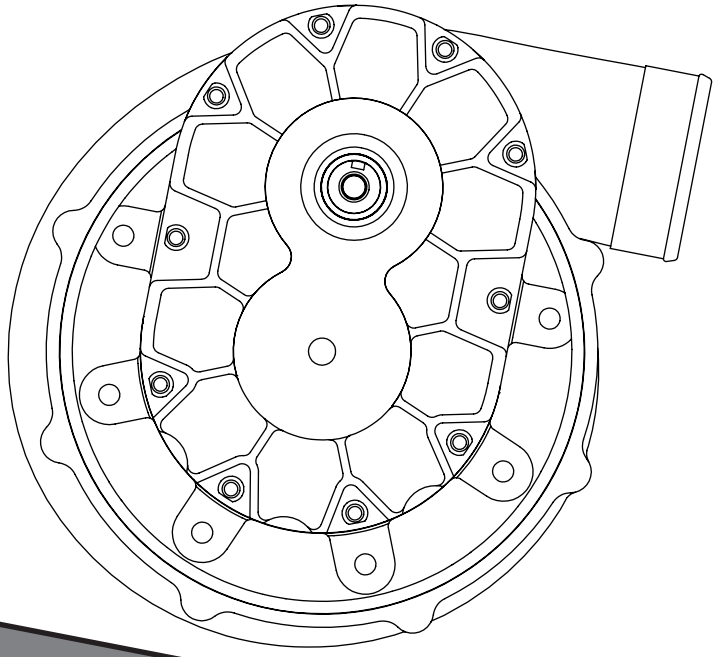
FORD F-150 5.0L

Supercharger System Installation Instructions

2018-2020 Model Year



VORTECH®

ENGINEERING, INC

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P/N: 4FV020-020 - v1.0, 01/16/2024

FOREWORD

This manual provides information on the installation, maintenance and service of the Vortech supercharger kit expressly designed for this vehicle. All information, illustrations and specifications contained herein are based on the latest product information available at the time of this publication. Changes to the manual may be made at any time without notice. Contact Vortech Engineering for any additional information regarding this kit and any of these modifications at (805) 247-0226 7:00am-3:30pm PST.

Take note of the following before proceeding:

1. Proper installation of this supercharger kit requires general automotive mechanic knowledge and experience. Please browse through each step of this instruction manual prior to beginning the installation to determine if you should refer the job to a professional installer/technician. Please contact your dealer or Vortech Engineering for possible installers in your area.
2. This product was designed for use on stock (unmodified, OEM) vehicles. The PCM (computer), engine, transmission, drive axle ratios and tire O.D. must be stock. If the vehicle or engine has been modified in any way, check with Vortech prior to installation and use of this product.
3. Use only premium grade fuel with a minimum of 91 octane (*R+M/2*).
4. Always listen for any sign of detonation (*knocking/pinging*) and discontinue hard use (*no boost*) until problem is resolved.
5. Vortech is not responsible for any clutch, transmission, driveline or engine damage.

Exclusions from Vortech warranty coverage considerations include, but not limited to:

1. Neglect, abuse, lack of maintenance, abnormal operation or improper installation.
2. Continued operation with an impaired vehicle or sub-system.
3. The combined use of Vortech components with other modifications such as, but not limited to, exhaust headers, aftermarket camshafts, nitrous oxide, third party PCM programming or other such changes.

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NOTICE

Before beginning this installation, please read through this entire instruction booklet and the Street Supercharger System Owner's Manual which includes the Limited Warranty Program, the Warranty Registration form, and return envelope.

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2018-2020 FORD F-150 5.0L

Installation Instructions

Vortech supercharger systems are performance improving devices. In most cases, increases in torque of 30-35% and horsepower between 35-45% can be expected with the boost levels specified by Vortech Engineering. This product is intended for use on healthy, well maintained engines. Installation on a worn-out or damaged engine is not recommended and may result in failure of the engine as well as the supercharger. Vortech Engineering is not responsible for engine damage.

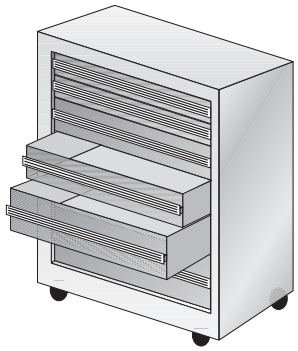
Installation on new vehicles will not harm or adversely affect the break-in period so long as factory break-in procedures are followed.

For best performance and continued durability, please take note of the following key points:

1. Use only premium grade fuel 91 octane or higher (R+M/2).
2. The engine must have stock compression ratio.
3. If the engine has been modified in any way, check with Vortech prior to using this product.
4. Always listen for any sign of detonation (pinging) and discontinue hard use (no boost) until problem is resolved.
5. Before beginning installation, replace all spark plugs that are older than 1-year or 15,000 miles with original heat range plugs as specified by the manufacturer and reset timing to factory specifications (follow the procedures indicated within the factory repair manual and/or as indicated on the factory under hood emissions tag). Do not use platinum spark plugs unless they are original equipment. Change spark plugs every 15,000 miles.
6. **Oil-Fed Units Only:** Perform an oil and filter change upon completion of this installation and prior to test driving your vehicle. Thereafter, always use a high-grade SF rated engine oil or a high quality synthetic and change the oil and filter every 3,000 miles. Never attempt to extend the oil change interval beyond 3,000 miles, regardless of oil manufacturer's claims as potential damage to the supercharger may result.

Tool and supply requirements:

- 3/8" ratchet and socket set: SAE and metric
- 3/8" ratchet extensions
- 1/2" ratchet or breaker bar and socket set: SAE
- IN-LB and FT-LB torque wrenches
- Combination wrench set: SAE and metric
- Panel remover set
- Hose cutters
- Utility knife
- Angle Grinder
- Reciprocating saw
- Hex keys: SAE
- T15 Torx Bit
- Center punch, 1/8", 11/64" and 1/4" drill bits
- Power Drill
- Heat Gun
- Needle nose pliers
- Stepless / Ear Clamp Crimpers
- Medium Strength **(**Blue) threadlocker
- Pipe thread sealant
- Ramps or lift
- Clean coolant container



If it has been one year or 15,000 miles or more since your vehicle's last spark plug change, then you will also need:

- Spark plug socket
- New spark plugs

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2018-2020 FORD F-150 5.0L PARTS LIST

Complete Kits 4FV218-030L / 034L / 038L

Tuner Kits 4FV218-310L / 314L / 318L

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IMPORTANT: Before beginning installation, verify that all parts are included in the kit. Report any shortages or damaged parts immediately.

PART NO.	DESCRIPTION	QTY.
008110	**SMALL SILVER DIE CUT DECAL**	**2**
008130	**LICENSE PLATE FRAME, VORTECH**	**1**
008447	**1 YR S/C STRT INFO PKG VORT**	**1**
009035	**S/C LUBE, BOTTLED, 3-PACK**	**1**
2A046-790	**BELT, GATES K060790**	**1**
2F329-260/264/268	**S/C, V-3 SI CCW, 2018-2020 F150 5.0L SAT, BLK, POL 45**	**1**
4FV020-020	**INSTR MAN, 2018-2020 FORD TRUCK**	**1**
4FV110-054	**MTNG BRKT ASSY, 2018-20 FORD TRUCK, 5.0**	**1**
1210517	ASY, IDLER PLY, SMOOTH 6RIB	2
2A017-700-105	STANDOFF, .260" ID, .700" OD, 1.053" L	2
2A017-875-445	STANDOFF, .354" ID, .875" OD, 4.456" L, NECK DOWN 0.75"	1
2A017-880-398	STANDOFF, .397" ID, .880" OD, 3.976" L	2
4FV010-070	S/C BASE PLATE FRNT, 2018 FORD TRK, 5.0	1
4FV010-080	S/C BASE PLATE REAR, 2018 FORD TRK, 5.0	1
4FV010-090	MOUNT, BASE, 2018 FORD F150 5.0	1
4FV017-980-119	BEARING SUPPORT, 17 MM, IDLER PULLEY, .433" ID X 1.197" L	1
4FV017-980-188	BEARING SUPPORT, 17 MM, IDLER PULLEY, .531" ID X 1.875" L	1
4FV017-980-189	BEARING SUPPORT, 17 MM, IDLER PULLEY, .433" ID X .100" L	1
4GA017-002	BEARING SUPPORT, 17 MM, IDLER PULLEY, .500" ID X .100" L	1
7A375-138	3/8-16 X 2 HXHD	5
7A375-500	3/8-16 X 5" HX HD GRADE 8	1
7A375-575	3/8-16 X 5.75 HXHD GR8 PLT	1
7A500-300	1/2"-13 X 3.00"L HHCS GR 8.8. YELLOW ZINC	1
7C010-100	M10 X 1.5 X 100 HXHD CL8.8	1
7C060-100	M6 X 1.0 X 100MM FLG HD CL10.9+ ZINC	2
7C080-070	M8 X 1.25 X 70 HXHD ZINC	2
7C080-200	M8 X 1.25 X 200MM STUD, 35MM THREAD	1
7F008-023	NUT, M8 X 1.25 NYLOCK NUT	1
7J080-002	WASHER, M8 X 1.8 FLAT, ZN PLT	3
7J375-044	WASHER, 3/8 SAE PLTD	7
4FV112-210/214/218	**AIR INLET ASSY, 2018-20 FORD TRUCK, SAT / BLK / POL**	**1**
4FV112-010/014/018	AIR INLET TUBE, 2018 F150, SAT/BLK/POL	1
4GR012-011	DUCT, S/C INTAKE, MACH	1
7P250-043	1/4NPT X 5/16" BARB	1
7P375-020	3/8 NPT X 5/8 HOSE BARB, BEADED	1
7P375-378	VALVE, CHECK, 3/8 BARB X 3/8 BARB	2
7PS350-351	ELBOW, BLK-SIL 3.5" X 45, SHORT	1
7PS375-350	REDUCER, BLK 3.75-3.5 X 3.0L	1
7R001-004	#4 HOSE CLAMP	1
7R002-010	#10 SAE TYPE F SS HOSE CLAMP	1
7R002-056	# 56 SAE TYPE F SS HOSE CLAMP	3
7R002-060	# 60 SAE TYPE F SS HOSE CLAMPS	1
7R004-001	STEPLESS CLAMP, 15.7-70	3
7R004-004	STEPLESS CLAMP, 25.6 X 7MM WID 1" HOSE	1
7R005-001	CLAMP, T-BOLT, 208-91	1
7U031-016	5/16" PCV/VAC RUBBER HOSE	2.00 FT.
7U033-000	5/8" FUEL LINE/PCV/EEC RUBBER HOSE	1.25 FT.
4FV212-030/034	**DISCH ASSY, 2018-20 FORD TRUCK, SAT / BLK**	**1**
4FV112-020/024	DISCHARGE TUBE B, 1 IN PORT, 2021 F150, SAT/BLK	1
4FV012-030/034	DISCHARGE TUBE C, 2021 F150, SAT/BLK	1
4FV012-040	DISCHARGE TUBE D, 2021 F150	1
7P250-033	1/4 X 5/32 REDUCER UNION	1
7P312-082	5/16 TEE HOSE BARB	1
7PS300-091	ELBOW, BLK, 3" X 90 SILICONE, .75" LEGS, MOD	2
7PS300-278	REDUCER, ELBOW, BLK, 3.0-2.75, 90 DEG	1
7PS300-301	BUMP HOSE, 3.00D X 3.00L	1
7PS350-305	REDUCER, ELBOW, 3.50 X 3.0 X 90	1
7R002-016	# 16 SAE TYPE F SS HOSE CLAMP	2

PART NUMBER	DESCRIPTION	QTY.
7R002-048	# 48 SAE TYPE F SS HOSE CLAMP	1
7R002-052	# 52 SAE TYPE F SS HOSE CLAMP	8
7R002-056	# 56 SAE TYPE F SS HOSE CLAMP	1
7U030-030	1/4" VACUUM HOSE	0.33 FT.
7U030-046	5/32" VACUUM LINE	3 FT.
7U034-016	1" GS HEATER HOSE	0.22 FT.
8D001-004	COMPRESS BYPASS VALVE, G2	1
8H040-075	FILTER, 1" BYPASS VALVE	1
8PN101-050/054	WELDED CORE ASSY, 05 MUST GT / BLK	1
4FV114-030	**COOLANT MOD ASSY, 2018-20 FORD F150, 5.0L**	**1**
4FV214-021	ASSY, WTR OUTLT, 2018 FORD F150, 5.0L	1
7R002-010	#10 SAE TYPE F SS HOSE CLAMP	4
7R002-024	#24 SAE TYPE F SS HOSE CLAMP	1
7R002-028	#28 SAE TYPE F SS HOSE CLAMP	3
7U038-000	3/4" HEATER HOSE	2 FT.
7U133-126	REDCR, 1.50" TO 1.25", MLD, CLNT, 2020 F150 5.0	1
7U133-150	CLNT HSE, LWR, 1.5", 2020 F150 5.0	1
4FV115-010	**SUPPORT ITEMS, CAC SYS, 2018-2023 FORD TRUCK**	**1**
4FV010-030	BRKT, SUPPORT, DISCHARGE TUBE, 2021 F150	2
4FV010-040	BRKT, CHARGE COOLER, LEFT, F150, 2021	1
4FV010-050	BRKT, CHARGE COOLER, RIGHT, F150, 2021	1
7A250-101	1/4-20 X 1 HHCS ZINC PLTD	6
7A375-100	3/8-16 X 1 G5 HHCS, PLT	4
7E014-075	#14 X .75 HEX HD SHEETMETAL SCREW	4
7F250-021	1/4-20 NYLOCK NUT ZINC PLATED	6
7F375-021	3/8-16 NYLOCK FLANGE NUT	4
7J250-001	1/4 WASHER, SAE, PLTD	12
7J375-044	3/8 SAE WASHER, PLTD	4
7R002-052	#52 SAE TYPE F SS HOSE CLAMP	2
7U100-055	TIE WRAP, 7.5" NYLON	12
4FV139-086	**PCV ASSY, 2018-20 FORD TRUCK, 5.0L**	**1**
5W001-030	1 1/2" HEAT SHRINK	0.25 FT.
5W001-082	SLEEVE, FLEX BRAID .75" NOM.	1 FT.
7P375-106	PCV VALVE, FORD, 3/8" HOSE	1
7P625-375	REDUCER, 5/8 BARB TO 3/8 BARB	1
7R004-002	STEPLESS CLAMP, 17.0-70	2
7R004-004	STEPLESS CLAMP, 25.6 X 7MM WID 1" HOSE	3
7R004-007	STEPLESS CLAMP, 28.6 X 7MM WID 1.126 IN OPEN - 1.00 IN CLOSED	1
7U030-056	3/8" FUEL LINE/PCV/EEC RUBBER HOSE	0.33 FT.
7U033-000	5/8" FUEL LINE/PCV/EEC RUBBER HOSE	0.66 FT.

OPTIONAL PARTS

4FV212-100/104	**RACE BOV UPGRADE ASSY, 2021-23 F150, SAT / BLK**	**1**
4FV112-050/054	DISCHARGE TUBE B, 2021 F150, RACE BOV, SAT / BLK	1
7U030-030	1/4" VACUUM HOSE	4 FT.
7U100-055	TIE WRAP, 7.5" NYLON	4
8D204-111	ASSY, BILLET RACE BOV, BLACK	1

TUNER KITS DO NOT INCLUDE THE FOLLOWING:

5A002-080	**MAP SENSOR, GT500**	**1**
5A003-180	**2018-2020 PROGRAMMER F-150**	**1**
5W001-162	**HRNSS, MAP SNSR ADPTR, 2018-2020 FORD F150**	**1**

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1. BASIC COMPONENT REMOVAL

A. Using a 10mm socket, disconnect the negative battery cable and set it aside.

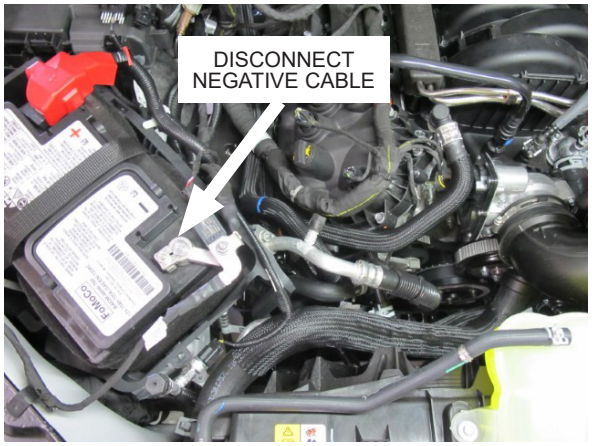

Fig. 1-A: Disconnect negative battery cable

B. Remove the 5/8" PCV breather hose assembly connected to the air inlet tube and the driver side valve cover. Disconnect the assembly and set it aside as the fittings will be reused in a later step. Disconnect the 5/16" PCV hose assembly from the vacuum check valve and the air inlet tube. The 5/16" PCV hose assembly will not be reused.

Fig. 1-B: Disconnect breather hoses

C. Using an 7mm socket, loosen the hose clamps securing the air inlet tube to the throttle body and the air box. With both hose clamps loosened, proceed to remove the air inlet tube from the vehicle and set it aside. It will not be reused. To avoid any foreign object damage, place a clean rag into the throttle body or cover it with tape.

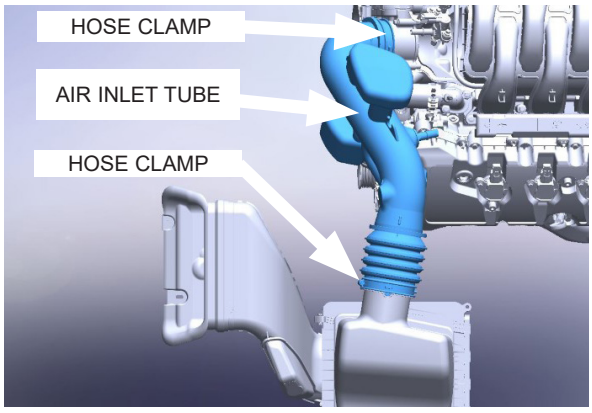

Fig. 1-C: Remove air inlet tube

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1. BASIC COMPONENT REMOVAL

D. Using a 13mm socket, loosen the bolt securing the air cleaner assembly to the chassis. Remove the plastic fasteners that secure the ram air inlet duct to the chassis. Remove the air cleaner assembly and ram air duct by pulling it upwards.

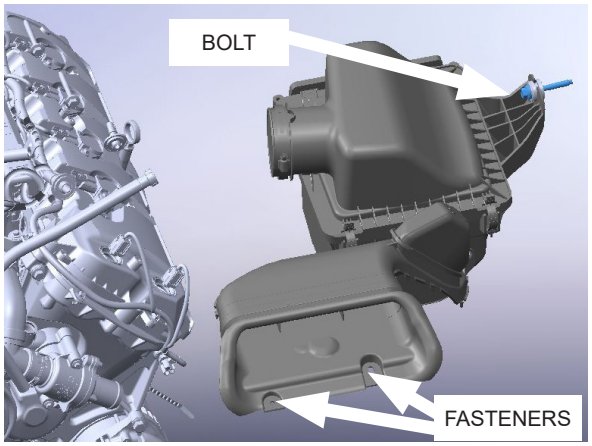

Fig. 1-D: Remove air cleaner assembly

E. Using a long ratchet and 15mm socket, turn the belt tensioner counterclockwise and remove the serpentine belt. It will not be reused.

NOTE: The use of a leverage bar may help in this step.

Fig. 1-E: Remove OEM serpentine belt

F. The engine coolant will now be drained. Remove the coolant reservoir cap. Locate the coolant hose going to the oil cooler closest to the crank pulley. Undo the hose clamp, pull out the coolant hose and drain the coolant into a bucket.

Fig. 1-F: Remove cap and drain coolant

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1. BASIC COMPONENT REMOVAL

G. Once the coolant is drained, remove the remainder of the coolant hose assembly by removing the other coolant lines from the oil cooler and larger hoses connected to the thermostat housing inlet and to the radiator outlet. Set aside as it will be modified in a later step.

Fig. 1-G: Remove coolant hose assembly

H. Using an 8mm socket, remove the 2 screws securing the thermostat inlet and remove it.

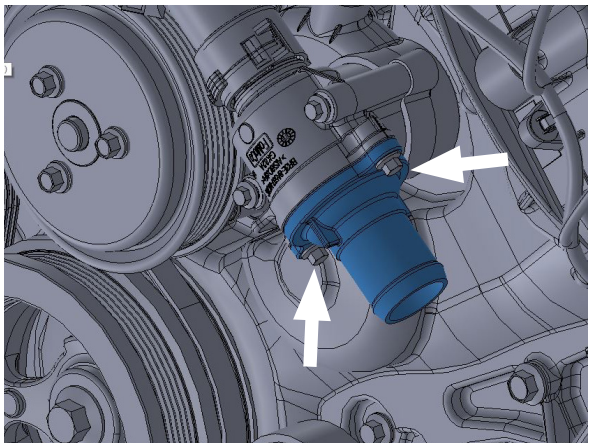

Fig. 1-H: Remove thermostat inlet

I. Replace the thermostat inlet with the supplied thermostat assembly in the orientation as shown. Torque to 85 lb-in.

NOTE: See Appendix E2 as reference.

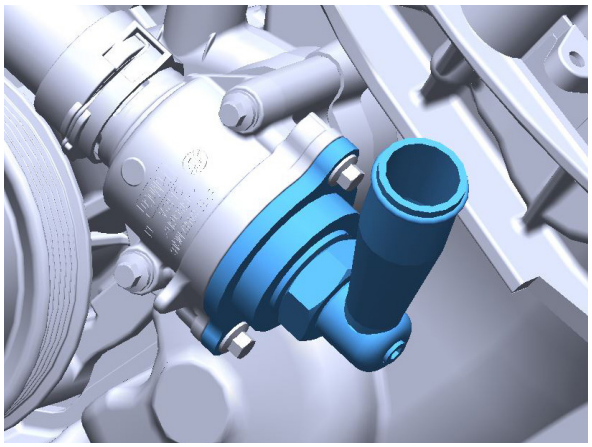

Fig. 1-I: Install 90-degree assembly

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1. BASIC COMPONENT REMOVAL

J. Using a 8mm socket, remove the thermostat housing bolts. They will be replaced with longer bolts when installing the front supercharger mounting bracket. Ensure the O-ring in between the thermostat housing and engine block stays in place and does not get lost.

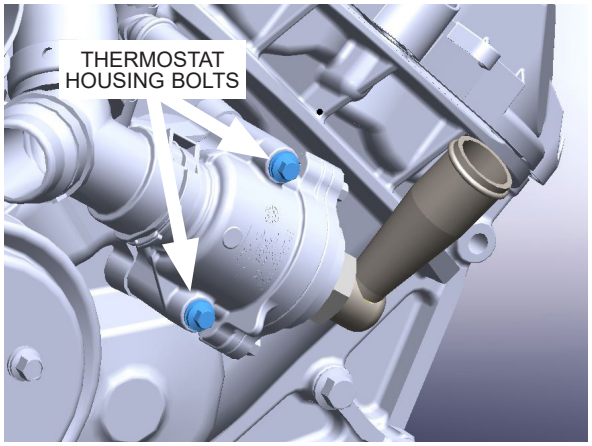

Fig. 1-J: Remove thermostat housing bolts

K. Using a 13mm socket, remove the indicated top, inner, front engine cover bolt. It is located on the driver's side of the engine next to the valve cover. It will be replaced with a longer bolt which will support the supercharger mounting bracket.

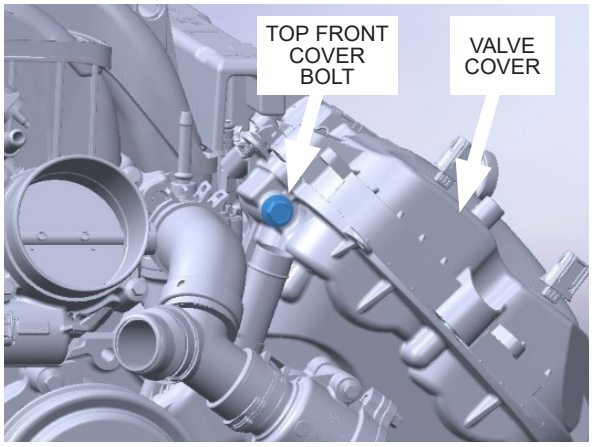

Fig. 1-K: Remove front engine cover bolt

L. Using a 13 mm socket, remove the two indicated front engine cover bolts. They are located on the driver's side of the engine, above the alternator. They will be replaced with longer bolts which will support the supercharger mounting bracket.

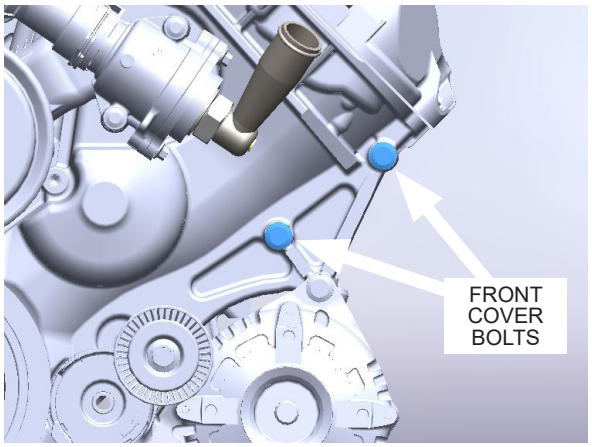

Fig. 1-L: Remove front engine cover bolts above the alternator

1. BASIC COMPONENT REMOVAL

M. Using a 15mm socket, remove the top alternator mounting bolt. It will be replaced with longer bolt, spacer and idler pulley in a later step.

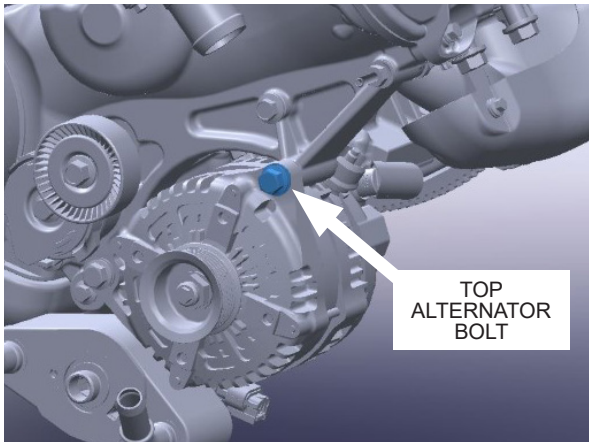

Fig. 1-M: Remove top alternator mounting bolt

N. Using a panel removal tool or a flathead screwdriver, remove the plastic fasteners securing the radiator support cover. Pop the center section of each fastener upward and then the large outer part of the fastener will loosen. Set the cover and plastic fasteners aside as they will be reused.

Fig. 1-N: Remove radiator support cover

O. Disconnect the shutter actuator and ambient air temperature plugs located near the hood latch.

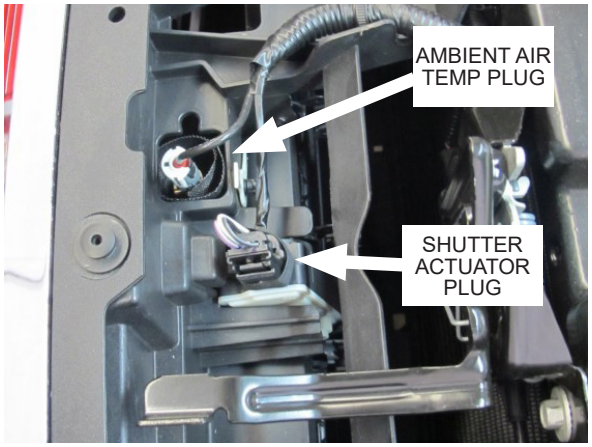

Fig. 1-O: Disconnect indicated plugs

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1. BASIC COMPONENT REMOVAL

P. Using a 10mm socket, remove the four screws securing the upper section of the grill assembly to the radiator support.

Fig. 1-P: Remove upper grill screws

Q. You'll notice that there's two screws on each corner of the bumper trim securing it to the vehicle. Using an 7mm socket, remove the two screws on each side.

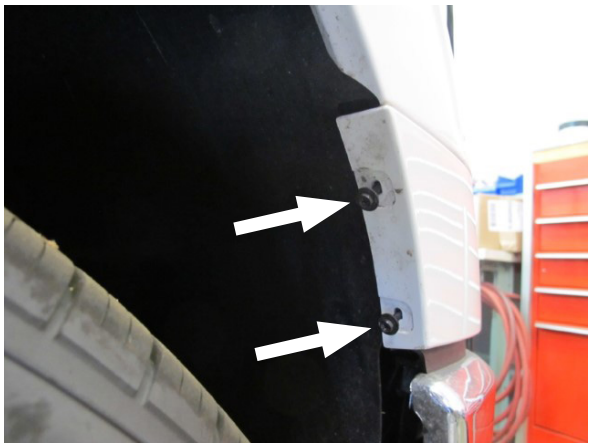

Fig. 1-Q: Remove bumper trim screws

R. To release the bumper trim, you will need to pull it away from the front bumper with a good amount of force until you feel them unsnap from the vehicle. Make sure you have a good grip as to not cause any damage to yourself or the trim during removal.

Fig. 1-R: Remove bumper trim

1. BASIC COMPONENT REMOVAL

S. Using a 8mm socket, remove the two screws that mount the grill to the radiator support. There is one bolt on each bottom corner of the grill. Remove the grill by pulling it forward from the truck.

Fig. 1-S: Remove grill lower screws

T. Remove all the air deflectors and linkages from the grill assembly by using a screwdriver to pry and unclip them from the inner and outer mount tabs. Place the deflectors linkages aside as they will not be reused. The shutter assembly housing will be later modified to make clearance for the charge air cooler.

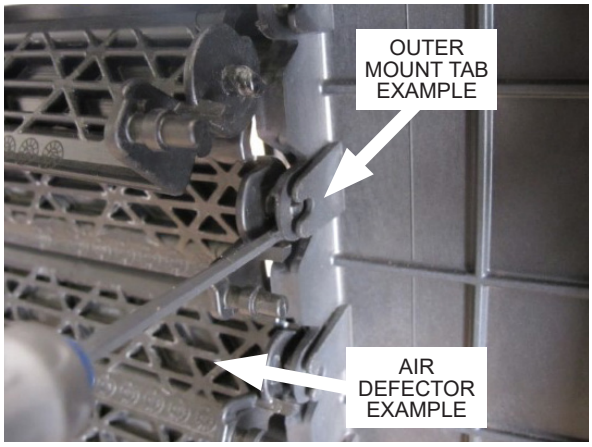

Fig. 1-T: Remove air deflectors

U. Using a T15 torx bit, remove the air deflector actuator motor and ambient air temperature sensor from the shutter housing. The ambient air temperature sensor is held on by a plastic clip. These parts will be relocated in a later step.

NOTE: Though the air deflectors were removed, the actuator motor will remain connected to prevent diagnostic trouble codes.

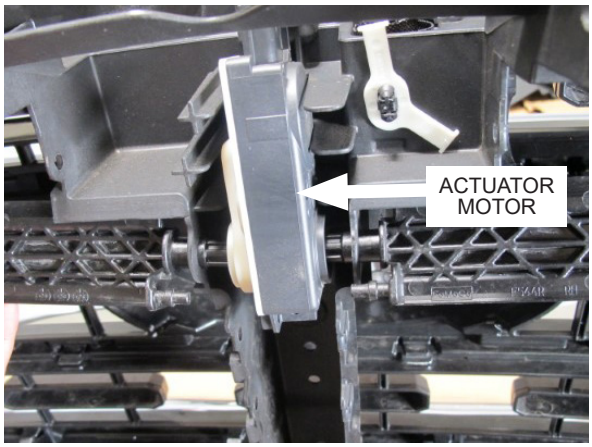

Fig. 1-U: Remove actuator and air temp sensor

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1. BASIC COMPONENT REMOVAL

V. Using a panel remover tool, remove the vinyl flap from the bottom of the grill assembly by prying from under the plastic tabs. Set the flap and its fasteners aside as they will not be reused.

Fig. 1-V: Remove grill lower flap

W. Using a 10mm and 8mm socket, remove the indicated nuts which secure the shutter assembly to the front grill.

Fig. 1-W: Remove grill nuts

X. Using a panel removal tool or a flathead screwdriver, remove the plastic fasteners securing the shutter assembly from the grill. Pop the center section of each fastener upward and then the large outer part of the fastener will loosen.

Fig. 1-X: Remove grill plastic fasteners

1. BASIC COMPONENT REMOVAL

Y. Using a panel removal tool or a flathead screwdriver, remove the shutter assembly housing from the grill by unclipping the spring clips that hold the bottom of the housing to the grill. Once the shutter housing is removed from the grill, remove the metal spring clips as they will no longer be used.

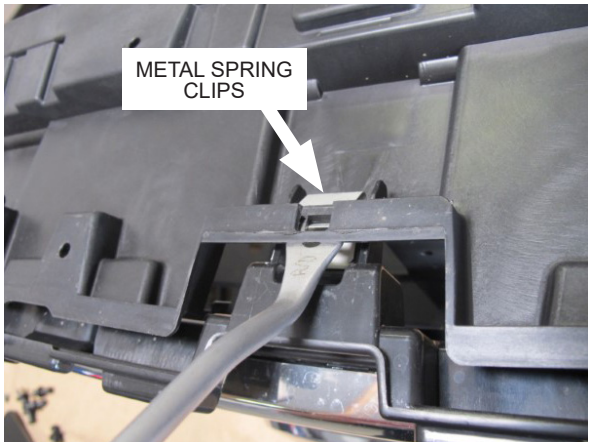

Fig. 1-Y: Remove shutter housing from grill

Z. Locate the horn assembly on the passenger side upper radiator support. Unplug it and remove the mounting bolt using a 10mm socket. Remove the horn assembly from the radiator support and set it aside. It will be relocated in a later step.

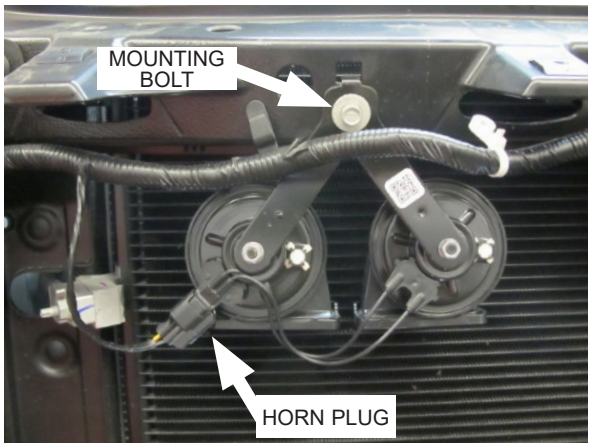

Fig. 1-Z: Remove horn assembly

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2. COMPONENT MODIFICATIONS

A. To make room for the charge air cooler, the shutter housing needs to be modified. The center section will be removed which will be detailed in the following steps.

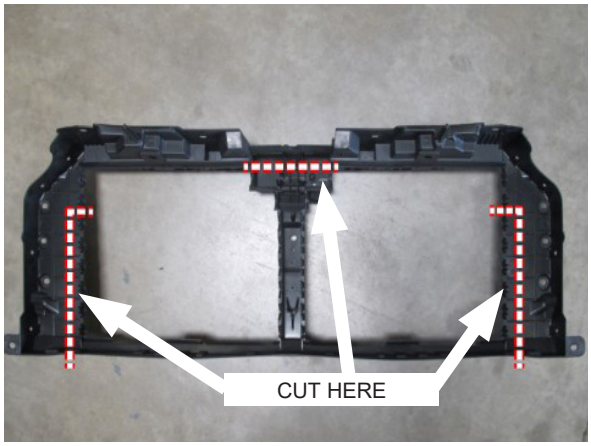

Fig. 2-A: Preview of cut locations

B. Cut the housing using a reciprocating saw or an abrasive cut off wheel on the driver's side as indicated by the dotted line. Use the ribs molded on the housing as a reference. Cut from the second rib down and first rib over from the inside edge.

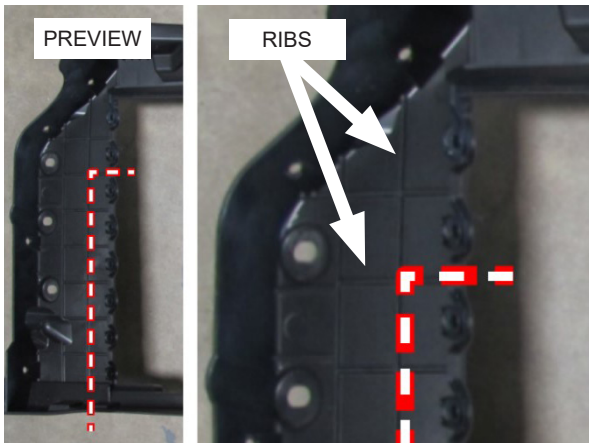

Fig. 2-B: Cut shutter housing as indicated

C. Repeat the process on the passenger side of the housing.

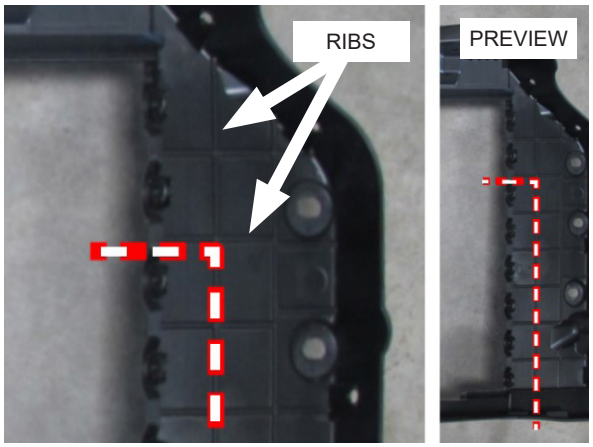

Fig. 2-C: Cut shutter housing as indicated

2. COMPONENT MODIFICATIONS

D. Cut the center of the housing as indicated in the image. After the center section is cut, remove, and discard it. Deburr the plastic edges with a file or sanding disc.

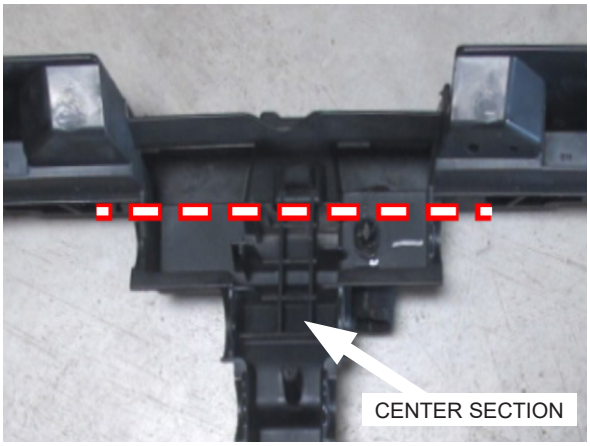

Fig. 2-D: Cut shutter housing as indicated

E. Reattach the modified shutter shroud to the grill using the 4 nuts and plastic fasteners which were previously removed from the assembly.

Fig. 2-E: Reattach shutter housing to grill

F. Cut and remove the lower and center middle mounting tabs on the front grill that no longer attach to the shutter shroud to make clearance for the charge cooler.

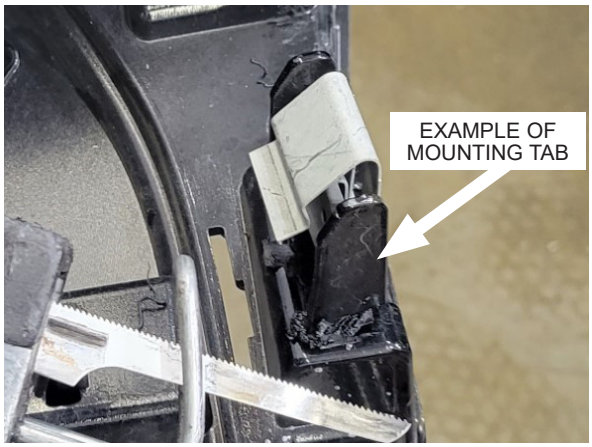

Fig. 2-F: Cut off un-used mounting tabs

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2. COMPONENT MODIFICATIONS

G. The coolant hose assembly which was previously removed will need to be modified. Cut off all the molded plastic retainer clamps on the assembly as shown to release the hoses from the union. Remove all hoses from the union taking caution not to damage the plastic barbs in the process. All clamps will be replaced with stainless steel hose clamps after the modification. The two smaller 3/4 inch hoses and 1.5 inch diameter metal spring clamps will not be reused.

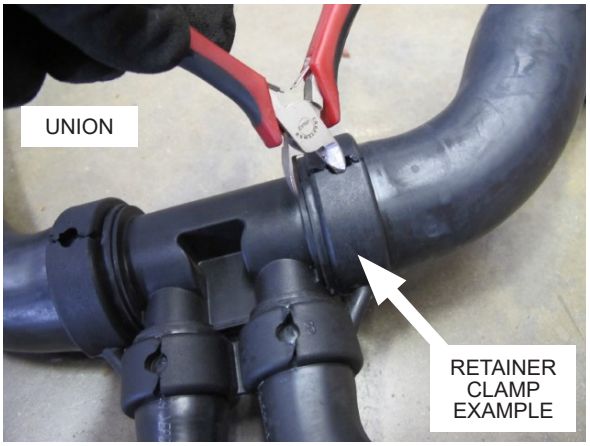

Fig. 2-G: Remove clamps and hoses from union

H. Assemble the supplied molded hoses, and two 12 inch lengths of 3/4" hose onto the OEM union and elbow was shown. They will be cut to the approximate indicated lengths once assembled onto the engine.

NOTE: Applying a little oil and heat to the inside of the hoses where they mate with the plastic barbs will help get them into position.

NOTE: See Appendix E1 as reference.

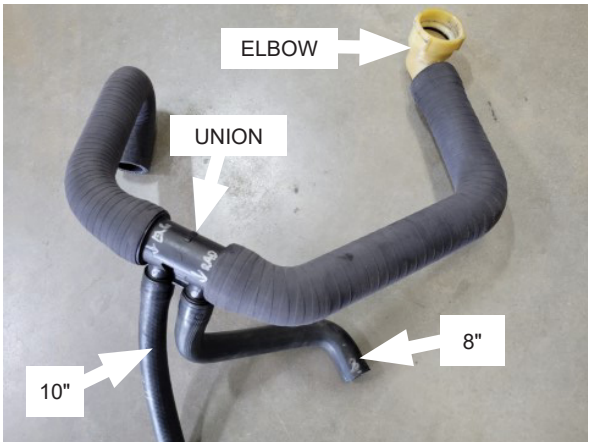

Fig. 2-H: Assemble coolant hoses onto union and elbow

I. Assemble two #10 and two #28 stainless hose clamps onto the assembly as shown.

NOTE: Do not overtighten the clamps to prevent damage to the thin plastic union barbs.

See Appendix E1 as reference.

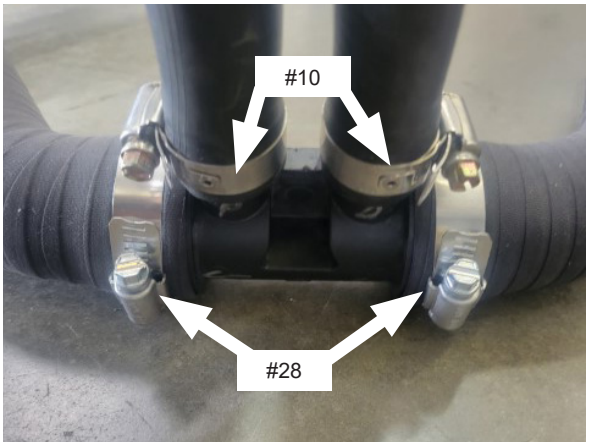

Fig. 2-I: Assemble hoses clamps

2. COMPONENT MODIFICATIONS

J. Assemble a #28 stainless hose clamp onto hose where the elbow is as shown.

NOTE: See Appendix E1 as reference.

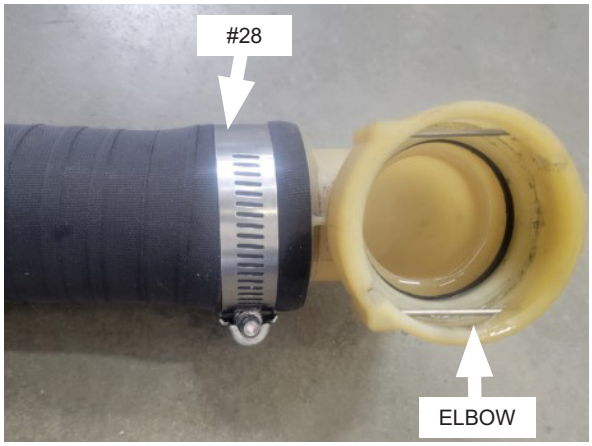

Fig. 2-J: Assemble hose and clamp

K. Remove the quick disconnect coolant fitting from the indicated coolant barb. Insert a rod inside the coolant hard line and bend it over toward the passenger side of the vehicle about a 1/4 inch to make clearance for a standoff. Reconnect the hose after the modification.

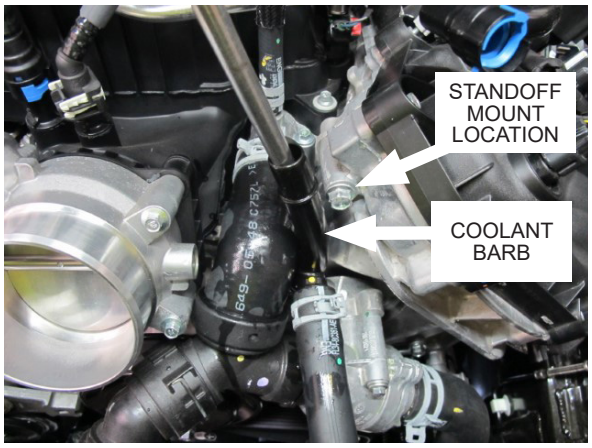

Fig. 2-K Bend hard line for standoff clearance

L. Clearance for the air inlet duct needs to be made on the radiator fan support ribs. Locate the bottom, left, support ribs for the radiator fan shroud. Carefully cut and remove the indicated ribs and their supports on the shroud. Take caution not to damage the wiring harness on the bottom of the shroud.

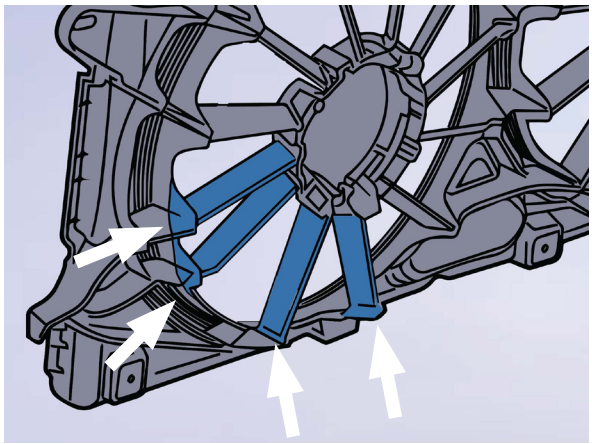

Fig. 2-L: Cut and remove indicated support ribs

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2. COMPONENT MODIFICATIONS

M. Now that there will be positive manifold pressure under boost, you will need to add a check valve on the crank case breather hose assembly. It is located on the passenger side valve cover and connects to the throttle body.

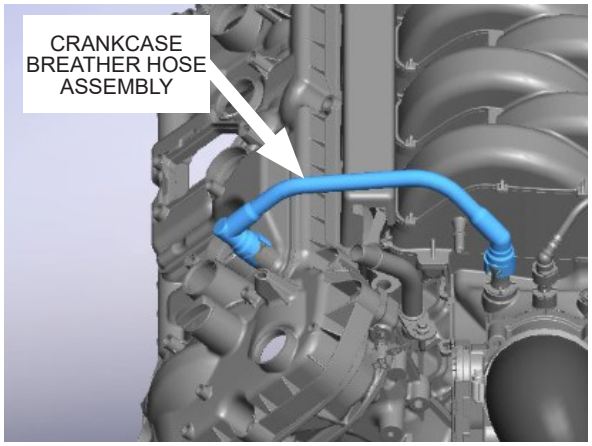

Fig. 2-M: Locate breather hose assembly

N. Remove the hose assembly from the engine. Carefully cut the hose off the fittings with a razor blade. Cut the hose along its axis in several light passes until the hose can split off the fitting as to not damage the barbs and O-ring. The fittings will be reused in the following step.

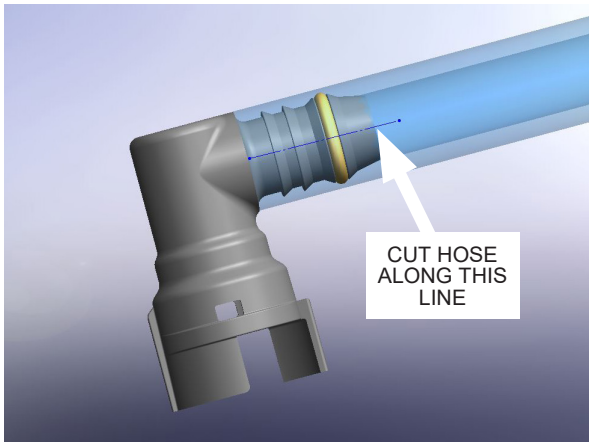

Fig. 2-N: Remove fittings from hose assembly

O. Assemble the new PCV assembly using Appendix C as a reference. Assemble the check valve, hoses, elbow, reducer and stepless clamps. Cover the assembly with protective sheath. Secure the sheath ends with heat shrink. Assemble the fittings from the previous step and secure them with stepless clamps.

NOTE: See Appendix C as reference.

Fig. 2-O: Assemble the new PCV assembly

2. COMPONENT MODIFICATIONS

P. Install the new PCV assembly to the engine in its original location.

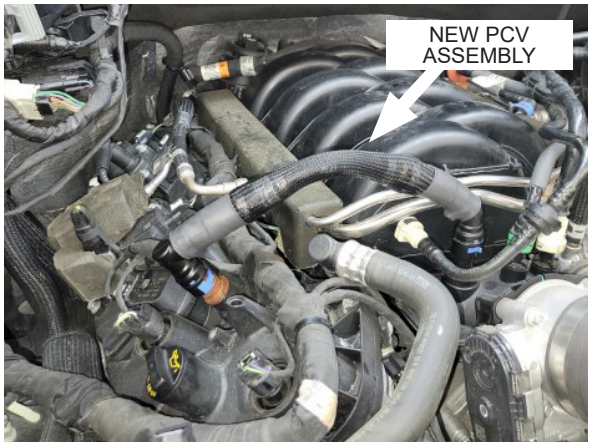

Fig. 2-P: Install new PCV assembly

Q. The front engine cover needs to be modified to make room for the supercharger pulley. Cover the surrounding area to keep out dust and debris during the process. Carefully remove the material on the cover indicated in the following steps. Remove any sharp edges or burrs.

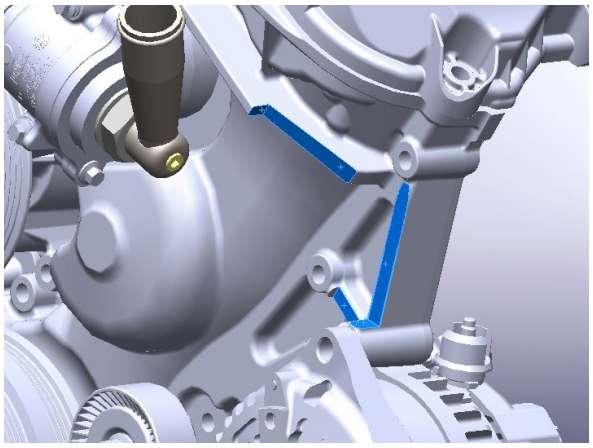

Fig. 2-Q: Material removal preview

R. Carefully remove the material on the front engine cover to the dimensions as shown. Remove any sharp edges or burrs.

NOTE: A reciprocating saw and an angle grinder with a sanding disk is recommended.

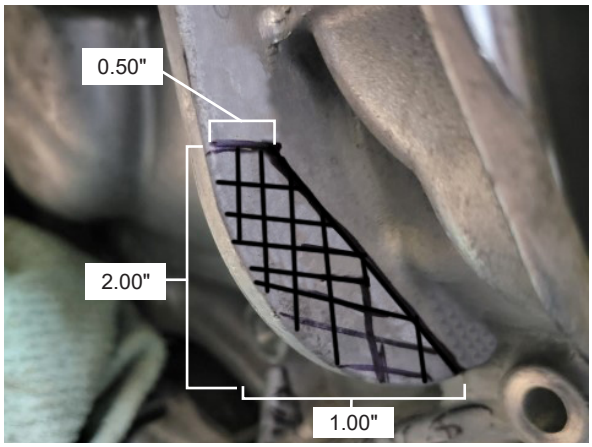

Fig. 2-R: Remove indicated material from front engine cover

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2. COMPONENT MODIFICATIONS

S. The support ribs for the upper alternator mounting boss need to be modified to make room for a mounting plate. Carefully remove the indicated areas to a depth slightly below the mounting boss surface. Remove any sharp edges or burrs.

NOTE: An angle grinder with a sanding disk is recommended.

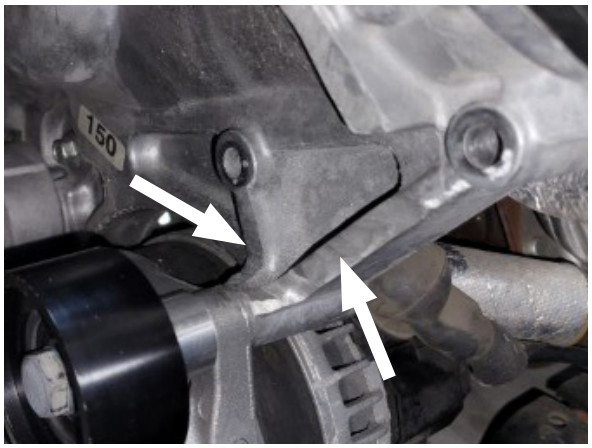

Fig. 2-S: Remove indicated material from front engine cover

3. MOUNTING BRACKET AND SUPERCHARGER INSTALLATION

Use blue threadlocker on all screws in this section.

A. A preview of the supercharger mounting bracket assembly is shown in the figure.

NOTE: Refer to Appendix A1-A2 for parts and torque specifications.

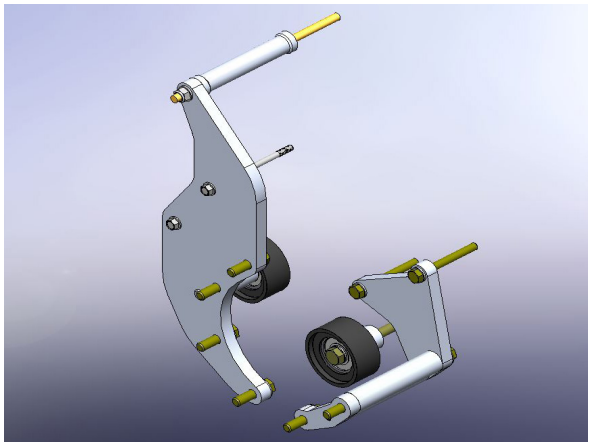

Fig. 3-A: Supercharger mounting bracket assembly

B. Turn the supercharger upside down to access the oil drain cap. Using a 9/16" wrench, remove the oil drain plug and install the oil drain line.

NOTE: Take care not to spill any of the prefilled supercharger oil.

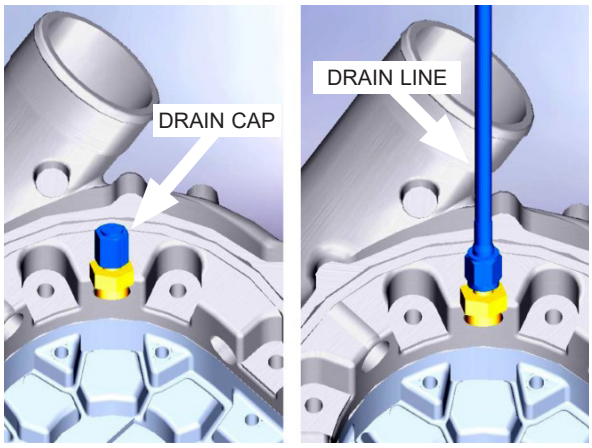

Fig. 3-B: Install oil drain line

C. Turn the supercharger right side up. Using a 3/16" hex key, remove the flat shipping plug and replace it with the provided vent plug. Take care not to spill any of the prefilled supercharger oil. Do not overtighten the vent plug.

NOTE: Failure to replace the flat shipping plug with the provided vent plug can result in damage to the supercharger.

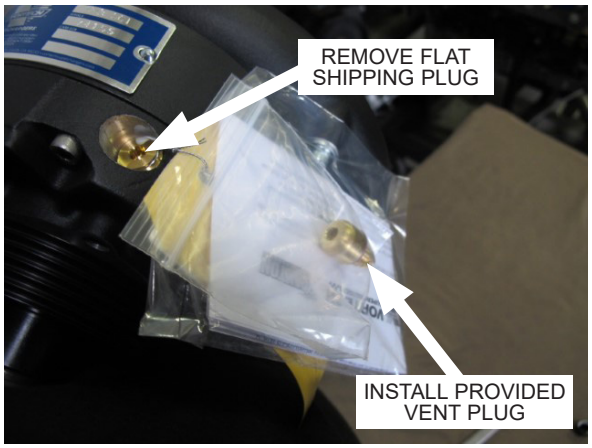

Fig. 3-C: Remove shipping plug and install vent plug

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3. MOUNTING BRACKET AND SUPERCHARGER INSTALLATION

D. Assemble the rear mounting plate as shown onto the two holes above the alternator. Torque the two M8 bolts to 22 lb-ft. Assemble the spacer, idler pulley, retainer and bolt into the upper alternator mounting hole. The snap rings of the idler pulley should face the front of the vehicle. Torque to 33 lb-ft.

NOTE: See Appendixes A1-A2 as reference.

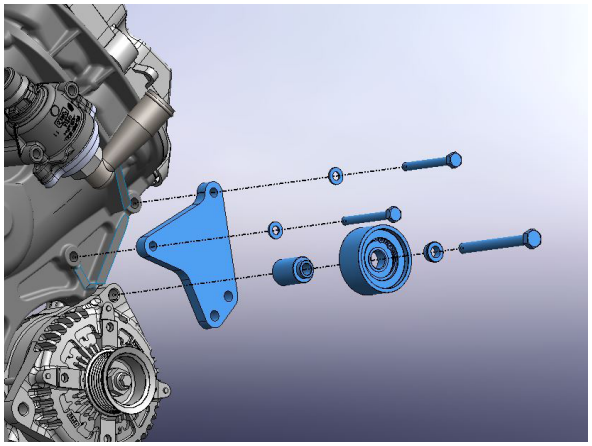

Fig. 3-D: Install rear mounting plate and idler pulley

E. Preassemble the front mounting plate, mount base as shown onto the blower. Bolt the idler pulley, spacer and hardware to the base plate. The snap ring of the idler pulley should face the front of the vehicle. Torque to 35 lb-ft. Place the small mount base into position and use the bottom bolt hole only for this step. Torque the 3/8" fasteners to 22 lb-ft.

NOTE: See Appendixes A1-A2 as reference.

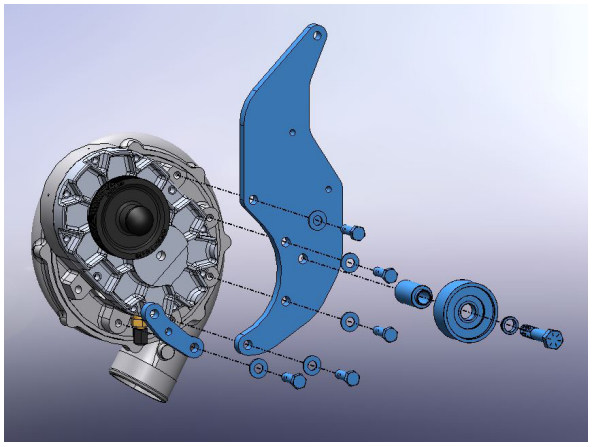

Fig. 3-E: Preassemble the front mounting plate and mount base

F. Hold the middle of the M8 threaded stud with pliers or in a vise. Screw the M8 nut onto the stud until at least 3 threads show past the nut. Assemble the front plate assembly with the indicated hardware and spacers to the engine. The M8 stud assembles to the top front engine cover screw location. The M6 screws and spacers assemble onto the thermostat housing screw locations. Ensure the o-ring for the thermostat housing is in place. Hand tighten the fasteners in place at this time.

NOTE: See Appendixes A1-A2 as reference.

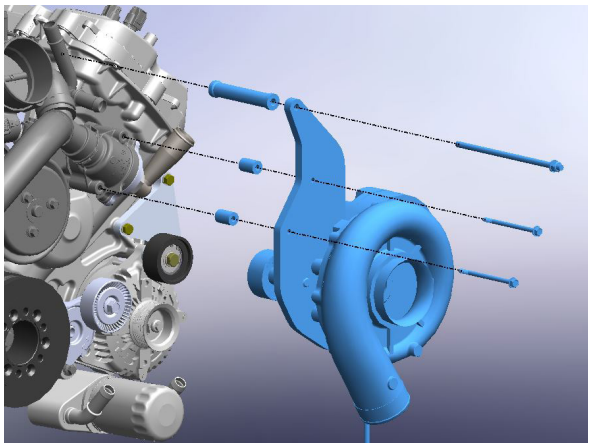

Fig. 3-F: Assemble front mounting plate to engine

3. MOUNTING BRACKET AND SUPERCHARGER INSTALLATION

G. Assemble two 3/8" bolts, two 3/8" washers and two standoffs as shown through the rear base plate to the base mount as shown. Torque to 22 lb-ft. Route the drain line downwards towards the front of the vehicle. This line will be secured in a later step. Once all the mounting plate hardware is in place, torque all fasteners to their specs.

NOTE: See Appendixes A1-A2 as reference.

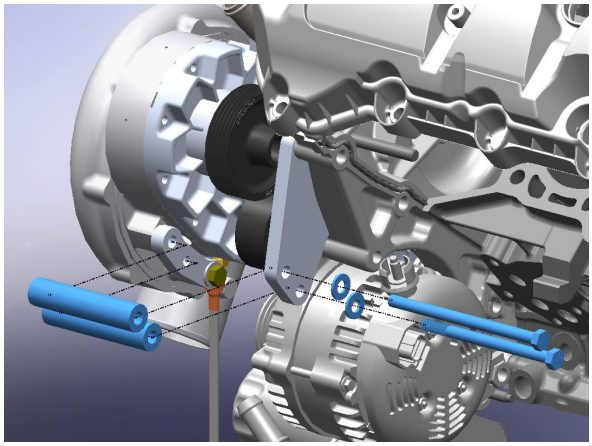

Fig. 3-G: Assemble supercharger to rear base plate

H. Install the provided 6 rib belt from the bottom in between the two idler pulleys, then wrap it around the supercharger pulley. Wrap the rest of the belt around the accessary pulleys. Use a 14mm wrench to turn the tensioner counterclockwise, then wrap the belt over the tensioner pulley.

NOTE: See Appendix G as reference.

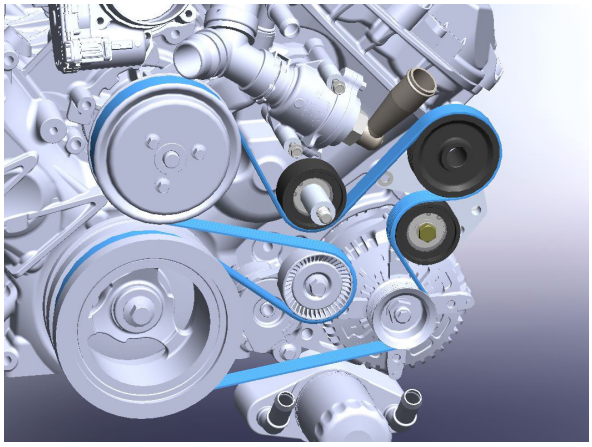

Fig. 3-H: Install the provided 6 rib belt

I. Assemble the air inlet elbow onto the supercharger inlet in place with a T-bolt clamp, however, leave the clamp loose until the silicon air inlet is assembled to it.

NOTE: See Appendix B as reference.

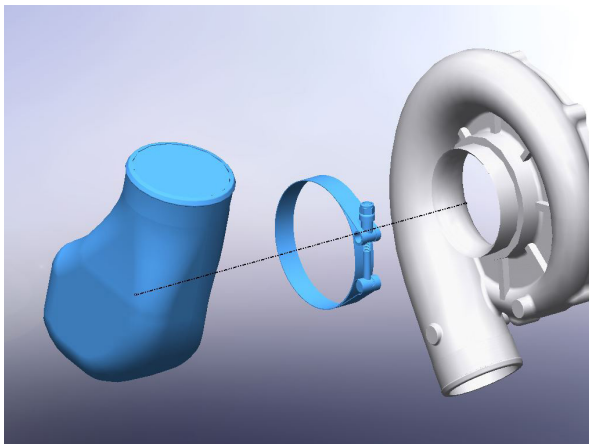

Fig. 3-I: Assemble air inlet elbow

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4. CHARGE AIR COOLER INSTALLATION

A. Center punch locations for holes to be drilled for the charge air cooler mounts. On the top radiator support, notice diagonal indentations marks on the front surface. On the driver's side, use the point where the diagonal intersects the bottom of the support for a reference point as shown. Center punch a mark .650 inch up from the bottom surface and 1.00 inch inwards from the reference point, towards the center of the vehicle as shown. Drill a hole out in steps using a 1/8" drill bit first then a 1/4 inch drill for the final size. Repeat process for the passenger side.

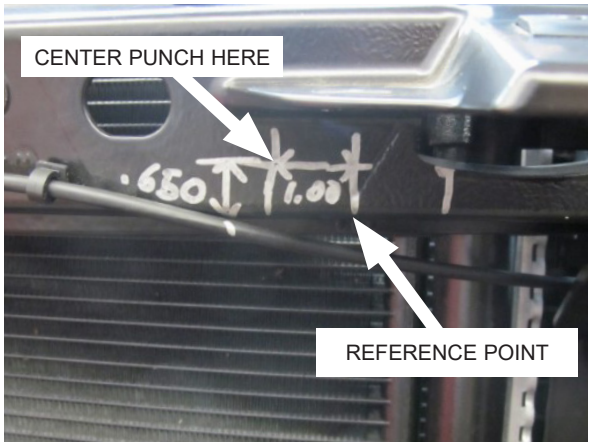

Fig. 4-A: Drill holes in top radiator support

B. Temporarily mount the left and right charge cooler brackets from the top hole to the upper radiator support with the 1/4 inch hardware. Once in position a lower slot should line up with a preexisting hole in the vehicle's lower radiator support's top surface. Temporarily install the 1/4 inch hardware for this hole. Ensure that the bracket is vertical and perpendicular to the lower radiator support. Center punch the lower radiator support to mark the center of the other slot in the bracket. Drill the hole out in steps using a 1/8 inch drill bit first then a 1/4 inch drill for the final size. Repeat for the other bracket.

NOTE: See Appendix F as reference.

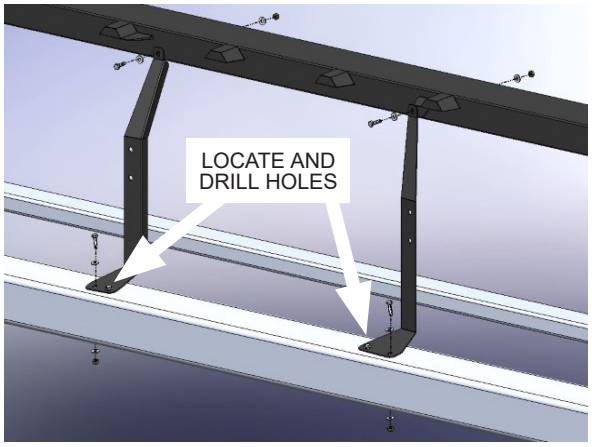

Fig. 4-B: Drill bracket hole locations

C. Temporarily mount the charge air cooler and its mounting hardware in the orientation as shown. Center and level the cooler in position and then tighten the mounting hardware to spec.

NOTE: See Appendix F as reference.

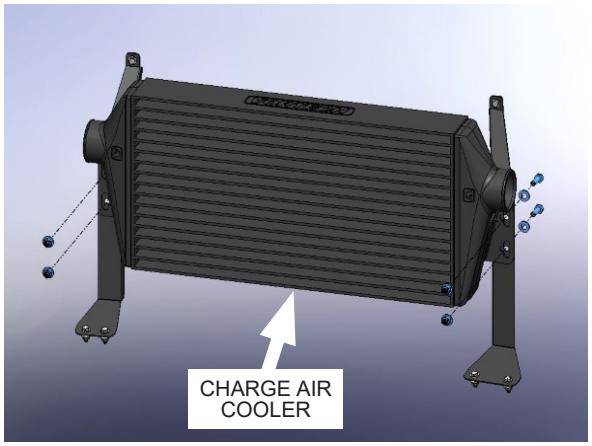

Fig. 4-C: Install charge air cooler

5. DISCHARGE ASSEMBLY INSTALLATION

A. Assemble the 3.0 to 2.75 inch elbow reducer and hose clamp from the blower outlet in the orientation as shown.

NOTE: See Appendixes D1-D2 as reference.

NOTE: For ease of installing tubes to silicone couplers, brush a light coat of oil on the inside mating surface of the silicone sleeve prior to assembly.

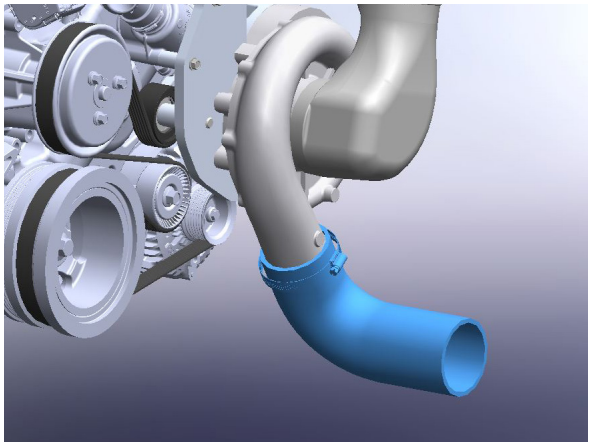

Fig. 5-A: Install elbow reducer

B. Assemble discharge tube B with a 90 degree elbow and hose clamps to the charge air cooler. Leave the hose clamps loose until all discharge tubes are set in place.

NOTE: See Appendixes D1-D2 as reference.

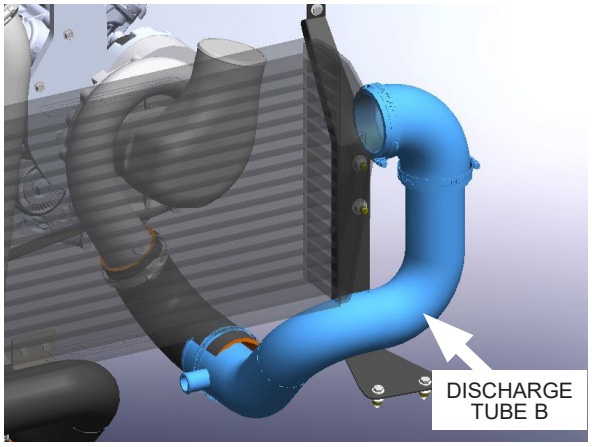

Fig. 5-B: Install discharge tube B

C. Assemble a 90 degree elbow and hose clamps from the charge air cooler to discharge tube C. Assemble a 3.0 inch bump sleeve and hose clamps from discharge tube C which will lead to discharge tube D. Leave the hose clamps loose until all discharge tubes are set in place.

NOTE: See Appendixes D1-D2 as reference.

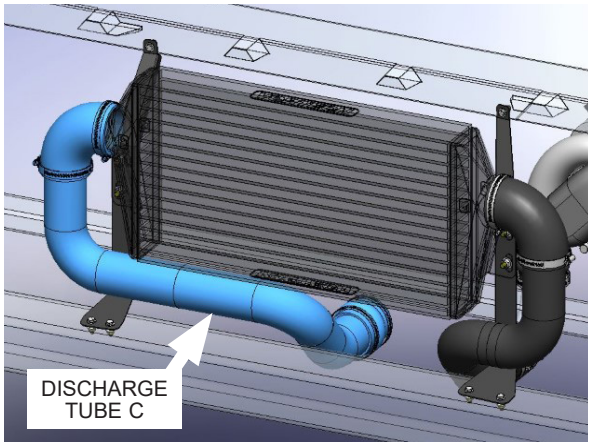

Fig. 4-C: Install discharge tube C

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5. DISCHARGE ASSEMBLY INSTALLATION

D. Remove any tape or protective cover on the throttle body then assemble a 3.5 to 3.0 inch elbow reducer and hose clamps onto the throttle body. Install discharge tube D in between discharge tube C and the throttle body as shown. Note the orientation of the elbow and discharge tube D to clear the indicated coolant hose. Leave the hose clamps loose until all discharge tubes are set in place.

NOTE: See Appendixes D1-D2 as reference.

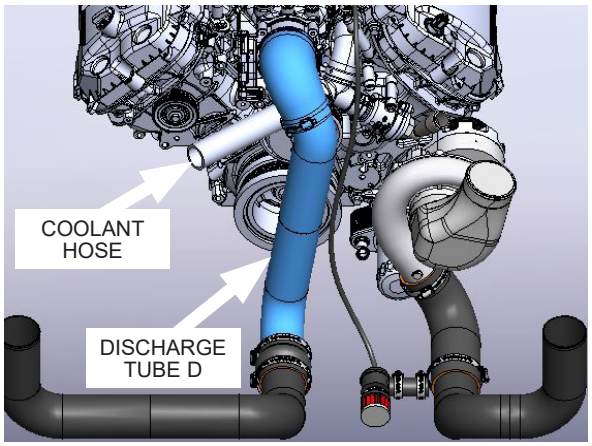

Fig. 5-D: Install discharge tube D

E. Discharge tubes B and C will be supported from the vehicles lower radiator support cross member. Set the support brackets in position over discharge tubes B and C and against the front of the cross member. The direction od the brackets will vary truck to truck. Using the bracket as a template, mark the slot locations on the cross member. Center punch the center of the marked slots. Drill the locations to 11/64“ in two steps using a 1/8” drill as a pilot hole then a 11/64” drill for the final diameter. Mount each bracket to the cross member with 2 self-tapping screws. Clamp the discharge tubes to the support brackets with a #52 hose clamp.

NOTE: See Appendix F as reference.

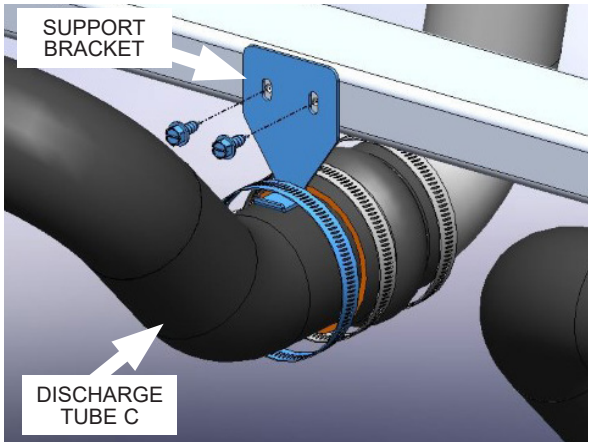

Fig. 5-E: Install support brackets

F. Check that all discharge tubes, silicone couplers and hose clamps are free from interference with surrounding components. Once all the discharge tubes are in position, tighten the hose clamps.

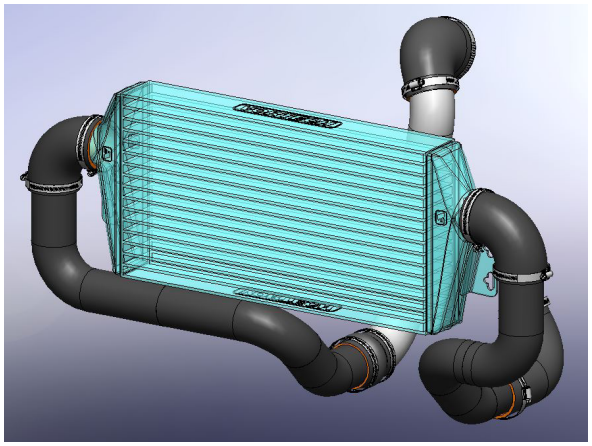

Fig. 5-F: Tighten hose clamps

5. DISCHARGE ASSEMBLY INSTALLATION

G. Preassemble the bypass components as shown.

NOTE: See Appendixes D1-D2 as reference.

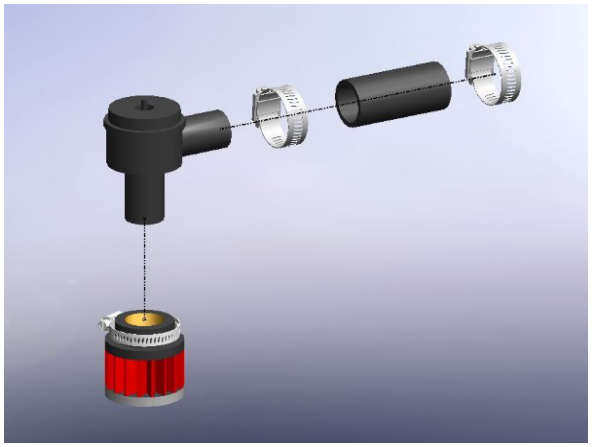

Fig. 5-G: Preassemble bypass components

H. Install the bypass assembly onto the 1 inch port on discharge tube B as shown.

NOTE: See Appendixes D1-D2 as reference.

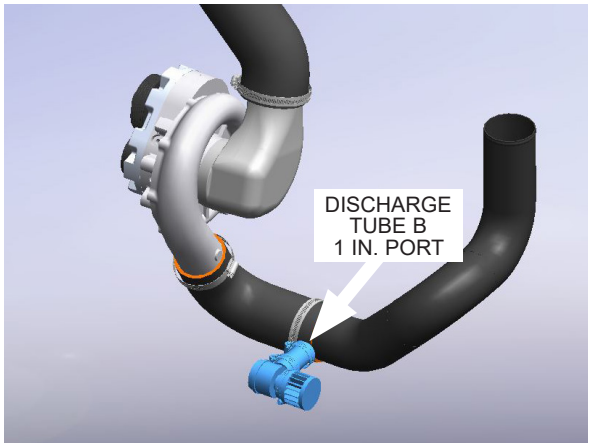

Fig. 5-H: Install bypass assembly

I. Assemble the vacuum tee assembly as shown. Assemble a 4 inch length of 1/4" vacuum hose to a 3 foot length of 5/32" vacuum hose with a 1/4" to 5/32" reducer. Assemble the 1/4" hose onto the side leg of the tee fitting.

NOTE: See Appendixes D1-D2 as reference.

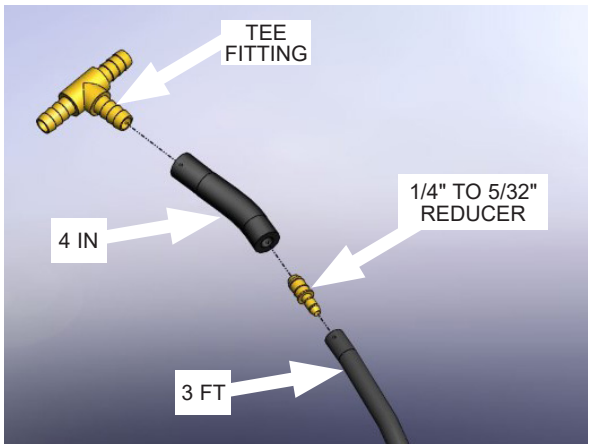

Fig. 5-I: Preassemble vacuum tee assembly

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5. DISCHARGE ASSEMBLY INSTALLATION

J. Cut the 1/4" vacuum hose that comes off the throttle body and over to the driver's side where indicated. Insert the tee assembly in the orientation shown with the 5/32" vacuum hose going towards the front of the vehicle.

NOTE: See Appendixes D1-D2 as reference.

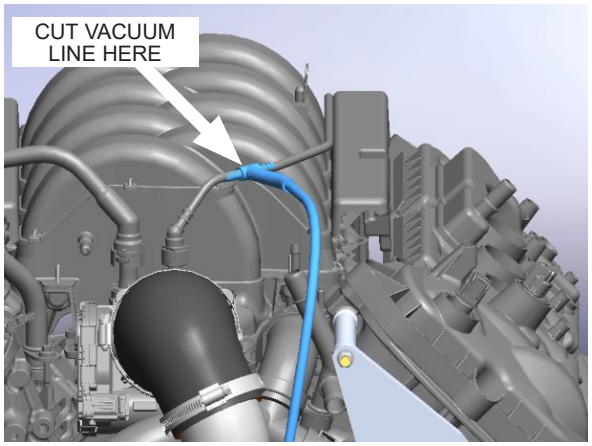

Fig. 5-J: Insert tee assembly

K. Route the 5/32" vacuum hose along discharge tube D, towards the bypass valve. Secure the vacuum hose to the discharge tube with zip ties. Use two zip ties to make one long zip tie long enough to wrap around the discharge tube and vacuum hose. Connect the vacuum hose to the vacuum port on the bypass valve. Do not choke the vacuum hose by over tightening the zip ties.

NOTE: See Appendixes D1-D2 as reference.

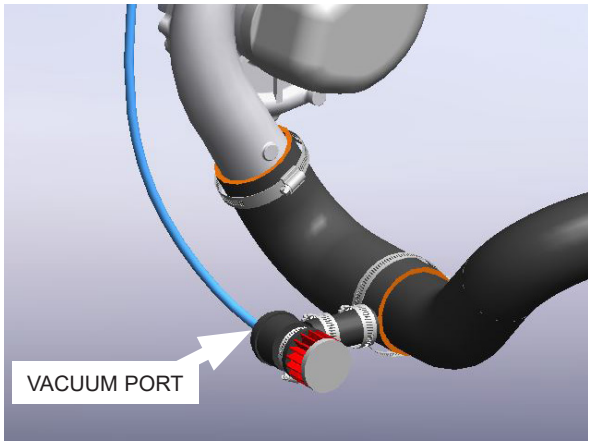

Fig. 5-K: Connect vacuum hose to bypass valve

6. AIR INLET INSTALLATION

A. Install the air cleaner assembly back into its original location. Align the rubber grommets on the chassis to the post on the bottom of the air cleaner assembly. Press the air cleaner assembly down to secure it in the rubber grommets. Secure the air cleaner assembly to the chassis with its retaining bolt.

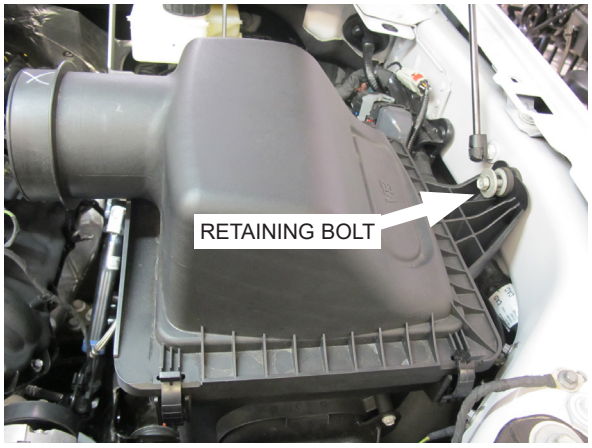

Fig. 6-A: Install air cleaner assembly

B. Install a 3.75" to 3.50" reducer onto the air cleaner assembly and secure it with a #60 hose clamp.

NOTE: See Appendix B as reference.

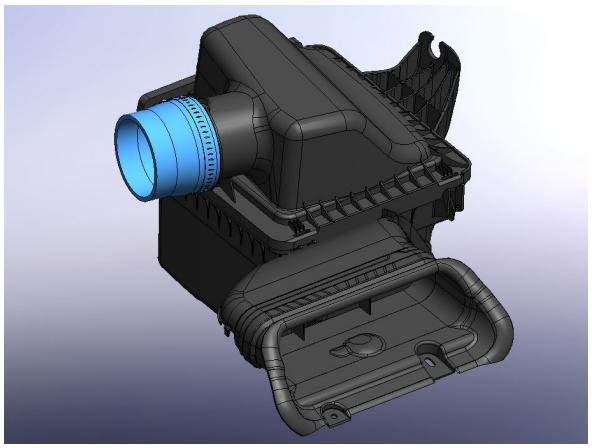

Fig. 6-B: Install reducer onto air cleaner

C. Install a 45 degree elbow onto the cast aluminum air inlet elbow. Loosely secure it with a #56 hose clamp.

NOTE: See Appendix B as reference.

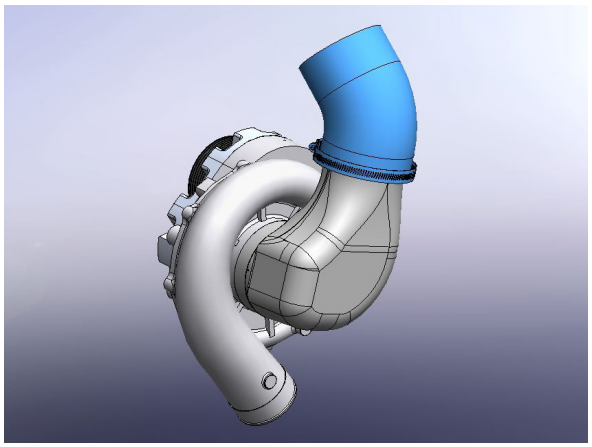

Fig. 6-C: Install 45 degree elbow

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6. AIR INLET INSTALLATION

D. Clearance for the 45 degree silicone elbow may need to be made on one of the radiator fan support ribs. If so mark the area around the elbow on the support rib. Remove the elbow then remove the material as required. Reinstall the elbow.

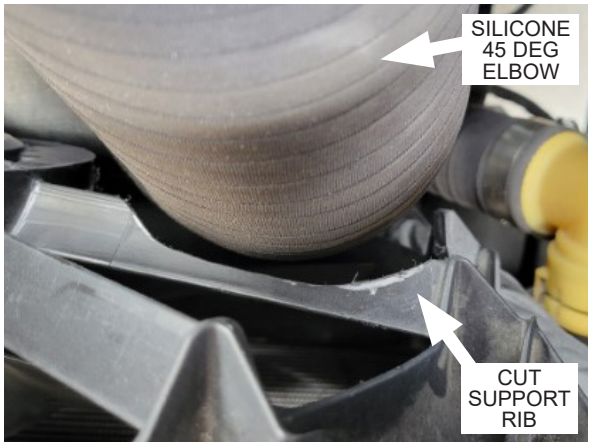

Fig. 6-D: Remove support rib material if needed

E. Assemble 1/4" and 5/8" barb fittings onto the air inlet tube. Use pipe sealant on the threads of the fittings prior to assembly.

NOTE: See Appendix B as reference.

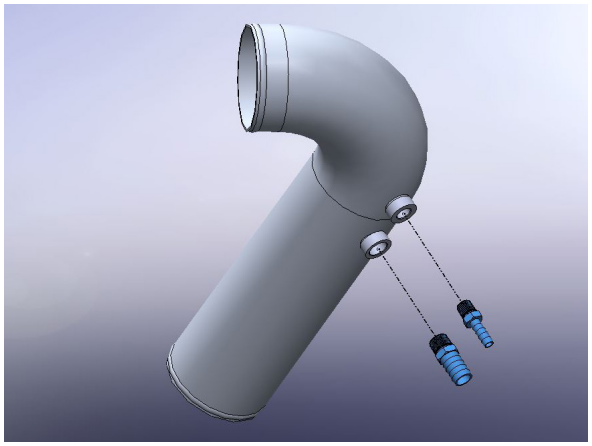

Fig. 6-E: Install barbed fittings on air inlet tube

F. Assemble 1/4" and 5/8" PVC hose onto the barbed fittings.

NOTE: See Appendix B as reference.

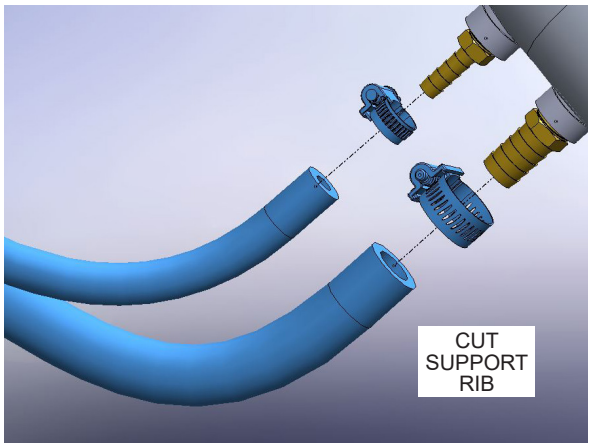

Fig. 6-F: Install hoses on barbed fittings

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6. AIR INLET INSTALLATION

G. Locate the breather hose assembly that was removed in step 1B. Carefully cut the hose off of the 90-degree fitting with a razor blade. Cut the hose along its axis in several light passes until the hose can split off the fitting as to not damage the barbs and O-ring on the fitting. Connect the 5/8" PCV hose to this fitting and secure with a stepless clamp. Reconnect the fitting to the divers side valve cover breather port.

NOTE: See Appendix B as reference.

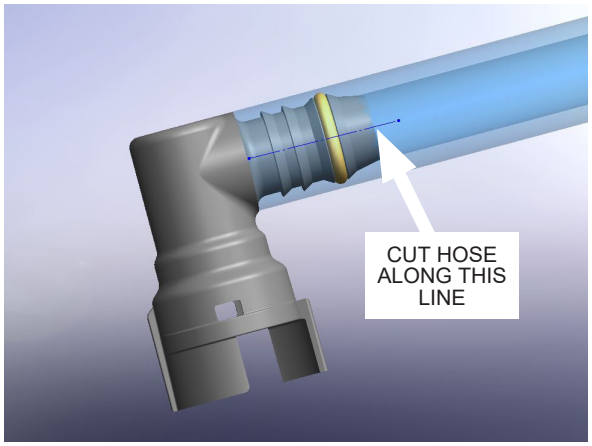

Fig. 6-G: Remove and install 90-degree fitting

H. Cut the 3/8" hose from the air inlet assembly about 4 inches from the end and assemble a check valve with stepless clamps. Ensure that the flow arrow is in the direction pointed towards the intake manifold. Assemble the 4 inch length of hose between the installed check valve and the factory vacuum check valve. Secure the 5/16" hose with stepless clamps as shown.

NOTE: See Appendix B as reference.

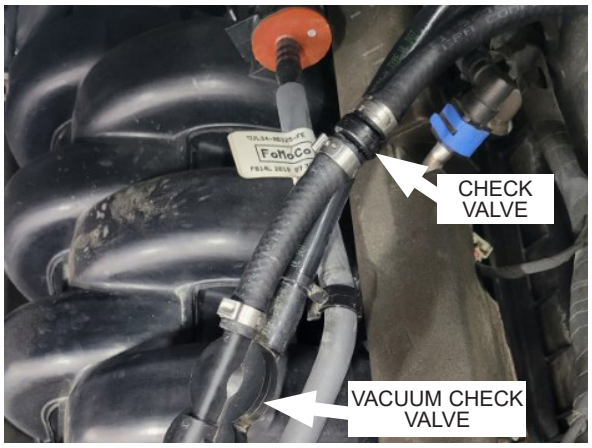

Fig. 6-H: Cut hose and install check valve

I. Assemble the air inlet tube assembly between the supercharger and air cleaner assembly. Secure it with two #56 clamps. Route the 5/16" breather hose to the vacuum check valve secure it with a stepless clamp. Route the larger 5/8" hose to the quick disconnect port on the driver side valve cover.

NOTE: See Appendix B as reference.

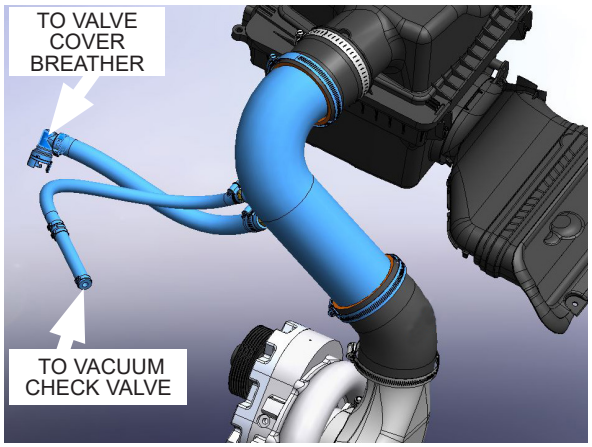

Fig. 6-I: Assemble the air inlet tube

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7. COOLANT HOSE ASSEMBLY INSTALLATION

A. Install the coolant hose assembly which was previously modified in the orientation as shown. Secure the hose to the thermostat water outlet with a #24 hose clamp. Cut to length the 3/4" heater hoses going to the oil cooler, ensuring there are no kinks in the hoses. Secure the 3/4" heater hoses to the oil cooler with #10 hose clamps. Reconnect the coolant hose assembly to the radiator.

NOTE: See Appendix E as reference.

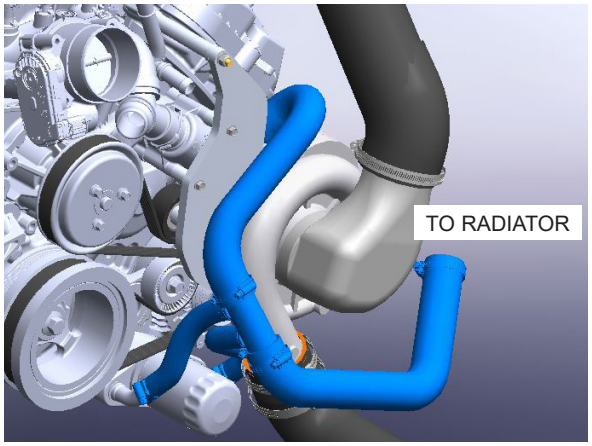

Fig. 7-A: Install coolant hose assembly

B. Check that all coolant hoses are secure and free from interference with surrounding components. Locate the coolant reservoir and refill the engine coolant.

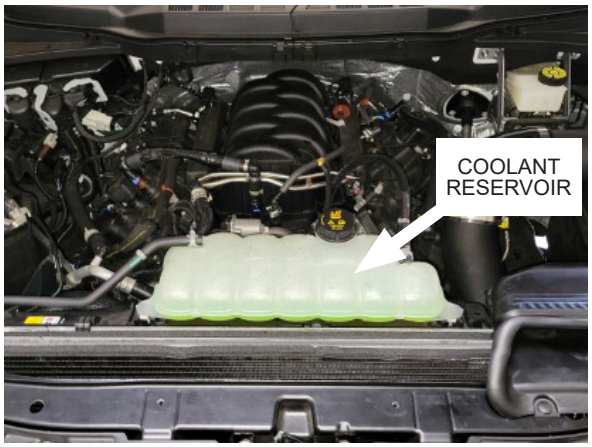

Fig. 7-B: Refill coolant

8. MAP / IAT SENSOR INSTALLATION

A. The MAP / IAT (manifold absolute pressure / intake air intake temperature) sensor is integrated into a single unit. Locate the MAP / IAT sensor on back of the intake manifold. It is in a tight space between the intake manifold and fire wall.

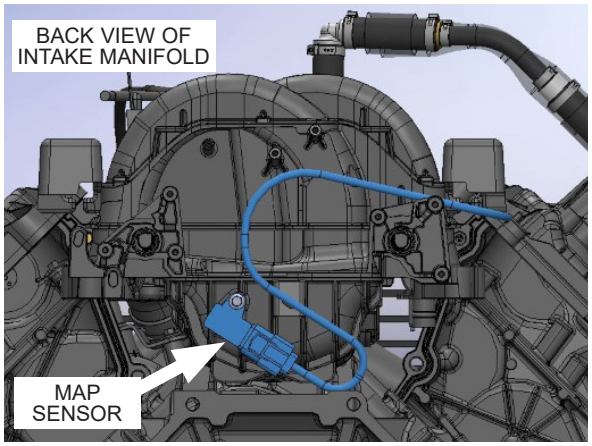

Fig. 8-A: Locate MAP / IAT sensor

B. Using an 8mm deep socket, remove the single fastener which secures the sensor to the intake manifold. Remove the sensor from the intake manifold by pulling it out towards the rear of the truck. Pull the sensor up to where you can see the connector and harness. Carefully unlock the connector by pulling the lock tab and then depress the connector latch and disconnect the MAP / IAT connector.

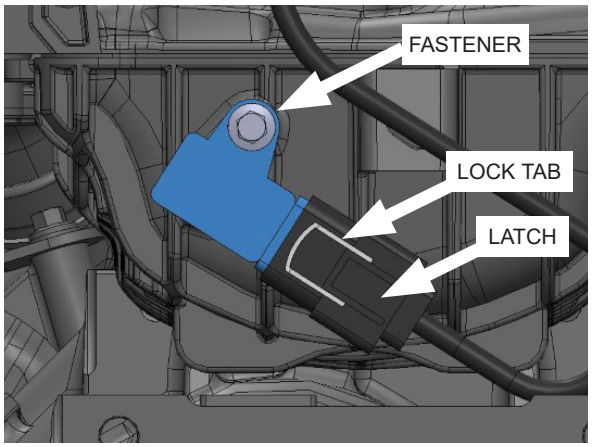

Fig. 8-B: Disconnect and remove MAP / IAT sensor

C. Install the adapter harness between the chassis harness and new MAP sensor. Install the new MAP / IAT sensor in the reverse order of removal.

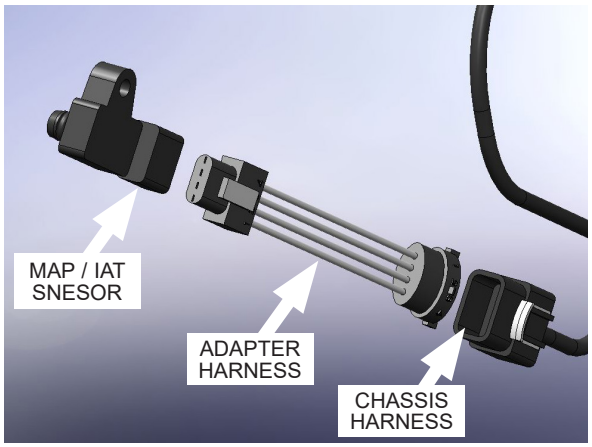

Fig. 8-C: Install harness adapter and new MAP / IAT sensor

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9. GENERAL REASSEMBLY

A. Drill a 1/4 inch hole in the side of plastic oil drain gutter for a hole to zip tie the supercharger drain line to. The oil drain gutter is located directly below the oil filter.

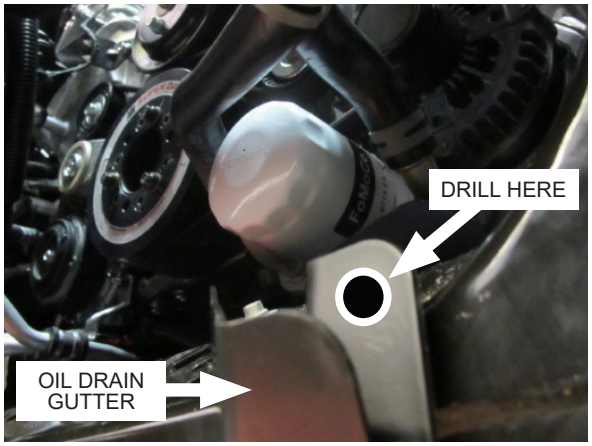

Fig. 9-A: Drill hole in oil drain gutter

B. Route the supercharger oil drain line downwards and towards the front of the truck. Secure it to the oil drain gutter with zip tie.

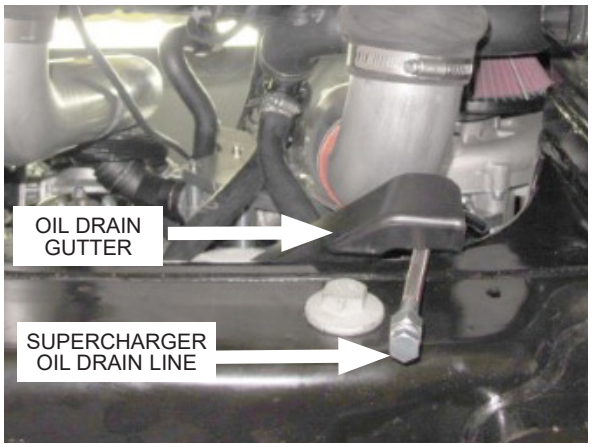

Fig. 9-B: Secure oil drain line

C. Flip the horns on its mounting bracket so the locating tab is facing the front of the truck and not towards the locating hole in the radiator support. Ensure the connector is on the indicated side. Reconnect the connector and reinstall the horn assembly. Some adjustments to the clocking and horn position by bending the bracket slightly maybe necessary to make clearance for the connector behind the charge cooler mounting bracket.

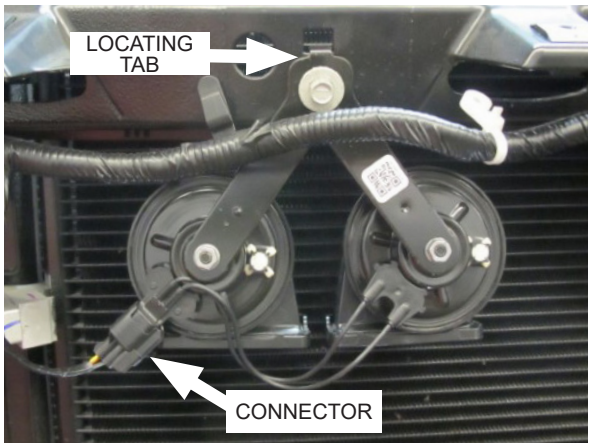

Fig. 9-C: Flip bracket and install horn

9. GENERAL REASSEMBLY

D. Reinstall the grill and secure using the original hardware and plastic fasteners.

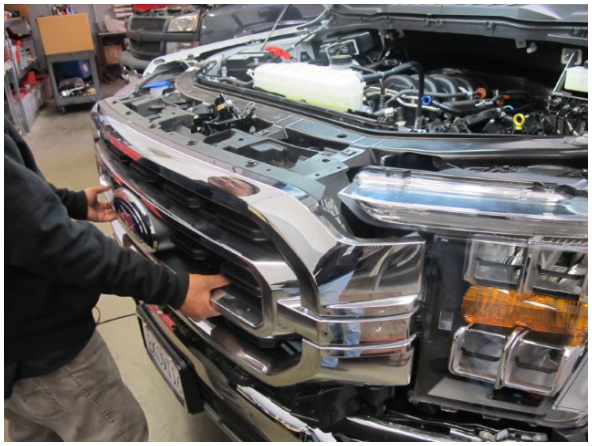

Fig. 9-D: Reinstall the grill

E. Relocate the air deflector actuator motor to a plastic cross member located on top of the shutter shroud, next to the hood latch. Secure it with the suppled zip ties. Reconnect the connector

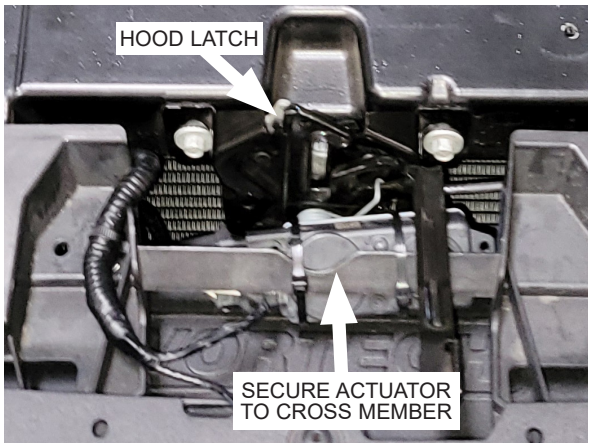

Fig.9-E: Mount air deflector actuator motor

F. Reinstall the ambient air temperature sensor to its original location. Secure it with its locking clip. Reconnect the connector

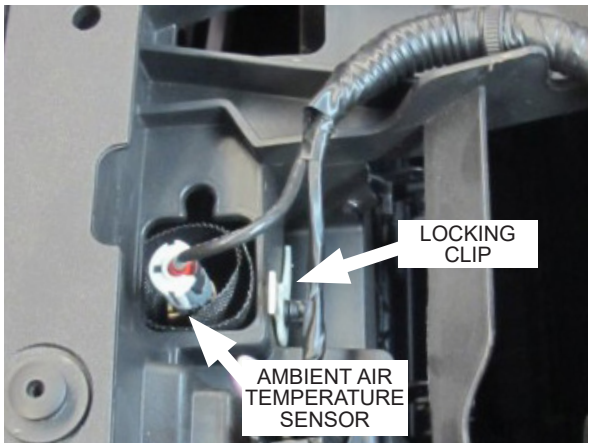

Fig. 9-F: Install and reconnect ambient air temperature sensor

9. GENERAL REASSEMBLY

G. Reinstall the bumper trim by snapping it back into place and securing it using the original hardware at the corners.

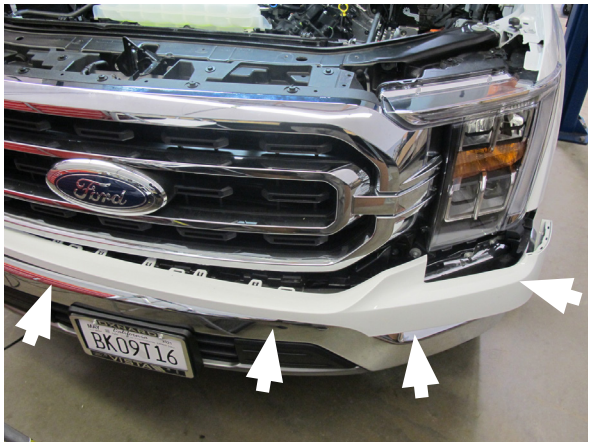

Fig. 9-G: Reinstall bumper trim

H. Reinstall the radiator support cover and secure it using the original plastic fasteners.

Fig. 9-H: Reinstall radiator support cover

I. Using a 10mm socket, reconnect the negative battery cable.

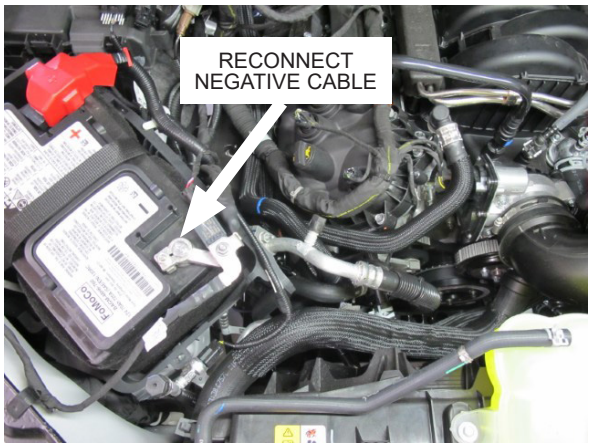

Fig. 9-I: Reconnect negative battery cable

10. ECU PROGRAMMING

NOTE: This section applies to 'Complete' supercharger systems. All others proceed to Section 11.

The software provided to load the tune to the handheld device is compatible only with Windows 7 and newer Based computers and can be found at:

https://www.livernoismotorsports.com/instructions-and-downloads

The device is sent out blank, so you will need to complete a tune request here:

https://forms.gle/wnkG4o1QDzezTtsK6

A. Install Livernois MyCalibrator software on your Widows 7, 8, 8.1, or 10 Machine.

1. After install is complete, connect device to PC via supplied USB cable.
2. Program should connect automatically with tuner displaying serial number, firmware version number, and will check for updates. Please follow all on screen prompts and fully complete all updates for MyCalibrator Software and MyCalibrator Touch Tuner before connecting to vehicle.
3. Complete registration prompt.

B. Connecting to vehicle:

1. Turn off all accessories & unplug any electronic devices from any power or USB ports (A/C, radio, auto lights, bluetooth, etc.).
2. Set the device on a stable, flat surface.
3. Do not let anyone else approach the vehicle. Do not open the doors and be sure that the radio is in the 'OFF' position.
4. Be sure your vehicle's battery is sufficiently charged, otherwise use a battery tender to ensure that the battery doesn't fall below 12 volts.
5. On vehicles with active cruise control and rain sensing wipers, it is common for the warning light on top of the dash and the wipers to turn on.
6. For vehicles with traditional keyed ignition, turn your key to the “RUN” position while keeping the engine turned off. For vehicles with push-button ignition refer to your owner’s manual for your vehicle’s proper method. **KEEP YOUR FOOT OFF THE BRAKE - DO NOT START THE VEHICLE!**
7. Connect the MyCalibrator handheld device to the OBD-II port with the supplied cable.
8. Retrieve the “SW”, “Strat”, and “Trans” Code(s) by select 'Module Info' from the main menu.
9. Record, and provide the 1-3 code(s) note that not all vehicles utilize all 3 codes, along with all other items identified in the Tune Request Form:

https://forms.gle/wnkG4o1QDzezTtsK6

C. Installation:

1. Saving your stock tune file:
   i. With the device still connected to the OBD-II port, vehicle in run mode, and the engine turned off. Select the 'PROGRAMMING' option in the main menu and follow the on-screen prompts to read/save your stock tune file. Do not turn off the ignition or unplug the device until the device prompts you to do so.
2. Sending your stock tune to Livernois Motorsports:
   i. Connect MyCalibrator Touch to Windows PC.
   ii. Run MyCalibrator Program.
   iii. Confirm VIN now displays on MyCalibrator Program.
   iv. Allow program to send stock file to Livernois Motorsports for backup purposes.
3. Requesting your Livernois Motorsports Tune:
   Fill out online Tune Request Form. This must be filled out completely and accurately for us to be able to produce your calibrations. You will need the information from Section “B” above to complete.

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4. Downloading your Tune:

   i. After receiving your email/communication from Livernois Motorsports stating your Tune File(s) is (are) ready, connect MyCalibrator Touch to Windows PC.

   ii. Run MyCalibrator Program.

   iii. Allow Download/update process to complete.

   iv. Confirm Program now shows Livernois Tunes in addition to Stock file.

5. Installing your Tune:

   i. Turn off all accessories & unplug any electronic devices from any power or USB ports (A/C, radio, auto lights, etc.).

   ii. Connect the MyCalibrator handheld device to the OBD-II port with the supplied cable.

   iii. Set the device on a stable, flat surface.

   iv. Do not touch anything until it finishes.

   v. Do not let anyone else approach the vehicle. Do not open the doors and be sure that the radio is in the **"OFF"** position.

   vi. Be sure your vehicle's battery is sufficiently charged, otherwise use a battery tender to ensure that the battery doesn't fall below 12 volts.

   vii. On vehicles with active cruise control and rain sensing wipers, it is normal for the warning light on top of the dash and the wipers to turn on (unless rain sensing is shut off).

   viii. For vehicles with traditional keyed ignition, turn your key to the **"RUN"** position while keeping the engine turned off. For vehicles with push-button ignition refer to your owner's manual for your vehicle's specific method. **KEEP YOUR FOOT OFF THE BRAKE,** and depending on your specific vehicle's method, press the start button once, twice, or press and hold to enter 'RUN' mode. **DO NOT START THE VEHICLE.**

   ix. Select "PROGRAMMING" option from main menu

   x. Select "Preloaded Tunes" Option on Tuner

   xi. Touch, and Drag to select the desired Livernois Tune

   xii. Confirm your desired Livernois Tune is selected and follow all on screen prompts

6. After install of tuning:

   i. If mechanical upgrades were installed, check vehicle for any possible fuel or vacuum leaks, and if none present, start vehicle.

   ii. If your vehicle is equipped with an automatic transmission, several miles and/or days of driving may be required for all adaptive learning to complete. Do not be alarmed at shift quality immediately after installing of tune. It is recommended to do light throttle driving until shift quality has stabilized.

D. California Residents:

1. Clean a flat visible surface under the hood and affix the enclosed CARB EO sticker for SMOG purposes.

For tuning support:

https://www.livernoismotorsports.com/support

313-561-5500

Livernois Motorsports business hours - 9:00am - 6:00pm EST M-F 9:00am – 1:00pm EST Saturdays.

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10. FINAL CHECK

WARNING: Do not attempt to operate the vehicle until all components are installed and all operations are completed including the final check.

A. If your vehicle has gone over 15,000 miles since its last spark plug change, you will need to change the spark plugs now *before* test driving the vehicle.

B. Check all fittings, and clamps for tightness. Double check that all nuts and bolts are torqued to specifications noted in the appendixies. Pay particular attention to oil and fuel lines around moving parts, sharp edges and exhaust system parts. Make sure all wires and lines are properly secured with clamps or zip ties.

C. Check all fluid levels, making sure that your tank(s) is/are filled with 91 octane or higher fuel before commencing test drive.

D. Start the engine and allow to idle a few minutes, then shut off.

E. Recheck to be sure that no hoses, wires, etc. are near exhaust headers or moving parts. Look also for any signs of fluid leakage.

F. **PLEASE TAKE SPECIAL NOTE:** Operating the vehicle without ALL the subassemblies completely and properly installed may cause **FAILURE OF MAJOR COMPONENTS.**

G. Test drive the vehicle.

H. Always listen carefully for engine detonation. Discontinue heavy throttle usage if detonation is heard.

I. Read the **STREET SUPERCHARGER SYSTEM OWNER'S MANUAL AND RETURN THE WARRANTY REGISTRATION FORM** within thirty (30) days of purchasing your supercharger system to qualify.

For internally lubricated V3 units only

This supercharger has been factory pre-filled with special Vortech synthetic lubricant. Oil does not need to be added to a brand-new unit, however a fluid level check should be performed.

Prior to operating the supercharger on the vehicle and after installation onto the vehicle:

Remove the factory installed flat-head brass shipping plug (not the dipstick) from the top of the supercharger case. Replace the sealed shipping plug with the supplied “vented” plug. Do not operate the supercharger without it. Check the supercharger fluid level.

Fluid level checking procedure:

1. Verify that the vehicle is at room temperature. Ensure that the .06” copper sealing washer is located on the dipstick base.
2. Thread the clean dipstick into the unit until it seats.
3. Once the dipstick has seated, remove the dipstick from the unit. Fluid should register in the crosshatched area on the dipstick.
4. DO NOT OVERFILL!!! Drain excess fluid from the unit if it is above the maximum level on the dipstick.

Check the fluid level using the dipstick at least every 2,500 miles.

Initial supercharger fluid change must be performed at 2,500 miles. The supercharger fluid must be changed at least every 7,500 miles.

Drain the fluid, refill the unit with 4 oz. of Vortech V3 synthetic lubricating fluid and then confirm proper oil level using the dipstick. DO NOT OVERFILL!!!

WARNING: Use of any other fluid other than the proprietary Vortech/Paxton synthetic lubricant will void the warranty and may cause component failure.

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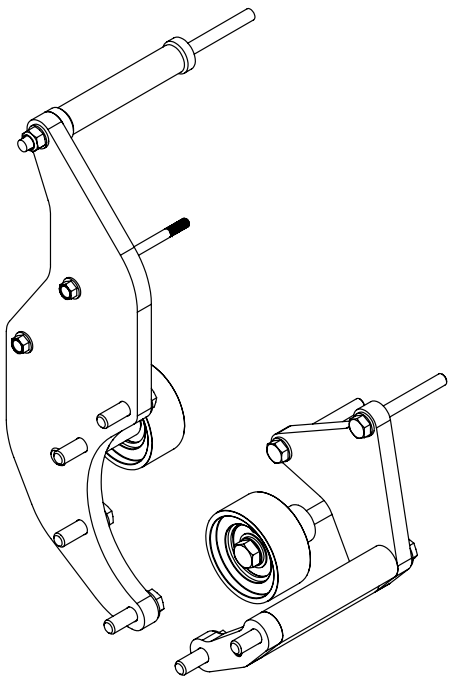
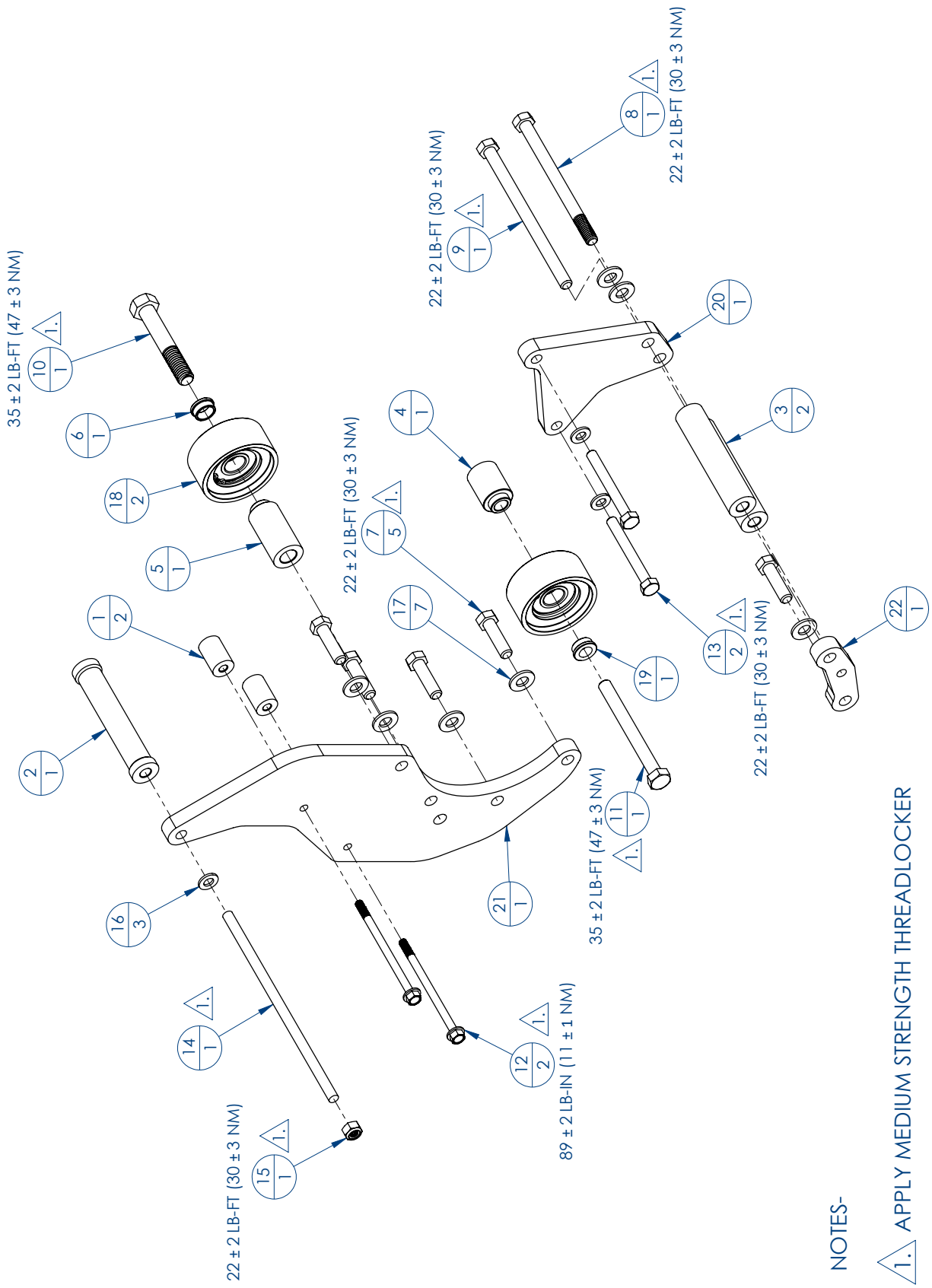
APPENDIX A1. DIAGRAM, MOUNTING BRACKET ASSEMBLY



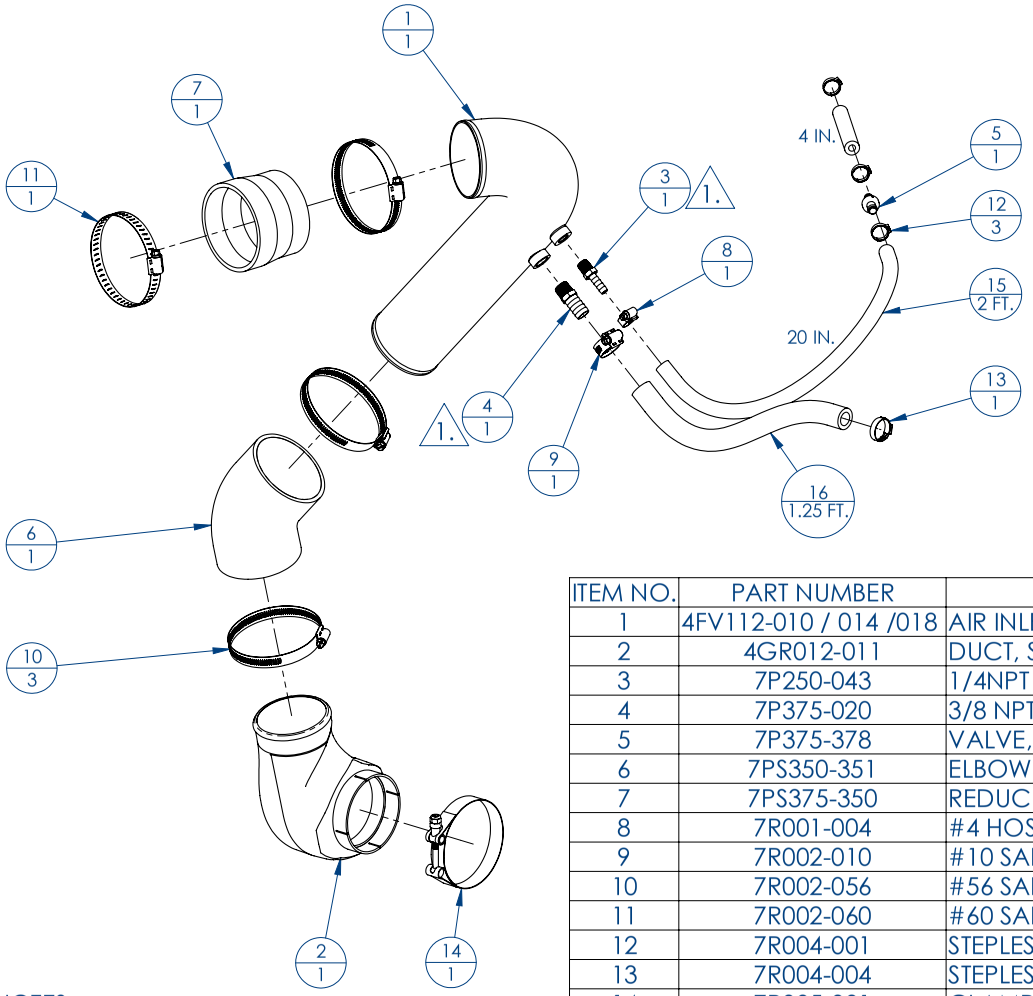
VIEW FOR REFERENCE

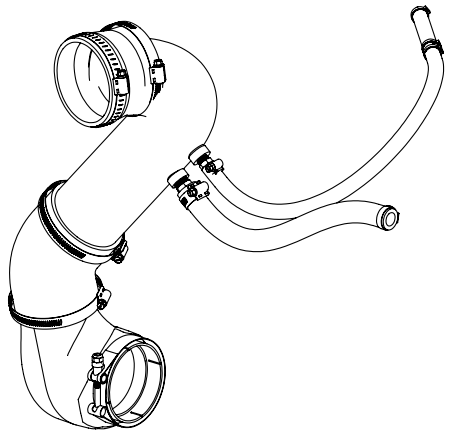
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	2A017-700-105	STANDOFF, .260" ID, .700" OD, 1.053" L	2
2	2A017-875-445	STANDOFF, .354" ID, .875" OD, 4.456" L, NECK DOWN 0.75"	1
3	2A017-880-398	STANDOFF, .397" ID, .880" OD, 3.976" L	2
4	4FV017-980-119	BEARING SUPPORT, 17 MM, IDLER PULLEY, .433" ID X 1.197" L	1
5	4FV017-980-188	BEARING SUPPORT, 17 MM, IDLER PULLEY, .531" ID X 1.875" L	1
6	4GA017-002	BEARING SUPPORT, 17 MM, IDLER PULLEY, .500" ID X .100" L	1
7	7A375-138	3/8-16 X 2 HXHD	5
8	7A375-500	3/8-16 X 5" HX HD GRADE 8	1
9	7A375-575	3/8-16 X 5.75 HXHD GR8 PLT	1
10	7A500-300	1/2"-13 X 3.00"L HHCS GR 8.8. YELLOW ZINC	1
11	7C010-100	M10 X 1.5 X 100 HXHD CL8.8	1
12	7C060-100	M6 X 1.0 X 100MM FLG HD CL10.9+ ZINC	2
13	7C080-070	M8 X 1.25 X 70 HXHD ZINC	2
14	7C080-200	M8 X 1.25 X 200MM STUD, 35MM THREAD	1
15	7F008-023	NUT, M8 X 1.25 NYLOCK NUT	1
16	7J080-002	WASHER, M8 x 1.8 FLAT, ZN PLT	3
17	7J375-044	WASHER, 3/8 SAE PLTD	7
18	1210517	ASY, IDLER PLY, SMOOTH 6RIB	2
19	XP-2978	BEARING SUPPORT, 17 MM, IDLER PULLEY, .433" ID X .100" L	1
20	XP-3040	S/C BASE PLATE REAR, 2018 FORD TRUCK, 5.0	1
21	XP-3041	S/C BASE PLATE FRONT, 2018 FORD TRUCK, 5.0	1
22	XP-3043	MOUNT, BASE, 2018 FORD F150 5.0	1

APPENDIX A2. DIAGRAM, MOUNTING BRACKET ASSEMBLY



APPENDIX B. DIAGRAM, AIR INLET ASSEMBLY





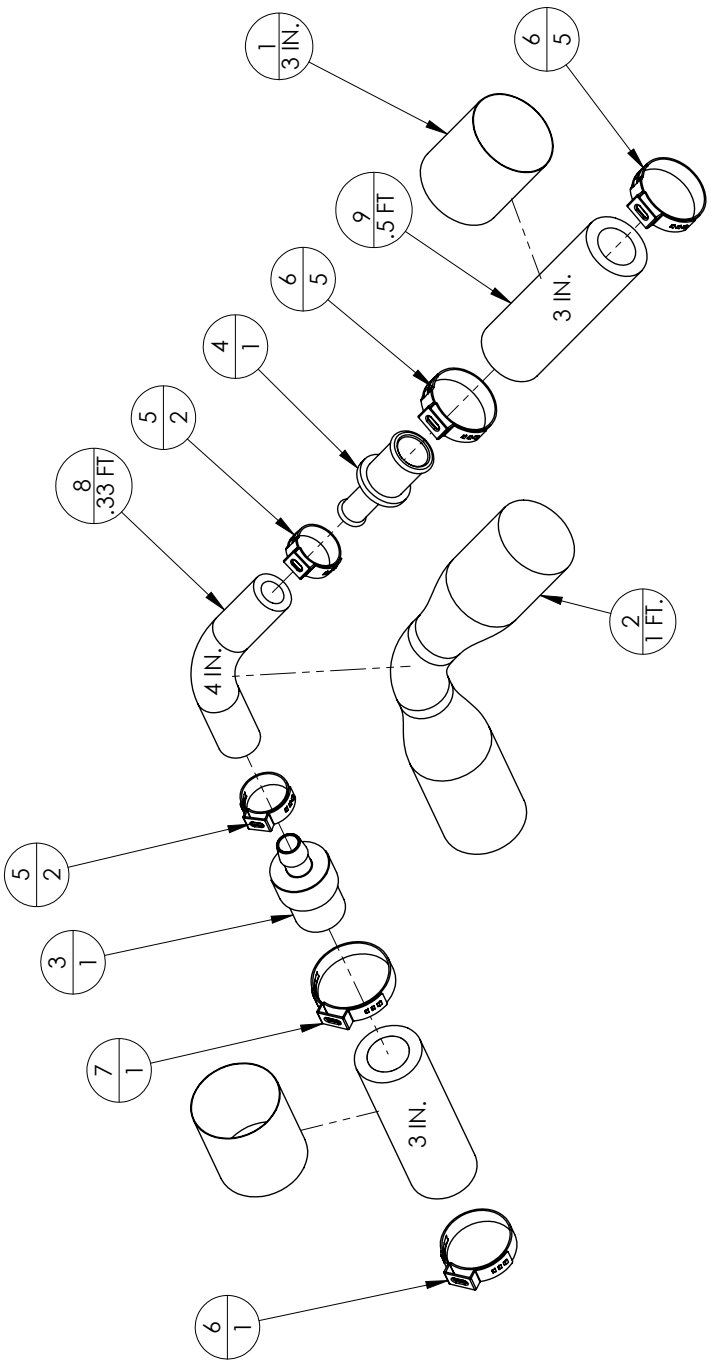
VIEW FOR REFERENCE

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	4FV112-010 / 014 /018	AIR INLET TUBE, 2020 F150, SAT / BLK / POL	1
2	4GR012-011	DUCT, S/C INTAKE, MACH	1
3	7P250-043	1/4NPT X 5/16" BARB	1
4	7P375-020	3/8 NPT X 5/8 HOSE BARB, BEADED	1
5	7P375-378	VALVE, CHECK, 3/8 BARB X 3/8 BARB, VITON DIAPHRAGM	1
6	7PS350-351	ELBOW, BLK-SIL 3.5" X 45, SHORT	1
7	7PS375-350	REDUCER, BLK 3.75-3.5 X 3.0L	1
8	7R001-004	#4 HOSE CLAMP	1
9	7R002-010	#10 SAE TYPE F SS HOSE CLAMP	1
10	7R002-056	#56 SAE TYPE F SS HOSE CLAMP	3
11	7R002-060	#60 SAE TYPE F SS HOSE CLAMPS	1
12	7R004-001	STEPLESS CLAMP, 15.7-70	3
13	7R004-004	STEPLESS CLAMP, 25.6 X 7MM WID 1" hose	1
14	7R005-001	CLAMP, T-BOLT, 208-91	1
15	7U031-016	5/16" PCV/VAC RUBBER HOSE8" PCV HOSE	2 FT.
16	7U033-000	5/8" PCV HOSE	1.25 FT.

NOTES-

1. APPLY PIPE SEALANT TO THREADS

APPENDIX C. DIAGRAM, PCV ASSEMBLY



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	5W001-030	1 1/2" HEAT SHRINK	3 IN.
2	5W001-082	SLEEVE, FLEX BRAID .75" NOM.	1 FT.
3	7P375-106	PCV VALVE, FORD, 3/8" HOSE	1
4	7P625-375	REDUCER, 5/8 BARB TO 3/8 BARB	1
5	7R004-002	STEPLESS CLAMP, 17.0-70	2
6	7R004-004	STEPLESS CLAMP, 25.6 X 7MM WID 1" hose	3
7	7R004-007	STEPLESS CLAMP, 28.6 X 7MM WID 1.126 IN OPEN - 1.00 IN Closed	1
8	7U030-056	3/8" FUEL LINE/PCV/EEC RUBBER HOSE	.33 FT.
9	7U033-000	5/8" FUEL LINE/PCV/EEC RUBBER HOSE	.5 FT.

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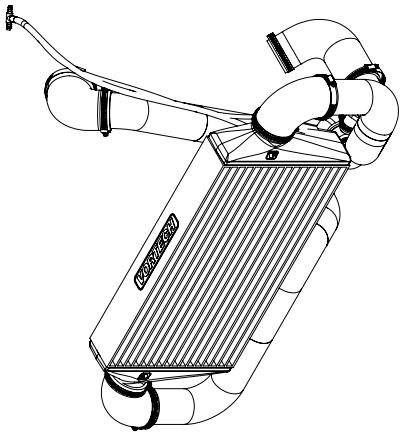
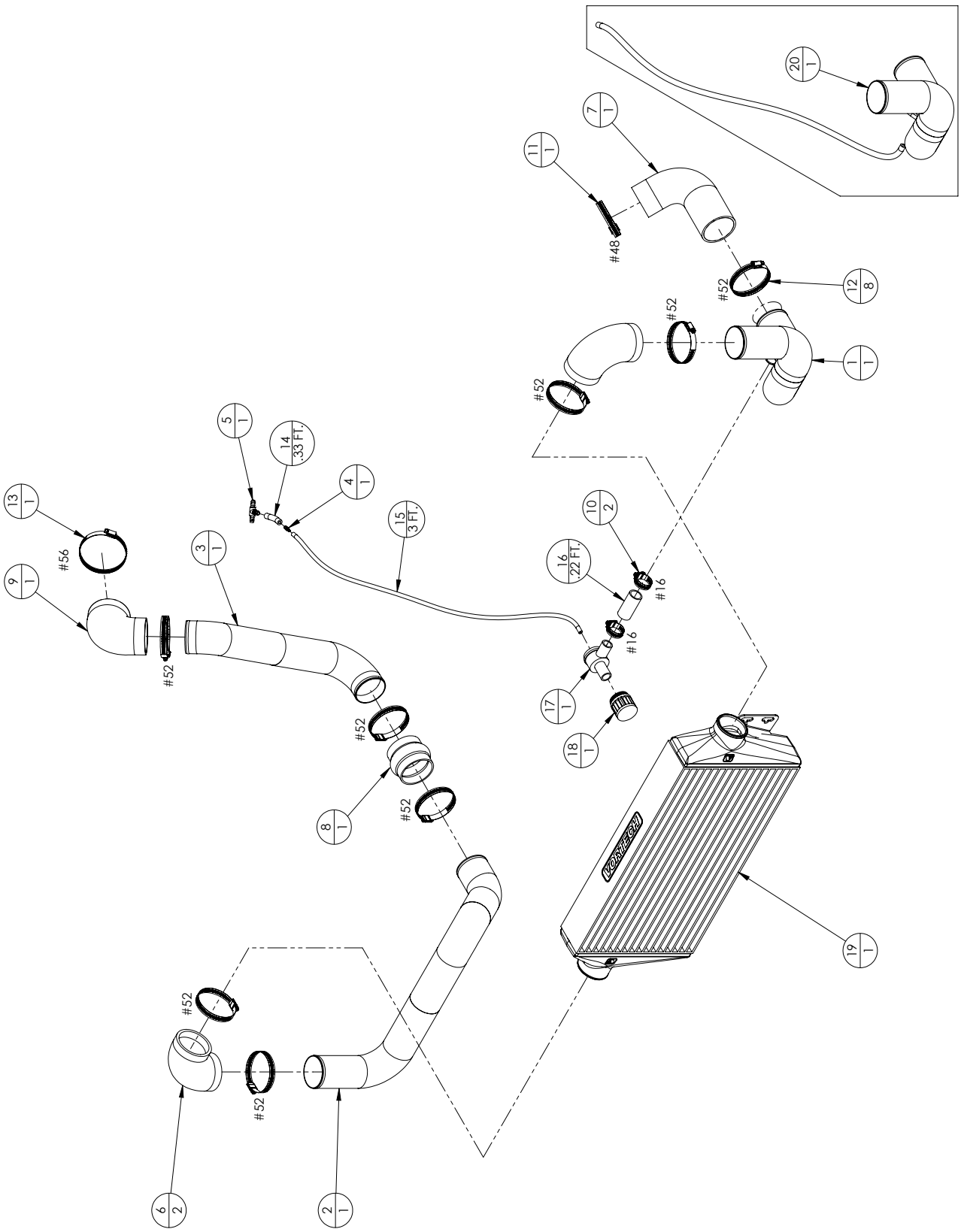
APPENDIX D1. DIAGRAM, DISCHARGE ASSEMBLY



VIEW FOR REFERENCE

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	4FV112-020 / 024	DISCHARGE TUBE B, 1 IN PORT, 2021 F150 SAT / BLK	1
2	4FV012-030 / 034	DISCHARGE TUBE C, 2021 F150, SAT / BLK	1
3	4FV012-040	DISCHARGE TUBE D, 2021 F150	1
4	7P250-033	1/4 X 5/32 REDUCER UNION	1
5	7P312-082	5/16 TEE HOSE BARB	1
6	7PS300-091	ELBOW, BLK, 3" X 90 SILICONE, .75" LEGS, MOD	2
7	7PS300-278	REDUCER, ELBOW, BLK, 3.0-2.75, 90 DEG	1
8	7PS300-301	BUMP HOSE, 3.00D X 3.00L	1
9	7PS350-305	REDUCER, ELBOW, 3.50 X 3.0 X 90	1
10	7R002-016	#16 SAE TYPE F SS HOSE CLAMP	2
11	7R002-048	#48 SAE TYPE F SS HOSE CLAMP	1
12	7R002-052	#52 SAE TYPE F SS HOSE CLAMP	8
13	7R002-056	#56 SAE TYPE F SS HOSE CLAMP	1
14	7U030-030	1/4" VACUUM HOSE	.33 FT.
15	7U030-046	5/32" VACUUM LINE	3 FT.
16	7U034-016	1" GS HEATER HOSE	.22 FT.
17	8D001-004	COMPRESS BYPASS VALVE, G2	1
18	8H040-075	FILTER, 1" BYPASS VALVE	1
19	8PN101-050 / 054	WELDED CORE ASSY, 05 MUST GT / BLK	1
20	4VF212-100 / 104	RACE BOV UPGRADE ASSY, 2021 F150, SAT/ BLK	1

APPENDIX D2. DIAGRAM, DISCHARGE ASSEMBLY



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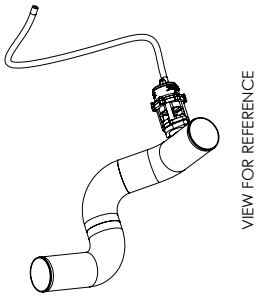
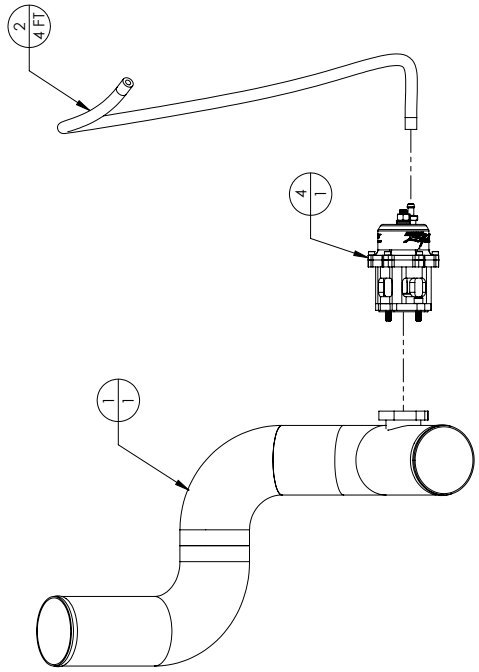
APPENDIX D3. DIAGRAM, RACE BOV UPGRADE ASSEMBLY

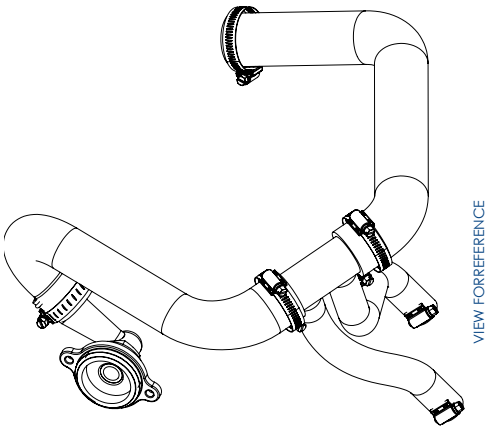


VIEW FOR REFERENCE

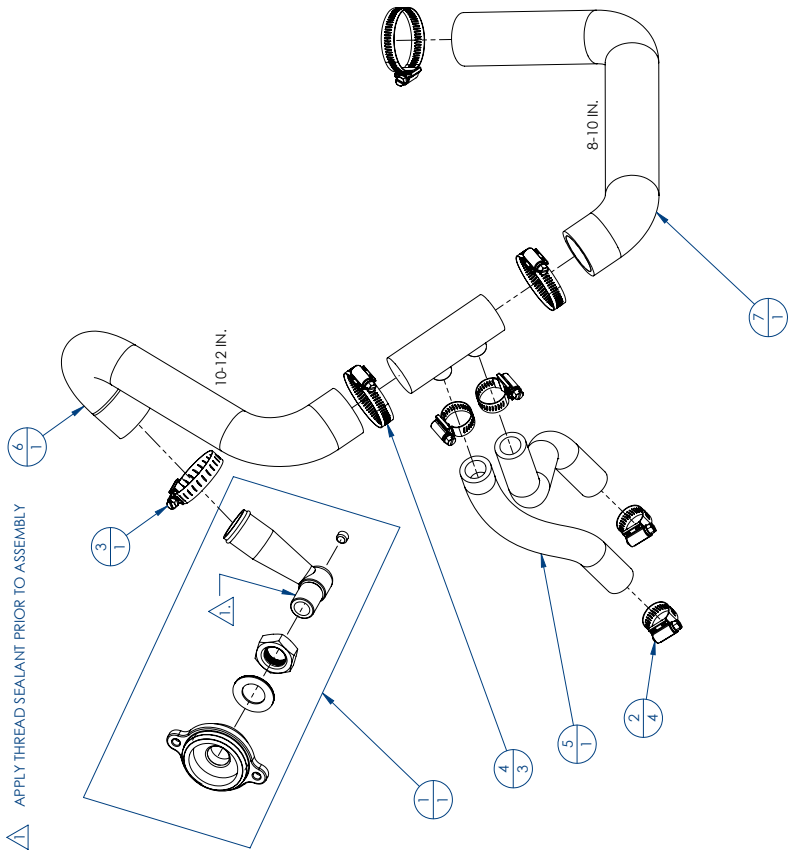
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	4FV112-050 / 054	DISCHARGE TUBE B, 2021 F150, RACE BOV, SAT / BLK	1
2	7U030-030	1/4" VACUUM HOSE	4 FT.
3	7U100-055	TIE WRAP, 7.5" NYLON	4
4	8D204-111	ASSY, BILLET RACE BOV, BLACK	1



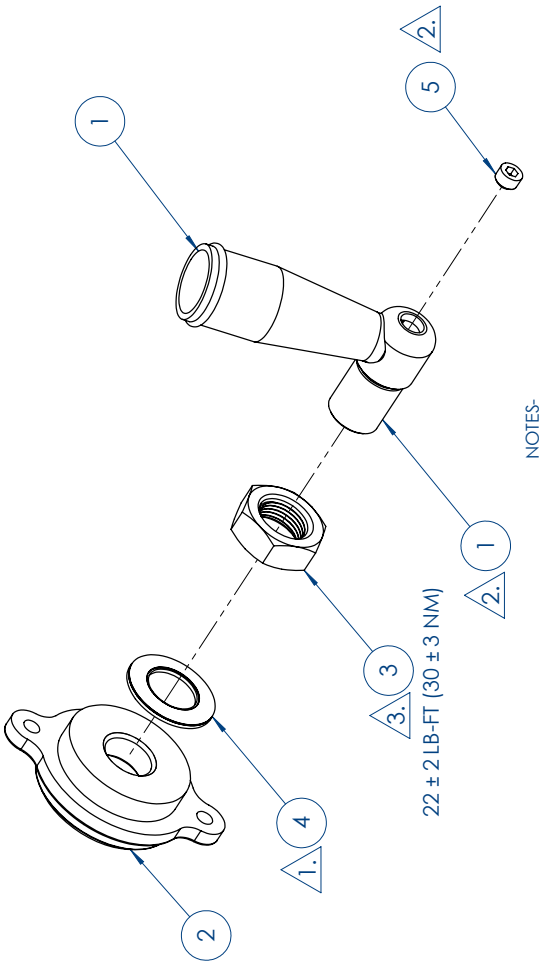
APPENDIX E1. DIAGRAM, COOLANT MOD ASSEMBLY



ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	4FV214-021	ASSY, WTR OUTLT, 2018 FORD F150, 5.0L	1
2	7R002-010	#10 SAE TYPE F SS HOSE CLAMP	4
3	7R002-024	#24 SAE TYPE F SS HOSE CLAMP	1
4	7R002-028	#28 SAE TYPE F SS HOSE CLAMP	3
5	7U038-000	3/4" HEATER HOSE	2 FT.
6	7U133-126	REDCR, 1.50" TO 1.25", MLD, CLNT, 2020 F150 5.0	1
7	7U133-150	CLNT HSE, LWR, 1.5", 2020 F150 5.0	1



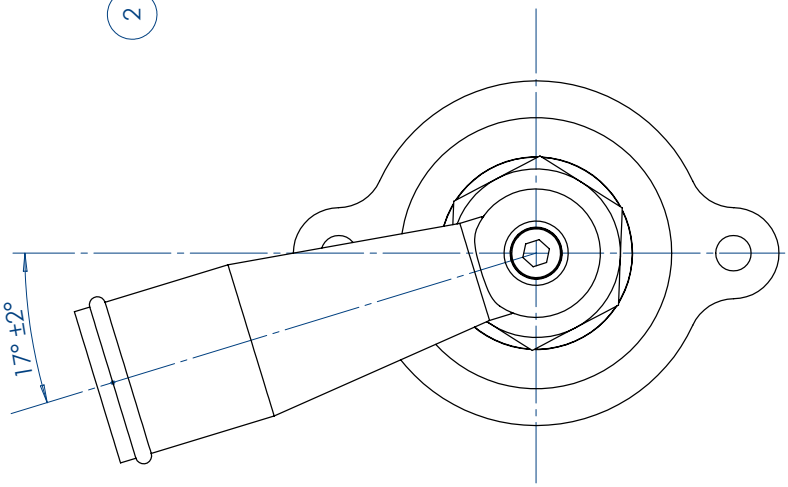
APPENDIX E2. DIAGRAM, WATER OUTLET ASSEMBLY



NOTES-

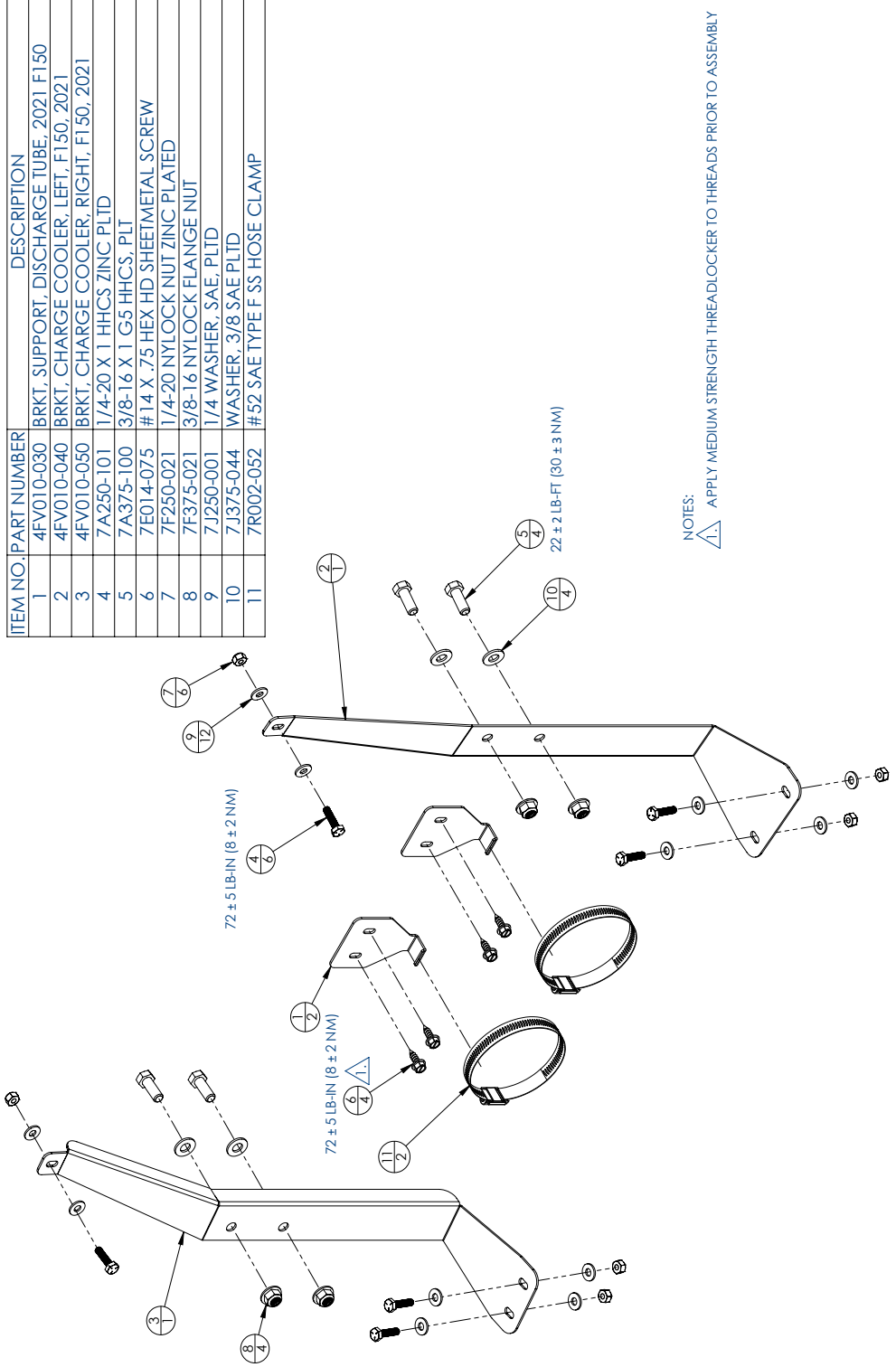
1. ASSEMBLE RUBBER SIDE TOWARDS THERMOSTAT HOUSING
2. APPLY PIPE SEALANT TO THREADS PRIOR TO ASSEMBLY
3. SCREW JAM NUT ALL THE WAY ONTO THREADS OF WATER PIPE ASY THEN ASSEMBLE INTO THERMOSTAT HOUSING IN THE CLOCKING POSITION AS SHOWN BEFORE TIGHTENING JAM NUT

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	4FU114-021	ASY, WATER OUTLET, 05 MUST GT	1
2	4FV014-030	THERMOSTAT HOUSING, 7/8-14 PORT, 2018 FORD F150 5.0	1
3	7F875-010	NUT, 7/8-14, SHORT/JAM	1
4	7J875-015	7/8 SEALING WASHER, STAINLESS STEEL	1
5	7P125-016	PLUG, 1/8" NPT, STEEL	1

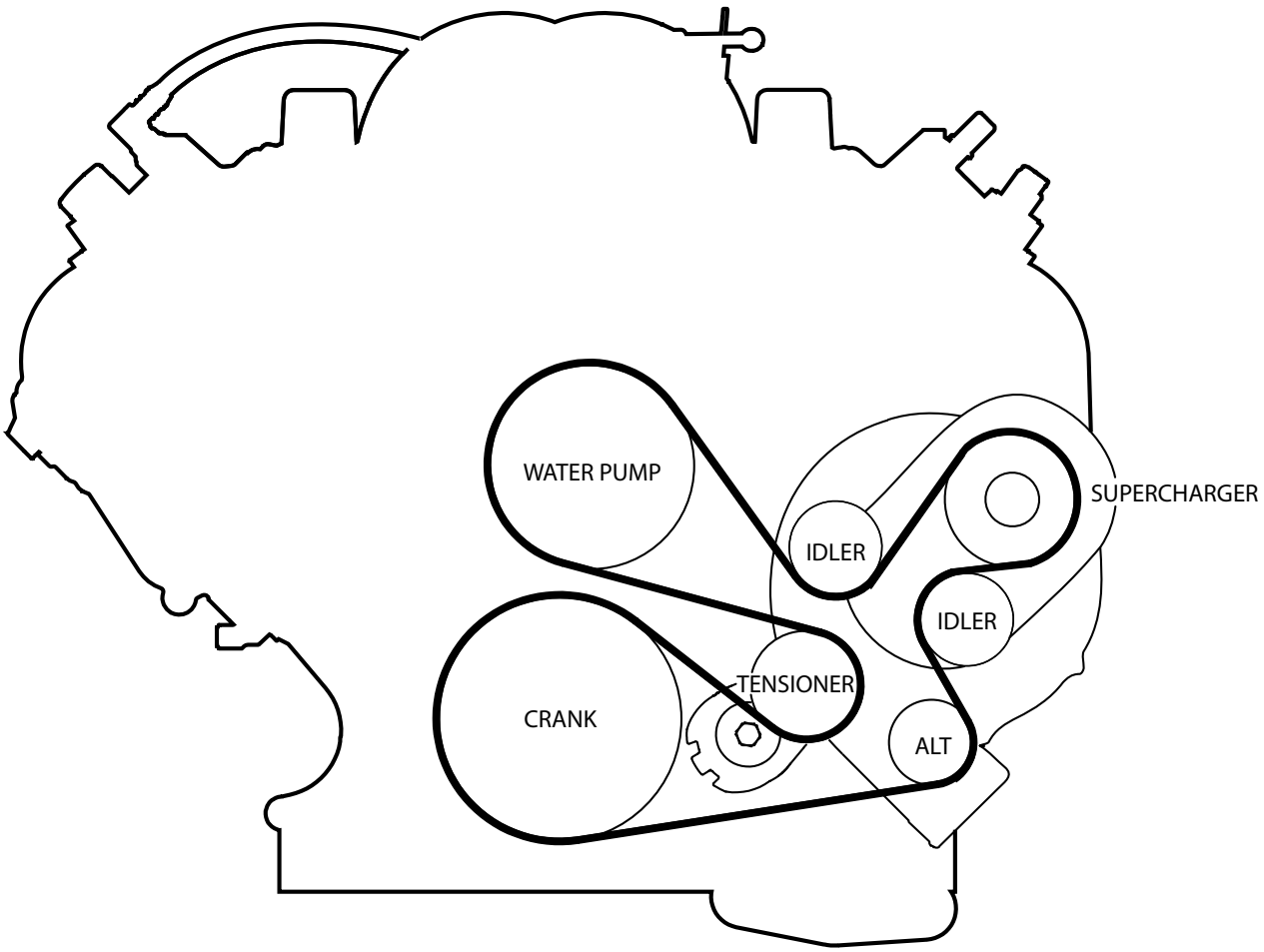


APPENDIX F. DIAGRAM, SUPPORT ITEMS

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	4FV010-030	BRKT, SUPPORT, DISCHARGE TUBE, 2021 F150	2
2	4FV010-040	BRKT, CHARGE COOLER, LEFT, F150, 2021	1
3	4FV010-050	BRKT, CHARGE COOLER, RIGHT, F150, 2021	1
4	7A250-101	1/4-20 X 1 HHCS ZINC PLTD	6
5	7A375-100	3/8-16 X 1 G5 HHCS, PLT	4
6	7E014-075	#14 X .75 HEX HD SHEETMETAL SCREW	4
7	7F250-021	1/4-20 NYLOCK NUT ZINC PLATED	6
8	7F375-021	3/8-16 NYLOCK FLANGE NUT	4
9	7J250-001	1/4 WASHER, SAE, PLTD	12
10	7J375-044	WASHER, 3/8 SAE PLTD	4
11	7R002-052	#52 SAE TYPE F SS HOSE CLAMP	2



APPENDIX G. DIAGRAM, BELT ROUTING



REPLCAEMNT BELT:

VORTECH PN: 2A046-790

GATES PN: K060790

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P/N: 4FV020-020 - v1.0, 01/16/2024