

Z1 D41 FRONTIER SUPERCHARGER INSTALLATION MANUAL



This Installation Manual is intended for the following models:

2022+

Nissan Frontier (D41)

PROLOGUE:

Study these instructions completely before proceeding to assembly. The installer must have a thorough knowledge of automotive systems operation. If unfamiliar with any of the concepts outlined in this instruction, we recommend the installation be completed by a qualified professional.

WARNING!

Extreme caution should be taken when performing maintenance or performance upgrades to your vehicle. Please observe and abide by any Warning or Caution labels placed on the various components and tools used when servicing your vehicle. If you have any questions regarding installation or the various components included with the Z1 Off-Road D41 Frontier Supercharger, consult with a Professional Mechanic, or contact Z1 Off-Road for more information.

PARTS INCLUDED:

Item	Quantity	Description
SUPERCHARGER KIT		
1	1	Supercharger Unit Assembly
2	1	Supercharger Intercooler
3	1	Bracket Kit
4	1	Coolant Reservoir
5	1	Heat Exchanger
6	1	Coolant Pump Controller
HEAT EXCHANGER HARDWARE KIT		
7	2	M6 x 1.0 Socket Head Screw, 14mm
8	2	M6 x 1.0 Flat Head Screw, 14mm
9	5	M6 x 1.0 Flanged Hex Head Screw, 25mm
10	8	M8 x 1.25 Flanged Hex Head Screw, 12mm
11	2	M6 x 1.0 Flanged Locknut
12	1	Loctite Threadlocker
13	8	Hose Clamp
14	2	Coolant Pump Bracket
15	1	Coolant Pump
16	1	Coolant Pump Controller Bracket
17	1	Coolant Temperature Sensor
COOLANT RESERVOIR HARDWARE KIT		
18	1	Radiator Cap
19	4	M8 x 1.25 Socket Head Screw, 14mm
20	4	M6 x 1.0 Flanged Bolt, 14mm
21	4	Steel M6 Washer
INTAKE HARDWARE KIT		
22	2	M8 x 1.25 Socket Head Screw, 14mm
23	1	M6 x 1.0 Flanged Hex Head Screw, 25mm
24	3	M6 x 1.0 Flanged Locknut
25	2	M6 x 1.0 Socket Head Screw, 70mm
26	3	Worm Gear Hose Clamp

SUPERCHARGER KIT 2		
27	1	Intake Manifold Plate
28	1	Hose Kit
29	1	Dual Idler Pulley Bracket
30	1	Idler Adjuster
31	1	Supplemental Bracket Kit
32	1	IAT Adapter Harness
33	1	Carbon Fiber Intake Tube
DUAL IDLER PULLEY BRACKET HARDWARE KIT		
34	4	M6 x 1.0 Socket Head Screw, 14mm
35	2	60mm Smooth Idler Pulley
36	2	5mm Spacer
37	2	1mm Spacer
38	2	M10 x 1.25 Bolt, 50mm
39	1	M8 x 1.25 Socket Head Screw, 20mm
40	2	M10 x 1.50 Socket Head Screw, 95mm
41	1	M10 x 1.5 Set Screw, 60mm
42	1	M10 x 1.5 Flange Nut
43	6	Zip Tie
INTERCOOLER HARDWARE KIT		
44	1	Smaller Intercooler Gasket
45	1	Larger Intercooler Gasket
46	2	Plenum Spacer Gasket
47	8	M8 x 1.25 Socket Head Sealing Screw, 25mm
48	3	M8 x 1.25 Socket Head Screw, 60mm
49	10	M8 x 1.25 Socket Head Screw, 25mm
50	5	M8 x 1.25 Socket Head Screw, 45mm
51	2	M6 x 1.0 Flanged Button Head Screw, 10mm
52	1	M6 x 1.0 Socket Head Screw, 14mm
53	1	Intake Manifold MAP/IAT Sensor
54	2	-10 ORB to 3/4" Hose Barb Fitting
55	1	Lower Coolant Reservoir Bracket
56	1	Ball-End 6mm 3/8" Socket
57	1	Throttle Body Gasket

BOOST LEAK TEST KIT		
58	1	Intake Throttle Body Coupler
59	1	Boost Leak Tester with Gauge
SUPERCHARGER PULLEY KIT		
60	1	Supercharger Drive Pulley
61	1	7 Rib Belt
OPTIONAL ITEMS		
62	6	Spark Plug
63	1	50/50 Coolant
64	1	Redline Water Wetter
65	1	Z1 Air Intake Kit

TOOLS REQUIRED:

- Ratchet
- Ratchet Extension(s)
- Assorted Metric Sockets
- Assorted Metric Wrenches
- Torque Wrench
- Allen/Hex Keys/Sockets
- Torx Sockets
- Scissors/Flush Cut Pliers
- Pliers
- Drill
- Drill Bits
- Drain Pan
- Air Compressor

SAFETY REQUIREMENTS:

- Always wear safety glasses and any necessary protective garments. If using any fluids, chemicals, or solvents, a respirator is recommended.
- Always use properly rated jack stands when working under your vehicle.
- Always keep limbs and parts away from moving drivetrain parts.
- Always turn the ignition to the OFF position and disconnect the NEGATIVE battery terminal.
- Only operate drivetrain in safe space and well-ventilated areas.

BEFORE YOU BEGIN:

Remove contents from the Z1 Off-Road D41 Supercharger Kit and verify that ALL necessary hardware is present.

This kit contains multiple sub-kits with similar hardware. Make sure to keep the hardware organized as to not mix up hardware. Diagrams on the following pages will show the included hoses and brackets necessary for installation.

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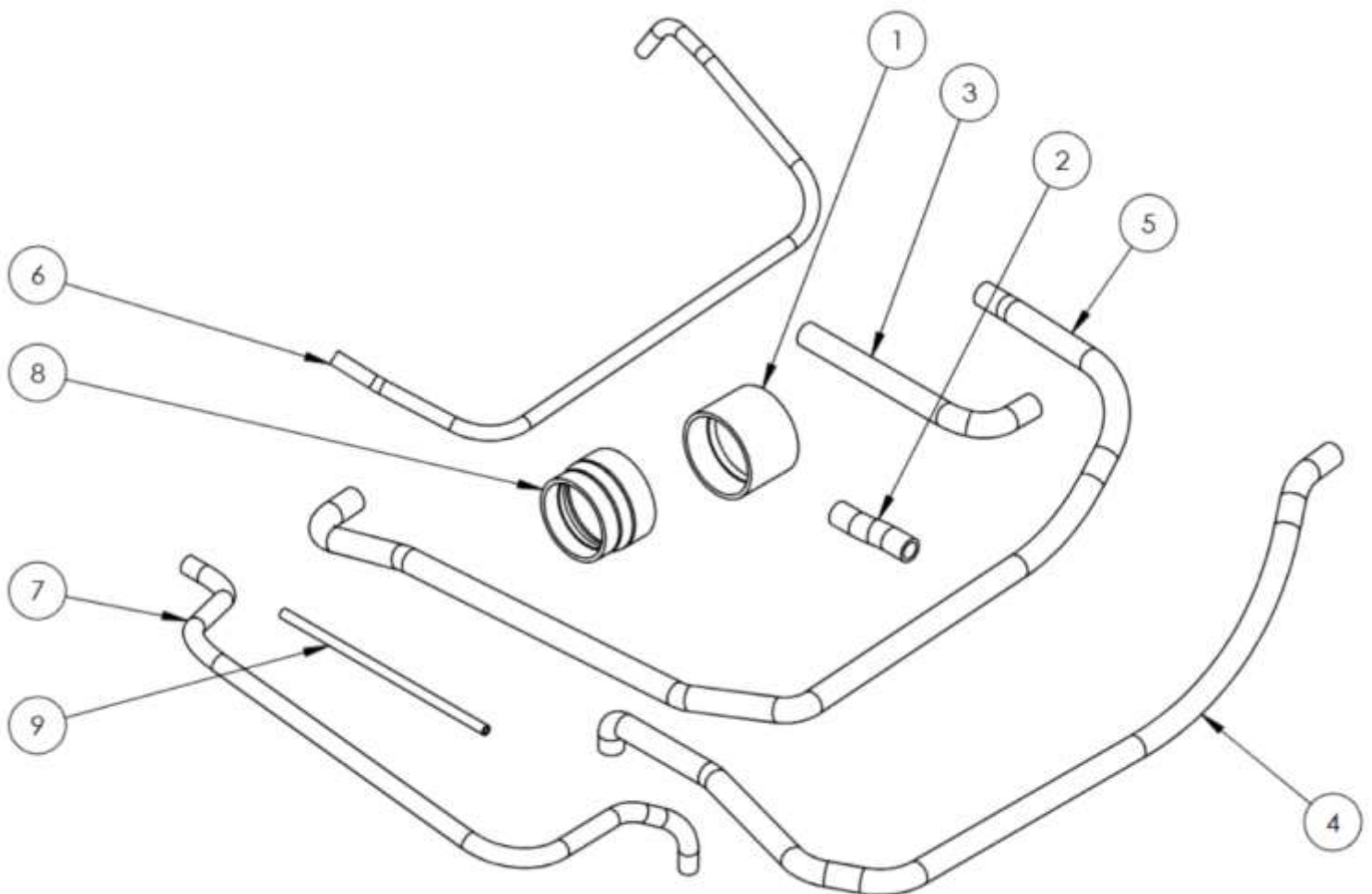
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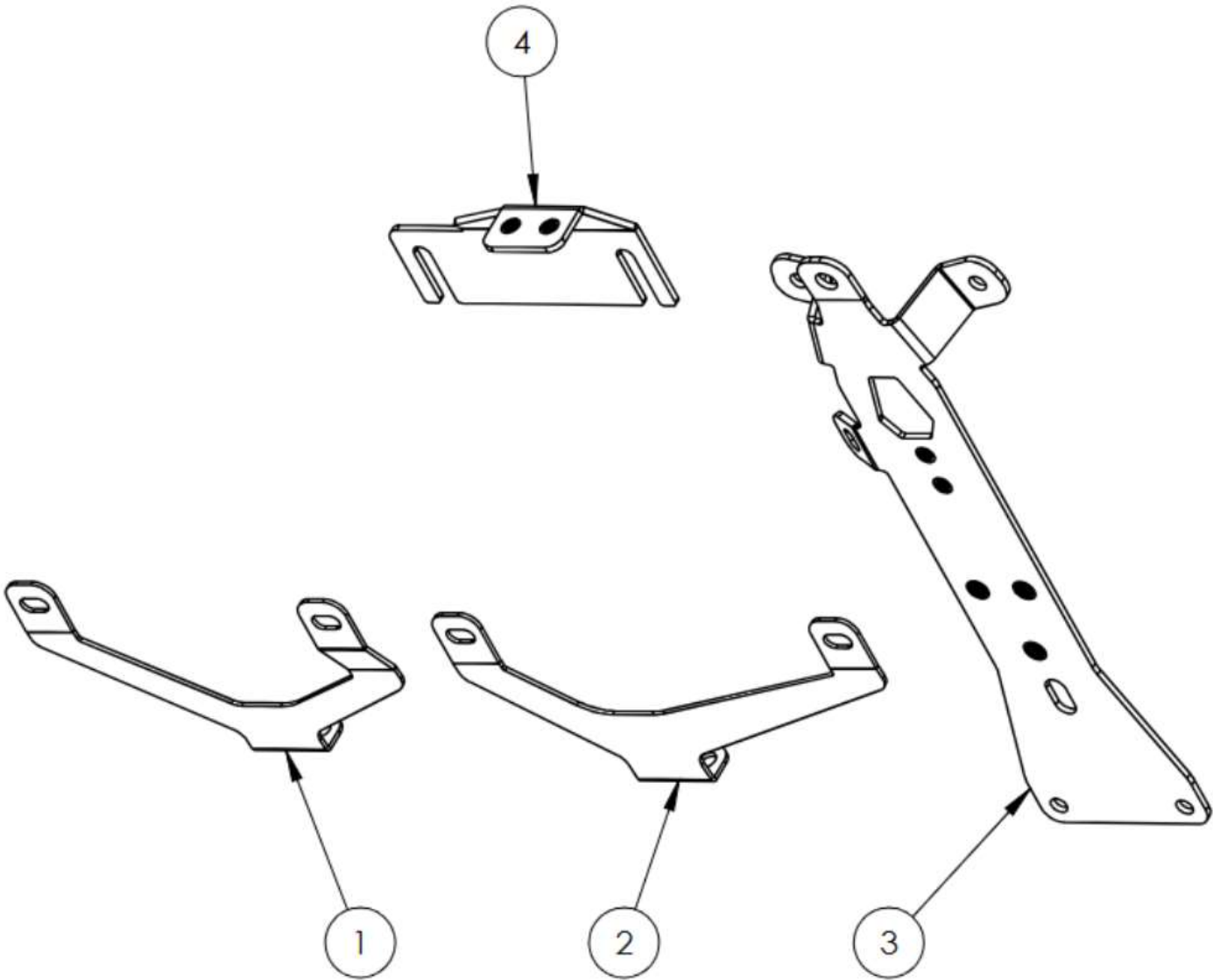
HOSE KIT

HOSE KIT	
1	Intake Plenum Joiner Coupler
2	Reservoir to Intercooler Hose
3	Coolant Pump to Heat Exchanger Hose
4	Coolant Reservoir to Coolant Pump Hose
5	Heat Exchanger to Intercooler Hose
6	Throttle Body Heater Hose
7	Engine Coolant Crossover Hose
8	Throttle Body Coupler
9	Diverter Valve Hose



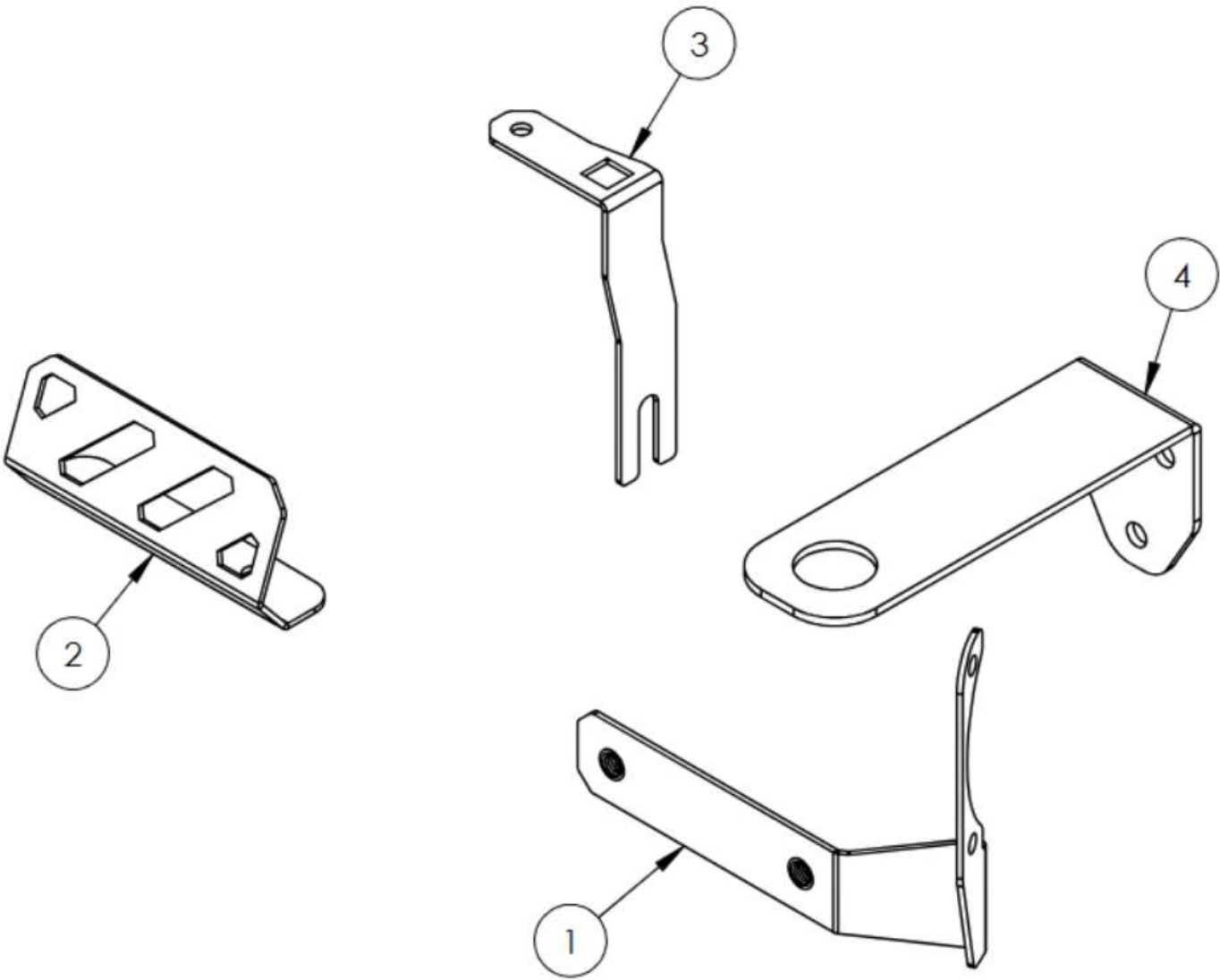
BRACKET KIT

BRACKET KIT	
1	Driver Side Heat Exchanger Support
2	Passenger Side Heat Exchanger Support
3	Coolant Pump Support
4	Upper Coolant Reservoir Support



SUPPLEMENTAL BRACKET KIT

SUPPLEMENTAL BRACKET KIT	
1	Intake Manifold Support
2	Wiring Harness Cover
3	EVAP Solenoid Mount
4	Grille Shutter Support



DISASSEMBLY:

TOOLS REQUIRED:

- Ratchet
- Ratchet Extension(s)
- Assorted Metric Sockets
- Assorted Metric Wrenches
- Torx Bits
- Allen/Hex Keys
- Pliers
- Scissors/Flush Cut Pliers

PARTS REQUIRED:

- Spark Plugs (Optional) (#62)

PROCEDURE:

1. Place the transmission in Park position (or in Reverse gear if equipped with a manual transmission). Apply the parking brake.
2. Raise and support the hood of the vehicle.
3. Remove the Plastic Cover on top of the Radiator, it is held on by (6) six plastic tabs. *Figure 1.*

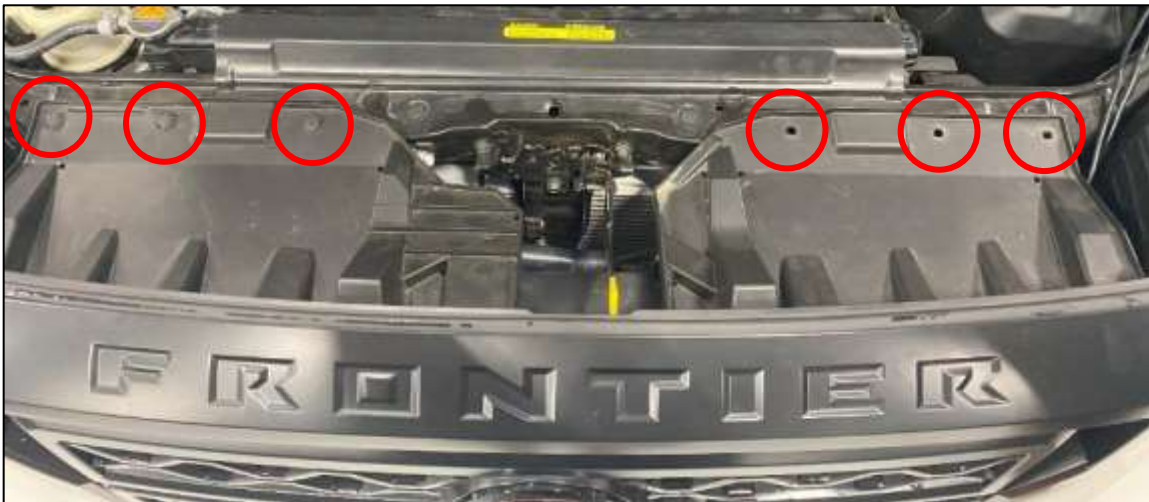


Figure 1

4. Remove the Front Grille from the vehicle, it is held on by plastic tabs on the sides and bottom of the Grille that must be unclipped. *Figure 2.*

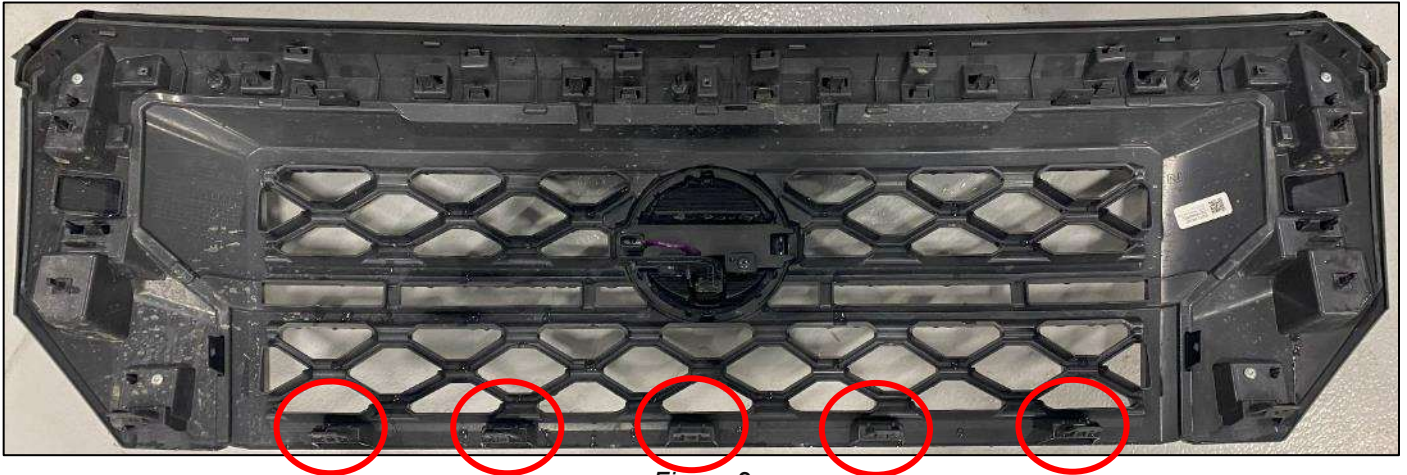


Figure 2

5. Remove the Air Intake from the Engine Bay:

- a. Loosen the (2) two Hose Clamps securing the Intake Tube to the Air Filter Box. *Figure 3.*



Figure 3

- b. Loosen the (2) two Hose Clamps securing the Intake Tube to the Throttle Body. *Figure 4.*

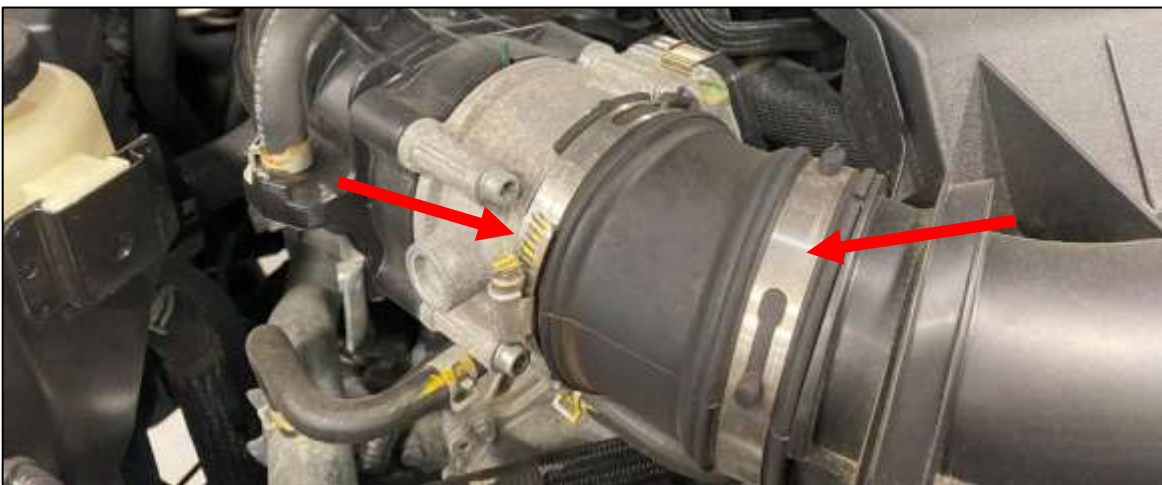


Figure 4

- c. Remove the PCV Hose from the Intake and Valve Cover and unclip the MAF Sensor from the Intake Tube. *Figure 5.*



Figure 5

- d. Remove the (2) two bolts securing the Intake Pipe to the Engine. *Figure 6.*



Figure 6

- e. Remove the (1) one bolt securing the back of the OE Airbox to the vehicle.

- f. Lift up and remove the OE Airbox and Intake Tube from the vehicle. Retain the MAF Sensor and Hardware from the OE Intake. *Figure 7.*



Figure 7

6. If your vehicle is equipped with Active Shutters, remove them.
7. Disconnect the (2) two Sensors/Connectors from the Center Support of the Core Support. *Figure 8.*



Figure 8

8. Remove the (5) five nuts and bolts securing the Support Piece in the middle of the Core Support and remove the Support Piece. Retain this hardware as it will be reused. *Figure 9.*



Figure 9

9. Trim the Driver Side Radiator Guide as shown below with Snips or an Air Saw. This is necessary to allow clearance for the Heat Exchanger Hoses to pass through. Clean up all debris before proceeding. *Figure 10.*



Figure 10

10. Locate a long M6 bolt, skinny screwdriver or similar tool. Use a ratchet to loosen the Belt Tensioner and use the Bolt/Tool to secure the Tensioner in position. *Figure 11.*



Figure 11

11. Remove the OE Drive Belt from the vehicle.

12. Remove the upper Idler Pulley. There is a small cover that will need to be pried off first. *Figure 12.*



Figure 12

13. Remove the (3) three bolts securing the Timing Cover and the OE Coolant Line Bracket to the Timing Cover. Disconnect the Coolant Lines from the Bracket and remove the Bracket. *Figure 13.*



Figure 13

14. Remove the (4) four Bolts securing the Throttle Body to the Intake Manifold. Retain these bolts as they will be reused. Position the Throttle Body out of the way in the engine bay but do not disconnect the Coolant Lines. *Figure 14.*

NOTE: These bolts are easily stripped, make sure your Allen/Hex Key is properly seated before loosening.

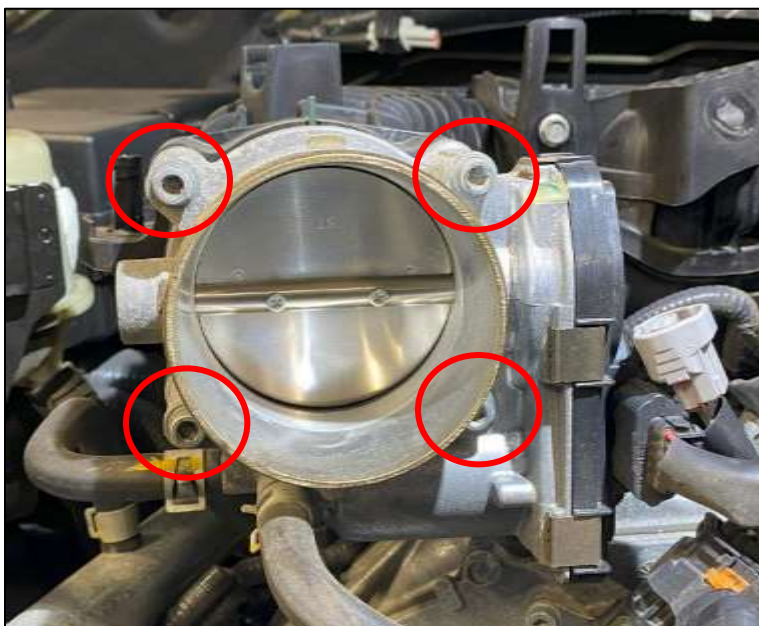


Figure 14

15. Disconnect the EVAP Sensor Connector. *Figure 15.*



Figure 15

16. Remove the EVAP Hose and unclip the Sensor from the Intake Manifold.

17. Remove the PCV Hose from the rear of the Driver Side Intake Manifold. *Figure 16.*

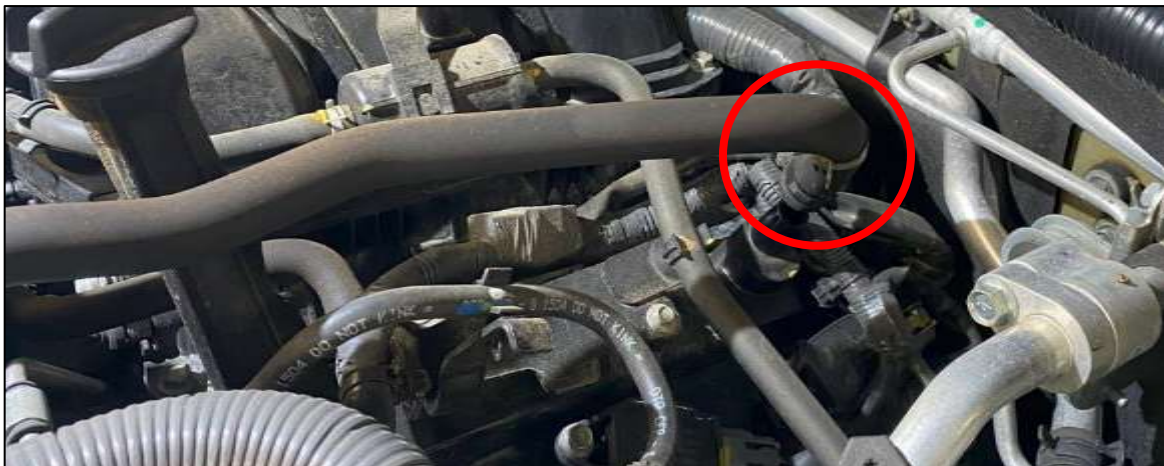


Figure 16

18. Disconnect the PCV Hose from the Intake Elbow on the Passenger Side of Intake Manifold. *Figure 17.*



Figure 17

19. On the Driver Side of the Engine, remove the (2) two bolts securing the EVAP Canister Bracket and remove this bracket. Retain (1) one of the bolts, it will be reused. *Figure 18.*

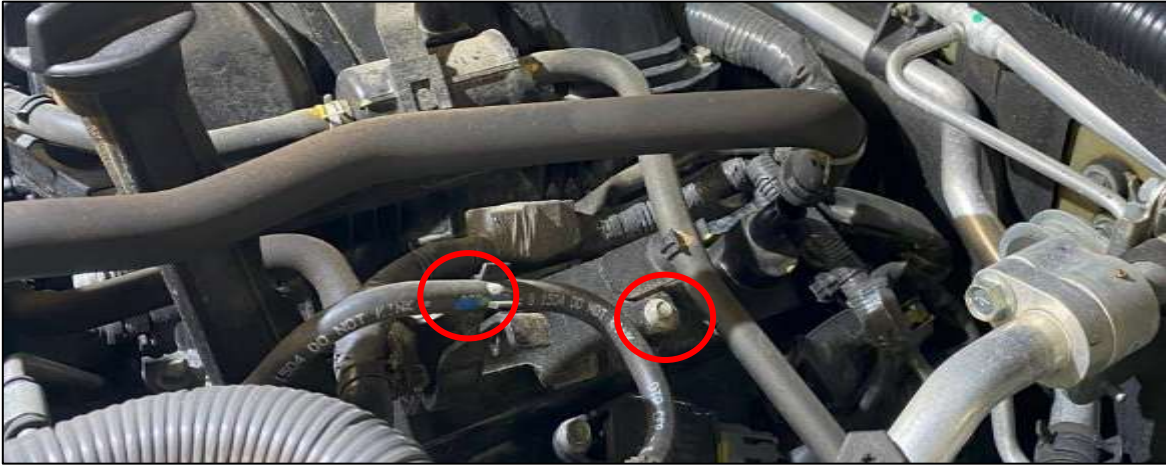


Figure 18

20. Disconnect the EVAP Canister from the it's bracket. *Figure 19.*



Figure 19

21. Remove the (2) two bolts securing the Intake Tube Support Bracket to the engine. Retain these bolts as they will be reused. *Figure 20.*



Figure 20

22. Unclip the EVAP Line from the Intake Manifold.
23. Remove the (8) eight nuts and bolts securing the Intake Manifold to the Lower Intake Plenum. *Figure 21.*

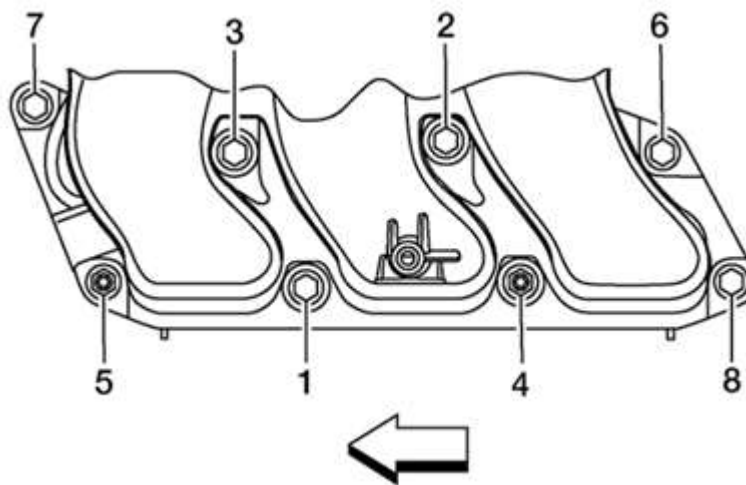


Figure 21

24. Remove the Intake Manifold from the vehicle, be careful not to drop anything into the Lower Intake Plenum.

25. If the (2) two Studs did not come out of the Lower Intake Plenum, remove them with a Torx bit. *Figure 22.*

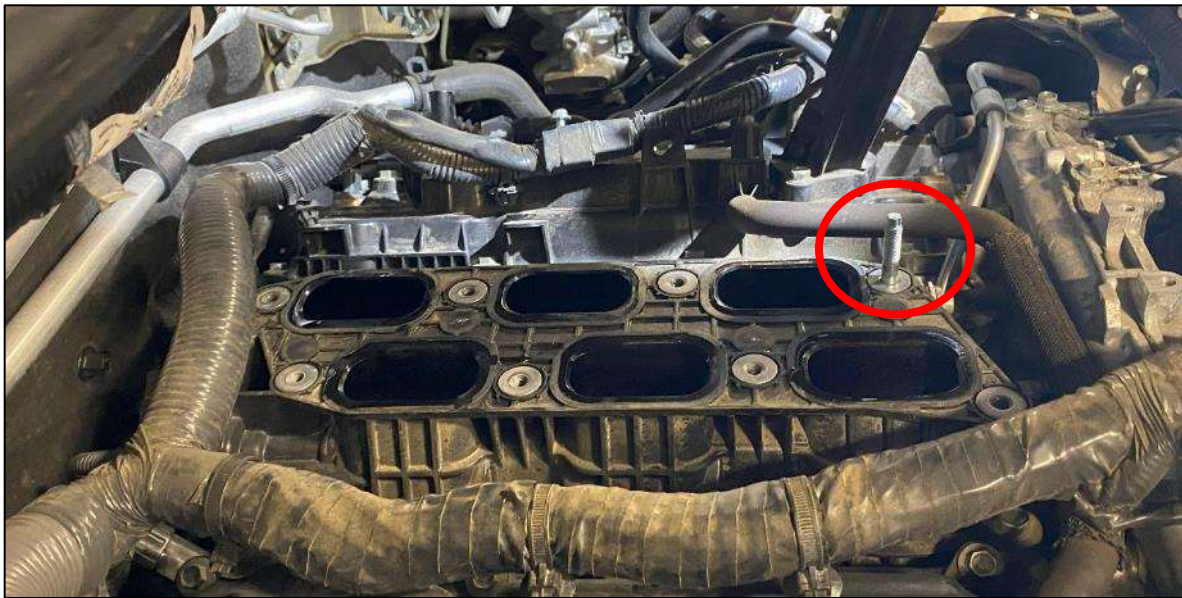


Figure 22

26. Thoroughly clean the top of the Lower Intake Plenum of all debris. It is recommended to cover the ports in the Plenum with Painters Tape or a rag while cleaning and installing other parts to prevent debris from falling into the engine.

27. Remove the OE Intake Bracket from the top of the Timing Cover. *Figure 23.*



Figure 23

28. Remove the (2) two bolts securing the Oil Fill tube to the vehicle. Retain this hardware. *Figure 24.*



Figure 24

29. Using pliers or snips, remove the small tab on the base of the Oil Fill Tube. *Figure 25.*



Figure 25

30. Reinstall the Oil Fill Tube in reverse orientation. This is necessary to clear the Supercharger. *Figure 26.*

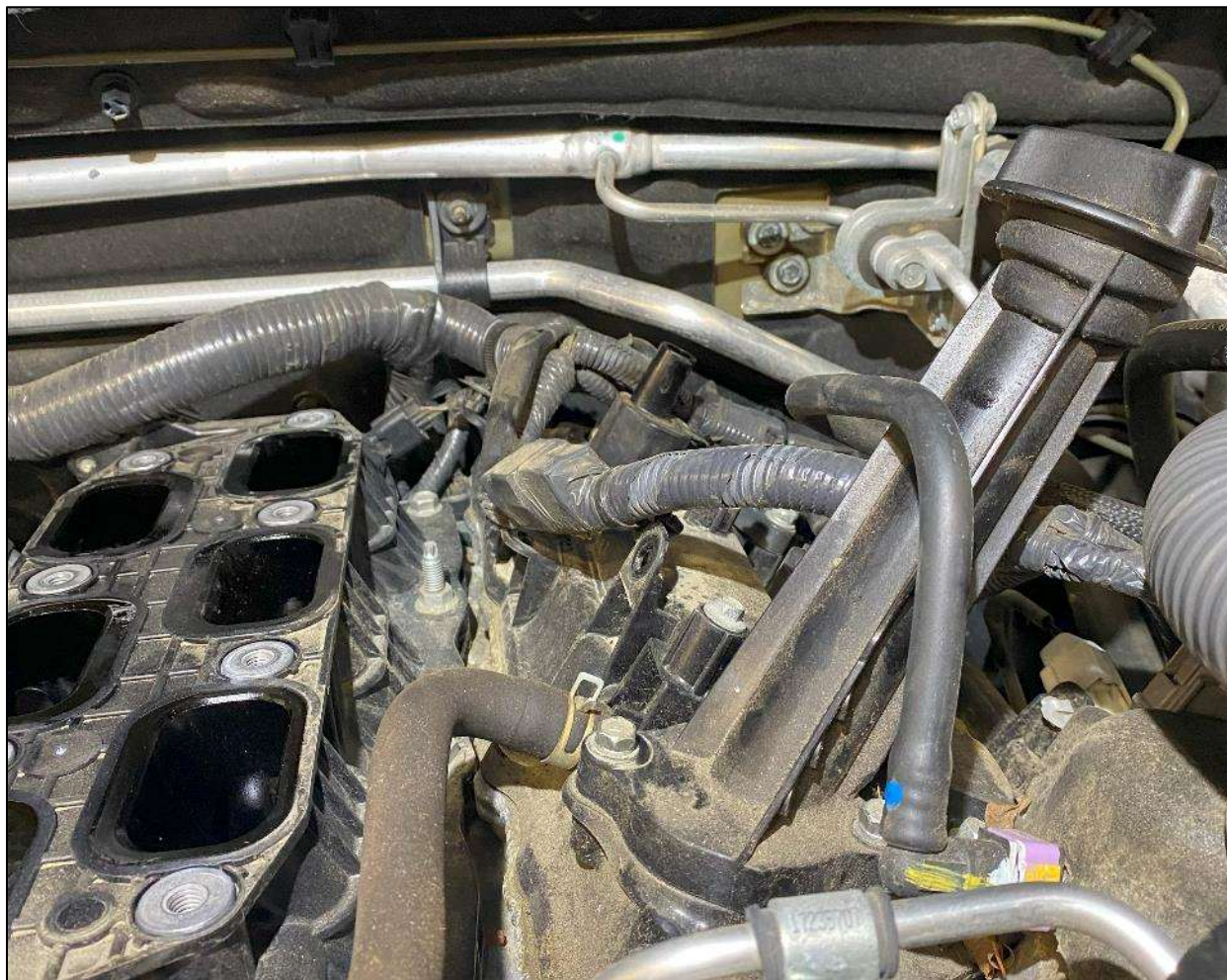


Figure 26

31. Unclip the EFI Harness from the Passenger Side of the Engine. This is necessary to allow clearance for the Supercharger to seat correctly on the Engine. *Figure 27.*



Figure 27

32. If you are installing new Spark Plugs, that should be done at this point. It will be more difficult to remove the Plugs later once the Supercharger and Coolant Reservoir are installed.

DUAL IDLER BRACKET

TOOLS REQUIRED:

- Ratchet
- Ratchet Extension(s)
- Assorted Metric Sockets
- Assorted Metric Wrenches
- Allen/Hex Keys
- Pliers
- Scissors/Flush Cut Pliers
- Torque Wrench

PARTS REQUIRED:

- Dual Idler Bracket (#29)
- Idler Adjuster (#30)
- Supplemental Bracket Kit – Wiring Harness Cover (#31)
- (2) 60mm Smooth Pulleys (#35)
- (2) 5mm Spacer (#36)
- (2) 1mm Spacer (#37)
- (2) M10 x 1.25 Bolts, 50mm (#38)
- (1) M8 x 1.25 Socket Head Screw, 20mm (#39)
- (2) M10 x 1.50 Socket Head Screw, 95mm (#40)
- (1) M10 x 1.5 Set Screw, 60mm (#41)
- (1) M10 x 1.5 Flange Nut (#42)
- (2) M6 x 1.0 Button Head Screw, 10mm (#51)

PROCEDURE:

1. Locate the Dual Idler Bracket, Idler Adjuster, M10 x 1.5 Set Screw, 60mm, and (1) M10 x 1.5 Flange Nut. Insert the Idler Adjuster in the back of the Dual Idler Bracket as shown. Slightly thread in the Set Screw and place the Flange Nut on the Set Screw. These will be used to adjust belt tension later. *Figure 28.*

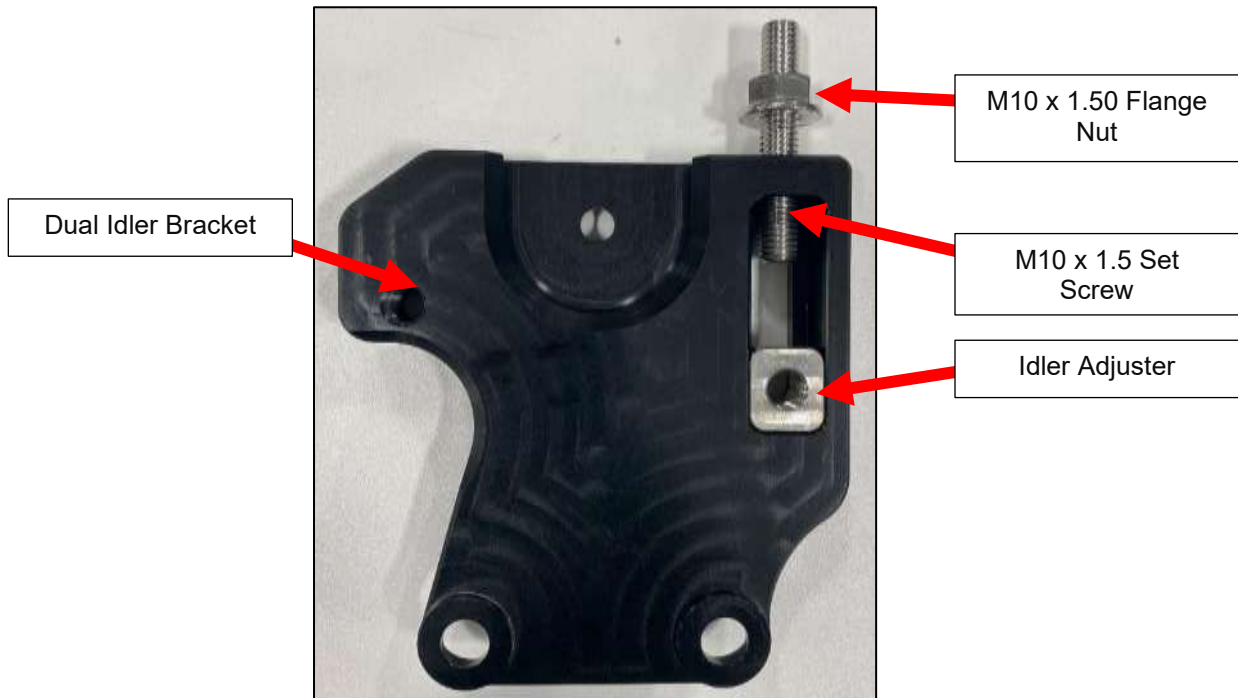
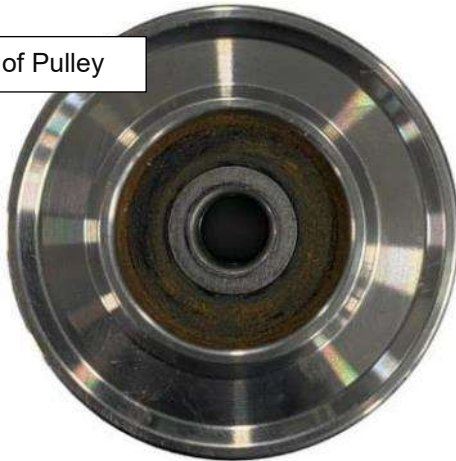


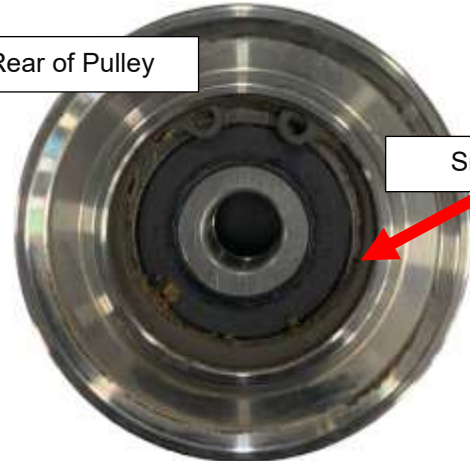
Figure 28

2. Locate the (2) two 60mm Smooth Pulleys, (2) two 1mm Spacers, (2) two 5mm Spacers and (2) two M10 x 1.25 Bolts, 50mm. Place (1) one 1mm and (1) one 5mm Spacer on the back of each Pulley on the Dual Idler Bracket, and secure with a M10 x 1.25 Bolt. The Pulleys **MUST** have the Snap Ring facing the Idler Bracket. Do not fully tighten these bolts yet. *Figure 29.*

Front of Pulley



Rear of Pulley



Snap Ring

1mm and 5mm
Spacer on back of
each Pulley

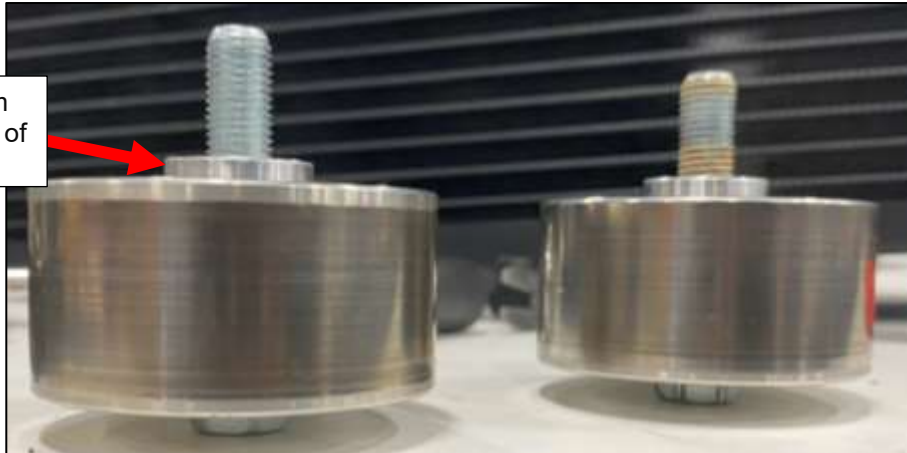


Figure 29

3. Locate (2) two M10 x 1.50 Socket Head Screws, 95mm and (1) one M8 x 1.25 Socket Head Screw, 20mm. Use the (2) two M10 Socket Head Screws to secure the bottom of the Dual Idler Bracket to the Timing Cover, and the M8 Socket Head Screw will secure the top. When threading in the bolts, slightly lift up on the Dual Idler Bracket to relieve any downward tension on the bolts, and to allow the bolts to thread in smoothly. Torque the M10 Bolts to **13 ft-lbs** and the M8 Bolt to **9 ft-lbs**. *Figure 30.*

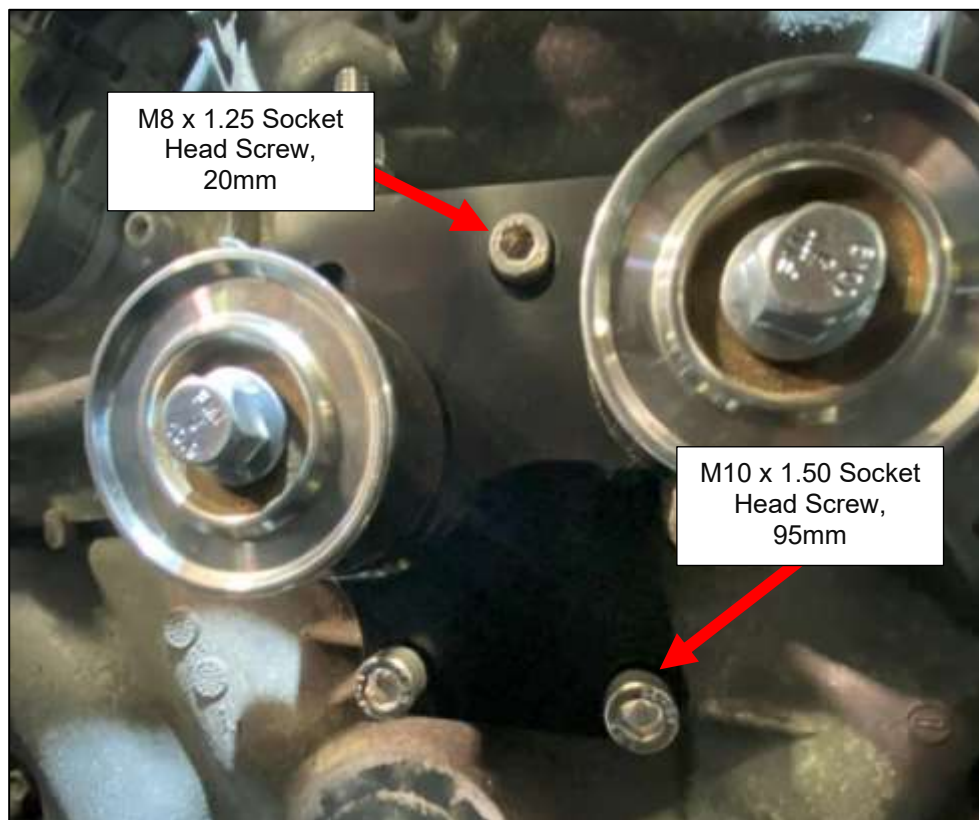


Figure 30

4. Unbolt the (2) two Ground Wires on the Driver Side of the Timing Cover. Route them **UNDER** the Wiring Harness and reinstall the two bolts. *Figure 31.*

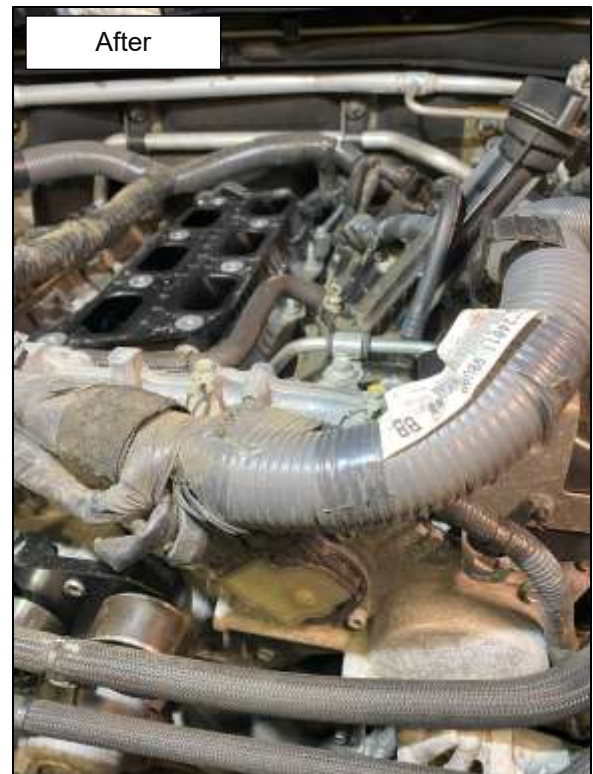


Figure 31

5. Unclip the Wiring Harness from the bracket on the Driver Side of the Timing Cover. *Figure 32.*



Figure 32

6. Carefully cut the tape securing the smaller and larger Wiring Harness together. *Figure 33.*



Figure 33

7. Locate the Wiring Harness Cover from the Supplemental Bracket Kit and (2) two M6 x 1.0 Button Head Screws, 10mm. Push the Main Wiring Harness up on top of the Timing Cover and secure the Wiring Harness Cover to the Timing Cover with the (2) two M6 Button Head Screws. This will mount in the same position as the bracket removed in *Step 27, Disassembly. Figure 34.*

NOTE: None of the Wiring Harness can be in front of this Bracket, as it will contact the Supercharger Belt and destroy the Harness. Ensure that the Wiring Harness is not under tension anywhere, undo more clips if necessary.

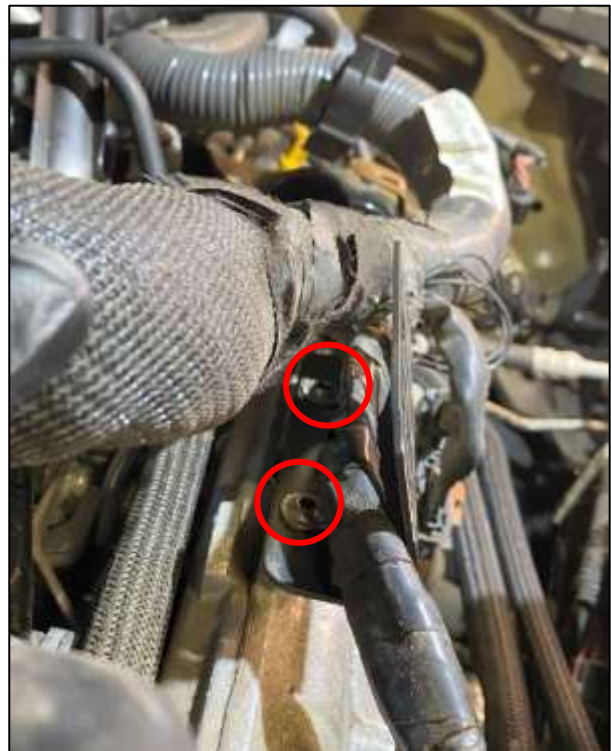
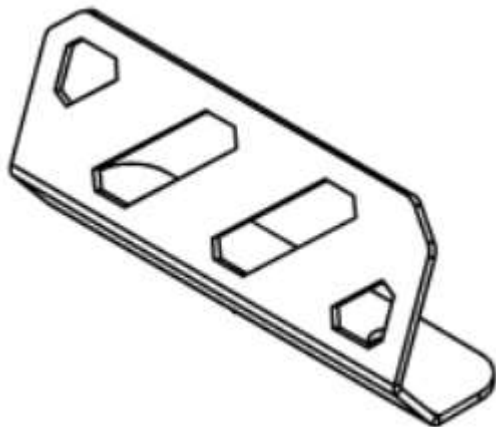


Figure 34

SUPERCHARGER INSTALLATION

TOOLS REQUIRED:

- Ratchet
- Ratchet Extension(s)
- Assorted Metric Sockets
- Assorted Metric Wrenches
- Allen/Hex Keys
- Torque Wrench
- Air Compressor

PARTS REQUIRED:

- Supercharger Unit Assembly (#1)
- Supercharger Intercooler (#2)
- (2) M8 x 1.25 Socket Head Screws, 14mm (#22)
- (1) M6 x 1.0 Flanged Hex Head Screw, 25mm (#23)
- (3) M6 x 1.0 Flanged Locknut (#24)
- (2) M6 x 1.0 Socket Head Screws, 70mm (#25)
- (2) Worm Gear Hose Clamps (#26)
- (4) M6 x 1.0 Socket Head Screws, 14mm (#34)
- Intake Manifold Plate (#27)
- Carbon Fiber Intake Tube (#33)
- Hose Kit (#28)
- Supplemental Bracket Kit (#31)
- IAT Adapter Harness (#32)
- Smaller Intercooler Gasket (#44)
- Larger Intercooler Gasket (#45)
- (2) Plenum Spacer Gasket (#46)
- (8) M8 x 1.25 Socket Head Sealing Screws, 25mm (#47)
- (3) M8 x 1.25 Socket Head Screws, 60mm (#48)
- (10) M8 x 1.25 Socket Head Screws, 25mm (#49)
- (5) M8 x 1.25 Socket Head Screws, 45mm (#50)
- (1) M6 x 1.0 Socket Head Screw, 14mm (#52)
- Intake Manifold MAP/IAT Sensor (#53)
- (2) -10 ORB to 3/4" Hose Barb Fittings (#54)
- Ball-End 6mm 3/8" Socket (#56)
- Throttle Body Gasket (#57)
- Intake Throttle Body Coupler (#58)
- Boost Leak Tester with Gauge (#59)
- Supercharger Drive Pulley (#60)

PROCEDURE:

1. Route the OE EVAP Line back behind the Engine. It needs to be routed behind the Supercharger to not interfere with the Drive Belt and it is easier to route before the Blower is on. *Figure 35.*



Figure 35

2. Clean the Lower Intake Manifold of the Engine if you have not done so already.
3. Locate the Intake Manifold Plate and (2) two Plenum Spacer Gaskets. Install the Gaskets into the Intake Manifold Plate as shown below. *Figure 36.*



Figure 36

4. Install the Intake Manifold Plate face down on the Lower Intake Manifold as shown. Secure with (8) eight M8 x 1.25 Socket Head Sealing Screws (the ones with O-Rings built in). Torque the M8 Bolts to **8 ft-lbs** in a crisscross pattern starting from the middle of the Plate. *Figure 37.*



Figure 37

5. Locate the Larger Intercooler Gasket. Install it into the groove of the Intake Manifold Plate. **DO NOT** stretch the Gasket when installing, as it will not fit if it is stretched. Make sure the Gasket is properly installed before proceeding to the next step. *Figure 38.*

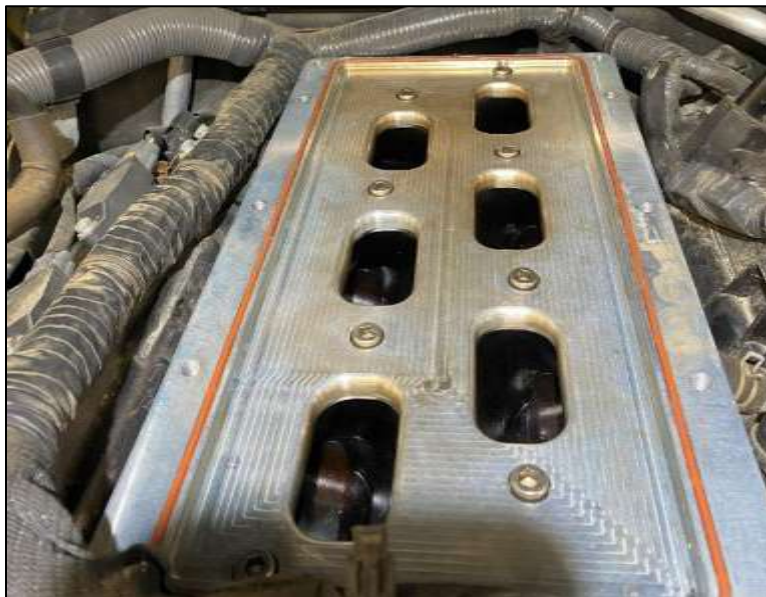


Figure 38

6. Locate the Intercooler. Install the (2) two -10 ORB to $\frac{3}{4}$ " Hose Barb Fittings into the side of the Intercooler. *Figure 39.*



Figure 39

7. Locate the MAP/IAT Sensor and (1) one M6 x 1.0 Socket Head Screw, 14mm. Install the MAP/IAT Sensor into the back of the Intercooler, and secure with the M6 Screw as shown below. *Figure 40.*



Figure 40

8. Place the Intercooler on top of the Intake Manifold Plate with the Fittings on the Driver Side of the vehicle. Be careful not to dislodge the gasket in the Intake Manifold Plate. If the Gasket is dislodged, there will be a major boost leak.
9. Locate (5) five M8 x 1.25 Socket Head Screws, 45mm, and (2) two M8 x 1.25 Socket Head Screws, 25mm. Install the (2) two 25mm Socket Head Screws into the back of the Intercooler, and the (5) five 45mm Socket Head Screws onto the top of the Intercooler as indicated by the **RED** circles below. Leave the Top Right, Bottom Right and Bottom Left Holes open. Torque the bolts to **26 ft-lbs** in a crisscross pattern starting from the middle of the Intercooler. *Figure 41.*

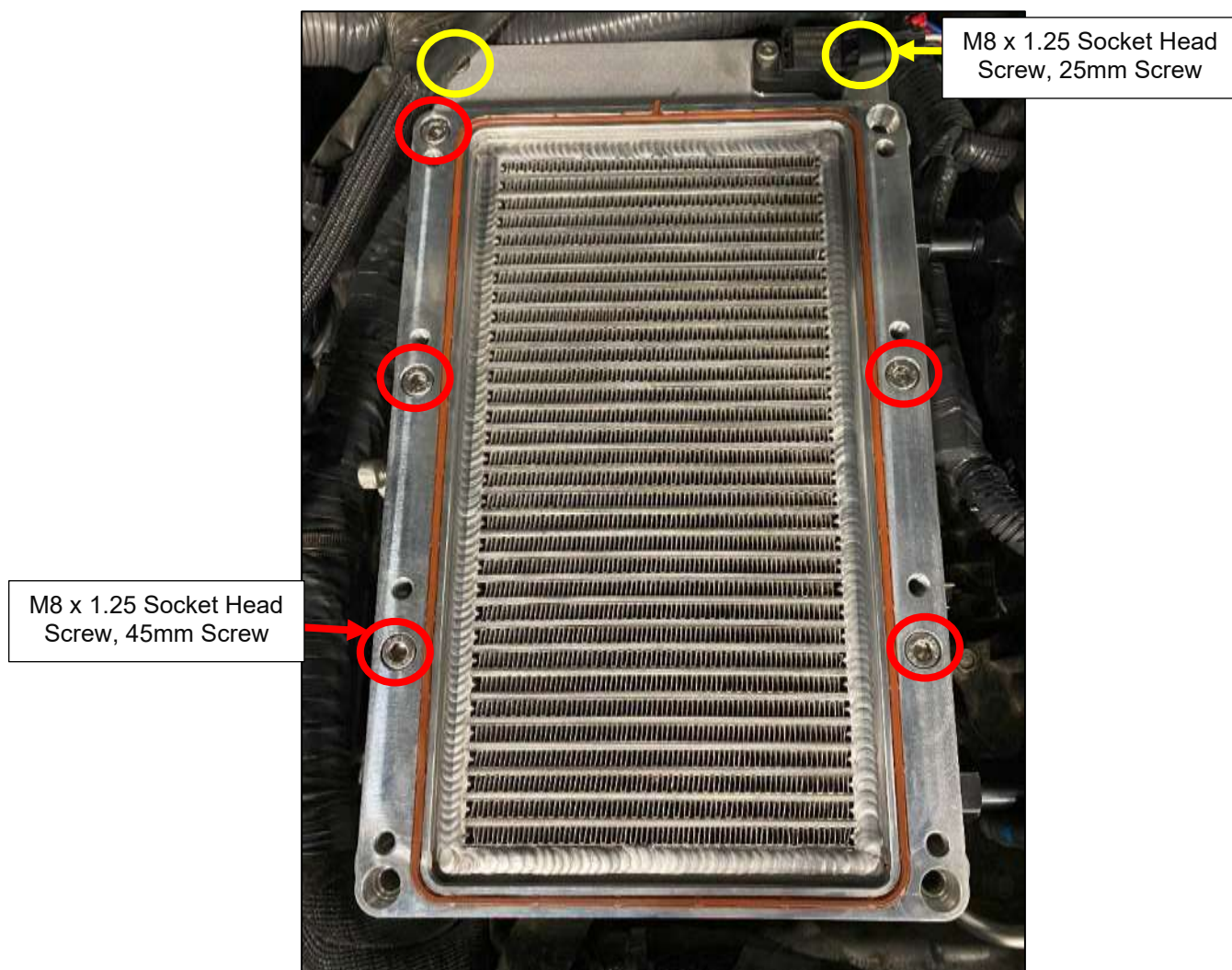


Figure 41

10. Locate the Smaller Intercooler Gasket. Place it in the groove on the top of the Intercooler. **DO NOT** stretch the Gasket when installing, as it will not fit if it is stretched. Make sure the Gasket is properly installed before proceeding to the next step. *Figure 42.*



Figure 42

11. Locate the Supercharger Unit and place it on top of the Intercooler. Be careful not to dislodge the gasket in the Intercooler. *Figure 43.*

NOTE: It is extremely important that the Supercharger does not dislodge the Gasket in the Intercooler. It may be easier to install the Supercharger with two people to help prevent this. Stretching or dislodging the Gasket will cause a Boost Leak and will cause Tuning Issues and a loss of power.



Figure 43

12. Locate (8) eight M8 x 1.25 Socket Head Screws, 25mm and (3) three M8 x 1.25 Socket Head Screws, 65mm. Install the 60mm Screws into the (3) three corner holes as indicated by the **YELLOW** circles to secure the plate stack together. Install the 25mm Screws into the middle holes of the Supercharger as indicated by the **RED** circles into the Lower Supercharger plate to secure it to the Intercooler. Torque the Screws to **26 ft-lbs** in a crisscross pattern starting from the middle of the Plate. Use the included 6mm Ball End 3/8" Socket to reach these bolts. *Figure 44.*

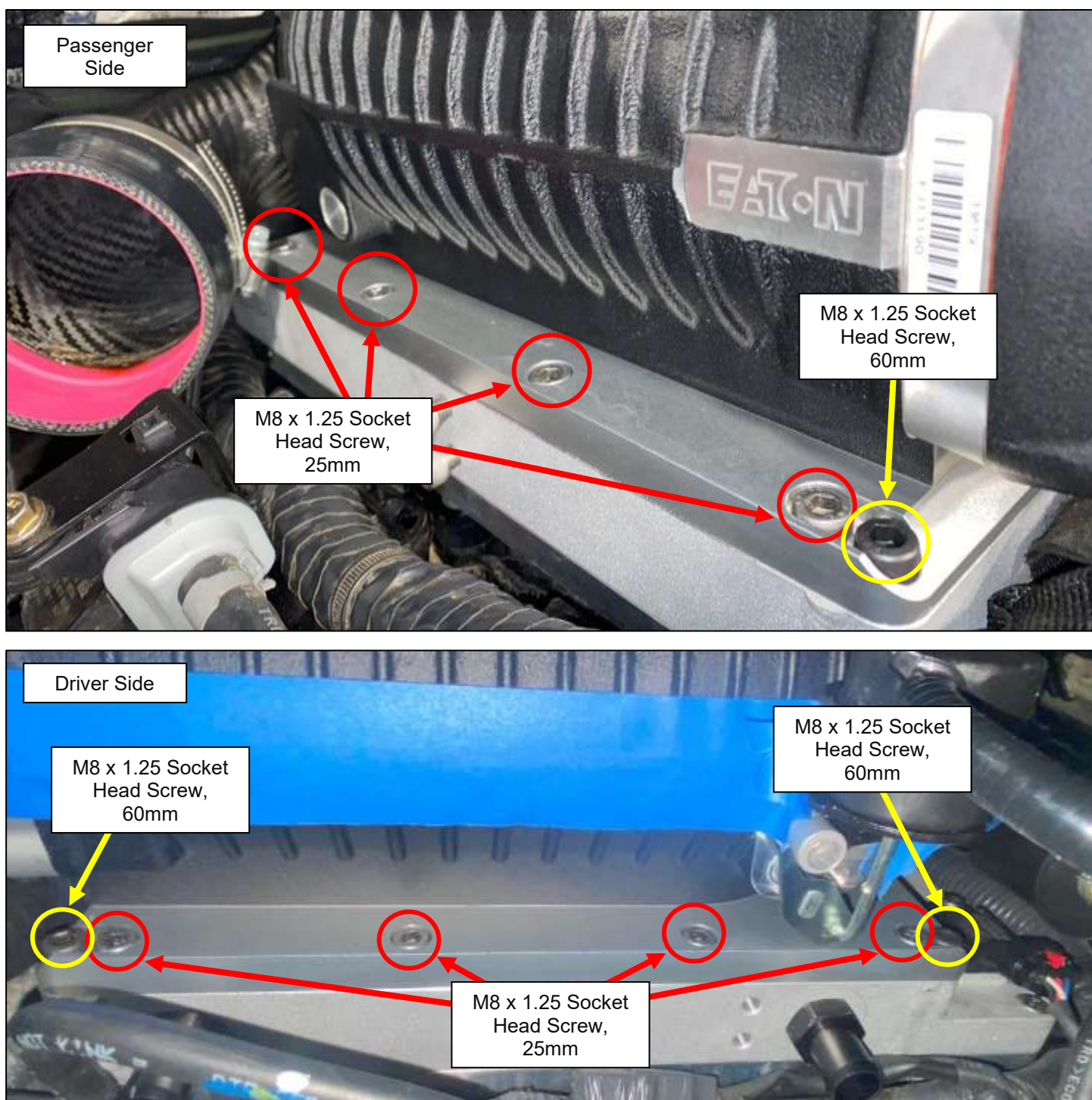


Figure 44

13. Locate the Diverter Valve Hose (Refer to *Page 7* for the Hose Diagram). Install it on the top port of the Diverter Valve and the other end on the Port on the Supercharger Inlet. *Figure 45*.



Figure 45

14. Locate the Supercharger Drive Pulley and (4) four M6 x 1.0 Socket Head Screws, 14mm. Place the Pulley onto the snout of the Supercharger Unit, and secure with the M6 Screws. You will not be able to torque these bolts until the belt is on and tensioned. *Figure 46*.



Figure 46

15. Locate the EVAP Support Bracket and (2) two M8 x 1.25 Socket Head Screws, 14mm. Loosely thread the M8 Screws into the Passenger Side of the Intercooler. Place the slot of the EVAP Support Bracket behind the screws and tighten them to secure the bracket. Clip the EVAP Connector to this bracket and secure with (1) one M6 x 1.0 Flanged Hex Head Screw and (1) one M6 x 1.0 Flanged Locknut. *Figure 47.*



Figure 47

16. Locate the Intake Support Bracket and the (2) two OE Bolts removed in *Step 21: Disassembly*. Attach the Bracket to the position of the OE Intake Support Bracket and secure with the (2) two OE Bolts. *Figure 48*.

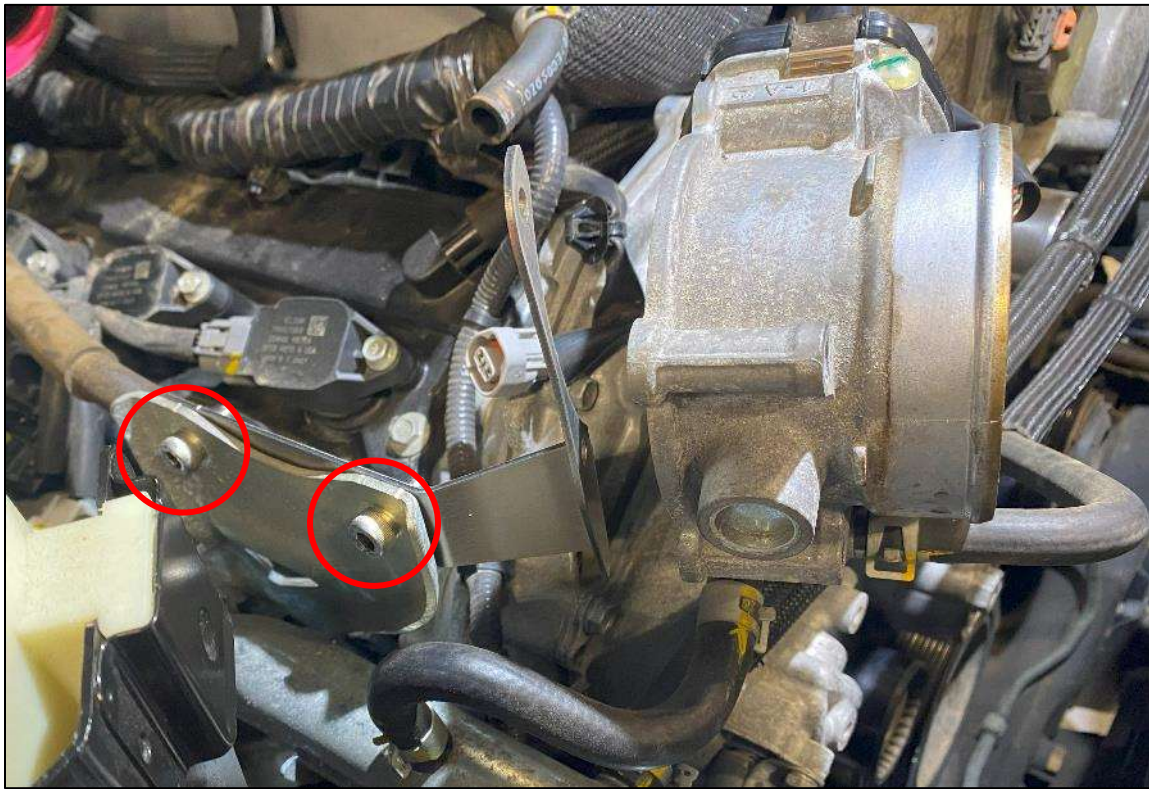


Figure 48

17. Locate the Intake Plenum Joiner and (2) two Worm Gear Hose Clamps. Place the Joiner on the Supercharger Inlet, and secure with (1) one Worm Gear Hose Clamp. The second Clamp will be used in the next step. *Figure 49*.



Figure 49

18. Locate the Carbon Fiber Intake Tube. Install the Intake Tube into the Joiner installed in *Step 17*, and secure with the second Hose Clamp. Install the included Throttle Body Gasket into the groove of the Intake Tube. *Figure 50.*

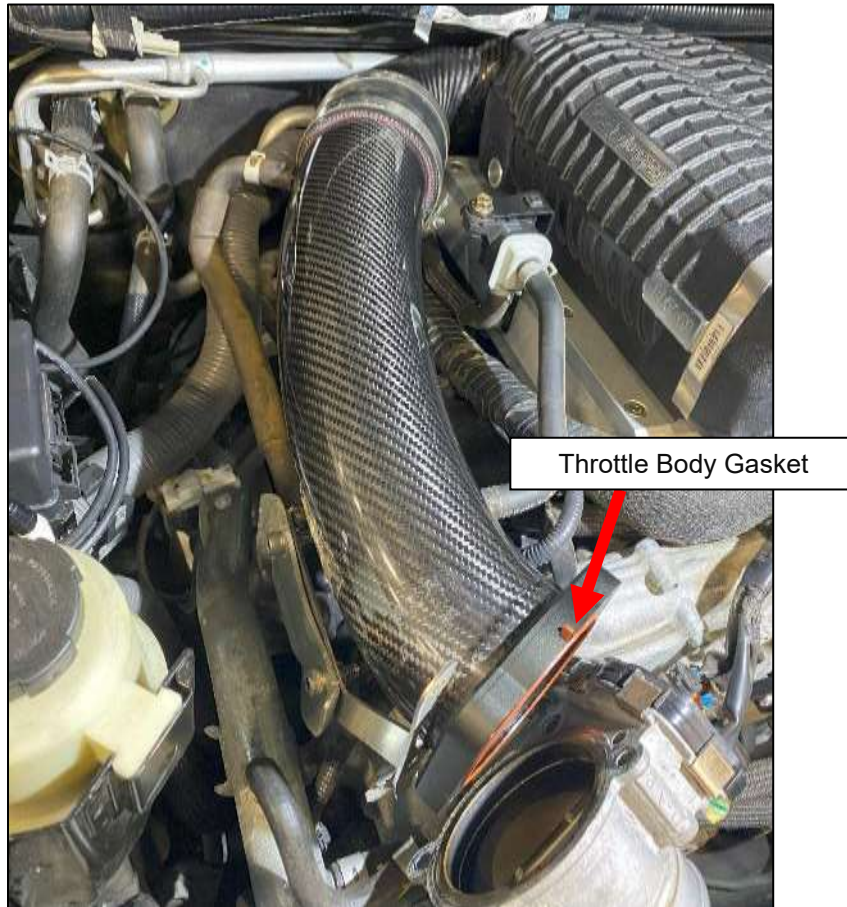


Figure 50

19. Locate the (2) two M6 x 1.0 Socket Head Screws, 70mm, (2) two M6 x 1.0 Flanged Locknuts and (2) two OE Throttle Body Mounting bolts that were removed in *Step 14: Disassembly*. On the outboard side of the Throttle Body, install the (2) two 70mm Bolts through the Throttle Body, Intake Plenum, and Intake Support Bracket. Secure the (2) two Bolts with the (2) two M6 Locknuts. Install the OE Bolts on the inboard side of the Throttle Body. *Figure 51.*

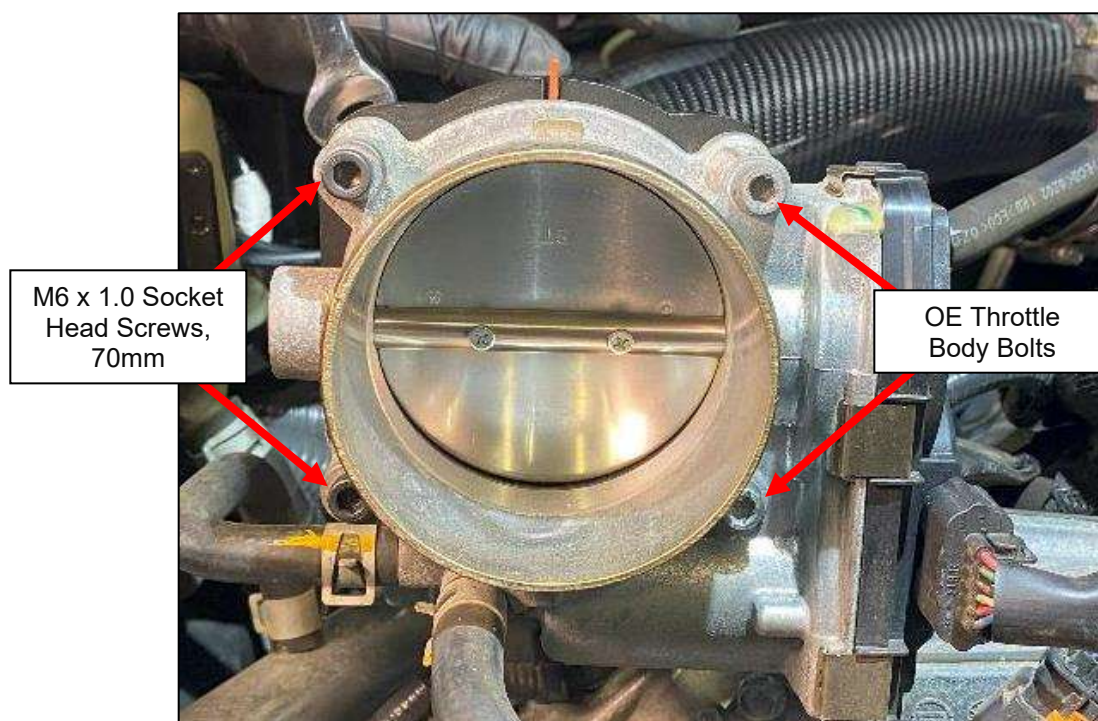
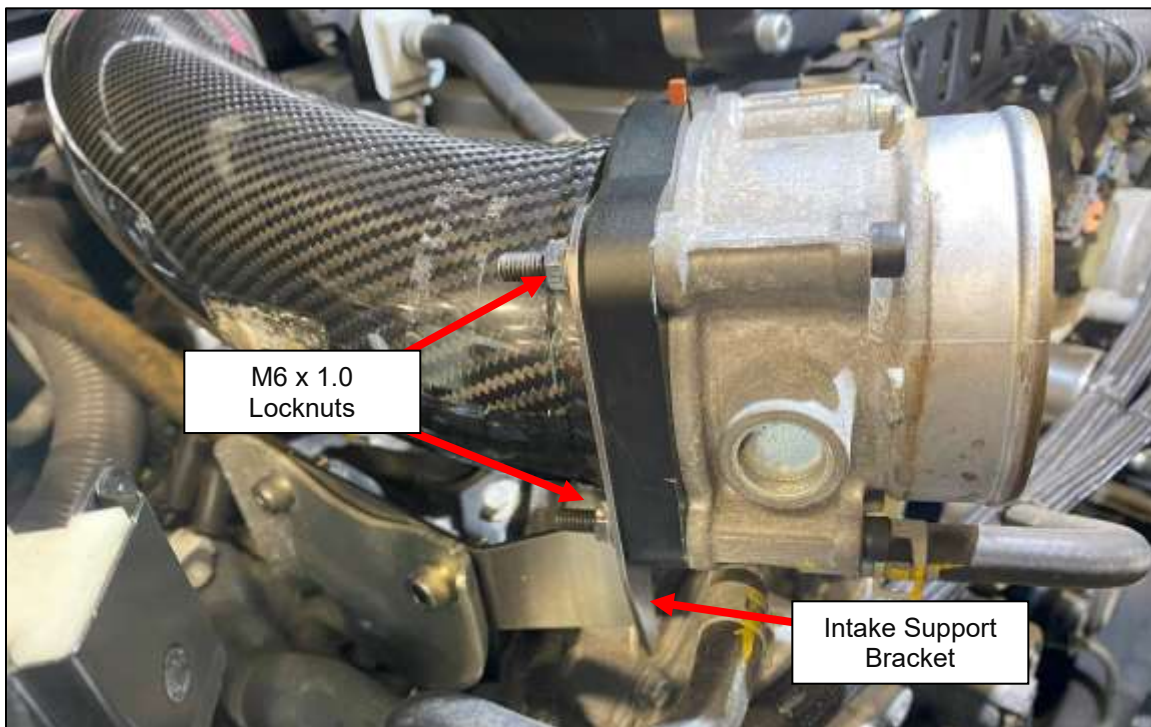


Figure 51

20. Install the EVAP Hose onto the Inboard Port and the PCV Hose to the Outboard Port of the Intake Tube.
Figure 52.

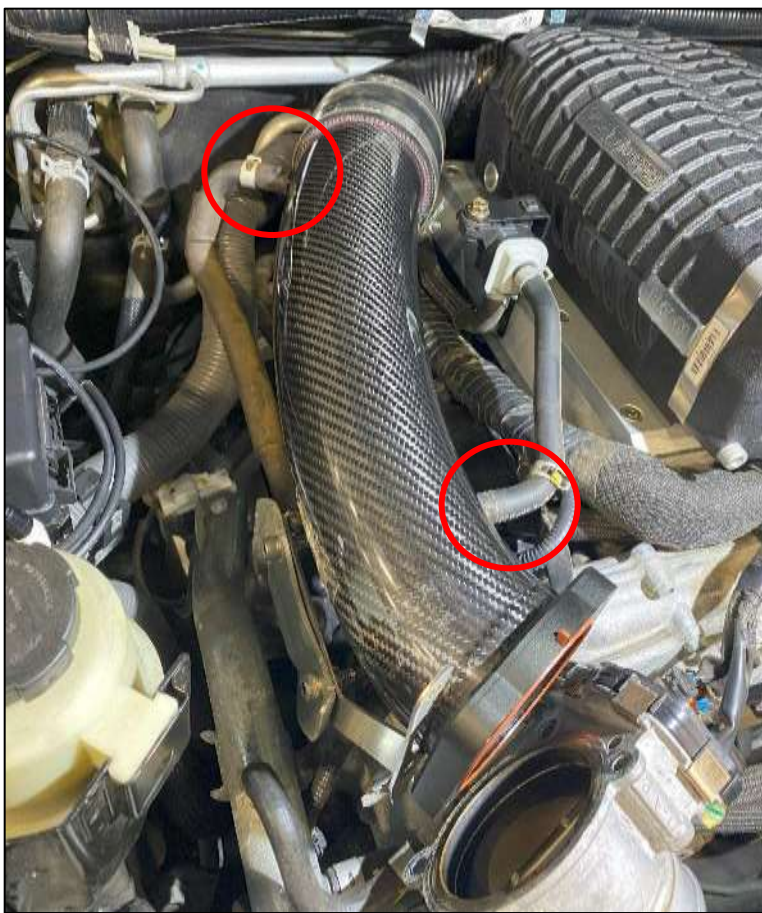


Figure 52

21. Locate the IAT Adapter Harness. Plug (1) one end into the MAP/IAT Sensor on the Intercooler and the Other end to the OE MAF Sensor Connector. The other open end will be plugged into the MAF Sensor in the Intake Tube at a later step. *Figure 53.*

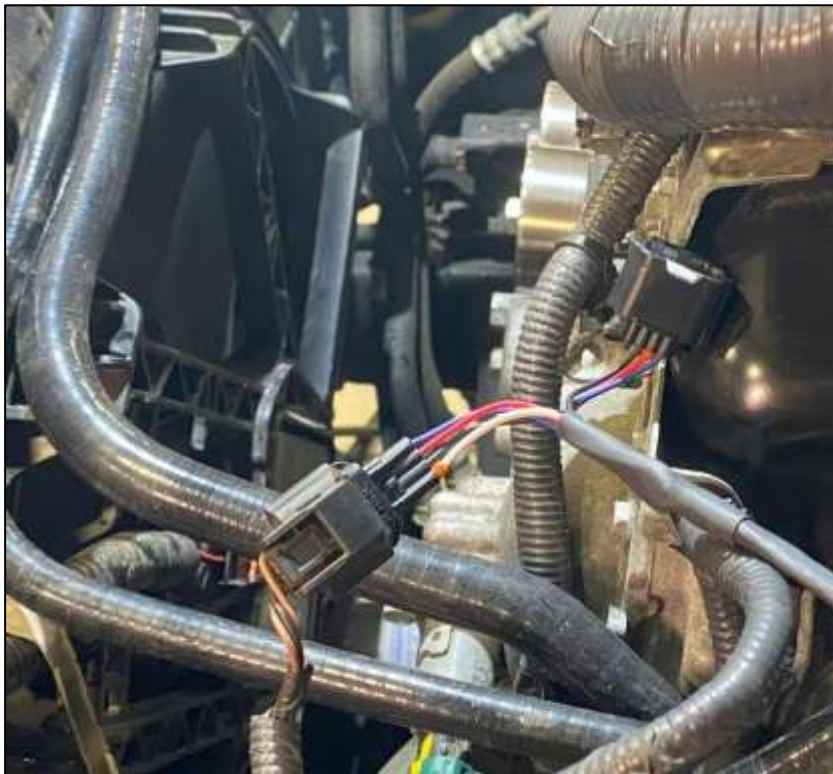


Figure 53

22. Locate the PCV Hose from the Z1 Air Intake Kit. Place the bent end on the Driver Side PCV Port.
23. Locate the Intake Throttle Body Coupler and the Boost Leak Tester with Gauge. Install the Boost Leak Tester and Coupler onto the Throttle Body and secure with Hose Clamps from the Air Intake Kit. *Figure 54.*



Figure 54

24. Pinch or plug the end of the PCV Hose installed in *Step 22*.

25. Connect an Air Compressor to the Boost Leak Tester. Pressurize the system **NO MORE** than **10 PSI**. Going over 10 psi could damage the assembly or the engine. Watch the pressure gauge, verify that the system can build pressure. The pressure will drop as it leaks down over the engine. Ensure that the pressure leak is not instantaneous, this could indicate a rolled Gasket between the plates, or a loose Coupler on the Intake Tube. Listen for any apparent leaks as and tighten clamps as necessary. *Figure 55*.



Figure 55

HEAT EXCHANGER AND COOLANT RESERVOIR

TOOLS REQUIRED:

- Ratchet
- Ratchet Extension(s)
- Assorted Metric Sockets
- Assorted Metric Wrenches
- Allen/Hex Keys
- Pliers
- Drill
- Drill Bits
- Vise Grips
- Drain Pan

PARTS REQUIRED:

- Bracket Kit (#3)
- Coolant Reservoir (#4)
- Heat Exchanger (#5)
- (2) M6 x 1.0 Socket Head Screw, 14mm (#7)
- (2) M6 x 1.0 Flat Head Screw, 14mm (#8)
- (4) M6 x 1.0 Flanged Hex Head Screw, 25mm (#9)
- (8) M8 x 1.25 Flanged Hex Head Screw, 12mm (#10)
- M6 x 1.0 Flanged Locknut (#11)
- Loctite Threadlocker (#12)
- (8) Hose Clamp (#13)
- (2) Coolant Pump Bracket (#14)
- Coolant Pump (#15)
- Radiator Cap (#18)
- (4) M8 x 1.25 Socket Head Screw, 14mm (#19)
- (4) M6 x 1.0 Flanged Bolt, 14mm (#20)
- (4) M6 Washers (#21)
- Hose Kit (#28)
- Supplemental Bracket Kit (#31)
- Zip Ties (#43)

PROCEDURE:

1. Drain the Radiator of Coolant or pinch the (2) two Coolant Crossover Lines on the front of the engine for a minimal mess. Ensure the coolant is not hot before proceeding.
2. With the Coolant drained, or the lines pinched, remove the rear hose on the Driver Side of the Engine, it will connect at the Throttle Body as well. Coolant will leak out so prepare to catch or clean it. Retain these Hose Clamps as they will be reused. *Figure 56.*

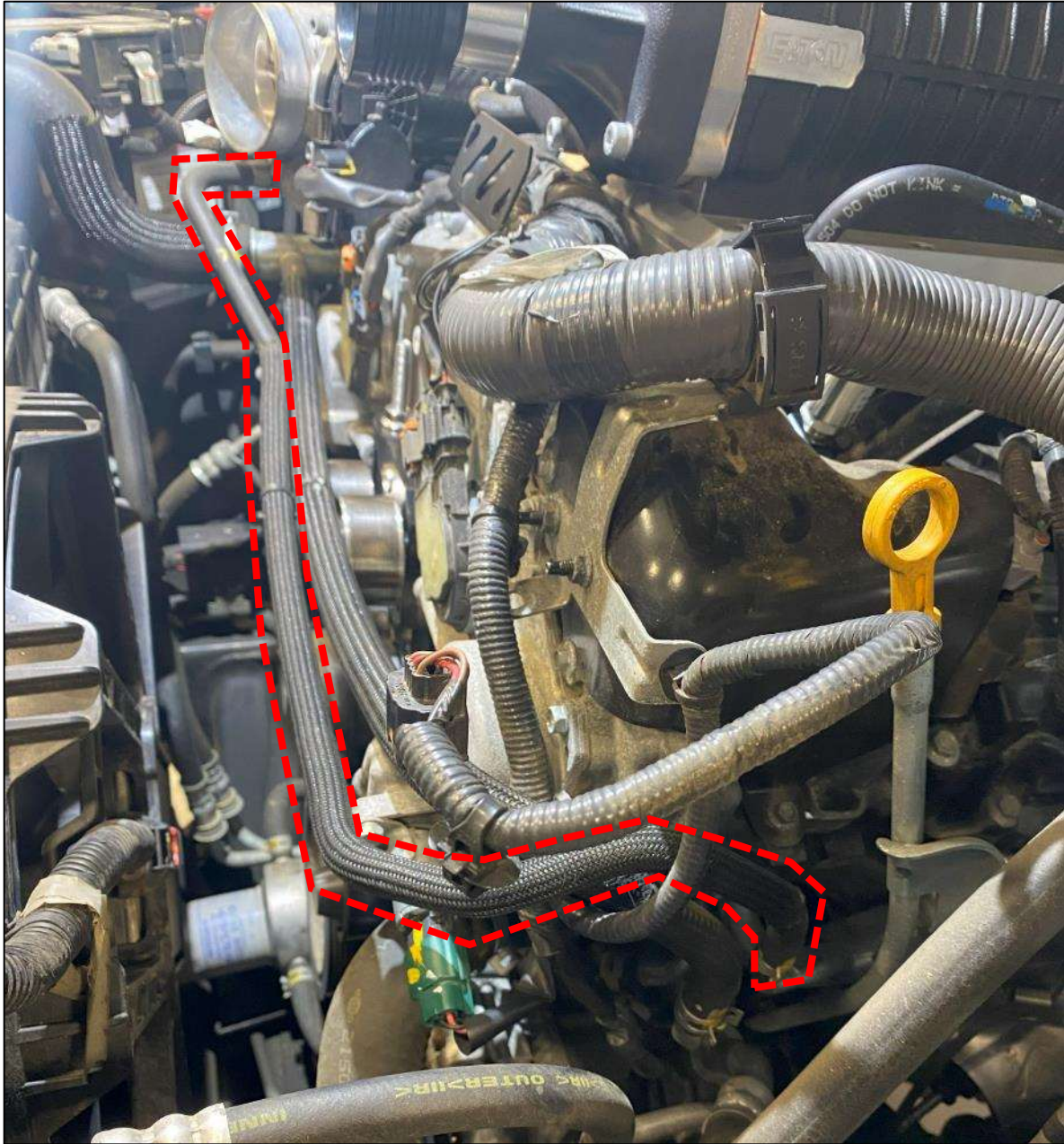


Figure 56

3. Locate the Throttle Body Heater Hose from the Hose kit, it will be the skinnier one. Using the Hose Clamps removed in *Step 2*, install the Hose on the Throttle Body and Coolant Pipe on the Driver Side of the Engine. *Figure 57.*

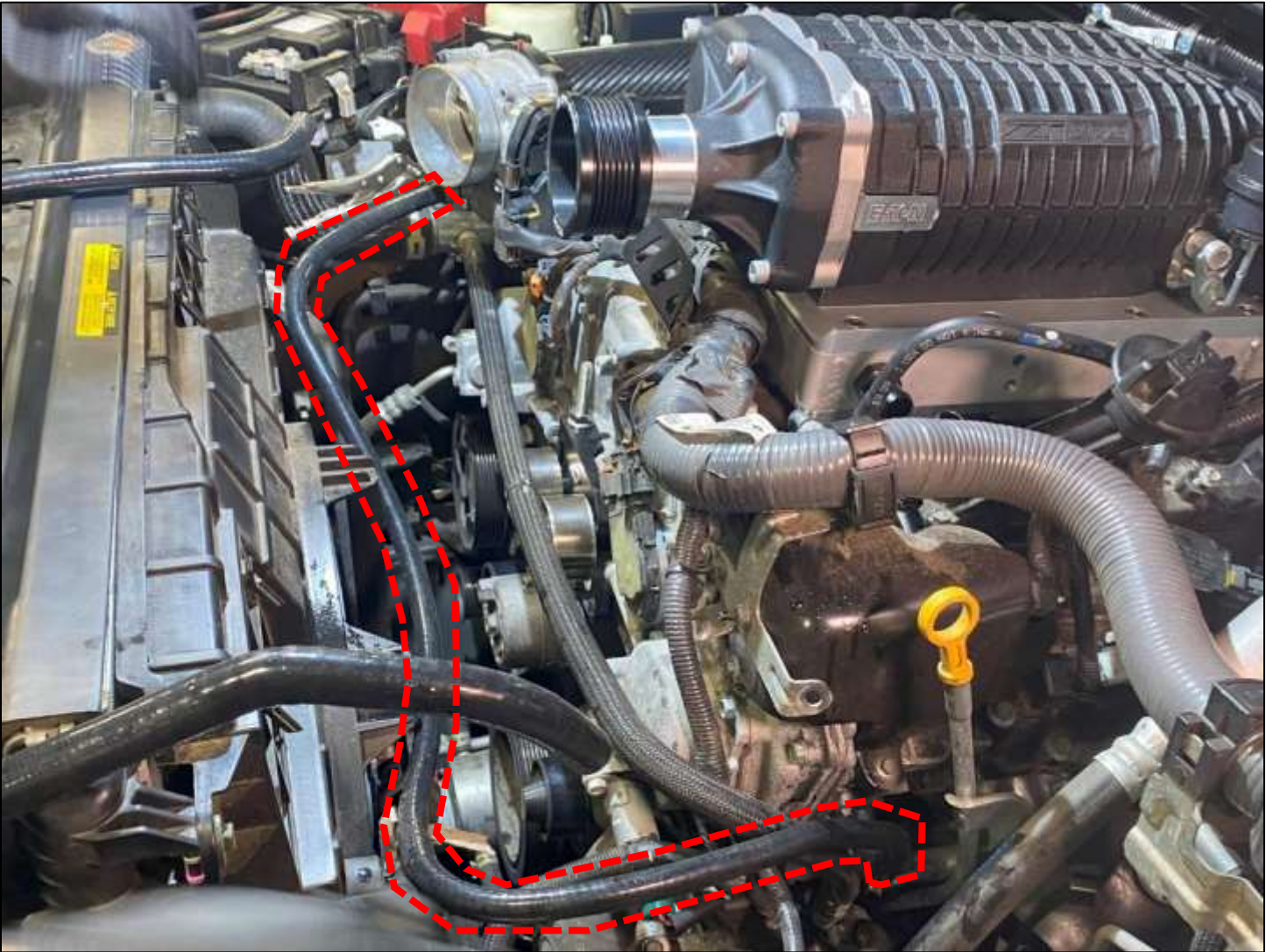


Figure 57

4. Remove the Front Hose on the Driver Side of the Engine and follow it to the Coolant Crossover on the Passenger Side of the Engine. Retain these Hose Clamps as they will be reused. *Figure 58.*

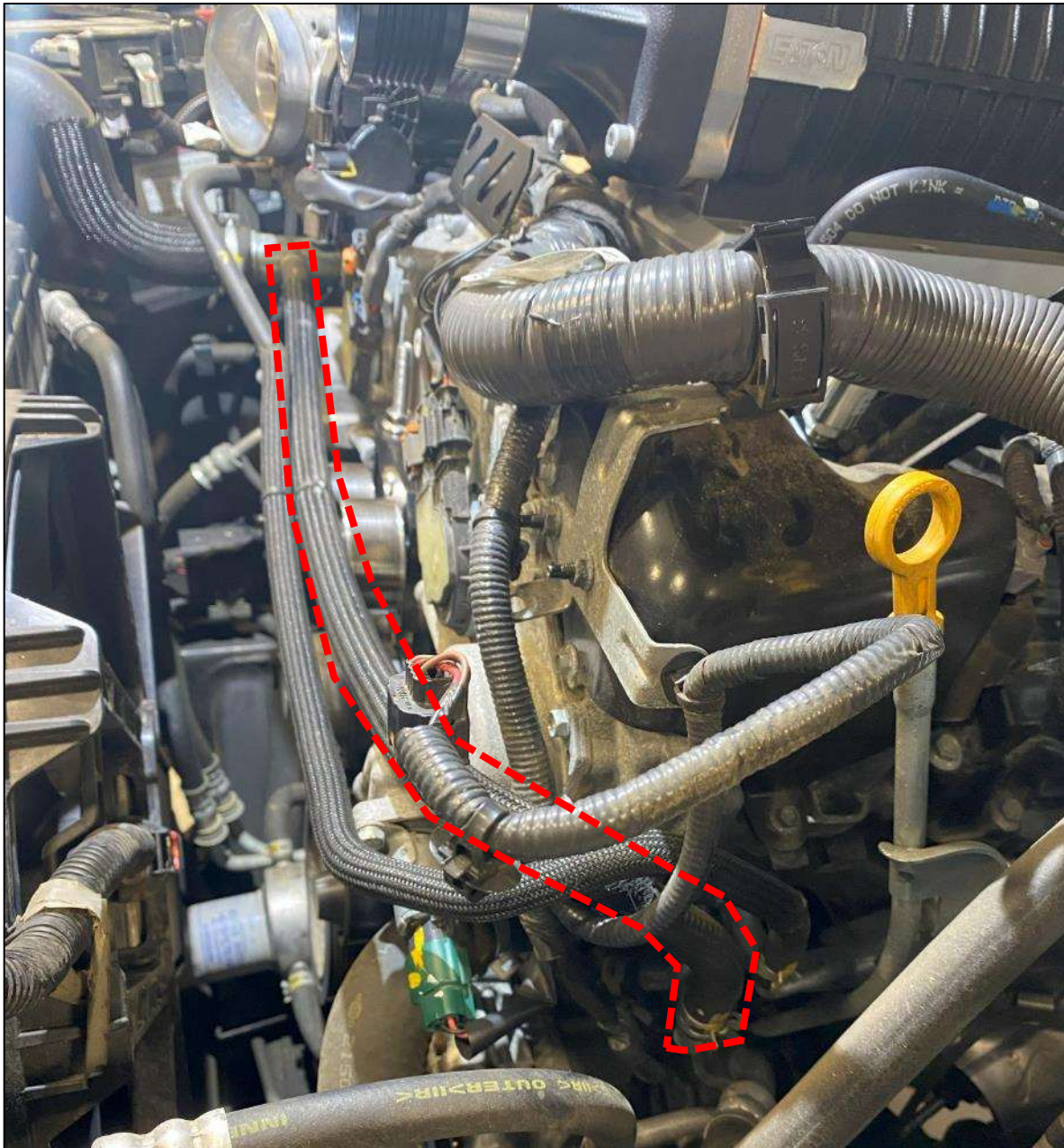


Figure 58

5. Locate the Engine Crossover Hose from the Hose Kit. Install it on the ports that the OE Hose was removed from in *Step 4* and secure with the OE Hose Clamps. *Figure 59*.

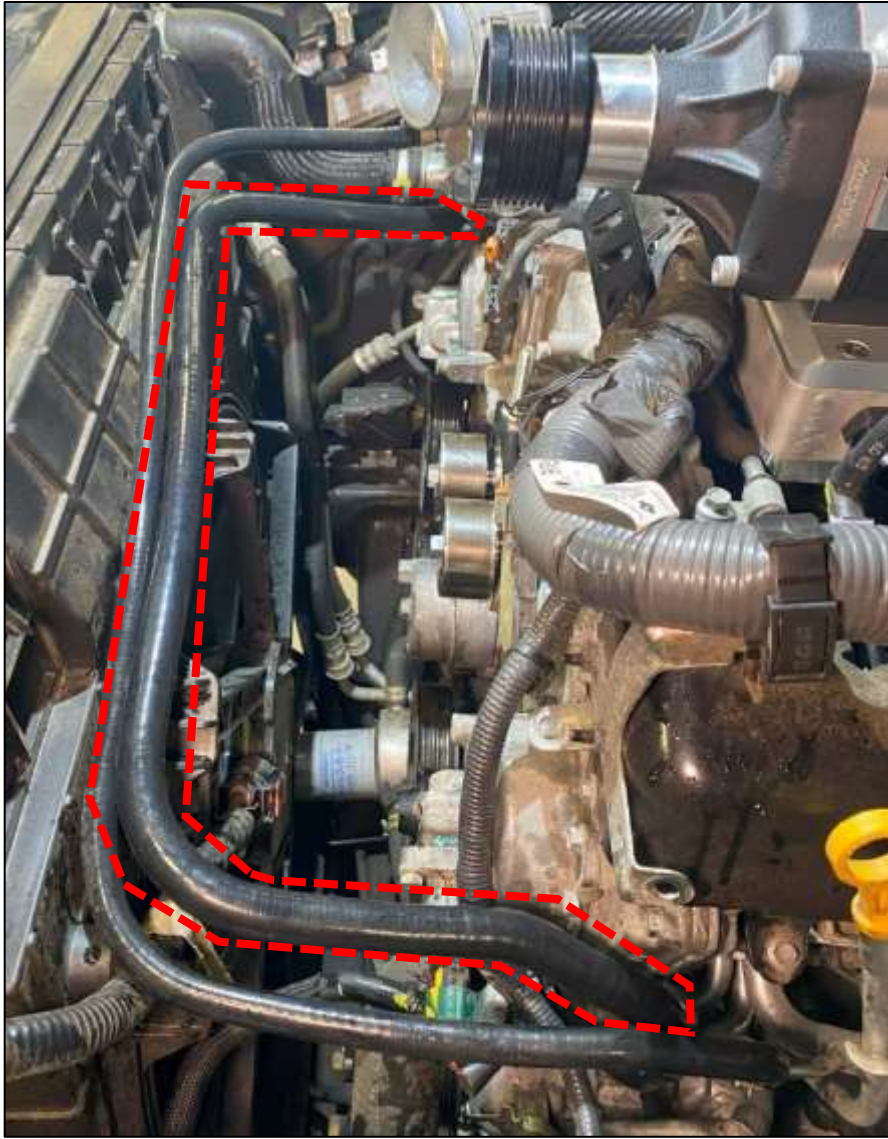


Figure 59

6. With a few Zip Ties, secure the Coolant Lines together, then secure them to the Radiator Fan Shroud. This will keep them out of the way of the Supercharger Drive Belt. Newer model D41 Frontiers will have a different Fan Shroud than the early model D41s. *Figure 60.*

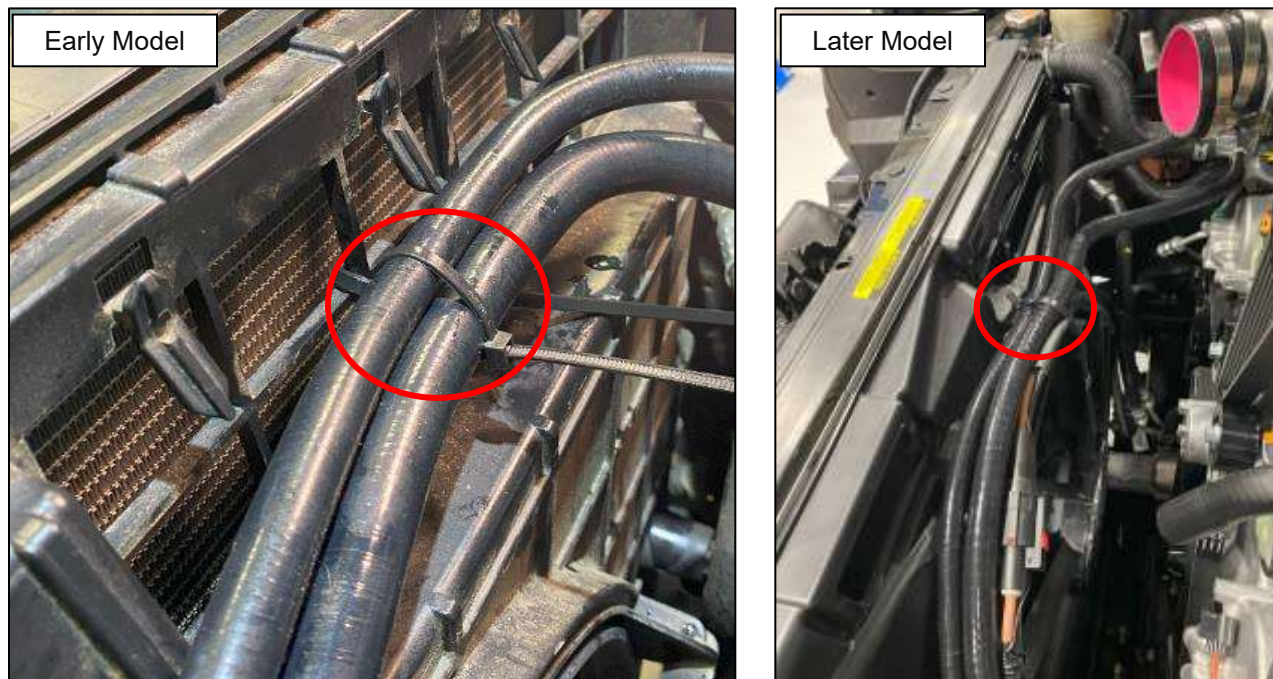


Figure 60

7. Remove the (1) one bolt securing the Power Steering Cooler to the Core Support. *Figure 61.*

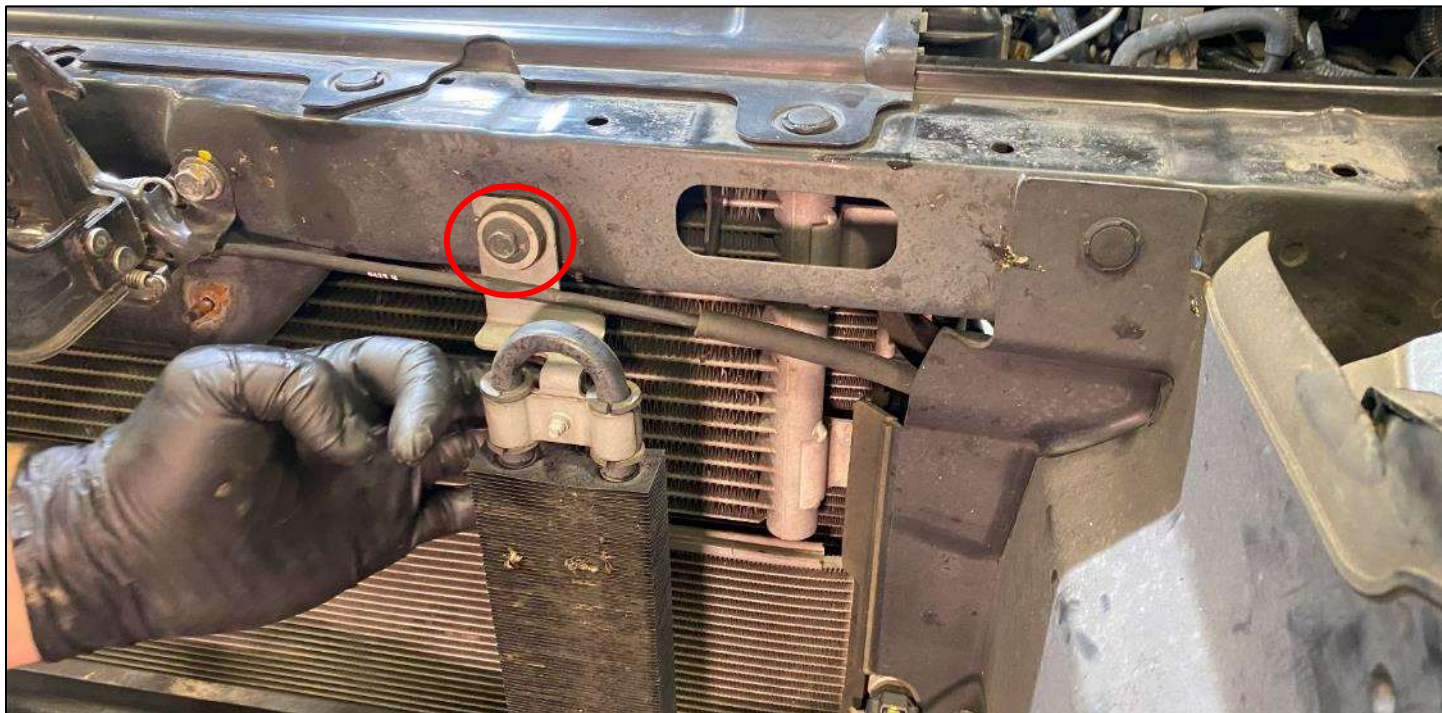


Figure 61

8. Locate the Heat Exchanger, both Heat Exchanger Brackets from the Bracket Kit, and (4) four M8 x 1.25 Flanged Hex Head Screws, 12mm. Position the Heat Exchanger Brackets on the Heat Exchanger as shown, and secure with the (4) four M8 Screws. *Figure 62.*



Figure 62

9. Position the Heat Exchanger in front of the Radiator and loosely secure it with the M6 x 1.0 Flanged Hex Screws, 25mm. The Power Steering Cooler will be positioned on top of the Bracket. Depending on your vehicle, there may be a threaded hole on the right of the Driver Side Bracket. If there is, install a Screw here to secure the Heat Exchanger. If there is not, you will need to drill a small hole in the Core Support and use the M6 x 1.0 Flanged Hex Head Screw with (1) one M6 Flanged Locknut on the Back of the Core Support. *Figure 63 and 64.*

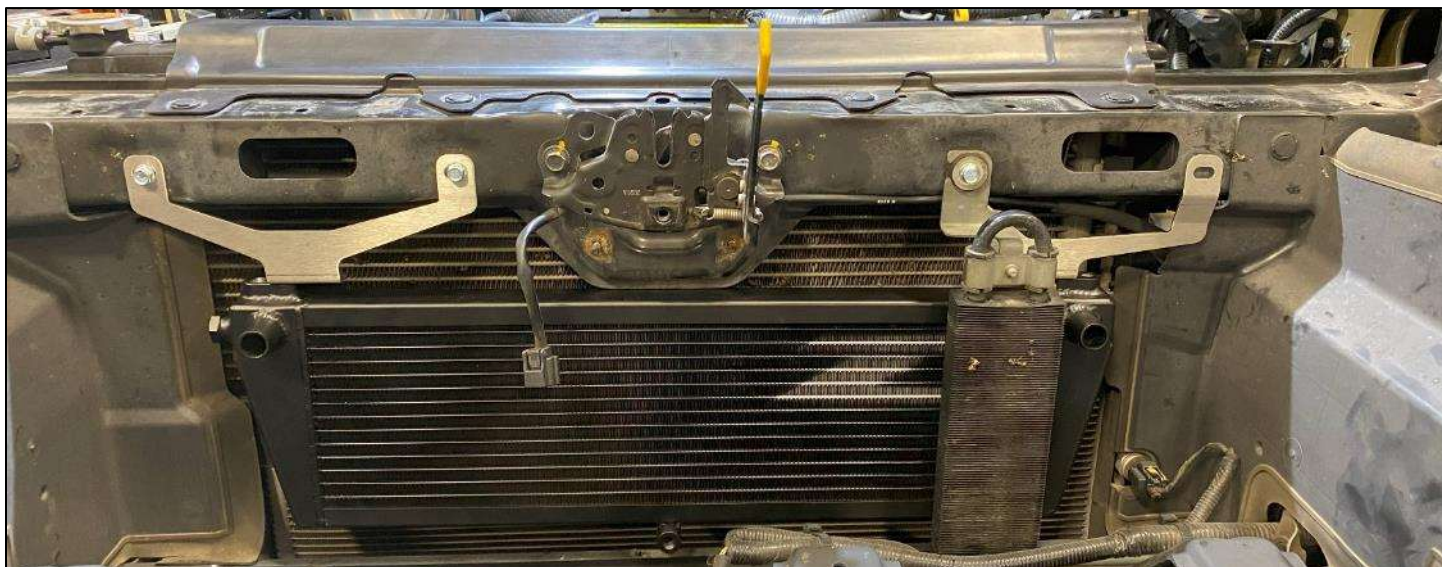


Figure 63

NOTE: If you need to drill into the Core Support, be careful not to drill too far into the Radiator or anything behind the Core Support.

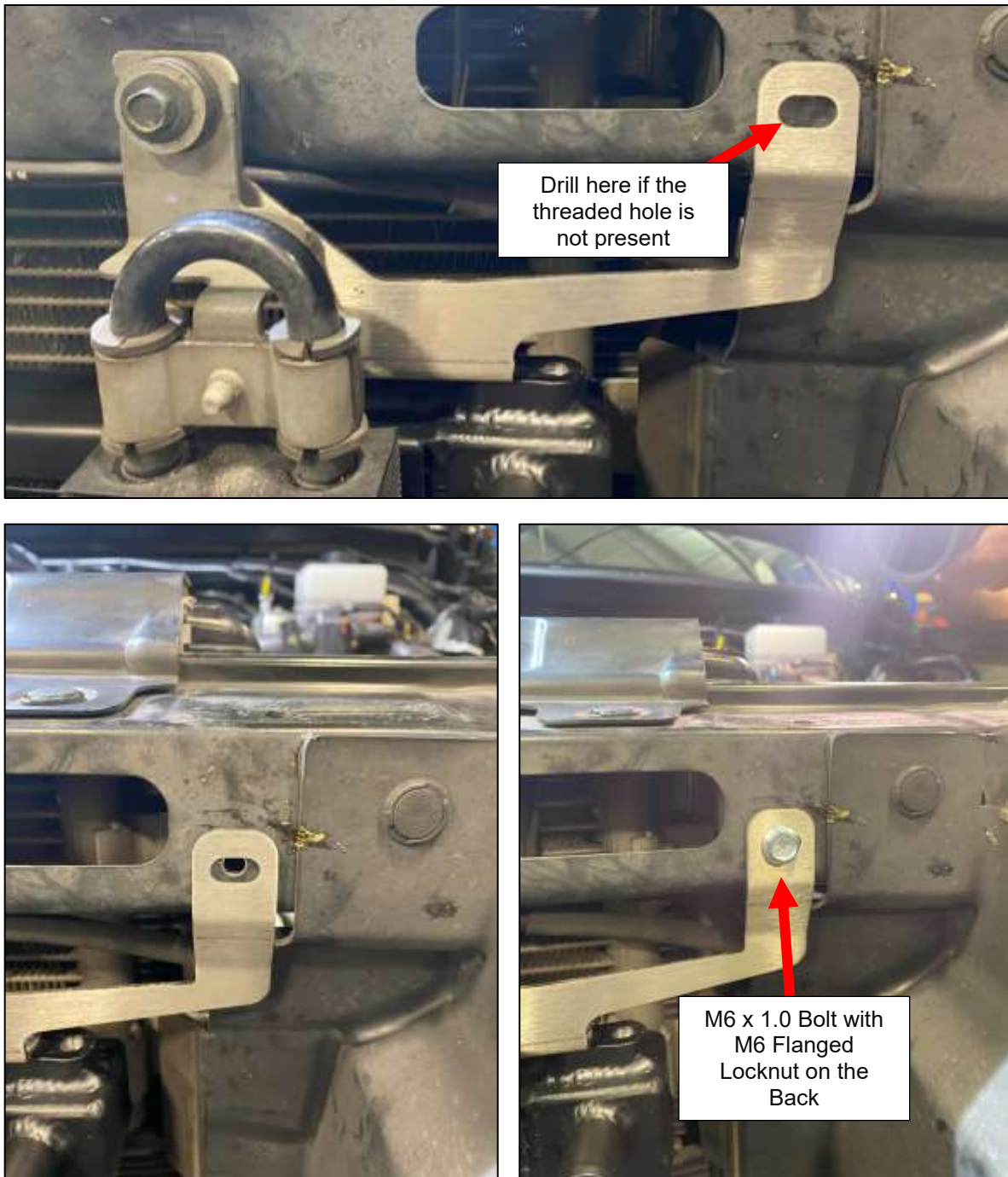


Figure 64

10. Locate the Coolant Pump Bracket, Coolant Pump Support from the Bracket Kit, and (2) two M6 x 1.0 Flat Head Screws, 14mm. Attach one half of the Coolant Pump Bracket to the Coolant Pump Support with the M6 Flat Head Screws as shown below. Use some of the supplied Loctite on the screws. *Figure 65.*

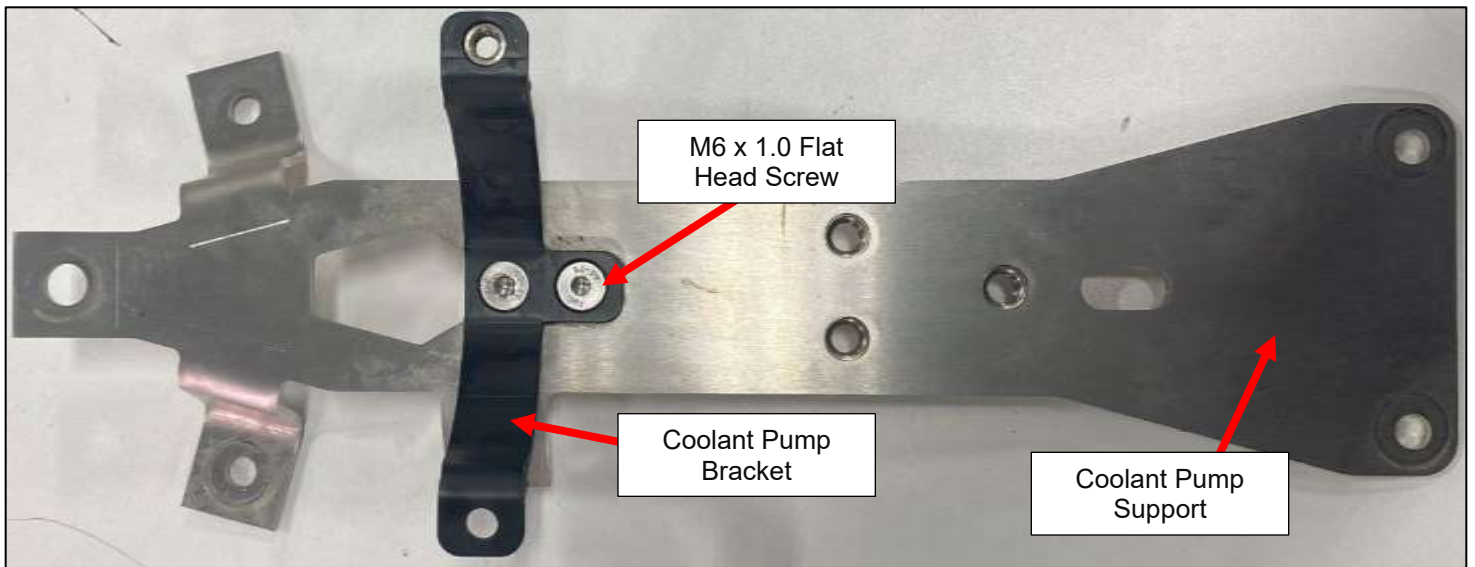


Figure 65

11. If your vehicle is equipped with the Active Shutters, locate the Shutter Bracket and (3) three M8 x 1.25 Flanged Hex Head Screws, 12mm. Install the Shutter Bracket onto the Coolant Pump Support with the (3) three M8 Screws. *Figure 66.*

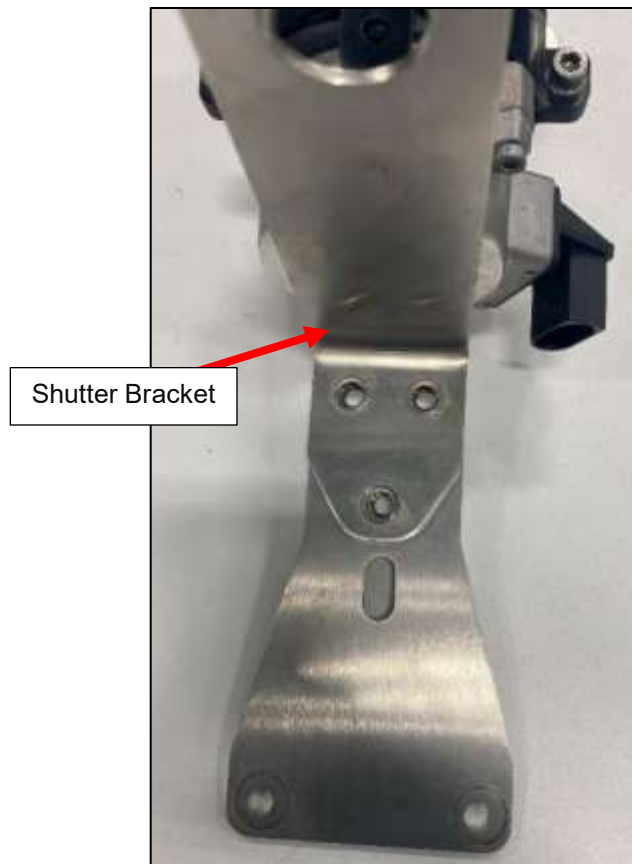


Figure 66

12. Locate the Coolant Pump, the other half of the Coolant Pump Bracket and (2) M6 x 1.0 Socket Head Screws, 14mm. Position the Coolant Pump into the Pump Bracket with the Port facing to the right and secure with the other half of the Coolant Pump Bracket and the (2) two M6 x 1.0 Socket Head Screws. Use some of the supplied Loctite on these bolts. *Figure 67.*



Figure 67

13. Position the Coolant Pump bracket Assembly in front of the Heat Exchanger and secure it with the hardware removed in *Step 7, Disassembly. Figure 68.*

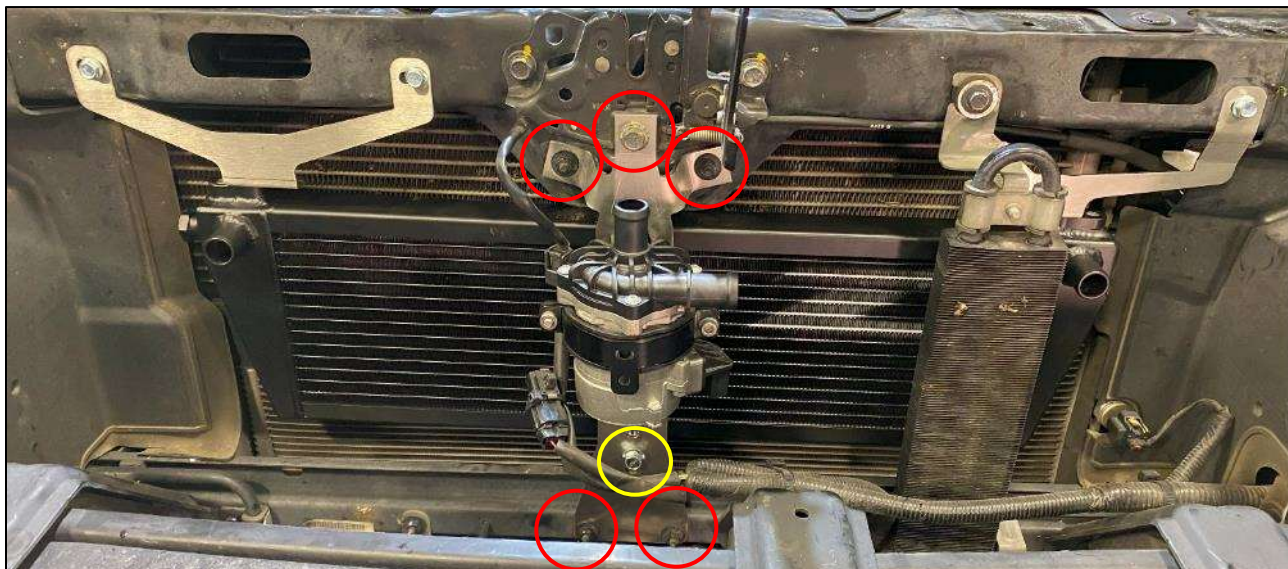


Figure 68

14. Locate (1) one M8 x 1.25 Flanged Hex Head Screw, 12mm. Secure the Coolant Pump Bracket to the Heat Exchanger with this bolt. Circled in yellow in *Figure 68* above.
15. Reconnect the Sensors disconnected in *Step 7, Disassembly* to the Coolant Pump Bracket. The Ambient Air Temperature Sensor can be zip-tied to the connector.
16. Locate the Coolant Pump to Heat Exchanger Hose and (2) two Hose Clamps. Install the Hose as shown below and secure with the Hose Clamps. *Figure 69*.

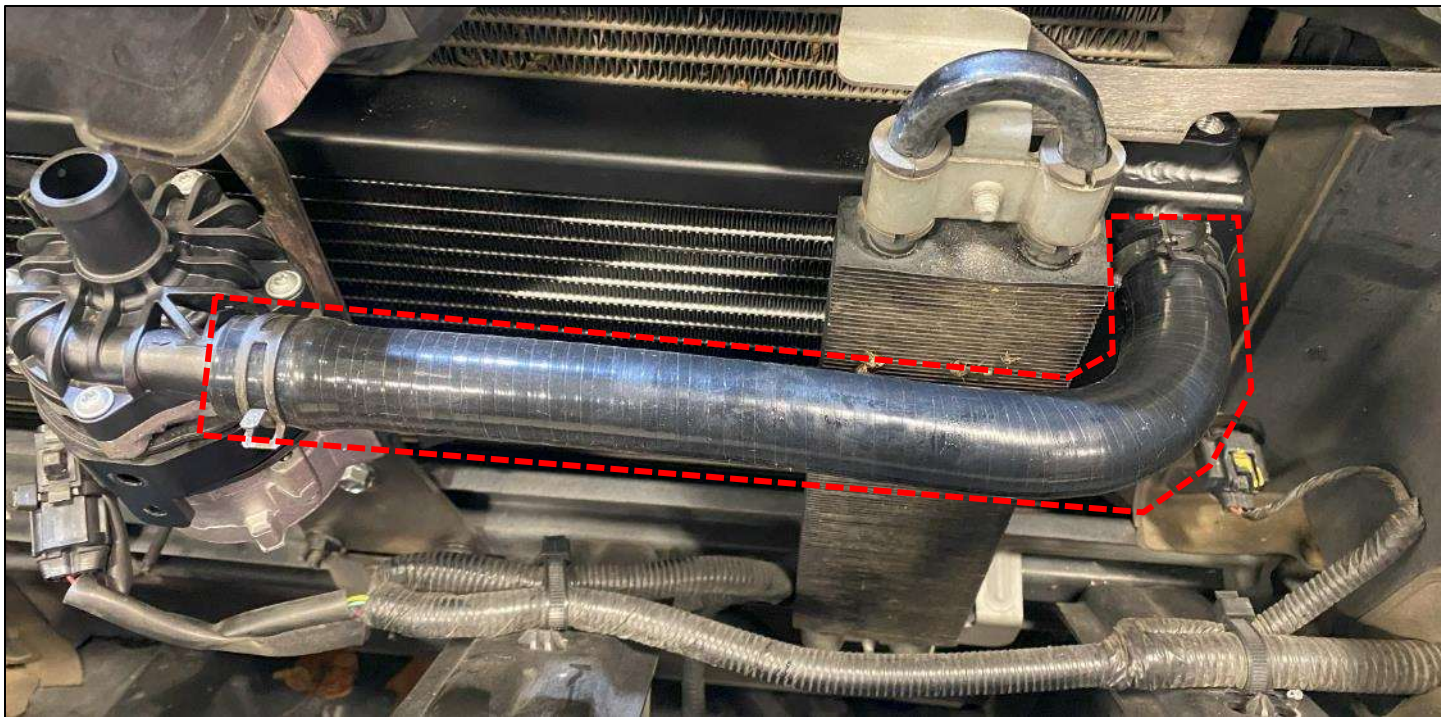


Figure 69

17. Trim the Driver Side Radiator Air Guide if you have not already done so. Refer to *Step 9, Disassembly* for instructions.

18. Locate the Heat Exchanger to Intercooler Hose and (2) two Hose Clamps. Attach the 90° end of the Hose to the Heat Exchanger and secure with a Hose Clamp. Run the rest of the Hose across the front of the engine and through the Core Support in the hole made in the Radiator Air Guide. The Hose will connect to the Front Port of the Intercooler, secure with a Hose Clamp. *Figure 70.*

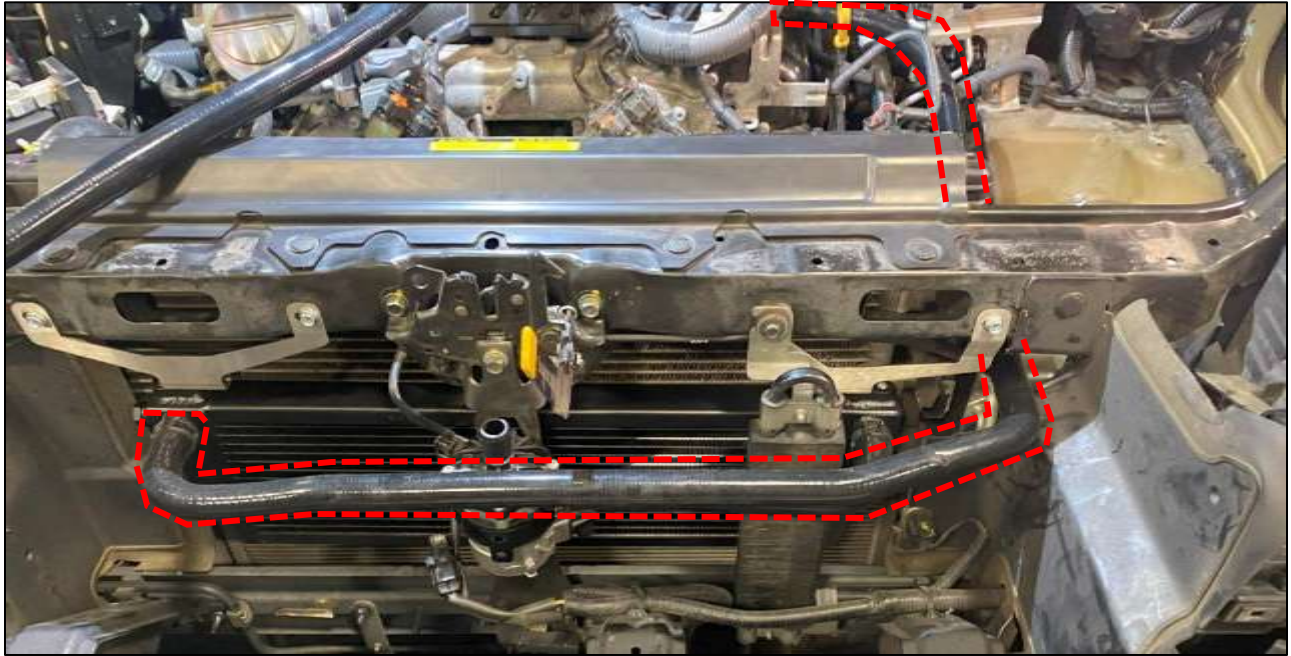


Figure 70

19. Locate the Coolant Reservoir to Coolant Pump Hose and (1) one Hose Clamp. Connect the end with the bend to the Top of the Coolant Pump and secure with the Hose Clamp. Route the rest of the hose similar to the Heat Exchanger to Intercooler Hose in *Step 18*. You will install the Coolant Reservoir in the upcoming steps. *Figure 71.*

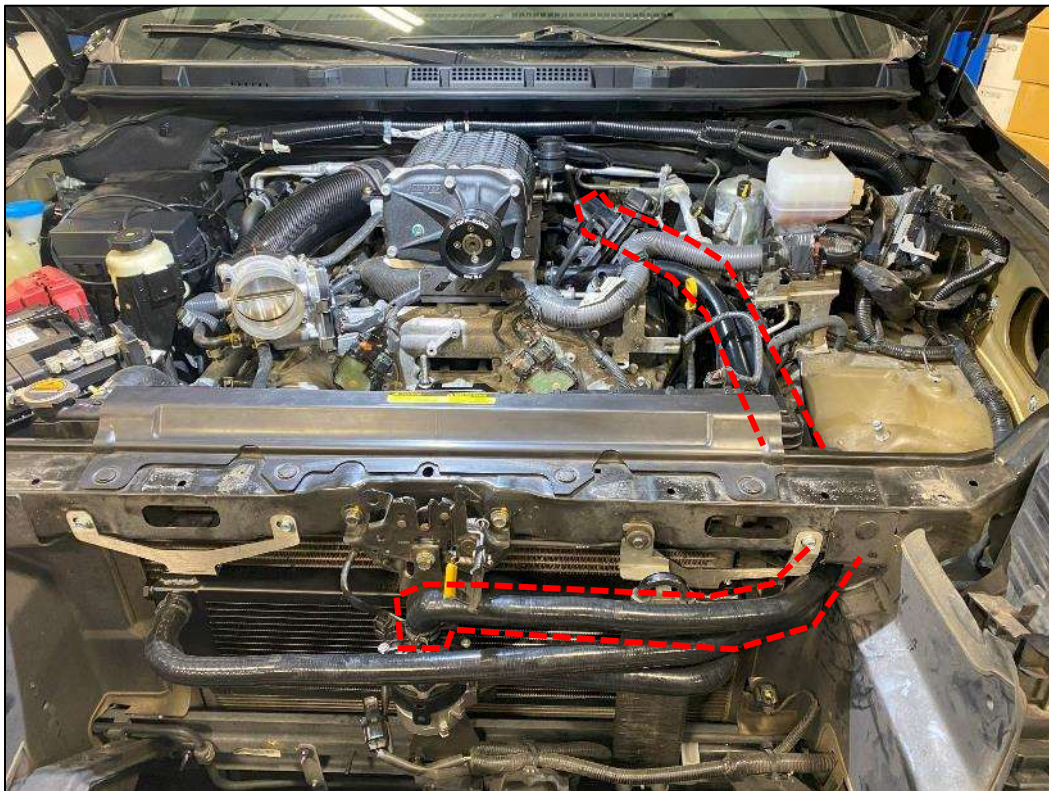


Figure 71

20. Locate the Coolant Reservoir, the Reservoir to Intercooler Hose and (2) two Hose Clamps. Attach the Hose to the left port of the Coolant Reservoir as shown, and secure with a Hose Clamp. Place the Second Hose Clamp on the hose as it will allow easier installation of the Reservoir. *Figure 72.*



Figure 72

21. Locate the Lower Coolant Reservoir Support, (2) two M6 x 1.0 Socket Head Screws, 14mm and (2) two M6 Washers. Secure the Lower Support to the bottom of the Coolant Reservoir with an M6 Screw and Washer. *Figure 73.*

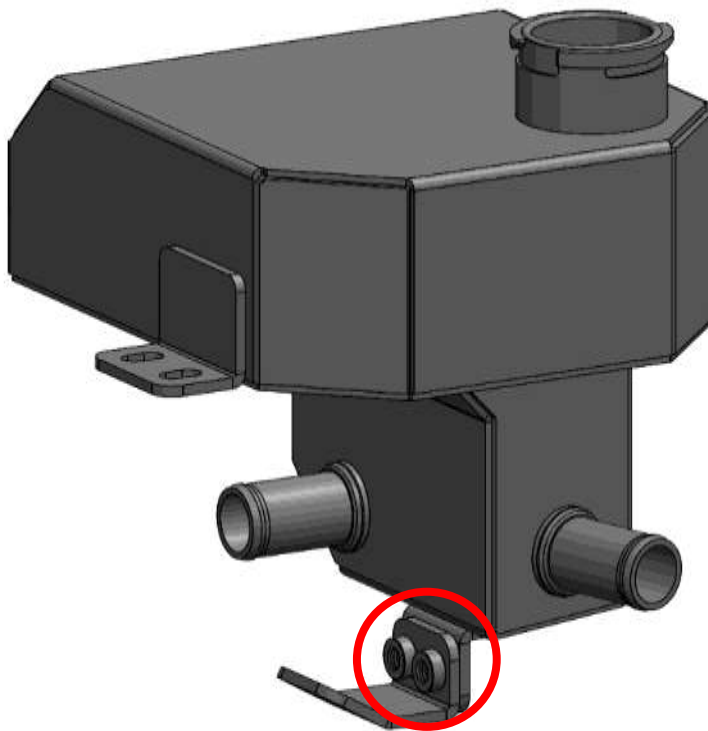


Figure 73

22. Locate the Upper Coolant Reservoir Support and (4) four M8 x 1.25 Socket Head Screws. Loosely install the (4) four M8 Socket Head Screws into the Driver Side of the Intercooler, but do not thread them all the way. Place the Bracket Slots over the bolts and then tighten the bolts to secure the Bracket. *Figure 74.*



Figure 74

23. Position the Coolant Reservoir into the Engine Bay connect the Reservoir to Intercooler Hose to the Intercooler and secure with the Hose Clamp installed on the Hose. Use the OEM Bolt that held the Bracket to the Valve Cover (removed in *Step 19, Disassembly*) to secure the Lower Foot of the Coolant Reservoir. *Figure 75.*
24. Locate (2) two M6 x 1.0 Flanged Bolts, 14mm and (2) two M6 Washers. Place a Washer on each Screw and secure the top of the Coolant Reservoir to the Reservoir Bracket on the Intercooler. *Figure 75.*

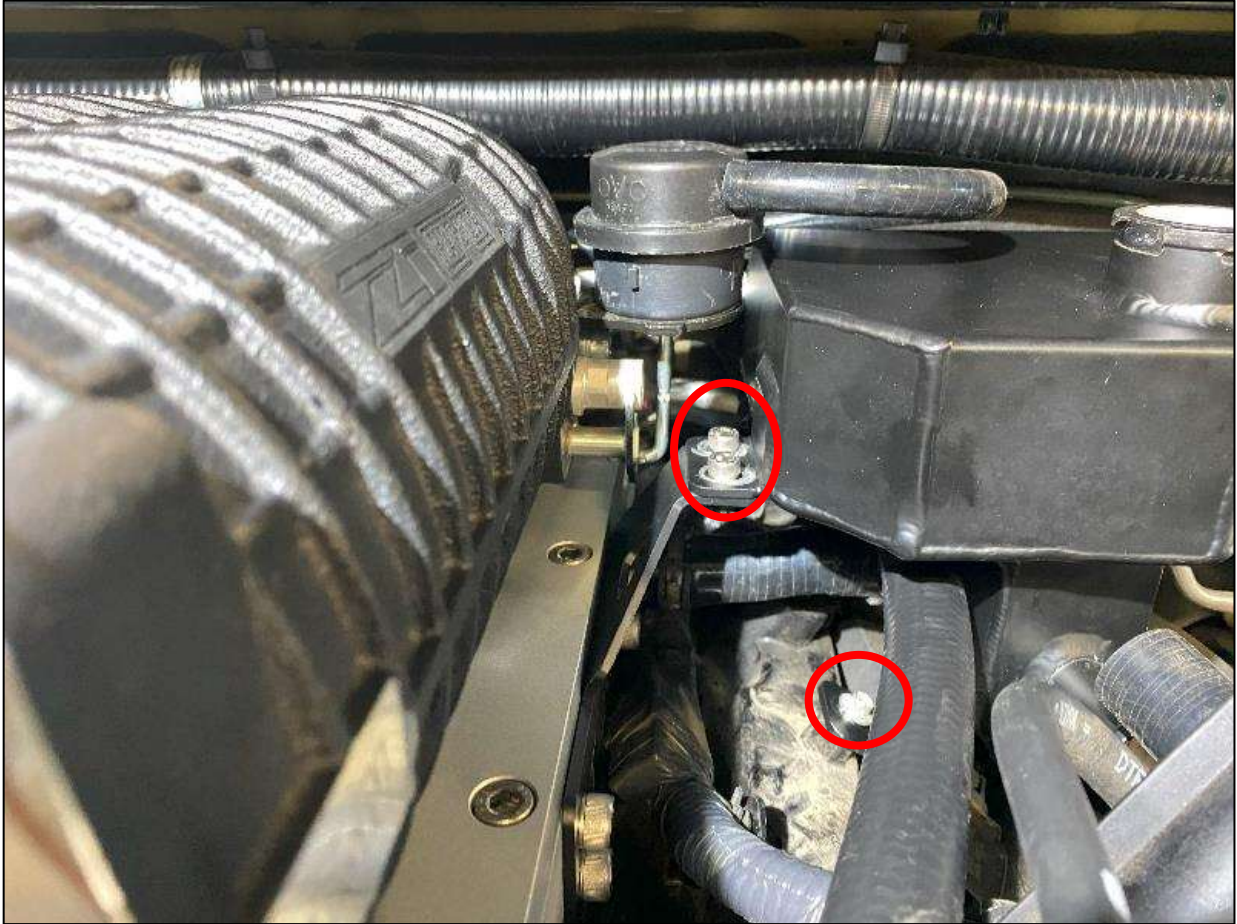


Figure 75

25. Place the Z1 Radiator Cap on the Coolant Reservoir.

26. Connect the Coolant Reservoir to Coolant Pump Hose to the open port of the Coolant Reservoir and Secure with a Hose Clamp. *Figure 76.*



Figure 76

27. Use the remaining Zip Ties to secure and position the Coolant Hoses out of the way of sharp edges and the Supercharger System.

SUPERCHARGER BELT

TOOLS REQUIRED:

- Ratchet
- Ratchet Extension(s)
- Assorted Metric Sockets
- Assorted Metric Wrenches
- Allen/Hex Keys
- Torque Wrench

PARTS REQUIRED:

- Supercharger 7-Rib Drive Belt (#61)

PROCEDURE:

1. Place the Supercharger Driver Pulley on the snout of the Supercharger and secure with the (4) four M6 x 1.0 Socket Head Screws if you have not done so already.
2. Route the Drive Belt similar to the OEM Path but go up in between the (2) two idler pulleys and around the Supercharger Drive Pulley. Place the belt on the lip of the Supercharger Pulley for now. *Figure 77 and 78.*

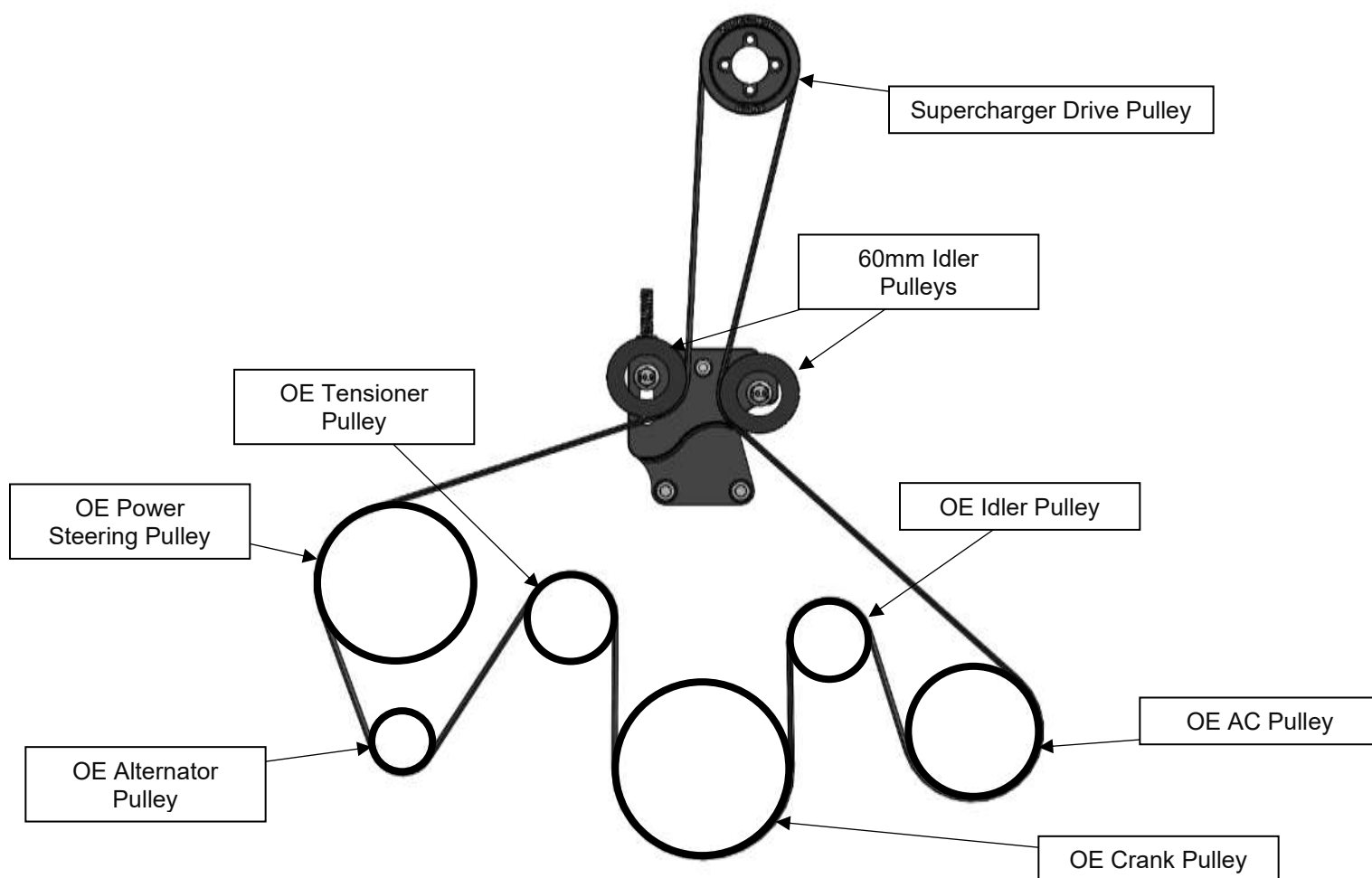


Figure 77



Figure 78

3. Torque the Right Idler Pulley to **21 ft-lbs.**
4. Adjust the Left Idler Pulley to take out most of the slack from the Drive Belt. Once adjusted, torque to **21 ft-lbs.**
5. Adjust the Threaded Rod in the Idler Pulley Bracket until it is tight against the Idler Pulley Nut.
6. Tighten the Jam Nut and Threaded Rod to secure the Pulley in place.

7. Slip the Drive Belt on over the Supercharger Drive Pulley. *Figure 79.*



Figure 79

8. Using a long ratchet, loosen the OE Belt Tensioner to remove the pin inserted to lock it in place, and allow the Tensioner to tighten the belt.
9. Torque the (4) four Supercharger Drive Pulley bolts to **14 ft-lbs.**
10. Check for belt contact with any Wiring Harnesses or Hoses. Move them as necessary.

COOLANT PUMP CONTROLLER

TOOLS REQUIRED:

- Ratchet
- Ratchet Extension(s)
- Assorted Metric Sockets
- Assorted Metric Wrenches
- Allen/Hex Keys
- Torque Wrench
- Thread Sealant

PARTS REQUIRED:

- Coolant Pump Controller Kit (#6)
- (1) M6 x 1.0 Flanged Hex Head Screw, 25mm (#9)
- (1) M6 x 1.0 Flanged Locknut (#11)
- Coolant Pump Controller Bracket (#16)
- Coolant Temperature Sensor (#17)
- Coolant (#63)
- Water Wetter (optional) (#64)

PROCEDURE:

1. Locate the Coolant Pump Controller Kit and the Coolant Pump Controller Bracket. Attach the Bracket to the Coolant Pump Controller with the included hardware. *Figure 80.*



Figure 80

2. Remove the (1) one Plastic Clip on the Passenger Side Headlight. *Figure 81.*



Figure 81

3. Locate (1) one M6 x 1.0 Flanged Hex Head Screw, 25mm, and (1) one M6 x 1.0 Flanged Locknut. Secure the Coolant Pump Bracket to the Body of the vehicle with the hardware in the spot where the Plastic Clip was removed in *Step 2*. *Figure 82.*



Figure 82

4. Locate the Coolant Temperature Sensor. Apply a light coat of Thread Sealant onto the Temperature Sensor and install it into the Passenger Side of the Heat Exchanger. A small plug will need to be removed in the Heat Exchanger. *Figure 83.*

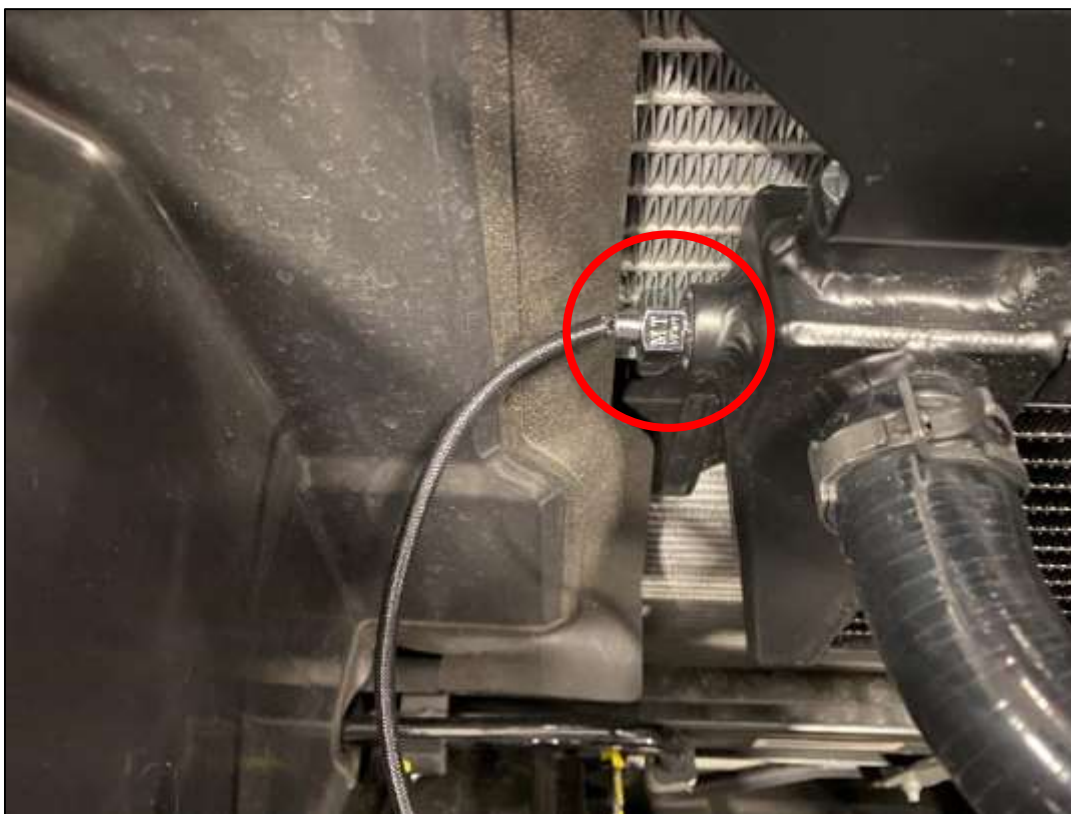


Figure 83

5. Locate the Coolant Pump Controller Wiring Harness. Connect the Wiring Harness to the Coolant Pump Controller and run the other (2) two connectors through the Core Support and under the Passenger Side Radiator Guide towards the Coolant Pump and Heat Exchanger. Connect (1) one end to the Coolant Pump, and the other to the Coolant Temperature Sensor installed in *Step 4*. *Figure 84*.

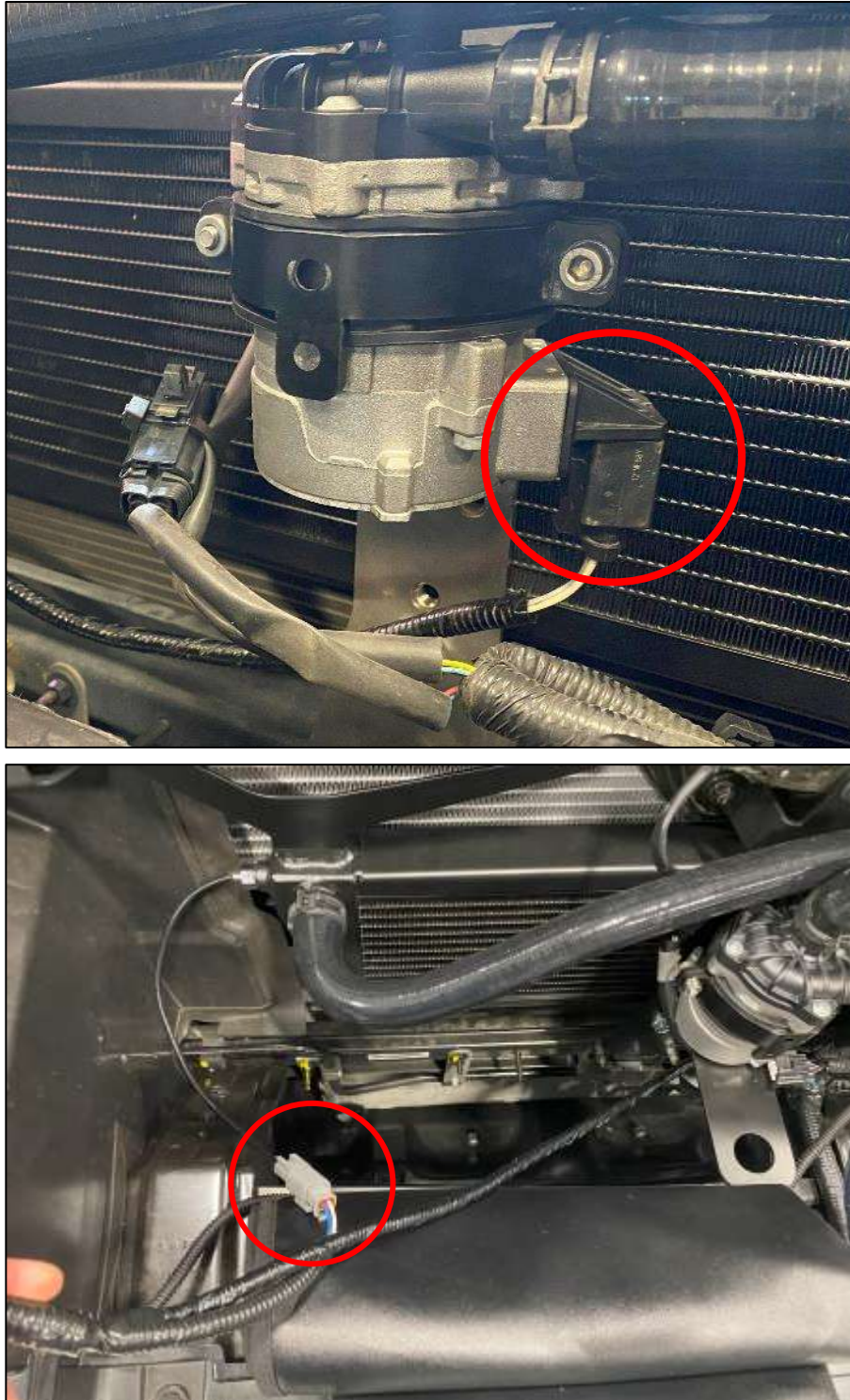


Figure 84

6. Connect the Red Wire from the Coolant Pump Controller to a terminal on the (+) **POSITIVE** terminal of the Battery. *Figure 85.*



Figure 85

7. Connect the Ground Wire to a ground anywhere in the Engine Bay, we used the spot shown below behind the Battery. *Figure 86.*



Figure 86

8. Run the Add a Circuit Wire and Ground to the Fuse Box and notch the Fuse Box to fit the Wire through without being pinched.
9. Decide on a Fuse to tap into. The Fuse should be something that turns on with the Key in the ON position, we used the ABS Module Fuse. Refer to your Owner's Manual for a Fuse Diagram. Remove the Fuse and add it to the Add-a-Circuit, then install the Add-a-Circuit to the Fuse Box. *Figure 87.*

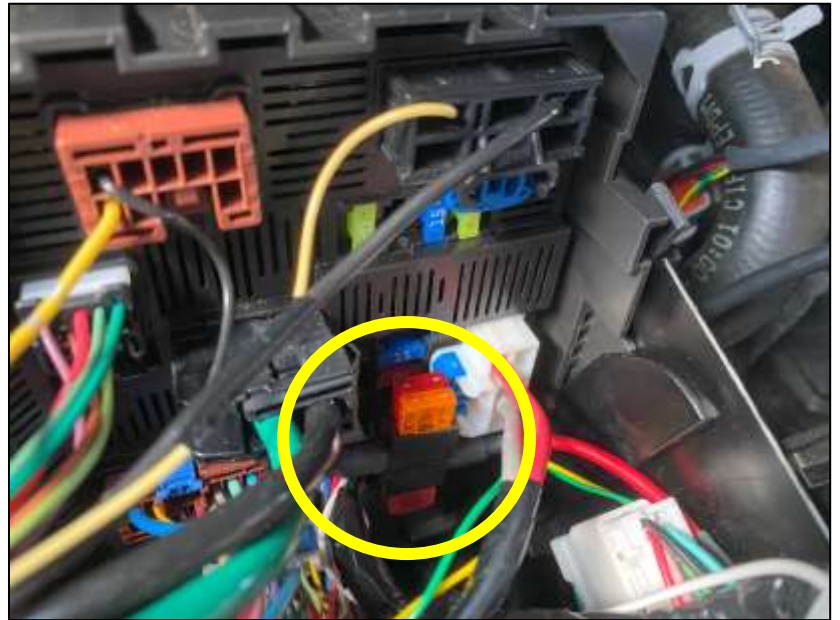


Figure 87

10. Fill the Supercharger Coolant Reservoir with Water Wetter and Coolant/Distilled Water until the Supercharger Coolant Reservoir is almost full. While filling, check the system for any leaks. Turn the Ignition to the ON Position (DO NOT start the Engine) to verify Coolant Pump Function. Run the Pump for a few minutes with the cap off to bleed system. Squeeze the hoses to purge any air bubbles from the system.

You should be able to squeeze the Inlet Hose at the Pump and feel the Coolant flowing through. If you do not feel the Coolant flowing, unbolt the Coolant Pump and turn it upside down. This will purge any bubbles that have gotten stuck and allow the Coolant Pump to properly flow.

11. Top off the Coolant System with fluid if necessary and replace the Radiator Cap if necessary.
12. Refill the Engine Coolant Reservoir to the specified amount since some fluid was drained during the Coolant Hose Swap. The Engine Coolant System will also need to be bled once the Engine is started upon complete installation. Refer to you Factory Service Manual for the proper procedure.

AIR INTAKE

TOOLS REQUIRED:

- Ratchet
- Ratchet Extension(s)
- Assorted Metric Sockets
- Assorted Metric Wrenches
- Allen/Hex Keys
- Torque Wrench

PARTS REQUIRED:

- (1) Worm Gear Hose Clamp (#26)
- Frontier Intake Kit (#65)

PROCEDURE:

28. Refer to the [D41 Frontier Intake Installation Manual](#) on how to install the Z1 Airbox into the Vehicle.
29. Locate the Throttle Body Coupler and (1) one Worm Gear Hose Clamp. Place the Smaller end on the Throttle Body and secure with the Clamp.
30. Transfer the MAF from the OE Intake Tube into the new Carbon Intake Tube and secure with the OE Hardware. Make sure the MAF is in the correct orientation with the → facing the direction of air flow. Use the MAF Gasket and Flange included with the Intake Kit. *Figure 88.*



Figure 88

31. Install the Filter and Clamp from the Intake Kit onto the Carbon Tube. *Figure 89.*



Figure 89

32. Install the Carbon Air Filter Tube into the Airbox and onto the Throttle Body. Secure with Hose Clamps included in the Intake Kit. *Figure 90.*



Figure 90

33. Connect the PCV Hose from the Driver Side Valve Cover to the Port on the Intake Tube, circled above in *Figure 90*. Secure with a Hose Clamp in the Air Intake Kit.
34. Connect the IAT Adapter Harness to the MAF Sensor in the Intake Tube.
35. Contact your Tuner and flash a startup tune onto your vehicle.
36. Start the Vehicle. While running, check for any leaks, contact with the Belt Drive system, make sure that the Supercharger Coolant Pump is running and bleed the Engine Coolant system/refill as necessary.
37. Reinstall the Grille and Top Cover of the Radiator, and Active Shutters if applicable.

END

Additional Technical Support:

Contact Z1 Off-Road at info@z1offroad.com
Or call 678-839-8019 between 9am and 6pm ET