NOTE
THIS BULLETIN SUPERCEDES FIELD SERVICE BULLETIN 2898 IN IT'S ENTIRETY.

Rocore Thermal Systems has informed MCI that the recommended service interval to dis-assemble, clean, and inspect their floating bundle design is at every major transmission repair or overhaul, 300,000 miles or 3 years (whichever occurs first).

Coaches operating in severe service conditions are instructed to reduce the recommended service interval accordingly.

A copy of Rocore Thermal Systems Transmission Oil Cooler Installation/Maintenance Procedure is attached at the end of this MCI Service Bulletin.

**Description:**
The following bulletin provides information on the replacement and/or service intervals for transmission coolers installed on D, E and J model coaches. Transmission oil coolers should be replaced or serviced after a major transmission repair or overhaul, on all MCI coach models. This precaution will greatly increase the likelihood of preventing a transmission failure due to the presence of engine coolant in the transmission oil.

The table below will assist customers in selecting the proper replacement transmission cooler for their MCI coach by identifying factory installed transmission coolers by model and effective unit number cut-in, and the replacement cooler options available from MCI Service Parts.

<table>
<thead>
<tr>
<th>Model</th>
<th>Effective Unit Number</th>
<th>Transmission</th>
<th>Factory Supplied Cooler</th>
<th>Replacement Cooler</th>
</tr>
</thead>
<tbody>
<tr>
<td>D/DL/DLS</td>
<td>47553</td>
<td>B500</td>
<td>13-11-1020, Serck</td>
<td>13-11-1070, Rocore</td>
</tr>
<tr>
<td>E</td>
<td>60001</td>
<td>B500</td>
<td>13-11-1020, Serck</td>
<td>13-11-1070, Rocore</td>
</tr>
<tr>
<td>E (S60)</td>
<td>60001</td>
<td>B500</td>
<td>13-11-1020, Serck</td>
<td>13L-11-102, Modine</td>
</tr>
<tr>
<td>D/DL/DLS</td>
<td>47553</td>
<td>B500R</td>
<td>13-11-1020, Serck</td>
<td>13-11-1070, Rocore</td>
</tr>
<tr>
<td>E</td>
<td>60001</td>
<td>B500R</td>
<td>13-11-1020, Serck</td>
<td>13-11-1070, Rocore</td>
</tr>
<tr>
<td>D4000/4500</td>
<td>55606</td>
<td>B500</td>
<td>13L-11-102, Modine</td>
<td>13L-11-102, Modine</td>
</tr>
<tr>
<td>D4000/4500</td>
<td>54328</td>
<td>B500R with sump</td>
<td>13-11-1028, Rocore</td>
<td>13-11-1028, Rocore</td>
</tr>
<tr>
<td>E4500/J4500</td>
<td>62078</td>
<td>B500</td>
<td>13L-11-102, Modine</td>
<td>13L-11-102, Modine</td>
</tr>
<tr>
<td>E4500/J4500</td>
<td>61725</td>
<td>B500R with sump</td>
<td>13-11-1028, Rocore</td>
<td>13-11-1028, Rocore</td>
</tr>
</tbody>
</table>
D / E / J Coach B500 or B500R Parts

<table>
<thead>
<tr>
<th>Qty.</th>
<th>Old P/N</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>13-11-1020</td>
<td>Cooler - Transmission, B500/B500R, Serck</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Qty.</th>
<th>New P/N</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>13-11-1070</td>
<td>Cooler - Transmission, Replaceable Bundle, B500/B500R, Rocore</td>
</tr>
</tbody>
</table>

D / E / J Coach B500R Parts with Sump Cooling

<table>
<thead>
<tr>
<th>Qty.</th>
<th>New P/N</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>13-11-1028</td>
<td>Cooler - Transmission, B500R, Rocore</td>
</tr>
</tbody>
</table>

E/J Coach ( S60 ) Retrofit Kit

<table>
<thead>
<tr>
<th>Qty.</th>
<th>Old P/N</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>13-11-1020</td>
<td>Cooler - Transmission, B500, Serck</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Qty.</th>
<th>New P/N</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>13-11-1066</td>
<td>Kit, Cooler - Transmission, S60</td>
</tr>
<tr>
<td></td>
<td>13L-11-102</td>
<td>Cooler - Transmission, Modine, Plate</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Qty.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>19-10-1695 O-rings (as required after every trans. repair or overhaul)</td>
</tr>
<tr>
<td>1</td>
<td>13-11-1011 Isolators (as required after every trans. repair or overhaul)</td>
</tr>
</tbody>
</table>

Serck B500 Transmission Coolers

Effective with unit number 47553 on D/DL/DLS and unit number 60001 on E model coaches, MCI installed Serck transmission coolers (part number 13-11-1020). Serck transmission oil coolers should be replaced after 30 months of use and after major transmission repair or overhaul. This precaution will greatly increase the likelihood of preventing a transmission failure due to the presence of engine coolant in the transmission oil.

Customers with D/E/J model coaches can order the Rocore transmission cooler with replaceable bundle (part number 13-11-1070) to replace the Serck transmission cooler. The Rocore transmission cooler is a drop-in replacement.

Customers with E/J model coaches, with S60, can order the Modine transmission cooler kit (part number 13-11-1066) to replace the Serck transmission cooler. The Modine transmission cooler (part number 13L-11-102) requires replacement/service only at a major transmission repair or overhaul. Installation of the kit requires changing the coolant and oil lines.

Modine B500 Transmission Plate Coolers

Effective with unit number 55606 on D4000/D4500 and unit number 62078 on E4500/J4500 model coaches, MCI has installed Modine transmission coolers (part number 13L-11-102). The Modine transmission cooler (part number 13L-11-102) requires replacement/service only at a major transmission repair or overhaul.

Rocore B500R Transmission Coolers with Sump Cooling

Effective with unit number 54328 on D4000/D4500 and unit number 61725 on E4500/J4500 model coaches, MCI has installed Rocore transmission coolers (part number 13-11-1028).
NOTE

Replace the fitting o-rings (part number 19-10-1695) at every transmission repair or overhaul. Inspect the isolators at every transmission repair or overhaul. If signs of wear or damage are present, replace isolator(s) (part number 13-11-1011).

Isolation kit should be on the vehicle.
Installation & Maintenance

Code 37 – Transmission Oil Coolers

OCT. 06
Rev. 01
OVERVIEW

This procedure has been developed to help the end user with the installation and maintenance of the Rocore Code 37 Transmission Oil Cooler. Please read it in its entirety prior to any installation of maintenance work on the cooler.

This procedure will cover three areas:
1. Storage
2. Installation
3. Maintenance

Storage:

Rocore heat exchangers are packaged to protect them from damage during transportation to the customer. Heat exchangers are packaged for immediate use upon arrival at the customer. If the heat exchanger is not to be used upon its arrival, certain procedures are helpful in order to prevent degradation of the assembly.

The following recommended practices are provided as a service to the end user, who shall use his/her own discretion as to their applicability.

1. On receipt of the heat exchanger, inspect for shipping damage. If damage has occurred, inspect for contamination. If damage is extensive, notify the carrier immediately.

2. For storing, fill the heat exchanger with the appropriate oil or coat them with a corrosion prevention substance. The choice or corrosion prevention substance will depend on your system requirements and economics.

3. Store in a heated building, above grade, in low humidity environment. Ideal room temperature is between 70-105 °F. NOTE: Large temperature swings can cause condensation and sweating of parts. In tropical climates, it may be necessary to use desiccant or portable dehumidifiers to remove moisture from the air.

Installation:

1. If possible, find a location on the vehicle that would allow for easy maintenance/cleaning (i.e. unobstructed access to the heat exchanger).

2. It is recommended that the heat exchanger be positioned on the vehicle so that the oil ports are positioned vertically straight up. This will allow any potential air pockets to be purged from the heat exchanger during operation. However, we will allow the cooler oil ports to be rotated 30 degrees max of vertical (12 o’clock position). It is NOT recommended to position the oil ports in any other direction.
3. If the oil ports cannot be positioned within the guidelines of #2, it is recommended that an air vent (for purging) be added to the shell side (oil side) of the cooler. One possible method for doing this would be to add a threaded boss to the shell casting and a STOR (straight thread o-ring) screw as the method for purging.

4. Before plumbing the heat exchanger in the cooling circuit, inspect all openings for foreign debris and remove from heat exchanger.

5. Fluid line hoses should be installed per the recommendation of the hose supplier.

6. Brackets should be bolted to the vehicle and torqued to the proper specification – based on screw diameter and the material the screw is going into.

7. Standard Rocore mounting brackets are designed (and tested) to withstand “typical” applications. It is recommended that a vibration analysis be completed on your specific vehicle under its specific duty cycle to verify no vibration issues.

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**Maintenance**

**Description:**
The entire cooler consists of three major components. They are:

1. Bundle Assembly
2. Cast Aluminum Housing (Cylinder)
3. Cast Aluminum End Caps

The Bundle Assembly is made of 5/16” copper tubes, a number of baffles and two “cupped” Tube Plates (header plates). The tubes are silvered brazed to the Tube Plates to make a stable bundle.

The Cast Aluminum Housing is bored out to the correct diameter to receive the Bundle Assembly. It has two tapped ports in the side, one at each end, to provide an oil inlet and outlet to the cooler. It has one machined o-ring groove and one chamfer on each end of the housing. They are used for seating o-rings.

The cast End Caps come in different shapes but all have four-bolt hole pattern that uses 3/8” diameter bolts for assembling the End Caps to the housing.
Dis-Assembly:

1. Unbolt the two end caps from the housing and remove the o-rings (2).
2. Make note of the “timing mark” that is in the large cupped tube plate and the mark on the housing face. These will need to be re-aligned during installation. See Fig 1 and Fig 2.

   ![Fig 1](image1.png)  ![Fig 2](image2.png)
   
   **Fig 1**  **Cupped Tube Plate**  **Fig 2**  **Housing Face**

3. Examine the housing and notice on which side the bundle assembly is protruding out from the housing. This is the Larger Diameter Cup end.

4. Place housing (and bundle assembly) on a press. Place a flat board on the tops of the tubes of the Smaller Diameter Cupped Tube Plate and gently & slowly press the bundle assembly out of the cylinder using an arbor press. See Fig 3.

   ![Fig 3](image3.png)
   
   **Fig 3**  **Removing Tube Stack**

   NOTE:
   - Be very careful not to bend the sides of the “cup” on the bundle assembly as that surface is used for sealing the o-rings.
   - Care needs to be taken so as not to bend any of the tubes that pass through the cooler.

5. Remove O-rings (2) that are in the grooves in the housing. You will find one o-ring on each end.

Cleaning:

The cooler should be removed and cleaned at overhaul periods as a normal practice. If, however, due to faulty filtration (for instance) there is a reduction of oil circulation, remove and examine the cooler to ensure that it is not fouled on the oil side.

Oil Side:

Usually, immersion in a paraffin or degreasing tank is sufficient to remove all traces of dirty oil from the bundle assembly and cylinder. When stubborn carbon deposits are difficult to remove in this manner, the bundle assembly should be immersed in a bath of detergent, preferably heated (except in the case of vapor solvents) and moved vigorously back and forth.

Agitation of the detergent by a steam or compressed air jet accelerates cleaning. The steam can be used to heat the solution. The pressure, however, should not exceed 10 psi.

Never use stiff metal brushes or probes which may damage the tubes, baffles and or headers.
**Water Side:**
Since the water passing through the cooler is from the engine cooling circuit, the cooler should not become fouled on the inside of the tubes. If however, hard or impure water is used to top-off the radiator, the cooler may become blocked by hard scale or other impurities.

A badly scaled cooler can be restored to its original cleanliness by immersing the bundle assembly in a suitable inhibited acid solvent, the bundle assembly having first been thoroughly cleaned on the oil side.

One suitable solution is a mixture of hydrochloric acid and water. Mix a 4% solution hydrochloric acid with water. Make sure to add the acid to the water (NEVER VICA VERSA). Heat to 120 °F (if possible). Heating the solution is not essential but it does quicken the descaling.

Immerse the bundle assembly in the solution, and effervescence (fizz) will take place. When it ceases, remove the bundle assembly and rinse in hot water. Inspect for cleanliness and repeat if necessary. When the tubes are clean, neutralize by immersing the stack in a boiling solution of soda (1 lb. command soda crystals to 5 gallons of water). Finally, wash in hot fresh water.

**Re-Assembly:**

Make certain that all component parts are clean before commencing assembly. Pay close attention to the cleanliness of the cylinder bore and to the o-ring groves.

1. Coat the inside of the Cylinder with a light layer of fresh lubricating oil before starting
2. It is recommended that new O-rings should always be used when re-installing. O-rings are a Viton material and can be purchased from a local O-ring supplier. O-ring AS568A Dash No’s are –257 (small cup) and –259 (large cup).
3. Place a light layer of lubricant on the o-ring to help during installation of the Bundle Assembly.
4. Install the small o-ring (-257) in the Cylinder (housing) groove. This O-ring goes on the end of the Cylinder that does not have step in it.
5. Install the larger O-ring (-259) in the opposite groove.
6. Inspect Bundle Assembly for any “handling damage”. Pay particular attention to the Tube Plate cups to make sure they were not bent/deformed from their round shape. This is critical, as it is a sealing surface. If this is damaged, you will need to replace the Bundle Assembly.
7. Place Cylinder on a clean flat surface with the large end up. Remember that the large end is the one that has a machined step in the Cylinder.
8. Place a light layer of lubricant around the OD of the Tube Plate cups (on the bundle assembly).
9. Gently lower the Bundle Assembly into the Cylinder - small end first.
   - If the Bundle Assembly will not install, flip the bundle 180° – you may have the large end going first.
   - Make sure to align the timing mark (X or Y) on the cup with the timing mark on the face of the Cylinder (large end). It is critical that the baffles on the Bundle Assembly are aligned properly to the oil ports on the shell casting.
   - It is important for this installation to go slowly, as you need to insure that the O-ring does not get nicked/cut during this process.
10. Place the partial assembly on an arbor press (large end up), place a flat board on the tubes in the large diameter Tube Plate and slowly, gently “press” the Bundle Assembly into the Cylinder until it “seats” on the groove that was machined in the Cylinder. NOTE: Do not force the Bundle Assembly, as damage will occur to the Tube Plate cup and or the tubes. If the Bundle Assembly will not seat, remove the Bundle Assembly and try again. Make sure you did not nick/cut the O-rings during your first attempt.
11. Place O-rings around the Tube Plate cups in the chamfers provided on the Cylinder. The large O-ring (-259) goes around the tube plate cup with the timing mark (See fig 4).
12. Place end cap on the Cylinder and hand tightens the screws (with lock washers). Do not tighten in a circular pattern but “cris-cross” the End Cap to ensure an even “seat” of the End Cap and O-ring.
13. Repeat for the opposite end.
14. On a two pass (water) unit, the Division Rib fits in the large Tube Plate cup and must be aligned properly to the water ports of the end cap.
15. Torque screws to 20-22 lbf-ft (27-30 N-m)
16. Test the assembly on either the water or the oil side by using 60-psi air with the cooler immersed in water so that any leaks are revealed by the release of bubbles. Leakage past the sealing o-rings necessitates their replacement. If one tube leaks it should be sealed at both ends by means of a turned hardwood dowel plug. If more than five (5) tubes leak, a new bundle assembly is needed.

**Coolers with Sump Cooling Module:**

A variant of the preceding cooler information is to add a Sump Cooling module to the traditional Retarder cooler. This cooler is specifically designed to work with Allison Transmissions that have the sump-cooling feature.

**Installation – Sump Cooler:**

1. Follow the instruction for the Retarder cooler that was covered earlier.
2. For best performance of both coolers, it is recommend that the sump cooler be plumbed into the water circuit before the Retarder cooler.

**Maintenance – Sump Cooler:**

**Description:**
The sump module consists of the same components as the Retarder cooler (only smaller) as well as a couple of additional parts:

1. Spacer
2. Division Rib with a Seal attached

The Spacer is a cast aluminum component that is machined to desired size where as the Division Rib is made of nylon material.
**Dis-Assembly:**

Follow the procedures that were listed for the Retarder cooler. Do the same things for the Sump Cooler module to disassemble the cooler.

Take special note of how the Spacer fits between the Retarder cooler and the Sump Module. This will make assembly easier.

**Cleaning:**

Follow the procedures that were listed for the Retarder cooler.

**Re-Assembly:**

**NOTE:** The following procedure is for a two-pass water cooler.

1. Follow the procedures that were listed for the Retarder cooler, omitting the installation of the End Caps.
2. Repeat step #1 for the sump cooler – omitting both Ends Caps at this point.
3. Take the assembled Sump Module and place it on a flat surface with the small diameter Tube Plate end up.
4. Place the Division Rib in the cup of the small diameter Tube Plate. Use the “tangs/feet” of the Division Rib to fit in the tubes of the bundle. This helps to hold the Division Rib in proper place. Make sure to align this properly relative to the water flow. This is **critical** and will adversely affect performance if not completed correctly. See figure 6.
5. Place the Retarder assembly on a flat surface with the large diameter Tube Plate end up (this is the end where the bundle protrudes significantly past the housing/Cylinder surface). Place a second Division Rib in the cup of the large diameter tube plate. Use the “tangs/feet” of the Division Rib to fit in the tubes of the bundle. This helps to hold the Spacer in proper place. Make sure to align this properly relative to the water flow. This is **critical** and will adversely affect performance if not completed correctly. See Figure 7.
6. Place the Spacer on the Retarder portion. Align the “bar” (of the spacer) with the Division Rib. The bar should sit against the “foam” pad and when bolted together will crush the Seal into the “bar” and create a sealed area. There is a recessed groove around the ID of the Spacer. This recess should be placed in the down position as the groove is needed to accommodate the cupped Tube Plate of the Retarder Bundle Assembly. See Figure 8.
7. Place the Sump Cooler assembly onto the Retarder cooler. Align the “Spacer Bar” (of the Spacer) with the Division Rib that has been assembled on the Sump Module Assembly. Again, the bar should sit against the “foam” pad and when bolted together will crush the Seal into the “bar” and create a sealed area. See Figure 9.

8. Place bolts in the hole/threads of the converter/sump modules capturing the Spacer in the middle. Tighten bolts in a criss-cross fashion to insure the components are drawn together in an even manner. Torque all screws to 20-22 lbf-ft (27-30 N-m). See Figure 10.

9. A third Division Rib is placed in the large diameter Tube Plate cup of the sump module and must be aligned properly relative to the water ports of the End Cap (of the sump).

10. Place End Cap on the Sump cooler (large end) and hand tighten the screws (with lock washers). Do not tighten in a circular pattern but “criss-cross” the End Cap to ensure an even “seat” of the cap and O-ring. Torque all screws to 20-22 lbf-ft (27-30 N-m). See Figure 11.

11. Place End Cap on the Retarder cooler (small end) and hand tighten the screws (with lock washers). Do not tighten in a circular pattern but “criss-cross” the End Cap to ensure an even “seat” of the cap and O-ring. Torque all screws to 20-22 lbf-ft (27-30 N-m).

12. ONE PASS WATER – you can omit all three Division Ribs, and a different Spacer is used.

13. Test the assembly on either the water or the oil side by using 60-psi air with the cooler immersed in water so that any leaks are revealed by the release of bubbles.

14. Leakage past the sealing o-rings necessitates their replacement. If one tube leaks it should be sealed at both ends by means of a turned hardwood dowel plug. If more than five (5) tubes leak, a new bundle assembly is needed.
CUT AWAY OF A RETARDER COOLER

- Cast Aluminum Housing
- Oil Ports
- Cast Aluminum End Cap
- Bundle Assembly
- Coolant Ports
- O-Rings (2 per end)
CUT AWAY OF RETARDER AND SUMP COOLER

- Cast Aluminum Housing
- Sump Oil Ports
- Oil Port
- O-Rings – 2 per Bundle Assm Cup
- Division Rib + Seal
- Bundle Assembly
- Cast Aluminum End Cap
- Bundle Assembly - Sump
- Spacer
- Coolant Port