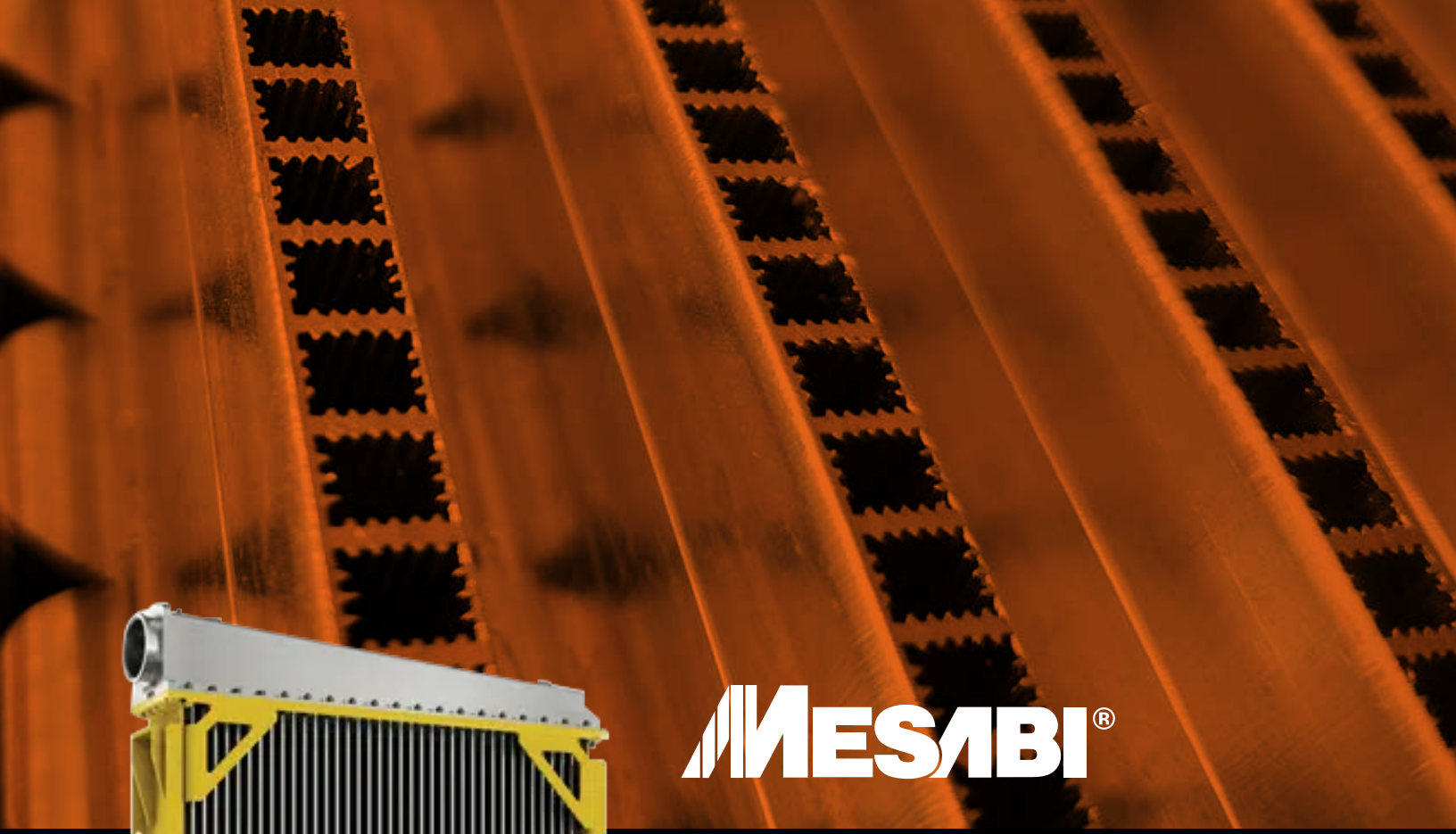
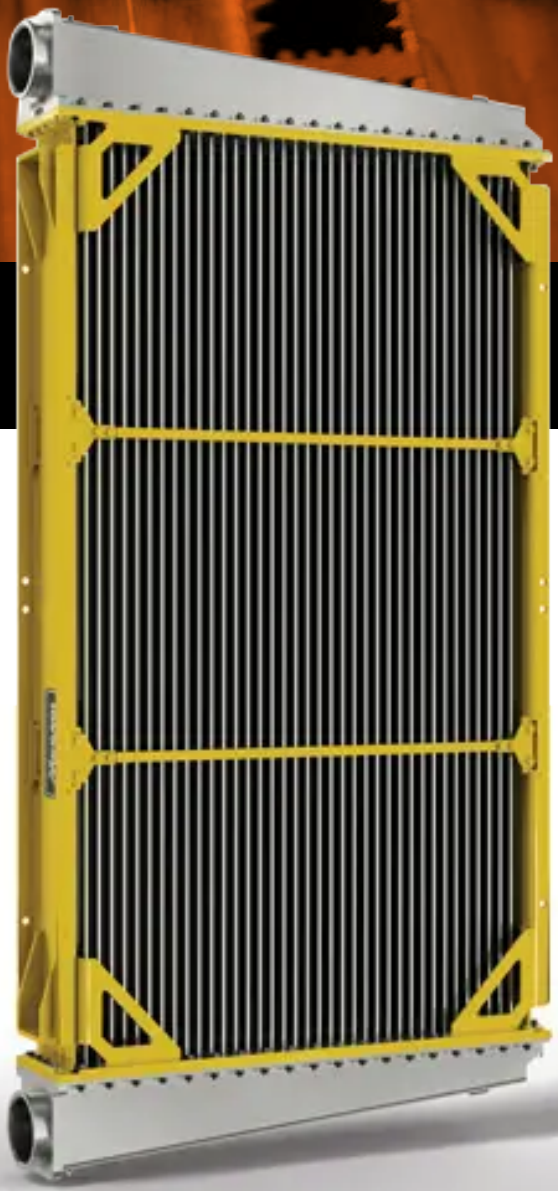


MESABI®

SERVICE MANUAL



5.67 S-FIN
AIR-TO-AIR COOLERS

PLEASE READ AND FOLLOW INSTRUCTIONS AND WARRANTY CAREFULLY BEFORE PROCEEDING WITH ANY SERVICE WORK AND/OR REPAIRS. CONSULT FACTORY BEFORE PROCEEDING WITH ANY POSSIBLE WARRANTY CLAIMS. ONLY USE GENUINE MESABI® PARTS.

ALWAYS CONSULT NAMEPLATE FOR MAX PRESSURE RATING.

IF YOU HAVE ANY QUESTIONS REGARDING THE PROCEDURES DESCRIBED IN THIS MANUAL, PLEASE CONTACT L&M RADIATOR, INC. AND ASK FOR CUSTOMER SERVICE.

Rev 1 10.03.2023

L&M RADIATOR, INC. GENERAL WARRANTY

Consult L&M Radiator, Inc. before proceeding with warranty claims or repairs. Failure to do so may void this limited warranty. This limited warranty allocates the risk of failure of the product(s) between the Buyer and L&M Radiator, Inc. and is reflected in the purchase price.

L&M Radiator, Inc. warrants that MESABI® products will conform to the L&M Radiator, Inc. written quotation specifications and drawings. MESABI® framework components are warranted for 18 months from the date of invoice against defects in materials and workmanship during normal usage. The L&M Radiator, Inc. warranty against seal leakage during normal operation is stated in individual product literature.

L&M Radiator, Inc. liability is limited to the rework or replacement (at L&M Radiator, Inc. sole option) of products or parts manufactured by L&M Radiator, Inc. that are determined by L&M Radiator, Inc. to be defective in workmanship or material or do not meet L&M Radiator, Inc. quoted specifications.

The L&M Radiator, Inc. product warranty does not apply if the product has been subjected to abnormal use or conditions, unauthorized modifications or repair, corrosion, misuse, neglect, abuse, accident, improper installation, or other facts which are not the fault of L&M Radiator, Inc., including damage caused by shipping.

L&M Radiator, Inc. does not warrant products incorporated into L&M Radiator, Inc. products that are not manufactured by L&M Radiator, Inc. Buyer's sole recourse with respect to such products will be subject to the warranty of the individual manufacturer.

Other than as stated herein, L&M Radiator, Inc. makes no representation or warranty of any kind, expressed or implied, as to the merchantability or fitness for a particular purpose, or any other matters with respect to the sale of L&M Radiator, Inc. products(s) and all implied warranties of merchantability or fitness for a particular purpose are hereby disclaimed. In no event will L&M Radiator, Inc.'s liability include any special, incidental, consequential, or punitive damages, even if L&M Radiator, Inc. knew of the likelihood of such damages.

Any action or lawsuit for breach of the limited warranty in these L&M Radiator, Inc. terms and conditions must commence in Minnesota. This warranty supersedes all previously published warranties.

MESABI® PRODUCT SPECIFIC WARRANTY S-FIN COOLERS

Consult L&M Radiator, Inc. before proceeding with warranty claims or repairs. 5.67 S-Fin General Warranty is 18 months from the date manufactured. Contact L&M Radiator Customer Service for more details.

MESABI® HEAT EXCHANGERS ARE THE WORLD STANDARD FOR HEAT EXCHANGER RELIABILITY

If you have any questions regarding the procedures described in this Service Manual, please contact L&M Radiator Customer Service.

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. L&M Radiator reserves the right to make changes at any time without notice.

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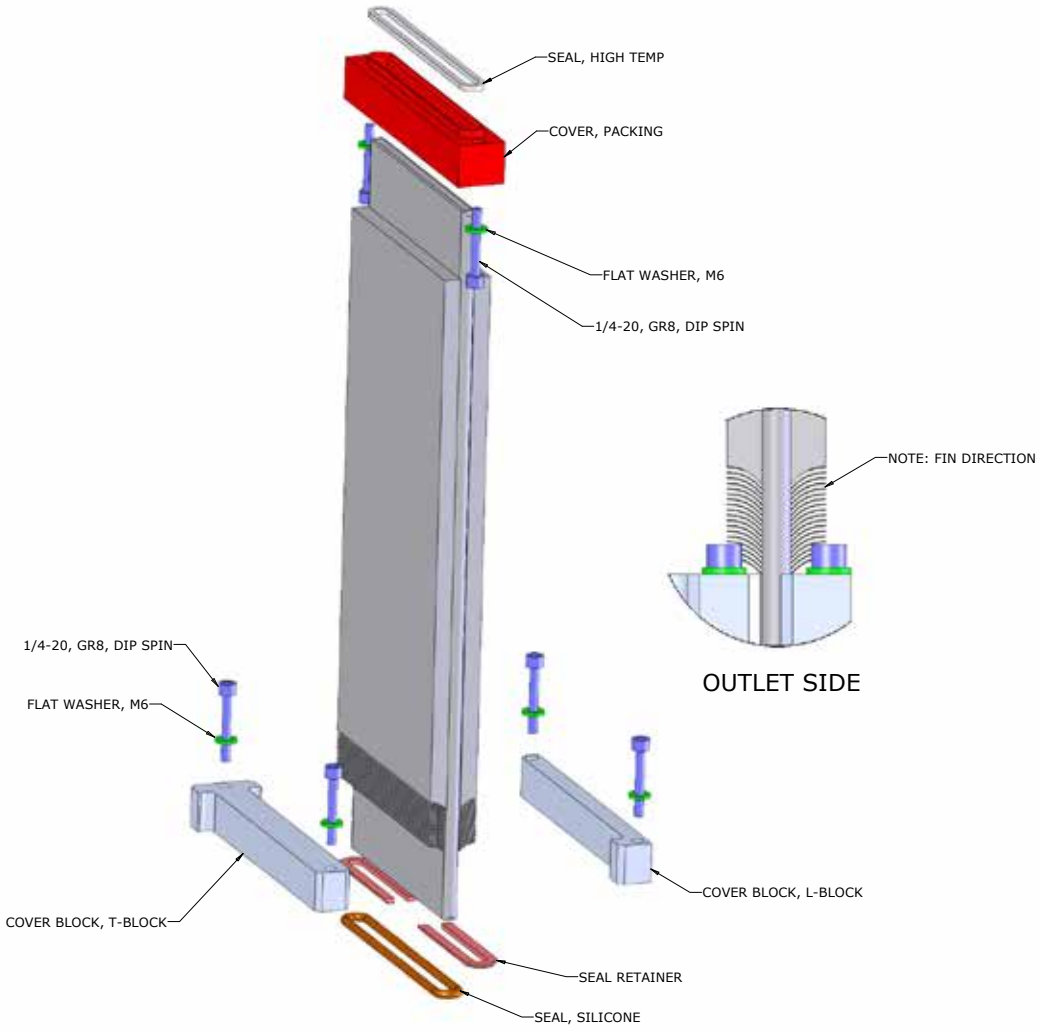
STANDARD PARTS

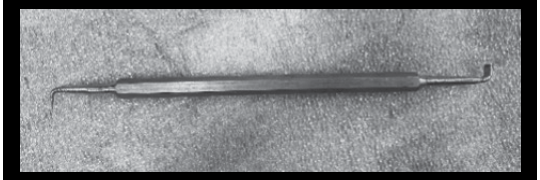
INLET SIDE



OUTLET SIDE

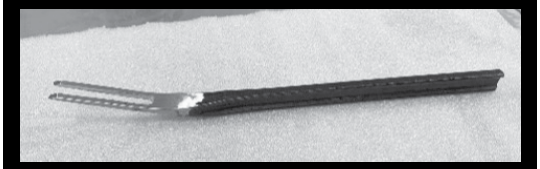
When purchasing parts, contact L&M Customer Service to ensure correct genuine Mesabi® parts.

GENUINE
MESABI® TOOLS



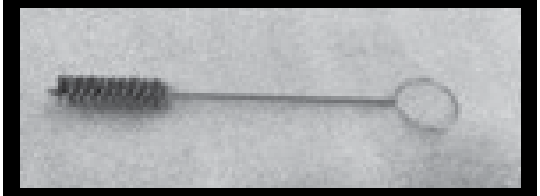
SEAL O-RING TOOL

#97892 Used for the removal of retainer clips.



S-FIN TUBE ASSEMBLY TOOL

#317596 Used to assist in removal of the S-Fin tubes away from the Cover Blocks.

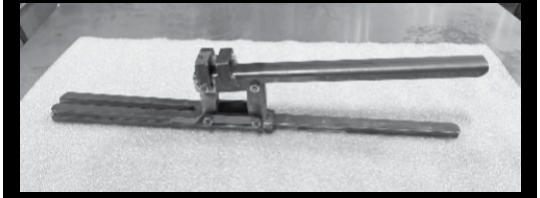


BRUSH

#63451 Used in header preparation.

SILICONE LUBRICANT

#100276 Used in tube preparation.



S- FIN SEAL INSTALLATION / REMOVAL TOOL

#364417 Used in the installation and removal of S-Fin tubes.

1 EXTERNAL CLEANING

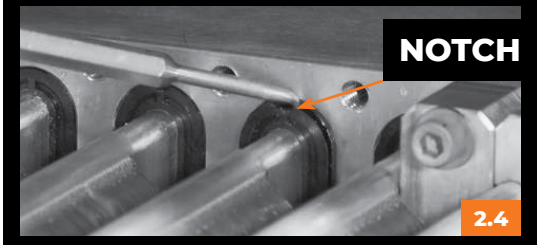
To maintain efficiency and assure maximum life of MESABI® S-Fin Coolers, reasonable care must be taken when cleaning.

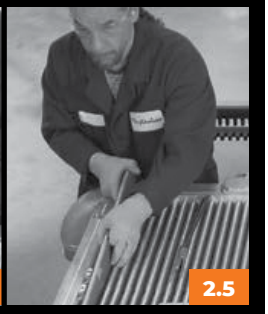
1.1 In some cases, it may be best to blow out any dry dirt with shop air prior to washing the core with a high-pressure washer. If there is any doubt on what cleaning method to use, try the method on a small portion of a single tube first, or contact L&M Customer Service.

1.2 For general external cleaning, high pressure hot water (with or without soap) can be used at pressures up to 1200 PSI (8274 kPa.) Spray straight into the core; do not spray at an angle and stay at least 6 inches away from the tubes. It is important to start on the air exit side first. 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 on the other side.

1.3 Blow dry the core section.

NOTE: Many radiator shops use a hot alkaline soap or caustic soda with additives in their boil-out tanks. 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.





2 REMOVING MESABI® TUBES

NOTE: Removing tubes will require two people. Be sure to note fin orientation when removing tubes.

2.1 Remove support bar if equipped.

2.2 Remove the T and L blocks from tanks. Slide the T block out from between the tubes. Only need to remove the T and L blocks around the tube(s) being removed.

2.3 Loosen cover blocks from header plate. Only need to loosen the cover blocks of the tube(s) being removed.

2.4 Remove plastic seal retainer. The notch on the retainer can be used to remove the retainer clip using the seal O-ring tool (#97892). Be very careful not to damage the tubes or sealing surface of the tank.

2.5 Using Tube Assembly Tool (#317596) pry cover block away from the header plate pushing the tube into the opposite tank.

NOTE: Do not force the tube out or tube could become damaged. Remember to remove the tube at the smallest angle possible. If experience trouble removing the tubes, contact L&M Customer Service.

NOTE: If there is excessive damage or wear to tubes, contact the L&M Customer Service for evaluation.


3.3


3.3

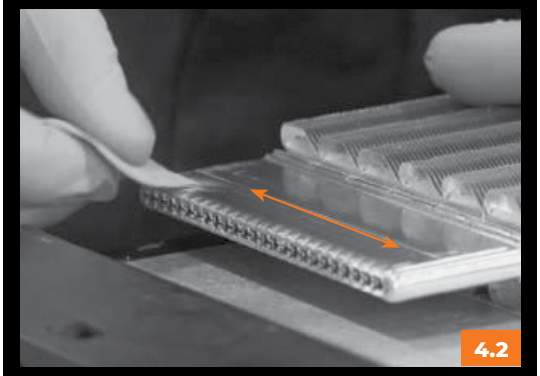
3 HEADER PREPARATION

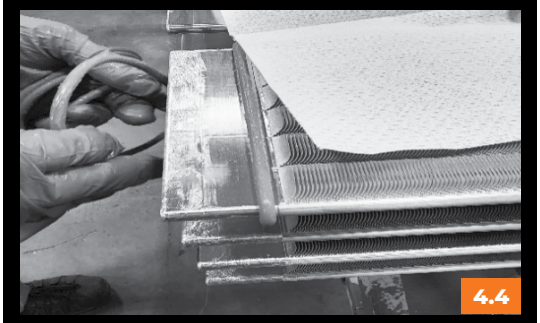
3.1 Clean the seal pockets with a dry non-lubricant brush (#63451) in good condition. DO NOT use a steel or brass brush as the tube holes could be damaged.

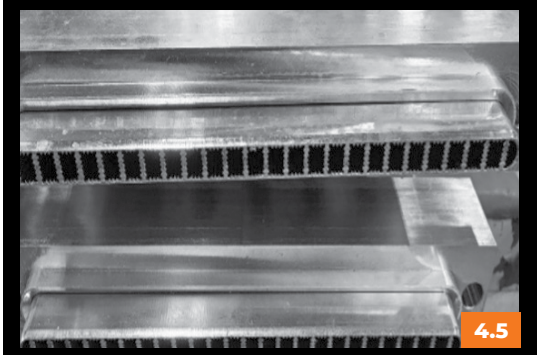
3.2 Using compressed air blow the header plate/tanks out. Remove all debris loosened by the fiber brush. Inspect the sealing pockets to make sure there are no nicks, scratches, weld BB's, or other contamination especially in the sealing groove.

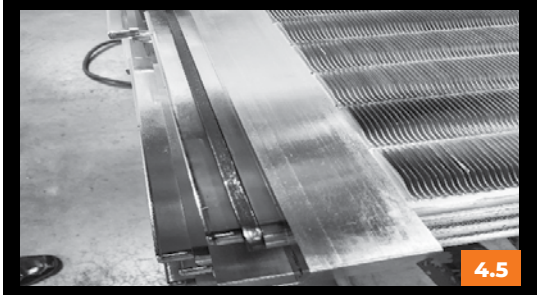
3.3 Lubricate the bevel on the header plate to help assist the installation of the tube.

NOTE: Only lubricate the header holes that the rubber seals go into. (Outlet Tank)









4 TUBE PREPARATION

Before inserting new or original tubes into the header plates, new seals must be installed properly as described below. This section addresses tube installation in an assembled frame.

4.1 Inspect the tubes for scratches, nicks, and other defects. Make sure the tube ends are clean and free from debris.

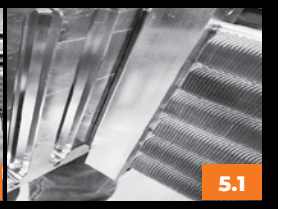
4.2 If any burrs or scratches are noticed, use 280 grit or finer sandpaper to clean the tube surface.

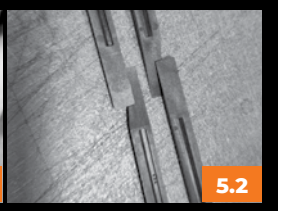
NOTE: Be sure to sand the full width in the direction shown to prevent low spots and valleys which can result in leak pathways.

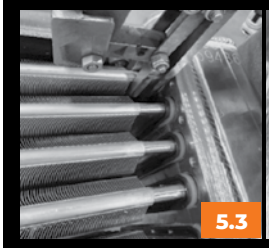
4.3 Apply a small amount of lubricant (#100276) to only a 1/4" area around the outlet end of the tubes.

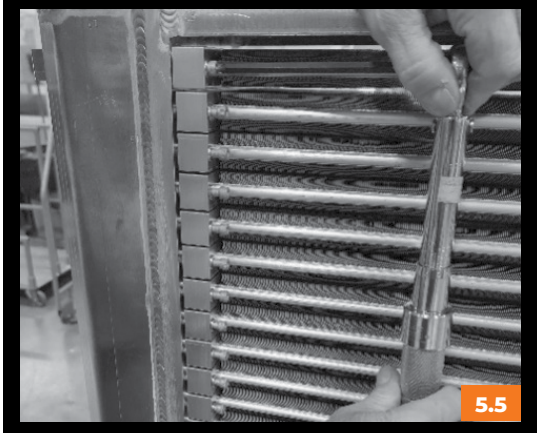
4.4 Apply a small amount of lubricant to the silicone seals and place over the outlet ends of the tubes.

4.5 Install packing cover block to inlet tube end. Carefully slide the graphite seal over the inlet end of tube.









5 TUBE INSTALLATION

5.1 Insert silicone seal end of the tube into the outlet end of the header at the smallest angle possible. Be careful not to scratch or damage the tube hole or tube end. Note the fin direction on print and tilt the tube into the core and center the tube end with the graphite seal into the header hole.

5.2 On the silicone seal end, install the seal retainer (#399202) around the tube above the seal with the side shown in the picture facing away from the seal. Make sure the smooth side is facing the seal.

5.3 Use the Seal Installation Tool (#364417) to press the seal and seal retainer into the tube hole. The seal retainer will be flush with the surface of the header if properly installed.

5.4 Install T&L Blocks on the silicone seal end (outlet end). The bolts will need to be torqued to 12ft-lbs (16.27 NM).

5.5 Carefully insert the graphite seal / cover block into the header plate (inlet end) when tightening the cover block bolts. Alternate between the two bolts to prevent the packing cover from binding. Torque the packing cover to the header plate (front and back) to 8ft-lbs (10.85 NM) uniformly.

5.6 Install support bars. Make sure the support material is not touching the tubes in the valleys. There should be a nominal 1/8" (+/- 1/16") gap between the support valley and the round part of the tube.

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L&M QUALITY POLICY

The quality policy of L&M Radiator is to produce a quality engineered, quality manufactured product through continuous improvement that we deliver to the customer's satisfaction.