



## ***DUAL IC PUMP UPGRADE INSTALLATION MANUAL***

***2023 AND UP RAPTOR R***



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## **INTRODUCTION**

Please read the installation manual and verify that all items are present. If you are missing hardware or have any questions, please contact your dealer or Whipple Superchargers.

## **RECOMMENDED TOOLS AND SUPPLIES**

The following items are not included in this supercharger kit and it is strongly recommended that they're used for ease of installation or maximum performance:

### **Tools**

1/4" and 3/8" torque wrenches with metric socket set, pinch clamp tool or pliers and nut driver set for clamps. Safety glasses and drain pan (for coolant). Clean shop towels.

### **Tie Straps**

These will be useful for securing the wiring harness away from the installation area as directed in the instruction manual. They are inexpensive and will be very handy during installation. You will need an assortment of 8" and 12".

### **Sealants, Chemicals and Lubricants**

Assembly lubricant (white lithium grease or petroleum jelly).

You'll be required to refill your intercooler system with approx. 2 gallons of **DISTILLED** water and Ford Factory specification engine coolant. This is not supplied in the kit, you can find engine coolant at any local auto parts store. **NEVER USE TAP WATER**, as it can corrode and create poor performance.

## **SAFETY PRECAUTIONS**



### **CAREFULLY READ THE IMPORTANT SAFETY PRECAUTIONS AND WARNINGS BEFORE PROCEEDING WITH THE INSTALLATION!**

Appropriate disassembly, assembly methods and procedures are essential to ensure the personal safety of the individual performing the kit installation. Improper installation due to the failure to correctly follow these instructions could cause personally injury or death. Read each step of the installation manual carefully before starting the installation.

- Always wear safety glasses for eye protection.
- Place the ignition switch in the off position.
- Always apply the parking brake when working on vehicle.
- Block the front and rear tire surfaces to prevent unexpected vehicle movement.
- Use chemicals and cleaners only in well-ventilated areas.
- Batteries can produce explosive hydrogen gas which can cause personal injury. Do not allow flames, sparks or flammable sources to come near the battery.
- Keep hands and any other objects away from the radiator fan blades.
- Keep yourself and your clothing away from moving parts when the engine is running.
- Do not wear loose clothing or jewelry that can be caught in rotating or moving parts.

## **GLOSSARY OF TERMS**

<b>ABBREVIATION</b>	<b>DESCRIPTION</b>
ACT	Air Charger Temperature
DTC	Diagnostic Trouble Code
ECT	Engine Coolant Temperature
EGR	Exhaust Gas Recirculation
ETC	Electronic Throttle Control
EVAP	Evaporative emissions system
FHSCS	Flat Head Socket Cap Screw
IAT	Inlet Air Temperature
IC	Intercooler
ID	Internal Diameter
LB-IN	Pound-force inch
LB-FT	Pound-force foot
LTR	Low temp radiator
MAF	Mass Air Flow
MAP	Manifold Absolute Pressure
MY	Model Year
OBD	On Board Diagnostics
OD	Outside Diameter
PCV	Positive Crankcase Ventilation
PSI	Pound per Square Inch
SC	Supercharger
SHCS	Socket Head Cap Screw
TPS	Throttle Pressure Sensor
TRQ	Torque



**\*\*NOTICE:** *Installation of Whipple Supercharger products signifies that you have read this document and have agreed to the terms stated within.*

*It's the purchaser's responsibility to follow all installation instruction guidelines and safety procedures supplied with the product as it's received by the purchaser to determine the compatibility of the product with the vehicle or the device the purchaser intends to install the product on.*

*Whipple Superchargers assumes no responsibility for damages occurring from accident, misuse, abuse, improper installation, improper operation, lack of reasonable care or all previously stated reasons resulting from incompatibility with other manufacturer's products.*

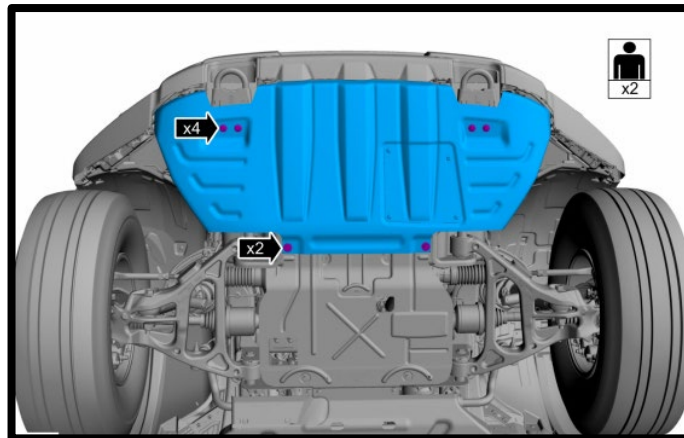
*There are no warranties expressed or implied for engine failure or damage to the vehicle in any way, loss of use or inconvenience or labor reimbursement. This includes merchantability and fitness.*

*The information contained in this publication was accurate and in effect at the time the publication was approved for printing and is subject to change without notice or liability. Whipple Superchargers reserves the right to revise the information presented herein or to discontinue the production of parts described at any time.*

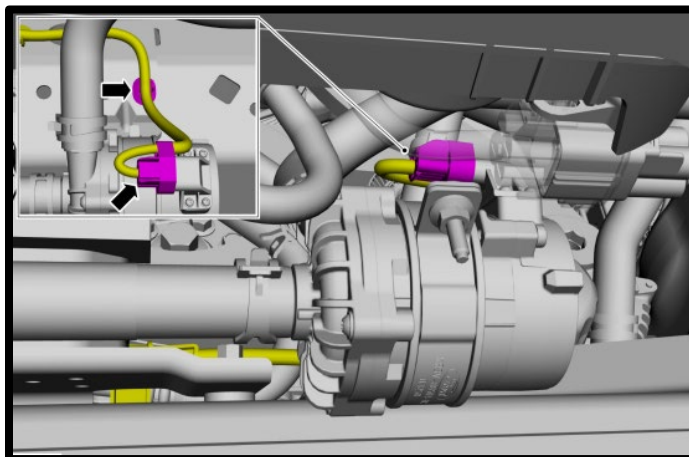
## **INSTALLATION INSTRUCTIONS**

It is strongly recommended that you read through this guide **before** you begin installing the performance parts.

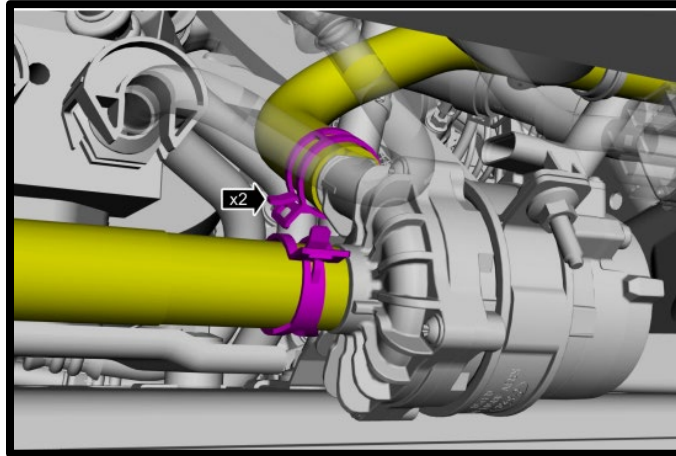
1. Place vehicle in clear, safe, flat workspace. Ensure you have ample space below the under shield and bumper for access to the intercooler pump.
2. Locate the battery on the passenger side of vehicle. With an 10mm wrench disconnect the (-) negative battery cable. Make sure the cable is far enough away from the battery that it does not accidentally touch the battery and make connection during the installation.
3. Remove the (6) bolts from under shield and remove from vehicle.



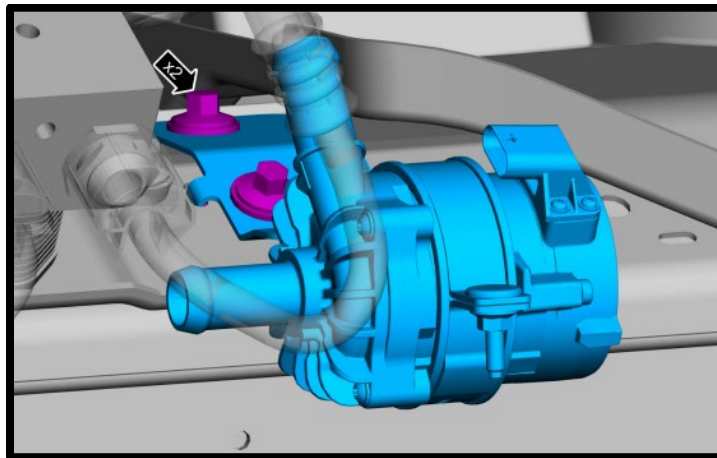
4. Disconnect stock IC pump electrical connector.



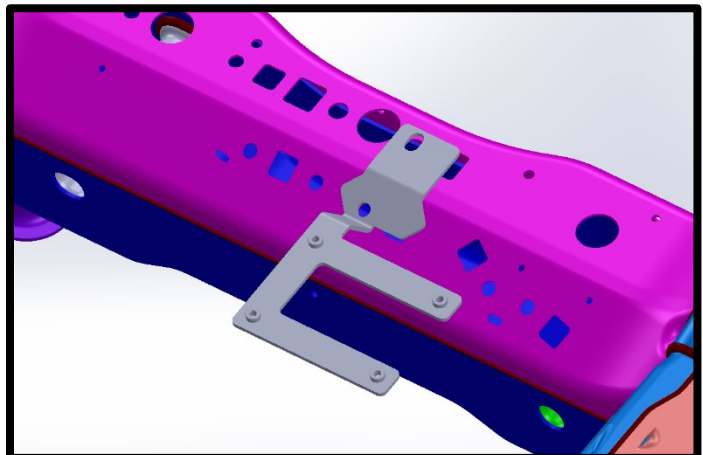
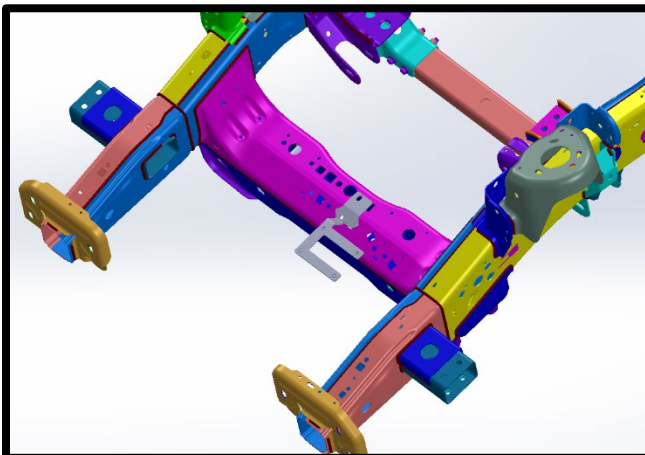
5. Remove the lower IC inlet hose from IC pump and drain coolant into reservoir (will reuse). Remove outlet hose from pump.



6. Remove the stock pump and bracket from the stock mounting location.



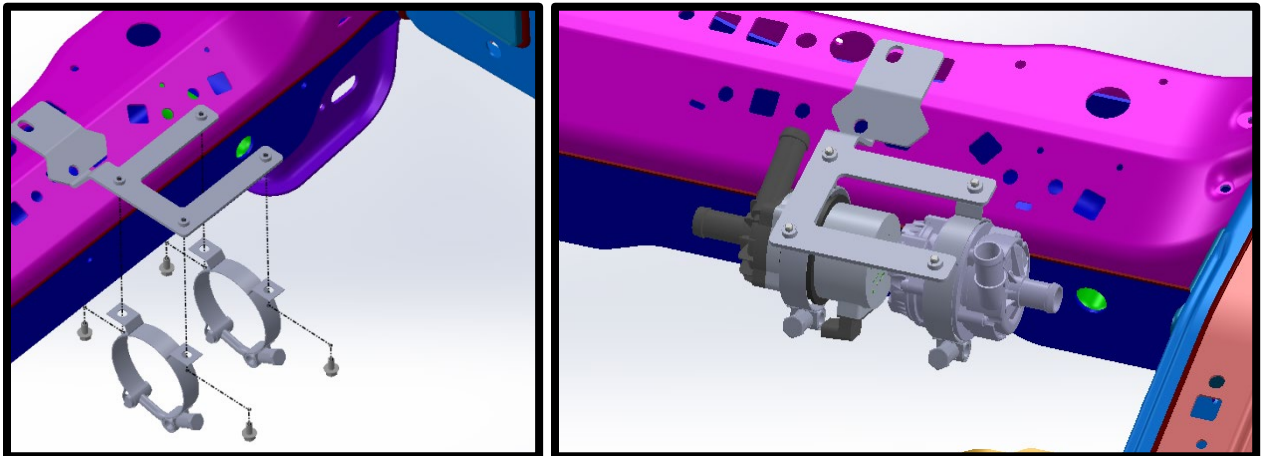
7. Mount the new dual pump bracket to frame using stock fasteners. Torque to 93 lb-in.



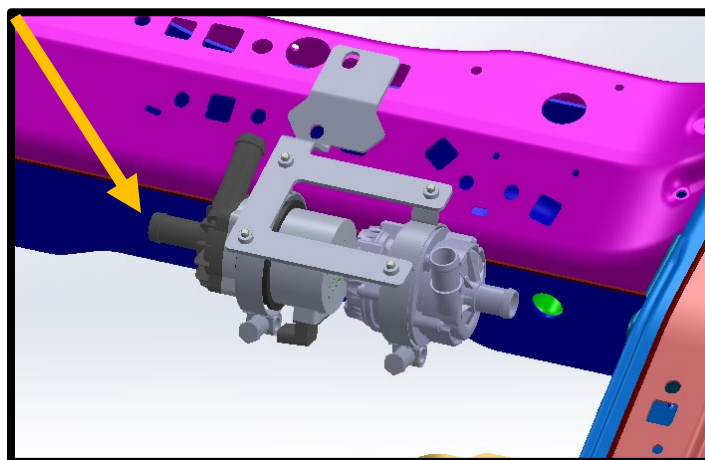
8. Install the t-bolt clamp over the IC pumps, leave loose for now to allow proper rotation during mounting.



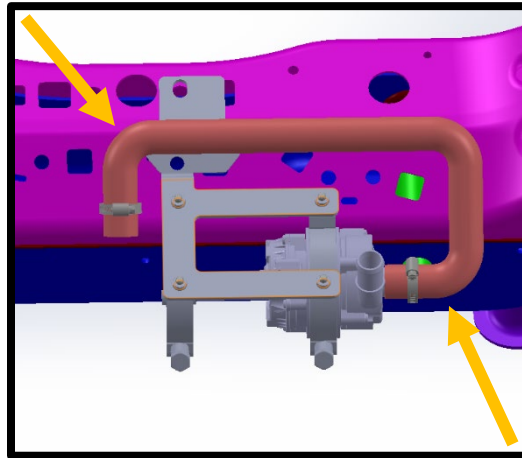
9. Mount the supplied t-bolt clamp and pump to the bracket using the (4x) 6mm x 12mm HHFCS. Leave pumps loose for now to allow proper rotation of the pumps.



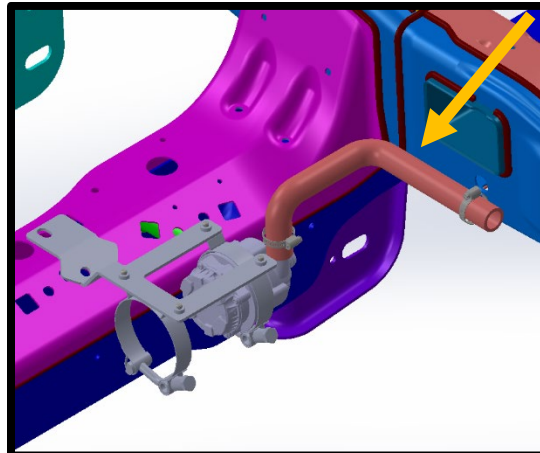
10. Reconnect stock INLET hose to stock IC pump INLET barb, secure using #12 hose clamp.



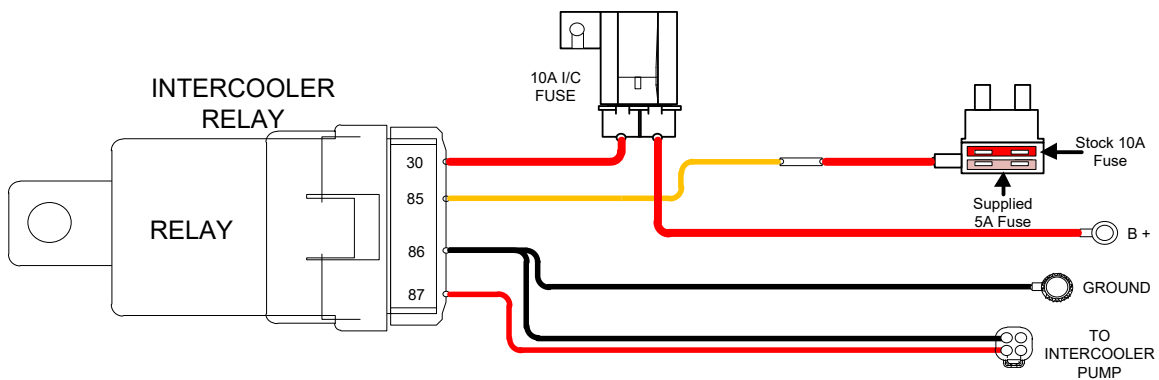
11. Install the supplied coupling hose #3103494 from the stock IC pump OUTLET to new IC pump INLET. Secure with #12 hose clamps.



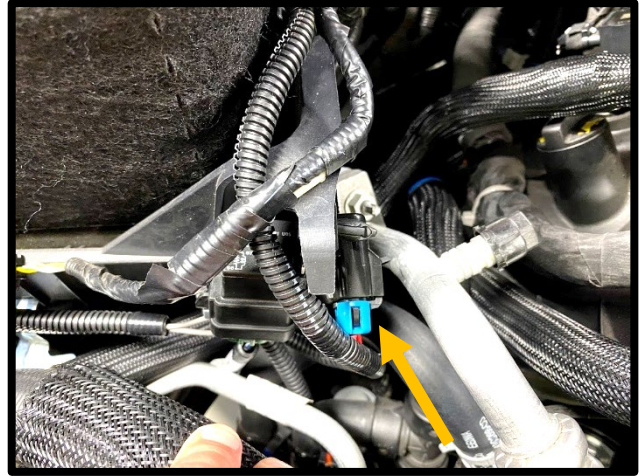
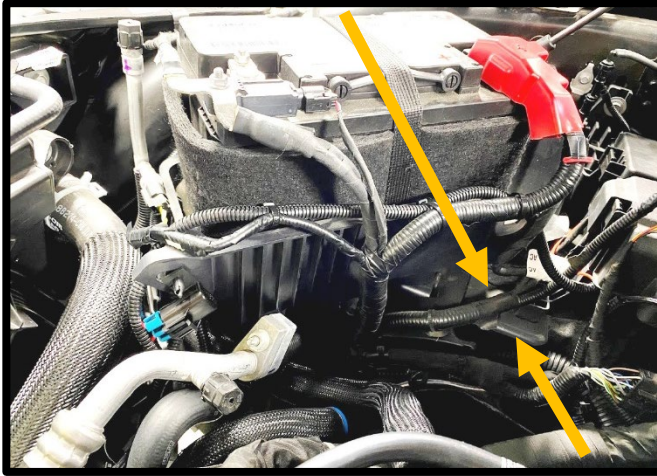
12. Install supplied hose #3103493 from the 2<sup>nd</sup> pump OUTLET, to the stock heat exchanger inlet, secure with #12 hose clamps.



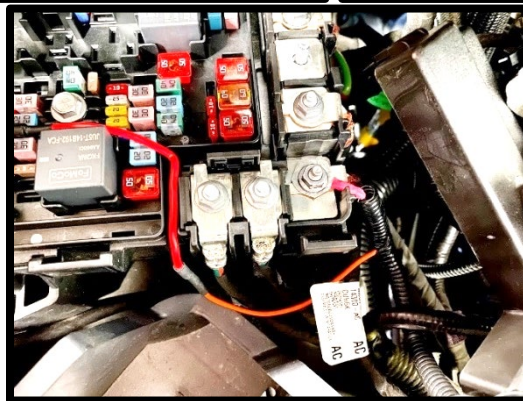
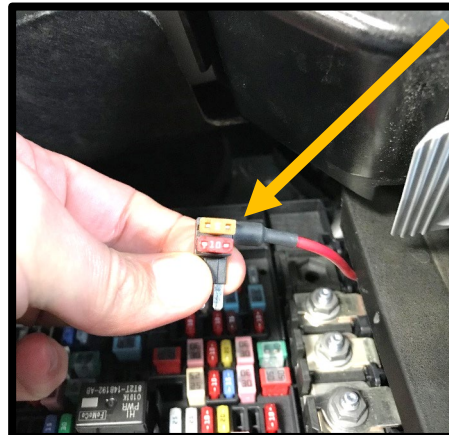
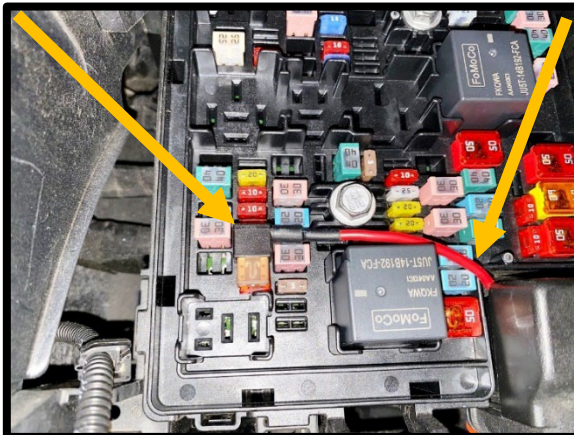
13. Follow the supplied diagram to verify the installation of the IC pump relay harness.



14. Locate the stock hole in the battery box as shown below. Use the supplied plastic push pin to secure the intercooler relay and fuse holder to the battery box. Route power and ground around box to fuse box area.

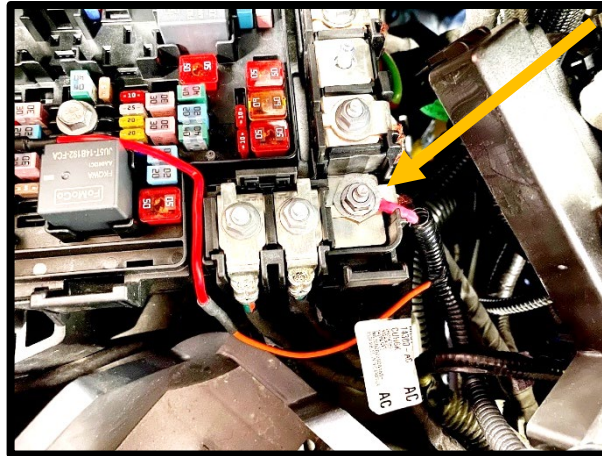


15. Pull the stock fuse from position (MY2023 uses **#F23**), (MY2024-2025 uses **#F49**) (**ABS**). Install the 10amp red fuse in the unused fuse slot on the fuse tap. Install the supplied fuse tap into position (MY2023 uses **#F23**), (MY2024-2025 uses **#F49**) (**ABS**). **Note:** 10amp red fuse should be in bottom slot, 5amp should be in top slot. Make sure wire has enough room when fuse cover closes, route around fuses for clean installation.

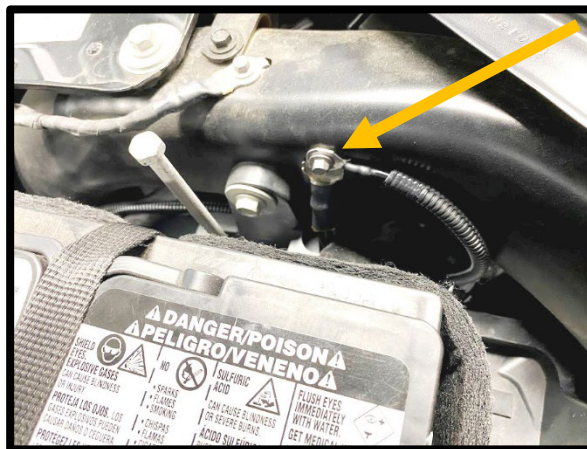




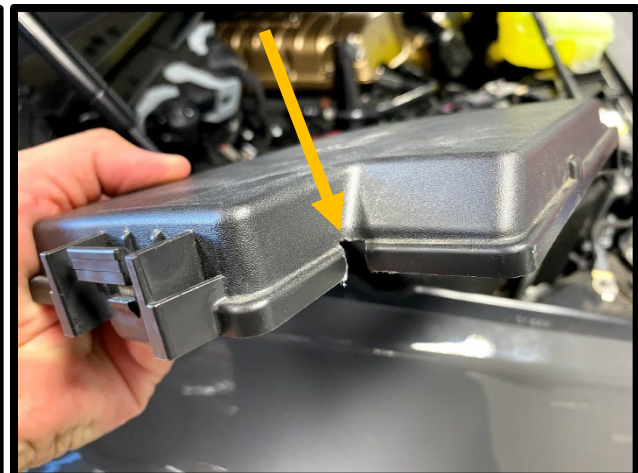
16. Using a 10mm socket, remove the nut on the power stud, located on the positive stud under fuse box cover. Install the IC pump relay power eyelet (red wire) to the power stud on the battery positive (+) stud. Use a 10mm socket to secure stock and IC power wire.



17. Remove the ground bolt from the **RH** side frame, next to the battery using an 8mm socket. Install IC pump relay ground eyelet here. Secure with factory bolt using an 8mm socket.



18. Test fit fuse box cover. Using small file or cutters, make small notch in the lid to clear the power wire.



19. Secure the relay/fuse with zip-ties along with the harness for a clean installation. Route IC pump connector down below radiator, secure to new IC pump. Reconnect stock pump connector. Ensure all other wires are clear of the belt system, use zip-ties to eliminate any potential interference.
20. Reinstall underbody shield, torque to 35 lb-ft.

***WARNING: Always avoid removing the degas bottle cap when the system is hot. The hot coolant is under pressure and may spray out causing burns.***

**For the best result, it is highly recommended to use a Radiator Cooling System Vacuum Purge and Refill Kit to properly evacuate the air from the intercooler system before filling the 50/50 mixture of coolant and distilled water. If one is not available, the following procedure will be adequate.**

21. Using a Lisle 24680 Spill-Free Funnel, or equivalent, secure the appropriate filler neck adapter to the degas bottle.
22. **NEVER MIX COOLANT TYPES.** Whipple recommends Ford Motorcraft coolant. It's also recommended to add 1 bottle of Red Line Water Wetter or equivalent. Never use tap water, this will cause corrosion and destroy the system. Attach the funnel and refill with a 50/50 mixture of coolant and distilled water until degas bottle is at MAX FILL line.
23. Install the vacuum cooling system filler and follow the manufacturer's instructions to fill and bleed the system. If no vacuum system available, continue to manually fill.
24. Start engine, allow motor to idle. While both pumps are running, continue to fill to the MAX FILL line of the degas bottle. Squeeze the IC INLET/FEED hose to limit flow for 3-5 seconds at a time to help bleed out bubbles.
25. Turn the ignition off and wait 1 minute to purge any large air pockets from the cooling system.
26. Check the intercooler coolant level in degas bottle and if necessary, fill to the top of the MAX FILL line on the degas bottle if the engine is warm or to the top of the MIN FILL LEVEL if the engine is cold.
27. Repeat steps a total of 10 times to remove any remaining air trapped in the system. ***NOTE: During water pump start-up, it is normal for a slight pulsation to occur. Once the pump has reached its maximum cycle speed, no pulsations should be present. If any pulsations occur, there is air in the system. NEVER GO WOT UNTIL AIR IS BLED OUT!***
28. Test drive vehicle for the first few miles under normal driving conditions. Listen for any noises, vibrations, engine misfire or anything that does not seem normal. The Raptor R has manifold air temps available on the gauge cluster for viewing.

***WARNING: Triple check that the intercooler system is properly bled. Failure to do so can result in engine damage. Turn ignition on, let the pump run for 60 seconds, there should be zero cavitation during this test.***