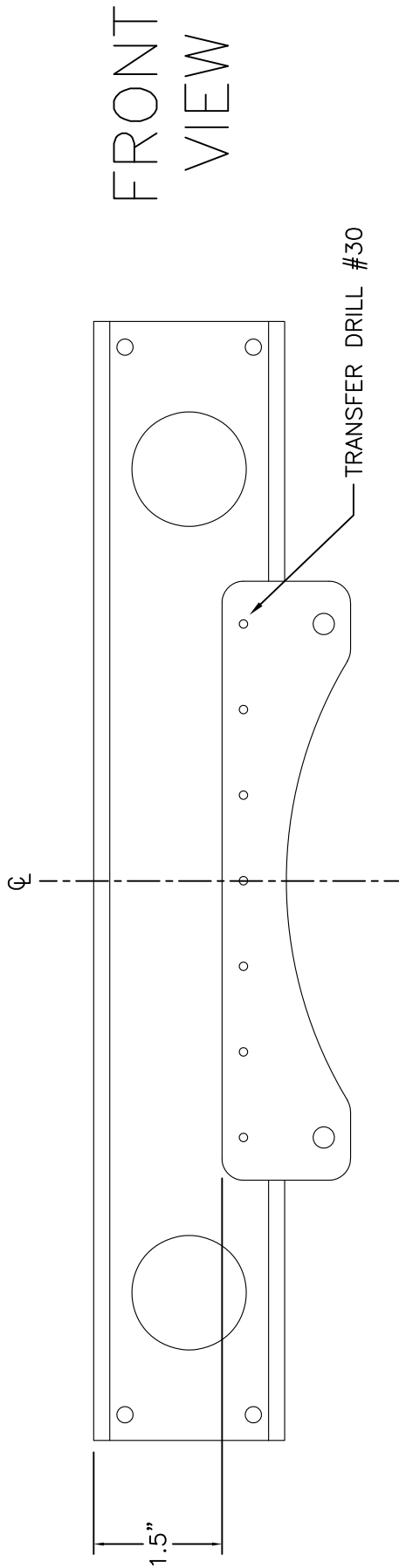


CUT HOLES TO ALLOW FOR FITTINGS. USE UPPER OIL COOLER MOUNT AS A TEMPLATE



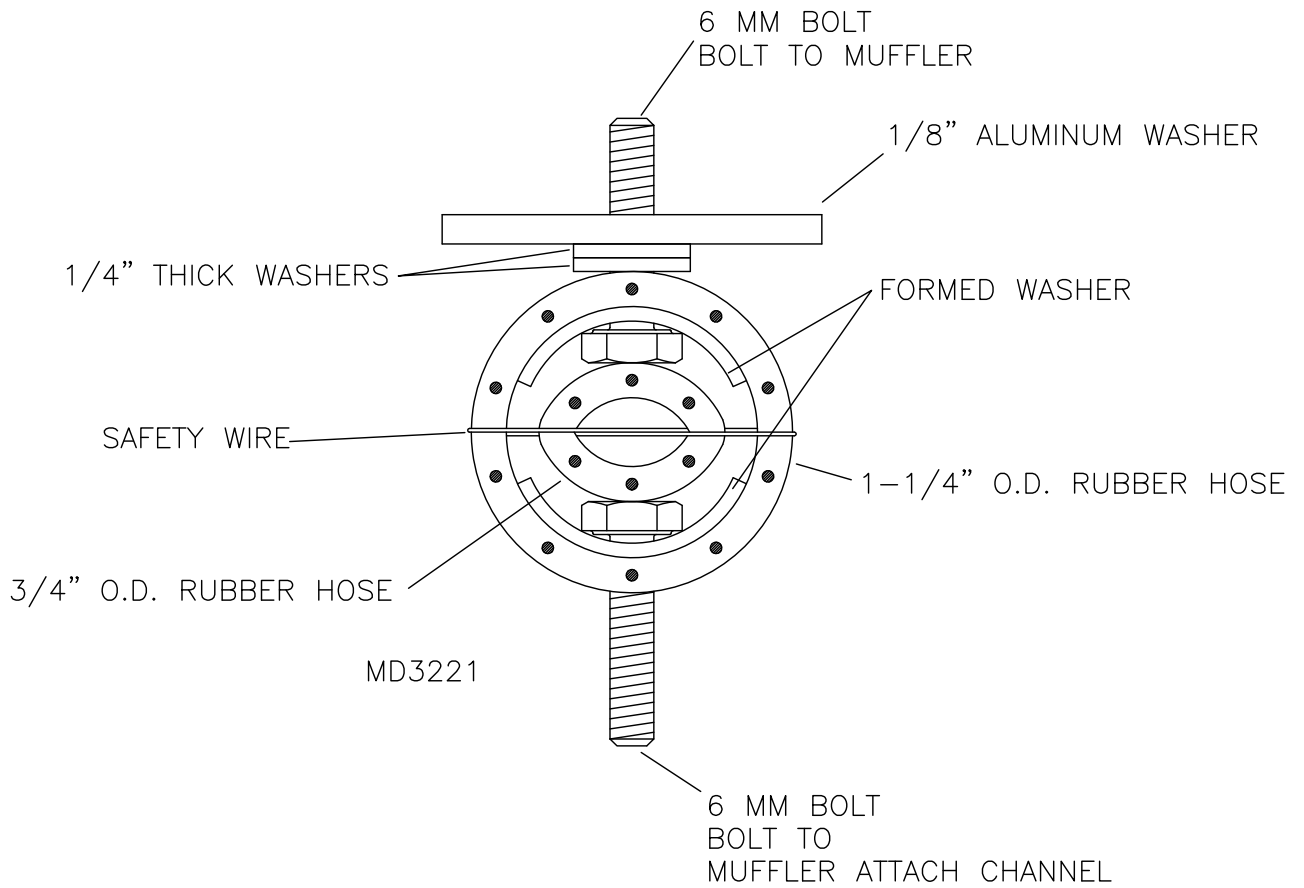
RAMB S-20 RAVEN
ROTAX 912ULS
OIL COOLER INSTALLATION
FIGURE 03D-06

MD4449



RRR S-20 RAVEN
 ROTAX 912ULS
 UPPER OIL COOLER MOUNT
 FIGURE 03D-07

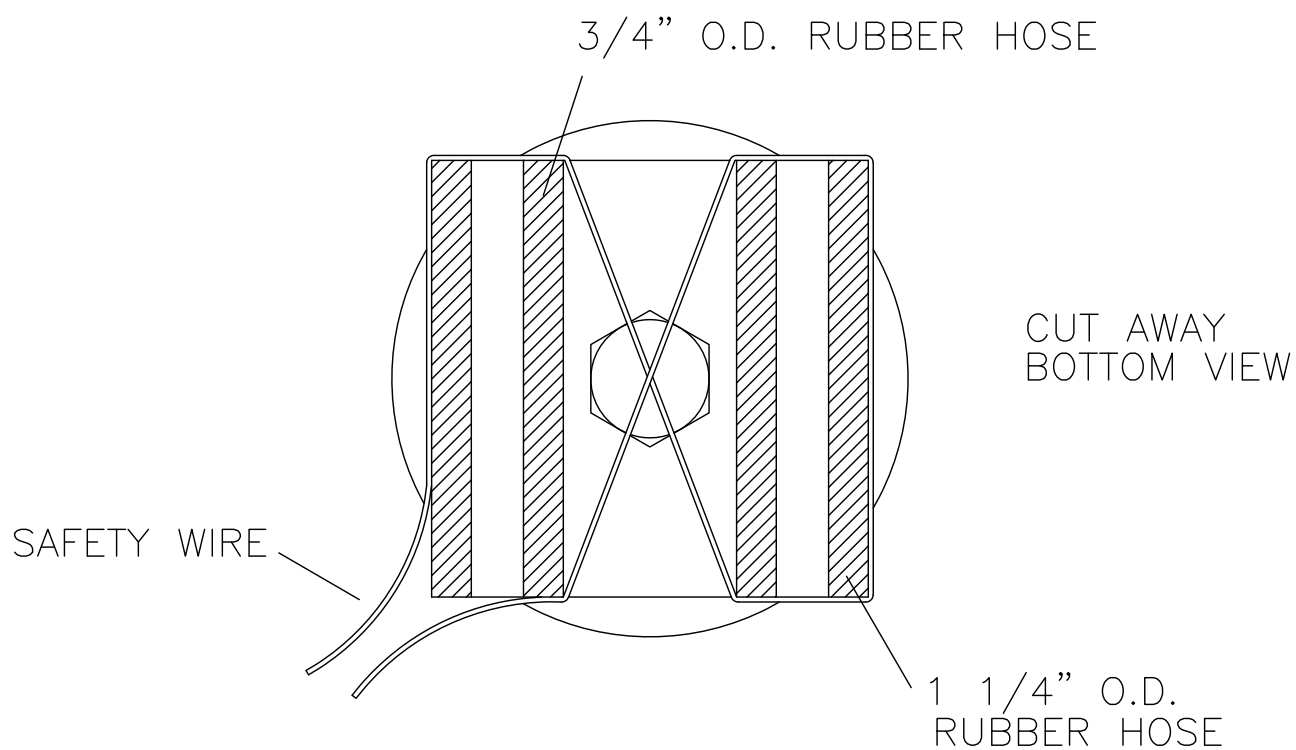
MD5459
 REV. - ORIG



MD3221
REV. - ORIG

RANS S-20 RAVEN
ROTAX 912ULS
MUFFLER ISOLATOR
FIGURE 03E-02

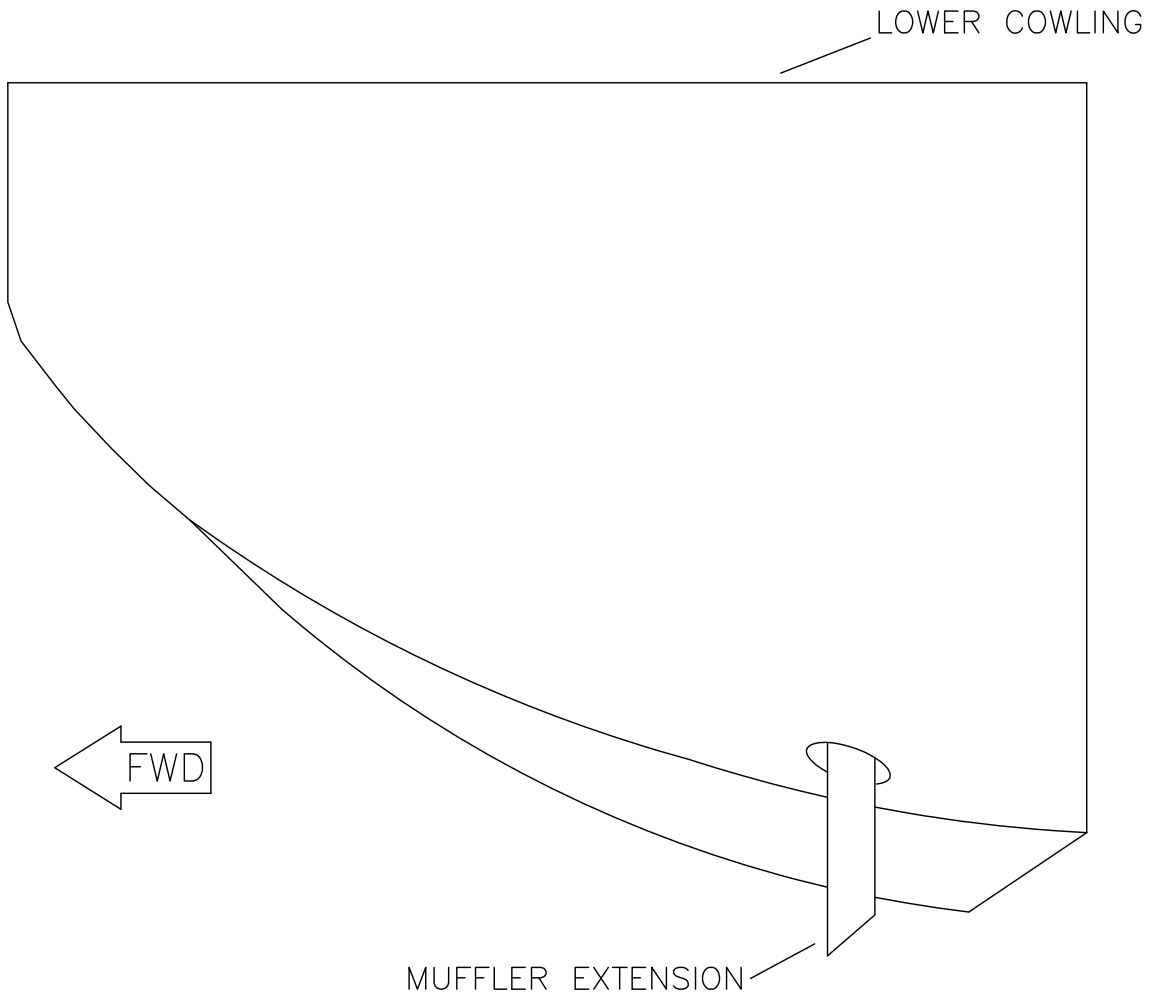
09/01/2013



MD3222
REV. - ORIG

RANS S-20 RAVEN
ROTAX 912ULS
MUFFLER ISOLATOR SAFETY WIRE
FIGURE 03E-03

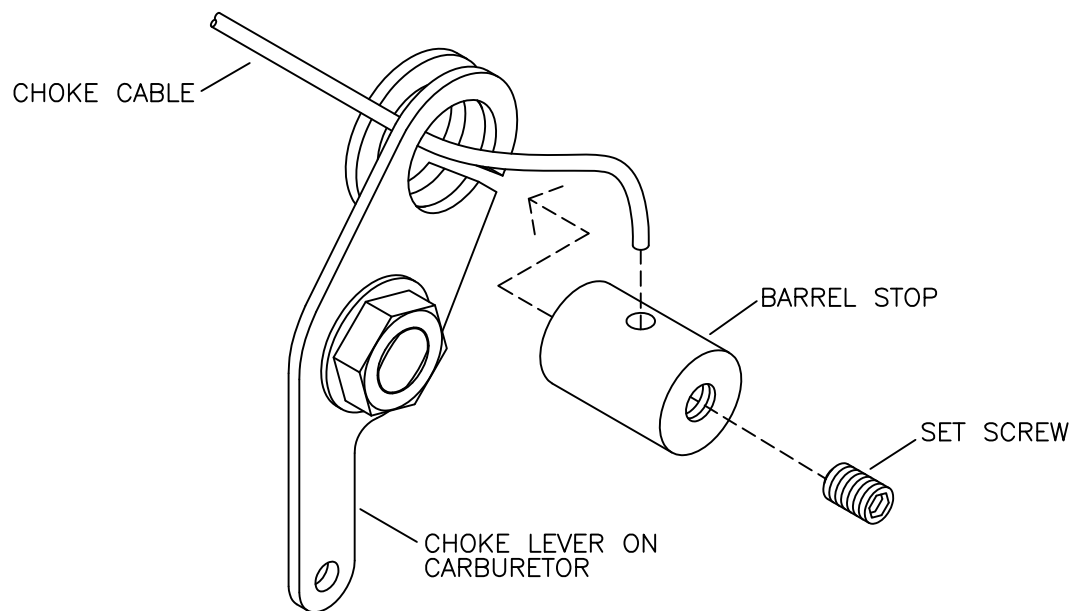
09/01/2013



RAMS S-20 RAVEN
ROTAX 912ULS
MUFFLER EXTENSION
FIGURE 03E-09

MD2837
REV. - ORIG

09/01/2013

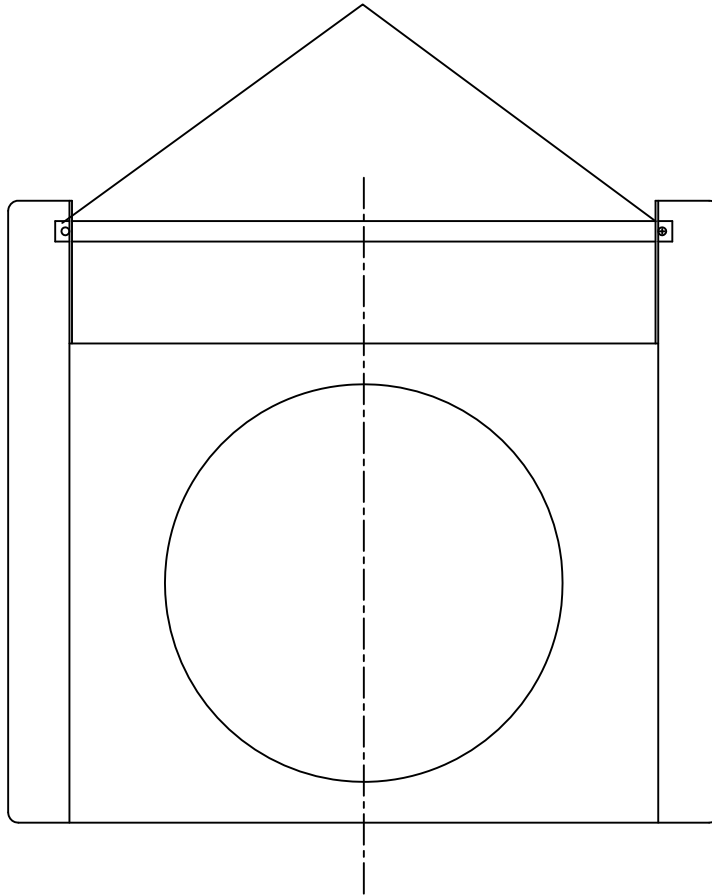


MD4440

RANS S-20 RAVEN
ROTAX 912ULS
CHOKE CABLE INSTALLATION
FIGURE 03H-07

09/01/2013

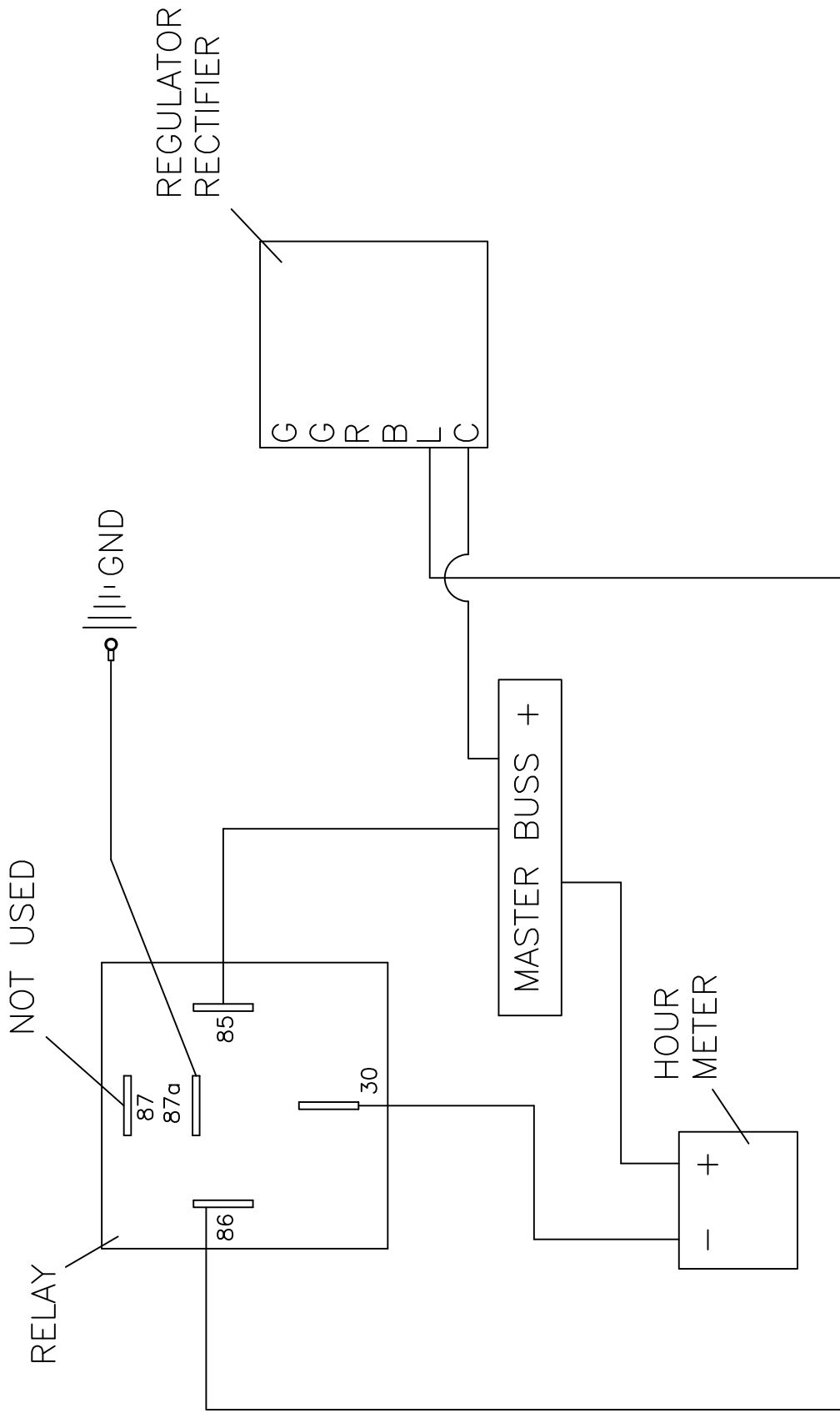
CENTER BATTERY BAR AND DRILL #40
AS NECESSARY



RANS S-20 RAVEN
ROTAX 912ULS
BATTERY BAR MODIFICATION
FIGURE 03I-07

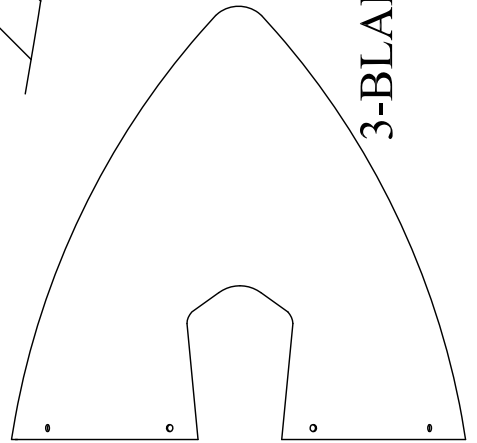
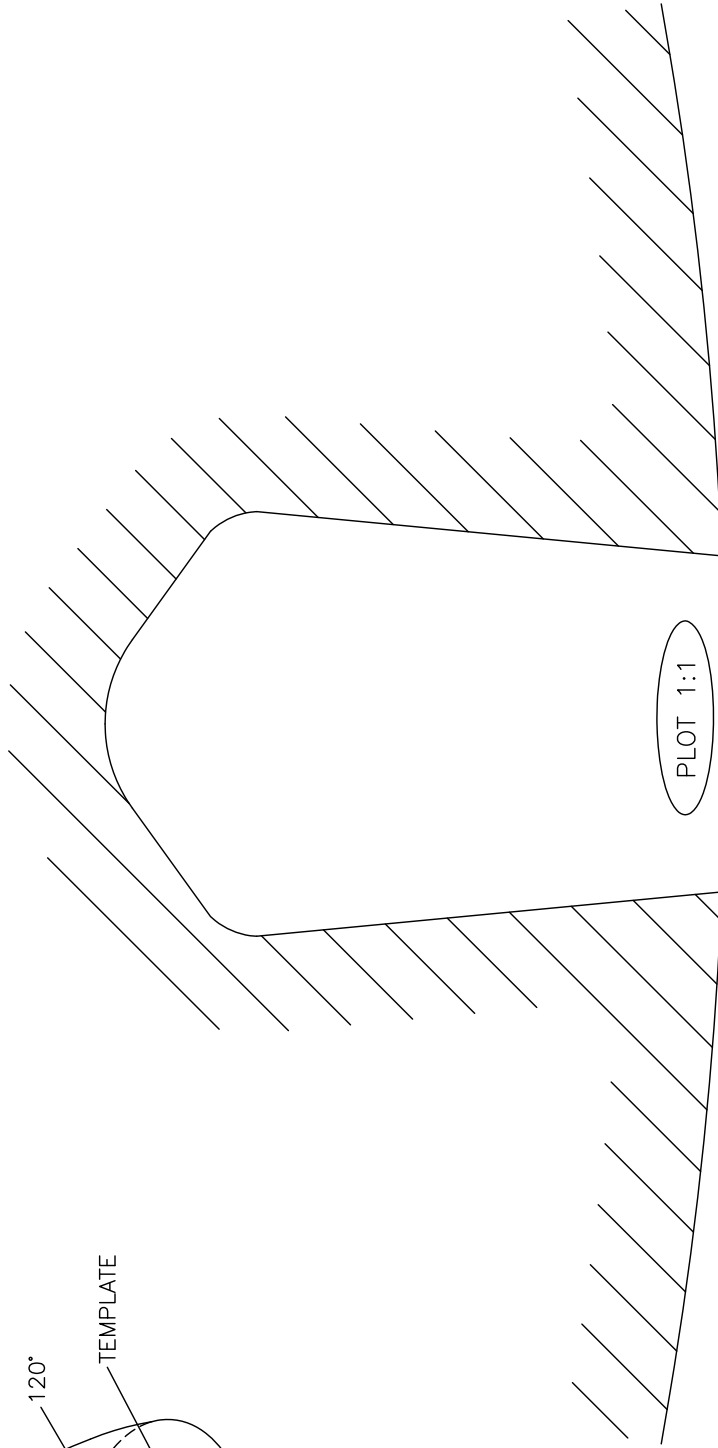
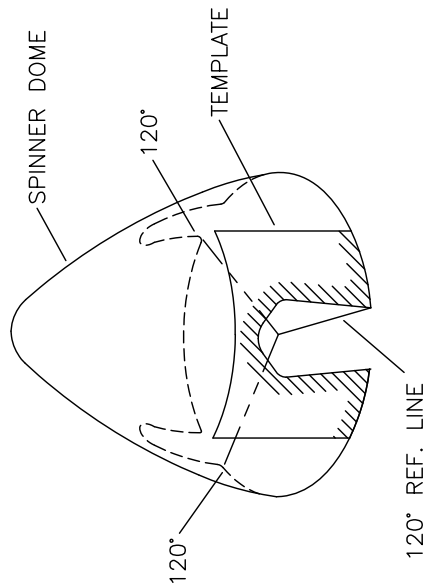
MD5468

09/01/2013



MD5485
REV. A

RAVEN S-20 RAVEN
ROTAX 912ULS
OPTIONAL HOUR METER RELAY
FIGURE 03J-05



RRR S-20 RAVEN

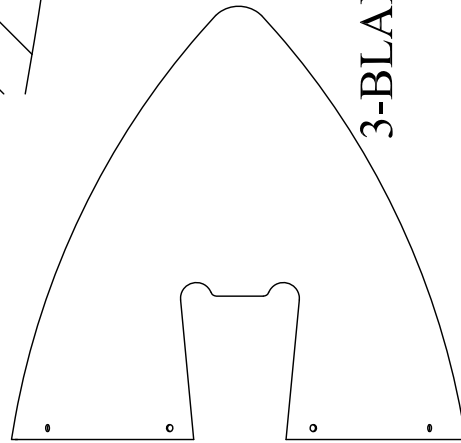
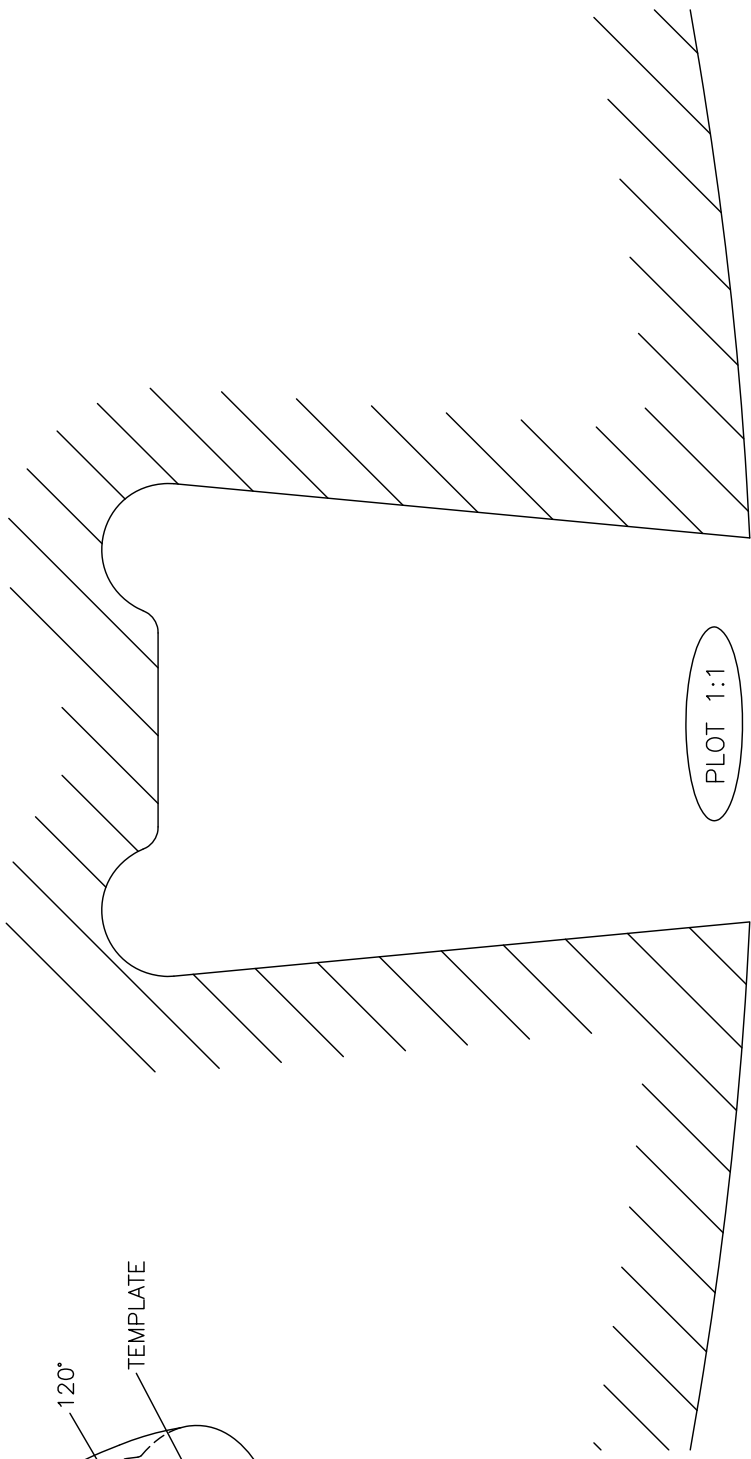
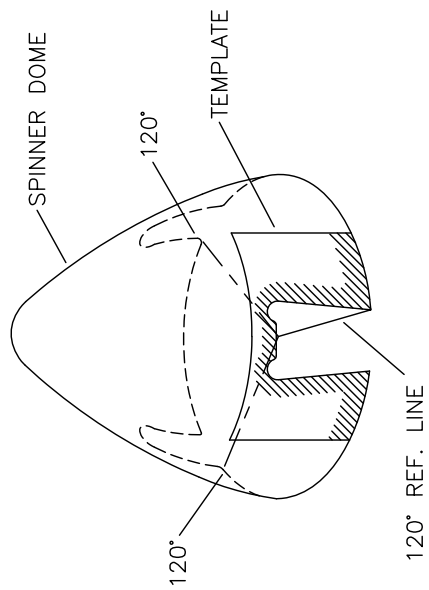
ROTAX 912ULS

3-BLADE WHIRL WIND PROP - 12" SPINNER TEMPLATE

FIGURE 03K-04

MD5228

09/01/2013



RRR S-20 RAVEN

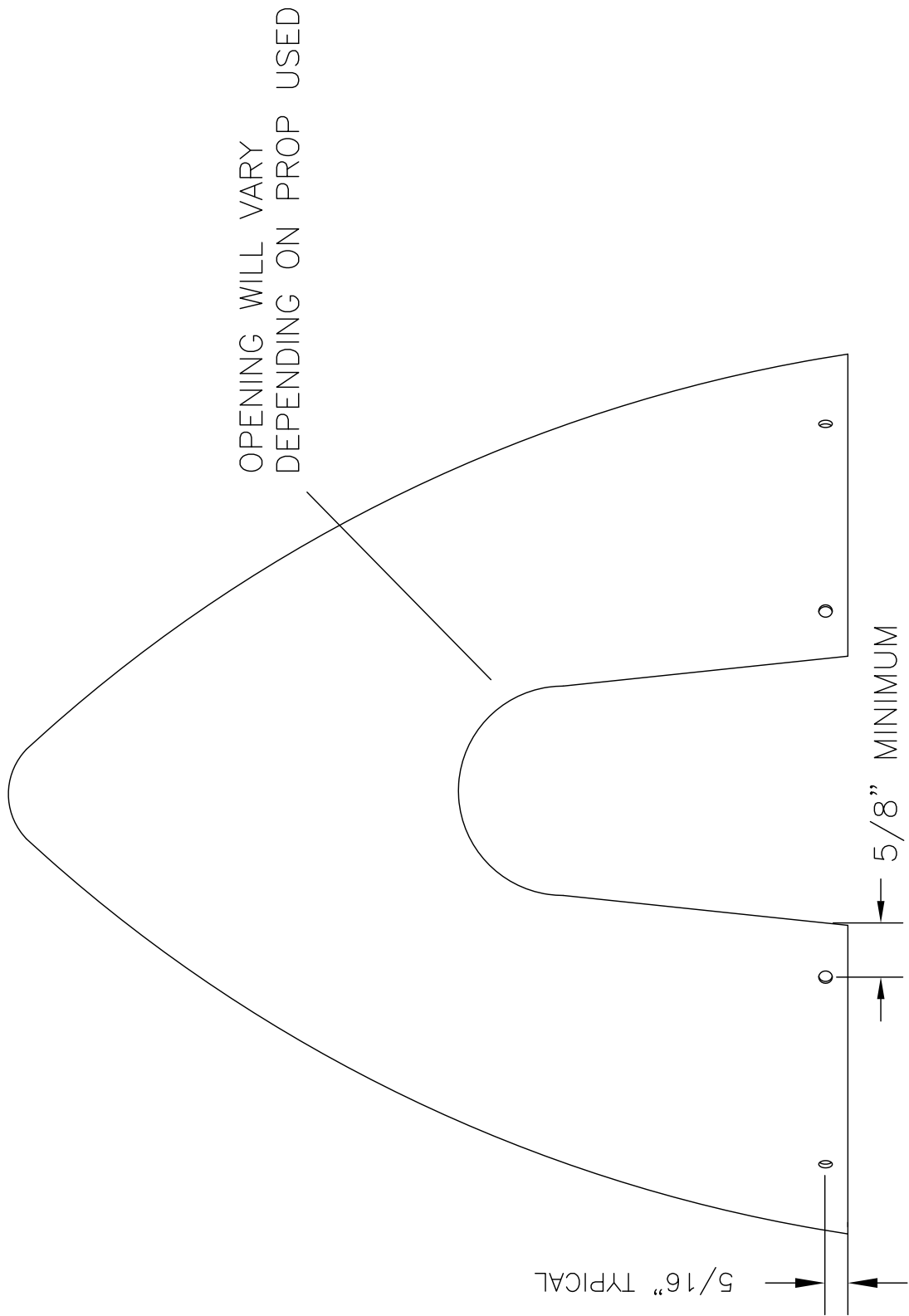
ROTAX 912ULS

3-BLADE WARP DRIVE PROP - 12" SPINNER TEMPLATE

FIGURE 03K-04A

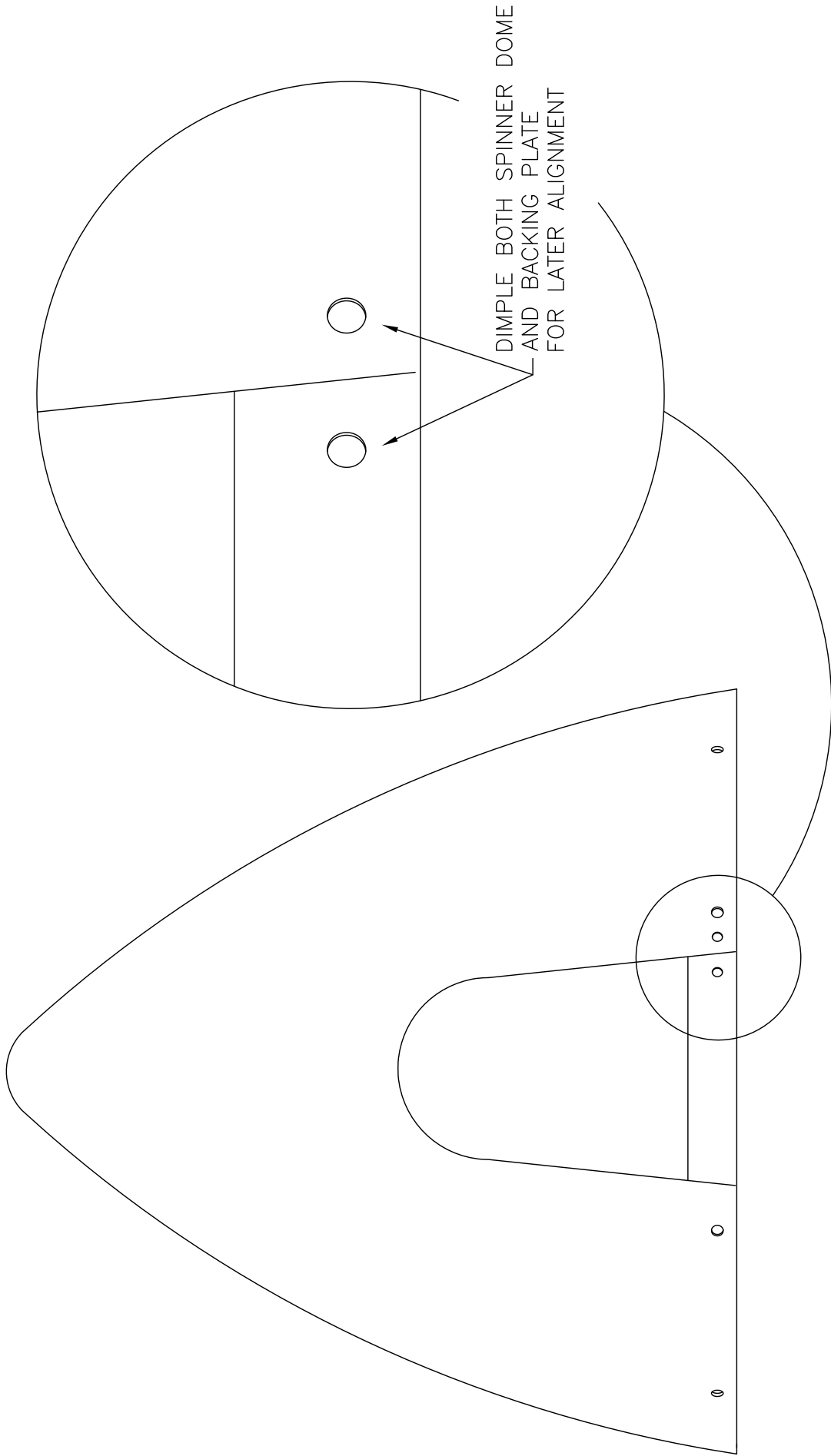
MD5228

09/01/2013



ROTAPRO S-20 RAVEN
ROTAX 912ULS
SPINNER DRILLING
FIGURE 03K-07

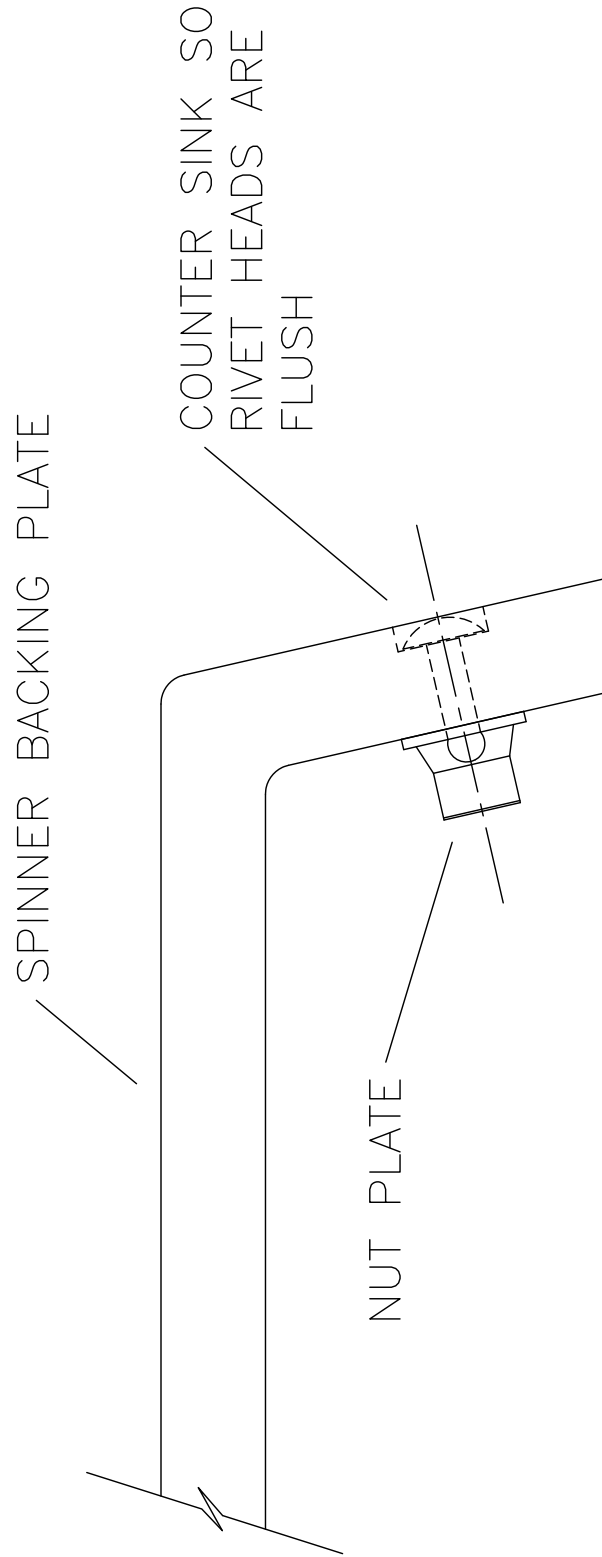
MD5228



DIMPLE BOTH SPINNER DOME
AND BACKING PLATE
FOR LATER ALIGNMENT

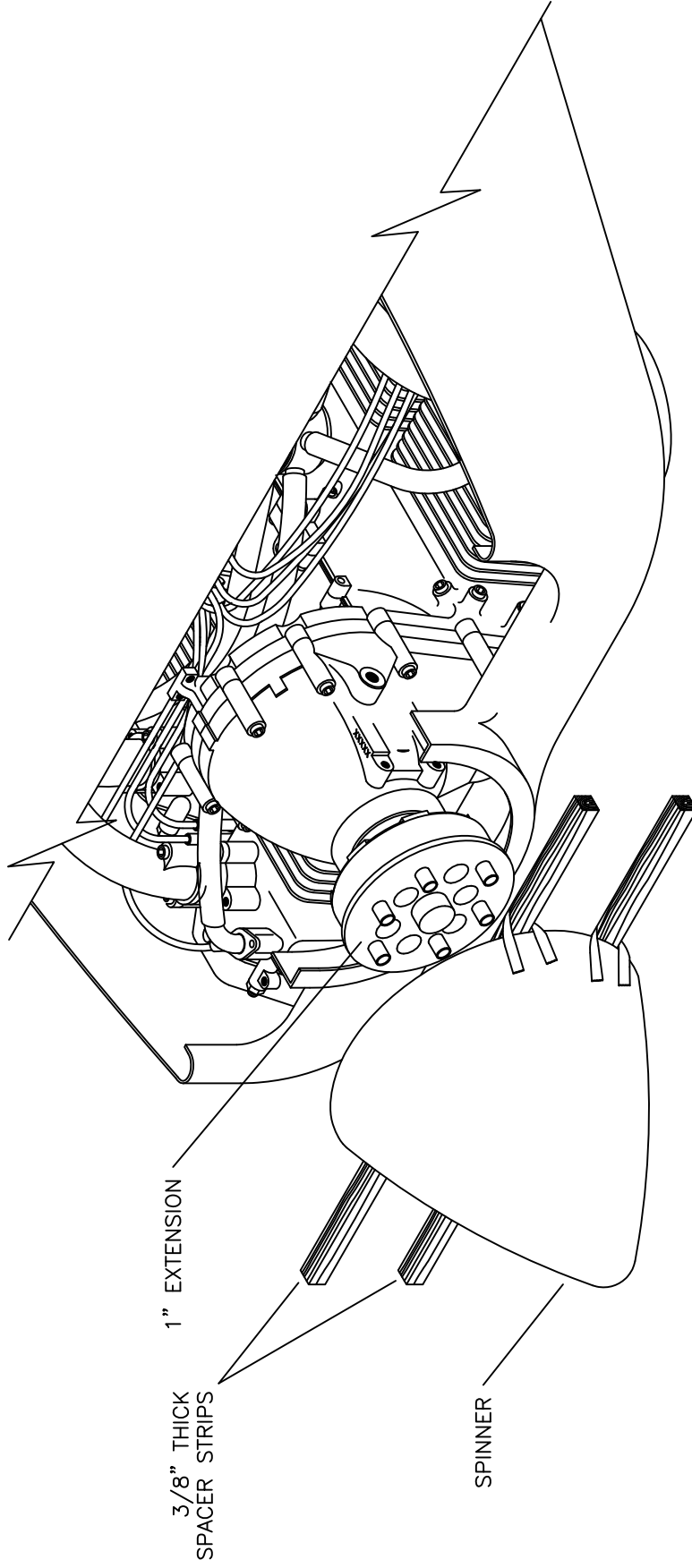
RRR S-20 RAVEN
ROTAX 912ULS
SPINNER ALIGNMENT MARKS
FIGURE 03K-10

MD5228



RAVEN S-20 RAVEN
ROTAX 912ULS
SPINNER NUT PLATE INSTALLATION
FIGURE 03K-11

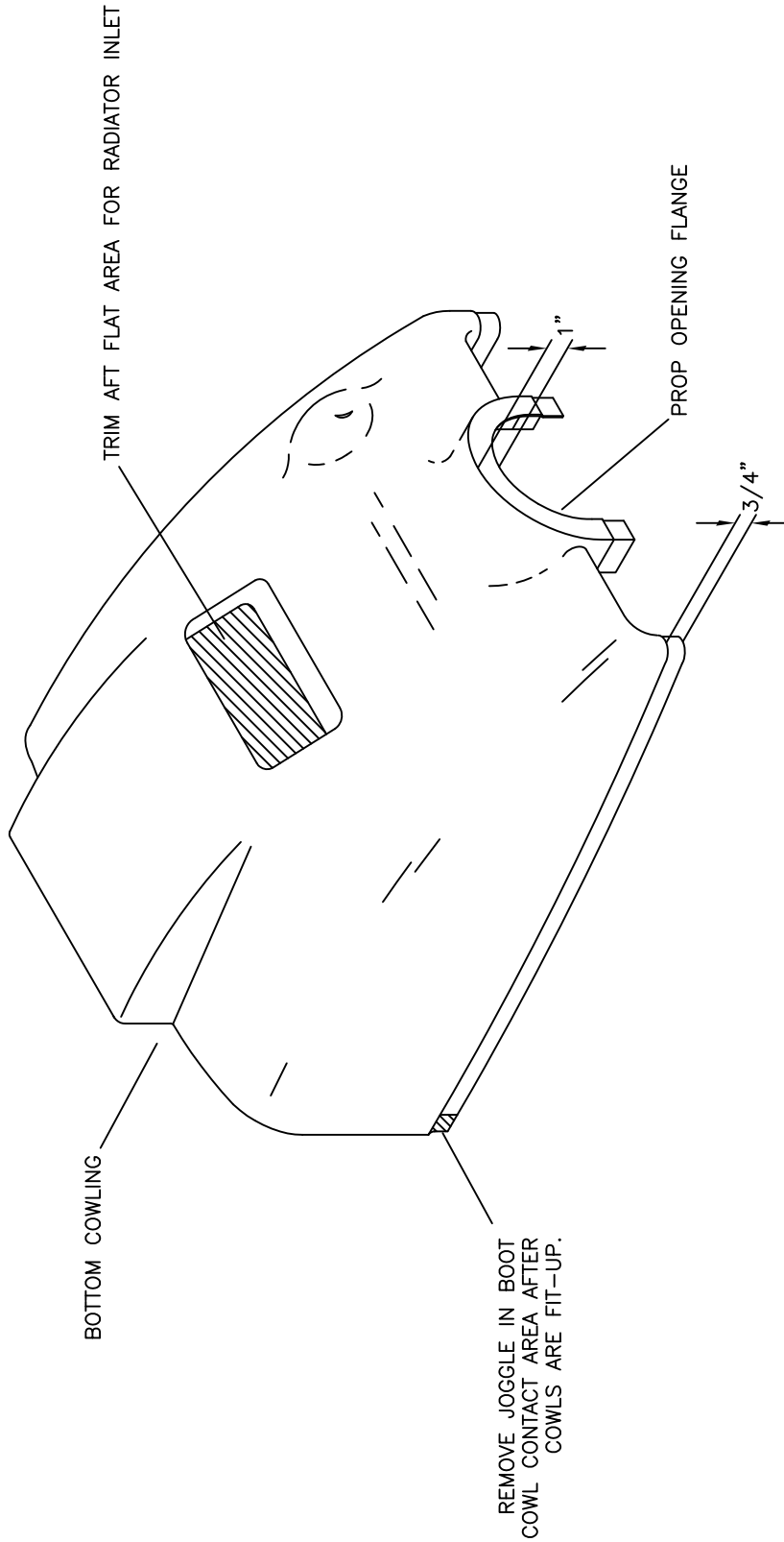
MD5228



IMPORTANT: INSTALLATION OF COWLING REQUIRES ENGINE, PROP EXTENSION AND SPINNER BACKING PLATE TO BE INSTALLED.

MD4402
REV. - ORIG

RAVEN S-20 RAVEN
 ROTAX 912ULS
 COWLING TO SPINNER SPACING
 FIGURE 03L-02

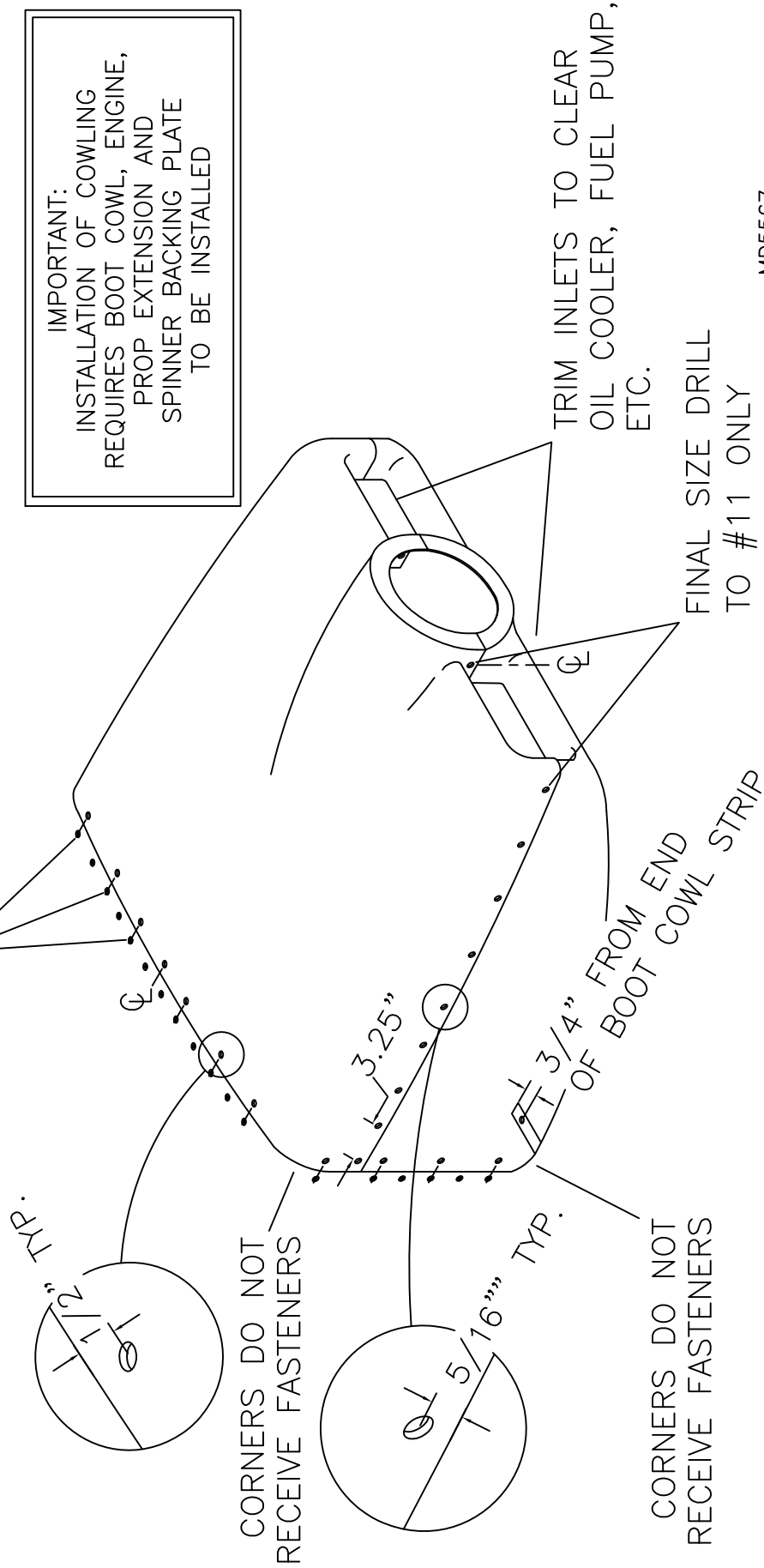


MD2833
REV. - ORIG

RAMBLER S-20 RAVEN
ROTAX 912ULS
BOTTOM COWLING MODIFICATION
FIGURE 03L-03

ALIGN WITH RIVETS ON BOOT COWL.
 SKIP EVERY OTHER RIVET.
 (TYPICAL FOR AFT EDGE)

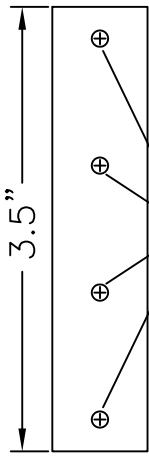
DRILL ALL LOCATIONS #40 FOR FIT-UP.
 THEN, TRANSFER DRILL #111 FOR
 RECEPTACLE RIVET LOCATING.



MD5567
 REV. - ORIG

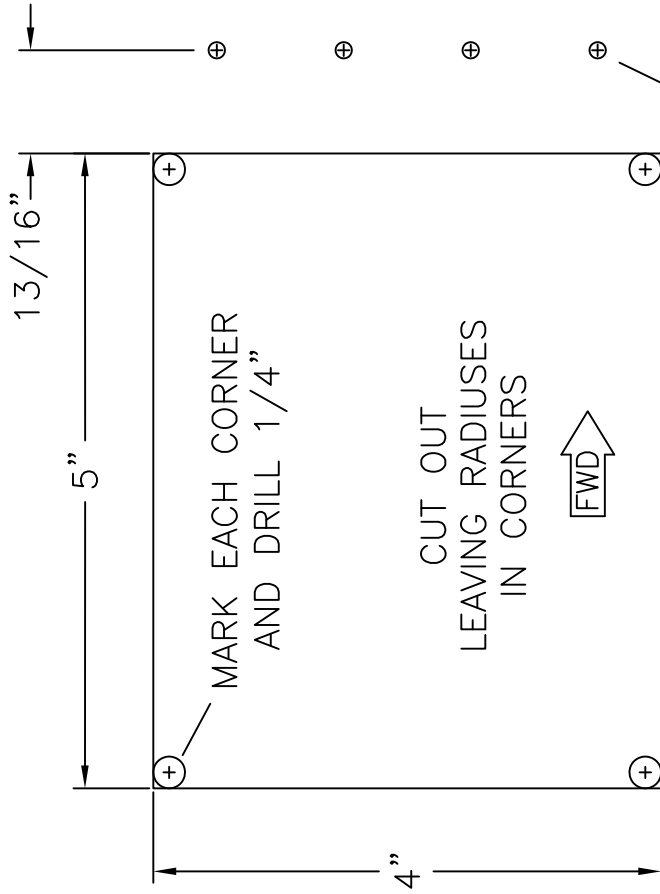
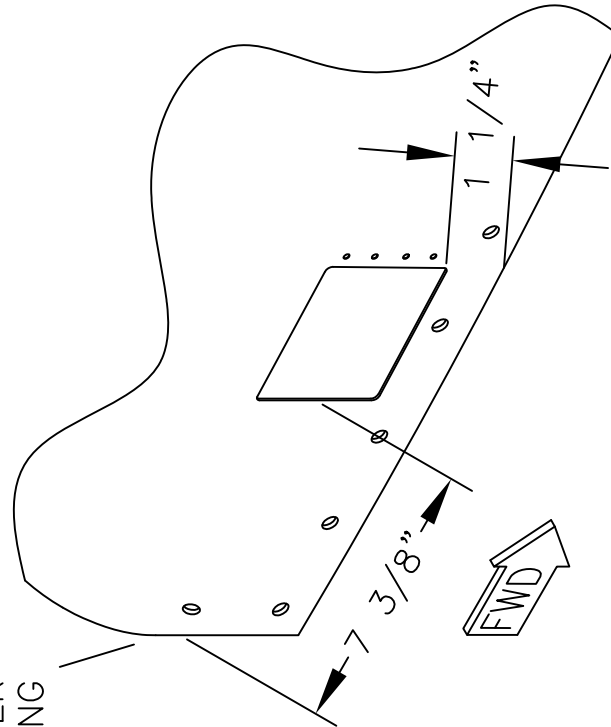
RRR S-20 RAVEN
 ROTAX 912ULS
 COWLING FASTENER LOCATION
 FIGURE 03L-12

ALUMINUM STRIP
(FABRICATE 2 FROM RAW STOCK)



LOCATE AND
DRILL #30

AFT EDGE
LOWER
COWLING



MARK EACH CORNER
AND DRILL 1/4"

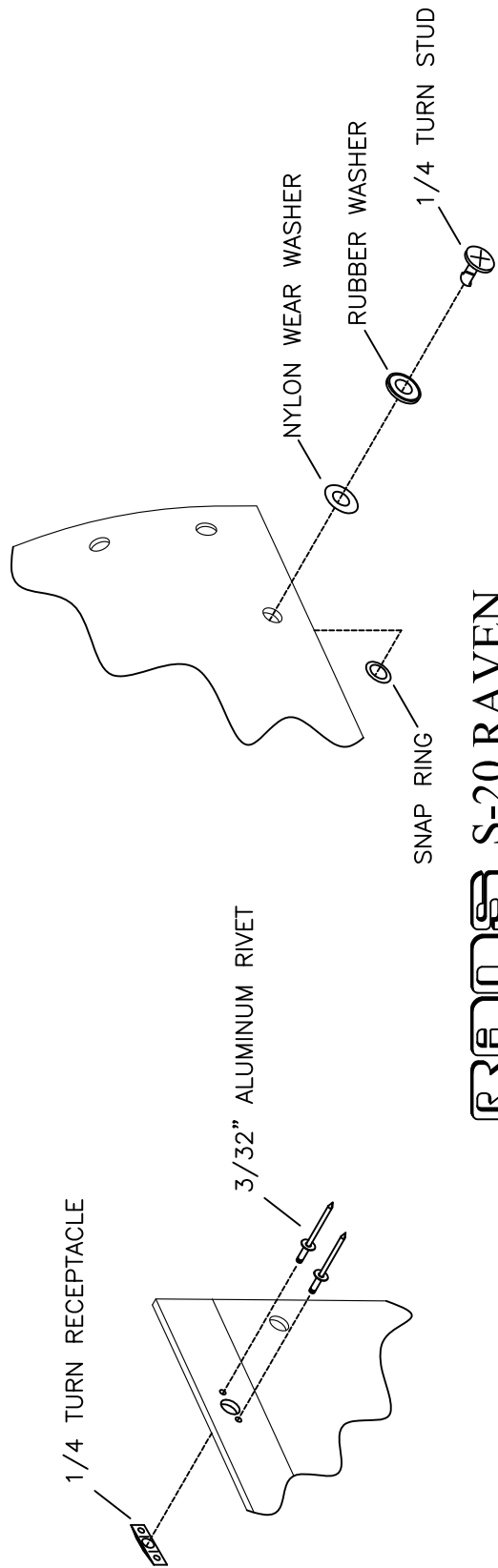
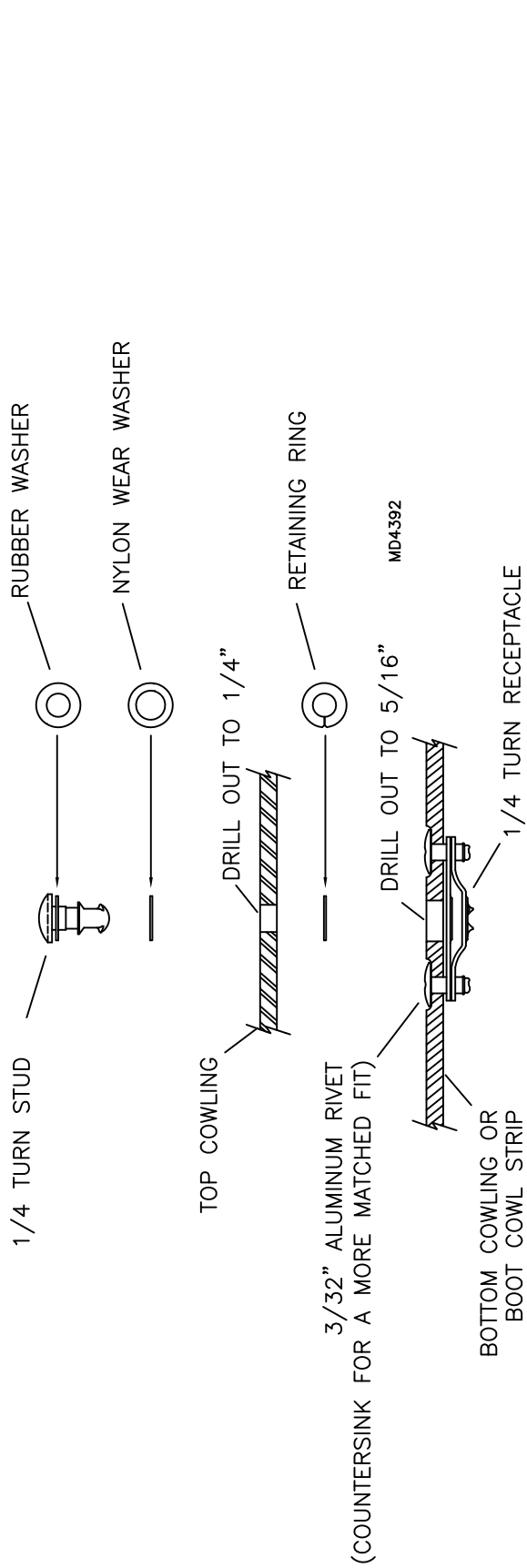
CUT OUT
LEAVING RADIUSSES
IN CORNERS



LOCATE AND DRILL #30 (4 PLS)
USING FABRICATED ALUMINUM STRIP
AS A GUIDE

MD5567
REV. - ORIG

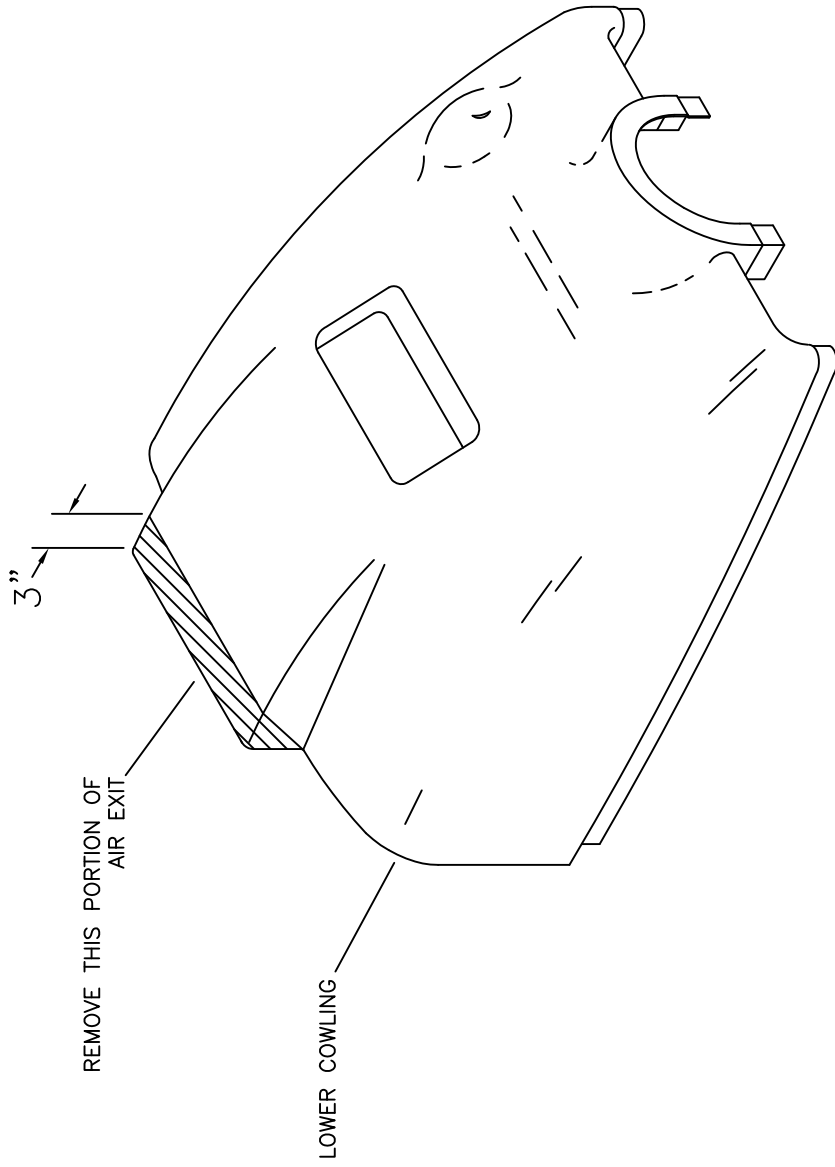
RRR S-20 RAVEN
ROTAX 912ULS
OIL TANK ACCESS OPENING
FIGURE 03L-20



RAMROB S-20 RAVEN
ROTAX 912ULS
1/4 TURN FASTENER INSTALLATION

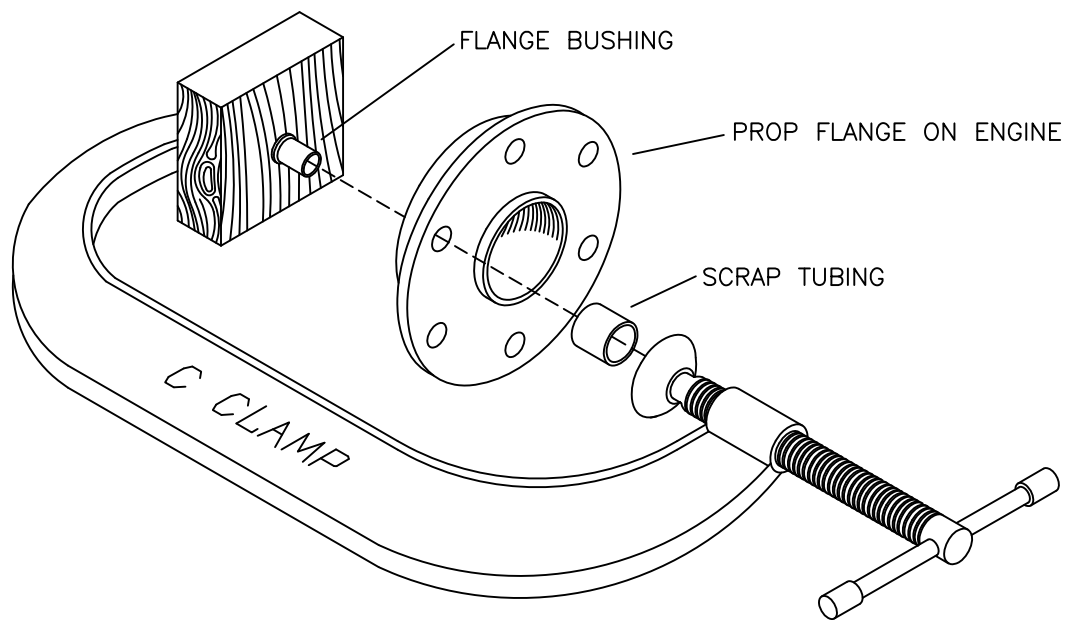
FIGURE 03L-28

MD5143
 REV. - ORIG



MD2833
REV. - ORIG

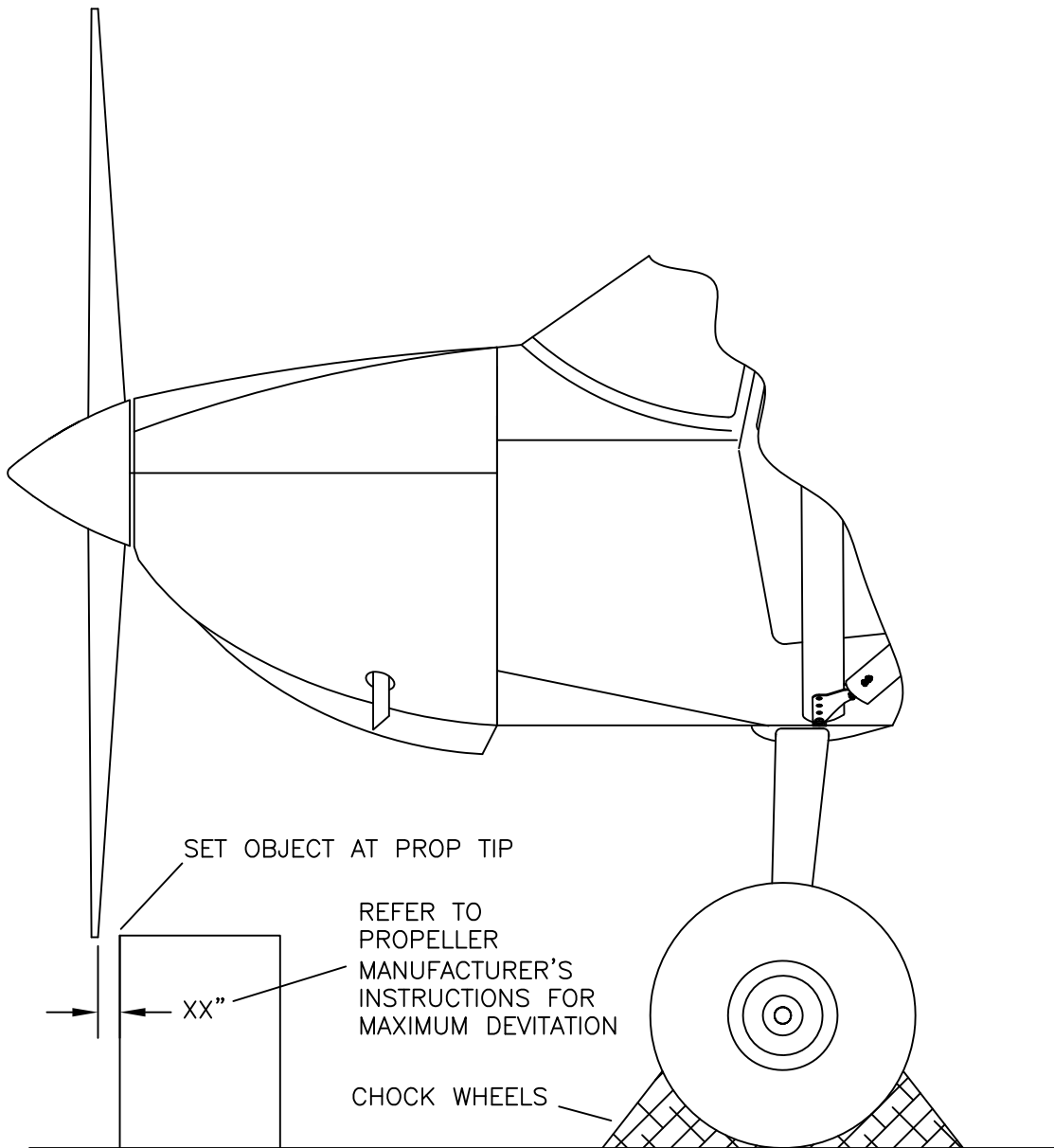
ROTAX S-20 RAVEN
ROTAX 912ULS
AIR EXIT MODIFICATION
FIGURE 03L-31



RANS S-20 RAVEN
ROTAX 912ULS
FLANGE BUSHING INSTALLATION
FIGURE 03M-02

MD4401
REV. - ORIG

09/01/2013



IMPORTANT!

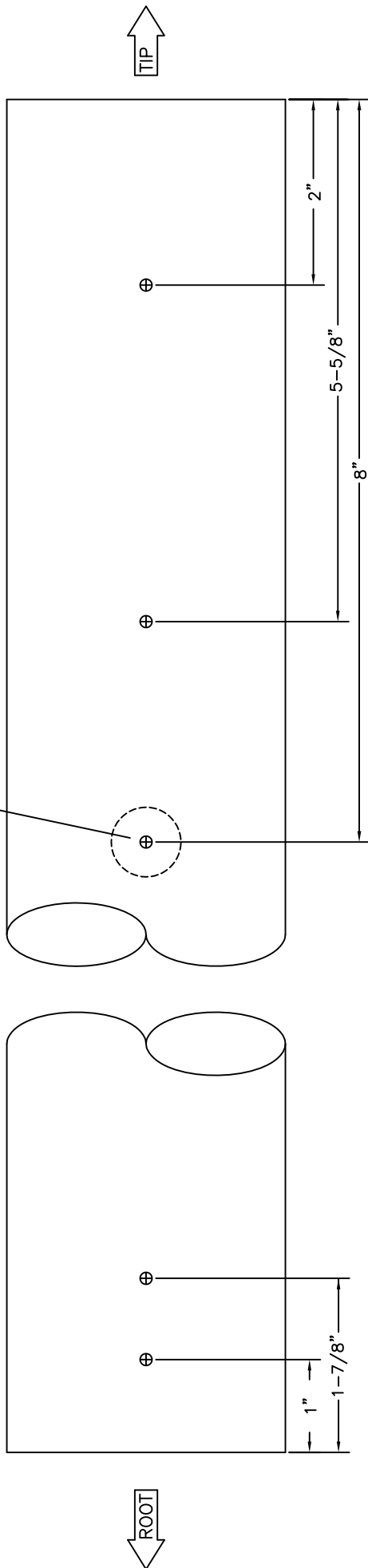
RE-CHECK PROPELLER TORQUE PER MANUFACTURE'S RECOMMENDED INSPECTION INTERVAL. FAILURE TO MAINTAIN PROP TORQUE MAY RESULT IN SEPARATION OF THE PROPELLER FROM THE AIRCRAFT AND MAY CAUSE INJURY OR DEATH. REFER TO PROPELLER MANUFACTURER'S INSTRUCTIONS FOR ANY SPECIAL MAINTENANCE REQUIREMENTS.

RANS S-20 RAVEN ROTAX 912ULS PROPELLER TRACKING FIGURE 03M-06

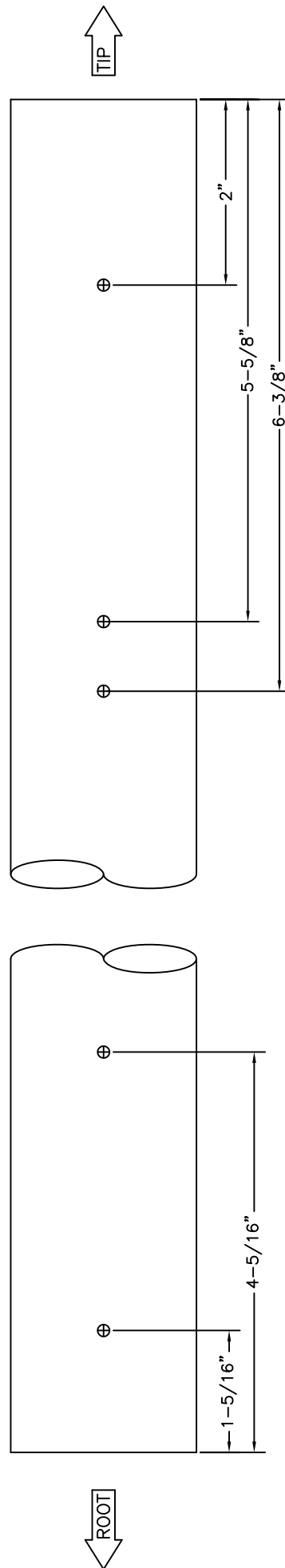
MD4380
REV. - ORIG

09/01/2013

LH SPAR ONLY (STEP DRILL TO 3/4" ON BOTH SIDES; THIS HOLE ONLY)
FOR PITOT/STATIC TUBE INSTALLATION



LEADING EDGE SPAR (FWD SIDE SHOWN)

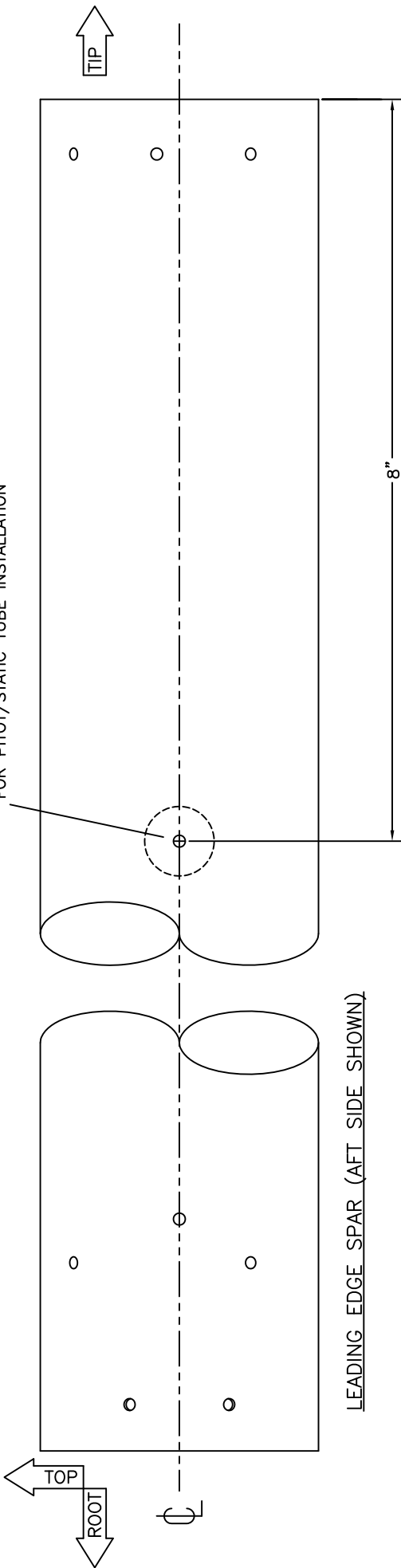


TRAILING EDGE SPAR (AFT SIDE SHOWN)

MD4351
REV. A

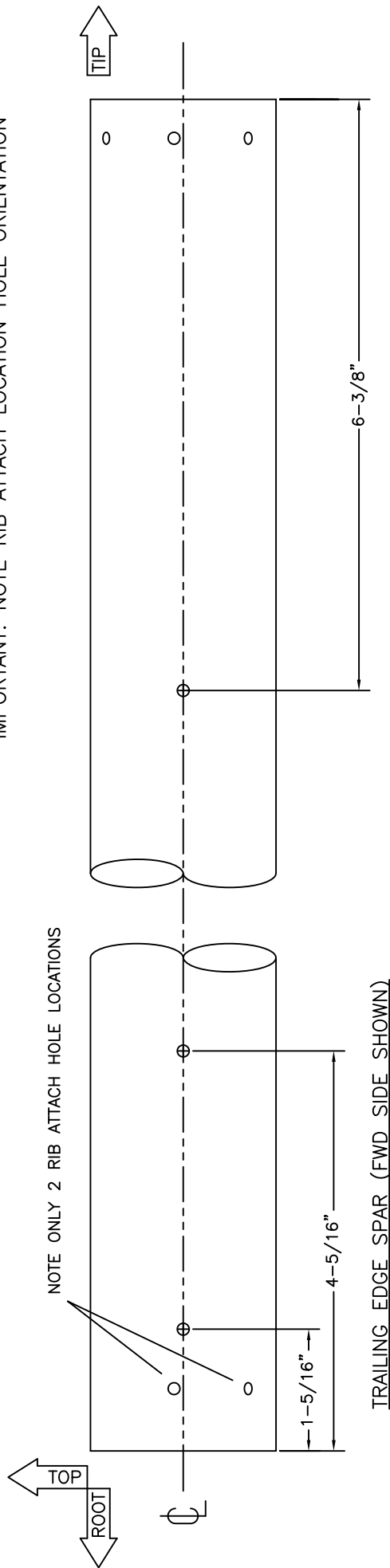
RAMS S-20 RAVEN
WING SPAR ORIENTATION
FIGURE 05-02

LH SPAR ONLY (STEP DRILL TO 3/4" ON BOTH SIDES; THIS HOLE ONLY)
FOR PITOT/STATIC TUBE INSTALLATION



LEADING EDGE SPAR (AFT SIDE SHOWN)

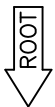
IMPORTANT: NOTE RIB ATTACH LOCATION HOLE ORIENTATION



TRAILING EDGE SPAR (FWD SIDE SHOWN)

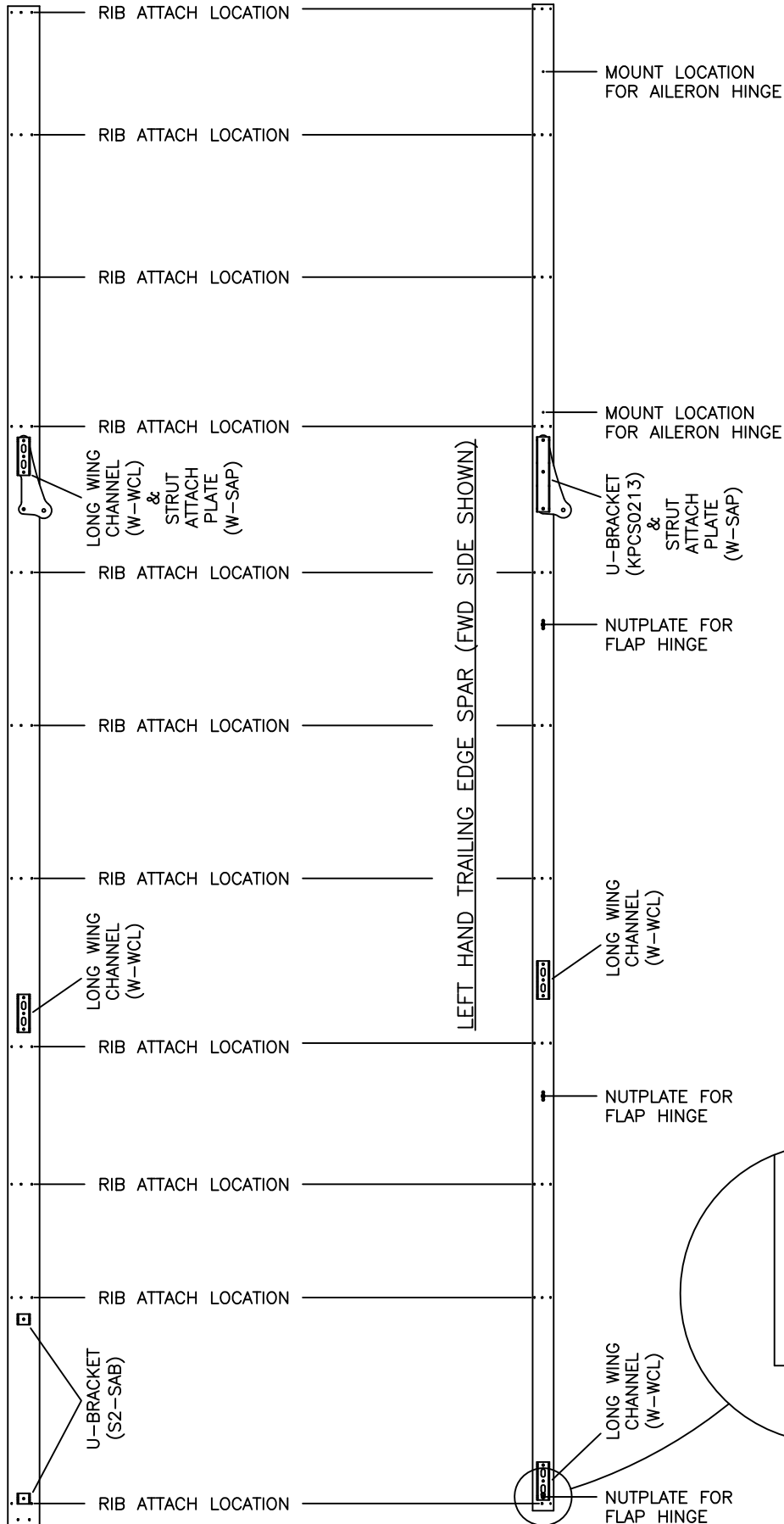
MD4351
REV. A

RRF S-20 RAVEN
WING SPAR ORIENTATION
FIGURE 05-02A



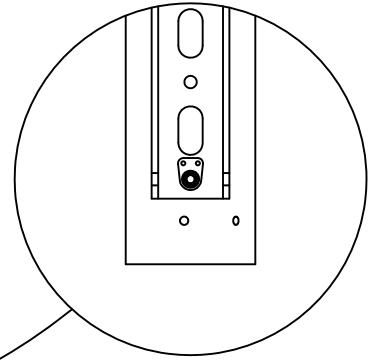
RIGHT HAND LEADING EDGE SPAR (AFT SIDE SHOWN)

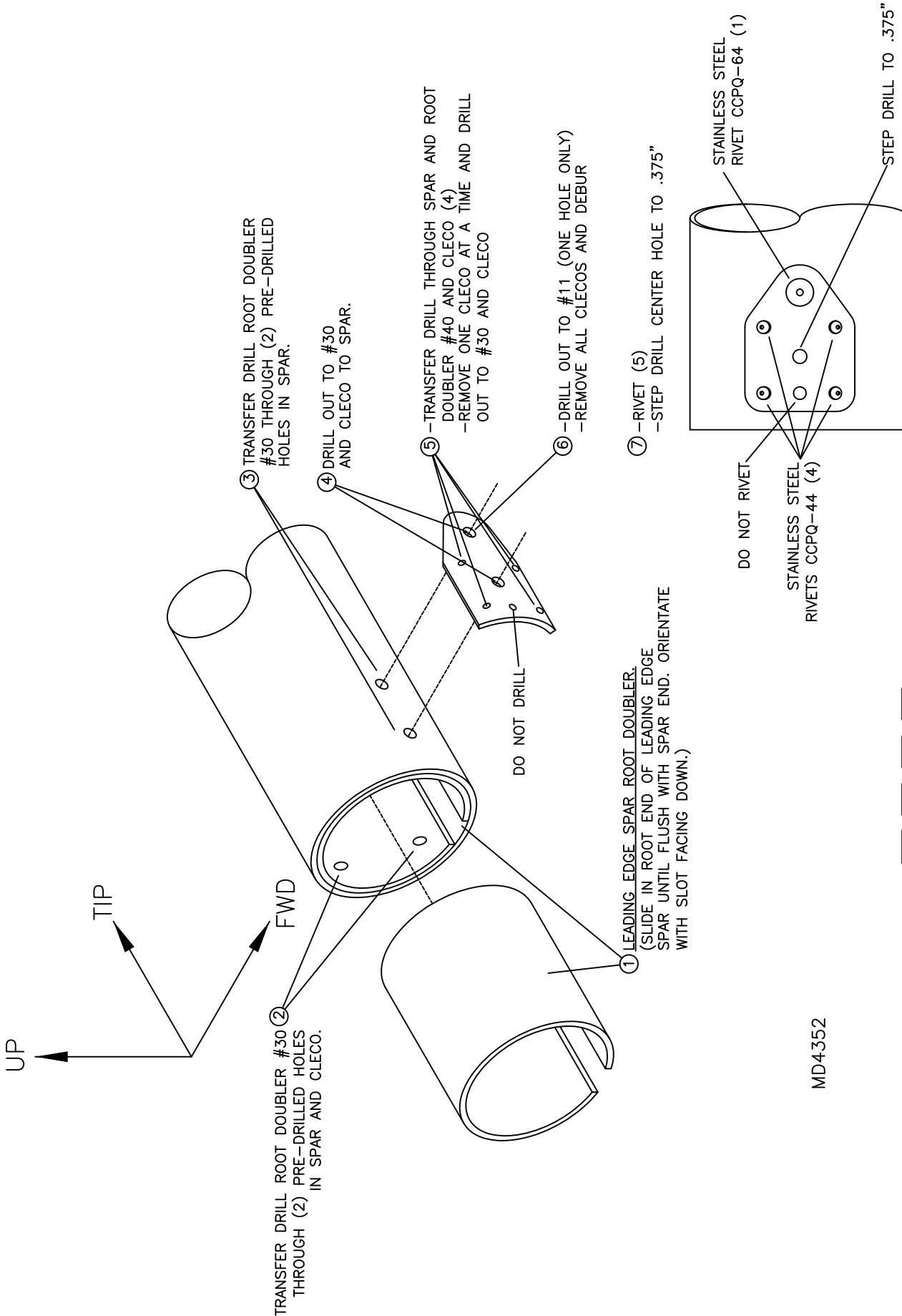
LEFT HAND TRAILING EDGE SPAR (FWD SIDE SHOWN)



MD4351
REV. B

RAVEN S-20 RAVEN
WING SPAR ORIENTATION
FIGURE 05-03





UP

TIP

FWD

TRANSFER DRILL ROOT DOUBLER #30 THROUGH (2) PRE-DRILLED HOLES IN SPAR AND CLECO.

③ TRANSFER DRILL ROOT DOUBLER #30 THROUGH (2) PRE-DRILLED HOLES IN SPAR.

④ DRILL OUT TO #30 AND CLECO TO SPAR.

⑤ -TRANSFER DRILL THROUGH SPAR AND ROOT DOUBLER #40 AND CLECO (4) -REMOVE ONE CLECO AT A TIME AND DRILL OUT TO #30 AND CLECO

⑥ -DRILL OUT TO #11 (ONE HOLE ONLY) -REMOVE ALL CLECOS AND DEBUR

① LEADING EDGE SPAR ROOT DOUBLER. (SLIDE IN ROOT END OF LEADING EDGE SPAR UNTIL FLUSH WITH SPAR END. ORIENTATE WITH SLOT FACING DOWN.)

DO NOT DRILL

⑦ -RIVET (5) -STEP DRILL CENTER HOLE TO .375"

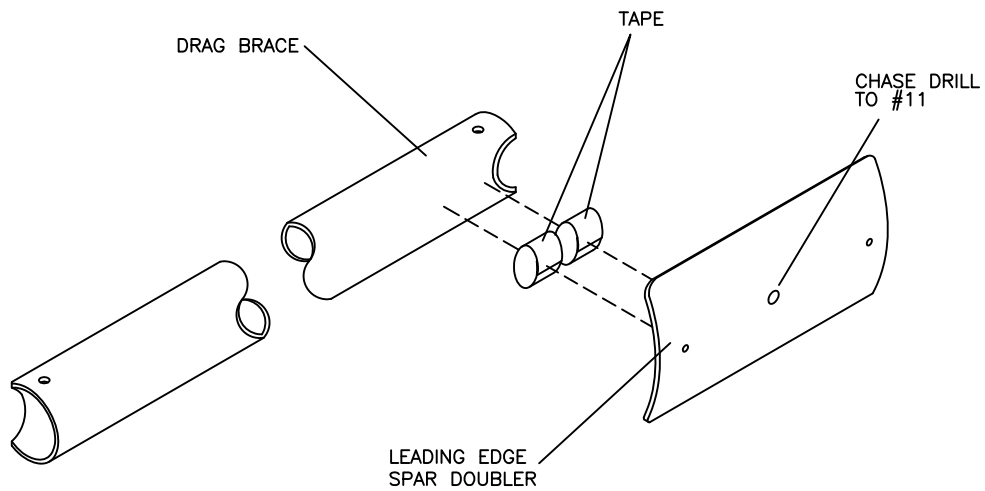
DO NOT RIVET.
STAINLESS STEEL RIVETS CCPQ-44 (4)

STAINLESS STEEL RIVET CCPQ-64 (1)

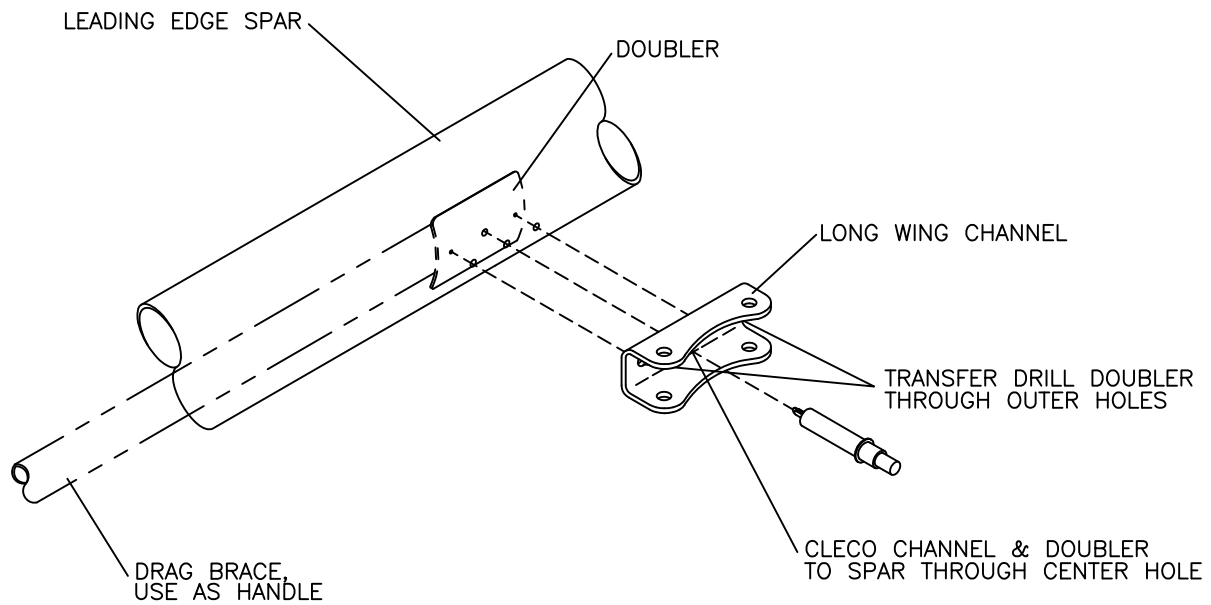
STEP DRILL TO .375"

MD4352

RAMS S-20 RAVEN
LEADING EDGE SPAR ROOT DOUBLER &
LEADING EDGE SPAR PATCH INSTALLATION
FIGURE 05-05

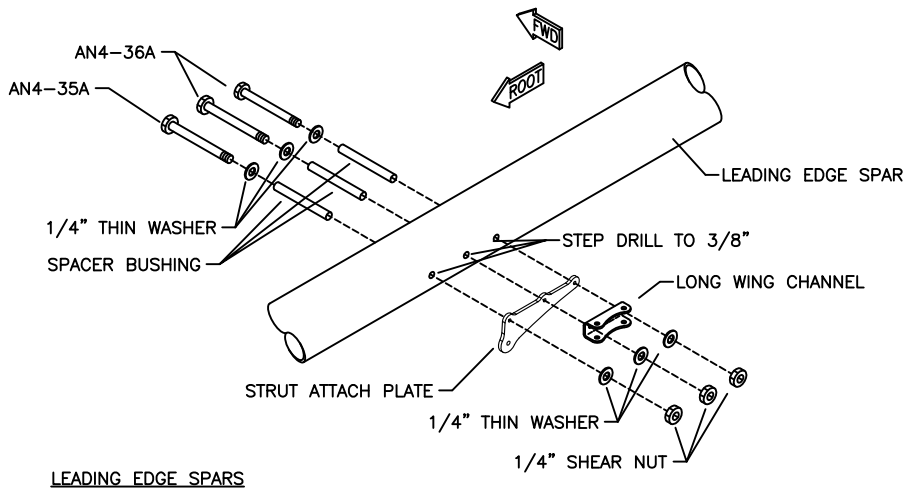
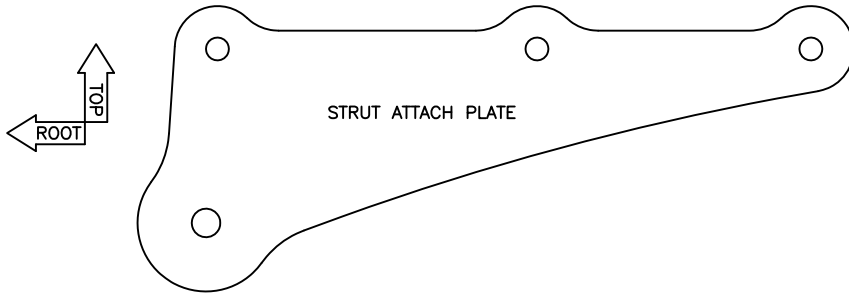


NOTE: USE DRAG BRACE TO POSITION DOUBLER INSIDE THE LEADING EDGE SPAR.

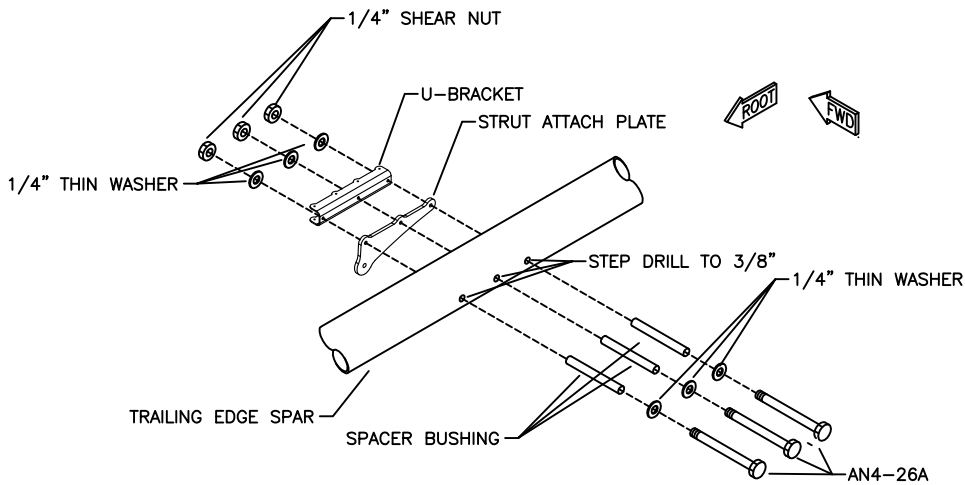


MD4353

RAVENS S-20 RAVEN
LEADING EDGE SPAR
DOUBLER INSTALLATION
FIGURE 05-14



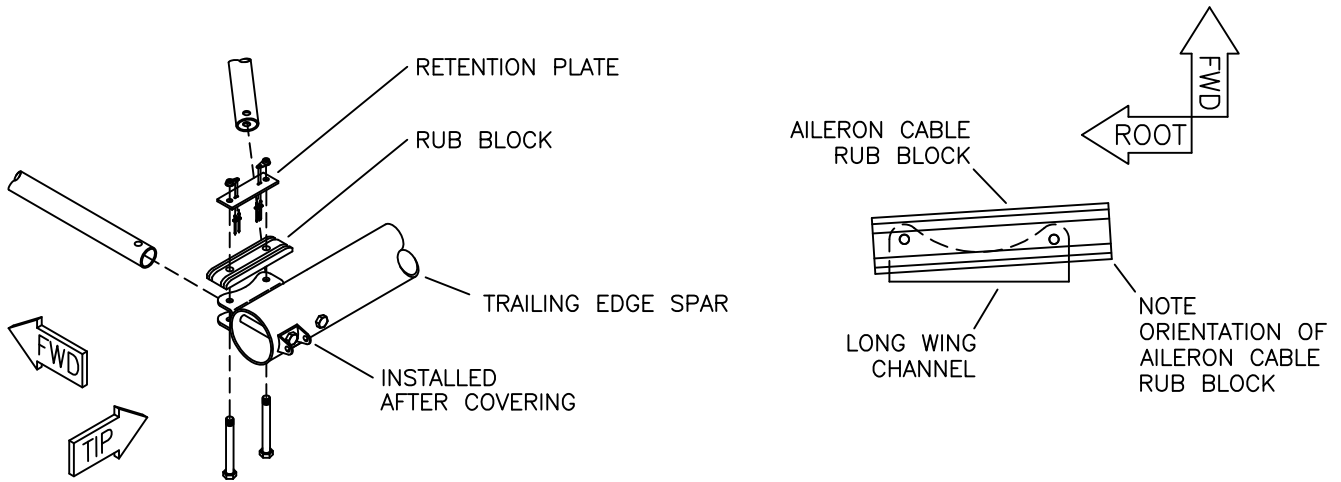
LEADING EDGE SPARS



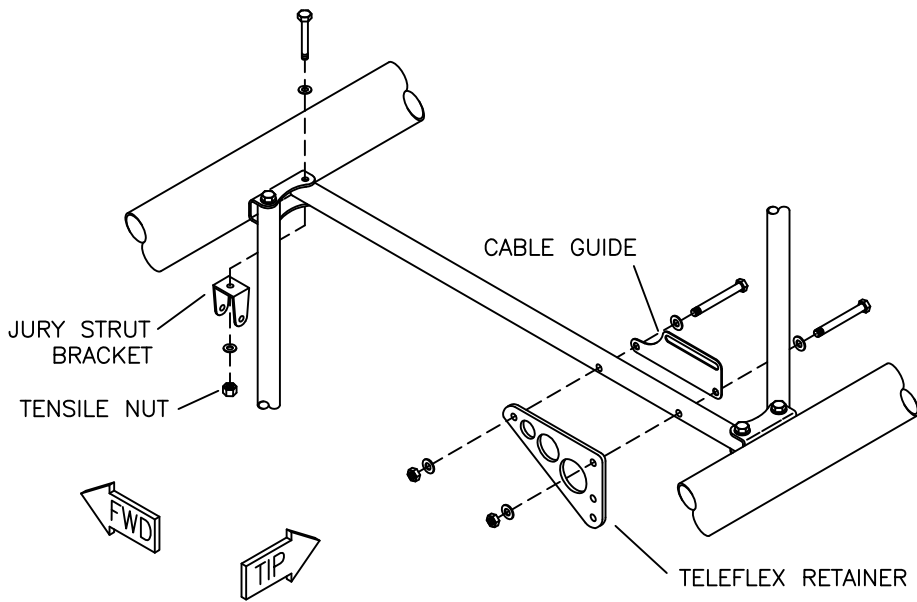
TRAILING EDGE SPARS

MD4354
REV. A

RANS S-20 RAVEN
STRUT ATTACH PLATE INSTALLATION
LEADING AND TRAILING EDGE SPARS
FIGURE 05-18



AILERON CABLE RUB BLOCK



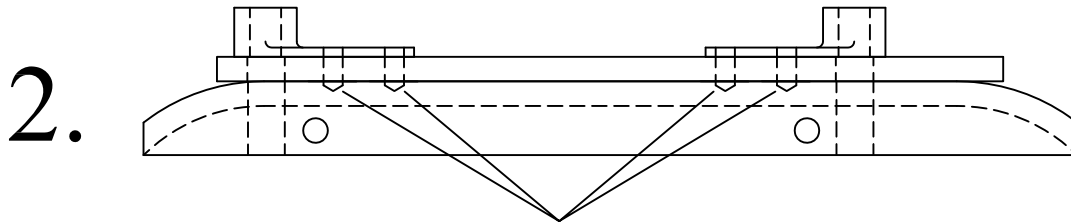
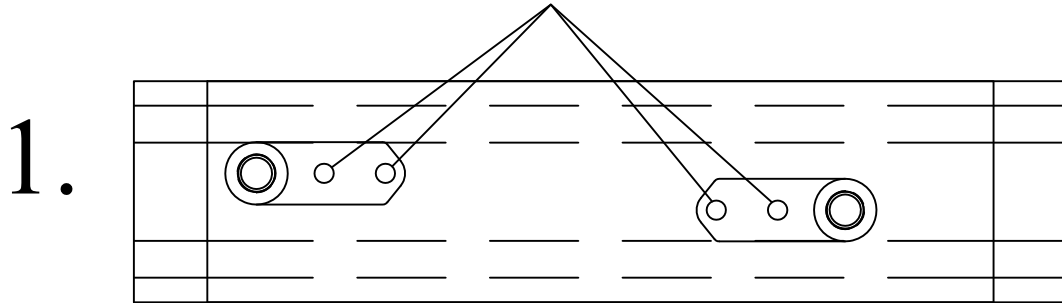
JURY STRUT BRACKET, CABLE GUIDE AND TELEFLEX RETAINER

MD4355
REV. A

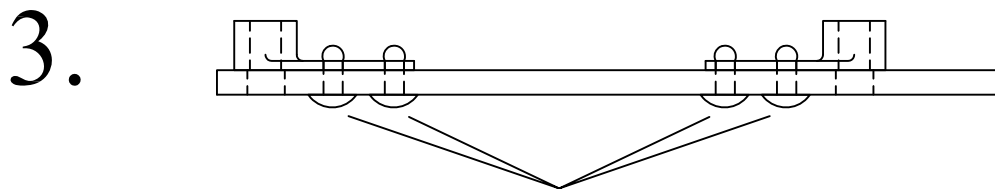
RANS S-20 RAVEN
WING FRAME ASSEMBLY DETAILS
FIGURE 05-26

INSERT 3/16" BOLTS THROUGH RUB BLOCK & RETENTION PLATE TO ALIGN NUT PLATES.
ORIENTATE NUT PLATES PARALLEL TO RUB BLOCK.

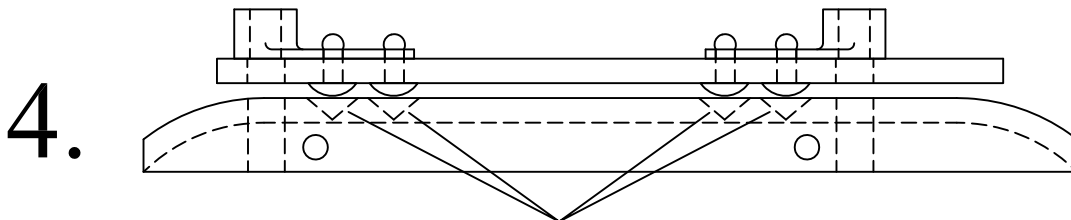
TRANSFER DRILL #40 THROUGH PLATE.



TRANSFER DRILL #40 INTO RUB BLOCK JUST
DEEP ENOUGH TO MARK RIVET HOLE LOCATIONS.

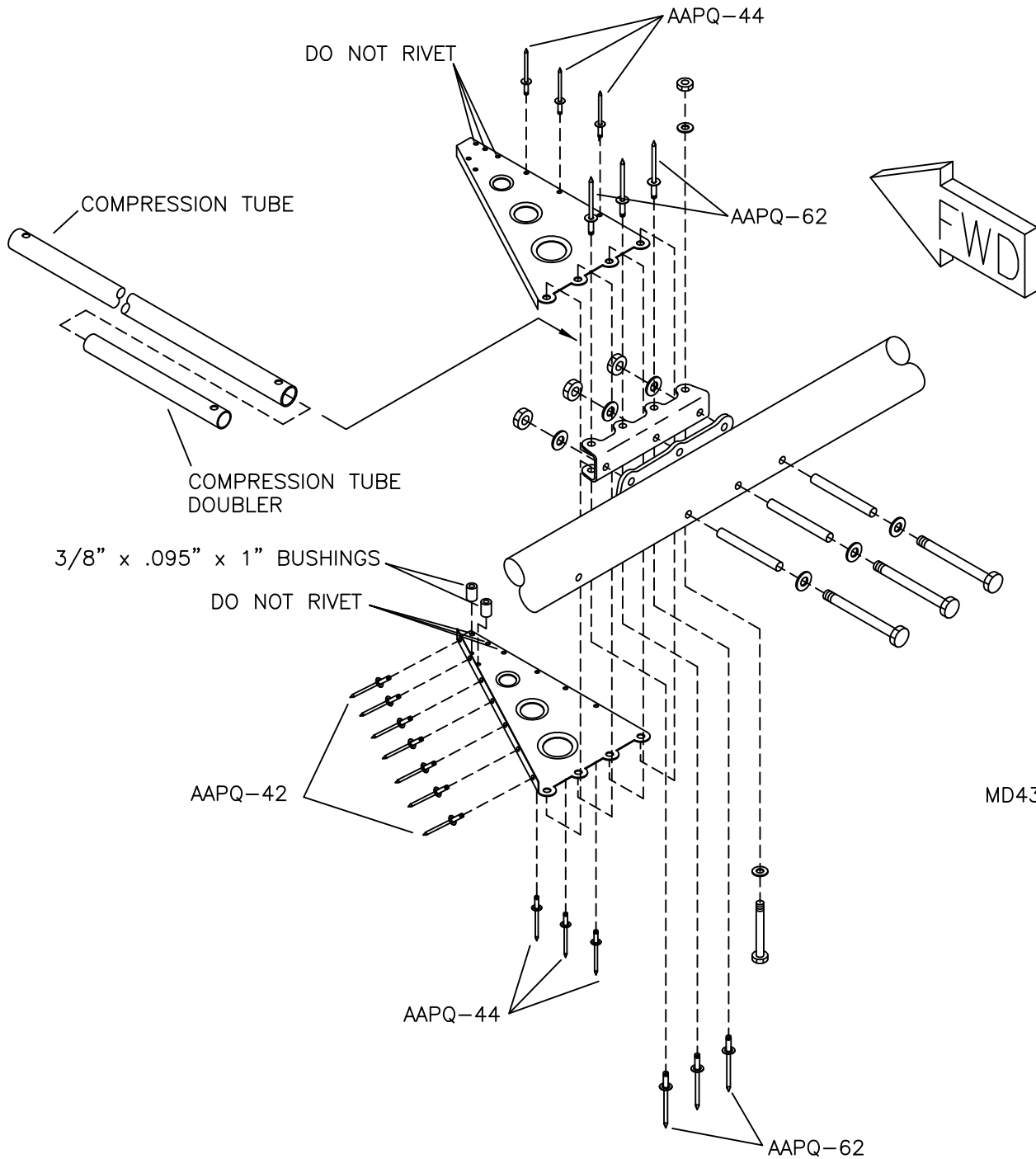


RIVET THROUGH BOTTOM OF RETENTION PLATE.



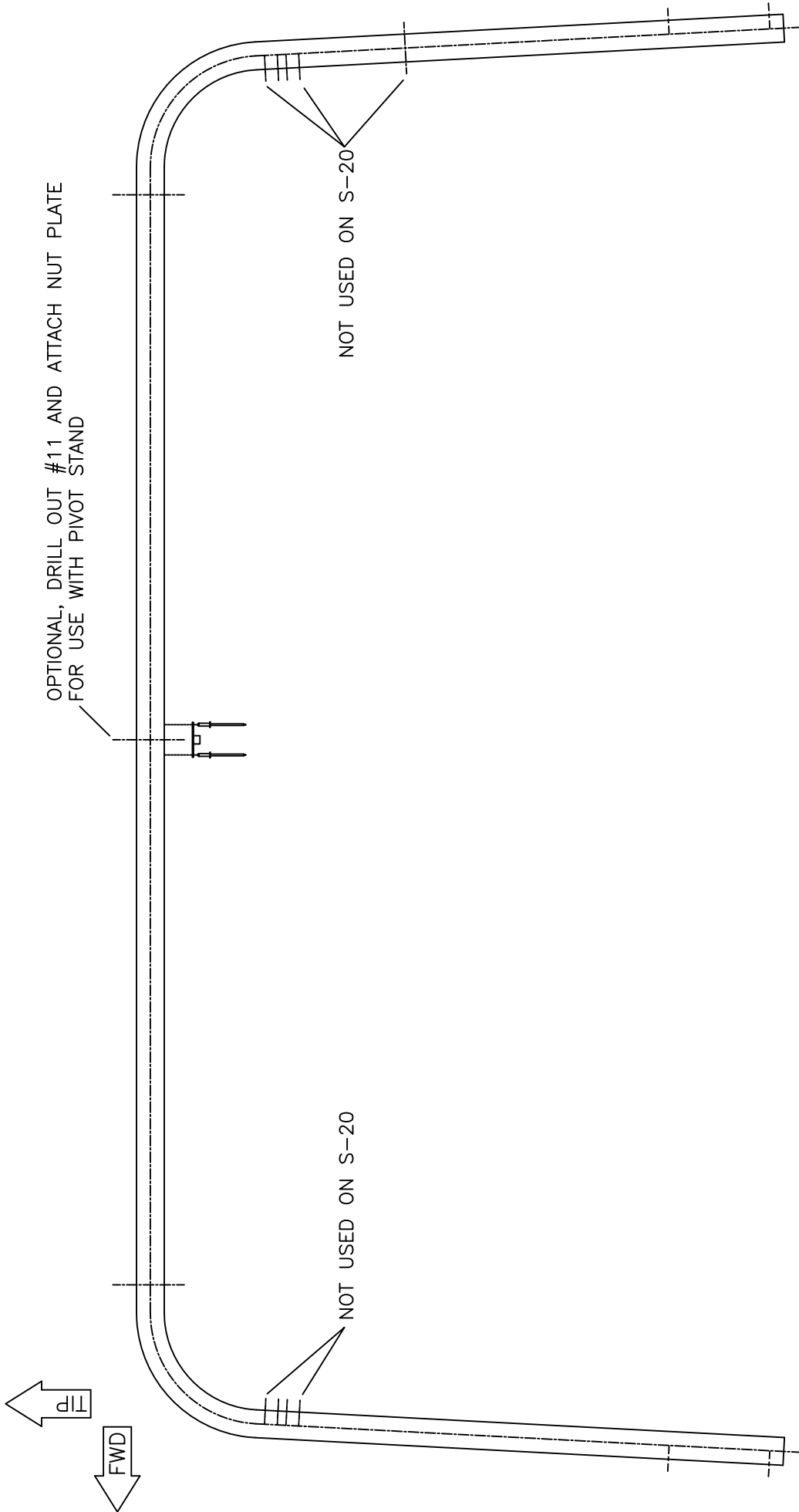
COUNTER-SINK MARKED LOCATIONS IN RUB
BLOCK TO ALLOW CLEARANCE FOR RIVET HEADS

RANS S-20 RAVEN
RUB BLOCK & RETENTION PLATE
FIGURE 05-26A



MD4357

RANS S-20 RAVEN
BELLCRANK BRACE INSTALLATION
FIGURE 05-27



OPTIONAL, DRILL OUT #11 AND ATTACH NUT PLATE FOR USE WITH PIVOT STAND

NOT USED ON S-20

NOT USED ON S-20

FWD

REV

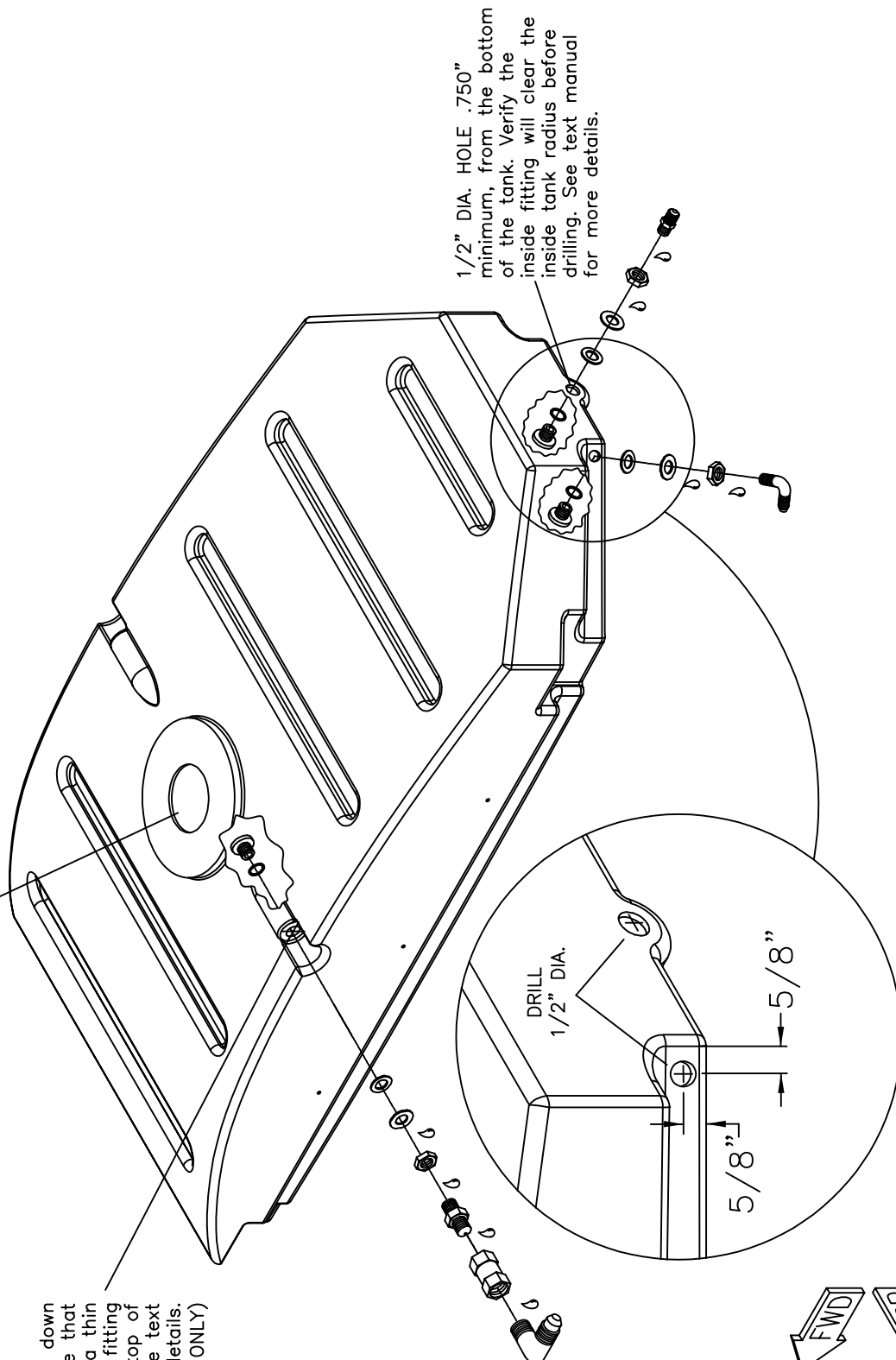
MD5552

RRR S-20 RAVEN
TIP BOW ORIENTATION

FIGURE 05-34

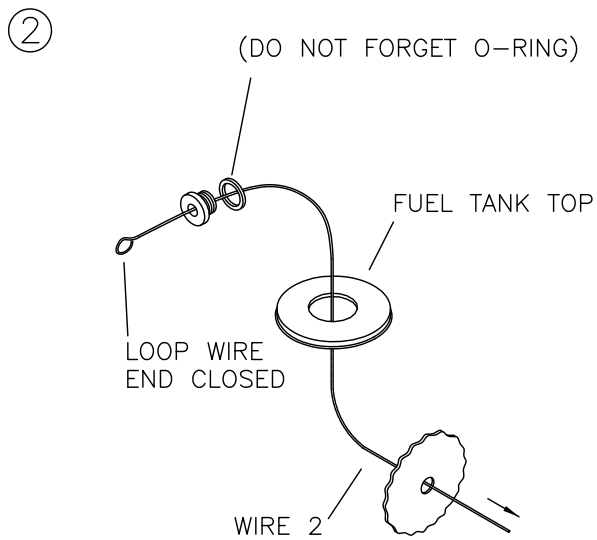
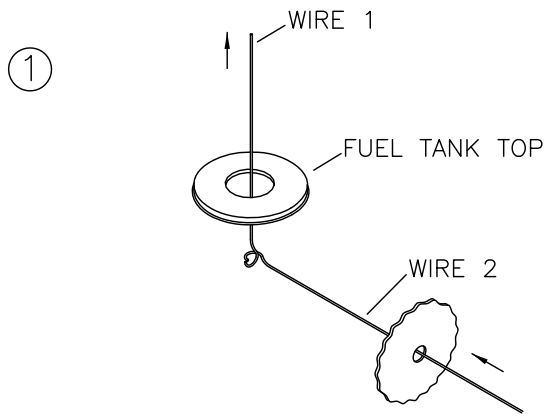
(DO NOT LOCATE UNTIL RIBS AND ROOT SKIN ARE INSTALLED)

1/2" DIA. hole. .625" minimum, down from the top of tank. Validate that you can tighten the nut with a thin walled socket and the inside fitting will clear the radius of the top of the tank before drilling. See text manual for more details. (INBOARD SIDE ONLY)



MD5540
REV. A

RAVEN S-20 RAVEN
WING FUEL TANK ASSEMBLY
FIGURE 05A-02

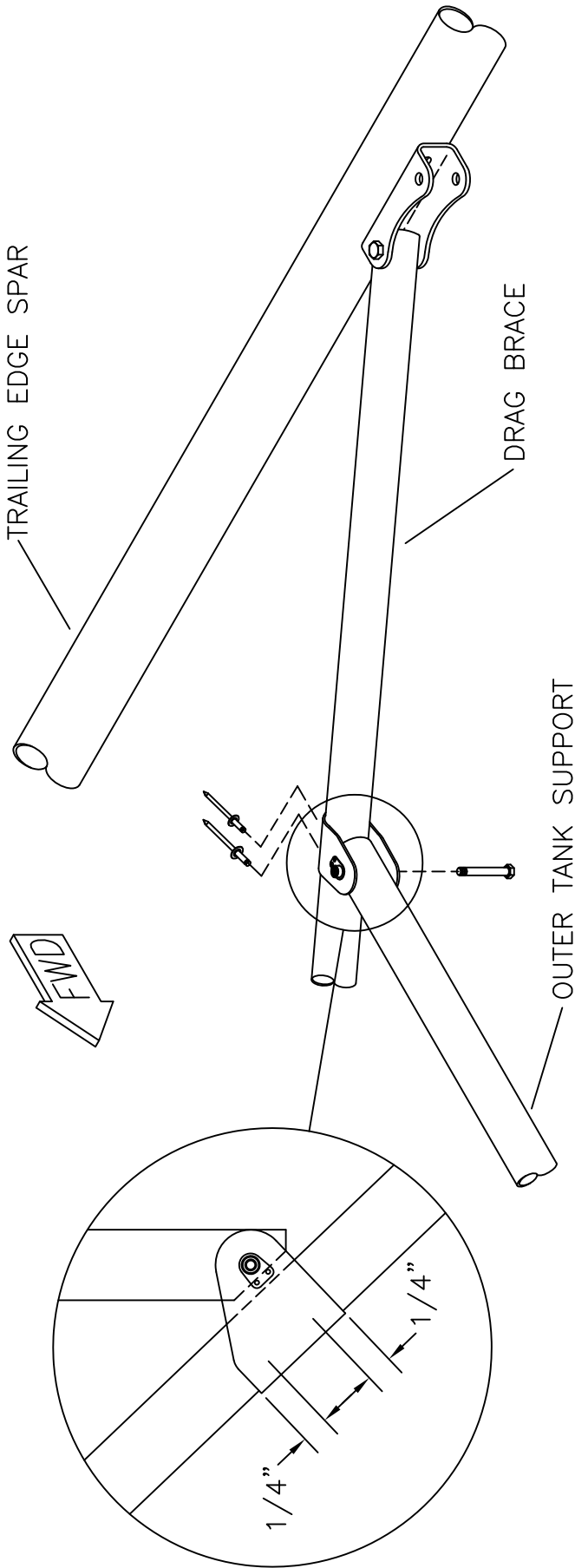


③ INSTALL RUBBER WASHER, STEEL WASHER, LOCTITE, AND NUT.

④ REMOVE FISHING LINE AND/OR WIRE.

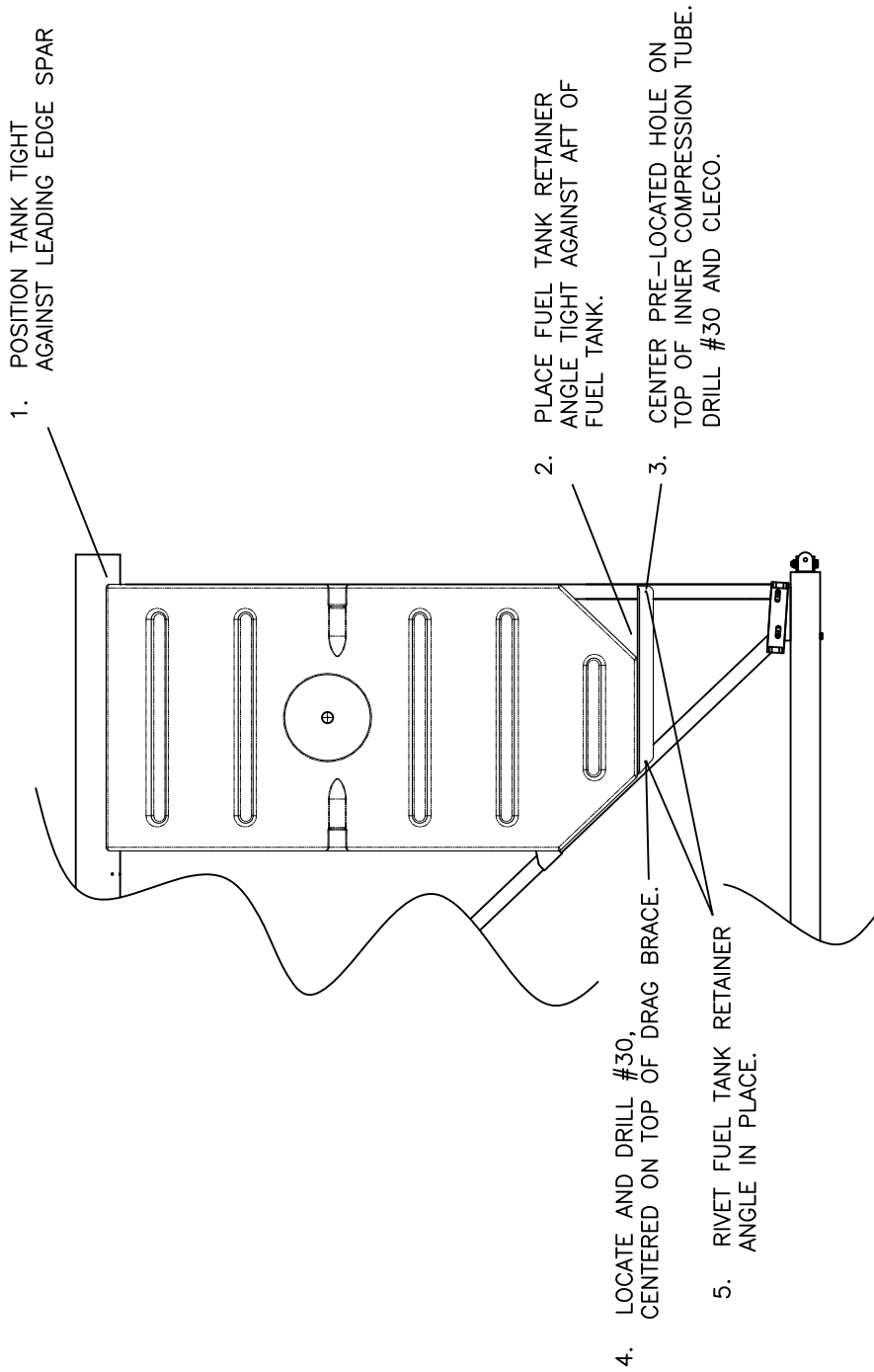
RANS S-20 RAVEN
FUEL TANK FITTING INSTALLATION
FIGURE 05A-03

MD4832



MD4359

RAVEN S-20 RAVEN
WING TANK SUPPORT TUBE INSTALLATION
FIGURE 05A-07



1. POSITION TANK TIGHT AGAINST LEADING EDGE SPAR

2. PLACE FUEL TANK RETAINER ANGLE TIGHT AGAINST AFT OF FUEL TANK.

3. CENTER PRE-LOCATED HOLE ON TOP OF INNER COMPRESSION TUBE. DRILL #30 AND CLECO.

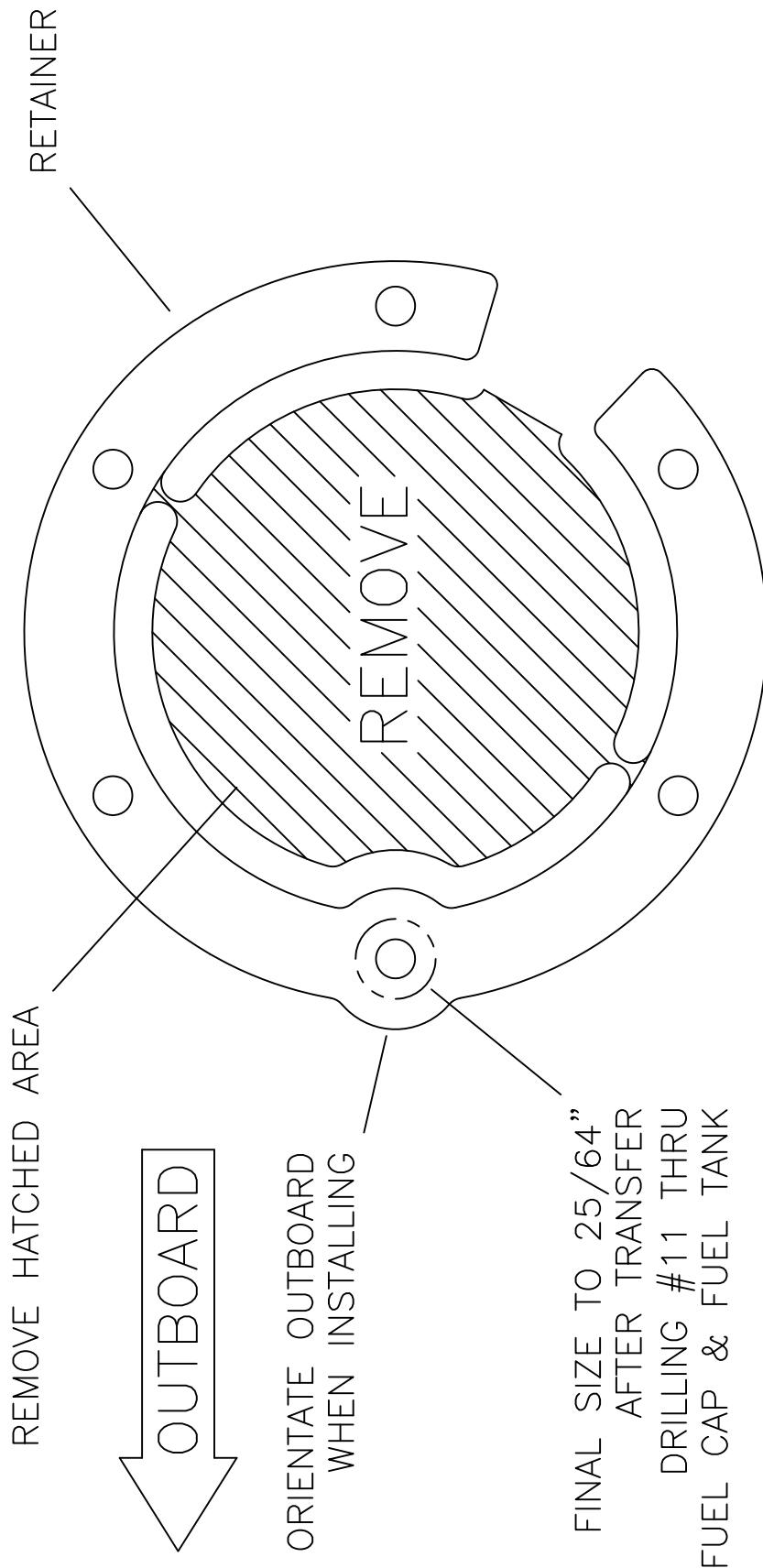
4. LOCATE AND DRILL #30, CENTERED ON TOP OF DRAG BRACE.

5. RIVET FUEL TANK RETAINER ANGLE IN PLACE.

TIP
LH WING SHOWN

RAVEN S-20 RAVEN
FUEL TANK RETAINER ANGLE INSTALLATION
FIGURE 05A-10

MD4365



MD5549

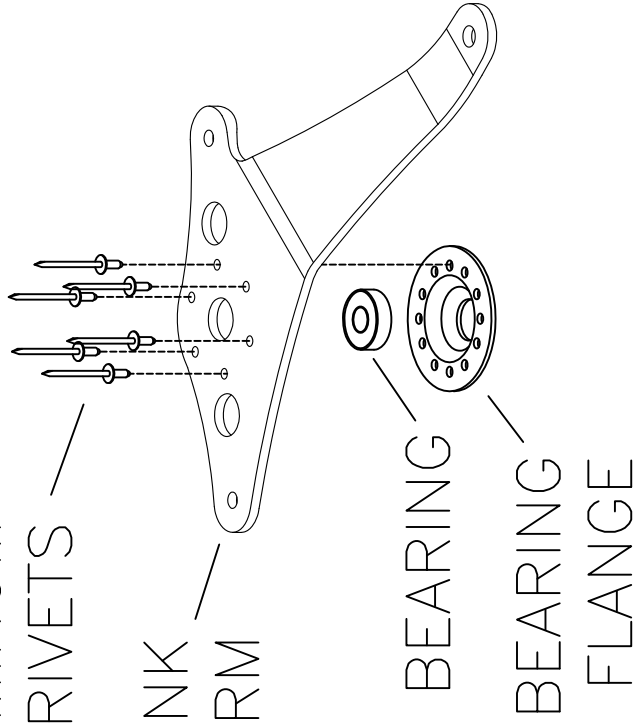
RRANOS S-20 RAVEN
RETAINER MODIFICATION
FIGURE 05A-14

1/8" ALUMINUM

RIVETS

BELL CRANK

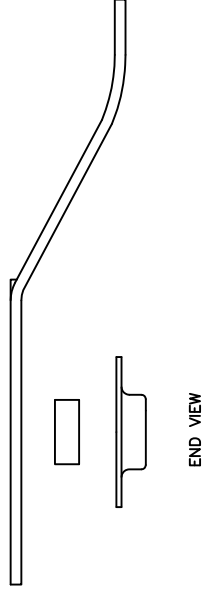
UPPER ARM



BEARING

BEARING

FLANGE

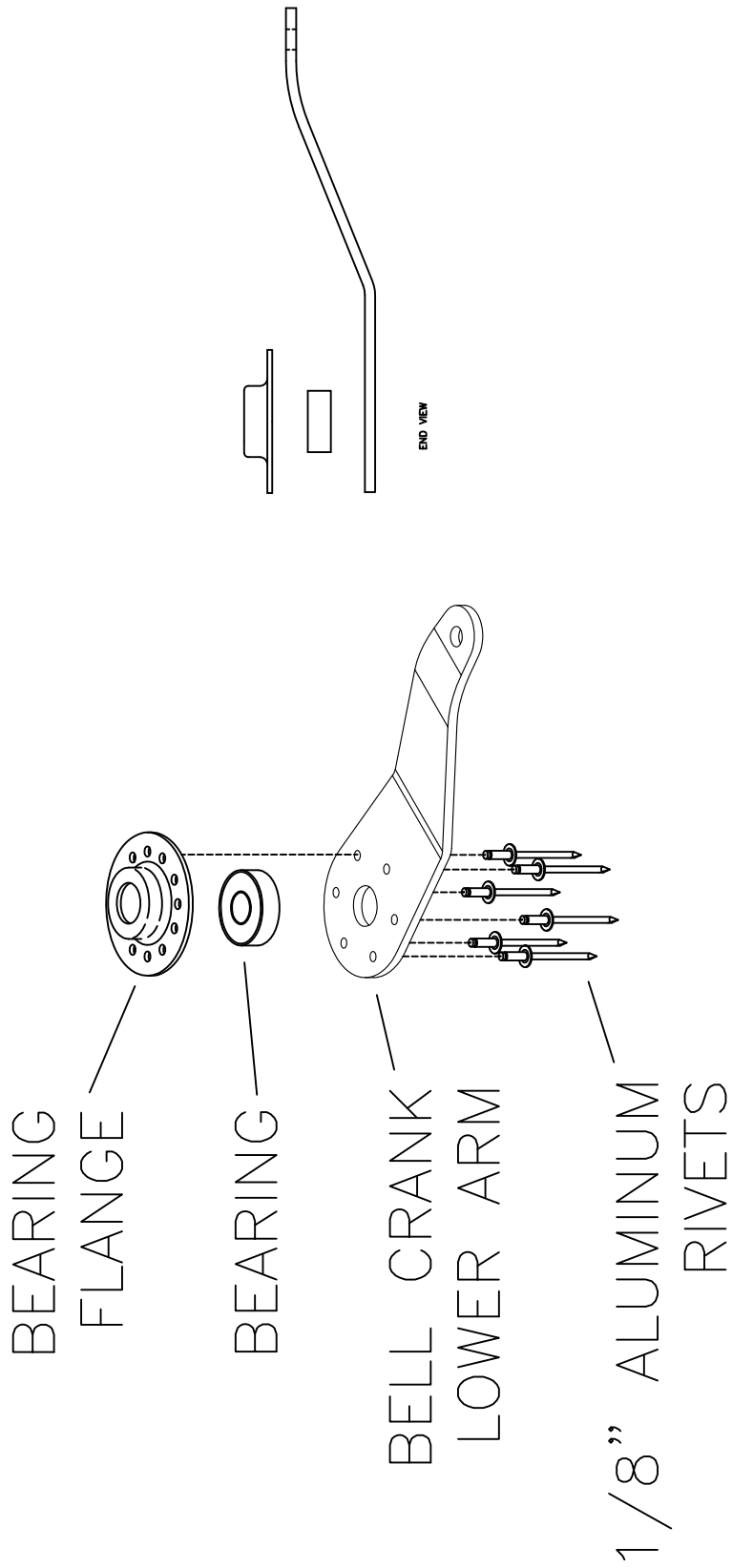


END VIEW

MAKE LEFT AND RIGHT ASSEMBLIES

MD5639
REV. - ORIG

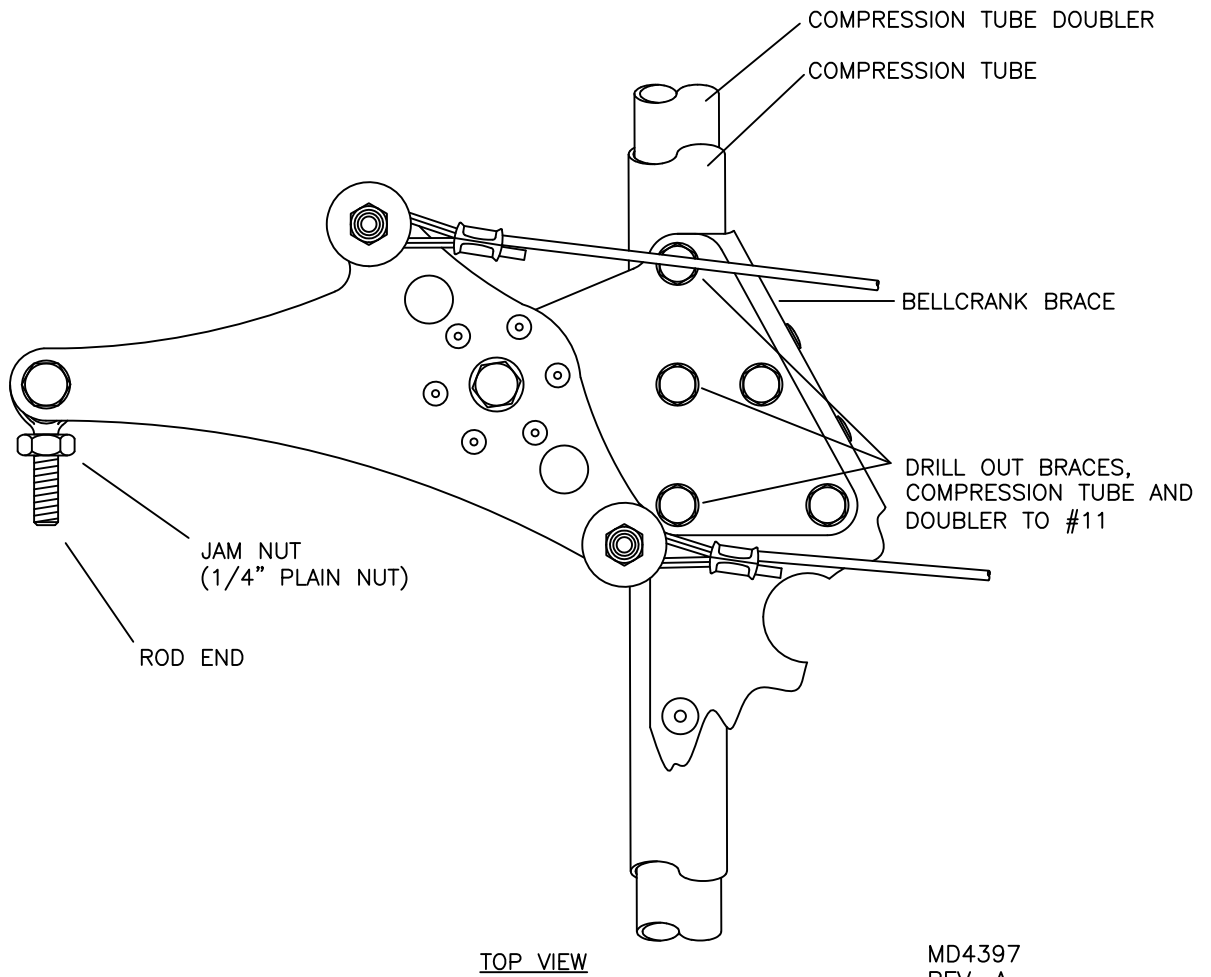
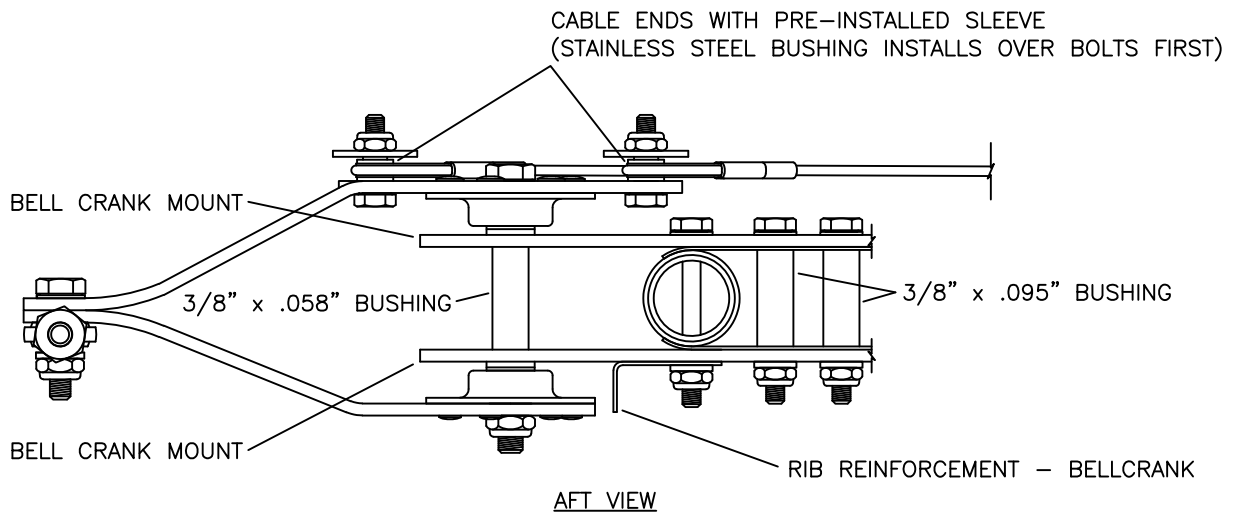
RRR S-20 RAVEN
BELL CRANK - UPPER ARM ASSEMBLY
FIGURE 05B-02



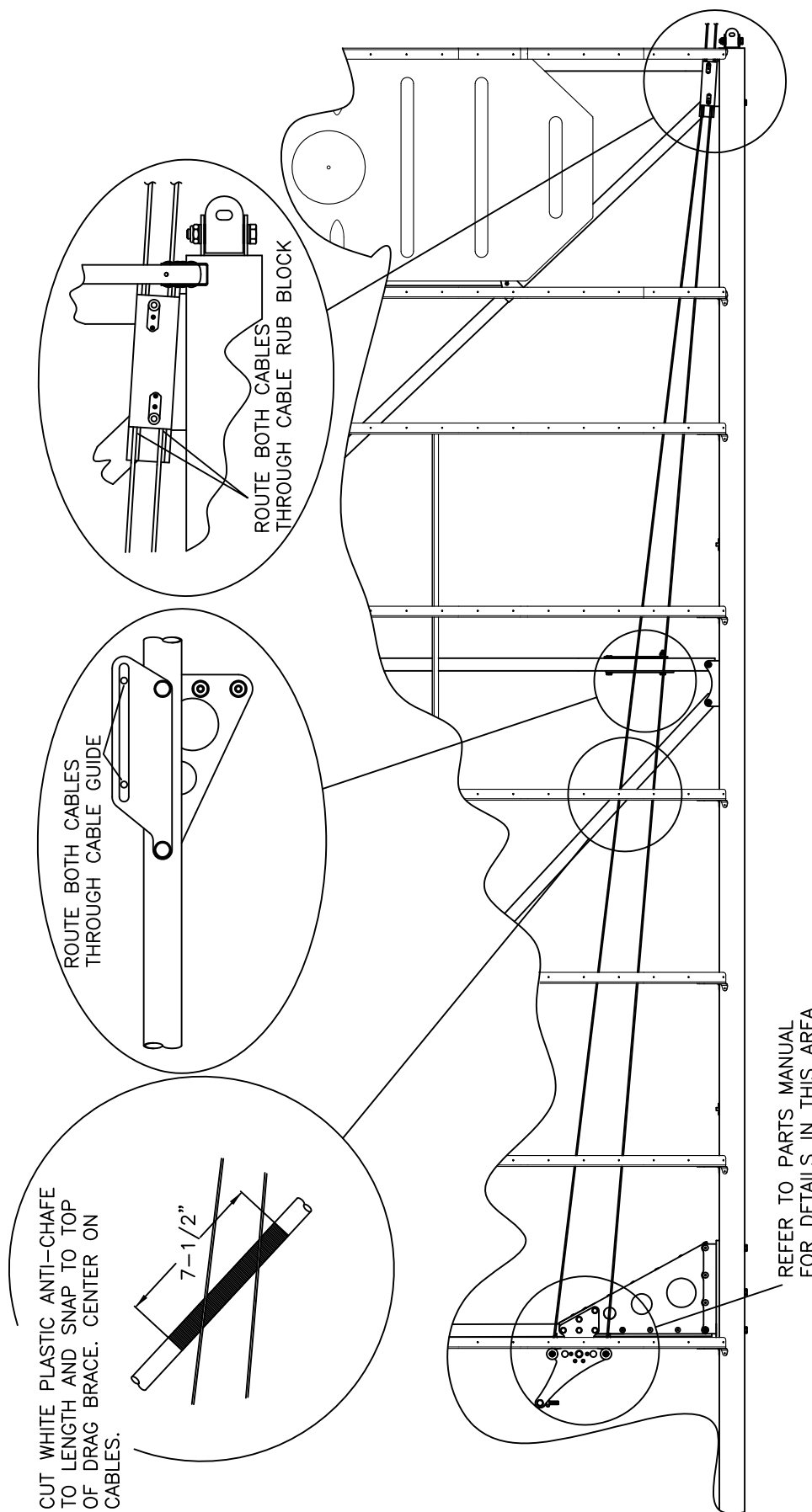
MAKE 2 ASSEMBLIES

MD5639
REV. - ORIG

RRR S-20 RAVEN
BELL CRANK - LOWER ARM ASSEMBLY
FIGURE 05B-02A



RANS S-20 RAVEN
WING BELL CRANK ASSEMBLY AND INSTALLATION
FIGURE 05B-04



CUT WHITE PLASTIC ANTI-CHAFE TO LENGTH AND SNAP TO TOP OF DRAG BRACE. CENTER ON CABLES.

7-1/2"

ROUTE BOTH CABLES THROUGH CABLE GUIDE

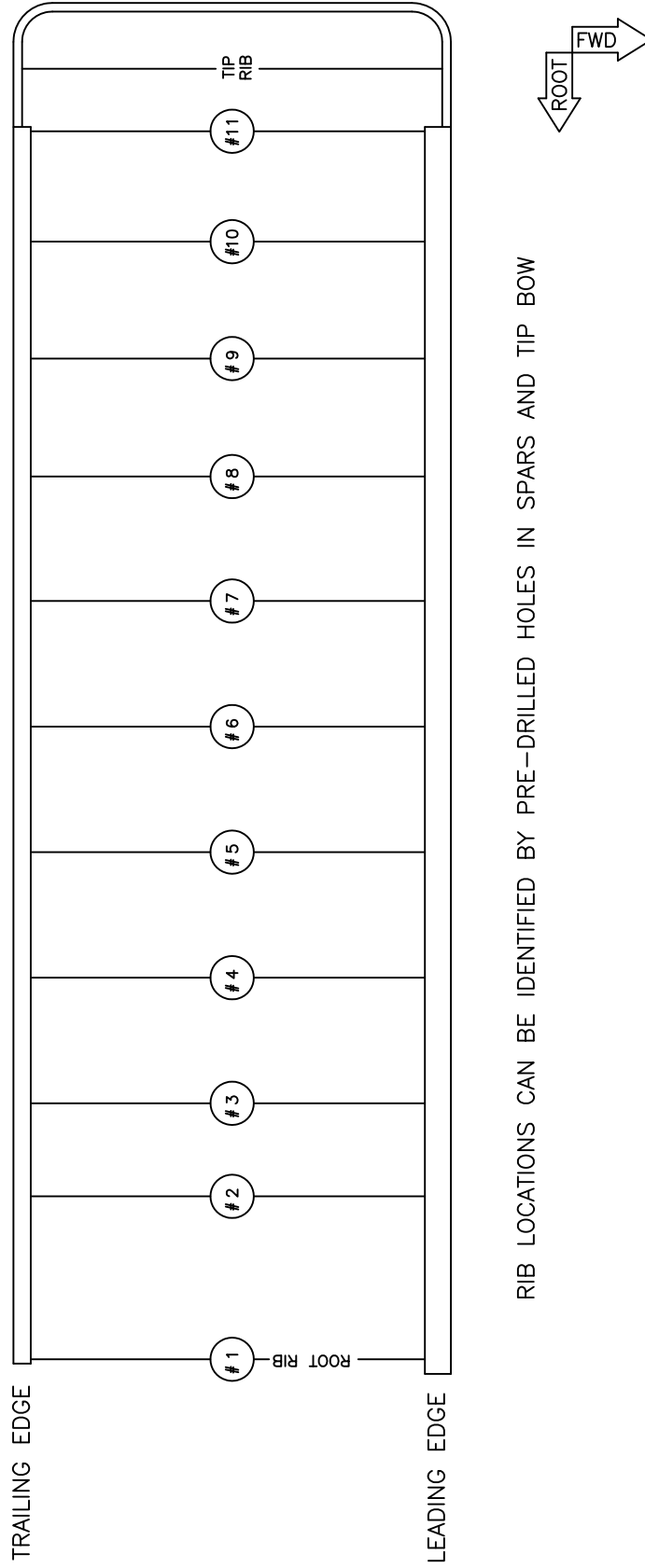
ROUTE BOTH CABLES THROUGH CABLE RUB BLOCK

REFER TO PARTS MANUAL FOR DETAILS IN THIS AREA

TIP
LH WING SHOWN

RAVEN S-20 RAVEN
AILERON CABLE INSTALLATION - WING
FIGURE 05B-09

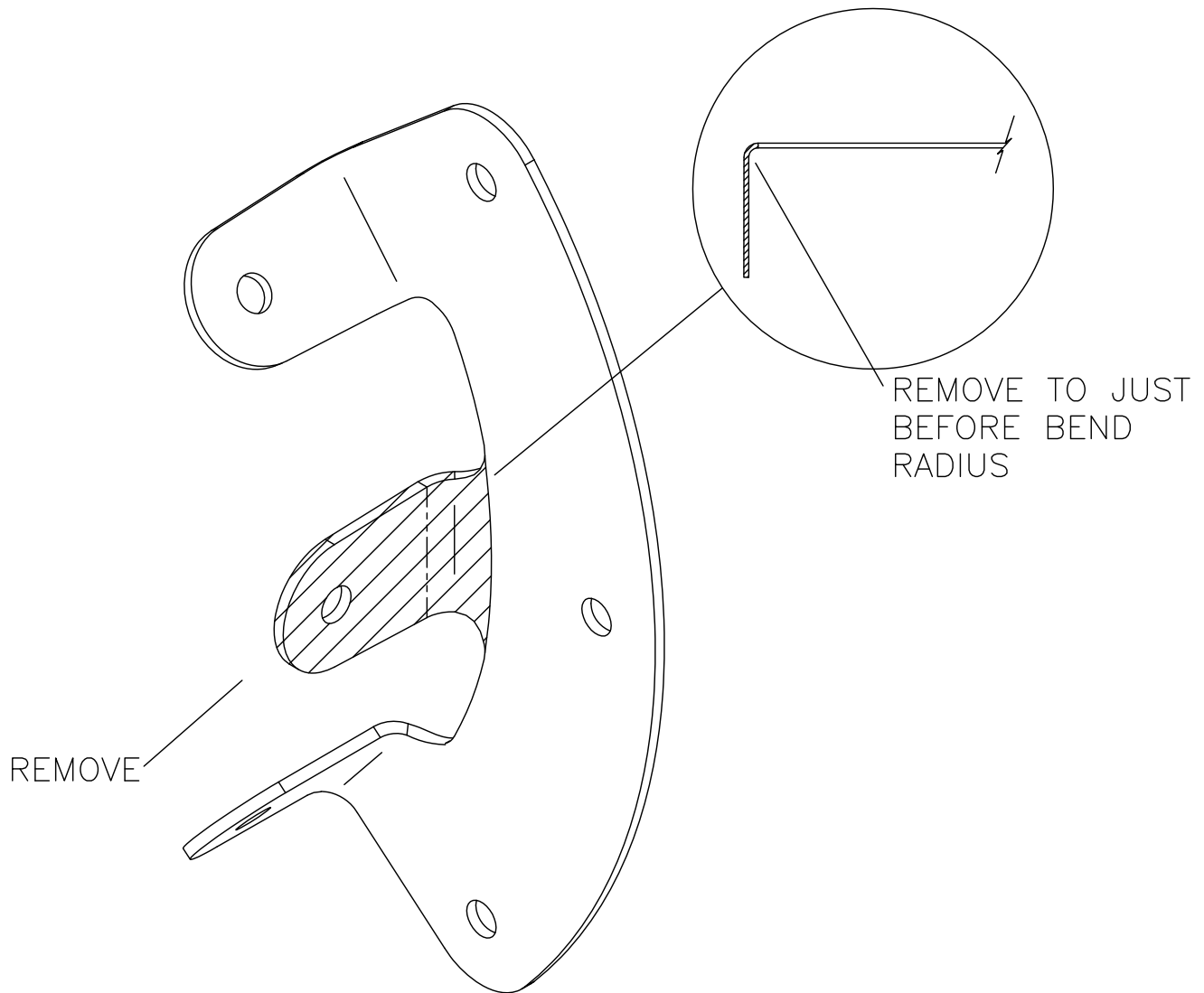
MD4365



RIB LOCATIONS CAN BE IDENTIFIED BY PRE-DRILLED HOLES IN SPARS AND TIP BOW

RAVEN S-20 RAVEN
RIB LOCATIONS
FIGURE 05C-01

MD4348

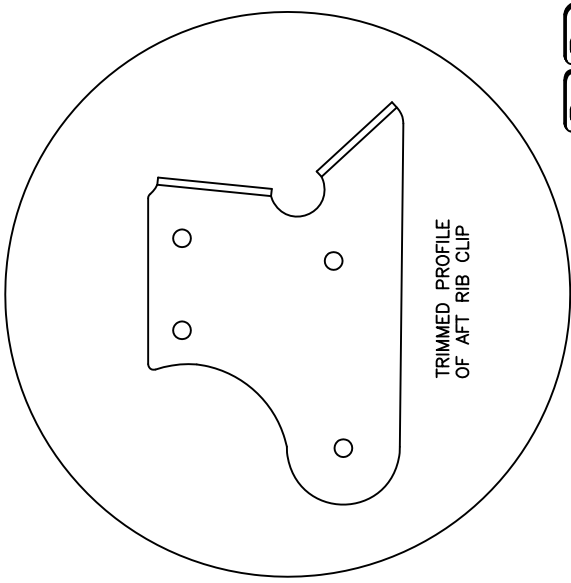
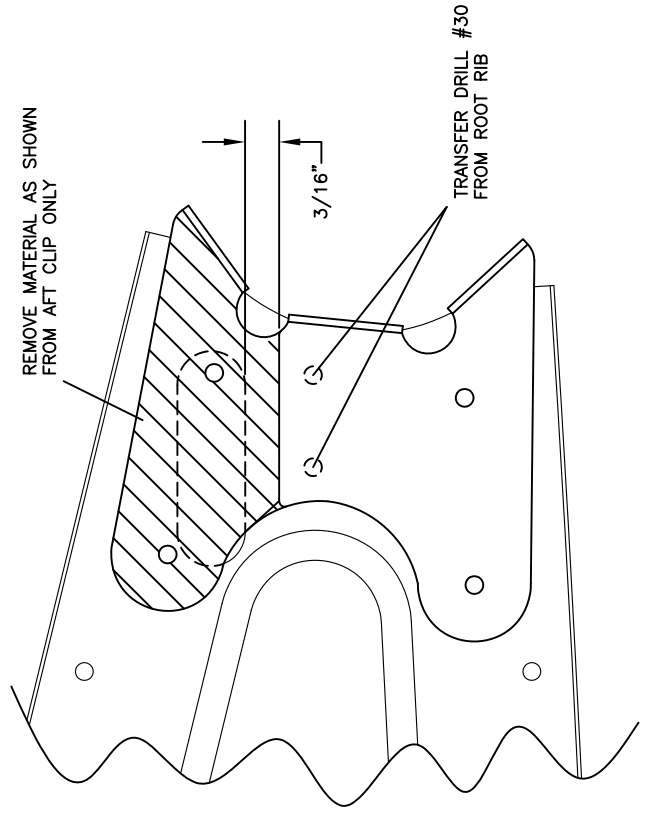
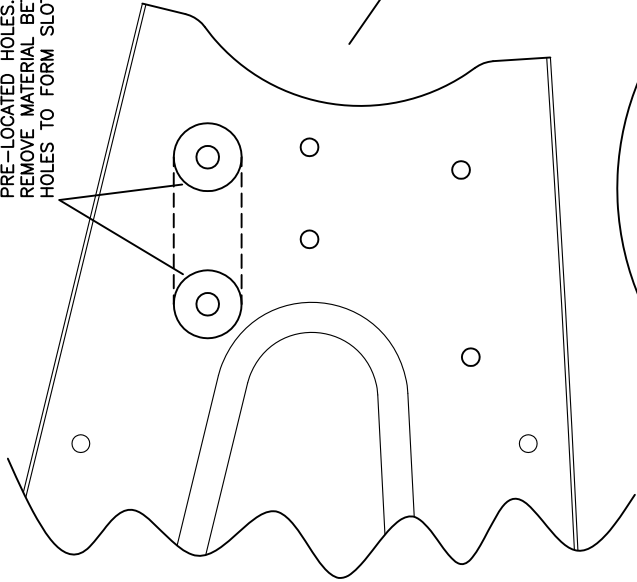


MD5558

RANS S-20 RAVEN
ROOT RIB - FWD RIB ATTACH CLIP MODIFICATION
FIGURE 05C-06

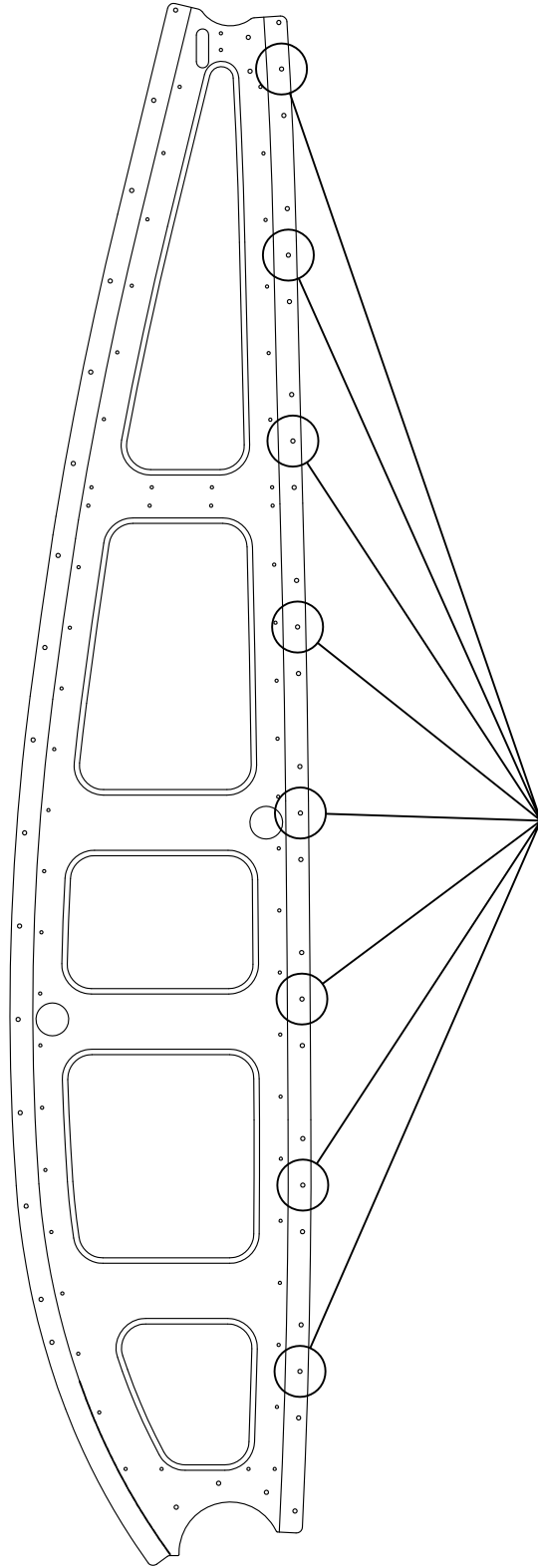
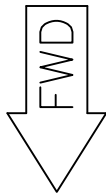
09/01/2013

DRILL 3/8" CENTERED ON
PRE-LOCATED HOLES.
REMOVE MATERIAL BETWEEN
HOLES TO FORM SLOT.



MD5542
REV. A

RAMB S-20 RAVEN
ROOT RIB - AFT RIB ATTACH CLIP MODIFICATION
FIGURE 05C-07

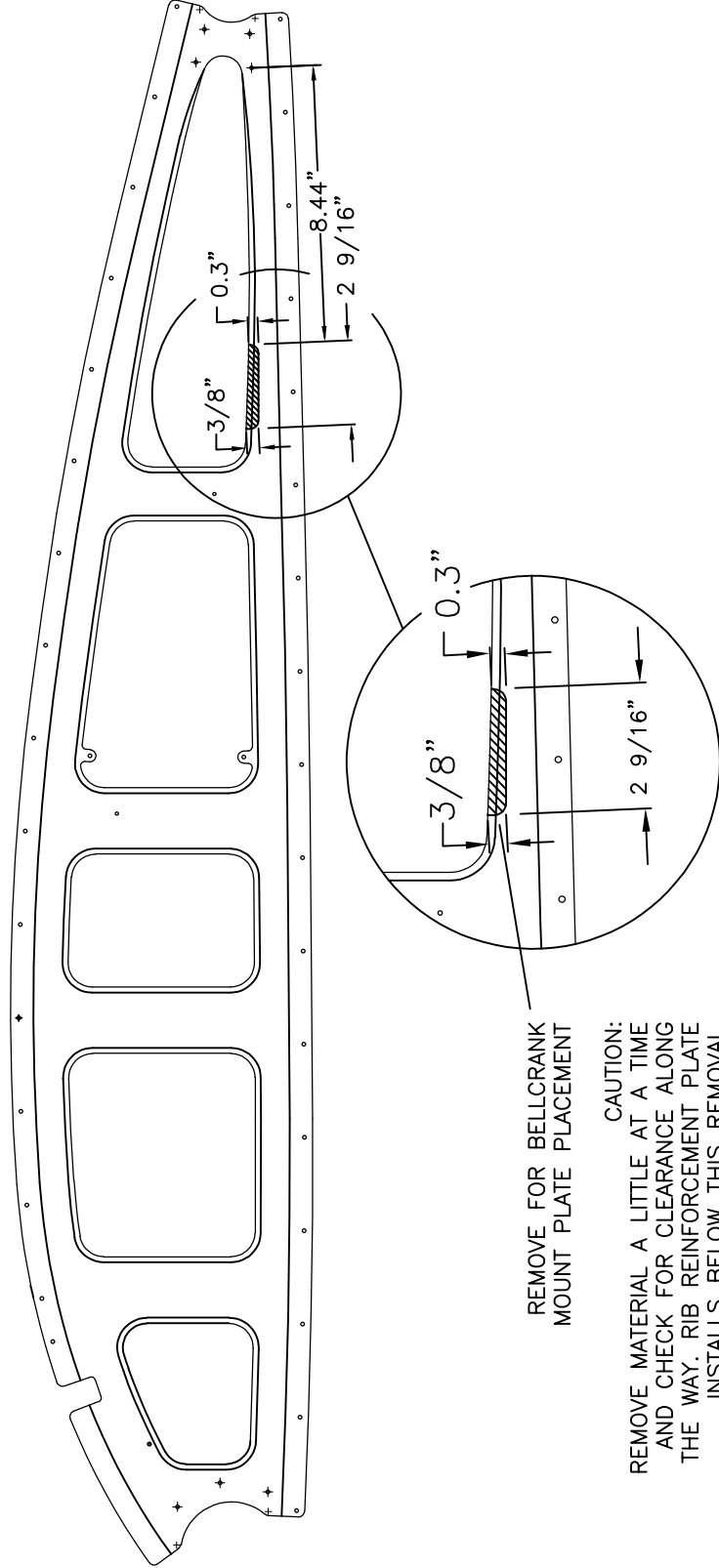
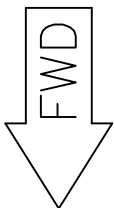


DRILL TO #11 FOR TINNERMAN CLIPS
DO NOT DIMPLE!!

DIMPLE ALL RIVET HOLES ON UPPER AND LOWER FLANGES EXCEPT
THOSE THAT ARE CIRCLED

MD5557
REV. A

RAFAL S-20 RAVEN
ROOT RIB MODIFICATION
FIGURE 05C-09

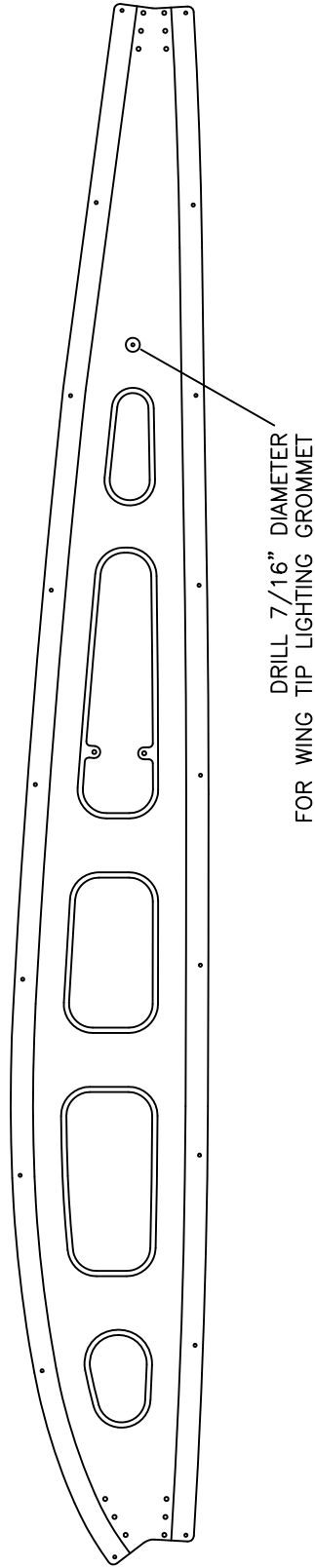
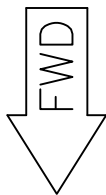


REMOVE FOR BELLCRANK
MOUNT PLATE PLACEMENT

CAUTION:
REMOVE MATERIAL A LITTLE AT A TIME
AND CHECK FOR CLEARANCE ALONG
THE WAY. RIB REINFORCEMENT PLATE
INSTALLS BELOW THIS REMOVAL.
DO NOT REMOVE EXCESS MATERIAL

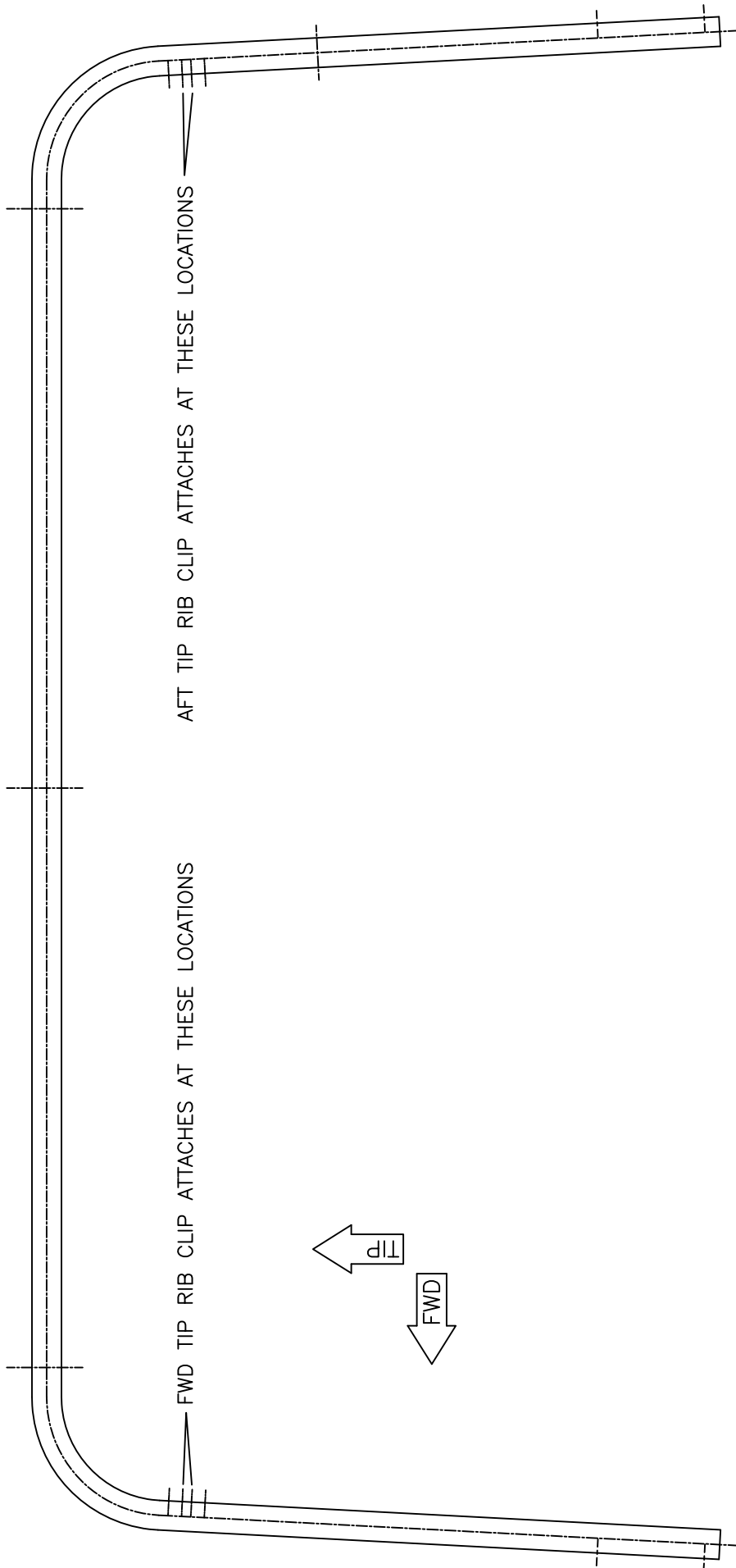
MD5557
REV. A

RAMS S-20 RAVEN
RIB #8 MODIFICATION
FIGURE 05C-09A



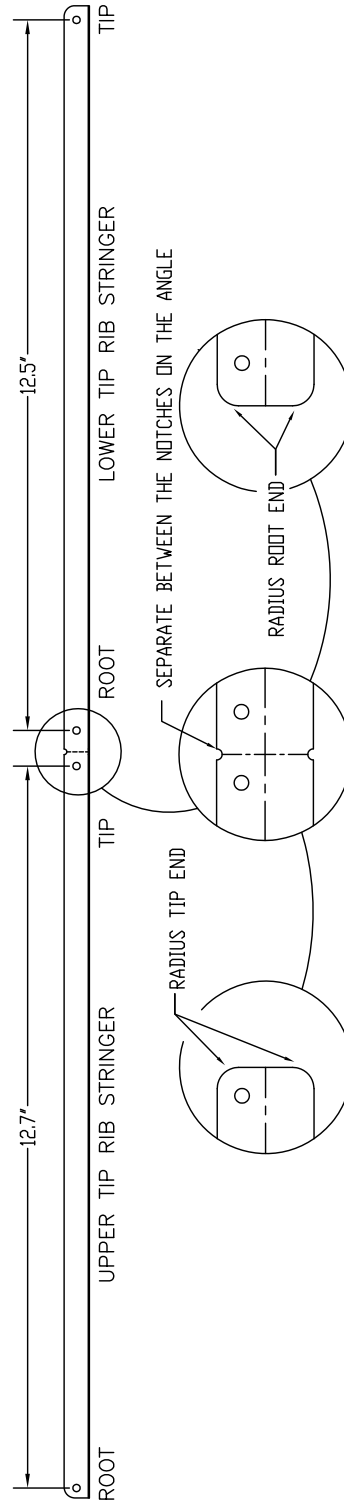
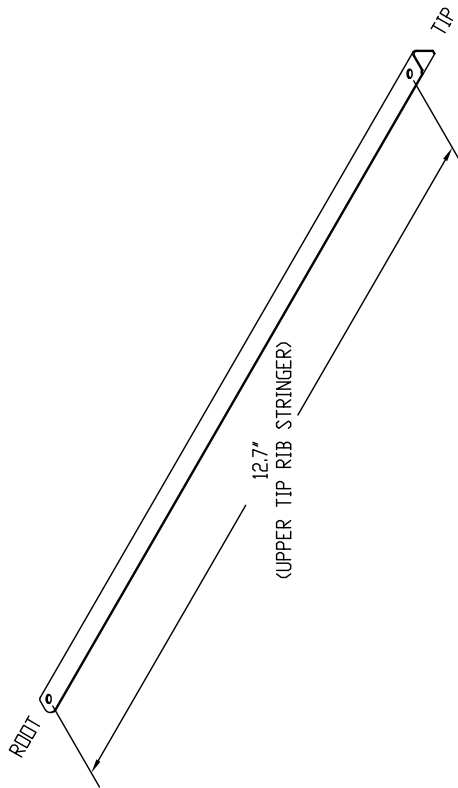
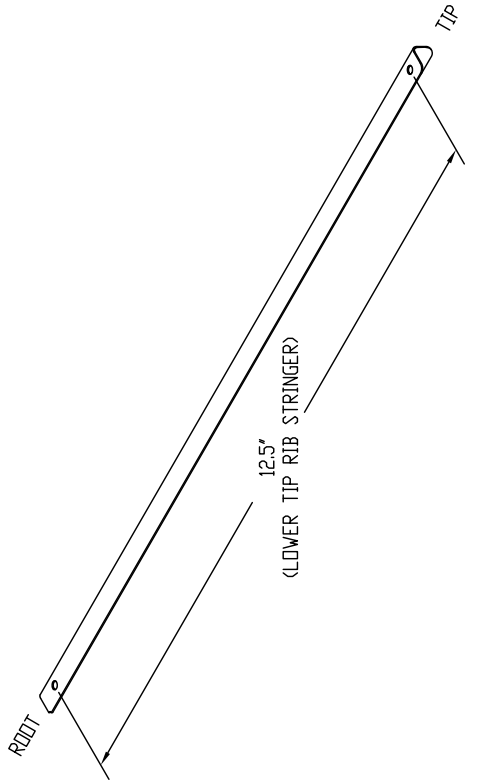
MD5557
REV. A

RRF S-20 RAVEN
TIP RIB MODIFICATION
FIGURE 05C-09B



MD5552

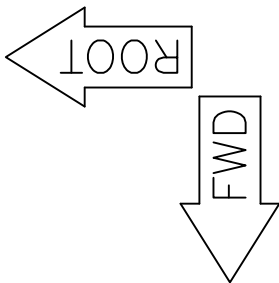
RRR S-20 RAVEN
TIP RIB CLIP LOCATION
FIGURE 05C-11



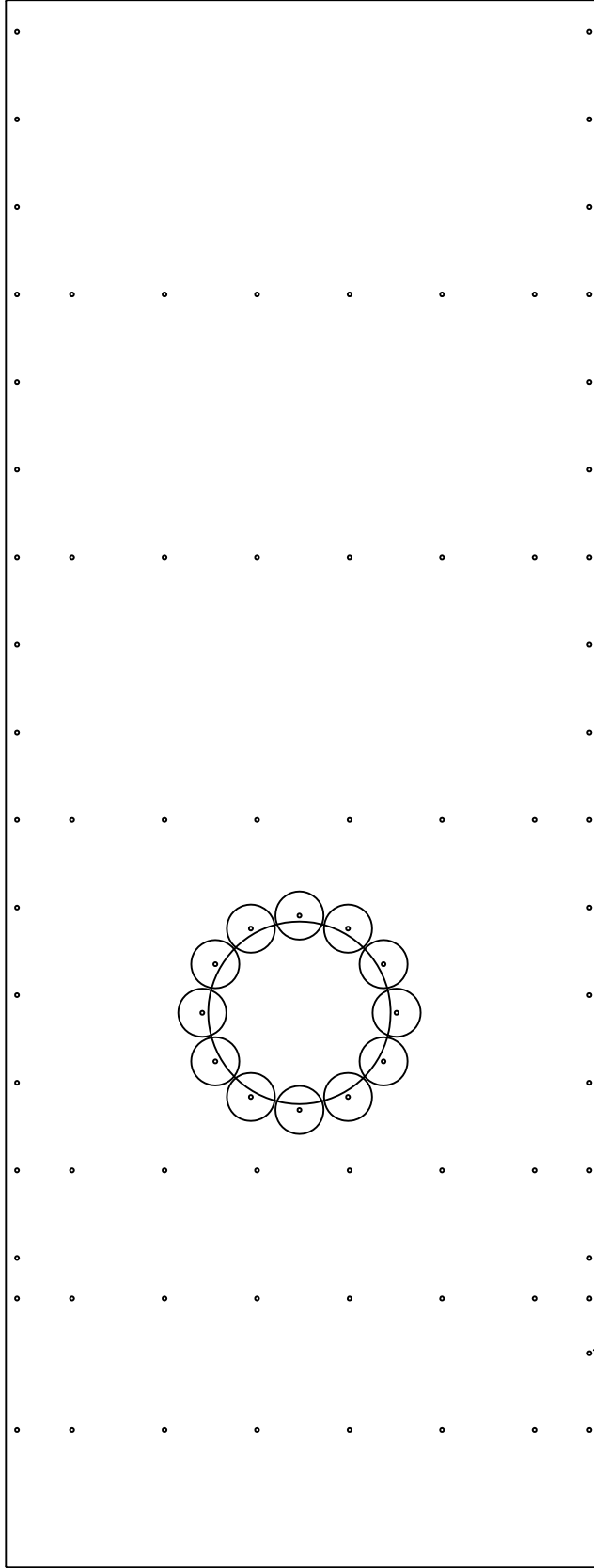
NOTE: STRINGER SHOWN UN-BENT FOR CLARITY

MD5635
REV. — ORIG

RAVEN S-20 RAVEN
TIP RIB STRINGER MODIFICATION
FIGURE 05C-18



DIMPLE ALL RIVET HOLES EXCEPT THOSE THAT ARE CIRCLED

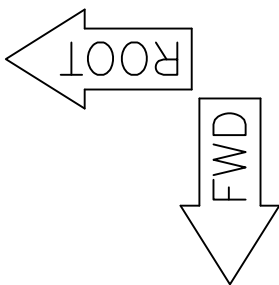


LEFT TOP ROOT SKIN SHOWN

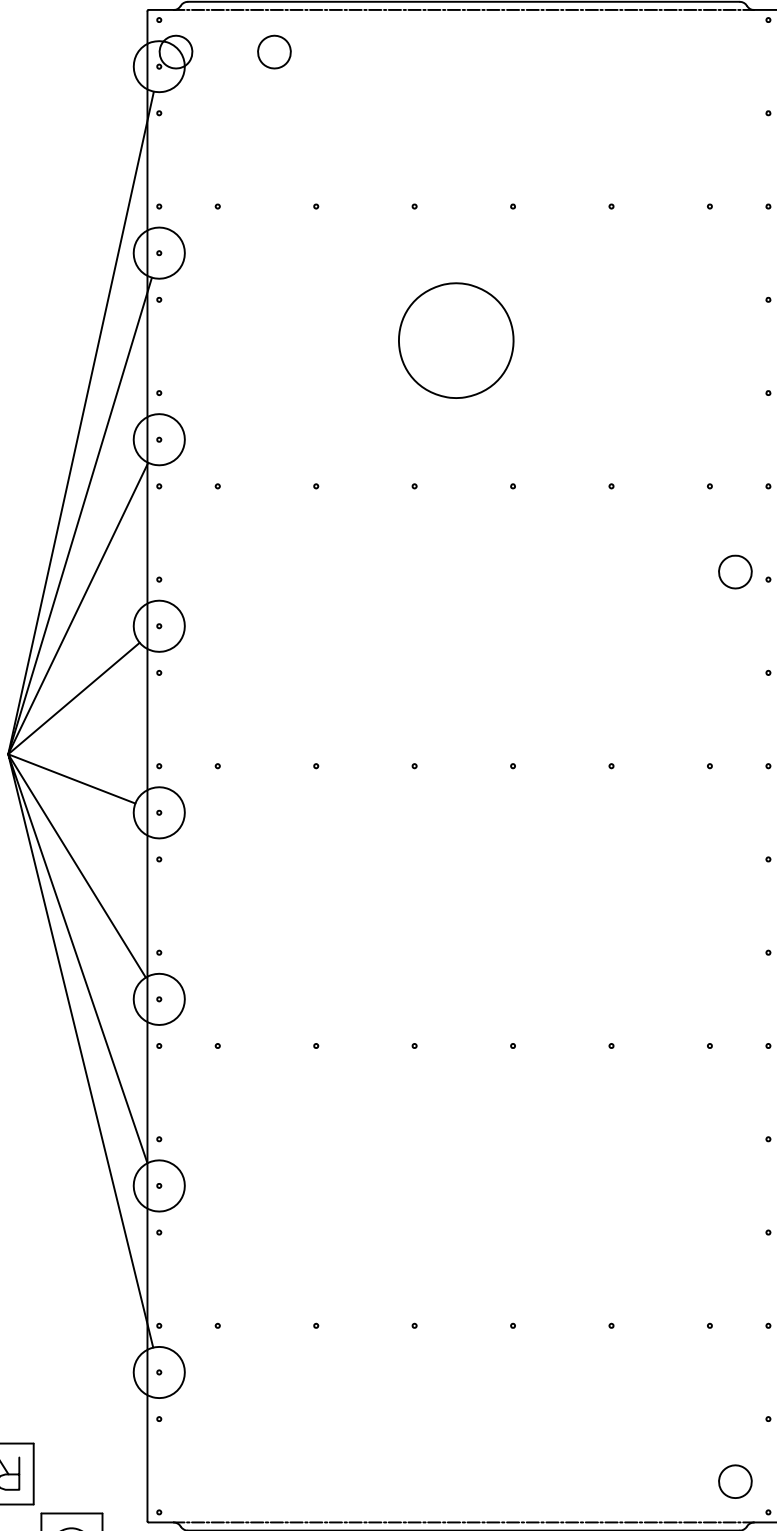
THIS HOLE IDENTIFIES
FWD OUTBOARD SIDE

MD5556

RAVEN S-20 RAVEN
UPPER ROOT SKIN MODIFICATION
FIGURE 05C-22



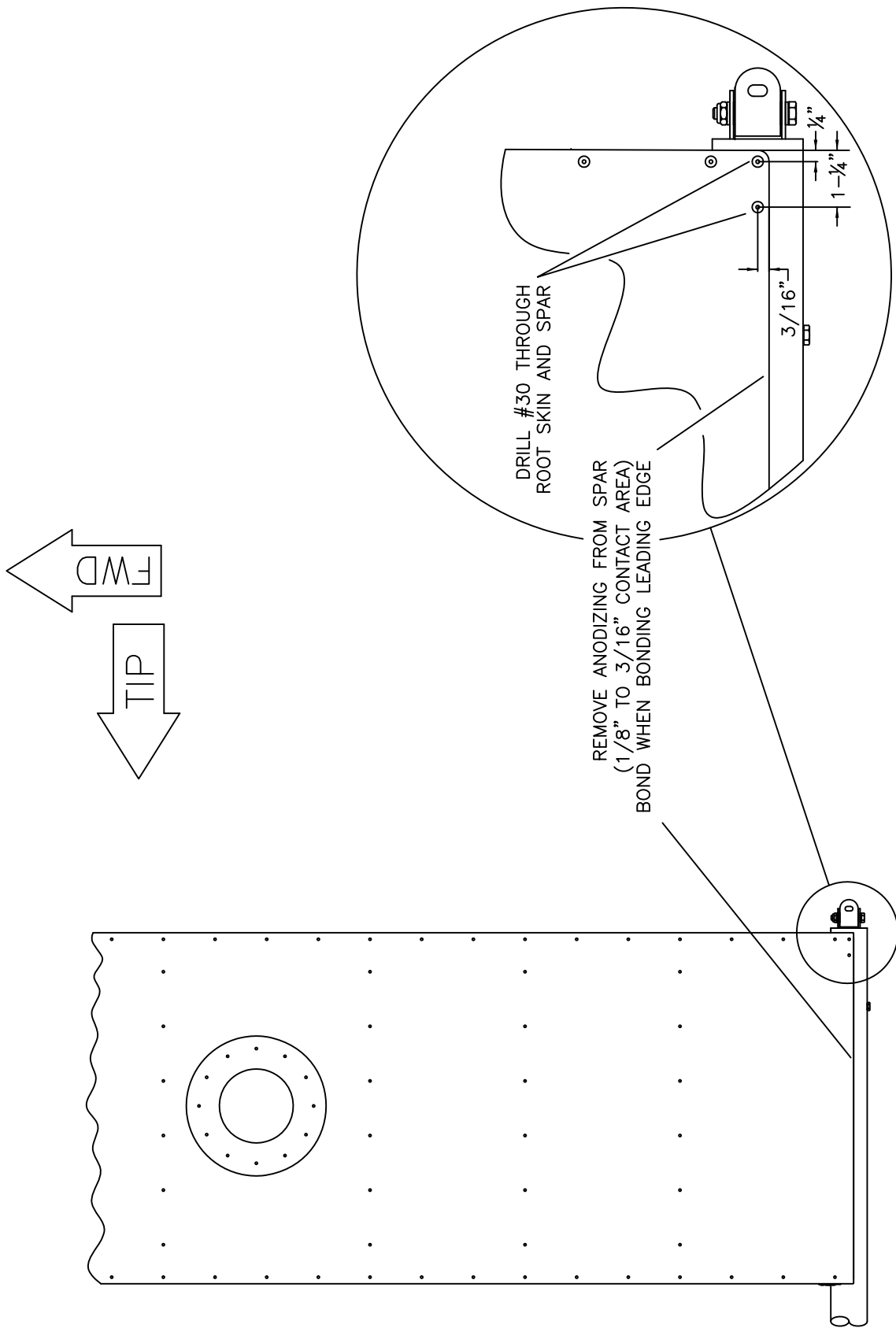
LOCATION OF HOLES WHERE PAN HEAD SCREWS
WILL PICK UP TINNERMAN CLIPS ON ROOT RIB.
PRE-DRILLED #40 TO DISTINGUISH FROM RIVET HOLES.



DIMPLE ALL RIVET HOLES EXCEPT THOSE THAT ARE CIRCLED
LEFT BOTTOM ROOT SKIN SHOWN

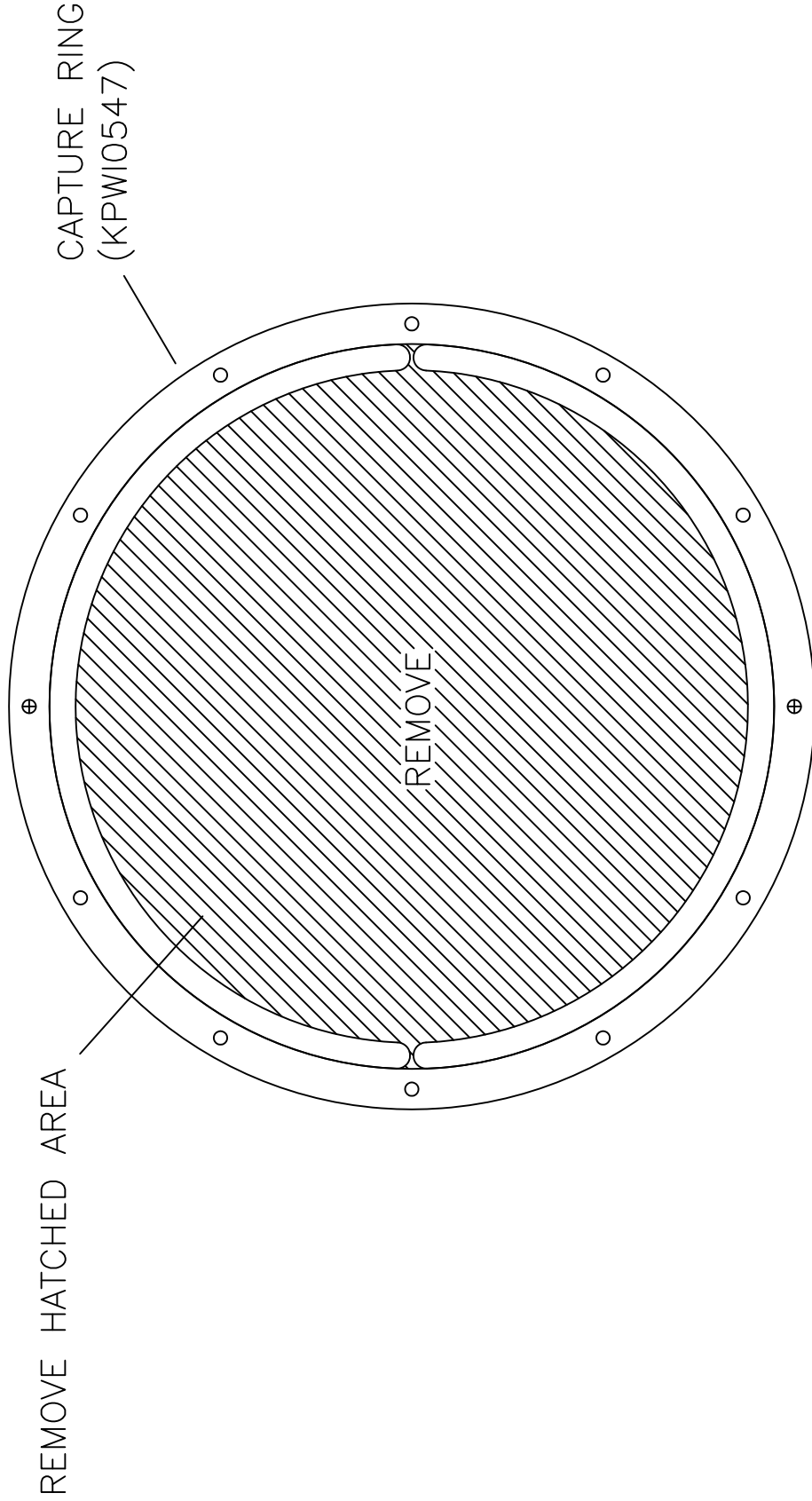
MD5555

RAVEN S-20 RAVEN LOWER ROOT SKIN MODIFICATION FIGURE 05C-23



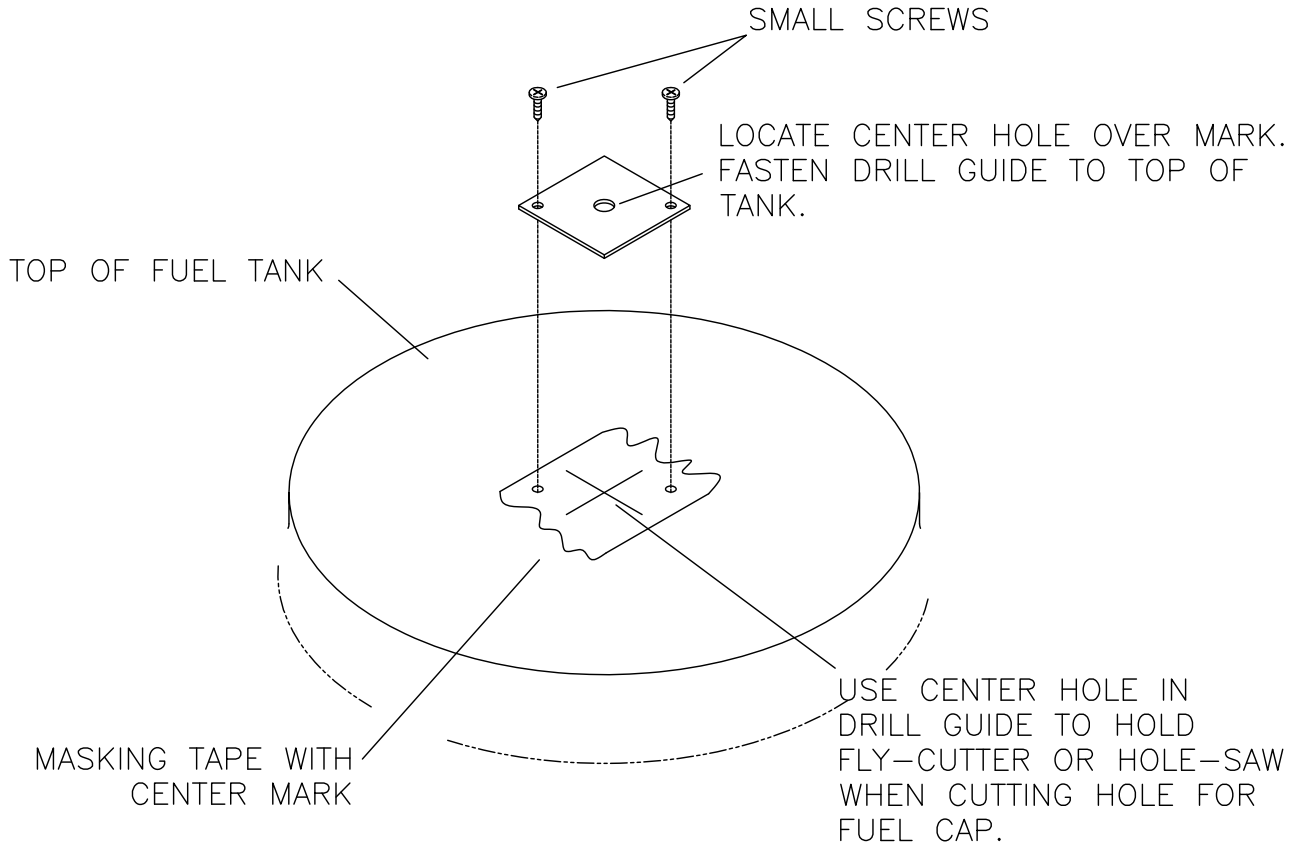
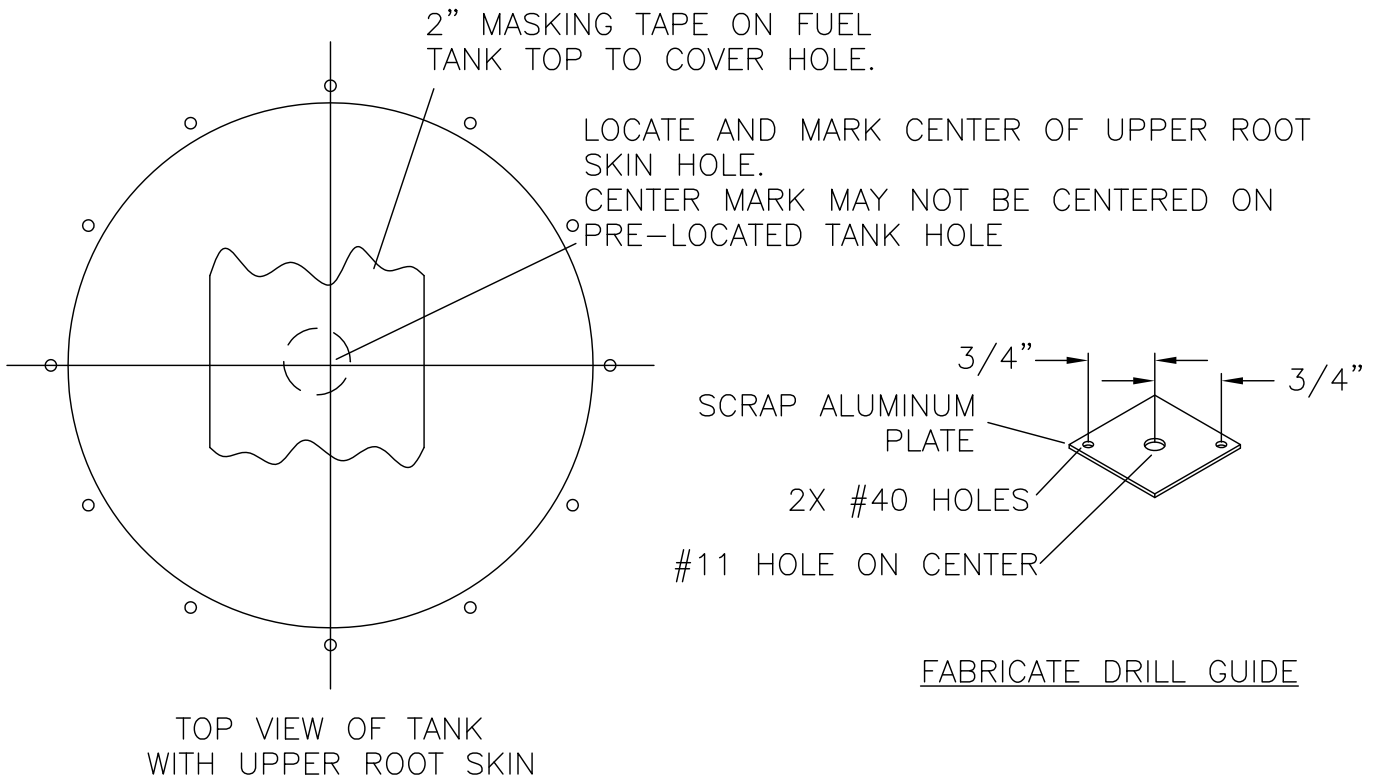
MD4366

RANDES S-20 RAVEN
TOP ROOT SKIN INSTALLATION
FIGURE 05C-30



MD5549

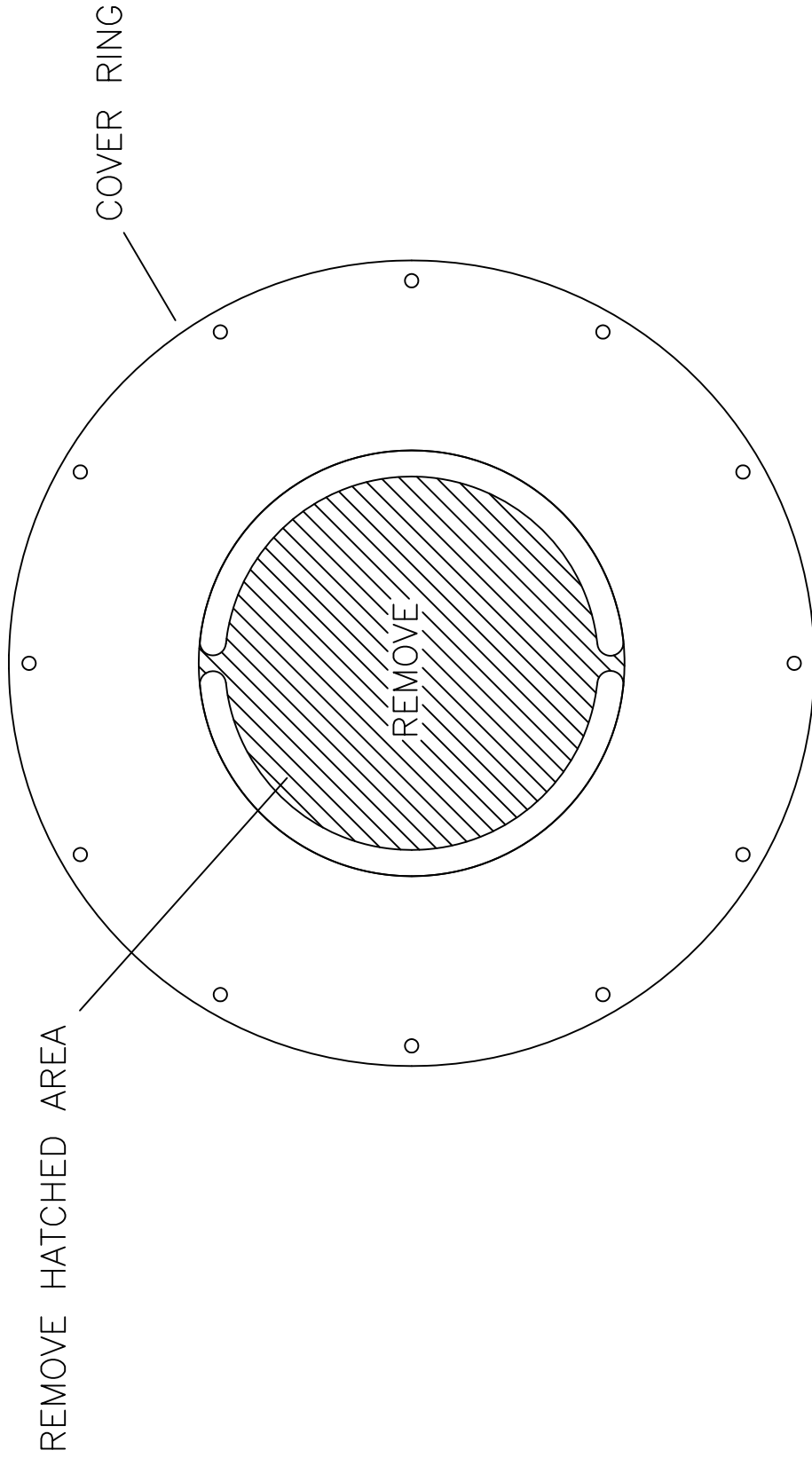
RRANOS S-20 RAVEN
CAPTURE RING MODIFICATION
FIGURE 05C-36



RANS S-20 RAVEN
FUEL CAP HOLE PLACEMENT
FIGURE 05C-37

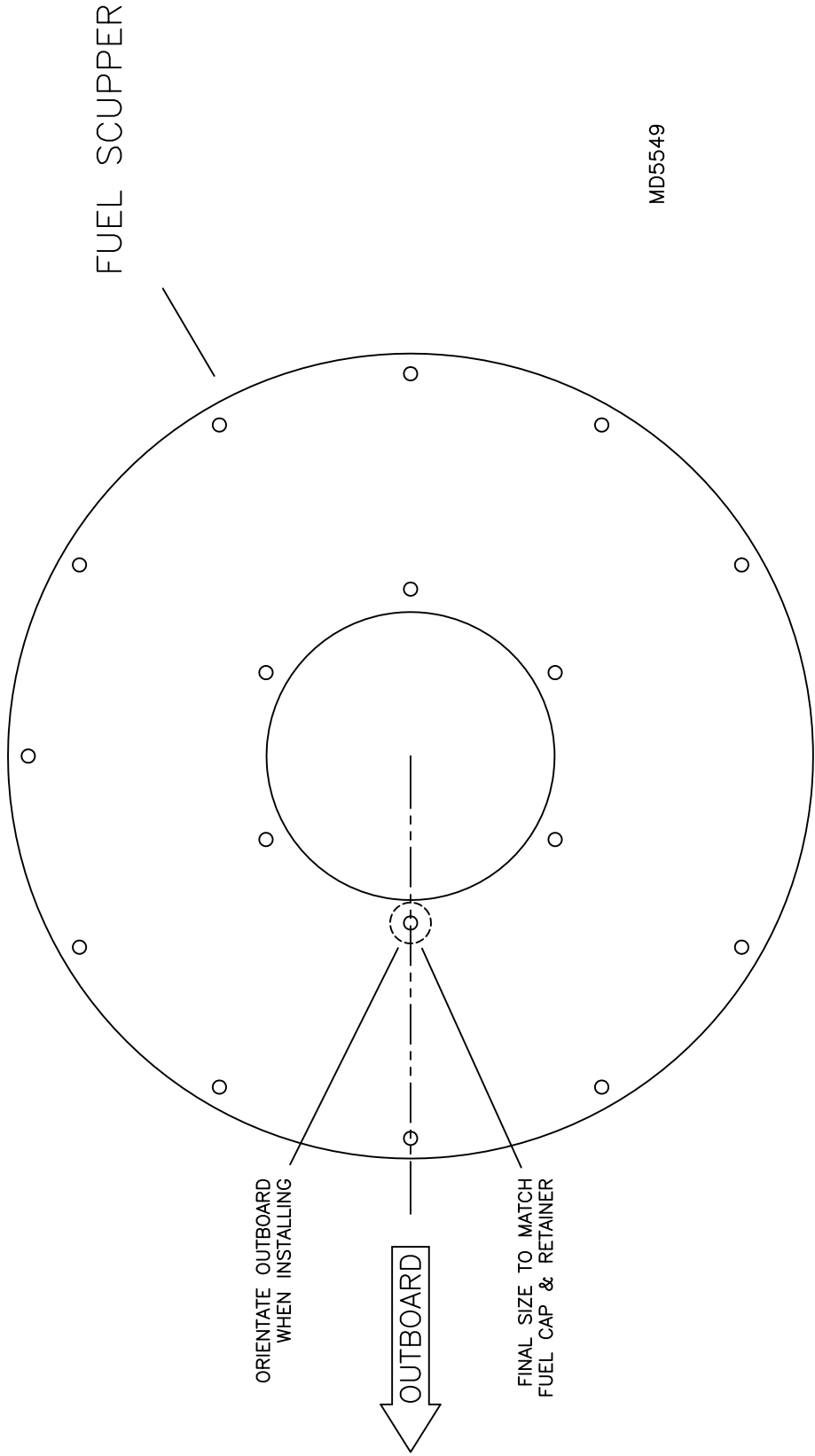
MD5560

09/01/2013



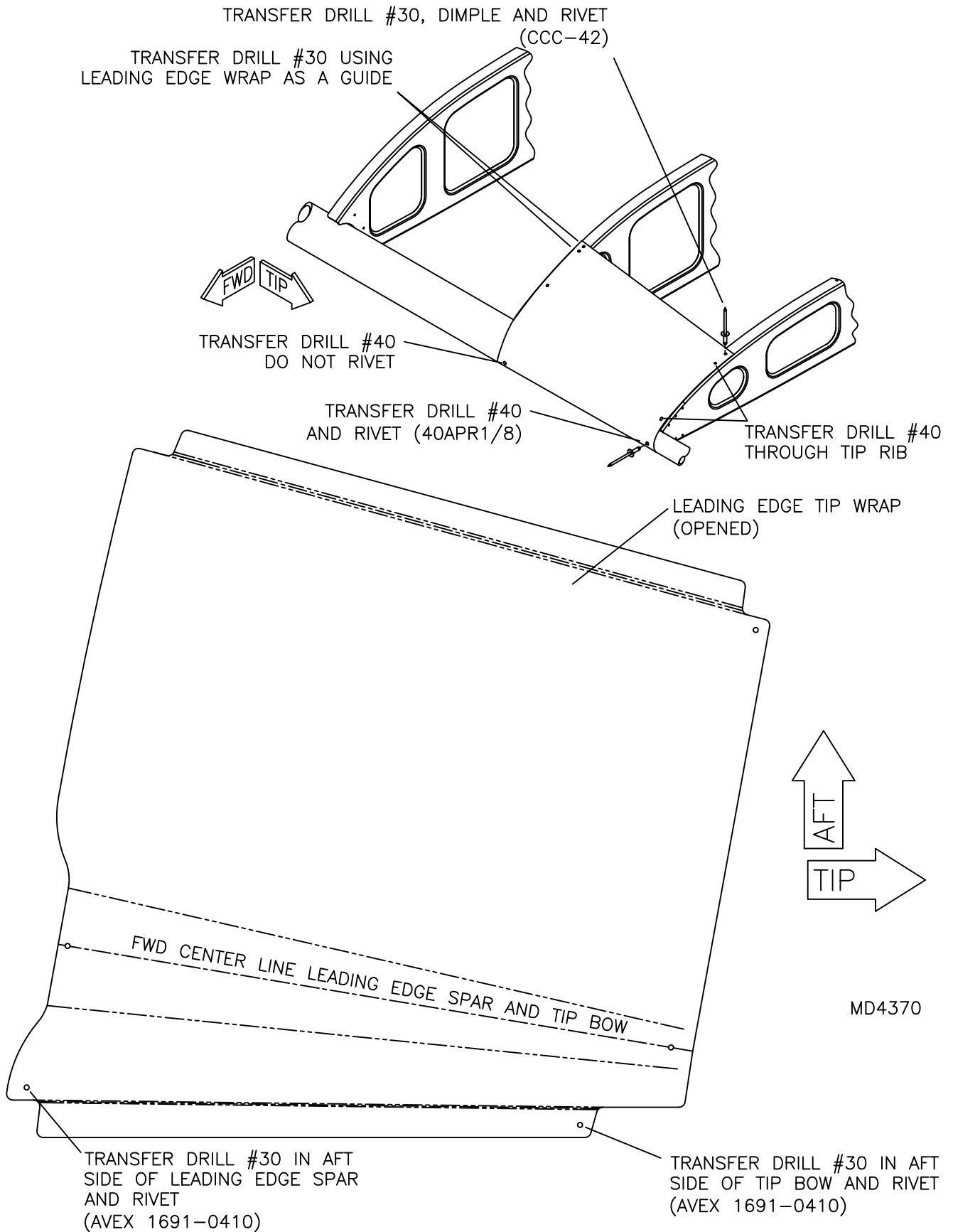
MD5549

RRR S-20 RAVEN
COVER RING MODIFICATION
FIGURE 05C-41

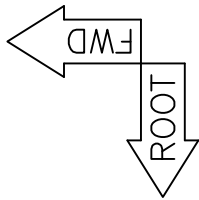


MD5549

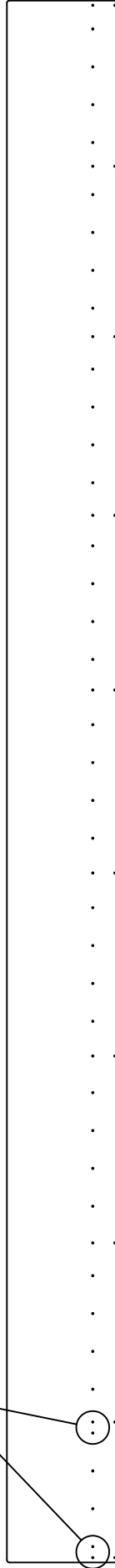
RAMRO S-20 RAVEN
FUEL SCUPPER ORIENTATION
FIGURE 05C-41A



RANS S-20 RAVEN
LEADING EDGE TIP WRAP INSTALLATION
FIGURE 05C-47



KEY TO POSITIONING

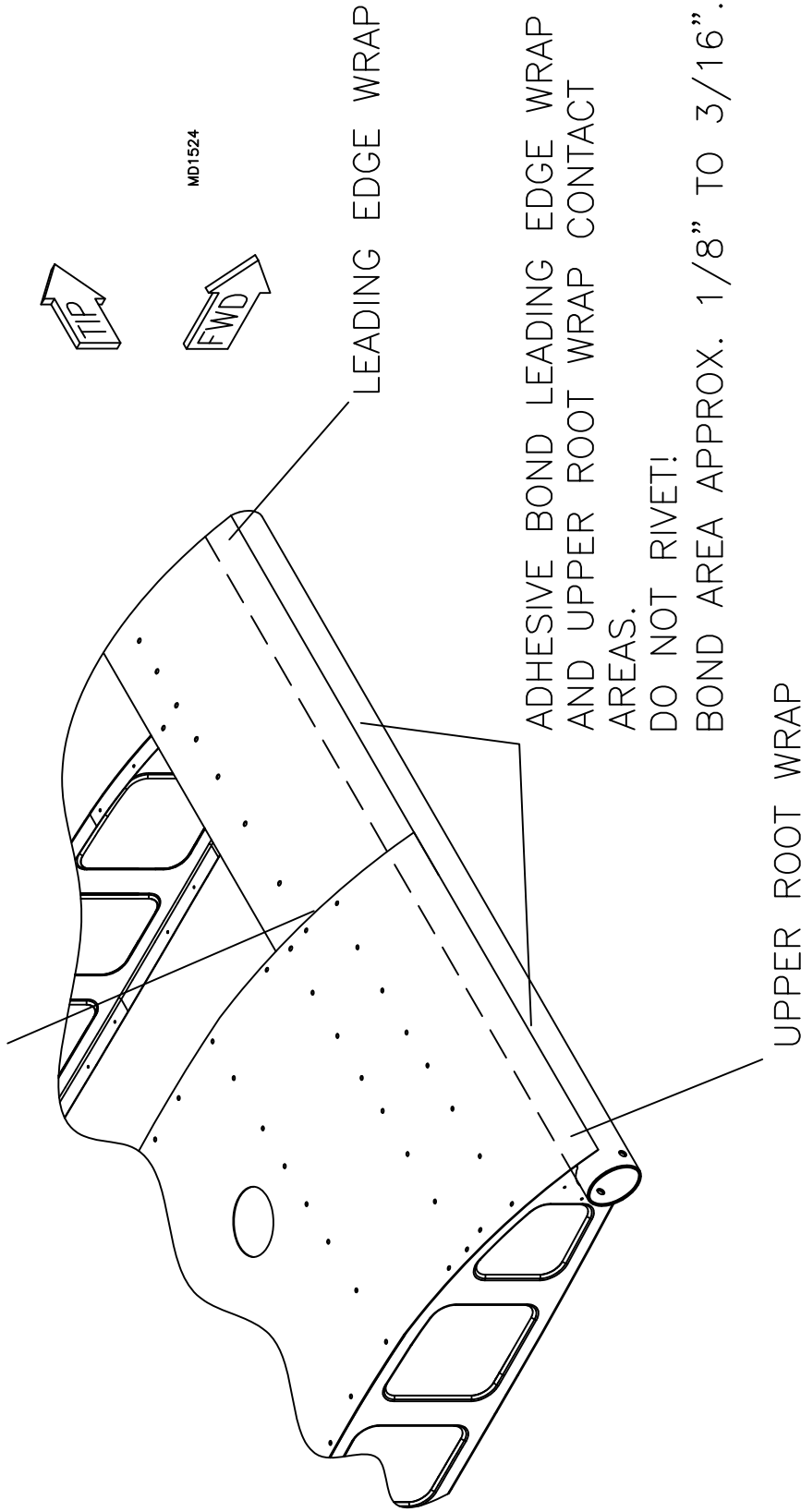


RH WING SHOWN
DIMPLE ALL HOLES

MD5554

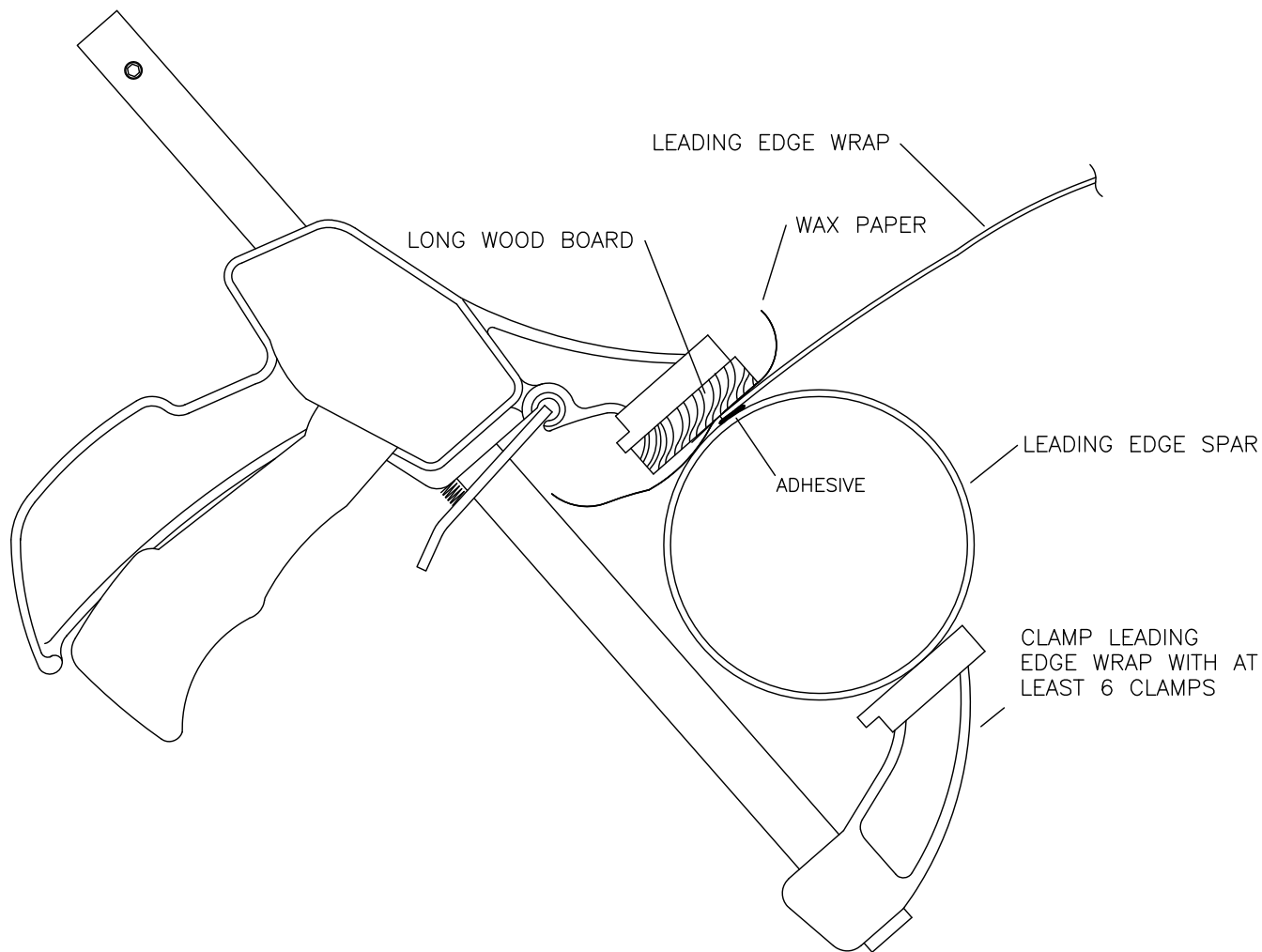
RRR S-20 RAVEN
LEADING EDGE WRAP MODIFICATION
FIGURE 05C-53

LEADING EDGE WRAP INSERTS
UNDER UPPER ROOT WRAP



MD4371
REV. A

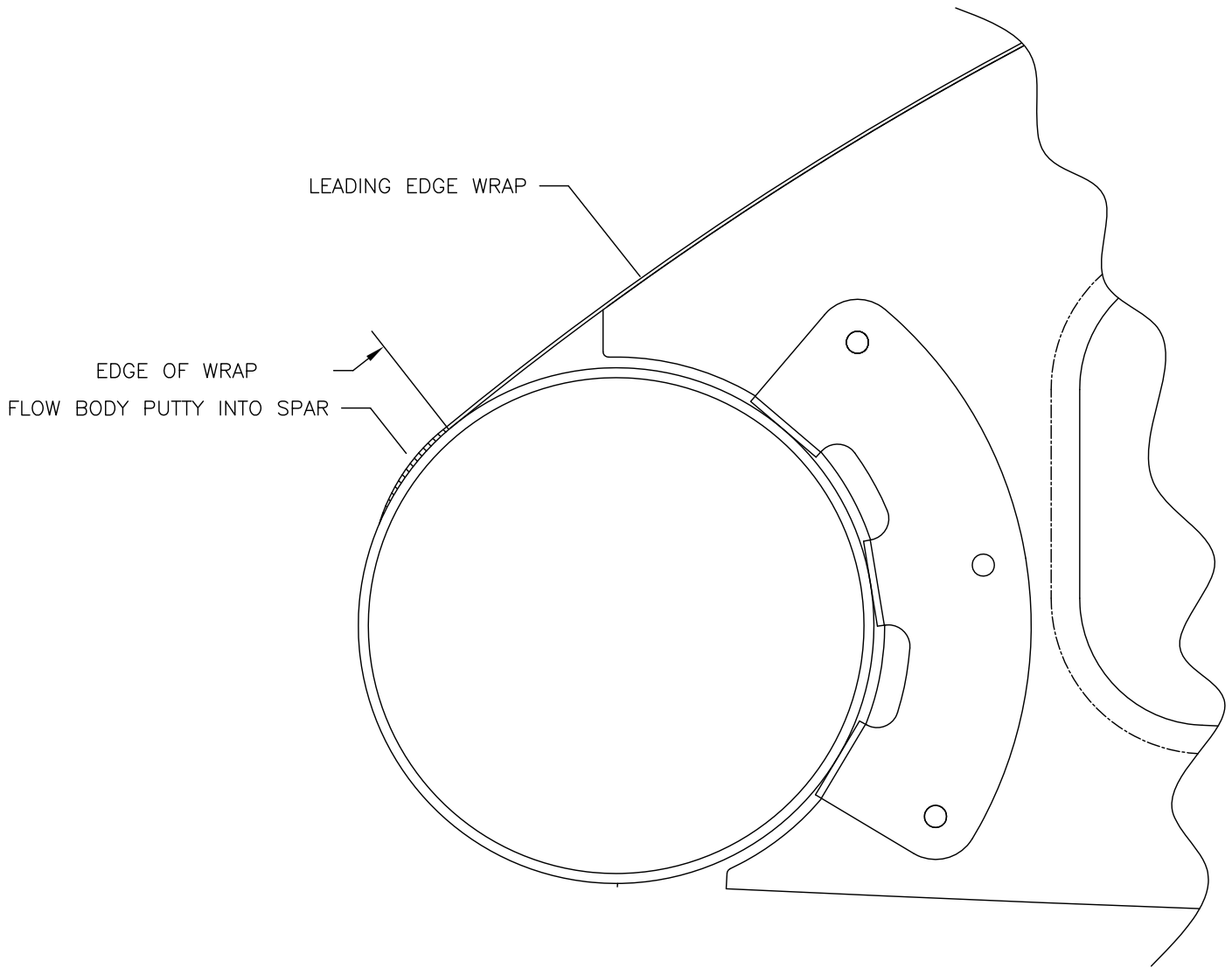
RAVEN S-20 RAVEN
LEADING EDGE & UPPER ROOT WRAP BOND AREA
FIGURE 05C-55



MD1525
REV. A

RANS S-20 RAVEN
LEADING EDGE WRAP CLAMPING
FIGURE 05C-56

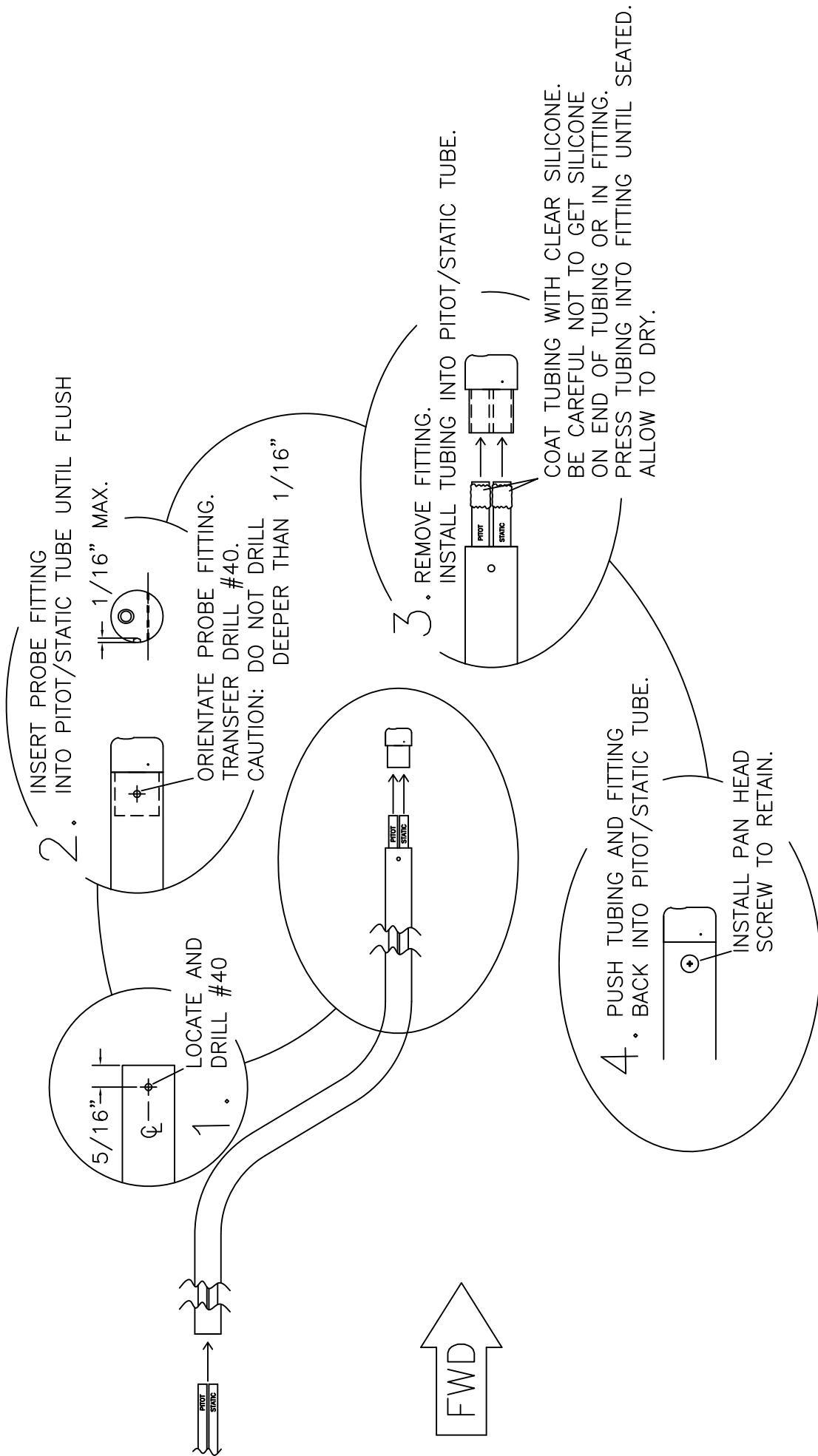
05/01/2017



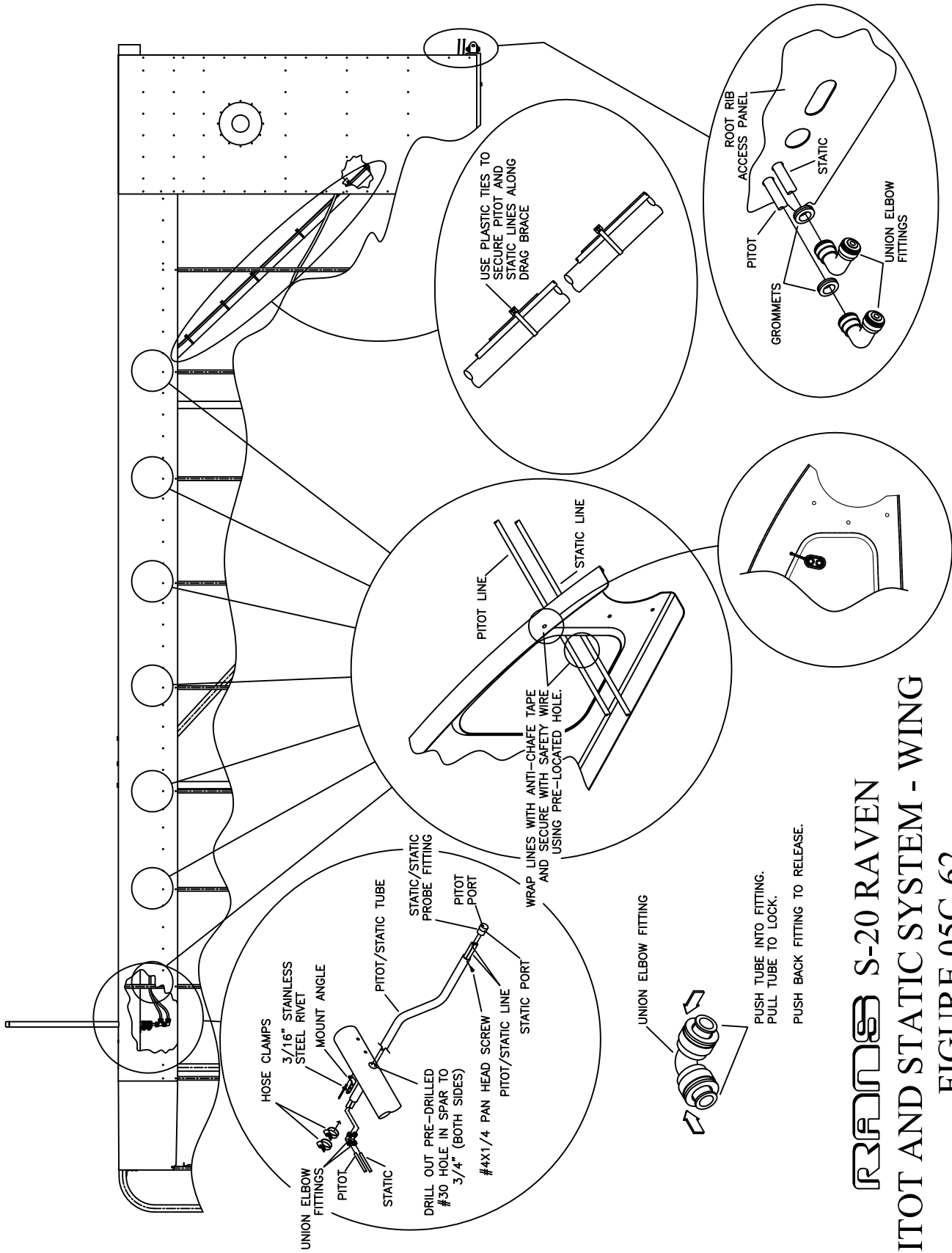
MD1525

RANS S-20 RAVEN
LEADING EDGE WRAP FILLET
FIGURE 05C-58

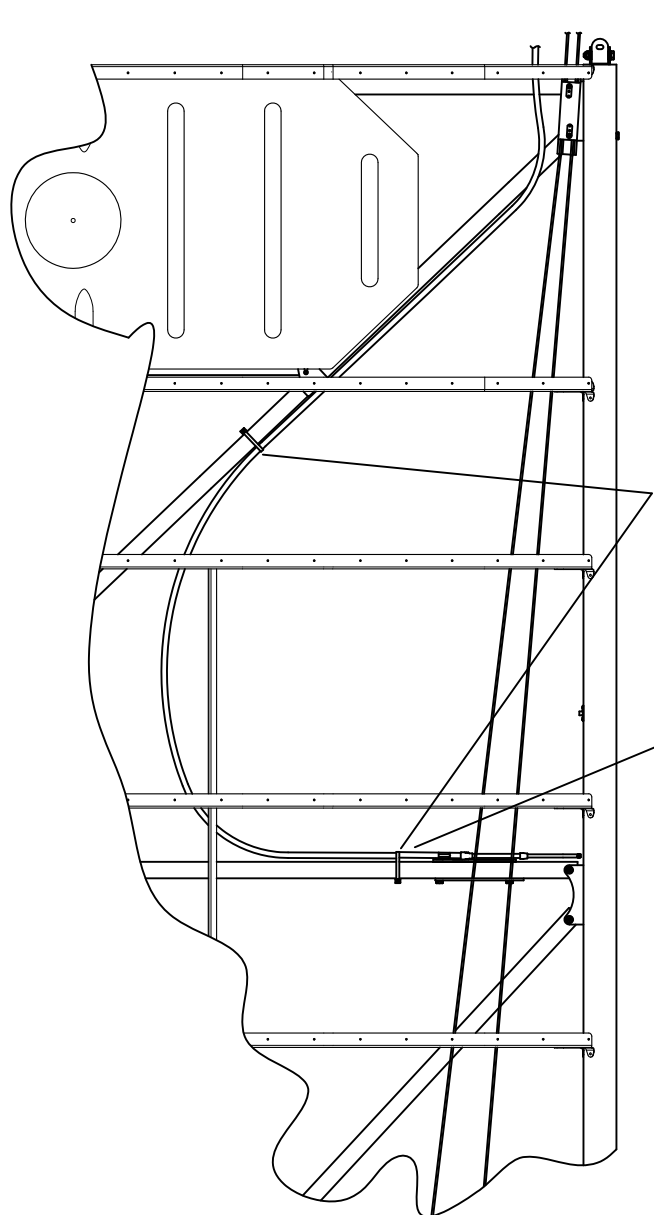
09/01/2013



RRAD S-20 RAVEN
 PITOT/STATIC PROBE ASSEMBLY
 FIGURE 05C-60



RRANOR S-20 RAVEN
PITOT AND STATIC SYSTEM - WING
FIGURE 05C-62



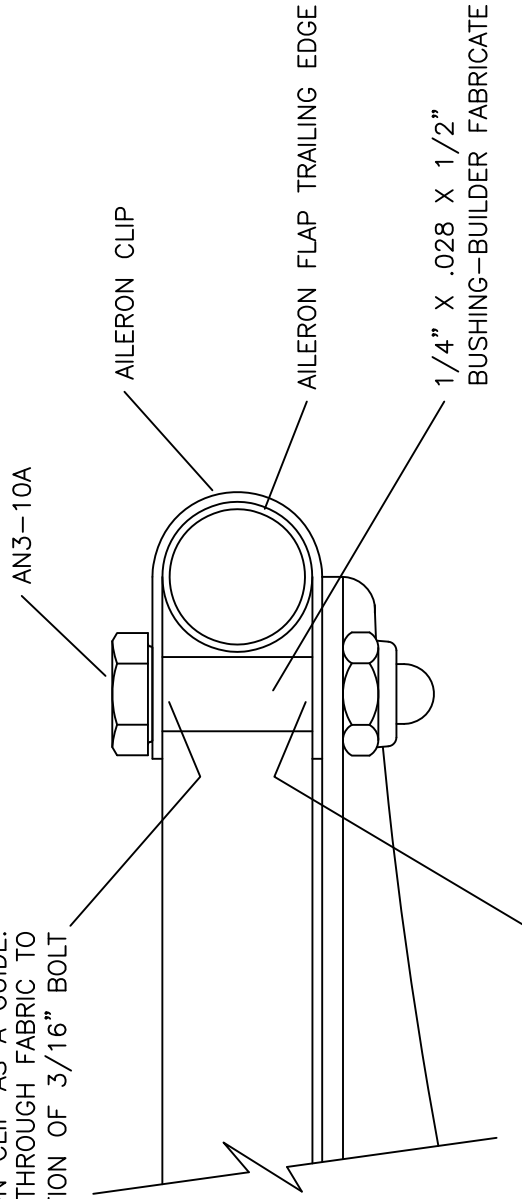
SECURE FLAP TELEFLEX CABLE TO FRAME
TUBES USING PLASTIC TIES.

TIGHTEN THIS PLASTIC TIE SO THAT MOVEMENT
OF CABLE IS POSSIBLE AND PUSH FLAP
TELEFLEX CABLE INSIDE WING STRUCTURE FOR
COVERING. RETRIEVE AFTER COVERING.

TIP
LH WING SHOWN

RAMROD S-20 RAVEN
FLAP TELEFLEX CABLE INSTALLATION - WING
FIGURE 05C-68

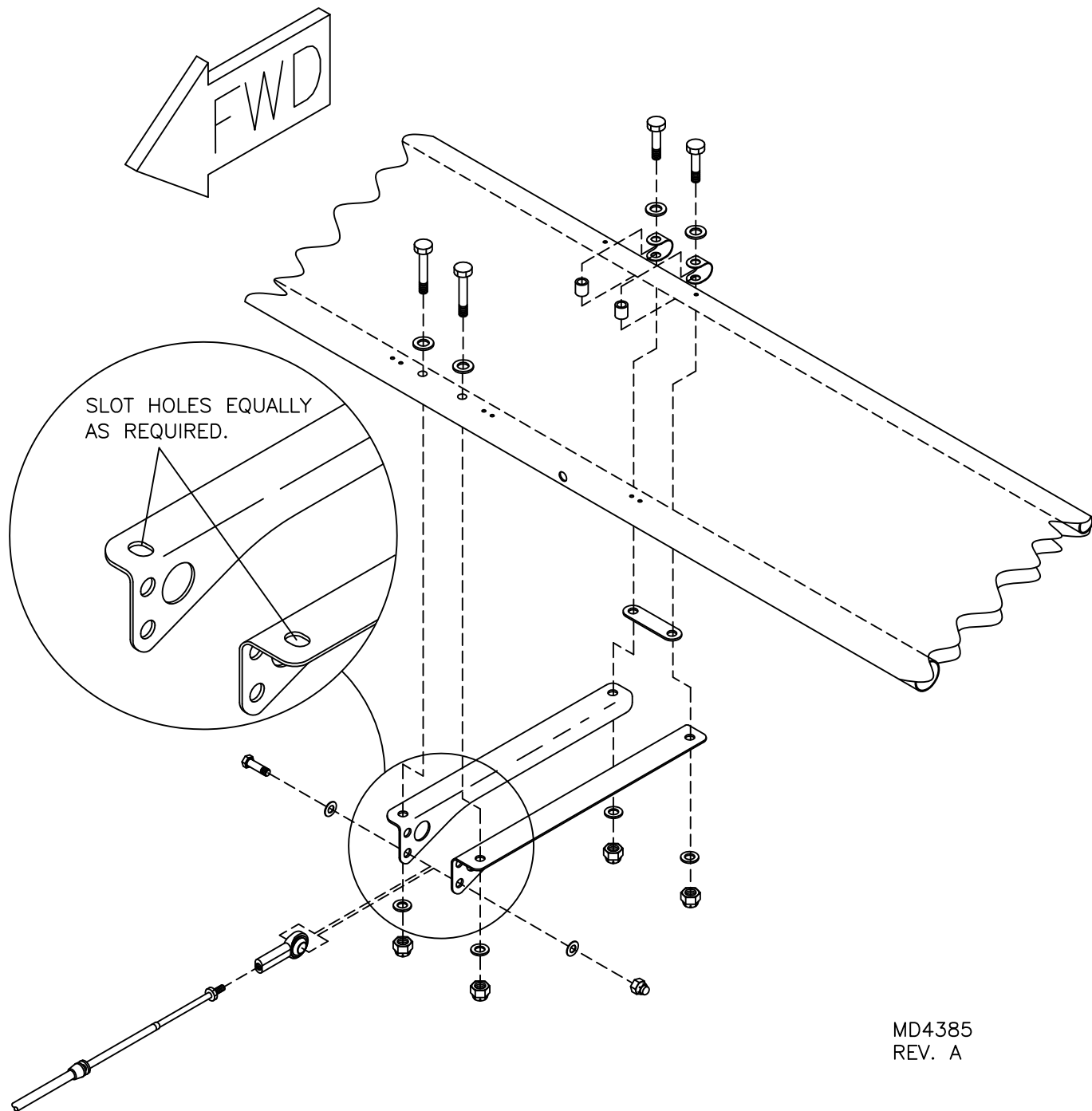
USE AILERON CLIP AS A GUIDE.
MARK AND BURN THROUGH FABRIC TO
ALLOW INSERTION OF 3/16" BOLT



USE AILERON CLIP AS A GUIDE.
MARK AND BURN THROUGH FABRIC TO
ALLOW INSERTION OF 1/4" SPACER

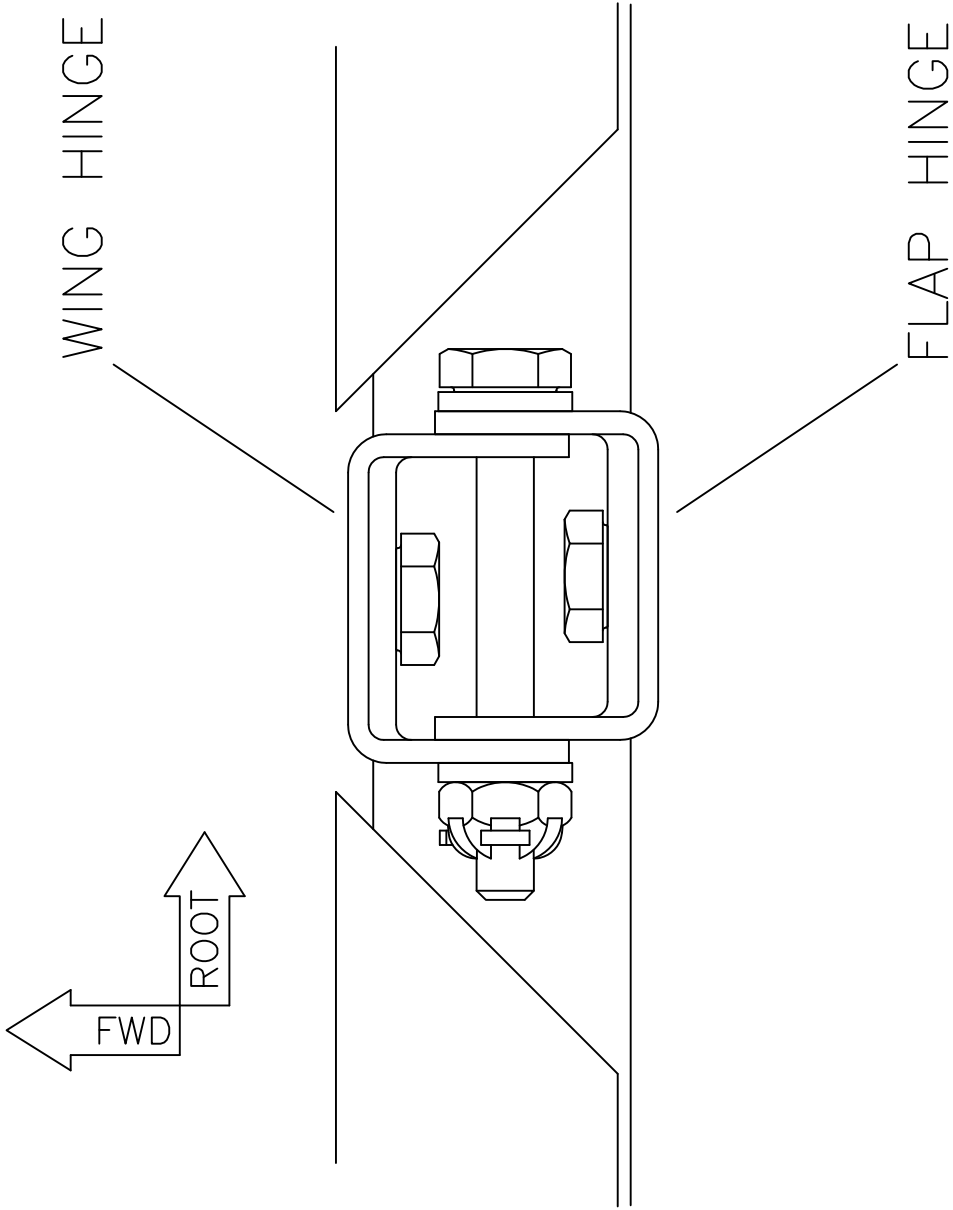
MD4349

RAVEN S-20 RAVEN
AILERON AND FLAP ATTACH ANGLE
(TRAILING EDGE)
FIGURE 05D-05



MD4385
REV. A

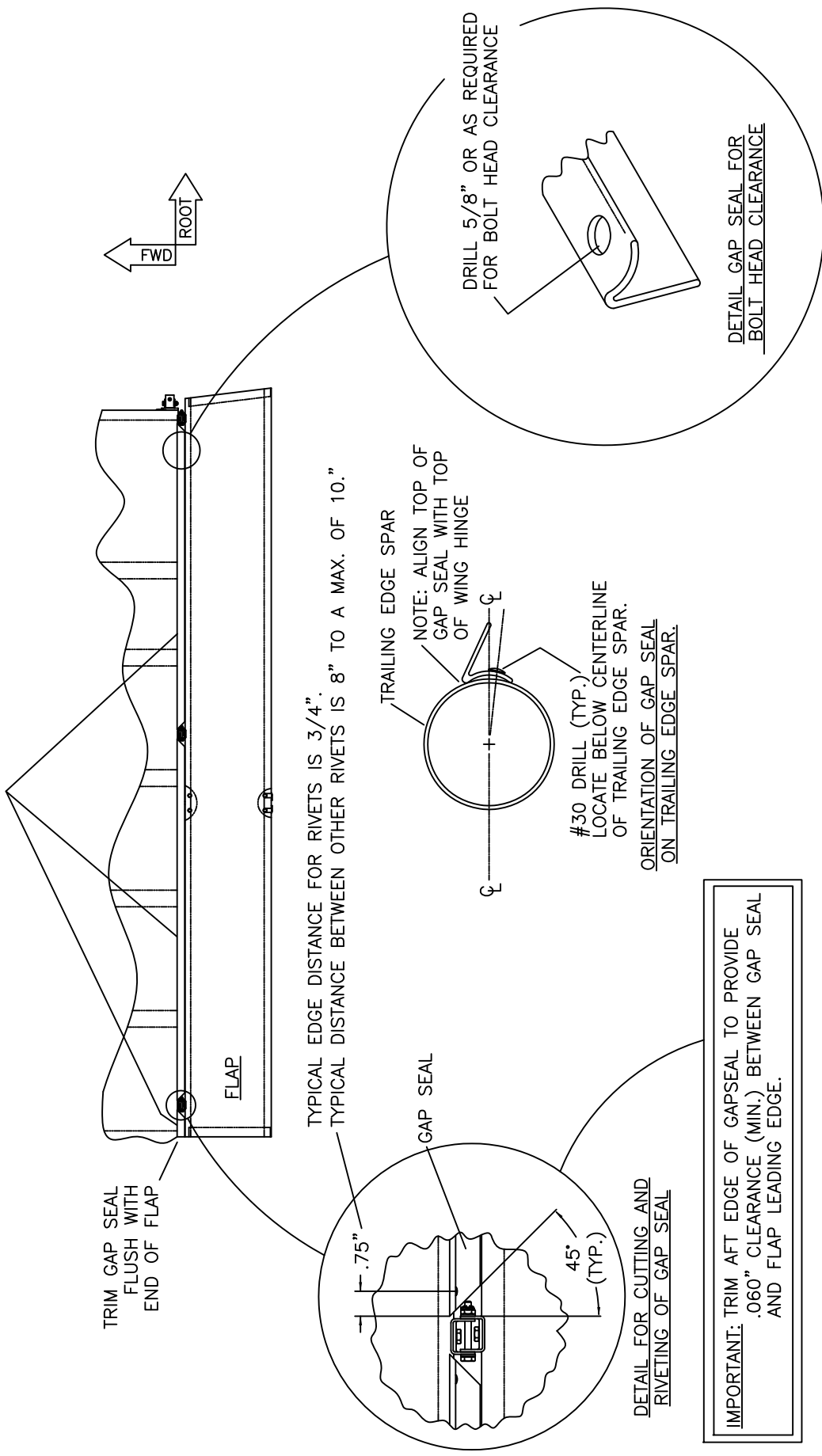
RANS S-20 RAVEN
FLAP HORN ATTACH ANGLE INSTALLATION
FIGURE 05D-08



RAVEN S-20 RAVEN
 FLAP HINGE ORIENTATION
 FIGURE 05D-09

MD4384

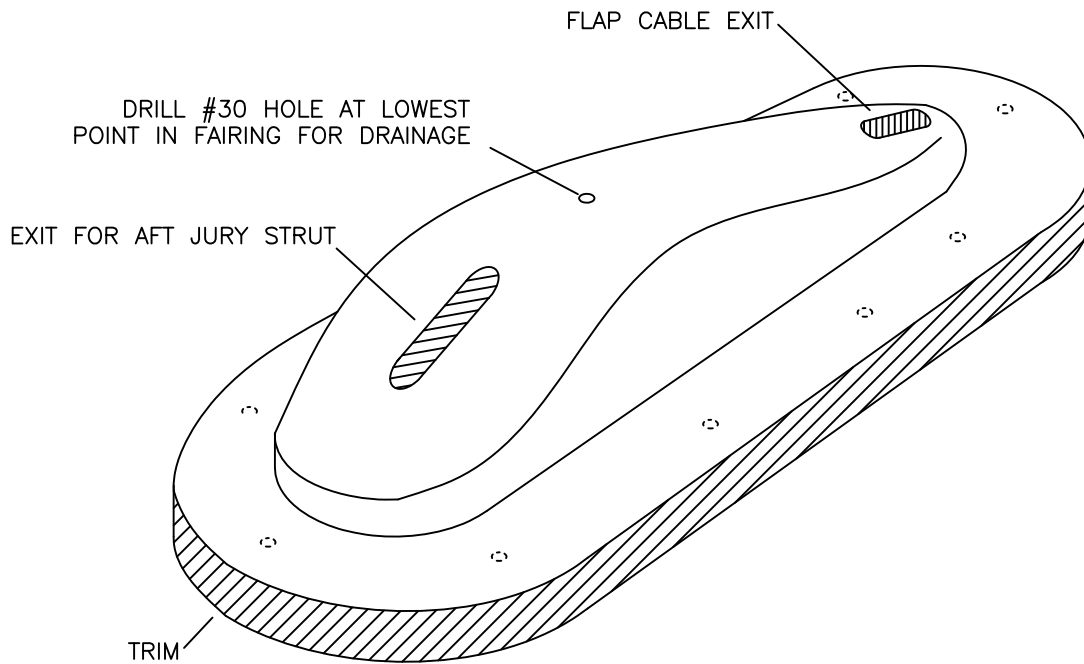
CONTROL SURFACE GAP SEAL (3 PIECES PER WING)



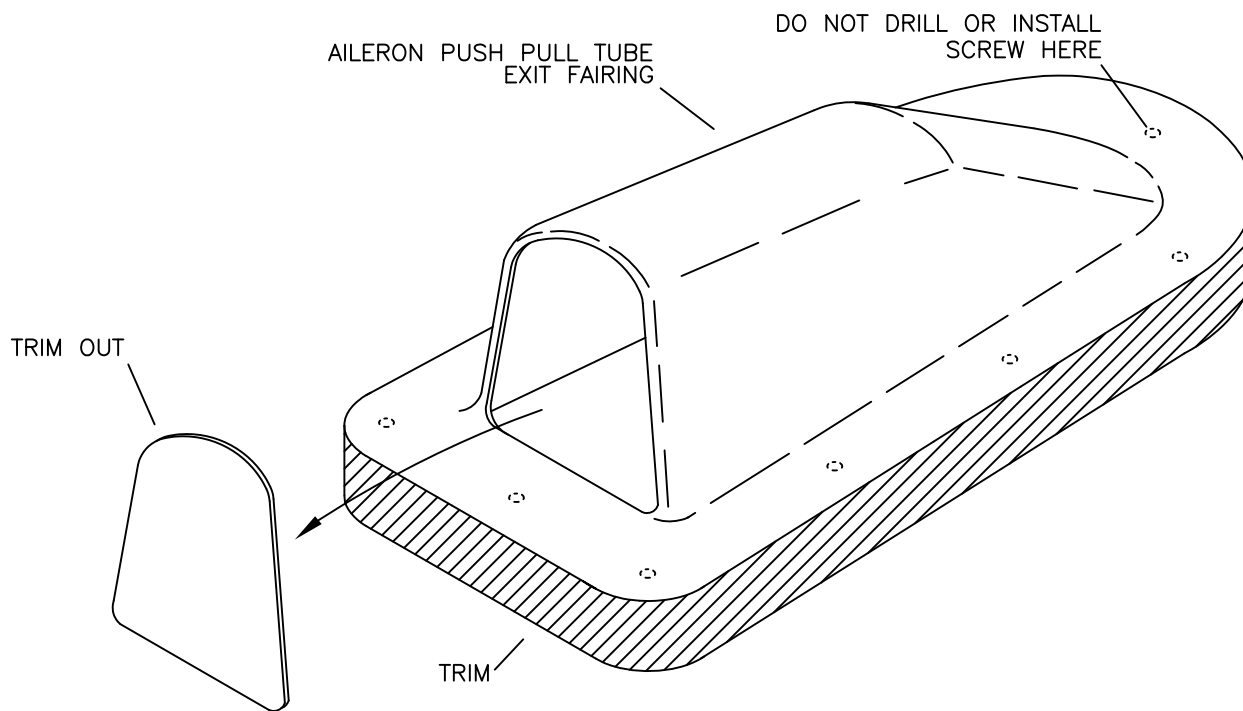
IMPORTANT: TRIM AFT EDGE OF GAPSEAL TO PROVIDE .060" CLEARANCE (MIN.) BETWEEN GAP SEAL AND FLAP LEADING EDGE.

RAMS S-20 RAVEN
GAP SEAL INSTALLATION
 FIGURE 05D-13

MD4-382



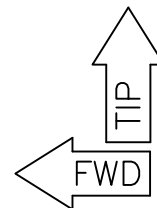
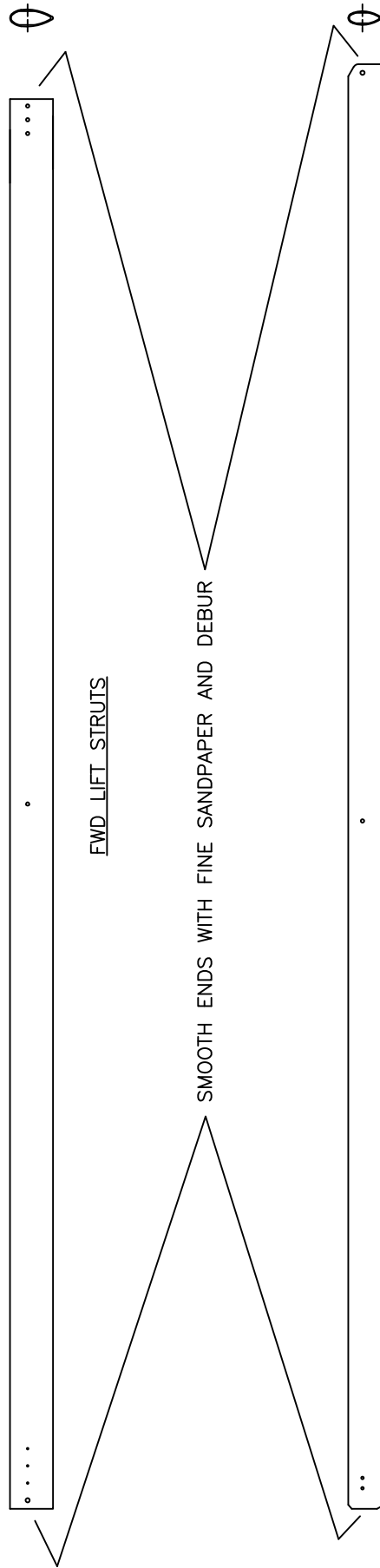
FLAP CABLE EXIT



AILERON PUSH-PULL TUBE EXIT

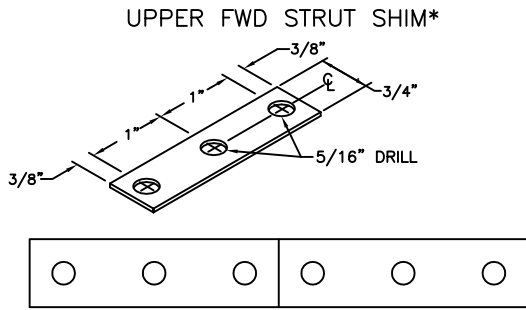
MD4418

RANS S-20 RAVEN
EXIT FAIRING MODIFICATION
FIGURE 05D-19

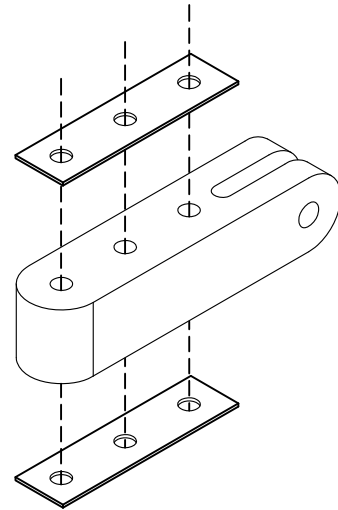
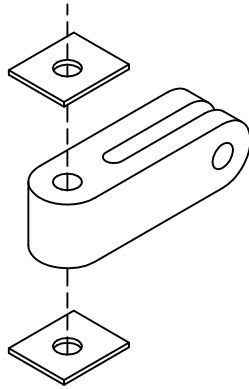


RRR S-20 RAVEN
 LIFT STRUT ORIENTATION
 FIGURE 05E-01

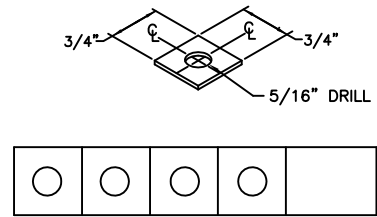
MD4383
 REV. A



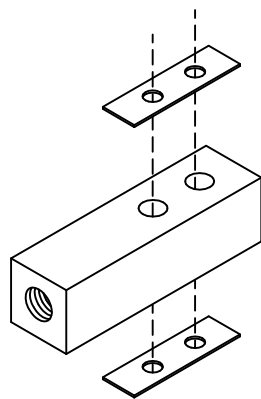
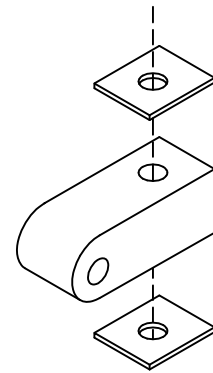
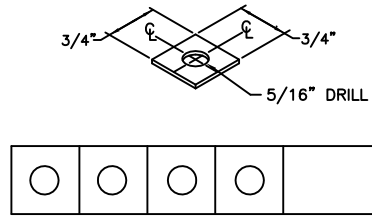
HINT: DRILL HOLES IN SHIM, THEN CUT TO LENGTH. MAKE AS REQUIRED*.



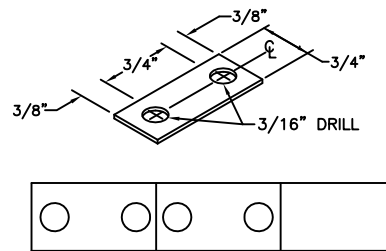
UPPER AFT STRUT SHIM*



LOWER FWD STRUT SHIM*



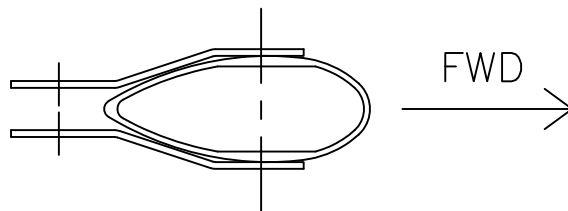
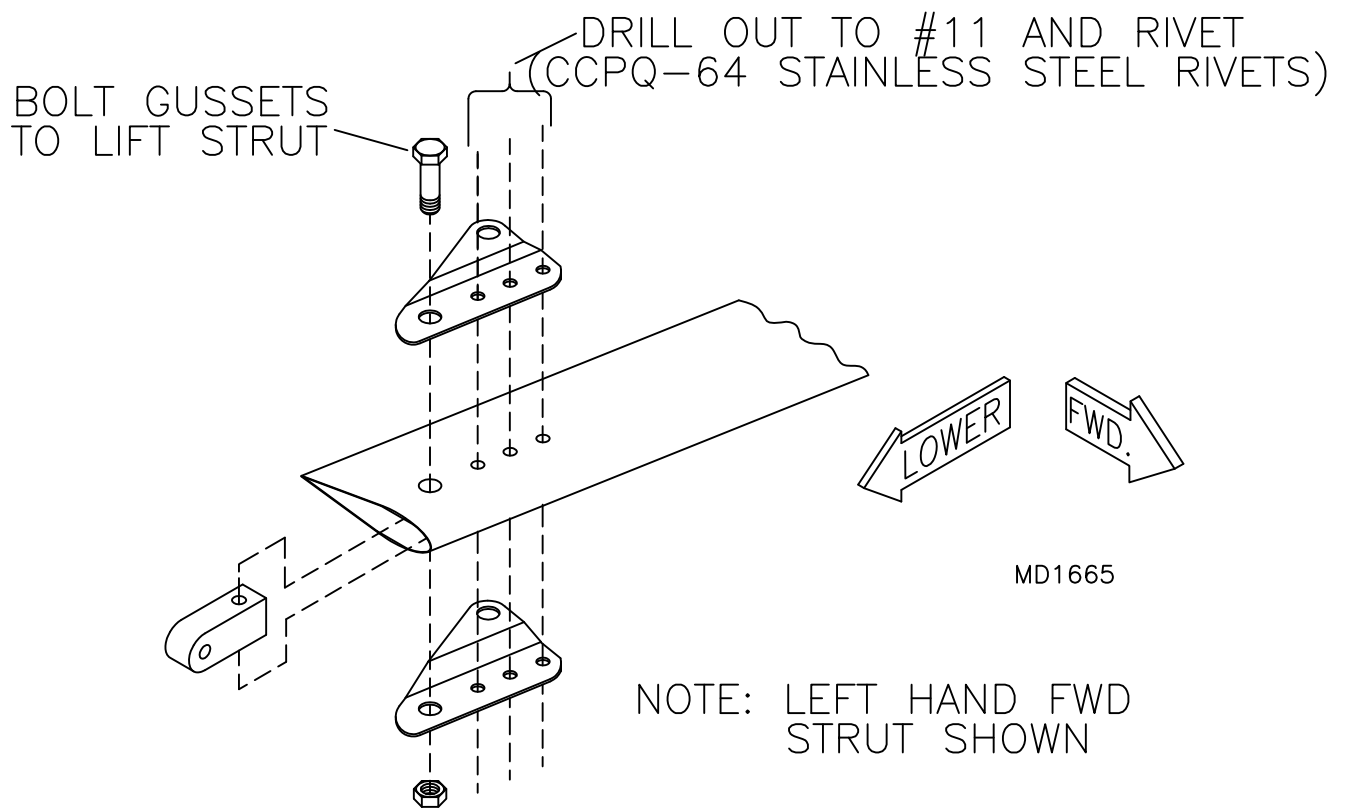
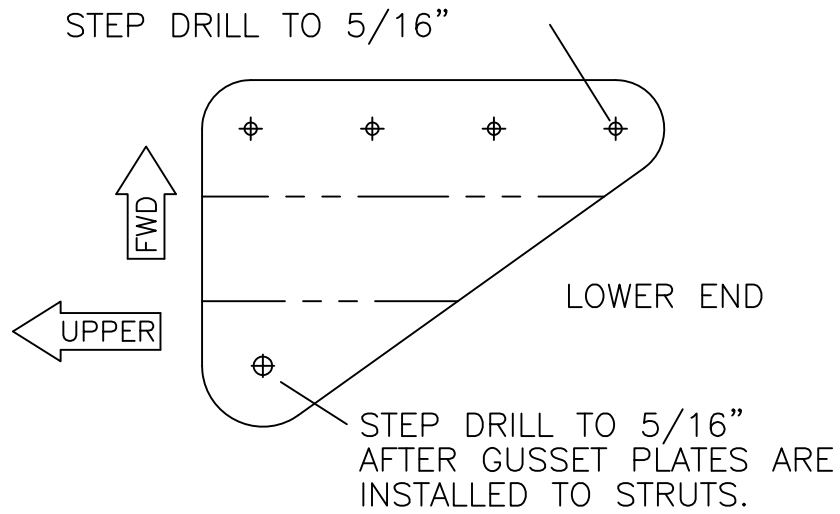
ADJUSTABLE STRUT SHIM*



RANS S-20 RAVEN
LIFT STRUT SHIMS
FIGURE 05E-03

MD4375
 REV. A

*CUT & USE ONLY AS NEEDED

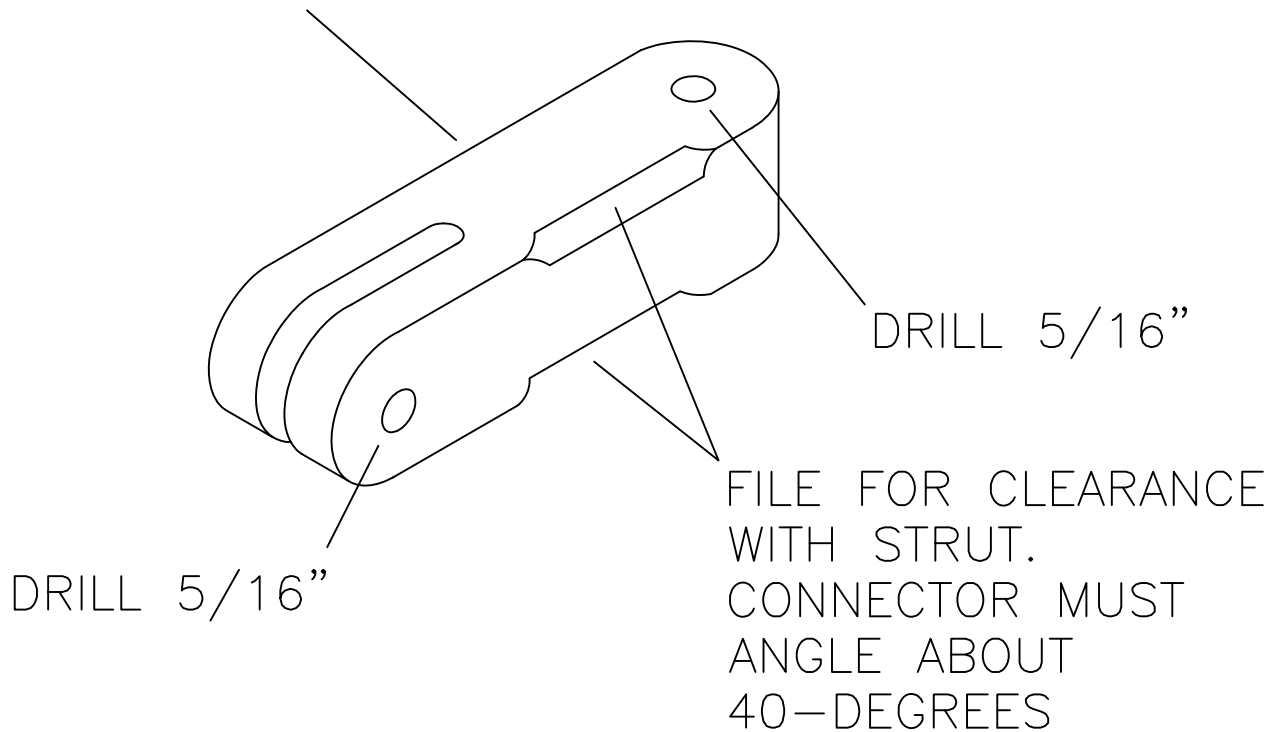


RANS S-20 RAVEN
LIFT STRUT GUSSET PLATES
FIGURE 05E-04

MD4376

09/01/2013

AFT CONNECTOR — LIFT STRUT
(LS-ACU-2)

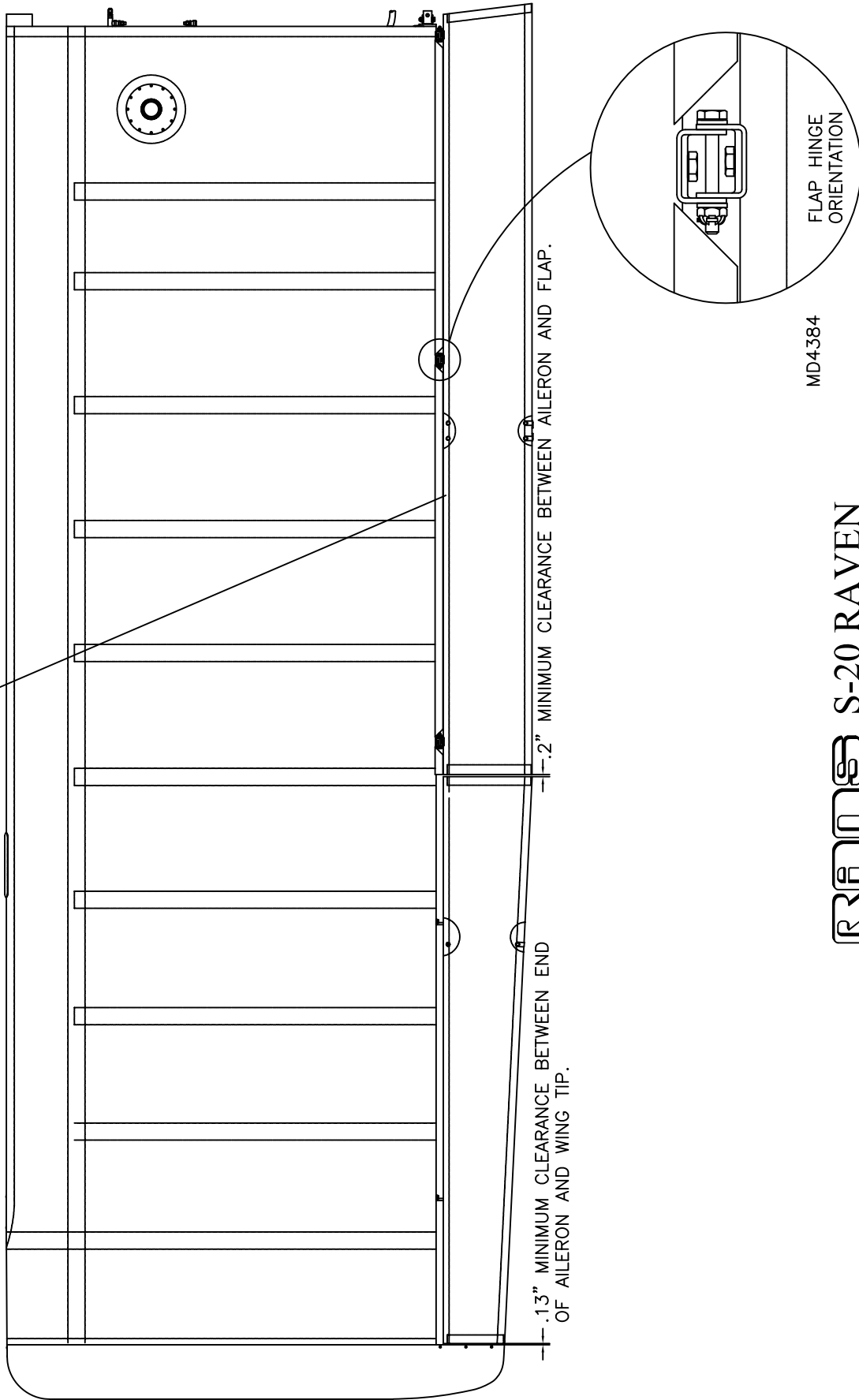


RANS S-20 RAVEN
UPPER AFT LIFT STRUT CONNECTOR MODIFICATION
FIGURE 05E-13

MD1416

09/01/2013

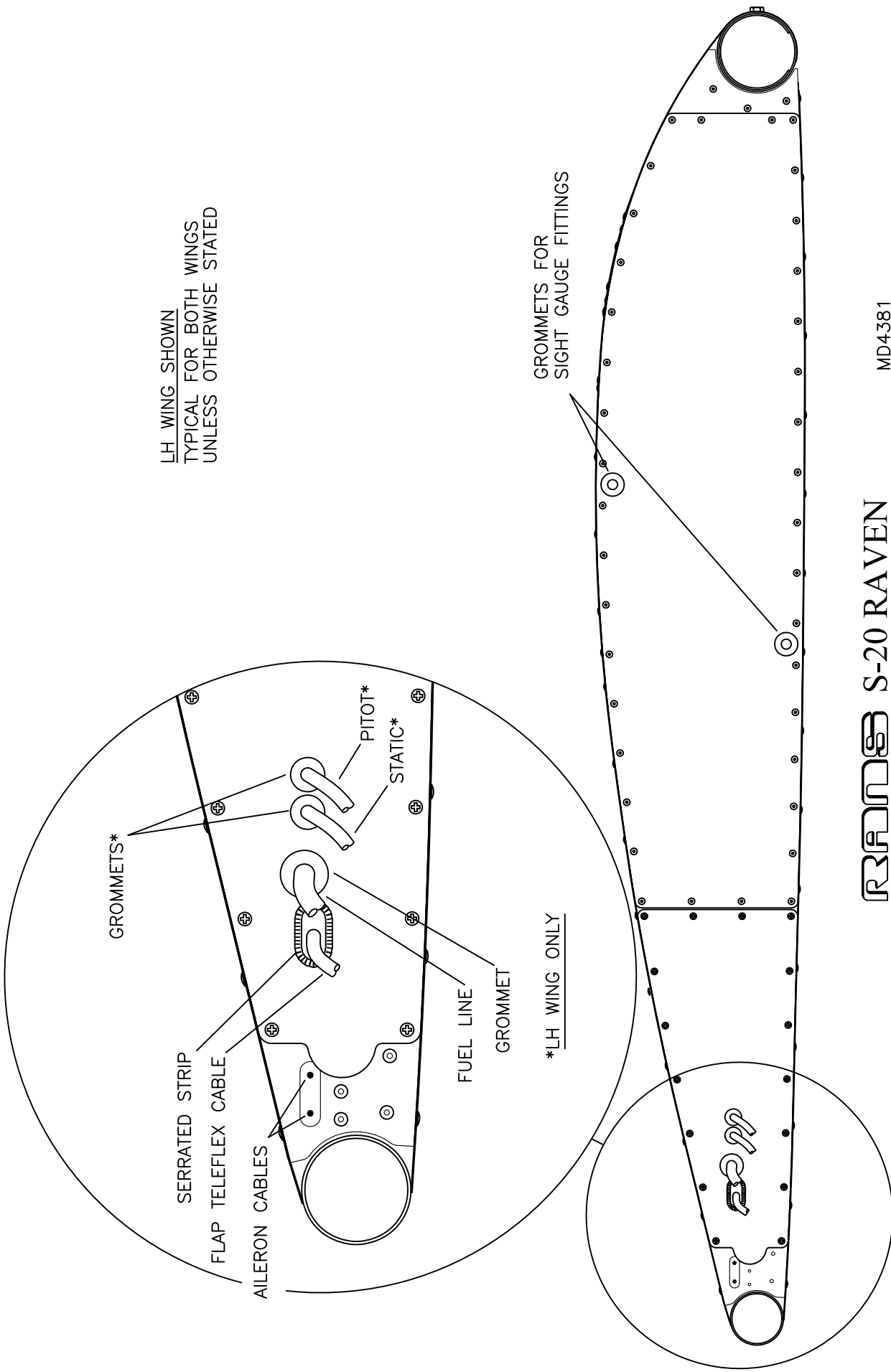
MINIMUM CLEARANCE BETWEEN FLAP AND GAP SEAL - .060" (ENTIRE LENGTH)



MD4384

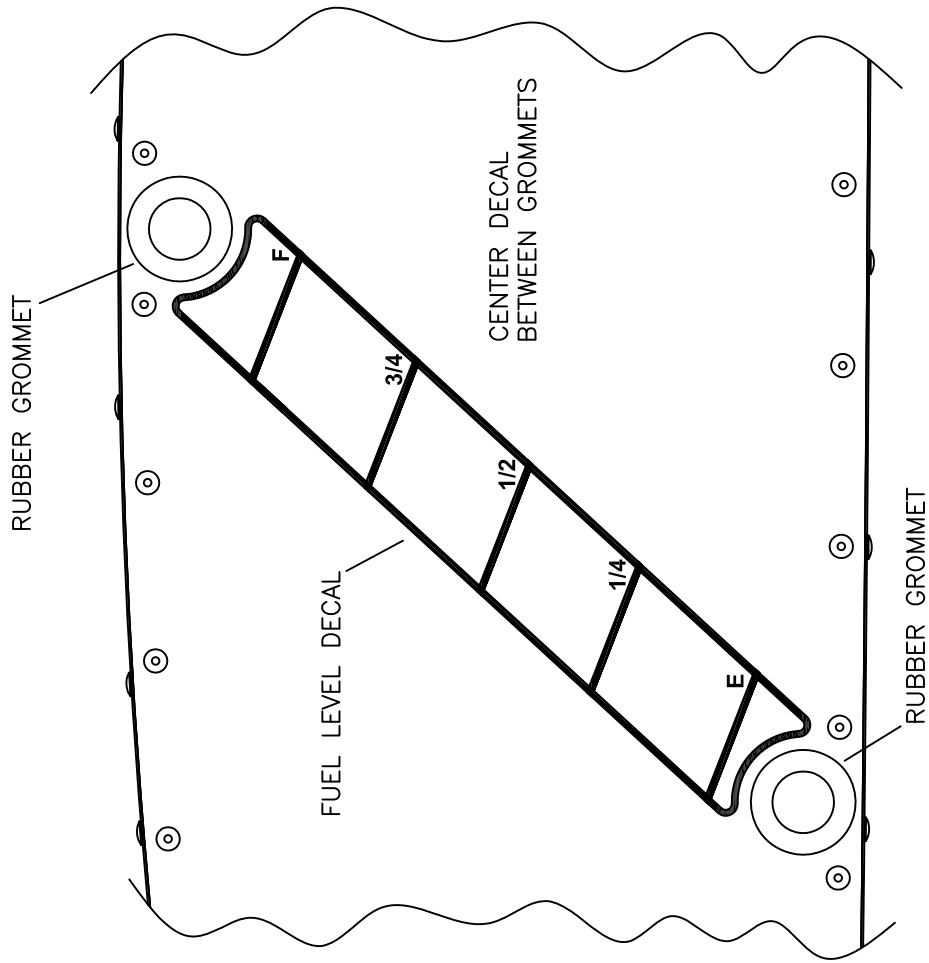
RAMBOS S-20 RAVEN
CONTROL SURFACE CLEARANCE - WING
FIGURE 05F-04

LH WING SHOWN
 TYPICAL FOR BOTH WINGS
 UNLESS OTHERWISE STATED

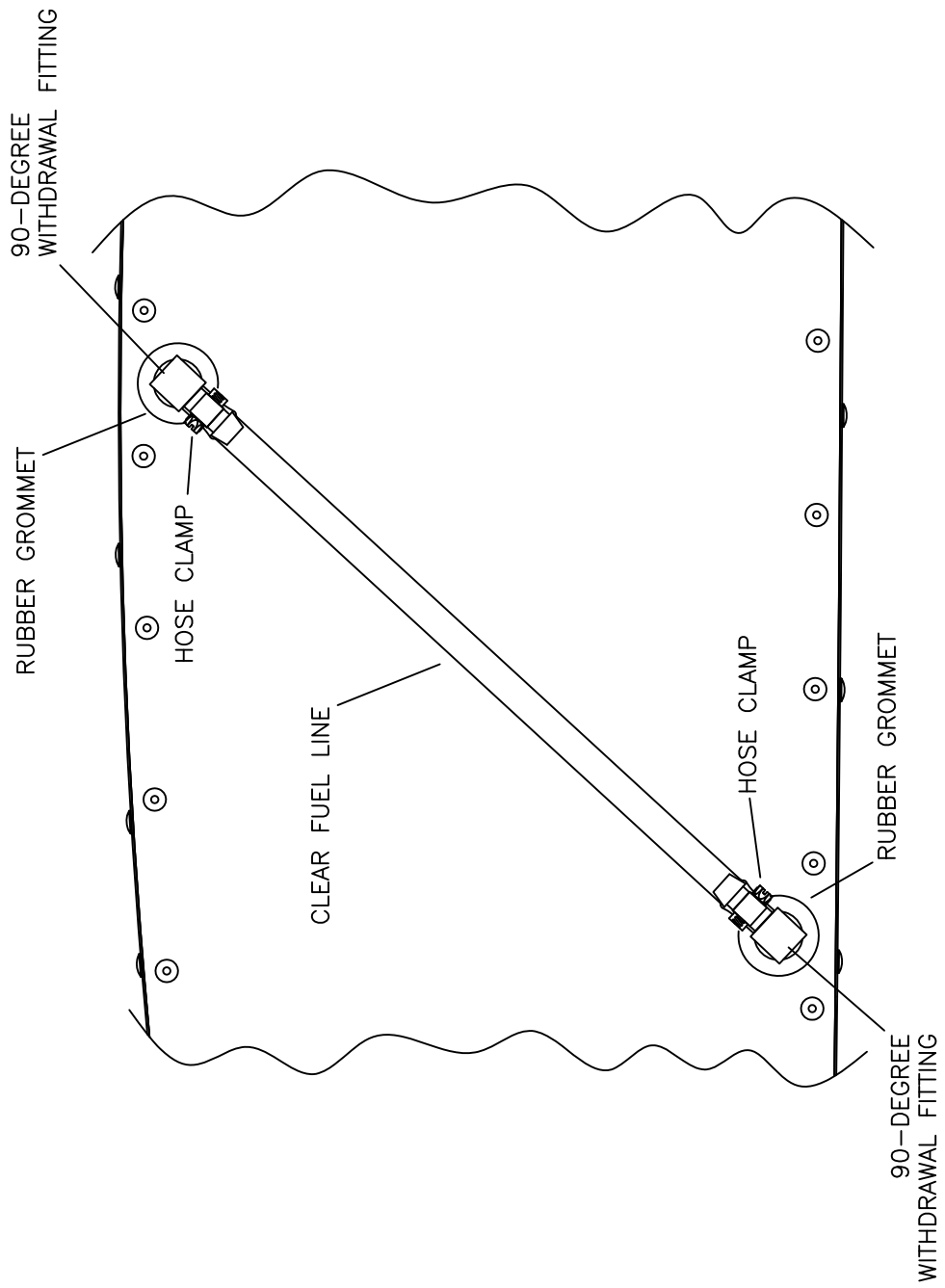


RRAMES S-20 RAVEN
 ROOT CLOSEOUT DETAIL
 FIGURE 05G-03

MD4381

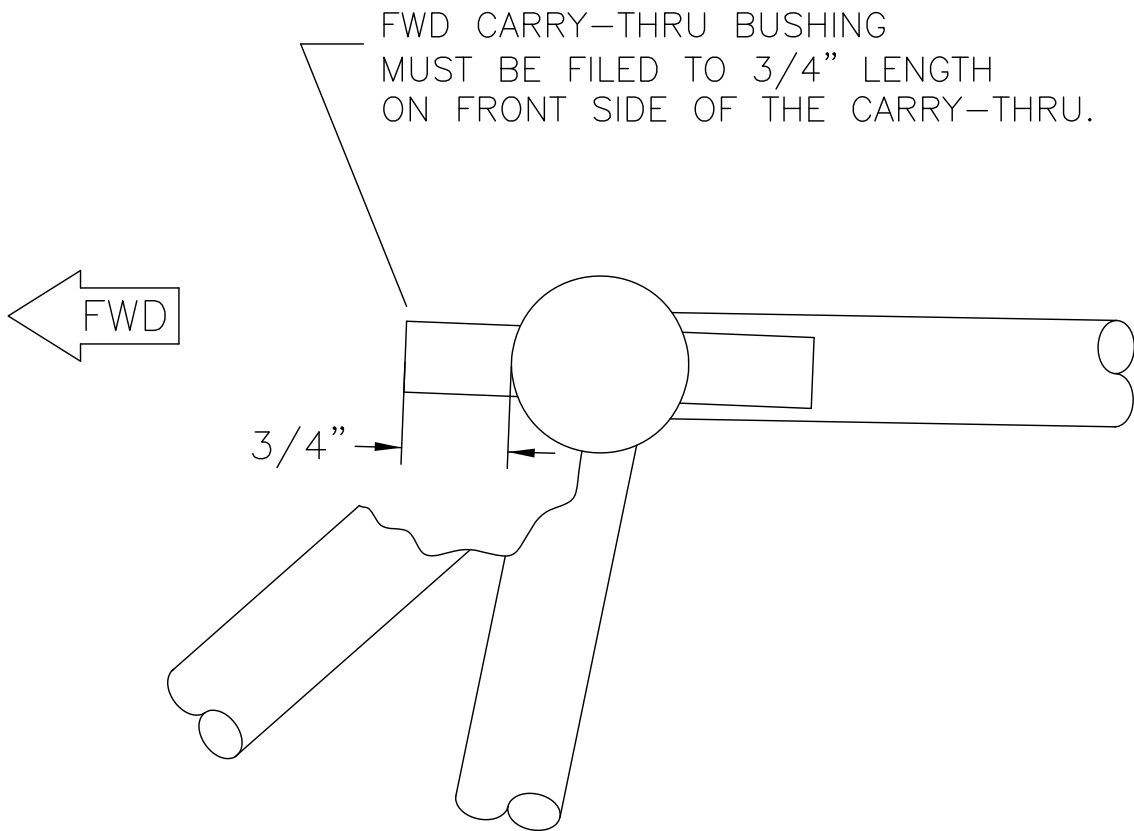


RAMMS S-20 RAVEN MD4414
 FUEL SIGHT GAUGE DECAL INSTALLATION
 FIGURE 05G-04



RAMS S-20 RAVEN
FUEL SIGHT GAUGE INSTALLATION
FIGURE 05G-05

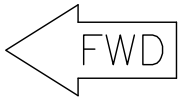
MD4414
 REV. A



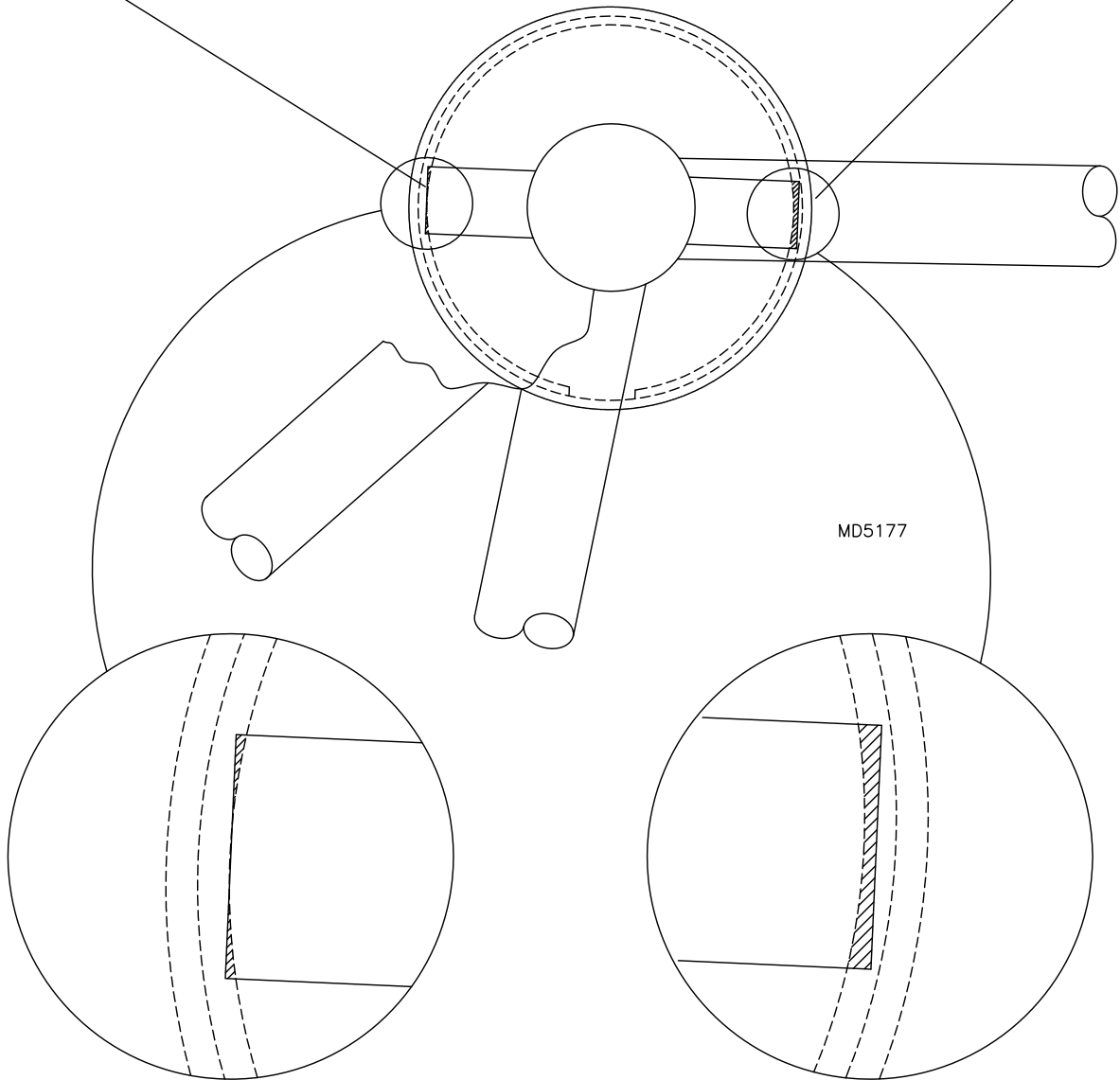
MD5177

RANS S-20 RAVEN
WING ATTACHMENT (T-BONE) MODIFICATION
FIGURE 05H-07

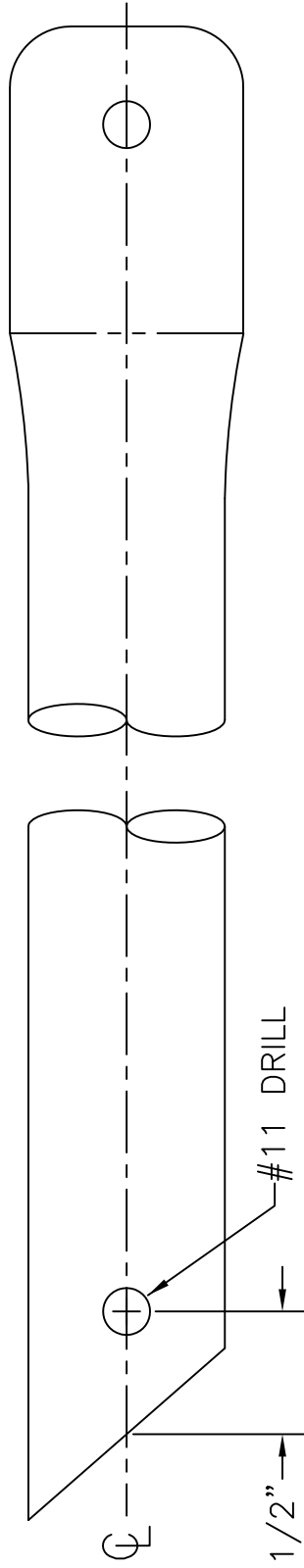
09/01/2013



CONTOUR FWD AND AFT PORTION OF THE BUSHING (T-BONE)
UNTIL LEADING EDGE SPAR (WITH DOUBLER INSTALLED)
SLIPS OVER THE CARRY-THRU BUSHING.



RAVENS S-20 RAVEN
WING ATTACHMENT (T-BONE) MODIFICATION
FIGURE 05H-08

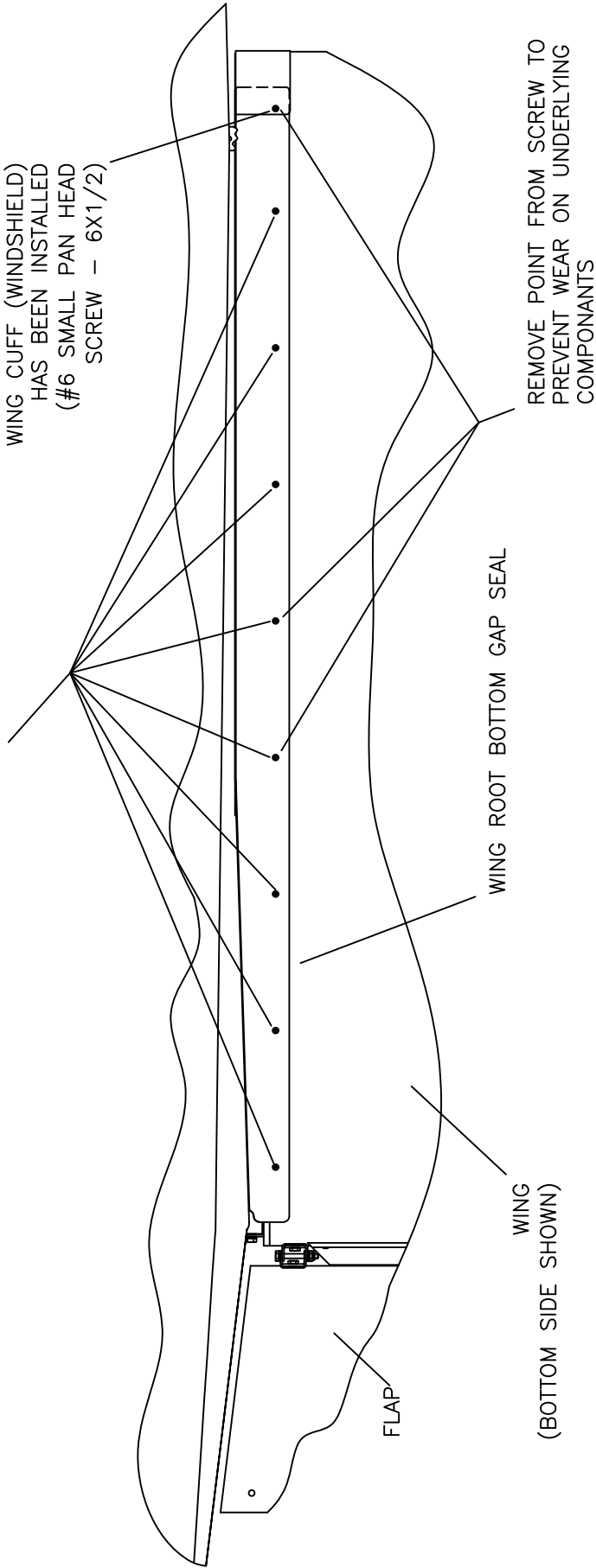


MD4510
REV. - ORIG

RAVEN S-20 RAVEN
AFT JURY STRUT MODIFICATION
FIGURE 05H-18

LOCATE CENTER OF TINNERMANS INSTALLED ON ROOT RIB.
DRILL #30 AND INSTALL #8 PAN HEAD SCREW - 8X1/2

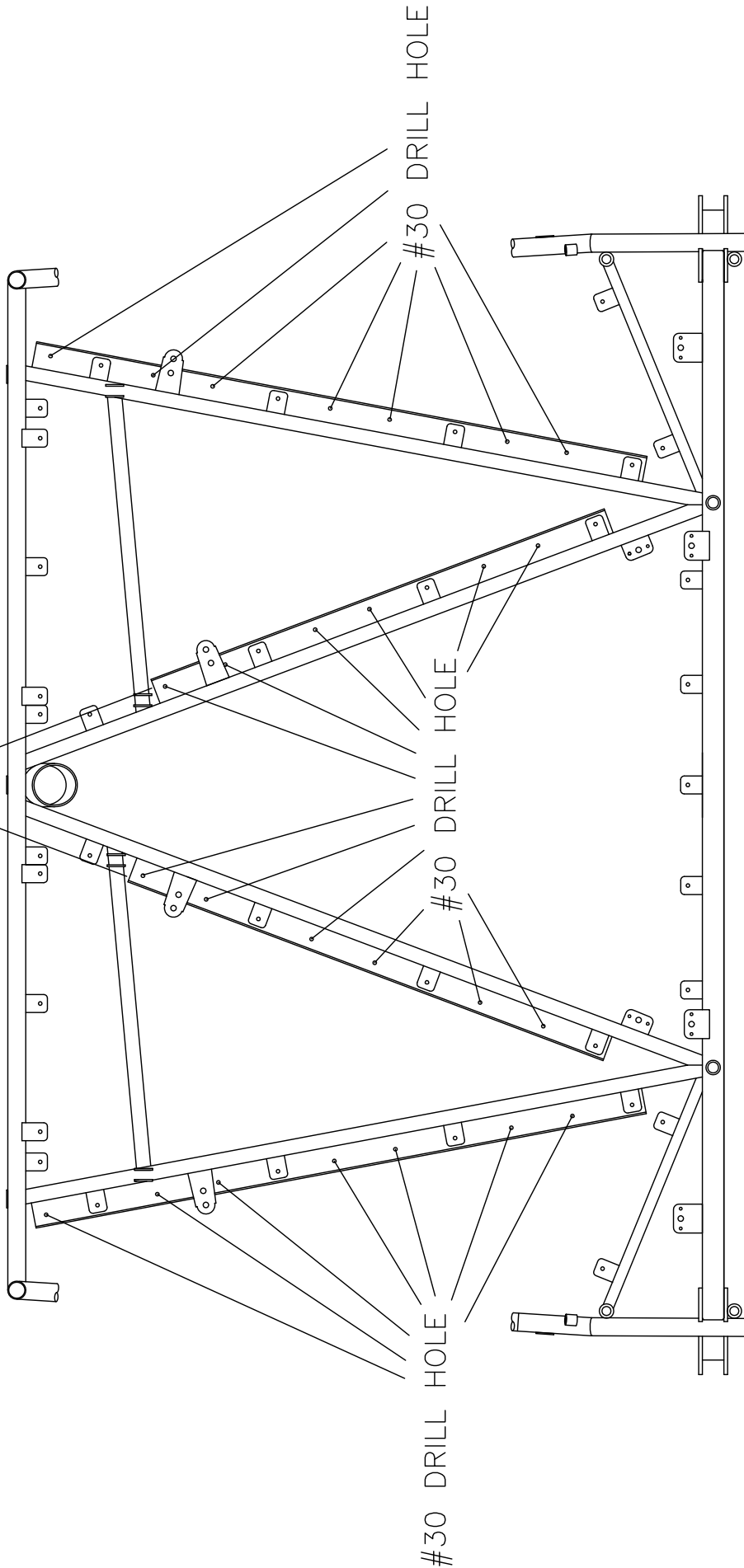
LOCATE ON WING AFTER
WING CUFF (WINDSHIELD)
HAS BEEN INSTALLED
(#6 SMALL PAN HEAD
SCREW - 6X1/2)



RAMS S-20 RAVEN
WING ROOT BOTTOM GAP SEAL ATTACH
FIGURE 05H-30

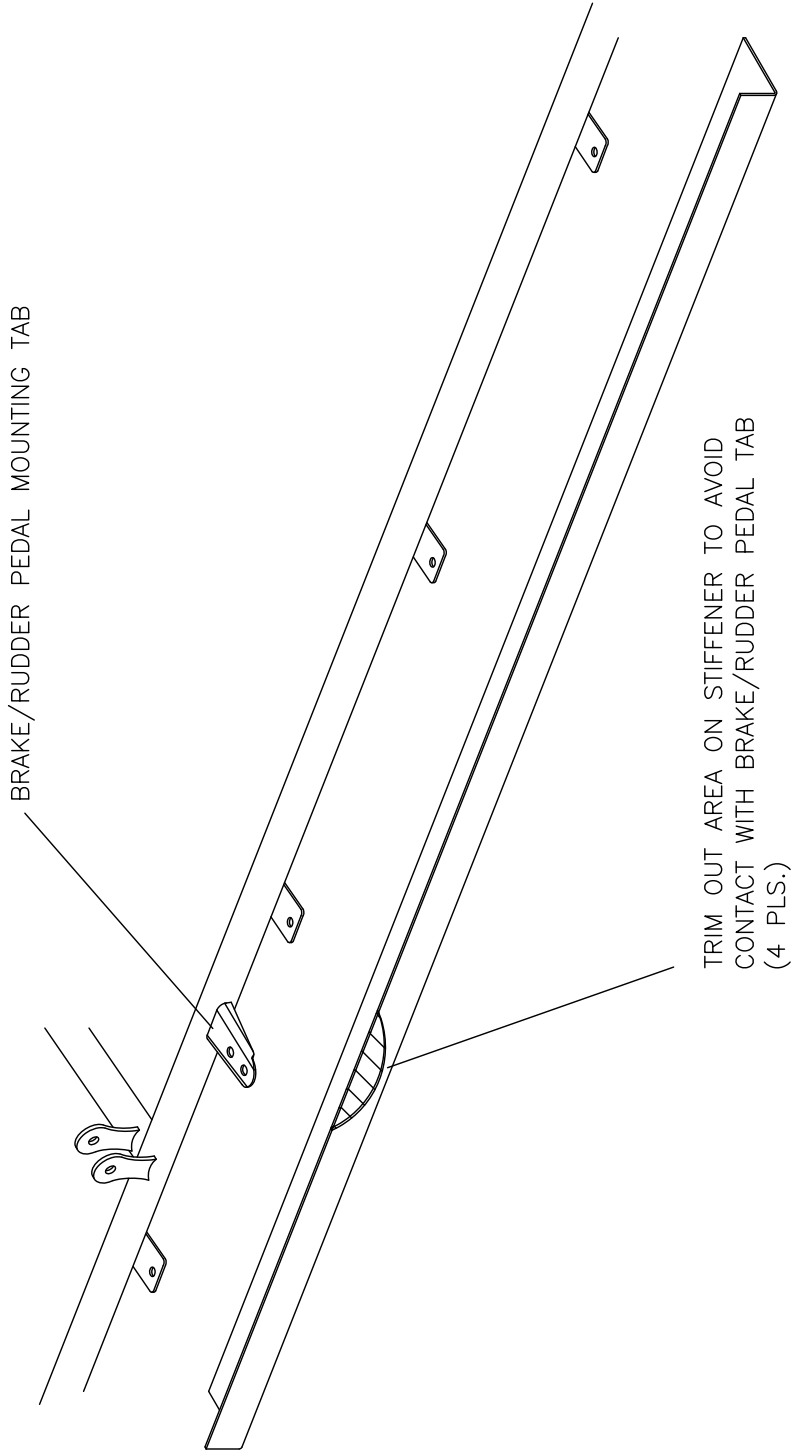
MD4407

TRIM STIFFENER LENGTH TO
CLEAR FUSELAGE TUBES



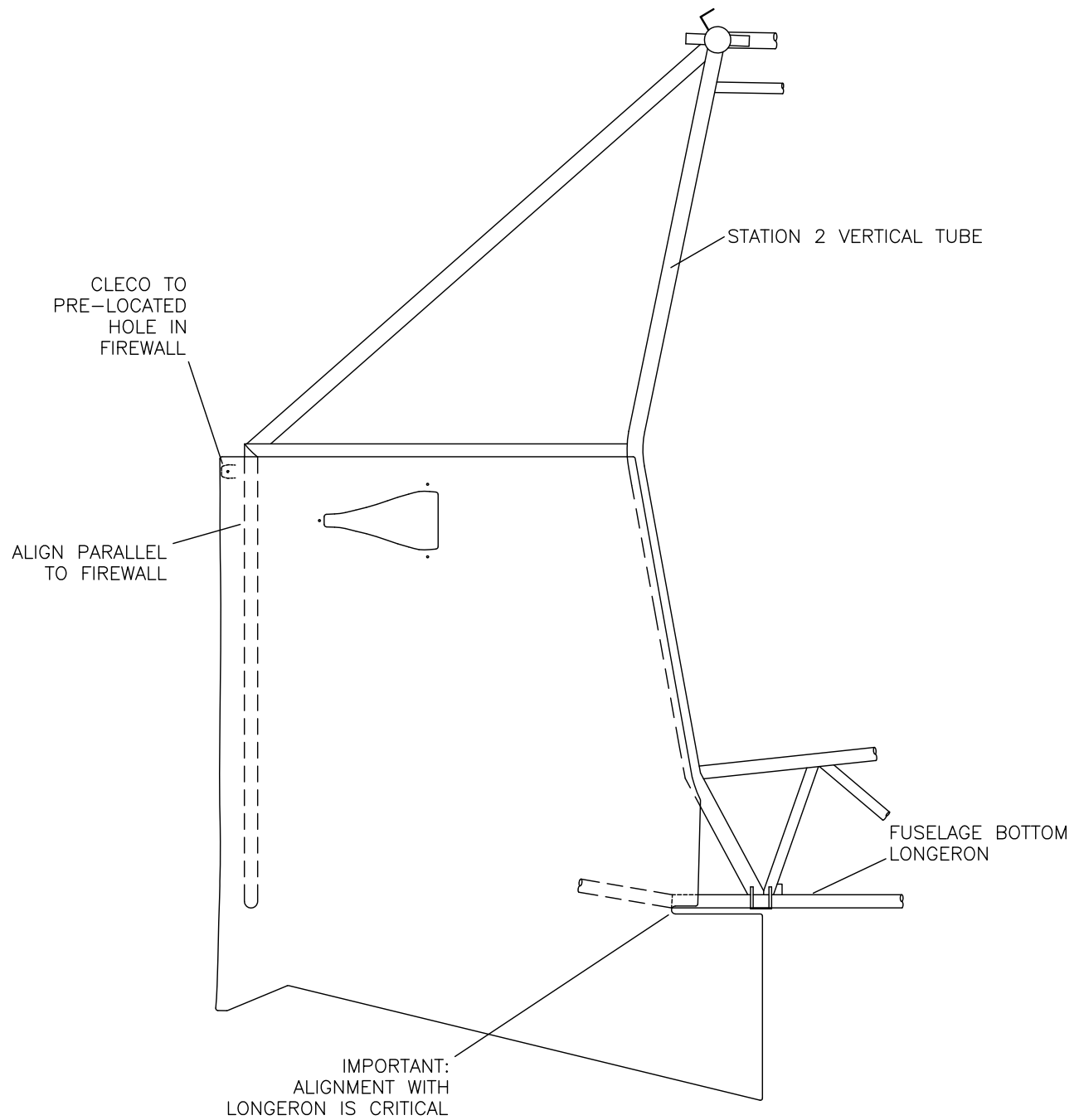
MD5606
REV. - ORIG

RAMS S-20 RAVEN
BOOT COWL STIFFENER LOCATION
FIGURE 06-07



MD5605
REV. - ORIG

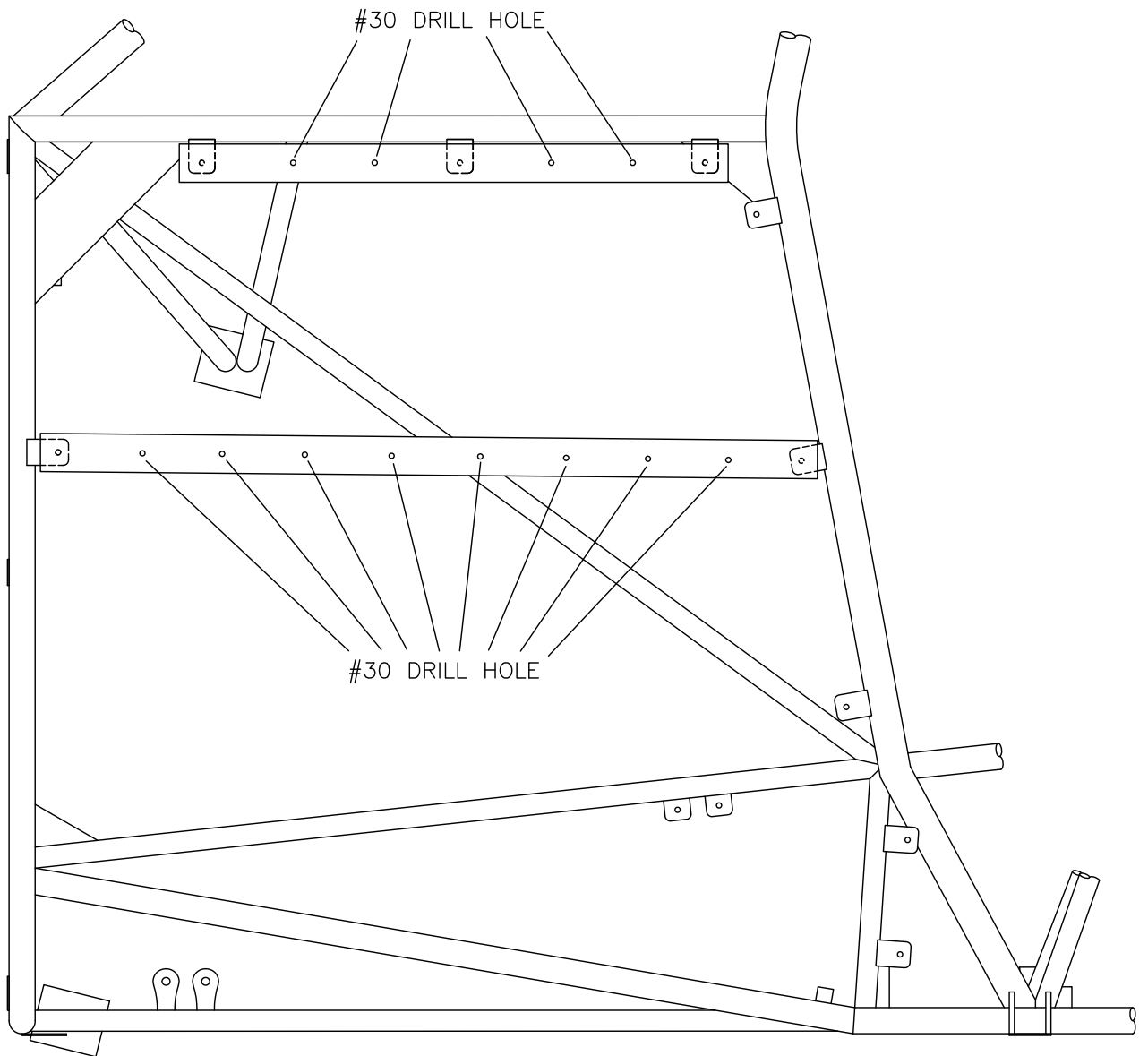
RAMS S-20 RAVEN
BOOT COWL STIFFENER TRIMMING
FIGURE 06-08



MD5607
REV. A

RANS S-20 RAVEN
SIDE BOOT COWL INSTALLATION
FIGURE 06-11

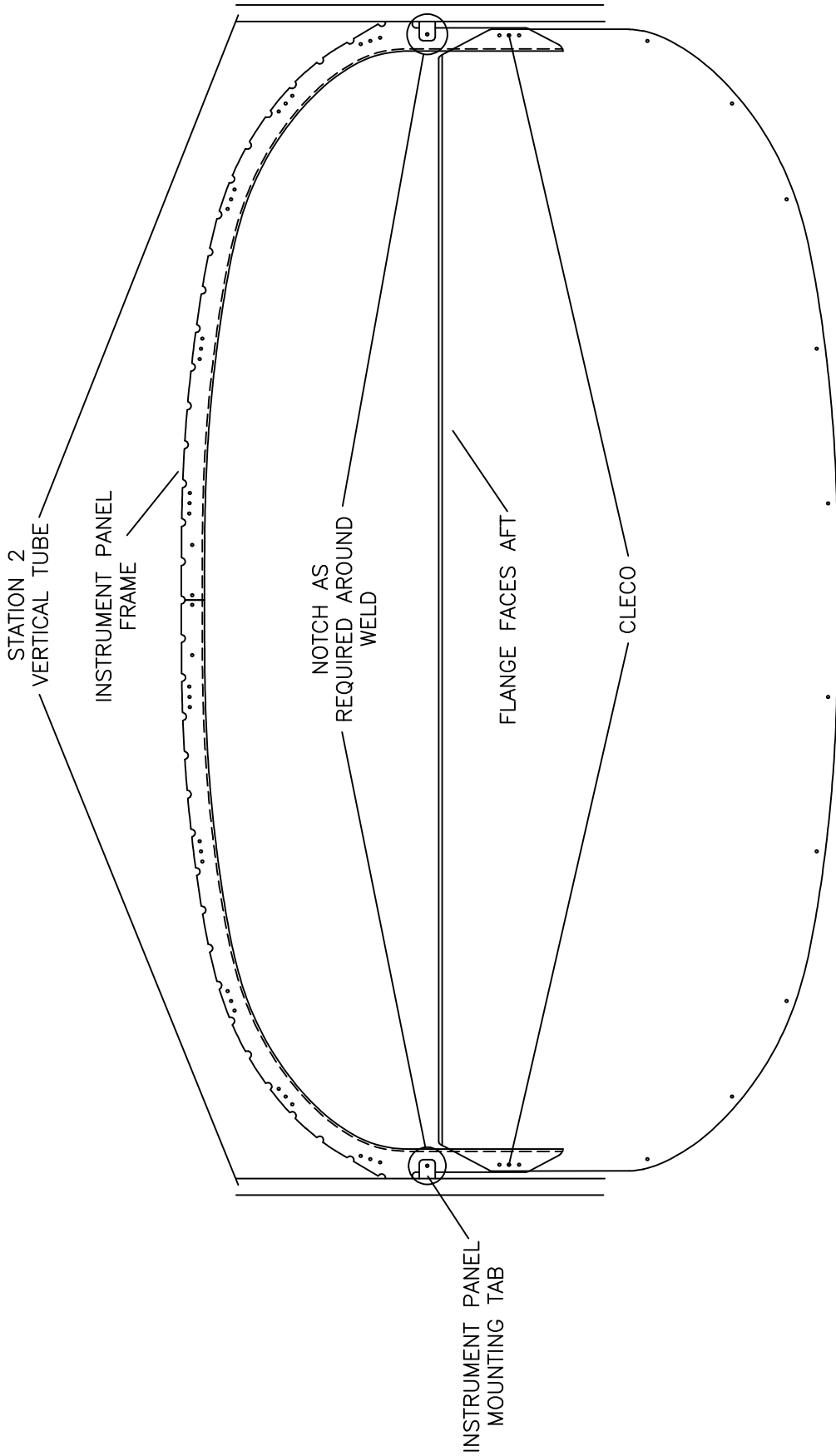
09/01/2013



MD5608
REV. A

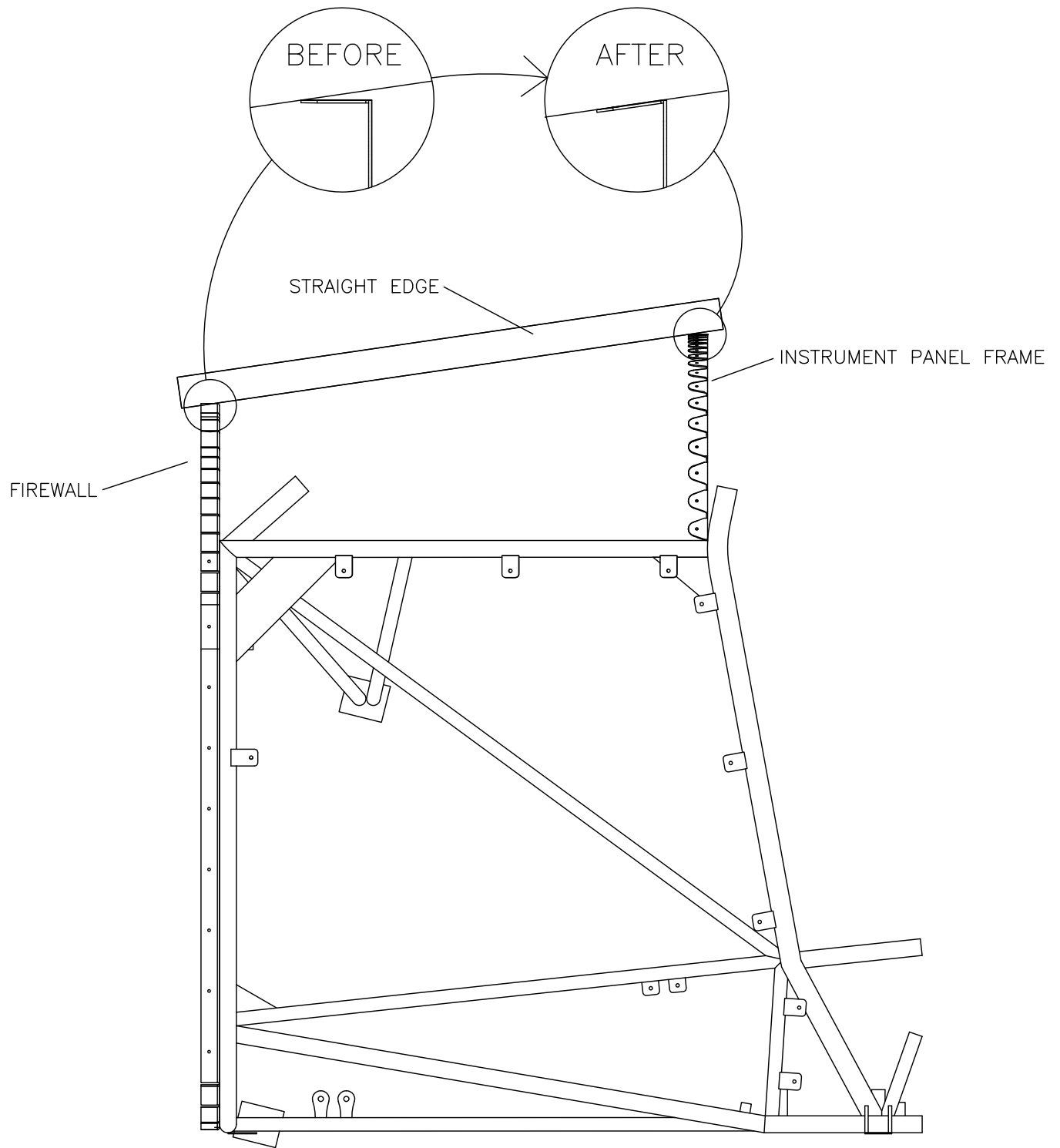
RANS S-20 RAVEN
SIDE BOOT COWL STIFFENER LOCATION
FIGURE 06-13

09/01/2013



MD5609
REV. - A

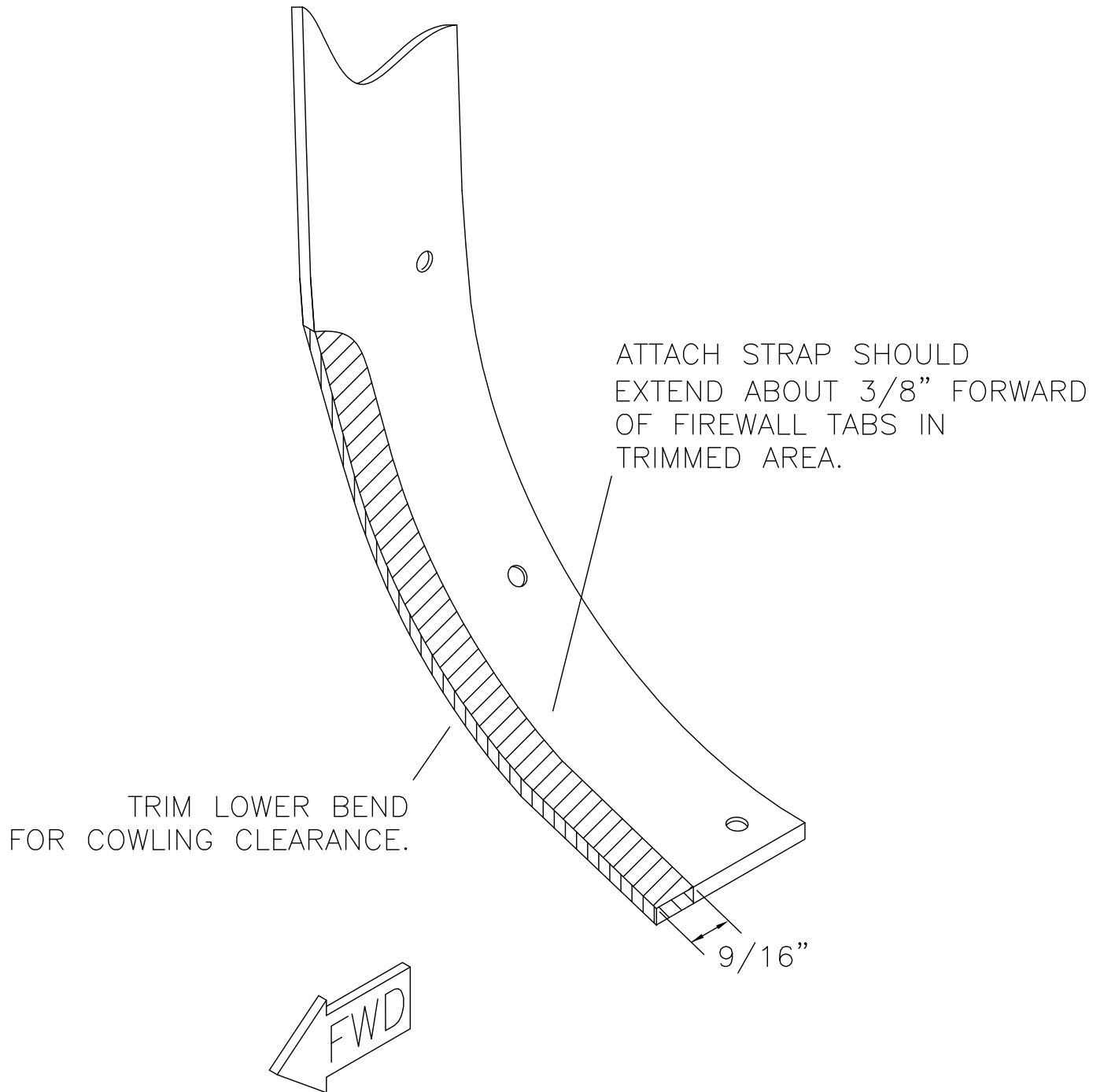
RRR S-20 RAVEN
INSTRUMENT PANEL INSTALLATION - BOOT COWL
FIGURE 06-18



MD5610
REV. A

RANS S-20 RAVEN
TAB ALIGNMENT
FIGURE 06-19

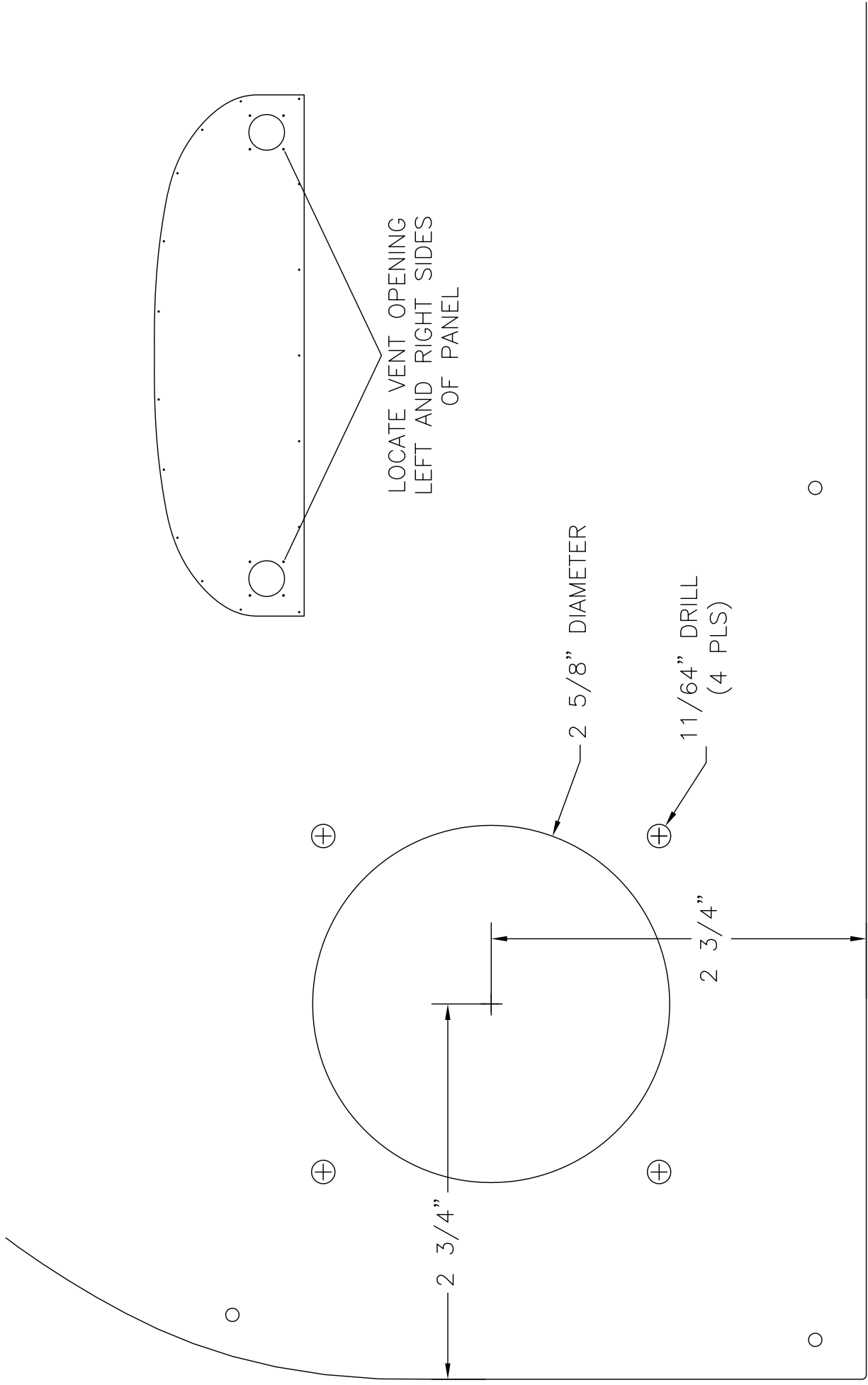
09/01/2013



MD5611
REV. - ORIG

RANS S-20 RAVEN
COWLING ATTACH STRAP TRIMMING
FIGURE 06-29

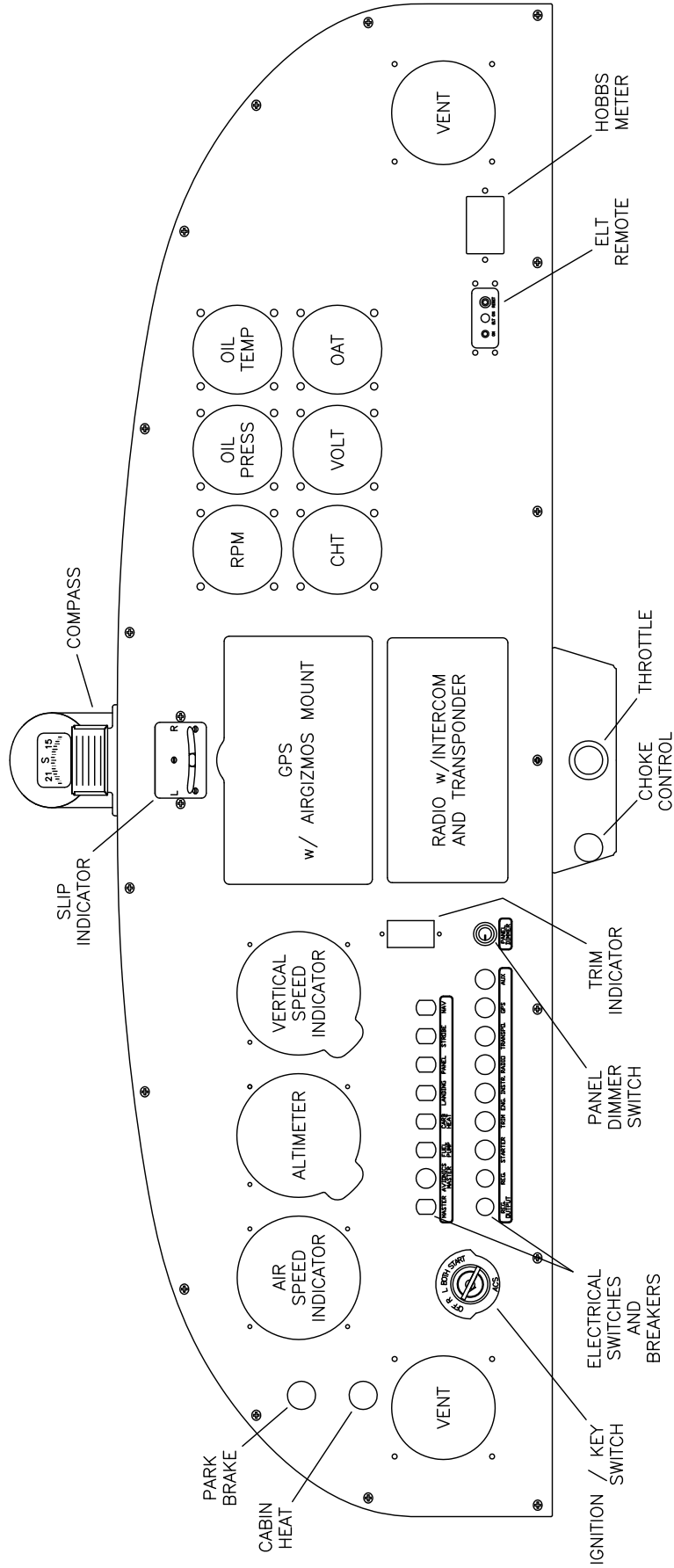
09/01/2013



PLOT 1:1

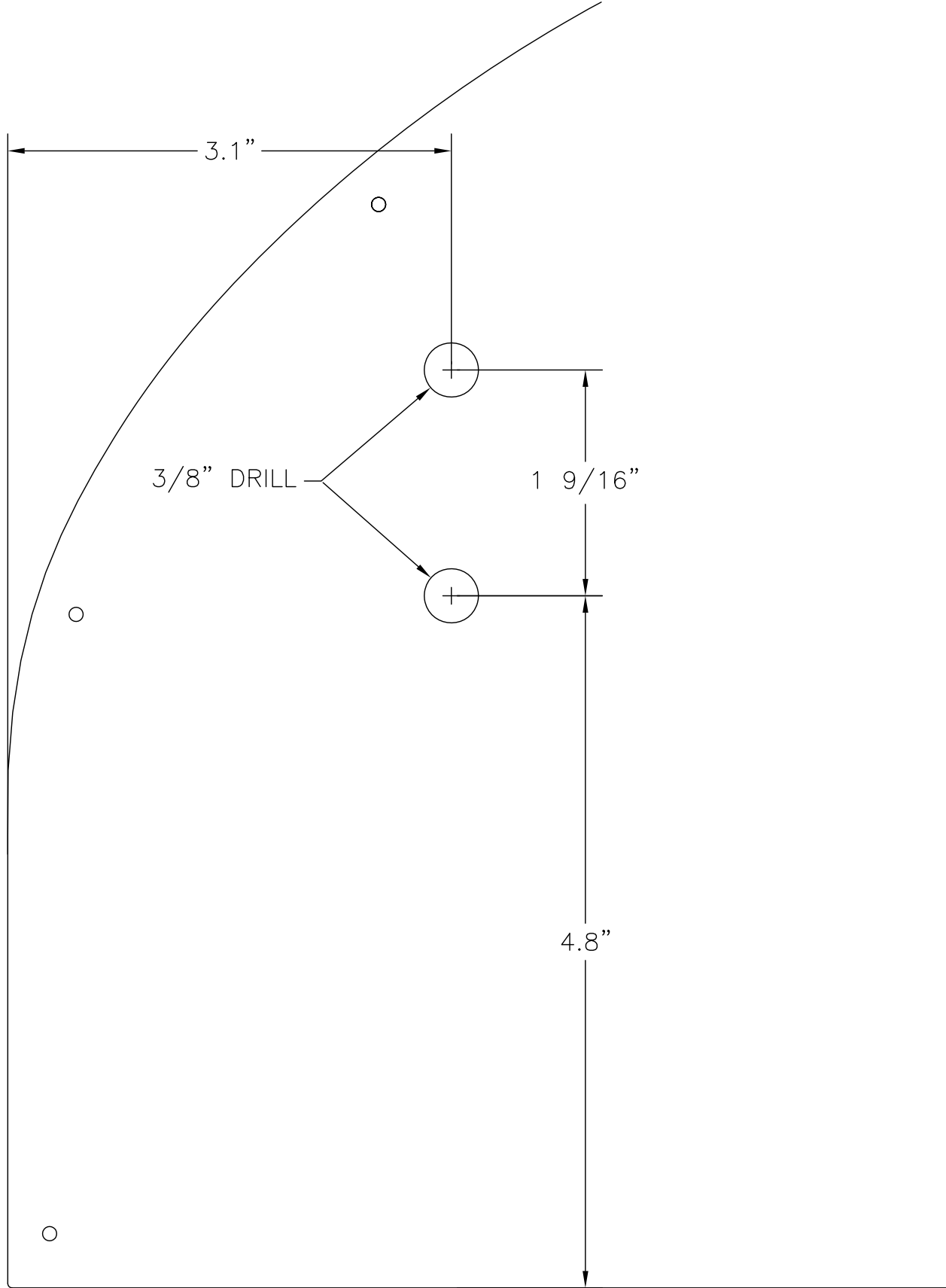
MD5618
REV. - ORIG

RRMO S-20 RAVEN
VENT SYSTEM - INSTRUMENT PANEL MODIFICATION
FIGURE 06-38



MD5618
REV. - ORIG

RAVEN S-20 RAVEN
SAMPLE INSTRUMENT PANEL LAYOUT
FIGURE 06A-01

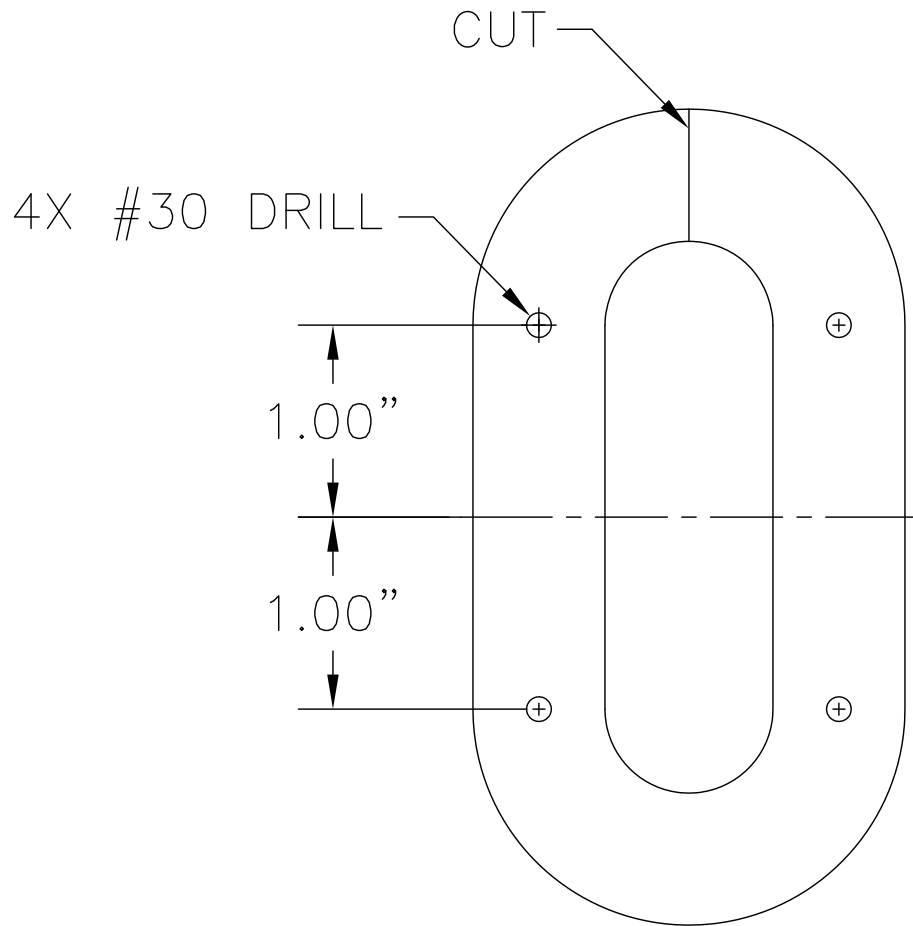


PLOT 1:1

MD5618
REV. - ORIG

RANS S-20 RAVEN
CONTROL CABLE - INSTRUMENT PANEL
FIGURE 06A-02

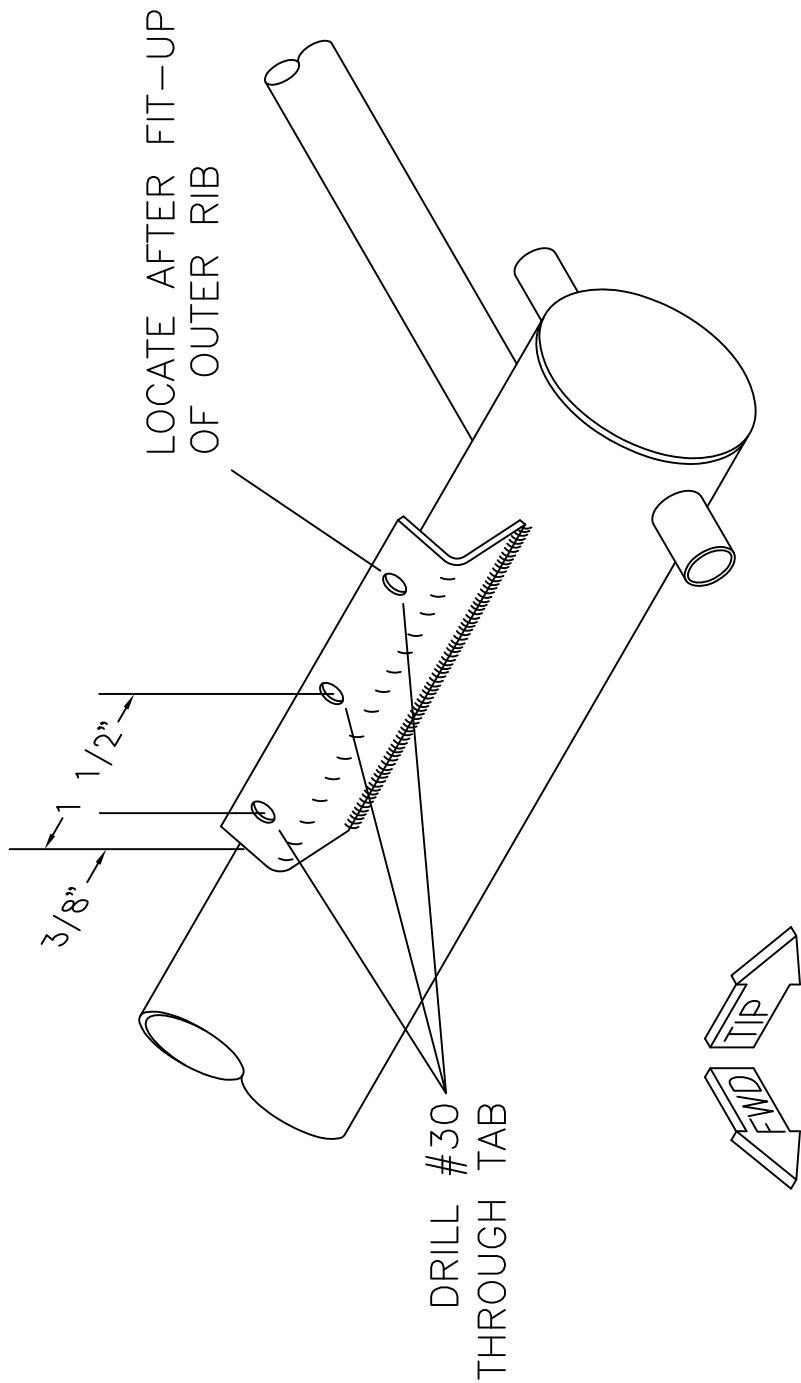
09/01/2013



MD5118
REV. A

RANS S-20 RAVEN
OVAL GLARE SHIELD RING MODIFICATION
FIGURE 06A-08

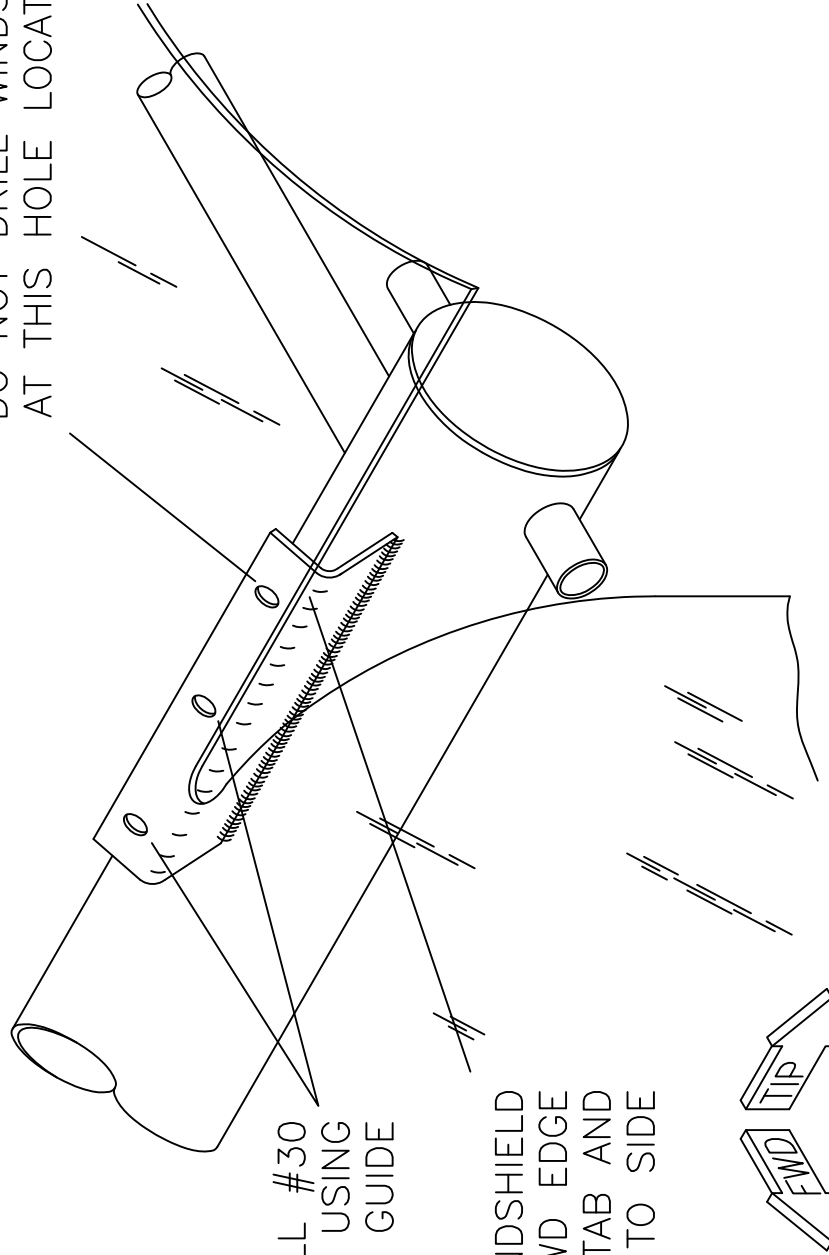
12/29/2016



MD4408
REV. - ORIG

RAVEN S-20 RAVEN
WINDSHIELD MOUNTING TAB MODIFICATION
FIGURE 07-02

DO NOT DRILL WINDSHIELD
AT THIS HOLE LOCATION

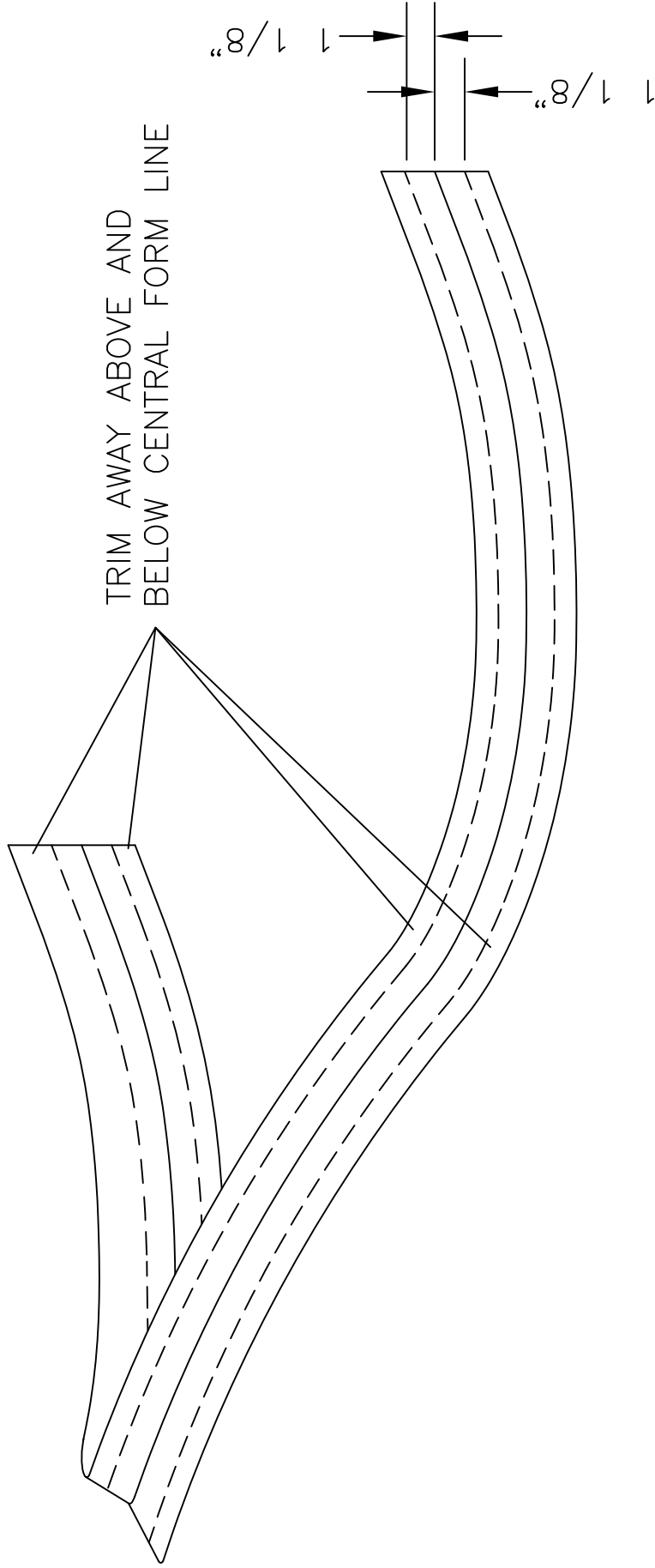


DRILL #30
THROUGH WINDSHIELD USING
TAB HOLES AS GUIDE

FWD. EDGE OF WINDSHIELD
FLUSH WITH FWD EDGE
OF TAB AND
CENTERED SIDE TO SIDE

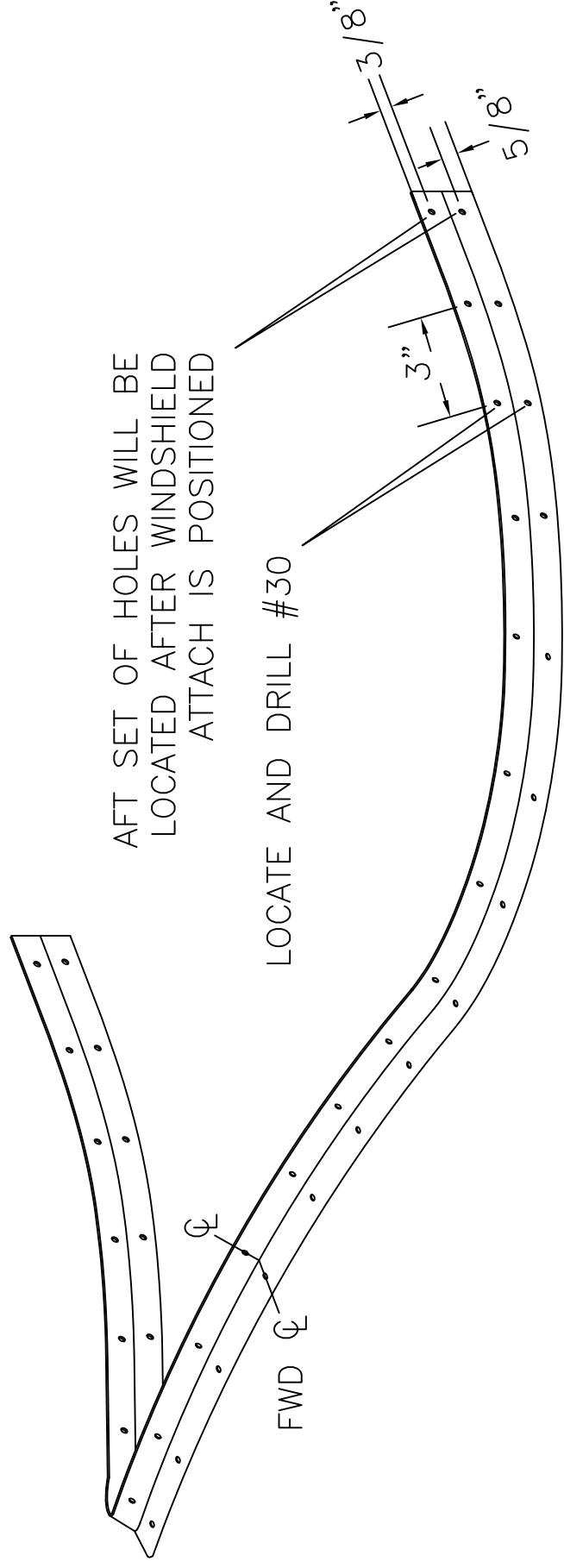
MD4408
REV. - ORIG

RAVEN S-20 RAVEN
WINDSHIELD LOCATION
FIGURE 07-03



MD4408
REV. - ORIG

RAMS S-20 RAVEN
WINDSHIELD HOLD DOWN STRIP MODIFICATION
FIGURE 07-05

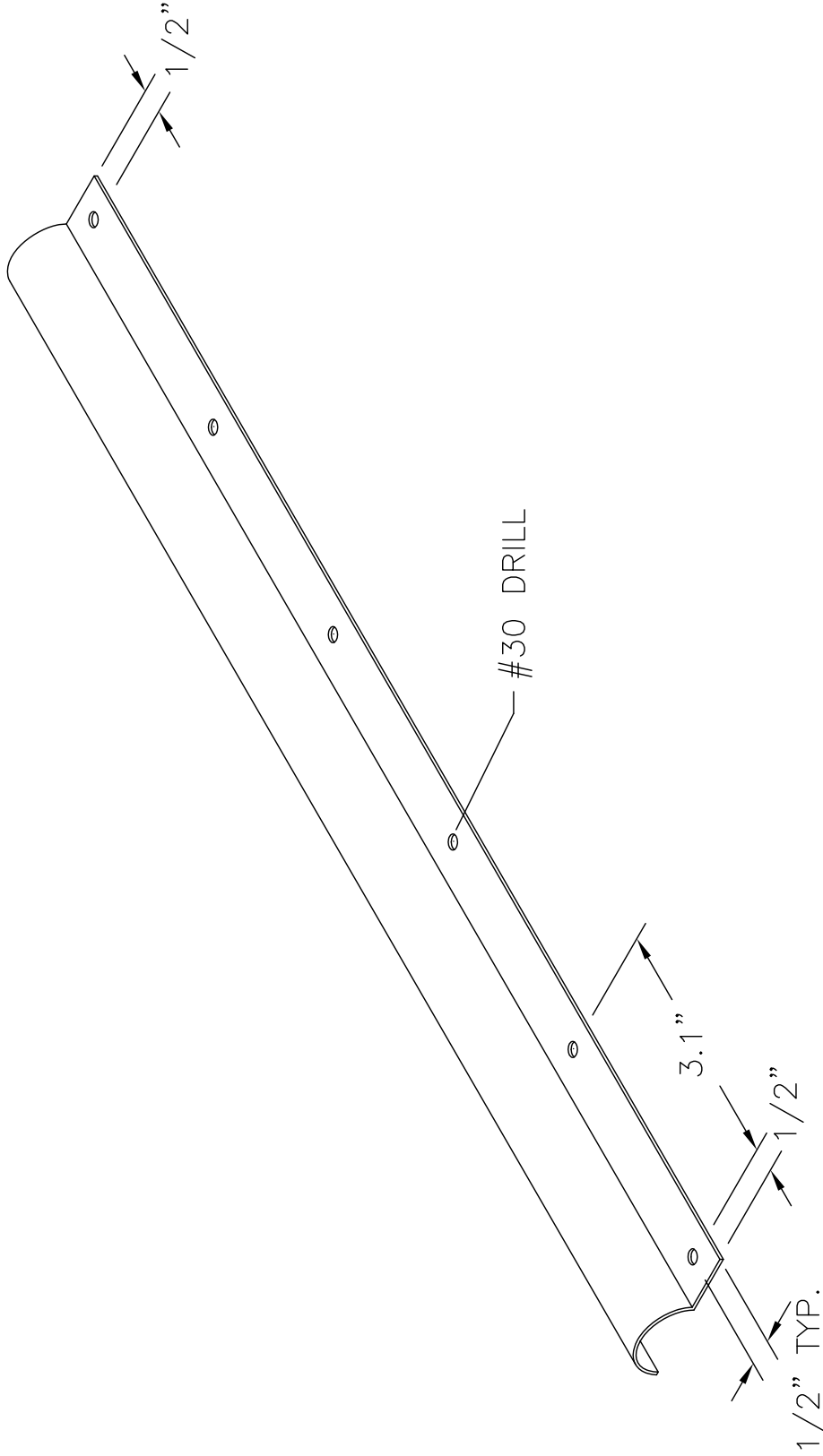


AFT SET OF HOLES WILL BE
 LOCATED AFTER WINDSHIELD
 ATTACH IS POSITIONED

LOCATE AND DRILL #30

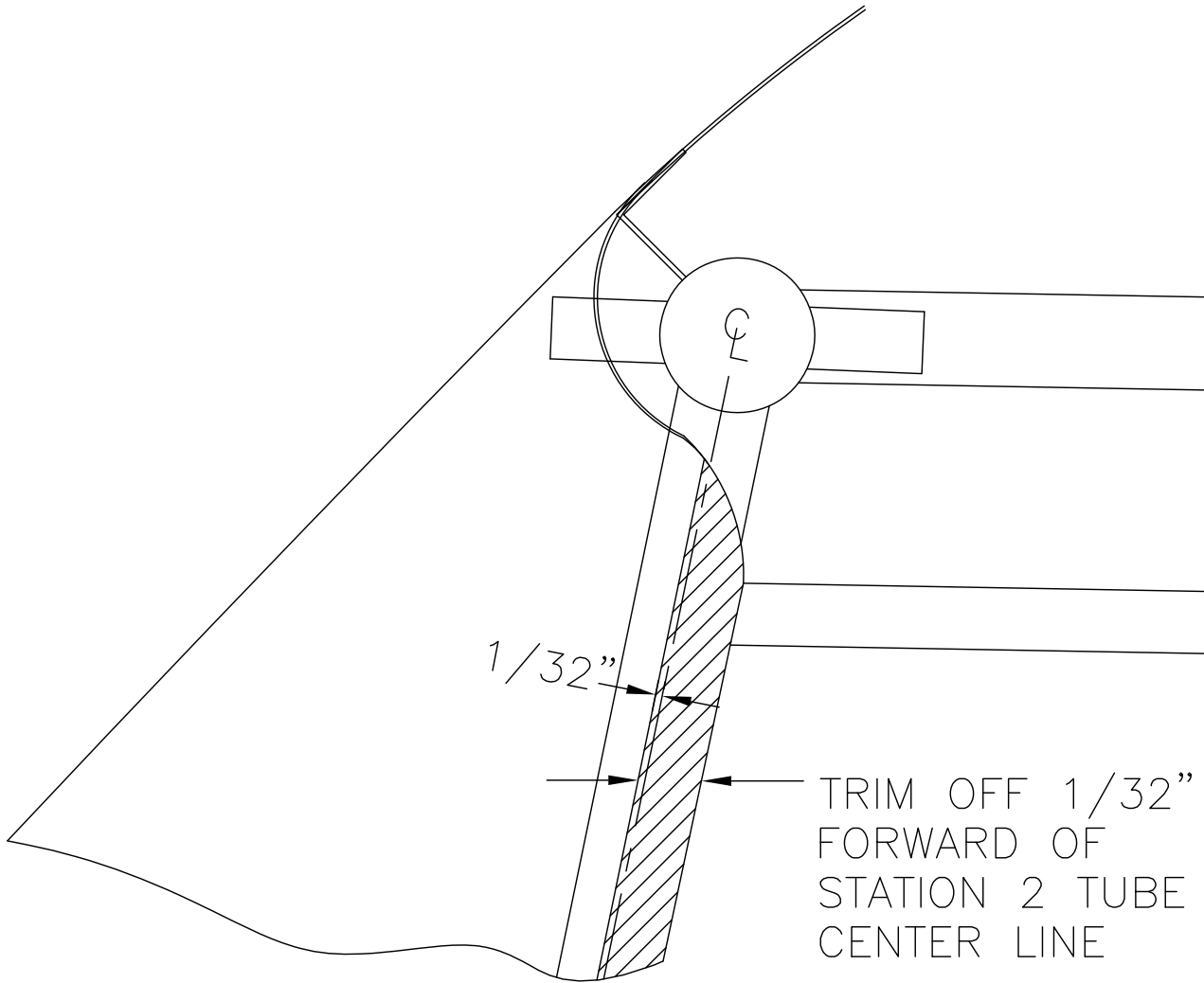
MD4408
 REV. - ORIG

RAVEN S-20 RAVEN
 WINDSHIELD HOLD DOWN STRIP DRILLING
 FIGURE 07-06



MD1428
REV. - ORIG

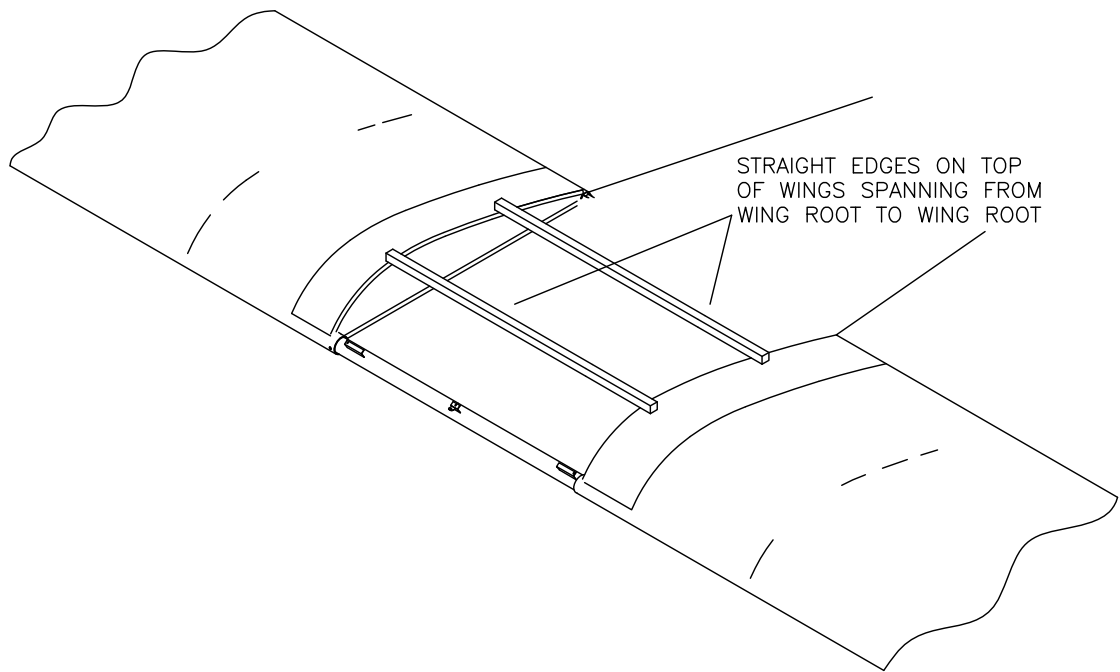
RAVEN S-20 RAVEN
WINDSHIELD ATTACH MODIFICATION
FIGURE 07-07



MD1428
REV. - ORIG

RANS S-20 RAVEN
WINDSHIELD TRIMMING
FIGURE 07-08

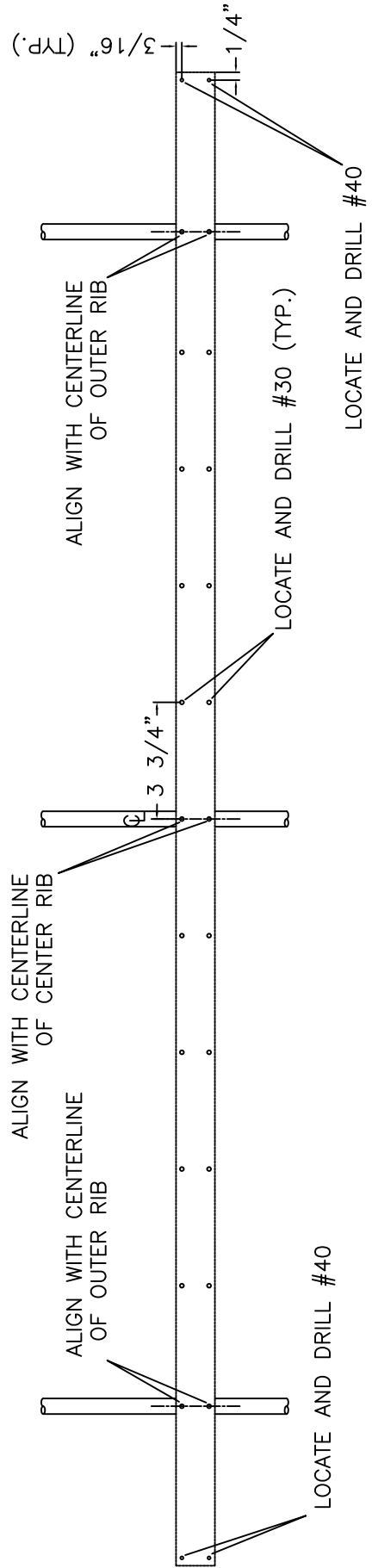
09/01/2013



MD3354
REV. - ORIG

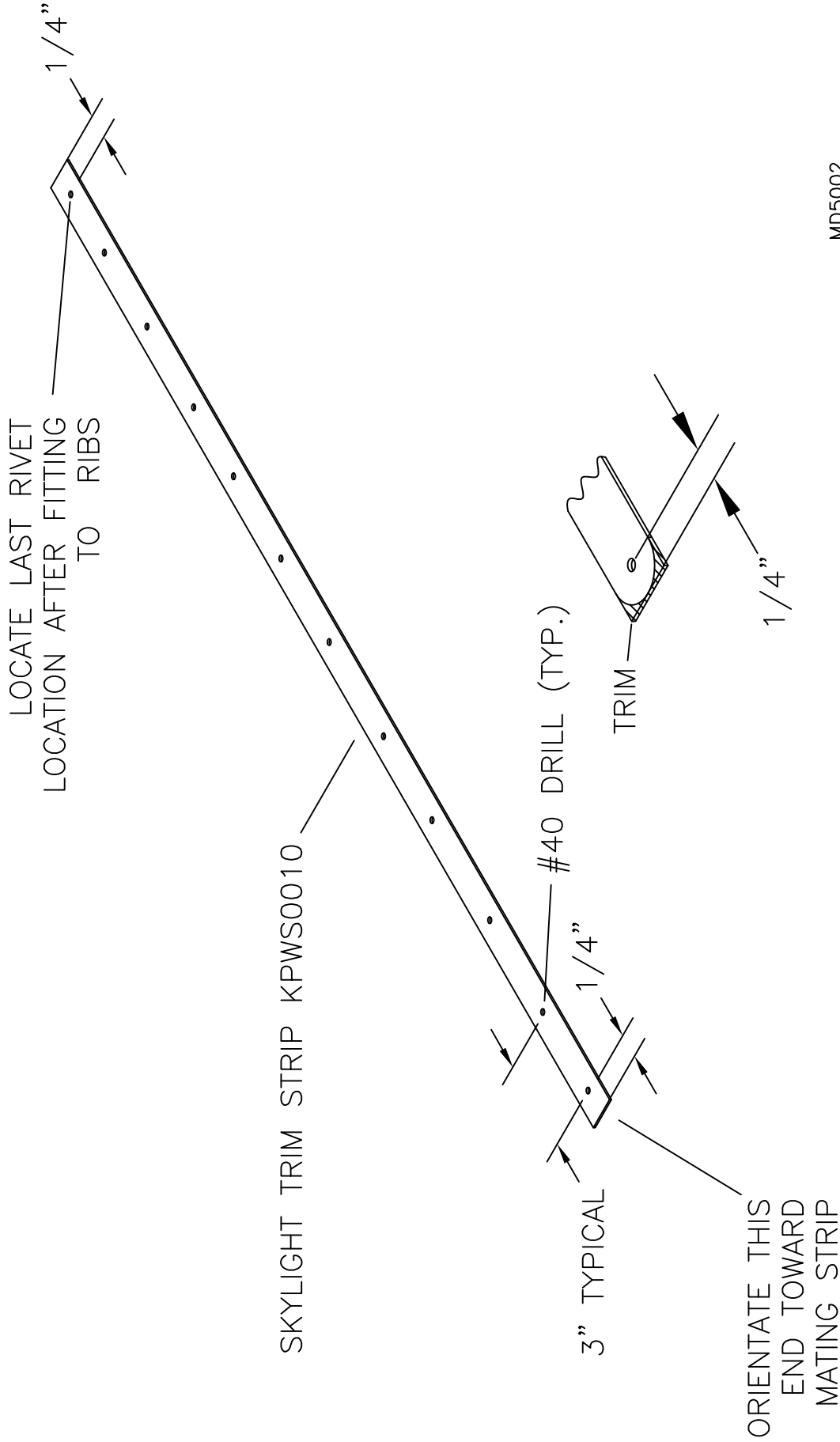
RANS S-20 RAVEN
RIB HEIGHT ADJUSTMENT - FUSELAGE
FIGURE 07-11

09/01/2013



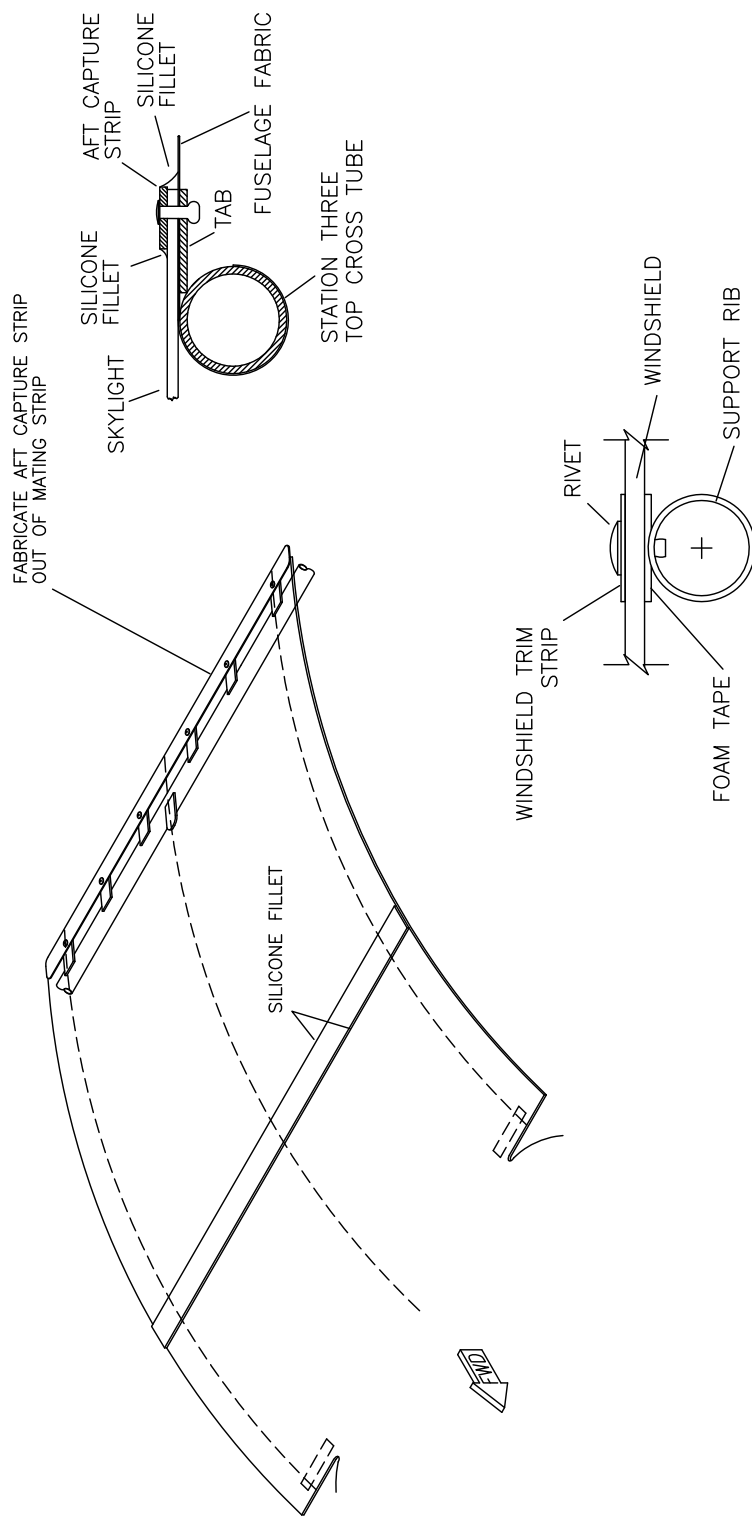
MD5576
REV. - ORIG

RRMS S-20 RAVEN
MATING STRIP MODIFICATION
FIGURE 07-20



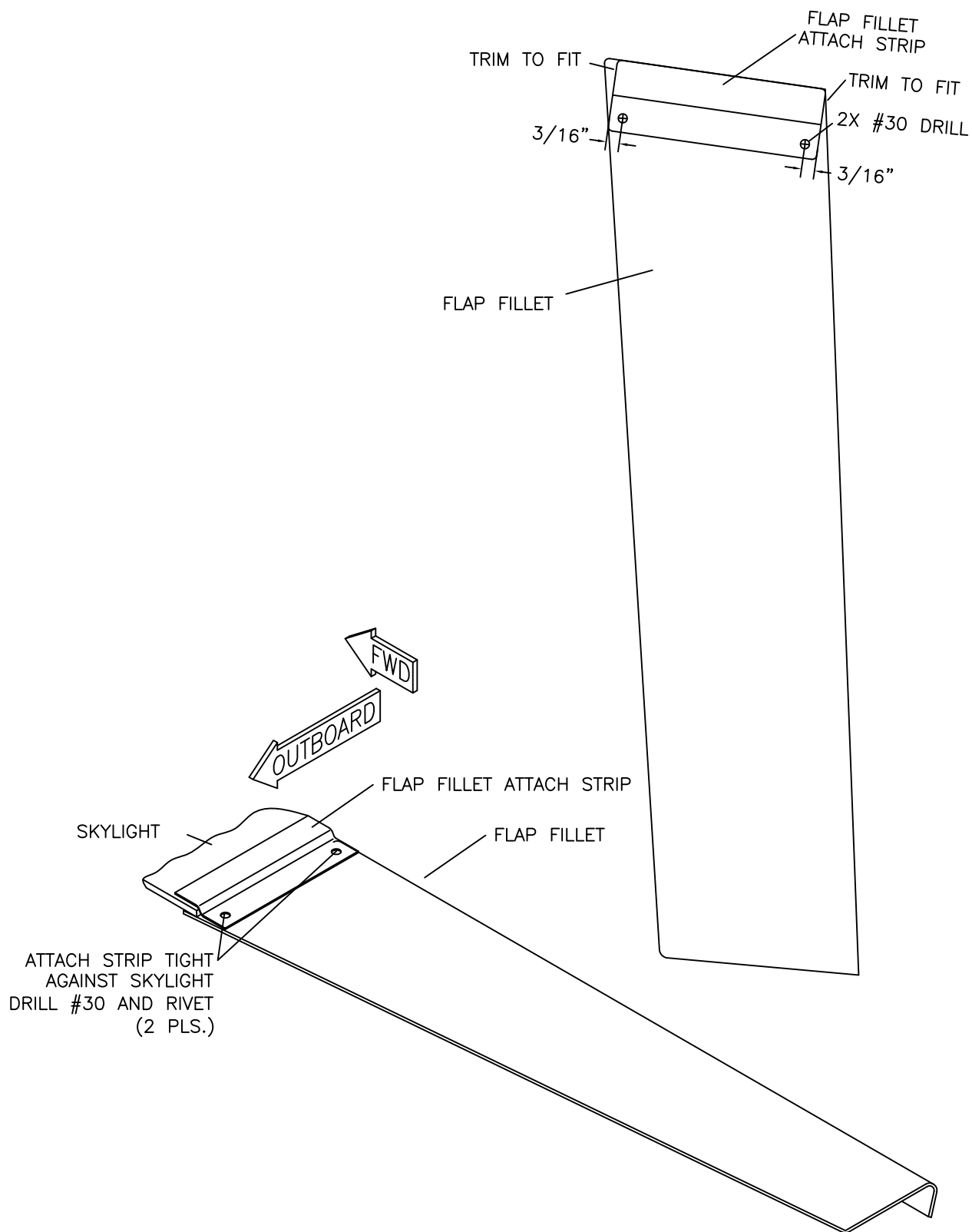
MD5002
REV. - ORIG

RAVEN S-20 RAVEN
SKYLIGHT TRIM STRIP MODIFICATION
FIGURE 07-25



MD2580
REV. - ORIG

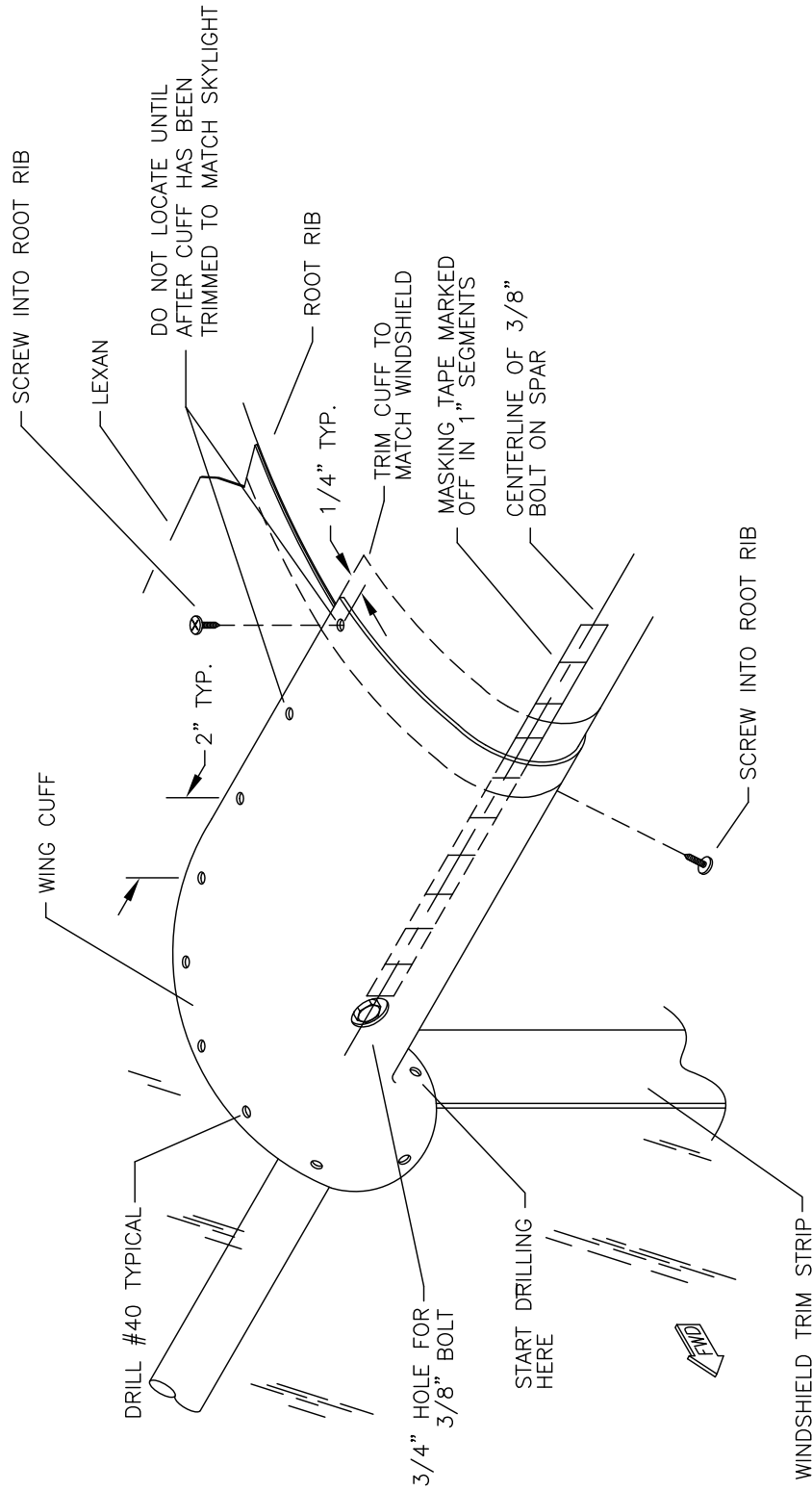
RAVEN S-20 RAVEN
WINDSHIELD - TOP DETAIL
FIGURE 07-32



MD5083
REV. - ORIG

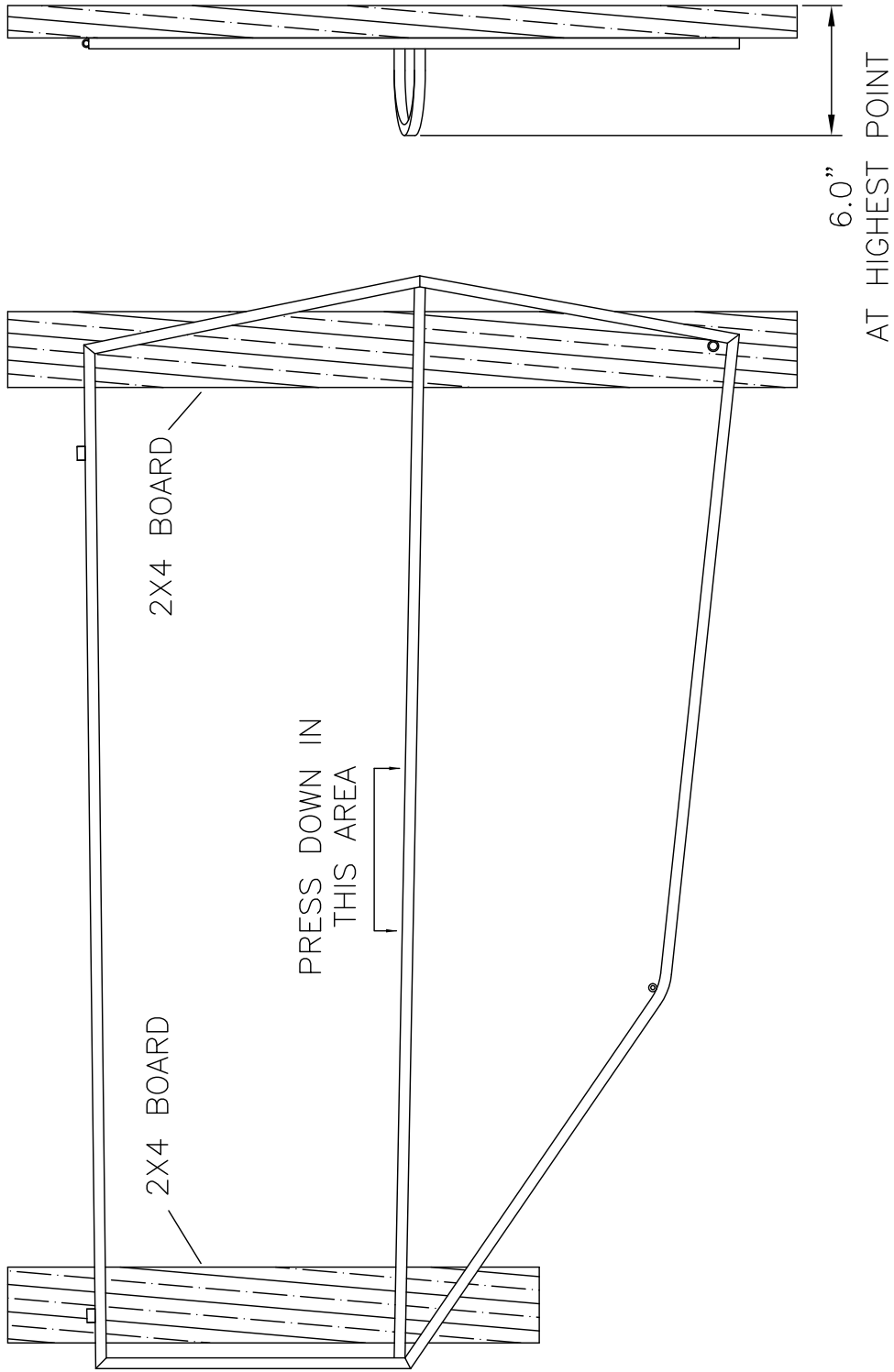
RANS S-20 RAVEN
FLAP FILLET MODIFICATION
FIGURE 07-33

09/01/2013



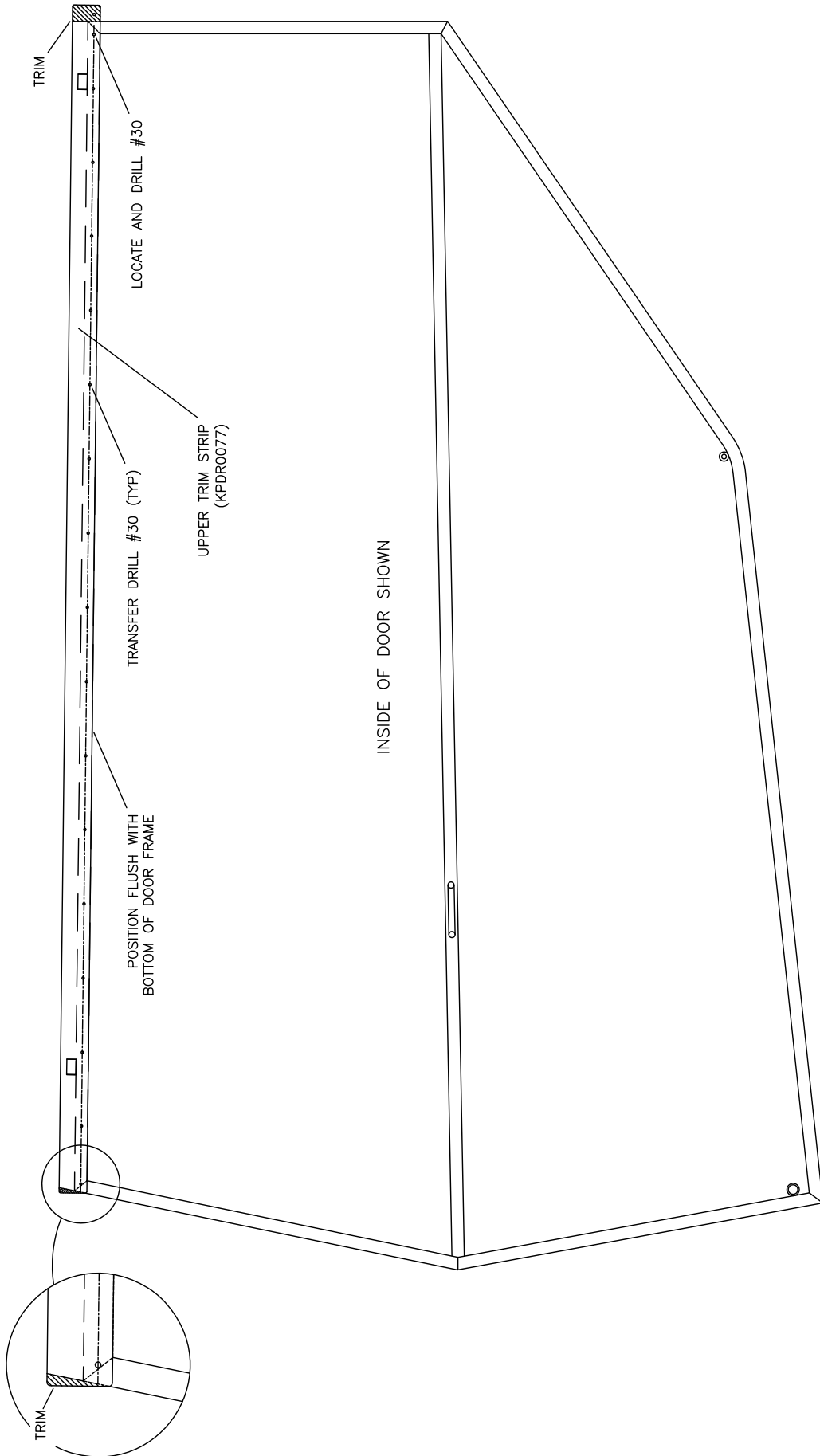
MD571
REV. - ORIG

RAVEN S-20 RAVEN
WING CUFF INSTALLATION
FIGURE 07-39



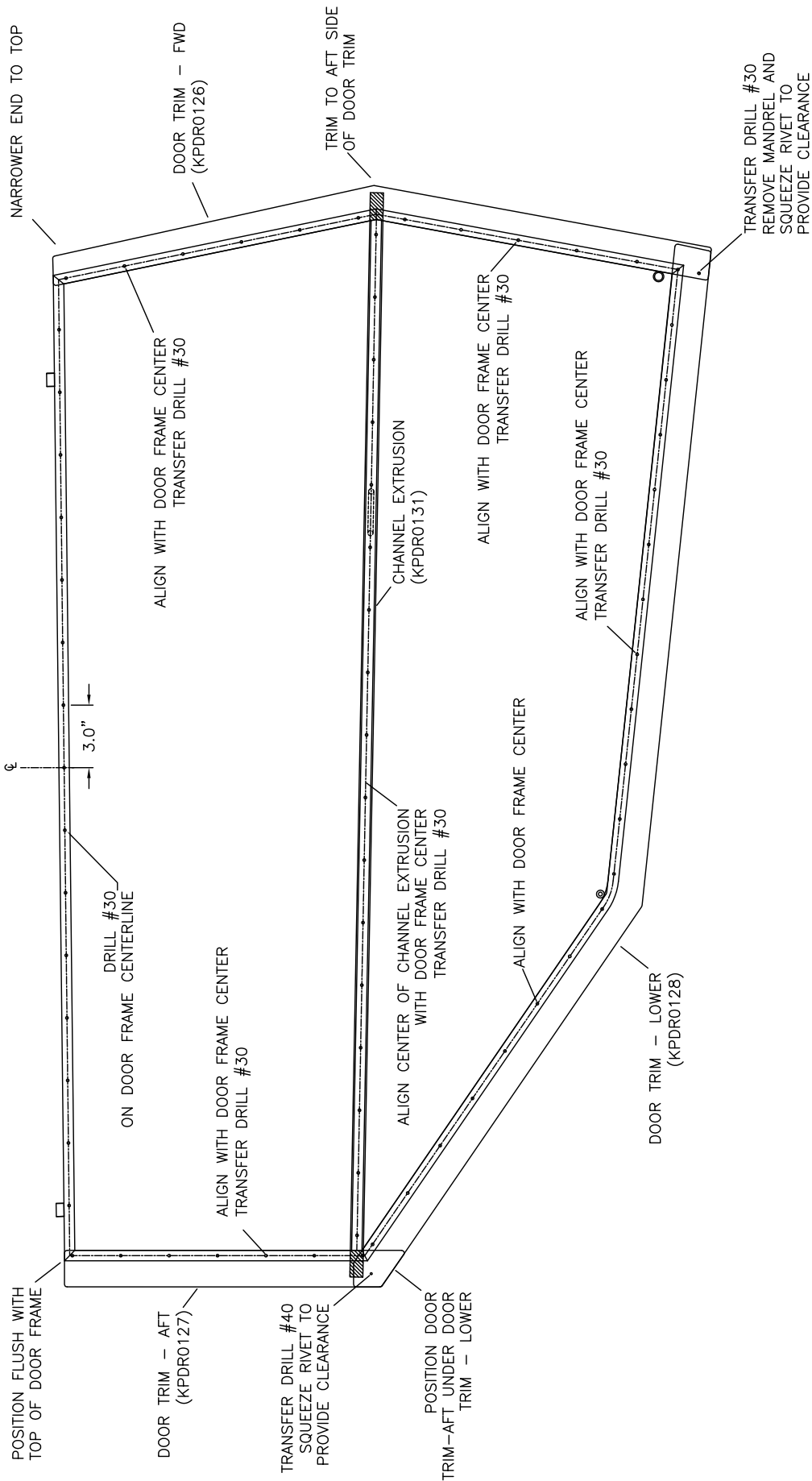
MD5621
REV. A

RAVEN S-20 RAVEN
DOOR FRAME CHECK
FIGURE 07A-01



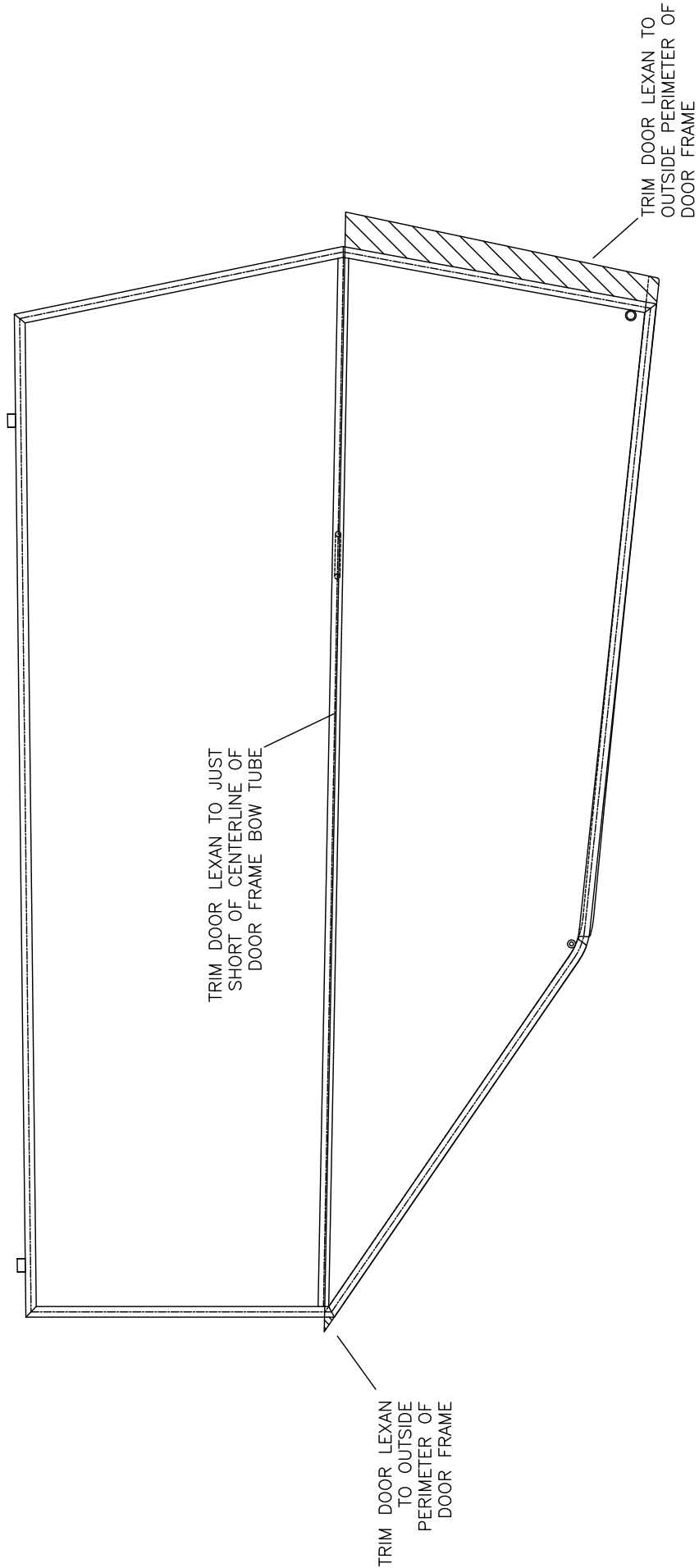
MD5621
REV. A

RAMS S-20 RAVEN
UPPER TRIM STRIP MODIFICATION
FIGURE 07A-03



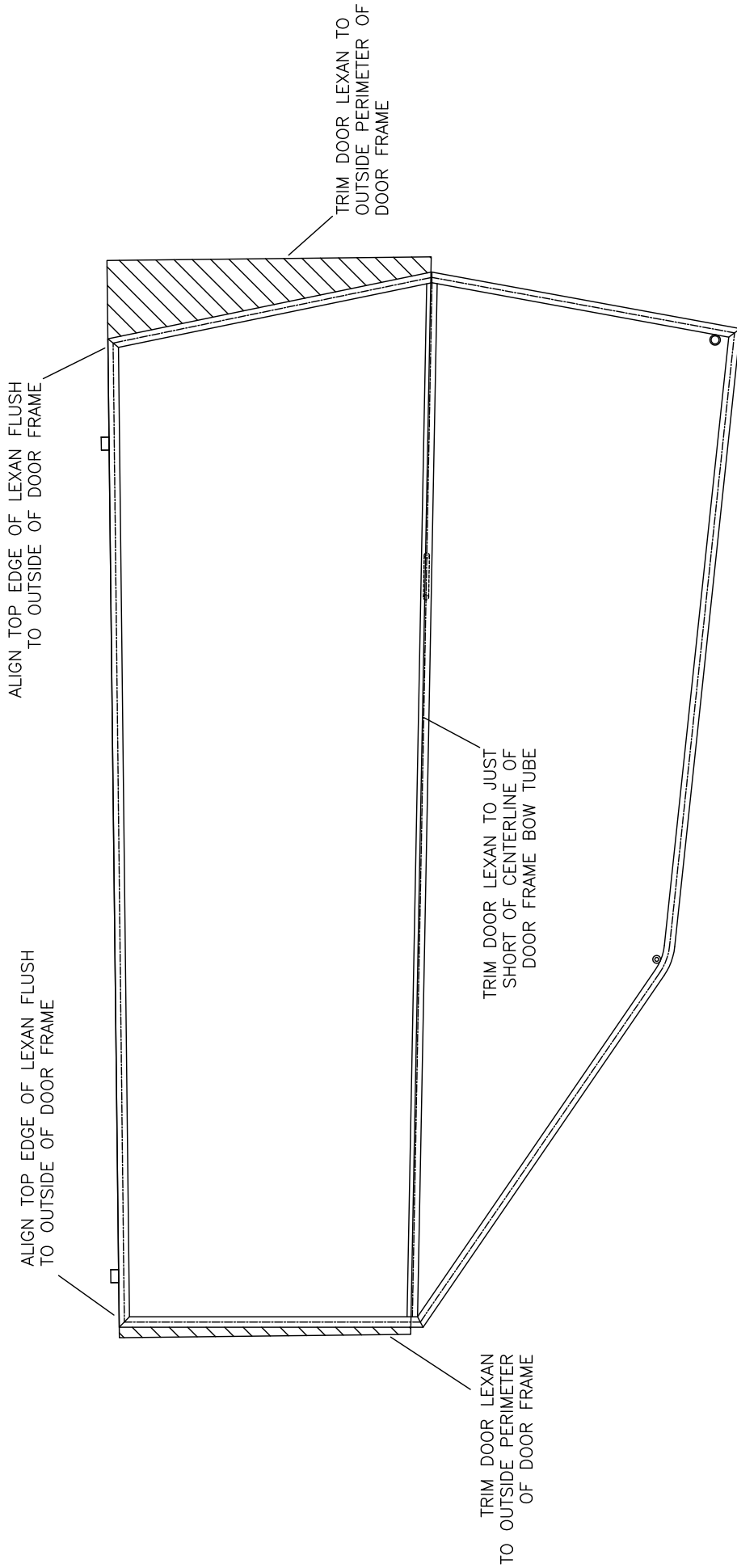
MD5621
REV. A

RRR S-20 RAVEN
DOOR TRIM ASSEMBLY
FIGURE 07A-04



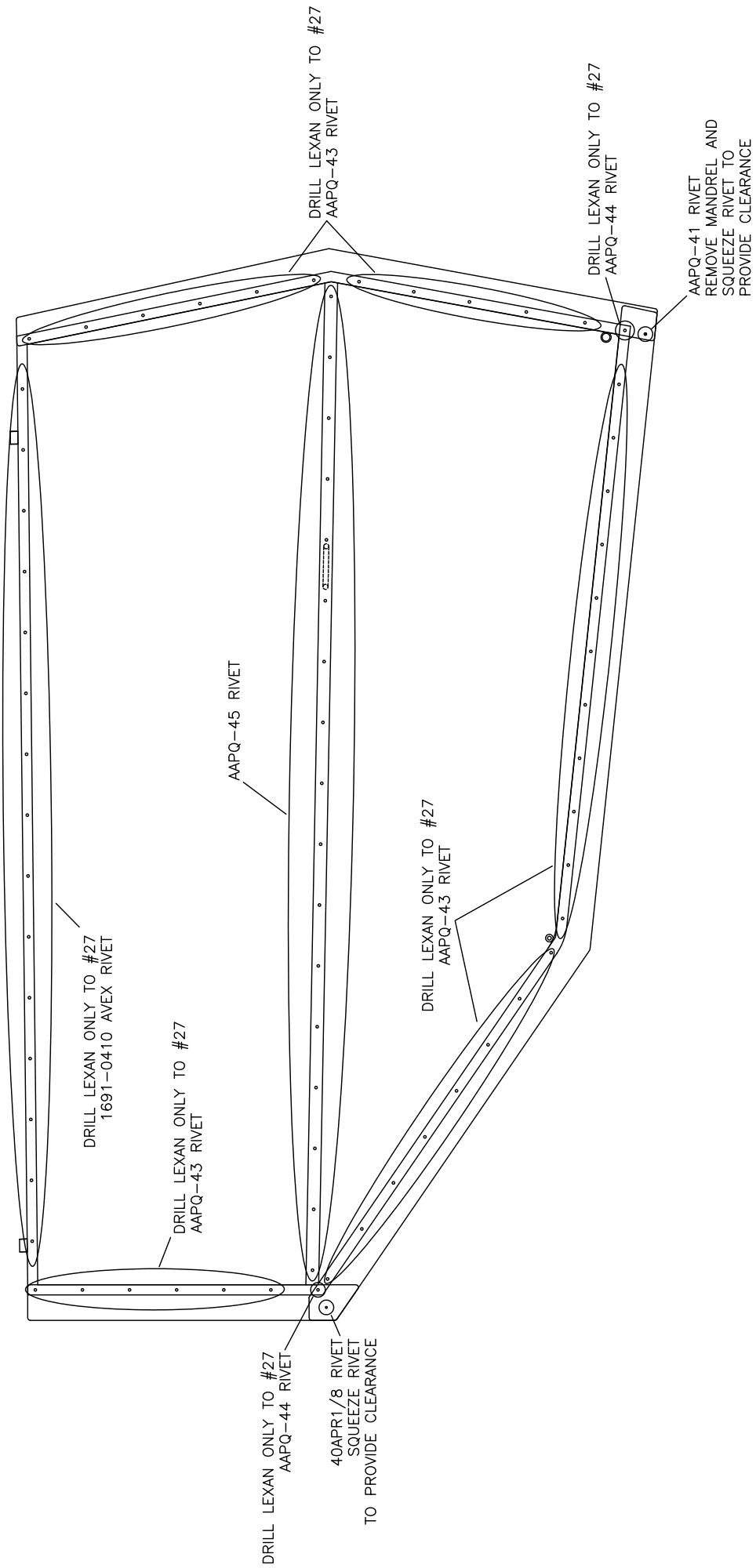
MD5621
REV. A

RAVEN S-20 RAVEN
LOWER DOOR LEXAN TRIMMING
FIGURE 07A-13



MD5621
REV. A

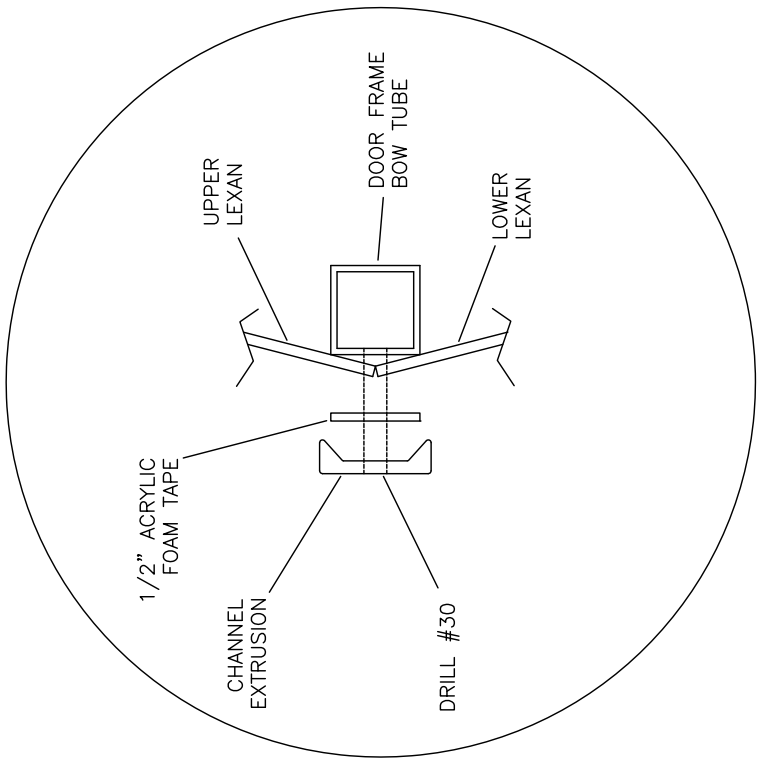
RAVEN S-20 RAVEN
UPPER DOOR LEXAN TRIMMING
FIGURE 07A-14



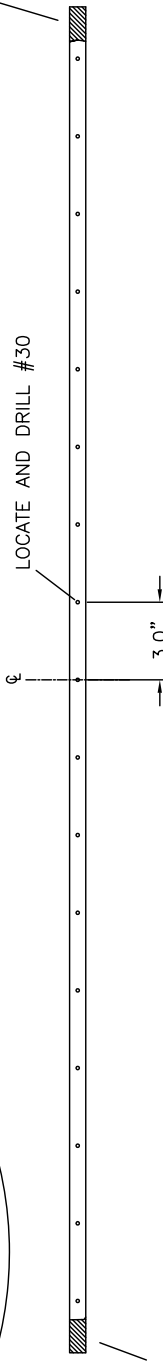
MD5621
REV. A

RAMS S-20 RAVEN
DOOR RIVETING
FIGURE 07A-17

09/01/2013



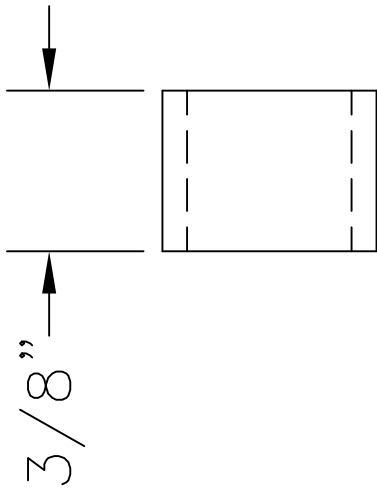
TRIM FWD EDGE TO MATCH
AFT EDGE OF DOOR TRIM



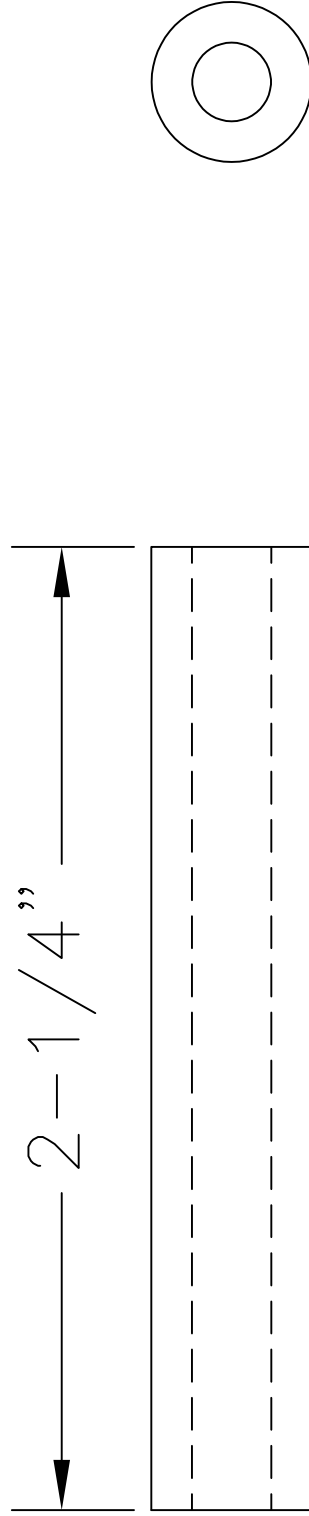
TRIM AFT EDGE TO MATCH
FWD EDGE OF DOOR TRIM



RAVEN S-20 RAVEN
CHANNEL EXTRUSION MODIFICATION
FIGURE 07A-18



DOOR SPACER BUSHING
 (FABRICATE 2 FROM KPAC0278)

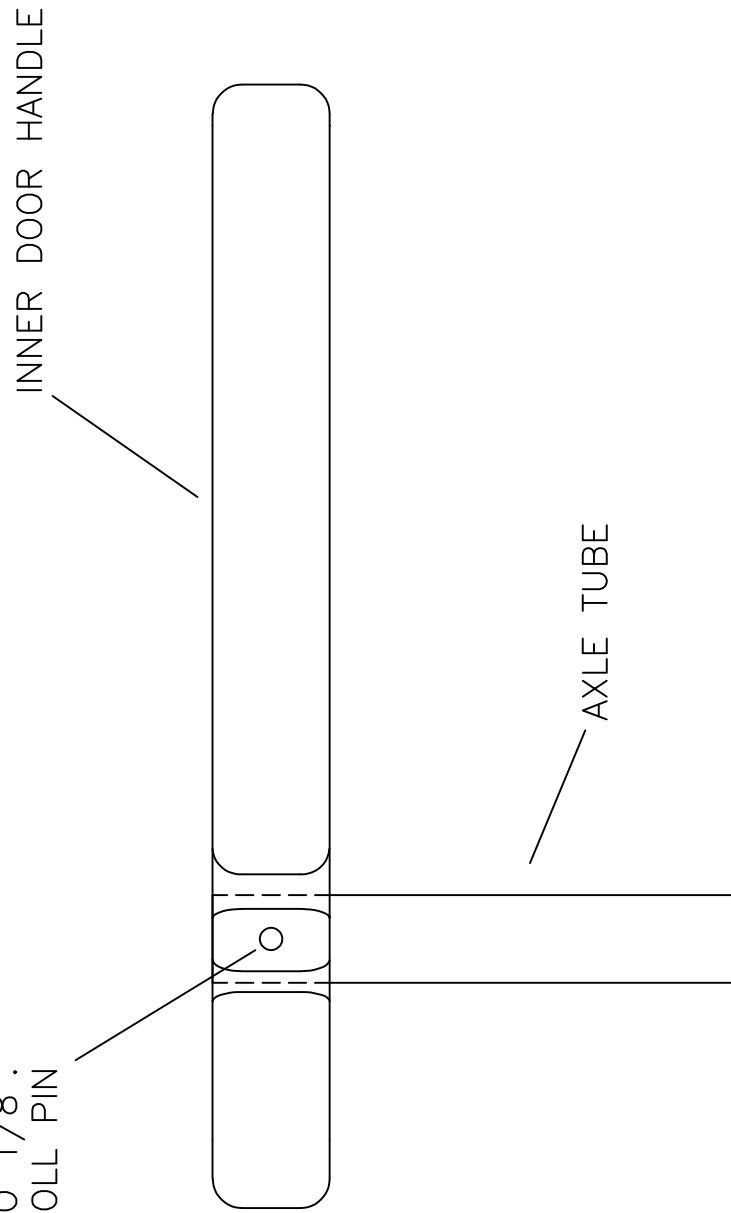


AXLE TUBE
 (FABRICATE 2 FROM KPST0132)

MD4404
 REV. ORIG

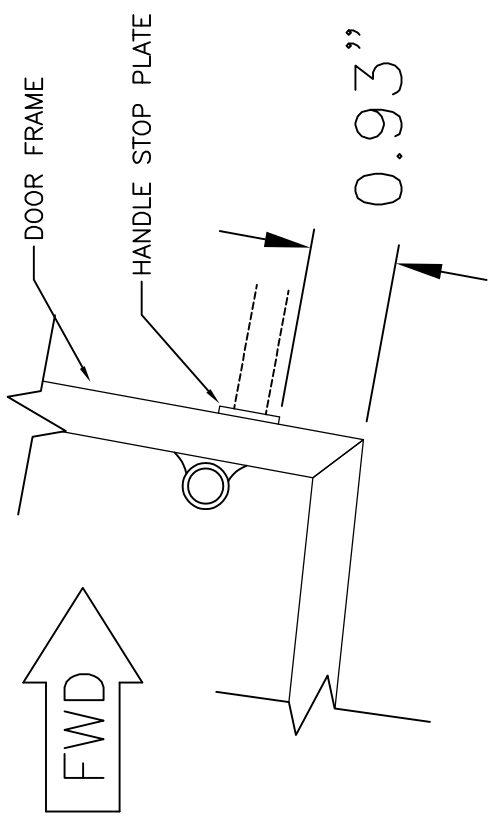
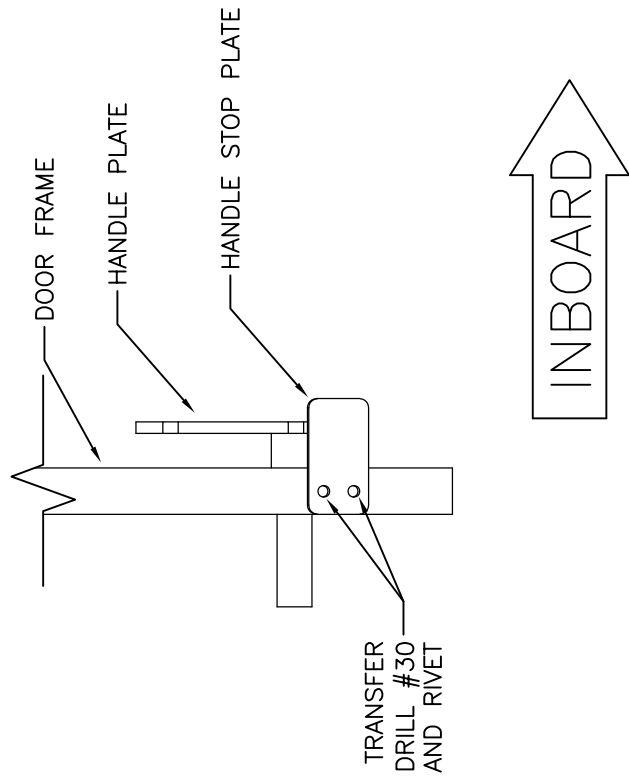
RAMBER S-20 RAVEN
 DOOR SPACER BUSHING & AXLE TUBE FABRICATION
 FIGURE 07A-25

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



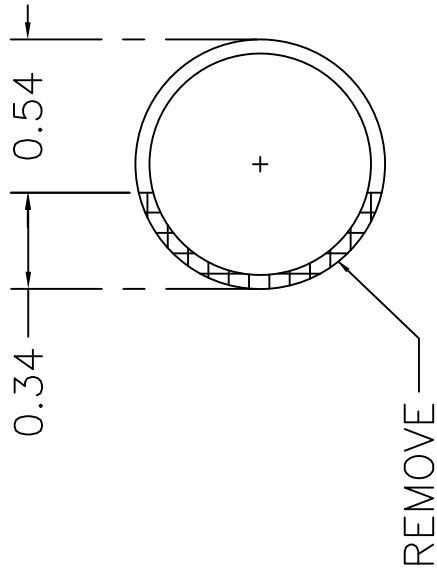
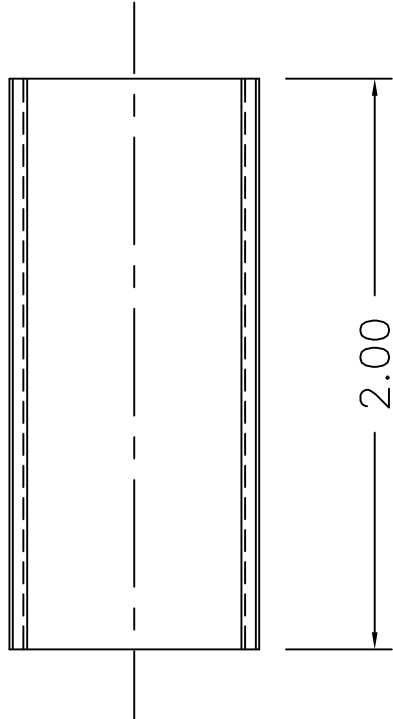
MD4404
REV. - ORIG

RAMBO S-20 RAVEN
INNER DOOR HANDLE DETAIL
FIGURE 07A-26



MD4404
REV. ORIG

RRR S-20 RAVEN
DOOR STOP PLATE LOCATION
FIGURE 07A-27



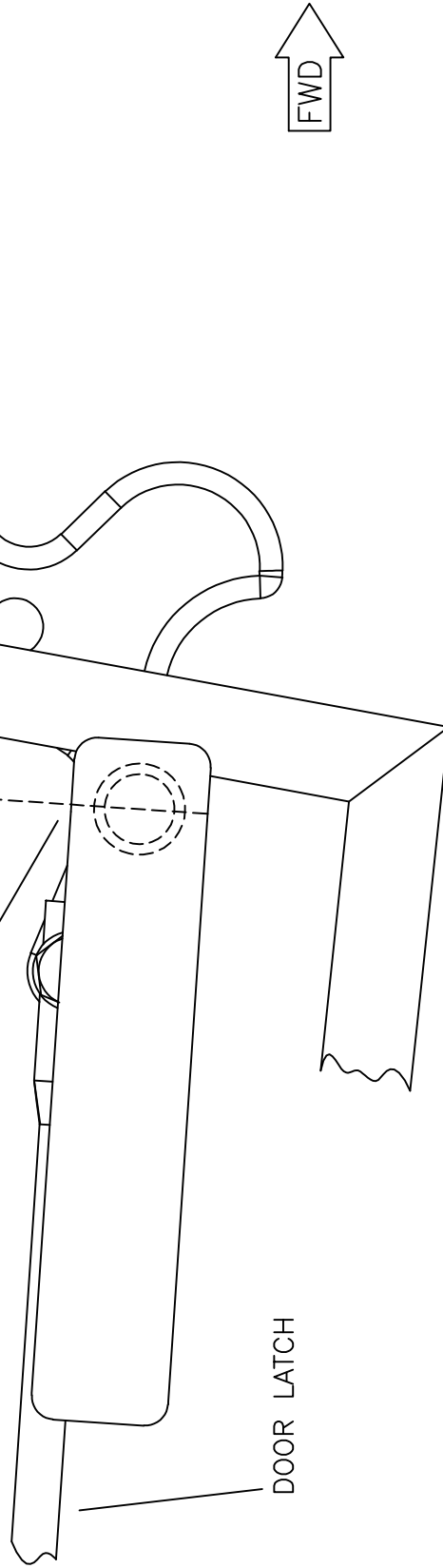
MD4404
REV. ORIG

RAMMS S-20 RAVEN
DOOR LATCH STRIKER PLATE MODIFICATION
FIGURE 07A-28

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.

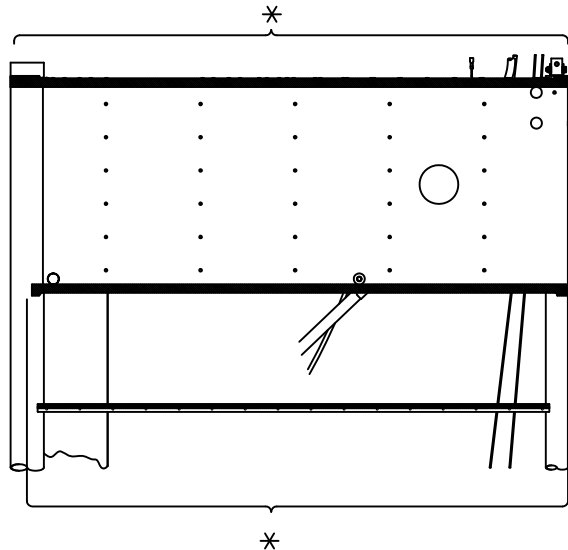
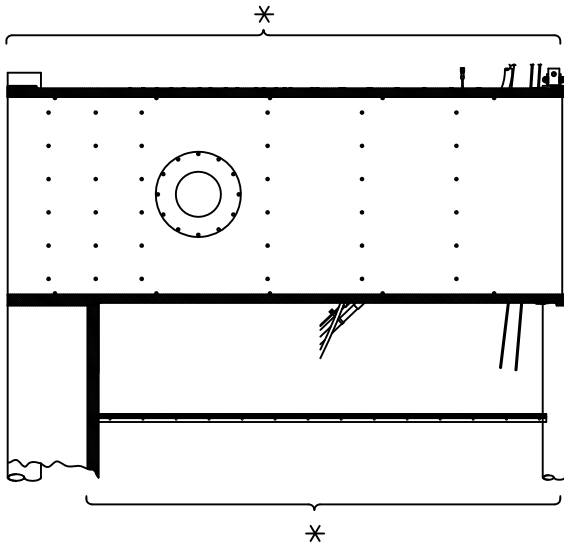
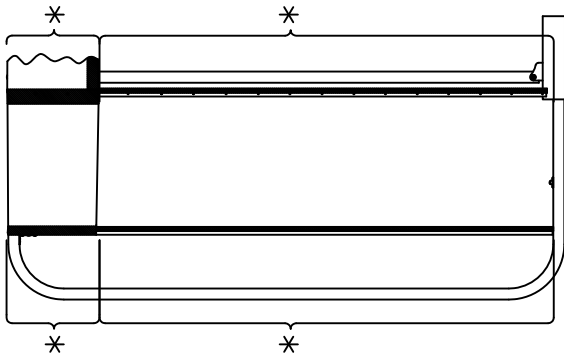
DRILL #40 THROUGH PRE-DRILLED
TOP AND BOTTOM HOLES IN OUTER
DOOR HANDLE.

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



MD4404
REV. A

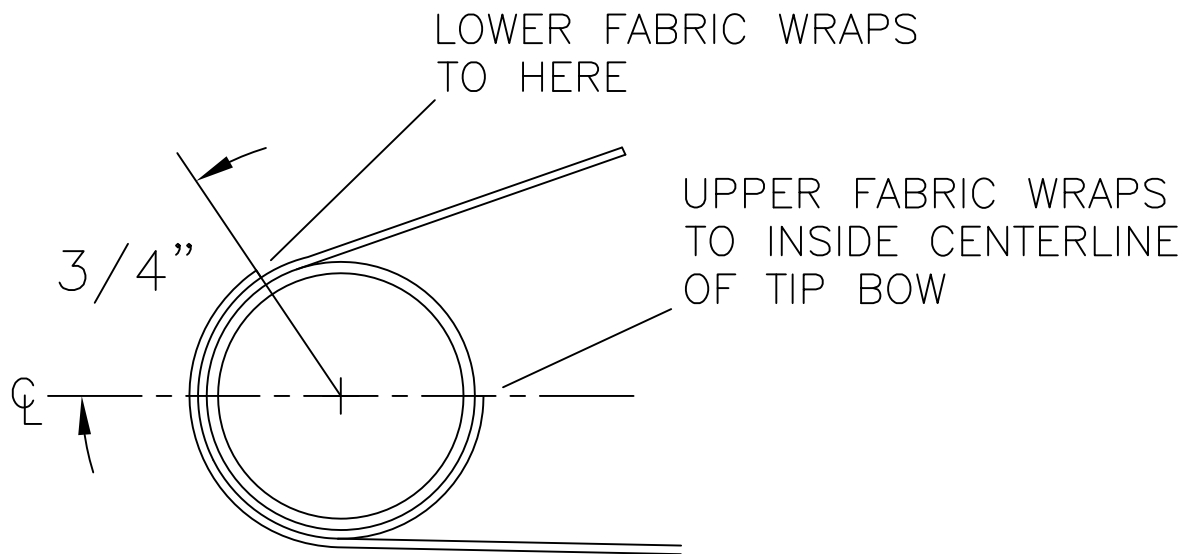
RAMS S-20 RAVEN
OUTER DOOR HANDLE DETAIL
FIGURE 07A-29



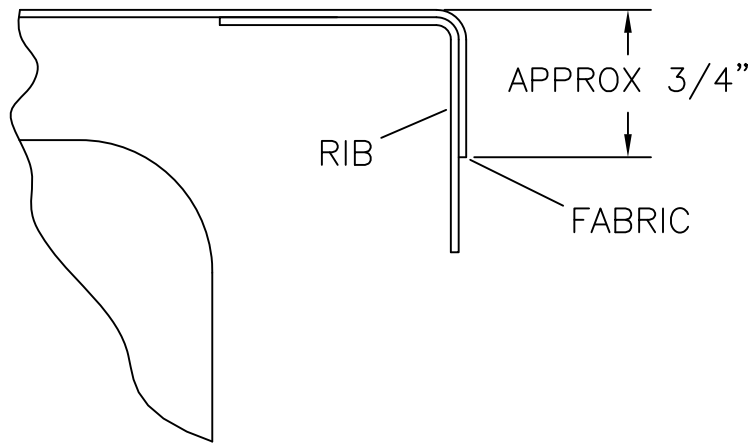
* APPLY ANTI-CHAFE TAPE
 (3/4" MASKING TAPE) BEFORE COVERING
 ALL SHARP METAL EDGES MUST RECEIVE
 ANTI-CHAFE TAPE

RRR S-20 RAVEN
WING COVERING - ANTI-CHAFE TAPE
FIGURE 08A-04

MD4-362



WING TIP BOW DETAIL

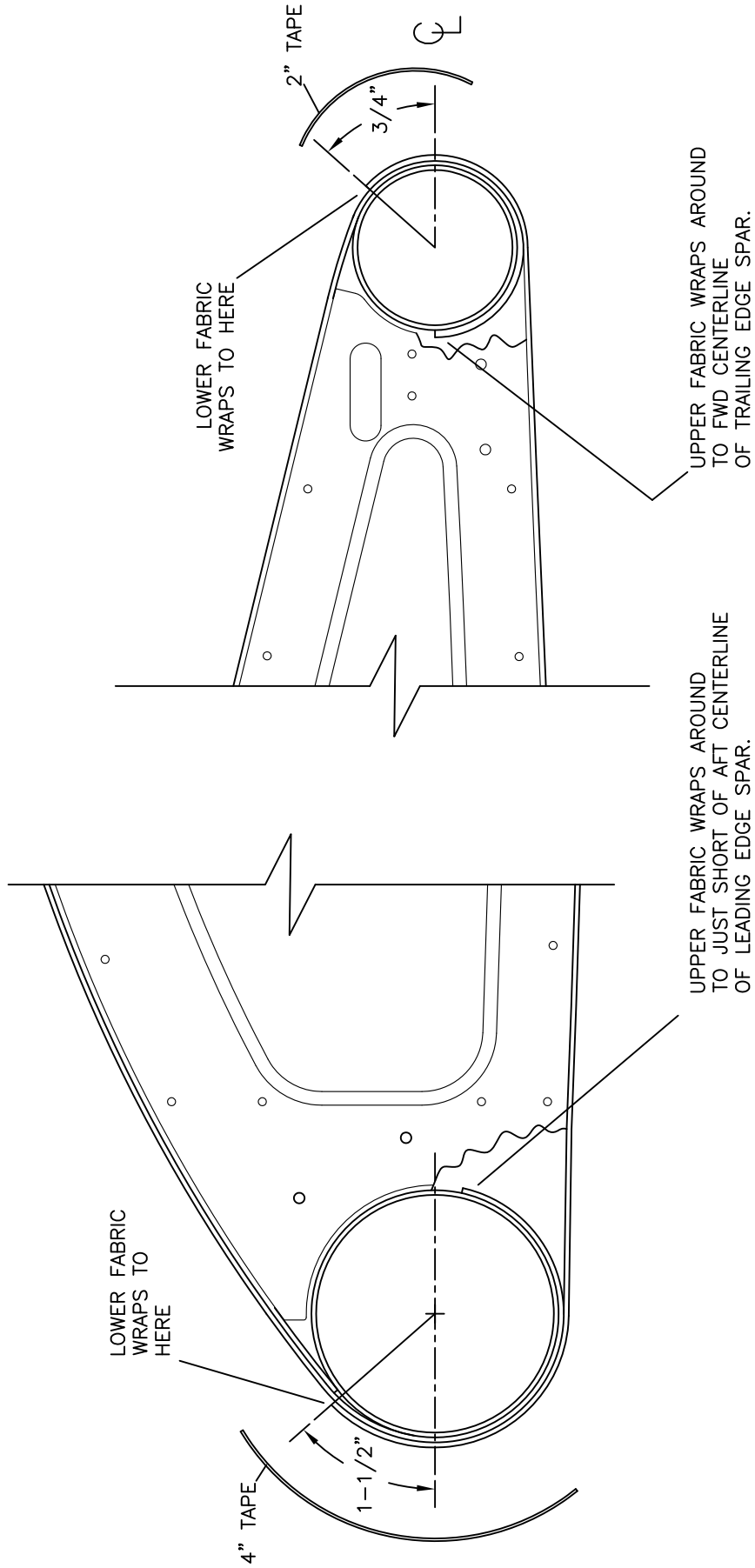


ROOT RIB DETAIL

MD4340

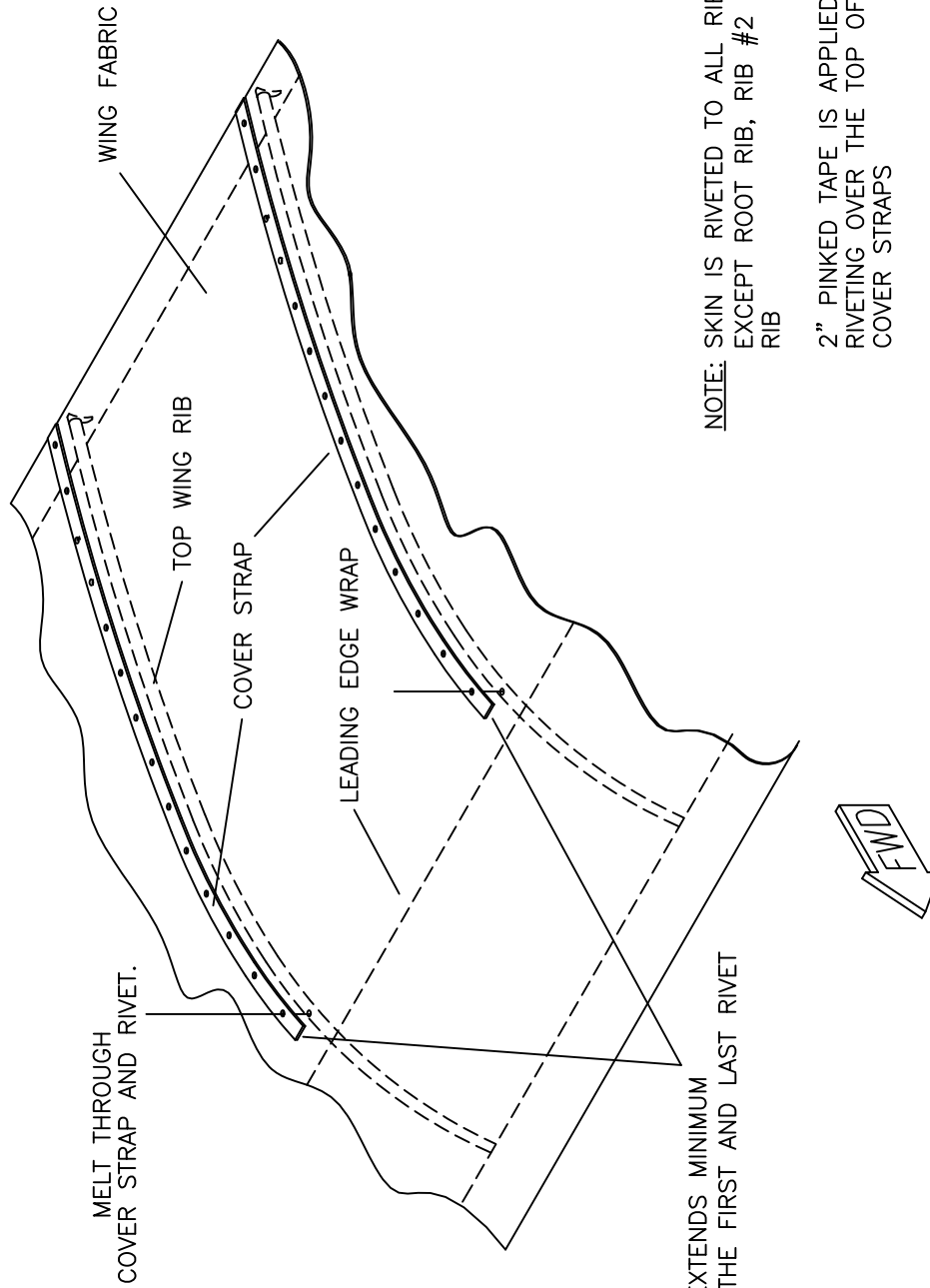
**RAMS S-20 RAVEN
WING COVERING - FABRIC
OVERLAP ON TIP AND ROOT
FIGURE 08A-17**

09/01/2013



MD4341

RRAN S-20 RAVEN
WING COVERING - FABRIC OVERLAP ON LEADING EDGE AND TRAILING EDGE SPAR
FIGURE 08A-17A



NOTE: SKIN IS RIVETED TO ALL RIBS EXCEPT ROOT RIB, RIB #2 AND TIP RIB

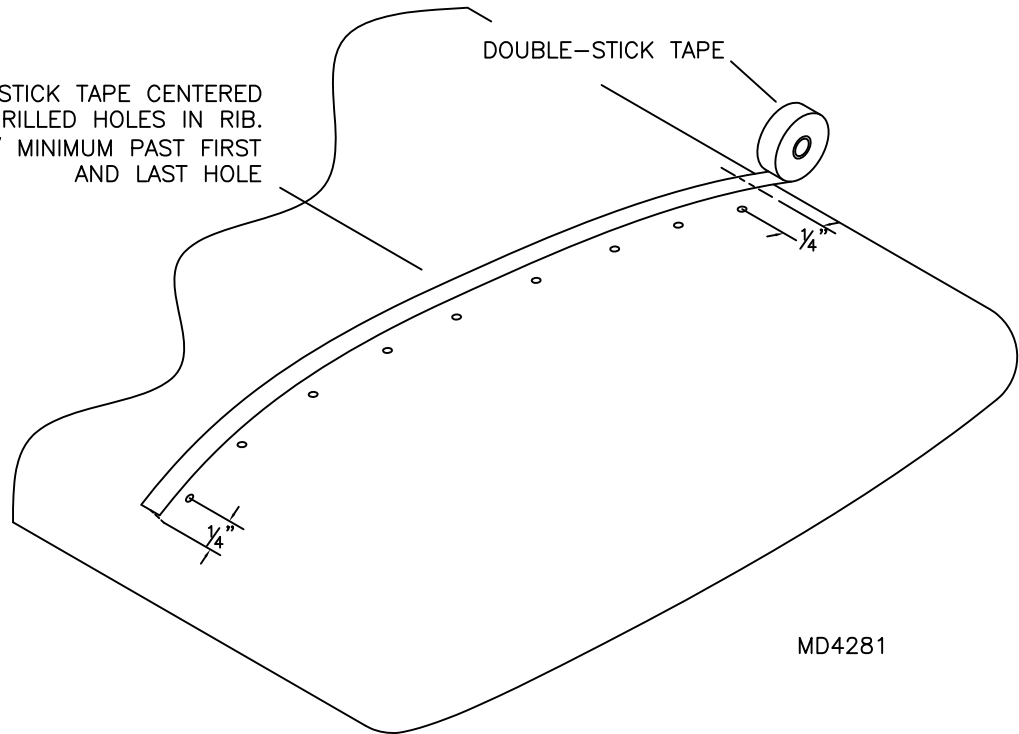
2" PINKED TAPE IS APPLIED AFTER RIVETING OVER THE TOP OF ALL COVER STRAPS

RAVEN S-20 RAVEN
WING COVERING RIVETING
FIGURE 08A-26

MD4337

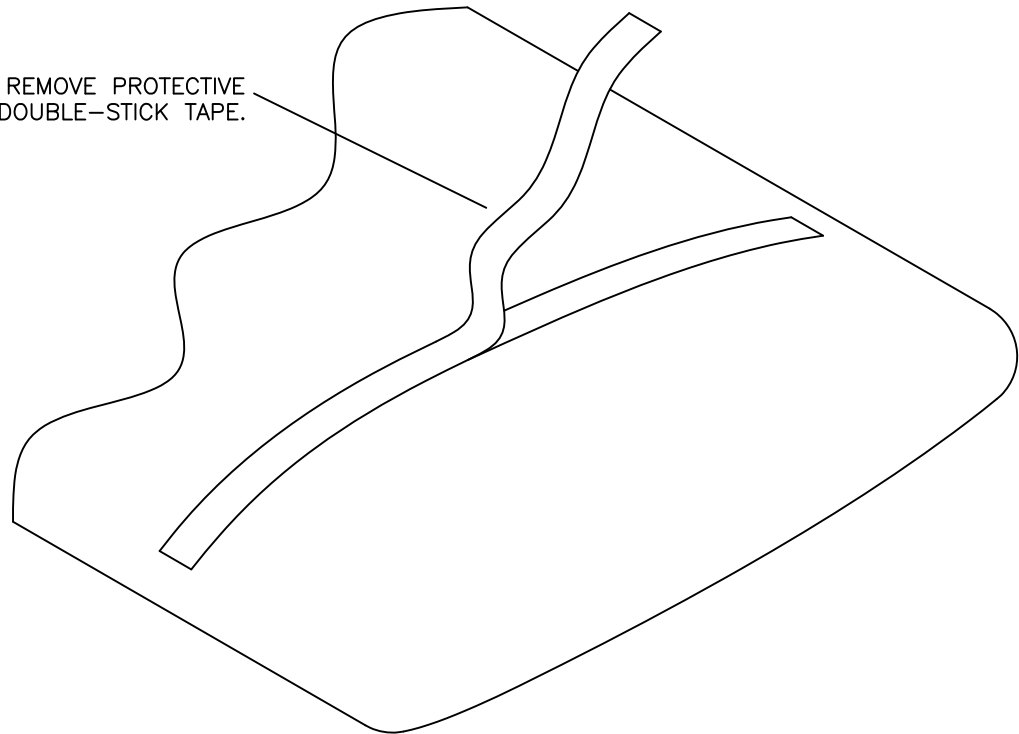
STEP 1:

APPLY DOUBLE-STICK TAPE CENTERED
ON PRE-DRILLED HOLES IN RIB.
EXTEND 1/4" MINIMUM PAST
FIRST AND LAST HOLE



STEP 2:

REMOVE PROTECTIVE
PAPER FROM DOUBLE-STICK TAPE.

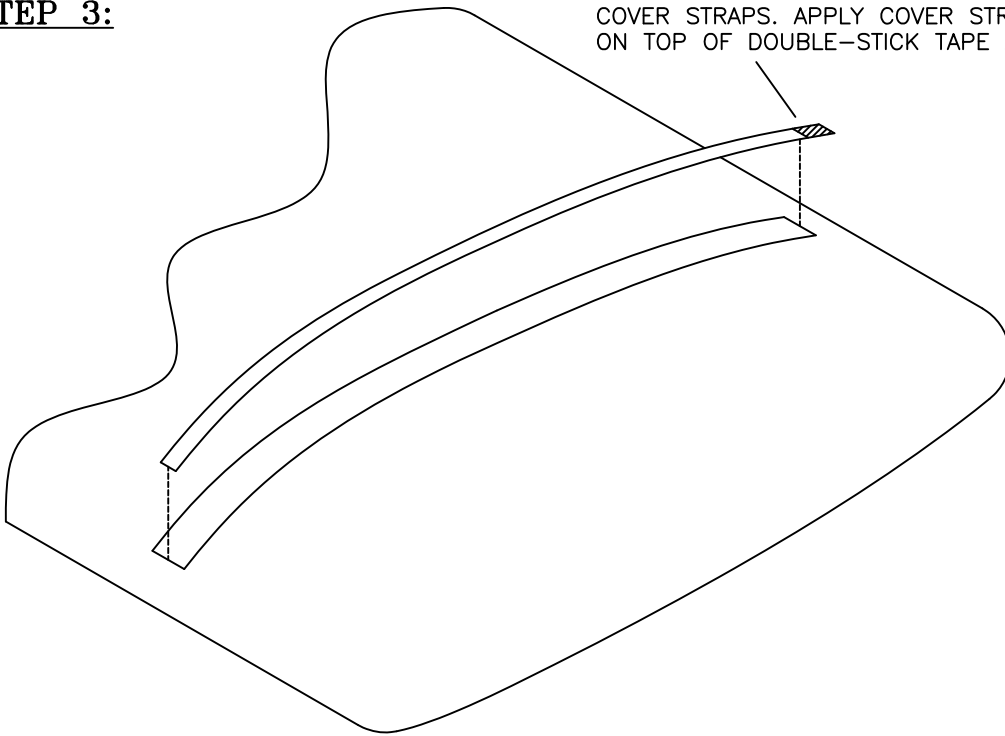


**RAMS S-20 RAVEN
FABRIC RIVETING
FIGURE 08A-26A**

09/01/2013

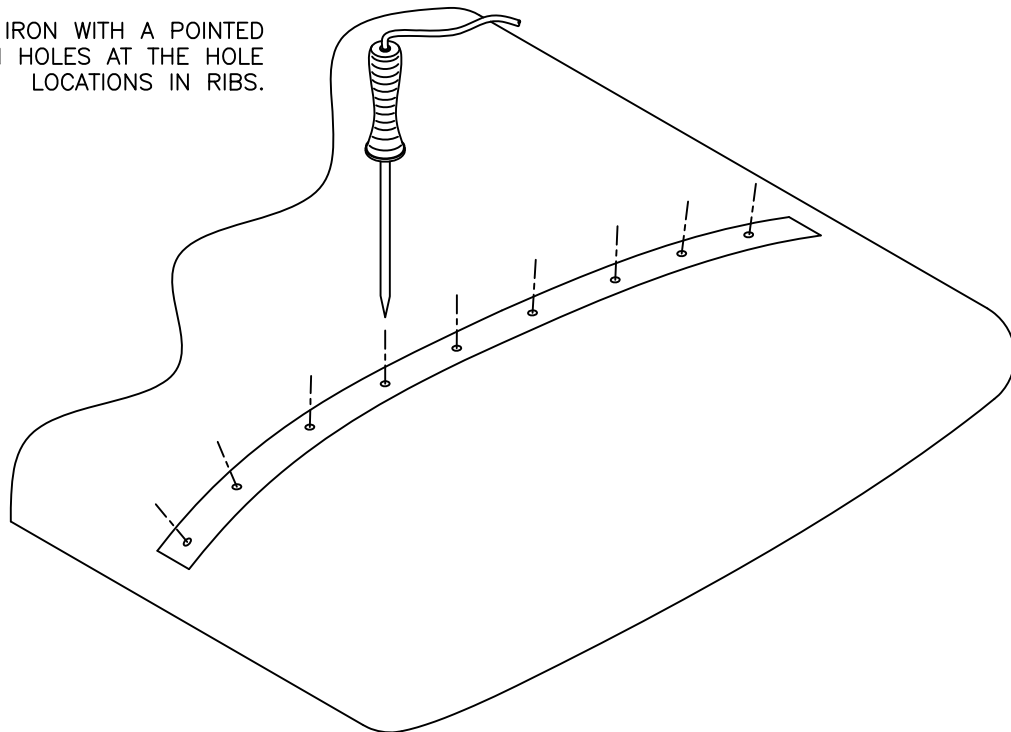
STEP 3:

REMOVE PROTECTIVE PLASTIC FROM BOTH SIDES OF COVER STRAPS. APPLY COVER STRAP CENTERED ON TOP OF DOUBLE-STICK TAPE AND CUT OFF EXCESS.



STEP 4:

USE A HOT IRON WITH A POINTED TIP TO BURN HOLES AT THE HOLE LOCATIONS IN RIBS.



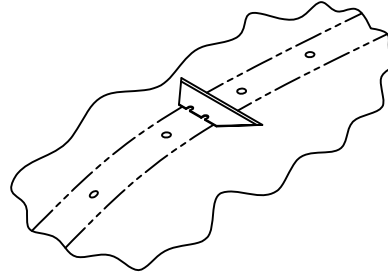
MD4281

**RAMS S-20 RAVEN
FABRIC RIVETING
FIGURE 08A-26B**

09/01/2013

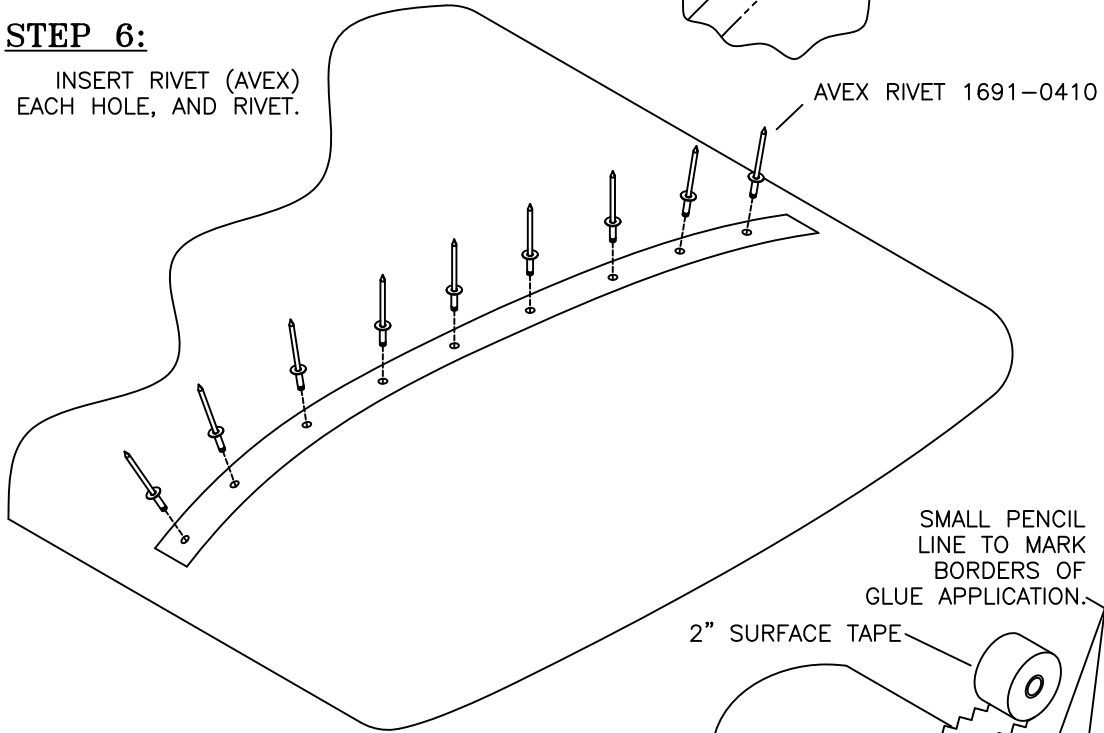
STEP 5:

USE A SHARP BLADE TO CUT OFF MELTED BUILD UP ON TOP OF COVER STRAP.



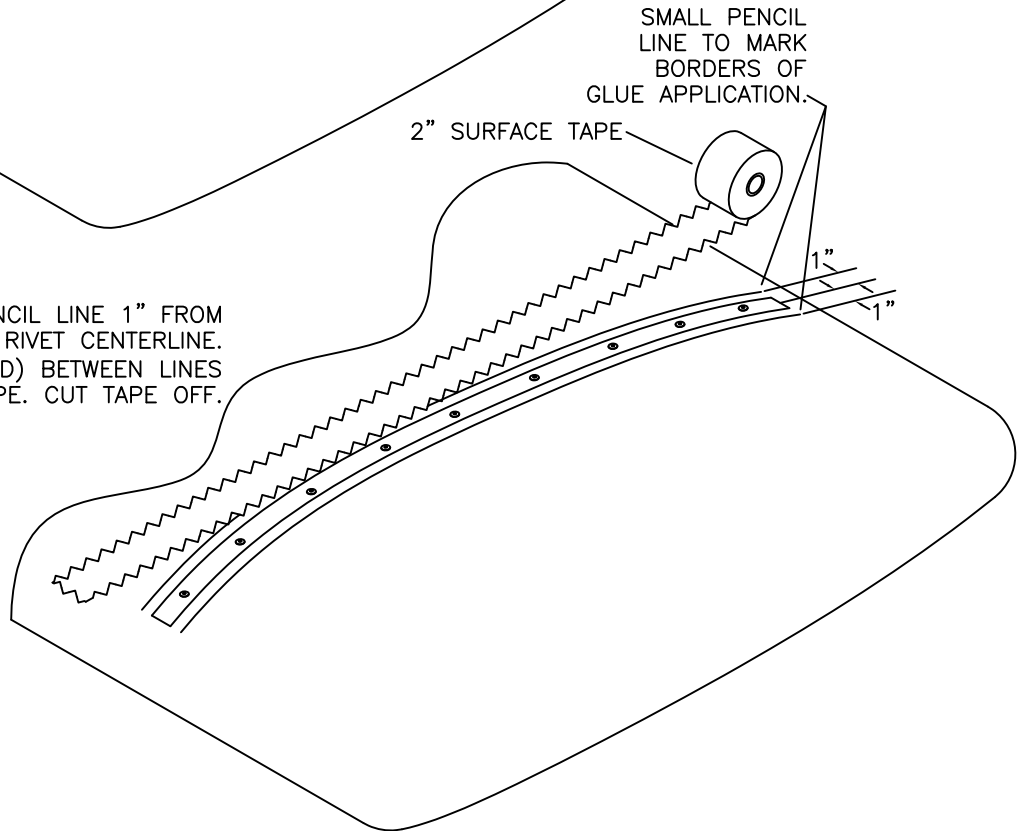
STEP 6:

INSERT RIVET (AVEX) IN EACH HOLE, AND RIVET.



STEP 7:

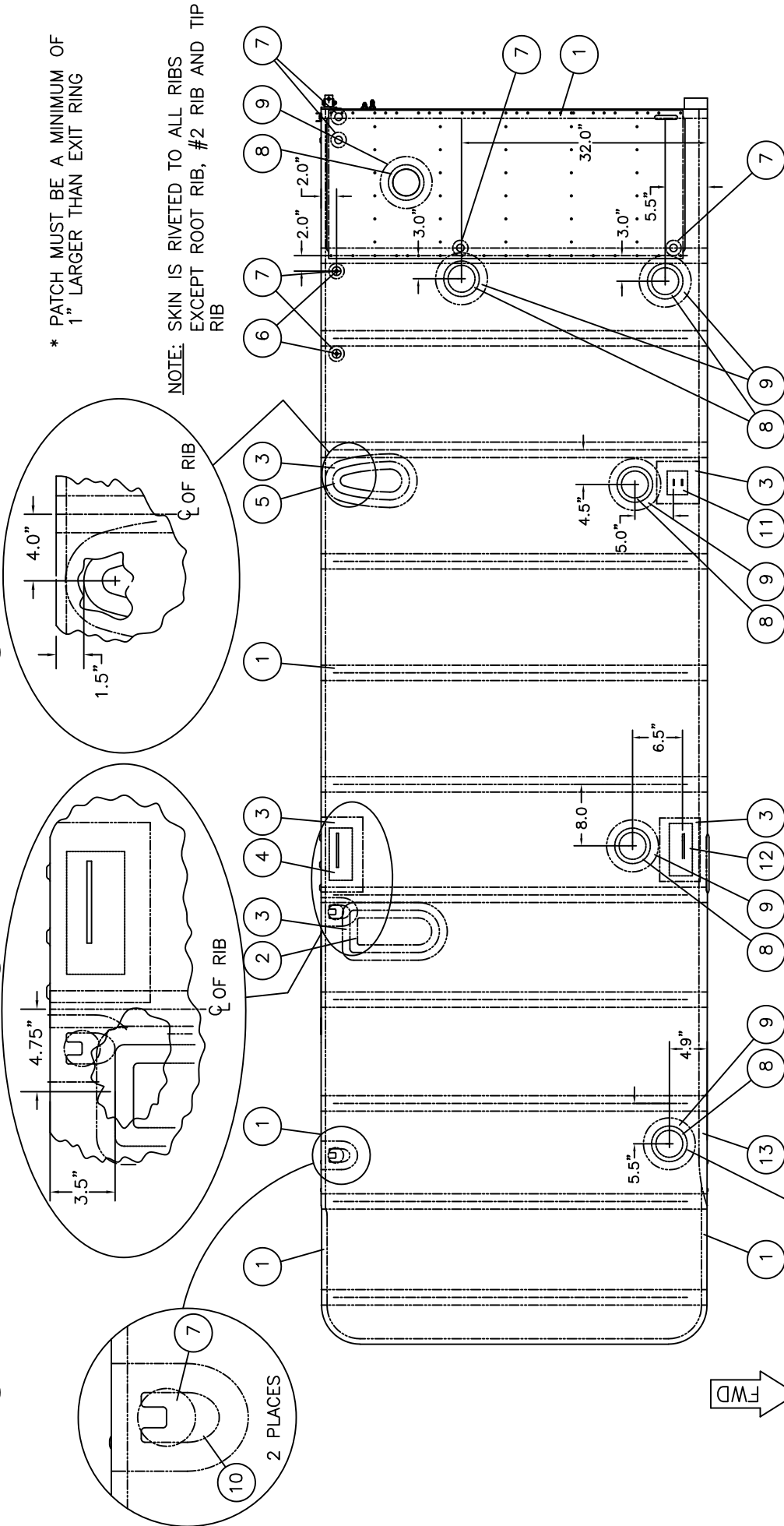
DRAW SMALL PENCIL LINE 1" FROM EACH SIDE OF THE RIVET CENTERLINE. APPLY GLUE (THINNED) BETWEEN LINES AND APPLY TAPE. CUT TAPE OFF.



MD4281

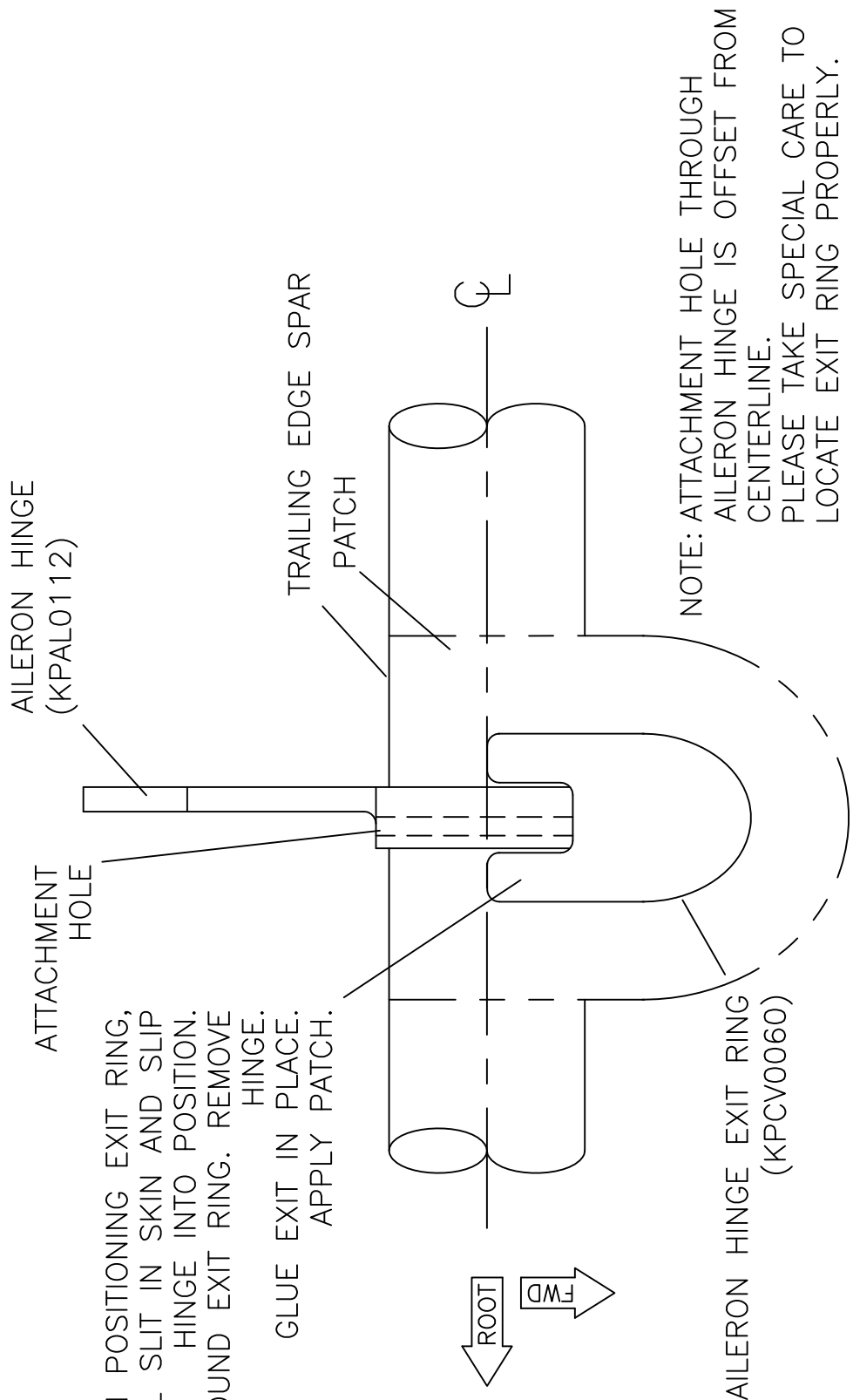
**RAMS S-20 RAVEN
FABRIC RIVETING
FIGURE 08A-26C**

- 1 2" PINKED TAPE
- 2 AILERON PUSH/PULL TUBE EXIT RING
- 3 PATCH*
- 4 TE STRUT ATTACH PLATE EXIT
- 5 FLAP TELEFLEX EXIT RING
- 6 DRAIN GROMMET
- 7 2" DIA. ROUND PATCH
- 8 INSPECTION RING
- 9 6.5" DIA. ROUND PATCH
- 10 AILERON HINGE EXIT RING
- 11 JURY STRUT BRACKET EXIT
- 12 LE STRUT ATTACH PLATE EXIT
- 13 4" PINKED TAPE



**RAVEN S-20 RAVEN
WING BOTTOM COVERING
FIGURE 08A-33**

MD4-339
REV. A

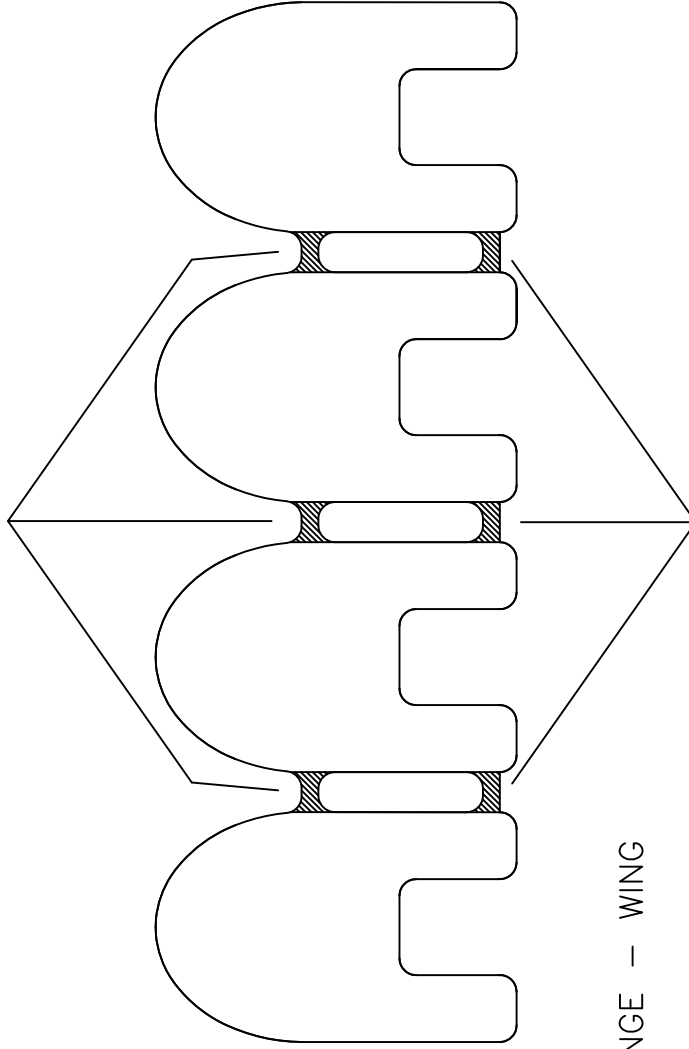


VIEWED FROM BOTTOM SIDE

RAMS S-20 RAVEN
AILERON HINGE EXIT RING PLACEMENT
FIGURE 08A-33A

MD5561

REMOVE HATCHED AREAS

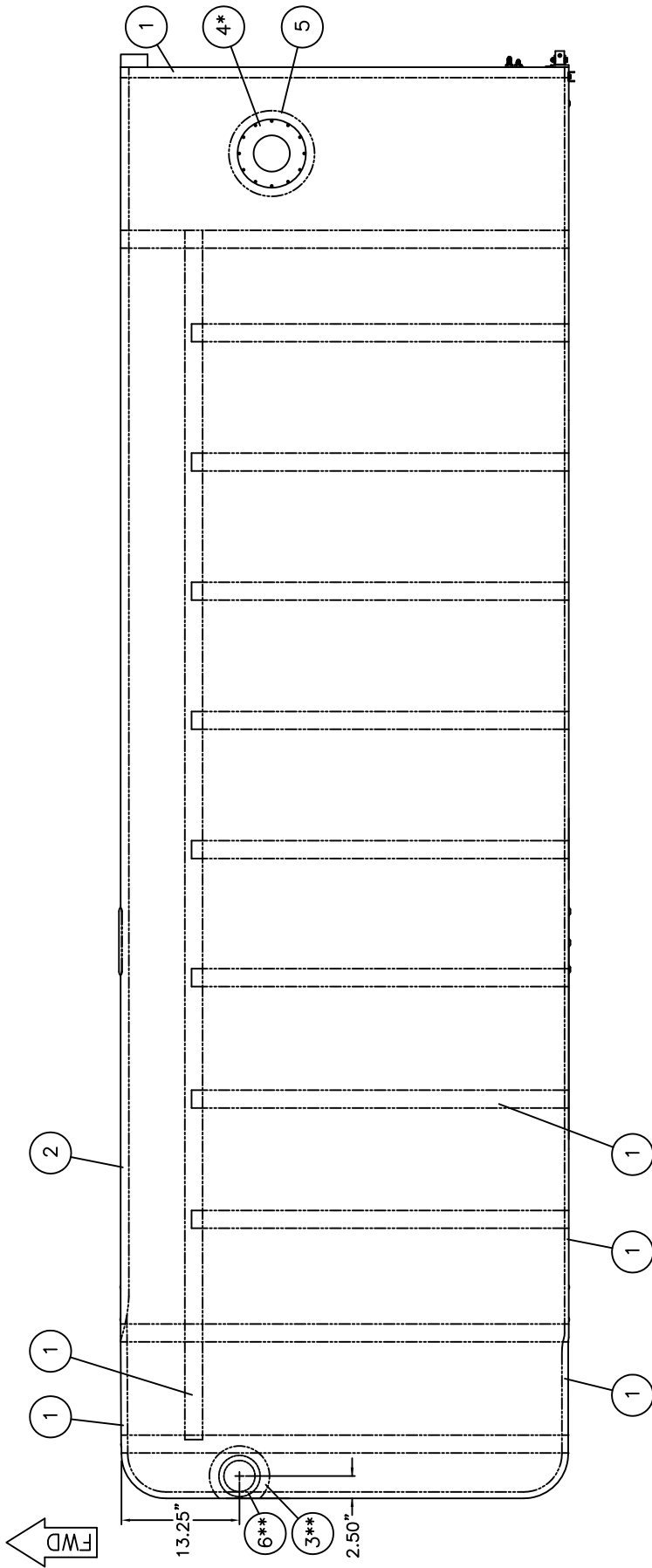


EXIT RING
AILERON HINGE -- WING
(KPCV0060)

REMOVE HATCHED AREAS

MD5549

RAVEN S-20 RAVEN
AILERON HINGE EXIT RING MODIFICATION
FIGURE 08A-33B



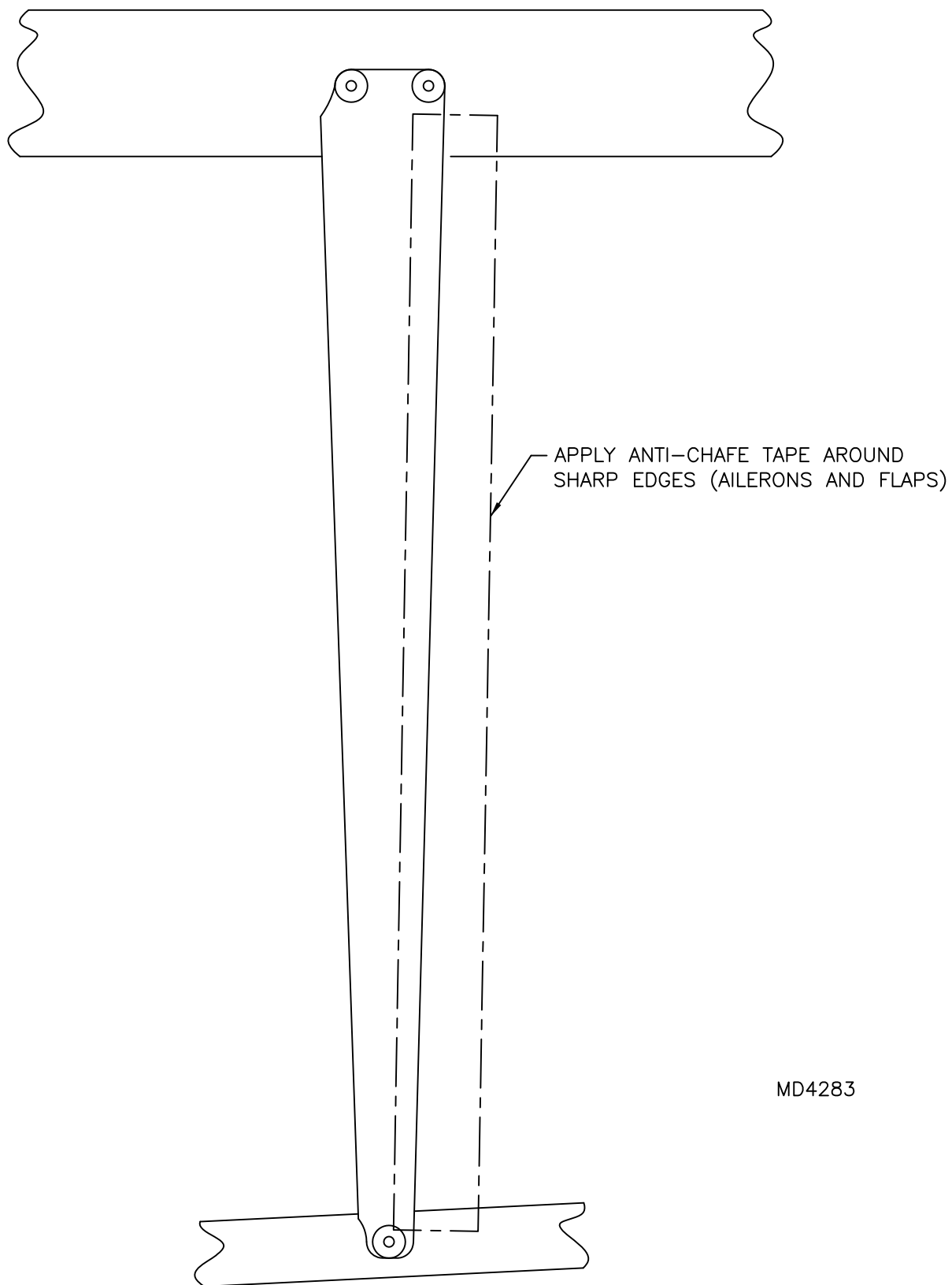
- ① 2" PINKED TAPE
- ② 4" PINKED TAPE
- ③ 6.5" DIA. ROUND PATCH**
- ④ COVER RING*
- ⑤ 9 5/8" DIA. ROUND PATCH
- ⑥ INSPECTION RING**

* INSTALL COVER RING AFTER COVERING AND PRIOR TO PRIMING

** INSTALL FOR OPTIONAL STROBES

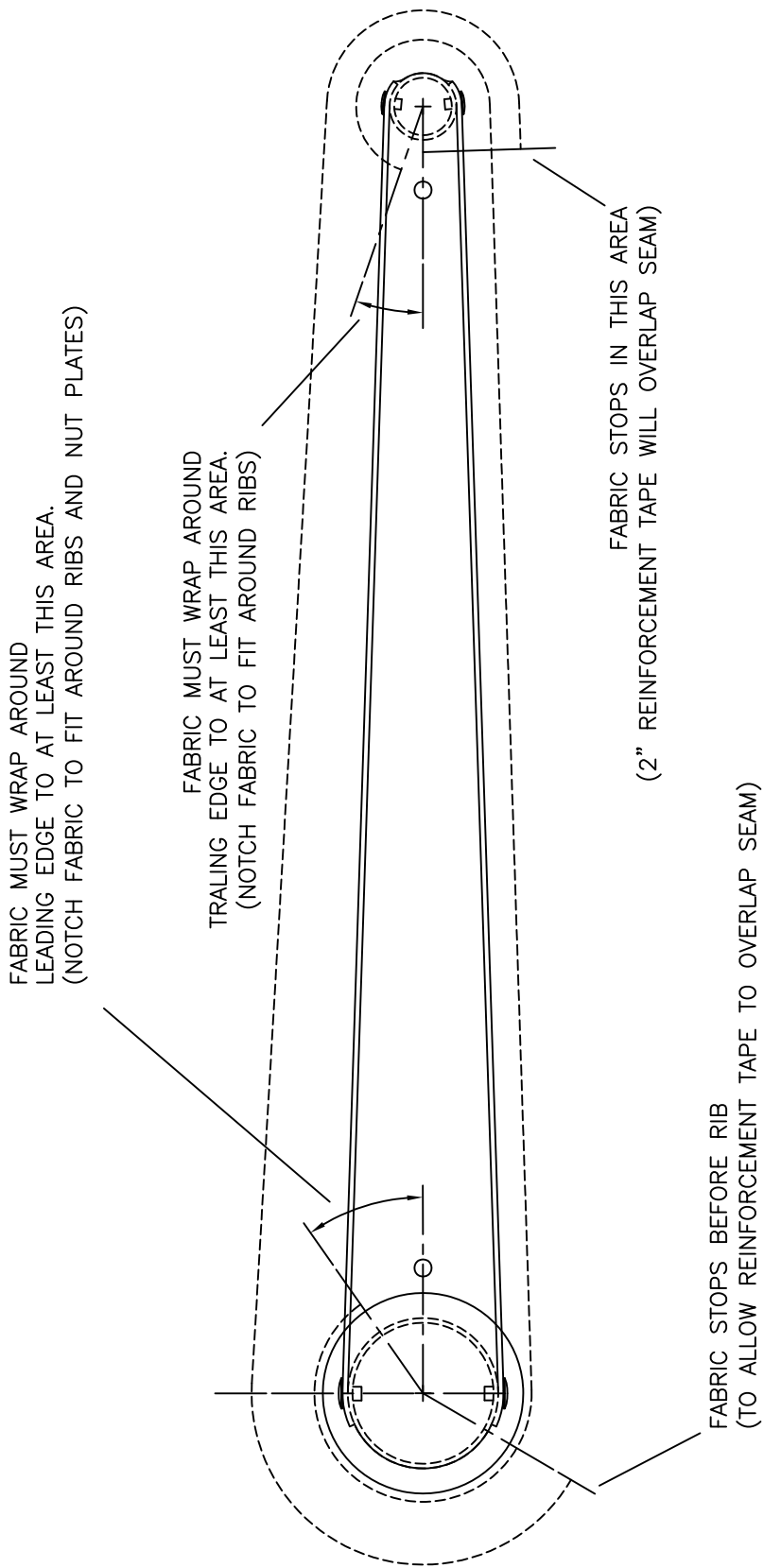
MD4338

RAMSES S-20 RAVEN
WING TOP COVERING
FIGURE 08A-37



MD4283

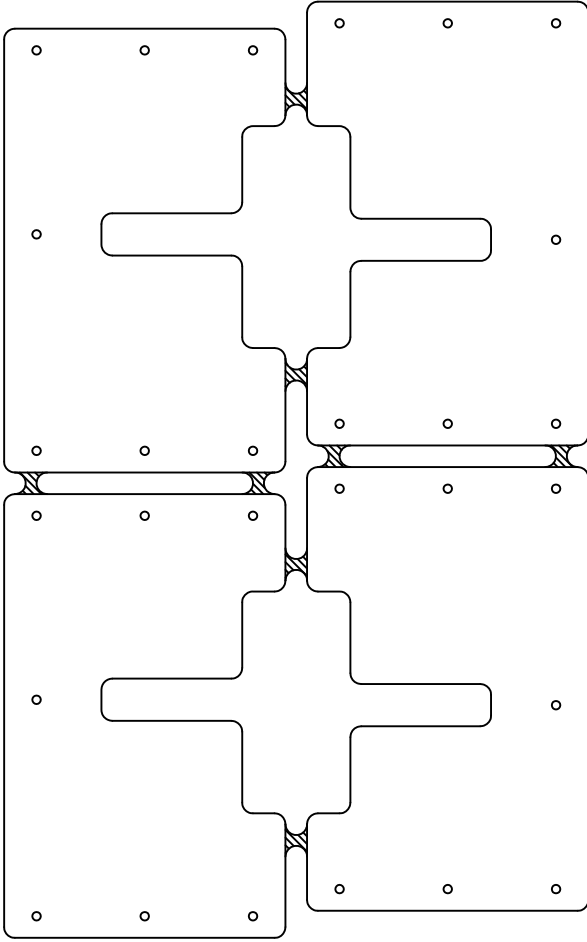
RAMS S-20 RAVEN
ANTI-CHAFE TAPE APPLICATION FOR AILERONS AND FLAPS
FIGURE 08B-03



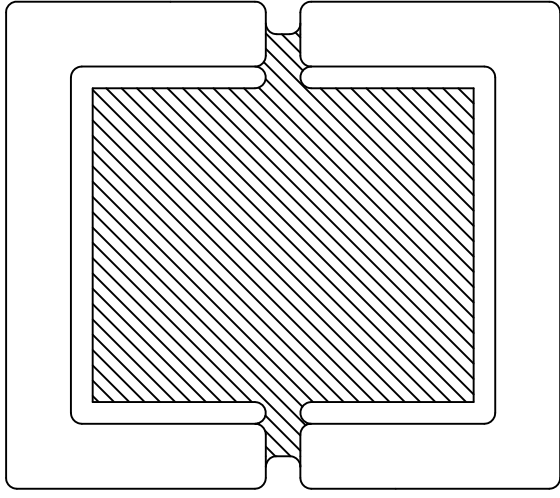
NOTE: CUT FABRIC SLIGHTLY LONG TO ALLOW FABRIC TO EXTEND PAST THE FRAME ENDS BY APPROXIMATELY 2"

MD4284

RAVEN S-20 RAVEN
AILERON AND FLAP COVERING
FIGURE 08B-05



EXIT COVER
AILERON HINGE – AILERON
(KPCV0059)

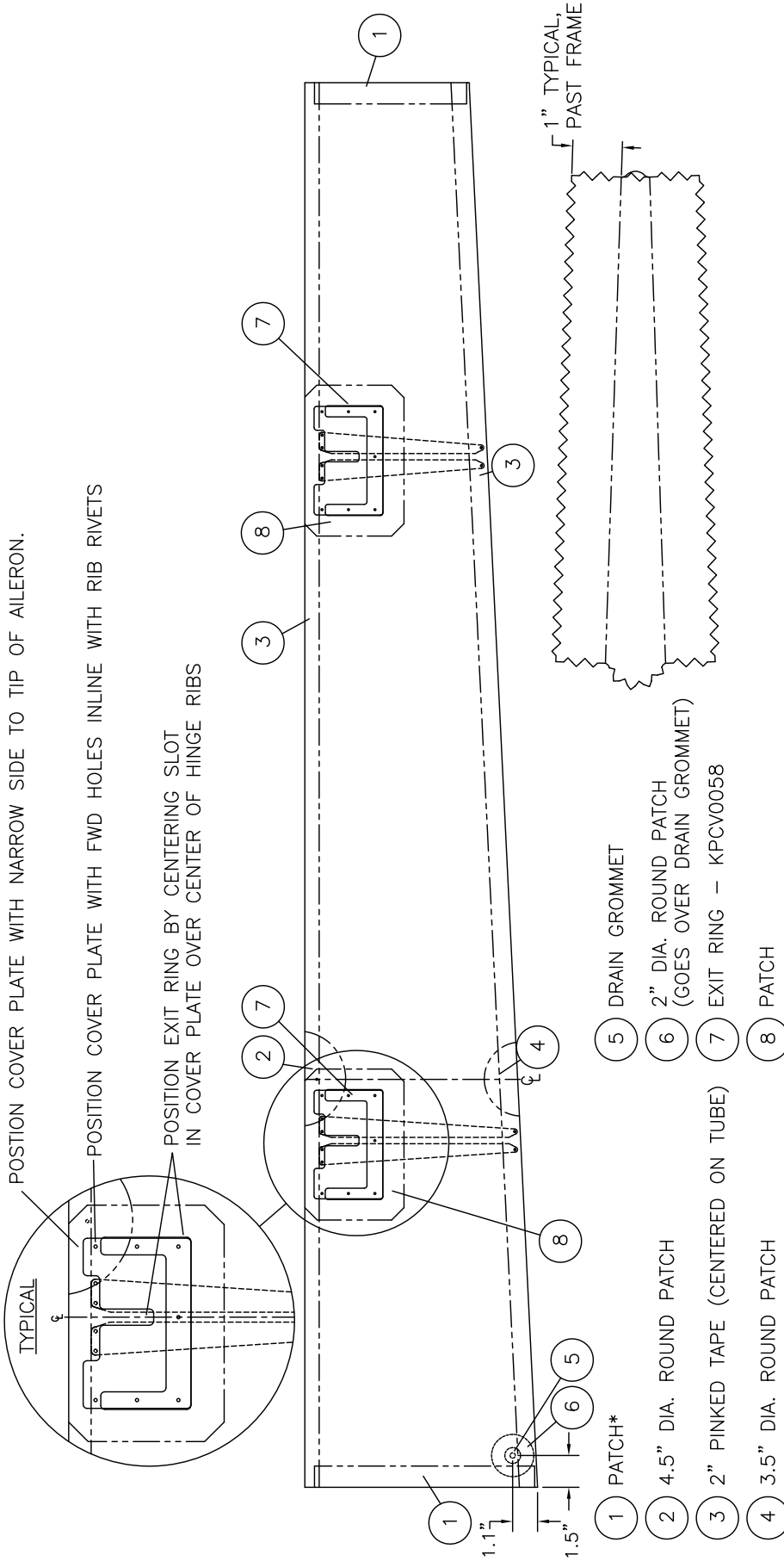


EXIT RING
AILERON HINGE – AILERON
(KPCV0058)

REMOVE HATCHED AREAS

MD5549

RAVEN S-20 RAVEN
AILERON HINGE COVER AND RING MODIFICATION
FIGURE 08B-12



POSITION COVER PLATE WITH NARROW SIDE TO TIP OF AILERON.

POSITION COVER PLATE WITH FWD HOLES INLINE WITH RIB RIVETS

POSITION EXIT RING BY CENTERING SLOT IN COVER PLATE OVER CENTER OF HINGE RIBS

TYPICAL

1" TYPICAL, PAST FRAME

- 1 PATCH*
- 2 4.5" DIA. ROUND PATCH
- 3 2" PINKED TAPE (CENTERED ON TUBE)
- 4 3.5" DIA. ROUND PATCH
- 5 DRAIN GROMMET
- 6 2" DIA. ROUND PATCH (GOES OVER DRAIN GROMMET)
- 7 EXIT RING - KPCV0058
- 8 PATCH

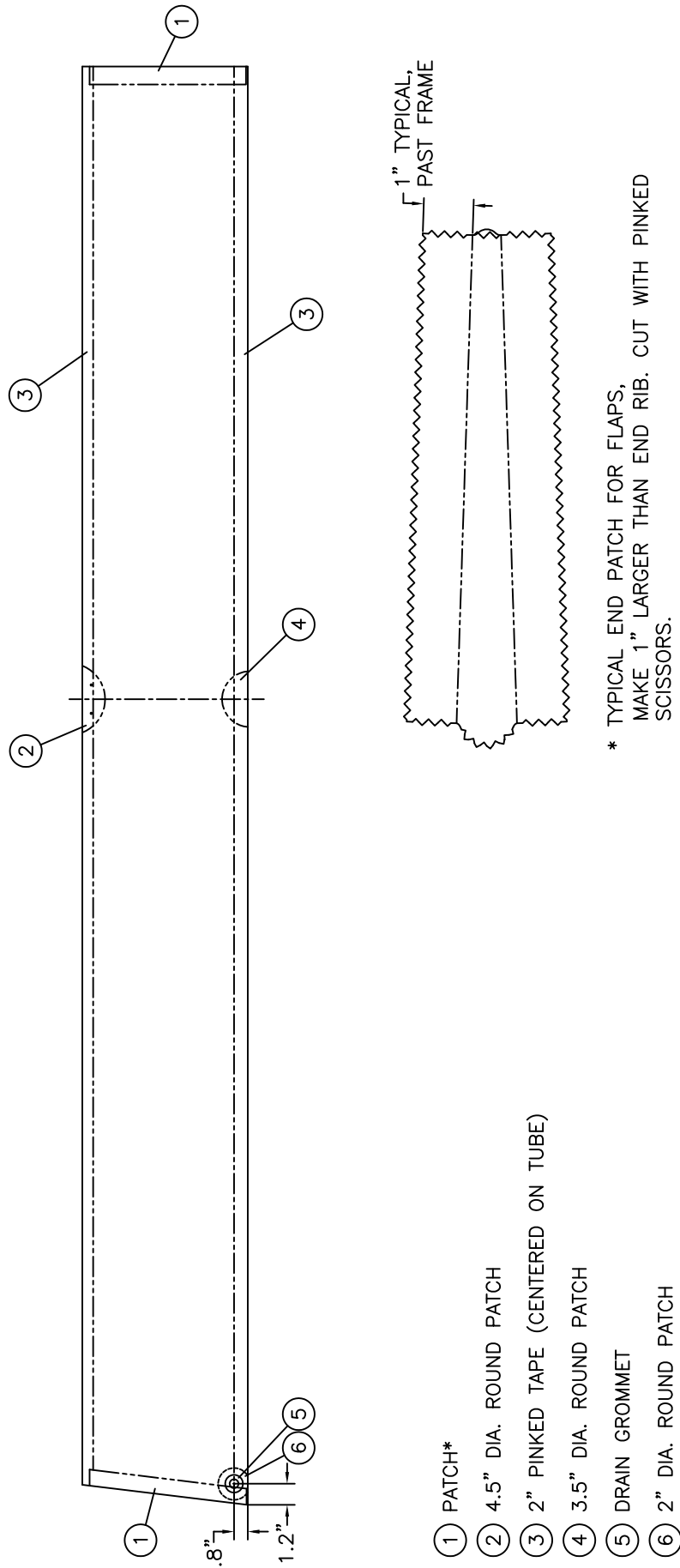
* TYPICAL END PATCH FOR AILERONS.
MAKE 1" LARGER THAN END RIB. CUT WITH PINKED SCISSORS.

LOWER SIDE OF LEFT HAND
AILERON SHOWN

MD5538

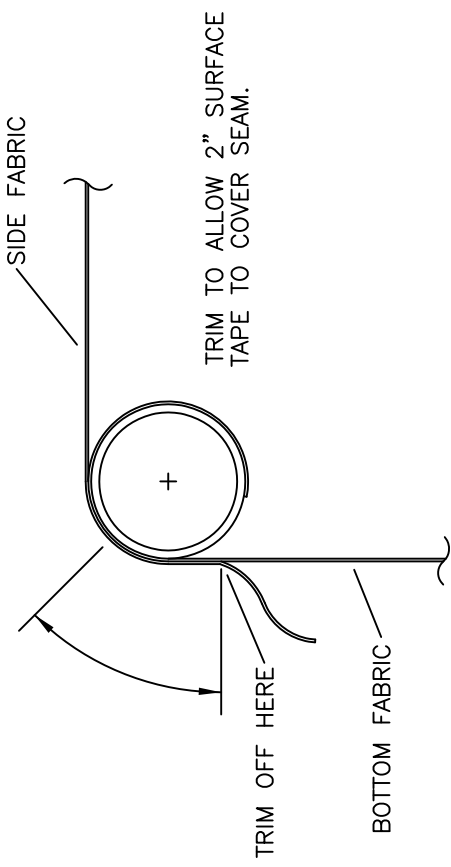
RAVEN S-20 RAVEN
AILERON COVERING
FIGURE 08B-13

NOTE: DRAIN GROMMETS LOCATED AT THE LOWER
 INBOARD SIDE OF THE FLAPS
 MAKE LEFT AND RIGHT

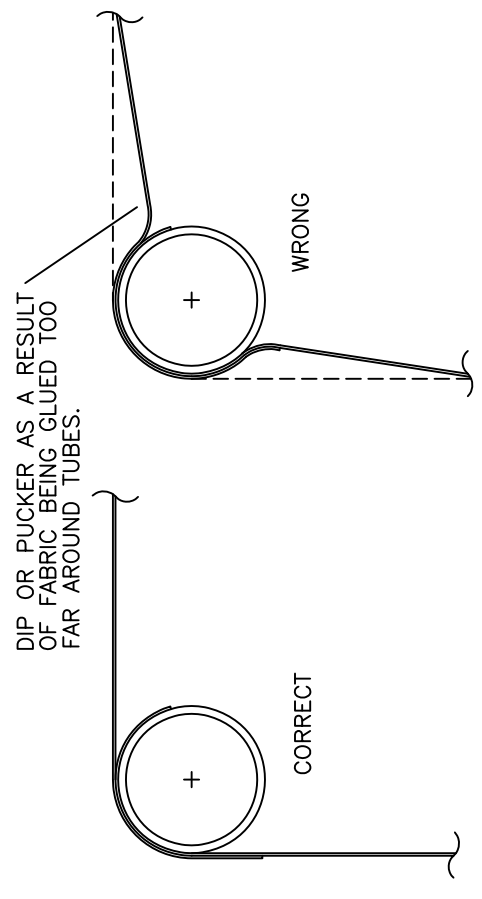


RRAD S-20 RAVEN
FLAP COVERING
 FIGURE 08B-14

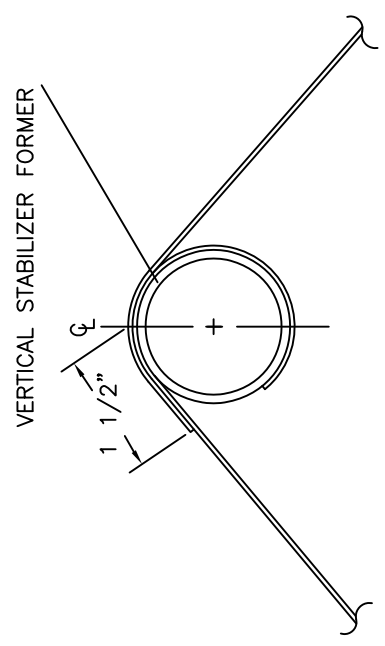
MD4279



FABRIC OVERLAP (SIDE AND BOTTOM FABRIC)



FABRIC ATTACH TO BOTTOM LONGERONS



FABRIC OVERLAP (TOP OF FUSELAGE)

GENERAL INFORMATION

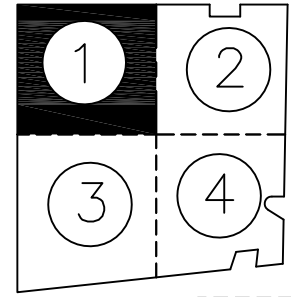
RAMS S-20 RAVEN
FUSELAGE COVERING DETAILS

FIGURE 08C-07

MD4334

RANS S-20 RAVEN
AFT EXIT TEMPLATE #1
FIGURE 08C-30

MD5578

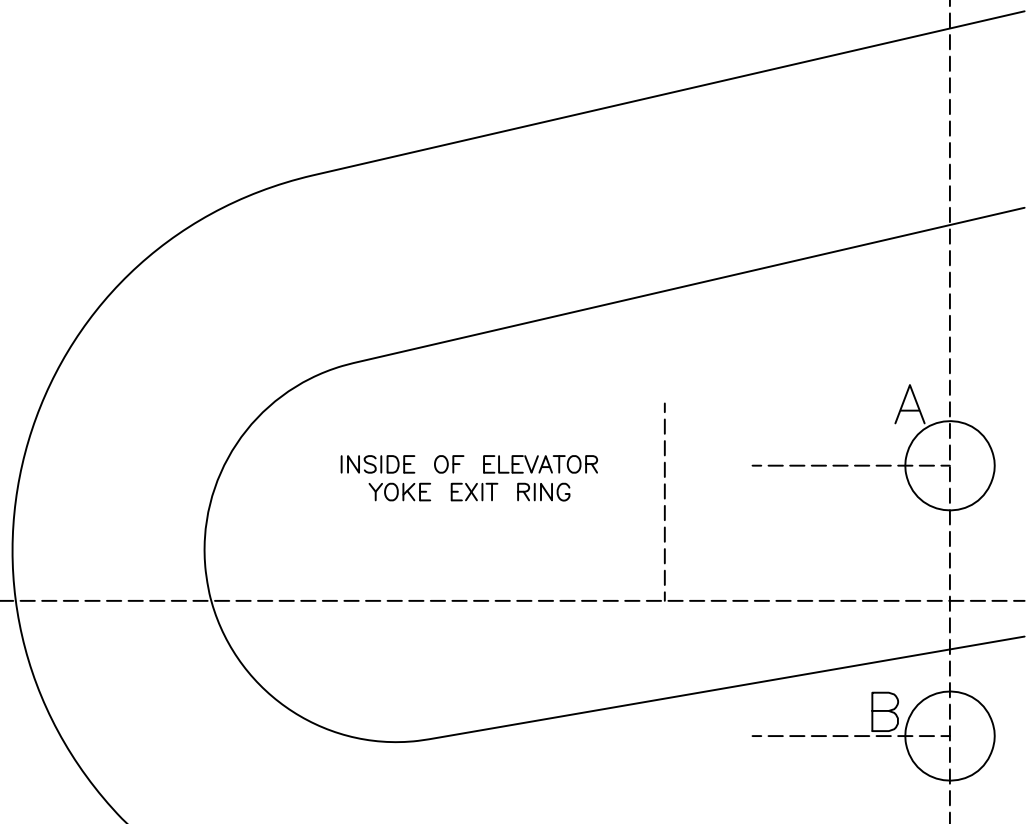
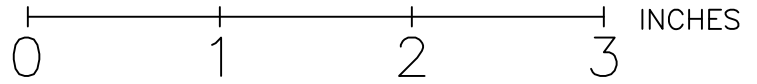


PLOT 1:1

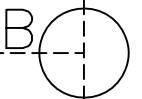
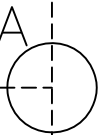
ELEVATOR YOKE EXIT TEMPLATE,
FWD TOP

(NO SCALING)

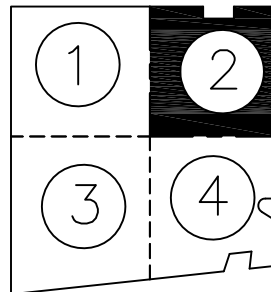
INCHES



INSIDE OF ELEVATOR
YOKE EXIT RING



RANS S-20 RAVEN
AFT EXIT TEMPLATE #2
FIGURE 08C-30A

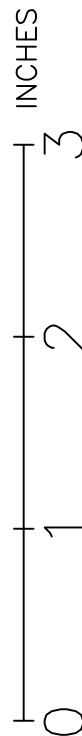
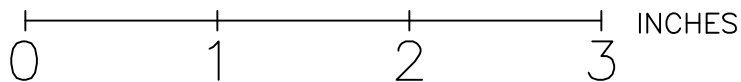


MD5578

SLIDE OVER REAR HORIZONTAL
STABILIZER ATTACH BUSHING

ELEVATOR YOKE EXIT TEMPLATE,
AFT TOP

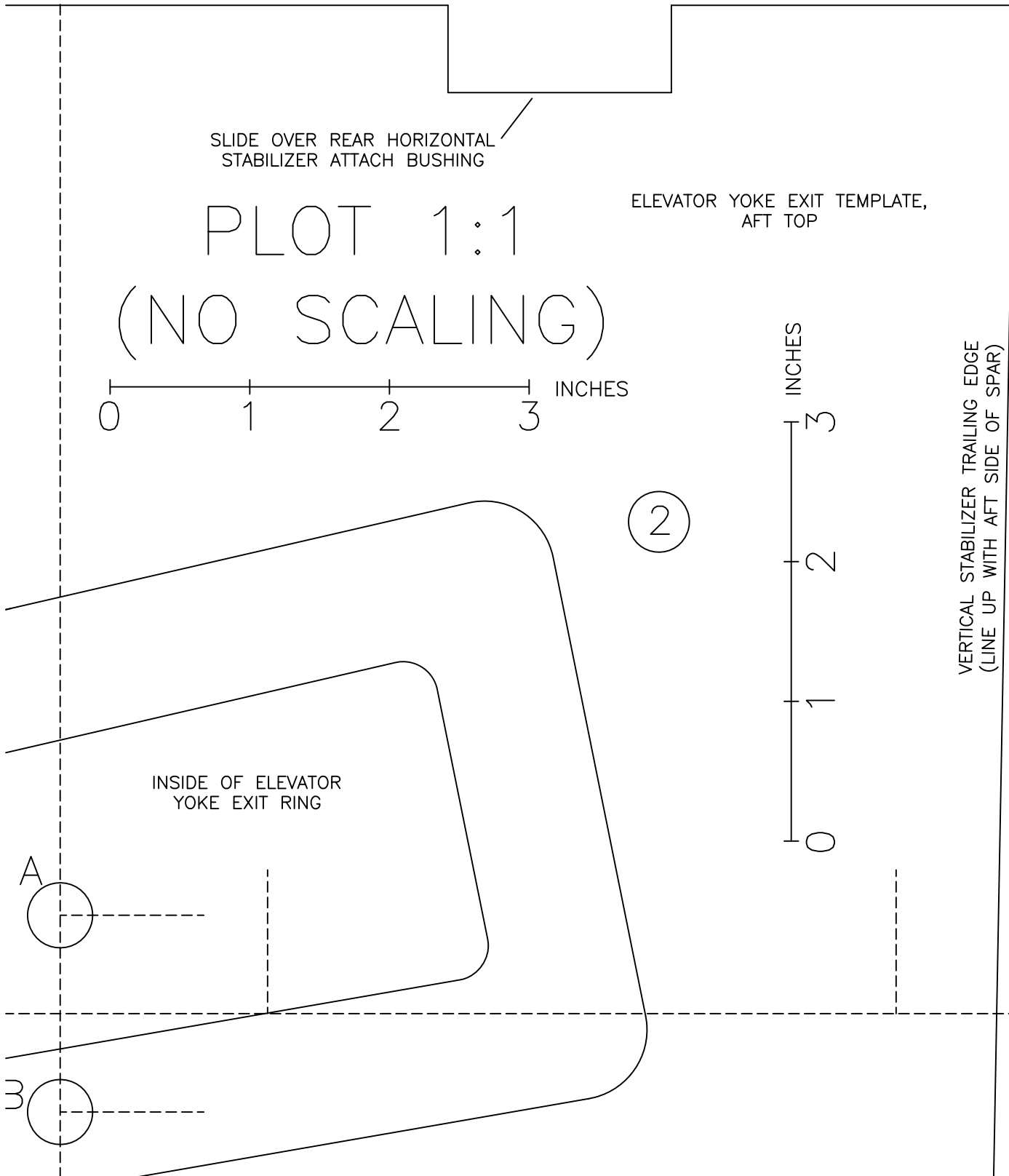
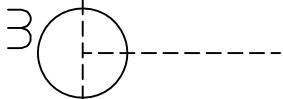
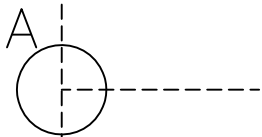
PLOT 1:1
(NO SCALING)

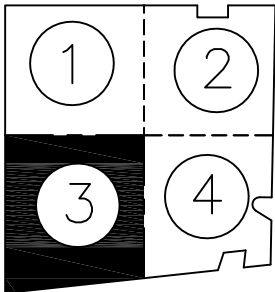
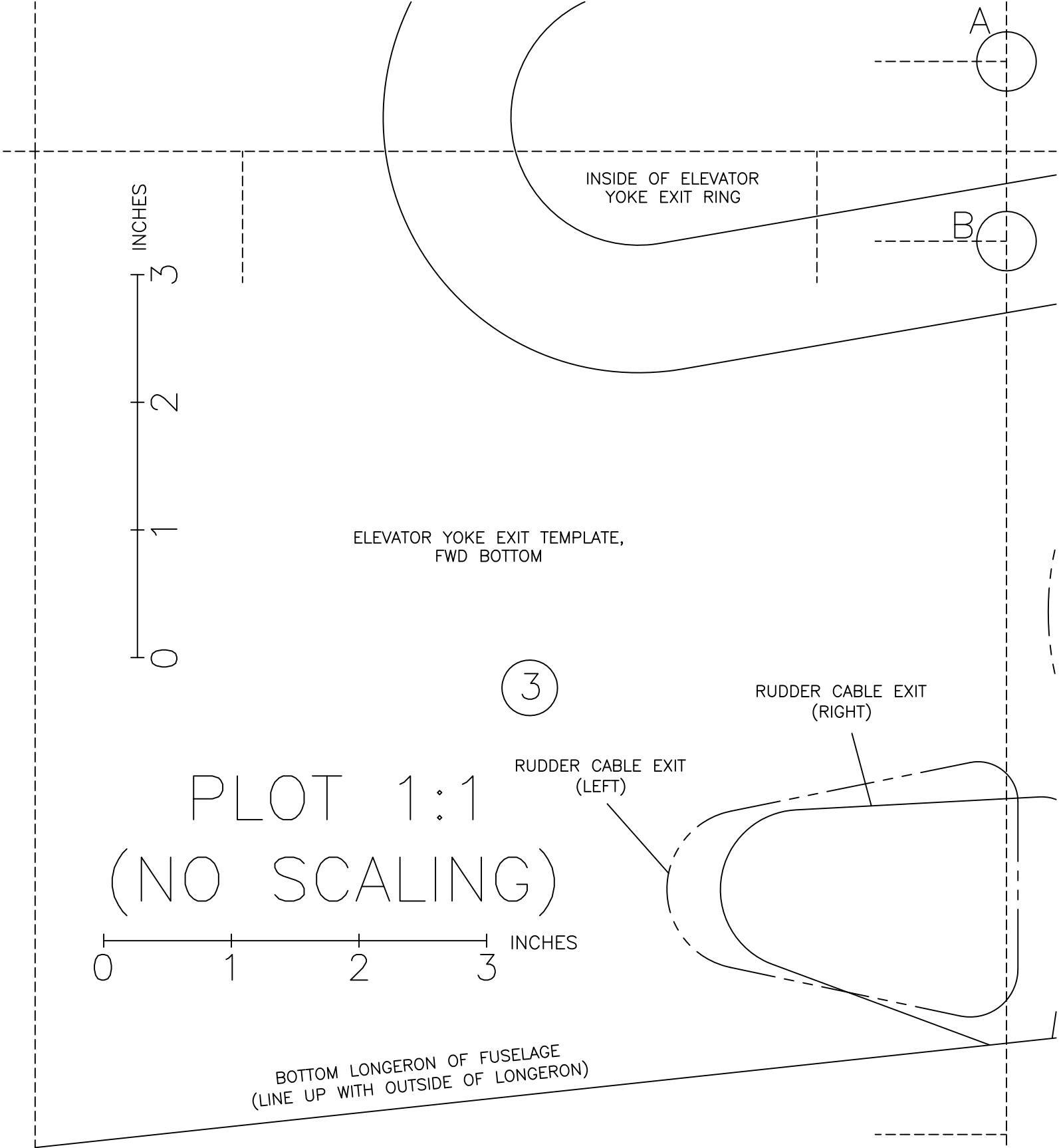


VERTICAL STABILIZER TRAILING EDGE
(LINE UP WITH AFT SIDE OF SPAR)



INSIDE OF ELEVATOR
YOKE EXIT RING

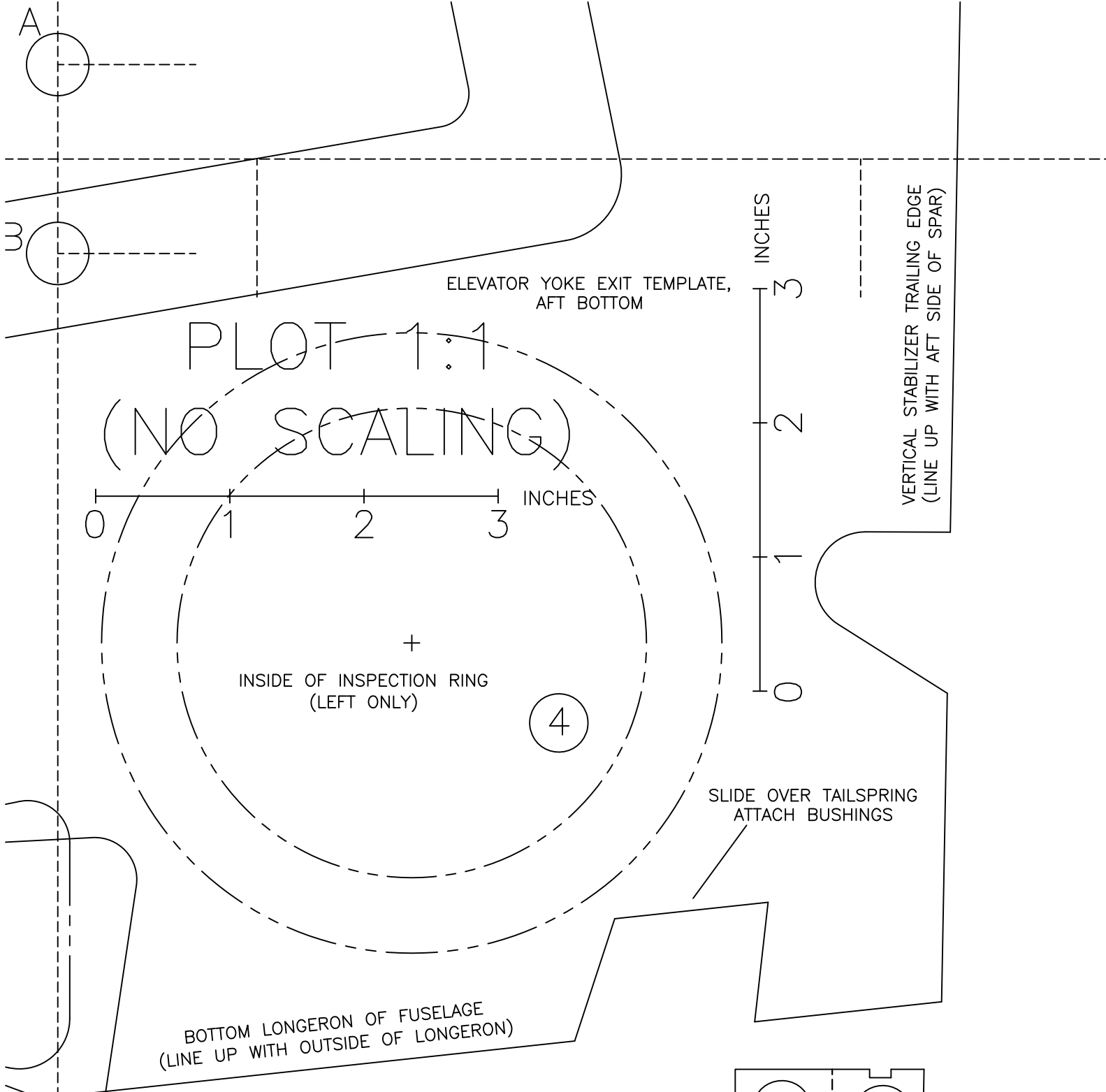




MD5578

RANS S-20 RAVEN
AFT EXIT TEMPLATE #3
FIGURE 08C-30B

09/01/2013



ELEVATOR YOKE EXIT TEMPLATE,
AFT BOTTOM

PLOT 1:1

(NO SCALING)

0 1 2 3 INCHES

INCHES
3
2
1
0

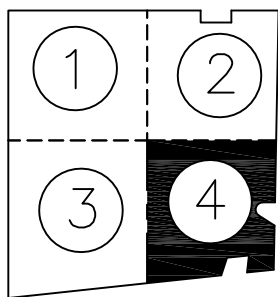
INSIDE OF INSPECTION RING
(LEFT ONLY)

4

SLIDE OVER TAILSPRING
ATTACH BUSHINGS

BOTTOM LONGERON OF FUSELAGE
(LINE UP WITH OUTSIDE OF LONGERON)

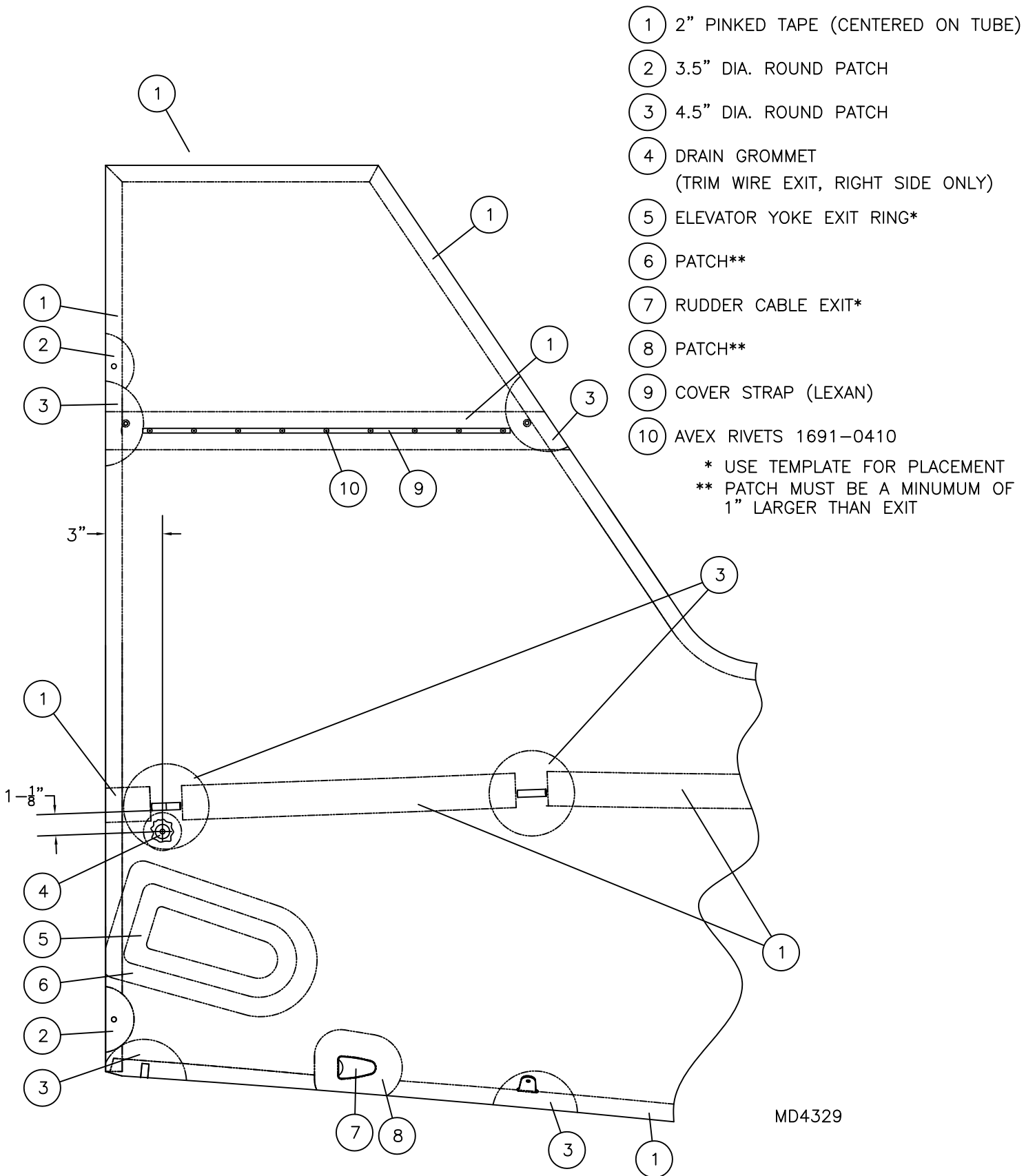
VERTICAL STABILIZER TRAILING EDGE
(LINE UP WITH AFT SIDE OF SPAR)



RANS S-20 RAVEN
AFT EXIT TEMPLATE #4
FIGURE 08C-30C

MD5578

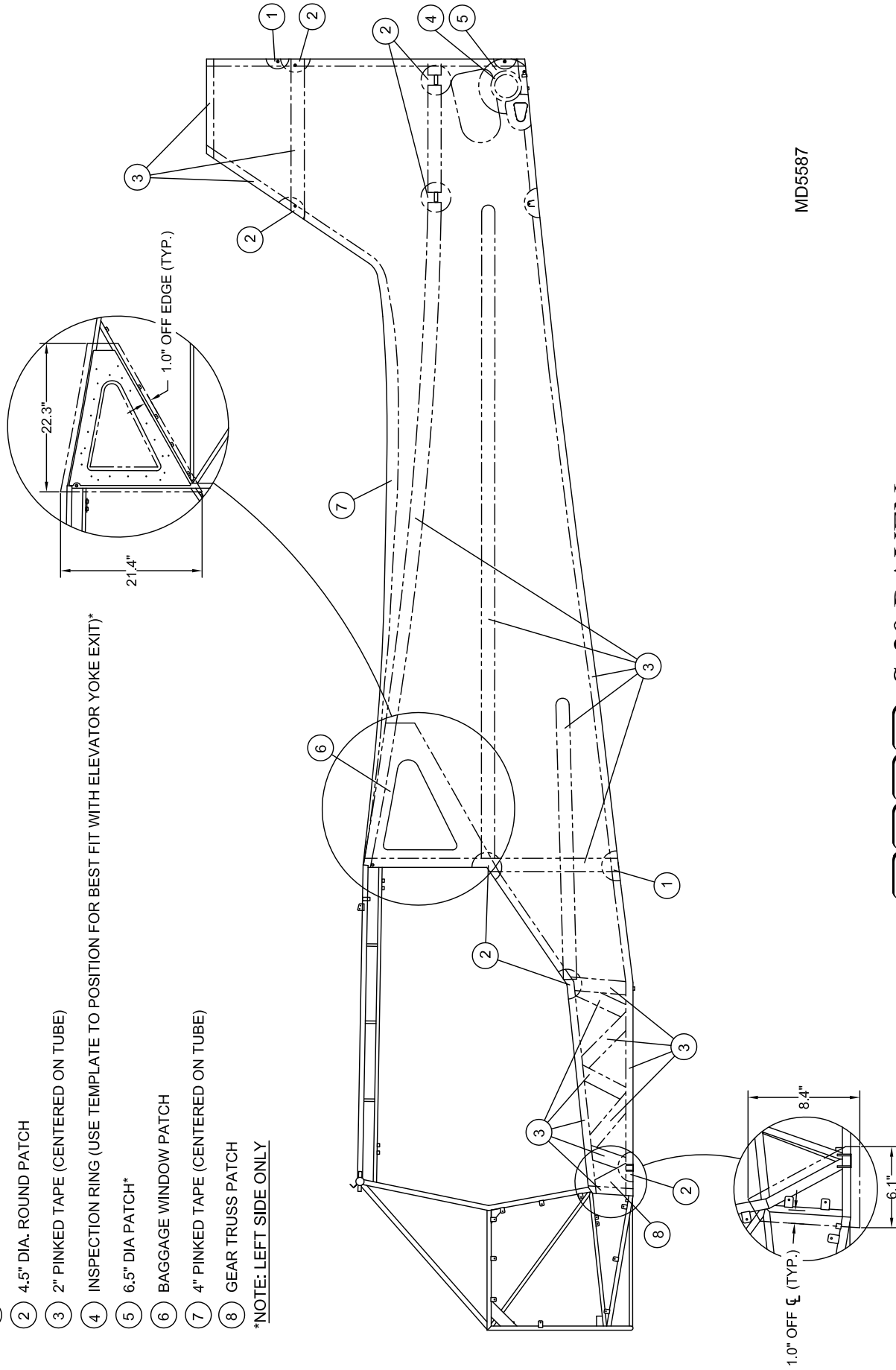
09/01/2013



**RANS S-20 RAVEN
 VERTICAL STABILIZER AND REAR
 FUSELAGE COVERING
 FIGURE 08C-33**

- ① 3.5" DIA. ROUND PATCH (CENTERED OVER TABS)
- ② 4.5" DIA. ROUND PATCH
- ③ 2" PINKED TAPE (CENTERED ON TUBE)
- ④ INSPECTION RING (USE TEMPLATE TO POSITION FOR BEST FIT WITH ELEVATOR YOKE EXIT)*
- ⑤ 6.5" DIA PATCH*
- ⑥ BAGGAGE WINDOW PATCH
- ⑦ 4" PINKED TAPE (CENTERED ON TUBE)
- ⑧ GEAR TRUSS PATCH

*NOTE: LEFT SIDE ONLY

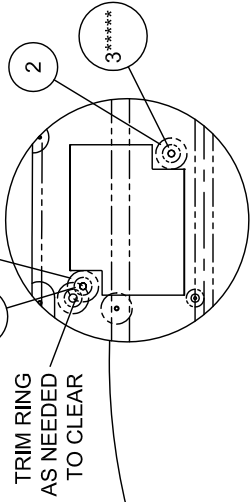


MD5587

RAVEN S-20 RAVEN
FUSELAGE SIDE COVERING
FIGURE 08C-33A

- ① 2" PINKED TAPE (CENTERED ON TUBE)
- ② 3.5" DIA. ROUND PATCH
- ③ 2" DIA. RING LEXAN
- ④ 1/2 OVAL PATCH
- ⑤ INSPECTION RING
- ⑥ 6.5" DIA. ROUND PATCH

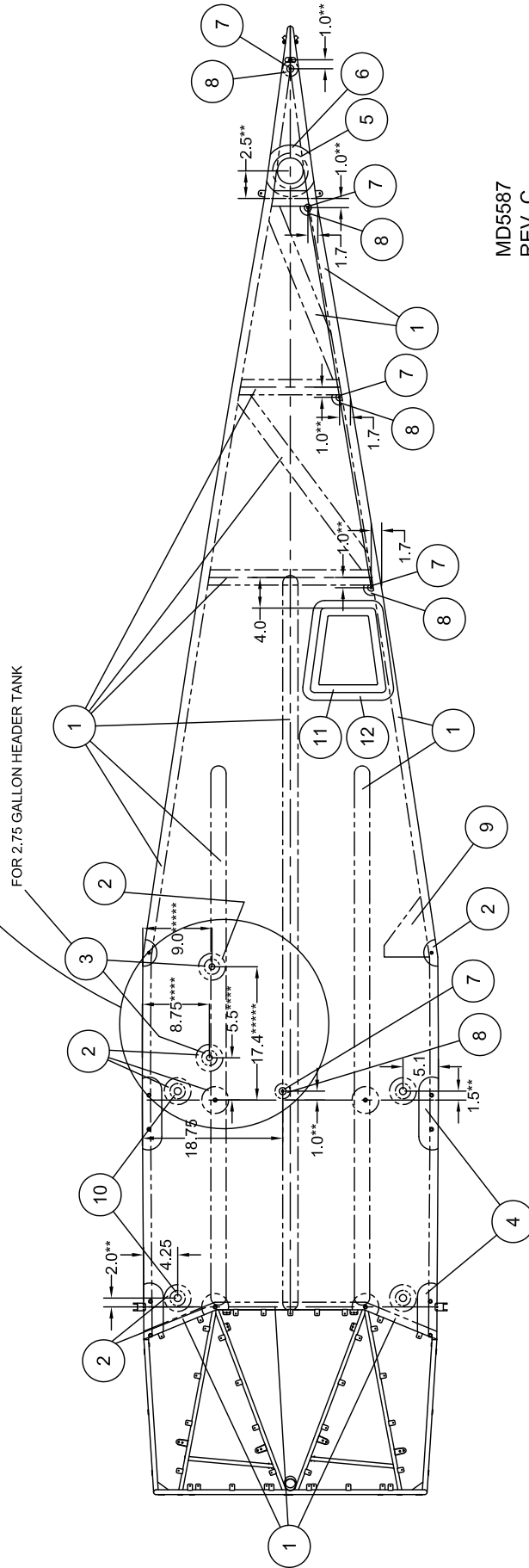
- ⑦ DRAIN GROMMET*
- ⑧ 2" DIA. ROUND PATCH
- ⑨ PATCH (CENTERED ON COMM ANTENNA MOUNT PLATE)**
- ⑩ BRAKE LINE EXIT RING
- ⑪ BATTERY ACCESS RING (TITAN 340 ONLY)
- ⑫ PATCH (CENTERED ON BATTERY ACCESS RING)**



TRIM RING
AS NEEDED
TO CLEAR

FOR 6.9 GALLON HEADER TANK
LOCATE SUMP DRAIN RINGS
CENTERED ON MOUNT CUTOUTS

* BURN 1/8" DRAIN HOLE AFTER PAINTING
** FROM CENTERLINE OF TUBE.
*** PATCH MUST BE A MINIMUM OF 1" LARGER ALL AROUND
**** TRIKE SUMP DRAIN ONLY (MAY INSTALL HEADER TANK TO LOCATE RING)
***** TAILDRAGGER SUMP DRAIN ONLY (MAY INSTALL HEADER TANK TO LOCATE RING)

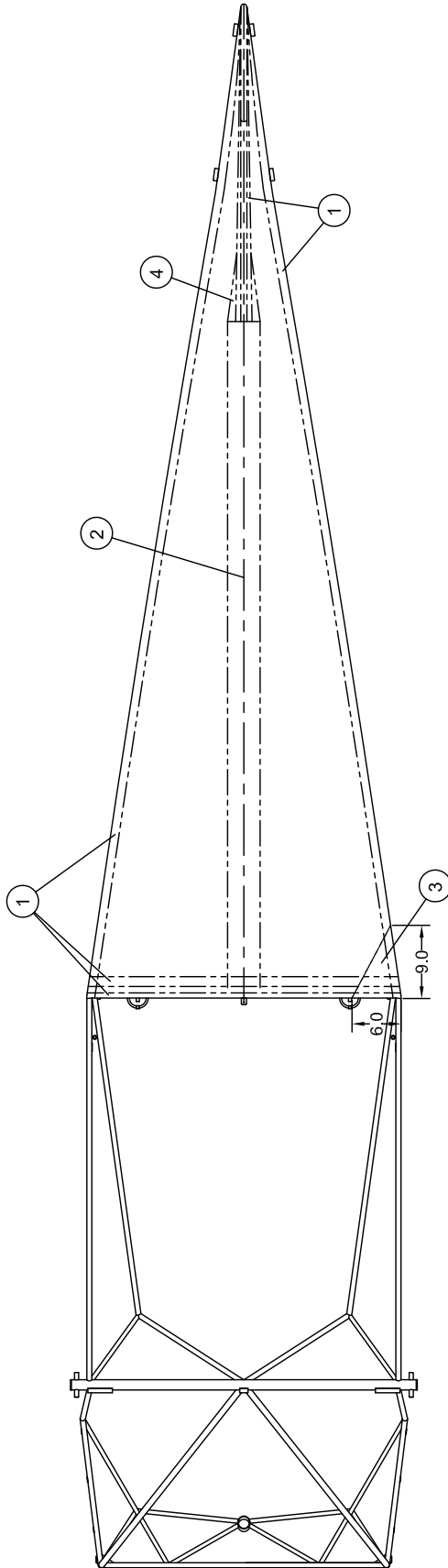


ALL DIMENSIONS IN INCHES

RAVEN S-20 RAVEN FUSELAGE BOTTOM COVERING FIGURE 08C-33B

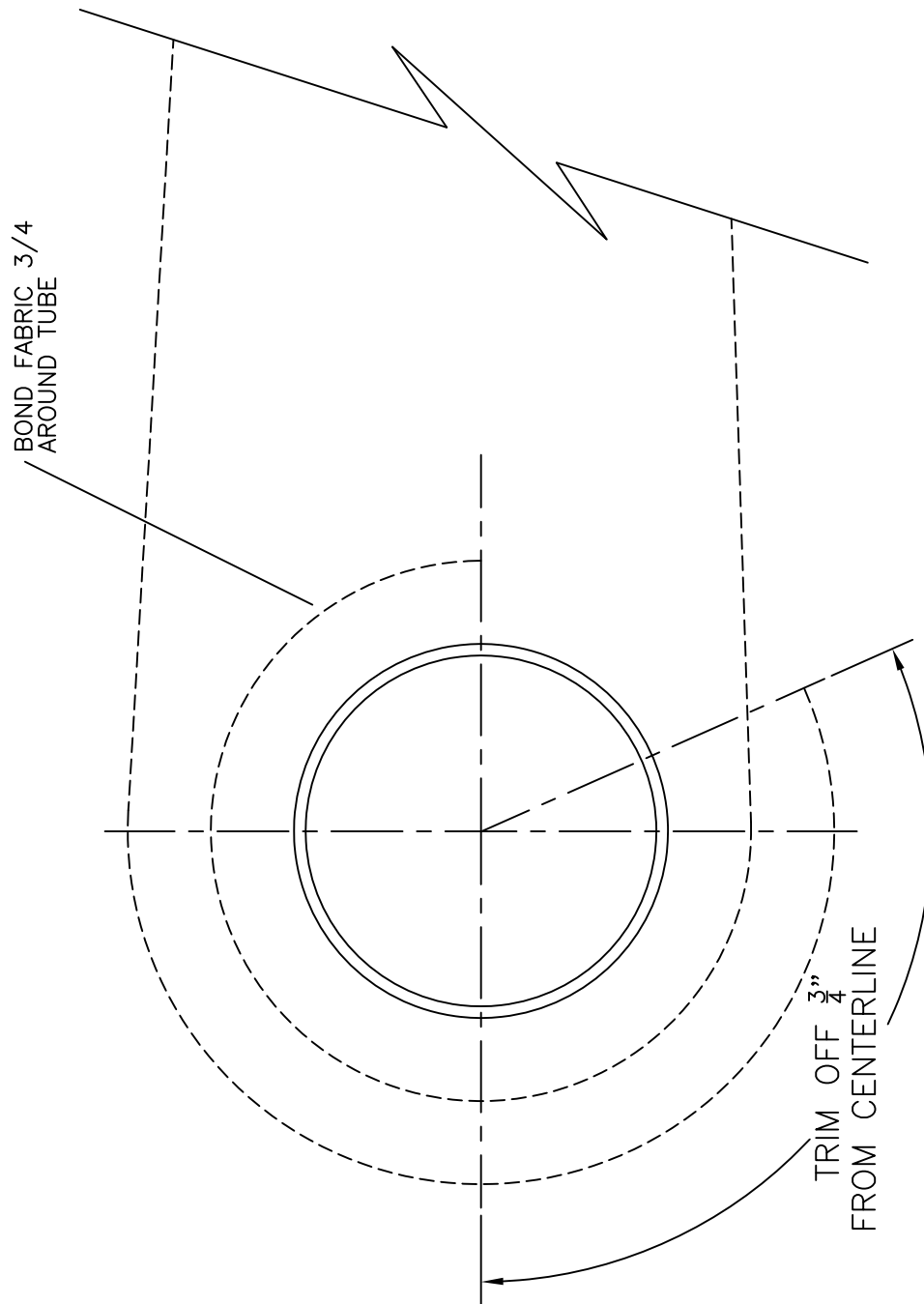
MD5587
REV. C

- ① 2" PINKED TAPE (CENTERED ON TUBE)
- ② 4" PINKED TAPE (CENTERED ON TUBE)
- ③ PATCH (CENTERED OVER ANTENNA PLATE)
- ④ PATCH (TRANSITION FROM 4" TAPE TO 2" TAPE)



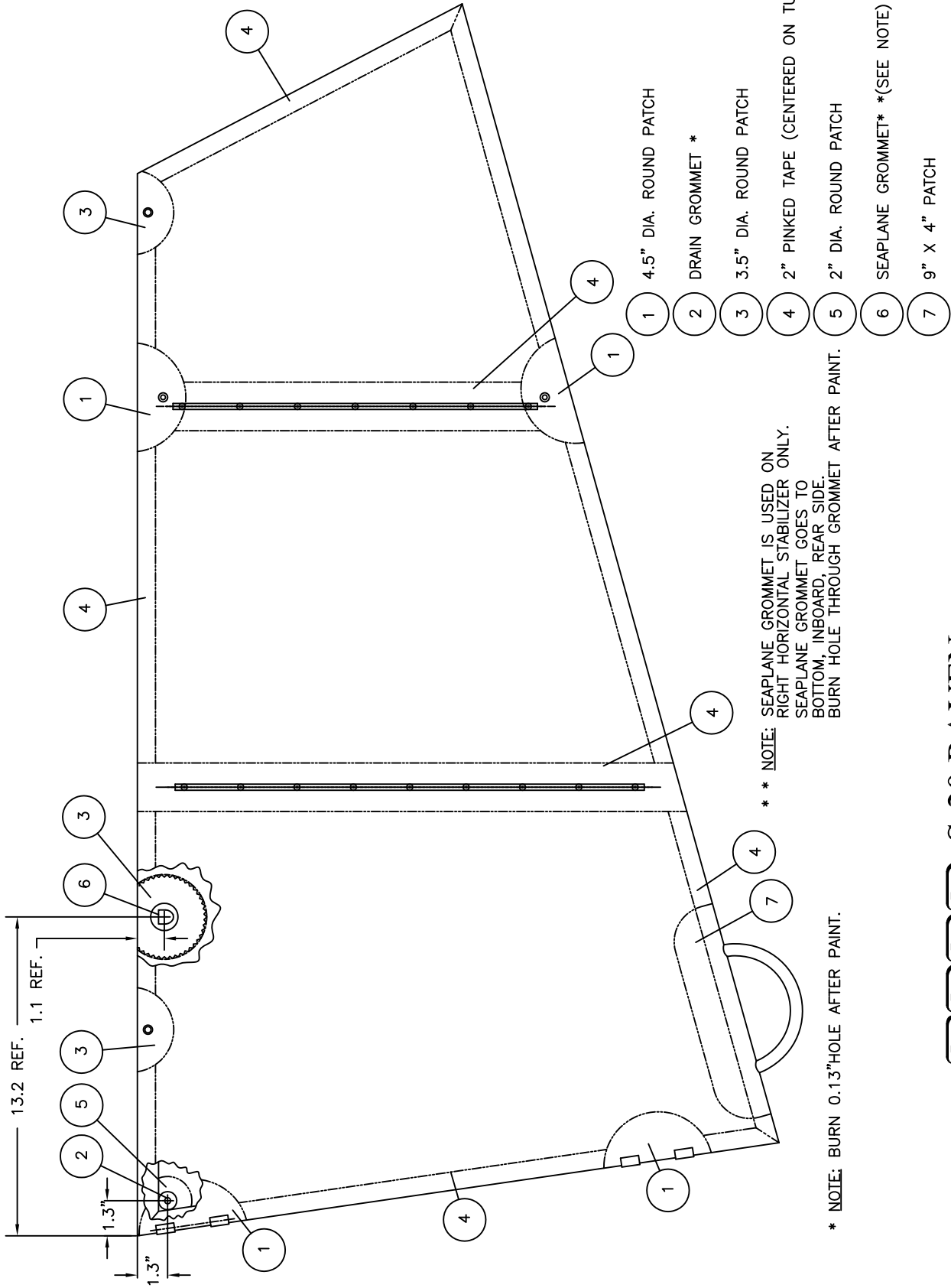
MD5587

RAVEN S-20 RAVEN
FUSELAGE TOP COVERING
FIGURE 08C-34



MD4326

RAMROD S-20 RAVEN
FABRIC OVERLAP TYPICAL FOR TAIL SURFACES
FIGURE 08D-06

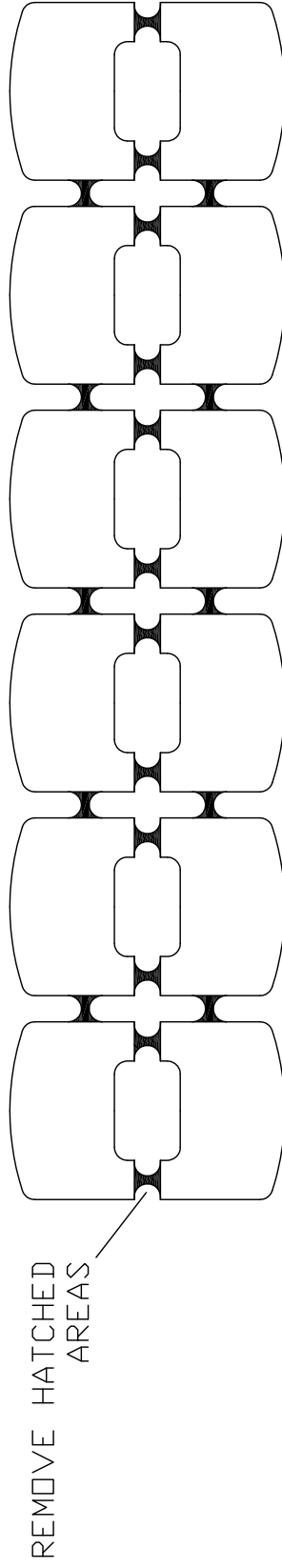
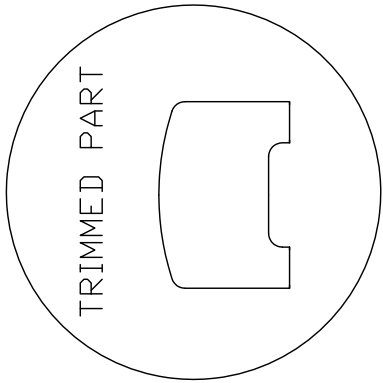


** NOTE: SEAPLANE GROMMET IS USED ON
 RIGHT HORIZONTAL STABILIZER ONLY.
 SEAPLANE GROMMET GOES TO
 BOTTOM, INBOARD, REAR SIDE.
 BURN HOLE THROUGH GROMMET AFTER PAINT.

* NOTE: BURN 0.13\"HOLE AFTER PAINT.

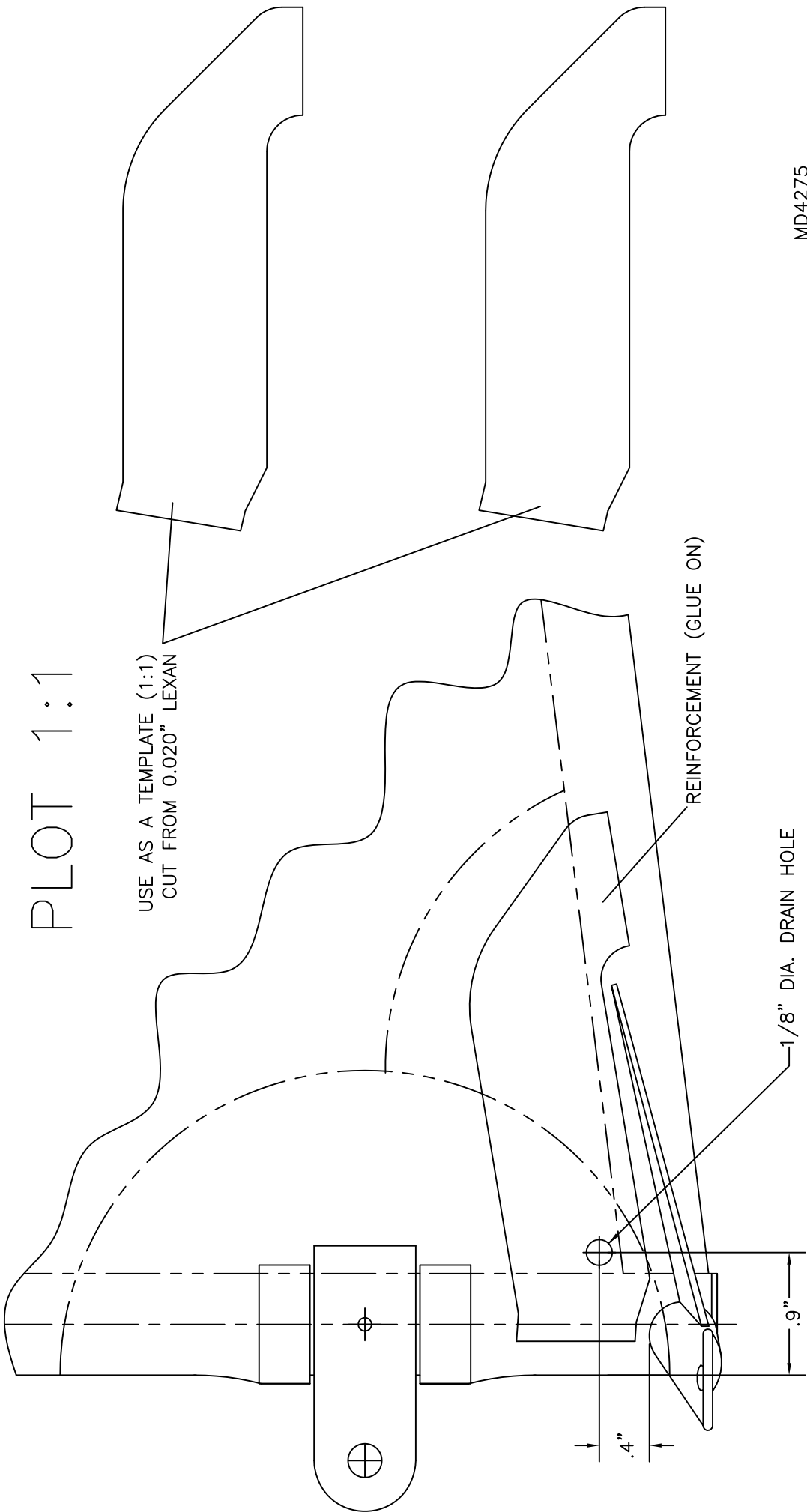
- 1 4.5" DIA. ROUND PATCH
- 2 DRAIN GROMMET *
- 3 3.5" DIA. ROUND PATCH
- 4 2" PINKED TAPE (CENTERED ON TUBE)
- 5 2" DIA. ROUND PATCH
- 6 SEAPLANE GROMMET* *(SEE NOTE)
- 7 9" X 4" PATCH

RAMS S-20 RAVEN
HORIZONTAL STABILIZER COVERING
FIGURE 08D-17



MD5647

RAVEN S-20 RAVEN
RUDDER / ELEVATOR HINGE REINFORCEMENT MODIFICATION
FIGURE 08E-10



PLOT 1:1

USE AS A TEMPLATE (1:1)
CUT FROM 0.020" LEXAN

REINFORCEMENT (GLUE ON)

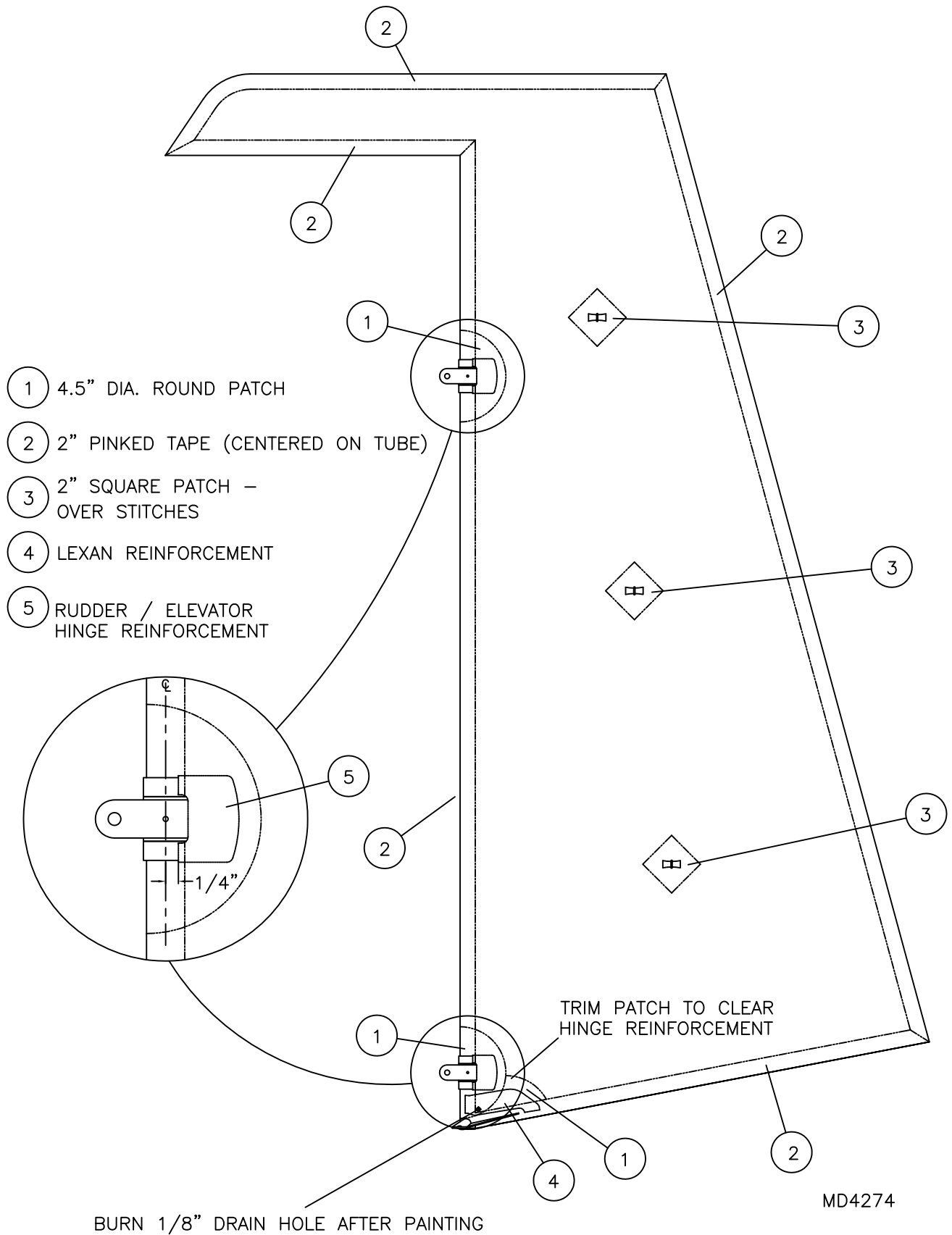
1/8" DIA. DRAIN HOLE

.4"

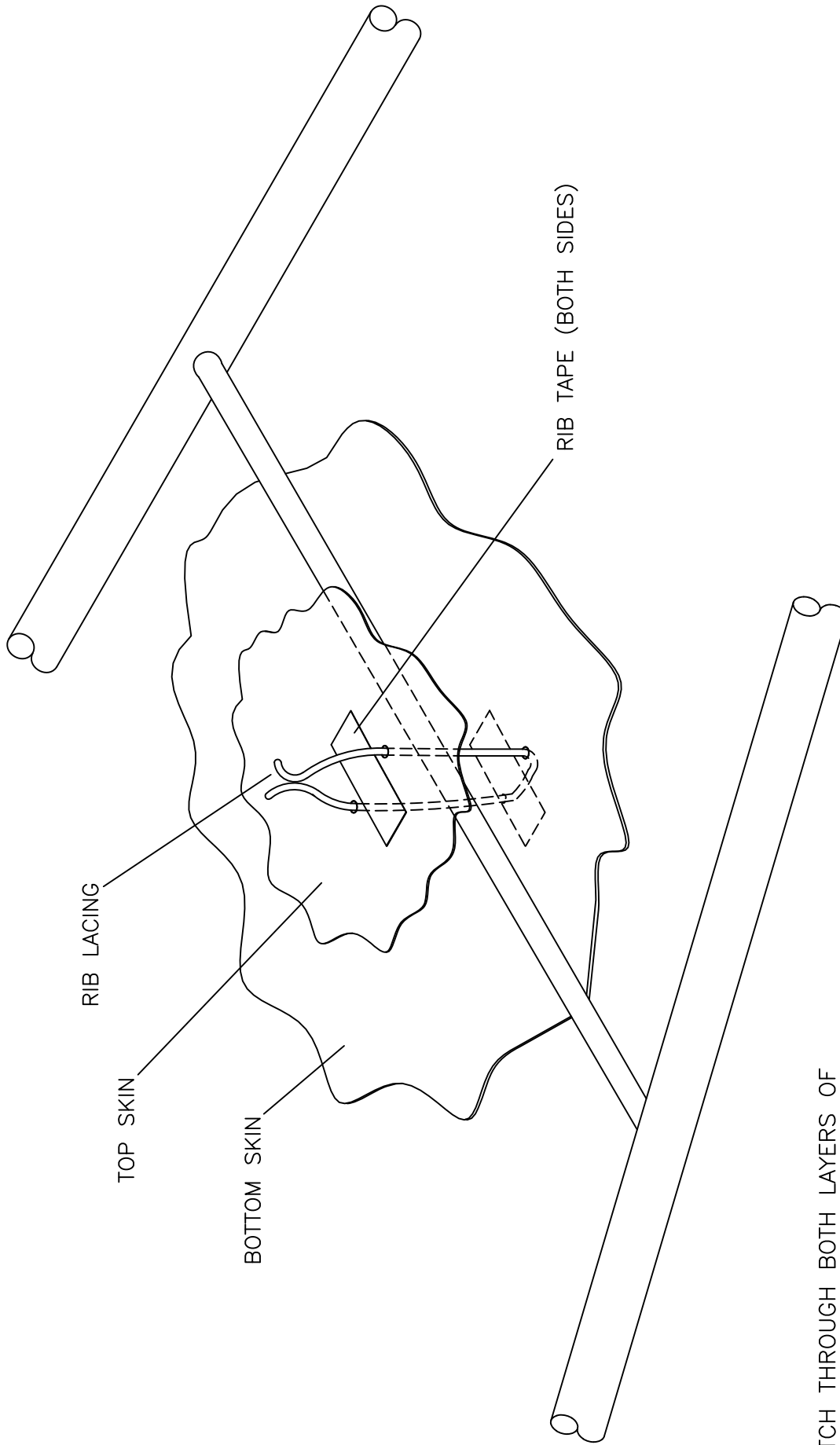
.9"

MD4275

RAVEN S-20 RAVEN
RUDDER - FABRIC REINFORCEMENT
FIGURE 08E-11



RANS S-20 RAVEN
RUDDER COVERING - RANS RUDDER
FIGURE 08E-12

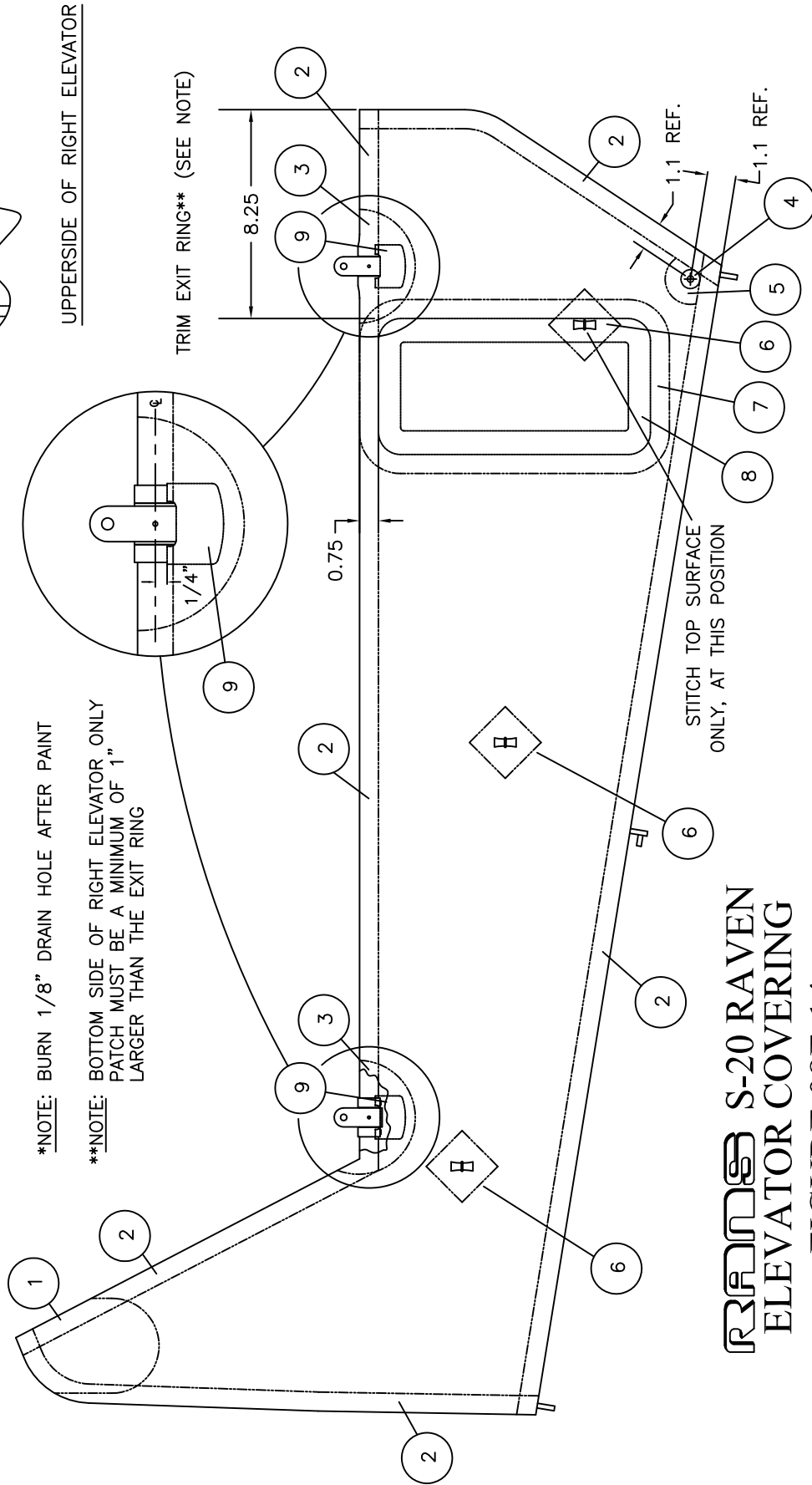
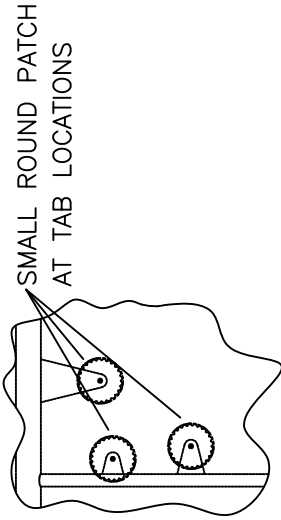


STITCH THROUGH BOTH LAYERS OF FABRIC COMPLETELY AROUND TUBE. TIE A KNOT AND ROTATE THE KNOT TO INTERIOR SIDE. PLACE A DIAMOND PATCH OVER STITCH ON EACH SIDE.

RAFAMES S-20 RAVEN
RUDDER AND ELEVATOR STITCHING
FIGURE 08E-12A

MD4273

- 1 PATCH TO COVER BALANCE WEIGHT MOUNT PLATE (BOTTOM OF EACH ELEVATOR)
- 2 2" PINKED TAPE (CENTERED ON TUBE)
- 3 4.5" DIA. ROUND PATCH
- 4 DRAIN GROMMET* (BOTTOM SIDE/ SEE NOTE)
- 5 2" DIA. ROUND PATCH
- 6 SQUARE PATCH
- 7 PATCH** (SEE NOTE)
- 8 TRIM EXIT RING** (SEE NOTE)
- 9 RUDDER / ELEVATOR HINGE REINFORCEMENT

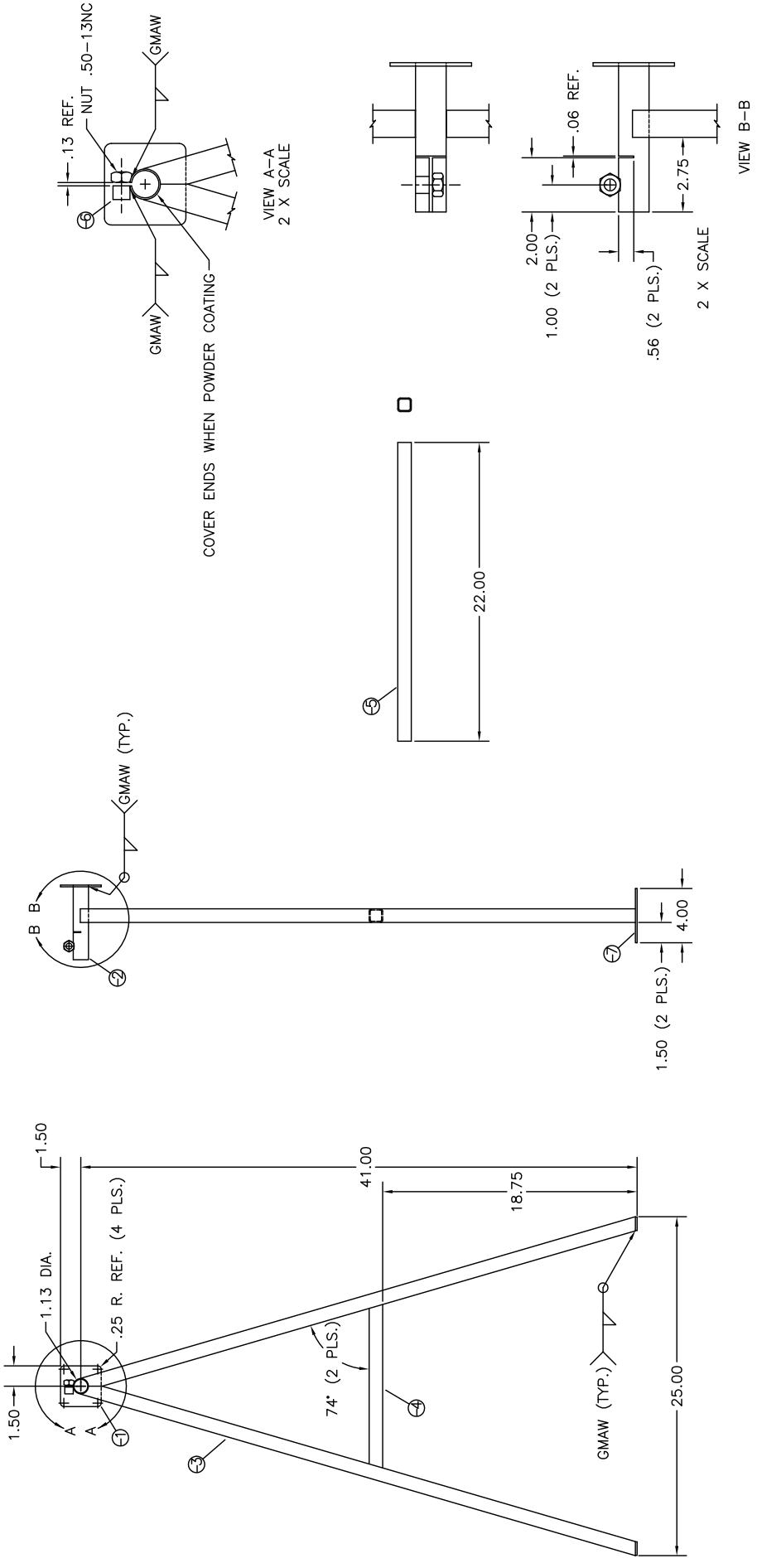


*NOTE: BURN 1/8" DRAIN HOLE AFTER PAINT

**NOTE: BOTTOM SIDE OF RIGHT ELEVATOR ONLY PATCH MUST BE A MINIMUM OF 1" LARGER THAN THE EXIT RING

RAVEN S-20 RAVEN
ELEVATOR COVERING

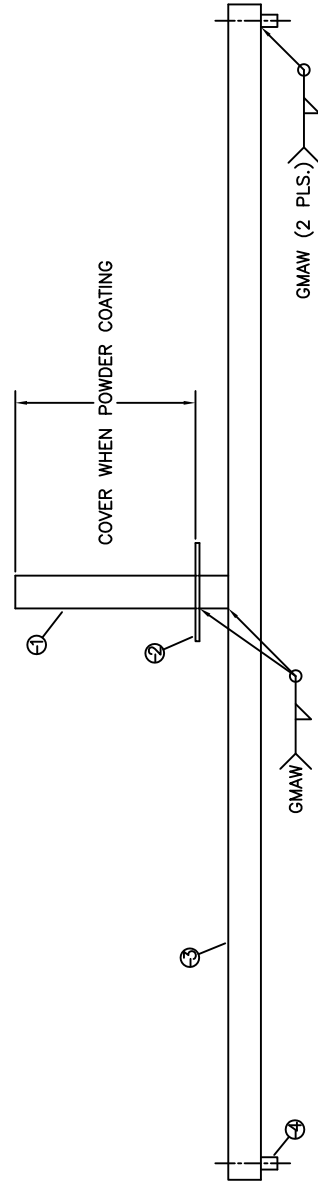
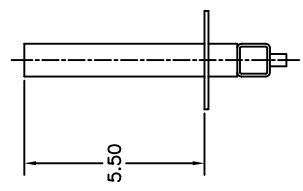
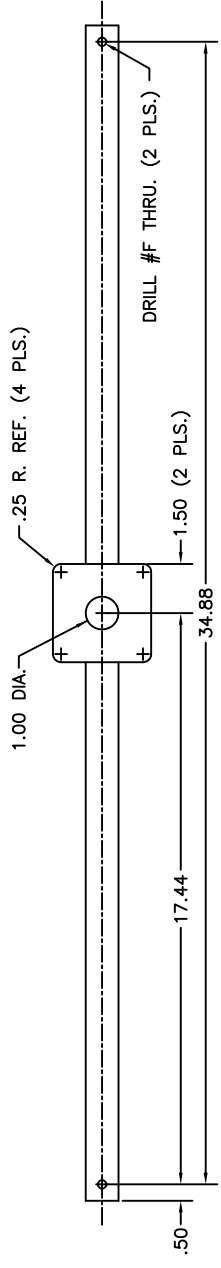
FIGURE 08F-14



- UNLESS OTHERWISE SPECIFIED:
- ALL CORNER FILLETS AND SHARP EDGES .005/.015 R.
 - ① .125 SHT. X 3.00 X 3.00
 - ② 1.125 DIA. X .058 X 5.50 TUBING
 - ③ 1.000 SQ. X 14 GA. X 42.75 TUBING (2 REQ'D.)
 - ④ 1.000 SQ. X 14 GA. X 12.00 TUBING
 - ⑤ 1.000 SQ. X 14 GA. X 22.00 TUBING (2 REQ'D.)
 - ⑥ .625 DIA. X .058 X .50 TUBING
 - ⑦ 1.000 X .125 FLAT BAR (2 REQ'D.)

MATERIAL:	MILD STEEL AS NOTED	FINISH:	POWDER COAT PAINT PER R-101
PROD. TIME	RAW MATL. AS NOTED	DATE	11.22.93
ISSUES	ISSUES	DESIGNED BY	R. HOFFNER
DIMENSIONS ARE IN INCHES	DIMENSIONS ARE IN INCHES	CHECKED BY	
DECIMALS	DECIMALS	APPROVED BY	
XX ± .125	XX ± .125	DATE	
XXX ± .25	XXX ± .25	REVISED DATE NO.	A-FRAME STAND
XXX ± .50	XXX ± .50	SIZE	D
XXX ± 1.00	XXX ± 1.00	REF. DATE NO.	N/A
XXX ± 2.00	XXX ± 2.00	SCALE	1 = 4
XXX ± 4.00	XXX ± 4.00	WEIGHT	X
XXX ± 8.00	XXX ± 8.00	SHEET	1 OF 1
XXX ± 16.00	XXX ± 16.00	REV.	N/A

REVISIONS		DATE
LTR.	DESCRIPTION	

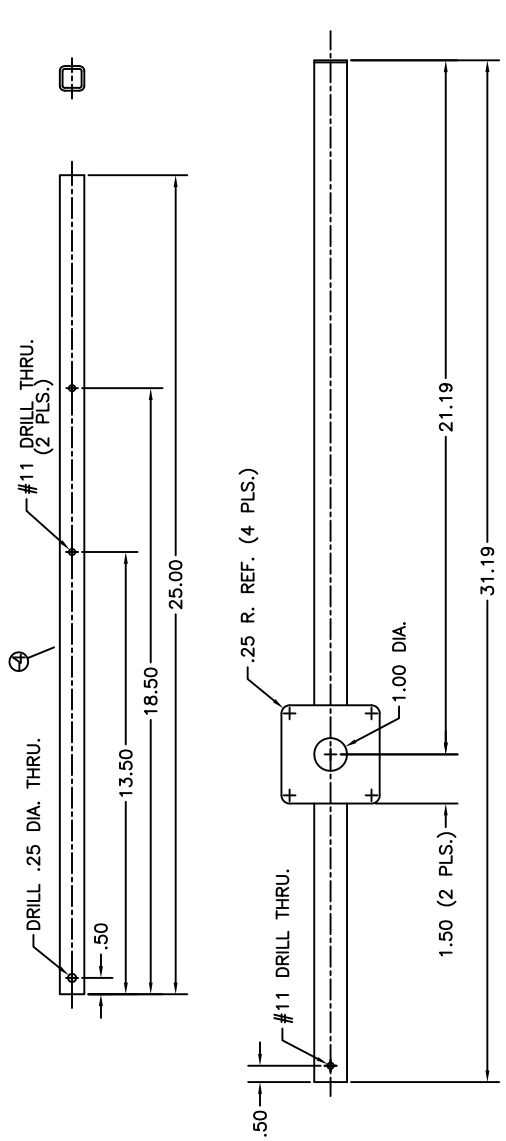


UNLESS OTHERWISE SPECIFIED:
 - ALL CORNER FILLETS AND SHARP EDGES .005/ .015 R.
 ① 1.000 DIA. X 6.50 BAR
 ② .125 SHT. X 3.00 X 3.00
 ③ 1.000 SQ. X 14 GA. X 35.88 TUBING
 ④ .375 DIA. X .035 X .50 TUBING (2 REQ'D.)

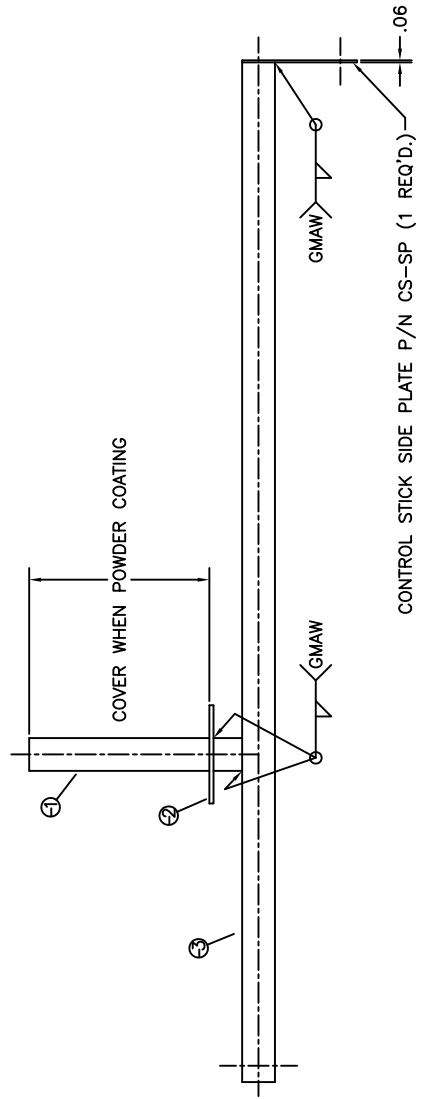
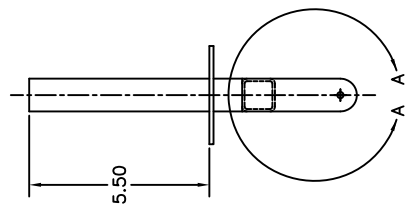
MATERIAL:		FINISH:	
MILD STEEL	AS NOTED	POWDER COAT PAINT	
PROD. TIME	PAINT MTL.	DRINK	
X	AS NOTED	R. HAFNER 11.22.03	
DESIGNER	AS NOTED	DATE	
DATE	AS NOTED	FORMED DRG. NO.	
DECIMALS	AS NOTED	SIZE	
INCHES	AS NOTED	DRG. NO.	
31	AS NOTED	APPROVED	
32	AS NOTED	SCALE	1 = 2
33	AS NOTED	SHEET	1 OF 1
34	AS NOTED	REV.	N/A

RRP
 4800 Highway 133, Memphis, Tenn. 38117 USA / Phone: (901) 625-4346
 FWD. FUSELAGE ATTACH
 N/A
 KP-101

REV.	DESCRIPTION	DATE
------	-------------	------



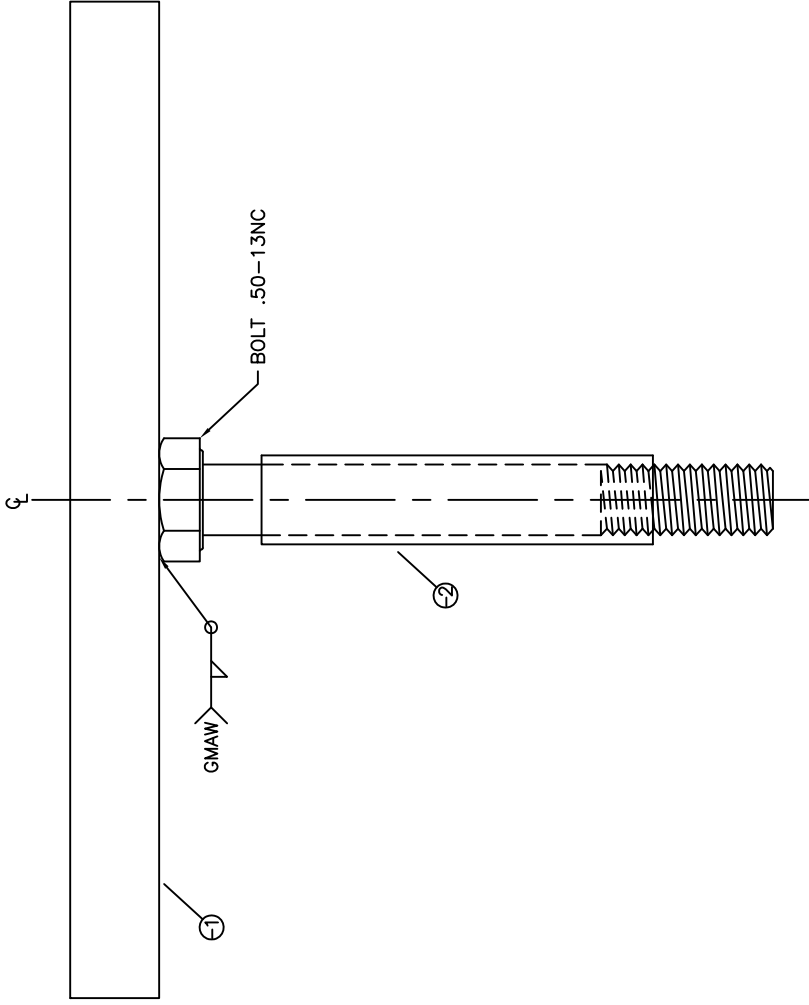
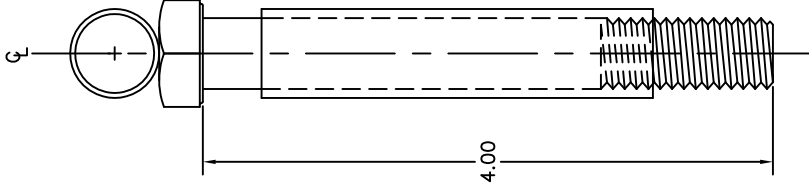
DETAIL A-A
2 X SCALE



- UNLESS OTHERWISE SPECIFIED:
- ALL CORNER FILLETS AND SHARP EDGES .005/.015 R.
 - ① 1.000 DIA. X 6.50 BAR
 - ② .125 SHT. X 3.00 X 3.00
 - ③ 1.000 SQ. X 14 GA. X 31.13 TUBING
 - ④ .750 SQ. X 14 GA. X 25.00 TUBING

MATERIAL: MILD STEEL AS NOTED		FINISH: POWDER COAT PAINT PER R-101	
PROD. TIME	PART MTL. AS NOTED	DRWING	DATE
TESTS PERFORMED AS NOTED	DESIGNER R. HOFFNER (11.22.03)	FILE	4800 HOFFNER 133 Alameda, Novato, CA 94901 USA / Phone (708) 625-8348
INSPECTION AS NOTED	QUANTITY 1	SIZE	WING ROOT ATTACH
APPROVALS	DESKMAN J. J. J.	DRY DATE NO.	N/A
APPROVED	FOR SCALE DRAWING	FOR DATE NO.	KP-103
NEXT ASSY. USED ON	QTY.	SCALE	1 = 2
APPLICATION		WEIGHT	X
		SHEET	1 OF 1

REVISIONS	
LTR.	DATE
DESCRIPTION	



UNLESS OTHERWISE SPECIFIED:
 - ALL CORNER FILLETS AND SHARP EDGES .005/.015 R.
 ① .625 DIA. X .035 X 7.00 TUBING
 ② .625 DIA. X .058 X 2.75 TUBING

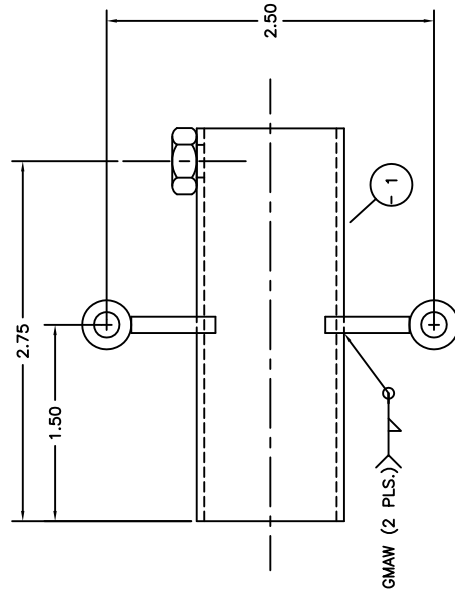
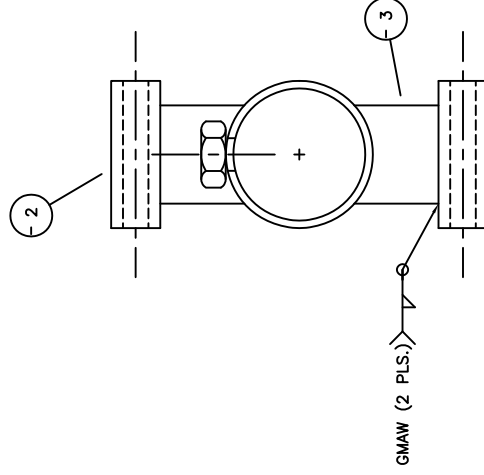
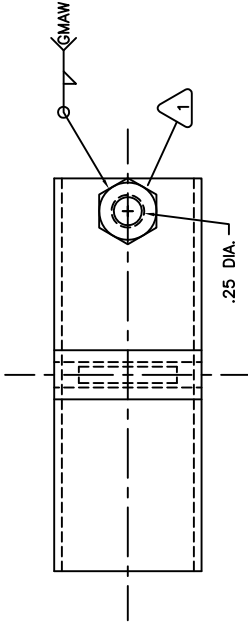
MATERIAL: MILD STEEL AS NOTED		FINISH: POWDER COAT PAINT PER R-101		RRRANS	
PROD. TIME: X	RAW MATL.: AS NOTED	DRAWN: R. HAFFNER	DATE 11.20.93	4600 Highway 183 Alternate, Hays, KS. 67601 USA / Phone (785) 625-6346	
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES		CHECKED:	CERTIFIED DWG. NO.	TITLE "T" LOCK HANDLE	
DECIMALS X ± .1	ANGULAR ± 1°	CHECKED:	SIZE B	KIT DWG. NO. N/A	
.XX ± .05		APPROVED:	SCALE 1 = 1	WEIGHT X	SHEET 1 OF 1
.XXX ± .010					REV. N/A
DO NOT SCALE DRAWING		NEXT ASSY. USED ON QTY.		KP-107	
APPLICATION					

REVISIONS

DESCRIPTION

L.T.R.

DATE



ITEM NO.	DESCRIPTION	CUT LENGTH	MATERIAL	MISC. NOTES
1	1	NUT AN345-416	-	-
-3	2	.125 X .750 FLAT BAR	4130 STEEL	PER MIL-S-6758
-2	2	.375 DIA. X .090 TUBING	4130 STEEL	PER MIL-T-6736
-1	1	1.125 DIA. X .056 TUBING	4130 STEEL	PER MIL-T-6736

S/N:	FINISH:	DATE	TITLE
		4.10.96	PAINT STAND
SUPERSEDES: N/A	DRAWN: J. BILES	4.10.96	4600 Highway 183 Alternate, Hays, KS. 67601 USA / Phone (913) 625-6346
SUPERSEDED BY: N/A	CHECKED: R. HAFFNER	4.10.96	
DO NOT SCALE DRAWING	CHECKED: R.L.	4.11.96	
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES	APPROVED: R. IDBEIS	4.12.96	
TOLERANCES			
DECIMALS ± .05			
XX ± .01			
XXX ± .005			
ANGULAR ± 1°			
SIZE B	DWG. NO. KP-108	SCALE 1 = 1	WEIGHT X
REV. N/A	SHEET 1	OF 1	



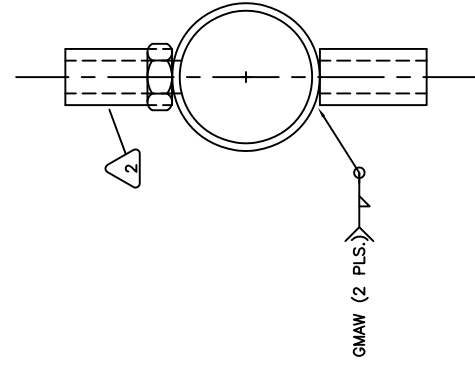
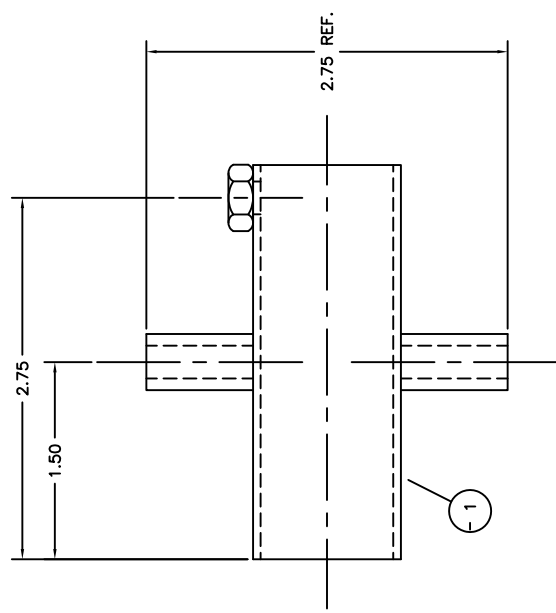
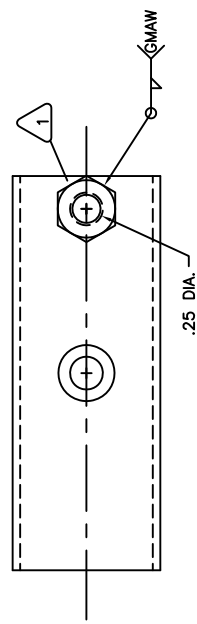
- ALL CORNER FILLETS AND SHARP EDGES .005/.015 R. UNLESS OTHERWISE SPECIFIED:

REVISIONS

DESCRIPTION

LTR.

DATE

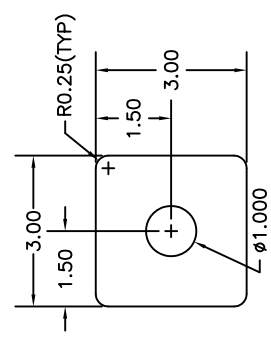
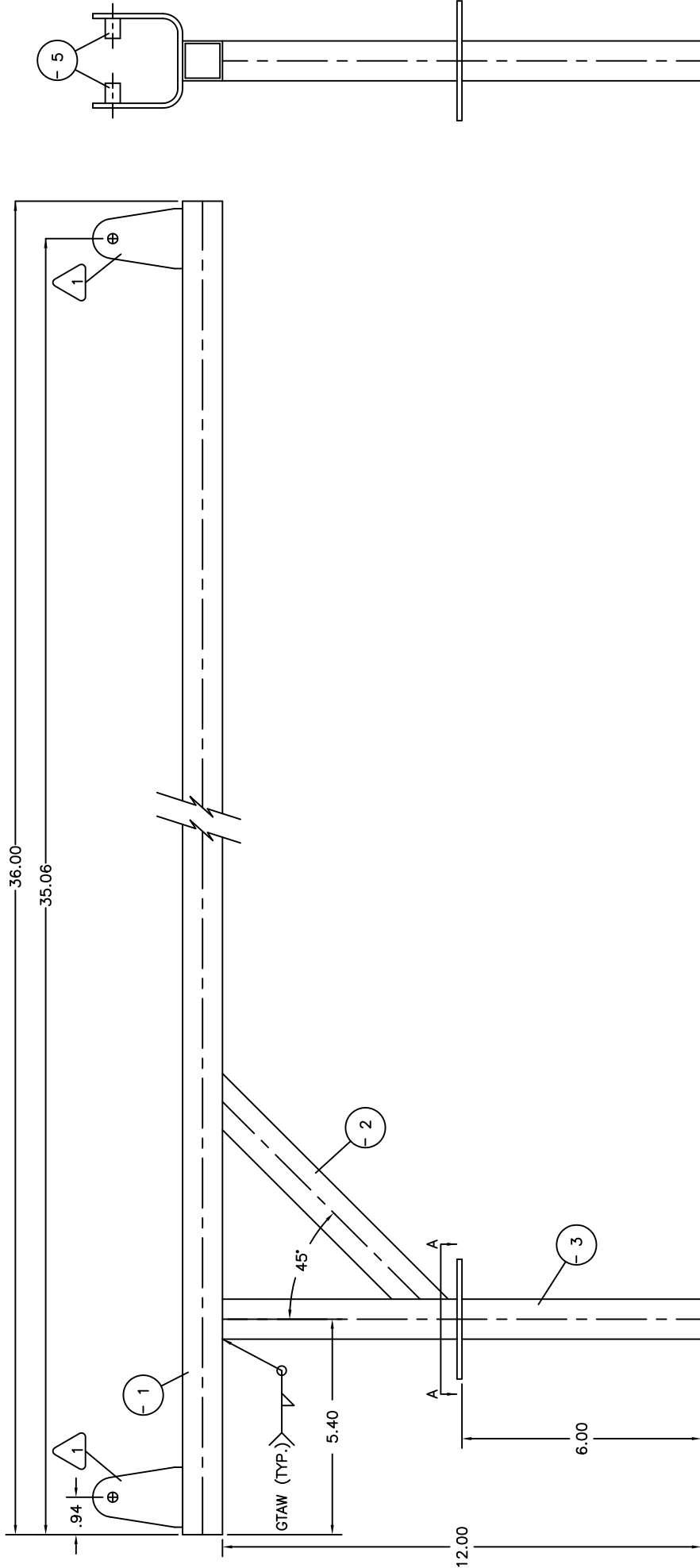


GMAW (2 PLS.)

2	2	INSERT NUT KPAC0012	-	-	-	-	-
1	1	NUT AN345-416	-	-	-	-	-
-1	1	1.125 DIA. X .058 TUBING	3.00 IN	4130 STEEL	PER MIL-T-6736	-	-
ITEM NO.	REQ'D	DESCRIPTION	CUT LENGTH	TYPE	MATERIAL SPEC.	MISC. NOTES	
S/N:		FINISH:					
SUPERSEDES: N/A		DRAWN: J. BILES	DATE: 4.10.96	TITLE: PAINT STAND			
SUPERSEDED BY: N/A		CHECKED: R. HAFFNER	4.10.96	4600 Highway 183 Alternate, Hoys, KS. 67601 USA / Phone (913) 625-6346			
DO NOT SCALE DRAWING		CHECKED: R.I.	4.11.96	SIZE DWG. NO. KP-109			
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES		APPROVED: R. IDBEIS	4.12.96	SCALE 1 = 1			
DECIMALS: .XX ± .05		NEXT ASSY. USED ON		WEIGHT		REV. N/A	
ANGULAR: ± 1'		APPLICATION		SHEET 1 OF 1			
.XXX ± .005							

RRR

- ALL CORNER FILLETS AND SHARP EDGES .005/.015 R. UNLESS OTHERWISE SPECIFIED:



VIEW A-A
 1 X SCALE

ALL CUT LENGTHS ARE REFERENCE ONLY
 REMOVE ALL BURRS AND SHARP EDGES
 UNLESS OTHERWISE SPECIFIED:

ITEM NO.	DESCRIPTION	CUT LENGTH	MATERIAL	TYPE	QUANTITY	MISC. NOTES
1	2" U-BRACKET - SU-218	-	-	-	-	-
2	.375 DIA. X .058 TUBING	.50 IN.	4130 STEEL	AMS-T-6736A	-	-
3	.125 SHT.	9.00 IN ²	4130 STEEL	MIL-S-18729C	-	-
4	1.000 DIA. X .095 TUBING	12.00 IN.	4130 STEEL	AMS-T-6736A	-	-
5	1.000 SQ. X .065 TUBING	36.00 IN.	4130 STEEL	AMS-T-6736A	-	-

FINISH:
 X X X
 X X X

DRAWN:
 T. BUTLER

CHECKED:
 R.C.H.

DATE
 XX.XX.XX

DATE
 XX.XX.XX

SUPERSEDES: N/A

SUPERSEDED BY: N/A

DO NOT SCALE DRAWING

UNLESS OTHERWISE SPECIFIED:
 DIMENSIONS ARE IN INCHES
 DECIMALS ANGULAR
 .X ± .1
 .XX ± .05
 .XXX ± .010

APPROVED:
 X

ITEM NO. DESCRIPTION CUT LENGTH MATERIAL TYPE QUANTITY MISC. NOTES

S/N: X

MANUFACTURER:
 CONTRACTED BY: N/A

NOTES:

ALL INFORMATION CONTAINED ON THIS DRAWING IS PROPRIETARY TO RAMS INC. REPRODUCTION FOR ANY USE IN ANY WAY FOR OTHER THAN THE PURPOSES IS PROHIBITED WITHOUT THE WRITTEN CONSENT OF RAMS INC. MATERIAL ARE RESERVED.

RRRams
 4600 Highway 183 Alternate, Hoye, KS. 67601 USA / Phone (785) 625-6346

TITLE
 PAINT STAND
 AFT ATTACH FUSELAGE

SIZE
 C

DWG. NO.
 KP-112

SCALE
 1 = 2

WEIGHT
 X

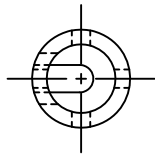
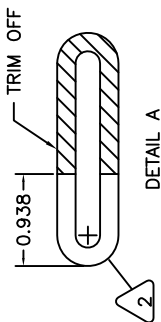
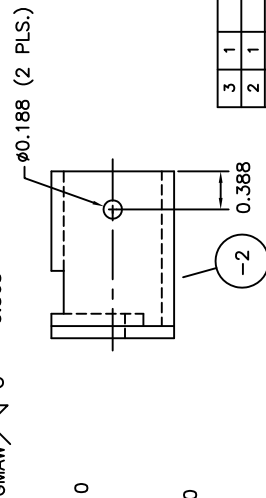
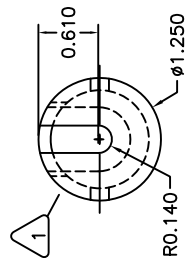
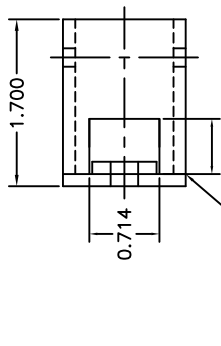
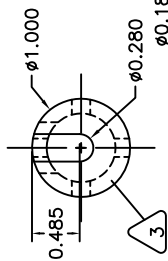
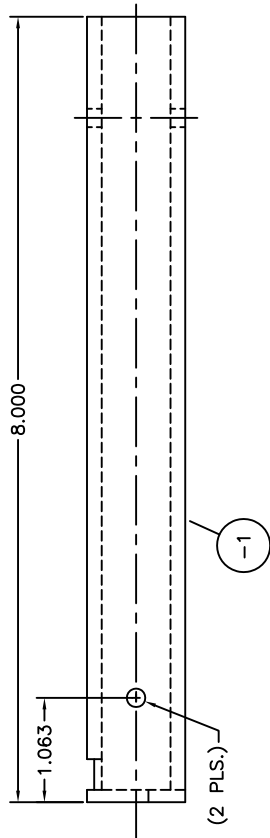
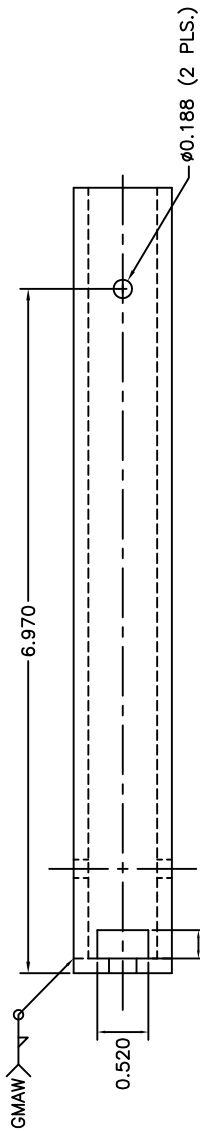
SHEET
 1

OF
 1

REV.
 N/A

NEXT ASSY.	USED ON	QTY.	APPLICATION
S-17	1		

LTR.	REVISIONS
	DESCRIPTION
	DATE



ITEM NO.	DESCRIPTION	CUT LENGTH	TYPE	MATERIAL	SPEC.	MISC. NOTES
3	.125 PLT.	.78 IN. ²	-	-	-	-
2	MOD. KPAC0122	-	-	-	-	SEE DETAIL A
1	.125 PLT.	1.25 IN. ²	-	-	-	-
-2	1.25 DIA. X .120 TUBE	1.45 IN.	-	-	-	-
-1	1.00 DIA. X .15 TUBE	8.00 IN.	-	-	-	-

S/N:	FINISH:	DATE:	7.14.14
SUPERSEDED BY: N/A	DRAWN: A.MCELWAIN	CHECKED:	
DO NOT SCALE DRAWING	UNLESS OTHERWISE SPECIFIED:	DECIMALS:	1
DIMENSIONS:	TOLERANCES:	ANGULAR:	± 1°
XXX:	± .05	XXX:	± .010

ALL INFORMATION CONTAINED ON THIS DRAWING IS PROPRIETARY TO RRAMS INC. REPRODUCTION FOR ANY USE IN ANY WAY WITHOUT THE WRITTEN CONSENT OF RRAMS INC. IS PROHIBITED. ALL RIGHTS ON THIS MATERIAL ARE RESERVED.
MANUFACTURER:
CONTRACTED BY: N/A
NOTES:
NEXT ASSY. USED ON QTY.
APPLICATION

RRRAMS
4600 Highway 183, Altamonte, Hoya, KS. 67601 USA / Phone (913) 625-6346

WING TIP PIVOT

SIZE DWG. NO. KP-117

SCALE 1 = 1 WEIGHT .XX lb. SHEET 1 OF 1 REV. N/A

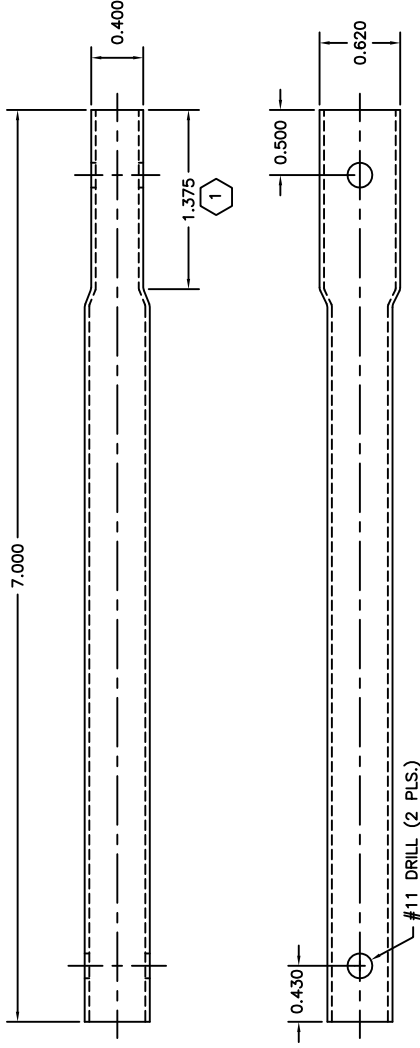
- REMOVE ALL BURRS AND SHARP EDGES UNLESS OTHERWISE SPECIFIED:

REVISIONS

LTR.

DESCRIPTION

DATE



- 1 SMASH END FROM DIMENSION
- ALL CORNER FILLETS AND SHARP EDGES .005/.015 R. UNLESS OTHERWISE SPECIFIED:

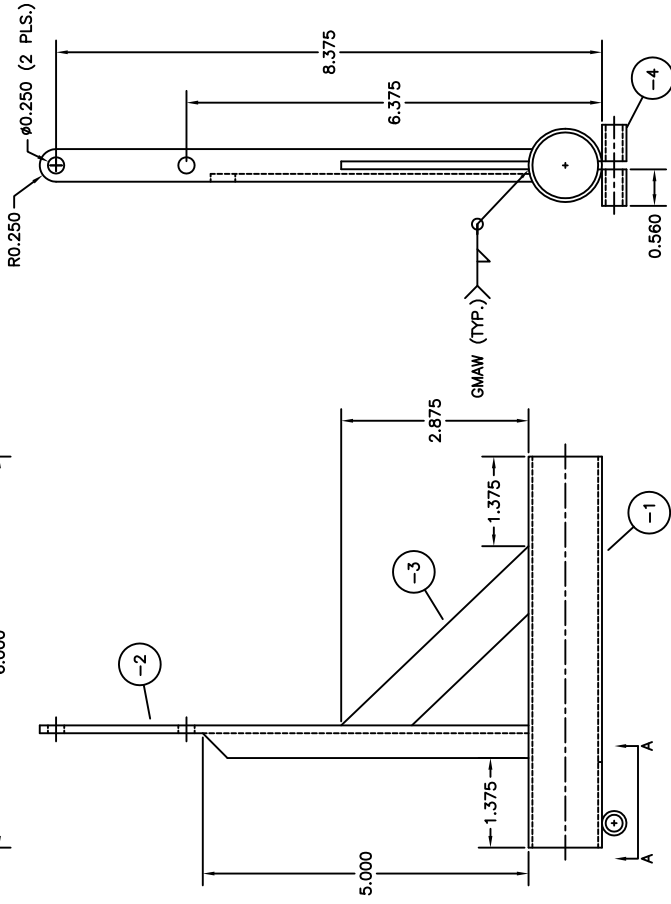
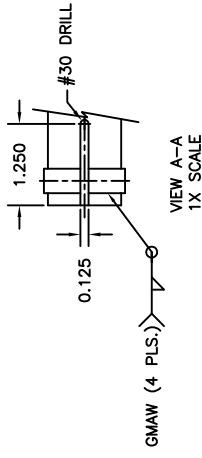
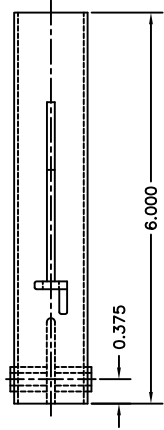
-1	1	.50 DIA. X .035 TUBING	7.00 IN	4130 STEEL	AMS-T-6736A	-
ITEM NO.	REQ'D.	DESCRIPTION	CUT LENGTH	TYPE	SPEC.	MISC. NOTES
S/N:						
SUPERSEDES: N/A		FINISH:	RRANBS			
SUPERSEDED BY: N/A		DATE	4600 Highway 183 Alternate, Hoye, KS. 67601 USA / Phone (913) 625-6346			
DRAWN: A.MCELWAIN		DATE	TITLE			
CHECKED:		7.29.14	PAINT STAND - AILERON ATTACH			
DO NOT SCALE DRAWING		SIZE				
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES		B				
TOLERANCES		DWG. NO. KP-118				
DECIMALS ± .05		SCALE 1 = 1				
ANGULAR ± 1°		WEIGHT X				
.XXX ± .005		SHEET 1 OF 1				
NEXT ASSY. USED ON	QTY.	REV. N/A				
APPLICATION						

REVISIONS

DESCRIPTION

LTR.

DATE



ITEM NO.	NO. RECD.	DESCRIPTION	CUT LENGTH	TYPE	MATERIAL	MISC. NOTES
-4	2	1.125 DIA X .058 TUBE	.56 IN.	4130 STEEL	AMS-T-6736A	-
-3	1	.125 X .75 REC. BAR	4.0 IN.	MILD STEEL	-	-
-2	1	.50 X .50 X .120 ANGLE	7.5 IN.	4130 STEEL	MIL-S-6758	-
-1	1	1.125 DIA X .058 TUBE	6.0 IN.	4130 STEEL	AMS-T-6736A	-

S/N:		FINISH:	
SUPERSEDES: N/A		DRAWN: A.MICELWAIN	
SUPERSEDED BY: N/A		CHECKED:	
DATE: 7.30.14		CHECKED:	
DO NOT SCALE DRAWING		APPROVED: X	
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES		TOLERANCES	
DECIMALS ± .01		ANGULAR ± 1	
XX ± .05		XX.XX ± .010	
NEXT ASSY. USED ON		QTY.	
APPLICATION			

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MANUFACTURER: CONTRACTED BY: N/A

NOTES:

REMOVE ALL BURRS AND SHARP EDGES UNLESS OTHERWISE SPECIFIED:

RRR

4600 Highway 183 Alternate, Hays, KS. 67601 USA / Phone (785) 625-6346

TITLE: ELEVATOR ROOT ATTACH

SIZE: B DWG. NO. KP-119

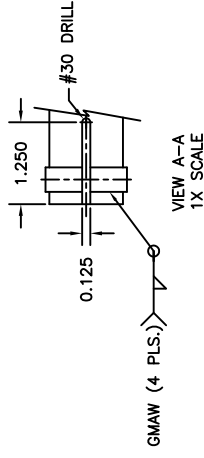
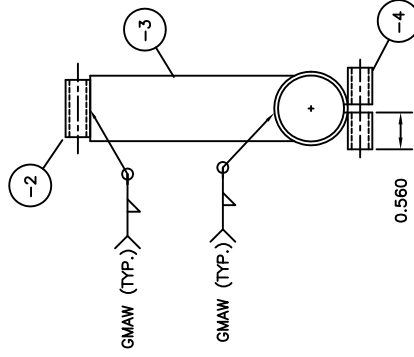
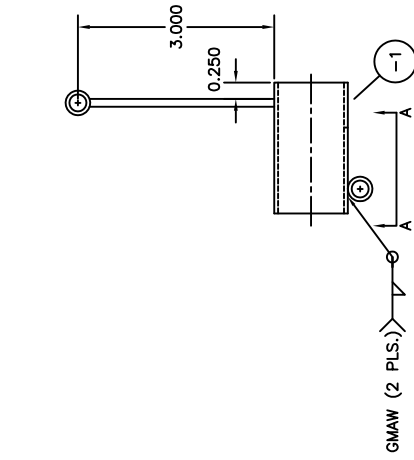
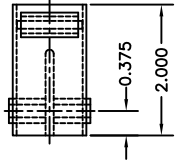
SCALE: 1 = 2 WEIGHT .XX lb SHEET 1 OF 1 REV. N/A

REVISIONS

DESCRIPTION

LTR.

DATE



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MANUFACTURER:
CONTRACTED BY: N/A

NOTES:

- REMOVE ALL BURRS AND SHARP EDGES UNLESS OTHERWISE SPECIFIED:

FINISH:	
DRAWN:	A.MCELWAIN
CHECKED:	
DATE:	7.30.14
SUPERSEDES:	N/A
SUPERSEDED BY:	N/A
DO NOT SCALE DRAWING	
UNLESS OTHERWISE SPECIFIED:	
DIMENSIONS ARE IN INCHES	
TOLERANCES	
DECIMALS	± .05
XX	± .10
XXX	± .10
ANGULAR	± 1°
APPROVED:	X
SCALE	1 = 2
WEIGHT	.XX lb
SHEET	1 OF 1
REV.	N/A

ITEM NO.	DESCRIPTION	CUT LENGTH	MATERIAL	MISC. NOTES
-4	2 1.125 DIA. X .058 TUBE	.56 IN.	4130 STEEL	AMS-T-6736A -
-3	1 .125 X 1.0 REC. BAR.	3.12 IN.	MILD STEEL	-
-2	1 .375 DIA. X .058 TUBE	.88 IN.	4130 STEEL	MIL-S-6758 -
-1	1 1.125 DIA. X .058 TUBE	2.0 IN.	4130 STEEL	AMS-T-6736A -

RRAINS
4600 Highway 183 Alternate, Hays, KS. 67801 USA / Phone (785) 625-6346

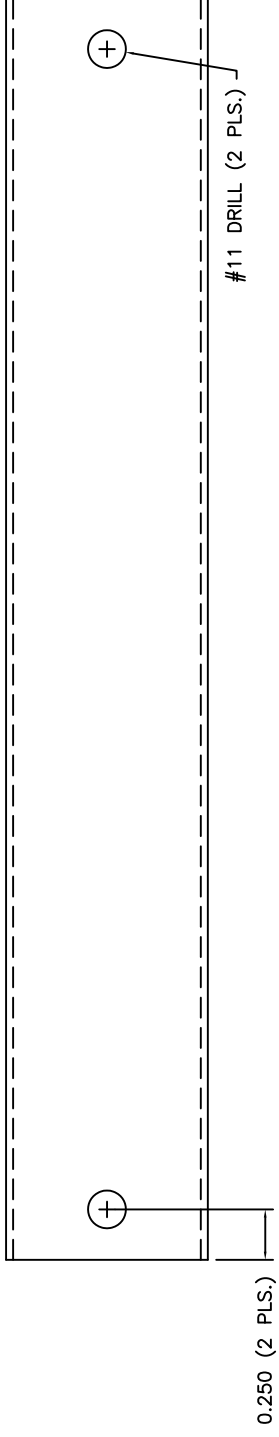
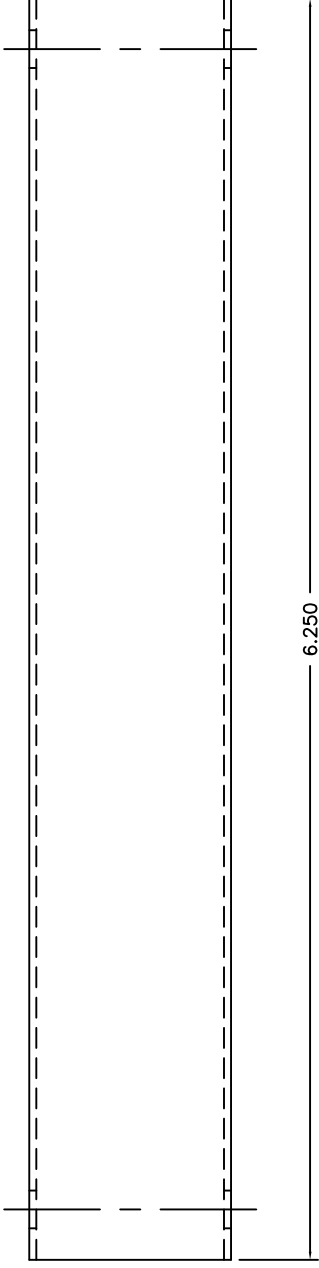
TITLE
ELEVATOR OUTER ATTACH

SIZE
B

DWG. NO.
KP-120

SCALE	1 = 2	WEIGHT	.XX lb	SHEET	1 OF 1	REV.	N/A
-------	-------	--------	--------	-------	--------	------	-----

REVISIONS	
LTR.	DATE



- REMOVE ALL BURRS AND SHARP EDGES
UNLESS OTHERWISE SPECIFIED:

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MANUFACTURER:

CONTRACTED BY: N/A

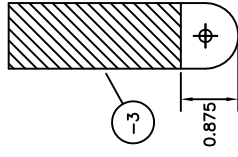
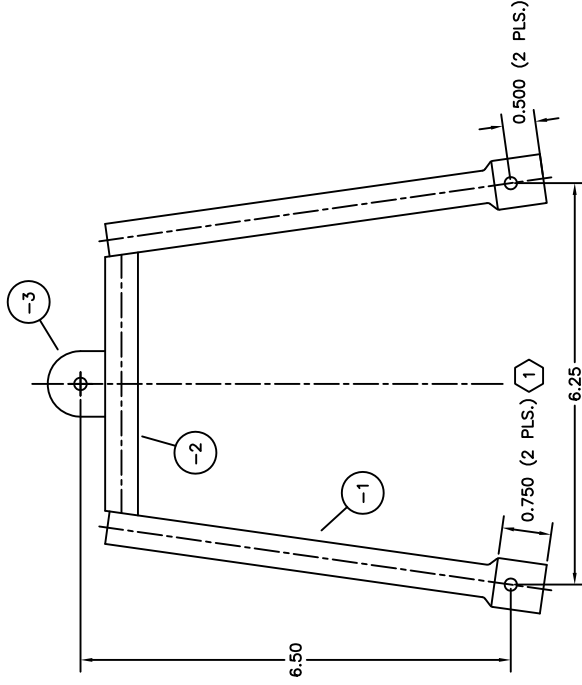
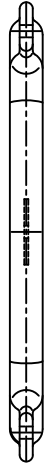
NOTES:

-1	1	1.0 X 1.0 X .035 SQ. TUBE	6.25 IN.	4130 STEEL	AMS-T-6736A	-
ITEM NO.	REQ'D	DESCRIPTION	CUT LENGTH	TYPE	MATERIAL	MISC. NOTES
S/N:						
SUPERSEDES: N/A		DATE	FINISH:			
SUPERSEDED BY: N/A		8.04.14	DRAWN: A.MCELLWAIN			
DO NOT SCALE DRAWING		CHECKED:	CHECKED:			
UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES		APPROVED:	APPROVED:			
DECIMALS ± .1		TITLE				
.X ± .1		4600 Highway 183 Alternate, Hays, KS. 67601 USA / Phone (913) 625-6346				
.XX ± .05		UPPER RUDDER SUPPORT TUBE				
.XXX ± .010		SIZE DWG. NO. KP-121				
NEXT ASSY.		USED ON	QTY.	SCALE 1 = 1		
APPLICATION		WEIGHT .XX lb.		SHEET 1	OF 1	REV. N/A

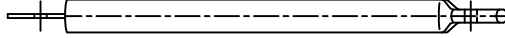


REVISIONS

LTR.	DESCRIPTION	DATE



DETAIL A
1X SCALE



ITEM NO.	DESCRIPTION	CUT LENGTH	MATERIAL	MISC. NOTES
-3	1 MOD. CS-SP	-	-	SEE DETAIL A
-2	1 .50 DIA. X .035 TUBE	4.00 IN.	4130 STEEL	AMS-T-6736A
-1	2 .50 DIA. X .035 TUBE	6.70 IN.	4130 STEEL	AMS-T-6736A

S/N: _____

FINISH: _____

DATE: 8.05.14

DRAWN: A. MCELWAIN

CHECKED: _____

APPROVED: _____

CONTRACTED BY: N/A

MANUFACTURER: _____

CONTRACTED BY: N/A

NOTES:

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UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES DECIMALS ANGULAR ± .1° ± .05° ± .010

SMASH END
- REMOVE ALL BURRS AND SHARP EDGES UNLESS OTHERWISE SPECIFIED:

1

NEXT ASSY. USED ON QTY. APPLICATION

DO NOT SCALE DRAWING

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES DECIMALS ANGULAR ± .1° ± .05° ± .010

RRRANIS

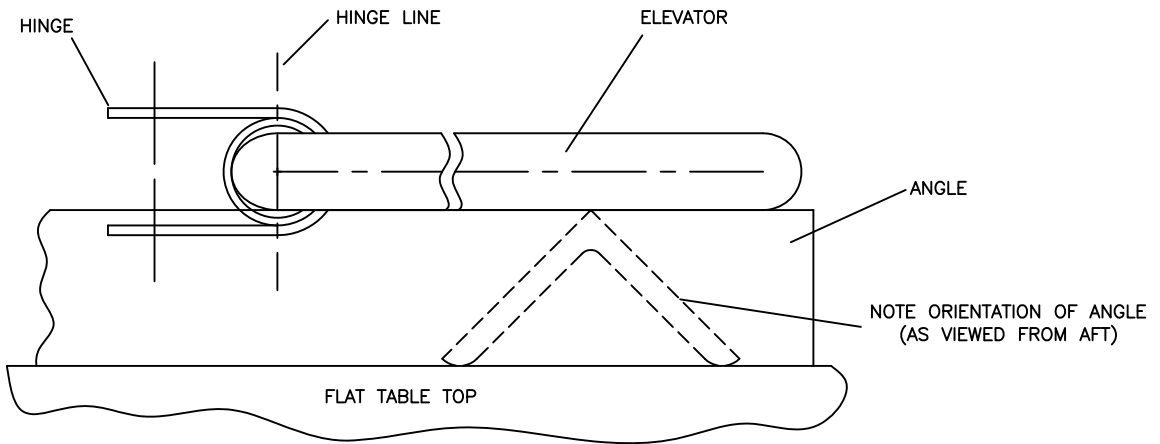
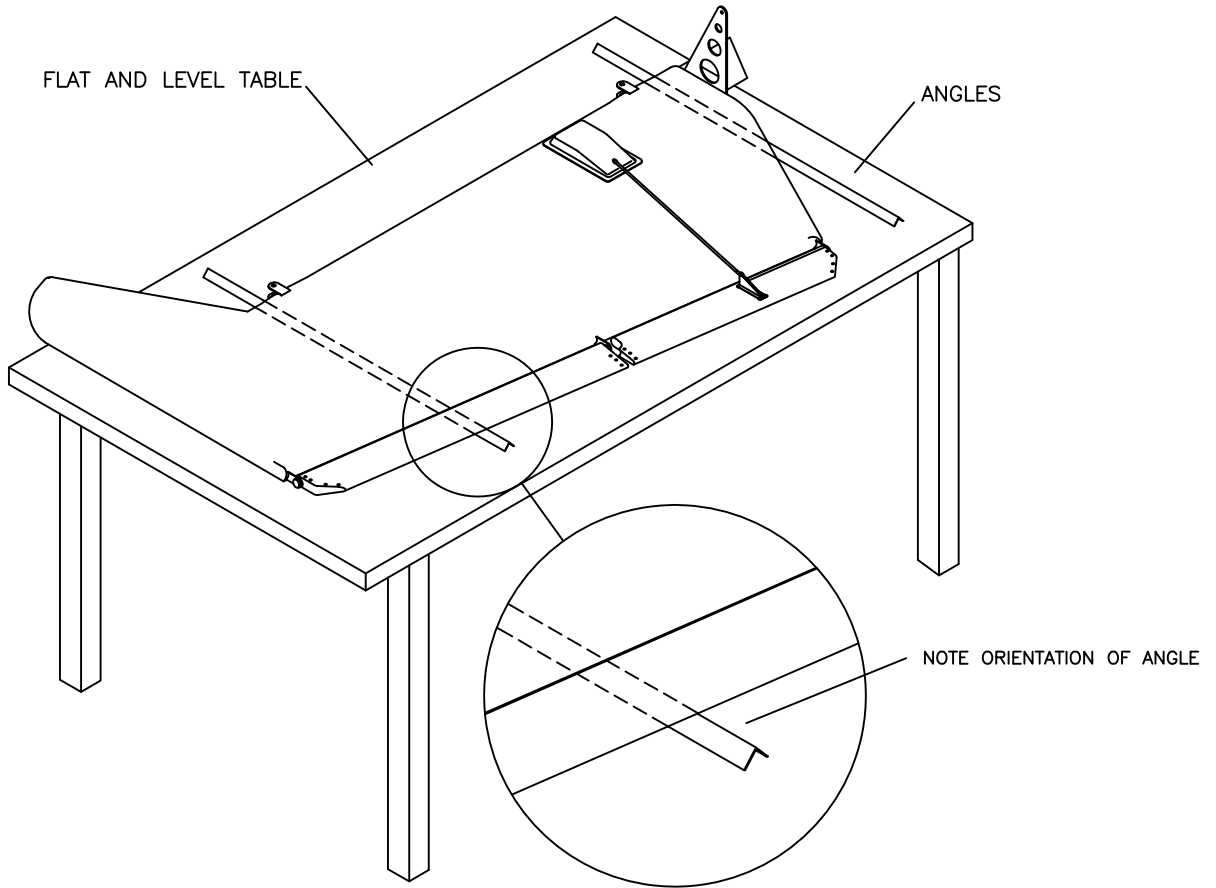
4600 Highway 183 Alternate, Hays, KS. 67601 USA / Phone (785) 625-6346

TITLE: LOWER RUDDER SUPPORT

SIZE: B DWG. NO. KP-122

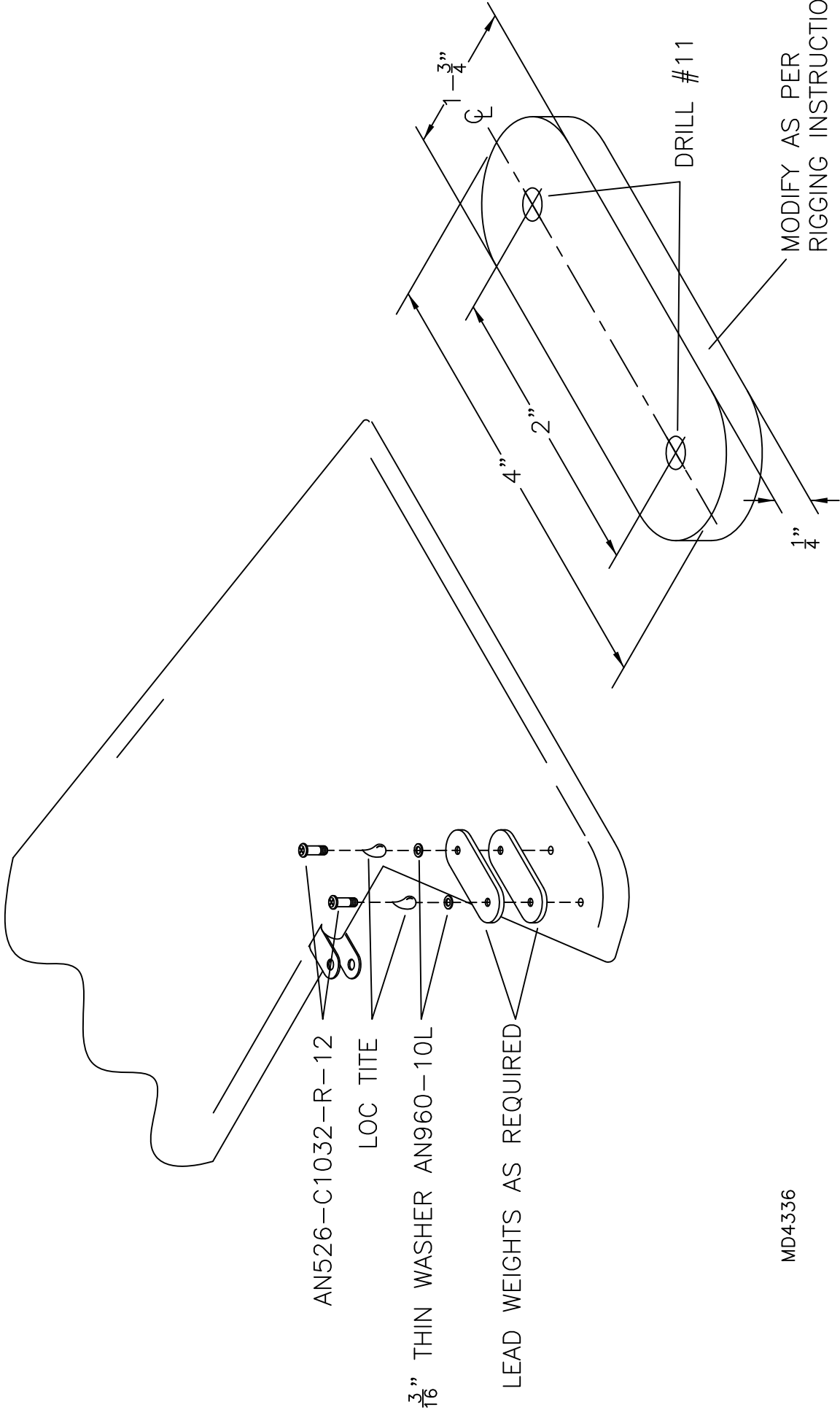
SCALE: 1 = 2 WEIGHT .XX lb SHEET 1 OF 1 REV. N/A

ITEM NO.	DESCRIPTION	CUT LENGTH	MATERIAL	MISC. NOTES
-3	1 MOD. CS-SP	-	-	SEE DETAIL A
-2	1 .50 DIA. X .035 TUBE	4.00 IN.	4130 STEEL	AMS-T-6736A
-1	2 .50 DIA. X .035 TUBE	6.70 IN.	4130 STEEL	AMS-T-6736A



MD4328

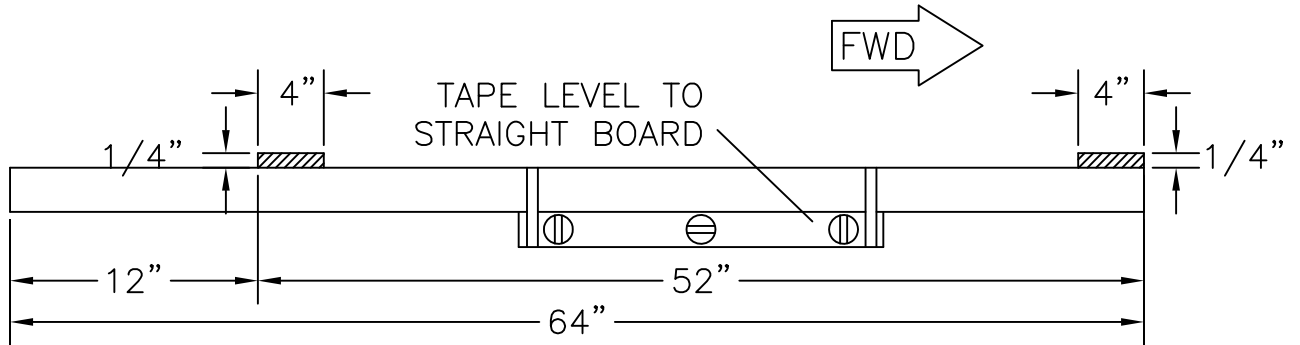
RAMS S-20 RAVEN
ELEVATOR MASS BALANCE
FIGURE 11-03



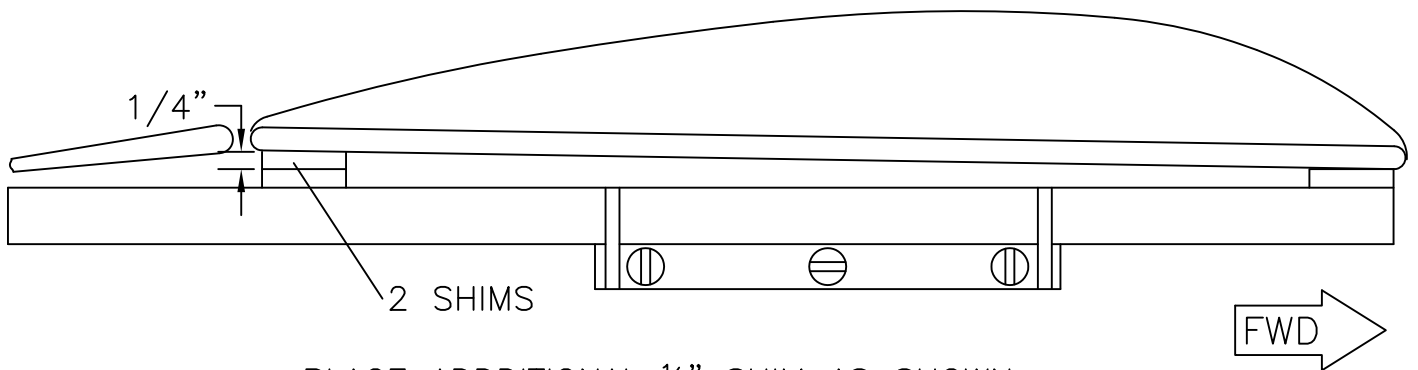
MD4336

RAMB S-20 RAVEN
 ELEVATOR MASS BALANCE
 WEIGHT AND ATTACH
 FIGURE 11-04

NOTE: RH ELEVATOR REQUIRES
 MORE WEIGHT THAN LH ELEVATOR



FIRST, FABRICATE RIGGING LEVEL AS SHOWN AND USE TO LEVEL WING ROOT.



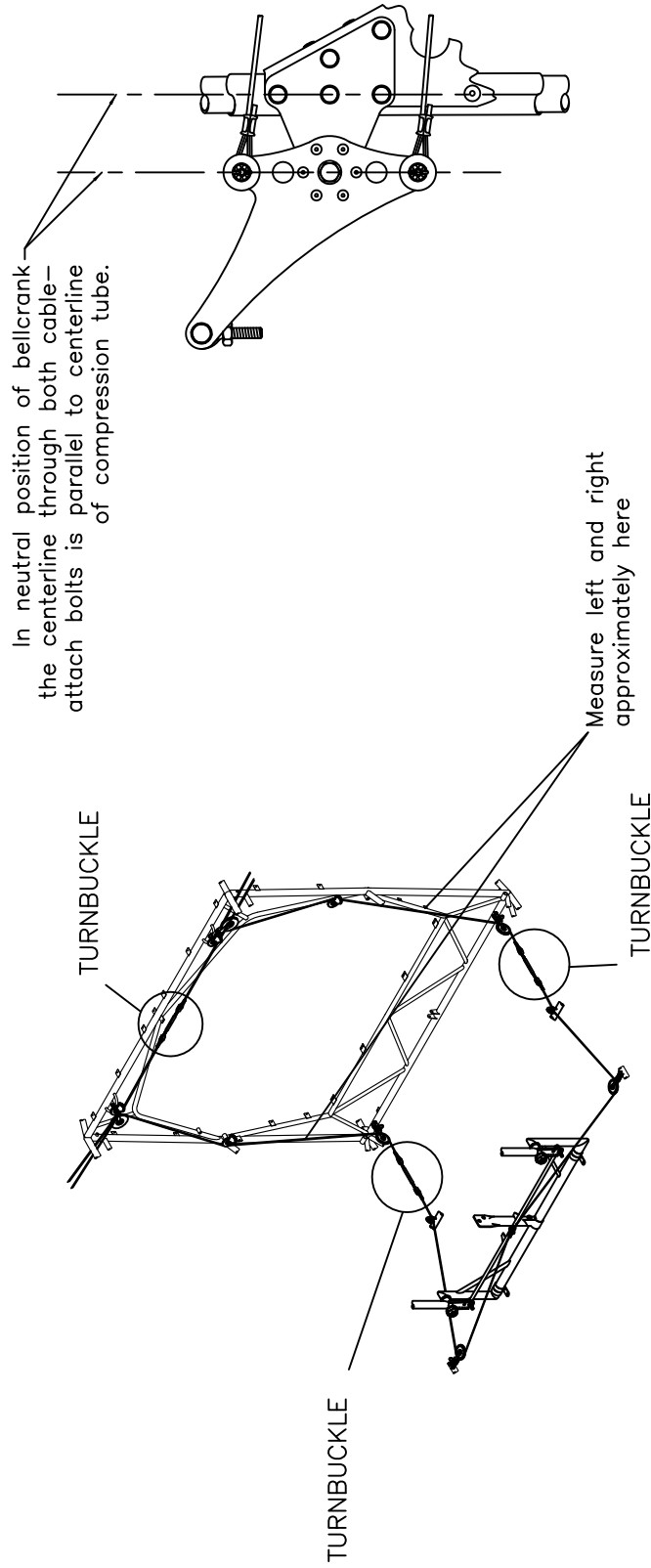
PLACE ADDITIONAL 1/4" SHIM AS SHOWN. WITH LEVEL JUST OUTBOARD OF STRUT ATTACH POINTS, ADJUST REAR STRUT FOR LEVEL READING.

MD4426

RANS S-20 RAVEN
WING WASH OUT RIGGING LEVEL
FIGURE 11A-01

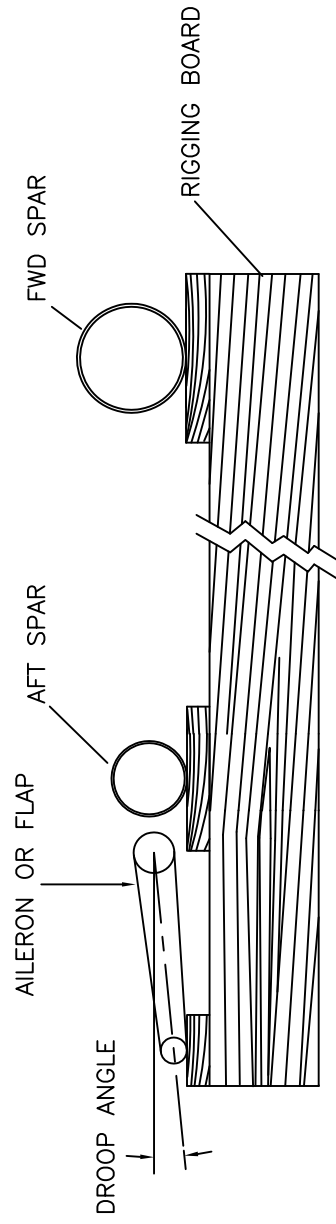
09/01/2013

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)



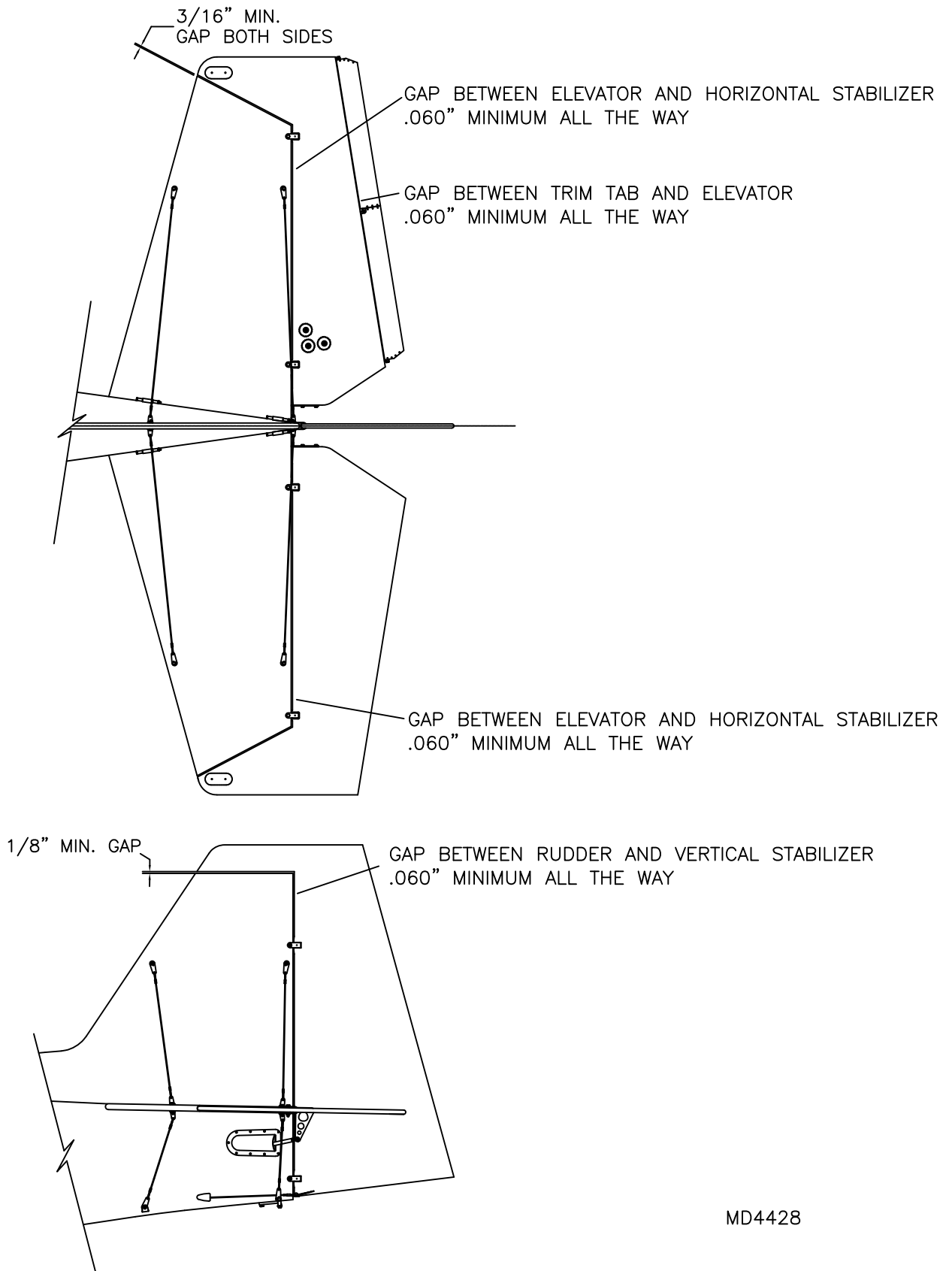
MD4427
 REV. - ORIG

RAVEN S-20 RAVEN
 AILERON RIGGING
 FIGURE 11A-09



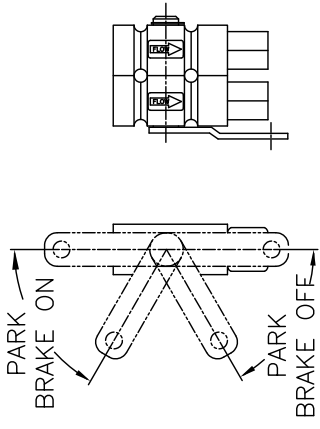
MD4427
REV. - ORIG

RAVEN S-20 RAVEN
AILERON RIGGING BOARD
FIGURE 11A-11



MD4428

**RANS S-20 RAVEN
CONTROL SURFACE RIGGING
CLEARANCES - TAIL
FIGURE 11B-09**



PARK BRAKE
VALVE OPERATION

CABLE HOUSING

"ON" STOP
(SHORT HOSE)

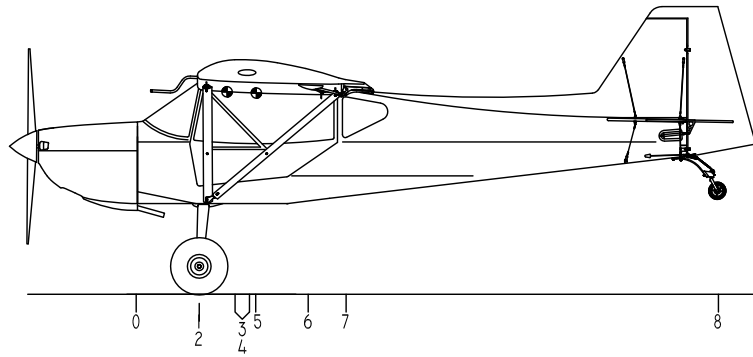
SWIVEL STOP
CONTROL ARM

CONTROL KNOB

FRICTION ADJUSTMENT

RRP S-20 RAVEN
PARK BRAKE RIGGING
FIGURE 11C-04

MD4434



N _____	
DATE WEIGHED	
ENGINE TYPE	ROTAX 912ULS
C.G. CONDITION	
EMPTY WEIGHT	LBS.
GROSS WT.	1320 LBS.

RANS S-20 RAVEN (Taildragger) WEIGHT AND BALANCE

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	34.2	22.0"	752.4
2	MAIN - LH	33.7	22.0"	741.4
3	PILOT	80	37.0"	6660
4	PASSENGER	70	37.0"	6290
5	FUEL - WINGS	156	41.7"	6505.2
6	FUEL - HEADER TANK	16.5	60.0"	990
7	BAGGAGE *	29.5	73.25"	2160.88
9	TAILWHEEL	52	203.0"	10556
TOTAL =		1283	TOTAL =	48100.08

RANGE 34.5" TO 39.5"
RANGE 34.5" TO 39.5"
MAX. 26 GALLON
MAX 2.75 GALLON

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

$$\frac{48100.08}{1283} = 37.49$$

#	ITEM	WEIGHT	ARM	MOMENT
1	MAIN - RH			
2	MAIN - LH			
3	PILOT			
4	PASSENGER			
5	FUEL - WINGS			
6	FUEL - HEADER TANK			
7	BAGGAGE *			
9	TAILWHEEL			
TOTAL =			TOTAL =	

RANGE 34.5" TO 39.5"
RANGE 34.5" TO 39.5"
MAX. 26 GALLON
MAX 2.75 GALLON
MAX 80 POUNDS

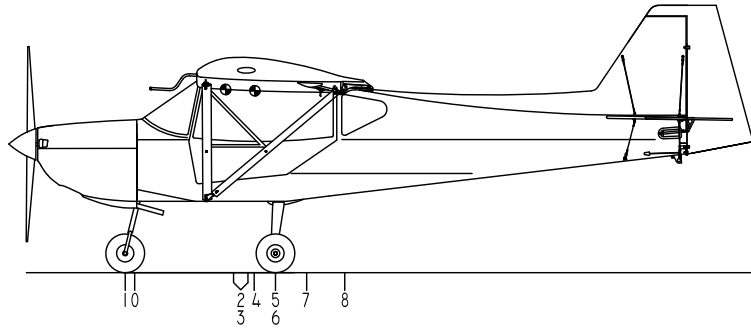
$$\frac{\text{TOTAL MOMENTS}}{\text{TOTAL WEIGHT}} = \text{C.G.}$$

$$\text{_____} =$$

MD5573
REV. B

* ARM CALCULATED AT CENTER OF BAGGAGE COMPARTMENT

RANS S-20 RAVEN WEIGHT & BALANCE STANDARD RANS TAILWHEEL FIGURE 12-01



N _____	
DATE WEIGHED	
ENGINE TYPE	ROTAX 912ULS
C.G. CONDITION	
EMPTY WEIGHT	LBS.
GROSS WT.	1320 LBS.

RAMS S-20 RAVEN (Trike)
WEIGHT AND BALANCE

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

#	ITEM	WEIGHT	ARM	MOMENT	
1	NOSE WHEEL	199	3.2"	-636.8	
2	PILOT	180	37"	6660	RANGE 34.5" TO 39.5"
3	PASSENGER	170	37"	6290	RANGE 34.5" TO 39.5"
4	FUEL - WINGS	36	41.7"	6505.2	MAX. 26 GALLON
5	MAIN - RH	268	49.1"	13158.8	
6	MAIN - LH	264	49.1"	12962.4	
7	FUEL - HEADER TANK	16.5	60.0"	990.0	MAX 2.75 GALLON
8	BAGGAGE *	29.5	73.25"	2160.88	
TOTAL =		1283	TOTAL =	48090.48	

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

$$\frac{48090.48}{1283} = 37.48"$$

#	ITEM	WEIGHT	ARM	MOMENT	
1	NOSE WHEEL				
2	PILOT				RANGE 34.5" TO 39.5"
3	PASSENGER				RANGE 34.5" TO 39.5"
4	FUEL - WINGS				MAX. 26 GALLON
5	MAIN - RH				
6	MAIN - LH				
7	FUEL - HEADER TANK				MAX 2.75 GALLON
8	BAGGAGE *				MAX 80 POUNDS
TOTAL =			TOTAL =		

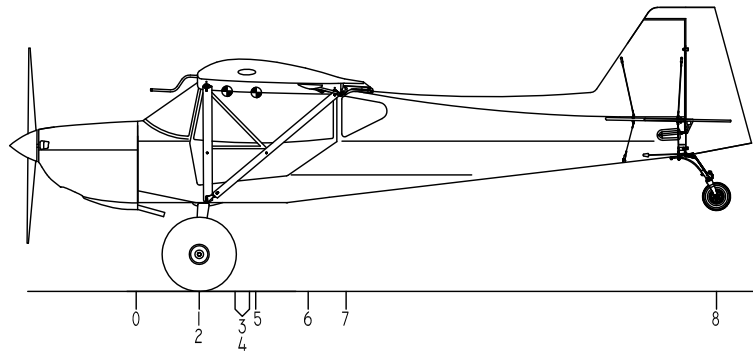
$$\frac{\text{TOTAL MOMENTS}}{\text{TOTAL WEIGHT}} = \text{C.G.}$$

$$\text{_____} = \text{_____}$$

MD5573
REV. B

* ARM CALCULATED AT CENTER OF BAGGAGE COMPARTMANT

RAMS S-20 RAVEN
WEIGHT & BALANCE
TRIKE
FIGURE 12-01A



N _____	
DATE WEIGHED	
ENGINE TYPE	ROTAX 912ULS
C.G. CONDITION	
EMPTY WEIGHT	LBS.
GROSS WT.	1320 LBS.

RANS S-20 RAVEN (Taildragger)
WEIGHT AND BALANCE

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	350	22.0"	7700
2	MAIN - LH	358	22.0"	7876
3	PILOT	80	37.0"	6660
4	PASSENGER	70	37.0	6290
5	FUEL - WINGS	156	41.7"	6505.2
6	FUEL - HEADER TANK	16.5	60.0"	990
7	BAGGAGE *	29.5	73.25"	2160.88
9	TAILWHEEL	60	203.0"	12204
TOTAL =		1320	TOTAL =	50386.08

RANGE 34.5" TO 39.5"
 RANGE 34.5" TO 39.5"
 MAX. 26 GALLON
 MAX 2.75 GALLON

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

$\frac{50386.08}{1320} = 38.17$

#	ITEM	WEIGHT	ARM	MOMENT
1	MAIN - RH			
2	MAIN - LH			
3	PILOT			
4	PASSENGER			
5	FUEL - WINGS			
6	FUEL - HEADER TANK			
7	BAGGAGE *			
9	TAILWHEEL			
TOTAL =			TOTAL =	

RANGE 34.5" TO 39.5"
 RANGE 34.5" TO 39.5"
 MAX. 26 GALLON
 MAX 2.75 GALLON
 MAX 80 POUNDS

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

_____ = _____

MD5573
 REV. B

* ARM CALCULATED AT CENTER OF BAGGAGE COMPARTMANT

RANS S-20 RAVEN
WEIGHT & BALANCE
OPTIONAL 10" TAILWHEEL
FIGURE 12-01B

SAMPLE WEIGHT AND BALANCE RECORD

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

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

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REV. - ORIG

S-20 RAVEN WEIGHT & BALANCE RECORD FIGURE 12-02