



REPLACING TEC IN M100A & M200A ANALYZER

I. SCOPE:

To guide you through replacing the Thermo Electric Cooler (TEC) in the M100A & M200A family of analyzers. It is important that the TEC work correctly in your analyzer. That is to say that if your PMT temp is not correct & stable then you can have noise & drift problems with your analyzer, that you might think is being caused by another item in the analyzer.

II. PARTS:

KIT 95

III. TOOLS:

7/16" wrench.

9/16" wrench.

Phillips head screw driver.

Flat head screwdriver.

Needle nose pliers.

Soldering Iron (w/solder).

Flash light.

IV. PROCEDURE:

1. Remove power from the instrument & remove the cover.
2. Remove the sensor assy for M100A go to step 3 for M200A go to step 8
3. *Remove the SO2 Sensor assy:*
4. Remove the 1/8" & 1/4" fittings from the top of the Rcell.
5. Remove the following electrical connectors.
 - Two wires to the lamp.
 - Two pin Molex connector to the shutter.
 - Five pin Molex connector for Rcell heater/thermistor assy.
 - PMT Pre-amp card ribbon cable, J5 on Motherboard.
 - Ground strap from UV detector/pre-amp assy to chassis ground
 - UV lamp detector/pre-amp ribbon cable on bottom of UV detector/pre-amp assy.
 - Two pin Molex connector that feeds the TEC on the rear of the pmt housing.
6. Remove the three Phillips head screws that hold the sensor assy into the chassis.
7. Remove the sensor assy from the analyzer by lifting straight up, slowly & carefully. If anything prevents you from lifting the sensor assy out of the analyzer remove it being careful not to damage the sensor assy.
8. *Remove the NOx sensor assy.*

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9. Remove the two 1/8" lines to the top of the Rcell & the 1/4" line to the exhaust of the Rcell.
10. Remove the following electrical connectors:
Five (or six) pin Molex connector for Rcell heater/thermistor assy.
PMT pre-amp card ribbon cable, J5 on Motherboard.
Two pin Molex connector that feeds the TEC on the rear of the PMT housing.
11. Remove the four Phillips head screws that hold the sensor assy into the chassis.
12. Remove the sensor assy from the analyzer making sure to be careful not to damage anything when you remove it from the analyzer.
13. Remove the four screws that hold the Rcell to the PMT housing, & remove the cell from the PMT housing.
14. *Removing the cooler from the sensor assy. for both analyzers.*
15. Remove the cooler drive wire/s (might be one wire or two) that goes to the TEC drive card from the PMT pre-amp assy.
16. Remove the four screws that hold the TEC drive card to the PMT housing, & unplug the electrical connector that goes to the heat sink assy from the TEC drive card.
17. Remove the four screws that are on the outside corners of the heat sink assy.
18. Pull slowly on the heat sink so that you can just see the cold block starting to come out of the PMT housing.
19. Remove the two screws that are in the middle of the heat sink assy.
20. Pull the heat sink & TEC off of the cold block.

NOTE: YOU MUST PAY CLOSE ATTENTION TO THE DIRECTION OF THE TEC. IF YOU INSTALL THE NEW TEC WITH THE HOT SIDE TO THE COLD BLOCK YOU WILL NOT EVER GET THE COOLER TO WORK (SEE DIAGRAM PAGE 5).

21. De-solder the TEC from the two terminals on the heat sink assy. Please note the colors of the wires & what terminals that they go on.
22. Solder the new TEC onto the two terminals on the heat sink assy, paying close attn to the direction of the TEC. The HOT side of the TEC goes toward the heat sink assy.
23. Put a light coat of thermal grease between the cooler & the heat sink assy, & push the cooler to the heat sink.
24. Put a light coat of thermal grease on the cool side of the cooler & put the cooler onto the cold block & slowly tighten the two screws that hold the heat sink assembly to the cold block.

WHEN YOU ARE TIGHTENING THE TWO SCREWS THAT HOLD THE HEAT SINK ASSEMBLY TO THE COLD BLOCK YOU HAVE TO TIGHTEN THE TWO SCREW EVENLY. IF YOU DO NOT TIGHTEN THEM EVENLY THE COOLER WILL NOT SIT FLUSH WITH THE COLD BLOCK & YOU WILL PREMATURELY BURN OUT THE COOLER (SEE DIAGRAM PAGE 7).

25. Push the cold block & heat sink assembly back into the pmt housing & secure the heat sink assembly to the pmt housing with the four screws that you removed.

IF THE SCREWS THAT YOU REMOVED HAVE STAR WASHERS REPLACE THEM WITH THE NYLON WASHERS THAT COME IN THE KIT. IF YOU DON'T REPLACE THE STAR WASHERS THE PMT HOUSING WILL LEAK & YOU WILL GET CONDENSATION INTO THE PMT HOUSING.

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26. Re-connect the drive wires to the TEC driver that come from the heat sink assembly.
27. Install the TEC drive card & angled bracket back onto the pmt housing.
28. Remove the end plate from the other end of the pmt housing.
29. Remove the desiccant baggies from the front end of the PMT housing & replace with the ones provided in the kit.
30. Replace the end plate onto the end of the pmt housing. Again if there are any star washers on the pmt end plate replace them with the nylon washers provided in the kit. When you are putting the end plate back onto the PMT housing make sure that the O-ring seats against the pmt housing & that it is seated into the groove in the end plate as it should be.
31. If you have an older M200A PMT housing you might have four screws in the side of the Rcell assy that are the same pattern for the SO2 sensor assy. If you do make sure that there are NO star washers on these screws. If there are replace them with the nylon washers in the kit (see diagram page 6).
32. Install the sensor assembly back into the analyzer & hook up all the wires & pneumatic connections that you removed.
33. Turn the unit back on & make sure that the PMT temp comes down to 7°C, as it should.
34. If you have more problems with the cooler, contact the API service department & ask for service note 97-027A & we will fax it to you. This service note will guide you through troubleshooting the pmt temp circuit & how to fix any problems that you have.
35. Recalibrate the analyzer following the instructions in your manual.

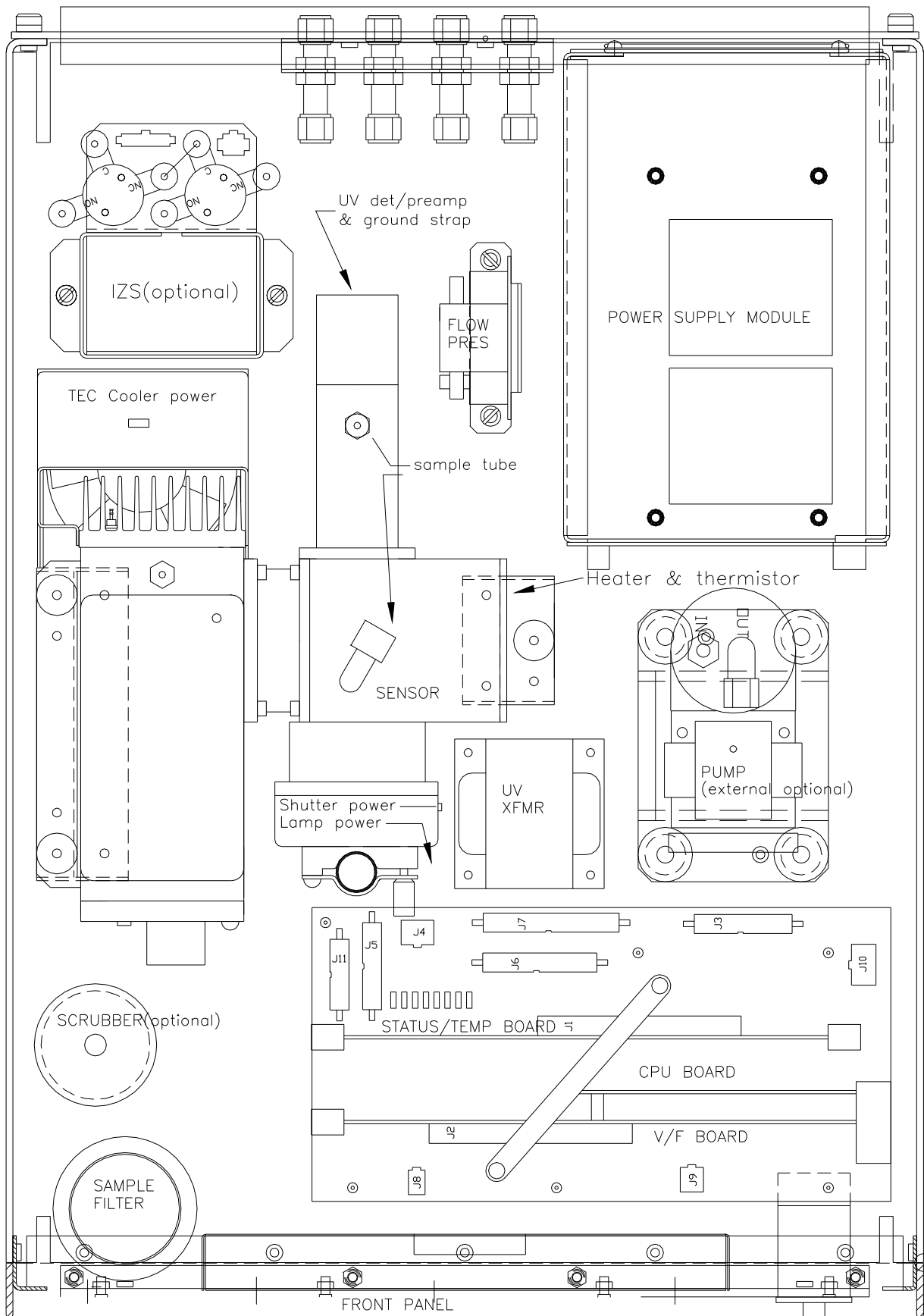
If you have questions regarding this procedure or any API equipment, please contact an API Customer Service representative at:

Phone: (858) 657-9800

Email: customerservice@advpol.com

Fax: (858) 657-9816

WWW: <http://www.advpol.com>

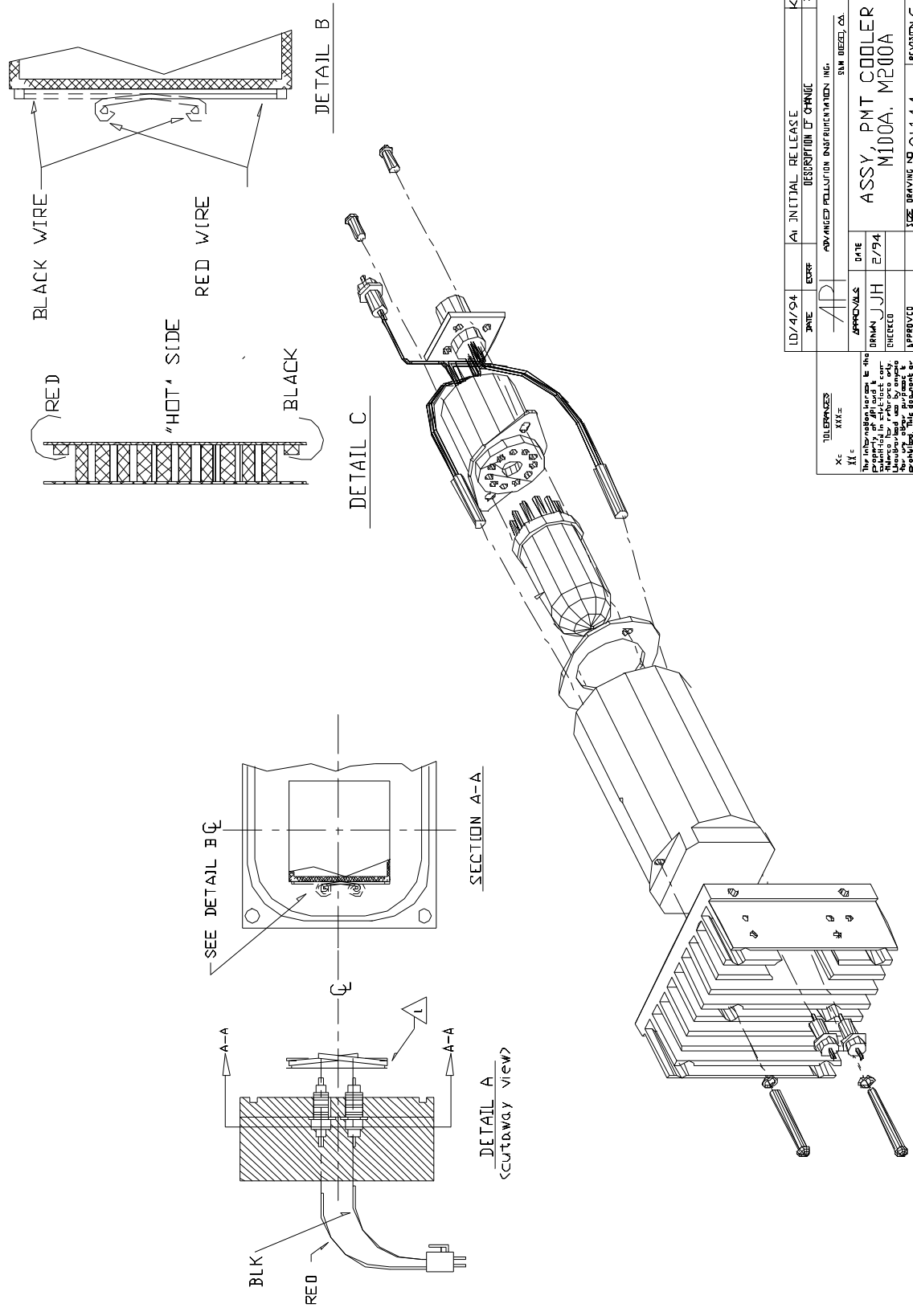


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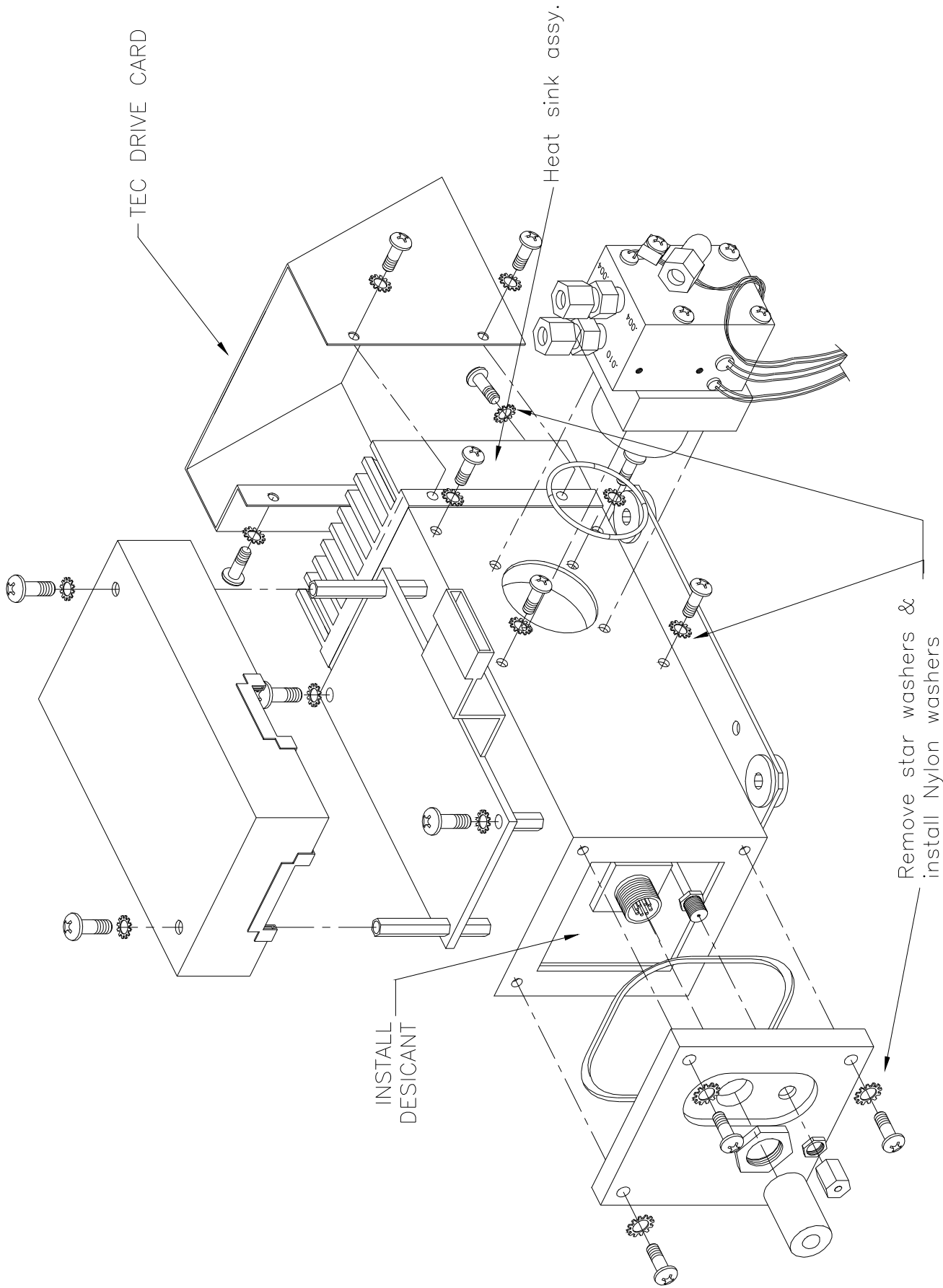
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▲ VERIFY THAT LEADS CONNECT TO HOT SIDE OF COOLER AND MARK THAT SIDE "HOT" (SEE DETAIL C).
 APPLY GENEROUS LAYER OF THERMAL GREASE TO BOTH SIDES OF COOLER. PLACE "HOT" SIDE AGAINST HEATSINK.

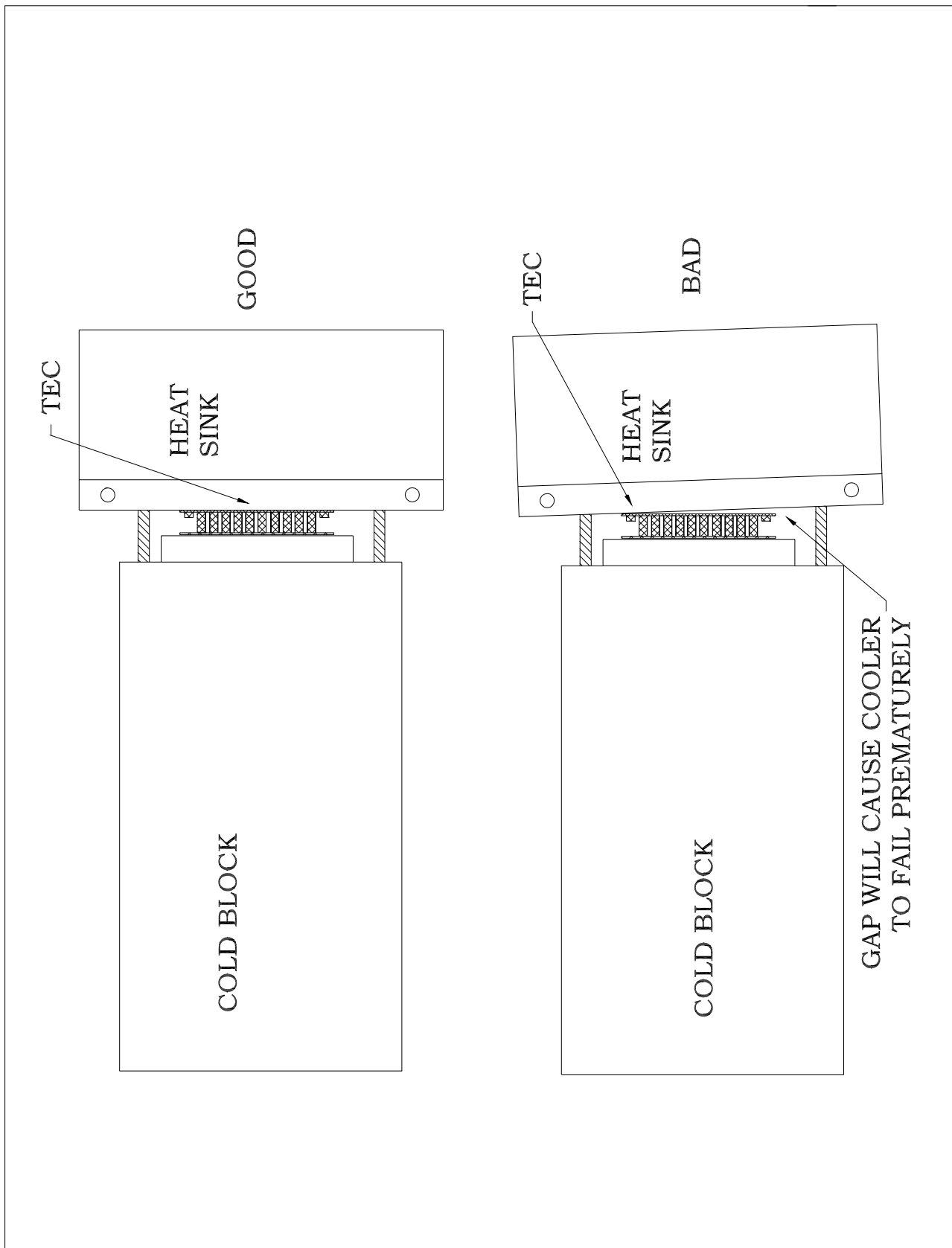


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