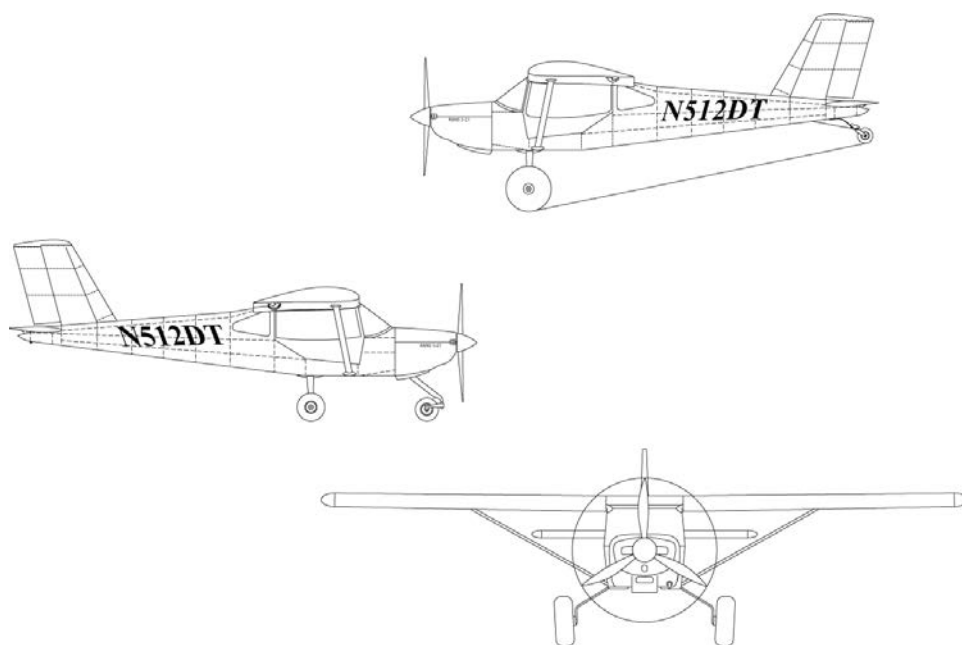


RANS



S-21 OUTBOUND

FIGURES MANUAL



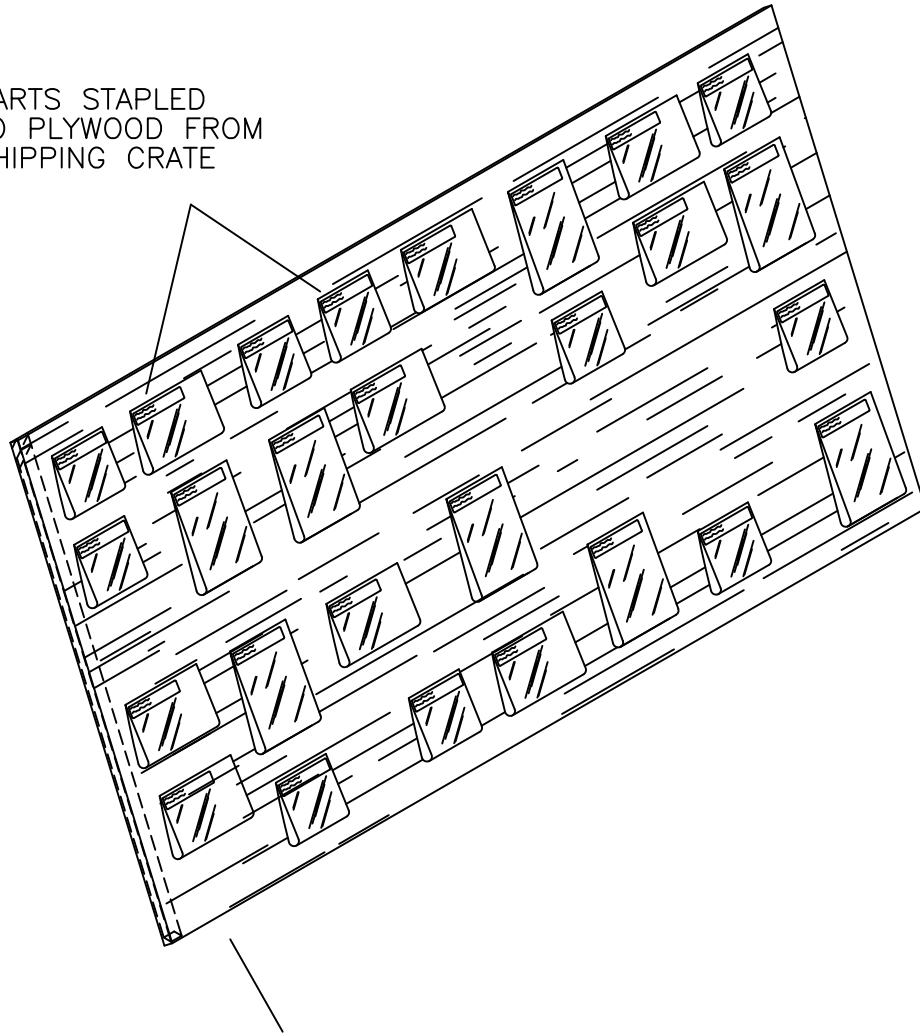
Serial Number: _____

Registration Number: _____

COPYRIGHT © 2017
RANS DESIGNS
4600 HWY 183 Alt
HAYS, KANSAS, USA 67601
785-625-6346
WWW.RANS.COM

This manual conforms to FAA Evaluated date 9/11/2018

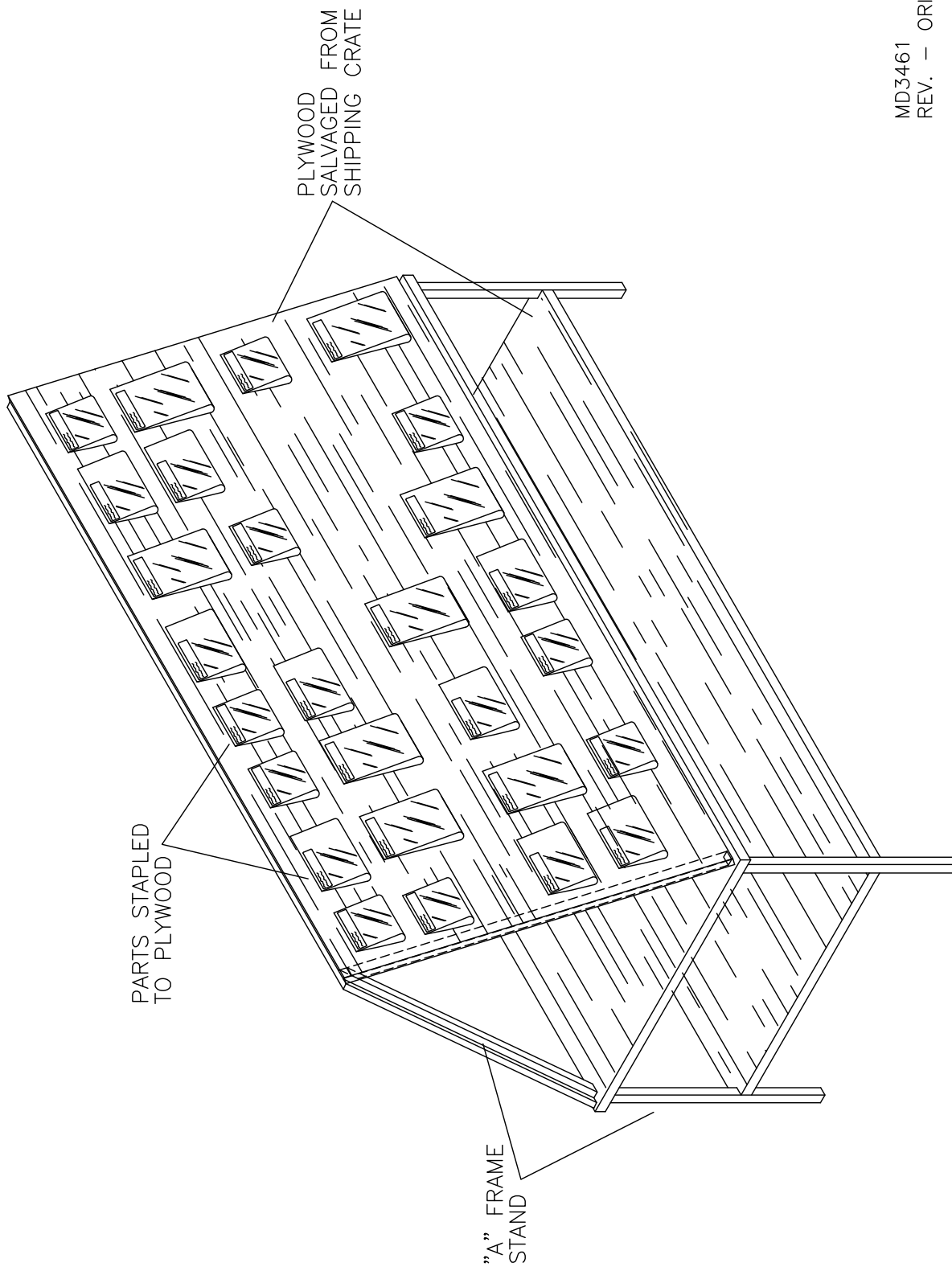
PARTS STAPLED
TO PLYWOOD FROM
SHIPPING CRATE



NAIL BOARD TO
SHOP WALL

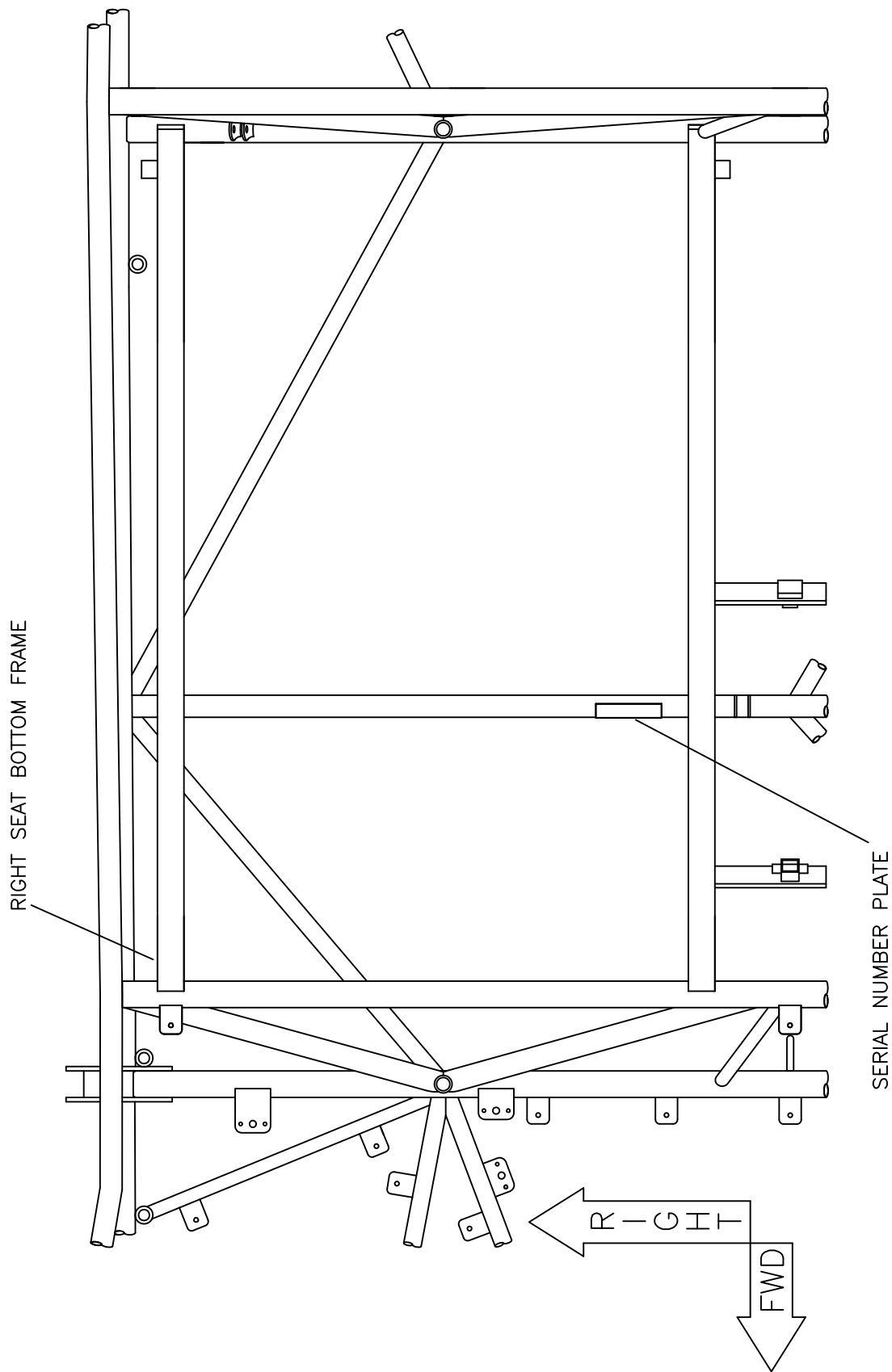
MD4363

RANS S-21 OUTBOUND
PARTS ORGANIZATION
FIGURE 00-01



MD3461
REV. — ORIG

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

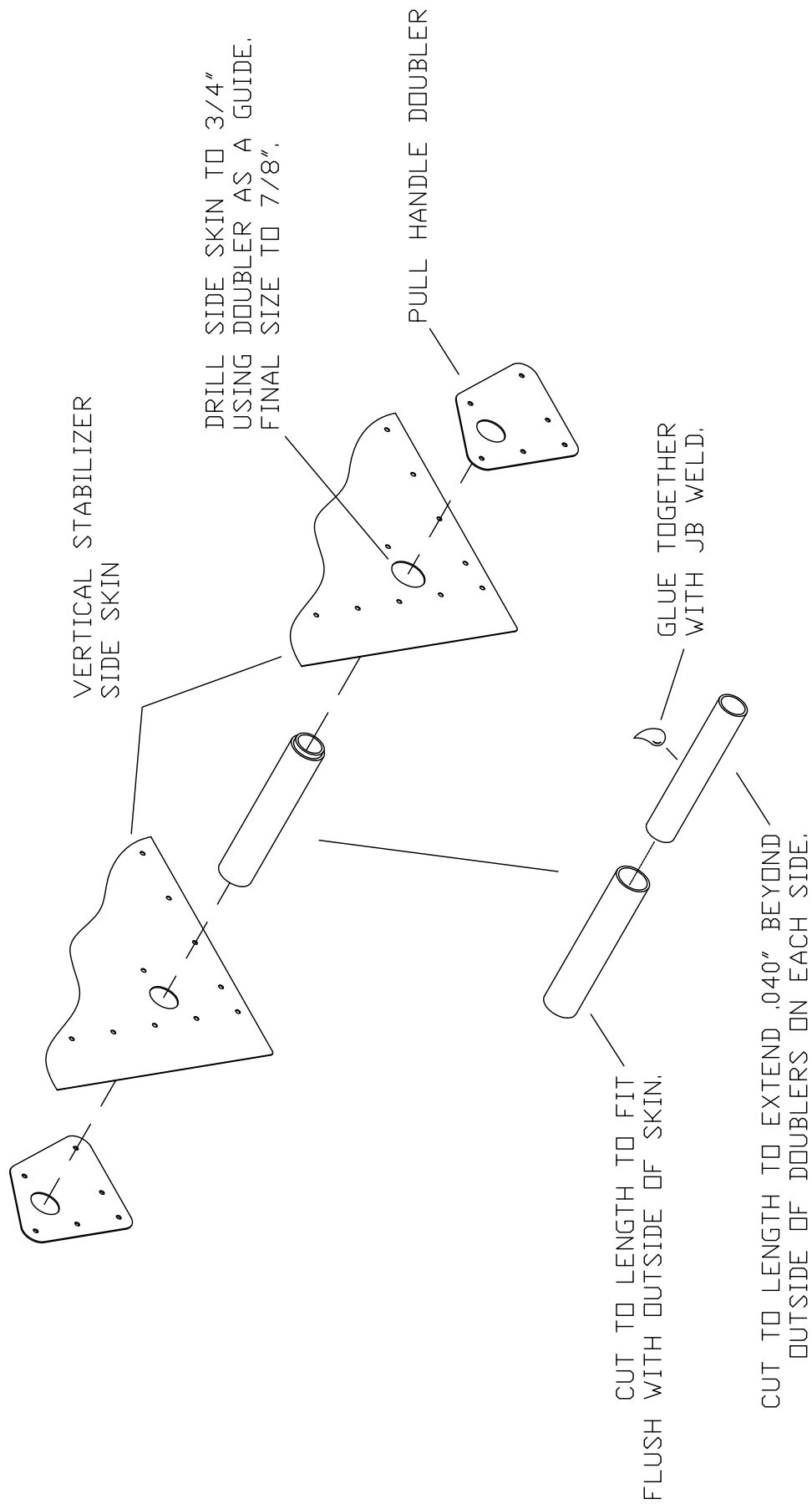


RRM S-21 OUTBOUND
SERIAL NUMBER PLATE LOCATION
FIGURE 00-03

MD5602
 REV. - ORIG

The drawing shows a long, narrow mechanical component, possibly a shaft or a tube, with a central longitudinal hole. The top view (the wider part at the top) shows a rectangular cross-section with rounded corners and a central circular hole. The side view (the long, narrow part) shows a series of circular holes along its length. The drawing is labeled with various numbers and letters, including '42', '44', '46', '48', '50', '52', '54', '56', '58', '60', '62', '64', '66', '68', '70', '72', '74', '76', '78', '80', '82', '84', '86', '88', '90', '92', '94', '96', '98', '100', '102', '104', '106', '108', '110', '112', '114', '116', '118', '120', '122', '124', '126', '128', '130', '132', '134', '136', '138', '140', '142', '144', '146', '148', '150', '152', '154', '156', '158', '160', '162', '164', '166', '168', '170', '172', '174', '176', '178', '180', '182', '184', '186', '188', '190', '192', '194', '196', '198', '200', '202', '204', '206', '208', '210', '212', '214', '216', '218', '220', '222', '224', '226', '228', '230', '232', '234', '236', '238', '240', '242', '244', '246', '248', '250', '252', '254', '256', '258', '260', '262', '264', '266', '268', '270', '272', '274', '276', '278', '280', '282', '284', '286', '288', '290', '292', '294', '296', '298', '300', '302', '304', '306', '308', '310', '312', '314', '316', '318', '320', '322', '324', '326', '328', '330', '332', '334', '336', '338', '340', '342', '344', '346', '348', '350', '352', '354', '356', '358', '360', '362', '364', '366', '368', '370', '372', '374', '376', '378', '380', '382', '384', '386', '388', '390', '392', '394', '396', '398', '400', '402', '404', '406', '408', '410', '412', '414', '416', '418', '420', '422', '424', '426', '428', '430', '432', '434', '436', '438', '440', '442', '444', '446', '448', '450', '452', '454', '456', '458', '460', '462', '464', '466', '468', '470', '472', '474', '476', '478', '480', '482', '484', '486', '488', '490', '492', '494', '496', '498', '500', '502', '504', '506', '508', '510', '512', '514', '516', '518', '520', '522', '524', '526', '528', '530', '532', '534', '536', '538', '540', '542', '544', '546', '548', '550', '552', '554', '556', '558', '560', '562', '564', '566', '568', '570', '572', '574', '576', '578', '580', '582', '584', '586', '588', '590', '592', '594', '596', '598', '600', '602', '604', '606', '608', '610', '612', '614', '616', '618', '620', '622', '624', '626', '628', '630', '632', '634', '636', '638', '640', '642', '644', '646', '648', '650', '652', '654', '656', '658', '660', '662', '664', '666', '668', '670', '672', '674', '676', '678', '680', '682', '684', '686', '688', '690', '692', '694', '696', '698', '700', '702', '704', '706', '708', '710', '712', '714', '716', '718', '720', '722', '724', '726', '728', '730', '732', '734', '736', '738', '740', '742', '744', '746', '748', '750', '752', '754', '756', '758', '760', '762', '764', '766', '768', '770', '772', '774', '776', '778', '780', '782', '784', '786', '788', '790', '792', '794', '796', '798', '800', '802', '804', '806', '808', '810', '812', '814', '816', '818', '820', '822', '824', '826', '828', '830', '832', '834', '836', '838', '840', '842', '844', '846', '848', '850', '852', '854', '856', '858', '860', '862', '864', '866', '868', '870', '872', '874', '876', '878', '880', '882', '884', '886', '888', '890', '892', '894', '896', '898', '900', '902', '904', '906', '908', '910', '912', '914', '916', '918', '920', '922', '924', '926', '928', '930', '932', '934', '936', '938', '940', '942', '944', '946', '948', '950', '952', '954', '956', '958', '960', '962', '964', '966', '968', '970', '972', '974', '976', '978', '980', '982', '984', '986', '988', '990', '992', '994', '996', '998', '1000'. The drawing is a technical illustration of a mechanical part, likely a shaft or a tube, with a central longitudinal hole and a series of smaller holes along its length. The drawing is labeled with various numbers and letters, including '42', '44', '46', '48', '50', '52', '54', '56', '58', '60', '62', '64', '66', '68', '70', '72', '74', '76', '78', '80', '82', '84', '86', '88', '90', '92', '94', '96', '98', '100', '102', '104', '106', '108', '110', '112', '114', '116', '118', '120', '122', '124', '126', '128', '130', '132', '134', '136', '138', '140', '142', '144', '146', '148', '150', '152', '154', '156', '158', '160', '162', '164', '166', '168', '170', '172', '174', '176', '178', '180', '182', '184', '186', '188', '190', '192', '194', '196', '198', '200', '202', '204', '206', '208', '210', '212', '214', '216', '218', '220', '222', '224', '226', '228', '230', '232', '234', '236', '238', '240', '242', '244', '246', '248', '250', '252', '254', '256', '258', '260', '262', '264', '266', '268', '270', '272', '274', '276', '278', '280', '282', '284', '286', '288', '290', '292', '294', '296', '298', '300', '302', '304', '306', '308', '310', '312', '314', '316', '318', '320', '322', '324', '326', '328', '330', '332', '334', '336', '338', '340', '342', '344', '346', '348', '350', '352', '354', '356', '358', '360', '362', '364', '366', '368', '370', '372', '374', '376', '378', '380', '382', '384', '386', '388', '390', '392', '394', '396', '398', '400', '402', '404', '406', '408', '410', '412', '414', '416', '418', '420', '422', '424', '426', '428', '430', '432', '434', '436', '438', '440', '442', '444', '446', '448', '450', '452', '454', '456', '458', '460', '462', '464', '466', '468', '470', '472', '474', '476', '478', '480', '482', '484', '486', '488', '490', '492', '494', '496', '498', '500', '502', '504', '506', '508', '510', '512', '514', '516', '518', '520', '522', '524', '526', '528', '530', '532', '534', '536', '538', '540', '542', '544', '546', '548', '550', '552', '554', '556', '558', '560', '562', '564', '566', '568', '570', '572', '574', '576', '578', '580', '582', '584', '586', '588', '590', '592', '594', '596', '598', '600', '602', '604', '606', '608', '610', '612', '614', '616', '618', '620', '622', '624', '626', '628', '630', '632', '634', '636', '638', '640', '642', '644', '646', '648', '650', '652', '654', '656', '658', '660', '662', '664', '666', '668', '670', '672

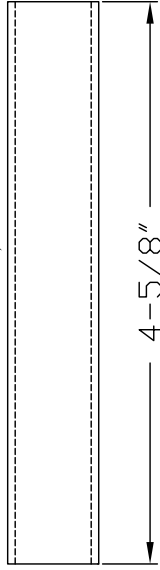
**RAMS S-21 OUTBOUND
VERTICAL STABILIZER SPAR RIVETING
FIGURE 003-03**



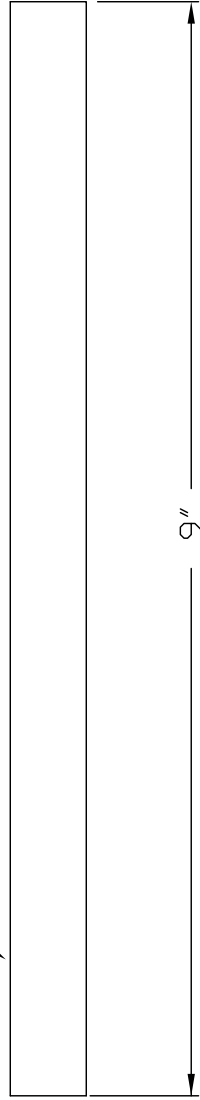
MD5651
REV. A

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

KAAC0106-2

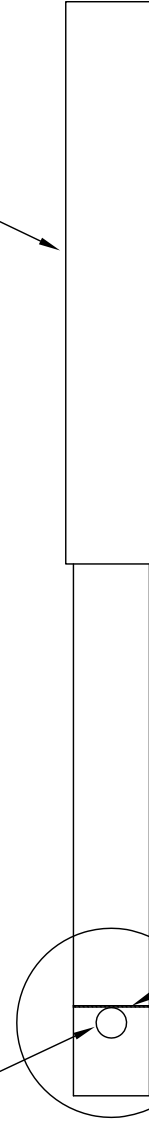


KAAC0106-1

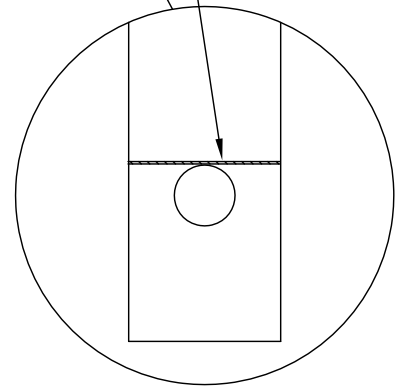


DRILL 1/4"
(ONE SIDE ONLY)
HOLE SHOULD LINE
UP WITH OUTER SIDE
OF PULL HANDLE DOUBLER.

GLUE IN PLACE
WITH JB WELD



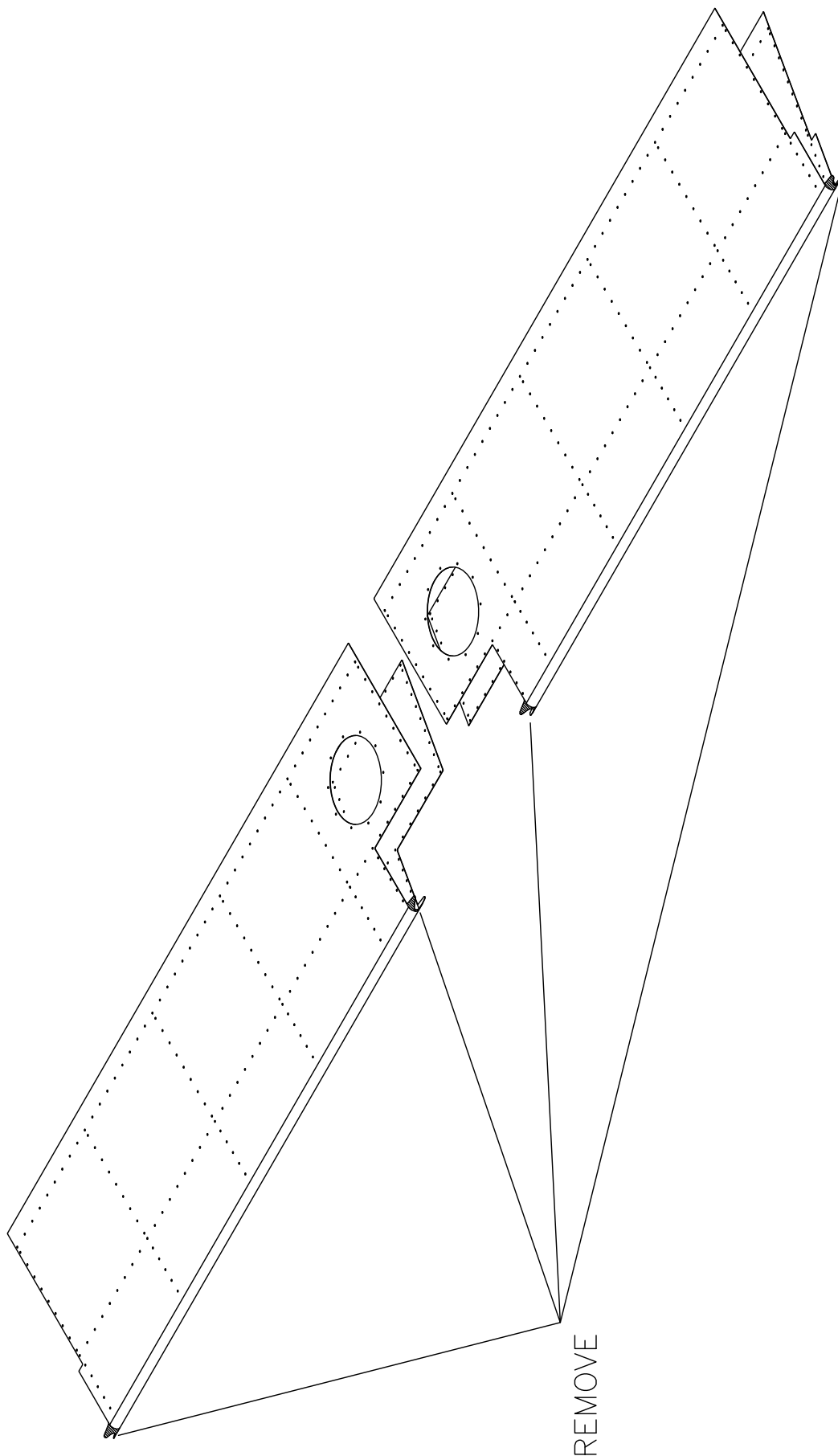
MARK PLACED FLUSH WITH DOUBLER



MD5651
REV. - ORIG

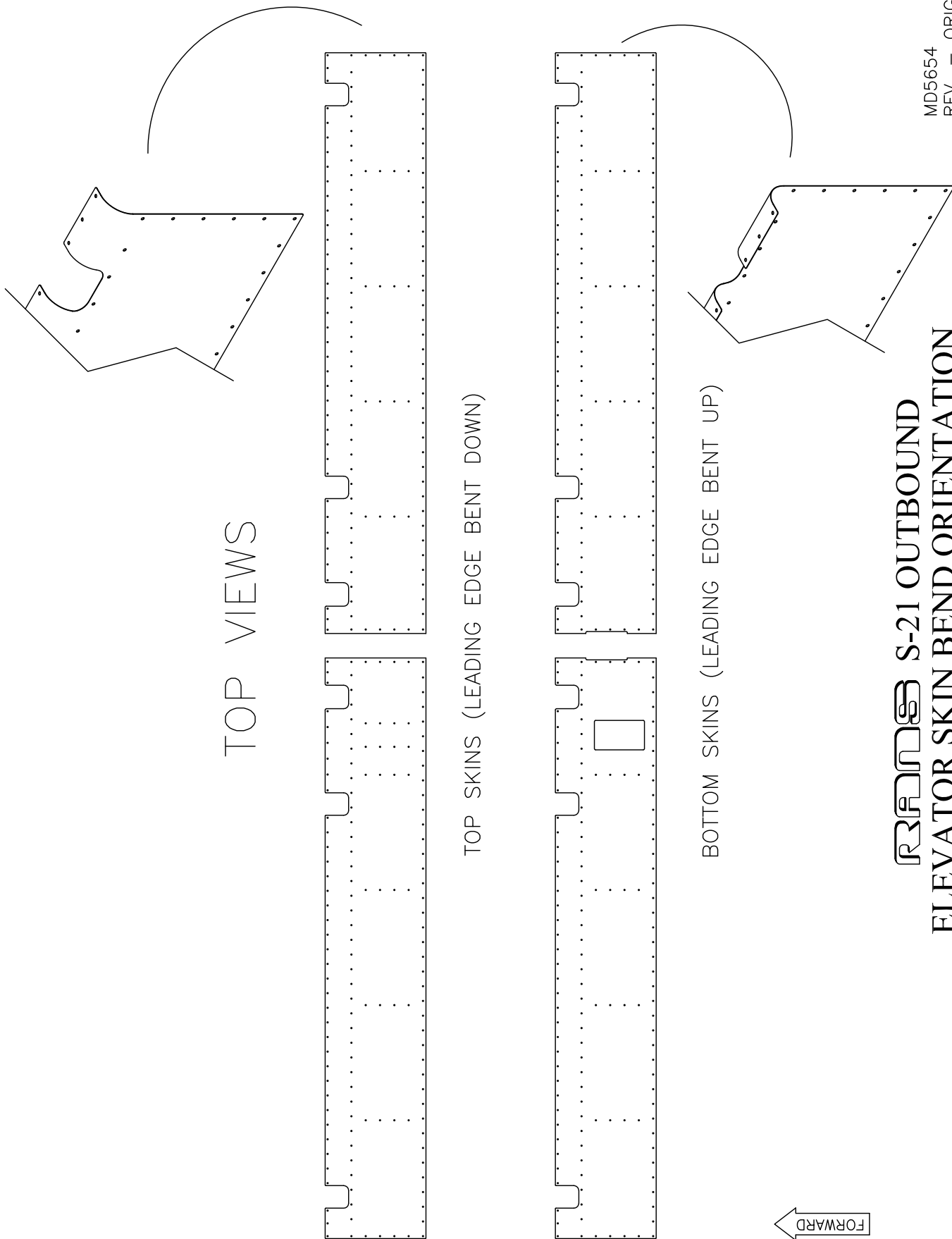
RAM S-21 OUTBOUND PULL HANDLE ASSEMBLY

FIGURE 003-05

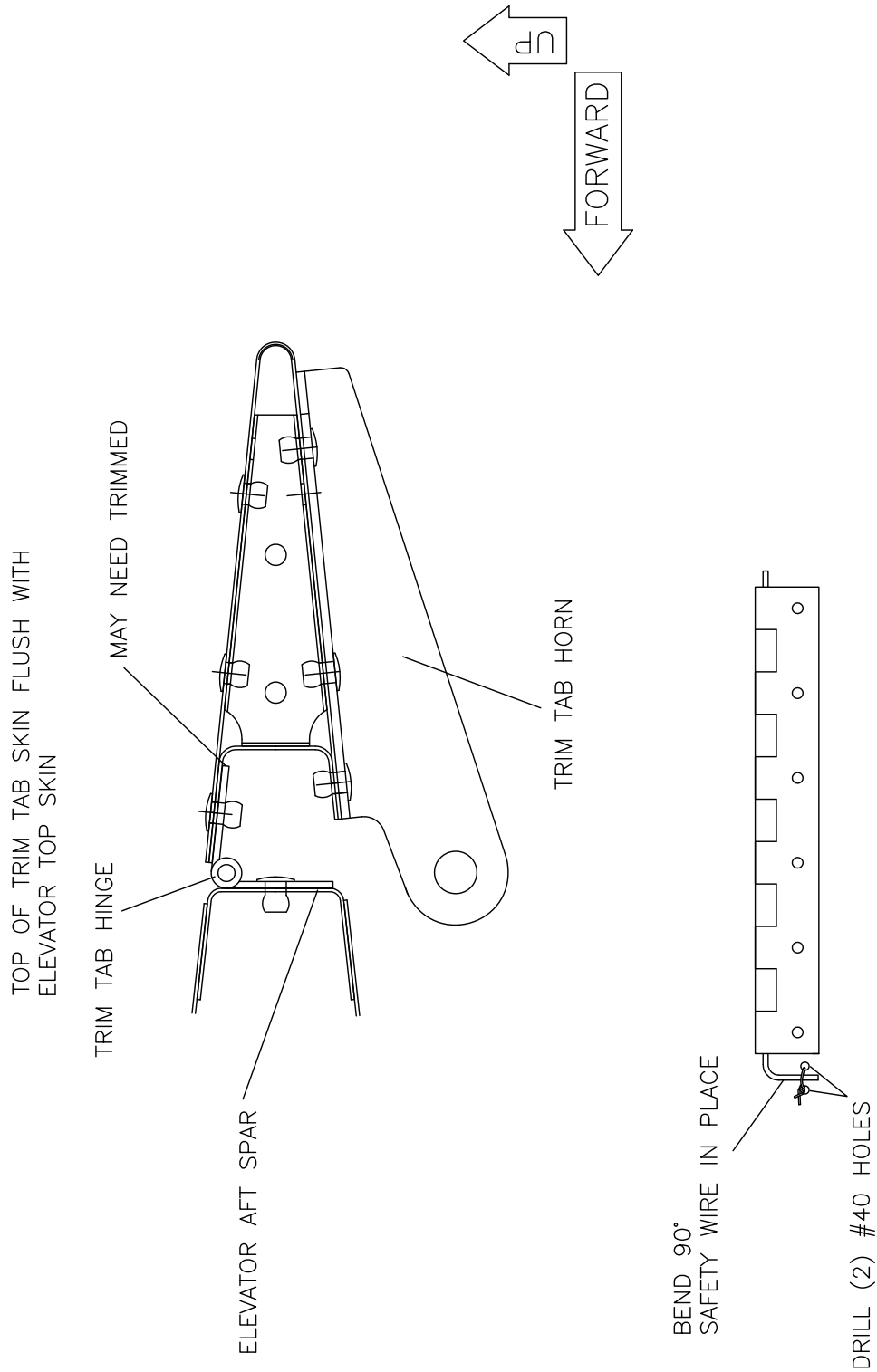


RRF S-21 OUTBOUND
HORIZONTAL SKIN MODIFICATION
FIGURE 04-01

MD5654
 REV. - A

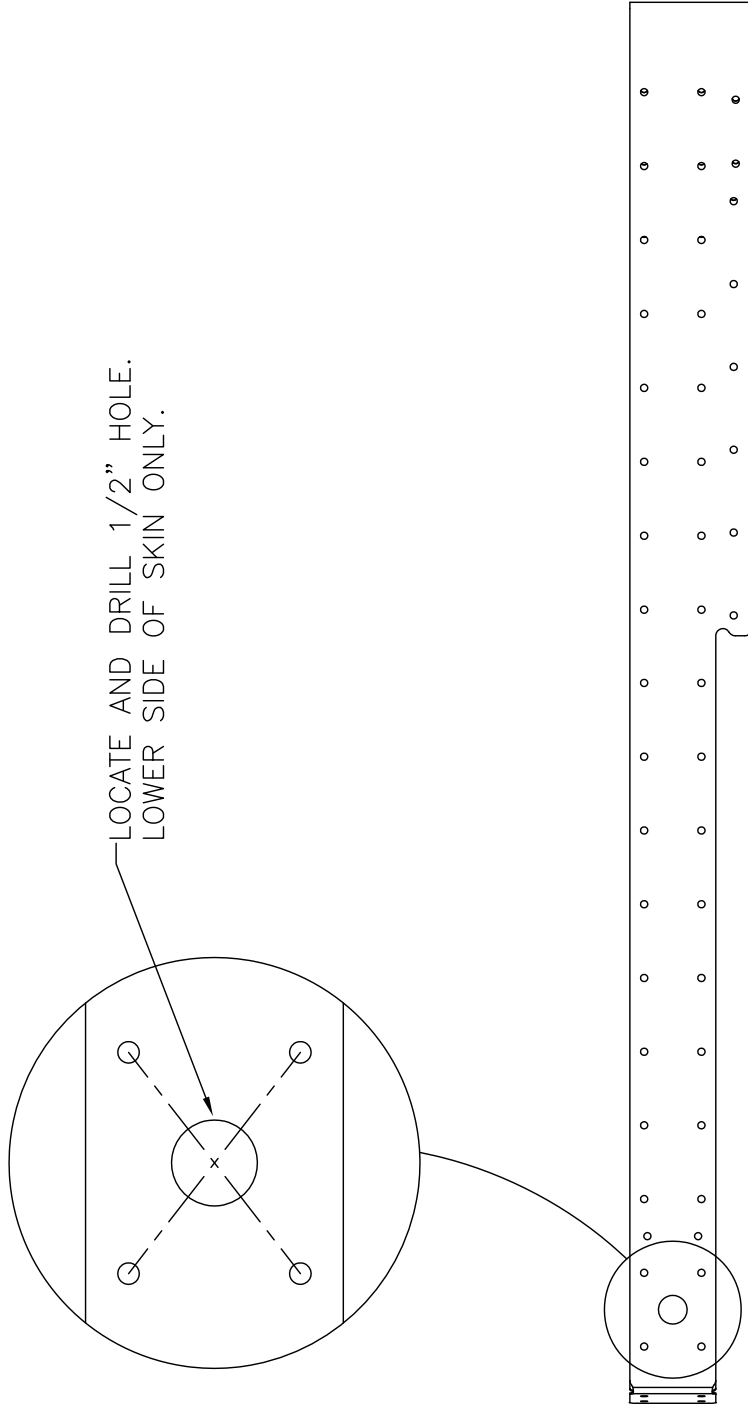


RRAMES S-21 OUTBOUND
ELEVATOR SKIN BEND ORIENTATION
FIGURE 05-01



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

MD5654
 REV. - ORIG

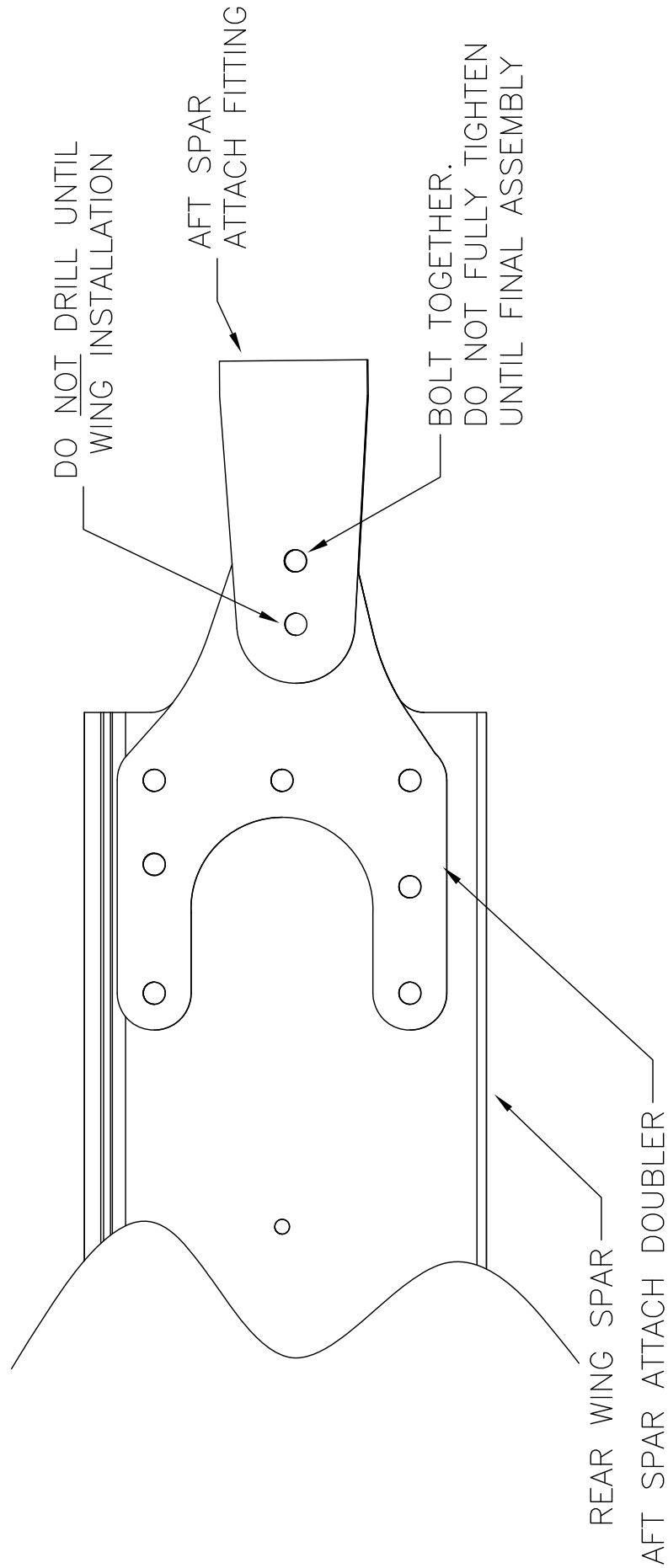


LOWER SIDE OF LEFT HAND ELEVATOR TIP SKIN SHOWN FOR REFERENCE



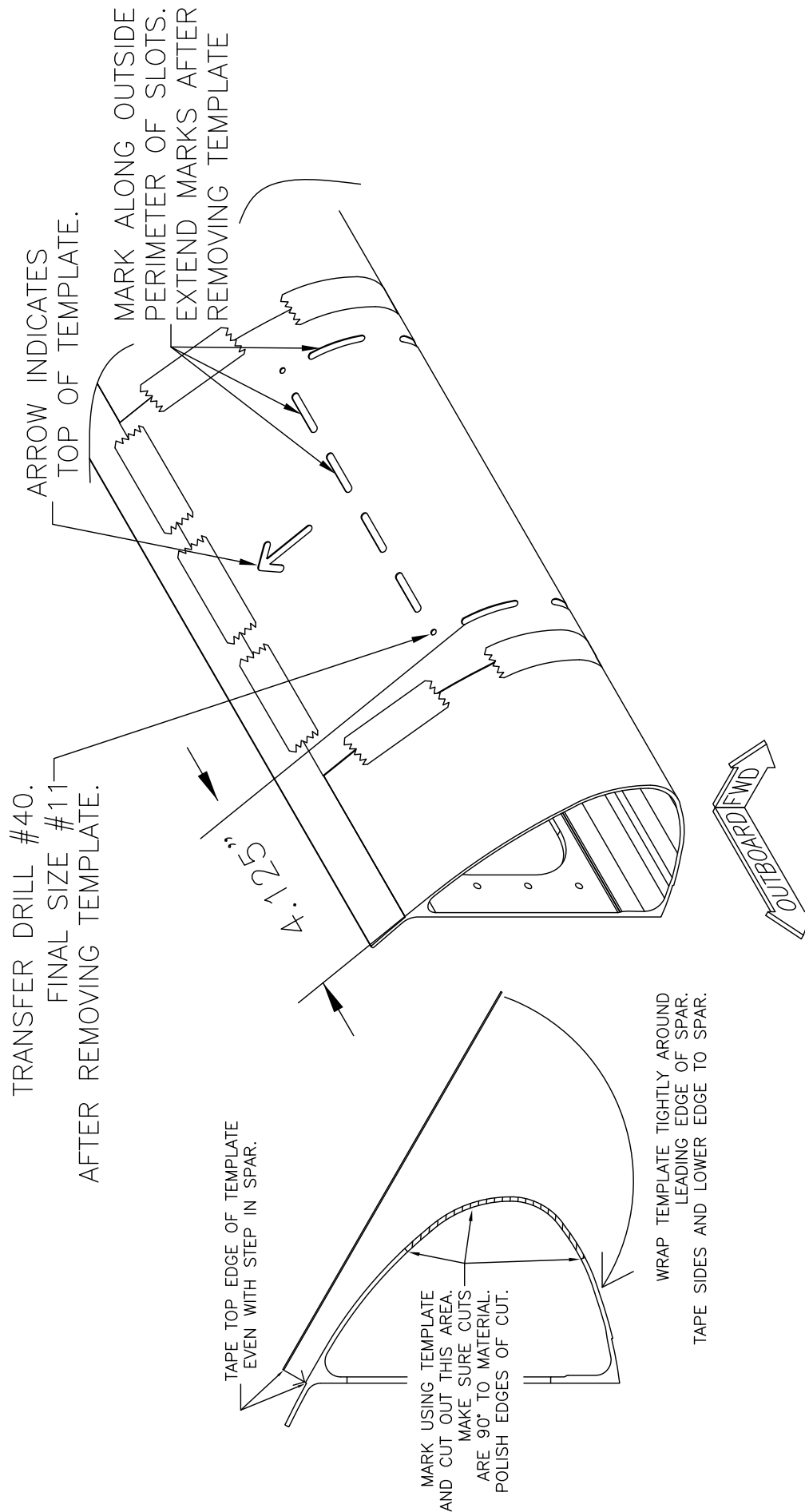
RRR S-21 OUTBOUND **ELEVATOR TIP SKIN - BALANCE HOLE DRILLING** **FIGURE 005-03**

MD5654
REV. - ORIG



MD5650
REV. - ORIG

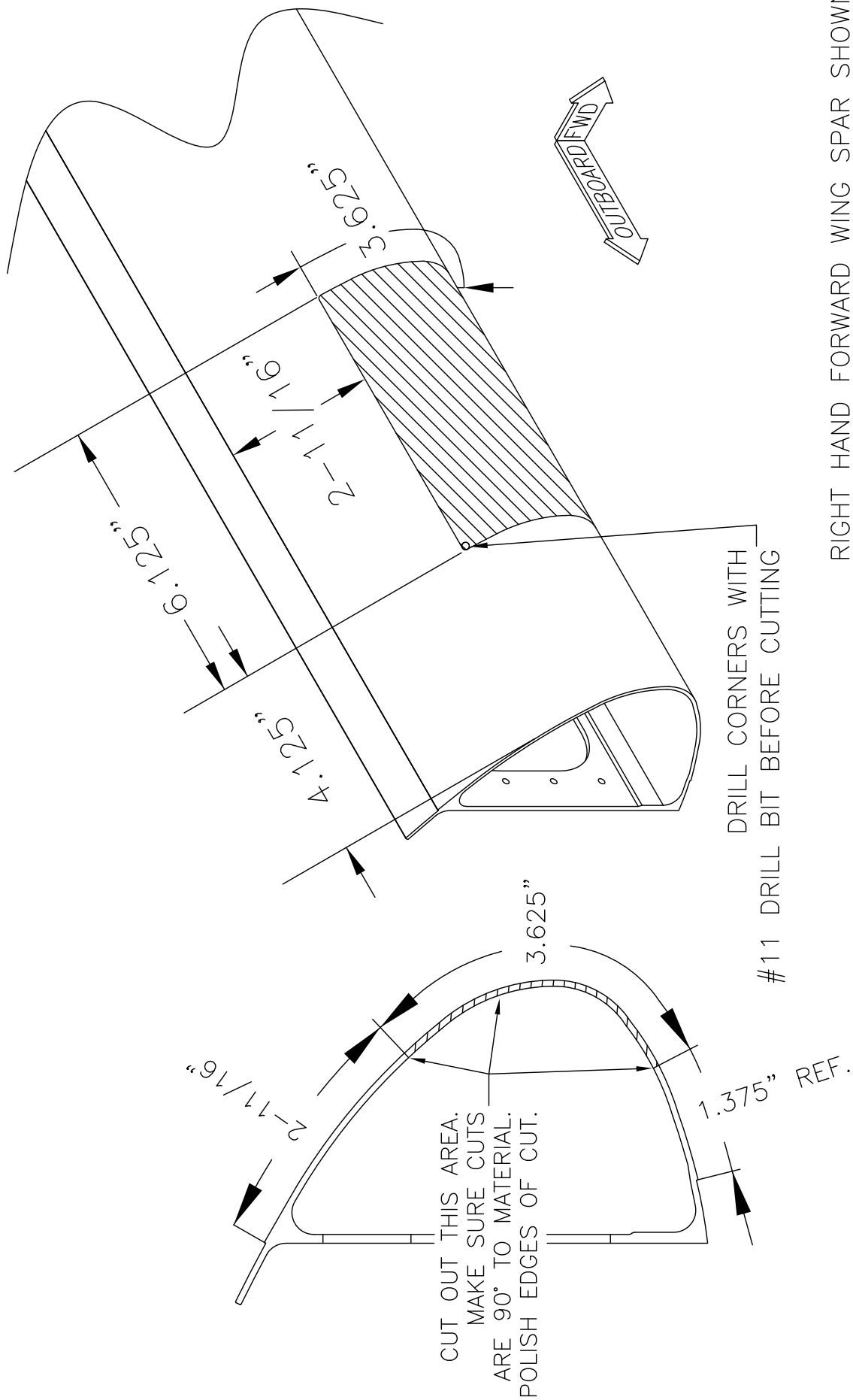
RRF S-21 OUTBOUND
REAR WING SPAR ATTACHMENT
FIGURE 06-01A1



RIGHT HAND FORWARD WING SPAR SHOWN

MD5650
REV. - ORIG

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

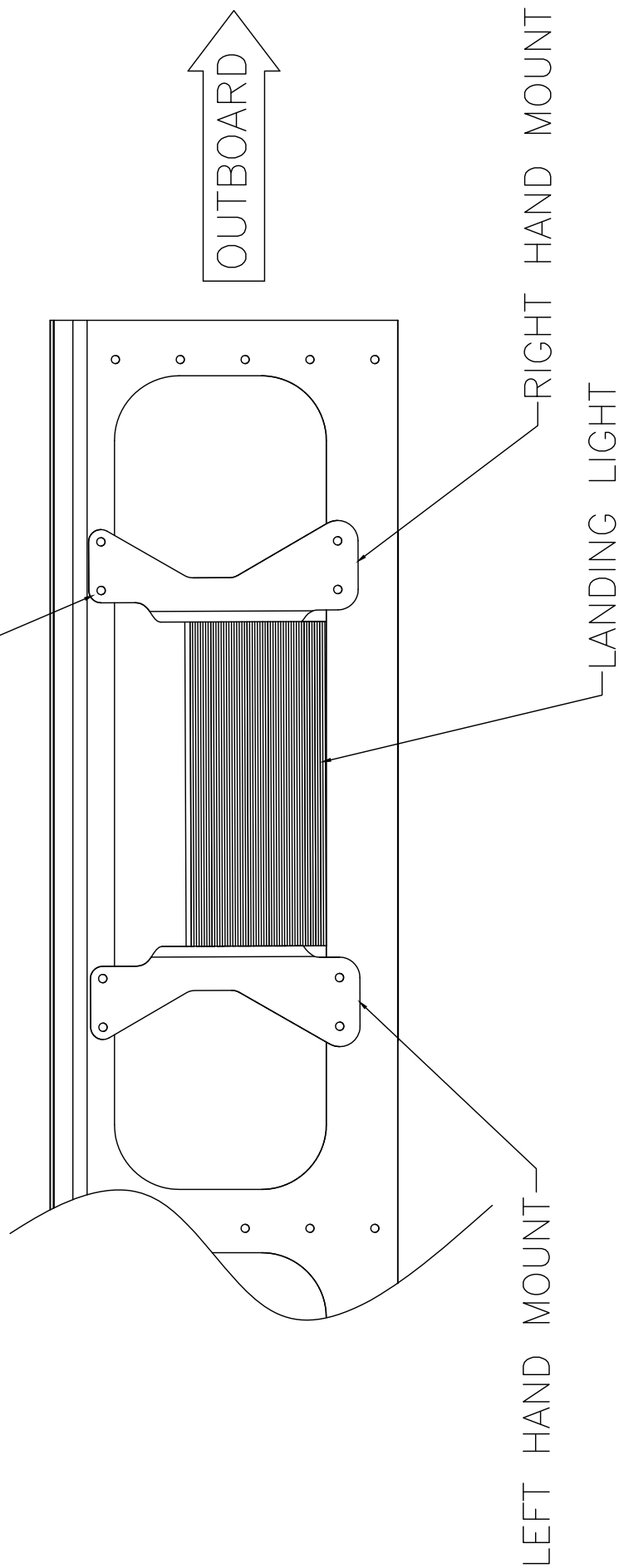


RIGHT HAND FORWARD WING SPAR SHOWN

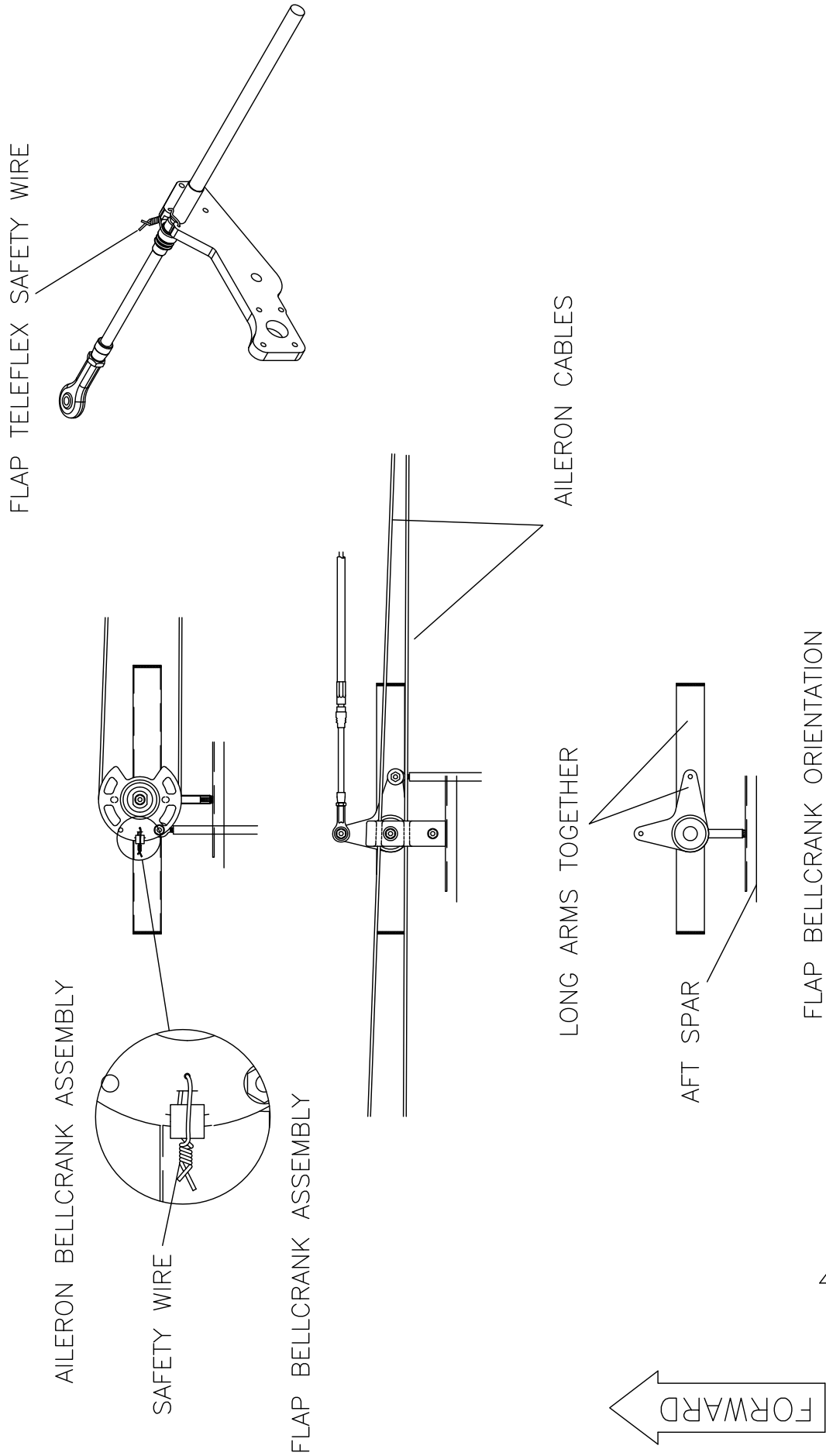
MD5650
REV. - ORIG

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

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

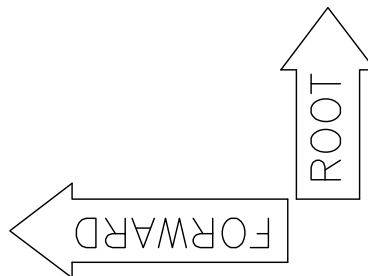


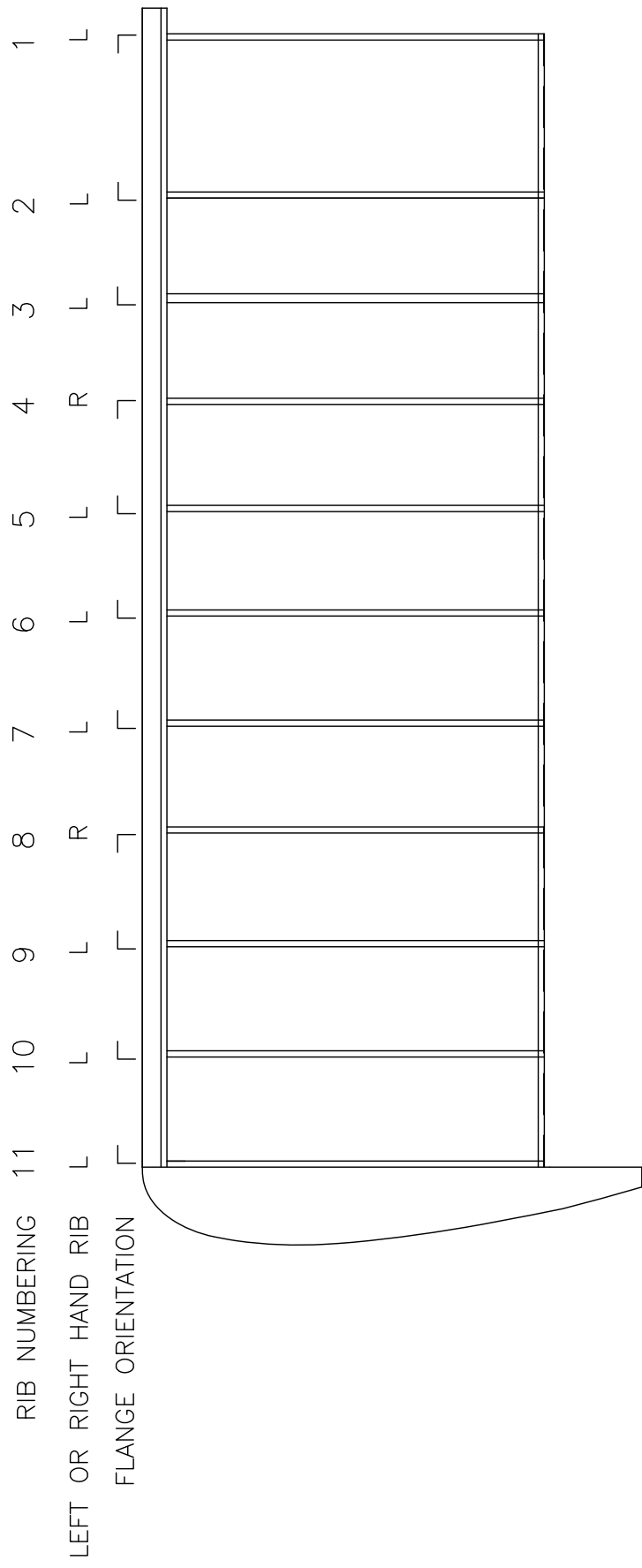
AFT SIDE OF RIGHT HAND FWD SPAR SHOWN



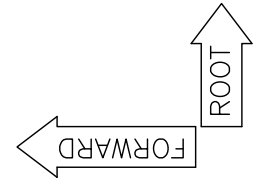
MD5650
REV. - ORIG

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



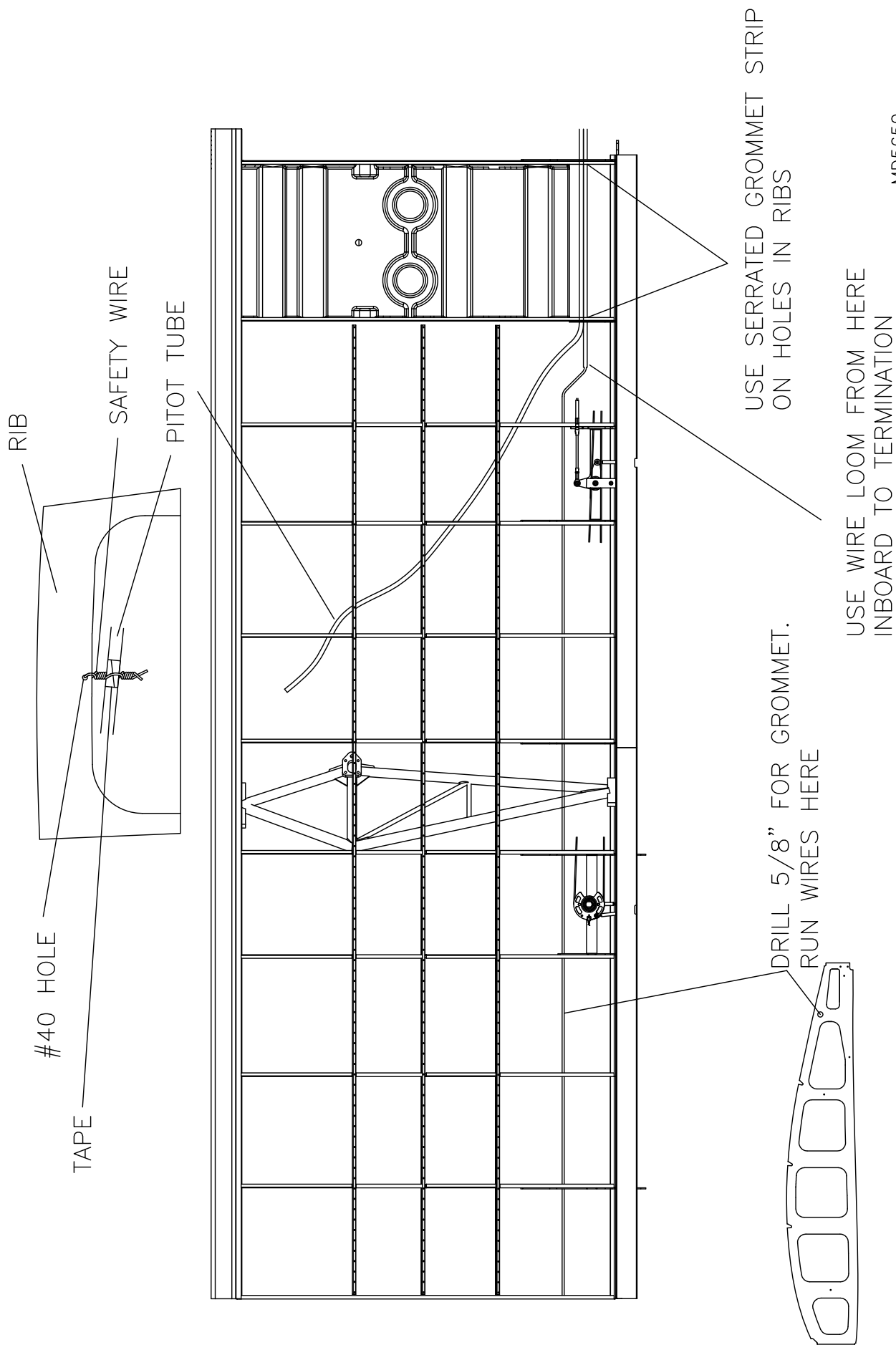


LEFT-HAND WING SHOWN
(RIGHT-HAND WING IS A MIRROR IMAGE)



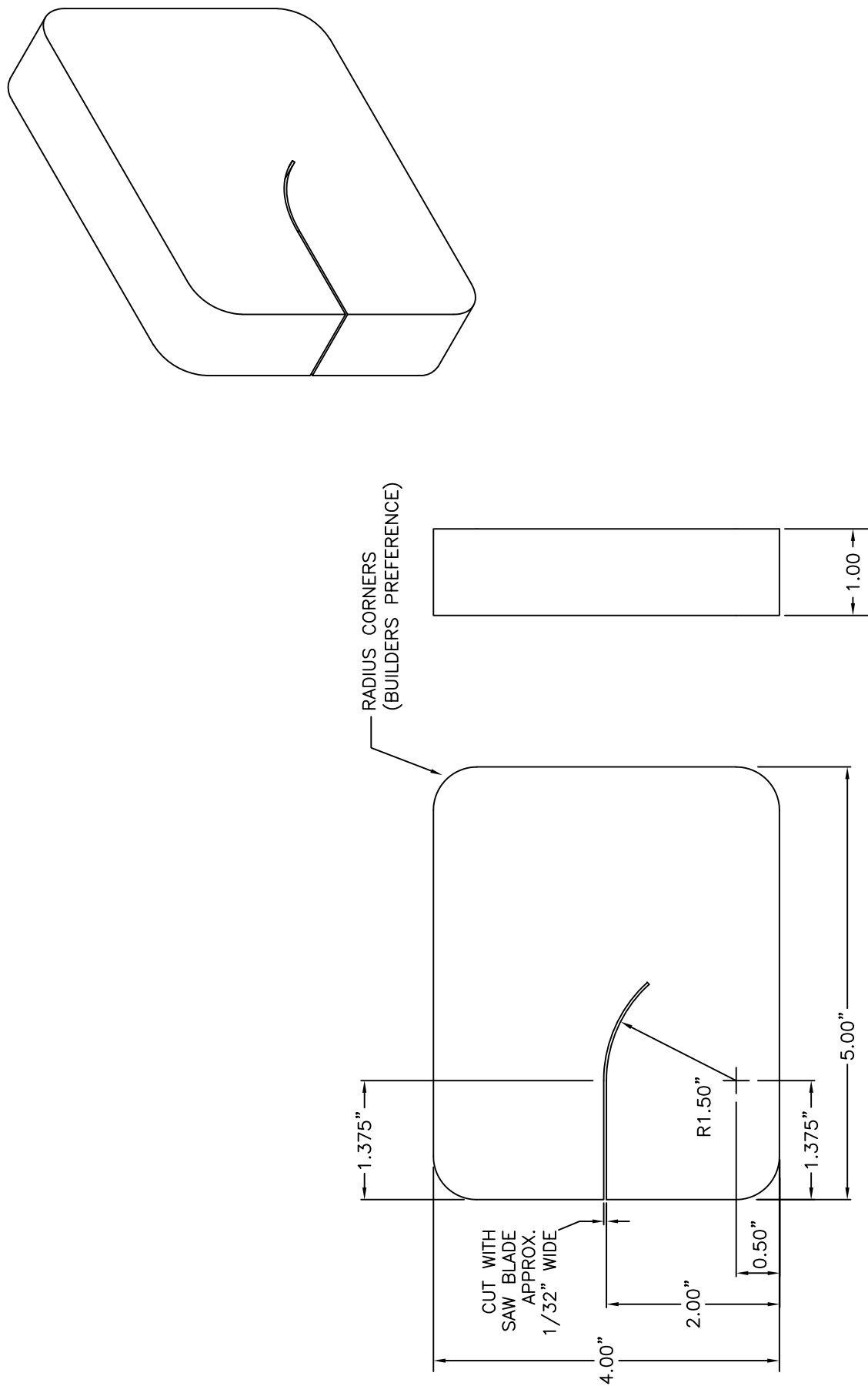
MD5650
REV. - ORIG

141 WING - RIB ORIENTATION
FIGURE 06-03



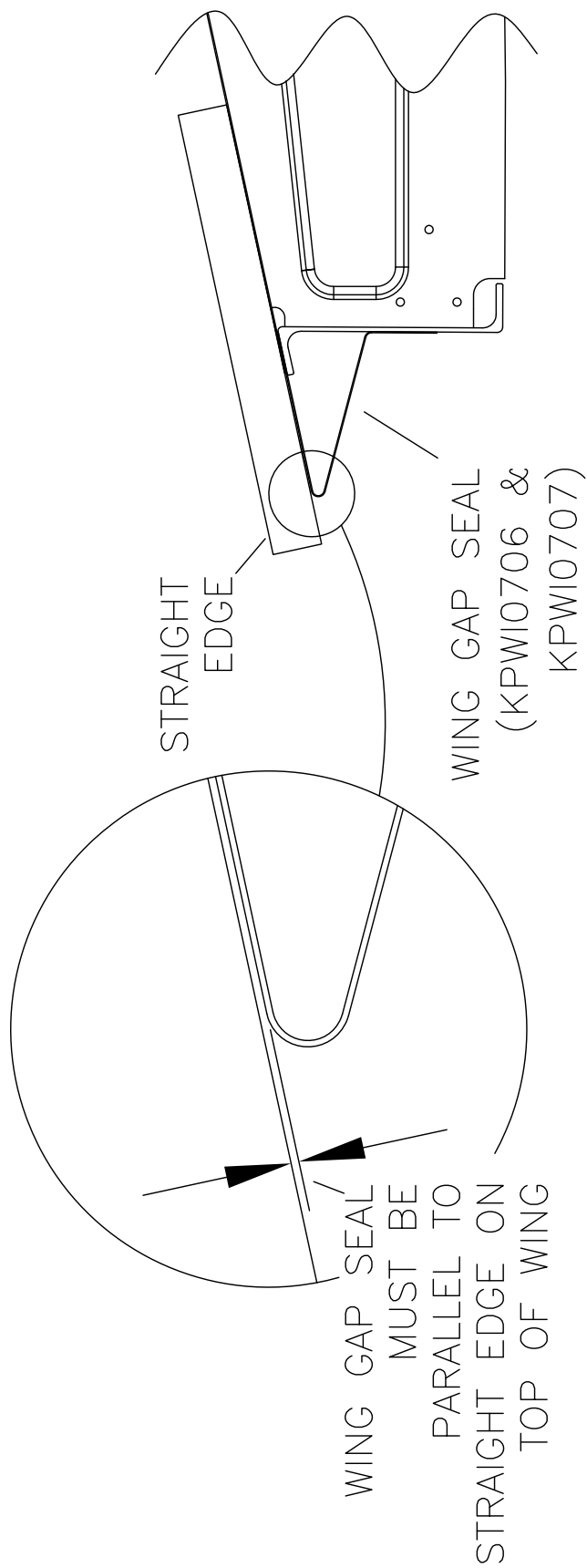
MD5650
REV. A

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



MD5650
REV. - ORIG

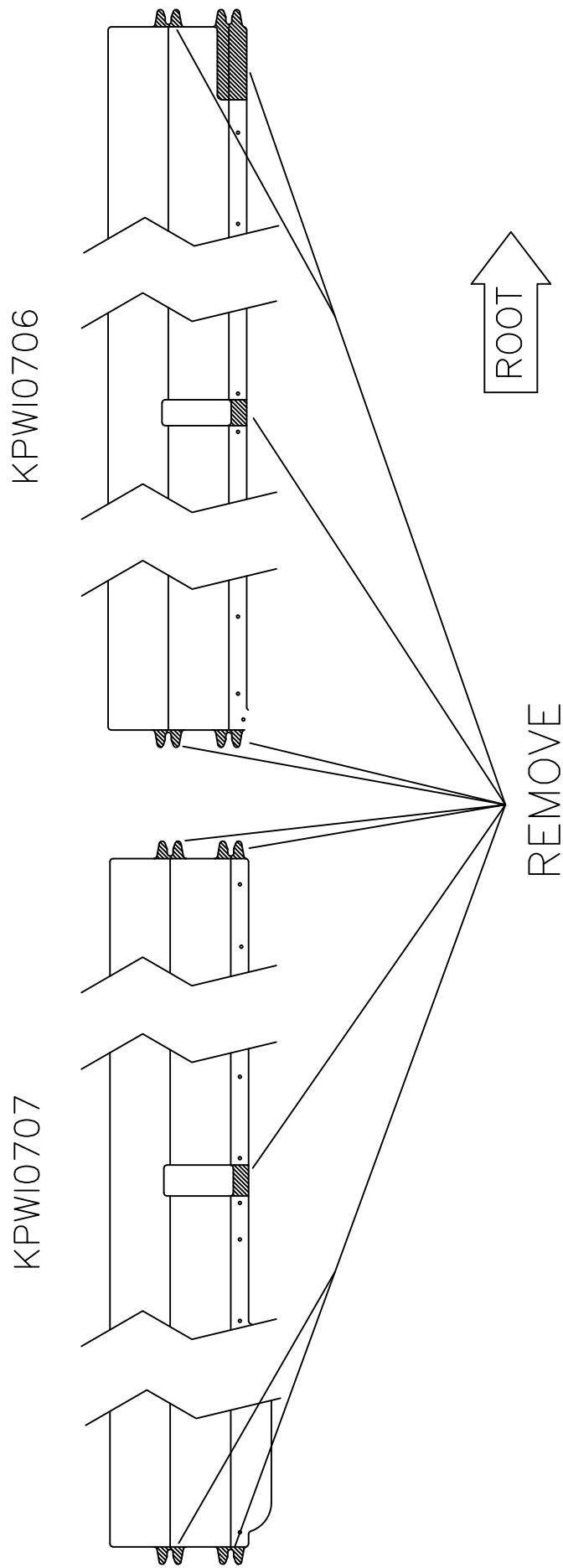
RRF S-21 OUTBOUND
WING SKIN LEADING EDGE FORMING TOOL
FIGURE 06-04A



MD5650
REV. A

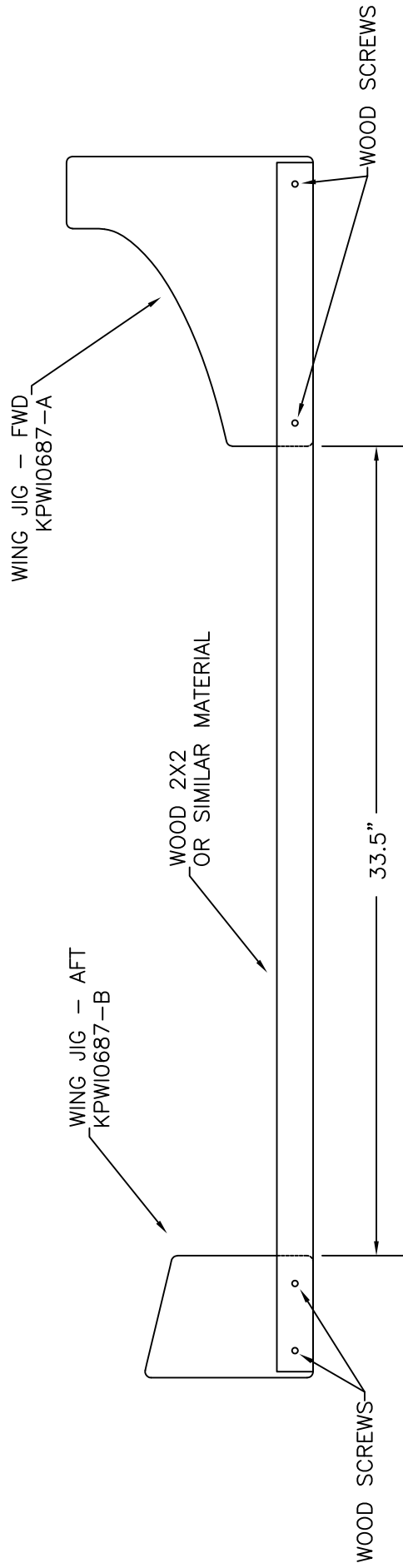
RRMS S-21 OUTBOUND
141 WING - CONFIRMING WING GAP SEAL PROFILE
FIGURE 06-05

WING GAP SEALS SHOWN UN-BENT FOR CLARITY



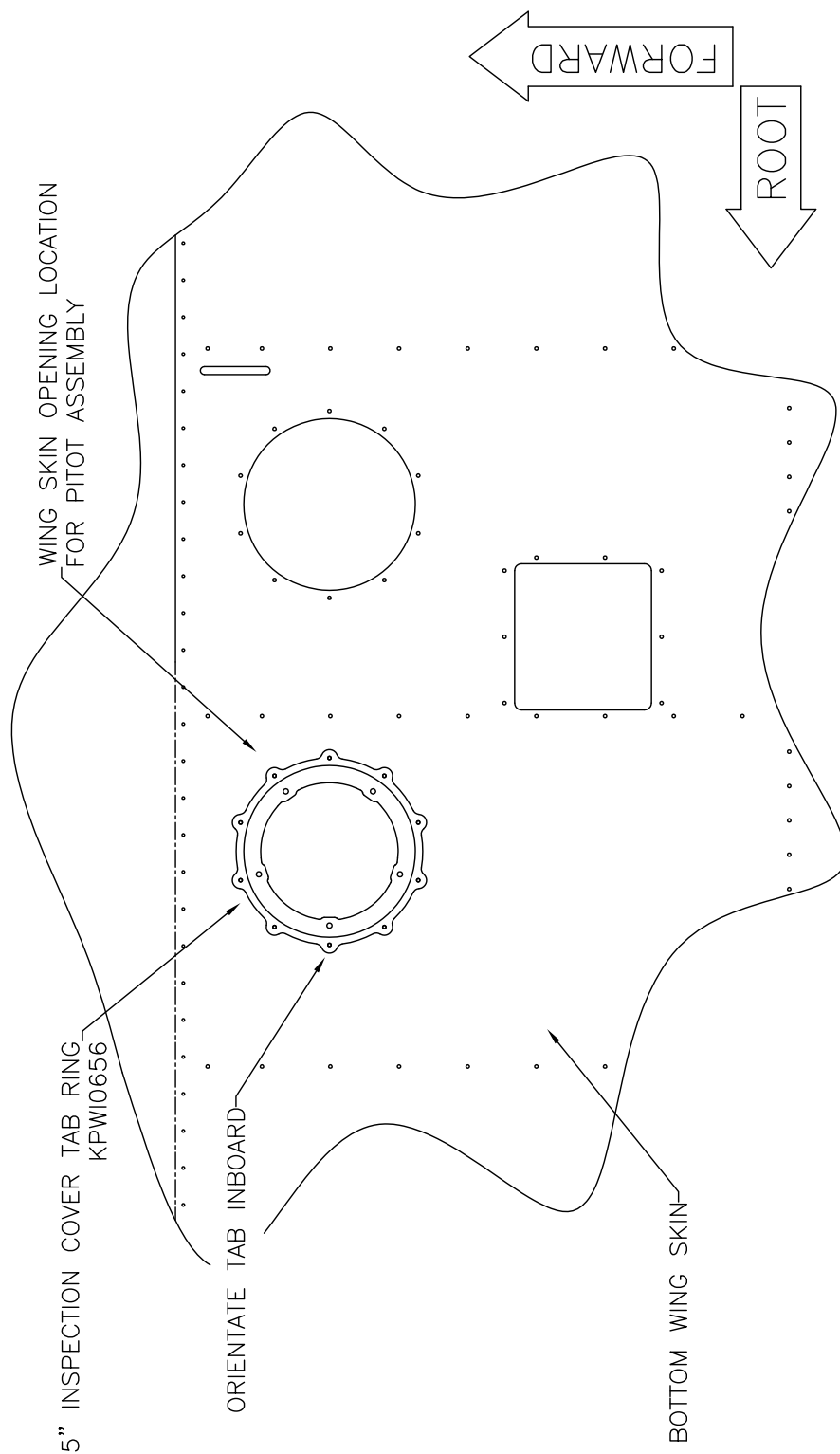
MD5650
REV. A

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



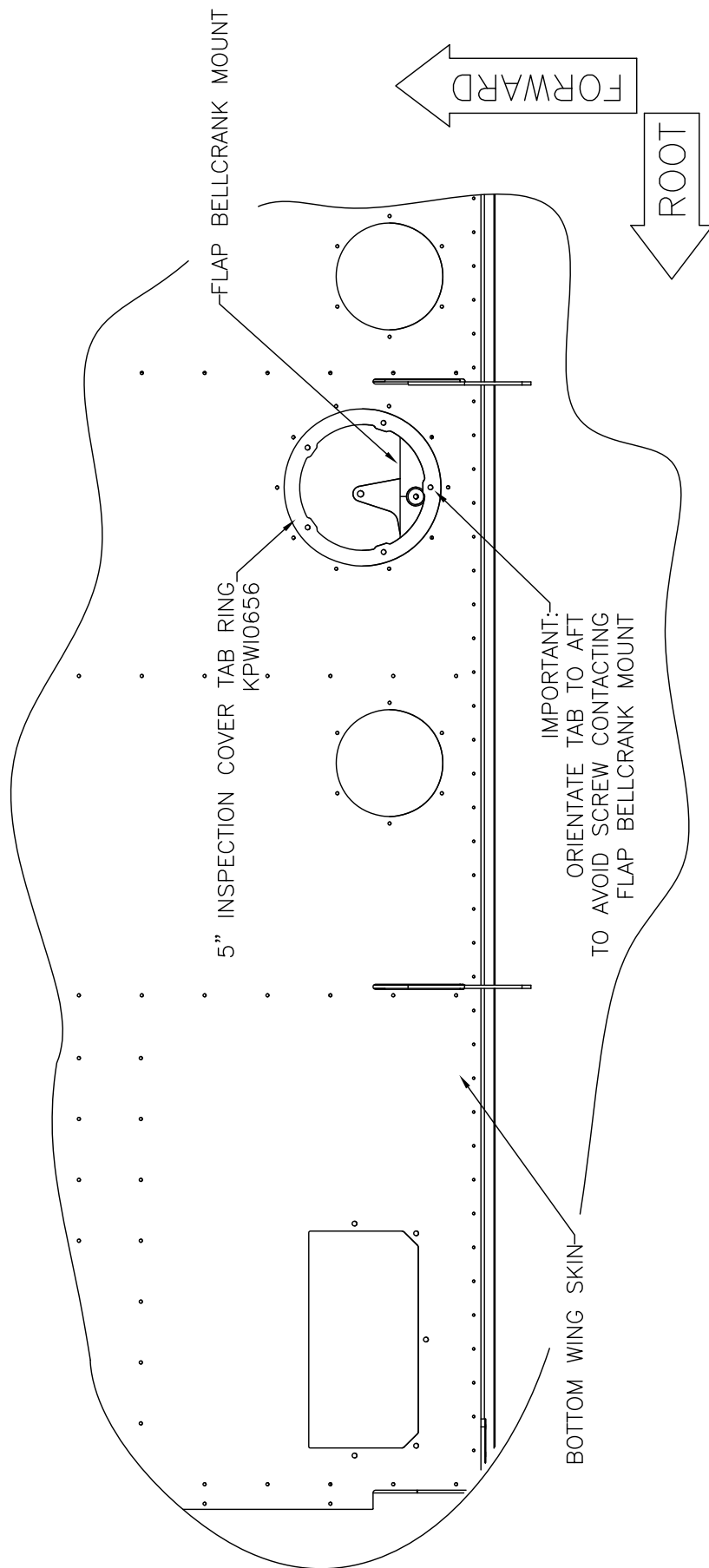
141 WING - WING JIG ASSEMBLY
FIGURE 06-06

MD5650
 REV. - ORIG



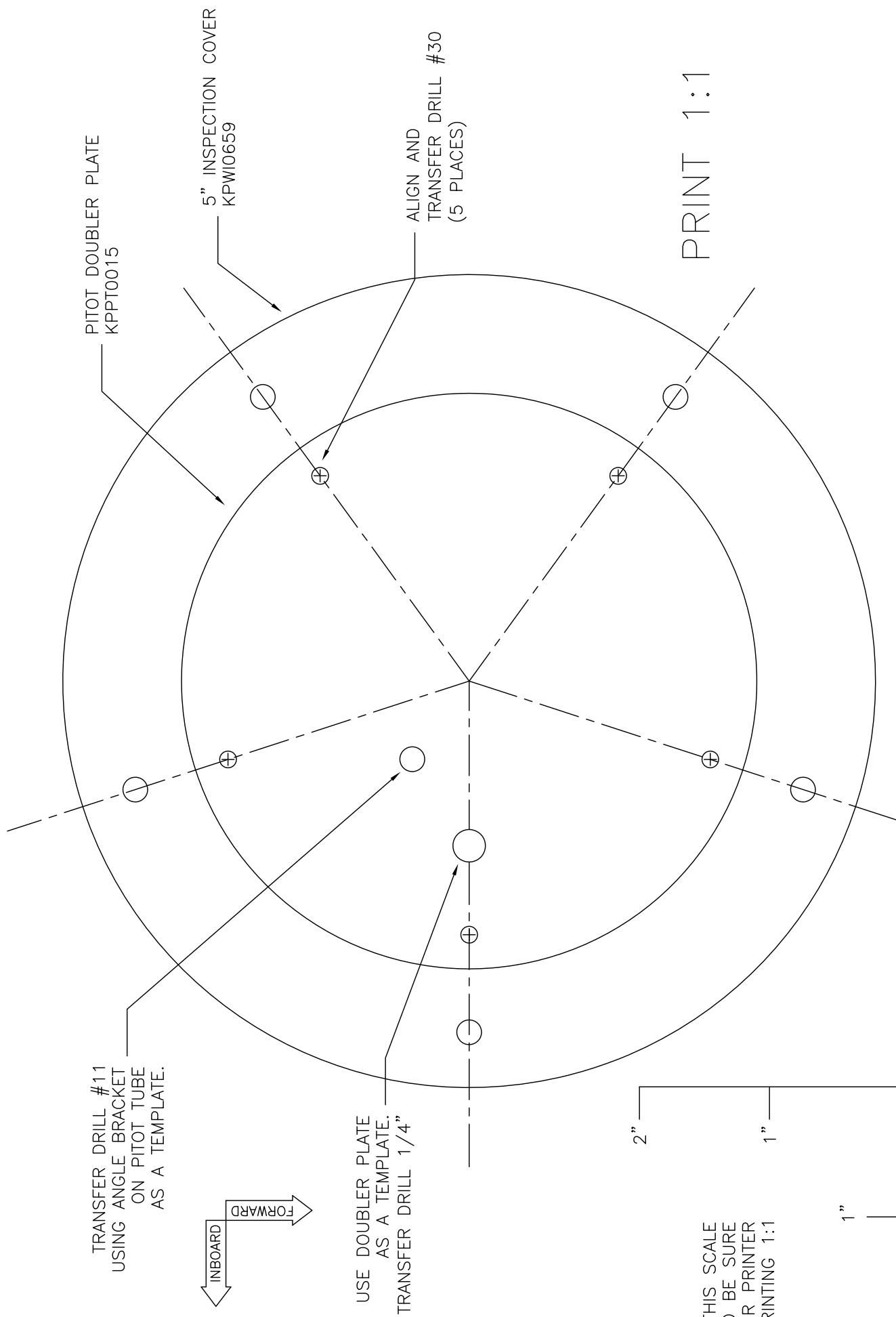
MD5650
REV. - ORIG

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



MD5650
REV. - ORIG

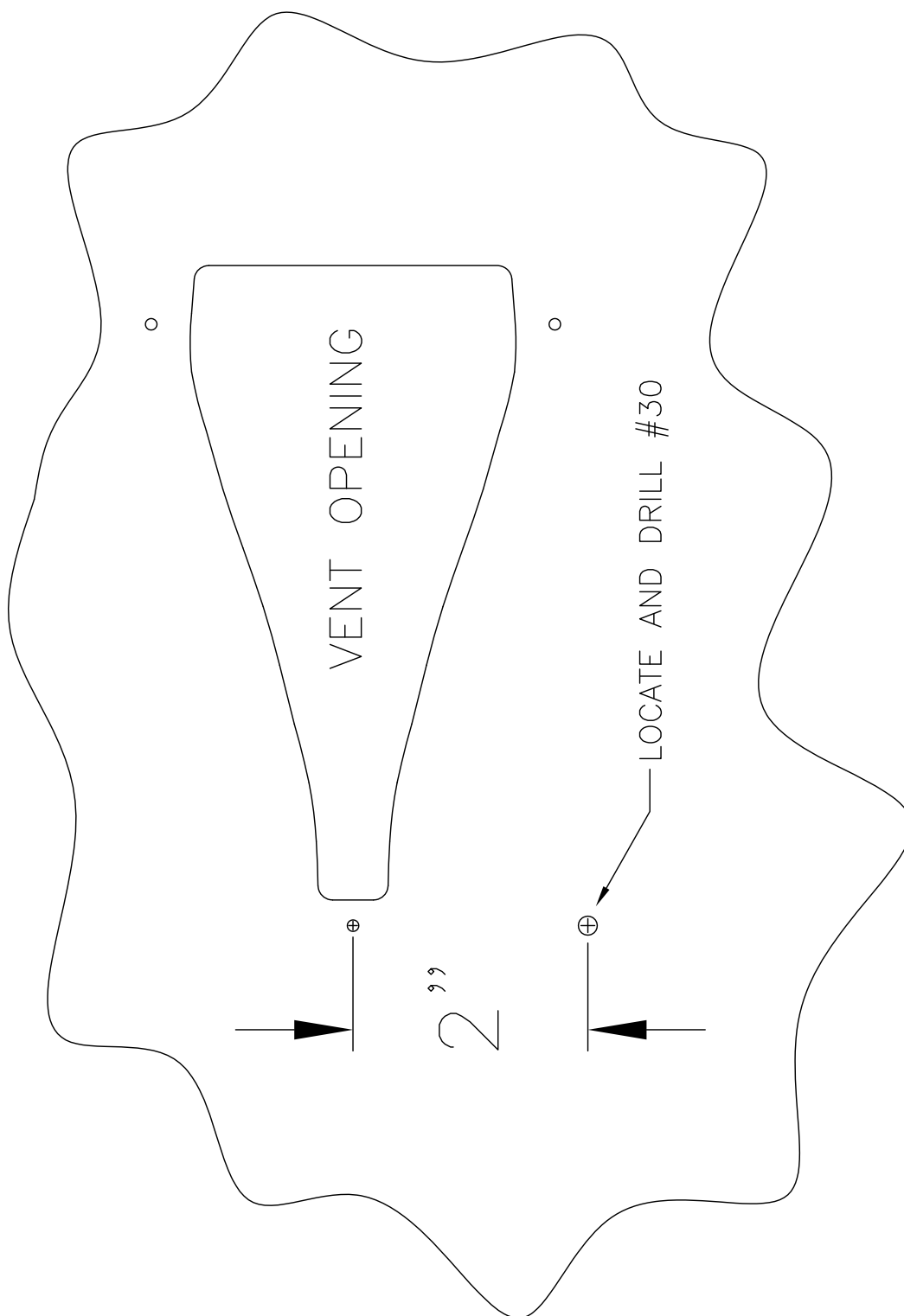
RRMS S-21 OUTBOUND
141 WING - INBOARD AFT 5" TAB RING ORIENTATION
FIGURE 06-07A



PRINT 1:1

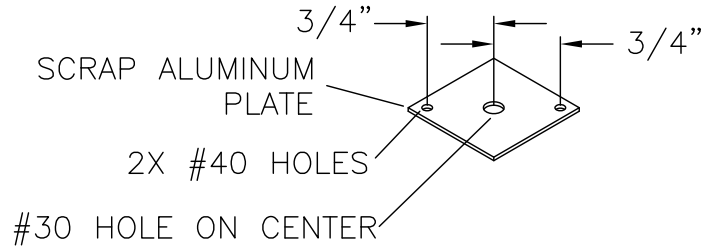
RRR S-21 OUTBOUND **PITOT MOUNT PLATE MODIFICATION** **FIGURE 06-08**

MD5650
 REV. - ORIG

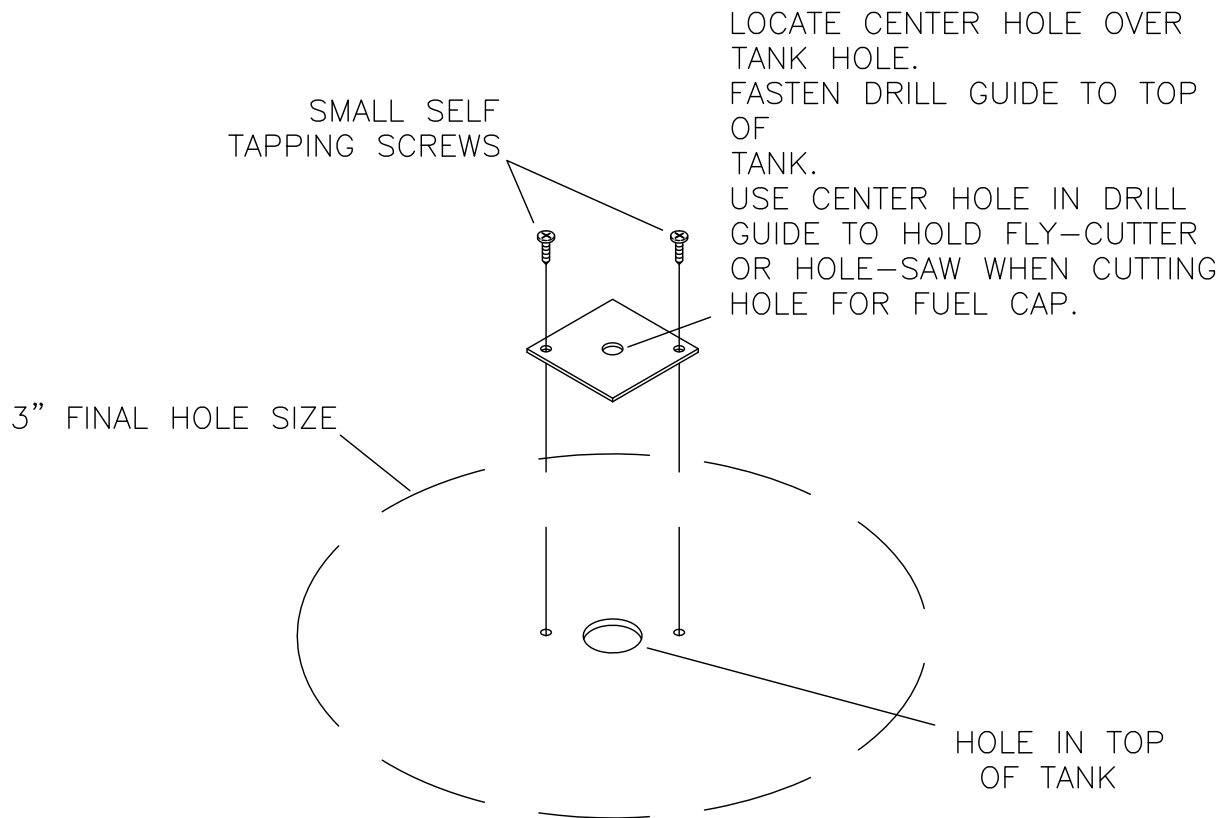


MD5650
REV. - ORIG

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



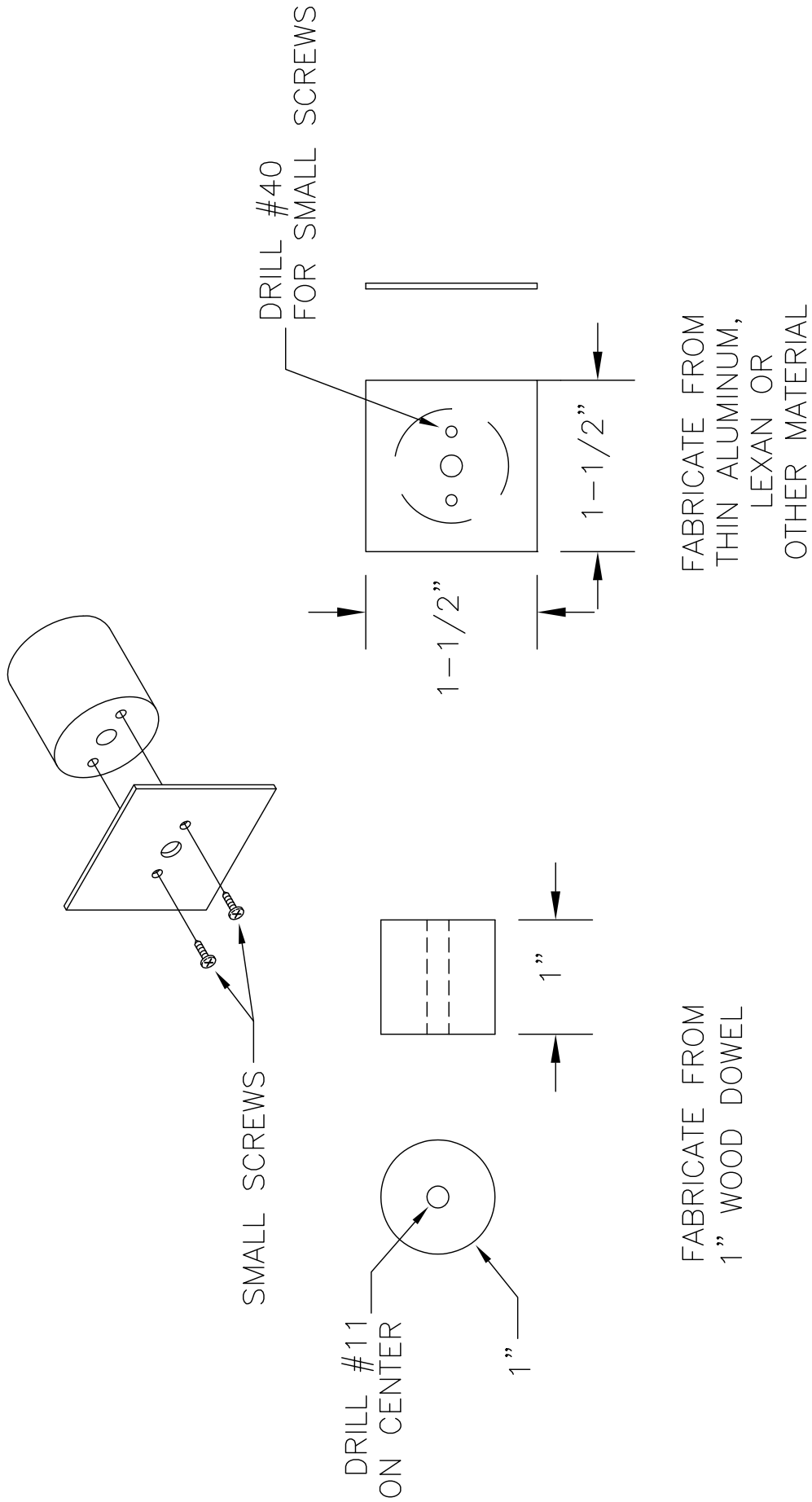
FABRICATE DRILL GUIDE



MD5650
REV. — ORIG

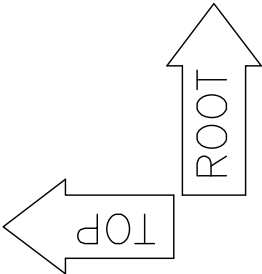
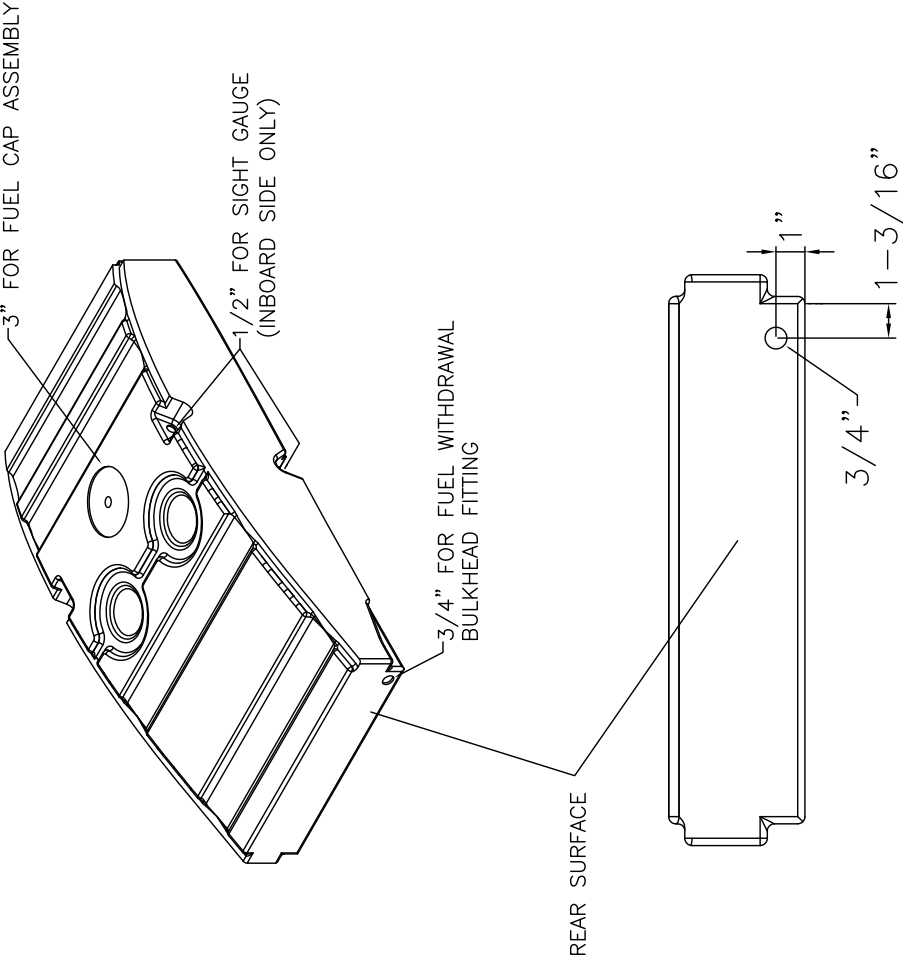
RANS S-21 OUTBOUND FUEL CAP HOLE DRILL GUIDE FIGURE 06-11

09/11/2018

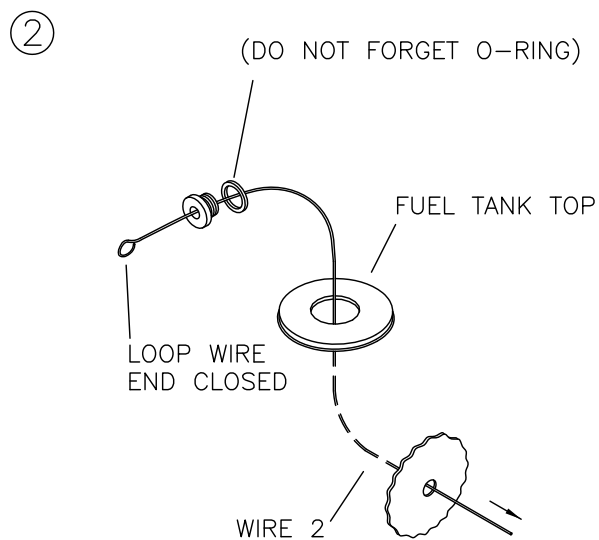
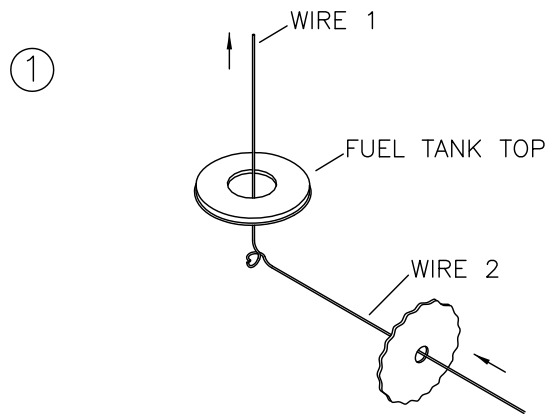


**RRR S-21 OUTBOUND
SIGHT GAUGE LOCATION TOOL**
FIGURE 06-12

MD5650
REV. - ORIG



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



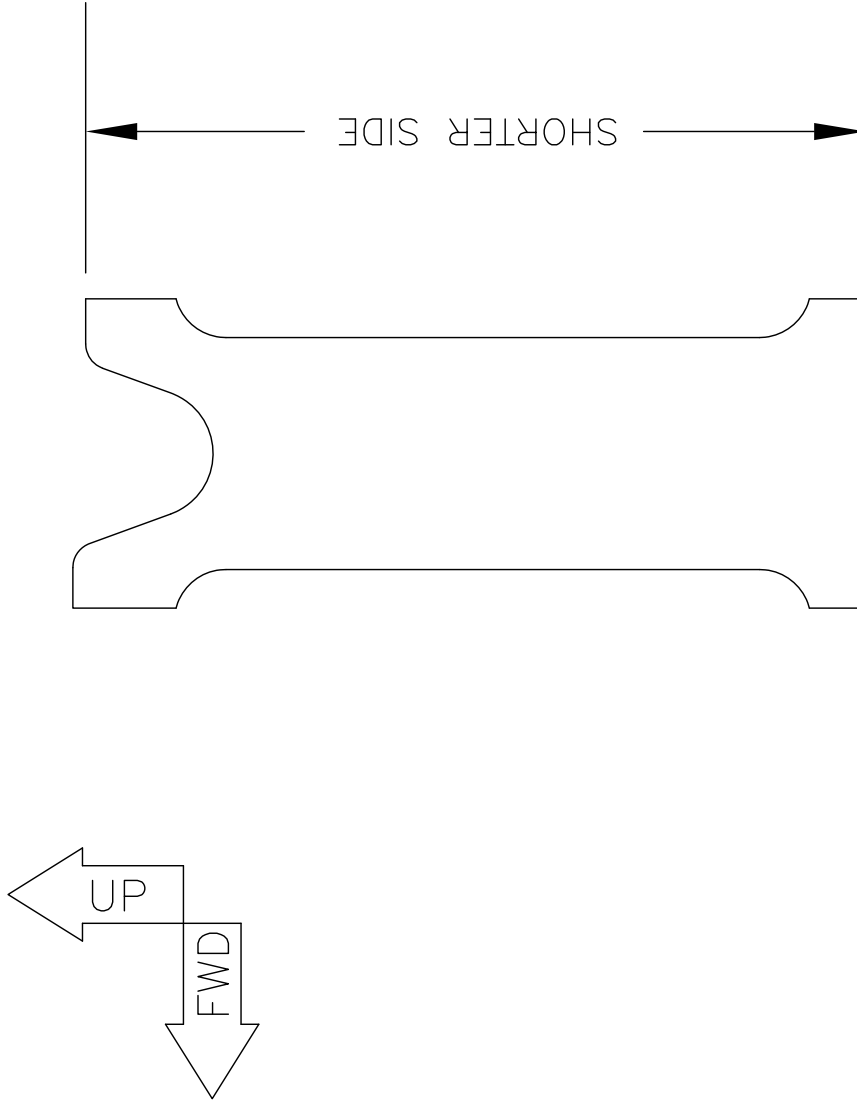
③ INSTALL RUBBER WASHER, STEEL WASHER, LOCTITE, AND NUT.

④ REMOVE WIRE.

RANS S-21 RAVEN
FUEL TANK FITTING INSTALLATION
FIGURE 06-14

MD5650

09/11/2018



MD5650
REV. - ORIG

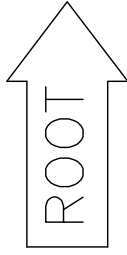
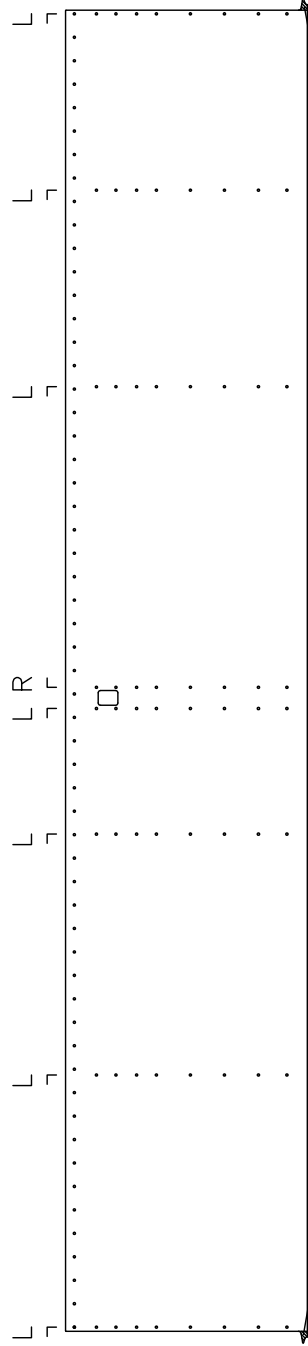
141 WING - FUEL TANK SUPPORT ORIENTATION
FIGURE 06-14A

LEFT FLAP
TOP VIEW

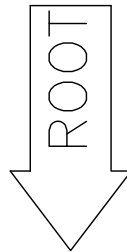
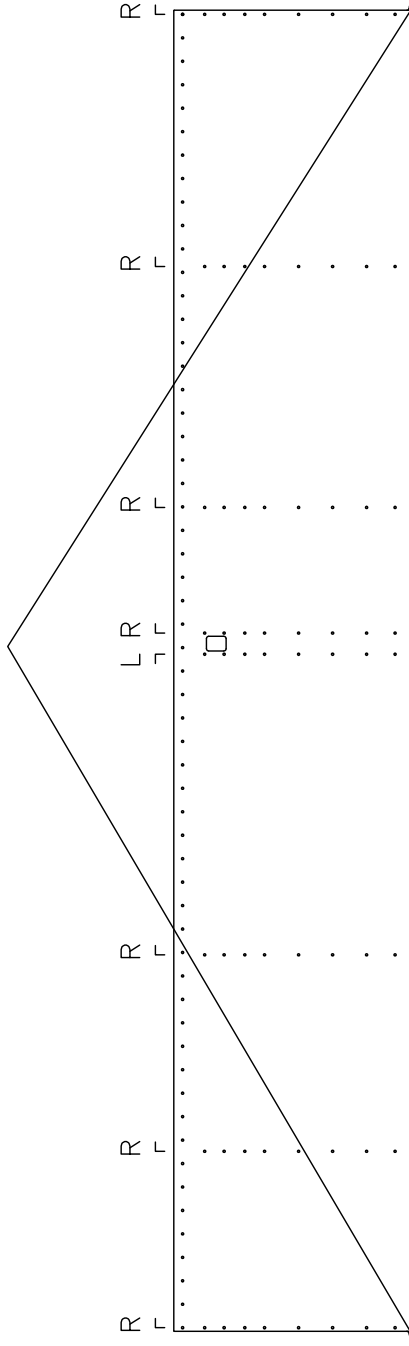
ACTION RIBS



FLANGE ORIENTATION



REMOVE

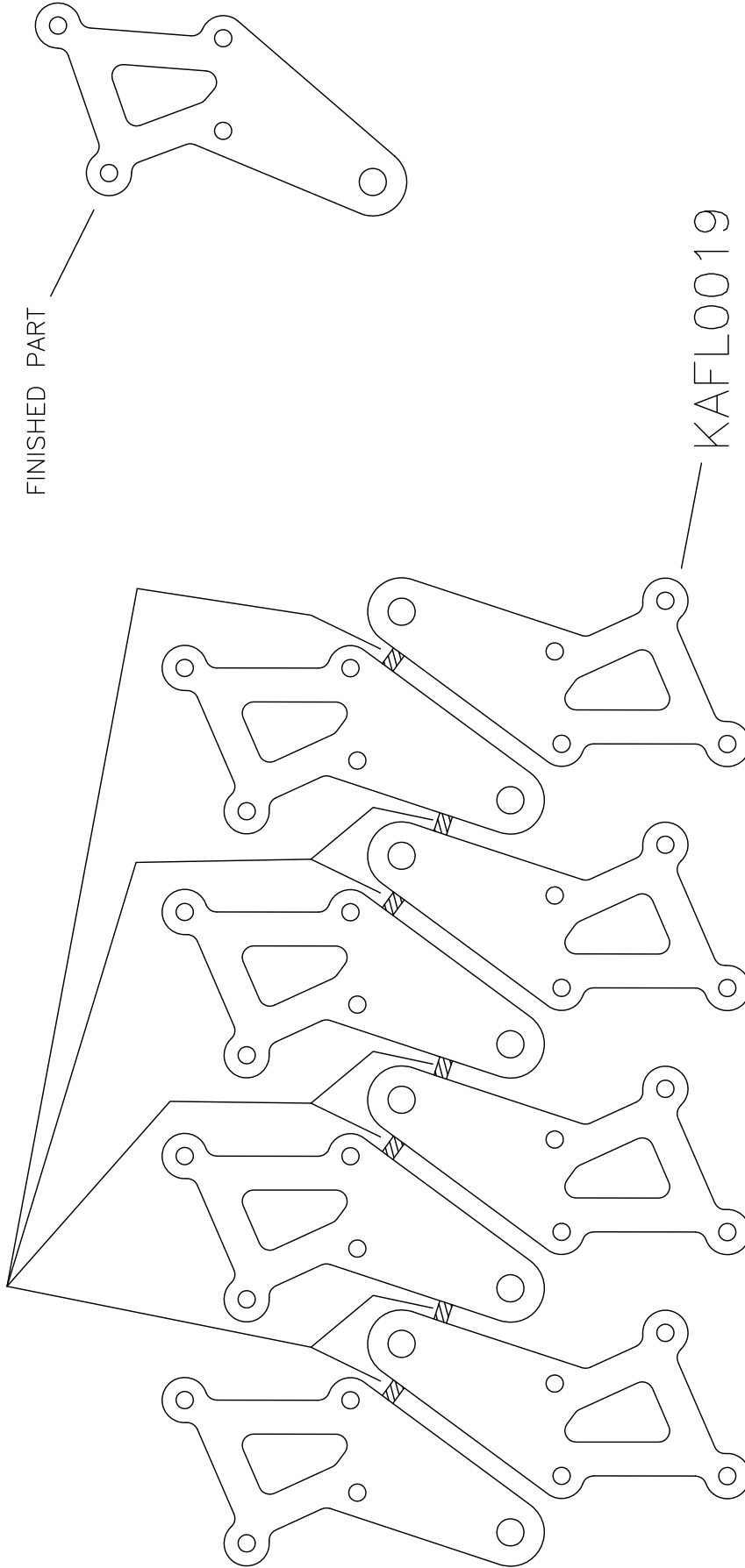


RIGHT FLAP
TOP VIEW

MD5650
REV. - ORIG

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

REMOVE ATTACHMENT TABS
TO MAKE 8 INDIVIDUAL PARTS

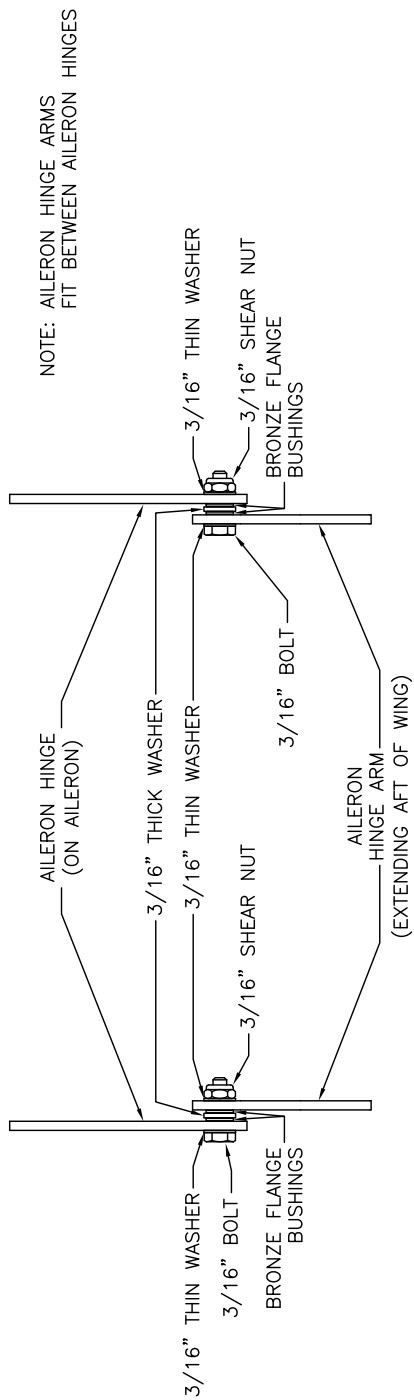


MD5650
REV. - ORIG

141 WING - FLAP HINGE - PART ASSEMBLY MODIFICATION
FIGURE 06-15A

09/11/2018

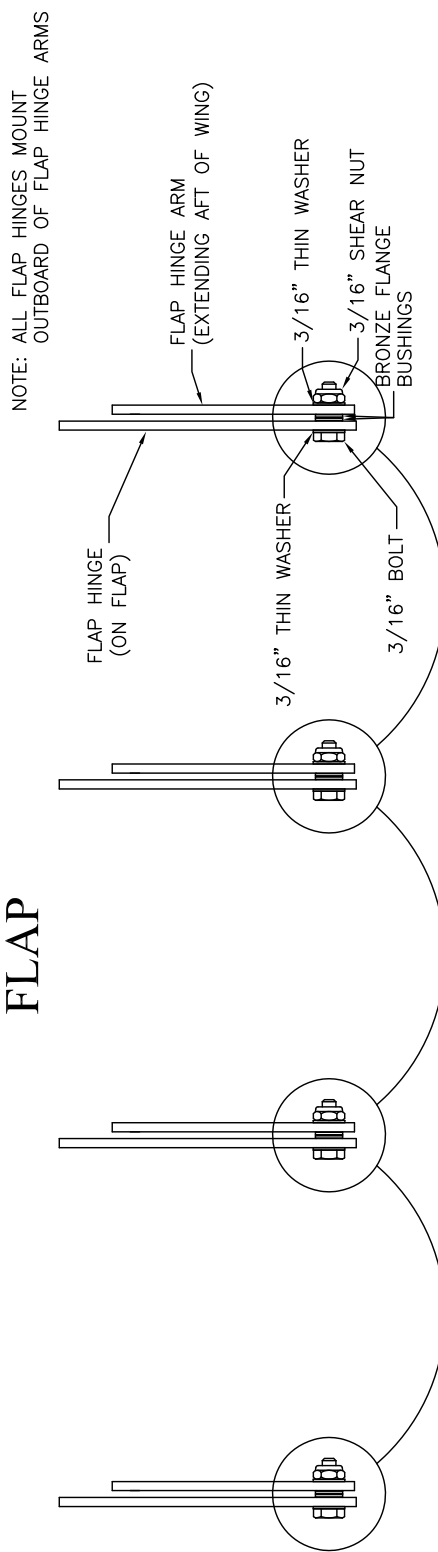
AILERON



OUTBOARD

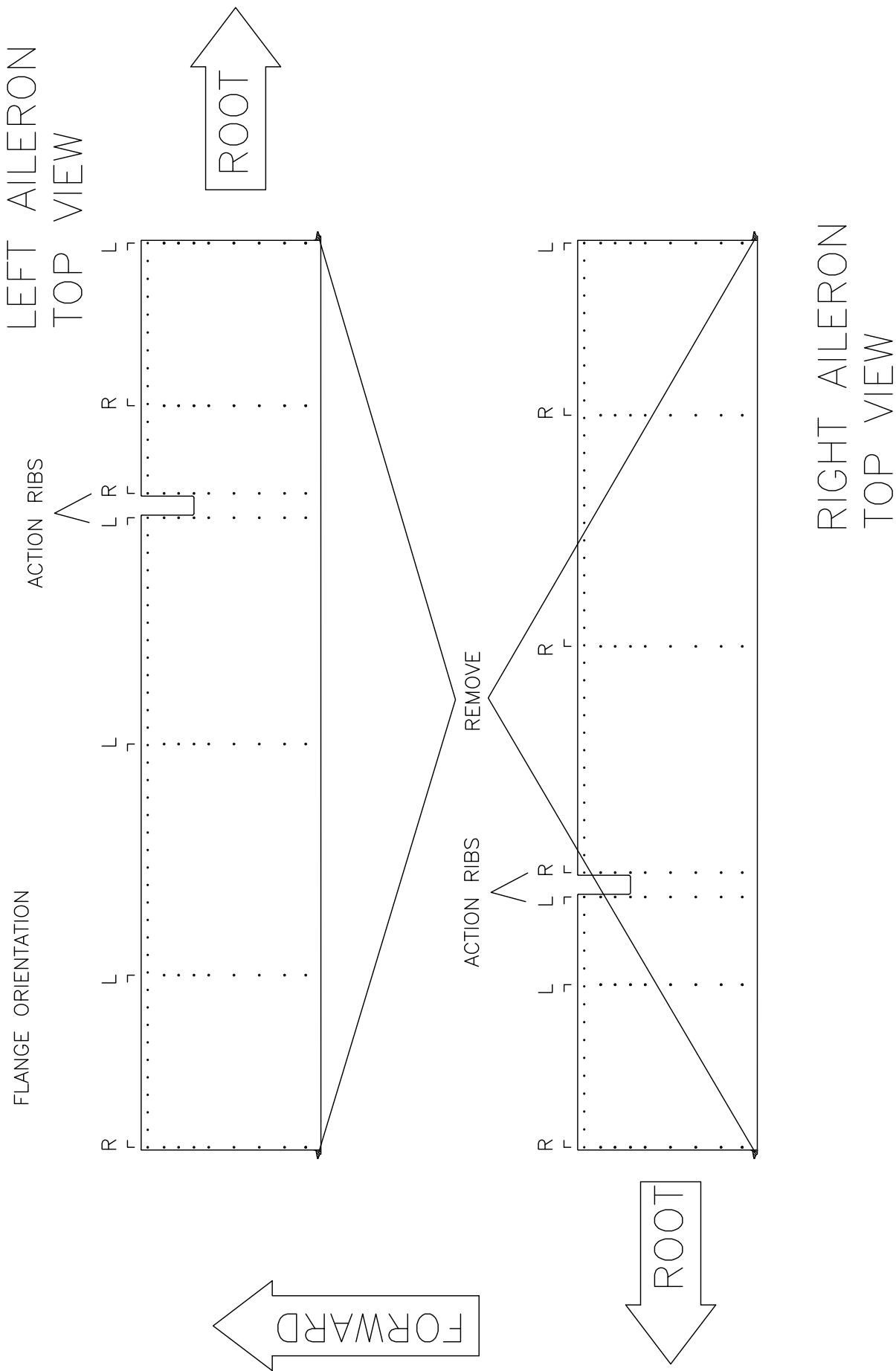
ROOT

FLAP



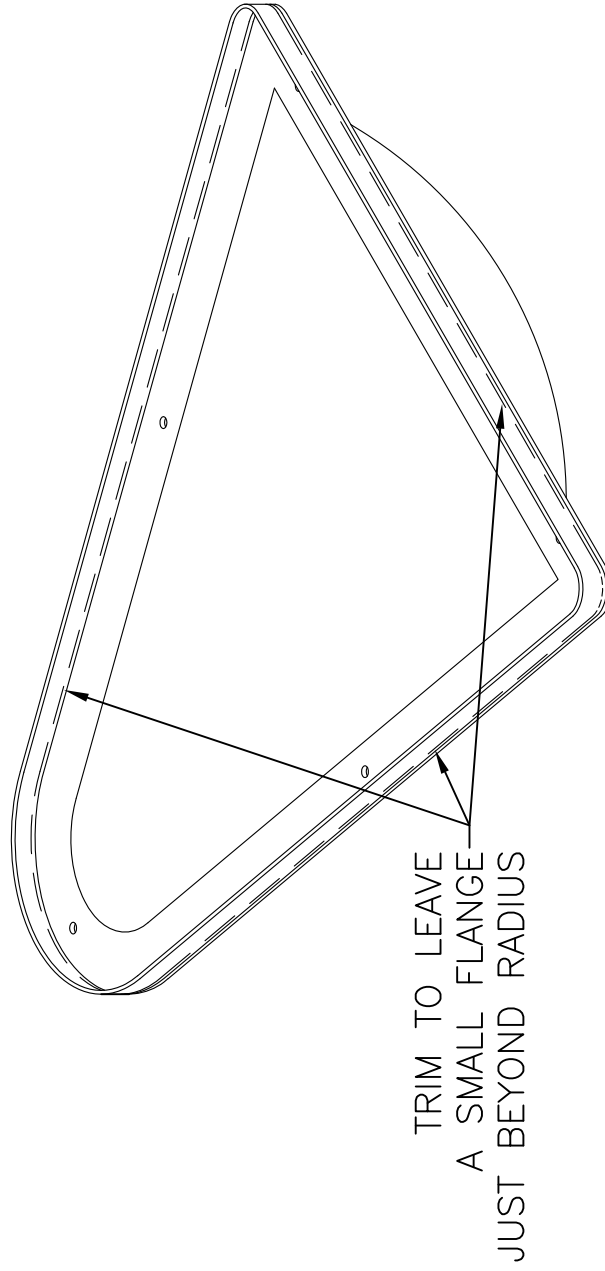
MD5650
REV. A

141 WING - TYPICAL AILERON/FLAP HINGE ASSEMBLY
FIGURE 06-16



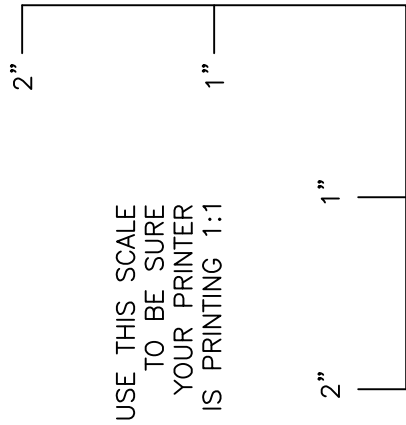
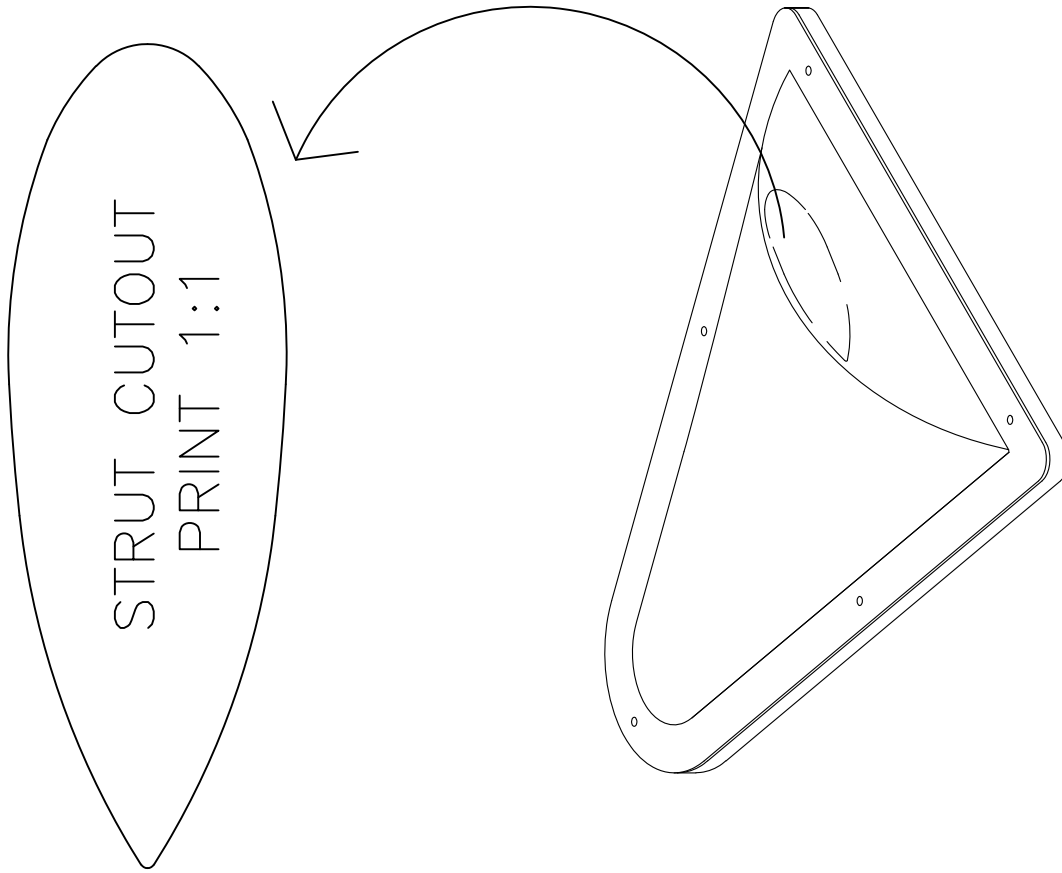
MD5650
REV. - ORIG

141 WING - AILERON ORIENTATION
FIGURE 06-17

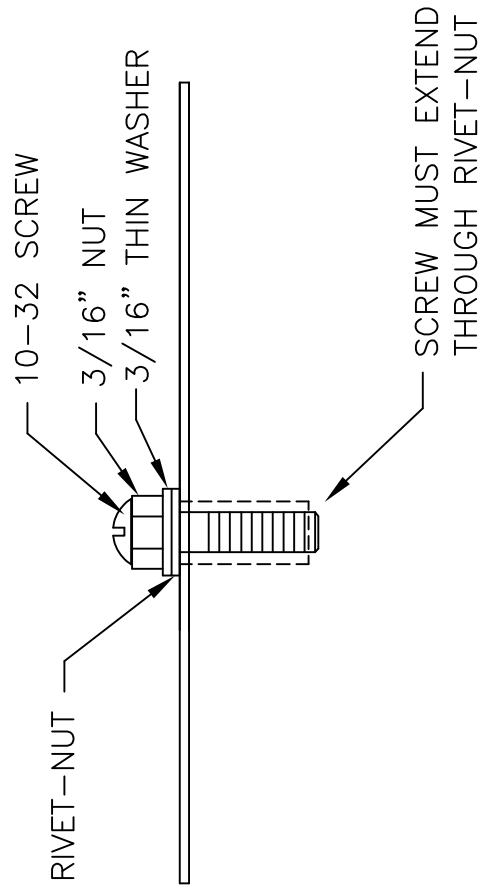


MD5650
REV. - ORIG

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



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

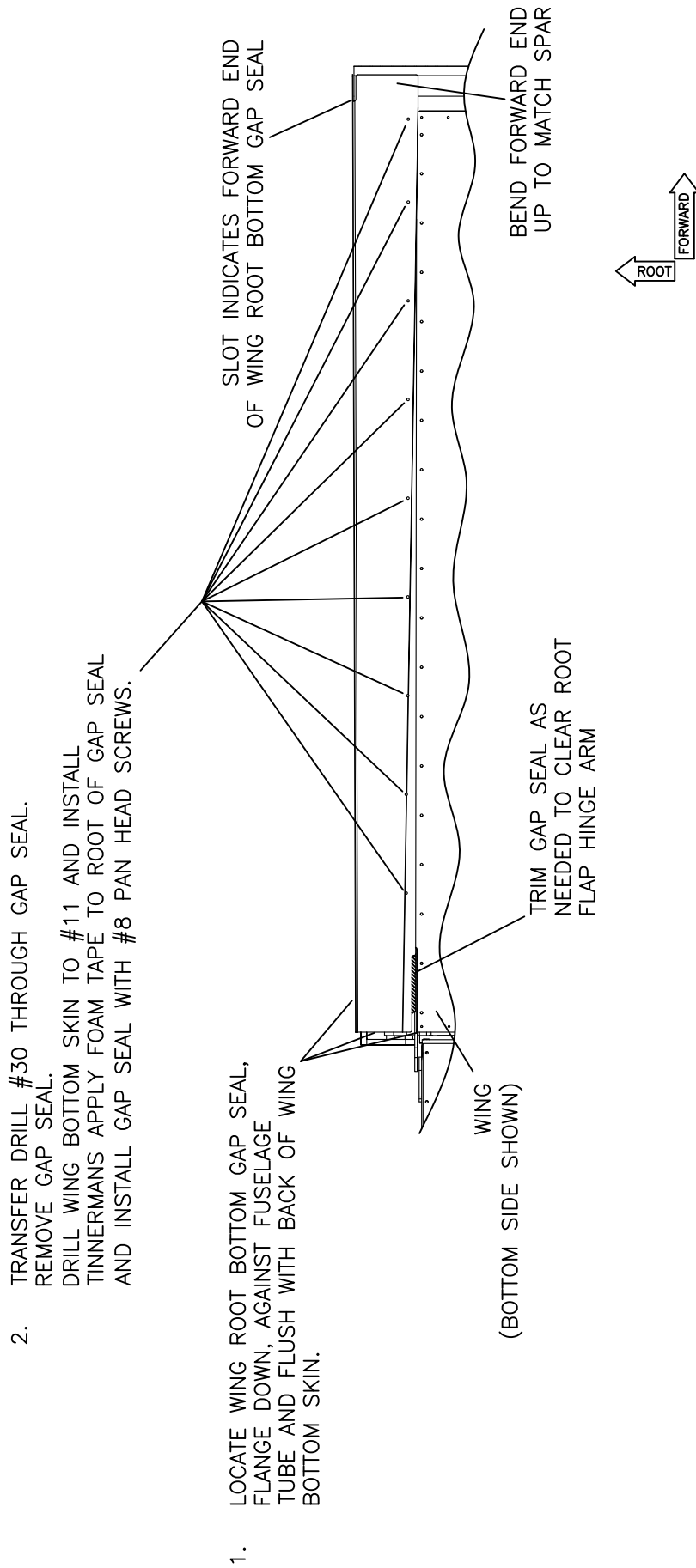


PROCEDURE BELOW MAY BE USED WHEN A RIVET-NUT PULLER IS NOT AVAILABLE.

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

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

MD343
 REV. - ORIG



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

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

ALL STRINGERS
AAPQ-42

S-4 TO S-10 BULKHEADS
AAPQ-41

INSPECTION PANEL TAB RINGS
AAPQ-41

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

S-11 BULKHEAD
AAPQ-42

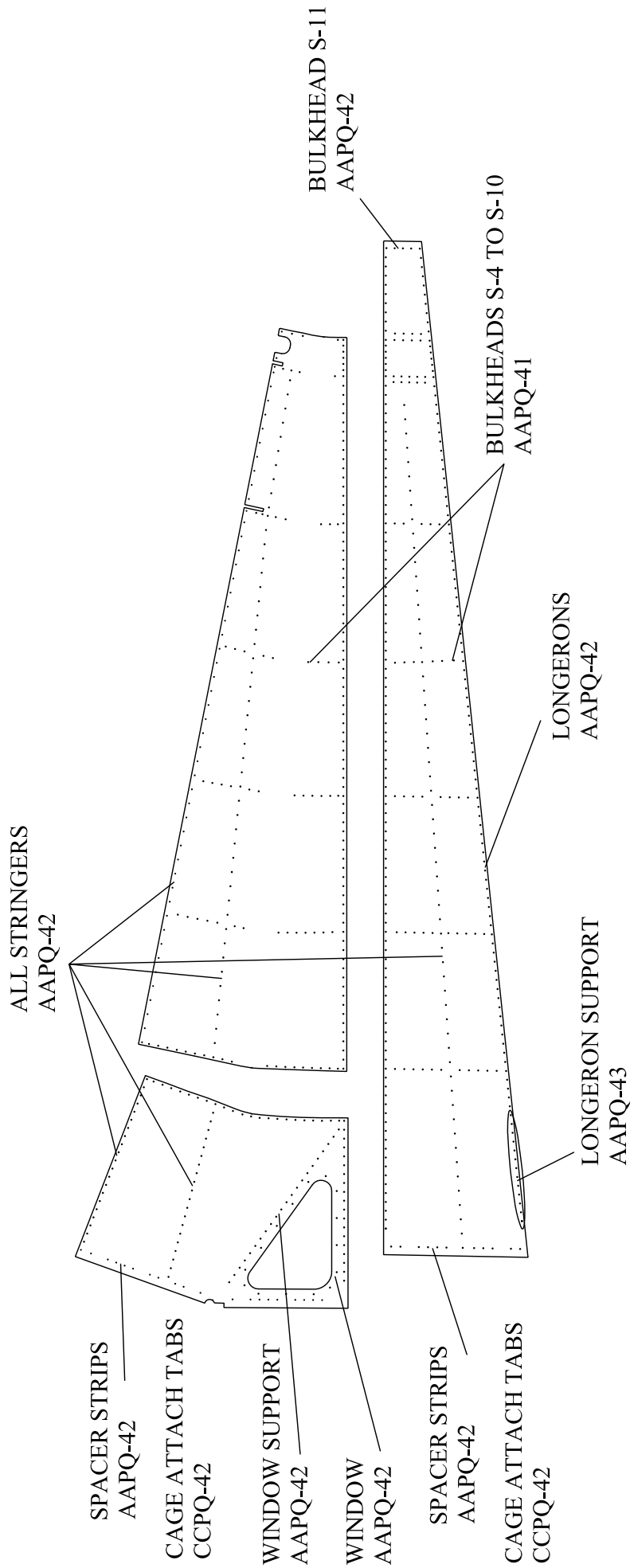
REMOVE AND DEBURR
SLOT COVERS

LONGERONS
AAPQ-42
AAPQ-43



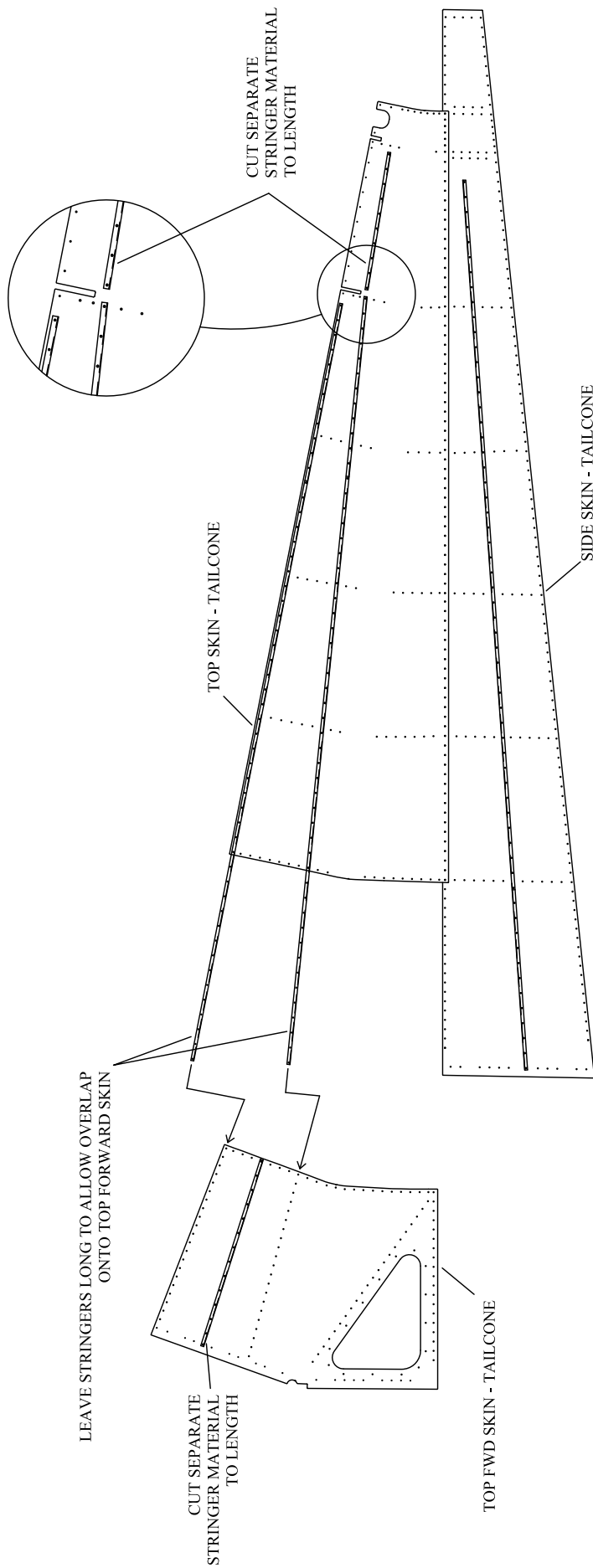
MD5654
REV. - ORIG

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



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

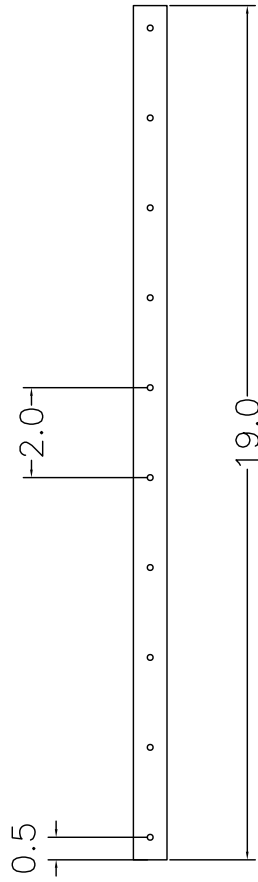
MD5654
 REV. - ORIG



MD5654
REV. - ORIG

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

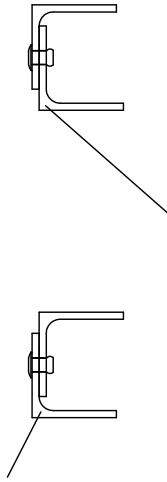
FABRICATE FROM KPFU0748



LEFT

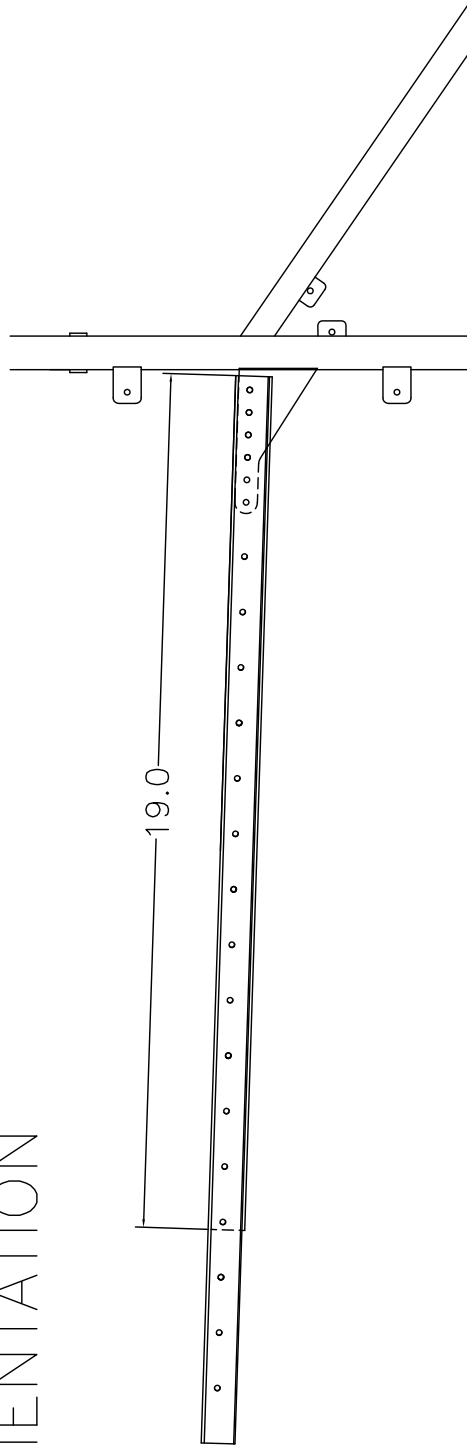
RIGHT

MIDDLE LONGERON



SUPPORT

ORIENTATION



STATION 3



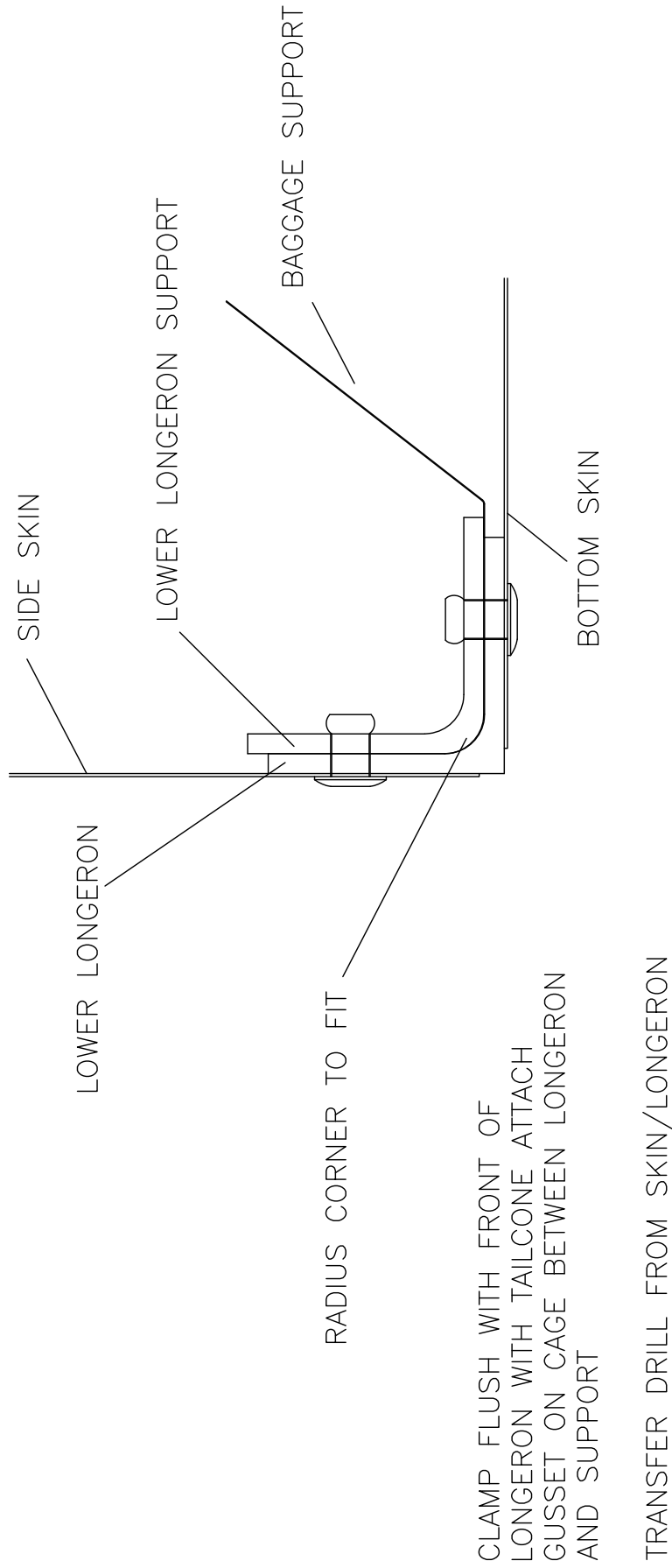
09/11/2018

MD5654
REV. - ORIG

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

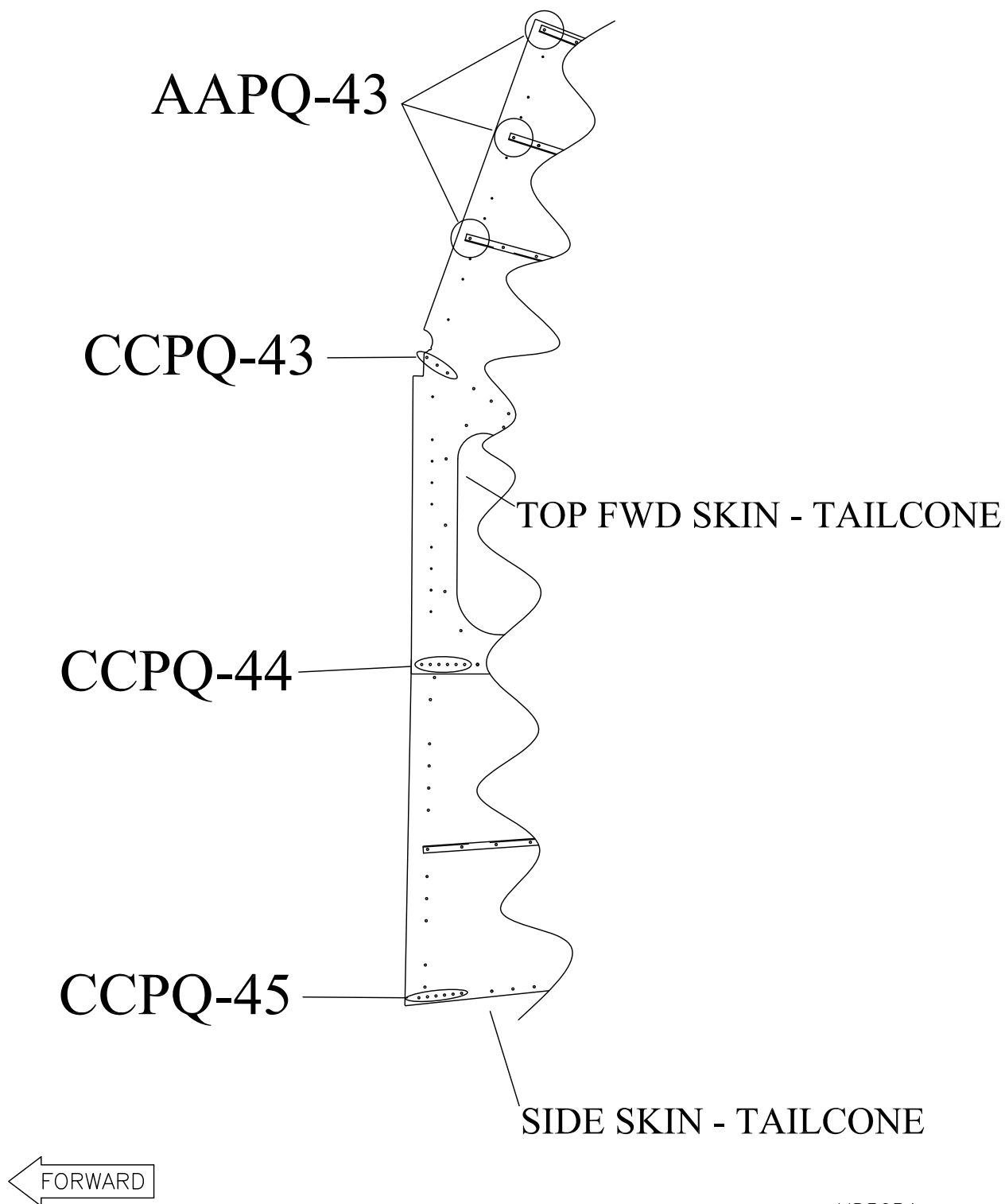
FABRICATE FROM KPFU0748

CUT LENGTH 19"



MD5654
REV. - ORIG

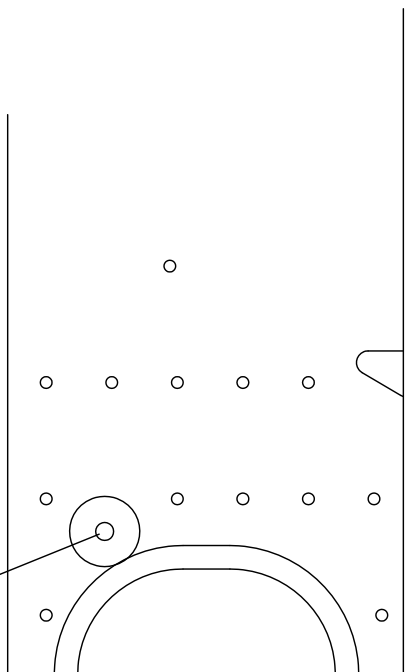
RRMS S-21 OUTBOUND
LOWER LONGERON SUPPORT FABRICATION
FIGURE 07-04



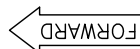
MD5654
REV. - ORIG

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

DRILL TO 5/8" FOR RUDDER CABLE
INSERT GROMMET



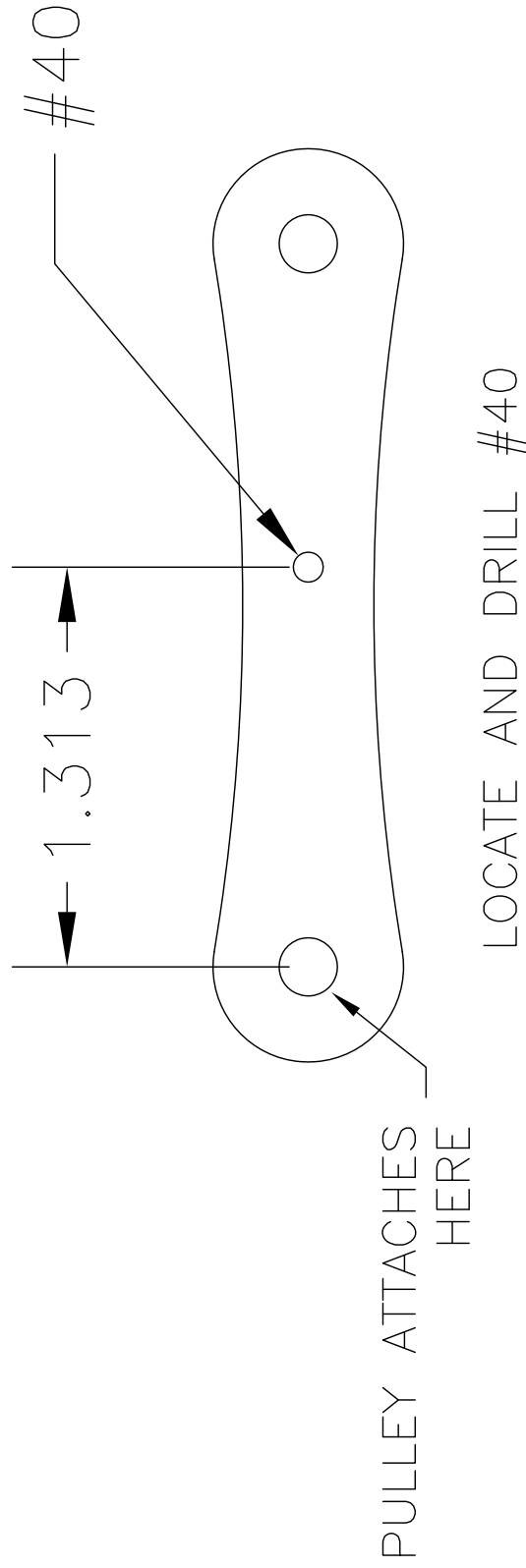
STATION 4 BULKHEAD
KPFU0707



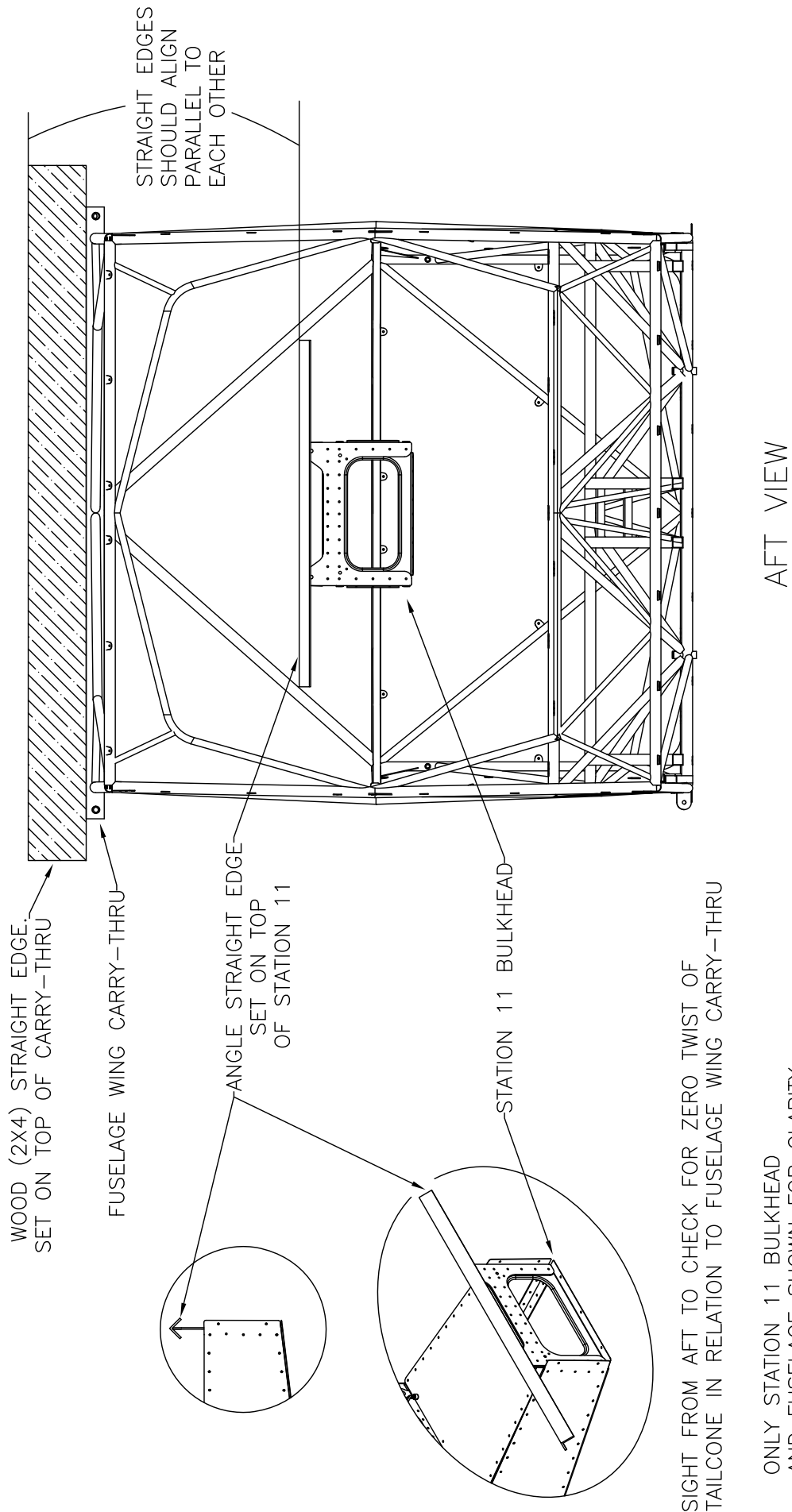
09/11/2018

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

MD5654
REV. - ORIG



INSERT APPROPRIATE COTTER PIN TO
RETAIN CABLE IN PULLEY



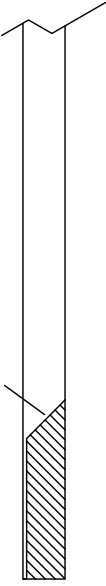
MD5654
REV. - ORIG

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

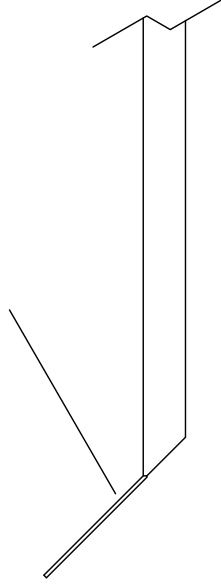
FABRICATE FROM KPFU0748

CUT LENGTH 33.5"

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



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



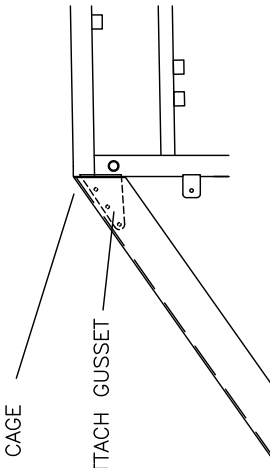
TEST FIT

CLAMP IN PLACE WITH FLAT FACE FLUSH WITH BULKHEAD
MARK AND TRIM TO TOP ATTACH GUSSET ON CAGE
CLAMP BACK IN PLACE WITH THE ANGLE RESTING ON THE OUTSIDE OF THE ATTACH GUSSET

DRILL (3) HOLES IN TANG AND RIVET IN PLACE

ALIGN TOP EDGE WITH TOP OF CAGE

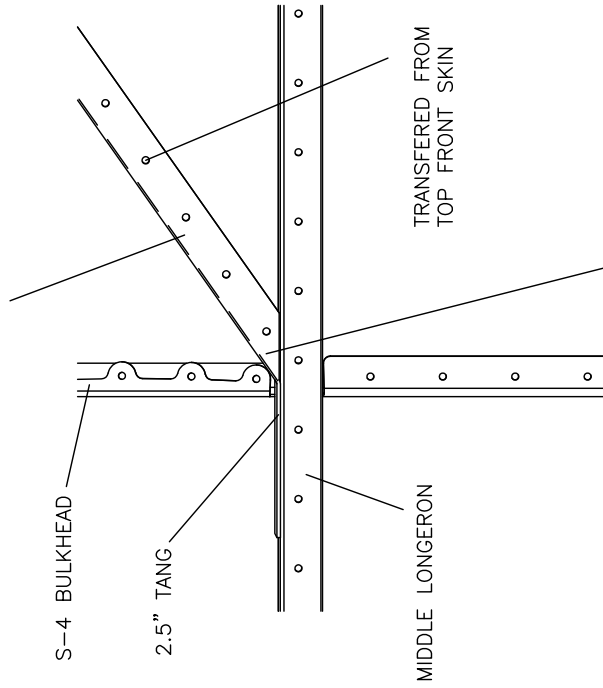
TRANSFER DRILL FROM THE TOP ATTACH GUSSET



STATION 3

MD5654
REV. - ORIG

SIDE FLUSH WITH SIDE SKIN
FLANGE ON TOP POINTING INWARDS



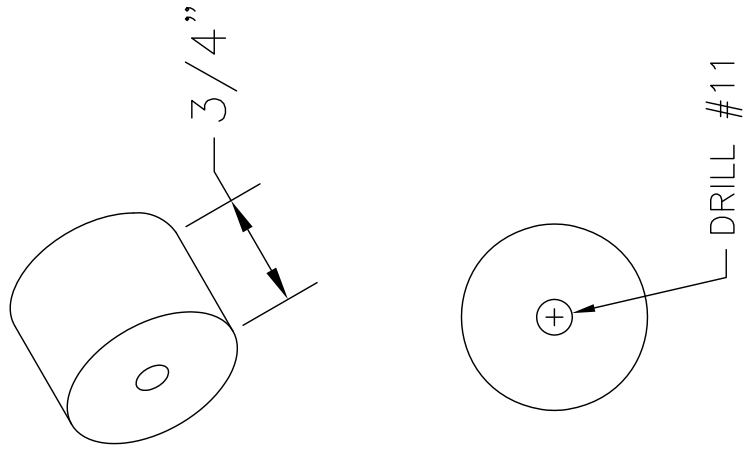
TANG SLIDES THROUGH BULKHEAD WITH LONGERON.
SLIDE FORWARD JUST ENOUGH TO PREVENT WINDOW SUPPORT
FROM OVERLAPPING THE FLANGE ON S-4 BULKHEAD



FORWARD

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

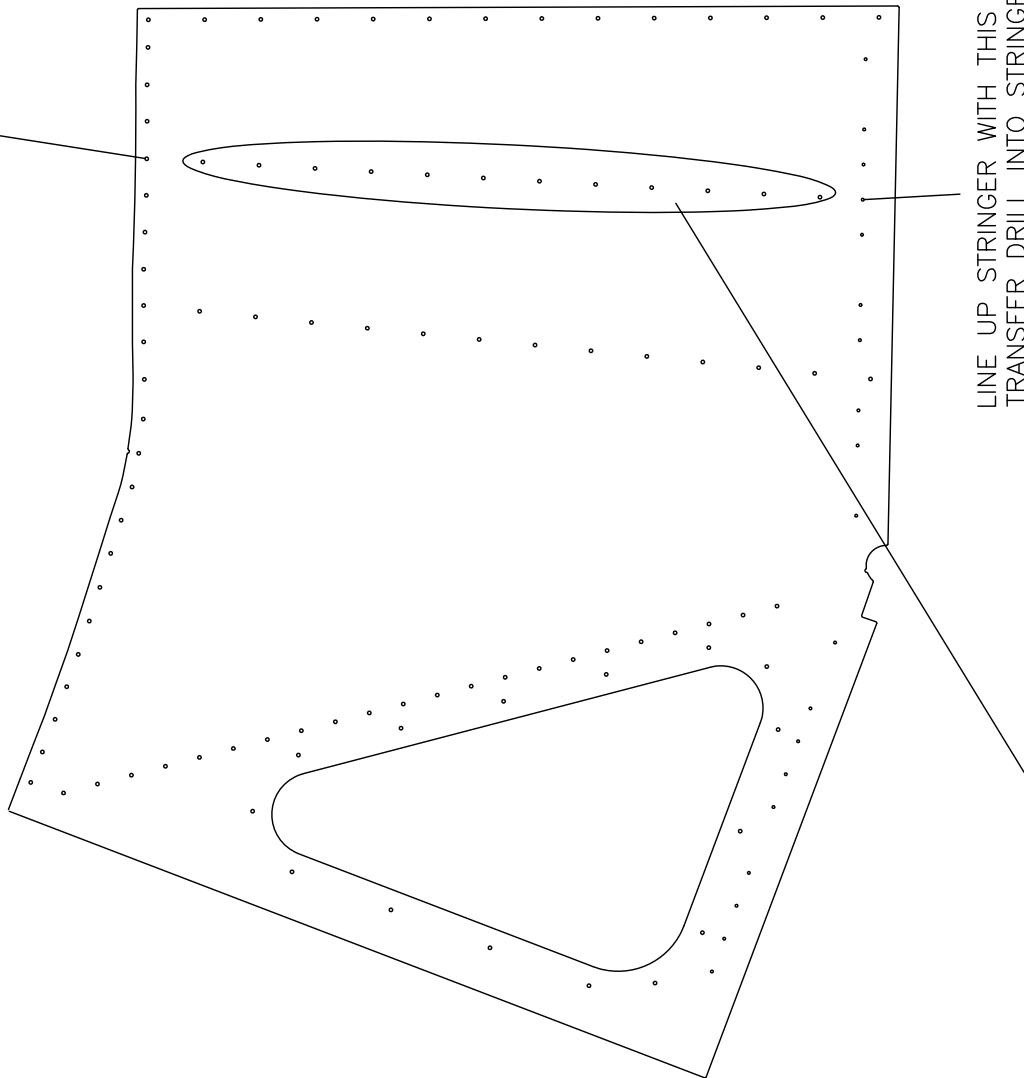
FABRICATE 2 SPACERS
FROM PROVIDED SPACER MATERIAL



MD5593
REV. - ORIG

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

CLECO STRINGER TO THIS HOLE
THE STRINGER DOES NOT PROTRUDE THROUGH THE BULKHEAD

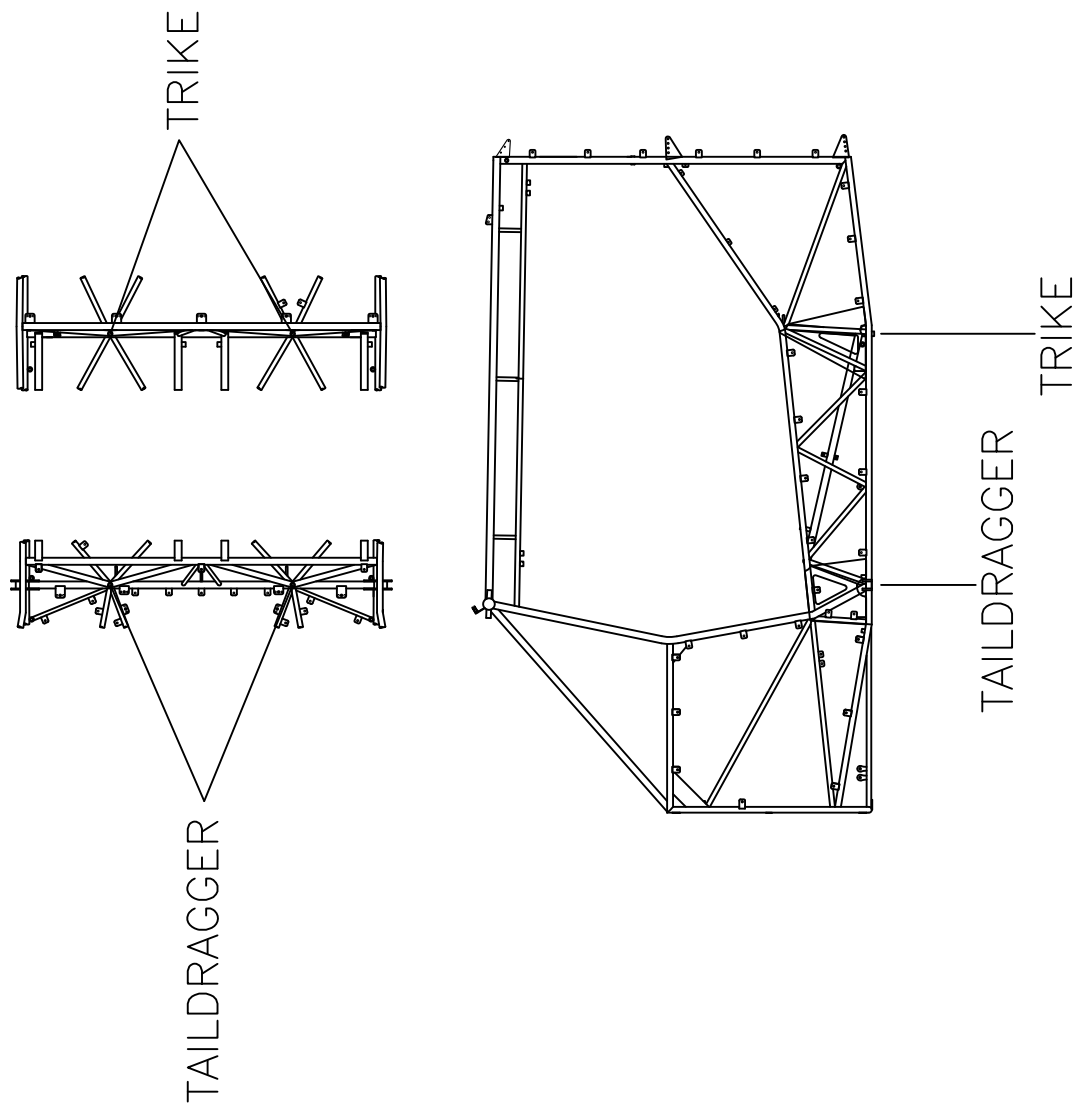


TRANSFER DRILL FROM STRINGER TO SKIN

LINE UP STRINGER WITH THIS HOLE
TRANSFER DRILL INTO STRINGER AND TRIM TO LENGTH

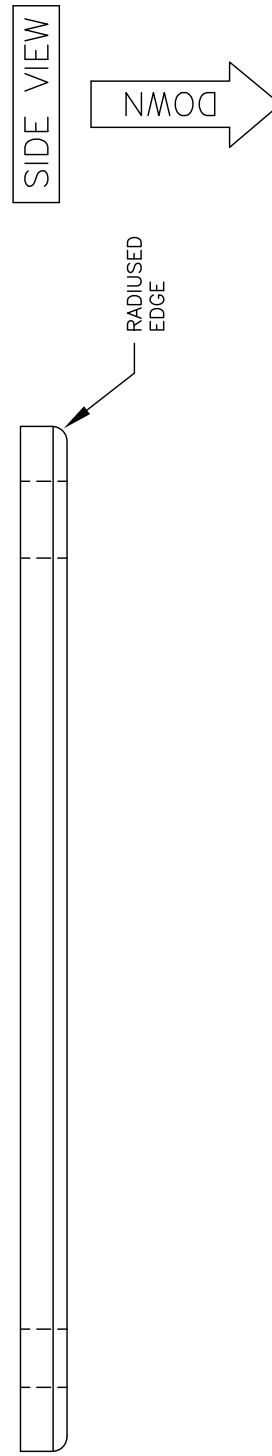
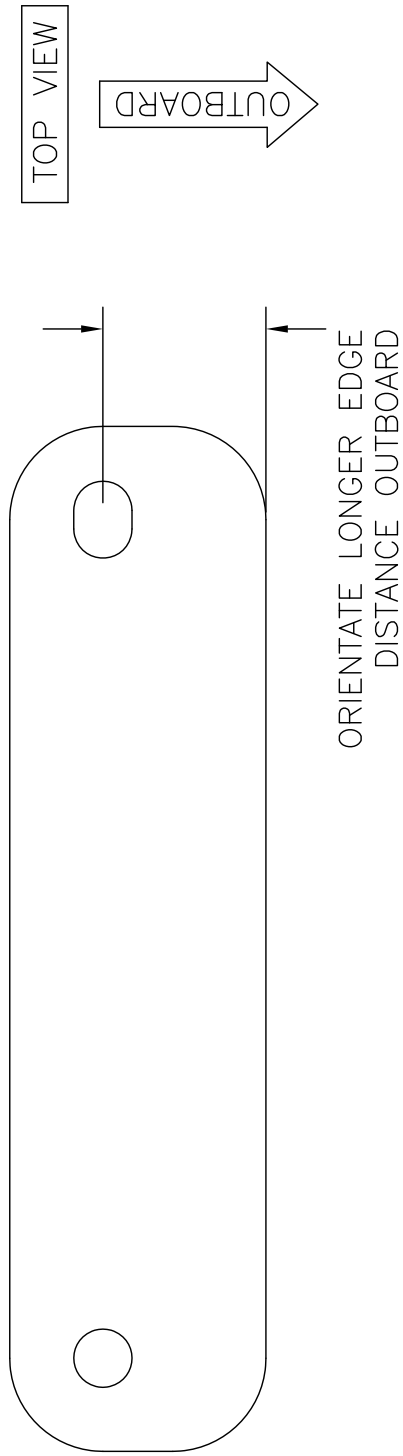
MD5654
REV. - ORIG

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



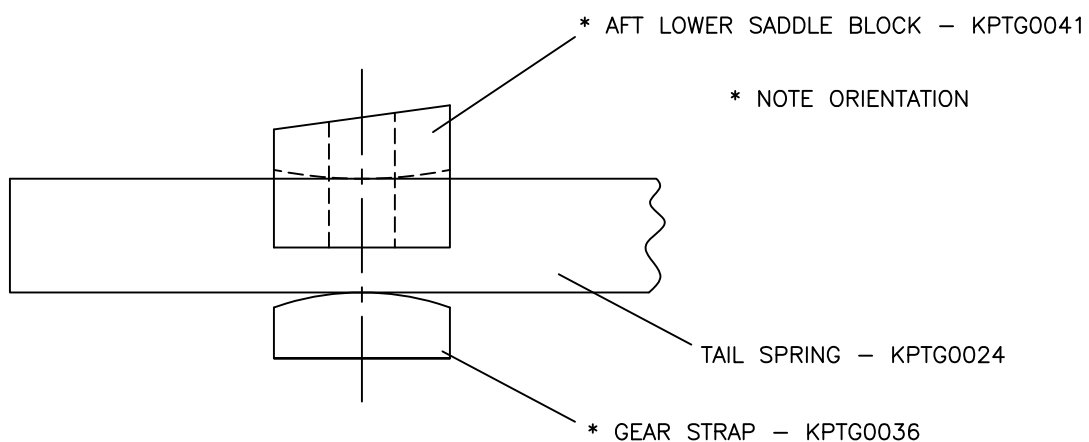
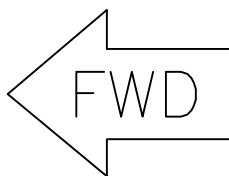
RRR S-21 OUTBOUND
MAIN LANDING GEAR LOCATIONS
FIGURE 08-04

MD5603
 REV. - ORIG



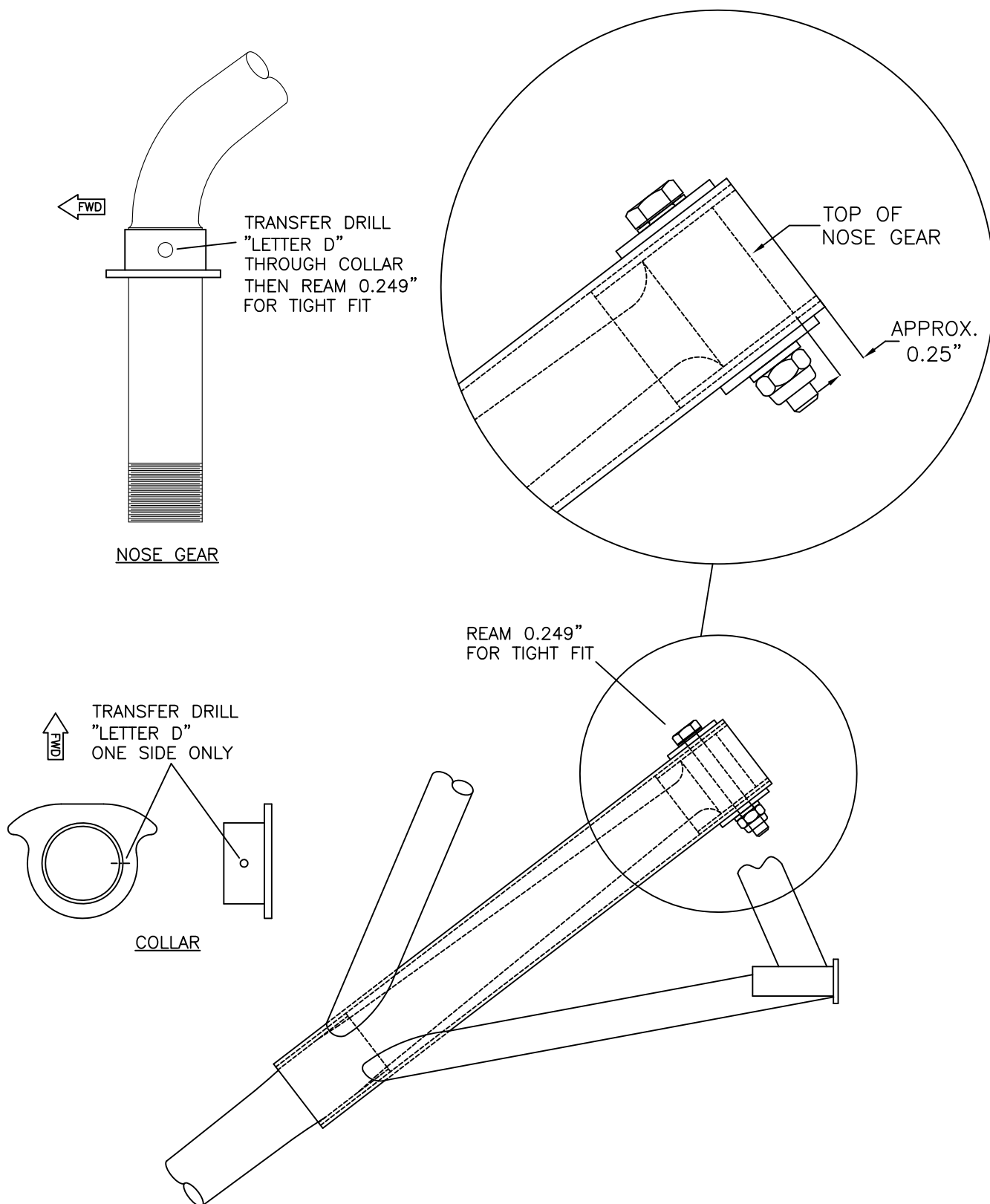
MD5600
REV. - ORIG

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



MD5054
REV. - ORIG

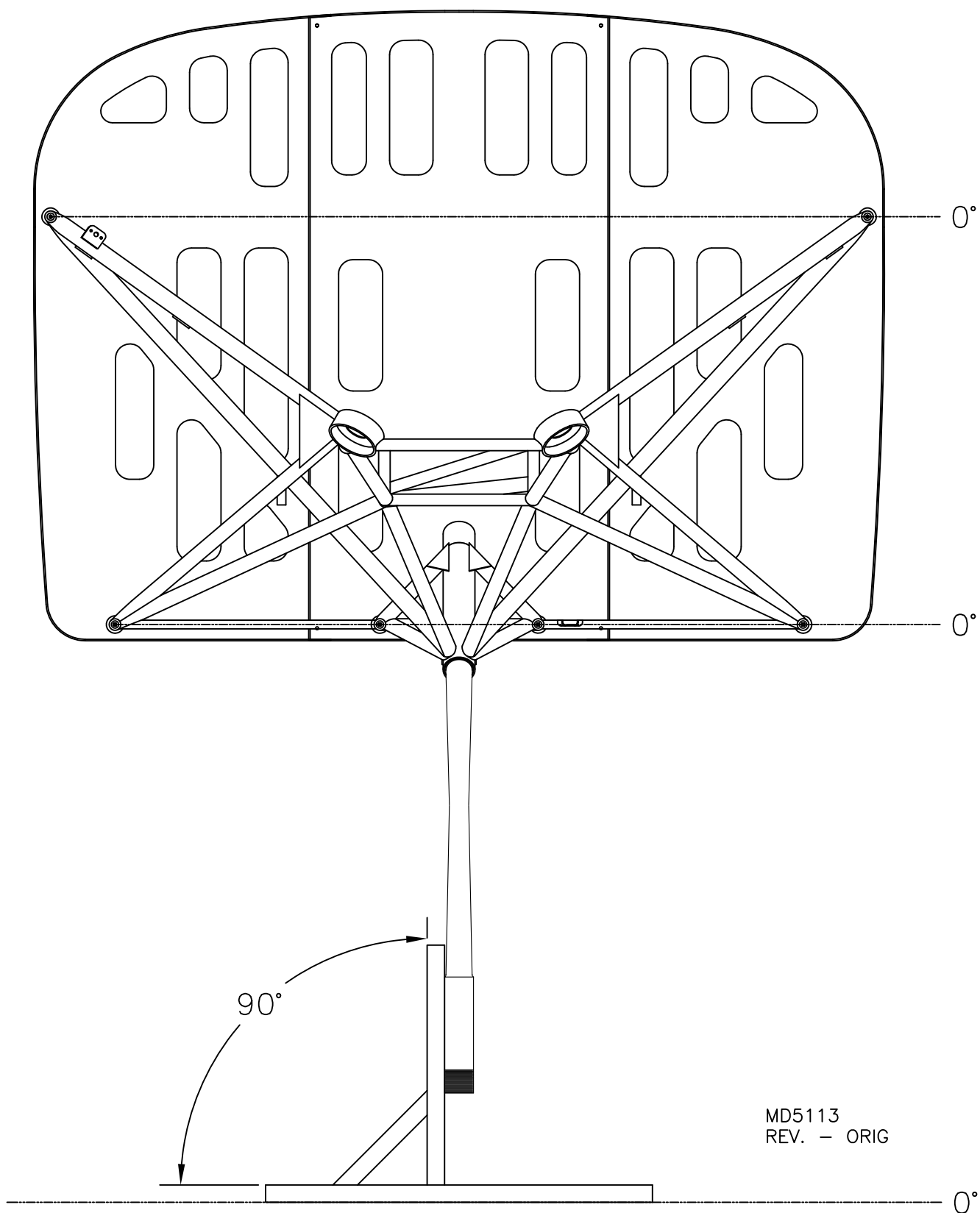
**RANS S-21 OUTBOUND
TAIL SPRING INSTALLATION
FIGURE 08A-02**



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

MD5112
 REV. — ORIG

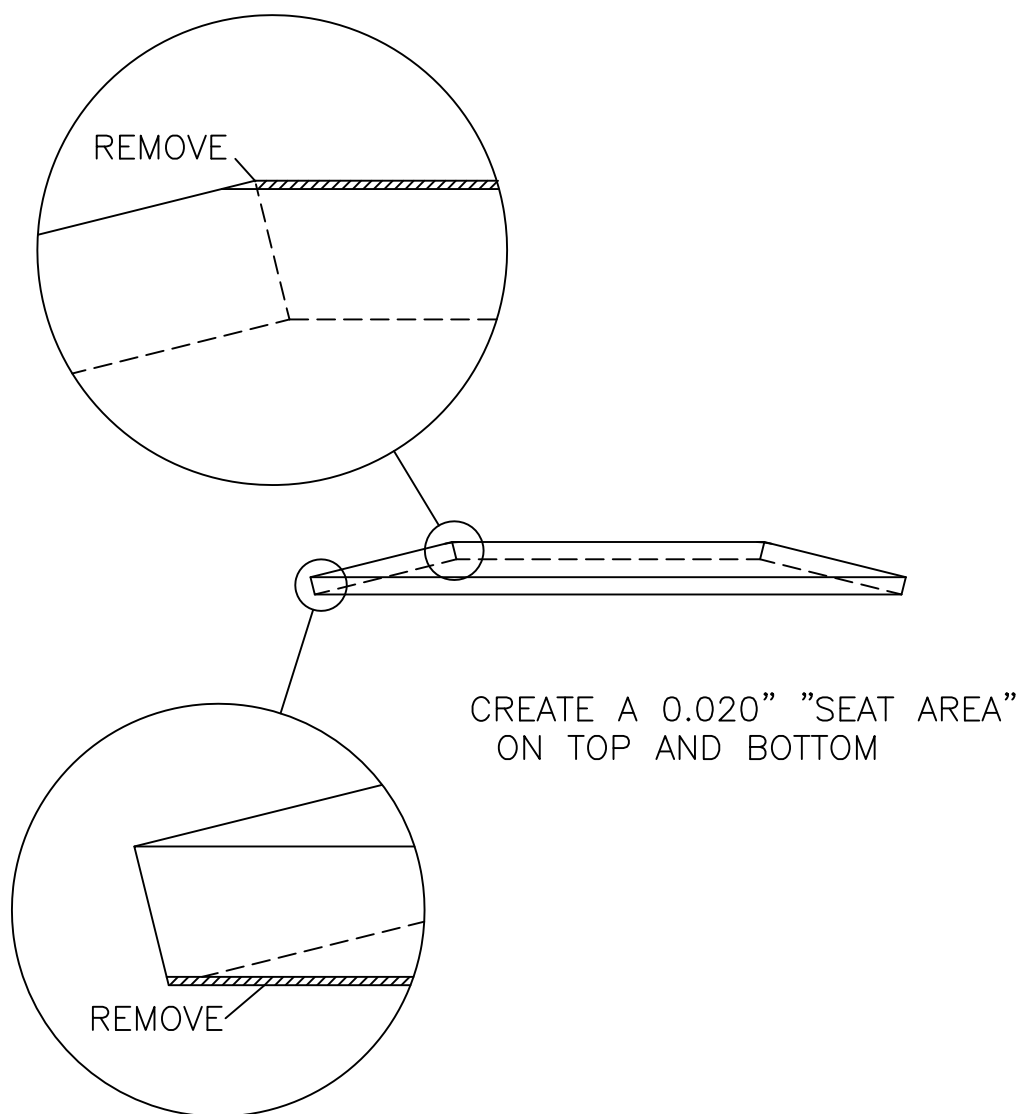
09/11/2018



MD5113
REV. — ORIG

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

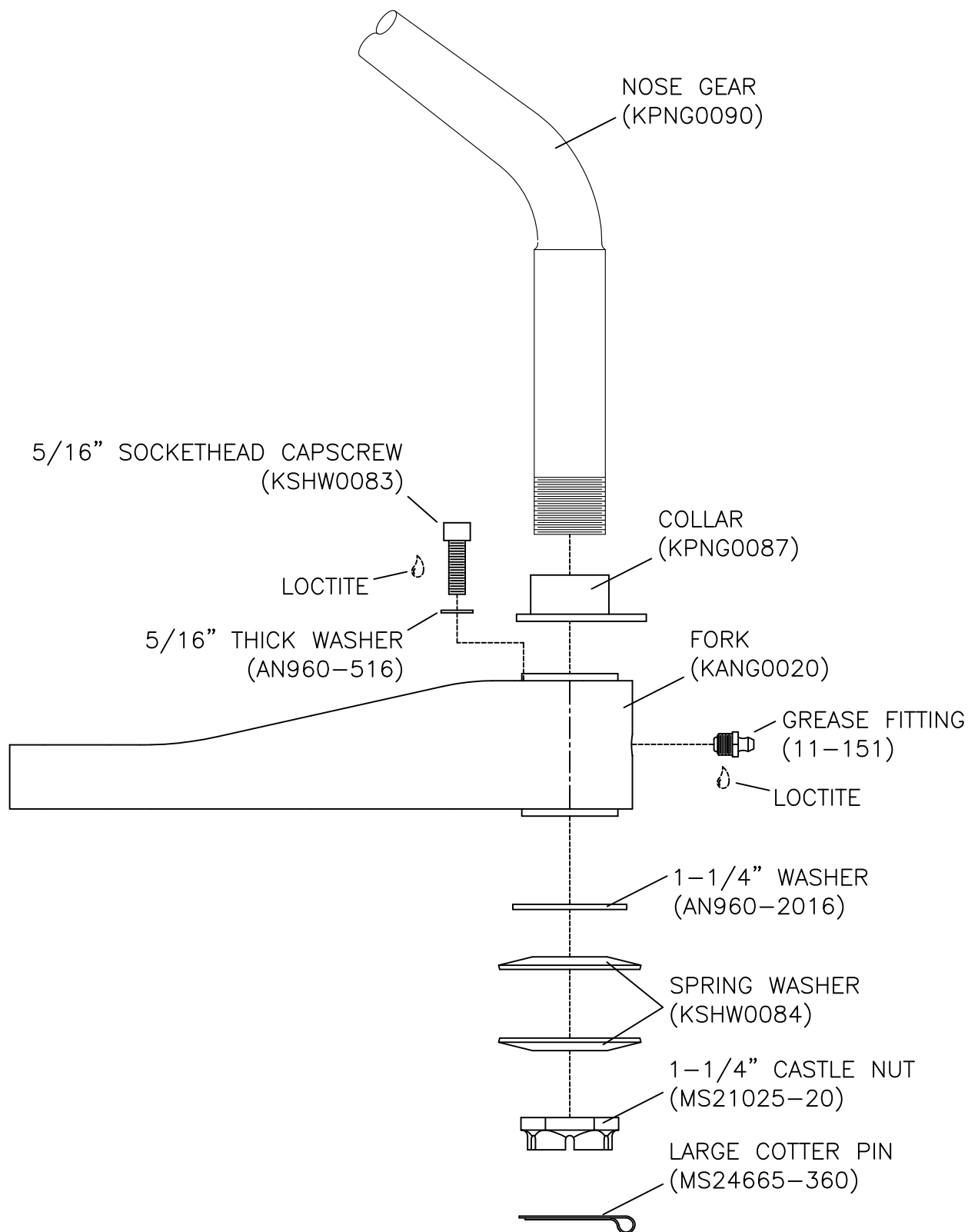
09/11/2018



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

MD5220
 REV. — ORIG

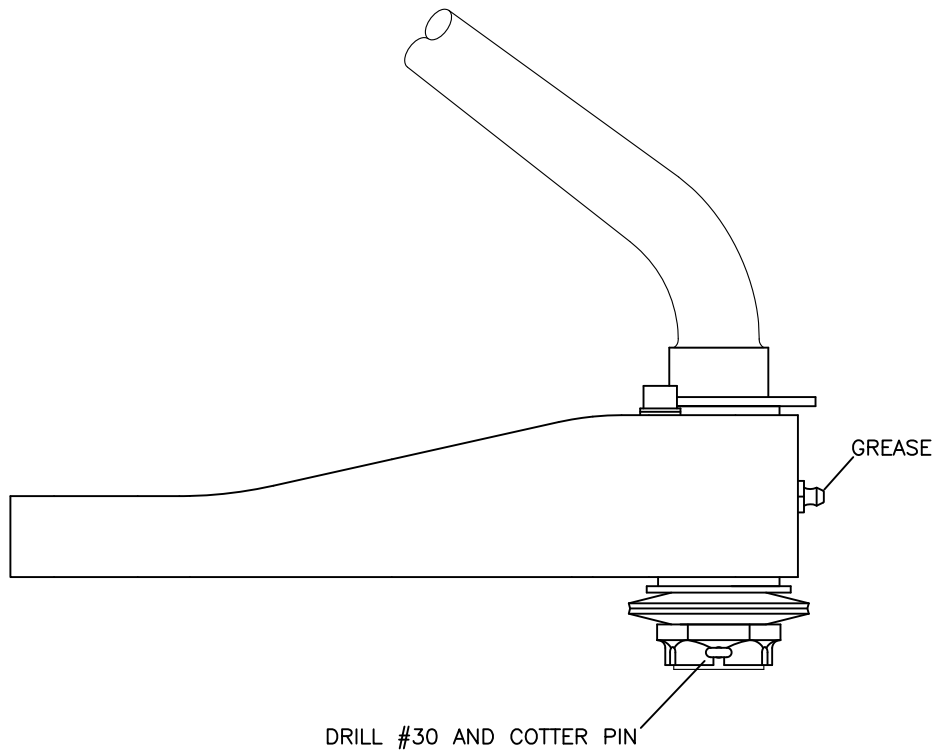
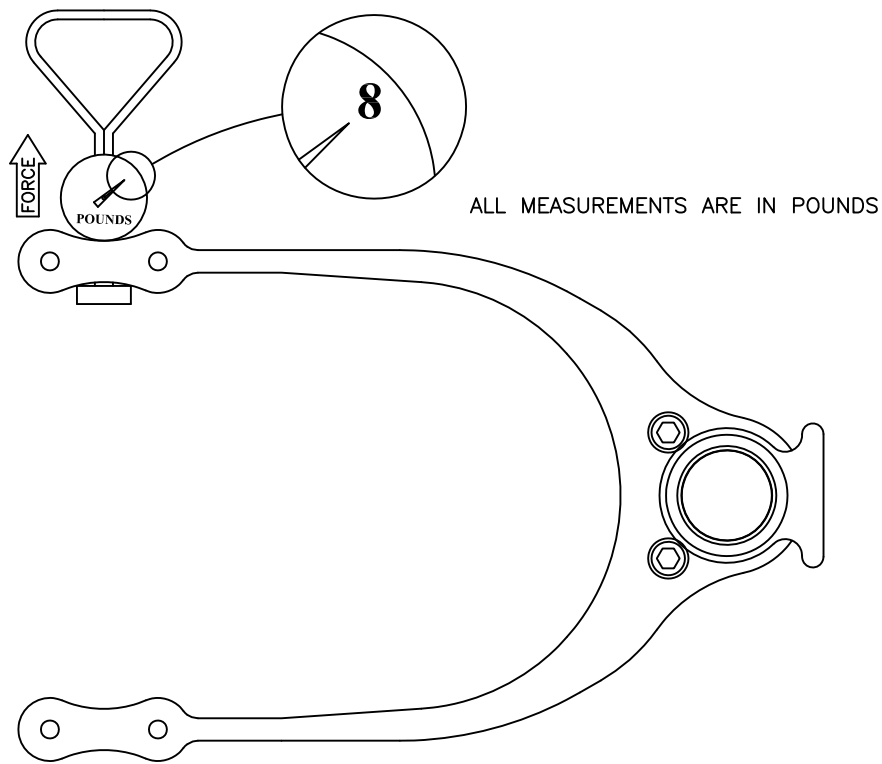
09/11/2018



MD5086
REV. - ORIG

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

09/11/2018



RAND S-21 OUTBOUND FORK TENSION ADJUSTMENT FIGURE 08A-22

MD5111
REV. — ORIG

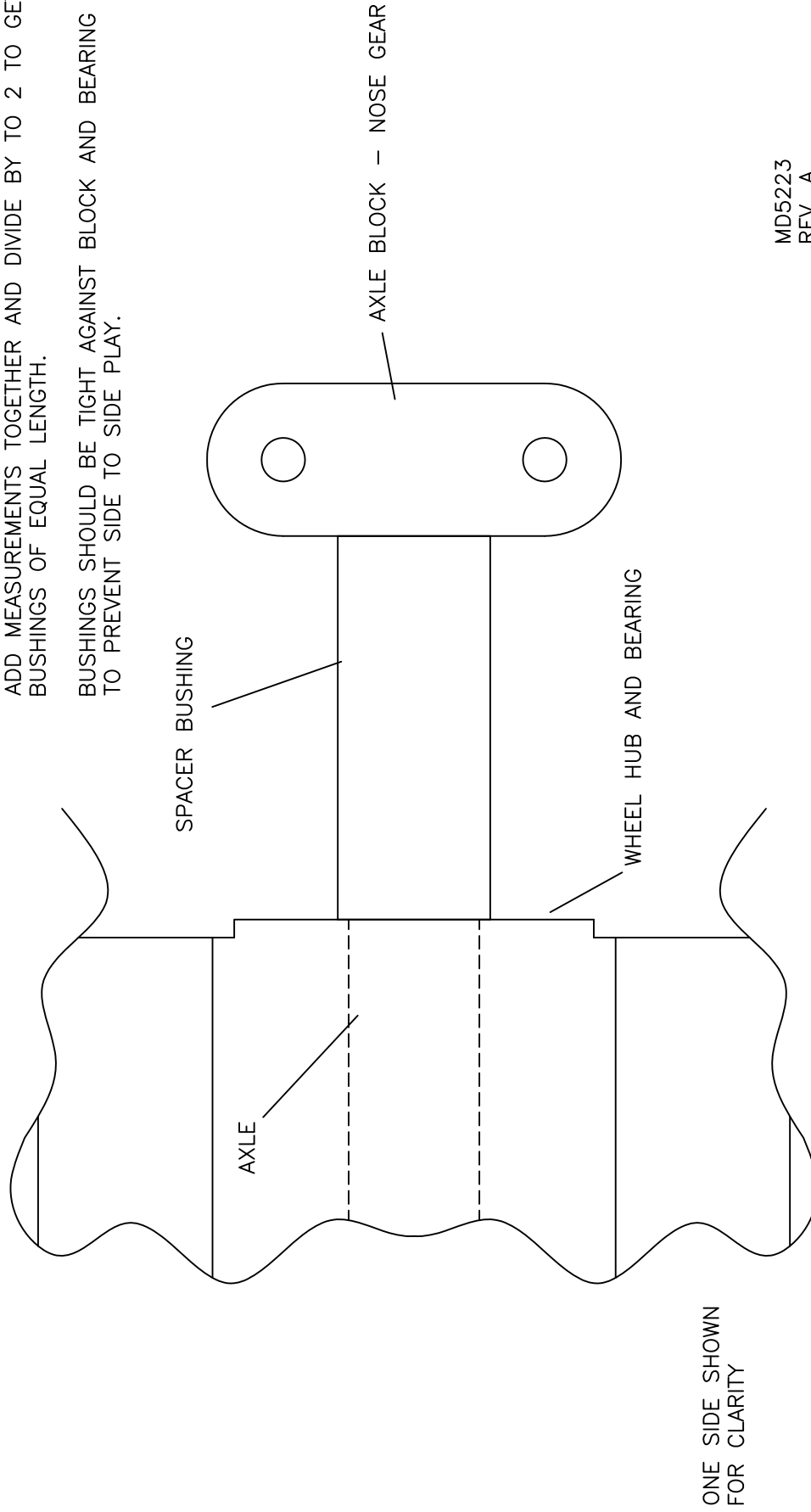
09/11/2018

CUT SPACER BUSHING TO CENTER WHEEL BETWEEN ARMS OF NOSE GEAR FORK.

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

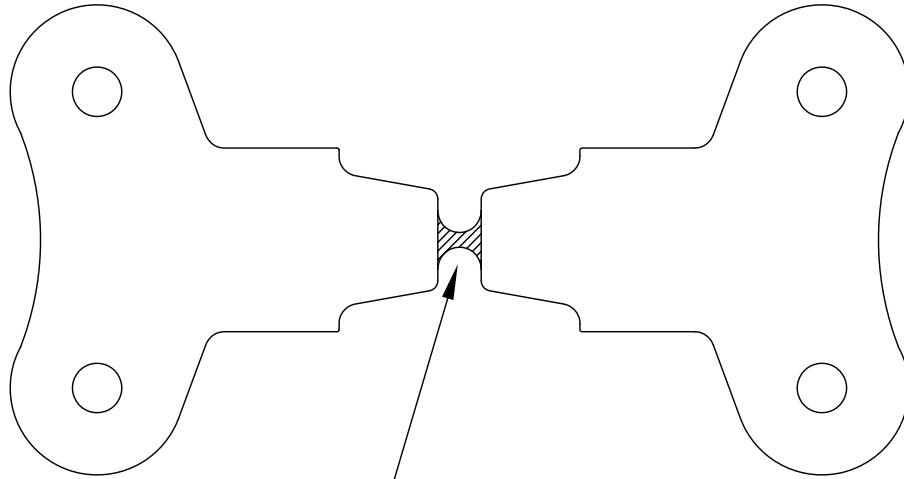
ADD MEASUREMENTS TOGETHER AND DIVIDE BY 2 TO GET BUSHINGS OF EQUAL LENGTH.

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

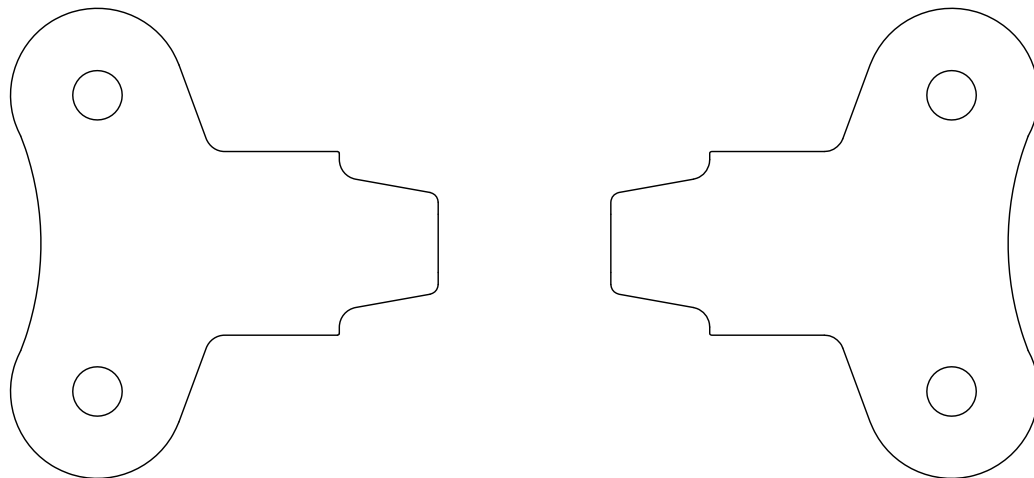


MD5223
REV. A

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



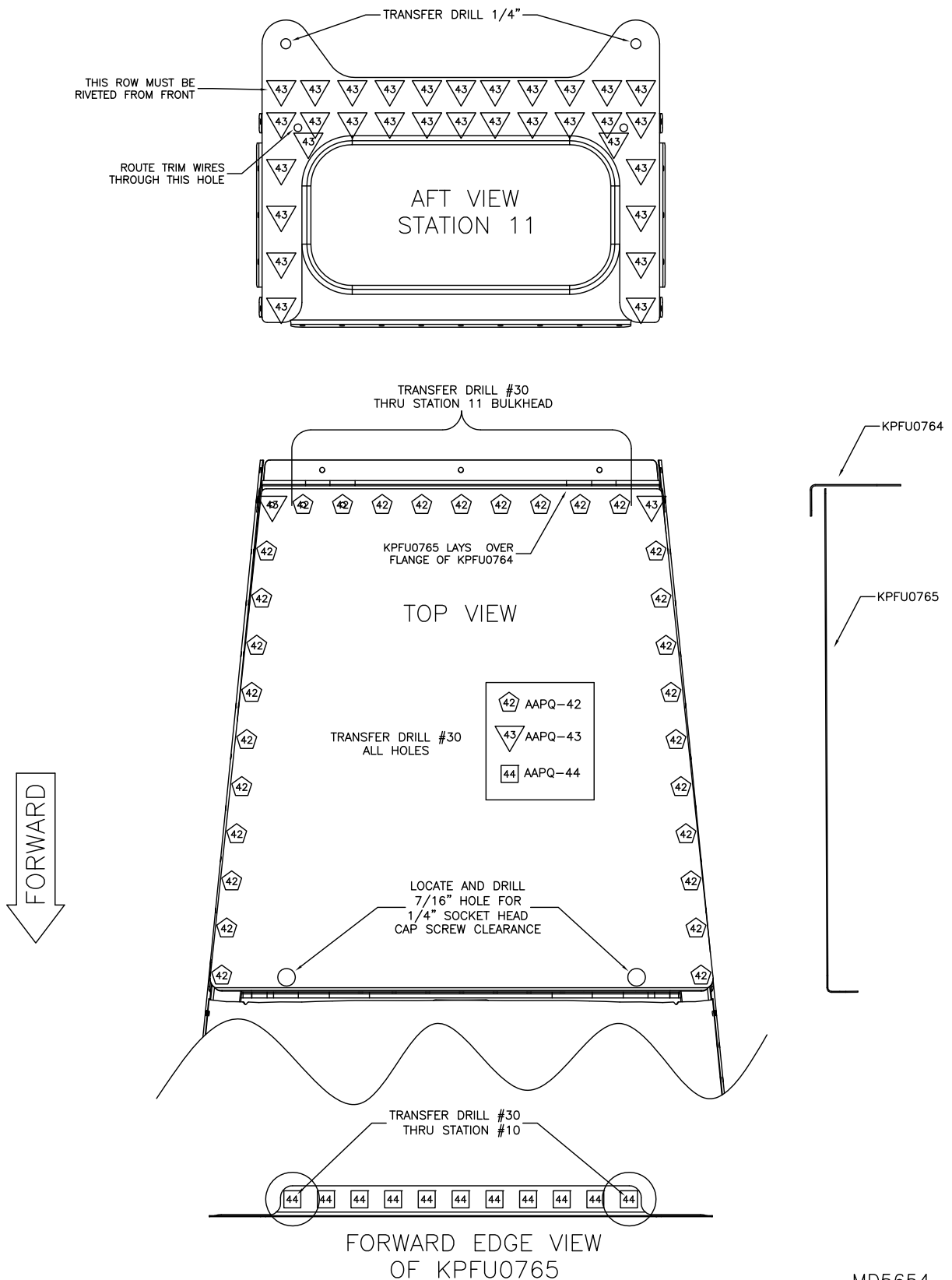
REMOVE THIS AREA
TO MAKE 2 PARTS



MD5497
REV. - ORIG

RANS S-21 OUTBOUND
NOSE GEAR TOW PLATE MODIFICATION
FIGURE 08A-31

09/11/2018

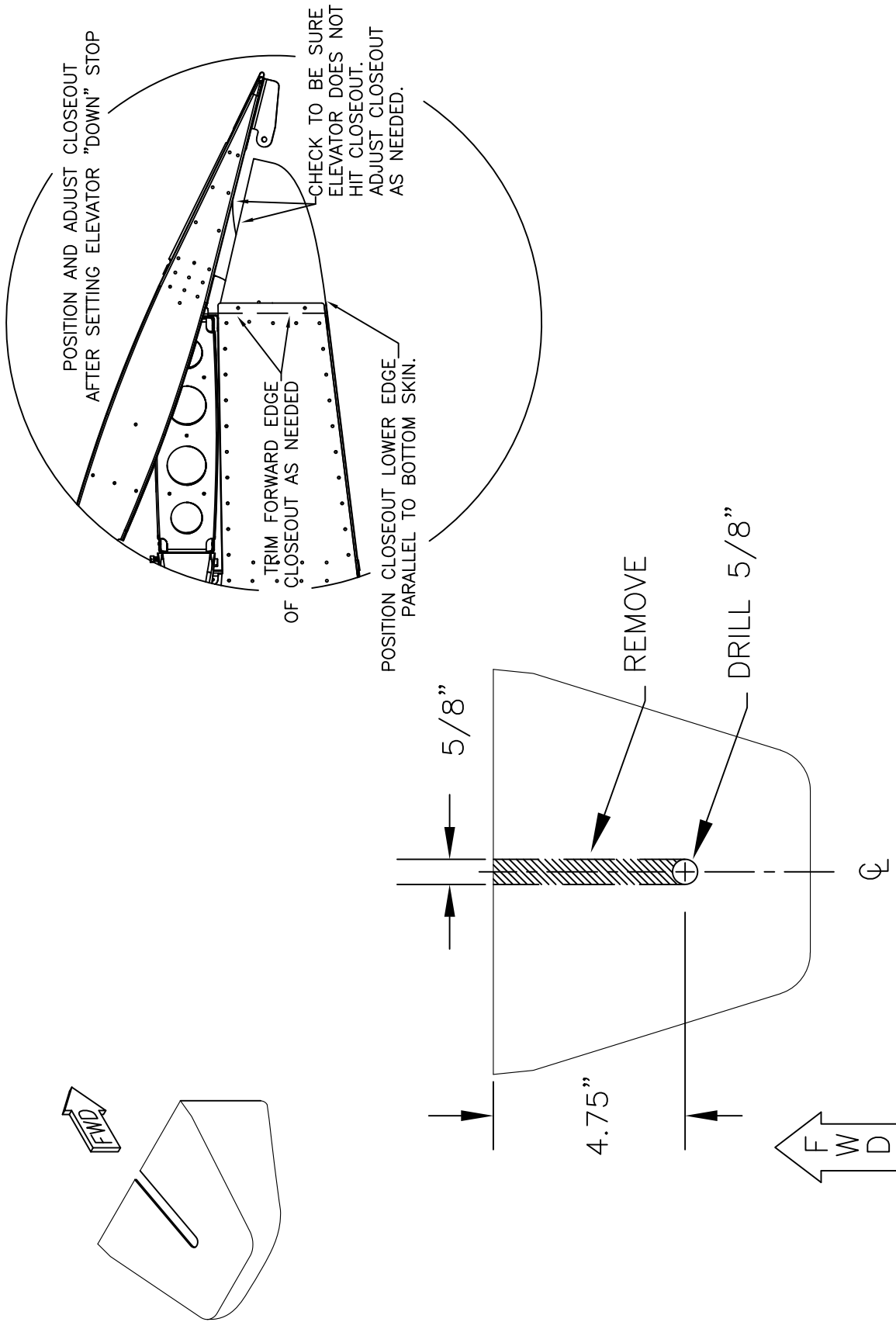


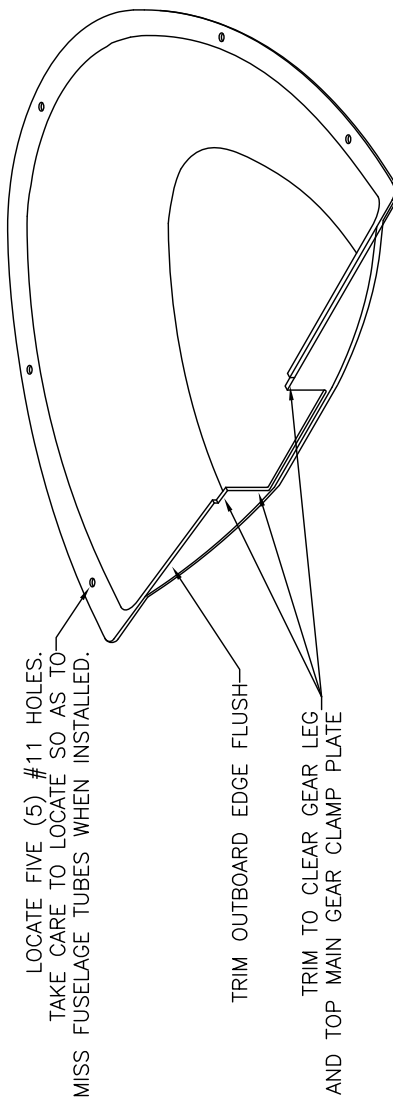
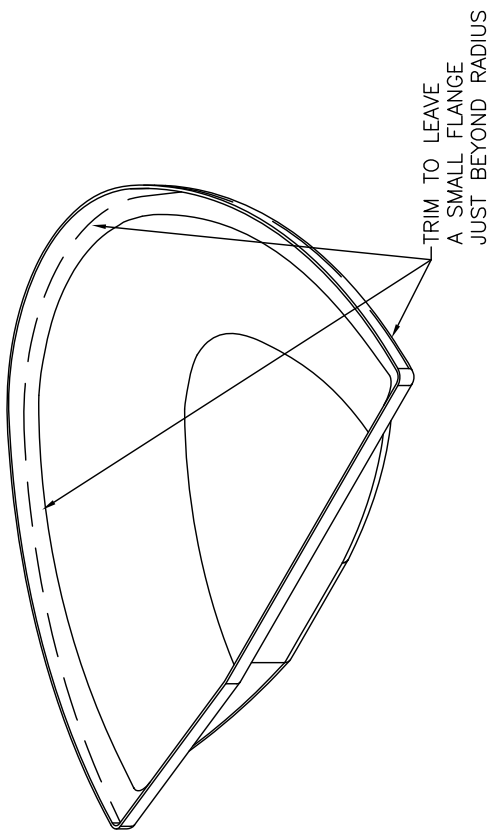
MD5654
REV. - ORIG

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

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

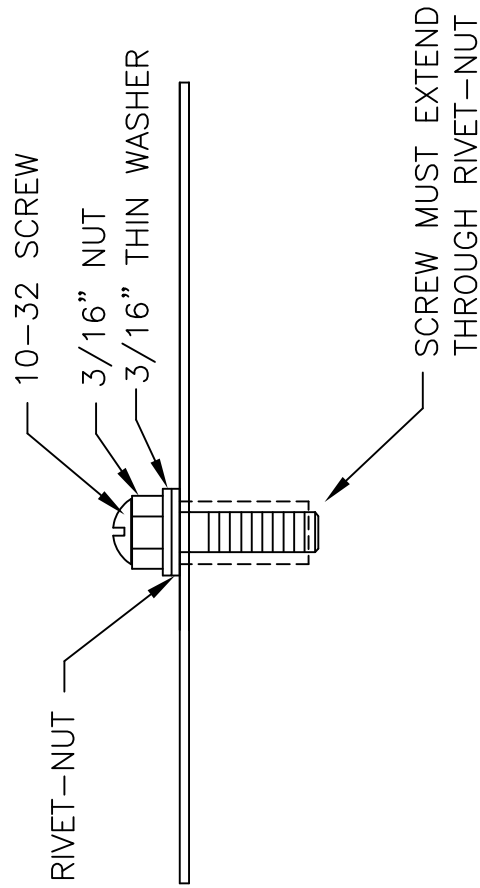
09/11/2018





MD5654
REV. - ORIG

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

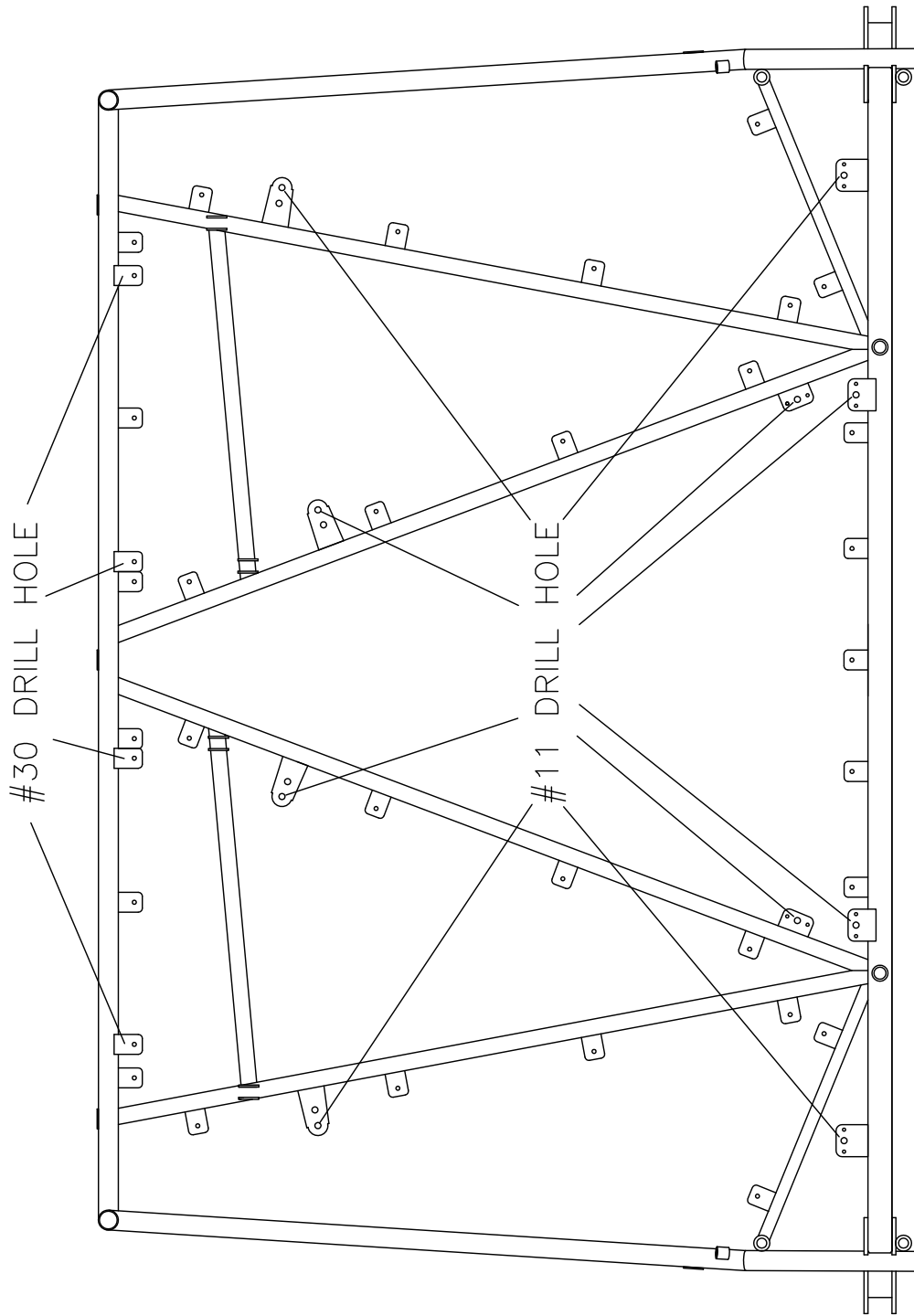


PROCEDURE BELOW MAY BE USED WHEN A RIVET-NUT PULLER IS NOT AVAILABLE.

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

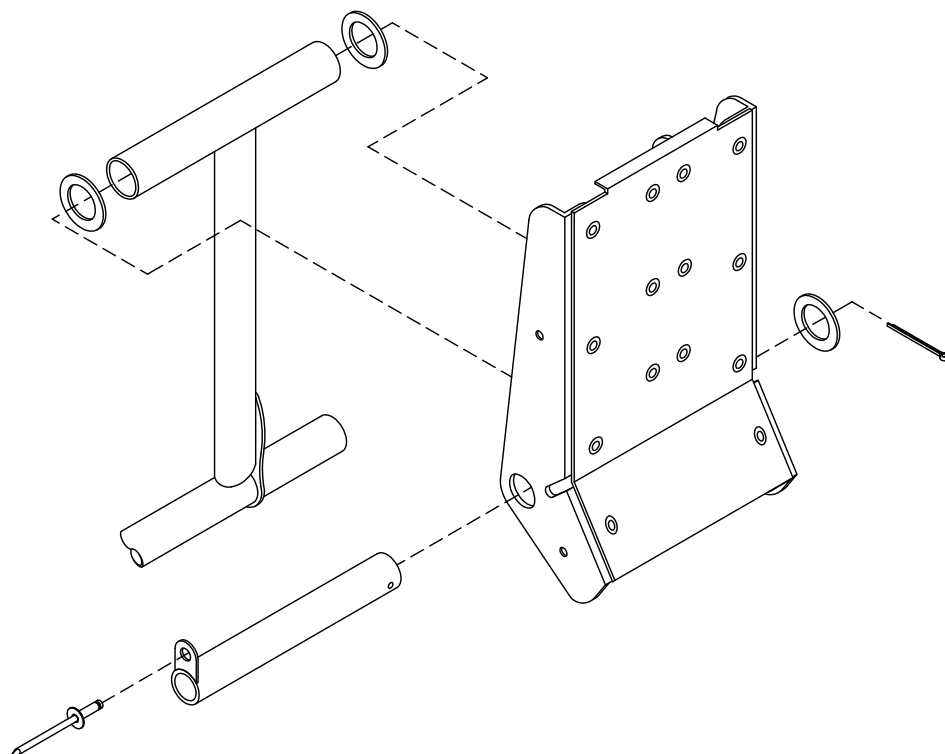
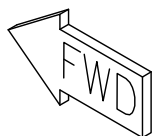
RRM S-21 OUTBOUND
RIVET-NUT INSTALLATION
FIGURE 08B-06

MD343
 REV. - ORIG



MD5604
REV. — ORIG

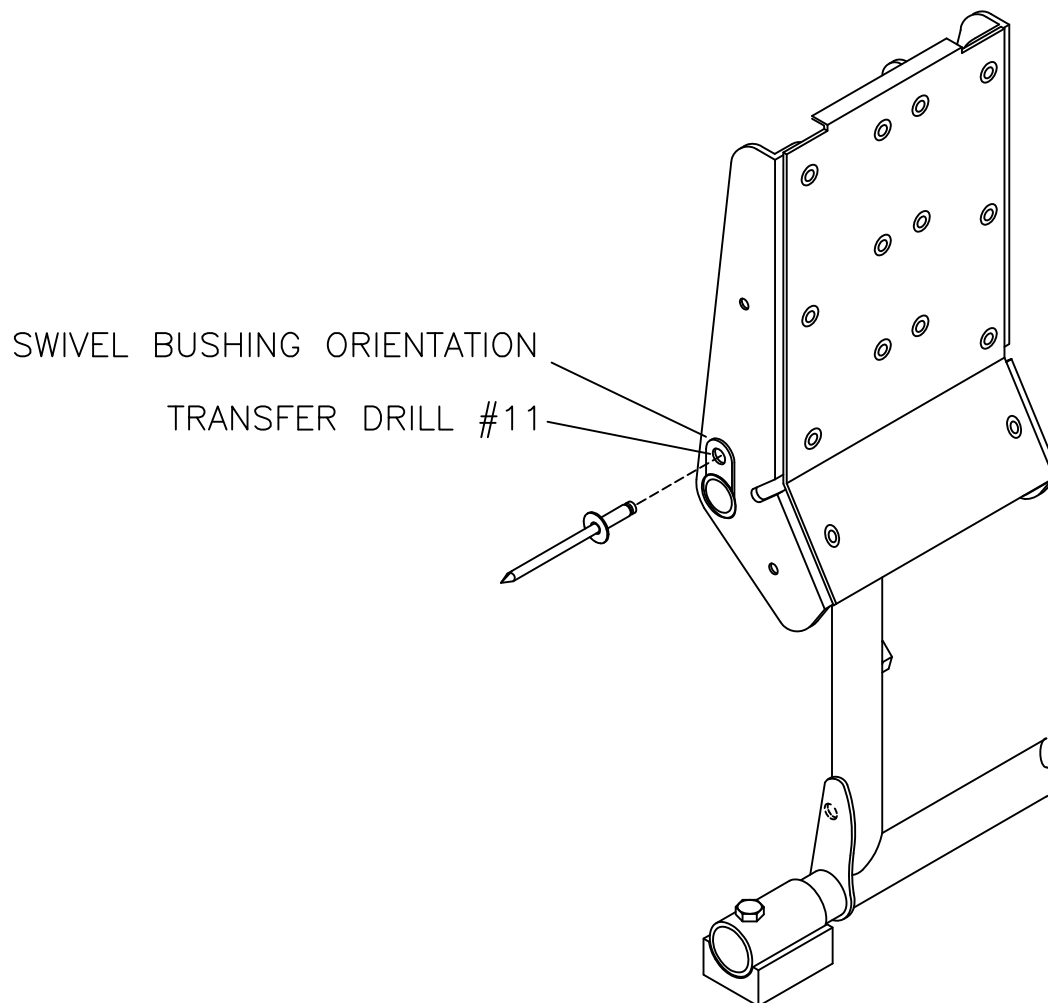
RAMP S-21 OUTBOUND
FLOORBOARD DRILL SCHEDULE
FIGURE 09-01



MD2266
REV. — ORIG

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

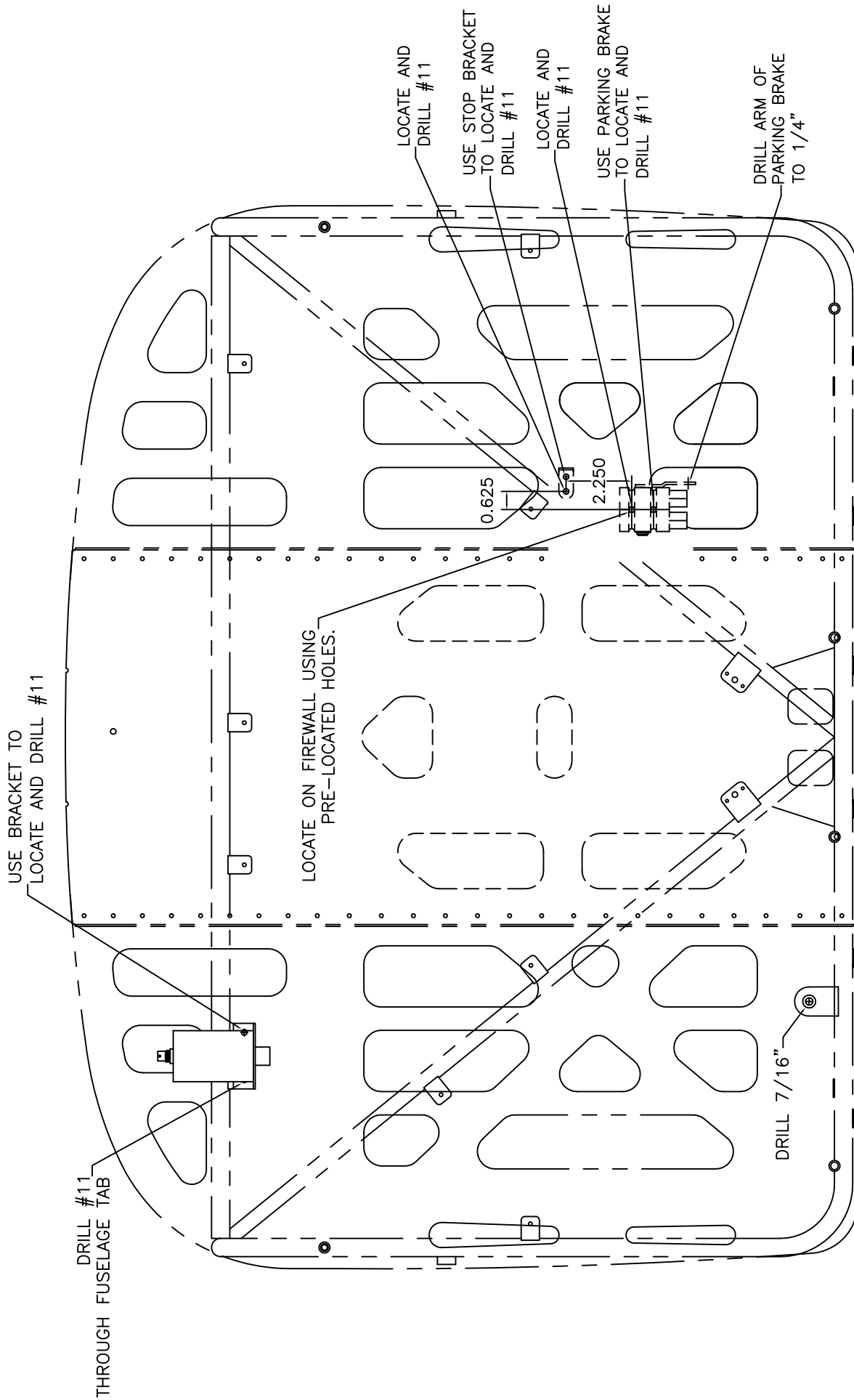
09/11/2018



MD2267
REV. — ORIG

RANS S-21 OUTBOUND
TOE PEDAL INSTALLATION
FIGURE 09A-03

09/11/2018

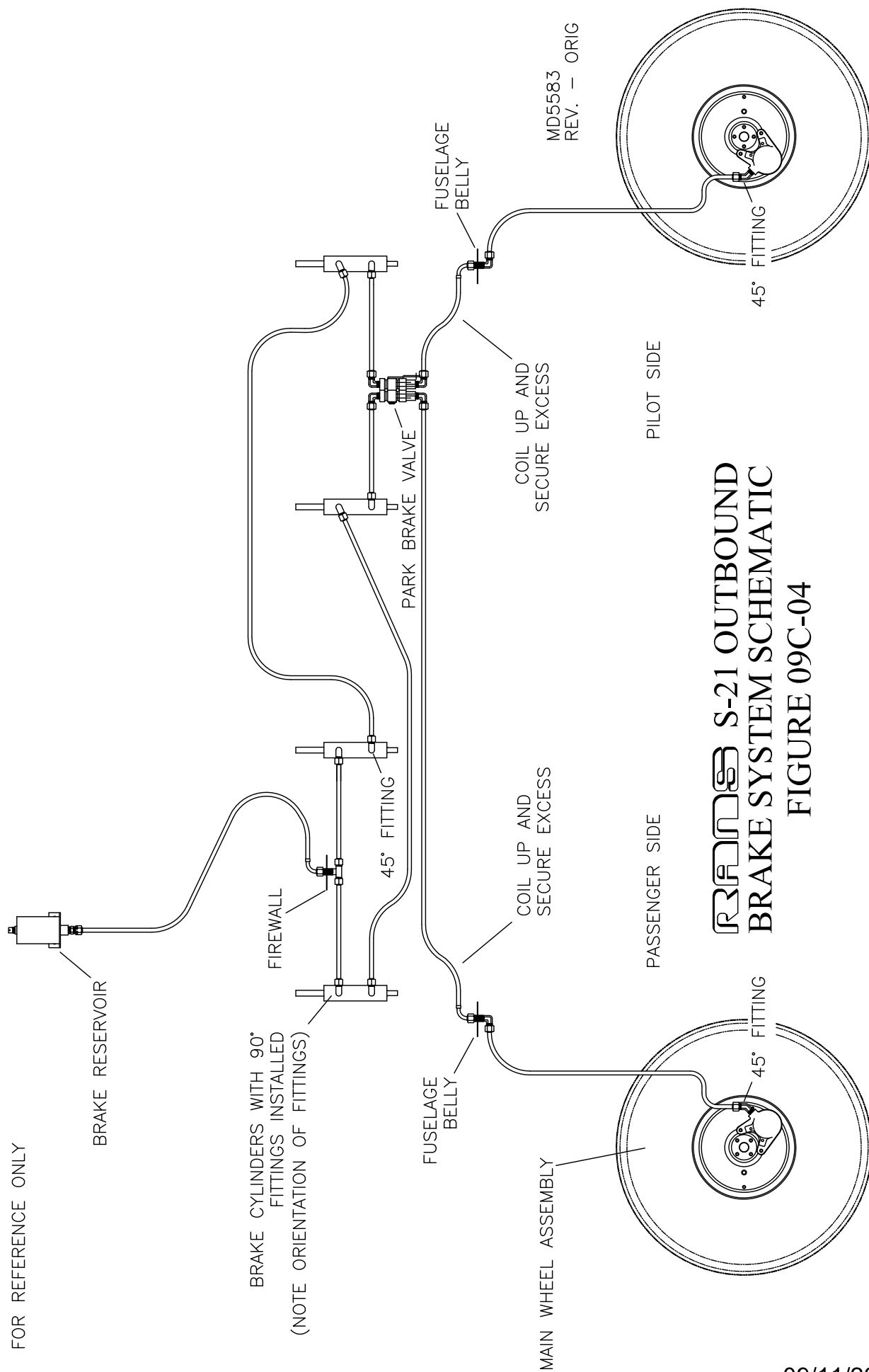


VIEWED FROM FRONT

MD5575
REV. -- ORIG

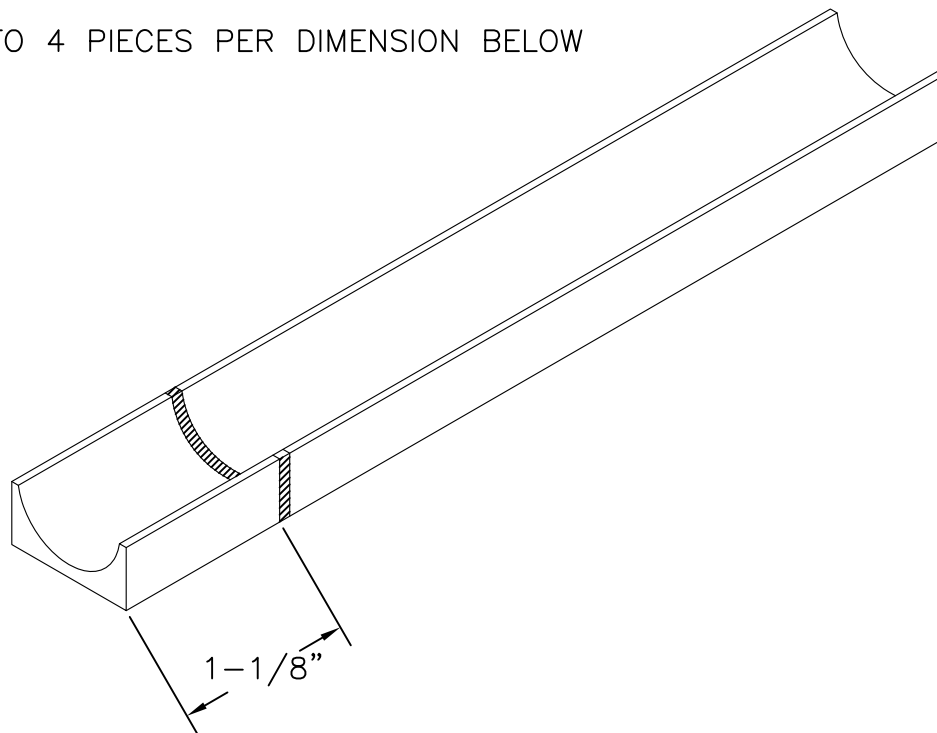
RRR S-21 OUTBOUND **FIREWALL MODIFICATION FOR HYDRAULIC BRAKE INSTALL** **FIGURE 09C-03**

NOT TO SCALE
FOR REFERENCE ONLY

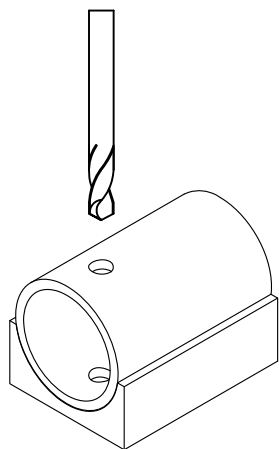


**RAMS S-21 OUTBOUND
BRAKE SYSTEM SCHEMATIC
FIGURE 09C-04**

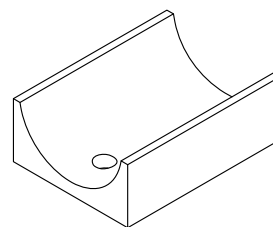
CUT PART INTO 4 PIECES PER DIMENSION BELOW



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



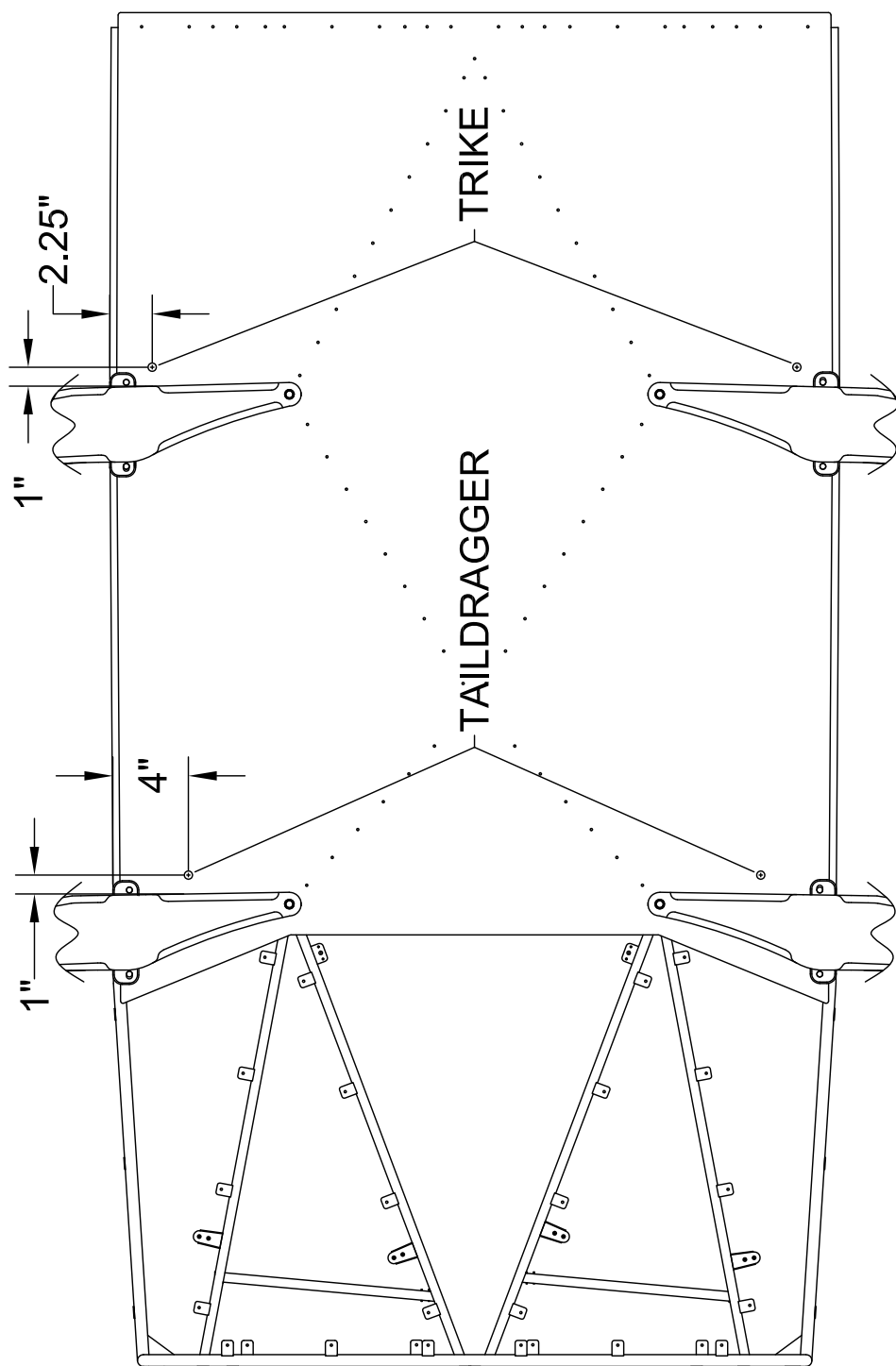
FINISHED PART



MD2267
REV. - ORIG

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

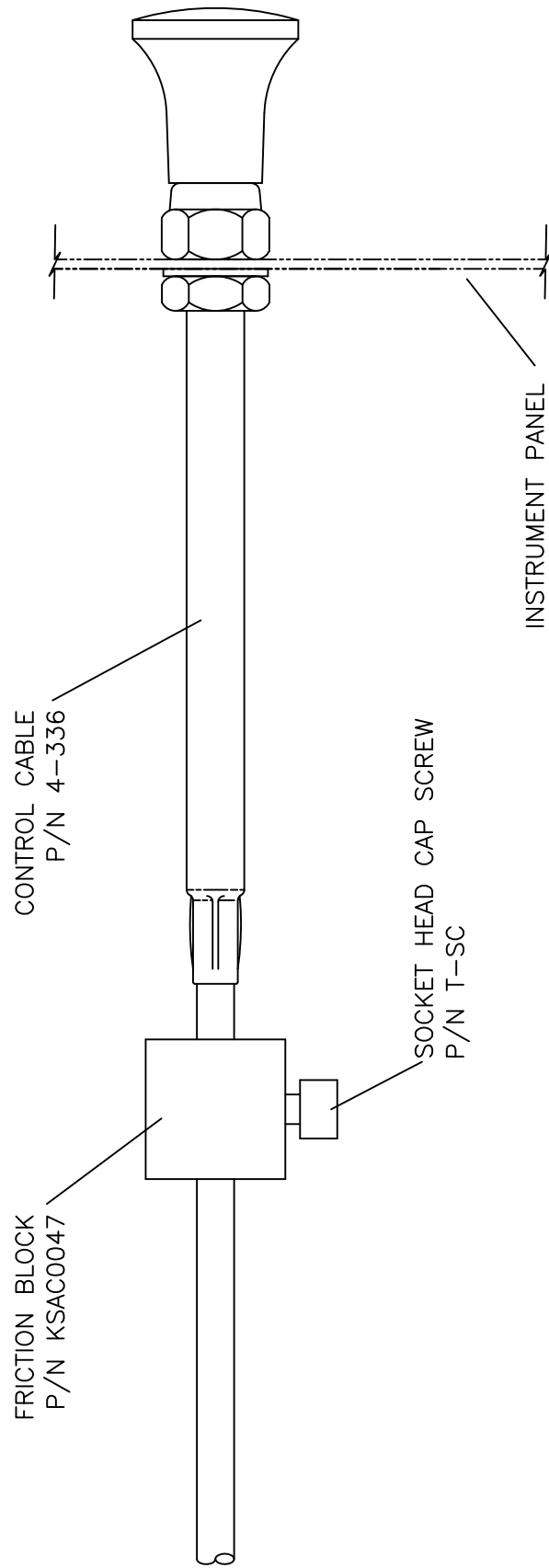
09/11/2018



DRILL APPROPRIATE
LOCATIONS TO 7/16"

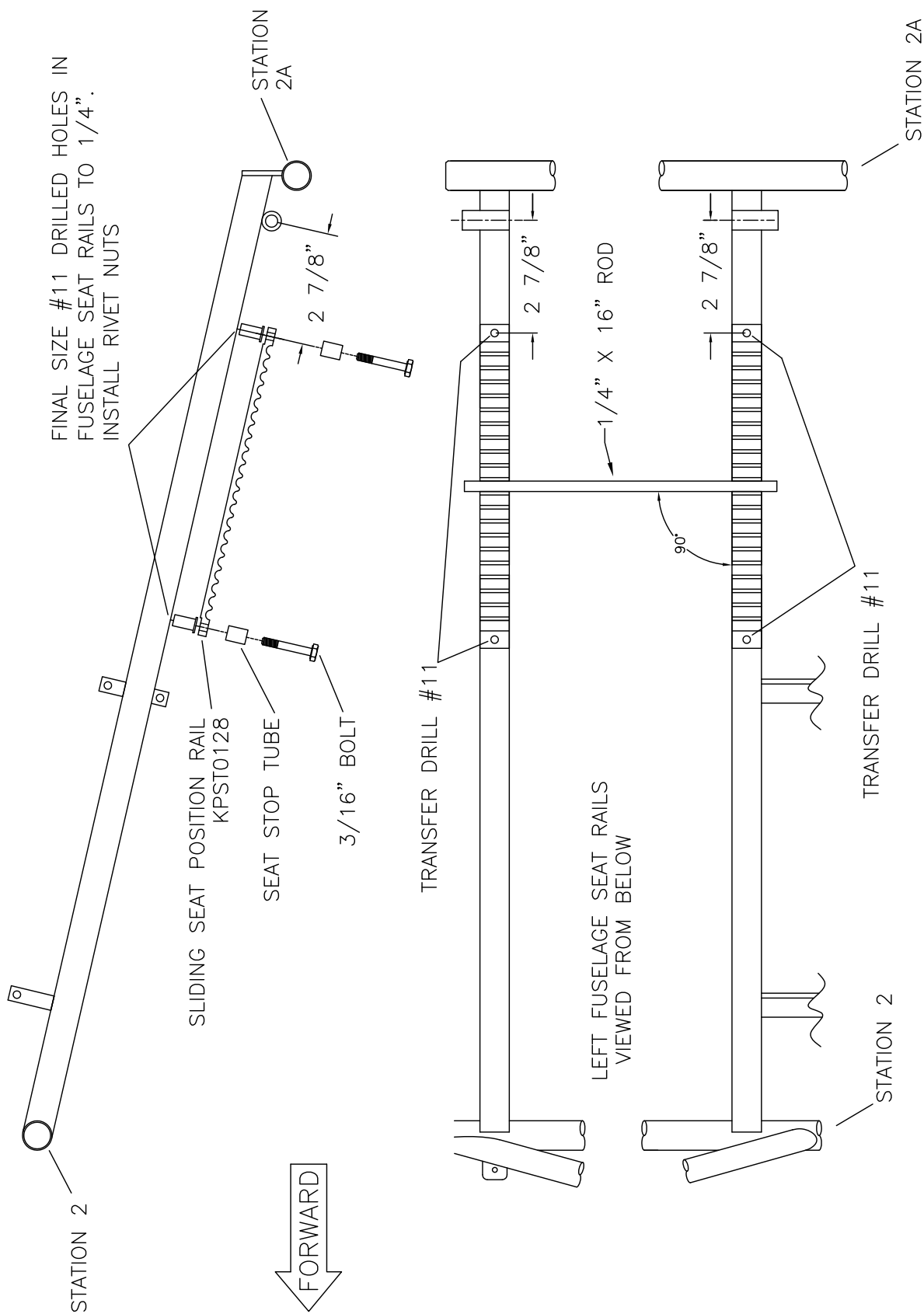
RRR S-21 OUTBOUND
BRAKE LINE EXIT LOCATION
FIGURE 09C-08

MD5587
REV. - ORIG



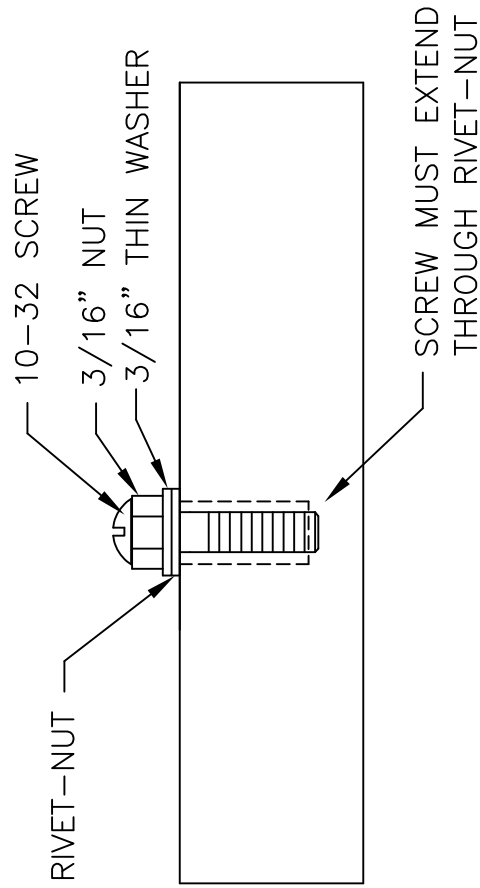
MD4423
REV. - ORIG

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



MD5615
REV. - ORIG

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

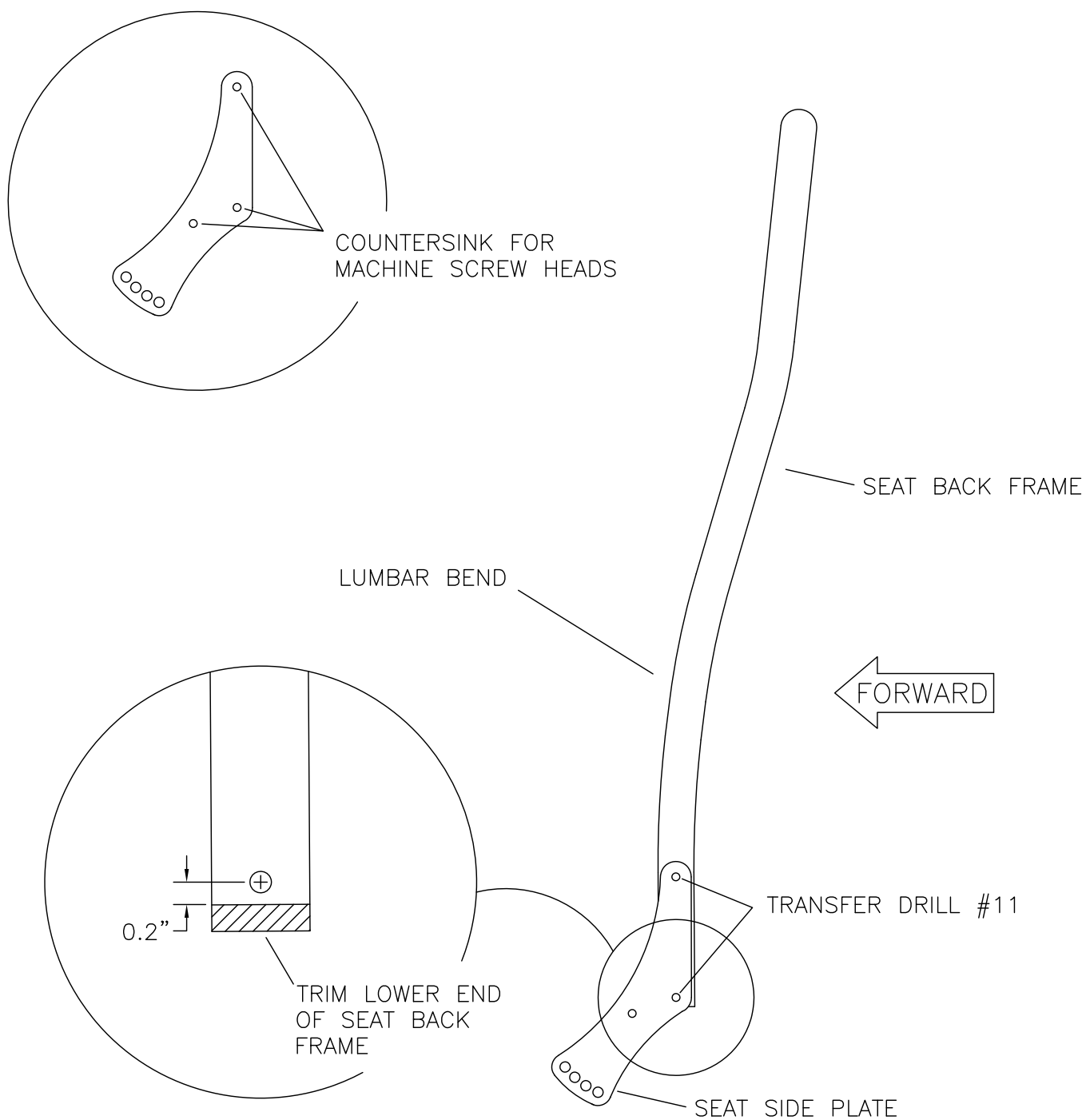


PROCEDURE BELOW MAY BE USED WHEN A RIVET-NUT PULLER IS NOT AVAILABLE.

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

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

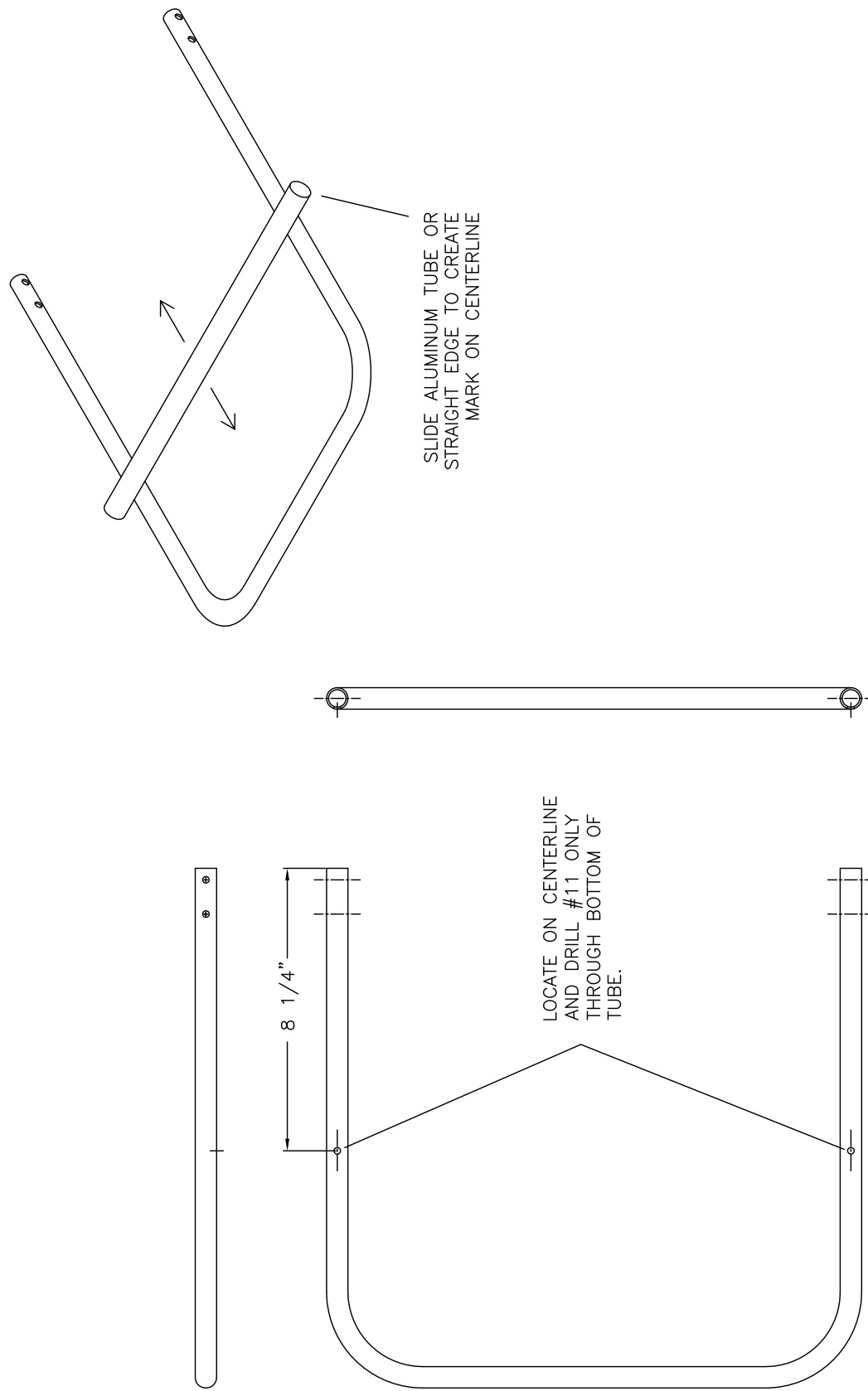
MD343
 REV. - ORIG



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

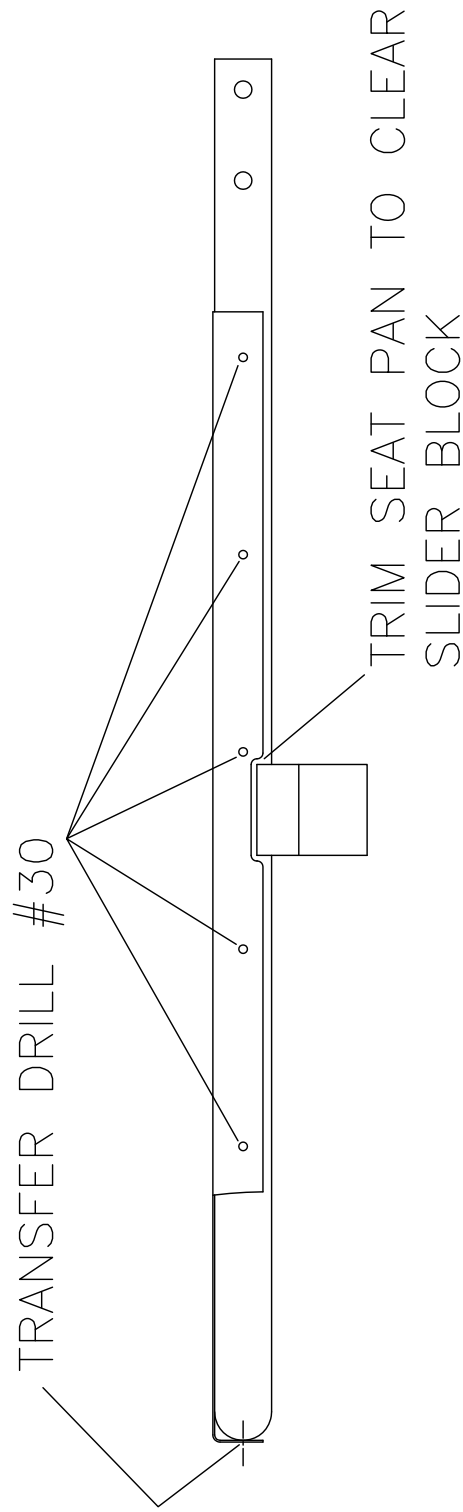
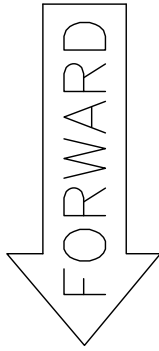
MD5534
 REV. - ORIG

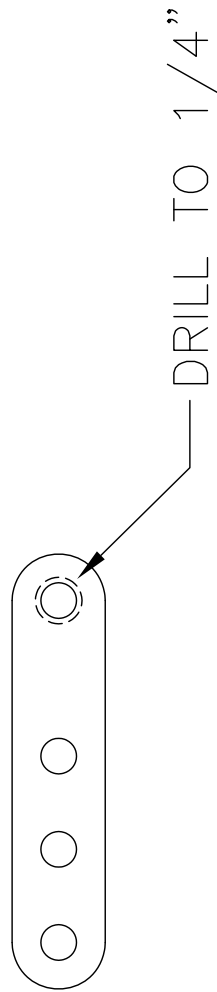
09/11/2018



MD5615
REV. - ORIG

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

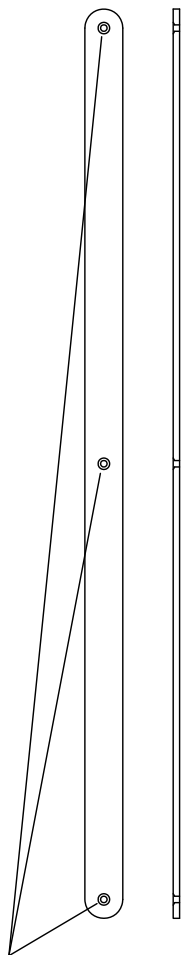




MD5614
REV. - ORIG

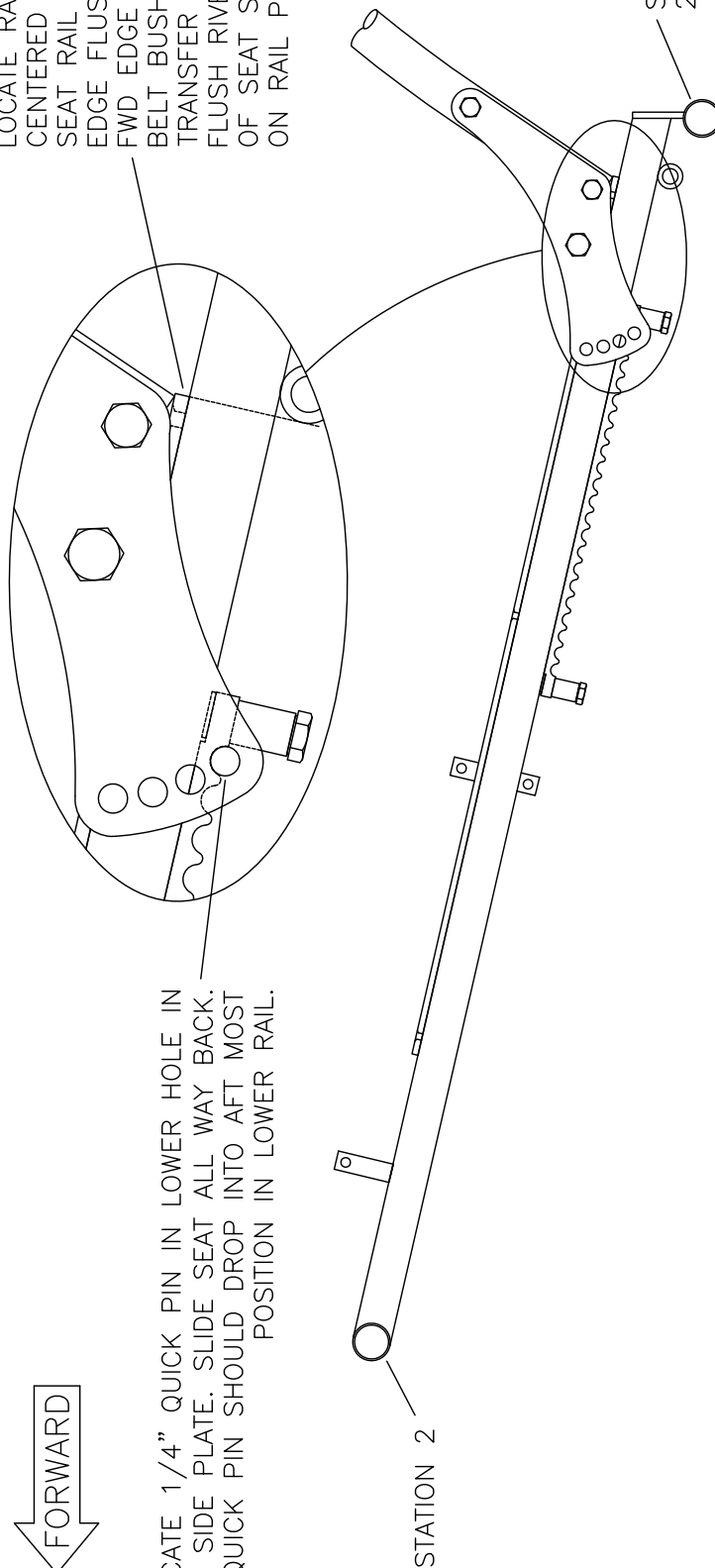
REVISION S-21 OUTBOUND
MULTI-HOLE TANG MODIFICATION
FIGURE 09D-08

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



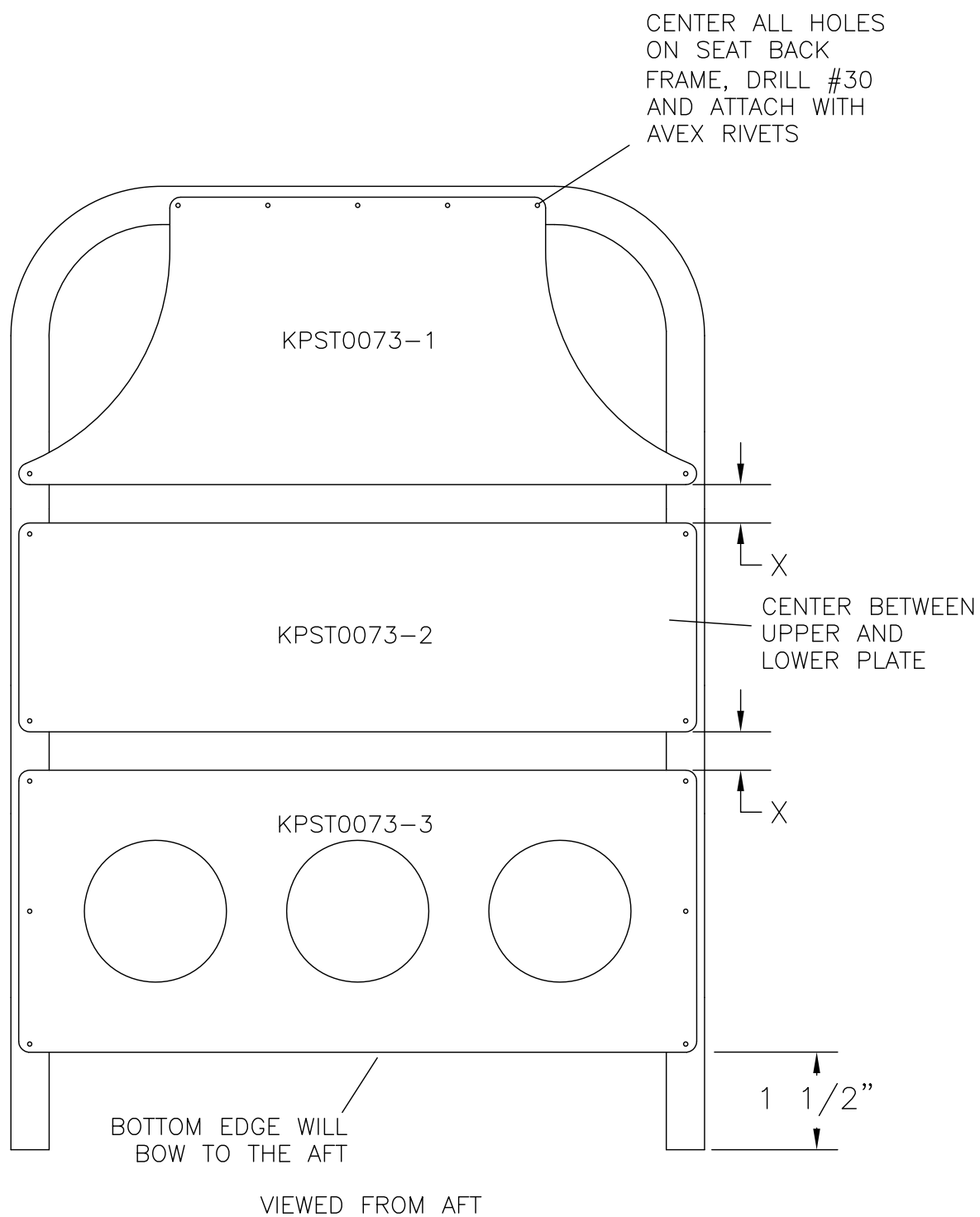
LOCATE 1/4" QUICK PIN IN LOWER HOLE IN
SIDE PLATE. SLIDE SEAT ALL WAY BACK.
QUICK PIN SHOULD DROP INTO AFT MOST
POSITION IN LOWER RAIL.

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



MD5615
REV. - ORIG

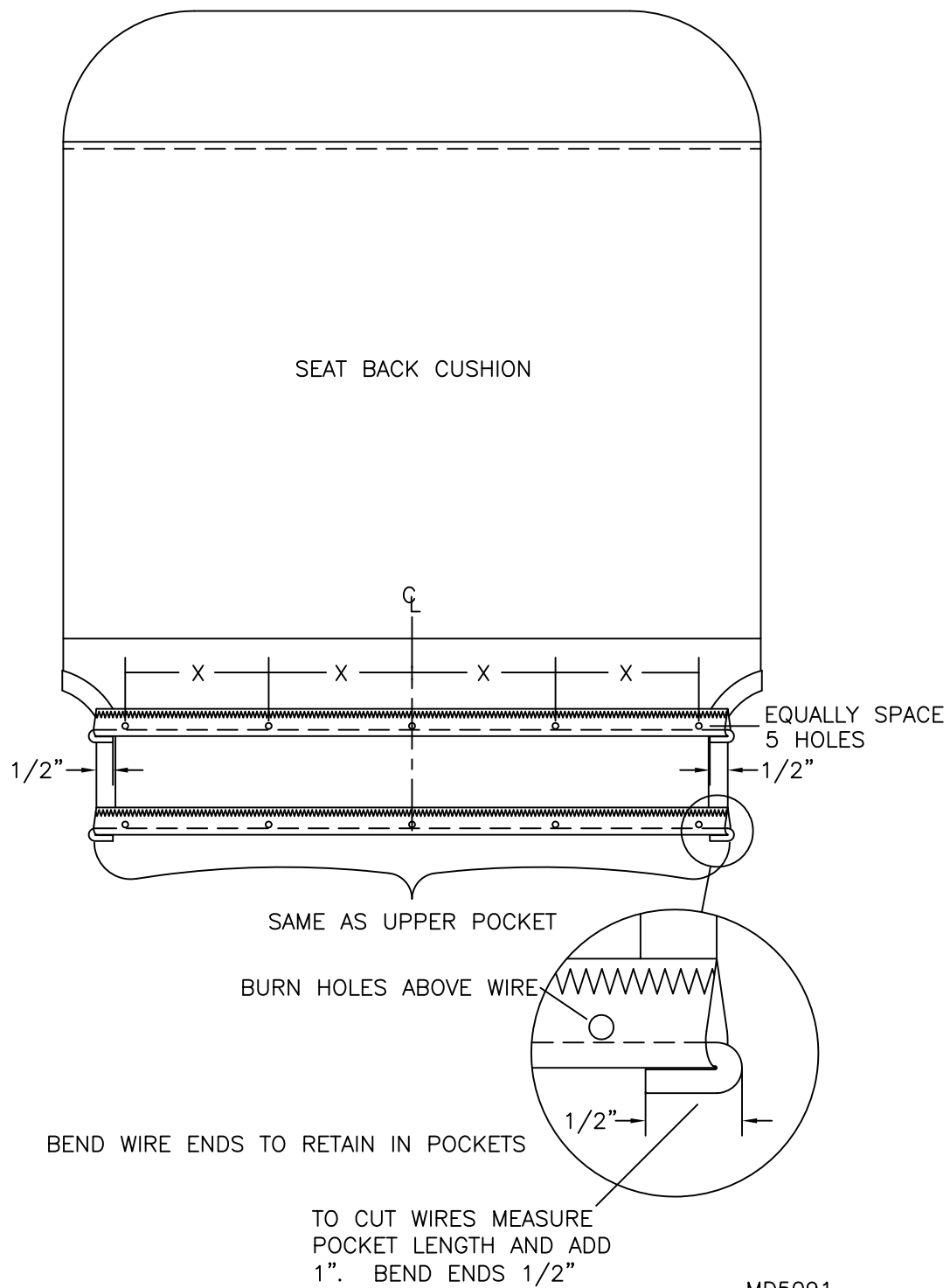
RAMS S-21 OUTBOUND
SLIDING SEAT RAIL PLATE LOCATION
FIGURE 09D-12



MD5534
REV. - ORIG

RANS S-21 OUTBOUND SEAT BACK PLATE DRILLING FIGURE 09D-14

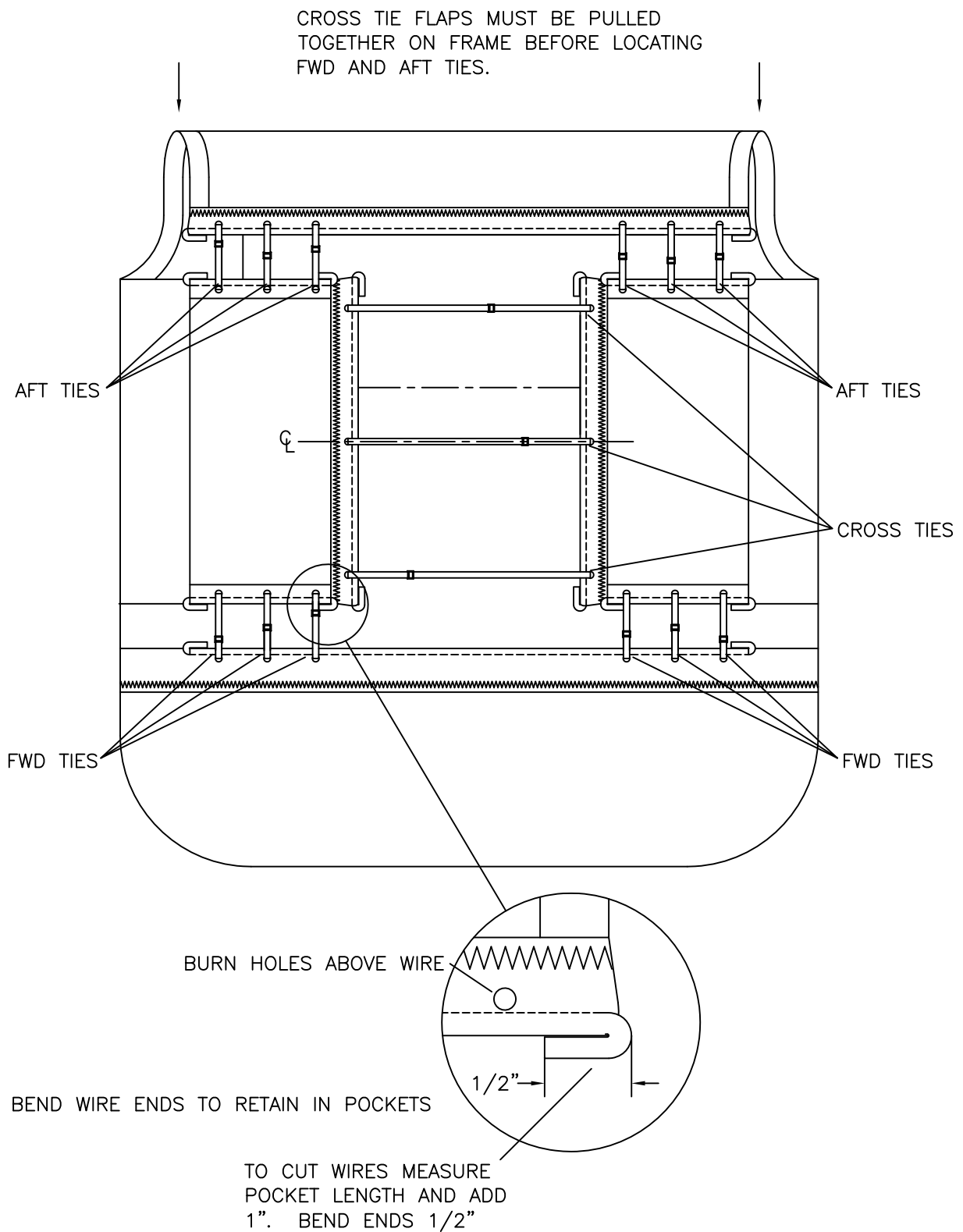
09/11/2018



MD5091
REV. - ORIG

RANDS S-21 OUTBOUND
SEAT BACK COVERING DETAIL
FIGURE 09D-16

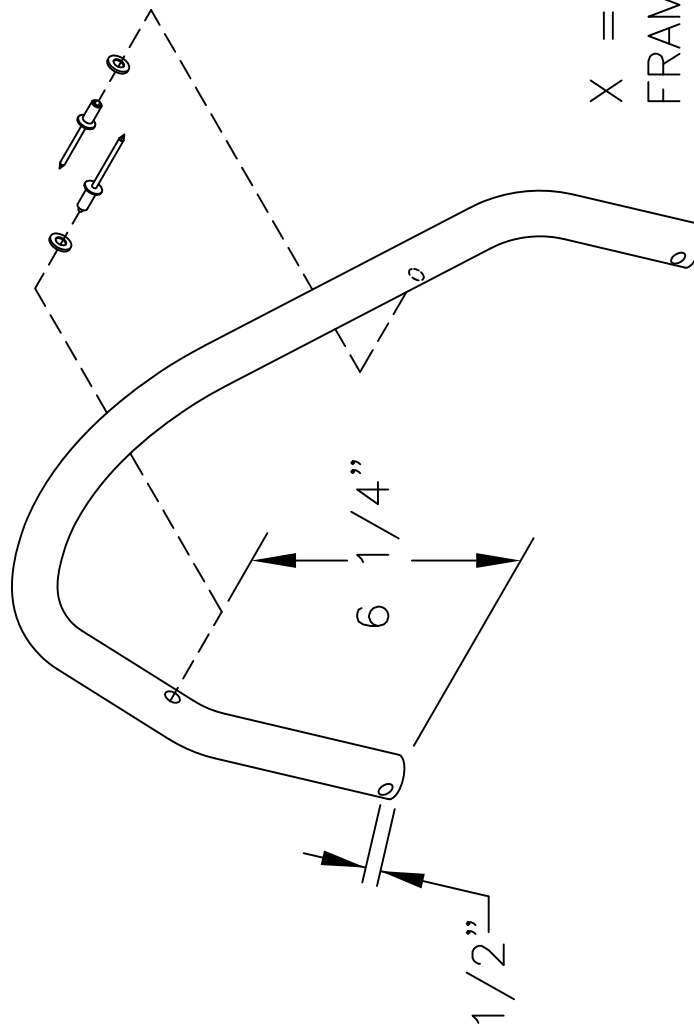
09/11/2018



MD808
REV. - ORIG

**RANS S-21 OUTBOUND
SEAT BOTTOM COVERING DETAIL
FIGURE 09D-16A**

09/11/2018



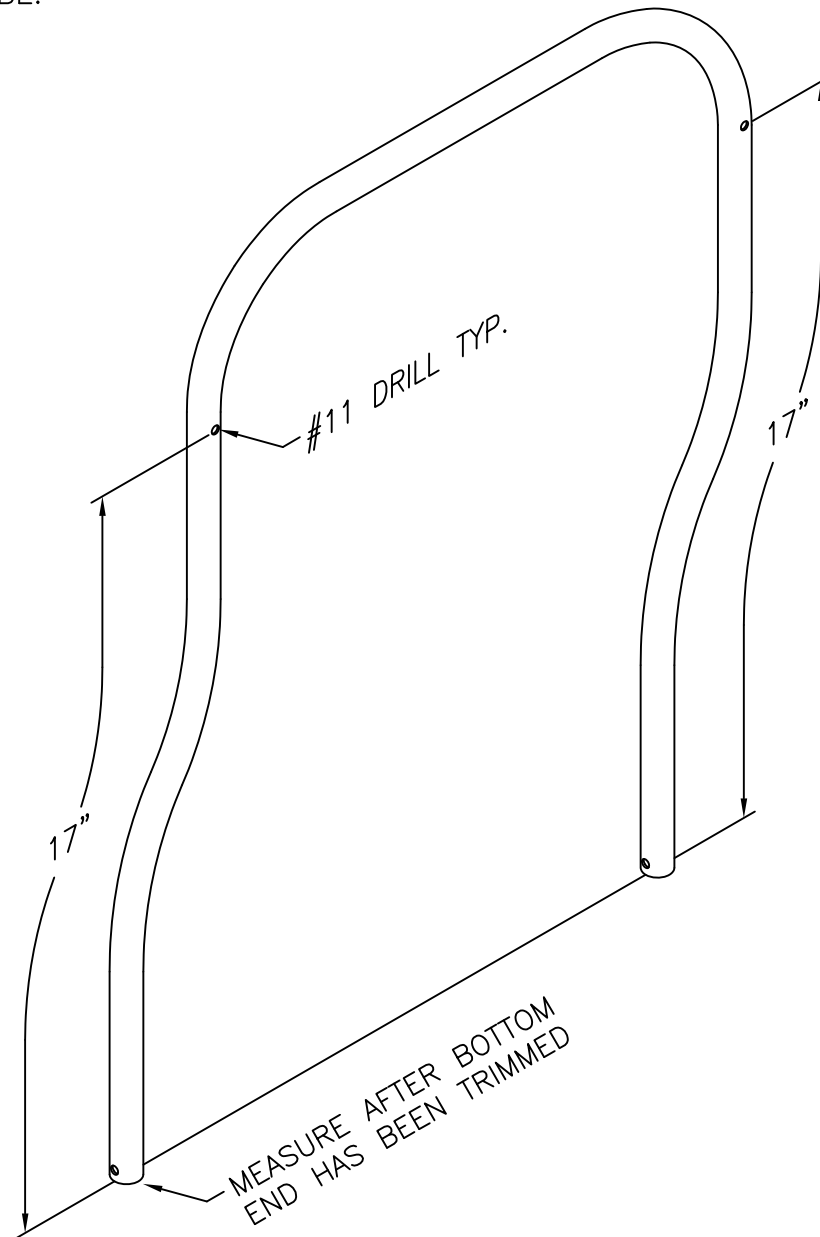
X = WIDTH OF HEADREST
FRAME AT RIVET (BUTTON)
LOCATION AFTER
INSTALLATION ON SEAT BACK.

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

MD5109
REV. - ORIG



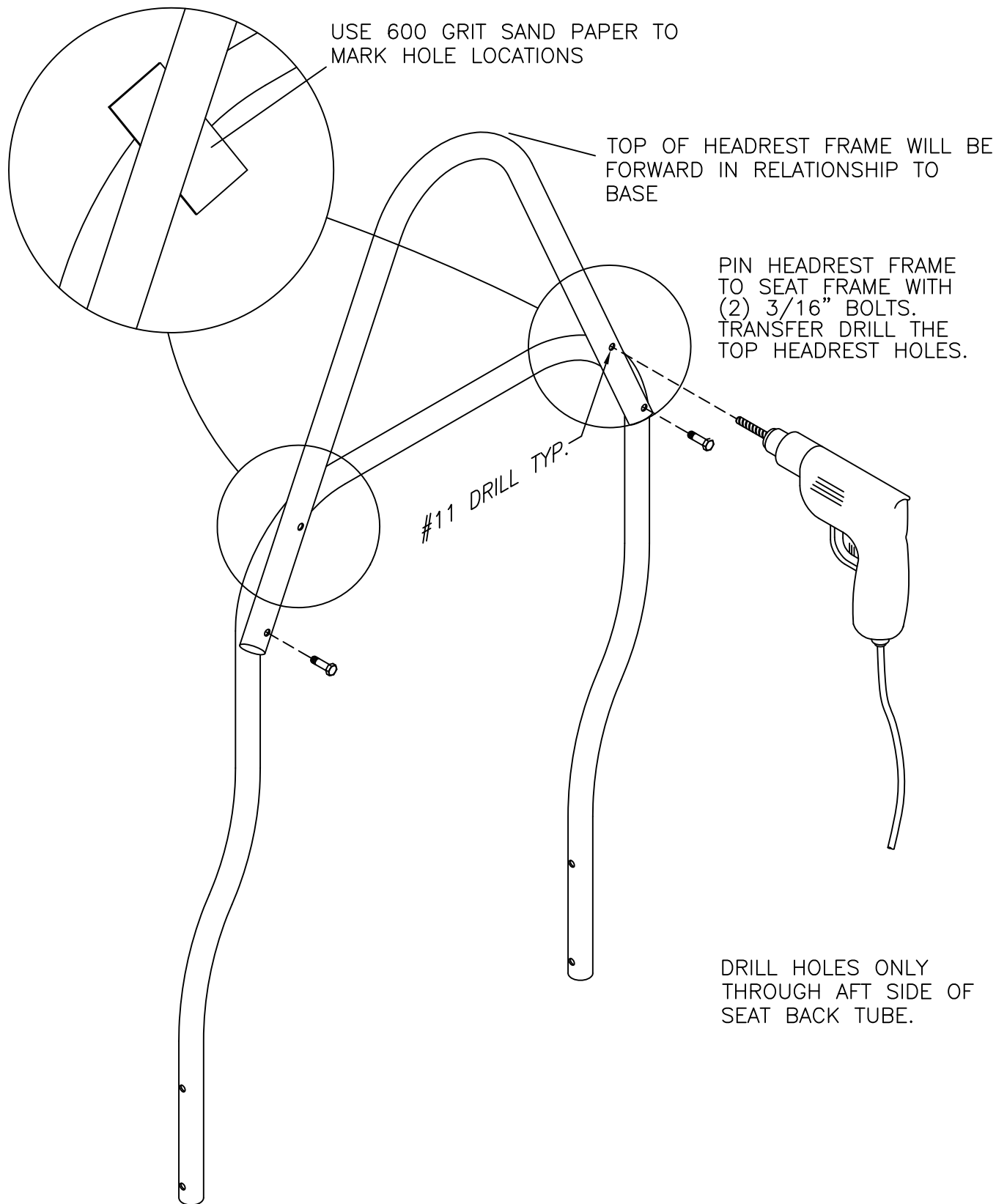
DRILL HOLES ONLY
THROUGH AFT SIDE OF
TUBE.



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

MD5109
REV. — ORIG

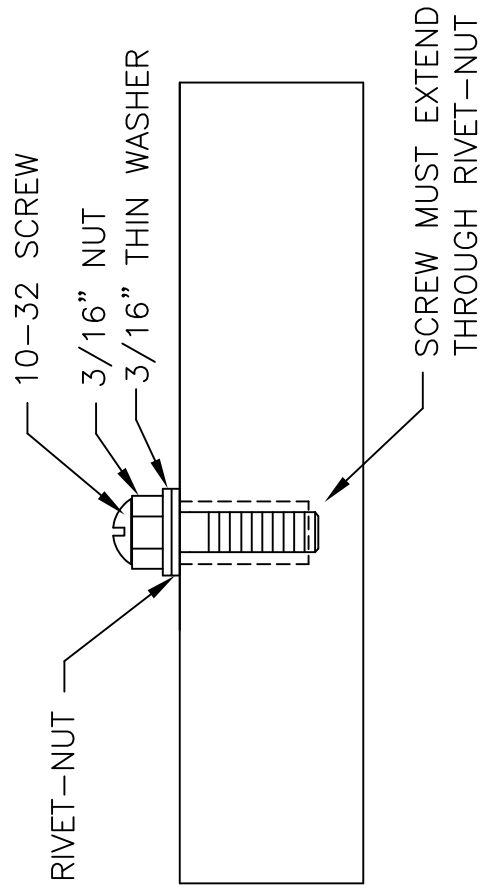
09/11/2018



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

MD5109
 REV. - ORIG

09/11/2018



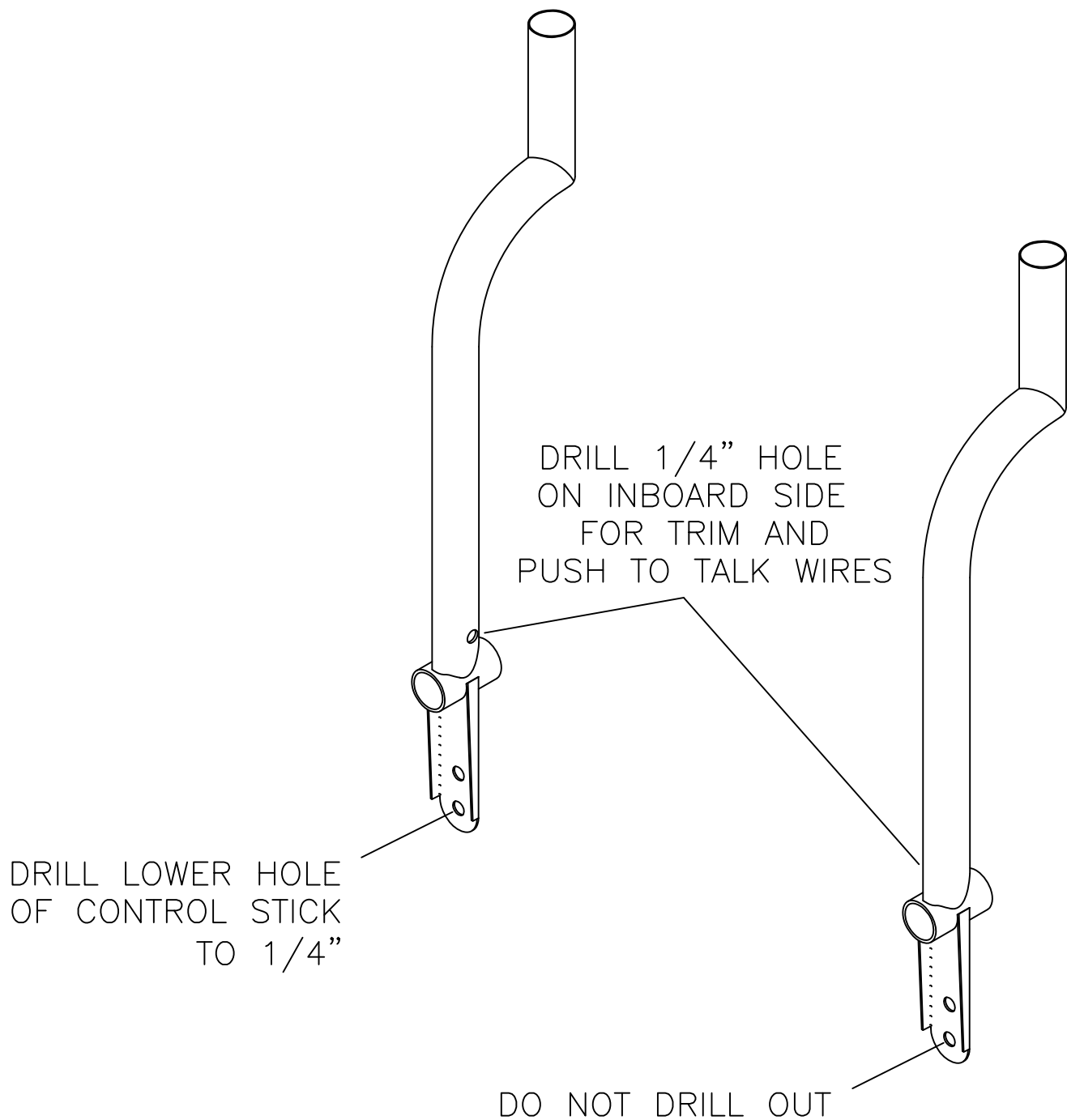
PROCEDURE BELOW MAY BE USED WHEN A RIVET-NUT PULLER IS NOT AVAILABLE.

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.

S-21 OUTBOUND RIVET-NUT INSTALLATION

FIGURE 09D-27

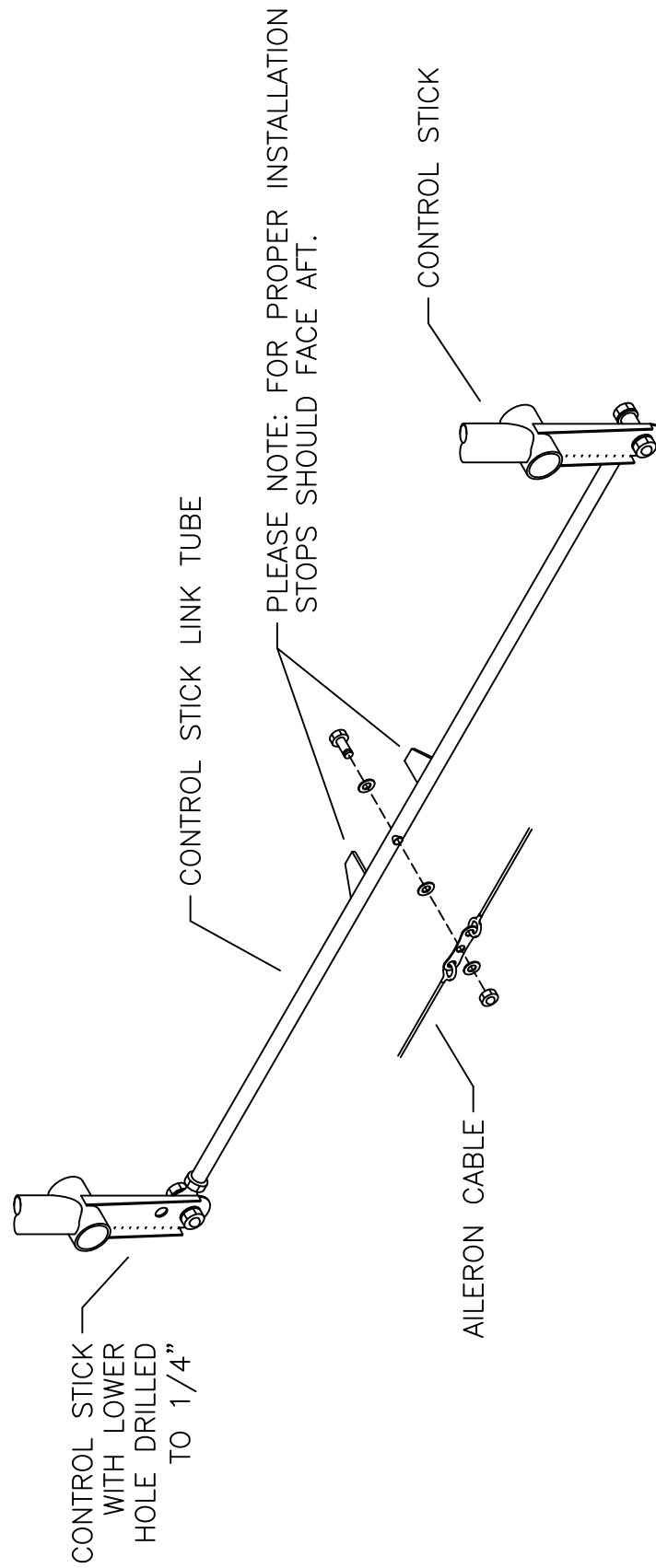
MD343
REV. - ORIG



MD510
REV. - ORIG

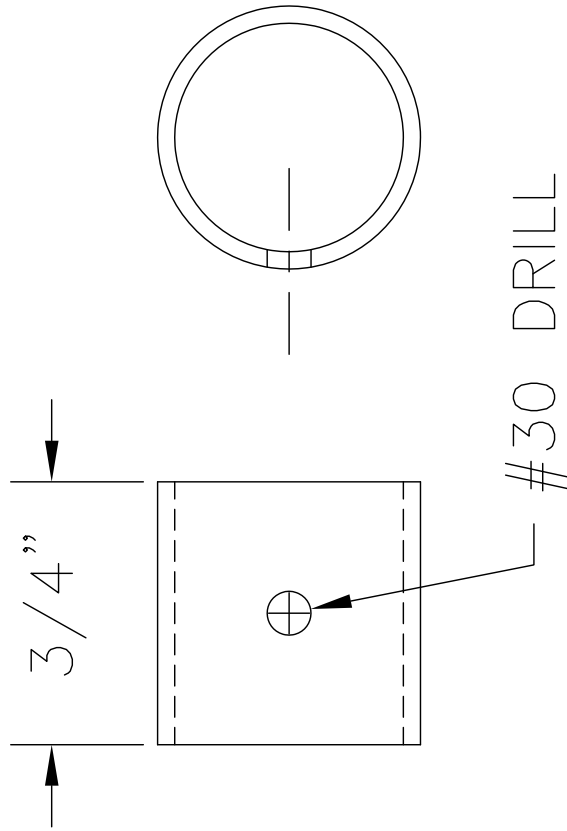
**RANS S-21 OUTBOUND
CONTROL STICK MODIFICATION
FIGURE 10-02**

09/11/2018



MD510
REV. - ORIG

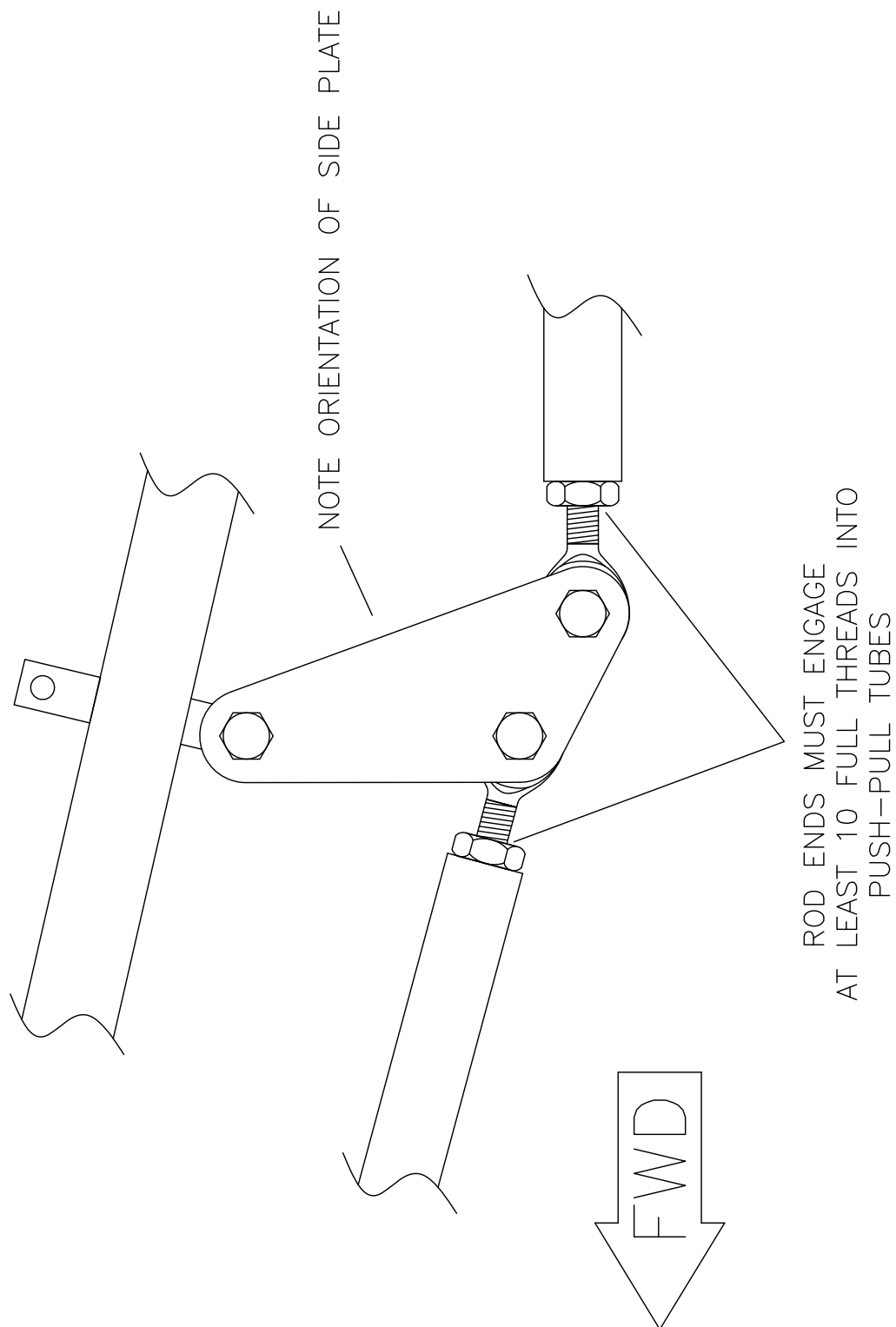
**S-21 OUTBOUND
CONTROL STICK LINK TUBE**
FIGURE 10-05



FABRICATE QTY: 2

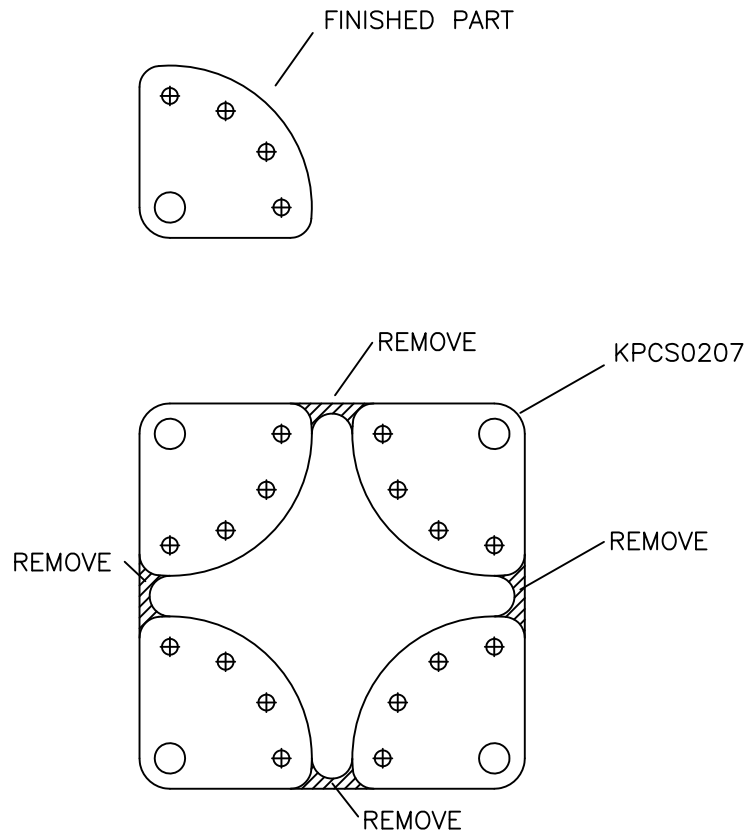
MD3650
REV. - ORIG

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



MD3650
REV. - ORIG

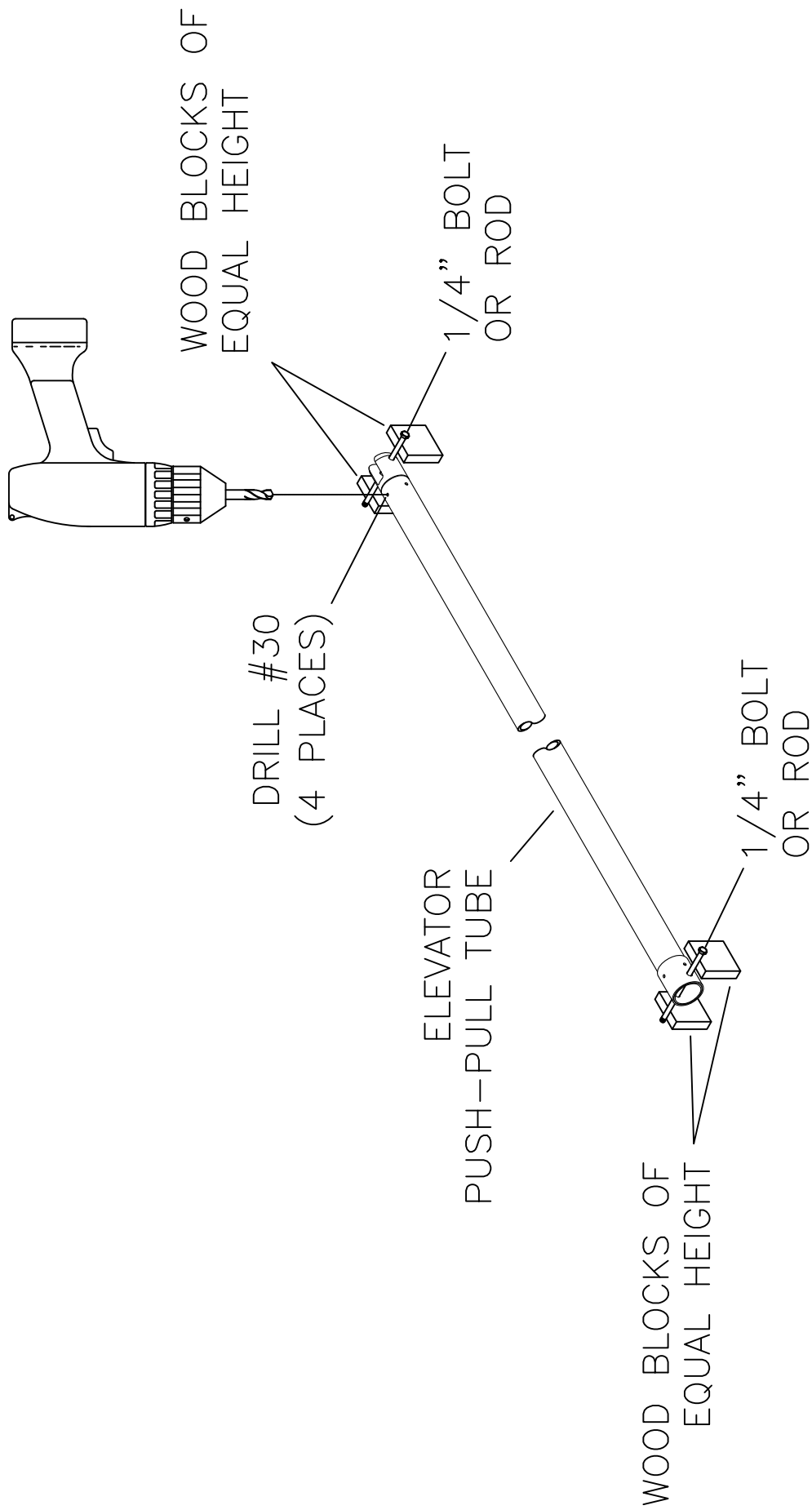
**RRMS S-21 OUTBOUND
SIDE PLATE INSTALLATION**
FIGURE 10A-03



REMOVE SHADED AREA, MAKES 4 PARTS

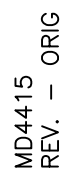
MD4390
REV. — ORIG

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

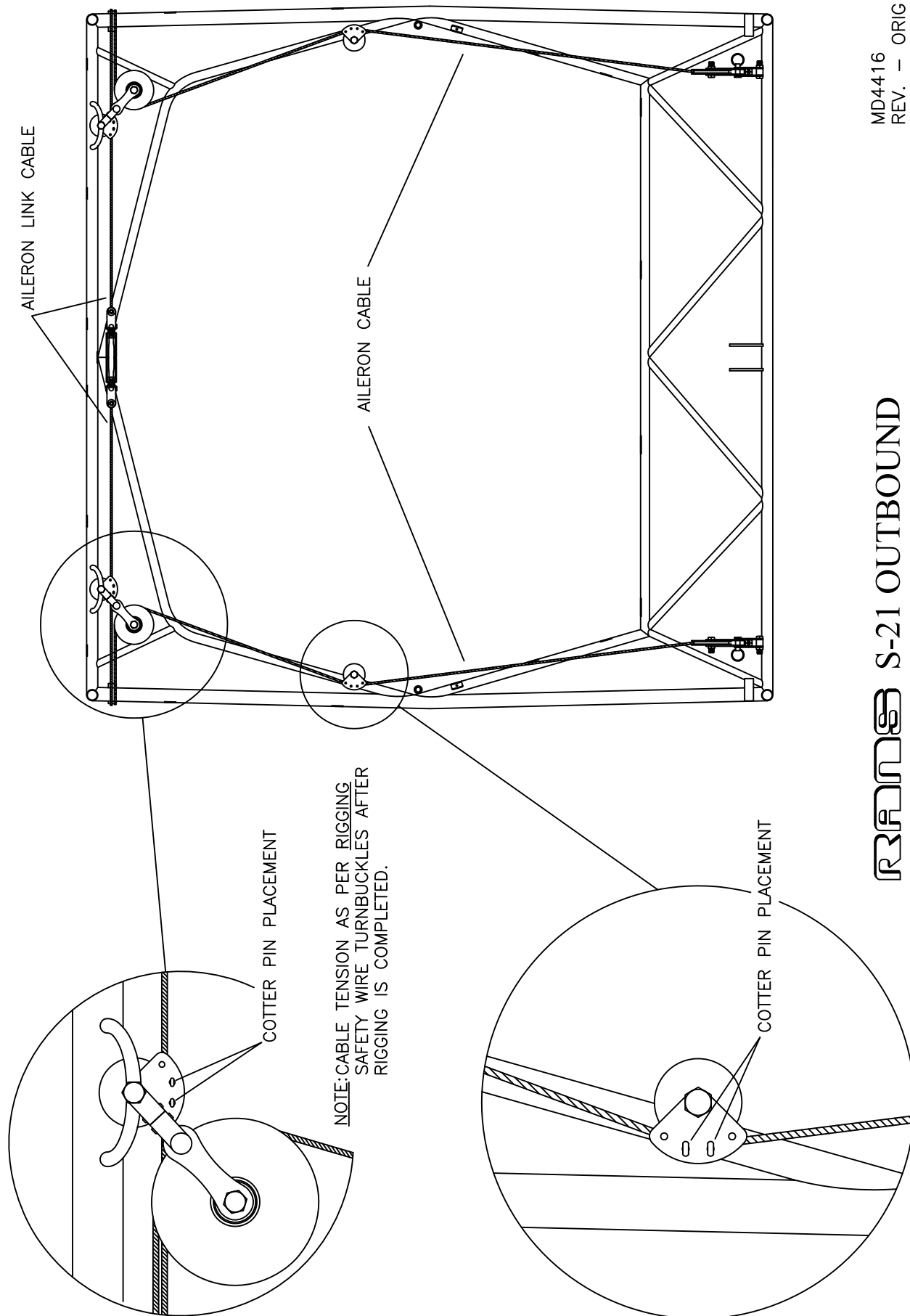


MD565
REV. - ORIG

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

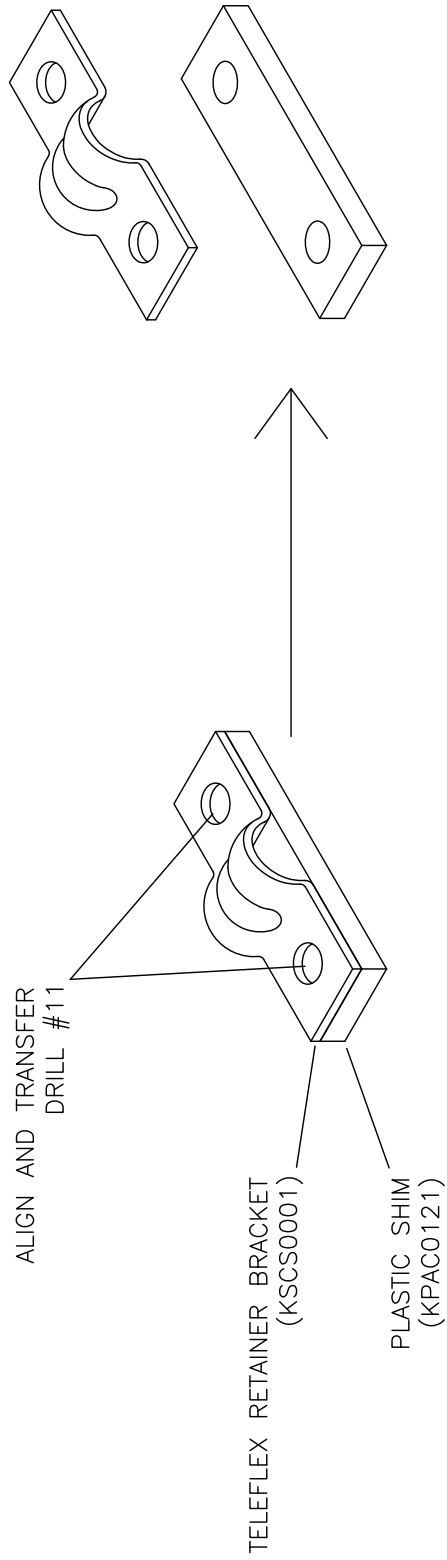


09/11/2018



MD4416
REV. - ORIG

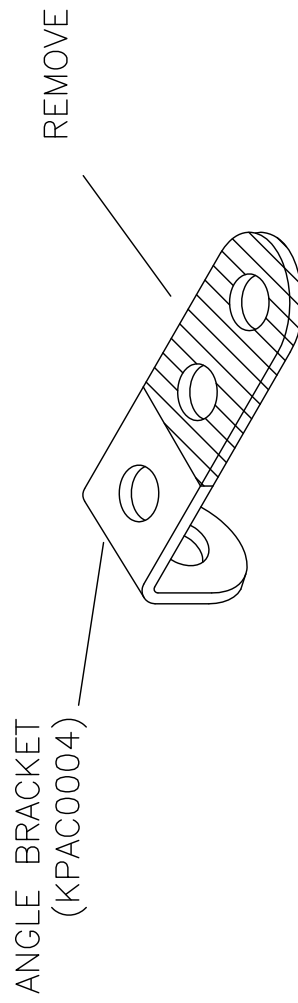
RAVEN S-21 OUTBOUND
AILERON CONTROL SYSTEM - STATION 3
FIGURE 10C-07



MODIFY 2 PLASTIC SHIMS

MD5617
REV. - ORIG

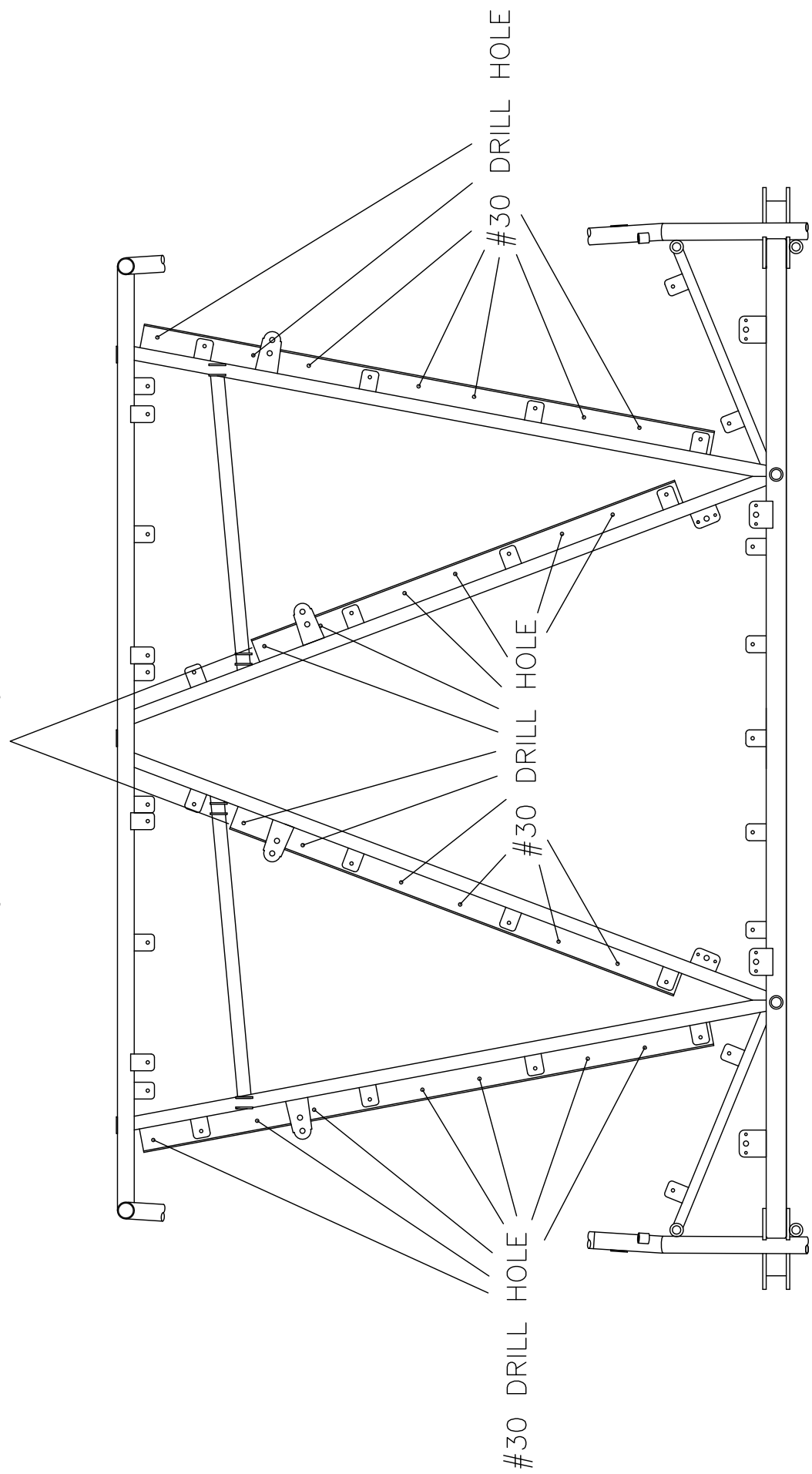
RRAMES S-21 OUTBOUND
FLAP LEVER PLASTIC SHIM MODIFICATION
FIGURE 10D-08



MD5617
REV. - ORIG

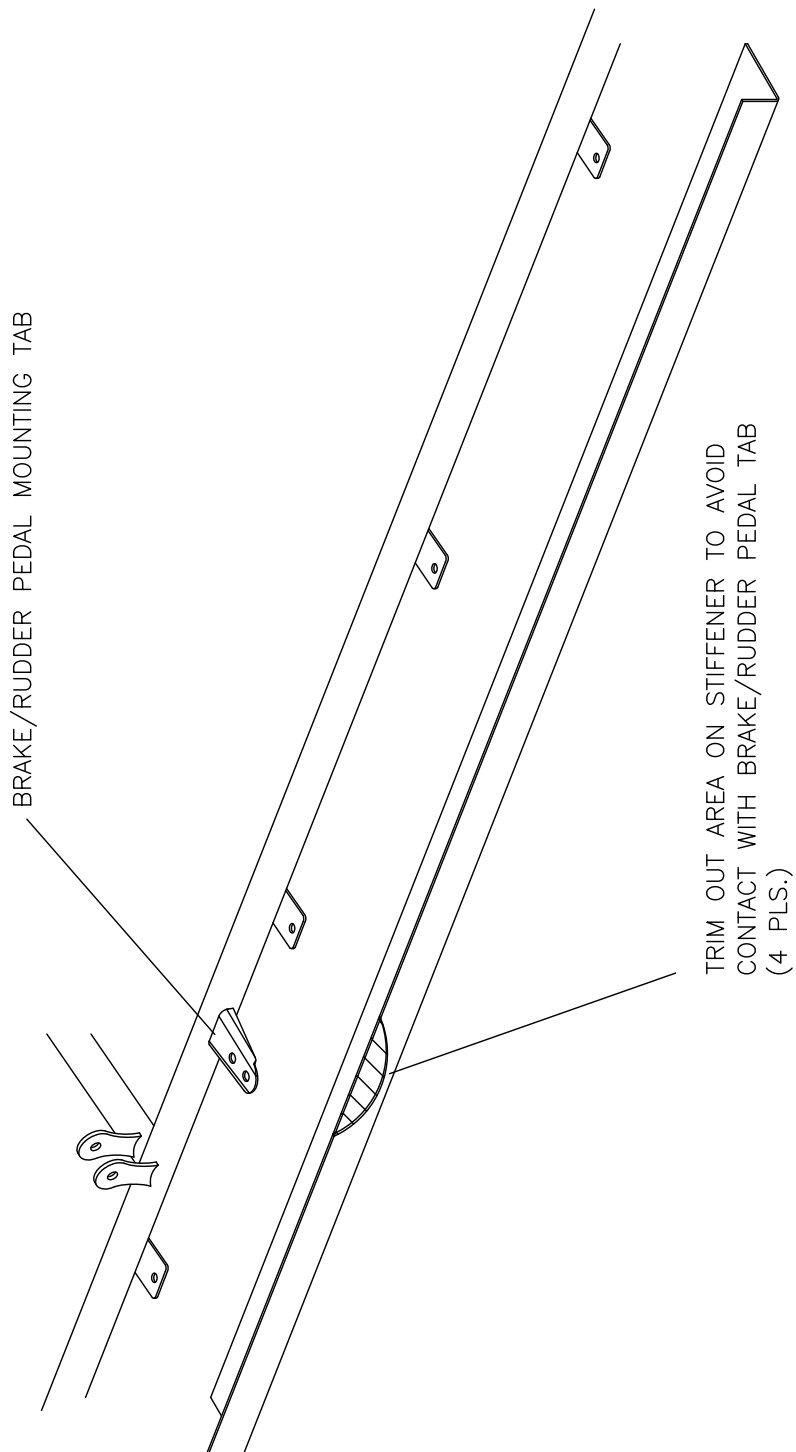
RRMS S-21 OUTBOUND
ANGLE BRACKET MODIFICATION
FIGURE 10D-09

TRIM STIFFENER LENGTH TO
CLEAR FUSELAGE TUBES



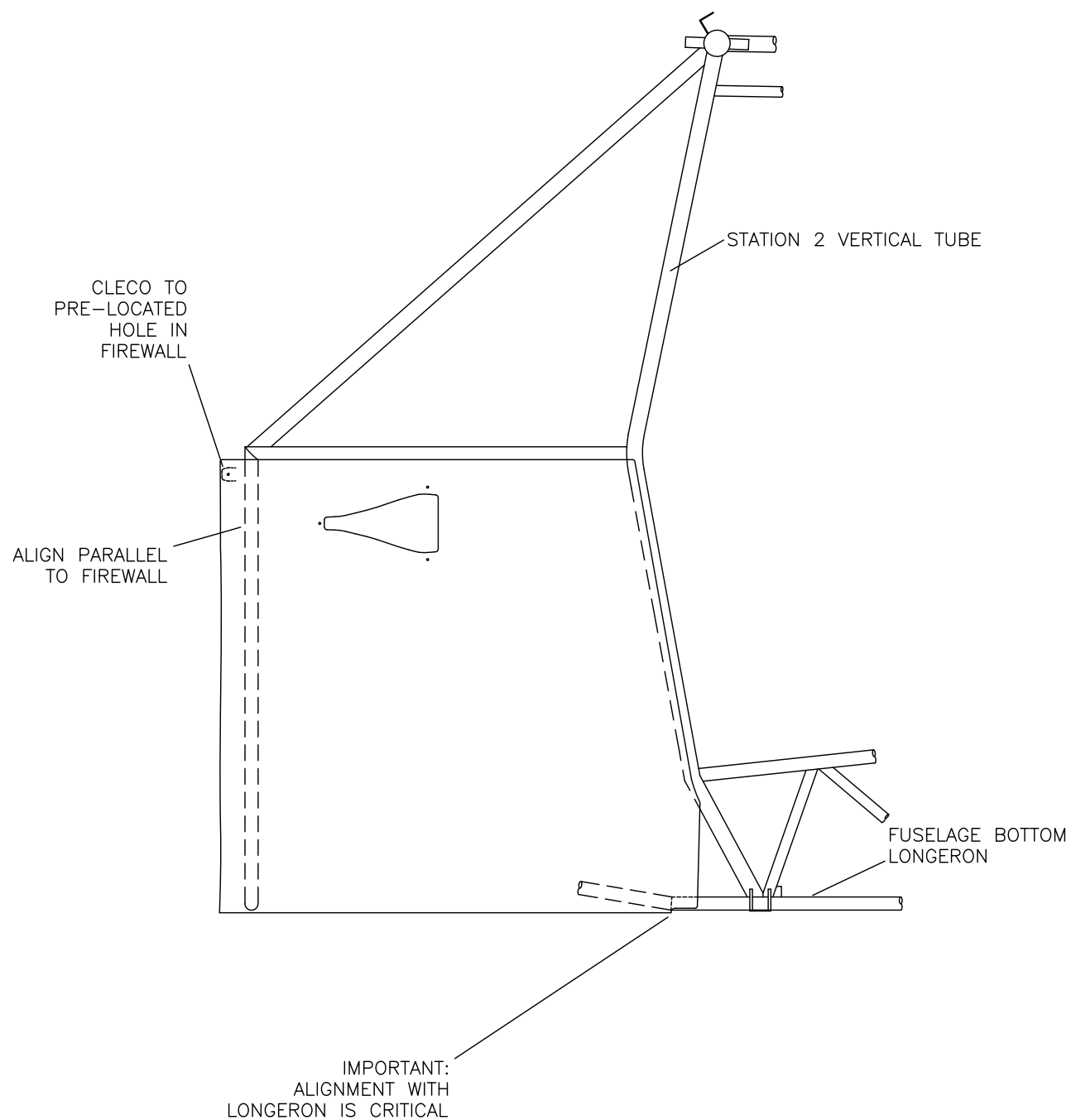
MD5606
REV. - ORIG

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



MD5605
REV. - ORIG

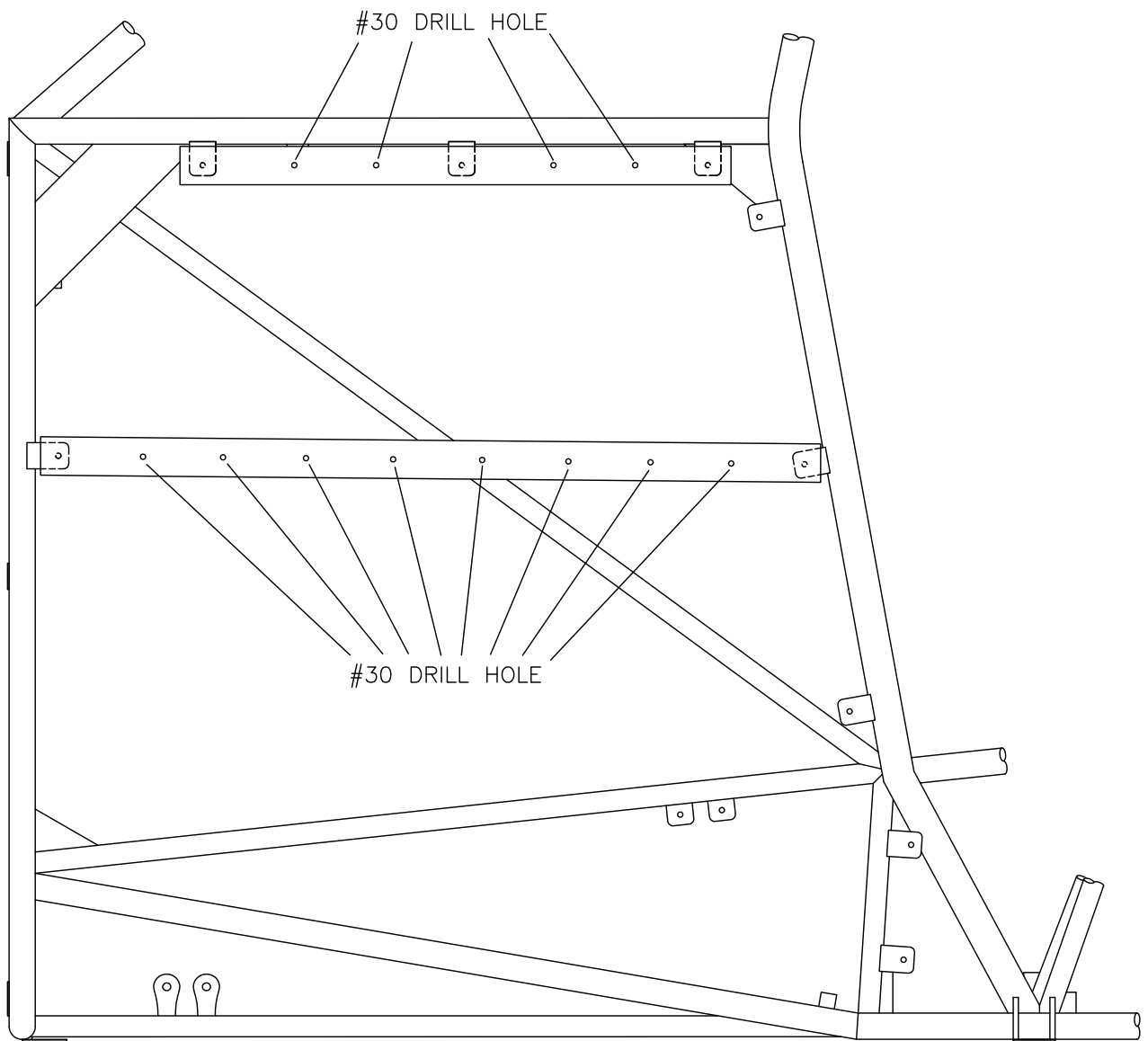
**RAMS S-21 OUTBOUND
BOOT COWL STIFFENER TRIMMING
FIGURE 10E-08**



MD5607
REV. — ORIG

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

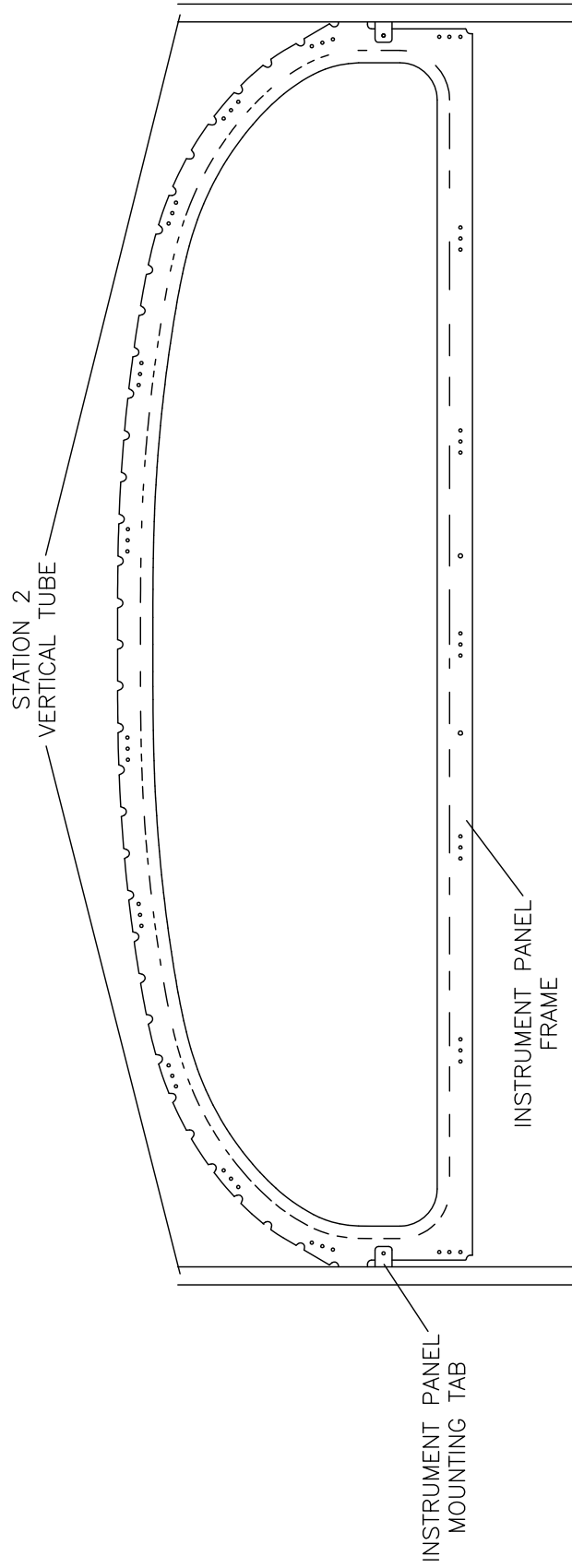
09/11/2018



MD5608
REV. - ORIG

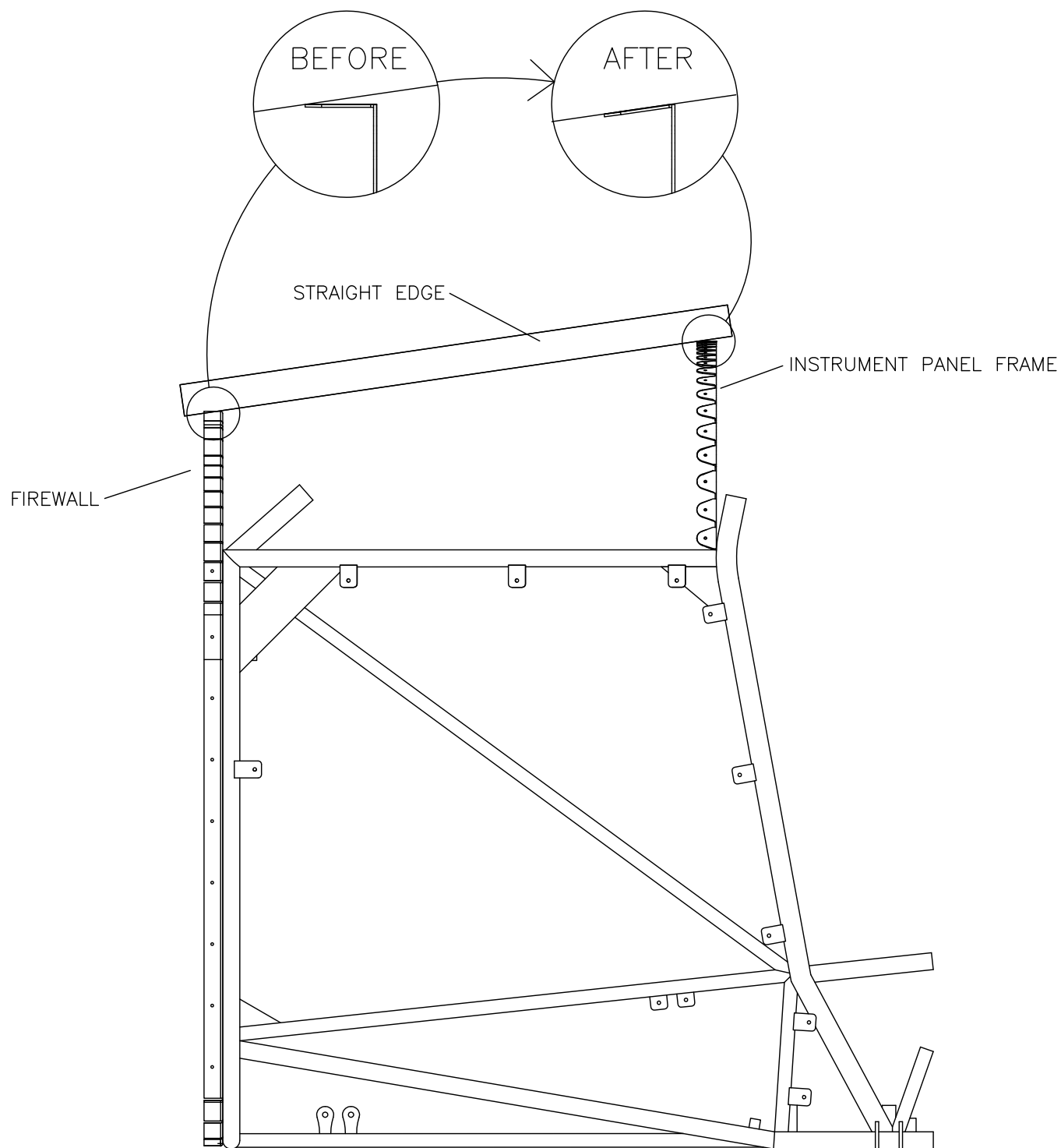
**RANS S-21 OUTBOUND
SIDE BOOT COWL STIFFENER LOCATION
FIGURE 10E-13**

09/11/2018



MD5609
REV. — ORIG

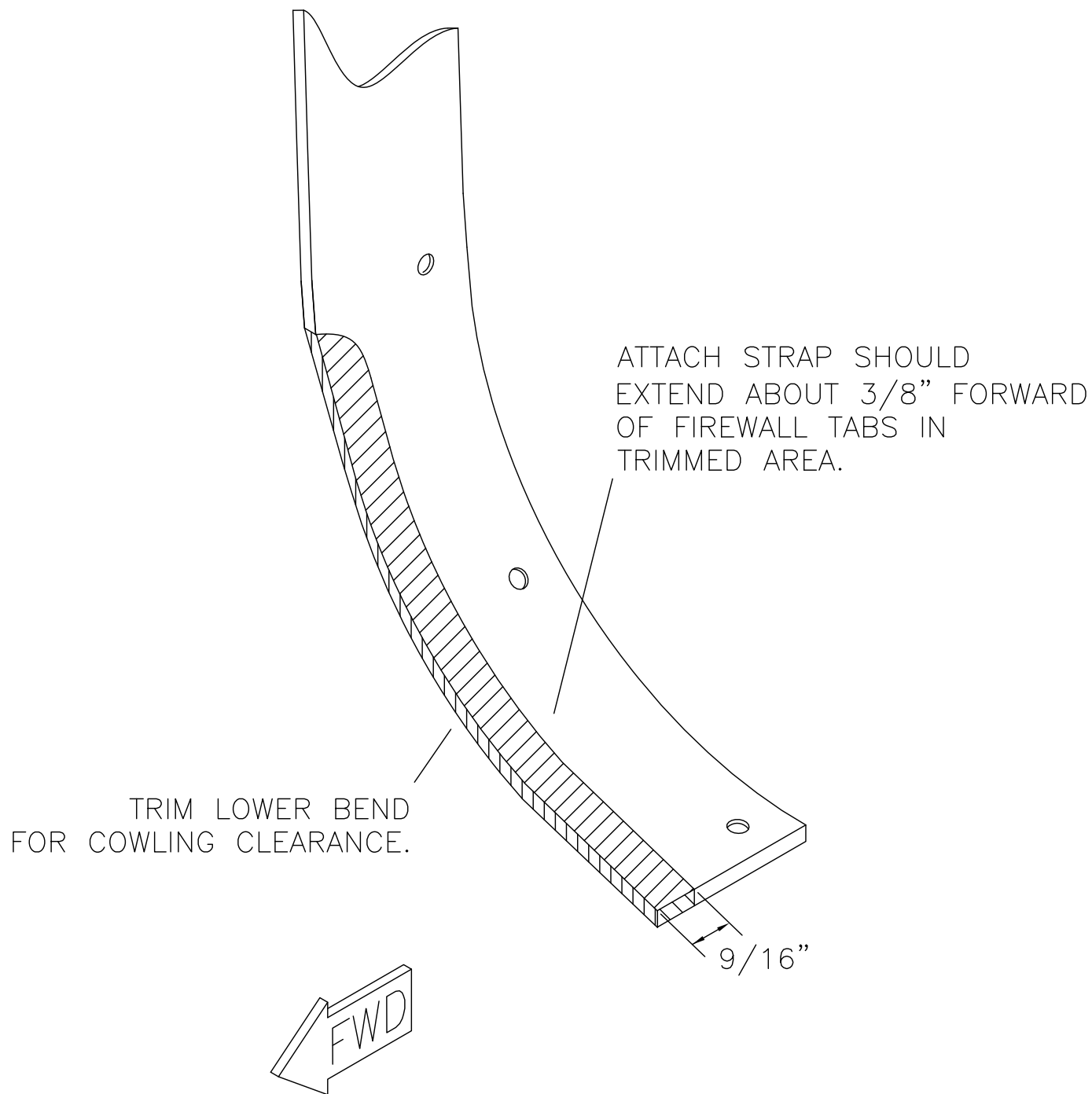
RRMS S-21 OUTBOUND
INSTRUMENT PANEL INSTALLATION - BOOT COWL
FIGURE 10E-18



MD5610
REV. - ORIG

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

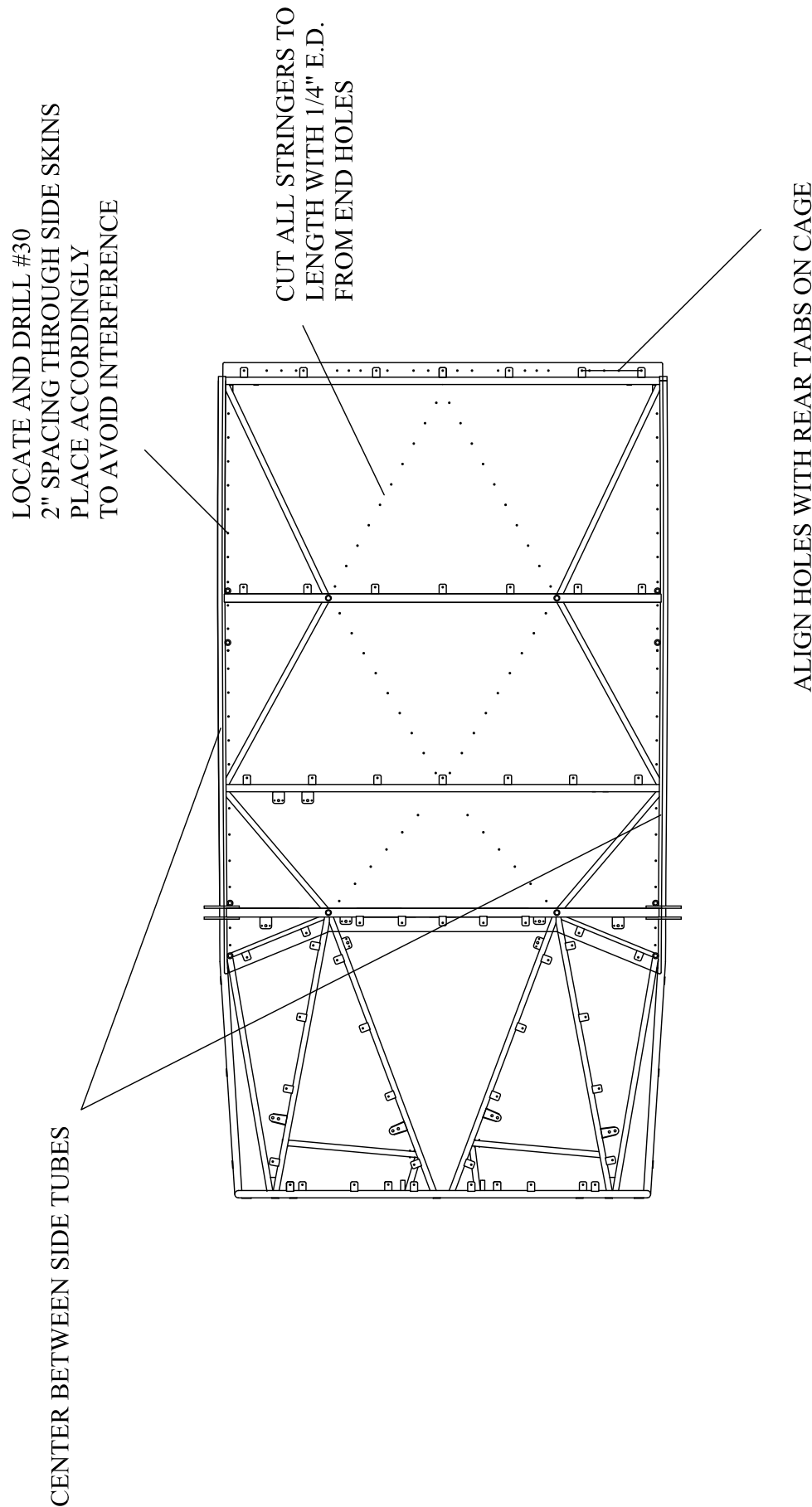
09/11/2018



MD5611
REV. — ORIG

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

09/11/2018

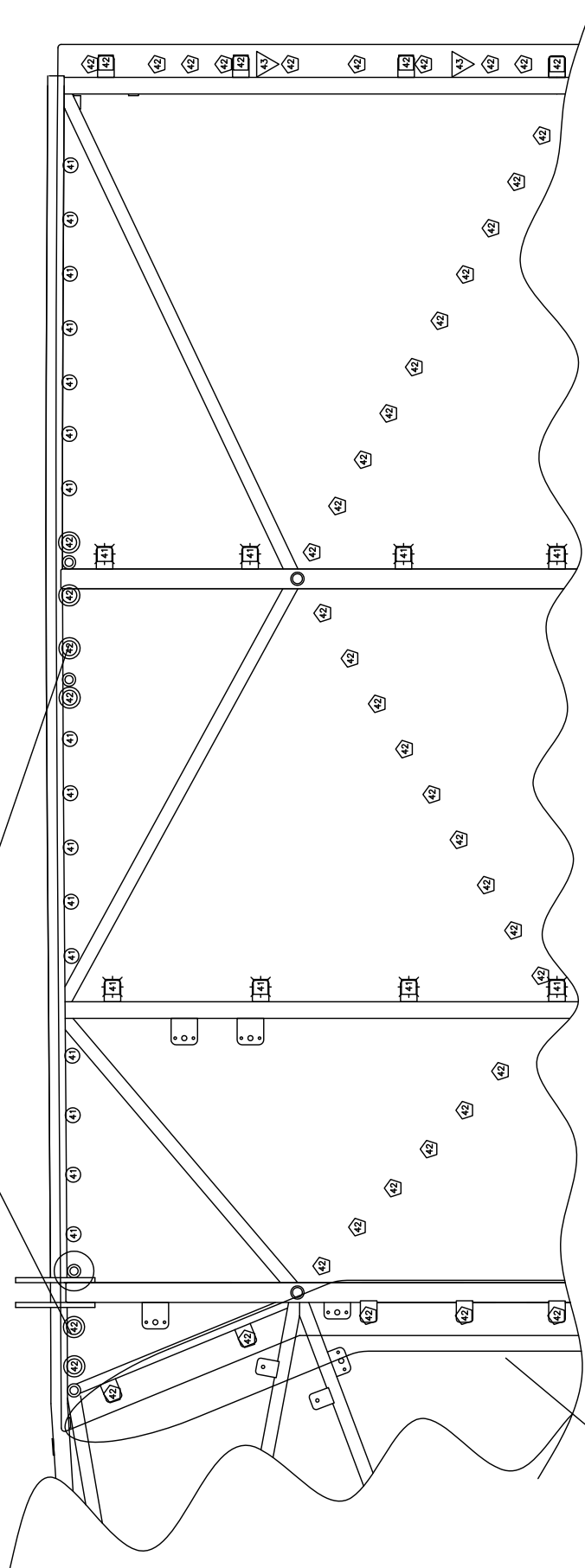


MD5654
REV. - ORIG

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

FLUSH RIVETS REQUIRED UNDER
TOP MAIN GEAR CLAMP PLATE LOCATIONS

ONLY LOWER RH SIDE
SHOWN FOR CLARITY

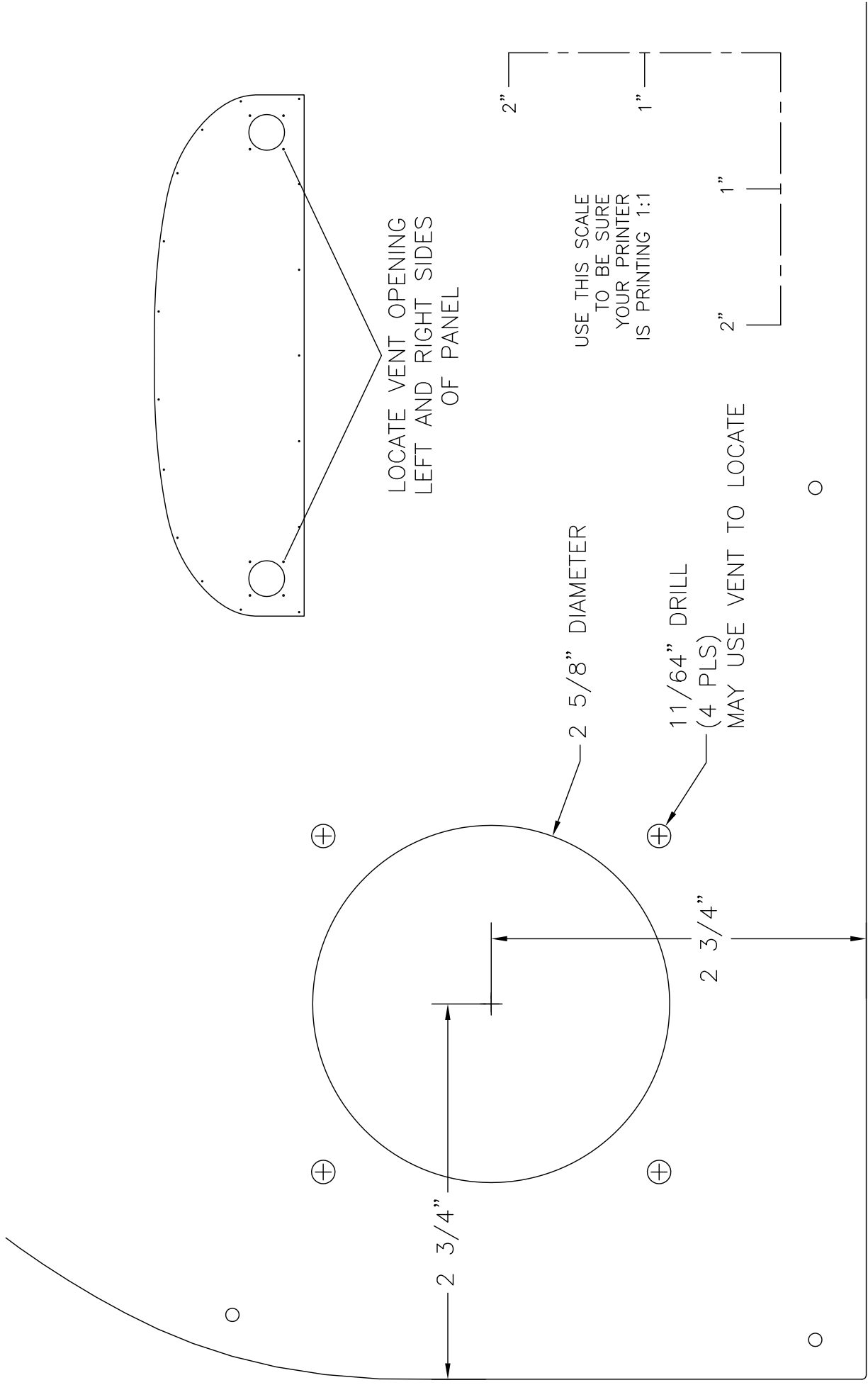


DO NOT RIVET FORWARD EDGE
UNTIL BOOT COWL INSTALLATION

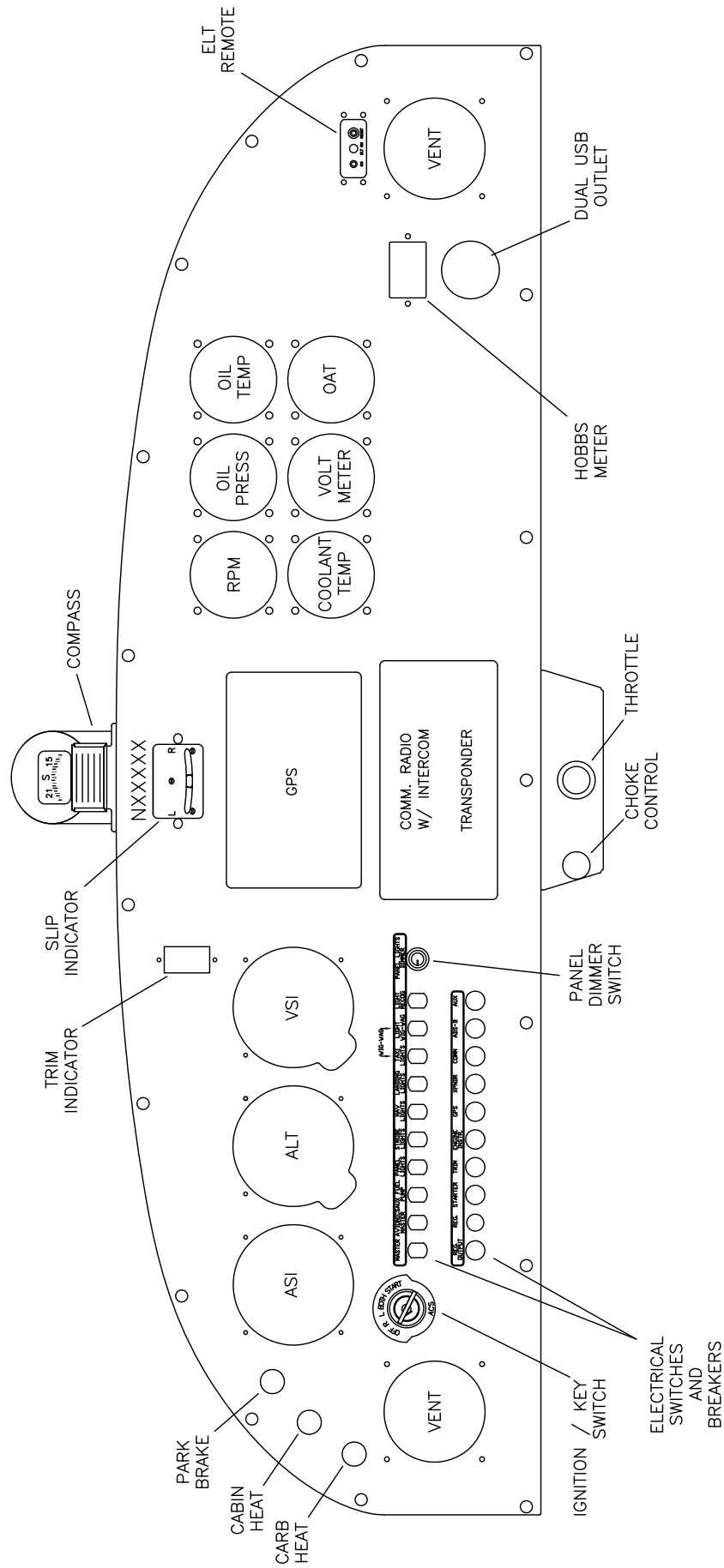
FORWARD

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

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

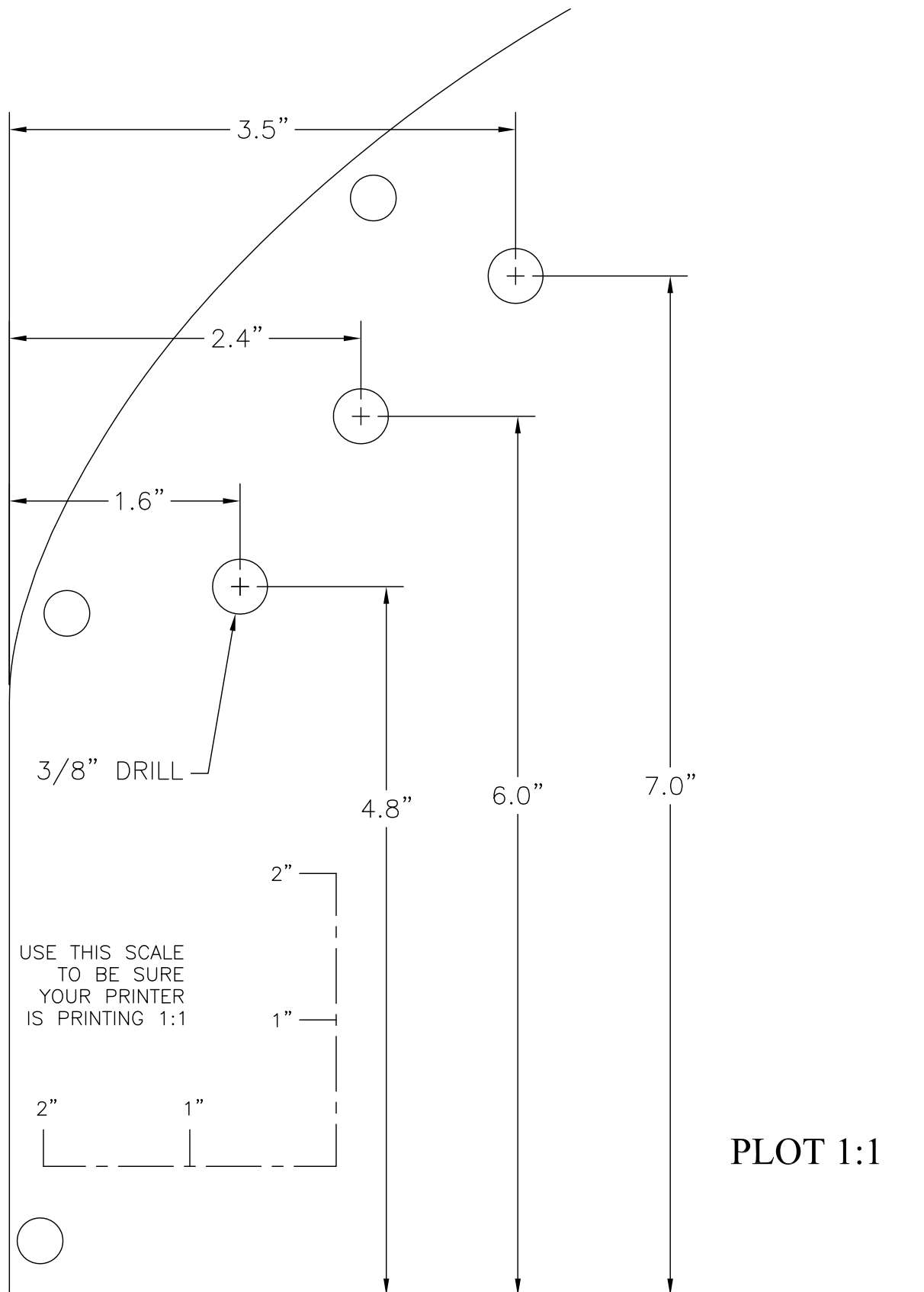


PLOT 1:1



MD5618
REV. - ORIG

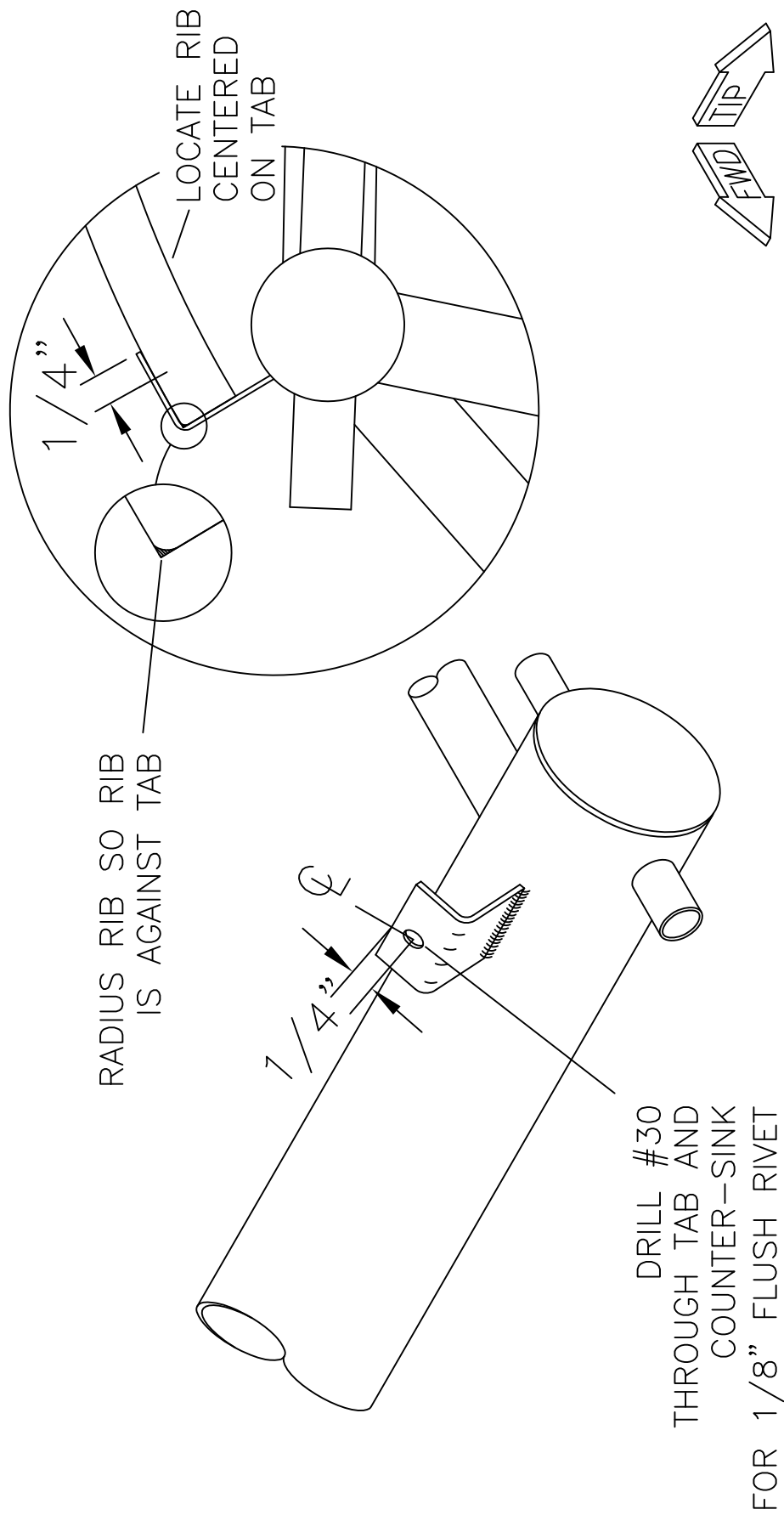
RRAMES S-21 OUTBOUND
SAMPLE ANALOG INSTRUMENT PANEL LAYOUT
FIGURE 10F-01



MD5618
REV. - ORIG

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

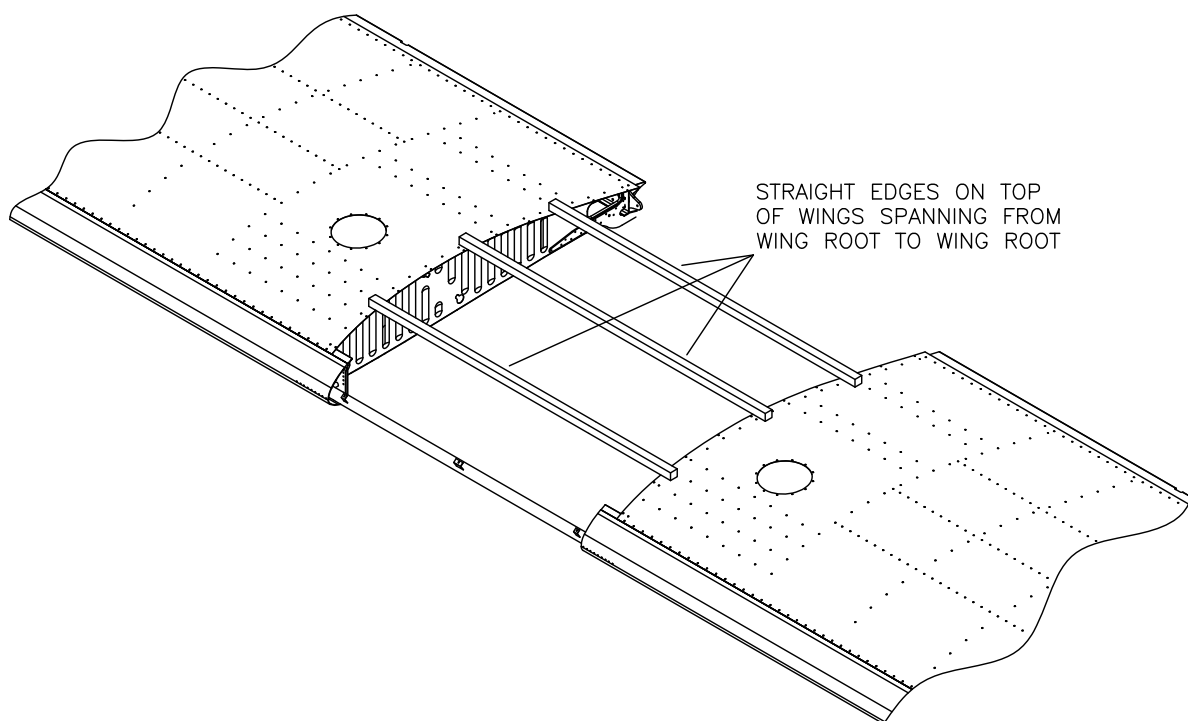
09/11/2018



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

MD4408
REV. - ORIG

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

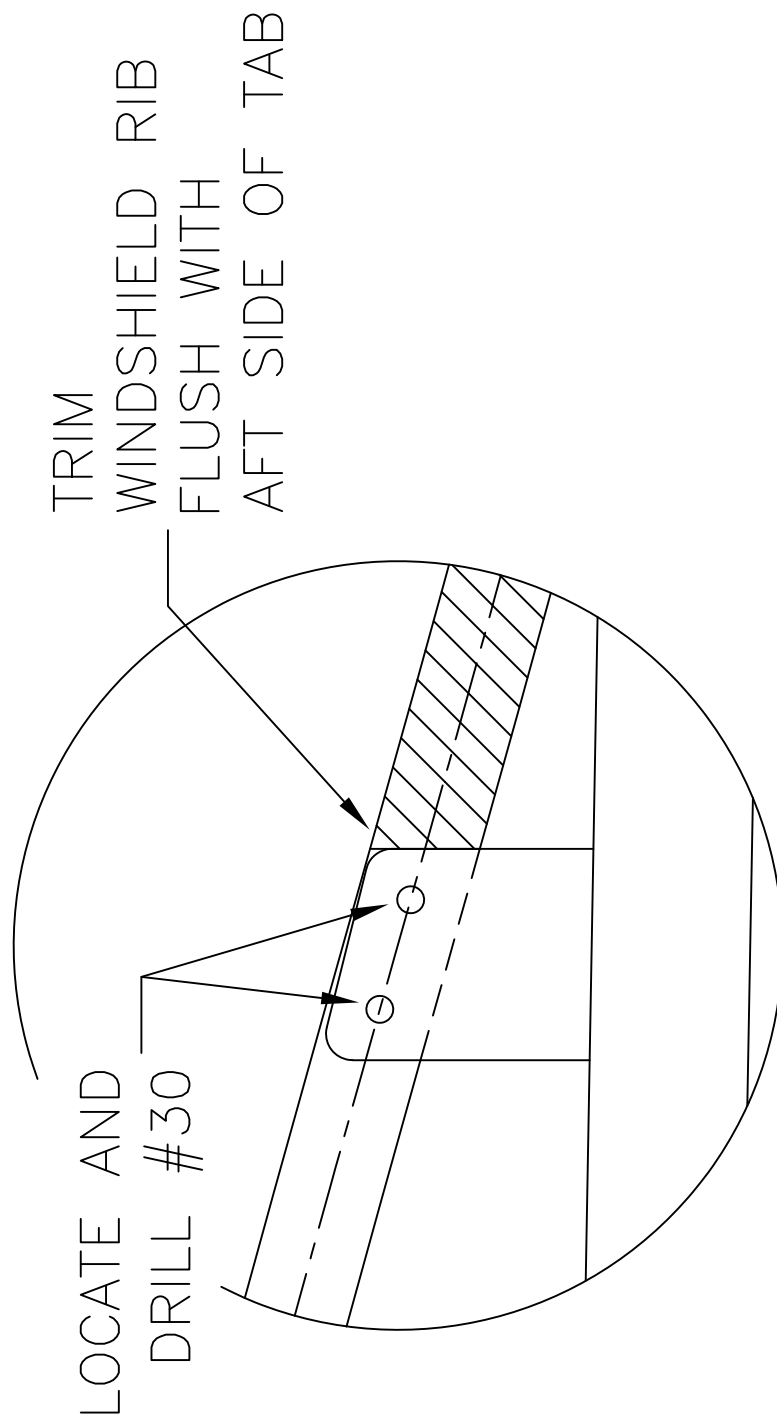


MD3354
REV. — ORIG

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

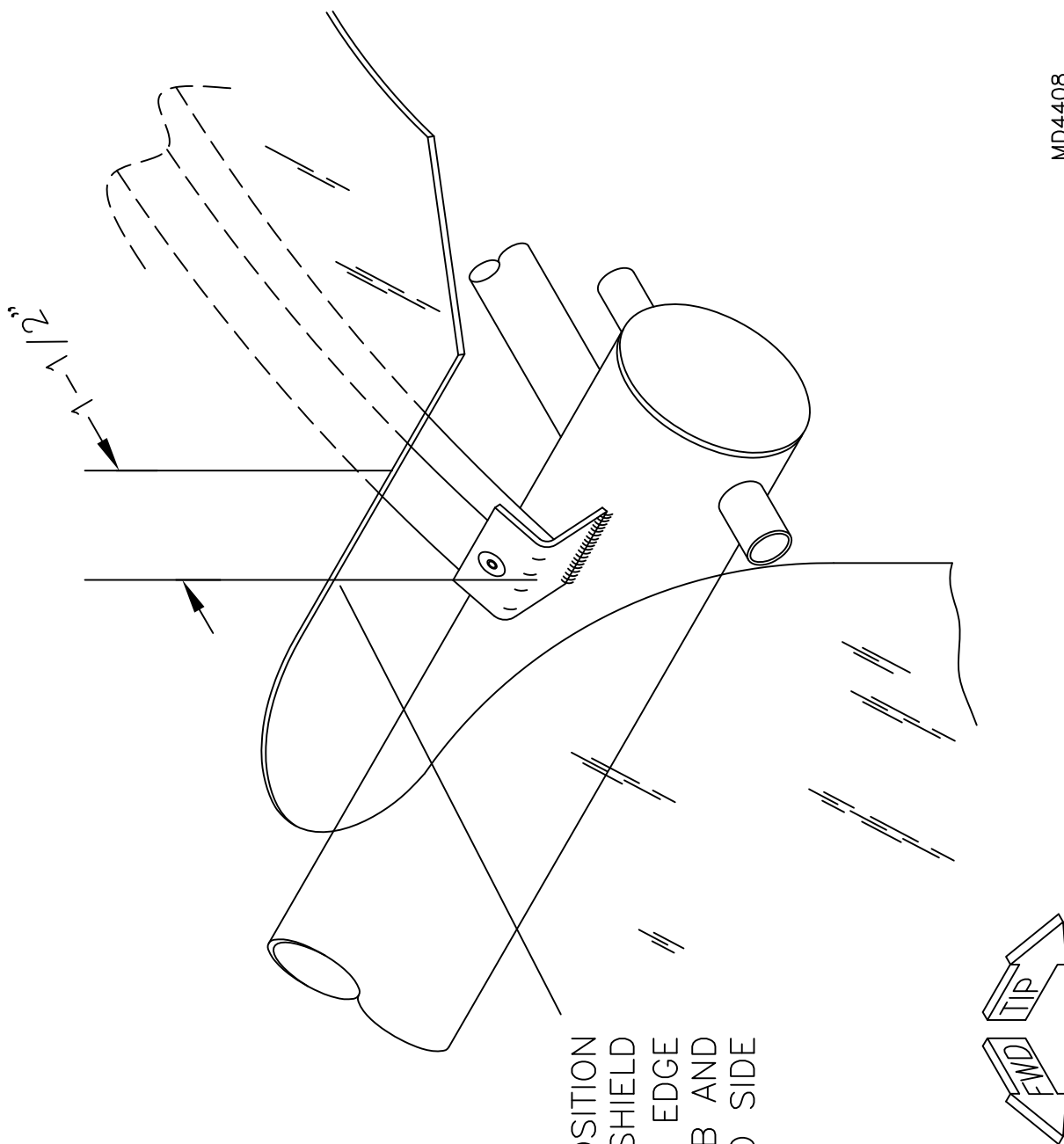
09/11/2018

RIB MOUNTS TO OUTBOARD
SIDE OF ATTACH TAB

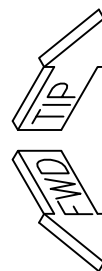


MD2580
REV. A

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



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



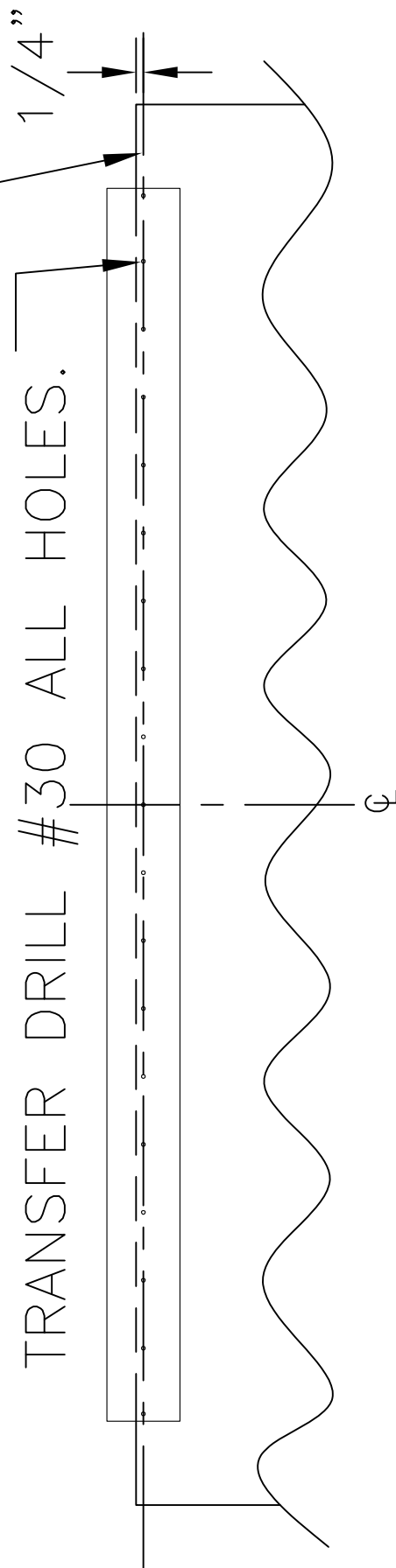
MD4408
REV. - ORIG

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



1. MARK LINE ON SKYLIGHT

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



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

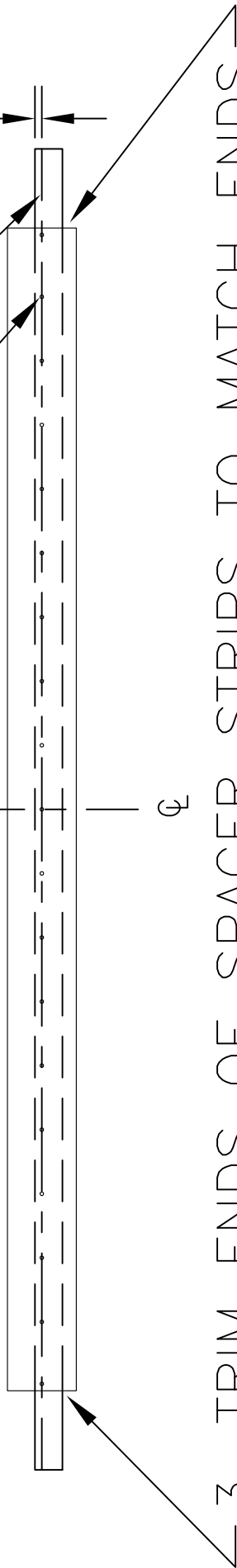
MD4408
REV. - ORIG

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

1. MARK LINE ON BOTH SKYLIGHT
SPACER STRIPS

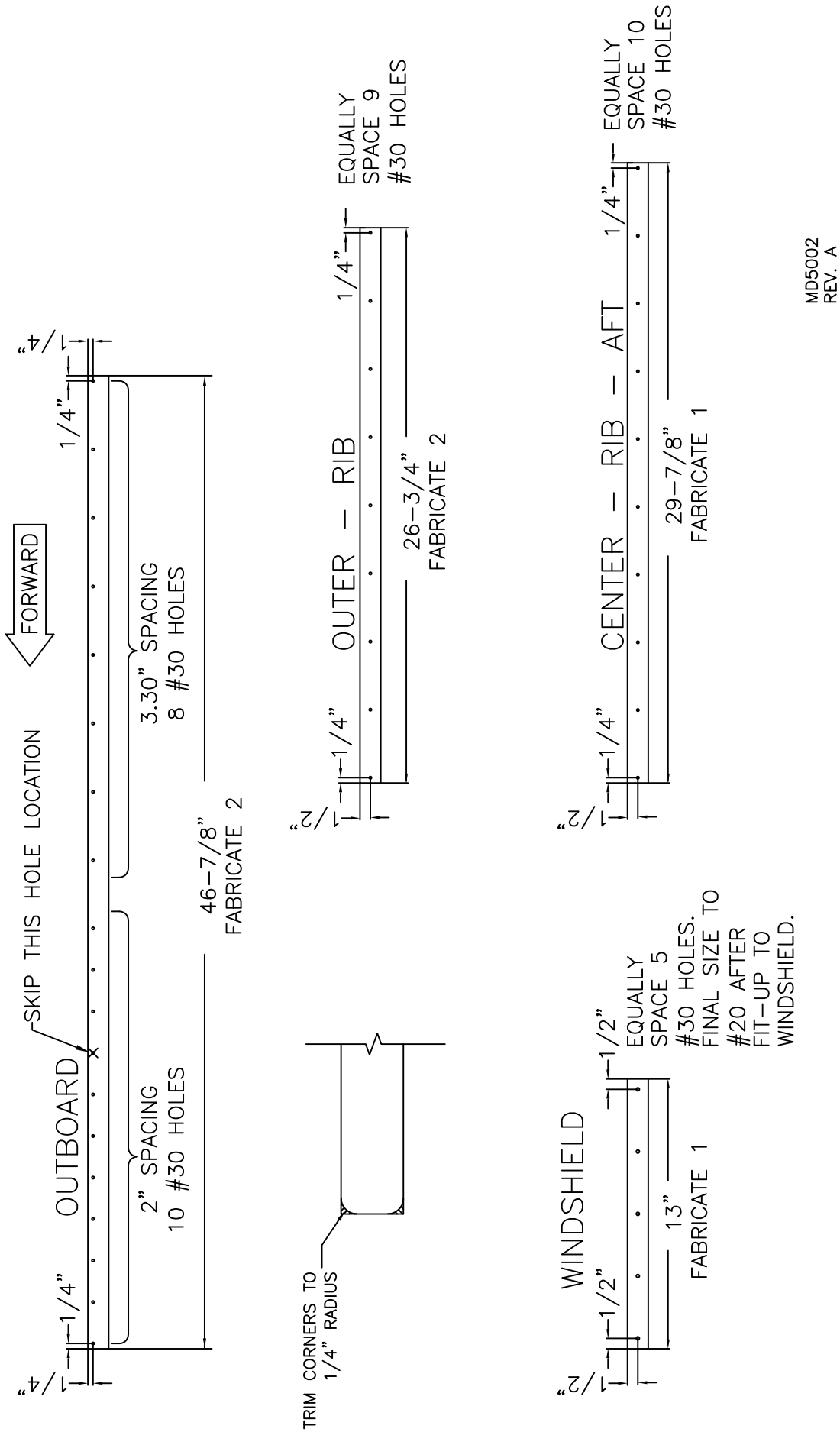
2. USE MATING STRIP AS GUIDE.
TRANSFER DRILL #30 ALL HOLES.

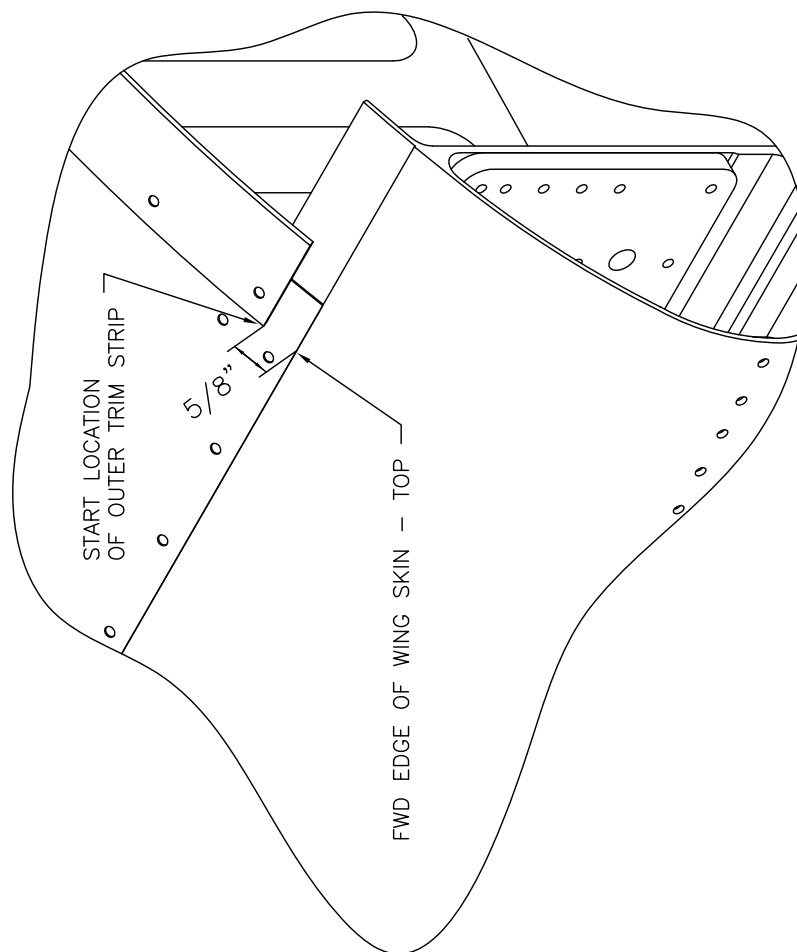
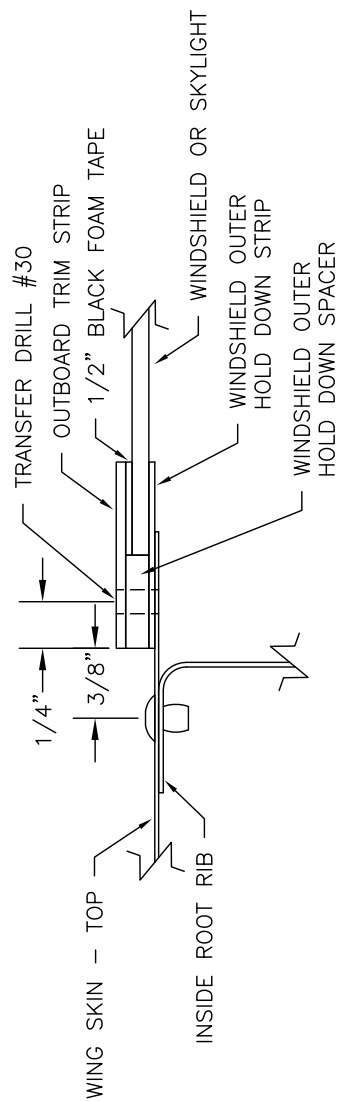
3. TRIM ENDS OF SPACER STRIPS TO MATCH ENDS
OF MATING STRIP. DEBUR.



MD4408
REV. - ORIG

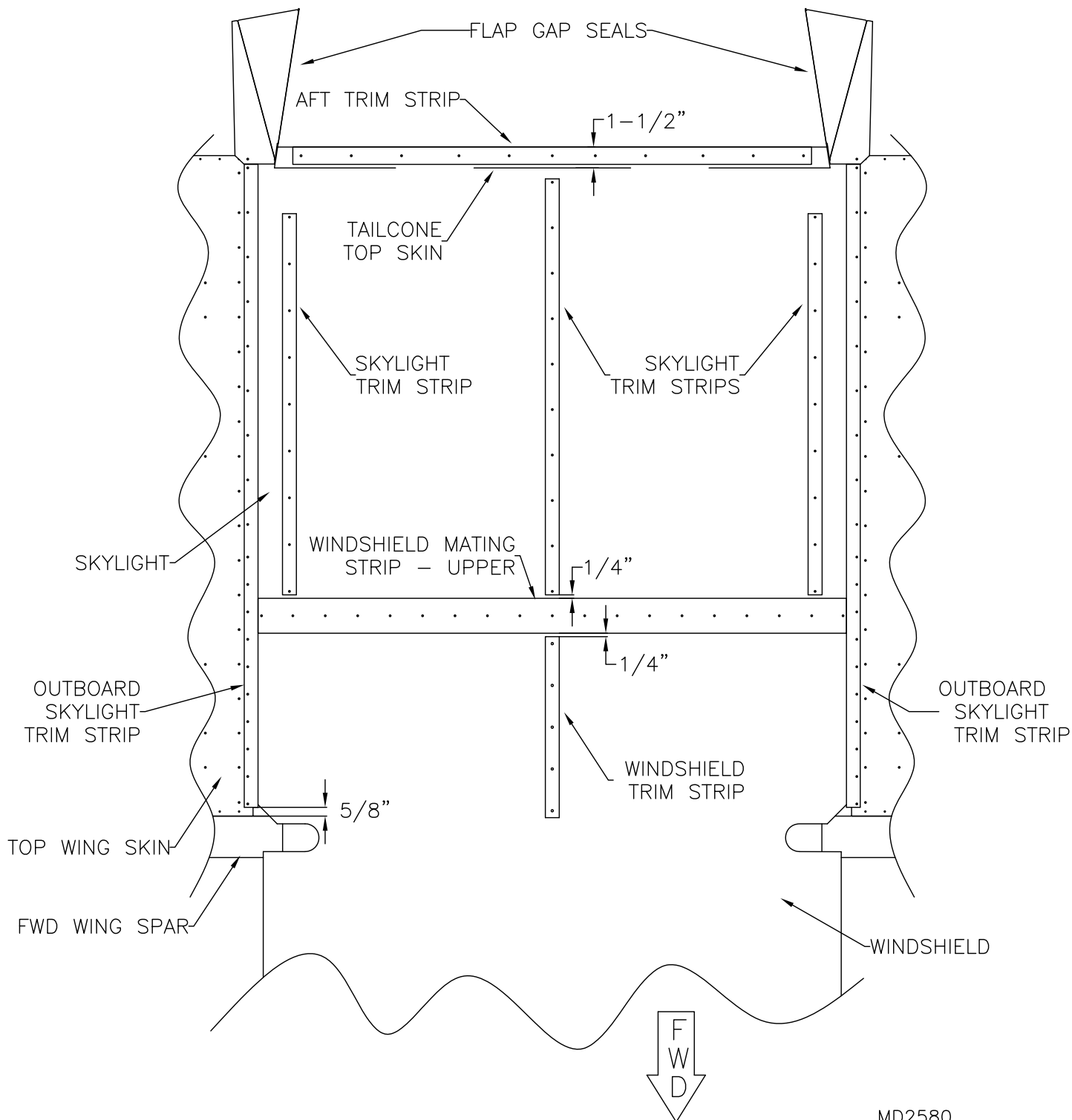
RRM S-21 OUTBOUND
SKYLIGHT SPACER STRIP DRILLING
FIGURE 10G-10A





MD2580
REV. - ORIG

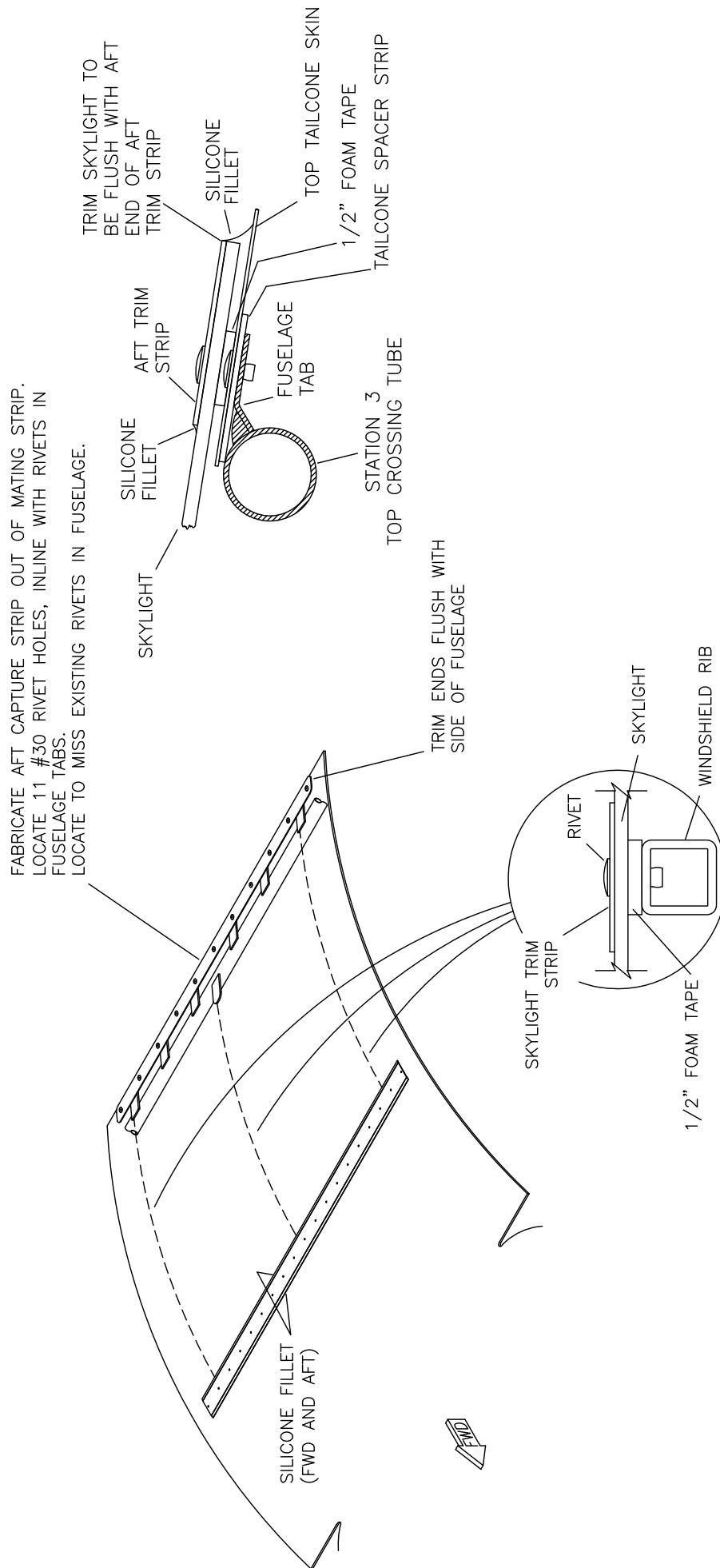
**RRR S-21 OUTBOUND
OUTERBOARD TRIM STRIP LOCATION
FIGURE 10G-12**



MD2580
REV. - ORIG

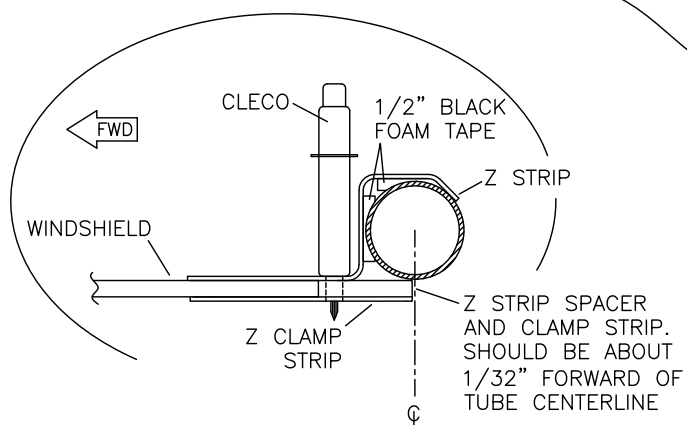
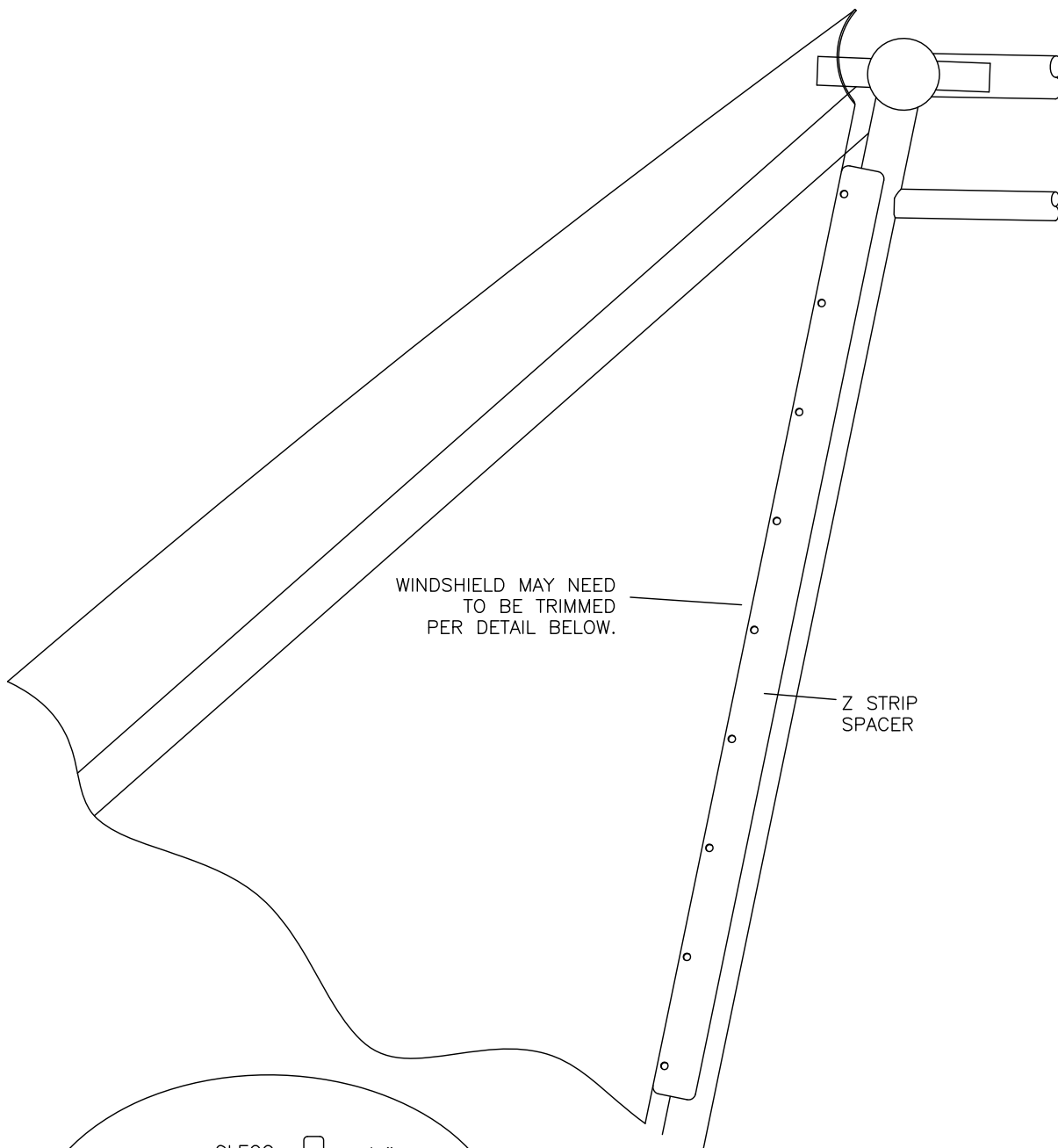
**RANS S-21 OUTBOUND
WINDSHIELD & SKYLIGHT - TOP VIEW
FIGURE 10G-17**

09/11/2018



MD2580
 REV. - ORIG

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

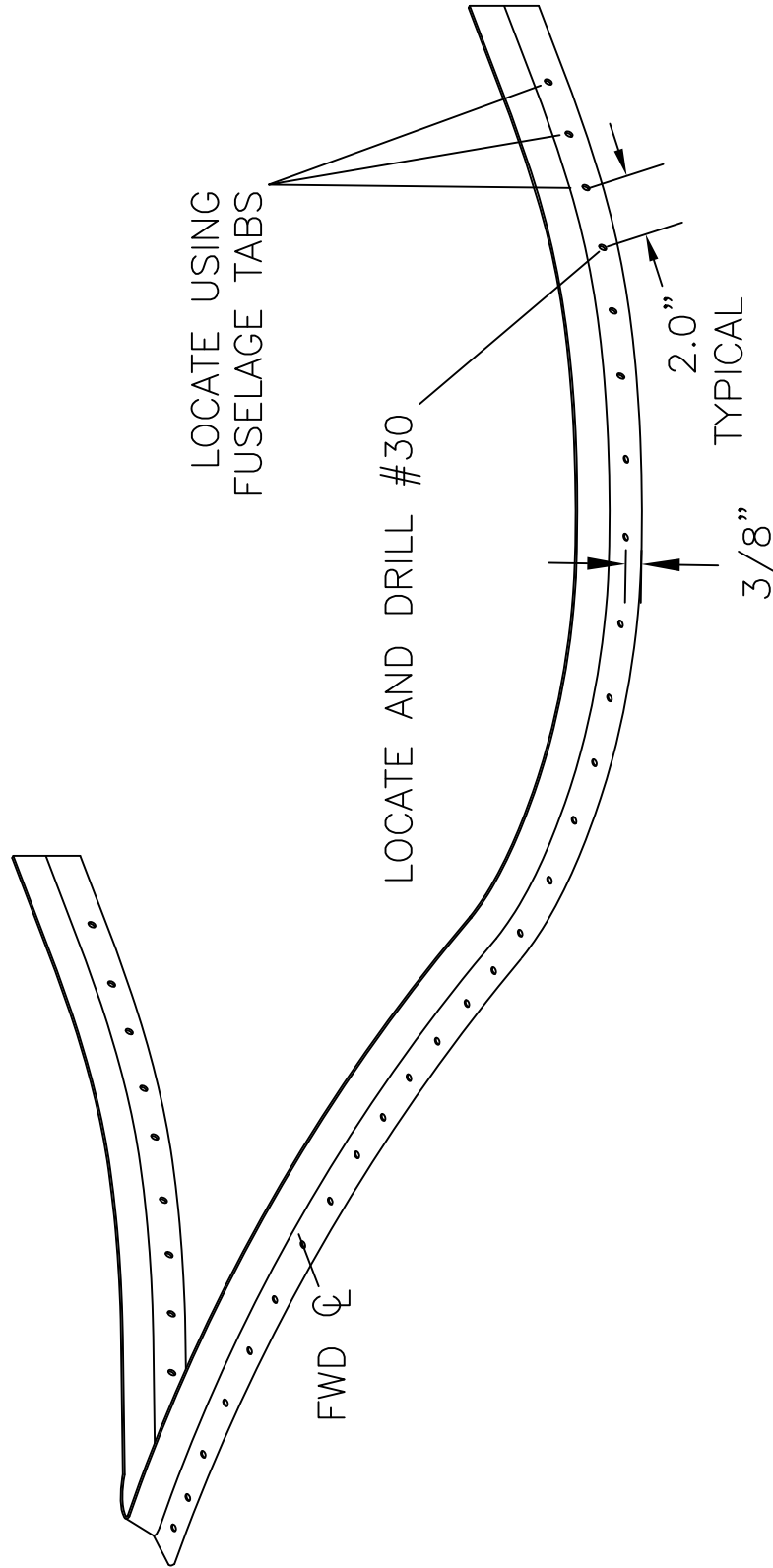


CLECO THE Z STRIP (KPWS0070), Z CLAMP STRIP (KPWS0068) AND THE Z STRIP SPACER (KPWS0069) TOGETHER AFT OF WINDSHIELD. Z STRIP SPACER SHOULD ALIGN FLUSH WITH AFT OF WINDSHIELD.

MD1428
REV. — ORIG

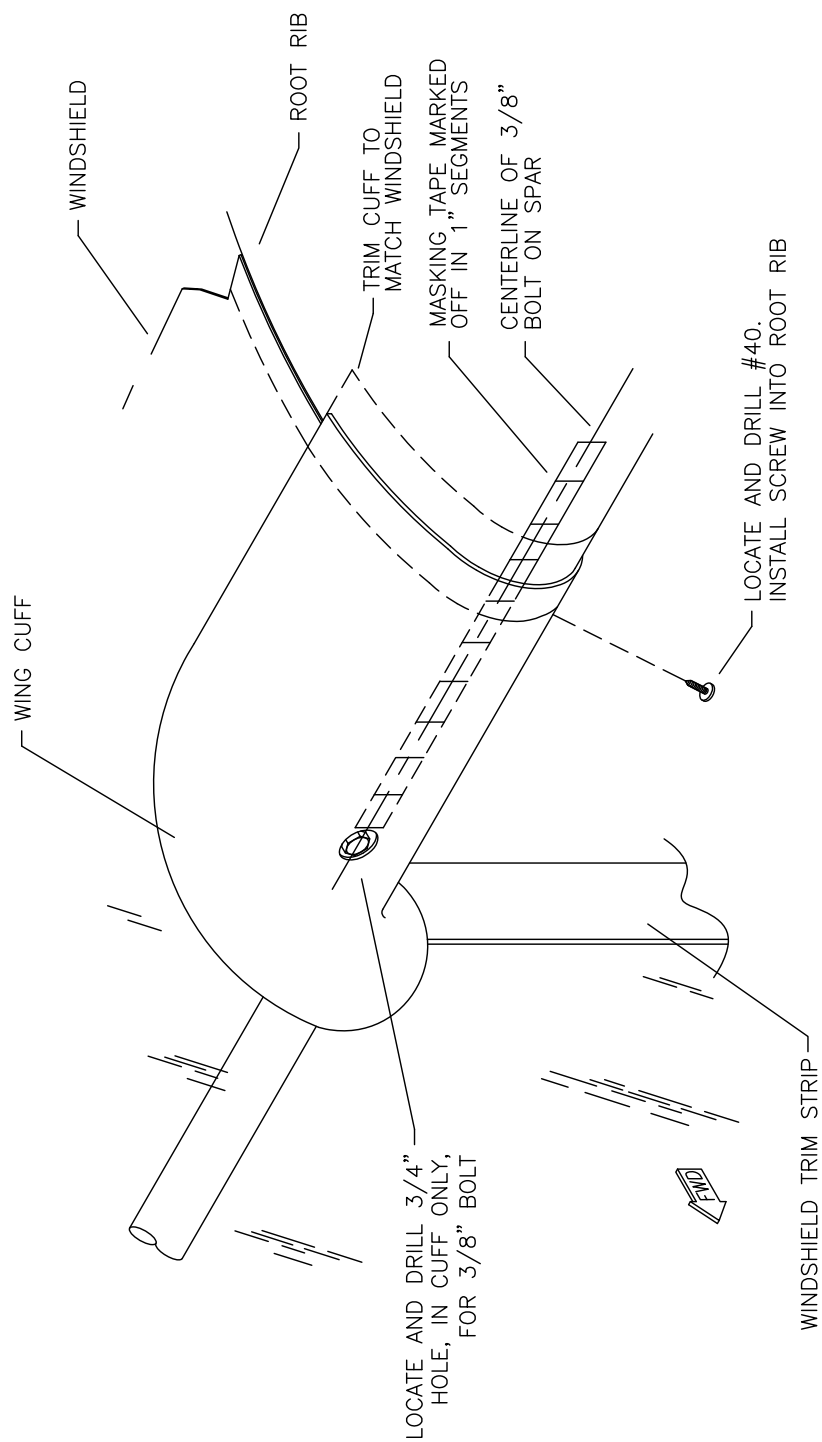
RANS S-21 OUTBOUND WINDSHIELD SIDE FIT-UP FIGURE 10G-20

09/11/2018



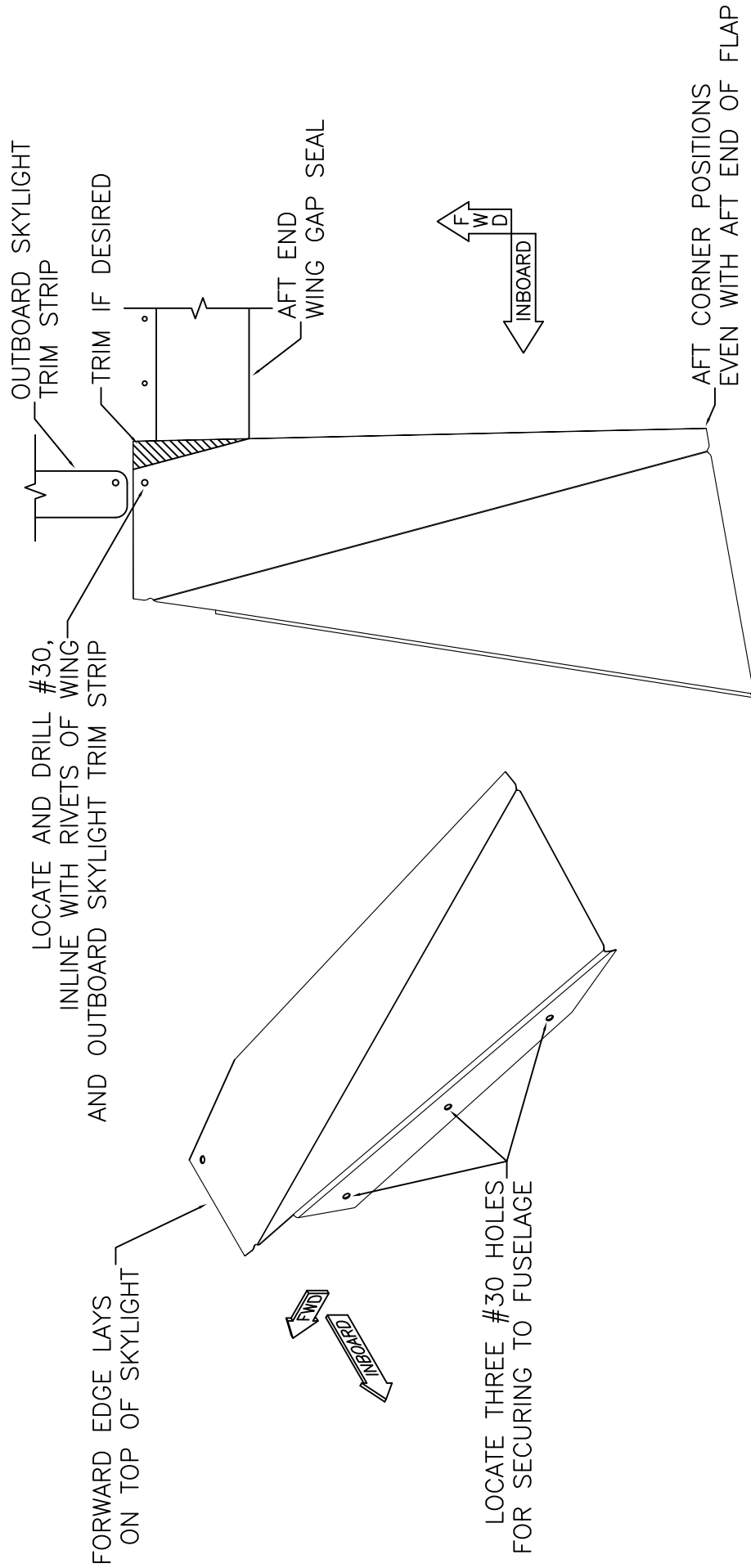
MD4408
REV. - ORIG

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



MD571
REV. — ORIG

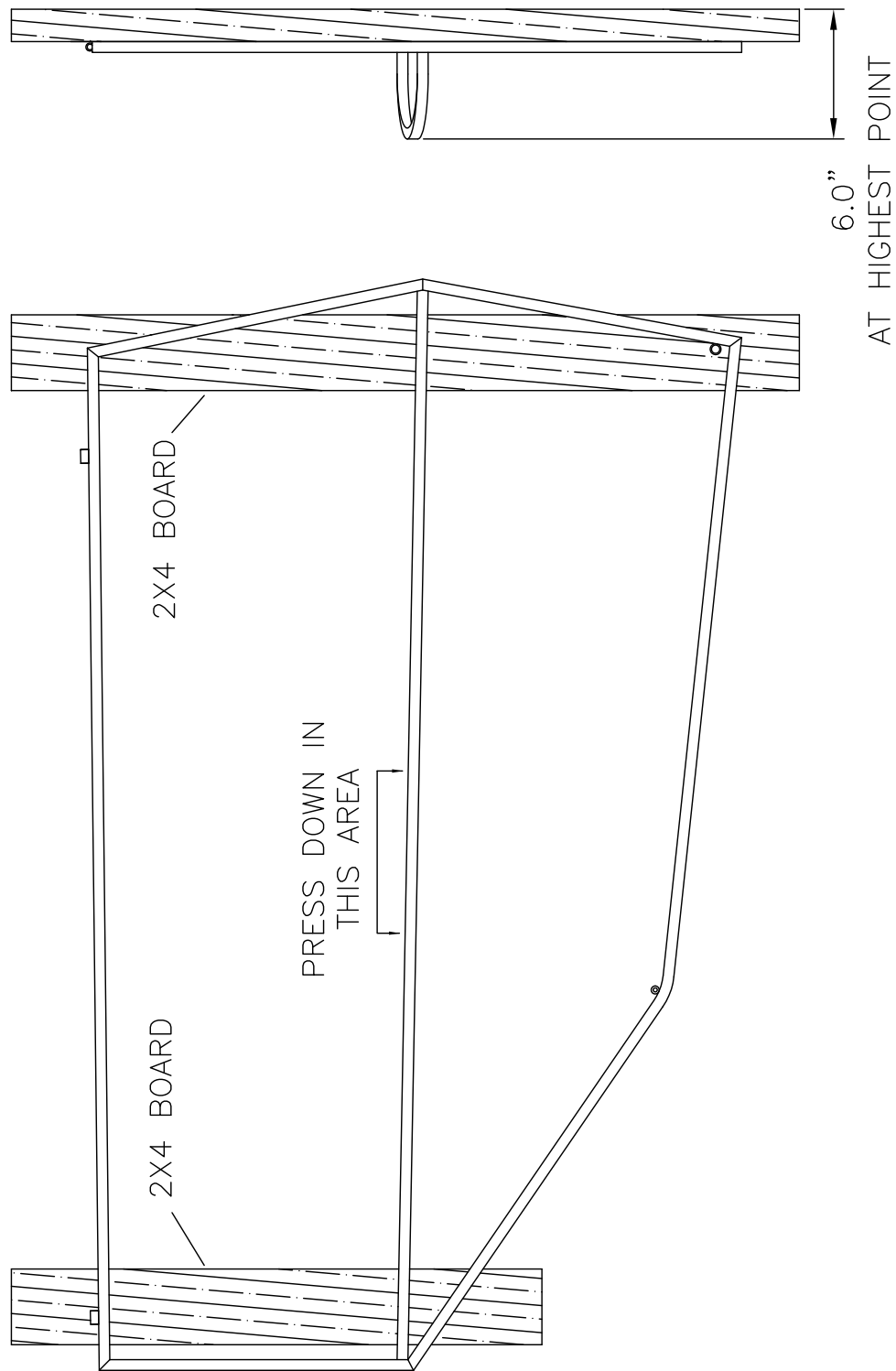
**RRMS S-21 OUTBOUND
WING CUFF INSTALLATION**
FIGURE 10G-37



REFER TO 141 WING - ROOT SEAL INSTALLATION
FOR PARTS LISTING

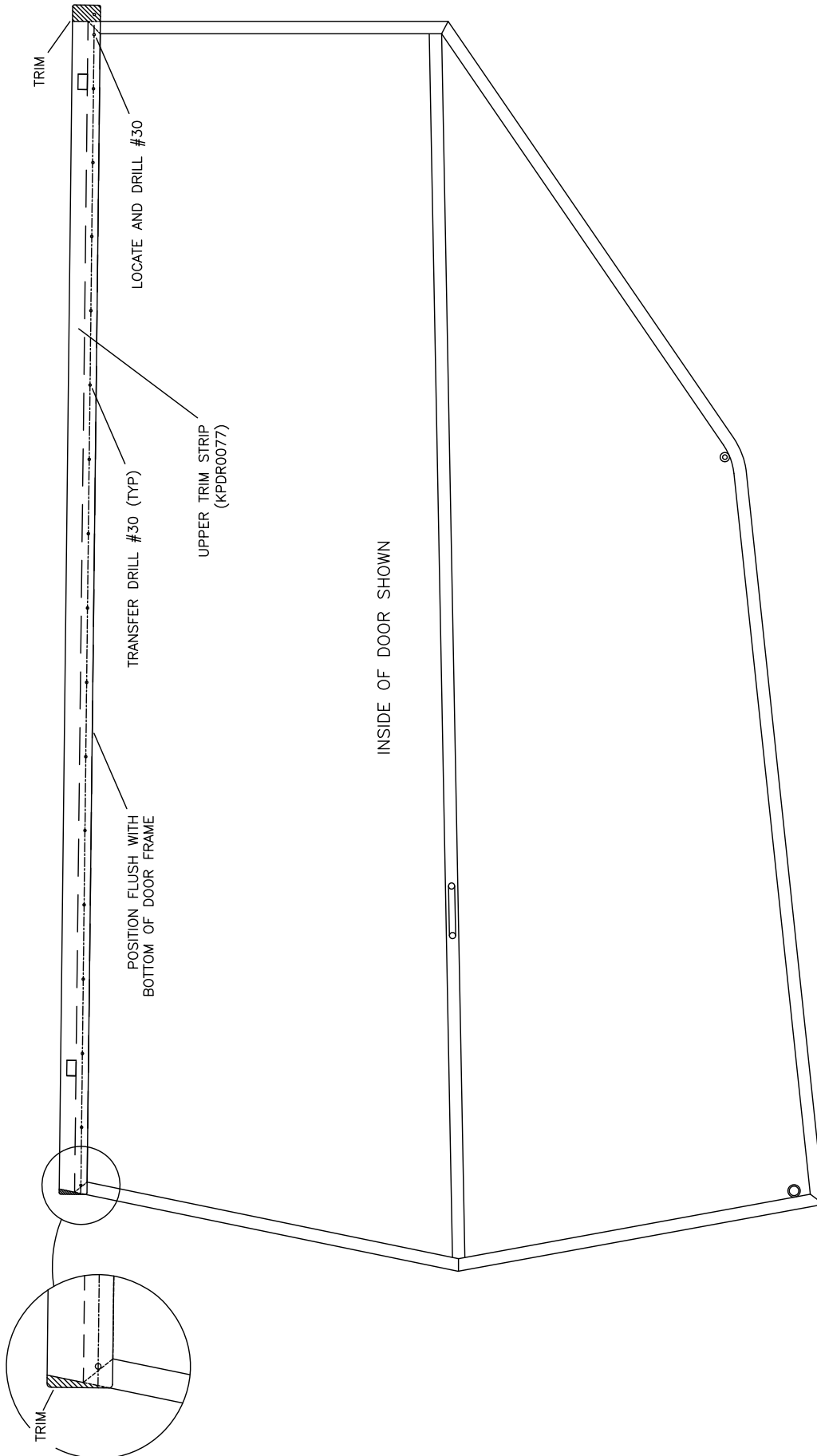
MD5083
REV. - ORIG

RAMS S-21 OUTBOUND WING GAP SEAL MODIFICATION FIGURE 10G-45



MD5621
REV. — ORIG

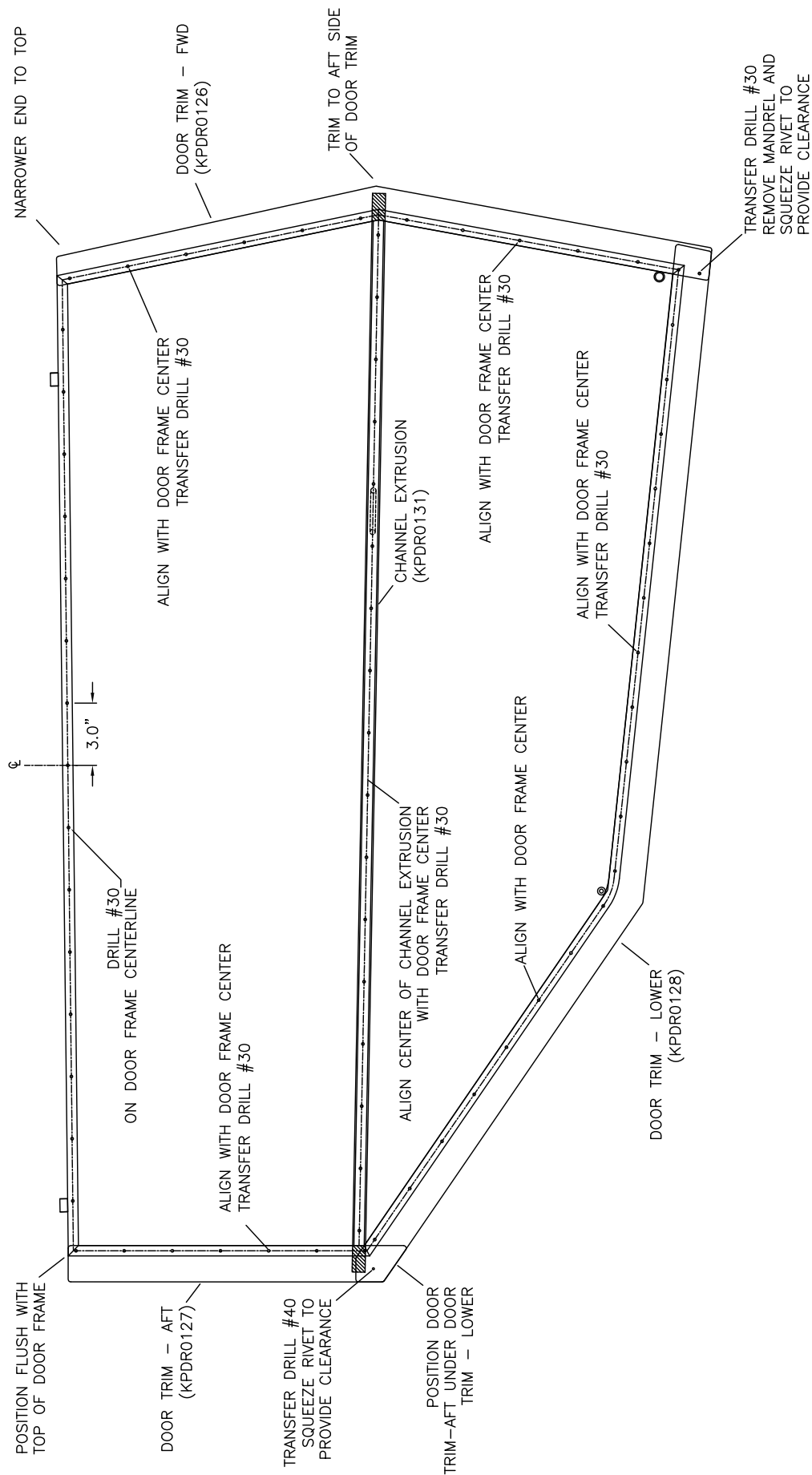
RRR S-21 OUTBOUND DOOR FRAME CHECK FIGURE 10H-01



MD5621
REV. - ORIG

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

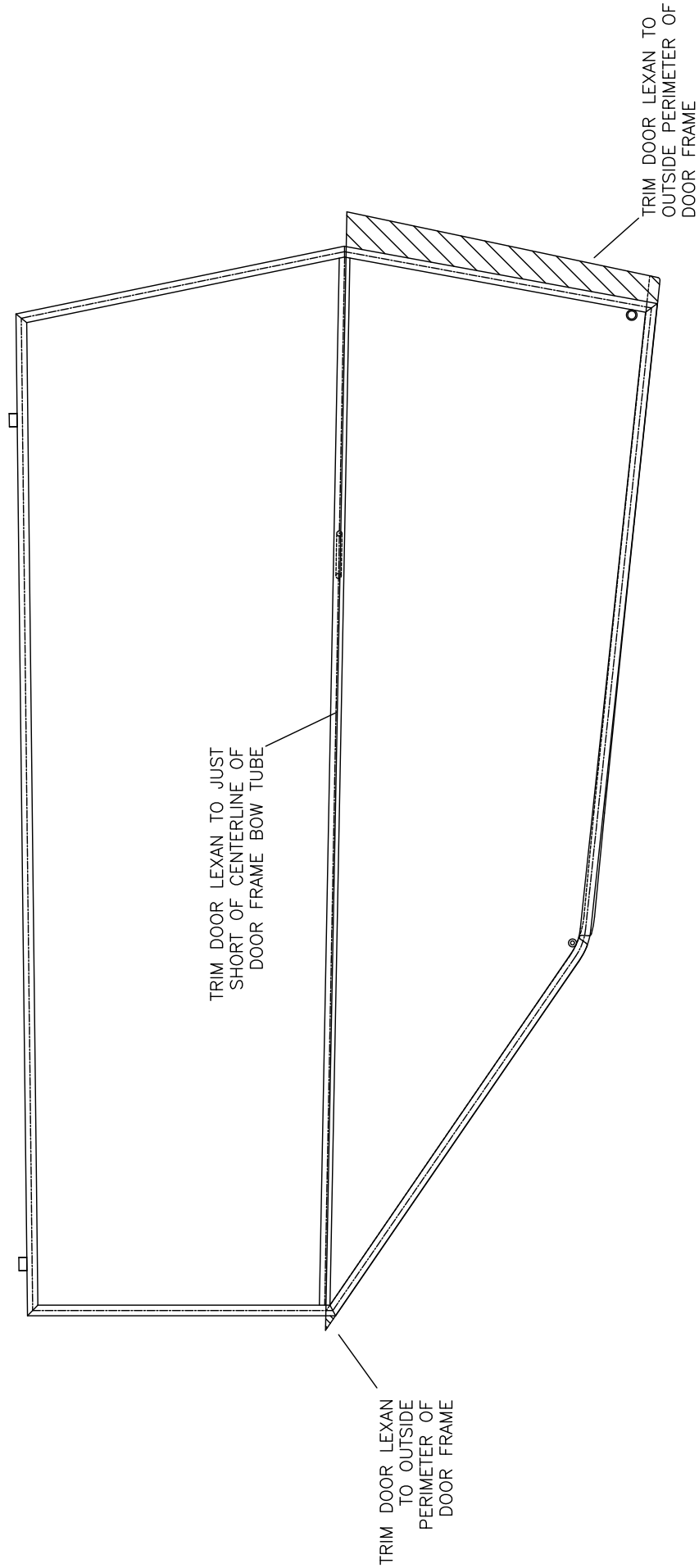
09/11/2018



09/11/2018

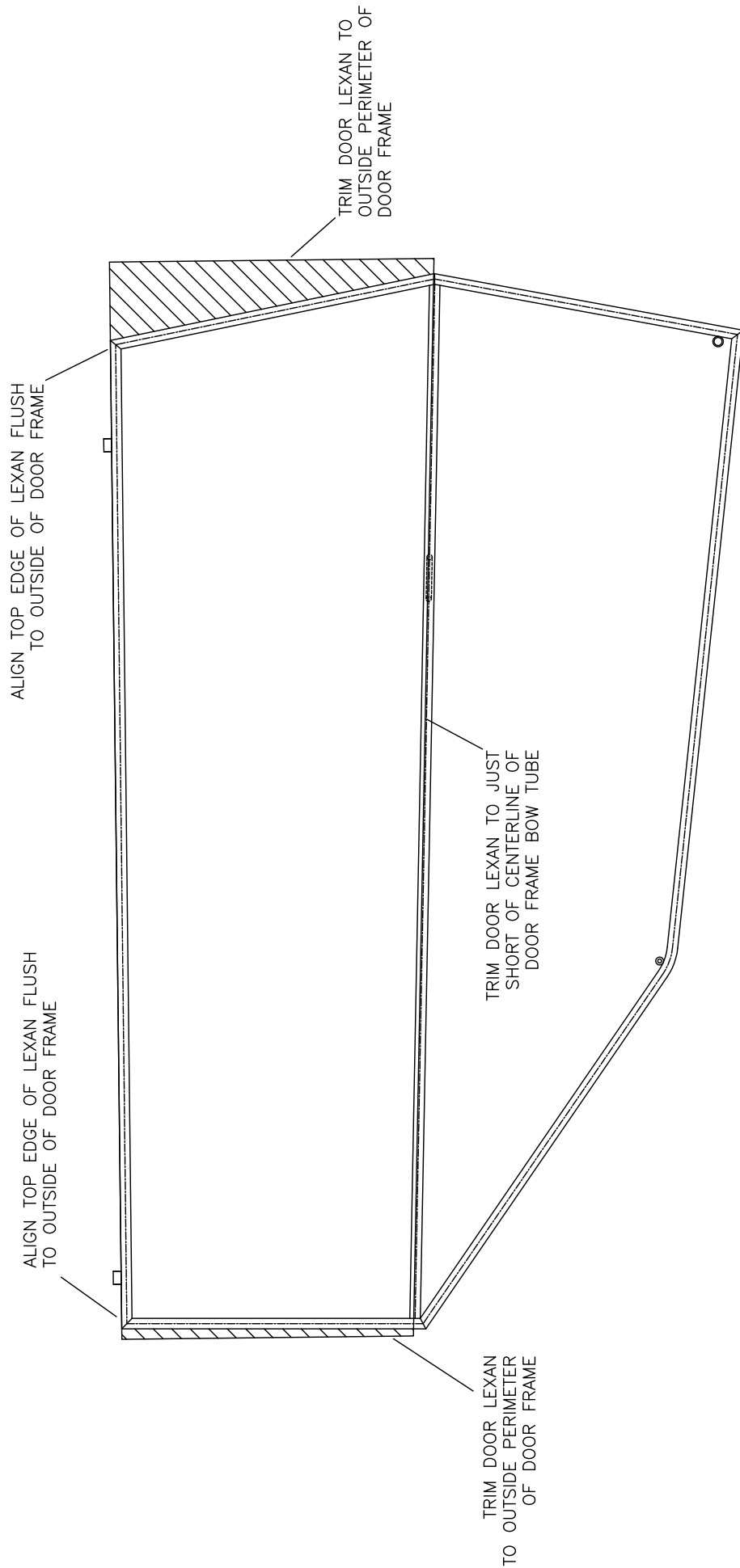
RRR S-21 OUTBOUND DOOR TRIM ASSEMBLY FIGURE 10H-04

MD5621
REV. - ORIG



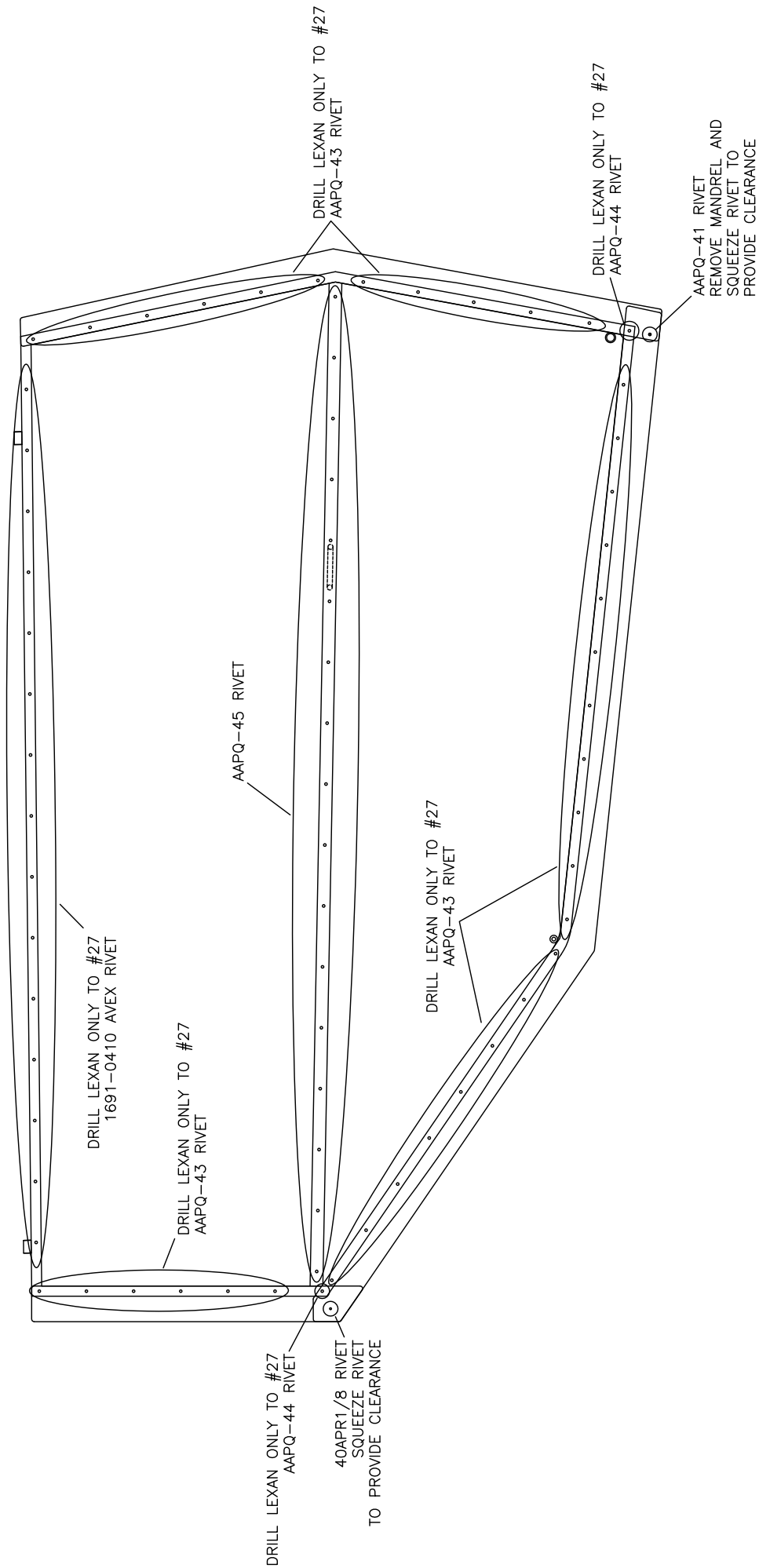
MD5621
REV. — ORIG

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



MD5621
REV. — ORIG

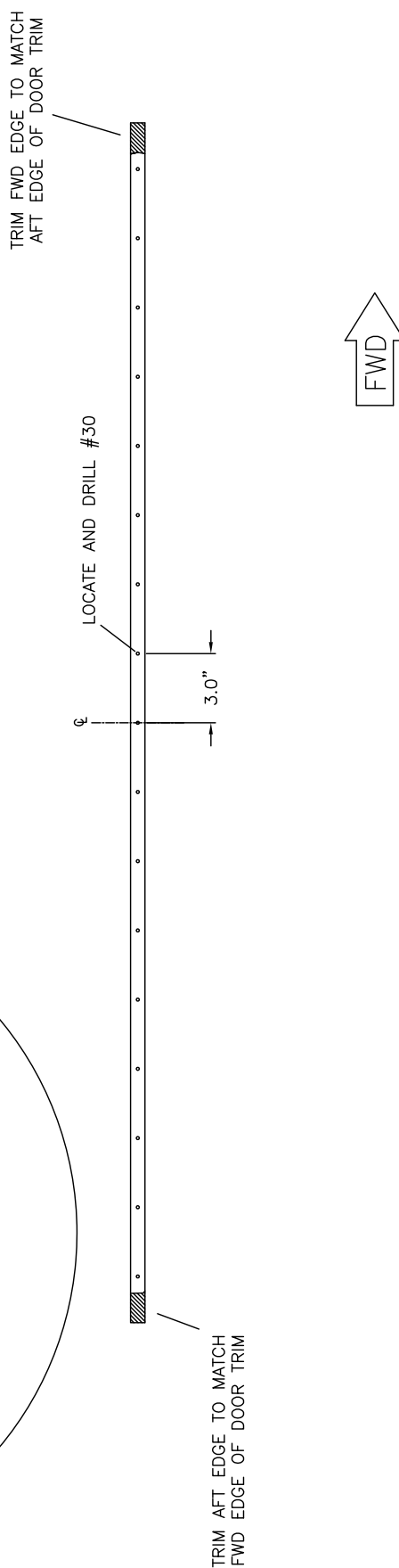
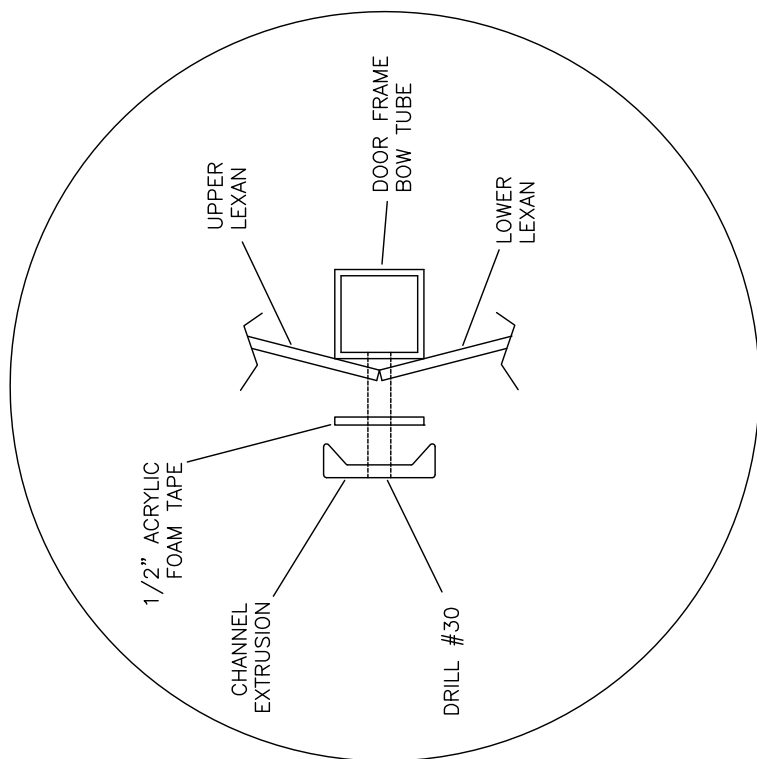
RAMS S-21 OUTBOUND UPPER DOOR LEXAN TRIMMING FIGURE 10H-14

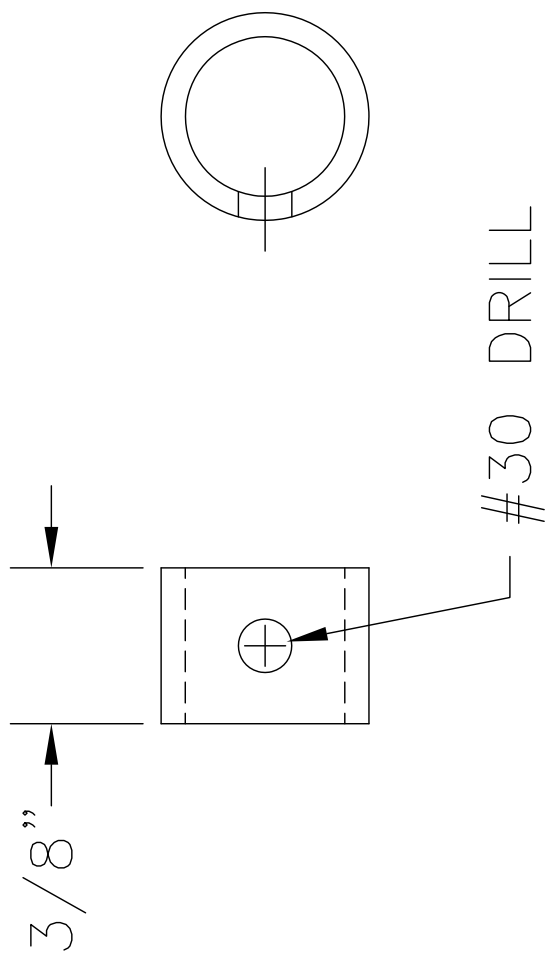


MD5621
REV. - ORIG

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

09/11/2018

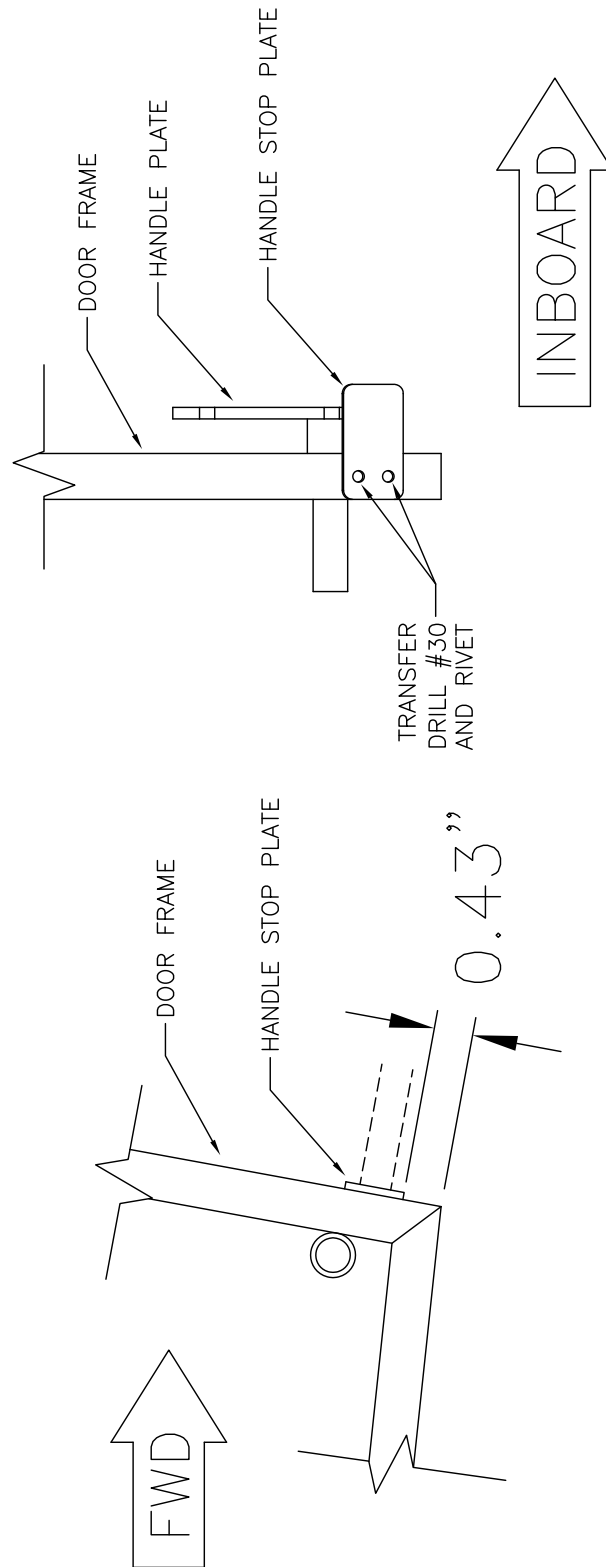




FABRICATE 2

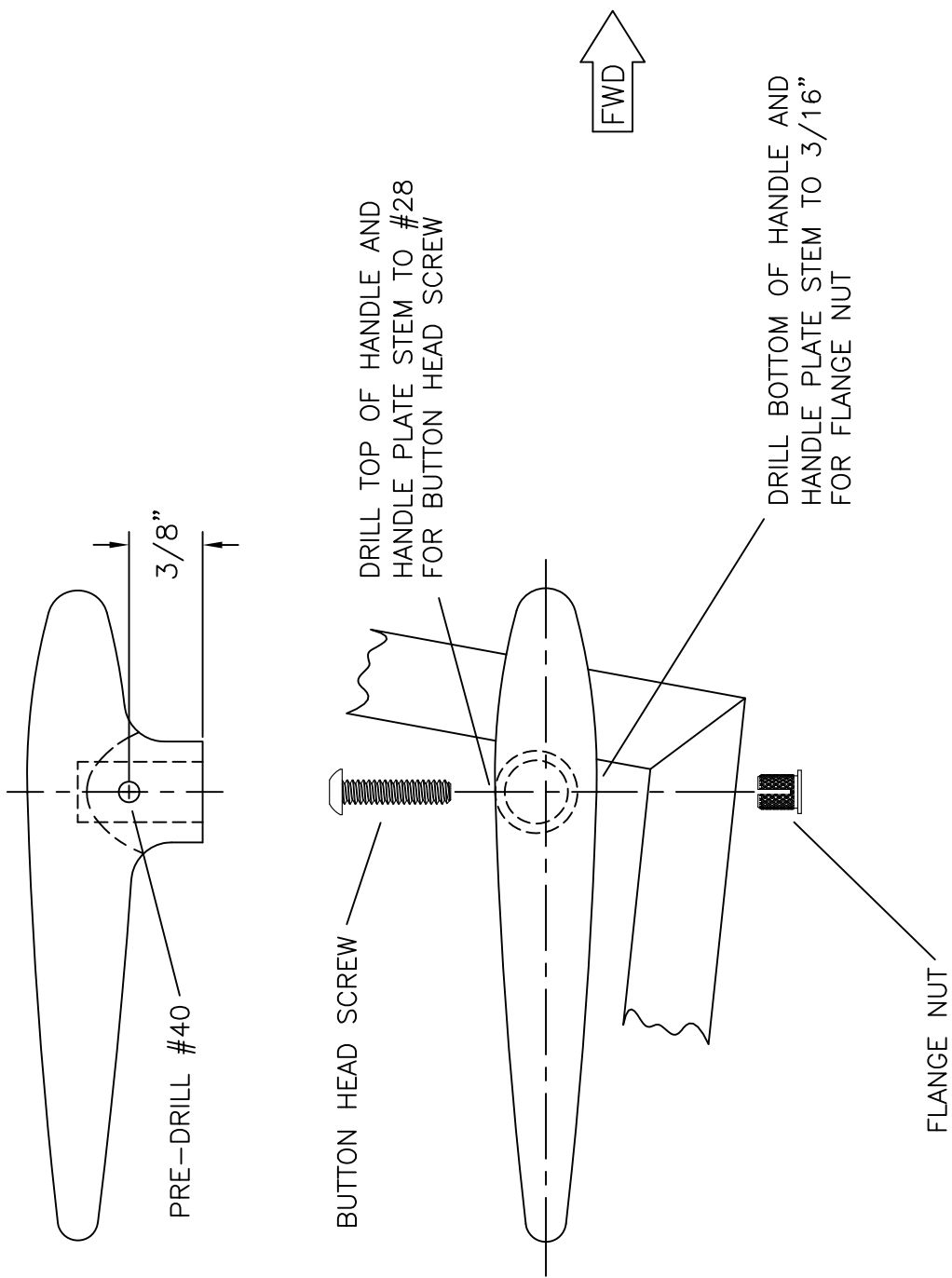
MD3650
REV. - ORIG

**RRR S-21 OUTBOUND
DOOR SPACER BUSHING
FIGURE 10H-24**



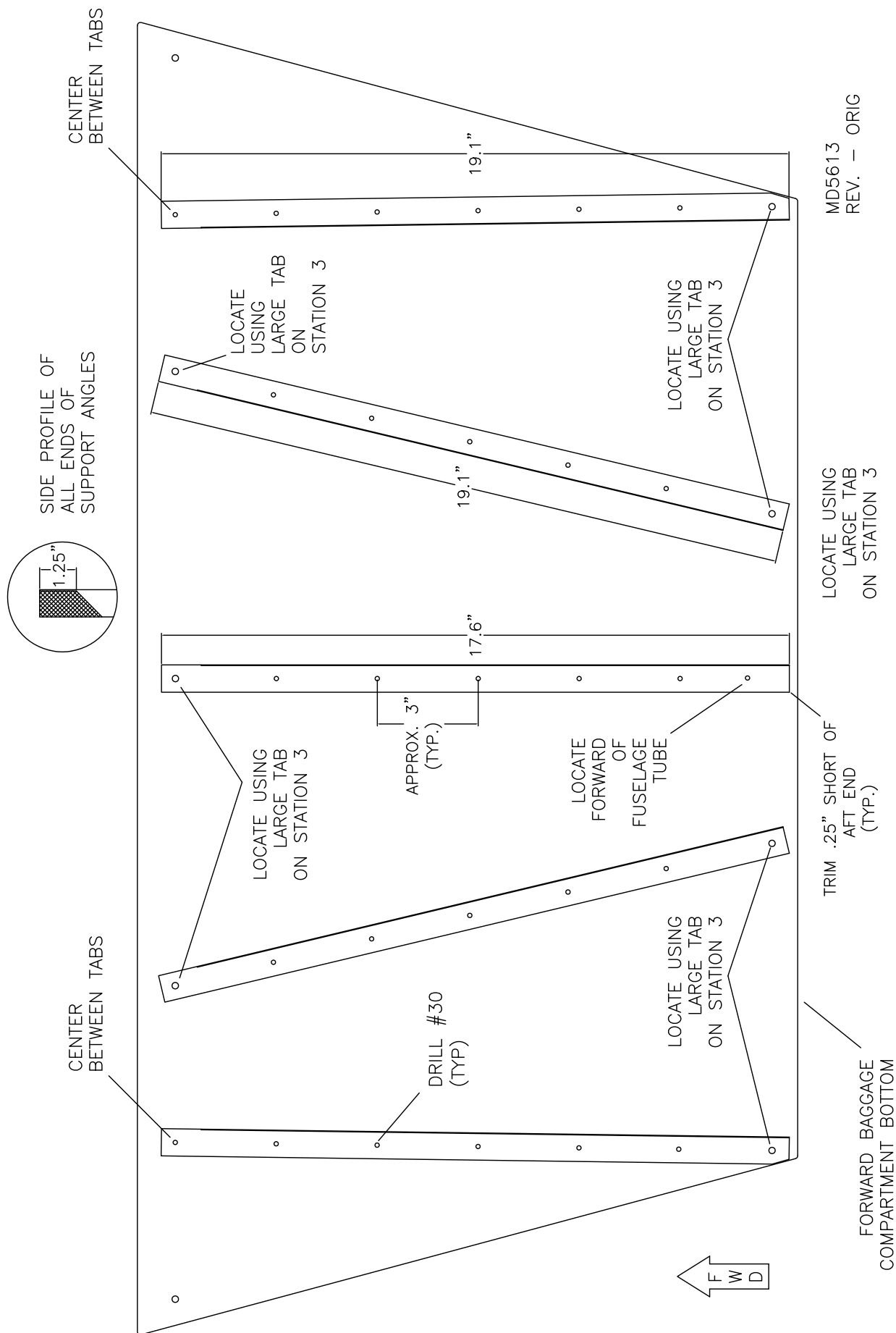
MD5621
REV. — ORIG

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



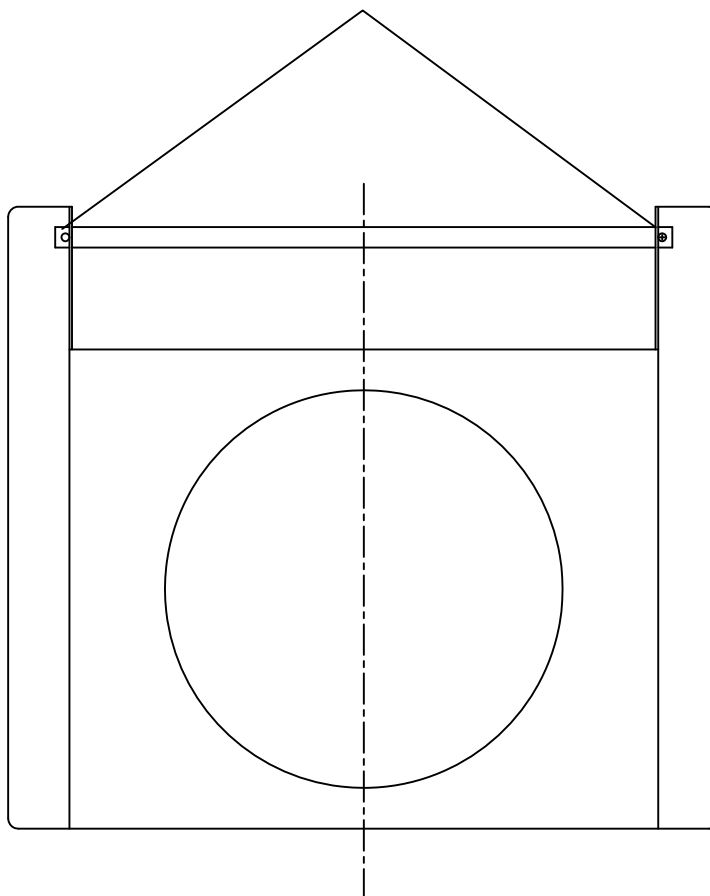
MD4404
REV. - ORIG

RRR S-21 OUTBOUND
DOOR HANDLE DETAIL
FIGURE 10H-32



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

CENTER BATTERY BAR AND DRILL #40
AS NECESSARY

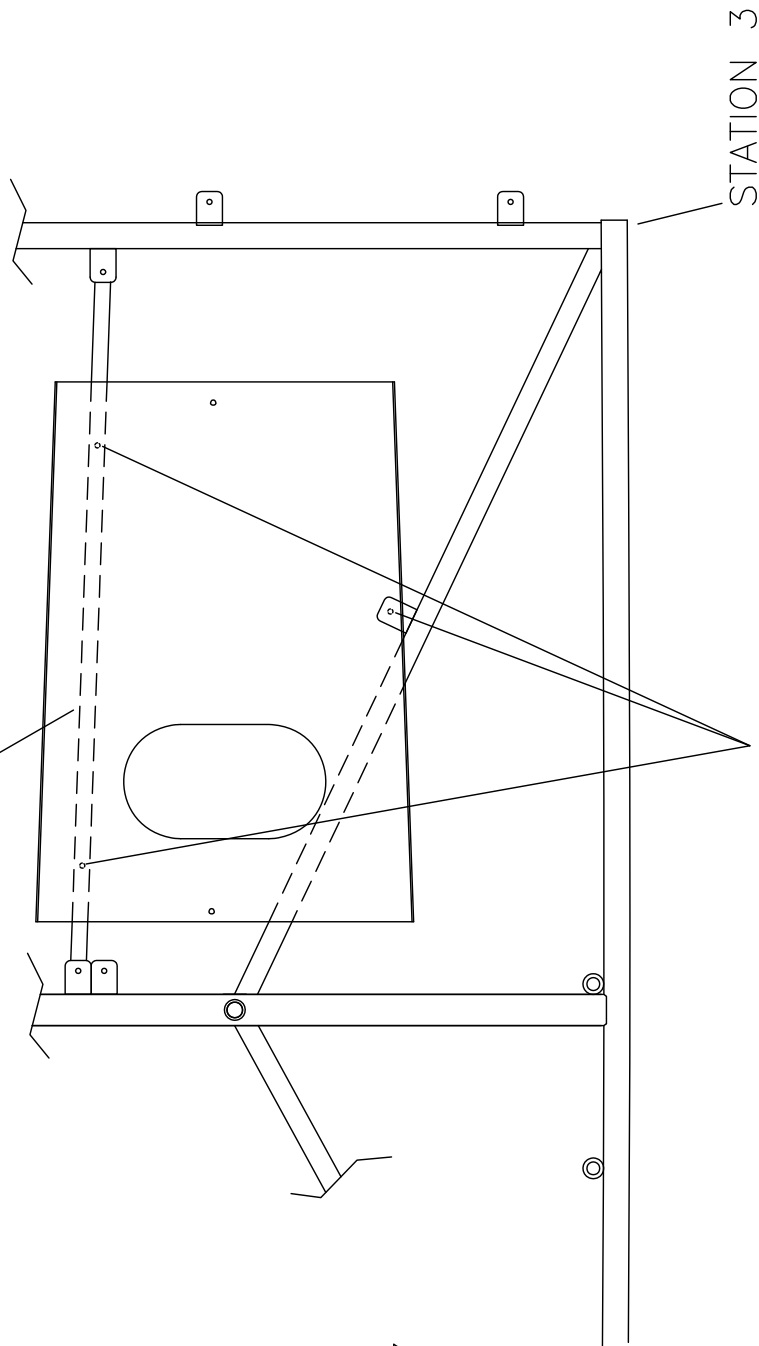
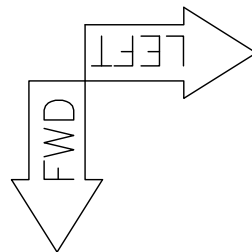


RANS S-21 OUTBOUND
ROTAX 912ULS
BATTERY BAR MODIFICATION
FIGURE 11A-07/912

MD5468
REV. — ORIG

09/11/2018

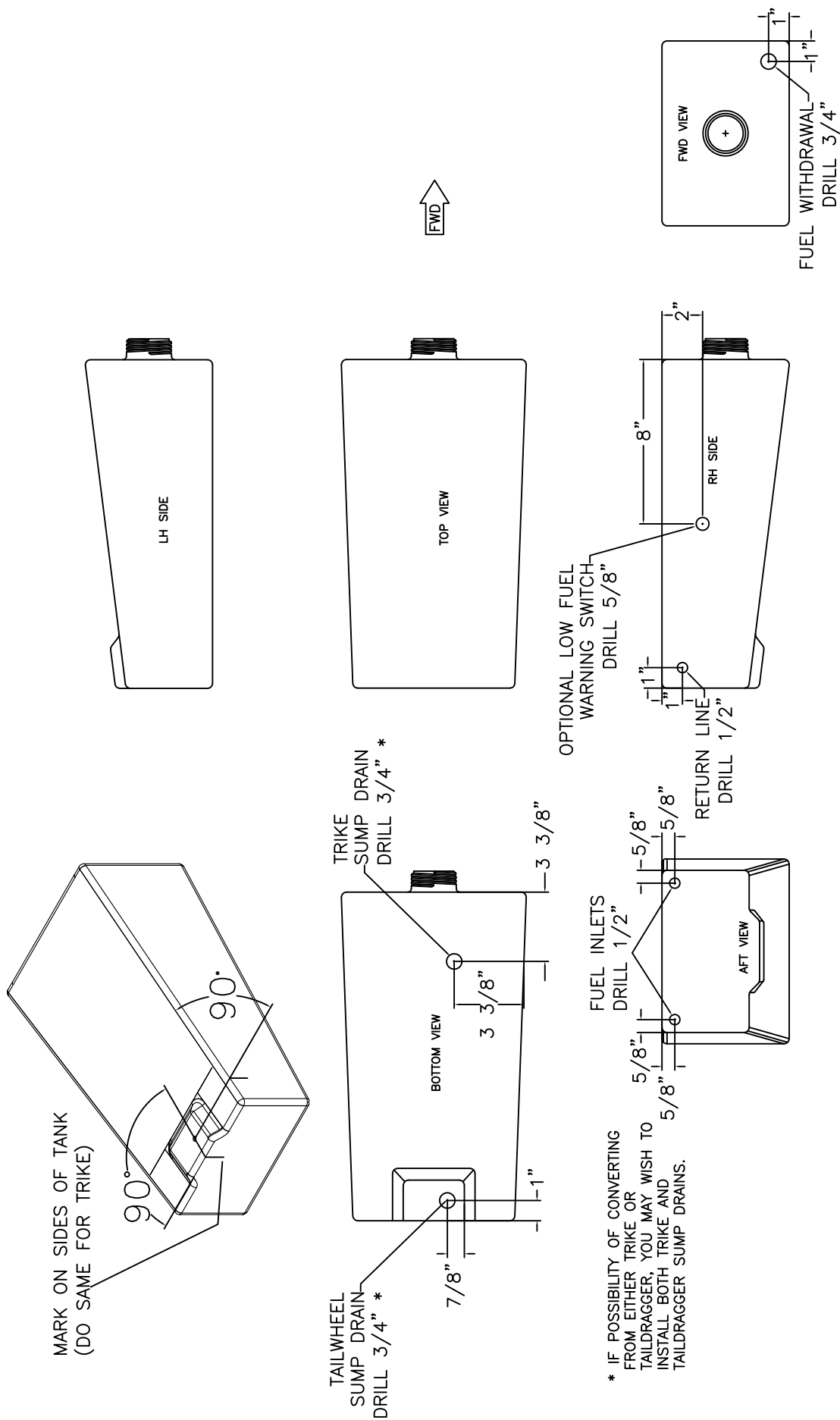
HEADER TANK SUPPORT ANGLE
RIVETED TO BOTTOM OF TABS



LOCATE AND
DRILL #30 (3 PLACES).

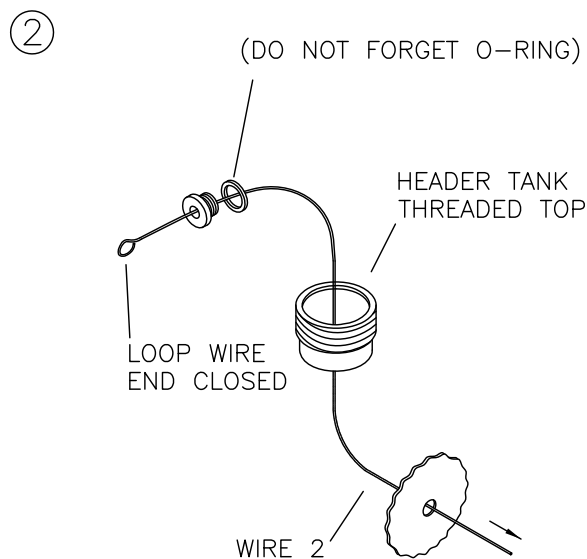
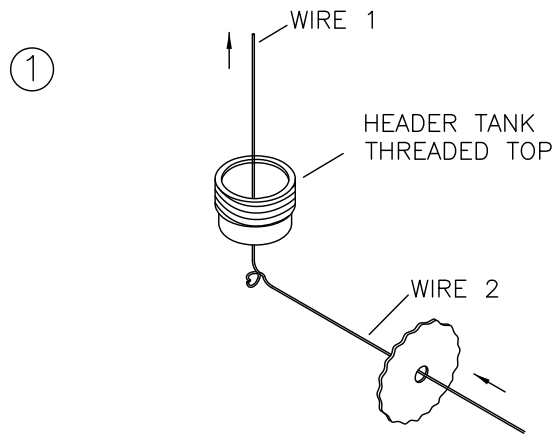
MD5616
REV - ORIG

RRF S-21 OUTBOUND
ROTAX 912ULS
HEADER TANK MOUNT
FIGURE 11B-01/912



RAMS S-21 OUTBOUND
ROTAX 912ULS
2.75 GALLON HEADER TANK MODIFICATION
FIGURE 11B-02/912

MD2861
REV. A



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

④ REMOVE WIRE.

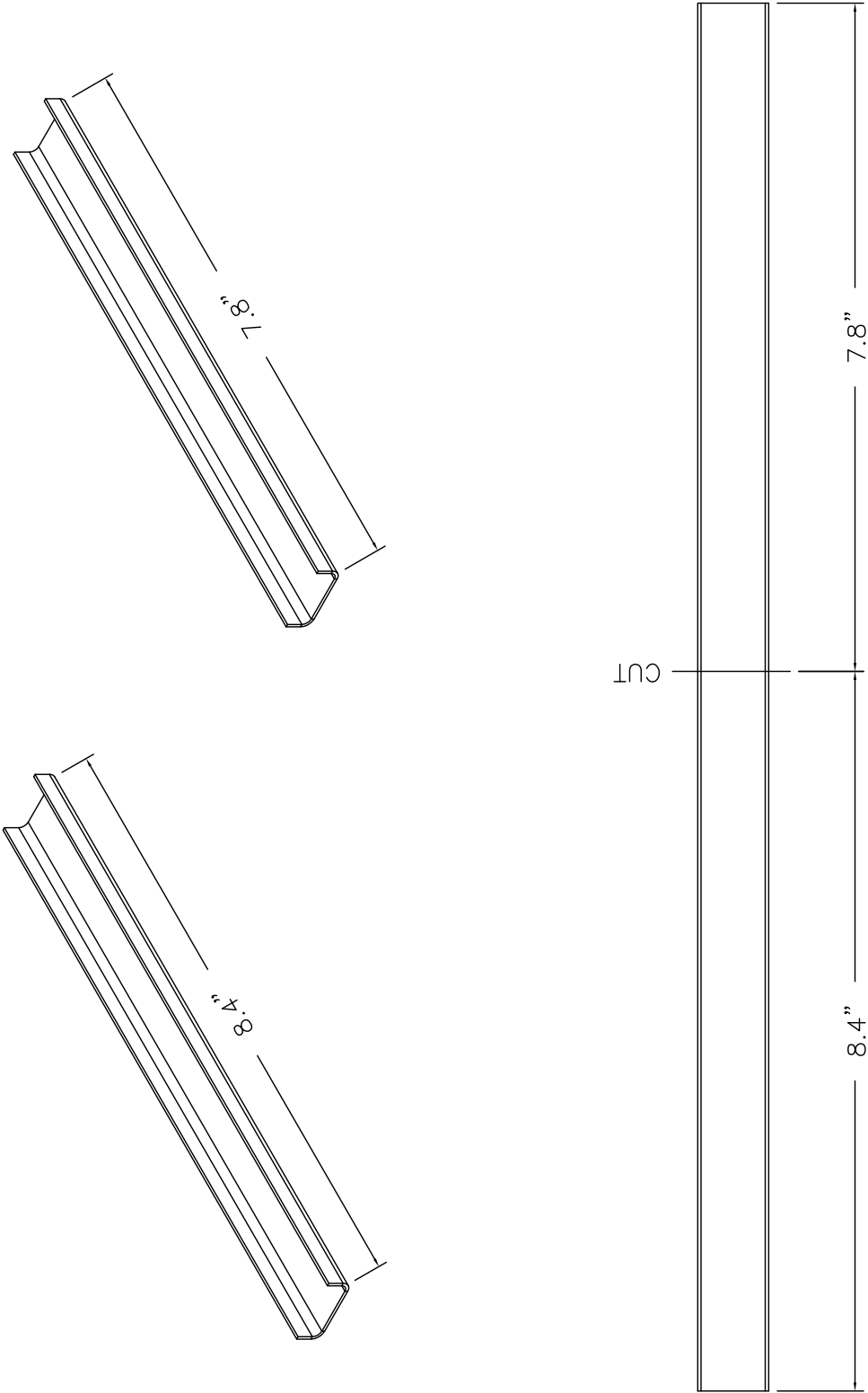
**RANS S-21 OUTBOUND
ROTAX 912ULS
HEADER TANK FITTING INSTALLATION
FIGURE 11B-03/912**

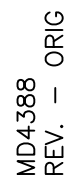
MD4832
REV. — ORIG

09/11/2018

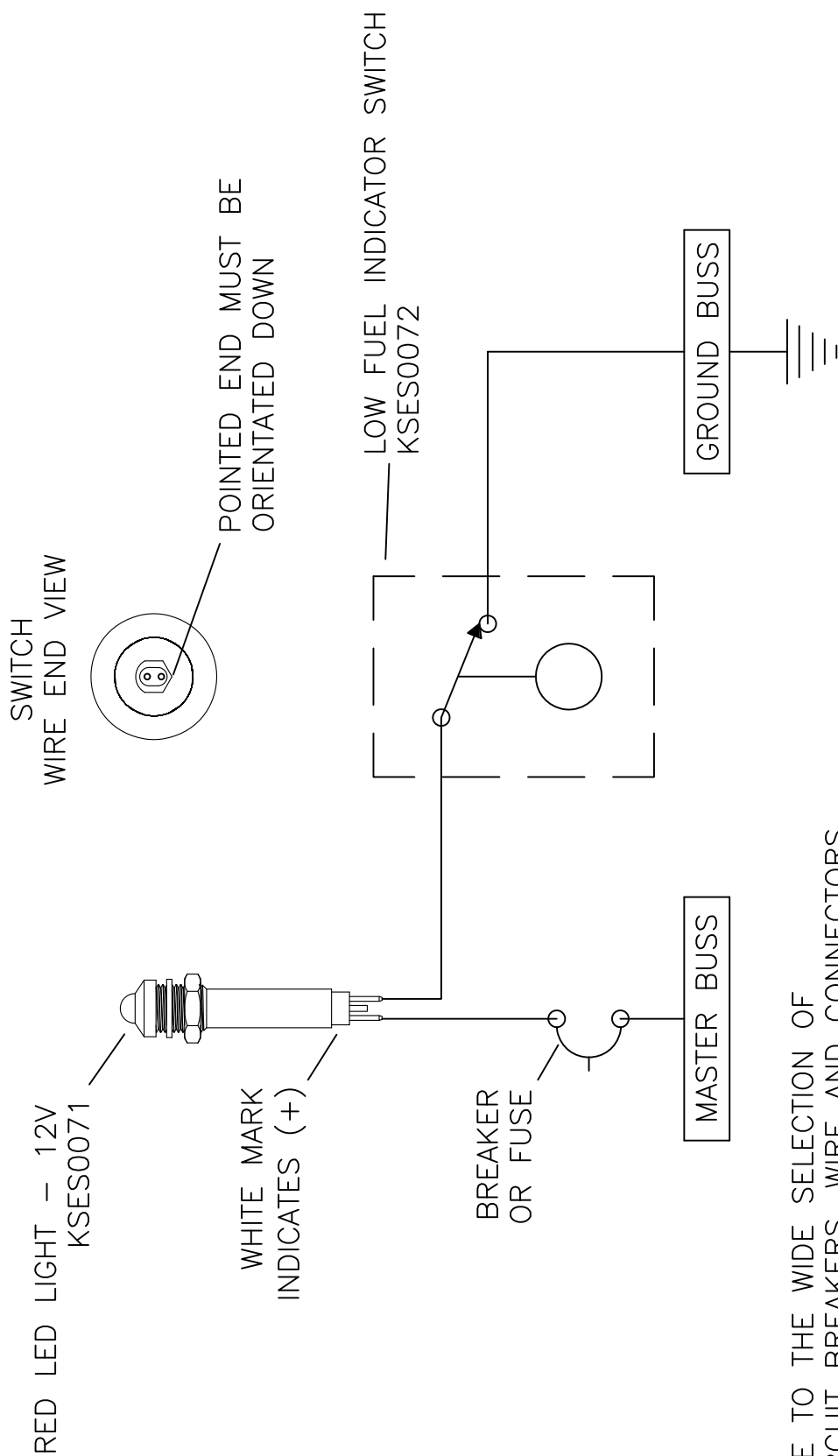
RAMCO S-21 OUTBOUND
ROTAX 912ULS
HEADER TANK MOUNT CHANNEL MODIFICATION
FIGURE 11B-08/912

CUT TO INDICATED LENGTHS





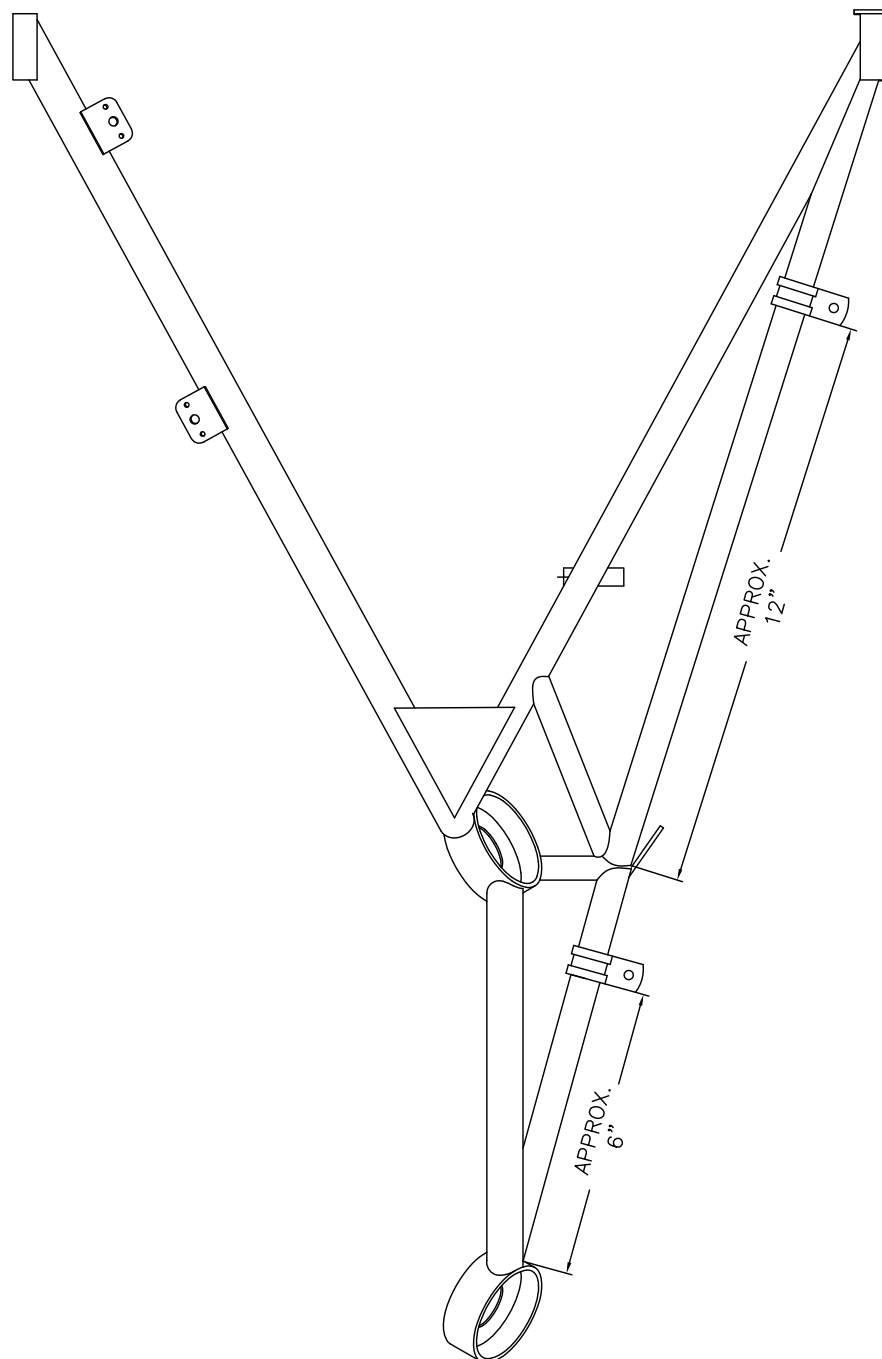
09/11/2018



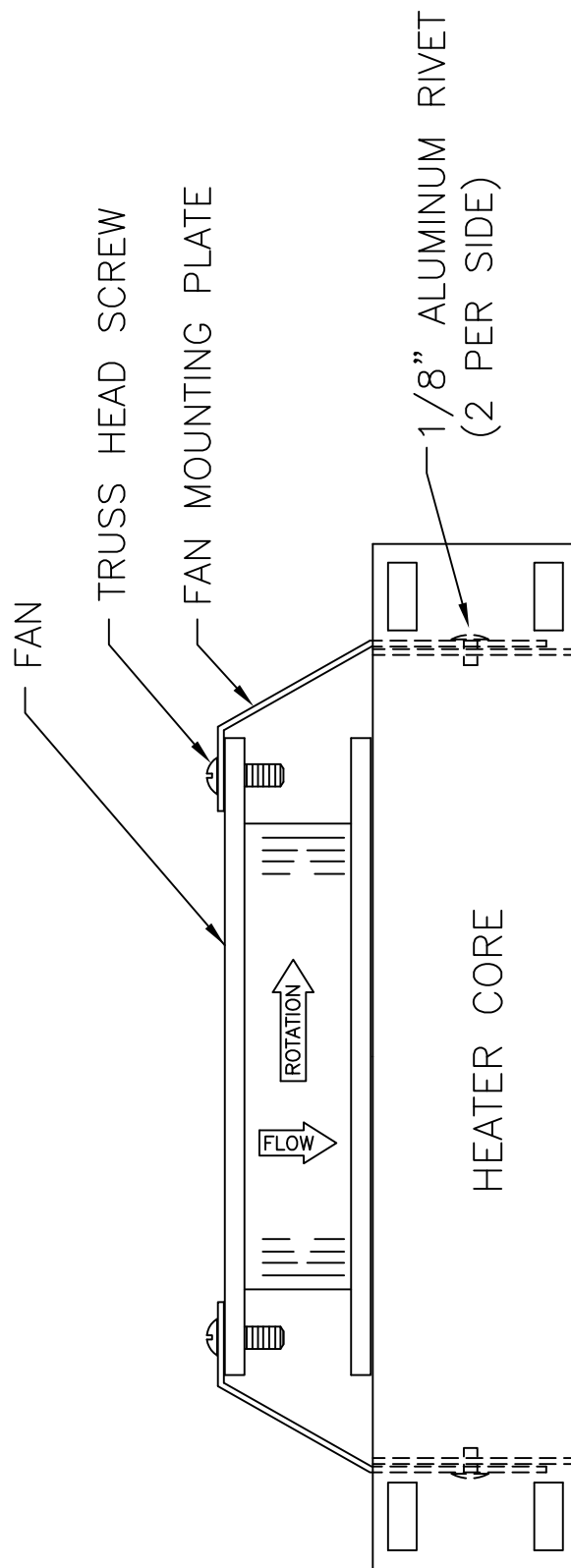
DUE TO THE WIDE SELECTION OF
CIRCUIT BREAKERS, WIRE AND CONNECTORS
WHICH MAY BE USED TO CUSTOMIZE YOUR
AIRCRAFT. THESE ITEMS ARE "BUILDER SUPPLIED"

RAMS S-21 OUTBOUND ROTAX 912ULS LOW FUEL WARNING SYSTEM WIRING FIGURE 11B-10/912

MD2861
REV. - ORIG

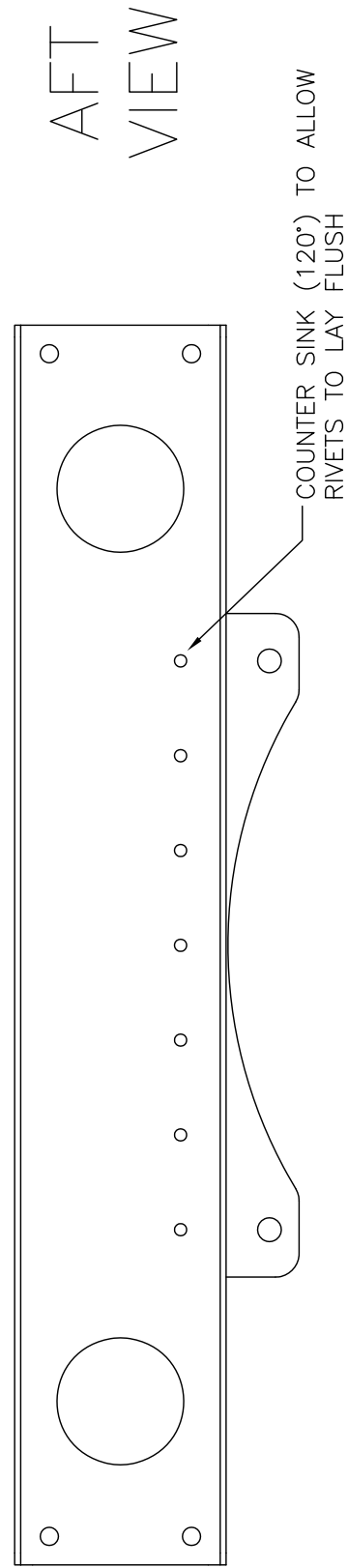
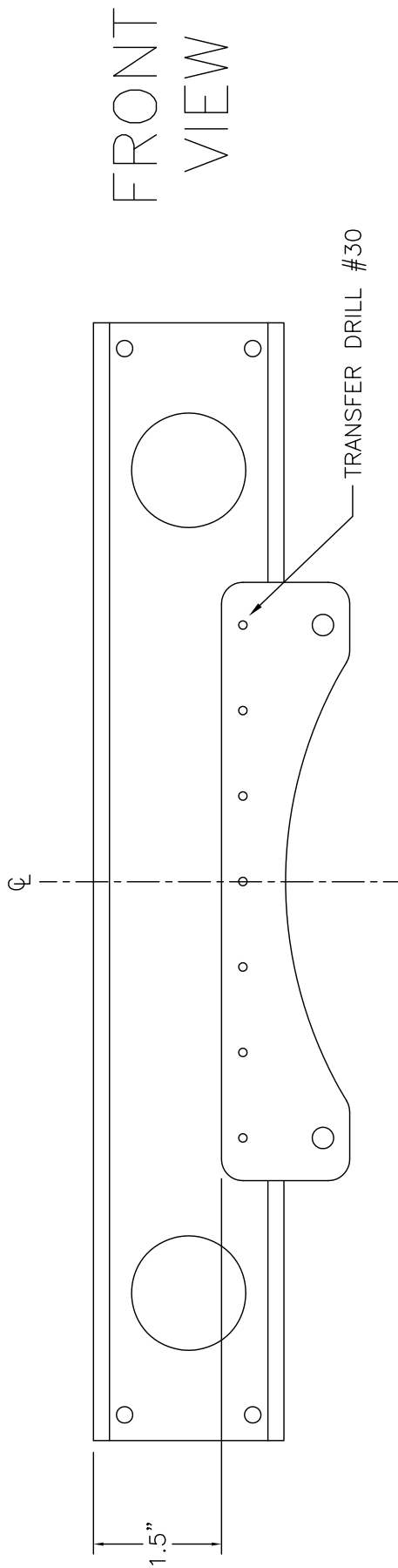


RAMS S-21 OUTBOUND
ROTAX 912ULS
CUSHION CLAMP LOCATIONS
FIGURE 11C-03/912



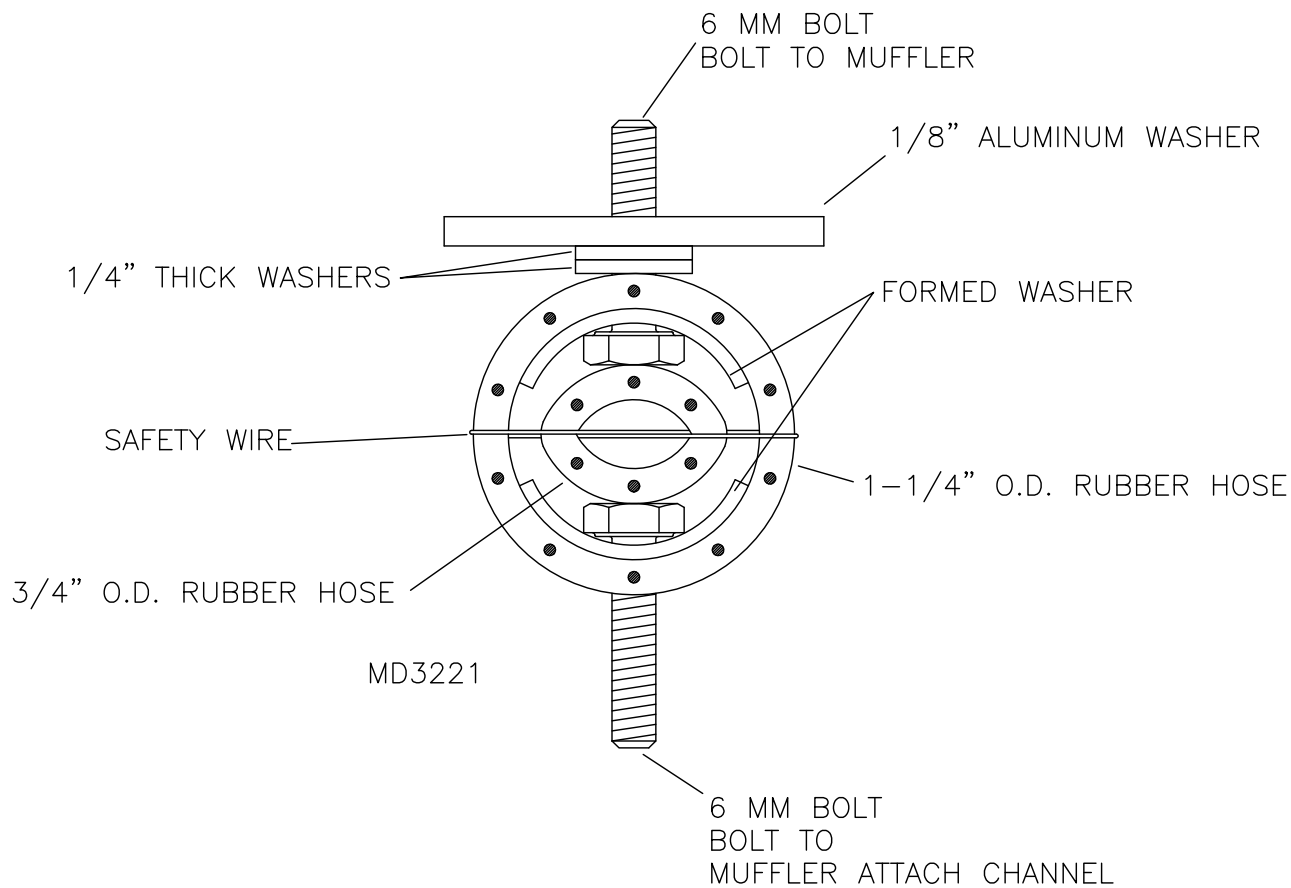
MD434
REV. - ORIG

RRM88 S-21 OUTBOUND
ROTAX 912ULS
HEATER CORE ASSEMBLY
FIGURE 11C-14/912



RAMS S-21 OUTBOUND
ROTAX 912ULS
UPPER OIL COOLER MOUNT
FIGURE 11D-06/912

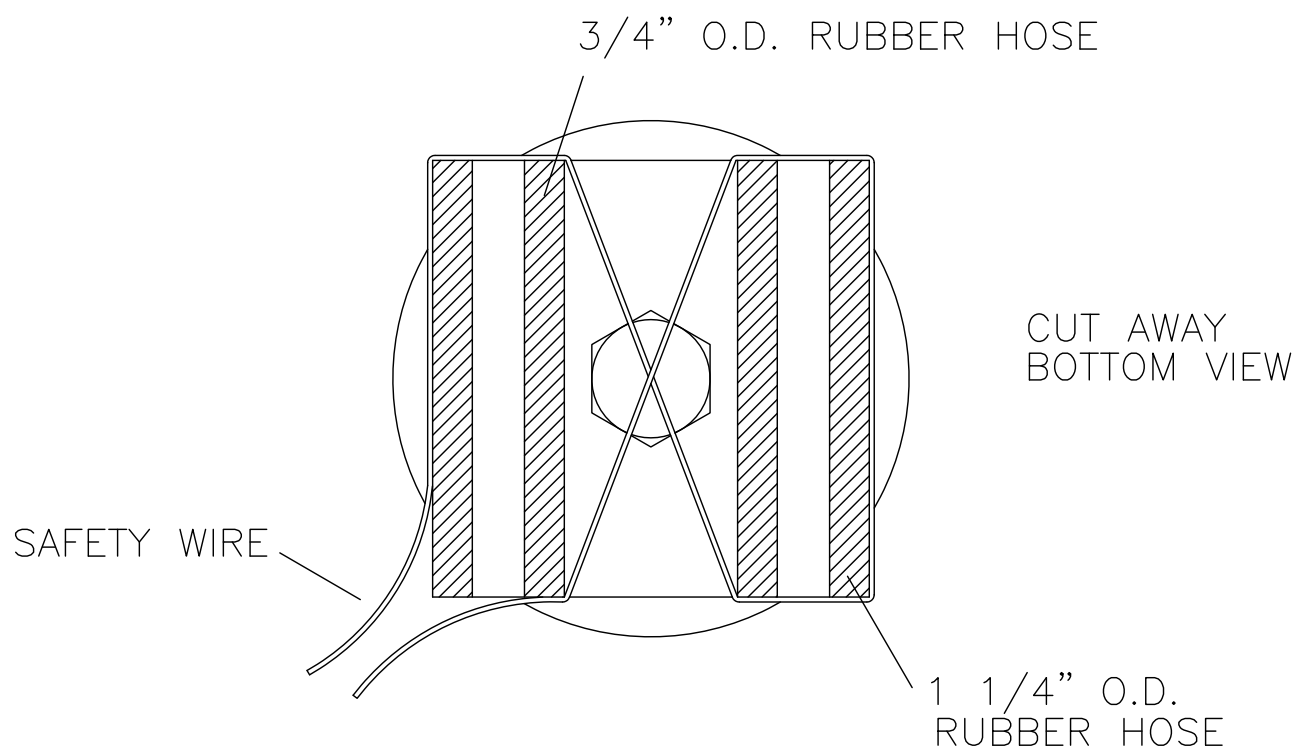
MD5459
 REV. - ORIG



MD3221
REV. — ORIG

**RANS S-21 OUTBOUND
ROTAX 912ULS
MUFFLER ISOLATOR
FIGURE 11E-02/912**

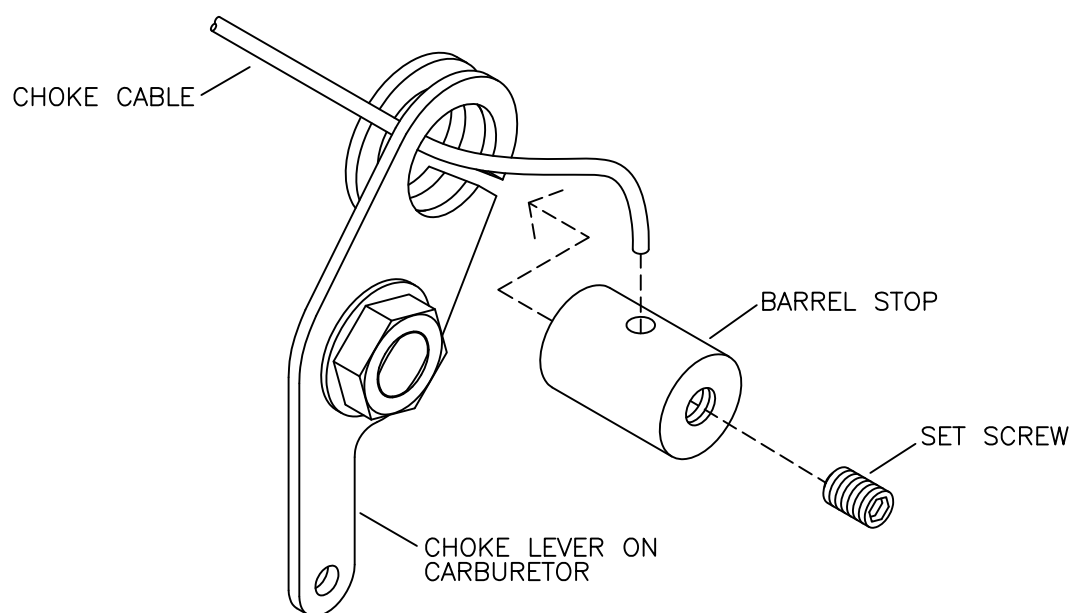
09/11/2018



**RANS S-21 OUTBOUND
ROTAX 912ULS
MUFFLER ISOLATOR SAFETY WIRE
FIGURE 11E-03/912**

MD3222
REV. - ORIG

09/11/2018

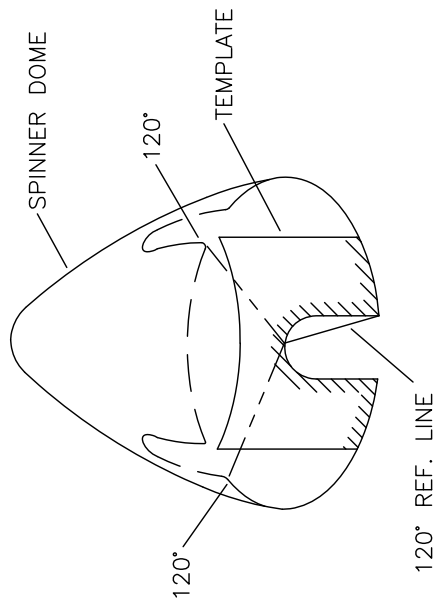


MD4440

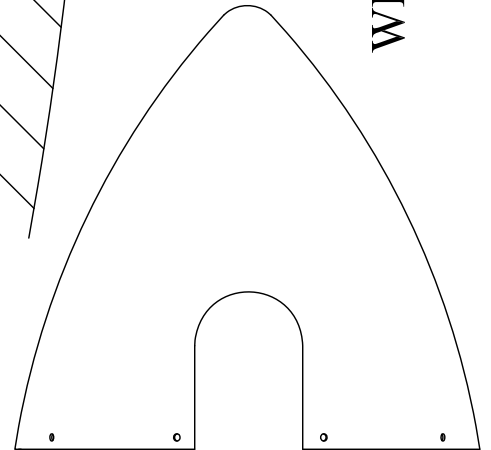
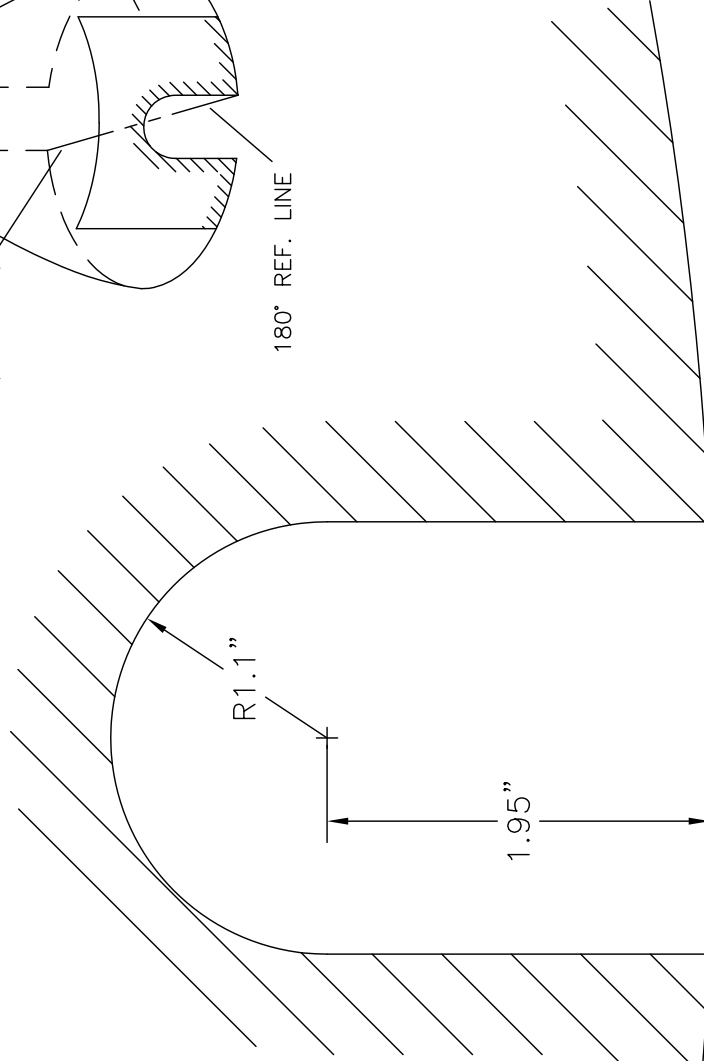
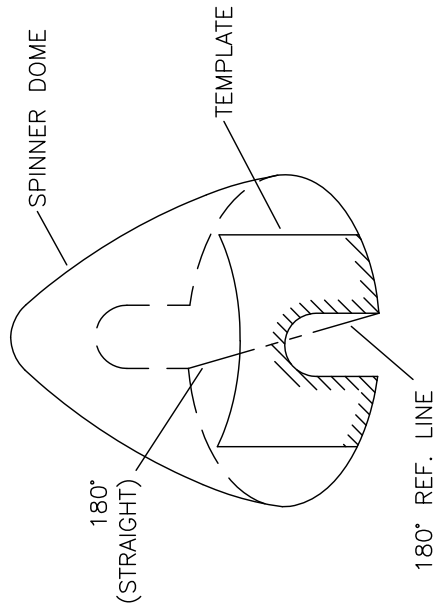
RANS S-21 OUTBOUND
ROTAX 912ULS
CHOKE CABLE INSTALLATION
FIGURE 11G-07/912

09/11/2018

3-BLADE



2-BLADE



PLOT 1:1

RRR S-21 OUTBOUND

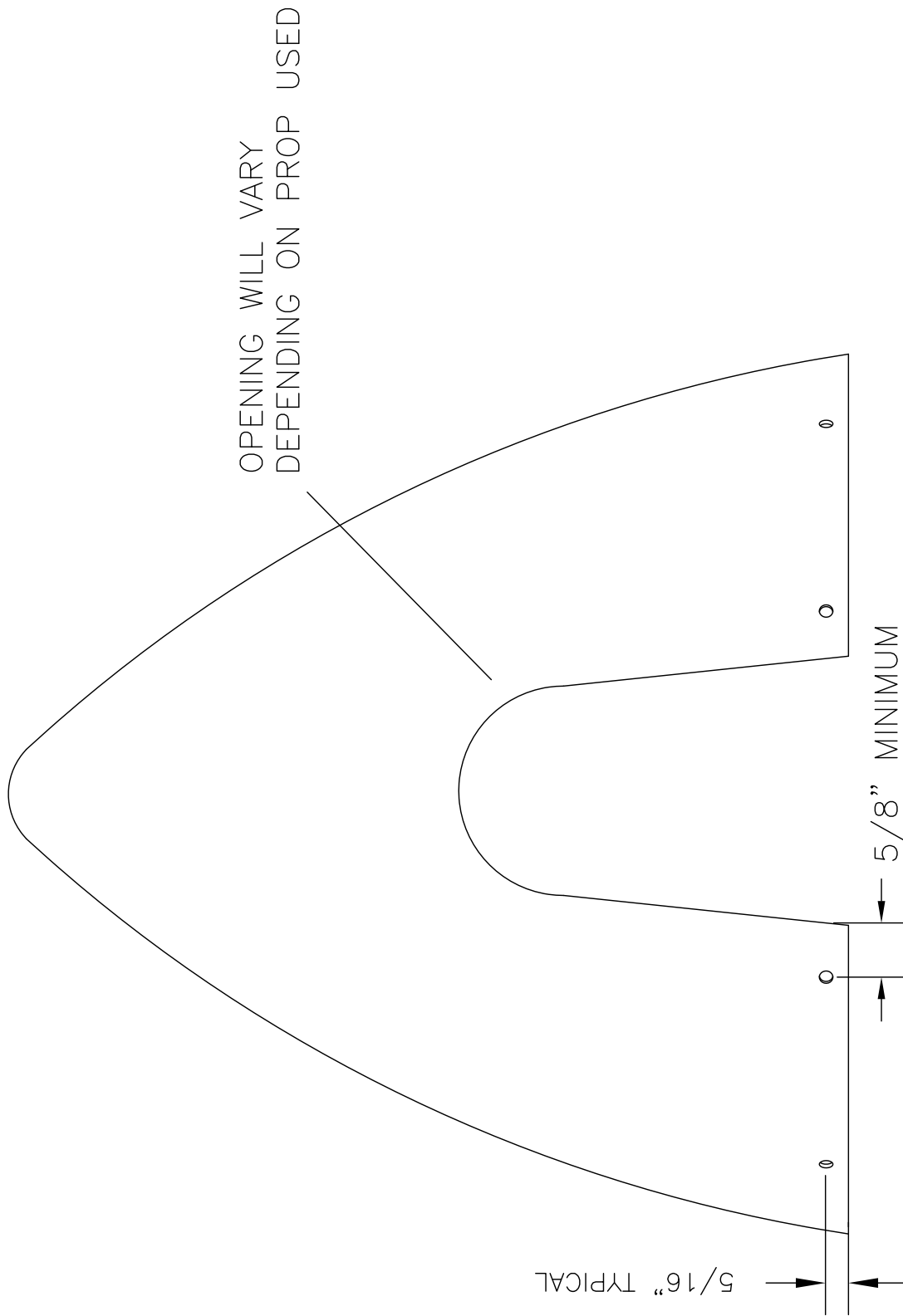
ROTAX 912ULS

WHIRL WIND PROP - 11.3" SPINNER TEMPLATE

FIGURE 11J-04/912

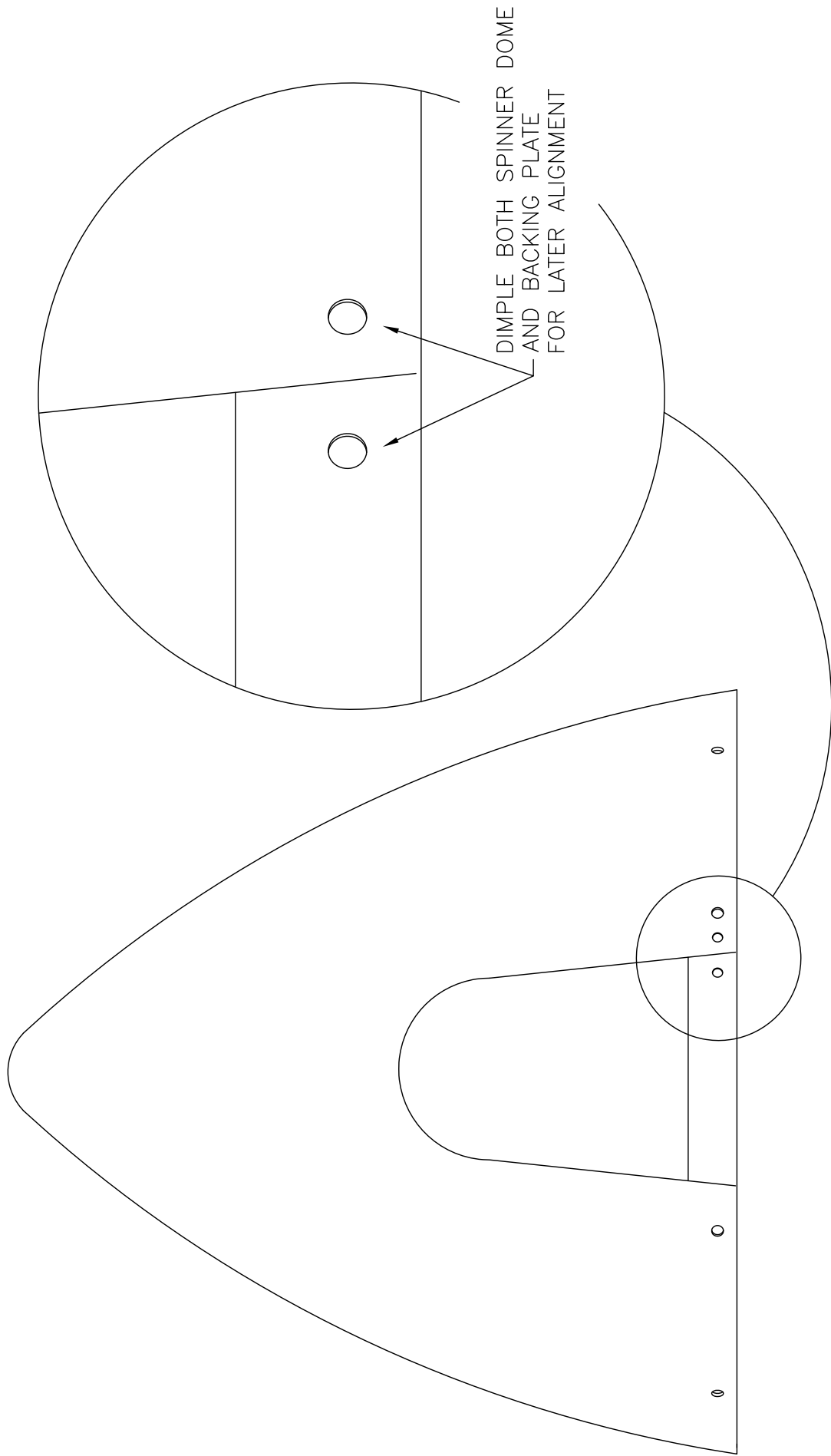
MD5228

09/11/2018



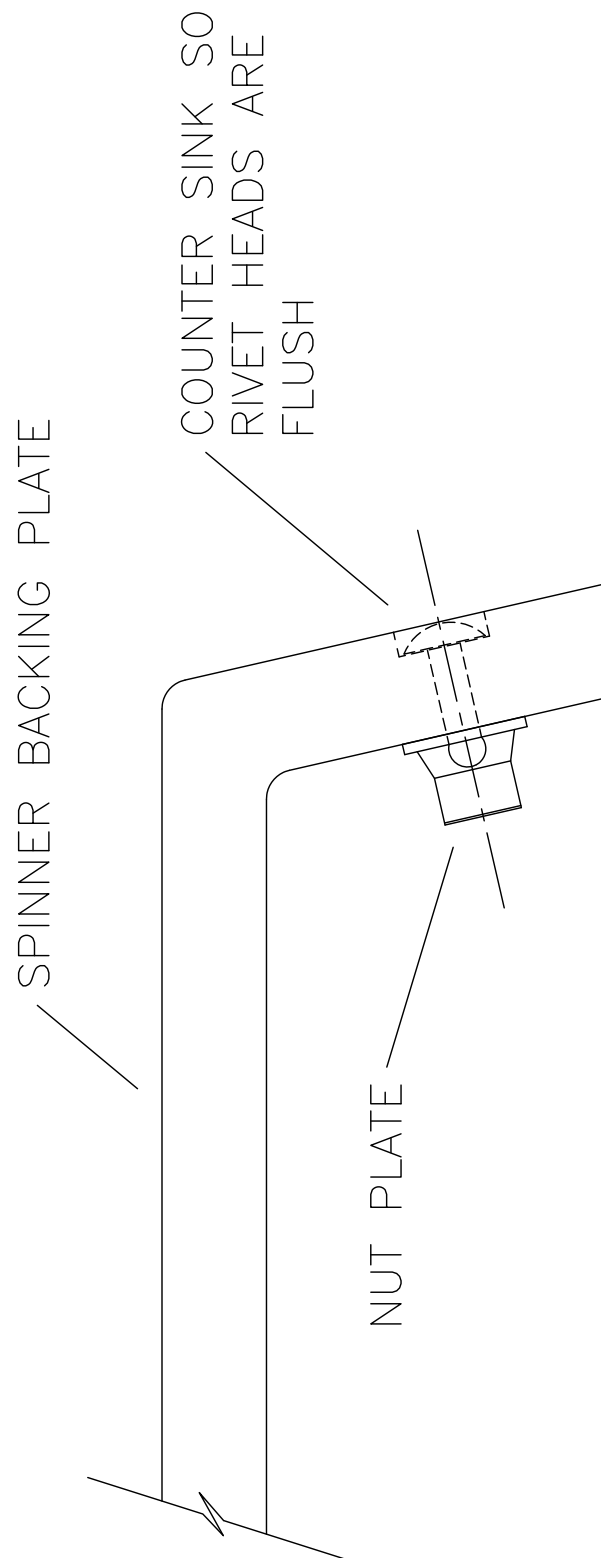
ROTAX S-21 OUTBOUND
ROTAX 912ULS
SPINNER DRILLING
FIGURE 11J-08/912

MD5228
 REV. - ORIG



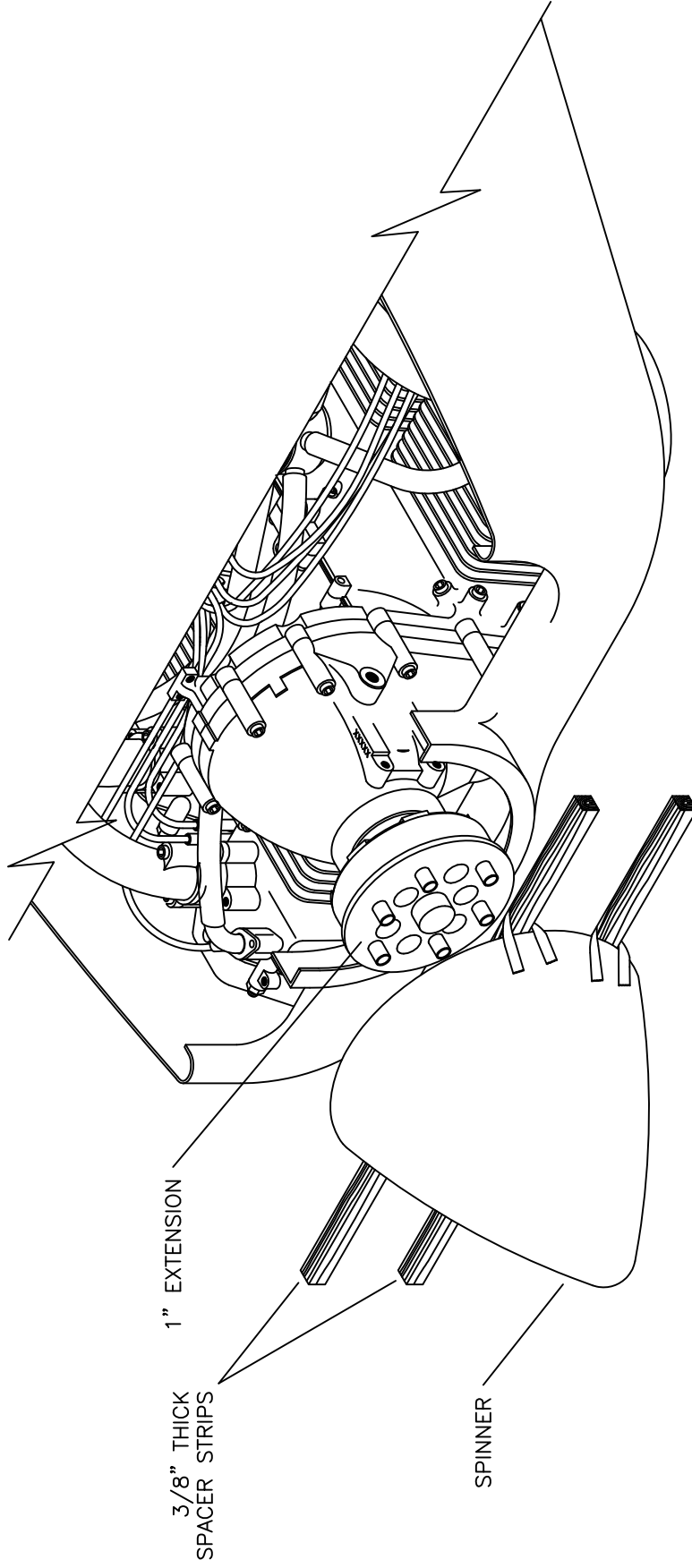
RRR S-21 OUTBOUND
 ROTAX 912ULS
 SPINNER ALIGNMENT MARKS
 FIGURE 11J-12/912

MD5228
 REV. - ORIG



RAVEN S-20 RAVEN
ROTAX 912ULS
SPINNER NUT PLATE INSTALLATION
FIGURE 11J-15/912

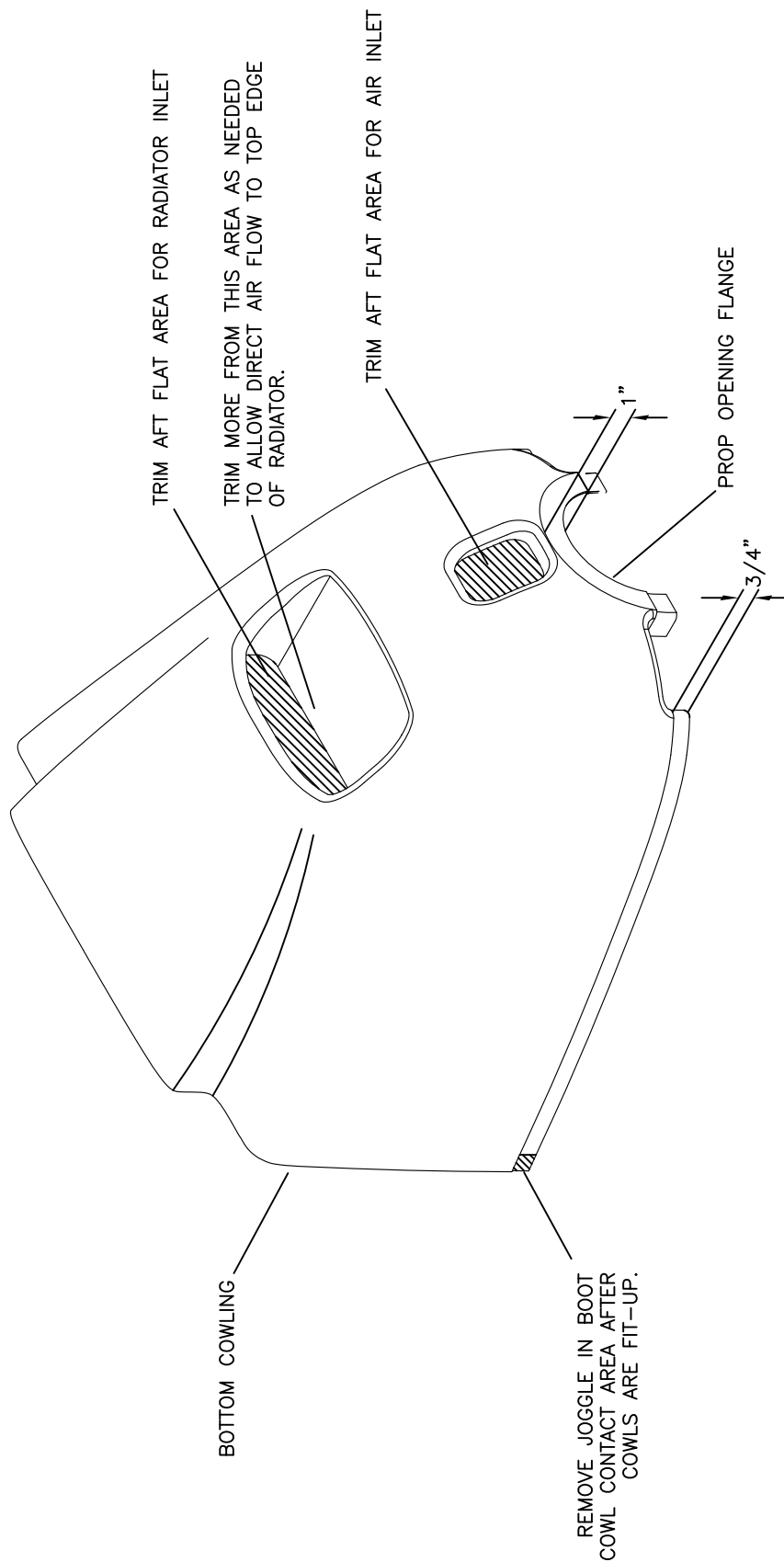
MD5228
 REV. - ORIG



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

MD4402
REV. - ORIG

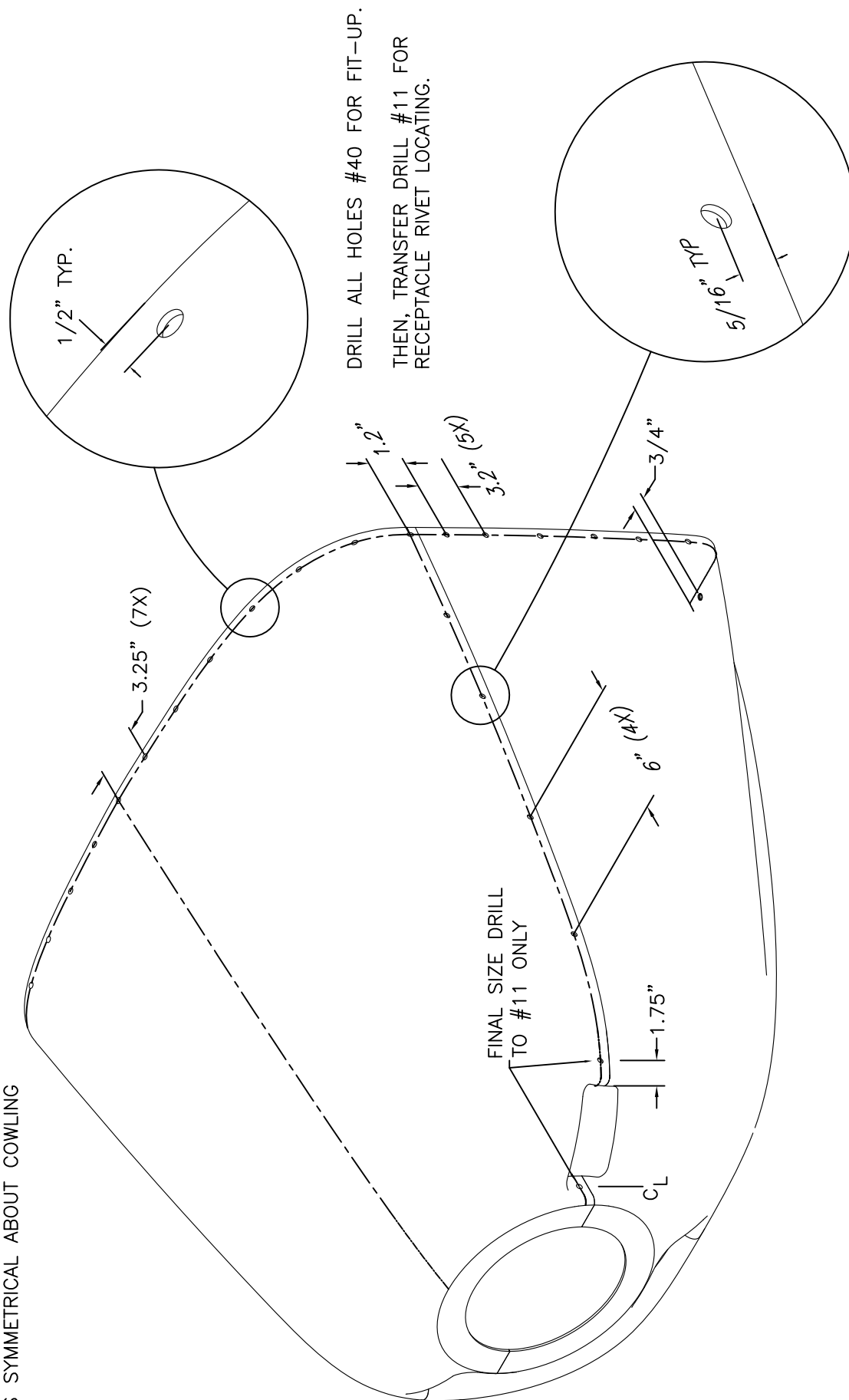
RRR S-21 OUTBOUND
ROTAX 912ULS
COWLING TO SPINNER SPACING
FIGURE 11K-02/912



MD2833
REV. — ORIG

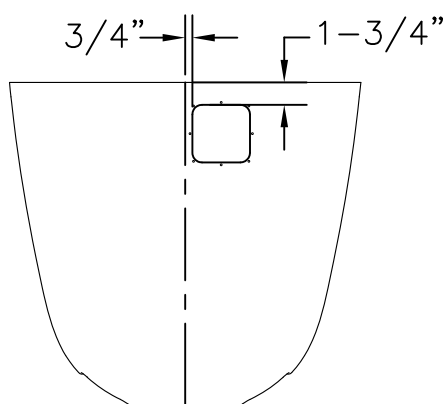
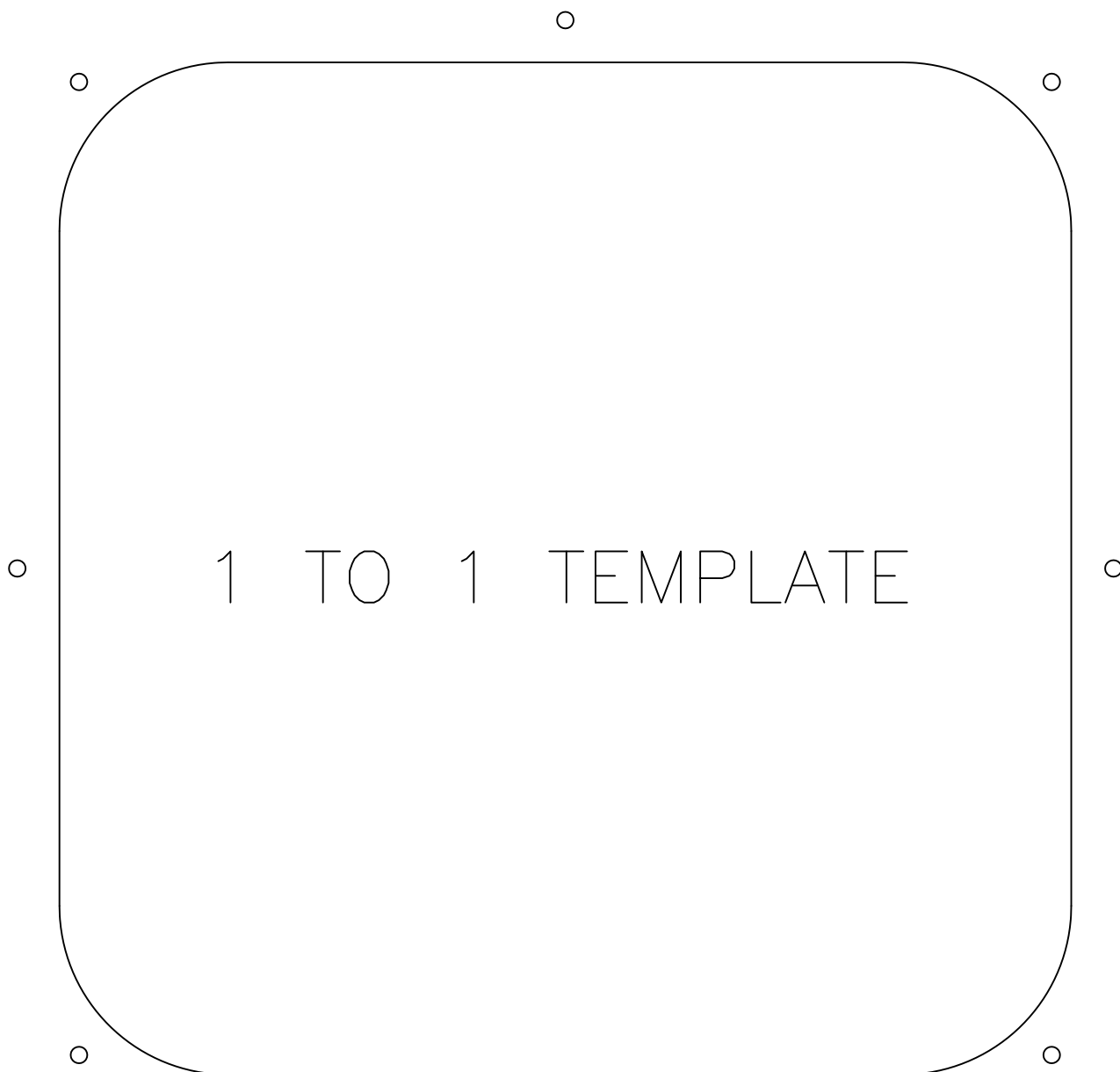
RAMS S-21 OUTBOUND
ROTAX 912ULS
BOTTOM COWLING MODIFICATION
FIGURE 11K-03/912

SPACING IS SYMMETRICAL ABOUT COWLING



**RRR S-21 OUTBOUND
ROTAX 912ULS
COWLING FASTENER SPACING
FIGURE 11K-13/912**

MD5138
REV. - ORIG.



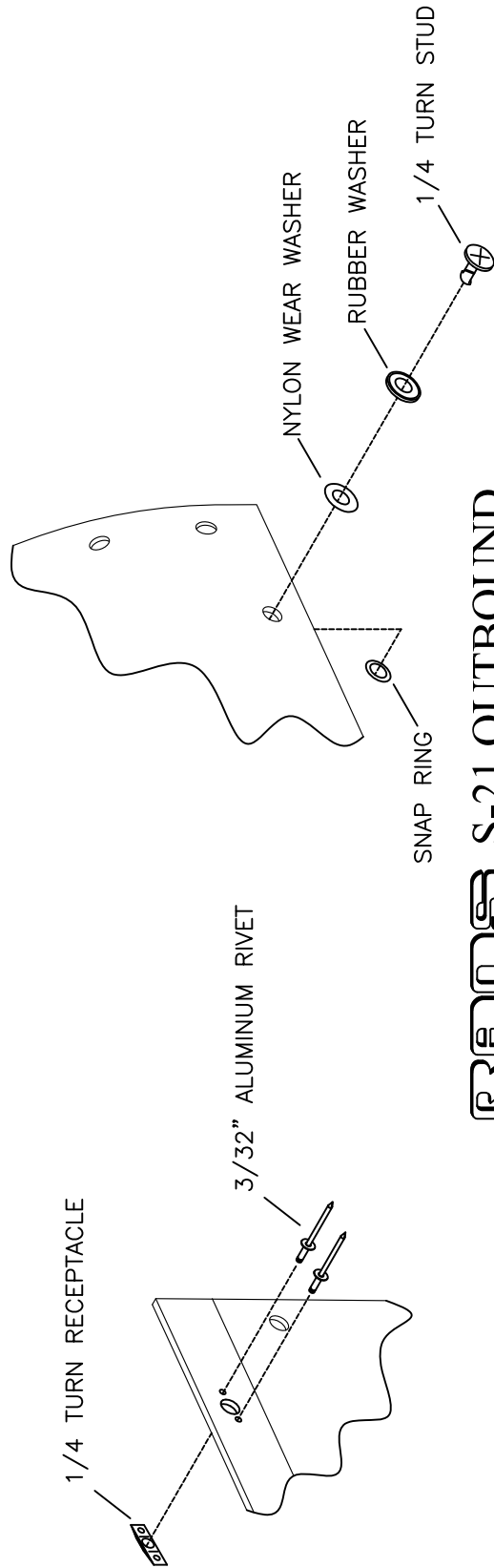
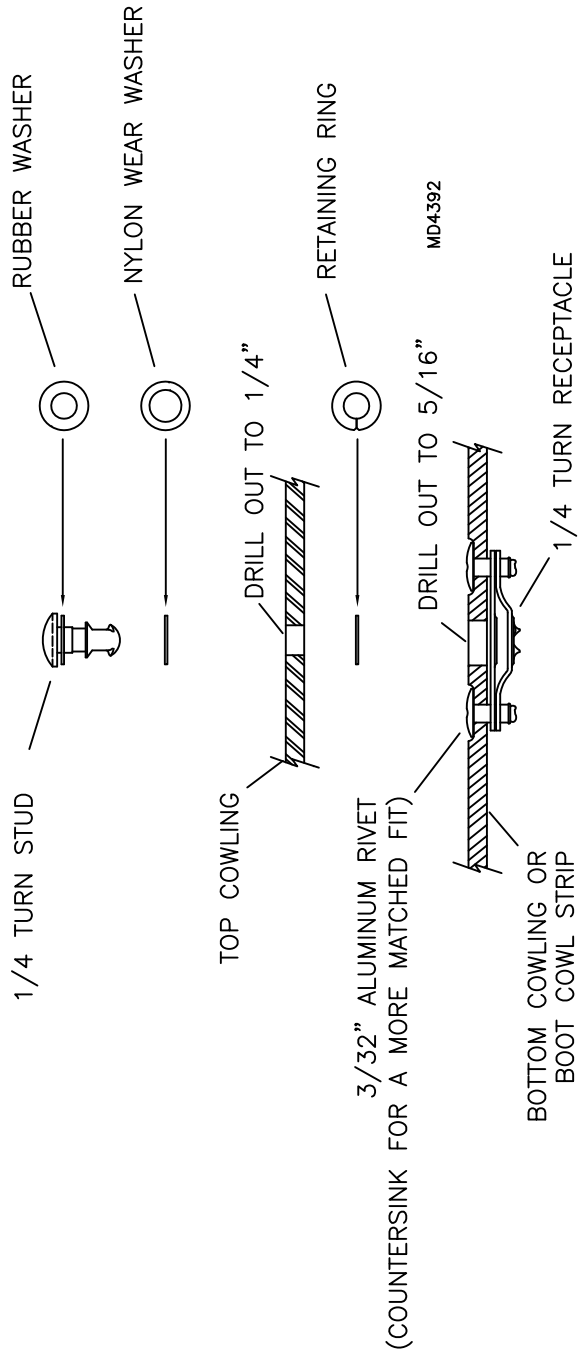
COMPARE TEMPLATE TO:
REINFORCEMENT RING
(KPCW0015)
TO VERIFY 1:1

MEASUREMENTS AFTER FINAL COWLING TRIM

MD5142
REV. - ORIG

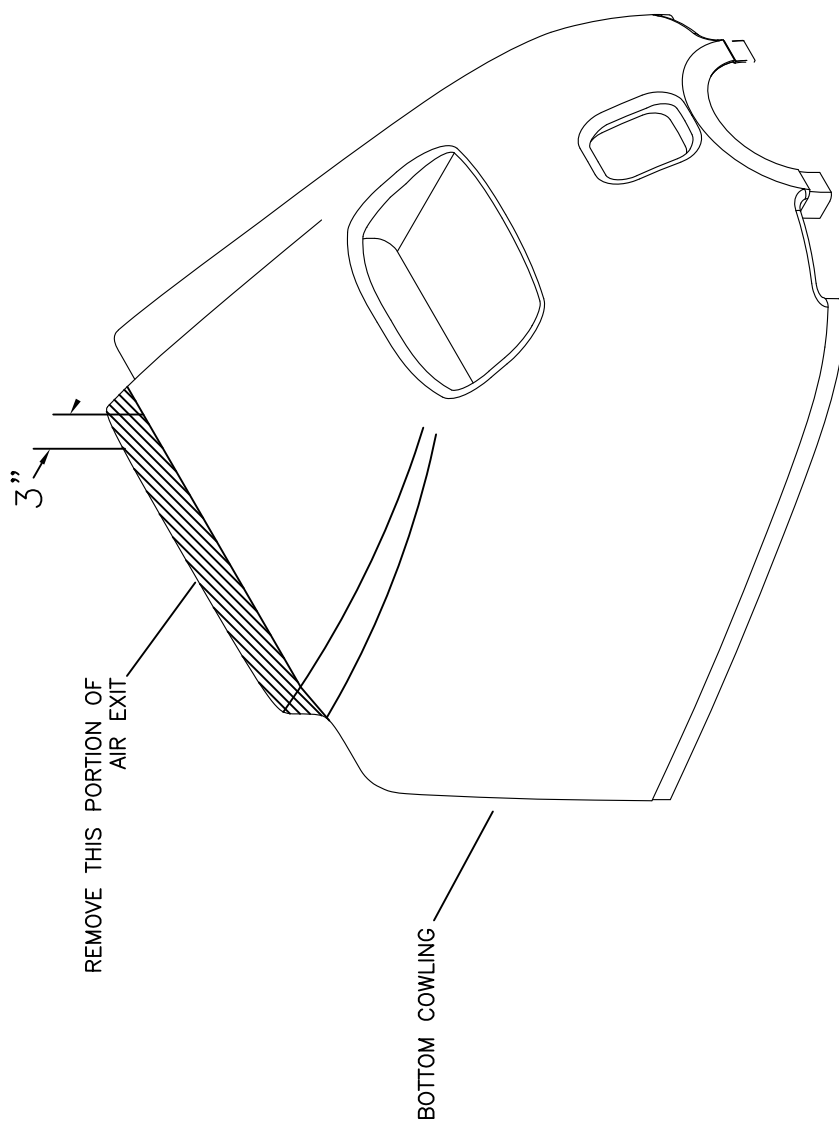
**RANS S-21 OUTBOUND
OIL CHECK DOOR TEMPLATE
FIGURE 11K-21/912**

09/11/2018



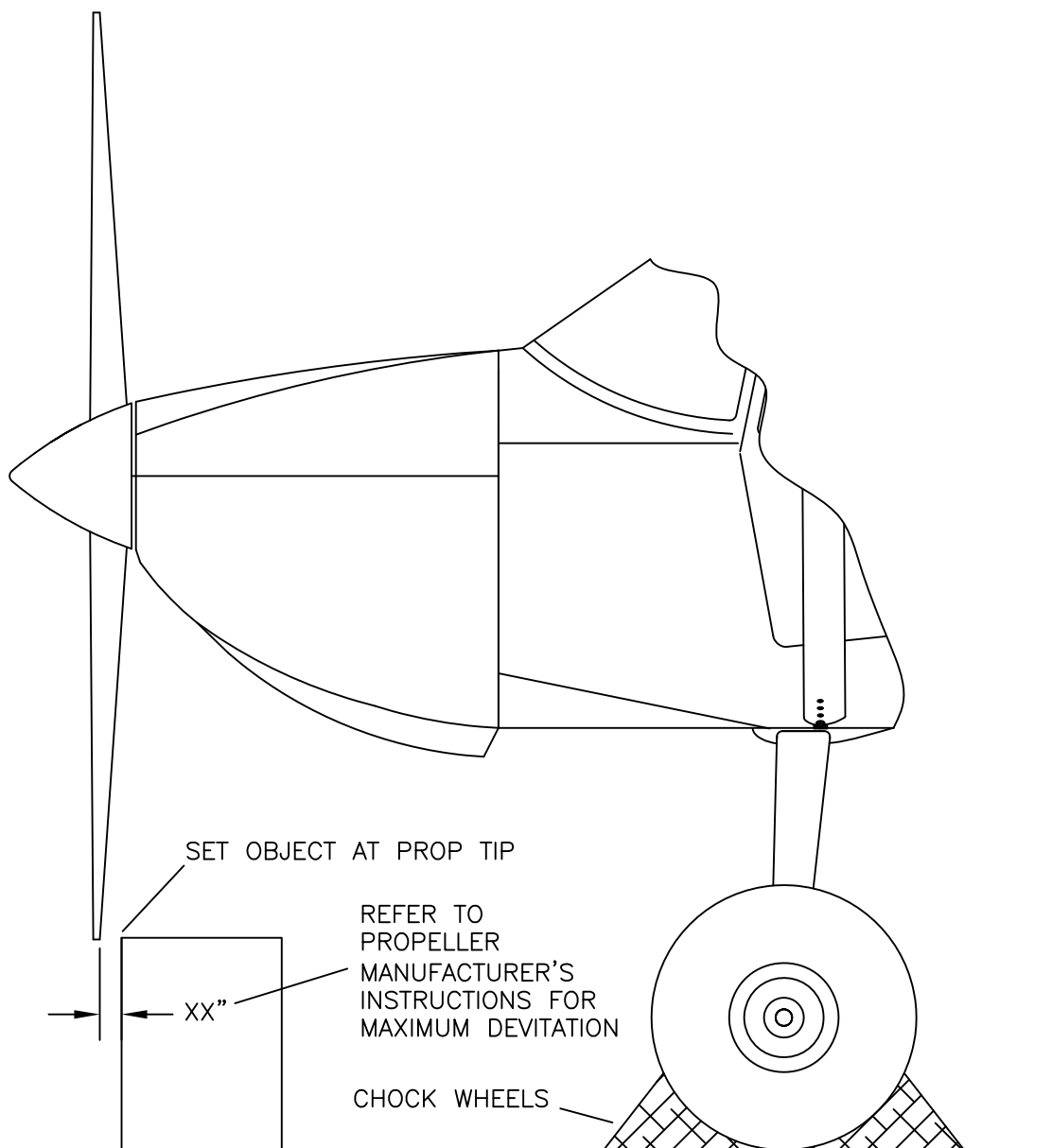
RAMS S-21 OUTBOUND
ROTAX 912ULS
1/4 TURN FASTENER INSTALLATION
FIGURE 11K-26/912

MD5143
REV. - ORIG



MD2833
REV. - ORIG

RRR S-21 OUTBOUND
ROTAX 912ULS
AIR EXIT MODIFICATION
FIGURE 11K-28/912



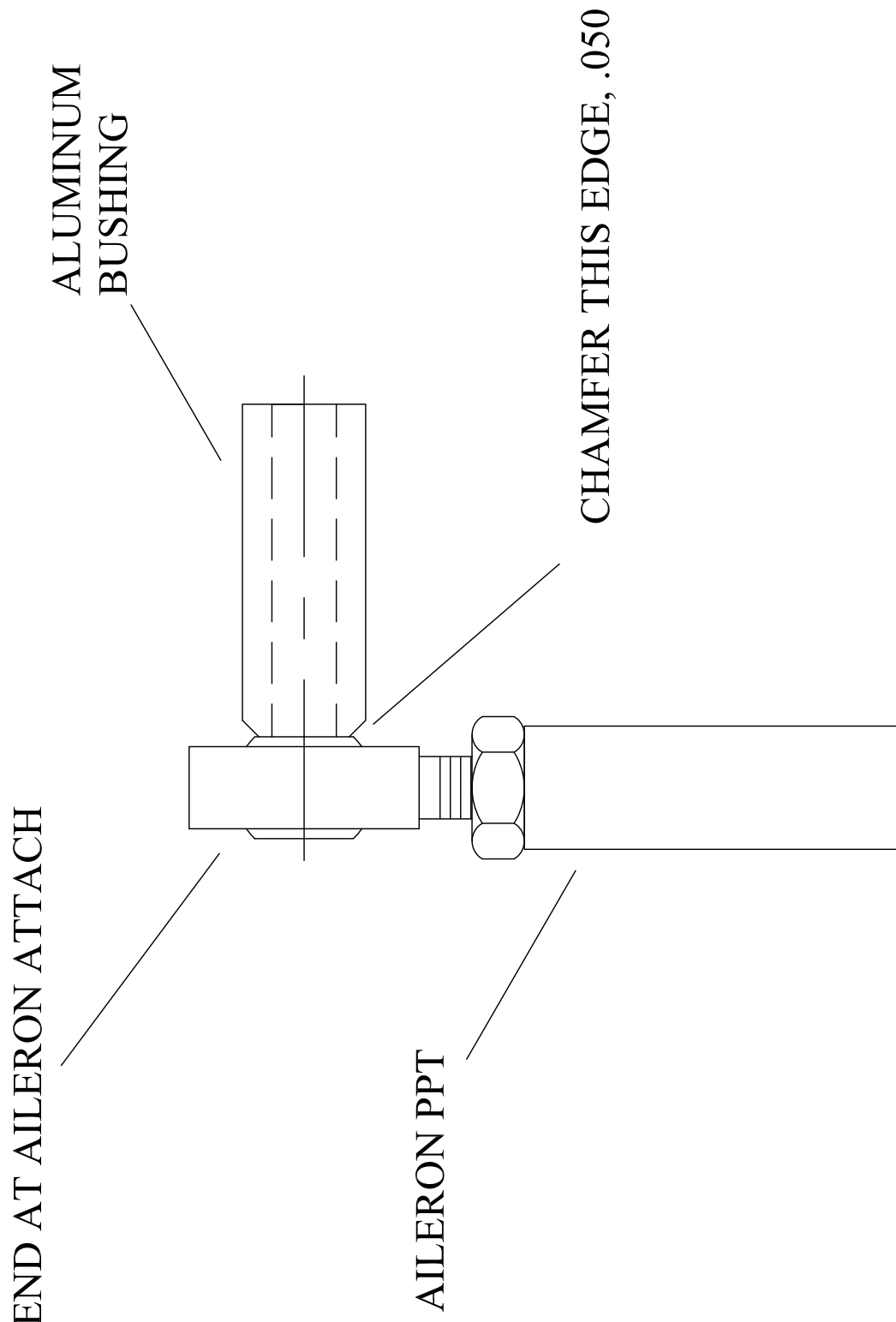
IMPORTANT!

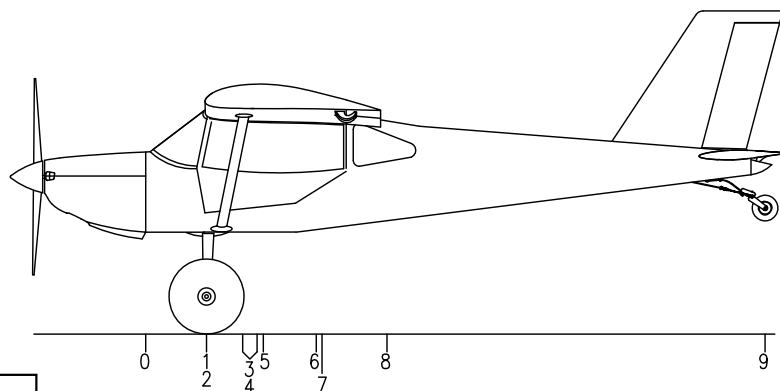
RE-CHECK PROPELLER TORQUE PER MANUFACTURE'S RECOMMENDED INSPECTION INTERVAL. FAILURE TO MAINTAIN PROP TORQUE MAY RESULT IN SEPARATION OF THE PROPELLER FROM THE AIRCRAFT AND MAY CAUSE INJURY OR DEATH. REFER TO PROPELLER MANUFACTURER'S INSTRUCTIONS FOR ANY SPECIAL MAINTENANCE REQUIREMENTS.

RANS S-21 OUTBOUND **ROTAX 912ULS** **PROPELLER TRACKING** **FIGURE 11L-07/912**

MD4380
REV. — ORIG

09/11/2018





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

RANS S-21 OUTBOUND (Taildragger)

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

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

range 34.5" to 39.5"

range 34.5" to 39.5"

MAX. 43 GALLON

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

$$\frac{53298.6}{1317.5} = 40.45"$$

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

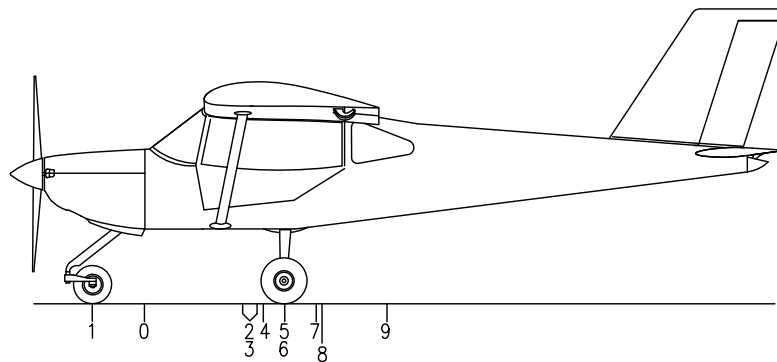
** ROTAX 912ULS - MAXIMUM OF 50 LBS IS ALLOWED FWD OF STATION 3.
 TITAN X-340 - MAXIMUM OF 113 LBS IS ALLOWED FWD OF STATION 3.

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

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

MD5655
 REV. - ORIG

09/11/2018



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

RANS S-21 OUTBOUND (Trike)

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

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

range 34.5" to 39.5"

range 34.5" to 39.5"

MAX. 43 GALLON

$$\frac{\text{TOTAL MOMENTS}}{\text{TOTAL WEIGHT}} = \text{C.G.} \quad \frac{52460.6}{1314.5} = 39.91"$$

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

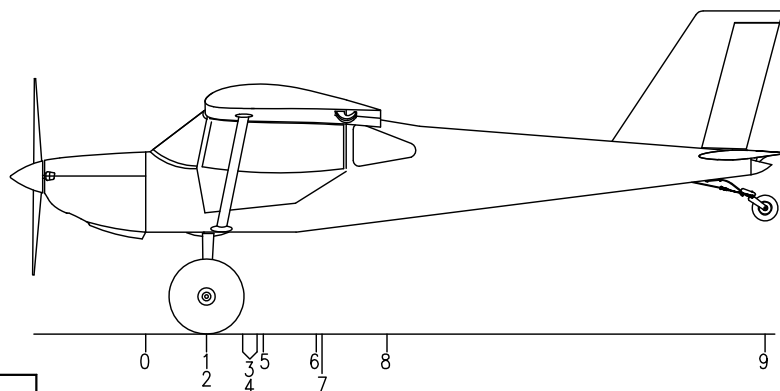
** ROTAX 912ULS - MAXIMUM OF 50 LBS IS ALLOWED FWD OF STATION 3.
 TITAN X-340 - MAXIMUM OF 113 LBS IS ALLOWED FWD OF STATION 3.

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

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

MD5655
 REV. - ORIG

09/11/2018



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

RANS S-21 OUTBOUND (Taildragger)

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

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

range 34.5" to 39.5"

range 34.5" to 39.5"

MAX. 43 GALLON

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

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

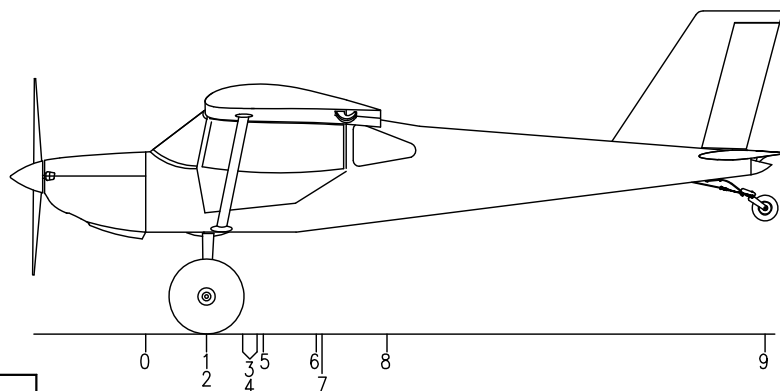
** ROTAX 912ULS – MAXIMUM OF 50 LBS IS ALLOWED FWD OF STATION 3.
 TITAN X-340 – MAXIMUM OF 113 LBS IS ALLOWED FWD OF STATION 3.

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

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

MD5655
 REV. – ORIG

09/11/2018



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

RANS S-21 OUTBOUND (Taildragger)

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

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

range 34.5" to 39.5"

range 34.5" to 39.5"

MAX. 43 GALLON

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

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

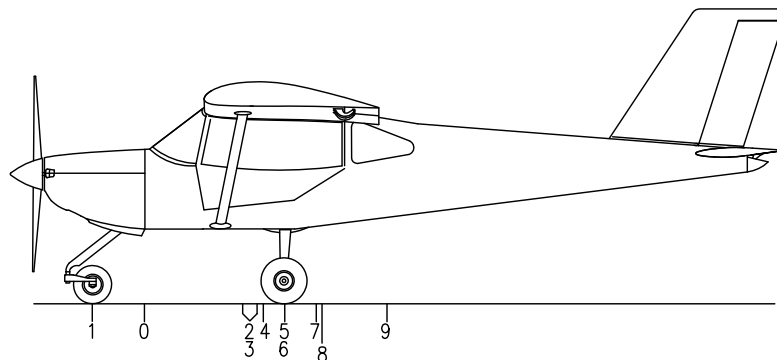
** ROTAX 912ULS – MAXIMUM OF 50 LBS IS ALLOWED FWD OF STATION 3.
 TITAN X-340 – MAXIMUM OF 113 LBS IS ALLOWED FWD OF STATION 3.

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

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

MD5655
 REV. – ORIG

09/11/2018



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

RANS S-21 OUTBOUND (Trike)

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

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

range 34.5" to 39.5"

range 34.5" to 39.5"

MAX. 43 GALLON

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

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

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

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

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

MD5655
 REV. – ORIG

09/11/2018

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

[illegible]MD5655
REV. - ORIG

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