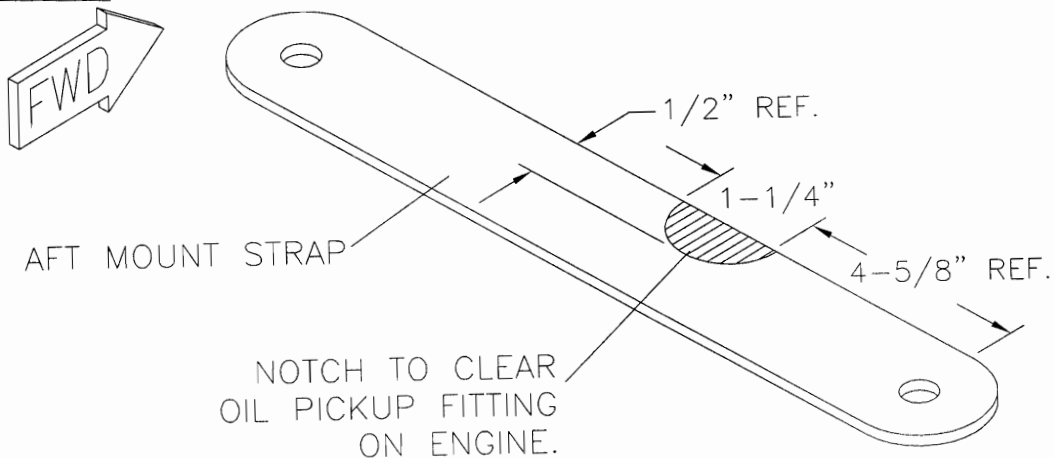


## S-12XL 912/912S ENGINE INSTALLATION

### 912/912S ENGINE MOUNT ASSEMBLY

1. Locate the parts shown in the parts manual.
2. Modify aft mount strap per **FIGURE 04-02**. Drill (1) hole in aft mount strap to  $3/8"$ . Temporarily bolt to engine mount angle. Align remaining strap hole with mount angle hole. Transfer drill  $3/8"$ .

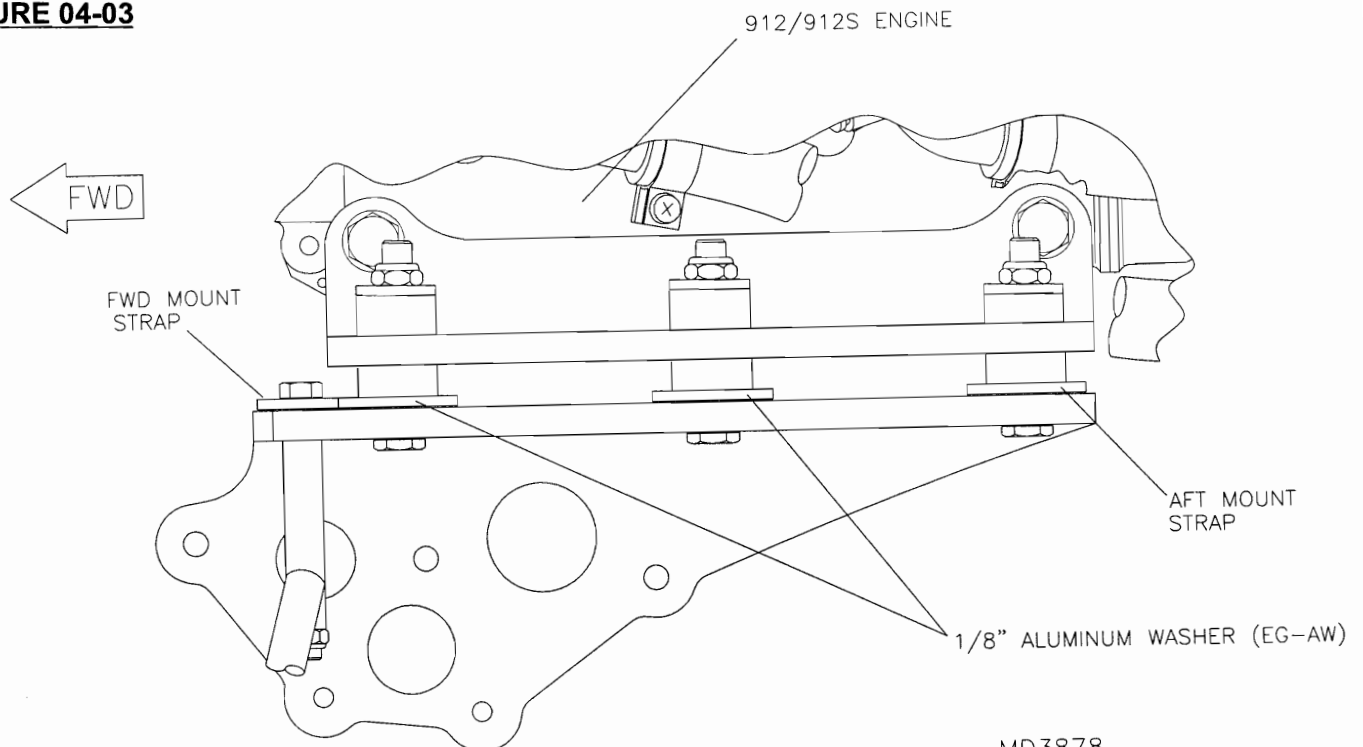
**FIGURE 04-02**



MD4243

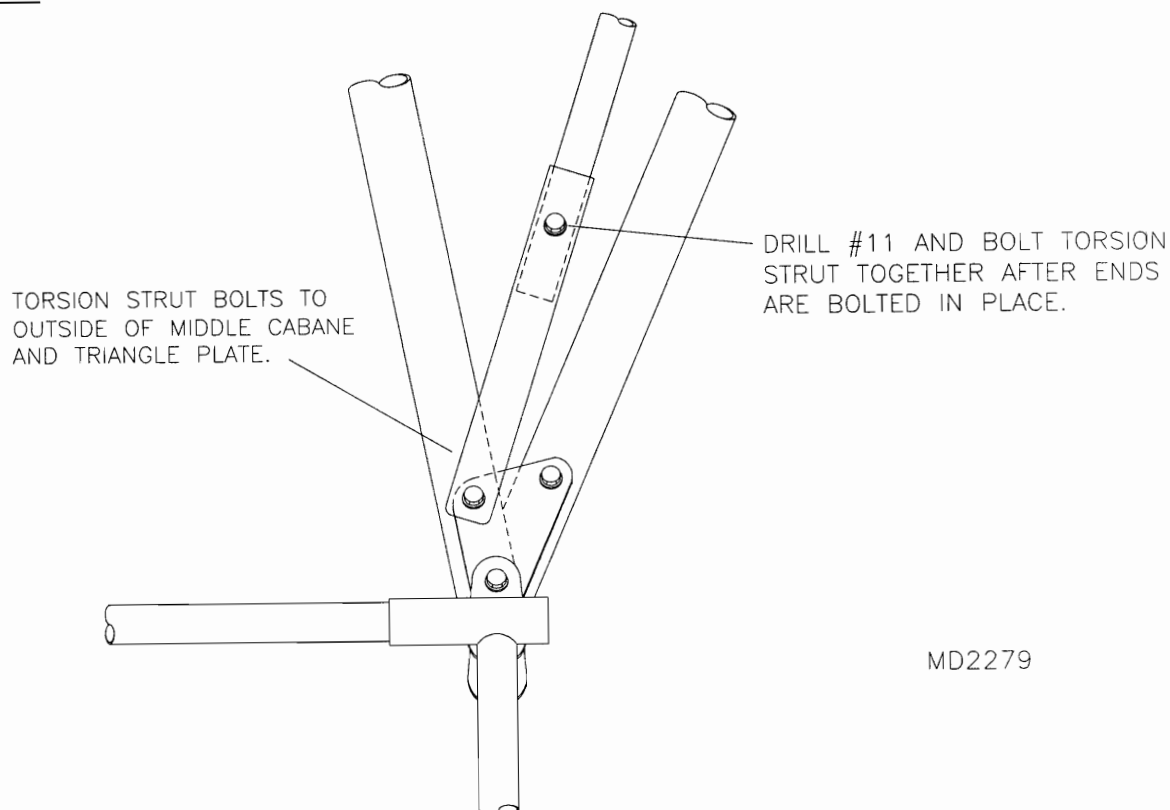
3. Assemble the engine mount as shown in the parts manual. **CAUTION: Washers under rubber isolator set tilt to engine. Failure to follow sequence shown in FIGURE 04-03 may result in prop striking flow fence.**

**FIGURE 04-03**



MD3878

4. Drill (1) hole in fwd mount strap to 1/4". Temporarily bolt to engine mount angle. Align remaining strap hole with mount angle hole. Transfer drill 1/4".
5. Attach the torsion struts and forward mount strap to the forward holes on the engine mount. Bolt the torsion strut end fittings to the middle cabane at the top of the triangle plate. Determine the length of the torsion strut so that it will bottom into the end fitting and cut. Transfer drill #11, once both ends are bolted in place, maintain at least 1/4" E.D. and install hardware shown in the part manual. See **FIGURE 04-05**.

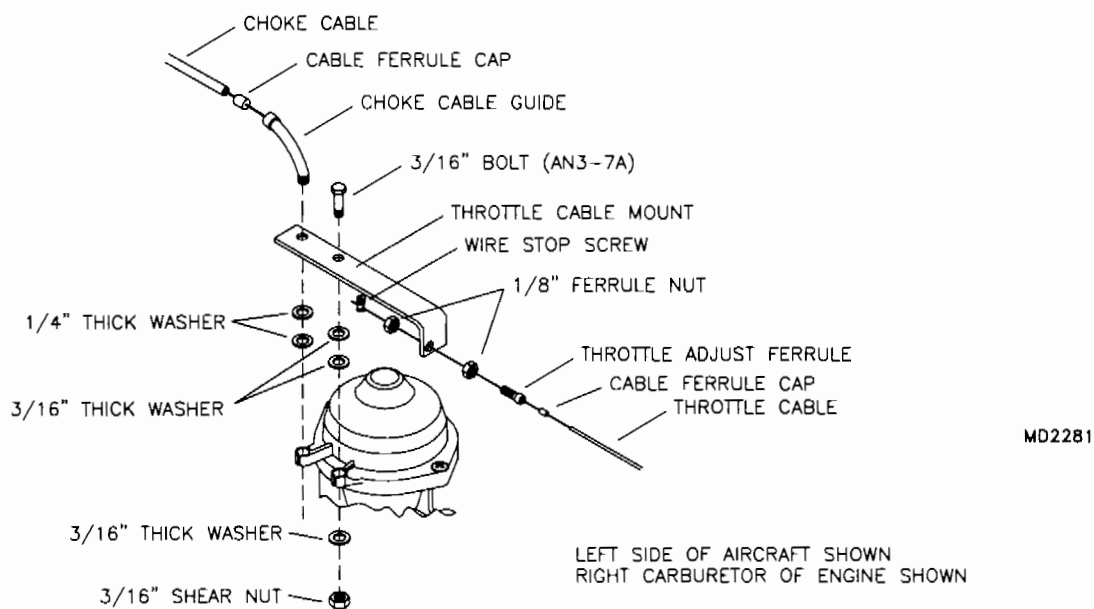
**FIGURE 04-05**

6. Bolt the engine in place using 10MM hardware shown. Use Loctite on these bolts. **CAUTION:** Be sure that if the tail boom is removed during any step of assembly to have sufficient weight in the front of the fuselage cage to prevent the cage from tipping aft ward.

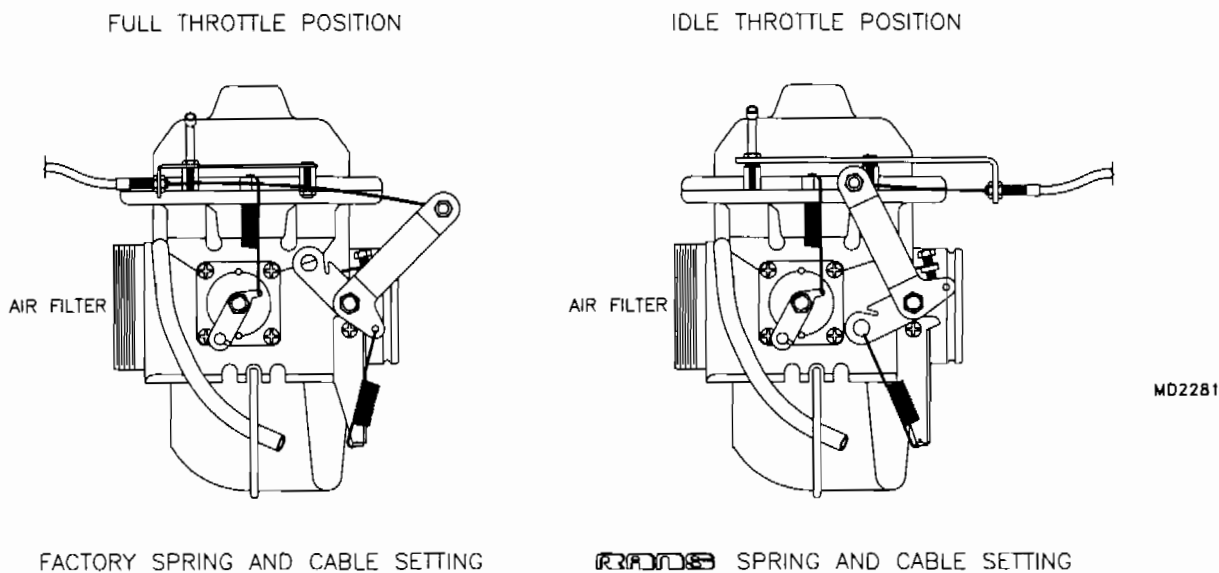
## 912 ENGINE, THROTTLE & FUEL HOOK UPS

1. Collect the parts shown in the parts manual
2. **WARNING:** The following parts must be installed and springs must be relocated to reverse the motion of the throttle on the 912. **DO NOT OMIT THIS STEP!** Remove the existing throttle cable mounts on the carburetor and install the RANS-supplied throttle cable mounts as shown in **FIGURE 04A-02**. Relocate the throttle spring as shown in **FIGURE 04A-02A**.

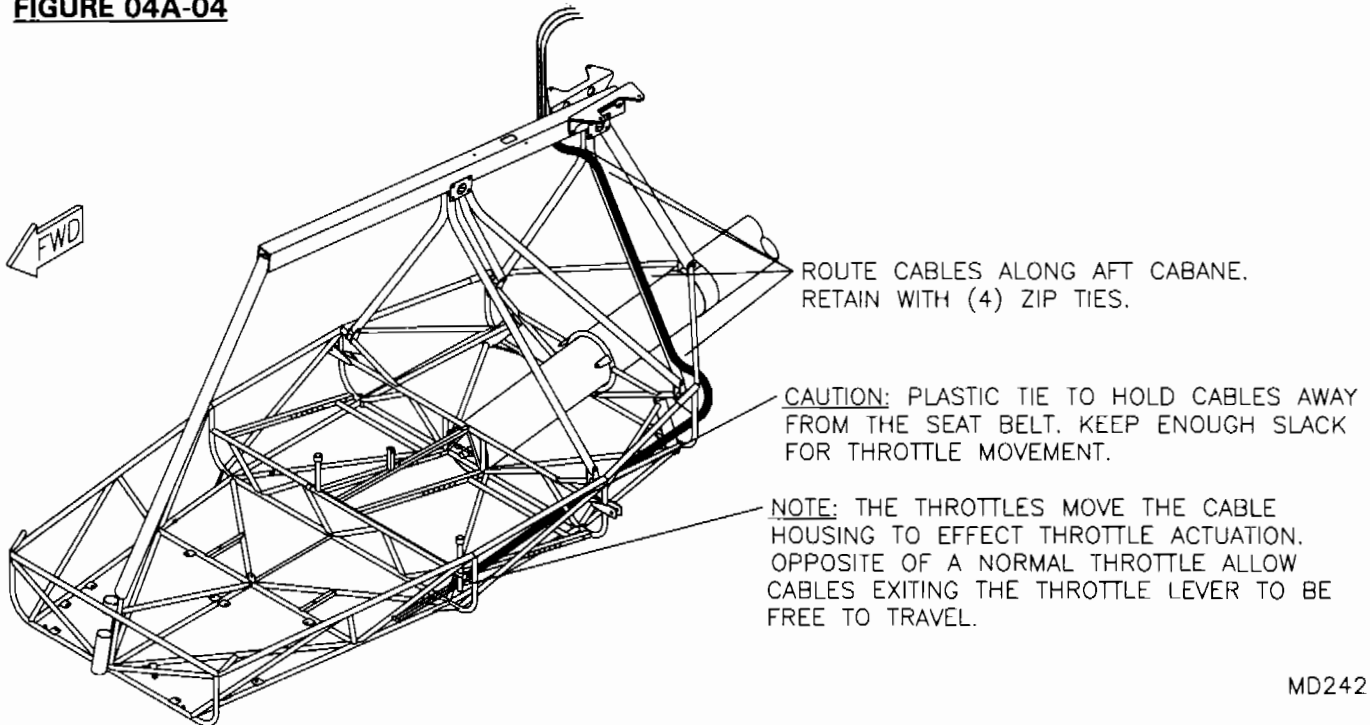
**FIGURE 04A-02**



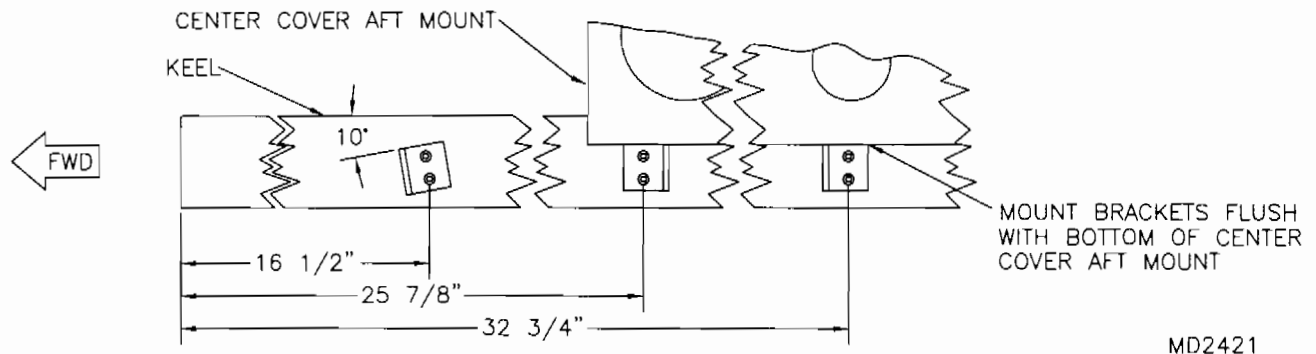
**FIGURE 04A-02A**



3. Make sure that the carbs are completely seated in the boots and the carb clamps are tight. Attach air filters to carbs. Make sure that air filters are completely seated.
4. Route the cable and housing, including cable ferrule caps, to the throttle lever. Follow the route shown in **FIGURE 04A-04**. Be sure that the throttle cables actuate the carbs equally and simultaneously. **HINT:** With the air filters removed, have an assistant watch the carb barrels move, while moving the throttle lever. Barrels should be equal at all throttle lever positions. If necessary adjust wire stop screws.

**FIGURE 04A-04**

5. Locate and drill #30 holes for the choke cable hardware as shown in **FIGURE 04A-05**. Make sure to rotate the pull choke mount downward  $10^\circ$  as shown. Install the cables using the hardware shown in the parts manual. Cable housing on choke assembly will need to be cut to correct length. **HINT:** To keep the trimmed ends of the choke cables from fraying use a dab of super glue. Loctite to secure wire nuts used on throttle and choke cables.

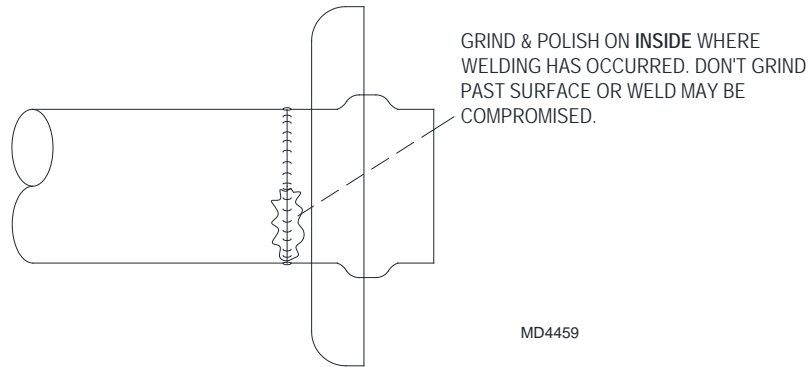
**FIGURE 04A-05**

6. Route the fuel lines as shown in the parts manual. Route from the output of the fuel pump to the brass tee and then to each carburetor. Fasten fuel lines using the hardware shown. Routing of the fuel supply line takes place in the fuel system detail.

## S-12XL - 912 EXHAUST ASSEMBLY

1. Select the parts depicted in the parts manual.
2. Profile and polish inside all lower exhaust pipes, where they attach to the engine. See **FIGURE 04B-02**. **CAUTION:** Do **NOT** grind past the inner surface or weld may be compromised.

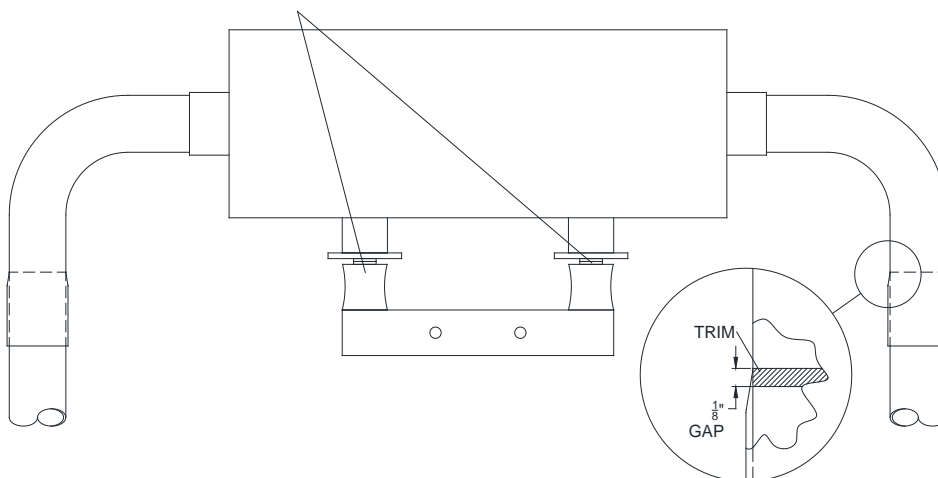
**FIGURE 04B-02**



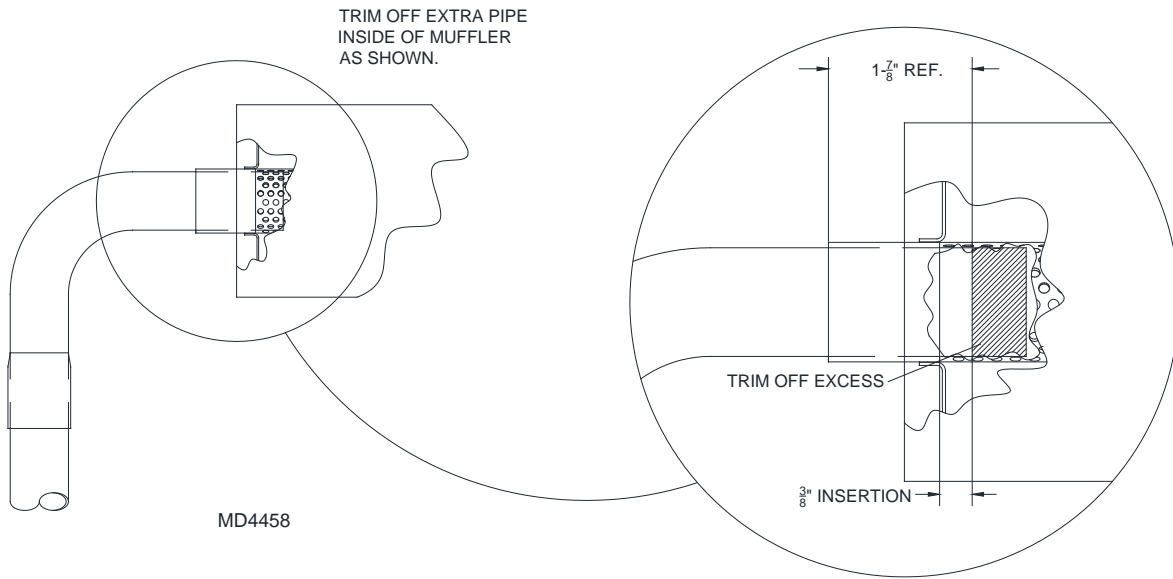
3. Install the muffler mount angle to the backside of the gear box as shown in the parts manual. **IMPORTANT:** The muffler mount angle bolts to the **Lower** set of holes on the accessory side of the gear box. Install the rubber isolators to the muffler. Attach the muffler and rubber isolators to the muffler mount angle using the hardware shown in the parts manual. **NOTE:** Apply Loctite to the studs on both ends of the rubber isolators. **IMPORTANT:** The muffler canister must be oriented with the exhaust port on the aircraft's right-hand side. Safety wire the muffler to the gear box using the mounts on the lower side of the muffler.
4. Install the exhaust manifolds as shown in the parts manual. Trim the pipes to length. Refer to **FIGURE 04B-04** and **FIGURE 04B-04A**. When installed the muffler canister must rest on the rubber isolators. The isolators should not be stretched or distorted, as early failure will result. **CAUTION:** If the muffler canister clears the gear box by more than about 1/4", then check for interference of the pipes or incorrect installation. Make sure the Lower Manifolds are rotated inboard to help retain the Upper Manifolds in place.

**FIGURE 04B-04**

IF THE ISOLATORS ARE BEING PULLED UP, TRIM PIPES THAT INSERT INTO SWAGGED PIPES.



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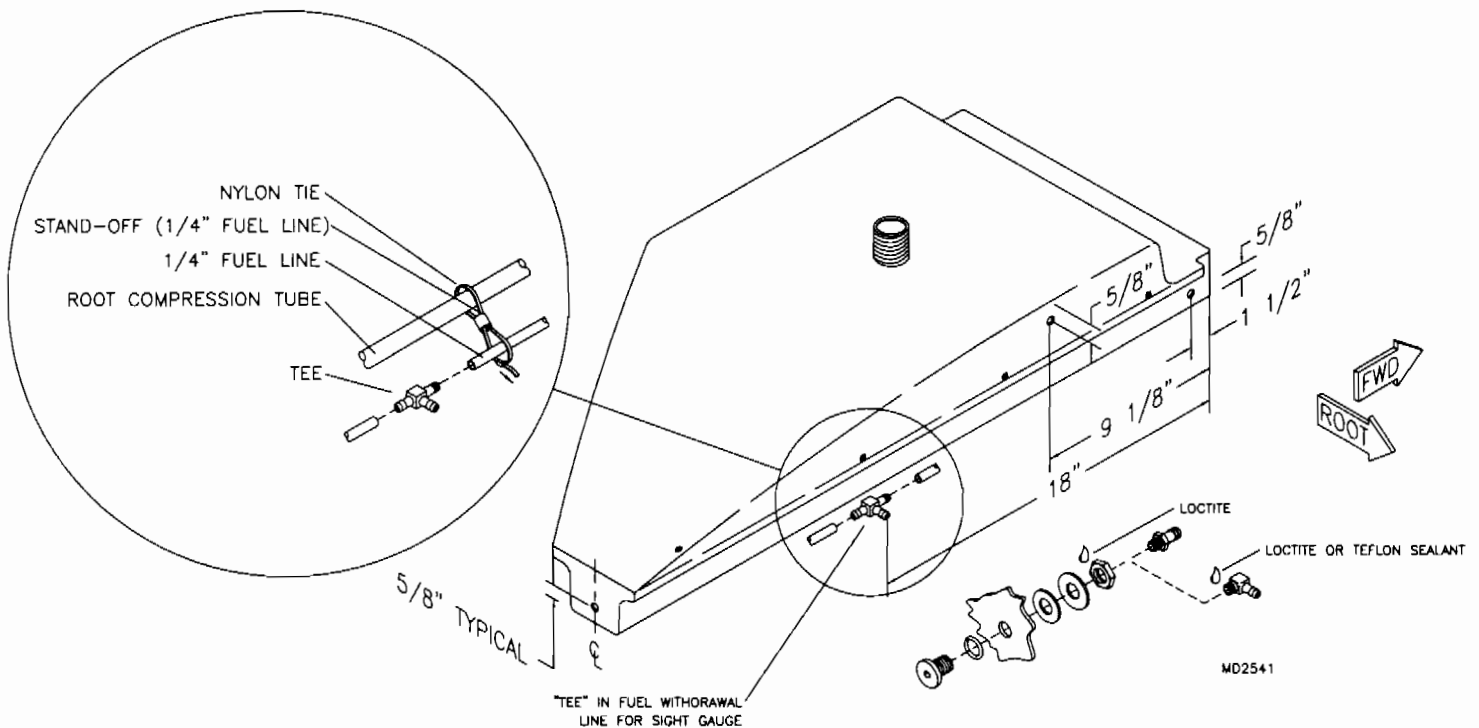
**FIGURE 04B-04B**

5. Re-route and secure sparkplug wires away from the exhaust pipes.

## FUEL TANK ASSEMBLY

1. Locate the fuel tank(s). See wing frame assembly for part numbers.
2. 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 04C-02**. **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.

**FIGURE 04C-02**



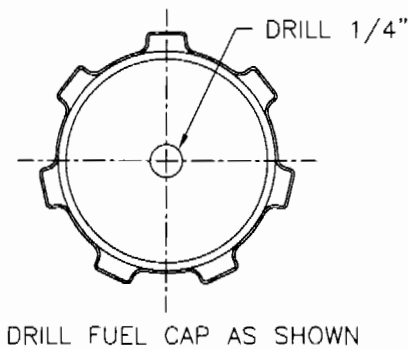
3. Refer to parts drawing, for proper orientation of parts. See wing frame assembly for part numbers.
4. Install the fittings by placing a wire in the fitting hole and up through the filler neck, attach a tank withdrawal fitting and an o-ring. Make a loop in the end of the wire to keep the parts from 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.

## FUEL CAP/VENT ASSEMBLY

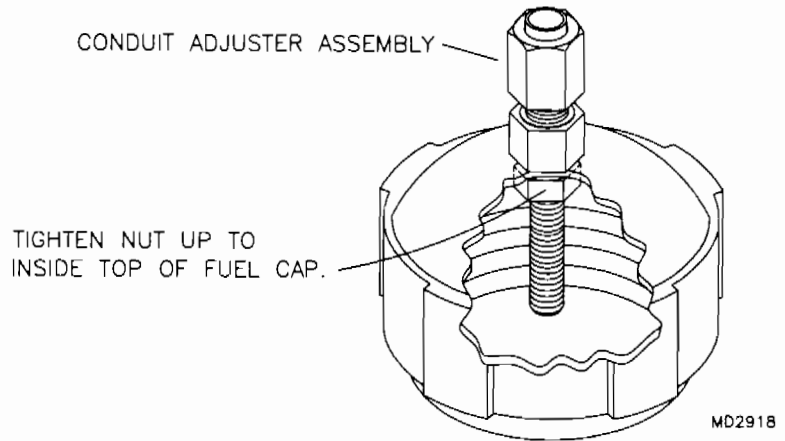
1. Remove the rubber gasket and plastic baffle from the fuel cap. The plastic baffle will "snap" out of the fuel cap. A screwdriver works well for the removal.

Locate and drill a 1/4" hole in the center of the fuel cap as shown in **FIGURE 04D-01**. Install the conduit adjuster ferrule into the fuel cap. Apply a small drop of loctite and install the 1/4" plain nut and tighten to secure the ferrule into the cap. See **FIGURE 04D-01A**.

**FIGURE 04D-01**



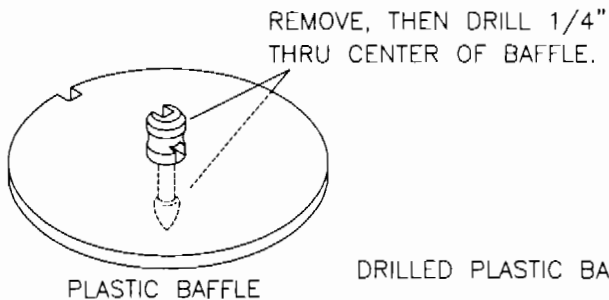
**FIGURE 04D-01A**



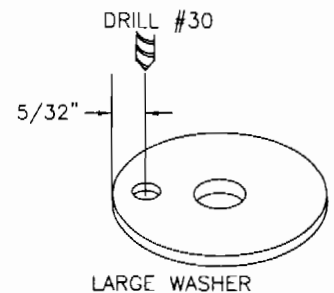
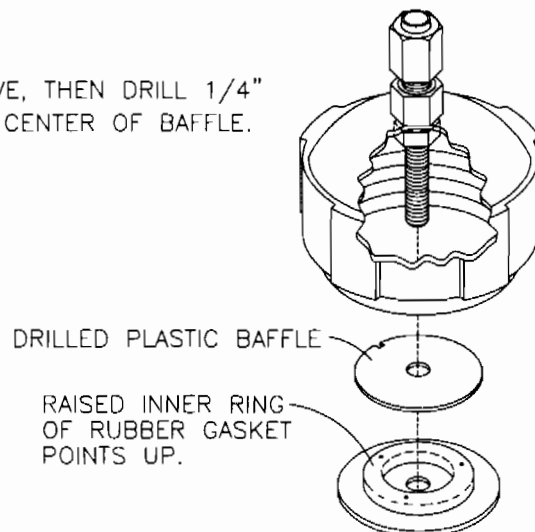
2. With a side cutters or file remove the attach nipples from the plastic baffle. See **FIGURE 04D-02**. Drill a 1/4" hole in the center of the plastic baffle and install into the fuel cap over the adjuster ferrule stem. Drill a 1/4" hole in the center of the rubber gasket and install into the cap. Note the orientation of the rubber gasket.

3. Drill the 1/4" large wood washer as shown in **FIGURE 04D-03**. Assemble the bead chain to the bead chain retainer sleeve. Install the bead chain and retainer sleeve into the #30 hole in the large wood washer. Install the washer and bead chain into the fuel cap. Install the 1/4" shear nut on the adjuster ferrule stem and tighten.

**FIGURE 04D-02**



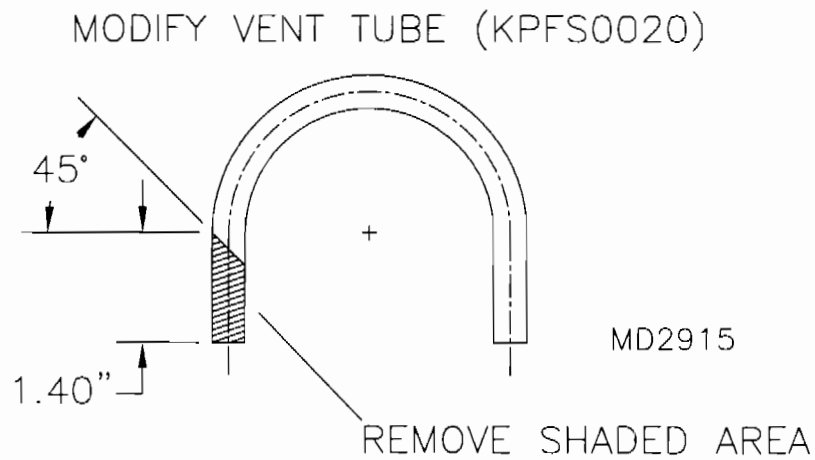
**FIGURE 04D-03**



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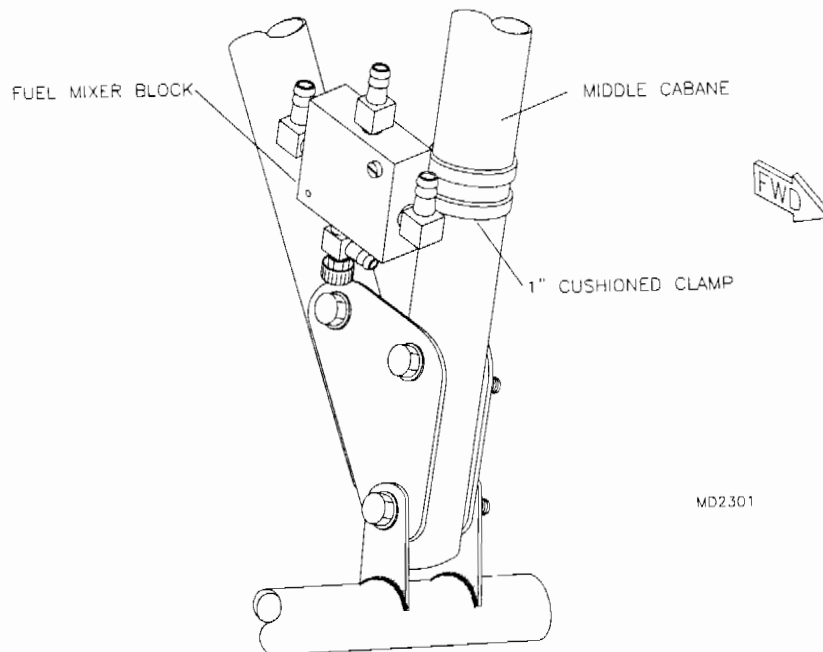
4. Install the bead chain end coupling onto the bead chain. Find the center of the plastic retainer and drill a #30 hole. Using the brass-backing washer, rivet the plastic retainer to the bead chain. Refer to the parts drawing.
5. Modify the vent tube as shown in **FIGURE 04D-05**. Install the vent tube 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 04D-05**

## 912 FUEL SYSTEM - SINGLE WING TANK

1. Locate the parts shown in the parts drawing.
2. Route the 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. The fuel mixer block attaches to the middle cabane. See **FIGURE 04-02**. Route fuel line upward from the mixer block to the fuel pump. Include the fuel shut-off valve and fuel filter. Route the fuel feeds from the mixer block, up the aft cabane. Leave approximately 4 feet of excess line at the keel for the forward withdrawal line and 1 foot of excess for the aft withdrawal line from the fuel tank. This will be connected to the tank during trial assembly and rigging.

**FIGURE 04E-02**

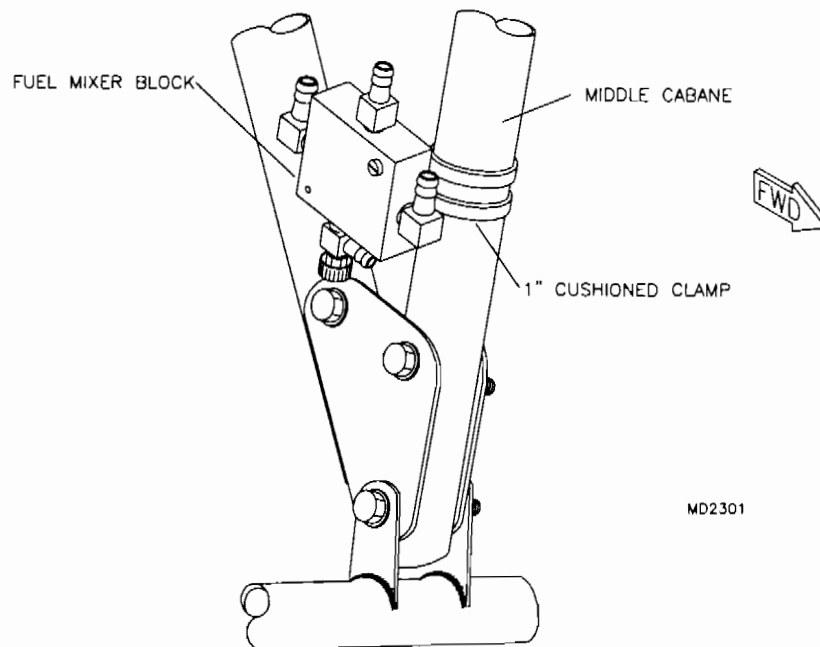


3. Once the wings are built and the fuel tank(s) in place, it will be necessary to leave fuel lines routed out the root rib. Therefore; it will be necessary to only trial fit the withdrawal lines to the fuselage. Once the wings are assembled, attach the fuel withdrawal lines to their appropriate fittings. Trial assembly and rigging will be the appropriate time for routing of all fuel lines. Remember, once the wings are covered, fuel tanks will become inaccessible.
4. Install the sump drain valve to the bottom of the mixer block. Route the sump drain line down the gear leg. For installation of the fuel tanks into the wing, see wing frame assembly.
5. When installing the tensioning ribs (during the covering section) it will be necessary to project the holes for the sight gauge over to the tensioning rib. Once tension ribs and wing skins are installed, locate the loop clamp at the mid-point of the sight. This will allow the turnbuckles to clear the sight gauges.

## 912 FUEL SYSTEM - DUAL WING TANKS

1. Locate the parts shown in the parts drawing.
2. Route the 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. The fuel mixer block attaches to the middle cabane. See **FIGURE 04F-02**. Route fuel lines upward from the mixer block to the fuel pump. Include the fuel shut-off valve and fuel filter. Route the fuel feeds from the mixer block, up the aft cabane. Include the "Y" in the system. Make sure that the "Y" is mounted at least 12" below the keel. Leave approximately 4 feet of excess line at the keel for the forward withdrawal line and 1 foot of excess for the aft withdrawal line from the fuel tank. This will be connected to the tank during trial assembly and rigging.

**FIGURE 04F-02**

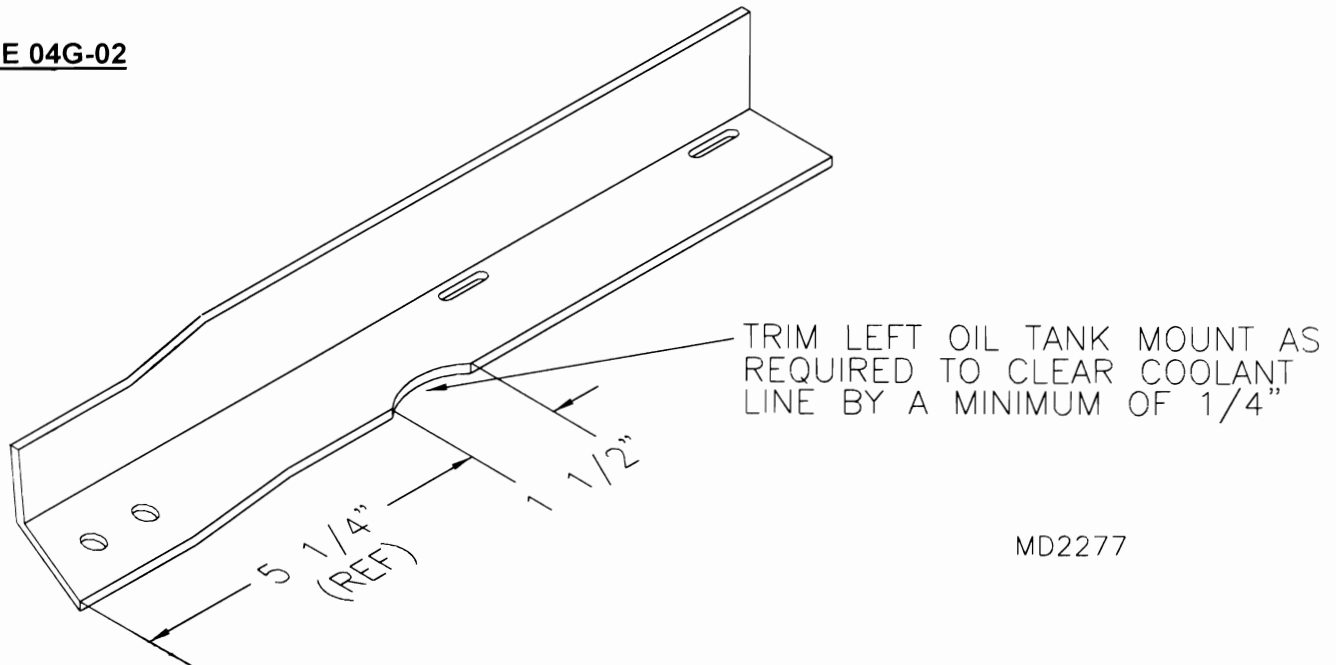


3. Once the wings are built and the fuel tank(s) in place, it will be necessary to leave fuel lines routed out the root rib. Therefore; it will be necessary to only trial fit the withdrawal lines to the fuselage. Once the wings are assembled, attach the fuel withdrawal lines to their appropriate fittings. Trial assembly and rigging will be the appropriate time for routing of all fuel lines. Remember, once the wings are covered, fuel tanks will become inaccessible.
4. Install the sump drain valve to the bottom of the mixer block. Route the sump drain line down the gear leg. For installation of the fuel tanks into the wing, see wing frame assembly.
5. When installing the tensioning ribs (during the covering section) it will be necessary to project the holes for the sight gauge over to the tensioning rib. Once tension ribs and wing skins are installed, locate the loop clamp at the mid-point of the sight. This will allow the turnbuckles to clear the sight gauges.

## S-12XL 912 OIL TANK & COOLER MOUNT

1. The oil tank mounts forward of the engine, approximately 10 1/2" from the aft end of the keel. The oil tank mounts should be located against the center cover aft wrap, flush with the bottom of the keel. Locate and drill 3/16" holes for the mount angles. Make sure the mount angles are perpendicular to the keel tube. After installation, it may be necessary to tweak the mounts forward in order to obtain clearance between the oil bottle and the engine.
2. Trim the left oil tank mount as required to clear the water pump fittings by at least 1/4". See **FIGURE 04G-02**.

**FIGURE 04G-02**



3. Attach the oil tank and cooler assembly to the mounts using the hose clamps shown in the parts manual. Install the fittings as shown in the parts manual. **IMPORTANT:** The pickup fitting is the fitting (OUT) that enters straight into the top of the oil bottle and **MUST** route to the oil pump just below the engine gearbox. **NOTE:** If installing the optional oil cooler, route the pickup line to the top of the oil cooler. The bottom oil cooler line will route to the oil pump. **CAUTION:** There are two types of oil line used. It is **important** to use the correct line in the correct location to prevent oil pump & engine damage. The Suction Line is very stiff when compared to the Return Line.
4. The return fitting is the angled fitting (IN) on the oil bottle and **MUST** route to the fitting on the bottom of the engine. **IMPORTANT:** Refer to the Rotax engine manual, it states that the oil withdrawal fitting on the bottom of the engine needs to be moved to the aft position on pusher type aircraft, to assure proper oil circulation on start-up. **NOTE:** The Banjo Fitting will replace the UNF fitting on the bottom of the engine. Failure to route the oil lines properly will result in engine failure. **CAUTION:** There are two types of oil line used. It is **important** to use the correct line in the correct location to prevent oil pump & engine damage. **IMPORTANT:** When tightening fittings, back up with the proper wrench to prevent damage.
5. Cut the oil line to the length required and install with hose clamps. **NOTE:** The Suction Line does not require hose clamps when used with the supplied fittings. **IMPORTANT:** The Return Line requires hose clamps. Refer to the parts manual and the Rotax engine manuals. **HINT:** To install the fittings to the oil line, place the fitting in a padded vise and push the line onto the fitting. Double-check all hose clamps. Fill the oil cooler with oil using a syringe or funnel before engine start-up. Apply anti-chafe where necessary and secure all lines.

## PRE ENGINE START UP

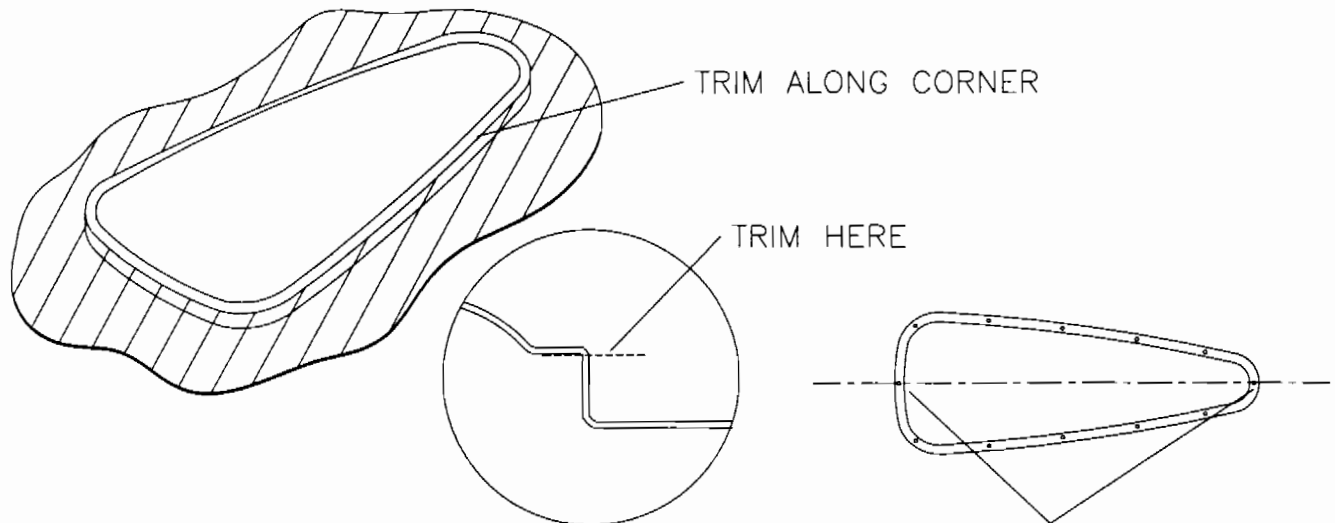
6. Prior to starting the engine for the first time, install a new oil filter and fill the oil bottle to the full line on the dip stick. Refer to the Rotax manuals for oil specifications. Remove the top spark plugs on all four cylinders. Verify the mag switch positions to **OFF** (mags grounded). Turn the prop through several revolutions by hand. With the spark plugs out and from the pilots seat, turn the key switch to the start position and crank the engine for several seconds. Check for an oil pressure indication on the gauge. If after several seconds there is no sign of oil pressure, stop cranking the engine. Remove the oil pick up line at the oil bottle. Using a funnel prime the oil liner to the pump. Attach the pick up line to the oil bottle and crank the engine. When an oil pressure indication is achieved, stop cranking. Install the spark plugs and start the engine. Watch the oil pressure gauge as the engine starts. At the moment the engine starts, allow 10 seconds for oil pressure to come up. If there is no pressure indication within 10 seconds shut the engine off and repeat the previous procedures. The engine will change sound (quieter) as the oil starts pumping. After running the engine for a few minutes, check the oil level and check for any leaks in the system.

## 912 COOLING SYSTEM - MINI-POD OR PARTIAL

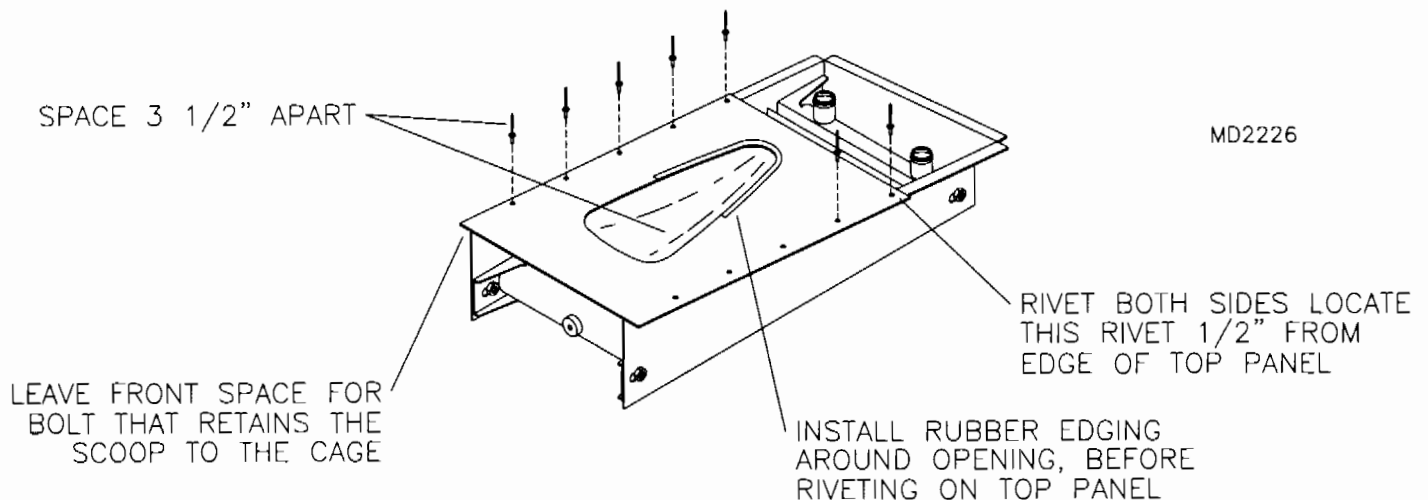
- The cooling system can be installed on the Airaile after the fuselage is completed and the engine mounted. The wings can be off for the cooling system installation; however, you must allow for the coolant hose to route inboard of the tensioning root ribs and off of the center cover.

- Select the parts shown in the parts manual.
- Assemble the radiator cooling scoop by first bolting the radiator to the scoop as shown in the parts drawing. Locate the radiator/boom seal. Trim the edge of the seal and locate #30 holes as shown in **FIGURE 04H-02**. Center mold over the cut out in the radiator top panel's bottom side as shown. Mark, drill, and rivet using the radiator/boom seal as a guide. Make sure to use the  $\frac{1}{8}$ " washers as shown in the parts manual. The top panel attaches to the scoop with (5)  $\frac{1}{8}$ " aluminum pop rivets evenly spaced on each side. See **FIGURE 04H-02A**. Be sure to install the rubber edging onto the top panels AFT flange and around the edges of the tail boom hole. This rubber edging helps seal and protect the radiator and tail boom from chafing. Once radiator/boom seal and rubber edging are in place, rivet top panel in position.

**FIGURE 04H-02**

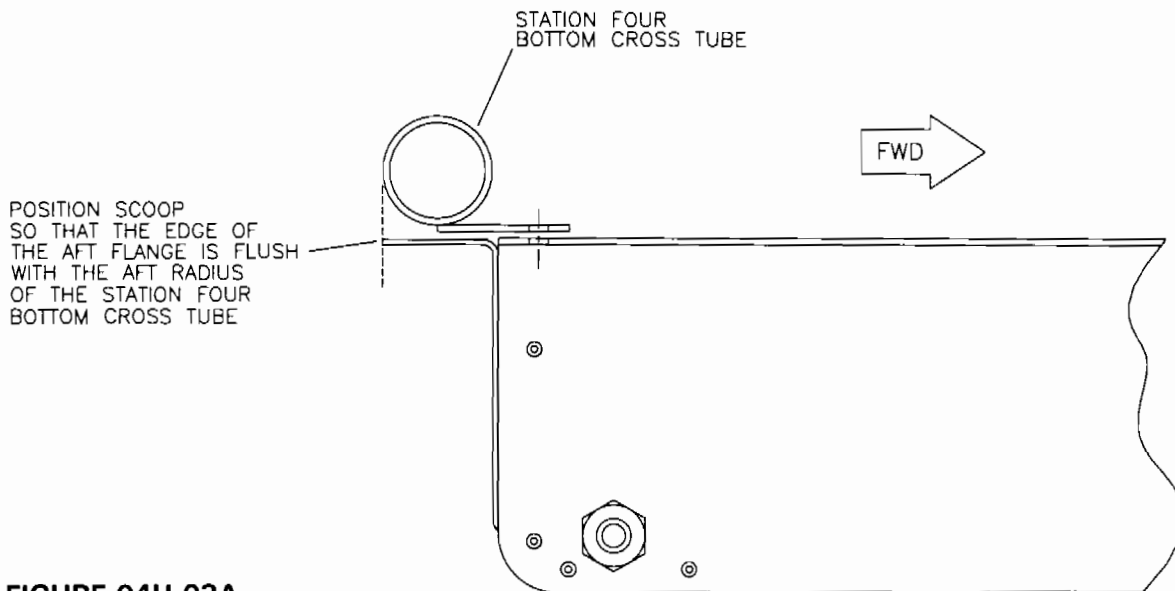


**FIGURE 04H-02A**



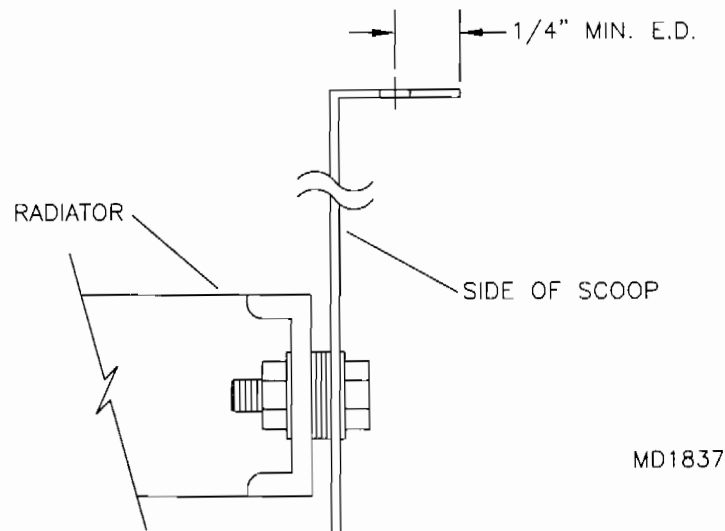
3. Clamp the radiator/scoop assembly to the tabs on the belly of the fuselage so that the aft flange is flush with the aft radius of the station four bottom cross tube. Refer to **FIGURE 04H-03**. Center and square the scoop with the fuselage. With a #11 drill bit, transfer drill through the mount tabs and into the side flanges on the scoop. **NOTE:** It may be necessary to spread or compress the side walls of the radiator scoop to match the holes in the tabs in order to maintain a 3" flange E.D. Refer to **FIGURE 04H-03A**. Remove the radiator scoop and nut plate the tabs. **NOTE:** If you are installing the #2 belly pan, do not nut plate the forward mount tabs until the mount holes have been transfer drilled through the belly pan. Upon final installation of the #2 belly pan, bolt the radiator in place using hardware shown.

**FIGURE 04H-03**



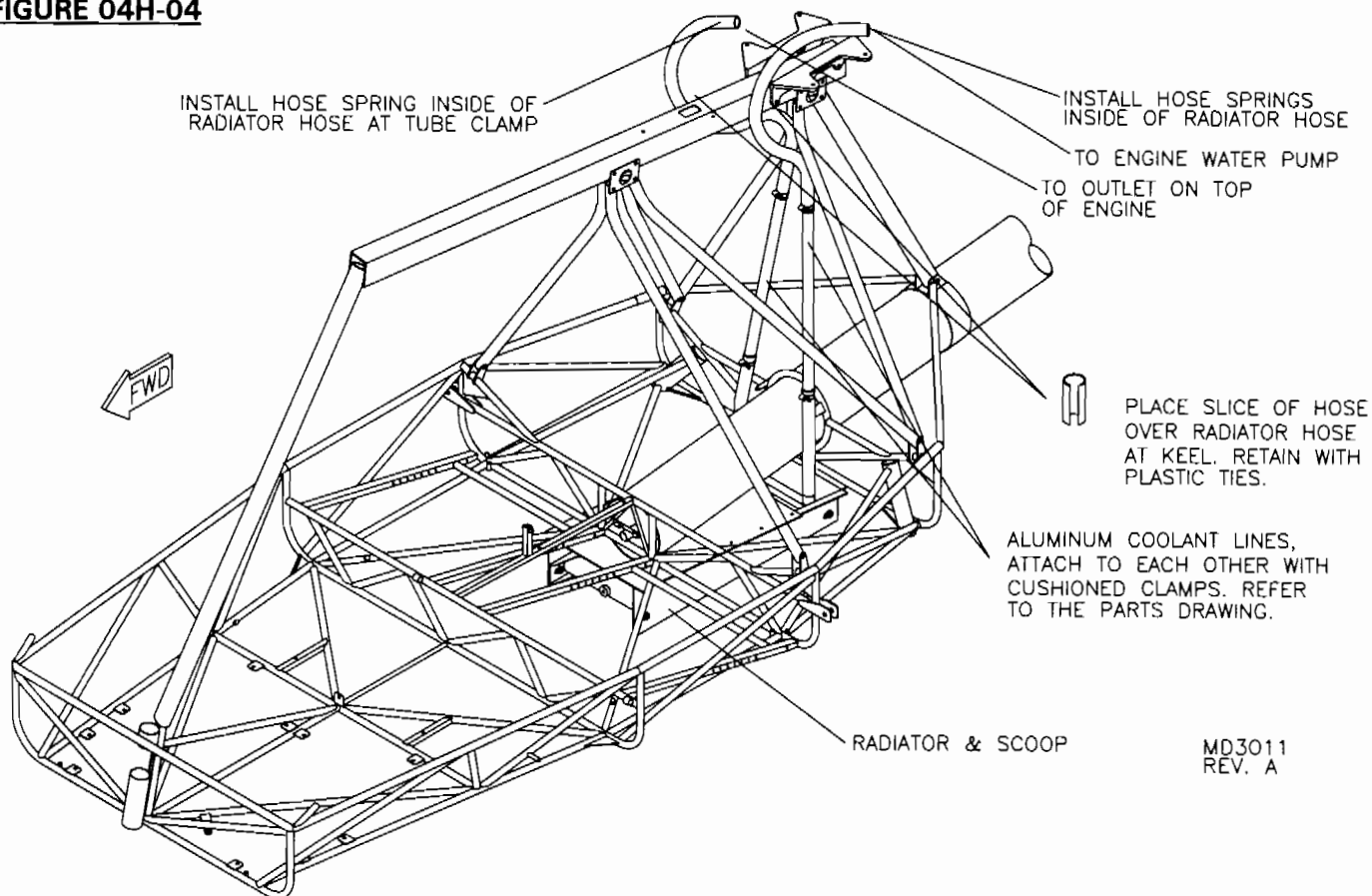
**FIGURE 04H-03A**

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REV. A

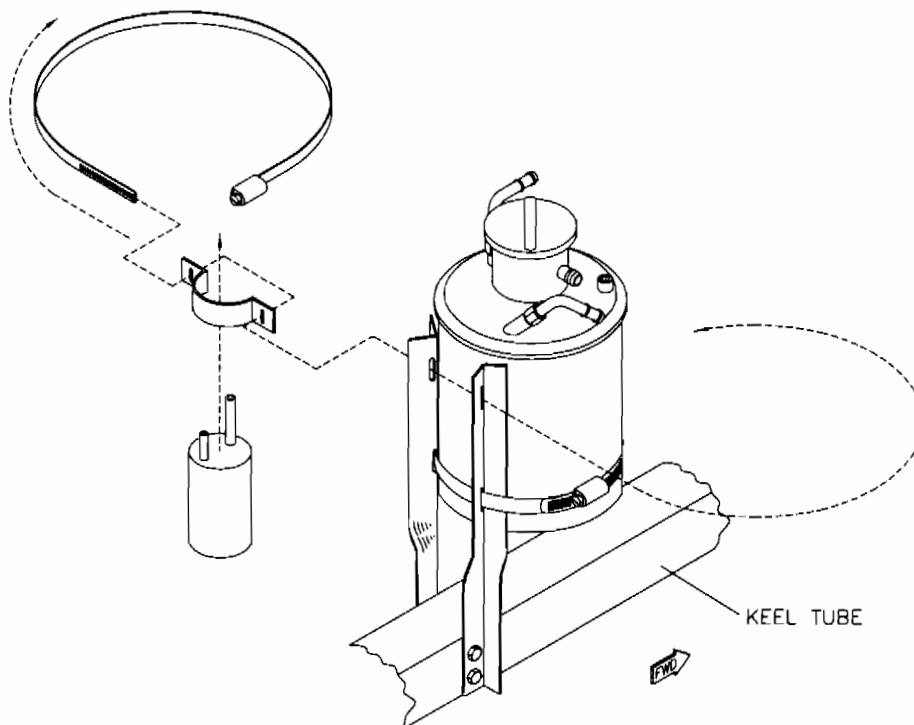


MD1837

4. Install the AS $\cong$  shaped hoses from the aft cylinder head coolant fitting to the water pump, these are used to clear the Barry mounts. Install the hoses to the cockpit cage in the manner shown in **FIGURE 04H-04**. **PLEASE NOTE:** The hoses run up each side of the AFT cabanes and are retained with plastic zip ties. The hoses route around the **FRONT** side of the rear spars. If you are installing the partial enclosure, the radiator hoses must be included **INSIDE** the windshield top former. At the point where the hoses pass by the keel, install the remaining two short segments of rubber hose. Split this lengthwise and retain them to the hoses with plastic ties.

**FIGURE 04H-04**

5. Attach the coolant recovery bottle to the oil bottle as shown in **FIGURE 04H-05**. One line routes from the nipple on the filler neck to the coolant overflow bottle. The exit on the coolant overflow bottle routes down the right side cabanes and down the gear leg.

**FIGURE 04H-05**



## COOLING SYSTEM FILLING & OPERATIONS

### FILLING

Prior to filling the system check all connections and hose clamps for a tight secure fit. Fill the system with 50/50 mix of water and anti-freeze. With the radiator drain open, fill slowly until fluid runs out the drain. Once fluid begins to exit the drain; close the drain and continue filling. Air in the cooling system will be your biggest concern. It is a good idea to let the coolant sit for a while before running the engine. This will let air work its way out of the system. After one or two minutes of engine operation, cut the engine off and check the coolant level again. This should let most of the air out of the system.

### BREAK IN & OPERATIONS

**IMPORTANT:** Use a box fan to circulate the air over the radiator during break in. We usually run our S-12's with quite a breeze, that's Kansas you know, but other parts of the world are less windy. The fan will assure proper cooling during break in. During the break in run of the engine it is normal for some coolant to overflow. This may be due to air bubbles or excessive fluid. Closely monitor the CHT gauge. Refer to the Rotax manuals for normal operating temperatures.

### REASONS FOR POOR COOLING

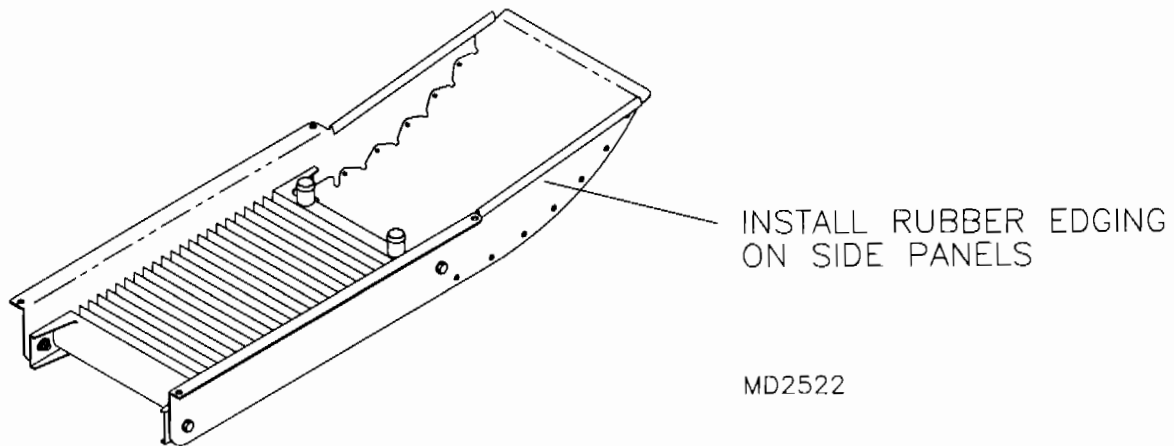
1. **LOW COOLANT LEVEL:** Check level and fill. Inspect for leaks. Look around the pump, they are famous for leaking through the drive shaft. Make it a habit to check the coolant before every first flight of the day.
2. **AIR IN THE SYSTEM:** Purge by venting the top hose.
3. **KINK OR RESTRICTION IN THE HOSES:** Check for kinks, collapsed hose or broken pump impeller.
4. **DIRTY OR CLOGGED AIR FLOW THROUGH RADIATOR:** The under belly position of the radiator allows debris to collect in the scoop. This will reduce the amount of air flow through the radiator and thus reduce its cooling ability. Inspect for debris as part of your pre-flight.
5. **IMPROPER FILLER CAP PRESSURE:** Using anything less than a 15 to 18 lb cap will allow fluid to overflow and drain down the coolant level. Check to make sure your cap is rated for 15 to 18 lbs.

## 912 COOLING SYSTEM - FULL ENCLOSURE

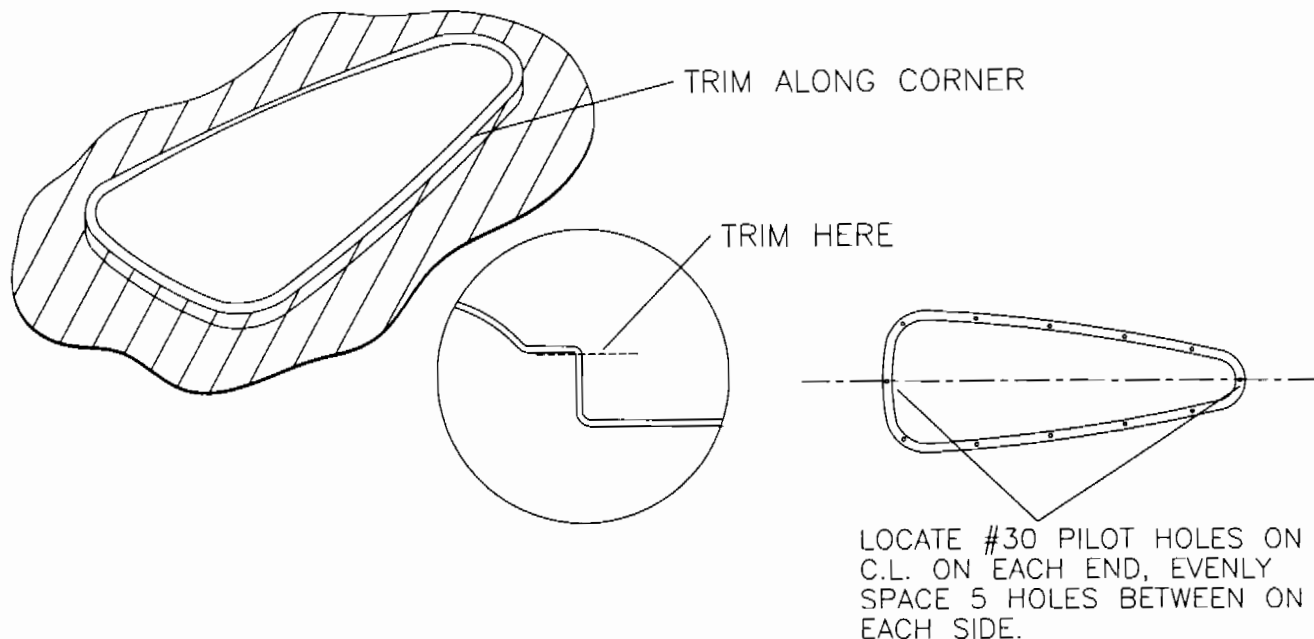
- The cooling system can be installed on the Airaile after the fuselage's super structure is completed and the engine mounted. Belly pan #2 and #3 should only be clecoed in place to ease in assembly. The wings can be off for the cooling system installation; however, you must allow for the coolant hose to route inboard of the tensioning root ribs and off of the center cover.

- Select the parts shown in the parts manual.
- Assemble the radiator scoop by first riveting the left and right radiator scoop-side panels to the radiator scoop-bottom panel. Refer to the parts manual for the necessary hardware. Bolt the radiator in place using the four pre-drilled holes in the side panels and the proper hardware. See **FIGURE 04I-02**. Locate the radiator boom/seal. Trim the edge of the seal and locate #30 holes as shown in **FIGURE 04I-02A**. Center the boom/seal over the cut out in belly pan #3, mark, drill and rivet using the boom/seal as a guide.

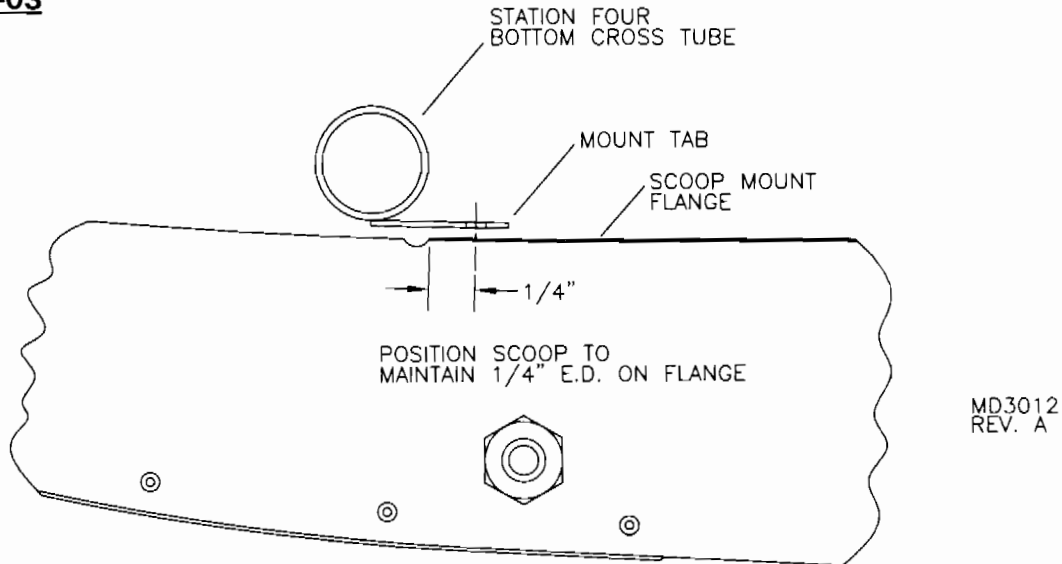
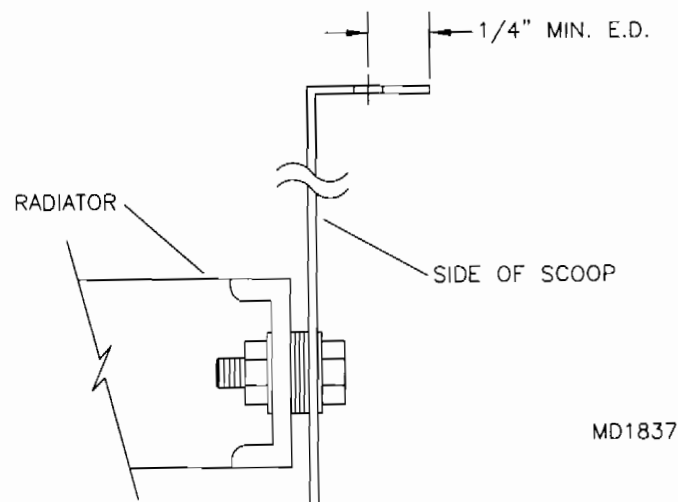
**FIGURE 04I-02**



**FIGURE 04I-02A**

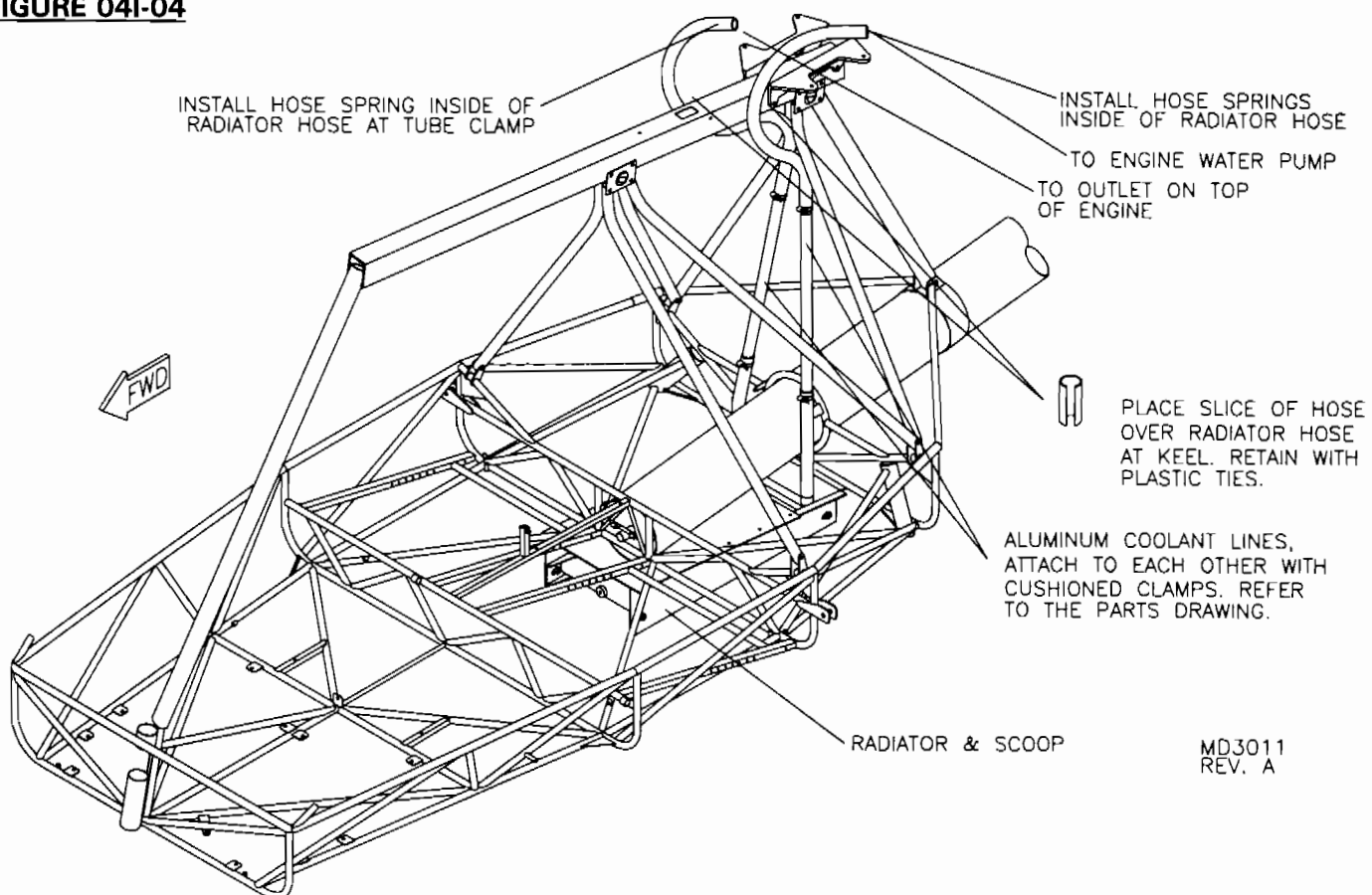


3. Clamp the radiator/scoop assembly to the tabs on the belly of the fuselage so that there is  $\frac{1}{4}$ " E.D. from the aft end of the mount flange to the center of the hole in the mount tab. Refer to **FIGURE 04I-03**. Center and square the scoop with the fuselage. With a #11 drill bit, transfer drill through the mount tabs and into the side flanges on the scoop. **NOTE:** It may be necessary to spread or compress the side walls of the radiator scoop to match the holes in the tabs in order to maintain a  $\frac{1}{4}$ " flange E.D. Refer to **FIGURE 04I-03A**. Once the scoop has been located, install the belly pans and transfer drill the mounting holes through the belly pans. Using the aft set of mounting holes as a reference, locate two 1" holes in belly pan #3 for radiator hose access. Use a hole saw or adjustable fly cutter. Remove the belly pans and install the nut plates on the mount tabs. Note that the nut plate rivets are installed from the bottom side. Upon final installation of the belly pans, bolt the radiator in place using hardware shown.

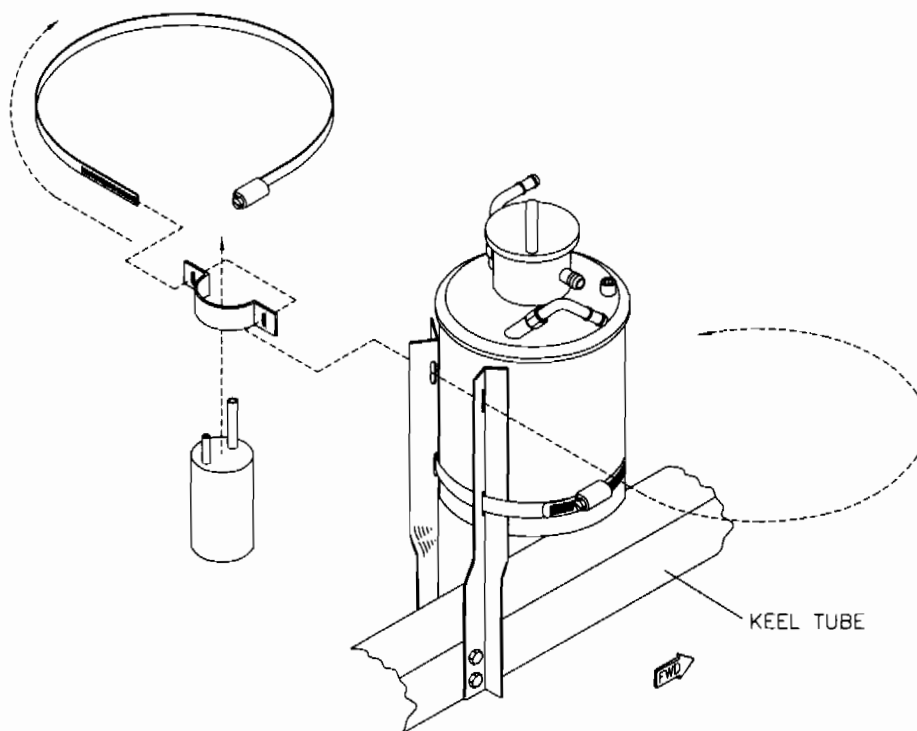
**FIGURE 04I-03**MD3012  
REV. A**FIGURE 04I-03A**

MD1837

4. Install the "S" shaped hoses from the aft cylinder head coolant fitting to the water pump. These are used to clear the Barry mounts. Install the hoses to the cockpit cage in the manner shown in **FIGURE 04I-04**. The hoses route around the **FRONT** side of the rear spars. The radiator hoses must be **INSIDE** the windshield top former. At the point where the hoses pass by the keel, install the remaining two short segments of rubber hose. Split lengthwise and retain to the hoses with plastic ties.

**FIGURE 04I-04**

5. Attach the coolant recovery bottle to the oil bottle as shown in **FIGURE 04I-05**. One line routes from the nipple on the filler neck to the coolant overflow bottle. The exit on the coolant overflow bottle routes down the right side cabanes and down the gear leg.

**FIGURE 04I-05**

MD2278

## COOLING SYSTEM FILLING & OPERATIONS

### FILLING

Prior to filling the system check all connections and hose clamps for a tight secure fit. Fill the system with 50/50 mix of water and anti-freeze. With the radiator drain open, fill slowly until fluid runs out the drain. Once fluid begins to exit the drain; close the drain and continue filling. Air in the cooling system will be your biggest concern. It is a good idea to let the coolant sit for a while before running the engine.

This will let air work its way out of the system. After one or two minutes of engine operation, shut the engine off and check the coolant level again. This should let most of the air out of the system.

### BREAK IN & OPERATIONS

**IMPORTANT:** Use a box fan to circulate the air over the radiator during break in. We usually run our S-12's with quite a breeze, that's Kansas you know, but other parts of the world are less windy. The fan will assure proper cooling during break in. During the break in run of the engine it is normal for some coolant to overflow. This may be due to air bubbles or excessive fluid. Closely monitor the CHT gauge. Refer to the Rotax manuals for normal operating temperatures.

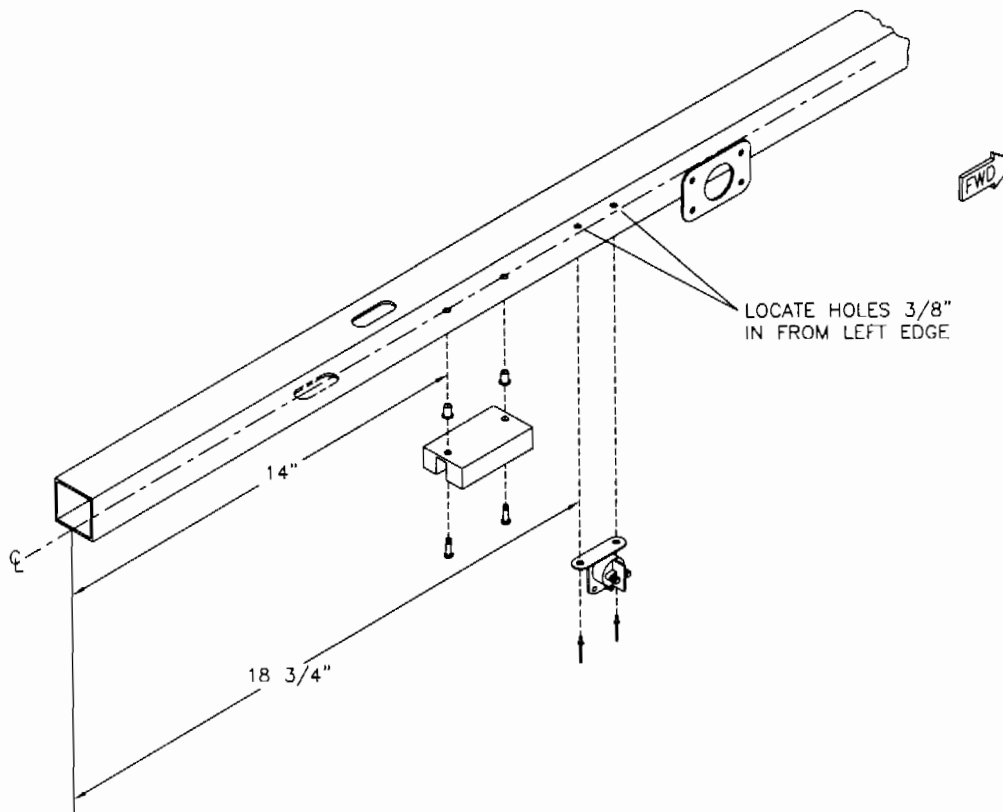
### REASONS FOR POOR COOLING

1. **LOW COOLANT LEVEL:** Check level and fill. Inspect for leaks. Look around the pump, they are famous for leaking through the drive shaft. Make it a habit to check the coolant before every first flight of the day.
2. **AIR IN THE SYSTEM:** Purge by venting the top hose.
3. **KINK OR RESTRICTION IN THE HOSES:** Check for kinks, collapsed hose or broken pump impeller.
4. **DIRTY OR CLOGGED AIR FLOW THROUGH RADIATOR:** The under belly position of the radiator allows debris to collect in the scoop. This will reduce the amount of air flow through the radiator and thus reduce its cooling ability. Inspect for debris as part of your pre-flight.
5. **IMPROPER FILLER CAP PRESSURE:** Using anything less than a 15 to 18 lb cap will allow fluid to overflow and drain down the coolant level. Check to make sure your cap is rated for 15 to 18 lbs.

## 912 INSTRUMENTS AND ELECTRICAL

1. Locate the parts shown in the parts manual.
2. It will be easier to complete wiring if the battery is installed. See 912 Battery Box Installation.
3. Temporarily install the aft center cover as shown in the Fuselage Enclosure section of the manual. This will help to determine the best path for the engine-related wires.
4. Install instruments into the instrument panel. Study the instrument and electrical schematic very carefully. Route all wiring as neatly as possible. This will greatly ease installation and any trouble shooting should it ever be required.
5. Install the regulator/rectifier and solenoid in the locations shown in **FIGURE 04J-05**. Drill as required to install the hardware shown.

**FIGURE 04J-05**



MD2141

6. When routing pitot and static lines into the instrument panel, be sure not to kink or crush the lines. Install wiring according to the schematic in the parts manual.

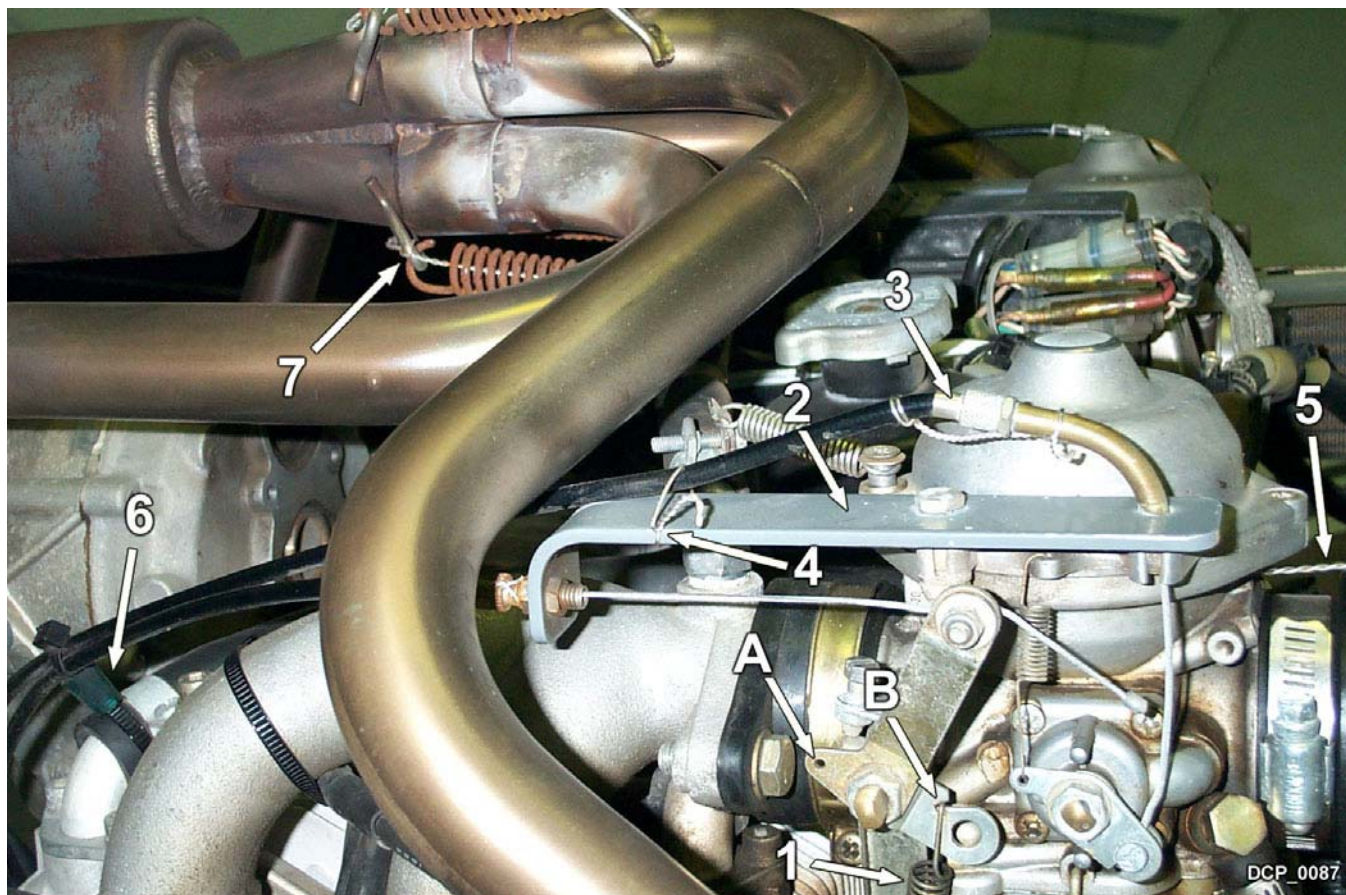
## 912 BATTERY BOX INSTALLATION

1. 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.
2. Position one side of the side plate flush with the mount plate. Using the mount plate as a guide, transfer drill #30 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 onto the station three top cross tube and diagonals as shown in the parts drawing. Note the orientation of the cushioned clamps. Position the battery box to the aft side of the truss so that there is approximately 1/4" clearance to the belly pan. 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 battery, battery bar and cotter pins. Refer to the instruments and electrical section for wiring.

## 912 STROBE SYSTEM SCHEMATIC

1. Locate the parts shown in the parts manual.
2. Final wiring of the strobes will be done during trial assembly and rigging. For now, attach wire to the panel switch and tape excess wire in a bundle.

S-12XL & S-12S – 912 INSTALLATION – 80/100 HP



1. THROTTLE SPRING IS MOVED FROM A TO B
2. MOUNT FOR THROTTLE
3. SAFETY WIRE IN CHOKE AND THROTTLE CABLES
4. SAFETY WIRE CHOKE CABLE TO CLEAR MUFFLER
5. SAFETY WIRE AIR FILTER TO CARBURETOR, VERY IMPORTANT ON PUSHERS
6. USE STAND-OFFS TO SECURE CABLES
7. SAFETY WIRE SPRINGS