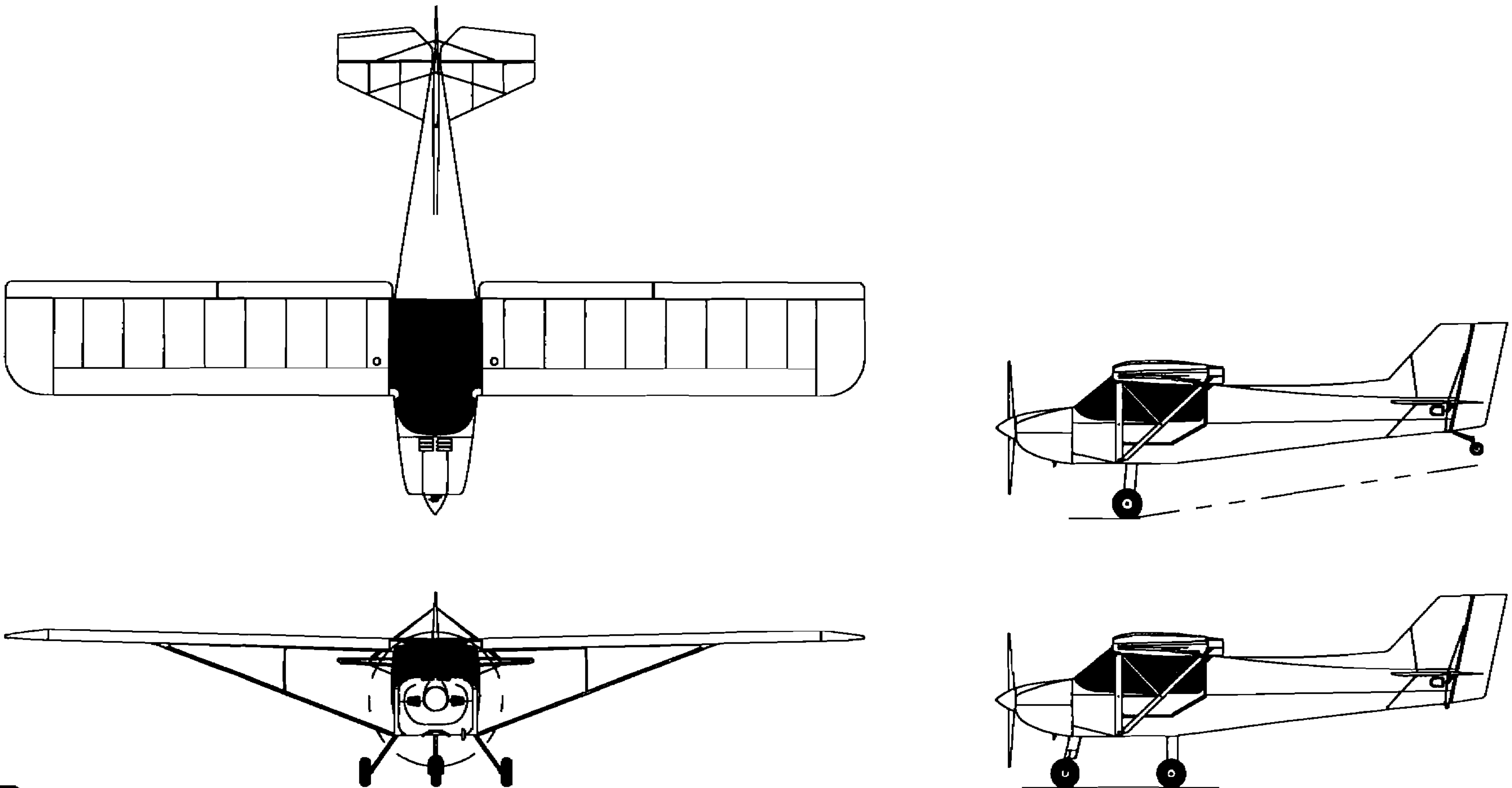
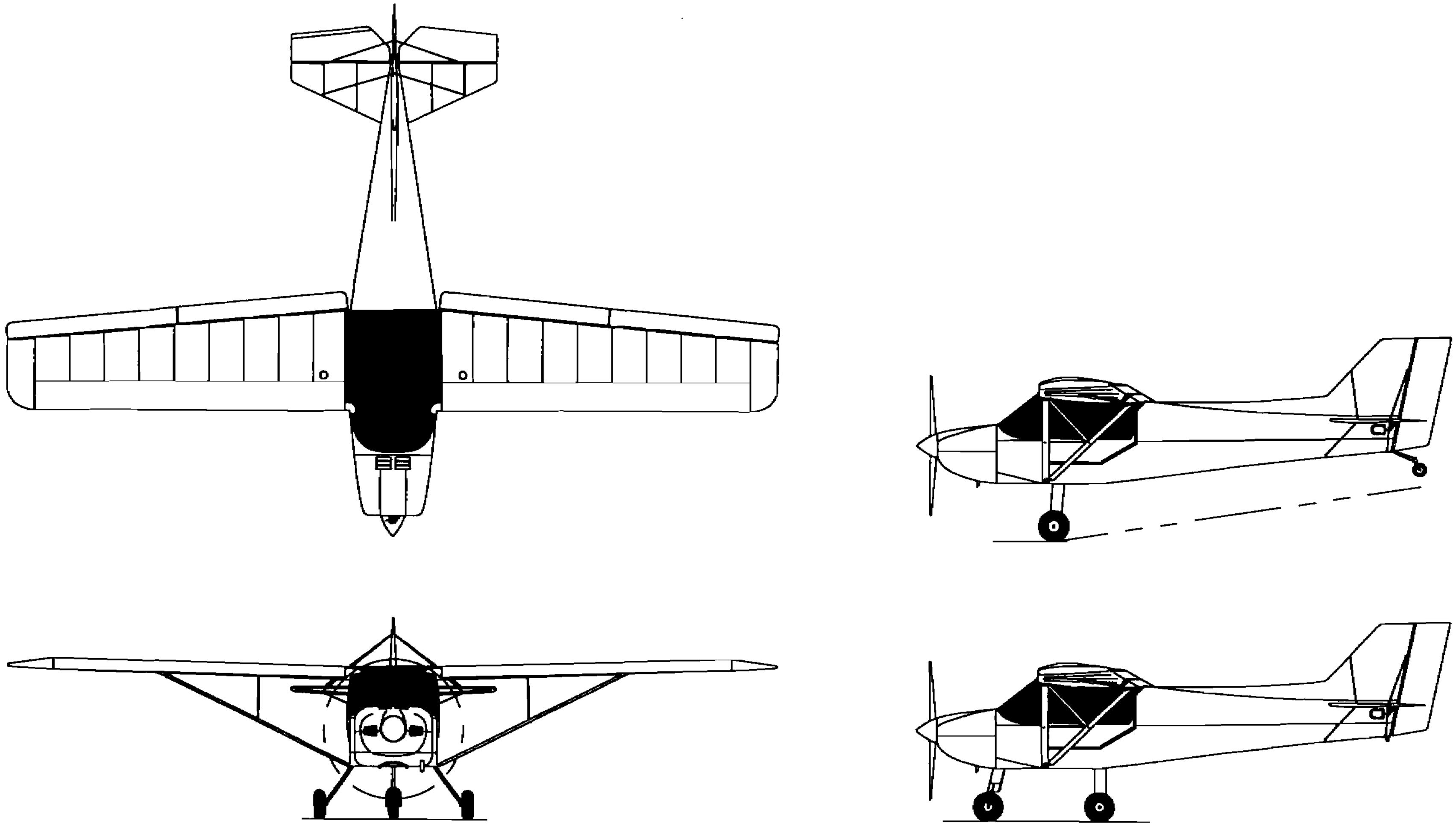
RANS S-6S
COYOTE II



RANS
4600 Highway 183 Alternate
Hays, KS 67601
(785) 625-6346

DESIGNED BY:
RANDY SCHLITTER

RANS S-6S COYOTE II
116 WING



RANS
4600 HIGHWAY 183 ALTERNATE
HAYS, KS 67601
(785) 625-6346

DESIGNED BY:
RANDY SCHLITTER

HOW TO ASSEMBLE YOUR S-6S COYOTE II TECHNICAL MANUAL

Your manual is ready for assembly:

1. Place the technical manual in the larger 3 ring binder and the parts manual in the smaller 3 ring binder. Every page has a section number then a page number within that section. (Example: parts page 13-02) Parts pages have an exploded view and a parts listing. Text pages are assigned with the prefix "0".

2. Separate the sections with the tab inserts listed below. Follow the table of contents for the order that the manual should follow.

3. Cut out and slip in the labels to corresponding sections.

GENERAL DATA GENERAL DATA	S-1 FIREWALL S-1 FIREWALL	DOORS DOORS	WINGS WINGS	OPTIONS OPTIONS
FUSELAGE FUSELAGE	ENGINE MOUNT ENGINE MOUNT	WINDSHIELD WINDSHIELD	TRIAL ASSEMBLY TRIAL ASSEMBLY	
MAIN GEAR MAIN GEAR	TAILCONE TAILCONE	BATTERY BOX BATTERY BOX	COVERING COVERING	
NOSE GEAR/ TAILWHEEL NOSE GEAR/ TAILWHEEL	CONTROL STICK CONTROL STICK	SEAT/SEAT BELT SEAT/SEAT BELT	PAINTING PAINTING	
FLOORBOARD/ RUDDER PEDAL FLOORBOARD/ RUDDER PEDAL	INTERIOR INTERIOR	TAIL TAIL	FINAL ASSEMBLY FINAL ASSEMBLY	

RANS, INC.

COYOTE II SUPER "6"

ASSEMBLY MANUAL

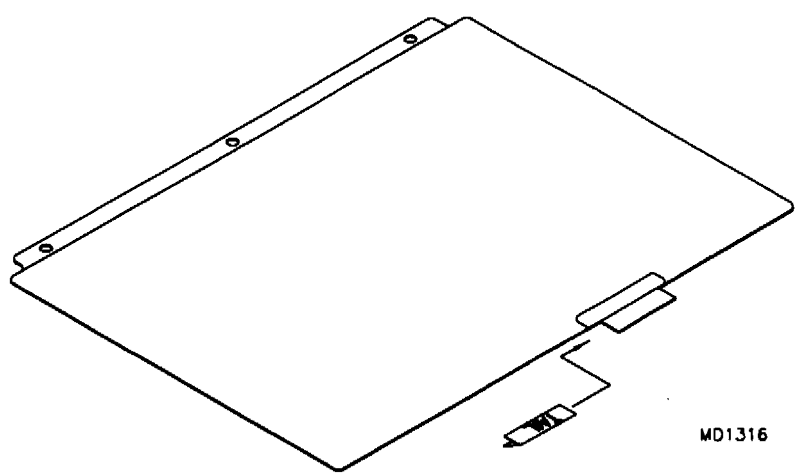
1/7/93

RANS, INC.

COYOTE II SUPER "6"

PARTS MANUAL

1/7/93



MD1316

SUPER 6 TABLE OF CONTENTS

TO USE MANUAL, OPEN PARTS BOOK TO APPLICABLE SECTION FOR PART IDENTIFICATION AND ORIENTATION.

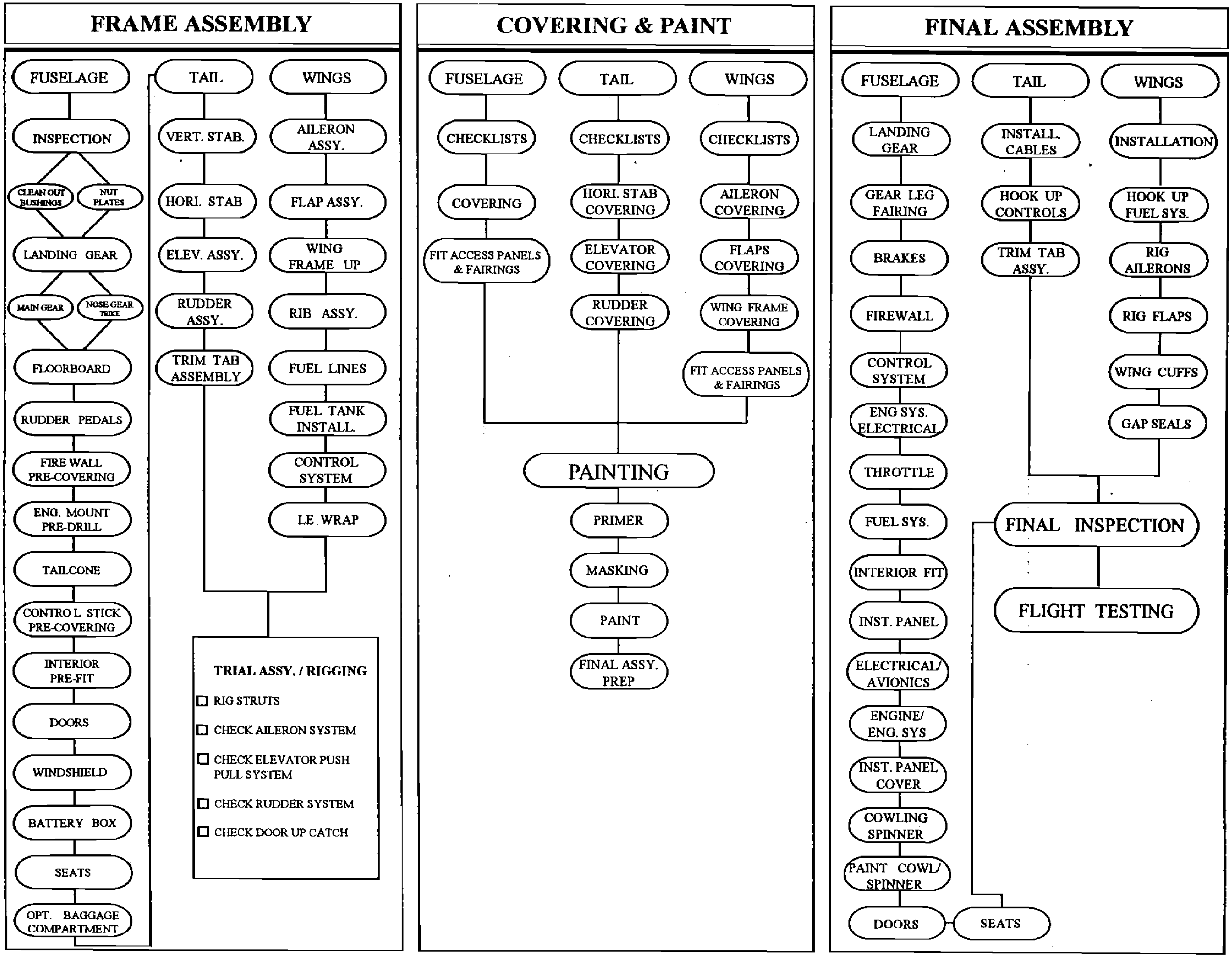
FRAME ASSEMBLY

COVERING/PAINT

FINAL ASSEMBLY

THE SECTIONS ARE LISTED IN ORDER OF APPEARANCE. CONSULT THE FLOWCHART FOR FURTHER SEQUENCE DATA.

SUPER SIX FLOWCHART



RANS INC.

4600 Highway 183 Alternate
Hays, KS 67601

Technical Support
(785) 625-0069

Parts Department
(785) 625-6346

When calling Technical Support please have the following ready:

- ❑ Aircraft Model
- ❑ Serial Number
- ❑ Engine Model
- ❑ Your Aircraft Assembly Manual

Note: Please make your questions precise and to the point so that we may assist as many customers as possible.

RANS Aircraft
Tool List

This is a partial list of tools that would be helpful when assembling a RANS airplane.

Hand Tools

Pliers	Safety wire pliers
Needle nose pliers	Electrical wire stripers
Side cutters	Pop rivet tool
Aviation snips	Click punch
Hammer	Ball peen hammer
Rubber mallet*	Scratch awl
Center punch	Screwdriver set
Drift pin and punch set	Safety glasses
Several small clamps	Socket set SAE and metric
Wrench set SAE and metric	2 or 4 ft. Level
Ruler and tape measure	Electronic Protractor*
Adjustable fly cutter*	Utility knife
1/2” Uni-Bit® Step Drill	Hole saw*
Hack saw	Files

Power Tools

Electric hand drill	Bench disk sander*
Dremel*	Heat gun*
Soldering gun or Hot Knife	Household Iron
CD/MP3 Player*	90° Close Quarters Drill or adaptor
Small electric grinder*	

Lubricants, Sealants and Glues

Small can lithium grease	
Contact cement	Clear silicone
Super glue	WD-40
3M DP-460 Epoxy Adhesive	Wheel Bearing Grease
Acrylic Foam Tape (double sided)	3M DP-460 Epoxy Mixer Tips

Drill Bit Sizes

A full set of fractional drill bits ranging from 3/32" to 5/8" is strongly recommended. In addition the following number bits will be required.

NUMBERED BITS & TAPS	FRACTIONAL BITS
#40	1/4”
#30	5/16"
#28	3/8"
#21 & 10-32 TAP	1/2"
#19	7/8"
#11	
5mm Tap	

* Not a necessary tool but helpful.

RANS Aircraft
RECOMMENDED AVIONICS LIST – S-6S

Comm Radios

KING	KLX-135A GPS/COM with moving map
ICOM	IC-A200 Transceiver

Transponder

KING	KT-76A Transponder

Encoder

Trans-Cal	SSD-120-30 Altitude Encoder

Intercom

PS Engineering	PM1000 II Intercom (RANS "pre-cut" panels are designed for this intercom)

ELT

ACK Technologies	ELT Model E-01

Push to Talk Switch

Radio Shack	#275-644 Pushbutton Switch

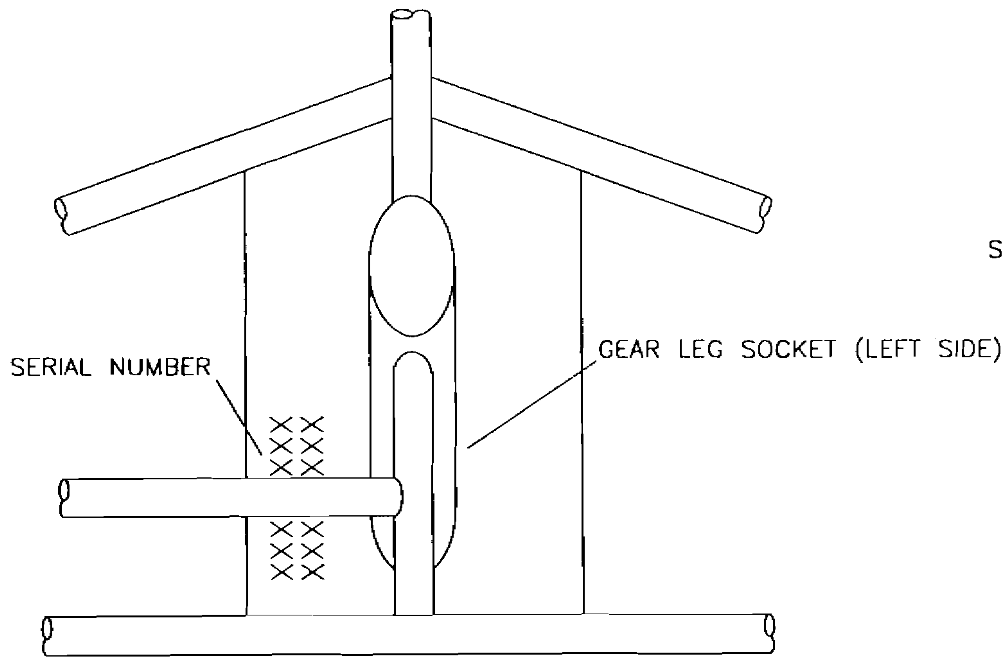
Local Avionic shops can wire your avionic harnesses for you.
Wells Aircraft does the wiring harnesses for the RANS Fleet. Contact George at 620-663-1546 for details.

WELLS AIRCRAFT*
P.O. BOX 858
HUTCHINSON, KS 67504
*Authorized Bendix/King dealer

Switches, circuit breakers, and other electrical parts are also available for RANS aircraft panels.
Contact RANS Parts Department for pricing.

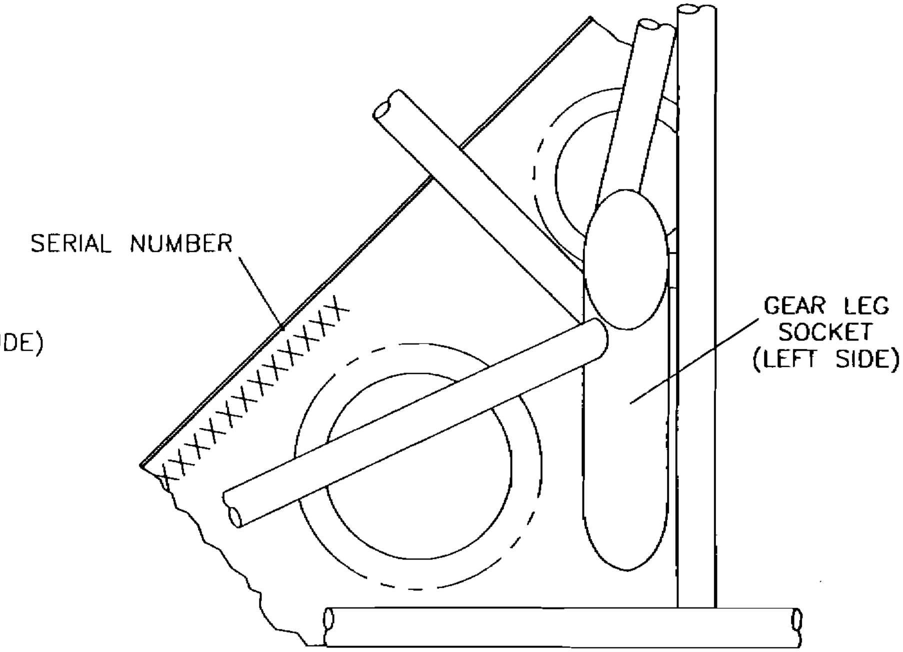
RED Illuminated Master Switch		KSES0017
Non-illuminated Switch		KSES0016
Panel Post Lights		KSES0018
Electrical Buss Bar		AMW 636
W58 Circuit Breakers		
	1 amp	KSES0010
	2 amp	KSES0012
	4 amp	KSES0014
	5 amp	KSES0015
	10 amp	KSES0013
	15 amp	KSES0011

TOP VIEW

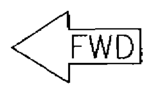


TRIKE

TOP VIEW



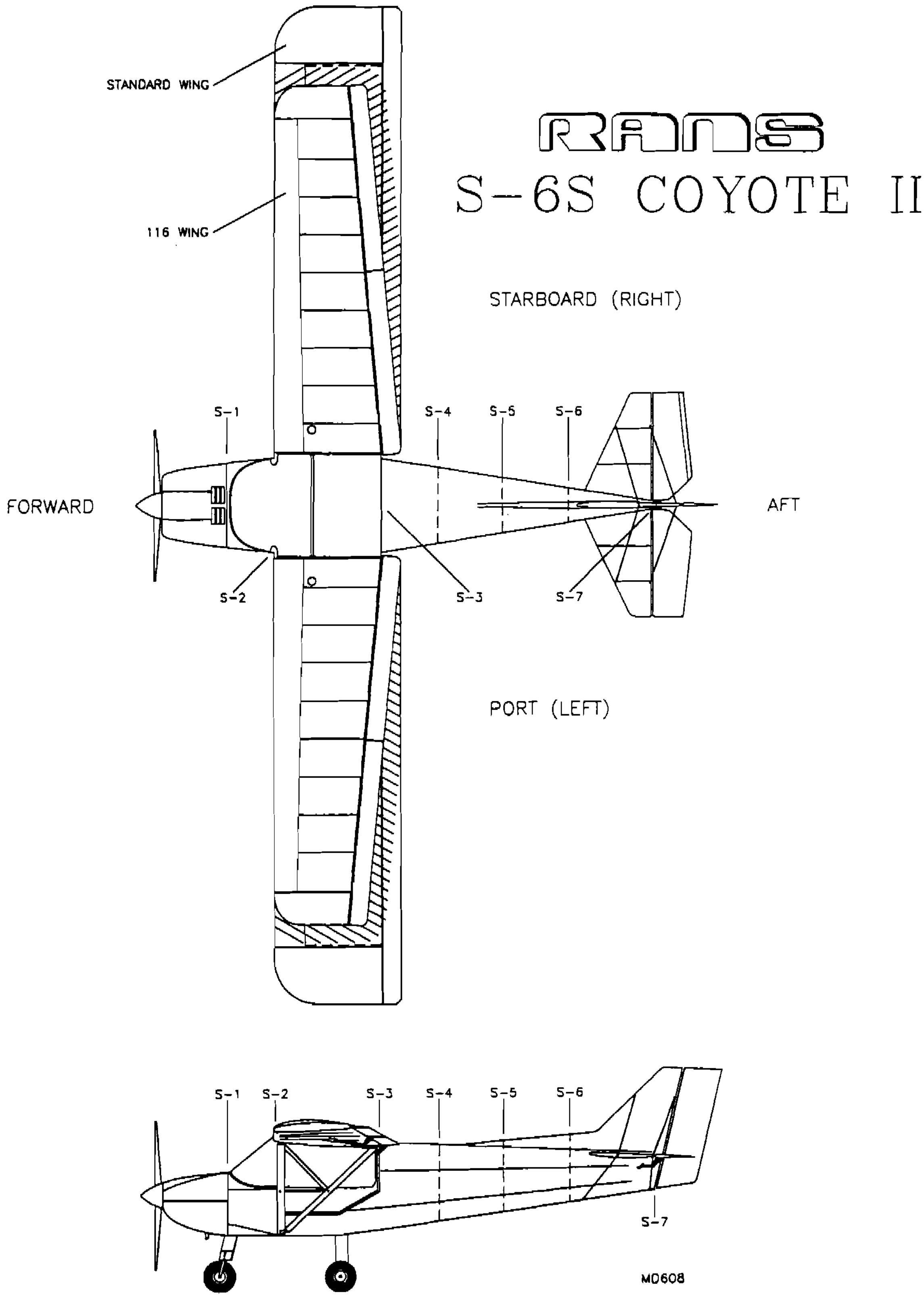
TAILDRAGGER



MD3174

RANS S-6S COYOTE II
SERIAL PLATE LOCATION

STRUCTURAL STATION LOCATIONS



RANS S-6S COYOTE II
ASSEMBLY SEQUENCE

Fuselage

Tailcone Assembly

Floorboard Pre-fit

Rudder Pedal Pre-fit

Install Control Stick Torque Tube

Rudder Cable Installation

Elevator Push-Pull Tube Installation

SPEEDY ASSEMBLY

A quick study of this assembly sequence reveals a primary time saver. The Aircraft is already covered and clear coated prior to final assembly.

Tail Group

Vertical & Horizontal Stabilizer Assembly

Elevator Assembly

Rudder Assembly

Wings

Wing Assembly

Flap & Aileron Assembly

Covering

Painting

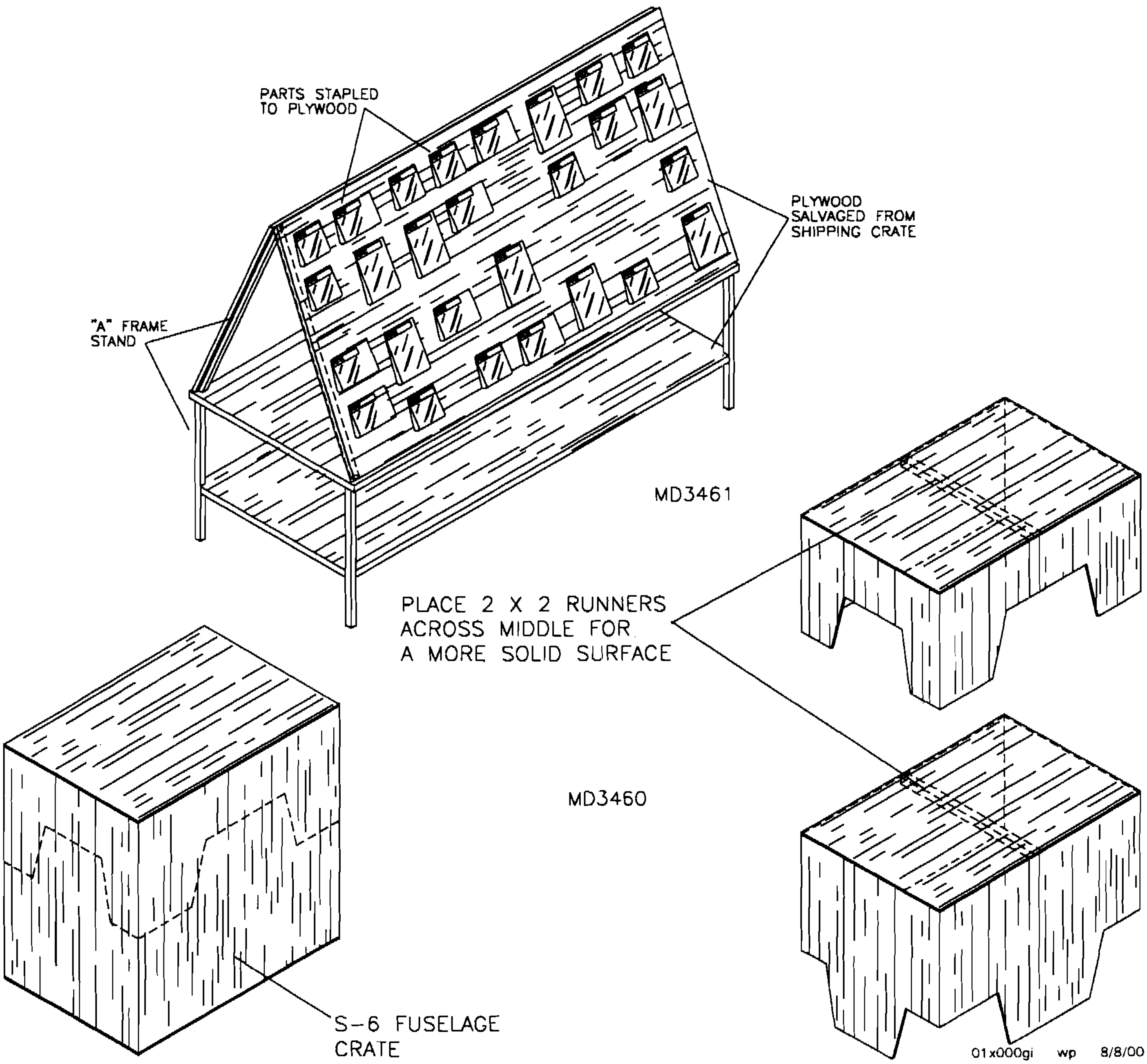
Final Assembly & Installation of all Parts & Components

MD3626

S-6S COYOTE II
GENERAL INFORMATION

BEFORE BEGINNING:

TAKE INVENTORY*:* You must complete an inventory within 60 days of receiving your kit. We check and re-check and are 99.9% certain that if we say we shipped it, we did. The first task in building your kit is to inventory the parts using the packing list provided. It's your job to keep all parts organized and accounted for. We can not provide missing parts cost free after 60 days. Use the supplied pack list to verify that everything that we packed is in the box. The fast way to inventory, is to use the Priority Number that appears on the Part Number labels, these will match the pack list in numeric order. Go through the list item by item. If anything is not there that should be, please contact our parts department immediately. ***HINT:*** *Use sections of plywood from the packing crate to fabricate a part inventory board. As each part is inventoried and checked off on the pack list, staple the bag to the board. This allows for quick identification and part selection during assembly. We fabricate "A" Frame stands to support the plywood. Refer to the figure below. Plywood can also be attached to shop wall. Two work benches can also be fabricated out of the fuselage crate by making the cuts as shown in the figure below.*



PLEASE READ the manual cover to cover; this will speed up your build time considerably.

GET ORGANIZED. Prepare your workshop and be certain that what comes *in* the shop door will be able to go *out*!!!

KEEP IT CLEAN. Wash hands, tools and work tables. You'll notice many parts are marked with part numbers; these wipe away with acetone or lacquer thinner. ***Do not allow acetone, lacquer thinner or loctite to contact lexan glazing; these and other solvents will destroy it.***

DEBURR ALL HOLES. This is important and must be performed. Burrs can cause stress risers and lead to failure. Various tools may be used. Nice as a deburring tool is, a half-inch drill bit does as well for most applications.

RADIUS AND SMOOTH sharp corners with files, grinders or fine grit paper. Edges of certain parts also may need deburring.

A FEW SPECIAL TOOLS will be needed: a power drill, pop riveter and wrenches. Clecos make trial fitting and assembly go smoothly on assemblies such as cowling, firewall and windows.

CLECOS, temporary fasteners used to hold things together while fitting and drilling, are included with the kit. Cleco pliers also are include. Clecos are color-coded according to size:

(4)	Silver	#40
(10)	Copper	#30
(12)	Gold	#11

To set a cleco, place it in the special pliers, squeeze, insert the tip in the desired hole and release. To remove, grasp the cleco with the pliers, squeeze and lift from the hole. You'll find clecos extremely helpful throughout assembly.

RIVETS. Your kit is supplied with various sizes of aluminum and stainless steel pop rivets. Even though we are careful, there is always the chance of the packages being mis-labeled. So before riveting, be sure to double check that you have the correct aluminum or stainless steel pop rivet for the particular section you are working on.

ROD ENDS. When installing rod ends and similar hardware, be certain at least ten threads are engaged, unless instructed otherwise within the text.

FABRICATED PARTS: The builder is required to fabricate some small parts within the kit from raw stock provided.

STATIONS: Throughout the manual, reference is made to structural stations. These are locations of formers or bulkheads from nose to tail of the aircraft. Refer to the diagram labeled *structural station locations* earlier in this manual.

PLACARDS & MARKINGS

Included in your S-6S kit is a decal sheet and gauge marking decal. These should provide you with just about every label/placard the FAA requires. Apply the decals as per FAA recommendations. Affix the passenger warning decal to the instrument panel. Not included in your kit is the data plate and aircraft identifier plate. The data plate can be purchased from one of the aircraft supply houses such as Spruce & Speciality. The identifier plate (which is a fairly new requirement) can be made from a small 1" x 1" ½" piece of aluminum. Hand stamp or engrave the make, model and serial number and then rivet this to the side of the tail channel. The Experimental decal is best applied along either door's bottom edge.

For the "N" number, use 3" vinyl letters. We use Cole brand, available at most hardware stores. These just stick on the tailcone about midway. Make sure the skin is clean before applying.

WARRANTY INFORMATION

KODIAK RESEARCH, INC.
P.O. BOX N7113
MARLBOROUGH HOUSE, CUMBERLAND ST.
NASSAU, N.P. BAHAMAS

PH: (809) 356-5377

Attn: O.E.M.'s

Date: October 31, 1991

Subject: Warranty Extension Requests

Dear Customer (RANS, INC),

1) In order for your customers (the builder) to receive their six month full warranty from time of first use, you must submit for extension on the enclosed form (please add your letterhead to this form.) If no request is received, warranty will begin from the date the invoice was sent to your customer (the builder).

2) Extension will be required, for any warranty outside the original six month period. This must be submitted prior to any claim or failure and cannot be applied retro-actively.

3) Supply a copy of the original customer request and reason for same as per guideline, submit with your verification on the request form.

4) All request must be submitted by manufacturer only. Any request for extensions from retail customers direct will be forwarded to the O.E.M. to process in the above format.

If you have any problem understanding this policy, please call for clarification.

CALCULATING WARRANTY

"When does the warranty start?"

1. The final owner should have a six (6) month period of operation to find any proven defective part in his engine or Rotax assembly.

2. There is, however, a one (1) year limit which starts on our invoice date to you. If we sold you an engine today, unless we hear from you, the warranty will end one year from today's date regardless of whether the engine was in the customers hand or dealer inventory.

EXAMPLE A: We invoice an engine to you today and two (2) weeks later the engine is sold to your customer and put into service. Six (6) months from date of sale to customer the warranty period is finished. (The customer has owned the engine for six (6) months.)

EXAMPLE B: Engine is invoiced to you today but not put into service (not sold by you) for 3, 4, 5, or up to 6 months later. Your customer still has 6 months warranty as it still falls in the one period to you.

EXAMPLE C: Engine is invoiced to you today, but for some legitimate reason, either at your end or at your customer's end, the engine cannot be put into service until 7 months or up to a maximum of the 12 months after the invoice date to you. Then, before the 12 months from invoice date to you are up, you advise us that the engine still has not been used an ask us for a one time, 6 month extension together with a valid reason. We ask permission from Rotax for a 6 month extension of that particular engine. To this date, we have not been refused a legitimate request for extension. In this case, warranty period will elapse 18 months from our invoice date to you.

3. As you can see, it is important to properly rotate your engine stock. Never send out a newly arrived engine if you still have older engines in house.

FAA PROCEDURES

--Obtaining an "N" Number

--Registration

--Obtaining An Airworthiness Certificate

OBTAINING AN "N" NUMBER

In order to register your plane, it will be necessary to obtain an identification number for the plane. This is referred to as an "N" number.

If any number is acceptable to you, write to the FAA Aircraft Registry, Dept. of Transportation, P.O. Box 25504, Oklahoma City, OK 73125 and ask them to assign you a free U.S. identification number of their choice.

If you prefer a number of your own choosing or a smaller number, you may be able to obtain the exact number you want by asking the FAA registry to assign you a specific number of your choice.

NOTE: U.S. identification numbers do not exceed 5 symbols in addition to the prefix "N". These symbols may be all numbers (N55555), one to four numbers and a suffix letter (N5555A or N5A), or one to three numbers and two suffix letters (N555AB).

If you request a special "N" number it would be best to list at least five choices in case your first choice is not available. A special number of your own choosing will cost $10.00 and you should enclose that fee with your letter.

When To Obtain Your "N" Number

If you plan to complete your kit within a very short time, it is recommended that you obtain your "N" number right away. If your project will be fairly lengthy, you will not need to obtain your number until the last several months of construction. Keep in mind that if you request a special "N" number it can be reserved for no longer than one year. If this number has not been affixed to the fuselage within this time and the registration completed, it will be necessary to pay an additional $10.00 to reserve that number for another year.

AFFIDAVIT OF OWNERSHIP FORM

Enclosed you will find an Affidavit of Ownership Form. This form should accompany your letter requesting the assignment of an "N" number.

This form must be notarized as it establishes your ownership to the airplane even though you know you did build it. It will be used by the FAA to create a file on your aircraft and will serve as a legal document and a **substitute for the Bill of Sale** (AC Form 8050-2) that a buyer gets when he buys any existing airplane.

REGISTERING YOUR AIRCRAFT

After you have written the Aircraft Registry requesting an "N" number, you will receive a form letter giving your number assignment. You will also receive a blank Aircraft Registration Form. (Sample Enclosed.) Complete the Application for Aircraft Registration (Form 8050-1) and return it to the Aircraft Registry along with the $5.00 registration fee.

Retain the **PINK** copy of the Registration and mail both the **WHITE** original and the **GREEN** copy. Your **PINK** copy is your authority to operate the aircraft, **when carried in the aircraft with an appropriate and current airworthiness certificate**.

RECEIVING AUTHORITY TO FLY YOUR AIRCRAFT

Registration alone does not authorize you to fly your aircraft. The aircraft must, after it has been properly registered, also obtain an Airworthiness Inspection by an inspector of the FAA, at which time the necessary Airworthiness Certificate may be issued. Then, and only then, is your aircraft ready for flight.

WHAT IS THE PROCEDURE FOR OBTAINING AN AIRWORTHINESS CERTIFICATE

Since the final step in obtaining an Airworthiness Certificate is to obtain an inspection of your airplane by an official of the FAA, it is a good idea to make an early contact with the FAA inspector's office nearest your home. Members of the local EAA chapter or a local flying service may be able to help direct you to this office. The purpose of such an early contact would be to discuss with the FAA representative, your proposed home built project and to generally familiarize yourself with the procedures established by the FAA for home built projects. At this time you can establish a tentative plan for inspection of the aircraft upon completion. The typical FAA inspector is interested in your project and wants to help you do a good job.

The FAA requires that everyone building an airplane must maintain a construction log of the work he does on his airplane. You can use a notebook of conventional size and keep a daily diary of the work done on your aircraft. Since all our planes come with assembly manuals, it is a good idea to also make notes in the manual as well as listing dates when certain procedures were done. It is a very good idea to take photographs of work on your plane in various stages. This helps to document that you, the builder, actually completed 51% of this kit. (Advisory Circular 20-27C available from the FAA or EAA describes the procedure used so that your logbook will be a verification of having complete at least 51% of the aircraft yourself.)

MY AIRCRAFT IS COMPLETED, ALL MARKING AND PLACARDS ARE IN PLACE. WHAT ELSE MUST I DO TO MY AIRCRAFT BEFORE I AM READY FOR MY PRE-CERTIFICATION INSPECTION?

Included in your manual is a weight and balance sheet. This will need to be completed before the inspection.

You will need to purchase a logbook for the aircraft, engine and propeller. These can be separate books or just one.

Have handy a copy of your Sales Invoice from us.

I FEEL I AM READY FOR INSPECTION BY THE FAA INSPECTOR, WHAT DO I DO?

If you have had prior contact with your FAA inspector, you will probably be familiar with the procedures used by that office. Different offices have slightly different procedures. Some inspectors will help you fill out the paperwork at the time of inspection. Others require that you submit the paperwork prior to inspection. If you are not sure and there are no other builders in your area to ask, you could call and ask the local office. Or you can submit the following to the Inspector's Office.

1. A letter requesting a final inspection.
2. Form 8130-12 Eligibility Statement (sample follows).
3. Form 8130-6 Application for Airworthiness Certificate (sample follows).
4. A 3-view drawing of the aircraft or photos of topside and front view. Include with this the following:

   Horsepower rating of engine and type of prop.
   Empty weight and maximum weight at which the aircraft will be operated.
   Number of seats and their arrangement (tandem, side by side).
   Whether single or dual controlled.
   Fuel capacity.
   Maximum speed at which you expect to operate the aircraft.

5. Estimated time or number of flights required. (Usually 25 hours for aircraft equipped with certified aircraft engine and prop combinations and 40 hours for those with non-aircraft engine propeller combinations.)

6. The area over which you will be testing. (Request an area encompassing a 25 mile radius for day VFR operations. Exclude congested areas and airways, but try to include nearby airports even if a few miles beyond the 25 mile radius.

Upon satisfactory completion of the necessary final FAA inspection of the aircraft and whatever ground tests may be required, the FAA Inspector will issue your amateur-built "Experimental" Airworthiness Certificate. Along with the certificate you will be given certain "**OPERATING LIMITATIONS**" under which you must operate the aircraft.

WHAT ARE THE SPECIAL REQUIREMENTS AS FAR AS ATTACHING NUMBERS AND PLACARDS TO HOME BUILT AIRCRAFT?

10-1 DISPLAY OF MARKS
(Reference is FAR Part 45.23)

After you obtain the registration of your aircraft, the Registration numbers or marks must be affixed to the aircraft in some permanent fashion. The marks must be legible and have no ornamentation. They must contrast in color with the background.

The marks displayed on the aircraft shall include the letter "N" signifying U.S. Registry, followed by the registration number issued for the aircraft.

In addition, amateur-built(Experimental) aircraft must have displayed on that aircraft near each entrance to the cabin or cockpit, in letters not less than 2" not more than 6" in height, the word, "EXPERIMENTAL".

10-2 LOCATION OF MARKS ON FIXED WING AIRCRAFT (Reference is FAR Part 45.25)

(b) (1) If displayed on the vertical tail surfaces, horizontally on both surfaces, horizontally on both surfaces of a single vertical tail or on the outer surfaces of a multivertical tail. However, an aircraft on which marks at least 3" high may be displayed and in accordance with 45.29 (b)(1), the marks may be displayed vertically on the vertical tail surface.

(2) If displayed on the fuselage surfaces, horizontally on both sides of the fuselage between the trailing edge of the wing and the leading edge of the horizontal stabilizer. However, if engine pods or other appurtenances are located in this area and are an integral part of the fuselage side surfaces, the operator may place the marks on those pods or appurtenances.

10-3 SIZE OF MARKS

FAR 45.29 (b) (1) (iii) states "Marks at least 3" high may be displayed on an aircraft for which an experimental certificate has been issued under 21.191 (d) or 21.191 (g) for operating as an exhibition aircraft or as an amateur-built aircraft when the maximum cruising speed of the aircraft does not exceed 180 knots Calibrated Air Speed (CAS).

And © characters must be two-thirds as wide as they are high except "1" which must be one-sixth as wide as it is high and the letters "M" and "W" which may be as wide as they are high.

(d) Characters must be formed by solid lines one-sixth as thick as the character is high.

(e) Spacing. The space between each character may not be less than one-fourth of the character width.

10-5 IDENTIFICATION PLATE
(Reference is FAR Part 45.11)

In addition to affixing the aircraft's registration number to the sides of the fuselage, the builder must also identify his aircraft by attaching an identification plate to the aircraft's structure.

This identification data required to be inscribed on the plate for amateur-built aircraft shall include the following information:

a. Builder's name and address
b. Model designation
c. Builder's serial number
d. Date of manufacture

The identification plate containing these essential elements must be of fireproof material and must be secured in such a manner that it will not likely be defaced or removed during normal service, or lost or destroyed in an accident. It must be secured to the aircraft at an accessible location near an entrance, except that if it is legible to a person on the ground it may be located externally on the fuselage near the tail surfaces.

The identification plate information must be marked thereon by etching, stamping, engraving, or other acceptable fireproof marking.

Metal plates which comply with these requirements may be purchased from the Experimental Aircraft Association for a very nominal fee.

AIRCRAFT INSTRUMENT MARKINGS & COCKPIT PLACARDS

Your reference is FAR Part 91.31 Civil Aircraft Operating Limitations and Marking Requirements

8-1 GENERAL

To insure that each person operating an aircraft does so within the operating limitations prescribed for it, the FAA requires that there is available in it a current Flight Manual, appropriate instrument marking and placards, **or any combination thereof.**

The purpose of the flight manual, markings and placards is to detail for the operator of the aircraft, the operational limitations prescribed for the aircraft.

In lieu of a flight manual, most amateur builders prefer to mark their instruments and to affix the necessary placards to the instrument panel as the primary means for complying with these requirements.

8-2 MARKINGS AND PLACARDS

The markings and placards necessary for the safe operation and handling of the aircraft should be displayed in a conspicuous place and may not be easily erased, disfigured or obscured. Such placards and markings should include but not necessarily be limited to the following criteria: Special emphasis on fuel system markings are very important; such as fuel valves-on-off fuel octane quantity, unusable fuel, minimum fuel for take-off, minimum fuel for inverted flight, etc.

8-3 POWERPLANT INSTRUMENT MARKINGS

Each required powerplant instrument should be marked to indicate the maximum and, if applicable, minimum safe operating limits with a **red radial line**.

Each normal operating range is to be marked with a **green arc** not extending beyond the maximum and minimum continuous safe operating limits.

Each engine speed range that is restricted because of excessive vibration should be marked with a **red arc.**

8-4 AIRSPEED INSTRUMENT MARKINGS

The airspeed indicator should be marked with a **red radial line** to establish the never-exceed speed. (Vne).

The takeoff and any pre-cautionary range should be marked with a **yellow arc**. The normal range is marked with a **green arc**. The flap actuation range is marked with a **white arc.**

8-5 AIRSPEED PLACARDS

There should be an airspeed placard in clear view of the pilot and as close as practicable to the airspeed indicator listing:

The design maneuvering speed.
The maximum landing gear operating speed (if applicable).
The maximum flap extension operating speed (if applicable).

8-6 LANDING GEARS

If a retractable landing gear is used, an indicator should be marked so that the pilot can, at any time, ascertain that the wheels are secured in their extreme positions.

Each emergency control should be **red** and must be marked as to method of operation and identity.

8-7 CONTROL MARKINGS

Each fuel tank selector should be marked to indicate the position corresponding to each tank and to existing cross feed position.

If safe operation requires the use of any tanks in a specific sequence, that sequence must be identified.

8-8 POWERPLANT FUEL CONTROLS

Each fuel tank selector should be marked to indicate the position corresponding to each tank and to existing cross feed position.

If safe operating requires the use of any tanks in a specific sequence, that sequence must be identified.

8-9 FLIGHT MANEUVER PLACARD

For non-acrobatic category airplanes, there should be a placard in front of and in clear view of the pilot stating: "No acrobatic maneuvers, including spins, approved.".

For acrobatic category airplanes, there should be a placard in clear view of the pilot listing the approved acrobatic maneuvers and the recommended entry airspeed for each. If inverted flight maneuvers are not approved, the placard must have a notation to this effect.

8-10 BAGGAGE PLACARD

The maximum baggage load permitted should be displayed in a conspicuous place adjacent to the baggage area.

8-11 PASSENGER WARNING PLACARD

A placard must be affixed to the aircraft so that it is readily seen in the cockpit. It will state: "Passenger Warning-This aircraft is amateur built and does not comply with the Federal Safety Regulations for Standard Aircraft". This placard is part of a set available for EAA. See section 10-5.

OPERATING LIMITATIONS

13-1 MANDATORY TEST FLIGHT PROVING PHASE

All amateur-built sport aircraft as well as standard aircraft have federally imposed operating limitations.

Upon satisfactory completion of the necessary final FAA Inspection of the aircraft and whatever ground tests may be required, the FAA inspector will issue your amateur-built "Experimental" Airworthiness Certificate.

He will also issue a form letter establishing the operating limitations applicable to your aircraft during its mandatory flight proving period. These Special Airworthiness Experimental Operating Limitations must be displayed in the aircraft at all times.

The operating limitations imposed on the aircraft during its flight proving period will be more stringent than those issued later after mandatory flight testing phase has been completed.

This phase may begin with the issuance of the aircraft's initial airworthiness certificate and the original operating limitations. At this time the FAA inspector will acquaint you with the requirements for a mandatory flight test and proving period. This flying will be confined to an assigned flight area approved by the FAA Inspector.

The presence of the FAA Inspector is not required, by regulation, at the initial flight of the experimental amateur-built aircraft. If time permits, however, it is not unusual for him to attend.

If he deems necessary, the inspector could issue a permit for a single flight within the boundaries of the airport and, upon witnessing the safe completion of the test, issue a further permit for more extended flights within the permissible area.

A tremendous responsibility for the safe operation of the experimental aircraft rests on the FAA Inspector. If the plane has any new and unusual features, he will naturally tend to treat its first flights with care. Also, pilot qualification and skill is a consideration.

13-2 PURPOSE OF THE FLIGHT TEST PERIOD

A flight test period is necessary to show to the FAA that the aircraft is controllable throughout its normal range of speeds and throughout all the maneuvers to be executed. It will also serve to prove that the aircraft has no hazardous operating characteristics or design features.

13-3 DURATION OF MANDATORY FLIGHT TEST PERIOD

For standard aircraft type engines: When an FAA approved aircraft engine/propeller combination is installed the flight test period is usually limited to 25 hours of flight time.

For non-aircraft type or automotive engines: An aircraft equipped with such an engine is required to be flown for a longer test period, usually at least 40 hours, to prove its reliability.

NOTE: It should be understood that the local FAA Inspector has the prime responsibility in determining the extent of the flight test period to be required for your aircraft. He is permitted to exercise considerable discretion in extending or in reducing the number of hours required to be flown during this period.

13-4 FLIGHT TEST AREA

The FAA Inspector will authorize the flight tests to be carried out in a designated and limited test area, usually within a 25 mile radius of the aircraft's base of operations.

He will insure the area selected is not over densely populated areas or in a congested airway.

In assigning the flight test area, the FAA Inspector may modify the size and shape of the area to suit the best purposes of the flight test program. In some locations, particularly around bigger cities where air traffic is heavy, a flight test area may not be practical. The builder must be prepared to except that an approved flight test area may not be the one chosen to him as the most convenient.

13-5 OTHER LIMITATIONS DURING THE FLIGHT TEST PERIOD

As a rule, the carrying of passengers or other crew members will not be permitted unless necessary to the safe operation of that aircraft.

13-6 AIRCRAFT FLIGHT LOG

During the flight test period, the pilot should record the aircraft flight history in an appropriate log book. This should be in addition to any engine tachourmeter or engine hourmeter that may be installed in the aircraft.

Specifically, the duration of each individual flight should be recorded including the number of landings made.

A full description of any mishaps, however minor, or any experiences not entirely normal that occur during the flight experience period should also be duly recorded.

Although not required, it is strongly recommended that all operating data be recorded flight by flight. Such information as airspeeds, cylinder head temperatures, etc., will be very valuable and may be used to determine or establish the various performance figures and operating characteristics of the aircraft.

Although the FAA Inspector is required by law to apply certain basic restrictions permanently to the amateur-built aircraft he is certificating, he can apply whatever other limitations he deems necessary at his own discretion. Unfortunately, nothing in the regulations states that the initial restrictions are required to be removed after successful completion of the test period....they only may be modified.

After the mandatory flight test period....then what?

REPAIRMAN'S CERTIFICATION

The Repairman's Certificate is applied for using the application form 8610-2, available from the local FAA offices. You should ask for this when you apply for your final inspection on your aircraft. You should also be familiar with the Appendix D of FAR part 43. (Items included in the Annual Condition Inspection.)

The Repairman's Certificate is only available to those who have built 51% or more of the specific aircraft they are having inspected.

Every twelve calendar months a condition inspection is performed in accordance with Appendix D of FAR part 43. The repairman has to include the aircraft total time in service, the name, the signature and the certificate type number of the repairman or A & P, who does the examination.

A & P mechanics must do the Annual Condition Inspection for those who are non-builders who own an amateur-built aircraft. On those aircraft where the builder has a Repairman's Certificate, it is recommended that from time to time the Annual Condition Inspection of those aircraft be done by an A & P simply as a check on the builder/repairman's work. One legal representative recommends that every other Annual Condition Inspection for a builder holding a repairman's certificate be done by an A & P mechanic.

FINAL INSPECTION

Listed below are two checklists. One is a sample checklist for condition inspection from the FAA and the other is an EAA safety checklist. These should be very helpful in getting your airplane signed off by the FAA Inspector and ensuring that your airplane is safe for operation.

APPENDIX 1. SAMPLE CHECKLIST FOR A CONDITION INSPECTION

AC 90-89

AIRCRAFT IDENTIFICATION:

TYPE/SN ____________________ ENGINE MODEL/SN ____________________

"N" NUMBER ____________________ PROPELLER MODEL/SN ____________________

A/F TOTAL TIME ____________________ ENGINE TOTAL TIME ____________________

OWNER ____________________ PROPELLER TOTAL TIME ____________________

	BUILDER		INSPECTOR	
GENERAL:	**Sat**	**Unsat**	**Sat**	**Unsat**
REGISTRATION/AIRWORTHINESS/OPERATING LIMITATIONS				
AIRCRAFT IDENTIFICATION PLATES INSTALLED				
EXPERIMENTAL PLACARD INSTALLED				
WEIGHT AND BALANCE/EQUIPMENT LIST				
WINGS:				
REMOVE INSPECTION PLATES/FAIRINGS				
GENERAL INSPECTION OF THE EXTERIOR/INTERIOR WING				
FLIGHT CONTROLS BALANCE WEIGHT FOR SECURITY				
FLIGHT CONTROLS PROPER ATTACHMENT (NO SLOP)				
FLIGHT CONTROL HINGES/ROD END BEARINGS SERVICEABILITY				
FLIGHT CONTROLS PROPERLY RIGGED/PROPER TENSION				
INSPECT ALL CONTROL STOPS FOR SECURITY				
TRIM CONTROL PROPERLY RIGGED				
TRIM CONTROL SURFACES/HINGES/ROD END BEARINGS SERVICE				
FRAYED CABLES OR CRACKED/FROZEN PULLEYS				
SKIN PANELS DELAMINATE/VOIDS (COIN TEST)				
POPPED RIVETS/CRACKED/DEFORMED SKIN				

FABRIC/RIB STITCHING/TAPE CONDITION				
LUBRICATION				
WING ATTACH POINTS				
FLYING/LANDING WIRES/STRUTS FOR SECURITY				
CORROSION				
FLIGHT CONTROL PLACARDS				
INSPECT FIREWALL FOR DISTORTION AND CRACKS				
INSPECT RUDDER PEDALS AND BRAKES FOR OPERATION AND SECURITY				
INSPECT BEHIND FIREWALL FOR LOOSE WIRES AND CHAFFING LINES				
CHECK CONTROL STICK/YOKE FOR FREEDOM OF MOVEMENT				
CHECK FLAP CONTROL OPERATION				
CHECK CABLE AND PULLEYS FOR ATTACHMENT AND OPERATION				
PERFORM FLOODLIGHT CARBON MONOXIDE TEST				
ENSURE THE COCKPIT INSTRUMENTS ARE PROPERLY MARKED				
INSPECT INSTRUMENTS, LINES, FOR SECURITY CHECK/CLEAN/REPLACE INSTRUMENT FILTER				
INSPECT COCKPIT FRESH AIR VENTS/HEATER VENTS FOR OPERATION AND SECURITY				
INSPECT SEATS, SEAT BELTS/SHOULDER HARNESS FOR SECURITY AND ATTACHMENT				
CORROSION				
EMPENNAGE/CANARD:				
REMOVE INSPECTION PLATES AND FAIRINGS				
INSPECT CANARD ATTACH POINTS FOR SECURITY				
INSPECT VERTICAL FIN ATTACH POINTS				
INSPECT ELEVATOR/STABILIZER ATTACH POINTS				
INSPECT HINGES/TRIM TABS/ROD ENDS FOR ATTACHMENT AND FREE PLAY (SLOP)				
INSPECT EMPENNAGE/CANARD SKIN FOR DAMAGE/CORROSION				
INSPECT ALL CONTROL CABLES, HINGES AND PULLEYS				
INSPECT ALL CONTROL STOPS				
ENGINE:				
PERFORM COMPRESSION TEST #1 _______ #2 _______ #3 _______ #4 _______ #5 _______ #6 _______				
CHANGE OIL AND FILTER (CHECK FOR METAL)				
INSPECT IGNITION HARNESS FOR CONDITION AND CONTINUITY				
CHECK IGNITION LEAD CIGARETTES FOR CONDITION/CRACKS				
CLEAN AND GAP SPARK PLUGS				

CHECK MAGNETO TIMING/POINTS/OIL SEAL/DISTRIBUTOR				
INSPECT ENGINE MOUNT/BUSHINGS				
CHECK LANDING LIGHT OPERATION				
CHECK POSITION LIGHTS OPERATION				
CHECK ANTI-COLLISION LIGHT FOR OPERATION				
INSPECT ALL ANTENNA MOUNTS AND WIRING FOR SECURITY				
CHECK ALL GROUNDING WIRES (ENGINE TO AIRFRAME, WING TO AILERON/FLAP, ETC)				
INSPECT RADIOS/LEADS/WIRES FOR ATTACHMENT & SECURITY				
INSPECT CIRCUIT BREAKERS/FUSES/PANEL FOR CONDITION				
OPERATIONAL INSPECTION:				
VISUAL INSPECTION OF THE ENGINE/PROPELLER				
ALL INSPECTION PANELS AND FAIRINGS SECURE				
PERSONNEL WITH FIRE BOTTLE STANDING BY				
BRAKE SYSTEM CHECK				
PROPER FUEL IN TANKS				
ENGINE START PROCEDURES				
OIL PRESSURE/OIL TEMPERATURE WITHIN LIMITS				
VACUUM GAUGE CHECK				
MAGNETO CHECK/HOT MAG CHECK				
IDLE RPM/MIXTURE CHECK				
STATIC RPM CHECK				
ELECTRICAL SYSTEM CHECK				
COOL DOWN PERIOD/ENGINE SHUT DOWN				
PERFORM OIL, HYDRAULIC, AND FUEL LEAK CHECK				
PAPERWORK:				
AIRWORTHINESS DIRECTIVES				
RECORD FINDINGS AND SIGN OFF INSPECTION AND MAINTENANCE IN LOGBOOKS				

AN3 - AN8 AIRFRAME BOLTS

AN3-AN8 CADMIUM-PLATED STEEL BOLTS (DRILLED AND UNDRILLED)

A non-corrosion-resistant steel machine bolt which conforms to Specification MIL-B-6812. Cadmium-plated to Specification QQ-P-416.

Available with or without single hole through shank and/or single hole through head. Examples of part members for a cadmium plated steel bolt having a diameter of 1/4" and nominal length of 1".

AN4-6	For drilled shank
AN4-6A	Designates undrilled shank
AN4H-6	Drilled head, drilled shank
AN4H-6A	Drilled head, undrilled shank

NUT AND COTTER PIN SIZES

AN NUMBER	DIAMETER	PLAIN NUT AN NUMBER	CASTLE NUT AN NUMBER	COTTER PIN MS NUMBER
AN3	3/16	AN315-3R	AN310-3	MS24665-132
AN4	1/4	AN315-4R	AN310-4	MS24665-132
AN5	5/16	AN315-5R	AN310-5	MS24665-132
AN6	3/8	AN315-6R	AN310-6	MS24665-283
AN7	7/16	AN315-7R	AN310-7	MS24665-283
AN8	1/2	AN315-8R	AN310-8	MS24665-283

HOW TO DETERMINE GRIP For Steel and Aluminum Aircraft Bolts
(Subtract Fractions Shown Below From Length of Bolt)

AN 3 to AN 8	AN NUMBER, Diameter, and Threads per Inch	AN3 10 -32	AN4 1/4 -28	AN5 5/16 -24	AN6 3/8 -24	AN7 7/16 -20	AN8 ½ -20
	Grip = Length Less	13/32	15/32*	17/32	41/64	21/32	25/32

*Formula does not apply for AN4-3. Grip for AN4-3 is 1/16.

DASH NUMBER -- NOMINAL LENGTH

-3 . . . 3/8	-6 . . . 3/4	-11 . . . 1 ⅛	-14 . . . 1 ½	-17 . . . 1 7/8	-22 . . . 2 1/4	-25 . . . 2 5/8
-4 . . . ½	-7 . . . 7/8	-12 . . . 1 1/4	-15 . . . 1 5/8	-20 . . . 2	-23 . . . 2 3/8	-26 . . . 2 3/4
-5 . . . 5/8	-10 . . . 1	-13 . . . 1 3/8	-16 . . . 1 3/4	-21 . . . 2 1/8	-24 . . . 2 ½	-27 . . . 2 7/8
						-30 . . . 3

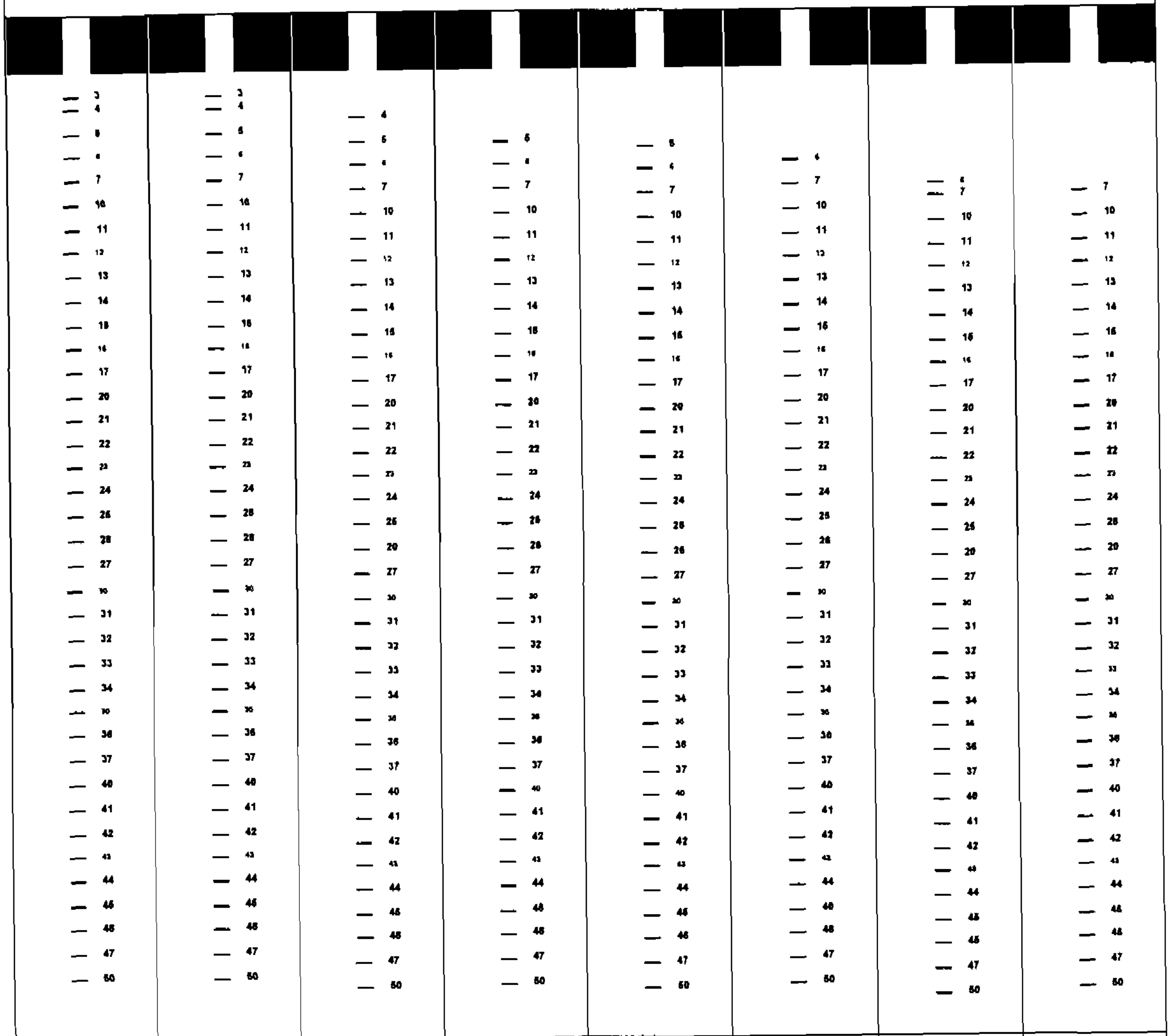
PART IDENTIFICATION

Use the above chart to determine lengths of bolts. Diameters are as follows:

AN3 = 3/16"   AN4 = 1/4"   AN5 = 5/16"   AN6 = 3/8"

Use the parts manual for other part identification. The drawings depict a fairly accurate likeness of the real thing. Other parts are labeled by part number. Again, reference the parts manual to confirm part identity.

AN Bolt Gauge



AN3	AN4	AN5	AN6	AN7	AN8	AN9	AN10
3/16	¼	5/16	⅜	7/16	½	9/16	⅝

RIVETS CROSS REFERENCE LIST

DIA.	RANS	POP RIVET				CHERRY Q			
	NO.	NO.	SHER.	TNSL.	GRIP	NO.	SHER.	TNSL.	GRIP
3/32 (#41)	40APR1/8	AD32ABS	85	135	.031-.125	--	--	--	--
3/32 (#41)	40APR1/4	AD34ABS	85	135	.126-.250	--	--	--	--
3/32 (#41)	40APR3/8	AD36ABS	85	135	.251-.375	--	--	--	--
1/8 (#30)	30APR1/16	--	--	--	--	AAPQ-41	225	250	.0-.062
1/8 (#30)	30APR1/8	AD42ABS	155	235	.063-.125	AAPQ-42	225	250	.063-.125
1/8 (#30)	30APR1/4	AD44ABS	155	235	.188-.250	AAPQ-44	225	250	.126-.250
1/8 (#30)	30APR3/8	AD46ABS	155	235	.313-.375	AAPQ-46	225	250	.251-.375
1/8 (#30)	30SSPR1/16	--	--	--	--	CCPQ-41	700	600	0-.062
1/8 (#30)	30SSPR1/8	SSD42SSBS	550	700	.031-.125	CCPQ-42	700	600	.063-.125
1/8 (#30)	30SSPR1/4	SSD44SSBS	550	700	.188-.250	CCPQ-45	700	600	.188-.312
1/8 (#30)	30SSPR3/8	SSD46SSBS	550	700	.251-.375	CCPQ-46	700	600	.251-.375
3/16 (#11)	12APR1/8	AD62ABS	315	500	.063-.125	AAPQ-62	500	450	.062-.125
3/16 (#11)	12APR1/4	AD64ABS	315	500	.126-.250	AAPQ-64	500	450	.126-.250
3/16 (#11)	12APR3/8	--	--	--	--	AAPQ-66	500	450	.251-.375
3/16 (#11)	12APR1/2	AD68ABS	315	500	.375-.500	AAPQ-68	500	450	.376-.500
3/16 (#11)	12SSPR1/8	--	--	--	--	CCPQ-62	1650	1300	.062-.125
3/16 (#11)	12SSPR1/4	SSD64SSBS	1000	1375	.126-.250	CCPQ-64	1650	1300	.126-.250
3/16 (#11)	12SSPR3/8	SSD66SSBS	1000	1375	.251-.375	CCPQ-66	1650	1300	.251-.375
3/16 (#11)	--	--	--	--	--	SSPQ-68	1050	825	.376-.50
3/16 (#11)	--	--	--	--	--	SSPQ-610	1050	825	.501-.625
1/8"	--	--	--	--	--	CCPQ-44	700	600	.126-.250
						AVEX RIVET			
1/8 (#30)	--	--	--	--	--	1691-0410	165	230	.031-.187

EF-39G

AFFIDAVIT OF OWNERSHIP FOR AMATEUR-BUILT AIRCRAFT

U.S. Identification Number: N12344

Builder's Name: John Q. Amateur

Model: RANS S-9 Serial Number: 1288054

Class (airplane, rotorcraft, glider, etc.): Airplane

Type of Engine Installed (reciprocating, turbopropeller, etc.): Reciprocating

Number of Engines Installed: 1

Manufacturer, Model, and Serial Number of each Engine Installed: Rotax 503 3572333

Built for Land or Water Operation: Land

Number of Seats: 1

The above-described aircraft was built from parts by the undersigned and I am the owner.

(Signature of Owner-Builder)

State of: Kansas

County of: Anywhere

Subscribed and sworn to me before this ______ day of ________________, 19______.

My commission expires ____________________.

(Signature of Notary Public)

THIS PAGE IS ONLY A SAMPLE

AC Form 8050-88 (9-75) (0052-00-559-0002) Supersedes previous edition

FORM APPROVED
OMB No. 2120-0042

UNITED STATES OF AMERICA DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION-MIKE MONRONEY AERONAUTICAL CENTER
AIRCRAFT REGISTRATION APPLICATION

CERT. ISSUE DATE

UNITED STATES REGISTRATION NUMBER N 1234Y

AIRCRAFT MANUFACTURER & MODEL
RANS S-9

AIRCRAFT SERIAL No.
1288054

FOR FAA USE ONLY

TYPE OF REGISTRATION (Check one box)

☒ 1. Individual ☐ 2. Partnership ☐ 3. Corporation ☐ 4. Co-owner ☐ 5. Gov't. ☐ 8. Non-Citizen Corporation

NAME OF APPLICANT (Person(s) shown on evidence of ownership. If individual, give last name, first name, and middle initial.)

John Q. Amateur

TELEPHONE NUMBER: (913) 888-8888

ADDRESS (Permanent mailing address for first applicant listed.)

Number and street: #1 Build-it Road

Rural Route: P.O. Box:

CITY	STATE	ZIP CODE
Anytown	KS	67601

☐ **CHECK HERE IF YOU ARE ONLY REPORTING A CHANGE OF ADDRESS**

ATTENTION! Read the following statement before signing this application. This portion MUST be completed.

A false or dishonest answer to any question in this application may be grounds for punishment by fine and / or imprisonment (U.S. Code, Title 18, Sec. 1001).

CERTIFICATION

I/WE CERTIFY:

(1) That the above aircraft is owned by the undersigned applicant, who is a citizen (including corporations) of the United States.

(For voting trust, give name of trustee: ______), or:

CHECK ONE AS APPROPRIATE:

a. ☐ A resident alien, with alien registration (Form 1-151 or Form 1-551) No. ______

b. ☐ A non-citizen corporation organized and doing business under the laws of (state) ______ and said aircraft is based and primarily used in the United States. Records or flight hours are available for inspection at ______

(2) That the aircraft is not registered under the laws of any foreign country; and

(3) That legal evidence of ownership is attached or has been filed with the Federal Aviation Administration.

NOTE: If executed for co-ownership all applicants must sign. Use reverse side if necessary.

TYPE OR PRINT NAME BELOW SIGNATURE

EACH PART OF THIS APPLICATION MUST BE SIGNED IN INK.	SIGNATURE	TITLE	DATE
	John Q. Amateur	Builder/Owner	3/16/88
	SIGNATURE: John Q. Amateur	TITLE	DATE
	SIGNATURE	TITLE	DATE

NOTE Pending receipt of the Certificate of Aircraft Registration, the aircraft may be operated for a period not in excess of 90 days, during which time the PINK copy of this application must be carried in the aircraft.

AC Form 8050-1 (12/90) (0052-00-628-9007) Supersedes Previous Edition

AC FORM 8050-1 IS A 3-PART FORM

THIS PAGE IS ONLY A SAMPLE

Form Approved
O.M.B. NO. 2120-0018

US Department of Transportation
Federal Aviation Administration

ELIGIBILITY STATEMENT AMATEUR-BUILT AIRCRAFT

Instructions: Print or type all information except signature. Submit original to an authorized FAA representative. Applicant completes Section I thru III. Notary Public Completes Section IV.

I. REGISTERED OWNER INFORMATION

Name(s) John Q. Amateur

Address(es) #1 Build-it Road (No. & Street) Anytown (City) KS (State) 67601 (Zip)

Telephone No.(s) (913)888-8888 (Residence) ( ) (Business)

II. AIRCRAFT INFORMATION

Model	RANS S-9	Engine(s) Make	Rotax 503
Assigned Serial No.	1288054	Engine(s) Serial No.(s)	3572333
Registration No.	N1234Y	Prop./Rotor(s) Make	Sterba
Aircraft Fabricated:	Plan ☐ Kit ☒	Prop./Rotor(s) Serial No.(s)	

III. MAJOR PORTION ELIGIBILITY STATMENT OF APPLICANT

I certify the aircraft identified in Section II above was fabricated and assembled by John Q. Amateur (Name of Person(s) (Please Print)) for my (their) education or recreation. I (we) have records to support this statement and will make them available to the FAA upon request.

— NOTICE —

Whoever in any matter within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals or covers up by any trick, scheme, or device a material fact, or who makes any false, fictitious or fraudulent statements or representations, or makes or uses any false writing or document knowing the same to contain any false, fictitious or fraudulent statement or entry, shall be fined not more than $10,000 or imprisoned not more than 5 years, or both (U.S. Code, Title 18, Sec. 1001.)

APPLICANT'S DECLARATION

I hereby certify that all statements and answers provided by me in this statement form are complete and true to the best of my knowledge, and I agree that they are to be considered part of the basis for issuance of any FAA certificate to me. I have also read and understand the Privacy Act statement that accompanies this form.

Signature of Applicant *(In Ink)*	Date
John Q. Amateur	3/16/88

IV. NOTARIZATION STATEMENT

THIS MUST BE NOTARIZED!

THIS PAGE IS ONLY A SAMPLE

Form Approved
O.M.B. No. 2120-0018

US Department of Transportation
Federal Aviation Administration

APPLICATION FOR AIRWORTHINESS CERTIFICATE

INSTRUCTIONS — Print or type. Do not write in shaded areas; these are for FAA use only. Submit original only to an authorized FAA Representative. If additional space is required, use an attachment. For special flight permits complete Sections II and VI or VII as applicable.

I. AIRCRAFT DESCRIPTION

1. REGISTRATION MARK N1234Y	2. AIRCRAFT BUILDER'S NAME *(Make)* John Q. Amateur	3. AIRCRAFT MODEL DESIGNATION RANS S-9	4. YR MFR 88	FAA CODING
5. AIRCRAFT SERIAL NO 1288054	6. ENGINE BUILDER'S NAME *(Make)* Rotax	7. ENGINE MODEL DESIGNATION 503		
8. NUMBER OF ENGINES 1	9. PROPELLER BUILDER'S NAME *(Make)* Sterba	10. PROPELLER MODEL DESIGNATION Wood 64 X 44	11. AIRCRAFT IS *(Check if applicable)* IMPORT	

II. CERTIFICATION REQUESTED

APPLICATION IS HEREBY MADE FOR: *(Check applicable items)*

A	1		STANDARD AIRWORTHINESS CERTIFICATE *(Indicate category)* — NORMAL / UTILITY / ACROBATIC / TRANSPORT / GLIDER / BALLOON
B		X	SPECIAL AIRWORTHINESS CERTIFICATE *(Check appropriate items)*

2		LIMITED			
5		PROVISIONAL *(Indicate class)*	1		CLASS I
			2		CLASS II
3		RESTRICTED *(Indicate operation(s) to be conducted)*	1		AGRICULTURE AND PEST CONTROL · 2 AERIAL SURVEYING · 3 AERIAL ADVERTISING
			4		FOREST *(Wildlife conservation)* · 5 PATROLLING · 6 WEATHER CONTROL
			7		CARRIAGE OF CARGO · 0 OTHER *(Specify)*
4	X	EXPERIMENTAL *(Indicate operation(s) to be conducted)*	1		RESEARCH AND DEVELOPMENT · 2 X AMATEUR BUILT · 3 EXHIBITION
			4		RACING · 5 CREW TRAINING · MKT SURVEY
			0		TO SHOW COMPLIANCE WITH FAR
8		SPECIAL FLIGHT PERMIT *(Indicate operation to be conducted, then complete Section VI or VII as applicable on reverse side)*	1		FERRY FLIGHT FOR REPAIRS, ALTERATIONS, MAINTENANCE OR STORAGE
			2		EVACUATE FROM AREA OF IMPENDING DANGER
			3		OPERATION IN EXCESS OF MAXIMUM CERTIFICATED TAKE-OFF WEIGHT
			4		DELIVERING OR EXPORT · 5 PRODUCTION FLIGHT TESTING
			6		CUSTOMER DEMONSTRATION FLIGHTS

C | 6 | MULTIPLE AIRWORTHINESS CERTIFICATE *(Check ABOVE "Restricted Operation" and "Standard" or "Limited," as applicable.)*

III. OWNER'S CERTIFICATION

A. REGISTERED OWNER *(As shown on certificate of aircraft registration)* — IF DEALER, CHECK HERE →

NAME	ADDRESS
John Q. Amateur	#1 Build-it Road Anytown, KS 67601

B. AIRCRAFT CERTIFICATION BASIS *(Check applicable blocks and complete items as indicated)*

AIRCRAFT SPECIFICATION OR TYPE CERTIFICATE DATA SHEET *(Give No. and Revision No.)*	AIRWORTHINESS DIRECTIVES *(Check if all applicable AD's complied with and give latest AD No.)*
AIRCRAFT LISTING *(Give page number(s))*	SUPPLEMENTAL TYPE CERTIFICATE *(List number of each STC incorporated)*

C. AIRCRAFT OPERATION AND MAINTENANCE RECORDS

CHECK IF RECORDS IN COMPLIANCE WITH FAR 91.173	TOTAL AIRFRAME HOURS	3 EXPERIMENTAL ONLY *(Enter hours flown since last certificate issued or renewed)* 0

D. CERTIFICATION — I hereby certify that I am the registered owner (or his agent) of the aircraft described above, that the aircraft is registered with the Federal Aviation Administration in accordance with Section 501 of the Federal Aviation Act of 1958, and applicable Federal Aviation Regulations, and that the aircraft has been inspected and is airworthy and eligible for the airworthiness certificate requested.

DATE OF APPLICATION	NAME AND TITLE *(Print or type)*	SIGNATURE
3/16/88	John Q. Amateur	John Q. Amateur

IV. INSPECTION AGENCY VERIFICATION

A. THE AIRCRAFT DESCRIBED ABOVE HAS BEEN INSPECTED AND FOUND AIRWORTHY BY *(Complete this section only if FAR 21.183(d) applies)*

2 FAR PART 121 OR 127 CERTIFICATE HOLDER *(Give Certificate No.)*	3 CERTIFICATED MECHANIC *(Give Certificate No.)*	6 CERTIFICATED REPAIR STATION *(Give Certificate No.)*
5 AIRCRAFT MANUFACTURER *(Give name of firm)*		

DATE	TITLE	SIGNATURE

V. FAA REPRESENTATIVE CERTIFICATION

(Check ALL applicable blocks in items A and B)

A. I find that the aircraft described in Section I or VII meets requirements for: THE CERTIFICATE REQUESTED / 4 AMENDMENT OR MODIFICATION OF CURRENT AIRWORTHINESS CERTIFICATE

B. Inspection for a special flight permit under Section VII was conducted by: FAA INSPECTOR / FAA DESIGNEE / CERTIFICATE HOLDER UNDER: FAR 65 / FAR 121, 127 or 135 / FAR 145

DATE	DISTRICT OFFICE	DESIGNEE'S SIGNATURE AND NO	FAA INSPECTOR'S SIGNATURE

THIS PAGE IS ONLY A SAMPLE

EAA Safety Check List

Spend some time with your plane and this check list before those first flights. Thirty minutes with a pencil here may be worth the rest of your life.

	Yes	No
PROPELLER		
1. Blades		
Laminations not separated?		
Breaks, scratches, nicks tipping?		
Loose rivets in tipping?		
Drain holes in tip clear?		
2. Hub		
Any cracks or corrosion?		
Hub properly seated and safetied?		
3. Control Mechanism		
Oil leaks?		
Worn bearings?		
Secure?		
4. Attachment		
All bolt & nut threads undamaged?		
All bolts & nuts secured & safetied?		
5. Spinner		
Cracks?		
Properly secured?		
Is spinner chafing into prop?		
ENGINE & ENGINE COMPARTMENT		
1. Fuel System		
All lines of approved type?		
All strainers clean?		
All lines secured against vibration?		
Gascolator bowl at low point in system when aircraft is in normal ground position?		
Fuel drains operative?		
All connections properly tightened?		
2. Oil System		
All lines of approved type?		
All lines secured against vibration?		
Oil tank has no cracks or leaks?		
Tank properly secured & safetied?		
All plugs & strainers cleaned & safetied?		
3. Ignition-Electrical System		
All wiring proper type and gauge?		
All fastenings secured & safetied?		
Magnetos properly grounded?		
Spark plugs cleaned & undamaged?		
Spark plugs properly torqued?		
Engine grounded to airframe?		
Starter/generator secured?		
4. Exhaust Manifold		
Secured and safetied?		
All gaskets in good condition?		
ENGINE & ENGINE COMPARTMENT		
All stacks in good condition-no cracks or rusted-out areas?		
Carb heat and cabin heat muffs removed and manifold inspected?		
5. Controls		
All secured and safetied?		
No excessive play in any linkages?		
No interference between any control and the structure throughout the full operating range?		
Carb heater gate open & close fully?		
6. Mount		
Secured and safetied?		
All joints inspected for cracks?		
Any bends in mount tubes?		
Bushings in good condition?		
7. Cowlings		
Secured and/or safetied?		
All latches or fastenings working properly?		
Any cracks properly checked or reinforced?		
Cowlings clean?		
8. Power Plant in General		
All necessary safeties, palnuts, locknuts, etc. in place?		
No fuel or oil leaks?		
All accessories secured & safetied?		
FUSELAGE-HULL		
1. Structure		
All welds sound?		
All tubing straight and uncracked?		
No rust or corrosion?		
All attach fittings sound, no cracks, elongation of holes or worn threads?		
All rivets properly installed?		
Inspection openings for all vital areas?		
Fuselage properly drained, that is, no built-in moisture traps?		
Firewall of proper fireproof material?		
2. Cover		
Properly attached?		
No tears, distortions, or abrasions?		
Any breaks or ruptures properly repaired?		
3. Control System		
Properly secured and safetied?		
Controls stops provided & adjusted?		
All fittings of proper thread & size?		
FUSELAGE-HULL		
All pulleys of proper diameter for bends, proper size for cable, and guarded?		
All cable of proper size (1/8" min) and condition?		
Any parts in system subject to rotation for any reason properly secured and safetied?		
Return springs on rudder pedals?		
No interference between any control part (cable, tube or linkage) and any other part of the structure throughout full control movement?		
Adequate room for full control throw when aircraft is occupied?		
Controls arranged to minimize danger of blocking by foreign objects?		
Grip properly secured to control stick or wheel?		
4. Electrical System		
All grommets, particularly in firewall, snug fitting and in good condition?		
All wires of proper gauge, insulated, and secured?		
Wires do not rest on abrasive surfaces?		
Battery installation of sufficient strength?		
Battery properly ventilated and drained?		
No corrosion at or around battery or its vents?		
Fuses of adequate amperage?		
5. Fuel System-Tanks		
Drains properly located to discharge clear of aircraft?		
All outlets properly screened?		
Breather inlets clear?		
Fuel shut-off valve installed?		
Fuel shut-off valve easily reached by pilot?		
All fuel lines of proper approved type?		
All fuel lines secured against vibration?		
Is tank located so that sufficient head is available in maximum climb with minimum fuel? Placard if necessary?		
Has tank sufficient expansion area?		
Any tank overflow discharge clear of hazardous areas on aircraft?		
Is tank support sufficient to meet strength requirements?		
Does tank clear surrounding structure?		
Do tank supports minimize strain and chafing?		

To insure its safe construction and operation, and to further emphasize the vital necessity for thorough consideration of every item which goes into your airplane, the following working check-list should be used, and it is suggested that it be made a part of the aircraft records.

	Yes	No
<u>**EXITS**</u> **1. Can aircraft be cleared rapidly in case of emergency?**		
Are special precautions available during test period, such as jettisonable doors or canopy?		
If parachute is to worn, does it clear all controls?		
Baggage Compartment **1. Are walls and floors of sufficient strength to withstand flight loads?**		
Can anything escape from baggage compartment by accident?		
Cabin-Cockpit **1. Instruments**		
Are all instruments functioning and accurate?		
Are all instruments marked, max pressures, temperatures, speeds?		
Are all vital instruments easily visible to pilot?		
2. Flight-Engine Controls Are all engine controls marked or easily identifiable?		
Are all engine controls smooth in operation, without excessive resistance, and easily available to pilot?		
Are all flight controls arranged so that jamming by dropped gloves, etc. is impossible?		
3. Fuel Systems Are all gas valves easily reached by pilot?		
Are all gas valves marked ON, OFF, LEFT, RIGHT?		
Are all gas valves in such a position that accidental operation is impossible or guarded in such a way that accidental operation is impossible?		
4. Seats Are seats of sufficient strength for maximum flight loads contemplated?		
Does seat "flex" enough at any time to interfere with flight controls?		
5. Safety Belts and Shoulder Harness Is installation and attachments of sufficient strength to meet 9G forward load minimum?		
Does attachment connect directly to primary structure?		
Are belts and harness in top condition?		
Is belt of correct size, that is, no long over-tongue?		
Is a separate belt and shoulder harness supplied for each occupant?		

	Yes	No
6. Heating-Ventilation Is cabin or cockpit in negative pressure area and liable to suck in exhaust fumes?		
Is any provision made for ventilating cabin other than normal leakage?		
7. Windshield-Windows Are windshield and windows of recognized aeronautical materials?		
Is windshield braced against positive or negative pressures in flight, either by design or extra bracing?		
<u>**WING-TAIL SURFACES**</u> **Fixed Surfaces** Are all interior fastenings secured and/or safetied?		
Is interior properly weatherproofed?		
Have any mice been inside lately?		
Movable Surfaces Are stops provided, either at wing or somewhere else in the control system?		
Are all hinges and brackets sound?		
Are all hinge pins secured and safetied?		
Is there any excessive play in hinges?		
Is there any excessive play in control cables or tubes?		
External Bracing Is the interior of all struts weather protected?		
Are all adjustable fittings locked, secured, and safetied?		
Are struts undamaged by bends or dents?		
Are all wires serviceable with proper end fittings?		
Attach Fittings Are bolts of proper size installed?		
Are all bolts secured and safetied?		
Have all bolts been examined for wear?		
Flight Control Mechanism All cables and tubes unbroken or unbent & with proper end fittings?		
All control attachments secured and safetied?		
All pulleys free from interference and guarded?		
All torque tubes and bell cranks in good condition?		
No interference with fuselage or wing structure throughout full control travel?		
Fuel Tanks **(See Fuselage Section Also)** Are drains supplied at low point in tank when aircraft is in normal ground position?		

	Yes	No
Fuel overflow drains clear of aircraft - no tendency for overflow to soak into aircraft structure?		
LANDING GEAR Properly lubricated?		
Proper oleo inflation?		
Shock cords or springs in good condition?		
All attach fittings uncracked and sound?		
All bolt holes not elongated?		
All attach bolts secured and safetied?		
Brake lines in good condition?		
Brakes operating properly?		
Correct hydraulic fluid in lines?		
Wheels uncracked?		
Tires unworn & properly inflated?		
Excessive side play in wheel bearings?		

GENERAL

ALL BOLTS WHEREVER POSSIBLE,
HEAD UP AND FORWARD.

All exterior fastenings visible from cockpit or cabin should have safetied end toward pilot, wherever possible.

A complete walkaround inspection of the aircraft should be accomplished to check that every bolt visible on the exterior is secured and safetied. That there is no visible structural damage. That all inspection panels and covers are in place and attached. That all parts of the aircraft are in proper alignment.

DON'T FORGET TO PUT IN ENOUGH GAS PRIOR TO THAT FIRST FLIGHT - GROUND RUNNING AND TAXI TESTS CAN USE UP A LOT MORE THAN YOU THINK!

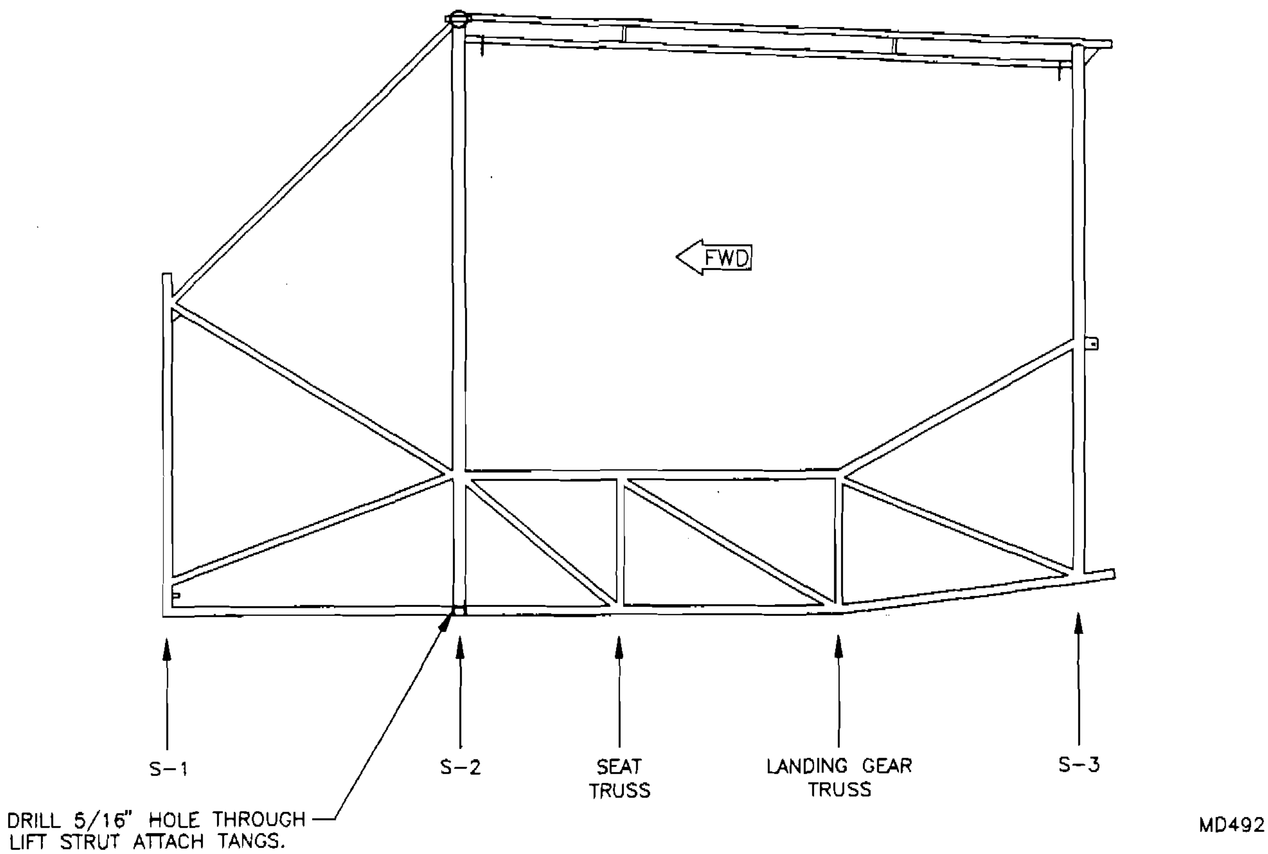
OK - Kick the tires, add another coat of paint and AWAY WE GO!

RANS S-6S COYOTE II FUSELAGE ASSEMBLY

1. The fuselage comes pre-welded and powder coated, ready for assembly. Attaching nut plates to the various tabs is the only assembly required. The exact location of these nut plates will be called out where applicable.

2. Inspect the forward strut attach tangs at the lower S-2 location. (See **Figure 01-02**). These should be drilled 5/16".

FIGURE 01-02



3. Before proceeding to the next section inspect the fuselage cage for damage.

4. The fuselage tailcone assembly will be completed after subassembly of the following sections.

S-6S COYOTE II

TRIKE - MAIN GEAR ASSEMBLY

NOTE: *Setting the toe-in on the main gear requires the nose wheel to be installed.*

1. From the parts drawing and list collect the required components for the main gear assembly. It is easier to fit and drill the gear legs before the fuselage fabric covering is applied.

2. Place the fuselage on a set of sawhorses, or other suitable work surface. Mark a ring on the top of the gear leg per **FIGURE 02-02-TRIKE**. Install the gear legs with the fuselage in its upright position. Slide each gear leg into the sockets on the fuselage until the marked ring centers in the upper pre-drilled hole in the gear leg socket. See **FIGURE 02-02-TRIKE**. ***IMPORTANT:*** *The gear legs must be centered on the marked hole in their socket.* It may be necessary to slightly ream the inside of the socket to allow the gear leg to fully insert. It's also acceptable to lightly sand the upper portion of the gear leg (spinning the end of the gear leg over a disk sander works well). Both gear legs should measure equal length from a common point on the fuselage. See **FIGURE 02-02A-TRIKE**.

FIGURE 02-02-TRIKE

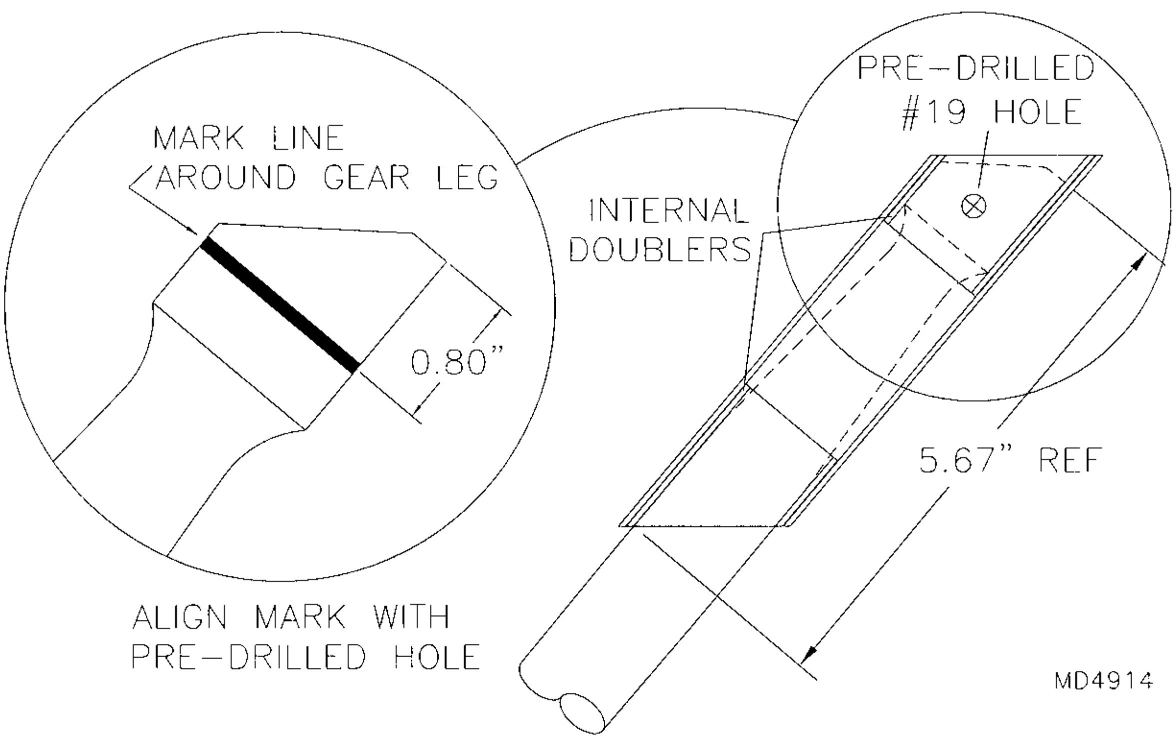
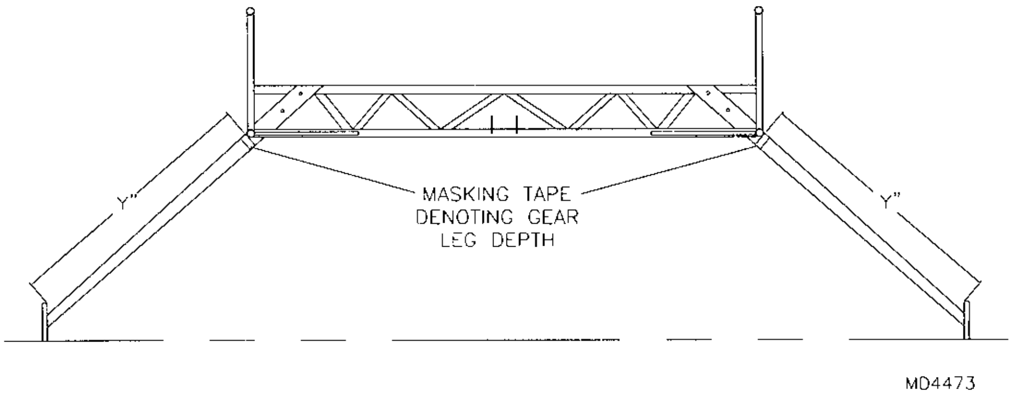
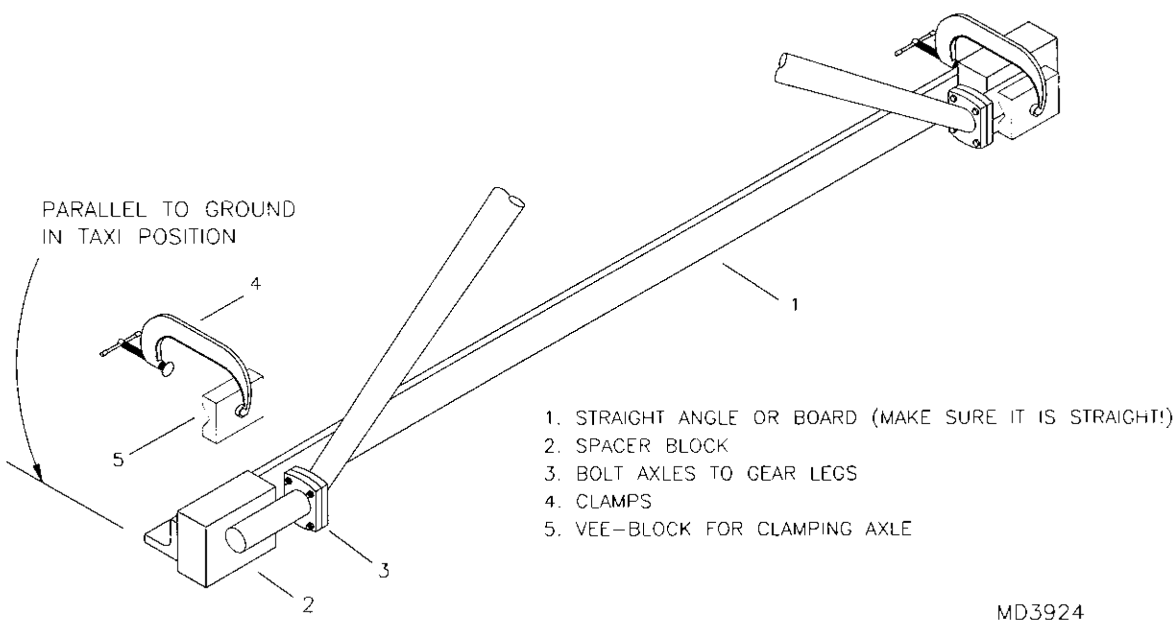


FIGURE 02-02A-TRIKE



3. Assemble the axles to the gear leg assembly. With gear legs properly inserted, set axles straight by fabricating the alignment jig shown in **FIGURE 02-03-TRIKE**. ***NOTE:*** *Aligning the gear legs requires the fuselage to be in the taxi position.* ***HINT:*** *Temporarily install the wheels and block the fuselage to the same height, then remove the wheels for setting the gear.*

FIGURE 02-03-TRIKE



4. With the gear legs properly set, use the upper pre-drilled hole in the fuselage socket as a drill guide. Drill #19 from the front side to mark each gear leg. *IMPORTANT: Do **NOT** drill through.* A 90° drill attachment may be helpful.

5. Remove the gear leg, drill #19 in a drill press with a V-Block. ***NOTE:*** *Use a slow speed and plenty of cutting fluid to keep the metal cool.* Drill #11 in the drill press.

6. Re-insert the gear leg into the fuselage socket and align the holes. ***HINT:*** *Re-lock in place with the alignment jig.* Transfer drill #11 completely through the gear leg socket and gear leg.

7. Transfer drill with the supplied 6.2 mm drill bit.

8. Ream with the supplied 0.249" ream. ***IMPORTANT:*** *Run the ream from front to back. It is recommended to run the ream completely through. Do **NOT** pull the ream back forward.*

9. The gear legs are final installed after the fuselage is covered and painted.

10. Install the gear legs using the hardware called out in the parts drawing. The wheel axles should be 90° to the aircraft centerline. If not it is possible to shim between axle and gear leg plate to correct alignment.

11. Camber (the leaning of the top of the tire) can also be adjusted by inserting a couple washers between the top of the axle and gear leg plate.

12. Bolt caliper mount, fairing mount bracket and axle to the gear leg assembly as per parts drawing. Assemble the wheel and brake kit as per parts manual and manufacturer's instructions. With the aircraft in a level attitude the brake assembly will be orientated to the aft and slightly downward. ***CAUTION:*** *Be sure to safety wire the bolts holding the brake disk.* The tire pressure should be approximate 25 psi. To install the wheel assembly, the outer brake pad removes via the 1/4" retainer bolts. Loctite and safety wire these bolts in final assembly.

13. Clean and pack the tapered wheel bearings. The tapered roller bearings are oiled from the factory for rust prevention, but not greased. The roller bearings should be cleaned, dried and then packed with suitable grease. Packing grease without first removing the oil will dilute the wheel grease, causing it to run out past the seal and not lubricate properly.

14. Slip the bearings and wheel / tire assembly back onto the axle. Install the castle nut and washer. Tighten the castle nut to manufactures specifications or bearing failure may result. Secure with the large cotter pin. Wrap Teflon tape on the threads of the brake fitting and install the fitting into the caliper. The fitting should face forward. At this point it is suggested to test fit the gear leg fairings so that they are ready for paint.

IMPORTANT INFORMATION: MATCO mfg wheels using tapered roller bearings are equipped with Timken bearings utilizing integrated grease seals on the bearing cone to ensure the longest possible life. The torqueing procedure for bearings with these type seals is different than for tapered roller bearings without them. A common torqueing technique for bearings *without integrated seals* is to tighten the axle nut until the wheel stops spinning freely and then back off to the nearest locking feature. THIS TECHNIQUE WILL NOT WORK ON A BEARING WITH AN INTEGRATED SEAL. The reason for a different torqueing technique is that the grease seal produces some drag and makes the wheel feel somewhat stiff when rotated. Reducing the axle nut torque until the wheel spins freely will allow the grease seal and the bearing cone to improperly rotate with the wheel (the cone must not rotate relative to the axle). The higher rolling drag is completely normal for this bearing and allows for longer bearing life since the seal will keep most contaminants out. Timken specification state, for example, that the two 1.25 inch tapered roller bearing used on the WE51 will produce 18-26 inch pounds of torque (drag) when properly installed. A light coating of grease on the seal will help reduce the drag on initial installation. The drag will also reduce after the bearings have been installed and the seal relaxes in the bore. It is important that the axle nut torque be sufficient to keep the seal from rotating with the wheel. With the bearings cleaned, dried, greased, and inserted in the wheel, the axle nut should be tightened until all play is out of the assembly. Rotate the wheel back and forth while tightening the nut to help seat the bearings. When all play is out of the assembly, and the wheel rotates freely, tighten to the next castle slot and insert the cotter pin. The rubber seal on the tapered roller bearing will remain stationary while the wheel rotates around it. If the seal is spinning on the axle, the nut should be tightened further until the seal stops spinning with the wheel.

S-6S COYOTE II

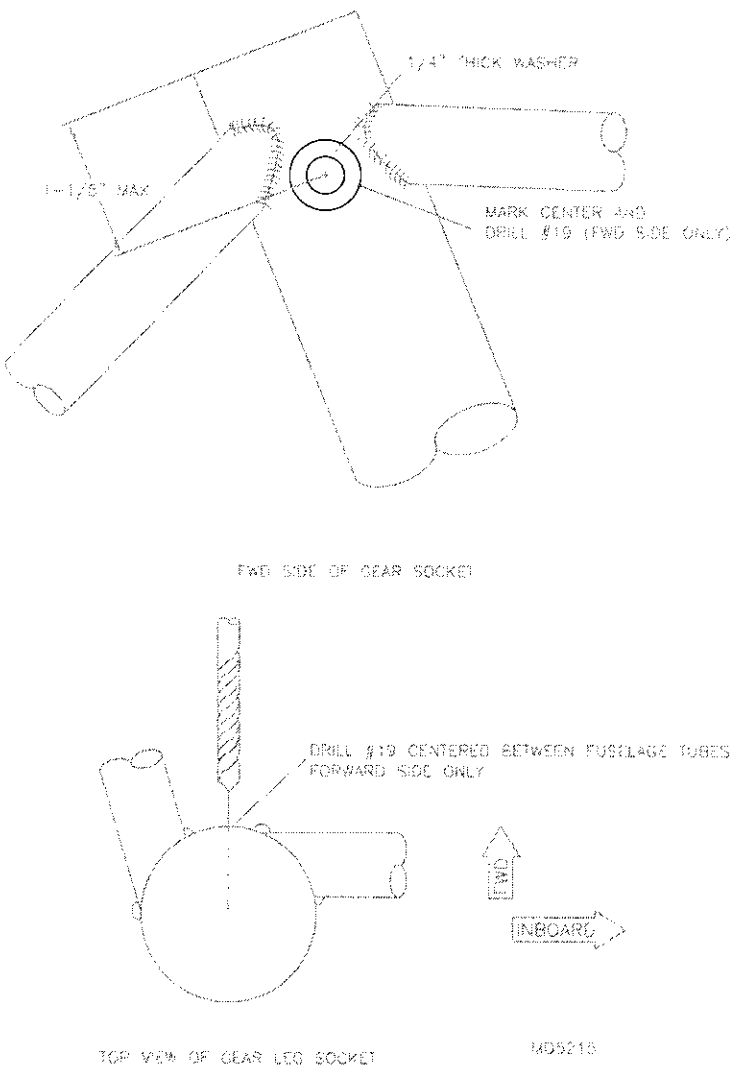
TAILDRAGGER - MAIN GEAR ASSEMBLY

NOTE: *Setting the toe-in on the main gear requires the tail wheel to be installed.* Set the gear after the tail cone and tail wheel have been assembled.

1. From the parts drawing and list collect the required components for the main gear assembly. It is easier to fit and drill the gear legs before the fuselage fabric covering is applied.

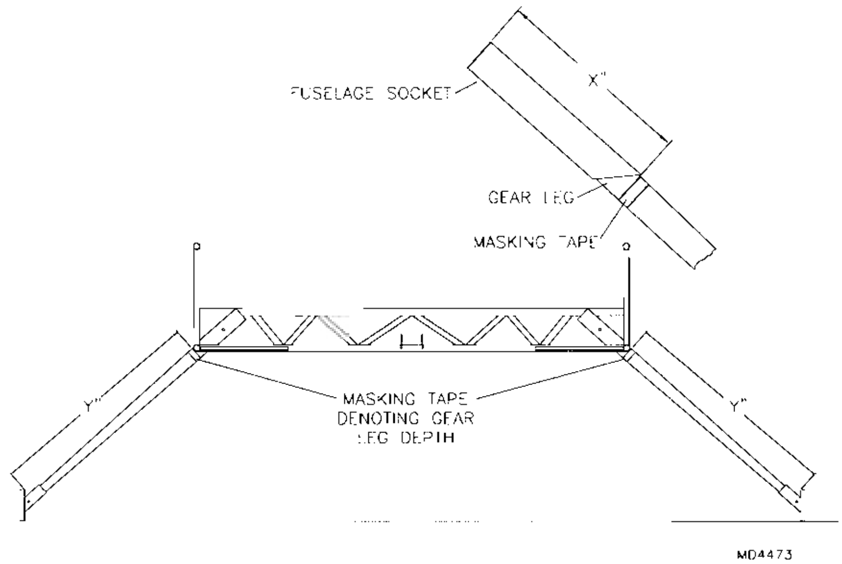
2. Place the fuselage on a set of sawhorses, or other suitable work surface. Measure down on the forward side of each gear leg socket per **FIGURE 02-02-TAILDRAGGER**. Mark and drill #19 through the forward side only. ***IMPORTANT:*** *Make sure the bolt head and washer clears the welds.* ***HINT:*** *Lay a 1/4" Thick Washer between the welds and mark the center.* Deburr inside of the socket.

FIGURE 02-02-TAILDRAGGER



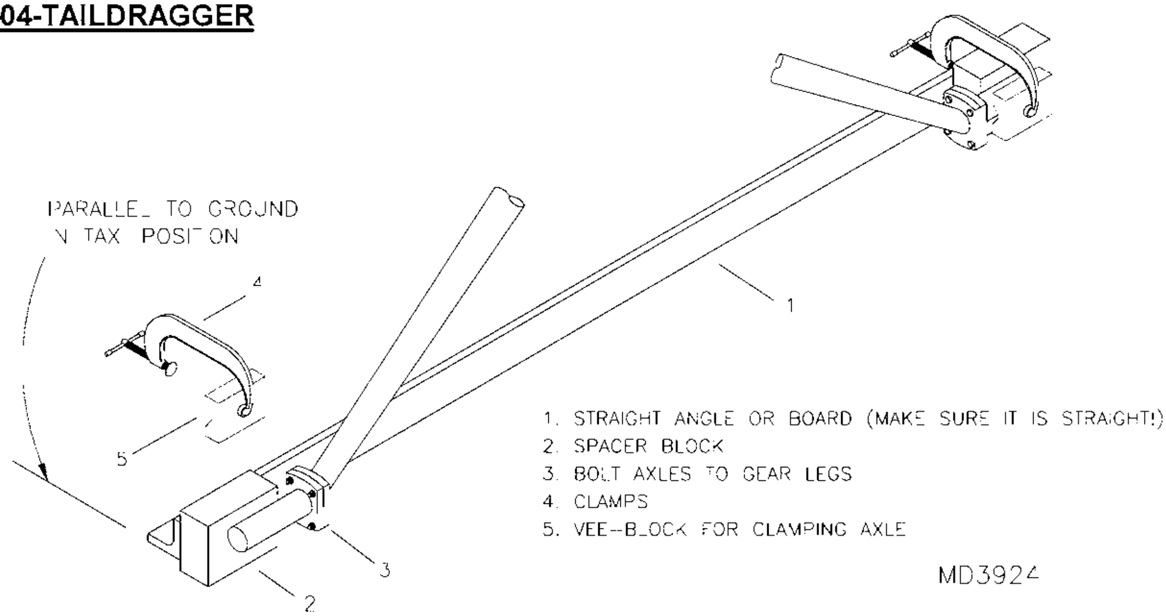
3. Measure the depth of each gear leg socket in the fuselage. Transfer this measurement to the top of each gear leg and mark with a piece of masking tape. Install the gear legs with the fuselage in its upright position. Slide each gear leg into the sockets on the fuselage until the tape on the gear leg is flush with the socket. ***IMPORTANT:*** *The gear legs must be completely bottomed in their socket.* It may be necessary to slightly ream the inside of the socket to allow the gear leg to fully insert. It's also acceptable to lightly sand the upper portion of the gear leg (spinning the end of the gear leg over a disk sander works well). Both gear legs should measure equal length from a common point on the fuselage. See **FIGURE 02-03-TAILDRAGGER**. If adjustments need to be made to gear leg length, remove material from the top of the longer gear leg.

FIGURE 02-03-TAILDRAGGER



4. Assemble the axles to the gear leg assembly. With gear legs properly inserted, set axles straight by fabricating the alignment jig shown in **FIGURE 02-04-TAILDRAGGER**. ***NOTE:*** *Aligning the gear legs requires the fuselage to be in the taxi position.* ***HINT:*** *Temporarily install the wheels and block the fuselage to the same height, then remove the wheels for setting the gear.*

FIGURE 02-04-TAILDRAGGER



5. With the gear legs properly set, use the previously drilled hole in the fuselage socket as a drill guide. Drill #19 from each side to mark each gear leg (Do **NOT** drill through). A 90° drill attachment will be required.

6. Remove the gear leg, drill #19 in a drill press with a V-Block. ***NOTE:*** *Use a slow speed and plenty of cutting fluid to keep the metal cool.* Drill #11 in the drill press.

7. Re-insert the gear leg into the fuselage socket and align the holes. ***HINT:*** *Re-lock in place with the alignment jig.* Transfer drill #11 completely through the gear leg socket and gear leg.

8. Transfer drill with the supplied 6.2 mm drill bit.

9. Ream with the supplied 0.249" ream. ***IMPORTANT:*** *Run the ream from front to back. It is recommended to run the ream completely through. Do* ***NOT*** *pull the ream back forward.*

10. The gear legs are final installed after the fuselage is covered and painted.

11. Install the gear legs using the hardware called out in the parts drawing. The wheel axles should be 90° to the aircraft centerline. If not it is possible to shim between axle and gear leg plate to correct alignment.

12. Camber (the leaning of the top of the tire) can also be adjusted by inserting a couple washers between the top of the axle and gear leg plate.

13. Bolt caliper mount, fairing mount bracket and axle to the gear leg assembly as per parts drawing. Assemble the wheel and brake kit as per parts manual and manufacturer's instructions. With the aircraft in a level attitude the brake assembly will be orientated to the aft and slightly downward. ***CAUTION:*** *Be sure to safety wire the bolts holding the brake disk.* The tire pressure should be approximate 25 psi. To install wheel assembly, the outer brake pad removes via the 1/4" retainer bolts. Loctite and safety wire these bolts in final assembly.

14. Clean and pack the tapered wheel bearings. The tapered roller bearings are oiled from the factory for rust prevention, but not greased. The roller bearings should be cleaned, dried, and then packed with suitable grease. Packing grease without first removing the oil will dilute the wheel grease, causing it to run out past the seal and not lubricate properly.

15. Slip the bearings and wheel / tire assembly back onto the axle. Install the castle nut and washer. Tighten the castle nut to manufactures specifications or bearing failure may result. Secure with the large cotter pin. Wrap Teflon tape on the threads of the brake fitting and install the fitting into the caliper. The fitting should face forward. At this point it is suggested to test fit the gear leg fairings so that they are ready for paint.

IMPORTANT INFORMATION: MATCO mfg wheels using tapered roller bearings are equipped with Timken bearings utilizing integrated grease seals on the bearing cone to ensure the longest possible life. The torqueing procedure for bearings with these type seals is different than for tapered roller bearings without them. A common torqueing technique for bearings *without integrated seals* is to tighten the axle nut until the wheel stops spinning freely and then back off to the nearest locking feature. THIS TECHNIQUE WILL NOT WORK ON A BEARING WITH AN INTEGRATED SEAL. The reason for a different torqueing technique is that the grease seal produces some drag and makes the wheel feel somewhat stiff when rotated. Reducing the axle nut torque until the wheel spins freely will allow the grease seal and the bearing cone to improperly rotate with the wheel (the cone must not rotate relative to the axle). The higher rolling drag is completely normal for this bearing and allows for longer bearing life since the seal will keep most contaminants out. Timken specification state, for example, that the two 1.25 inch tapered roller bearing used on the WE51 will produce 18-26 inch pounds of torque (drag) when properly installed. A light coating of grease on the seal will help reduce the drag on initial installation. The drag will also reduce after the bearings have been installed and the seal relaxes in the bore. It is important that the axle nut torque be sufficient to keep the seal from rotating with the wheel. With the bearings cleaned, dried, greased, and inserted in the wheel, the axle nut should be tightened until all play is out of the assembly. Rotate the wheel back and forth while tightening the nut to help seat the bearings. When all play is out of the assembly, and the wheel rotates freely, tighten to the next castle slot and insert the cotter pin. The rubber seal on the tapered roller bearing will remain stationary while the wheel rotates around it. If the seal is spinning on the axle, the nut should be tightened further until the seal stops spinning with the wheel.

S-6S COYOTE II

MAIN GEAR LEG FAIRINGS

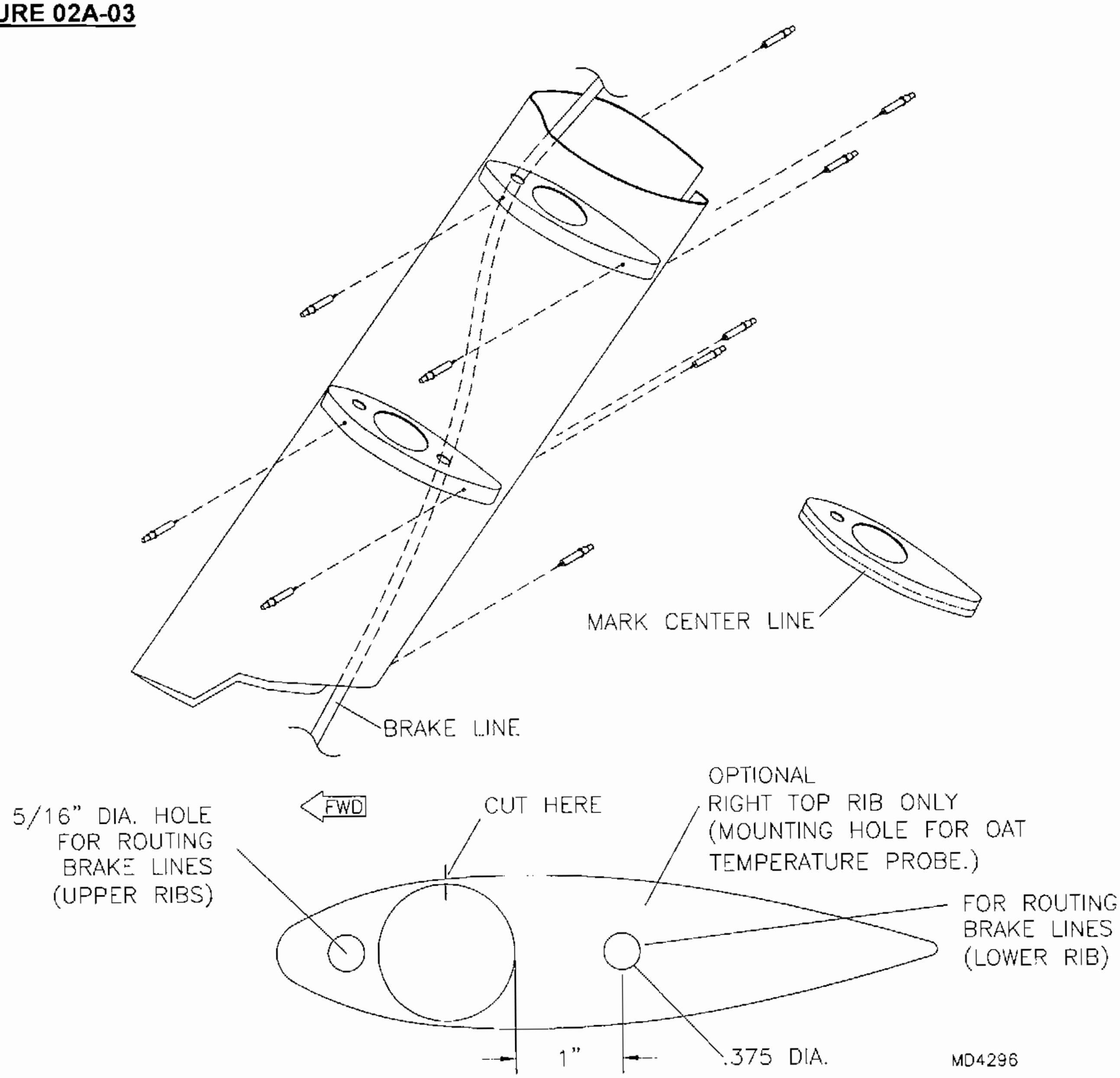
NOTE: *Gear leg fairings may be fit up after the aircraft skin is in place. Some trimming may be required.*

1. From the parts drawing and list collect the required components.

2. Bolt the Main Gear Fairing Lower Bracket to the top inboard side of the Axle Socket. Bend the bracket to align with the gear leg.

3. Trim the fairing ribs and drill per **FIGURE 02A-03**. Mark centerline, forward to aft, on each side of the rib. Insert the rib into the fairing, flange down. Align the centerline mark on the pre-drilled fairing holes. Transfer drill #40 and cleco. Mark ribs LH and RH. Transfer drill #40 the fairing trailing edge and cleco.

FIGURE 02A-03



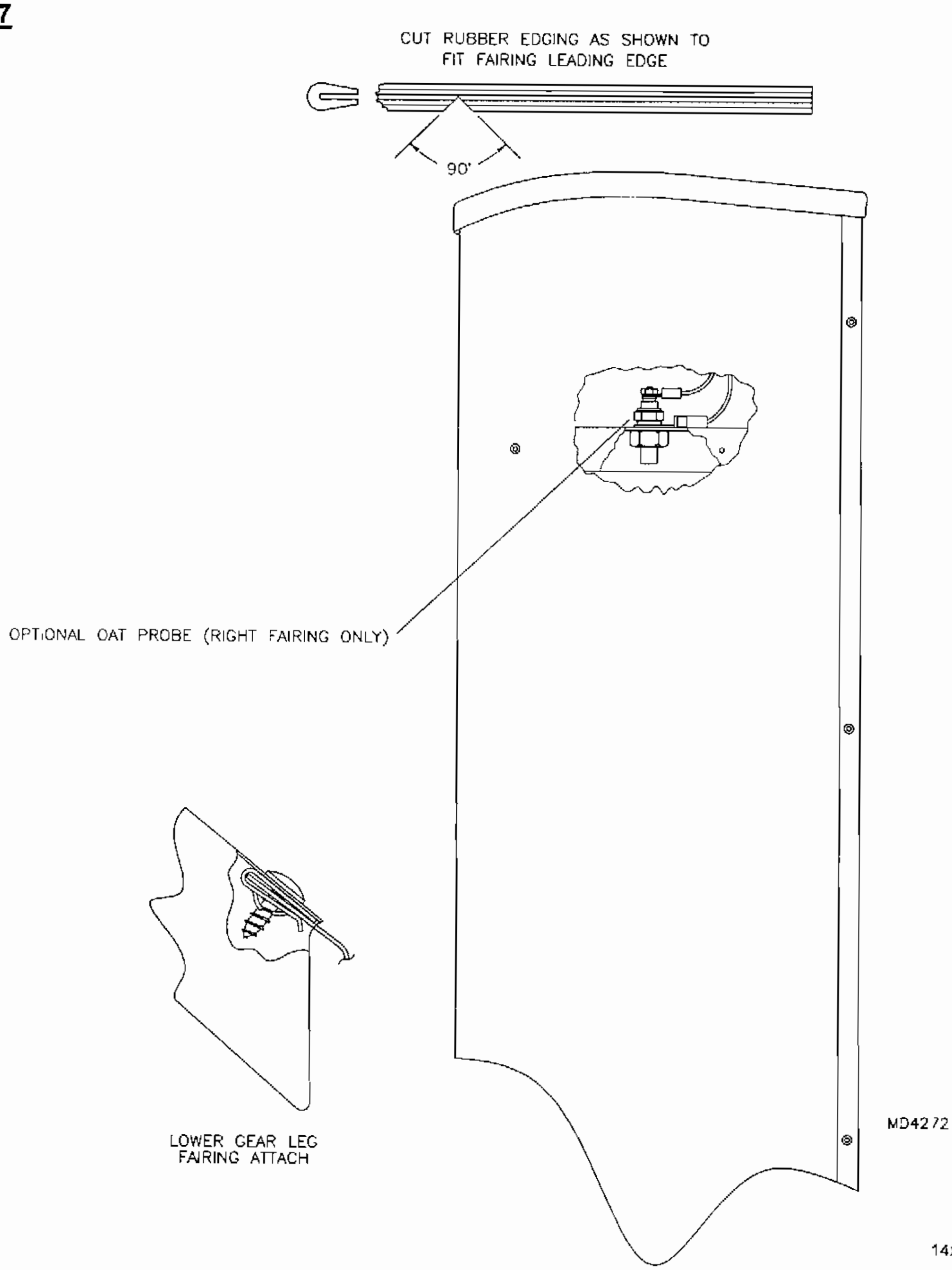
4. Cut the ribs on the inboard side to allow them to slip over the gear leg. Gently twist to open and slip over the gear leg. Fit the fairing over the gear leg and ribs. Cleco the outboard side of the ribs to the fairing. Fold the fairing together and cleco. Slip the fairing over the Lower Fairing Bracket. Be sure the fairing is aligned with the aircraft belly and slipstream. Trim as required for a tight fit.

5. Drill #11 and cleco the fairing to the Lower Fairing Bracket. ***HINT:*** *Use a hole finder or mark the holes from the underside.* Remove the fairing. Install tinnermans in the fairing bracket holes.

6. Rivet the outboard side of the ribs to the fairing. Do **NOT** rivet the inboard side or the trailing edge of the fairing at this time. Remove fairings and paint to match your aircraft.

7. Cut the rubber edging to fit as shown and super glue it to the top edge of the fairing. Refer to **FIGURE 02A-07**. Slip the fairing with ribs installed over the gear leg. Route the brake line through the forward rib hole in the top rib and the aft hole in the lower rib. ***IMPORTANT:*** *Slide a short length of anti-chafe (blue or clear fuel line) over the hydraulic brake line where it exits the bottom of the fairing.* Install the gear leg fairings. Rivet the trailing edge and attach fairings to brackets with pan head screws.

FIGURE 02A-07



S-6S COYOTE II OPTIONAL MAIN WHEEL PANT INSTALLATION

1. Press the Axle Extender into the axle until bottomed on the Axle Extender shoulder. Drill #30 through the extender using the pre-drilled axle holes as a guide. Complete Wheel and Brake assembly.

2. Make a template as shown in **Figure 02B-02** from poster board to mark the bottom hole for wheel clearance. Locate the hole 5 1/2" aft of the forward nose of the wheel pant as shown in **Figure 02B-02A.** Do not use the dimple molded into the wheel pant for hole location.

FIGURE 02B-02

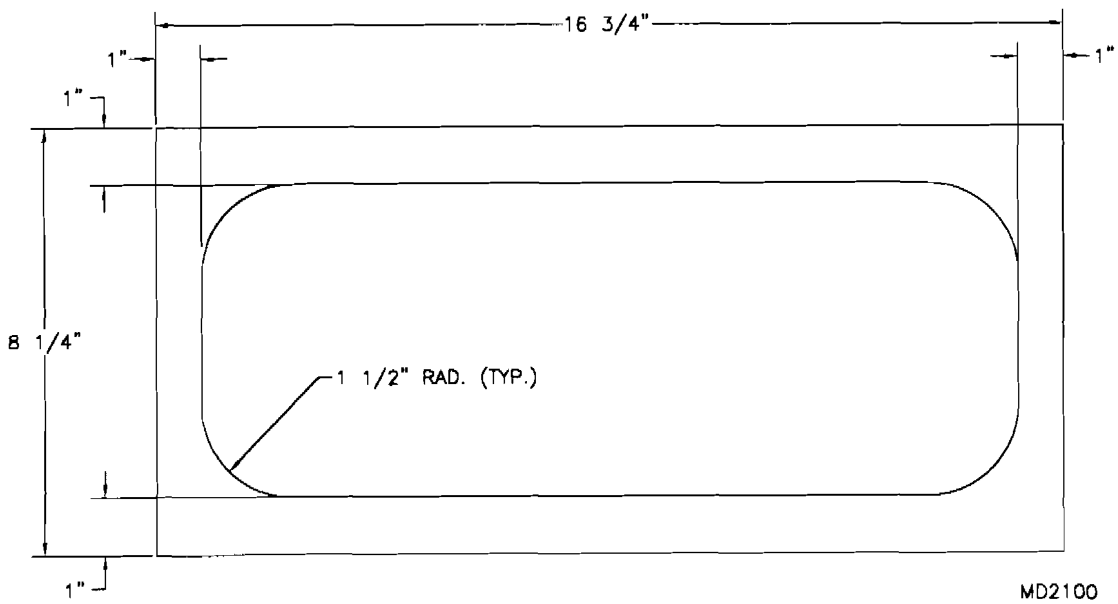
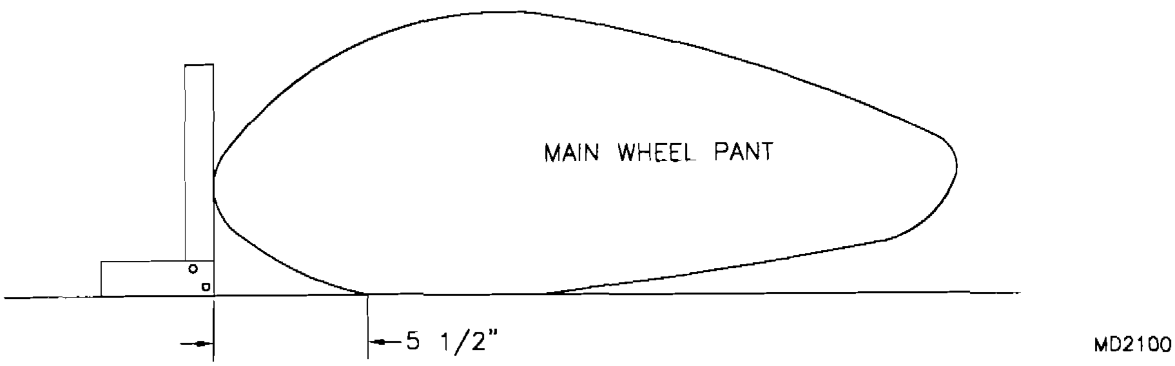
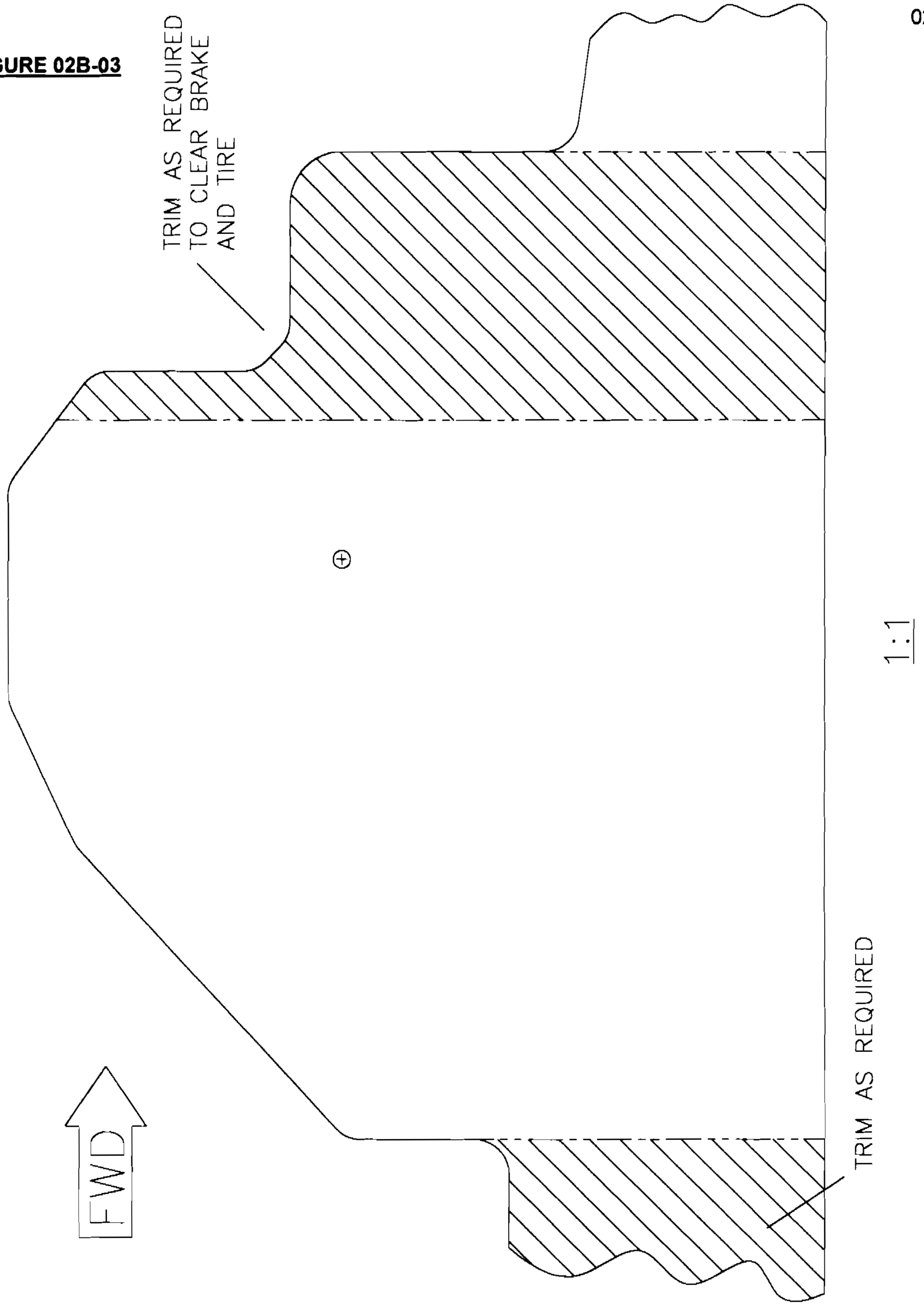


FIGURE 02B-02A



3. Make a template out of poster board as shown in **Figure 02B-03** for the brake cutout. The location of center should be 1/2" directly below the dimple on the wheel pant. Mark the wheel pant using the template. Remove the material using a fine blade jigsaw. **BE SURE** to make a right and a left wheel pant. The bolt hole on the outside of the wheel pant should also be 1/2" directly below the dimple on the wheel pant. Drill the outside hole to #11. If no dimple is present, locate the wheel pant with 3/4" to 1" clearance from the top of the tire. **HINT:** Place a small wood block on top of the wheel. Be sure the wheel is centered in the opening.

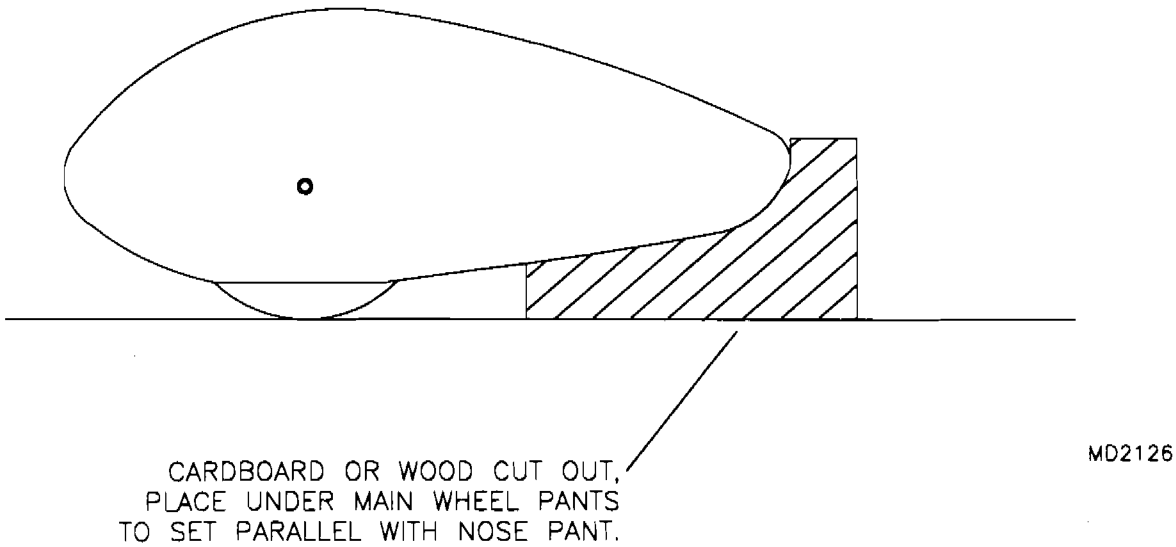
FIGURE 02B-03



The main gear wheel pants will need to be leveled with the nose wheel pant. Set aside the main gear wheel pants until installation of nose gear pant is complete.

4. Slip main wheel pants into position. With the bolt and washer in the outside hole, position main wheel pants parallel with nose wheel pant and mark the two inside attach holes using the tabs on the wheel pant mount plate as guides. See fixture idea in **FIGURE 02B-04.** Drill #11 and install hardware as shown in parts manual

FIGURE 02B-04



5. Install the nut plates to the outboard side of the tabs with the rivet heads to the inside. Slip the wheel pant over the wheel, spreading it enough to slip OVER the tabs. Install the bolts to check fit. Remove, sand and paint to match.

6. Final installation of the wheel pant requires blue Loctite on the axle bolts. Inspect the wheel pants for loose bolts every pre-flight.

S-6S COYOTE II NOSE GEAR ASSEMBLY

NOTE: Keep fuselage upside down for nose gear assembly. If you have purchased optional nose gear shimmy dampener or nose gear disconnect, refer to those sections during installation of the nose gear.

1. Select all the parts for the nose gear except for the steering linkage. This will be assembled during the rudder pedal installation.

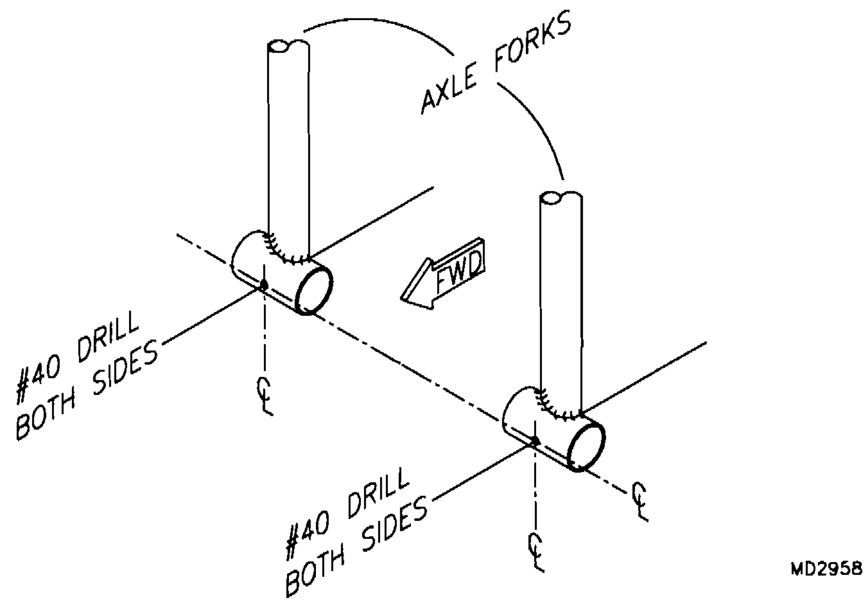
2. Apply a thin film of grease to the nose gear strut.

3. Pack and grease the thrust bearing and washer assembly and install on the nose gear strut. Slip the nose gear strut into the lower swivel bushing on the fuselage and install the stop ring and steering horn. Push the strut until it inserts into the top swivel bushing and bottoms out on the bearing assembly. Do not bolt the steer horn in place at this time. **NOTE:** Some filing or reaming of the fuselage bushings may be required to allow insertion and free rotation of the nose gear. However, it is important to not ream any more then necessary. Nose gear shimmy may result.

4. Locate the center of each axle bushing on the nose gear fork. Drill a #40 hole through the bushings on center line. See **FIGURE 03-04**.

Refer to the brake section and mount the tire onto the nose wheel. Install the wheel/tire assembly into the nose fork by first checking axle insertion into the hub bearings. If the axle will not slide into the wheel, spin sand it on a belt or disc sander. Install the axle with the aluminum bushings on each side. Note that the bushings may need to be filed to fit. Using a #40 drill bit, transfer drill through the pre drilled holes in the axle bushings on the fork through the axle and install the cotter pins to retain the axle.

FIGURE 03-04



5. Turn the fuselage right side up. Push the strut so that the thrust bearing and washers are tight against the lower swivel bushing. Push down the stop ring and steer horn. View the top of the fork and steer horn from above. Line the tabs on the horn parallel with the fork and drill through from each side of the steer horn with a #11 drill bit and bolt in place.

6. While rotating the nose column, lube the swivel bushings with a quality grease. This will be required at least every 12 months under normal operations. Disassemble, clean and re-lube the spring every 12 months or as required. To service, weight tail and tie with the nosewheel off the ground. Remove, clean and re-assemble. Use weight of aircraft to depress spring for bolt insertion. Inspect bolt every pre-flight for wear. Replace if the bolt shows signs of "grooving".

S-6S TRIKE OPTIONAL NOSE GEAR SHIMMY DAMPENER

NOTE: It is important to maintain tight hole tolerances in the installation of the shimmy dampener. The effectiveness of the dampener will be compromised if any play exists within the system. The nose gear must be completely installed prior to installing the shimmy dampener. Refer to the nose gear installation section.

1. Locate and drill the #11 attach holes in the dampener horn as shown in **FIGURE 03-01**. Position the horn on the nose gear strut 4 1/2" up from the top edge of the nose gear steer horn to the tab on the shimmy dampener horn with the tab pointing forward. See **FIGURE 03-01A**. Holding the horn parallel to the centerline of the fuselage, transfer drill through the attach holes in the horn into the nose gear strut. Bolt the horn to the strut.

FIGURE 03-01

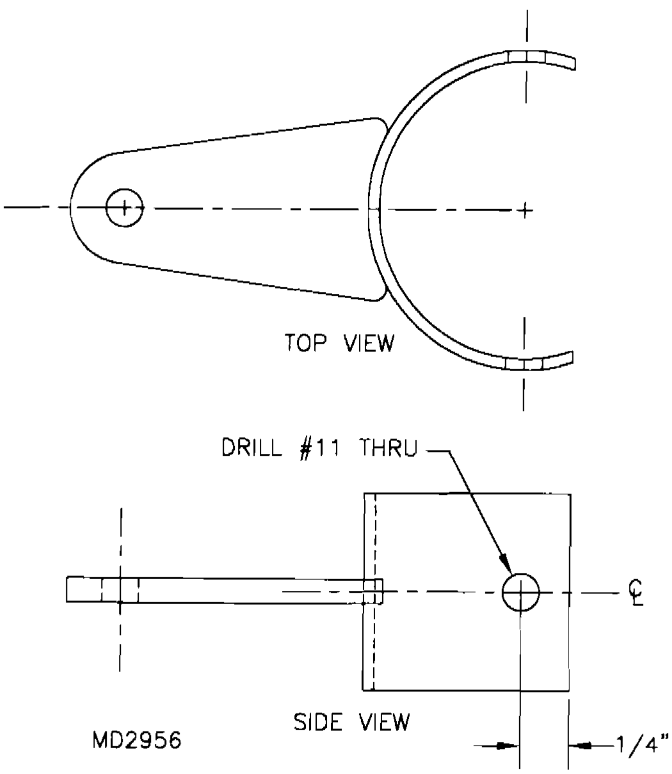
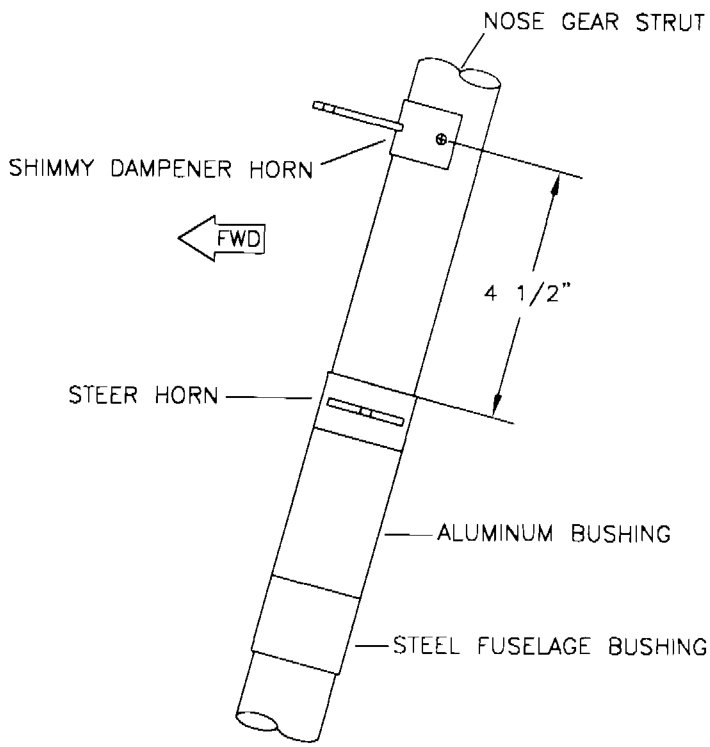


FIGURE 03-01A



2. Install the jam nut and clevis onto the piston of the shimmy dampener. Thread the clevis on as far as possible and tighten the jam nut. Refer to the parts drawing. Attach dampener to the horn tab. The dampener should extend to the left of the strut.

3. Drill out both holes in the shimmy dampener mount to #11. Temporarily attach the mount to the dampener. With the dampener level, extend the dampener to the point that the slot in the mount will fit around the left hand diagonal brace tube in station 1. With the dampener and mount in position, mark the outboard hole location of the mount onto the firewall. Remove the mount from the dampener and using the mount as a guide, mark the inboard hole location on the firewall. Drill both holes in the firewall to #11.

4. Drill out both holes in the shimmy dampener backing plate to #11 and pre drill the nut plate holes. Do not rivet the nut plates to the backing plate at this time. Position the backing plate on the forward side of the firewall so that the holes in the backing plate line up with the holes in the firewall. Temporarily install two bolts into the holes to maintain alignment. Using a #40 bit and the nut plate mount holes as a guide, transfer drill through the backing plate into the firewall. Rivet the nut plates to the forward side of the backing plate/ firewall. Note the direction of the rivets used to secure the nut plates. Refer to the parts drawing.

5. Bolt the mount to the aft side of the firewall. Bolt the shimmy dampener to the mount with the plastic washers between the mount and the dampener.

S-6S OPTIONAL NOSE GEAR DISCONNECT

NOTE: *Cabin floorboard must be in place prior to installation of optional nose gear disconnect; refer to FLOORBOARD & RUDDER PEDAL INSTALLATION section.* To assemble nose wheel, fork, and strut, refer to NOSE GEAR ASSEMBLY section.

1. Place locking cam over swivel bushing on floorboard; if necessary, remove inside powdercoat or grind locking cam to fit. Make certain locking cam is oriented with attach tangs at right angles to aircraft longitudinal axis and vertical tab forward, as per parts drawing. Locate holes on floorboard through attach tangs. ***CAUTION:*** *Location is critical, as holes will be drilled immediately adjacent to steel tubes under floorboard.*

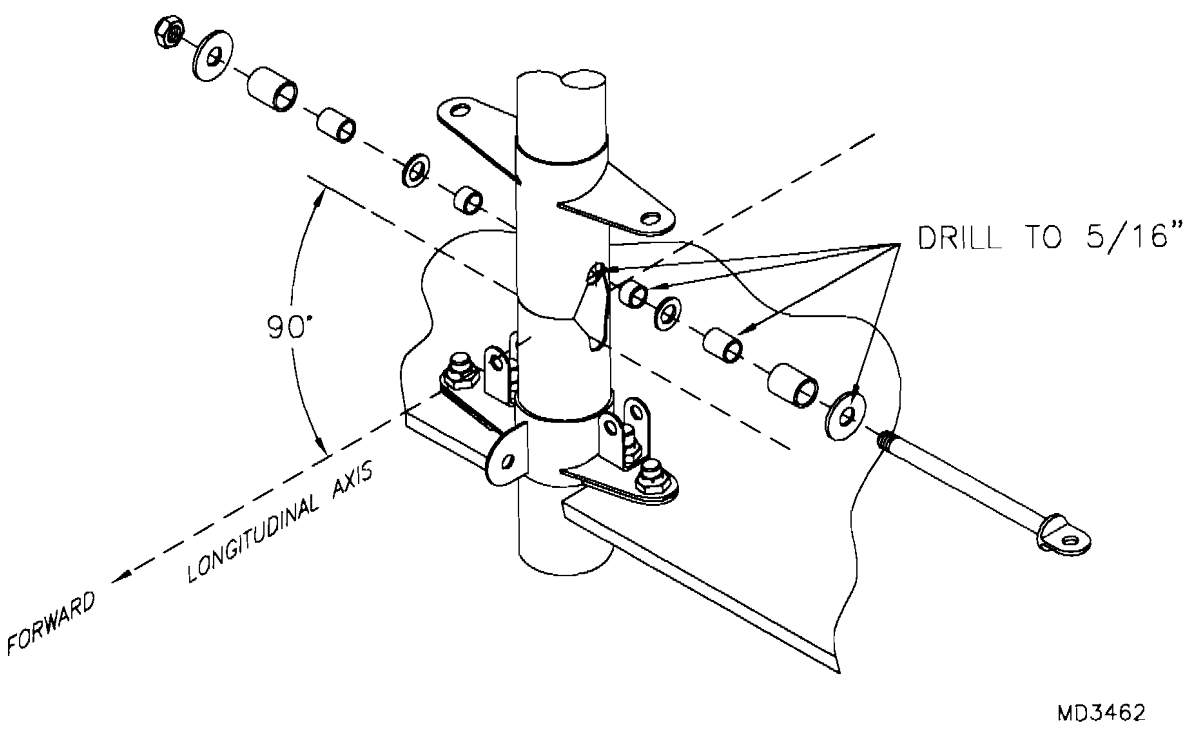
2. Using a #11 bit, transfer drill holes through floorboard, making certain to avoid steel tubes. Secure locking cam to floorboard, as per parts drawing. ***NOTE:*** *Steel tubes will be sandwiched between floorboard and lower aluminum shims.*

3. Attach Keep Rod as per parts drawing. Keep Rod ensures proper distribution of nose gear loads.

4. Apply grease to nose gear strut. With thrust bearing and washers in place, slide strut through locking cam, steer cam and nose gear sleeve, into top swivel bushing, as per parts drawing. Check for binding; strut should slide and rotate smoothly and easily at all points and be free of play. If binding occurs at locking cam, loosen hardware and adjust alignment. If binding persists, remove strut and grind bushing or cams as necessary; grease as required.

5. Cut 3/8" and 1/2" bushings from raw stock. Drill 3/8" steel bushings to 5/16". With nose gear strut seated against bearing and bearing washers, locate and drill 5/16" holes through both sides of strut, centered on apexes of steering cam cutouts, through which eye bolt will mount. See **FIGURE 03-05**. ***HINT:*** *Place the 3/8" steel bushing tight in the steer cam and use as a drill guide to mark the gear strut.* Remove gear strut and drill in a drill press to assure a tight fit. ***IMPORTANT:*** *Location is critical; be certain nose gear is straight (wheel axis must be perpendicular to aircraft longitudinal axis) when locating holes.* During ground operation, steering cam will rest on the steel bushing on the eyebolt, transmitting steering inputs from rudder pedals.

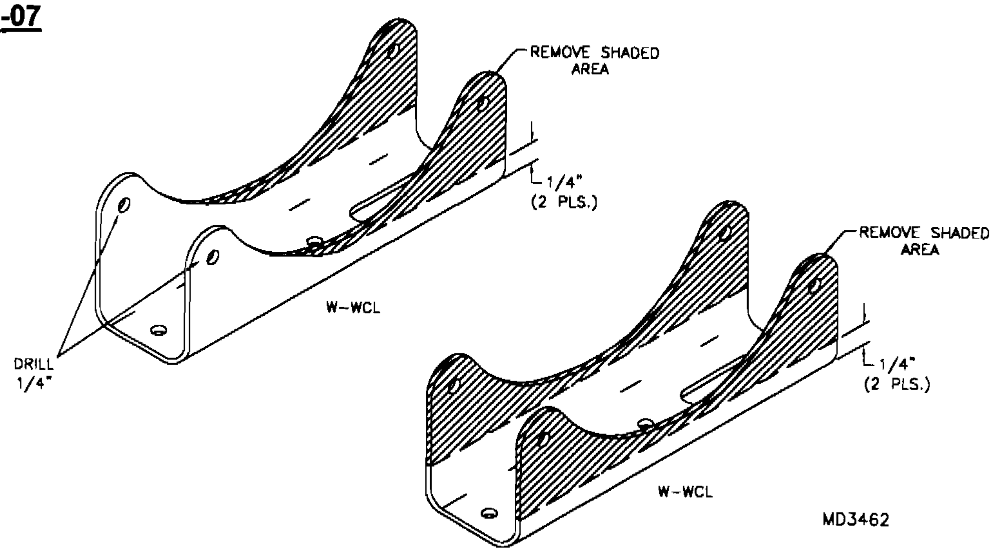
FIGURE 03-05



6. Drill 1/4" large washers to 5/16". Insert 1/4" aluminum bushing into eyebolt hole and trim to same thickness. Re-install gear strut and install eyebolt to strut with associated hardware. Springs anchored to locking cams wrap over bolt, ensuring that bolt seats in cutout when airborne. ***CAUTION:*** *Do not over-tighten eyebolt, as the steel bushings must roll to lock into cutouts.*

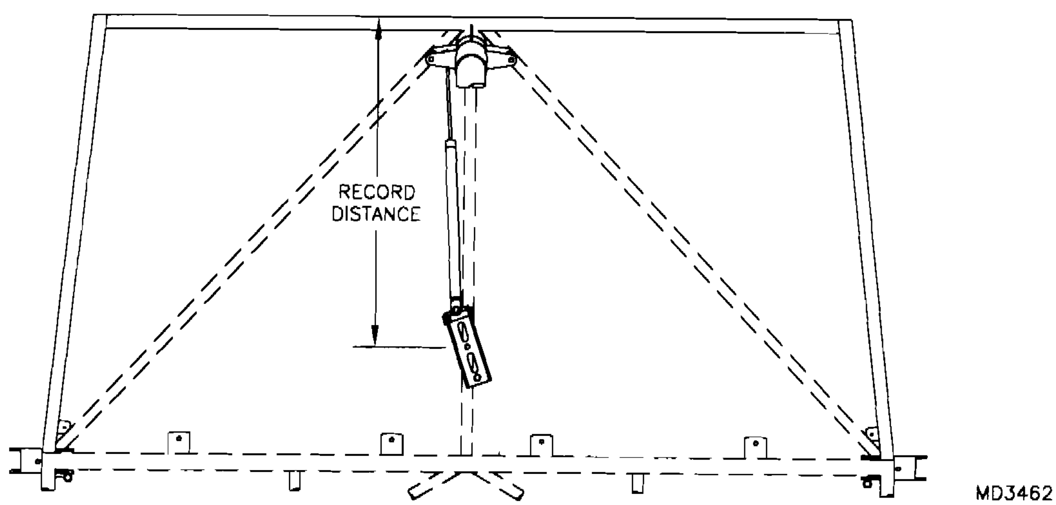
7. Cut sides of one wing channel to 1/4". Cut another channel similarly, but leave one pair of tangs; size drill holes in tangs to 1/4". See **FIGURE 03-07**.

FIGURE 03-07



8. Bolt clevis to eyebolt. Extend dampener rod half way and screw to clevis. Bolt long wing channel and associated hardware to dampener, as per parts drawing. Keeping nose wheel straight, locate channel over cabin centerline. See **FIGURE 03-08.** ***CAUTION:*** *Location is critical, as holes will be drilled immediately adjacent to tube beneath floorboard.* By extending dampener rod one-half its length and ensuring nose wheel is straight, dampener will allow full rudder travel.

FIGURE 03-08



9. Transfer drill #11, both end holes in channel, through floorboard. Holes will bracket centerline fuselage tube. Secure channel to floorboard as per parts drawing.

10. Measure along centerline tube from front of cage to center of channel. Record distance. Floorboard, rudder pedals, nose gear and associated components must be removed prior to covering, doping and painting

S-6S COYOTE II OPTIONAL NOSE WHEEL PANT INSTALLATION

1. Trim the bottom of the wheel pants for the wheel opening. Use the template provided for proper clearance. For the nose wheel pants, locate the template at 4 1/2". See **Figure 03-01** and **Figure03-01A**.

FIGURE 03-01

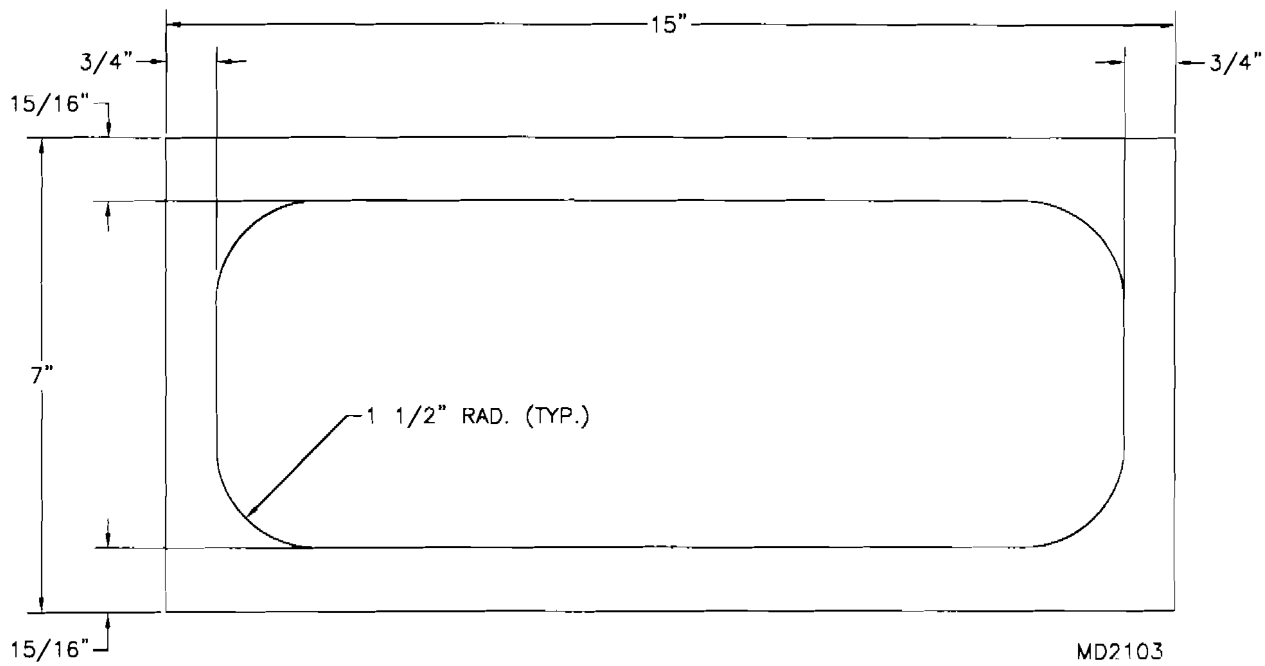
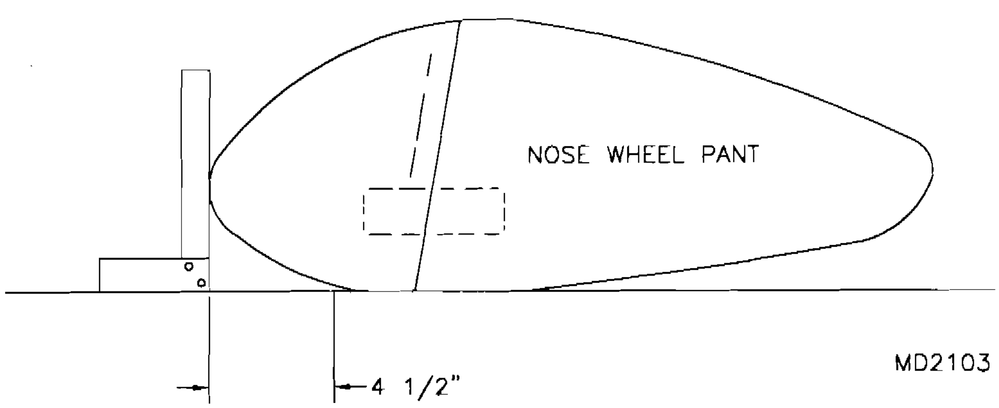
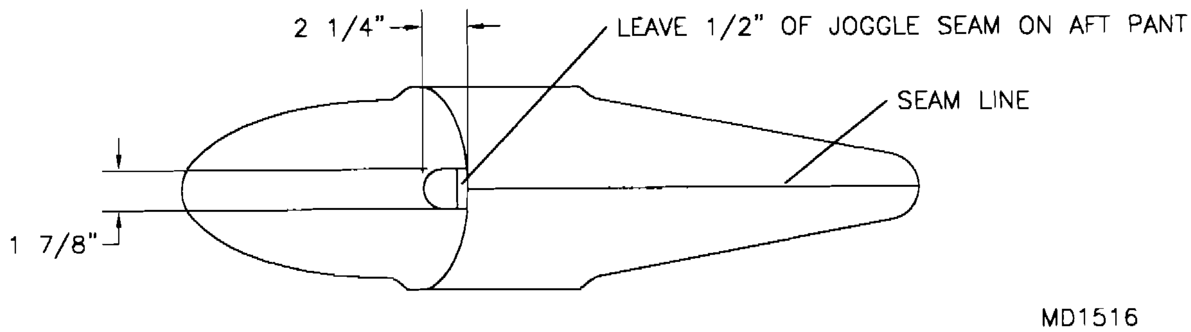


FIGURE 03-01A



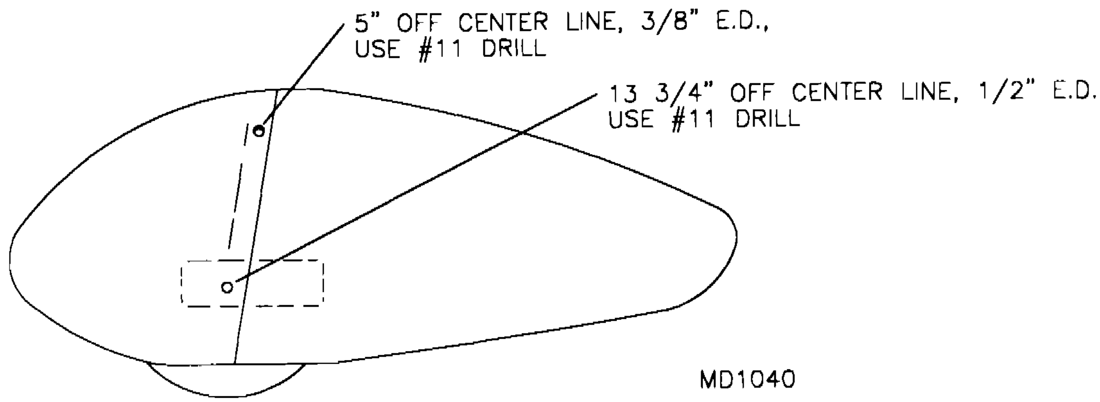
2. Trim the nose wheel pants as shown in **Figure 03-02** for nose gear strut clearance.

FIGURE 03-02



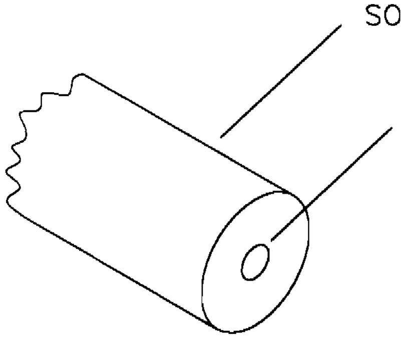
3. On the nose wheel pant, locate the 4 #11 holes as per **Figure 03-03**. Install the nut plates to the top two holes on the **INSIDE** of the AFT pant half.

FIGURE 03-03



4. Using a 10-32 tap, tap the pre-drilled hole in each end of the nose gear axle. Refer to **Figure 03-04**. Set the wheel pant in place and install the self-tapping screws into the ends of the axles.

FIGURE 03-04



5. Sandwich the two halves together and check fit, trim as required. Remove for paint prep. After painting, install the rubber trim on the opening for the nose gear column. Retain with super glue.

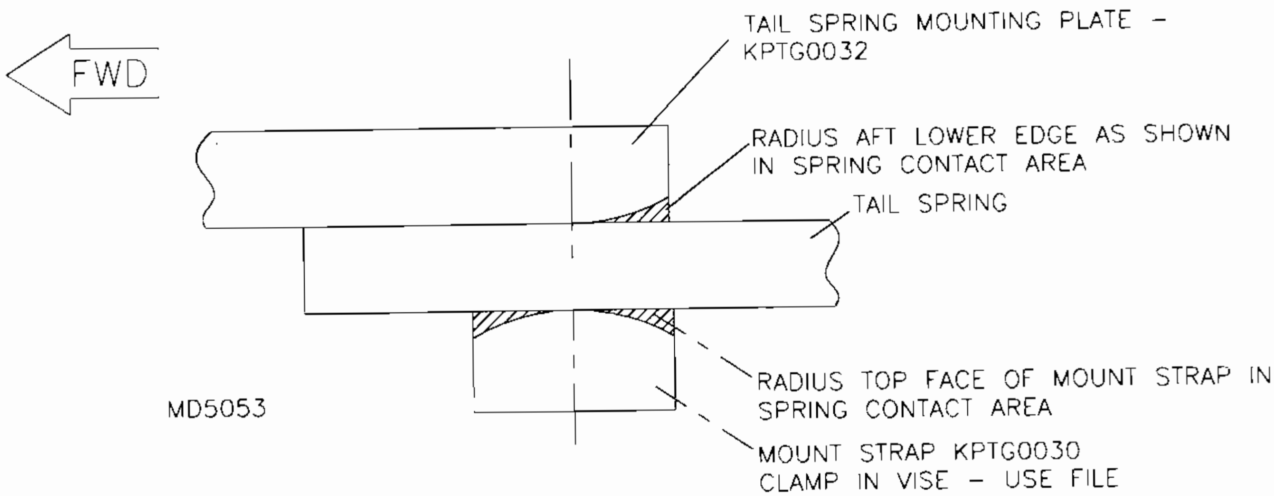
S-6S COYOTE II TAILWHEEL ASSEMBLY

NOTE: *Tailwheel and Tail Spring assembly can only be done after Tailcone Assembly is completed.*

1. Select the parts depicted in the parts drawing.

2. Modify the Tail Spring Mount Plate and Tailwheel Mounting Strap per **FIGURE 03A-02**. Bolt the Tail Spring to the Tail Spring Mount Plate.

FIGURE 03A-02



3. Bolt the Tail Spring Assembly to the tailcone. File or sand the Tailwheel Bushings to fit tight against the Tailwheel Spring. The Tail Cable Attach Hummertangs must also be tight. ***CAUTION:*** *Do* ***NOT*** *remove too much material. The Tailspring must be tight and centered between the Bushings.*

4. Bolt the Tailwheel to the Tail Spring assembly.

5. The S-6 tailwheel is full swivel. This allows pivot turns using brakes. A cam mechanism allows it to engage for steering. If the tailwheel mount leans to one side the full swivel feature will not work to that side. Shim the tailwheel to run vertical. Close study of the tailwheel cam will reveal its operation. If your tailwheel does not full swivel with side load or brake inputs try filing a radius on the corners of the cam parts.

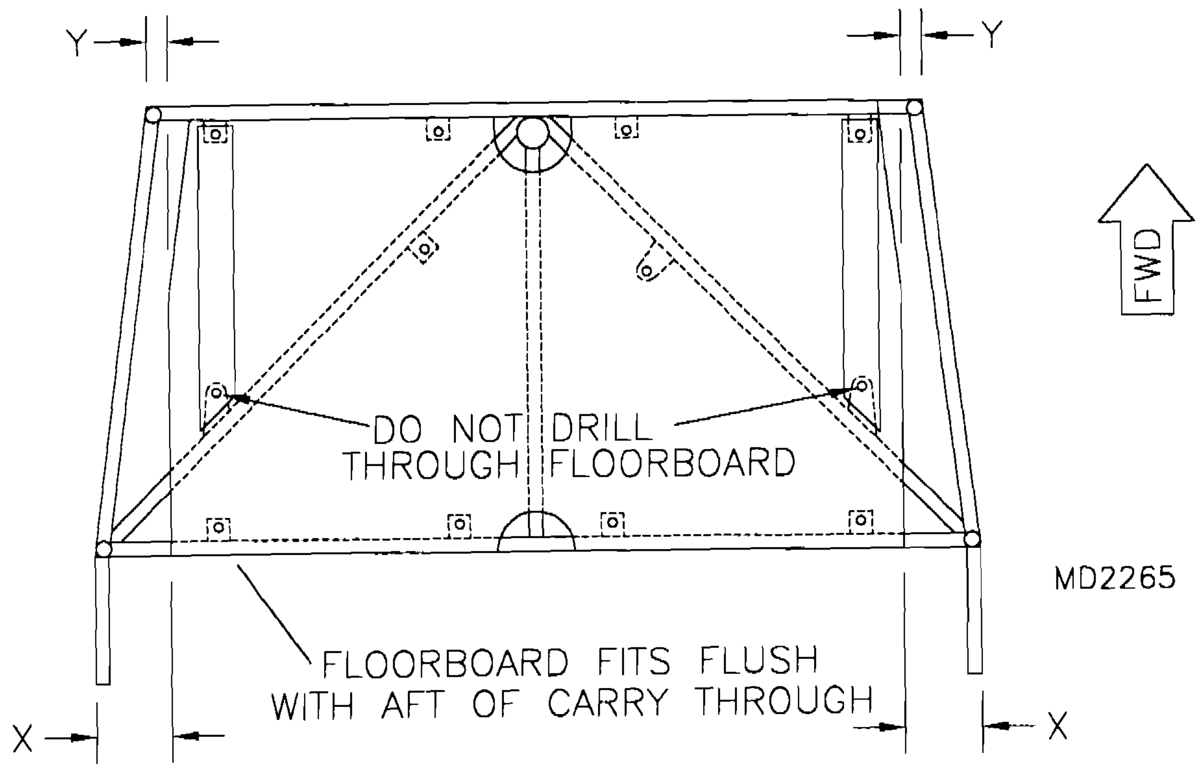
6. Steering is provided through the two chains and springs. Spring tension should be tight with the springs compressed about half of the full amount. Loose steer springs will cause very soft, indefinite steering. The spring is retained to the horn using two of the "S" hooks. Squeeze shut the "S" hooks, but do not crush, this will allow full steering movement. For assembly details on the tailwheel rudder steer horn, see **Rudder Assembly**.

7. After the Tailwheel is assembled to the aircraft, check it for proper steerage and alignment. The steering springs should be connected with enough tension (about half compressed) to move the tailwheel after the rudder has moved 10 degrees side to side.

S-6S COYOTE II - FLOORBOARD & RUDDER PEDAL INSTALLATION

1. The floorboard comes pre-cut, finished and ready to position in place. Clamp the floorboard in position as shown in **Figure 04-01. HINT:** *Pull the nose gear out enough to slip the floorboard in from the front.* With the floorboard clamped in position, drill up from the bottom with a #11 drill bit using the four tabs on the S-1, four tabs on the S-2 and the two **FWD** tabs on the diagonal tubes as drill guides. **HINT:** *Use a wood block placed over the top to prevent splinters.*

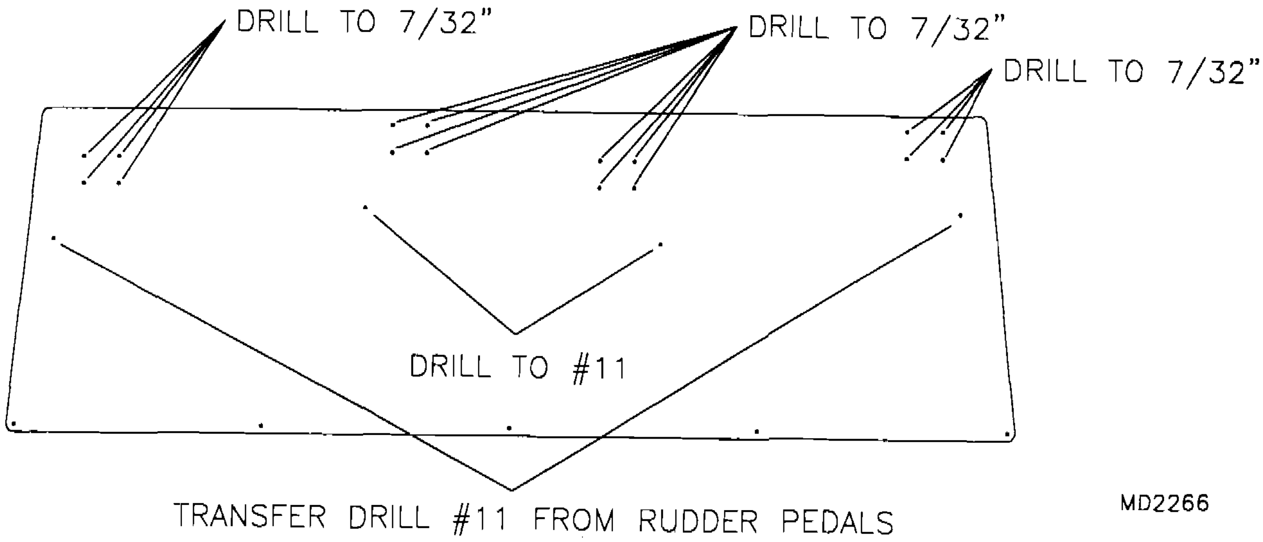
FIGURE 04-01



2. Remove the floorboard and position the floorboard support channels over the outboard tabs on the S-1 and AFT tabs on the diagonals. Trim the AFT edge of the channel to match the angle of the diagonals. Using the tabs as a drill guide, drill the channels #11. Drill #40 the forward end of the channels through the nut plate mount holes on the S-1 tabs. Remove and debur channels. Rivet the channels in place. Install nut plates on the perimeter tabs of the fuselage cage. Also install nut plates on the forward two diagonal tabs. Notice that the FWD tab on the right diagonal needs to be a single ear nut plate. Temporarily re-install the floorboard using the hardware shown.

3. Drill the wear plate as shown in **Figure 04-03.** Temporarily bolt the wear plate in place using the two center rudder pedal holes. Position rudder pedal tube assemblies parallel to each other and drill #11 the floorboard and support channel thru outer pivot. Using the sixteen holes for the brake mount brackets as guides, drill the floorboard 7/32".

FIGURE 04-03

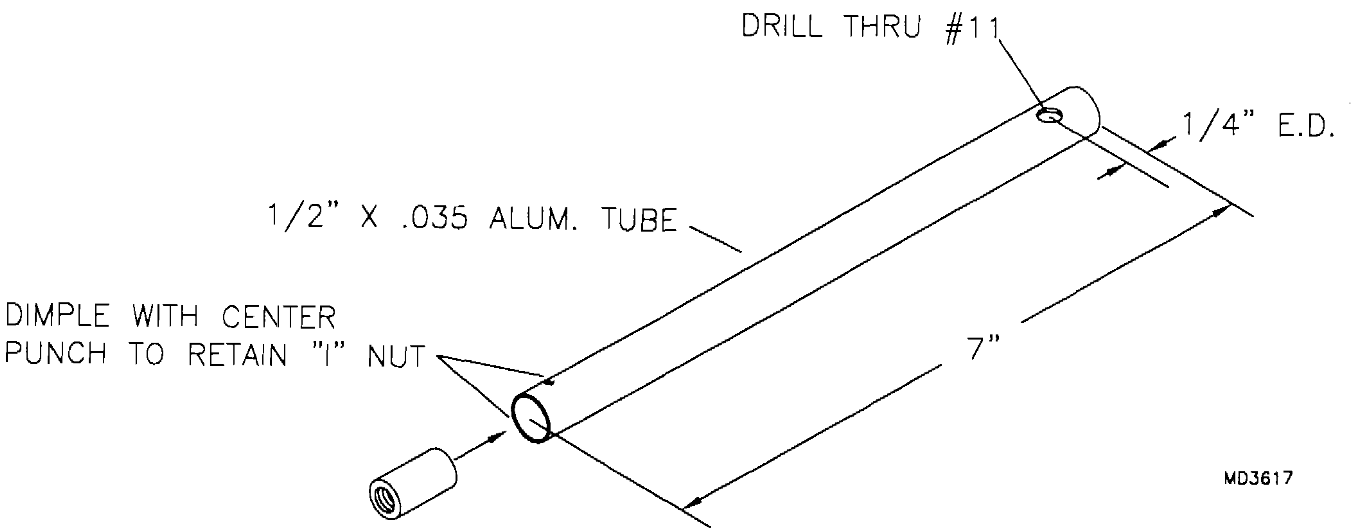


4. Remove the rudder pedals and floorboard. Install the tee nuts from the bottom of the floorboard. Install nut plates to the floorboard support channels. Re-install floorboard, wear plate, and rudder pedals. Install the brake mount brackets using the hardware shown. Be sure to orient the brackets correctly. The brake mount brackets face with the angled side forward. See the parts manual for exploded views.

5. Rivet together the upper toe pedal assembly as shown in the parts manual. Size drill #30 as required. Be sure to debur all holes before final assembly of the upper toe pedal. Install the lower end of the Hydraulic Cylinder into the brake mount brackets using the hardware shown. Attach the "U" bracket to the rudder pedal-cylinder attach brackets using the hardware shown.

6. **FOR SINGLE SIDE HYDRAULICS ONLY:** Fabricate and install the rudder pedal link rods on the passenger side. Refer to **Figure 04-06**.

FIGURE 04-06



7. Install the toe pedal assembly to the rudder pedals by sliding the swivel bushings in place. See **Figure 04-07.** Be sure to include the 1/2" plastic washers between the rudder pedals and the toe pedal assembly. **NOTE:** *The outboard swivel bushings have an insert nut welded in.* Drill the insert nut to #11. This is the location of the rudder cable attachment. Make sure these swivel bushings face the outside of the airframe on the outermost pedals. **HINT:** *Install the 3/16" bolt into the outboard swivel bushings before assembly.* Line up the tangs on the end of each swivel bushing with the toe pedal assembly and drill the edge of the toe pedal to 3/16" using the swivel bushings as a guide. See **Figure 04-07A** and parts manual for orientation of the swivel bushings.

FIGURE 04-07

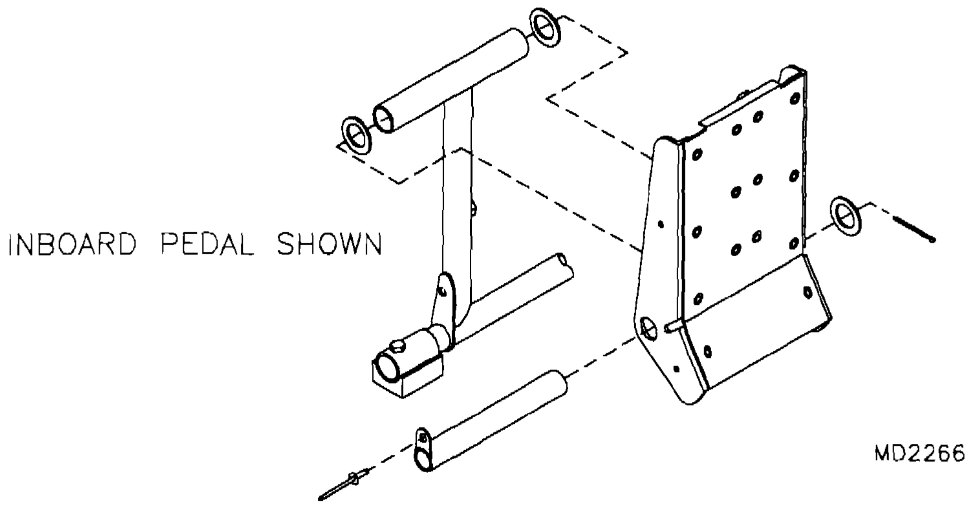
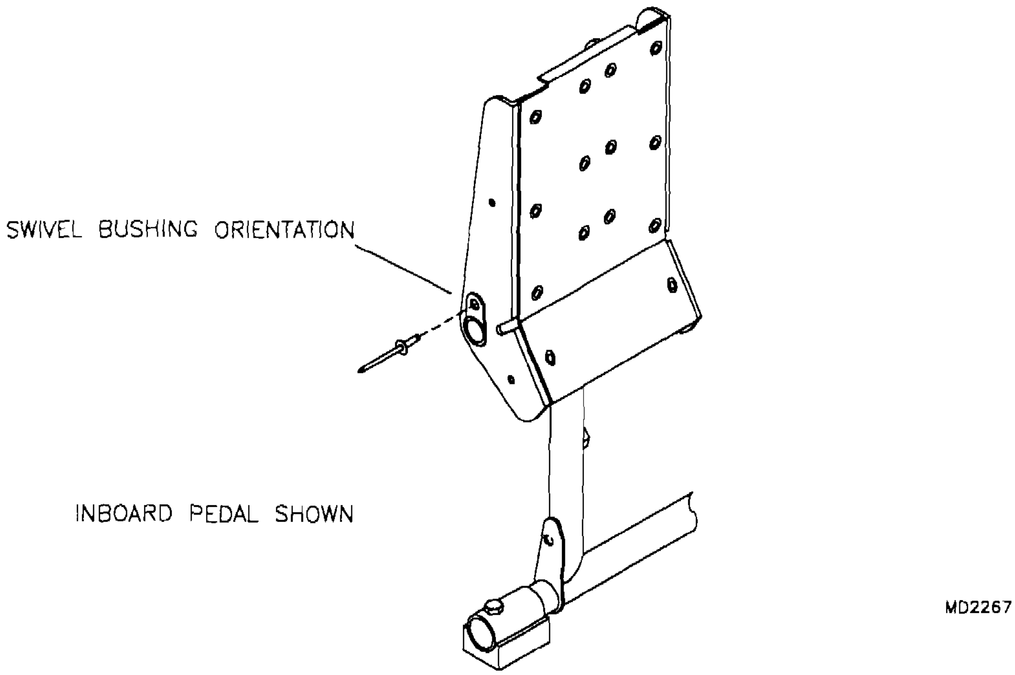


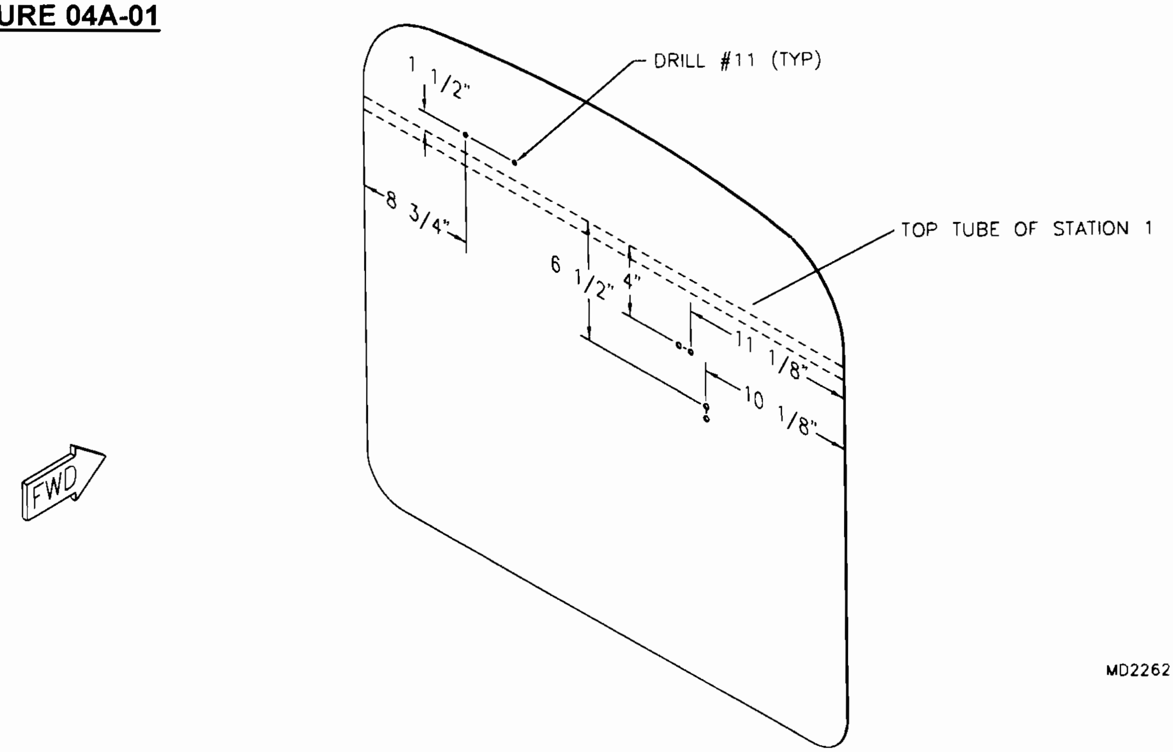
FIGURE 04-07A



S-6S COYOTE II - INSTALLATION OF HYDRAULIC ACCESSORIES

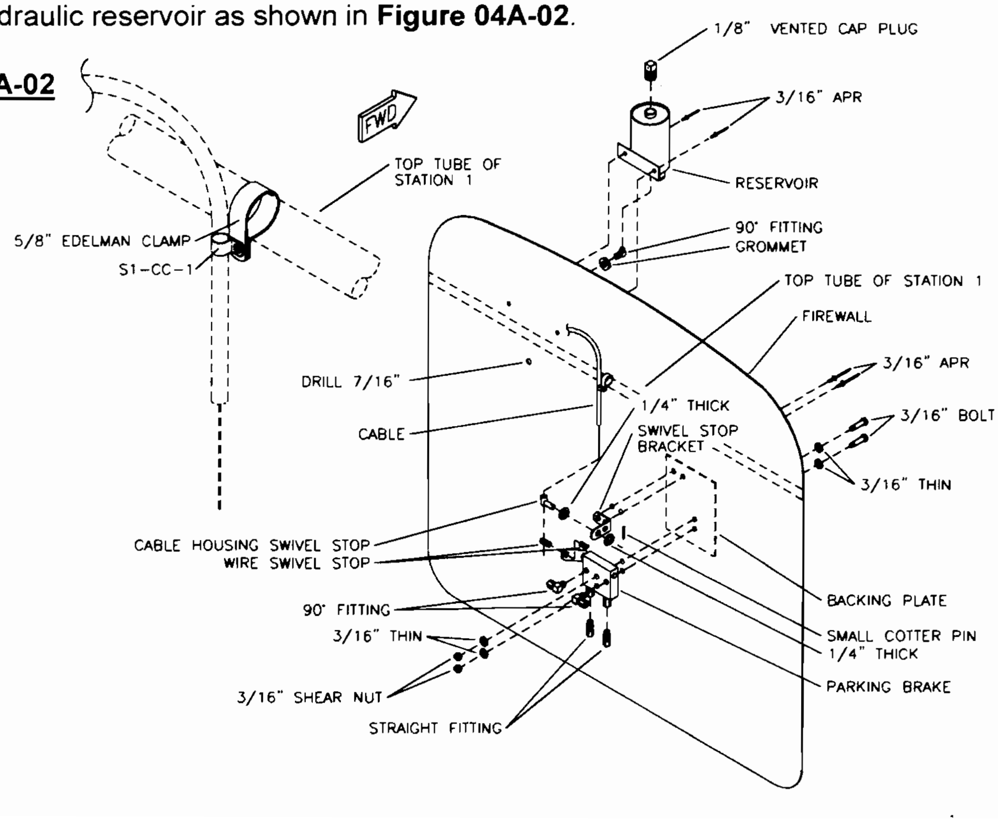
1. Installation of the firewall accessories should be performed when the firewall is test fit in **Section 5 - Firewall Assembly** of the manual. The locations of the accessory mounting holes are shown in **Figure 04A-01.** One hole location is given, use the parking brake, swivel stop bracket and reservoir to locate the second hole. Use the firewall as a guide to locate the required holes in the park brake backing plate. Rotate reservoir so the 90° fitting is aft. Locate a 7/16" hole for the brake line to pass thru the firewall. Insert the grommet to protect the line. Drill the hole in Parking Brake Valve arm to 1/4".

FIGURE 04A-01



2. During final assembly install the parking brake, park brake backing plate, park brake control cable, and the hydraulic reservoir as shown in **Figure 04A-02**.

FIGURE 04A-02



3. See **FIGURE 04A-03** for single hydraulic brake line routing. See **FIGURE 04A-03A** for dual hydraulic brake line routing.

FIGURE 04A-03

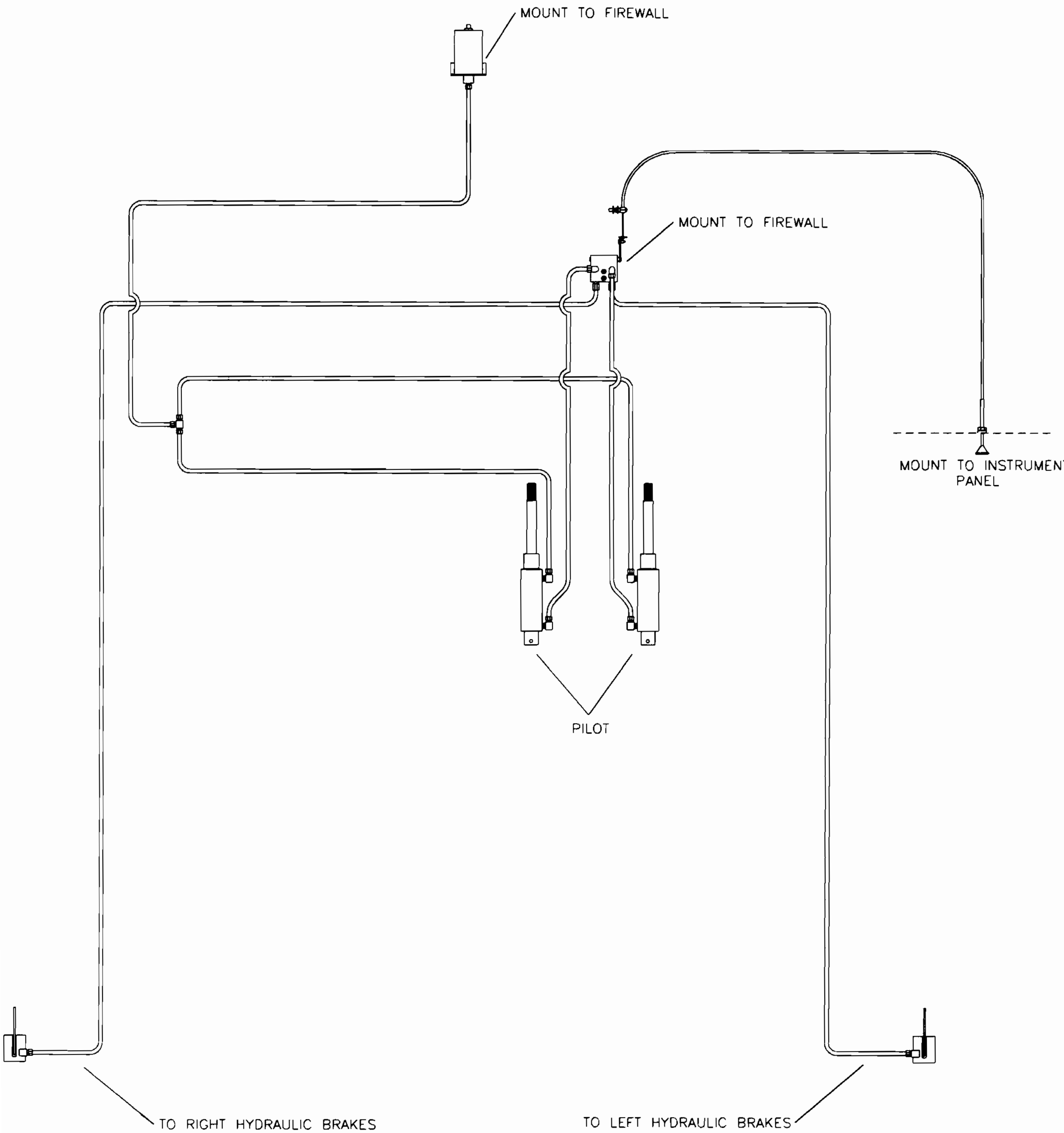
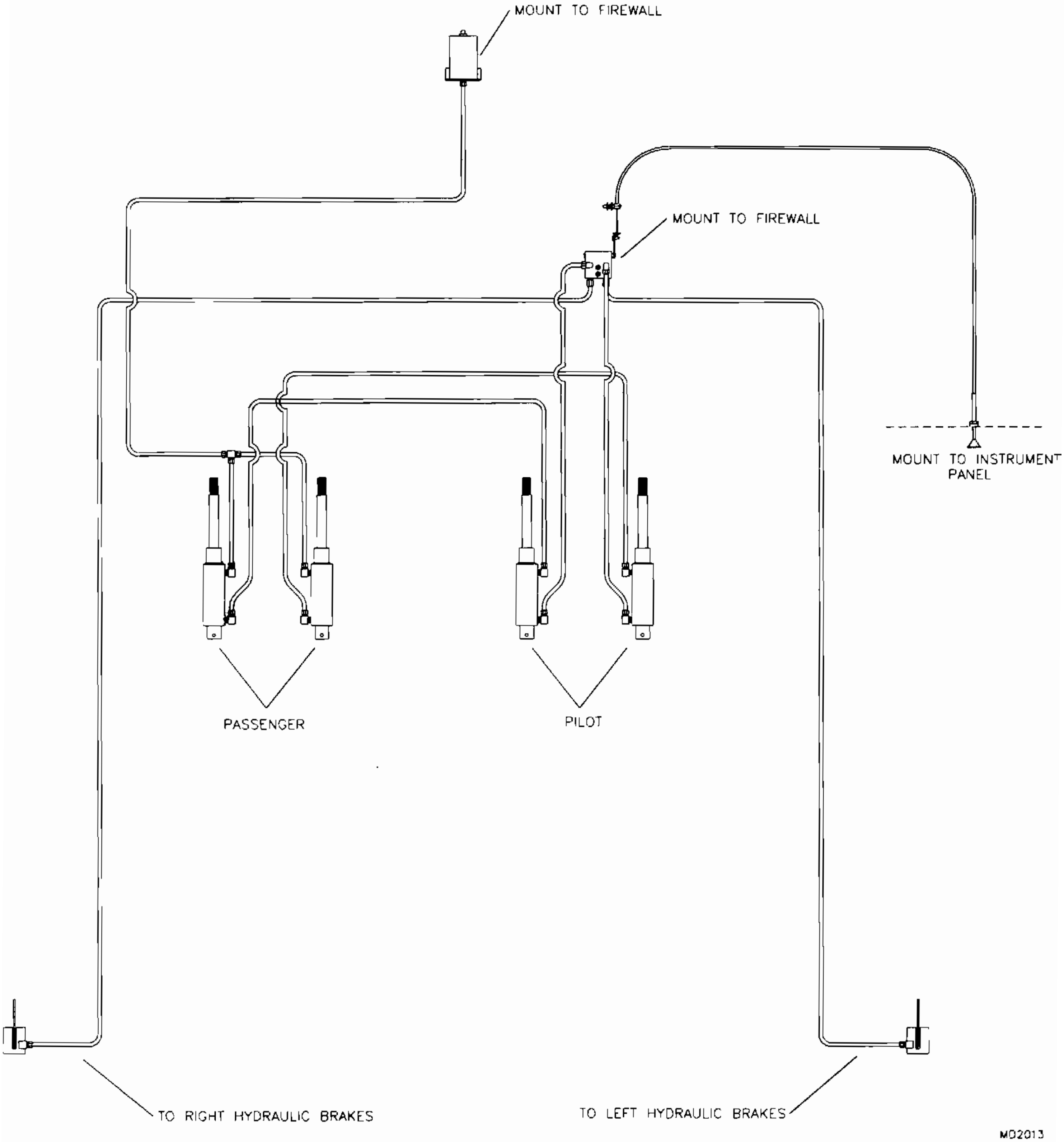


FIGURE 04A-03A



FILLING OF THE HYDRAULIC BRAKE SYSTEM

NOTE: These steps should be done during final assembly after floorboards, firewall, and instrument panel are installed. It may be necessary to move one of the bleed valves to the opposite side of the caliper assembly. Both bleed valves should be on the bottom side of the caliper. Wrap Teflon tape on the bleeder screw to minimize leakage during bleeding. **IMPORTANT:** *Use only standard aircraft* ***MIL-H-5606 Red Hydraulic Fluid****. Improper brake fluid will ruin the brake system seals.* ***Never use Automotive Brake Fluid!***

1. Open the lower left bleed valve. With the reservoir cap removed, start filling the system from the bottom. **NOTE:** *A small hand held oil pumping can with a short piece of 1/8" ID clear hose (blue primer line works well) attached works well to fill the system.* Fill the system until reaching just above the "T". Close the left bleed valve. Open the right bleed valve and fill the system until the air is removed from the right line. Close the right bleed valve.

2. Check your work by insuring that the reservoir has fluid and that you have a "hard pedal". If you have a "soft pedal", pump the brakes several times. Many times that will fix the problem. Bleed any accumulated air from the system. Tighten the bleeder valves and replace the rubber cap.

3. When satisfied fill the reservoir to approximately 3/4 full by pouring directly into the reservoir.

4. Test the brakes <u>**THOROUGHLY**</u> before flying. All air bubbles should be removed from the lines. Any size air bubble could cause insufficient braking. Please taxi test completely before flying.

5. The non-asbestos organic composition brake pads require a thin layer of glazed material at the lining friction surface in order to provide maximum braking performance. This glazed layer is produced by the heat generated during normal braking operations, and is maintained during the life of the lining. Since new brake pads do not have this layer, it must be created by the following process:

   - Heat the pads by performing a full stop from 30 mph. ***CAUTION:*** *Only perform once comfortable with the aircraft.*
   - Allow brakes to cool for 5-10 minutes.
   - Test the brakes at a high static rpm run-up. If the brakes hold, break-in is complete. If they fail to hold, repeat above steps until they do.

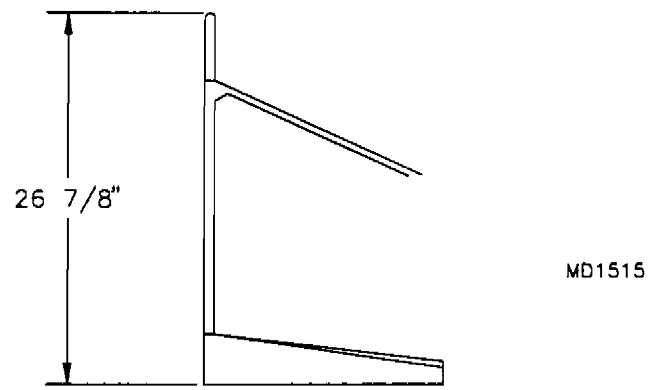
S-6S COYOTE II FIREWALL ASSEMBLY

1. Select the required parts for the firewall assembly as shown on the parts page.

2. Fabricate (2) 3/4" x .058 x 1" reducers and (1) 3/4" x .058 x 4" splice tube. HINT: Oval the splice tube slightly. A wooden mallet works nicely to assure the tubes stay in position. The firewall rivets will hold the tube in place.

3. Set the reducers over the stubs on top of the S-1. Refer to the parts drawing. Insert the splice tube halfway into an S-1 top former, then assemble with the other former. Set the assembly onto the stubs and reducers. Measure from the very bottom of the station 1 bottom crossing tube to the very top of the station 1 top former. It should measure 26 7/8", adjust accordingly. See **FIGURE 05-03**.

FIGURE 05-03

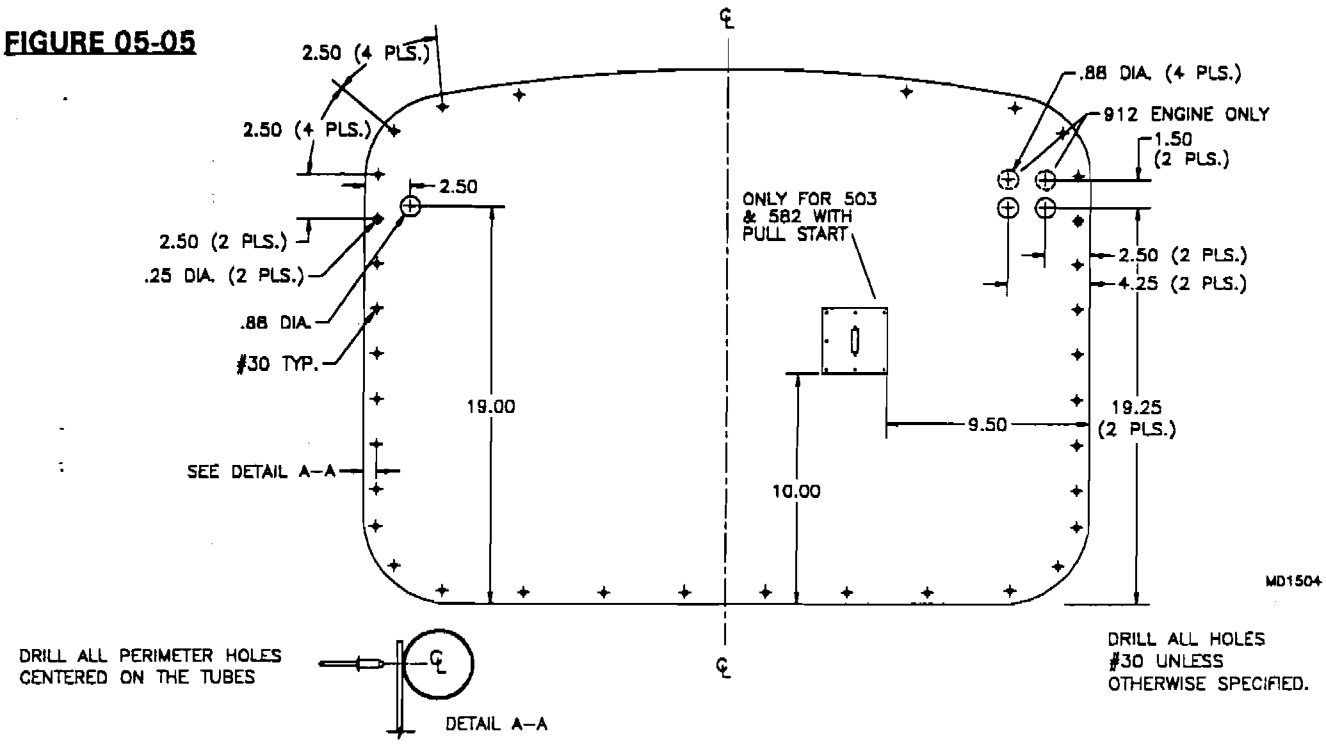


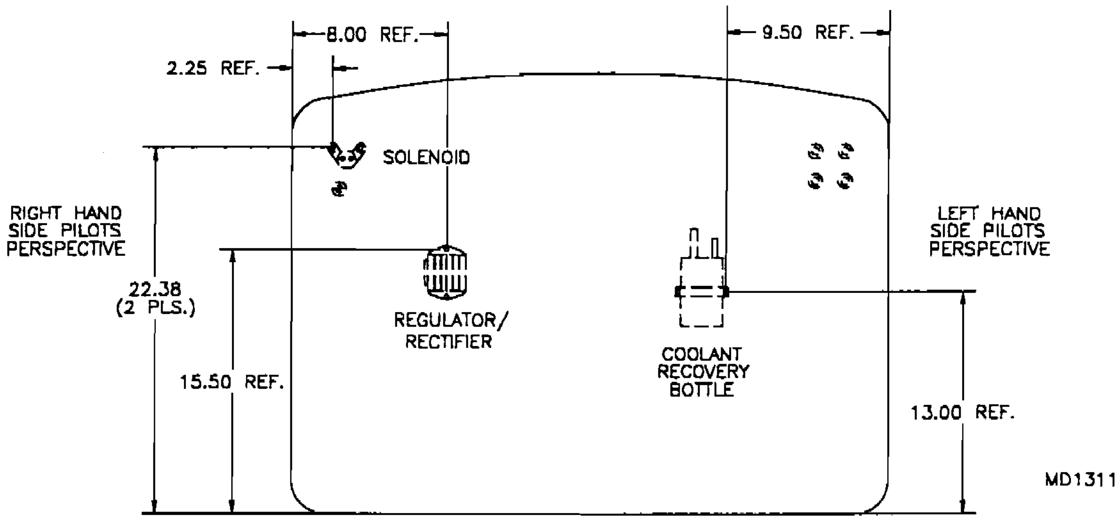
4. Clamp the firewall to the forward side of station 1. Position it so that the pre-drilled perimeter holes fall on, or as close to the center line of the station 1 side and bottom tubes as possible. Using the holes in the firewall as a guide, transfer drill into the station 1 tubes and cleco. Do not rivet the firewall to the fuselage at this time. Do not locate or drill the top perimeter holes at this time. The top holes will be drilled when the windshield deck and cowling hold down strip are installed in a later section.

5. With the firewall clecoed to the fuselage, layout and mark the accessory hole pattern onto the firewall as shown in **FIGURE 05-05**. Verify that all holes will miss the fuselage framework. Also, prior to drilling any of the accessory item mount holes, i.e. Reg/rect., solenoid etc. Verify that the location of the item will not conflict with any other item and that there is accessibility if need be. **NOTE:** The layout shown is for suggestion only. You may choose to design and layout your own firewall pattern depending on the engine and number of options that you are installing. Drill each hole to its respective size. Other holes may be located and drilled later as they are needed. Note that the 503 does not require the coolant recovery bottle. Also note that the solenoid is only needed with electric start engines. For pull start engines, verify the location for the firewall starter pulley and cut the firewall accordingly. Install the pulley and backing plate after installing the soundproofing. It is important to note, that all dimensions are for reference only. You must verify all locations. This may require temporary installation of the engine. It is also a good idea to familiarize yourself with the radiator mount. Refer to the engine section in final assembly.

Using a 1/4" drill bit, transfer drill through the bushings located near the top of the station 1 vertical side tubes. The engine mount will bolt to these bushings. Refer to the engine mount section.

FIGURE 05-05

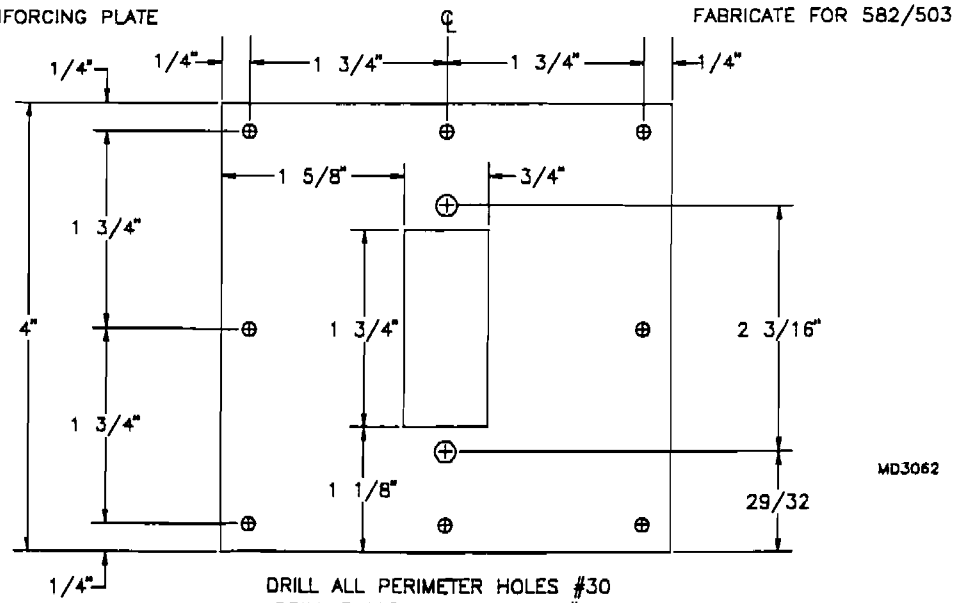




VIEWED FROM FRONT

FIREWALL STARTER PULLEY REINFORCING PLATE

FABRICATE FOR 582/503 PULL START ONLY

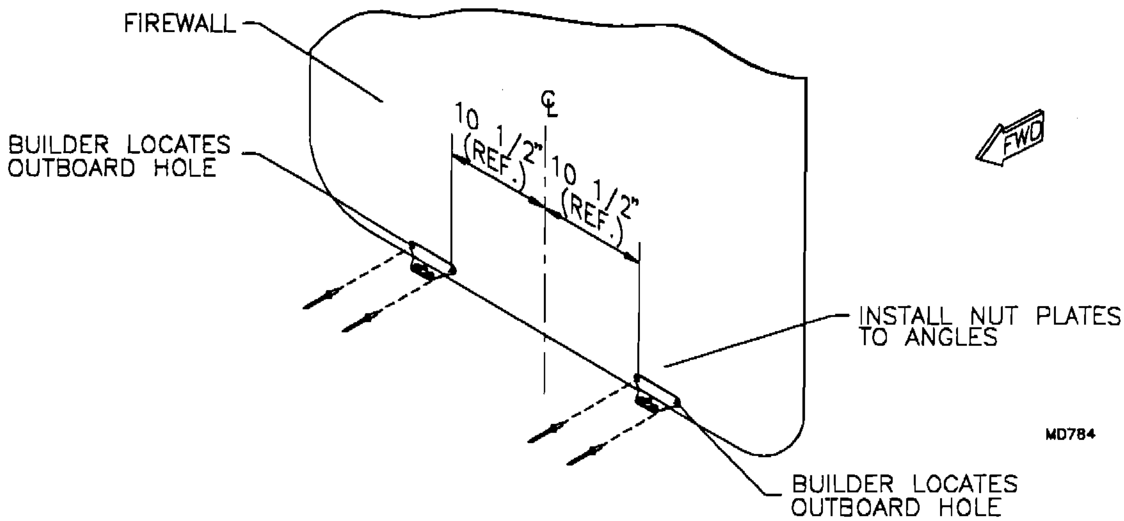


DRILL ALL PERIMETER HOLES #30
DRILL PULLEY RIVET HOLES #11

6. From left to right determine the centerline of the firewall. At the bottom edge of the firewall measure approximately 10 ½" to the left and right of centerline to find the existing pre-drilled firewall mount holes.

Chase drill the inboard hole in each cowling mounting bracket to #30 and cleco the mounting bracket to the firewall and station 1 bottom cross tube at the above determined location. Note the orientation of the brackets. Line up the bracket on the centerline of the station 1 bottom cross tube. Using a #30 bit, transfer drill through the outboard pre-drilled hole in the bracket through the firewall and bottom cross tube. Cleco in place only at this time. Refer to **FIGURE 05-06**. Upon completion of the cowl fit up, rivet the nut plates to the top side of the mounting brackets.

FIGURE 05-06



7. Form the forward contour formers over a 2" tube to shape. Place the formers in position as shown in **FIGURE 05-07**. Note that the former may extend past the firewall in order to achieve the best fit. Once locked in place, trim off any material that extends past the firewall so that the former is flush with the firewall. Using a #30 bit, transfer drill through the tabs and through the contour formers and rivet. Locate and drill four #30 holes into the lower curve of the station 1 framework and rivet. Refer to **FIGURE 05-07A.**

FIGURE 05-07

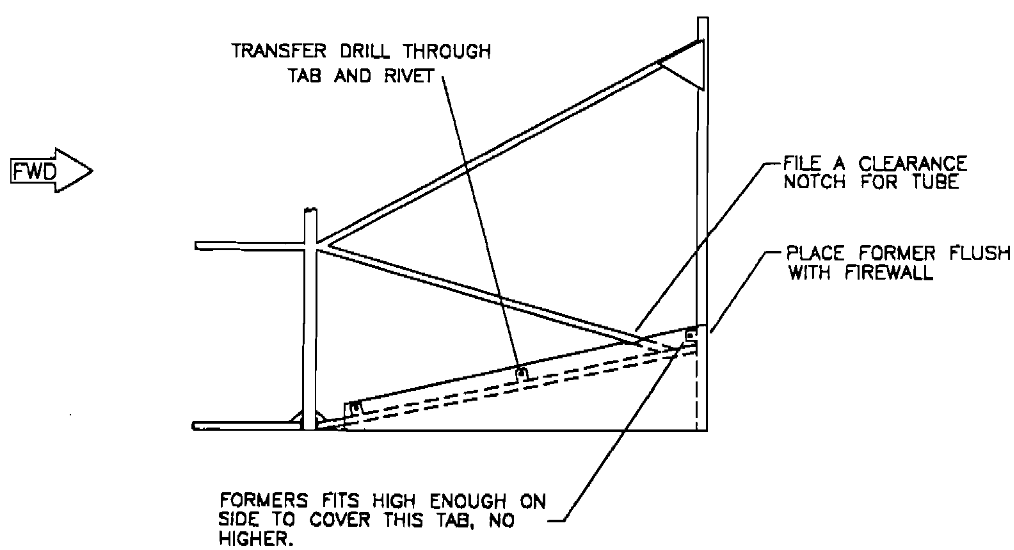
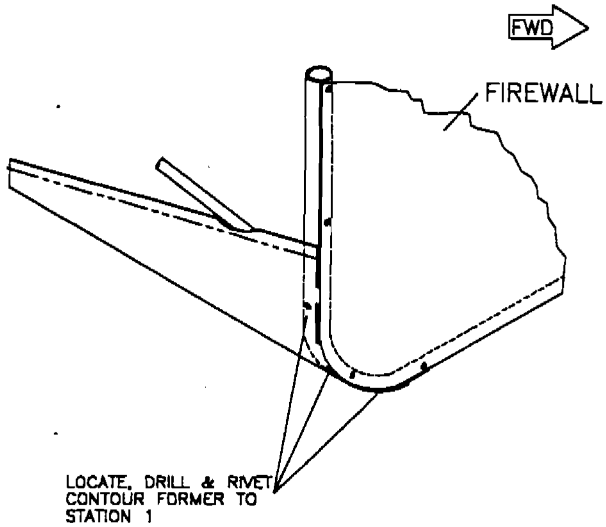
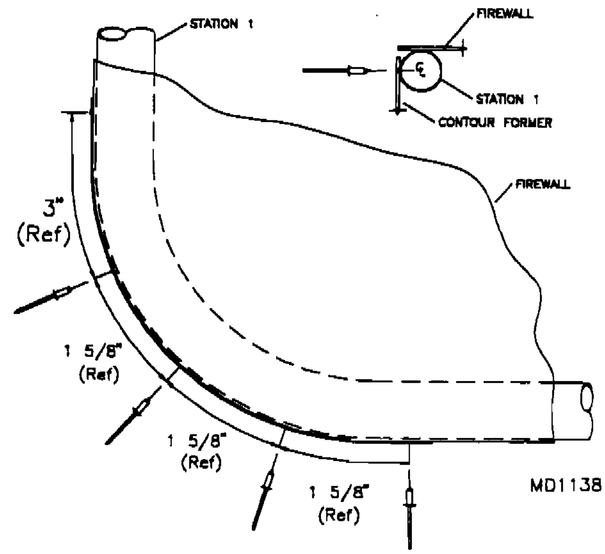


FIGURE 05-07A





8. Remove the firewall and bond the soundproofing to the aft side of the firewall. Contact cement works well to bond the soundproofing in place. If you decide to use contact cement, it is best to rough up the surface of the firewall first. 80 grit paper works well for this. After installing the soundproofing, use a hot knife to melt through all mount and access holes and to trim the outer perimeter. Install the grommets. Set the firewall aside until the fuselage is covered and painted.

9. During final assembly rivet the firewall to the fuselage. Rivet the cowl mounting brackets in place.

S-6S ENGINE MOUNT INSTALLATION INSTRUCTIONS (503,582,912)

1. Select the proper hardware and components depicted on the parts page.

2. Debur the 1 1/4" x 3/8" x .058 bushings. (503&582 ONLY)

3. Lightly oil the (2) 1/4" bolts used to hold the top of the mount to the firewall. Insert these with a single thick washer under the head into the mount lugs. Line up the mount in its proper position and insert the (2) bolts into the top receivers on the fuselage. **PLEASE NOTE:** The mount may need some "encouraging" in order to fit.

5. The bottom attach points of the mount should be on the plate welded into the S-1. Clamp the mount firm against the firewall. Drill through 1/4" using the mount bushings as drill guides. Debur the holes.

6. Install nuts and washers and tighten to 5 to 7 ft. lbs. (For 503 and 582) Bolt together the mount plates as per part drawing.

7. Assemble the barry mounts and plates as illustrated. Torque these bolts 5 to 7 Ft. lbs. Remove the mount from the firewall. Completion of mount and engine system will occur in final assembly.

S-6S COYOTE II TAIL CONE ASSEMBLY

The tail cone is built of aluminum tubes and unique, stamped gussets that allow tubes in two planes to join, resulting in a light, strong structure. While building, you will pull many stainless steel rivets, so use a high quality pop riveter. Air-powered riveters are *very* nice! When setting rivets, be certain holes are clean and rivets set flat against tubes and/or gussets. Pop rivets will not draw the gusset and tube together when pulled! Be certain everything is properly set before pulling; stainless steel rivets are not easy to drill out. ***NOTE: Support tail cone with a sawhorse between Stations 4 and 6 to prevent sagging.***

The tail cone can be built for either tricycle or conventional gear; references are made to steps required for completion as a taildragger.

1. The fuselage cage should be upright, on its gear. Forward end of longerons are marked "*F*" and have 4 holes at 90 degrees to each other. Top longerons are 117" long. Bottom longerons are 113 3/4" long. Cut 7/8" doubler tubes from raw stock and slide into aft ends of top longerons until flush. If building a taildragger, slide doublers into bottom longerons, as well; refer to conventional gear parts page. Retain doublers by locating #40 rivets 6" from ends of longerons, per **FIGURE 07-01A.** Push the forward ends of the longerons onto the stubs at the back of cage. ***Apply clear silicone liberally to stubs to create a corrosion barrier between fuselage steel and tail cone aluminum.*** Turn longerons so the small, pre-drilled holes are in a horizontal position, on the ***outside*** of the structure. Push longerons on as far as possible and use clamps to hold them in place. Drill holes of the outside gussets to #30 and rivet to the longerons through a middle hole of the gusset. See **FIGURE 07-01.** ***CAUTION:*** *Pay attention to rivet size and type.* Locate and drill #11 the two pre-drilled thru-holes located between S-6 and S-7 on both top longerons; horizontal stabilizer attach brackets bolt here. Rivet 3/16" nut plates over the inside holes, per **FIGURE 07-01A.**

FIGURE 07-01

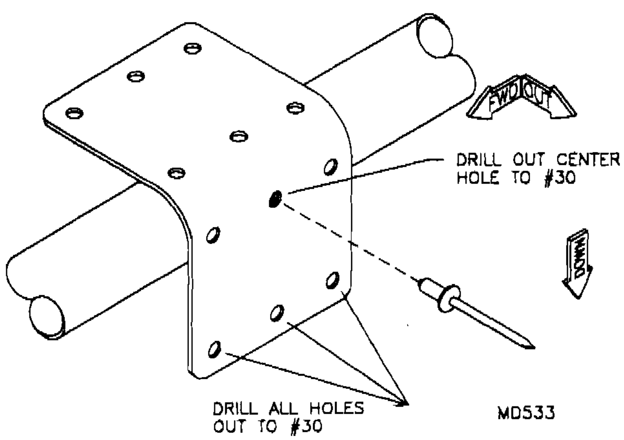
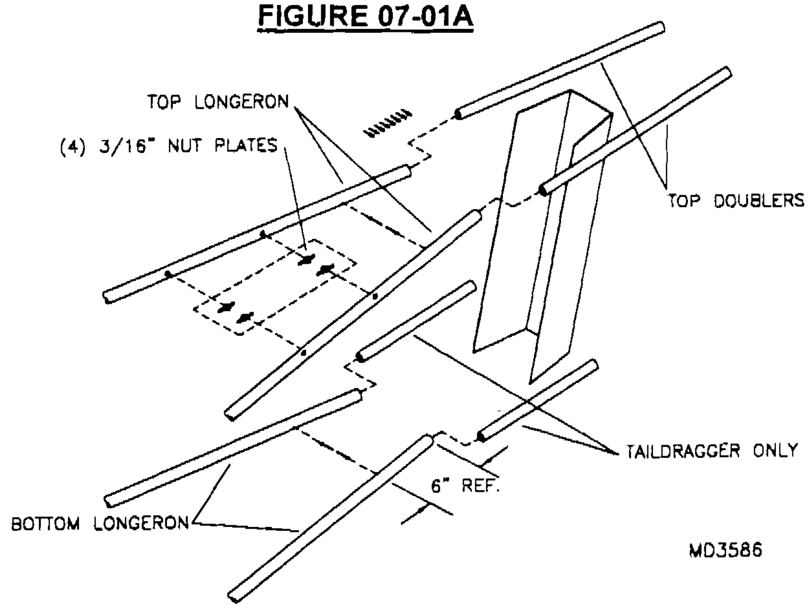


FIGURE 07-01A



2. Cleco top crossing and diagonal tubes to gussets and check for fit. ***NOTE:*** *The top and bottom crossing tubes attach to center gusset holes.* Crimp ends of Station 6 top diagonal to 3/4" to fit between gussets; this may be done by squeezing ends carefully within a padded vise (padding is necessary to protect anodizing). *Be certain pressure is applied along intended bolt axis, so that holes remain properly aligned.* Cleco Station 4 top diagonal *drilled* end to gusset. Rivet these tubes and gussets once the fit checks out; *do not rivet longerons to cage at this time.*

3. Cleco bottom crossing and diagonal tubes to gussets and check for fit. Install the *drilled* end of the Station 4 bottom diagonal to gusset and the *slotted* end over the welded web. Do not drill the slotted end at this time; drill and bolt this end after squaring tailcone. Rivet the tubes and gussets once the fit checks out.

4. Refer to **FIGURE 07-04** to locate and cleco side tubes to gussets. Fit the Station 4 upper and lower diagonals into place, but do not yet drill and rivet them. Cleco the Station 6 side diagonals into place; *do **not** rivet until bulkhead is installed.* After clecoing one side of the tailcone structure and checking it out, rivet it together. Repeat this for the other side. Do not install the inside gussets at this time, they will be installed after all the tubes are in place on all four sides of the tailcone. Refer to **FIGURE 07-04A** & **FIGURE 07-04B** for top & bottom view.

FIGURE 07-04

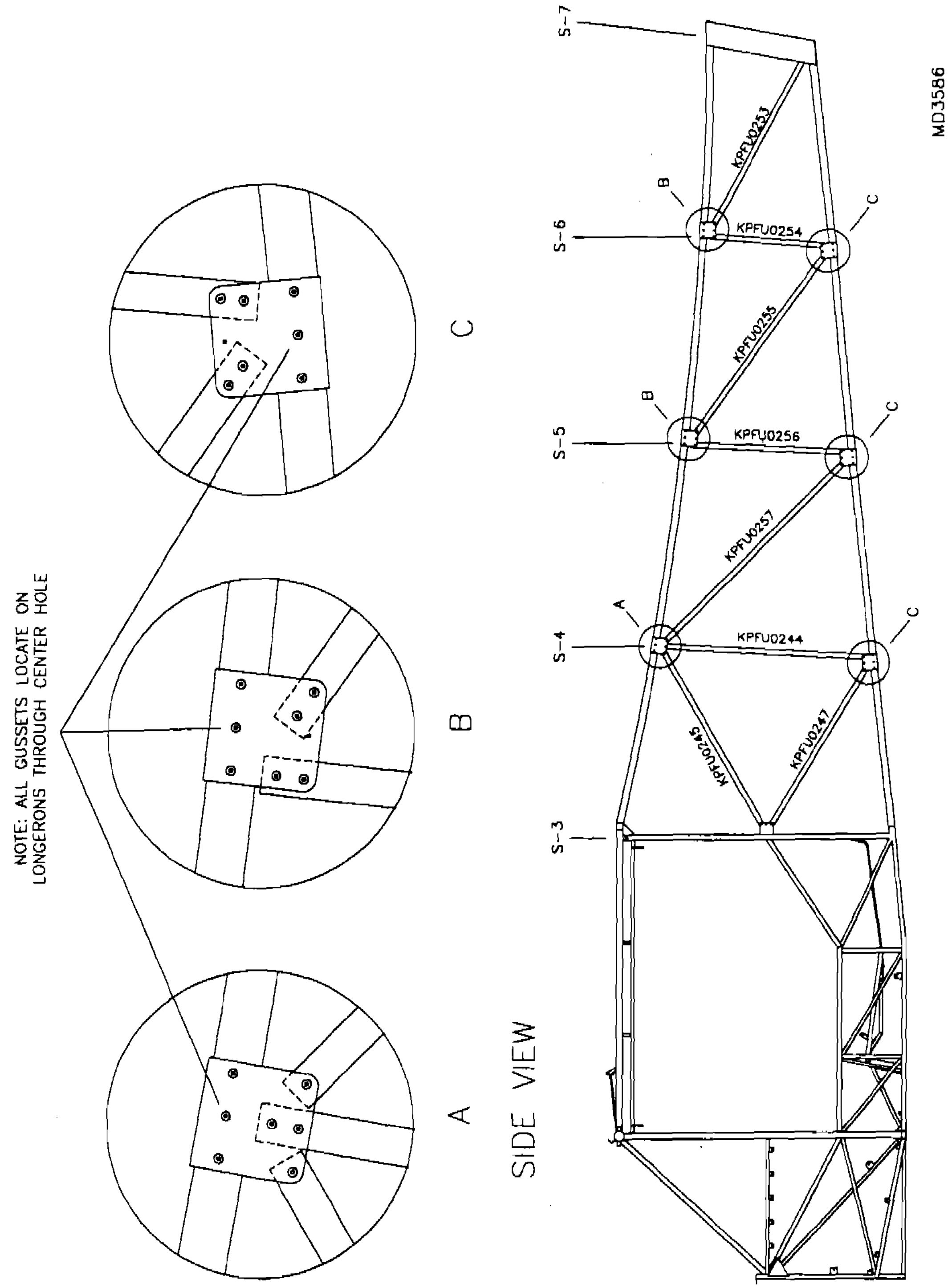


FIGURE 07-04A

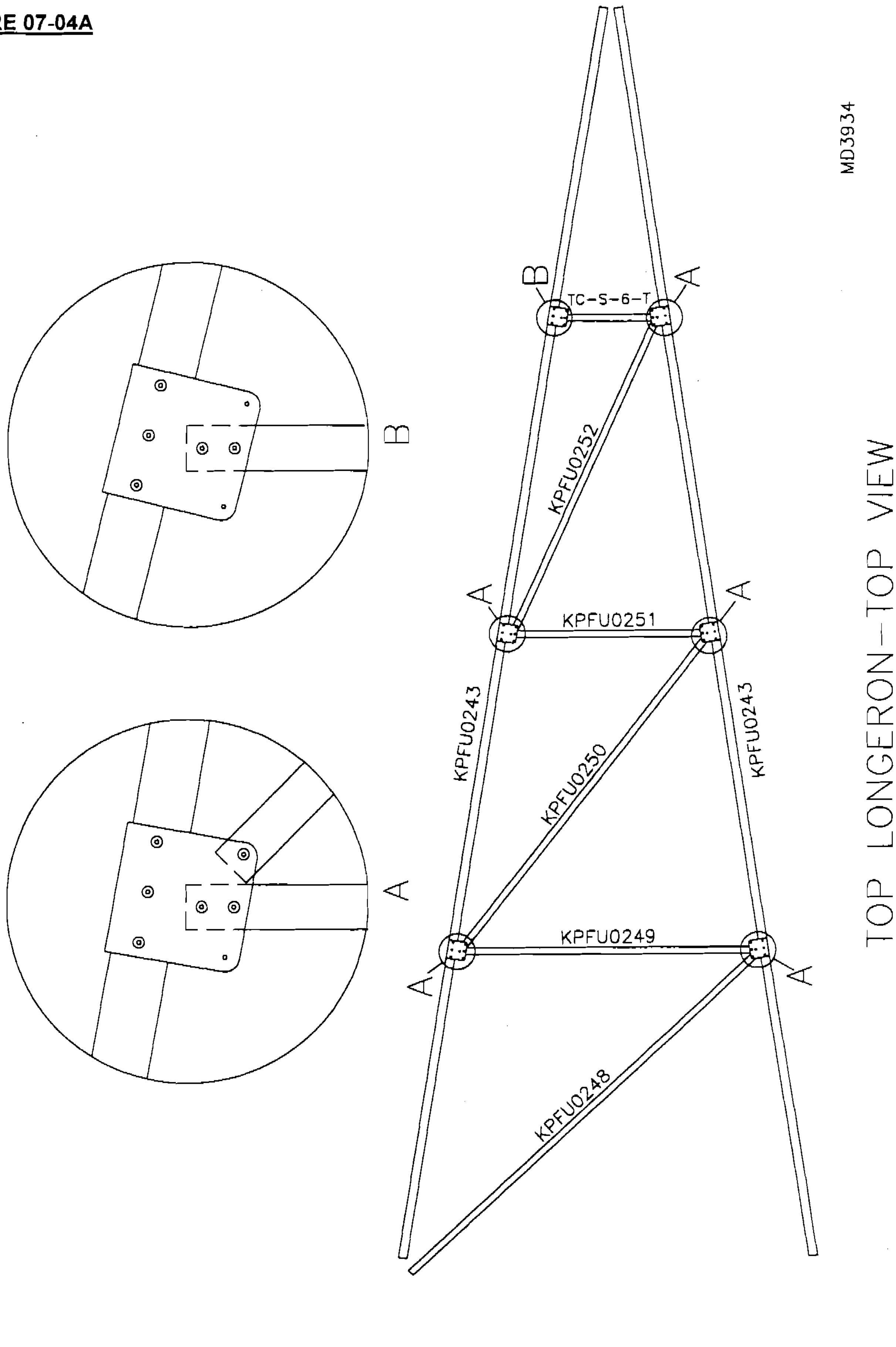
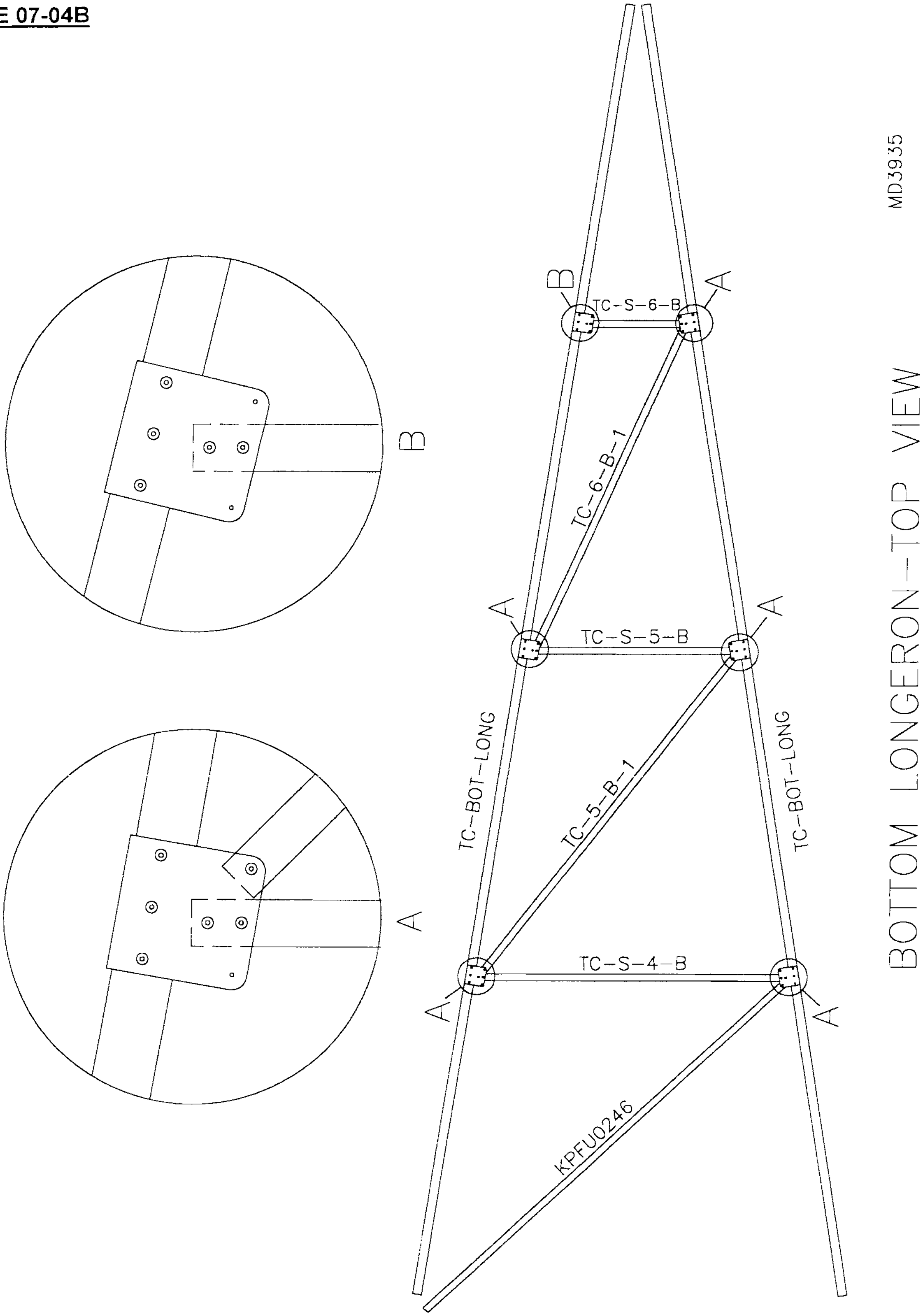
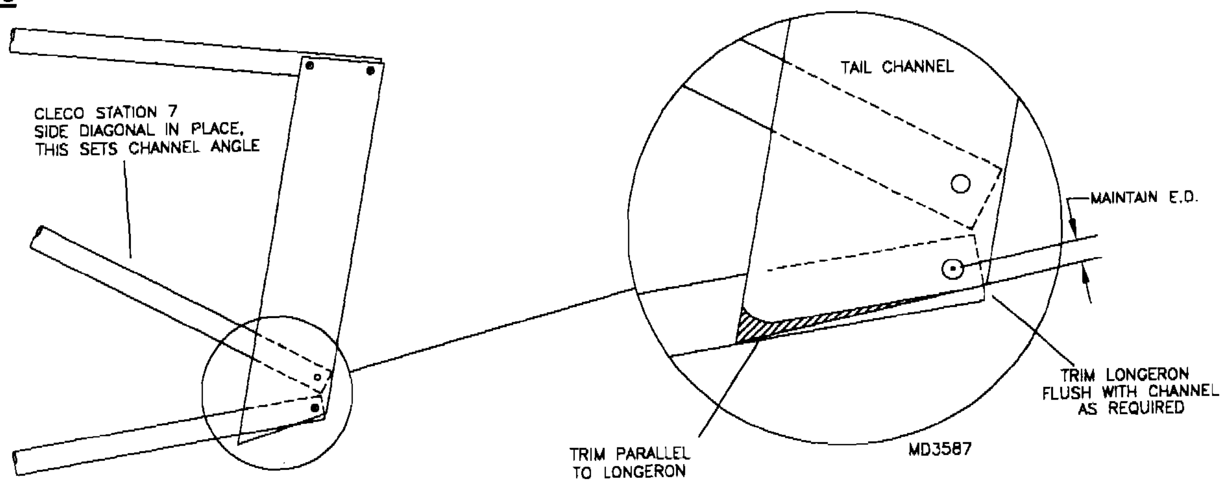


FIGURE 07-04B



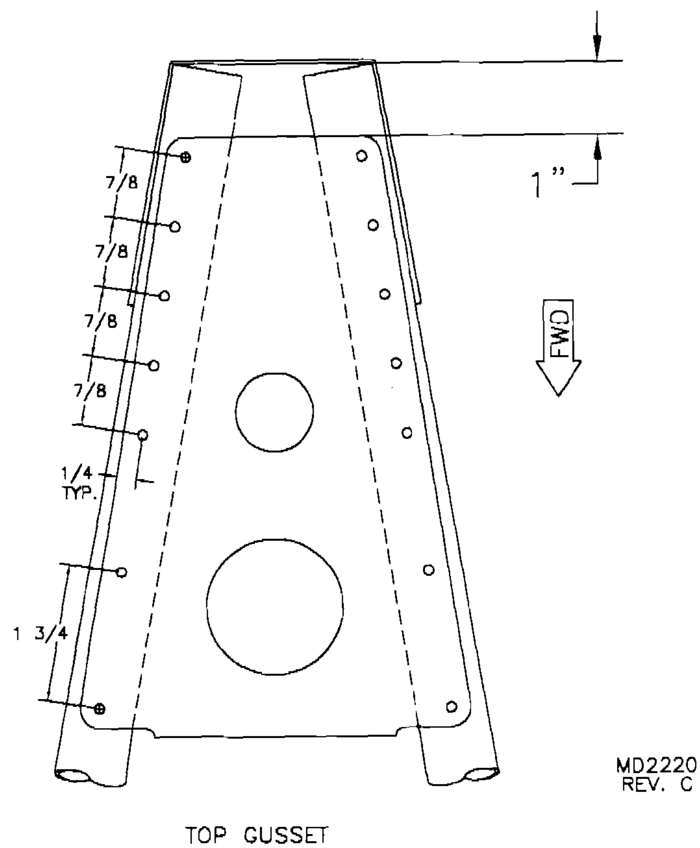
5. Place the tail channel over the ends of the longerons. Align the top holes on both sides of the channel with the holes at the ends of the top longerons; transfer drill to #30 and cleco channel into place. Align holes in Station 7 side diagonals with holes near bottom of channel, transfer drill to #30 and cleco. See **FIGURE 07-05**. Fitting these tubes sets the tail channel at the proper angle. Align the bottom holes on centerline of the bottom longerons; transfer drill to #30 and cleco channel into place. Before riveting the tail channel into place, trim its bottom edge to parallel bottom longeron. See **FIGURE 07-05**. Trim the bottom longerons flush with the aft edge of the tail channel.

FIGURE 07-05



6. Drill the Tail Cone Upper Gusset as in **FIGURE 07-06**. Locate the upper gusset 1" forward of the ends of top longerons. **NOTE:** *The gusset must clear the Vertical Stabilizer Spar.* Drill #30 on longeron centerline, Cleco, deburr and rivet.

FIGURE 07-06



7. **FOR TRIKE MODELS ONLY** - Drill the tail cone bottom gusset as in **FIGURE 07-07**. Locate the 1/4" holes of the lower cable tang 1 1/8" from the ends of the bottom longerons. Center the 1/4" holes on the longerons. Drill the bottom longerons 1/4". Keep the holes squared to the tubes by using a block of wood drilled 1/4" in a drill press as a guide. See **FIGURE 07-07A**. Locate the bottom gusset against the aft side of the tail channel. Drill #30 and cleco. Remove the tail channel, transfer drill 1/4" the bottom gusset. Rivet 1/4" nut plates to the top of the bottom longerons. Install the trimmed tail channel and rivet the longerons, gussets, and side diagonals.

FIGURE 07-07

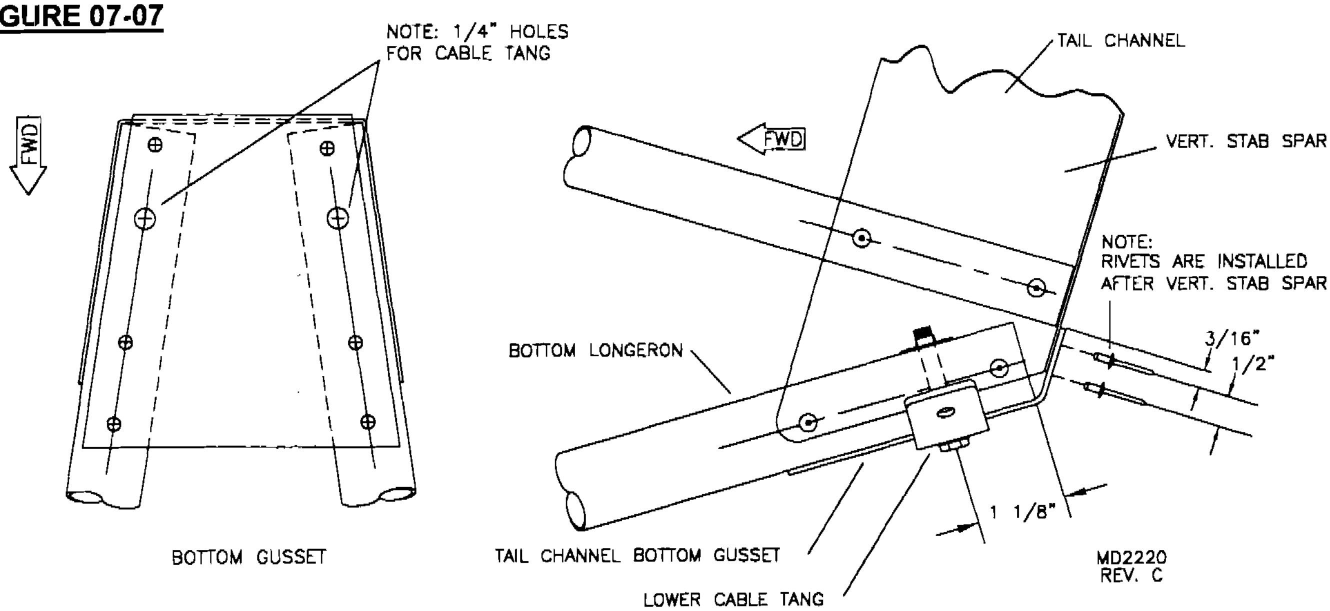
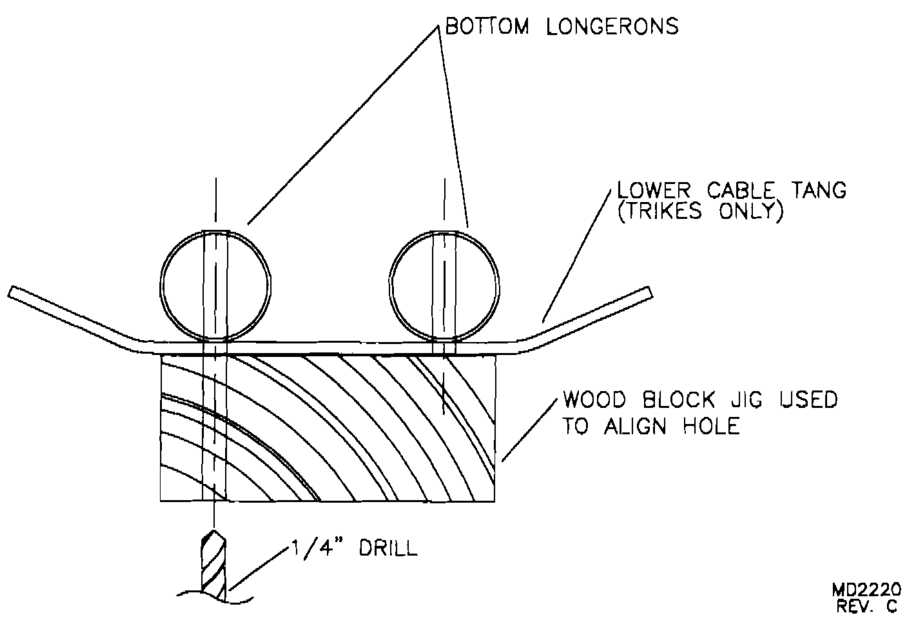


FIGURE 07-07A



8. **FOR TAILDRAGGER MODELS ONLY** - Drill the tail cone bottom gusset as in **FIGURE 07-08**. Locate the aft 1/4" holes of the tail spring mount plate 1 1/8" from the ends of the bottom longerons. Center the 1/4" holes on the longeron. Drill the bottom longerons 1/4". Keep the holes squared to the tubes by using a block of wood drilled 1/4" in a drill press as a guide. Refer back to **FIGURE 07-07A**. Pinch bottom longerons together if plate's holes do not fall on longeron centerlines. See **FIGURE 07-08A.** ***NOTE: Transfer drill and cleco bottom gusset between mount plate and longerons.*** Retain bottom gusset to longerons with four (4) rivets. Transfer drill 1/4" though Tail Spring Mount Plate fwd center hole. Remove Mount Plate and drill this hole to 9/16" to clear tail spring tensile nut. Remove tail channel and rivet 1/4" nut plates to top of bottom longerons. Fabricate four (4) 3/8" x 3/4" bushings to fit vertically inside doublers for reinforcement. Safety wire wrapped around bushings aids insertion; apply JB Weld epoxy to bushing edges to fix in place. Retain with bolts until set (wax or lightly grease bolts to keep them from binding). After glue sets and gussets are installed, remove bolts and install them through plate, gusset and longerons. Cleco tail channel back onto longerons and bolt tail spring mount plate to longerons. Slip Side Gusset Plates under tail channel so it laps under 3/4". **HINT:** *The aft lower end of the Side Gusset Plates will be flush with the bottom of the tail channel.* Trim the lower ends of the Side Gusset Plates to be parallel to the bottom longerons. Drill through remaining holes in channel and locate the others as shown in **FIGURE 07-08B**. After tailcone is aligned, rivet gusset in place on **OUTSIDE** of tail channel. **FIGURE 07-08B** also shows the assembly with tail spring mount plate.

FIGURE 07-08

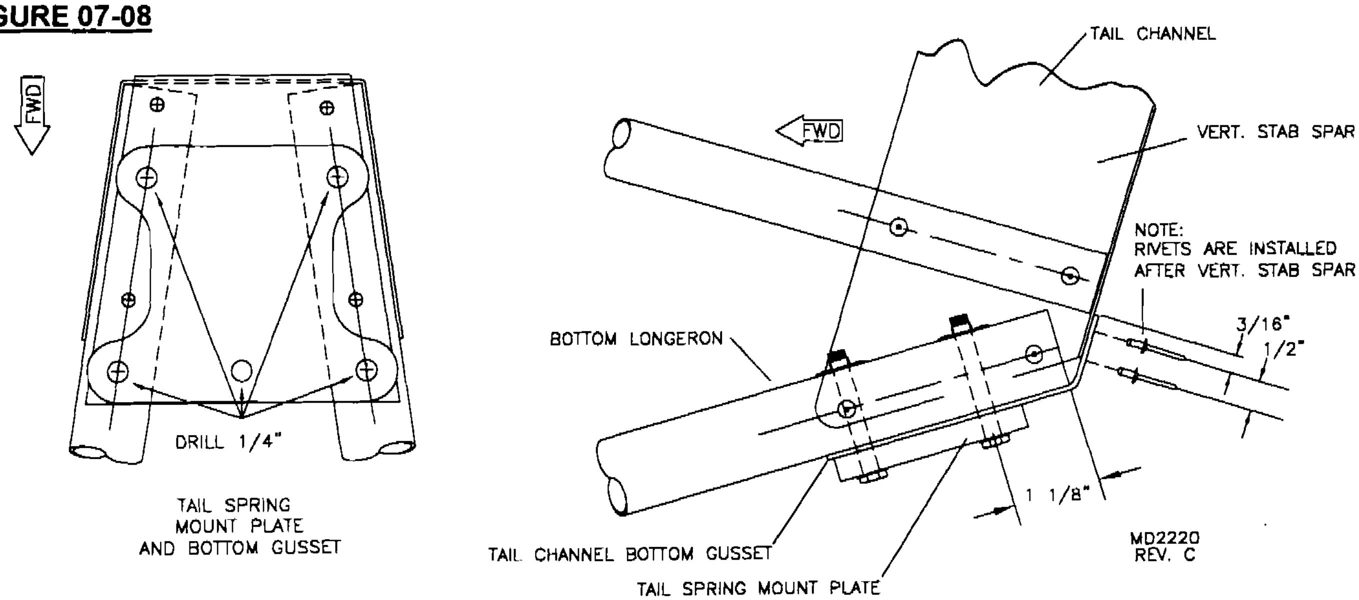


FIGURE 07-08A

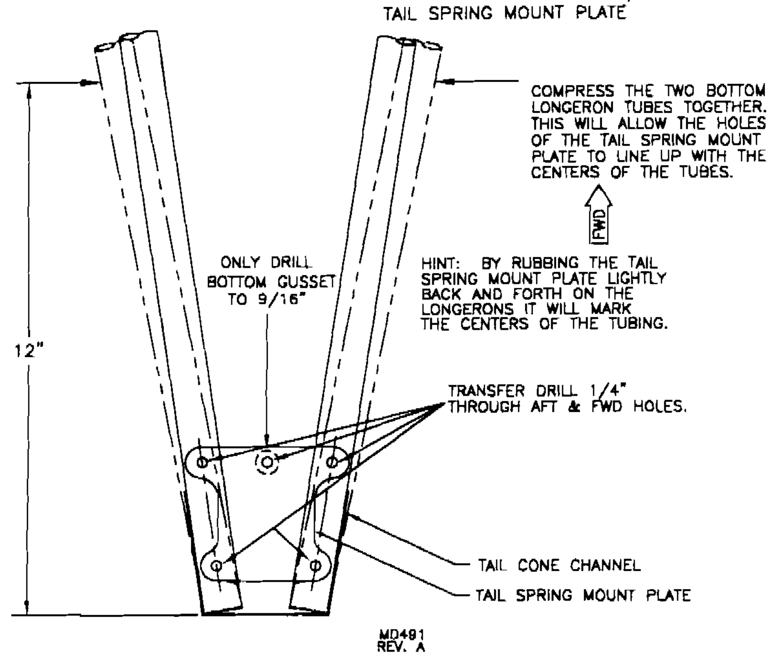
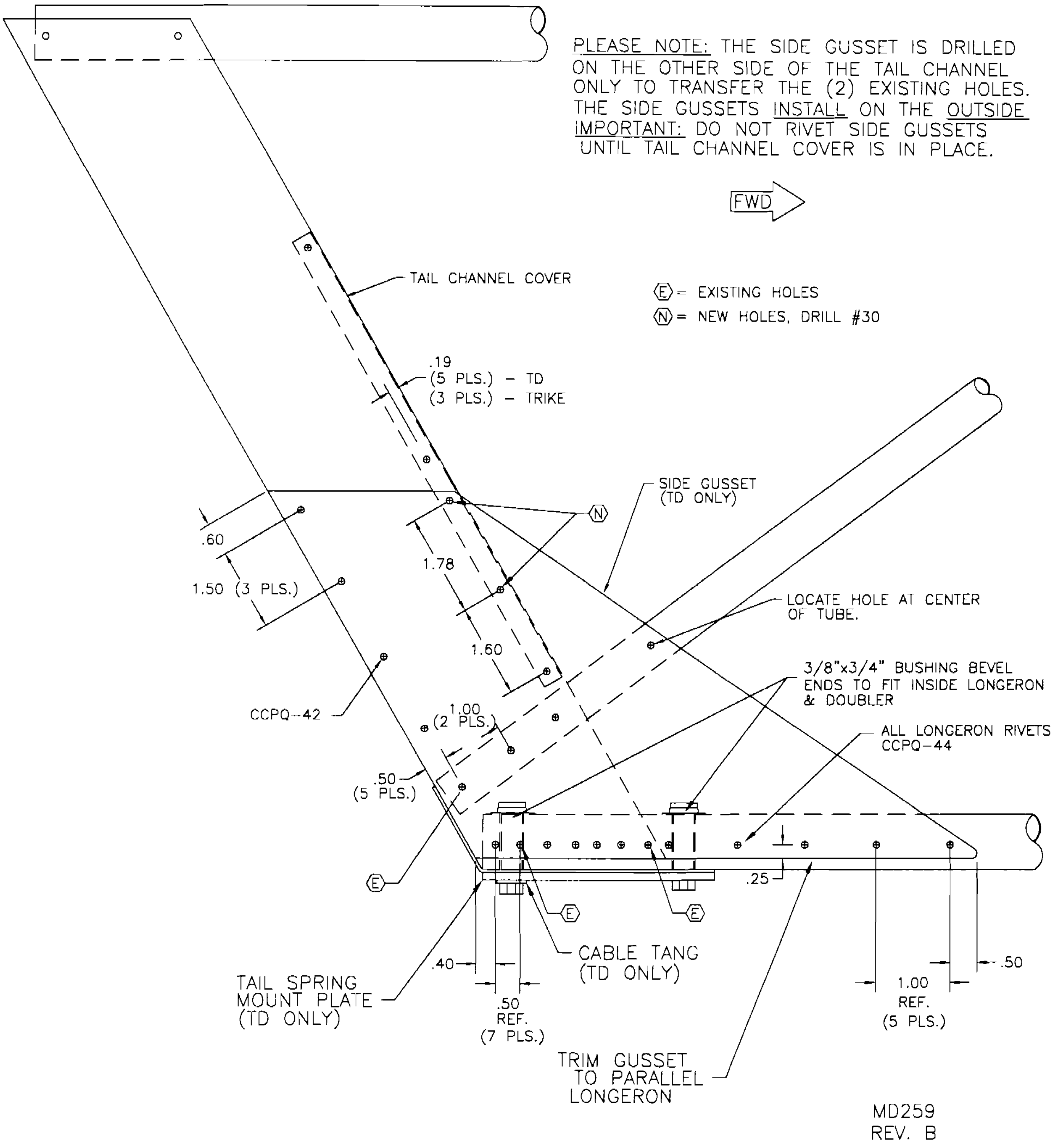


FIGURE 07-08B



9. Install inside cluster gussets. Be sure the gusset holes line up on tube centerlines. When riveting side tubes, you will install Station 4 and 5 diagonal cables and cable attachment pieces. **IMPORTANT:** *Cleco cable attachments at this time. Rivet only after installing second rivets in tailcone tubes as instructed later.* Drill the inboard hole of the cable attachment to #11. Use the longer 1/4" (CCPQ-44) grip where these rivet into tubes and the 1/8" (CCPQ-42) grip rivet where they attach to gussets only. Do not connect cables yet; wait until tailcone is aligned. Square the tailcone, measuring diagonally inside the tailcone. Use ratchet straps to temporarily hold the tailcone square. Install the Station 6 bulkhead. Refer to **FIGURE 07-09** and **FIGURE 07-09A** detail drawings for which holes to leave open. Detail "D" shows a 3/16" nut plate and bushing installed to middle hole of lower cluster at Station 6; this is the forward lower cable attach point. JB Weld epoxy bushing in place; hold with a waxed bolt while epoxy sets. **HINT:** *Drill each middle hole #11 and use a 3/16" bolt to align the inside gusset for riveting.* Drill #30 and cleco the tail channel cover to the tail channel. Refer to **FIGURE 07-08B.**

FIGURE 07-09

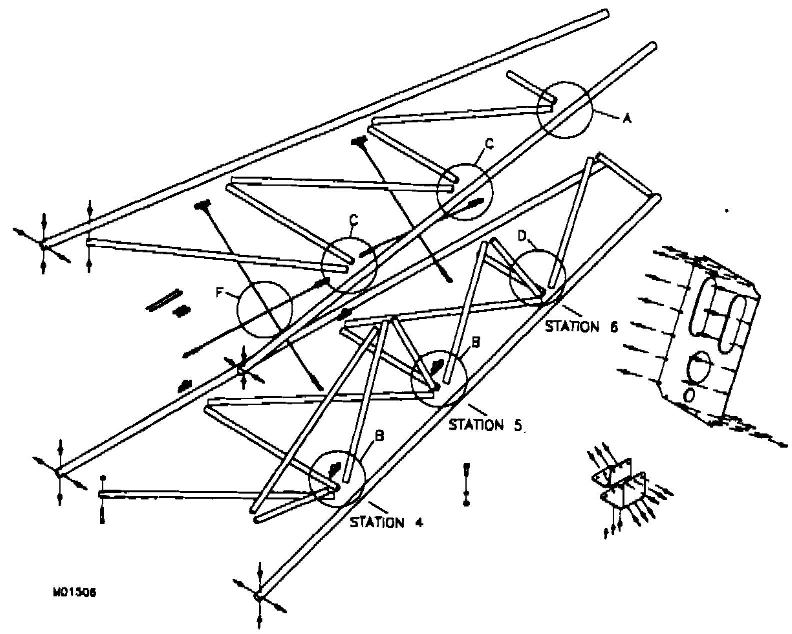
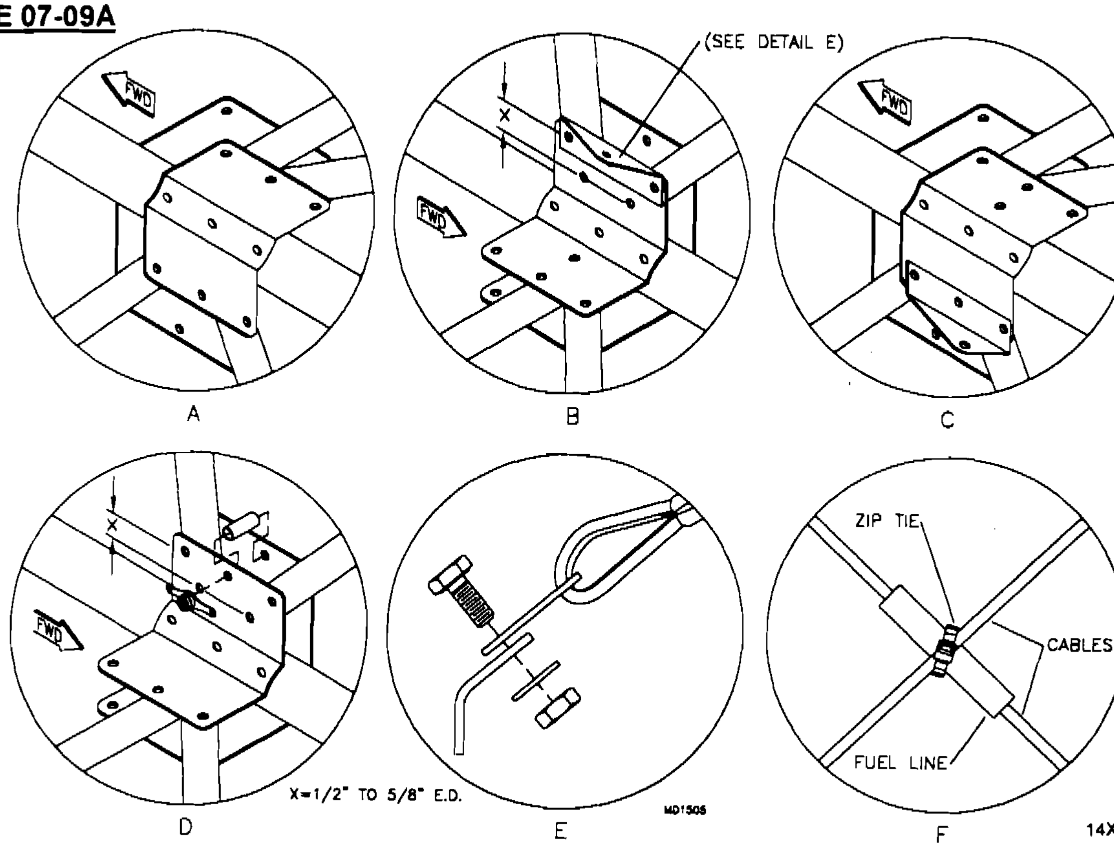


FIGURE 07-09A



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10. Install all second rivets in ends of the 3/4" tubes. Refer to **FIGURE 07-10.** ***NOTE:*** *Most tubes require double rivets on each end, totaling 4 rivets per end; however, Station 4 and 5 side diagonals attach with only two to top cluster.* Install six rivets to attach the outside of the gussets to the longerons. Install three rivets on inside gusset. See **FIGURE 07-10** and **FIGURE 07-10A**. Rivet cable attachments and connect cables.

FIGURE 07-10

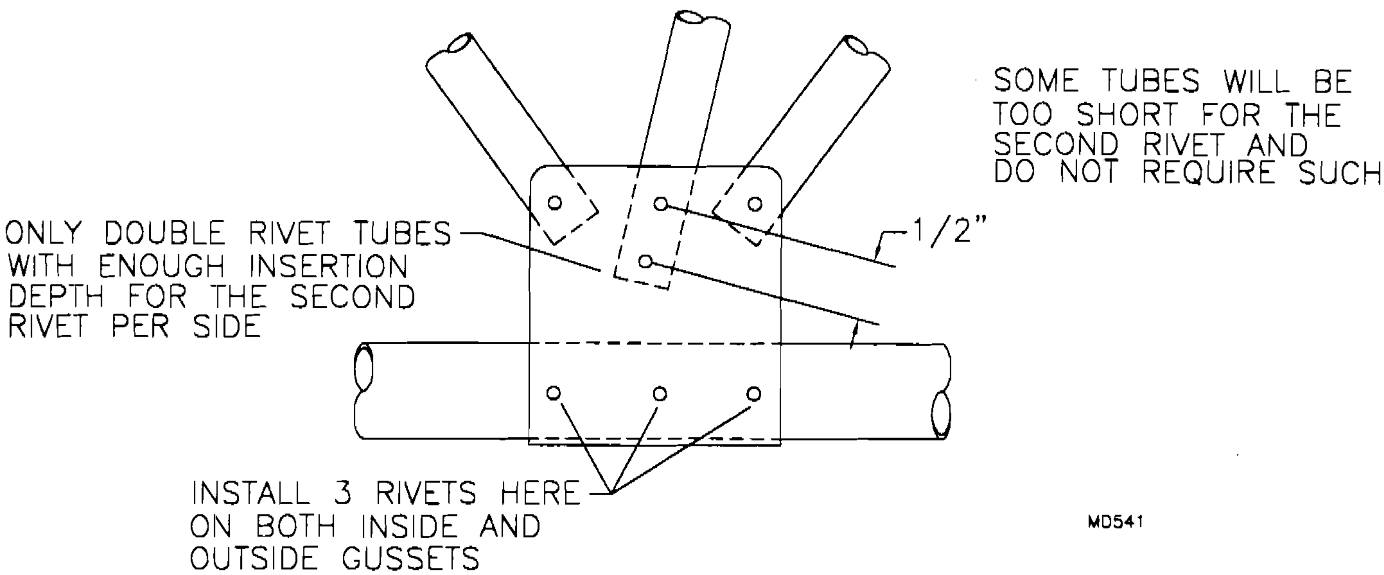
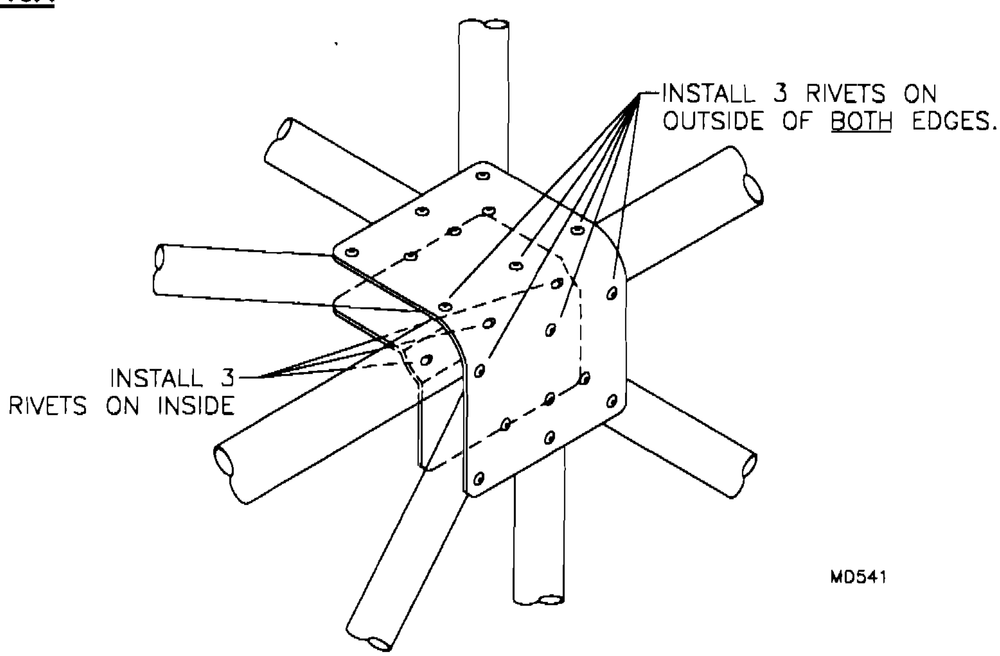


FIGURE 07-10A



11. Assure proper alignment before riveting longerons to cage; when symmetrical, tailcone sides have same lengths; see **FIGURE 07-11**. Once assured, clamp longerons and drill #11, steel stubs and longerons. See **FIGURE 07-11A**. Be sure stubs have been coated with silicone to protect from corrosion.

FIGURE 07-11

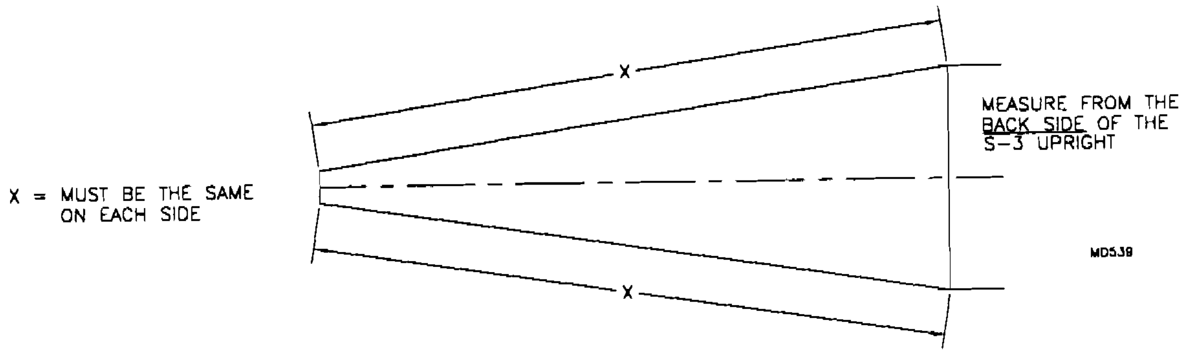
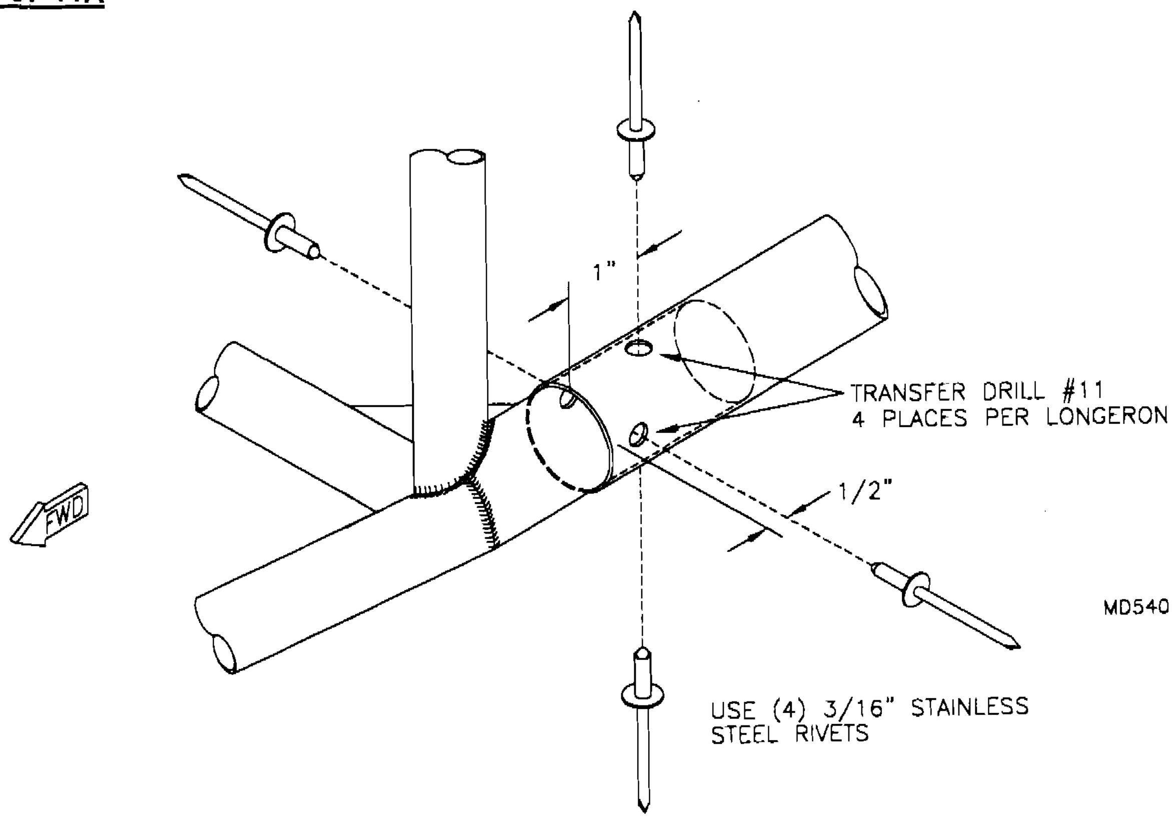
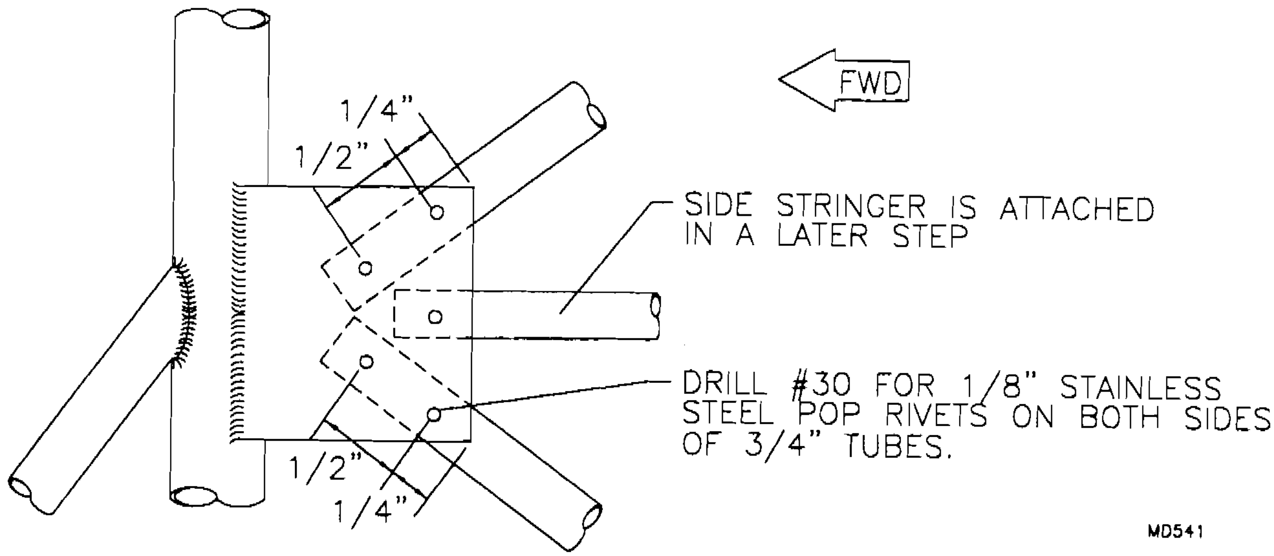


FIGURE 07-11A



12. With tail cone riveted to cage, Station 4 top and bottom diagonals may be riveted. Top diagonal attaches between welded tabs at upper right-hand corner; place tube between tabs, drill and rivet with #11 stainless steel rivets. Bottom diagonal is slotted to fit over gusset welded in the lower right-hand corner; drill through gusset using the tube as a guide. Bolt from the bottom. Rivet Station 4 side and lower side diagonals in place; refer to **FIGURE 07-12**. ***NOTE:*** *If installing the Optional Aft Baggage Compartment, rivet the right-side Station 4 side diagonal to the Station 3 welded tab during baggage door frame installation.*

FIGURE 07-12



13. Finish riveting tail channel. Locate and rivet, side and bottom stringers; see **FIGURE 07-13**. Attach forward ends of side stringers inside welded tabs at Station 3 and retain as depicted in **FIGURE 07-13A**. Rivet tail channel cover in place. Cut Bottom Stringers to length, flatten forward ends and slip over Station 1 tabs, drill #30 and rivet. See **FIGURE 07-13B** Trim aft end of stringer to clear bottom crossing tube. Install bottom stringers with stand-offs, per **FIGURE 07-13B**. Be certain stringers are straight and have stand offs in place, before covering.

FIGURE 07-13

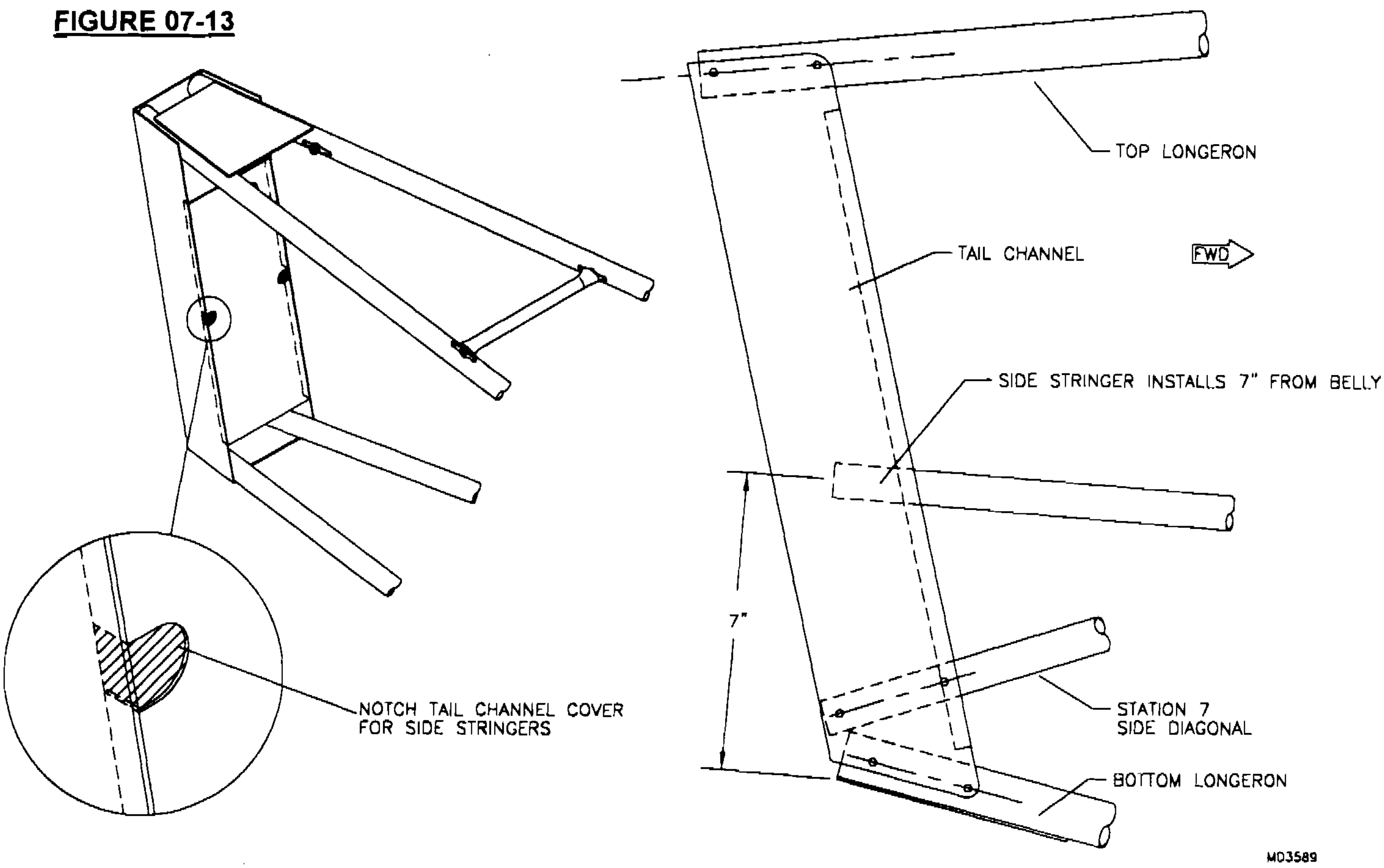


FIGURE 07-13A

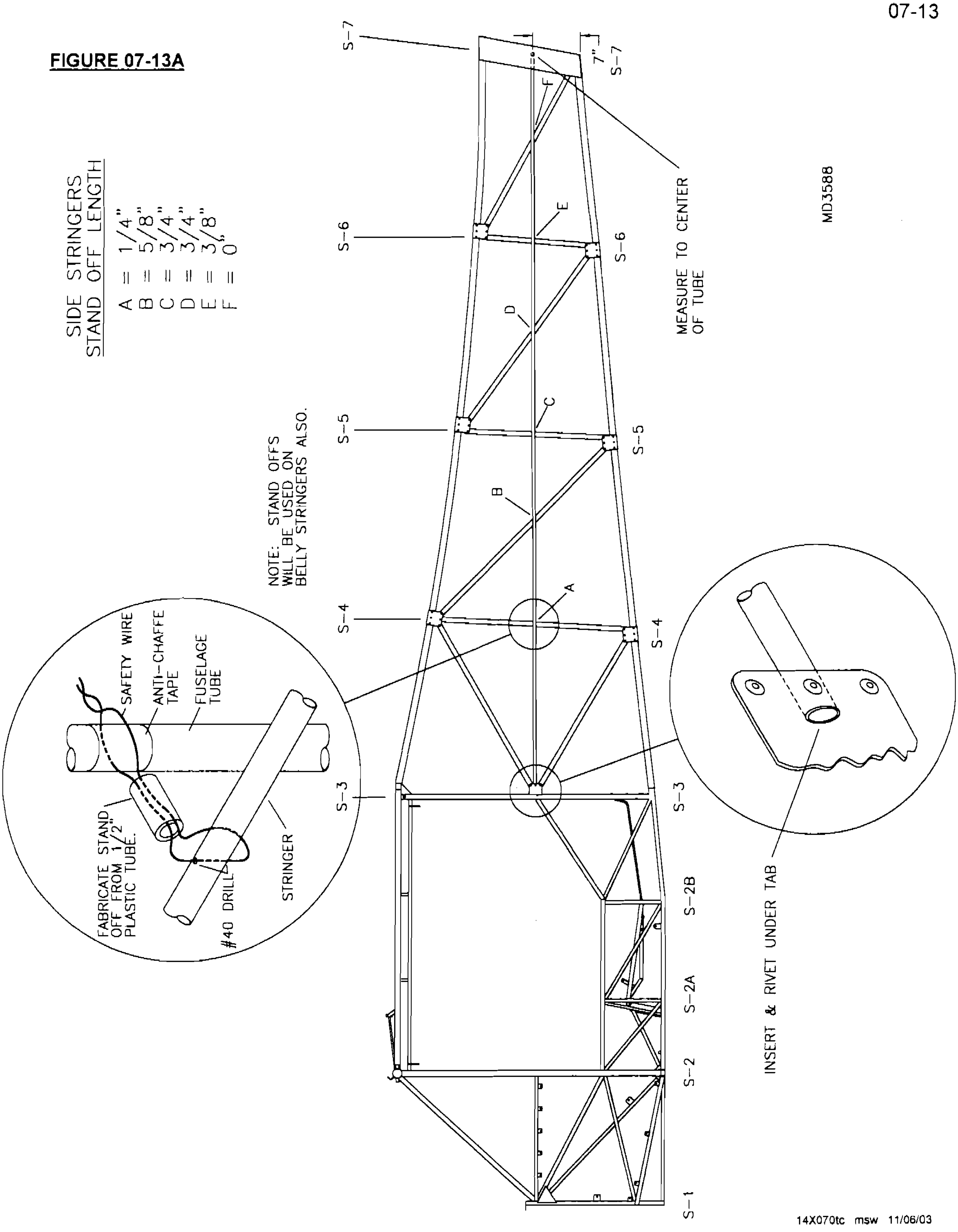
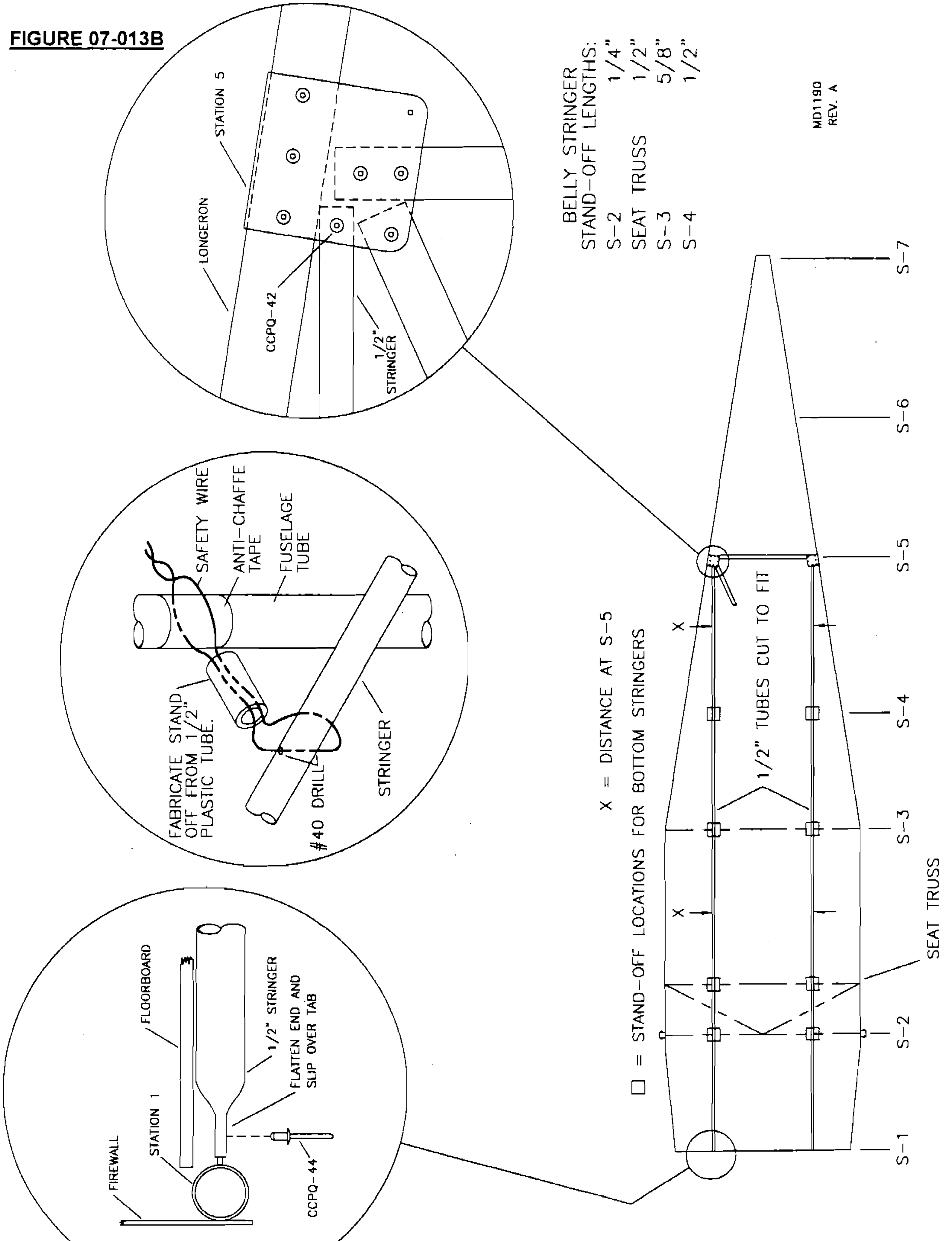
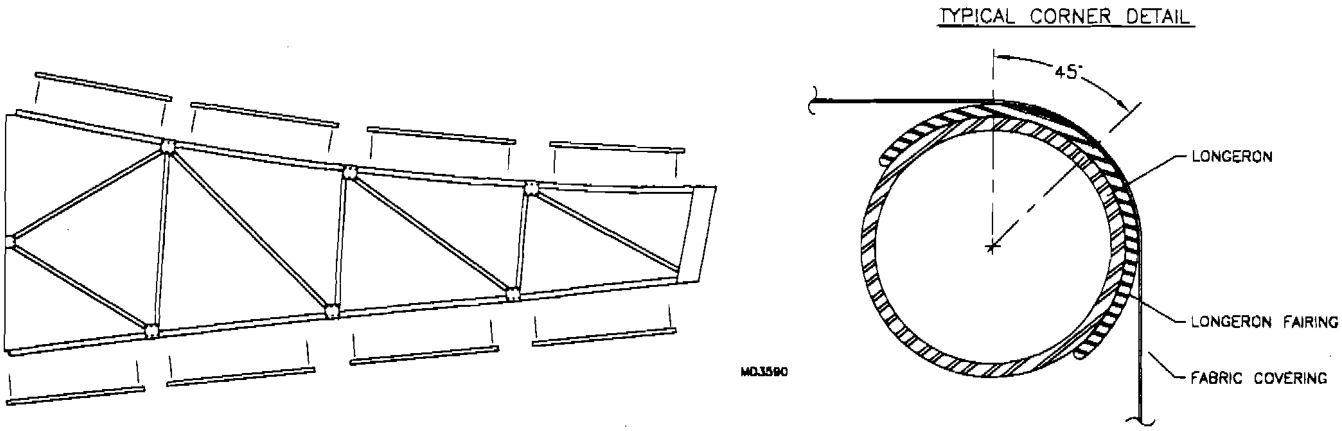


FIGURE 07-013B



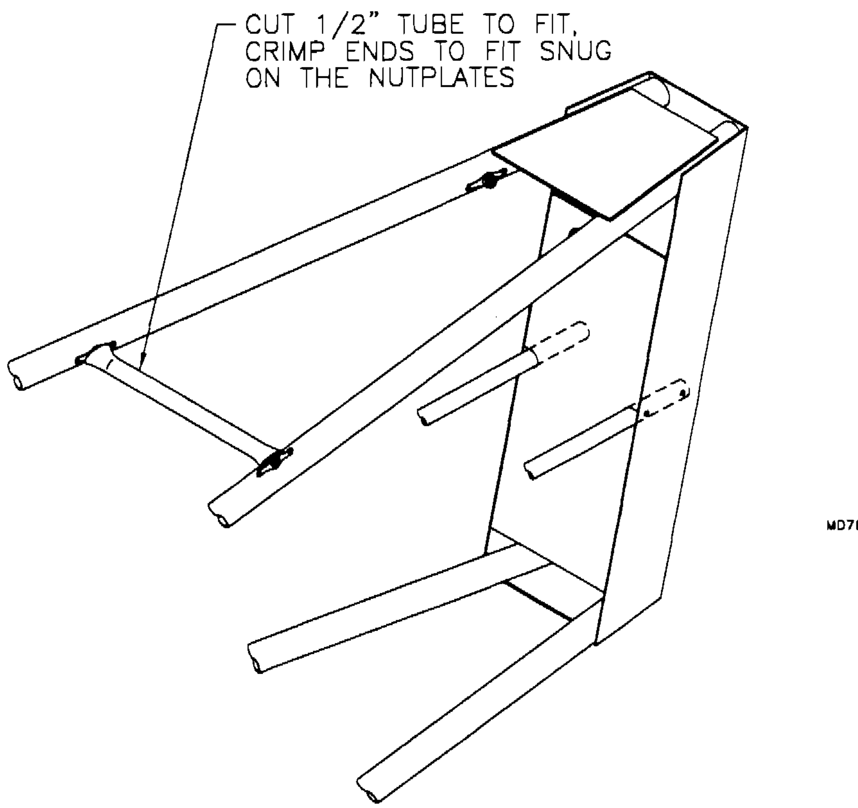
14. Cut longeron fairings to fit between cluster gussets, deburr, and snap in place. See **FIGURE 07-14**. Mark and drill fairings for horizontal stabilizer attachment bolts.

FIGURE 07-14



15. Measure between the two forward nut plates, which will retain forward horizontal stabilizer brackets. Cut and fit a 1/2" aluminum tube between these; crimp ends to secure against nut plates; see **FIGURE 07-15**. Tail cone now should be completely assembled; check carefully for placement of all rivets. *Note that rudder cable guides need to be installed prior to covering* (See Rudder).

FIGURE 07-15



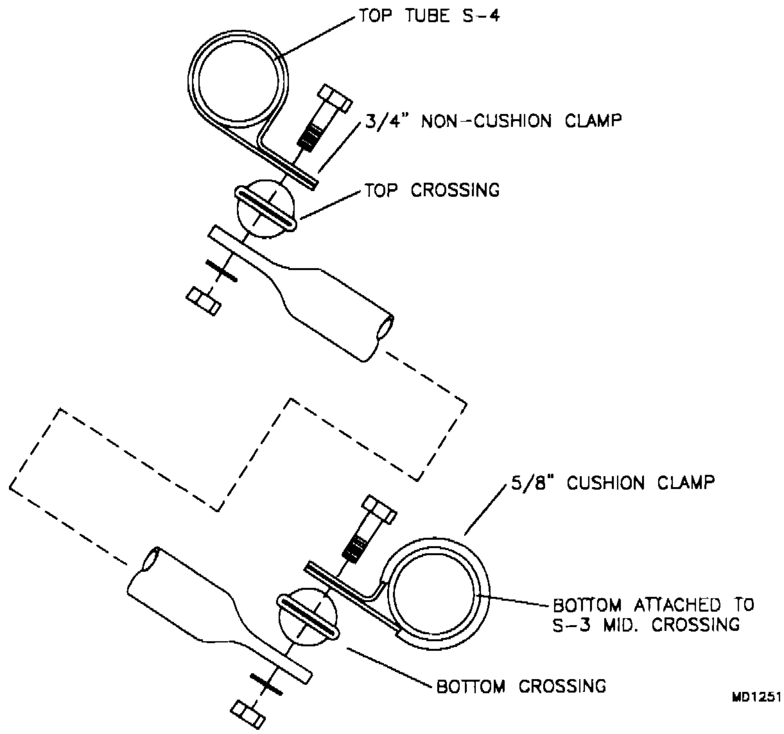
INSTALLING THE OPTIONAL AFT BAGGAGE COMPARTMENT

1. Select the parts shown in the parts drawing.

2. Drill #11 the ends of each baggage compartment support tube on center 1/4" in from the ends. Place the proper tube in the right pocket on the sides of the baggage compartment.

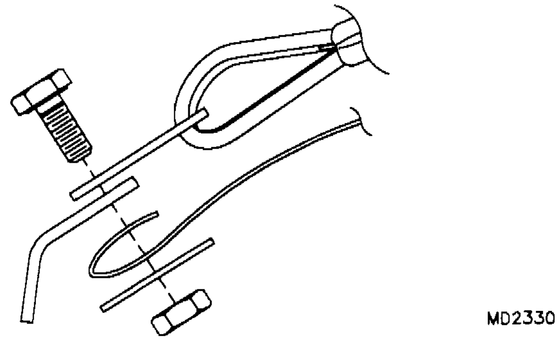
3. Slip the 3/4" non-cushioned clamps over the S-4 top crossing tube and bolt tubes as shown in **Figure 07A-03**. Place a 5/8" cushioned clamp over the S-3 mid crossing tube. Assemble the lower tubes in the same manner. The baggage compartment is shaped to fit into the cavity only one way. The top edge is narrower than the front bottom edge.

FIGURE 07A-03



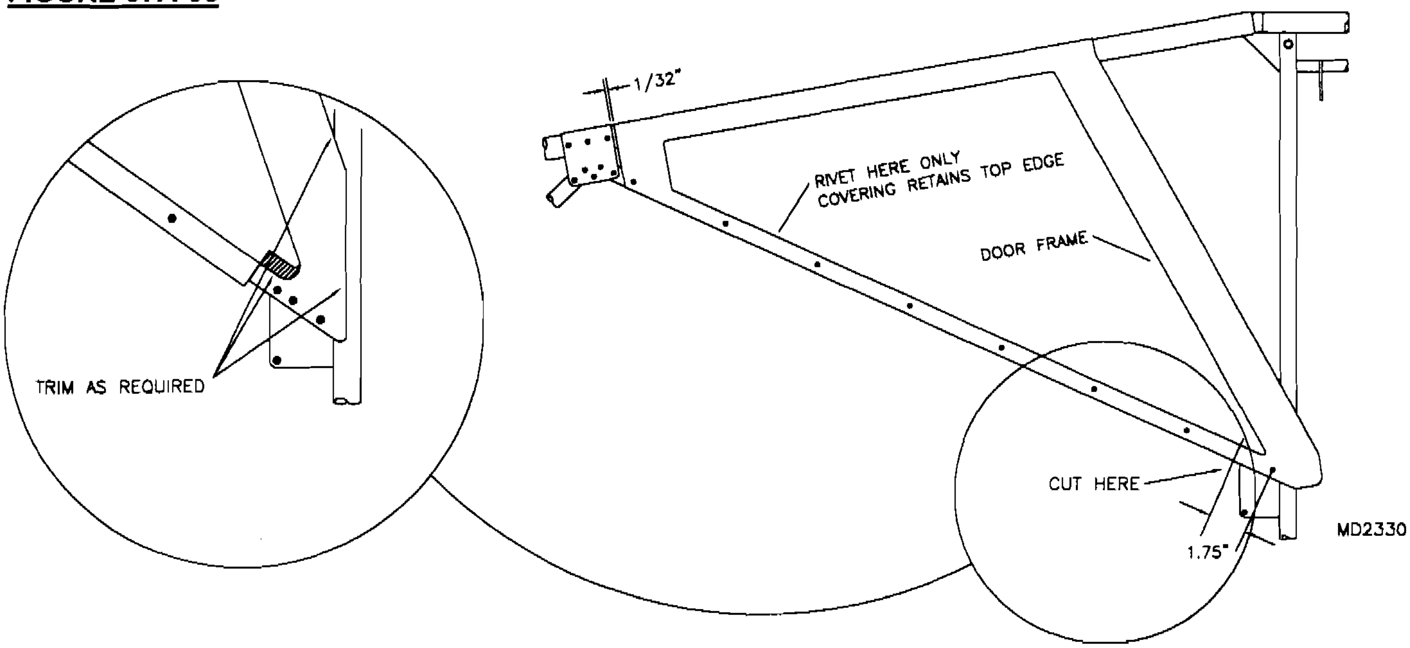
4. With the baggage compartment in place attach the strap to the lower Station 4 cluster as shown in **Figure 07A-04**. Fold over the strap for extra strength. Use a soldering iron to melt a hole into strap. Lace the strap through the buckle and pull tight. If the baggage compartment is properly installed all surfaces should be flat and tight. Lace the cargo flap straps to secure.

FIGURE 07A-04



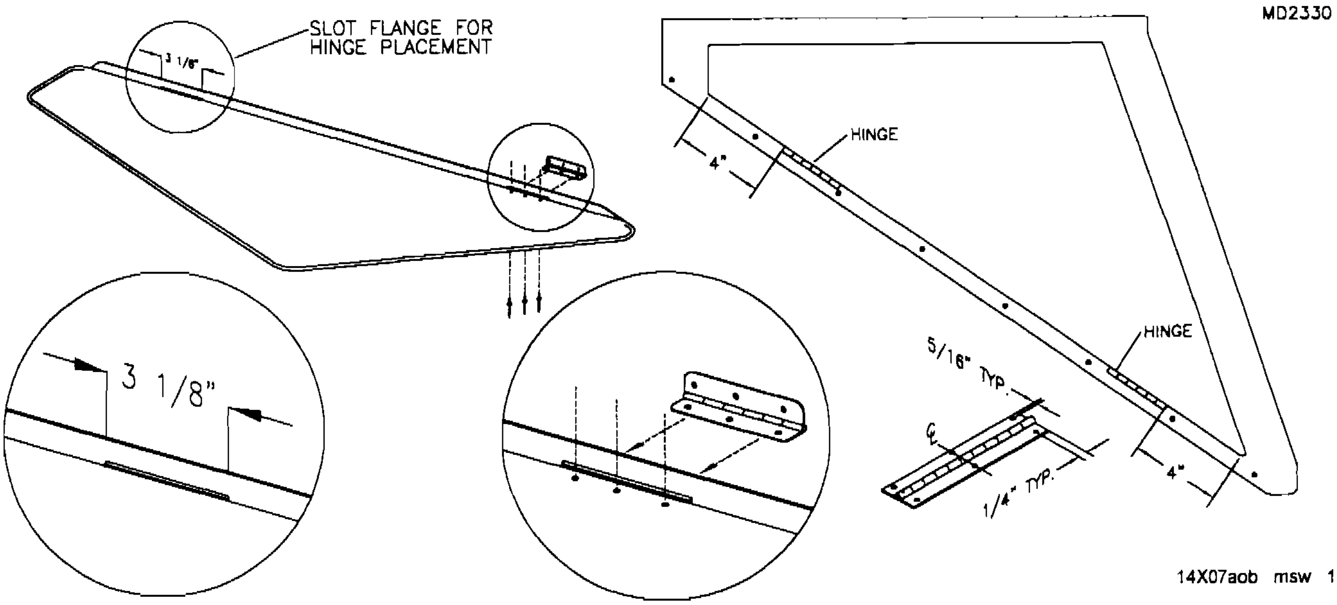
5. Cut the baggage door frame as shown in **Figure 07A-05**. Place the baggage door frame on the aircraft's right side. The frame should be self-locating, however check the location as shown in **Figure 07A-05**. With the frame in proper location transfer drill #30 and cleco. Flex the forward frame edge until parallel with the baggage door. Locate the holes under the frame in the Station 3 welded tab. Drill #30 and cleco. Locate an additional forward rivet if required. ***CAUTION:*** *Do **NOT** drill into the cage tube.* Trim the door frame as required. Rivet the frame to the tailcone. The top of the door frame is retained by the fabric.

FIGURE 07A-05



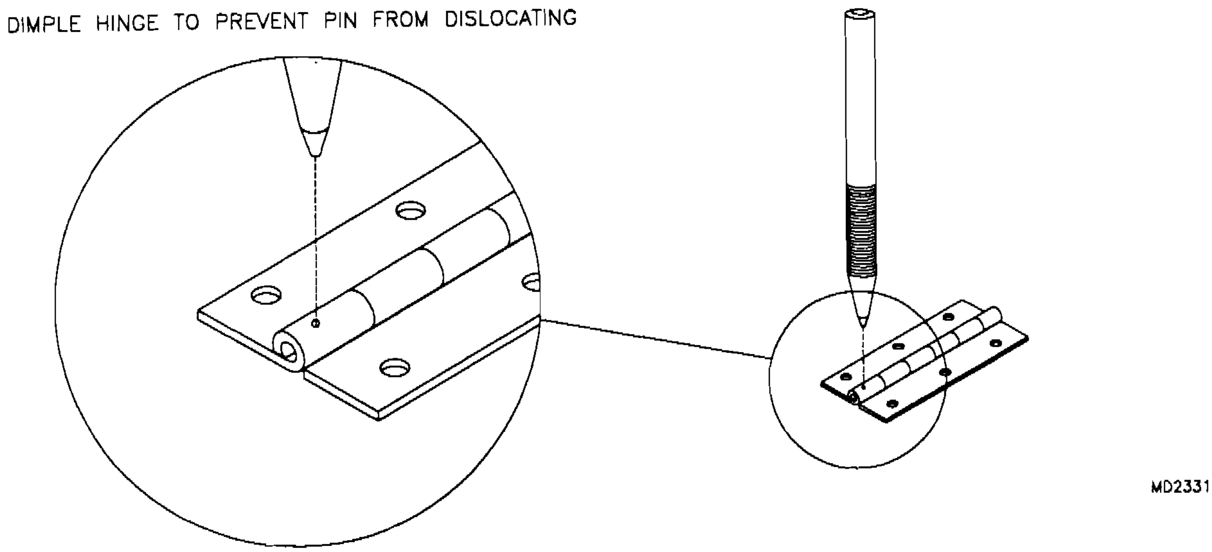
6. Mark the location of the two hinges 4" in from each corner of the baggage compartment frame as per **Figure 07A-06**. Transfer the hinge locations from the baggage compartment frame to the door. Slot the flange of the door as shown to allow for proper hinge placement. The slot can be easily made by drilling a series of #30 holes; then use a small round file or a hack saw to connect and smooth the slot (A Dremel tool is helpful here). Drill three holes per hinge. ***HINT:*** *It is a good idea to tape the hinges and door in place and check operation before drilling any holes.* Final rivet the hinges to the door frame after covering and painting. Make sure to overhang the hinges off of the frame to allow proper door operation.

FIGURE 07A-06



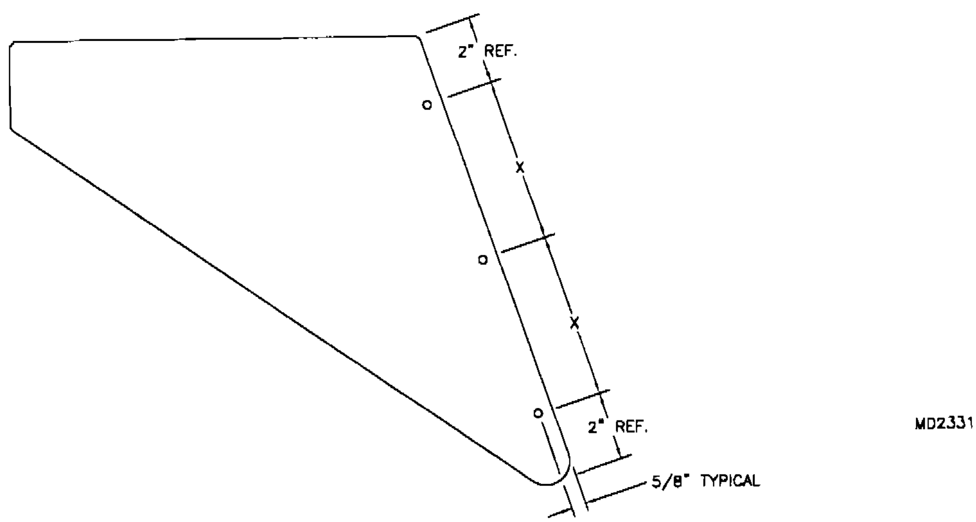
7. Use a punch to dimple the hinge to prevent the hinge pin from dislocating. See **Figure 07A-07**.

FIGURE 07A-07



8. Locate the wing head 1/4-turn fasteners as shown in **Figure 07A-08**. ***HINT:*** *Locate and drill #30. Tape the door in place, with hinges attached, transfer drill into the door frame.* See cowling for details on installing 1/4-turn fasteners. **NOTE:** *Position the receptacles so the wings on the 1/4-turn fasteners are parallel to the slipstream when locked.* **HINT:** *Position the receptacles perpendicular to the Fuselage Station 3 Vertical Tube.*

FIGURE 07A-08



9. **A WORD ABOUT COVERING:** Read this now, but remember to perform this task during covering. With the door frame in place cover over the door area. Before shrinking skin, cut the fabric from each corner to a common center point. Fold the flaps back over the frame edges and glue and trim. Shrink fabric as required.

S-6S COYOTE II CONTROL STICK ASSEMBLY

The S-6S features a cable and push pull tube operated aileron control system. To help with quick knock down of the wings telescoping sleeves are used to connect the aileron push pull tubes. These are retained by quick pins and require close inspection before each flight. Please be sure to inspect for correct insertion of these pins before each flight.

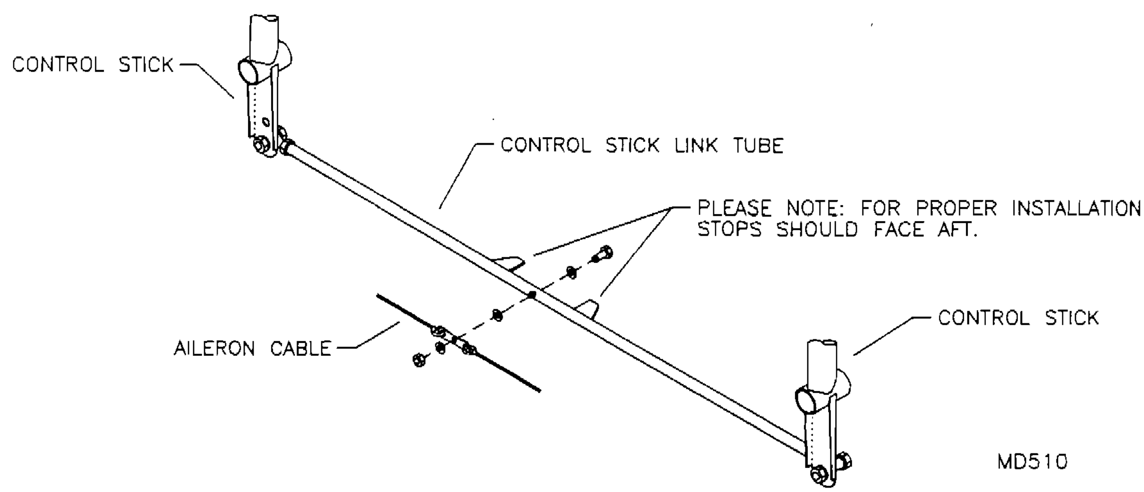
1. Refer to the parts catalog and select the required components for assembly.

2. Drill out **ONE** of the control stick's lower holes to 1/4" diameter. The other control stick has a 3/16" bolt inserted and does not need to be drilled.

3. Grease the inside of the connect tube pivot bushing, the bearings and the outside of the control stick torque tube's pivot stubs. Slip the control sticks onto the torque tube with the washers and bearings in the order shown in the parts drawing. Run on the 3/4" nut until it takes out all the play in the stick but is not to tight to cause binding.

4. Assemble the control stick link tube as per **Figure 08-04**. Assemble the unit to the control stick connector tubes. Adjust the sticks parallel using the rod end. The fixed end of the link tube uses a 1/4" diameter bushing slightly taller than the link tubes bushing to allow the bolt to be tightened and not bind the bushing. Fabricate the bushing using the 1/4" aluminum tube provided.. for easy fabrication drill out the inside diameter to 3/16" before cutting to length. Measure the link tube bushing and add 1/32" for the inner bushing cut length. It should measure approximately 21/32". Apply grease to this bushing prior to assembly. The 3/16" bolt must be tight to hold the alignment to obtain proper cable clearance and the link tube must swivel freely.

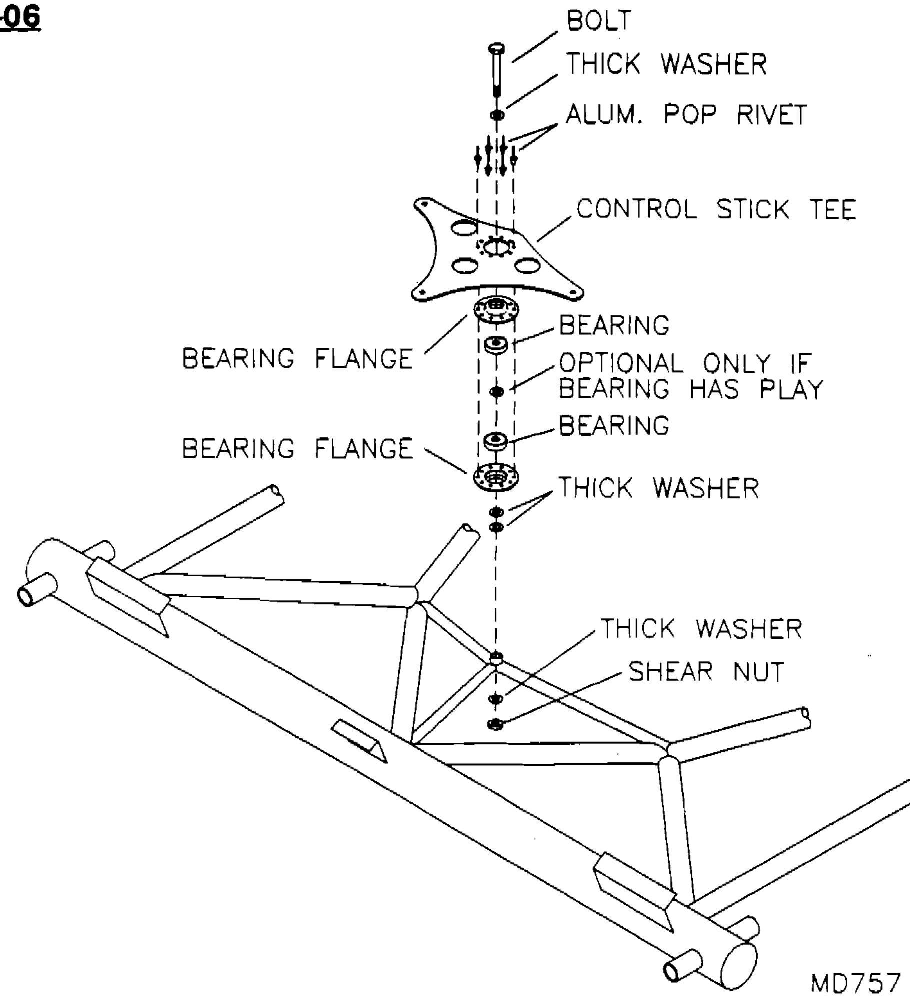
FIGURE 08-04



5. Bolt the control stick torque tube to the square tubes welded into the belly of the cockpit cage. Use the pillow block's second hole as a guide to locate and drill through the 1/2" square tube for the second bolt.

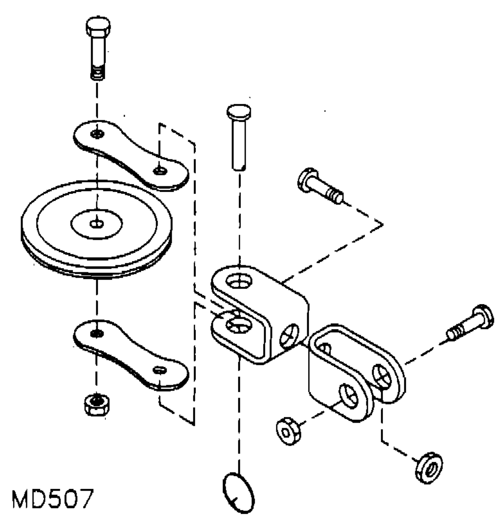
6. On the top of the cockpit cage on center near the forward spar carry through is the control tee swivel bushing. Assemble the flange bearing to the control tee by inserting one-half of the flange in the tee's center hole. Transfer drill six #30 holes into the tee. Test the fit of the flange bearing by clecoing the unit to the tee. Insert a 1/4" bolt, if it feels tight with no play rivet bearing to tee with (6) 1/8" Aluminum Pop Rivets. If play is present, insert thin 1/4" washer between the bearings. The tee should spin freely once bolted in place on the top side of the bushing. **See Figure 08-06.**

FIGURE 08-06



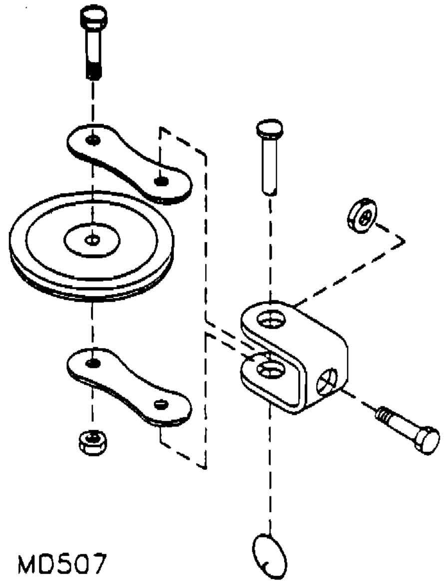
7. Bolt together four pulley assemblies as per **Figure 08-07**. **PLEASE NOTE:** The small shackles go on the outside of the tangs coming off the pulleys. Install a nut finger tight on the bolt through the pulley so the aileron cables can be inserted later. On the remaining four pulleys assemble them with the second shackle omitted. Please see **Figure 08-07A.**

FIGURE 08-07



PLEASE NOTE: REFER TO PARTS PAGE FOR PARTS.

FIGURE 08-07A



REFER TO PARTS PAGE FOR PARTS.

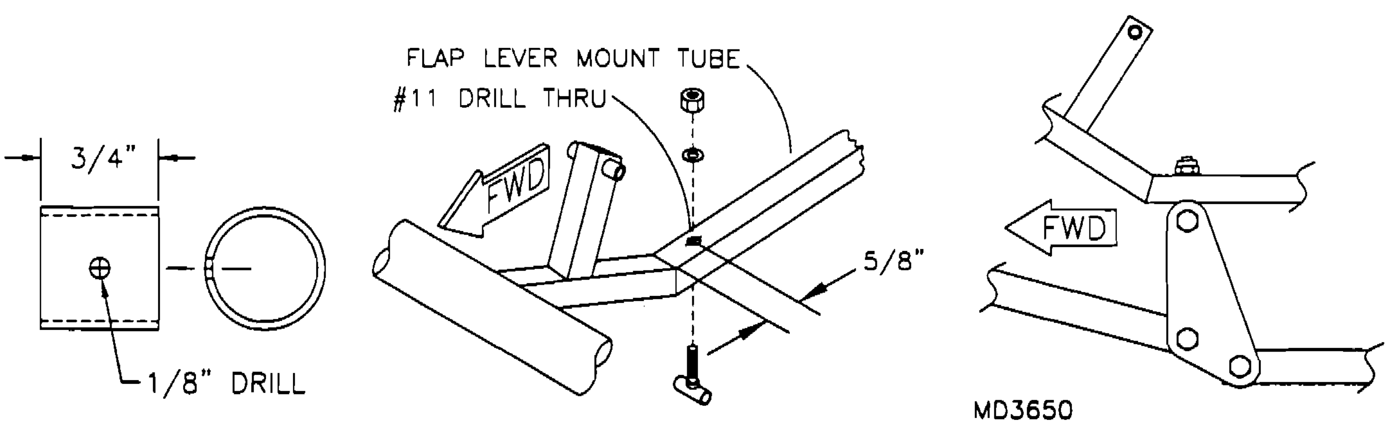
8. Install pulleys to locations in **Fig. 08-08.** Four locations are small bushings welded to cage. Note: pulleys which bolt to S-3 crossing tubes have nuts which are placed inside shackles. Insert bolt and finger tighten as much as possible. Use pliers to squeeze shackle tight against nut to tighten completely.

9. Route aileron cables per **Fig. 08-08.** Tighten turnbuckles slightly and test-run system. Check for smooth, free movement. If everything is lined up, it will operate with very little friction. If it binds or catches, inspect system for dragging pulley or gross misalignment. Once satisfied the system runs properly, tension cable so it produces low note when strummed. Excessive tension causes high system friction; too little tension allows play in system. Adjust turnbuckles as necessary.

10. Inspect all connections before flying. *Check controls before flight! Moving stick right should raise right aileron and drop left aileron; moving stick left should raise left aileron and drop right aileron.*

11. Assemble elevator push-pull tubes, side plates and associated hardware per parts drawing. Fabricate elevator stop sleeves from raw stock per **Fig. 08-11.** Slip one sleeve onto 32" push-pull tube before inserting tube through centerline bushing on S-3 truss; slip other sleeve onto tube aft of bushing. (Sleeves will be riveted in place during tail assembly.) Drill #11 hole 5/8" aft of bend in flap lever mount tube (between seat rails); install push-pull assembly to flap lever mount tube per **Fig. 08-11** and to control stick torque tube per parts drawing.

FIGURE 08-11

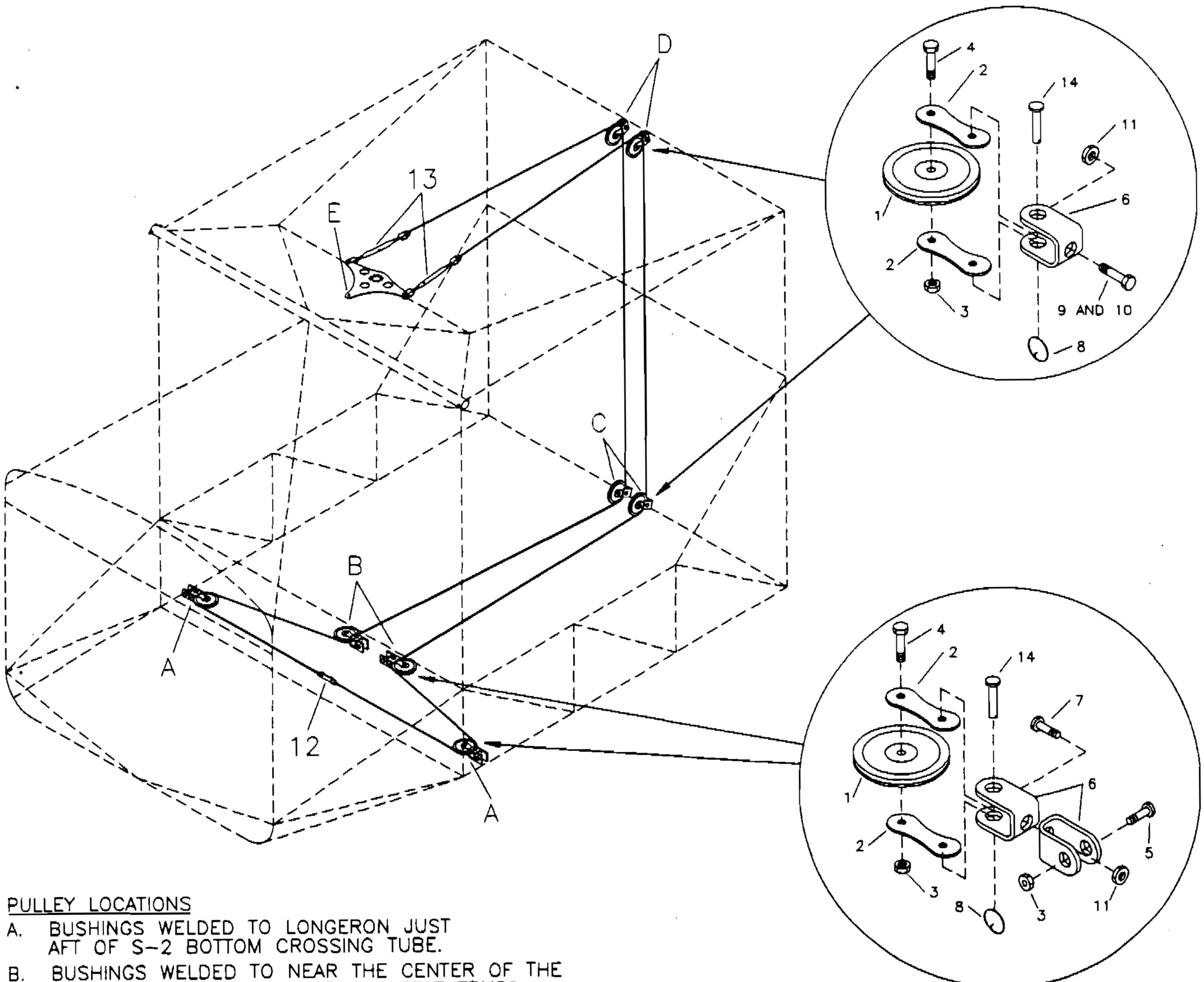


12. Check push pull tube assembly for smooth operation. Oil all pivot bushings and pillow blocks with a light machine oil. Keep these areas clean and well lubricated.

13. Insert the push pull tubes end fittings into their respective 3/4" diameter aileron push pull tubes. Drill through the #40 pilot holes with a #30 bit and rivet with 1/8" stainless steel rivets.

14. Completion of the aileron control system can only be done after the wings are installed. We recommend attaching the wings before covering. It is much easier to set the washout and rig the flaps and ailerons less the covering.

FIGURE 08-08



PULLEY LOCATIONS

A. BUSHINGS WELDED TO LONGERON JUST AFT OF S-2 BOTTOM CROSSING TUBE.

B. BUSHINGS WELDED TO NEAR THE CENTER OF THE BOTTOM CROSSING TUBE OF THE SEAT TRUSS.

C. #11 HOLES LOCATED NEAR THE CENTER OF THE S-3 BOTTOM CROSSING TUBE. HOLES ARE DRILLED AT AN ANGLE.

D. #11 HOLES LOCATED NEAR THE CENTER OF THE S-3 TOP CROSSING TUBE. HOLES ARE DRILLED AT AN ANGLE.

E. CONTROL TEE. SEE PUSH PULL TUBES.

INSTALLING THE MOLDED INTERIOR IN THE S-6S

NOTE: Installation of baggage compartment is covered in final assembly.

1. Un-pack the interior kit. Inventory the kit against the packing list. The components are carefully packed and should arrive intact. Inspect the panels prior to trimming and assembly.

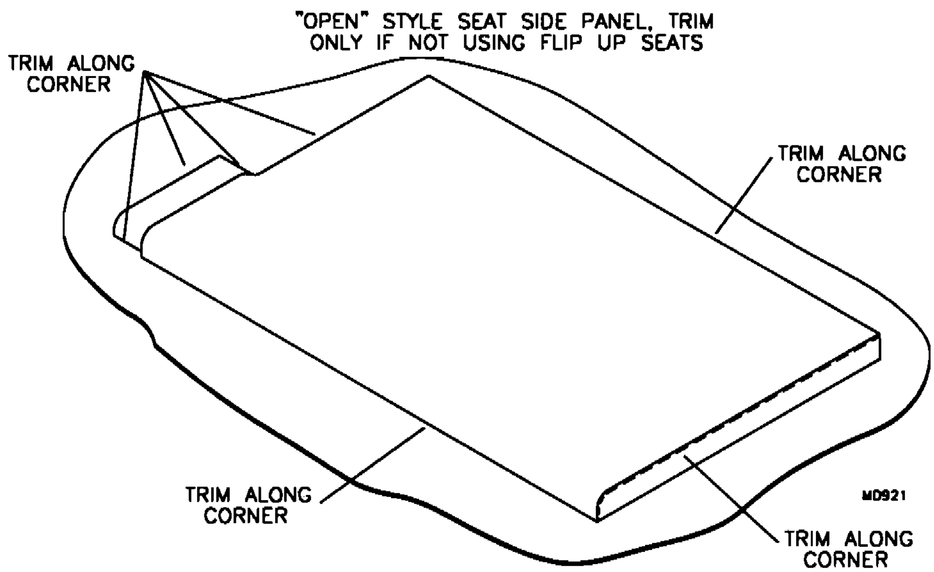
2. Look over the parts closely. You will notice trim lines molded into the parts. The parts will need to be trimmed and holes made accordingly. To trim, use a tin snip or a heavy duty scissors. For other openings use a Dremel tool with rotary file. For clean edges use a Dremel tool and a small sanding drum. A fine 1/4" diameter rat tail file will also work. To true up long straight edges, sand with a block and 80 grit sand paper. Smooth any other edges with a file.

3. Locate the back panel. Refer to **Figure 09-03**. This illustrates the various cut outs and trim lines. In views B and C it shows to leave at least 3/32" of an edge. Later, rubber inserts will be glued to these edges.

4. Trim the baggage compartment panel. **Note:** There are two different cut out patterns for the trike and the taildragger. See **Figure 09-04**. Do not cut out the opening for the baggage compartment at this time.

5. Determine if you are installing the flip up seat. Trim the respective parts for the seat type in your kit. See **Figure 09-05, 09-05A & 09-05B**. For the flip up seats we have included extra rubber that can be glued into the seat belt openings in the same manner as on the back panel.

FIGURE 09-05

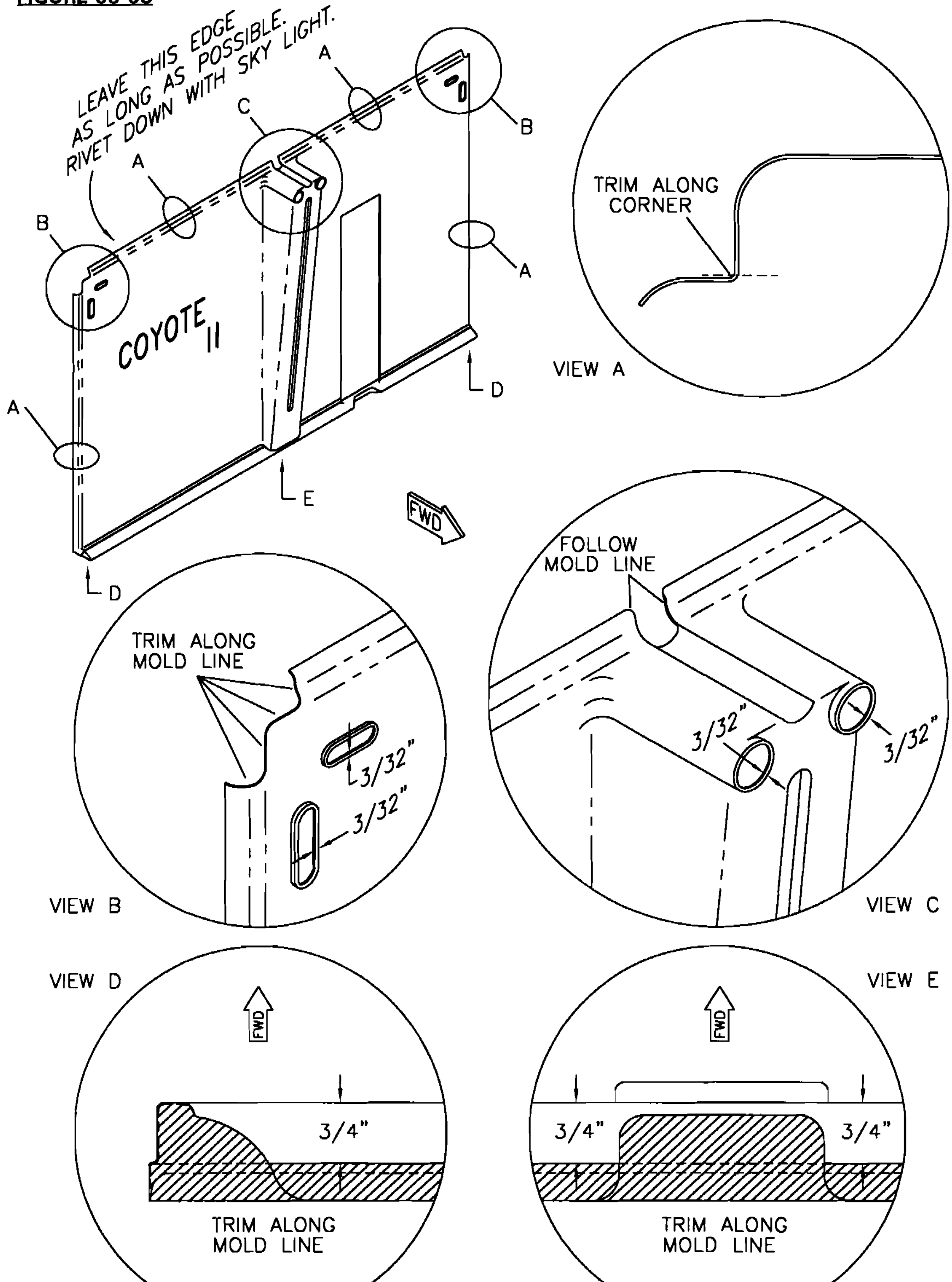


6. Trim all other components as per **Figures 09-06 thru 09-06F**. For the lace up type seat, not the flip up style, trim out the slot in the control stick panel molding. See **Figure 09-06G**. For dual throttles, trim out the openings also.

7. Cut the rubber inserts from the rubber sheet as shown on the template. See **Figure 09-7**. Glue the close outs into their respective locations with pliobond or super glue. After the rubber close outs are glued in place, slit them with a razor blade as per the template.

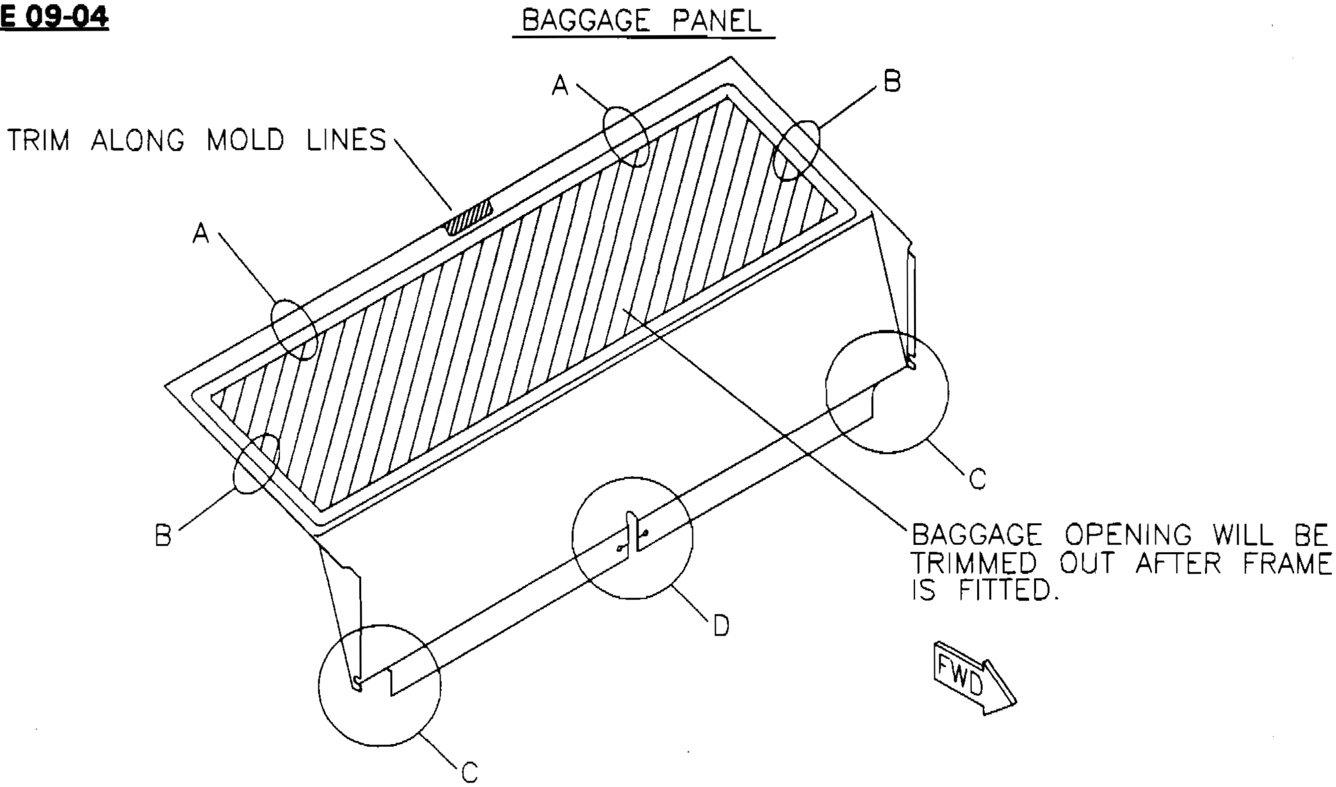
FIGURE 09-03

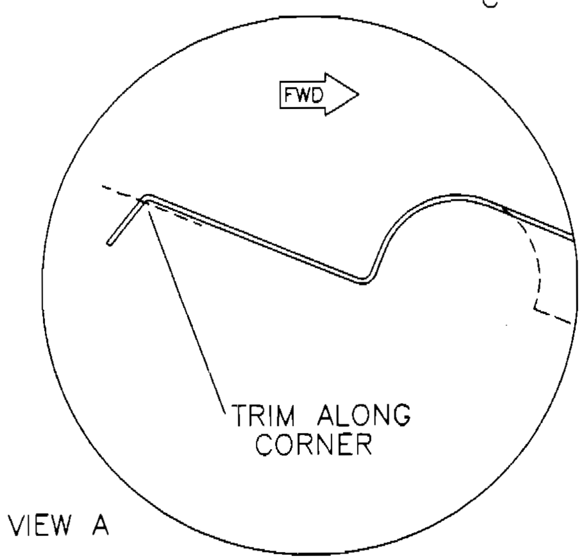
BACK PANEL

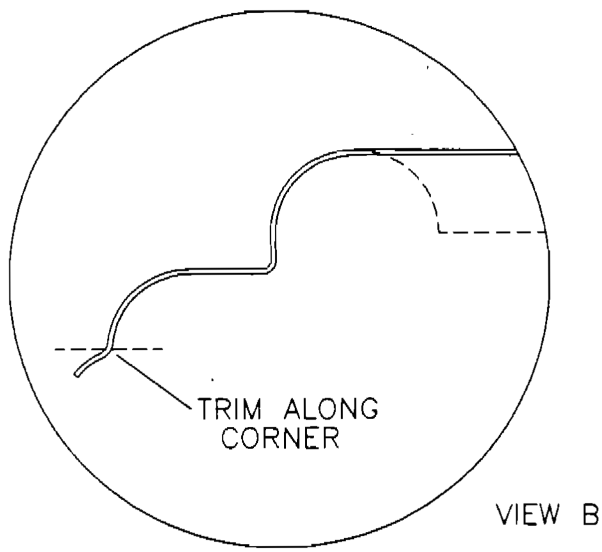


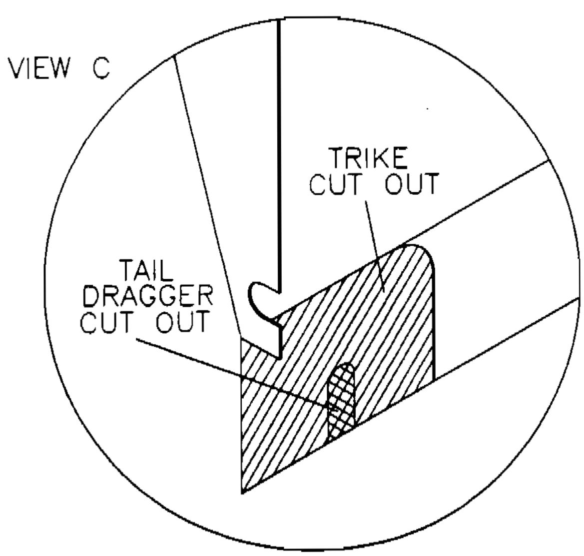
MD907

FIGURE 09-04









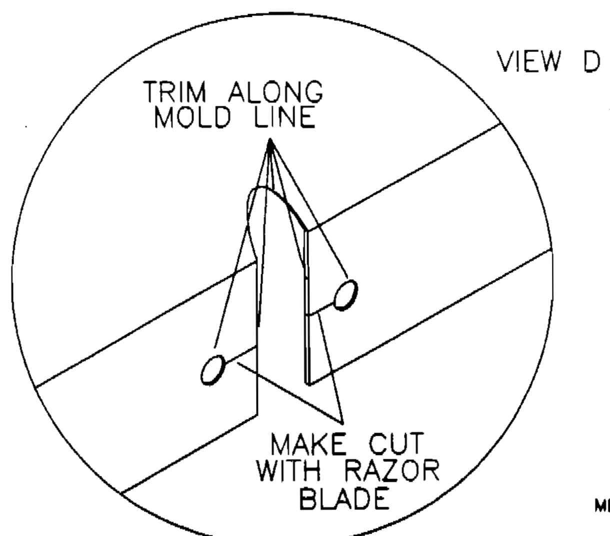


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FIGURE 09-05A

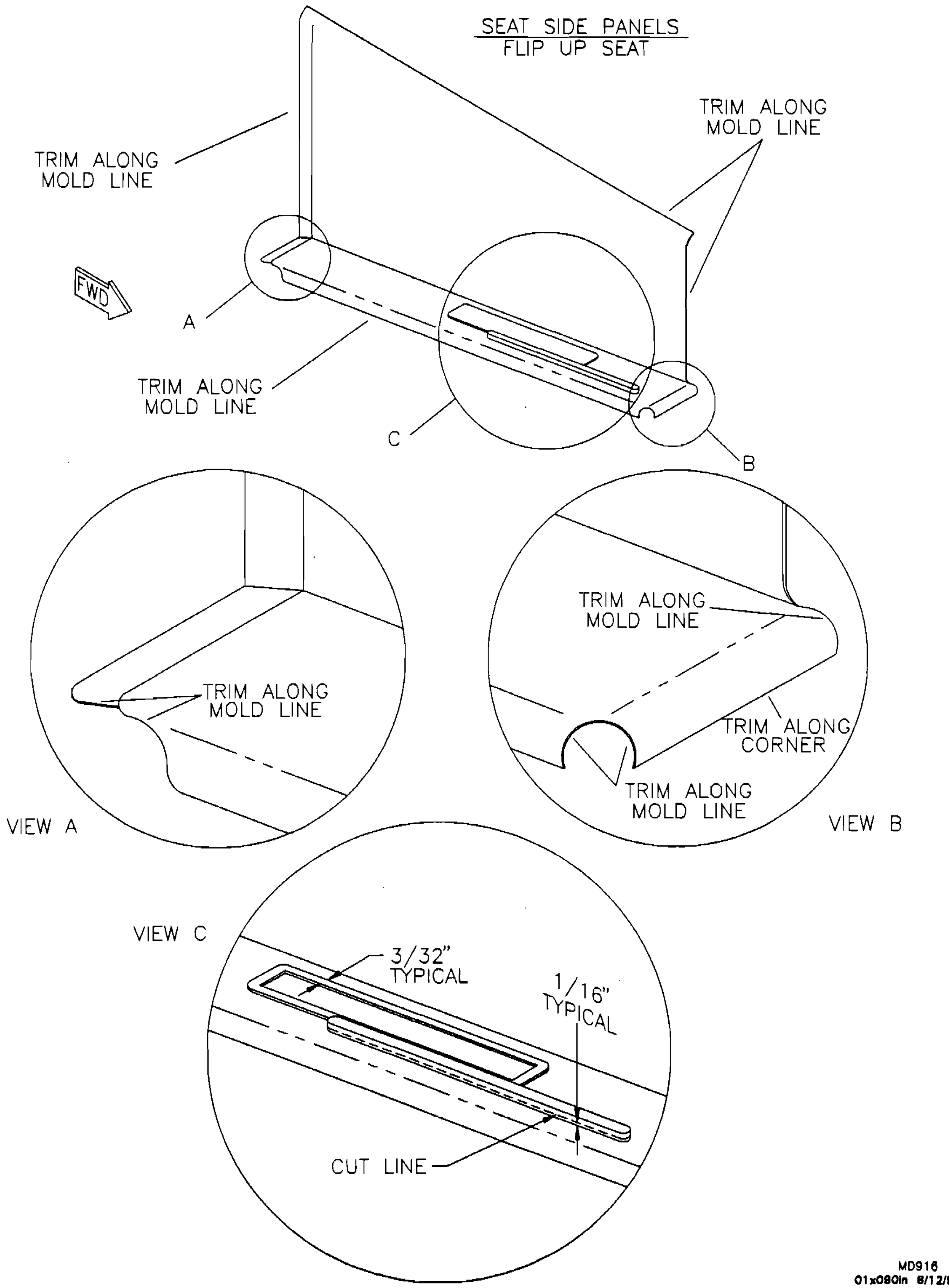


FIGURE 09-05B

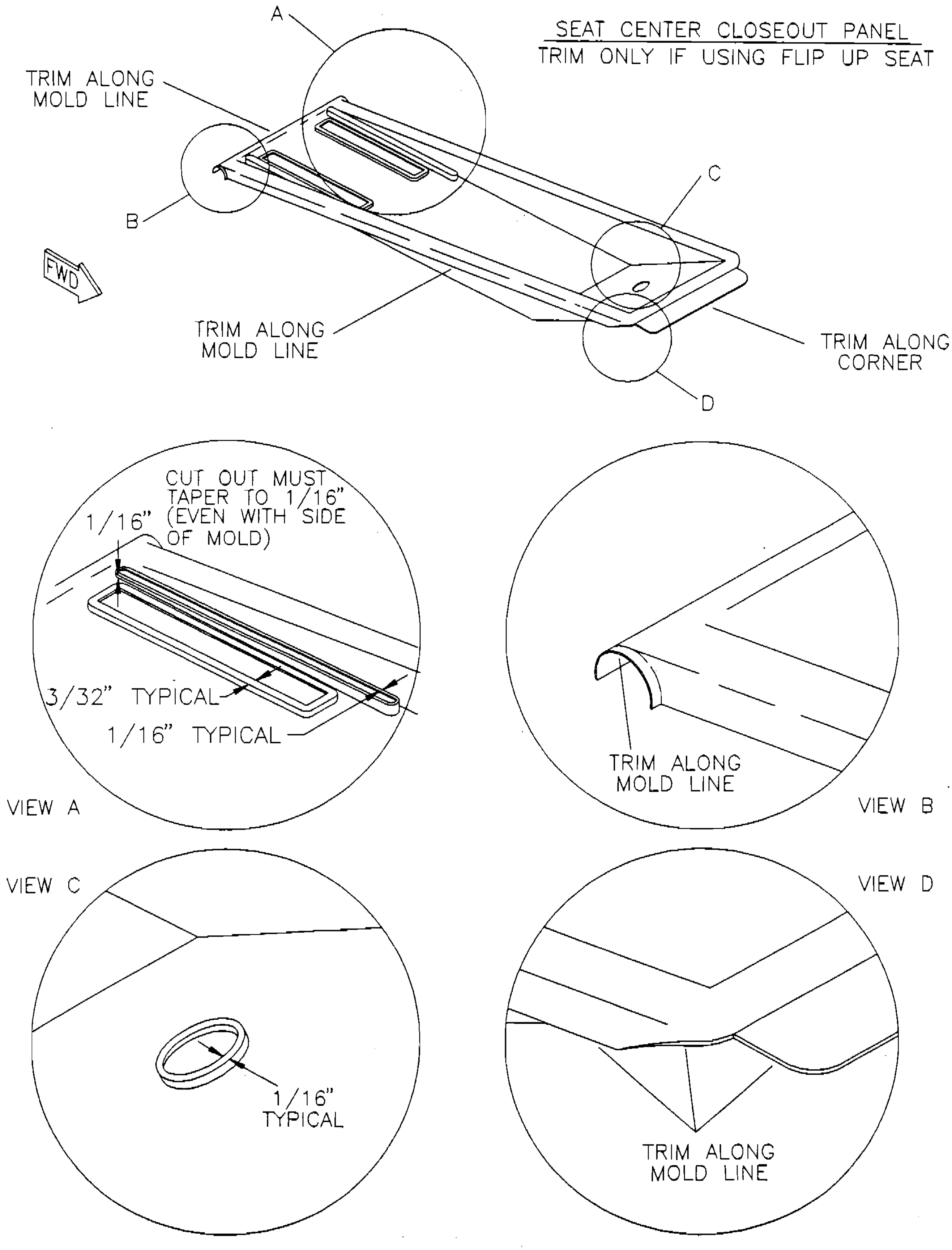
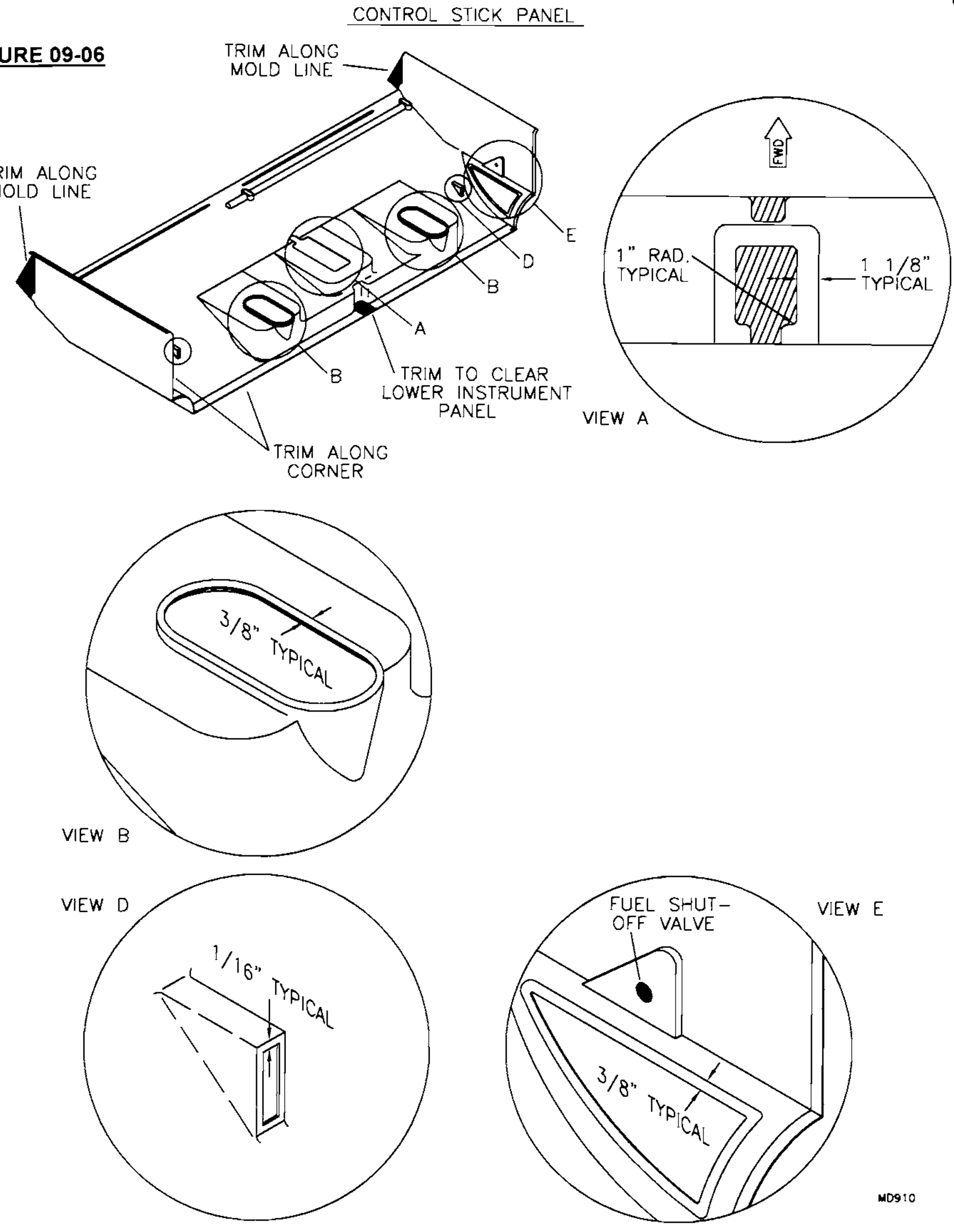


FIGURE 09-06



RANS S-6S
MOLDED INTERIOR, FLOOR MOLD FIG. 09-06

FIGURE 09-06A

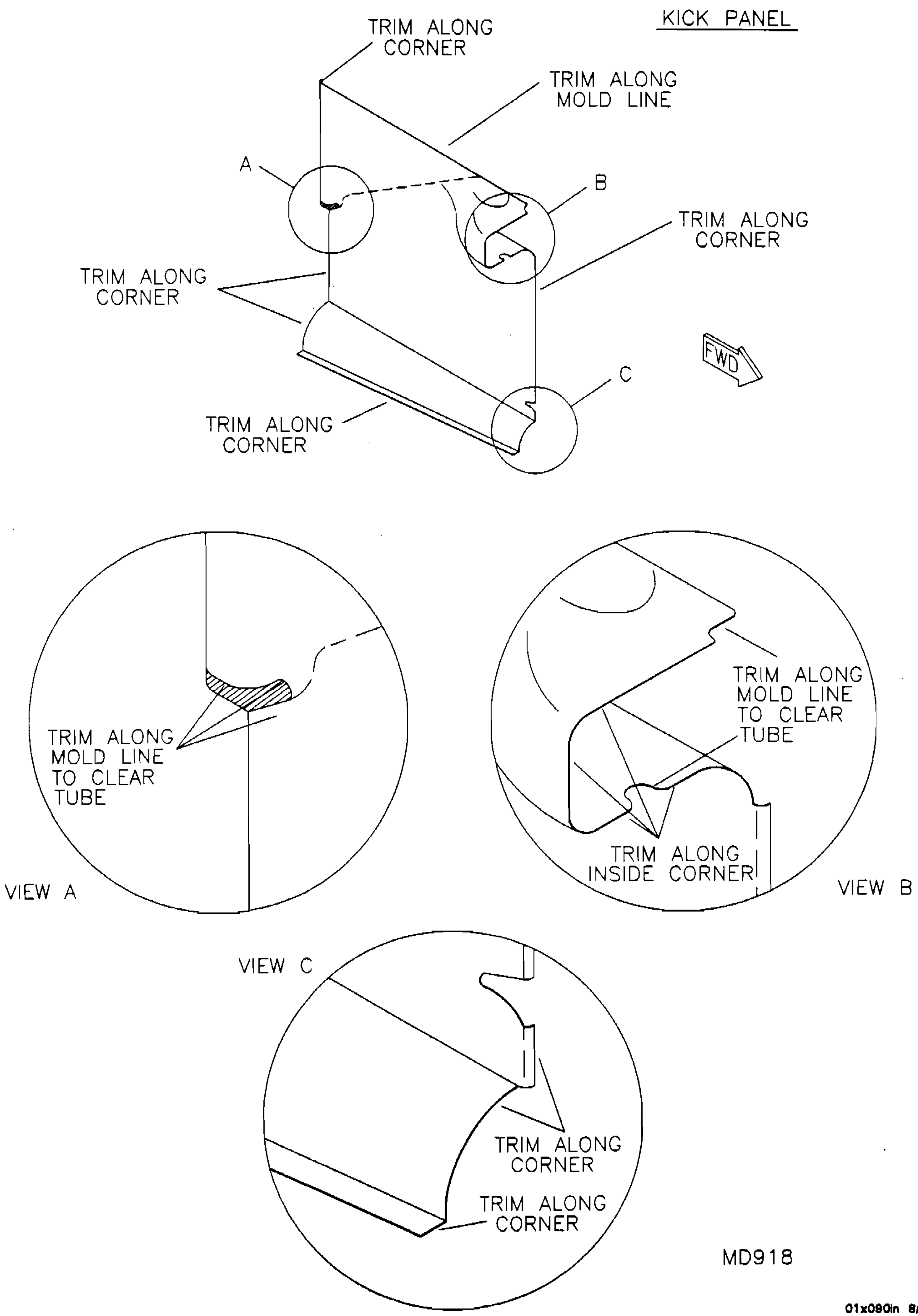


FIGURE 09-06B

FLAP TELEFLEX COVER

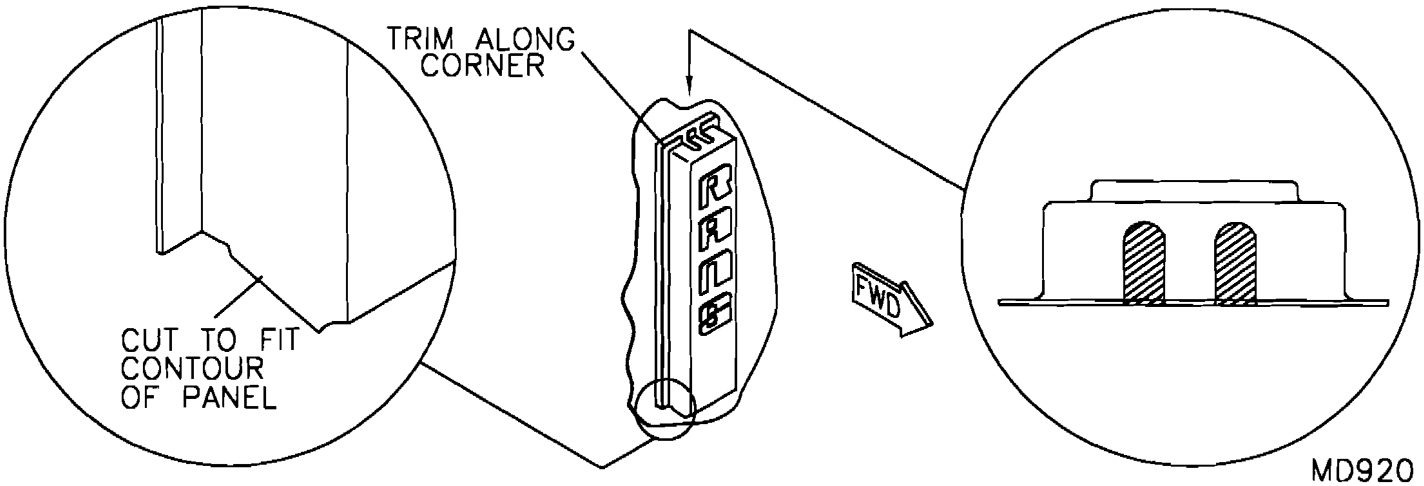
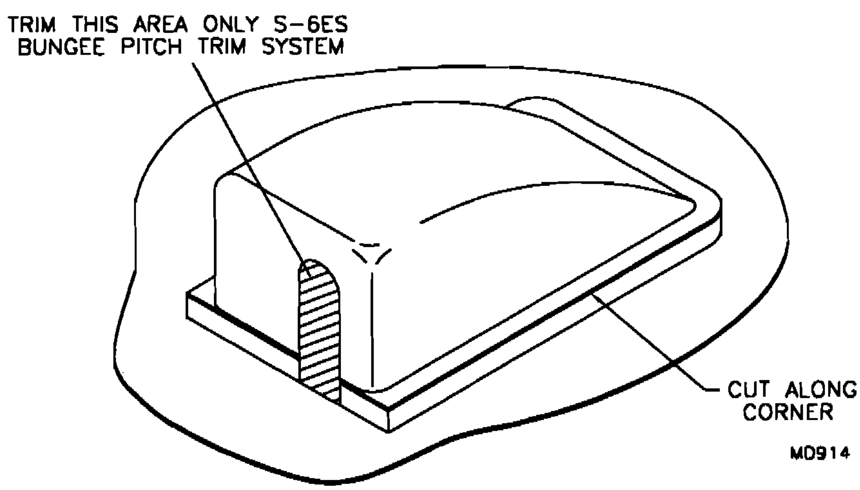


FIGURE 09-06C

TORQUE TUBE INSPECTION COVER



BOOT RETAINER

FIGURE 09-06D

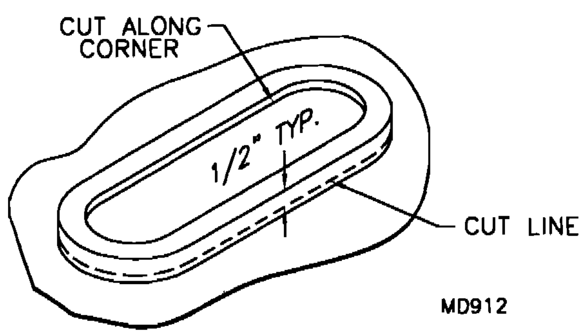


FIGURE 09-06E

INSPECTION PANEL COVER

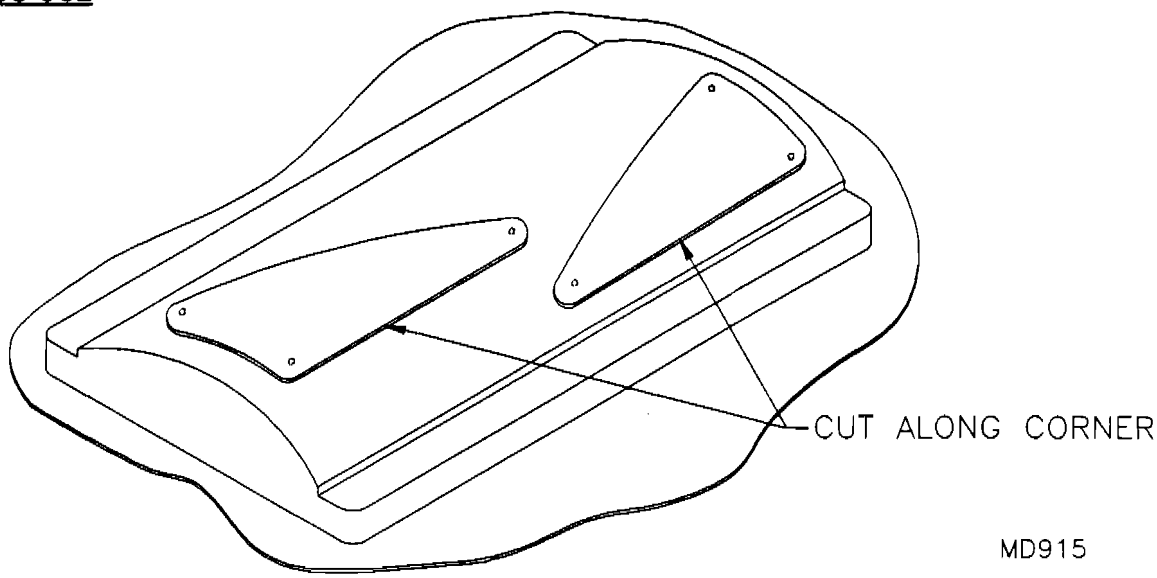


FIGURE 09-06F

LOG BOOK POCKET

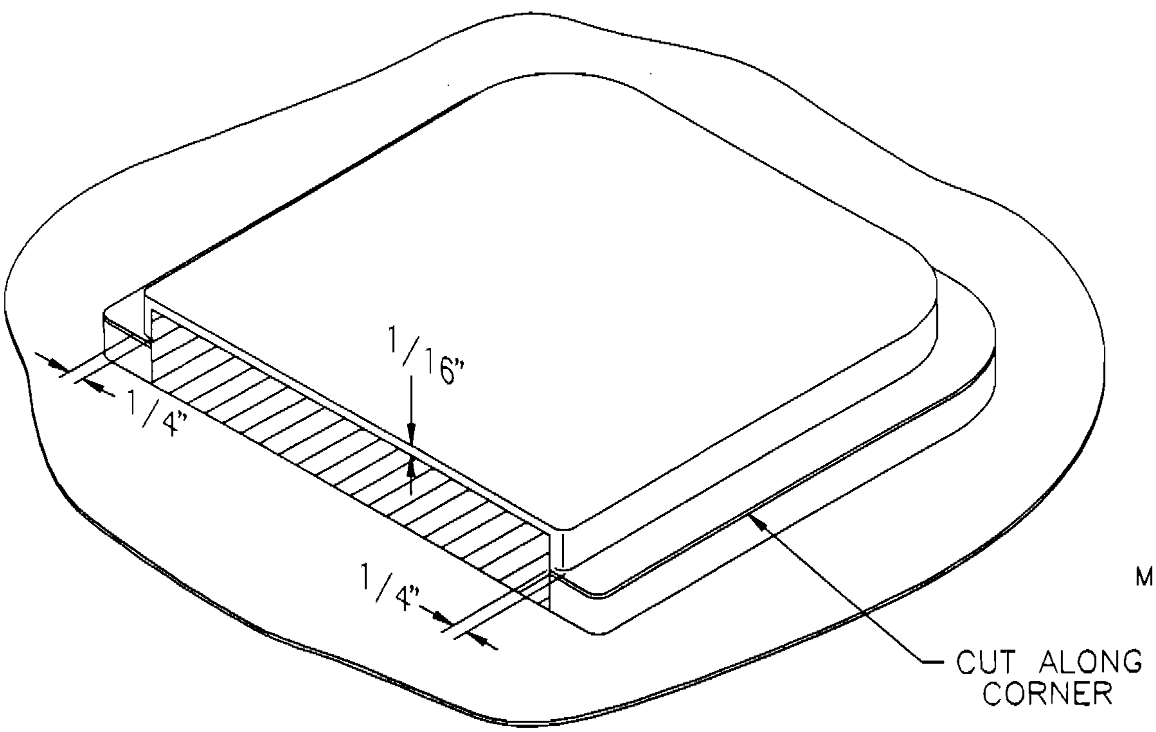


FIGURE 09-06G

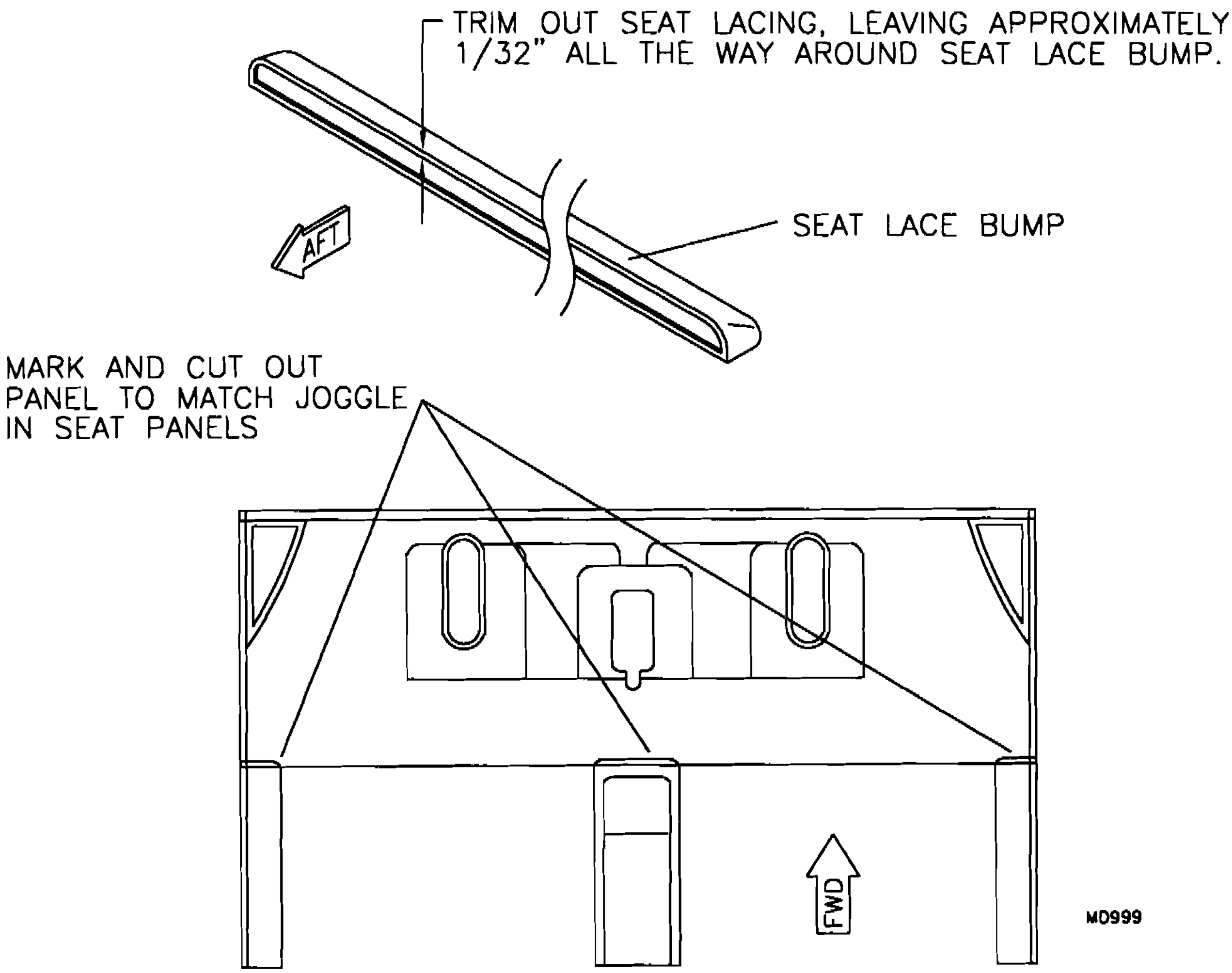
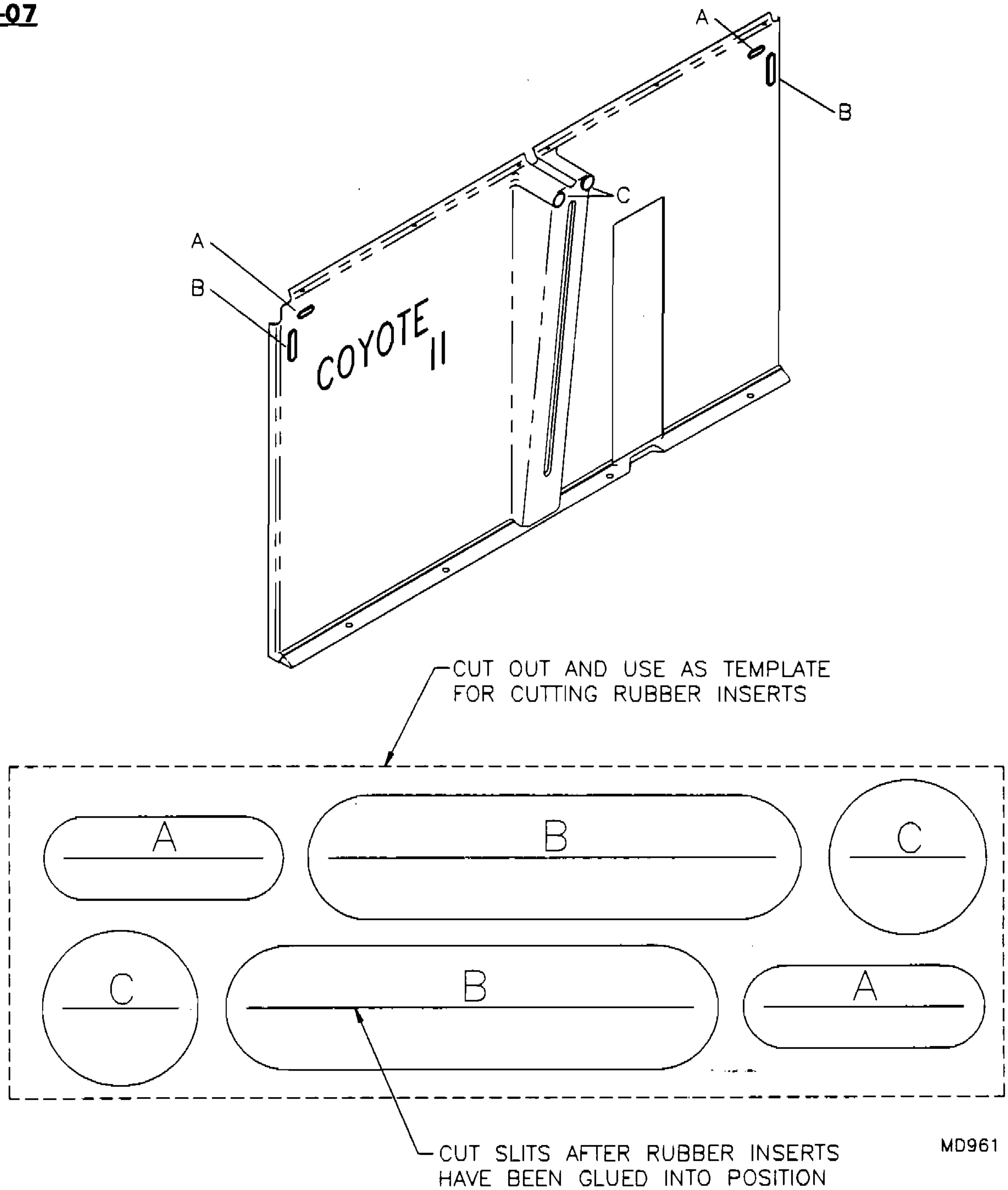
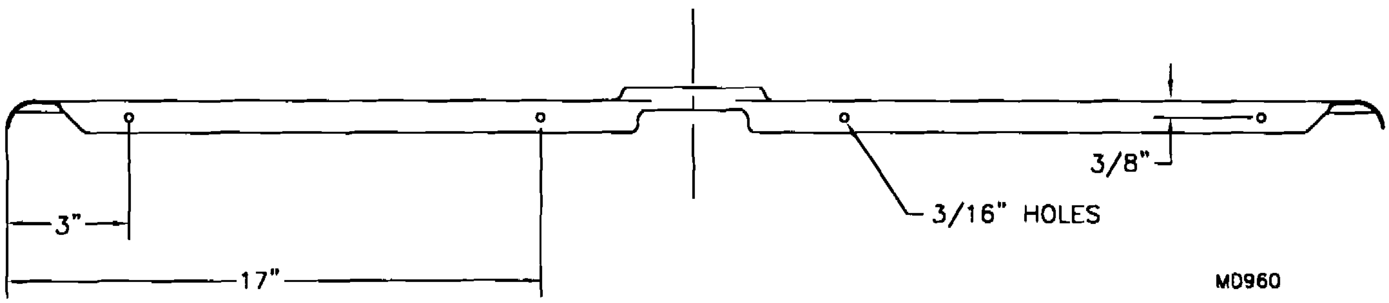


FIGURE 09-07


A
B
A
B
C
COYOTE II
CUT OUT AND USE AS TEMPLATE FOR CUTTING RUBBER INSERTS
A
B
C
C
B
A
CUT SLITS AFTER RUBBER INSERTS HAVE BEEN GLUED INTO POSITION
MD961

8. Six #30 aluminum pop rivets are used to secure the top of the back panel. Locate these using tabs welded to the cage. The bottom of the back panel is retained to the S-3 midway crossing tube with 4 cushioned tube clamps. Locate and drill #11 holes as per **Figure 09-08**. Bolt the extension tangs to the shoulder belt tangs. Set the back panel in place. It should fit against the S-3 with the panel overlapping the tubes approximately half way around. Tape the panel in place with masking tape.

FIGURE 09-08



9. Set the baggage compartment panel in place. The panel overlaps onto the flange at the bottom of the back panel. Tape in place.

10. Tape the seat close out and the control stick panels in place.

11. Locate and drill #40 holes in the bottom flange on the kick panels as per **Figure 09-011**. Cut a clearance notch and attach the kick panel firewall retainer. See **Figure 09-011A**. The plastic screw rivet used to attach the retainer expands in the 1/4" hole as it screws in. Tape the kick panels in place.

12. All the panels have now been trial fitted. From this you may tell if you need to fine tune the trimming. If the fit does not match the joggles with the other panels check for proper trimming. If properly trimmed the panels should fit together like a glove. Remove all but the back panel from the cabin. With the back panel still in place, reach up from the bottom and behind, then punch the hole locations for the flap teleflex retainer, then remove.

FIGURE 09-011

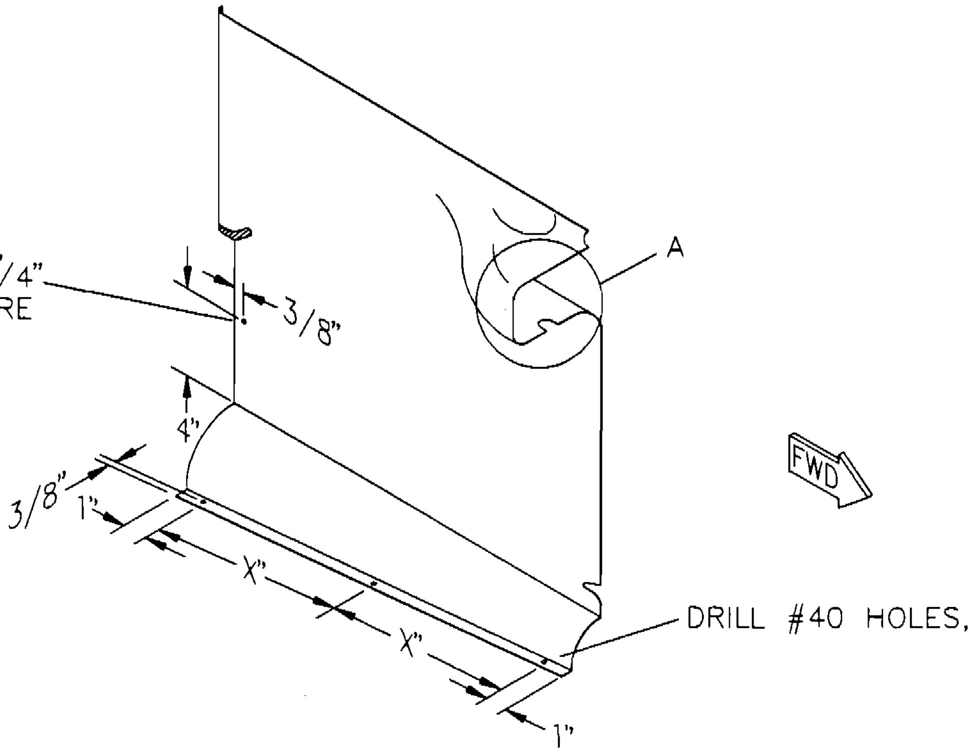
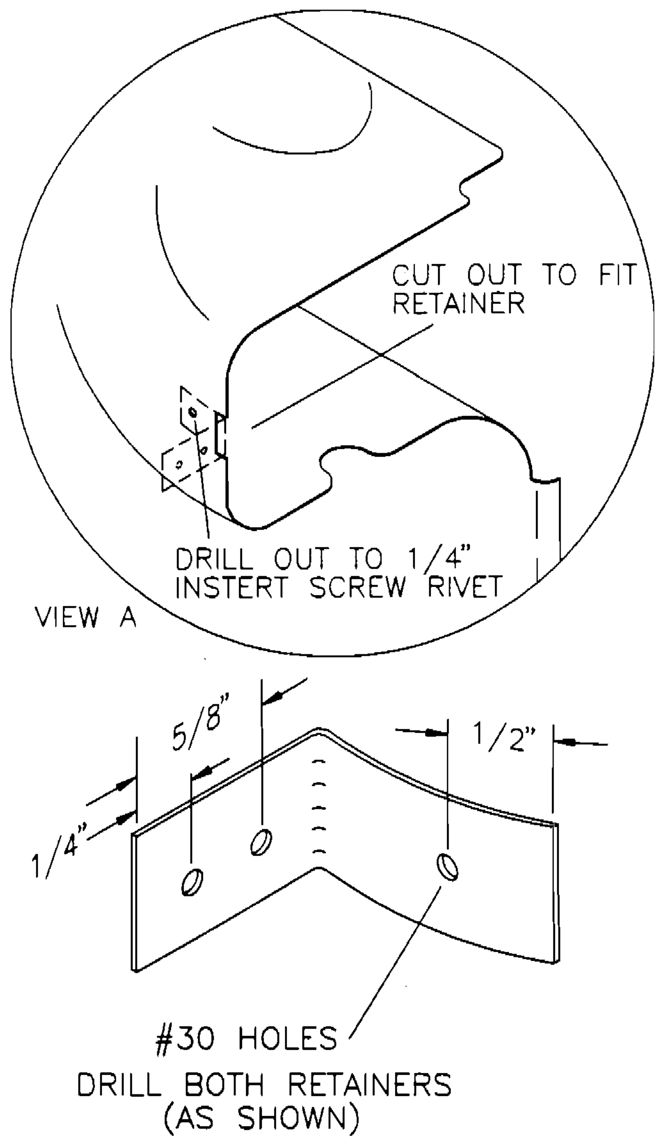


FIGURE 09-011A



MD996

S-6S COYOTE II - DOOR ASSEMBLY

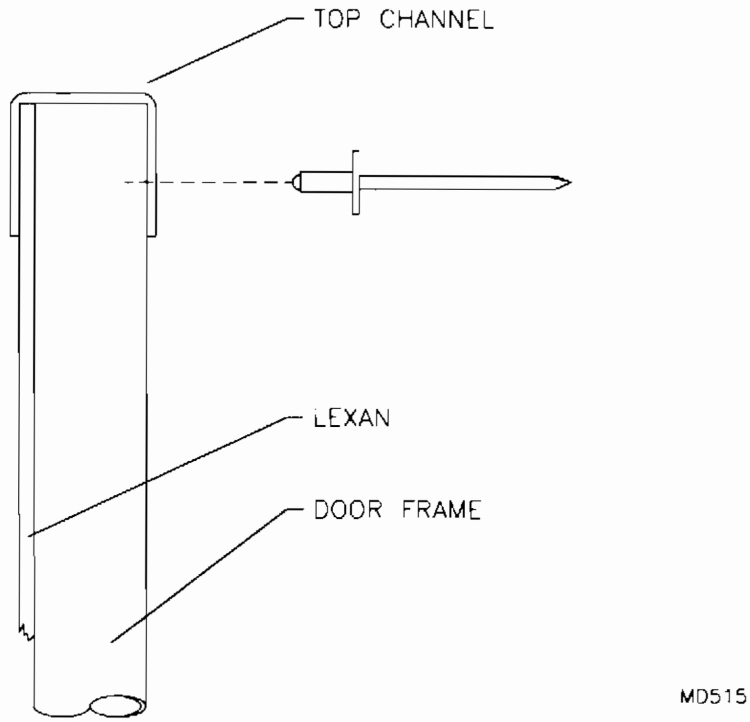
LEXAN INSTALLATION

NOTE: The windshield needs to be installed to final install the doors.

IMPORTANT: Install the Aluminum Door Doubler inside the Door Frame before riveting.
See 010B – Hydraulic Door Lift Installation.

1. Temporarily bolt the door frame in place on the fuselage. Place the Door Top Channel over the top of the frame. Drill #30 on centerline. See **FIGURE 010-01**. Rivet the channel on the inside to the frame with 1/8" stainless steel pop rivets. ***IMPORTANT:*** *The use of the stainless steel pop rivets in the assembly of the doors is very specific. Use them only in the places called for.* Locate and drill a hole on the outboard side of the channel centered on the frame.

FIGURE 010-01



2. Locate the top of the door rib flush with the bottom of the instrument panel tab and mark on the door frame. See **FIGURE 010-02**. This line will represent the top of the door rib. Measure down 1/4" from this mark and put a mark on the inside of the tube in line with the top hinge hole. This will represent the centerline of the door rib. Remove the door assembly from the fuselage. Place on a flat table or sawhorses. Refer to **FIGURE 010-02A** and drill a #11 hole at this point and install a button. ***NOTE:*** *A button is a 3/16" aluminum rivet with a 3/16" thick washer underneath it.* The button is used to retain the door rib to the door frame.

FIGURE 010-02

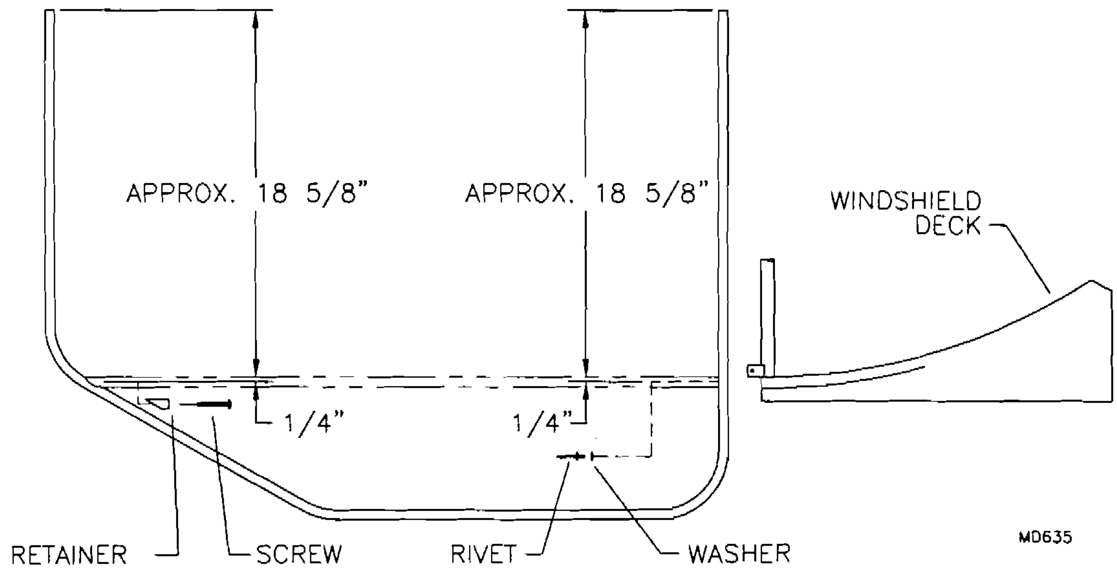
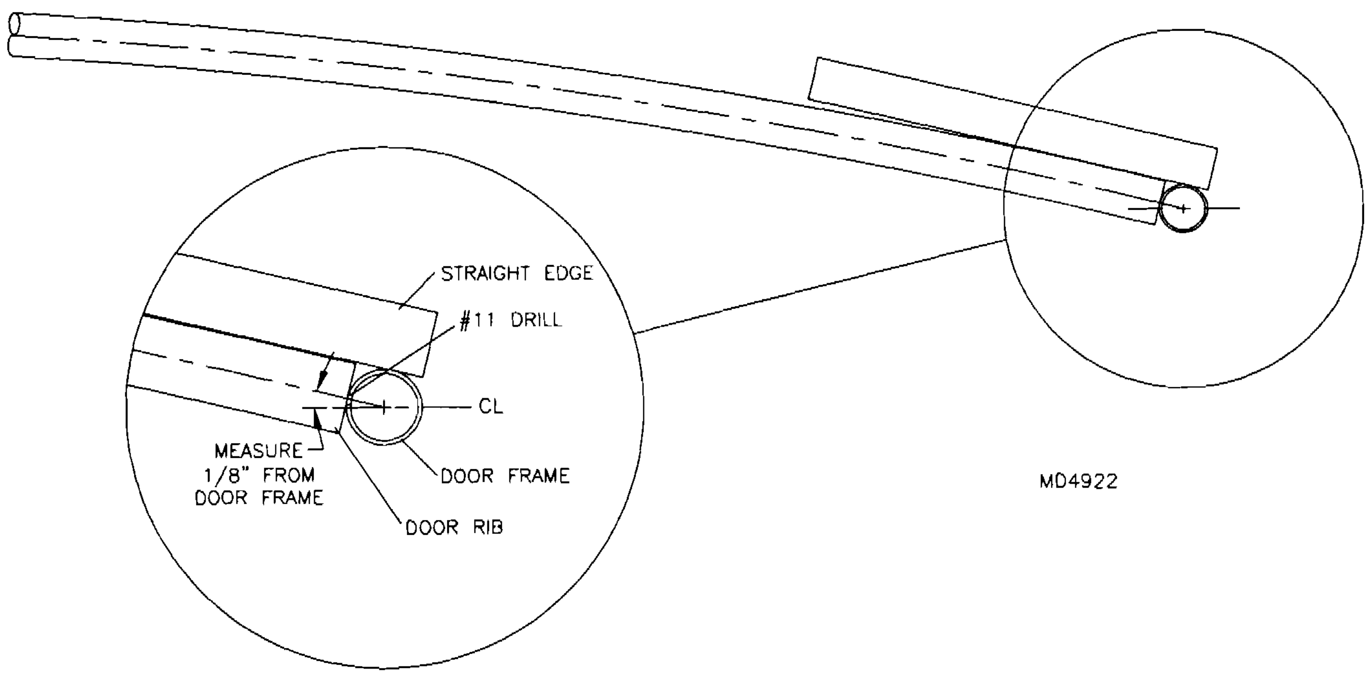
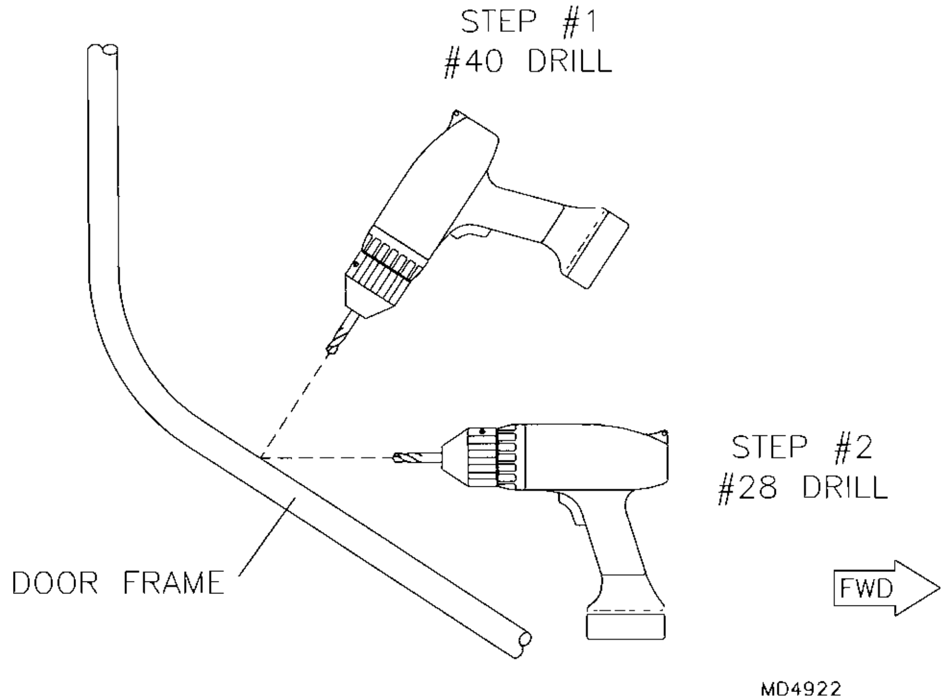


FIGURE 010-02A



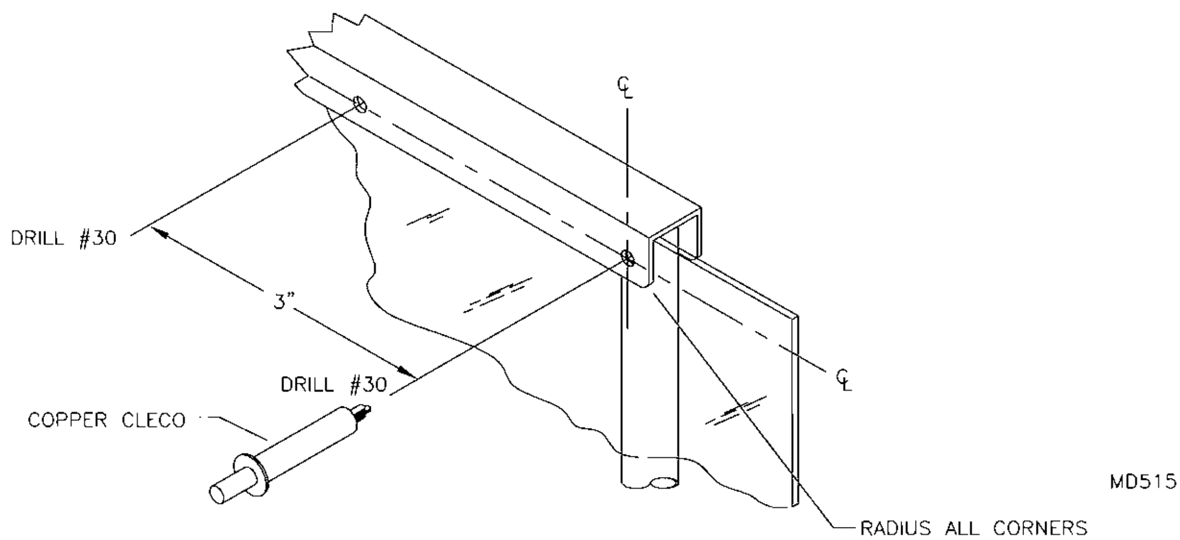
3. To locate the Door Rib Retainer, measure down the same amount as determined by the Fwd button. Mark the location and drill according to **FIGURE 010-03**.

FIGURE 010-03



4. Radius each corner of the Top Channel. Mark off the hole locations on the Top Channel every 3", starting from the front and drill #30. See **FIGURE 010-04**.

FIGURE 010-04



5. Clamp the Upper Door Lexan so the top edge is flush with the frame top (between Top Channel and Door Frame). Center the Lexan fwd and aft on the Door Frame. ***IMPORTANT:*** *Do* ***NOT*** *remove the protective plastic film until ready to rivet.* Transfer drill #30 through the previously drilled holes in the channel and Cleco. The Lexan should be tight against the channel. ***HINT****: Use a block of wood pressed up into the top channel to back up the channel and Lexan while drilling.* Remove the Lexan from the frame.

6. Cut the Door Rib Retainer material into 1" lengths. ***NOTE:** 2 retainers are required. Extra material is included for errors.* Refer to **FIGURE 010-06** and shape the retainer. ***HINT:** Chuck the Rib Retainer into a drill press, sand to fit inside the Door Rib.* Use a Dremel with 1/2" sanding drum to shape the aft end. Install the Rib Retainer to the Door Frame. Push the rib over the retainer. Be sure the rib curves upward, 90° to the door frame. Trim the fwd end of the rib to snap over the fwd button. ***IMPORTANT:** Do **NOT** change the curvature of the rib.* Mark the top centerline of the rib. Locate and drill #30 holes per **FIGURE 010-06A**.

FIGURE 010-06

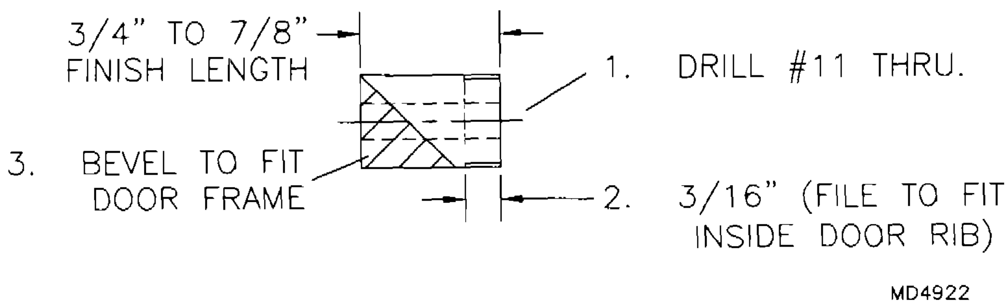
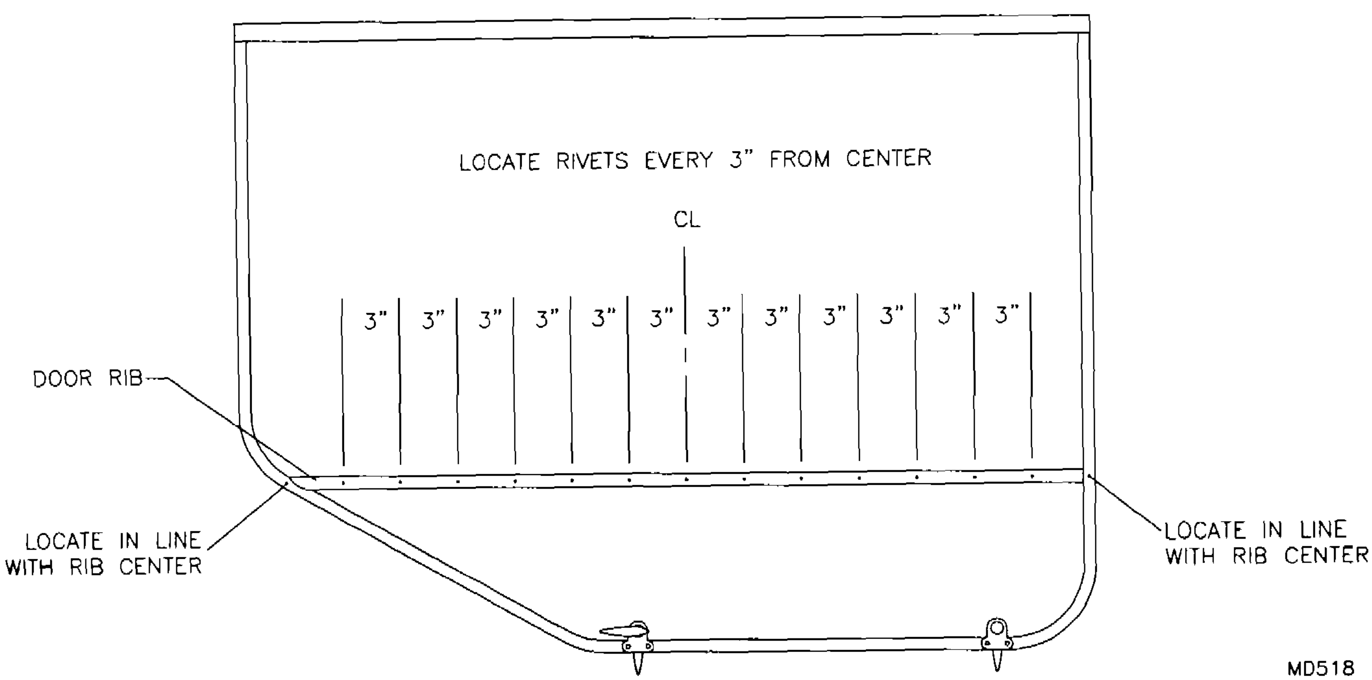
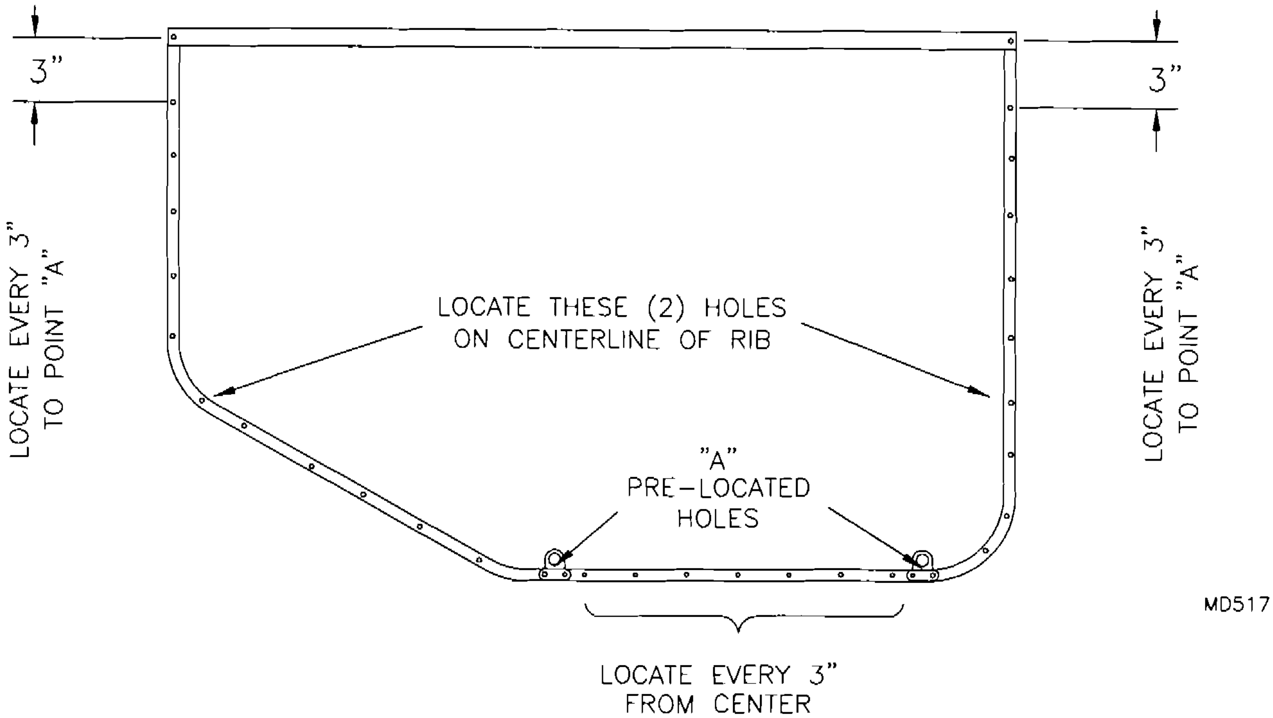


FIGURE 010-06A



7. Drill #30 holes every 3" along the center of the door frame as shown in **FIGURE 010-07** and deburr. The pre-drilled holes in the door frame near "A" is for the door handle gussets.

FIGURE 010-07

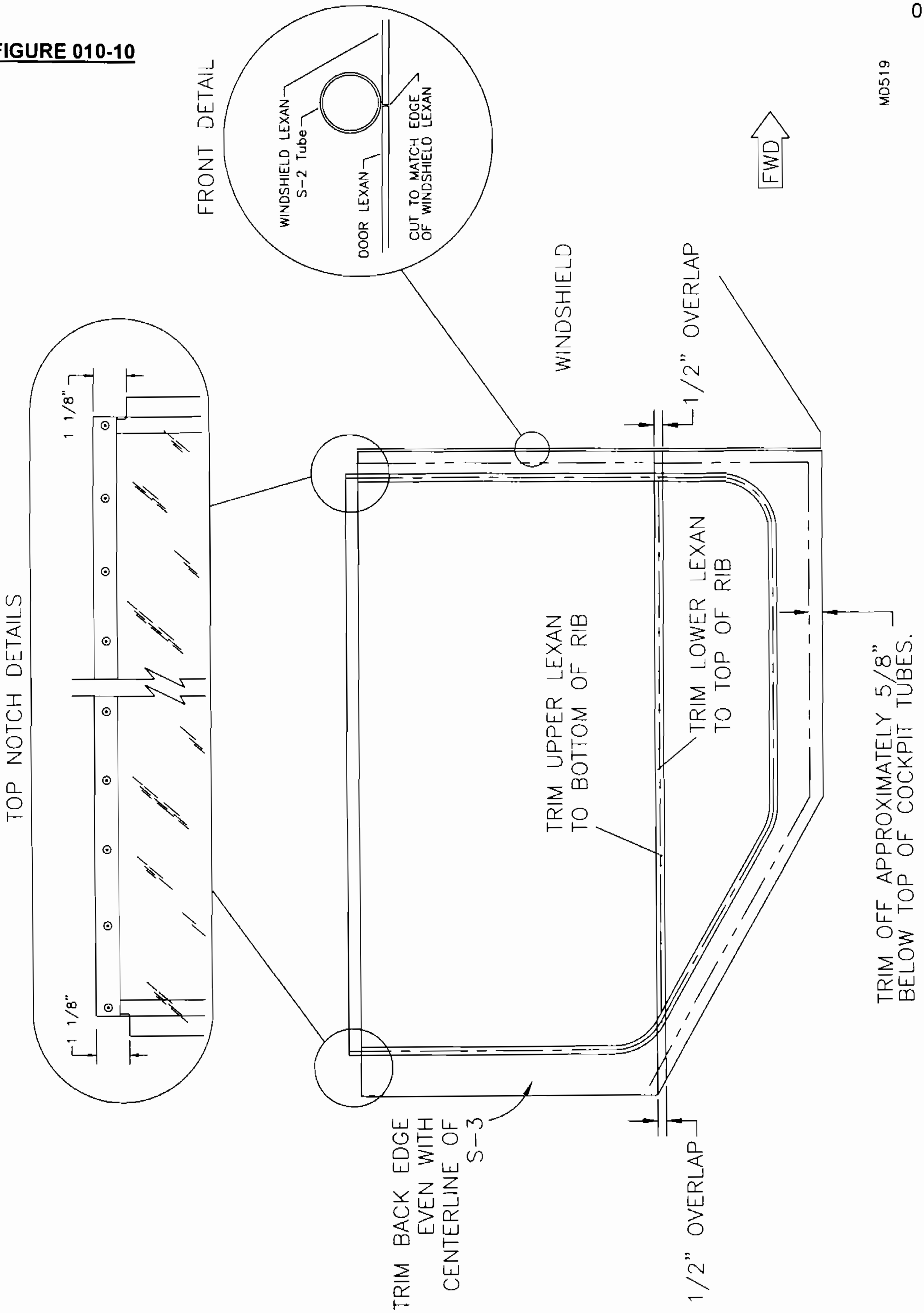


8. Re-cleco the Upper Door Lexan to the channel. Position the Lower Door panel under the Upper Panel and on top of the Door Rib. The Lower Lexan should be flush with the center top of the rib and the forward edge of the Upper Lexan. Transfer drill #30 into the Door Rib. Cleco as you drill. ***HINT:*** *Drill the center hole first to allow easier alignment.* Be sure the rib is straight. Transfer drill #30 the frame holes and Cleco. Mark and trim the Lexan as needed to be flush with the rib.

9. Re-bolt the Frame Assembly to the fuselage. Using a magic marker, trace the inside of the frame, door rib and the fuselage door opening to achieve a reference trim line.

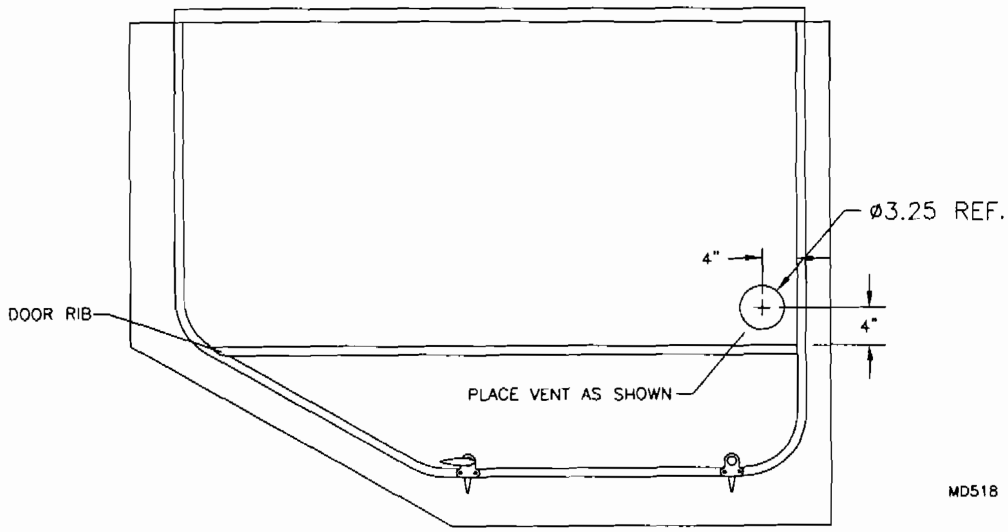
10. Trim off the Lexan so it extends past the bottom edge the thickness of the fuselage tubes. Trim the front edge to match with the windshield. Trim the back edge so it is even with the centerline of Station 3. ***NOTE:*** *This should be done when the door is on the plane.* See **FIGURE 010-10** for details on the edge trimming and notching. ***HINT:*** *Use a sharp sheet rock or utility knife to deeply score then snap off the trimmed edges.* Further smoothing of the Lexan edges can be done with a sanding block and sandpaper.

FIGURE 010-10



11. Locate the snap vent in the forward corner above the rib. Refer to **FIGURE 010-11**. ***HINT:*** *Use an adjustable fly-cutter and cut holes in scrap first, to assure a tight fit. Remove the Upper Lexan and place on a wood block to aid drilling.*

FIGURE 010-11



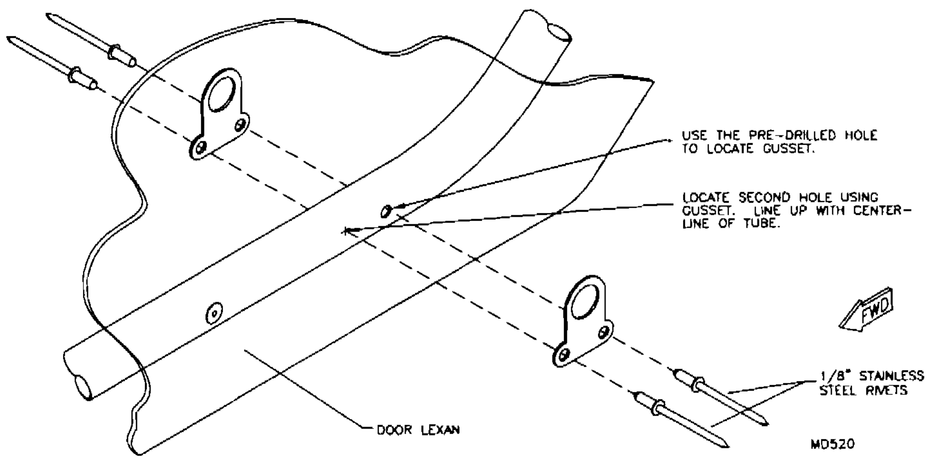
12. Glue the "D-Cell" Foam Seal to the Door Top Channel. The seal should be positioned on top of the channel, toward the inboard side. ***HINT:*** *Glue the seal with weatherstrip adhesive (3M Super Weatherstrip Adhesive #08008 works well).*

S-6S COYOTE II - DOOR ASSEMBLY

DOOR HANDLE INSTALLATION

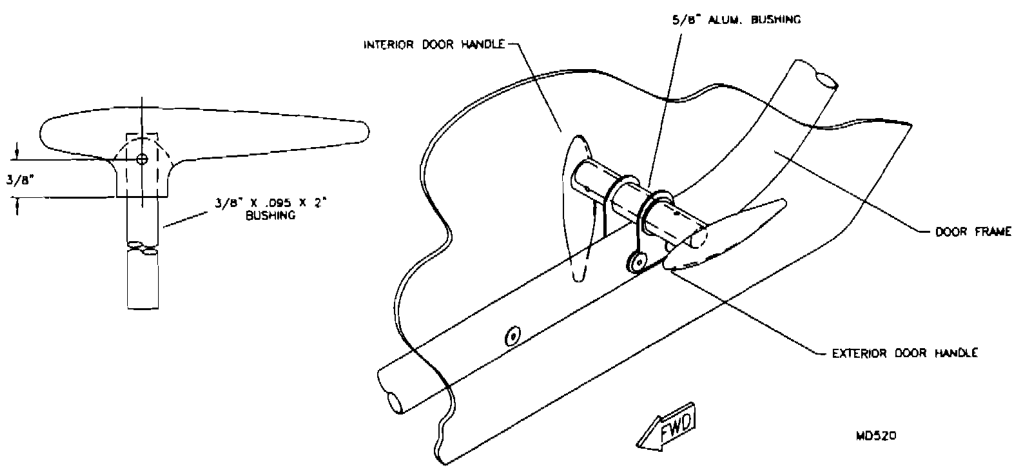
1. Fit fwd & aft door handle gussets; see **FIGURE 010A-01** and parts drawing. Remove the protective plastic film in the riveting and gusset area only. ***IMPORTANT:*** *Remove Lexan and drill the #30 holes in the **Lexan only** to #28.* Attach the trimmed Lexan to the door frame and rib with 1/8" AVEX rivets. When riveting to the top channel be sure to back-up with the small brass washers. Rivet door handle gussets with 1/8" Stainless Steel rivets.

FIGURE 010A-01



2. Insert 2" bushings 3/4" into shanks of two handles for exterior installation. Drill #30 holes through handles' shanks, per **FIGURE 010A-02**. Chase drill holes on undersides of shanks to 3/16" and insert flange nuts. Install button head screws, through shanks, into flange nuts; apply oil if installation proves too difficult.

FIGURE 010A-02

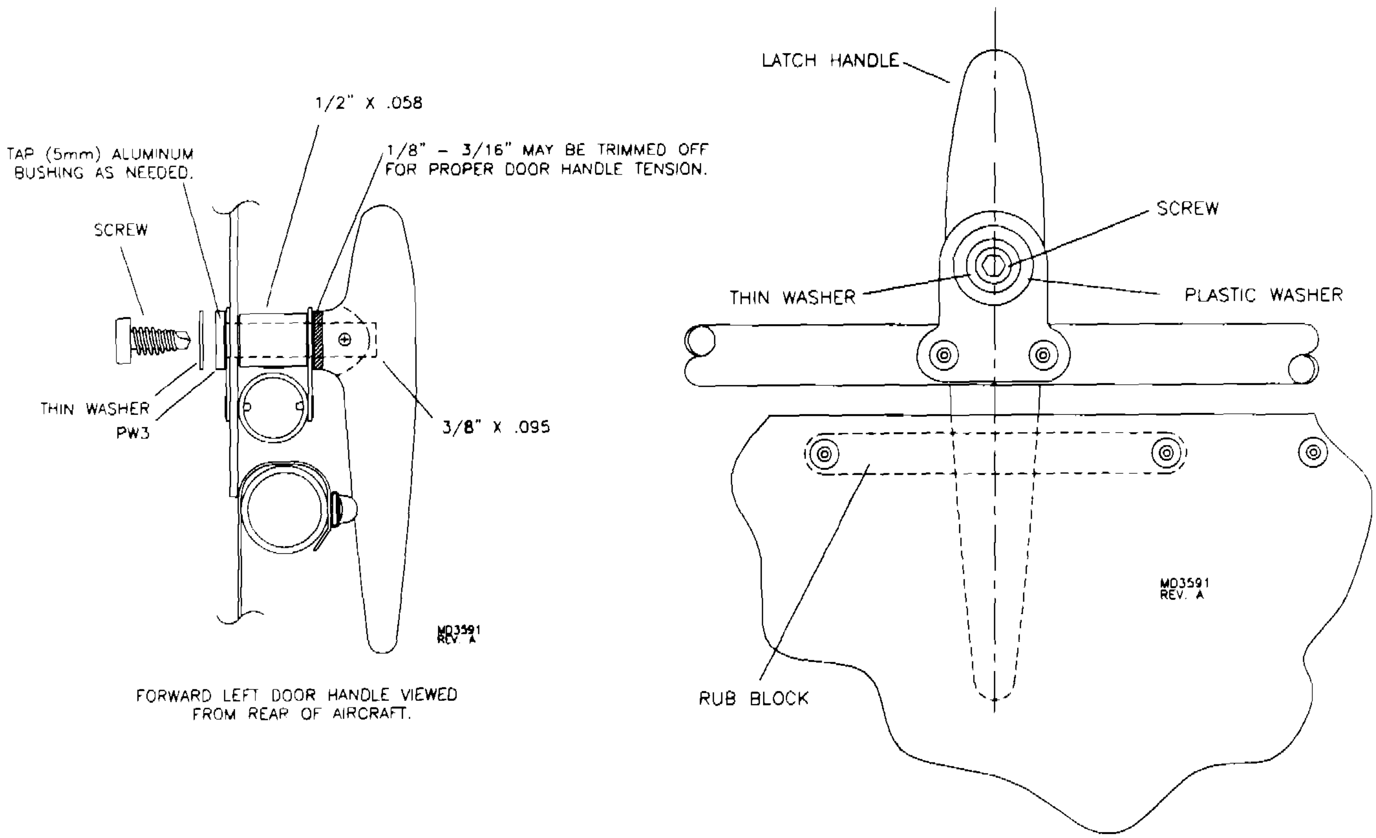


3. Prepare two more handles for interior; install handles and 1/2" x 5/8" long bushings per parts drawing. ***IMPORTANT:*** *Do* ***NOT*** *drill for or install flange nuts and screws for interior handles until fit is checked.* Orient handles at right angles such that exterior handles parallel longitudinal axis when door is latched; refer back to **FIGURE 010A-02**.

4. Bolt doors in place. Turn handles as if latching to locate rub blocks on door frame capture strips; refer to parts drawing. ***NOTE:*** *Final installation should be done after the molded Plastic Interior is installed.* Hold rub blocks against capture strips to test fit. Rub blocks should provide sufficient tension to close doors snugly when latched. If tension is insufficient, bend rub blocks to bow out as necessary or trim door handle shanks. Drill through rub blocks and capture strips, into fuselage tube, taking care to drill squarely into steel. The fuselage tube is 5/8" diameter; measure 5/16" from top of strip to locate tube centerline. Rivet rub blocks in place. Install flange nuts and screws to interior handles.

5. Drill remaining handles and assemble as forward latches, per parts drawing. See **FIGURE 010A-05**. As in previous step, bow rub blocks or trim shanks for snug fit.

FIGURE 010A-05



6. Place a fillet of Clear Silicone Seal at the junction of the Upper and Lower Door Lexan. ***NOTE:*** *If painting the door, apply the silicone after painting.*

OPERATION AND CARE OF THE DOORS

CAUTION: *NEVER ALLOW FUEL TO COME IN CONTACT WITH LEXAN.*
If fuel is spilled on Lexan, spray with water or cleaner immediately to lessen the chance of crazing damage. Refer to the Windshield Section.

1. Close doors while fueling to prevent spills from running off the wing onto the door.
2. During flight always latch the forward safety catch.
3. When the door is closed, position the door handle so it is in the rub block middle dent.
4. Open the door in-flight at or below 65 MPH. Do not exceed 100 MPH with an open door.
5. The doors may be removed for flight. No speed restrictions apply. However, a very windy cockpit will result. For operations with door/doors removed, or with the doors open, make sure the pilot and passenger are properly restrained.

S-6S COYOTE II - DOOR ASSEMBLY

HYDRAULIC DOOR LIFT INSTALLATION

NOTE: Wings will need to be installed to final install the Hydraulic Door Lift.

1. Slip the Aluminum Door Doubler into the aft end of the Door Frame. Position it flush with the top of the frame. Locate a #40 rivet to the forward side 1" below the pre-drilled #11 door hinge hole. Transfer drill #11 though the pre-drilled hinge hole.

2. Complete assembly of the door.

3. Install the Ball Stud to the welded gusset near the door frame at Station 3. ***NOTE:*** *Fit up the Back Interior Panel and transfer drill 5/16" through the center gusset hole. The Ball Stud will protrude through the Back Interior panel.*

4. After the wings have been attached. Bolt the doors to the fuselage hinges.

5. Remove the locking caps from the Gas Spring ends. ***IMPORTANT:*** *The Cylinder portion of the Gas Spring must be oriented upward when final installed to prevent drying out of the shaft seal during operation.* Press over the Ball Stud in the fuselage. Press the ball stud portion of the Flat Bracket into the Gas Spring end. Re-install locking caps on Gas Spring ends.

6. Position the door so it clears the wing bottom. Clamp the Flat Bracket to the **AFT** side of the Door Frame with the ball stud forward. The holes should be centered on the Door Frame tube. Re-check for clearance with the Gas Spring extended. Transfer drill #11 and rivet.

7. During operation the Gas Spring will raise the door part way. A gentle nudge should extend the Gas Spring completely and hold the door in the full open position.

S-6S COYOTE II - WINDSHIELD ASSEMBLY

Lexan windshields scratch very easy. To get a longer service life from your windshield and other Lexan surfaces, we recommend a soft terry cloth and a cleaner made for plastic. We use a product called Brillianize. It is available from RANS or any large aircraft supply company. ***IMPORTANT**: The big no-no is **NEVER** dust off a windshield unless you have sprayed on some sort of fluid. Your dry dusting action will readily cut millions of fine scratches into the glazing, dimming its clear optics.*

***NOTE:** The wing structures must be complete (can be covered and painted) and attached to the fuselage prior to final installation of the windshield and skylight. However, the windshield and windshield deck may be fit up, before final assembly, without the wings, skylight, and skylight ribs installed.*

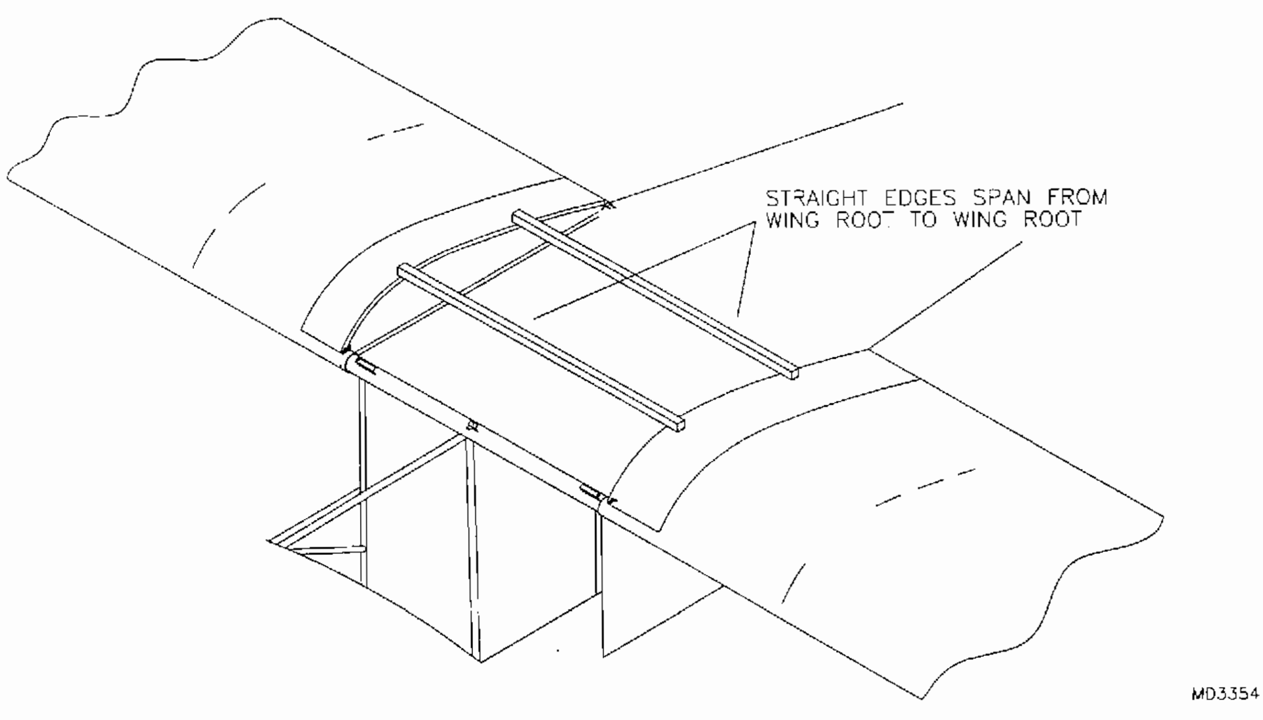
CAUTION: *NEVER ALLOW FUEL TO COME IN CONTACT WITH LEXAN.*

If fuel is spilled on Lexan, spray with water or cleaner immediately to lessen the chance of crazing damage.

1. Collect all the parts shown on the part pages for the windshield. Extra care should be taken when working with Lexan. Lexan scratches easily and as much as possible of the protective plastic should be left in place until the aircraft is ready to be flown. The windshield will require some minor trimming. Lexan can be easily trimmed with aviation snips or by scoring and snapping off the piece to be trimmed. A sanding block with 80 grit paper works well for dressing up trimmed Lexan.

2. With the wings attached to the fuselage, position two straight edges from wing root to wing root as shown in **FIGURE 011-02**.

FIGURE 011-02



Drill the windshield tabs located on the leading edge spar carry-through as shown in **FIGURE 011-03**. The outer skylight ribs mount to the topside of each tab through the outboard hole. ***NOTE:*** *Don't forget the plastic washers between the windshield and tabs upon final assembly.* Slip each rib into position under the tab and transfer drill through the carry through tab into the rib. Cleco the rib in place on **TOP** of the tab. Refer to **FIGURE 011-03A**. The center rib is positioned under the center tab on the leading edge spar carry thorough and slips over the center tab on the station three top cross tube. Position the center rib and transfer drill through the forward tab into the rib and cleco. Locate and drill a #11 hole in the center of the flattened portion on the aft end of each outer rib. Push the aft end of each rib forward until they uniformly contact the straight edges. Some tweaking of the ribs may be required. With the ribs contacting the straight edges transfer drill through the rib into the steel gusset on the fuselage and rivet. Refer to **FIGURE 011-03A**. Remove the center rib from the aft mount tab. Hold the rib under the tab and push forward until contacting the straight edges. Transfer drill through the tab through the rib. Reposition the rib over the tab and rivet. ***NOTE:*** *Do not rivet the forward ends of the outboard ribs until the windshield has been installed.* Locate and drill the holes on top centerline of the rib as shown in **FIGURE 011-03B**. ***IMPORTANT:*** *Do* ***NOT*** *drill completely through the ribs.*

FIGURE 011-03

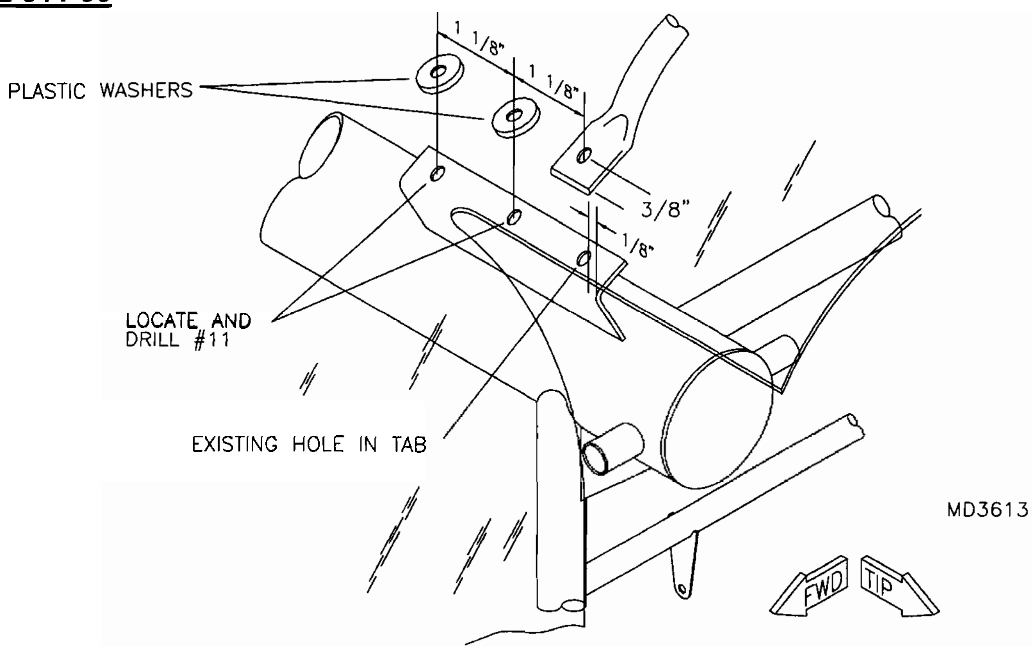


FIGURE 011-03A

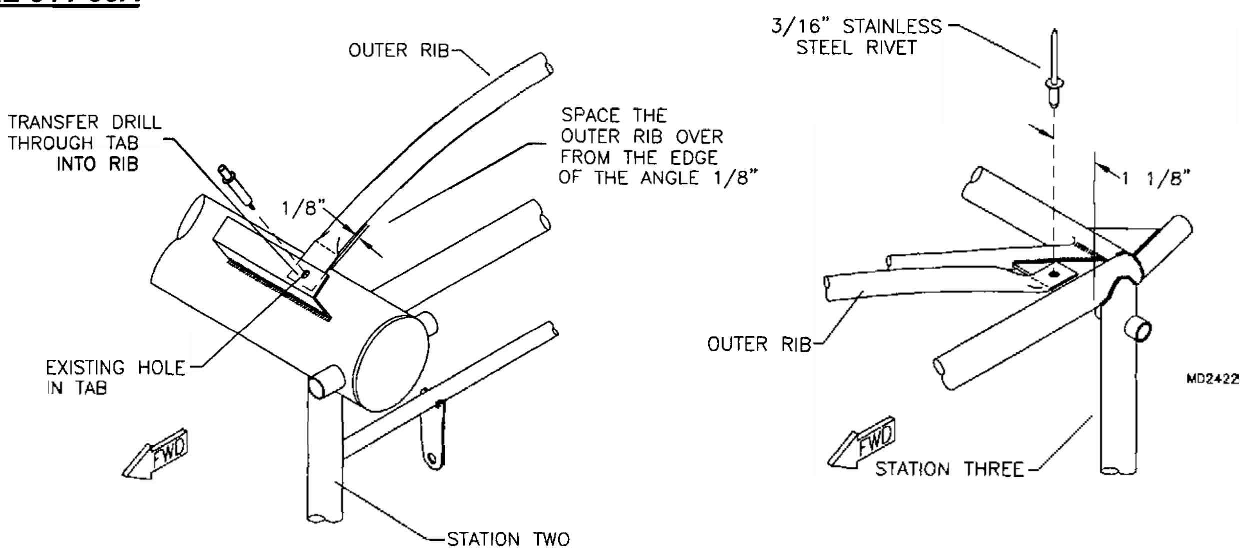
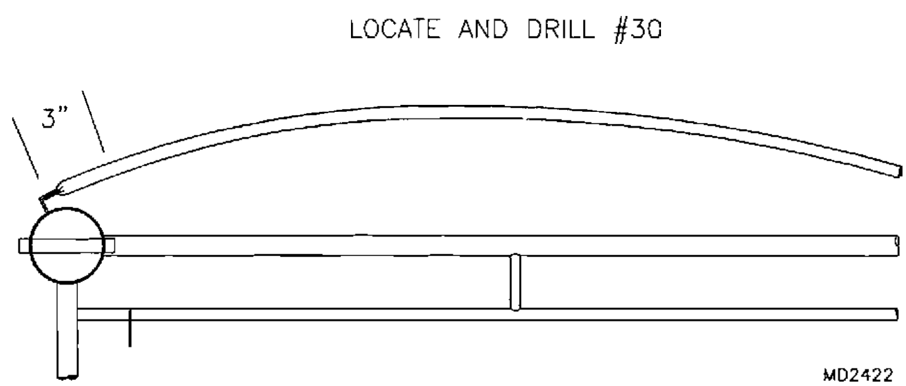


FIGURE 011-03B



4. The fiberglass windshield deck is supplied untrimmed. Trim on the trim lines per **FIGURE 011-04** and **FIGURE 011-04A**. ***IMPORTANT:*** *Do **NOT** trim off the raised joggle area.* Place the deck onto the aircraft by slipping it over the S-1 top formers. The deck should fit nicely onto the former. Align the top aft edge of the deck flush with the bottom of the instrument panel tab. See **FIGURE 011-04B.** Clamp the deck in place along the top former and secure the aft edge against S-2. ***HINT:*** *To prevent scratching the frame, wrap tape on the jaws of the clamps.*

FIGURE 011-04

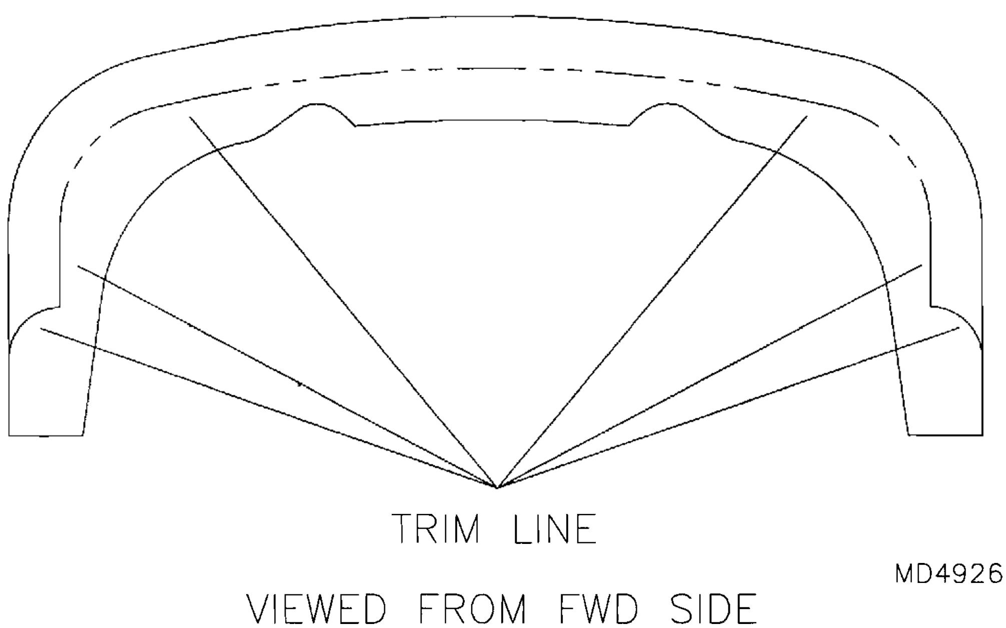


FIGURE 011-04A

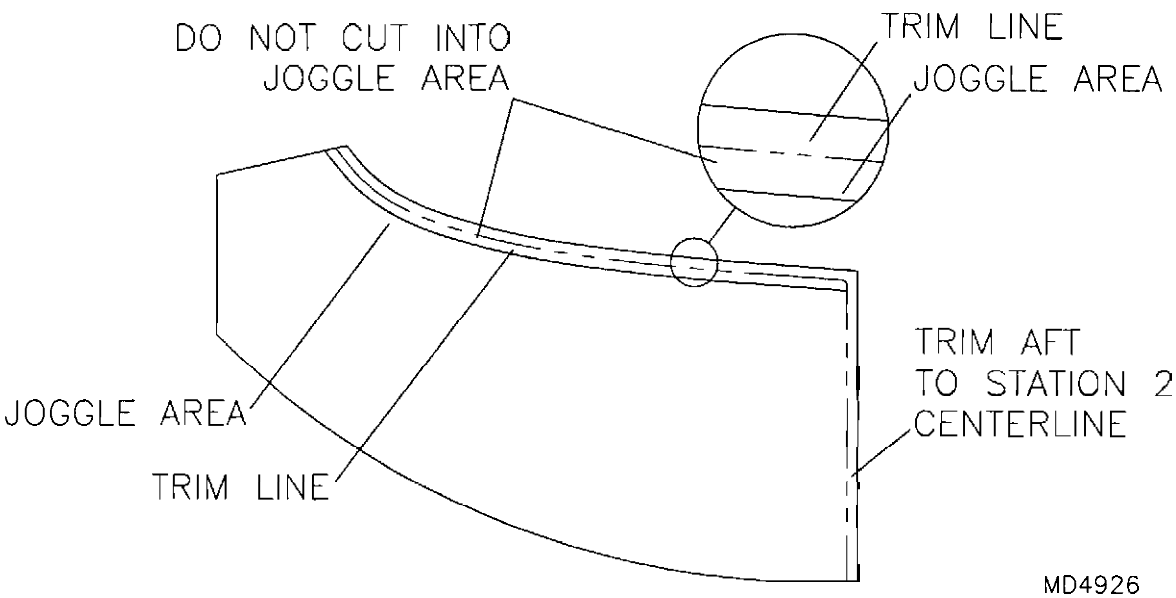
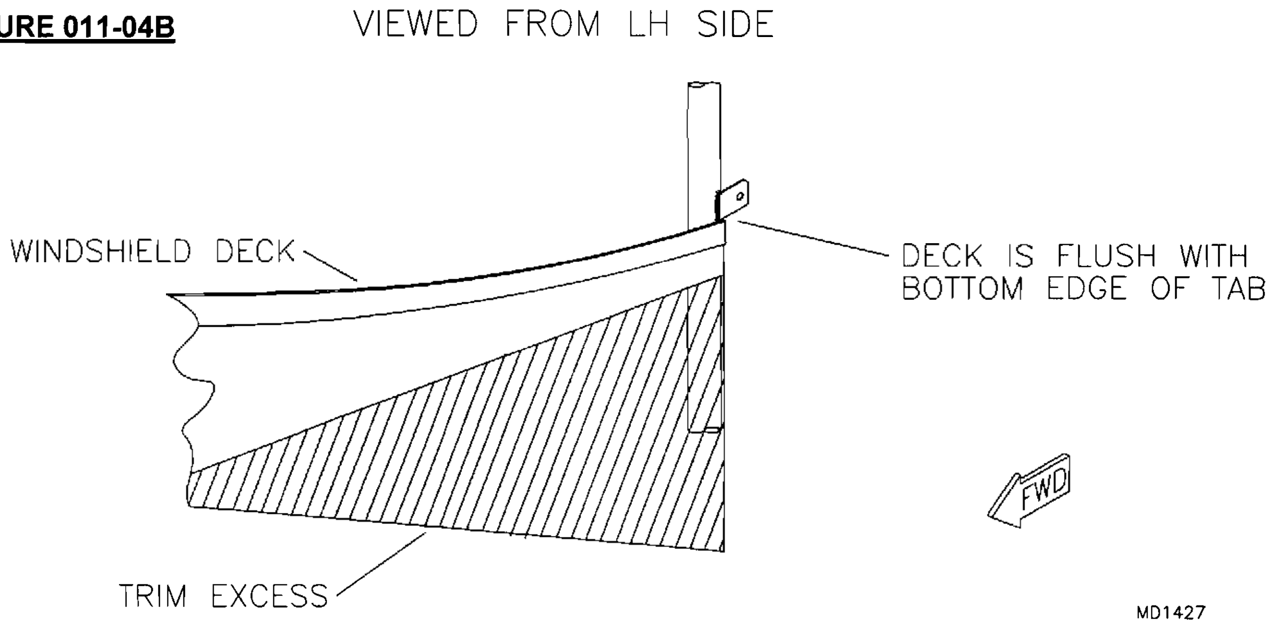


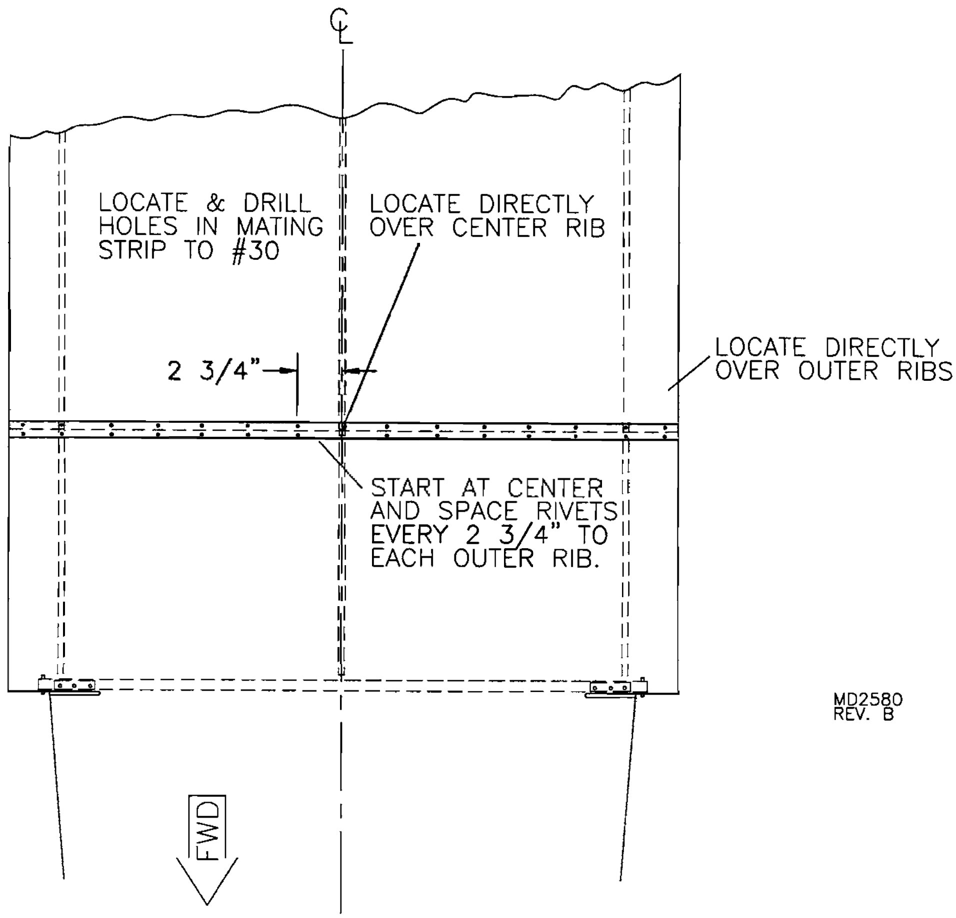
FIGURE 011-04B

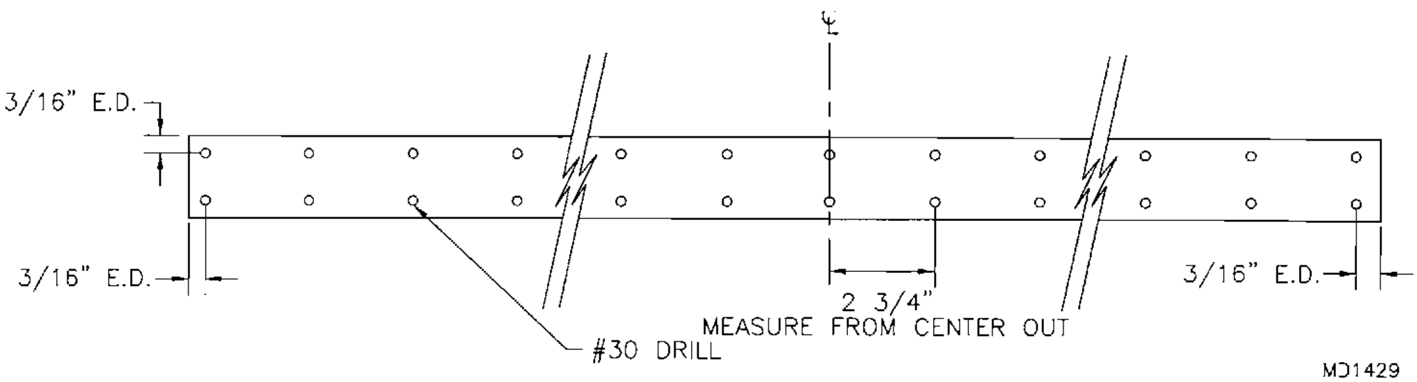


5. From the inside of the cockpit, transfer drill through the five side tabs through the windshield deck using a #30 bit. Cleco as you go. Mark onto the deck the forward and aft tab location along their bottom edge. Lay a straight edge along these two marks and scribe a line the full length of the deck. Remove the deck and trim to the scribed line. Re-install and Cleco in place.

6. The windshield and skylight panels are joined together with two mating strips. Pre-drill the mating strips as shown in **FIGURE 011-06**. Note that the center set of holes should be located to pick up the center rib, as well as the corresponding holes to the outer skylight ribs. Lay the windshield and skylight on a clean flat surface. Butt the skylight to the windshield. Center the top and bottom mating strips on the windshield and skylight seam. Using the pre-drilled holes as a guide, transfer drill through the mating strips and windshield and skylight. Cleco as you go. With all holes drilled, remove the mating strips and deburr. Drill out the windshield/skylight holes to #28. The mating strips may be painted or left as is. Run a small bead of silicon along the holes in the mating strips and rivet the strips to the windshield and skylight.

FIGURE 011-06

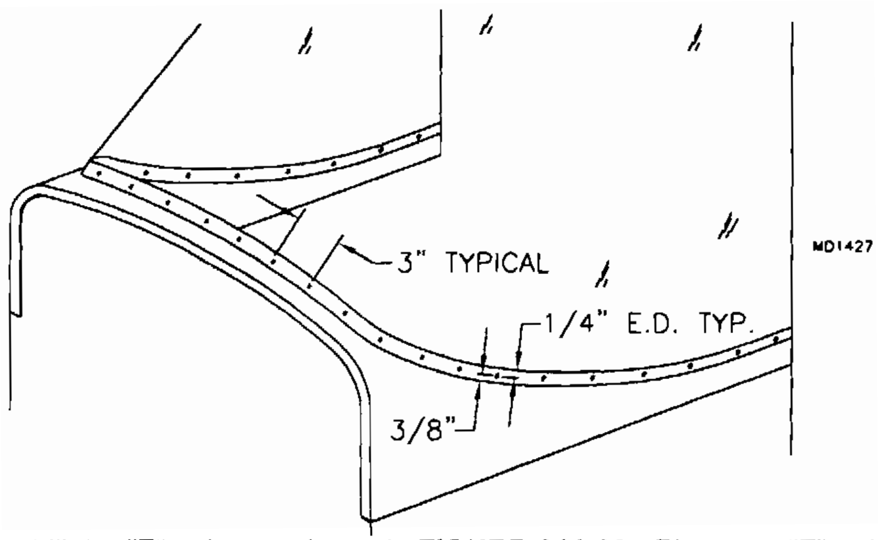




7. The windshield is supplied pre-cut, slightly oversized to create an overlap. Lay the windshield/skylight in position on the fuselage and ribs. There is a #11 hole drilled on each side of the windshield. Cleco the windshield in place through these holes and into the corresponding holes in the windshield tabs on top of the carry through. Clip the windshield in place **inside** the windshield deck. Push on the aft edges of the windshield to move the windshield tightly into place against the inside of the windshield deck. Clamp in place. The windshield should not contact the instrument panel top cover. It may be necessary to trim the lower end of the windshield to gain clearance. Pull the sides down to contour around the structure and clamp or tape in place. Check for an even amount of overhang on each side and if the Lexan is down against all edges. Re-position and clamp as required. Peel back a small area of the protective plastic around the windshield tab. With the skylight centered, drill through the windshield into the holes in each tab and cleco in place.

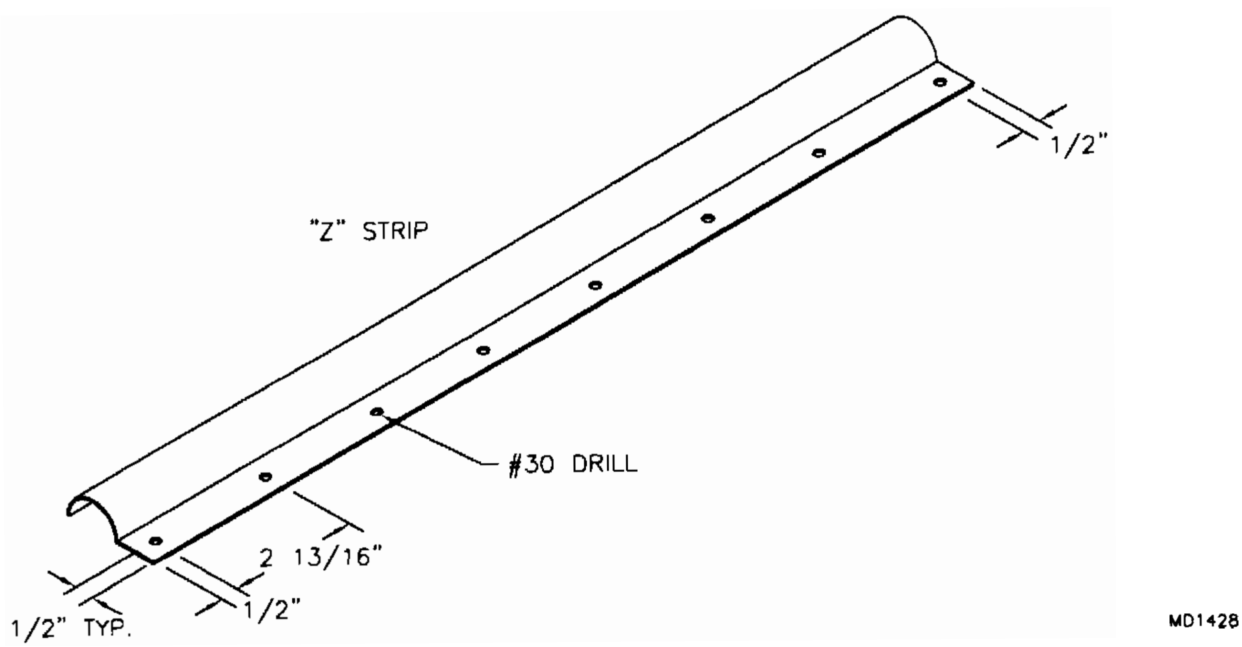
8. Measure off the firewall to determine the center of the deck. With the windshield clamped securely in place, tight against the inside of the deck, drill through on center line. Place holes with a 1/4" E.D. See **FIGURE 011-08**. Layout 3" rivet spacing around the windshield deck off the center line. Make sure the windshield stays tight against the windshield deck and is clamped tight to the door post. Trim the lower end of the windshield 3/8" below the holes. ***HINT:*** *Mark around the top edge of the windshield deck with a marker, measure down 5/8" and trim.*

FIGURE 011-08



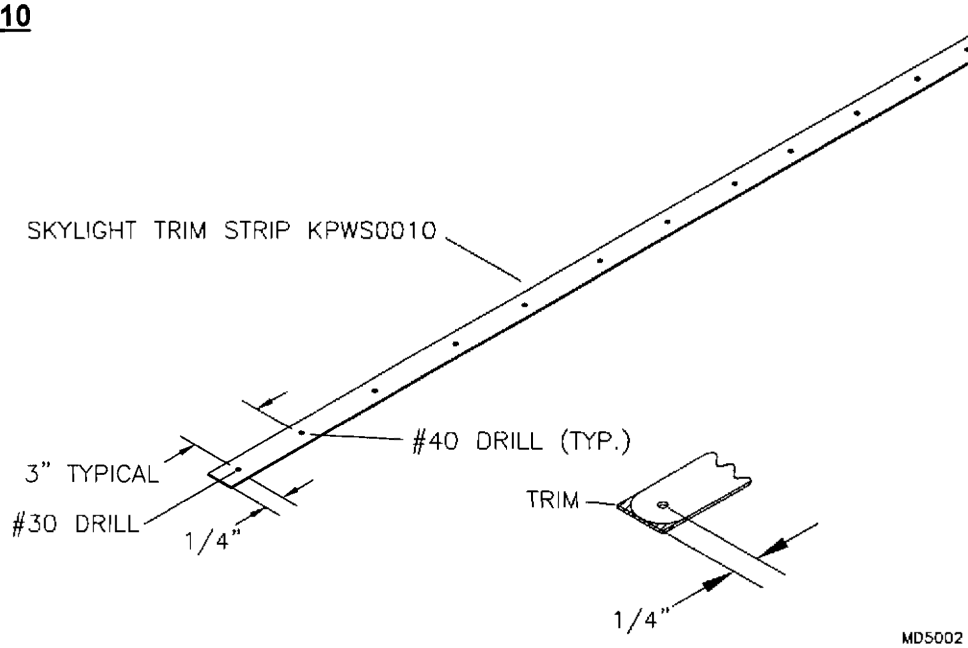
9. Locate and drill the "Z" strips as shown in **FIGURE 011-09**. Place the "Z" strips on the inside of the windshield. Position so that the flanges are against the windshield and centered up and down on the vertical cabane. Press the windshield flat against the "Z" strips with a board or scrap piece of lumber. Using a #30 bit, transfer drill through the pre-drilled holes in the "Z" strips through the windshield. Cleco as you go.

FIGURE 011-09



10. Layout and drill holes in the Skylight Trim Strips per **FIGURE 011-10**. Transfer drill through the windshield into the previously drilled #30 hole in each support rib. Cleco the Skylight Trim Strip to the hole in the rib. Align the strips on the centerline of each rib. Transfer drill; be sure to stay on centerline. Cleco as you drill. ***HINT:*** *Tension the strip to the aft as you drill to prevent puckering.* Trim the strip 1/4" past the hole next to the mating strips. ***NOTE:*** *The Trim Strips will* ***NOT*** *overlap the Mating Strips.* Size drill all holes to #30.

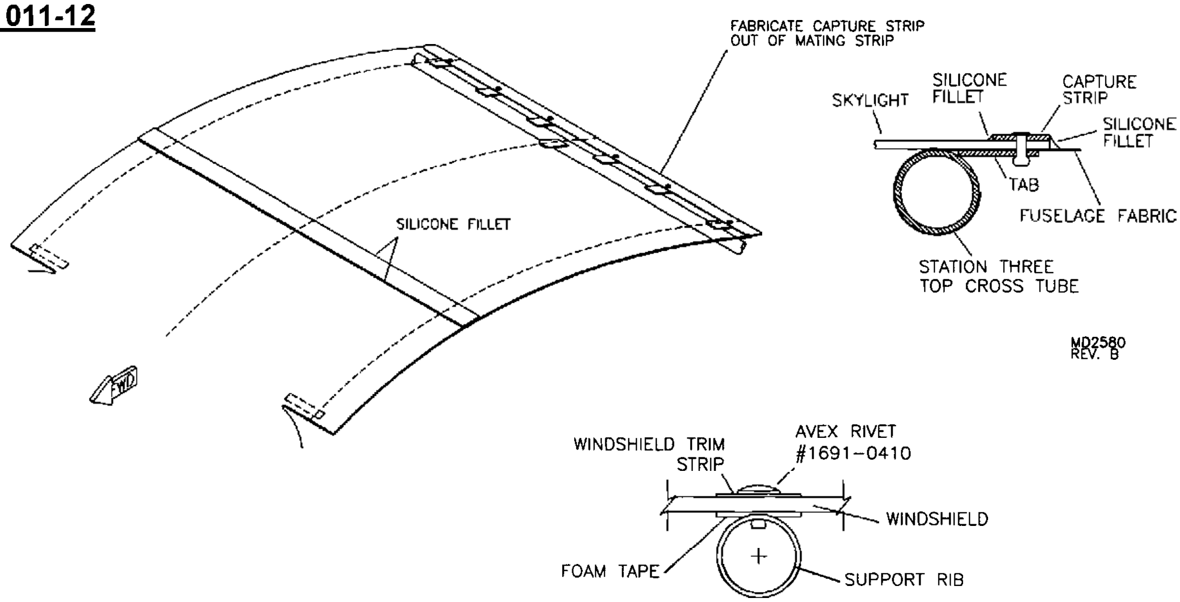
FIGURE 011-10



11. Mark where the outer and middle ribs lay under the Lexan with a marker. Trim the protective coating out of these areas. With the coating removed, the rib holes are visible. Using a #30 drill bit and starting at the forward end of each rib, transfer drill through the skylight at each hole location in the ribs. The skylight should fit tight against the ribs with no puckers or bulges.

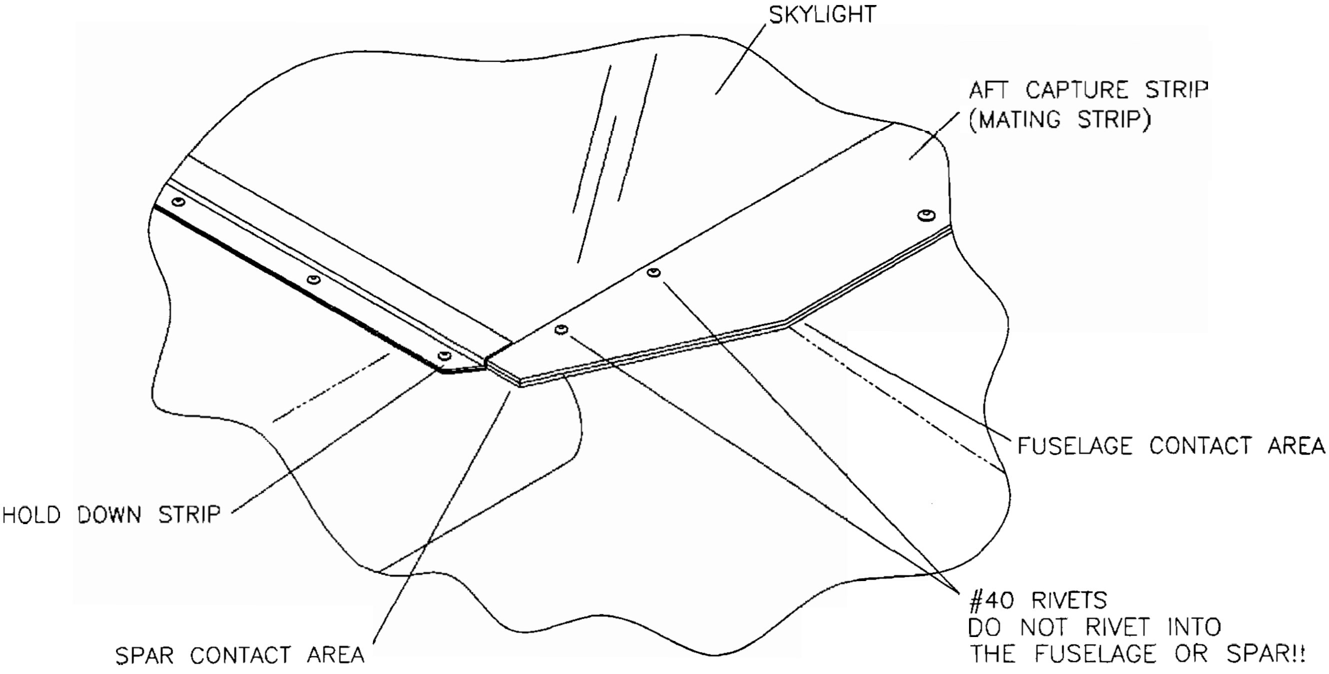
12. Use the third skylight mating strip supplied to fabricate an aft capture strip to attach the skylight to the S-3 fuselage tabs shown in **FIGURE 011-12**. Center the mating strip on the fuselage and the S-3 tabs. The capture strip should be flush with or slightly overlap the aft end of the skylight. Transfer drill #30 and cleco in place.

FIGURE 011-12



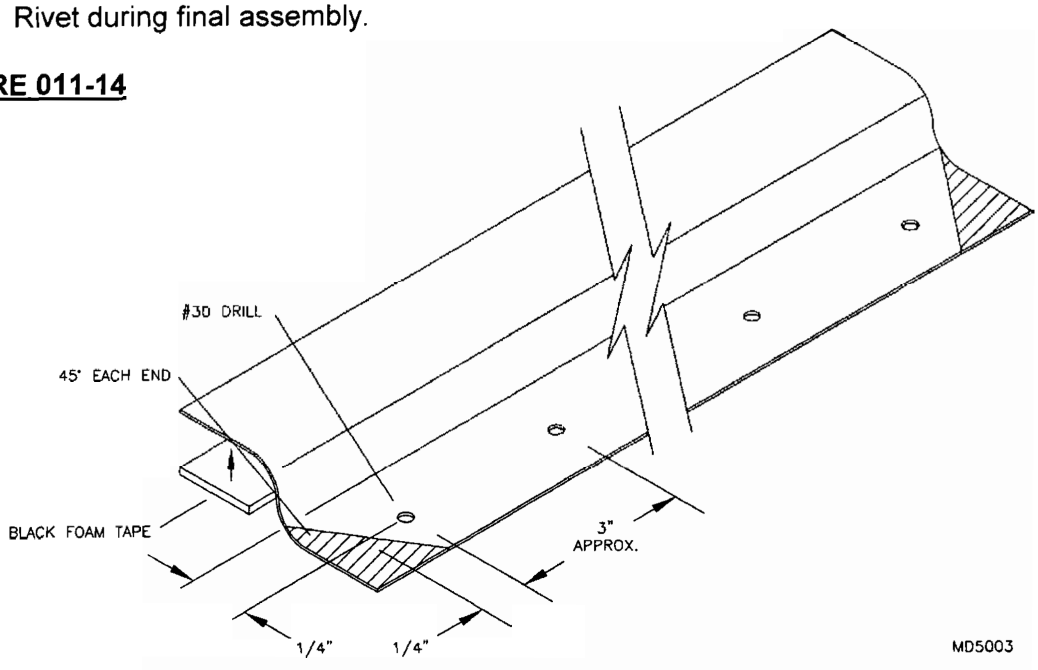
13. Mark and trim the aft outboard edges of the Skylight and Aft Capture Strip as shown in **FIGURE 011-13**. During final assembly, place #40 rivets near, but **NOT** into the aft spar to hold the capture strip tight against the sky light.

FIGURE 011-13



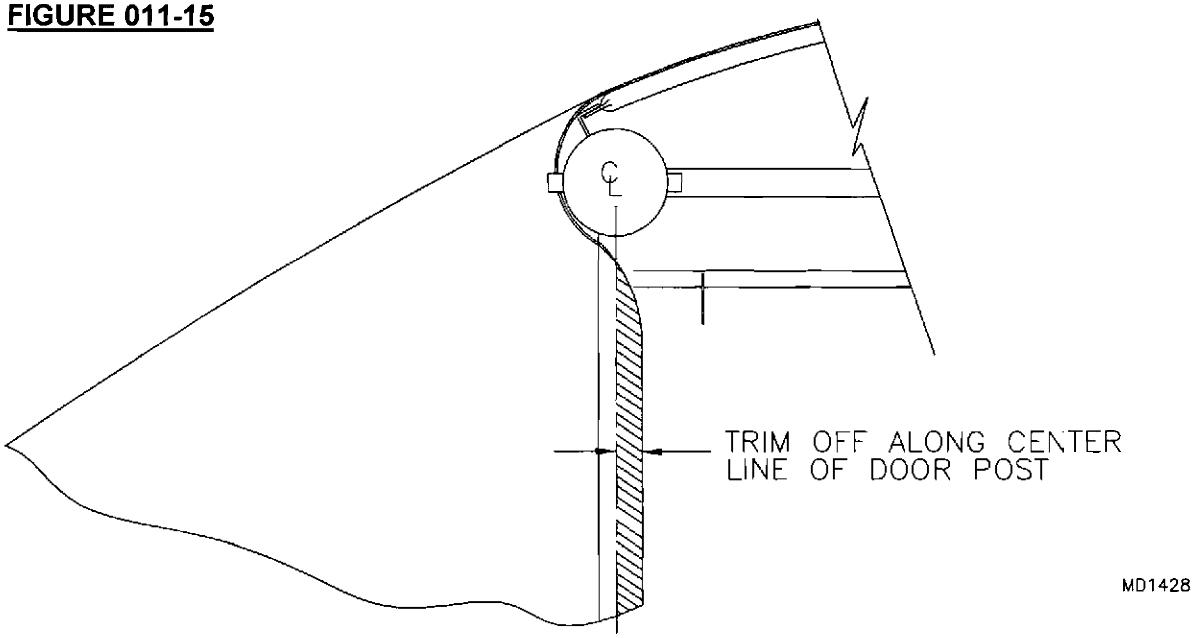
14. Position Skylight Hold Down Strip against the edge of the Skylight between the Mating Strip and Aft Capture Strip. ***NOTE:*** *The flange with a slightly downward angle overlaps the skylight.* Trim the Hold Down Strip length as needed to clear the strips. Layout and drill holes in the Skylight Hold Down Strip per **FIGURE 011-14**. Trim the ends of the Strip. Reposition the strip and transfer drill #30 into the Upper Root Skin. Cleco as you drill. ***CAUTION:*** *Do **NOT** drill into the fuel tank or fuel lines.* ***Use a Drill Stop!*** Remove and paint the strip if desired. Apply 1/2" black foam tape to the flange overlapping the skylight. Rivet during final assembly.

FIGURE 011-14



15. Use masking tape to mark the trim line on the AFT edge of the windshield at the S-2 vertical side tubes. Mark and trim so that the aft edge of the windshield is 1/32" forward of centerline of the door frame tube. Refer to **FIGURE 011-15**.

FIGURE 011-15



16. Remove the windshield. Drill out all holes, in the Lexan only, to #28 and debur. The "Z" and Mating Strips may be painted or left as is.

17. Apply 1/2" black foam tape to the top of each rib. Apply the 3/8" x 1/2" foam strip to the lower outer edge of the windshield/skylight. The foam will help seal against the wing. During final assembly, install the windshield/skylight, trim strips, hold down strips, "Z" strips, and rivet.

18. Install the rubber edging along the outer edges of the skylight. Use a small amount of cyanoacrylate glue (Permabond, super glue, etc.) to retain the edging in place. Do not glue the forward end until the wing cuffs are installed. During final assembly install the windshield and rivet. ***NOTE:*** *Place the plastic washers between the windshield tabs on top of the carry-through, inboard of the outer ribs.*

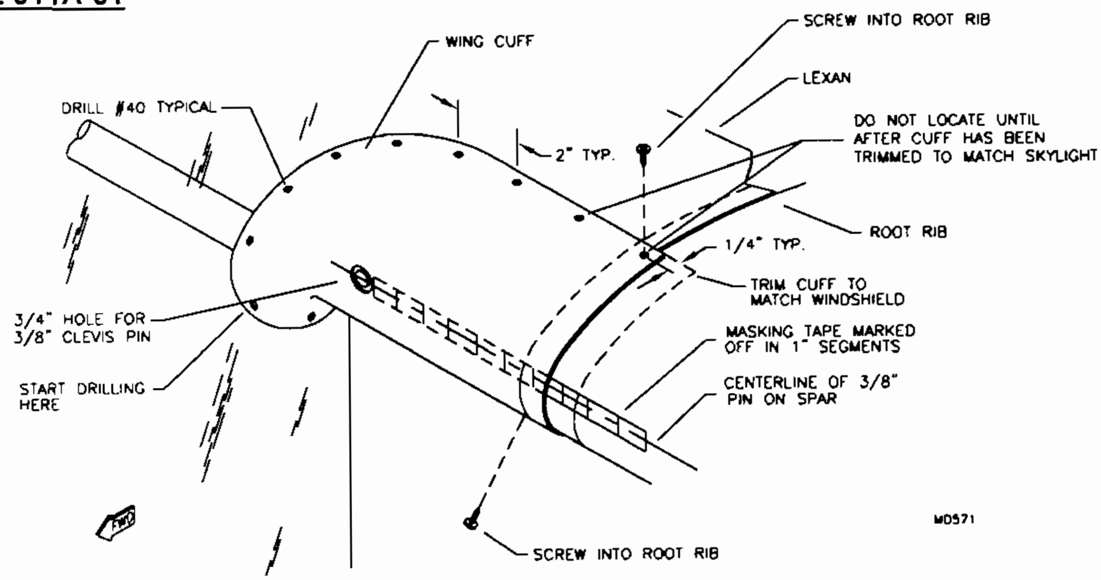
19. Apply a small fillet of clear silicon seal to the edge of the mating strip, aft capture strip, fuselage and windshield/skylight junction. ***HINT:*** *Apply tape flush with the edge of the metal strips. Place tape about 1/8" from the metal strips on the Lexan.* Clean Lexan and apply silicone seal and form into a fillet with your finger. Remove tape and allow silicone to dry.

INSTALLING THE WING CUFFS

PLEASE NOTE: *Before the wing cuffs can be installed the wings and windshield must be on the plane.*

1. Trim the cuffs to fit. See **FIGURE 011A-01.** Before installing the cuffs place a strip of masking tape on the spar at least 8" long on the spars centerline starting at the spar's 3/8" pin. Mark off the tape in 1" segments from the exact center of the pin. The tape will serve as a way of marking on the cuff where to drill for the 3/4" diameter pin access hole. See **FIGURE 011A-01**. To locate the pin under the cuff, measure onto the cuff using the tape as a reference. Because of the springy nature of the plastic, the cuffs are a bit tricky to fit up to the windshield. ***HINT:*** *The trick is to start drilling and installing clecos from the* ***BOTTOM*** *to the top.* A total of 9 rivets are used to retain the cuff to the windshield. Locate and mark for 9 rivets, along the edge with about a 1/4" edge distance.

FIGURE 011A-01



2. Hold the cuff in position. By moving the cuff around a bit you will find where it fits the best. ***HINT:*** *Place tape across the windshield, aft of the cuff, as a straight reference line to make positioning the cuffs parallel to each other easier.* Drill through at your marks with a #40 bit and cleco as you go starting near the bottom. Push firmly on the cuff to form it against the wing as you work your way to the top. See **FIGURE 011A-01** for starting hole location. Size drill all #40 holes to #30.

3. After drilling and clecoing the cuff in place drill a #30 hole at the top and bottom locations for #8 pan head screws. Before drilling make sure the cuff is tight against the wing by pushing it firmly into the wing. Drill into the root rib on the top and bottom. The screws will self tap into the spar but not without an effort. ***NOTE:*** *The bottom hole will also be used to secure the Wings's Root Gap Seal.* Be careful not to slip off the screw and punch a hole in the wing. Remove the screws and clecos and drill the 3/4" for the wing pin in the cuff. ***HINT:*** *A Uni-bit works well.* Clean up the 3/4" hole by rolling a piece of 80 grit sanding paper into a cylinder. Sand the inside of the hole smooth. Paint as desired.

4. Drill the #30 holes, in the Lexan only, to #28. Clean the windshield, cuff, and wing of any debris. Cleco the cuff in place. Install the rivets and screws. Make sure you use the small brass washers to back up the rivets. Use extra care in placing the washers; make sure they are up against the Lexan before pulling the rivet. Apply a small fillet of clear silicon seal to the edge of the cuff and windshield junction. A properly installed wing cuff will contour exactly with the wing and windshield as well as provide a water tight joint against the rain.

5. Install the rubber edging along the outer edges of the skylight from the cuff to the Hold Down Strip. Use a small amount of Cyanoacrylate glue (Permabond, super glue, etc.) to retain the edging in place.

S-6S COYOTE II BATTERY BOX INSTALLATION

1. Locate the parts shown in the parts manual.

2. Drill one hole in the support angles and the corresponding hole in the side plate to #30 and rivet the support angles to the side plate. Chase drill through the second hole of the side plate and support angle and rivet. Refer to the parts drawing.

Position one side of the side plate flush with the mount plate. Using a #30 drill bit and using the mount plate as a guide, transfer drill through the three side holes in the mount plate into the side plate. Rivet the side plate to the mount plate through the #30 hole(s) only. Slide the battery into the box and pull the opposite (loose) side of the side plate in tight to the battery. Using the mount plate as a guide transfer drill through the mount plate into the side plate with a #30 bit and rivet.

3. Install the cushioned clamps as shown in the parts drawing. Note the orientation of the cushioned clamps. Position the battery box for best placement. Mark the mount hole locations onto the box using the clamps as a guide. Drill the mount holes to #11 and bolt in place.

4. Install the cushioned clamps as shown in the parts drawing. Note the orientation of the cushioned clamps. Position the battery box for best placement. Mark the mount hole locations onto the box using the clamps as a guide. Drill the mount holes to #11 and bolt in place.

5. Connect the battery as shown in the parts drawing. Use the four gauge wire to make the cables, cut the negative cable long enough to go from the battery to the right socket bolt. Route the positive cable up the right side of the fuselage and connect it to the starter solenoid.

S-6S COYOTE II - SEAT ASSEMBLY

There are two types of seats used. The flip up style is standard, with the fixed bottom optional. The fixed bottom style is used when extra head room is required. The seats can also be set up with one of each style. If you find you require a fixed bottom seat, please call our parts department for pricing and availability. Assembly of the seat back is the same either style. Please read the whole seat assembly section for instructions on both types.

FLIP UP SEAT ASSEMBLY

1. Select the parts as shown in the S-6S parts drawing.

2. If you are installing the optional headrest mark and drill the headrest frame as shown in **Figure 013-02**. Install the buttons to the inside of the headrest frame as shown. Measure and mark up from the lower ends 17 ¼" on the seat frames' **BACK SIDE**. Drill a #11 hole through only the tubes' one side, on each side. See **Figure 013-02A.** Pin the headrest frame in place. Drill the second set of holes. Remove the headrest frame and drill the seat frame out to ¼" and install the rivnuts. See **Figure 013-02B.**

FIGURE 013-02

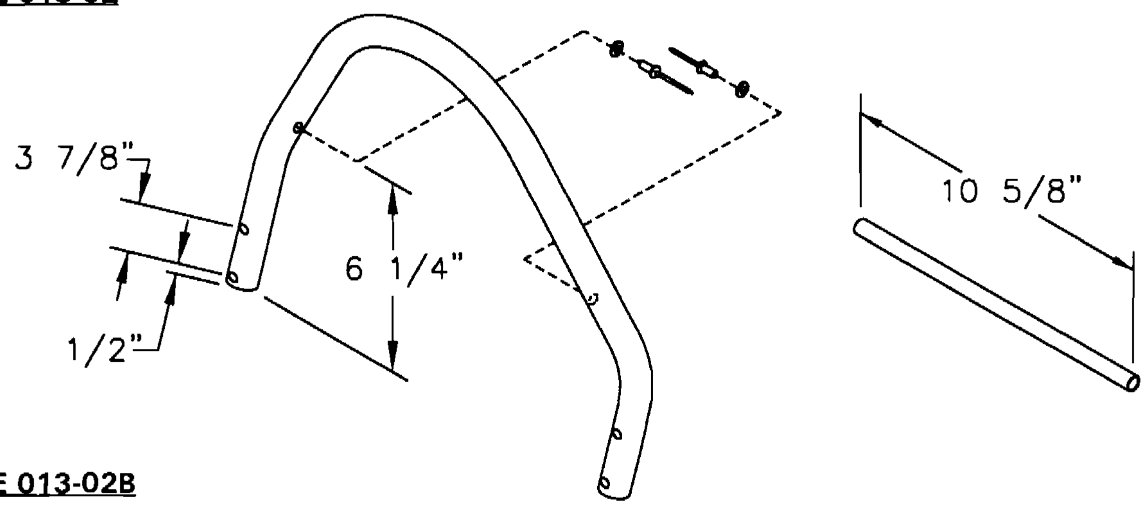
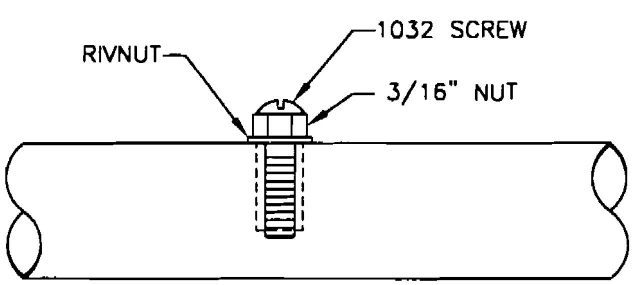


FIGURE 013-02B



PROCEDURE:

1. FINGER TIGHTEN NUT AND RIVNUT ONTO SCREW.
2. INSERT RIVNUT INTO 1/4" HOLE.
3. TURN NUT THREE TURNS CLOCKWISE WHILE HOLDING SCREW STATIONARY.
4. BACK NUT OFF HALF A TURN AND REMOVE SCREW.

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3. Refer to **Figure 013-03** for hole size and locations. Drill the seat gussets and deburr.

4. The doublers have been installed in the seat prior to the lumbar bend, but they need to be drilled. Drill through with a #11 bit using the frame as a guide. Bolt a set of seat back gussets to each seat back frame. Please orientate bolts so the nuts are facing inward towards each other.

FIGURE 013-02A

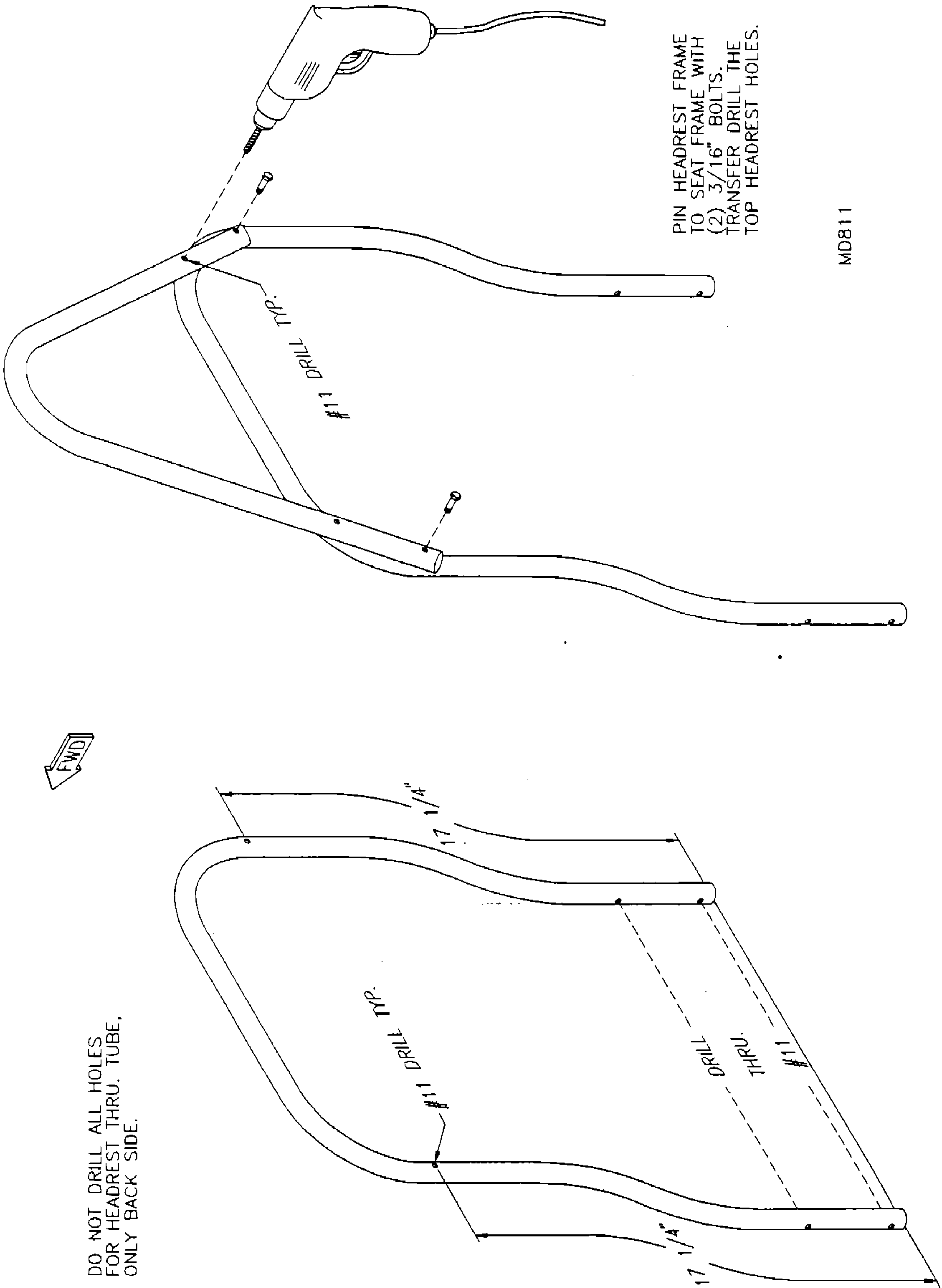
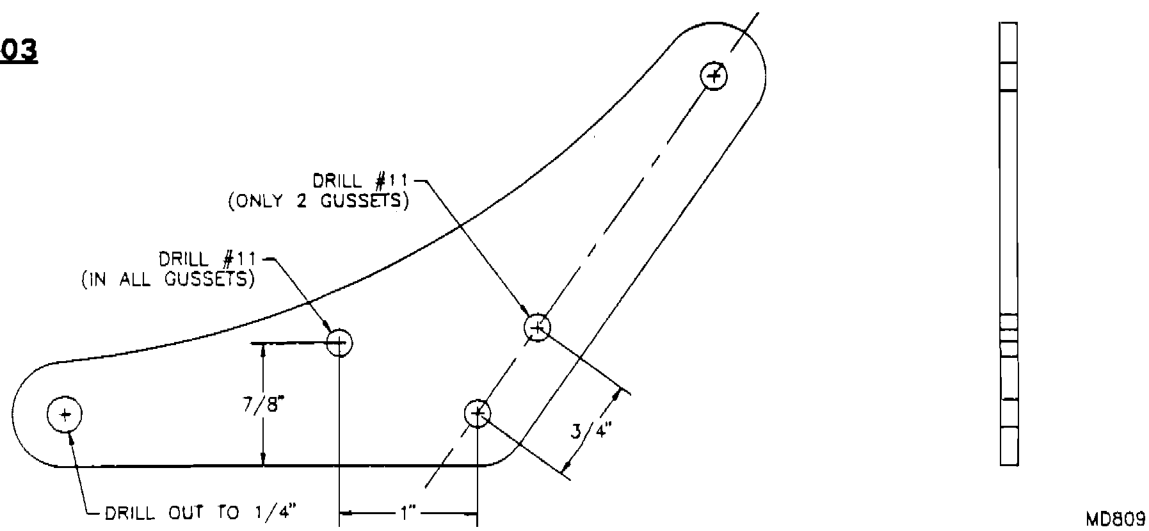
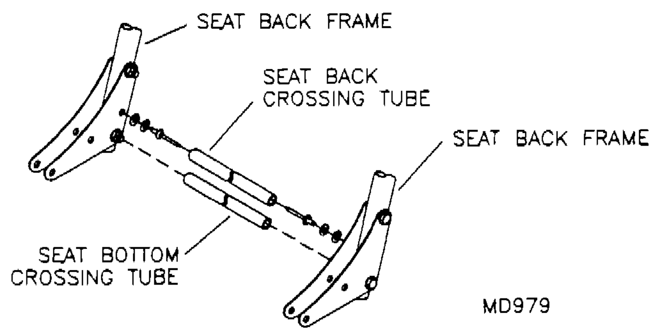


FIGURE 013-03



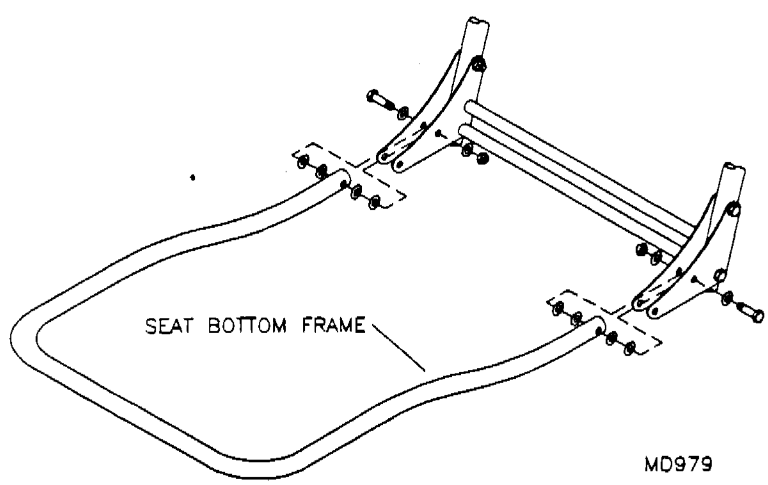
5. Rivet a "button" to the inside of each seat gusset as shown in **Figure 013-05**. This button will serve to retain the crossing tube that supports the seat back bottom edge. The second crossing tube is retained by the bolts at the lower end of the gusset also shown in **Figure 013-05.** The second crossing tube is used to retain the seat bottom aft edge. Cut (4) crossing tubes 14" for the flip up style seat and (2) for the fixed type.
Assemble the crossing tubes by spreading the frame apart just enough to slip the tube over the nuts and buttons. If the tube does not bottom out against the gusset lay the assembly on its side and tap it gently with a mallet.

FIGURE 013-05



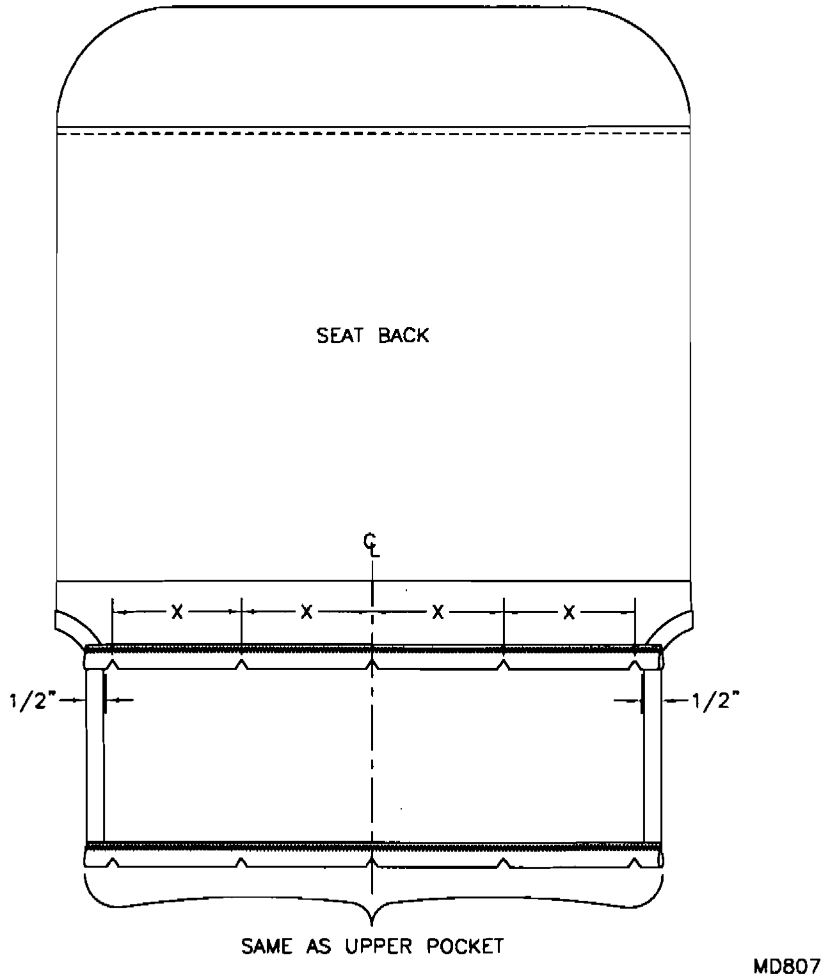
6. Assemble the bottom seat frame between the seat gussets. See **Figure 013-06**.

FIGURE 013-06



7. Slip the seat bottom onto the frame with the flaps facing down. Study **Figure 013-08** for wire and zip tie placement. Use a hot knife or scissors to cut the notches. The seat bottom aft flap goes around the tube that is retained by the bolts. Do not pull the tie around the flap all the way tight. They must be a little loose to allow the seat bottom to fold down flat.

FIGURE 013-07



8. Slip the seat back onto the frame with the pocket side to the aft. Study **Figure 013-07** for notch locations. The seat back flap wraps around the remaining tube. Cut to length and bend the ends of the wires the same way as done for the bottom. Pull the zip ties tight once the fabric is in place.

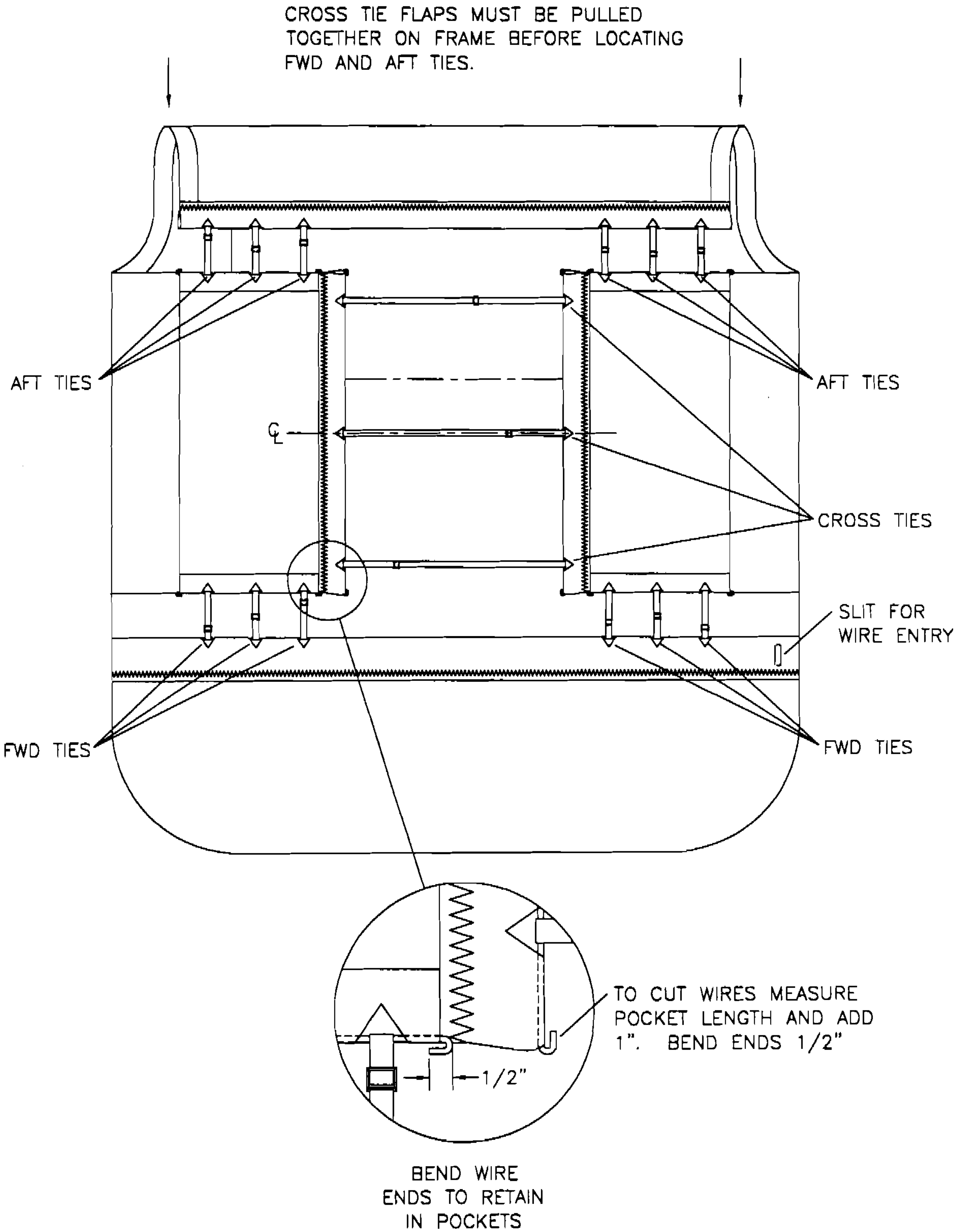
9. File the ends of the ½" tube to match the angle of the headrest frame for best fit. Snap the tube onto the buttons. Find the locations
of the four rivnuts on the seat back frame and melt through with the tip of a soldering iron. Bolt on the headrest frame with the ½" tube in place. Slip the headrest cover over the frame and close the Velcro.

10. Place the seat assembly in the fuselage. Position the seat so the gusset's lower open hole is lined up with the bushings welded to the bottom of the seat rails. Take a ¼" clevis pin and test fit through the newly drilled hole. If it is tight, drill out the welded in place bushings with a ¼" bit.

FOR FIXED SEAT BOTTOMS

11. Take the seat bottom and position it on the fuselage frame. Lace the crossing straps first, followed by the front to back straps. Pull these straps as tight as possible without tearing them. **NOTE:** You may need to tighten these straps after a few hours of flying. Loop the extra strap back into the buckle and trim off the excess so only 2" to 3" remain.

FIGURE 013-08



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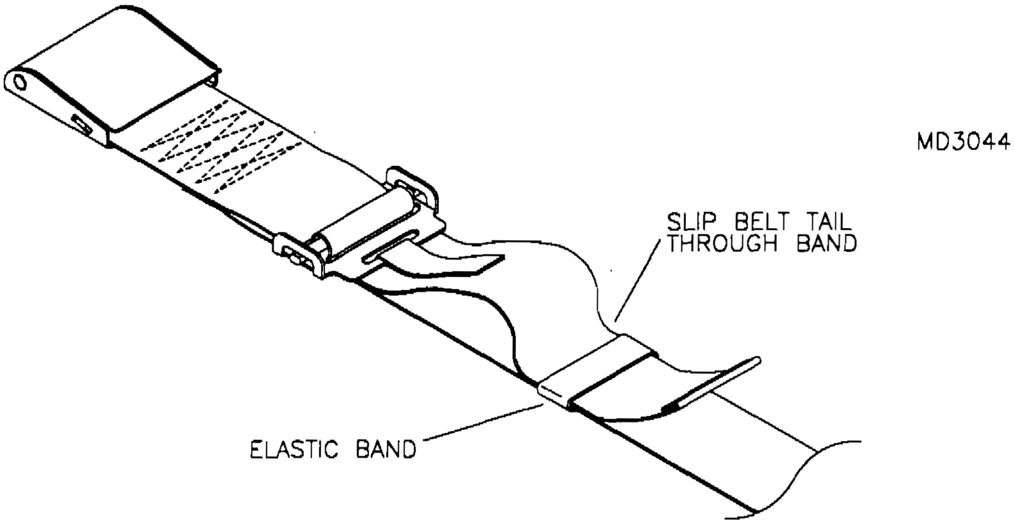
S-6S COYOTE II SEAT BELT ASSEMBLY

1. Prior to covering the fuselage, drill out to1/4" the seat belt mount tabs welded to the fuselage. Refer to the parts drawing for the mount tab locations. Note that the interior will need to be installed prior to installing the seat belts for the final time. Also note that extension tabs will need to be bolted to the welded mount tabs on the station three top cross tube. Refer to the interior installation instructions.

2. After covering the fuselage bolt each belt to there respective mount as shown in the parts drawing. Use the elastic band on the lap belt to hold the tail of the belts after adjustment has been made. Refer to **FIGURE 013A-02.**

FIGURE 013A-02



3. This seat belt design allows for quick exit out of both lap and shoulder belts simply by opening the buckle. To use, simply pull belts over lap and shoulder and adjust. **NOTE:** To exit, un-clip lap belt. **IMPORTANT:** The shoulder belt must pass over your **OUTSIDE** shoulder (in either seat) then diagonally across your chest to the lap belt attach point. Always make sure that seat belts are properly positioned and snug prior to and during entire flight.

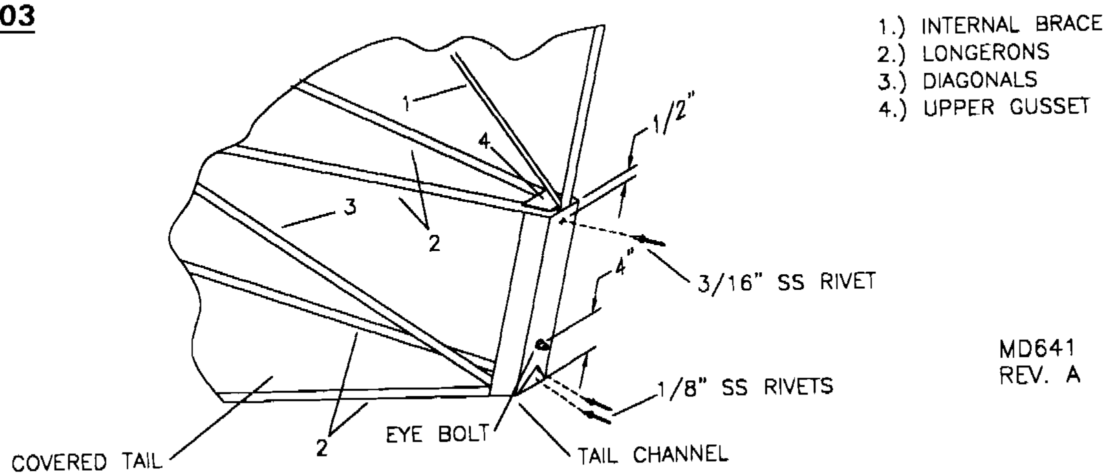
S-6S VERTICAL STABILIZER ASSEMBLY

1. Locate parts called out in parts drawing. Vertical stabilizer spar requires doubler where top aft tail cable attaches; refer to parts drawing. Mark doubler around middle and slide into spar until mark appears in cable attach hole of spar; drill #40 2" below cable attach hole on forward side of spar. Rivet doubler in place with 40APR1/8 and drill #11 hole in doubler through cable attach hole.

2. Drill #11 and rivet 3/16" nut plates to upper forward side of vertical stabilizer spar. ***NOTE:*** *Position the ear of the single-ear nut plate to the top.* Drill 1/4"and rivet 1/4" nut plate to lower forward side of spar. Forward side has #30 hole drilled near bottom; install 3/16" rivet button at this hole. This button and button on aft side of leading edge will secure 1/2" internal brace within stabilizer. See parts drawing.

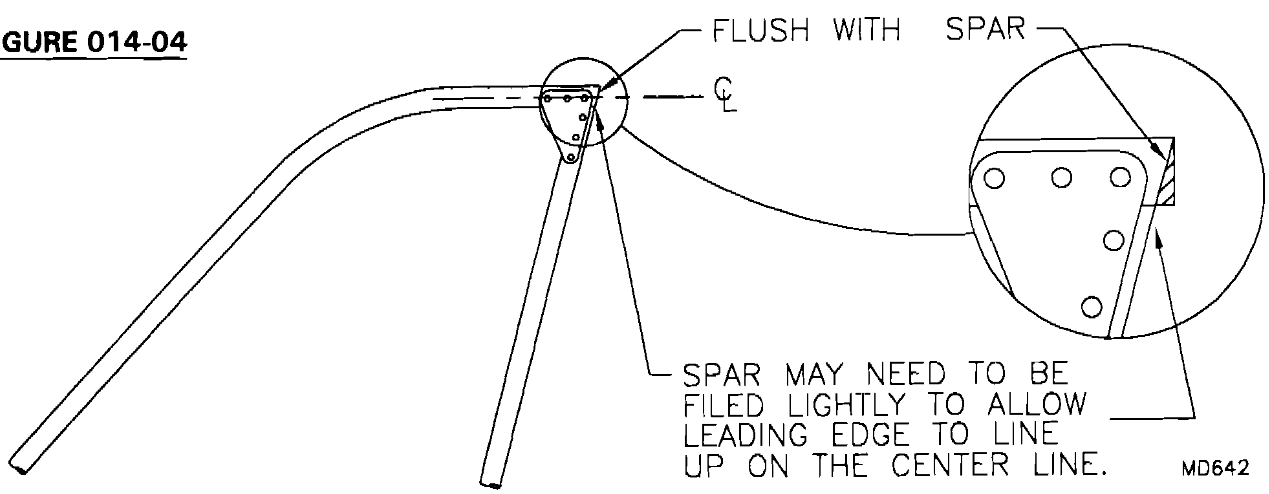
3. Locate and drill 1/4" hole 4" from bottom of tail channel, on centerline. See **FIGURE 014-03**. Slide vertical stabilizer into position and install 1/4" eyebolt. Sight stabilizer to ensure it is vertical and locate stainless steel rivets in the tail channel and bottom gusset, per **FIGURE 014-03**.

FIGURE 014-03



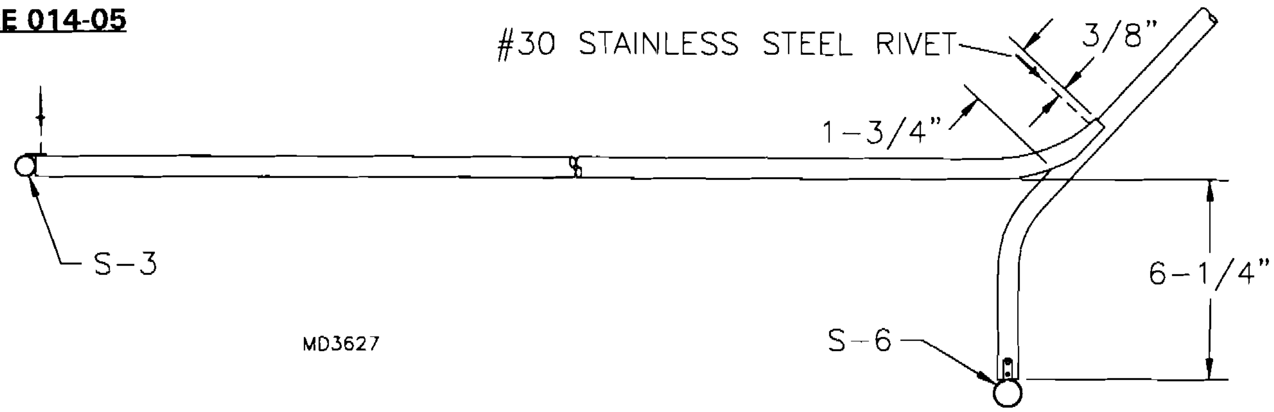
4. Near top of vertical stabilizer spar are three #30 holes 7/8" apart; cleco gussets in place, per parts drawing. Locate leading edge at station 6 crossing tube, using pre-drilled holes as centering guides. Transfer drill #11 through bent ST-16's and secure, to the crossing tube, with 3/16" stainless steel rivets, per parts drawing. Cleco the leading edge to the bent ST-16's. It probably will be necessary to fish mouth the top of the spar gently to align leading edge, gussets and spar; refer to **Figure 014-04**. Trim the top-aft end of the leading edge flush with the spar. Transfer drill through gussets into leading edge tube; remove gussets, debur, then rivet with #30 stainless steel rivets. Next, rivet the two bent ST-16's to pre-drilled holes in bottom of leading edge. Cut internal brace from raw stock. Brace should snap over buttons and fit snugly.

FIGURE 014-04



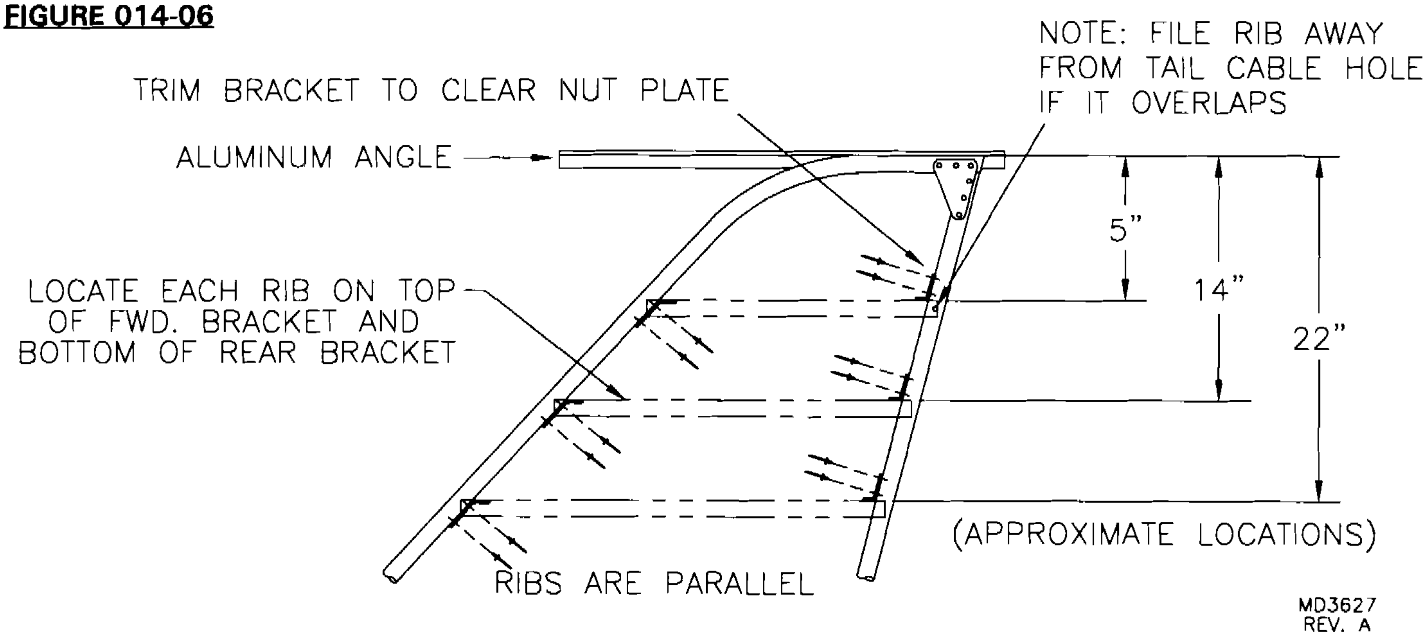
5. Top stringer extends from stabilizer to station 3; cut out and debur bent (aft) portion of stringer so as to snap over stabilizer leading edge. Help positioning by using the S-5 top stinger support as a guide. Drill a #30 hole ½" from stringer's aft end and cleco to vertical stabilizer. Refer to **FIGURE 014-05.** Place forward end of stringer against underside of station 3 centerline tab; transfer drill #30 and cleco to tab. Locate S-4 top stringer support to *aft* side of station 4 crossing tube, per parts drawing; drill and cleco. Locate S-5 top stringer support to *forward* side of S-5 crossing tube, per parts drawing; drill and cleco. When satisfied with fit, rivet components in place.

FIGURE 014-05



6. Straighten vertical stabilizer ribs with "fluting pliers". Locate upper, middle and lower ribs within vertical stabilizer; orient ribs with flanges down. Bend attach tangs as necessary to join ribs to leading edge and spar. Locate #30 holes through tangs; rivet into place, per parts manual and **FIGURE 014-06.** ***HINT:*** *Clamp an aluminum angle to the top of the vertical stabilizer, to assure ribs are parallel.*

FIGURE 014-06

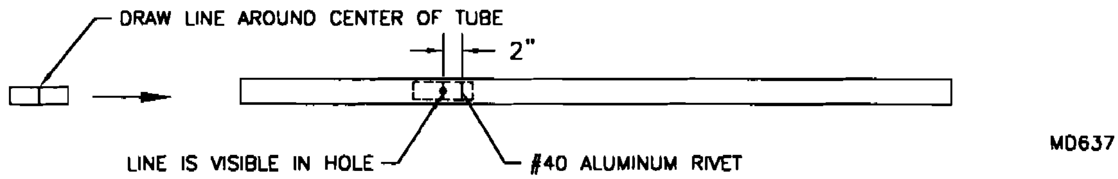


S-6S COYOTE II - HORIZONTAL STABILIZER AND ELEVATOR ASSEMBLY

8. Select all the horizontal stabilizer parts depicted on the parts page.

9. **IMPORTANT:** Install 6" doubler tubes. These will need to be installed at the tail cable hole approximately ⅔ outboard on the spar. Mark a line all the way around the center of the tube and slide it inside the spars until the line is visible. Drill a #40 hole 2" inboard of the cable attach hole and on the inside of the tubes. See **Figure 014-09**. Install doubler in the two leading edge tubes in the same manner. Rivet on the 3/16" nut plates to the hinge bracket locations on each horizontal stabilizer spar.

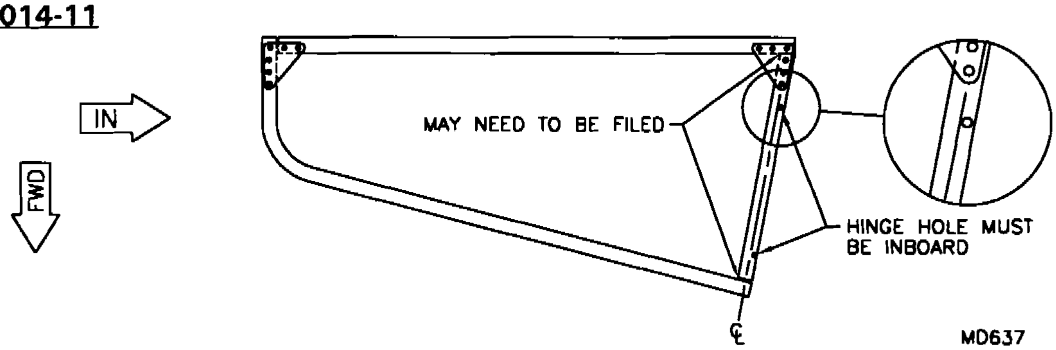
FIGURE 014-09



10. For the assembly of the horizontal stabilizer you will need a flat table top work surface or floor. There are three pre-drilled holes in each end of the horizontal spar. The tail cable attach hole indicates the outboard end. Pay careful attention to the parts drawing to select the proper gussets for each end of the spar. Drill #30 and cleco the 90° gusset to the top side of the outboard end of the spar. Cleco the 73° gusset to the top side of the inboard end of the spar. When attaching the gussets make sure they are oriented properly so that 3 holes are located in each tube.

11. Locate the two spreader tubes, the tubes have three gusset holes located on each end with two hinge attach holes inside of them. You will notice that the two hinge attach holes are located 20° off centerline of the gusset holes. This is done to allow the stabilizer enough room to clear the tailcone. The spreader tubes are symmetrical end for end so there isn't a specific left or right, however the tube must be oriented so the attach holes on the TOP of the stabilizer are inboard of the centerline of the gusset holes see **Figure 014-11**.Once you have determined the proper orientation of the spreader tubes, attach the aft end to the inboard gusset on the spar. **NOTE:** You may need to file the end of the spreader lightly in order to line up the holes. Do this procedure for left and right stabilizer before proceeding.

FIGURE 014-11



12. Locate the two leading edge tubes. Refer to the parts drawing for the correct gusset and cleco it in place on the inboard end of the leading edge. Lay this against the forward end of the spreader and determine the angle and how much the spreader tube needs to be cut to line up the pre-drilled gusset holes. Once the holes are lined up, cleco the leading edge in place. Make sure the leading edge is flush with (and touching) the outboard end of the spar. Transfer drill the three holes. **NOTE:** Since there are only three holes that are not pre-drilled it is critical that the stabilizer be laying on a flat surface when drilling. Make sure all gussets and tubes are deburred, then rivet each end with #30SSPR. After riveting flip the stabilizer over and install the gussets on the bottom side. The basic frame of the stabilizer is now complete.

13. Rivet the 3/16" nut plate to the bottom of side of the hinge attach holes on the spreader tubes. Refer to the parts drawing and select and install the hinge brackets.

14. The root rib can now be installed by lining up the pre-drilled holes on the center line of the spreader tube and notching out the rib to fit around the hinge brackets. See **Figure 014-14**. Once fit, rivet with #30 aluminum pop rivets. The root rib needs three angles riveted on the inside to stiffen it when the fabric is drawn tight. Refer to the parts drawing and select these angles. Separate the area between the forward and Aft gussets into fourths and attach these angles as shown in **Figure 014-14A.**

FIGURE 014-14

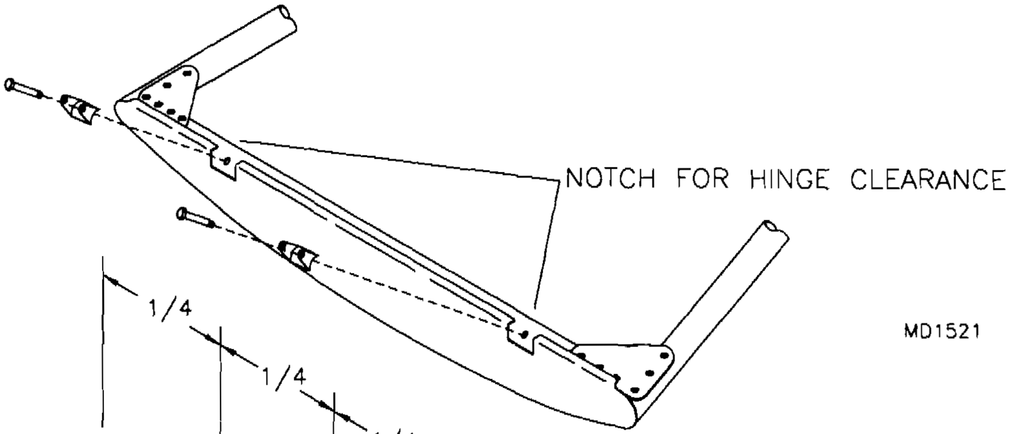
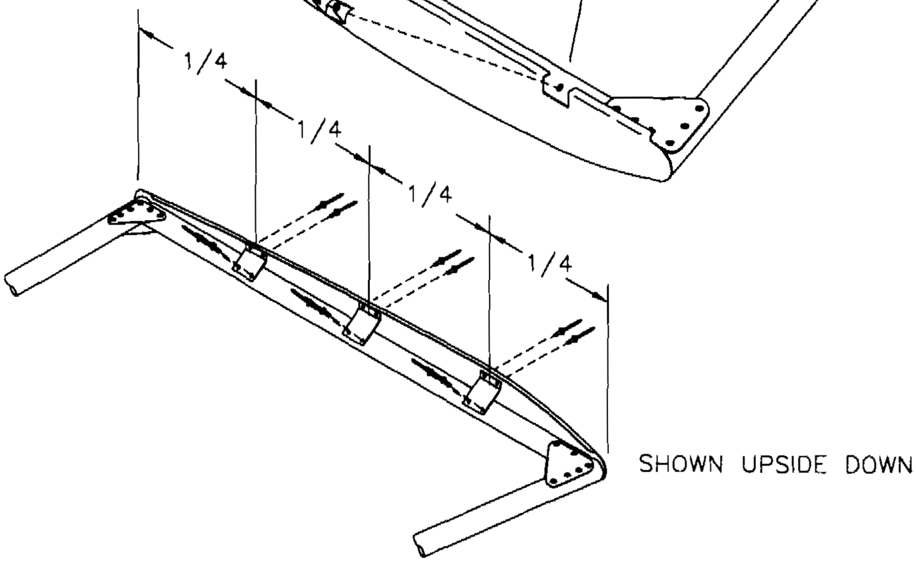
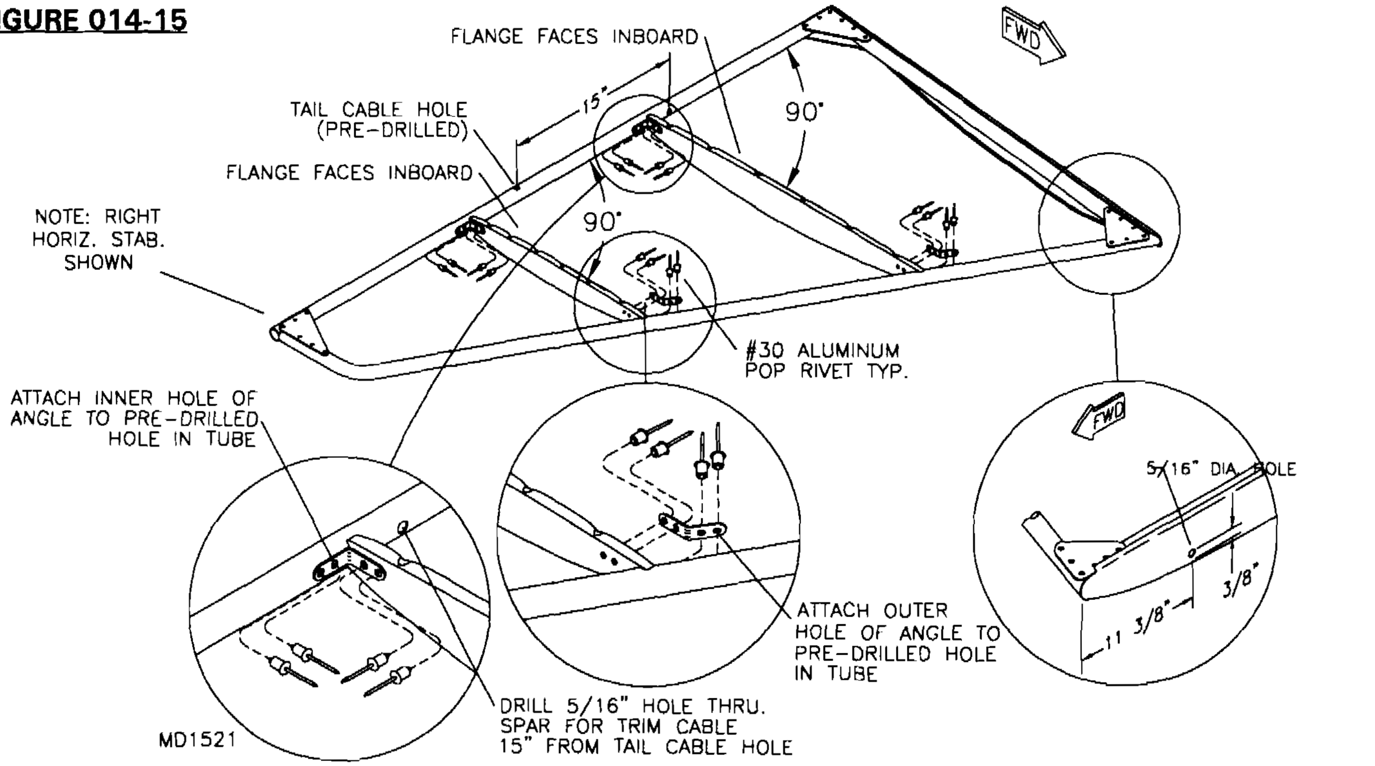


FIGURE 014-14A



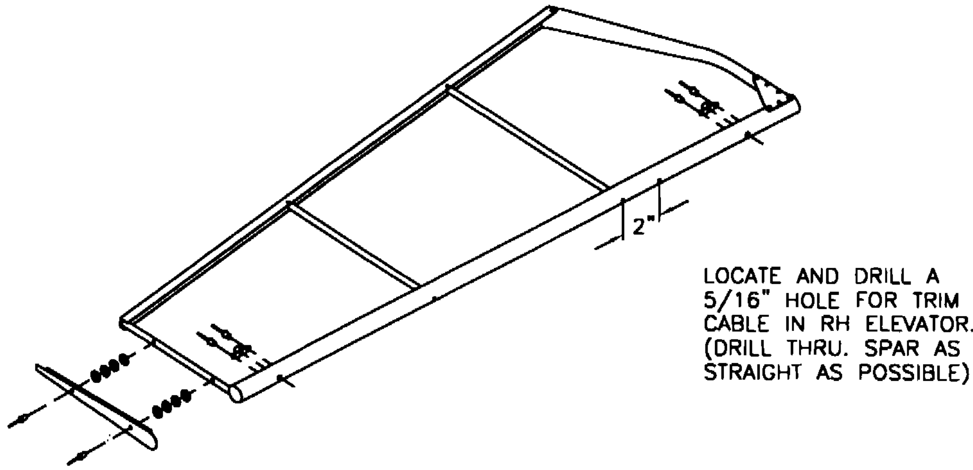
15. Attach the compression ribs using the tabs and pre-located holes in the tubes. These stamped .020 ribs are used to give the stabilizer compression strength and shape the inverted airfoil. Select the pre-bent tabs that are used to attach the ribs, pay careful attention to the orientation of these tabs in respect to the ribs. The two tabs in the leading edge are riveted inboard of the rib while the two tabs on the spar rivet outboard of the rib. There is a left and a right to each of the compression ribs and these should be marked. These flanges of the rib should face inboard with the airfoil inverted. Trial fit the ribs in place and file lightly if necessary. **NOTE:** The two tabs on the leading edge will need to be bent out in order to line up with the compression rib. Use **Figure 014-15** to locate ribs and rivet in place with #30 APR. See **Figure 014-15**.

FIGURE 014-15



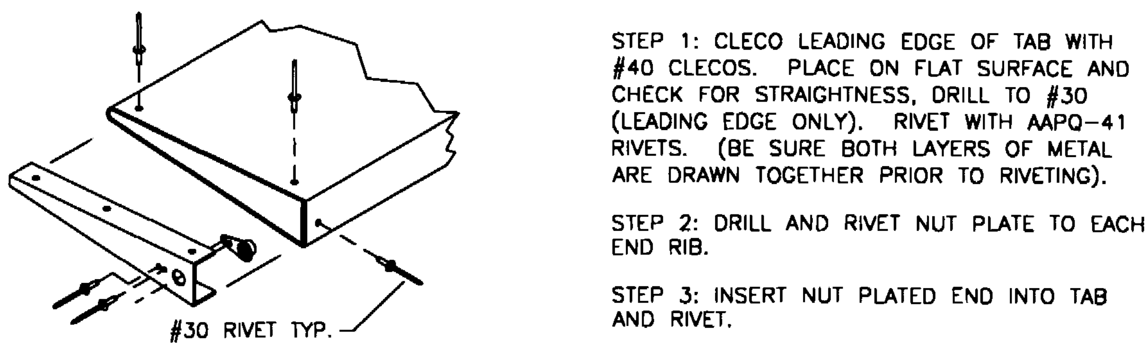
16. The elevator comes as a pre-assembled unit, ready for 3/16" nut plates, trim cable hole, and tip rib installation. Refer **FIGURE 014-16** for these locations and install. When installing the end rib, use small brass washers between the rib and the elevator end brace tube, this will keep the end rib from dipping in the middle.

FIGURE 014-16



17. Assemble the trim tab as per **FIGURE 014-17**.

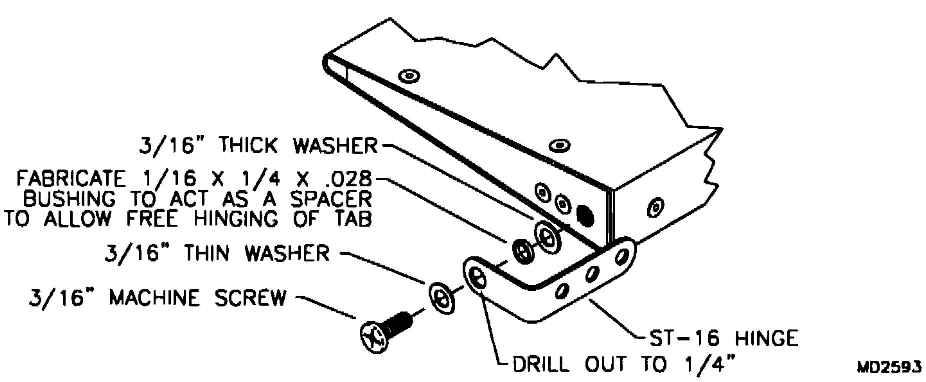
FIGURE 014-17



18. Cut (2) 1/16" x ¼" x .028 bushings from the ¼" aluminum tube stock provided. Use a tube cutter for the best results.

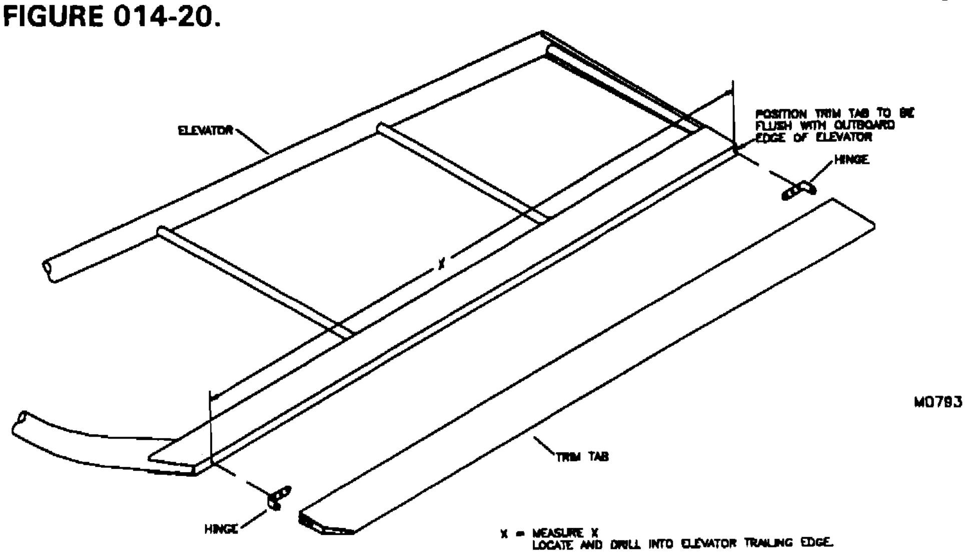
19. Temporarily assemble the hinges to the trim tab as per **FIGURE 014-19**.

FIGURE 014-19



20. With the hinges assembled to the trim tab measure the distance between the outer most holes on the hinge. Locate (2) holes centered on the trailing edge of the elevator this distance apart. Remove the hinges from the trim tab. Cleco the hinges to the elevator and transfer drill the remaining holes into the trailing edge. See **FIGURE 014-20**.

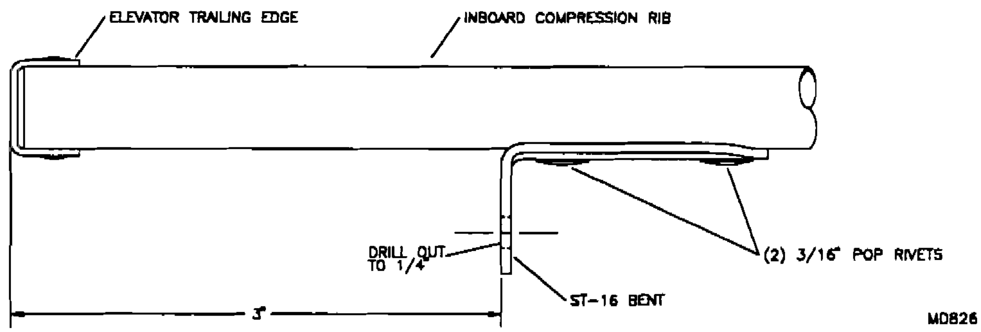
FIGURE 014-20



21. Rivet the hinges to the elevator with 1 rivet per hinge. Drill out the rivet to remove the hinge prior to covering. Install the trim tab check for free movement.

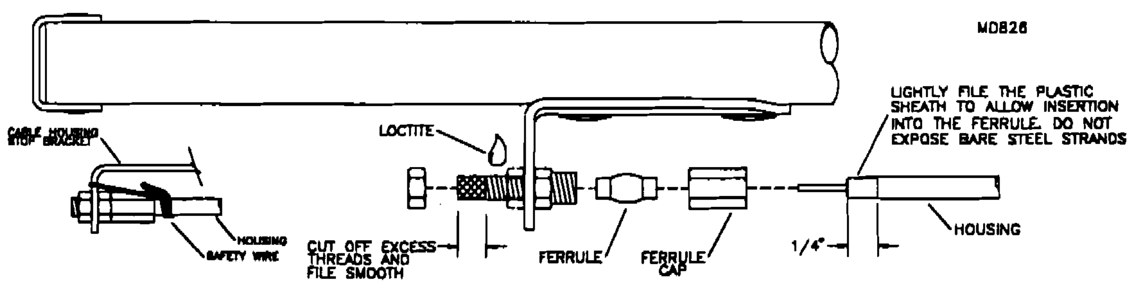
22. Drill out the single hole in the short leg of the ST-16BENT to 1/4" and rivet to the bottom of the RH elevator's inboard compression rib at 3" from the trailing edge. See **FIGURE 014-22**.

FIGURE 014-22



23. The fitting will be installed during final assembly as per **FIGURE 014-23**. Housing with push wire and trim tab horn will also be installed after painting. **Note:** Use safety wire to secure the cable housing to the cable housing stop bracket as shown in **FIGURE 014-23**. Paint tab and horn as seperate parts.

FIGURE 014-23



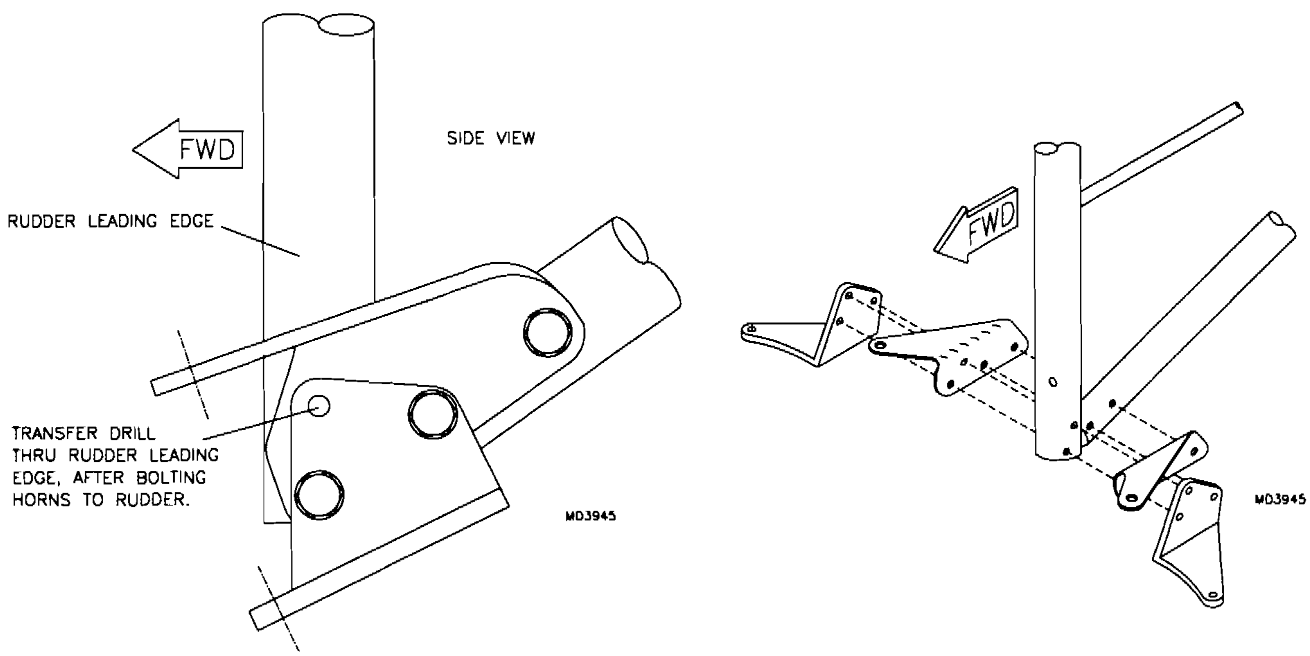
S-6S RUDDER ASSEMBLY

The rudder on the S-6S is cable operated from the rudder pedals directly to the rudder. The rudder system does not need the turnbuckles since the nose steering wheel rods adjust the tension of the rudder cables. On taildragger gear, bungees return the pedals. The stock system is designed for the average person's leg length. If you feel the seat adjustment is not enough to allow you to reach the pedals, the pedals can be tilted back. The tangs on the ends of the cables have extra holes to accommodate this feature. If greater amounts of adjustment are required consider making a custom seat cushion.

24. The rudder for the S-6S comes as a preassembled unit that needs only to have the nut plates for hinge attachment installed and the rudder horns pre-drilled. Refer to the parts drawing for the two nut plates to attach the hinges, and rivet these on with #40 APR's. When installing the end rib, use small brass washers between the rib and the rudder end brace tube, this will keep end rib from dipping in the middle.

25. The bottom most hole in the rudder spar is the forward attach hole for the rudder horns. Refer to the parts drawing to ensure proper orientation of the horns and the necessary hardware to bolt the forward most hole of the horns in place. For a conventional gear aircraft install the additional steer horn. As per **Figure 014-25.**

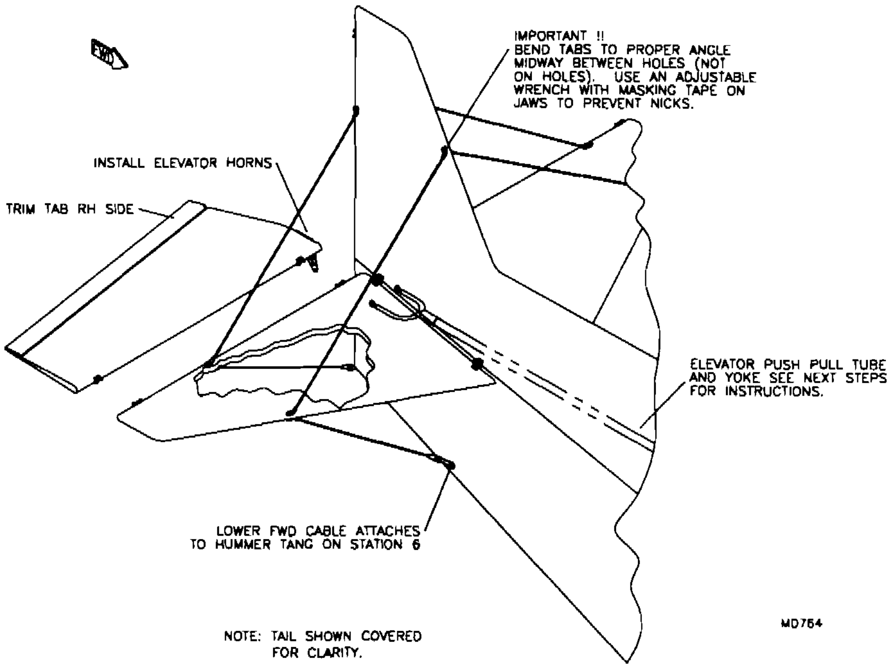
FIGURE 014-25



26. Align the aft two holes in the horns on centerline of the 1" bottom tube at the rudder frame, use the horn as a guide to drill these out #11. Place the plastic washers as spacers underneath the horns and bolt. The rudder is ready for trial setup. **NOTE:** The 1 ⅜" rudder spar and the 1" rudder bottom frame tubes are connected by a small stainless steel tang that is factory riveted inside the spar. This is used to hold these tubes in place when covering. The rudder horns are then re-attached after covering.

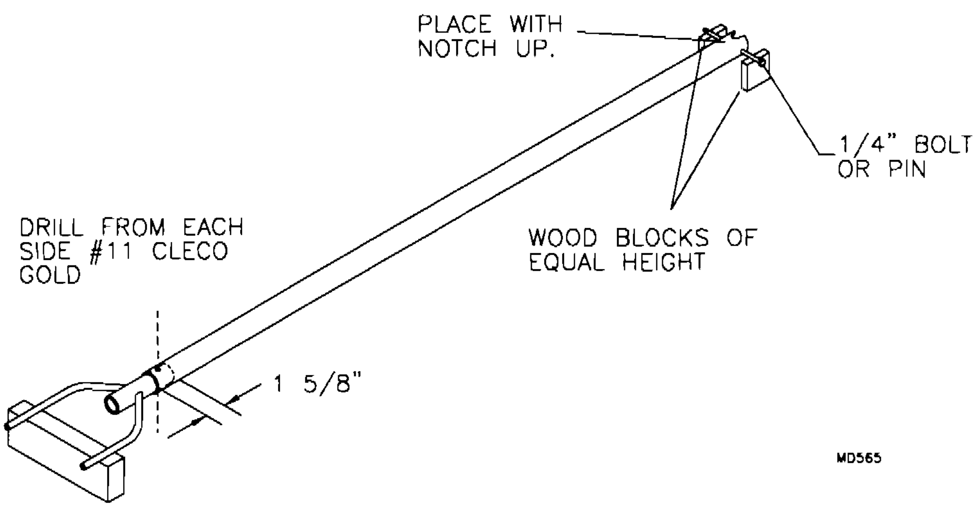
27. Assemble the tail to the fuselage. Use the parts drawing to select the hardware and cables. The cables should be adjusted so that the horizontal stabilizer is level with the wings. The tension should be enough so when you strum the cables they have a nice low tone. Final tension and alignment will be done during final assembly. Do not over tighten or the stabilizer could be distorted. See **Figure 014-27.**

FIGURE 014-27



28. Drill the #11 hole on the notched end of the elevator push pull tube out to ¼". Slip the elevator yoke into the un-drilled end of the 1 ¼" push pull tube . Insert it at least 1 ⅝" onto the end of the yoke. Lay the assembly on a flat bench or floor. Insert a long ¼" bolt or pin into the 1/4" hole in the opposite end. Support each side of the ¼" bolt with objects of equal height. Lay a scrap of lumber across the yoke. Re-check for flush at the yoke tube and drill through the yoke using the tube as a guide. Drill one side and cleco, flip over the assembly and drill the other side. This procedure will assure the yoke is installed 90 degrees to the ¼" bolt hole at the opposite end. See **Figure 014-28.** Bolt with an AN3-14A. **NOTE:** Elevator yoke exit location will be called out in the covering section.

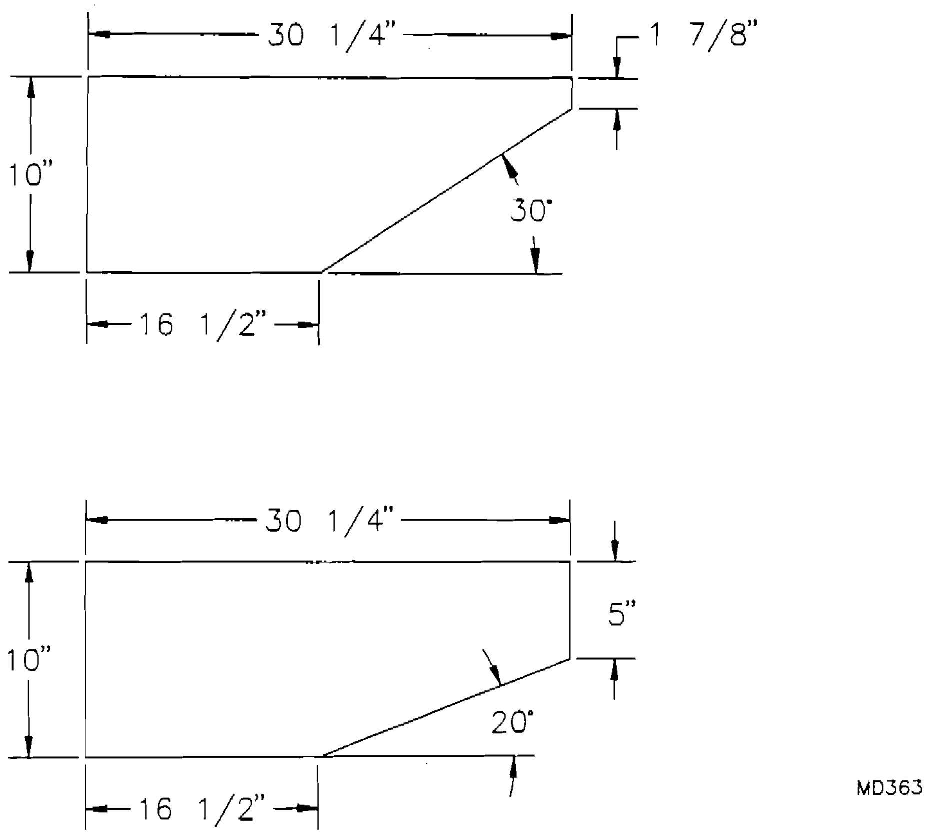
FIGURE 014-28



29. Slip the yoke/push pull tube assembly into the tailcone from either RH or L side of the S-3. Once the yoke is past the S-3 bulkhead turn it level with the bolt head up and slip it out of the tailcone. Thread ¼" plain nuts onto the ¼" rod ends. Then thread the ¼" rod ends into the yoke. Bolt the horns to the outside of the yoke and position in full down elevator. Check to see if the control stick assembly is against the down stop and the elevator moves up and down freely.

30. Cut out the (2) templates from cardboard. See **Figure 014-30.**

FIGURE 014-30



31. Hold the 20 degree template under the elevator flat against the horizontal stabilizer (be sure the control stick is flat against the stop). Adjust the rod ends until the template fits with both horizontal stabilizer and elevator flat against the template. Check for evenness of the elevators. They should be flat across each other and not one lower of higher than the other.

32. The 3/4" X .058 X 1 1/2" aluminum tube that was slipped over the 5/8" push pull tube during step 12 of the control stick assembly will now be used as an up elevator stop. Using the 30 degree template hold the elevator in position with the safety belts. Slide the stop against the swivel tube (built into the S-3) and drill and rivet with the rivet positioned top side. **IMPORTANT:** Please use a #30 stainless steel rivet. Check the system for proper movement. Be sure the **lock rings** are through the 1/4" bolt attaching the horns to the yoke. (Check this prior to each flight).

S-6S COYOTE II AILERON AND FLAP ASSEMBLY

FLAP SYSTEM ASSEMBLY

1. Fabricate the following bushings to the appropriate lengths:

Qty.	Length	Tube Size
1	7/8"	1/4" X .028
2	3/8"	3/8" X .058
2	9/16"	1/4" X .028

2. Press the plastic caps into each end of the 3/4" flap trip release tube.

3. Screw the rod end onto one end of the 8ft. teleflex cable. Using the plastic shim, teleflex retainer and 9/16" long bushings, bolt this end of the teleflex to the flap lever side plates inside right hand side as per the parts drawing. Note that the S2-SAB bolts to the lower hole. Bolt the 7/8" bushing into the side plates top hole.

4. Bolt the flap lever between the two side plates with the welded tab facing down. Tighten the flap lever pivot bolt so it is snug, but still allows the lever to pivot freely. Slip the spring into the flap lever tube and install the flap trip release tube.

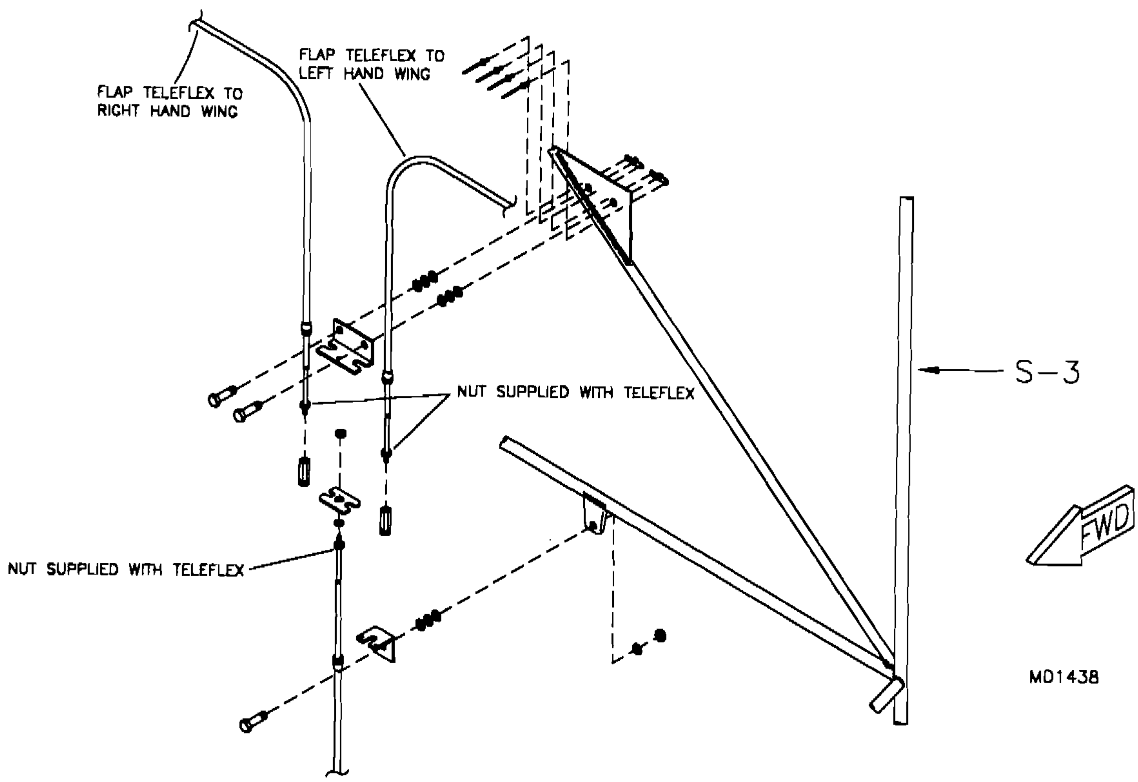
5. Depress and rotate the flap trip release tube until the 1/4" hole is lined up with the slot. Install the bolt and 3/8" diameter bushings into the flap lever and trip release tube. The bushings act as rollers and will ride against the flap lever sides. Tighten the bolt to the point the bushings still roll. Apply a light grease to the rollers for the best action. Test operate the lever by pulling up on the lever, then depressing the flap release tube return.

6. Bolt the teleflex rod end to the right hand side of the welded tab on the flap lever. The exact adjustment of the rod end on the teleflex will be determined when adjusting the flaps.

7. Install the flap lever assembly into the cockpit by slipping the forward part of the assembly over the attach fitting located between the seats on the airframe. Refer to the parts drawing. Using the hole in the S2-SAB as a guide, mark the hole location onto the steel mount tube. Pivot the flap lever assembly up and drill the #11 hole. Pivot the flap lever assembly down and bolt the S2-SAB to the mount tube.

8. Bolt the lower teleflex retainer to the tab located on the left hand side of the station 3 mid cross tube. Refer to the parts drawing and to **FIGURE 015-08**. Route the teleflex from the flap lever to the lower retainer. It must loop under the baggage compartment and rest on the bottom cross tubes and diagonals aft of station 3 in the tailcone and should not interfere with any other control systems such as the rudder and aileron cables. Install the teleflex into the lower retainer. Safety wire or make a brass wire clip to hold the teleflex in the retainer.

FIGURE 015-08



9. Slip the flap cover over the handle to cover up the roller ratchet section of the lever. Use the conveniently located pockets to store items such as an intercom box or a flashlight.

10. Install the aft dual teleflex retainer onto the flap teleflex and secure with the **TENSILE** nut. The jam nut is supplied on the teleflex. It is important that this jam nut be in place prior to installing the dual teleflex retainer. Final adjustments will be made to the retainer during flap rigging.

11. Position the forward dual teleflex retainer vertically in line above the aft dual teleflex retainer and clamp to the mount tab located on the station 3 upper diagonal. See **FIGURE 015-08**. The positioning of the retainer must also allow the installation of the nut plates. Using the retainer as a guide, mark the mount hole locations onto the tab. Remove the retainer and drill the mount holes in the tab to #11. Install the nut plates and bolt the retainer in place. Note that the retainer will have to be removed prior to the installation of the interior.

12. **NOTE:** The flap teleflexes should exit the wing as far AFT as possible. This allows the cables to stay attached when folding the wings. After the wings are installed, slip each flap teleflex into the forward retainer. Install the flap nuts and insert them into the aft retainer. Secure the teleflexes into the retainers with nylon ties or safety wire.

13. Rig the flaps by adjusting the rod ends and tensile nuts. Both flaps should be even when viewed from the front or aft center. To properly rig the flaps, all three teleflex cables may require adjustment. It may also be required to trim off the ends of the teleflex cables where they attach to the horns. During flight testing, if the aircraft tends to roll to the right or left, flap adjustment may be required. Refer to the jury strut section for further rigging instructions.

STD. AND 116 AILERON & FLAP FRAME ASSEMBLY

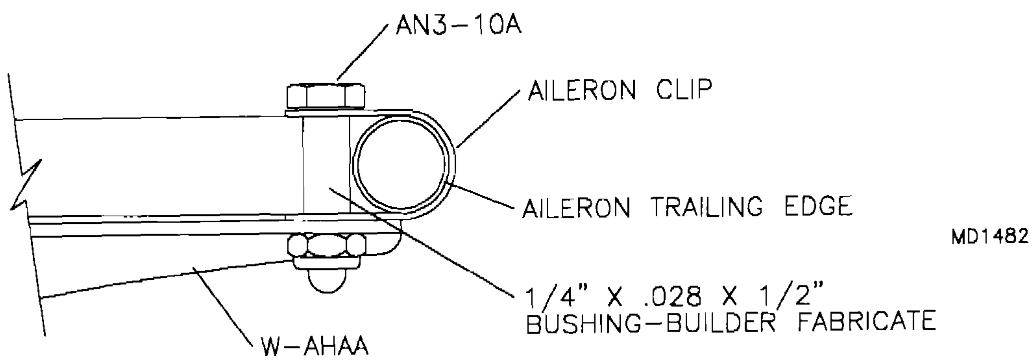
PRE-COVERING ASSEMBLY

14. All hinge and control horn hole locations are predrilled in the leading edge spar of each flap and aileron frame. Prior to covering the ailerons and flaps, drill all holes to #11. **NOTE:** Drill the flap root hinge hole to 1/4". Install the hinge nut plates to the interior side of the leading edge spar as shown in the parts drawing. Retain the trailing edge spar into the compression tubes with masking tape wrapped around the trailing edge spar and onto the compression tube. The flaps and ailerons are now ready to cover. Refer to the covering section. After covering, refer to this section for final assembly and installation of the flaps and ailerons.

AILERON & FLAP FINAL ASSEMBLY AND INSTALLATION

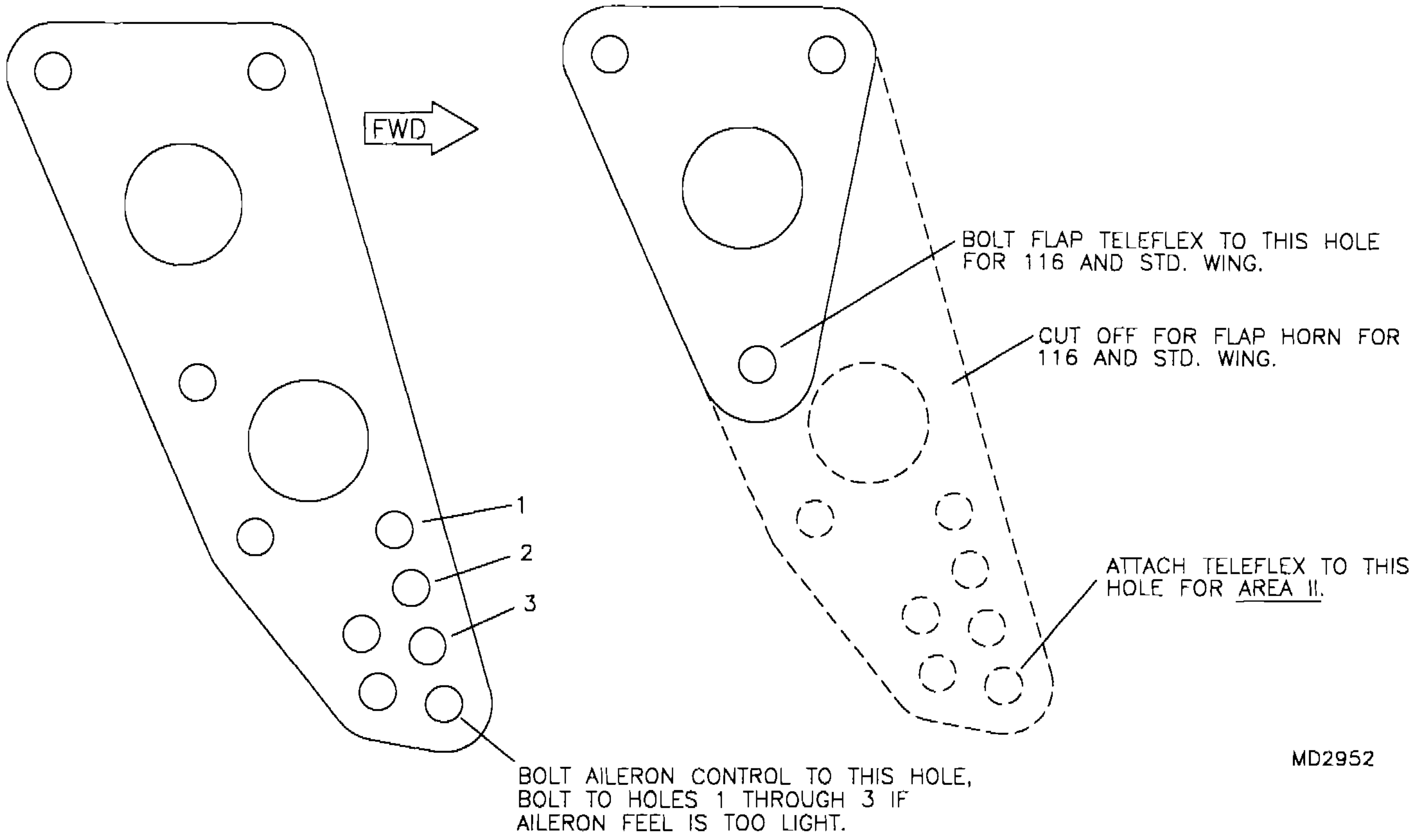
15. With a sharp razor blade, cut out all hinge and control horn holes. Assemble the control horn attach angles to the ailerons and flaps. The vertical flange of each angle should be toward the tip end. Fabricate the aluminum bushings to the dimensions described on the parts page. Position the aileron clip and bushing on the trailing edge spar 90 degrees to the leading edge spar and in line with the vertical forward attach hole. See **FIGURE 015-015**. **NOTE:** For 116 flaps and ailerons position the attach angles parallel to the slipstream.

FIGURE 015-015



16. Modify the **FLAP** unihorn as shown in **FIGURE 015-016**. Assemble the unihorns to the flap horn attach angle. Assemble the unmodified unihorns to the aileron attach angles. Note the correct orientation and positioning of the unihorns. Refer to the parts drawing.

FIGURE 015-016



17. Install the plastic end caps into the tip end of the aileron and root end of the flap leading edge spar as shown in the parts drawing. It may be necessary to trim or profile the caps in order to clear obstacles inside the spar. The end caps can be secured with a single #40 rivet.

18. Install the hinges onto the wings, flaps and ailerons and attach the flaps and ailerons to the wings using the hardware called out in the parts drawing. **NOTE:** Drill the hinge mounting holes to #11. Drill the **flap** root hinge mounting hole to 1/4". The flaps and ailerons may be shifted to either side of the hinges to achieve the best spacing. Some of the hinges may not line up. In this case shimming with washers is required. Place a small drop of light oil on each hinge. Ailerons and flaps must hinge freely, do not over tighten the hinge bolts. Prior to connecting controls, test the aileron and flap by holding the surface up by the trailing edge and letting go. The aileron and flap should swing freely. Refer to the final assembly section for gap seal installation.

19. Refer to the covering section for the aileron and flap control exit dimensions. Refer to the wing section for connecting the push pull tube and teleflex. Refer to the trial assembly section for rigging instructions.

S-6S STANDARD WING ASSEMBLY

LEADING EDGE SPAR ASSEMBLY

NOTE: Assemble both spars the same but make a LH and RH. This will be true for the aft spars as well. Support the wings on sawhorses, two per wing.

1. Select the necessary parts as shown in the parts drawing.

2. The leading edge spar comes with all critical holes pilot drilled. The final hole sizes are called out during assembly. **NOTE:** The front side of the spar has four holes for the tip bow rivets. The 5th hole, in the left wing spar, goes through the spar and serves to hold the pitot tube.

3. Rivet the S2-SAB's to the spar at 5 5/8" and 140 3/8" using a single 3/16" stainless steel rivet. ***NOTE:*** *The outboard compression tube will bolt to this bracket and another S2-SAB rivets to the aft spar's forward side in the same location after the tip extension is installed.* See parts drawing.

4. Bolt the long wing channel to the hole located 55" outboard of the root. Position the channel so the unbolted end points to the root. Line the channel parallel with the spar and then drill and rivet with a 3/16" stainless steel pop rivet through the remaining hole. Only drill through one side of the spar. ***HINT:*** *Lay a straight 1" tube between the S2-SAB and channel to aid in alignment.*

5. The three holes in a row are for attaching the lift strut attach plates. For best accuracy, lay the strut attach plate against the spar holes and use it as a template. Drill through 1/4" and bolt the plate to the spar, then drill the other two holes out to 1/4". Remove the strut plate and drill existing 1/4" holes out to 3/8" in the spar, not the plates! ***NOTE:*** *To avoid drilling oversize, drill from each side of the spar.* Debur and install the 3/8" x 3" bushings, 1/4" bolts, strut attach plate, and wing channel as shown in the parts catalog.

TRAILING EDGE SPAR ASSEMBLY

PLEASE NOTE: SPARS HAVE A FRONT & BACK

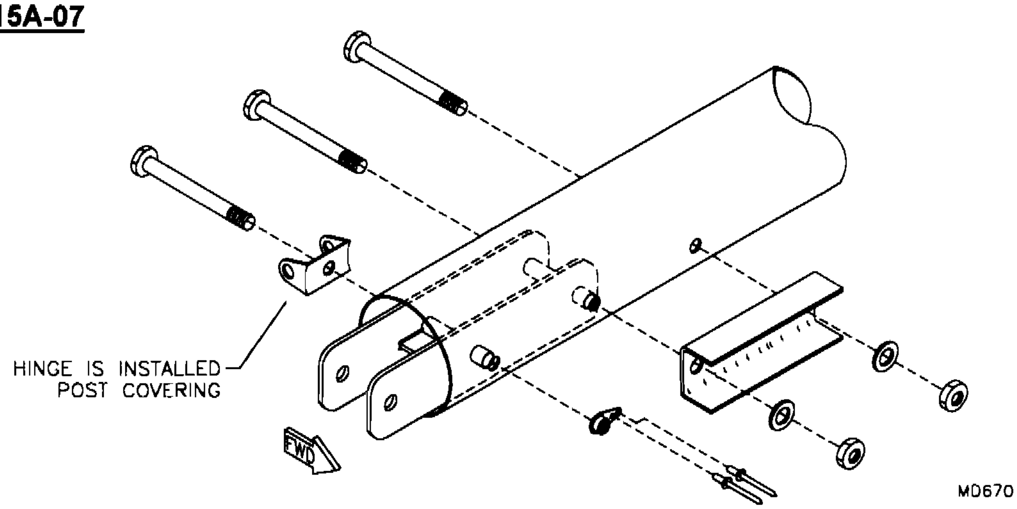
6. Bolt a long wing channel to the #11 hole drilled through the spar 6 3/4" from the root end. The unbolted end should point inboard. Line up the channel parallel and drill and rivet with one (1) 3/16" stainless steel rivet.

7. Collect the parts shown in the universal hinge drawing. Make and insert the bushings into the bushing fittings. Press the bushings into the ends of the bushings on the spar fitting. If the bushings do not press in, glue them in using a dab of J & B Weld. Test fit the fitting into the end of the spar. It most likely will need to be ground to contour the spar's inside diameter. Assemble the hinge into the trailing edge spar's inboard end. Use the first and second bolts at the spar's root to attach the fitting. Rivet a 3/16" single-ear nut plate to the front side of the rear spar for the first inboard bolt. This bolt is used as a flap hinge point. **NOTE:** The nut plate is required due to wing covering limiting access for nut installation. See **Figure 015A-07.**

8. Bolt a long wing channel to the trailing edge spar at the hole 53" outboard of the root on the same side as the inboard channel. Position the unbolted end to the **TIP** side. Line up the channel parallel and drill and rivet with 3/16" stainless steel pop rivets.

9. Drill the three holes in a row following the same procedure used for the leading edge spar.

FIGURE 015A-07



10. From the parts drawing, determine the location of the aileron and flap hinge bolts and rivet on the front forward inboard side of the spar a 3/16" nut plate. Position these nut plates parallel with the spars. Also, rivet two (2) nut plates to each trailing edge spar tip on the side with the 1 3/8" hole.

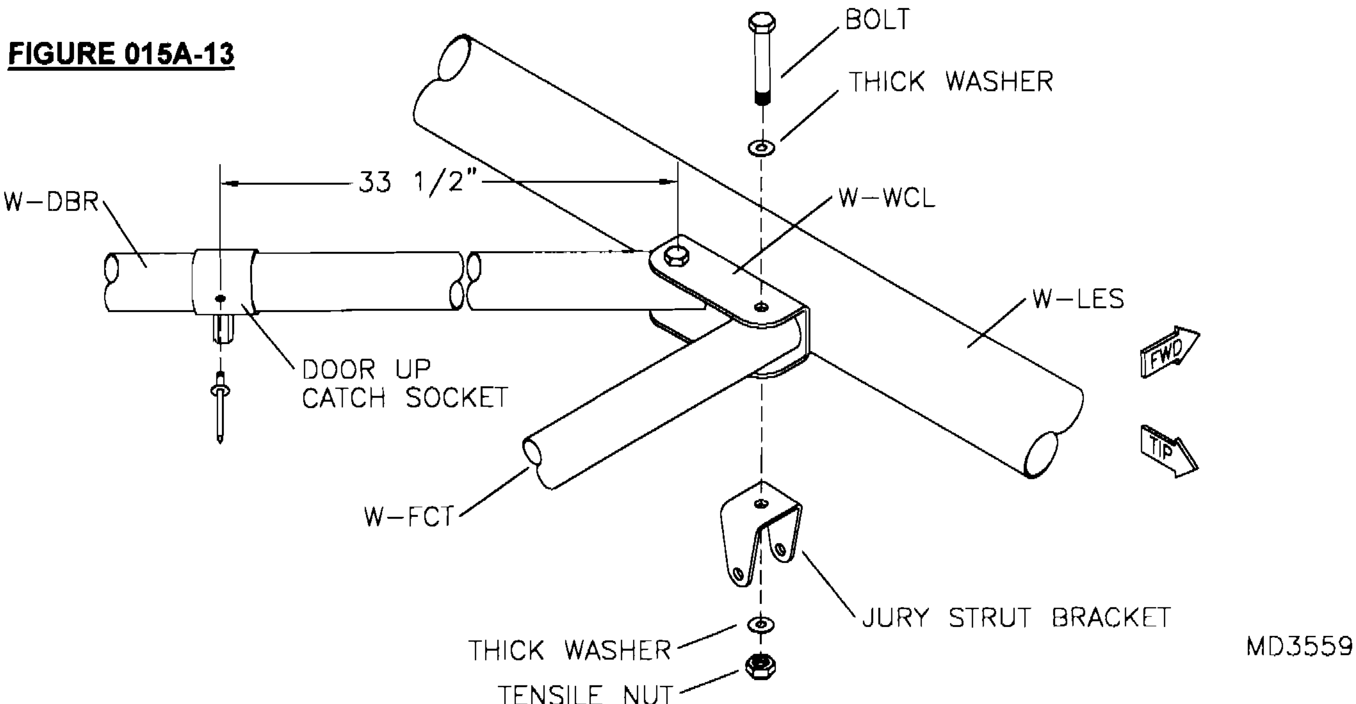
11. Slip the trailing edge spar tip into the spar. **DO NOT RIVET.** Assembly of the wing tip bow is required before riveting the tip.

INTERNAL BRACING TUBE ASSEMBLY

12. Refer to the Wing Internal Bracing Tubes and Control Stick sections. Select the parts for assembly.

13. Slide the door upcatch onto the root drag brace and install the drag braces. Slide the compression tube doubler onto the Middle Compression Tube and install all compression tubes. Note that the flap compression tube is positioned with the teleflex retainer mount hole toward the trailing edge and that the jury strut bracket attaches to the leading edge mount bolt. **IMPORTANT:** Double check the position of the jury strut bracket before covering the wing! Refer to the parts drawing. Position and rivet the door upcatch in place as shown in **FIGURE 015A-13**.

FIGURE 015A-13



14. Install the Jury Strut Bracket to the Flap Compression Tube as shown in the parts drawing. ***IMPORTANT:*** *Note the position and orientation of the bracket.* Double check the position of the jury strut bracket before covering the wing!

15. Locate Aileron Push Pull Tube Guide on Flap Compression Tube as per **Figure 015A-15**. Install the flap teleflex retainer on the W-FCT tube to the inside. Install the 3/16" nut plate, for the Aft Jury Strut, to the outboard side. See **Figure 015A-15A**.

FIGURE 015A-15

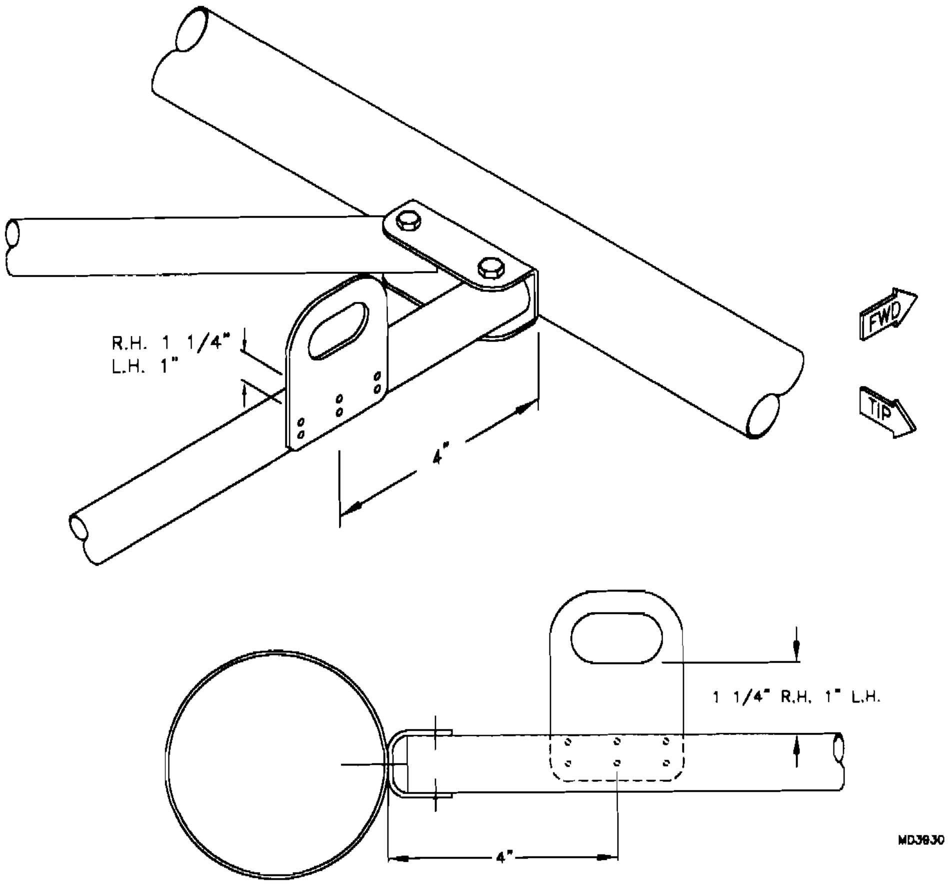
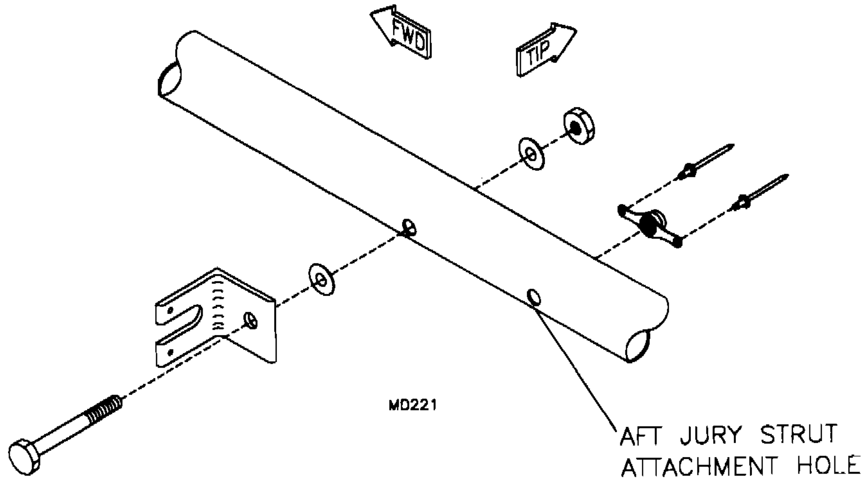
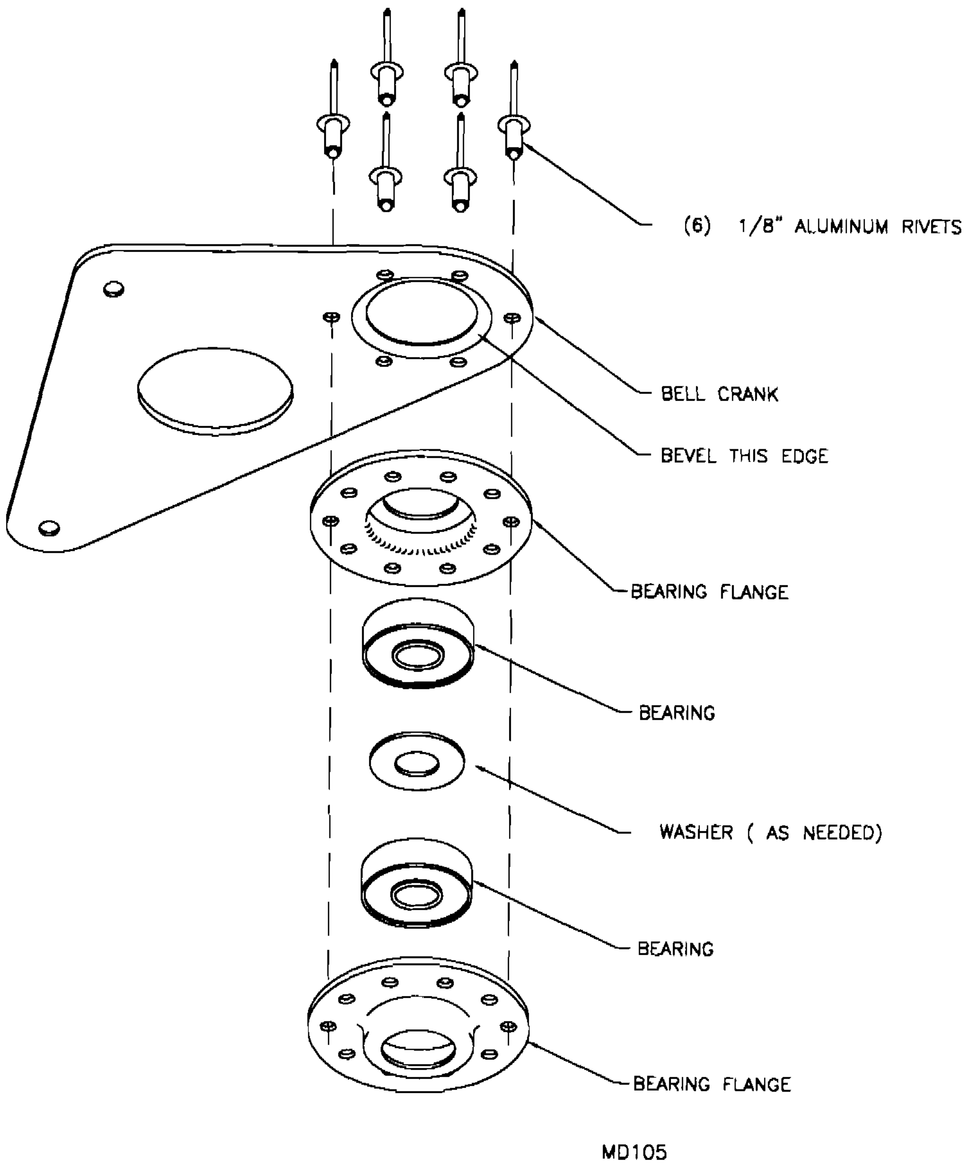


FIGURE 015A-15A



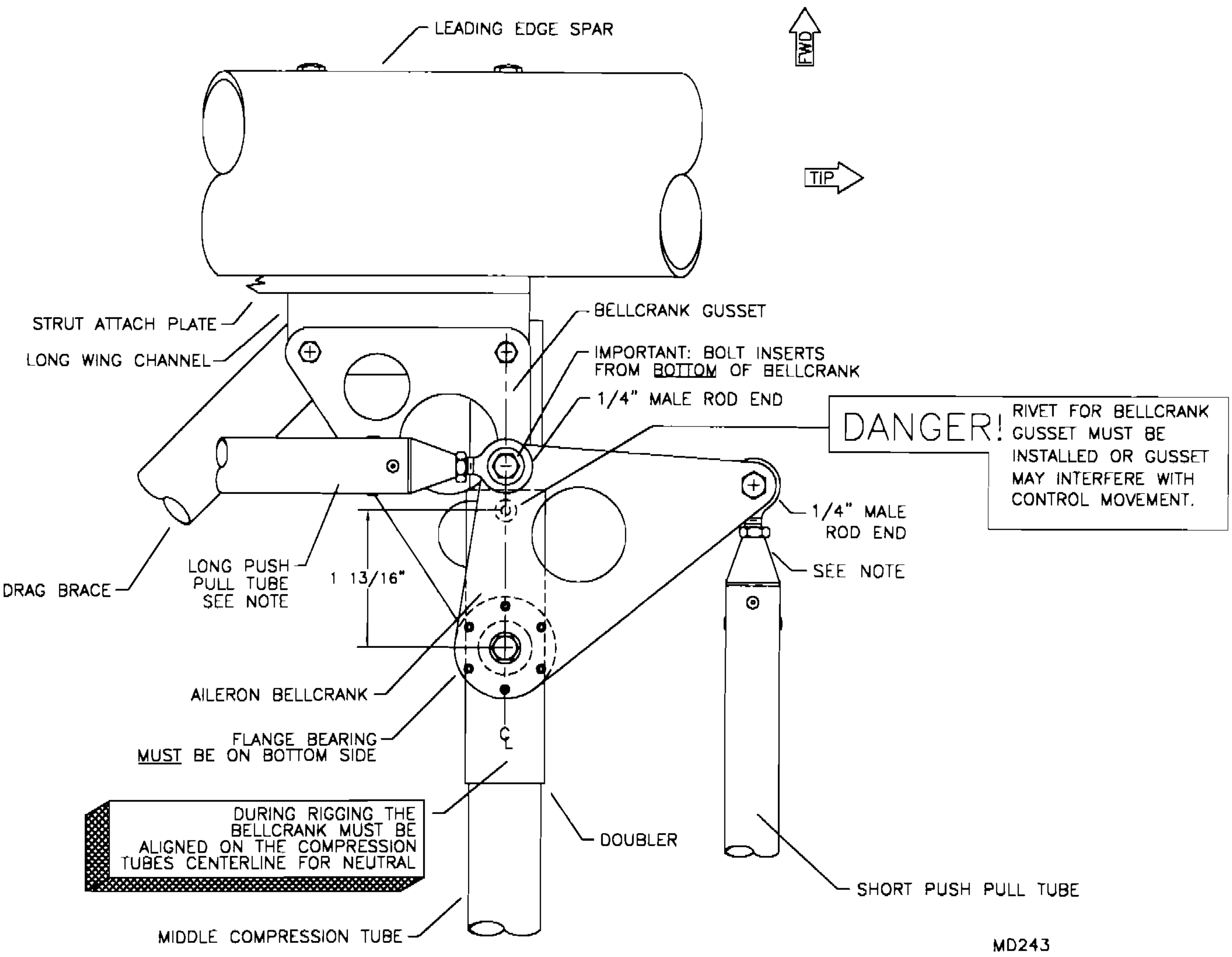
16. Drill out the 3/4" hole on the bellcrank to 7/8". It will be necessary to bevel the hole's inside edge to allow the bearing to fit flat against the bellcrank. Place the flange bearing in the bellcrank hole. Drill and rivet **every other hole** in the flange bearing for **a total of six (6) holes** (see control stick). Pay close attention to which side of the bellcrank the bearing rivets to and make one for the left and one for the right. See **Figure 015A-16**. Install the aileron bellcranks as shown in **Figure 015A-16A**. The bellcrank gusset bolts to the channel bracket's two bolts, the other hole is located over the compression tube. Starting from the bottom, drill out to 1/4" through the compression tube, doubler and gusset. From this 1/4" hole drill a #30 hole 1 13/16" FWD towards the channel bracket and rivet the gusset to the tube and doubler using a 1/8" Stainless Rivet. ***IMPORTANT:*** *Install the bellcrank gussets with the small flange pointing* ***DOWN.*** Install the aileron bellcrank with the bearing on the **UNDERSIDE** of the bellcrank. The longer arm of the bellcrank should be the wingtip side of the compression tube for attachment to the short aileron push pull tube.

FIGURE 015A-16



ATTACH FLANGE BEARING WITH
(6) 1/8" ALUMINUM RIVETS.
MAKE A LEFT AND RIGHT BELLCRANK.

FIGURE 015A-16A



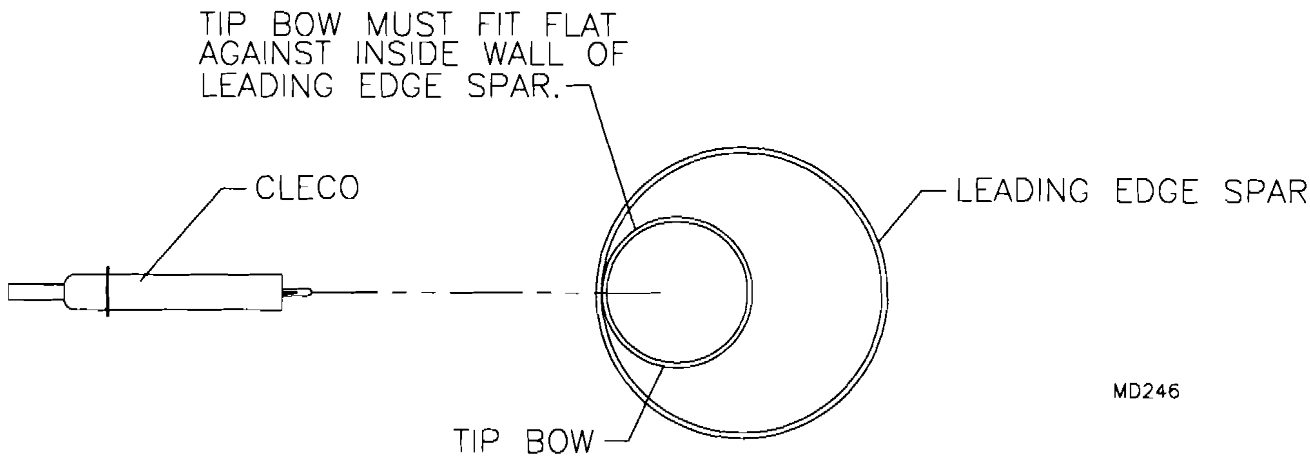
IMPORTANT: SMALL FLANGE ON GUSSET MUST POINT DOWN

CAUTION: ROD ENDS MUST BE TURNED IN AT LEAST 10 TURNS.

NOTE: STOP NUT OR BOTTOM OUT PUSH PULL TUBE ON BELLCRANK DURING FINAL ASSEMBLY. THE ROD END IS LEFT ATTACHED TO THE BELLCRANK . AFTER COVERING THE WING, THE AILERON PUSH PULL TUBE IS INSERTED THROUGH THE EXIT HOLE IN THE WING AND SCREWED INTO THE ROD END.

17. Insert the tip bow's drilled end into the leading edge spar so the tip bow's hole lines up with the fourth inboard hole and then cleco in place. **IMPORTANT:** The tip bow must be flat against the spar on the inside. See **Figure 015A-17.**

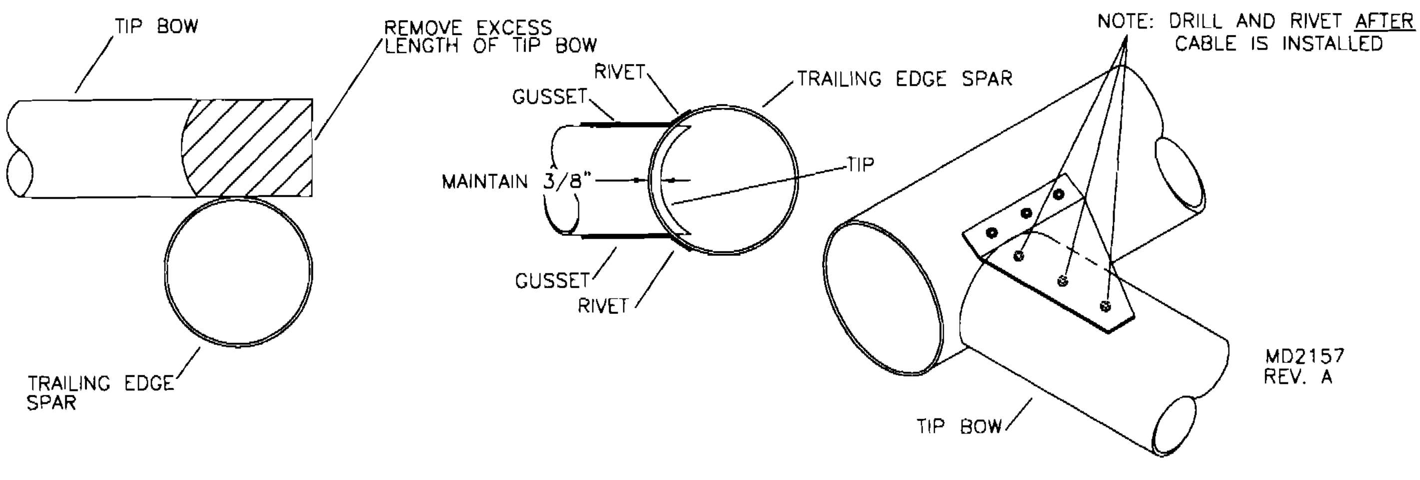
FIGURE 015A-17



18. Line up the bow parallel with the spar and drill through the remaining three (3) holes and cleco.

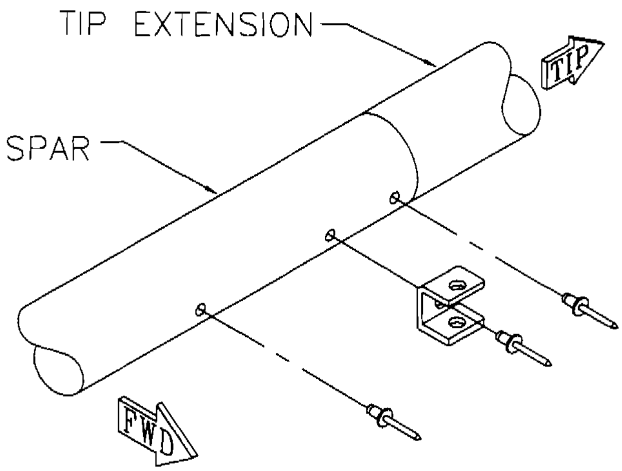
19. File and fit the tip bow's other end into the trailing edge spar's extension. See **Figure 015A-19**. The tip should enter the rear spar approximately 90 degrees. About 1 ½" of it will have to be trimmed off the fitted end of the tip. Rivet the gussets with three (3) ⅛" stainless steel rivets in the narrow flange through the spar and wide flange through the tip tube. Refer to **Figure 015A-19**.

FIGURE 015A-19



20. Once the tip bow is secure, rivet the tip extension to the spar with (2) 3/16" stainless steel rivets. Locate them on the **FRONT** side of the spar. **CAUTION:** These rivets must be stainless steel. **DO NOT** use aluminum rivets. Install rivets as shown in **Figure 015A-20**. **NOTE:** After the extension is riveted, drill through the doubler and rivet the S2-SAB's on the trailing edge spar's **FRONT** side using the hole located 3 ¾" inboard of the TES splice.

FIGURE 015A-20



21. Install W-WC-50 and W-WC-58 cables used to stabilize the wing tip's last two bays. The W-WC-50 is installed by bolting the shorter cable between the AFT spar's S2-SAB at the AFT strut plate, and the S2-SAB bracket at the outboard inner compression tube. The W-WC-58 cable is also bolted to the S2-SAB bracket on the outboard inner compression tube and to the wing-tip corner gusset. See **Figure 015A-21.** First, bolt the thimble end of the **SHORT** cable to the S2-SAB at the AFT strut plate using an AN3-16A bolt, plastic washer, ¼" X .028 X 3/16" bushing, and a 3/16" shear nut. Fabricate the bushings by drilling the raw stock out to #11 and then cutting to length. See **Figure 015A-21A.** Now insert the AN3-16A bolt up through the other S2-SAB and the compression tube (threads up) and place the adjustable tang of the short cable on the bolt. Place the tang of the **LONG** cable on the bolt using the hole nearest the tang end. Pull the cable taunt and mark the hole location on top of the wing tip corner gusset and drill a 3/16" hole. Remove the nut retaining the tang ends of the cables and slip off the tangs. Next, bolt the thimble end of the long cable to the **UNDERSIDE** of the wing tip corner gusset using the AN3-4A bolt, a plastic washer, a ¼" X .028 X 3/16" bushing, and a 3/16" shear nut. See **Figure 015A-21B**. Place the tangs of both cables back on the bolt, using the hole in the adjustable tang that makes the cable tight without distorting the tip bow or bending the rear spar. Sight down the spar to check for distortion. Place the washer and shear nut back on the bolt and secure.

FIGURE 015A-21

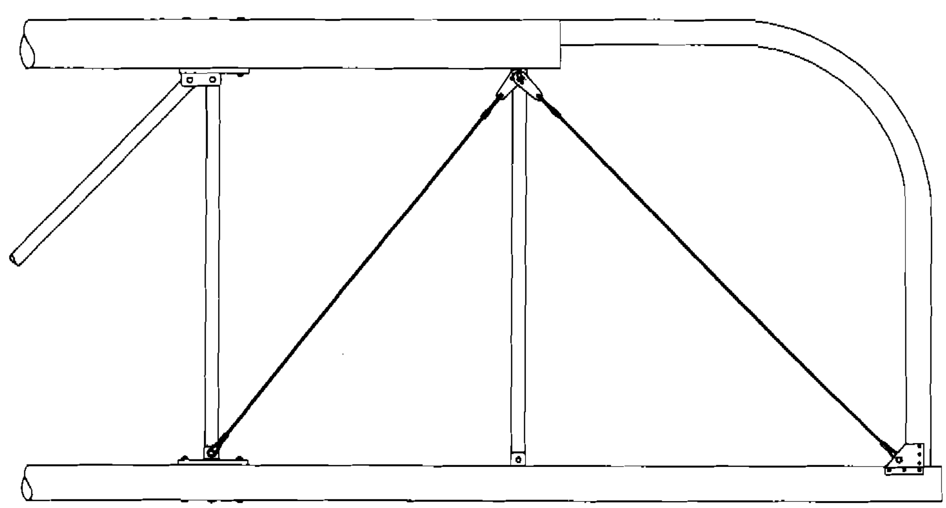
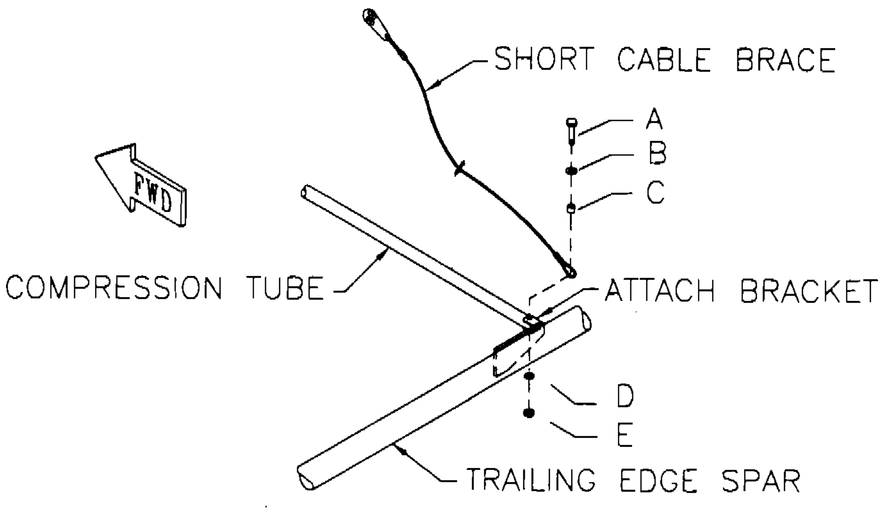


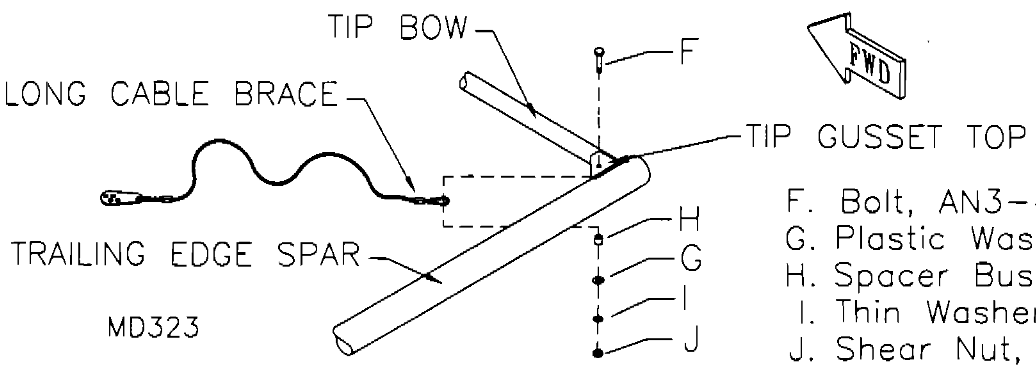
FIGURE 015A-21A



A. Bolt, AN3-16A
B. Plastic Washer, PW-3
C. Spacer Bushing, SB-1/4x028
D. Thick Washer, AN960-10
E. Shear Nut, AN364-1032A

MD323

FIGURE 015A-21B

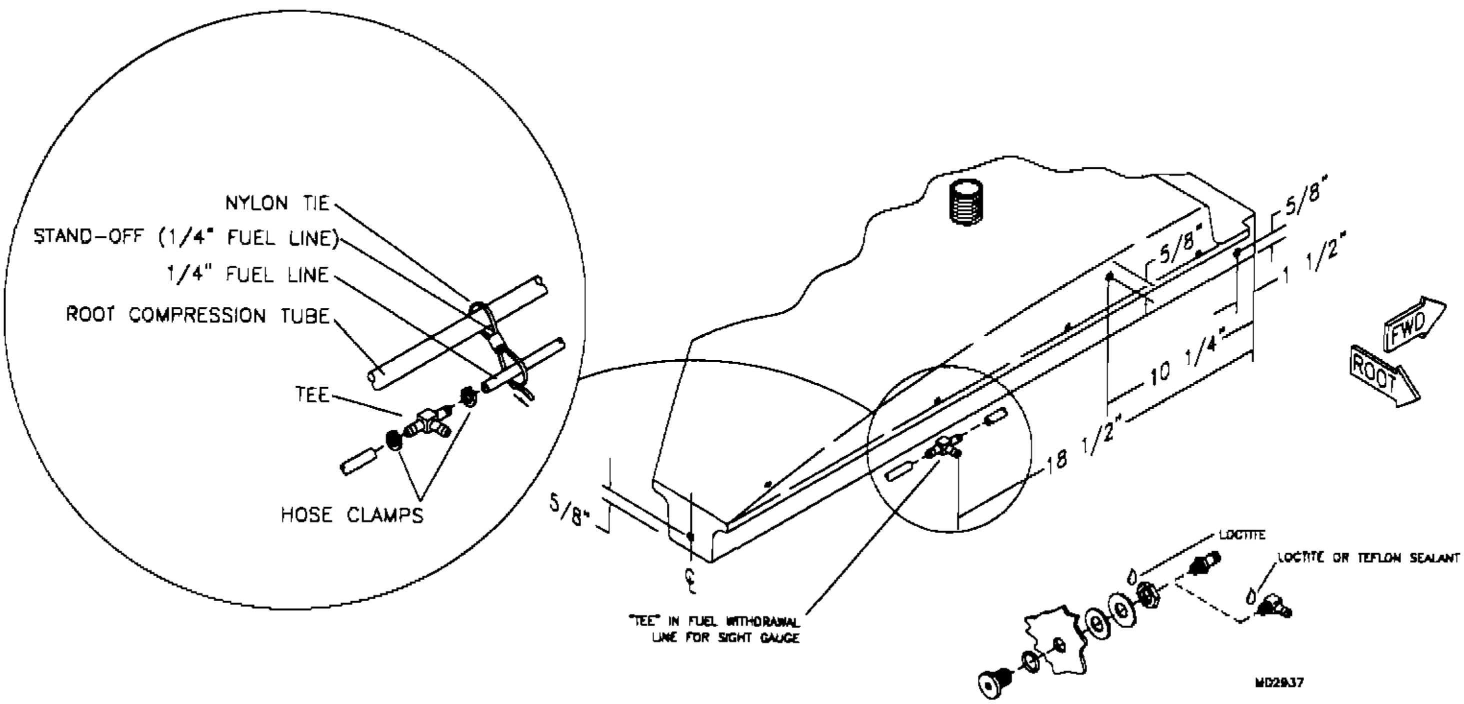


F. Bolt, AN3-4A
G. Plastic Washer, PW-3
H. Spacer Bushing, SB-1/4x028
I. Thin Washer, AN960-10L
J. Shear Nut, AN364-1032A

S-6S COYOTE II STANDARD WING TANK ASSEMBLY

22. Select the necessary parts as shown in the parts drawing. The fuel tanks are leak tested from the supplier and guaranteed leak proof. You, however, may want to perform a leak test, especially after installing the fuel fittings. If you desire, fill the tank(s) with water and let it sit for approximately 48 hours. Locate 1/2" diameter holes for the fuel fittings at the locations shown in **FIGURE 015A-22.** **IMPORTANT:** *These measurements are very critical for proper clearance of the Tank Withdrawal Fittings.* **HINT:** *A UNIBIT step-drill makes a very clean, accurate hole.* All fittings are located on the inboard side of the wing tank (see parts manual for orientation). Debur all holes. **NOTE:** *Mark on the tank the position for the 1/4" Tee (lower sight gauge attachment).* Secure the Tee to the Root Compression Tube when installing the tank in the wing. Remove **ALL** shavings and loose debris from the interior of the tank. Use a vacuum to assist in removal. Install the fittings by placing a wire in the fitting hole and up through the filler neck, attach a tank withdrawal fitting and an o-ring. Make a loop in the end of the wire to keep the parts from falling off, then pull the fitting to the hole with the threaded portion out of the tank. Remove the wire. Holding the fitting with the threaded portion extended out of the tank, thread on the rubber washer, metal washer and nut with Loctite. **NOTE:** *Use a 1/4" Allen wrench to hold the tank withdrawal fitting while tightening the nut.* **HINT:** *Hold the metal washer with a needle-nose Vise-Grip to prevent rotation while tightening the nut.* Allow Loctite to dry. Apply sealant to the straight or 90 degree fuel line fittings, and screw into the tank withdrawal fitting until snug. **CAUTION:** *Do not tighten to the point the tank withdrawal fitting turns in the tank.* Also do not over-tighten fuel line fittings, this may cause the withdrawal fitting to break.

FIGURE 015A-22



FUEL CAP/VENT ASSEMBLY

23. Remove the rubber gasket and plastic baffle from the fuel cap. The plastic baffle will "snap" out of the fuel cap. **HINT:** *A screw driver works well for the removal.*

24. Locate and drill a 1/4" hole in the center of the fuel cap as shown in **FIGURE 015A-24**. Install the conduit adjuster ferrule into the fuel cap. Apply a small drop of Loctite, install the 1/4" plain nut, and tighten to secure the ferrule into the cap. See **FIGURE 015A-24A**.

FIGURE 015A-24

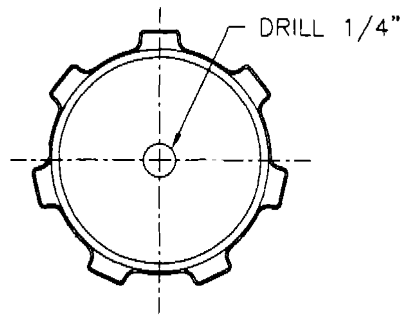
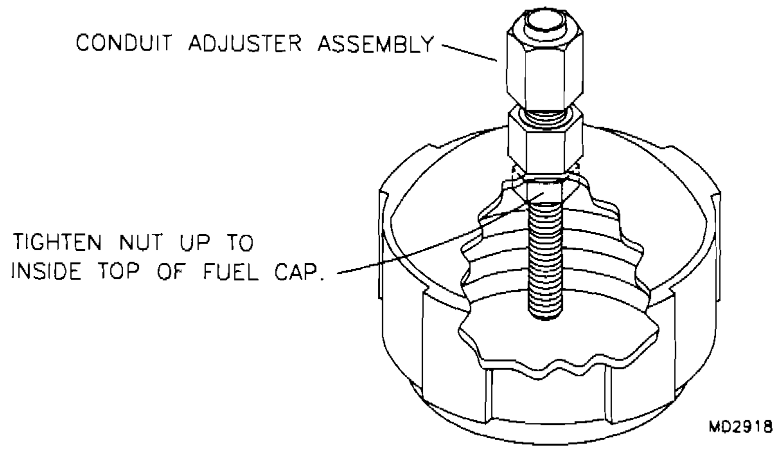


FIGURE 015A-24A



25. With a side cutters or file remove the attach nipples from the plastic baffle. See **FIGURE 015A-25.** Drill a ¼" hole in the center of the plastic baffle and install into the fuel cap over the adjuster ferrule stem. Drill a ¼" hole in the center of the rubber gasket and install into the cap. Note the orientation of the rubber gasket.

26. Drill the ¼" large washer as shown in **FIGURE 015A-26.** Assemble the bead chain to the bead chain retainer sleeve. Install the bead chain and retainer sleeve into the #30 hole in the large washer. Install the washer and bead chain into the fuel cap. Install the ¼" shear nut on the adjuster ferrule stem and tighten.

FIGURE 015A-25

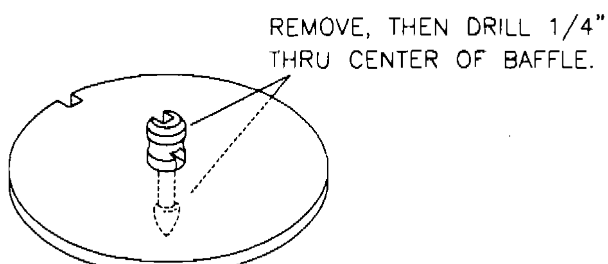
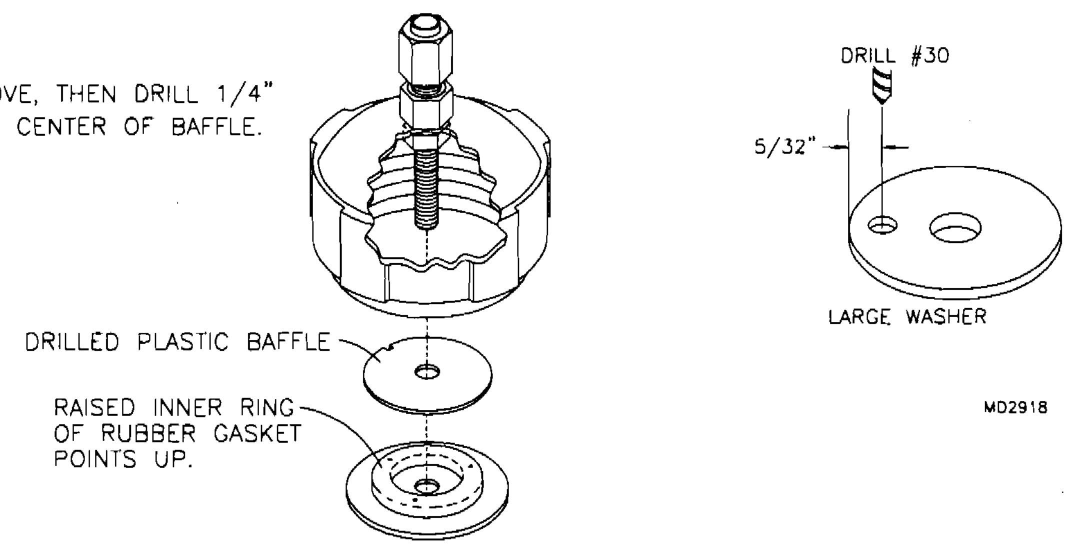


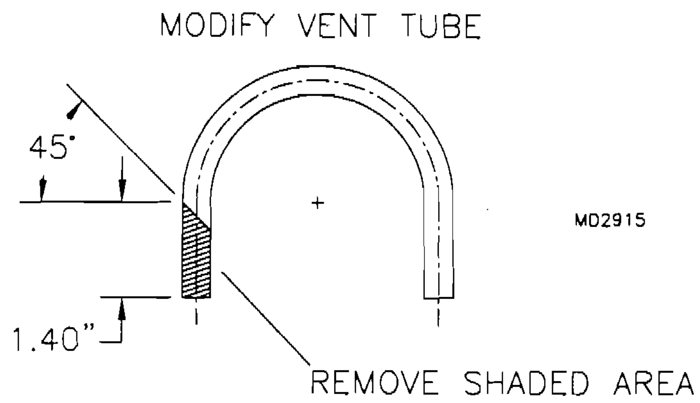
FIGURE 015A-26



27. Install the bead chain end coupling onto the bead chain. Find the center of the plastic retainer and drill a #30 hole. Using the brass backing washer, rivet the plastic retainer to the bead chain. Refer to the parts drawing.

28. Modify the vent tube as shown in **FIGURE 015A-28**. Install the vent tube into the adjuster ferrule. Install the fuel cap assembly onto the tank and tighten. Position the vent tube so that the 45 degree angle is pointing forward (into the slipstream) and tighten the ferrule cap to secure the vent tube.

FIGURE 015A-28

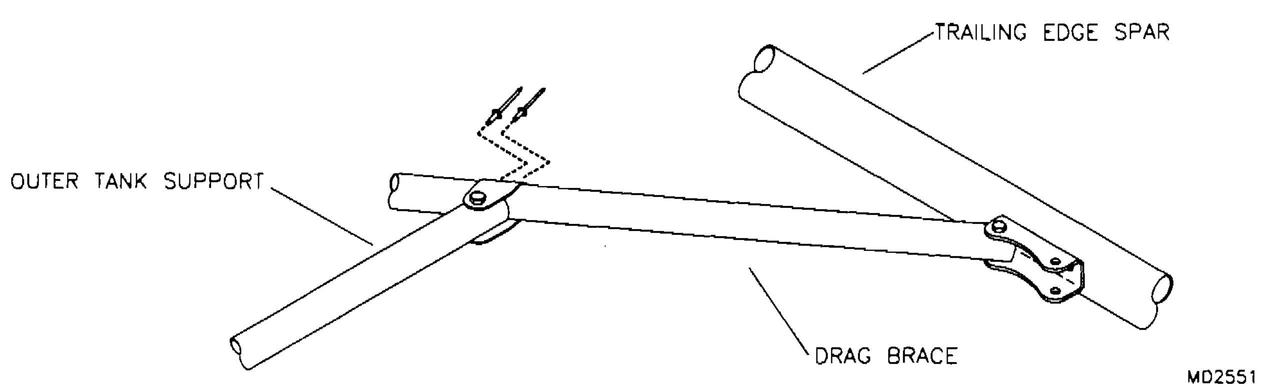


FUEL TANK MOUNTING

29. Be certain the tank assembly steps have been completed before installing fuel tanks to the wings. Mark the centerline along the aft side of the leading edge spar, from the S2-SAB on the inner compression tube to about 16" outboard; this helps locate the S2-SAB which retains the outer tank support.

30. Locate the tank to the wing frame, its forward side ⅛" from the leading edge spar and inboard side 1/10" from the inner compression tube. Locate an S2-SAB to the leading edge spar, ⅛" outboard of the fuel tank, transfer-drill #11 and rivet to spar. NOTE: **When locating the S2-SAB, check that the tank withdrawal fitting will clear the inner compression tube once the tank is in position.** If necessary, the S2-SAB may be moved slightly farther outboard, allowing the tank to be positioned farther from the compression tube; if doing so, ensure that the tank remains properly supported by the compression tube. Bolt the forward end of the outer tank support to the S2-SAB. Place the tank in position and pull the outer tank support parallel to the tank. Mark and cut the outer tank support diagonally where it meets the drag brace; be careful not to cut the tube short. Using the U-bracket as guide, transfer-drill the aft end of the outer tank support #11 and bolt it to the U-bracket. Locate and drill two #30 holes in the aft side of the U-bracket and rivet it to the drag brace per the parts drawing. See **Figure 015A-30.**

FIGURE 015A-30

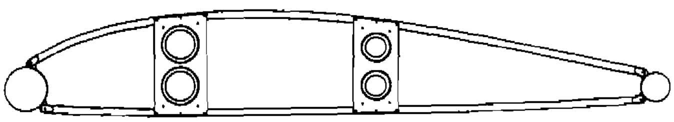


31. Bolt the wing tank mount brackets to the fuel tank using the hardware shown. Notice that the bent bracket bolts to the aft of the fuel tank on the inboard side. Using the tank mount brackets as a guide, drill the brackets and inner compression tube out to #30. Install the rivets shown in the parts manual. Repeat this for the outer tank support. Once tank installation is complete, apply loctite to the bolts which hold the tank in place. Repeat for the second wing tank. Route the fuel lines as shown in the parts manual. **HINT**: For now, only tape the fuel lines in position. This will ensure proper routing without wasting zip ties. Zip tie lines in position during final assembly once satisfied with the routing. **CAUTION:** Over-tight zip ties may cause fuel starvation. Be sure to route the fuel lines out the wing near the trailing edge of the wing. This will allow the wing to easily fold.

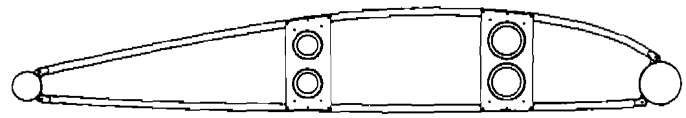
STANDARD WING RIB ASSEMBLY

BEGINNING NOTE: The design of our wing rib is such that it will be necessary to assemble both left and right hand ribs as well as several special ribs. These ribs can be assembled in the same rib jig simply by reversing the jig backing plate and inner jig. The special ribs are distinguished by the design of the compression plates and will also be right and left hand. Study the exploded view drawing now and familiarize yourself with the wing ribs. Take special note of the root rib compression plate orientation. Refer to **Figure 015A-31** for quantities of each. **NOTE:** The tip rib will will be built up on the wing frame.

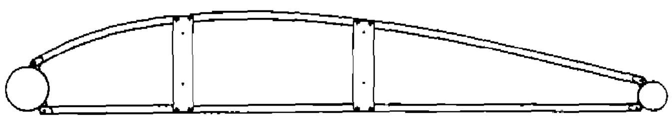
FIGURE 015A-31



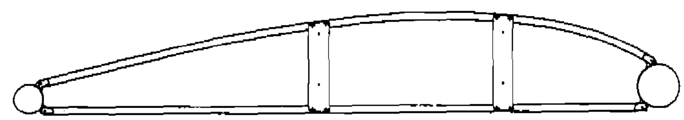
MAIN RIB, RIGHT HAND – (10) REQ'D.
(1 USED IN THE LEFT HAND WING,
POSITION #2. 9 USED IN THE
RIGHT HAND WING POSITION #3–#11)



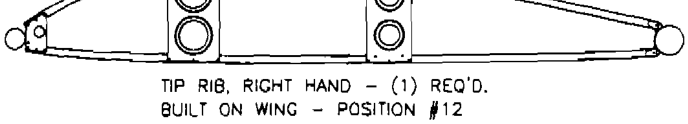
MAIN RIB, LEFT HAND – (10) REQ'D.
(1 USED IN THE RIGHT HAND WING,
POSITION #2. 9 USED IN THE
LEFT HAND WING POSITION #3–#11)



ROOT RIB, RIGHT HAND – (1) REQ'D.



ROOT RIB, LEFT HAND – (1) REQ'D.



TIP RIB, RIGHT HAND – (1) REQ'D.
BUILT ON WING – POSITION #12

TIP RIB, LEFT HAND – (1) REQ'D.
BUILT ON WING – POSITION #12

MD3697

32. Prior to assembling the ribs, it will be necessary to assemble the rib jig. Gather all parts for the rib jig as per the parts drawing. You will note that some of the parts in the jig will have to be fabricated from the plywood removed from your shipping crate. Begin the jig assembly by cutting the jig backing plate out of the plywood from your shipping crate to the same dimensions as the outer jig. See **Figure 015A-32.** Verify the dimensional accuracy of the jig cord by measuring the jig and comparing it to the assembled wing frame. Correct any variations by lightly sanding or adding shims to the jig at the rib clip locations. Screw the outer jig board to the backing plate. Dry assemble one complete rib, with the exception of the rib compression plates. **NOTE:** While the bottom rib does look almost symmetrical, there is a forward and aft end. The forward end will be designated with a black mark on the rib. Also note that there is a top and bottom to both the forward and aft rib clips. See **Figure 015A-32B.** Do not drill any holes or pop any rivets into the rib assembly at this time. **NOTE:** Make sure that the bottom rib is positioned with equal edge distance to the hole in the rib clip on each end. Slightly trim the aft end if necessary. Place the assembled rib on the plywood backing plate within the outer jig board. Insert the inner plywood jig into the rib. The inner piece should lock into its correct position by compressing against the rib and the outer jig board. Some minor sanding to the jig may be required to obtain the proper fit. If so, sand only the outer jig. **NOTE:** There should be a small gap between the inner jig and the forward and aft rib clip. Use a tapered wood dowel pressed between the inner jig and the aft and forward rib clips to retain the clips in there correct position. See **FIGURE 015A-32A.**

FIGURE 015A-32

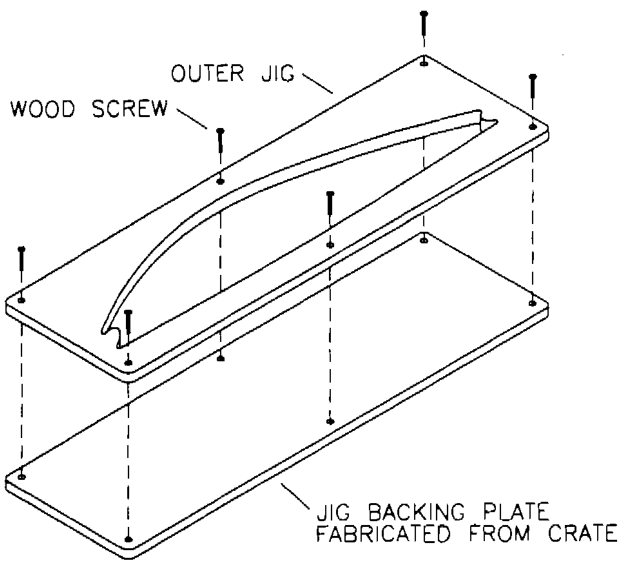


FIGURE 015A-32A

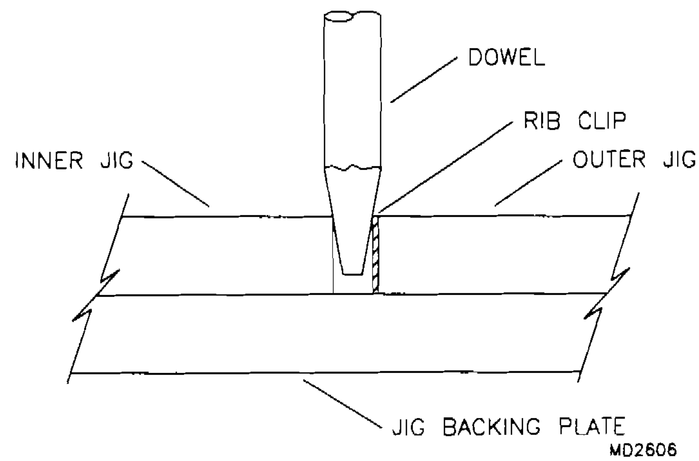
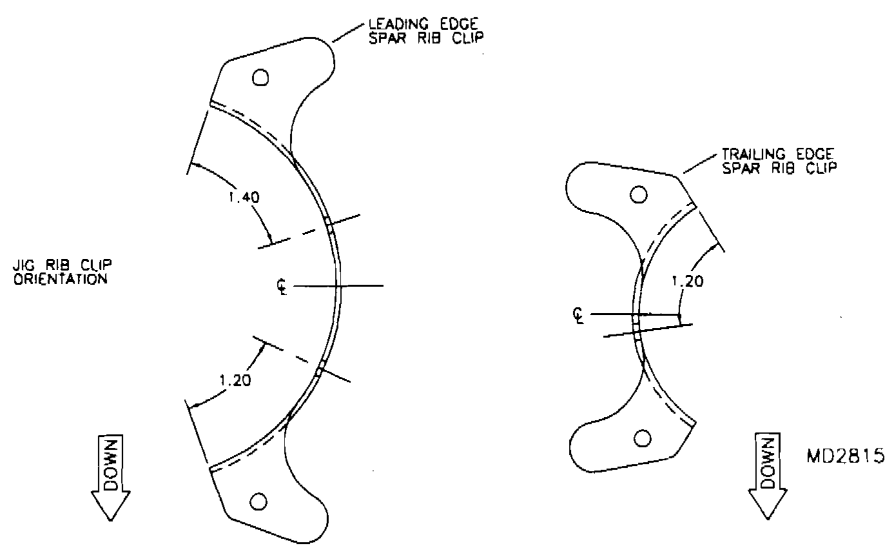


FIGURE 015A-32B



33. Position the forward and aft rib compression plates on the jig so that the top and bottom rivet holes are on centerline of the rib. There will be four predrilled holes in the inner jig at this location to pick up the tooling holes in the compression plates. The side flanges of the plates should be in the up position. Once satisfied with the position of the compression plates, from the ⅛" stainless rod provided cut eight (8) pins ⅝" long. Round the ends and press them into the tooling holes through the plates and into the predrilled holes in the jig. This will lock the plates into their correct position. The pins should be driven in as straight as possible to allow removal of the compression plates. See **Figure 015A-33.** After installing the pins, screw the inner jig in place and remove the forward and aft compression plates. See **Figure 015A-33A.**

FIGURE 015A-33

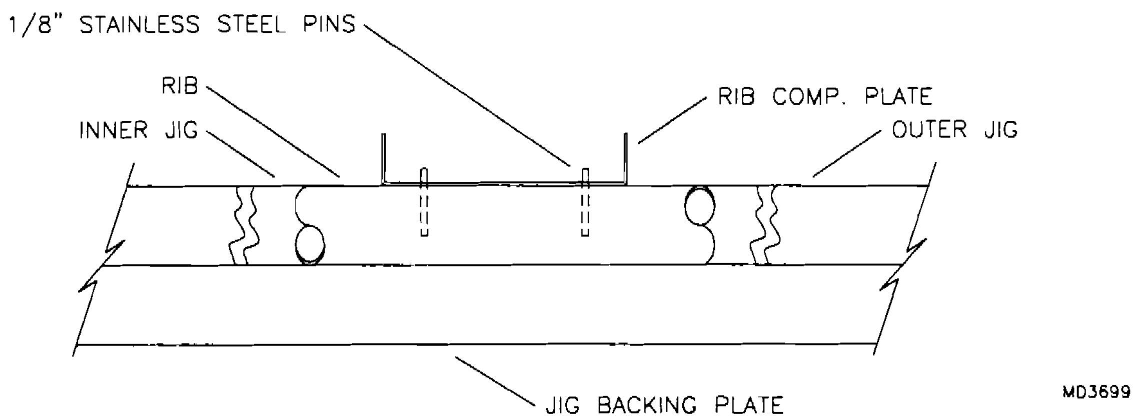
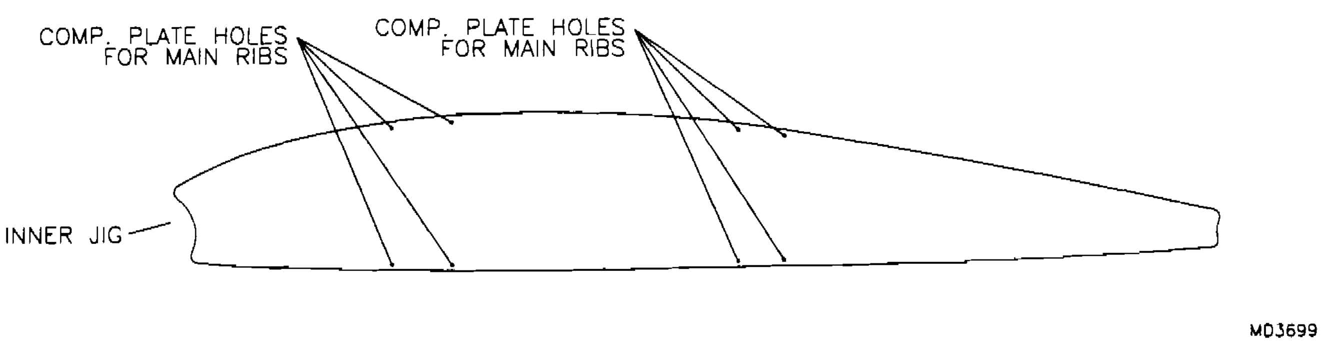
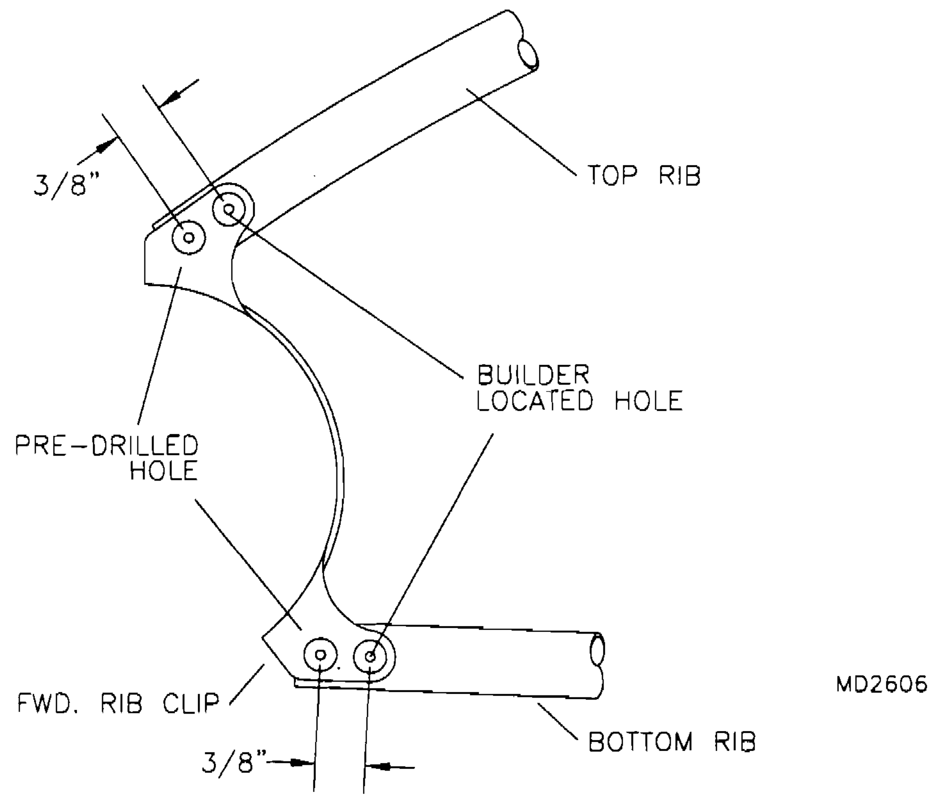


FIGURE 015A-33A



34. With the jig completely assembled and one complete set of rib components in place, transfer drill #30 through the predrilled hole in each rib clip into the rib and rivet. Locate the second hole ⅜", center hole to center hole, from the first and on center line of the rib, click punch, drill and rivet. See **Figure 015A-34.** Drill and rivet in place both the forward and aft compression plates. Remove the rib assembly from the jig. Drill and rivet the opposite side rib clips, following the same procedure used on the first side. Verify the rib fit by installing it into the assembled wing frame. The fit should be snug without bowing the rib assembly. Make any necessary adjustments before continuing. Assemble all ribs for this side of the jig (right or left hand for a total of 11 ribs). **NOTE:** One of these ribs will be special. The root rib uses root rib channels, raw stock for the bottom rib and a root rib skin. Assemble and rivet the top rib to the clips. **IMPORTANT:** Do **not** install the bottom rib at this time. See rib chart and refer to the parts drawing.

FIGURE 015A-34

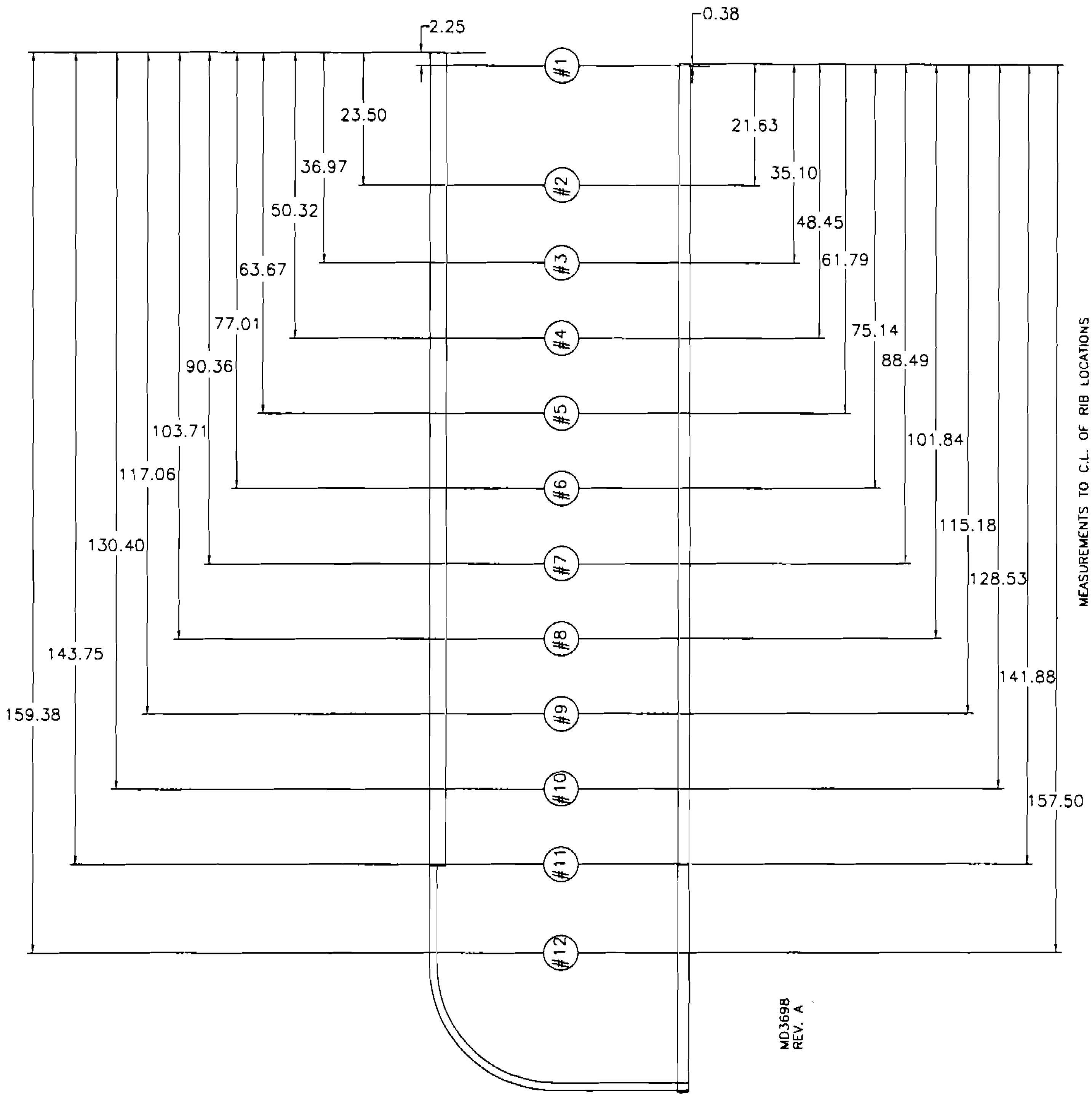


35. Remove the jig backing plate and install on the other side of the inner and outer jig. Be sure to maintain top and bottom and end orientation of jig. Assemble another set of ribs on this side of the jig following the same procedure as before.

STANDARD WING RIB INSTALLATION

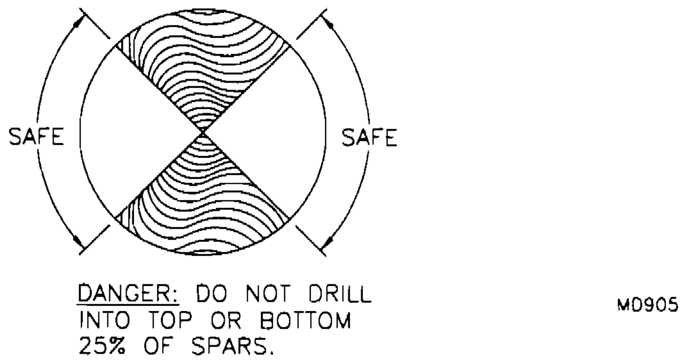
36. After assembling two complete sets of ribs, begin installing ribs #1 thru #11 into the wing. Refer to the parts drawing and **Figure 015A-36** for the proper location of each rib. Align and transfer drill #30 the rib clips and cleco. **NOTE:** Notch the aft rib clips to clear the single ear nutplates. It will be necessary to remove one end of each drag brace to allow the ribs to be installed to their correct position and to allow room for a rivet gun. It may also be necessary to remove the bolt from the aft end of the outer tank support tube to obtain enough movement in the root drag brace. When satisfied that the correct ribs are in their respective position, rivet in place. **IMPORTANT:** Do **not** rivet rib #1 to the spar at this time. **NOTE:** Be aware that some ribs use a different rivet length due to an internal doubler within the spars.

FIGURE 015A-36



37. **DANGER**: Do not install more than the required rivets per rib clip. Some builders have riveted the clips to the spars with rivets placed in the "work" zone. The "work" zone on a tubular spar is the top and bottom 25% of the circumference. See **Figure 015A-37**. This effectively destroys the strength of the spar, in most cases, should the top or bottom 25% of either the leading or trailing edge spars have holes. **EXCEPTION:** At the very root and tip ends of the spars, some holes are drilled in the top 25%. These are permitted due to load path terminal location.

FIGURE 015A-37



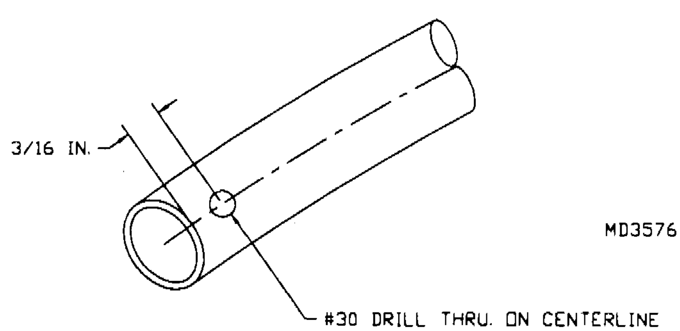
38. Also note that the root leading edge rib clip is retained with stainless steel rivets. This is to further retain the leading edge spar root doubler. After all ribs have been riveted in place, bolt and tighten the drag braces in place.

STANDARD WING RIB INSTALLATION - TIP AND ROOT RIB

39. Position the aft rib clip on the trailing edge spar. Refer to **Figure 015A-36**. Position the clip inline with the other clips. **HINT:** Use a long piece of angle to act as a clip stop. Tape or clamp angle to spar. Transfer drill #30 and cleco.

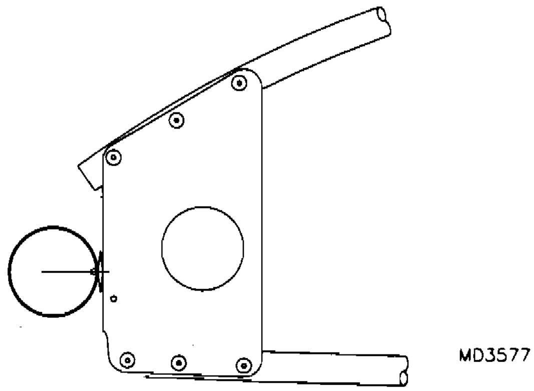
40. The top and bottom wing tip ribs for the S-6S std. wing come pre-shaped, however they will need to be trimmed to length. Drill #30 the forward end of each rib as shown in **Figure 015A-40.**
NOTE: The forward end of the rib is denoted by the bend or a mark on the tube. **HINT:** Lay the ribs on a flat surface to determine the centerline. Also, cut raw stock for the root bottom rib and drill as above. **HINT:** Cut the raw stock slightly long to allow for trimming.

FIGURE 015A-40



41. Drill the front tip rib clip holes to #30. Cleco the top tip rib to the front rib clip hole. See **Figure 015A-41.** Cleco the bottom tip rib to the clip. Position the forward rib clip on the tip bow tube centerline. Refer to **Figure 015A-36.** Transfer drill the ears #30 and cleco.

FIGURE 015A-41



42. Mark and trim the aft end of each rib as shown in **Figure 015A-42.** Allow the rib to rest naturally. **NOTE:** Gently flex the top rib if needed to maintain hole e.d. Allow the aft end of the rib to rest in the rib clip. Check the profile of the rib in relation to the trailing edge spar. See **Figure 015A-42A.** Transfer drill #30 and cleco the rib and clip. **NOTE:** At least a 3/16" e.d. should be maintained. Profile the rib as needed to clear the clip.

FIGURE 015A-42

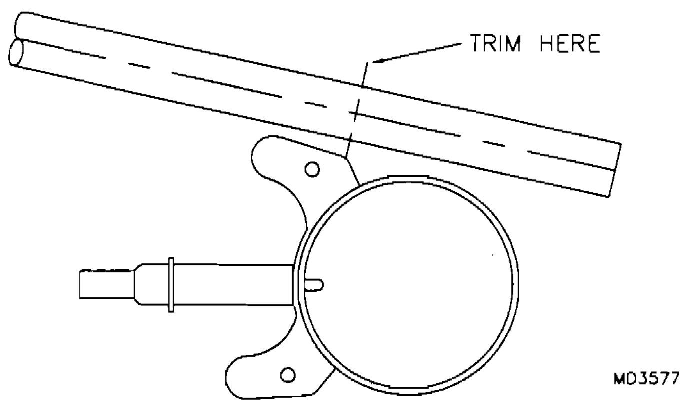
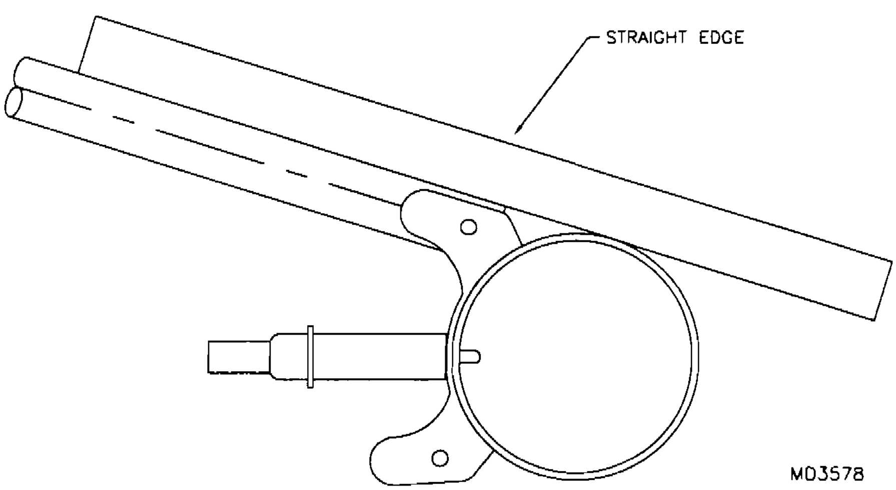


FIGURE 015-42A



43. Repeat the preceding steps for the bottom root rib. **NOTE:** The bottom rib #1 (root rib) is cut to length from raw stock. Fit as in the preceding steps.

44. Trim the forward and aft rib tip channels using the templates. See **Figures 015A-44** and **015A-44A.** **HINT:** Apply the templates to the channels with a gluestick. (see your local office supplier) **NOTE:** Trim the flange edges to the original part profile.

FIGURE 015A-44

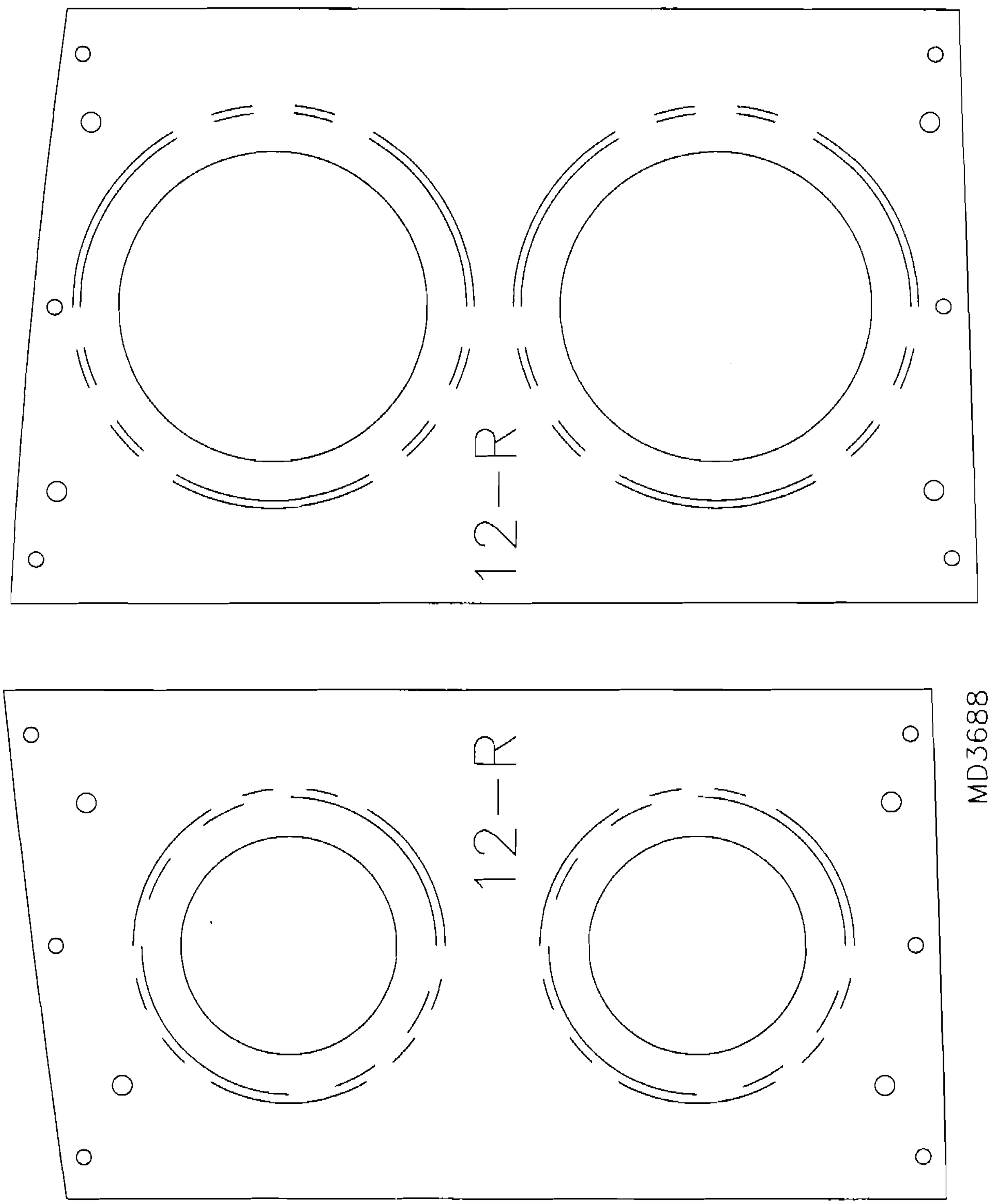
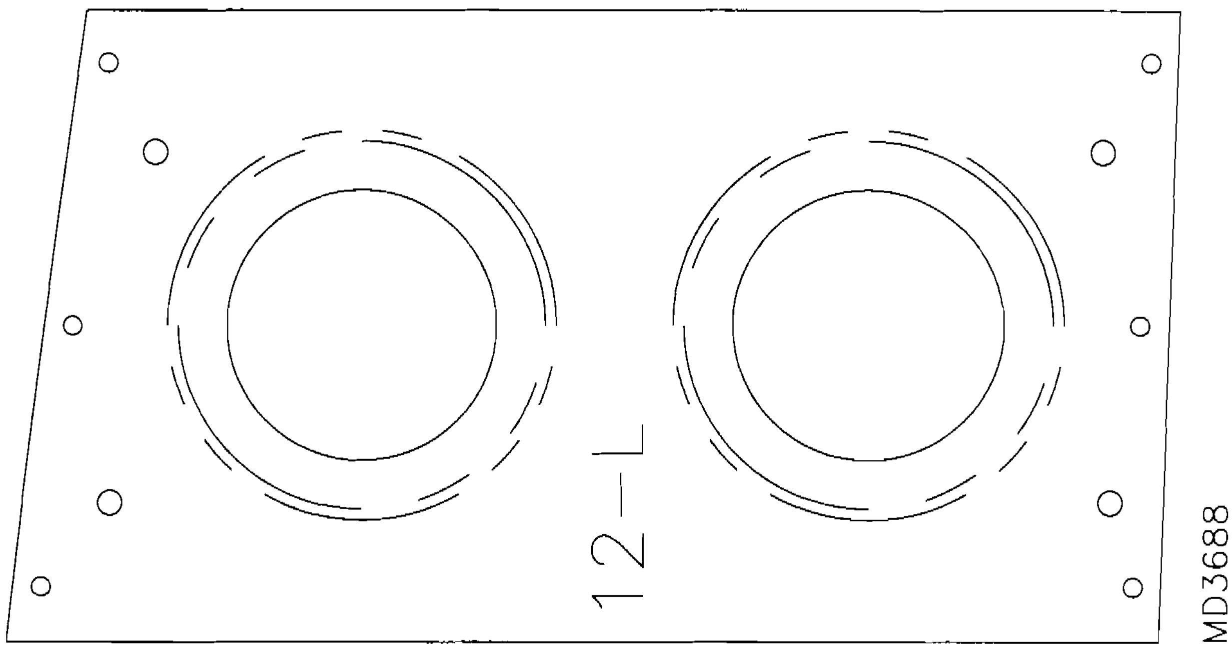
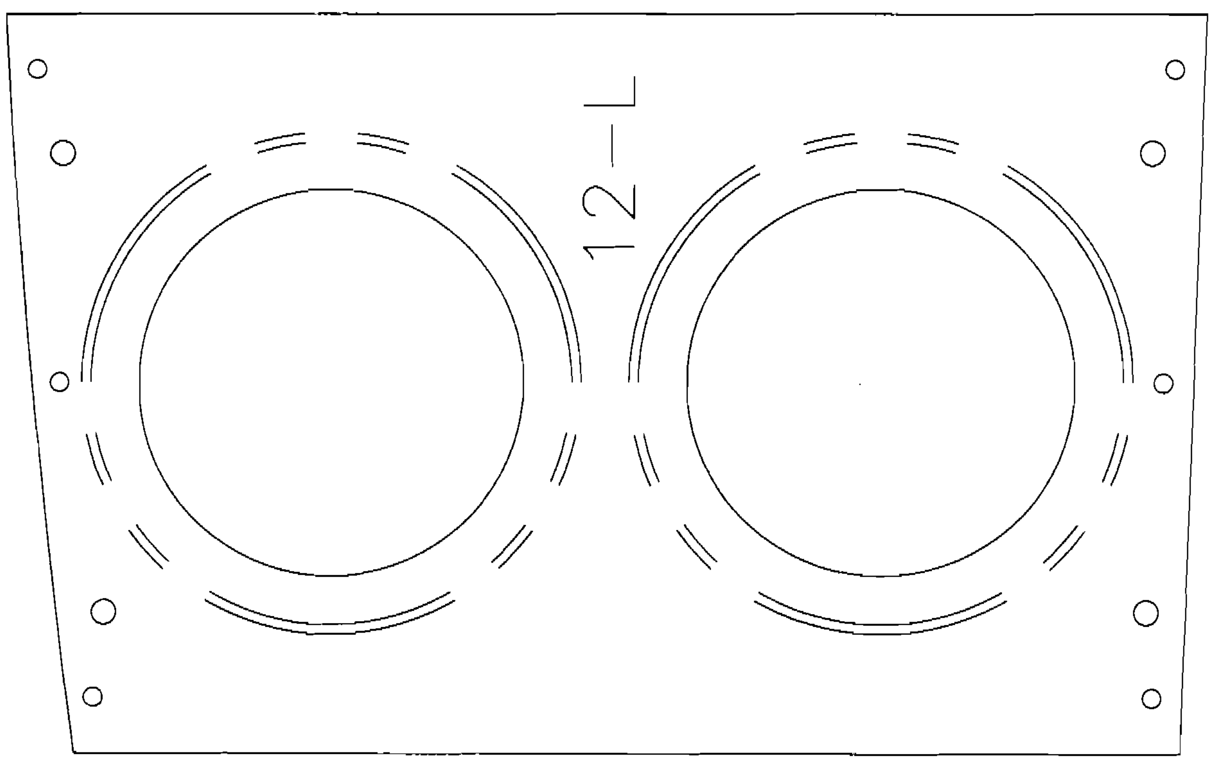


FIGURE 015A-44A





45. Position the channels in the tip rib inline with the other rib channels. The tip rib channels will mount on the inboard side of the ribs with the flanges inboard. The channel holes must align with the rib centerline. Slightly flex the rib for proper alignment. Transfer drill #30 and rivet. Transfer drill #30 the remaining front clip rib holes and rivet. Locate and drill the second holes in the aft rib clip and rivet per **Figure 015A-34.** Rivet the rib to the spar and tip bow.

46. Position the root rib skin against the #1 top and bottom ribs. Allow clearance between the l.e. spar and root rib skin. Transfer drill #30 the skin and ribs. Cleco as you drill. **NOTE:** The rib centerline should align with the pre-drilled skin holes. Glue the templates to the pre-bent channel stock and fabricate the root rib channels. See **Figure 015A-46 & Figure 015A-46A. HINT:** Apply the templates to the channel material with a gluestick. Position the channels between the ribs and root rib skin. Align the channels with the skin cutouts and on the rib centerlines. Transfer drill #30 and rivet. **NOTE:** Rivet the root rib skin after covering and painting the wing.

FIGURE 015A-46

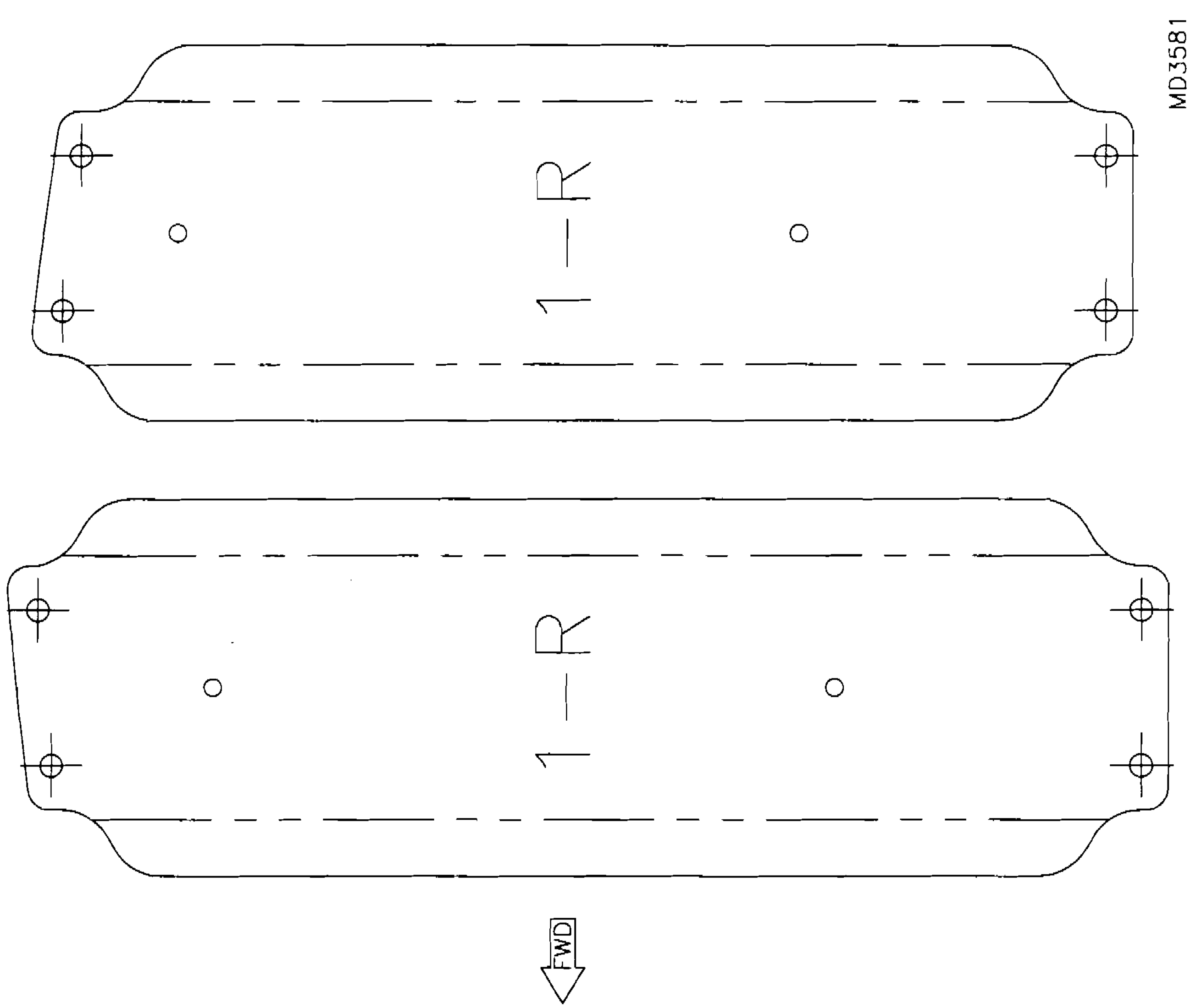
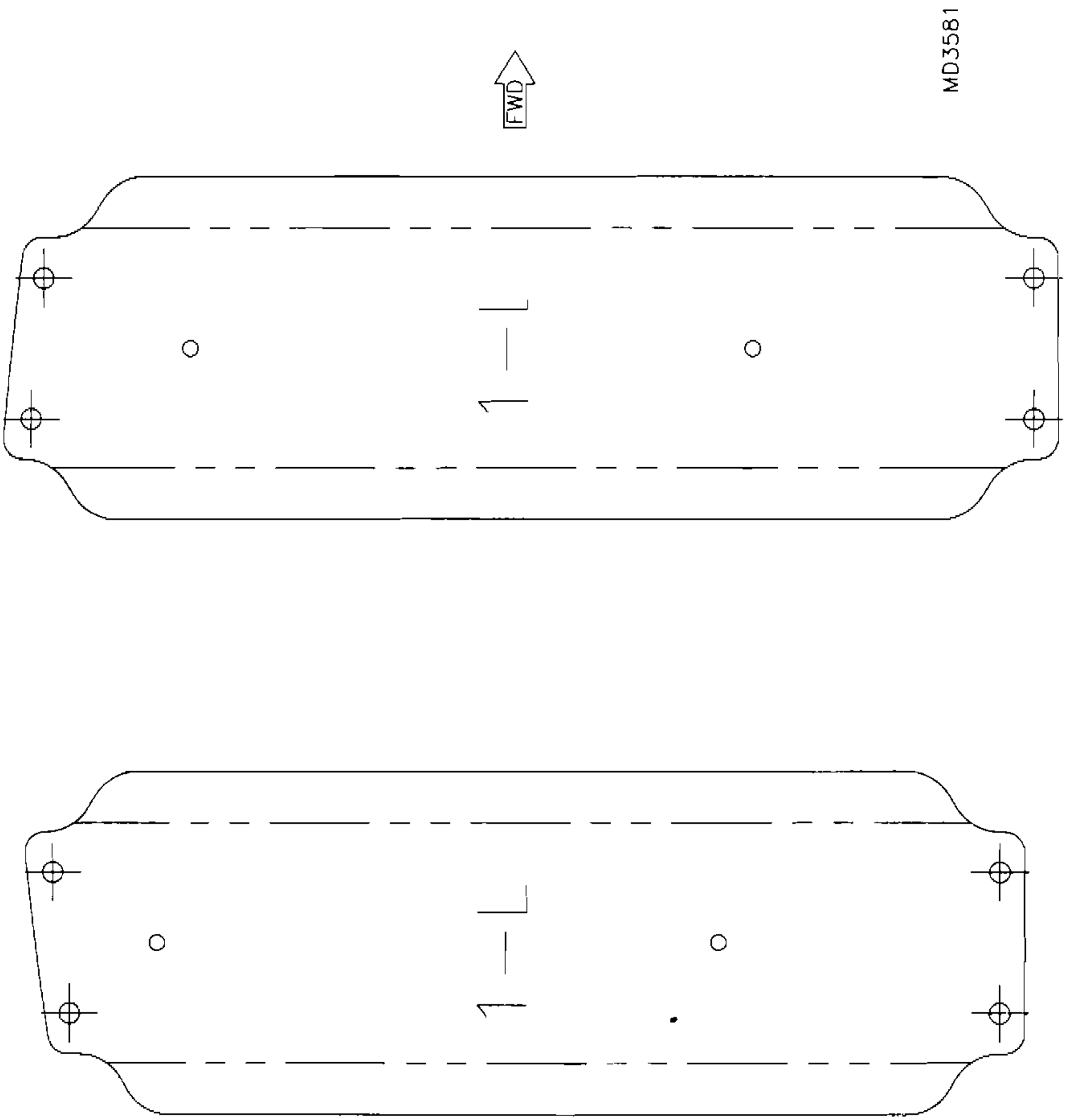


FIGURE 015A-46A



STANDARD WING RIB INSTALLATION - WING WRAPS

47. The wings 1st rib bay is held rigid against the fabric sheet metal root wraps. **NOTE:** The top root wrap fits under the leading edge wrap. **DO NOT** drill into the trailing edge spar other than fo the two rivets shown for **BOTH** top and bottom root wraps.

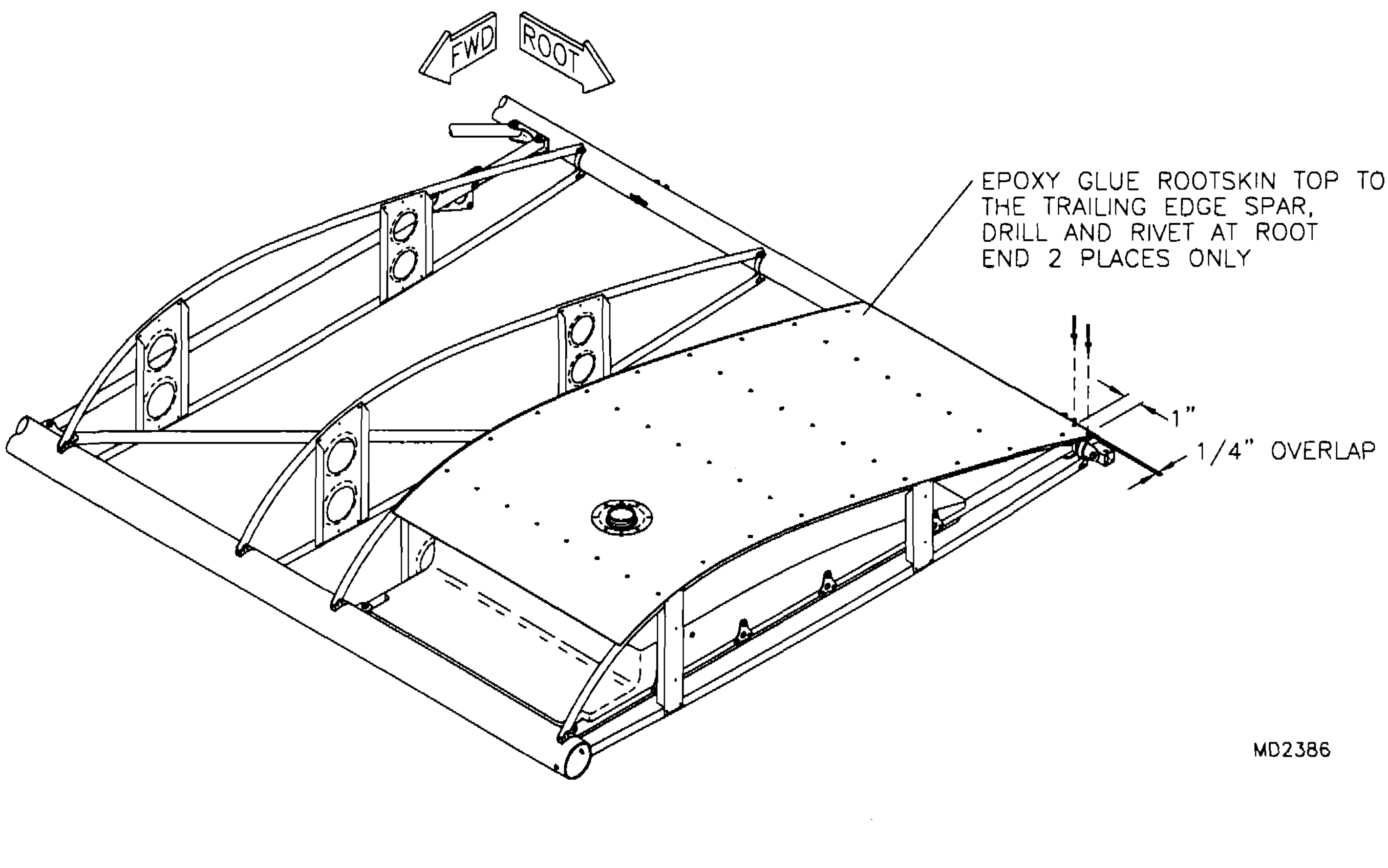
48. The top and bottom root skins are pre-drilled at the factory. **NOTE:** There are not left and right hand parts. These are determined on top wrap by orientation of hole over fuel filler neck. On the bottom wrap by orientation of hole over fuel tank AFT fitting. Cleco (4) stiffeners to bottom side of top root skin. **NOTE:** Do not cleco fwd stiffener in place at this time. Position the top root skin so that the rivet holes are on centerline of the ribs. The root skin should extend past the top centerline of the trailing edge spar by 1/4". The fuel tank filler neck should be nearly centered in the hole. Transfer drill using a #30 drill bit through the root skin into each rib, use clecos to retain the skin. Transfer drill stiffeners.

It is important to note that only two holes are drilled in the root of the trailing edge spar. **DO NOT** locate or drill any other holes in the spar, structural damage to the spar will result.

Using the aft edge of the root skin as a guide, mark a line on the trailing edge spar. After all holes have been drilled, remove the root skin, Debur and remove all shavings. Remove the anodizing on the trailing edge spar in the contact area **ONLY**. Rough up the ⅛" contact area of the root skin. Prior to riveting the root skin in place, apply double stick tape to the top of the second rib. When riveting the skin in place, only rivet to the root rib. The rivets in the second rib will be installed after the wing is covered. Rivet the root skin top everywhere but the last 3 rivets in each rib near the leading and trailing edges. These rivets will be installed after the aft edge is bonded to the spar.

With the root skin riveted in place, position the scupper so that it is centered around the fuel filler neck. With a #30 drill bit transfer drill through the perimeter holes in the scupper into the root skin. **CAUTION:** When drilling the scupper, use a drill stop to prevent drilling into the fuel tank. Cleco in place only, at this time. The scupper will be installed final, after the wings are covered. See **Figure 015C-48.**

FIGURE 015C-48



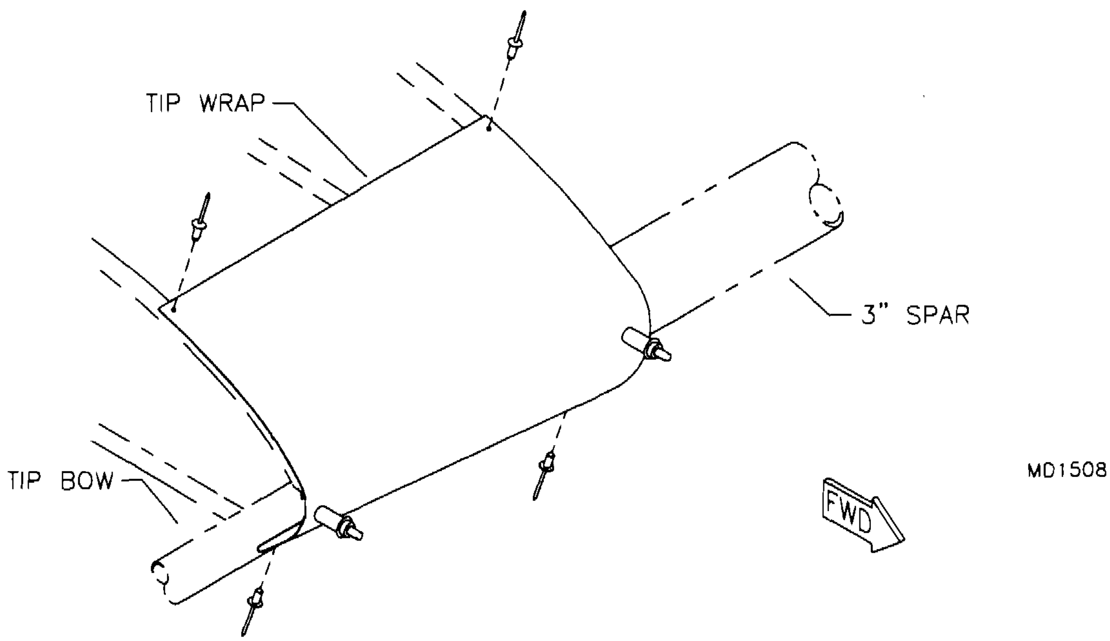
49. Install the bottom root skin following the same procedure for the top. NOTE: The bottom root wrap skin does not have stiffeners. Make sure to orientate holes over the compression tube bolts to make left and right part. Some forming of bottom root skin needs to be done on leading edge to lay flatn against leading edge spar. Form this by laying wrap on the tube, approximately one inch from edge. Using block of wood, form gentle radius over tube.

It is important to note that only two holes are drilled in the root of the trailing edge spar. **DO NOT** locate or drill any other holes in the spar, structural damage to the spar will result.

Using the aft and fwd edge of the root skin as a guide, mark a line on the leading edge spar and mark a line on the trailing edge spar. After all holes have been drilled, remove the root skin, deburr and remove all shavings. Remove the anodizing on the leading and trailing edge spars in the contact area **ONLY**. Rough up the ⅛" contact area of the root skin. **NOTE:** Prior to riveting the root skin in place, apply double stick tape to the top of the second rib. When riveting the skin in place, only rivet to the root rib. The rivets in the second rib will be installed after the wing is covered. Rivet the root skin bottom everywhere but the last 3 rivets in each rib near the trailing edge and the leading edge. These rivets will be installed after the fwd and aft edges are bonded to the spar. Bond the top and bottom root skins to trailing edge spar and bottom root skin to leading edge spar.

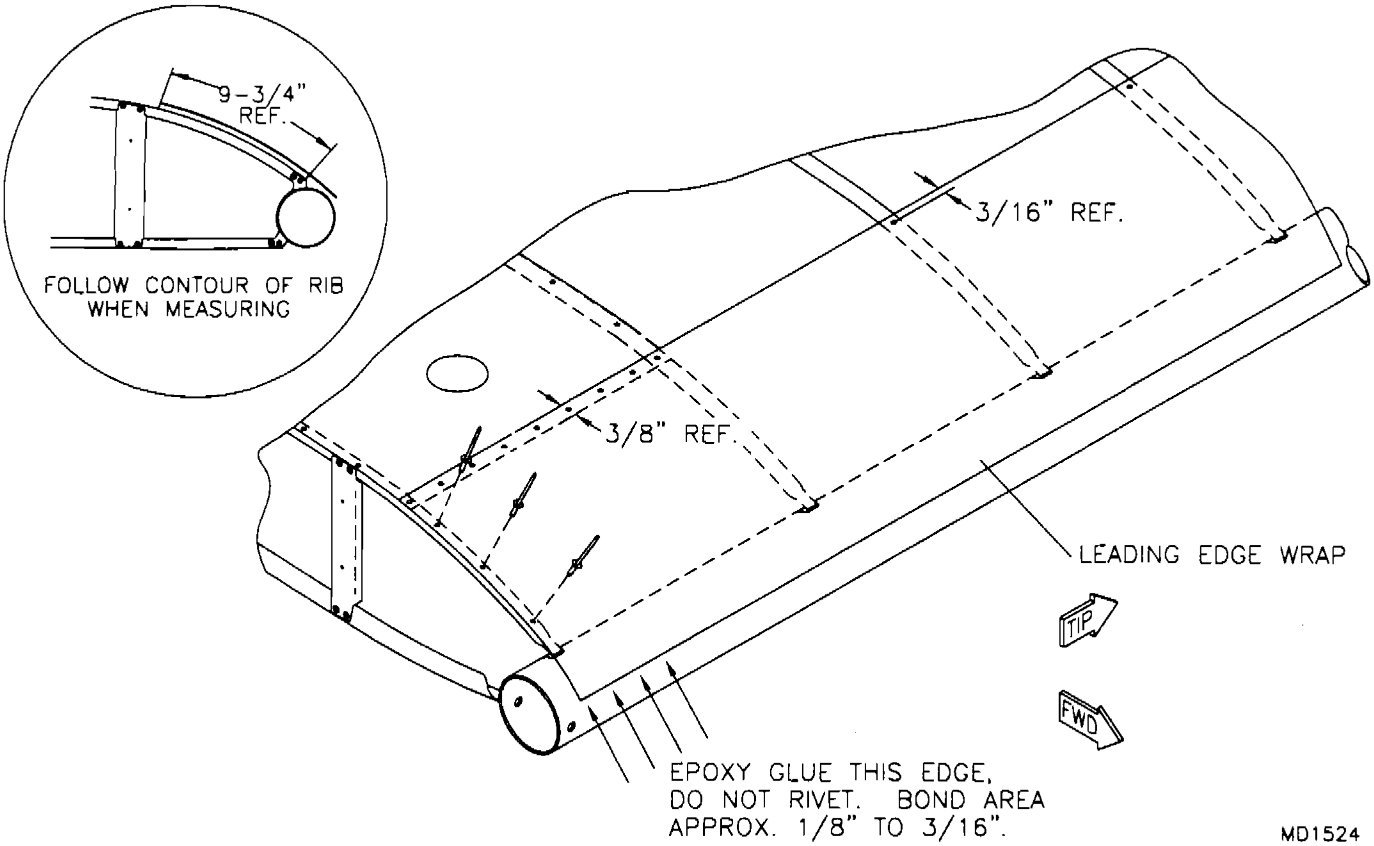
50. Locate the tip wraps. Fit the wraps between ribs #11 & #12. The wrap should overlap equally onto each rib. **NOTE:** The #40 holes should be centered on the spar and tip bow. Drill #30 holes as shown in **Figure 015A-50** and cleco. Do **not** rivet at this time.

FIGURE 015A-50



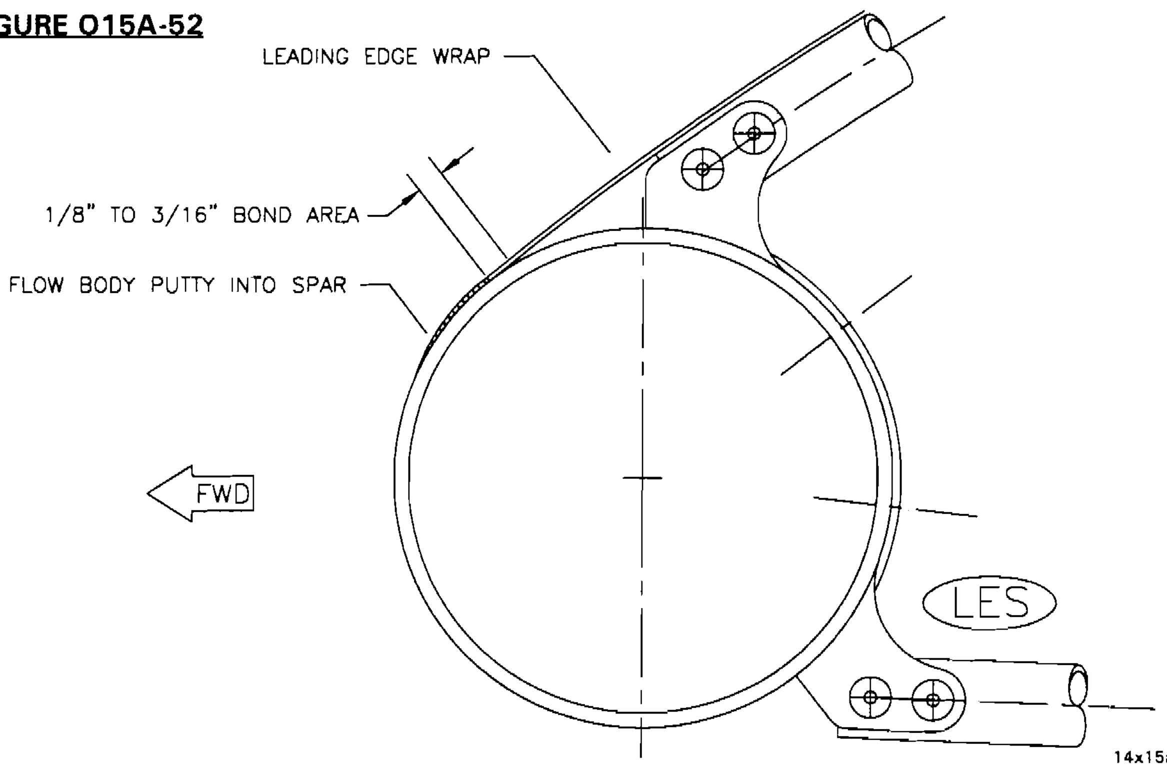
51. Unroll each leading edge wrap and lay it carefully in the position illustrated in **FIGURE O15A-51**. Fit the wrap so that it is flush with the outer radius of the root rib. Mark and trim off any excess length at the tip. The tip end should also be flush with the outer radius of the tip rib.

FIGURE 015A-51



52. Take special note of the forward and aft position of the leading edge wrap. The 9-3/4" measurement is a reference measurement from the forward end of the top rib, and is measured following the top centerline contour of the rib. The wrap should overlap the root skin top approximately ⅜". In its correct position, the leading edge wrap should flow into the leading edge spar and contact it with only an ⅛" bond area. See **FIGURE 015A-52**. Slide the leading edge wrap under the top root wrap and transfer drill leading edge wrap & forward root wrap stiffener.

FIGURE 015A-52

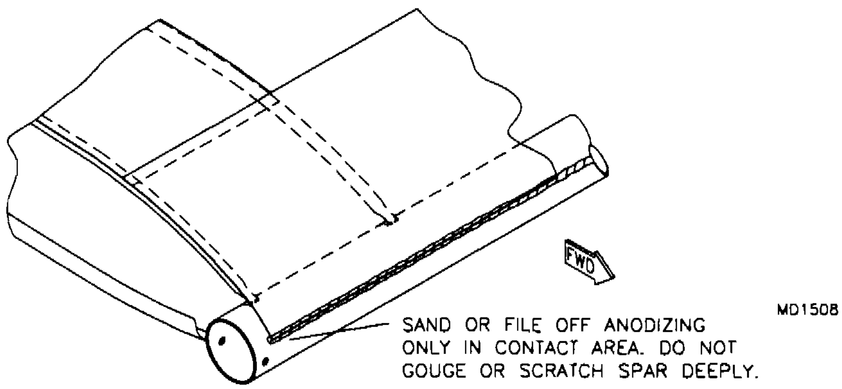


53. **NOTE:** Roll the edges down against the root and tip rib with a wood block after the wrap is riveted into place to eliminate a hard edge. . Do **not** drill into spar. The wrap is retained by only the rivets in each rib. Before drilling, make sure the ribs are 90 degrees to the spar.

54. With the leading edge wrap correctly positioned, locate and drill a #30 hole through the leading edge wrap aft edge and into each rib on centerline. Maintain a 3/16" edge distance. With the leading edge wrap clecoed in position to the top ribs, pull the wrap down tight against the ribs. Using the wrap as a guide, mark a line along the length of the spar. Remove the wrap, carefully file away the anodizing in the area that the wrap bonds to the spar **ONLY**. Use 80 grit sandpaper to rough up the bond area on the leading edge wrap.

55. Carefully sand or file away the anodizing where the wrap bonds to the spar. See **Figure 015A-55**. Rivet the leading edge wrap, and root wrap to the ribs. Do **not** rivet to the tip rib at this time. The tip wrap will install over the top of the leading edge wrap after bonding.

FIGURE 015A-55



56. Use J&B epoxy to glue the wrap. Use masking tape to hold the leading edge in place while the glue sets. If masking tape does not work clamp with a long straight board and several "C" clamps, see **Figure 015A-56**. After the epoxy sets up. Body putty the jog between wrap and spar. Sand smooth.
HINT: Put putty mix in a plastic bag. Squeeze out of a small hole (like icing on a cake). Smooth out with a putty knife. Apply the body putty so it rolls around the leading edge for a smooth blend of leading wrap and spar. See **Figure 015A-56A**.

FIGURE 015A-56

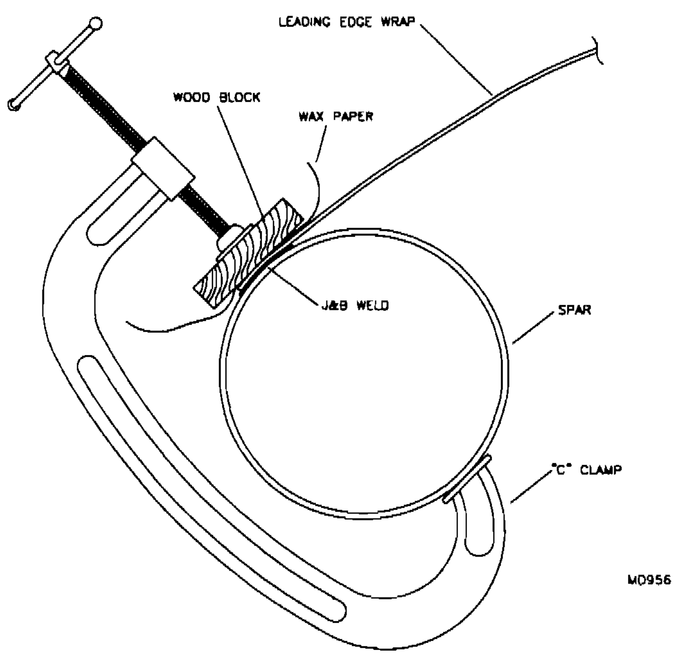
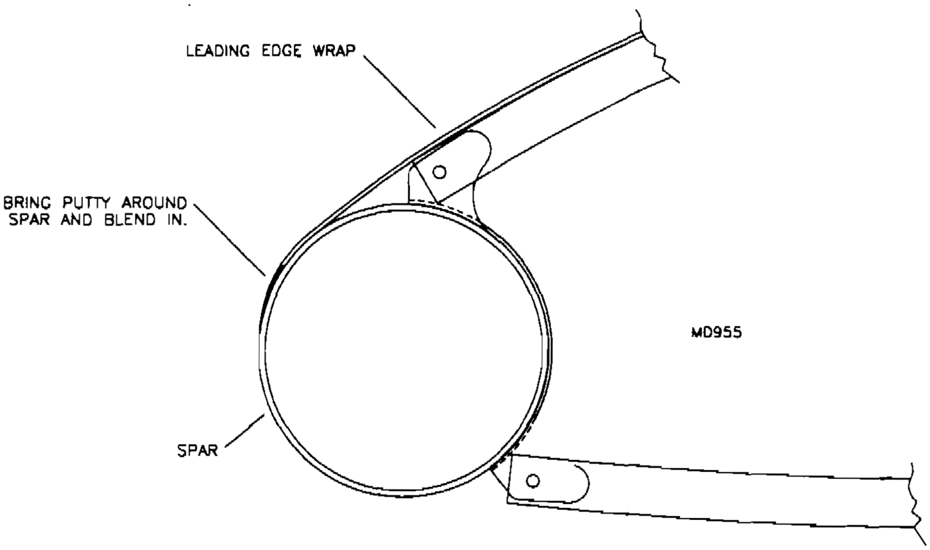


FIGURE 015A-56A

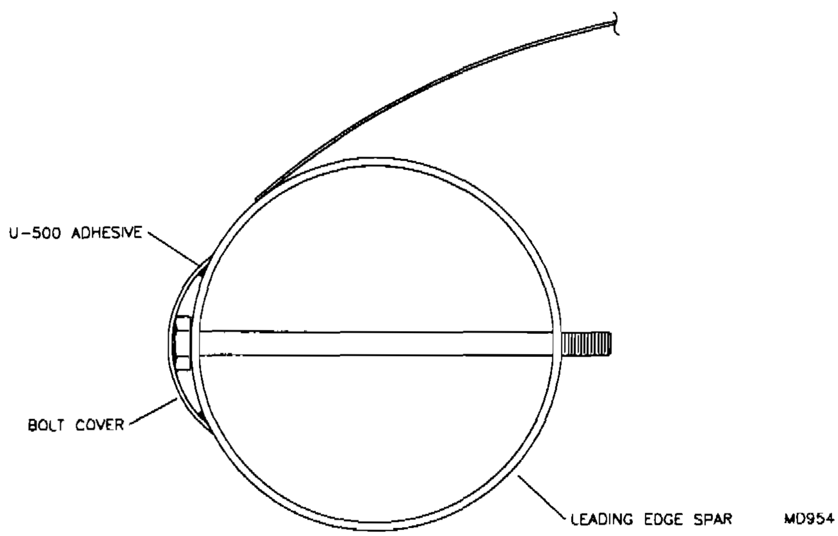


57. Equally space three (3) #30 holes on root rib between forward edge of rib and top wrap. See **Figure 015A-51**.

58. Rivet the tip wrap in place. Notice the tip wrap lays over the leading edge wrap.

59. The bolt cover is used to cover the three bolt heads that retain the strut attach plate. Trim the bolt cover as shown in **FIGURE 015A-59**. Use the U-500 adhesive provided in your kit to bond the cover to the spar. If you prefer, rather then mixing up a small quantity of glue at this time, install the bolt cover when covering the wings. Also, using body putty, contour over the single protruding bolt head on the leading edge spar.

FIGURE 015A-59



60. Mark and trim the filler neck to length. **NOTE:** The fuel caps should just clear the scupper when tightened. **HINT:** Use a small cut-off wheel and vacuum. It is also helpful to place a piece of foam inside the filler neck when trimming.

61. With the wings bottom side up, measure forward 3 ⅝" from the aft edge of the leading edge wrap and mark on the under side of ribs #7 thru #10. Measure the distance between each marked rib. Cut the raw stock tubing (½"x.028) to fit between each rib. Position each piece of tubing centered on the marks. Locate each gusset as shown in **FIGURE 015A-61.** Transfer drill through the gusset into each rib and rivet the gussets to the ribs. Holding each support tube in place, transfer drill through the gussets into each support tube and rivet in place. See **FIGURE 015A-61A**. **NOTE:** Fabricate the end gussets as shown in **FIGURE 015A-61B**

FIGURE 015A-61

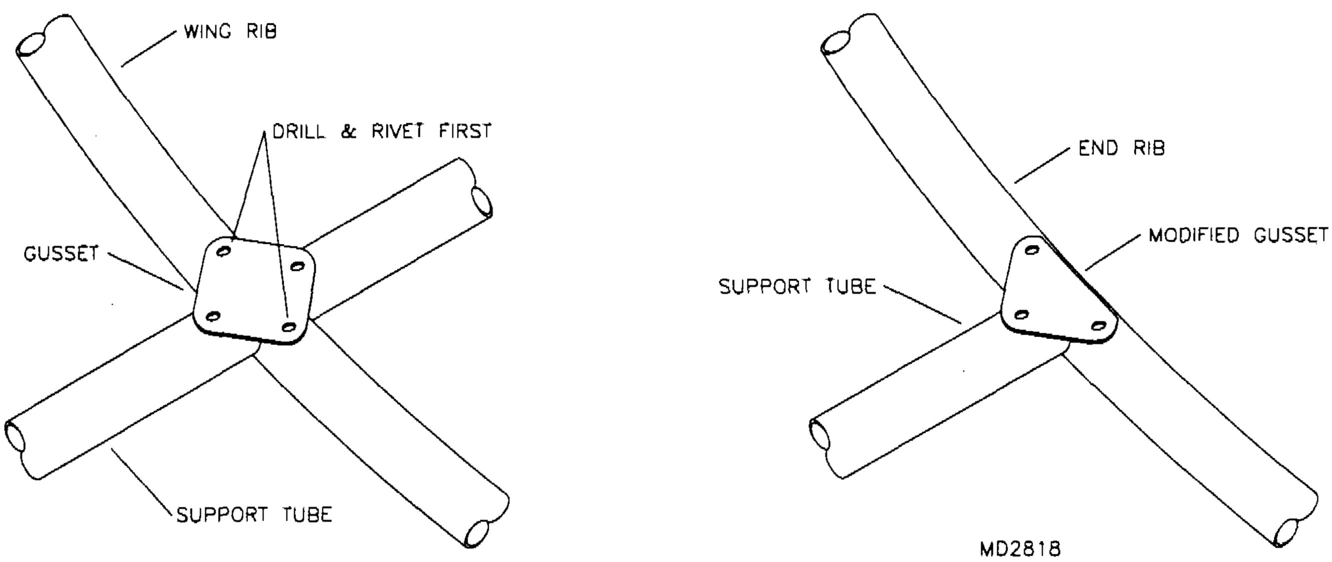


FIGURE 015A-61A

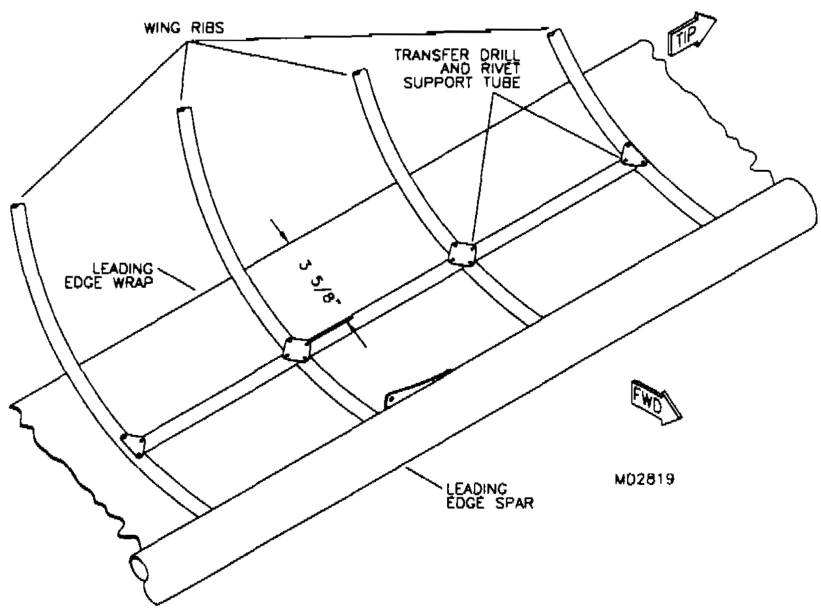
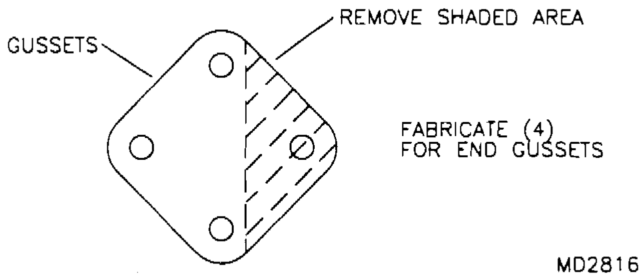


FIGURE 015A-61B



STANDARD WING PITOT/STATIC INSTALLATION

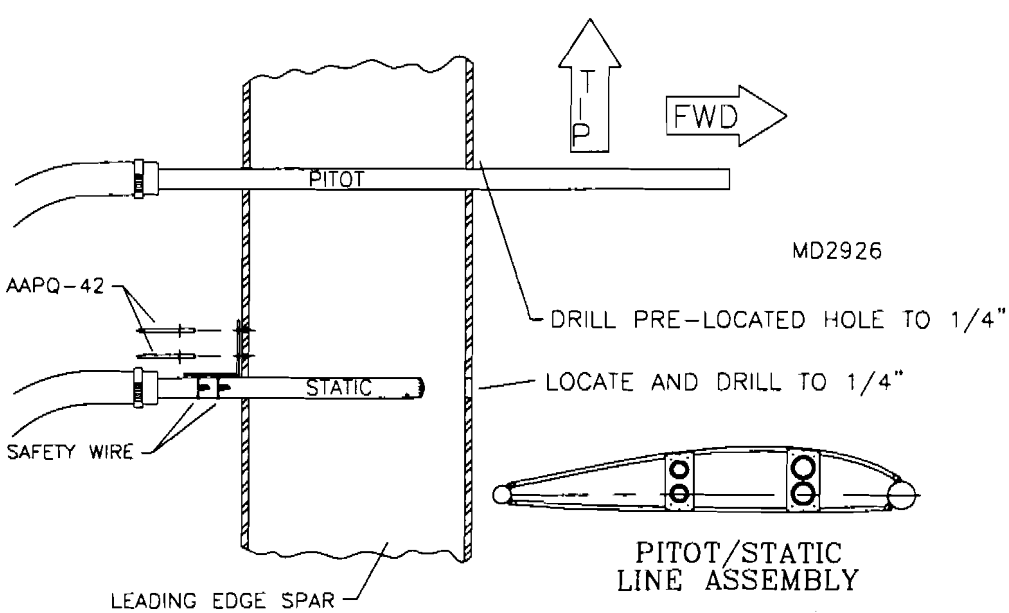
62. Located 8 ⅞" from the outer end of the left leading edge spar is a hole. Drill fwd & aft to ¼". Locate and drill a second ¼" hole through both sides of the spar 1 ½" inboard of the first. One will be for the static tube, the other the pitot tube. See **Figure 015A-62.** The tubes can be inserted through the spar after covering using the access panel in the wing bottom. However, it is best to run the lines to the ASI, VSI, and Altimeter prior to covering. Secure the lines to the wing structure with zip ties. For easy knockdown, make splices using ¼" diameter aluminum tubes 2" long. Locate these splices where the tubes exit the wing root. Line clamp the splice tubes to the lines coming out of the wing. If your aircraft is equipped with an Altimeter and VSI, run lines from these instruments to the static source on the ASI, then to the static tube. **IMPORTANT:** For accurate airspeed readings the static probe must be set inside of the spar tube. The airspeed should be checked against a timed mile flown in no wind.

NOTE: These are builder obtained items.

1. Angle .050" X 1.00" X 1.00"
2. #30 Pop Rivets
3. Safety Wire

Make an aluminum angle from .050 raw stock. Drill two holes for the pop rivets, in one side of the angle. Drill four #40 holes (two per side) for safety wiring to the static tube in the other angle.

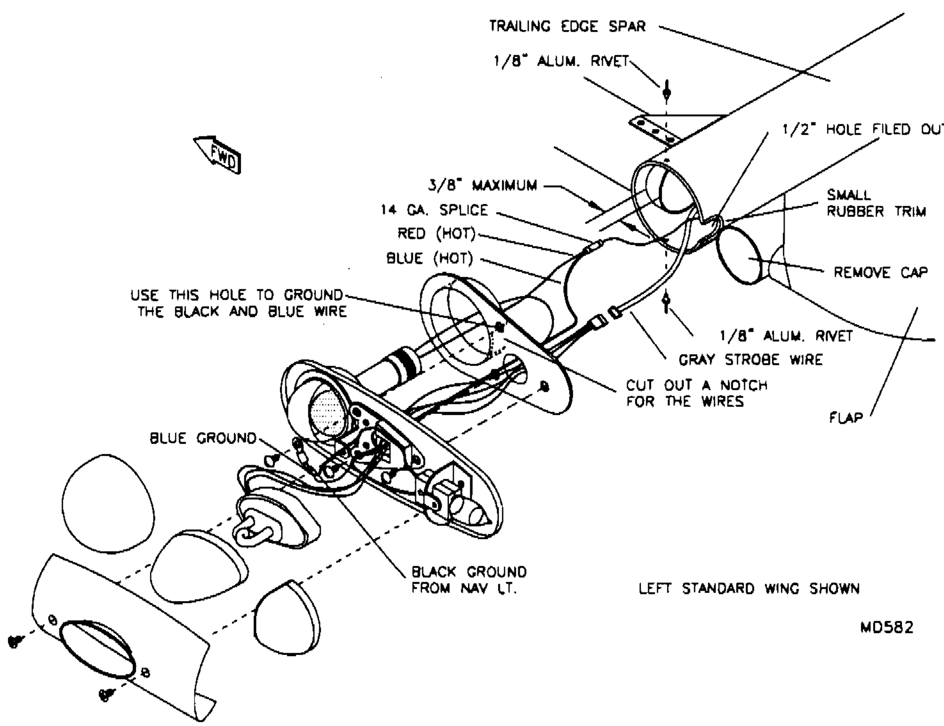
FIGURE 015A-62



STANDARD WING OPTIONAL STROBE INSTALLATION

63. Strobes can be installed to the wing post covering. The strobes mount to a custom bracket that installs into the end of the trailing edge spar. The wires can be pushed down the inside of the trailing edge spar by taping them together as a bundle and gently feeding it into the spar tip end. See **Figure 015A-63**.

FIGURE 015A-63



64. The light plate will screw to the light mount. You will have to drill out the 3 holes on the light plate to #11 to get the screws to go through.

65. Install the strobe power supply box. See the parts pages in the options section. The box mounts at station #3 with ¾" Non-cushioned clamps. **NOTE:** The strobe box has high voltage, keep clear of auxiliary tank and fuel lines. The box can be mounted upright or lying flat. Run a 14 gauge yellow wire from the Nav. switch back to the strobe box. Connect a brass "Y" to the end of the wire. The yellow wire coming out of each wing will connect to the "Y". Run a red 14 gauge wire from the strobe switch back to the strobe box. Also, run a black 14 gauge wire back to the switch for the ground. Connect these wires to the black and red wires coming out of the strobe box.

66. Connect the ends, provided in the strobe kit, to the 3 wires coming out of the grey wire. The kit has directions about which way they go on. Red connects to #1, black connects to #2, and white connects to #3. Make sure these ends are pushed up all the way into the connector.

67. The unprotected wire is grounded to the box by a bolt. The two white connectors, from the grey wire, are plugged into the number 1 and 2 outlets. Check all connections and wires. Test the strobes.

S-6S COYOTE II 10 GALLON AUXILIARY FUEL SYSTEM

WARNING: Use of the auxiliary tank will limit the amount of baggage weight. Please check the weight and balance before flight.

The 10-gallon auxiliary fuel tank for your S-6S comes ready to assemble. The fuel cap and fittings will install easily into the tank. At this point the fuselage should be completely assembled and ready to cover. The engine may or may not be mounted at this time. The main fuel system can be installed.

1. Collect all the parts as pictured on the parts page for the fuel system and fuel tank mount system.

2. Look at the fuel tank closely. The filler neck is on the left side of the tank when facing forward. Locate two holes in the top of the fuel tank and the bottom of the fuel tank for the vent, sight gauge, and fuel withdrawl in the raised center sections. Locate the sight gauge on center, top and bottom. Drill a ½" hole for the fittings. Debur all of the holes and vacuum the tank out being sure to remove any shavings. To install the fuel fittings, place a wire in the fitting hole and up through the filler neck, attach a withdrawal fitting and a o-ring to the wire. Make a loop in the end of the wire to keep the parts from falling off in the tank. Pull the fitting to the hole, with the treaded portion exposed, attach additional hardware. Remove the wire and use a allenwrench to hold the fittings in place while tightening nuts. **NOTE:** Do not let the allenwrench slip off of the fittings when tightening, this may cause the o-ring to fall off. Be sure to use loctite on the nuts and thread sealant on the exit fittings.

3. The tank mounts are two pieces, bolt the fuel tank mount braces to the fuselage. After the fuel tank has been prepared mount the fuel tank to the fuel tank mount braces with the fuel tank mount brackets.

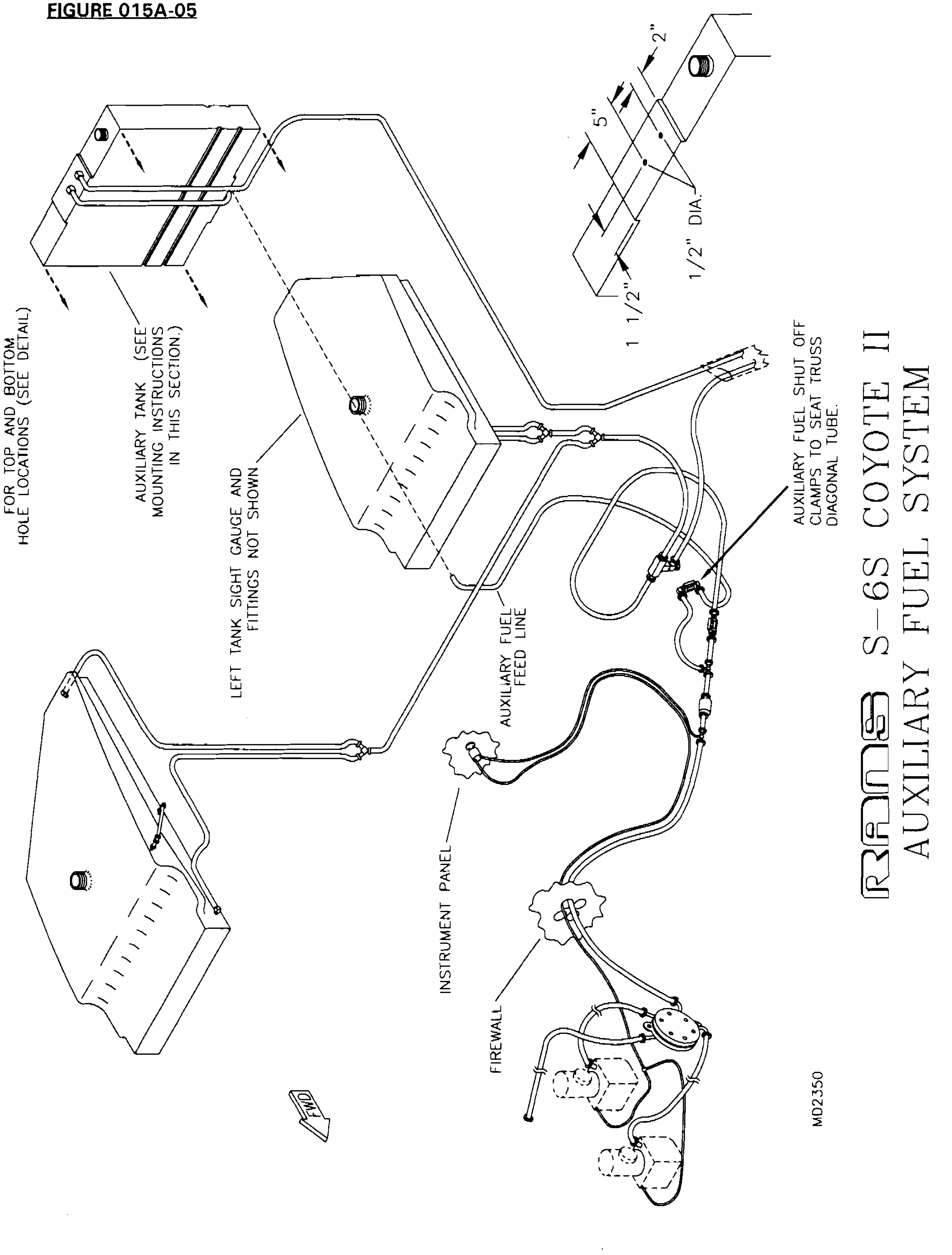
4. Install the fuel level sight gauge line between the two 90° fittings that face forward. Install the gauge after the fuselage skin is laced into place. Mark off the gauge line by the gallon. The vent line on the top of the fuel tank routes along the side of the fuselage and down a gear leg. The last 90° fitting is the fuel feed line, route this line forward along the left side up to the on/off valve.

5. Hook the auxiliary tank into the main fuel system as shown in **Figure 015A-05.** Attach the auxiliary shut valve to the far left seat diagonal using two hose clamps. Install the two 90° fittings pointing AFT. Hook up the fuel lines as shown in **Figure 015A-05.**

OPERATION OF THE AUXILIARY FUEL SYSTEM

The auxiliary tank is below the wing tanks. If both the auxiliary tank and wing tanks are full and both valves are open, fuel will flow into the auxiliary tank and out the overflow. During auxiliary tank operation; (1) Close the main tank valve until the fuel level is at the S-3 middle crossing tube. (2) During fueling close the auxiliary tank valve. **DO NOT OPEN THE AUXILIARY TANK VALVE WHEN FEEDING FROM THE WING TANKS**.

FIGURE 015A-05



INSPECTION OF THE AIRFOIL LIFT STRUTS

RANS airfoil lift struts are made of extruded aluminum. Extrusions of this nature are sensitive to deformation. Cracks and splits can occur along the length of the strut if the ends are compressed beyond the material limits. Over-tightened bolts can cause cracking. A compression bushing or fitting large enough to equal the struts inside diameter should be used. Remove any of the burrs that may be on the ends of the tubing before cutting bushings to fit.

Each and every piece of airfoil strut material is inspected two times before shipment to assure you of a quality product. However we are not infallible, therefore we encourage you to inspect material for any form of deformation and surface imperfection. Deeply grooved struts should not be used and returned to the factory for replacement. The surface should look and feel smooth.

Dents and nicks can occur during shipping. The strut material is very thick skinned and resistant to dents. If dents are present they will usually be large enough to require rejection of the material.
Minor nicks and scratches can and should be sanded out with 250, 350, and finally 400 grit wet or dry sandpaper. Sanding out such defects is an effective way of restoring the strut to a safe full strength status. Any nicks or scratches that need more than light sanding are cause for rejection.

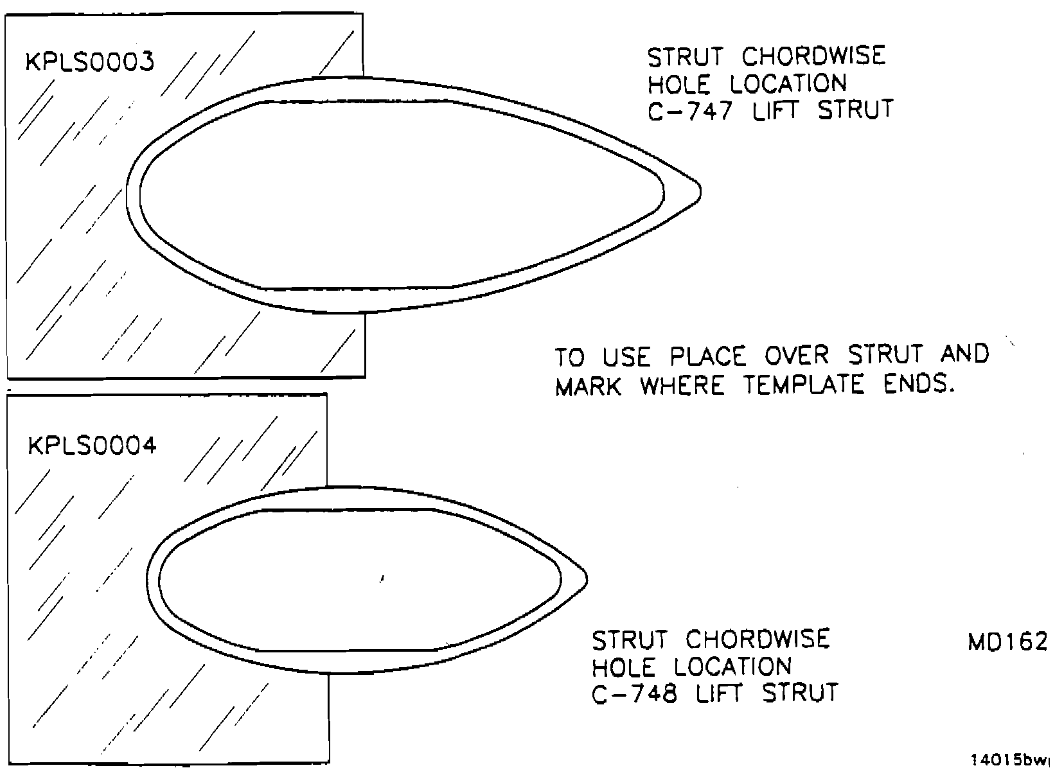
Once the struts are in service, continued inspection is the only required maintenance action. Anodized strut material is resistant to corrosion and needs little care. However, non-anodized material will corrode in a salt air environment and it should be protected inside and out. External protection can be effected using epoxy paints or other high grade finishes. The inside of the strut can be protected with paint by pouring a quantity of paint inside the tube and rotating to cover the entire surface.

Include strut inspection in your pre-flight.

WING STRUT ASSEMBLY

1. Select the parts depicted in the struts parts drawing. **NOTE:** If installing optional swing wing system, refer to options section for additional instructions.

FIGURE 015B-01



2. Take the two large struts, locate, drill and profile as per **Figure 015B-02**. Use the templates as shown in **Figure 015B-01** to locate the exact position of the holes cross wise on the struts. Due to dimensional variation in extruded material it may be required to shim the fittings. No gap should exist between the fittings and the struts. If there is a gap, it should not be eliminated by tightening down the bolts. If a gap exists this action may crack the struts. Instead, use the .020 shim material to insure a tight fit. At the root fittings of the lift struts washers or shims may be required. See **Figure 015B-02B** for guidelines to make these shims. Assemble the fittings to each end as per the parts drawing installing gusset plates using **Figure 015B-02A** for reference. **NOTE:** Drill out the fitting 5/16" as required. Rivet the gusset plates to the forward lift strut with 3/16" stainless steel pop rivets.

FIGURE 015B-02

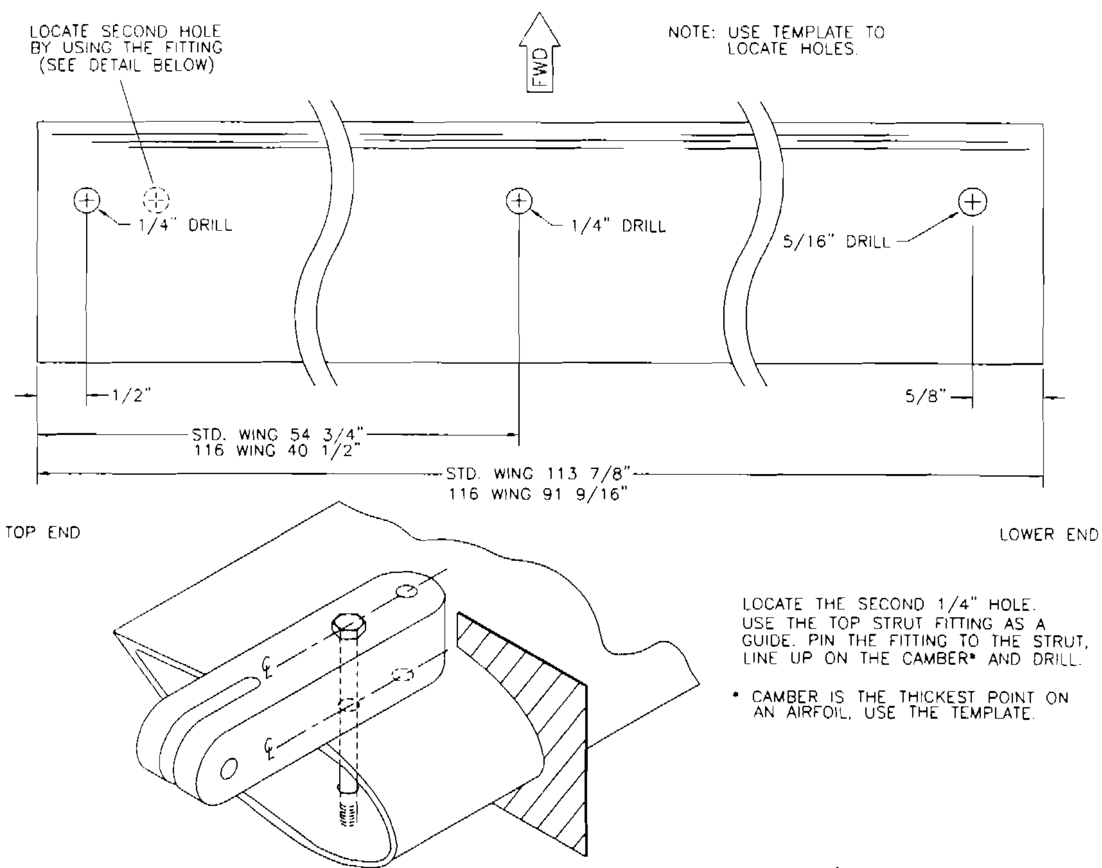


FIGURE 015B-02A

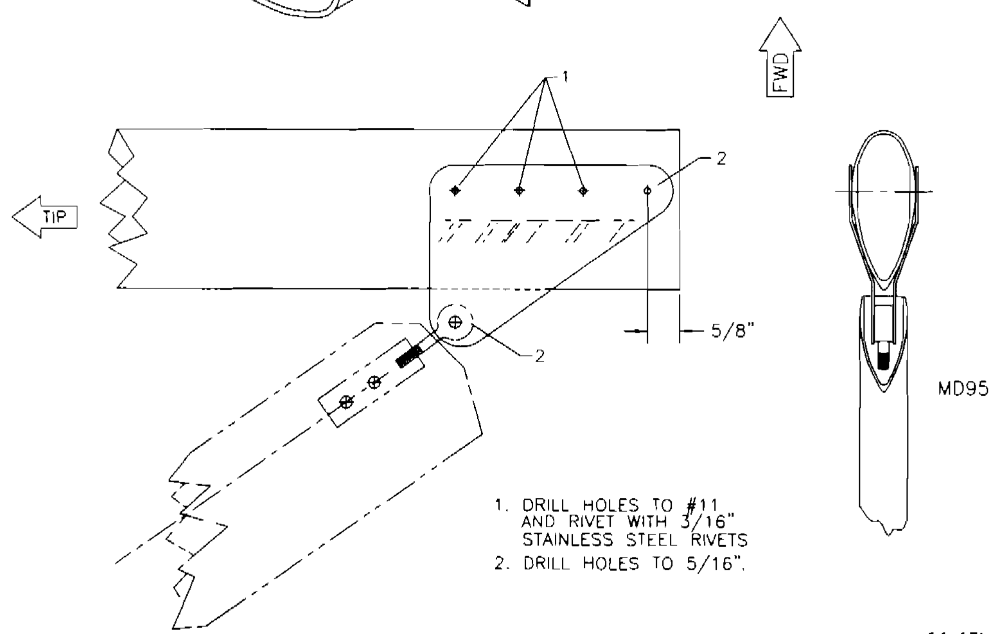
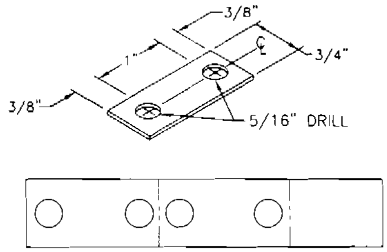


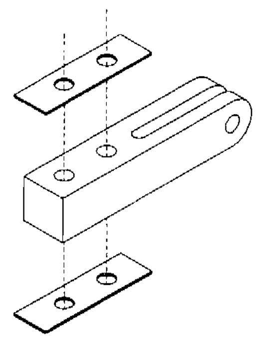
FIGURE 015B-02B

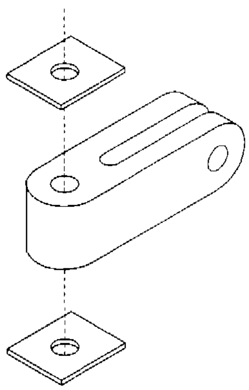
S-6S LIFT STRUT SHIMS

UPPER FWD STRUT SHIM

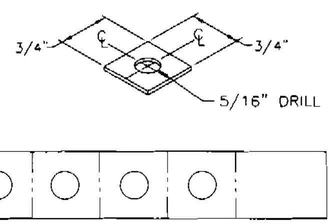


HINT: DRILL HOLES IN SHIM STRAP THEN CUT TO LENGTH. MAKE AS REQUIRED.

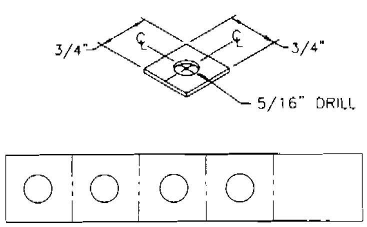


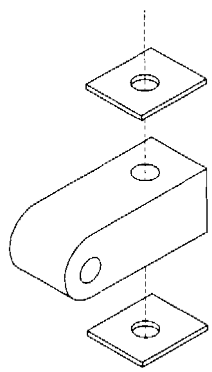


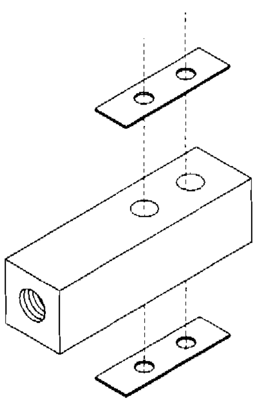
UPPER AFT STRUT SHIM



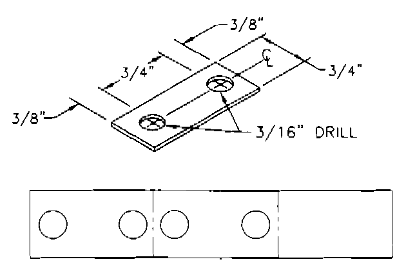
LOWER FWD STRUT SHIM







OPTIONAL ADJUSTABLE STRUT SHIM



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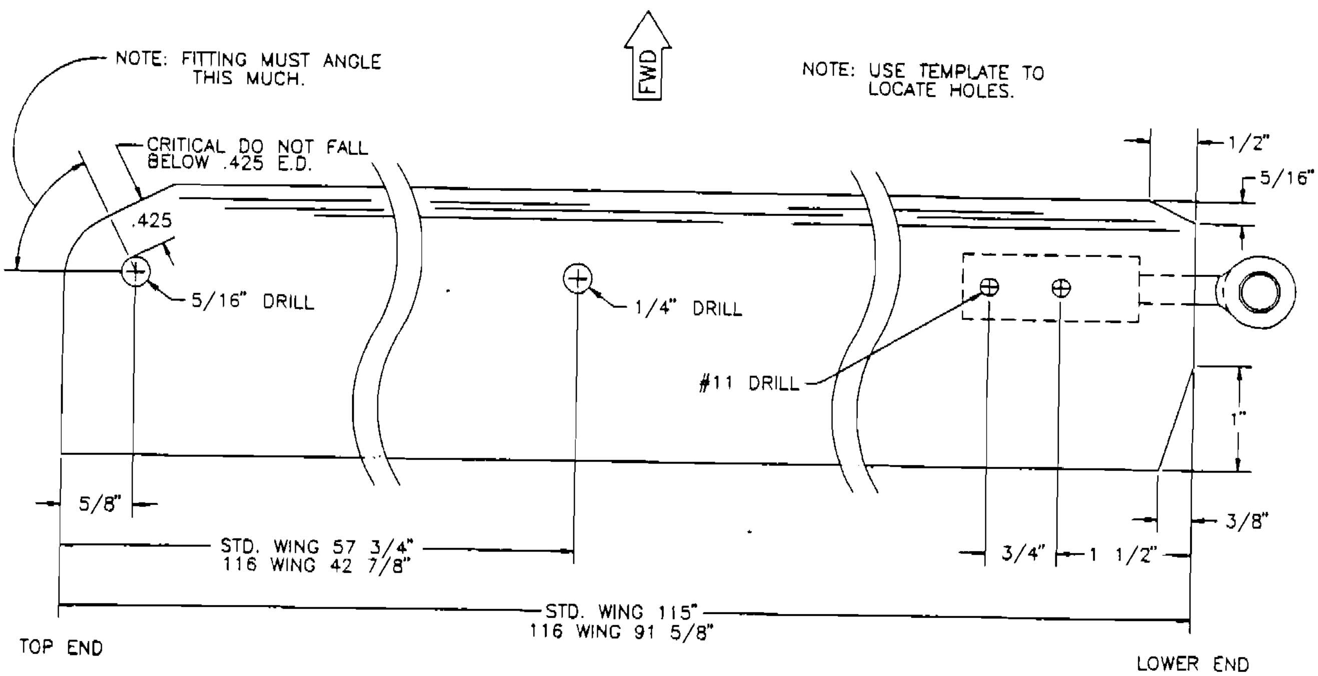
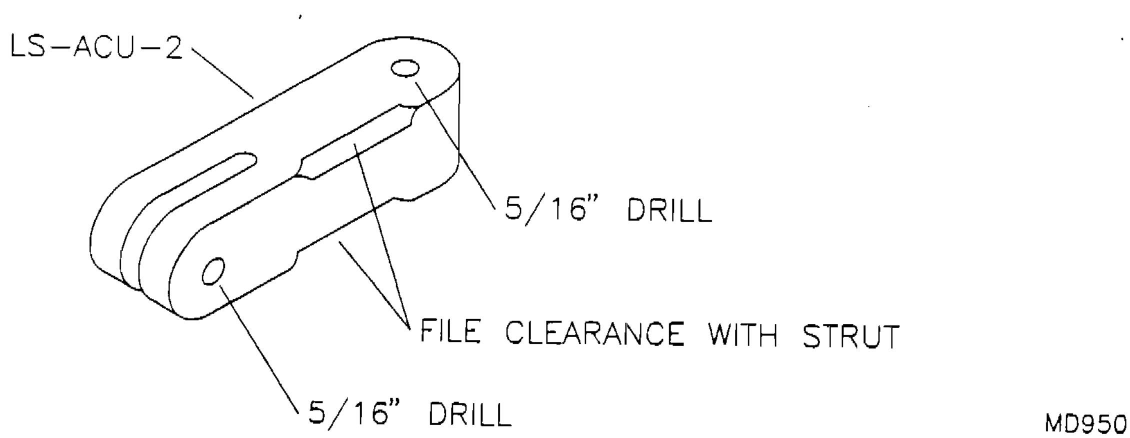
3. Cut, profile and drill the AFT lift strut as shown in **Figure 015B-03.**

FIGURE 015B-03



4. Take a 5/16" drill and drill a test hole in the scrap stock to check hole fit on bolt. Drill out the two #11 holes to 5/16" on the AFT strut top fitting. File clearance notches to allow the fitting to angle. Bolt in place both top and bottom fittings. See **Figure 015B-04.**

FIGURE 015B-04



S-6S COYOTE II 116 WING ASSEMBLY

LEADING EDGE SPAR ASSEMBLY

NOTE: The spars are different for LH and RH. Use the correct one for each wing. Support your wings on saw horses, 2 per wing.

NOTE: If installing optional swing wing system, refer to options section for additional instructions prior to assembly.

1. Select the necessary parts as shown in the parts drawing.

2. The leading edge spar comes with all primary holes pilot drilled. The final hole sizes are called out during assembly. **NOTE:** The front outboard side of the spar has two (2) holes for mounting the tip bow. The third and fourth outboard holes on the left leading edge spar will be drilled out to 1/4" to hold the static and pitot tubes.

3. Drill #11 the aft side holes 5 ⅝" and 45 7/16" outboard of the root. Rivet the S2-SAB in place. Bolt the long wing channel in place. **NOTE:** Position the channel so the unbolted end points to the tip. Line up the channel parallel with the spar, drill #11 and rivet through remaining holes. (Only drill through the one side of the spar). **HINT:** Lay a straight 1" tube between the S2-SAB and channel to aid in alignment.

4. Attach the strut attach plates. For best accuracy, lay the strut attach plate against the spar holes and use as a template. In fact it is best to drill through with a ¼" drill and bolt, then drill the other two holes out to 23/64", press fit bushing. When drilling out to ⅜", drill from each side **not** from one side through to the other. Debur and install the ⅜" x 3" bushings, ¼" bolts, strut attach plate and wing channel as shown in the parts drawing.

5. Drill #11 the hole located 2 ½", on the aft side, from the tip end of the leading edge spar. Rivet an S2-SAB to the spar. **NOTE:** The outboard compression tube will bolt to this bracket and another S2-SAB rivets to the aft spar's forward side in the same location after the tip bow is installed.

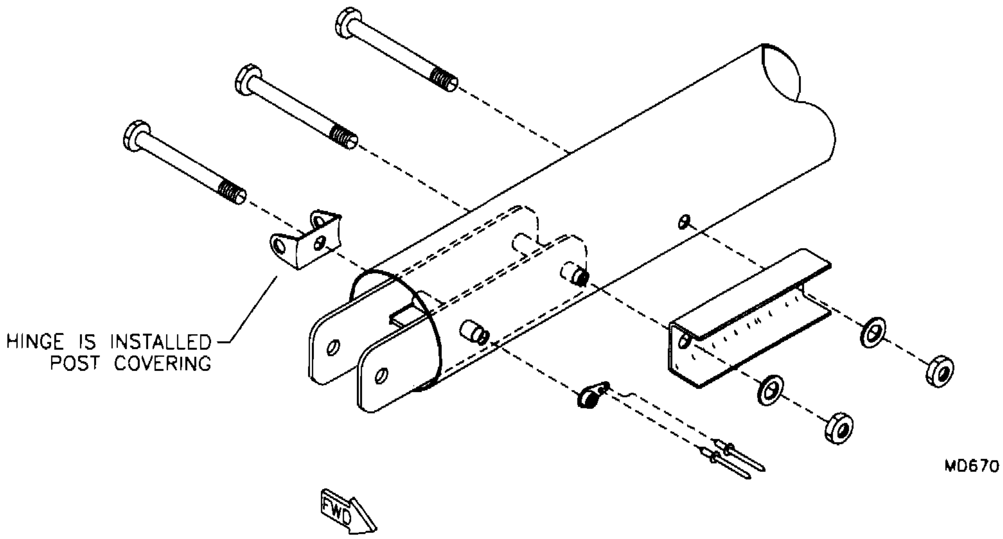
TRAILING EDGE SPAR ASSEMBLY

NOTE: The spars have a fwd and aft. The aft side has a hole near the outer tip. Assemble both spars the same but make a LH and a RH.

6. Drill #11 the three (3) inboard holes on both sides of the spar. Bolt a long wing channel to the outer two holes. **NOTE:** The inner bolt is used to retain the universal hinge bracket, do **not** tighten until the next step.

7. Collect the parts shown in the universal hinge drawing. Make and insert the bushings into the fitting bushings. **HINT:** An easy way to fabricate these bushings is to drill the inside diameter to #11 first. Cut them to length after drilling. Press the bushings into the ends of the bushings on the spar fitting. If the bushings do not press in, glue them in using a dab of JB weld. Test fit the fitting into the end of the spar. It most likely will need to be contoured to the spars inside diameter. Assemble the hinge into the trailing edge spars inboard end. Use the first and second bolts at the spars root to attach the fitting. Only finger tighten the bolt at this time. Rivet a 3/16" single-ear nut plate to the front side of the rear spar for the first inboard bolt. This bolt is used as a flap hinge point. **NOTE:** The nut plate is required due to wing covering limiting access for nut installation. See **Figure 015C-07.**

FIGURE 015C-07



8. Drill #11 the hole, fwd & aft, 46 11/16" outboard of the root end. Bolt a long wing channel to the spar. Position the unbolted end to the **TIP** side. Line up the channel parallel, drill #11and rivet.

9. Drill the three (3) in a row holes and attach the aft strut plates following the same procedure as in step 4.

10. Drill #11 the flap/aileron hinge position holes. Rivet on the front side of the rear spar a 3/16" nut plate. Position the nut plates so the rivets are parallel with the spars.

INTERNAL BRACE TUBE ASSEMBLY and AILERON PUSH PULL TUBE ASSEMBLY (REFER TO CONTROL STICK FOR SELECTION OF PARTS)

11. Refer to wing internal bracing tubes and select the parts for assembly.

12. Slide the door upcatch onto the root drag brace and install the drag braces. Slide the compression tube doubler onto the middle compression tube and install all compression tubes. Note that the flap compression tube is positioned with the teleflex retainer mount hole toward the trailing edge and that the jury strut bracket attaches to the leading edge mount bolt. **CAUTION:** Use a tensile nut. **IMPORTANT:** Double check the position of the jury strut bracket before covering the wing! Refer to the parts drawing. Position and rivet the door upcatch in place as shown in **FIGURE 015C-12.**

13. Before bolting the middle compression tube in place, slip on the aileron bellcrank doubler. The aileron bellcrank doubler is a 4" tube 1 ⅛" in diameter. Bolt the flap compression tubes with the hole for mounting the teleflex retainer closest to the trailing spar.

14. Locate aileron push pull tube guide on second outboard compression tube, as per **Figure 015C-14.** Install the flap teleflex retainer on the W-FCT tube to the inside. See **Figure 015C-14A.**

FIGURE 015C-12

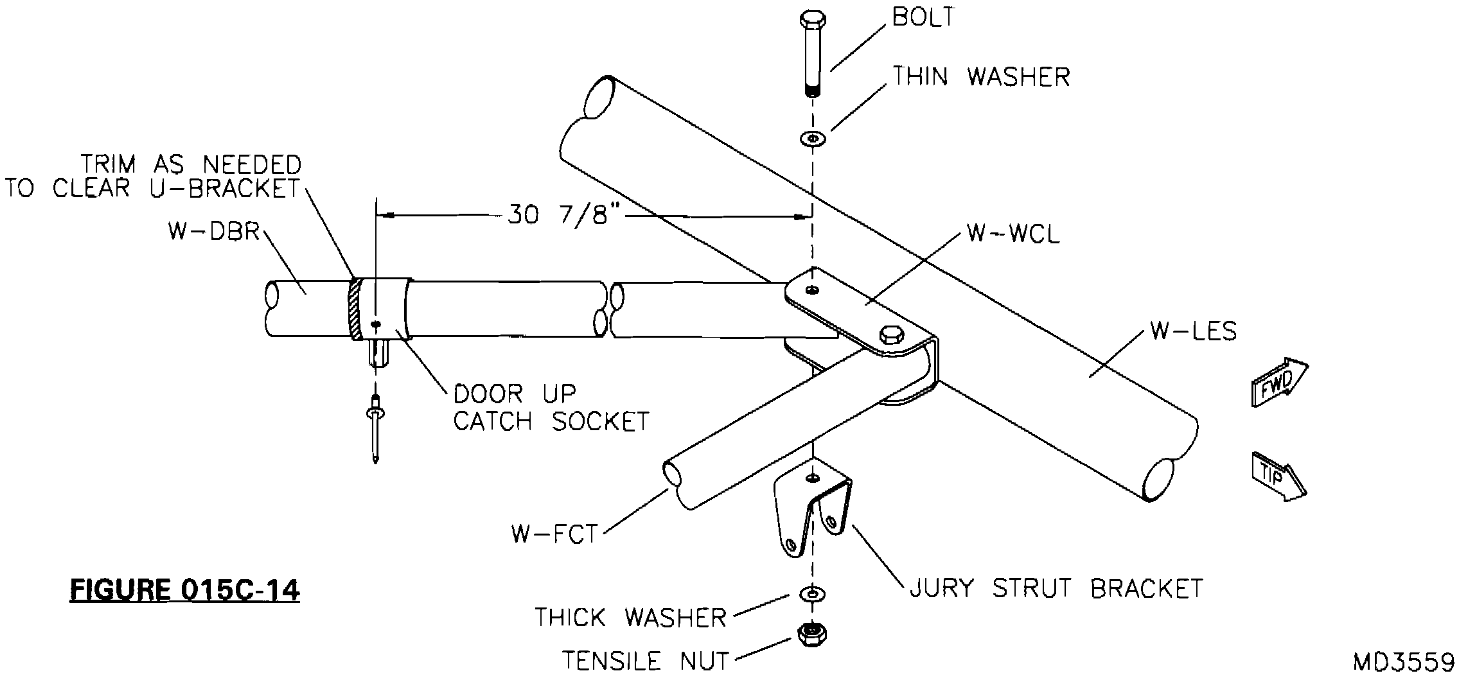


FIGURE 015C-14

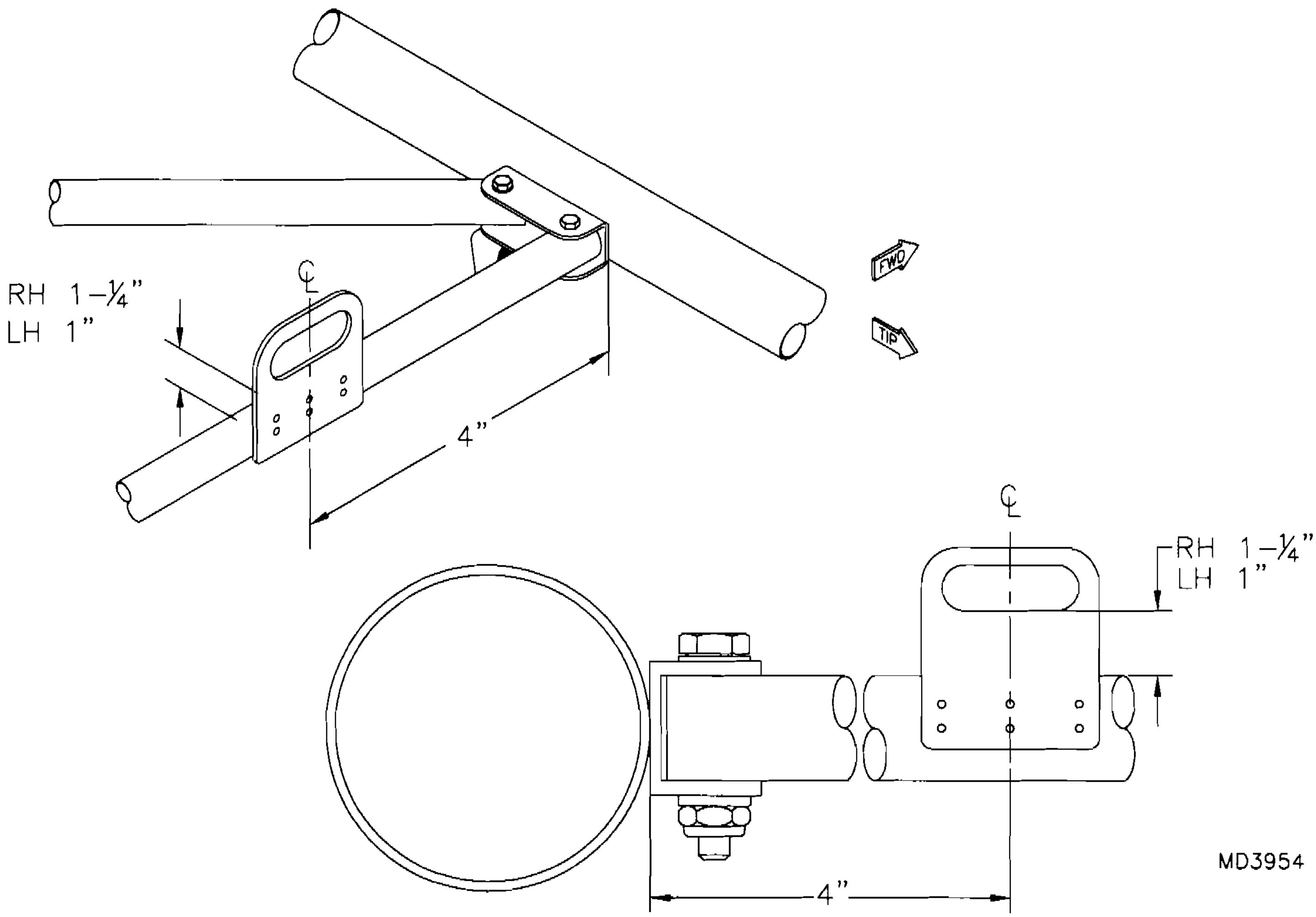
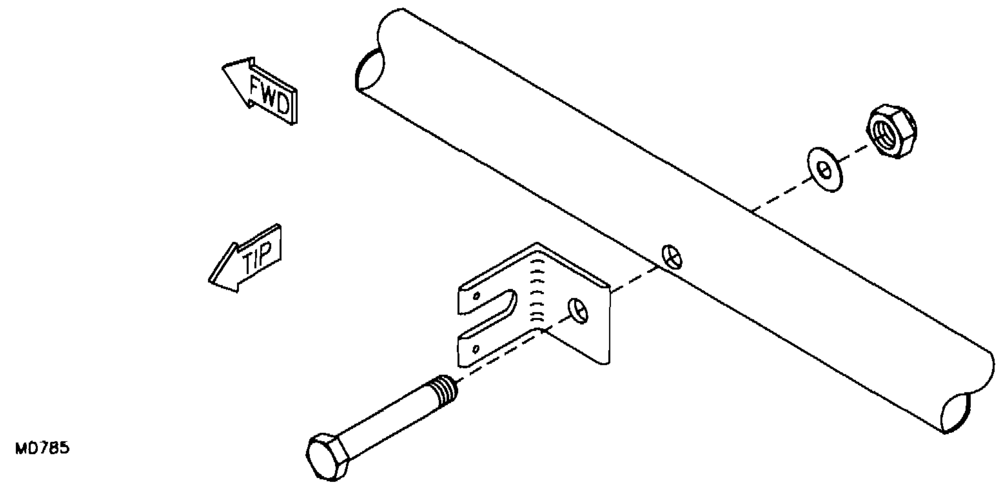


FIGURE 015C-14A



15. Place the flange bearing into the bellcrank hole. **PLEASE NOTE:** Due to variations in the flange bearing it may be required to drill out the ¾" hole to ⅞". It will also be required to bevel the holes inside edge to allow the bearing to fit flat against the bellcrank. Drill #30 and rivet every other hole in the flange bearing for a total of six holes. Pay close attention to which side of the bellcrank the bearing rivets and make one for the left and right. See **Figure 015C-15**. Install the aileron bellcranks as shown in **Figure 015C-15A**. The bellcrank gusset bolts to the channel bracket's two bolts, the other hole is located over the compression tube. Starting from the bottom, drill out to ¼" through the compression tube, doubler and gusset. From this ¼" hole drill a #30 hole 1 13/16" FWD towards the channel bracket and rivet the gusset to the tube and doubler. **IMPORTANT**: Install the bellcrank gussets with the small flange pointing **DOWN**. Install the aileron bellcrank with the bearing on the **UNDERSIDE** of the bellcrank. The longer arm of the bellcrank should be to the wing tip side of the compression tube for attachment to the short aileron push pull tube.

FIGURE 015C-15

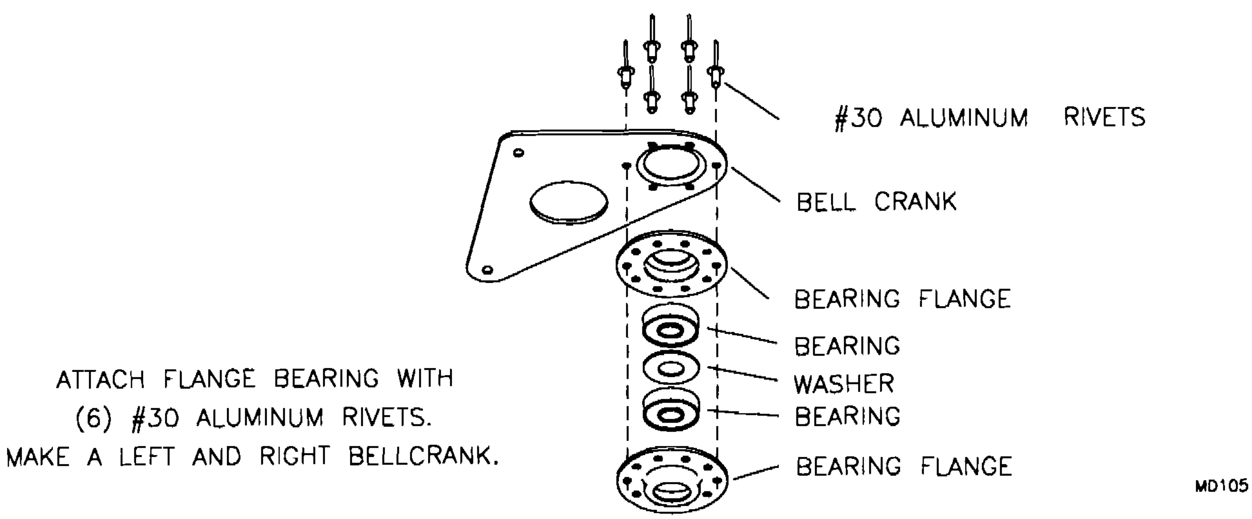
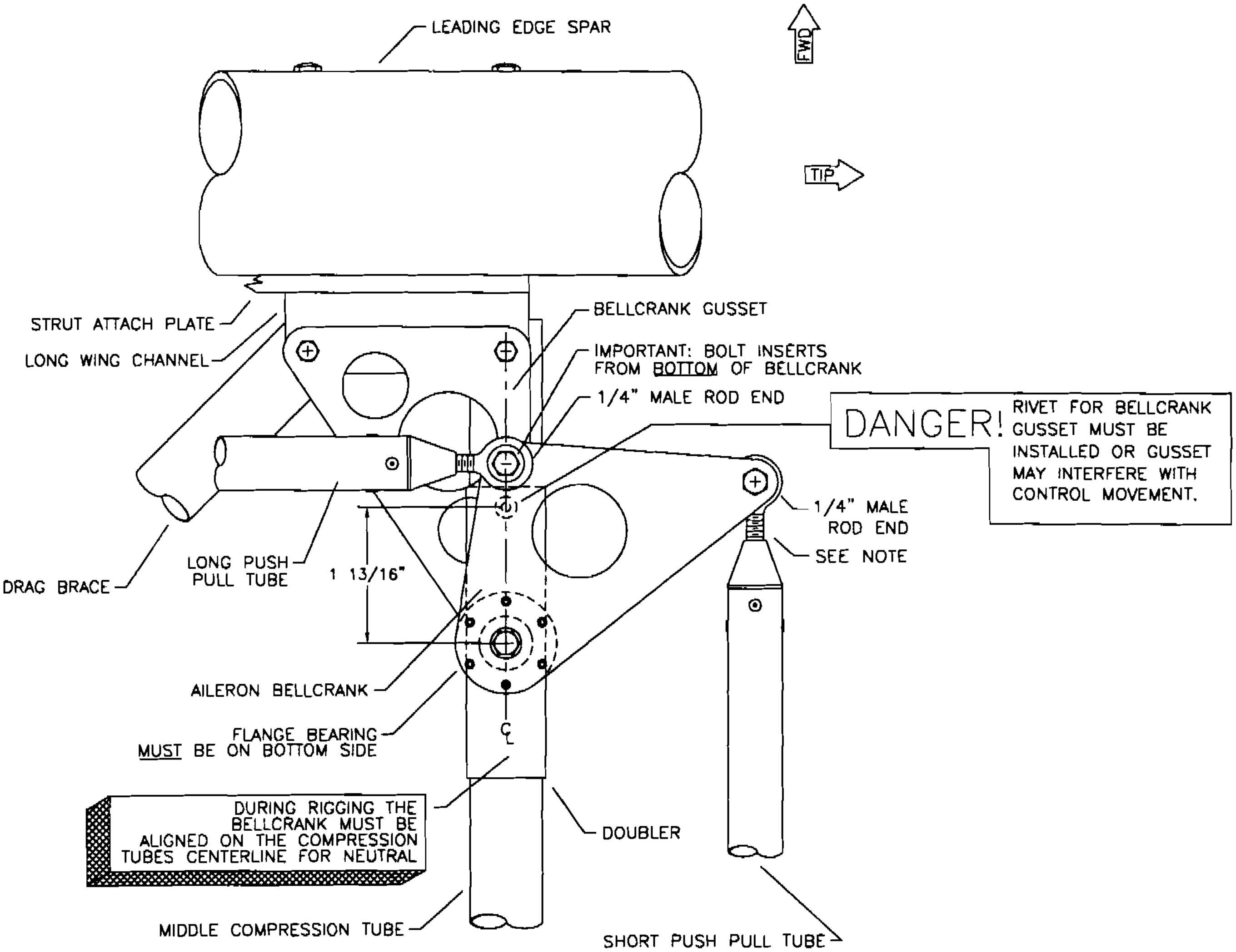


FIGURE 015C-15A



IMPORTANT: SMALL FLANGE ON GUSSET MUST POINT DOWN

NOTE: DO NOT STOP NUT. THE ROD END IS LEFT ATTACHED TO THE BELLCRANK AFTER COVERING THE WING THE AILERON PUSH PULL TUBE IS INSERTED THROUGH THE EXIT HOLE IN THE WING AND SCREWED INTO THE ROD END.

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TIP BOW ASSEMBLY

16. The wing tip bow fastens to the **OUTSIDE** of the leading edge spar and **INSIDE** of the trailing edge spar. This is done to allow attachment and support for the leading edge skin. The tip bow and leading/trailing edge spars come with pre-located holes. Drill #11 the matching spar holes. Drill the tip bow forward holes to ¼" and install two (2) rivnuts. See **Figure 015C-16**. Bolt the tip bow to the leading edge spar as per **Figure 015C-16A**. Rivet the tip bow to the trailing edge spar. See the parts page for hardware.

FIGURE 015C-16

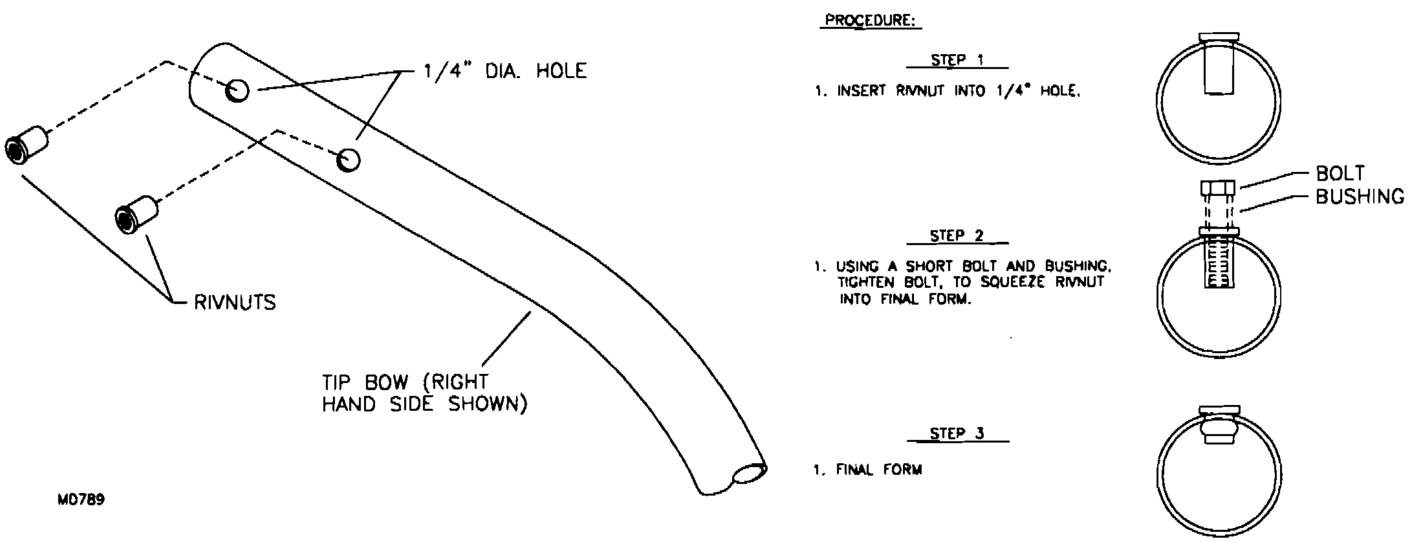
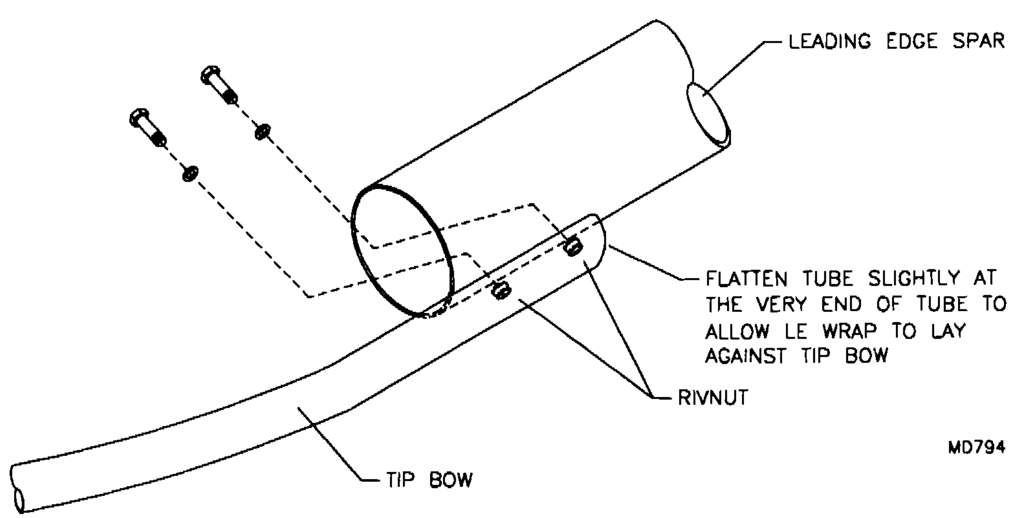


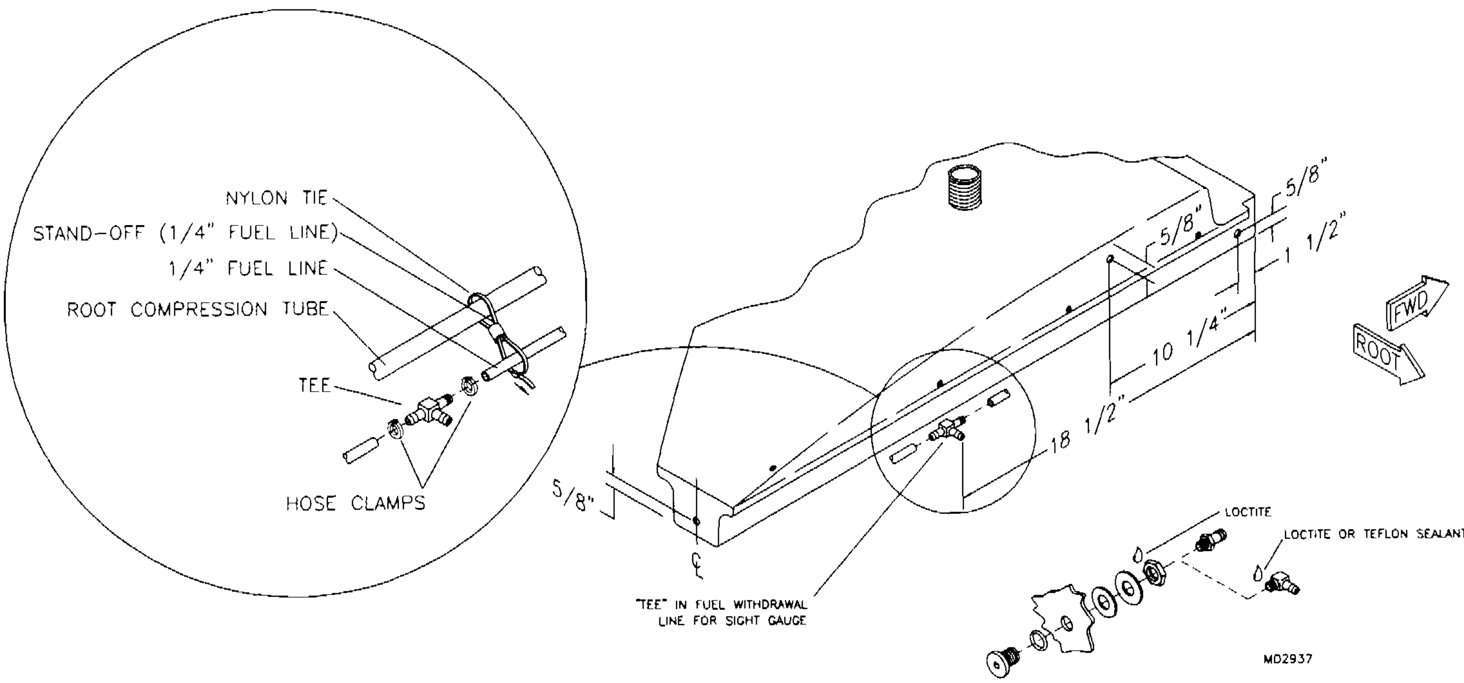
FIGURE 015C-16A



S-6S COYOTE II 116 WING TANK ASSEMBLY

17. Select the necessary parts as shown in the parts drawing. The fuel tanks are leak tested from the supplier and guaranteed leak proof. You, however, may want to perform a leak test, especially after installing the fuel fittings. If you desire, fill the tank(s) with water and let it sit for approximately 48 hours. Locate 1/2" diameter holes for the fuel fittings at the locations shown in **FIGURE 015C-17.** ***IMPORTANT:*** *These measurements are very critical for proper clearance of the Tank Withdrawal Fittings.* ***HINT:*** *A UNIBIT step-drill makes a very clean, accurate hole.* All fittings are located on the inboard side of the wing tank (see parts manual for orientation). Debur all holes. ***NOTE:*** *Mark on the tank the position for the 1/4" Tee (lower sight gauge attachment).* Secure the Tee to the Root Compression Tube when installing the tank in the wing. Remove ALL shavings and loose debris from the interior of the tank. Use a vacuum to assist in removal. Install the fittings by placing a wire in the fitting hole and up through the filler neck, attach a tank withdrawal fitting and an o-ring. Make a loop in the end of the wire to keep the parts from falling off, then pull the fitting to the hole with the threaded portion out of the tank. Remove the wire. Holding the fitting with the threaded portion extended out of the tank, thread on the rubber washer, metal washer and nut with Loctite. ***NOTE:*** *Use a 1/4" Allen wrench to hold the tank withdrawal fitting while tightening the nut.* ***HINT:*** *Hold the metal washer with a needle-nose Vise-Grip to prevent rotation while tightening the nut.* Allow Loctite to dry. Apply sealant to the straight or 90 degree fuel line fittings, and screw into the tank withdrawal fitting until snug. ***CAUTION:*** *Do not tighten to the point the tank withdrawal fitting turns in the tank.* Also do not over-tighten fuel line fittings, this may cause the withdrawal fitting to break.

FIGURE 015C-17



FUEL CAP/VENT ASSEMBLY

18. Remove the rubber gasket and plastic baffle from the fuel cap. The plastic baffle will "snap" out of the fuel cap. ***HINT:*** A screwdriver works well for the removal.

19. Locate and drill a 1/4" hole in the center of the fuel cap as shown in **FIGURE 015C-19**. Install the conduit adjuster ferrule into the fuel cap. Apply a small drop of Loctite, install the 1/4" plain nut, and tighten to secure the ferrule into the cap. See **FIGURE 015C-19A**.

FIGURE 015C-19

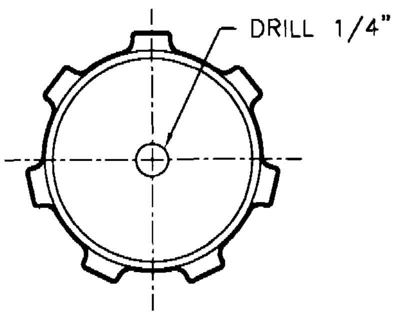
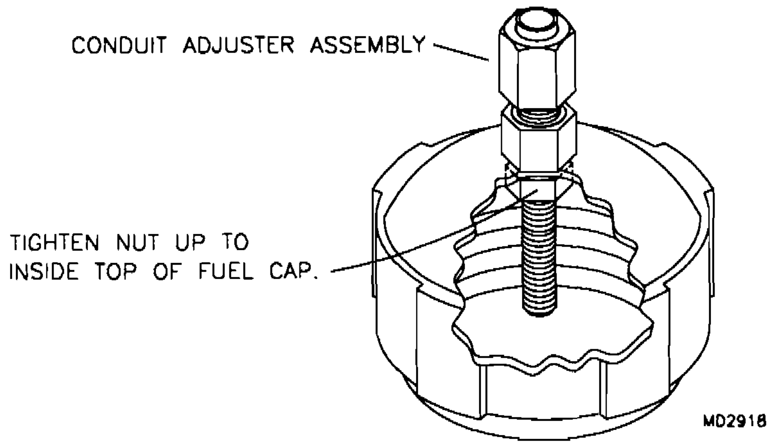


FIGURE 015C-19A



20. With a side cutters or file remove the attach nipples from the plastic baffle. See **FIGURE 015C-20.** Drill a ¼" hole in the center of the plastic baffle and install into the fuel cap over the adjuster ferrule stem. Drill a ¼" hole in the center of the rubber gasket and install into the cap. Note the orientation of the rubber gasket.

21. Drill the ¼" large washer as shown in **FIGURE 015C-21**. Assemble the bead chain to the bead chain retainer sleeve. Install the bead chain and retainer sleeve into the #30 hole in the large washer. Install the washer and bead chain into the fuel cap. Install the ¼" shear nut on the adjuster ferrule stem and tighten.

FIGURE 015C-20

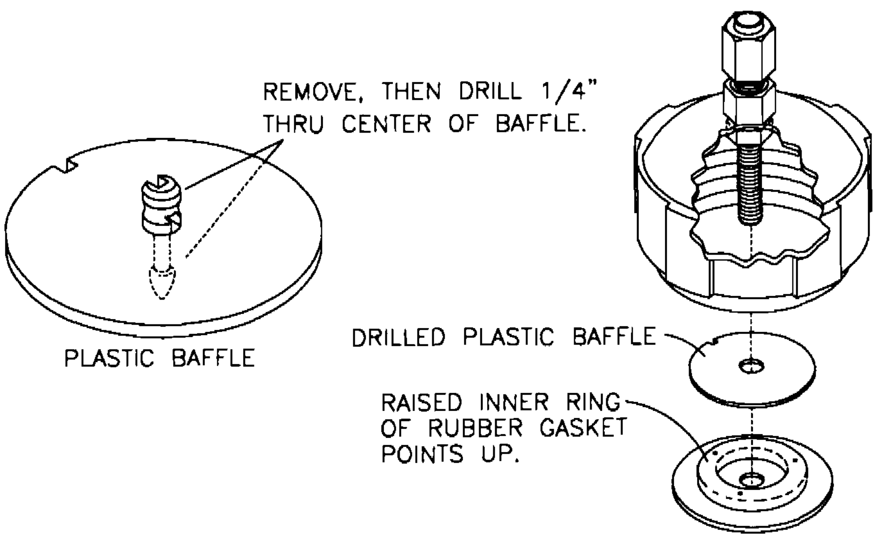
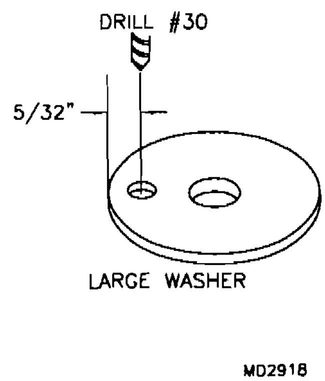


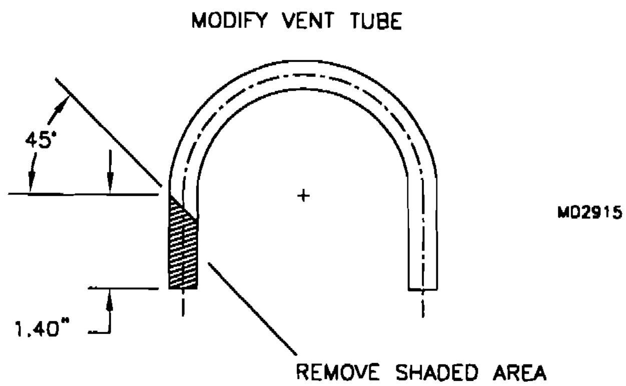
FIGURE 015C-21



22. Install the bead chain end coupling onto the bead chain. Find the center of the plastic retainer and drill a #30 hole. Using the brass backing washer, rivet the plastic retainer to the bead chain. Refer to the parts drawing.

23. Modify the vent tube as shown in **FIGURE 015C-23**. Install the vent tube into the adjuster ferrule. Install the fuel cap assembly onto the tank and tighten. Position the vent tube so that the 45 degree angle is pointing forward (into the slipstream) and tighten the ferrule cap to secure the vent tube.

FIGURE 015C-23

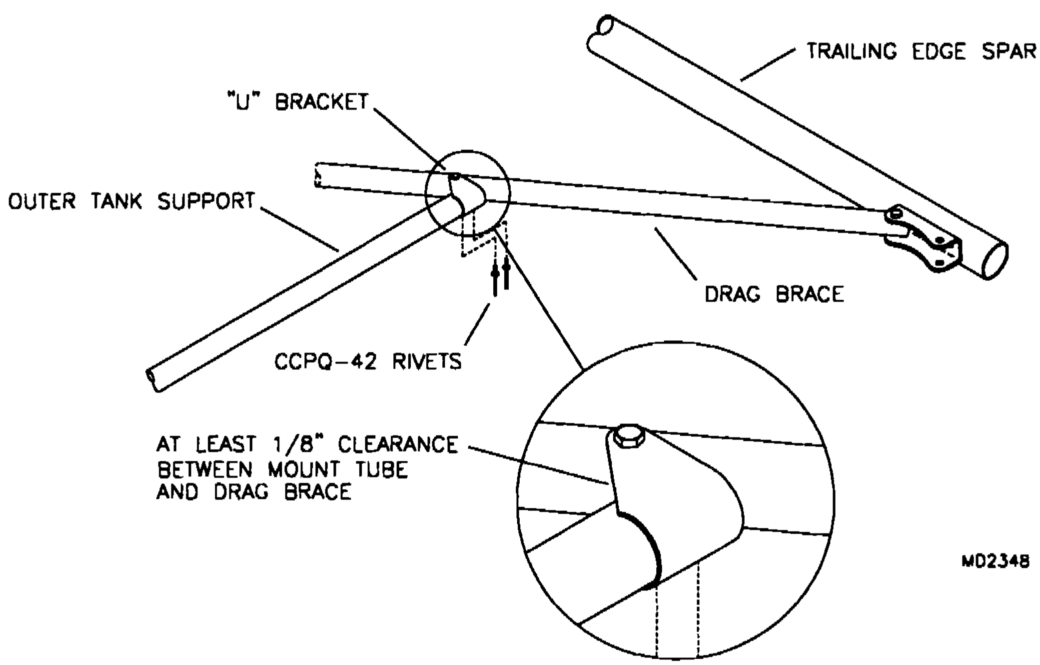


FUEL TANK MOUNTING

24. Be certain the tank assembly steps have been completed before installing fuel tanks to the wings. Mark the centerline along the aft side of the leading edge spar, from the S2-SAB on the inner compression tube to about 16" outboard; this helps locate the S2-SAB which retains the outer tank support.

25. Locate the tank to the wing frame, its forward side ⅛" from the leading edge spar and inboard side 1/10" from the inner compression tube. Locate an S2-SAB to the leading edge spar, ⅛" outboard of the fuel tank, transfer-drill #11 and rivet to spar. NOTE: **When locating the S2-SAB, check that the tank withdrawal fitting will clear the inner compression tube once the tank is in position.** If necessary, the S2-SAB may be moved slightly farther outboard, allowing the tank to be positioned farther from the compression tube; if doing so, ensure that the tank remains properly supported by the compression tube. Bolt the forward end of the outer tank support to the S2-SAB. Place the tank in position and pull the outer tank support parallel to the tank. Mark and cut the outer tank support diagonally where it meets the drag brace; be careful not to cut the tube short. Locate U-bracket to drag brace, transfer-drill #11, install nut plate and bolt. Drill two #30 holes through underside of U-bracket and rivet to tank support. See **Figure 015C-25.**

FIGURE 015C-25



26. Bolt the wing tank mount brackets to the fuel tank using the hardware shown. Notice that the bent bracket bolts to the aft of the fuel tank on the inboard side. Using the tank mount brackets as a guide, drill the brackets and inner compression tube out to #30. Install the rivets shown in the parts manual. Repeat this for the outer tank support. **NOTE:** Only the forward two (2) mount brackets are used on the outer tank support. Once tank installation is complete, apply loctite to the bolts which hold the tank in place. Repeat for the second wing tank. Route the fuel lines as shown in the parts manual. **HINT:** For now, only tape the fuel lines in position. This will ensure proper routing without wasting zip ties. Zip tie lines in position during final assembly once satisfied with the routing. **CAUTION:** Over-tight zip ties may cause fuel starvation. Be sure to route the fuel lines out the wing near the trailing edge. This will allow the wing to easily fold. **NOTE:** Remenber to **Loc-tite** bolts.

WING RIB INSTALLATION

27. Refer to **Figure 015C-27** for the location of each rib clip. **DANGER**: Do not install more than the required rivets per rib clip. **PLEASE NOTE:** Rib both front & rear rib clips have a top. See **Figure 015C-27B.** Be careful not to install clips upside down. Some builders have riveted the clips to the spars with rivets placed in the "work" zone. The "work" zone on a tubular spar is the top and bottom 25% of the circumference. See **Figure 015C-27A**. This effectively destroys the strength of the spar, in most cases, should the top or bottom 25% of either the leading or trailing edge spars have holes. **EXCEPTION:** At the very root and tip ends of the spars, some holes are drilled in the top 25%. These are permitted due to load path terminal location. The rib clips should be oriented on each spar as shown in **Figure 015C-27B. HINT:** Use a long piece of angle to act as a clip stop. Tape or clamp angle to spars.

FIGURE 015C-27

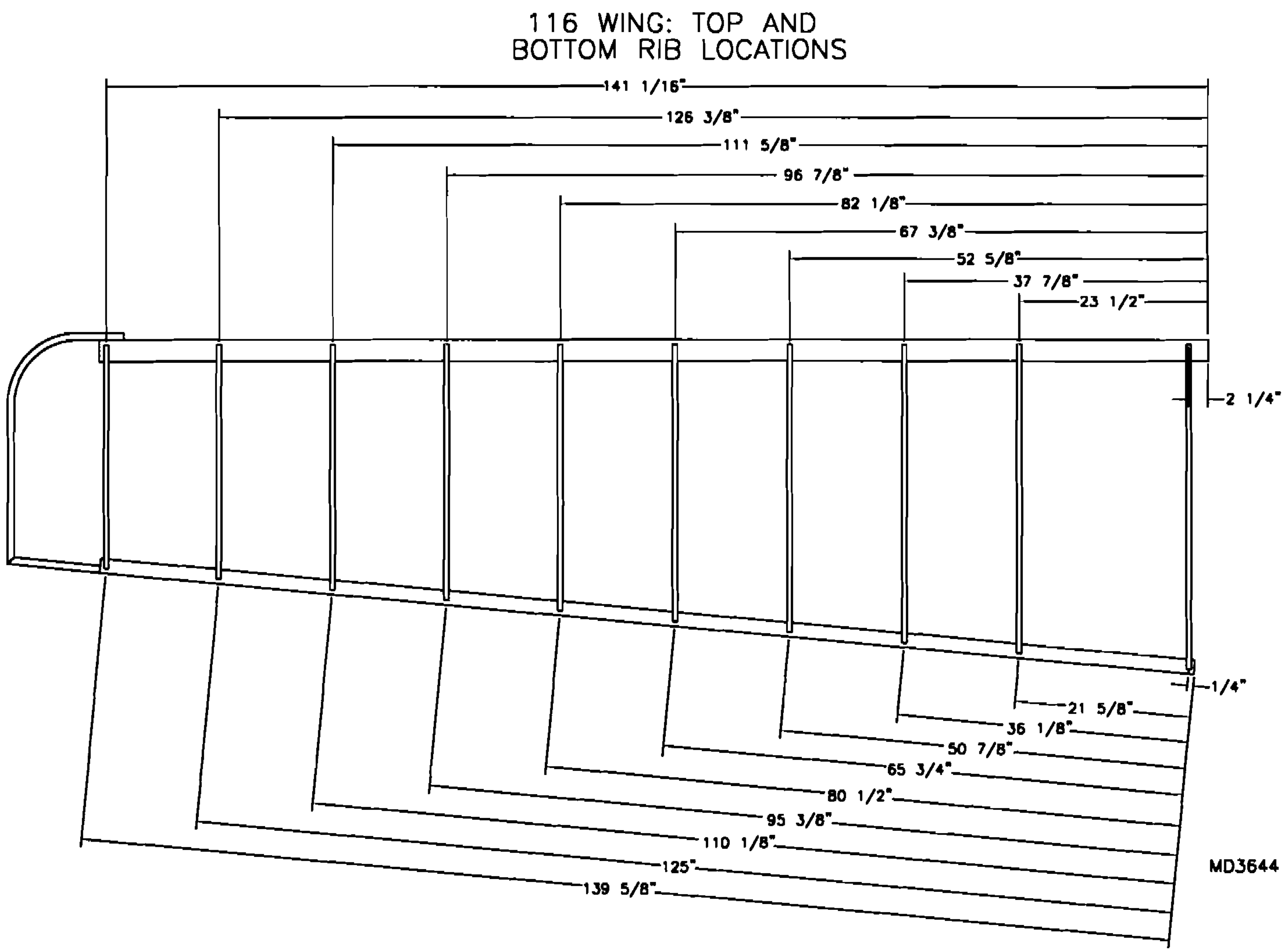


FIGURE 015C-27A

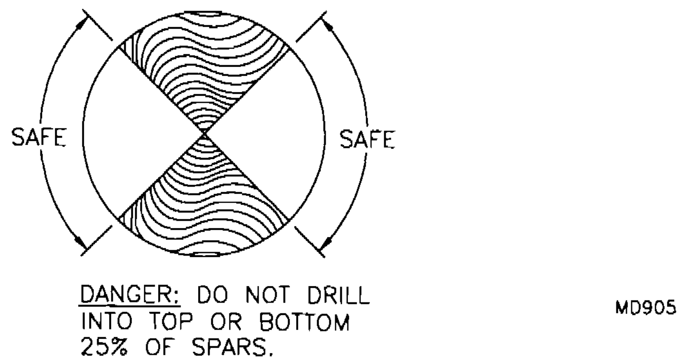
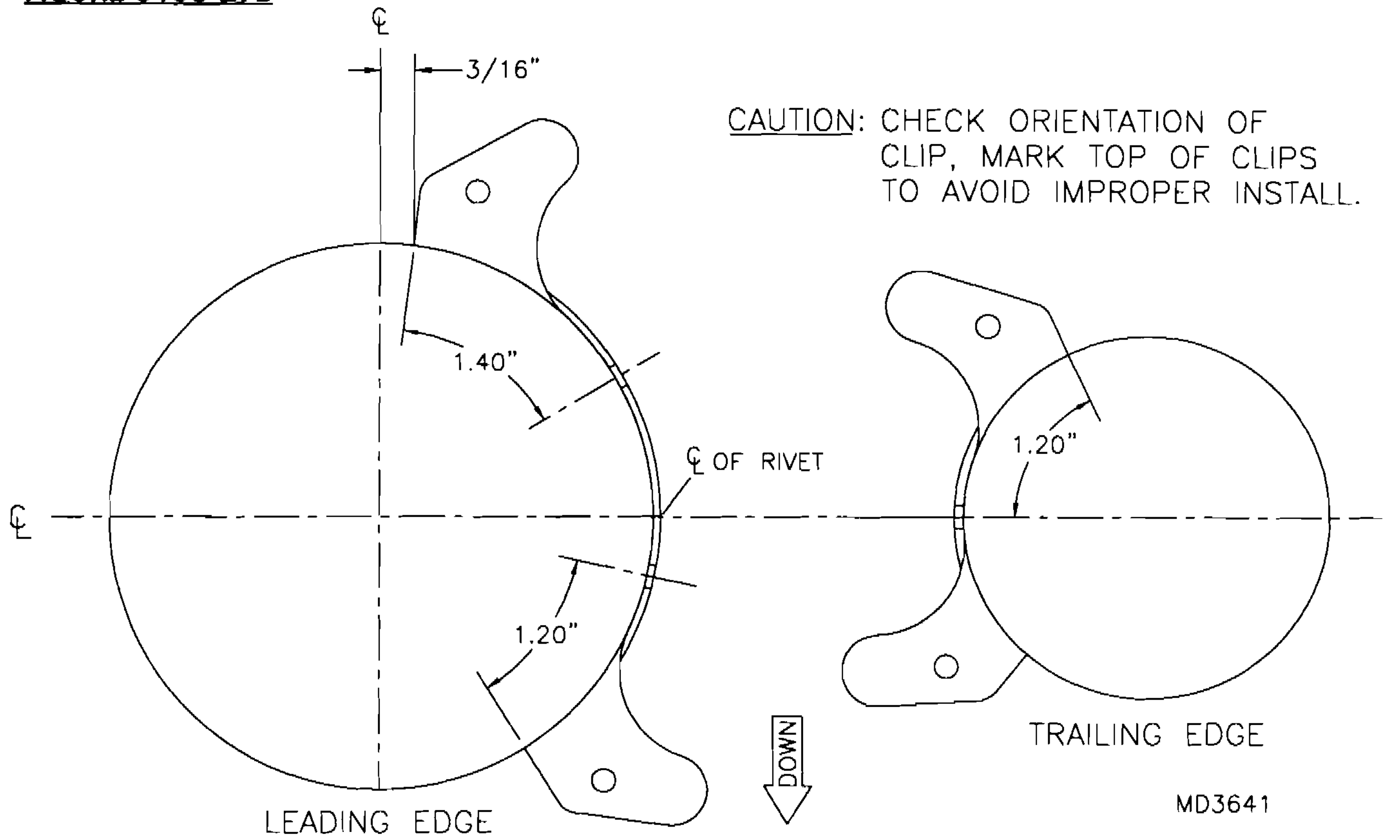


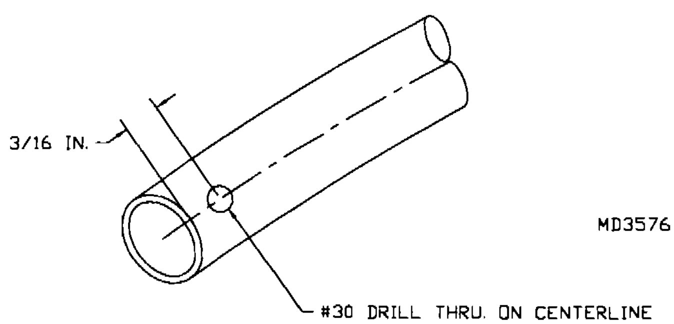
FIGURE 015C-27B



28. Drill #30 and cleco the rib clips to the spars. **NOTE:** The trailing edge clip for rib #5 will be mounted under the nut plate. Drill the clip mounting hole to #11 and cleco under the nut plate. See the detail in the parts manual.

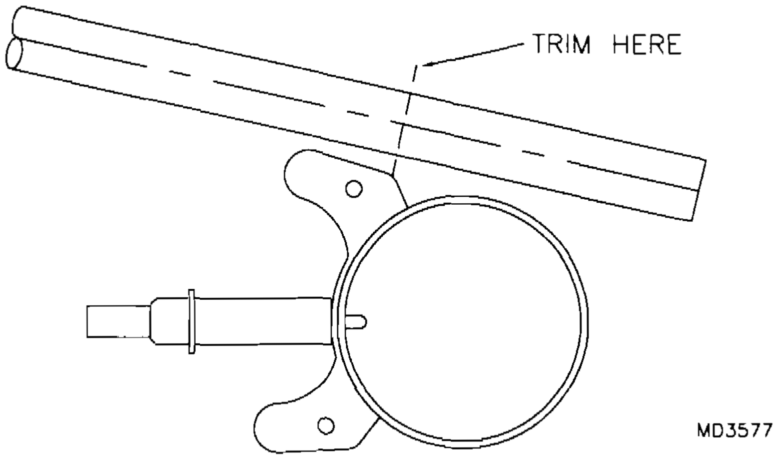
29. The top and bottom wing ribs for the S-6S 116 wing come pre-shaped, however they will need to be trimmed to length. Drill #30 the forward end of each rib as shown in **Figure 015C-29. Note:** The forward end of the rib is denoted by the bend or a mark on the tube. **HINT:** Lay the ribs on a flat surface to determine the centerline.

FIGURE 015C-29



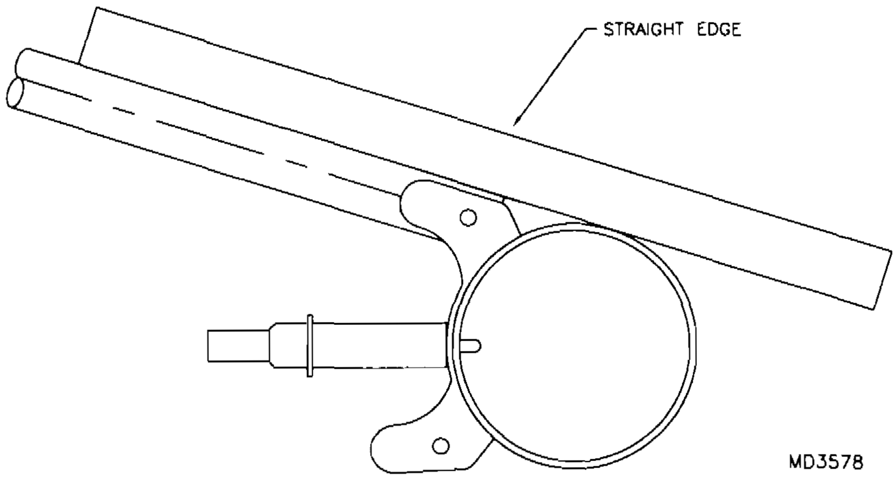
30. With the wing right side up, cleco the top ribs to the front rib clips. Mark and trim the aft end of each rib as shown in **Figure 015C-30.** Do **not** pull on the rib. Allow the rib to rest naturally. **HINT**: Start at the root and fit each rib one at a time, in case of trimming a rib too short.

FIGURE 015C-30



31. **NOTE:** The ears of the t.e. clip will need to be slightly bent to align with the rib. Allow the aft end of the rib to rest in the rib clip. Check the profile of the rib in relation to the trailing edge spar. See **Figure 015C-31.** Transfer drill #30 and cleco the rib and clip. **NOTE:** At least a 3/16" e.d. should be maintained. Profile the rib as needed to clear the clip.

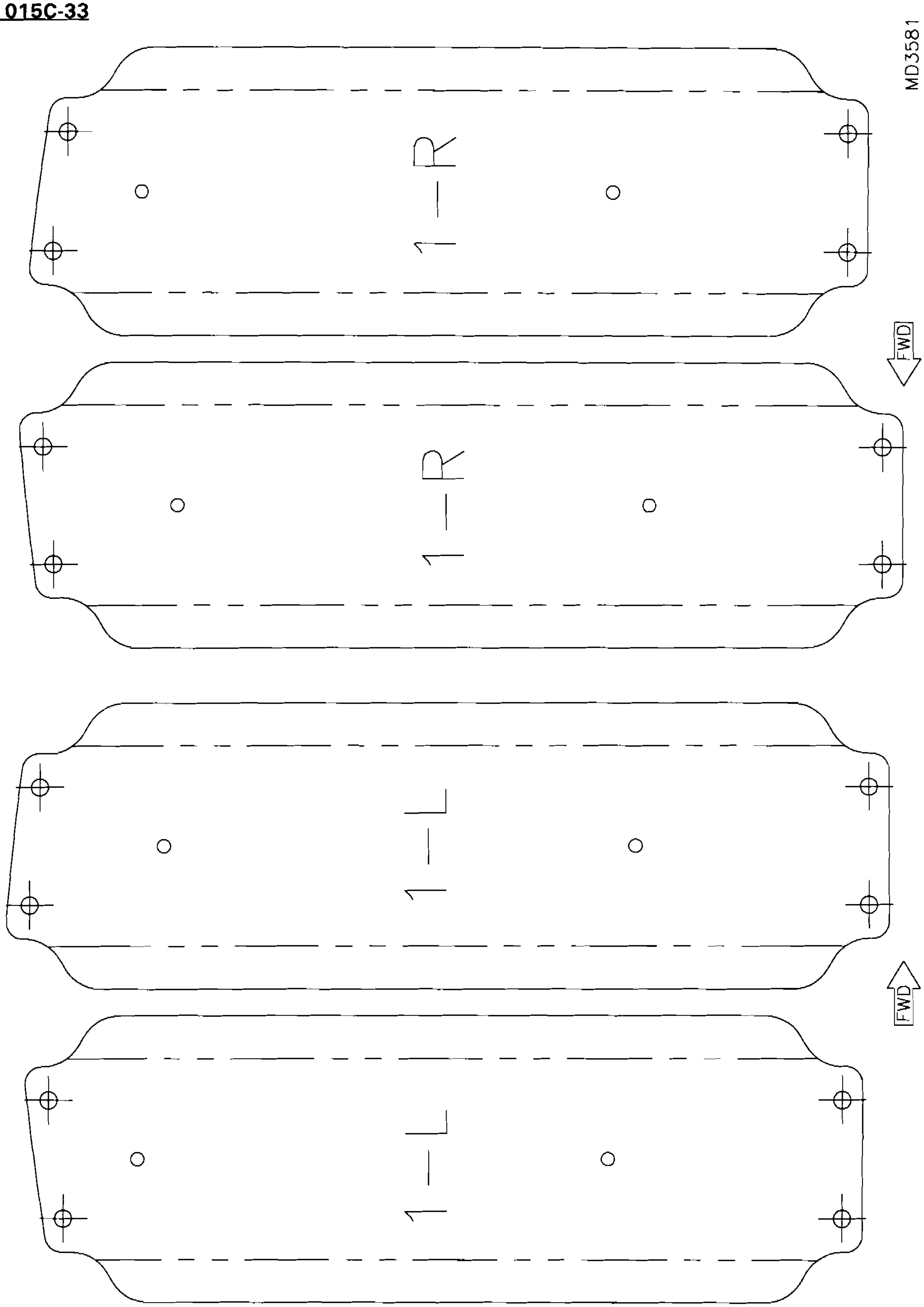
FIGURE 015C-31



32. With the wing upside down repeat the preceding steps for the bottom ribs. **Note:** The bottom rib #1 (root rib) is cut to length from raw stock. Fit as in the preceding steps.

33. Position the root rib skin against the #1 top and bottom ribs. Allow clearance between the l.e. spar and root rib skin. Transfer drill #30 the skin and ribs. Cleco as you drill. **NOTE:** The rib centerline should align with the pre-drilled skin holes. Glue the templates to the pre-bent channel stock and fabricate the root rib channels. See **Figure 015C-33. HINT**: Apply the templates to the channel material with a gluestick (see your local office supplier). Position the channels between the ribs and root rib skin. Align the channels with the skin cutouts and on the rib centerlines. Transfer drill #30 and rivet.

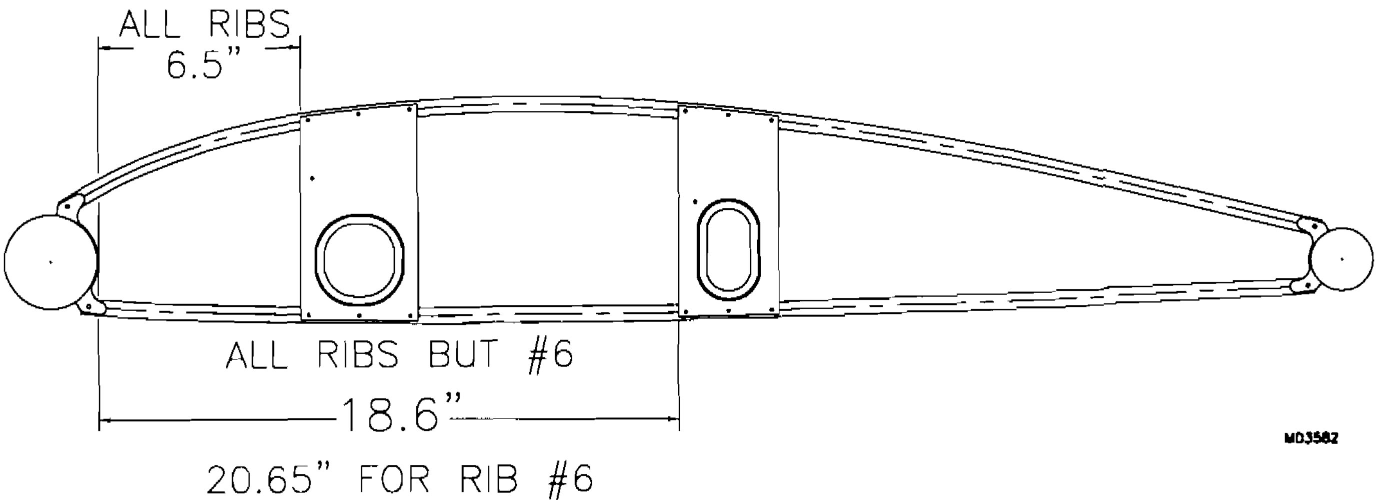
FIGURE 015C-33



34. Trim the forward and aft channels using the templates. See **Figures 015C-34 thru 015C-34Q** at the end of this section. **HINT**: Apply the templates to the channels with a gluestick. **NOTE:** Trim the flange edges to the original part profile.

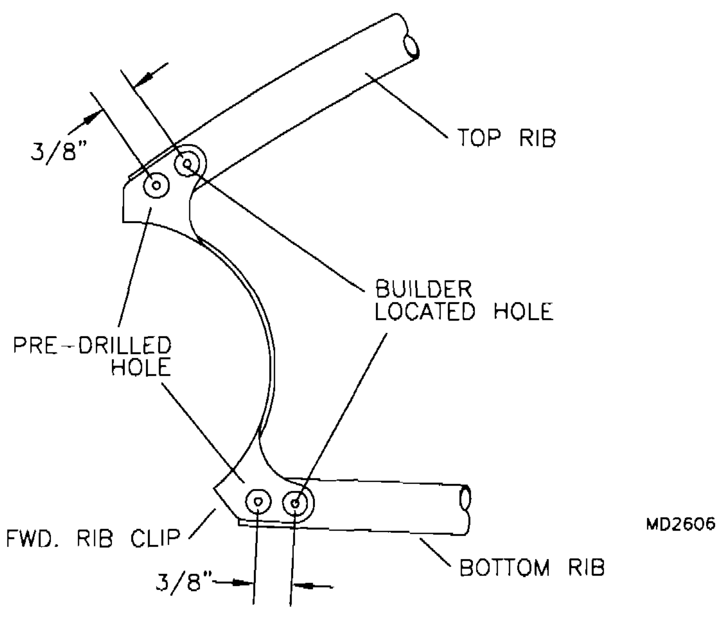
35. Position the channels as shown. NOTE: Rib #6 is located at 20.65", see **Figure 015C-35.** The channels will mount on the outboard side of the ribs with the flanges outboard. The channel holes must align with the rib centerline. Slightly flex the rib for proper alignment. Transfer drill #30 and rivet. **NOTE:** Fwd Channel #4 will slip over the root drag brace.

FIGURE 015C-35



36. Remove all rib assemblies from the spars as a unit. **NOTE:** Locate the second rib clip hole ⅜", center hole to center hole from the first, and on center line of the rib, click punch and drill #30. See **Figure 015C-36.** Rivet the ribs to the clips. Re-cleco the ribs to the spars. Place a stringline from rib #1 to rib #3 inline with the channels.

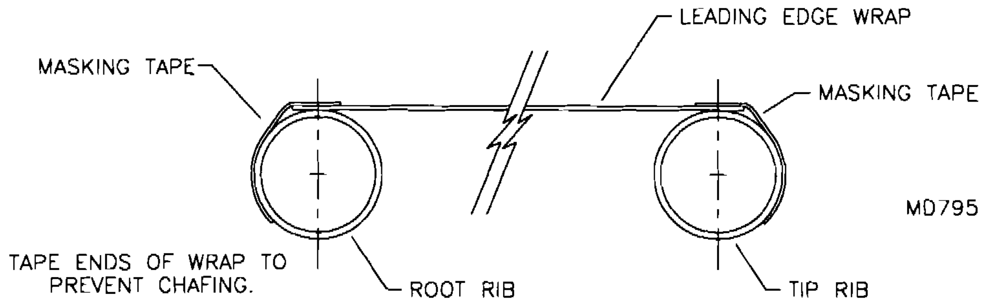
FIGURE 015C-36



37. Rivet all rib assemblies to the spars. Rivet rib #5 aft nutplate to the spar. Route the fuel lines.

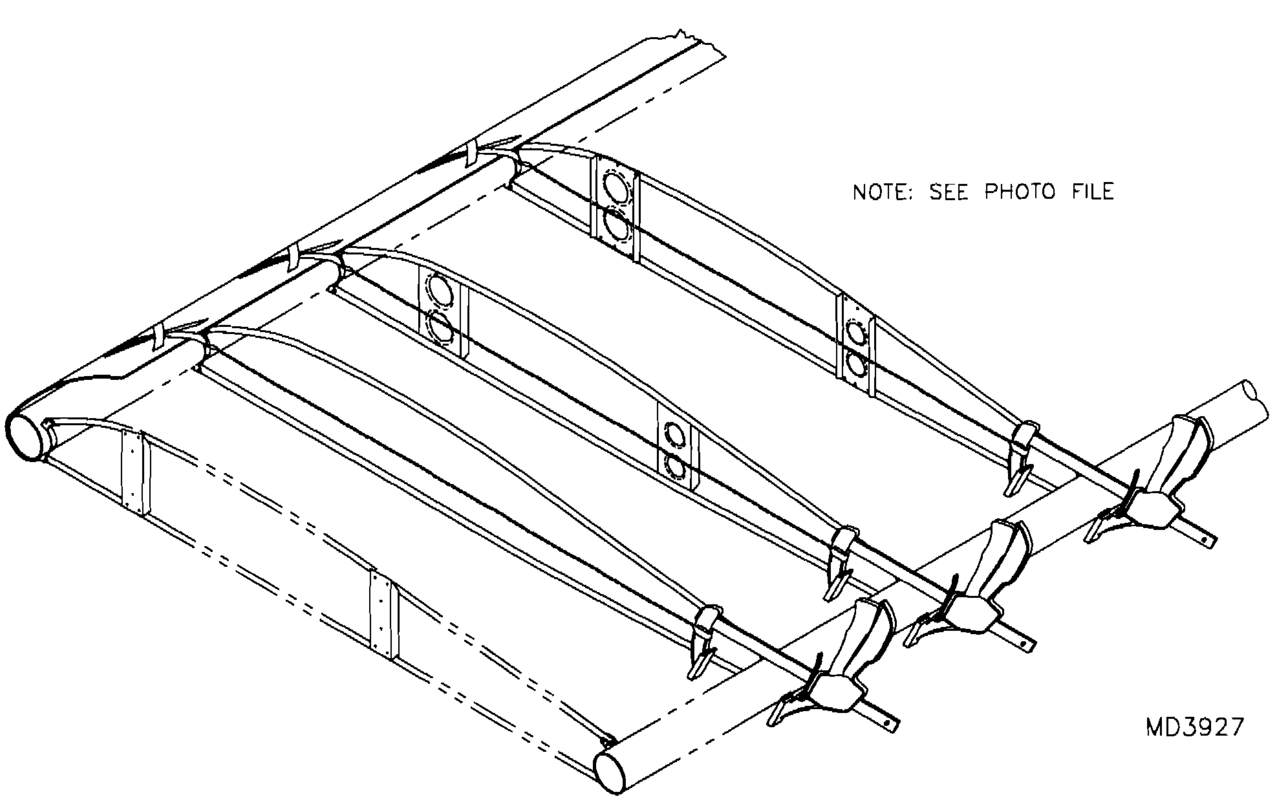
38. Turn the wings upside down on saw horses. Lay the respective leading edge wrap in position. Cleco the wrap to the pre-drilled holes on the back side of the leading edge spar. Apply masking tape to protect fabric from the metal edges. The wrap should not extend beyond either the root or tip rib. See **Figure 015C-38.** Rivet the wrap to the spar. Tape the wrap to the ribs before turning the wing over. (Tape in at least 6 places) **NOTE:** You may need to trim wrap at some rib locations.

FIGURE 015C-38



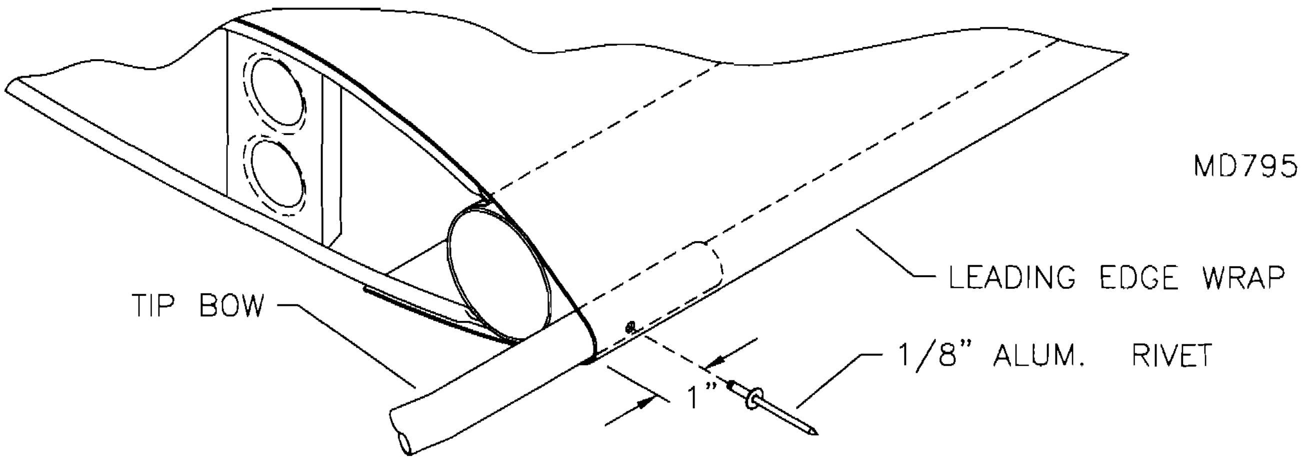
39. The wrap for the most part is self positioning, needing only to be pulled tight against the tip bow and spar at the root. This will set the wrap to its proper location. **HINT:** Filament tape may be used to "pull" the wrap into final position. Starting at the tip, run a length of tape from the bottom of the wrap. Pull the tape over the rib and wrap it around the rear spar. Pull hard enough to press the leading edge wrap against the tip bow. Apply at least six (6) more "tape" clamps along the wing, include the root. Tighten as required by peeling up the tapes and apply more tension. **IMPORTANT:** Keep tape over ribs. **NOTE:** More tension may be achieved by looping the aft end of the tape and using a quick clamp to pull tight. See **Figure 015C-39.**

FIGURE 015C-39



40. Locate, drill and rivet the leading edge wrap, as shown in **Figure 015C-40.**

FIGURE 015C-40



41. Mark 3/16" from the aft top edge of the leading edge wrap, on each rib centerline. Drill #30 the wrap and ribs. Cleco as you drill.

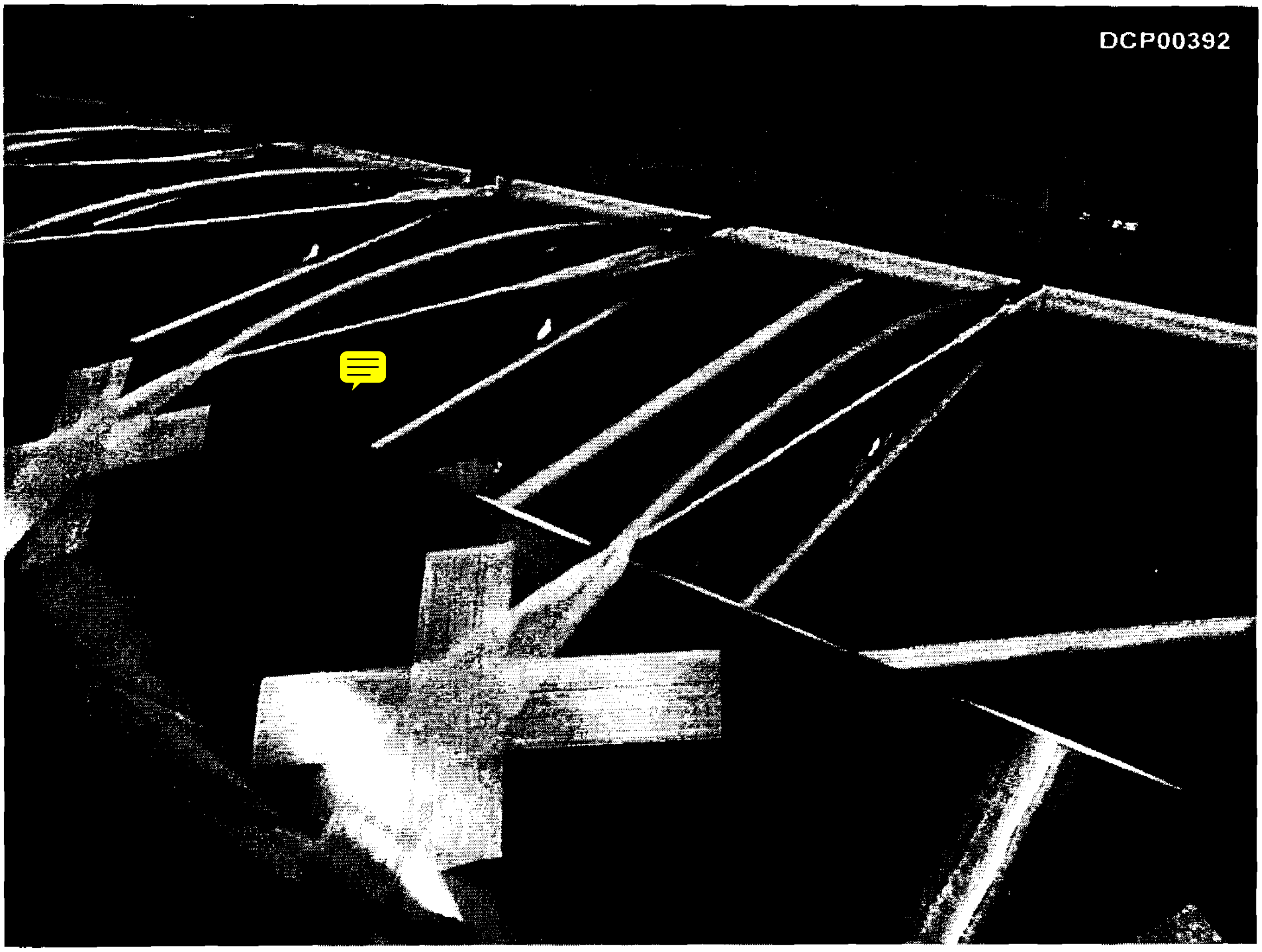
42. The wings 1st rib bay is held rigid against the fabric with sheet metal root wraps. **NOTE:** The top root wrap fits under the leading edge wrap. **DO NOT** drill into the trailing edge spar other than for the two rivets shown for **BOTH** top and bottom root wraps.

43. The top and bottom root skins are pre-drilled at the factory. **NOTE:** There are not left and right hand parts. These are determined on top wrap by orientation of hole over fuel filler neck. On the bottom wrap by orientation of hole over door upcatch. Cleco (4) stiffeners to bottom side of top root skin. **NOTE:** Do not cleco fwd stiffener in place at this time. Position fwd edge on top of leading edge wrap to transfer drill. Position the top root skin so that the rivet holes are on centerline of the ribs. The root skin should extend past the top centerline of the trailing edge spar by 1/8". The fuel tank filler neck should be nearly centered in the hole. Transfer drill leading edge. Transfer drill using a #30 drill bit through the root skin into each rib, use clecos to retain the skin. Transfer drill stiffeners.

It is important to note that only two holes are drilled in the root of the trailing edge spar. **DO NOT** locate or drill any other holes in the spar, structural damage to the spar will result.

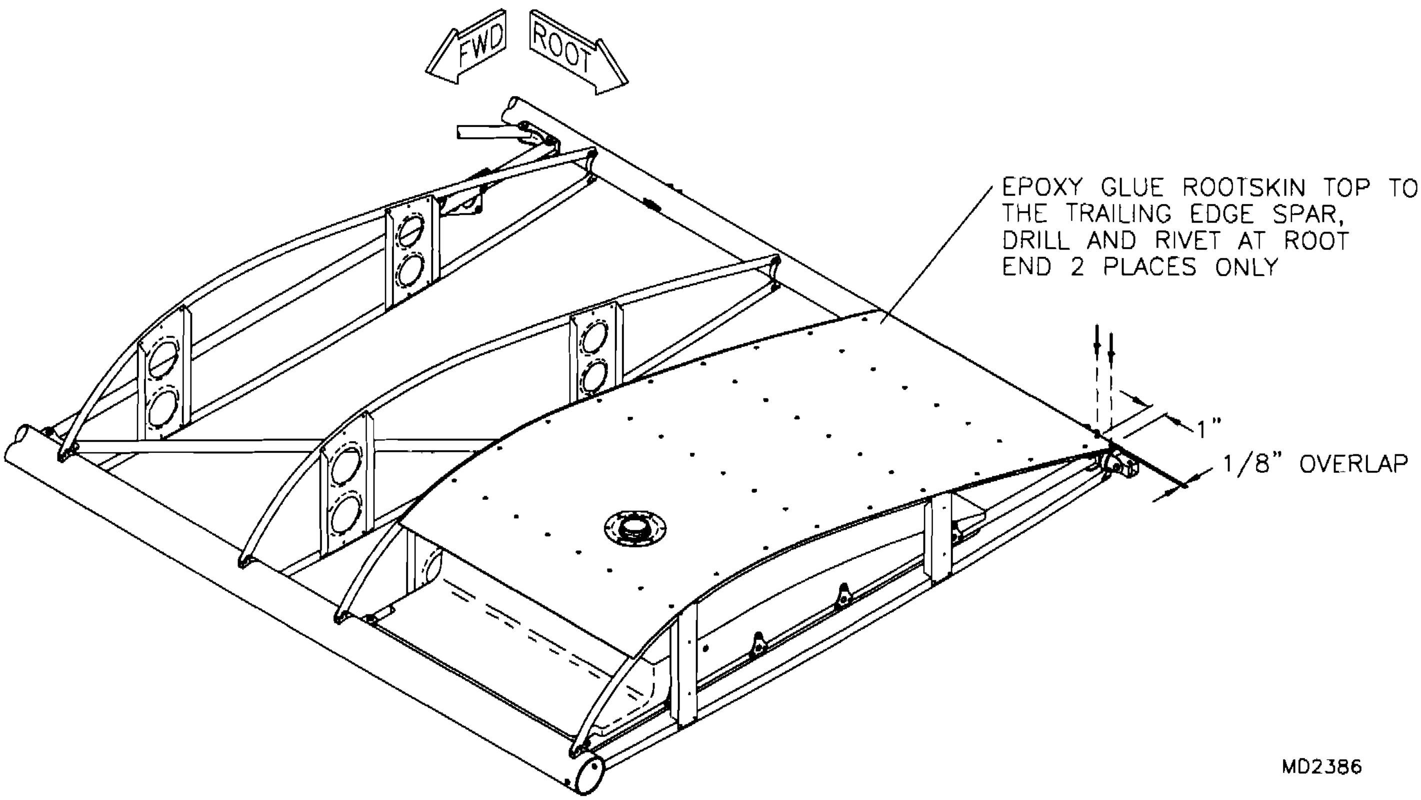
Using the aft edge of the root skin as a guide, mark a line on the trailing edge spar. After all holes have been drilled, remove the root skin, Debur and remove all shavings. Remove the anodizing on the trailing edge spar in the contact area **ONLY**. Rough up the ⅛" contact area of the root skin. **NOTE:** If you have opted to pop rivet in place of rib lacing, prior to riveting the root skin in place, apply double stick tape to the top of the second rib. When riveting the skin in place, only rivet to the root rib. The rivets in the second rib will be installed after the wing is covered. Rivet the root skin top everywhere but the last 3 rivets in each rib near the trailing edge. These rivets will be installed after the aft edge is bonded to the spar.

S-6S & S-6ES – WING RIB TENSIONING



With the root skin riveted in place, position the scupper so that it is centered around the fuel filler neck. With a #30 drill bit transfer drill through the perimeter holes in the scupper into the root skin. **CAUTION:** When drilling the scupper, use a drill stop to prevent drilling into the fuel tank. Cleco in place only, at this time. The painted scupper will be installed final, after the wings are covered. See **Figure 015C-43**.

FIGURE 015C-43



44. Install the bottom root skin following the same procedure for the top. NOTE: The bottom root wrap skin does not have stiffeners. Make sure to orientate holes over door upcatch to make left and right part. Some forming of bottom root skin needs to be done on leading edge to lay flatn against leading edge wrap. Form this by laying wrap on the tube, approximately one inch from edge. Using block of wood, form gentle radius over tube.

It is important to note that only two holes are drilled in the root of the trailing edge spar. **DO NOT** locate or drill any other holes in the spar, structural damage to the spar will result.

Using the aft and fwd edge of the root skin as a guide, mark a line on the leading edge wrap and mark a line on the trailing edge spar. After all holes have been drilled, remove the root skin, deburr and remove all shavings. Remove the anodizing on the trailing edge spar in the contact area **ONLY**. Rough up the ⅛" contact area of the root skin. **NOTE:** If you have opted to pop rivet in place of rib lacing, prior to riveting the root skin in place, apply double stick tape to the top of the second rib. When riveting the skin in place, only rivet to the root rib. The rivets in the second rib will be installed after the wing is covered. Rivet the root skin top everywhere but the last 3 rivets in each rib near the trailing edge and the leading edge. These rivets will be installed after the fwd and aft edges are bonded to the spar. Bond the top and bottom root skins to trailing edge spar and bottom root skin to leading edge wrap.

45. Mark and trim the fuel filler neck to length. **NOTE:** The fuel caps should just clear the scupper when tightened. **HINT**: Use a small cut-off wheel and vacuum. It is also helpful to place a piece of foam inside the filler neck when trimming.

46. With the wings bottom side up, measure forward 3 ½" from the aft edge of the leading edge wrap and mark on the under side of ribs #6 thru #9. Measure the distance between each marked rib. Cut the raw stock tubing (½"x.028) to fit between each rib. Position each piece of tubing centered on the marks. Locate each gusset as shown in **FIGURE 015C-46.** Transfer drill through the gusset into each rib and rivet the gussets to the ribs. Holding each support tube in place, transfer drill through the gussets into each support tube and rivet in place. See **FIGURE 015C-46A. NOTE:** Fabricate the end gussets as shown in **FIGURE 015C-46B.**

FIGURE 015C-46

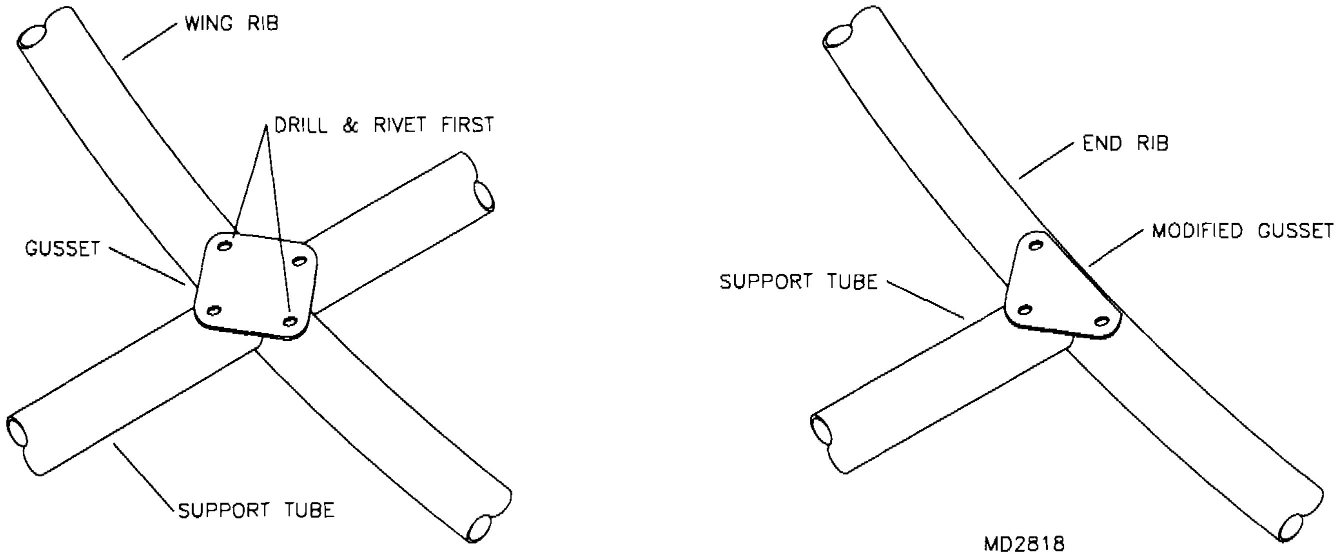


FIGURE 015C-46A

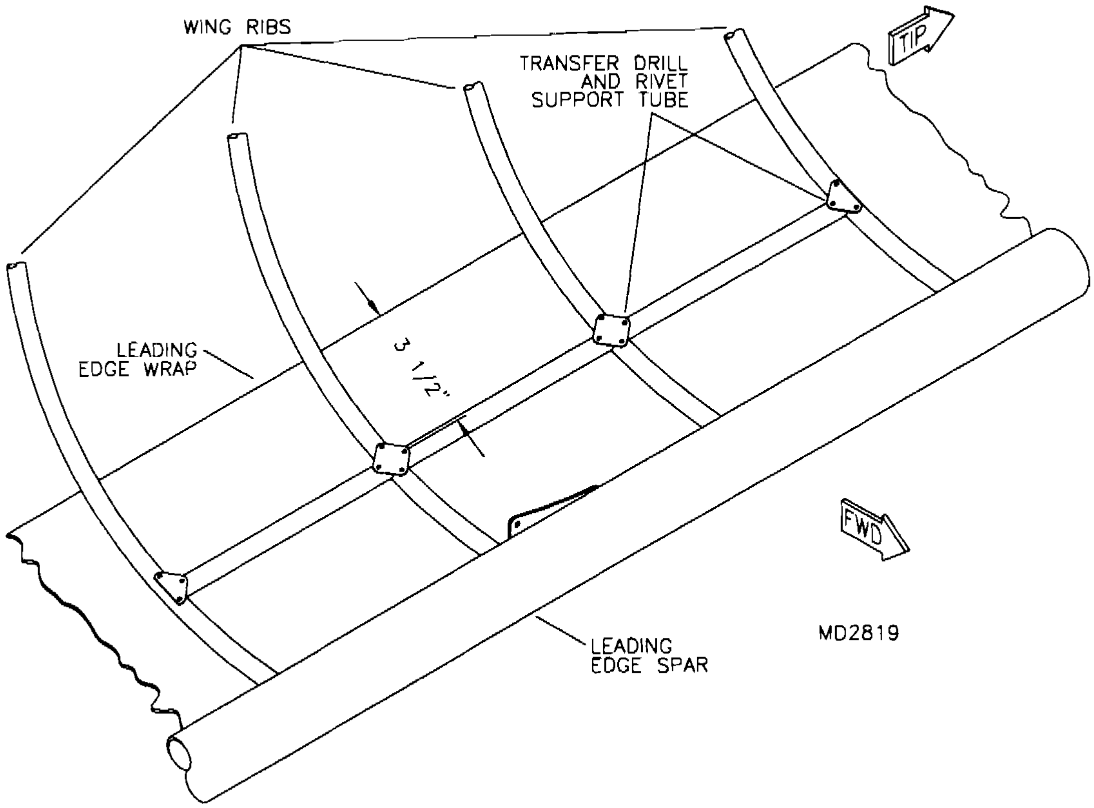
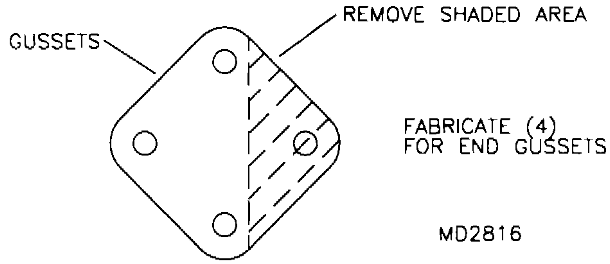


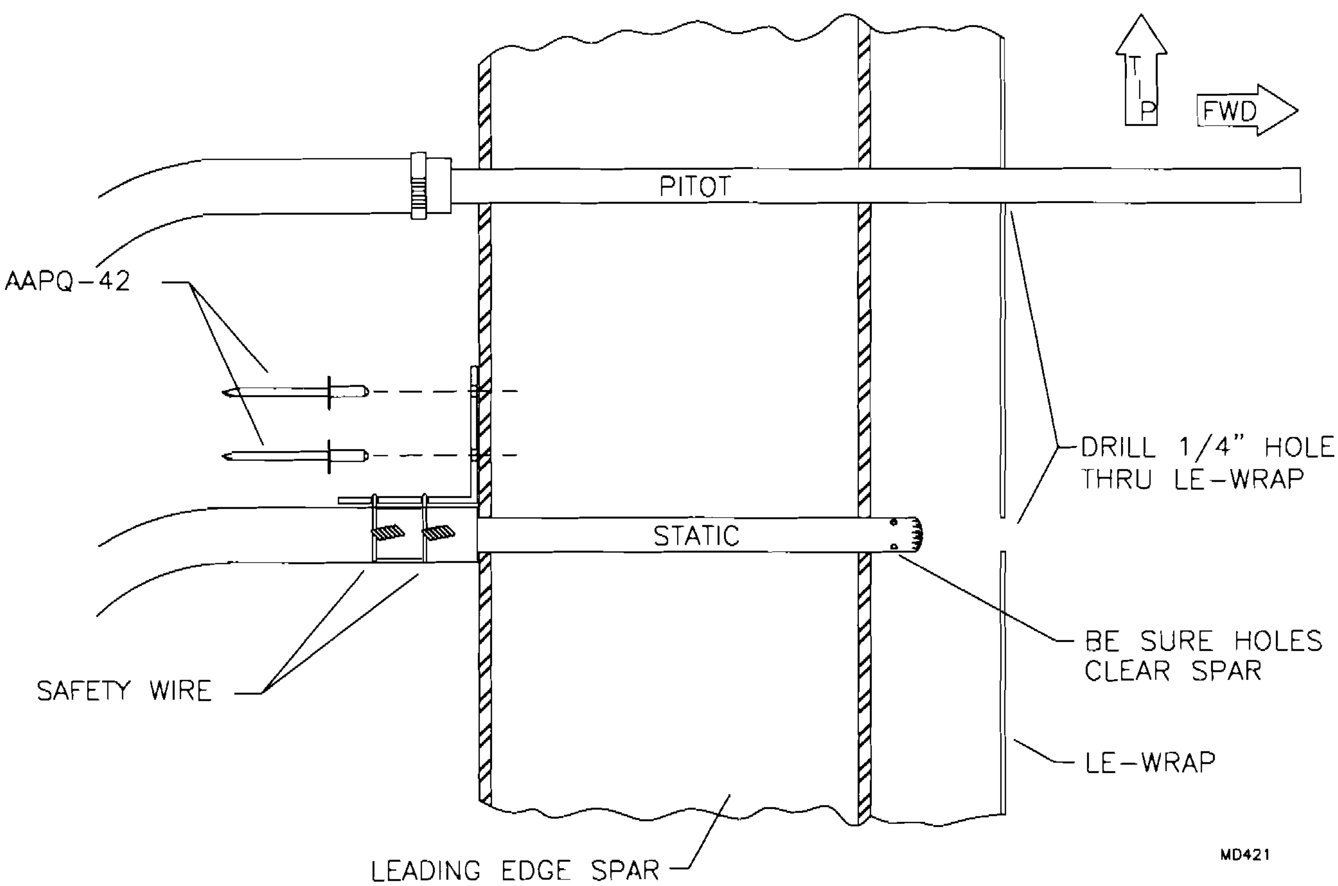
FIGURE 015C-46B



PITOT/STATIC INSTALLATION

47. Located on the left leading edge spar 7" and 8.5" in from the tip are two (2) holes for pitot and static tubes. Drill out to ¼" and through the LE wrap on the LH wing only. **IMPORTANT:** For accurate airspeed readings the static probe must be set inside of the LE wrap. See **Figure 015C-47**. The airspeed should be checked against a timed mile flown in no wind.

FIGURE 015C-47



S-6S 116 WING OPTIONAL STROBE INSTALLATION

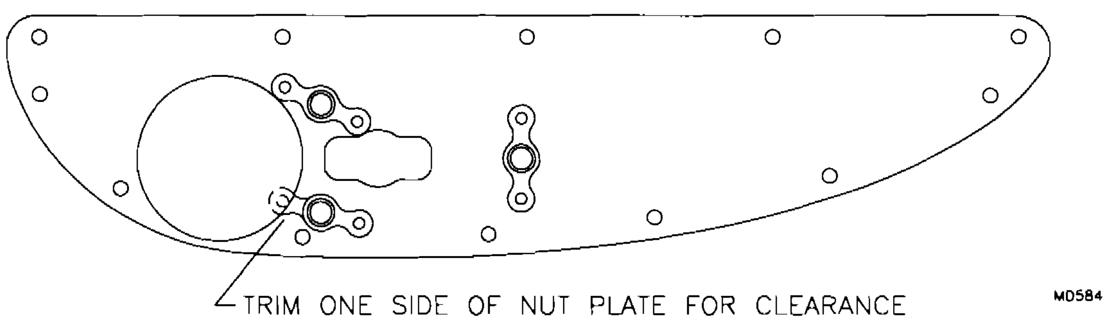
48. Rivet the three nut plates to the light tip mount. Use #40 ⅛" PR'S. The light plate will screw to the light mount. You will have to drill out the 3 holes on the light plate to #11 to get the screws to go through. See **Figure 015C-48.** Place the nav. light mount plate 6" from the trailing edge of the tip bow and rivet to the tip bow with ⅛" stainless steel rivets. Trim the upper end of the reinforcement straps as necessary to mount the plate to the bow. See **Figure 015C-48A.**

49. Install the strobe power supply box. The box mounts at station #3 with ¾" Non-cushioned clamps. **NOTE:** The strobe box has high voltage, keep clear of auxiliary tank and fuel lines. The box can be mounted upright or lying flat. Run a 14 gauge yellow wire from the Nav. switch back to the strobe box. Connect a brass "Y" to the end of the wire. The yellow wire coming out of each wing will connect to the "Y". Run a red 14 gauge wire from the strobe switch back to the strobe box. Also, run a black 14 gauge wire back to the switch for the ground. Connect these wires to the black and red wires coming out of the strobe box.

50. Connect the ends, provided in the strobe kit, to the 3 wires coming out of the grey wire. The kit has directions about which way they go on. Red connects to #1, black connects to #2, and white connects to #3. Make sure these ends are pushed up all the way into the connector.

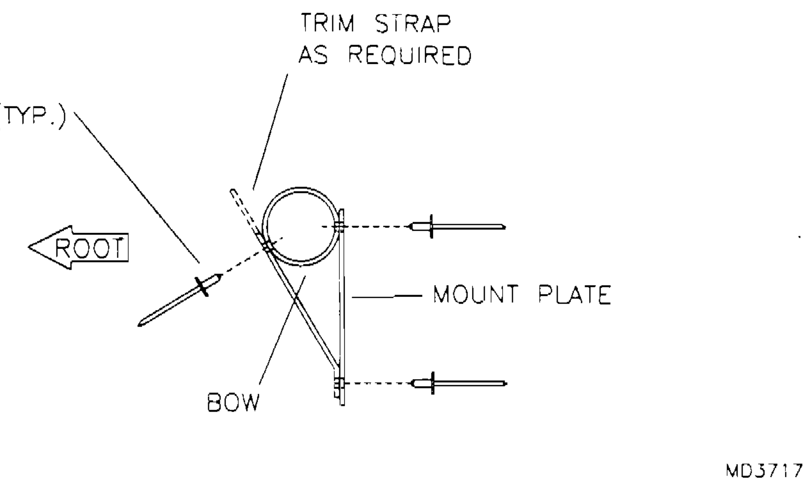
51. The unprotected wire is grounded to the box by a bolt. The two white connectors, from the grey wire, are plugged into the number 1 and 2 outlets. Check all connections and wires. Test the strobes.

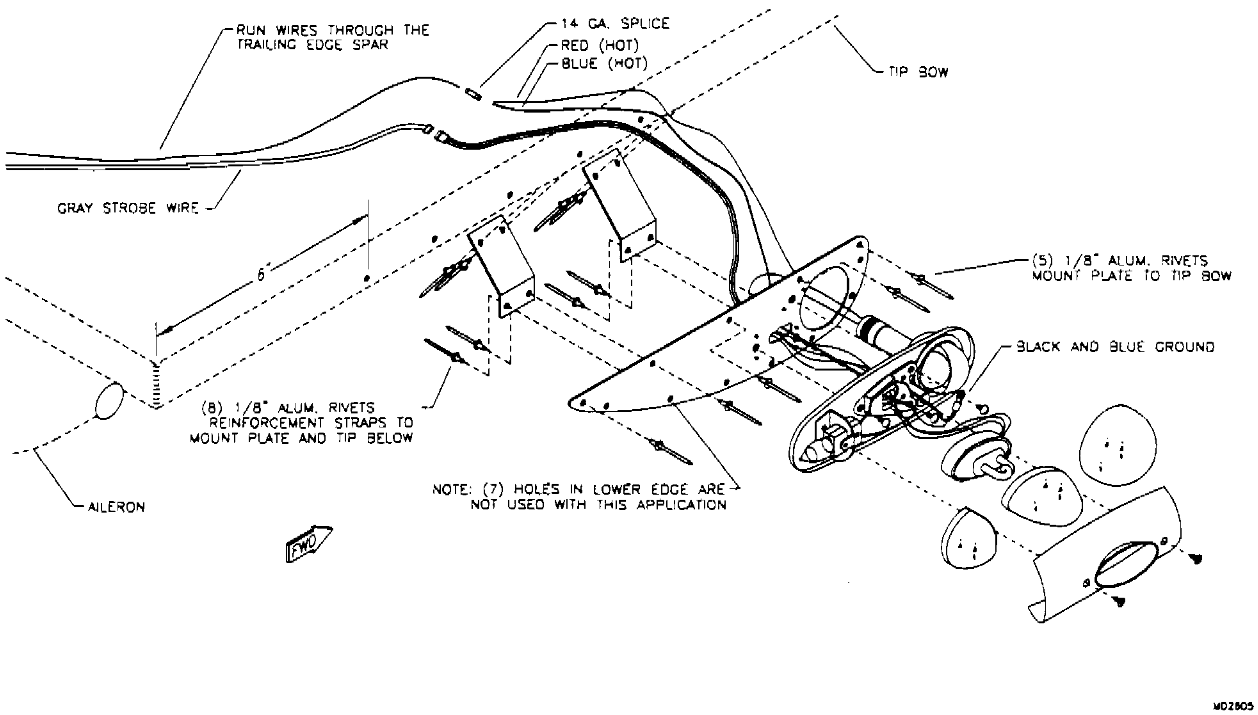
FIGURE 015C-48



PLACE NUT PLATES AS SHOWN
(3) NUT PLATES REQ'D. PER ASSEMBLY
(6) #40 RIVETS REQ'D. PER ASSEMBLY

FIGURE 015C-48A





RIGHT 116 WING SHOWN

FIGURE 015C-34

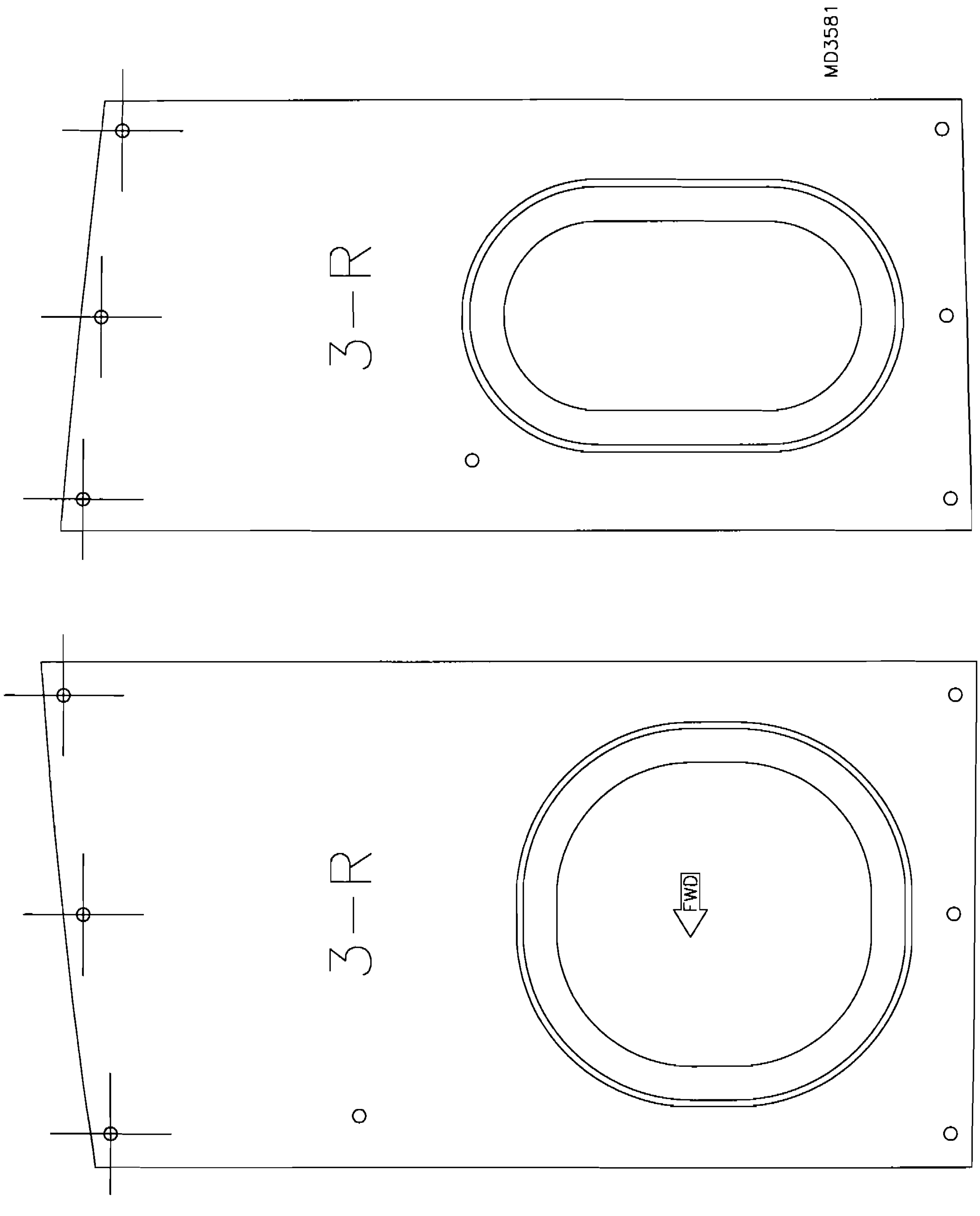


FIGURE 015C-34A

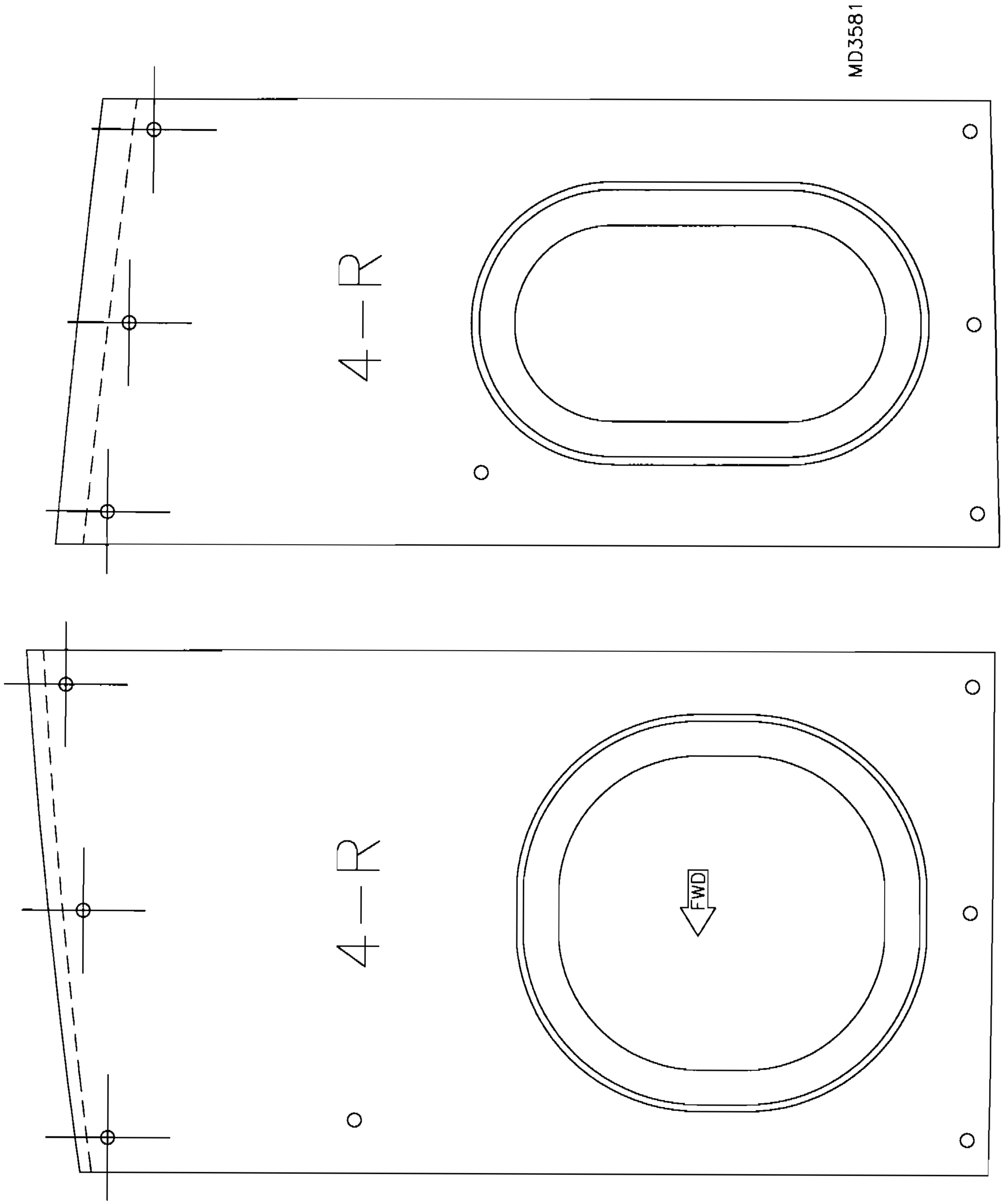


FIGURE 015C-34B

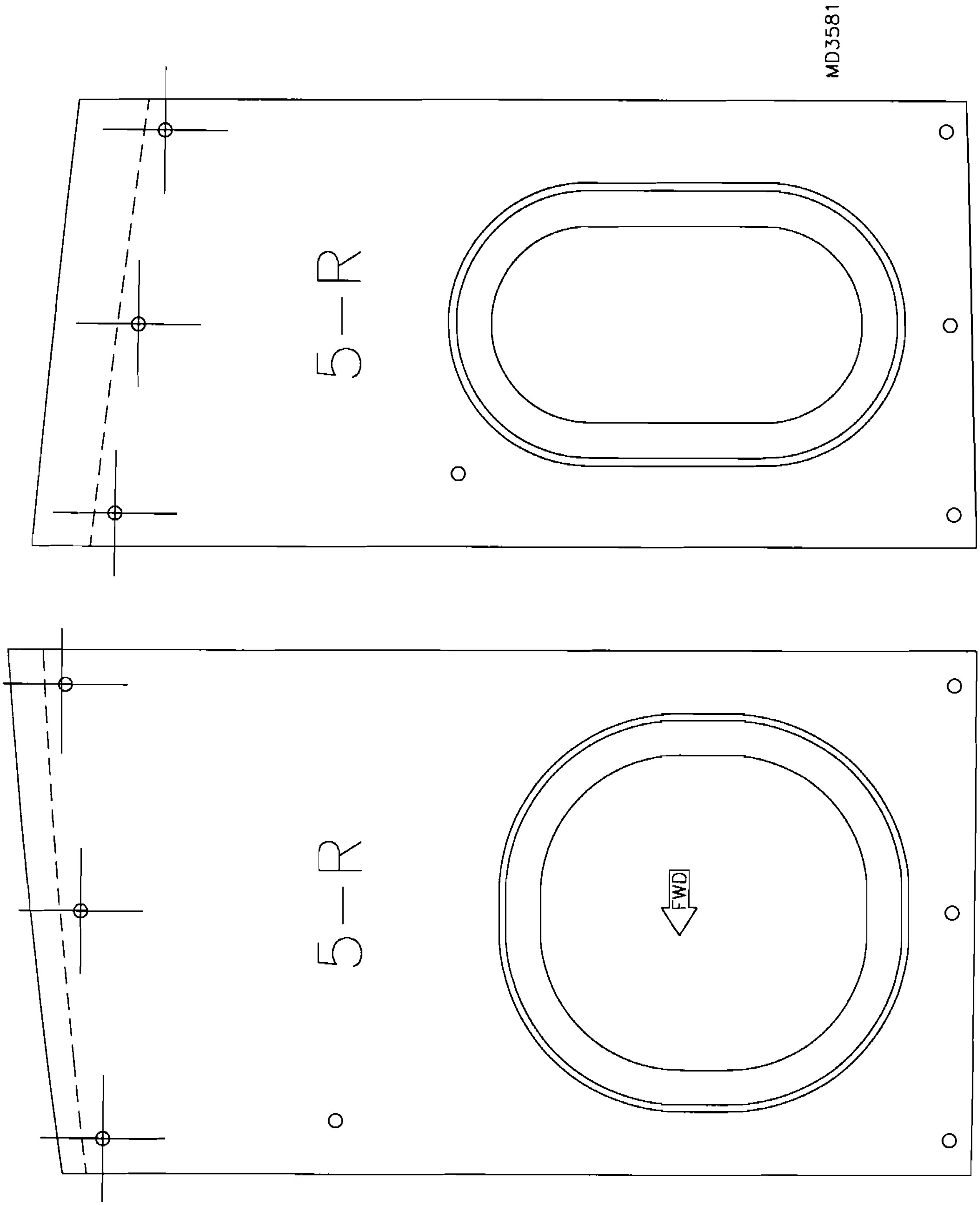


FIGURE 015C-34C

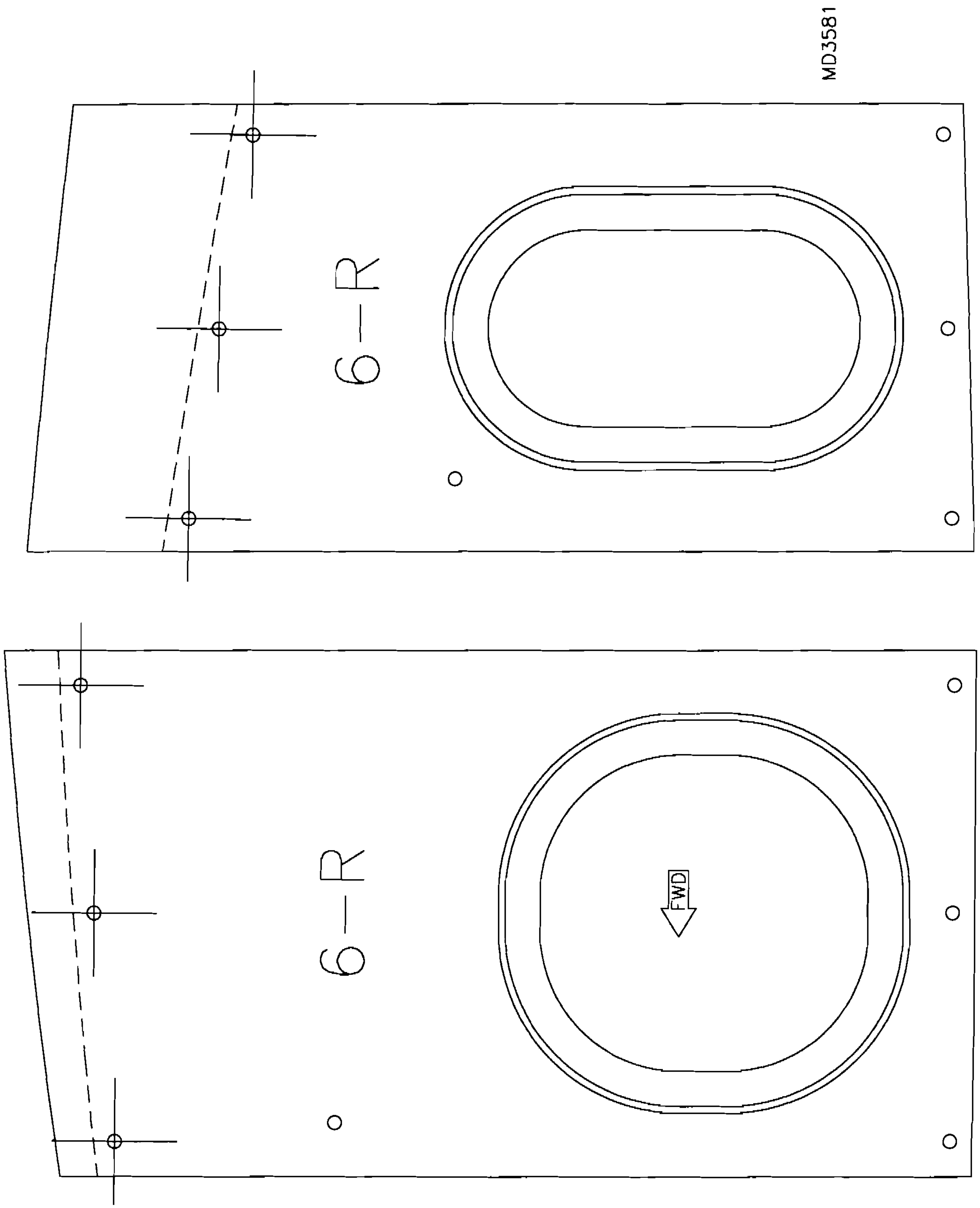


FIGURE 015C-34D

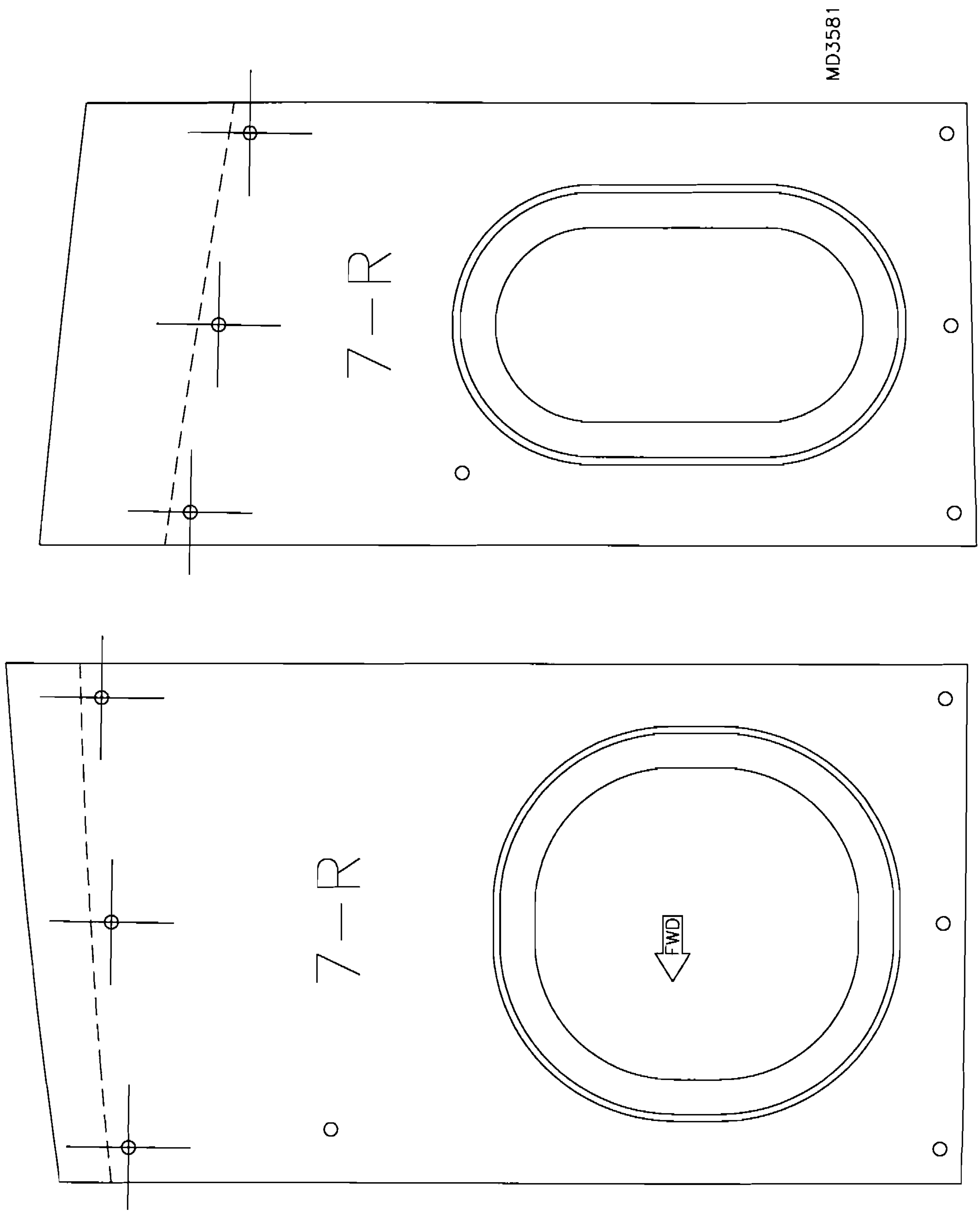


FIGURE 015C-34E

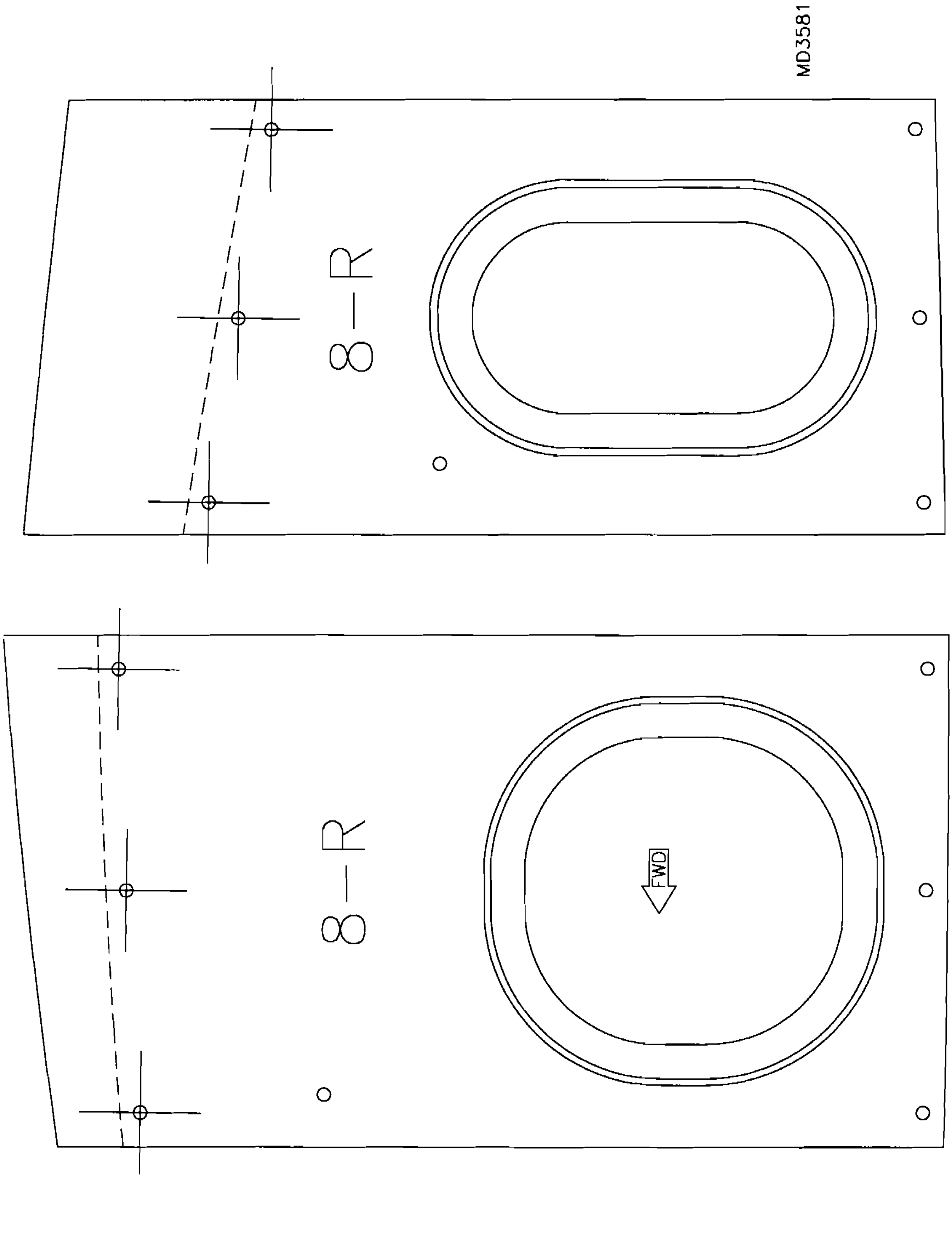
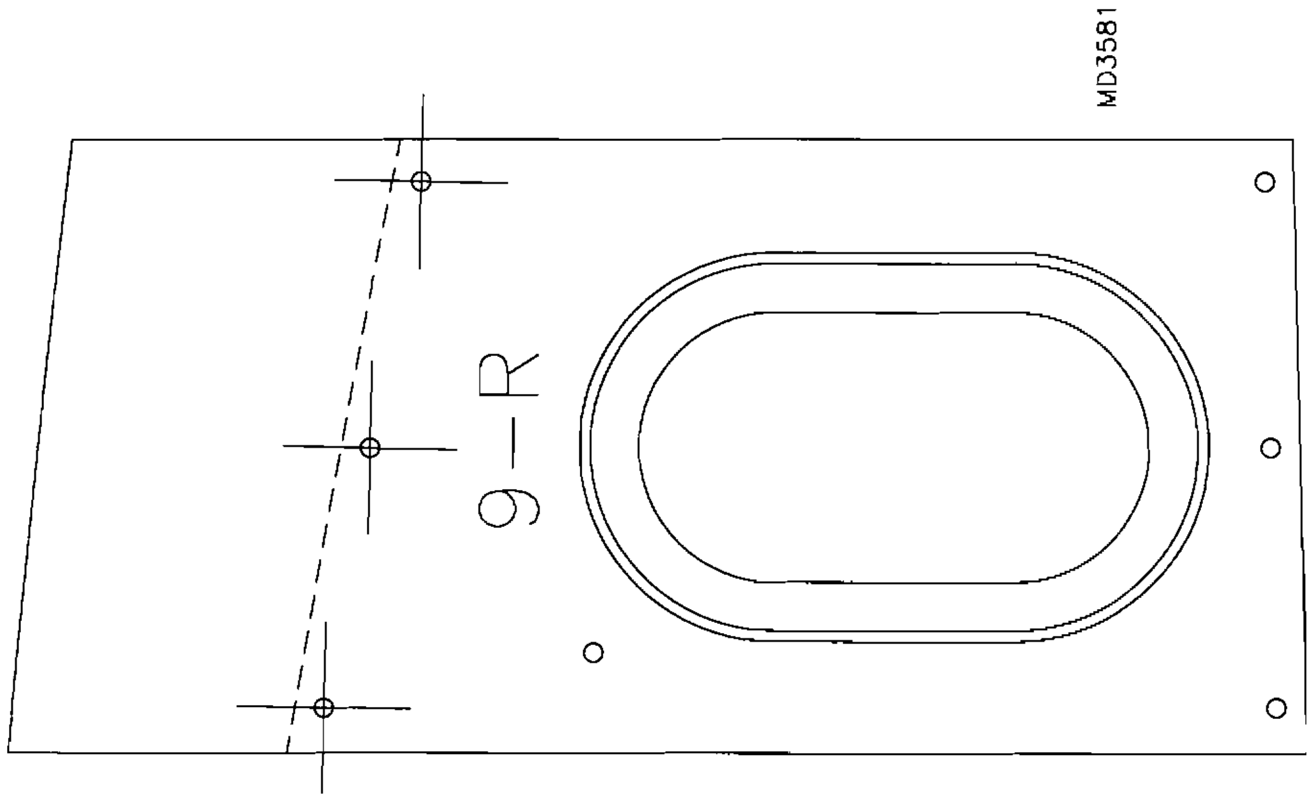


FIGURE 015C-34F



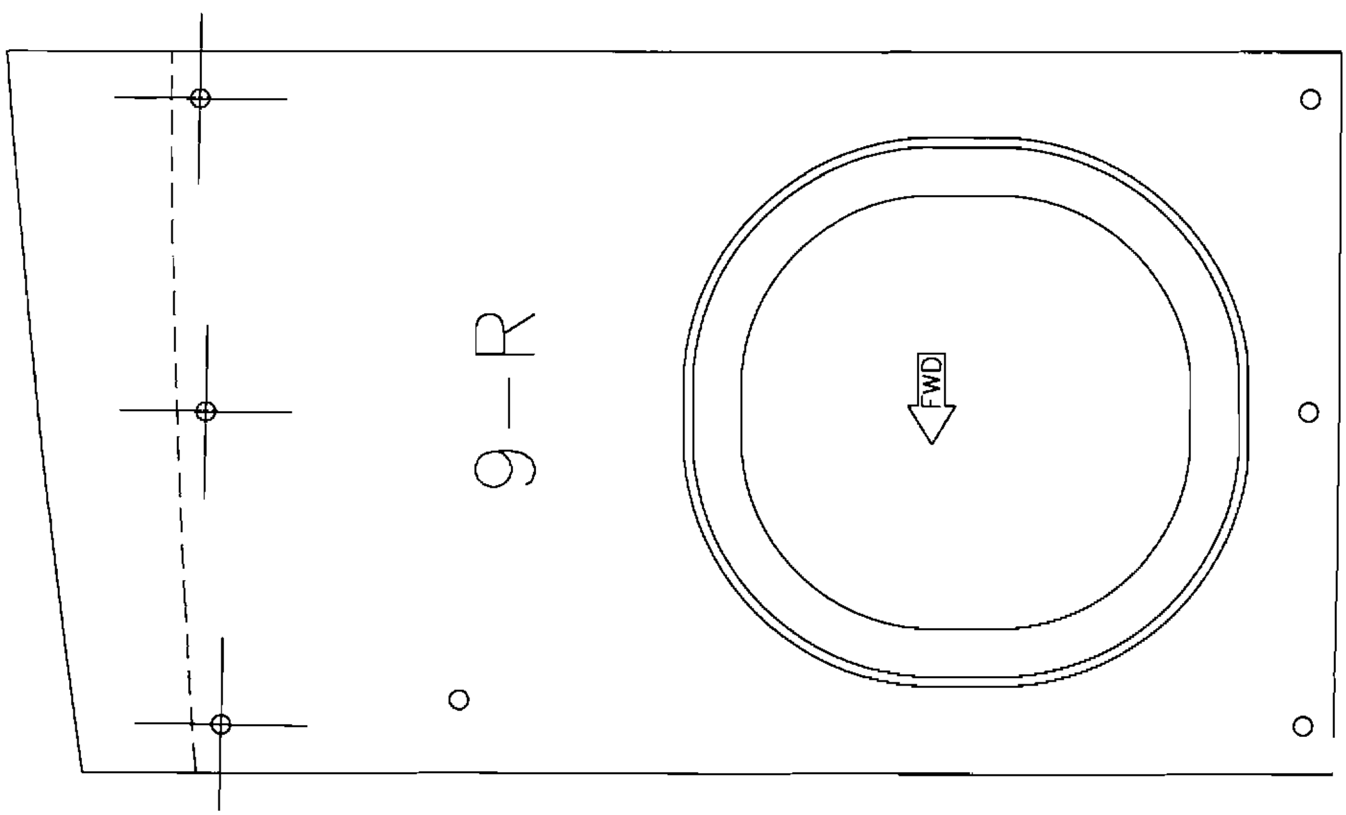


FIGURE 015C-34G

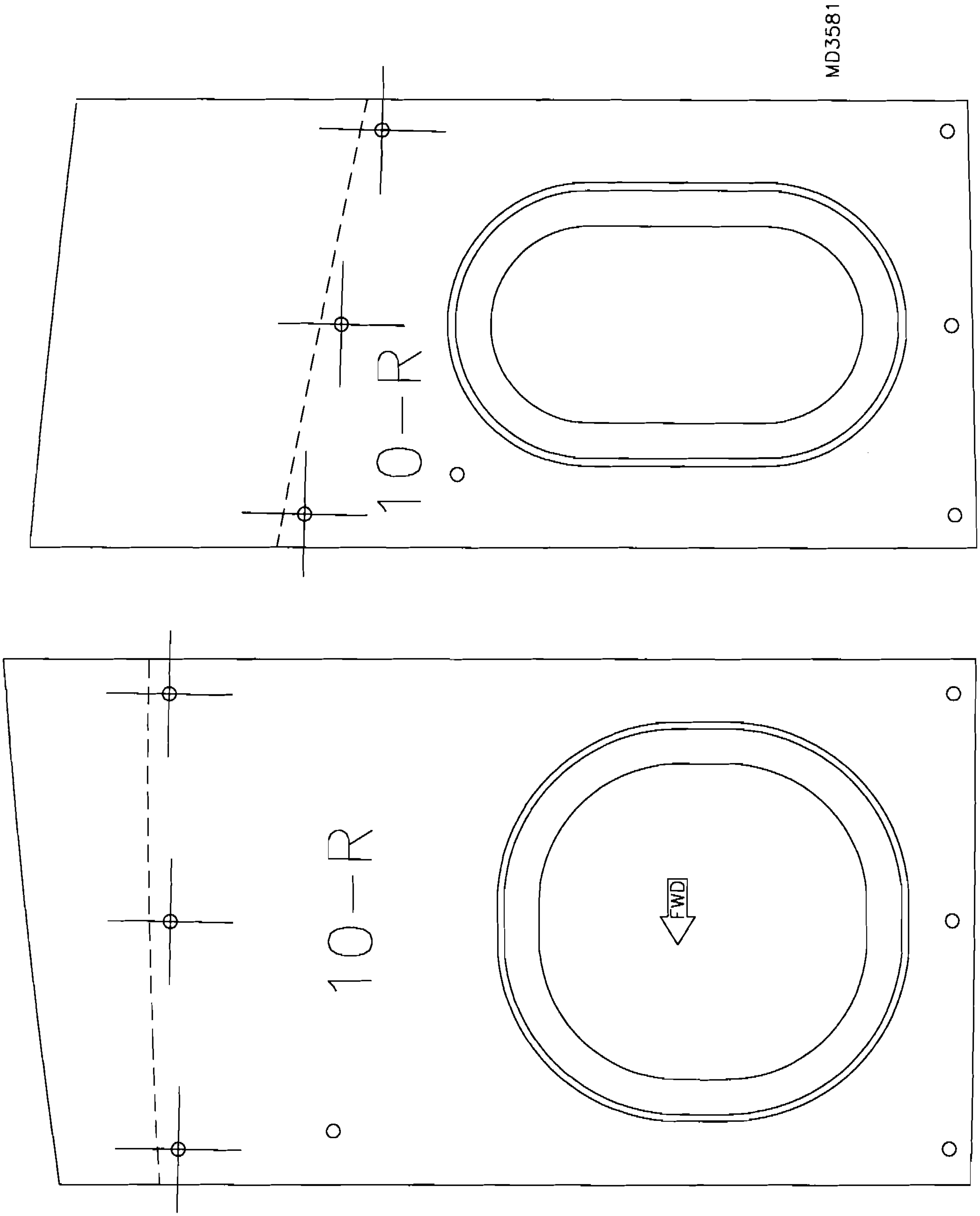


FIGURE 015C-34H

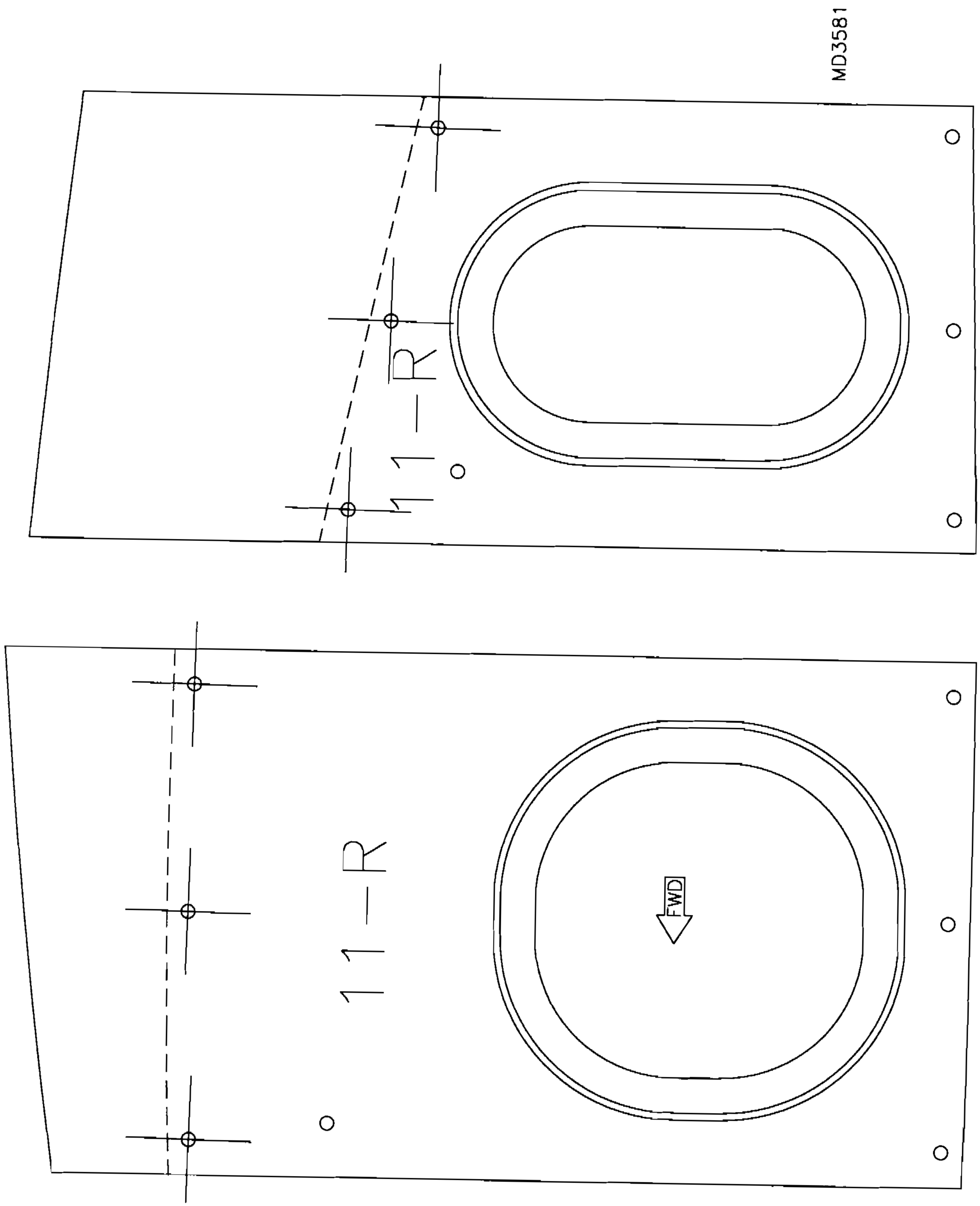


FIGURE 015C-34I

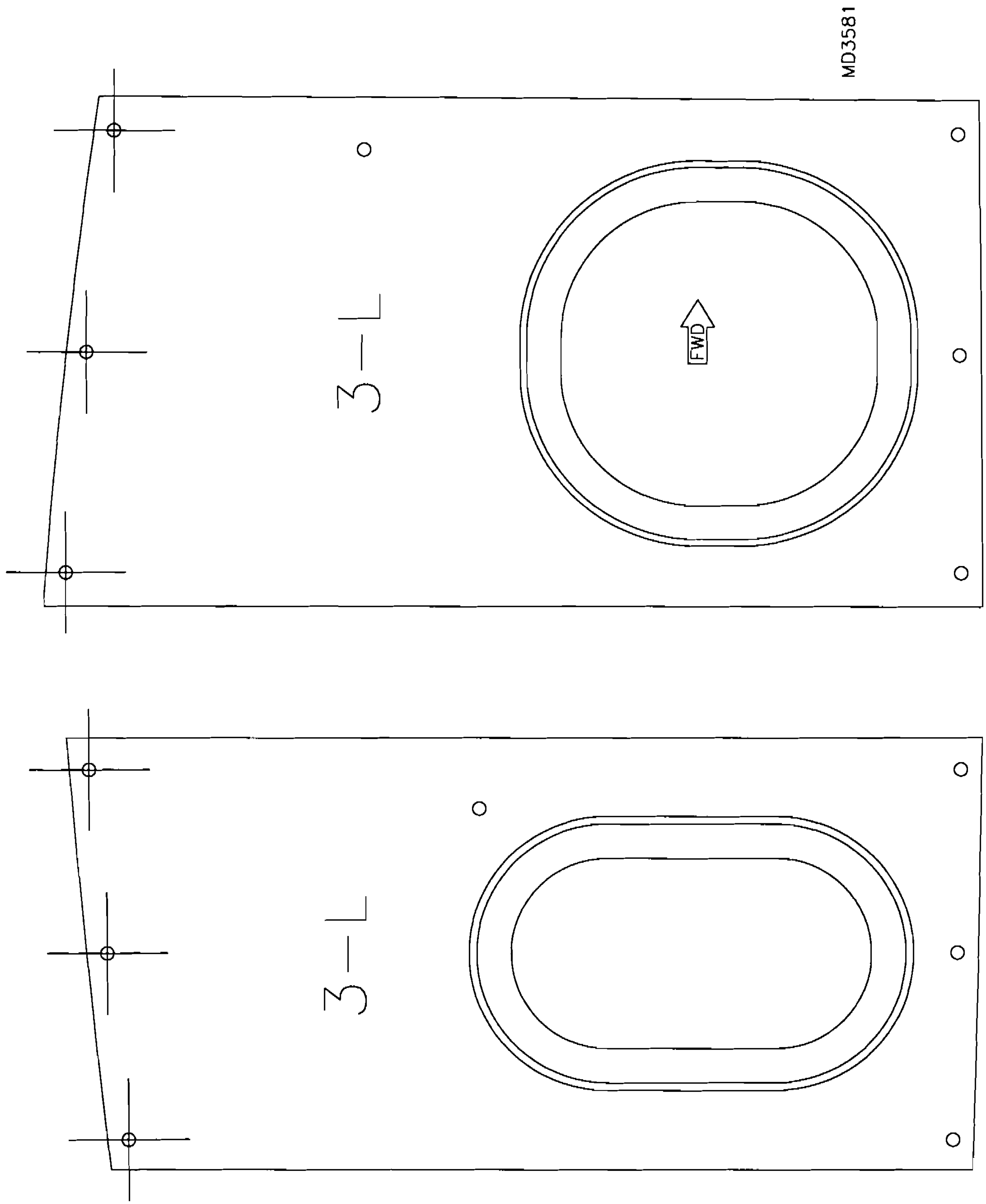


FIGURE 015C-34J

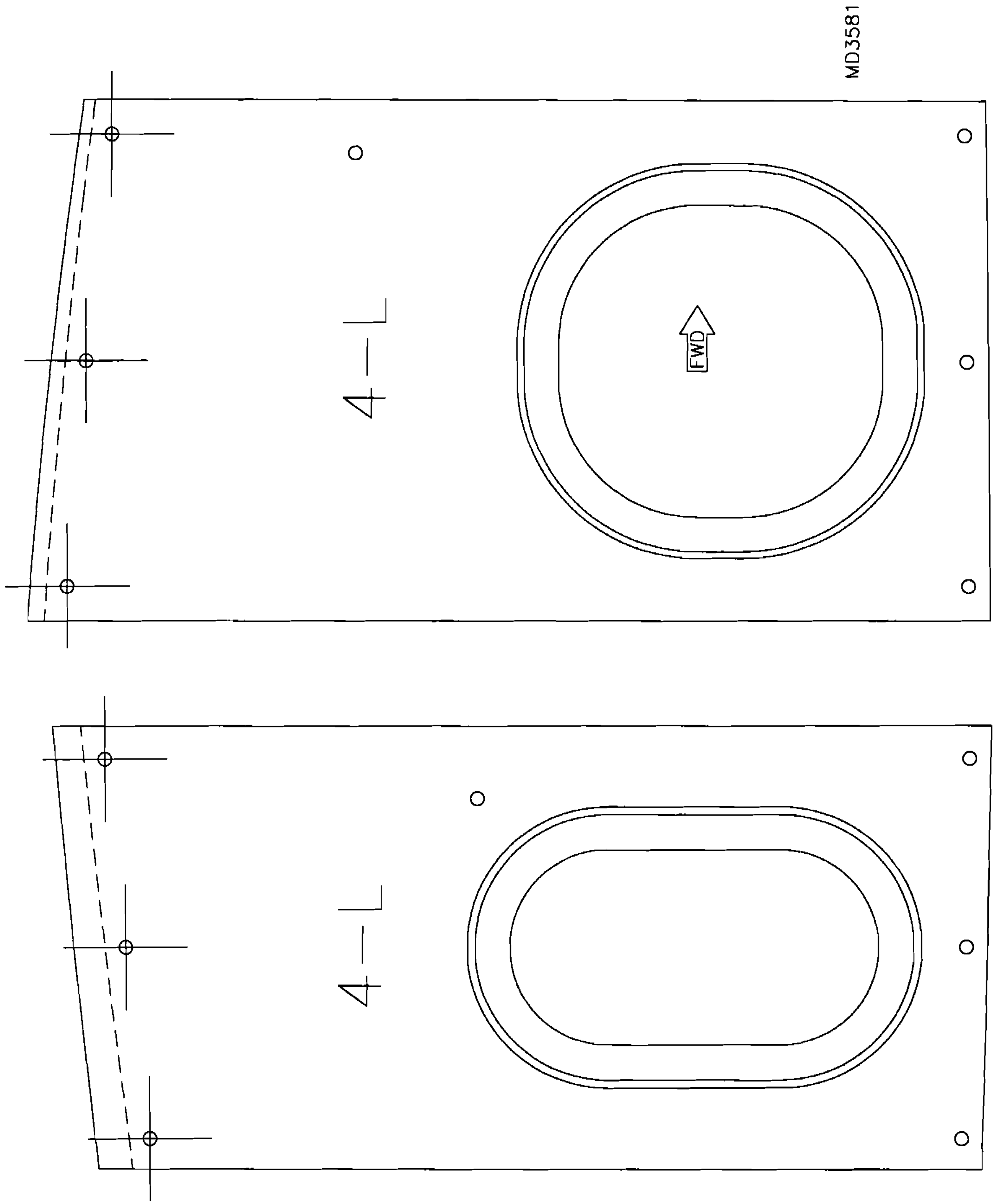


FIGURE 015C-34K

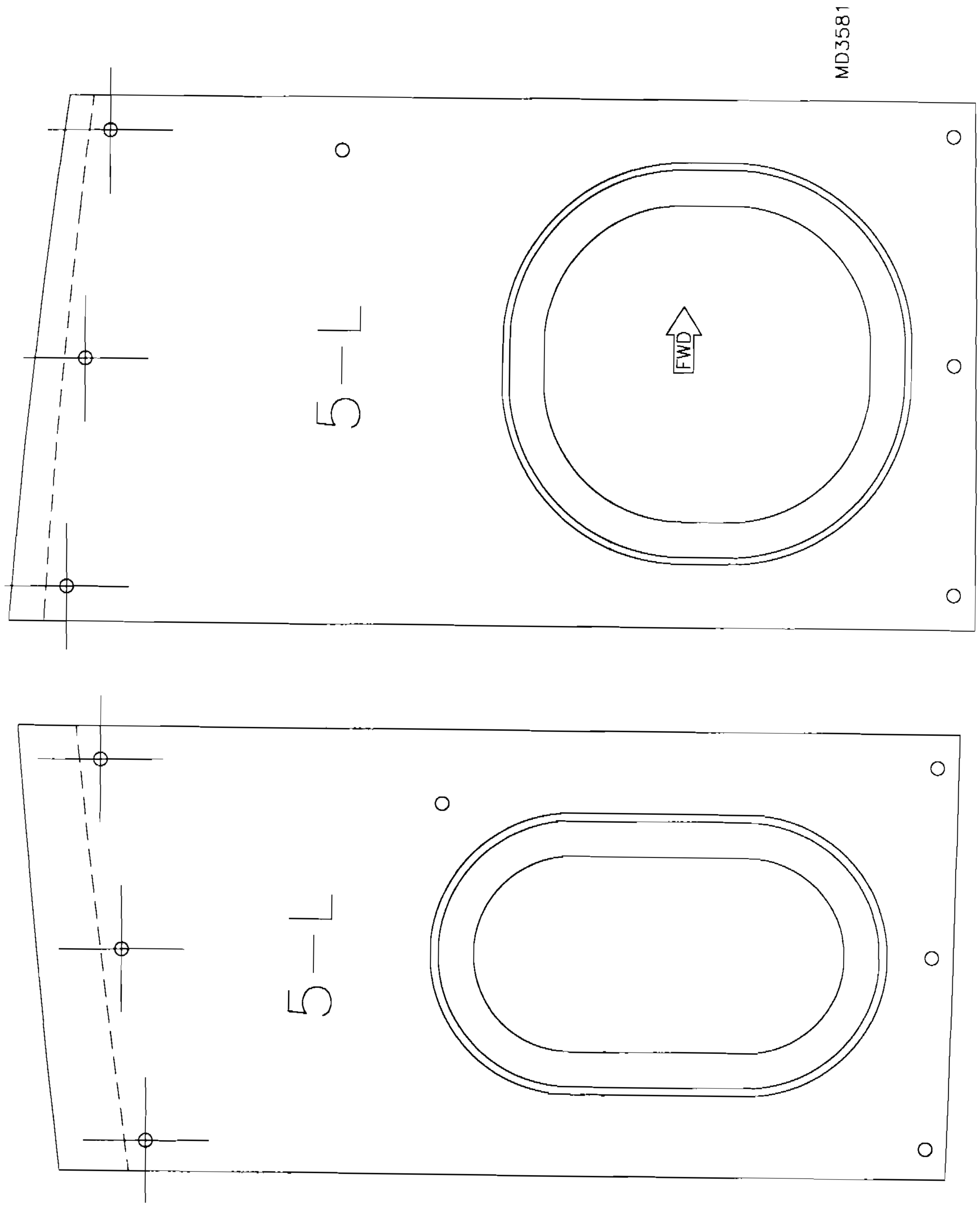


FIGURE 015C-34L

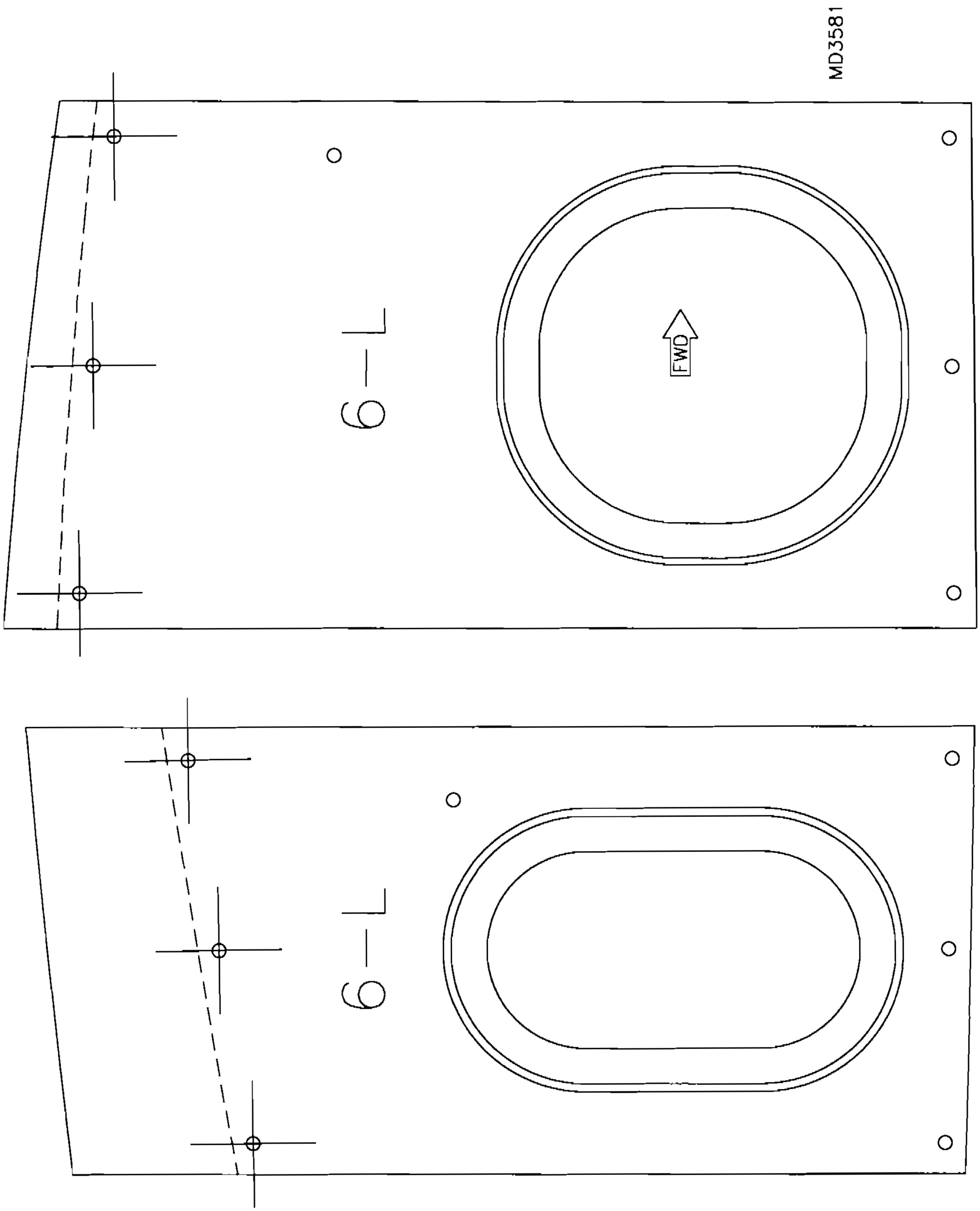


FIGURE 015C-34M

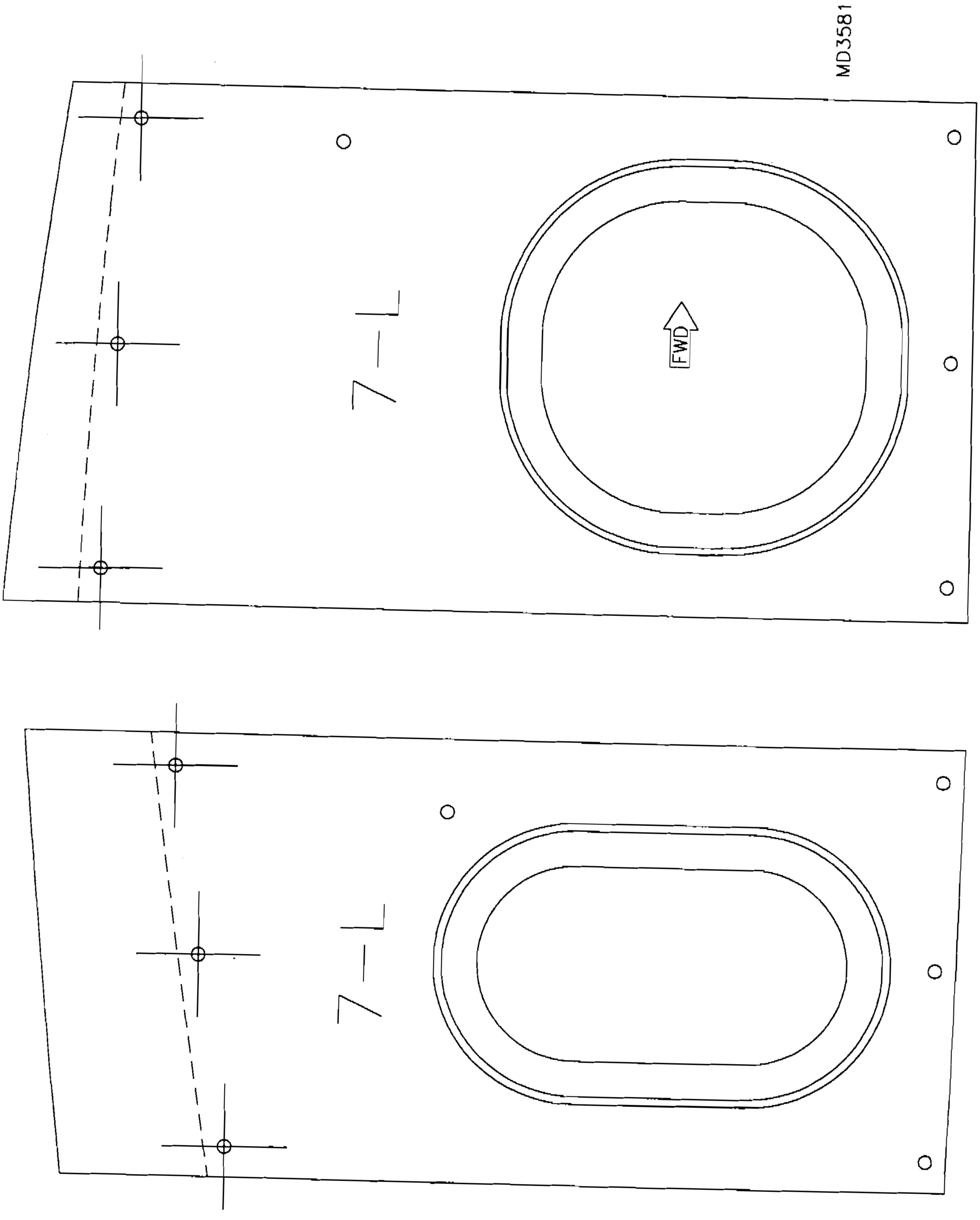


FIGURE 015C-34N

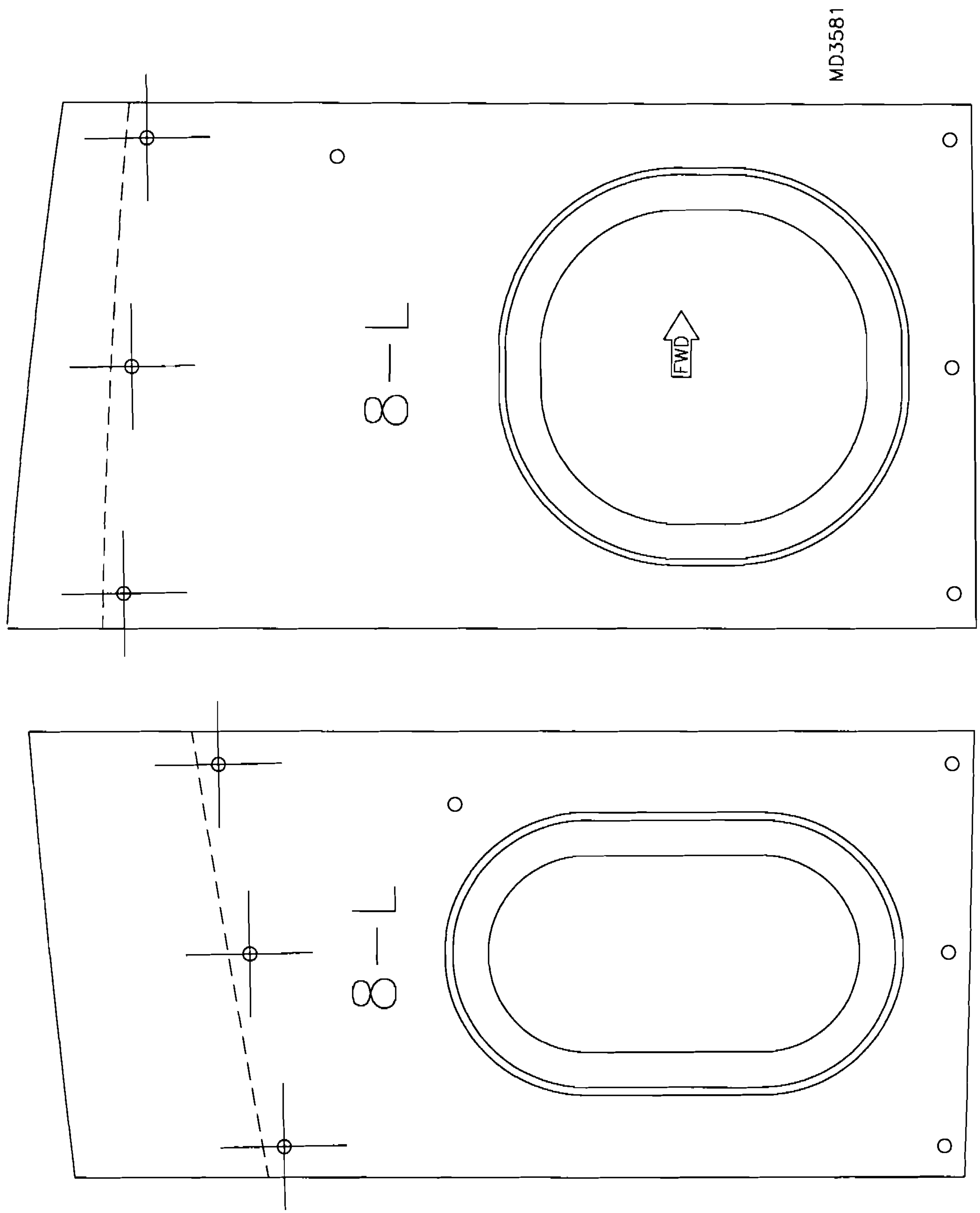


FIGURE 015C-340

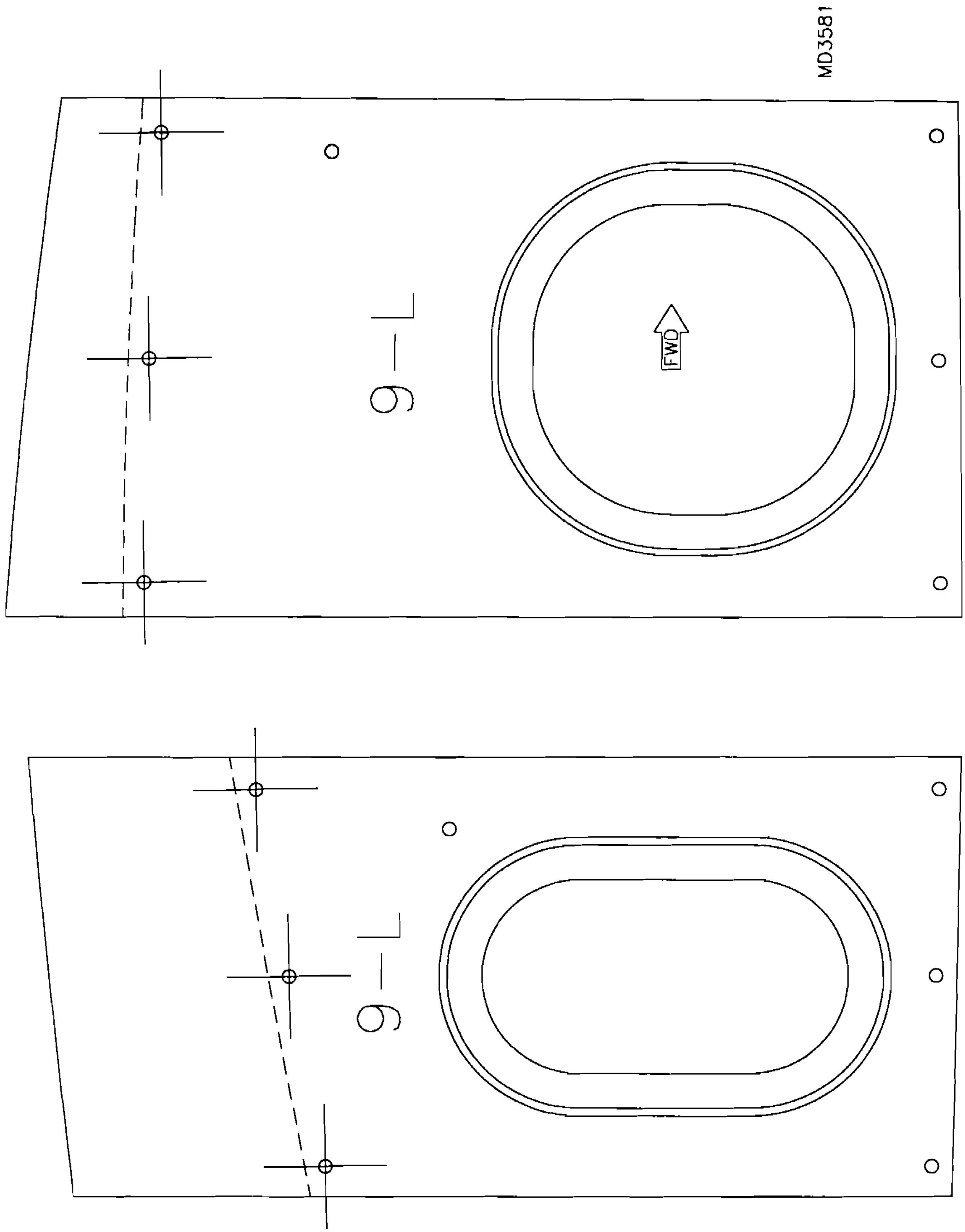


FIGURE 015C-34P

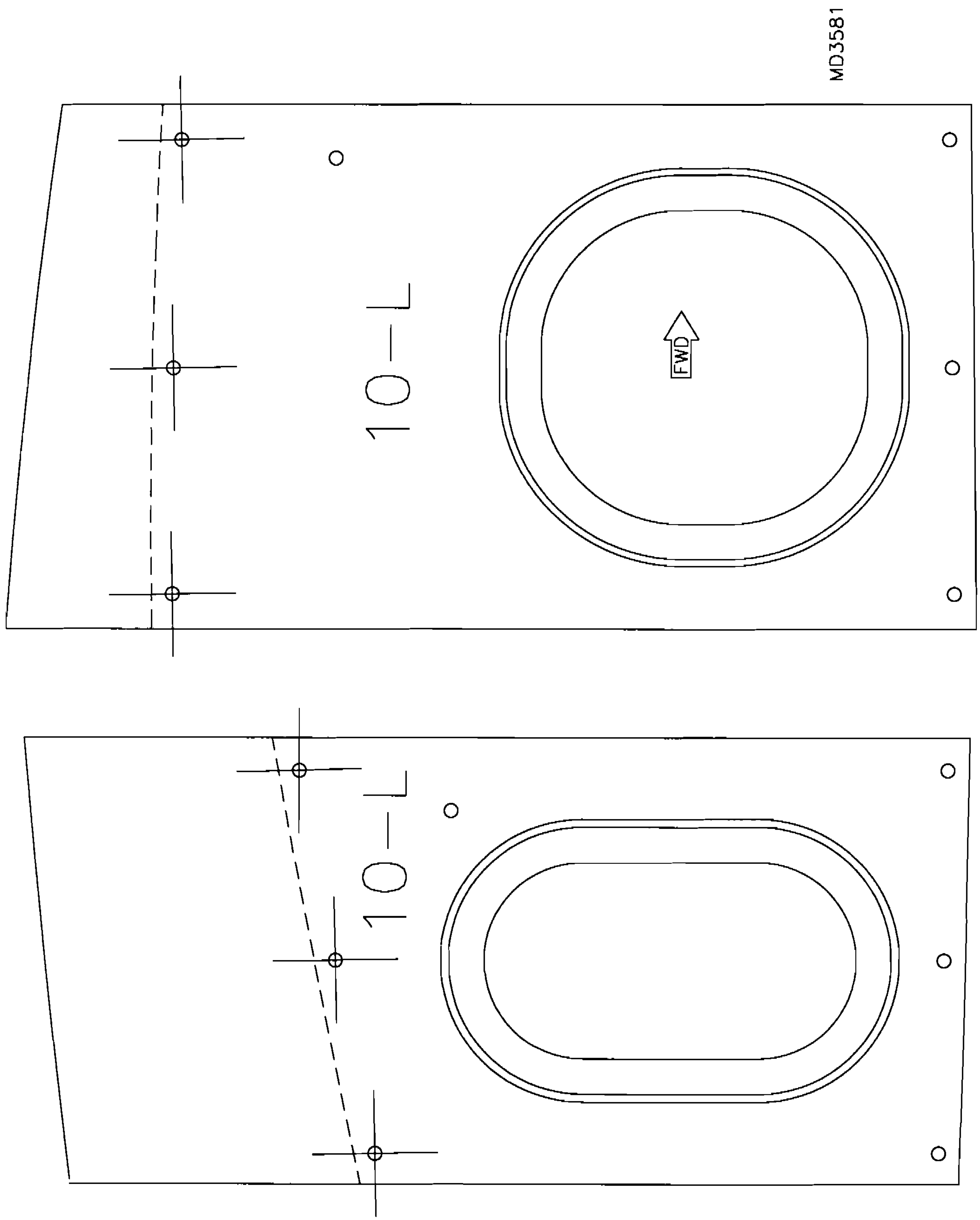
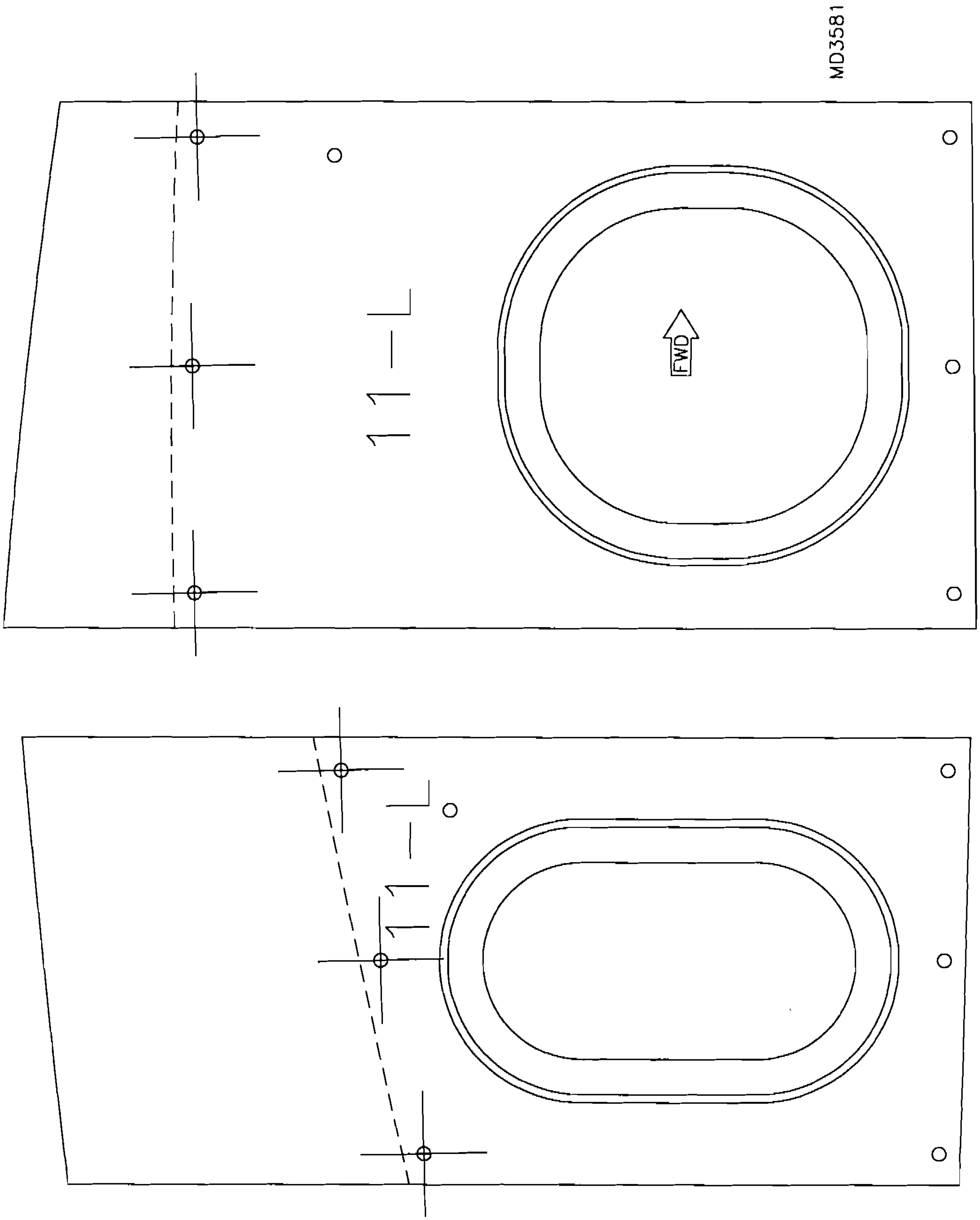


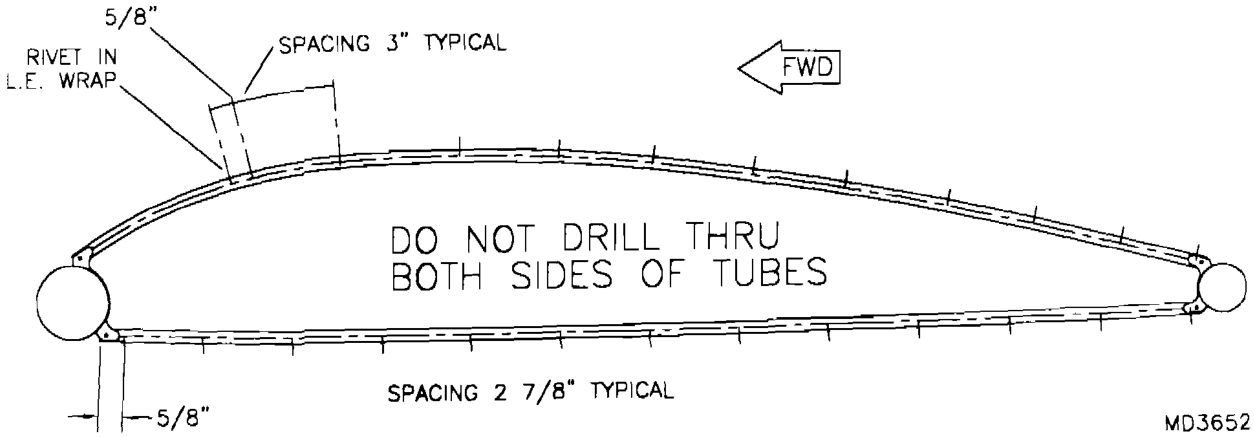
FIGURE 015C-34Q



S-6S COYOTE II   WING - PRE-COVERING

1.   Mark top ribs as shown in **Figure 015D-01** from the rivet in the aft edge of the leading edge wrap. Mark the bottom ribs as shown in **Figure 015D-01.** ***NOTE:*** *It is important that these holes be on top centerline of the top rib, and on bottom centerline of the bottom rib.* ***HINT:*** *Draw a straight piece of un-anodized aluminum across two ribs to make a centerline mark.* After marking the hole locations, click punch and drill #30. **IMPORTANT:** Drill through **one side** of the rib only. Debur.

FIGURE 015D-01



PREPARING 116 WING FOR AFT JURY STRUT

NOTE: *This instruction is only for the 116 wing.*

2.   Locate and drill a 1/4" hole in the forward side of each Trailing Edge Spar per **FIGURE 022C-27**. Install the 1/4" Riv-nut using the procedure shown in **FIGURE 022C-27A**. The Aft Jury Strut will bolt to the spar using this Riv-nut during final assembly.

FIGURE 015D-02

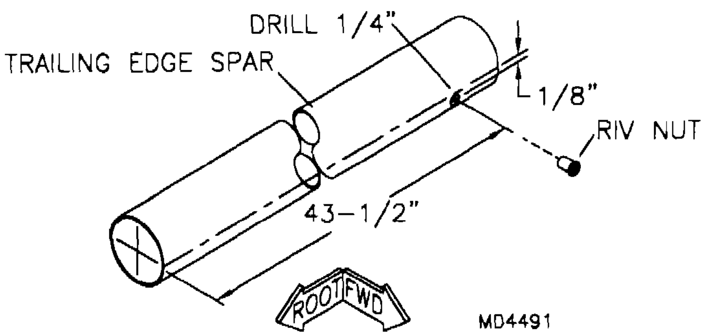
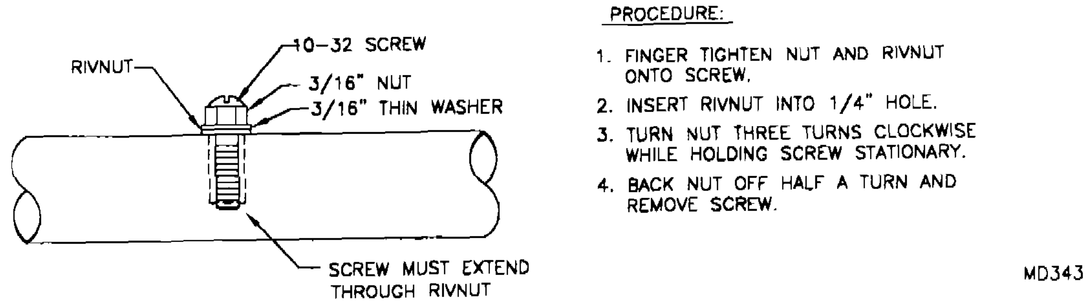


FIGURE 015D-02A



S-6S COYOTE II   JURY STRUT, TRIAL ASSEMBLY & RIGGING

Trial assembly and rigging is best done indoors. If you do not have the space, pick a calm day and set up outside. It will take pretty much a whole day, so plan to hit it hard.

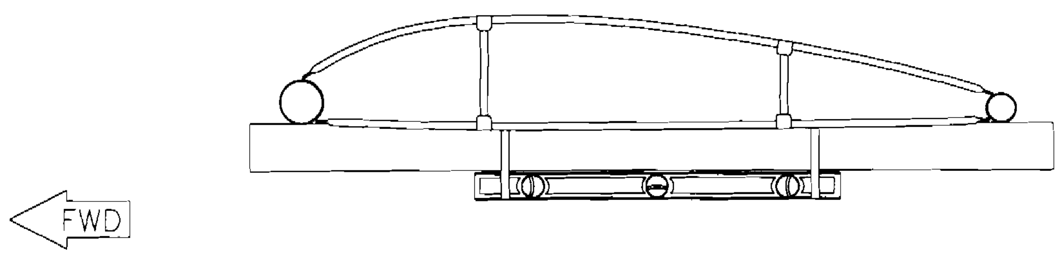
1. The front spar attaches to the airframe through the tee-bone fitting on the forward carry through. This needs grinding to fit inside the front spar. Attach the wing to the fuselage at the rear spar via the universal hinge. Swing the wing into place, support at the tip. File the tee-bone as required to allow the spar to slip on.

2. With the front spar over the tee-bone, line up the pilot hole in the spar over the tee-bone bushing. Drill through with a 3/8" diameter bit. **IMPORTANT:** Support the wing so it does not move during drilling of the spar. A loose fit may result if the spar moves. Drill through the spar 3/8" using the tee-bone bushing as a guide.

3. Pin the front spar with the 3/8" clevis pin provided. Attach the lift struts using the appropriate hardware.

4. Make a rigging level from 50" X 2" X 3/4" board. Use as straight of a board as possible. Tape a 24" level to the center of the board. Tape the rigging level to the bottom of the wing spars at the root. Raise the main gear or tail until level. See **Figure 016-04**.

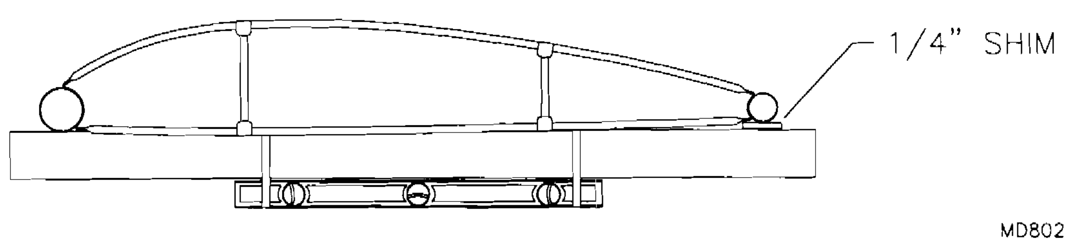
FIGURE 016-04



PLACE LEVEL AT WING ROOT

5. Remove the rigging level and attach a 1/4" thick shim to one end of the board to the top side. Place the shim under the **REAR SPAR**. Place the level outboard of the lift struts. See **Figure 016-05**. Screw in or out on the rear lift strut adjustor as required to read level. **IMPORTANT:** Adjustable lift strut rod requires 10 turns into fitting. If you are not able to obtain 10 turns as required, check strut lengths. Replace if required.

FIGURE 016-05



PLACE LEVEL JUST OUT
BOARD OF STRUTS

6. Remove the level and tape to the same location on the opposite wing and adjust washout. Once washout has been set, use Loctite and the jam nut to retain the setting before strut removal. During flight test further adjustment may be required, be sure to honor the 10 turn rule.

S-6S COYOTE II   STANDARD WING - JURY STRUT ASSEMBLY

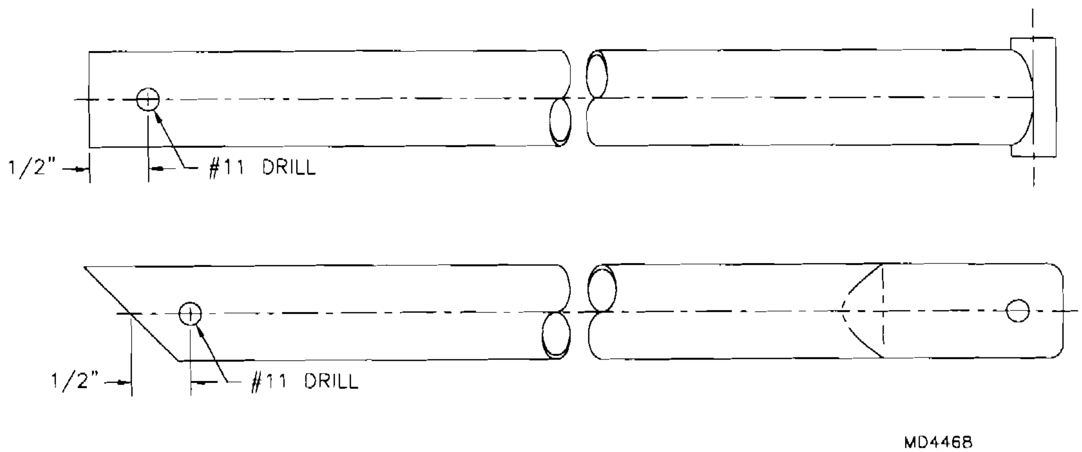
1. Collect the parts called out in the parts list for the jury strut. It is assumed the aircraft is assembled with the wings and struts on.

2. Install the eyebolts in the Lift Struts. ***CAUTION:*** *Do* ***NOT*** *crush the lift struts by over-tightening the eyebolts.*

3. Bolt the Jury Strut Connect Tube to the eyebolts. ***NOTE:*** *The straight vertical tab indicates the forward end.* Apply masking tape to the inboard edge of each tab. Mark the tab's centerline.

4. Drill a #11 hole per **Figure 016-04-STD** in the lower end of the Fwd and Aft Jury Struts. Slip the lower end of the Forward Jury Strut over the fwd tab. Bolt the top end to the Jury Strut Attach Bracket. Align the hole in the jury strut with the tab centerline. Transfer drill #11. ***NOTE:*** *You may want to mark the hole location on the tab with the #11 bit and drill in a drill press.* ***CAUTION:*** *Be sure the lift strut is straight before drilling.* Trim the lower end of the Fwd Jury Strut if required. Insert a bolt to temporarily hold in place.

FIGURE 016-04-STD



5. Slip the lower end of the Aft Jury Strut over the aft tab. Temporarily bolt the top end to the Flap Compression Tube (W-FCT), 1 1/2" aft of the Flap Retainer Bracket. Align the hole in the jury strut with the tab centerline. Transfer drill #11. ***NOTE:*** *You may want to mark the hole location on the tab with the #11 bit and drill in a drill press.* ***CAUTION:*** *Be sure the lift struts are straight before drilling.* Trim the lower end of the Fwd Jury Strut if required. Insert a bolt to temporarily hold in place.

6. Remove the Forward and Aft Jury Struts. Be sure to mark left and right. Trim the Plastic Shims to match the tabs on the Jury Strut Connect Tubes. Trim two (2) shims per tab. Align the Plastic Shims on each tab, mark and drill #11.

7. Paint or powdercoat the jury struts as desired. Reinstall the Forward and Aft Jury Struts with the Plastic Shims during final assembly. Tapering of the shim will be required for proper fit. Safety wire the drilled head bolts.

S-6S COYOTE II 116 WING - JURY STRUT ASSEMBLY

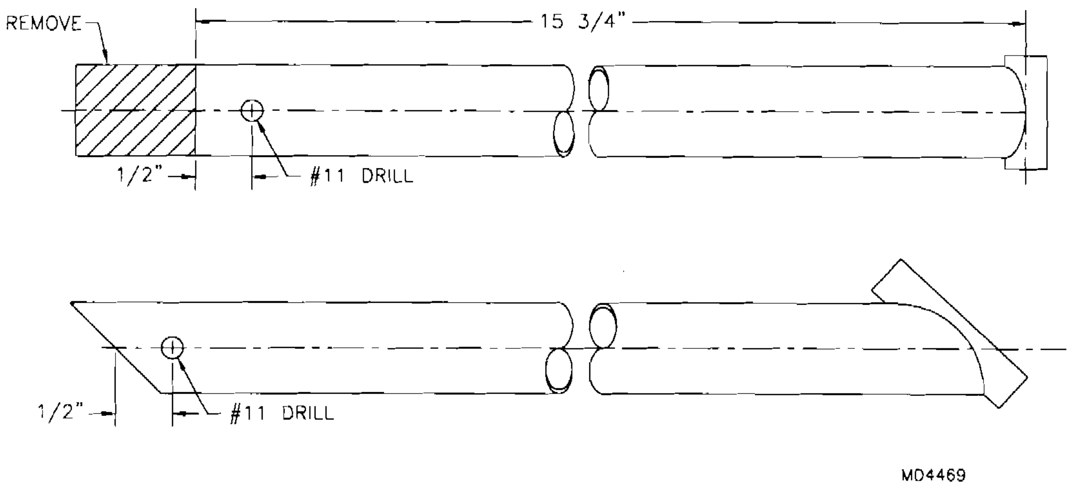
1. Collect the parts called out in the parts list for the jury strut. It is assumed the aircraft is assembled with the wings and struts on.

2. Install the eyebolts in the Lift Struts. ***CAUTION:*** *Do* ***NOT*** *crush the lift struts by over-tightening the eyebolts.*

3. Bolt the Jury Strut Connect Tube to the eyebolts. ***NOTE:*** *The straight vertical tab indicates the forward end.* Apply masking tape to the inboard edge of each tab. Mark the tab's centerline.

4. Trim the Fwd Jury Strut per **Figure 016-04-116**. Slip the lower end of the Forward Jury Strut over the fwd tab. Temporarily bolt the top end to the Jury Strut Attach Bracket. Trim the lower end of the Fwd Jury Strut if required. Drill a #11 hole per **Figure 016-04-116** in the lower end of the Fwd and Aft Jury Struts. Align the hole in the jury strut with the tab centerline. Transfer drill #11. ***NOTE:*** *You may want to mark the hole location on the tab with the #11 bit and drill in a drill press.* ***CAUTION:*** *Be sure the lift strut is straight before drilling.* Insert a bolt to temporarily hold in place.

FIGURE 016-04-116



5. Slip the lower end of the Aft Jury Strut over the aft tab. Temporarily bolt the top end to the Riv-nut in the Trailing Edge Spar. Align the hole in the jury strut with the tab centerline. Transfer drill #11. ***NOTE:*** *You may want to mark the hole location on the tab with the #11 bit and drill in a drill press.* ***CAUTION:*** *Be sure the lift struts are straight before drilling.* Trim the lower end of the Aft Jury Strut if required. Insert a bolt to temporarily hold in place.

6. Remove the Forward and Aft Jury Struts. Be sure to mark left and right. Trim the Plastic Shims to match the tabs on the Jury Strut Connect Tubes. Trim two (2) shims per tab. Align the Plastic Shims on each tab, mark and drill #11.

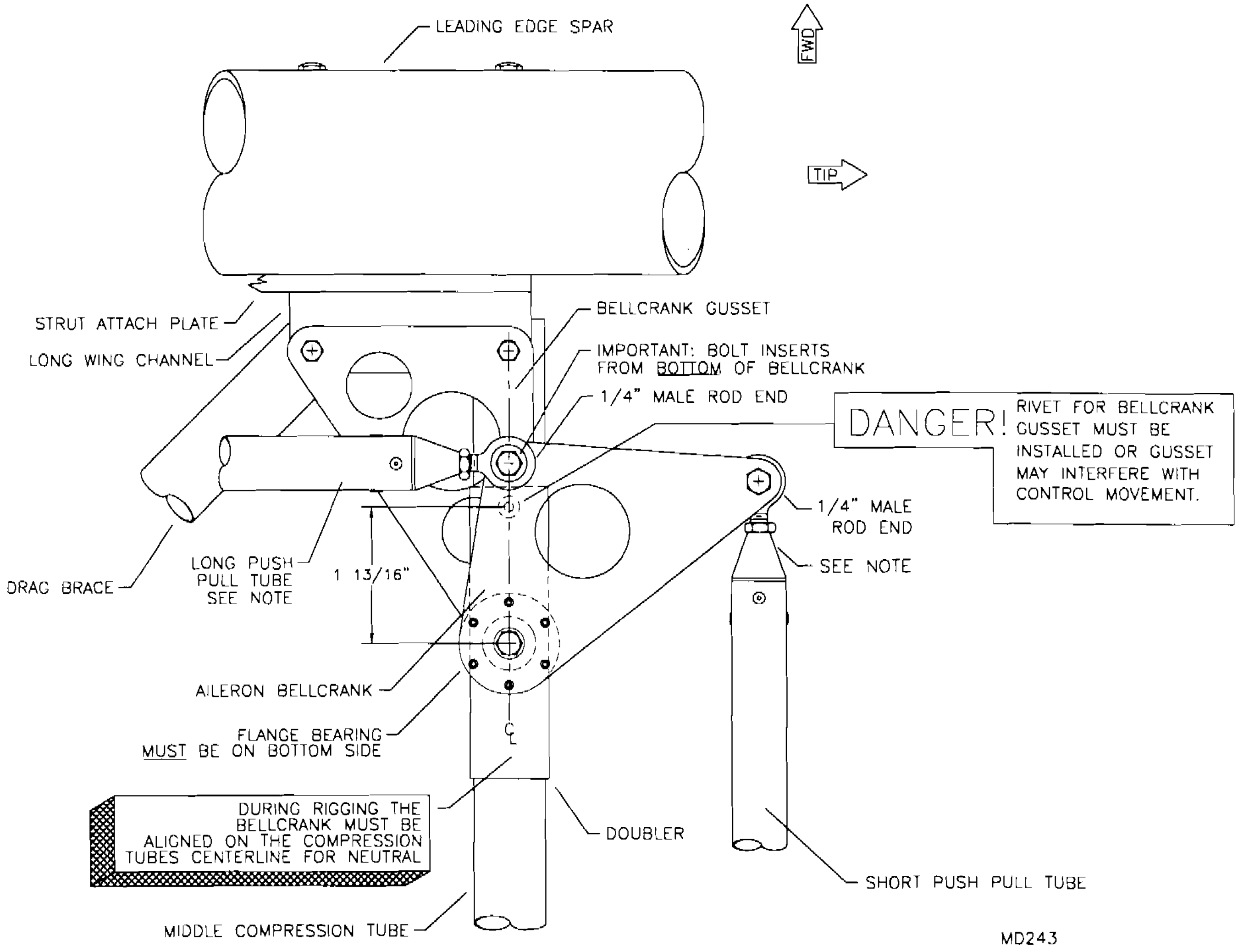
7. Paint or powdercoat the jury struts as desired. Reinstall the Forward and Aft Jury Struts with the Plastic Shims during final assembly. Tapering of the shim will be required for proper fit. Safety wire the drilled head bolts.

S-6S COYOTE II WING BELLCRANK RIGGING

1. If you have not already installed the long aileron push-pull tube, do so now. Screw the rod end with jam nuts into the push pull tube at least 10 turns. Be sure to install push-pull tube through guide on compression tube.

2. Check to see if the control stick and control tee are centered on top of the cabin. Adjust the cables as required. Center the bellcranks over the compression tubes. Locate and jam nut once set. See **Figure 016-02**.

FIGURE 016-02



IMPORTANT: SMALL FLANGE ON GUSSET MUST POINT DOWN

NOTE: STOP NUT OR BOTTOM OUT PUSH PULL TUBE ON BELLCRANK DURING FINAL ASSEMBLY. THE ROD END IS LEFT ATTACHED TO THE BELLCRANK. AFTER COVERING THE WING, THE AILERON PUSH PULL TUBE IS INSERTED THROUGH THE EXIT HOLE IN THE WING AND SCREWED INTO THE ROD END.

CAUTION: ROD ENDS MUST BE TURNED IN AT LEAST 10 TURNS.

3. Tape two 60" straight boards to the underside of the wing spars. Place at mid span of the ailerons. The boards should extend past the trailing edge of the ailerons and the leading edge spar. Install the short aileron push pull tube. Adjust the ailerons so they barely touch against the board. Remove the board. Operate the ailerons. They should have approximately twice as much up as down. This is done to minimize adverse yaw.

4. Tape the board under the mid span of the flaps. Install the flap teleflexes to the retainers in the cabin and on the wing. Again, the rod ends screw on a minimum of 6 turns. Adjust the flaps to barely touch against the board.

5. Remove the board and operate the flaps.

S-6S COYOTE II RUDDER RIGGING

6. The straight multi-hole tang attaches on the outside rudder pedals. The cables run straight back to the rudder. Lay the cables between the tangs welded to the frame in the seat area. Trim the cable keepers as shown in **Figure 016-06**. Install the cotter pin as shown in **Figure 016-06A**. Install the cable guides at station 6 as per **Figure 016-06B**.

FIGURE 016-06

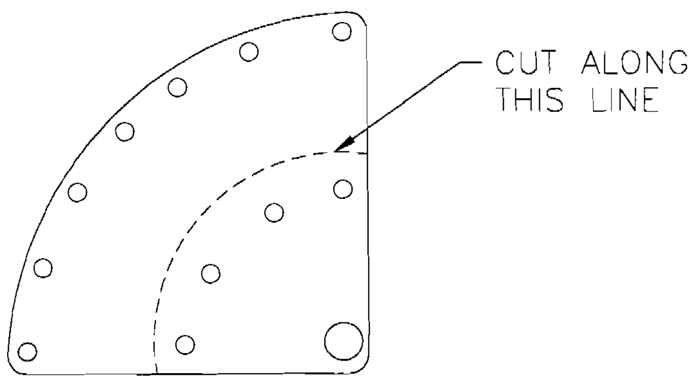


FIGURE 016-06A

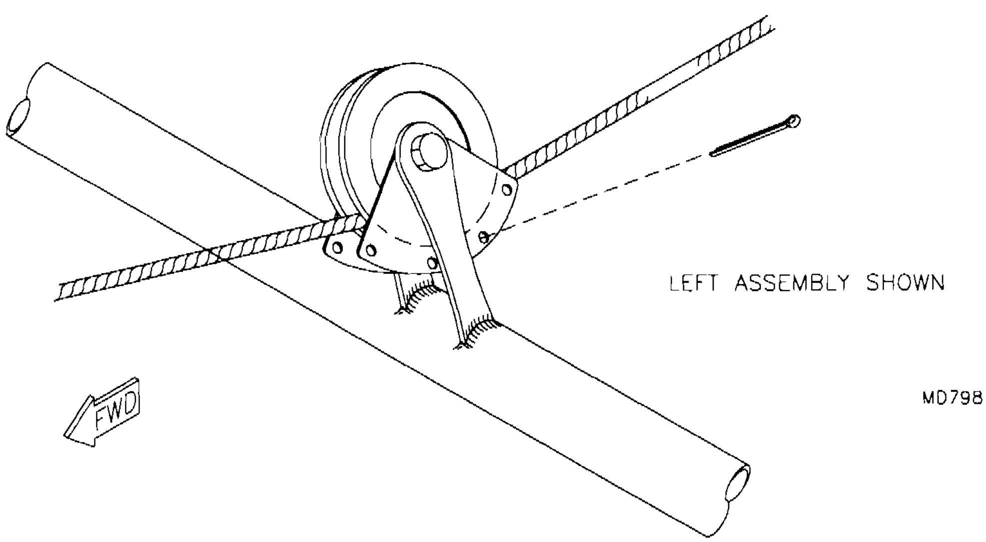
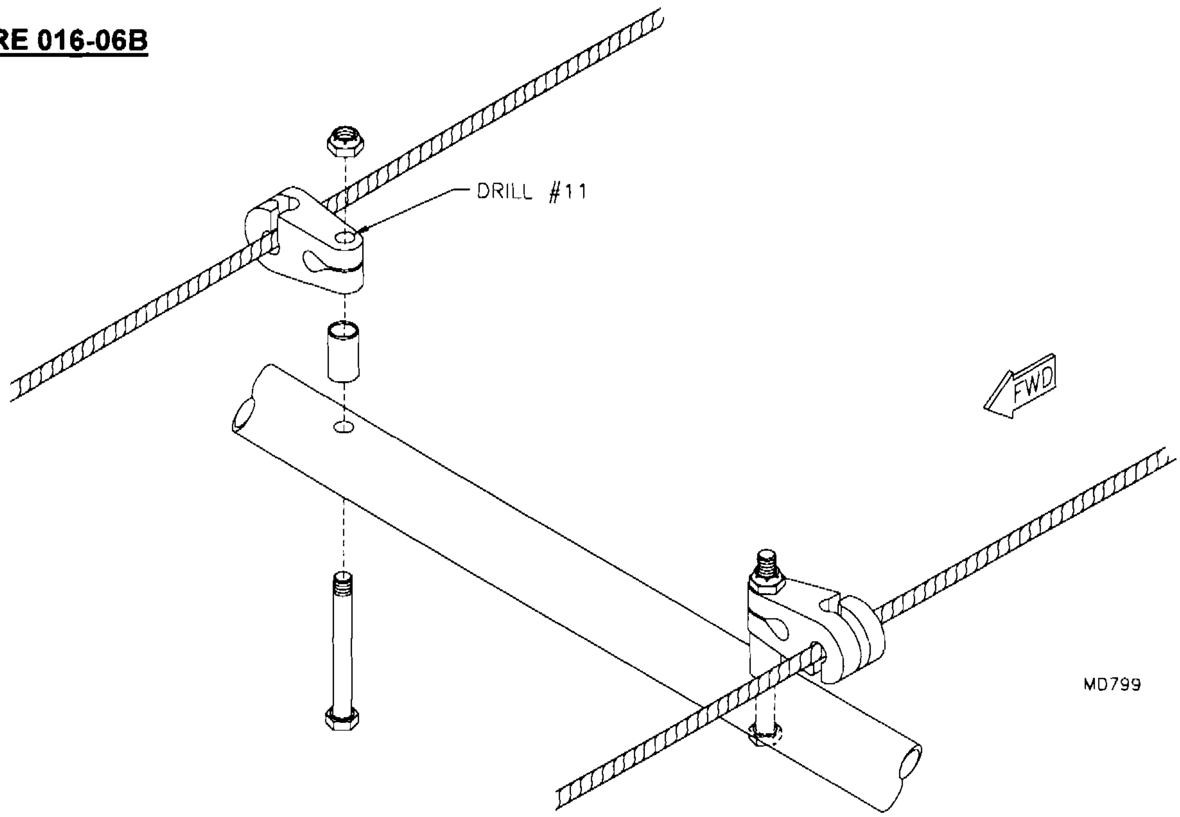
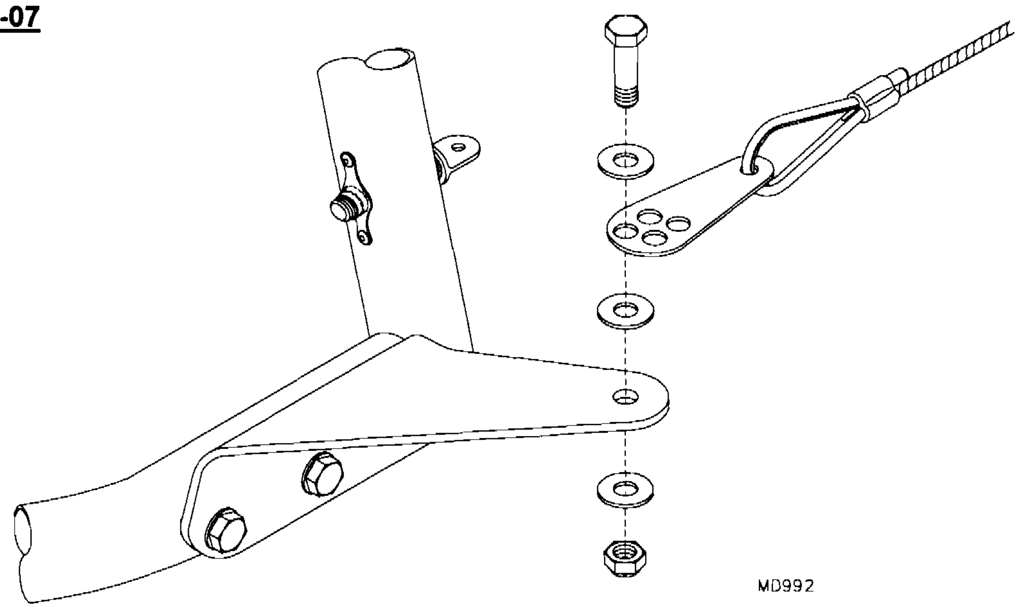


FIGURE 016-06B



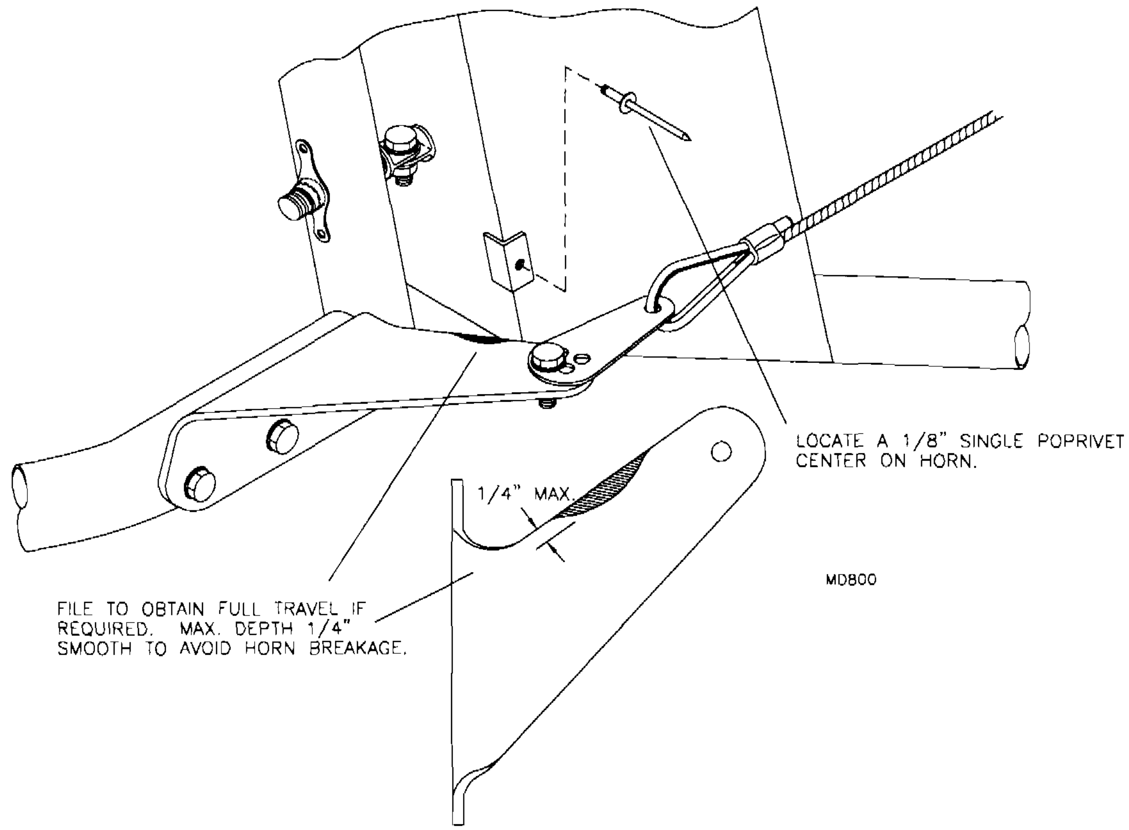
7. Bolt the cables to the rudder horns. Sequence washers accordingly to **Figure 016-07**. Do not overtighten. Rudder cables must be free to turn. Move the rudder side to side. Check cables for proper routing. Minor adjustments in the rudder to the rudder pedal position can be made by using a different hole in the end of the rudder cable tangs.

FIGURE 016-07



8. The rudder stops are aluminum angles riveted to the tail channel. Apply two layers of masking tape where the rudder horn contacts the tail channel. This will simulate the fabric thickness. Place the angles so they are centered on the rudder horn contact spot. Drill and cleco. Rivet angles after covering. See **Figure 016-08**.

FIGURE 016-08



DOOR UP CATCH LOCATION

9. Install the doors and door upcatch. Open the door to check operation. The door handle should present itself in a manner to hook the upcatch. Bend the door upcatch below the threads for adjustment.

RIGGING REVIEW

Check the control system. The controls should operate smoothly with little pressure. Inspect for any chafing or interference of any type. Correct as required. During flight testing, final adjustments will be made. The FAA and EAA publish excellent advice on flight testing new planes. Write for these publications:

Federal Aviation Administration
U.S. Department of Transportation
P.O. Box 25504
Oklahoma City, OK 73125

Experimental Aircraft Association
EAA Aviation Center
Oshkosh, WI 54903-3086

COVERING THE SUPER SIX

Included in your Super Six kit is a Poly Fiber aircraft covering manual. Before shrinking any fabric calibrate your clothing iron as described. Another problem area is curves. The fabric will want to wrinkle when being glued to a curved corner, like the ones on the tail. The Poly Fiber manual points out a slick way to glue down wrinkle free corners. Refer to the manual for basic covering technique.

Buy a pair of rotary pinking shears. They will be used to cut all the patches and tapes. The rotary style is so much better than the normal scissors type pinkers. It is money very well spent.

A model airplane iron is also useful in shrinking up tight areas. Use a regular clothing iron for over all shrinking. The best ones are the old steel irons. New irons are usually made of aluminum. They just don't have the mass to work like the old fashion irons. Look for an iron at a garage sale or second hand store, or borrow grannies.

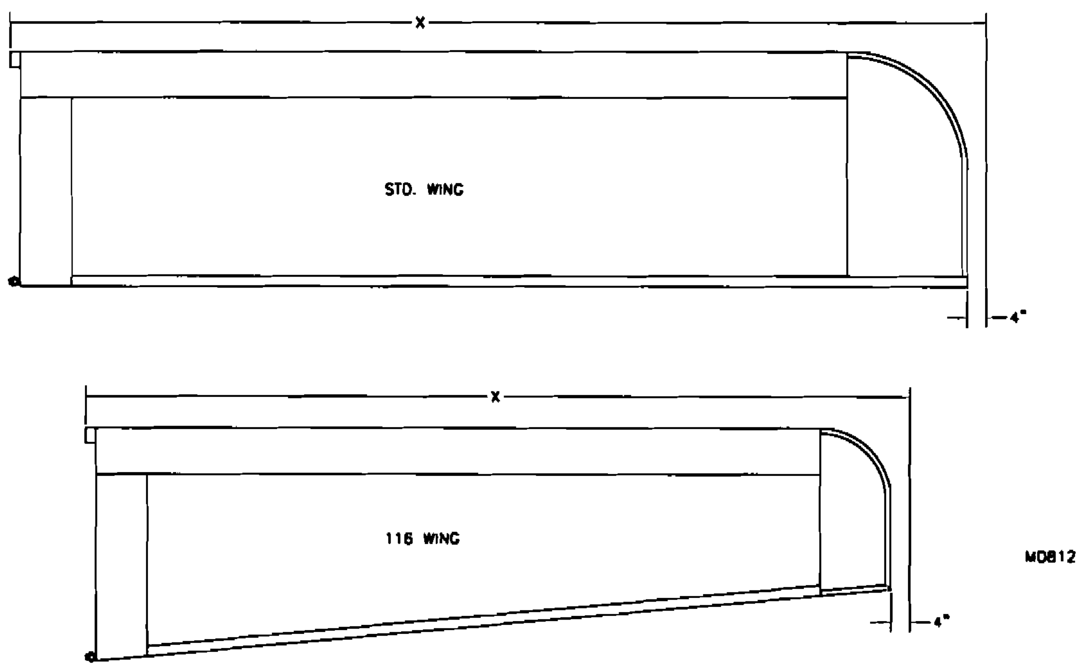
Several places in this manual we refer to "poly-brush". This is a particular product from the Poly Fiber Company. Poly-brush is used to seal fabric or glue down tapes and patches. It is not required to use the exact material. In fact, we currently use the U-500 glue, thinned with MEK or acetone. The idea is the same, no matter the brand. References may be made to applying a coat of poly-brush over the entire surface. In general, we do not recommend this, since it prevents adhesion of the primer base coat. Such double or seal coating is only required in areas of tapes, patches or underlying sheet metal surfaces. The coating will prevent pinholes.

In the back of this section, we have included plans for building copies of our pivot stands. These are used to hold the wings, fuselage, and tail parts while covering and painting. We have found the pivot stands an excellent aid. If you are not up to building these stands you may purchase or rent a set. Call our parts department or your nearest dealer for details.

COVERING THE SUPER SIX TAIL SURFACES

1. To gain experience, cover the tail first. However, cut four lengths of fabric as per **Figure 017-01**. This will assure enough material for the wings. Most all of the covering techniques are used in the tail. The experience gained will greatly enhance the rest of the job. There is enough fabric for at least one mistake. So, if a tail feather is not right, try again. Work toward perfection and neatness. Take your time, a good job is easy to live with. A bad job...you'll spend more time making excuses than it would have taken to do right!

FIGURE 017-01



2. Perform the following pre-covering inspections.

HORIZONTAL STABILIZER

1. All nut plates installed (hinge points, attach points)
2. All tubes, gusseted, riveted and secured
3. Trim tab cable housing holes located
4. Locate holes in compression ribs
5. Clean structure with a fresh tack cloth

ELEVATORS

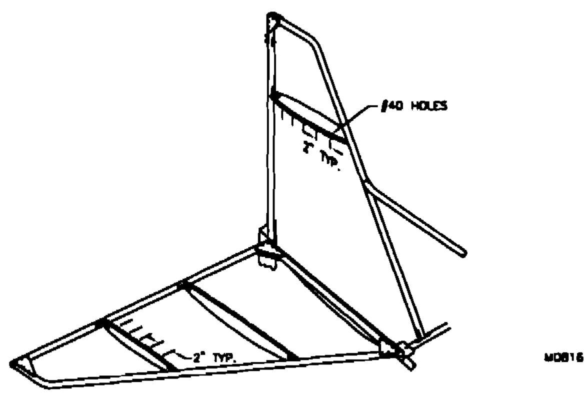
1. All nut plates installed (hinge points, horn attach point)
2. All tubes, gusseted, riveted and secured
3. Trim tab cable housing hole located
4. Trim tab cable housing attach point riveted
5. Clean structure with a fresh tack cloth

RUDDER

1. All nut plates installed (hinge points)
2. Rudder horns pre-drilled (not attached)
3. All tubes, gusseted, riveted and secured
4. Clean structure with a fresh tack cloth

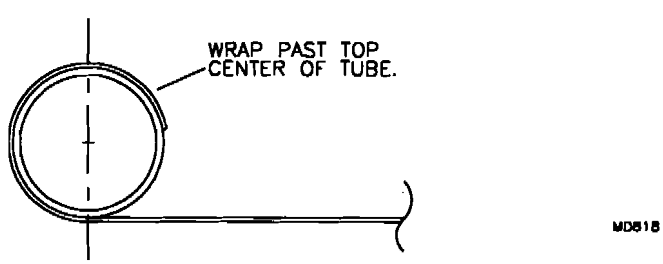
3. Drill #40 holes in the tail ribs every 2". See **Figure 017-03**. After covering, rivets will be installed through a small strip of .020 lexan to "rib stitch" the skin.

FIGURE 017-03



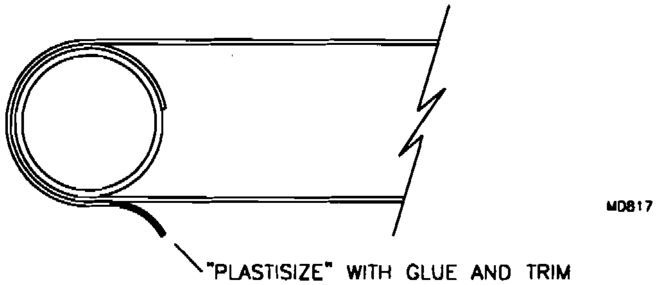
4. Cover the bottom of the horizontal stabilizer. Remember, the horizontal stabilizer features an inverted airfoil. Layout the fabric to the shape of horizontal stabilizer with enough border to wrap the tube as per **Figure 017-04**. Follow this rule on all tube wraps throughout the project. Apply glue and attach the fabric without tension. Pull out any large wrinkles or slack. After the glue is dry to the touch, shrink the fabric at the edges only. Use a low heat setting. Do not fully shrink the fabric. Only shrink the fabric enough to smooth out the edges. This is to make it wrinkle free for the top fabric.

FIGURE 017-04



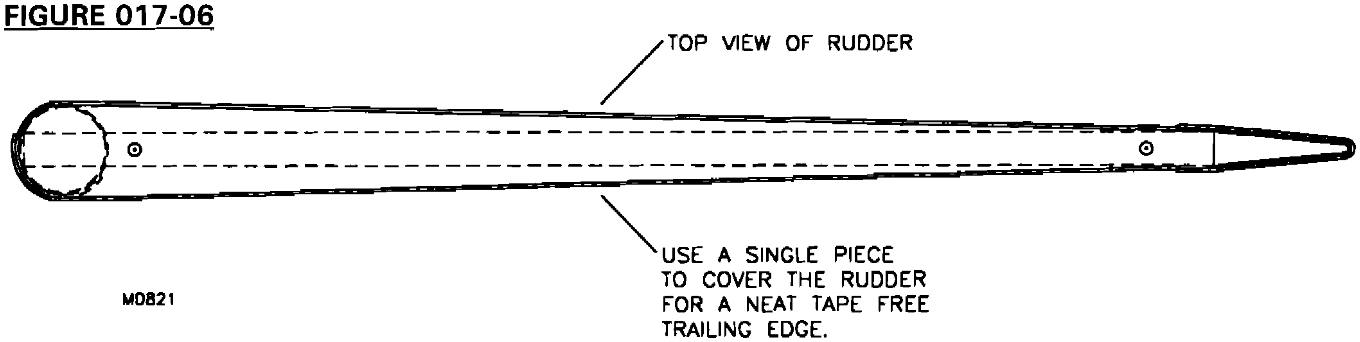
5. Apply glue and attach the top layer of fabric. Establish an overlap as shown in **Figure 017-05**. A super neat trim edge can be accomplished using a method called "plasticizing". Apply thinned glued to edges of the second layer of fabric. The glue will stabilize the fabric for trimming straight without frays. This method should be used for all trimming. Glue the fabric to the frame. Mark the trim line with a straight edge and pencil. Pull up the fabric past the line and trim. Use a sharp scissors and just slice. There is no need to pump the scissors. Glue down the trimmed edge. Heat seal the edge with the iron on low. Shrink the skins to final form once the glue has thoroughly dried. See the Poly Fiber manual for details.

FIGURE 017-05



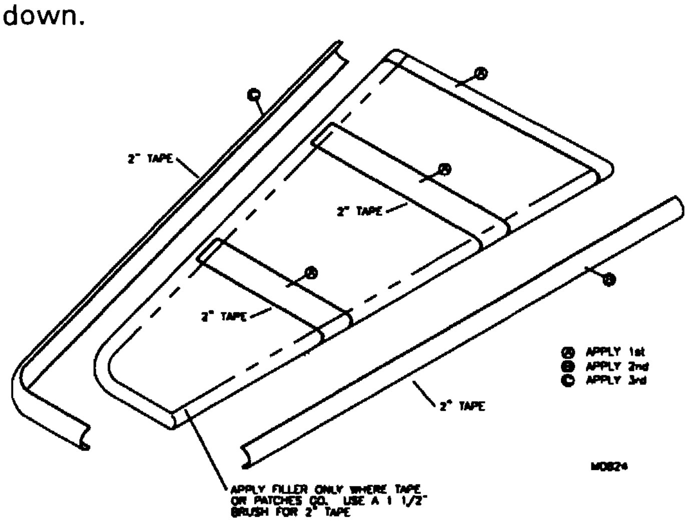
6. Apply a coating of poly-brush to the elevators, the rudder trailing edges and the end ribs. Let dry. Poly brush is a fabric filler from the Polyfiber Co. A filler is used to apply patches, tapes and fill the fabric weave. Also the filler applied to frames where there is significant surface area, will prevent wicking. Wicking will cause pinholes in the final paint job. Cover the elevators starting with the bottoms. Cover the rudder with a single piece. See **Figure 017-06**.

FIGURE 017-06



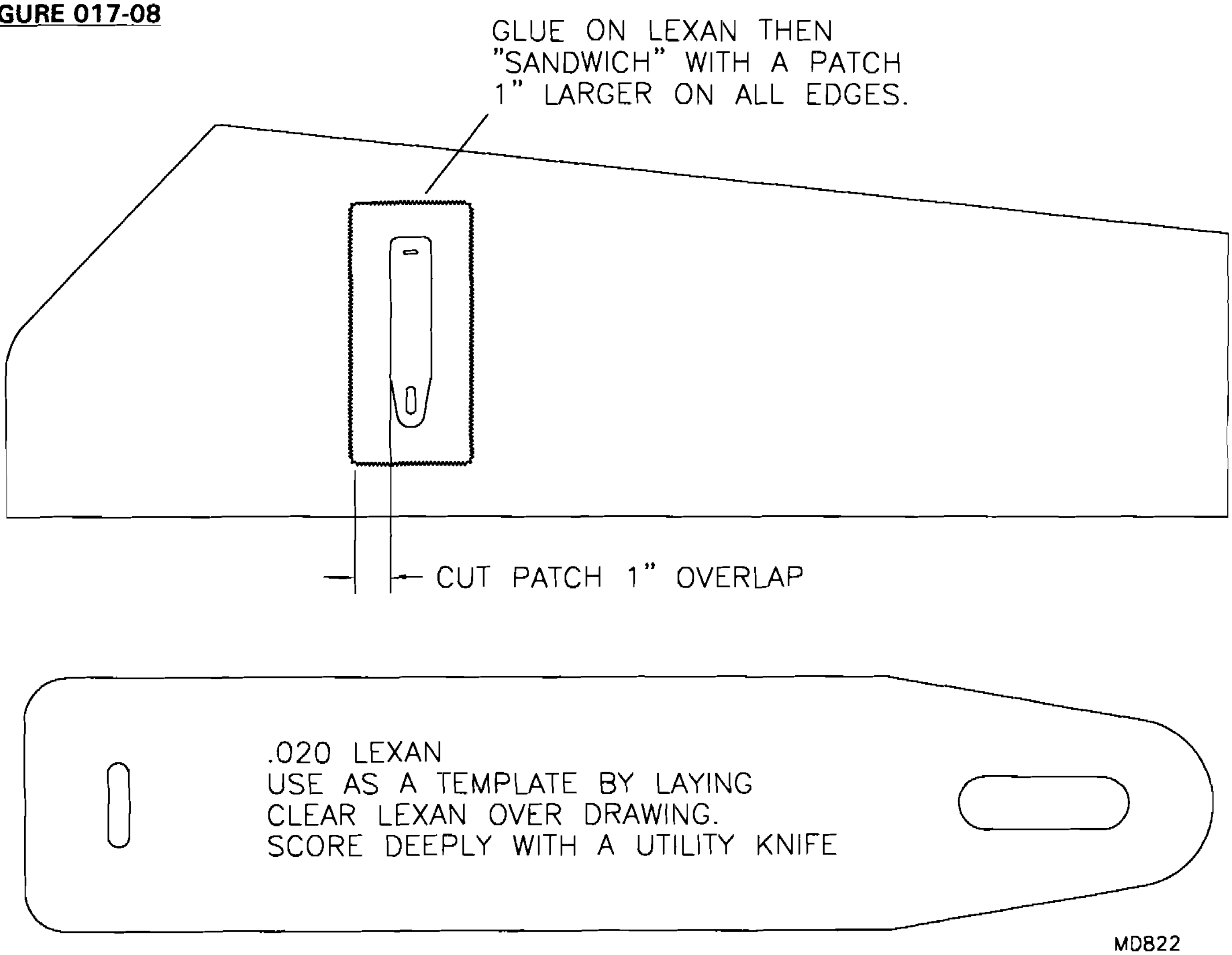
7. Cut the .020 lexan strips to the length of ribs. Glue the strips in place with poly-brush. Drill through #40 and rivet. Using a 1 ½" brush apply two brush coats of poly-brush to the ribs and edges. Only brush on a 2" wide area. This will be where the surface and edge tapes will be glued. Brush on a third coat and apply to the 2" tapes as in **Figure 017-07**. Cut out for the hinges on the root rib of the stabilizer with a razor. Apply two more brush coats of polybrush over the tapes and patches after all edges are heat sealed down.

FIGURE 017-07



8. Apply the trim cable exit to the right elevator bottom. See **Figure 017-08**. Finish out the elevator and rudder with edge tapes. No rib stitching is required on either the elevator or rudder. See **Figure 017-08**.

FIGURE 017-08



9. All tail parts should be inspected for loose pinked edges. Melt down loose pinks using the tip of the iron. All tapes and patches should have at least two brush coats of polybrush. Lack of polybrush will result in pin holes in doubled fabric areas. Do not brush polybrush over the whole part. The painting system we recommend avoids this sloppy and weighty process. Melt through with the tip of a soldering iron:

-All hinge points.
-Rudder/elevator horns.
-Tail cable locations.
-Melt open the holes for attaching the trim tab hinges, but do not rivet on the hinges.
-Open the holes for the trim cable.
-Poke drain holes in the bottom inside aft corners on the horizontal stab. and elevator.
-Hinge positions at the horizontal stabs, cut open with a utility knife.

10. Smooth down all pinked edges with the tip of the iron. Just use the tip applied over the pinked edge. Do not iron the tapes. Wrap the tail parts in plastic until painting.

COVERING THE SUPER SIX WINGS, AILERONS AND FLAPS

1. Perform the pre-covering checklist.

A. WINGS

1. All nut plates installed for hinge points
2. All wing fittings, brackets, tubes, and bolts in place and secure
3. Control system installed and checked out (PPT guide installed)
4. Flap teleflex routed and secured
5. Fuel tank mounted, inspected and fuel lines clamped, routed and secured
6. ASI and static lines in place and secured
7. Navigation light wires and mount plate installed.(route wires in TES)
8. Leading edge and root wraps bonded securely
9. Clean structure with fresh tack cloth

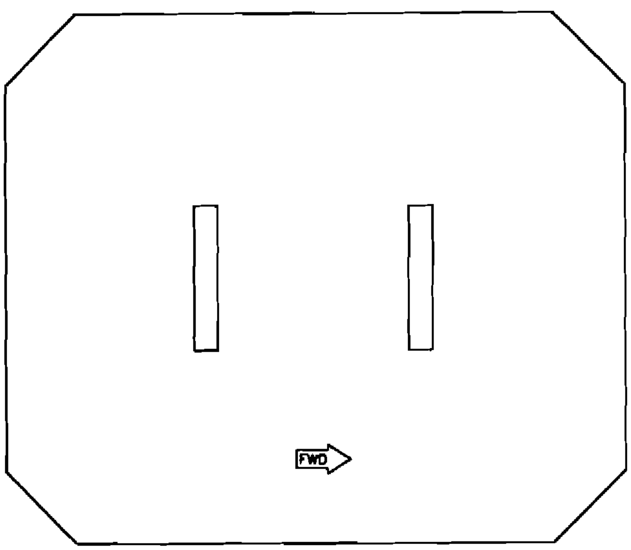
B. FLAPS AND AILERONS

1. All nut plates installed (hinge points)
2. All tubes riveted securely
3. Clean structure with a fresh tack cloth

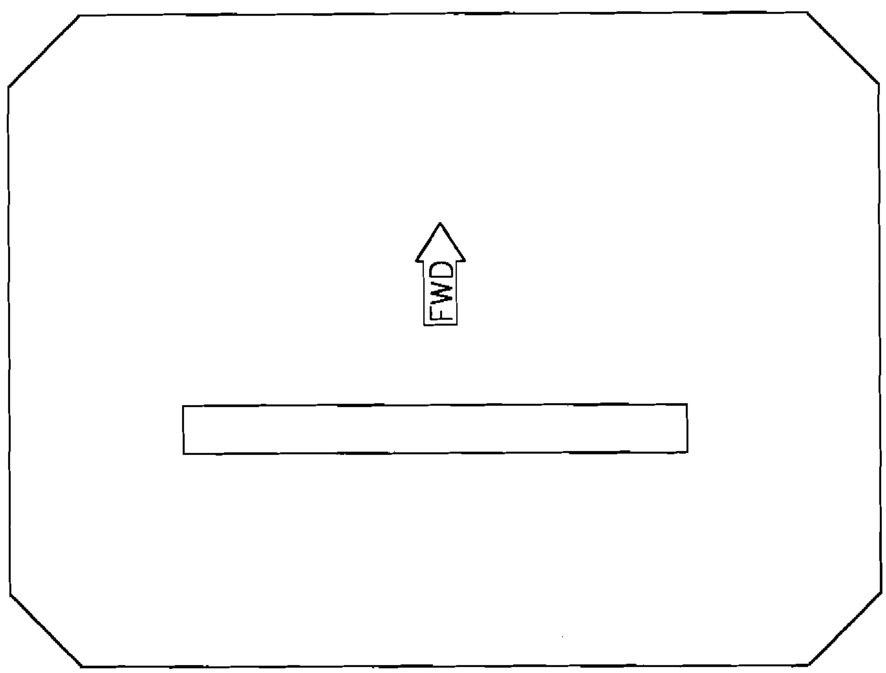
2. Fabricate all the .020 lexan panels. Lay the .020 lexan sheet over the templates and score with a utility knife. If the scores are deep enough, snap the parts out by bending the lexan. See **Figure 017-02.**

FIGURE 017-02

1. JURY STRUT LEXAN REINFORCEMENT (.020 LEXAN) (QTY. 2)



2. LEADING EDGE STRUT PLATE LEXAN REINFORCEMENT (.020 LEXAN) (QTY. 4)



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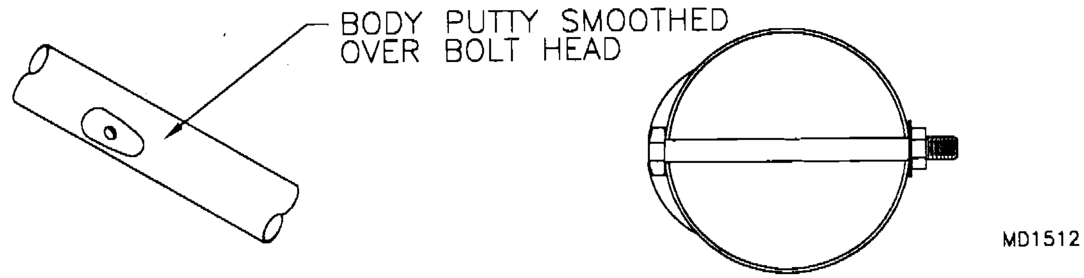
3. **FOR STANDARD WINGS:** Glue the bolt cover over the 3 bolt heads, if not already done. Apply body putty to the remaining bolt head. Shape to flair into the wing profile. See **Figure 017-03**.

FIGURE 017-03



4. Brush on one to two coats of polybrush on the leading edge and root wraps. This will prevent pinholes when painting.

5. The wing frame should be placed on saw horses or wing pivots right side up for the standard wing and upside down for the 116. The top fabric is attached first for the standard wing. The bottom is attached first for the 116 wing. Establish overlaps as shown in **Figure 017-05**. Allow at least 2" extra on the root end. Finish the root ends as shown in **Figure 017-05A**. Trim off the excess carefully, it will be used to cover the aileron and flaps. Use the iron to slightly shrink the corner at the tip. After the glue dries lightly shrink around the edges. This will pull the fabric tight against the spars, making it smooth for the bottom fabric.

FIGURE 017-05

STD

116

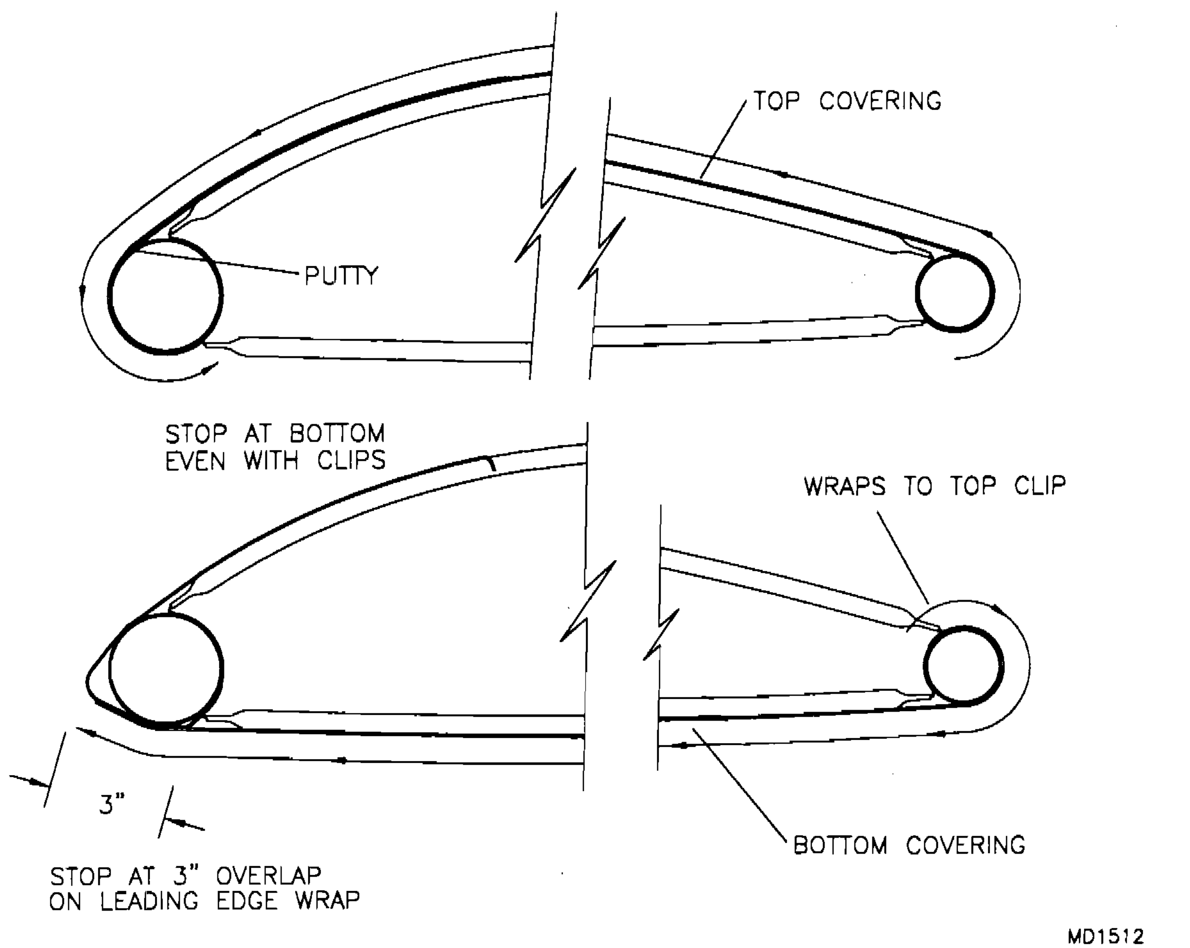
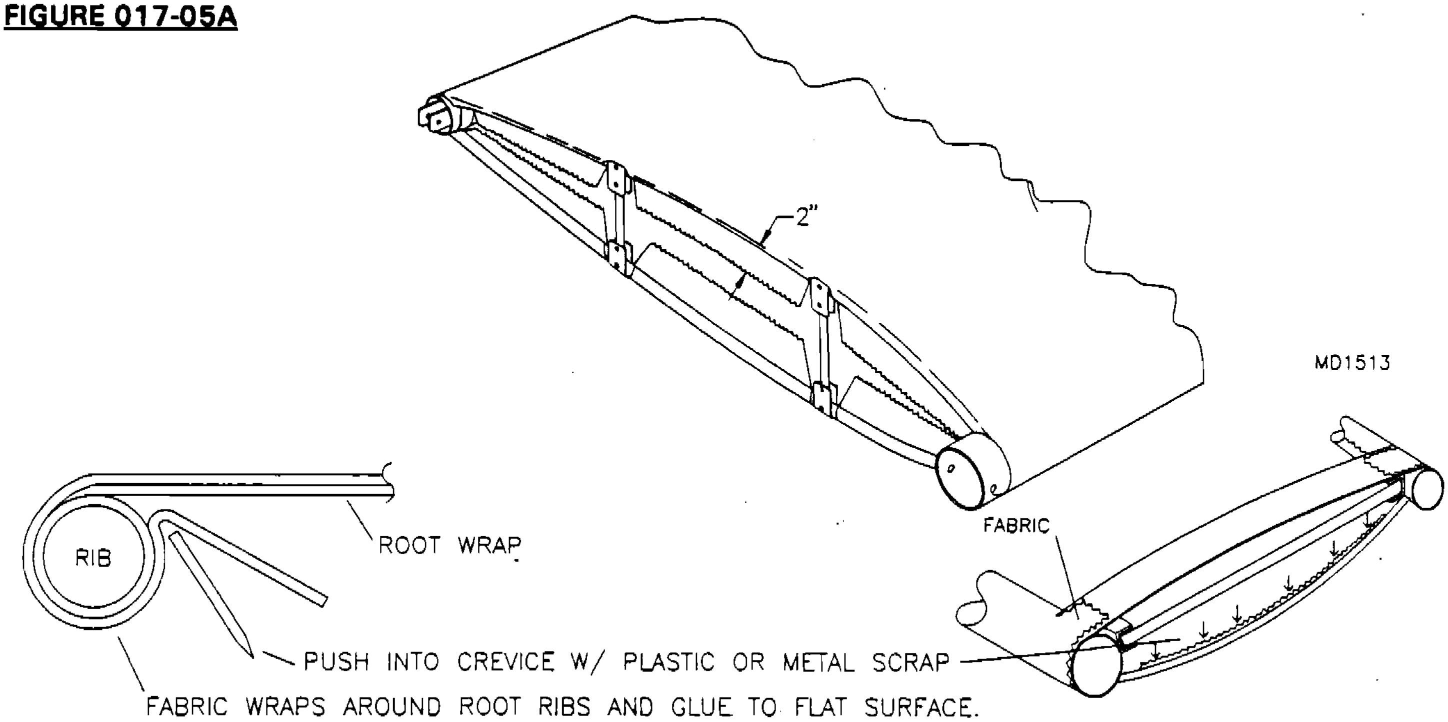


FIGURE 017-05A



6. Flip the wing over and attach the bottom fabric (or the top if 116). Establish the overlaps as per **Figure 017-06**. Trim the tip to overlap at least 3/4 of the tube. This works for both standard and 116. See **Figure 017-06A**.

FIGURE 017-06

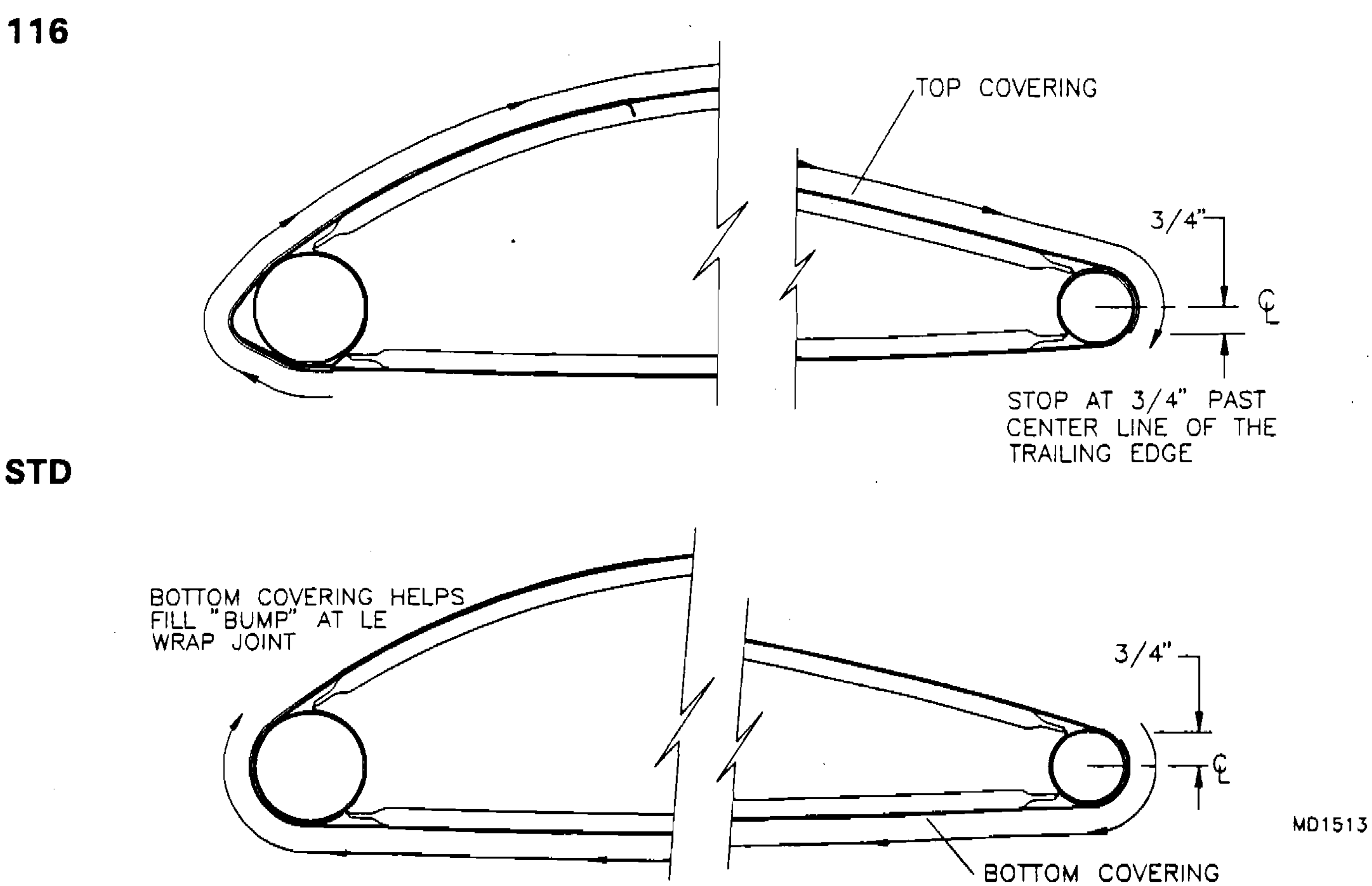
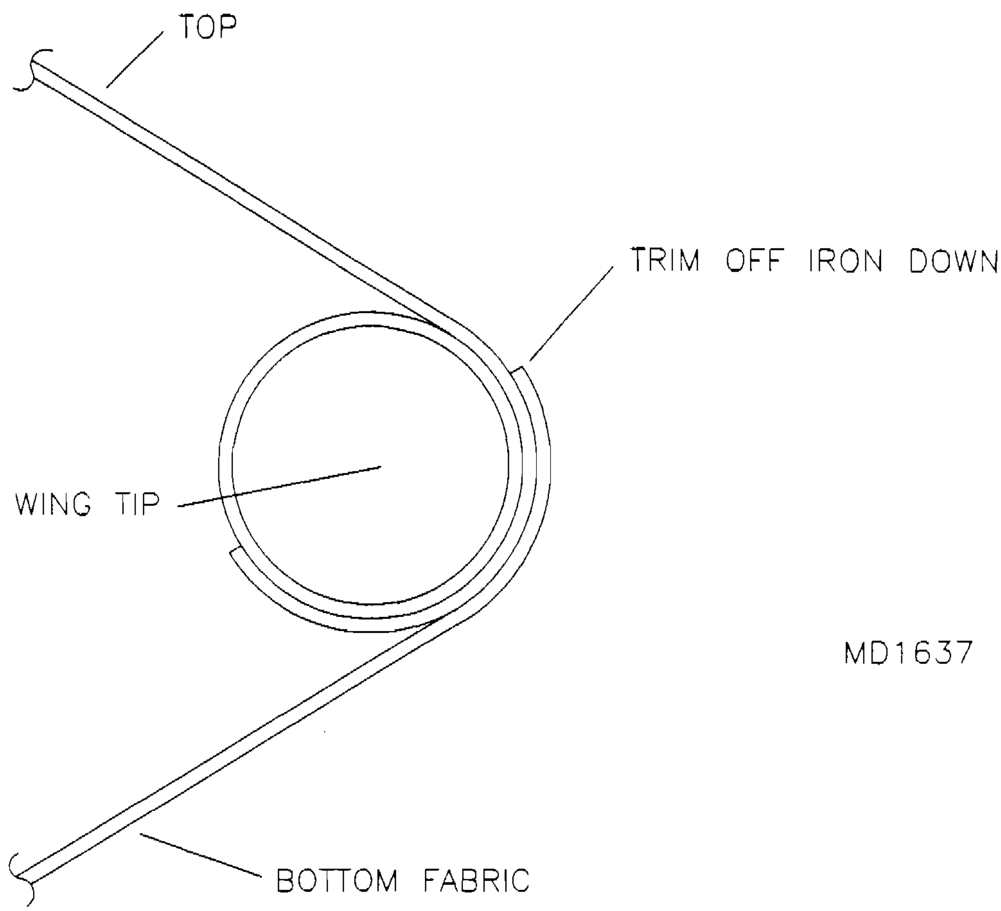


FIGURE 017-06A



7. Shrink the fabric lightly. Use low heat and do not tighten the whole surface. Shrink just enough to pull all the major wrinkles out.

8. Apply polybrush in the areas around lift strut attach plates, jury strut bracket, and fuel tank polybrush neck. Cut open with a razor knife when dry to allow the fabric to lay flat on the wing. Cut slots just large enough to fit over protrusions.

9. Shrink the fabric to final form. Try not to contact the poly brushed areas. Avoid iron boned seams, shrinking in these areas will shift and break the bond.

10. Apply a fresh coat of poly brush then install lexan patches and flap and aileron exit rings. Brush another coat of polybrush over each patch. Cut surface patches for each lexan patch or exit ring as shown on the last page of section 17. Notice that two of the rings are located for access to the fuel tank if ever needed. It is not necessary to remove the fabric from the inside of these rings. The rings are there in the event that the fuel tank ever needs to be removed. Paint the inspection plates to match the bottom of the wing and store them until needed (if ever).

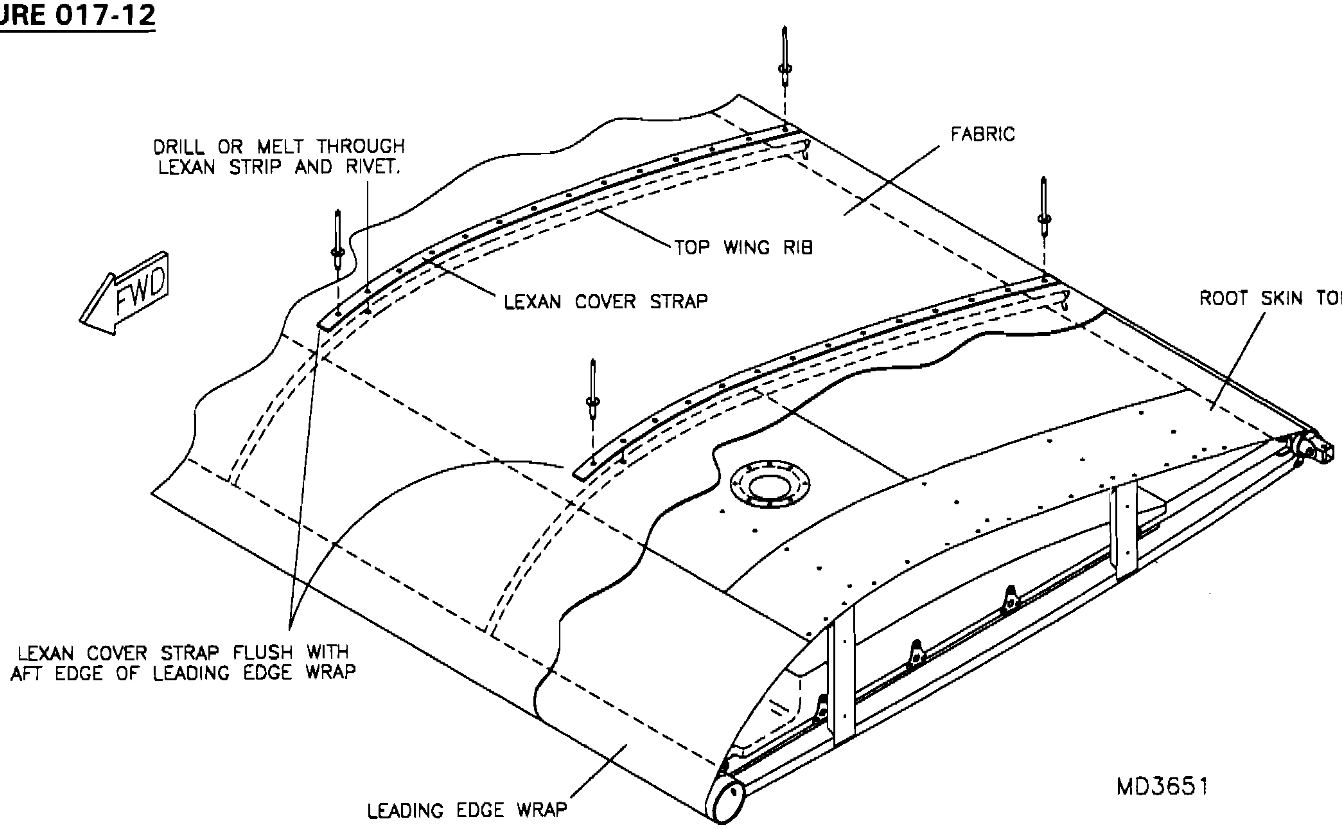
11. Brush a coat of poly-brush over the ring or lexan patch area and apply the fabric patch. After drying apply two more coats of poly-brush over the double fabric areas.

RIB RIVETING METHOD

NOTE: The wing must be covered prior to installing the lexan cover straps.

12. Position the wing top side up. Place the top cover strap so that the forward end is flush with the aft edge of the leading edge wrap and centered on the rib. Using a hot knife with a pointed tip or soldering iron, melt through the cover strap and fabric into the first hole in the rib and rivet. Pull light tension into the strap, melt through the second hole and rivet. Continue this pattern for the length of the rib. See **FIGURE 017-12.** Rotate the wing to the bottom side and follow the same procedure for installing the bottom cover straps. The bottom cover straps cover the full length of the rib. Refer to the covering section for completion of the surface tapes and patches.

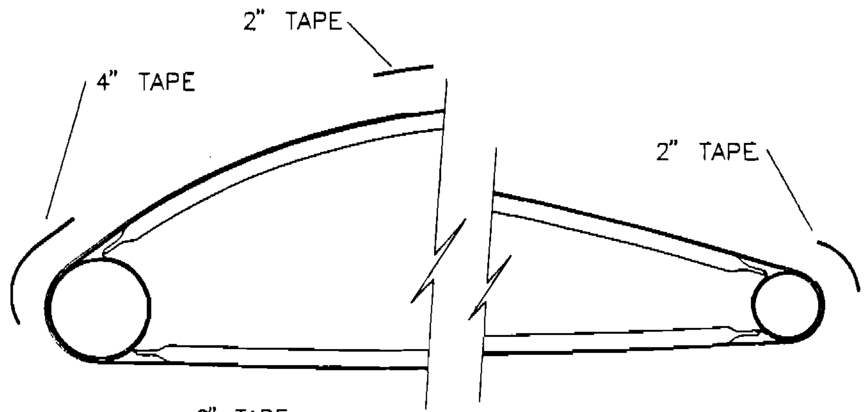
FIGURE 017-12



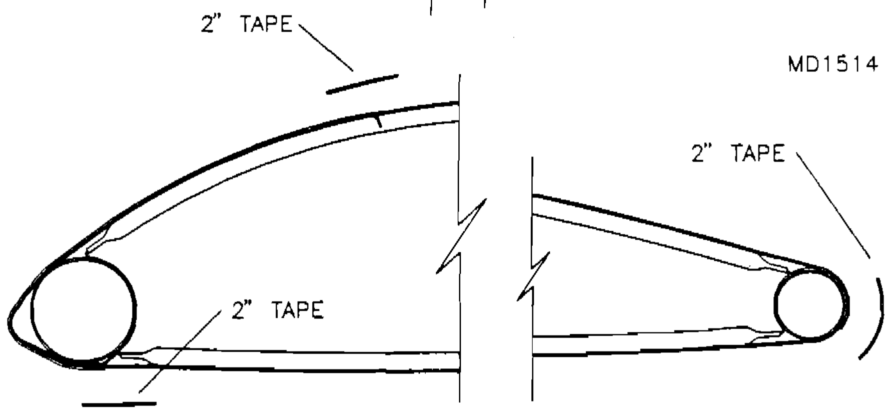
13. After rib stitching 2" surface tapes need to be applied to all the ribs. Using a 1 1/2" wide brush apply a two inch wide path of poly brush centered over every rib. Let dry, apply another coat followed by the 2" tape when wet. Start the surface tapes even with the top and bottom edges of the leading edge wrap. Wrap the tapes half-way around the rear spar. See **Figure 017-13**. Apply two inch tapes over the root ribs, including the riveted rib over the fuel tank.

FIGURE 017-13

STD

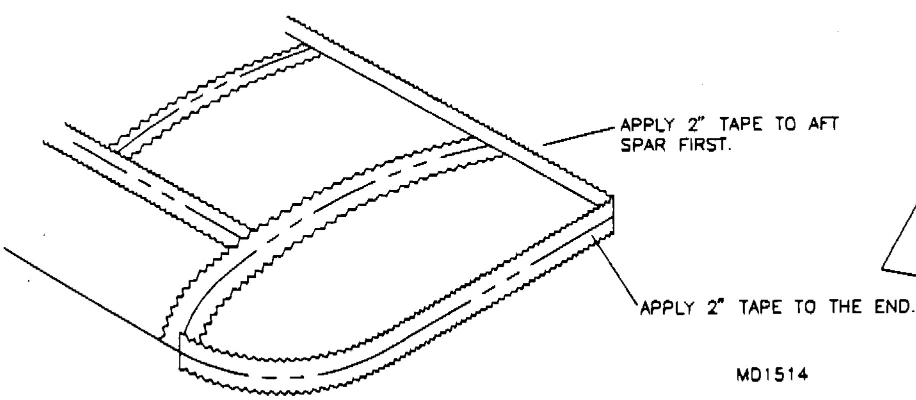


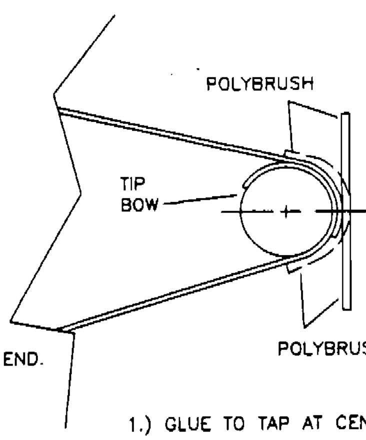
116



15. Apply 2" tapes to the wing tips. For best results glue the tape to the tip bow as shown in **Figure 017-15.**

FIGURE 017-15





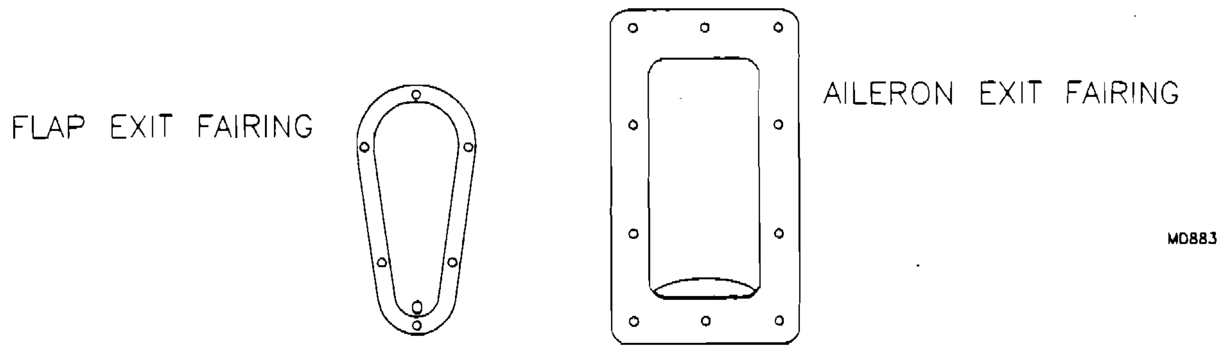
1.) GLUE TO TAP AT CENTER OF TAPE ONLY.
2.) POLYBRUSH WHERE TAP WILL LAY (2 COATS) AND POLYBRUSH TAPE.
3.) WHEN DRY IRON DOWN W/LOW HEAT. GLUE DOWN STRAIGHT AREAS.

16. Refer to **Figure 017-10** for the location of the inspection rings and lexan reinforcing pieces. Bond these in place with a fairly wet coat of polybrush. **NOTE:** Scotch® Brite all of the rings and lexan parts before bonding to make a better bond. Use 2" tape to patch all bond areas with a 1" overlap onto the fabric. When taping these areas always tape the aft edge first, the two sides second and the forward edge last. This is so your tape overlaps will always be in the slipstream. Do not cut out the centers of the ringed areas until after final painting.

17. After all tapes have been secured and the wing is wrinkle free apply two coats of the poly-brush over the taped areas. Use the tip of the iron to glue down any loose pinked edges. Inspect your work several times to assure no pinked edges are loose.

18. Layout the screw hole locations as per **Figure 017-18** on the aileron and flap exits. Drill all holes #40 through cover and ring. Remove covers and drill #40 holes out to #30. Prep cover for painting by sanding with Scotch® Brite. Follow our recommended procedures for painting Lexan. (see painting section). Paint all these parts off the wing.

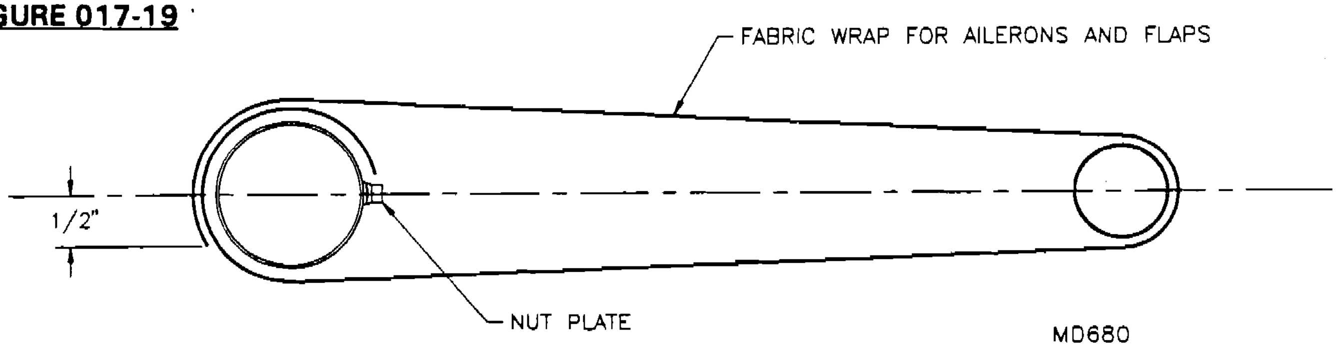
FIGURE 017-18



COVERING THE AILERONS AND FLAPS

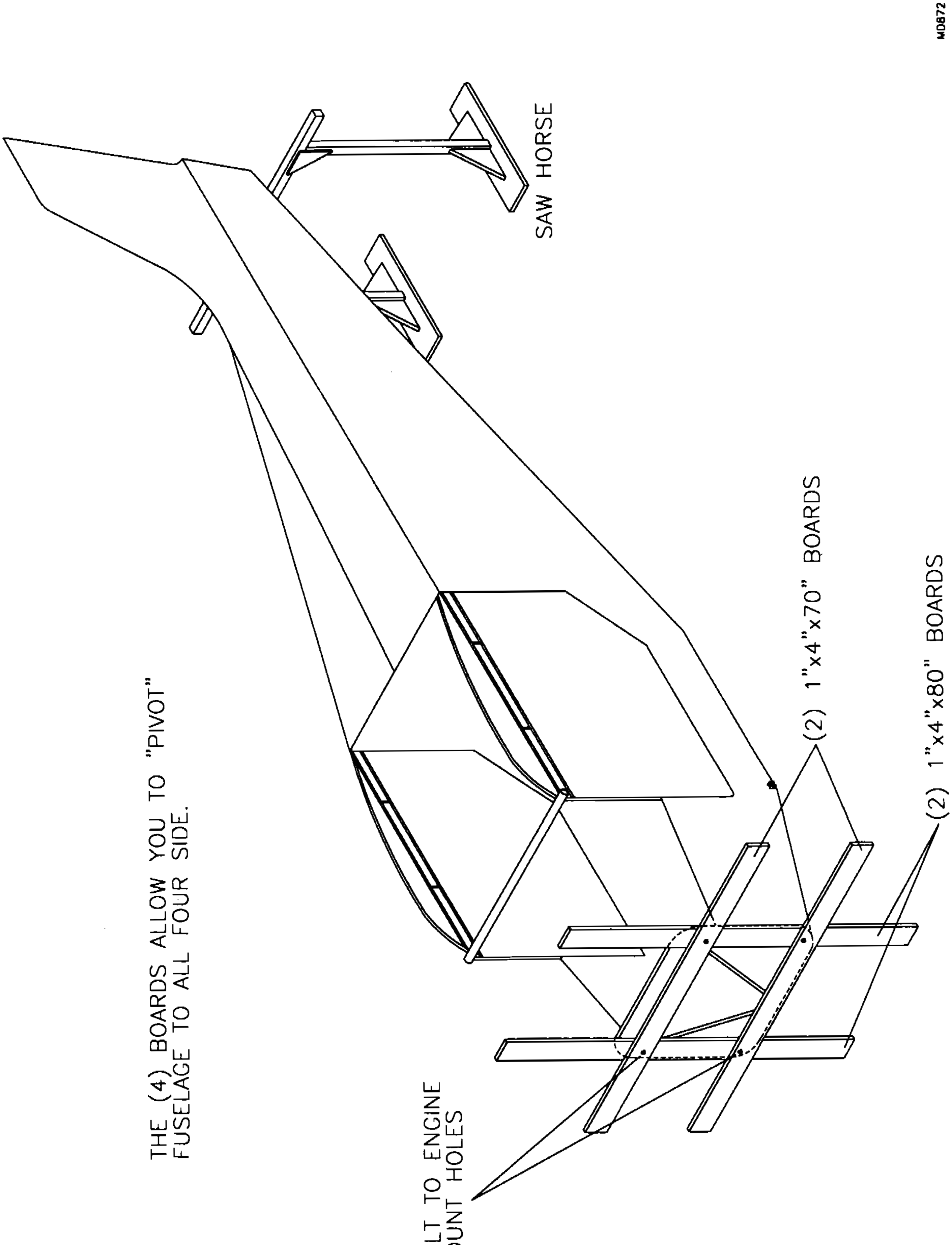
19. Each flap and aileron is covered with one piece of fabric. Use the remaining pieces of fabric from each wing to cover these surfaces. Cut a piece of fabric 3" longer than each surface. Cover by wrapping the fabric around the spar touching against the nut plates. Shrink slightly then attach second piece of fabric. See **Figure 017-19.** Finish the ends by wrapping the fabric just past the halfway point on the tubes. 2" tape will cover this seam. Remember to use a little heat around the rounded end of each surface to take out wrinkles.

FIGURE 017-19



20. After the fabric has been bonded on securely, shrink the fabric. The trailing edge of each surface will bow in slightly between each rib. Be careful not to use any more heat than necessary to keep the bowing to a minimum.

21. Polybrush all areas that will have 2" tape applied to them. These include the root and tip of each surface, as well as the spar. Apply 2" tape to the root and tip first, then to the spar.After all the tapes have been placed apply two coats of polybrush over taped areas. Iron down any pinked edges not sealed.


M0872
SAW HORSE
(2) 1"x4"x70" BOARDS
(2) 1"x4"x80" BOARDS
THE (4) BOARDS ALLOW YOU TO "PIVOT"
FUSELAGE TO ALL FOUR SIDE.
BOLT TO ENGINE
MOUNT HOLES

COVERING THE FUSELAGE

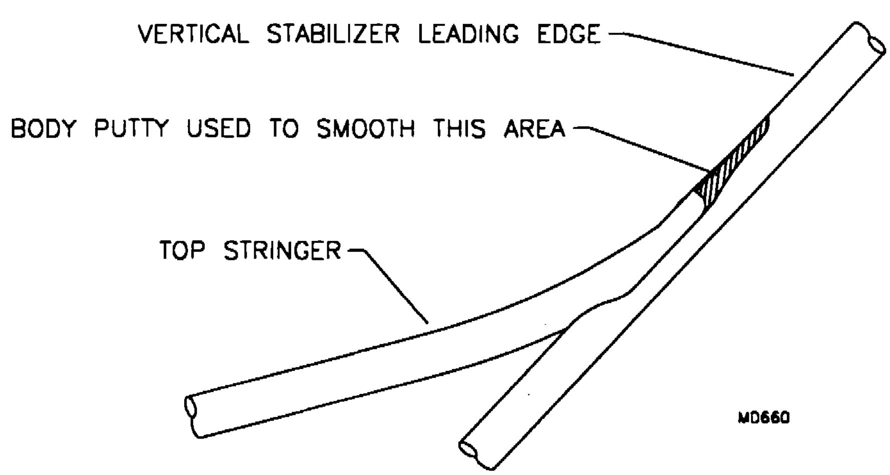
When covering the fuselage it will be required to turn it on all four sides. Set to the firewall the fixture shown, or rent or purchase pivot stands.

PRE-COVERING CHECKLIST-FUSELAGE:

1. All nut plates installed (Horizontal stabilizer attach points cable attach points).
2. All tubes, gussets and fittings,bolted,riveted and secured
3. Floorboard fit up
4. S-3 Control Stick pulley mount bolts installed and secured with pulleys and shackles removed
5. Control stick torque tube assembly
6. Side and bottom stringers secured in place
7. Fwd contour former
8. Rudder cable guides installed
9. Longeron fairings installed
10. Trim cable housing routed and secured
11. Vertical stabilizer complete rib pre-drilled for rivets
12. Option- Aft baggage compartment installed along with door frame
13. Clean structure with fresh tack cloth

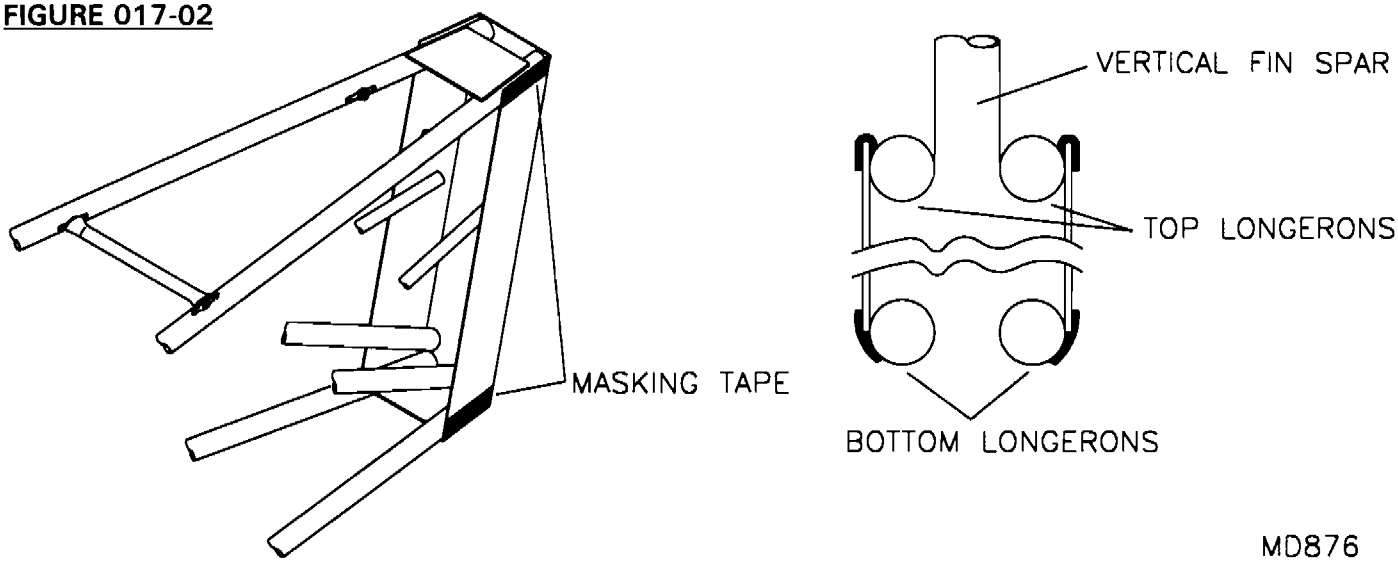
1. Before covering fuselage blend in the area where the vertical stabilizer leading edge and top stringer intersection with body putty. See **Figure 017-01.**

FIGURE 017-01



2. Place masking tape on the top edge of the tail channel. See **Figure 017-02**.

FIGURE 017-02

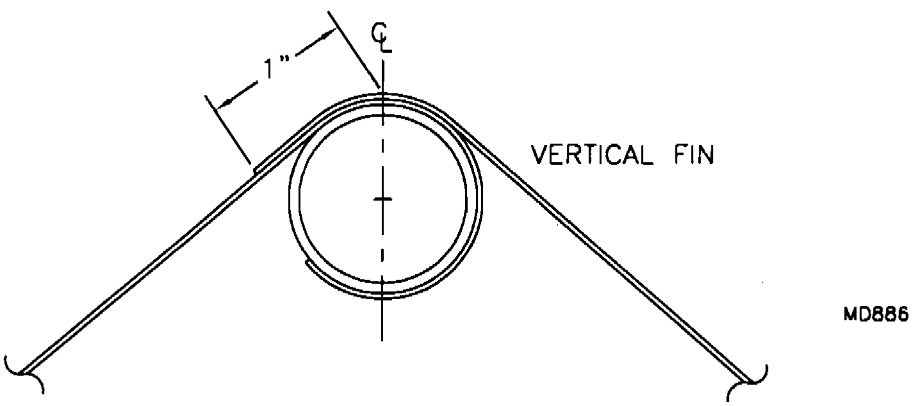


3. Flip the fuselage up side down. Poly-brush the firewall lower former, forward contour formers, and the tail channel, let dry. Roll off and cut a 16Ft. length of fabric. Clothes pin the fabric to the bottom tail cone longeron. Leave enough overhang to cover the firewall lower former and wrap around the tube. Trim off the excess and save for tail parts. Glue the fabric in place wrapping it around each tube just past the inside centerline. See **Figure 017-03**. Wrap fabric over the top of the forward contour former and overlap them on the inside 1". Pull the fabric fairly tight and as wrinkle free as possible when gluing. Once glued in place lightly iron the fabric just enough to get the wrinkles out.

4. Turn the fuselage to present either the left or right side up. Cut two pieces of fabric 18 ft. Roll up the extra piece and store. The side fabric actually will be used to cover the sides, vertical fin, and the top. Clothespin the fabric in place and trim the fabric to fit along the bottom. Overlap the bottom of the airplane approximately 7/8". Use the "plasticizing" method for neat thread free edges. Trim using a normal scissors. See **Figure 017-04**.

5. Turn the fuselage over and cover the opposite side. Over lap the top center of the vertical fin leading edge tube 1". See **Figure 017-05**. Again use "plasticizing" to allow neat straight trimmed edges. Once again make sure the fabric is started in the best position, so you will have the least wrinkles. Once fabric is glued on, shrink this side lightly to take out all wrinkles.

FIGURE 017-05



6. Shrink the skin to full tightness. Shrinking the fabric along vertical stabilizer by going side to side. Try not to pull it out of alignment. Do not apply the iron directly over fabric seams.

FIGURE 017-03

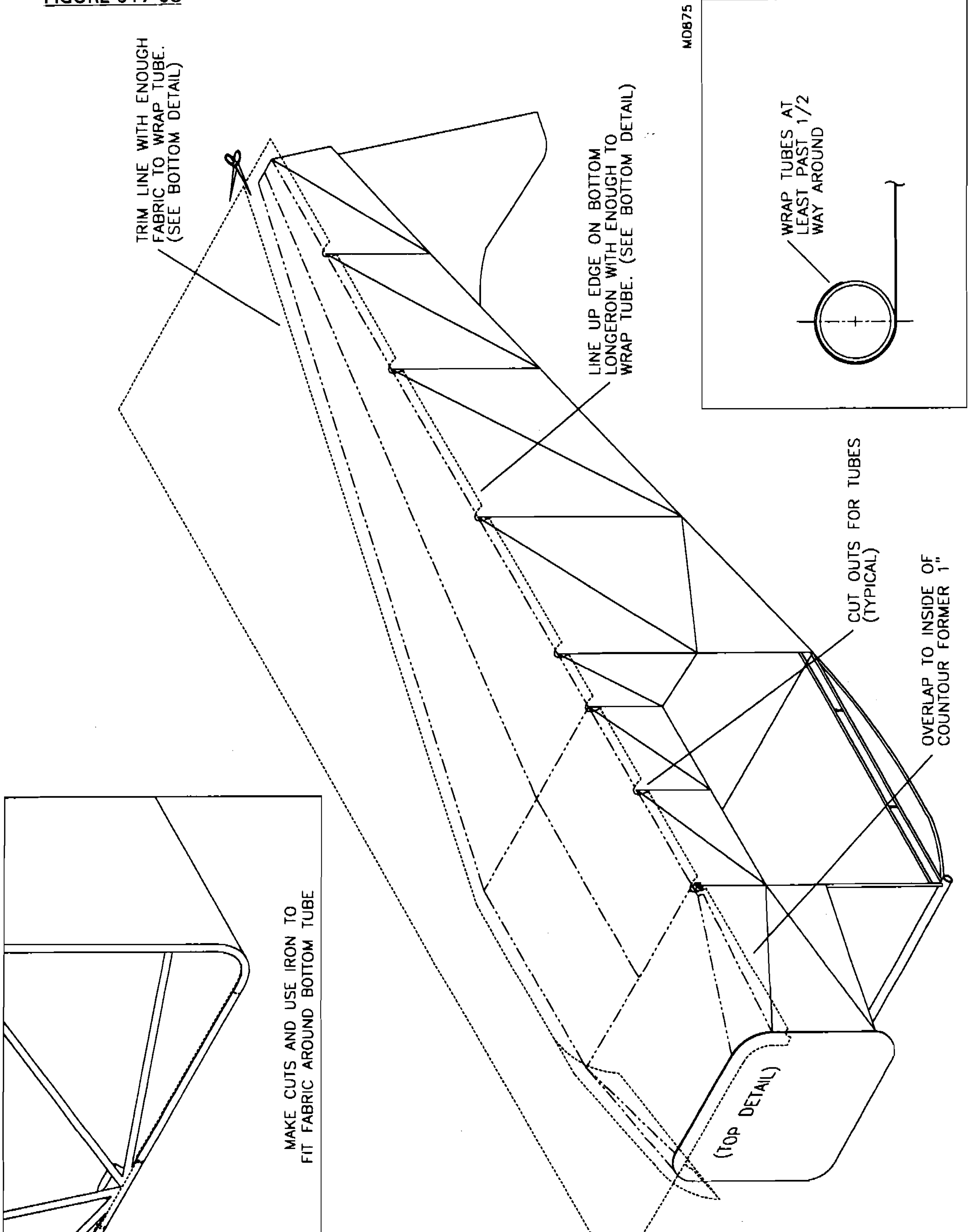
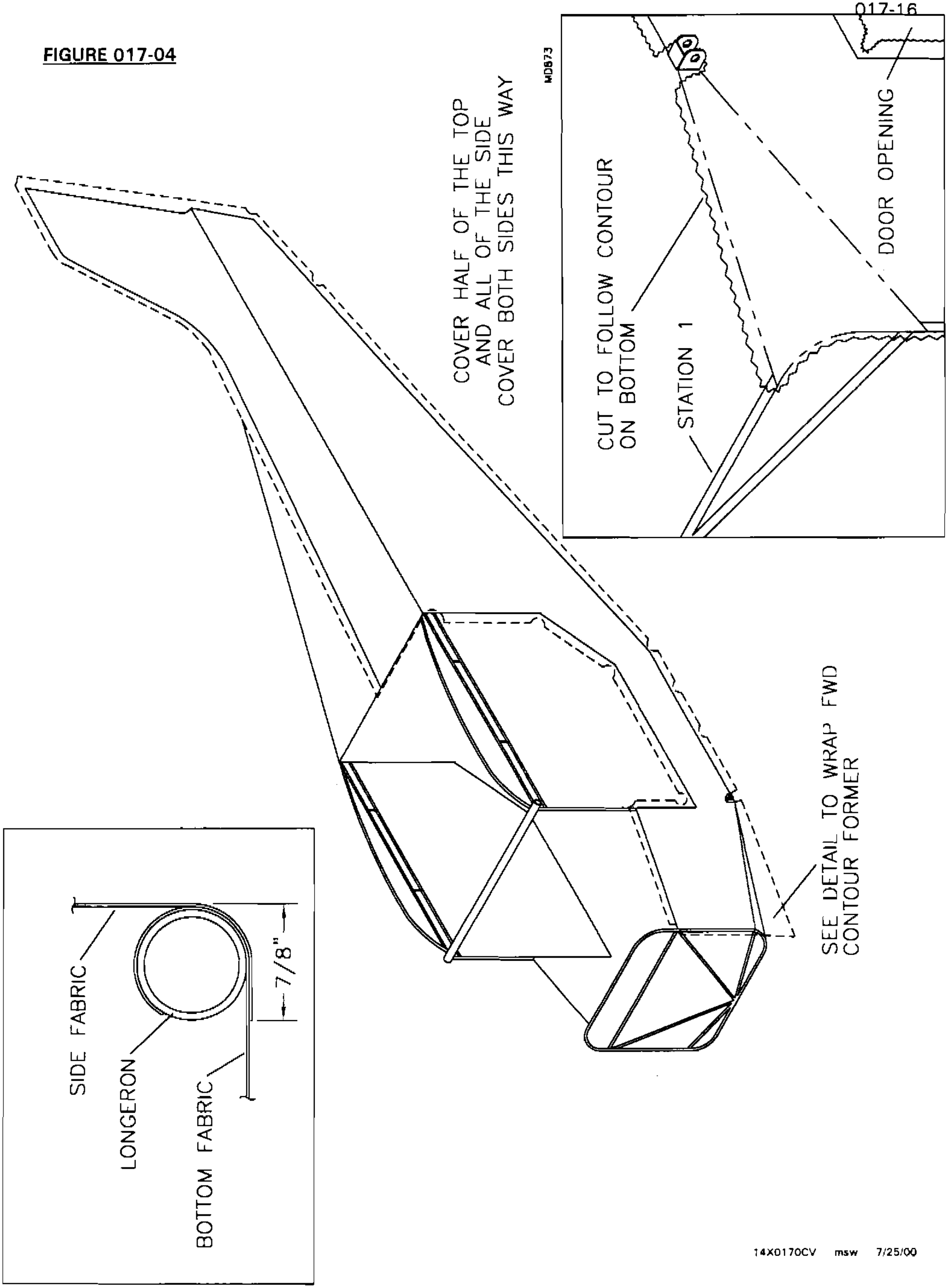


FIGURE 017-04



7. Study **Figure 017-07**. Poly-brush 2 coats where tapes, exits and patches will go. Locate the lexan inspection plates and exit rings as per **Figure 017-07**. Consult the list for **Figure 017-07** and cut the patches and tapes as required. Pop rivet the vertical fin rib with the Lexan strip as done for the horizontal stabilizer. The list below explains tape and patch locations and special notes.

1. 2" tape, vertical stabilizer spar.
2. 2" tape, each corner of tail channel.
3. 2" tape, compression rib.
4. Cut fabric for horizontal stabilizer area. Cut this patch to the shape of the airfoil at the root of the stabilizer with 1" added all around.
5. 1/2 circle, side cowling attach hole. 2" R.
6. 1/2 circle, strut attach receptacle. 3" R.
7. 1/2 circle, door corners. 3" R.
8. 1/2 circle, gear leg sockets. 3" R.
9. 1/2 circle, lower forward cable attach point. 2" R.
10. Rudder cable exit cover. Glue direct to fabric. Cut a patch 3/4" larger with center out for exit "bump".
11. 2" tape, side stringers.
12. 2" tape, bottom stringers.
13. 2" tape, bottom longerons.
14. 4" tape, vertical stabilizer top stringer.
15. 2" tape, vertical stabilizer leading edge.
16. 2" tape, S-4 top crossing tube.
17. 2" tape, baggage door (optional).
18. 2" tape, top longerons.
19. 2" tape, door frame.
20. 2" tape, S-3 top crossing tube.
21. 2" tape, windshield tube.
22. 2" tape, firewall.
23. Any auxiliary mounted equipment (antennas etc.).
24. Elevator yoke exit, cut and trim as per **Figure 016-07A**. Glue fabric in correct position with poly-brush. Apply 2" tapes around all three sides, overlapping onto fabric 1".
25. Vertical fin leading edge tape and patch, see detail **Figure 017-07B**.
26. 2" tape, center on bottom edge of contour former
27. Battery Access 912, and tail aft access. Scotch® Brite these and bond on with a generous amount of poly-brush. Once dry, use 2" tape overlapped 1" around the outside of the rings. Remember, aft side first, sides second, and the forward side last. In the same manner bond on the lexan ring for the elevator yoke exit.
28. Template for elevator and rudder cable exit.
29. Inspection panel for optional nose gear disconnect; builder locates (see options section).
30. Lexan patch ¾" x ¾" over trim cable exit. Use horizontal stabilizer to locate.

9. Locate and drill screw holes into the battery and tail access panels. Space out 12 holes evenly around exterior of these panels using a 3/8" E.D.. Transfer drill the holes to the Lexan rings. Remove panels and drill out to #30. Do not drill out the ring holes.

10. Inspect the fuselage covering for any loose pinked edges. Use the tip of the iron seal any loose edges. Do not apply heat directly to any patches or overlapping seams.

11. Apply two coats of poly-brush or thinned glue to all patches and double fabric areas. This completes the covering of the fuselage. Painting and assembly come next. Are we still having fun? I hope so!

FIGURE 017-07

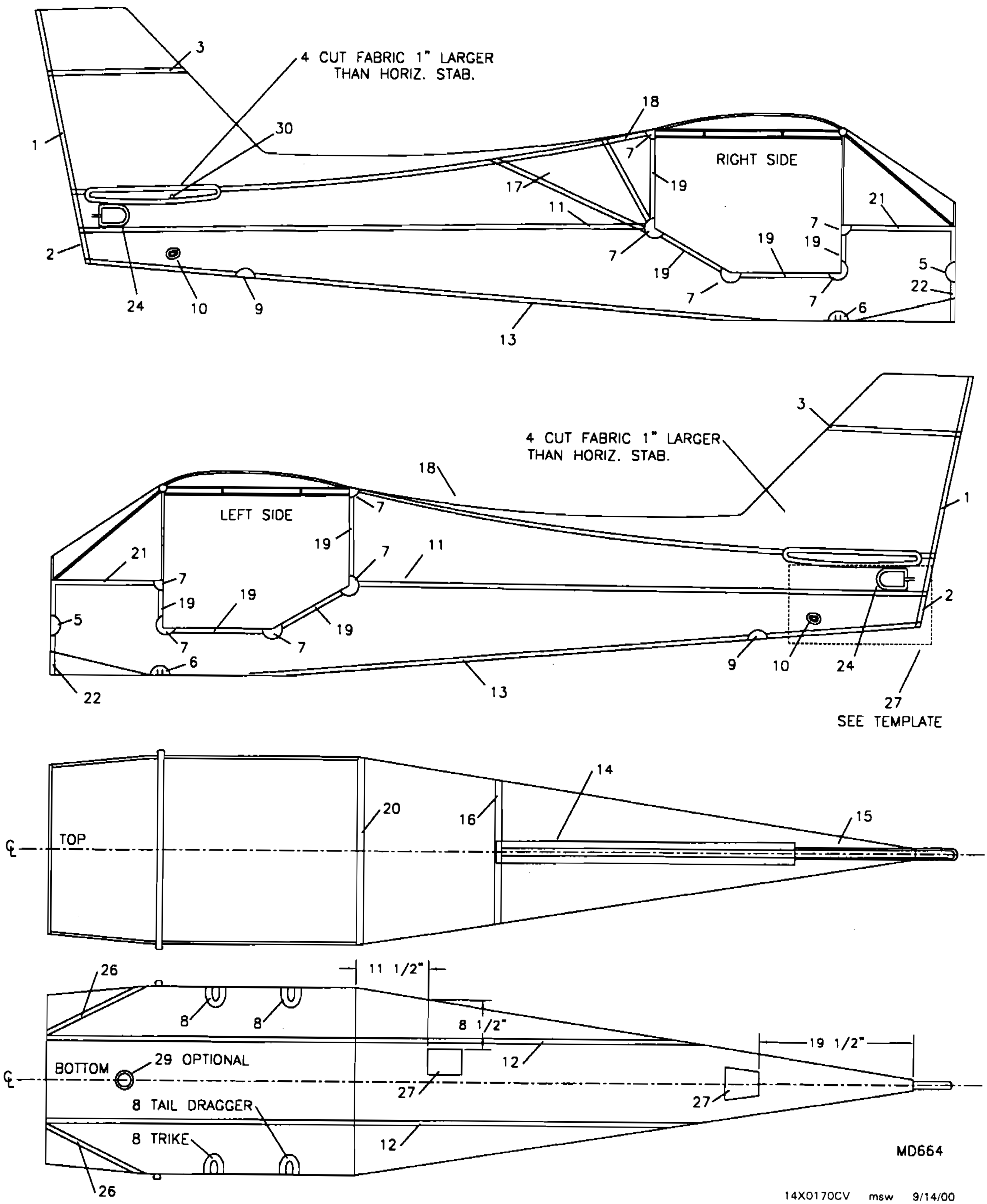


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FIGURE 017-07 (continued)

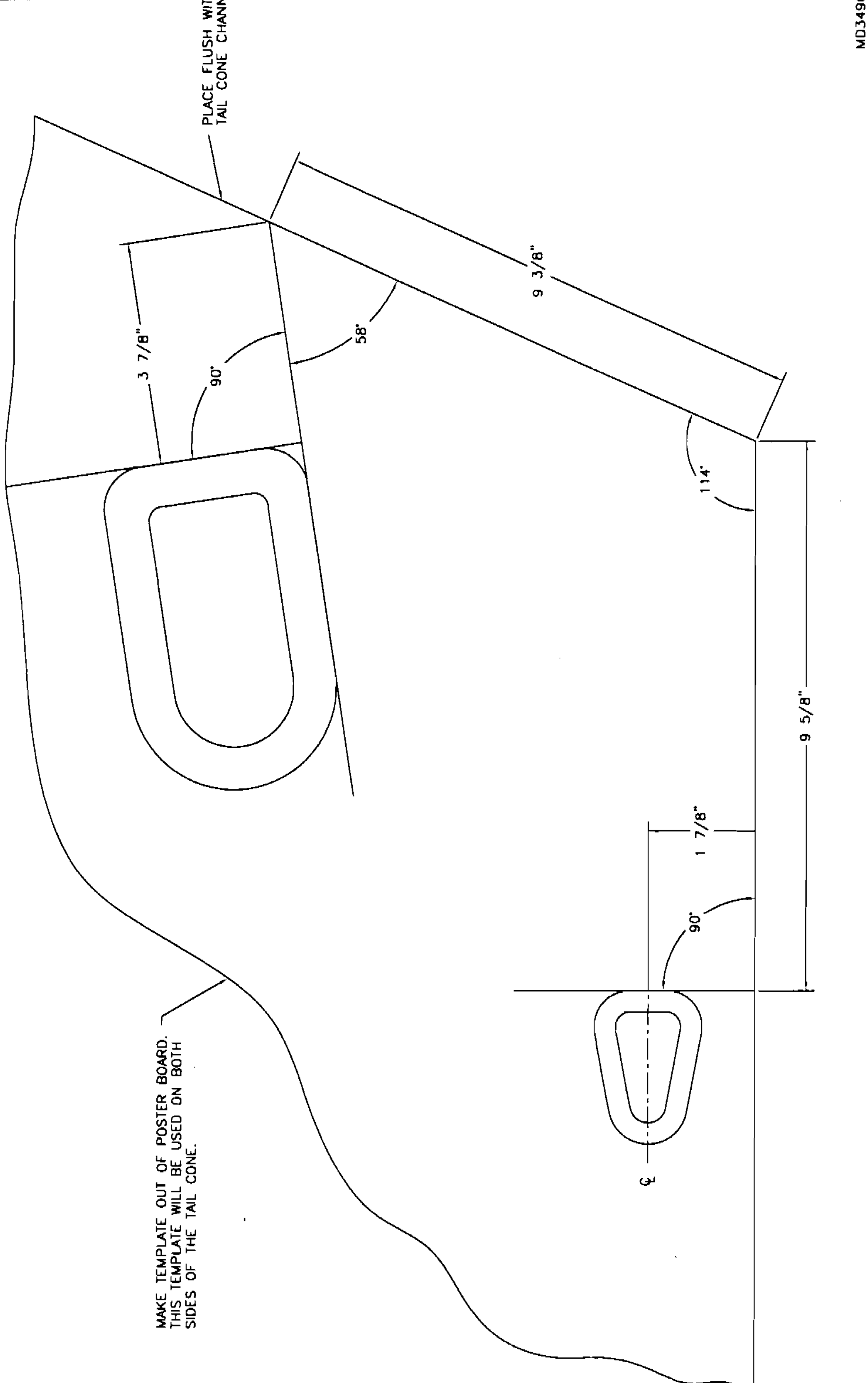


FIGURE 017-07A

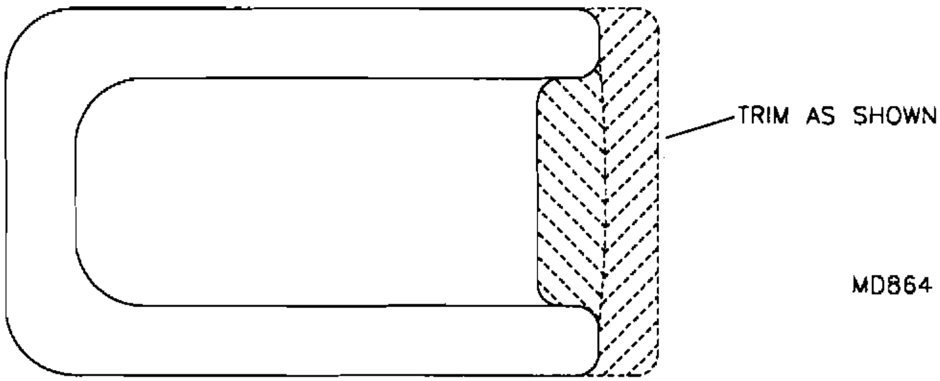
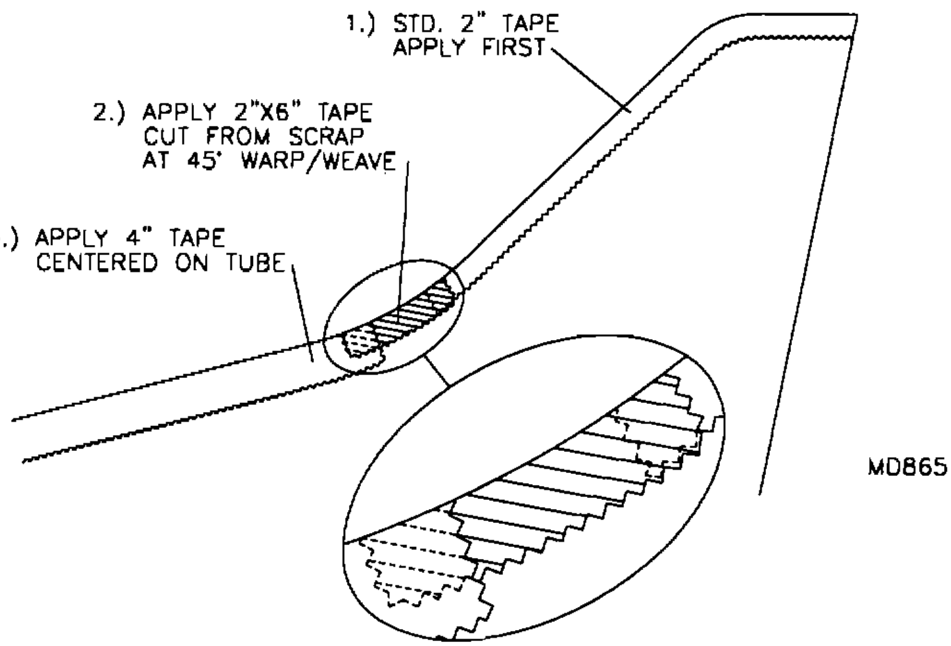
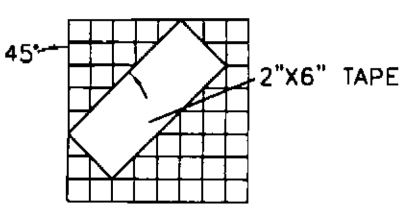


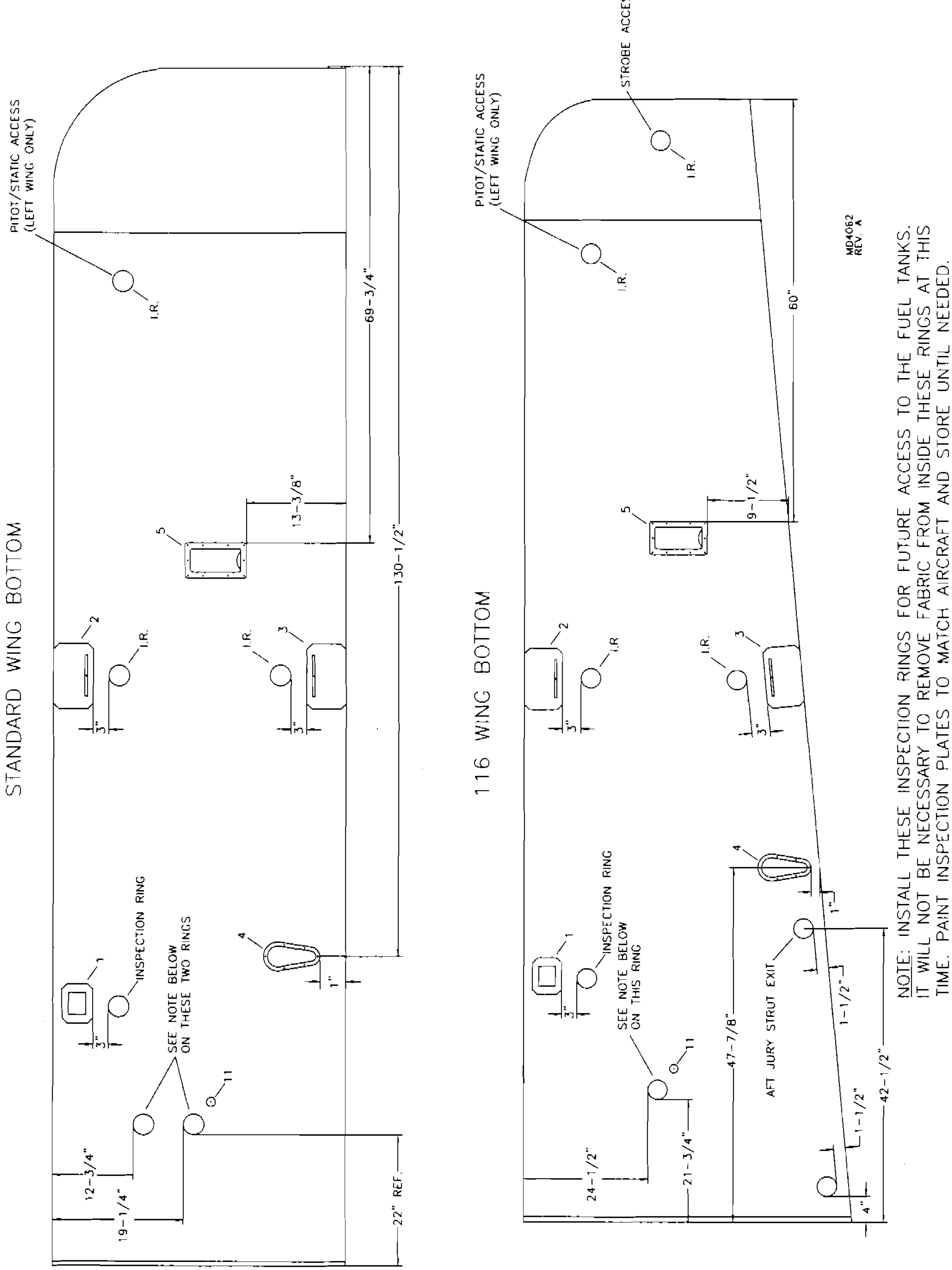
FIGURE 017-07B





CUT A 2"X6" PIECE OF TAPE FROM A PIECE OF SCRAP. ORIENTATE SO THE LENGTH OF THE PIECE OF TAPE IS 45 DEGREES TO WARP OR WEAVE OF CLOTH. YOU WILL FIND THE TAPE LAYS INTO THE CORNER VERY EASILY.

Inspection ring, lexan patch, and exit fairing locations.



PAINTING THE SUPER SIX

The painting process described within is what we found best for our planes. Your paint scheme may require a different approach. This section is provided as an example of how we solved the painting problem. You are welcome to use either of the paint schemes shown in this section. They are designed to be classic in appeal and easy to do. They both keyoff the cowl split and windshield deck line. This helps tremendously to have such a solid reference. The type of paint and the amounts used are also given within. Use plastic masking tape with urethane paints. The paper type tapes will allow paint to creep under. This makes for some ugly striping. Use the plastic tape just on the stripe edge and the paper tapes everywhere else.

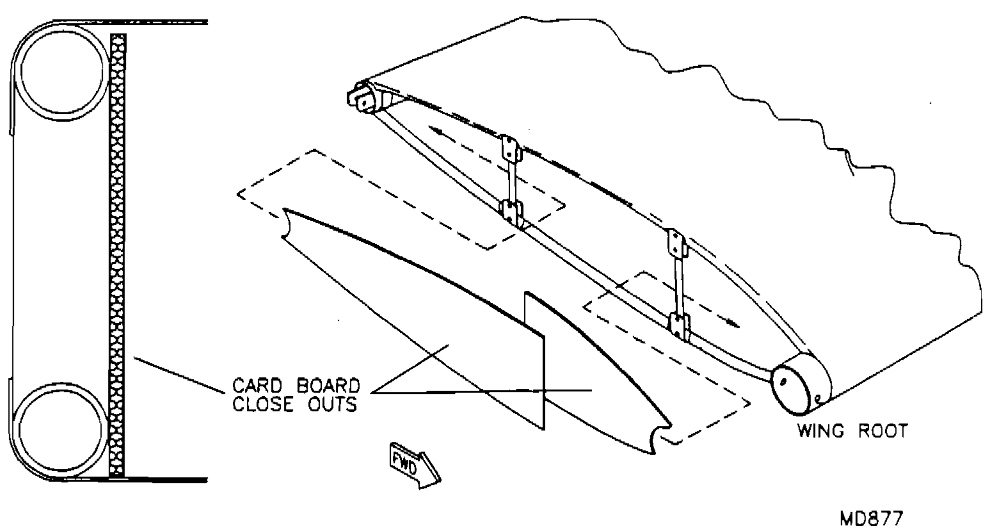
Your paint booth should provide adequate lighting and ventilation. Air filtration is also required. Check with your local paint shop on filters. The booth itself can be nothing more than a 2 X 2 wood frame and plastic tarps. That was our first paint booth! Again the important things are ventilation lighting and filtered air.

A paint gun and air compressor can be rented or borrowed. Check with the local paint shops on the best guns. There is a world of information and expertise when it comes to painting. Tap into this and you will gain confidence and a good looking paint job. If all else fails, hire it done. Above all be neat and safe. Modern paints are nothing to stick your nose in!

1. Support the wings on the sawhorse or pivot stands to apply primers and paints. Inspect the component for loose pinked edges and wrinkles. Remove any wrinkles with careful application of the iron.

2. The wing will need the root closed off to prevent unwanted entry of primer and paint. Tape with a good grade of masking tape. We made cardboard close outs cut into that slip inside the root of the wing. See **Figure 018-02**. The inspection holes, and aileron/flap exits should not be cut out at this time. However if they are, please tape shut. Remove the ailerons and flaps, including hinges if they are attached. Remove the aileron push pull tube. The flap teleflex should still be taped inside from covering. Inspect once more for loose edges.

FIGURE 018-02



3. Apply primer by spraying one side of the wing with a medium to heavy coat. Flip over the wing and repeat. Flip the wing over again and apply a medium coat. Flip the wing one last time and apply a medium coat. The idea is to fill the weave of the fabric. If the two coats have not filled and sealed apply a third. Let cure one to two days. Wet sand with 600 and plenty of water. **CAUTION:** Do not

sand through the skin. This may sound obvious but it is easy to do. Most commonly it happens when sanding over the ribs. Hitting the sanding block against the rib evenly lightly will sand through. The trick is to sand chordwise near the ribs. Apply masking tape over the ribs and other tubes to assure no sanding through. This will be required on the fuselage too. To sand the rib or tube areas use Scotch-brite held by hand, no block. Sanding of the leading edge wrap area presents no sand through problem unless you use excessive pressure. This process is used throughout the painting of primer on all parts.

4. After sanding the wing rinse thoroughly using a clean sponge to wash and wipe. Dry off with a clean towel. Let dry overnight. Tack cloth off the wing prior to applying the paint.

5. Follow the directions for mixing and application on the paint can. If you have pivot stands it will be easy to turn the wing for best lighting. This helps it getting a good even no run coating. If you are a beginning painter, the pivot stands will prove a life saver. You can tilt your work to avoid runs. Runs are difficult to sand out, so apply paint slowly, learn not to make that last pass just because you want to use up the paint. By the murphy laws of painting that will be the pass that runs!

PAINTING THE FUSELAGE

6. The fuselage is painted in the same method as the wings. However the cabin area will need to be masked off. We usually place paper across the cabin from side to side, then wrap the tubes. Whatever way you go, make sure you get everything well sealed. If not you may find overspray inside. Overspray can not be removed without effecting the powder coat. Tape shut other openings such as the access plates on the bottom and elevator exits as required. The windshield deck should not be installed if using a paint design similar to ours.

7. Prime and paint the fuselage. Allow at least 24 hours between coats. Use plastic masking tape to layout the edges of your design. The lower cost paper type masking tape can be used every where else. Press the tape against the skin using a plastic card or squeegee.

PAINTING THE TAIL FEATHERS

8. The trim tab should be removed from the elevator. If you have made or purchased the pivot stands they will really pay off painting the tail. The ability to hold the parts horizontally will prove its worth. If you have no pivot stands, devise a way of holding the parts flat. If you must hang them vertical, extra care must be used in painting to avoid runs. Paint the tail parts as per the wing method. Again all the same cautions and cares apply.

PAINTING FIBERGLASS

9. The fiberglass cowling, optional wheel pants and other parts require thorough sanding to remove the release agents. The parts should be rough trimmed and fitted. Use 350 wet or dry paper with lots of water. Follow with 400 and 600 grade paper. Prime with a self etching primer such as Vari-prime by Dupont. Paint right on top of the primer, no further sanding should be required. The cowling and wing cuffs can be painted at this time their overall color. The cowling will be striped, but usually the wing cuffs are one color. If you paint the cuffs prior to fitting, the parts will have to be ready to be trimmed post painting. This can be done if the cuffs are trimmed with files and fine sand paper. Also, applying a protective layer of masking tape on the edge to prevent marring the lexan and chipping the paint from drilling.

PAINTING THE SHEET METAL

10. Parts like the wing root gap seals and gear leg fairings (include nose gear fairing if applicable) should be rubbed with Scotch-brite, primed with self etching primer and painted. Fit and drill the fairings

and wing root gap seals before painting. Paint all inspection or access panels too. For inspection plates with strips passing through them, cut out fabric in the location and apply tape to match striping pattern.

PAINTING THE INSTRUMENT PANEL

11. If you have been following the sequence correctly you would not be ready to paint the panel. However, some of you may have jumped the gun or ordered a pre-cut panel and now want to paint it another color. If that case read on!

The instrument panel should be painted as the other metal parts. Choose a color that will be easy on the eyes, such as a light gray or flat black. Avoid bright colors anywhere in your direct field of vision.

PAINTING LEXAN

12. The lexan doors can be left un-painted, depending on your paint scheme. If you do paint the doors prepare the "to be painted" area with Scotch-brite. Prime with the same self-etching primer used on the metal parts. Add Adhesion promoter for plastic to the primer. Your paint shop may try to sell you on plastic primer. Do not waste your money, they do not work. Use the other primer with the promoter, this is what we have found to be best.

FINAL ASSEMBLY PREP

13. After the painting is complete remove all the masking tape and paper. Clean paint away from any critical fit areas such as gear sockets, etc. Inspect the paint job closely. If painting again is required, it is much easier before it is assembled.

DESIGNING A PAINT JOB

A paint job is an aircraft's only chance for a good 1st impression. Take care in deciding on style and colors. My best advise is to remind yourself that you may have to look at this aircraft for a long time. This is why you should stick to classic colors and design. Hot pink and lime green might look great at first, but in the end blue and white are always in style.

This assembly manual is sequenced to take advantage of a paint scheme that does not require the plane to be fully assembled to mask off. This is a great advantage in time and room usage. Our scheme keys off the edge of the windshields top deck. The cowl split happens to follow this close enough to permit painting of the fuselage to final colors and design with out ever having attached the cowling. Only until after the plane was final assembled did we fit and paint the cowling. This way the aircraft gets assembled only once. That is a big time savings.

You are welcome to borrow one of our paint schemes, the drawings show the exact layouts. Or break out on your own, dozens of schemes are possible that align with the split cowling, or do not involve the cowling prior to final assembly. Make copies of the three view in this section to try out a variety of schemes.

WHAT PAINTS TO USE AND HOW

We have had very good luck with **DITZLER** brand paints. These are a urethane base paint. The process eliminates many hours when compared to traditional aircraft dope finishes.

A primer coat is applied and wet sanded. This followed by the overall color coat. Then finally the trim colors. There is no need for silver "Light Blocking" dope. It is provided in the paint. The paint achieves a very hi-gloss, and requires no clear coating. So in a nut shell, it is a 2 coat system, very light and durable. The S-10 prototype was our 1st urethane paint job. After many airshows and several hundred hours it still shines above and beyond the dope/paint jobs in the hanger.

Urethane paints offer the short cut to show plane paint jobs. However, they can be hazardous to work with. Because they are such "heavy" bodied paints, the fumes and spray are not to be inhaled. Even good respirators achieve mild protection. The best system is good air flow through the booth, wear a respirator and stay "upwind". If you have the money an air pump respirator works great, but it is rather clumsy. Of course there is always the local car painter...but watch out! Being a car painter does not automatically mean they can do a good job on planes. Check it out thoroughly, get some references and prices. Remember your paint job is your planes only chance at a good first impression.

MATERIALS AND QUANTITIES USED ON OUR SUPER SIX PAINT JOBS

PRIMER

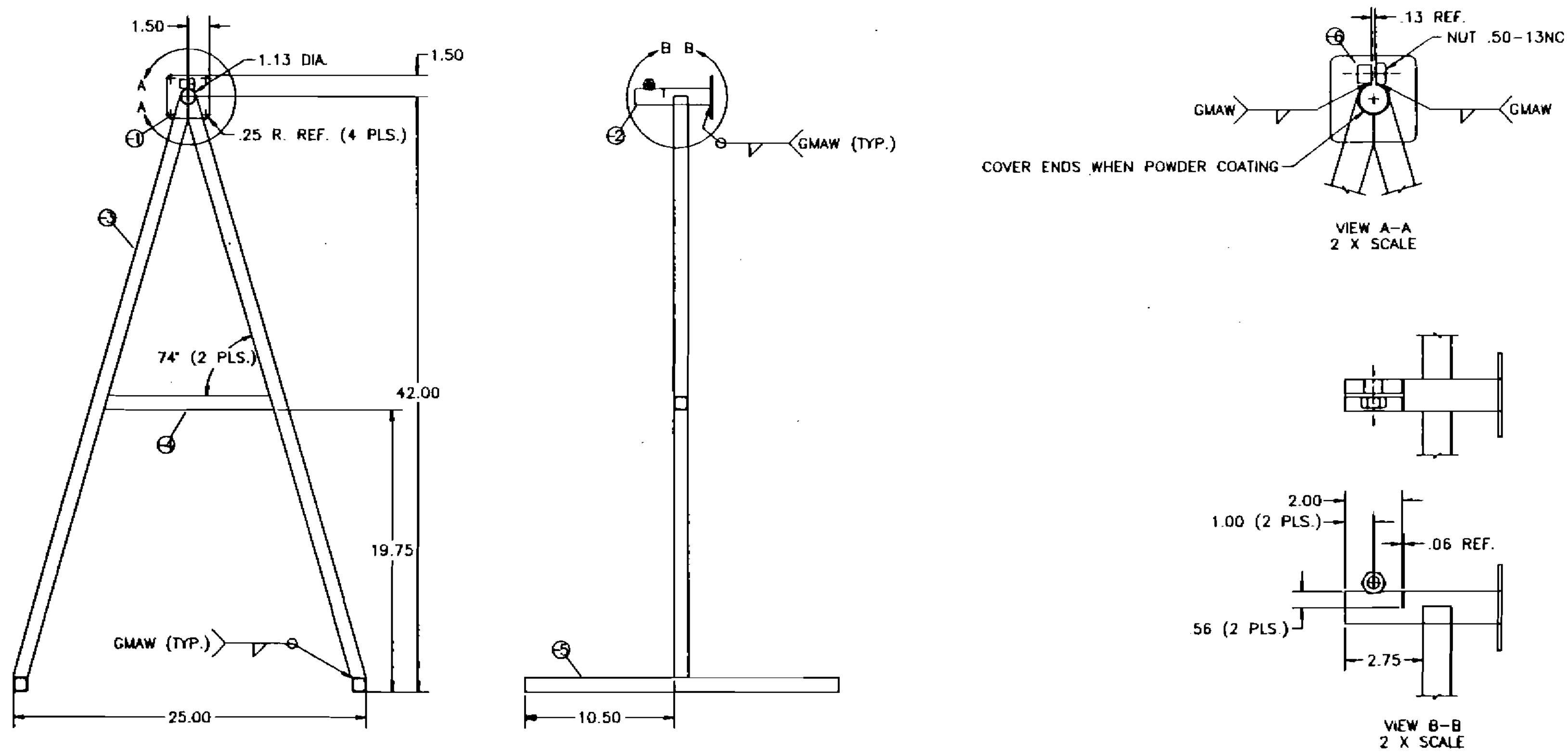
PAINT CODE	DESCRIPTION	QUANTITY
DPU-35	PRIMER	2 GALLON
DPU-301	CATALYST	1 GALLON
DT-870	REDUCER	1 GALLON
DX-369	FLEXATIVE	2 PINTS

THE GREEN MACHINE

PAINT CODE	DESCRIPTION	QUANTITY
DU-8000	WHITE	1 GALLON
DU-44931	GREEN	1 GALLON
DU-5	HARDENER	2 GALLON
DT-870	REDUCER	1 GALLON
DX-369	FLEXATIVE	2 PINTS

THE TRIKE

PAINT CODE	DESCRIPTION	QUANTITY
DU-8000	WHITE	1 1/2 GALLON
DU-72355	RED	1 QUART
DU-71698	MAROON	1 QUART
DU-5	HARDENER	2 GALLON
DT-870	REDUCER	1 GALLON
DX-369	FLEXATIVE	2 PINTS



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

MATERIAL: MILD STEEL AS NOTED

FINISH: POWDER COAT PAINT

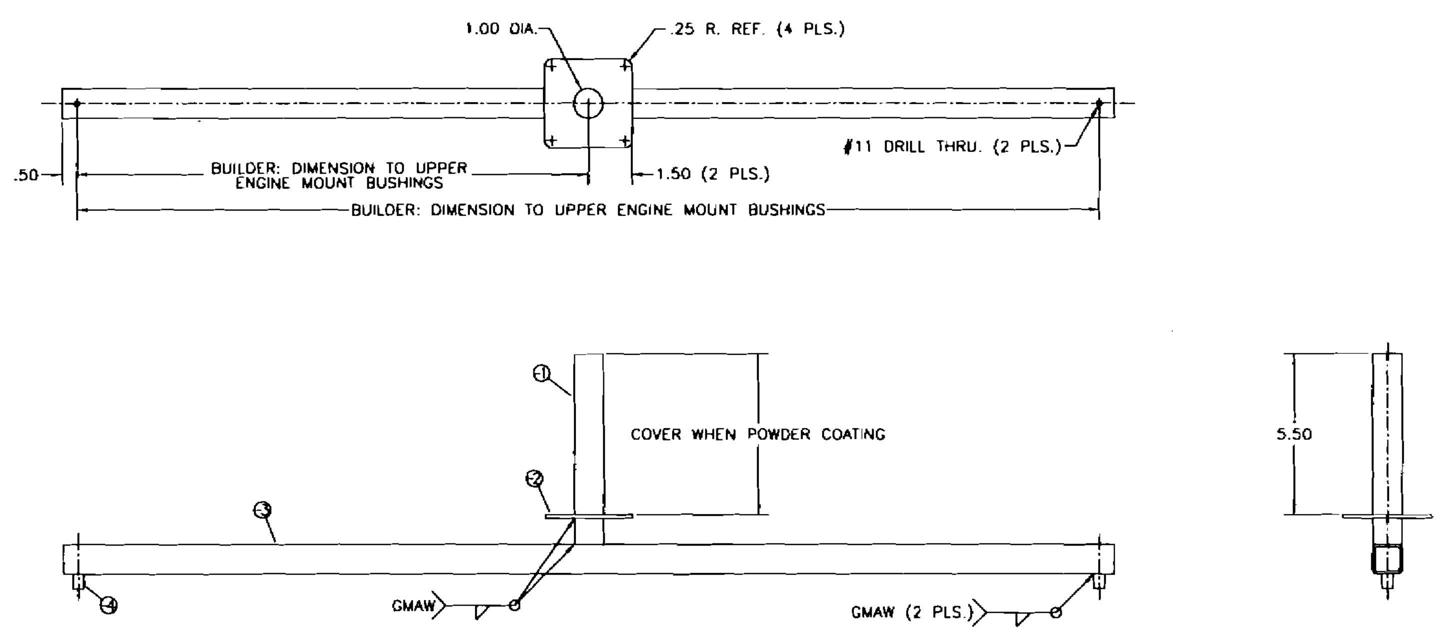
RANS

A-FRAME STAND

N/A

D KP-100

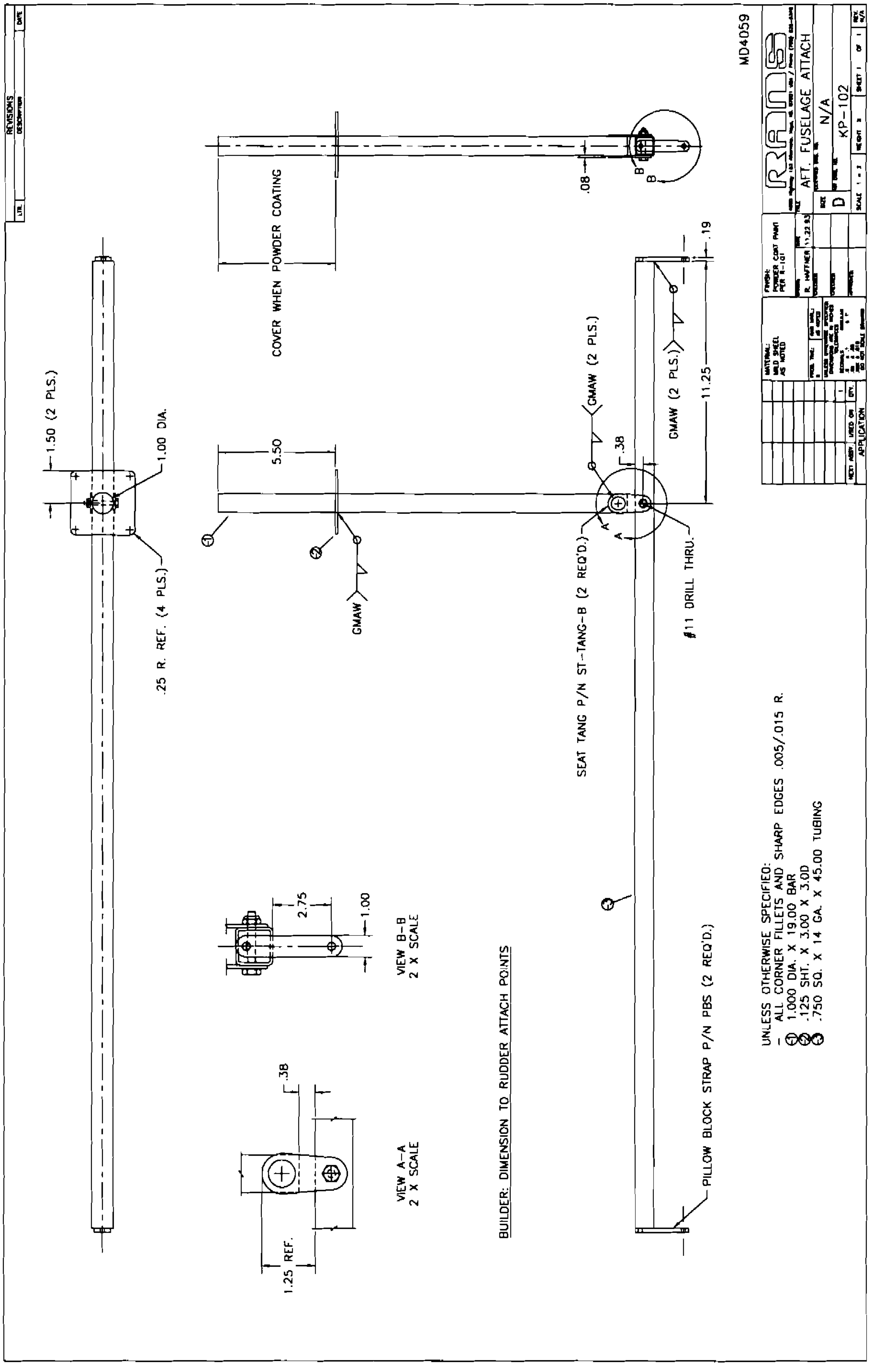
APPLICATION

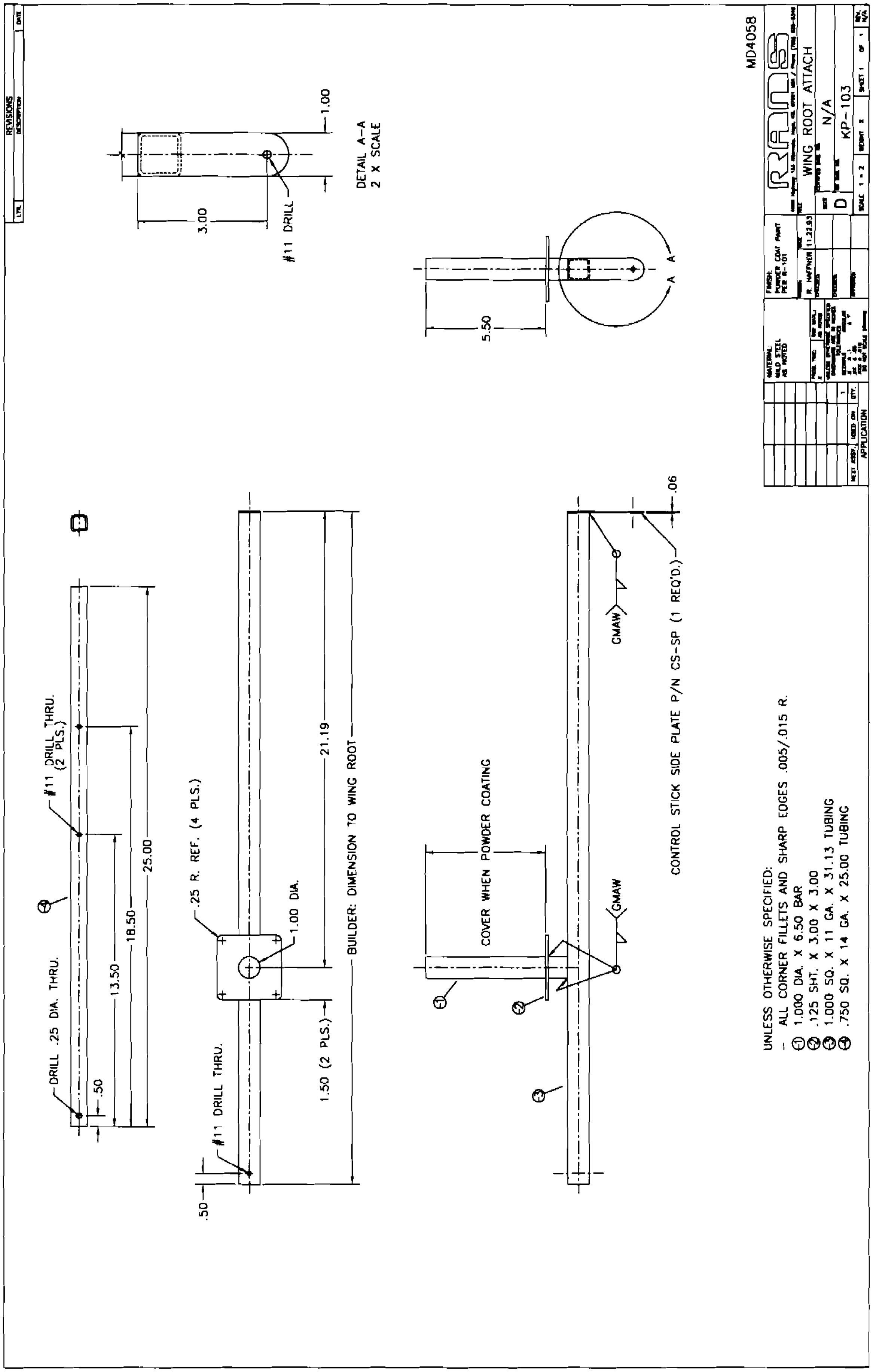


MD4060

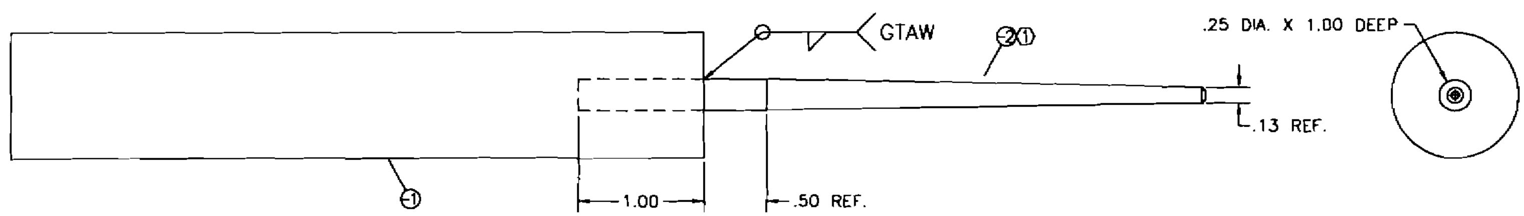
UNLESS OTHERWISE SPECIFIED:
- ALL CORNER FILLETS AND SHARP EDGES .005/.015 R.
1. 1.000 DIA. X 6.50 BAR
2. .125 SHT. X 3.00 X 3.00
3. 1.000 SQ. X 14 GA. X 35.88 TUBING
4. .375 DIA. X .058 X .50 TUBING (2 REQ'D.)

MATERIAL: MILD STEEL AS NOTED
FINISH: POWDER COAT PAINT
R. HAFFNER 11.22.83
RANS
FWD. FUSELAGE ATTACH
N/A
D KP-101
SCALE 1 = 2 SHEET 1 OF 1 REV. N/A
APPLICATION


REVISIONS
MD4059
AFT. FUSELAGE ATTACH
N/A
D
KP-102
FINISH:
POWDER COAT PAINT
R. HAFTNER
COVER WHEN POWDER COATING
.08
B
B
1.50 (2 PLS.)
1.00 DIA.
.25 R. REF. (4 PLS.)
5.50
GMAW
GMAW (2 PLS.)
GMAW (2 PLS.)
.38
.19
11.25
A
A
SEAT TANG P/N ST-TANG-B (2 REQ'D.)
#11 DRILL THRU.
UNLESS OTHERWISE SPECIFIED:
- ALL CORNER FILLETS AND SHARP EDGES .005/.015 R.
1 1.000 DIA. X 19.00 BAR
2 .125 SHT. X 3.00 X 3.00
3 .750 SQ. X 14 GA. X 45.00 TUBING
PILLOW BLOCK STRAP P/N PBS (2 REQ'D.)
2.75
1.00
VIEW B-B
2 X SCALE
.38
VIEW A-A
2 X SCALE
1.25 REF.
BUILDER: DIMENSION TO RUDDER ATTACH POINTS


REVISIONS
LTR.
DESCRIPTION
DATE
MD4058
WING ROOT ATTACH
N/A
KP-103
D
MATERIAL:
MILD STEEL
AS NOTED
FINISH:
POWDER COAT PAINT
PER R-101
R. HAFFNER
11.22.93
APPLICATION
DETAIL A-A
2 X SCALE
#11 DRILL
3.00
1.00
5.50
A
DRILL .25 DIA. THRU.
#11 DRILL THRU. (2 PLS.)
.50
13.50
18.50
25.00
#11 DRILL THRU.
.25 R. REF. (4 PLS.)
1.00 DIA.
1.50 (2 PLS.)
21.19
BUILDER: DIMENSION TO WING ROOT
COVER WHEN POWDER COATING
GMAW
CONTROL STICK SIDE PLATE P/N CS-SP (1 REQ'D.)
.06
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 11 GA. X 31.13 TUBING
4 .750 SQ. X 14 GA. X 25.00 TUBING

REVISIONS		
LTR.	DESCRIPTION	DATE



MD4057

UNLESS OTHERWISE SPECIFIED:
- ALL CORNER FILLETS AND SHARP EDGES .005/.015 R.
- 1 1.000 DIA. X 5.50 BAR
- 2 .250 DIA. X 5.00 BAR (304 STAINLESS STEEL PER QQS 766)
- 1 GRIND TAPER AS SHOWN

NEXT ASSY.	USED ON	QTY.
		1
APPLICATION		

MATERIAL: MILD STEEL AS NOTED

PROD. TIME: X | RAW MATL.: AS NOTED

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES
TOLERANCES
DECIMALS .X ± .1 .XX ± .05 .XXX ± .010
ANGULAR ± 1°
DO NOT SCALE DRAWING

FINISH: NONE

DRAWN:	DATE
R. HAFFNER	11.23.93
CHECKED:	
CHECKED:	
APPROVED:	

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

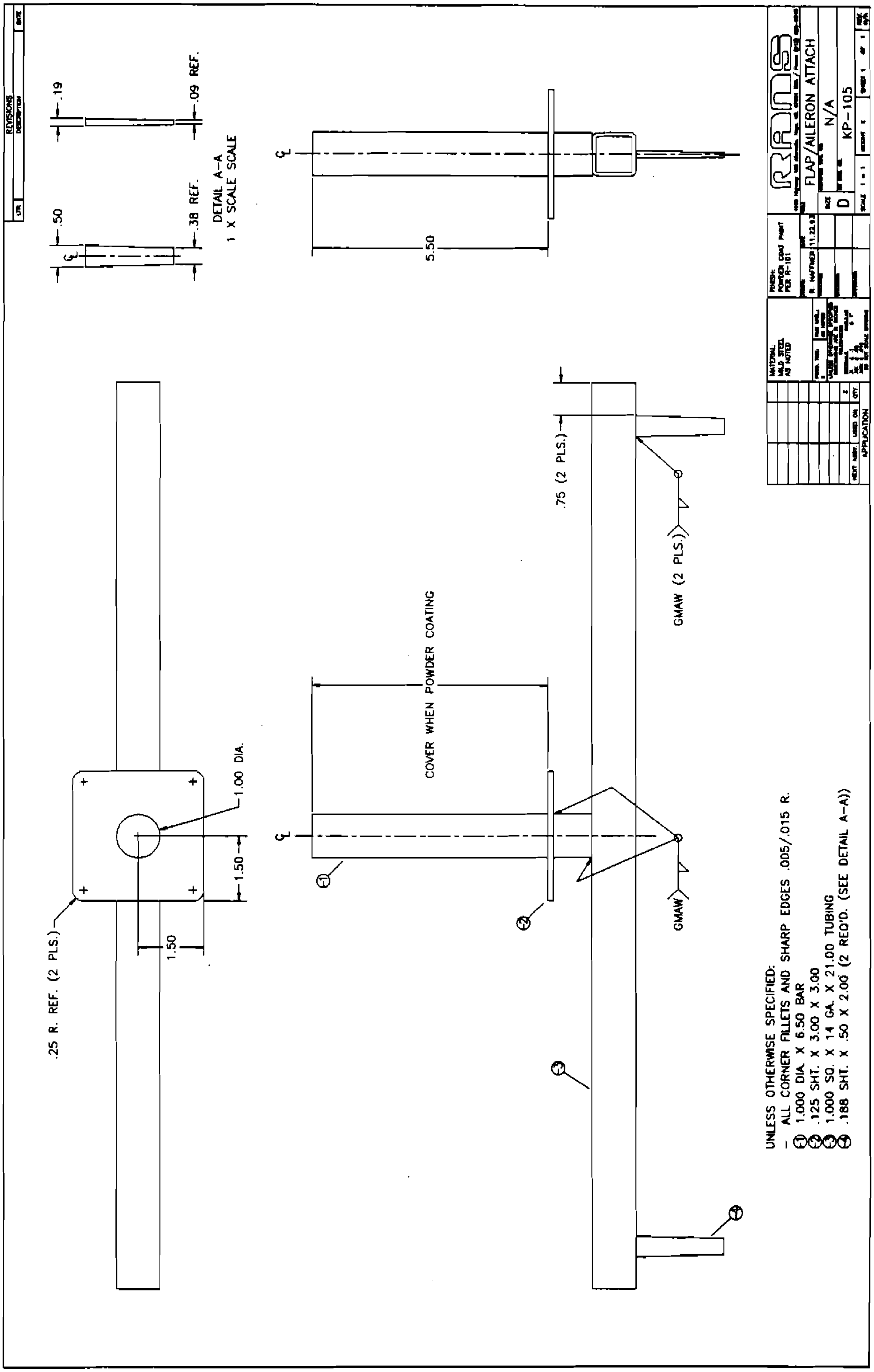
TITLE: WING TIP ATTACH

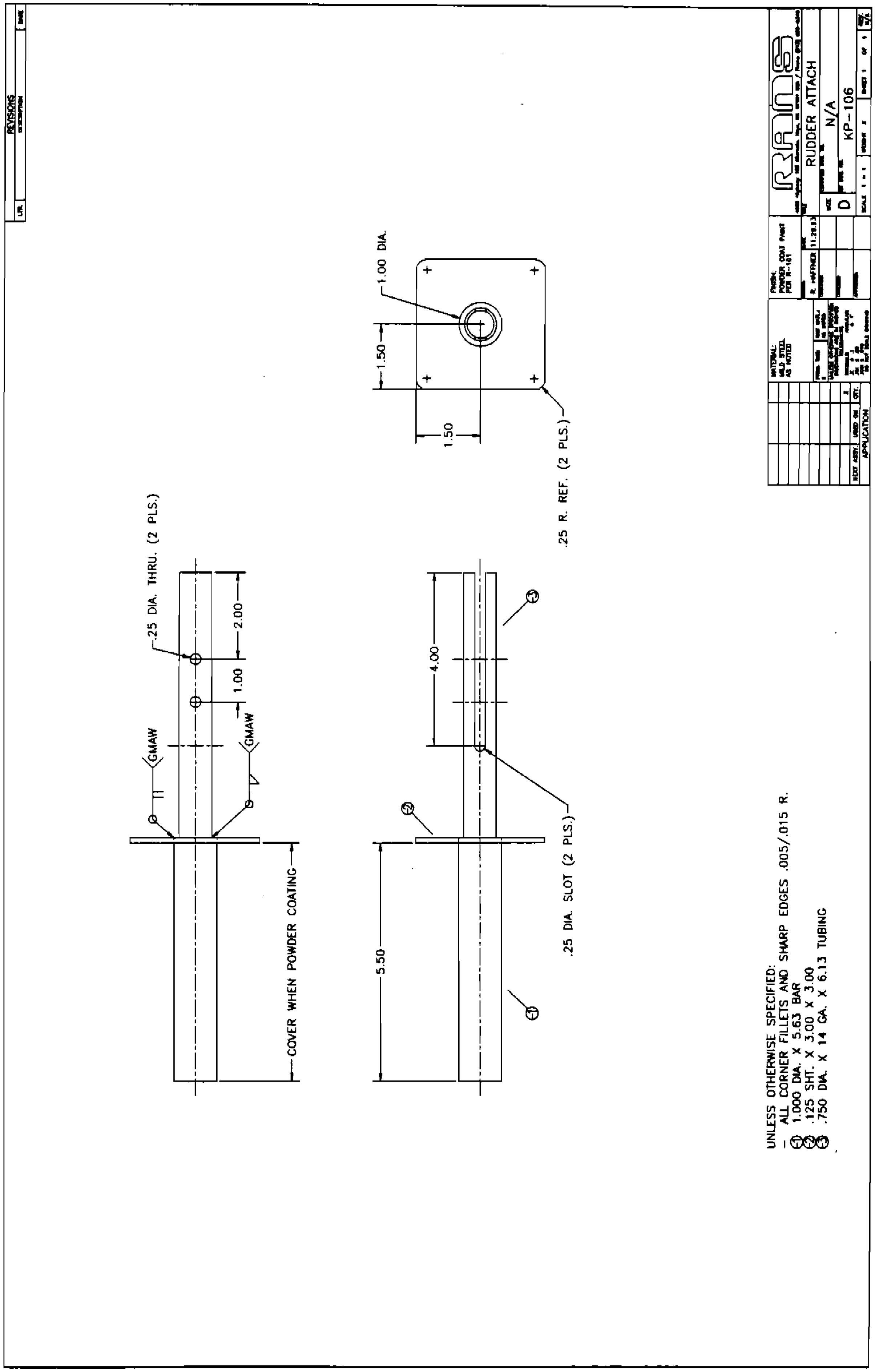
SIZE: B

CERTIFIED DWG. NO.: N/A

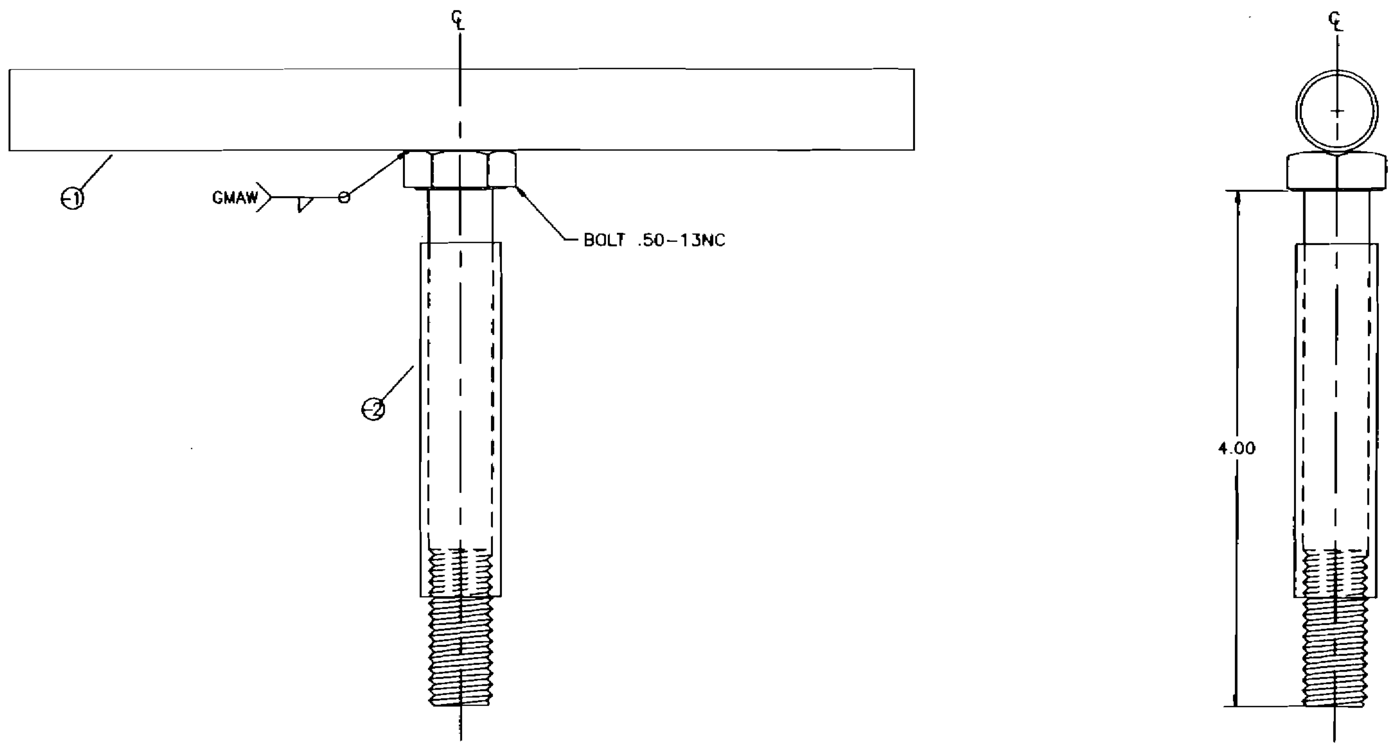
KIT DWG. NO.: KP-104

SCALE 1 = 1 | WEIGHT X | SHEET 1 OF 1 | REV. N/A


REVISIONS
LTR
DESCRIPTION
DATE
.19
.09 REF.
.50
.38 REF.
DETAIL A-A
1 X SCALE SCALE
5.50
.75 (2 PLS.)
GMAW (2 PLS.)
COVER WHEN POWDER COATING
1.00 DIA.
1.50
1.50
.25 R. REF. (2 PLS.)
GMAW
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 21.00 TUBING
4 .188 SHT. X .50 X 2.00 (2 REQ'D. (SEE DETAIL A-A))
MATERIAL: MILD STEEL AS NOTED
FINISH: POWDER COAT PAINT PER R-101
R. HAFFNER 11.22.93
FLAP/AILERON ATTACH
N/A
D
KP-105
SCALE 1 = 1
APPLICATION


REVISIONS
RUDDER ATTACH
N/A
D
KP-106
MATERIAL: MILD STEEL AS NOTED
FINISH: POWDER COAT PAINT PER R-101
R. HAFFNER
11.29.93
APPLICATION
1.00 DIA.
1.50
1.50
.25 R. REF. (2 PLS.)
.25 DIA. THRU. (2 PLS.)
2.00
1.00
GMAW
GMAW
COVER WHEN POWDER COATING
4.00
5.50
.25 DIA. SLOT (2 PLS.)
UNLESS OTHERWISE SPECIFIED:
– ALL CORNER FILLETS AND SHARP EDGES .005/.015 R.
1 1.000 DIA. X 5.63 BAR
2 .125 SHT. X 3.00 X 3.00
3 .750 DIA. X 14 GA. X 6.13 TUBING

REVISIONS		
LTR.	DESCRIPTION	DATE



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

NEXT ASSY.	USED ON	QTY.
		2
APPLICATION		

MATERIAL:
MILD STEEL
AS NOTED

PROD. TIME: X
RAW MATL.: AS NOTED

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES
DECIMALS .X ± .1, .XX ± .05, .XXX ± .010
ANGULAR ± 1°
DO NOT SCALE DRAWING

FINISH:
POWDER COAT PAINT
PER R-101

DRAWN:	DATE
R. HAFFNER	11.20.93
CHECKED:	
CHECKED:	
APPROVED:	

RAMS
4600 Highway 183 Alternate. Hays, KS. 67601 USA / Phone (913) 625-6346

TITLE: "T" LOCK HANDLE

SIZE: B
CERTIFIED DWG. NO.: N/A
KIT DWG. NO.: KP-107

SCALE 1 = 1 | WEIGHT X | SHEET 1 OF 1 | REV. N/A

FINAL ASSEMBLY

LANDING GEAR

1. To provide the main gear leg sockets a play free fit apply silicon caulking over the ends of the gear legs before insertion. Install the landing gear legs as per prior assembly. Slip on gear leg fairings followed by the axle sockets.

NOSE GEAR AND FAIRING ASSEMBLY

2. Install the nose gear as per previous instructions.

TAILWHEEL ASSEMBLY

3. Install the tailwheel as per prior instructions. **Please Note:** During initial taxi test spring tension may need to be adjusted.

BRAKES

4. Refer to the following sections and final install all parts.

    Floorboard and rudder pedal installation
    Installation of hydraulic accessories
    Filling of the hydraulic brake system

FIREWALL ASSEMBLY

1. Using contact cement, glue the firewall soundproofing to the back side of the firewall. After the glue has set, trim the edges and open all holes with a hot knife or soldering iron.

2. Install the S-1 top former.

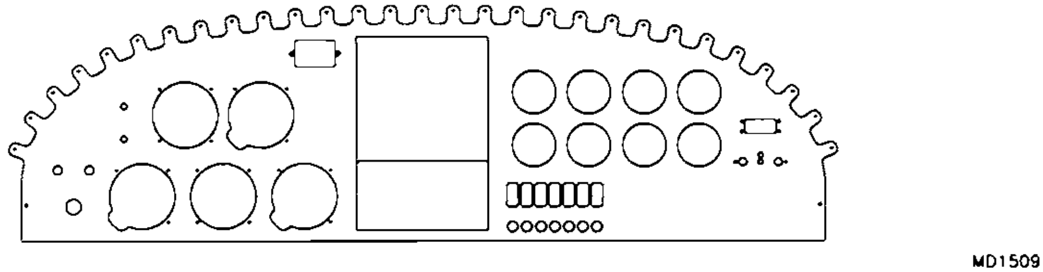
3. Place the firewall onto the S-1 and rivet in place.

4. Locate the cowling hold down strip. Place it on center at the top of the S-1.

INSTRUMENT PANEL ASSEMBLY

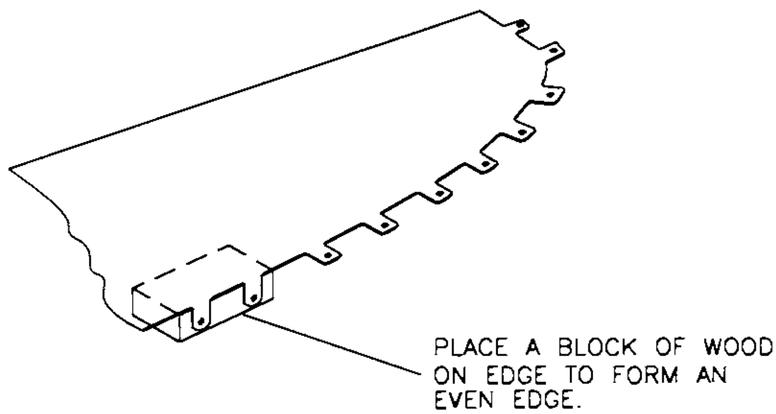
1. The instrument panel is provided as a blank. An Optional cut panel is also available as shown in **FIGURE 019-01**. Otherwise, layout and cut the panel to your design. See FIGURE 019-01A. Deburr and test fit the instruments before painting.

FIGURE 019-01



2. Bend the tabs over 90 degrees on the top of the main panel. Bend the tabs to face **FORWARD**. Use a block of wood to back up the tabs for even bends. Press the tabs over with your finger. See **FIGURE 019-02**.

FIGURE 019-02

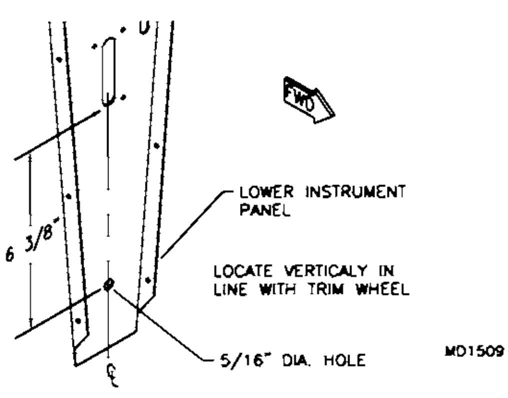


3. Paint the main panel and lower panel to match.

4. Located on each lower corner of the main panel is a #30 hole. Use these holes to cleco the panel to the lower tab welded to the aft side of the S-2. Transfer drill #30 through the upper tab.

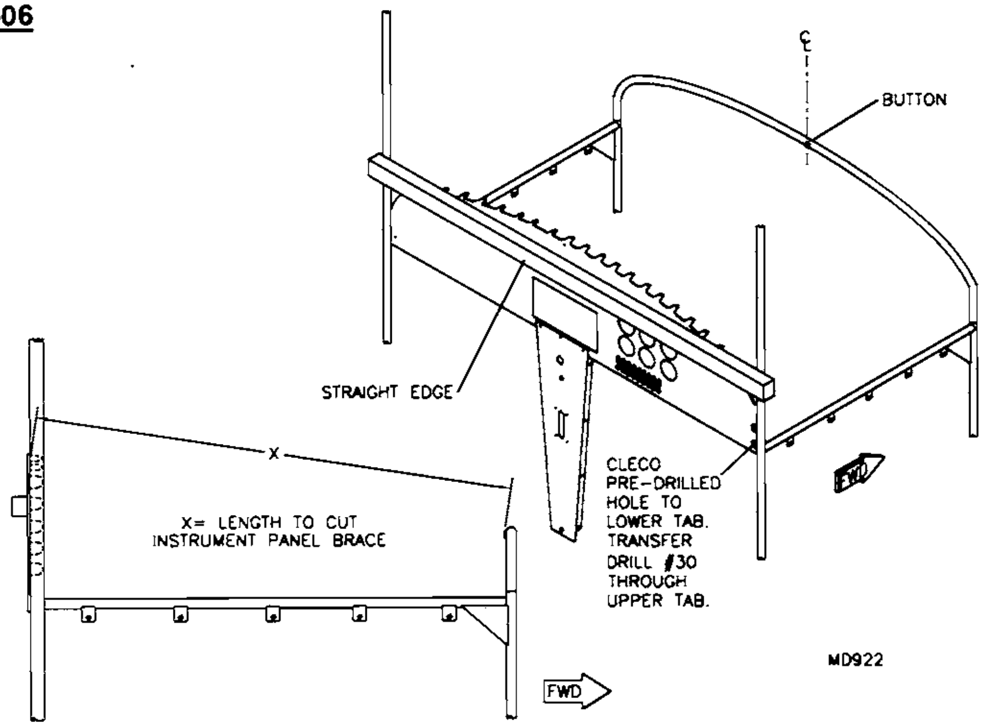
5. Locate and drill a 5/16" hole in the lower panel as shown in **FIGURE 019-05.** Cleco in the lower panel. The panel should attach to the aft side of the tab welded to the bottom carry through, and to the bottom edge of the main panel. Once the fit has been checked, remove the clecos, rivet, and bolt as per the parts drawing.

FIGURE 019-05



6. Clamp a straight edge across the aft side of the main panel. See **FIGURE 019-06**. Locate a "button" centered on the aft side of the S-1 top former. Position the button so that the brace tube will be flush with the top of the station one top former. Measure between the panel and the S-1 top former. Cut the tube to length. Install the panel brace by inserting the plastic plug into one end. Place this end against the panel. Install a rivet into the plug from the aft side of the panel. Place the forward end over the "button".

FIGURE 019-06

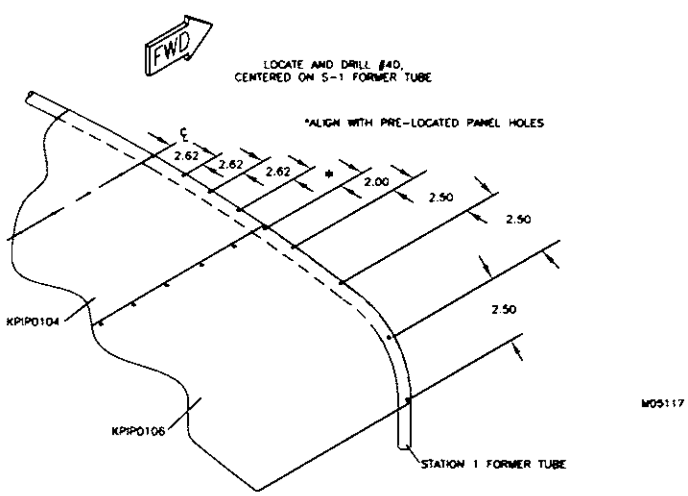


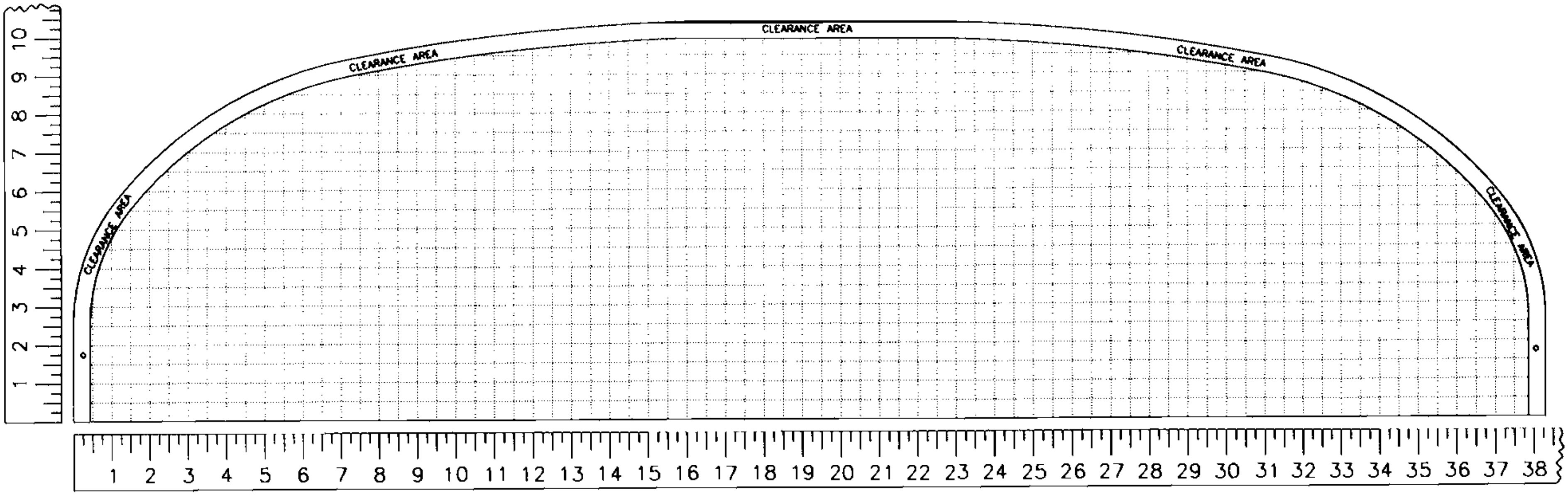
7. Place the center panel cover on top of S-1 and panel. The panel cover comes pre-drilled. Line up the center holes centered on the panel brace tube. Line up the front of the panel cover with the hole centered on the top of S-1. Tape or clamp in place. Transfer drill #40 all center holes.

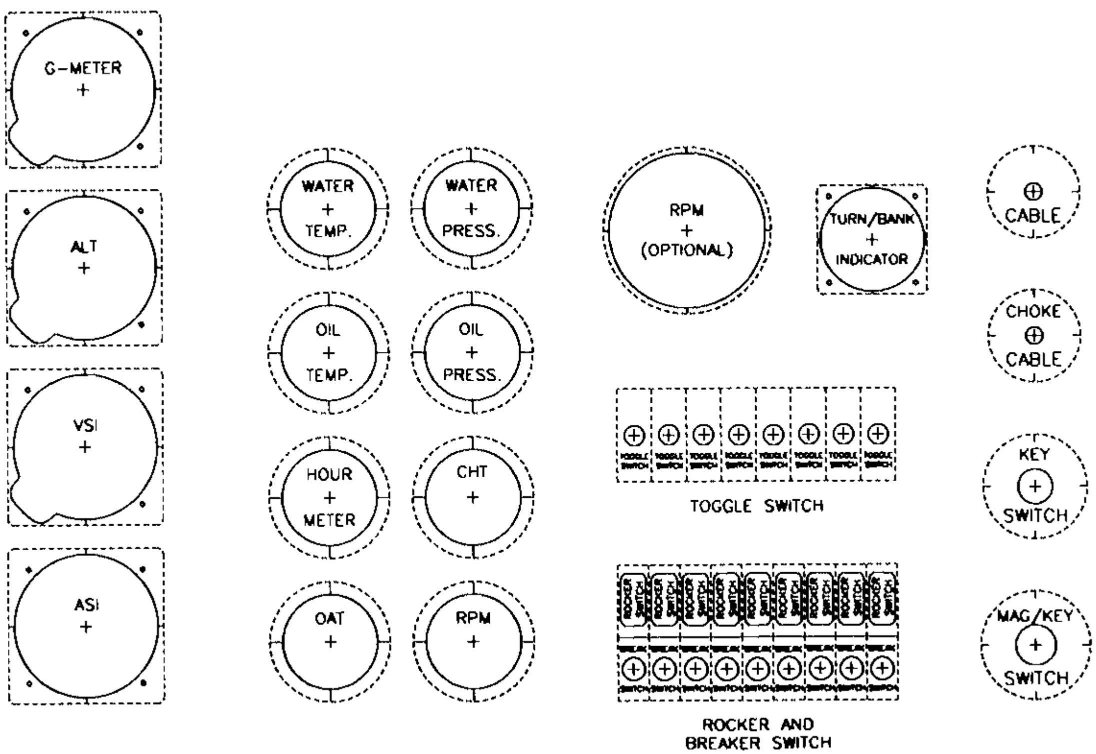
8. Pull the panel tight against the Instrument panel tabs and S-1. Reach under the main panel and mark or scribe the hole locations for the instrument panel tabs. ***NOTE:** A #40 hole finder may also be used.*

9. Cleco the Outboard Panel Cover to the Center Panel. Drill the Instrument panel tab holes as before. Be sure the entire cover assembly is pulled down tight. Locate and drill forward panel cover holes per **FIGURE 019-09**. Trim the forward edge flush with S-1, as needed.

FIGURE 019-09

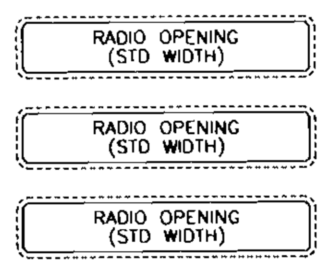






INSTRUMENT PANEL LAYOUT PROCEDURE

1. MAKE A COPY OF TEMPLATE
2. CUT OUT TEMPLATES ON DOTTED LINES (THIS ALLOWS CLEARANCE FOR SURROUNDING INSTRUMENTS)
3. ARRANGE PAPER TEMPLATES ON INSTRUMENT PANEL IN DESIRED CONFIGURATION (NOTE PANEL CLEARANCE AREA)
4. USE CENTER MARKS ON INSTRUMENTS TO LOCATE ON INSTRUMENT PANEL
5. NOTE: THE STANDARD RADIO WIOTH OPENING (HEIGHT VARIES WITH TYPE RADIO USED)



MD1050

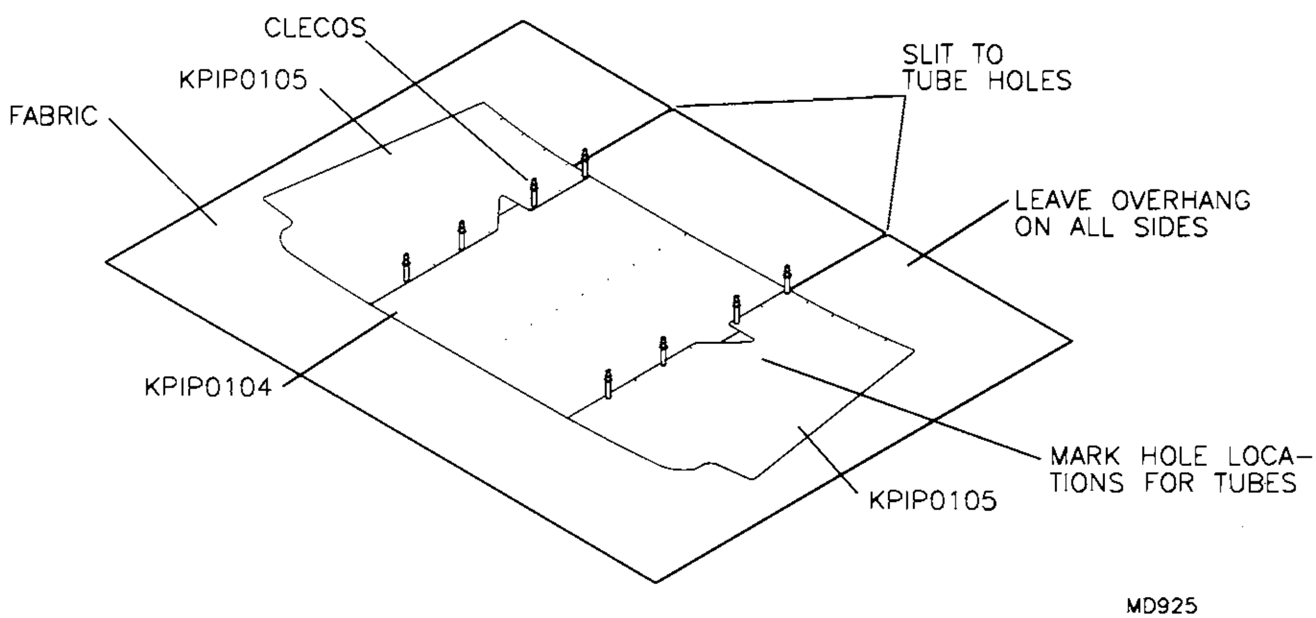
10. Set the panel covers aside. The panel cover and fabric covering will be installed after all the instruments are installed.

11. Install all instruments, controls, and wiring. Secure wires and control cables for heater, choke and throttle with plastic ties. Route wires and cables clear of rudder pedals and other moving parts. Try to do a neat job, even though everything will be hidden under the top panel.

12. Provided with your kit is a special fabric used to cover the top panel. It is highly recommended to use this fabric cover. It is made of a special sun resistant material. The fabric color is designed to allow the least amount of heat transfer to the instruments, as well as reduced glare and reflection. You simply can't do that with paint.

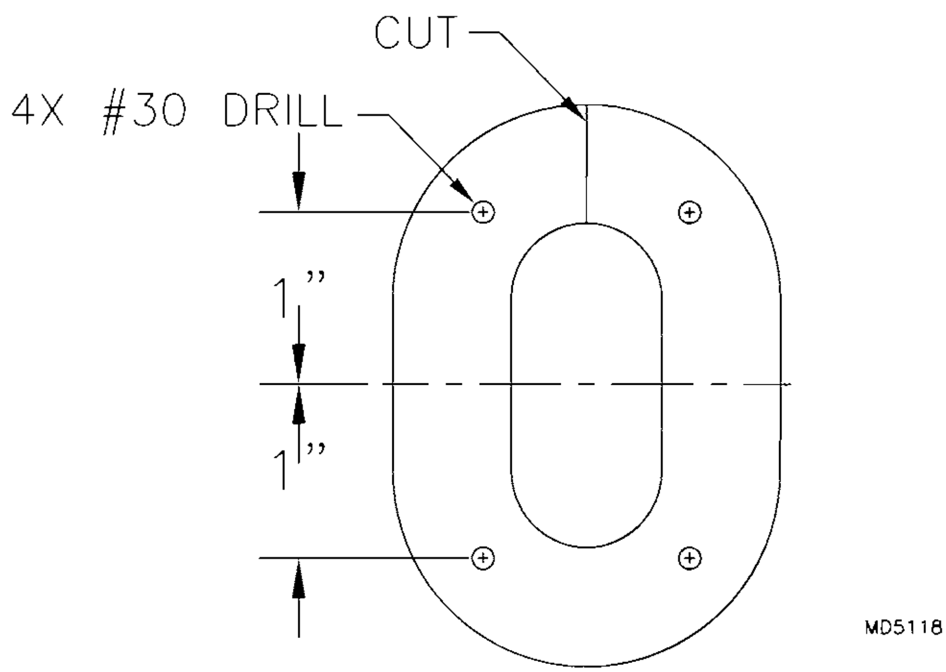
13. Unroll the fabric and lay it on a flat surface. The fabric is the same on either side. Lay the top panel cover over the fabric. Leave a generous amount of fabric overhang on all edges. Mark the location of the tube holes. Cut two slits in the fabric to the hole from the S-1. See **FIGURE 019-13**. Roll up the fabric and store. Later after installing the top panel covers, use spray on contact cement to attach the fabric.

FIGURE 019-13



14. Modify the Panel Close Outs per **FIGURE 019-14**. Center the Close Outs on the fuselage tubes and panel cut outs. The Close outs will cover the opening. Drill #30 and Cleco. Rivet to the panels. If desired touch up the rivets with black paint to match.

FIGURE 019-14



912 COOLING SYSTEM ASSEMBLY

PLEASE NOTE: Look on the photo pages for pictures of the cooling system.

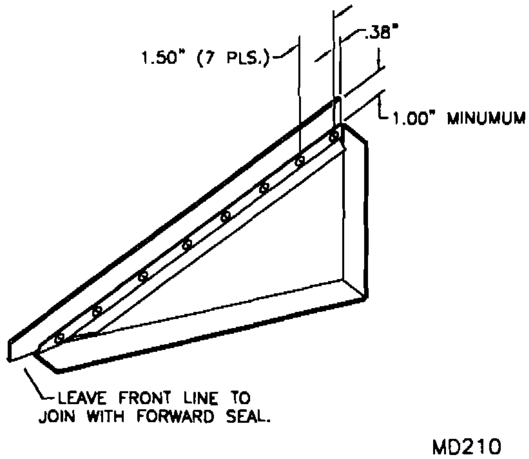
GENERAL INFORMATION

For best results the cooling system must be filled and void of air. The location of the filler "T" must be so the cap is above the highest cooling tube on the radiator.(The trike requires lowering of the tail to fill.) This will help avoid air bubbles in filling the system. The system works by "scooping" cooling air through the top cowling louvers. This air passes through the radiator and out the bottom hole in the cowling. In reality, you can not push air through a radiator, it must be pulled. On the S-6S there is a natural high pressure zone where the cowling meets the windshield. We take advantage of this high pressure air by placing louvers at this point. Incoming cooling air is further pulled through the radiator by the air flowing through the cowling. The two most critical elements to effect cooling performance are coolant level and air flow. Coolant level is something that should be monitored on a regular basis. The effectiveness of the cooling air will be directly affected by the fit and condition of the seals around the radiator and cowling edges. If these seals develop leaks, cooling will decrease. Maintain the seals for best cooling.

1. Select all the parts depicted in the parts drawings for the slant cooling system.

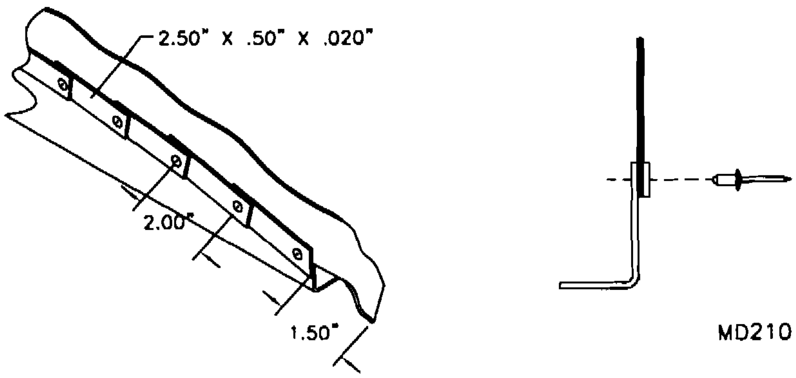
2. Install the rubber seals to the radiator mounting angles as shown in **Figure 019-02**. Maintain at least 1" of rubber strip **ABOVE** the top edge of the mounting angle.

FIGURE 019-02



3. Cut the strip of 26" X ½" X.020 aluminum into 2 ½" strips. Cut the entire strip into short segments. Drill a #30 hole in one end of each strip. Cut the 2" rubber strip to 27". Center the rubber strip on the forward seal overlapping the edge ½".
See **Figure 019-03**.

FIGURE 019-03

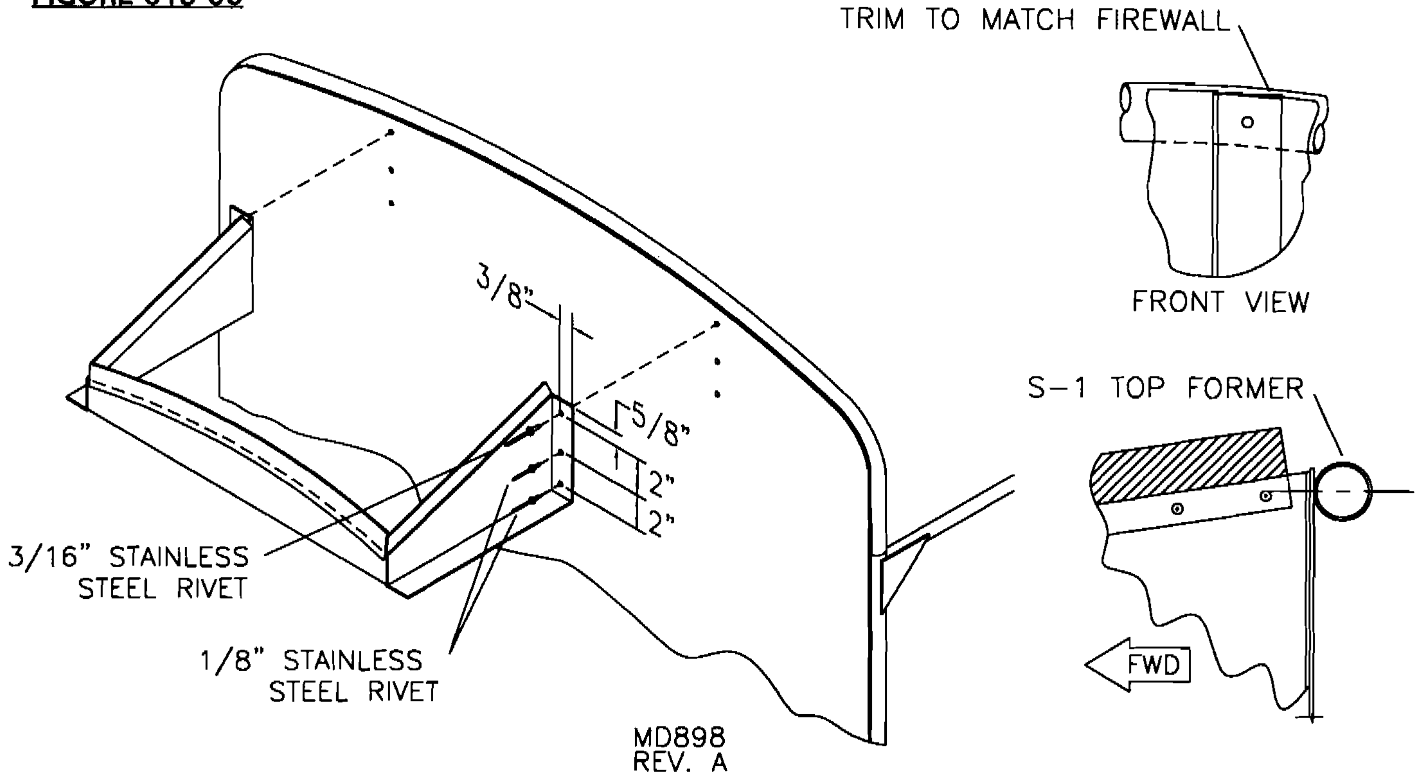


4. Apply the foam strip to the bottoms of each radiator mount attach angle. Make sure to place this foam so it seals against the radiator.

5. Refer to the slant radiator mount parts drawing for assembly sequence and bolt the mounting angles and front seal to the radiator. Locate and drill #11 holes through the "EARS" on the radiator to mount the angles and forward seal. These holes are located by putting the mount angles in place and drilling through the corners. Place the forward seal **UNDER** the mounting angles. Use a stack of (3) 3/16" thick washers to space off from the radiator. Apply the foam rubber to the **BOTTOM** of the forward seal.

6. The radiator and mount assembly is located on the center of the firewall. The assembly is located height-wise by the #11 hole in the top of each side mount angle. Locate these holes as per **Figure 019-06.**

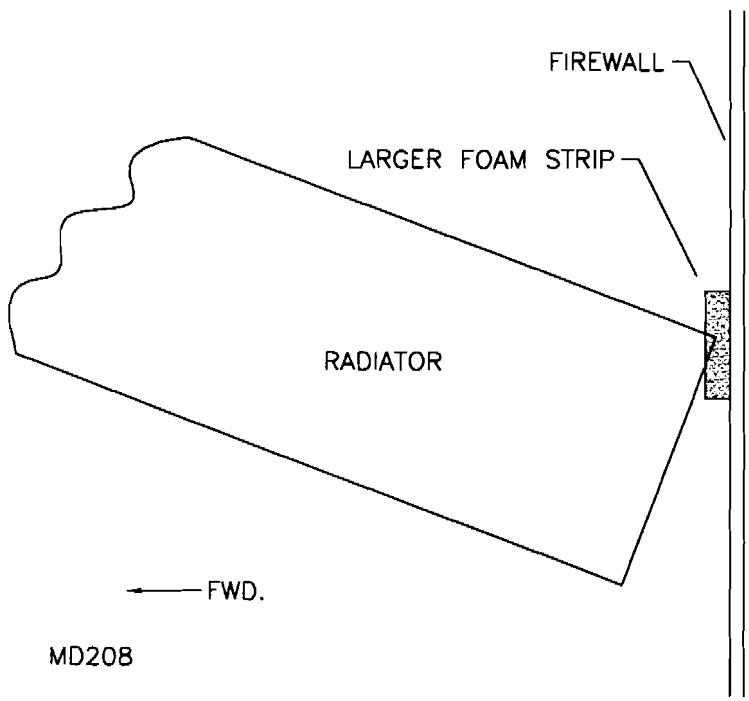
FIGURE 019-06



7. With the radiator assembly properly located on the firewall, locate and drill one 3/16" and two ⅛" holes in each mount angle flange. Do not install any rivets at this time, instead cleco it in place. The top 3/16" hole is critical for it to properly secure and locate the radiator assembly. It must go through the center of the S-1 top former tube. See **FIGURE 019-06**.

8. Before removing the radiator assembly, mark across the aft <u>**TOP**</u> edge of the radiator. Remove the radiator assembly and apply the larger foam seal on this mark. This is the radiator to firewall seal. See **FIGURE 019-08**.

FIGURE 019-08



9. Install the radiator assembly after de-burring the rivet holes.

582 OIL BOTTLE INSTALLATION

10. Unbolt the radiator from the mount (leave the mount attached to the firewall). Select the parts depicted in the oil injection tank mount drawing. Insert the segment of trim lock around the edges of the hole. Start and stop the trim lock at the aft notch.

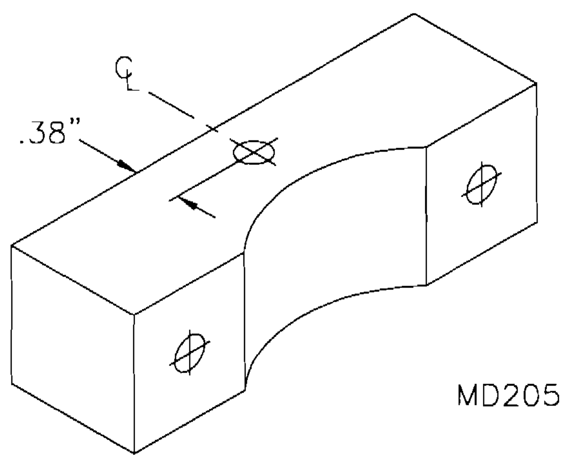
11. Insert the tank through the hole with the filler hole placed on the top left. Locate the tank side to side so there is enough room to install the 90 degree withdrawal fitting and clear the edge of the mounting bracket.

12. Use the larger hose clamp to attach the oil tank mounting strap to the tank. Place this clamp and strap assembly approximately 2" from the end so it clears the fittings welded to the end of tank. Bend the mounting straps so the aft flanges fit flat against the firewall. Bend by pinching the strap together at the tank contour bend. Level the tank to the fuselage. Use the main spar carry through for a reference. Once level, mark, drill and rivet with 3/16" stainless steel pop rivets. Bolt the radiator back in place. See photos, page ahead.

582/912 FILLER TEE ASSEMBLY

13. Locate the gray plastic block that serves as the filler tee mount. Drill a #11 hole through the block as shown in **Figure 019-13.**

FIGURE 019-13



14. Bolt the filler tee mounting block to the flange of the left radiator mount attach angle. This hole should be drilled #11 and is about 3" from the front of bracket. Bolt the block on so the groove is on the left side facing out. **NOTE:** To ease assembly, install the two (2) 3/16" bolts through the block before bolting to the radiator mount.

15. Select the proper hardware, then strap and bolt the filler tee to the mount block. **IMPORTANT:** In order to completely fill the cooling system void of air, this filler tee must have the lower rim of the cap bowl **ABOVE** the highest radiator cooling tube. The cooling fins may appear higher than the tank, but the cooling tubes are actually lower than the fins. If required, move the filler tee forward to raise.

16. Locate the coolant overflow bottle on the firewall. Refer to the Firewall Section for proper placement.

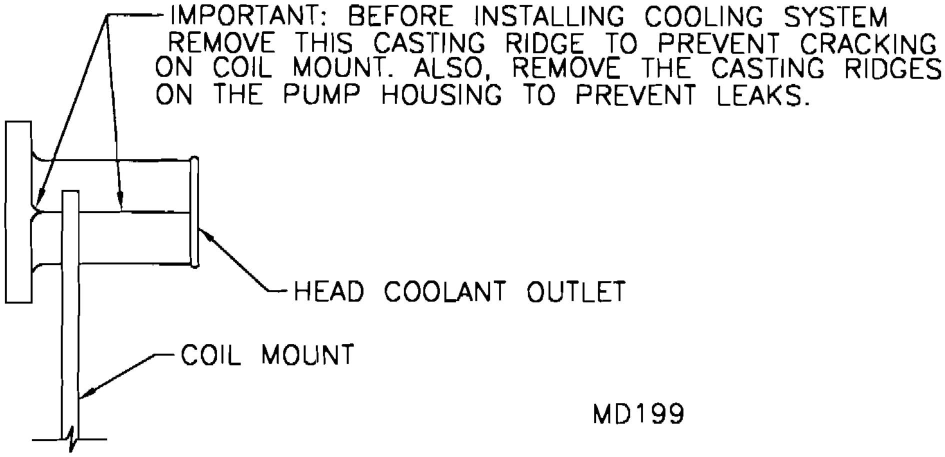
17. Refer to the parts drawing for the recommended routing of the coolant lines. Double-check the fit and routing before cutting. A little extra hose is provided but it will only accommodate small errors. When installing the coolant line clamps remember to check and re-check all fittings and clamps prior to adding coolant and during pre-flight. Insert the anti-collapse springs into the hose as needed.

18. When installing the top cowl please check for a good fit of the seal between the radiator and cowl.

COOLANT SYSTEM GENERAL NOTES

A. **582** - Before installing the cooling system remove the head outlet fitting and pump housing on the engine. File and sand the casting ridges smooth and re-install. See **Figure A**.

FIGURE A



B. Make sure all hose clamps and fittings are tight prior to adding coolant.

C. Add a 50-50 mixture of "For Aluminum Engines" anti-freeze and water. Fill through filler tank opening.

D. **582** - Remove the set-screw on top of the engine to fill system to engine level. (Apply Loctite to the set-screw when re-installing). **HINT:** A piece of fuel line will "screw" right into this hole and allow a no mess overfill.

E. Remove the screw from the nipple on the forward left side of the radiator. The nipple is sealed with silicone sealer. Raise the left main, (a chair works well). Continue filling the system until coolant runs out the nipple. Apply silicone seal to the screw and re-seal the nipple. Continue filling. Re-tighten and install the radiator cap.

F. Allow the recovery bottle to fill with fluid. If your system ever gets warm enough some fluid may overflow into the recovery bottle. Lower the left main after air has been purged.

G. Add more coolant after engine break-in. Re-tighten all the clamps and fittings.

H. Replace the coolant annually and inspect the system for wear. Replace hoses every 2 years.

INSTALLING THE ENGINE AND ENGINE MOUNT, ALL TYPES

Provided with this manual are photos showing details of the 80 and 100 hp 912 installation. Please use these as a reference, variations may be apparent.

1. Install the engine mount as before, be sure to use the washer spacing against the firewall as required.

INSTALLING THE 503 OR 582

2. Install the engine with three washers on each stud, placed between the mount plate and engine. Place the loc washers with the pointed side toward the nuts, and install the nuts. Torque to recommended values by Rotax. Reference the engine manual. If no values are stated, please call the nearest Rotax Service Center.

3. Install the muffler Y pipe in level position. If the "Y" pipe is installed pointing down the muffler will not clear the mount.

4. Install the muffler to the ball joint in the "Y" pipe. Install the rubber isolators between the muffler and mount locations. **NOTE:** The rubber mounts provided may separate in a few hours of operation. There is no need to replace the isolators unless an increase in vibration is noted.

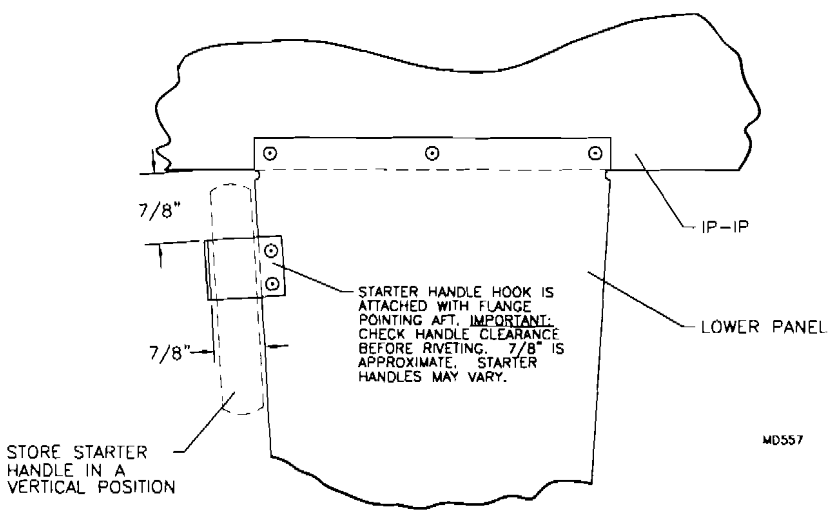
5. Hook the springs to the wire loops welded to the muffler. Avoid using pliers to grab the springs. This can cause "stress risers" in the hook of the spring. The "stress riser" will cause hook breakage. Adjust the springs tension by bending the loops. Springs should be expanded at least a 1/2" from the original length. Apply a bead of silicon to the springs after they are installed. This lengthwise bead of silicon will absorb any harmonic vibrations. This will prevent the springs from failing.

   Install the muffler extension to the exhaust pipe using the proper hose clamp. The extension is shaped to reduce drag, orientated so the extension presents the least area to the slipstream.

6. If you are using the standard pull starter, turn the starter can as required to line up with the pulleys. Run the rope through the proper pulleys into the cabin. A hook is supplied to hang the starter handle when not in use. Attach the hook to the lower panel as shown in **Figure 019-06**. The handle stows in the vertical position.

   If you are installing the electrical starter, please refer to instructions included in the starter kit. Consult the wiring diagram for the applicable engine type for circuit details.

FIGURE 019-06



7. Install carbs using the clamps provided with the engine. Install so the carb or carbs are 90 degrees to the crankshaft. During operations get into the habit of checking the integrity of the carb "boots". In certain parts of the country, where air pollution is high, the boots tend to deteriorate faster, so watch them.

8. Install the throttle reverser/splitter to the right side of the radiator mount. See **Figure 019-08**. For 503 equipped planes locate the reverser/splitter mount in the location shown in **Figure 019-08A**.

__FIGURE 019-08__

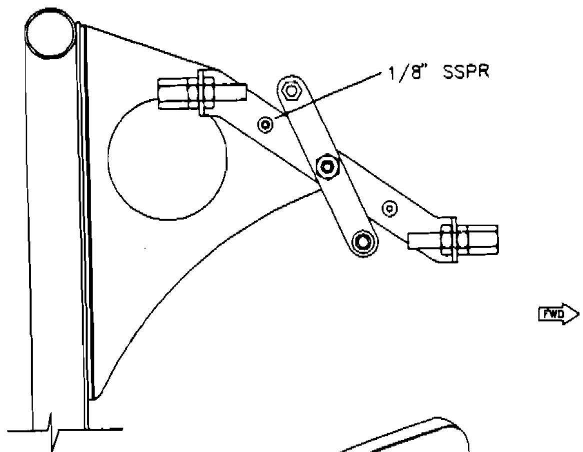
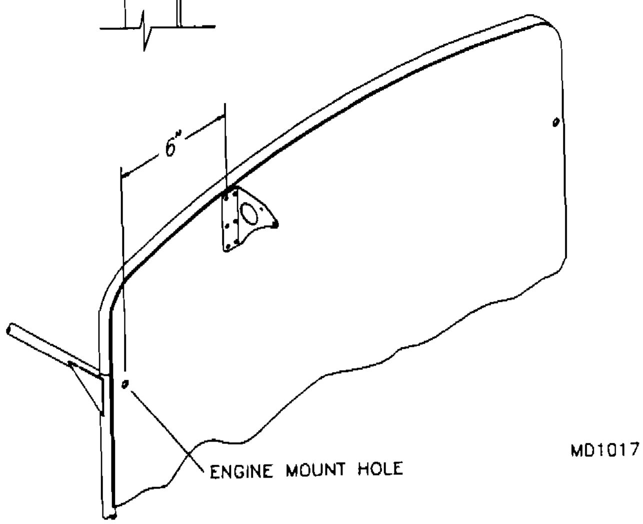
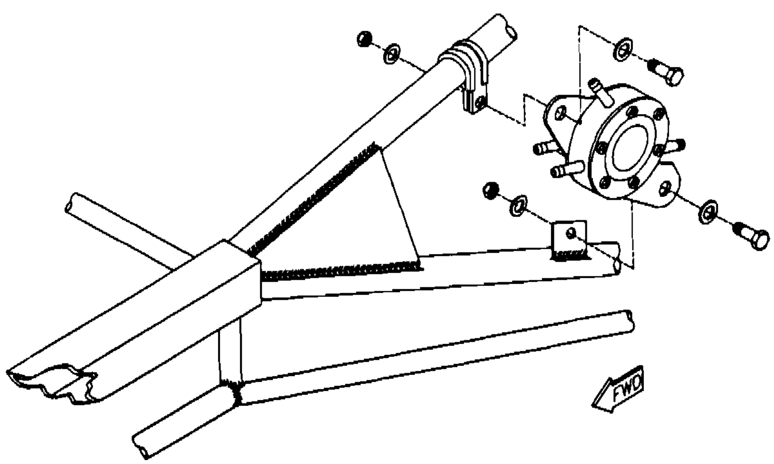


__FIGURE 019-08A__



9. Install the fuel pump for either the 503 or 582 on the left side to the mount tab provided. Use a tube clamp to secure the other end of the pump to the mount. See **Figure 019-09**.

__FIGURE 019-09__



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10. To hook up the throttle cables on 503's and 582's, un-screw the top of the carb or carbs. **CAUTION:** Under the cap is the throttle return spring. This will want to jump out once the cap is loose. At the bottom of the spring is a white plastic slider. The cable is inserted into the slider and seats into the indent. Thread the cable up through the top of the carb cap and through the center of the spring. Re-install the carb slider and cap.

11. The cable housing will run from the adjustor ferrule on top of the carb to the reverser/splitter. Cut a length or lengths of cable housing to fit. Allow the cable enough length, do not make any sharp bends. Cut the housing with a good wire cutters and check the ends for burrs. The end of the housing must be without any of the metal casing into the cable path. Friction or cable breakage will result if the cable rubs against the metal casing. Use a bench grinder to true up the ends of the housing.

12. Thread the cable through the housing and route to the reverser/splitter. Secure the cables to the reverser/splitter arm with wire swivels. See parts drawing for correct hardware and ferrules.

13. Install the throttle to the center panel and route to the reverser/splitter. Retain the throttle wire to the splitter arm with a wire swivel.

14. Adjust the throttles so they open together for full travel. Use the adjustor ferrules and wire swivels to obtain the proper travel in synch. Secure all wire swivels with blue loctite.

15. Hook up the choke, primers, oil injector lines, and fuel lines. Route the lines in the best possible manner to avoid sharp bends, chafing and heat. Refer to photos at the end of this section for ideas on line routings. Apply anti-chafe material where needed.

16. For the electric start equipped aircraft, locate the starter solenoid and regulator on the right side of the firewall near the wire exit points.

THOROUGHLY INSPECT THE ENGINE AND INSTRUMENT INSTALLATION PRIOR TO INSTALLING THE WINDSHIELD DECK.

INSTALLING THE 912

17. Place the rubber disc into the cups and install the washers and bolts. Place the forward bolts with the heads down for best cowling clearance.

18. Suspend the engine from an engine hoist or winch. Bolt on the 912 engine attachment using 10mm bolts and Loctite. Torque the bolts to 15 to 20 ft. lbs. Rotate the water pump inlet to the 10 o'clock position.

19. Lower the engine onto the mount. The bolts through the rubber disc should be pushed in flush with the top washers. Torque these bolts to 10 to 12 ft. pounds.

20. Install the "S" shaped radiator hoses to the aft cylinder head coolant fittings. The "S" hose prevents coolant hose conflict with the engine mount. Install on both right and left aft fittings. Trim hose as required to prevent binding. Install the throttle cable retainer angles to the right side of the radiator mount as shown in **Figure 019-20**.

21. Install the choke system to the left side of the radiator mount as shown in **Figure 019-21**. Use wire swivels to retain choke cables and wire. The system will require about 15 to 20 lbs. of pull to operate. If system does not operate properly check for a hard bend or a tight radius in the cable or cable housing.

FIGURE 019-20

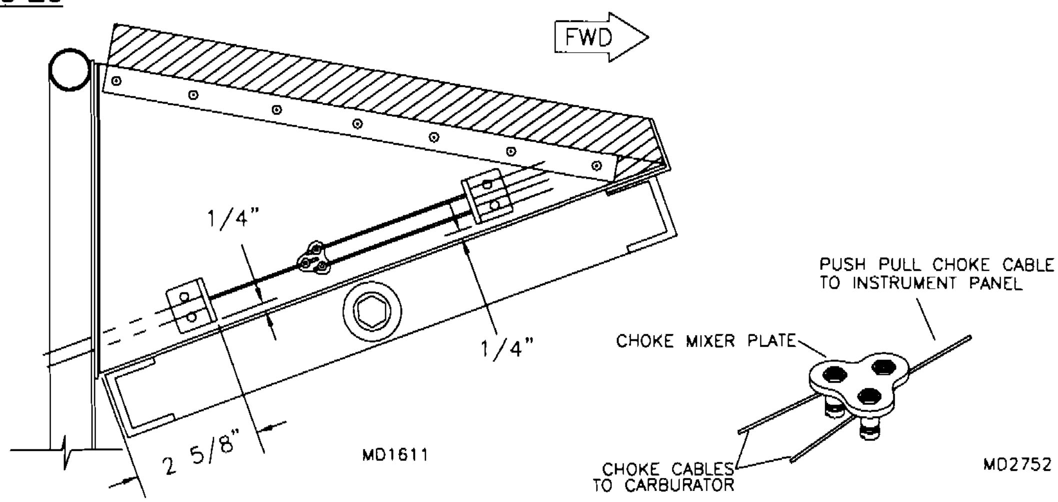
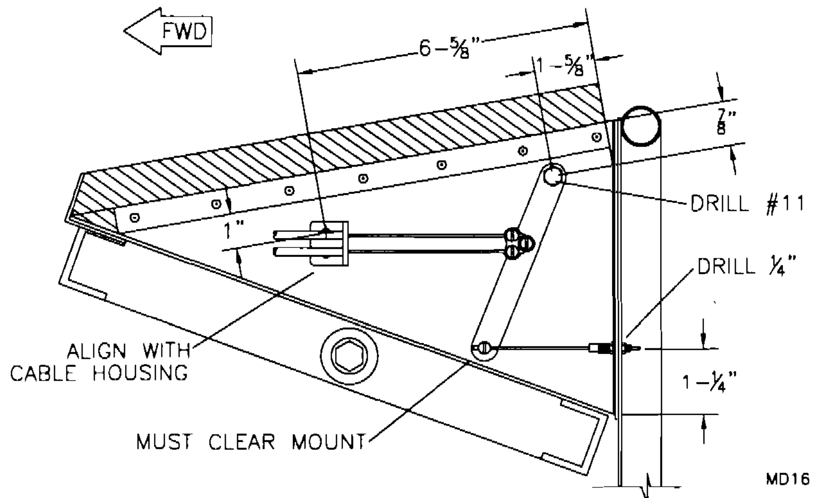


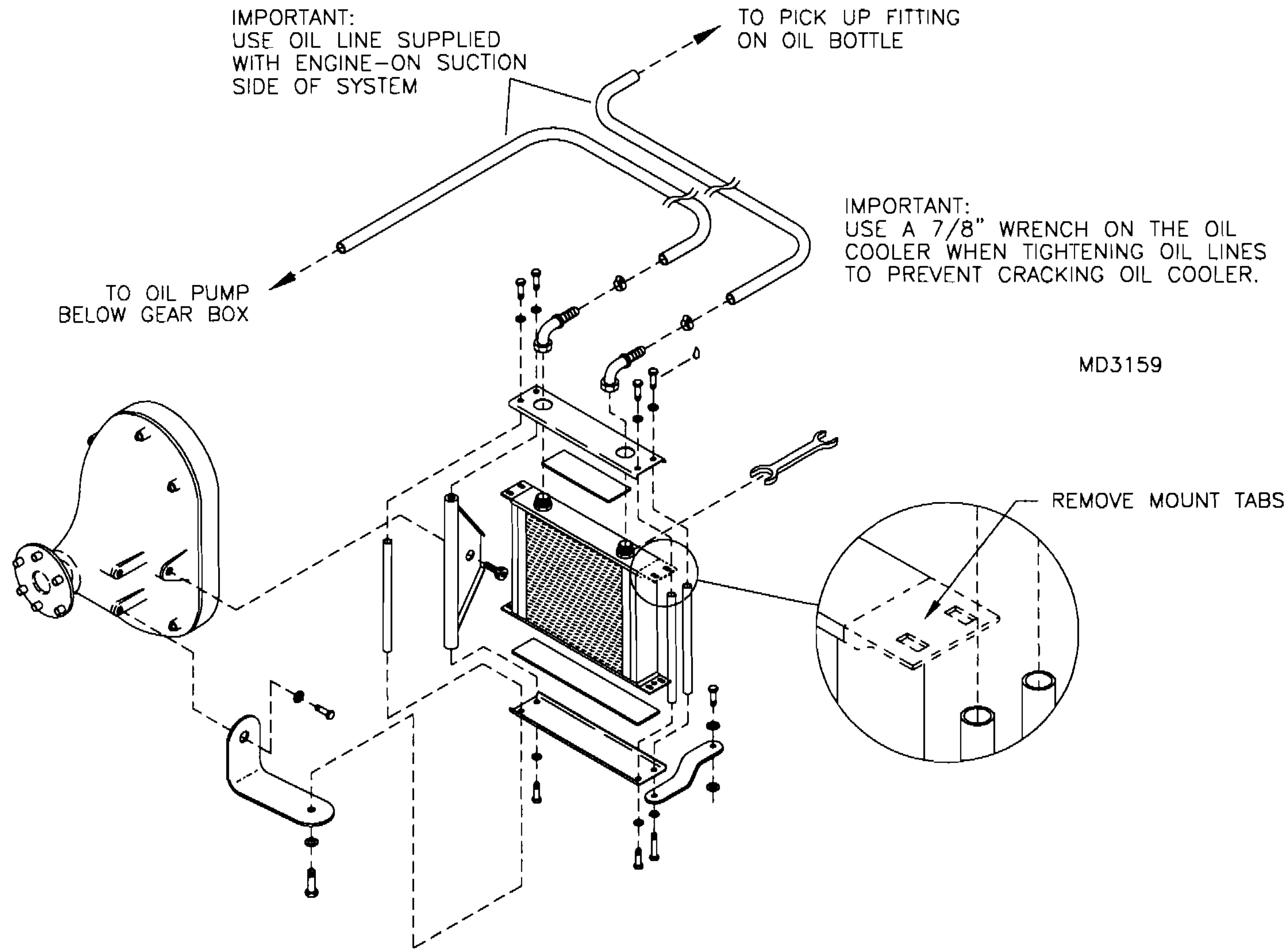
FIGURE 019-21



22. Bolt the oil tank to the right side of the mount. Use the parts drawing to assemble. Mark the center and drill a 3/16" hole on the closed end of the attach bushings. Bolt the attach bushings to the mount angles. Leave loose at this time to adjust for proper angle attachment. Clamp the oil reservoir in place on the oil tank aluminum angles. Check for clearance with everything in place; including muffler and manifolds. Tighten the bolts holding the attach bushings in place. Drill a ⅛" hole in the attach bushings and welded stubs to secure oil reservoir. Make sure to drill holes at the best orientation for reaching with a rivet gun and rivet.

23. The 912 installation features an oil cooler mounted to the left top side of the engine. **Caution:** When working with oil coolers be careful not to over tighten, or cracking may result. When tightening the lines of the oil cooler it is a must to use a wrench to support the fitting. Attach the oil cooler to the left side of the gear box. Remove the four ears of the oil cooler with a bandsaw or hacksaw. Leaving a 1/16" lip, then deburr any rough edges. Cut the strip of self adhesive foam provided into two lengths of 4" and 7". Apply the shorter piece between the oil line fittings and the other to the bottom of the oil cooler. Assemble the oil cooler mounts to the oil cooler with the bolts and bushings depicted in the parts drawing. Attach the oil cooler assembly to the oil cooler mount on the left side of the gear box. On the top of the left forward cylinder head is a hole tapped to 6MM. Attach the bent oil cooler support strap to the engine, using a 6mm bolt and Loctite. Install the oil hoses, cut to the appropriate lengths specified. The hose from the cooler to the oil pump is approximately 12" long and the hose from the cooler to the oil reservoir is approximately 18" long. See **Figure 019-23**.

FIGURE 019-23



912 MUFFLER ASSEMBLY & INSTALLATION

NOTE: If you are installing the optional 912 muffler heater system, refer to the options section and install the heater wrap prior to installing the muffler system.

24. Cut two segments, each 1 ⅜" long from the 1 ¼" O.D. rubber hose provided in the 912 muffler raw stock kit. Locate the center of each segment lengthwise and drill or punch a ¼" hole through the top and bottom wall. Install the 6mm bolts and formed washers from the inside of each segment. Refer to the parts drawing and **FIGURE 019-024**. Cut two segments, each 1 ⅜" long from the ¾" O.D. rubber hose. Insert the smaller diameter segments between the bolt heads in the isolator assembly until flush on each end. Safety wire the inner hose in place as shown in **FIGURE 019-024A**. **NOTE:** In order to tighten the bolts, it may be necessary to wait with installing the inner segments and safety wire until after the isolators have been installed on both the muffler and engine mount.

FIGURE 019-024

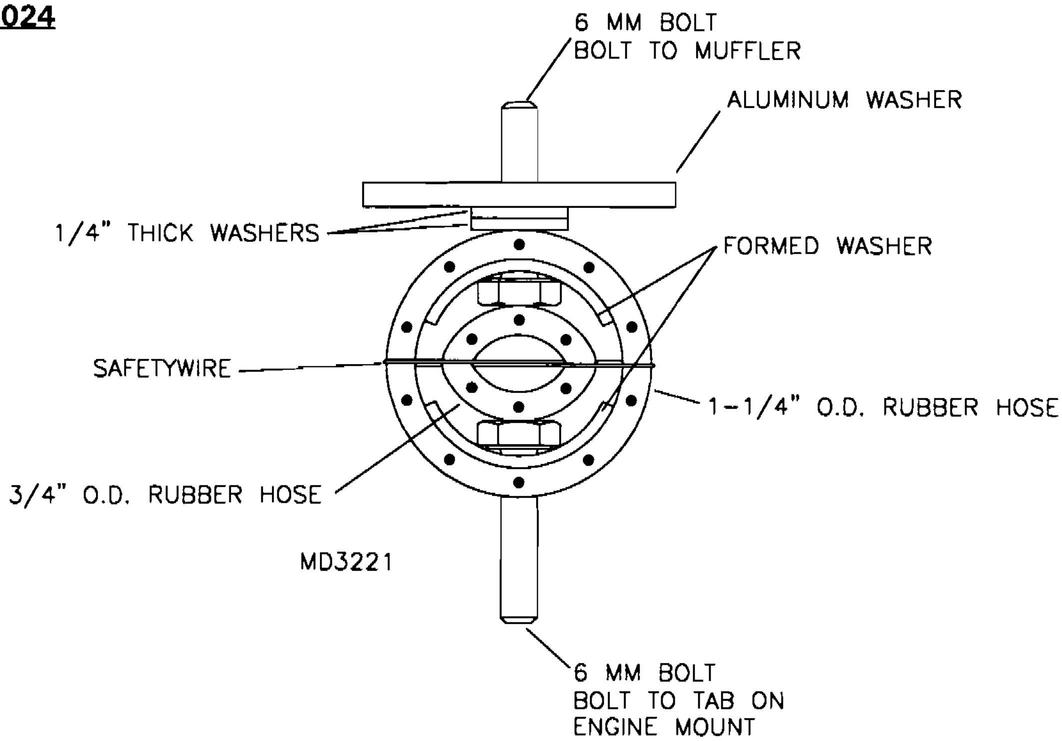
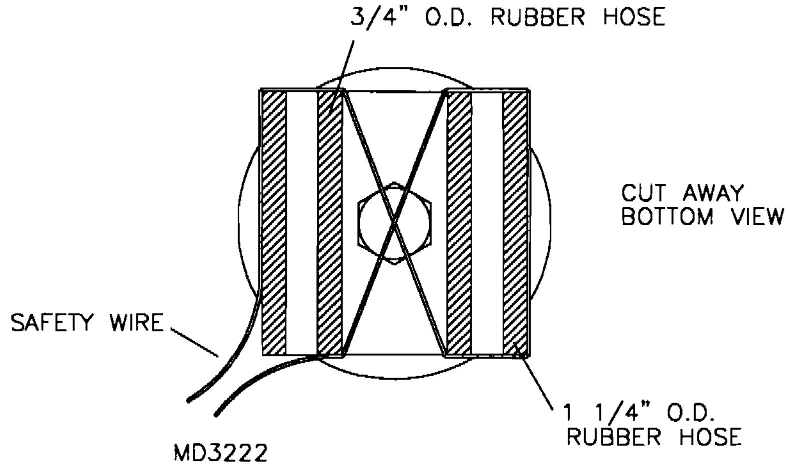


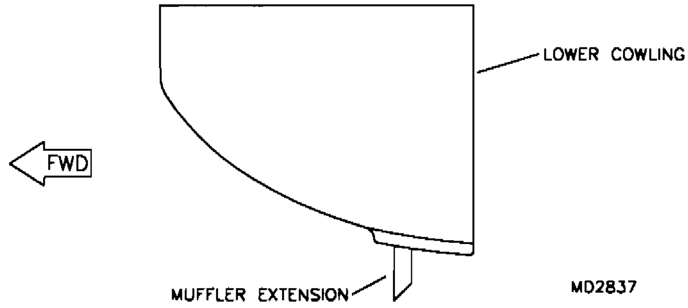
FIGURE 019-024A



25. Apply loctite to the threads of the top bolt and attach the rubber isolators, aluminum washers and thick washers to the muffler as shown in the parts drawing. Install the muffler/isolator assembly to the two tabs on the lower legs of the engine mount. Attach the forward sections of the forward and aft manifolds to the engine. Finger tighten the nuts at this time to allow for adjustment of the manifolds. Slip the aft sections of the forward and aft manifolds into place and install all retaining springs. Leave the manifold nuts loose until the cowling has been installed and proper positioning has been verified.

26. Slide the muffler extension over the exhaust port on the muffler until bottomed. Position so that the opening is pointing aft. See **FIGURE 019-026**. It will be necessary to locate and cut an exhaust hole in the bottom cowling for the muffler extension. Locate a #11 hole through the top flange of the muffler extension and through the flange on the muffler. Locate and drill a #30 hole in the hose clamp and install the stainless steel rivet. Install the hose clamp on the muffler extension with the pop rivet extending into the #11 hole in the extension and muffler and tighten.

FIGURE 019-026



27. Study the photos of the 912 installation. You will notice several areas where rubber hoses have been used as anti-chafe. This works very well and is cost effective. Place such anti-chafe measures where it is required. Look over the installation very closely for contact between hoses and sharp objects. Trace each line to make sure it is not rubbing on something that may eventually rub through. All lines are critical, fuel,oil, and coolant. If anyone of them leaks, a power loss is assured. Inspect the installation after a few hours of operations. Re-new any worn or missing ant-chafe. Inspect the lines and hoses often.

THOROUGHLY INSPECT THE ENGINE AND INSTRUMENT INSTALLATION PRIOR TO INSTALLING THE WINDSHIELD DECK.

28. **PLEASE NOTE:** The 1/8" stainless steel pop rivets acts as a safety pin to retain the extension. Install the extension and hose clamp. Drill through and remove the clamp. Install the rivet (head out). Drill through the extension and muffler with a 5/32" diameter bit to allow for the rivet to enter the hole. Install the clamp with the rivet into the hole.

INTERIOR INSTALLATION

1. If your plane is equipped with the 10 gallon auxiliary tank, drill a hole in the end of the sight gauge groove as per **Figure 019-01**. The sight gauge line will be routed from the bottom of the tank to the bottom hole of the groove then out the top. To secure the sight tube in the groove two methods are used.

1. Cut a scrap piece of lexan 1 1/2" wide by 1/2" longer than the groove. Locate 6 #30 holes for the small screws in the edges of the lexan. See **Figure 019-01**. Install over the sight gauge groove by transfer drilling #40 holes for the screws. When you fill the tank you can mark the lexan accordingly.
2. The alternate method uses a series of small holes and safety wire see **Figure 019-01A**.

FIGURE 019-01

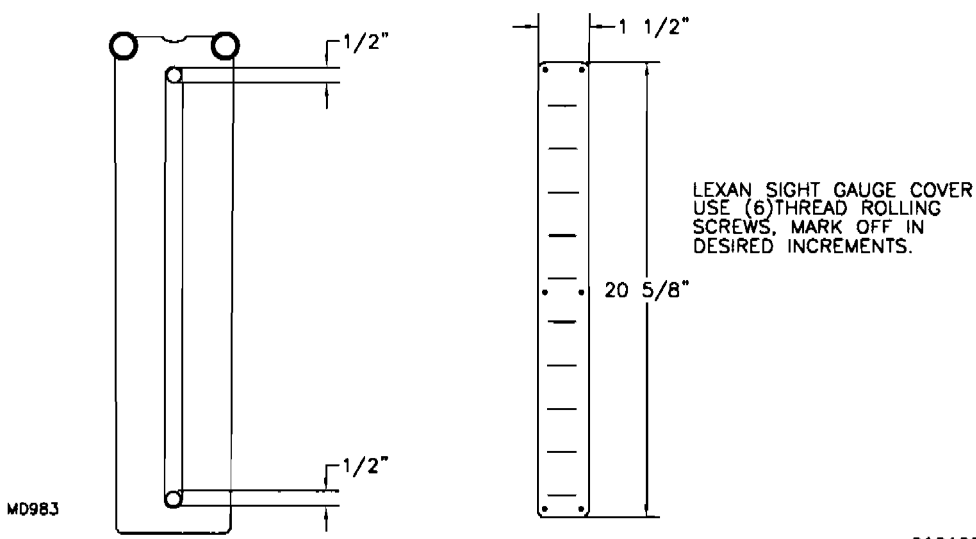
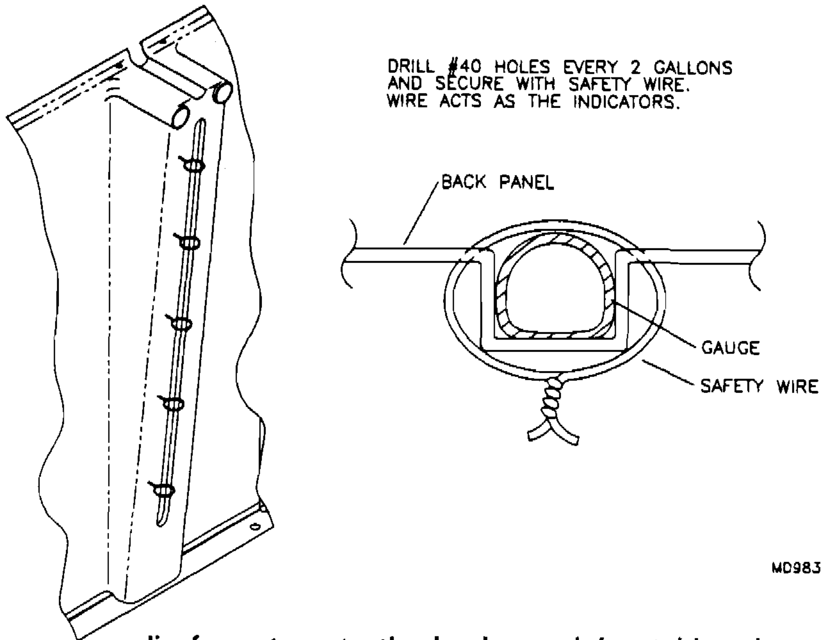
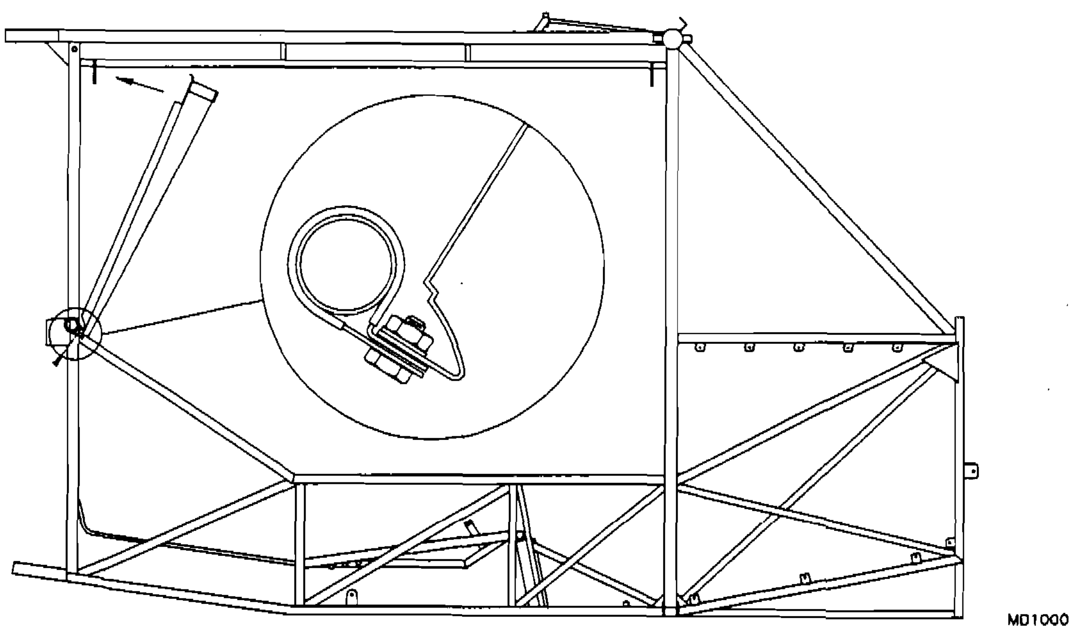


FIGURE 019-01A



2. Install the two way acrylic foam tape to the back panels' outside edges. Do not remove the backing from the tape at this time. Finally, assemble the back panel to the S-3 by placing the 4 tube clamps over the S-3 middle crossing tube. Set the back panel in at a tilt to help access the 4 clamps. See **Figure 019-02** with the detail of cross section.

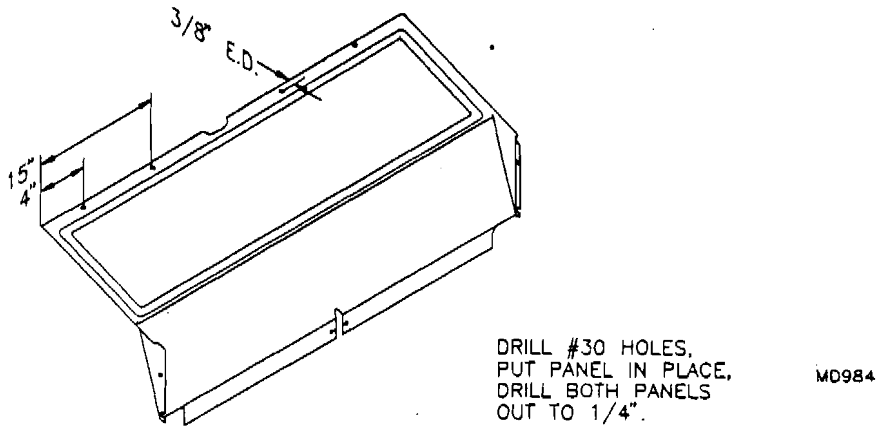
FIGURE 019-02



3. Rotate the back panel into place and transfer drill the #30 holes into the S-3 top crossing tube. Tilt the panel out slightly and remove the backing from the foam tape. Press the panel tight against the S-3. Install the proper rivets into the top of the back panel.

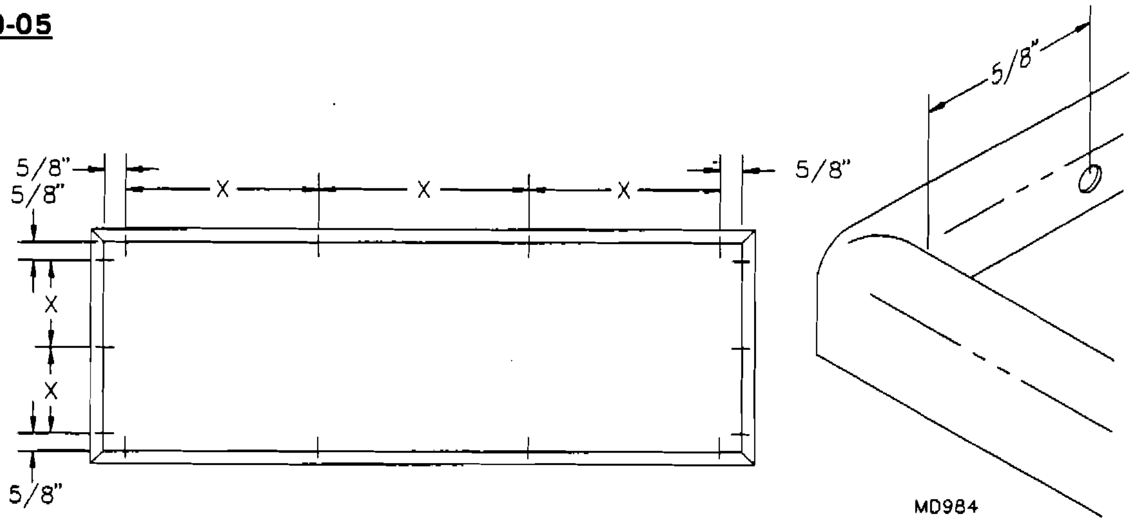
4. Locate and drill the top flange of the baggage panel as shown in **Figure 019-04**. Put the panel in place and drill through the back panel with a 1/4" bit. Remove baggage panel.

FIGURE 019-04



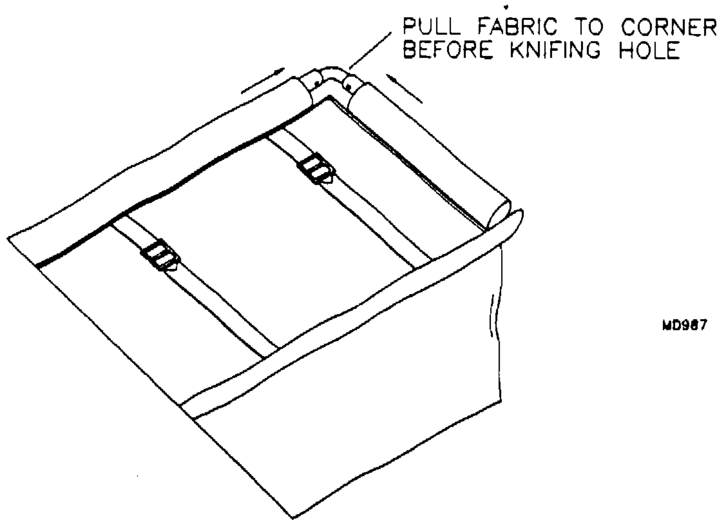
5. Cut the 1/2" aluminum tubes to length, (2) 37 1/4" and (2) 10 5/8". Connect the tubes together with the 90 degree plastic fittings and snap into place. Refer to **Figure 019-05** for the location of the rivet holes to retain the tubes. After drilling and before removing, mark the tubes one thru four on the back side to know which tube goes where during final assembly.

FIGURE 019-05



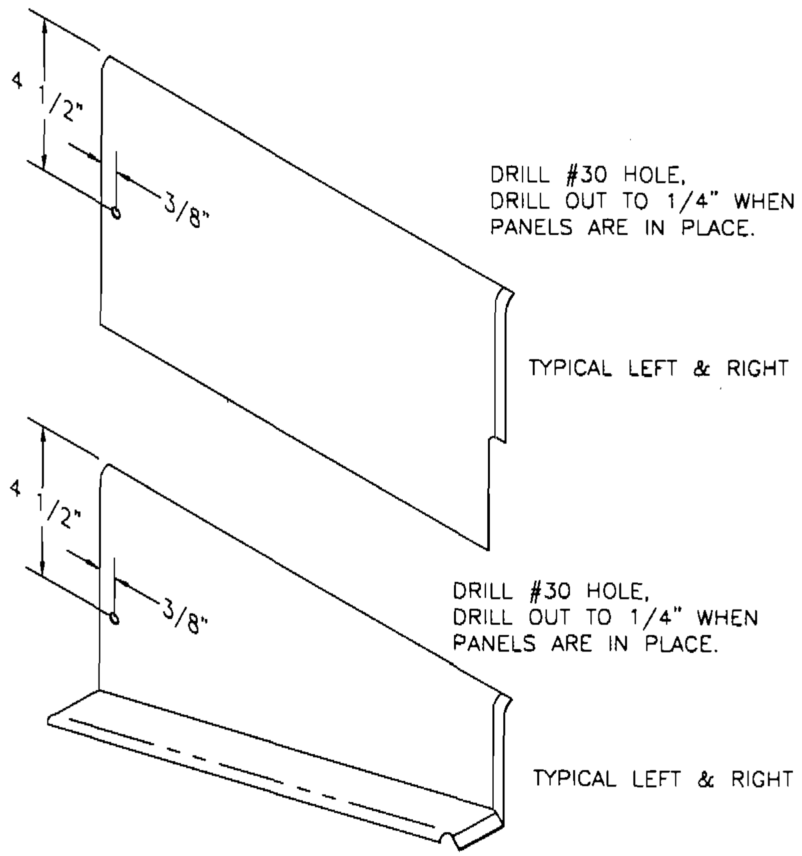
6. The baggage compartment is positioned with the zipper to the back. Slip the baggage tubes into the pockets sewn into the edges of the compartment. Pull the fabric into the corners. Locate the hole with a punch and cleco. This should stretch the fabric tight leaving no gap in the corners. See **Figure 019-06**. Place the assembly into the grooves and rivet in place. When installing the compartment it is best to leave the corners clecoed, pushing in the middle sections first. Cleco the middle to the panel, then remove the corner cleco and push into the groove. Use an ice pick or prick punch to locate the rivet holes. Cut away the center panel to open the baggage compartment.

FIGURE 019-06



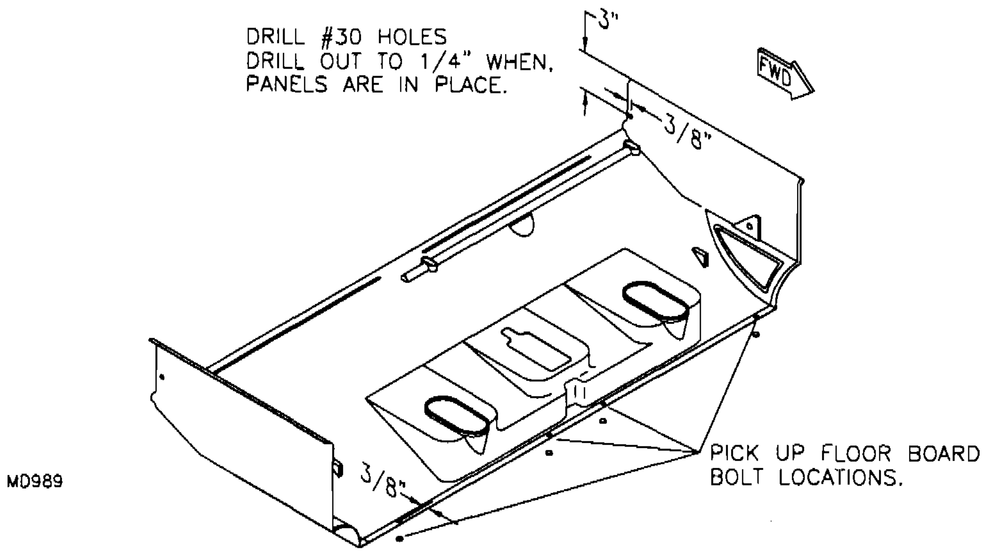
7. Locate and drill the holes as indicated in **Figure 019-07** for the proper type of seat panel. Install the seat side, drill the #30 holes out to 1/4" in both the seat side and baggage compartment panels. Install the screw rivet. Remove the flap lever and locate the flap mount bolt hole in the seat center panel. Set the panel in place and install the flap lever.

FIGURE 019-07



8. Drill the proper holes in the control stick panel as shown in **Figure 019-08**. For the front edge of the panel locate the holes for the existing floorboard bolts. They should have about 3/8" edge distance (ED). Bolt the panel in place. Drill the #30 side holes out to 1/4" and install the plastic screw rivets.

FIGURE 019-08

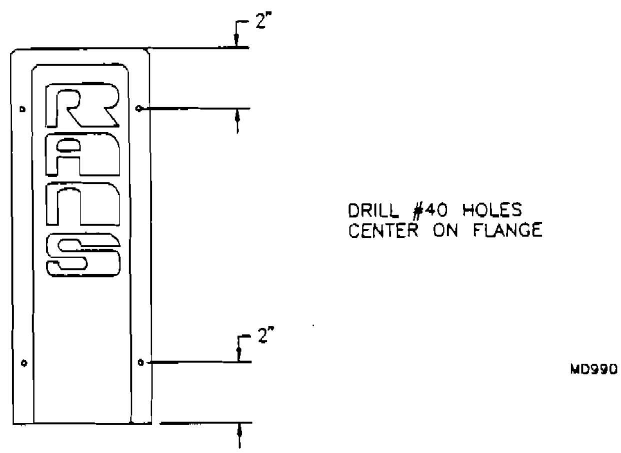


9. With the kick panels in place, slip the kick panel retainer over the top tube and locate (3) #30 pop rivets in each. Drill into the floorboard #40. Be careful not to drill through the floorboard. Lift out the kick panel. Drill out the holes against the floorboard to #30. Set the kick panel back in place. Install the screws into the floorboard. A plastic screw is located on the kick panel aft vertical edge. Drill the #30 hole out to 1/4" in both the kick and the control stick panels. Install the plastic screw rivets.

10. Press the aluminum tab attached to the kick front top corner against the firewall. Drill into the firewall and rivet the tab.

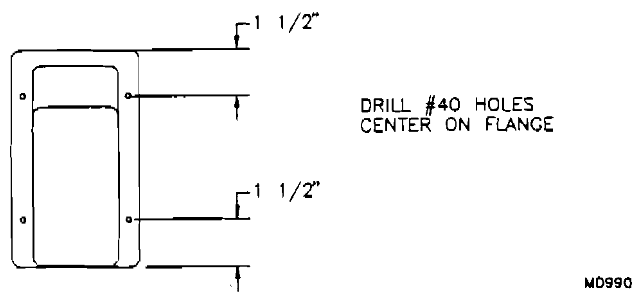
11. Locate the holes in the flap teleflex cover. Position and transfer drill into the back panel. Bolt on the teleflex retainer and route the flap cables. Safety clip the cables and install cover. See **Figure 019-011**.

FIGURE 019-011



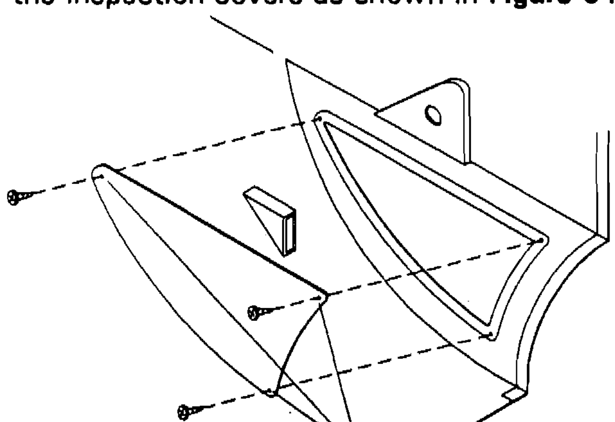
12. Drill #40 holes in the torque tube cover, position, drill and install the screws. See **Figure 019-012**.

FIGURE 019-012



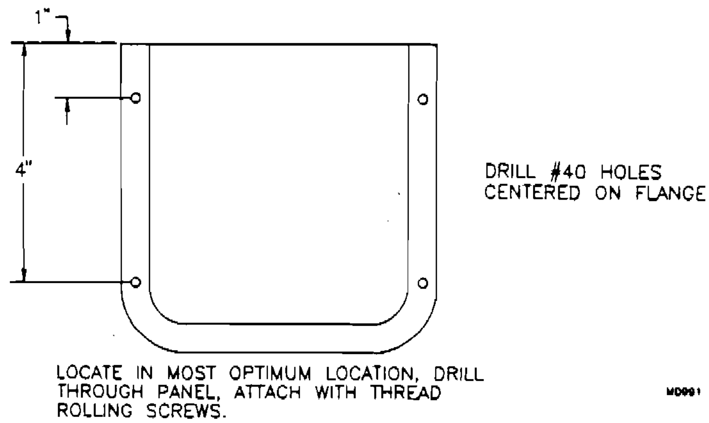
13. Locate and drill the inspection covers as shown in **Figure 019-013**. Drill and install the panels with screws.

FIGURE 019-013



14. The log book pocket is located by your preference, usually on the lower left side of the kick panel. Test fit the location prior to drilling and screwing in place. See **Figure 019-014.**

FIGURE 019-014



15. Locate holes in the control stick boot retainer as shown in **Figure 019-015**. Fit the control stick boots by placing the boots on with the seam aft. The fabric of the boots should extend past the edge of the retainers by 1/4" to 1/2". Push the retainers down tight and drill. See **Figure 019-015A**. Trim off the excess after installing the screws.

FIGURE 019-015

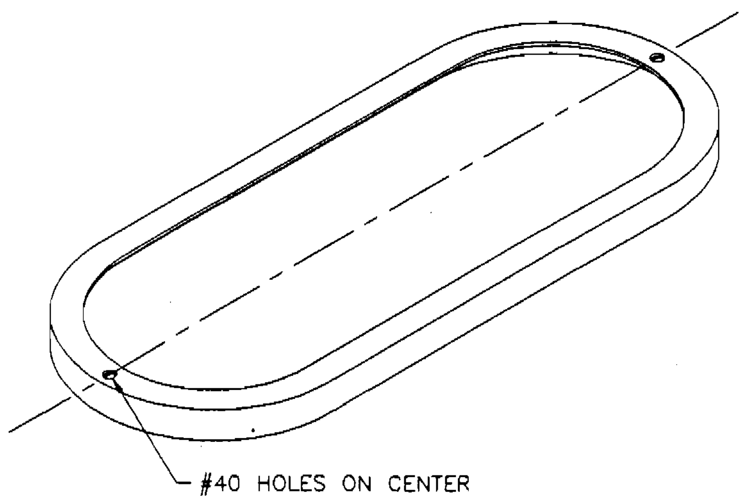
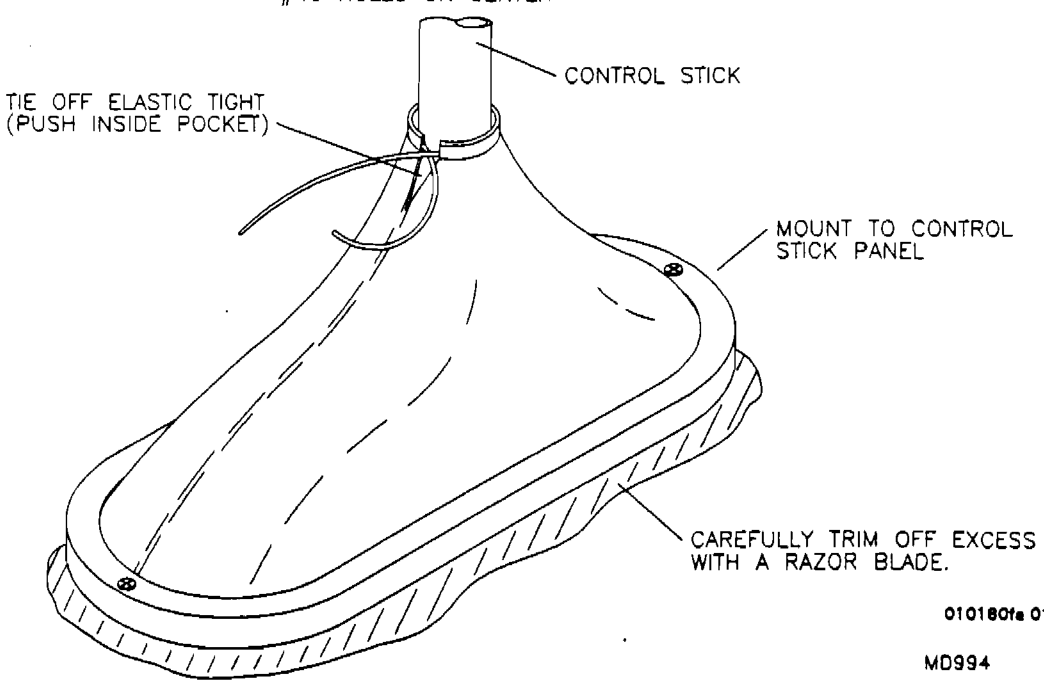


FIGURE 019-015A



16. The formed aluminum capture strips are now ready to install. The capture strips rivet on the inside, through the plastic panels in the pre-located holes. One rivet will need to be added to the very aft end of the aft capture strip. Determine the best location by pushing in on the capture strip until it sets itself tight. Drill into the fuselage cage and rivet. **NOTE:** Hole may need to be orientated above the centerline of the tube for the best fit.

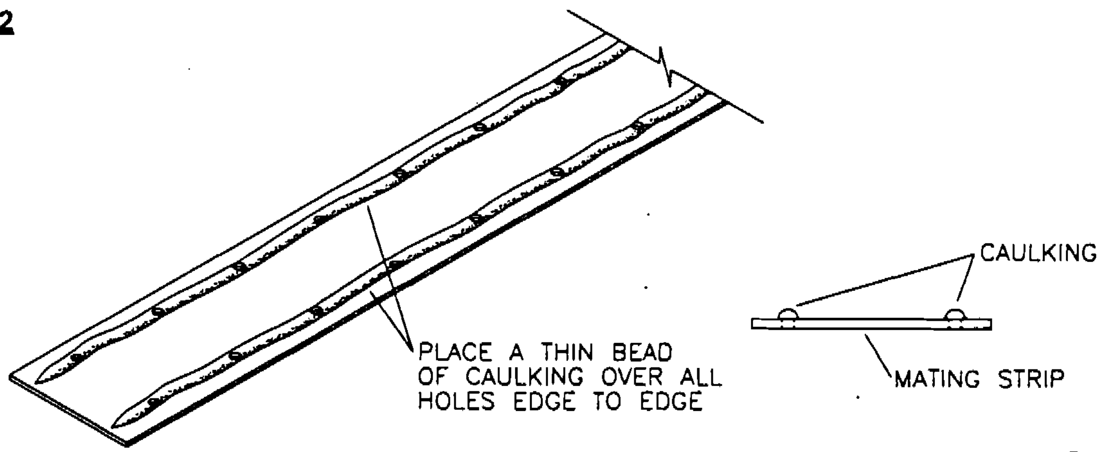
17. Inspect the interior for fit and security. Install the control system through the openings and test operate.

WINDSHIELD INSTALLATION

1. Thoroughly inspect the instrument and engine installation. All wires and controls should be neatly bundled and secured. If your paint scheme used the windshield deck or cowling line as a reference the windshield deck should be painted and ready to install. If not, pre-fit the deck, remove and paint prior to continuing with this section. Place the deck in position with the forward edge over lapping the firewall. Mark where the radiator mount angles contact, remove the deck and make clearance slots. Install the deck and rivet to the sides of the frame.

2. Lay the windshield flat on a work table right side up. Remove the clecos from the matting strip. Very neatly place a bead of silicon caulking on the mating strip as shown in **Figure 019-02**. Try to make a very small bead. This will present less excess to clean up later.

FIGURE 019-02



3. Cleco the windshield in place.

4. Rivet the center rib and then both side ribs. If the rivet holes prove difficult to insert the rivets, drill out #30.

5. Install skylight capture strip using AAPQ-64 rivets.

6. The front edge of the windshield will be inserted behind the windshield deck flange. Apply a bead of silicon to the deck flange. Locate the bead across the rivet holes. Apply only a thin, small bead about 1/8" in diameter.

7. Install the windshield against the flange and rivet. Wipe off any excess silicon.

8. Cleco on the "Z" strips. Check the fit, if the windshield is tight against the frame rivet on the strips. If not, make adjustments in the holes in the Lexan.

9. It is best to install the wings prior to fitting the wing cuffs. Therefore, we will return to completing the windshield installation after installing the wings.

SPINNER ASSEMBLY

NOTE: To properly fit the cowling the spinner must first be installed.

1. Refer to the spinner parts page for selection of components and hardware.

2. The spinner and backing plate comes ready to trim and drill. Observe the scribe lines and trim to these lines. Be especially careful to trim and sand the edges evenly. Check for trueness by setting on a flat surface. The center hole is 1" for 582's and 1 3/8" for 912's. Holes are redrilled. It may need a little sanding to fit over the prop flange. Test fit as you go. Wet sand with 350 grit sand paper.

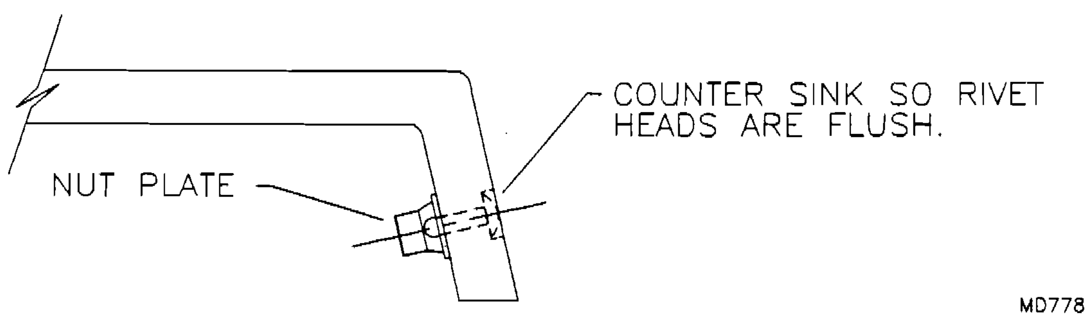
3. Insert the 1" or 1 3/8" aluminum tube scrap into the prop, then install on the backing plate. Prop **MUST** be flat against the plate. Drill six (6) 1/4" holes through the backing plate using the prop as a drill guide. **IMPORTANT:** After drilling the first hole insert a 1/4" bolt to prevent shifting. **NOTE:** The slight dip in the plate is used to "pre-load" the plate against the prop.

4. Set the prop and backing plate on a flat surface. **NOTE:** To assure accuracy bolt the backing plate to the prop with (3) bolts. (AN4-32A will work if washers are used.)

5. Cut out the spinner to match the prop type. Place the template exactly 180° apart. Test fit the openings and file to an exact fit. Once the dome is fitted, mark the hole locations on the spinner's perimeter with (5) screws evenly spaced on each side. Drill through at these locations with a #30 bit, cleco as you go. Be sure the spinner and backing plate are flat against the table.

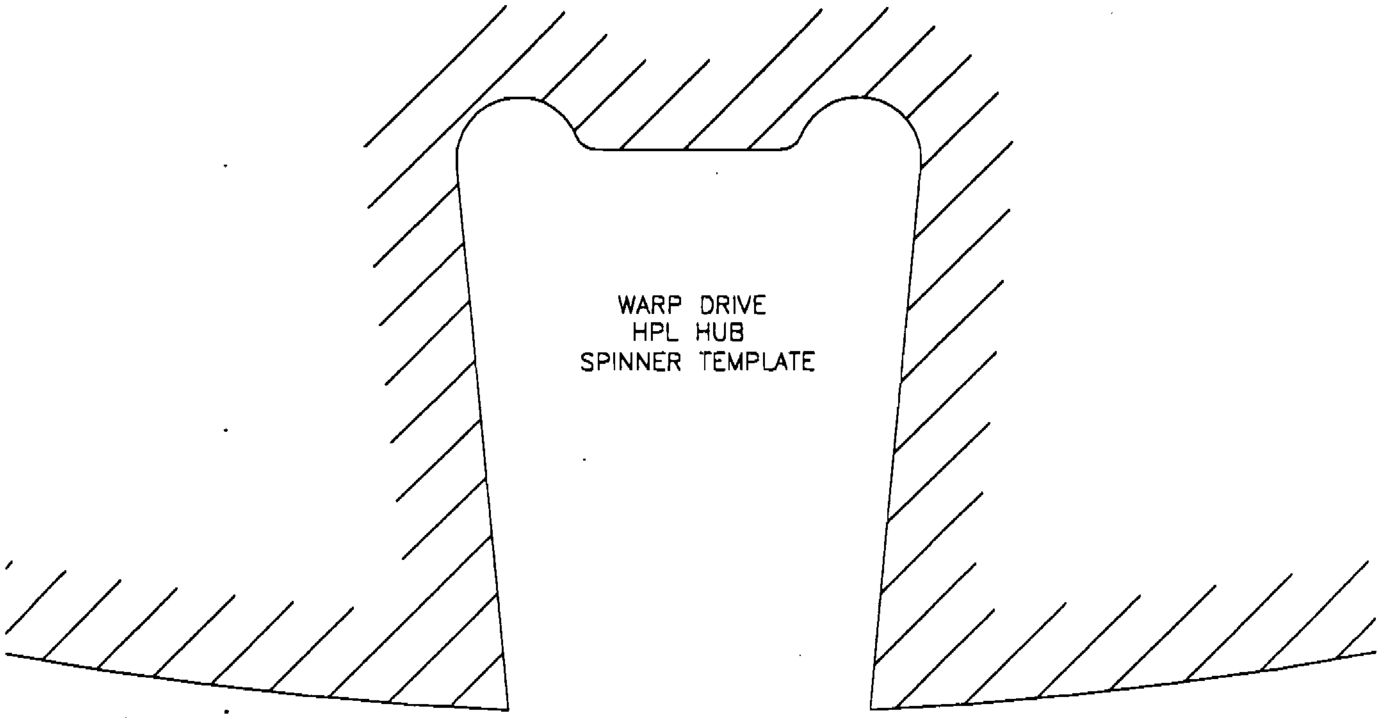
6. Disassemble and drill out the #30 holes to #11. Install the nut plates using a bolt to hold the nut plate in place and drilling from the inside. The rivets heads need to be "counter sunk", do so by drilling a slight depression with a #11 bit. See **Figure 019-06**.

FIGURE 019-06

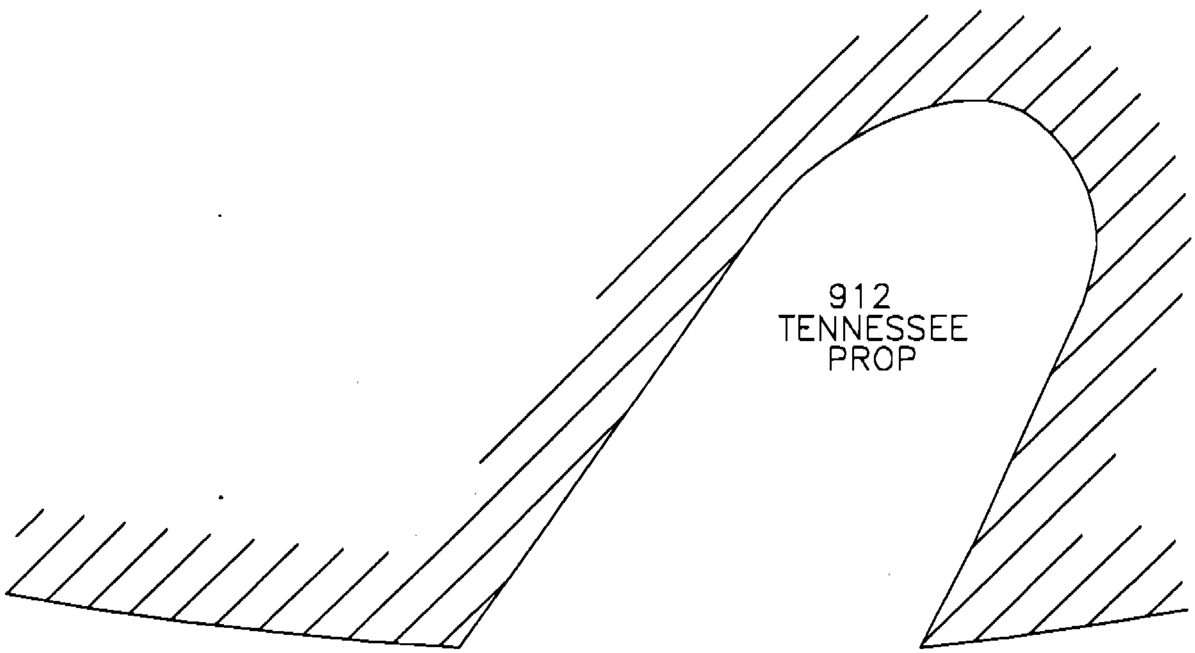


7. Sand the spinner with 350 wet/dry paper. Paint to match aircraft.

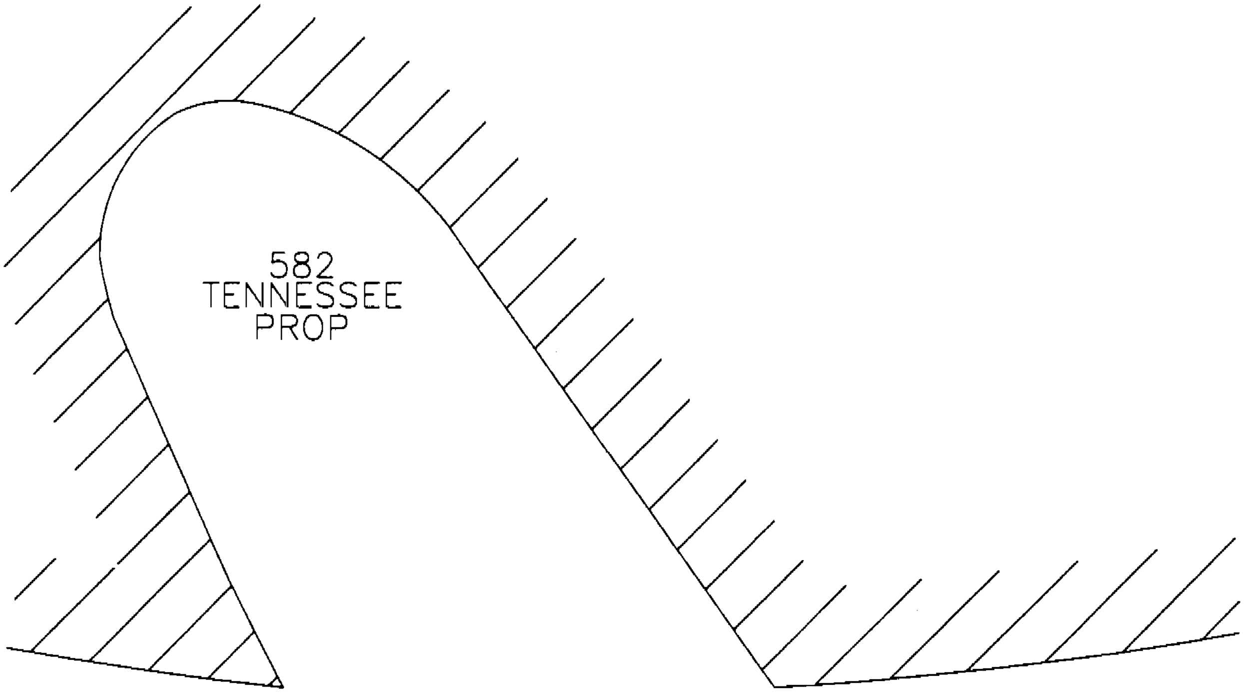
8. Bolt the backing plate and spinner to the engine. The spinner is used to line up the cowling. The spinner and prop should be balanced and no adjustment required. However, the ultimate test is in the running. If you have a lot of vibration it could be caused by out of balance or misalignment. Use a good prop balancer. Check both the prop and backing plate, if the misalignment is not correctable then a new spinner may be required. Misalignment occurs through improper trimming of the parts. A slight amount of "wobble" is acceptable and may disappear at higher RPM's. Always pre-flight your spinner.



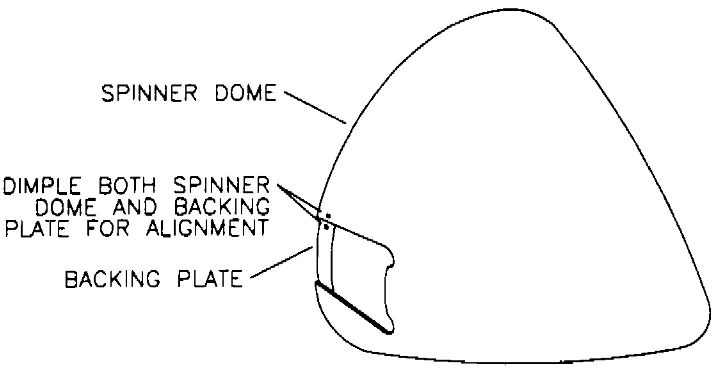
MD3031



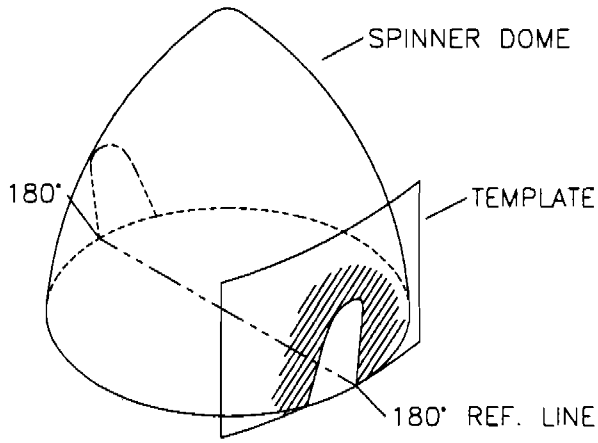
MD3020



MD3022



MD3035

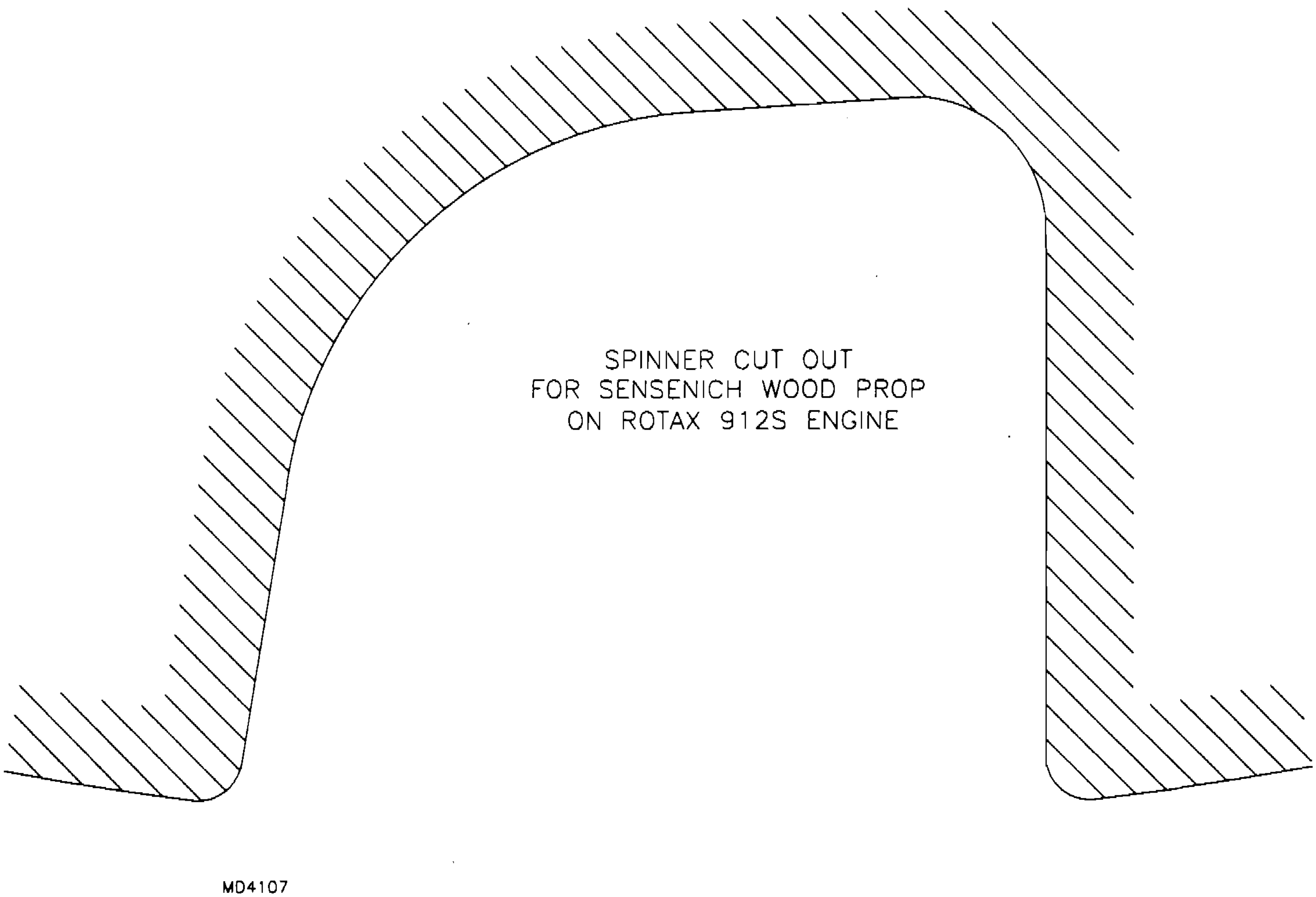


NOTE: The spinner and backing plate should be edge trimmed. Also block sand the back side of the backing plate to assure it is flat. This will help with prop tracking.

1. Mark a straight line across the center of the spinner backing plate. Mark the edges of the backing plate on this line.

2. Insert the backing plate, mark the spinner dome for 180^0 reference point.

3. Line up templates on the marks.

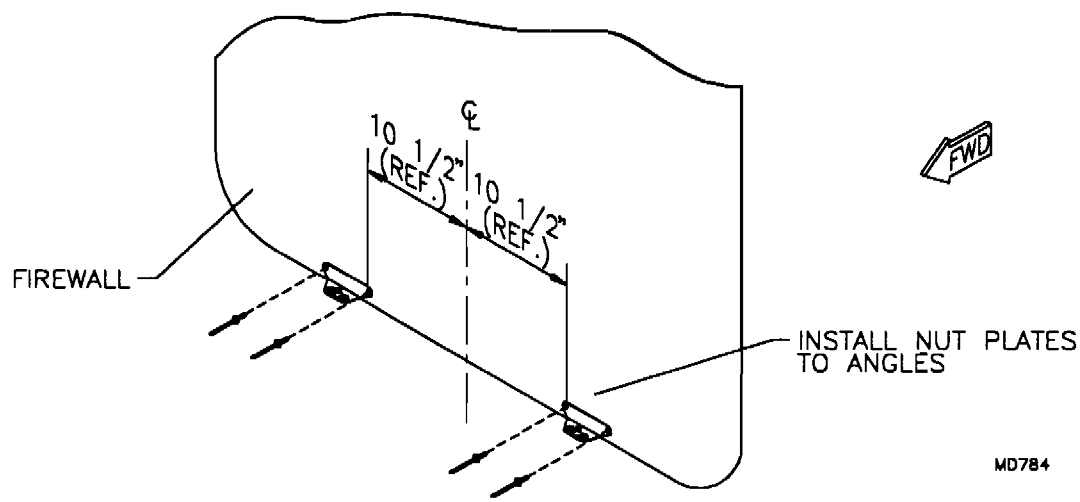

SPINNER CUT OUT
FOR SENSENICH WOOD PROP
ON ROTAX 912S ENGINE
MD4107

S-6S COWLING ASSEMBLY

NOTE: The windshield deck, engine and spinner backing plate must be installed prior to fitting the cowling.

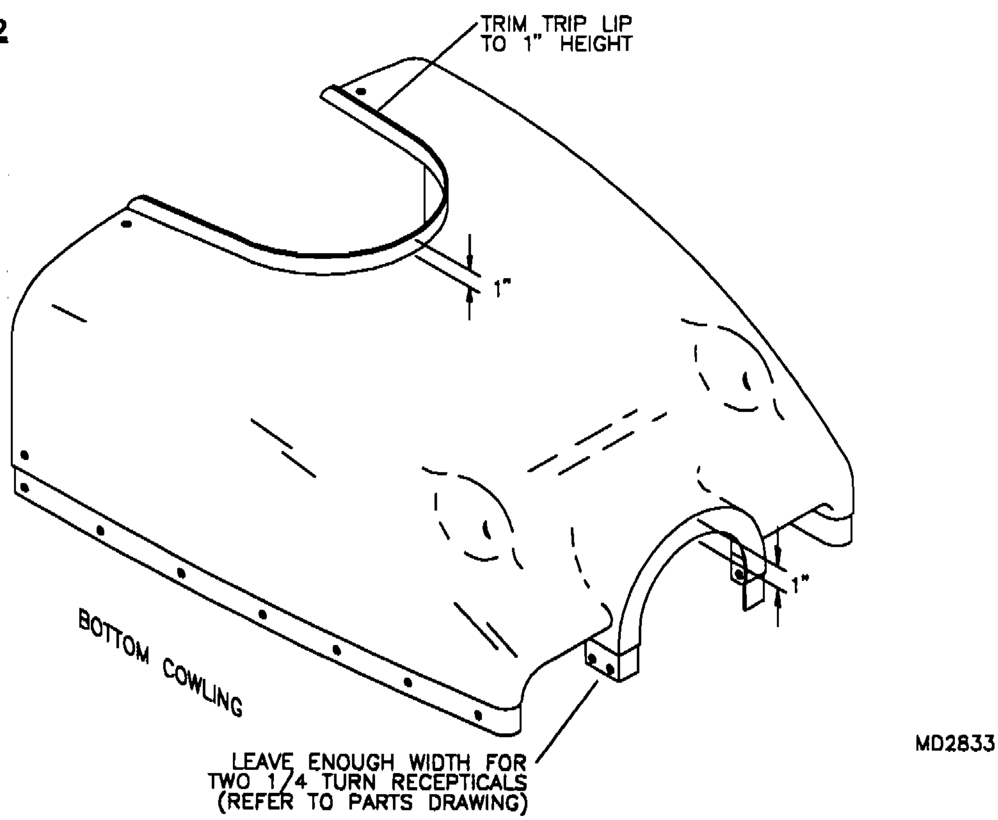
1. If you have not already done so, rivet the two bottom cowling attach angles to the firewall using one of the prelocated firewall mount holes that will approximately correspond to the dimensions shown in **FIGURE 019-01**.

FIGURE 019-01



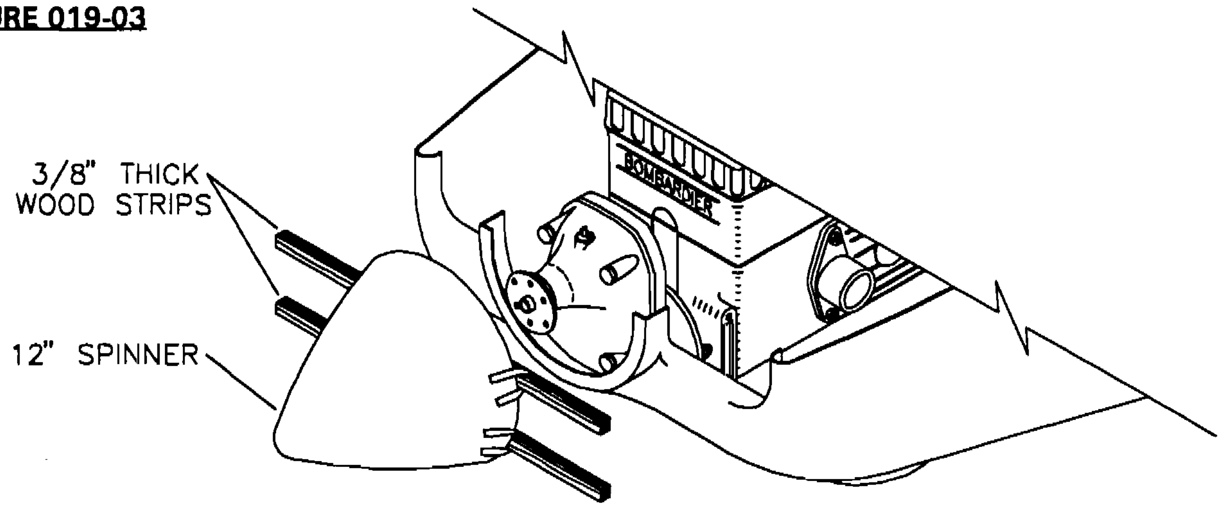
2. Trim the bottom cowling to the scribe lines on all edges except the firewall (aft) edge. **HINT:** Aviation snips, drum sanders and sanding blocks work well to trim the cowlings. Trim the bottom trip lip and the prop opening flange to 1". Be careful to not trim to much off of the ram air port flanges to allow for two quarter turn receptacles to be installed side by side. See **FIGURE 019-02**.

FIGURE 019-02



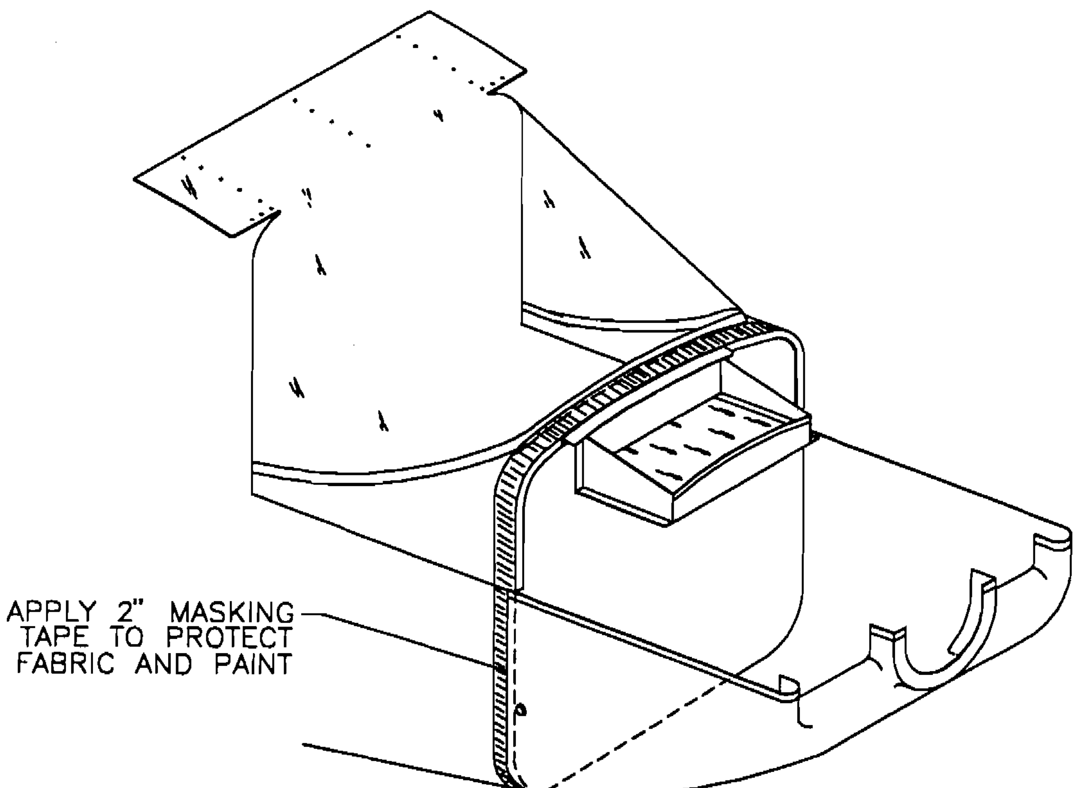
3. Tape two 3/8" thick wood strips (or similar material) to the aft side of the spinner backing plate as shown in **FIGURE 019-03**. If the aircraft is covered, apply 2" masking tape around the firewall perimeter to protect the fabric/paint. Clamp or tape the lower cowling in place with the forward side touching the 3/8" spacers. The cowl should fit tight around station 1 and be centered around the spinner. Using the two side mount tabs as guides mark the side mount holes onto the cowl. With a #11 bit drill both side mount holes in the cowling, nut plate the mount tabs and bolt the cowling to the fuselage. Check for proper position and alignment. Do not drill the lower mount holes at this time. See **FIGURE 019-03A**.

FIGURE 019-03



MD781

FIGURE 019-03A

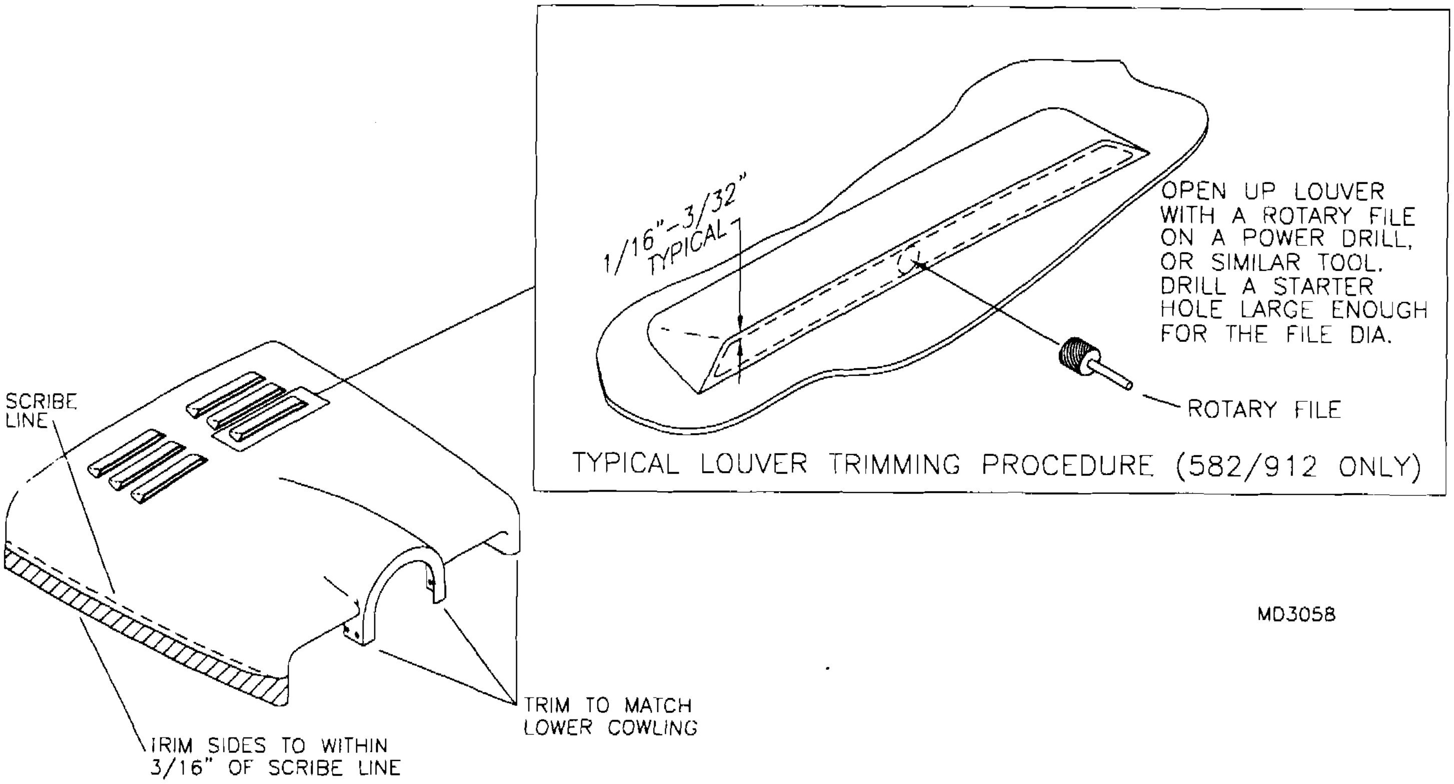


MD3056

4. Trim the forward side of the top cowling to match the bottom. Trim both sides of the top cowling to within 3/16" of the scribe lines. If you are installing a 912 or 582 open the cooling louvers using a rotary file on a power drill or similar tool. Do not trim the aft edge at this time. See **FIGURE 019-04**.

With the lower cowling on the fuselage, place the top cowling on the aircraft. It should fit tight over the windshield deck when the lower side edges are fit into the joggle of the lower cowling. Trim the top cowling as required to gain the best fit. When the cowl halves are fit together, and centered around the spinner backing plate the split line will be level with the aircraft. When satisfied with the fit, locate and drill the bottom cowling lower mount holes. Bolt the lower cowling in place.

FIGURE 019-04



5. Remove the top cowling and layout the hole pattern as shown in **FIGURE 019-05** and predrill to #30. Install the top cowling. Using a #11 drill bit, transfer drill through the #30 holes in the top cowl into the bottom cowl. Cleco as you go. Remove both cowlings and cleco the quarter turn receptacles to the bottom cowl. Using a #40 drill bit, drill both mount holes for the receptacles. Remove the receptacles and drill the quarter turn hole out to 5/16". Countersink the #40 rivet holes to allow the rivet heads to sit flush. Install the quarter turn receptacles. Drill the quarter turn holes in the top cowling out to 1/4". See **FIGURE 019-05A.**

FOR 912 or 912S ONLY: After top and bottom halves of cowl have been fitted together and quarter turn fasteners receptacles installed. Mark a hole in the top portion of cowl on the right side. Centerline at hole is 11" from aft side of cowl and 1 ¼" from bottom edge of cowl. The dimensions of the hole are 5" long and 4" tall. Leave ¼" round corners in hole. Install oil door with fastener hole towards aft edge of cowl. Center door vertically in hole and mark fastener hole on cowl. Install receptacle in same method as cowl half receptacles. See **FIGURE 019-05.** Install vinyl hinge on fwd end of oil door and cowling. Use .020 aluminum strip to sandwich vinyl. Cut .020 x 3/4", 3 ½" long, drill (Qty 4) #30 holes on centerline of each piece. See **FIGURE 019-05.** Locate holes in cowl 13/16" fwd of cut out. Locate holes in door ½" aft of fwd edge of cut out. Sandwich vinyl fabric between strips, cowl and door, excess material will bulge out at fwd edge of cut out to allow door movement, install rivets.

FIGURE 019-05

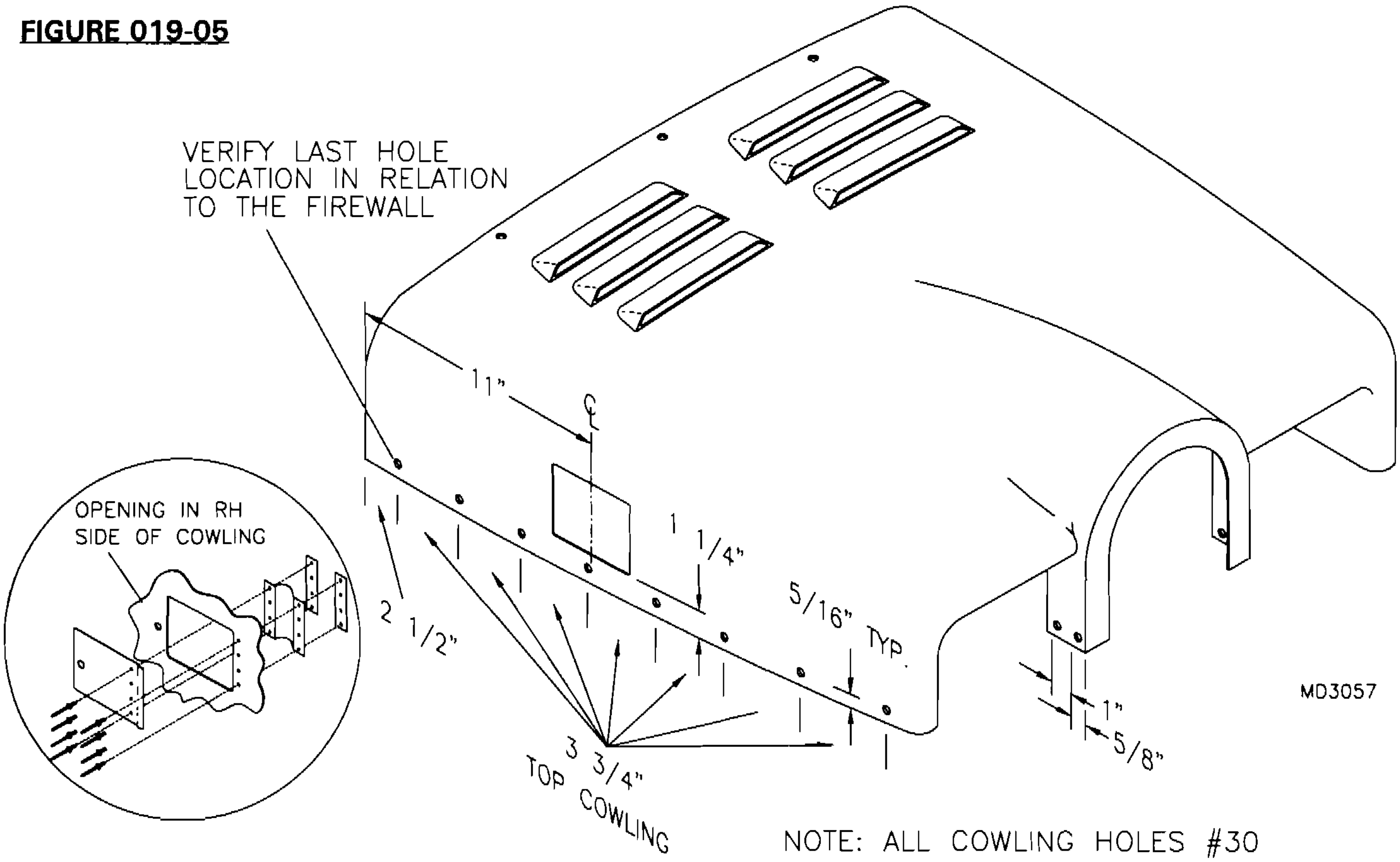
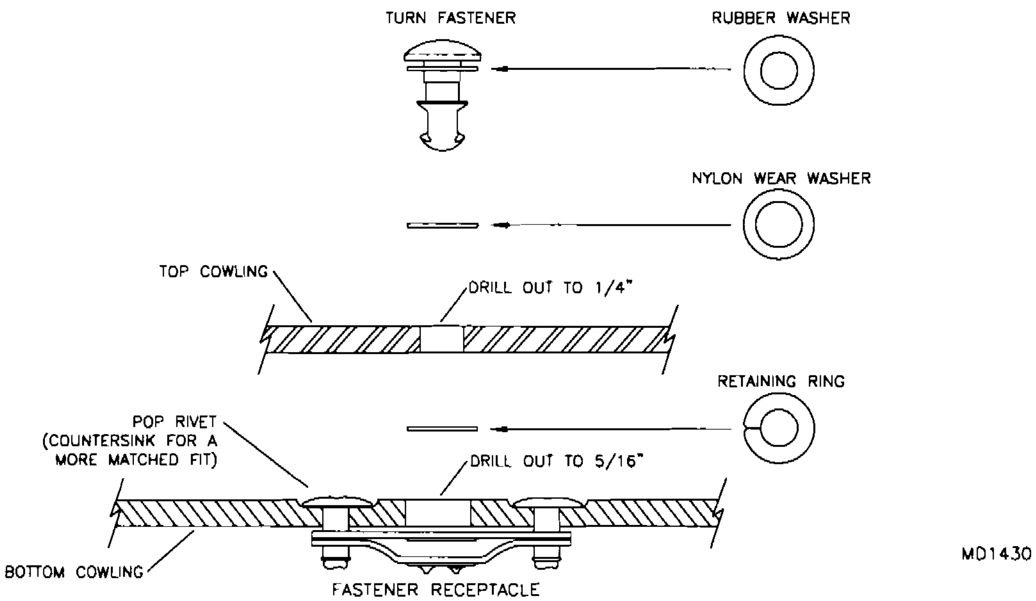


FIGURE 019-05A

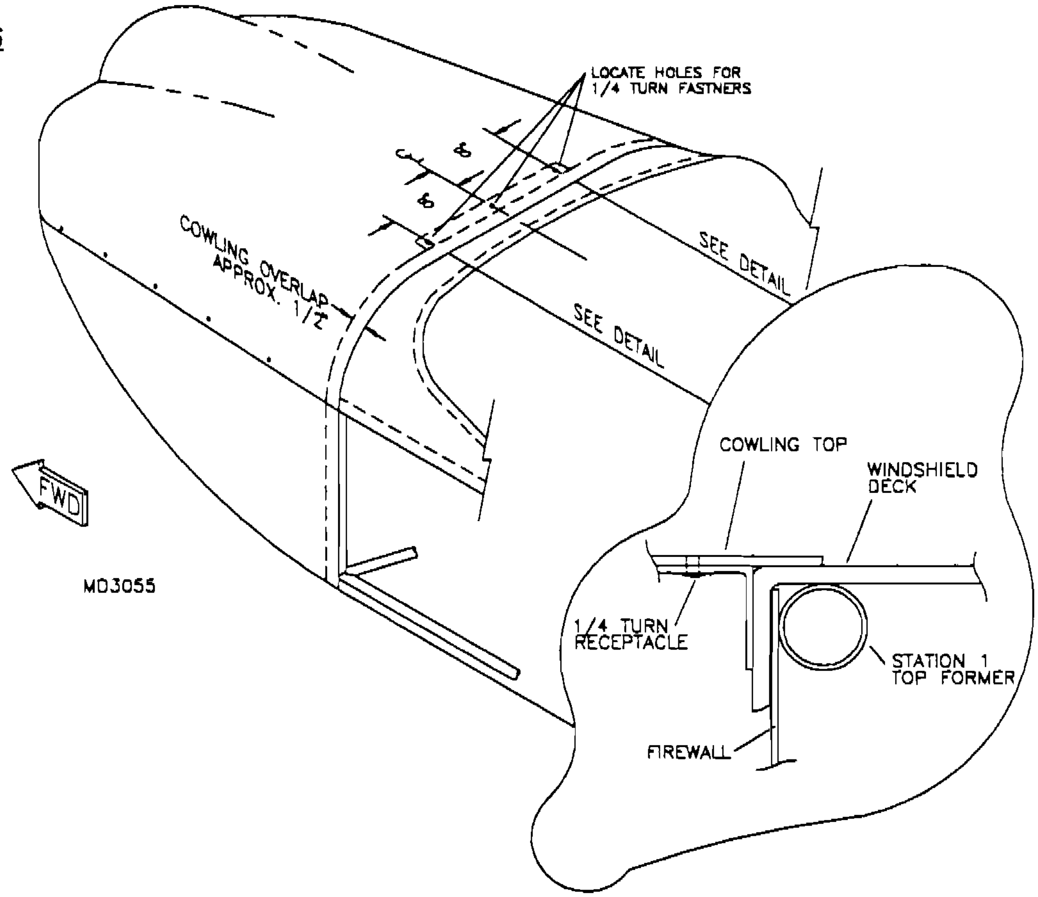


6. Install both cowlings on the fuselage. Install several quarter turn studs to hold the cowling in position. Mark a trim line on the aft edge of the cowlings. The top cowl should overlap the windshield deck by a minimum of 1/2". See **FIGURE 019-06**. Be sure to check below the bottom edge of the deck to ensure that the cowling is extending far enough aft onto the fuselage. **HINT**: 3/4" masking tape works well for marking a trim line completely around the perimeter of both cowlings. Remove the cowlings and trim.

If you have not already done so, install the cowling hold down strip. The hold down strip rivets to the forward side of the windshield deck flange, through the firewall and into the station 1 top former and must be flush with the top of the windshield deck. Refer to the windshield section.

Install the cowlings. Place a mark on the windshield deck at the aft edge of the top cowling. Remove the top cowling. Measure from the mark to the center of the hold down strip and record this dimension. Place the top cowl back in position. Lay out and mark the hole pattern shown in **FIGURE 019-06** for the top aft three quarter turn locations. Measuring from the aft edge of the top cowling forward, use the previously recorded dimension to locate the quarter turns in the center of the hold down strip. Using the step drill method described earlier, drill through the cowling and hold down strip. Install the quarter turn receptacles to the under side of the cowling hold down strip following the same procedure as before.

FIGURE 019-06



NOTE: Step 7 is to be performed only if you are installing a 503 engine.

7. Apply a 3/8" wide strip of contact cement to each long side of the exhaust duct seal. Refer to **FIGURE 019-07**. Double the material. The contact cement will hold the material together. Refer to **FIGURE 019-07A**. Lay the seal flat on a table. Position the exhaust duct with the flanges down so that the lower side overlaps 1/2" onto the joined side of the seal. The lower side of the duct is the side without the bent flanges. The duct should be centered from end to end on the seal. Some of the seal will extend past each end of the duct. Punch through the pre-drilled holes in the duct into the seal. Using the correct rivets and backing washers, rivet the seal to the duct. Refer to the parts drawing. Do not rivet the last hole in each end of the duct. Bend the duct and seal at the four corners to form a rectangle and rivet. Overlap the duct seal, trim as needed and rivet the last two holes in the seal. Refer to **FIGURE 019-07B**.

When satisfied with the cowl fit (refer to step 8), transfer the location of the exhaust air port in the cooling shroud on the top left hand side of the engine onto the cowling and cut the opening into the cowl. Use the exhaust duct to help transfer the location to the cowl. The opening should be cut directly above the exit and match the dimensions of the opening in the engine. Position the duct so that it is centered around the opening in the cowl and engine. Using the pre-drilled holes in the mount flanges of the duct as a guide, transfer drill through the cowling and rivet the duct to the cowl.

FIGURE 019-07

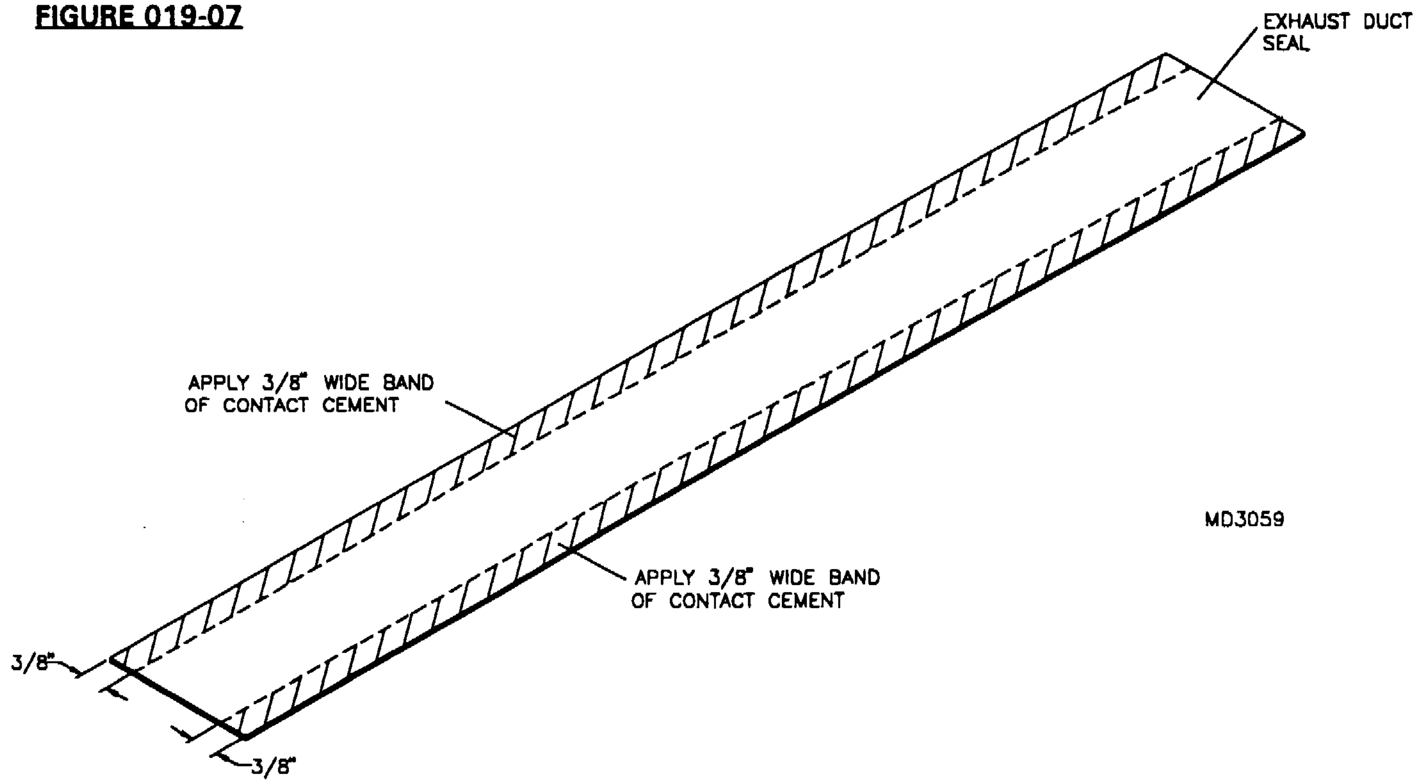


FIGURE 019-07A

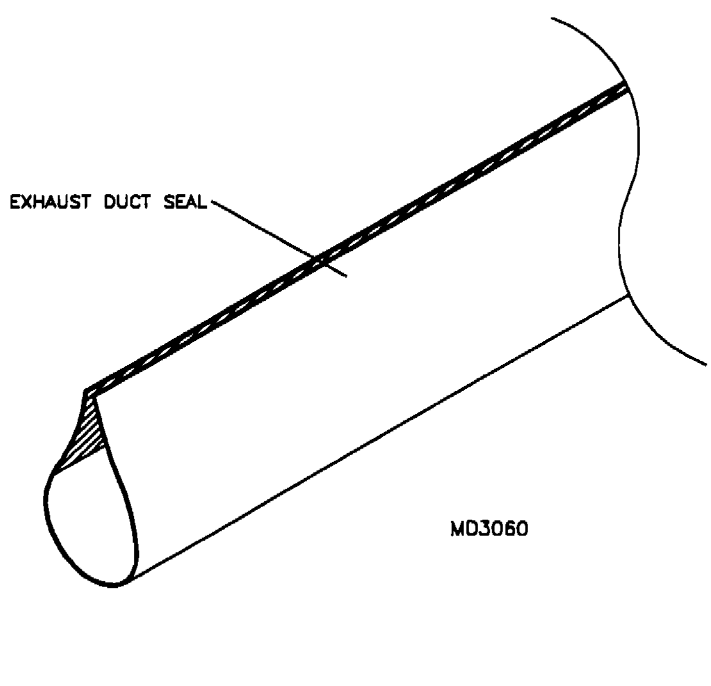
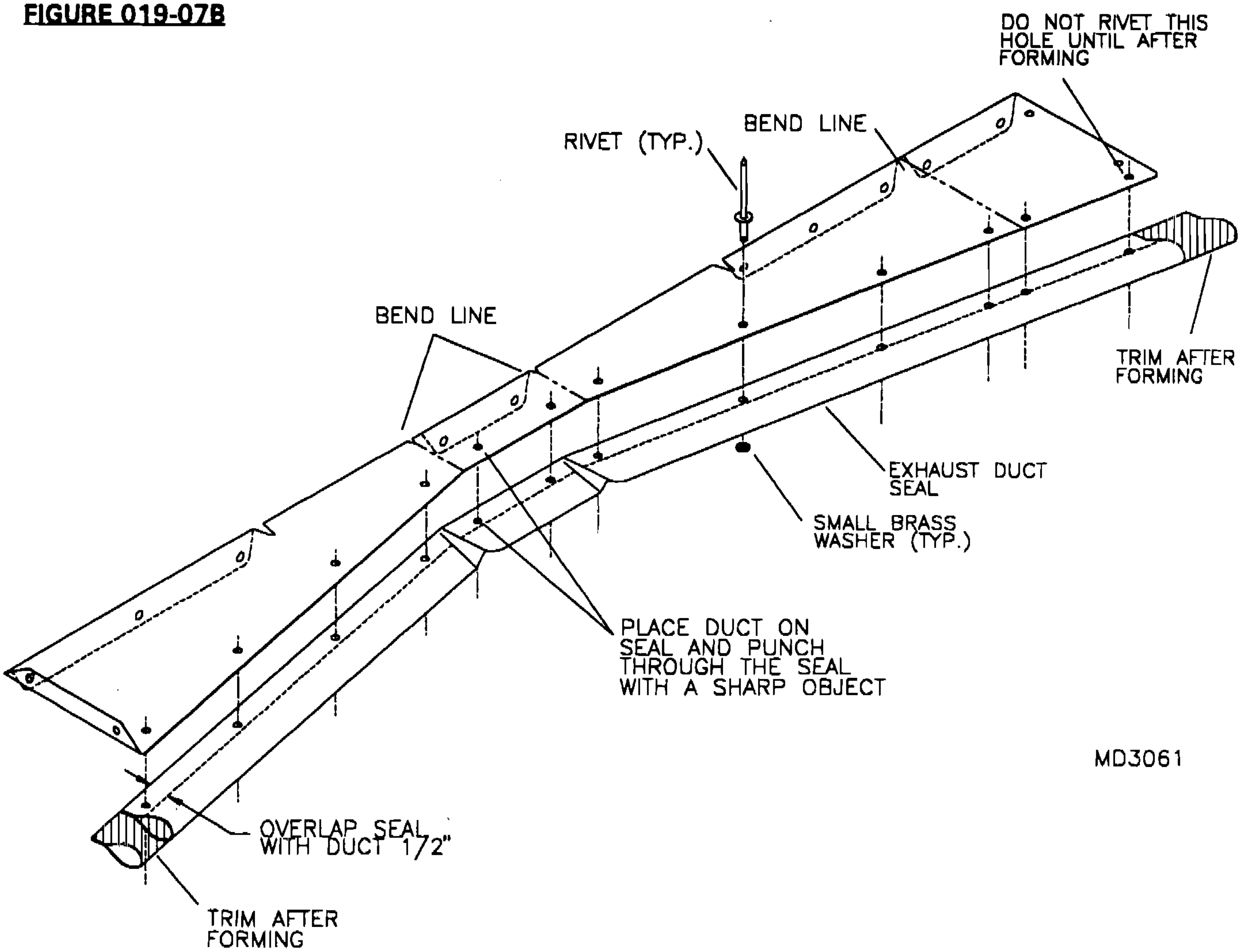


FIGURE 019-07B



8. This completes the cowling fit up. If the cowling is not perfectly positioned it is ok to relocate or slot some holes, being sure to fill the old hole or unused portion of the slot with resin or J&B weld. In fact, vertical or horizontal slots in the bottom cowl sides will usually clear up any alignment problems. The perfect fit has the cowling tight on the firewall, tight in the joggles and lined up on the spinner with a 3/8" gap between. When you are completely satisfied with the fit, remove the cowling and paint.

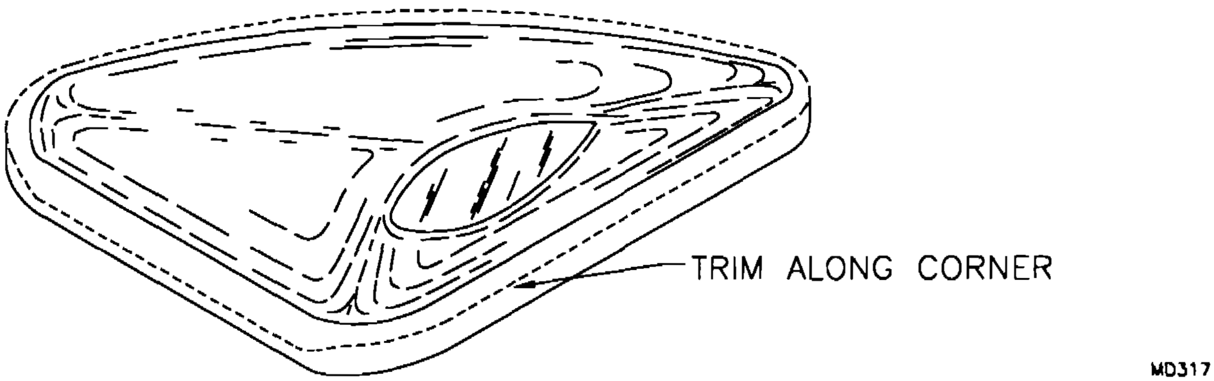
9. After painting, install the quarter turn studs into the top cowl. Refer back to **FIGURE 019-05A** for washer and lock ring placement. To ease cowling removal, do not install the retaining rings on the forward set of quarter turns. **NOTE:** several longer quarter turns are provided and may need to be used in certain areas.

FILLET FAIRING INSTALLATION INSTRUCTIONS

TRIMMING

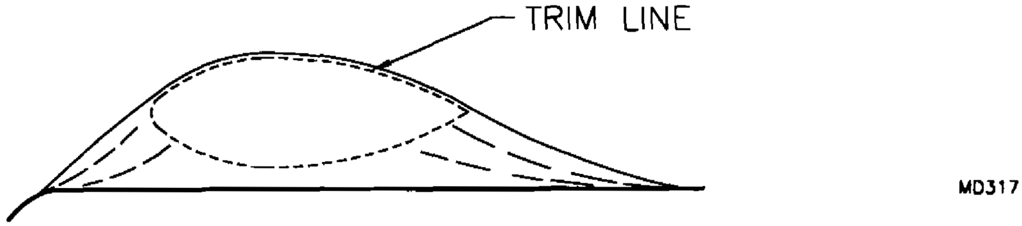
1. The fillet fairings are made of a thermoformed lexan and need to be trimmed out carefully before beginning installation. The trim line for these fairings is actually molded into the fairings by trimming right along the corner where the mold drops straight down. See **Figure 019-01**. Use a pair of aviation snips to rough trim, then a file or small sanding block to clean up the edges.

FIGURE 019-01



2. There is also an airfoil shape that matches the strut material molded into the fairings. This will need to be trimmed out to fit snug over the strut. See **Figure 019-02**. Do this by first trimmimg slightly inside the line, then test fit over the strut and file out accordingly until a nice snug fit is achieved.

FIGURE 019-02

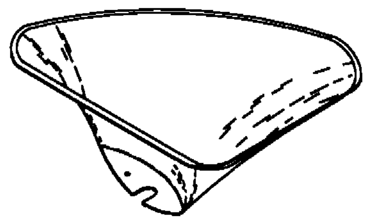


3. Also, molded into the fairing is a small indentation that is the location for the small screw that will later secure the fairing. This needs to be drilled to #40.

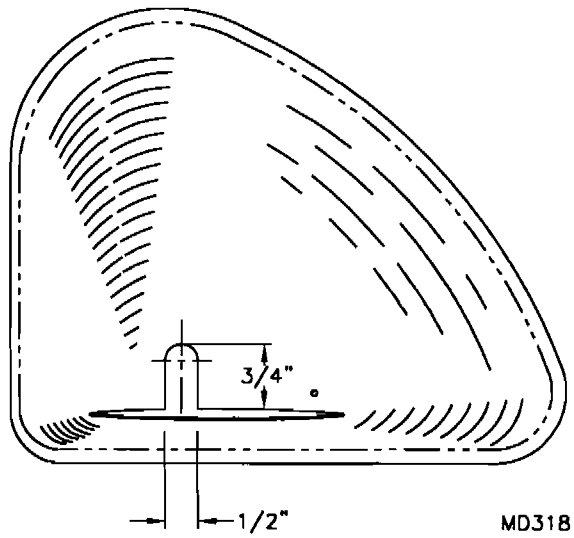
INSTALLING THE FAIRINGS

4. You are now ready to begin the installation process for the fairings. First unbolt the strut fitting from the strut attach plate and let the strut drop down. Next, slip the fairing over the strut and slide it down until it hits the bolt that attaches the strut fitting to the strut. Mark an approximate centerline of this bolt, then remove the fairing and cut out a slot as shown in **Figure 019-04**.

FIGURE 019-04



NOTE: LEFT SIDE SHOWN



5. After the slot has been cut out and filed neatly, reinstall the fairings and slide it down past the bolt. Bolt the strut back in place but do not tighten until the fairing has been fit and the foam tape applied, tape application will be covered later. Push the fairing back up past the top bolt until it fits tight against the wing. Check the fit of the fairing to make sure there are no gaps around the perimeter. It is possible that the fairing may need to be twisted slightly to align with the leading edge of the wing. This can be accomplished by removing the fairings and opening up the strut hole just slightly. Once you are happy with the fit of the fairing, drill through the pre-located #40 hole into the strut. Install the screw and tighten to check fit. If everything checks out, remove the fairing and apply the foam tape provided to the perimeter of the fairing and reinstall. **IMPORTANT:** Do not use any form of loctite to secure the screw. Loctite attacks lexan and will destroy your fairing.

TROUBLE SHOOTING

6. If the fairing does not want to fit tight against the leading edge spar, a simple fix is to add an extra screw on the forward side of the bolts in order to push the fairing up tight.

7. If the fairing seems to be sticking forward on the leading edge you will need to remove the fairing and file out the strut hole along its forward point, reinstall the fairing and slot the #40 hole accordingly. Remove the fairing, apply tape and reinstall.

S-6S COYOTE II PVC GAP SEAL

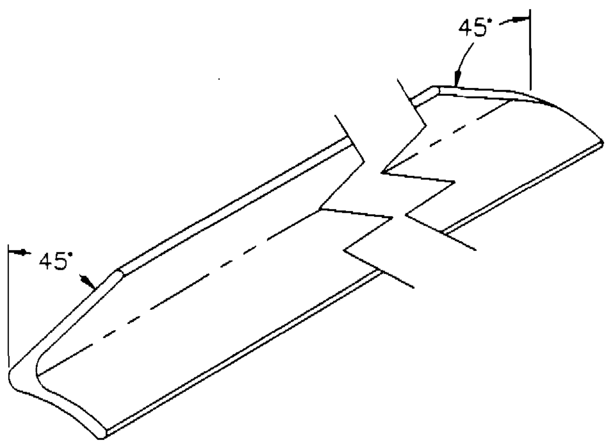
The wings should still be on the wing stands. If not, please set wings on the stands for convenient assembly of the gap seals. The PVC gap seal material can be used in it's natural white color or painted. Use the same paint and primer as used on the fabric. If you plan on painting the gap seals, use small self tapping screws to fit. The screws can be used in place of the rivets for permanent assembly. If you want to use rivets for final assembly, be sure to use a screw smaller in diameter than the rivet.

1. Install the ailerons, flaps, rudder, and elevators. Locate the control surface to the side of the hinge that allows clearance between them. Use washers as needed to shim the surface side to side.

2. Measure the distance between the hinges. **NOTE:** A handy way to figure required length is to measure center to center of the bolt hole. With the hinge bracket subtract 1 1/4" from the total length between bolt centers.

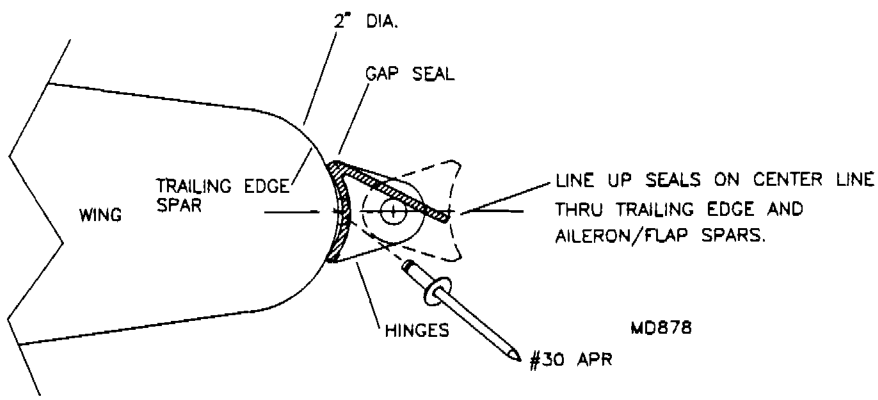
3. Cut the gap seal to this length with 45° miters on each end. This will open the gap seal so it can be riveted to the spar. See **Figure 019-02.**

FIGURE 019-02



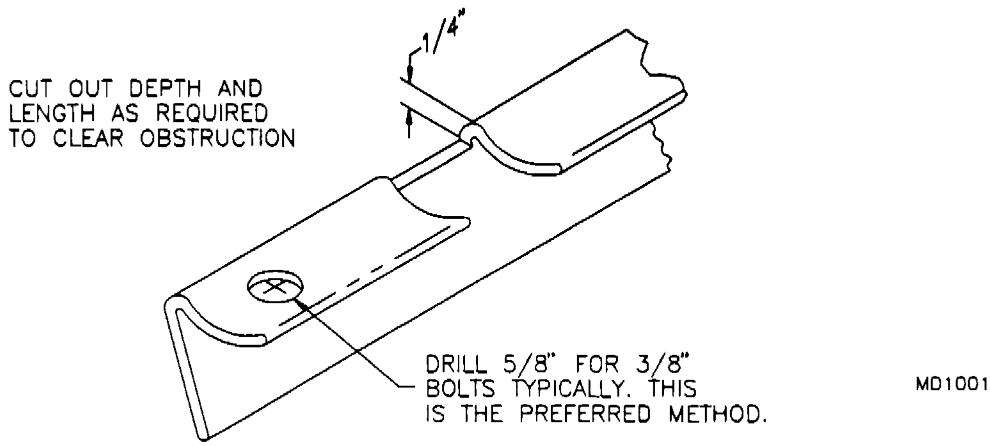
4. Unbolt the control surfaces linkage and let the surface hinge out of the way. Position the pre-cut gap seal centered between hinge points and lined up with the hinge line. See **Figure 019-04.** **HINT:** If you have two-way tape apply it to the gap seal and use it to hold it in position.

FIGURE 019-04



5. Cut away the concave side of the gap seal where the bolt heads prevent installation. Either drill a 5/8" diameter hole where the bolt heads contact or cut out the area. See **Figure 019-05.**

FIGURE 019-05



6. With the gap seal fitted and taped or held in position, drill each end and center #30, remove any burr's and fasten with #30 aluminum pop rivets.

7. Install the gap seal even in the short segments at the wing root and tip. It will increase performance, which is always worth the hassle.

8. The surfaces must move freely without rubbing the gap seals. Fit the gap seal by filing, sanding, or plane until proper clearance is obtained. A miniature wood plane works great to shave off excess material. Do not tighten the hinge bolts. They must turn freely for best feel. Install the castlated nuts and **COTTER PIN** all hinge bolt nuts.

...MORE WING PREP

9. Using a sharp utility knife blade, cut open all the control exits and inspection holes. Snap in all the inspection plates. Find the door up catch location and use an ice pick to poke through the skin. Screw in the door up catch with a drop of loctite.

10. Slip on the correct exit cover and hook up the flap teleflex and aileron push pull tubes. Install the exit cover screws. Operate the control surface by hand to check for interference with the exits. Correct any interference by trimming and filing to suit.

11. Open the pitot and static holes and push the pitot through a couple of inches.

12. Remove the root closeouts and masking tape to expose the fuel lines. Leave the lines bundled up inside the wing until the wing is attached.

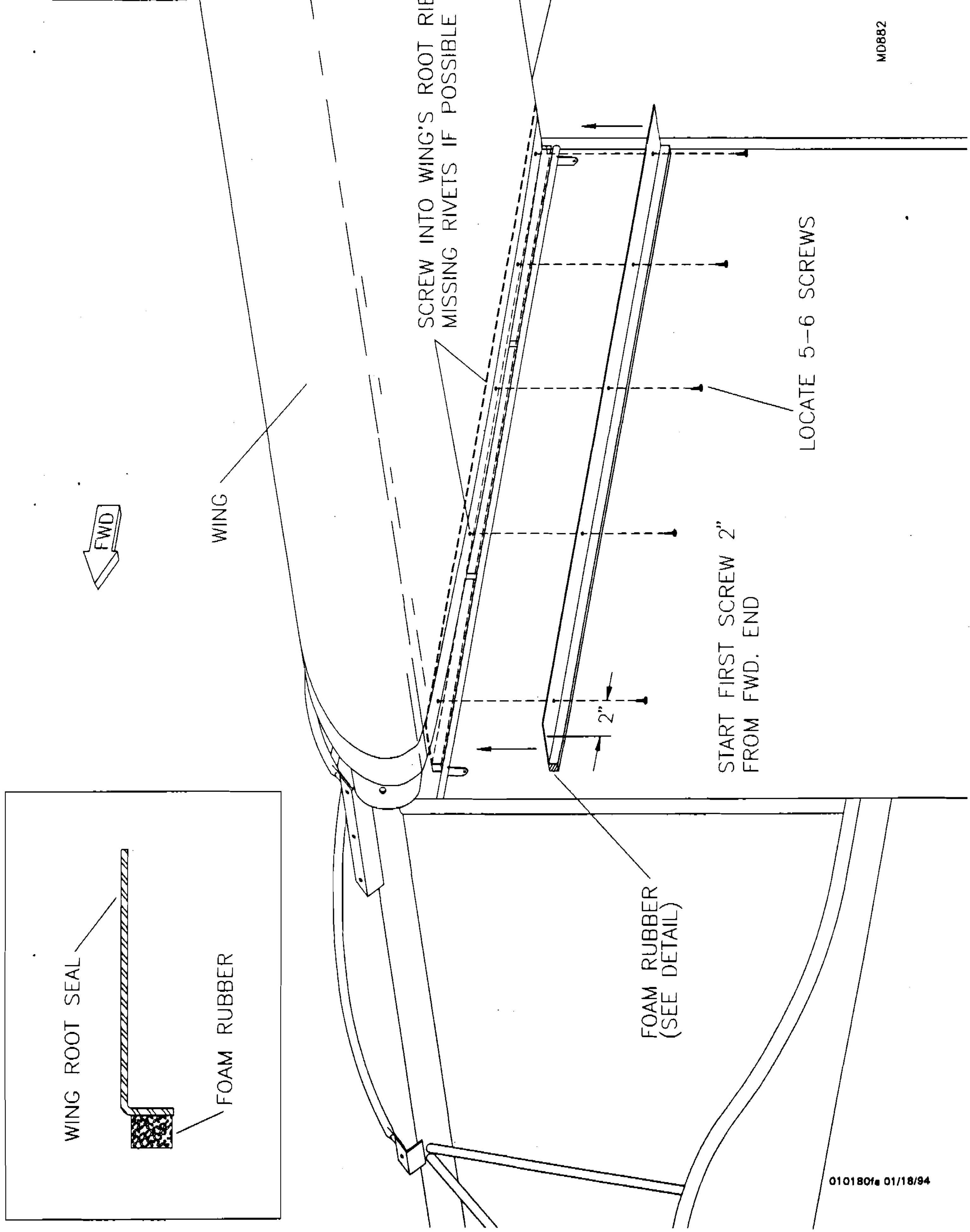
INSTALLING THE WINGS TO THE FUSELAGE

13. With the help of a friend attach the wings to the fuselage. Carefully feed flap teleflex, aileron push pull tube and fuel lines through the cabin. Connect all controls, lines, bolts, pins and etc.

14. Check the operation of the ailerons, flaps and routing of fuel lines. **INSPECT AILERONS FOR PROPER MOVEMENT, STICK LEFT, AILERON UP, AND VISE VERSA.**

15. Install the root gap seals using 5 to 6 screws evenly spaced along the length. The screws should attach into the bottom root rib. Space the screws to miss the rivets that retain the root wrap. Space the gap seal so it overlaps onto each spar evenly. Leave at least 2" to the front of the gap without a screw. The front will insert under the windshield wing cuffs. See **Figure 019-15**. The gap seal should fit tight against the fuselage. Place the foam rubber strip on the flange against the fuselage.

FIGURE 019-15



TAIL AND TRIM SYSTEM ASSEMBLY

1. Bolt on the horizontal stabilizers, and install the cables. Leave the right side lower cables unattached.

2. Lift up the right stabilizer and open the hole for the trim cable in the root rib. Locate a matching hole in the fuselage. Make a hole for the trim cable in the fuselage fabric. Study the trim wheel drawing and legend to become familiar with the parts.

3. Screw the brass fitting into the end of the trim wheel assembly. Install the trim wheel assembly onto the lower center instrument panel with (4) 1/8" aluminum pop rivets.

4. Cut the cable housing to length, leaving plenty of extra length on each end. The housing will be cut to its final length when installed in the fuselage. Straighten approximately three feet of one end of the trim cable. File a bevel on this end of the cable to remove any sharp edges or burrs. With a friend holding one end of the housing, pull the housing straight and slowly feed the straightened end of the cable into the housing. Leave plenty of cable length extending beyond each end of the housing. Do not attempt to install the housing into the fuselage without the cable installed in the housing. If the housing is not held straight while feeding the cable through, the cable will shave the nylon lining in the housing causing a jam that will damage the housing.

With the cable installed in the housing, install the cable/housing into the fuselage. Route the cable housing down the center or the left hand side of the fuselage structure. Use zip ties to secure the cable/housing away from all controls. Try to avoid any sharp turns as this may cause the cable to bind in the housing. Use **FIGURE 019-04** as general guide for routing. Access the cable by reaching through the baggage compartment and inspection openings in the fuselage belly.

With the cable/housing properly routed and installed in the fuselage, determine the correct length of housing needed. Pull the cable into the housing just far enough to make the housing cut without cutting the cable. Lightly file (dress) the end of the housing to remove any burrs that may cause cable wear and eventual failure. Push the cable back through and perform this procedure on the opposite end.

Pull the cable from the aft end until it is flush with the forward end of the housing. Install the forward end of the housing into the ferrule assembly on the trim wheel mechanism. It may be necessary to lightly file some of the plastic sheath to allow proper insertion into the ferrule cap and ferrule. Do not remove the plastic sheath to the bare steel strands. The ferrule will not grip on the strands and failure may result. Refer to **FIGURE 019-04A**.

FIGURE 019-04

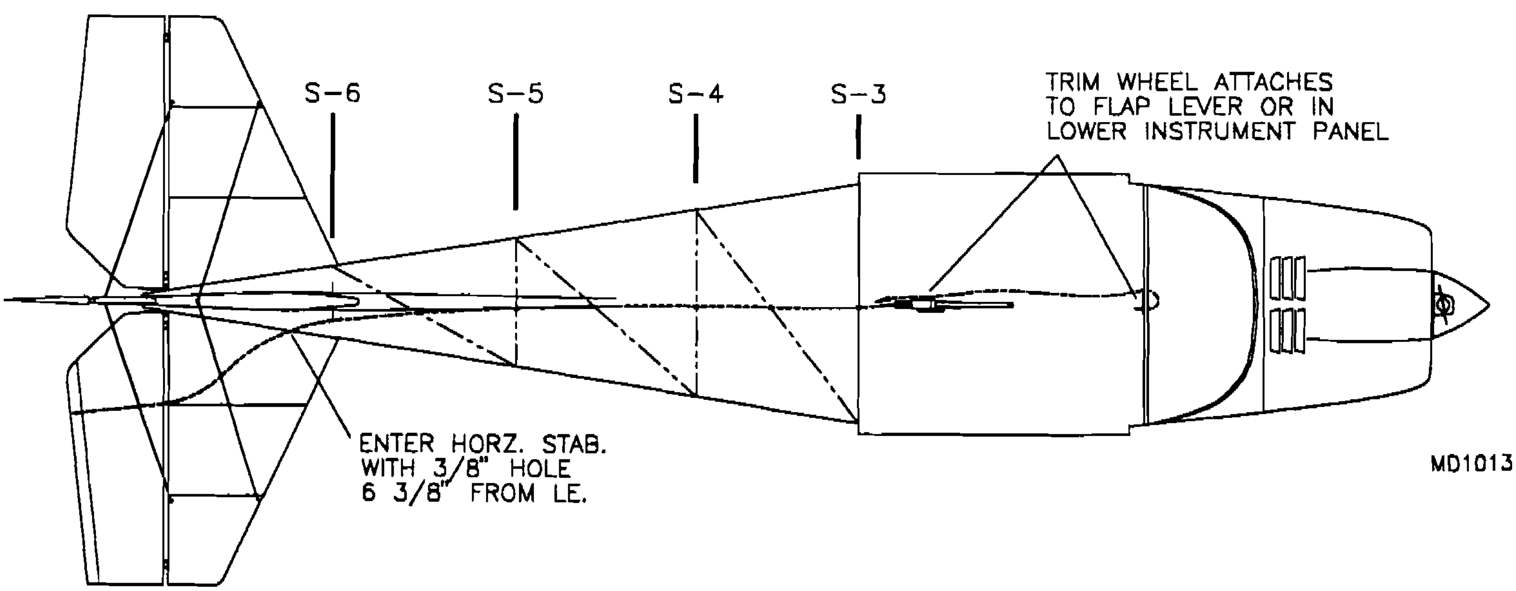
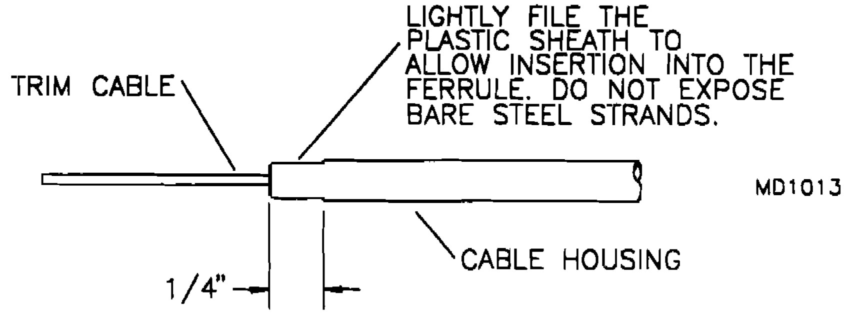
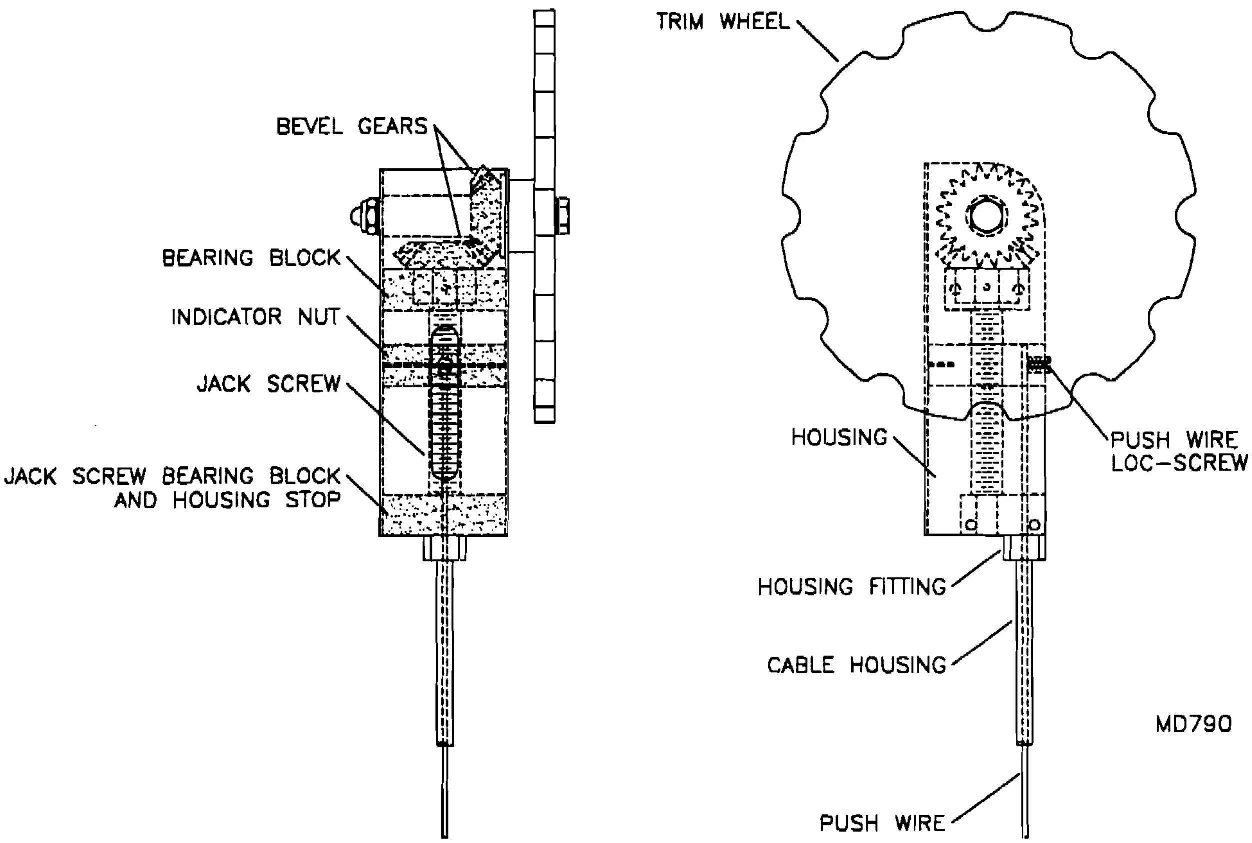


FIGURE 019-04A

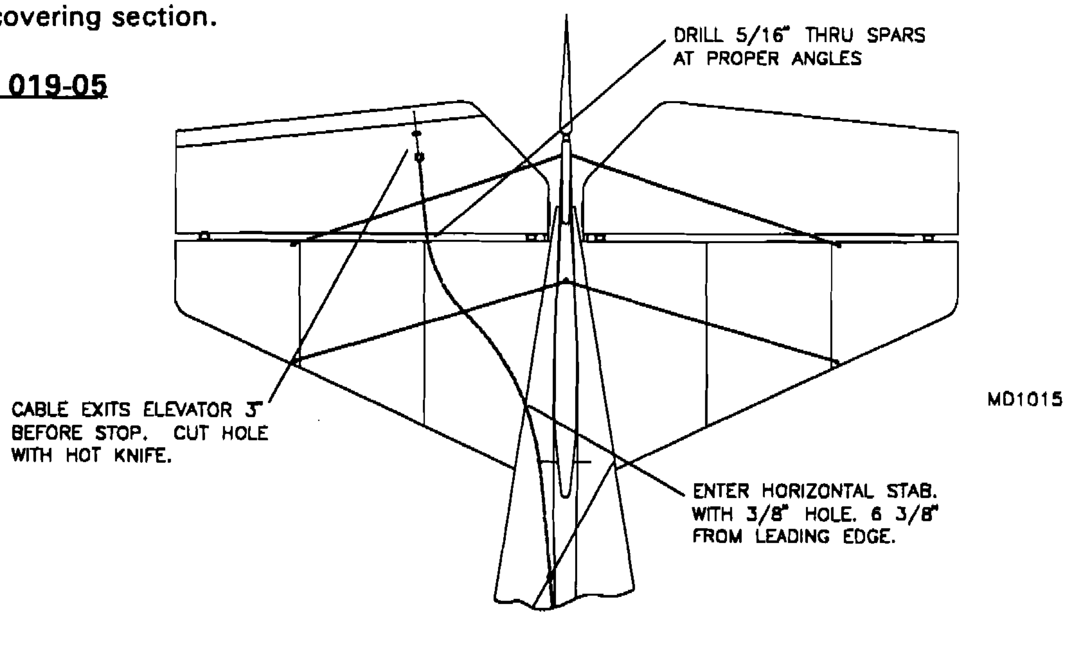


NOTE: The following figure is a general orientation of the trim wheel mechanism.



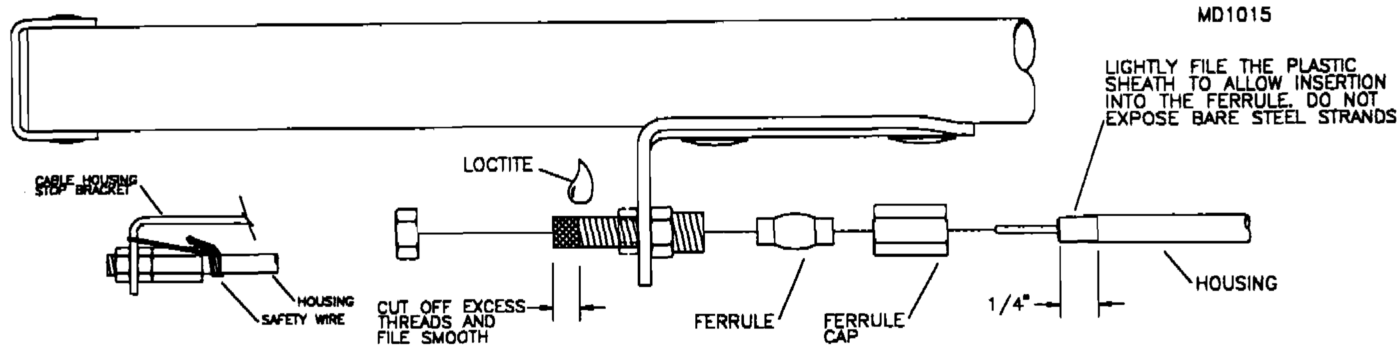
5. Using the bottom inspection panels to reach inside, thread the trim cable housing through the hole in the side of the fuselage and into the stabilizer. Trim out a clearance notch in the gap seal where the cable housing exits the spar. Run the housing into the elevator and exit as per **FIGURE 019-05.** Also refer to the covering section.

FIGURE 019-05



6. Assemble the conduit adjuster assembly into the stop on the bottom side of the elevators inboard compression tube. Trim off any excess threads of the assembly. Leave approximately 1/4" of threads exposed beyond the nut. Use loctite on the nut when installing final. See **FIGURE 019-06.** Install the cable/housing through the ferrule cap and ferrule and tighten. Safety wire the housing into the assembly.

<u>FIGURE 019-06</u>

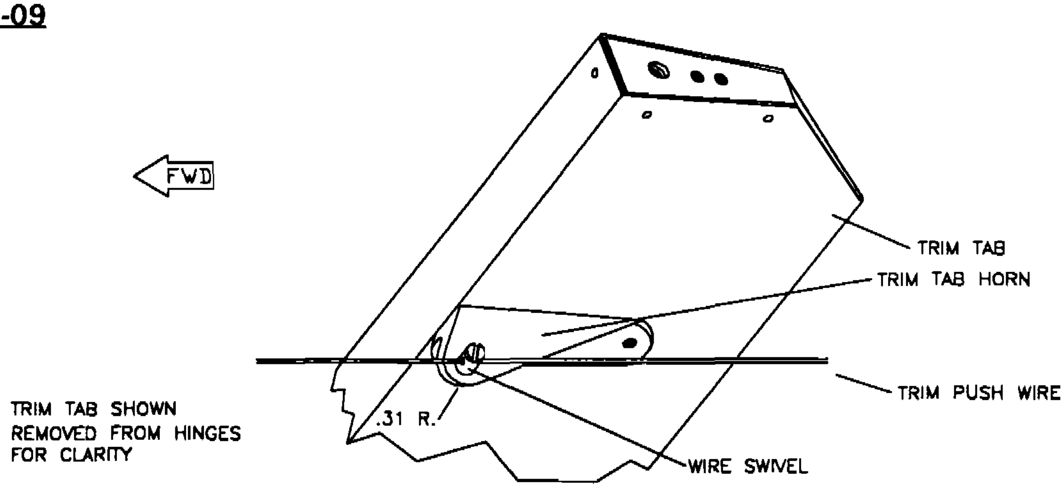


7. Push the trim cable from the trim tab end until it extends into and through the trim wheel indicator nut. Leave a little extra length and cut. Tighten the cable lock screw. Bend the tail of the cable flat against the top of the indicator nut.

8. Locate the trim tab hinge holes in the trailing edge of the elevator. Rivet on the trim tab hinges with 3/16" aluminum pop rivets and bolt on the trim tab.

9. The trim tab horn locates in line with the trim tab cable. Insert the wire swivel into the horn, then the cable. Locate the horn and rivet. Keep the horn in perfect alignment with the stop so the cable has a straight shot at the horn. See **FIGURE 019-09.** Set the indicator nut in its neutral position. Set the trim tab neutral. Gently pull any excess slack out of the cable and tighten the wire swivel set screw. Be sure to apply loctite to the set screw prior to tightening the final time.

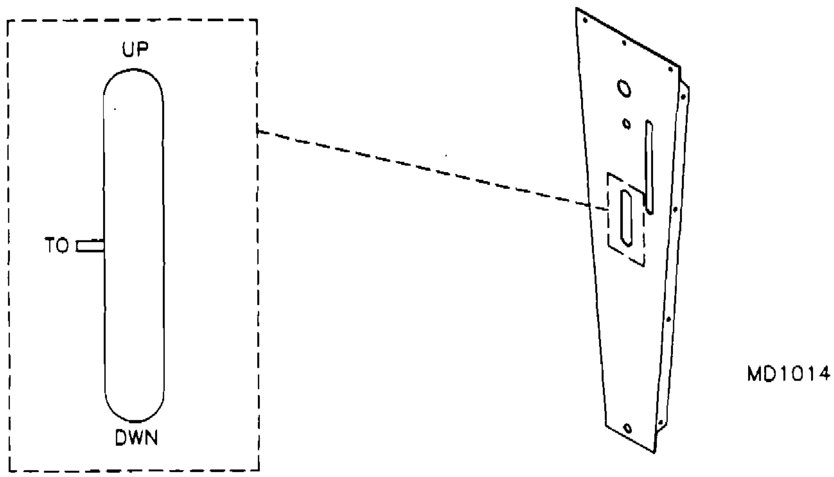
<u>FIGURE 019-09</u>



10. Test operate the trim. The tab should move the opposite way of the intended trim mode. <u>For Example:</u> With the nose up the trim tab should deflect down. The system should work smooth and gradually. The fine gearing allows minute adjustment in cruise. For wide trim changes such as flaps, start rolling trim with each notch of flaps. Trim input for large amounts will require fast movement of the trim wheel.

11. Mark the trim indicator using the labels provided as shown in **FIGURE 019-11.** The take off position is neutral, check the tab to see if it corresponds with the indicator. Make the proper adjustments if not.

FIGURE 019-011



COMPLETION OF THE TAIL ASSEMBLY

1. Attach the lower cables and check for rig and tension. The tail should be straight across. View the tail from a few steps back. In the case of a taildragger, you may have to lower your vantage point by kneeling. The tips of the stabilizer should be equal distance away from the wings. The cables should be tight enough to strum a pleasant low note. The right amount of tension requires the help of another to hook up the cables to the lower fitting. Have a helper push down on the tail at the point the cable intersects the spars. About 30 to 40 pounds of push should be required if the tension is right.

2. Attach the elevator yoke to the elevator horns. Check the adjust as to prior instructions. **DANGER:** Be sure elevator bolts have loc-rings installed. Be sure the rod ends are screwed in at least 6 full turns and secured with loctite and a jam nut. Failure to do so can result in loss of pitch control.

3. Remove the torque tube cover in the cockpit to inspect, adjust and loctite the jam nut on the elevator push pull tube. Check the elevator for proper function. Trim the yoke opening if required. The stick should move freely without binding or excessive force. Grease the push pull tube slide at Station 3 at least every 200 to 300 hours, or as required. Inspect all pitch control rod ends during preflight and 100 hour inspections. Install the torque tube cover once you are satisfied with the pitch and trim system.

SEAT AND SAFETY BELT INSTALLATION

1. The safety belts most likely have been installed prior. If not check back in the seat assembly to install. With belts installed, thread the ends through the interior close out panels.
2. Install the seats in the position to fit your size. Sit in the plane and check belt adjustment and stick throws. To use the shoulder belt pull the strap open enough to duck under. Tighten as required. The strap should cross the chest from right to left when in the right seat and vise versa for the left. To engross, slacken the shoulder strap enough to duck under.

SEAT: GENERAL INFORMATION

The seat in your S-6S is designed to give you support using special foam rubber and tension. The foam should last years before needing replacement. The tension can change within a few hundred hours of use. Check the zip ties or the straps, depending on what type of seat, every 100 hours. This will assure the same comfort level you enjoyed at the start. **IMPORTANT:** On flip up style seats do not *fully* tighten the back row of zip ties. They only need to be tight in the seat down position.

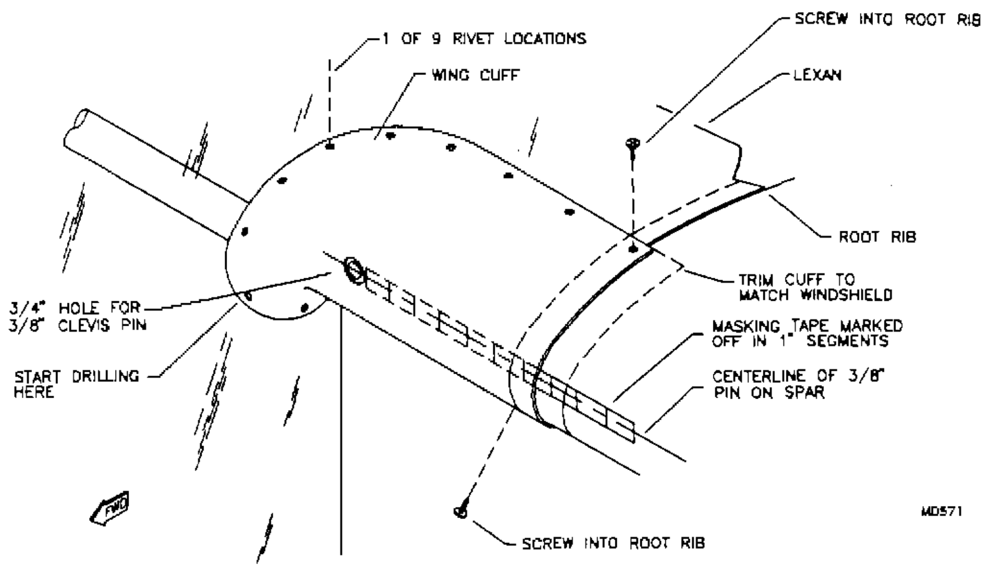
Adjust the seat position so you can reach the rudder pedals and have full travel. For non-pilot passengers adjust the seat all the way aft to allow them a greater degree of comfort. This will also keep them clear of the rudder pedals.

INSTALLING THE WING CUFFS

PLEASE NOTE: Before the wing cuffs can be installed the wings must be on the plane.

1. Before installing the cuffs, place a strip of masking tape on the spar at least 8" long on the spars centerline coming off the spars 3/8" pin. Mark off the tape in 1' segments from the exact center of the pin. The tape will serve as a way of marking on the cuff where to drill for the 3/4" diameter pin access hole. See **Figure 019-01**. To locate the pin under the cuff, measure into the cuff using the tape as a reference. The wing cuffs come trimmed, painted and ready to install. Because of the springy nature of the fiberglass the cuffs are a bit tricky to fit up to the windshield. Te trick is to start drilling and installing clecos from the BOTTOM to the top. A total of nine (9) rivets are used to retain the cuff to the windshield. Locate and mark nine (9) rivets along the edge with about a 3/8" edge distance (E.D.).

FIGURE 019-01



2. Hold the cufff in position. By moving the cuff around a bit you will find where it fits the best. Drill through at your marks with a #30 bit and cleco as you go starting near the bottom. Push firmly on the cuff to form it against the wing as you work your way to the top. See **Figure 019-01** for starting hole location.

3. After drilling and clecoing the cuff in place, drill a #30 hole at the top and bottom locations for the #8 pan head screws. Before drilling make sure the cuff is tight against the wing by pushing it firmly into the wing. Drill into the root rib on the top and into the spar on the bottm. The screws will self tap into the spar but not without an effort. Be careful not to slip off the screw and punch a hole in the wing. Remove the screws and cleco, then drill 3/4" hole for the wing pin in the cuff. Clean up the 3/4" hole by rolling a piece of 80 grit sanding paper into a cylinder. Sand the inside of the hole smooth, avoid scratching the paint.

4. Clean the cuff and wing of any debris and apply a small bead of silicon caulking to the edge of the cuff. Cleco the cuff in place, then install the rivets and screws. Make sure you use the small brass washers to back up the rivets. Use extra care in placing the washers, make sure they are up against the lexan before pulling the rivet. Wipe off any extra silicon with a damp paper towel. A properly installed wing cuff will contour exactly with the wing and windshield as well as provide a water tight joint against the rain.

582 PROPELLER INSTALLATION

1. Bolt on the propeller (582 engine drawing for correct hardware). **NOTE:** For spinner assembly and installation refer to spinner installation. Use 10 ft. lbs. for proper propeller torque. Make sure to install the tensile loc-nuts on the back side of the prop flange. See 582 engine drawing.

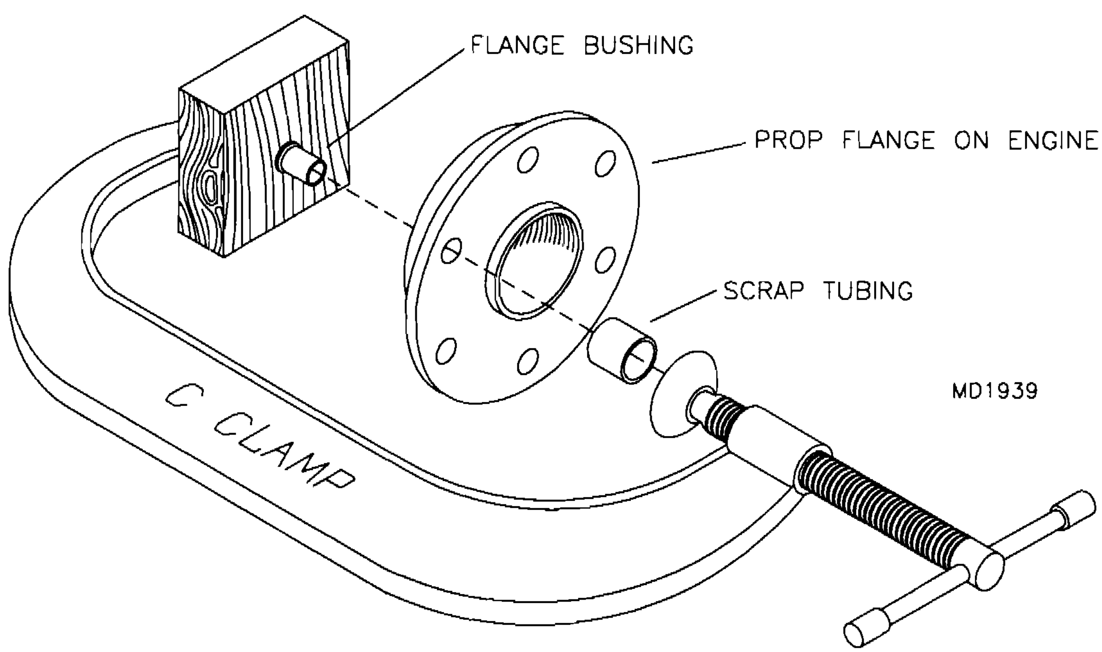
2. Check the propeller for balance by inserting a 1" tube through the prop center. Open a bench vise slightly wider than the prop. Position the prop horizontal with tube resting in the vise's jaws. If it is balanced it will remain level or any position it is set at. (Provided your vise is level across the prop and the jaws are smooth.) If the prop drops at tip balance by coating the light tip with a urethane spray varnish. **PLEASE NOTE:** According to the F.A.A. a propeller is still within acceptable balance if the difference is no more than the weight of a nickel. If you tape a nickel to the light end and the other tip still drops, the prop needs balancing.

3. Check prop tracking by placing a marker next to the back of the prop. **HINT:** A 5 gallon bucket works well as a marker. Let the marker touch the back of the prop. Make sure the plane is completely stationary with the wheels chocked and rotate the prop through **WITH THE IGNITION OFF!** If the prop is tracking correctly the other blade should touch the marker also. If tracking is off, loosen the bolts and try re-torquing the bolts until proper tracking is achieved.

912/912S PROPELLER INSTALLATION

1. Insert flange bushings into the prop flange of the engine. Insert the flange bushings from the aft side of the prop flange. Use a "C" clamp to completely seat the bushings into the flange. Use a small wood piece between the mouth of the clamp and the aluminum flange bushing to protect them from being damaged. **HINT:** A heavy layer of tape on the mouth of the clamp may be used instead of a wooden block. On the forward side of the prop flange use a piece of tubing approximately 1" long over the flange bushings to allow them to seat as the "C" clamp is tightened. See **Figure 019-01.**

FIGURE 019-01



2. Inspect the prop provided for any nicks, crack or dings. The propeller comes from the factory balanced and ready to bolt on, however depending on conditions and how the prop has been stored, it may not be in balance at the time of install. To balance the prop it is best to use a two-axis balancer. These are available from several Aircraft Supply stores. Place the prop on the balancer and follow method to correct balance in **Figure 019-02**.

3. Mount the propeller, as per parts drawing, using the bolts provided. Note the length of the bolts is critical. Use washers to be certain the bolts are not bottomed out on the threads. **DANGER:** If bolts are bottomed out on the threads, the prop is not properly torqued, separation from the aircraft during operation may occur and cause injury or death. Torque the bolt from 175 to 200 inch pounds in the pattern shown in **Figure 019-02**. Re-torque bolts after 5 hours of flight.

4. Check prop for tracking by turning blade into a vertical position and placing an object at the tip. Spin the prop to the next blade and check position. If the position is the same the prop is in track. If not, loosen prop bolts and re-torque until proper tracking is achieved. **HINT:** Start torquing pattern on the blade that is out of track. See **Figure 019-03**. **DANGER:** Track prop with ignition OFF!!

FINAL INSPECTION

Final inspection begins when the aircraft has been transported to the airport. Assemble the plane and prepare for flight. During the assembly inspect everything. Then inspect it again. By now you have a second hand knowledge of this plane, but still do not assume anything. Approach the plane as if you are seeing it for the first time...like the FAA will be! Remember the laws of physics do not make exceptions...even for you! Provided at the end of this manual are two inspection lists. One is from the FAA the other from the EAA. Both are fine lists and will serve well for final inspection. Also, use the specific pre-flight list for this aircraft.

In the pilot operating handbook are weight and balance examples and blank copies. Make at least 3 copies and perform C.G. checks for 2 conditions; fwd and aft loadings.

The FAA inspection only makes it legal to fly. It does not guarantee the plane is ready to fly. The inspector will find something to correct, and that is good. It just shows you how important it is to be thorough. After the sign off and the FAA has left just take a minute to stand back and admire that plane. You have accomplished a lot, and your head should be spinning with pride.

ENGINE TESTING

Secure the aircraft in a safe area to test run the engine. Tie a strong rope to the tail spring/tail wheel or each main gear on trikes. Secure the other end to a parked vehicle or a secure ground anchor.

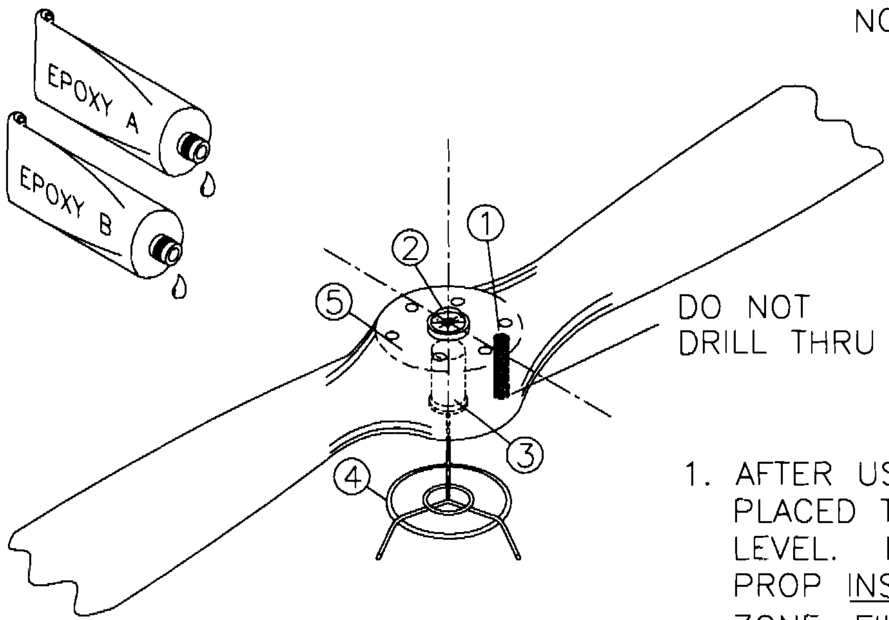
Fuel the aircraft and drain the sumps. Remove the engine cowling. Set the cowlings in the hanger, lay down flat. The common mistake is to set them on the firewall edge, only to have them later topple and ruin the paint job.

Follow the engine manufactures starting and break-in procedures for your engine. Check the gauges for the proper readings as per the engine manual. If the readings are not right **STOP THE ENGINE** and investigate. It may be faulty gauges, then again it may not. If you have problems with starting and testing the engine, please call our technical line. Do not risk flying an engine that is not reading in the green!

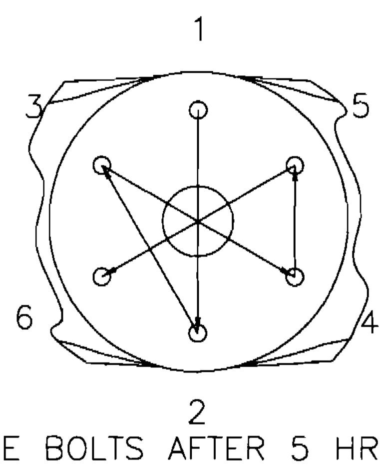
Vibration when the engine is at idle should be low enough that the instruments are steady. If you have a high vibration level take action to rectify. The engine we use are generally smooth in operation, however, some adjusting may be required. The 912 usually needs the carbs balanced right off. Use a mercury balancer to fine tune.

FIGURE 019-02

NOTE: BALANCE PROP INDOORS OUT OF WIND



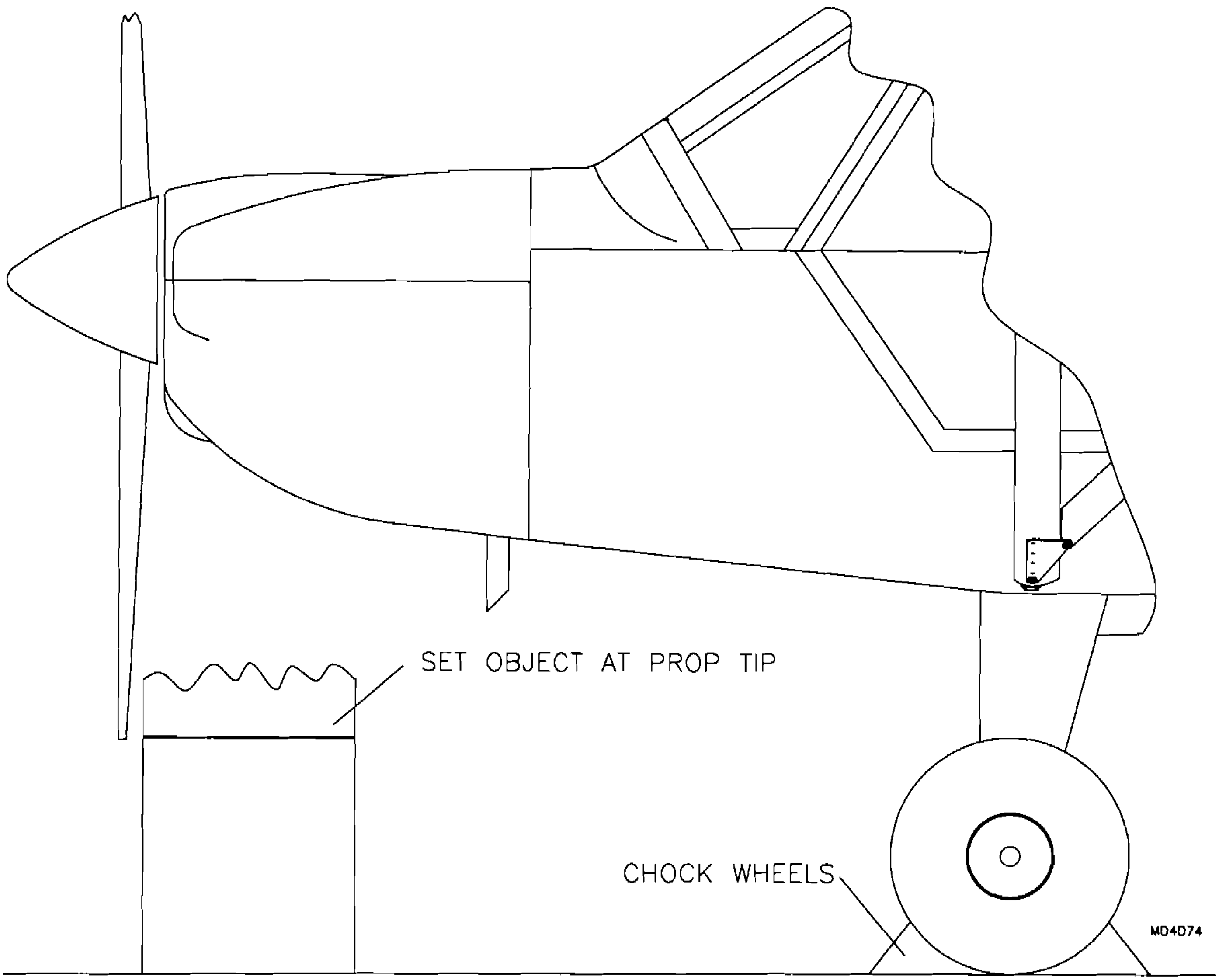
1. AFTER USING COINS PLACED TO CENTER BUBBLE LEVEL. DRILL A HOLE INTO PROP <u>INSIDE</u> OF CRUSH PLATE ZONE. FILL WITH LEAD "BB'S" SEAL WITH EPOXY.
2. CENTER LEVEL
3. DUAL AXIS PROP BALANCER INSERT SPECIFY PROP INSIDE DIAMETER WHEN ORDERING.
4. STAND FOR INSERT
5. CRUSH PLATE ZONE



MD4039

RE-TORQUE BOLTS AFTER 5 HRS. OF FLIGHT

FIGURE 019-03



TRACK PROP IN CALM CONDITIONS

IMPORTANT!!

Check propellers torque every 50 hours or after large changes in climate. Wood props will shrink and expand with humidity.
If you live in a climate with large changes in humidity or fly to a different climate, prop torque may change more often.
Failure to maintain proper torque may result in separation of the propeller from the aircraft and may cause injury or death.

CHECKING STATIC RPM

Prior to the first flight, determine the engine's static RPM; this is the speed it develops when stationary and fully throttled. An acceptable static RPM indicates that the engine is operating at or near full potential and should not over-speed during the first flight.

First, calibrate the engine tachometer to make certain it's accurate. Determine the propeller's RPM with a *light tach* (a hand-held device which measures propeller rotation with infrared pulses) and compare the reading to the tachometer's, taking into account the engine's gear reduction ratio. The tachometer supplied with your RANS kit is equipped with a calibration knob; refer to the manufacturer's instructions.

Once satisfied with the tachometer, run the engine with the throttle fully open; be certain the tail is tied down and the main gear is chocked. For the two-stroke Rotax 503 and 582, acceptable static RPM is usually about 6000 to 6200; for the four-stroke 912, it's usually 5000 to 5200. (A number of factors influence this, including the number of propeller blades, their length and pitch.) Ideal static RPM would render an *in-flight* RPM just below red line with the throttle fully open at sea level.

A high static RPM may indicate that the propeller is pitched too finely (the blades take too small a bite of air). This prevents the propeller from performing most efficiently and may allow the engine speed to exceed red line in flight. If the blades are adjustable, increase pitch; refer to the manufacturer's instructions. If the blades are fixed, contact the manufacturer.

A low static RPM may indicate that the propeller is pitched too coarsely (the blades take too large a bite). This also prevents the propeller from performing most efficiently and induces excessive load on the engine. If the blades are adjustable, decrease pitch; if fixed, contact the manufacturer. If finer pitch does not raise maximum engine speed to an acceptable RPM, another problem may be indicated.

WARNING: Attempting flight with too much or too little propeller pitch may have severe consequences. Conduct flights only with sufficient power output!

Knowing the ideal static RPM allows you to check the health of the engine during a full-throttle run-up prior to takeoff. Once you've become familiar with the in-flight performance of the engine and have adjusted the propeller, you'll know better what the tachometer should indicate during run-up.

FLIGHT TESTING

Flight testing a new aircraft can become quite involved, especially if there are problems with controls, engines or rigging. The approach one should take is to start with a competent pilot, sufficient runway and ideal weather. Flight time in the type of plane you are to test is ideal. This can be obtained at the factory or from a nearby willing owner.

A large amount of common sense should be on hand. The obvious is sometimes lost in the excitement. So keep your cool, to keep your head. The exact path you take to flight testing can be tailored to your experience and airport. To help you design your approach to flight testing, here is a brief synopsis of my approach. Please use this as a suggestion and not the bible...

"The airport we use features 6500 ft. of all weather runway. Off each end is acceptable overruns of another 1000 ft. Plus the fields nearby offer suitable landing sites. The main thing is our airports long runway gives us plenty of room to fast taxi.

"During the fast taxi it is determined if the plane is directionally controllable. Also some feel for pitch and roll can be established. A lot is happening fast, so several runs may be needed to digest the information. I'm looking for anything and everything to AVOID flight. In other words, I don't ignore the signs of

trouble and think my enthusiasm will fix it. I did that once and it nearly killed me! I want this plane to earn it's place in the sky. Sugar coatings now will only mean more trouble later. After the fast taxi, I get out of the plane and look her over; this is mainly to create a space in time to keep relaxed. A test pilot's best friend is his self-discipline. Whatever you need to do ritual-wise to keep the discipline is fair game.

"The next phase will be crow hops. Here we really start learning about the plane. In fact, it is amazing what she'll tell in these brief moments of flight. I can predict stall speed and sometimes stall behavior, just from a crow hop.

"The crow hops grow longer and higher as information confirms the control function. This is where the long runway starts to pay off. From the flights down the runway at above the wing span we learn the full landing nature of the plane, we also now have a pretty good feel for its control response, and whether or not it's "right". That is where experience in type will help. If this is your first exposure to the plane, it will be tough to know if the feel is right; however, you should at this point know if it is drastically wrong! If the engine is revving in the redline and you are barely able to climb, something big is wrong. In other words, we are developing a sense of performance this new machine may have. That performance should not be far from the expected values, if it is then something may be drastically wrong. To keep me from contradicting myself I write down the numbers I'm getting. Don't try this while flying down the runway, do it at the end of the run. You will be surprised later when you read it back. Your memory at this point is not the most accurate recorder! Also, write down what you actually see and not what you want to see on the gauges. Try to remain objective at this point; after the flight testing is over you will have earned your bragging rights.

"After flying down the runway enough to confirm engine health and the controls are okay it is time to take another break. This time we inspect under the cowl, plus another pre-flight. The next objective is what I call the maiden flight. During this flight we will leave the safety of the runway so everything has got to be right. Wear a parachute if your plane is not ballistic equipped, we will be flying high enough to use it. This is not the fly fast low by the waving crowd flight...that comes much much later. Remember baby steps!

"The maiden flight is designed to learn the main things about the plane: climb performance, moderate cruise speed(later I check out the top end at much higher altitudes)control at moderate cruise, and slow flight. The plane should be climbed to at least 3000 ft. above ground level. Here we in theory have enough height to bail out.

"The main idea is to advance slowly, getting to know what the new plane can and cannot do. As an amateur builder, it is your responsibility to establish the performance numbers. However precise the kit may be, it is still possible to have variations in performance. Establish the critical V-speeds through actual flight testing. Record them in your flight log. The following V-speeds are what I feel are the most important:

Vr *rotation*
Vlof *lift-off speed*
Vy *best rate of climb*
Vx *best angle of climb*
Vc *cruise at 65% power*
Vs *stall clean*
Vso *stall speed landing configuration*
(approach speed should be 1.3 of Vso)

"As the testing continues you may notice slight trim or rigging problems, such as a yaw to the left or right, or the ball sets off to the side in level flight, or it won't maintain level flight. It is best to fine tune the plane until it flies ball centered and level. This is considered perfect rig. In perfect rig you will

achieve the optimum cruise speeds, so it is worth the effort. The problem with such fine tuning is that it is easy to get confused as to what effects what. I have complied a little trouble shooting chart to help with the mystery of perfect rigging." RJS, RANS, Inc. Test Pilot

RIGGING TROUBLE SHOOTING

To properly correct a rigging problem the symptom must be correctly analyzed. This is done by establishing the plane in level straight flight, then releasing the controls. The test must be done is calm air. Write down what is happening, that way you make corrections in the right direction. Make adjustments in 1/2" and 1" turn increments. Isolate the problem, make and correct one axis at a time. If for instance you adjust the wing, twist and add a little rudder trim you may end up chasing the problem rather than solving it!

YAWS LEFT OR RIGHT

This is fairly rare in our planes and is usually caused by engine or rudder offset. Check the prop for at least 1/4" to 1/2" difference from side to side. The descending blade should be closer. If the engine offset is okay then it could be rudder rig. The rudder may not be going to a free state due to friction or mis-rigging at the rudder pedals. Adjust the rudder pedals so they are straight with rudder. In some cases there may be a slight offset in the vertical stabilizer. This may be built into the frame. Add a small trim tab to the rudder to correct. We use a piece of .020 aluminum 10" to 12" by 2.5" to 3". The .020 bends easy and should be installed and flown. We have trim tabs available, call the Parts Department for information. Remember if you are holding left rudder the tab will be bent the opposite way of the rudder needed. Stalls should be conducted after rigging adjustment to check for wing drop. If the plane flies straight and level but drops a wing in the stall, check your feet and hands, you must be pushing and little rudder or holding in some aileron!

WING LOW

If the plane flies wing low with very little or no tendency to yaw or roll to the low wing, the wing is washed out to much on the OPPOSITE wing. To correct wash in the OPPOSITE wing. Do so in 1/2" to 1" turn increments. It is always best to wash in because this means more threads will be holding on the rod end. Once the wings fly level the ball should be centered, in this rig you will achieve the best cruise possible (provided pitch is in trim).

This can also be a low flap on the opposite wing, but then a little roll should be present. Check the flaps for position during flight. Both the ailerons and flaps should be straight and together in level flight. When adjusting the flaps you may run out in travel. In this case it is okay to cut off the end of the teleflex 3/16" and remove the jam nut.

ROLL LEFT OR RIGHT

Roll and yaw can be hard to separate. If the wing rises before the nose yaws then the mis-rigging is in the aileron on the flap. Wing twist can induce roll but it will only lift the wing so far. A true roll tendency will keep right on going until the plane is in a steep bank. It will be the flap that induces the roll, because the ailerons should fly free in the slipstream, unless you are holding the stick again!

To correct, make sure all trailing edge surfaces are flying straight. The flaps and ailerons need to be a seamless surface. Adjust accordingly. See wing low for a tip on gaining more flap inward adjustment.

NOSE UP OR NOSE DOWN

This should be correctable with the elevator trim system. The trim system will have enough force for all cruise modes, however, some modes of flight such as full flaps and low power, the trim will be exceeded. This is not a big deal since the control forces in these modes are still very light.

If you have a nose down or nose up problem that in flight trim can not handle at any cruise speed, then there is a big weight and balance problem. Check your weight and balance sheet.

CREATING A PILOT OPERATING HANDBOOK FOR RANS AIRCRAFT

Most pilots are accustomed to flying light planes with comprehensive pilot operating handbooks. This is a result of the standardization required by FAA certification, the fruit of which is fleets of identical aircraft for which specific checklists, procedures and performance figures may be published.

This section includes much information on the operation, limitations and performance of RANS aircraft; however, the nature of kit-built aircraft makes it impossible to publish *specific* checklists and procedures applicable to *all* examples of a particular model. This is because the builder, as manufacturer of the aircraft, has the freedom to assemble, equip and modify his machine as he wishes. The result is fleets of aircraft that share the same name and designation, but vary somewhat in operation and performance.

The builder should consider carefully all aspects of the engine, airframe and equipment when developing checklists and procedures for his plane. For example, he might begin the preflight inspection by opening the cabin and checking that the magnetos are off; this would ensure the engine cannot start if the propeller were moved. With the cabin open, he also might drain fuel from the sump, allowing any water trapped in the system to escape. He then might begin a walk-around, moving about the ship in a logical, straightforward manner, checking the presence, security and condition of hardware and components.

With the walk-around completed, he might seat himself in the aircraft and consider the checks necessary for a safe and mechanically sound engine start. This will depend largely on the specifics of the engine, fuel, ignition and electrical systems he has installed. Again, a straightforward, logically-flowing checklist should be developed that addresses the particulars of his machine.

The same care should go into development of a pre-takeoff checklist. Of particular importance is a proper engine run-up to check the health of the power plant. An essential checklist item often given short shrift is that of free and correct movement of control surfaces; this is particularly important for aircraft that fold or disassemble.

Considerable forethought should be given to potential emergencies. What steps should be taken to deal with balked landings, engine failures or fires? How might these steps vary according to the phase and conditions of flight? Consideration of contingencies now is likely to mean faster, more appropriate reaction to urgent or emergency situations, should they arise.

Since each kit-built aircraft is unique, each builder should expect his aircraft's performance to be unique. The prudent builder will determine carefully the weight and balance parameters of his plane before its first flight. He'll familiarize himself with its flying characteristics during the flight test phase, cautiously exploring its capabilities and limitations while heeding the designer's words of advice. The U. S. Government, the Experimental Aircraft Association and other publishers offer a wealth of information on flight preparation and testing. As a first step, the builder might refer to the FAA's AC-90-89, "Amateur-Built Aircraft Flight Testing Handbook."

By applying suitable checklists and procedures to his plane and operating it within reasonable limits, the builder helps ensure his safety and the longevity of his airframe, power plant and components.

CORROSION and WASHING YOUR PLANE

Using the garden hose to wash the outside of your plane may seem like a great idea, however this is a practice avoided at the factory. We simply never let the plane get to the point it needs hosing. Instead, the exterior of the plane is cleaned using a product called Brilliance. This mild cleaner works great on all surfaces including the Lexan. For the oil or exhaust stains, we use 409 or Fantastic. These clean very effectively without apparent damage to the paint.

If your plane is open air like an Airaile or Stinger and you do use a hose to wash it down, you may be causing a future corrosion problem. In the case of any open cockpit plane with the tail sitting low, it is possible for water to collect inside the elevator push pull tube. This will rust away the elevator yoke and corrode the push pull tube also.

Even leaving the plane in the rain can allow moisture to collect in the elevator yoke. Please avoid the practice of spraying water into the cockpit area of your plane, open cockpit or not, this is a practice that will lead to corrosion problems and part replacement.

If you suspect your aircraft of corrosion problems, inspect all areas where water may collect, such as the elevator yoke area.

THE FINISH

Well, here we are with a finished and flying plane. Stand back for a moment and take a long look. Remember the moments of confusion and frustration? They faded and the joy of crafting a fine airplane has superseded them. You have just done something man has dreamed of since the beginning of time: you've *flown!* And you've done it in a plane you made! That, my fellow aviator, is a feeling that sticks with you a *long* time. Enjoy this newborn wonder and-- above all-- keep it safe. We want you around for the next fly-in!

FINAL INSPECTION

Listed below are two checklists. One is a sample checklist for condition inspection from the FAA and the other is an EAA safety checklist. These should be very helpful in getting your airplane signed off by the FAA inspector and ensuring that your airplane is safe for operation.

APPENDIX 1. SAMPLE CHECKLIST FOR A CONDITION INSPECTION

AC 90-89

AIRCRAFT IDENTIFICATION:

TYPE/SN. ____________________ ENGINE MODEL/SN. ____________________

N NUMBER ____________________ PROPELLER MODEL/SN ____________________

A/F TOTAL TIME ____________________ ENGINE TOTAL TIME ____________________

OWNER ____________________ PROPELLER TOTAL TIME ____________________

	BUILDER		INSPECTOR	
GENERAL:	Sat	Unsat	Sat	Unsat
REGISTRATION/AIRWORTHINESS/OPERATING LIMITATIONS				
AIRCRAFT IDENTIFICATION PLATES INSTALLED				
EXPERIMENTAL PLACARD INSTALLED				
WEIGHT AND BALANCE/EQUIPMENT LIST				
WINGS:				
REMOVE INSPECTION PLATES/FAIRINGS				
GENERAL INSPECTION OF THE EXTERIOR/INTERIOR WING				
FLIGHT CONTROLS BALANCE WEIGHTS FOR SECURITY				
FLIGHT CONTROLS PROPER ATTACHMENT (NO SLOP)				
FLIGHT CONTROL HINGES/ROD END BEARINGS SERVICEABILITY				
FLIGHT CONTROLS PROPERLY RIGGED/PROPER TENSION				
INSPECT ALL CONTROL STOPS FOR SECURITY				
TRIM CONTROL PROPERLY RIGGED				
TRIM CONTROL SURFACES/HINGES/ROD END BEARINGS SERV.				
FRAYED CABLES OR CRACKED/FROZEN PULLEYS				
SKIN PANELS DELAMINATE/VOIDS (COIN TEST)				

POPPED RIVETS/CRACKED/DEFORMED SKIN				
FABRIC/RIB STITCHING/TAPE CONDITION				
LUBRICATION				
WING ATTACH POINTS				
FLYING/LANDING WIRES/STRUTS FOR SECURITY				
CORROSION				
FLIGHT CONTROL PLACARDS				
INSPECT FIREWALL FOR DISTORTION AND CRACKS				
INSPECT RUDDER PEDALS AND BRAKES FOR OPERATION AND SECURITY				
INSPECT BEHIND FIREWALL FOR LOOSE WIRES AND CHAFFING LINES				
CHECK CONTROL STICK/YOKE FOR FREEDOM OF MOVEMENT				
CHECK FLAP CONTROL OPERATION				
CHECK CABLE AND PULLEYS FOR ATTACHMENT AND OPERATION				
PERFORM FLOODLIGHT CARBON MONOXIDE TEST				
ENSURE THE COCKPIT INSTRUMENTS ARE PROPERLY MARKED				
INSPECT INSTRUMENTS, LINES, FOR SECURITY CHECK/CLEAN/REPLACE INSTRUMENT FILTER				
INSPECT COCKPIT FRESH AIR VENTS/HEATER VENTS FOR OPERATION AND SECURITY				
INSPECT SEATS, SEATBELTS/SHOULDER HARNESS FOR SECURITY AND ATTACHMENT				
CORROSION				
EMPENNAGE/CANARD:				
REMOVE INSPECTION PLATES AND FAIRINGS				
INSPECT CANARD ATTACH POINTS FOR SECURITY				
INSPECT VERTICAL FIN ATTACH POINTS				
INSPECT ELEVATOR/STABILIZER ATTACH POINTS				
INSPECT HINGES/TRIM TABS/ROD ENDS FOR ATTACHMENT AND FREE PLAY (SLOP)				
INSPECT EMPENNAGE/CANARD SKIN FOR DAMAGE/CORROSION				
INSPECT ALL CONTROL CABLES, HINGES AND PULLEYS				
INSPECT ALL CONTROL STOPS				
ENGINE:				
PERFORM COMPRESSION TEST #1 ________ #2 ________ #3 ________ #4 ________ #5 ________ #6 ________				
CHANGE OIL AND FILTER (CHECK FOR METAL)				
INSPECT IGNITION HARNESS FOR CONDITION AND CONTINUITY				
CHECK IGNITION LEAD CIGARETTES FOR CONDITION/CRACKS				
CLEAN AND GAP SPARK PLUGS				

CHECK MAGNETO TIMING/POINTS/OIL SEAL/DISTRIBUTOR				
INSPECT ENGINE MOUNT/BUSHINGS				
CHECK LANDING LIGHT OPERATION				
CHECK POSITION LIGHTS OPERATION				
CHECK ANTI-COLLISION LIGHT FOR OPERATION				
INSPECT ALL ANTENNA MOUNTS AND WIRING FOR SECURITY				
CHECK ALL GROUNDING WIRES (ENGINE TO AIRFRAME, WING TO AILERON/FLAP, ETC)				
INSPECT RADIOS/LEADS/WIRES FOR ATTACHMENT & SECURITY				
INSPECT CIRCUIT BREAKERS/FUSES PANELS FOR CONDITION				
OPERATIONAL INSPECTION:				
VISUAL INSPECTION OF THE ENGINE/PROPELLER				
ALL INSPECTION PANELS AND FAIRINGS SECURE				
PERSONNEL WITH FIRE BOTTLE STANDING BY				
BRAKE SYSTEM CHECK				
PROPER FUEL IN TANKS				
ENGINE START PROCEDURES				
OIL PRESSURE/OIL TEMPERATURE WITHIN LIMITS				
VACUUM GAUGE CHECK				
MAGNETO CHECK/HOT MAG CHECK				
IDLE RPM/MIXTURE CHECK				
STATIC RPM CHECK				
ELECTRICAL SYSTEM CHECK				
COOL DOWN PERIOD/ENGINE SHUT DOWN				
PERFORM OIL, HYDRAULIC, AND FUEL LEAK CHECK				
PAPERWORK:				
AIRWORTHINESS DIRECTIVES				
RECORD FINDINGS AND SIGN OFF INSPECTION AND MAINTENANCE IN LOGBOOKS				

EAA Safety Check List

Spend some time with your plane and this check list before those first flights. Thirty minutes with a pencil here may be worth the rest of your life.

PROPELLER

	Yes	No
1. Blades		
Laminations not separated?	☐	☐
Breaks scratches, nicks tipping?	☐	☐
Loose rivets in tipping?	☐	☐
Drain holes in tip clear?	☐	☐
2. Hub		
Any cracks or corrosion?	☐	☐
Hub properly seated and safetied?	☐	☐
3. Control Mechanism		
Oil leaks?	☐	☐
Worn bearings?	☐	☐
Secure?	☐	☐
4. Attachment		
All bolt & nut threads undamaged?	☐	☐
All bolts & nuts secured & safetied?	☐	☐
5. Spinner		
Cracks?	☐	☐
Properly secured?	☐	☐
Is spinner chafing into prop?	☐	☐

ENGINE & ENGINE COMPARTMENT

	Yes	No
1. Fuel System		
All lines of approved type?	☐	☐
All strainers clean?	☐	☐
All lines secured against vibration?	☐	☐
Gascolator bowl at low point in system when aircraft is in normal ground position?	☐	☐
Fuel drains operative?	☐	☐
All connections properly tightened?	☐	☐
2. Oil System		
All lines of approved type?	☐	☐
All lines secured against vibration?	☐	☐
Oil tank has no cracks or leaks?	☐	☐
Tank properly secured & safetied?	☐	☐
All plugs & strainers cleaned & safetied?	☐	☐
3. Ignition-Electrical System		
All wiring proper type and gauge?	☐	☐
All fastenings secured & safetied?	☐	☐
Magnetos properly grounded?	☐	☐
Spark plugs cleaned & undamaged?	☐	☐
Spark plugs properly torqued?	☐	☐
Engine grounded to airframe?	☐	☐
Starter/generator secured?	☐	☐
4. Exhaust Manifold		
Secured and safetied?	☐	☐
All gaskets in good condition?	☐	☐

	Yes	No
All stacks in good condition-no cracks or rusted-out areas?	☐	☐
Carb heat and cabin heat muffs removed and manifold inspected?	☐	☐

5. Controls

All secured and safetied?	☐	☐
No excessive play in any linkages?	☐	☐
No interference between any control and the structure throughout the full operating range?	☐	☐
Carb heater gate open & close fully?	☐	☐

6. Mount

Secured and safetied?	☐	☐
All joints inspected for cracks?	☐	☐
Any bends in mount tubes?	☐	☐
Bushings in good condition?	☐	☐

7. Cowlings

Secured and/or safetied?	☐	☐
All latches or fastenings working properly?	☐	☐
Any cracks properly checked or reinforced?	☐	☐
Cowlings clean?	☐	☐

8. Power Plant in General

All necessary safeties, palnuts, locknuts, etc. in place?	☐	☐
No fuel or oil leaks?	☐	☐
All accessories secured & safetied?	☐	☐

FUSELAGE-HULL

1. Structure

All welds sound?	☐	☐
All tubing straight and uncracked?	☐	☐
No rust or corrosion?	☐	☐
All attach fittings sound, no cracks, elongation of holes or worn threads?	☐	☐
All rivets properly installed?	☐	☐
Inspection openings for all vital areas?	☐	☐
Fuselage properly drained, that is, no built-in moisture traps?	☐	☐
Firewall of proper fireproof material?	☐	☐

2. Cover

Properly attached?	☐	☐
No tears, distortions, or abrasions?	☐	☐
Any breaks or ruptures properly repaired?	☐	☐

3. Control System

Properly secured and safetied?	☐	☐
Controls stops provided & adjusted?	☐	☐
All fittings of proper thread & size?	☐	☐

FUSELAGE-HULL

All pulleys of proper diameter for bends, proper size for cable, and guarded?	☐	☐
All cable of proper size (1/8" min) and condition?	☐	☐
Any parts in system subject to rotation for any reason properly secured and safetied?	☐	☐
Return springs on rudder pedals?	☐	☐
No interference between any control part (cable, tube or linkage) and any other part of the structure throughout full control movement?	☐	☐
Adequate room for full control throwwhen aircraft is occupied?	☐	☐
Controls arranged to minimize danger of blocking by foreign objects?	☐	☐
Grip properly secured to control stick or wheel?	☐	☐

	Yes	No
4. Electrical System		
All grommets, particularly in firewall, snug fitting and in good condition?	☐	☐
All wires of proper gauge, insulated, and secured?	☐	☐
Wires do not rest on abrasive surfaces?	☐	☐
Battery installation of sufficient strength?	☐	☐
Battery properly ventilated and drained?	☐	☐
No corrosion at or around battery or its vents?	☐	☐
Fuses of adequate amperage?	☐	☐
5. Fuel System-Tanks		
Drains properly located to discharge clear of aircraft?	☐	☐
All outlets properly screened?	☐	☐
Breather inlets clear?	☐	☐
Fuel shut-off valve installed?	☐	☐
Fuel shut-off valve easily reached by pilot?	☐	☐
All fuel lines of proper approved type?	☐	☐
All fuel lines secured against vibration?	☐	☐
Is tank located so that sufficient head is available in maximum climb with minmum fuel? Placard if necessary?	☐	☐
Has tank sufficient expansion area?	☐	☐
Any tank overflow discharge clear of hazardous areas on aircraft?	☐	☐
Is tank support sufficient to meet strength requirements?	☐	☐
Does tank clear surrounding structure?	☐	☐
Do tank supports minimize strain and chafing?	☐	☐

To insure its safe construction and operation, and to further emphasize the vital necessity for thorough consideration of every item which goes into your airplane, the following working check-list should be used, and it is suggested that it be made a part of the aircraft records.

<u>EXITS</u>		
1. Can aircraft be cleared rapidly in case of emergency?	☐	☐
Are special precautions available during test period, such as jettisonable doors or canopy?	☐	☐
If parachute is to worn, does it clear all controls?	☐	☐
Baggage Compartment		
1. Are walls and floors of sufficient strength to withstand flight loads?	☐	☐
Can anything escape from baggage compartment by accident?	☐	☐
Cabin-Cockpit		
1. Instruments		
Are all instruments functioning and accurate?	☐	☐
Are all instruments marked, max pressures, temperatures, speeds?	☐	☐
Are all vital instruments easily visible to pilot?	☐	☐
2. Flight-Engine Controls		
Are all engine controls marked or easily identifiable?	☐	☐
Are all engine controls smooth in operation, without excessive resistance, and easily available to pilot?	☐	☐
Are all flight controls arranged so that jamming by dropped gloves, etc. is impossible?	☐	☐
3. Fuel Systems		
Are all gas valves easily reached by pilot?	☐	☐
Are all gas valves marked ON, OFF, LEFT, RIGHT?	☐	☐
Are all gas valves in such a position that accidental operation is impossible or guarded in such a way that accidental operation is impossible?	☐	☐

	Yes	No
4. Seats		
Are seats of sufficient strength for maximum flight loads contemplated?...............................	☐	☐
Does seat "flex" enough at any time to interfere with flight controls?....................................	☐	☐
5. Safety Belts and Shoulder Harness		
Is installation and attachments of sufficient strength to meet 9G forward load minimum?........	☐	☐
Does attachment connect directly to primary structure?...	☐	☐
Are belts and harness in top condition?..	☐	☐
Is belt of correct size, that is, no long over-tongue?...	☐	☐
Is a separate belt and shoulder harness supplied for each occupant?....................................	☐	☐
6. Heating-Ventilation		
Is cabin or cockpit in negative pressure area and liable to suck in exhaust fumes?..................	☐	☐
Is any provision made for ventilating cabin other than normal leakage?..................................	☐	☐
7. Windshield-Windows		
Are windshield and windows of recognized aeronautical materials?.......................................	☐	☐
Is windshield braced against positive or negative pressures in flight, either by design or extra bracing?..	☐	☐

<u>**WING-TAIL SURFACES**</u>

	Yes	No
1. Fixed Surfaces		
Are all interior fastenings secured and/or safetied?...	☐	☐
Is interior properly weatherproofed?..	☐	☐
Have any mice been inside lately?..	☐	☐
2. Movable Surfaces		
Are stops provided, either at wing or somewhere else in the control system?.........................	☐	☐
Are all hinges and brackets sound?..	☐	☐
Are all hinge pins secured and safetied?..	☐	☐
Is there any excessive play in hinges?...	☐	☐
Is there any excessive play in control cables or tubes?..	☐	☐
3. External Bracing		
Is the interior of all struts weather protected?..	☐	☐
Are all adjustable fittings locked, secured, and safetied?...	☐	☐
Are struts undamaged by bends or dents?..	☐	☐
Are all wires serviceable with proper end fittings?...	☐	☐
4. Attach Fittings		
Are bolts of proper size installed?...	☐	☐
Are all bolts secured and safetied?..	☐	☐
Have all bolts been examined for wear?..	☐	☐
5. Flight Control Mechanism		
All cables and tubes unbroken or unbent & with proper end fittings?.....................................	☐	☐
All control attachments secured and safetied?..	☐	☐
All pulleys free from interference and guarded?..	☐	☐
All torque tubes and bell cranks in good condition?..	☐	☐
No interference with fuselage or wing structure throughout full control travel?.......................	☐	☐
6. Fuel Tanks		
(See Fuselage Section Also)		
Are drains supplied at low point in tank when aircraft is in normal ground position?................	☐	☐
Fuel overflow drains clear of aircraft - no tendency for overflow to soak into aircraft structure?	☐	☐

7. LANDING GEAR	Yes	No
Properly lubricated?	☐	☐
Proper oleo inflation?	☐	☐
Shock cords or springs in good condition?	☐	☐
All attach fittings uncracked and sound?	☐	☐
All bolt holes not elongated?	☐	☐
All attach bolts secured and safetied?	☐	☐
Brake lines in good condition?	☐	☐
Brakes operating properly?	☐	☐
Correct hydraulic fluid in lines?	☐	☐
Wheels uncracked?	☐	☐
Tires unworn & properly inflated?	☐	☐
Excessive side play in wheel bearings?	☐	☐

GENERAL

ALL BOLTS WHEREVER POSSIBLE, HEAD UP AND FORWARD.

All exterior fastenings visible from cockpit or cabin should have safetied end toward pilot, wherever possible.

A complete walkaround inspection of the aircraft should be accomplished to check that every bolt visible on the exterior is secured and safetied. That there is no visible structural damage. That all inspection panels and covers are in place and attached. That all parts of the aircraft are in proper alignment.

DON'T FORGET TO PUT IN ENOUGH GAS PRIOR TO THAT FIRST FLIGHT - GROUND RUNNING AND TAXI TESTS CAN USE UP A LOT MORE THAN YOU THINK!

S-6S OPTIONAL MAP BOX INSTALLATION

1. The parts to the map box come ready to install. The map box door has been powder coated black and should match with any panel color. However, if you decide to paint the map box door another color, prepare the surface by scuffing with a Scotch Bright pad. No primer is required.

2. The door knob provided is extra long on the threaded shaft. Cut off and file leaving ½" remaining. Drill out the knob hole as indicated by the parts drawing to #11 and install the knob.

3. Rivet on the door catch above the door knob as indicated by the parts drawing.

4. Rivet the top panel to the map box. Attach the rollers to the top panel with the small screws provided. The exact location of the rollers will be determined once the door is installed.

5. Fit the front end close out to the narrow end of the box with a non-90 degree bend flange to the top and rivet.

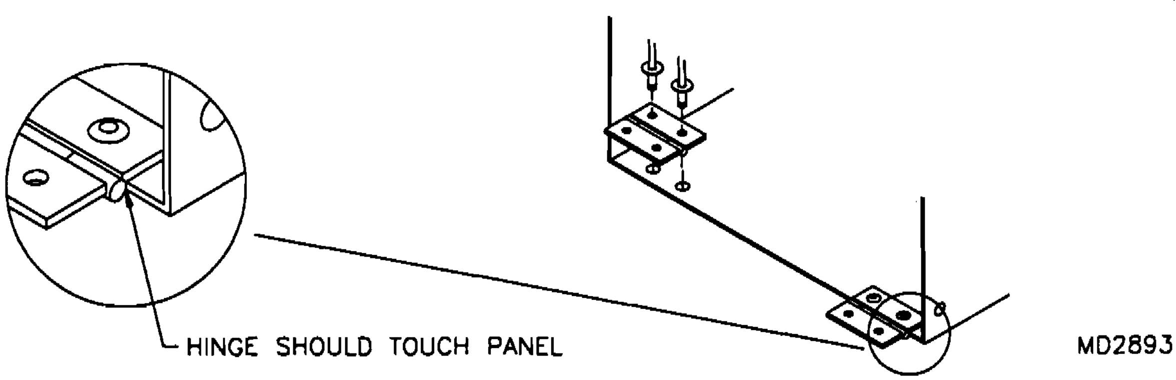
6. If your panel was cut custom for the map box, check the fit of the map box into the panel by clecoing it to the front side of the panel. Remember the front side of the panel is not the side the pilot sits on! Rivet from the pilot side after fit-up checks out.

For the non-custom panels, place the map box in position over the hole in the panel. Check if the opening is large enough to file to suit. With the box in the proper location, drill and cleco. **HINT:** Use an extra long #30 drill bit to gain the best access to transfer drill through the attach angles.

7. Place a center mark on the top front edge of the map box. Place another mark 1/4" to each side of the center mark. Place the front attach angles to the front of the map box so they are centered on the ½" tube and flat against the map box. Each inside edge of the angles should line up with their respective mark at 1/4" off center line. Use masking tape to hold the angles in place. Drill and rivet the angles to the map box front. Drill into the ½" tube on center line and rivet with stainless steel rivets.

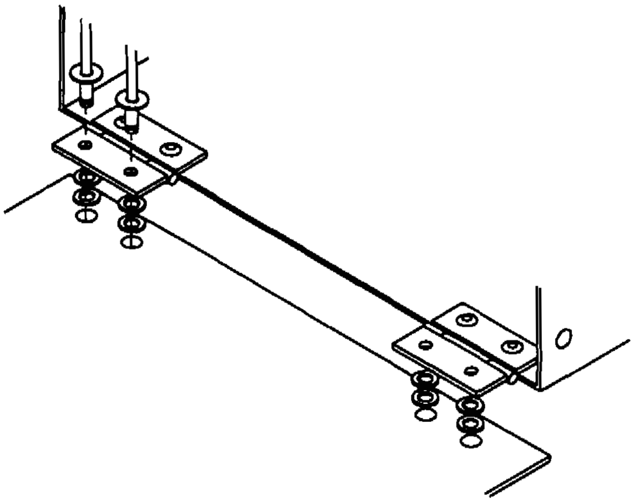
8. Rivet the hinges to the door edge of the map box as shown in **Figure 020-08.**

FIGURE 020-08



9. Rivet the door to the hinges placing a double stack of washers between the hinge and door as shown in **Figure 016E-09.**

FIGURE 020-09



MD2894

10. Test operate the door. It should be held firmly closed by the clasp. If the door does not close properly, adjust the roller location. Trim off the screws once the door catch is properly set.

11. In some cases, a magnetic compass maybe installed on the top of the dash. Placement of metal objects in the map box may cause the compass to be unreliable. Please post the warning decal provided.

S-6S OPTIONAL VENTRAL FIN ASSEMBLY & INSTALLATION
FOR TRIKES WITH NOSE WHEEL PANTS OR FLOAT PLANES

The ventral fin is designed to add direction stability and enhance roll/yaw coupling on super six trikes with nose wheel pants and float planes. The design of the fin uses flush blind rivets to allow it to be assembled, covered and painted, then attached to the aircraft via the existing tail hook and cable tang bolts and attach angles riveted to the station 5 bottom crossing tube. The ventral fin features a replaceable skid. Check the skid during pre-flight to monitor wear.

1. Refer to the parts drawing and install the three buttons (3/16 washer and rivet) onto both the ventral fins top and bottom spars.

2. Cleco the gussets to the top spar. Position the bottom spar between the gussets. Transfer drill through the gussets into the bottom spar on centerline. Counter sink the proper holes in the gussets. Refer to the parts drawing. Disassemble and debur.

3. Rivet the gussets to the spars. Use the correct rivets as called out in the parts drawing.

4. Fabricate the three spreader tubes from the raw stock provided. They should be approximately 5 7/8" long. Size so there is no bow in the top or bottom spars.

5. Stand the ventral fin on a flat surface with the top spar against the surface. Place an 1/8" spacer under the forward end. Position the aft attach angles on each side of the fin. Transfer drill through the attach angles, gussets and centerline of bottom spar. Cleco the attach angles in place. The angles will be riveted after fin is covered and painted.

6. Locate the center line of the bottom cross tube at station 5. Use masking tape to mark. This line will be used to locate the holes for the attach of the forward brackets to the bottom crossing tube.

7. Locate the centerline of the aircraft at the crossing tube and at the tailchannel. Remove the tail tie down hooks from the fuselage.

8. Support the fin in position. Keep on centerline of the aircraft. Mark the locations of the aft attach angles onto the lower cable tang. Remove the fin and cable tang. Position the cable tang on the attach brackets using the marks. Using the tang as a guide, transfer drill through the attach angles.

9. Bolt the tang, angles and fin onto the aircraft. There should be an 1/8" gap between the fin and the station 5 cross tube. Position the forward brackets on station 5. Keep the fin on centerline. Allow a small amount of clearance between the angle brackets and the fin for covering. Using the angle brackets as a drill guide, drill the station 5 bottom cross tube. Debur and rivet in place. Drill the 3/16" holes into the fin using the brackets as guides. Remove the fin and deburr.

10. Cover the fin and paint. The adhesive and paint are builder supplied items.

11. Apply the foam seal to the top edge of the fin. Install the fin onto the aircraft. Rivet to the aft brackets and bolt to the forward brackets.

12. Hold the tail of the aircraft down, mark the point of contact between the fin and ground. Position the skid block. Transfer drill and screw in place.

S-6S OPTIONAL SWING WING SYSTEM

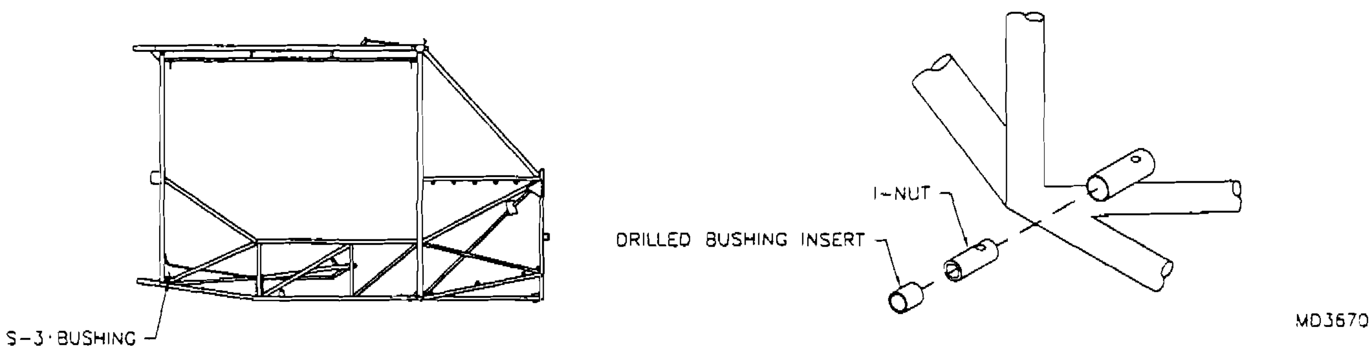
Review instructions thoroughly before starting; refer to appropriate parts drawing during assembly and installation. To assemble wing supports, wings must be mated to fuselage.

Swing Wing System comprises two wing supports, two tail braces, associated airframe components and hardware. While stowed, each wing rests on wing support and is secured to vertical stabilizer by tail brace.

1. Locate hole for nut plate along aft side of leading edge spar, 1 1/16" below center of Clevis pin hole and 1 3/8" from spar's root; drill 1/4" (hole is pre-located on 116 wing spar). Center nut plate over hole to locate and drill #40 rivet holes; rivet nut plate *inside* spar, per parts drawing.

2. Install I-nut, bushing insert and associated hardware to S-3 bushing, per **Figure 20E-2.** (Wing support will attach to fuselage at S-3 bushing; I-nut is threaded to accept U-bracket of wing support's lower TE support tube.)

FIGURE 20E-2



3. Cut and debur two ST-16 tangs, per **Figure 20E-3.** Bend tangs 40 degrees (this may be accomplished by mounting in vise and tapping with hammer). Bolt modified tang to wing at second aileron hinge from tip, per parts drawing. Bend two more ST-16 tangs to right angles, per **Figure 20E-3A.** Locate and rivet modified tang at edge of opening in root rib skin from which aileron push-pull tube emerges; position tang so that tube may be pinned to it. Refer to parts drawing. (Tang may be mounted to either inside or outside of rib skin.)

FIGURE 20E-3

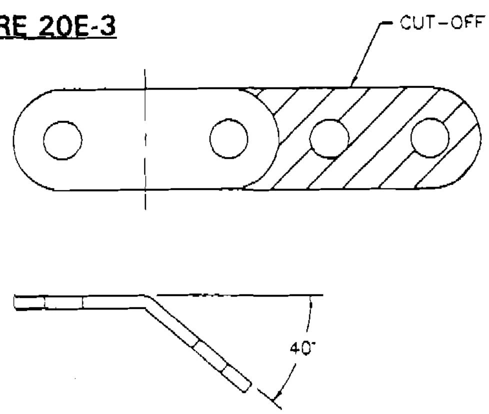
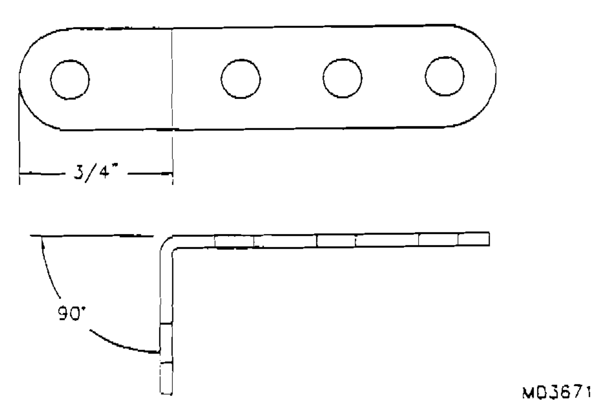


FIGURE 20E-3A



4. Install eye bolt, washer and shear nut to upper end of aft strut, per parts drawing.

5. Locate skylight support on aft end of wing root, per parts drawing; top surface of support should be flush with top of rib. Transfer locations of rivet holes in rib clip and aft rivet hole in root rib skin to skylight support; drill #30 and rivet skylight support in place. (Skylight will rest on skylight supports when wings are stowed.)

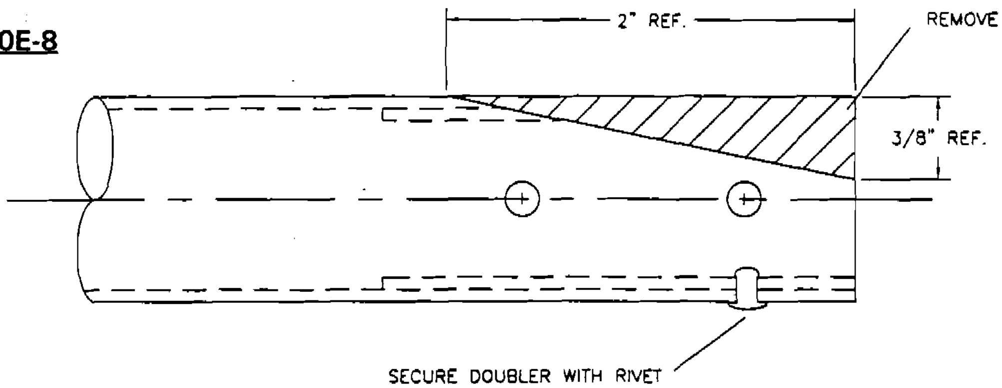
6. Install shackles to top aft cable locations of vertical stabilizer, per parts drawing.

7. Install swing wing U-bracket to pivot tube per parts drawing. Size-drill holes near top of lower TE support tube to 1/4". Slide lower TE support tube onto pivot tube until bend impedes travel; transfer-drill four holes near bottom with #11 bit and rivet. *Be certain to transfer-drill so that holes at upper end of lower TE support tube are vertical when fitted to aircraft; see parts drawing.* Slide middle TE support tube onto lower TE support tube, align #40 holes and transfer-drill to 1/4".

For 116 wing:

8. Fabricate doubler by cutting three-inch segment from lower end of TE doubler/extension. Slide doubler into top of upper TE support tube (top is identified by #40 holes ½" from end); secure by drilling #40 about ½" from end and riveting. Transfer-drill 1/4" through pre-located holes near top of upper TE support tube; cut and deburr per **Figure 20E-8**. Place lift strut connector along upper TE support tube to locate second bolt hole and transfer-drill 1/4". Slide connector into upper TE support tube, install bushings and secure with hardware per parts drawing.

FIGURE 20E-8



Screw lower TE support tube into fuselage. Pin upper TE support tube to aft strut eyebolt. Slip middle TE support tube onto end of upper TE support tube and pin to lower TE support tube. With all tubes in place, transfer-drill upper TE support tube through holes in middle TE support tube. *Before drilling, ensure that tubes are fully extended, eliminating slack.*

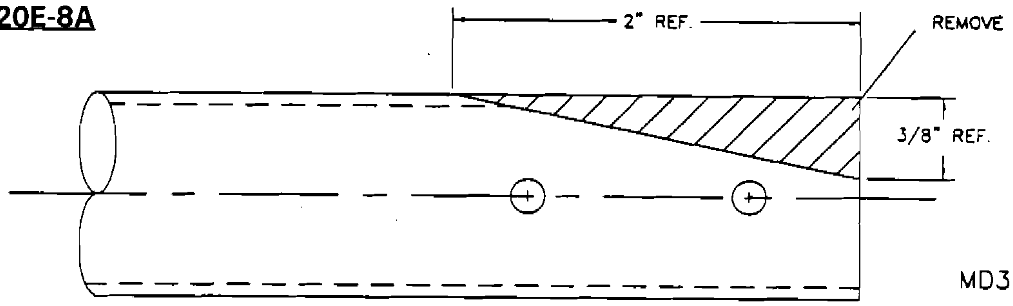
Fabricate flap support per parts drawing. To do so, remove Loc Ring, castle nut, bolt and Teleflex cable from flap horn and raise flap to vertical position. Note distance between pin joining middle and upper TE support tubes and bolt hole for retaining Teleflex to horn; cut flap support to this length, providing allowance for tangs. Assemble flap support per parts drawing and install between support tubes and flap.

For standard wing:

8. Slide middle TE support tube onto lower TE support tube, align holes per parts drawing and size-drill 1/4". Slide upper TE support tube into middle TE support tube, align holes per parts drawing and size-drill 1/4".

Cut and deburr TE doubler/extension per **Figure 20E-8A.** Size-drill pre-located holes near top of TE doubler/extension to 1/4". Slide connector into TE doubler/extension, install bushings and secure with hardware per parts drawing.

FIGURE 20E-8A

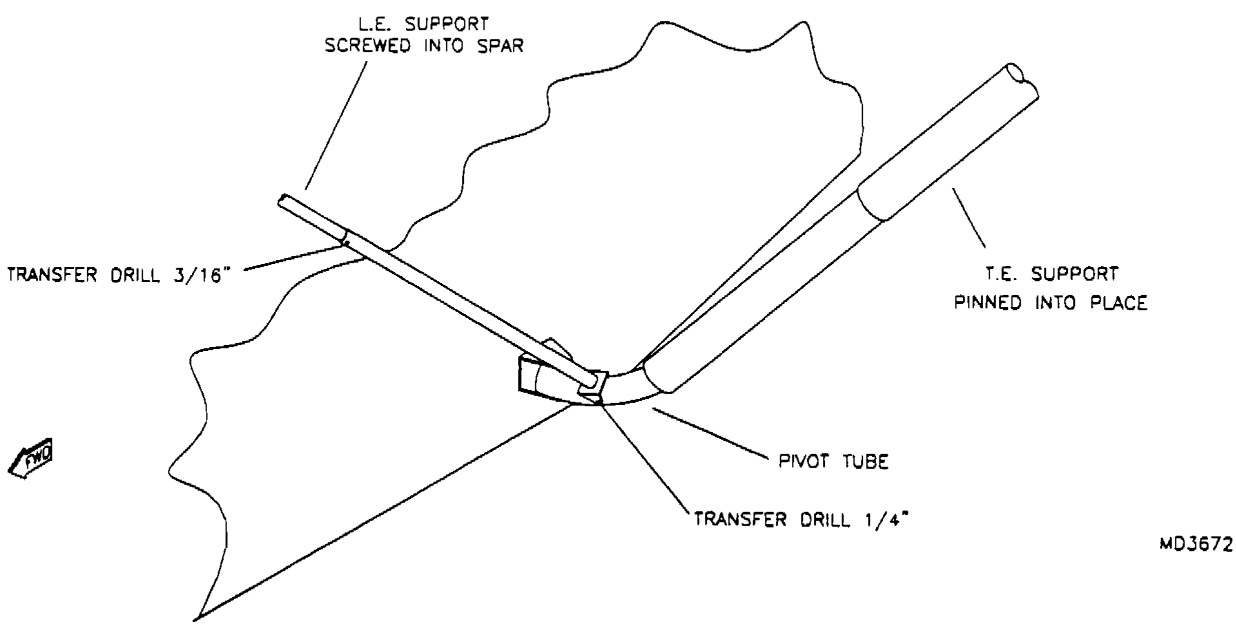


Screw lower TE support tube into fuselage. Pin middle TE support tube to lower TE support tube. Pin TE doubler extension to aft strut eyebolt. Slip upper TE support tube onto TE doubler/extension and pin to middle TE support tube. With all tubes in place, transfer-drill TE doubler/extension through holes in upper TE support tube. *Before drilling, ensure that tubes are fully extended, eliminating slack.*

Fabricate flap support per parts drawing. To do so, remove Loc Ring, castle nut, bolt and Teleflex cable from flap horn and raise flap to vertical position. Note distance between pin joining middle and upper TE support tubes and bolt hole for retaining Teleflex to horn; cut flap support tube to this length, providing allowance for tangs. Install assembled flap support between TE support tubes and flap.

9. Slide LE support tubes together and fit U-bracket at lower end onto pivot tube. Extend upper LE support tube and screw into nut plate in leading edge spar. Locate holes of U-bracket on pivot tube centerline and transfer-drill 1/4" into pivot tube; pin in place. Transfer-drill 3/16" through holes in lower LE support tube and pin LE support tubes together. See **Figure 20E-9.**

FIGURE 20E-9



For convenience, locate and drill 3/16" hole approximately 1" from upper end of upper LE support tube; collapsed LE support tubes may be pinned together through this hole. Six-inch segments of foam tape may be applied to inboard sides of lower LE support tubes to protect optional bubble doors from possible abrasion during stowage.

10. Locate hole in wing root seal to allow access for upper LE support tube. Install root seal and extend LE support tubes to check hole location; widen and/or elongate hole as necessary to accommodate upper LE support tube.

11. To preclude damaging universal hinge at trailing edge spar/fuselage juncture, check that bolt through inboard hinge of flap is oriented with head facing fuselage.

For 116 wing:

Repeat above steps as necessary for remaining wing to complete swing wing assembly and installation. Wing supports and tail braces may be broken down, placed in swing wing carry-all and stowed in Coyote's baggage compartment. See ***Swing Wing Operating Instructions*** below.

For standard wing:

Swing wing system may be completed to allow stowage of standard wings without need to fold horizontal stabilizer; however, if stabilizer is folded, wing tips can be stowed closer to tail, further reducing hangar space requirements.

To complete swing wing system without folding tail:

12. Inside cabin, remove Loc Ring from leading edge Clevis pin; push pin forward, allowing it to be grasped from front of spar. Remove pin from aileron push-pull tubes and pull tubes apart. Pin wings push-pull tube to right-angle bracket on root. Remove Clevis pin at strut/fuselage juncture; remove leading edge Clevis pin. Pivot wing to tail, leaving small space between trailing edge and tail cable to prevent chafing.

13. Note distance between shackle at aft cable attach location of vertical stabilizer and tang on respective aileron hinge; cut tail brace in middle and splice in segment of ⅞" x .058 extension required to span this distance. Test fit tail brace to aircraft, checking that ends of brace are rotated as necessary to pin in place. Once satisfied, drill #30 and rivet tail brace sections to extension.

To complete swing wing system with tail folded:

Additional parts required:

4	ST-16 Tangs
2	ST-16 Tangs - Bent
1	½"x.035"x48" Aluminum Tubing
4	CCPQ-62 Rivets
2"	Primer Line

14. Folded tail is secured by stabilizer braces. To fabricate, cut two (2) brace tubes (1/2"x.035") to 7½" length and gently squeeze ends in padded vise to flatten; inserting tang into end of tube will ensure that sufficient space remains when flattened. ***NOTE:*** *The flattened ends must be on the same plane.* Remove tang and drill #11 on centerline, 1/4" from each end; deburr and radius ends. Cut 5/8" segment of primer line tubing, slip segment onto quick pin and insert pin through end of brace; insert another quick pin, sans segment, through other end of brace.

15. Detach lower tail cables from horizontal stabilizers and elevator horns from elevator yoke. Install tangs, modified per **Figure 20E-3**, to forward cable attach locations on vertical stabilizer and upper surface of horizontal stabilizers; orient tangs roughly as depicted in parts drawing. Raise horizontal stabilizers to vertical position and secure to vertical stabilizer by fitting stabilizer brace over stabilizer's forward tang and installing quick pin; adjust orientation and bend angle of tangs as required to accommodate brace. Install pin with 5/8" plastic segment to lower end of brace; segment prevents quick pin from extending too far beyond tang and damaging horizontal stabilizer skin.

16. Install Bent ST-16 Tang to the aft underside of the trailing edge spar. ***CAUTION:*** *Position the tang as close to aft centerline as possible, yet allow free travel of the aileron.* Rivet the tang even with the aft end of the tailcone. Note distance between tang and center of top longeron when wing is folded. Cut 1/2"x.035" tube to approximate length, allowing margin for error. Gently squeeze one end in padded vise to flatten; as with stabilizer brace, allow sufficient space for fitting over tang. Drill #11 on centerline, 1/4" from end; deburr and radius. Pin brace to bent tang on aft spar. Locate unfinished end on top longeron aft of the upper tail gusset and determine finished length.
Remove brace from stabilizer, trim to length, flatten end as required, drill #11, deburr and radius. Drill #11 vertically through the longeron. Brace is secured to tailcone and wing with quick pins.

Repeat above steps as necessary for remaining wing to complete swing wing assembly and installation. Wing supports and tail braces may be broken down, placed in swing wing carry-all and stowed in Coyote's baggage compartment. See ***Swing Wing Operating Instructions*** below.

S-6S OPTIONAL SWING WING OPERATING INSTRUCTIONS

Wings may be stowed one-at-a-time as follows.

1. Pin tail braces to shackles on vertical stabilizer. (If folding tail, pin stabilizer braces to forward tangs on vertical stabilizer, detach lower tail cables from fuselage, detach elevator horns from elevator yoke, raise and pin stabilizers to stabilizer braces.)

2. Inside cabin, remove Loc Ring from wing leading edge Clevis pin; push pin forward, allowing it to be grasped from front of wing root in step 9. Remove pin from aileron push-pull tubes and pull tubes apart. Pin wing's push-pull tube to right-angle bracket on root. Close cabin door.

3. Remove screw(s) from wing cuff.

4. Remove Loc Ring, castle nut, bolt and Teleflex cable from flap horn.

5. Screw lower TE support tube to fuselage; pin remaining TE support tubes and flap support together.

6. Attach flap support to flap horn with horn's castle nut, bolt and Loc Ring; leave Teleflex aside.

7. Pin LE support to pivot tube; extend LE support to leading edge spar and screw into nut plate. Insert pin in LE support tubes.

8. Pin TE support to eyebolt in aft strut.

9. Remove Clevis pin at strut/fuselage juncture. Remove wing leading edge Clevis pin. Pivot wing tip to tail.

10. Pin tang on aileron hinge to tail brace.

Repeat steps 1 through 10 for other wing; reverse steps to unstow.

CAUTION!

Tricycle gear aircraft may settle onto tail during stowage; be prepared to lower tail gently to ground. Fuel may siphon between tanks and vent from aircraft when parked on uneven surfaces. TAKE CARE TO AVOID FUEL HAZARDS! Ensure that wings, struts, control surfaces, teleflex cables, push-pull tubes and hardware are correctly installed before entering aircraft. CHECK AIRCRAFT THOROUGHLY PRIOR TO FLIGHT!

S-6S OPTIONAL AVIONICS MOUNTS

ANTENNA BACKING PLATE

The Antenna Backing Plate may be installed before or after covering of the aircraft.

1. Locate the parts shown in the parts manual.

2. Several pilot holes have been located for antenna mounting. Determine location of each antenna and final hole size. **NOTE:** Typically the VHF/COM Antenna will mount on the right and the Transponder Antenna will mount on the left. **CAUTION:** Comply with Emergency Locator Transmitter (ELT) antenna location and cable routing directions. Otherwise unwanted ELT activation may be triggered by the VHF/COM transmission.

3. Position the Antenna Backing Plate, on the belly of the aircraft, between the Station 4 Bottom Crossing and Diagonal Tubes. Be sure the Antenna Backing Plate is flush with the bottom of the belly stringers, or against the skin if the fuselage is already covered.

4. Locate and drill five (5) #30 holes in each flange, on tube centerline. Cleco as you drill. Deburr and rivet. Install antennas during final assembly.

RADIO MOUNT PLATE

The Instrument Panel must be fit-up prior to installing the Radio Mount Plates. RANS Radio Mount Plates are available in single, dual or triple stack designs.

1. Locate the parts shown in the parts manual.

2. Position the Mount Plates with the short flanges against the Instrument panel. Place the radio trays between the Mount Plates. Center the assembly and drill #30 through the flanges and panel. Cleco in place. Install the radio trays to the Mount Plates. **NOTE:** Allow clearance for the radios to slide in and out freely. Rivet mount plates to the Instrument panel.

3. Mount the forward end of the Mount Plates to the diagonal fuselage brace tubes with cushioned clamps. Hummer Tangs may be needed, depending on the installation.

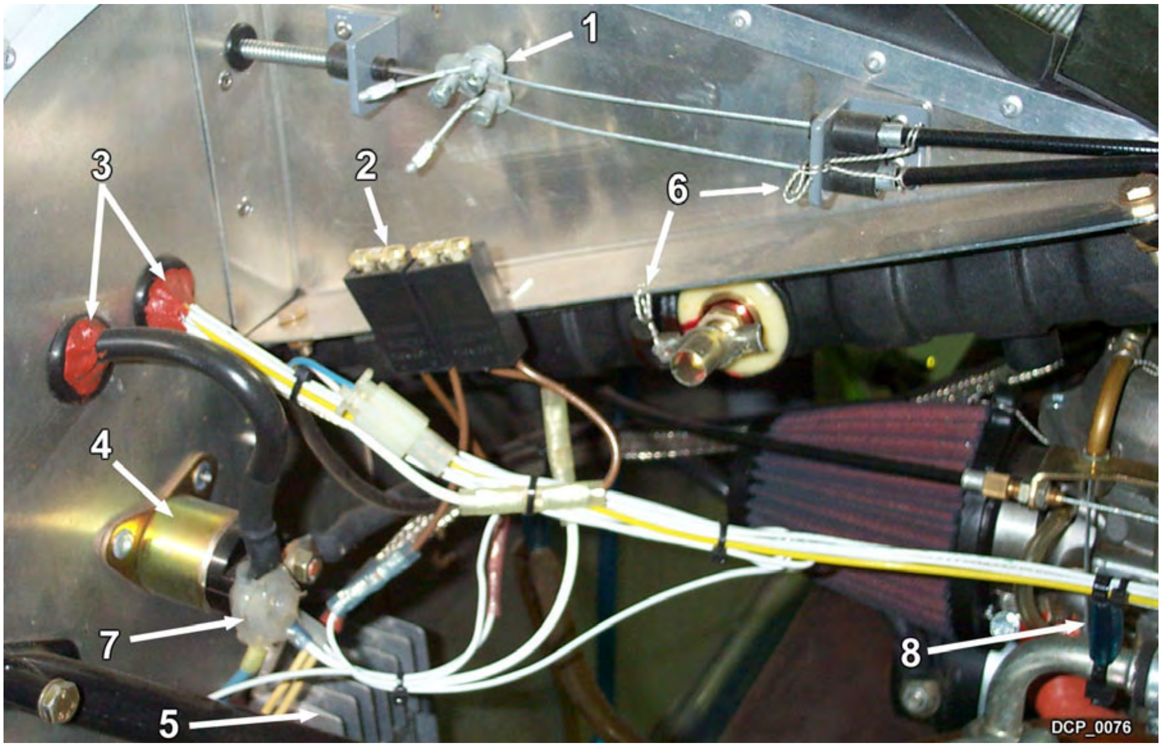
HEADSET JACK MOUNT PLATE

The Headset Jack Mount Plate is designed to retain Pilot & Co-pilot headset jacks and 2 aux. power plugs in the Interior Baggage Compartment Panel (KPIN0004).

1. Locate the parts shown in the parts manual.

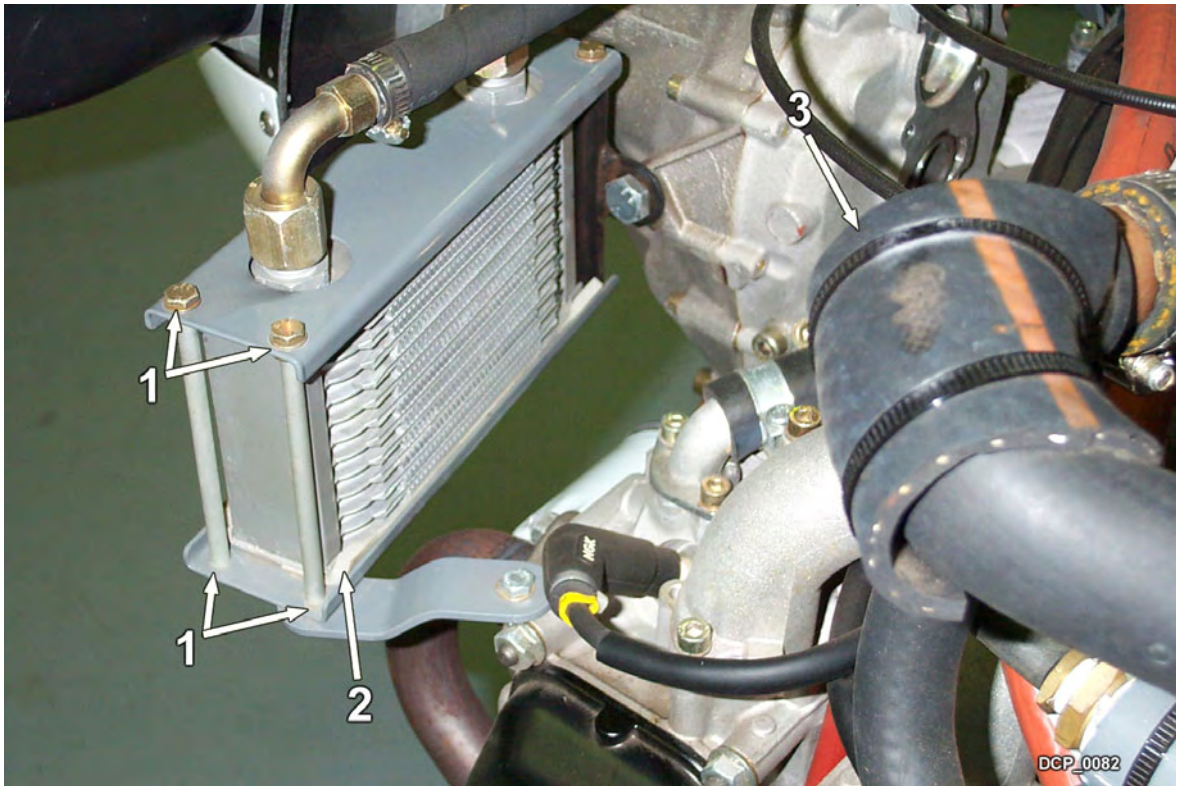
2. Position the top end of the Mount Plate centered and flush with the top of the Baggage Panel on the aft side. This will position the Mount Plate centered behind the seats. NOTE: The aux. power plugs are to the bottom.

3. Transfer drill #30 and rivet the Mount Panel. Use the mount panel as a guide and trim out the holes with a Dremel Tool.



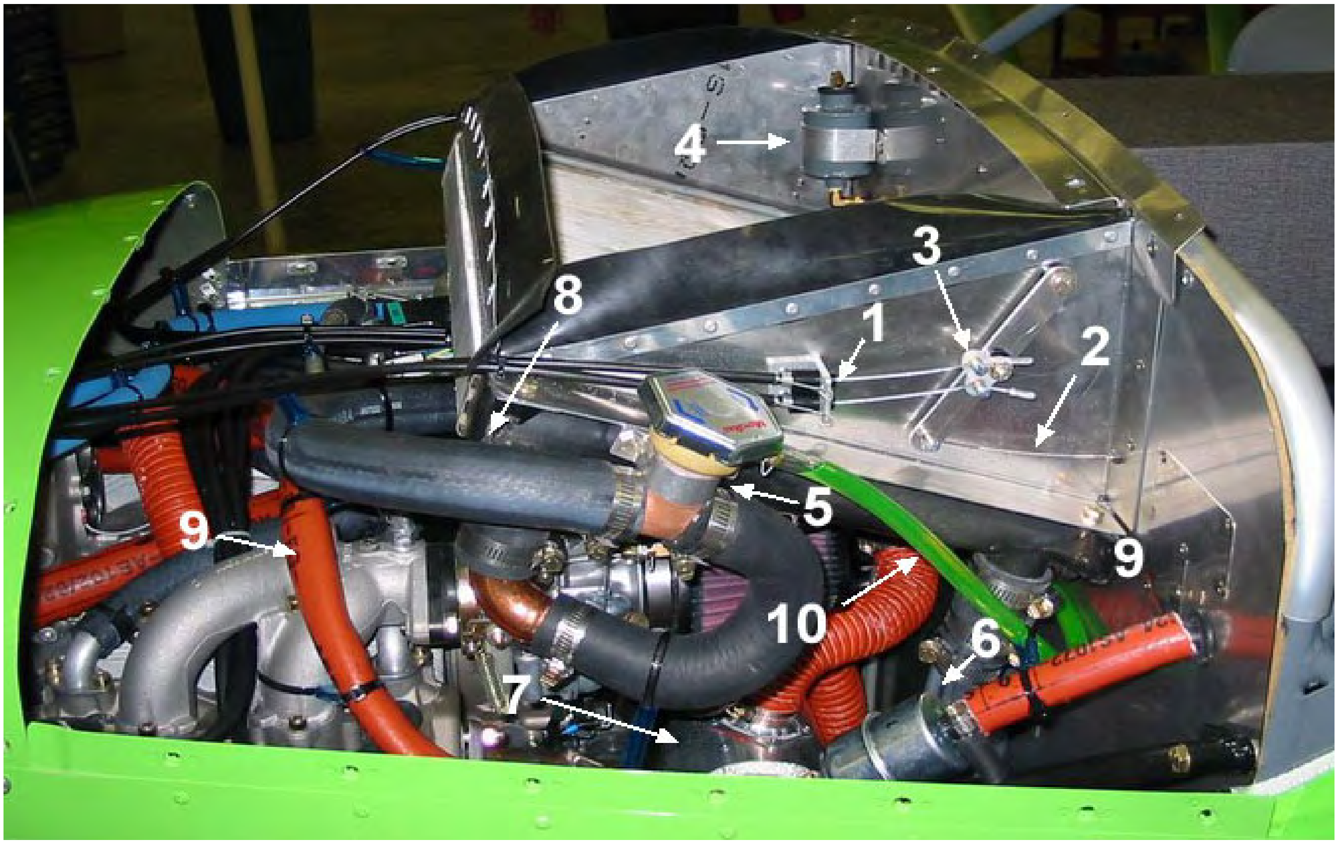
1. THROTTLE
2. BLADE TYPE FUSES
3. SEALANT, USE SILICONE
4. STARTER SOLENOID
5. REGULATOR
6. SAFETY WIRE RADIATOR DRAIN VALVE AND THROTTLE CABLES
7. SEALANT, USE SILICONE
8. STAND OFFS ARE HANDY TO ROUTE WIRE BUNDLES

OIL COOLER INSTALLATION



1. LOC-TITE ALL OIL COOLER MOUNTING
2. FOAM RUBBER PADS COOLER
3. ANTI-CHAFE, USE COOLANT HOSE SCRAP

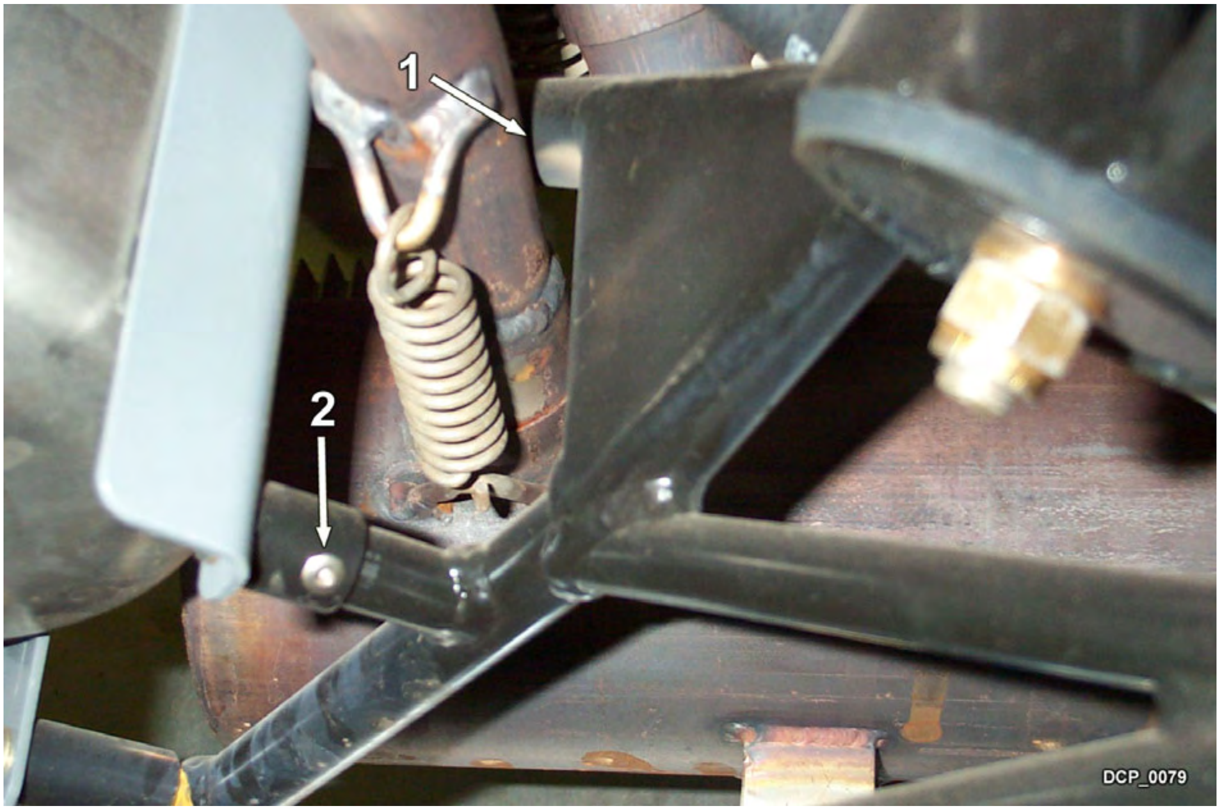
S-6ES – 912 INSTALLATION – 80/100 HP



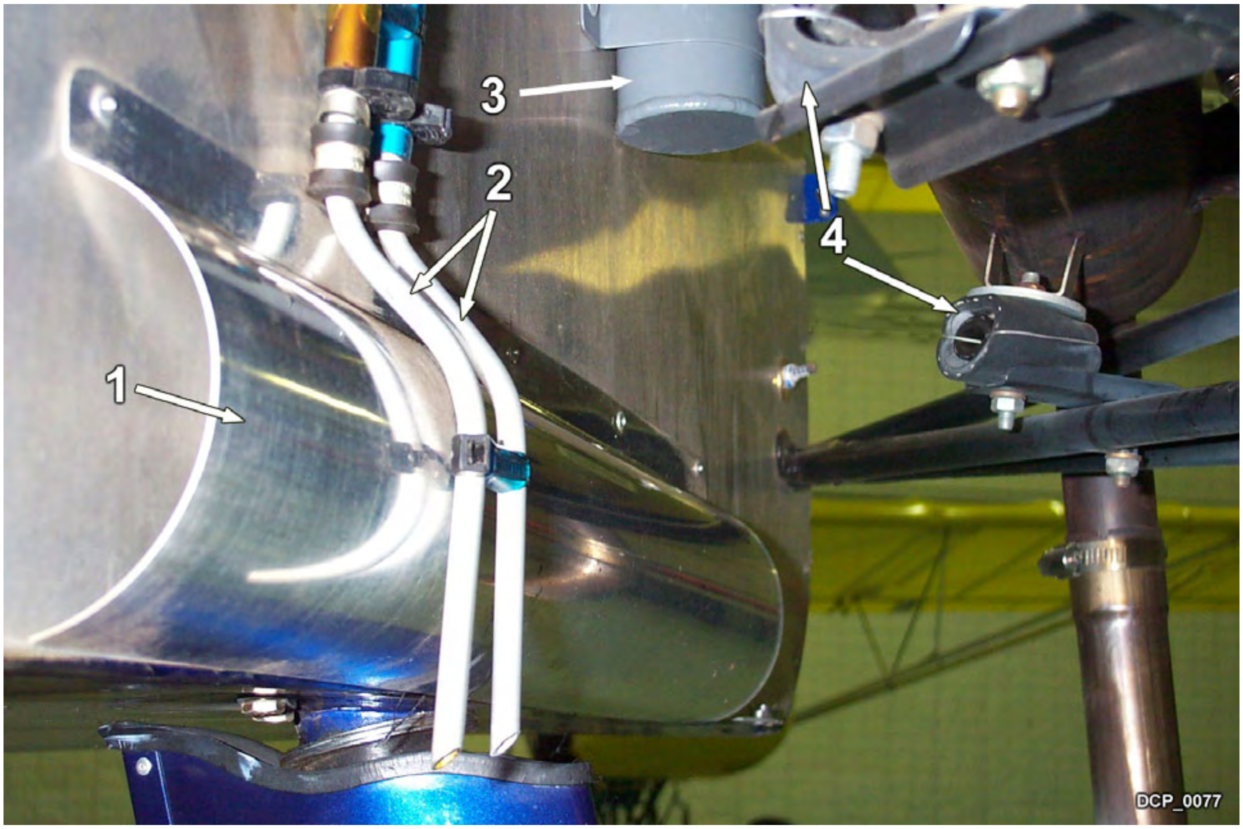
1. SAFETY WIRE CHOKE
2. CHOKE WIRE
3. LOC-TITE SCREWS
4. BRAKE FLUID RESERVOIR
5. FILLER TEE
6. FUEL FILTER
7. HEATER WRAP
8. BLEEDER SCREW (BEHIND HOSE)
9. FIRESLEEVE ON FUEL LINE IS A GOOD IDEA
10. COOLANT OVERFLOW TUBE

LANDING LIGHT INSTALLED ON 912

1. ECONO LANDING LIGHT FROM WAL-MART, BLAZER PROJECTOR BEAM FOG LAMP SYSTEM (C4072K)



1. CLEARANCES ARE TIGHT SOME DIMPLING OF EXHAUST TUBE MAY BE REQUIRED
2. 1/8" DIAMETER STAINLESS STEEL RIVET SECURES OIL TANK MOUNT IN POSITION



1. VENTURI BULB
2. METAL OVERFLOW TUBES
3. COOLANT OVERFLOW BOTTLE
4. MUFFLER MOUNT, NOTE: CHANNEL FLANGE POSITION

1. RIVET HOLDS POSITION OF CLAMP
2. MUFFLER IS CLOSE BUT WILL CLEAR