

# SERVICE MANUAL



## 5.7 S-Fin

Oil and Air Coolers

# High PreSSure Air-To-oil CoolerS Air-To-Air CoolerS

Consult Nameplate for Pressure Rating

**Please read and follow  
instructions carefully  
before proceeding with any  
service work and/or repairs.  
Consult factory before pro-  
ceeding with any possible  
warranty claims.**

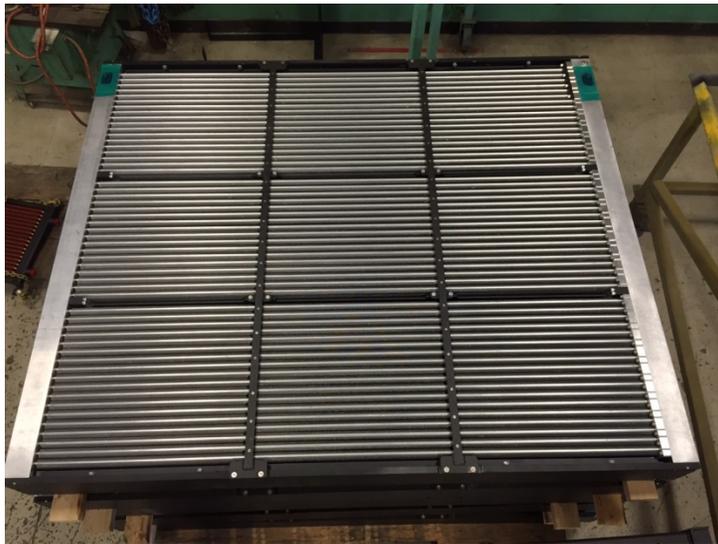
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## Warranty

Consult L&M before proceeding with warranty claims or repair. 5.7 S-Fin General Warranty is 18 months from date of manufacturer. Contact L&M Radiator Customer Service for more details.

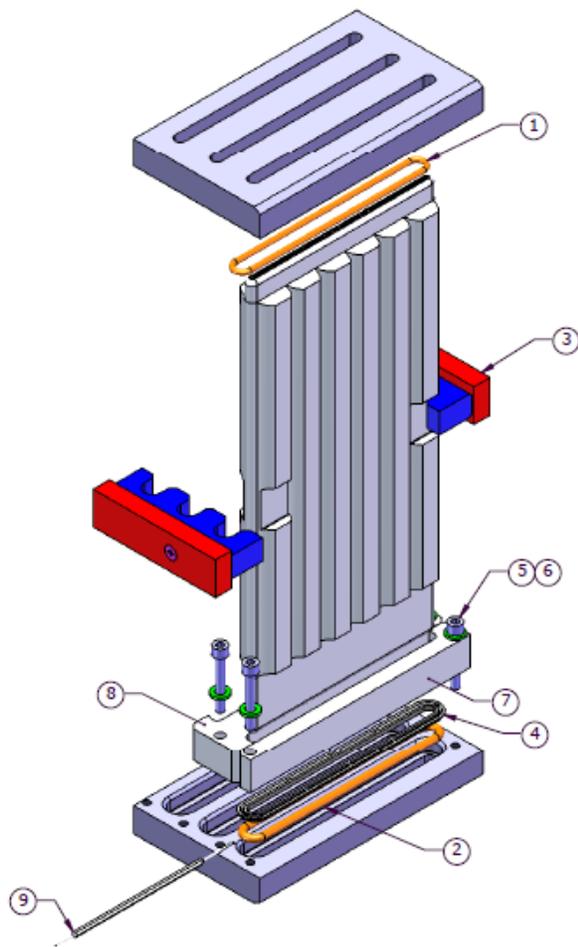
L&M Radiator Inc.  
1414 East 37<sup>th</sup> St.  
Hibbing, MN 55746

800-346-3500  
218-263-8993  
[www.mesabi.com](http://www.mesabi.com)

# Standard Parts:

Models S-Fin Air and Oil Coolers

Exploded view of a typical MESABI® S-Fin Cooler.



Exploded View- High Efficiency S-Fin Cooler Oil/Air		
	Description	Part No.
1	Rubber Seal Short End	Refer to parts list
2	Rubber Seal Long End	Refer to parts list
3	Tube-Support	Refer to parts list
4	Seal Retainer	356330
5	Dip Spin Bolt	120867.XX
6	Flat Washer	118246.XX
7	L-Block	356343
8	Y-Block	356329
9	Seal Tool	97892
10	Tube Assembly Tool	370677
11	Tube Removal Tool	317596



# External Cleaning and Tube Removal

## Helpful Hints:

- \*Read this manual thoroughly
- \*Work in a clean environment
- \*Good lighting is a must
- \*Use proper tools and lubricant
- \*Call L&M Customer Service (800-346-3500) with questions.

## External Cleaning

To maintain efficiency and assure maximum life of MESABI S-Fin coolers, reasonable care must be taken when cleaning.

In some cases it may be best to blow out any dry dirt with shop air prior to washing the core with a high pressure washer. If there is any doubt on cleaning method to be used, try the method on a portion of a single tube first, or contact L&M Customer Service. For general external cleaning, high pressure hot water (with or without soap) can be used at pressures up to 1200 psi (8274 kPa). You must spray straight into the core-not an angle (stay at least 6 inches away from tubes).

It is important to start on the air exit side. Work from top to bottom. Concentrate on small areas and work slowly. Keep washing until the water exiting the opposite side is free from dirt and debris. Complete this side and then repeat the process for the other side.

Many radiator shops use a hot alkaline soap or caustic soda in their boil-out tanks with chemical additives. Soaking in high pH solutions may damage the aluminum alloy, depending on the exact characteristics of the solution. Solutions that are either too alkaline (pH>9) or acidic (pH<5) are not recommended.

## Removing MESABI Tubes –

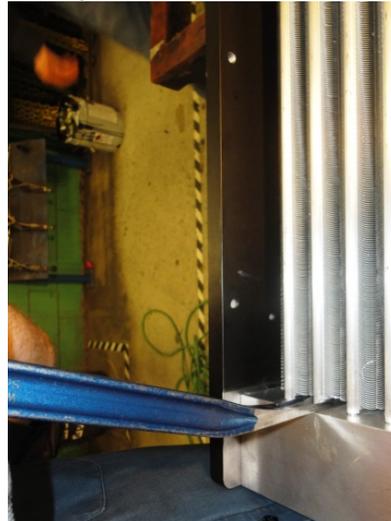
1. After a thorough cleaning as described above, blow dry the core section. Remove the T block bolts and then slide the T block out from between the tubes.



2. Remove plastic seal retainer then remove O-ring from tank making room for tube removal, being very careful not to damage the tube or sealing surface in the tank. (The seal will need to be replaced).



3. Using the tube removal tool PN 317596 on the opposite end of the tank, and or by gripping tube by hand, push the tube into the T block side tank.

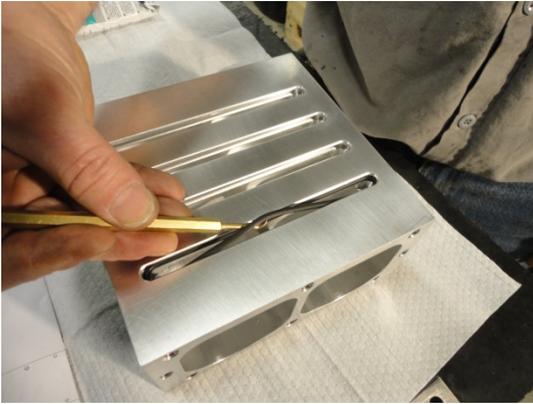


4. Once short machined end of the tube clears the header on the opposite side slowly remove tube using the least angle possible, being careful not to damage the tube end. Set the tubes and removed parts aside, keep them clean and protected for re-assembly.

**Caution:** Minimize the removal angle and do not force the tube out. Care must be taken to not damage tube.

5. Clean the header plate with high pressure washer, then blow the inside and outside surfaces of the tanks thoroughly dry with air.

6. On the short tube side tank, carefully, insert the seal tool between the seal and groove, then remove the rubber seal from the groove and discard. (Seals that are inadvertently dropped in the tank must be removed).



7. Thoroughly clean and inspect the seal groove in the tanks/headers.

Insert a clean brush into the header plate tube hole. Rotate the brush to remove any debris that may be in the groove. Use clean compressed air to blow tanks clean. Inspect seal groove to make sure it is clean and free of any defects. Fine emery cloth may be used to polish out minor scratches in the sealing surfaces of the groove.

8. After inspection and cleaning lightly lubricate seal groove and protect from dirt prior to tube installation.

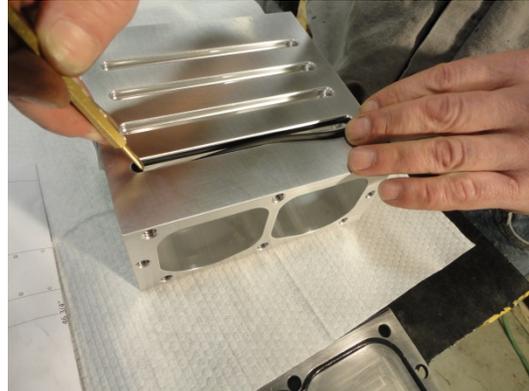


#### New Seal Installation

9. Lubricate seals with lubricant 100276 and protect from dirt.



9. Using the flat hooked end of the seal tool, pull the proper lubricated seal into an oval shape and insert one end of the seal into the seal groove. With your finger, push the other end of the seal into the groove while controlling the opposing end with the flat end of the seal tool.



10. Use the back of the seal tool to press the seal firmly into the groove so that it does not bulge out.



To avoid pinching the seal between the tube and groove, a small amount of lubricant may be needed to hold the seal tightly to the long sides of the groove. Note: The seal needs to be completely seated into the groove in order for the tube to be installed properly.



11. Repeat as necessary for remaining tubes in the repair. Protect from dirt prior to tube installation.

# Tube Installation

**Important:** Before inserting new or original tubes into the header plates, new seals must be installed and lubricated properly as described previously.

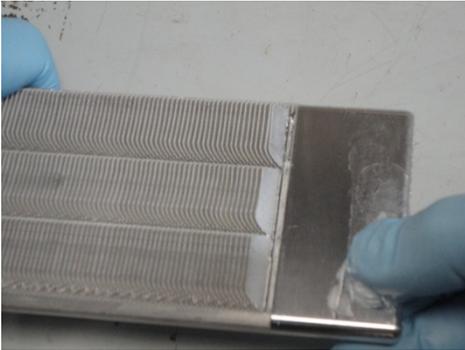
**Note:** This section addresses tube installation in an assembled frame. For frame assembly information see frame section at end of document.

## Tube Preparation

1. Inspect tubes for scratches, nicks, and other defects. Make sure tube ends are clean and free of debris.

Scotch brite can be used to polish out minor scratches in the sealing surface of the tubes.

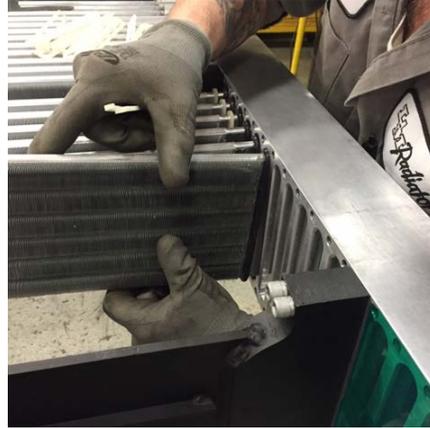
2. Lubricate (PN 100276) both ends of the tubes. Do not lubricate the internal tube ports as this could block flow!!



Place the proper lubricated seal on the long end of the tube.

## Tube Installation

1. Slide the long end of the tube into the stepped tube hole at the smallest angle possible. Be careful not to scratch or damage the tube hole and tube end.



2. Tilt the tube into the core and center the tube with the captured seal tube hole on the opposite end.

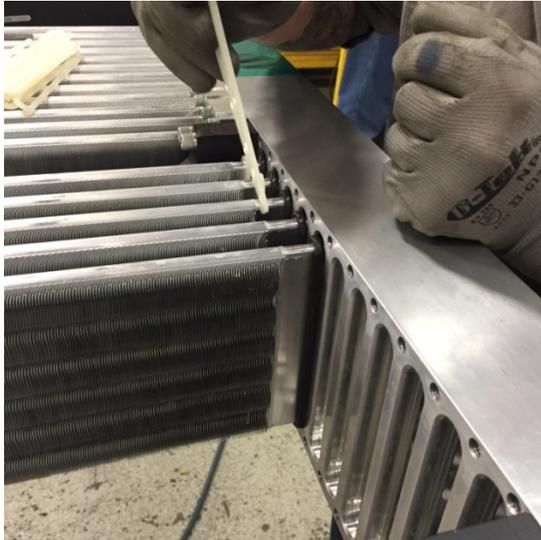
3. Carefully but firmly by hand, seat the tube into the hole up to the fin.

•Note: If the tube is difficult to seat, there is a high possibility the tube ripped the seal. Remove the tube and inspect the tube end for proper crimp, bevel, lubrication, and inspect seal for damage. Replace as necessary.



4. On the tube's long end, slide the seal to the surface of the header. Press the leading and trailing ends of the seal into the tube hole to center the tube better.

5. Install the seal retainer around the tube and after the seal.



6. Using the Seal Installation Tool, P/N 364417, press the seal and seal retainer into the tube hole. The seal retainer will be flush with the surface of the header if installed properly.

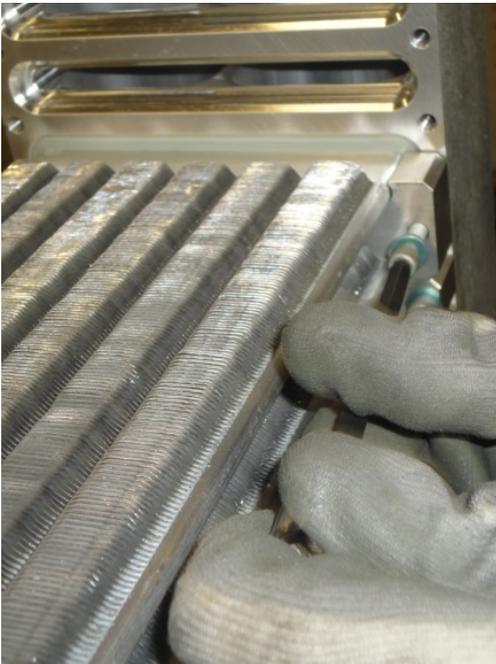


7. Repeat steps 1-6 for remaining tube holes.

8. Install the T&L Blocks. Alternate the direction of each T Block between the tube gaps. L-blocks on the ends and T-blocks in the middle.



9. Install bolts for the T&L Blocks. Applying anti-seize to bolts is recommended.



10. Torque each 1/4" bolt to 6 ft-lb. (72 in-lb.). Torque each 5/16" bolt to 17 ft-lb. (204 in-lb.). No gap between the T&L Cover Blocks and the header plate is allowed.



11. Complete assembly per drawing.

# Frame Assembly

Unless there is issue with the frame condition or side member seals, it is not necessary to disassemble frame for tube repair. Use instructions below to assemble, repair, and install new seals in the tank to side member assembly if required.

1. Tank extrusion should be clean and all O ring grooves inspected for damage.



2. Clean out seal groove in the side member and inspect groove for dirt or damage.



3. Lubricate side member seal with lubricant, (PN 100276), and install being careful not twist seal.

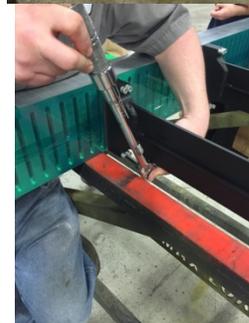
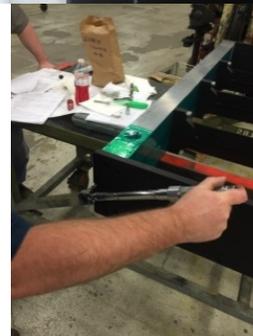


4. Install side members and tension tie supports to print and check frame for square. Torque tension tie bolts to 10 ft lbs. (120 in lbs.).



Note: Apply PN 119397 thread locker to all bolts used to fasten the tanks, side members, ports, and mounts. Torque bolts to the values listed below. Tighten side member/tank bolts in a star pattern.

- Torque 5/16" Button Head to 17 ft-lb (204 in lb)
- Torque 3/8" Button Head to 27 ft lb (324 in lb)





• If you have any questions regarding the procedures described in this Service Manual, please contact L&M Radiator and ask for Customer Service. See back page for contact information.

• All information, illustrations and specifications in this Service Manual are based on the latest information at the time of publication or posting online at [www.MESABI.com](http://www.MESABI.com). The right is reserved to make changes at any time without notice.

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