

ROTORWAY

COOLING SYSTEMS

One of the biggest problems in keeping your aircraft's engine cool comes from heat recirculating in the engine and cooling areas. In forward flight, the air scoops supply plenty of cool air to the fan, but in a hover cooling becomes more of a problem.

The fan will draw air from wherever there is an air supply. When building your aircraft or troubleshooting cooling problems, look carefully at the areas from which air is being drawn. The exhaust system radiates a lot of heat; fabricate the heat shielding to fit as close as possible around the exhaust pipes and out to the body panels. When all of the body panels are installed, look at the underside of the radiator and oil cooler where air pressure could escape and seal any gaps. (Note: The material used to seal gaps should be chosen carefully. Some silicone sealants could ignite and cause a serious fire when exposed to the high temperatures of the exhaust system.)

Cooling plays a big part in engine longevity and performance. An engine that runs hotter than normal will not operate at peak efficiency.

SECTION/OPERATION

18

COOLING SYSTEM

<u>COMPONENT</u>	<u>PROCEDURE</u>	<u>PRINT #</u>	<u>TEMPLATE</u>
RADIATOR AND FAN SHROUD (E30-2000)	Radiator Fan shroud Overflow tank	E30-2000 E37-2000	E30-1
OIL SYSTEM (E28-2000)	Oil cooler Oil hoses & filter Oil sump		
STANDPIPE (E34-2000)	Standpipe		
BODY (E32-2000) (see Section 8)	Fresh air collector		

NOTES

- FAN SHROUD: Complete the fan shroud to the radiators.
- OIL COOLER: Fabricate oil cooler, install completed unit into helicopter and fiberglass it to tail boom support tubes. Be sure the fan shroud is as far back as it will go, or you will experience clearance problems.
- FAN: Lower the radiator enough to install the fan (smooth side up).
Loctite the fan pulley to secondary shaft.

PREFACE:

This is a comparatively simple operation, however, it is important to ensure that there are no gaps which would allow air pressure to escape out of the fan shroud or between the two side-by-side radiators. Be sure to protect oil hoses which protrude through the fan shroud so that they do not chafe against the sharp edge of the fiberglass shroud. Position the oil cooler below the radiators as shown. Cooling tests have proven that this is the most effective placement for the oil cooler.

ROTORWAY

TOOLS REQUIRED FOR OPERATION 18:

Band saw	
Cleco	
Cleco Pliers	
Grinder	
Hammer	
Level	
Metal cutting snips	
Drill bits of the following sizes:	1/8"
	3/16"
	1/4"
	5/16"
	#40
File	
Hand drill (air or electric)	
Ratchet with sockets of the following sizes:	5/16"
	3/8"
	7/16"
	1/2"
Screwdriver	
Welding equipment	
Wrenches of the following sizes:	5/16"
	3/8"
	7/16"
	1/2"

RADIATOR

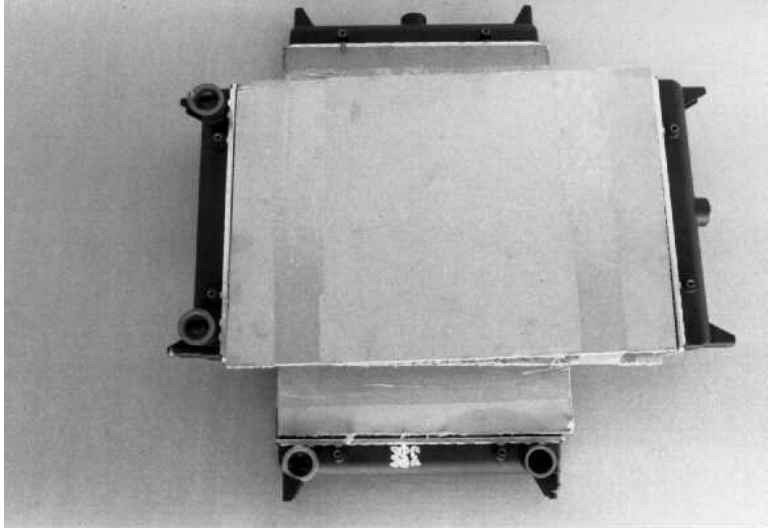


Photo #1

Use prints E30-2000, E37-2000 and template E30-1 when constructing this assembly. Parts as received from RotorWay International for the radiator.

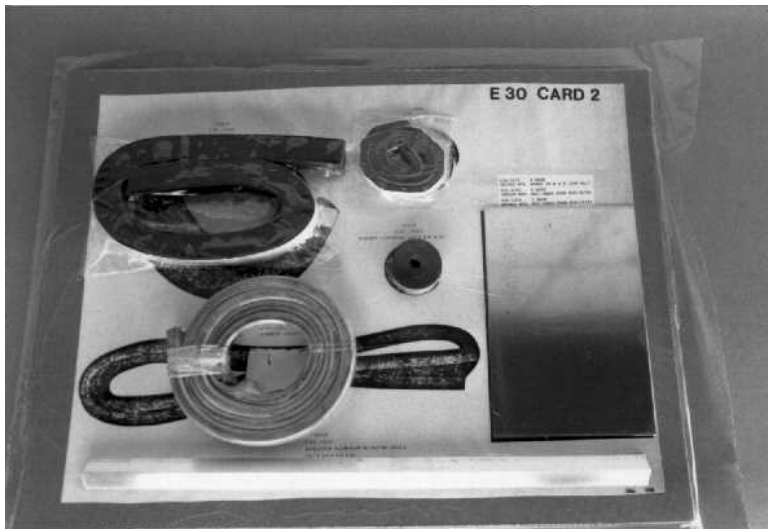


Photo #2

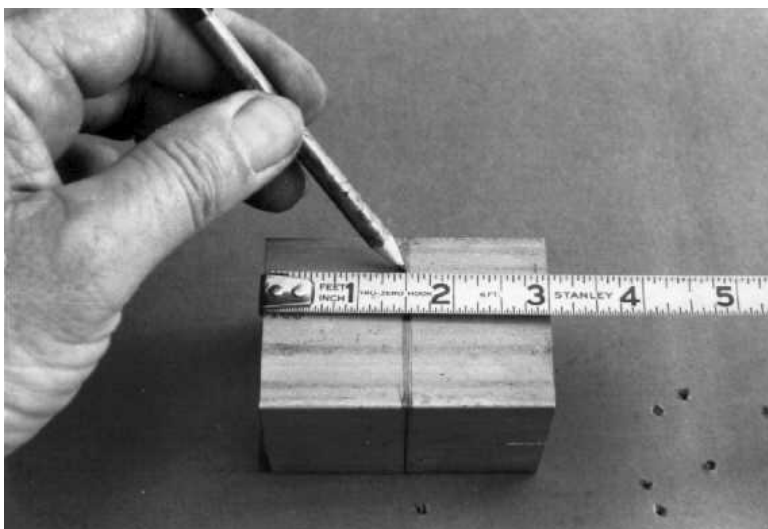


Photo #3

The radiator joiner bracket is used to hold the radiators together at the end which has the opening for the water hoses.

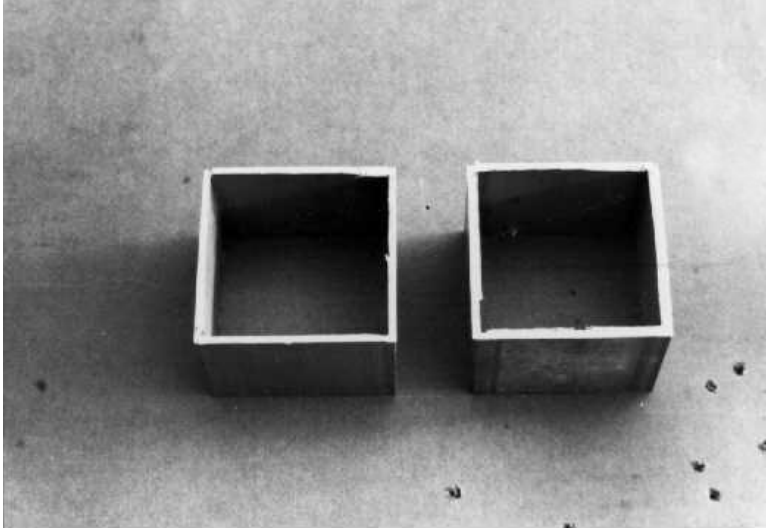


Photo #4

Cut the square tube (part number E30-3110) into two equal parts.

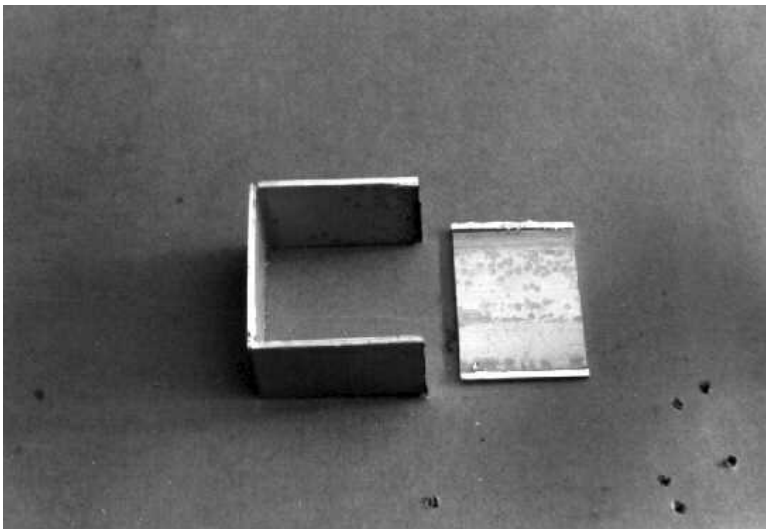


Photo #5

Cut one end off each of the two parts to make them into a U shape.



Photo #6

Clamp the two parts together back to back and drill a 1/8" hole in each corner.

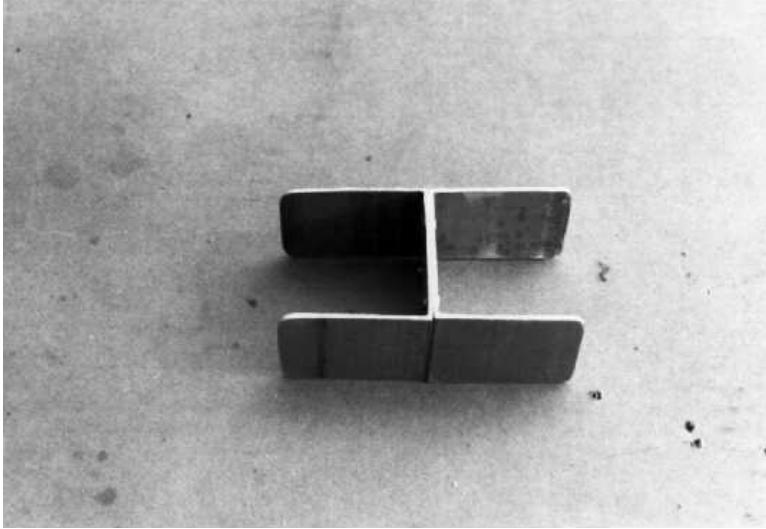


Photo #7

Deburr the 1/8" holes and all edges of the parts and pop rivet them together.



Photo #8

Use a hammer to flatten the pop rivets so that they do not hit the radiator when installed.



Photo #9

Cut and glue the rubber to the inside of the bracket with the #1300 yellow glue.

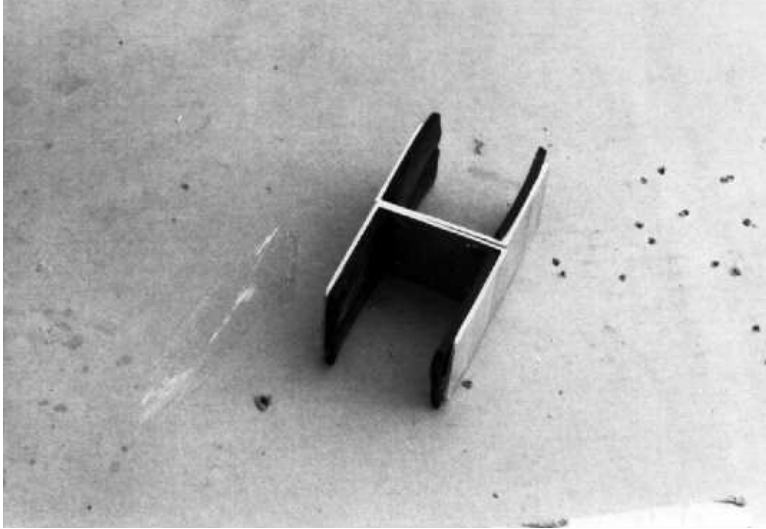


Photo #10

Rubber glued in the part.

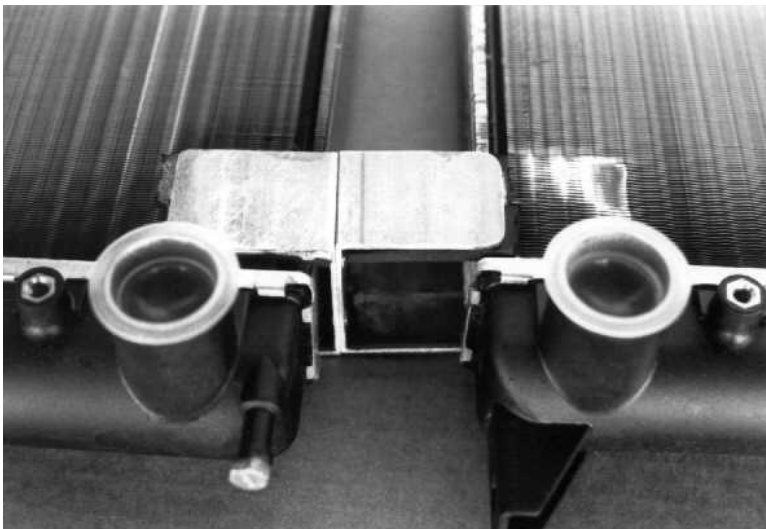


Photo #11

The bracket slides over the two radiators. Use care to prevent bending the fins of the radiators as much as possible.

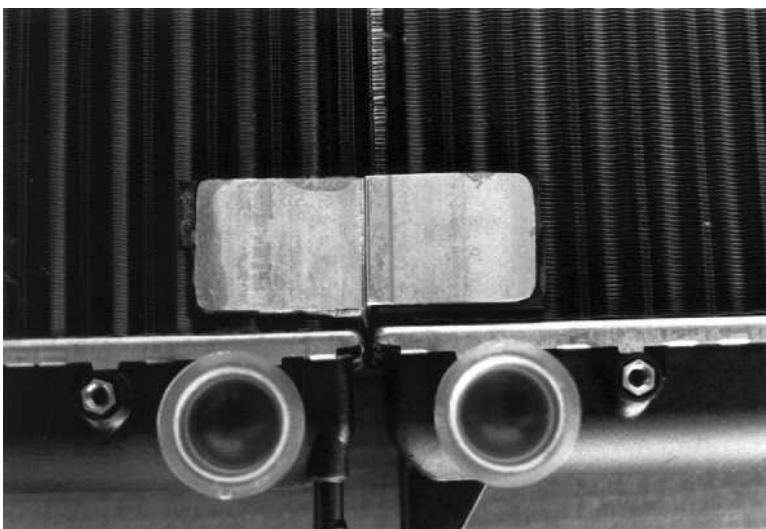


Photo #12

The bracket in final location on the radiators.



Photo #13

Place the two radiators on a flat surface side by side. Stick the foam strip to the side of one of the radiators. Then bolt the two radiators together with the foam strip between them.



Photo #14

Be sure to use the correct length spacer so that the radiator ears are not under pressure when the bolts are tight.

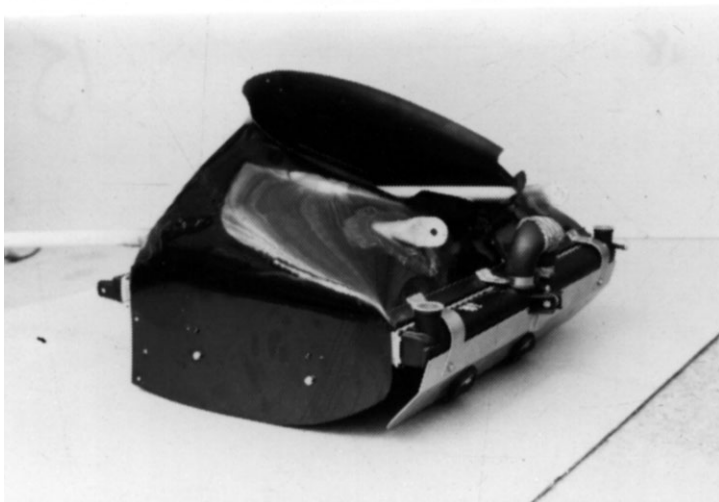


Photo #15

Place the radiators on a box so the fan shroud can hang below them. Place the fan shroud on the radiators and let them overlap each other until the sides are tight on each side of the radiators.

Note: This is a view of what the fan shroud and radiators should look like when finished.



Photo #16

Drill 1/8" holes. Install a cleco to hold the two halves of the shroud together. After checking the fit, drill and install the nut plates and screws.

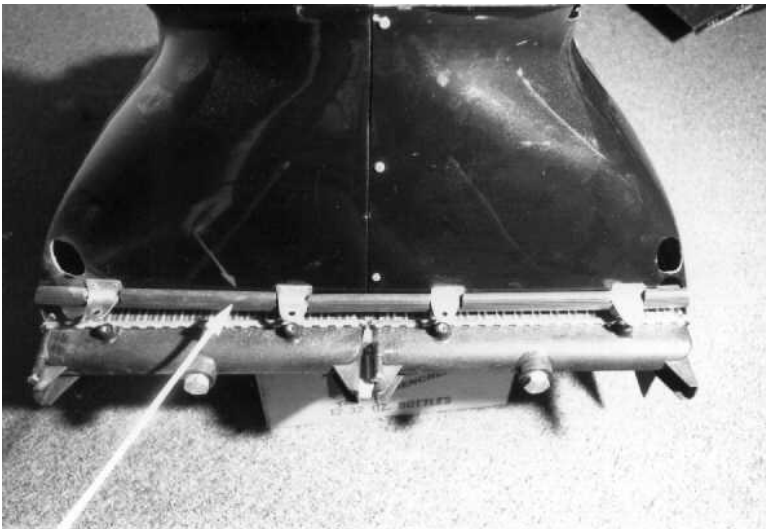


Photo #17

Cut and fit the rubber seal between the fan shroud and the radiators.

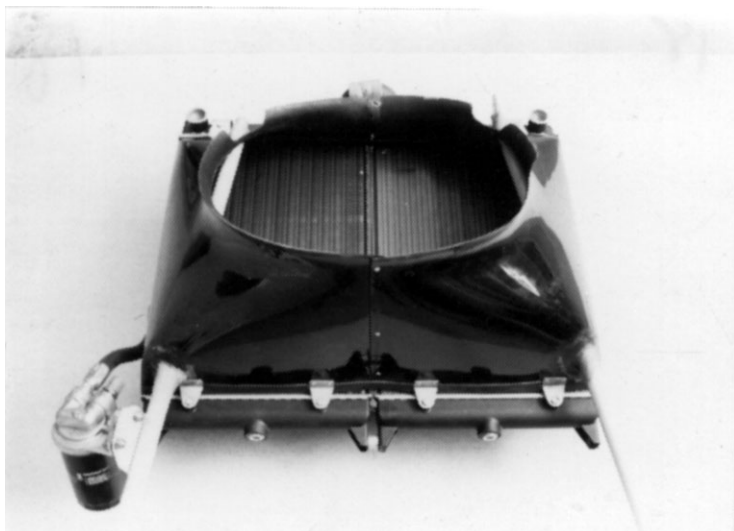


Photo #18

Use template E30-1 to make the mounting brackets. Place the fan shroud on the radiator. Bolt the brackets to the radiator; this will locate where the brackets should attach to the fan shroud.

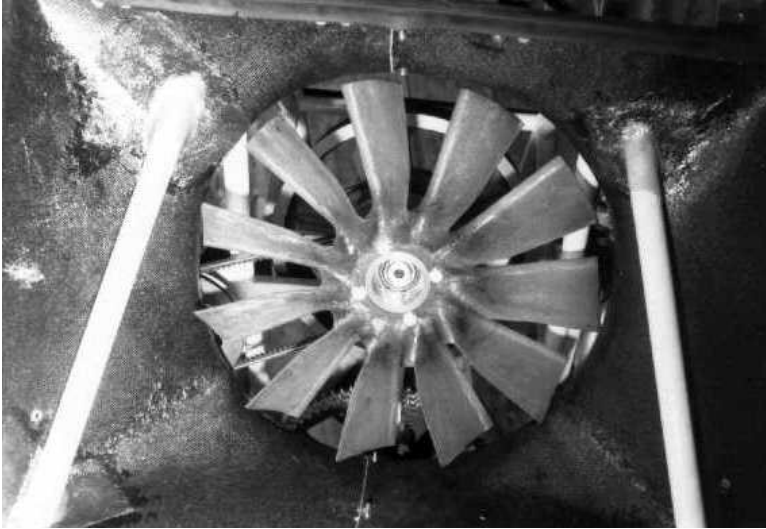


Photo #19

Cut the holes for the tail boom support braces using the scribe lines as a guide. Install the braces through the fan shroud into the airframe. Before fiberglassing the fan shroud to the tail boom support braces, check that the lip at the rear of the fan shroud is tight against the rear airframe cross tube and the fan is centered in the shroud opening.



Photo #20

Fill the openings around the tail boom supports with the fibreglass mat and cloth, part numbers E32-1180 and E32-1190.

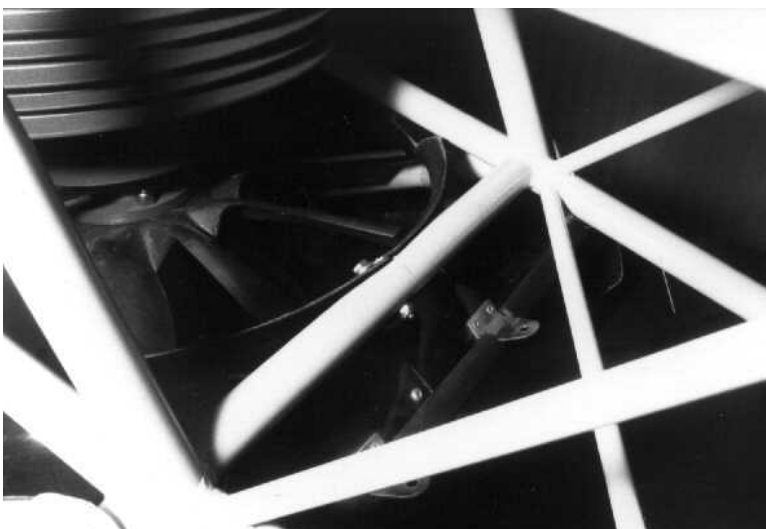


Photo #21

Drill holes and bolt the rear of the fan shroud to the rear airframe cross tube. Drill at an angle so that the fan does not hit the bolt.



Photo #22

Cut the angle bracket to length and glue the strip of rubber to the side that will make contact with the radiator.



Photo #23

Hold the angle bracket tight against the bottom of the radiator and drill the holes for the nut plates and screws. Use two strands of safety wire to hold the sides of the fan shroud together.

OIL COOLER



Photo #24

Use print E30-2000 and E37-2000 when constructing this assembly. Parts as received from RotorWay International for the oil cooler.

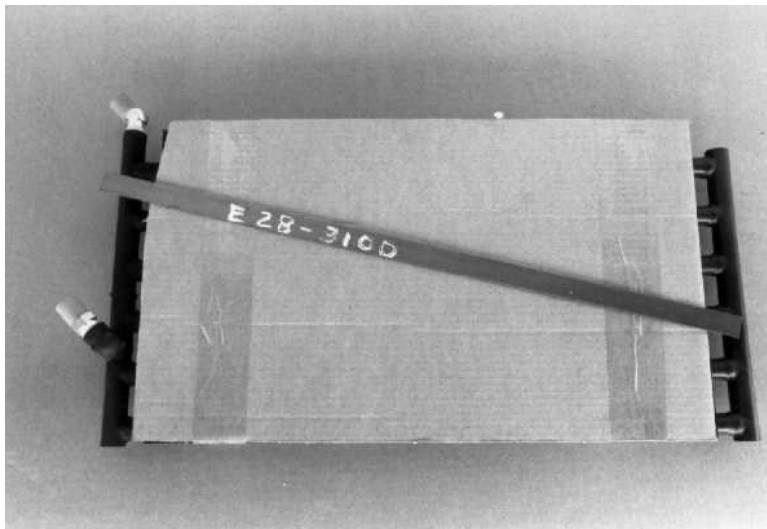


Photo #25

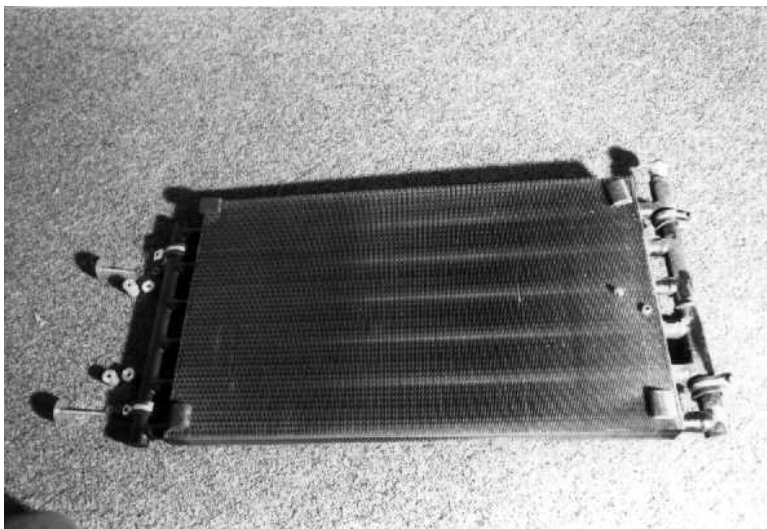


Photo #26

Cut the rubber strip into four equal parts and glue them onto the four corners of the oil cooler that will be next to the radiators. Install the adel clamps on the oil cooler.