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Service Instructions

Mesabi Aluminum Tube Air to Oil Coolers

Applicable for the following coolers: 235213

235735 242645 248434

MESABI® Aluminum Tube Air to Oil Cooler – Standard Parts



Allied Systems

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MESABI® Aluminum Tube Air to Oil Cooler

Tube Removal and Replacment

EXTERNAL CLEANING MESABI Aluminum Tube Air to Oil Cooler

To maintain efficiency and assure maximum life of a MESABI Aluminum Tube Oil Cooler, reasonable care must be taken when cleaning.

For general external cleaning, a high pressure hot water washer, up to 1200 PSI, can be used. Unlike conventional cores, you can and should get right up next to the core with the wand. Starting from the air exit side, place the high pressure washer nozzle next to the fin, concentrating on a small area, slowly working from the top down. Make sure you spray straight into the core, not at an angle. Continue washing until the exit water is free of dirt. Repeat from the opposite side.

In some cases it may be best to blow out any dry dirt with a high pressure (up to 1200 PSI) air gun prior to washing core with the high pressure hot water washer. If there is any doubt about the cleaning method to be used, try the method on a portion of a single tube first, or contact Allied Systems Co..

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>9.0) or too acid (pH<5.0) are not recommended.

Removing MESABI Tubes

After thorough cleaning, as described above, blow dry the core section, then remove retainer clips from top portion of tube, as shown in Fig. 1.

With Installation Tool No. 240834, grasp center portion of tube, as shown in Fig. 2. Rotate the tool, so as to break the tube free from the seal then raise the tube only enough to clear lower seal and swing tube out just far enough to allow tube to be pulled down and out of its upper seal, as shown in Fig. 3.

Remove all tubes in the row, repeating the above procedure.

Installing MESABI Tubes

IMPORTANT: Before inserting new or original tubes into header plates, new seals (P/N 226663) must be installed.

After removing old seals, tube holes should be cleaned of any foreign debris. A McMaster Carr Chuck Grip 3/4" brush #63005T42 placed in



Fig. 1







Fig. 3

MESABI® Aluminum Tube Air to Oil Cooler

Tube Removal and Replacment (Continued)



Fig. 4



Fig. 5





an electric or air drill can be used for this purpose. **Note: Caution must be taken when cleaning aluminum header plates not to damage hole surface finish.** Be sure to clean the inside of the tanks out with air before installing seals. Place new seals in the clean holes. Then, using a flat bottom rubber mallet, gently tap each seal down so that the shoulder of each seal is resting on the header plate.



ON THE LEFT: Properly installed 226663 seal. RIGHT: 226663 seal installed too far into header.

CORRECT INCORRECT

Before original tubes are reinstalled, tube ends must be clean of foreign material. A fine grit emery cloth or buffing wheel can be used. Precaution should be taken when buffing so as to not mar tube. Make sure the tube ends are wiped clean prior to installation.

Coat the inner hole of each seal and the outside ends of each tube with a small amount of #10 hydraulic oil or petroleum jelly. Cupped washers should be installed as shown in the exploded view on page 3, prior to installing tubes. Starting at the end of one of the rows of holes, push the top end of a tube (the top end of the tube is the end with the longest unfinned section) into one upper header plate seal, as shown in Fig. 4 . Place center bottom end of tube into respective hole in the bottom seal. Push tube down and into seal until the washer is located on top of the lower seal. This may be done by grasping tubes by hand and pulling tube downward until seated, or by using Installation Tool, new style No. 240834, as shown in Fig. 5. **Note:** Be sure tube is properly centered in the seal before pushing the tube in place or seal damage could result.

Reinstall retainer clip between upper two washers, as shown in Fig. 6. Make sure wings on retainer clips are parallel with each other to block bypassing air.

On some oil coolers (typically when tubes are longer than 35 inches) tube stabilizers will be required. Before starting a second row of tubes, place the center tube stabilizer, Part No. 252927, in position. Stabilizers should be lined up with the support bar location. Proceed with installation of the next row of tubes, using same procedure as when installing first row.

Remember that a center tube stabilizer should be located *BETWEEN* each row of tubes before starting another row of tubes.

When tubes are completely installed, fasten tube stabilizer, Part No. 240778, with support bracket to side members.

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MESABI[®] Oil Cooler – Internal Cleaning

In cases where it is necessary to clean the inside of the oil cooler, the following procedure can be used.

Remove all the tubes and seals from the oil cooler as described on page 3. Flush the inside of the tanks with a high pressure washer (a mild soap can be used but rinse thoroughly). Blow the excess water out with air and make sure the tanks are dry. The tube holes should be clean and dry.

Next remove the turbulators from the tube with the tools shown in Fig. 7 $\,$.

Note that the tube ends have been crimped at each end to secure the

turbulator inside the tube. Also note that there is a long, unfinned portion of the tube and a short, unfinned portion.

Place the tube end on a piece of hard industrial rubber as shown in Fig. 8 . Holding the tube upright, insert tool (P/N 252925) in the end of the tube (see Fig. 9), with a hammer lightly tap the tool forcing the end of the tube open just far enough to allow removal of the turbulator. **Care must be taken not to mushroom the tube ends.** Open both ends in this manner.

Typically, turbulators are removed out of the long unfinned end of the tube with a long nose plier. In this case, the tabs are facing downwards (see Fig. 10 .) **Care should be taken not to kink the turbulators.**

NOTE: Although rare, you may find turbulators inserted the opposite way because of flow direction. If so, please remove from the short unfinned end.

Clean and flush the tube with a high pressure washer. Blow off with air and make sure tubes are thoroughly dry.



Fig. 7





Fig. 9



Fig. 10

MESABI[®] Oil Cooler – Internal Cleaning (continued)

Replace the turbulator by pushing the turbulator through the short, unfinned end of the tube (see Fig. 11). Push the turbulator far enough into the tube to allow for recrimping.



Fig. 11

Note: Depending on tolerances "pushing" the turbulator into the tube may cause kinking. An alternative would be to use a piece of wire with a hook on the end. The turbulator can be pulled into place from the long unfinned end of tube.

Crimp both ends of the tube using tool (P/N 252926) and a hammer (see Fig. 12). Lightly tap, forcing the end closed far enough to hold the





turbulator securely in place. (Again, care should be taken not to mushroom the tube ends.)

Finally, check the tube ends for burrs, etc. Lightly buff the tube ends or use a fine emery cloth to remove any debris. Make sure the tube ends are wiped clean prior to installing. Follow the installation procedures on pages 3 and 4 to complete the job.