Scion FR-S and Subaru BRZ

Supercharger System Installation Instructions

2013 MODEL YEAR

50-state smog legal per CARB E.O. # D-213-34

VORTECH SUPERCHARGERS

1650 Pacific Avenue, Channel Islands, CA., 93033-9901 • Phone: 805 247-0226 • Fax: 805 247-0669 • vortechsuperchargers.com • M-F 7:00AM - 3:30PM (PST)

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 7am-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 (un-modified, 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 the problem is resolved.
5. Vortech is not responsible for any clutch, transmission, drive-line 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.

©2014 VORTECH ENGINEERING, INC
All rights reserved. No part of this publication may be reproduced, transmitted, transcribed, or translated into another language in any form, by any means without written permission of Vortech Engineering, Inc.

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

TABLE OF CONTENTS

FOREWORD ii
TABLE OF CONTENTS iii
TOOL & SUPPLY REQUIREMENTS v
PARTS LIST, 4TF218-014L, 4TF218-114L & 4TF218-124 vi
1. ECU RE-FLASH **(COMPLETE KITS ONLY)** 1
2. PREPERATION/REMOVAL 8
3. MOUNTING BRACKET AND SUPERCHARGER INSTALLATION 10
4. CHARGE AIR COOLER INSTALLATION 18
5. MAF HARNESS EXTENSION 25
6. WINDSHIELD WASHER RESERVOIR INSTALLATION 26
7. CHARGE AIR COOLER TUBE INSTALLATION 30
8. COMPRESSOR BYPASS VALVE INSTALLATION 33
9. PCV VALVE INSTALLATION 34
10. AIR INLET INSTALLATION 35
11. OIL FEED & DRAIN INSTALLATION **(COMPETITION UNITS ONLY)** 38
12. FINAL CHECK 47
13. APPENDIX 48

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

COPYRIGHT NOTICE

This product is protected by state common law, copyright and/or patent. All legal rights therein are reserved. The design, layout, dimensions, geometry and engineering features shown in this product are the exclusive property of Vortech Engineering, Inc. This product may not be copied or duplicated in whole or part, abstractly or fundamentally, intentionally or fortuitously, nor shall any design, dimension, or other information be incorporated into any product or apparatus without prior written consent of Vortech Engineering, Inc.

©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

SCION FR-S AND SUBARU BRZ
Installation Instructions

Congratulations on selecting the best performing and best backed automotive supercharger available today... the VORTECH® Supercharger!

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

Vortech supercharger systems are performance improving devices. In most cases, increases in torque of 30-35% and horsepower of 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.

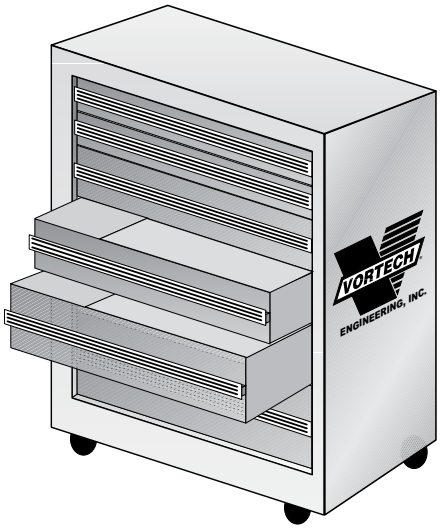
Installation on new vehicles will not harm or adversely affect the break-in period so long as factory break-in procedures are followed.

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. Perform an oil and filter change upon completion of this installation and prior to test driving your vehicle. Thereafter, always use a manufacture-rated, high grade engine oil or a high quality synthetic, and change the oil and filter every 3,000 miles or less. 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.
6. Before beginning installation, replace all spark plugs that are older than 1 year or 30,000 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 underhood emissions tag). Do not use platinum spark plugs unless they are original equipment. Change spark plugs every at least 30,000 miles and spark plug wires at least every 50,000 miles.

TOOL & SUPPLY REQUIREMENTS

- Factory Repair Manual
- 3/8" Socket and Drive Set: SAE & Metric
- Adjustable Wrench
- Open End Wrenches: SAE & Metric
- Flat #2 Screwdriver
- Phillips #2 Screwdriver
- Drill Motor
- 1/4" Drill Bit
- Tin snips or light-duty grinder
- Wire Strippers and Crimpers
- Utility Knife
- Thread lock compound (LOCTITE 242 or 248)



If your vehicle has in excess of 30,000 miles since its last spark plug change, then you will also need:

- Spark Plug Socket
- NEW Spark Plugs

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

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

PARTS LIST

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 ASY VOR	1
009035	S/C LUBE, BOTTLED, VORT 3-PACK	1
2F369-014	S/C ASY, 2013 SCION FR-S	1
4TF020-010	INSTR MAN, 2013 SCION FR-S BRZ	1
4TF110-044	MTG BRKT ASSY, 2013 SCION FR-S	1
4TF112-010	AIR INLET ASSY, 2013 SCION FR-S	1
4TF212-030	DISCH ASSY, 2013 SCION FR-S	1
8N101-354	CHARGE AIR COOLER, SCION FR-S	1
4TF218-014L INCLUDES BELOW ITEMS (COMPLETE KIT)		
5A001-130	TUNING KIT ASSEMBLY, ECUTEK	1

4TF212-030	DISCH ASSY, 2013 SCION FR-S	1
4TF010-160	TAB, PANL SUPPORT	2
4TF010-170	BRACKET, TUBE D	1
4TF010-180	MNT TAB, DISCH TUBE A	1
4TF012-060	DISCH TUBE B	1
4TF112-030	DISCH TUBE A ASSY	1
4TF112-040	DISCH TUBE C ASY	1
4TF012-071	DISCH TUBE D ASSY	1
7A250-051	1/4-20 X .50 HHCS	4
7C040-008	M4-.7X8MM SCHD SS	2
7C060-013	M6 X 1.0 X 12MM FLG HD	2
7C060-016	M6 X 1.0 X 16 HXHD	2
7C060-026	M6 X 1.0 X 25MM, FLG HD	4
7E014-075	#14 X .75 HEX HD SHEETMETAL SC	4
7F006-093	NUT, M6 X 1.0, NYLOCK	7
7F106-080	NUT PLATE, 2X M6	1
7J006-093	6MM WASHER	11
7J250-001	1/4 WASHER, SA	4
7P375-156	3/8"X3/8"X5/32"MALE BARB TEE	1
7P375-378	VALVE, CHECK, 3/8 BARB X 3/8	1
7PS251-250	SLEEVE, 2.5"D X 2.5"L STRAIGHT	3
7PS251-300	SLEEVE, 2.5"D X 3"L BUMP	2
7PS300-250	REDUCER, BLK 3.0-2.50	1
7PS301-175	SLEEVE, 3"D X 1.75"L STRAIGHT	1
7R002-016	#16 SAE TYPE F SS HOSE CLAMP	2
7R002-036	#36 SAE TYPE F SS HOSE CLAMP	14
7R002-048	#48 SAE TYPE F SS HOSE CLAMP	3
7R003-008	ADEL CLAMP, 1/2" ID	1
7R004-002	STEPLESS CLAMP, 17.0-70	2
7R009-012	CLAMP, SPRING, .75"	2
7U030-046	5/32" VACUUM LINE	3'
7U030-056	3/8" HOSE	5"
7U034-016	1" GS HTER HOSE	0.208'
7U314-004	LORD MOUNT, RUBBER M6 X 1" OD	1
8D001-004	COMPRESS BYPASS VALVE, G2	1
8H040-075	FILTER, 1" BYPASS VALVE	1
8N010-420	BRKT, CAC UPPER, RIGHT	1
8N010-430	BRKT, CAC UPPER, LEFT	1

4TF112-010	AIR INLET ASSY, 2013 SCION FR-S	1
008358	DECAL, INLET	1
4TF010-070	BRACKET, LID	1
4TF010-080	BRKT, AIR BOX MOUNT, LEFT	1
4TF010-090	BRKT, AIR BOX MOUNT, CENTER	1
4TF010-121	BRKT, AIRBOX SPPRT	1
4TF013-010	AIRBOX	1
4TF013-020	AIRBOX LID	1
4TF110-060	BULKHD ASSY	1
4TF110-100	BRKT ASY, AIR BOX, RH	1
4TF110-130	ASY, PROP ROD RELOC BRKT	1
7C060-013	M6 X 1.0 X 12MM FLG HD	9
7C060-026	M6 X 1.0 X 25MM, FLG HD	1
7F006-093	NUT, M6 X 1.0, NYLOCK	3
7F106-080	NUT PLATE, 2x M6	2
7J006-093	6MM WASHER	4
7J625-125	SHIM, .625" ID X .13" THK	2
7P500-001	1/2" HOSE UNION	1
7P500-009	1/2" X 90 HOSE BARB UNION	1
7R002-056	#56 SAE TYPE F SS HOSE CLAMP	1
7R002-080	#80 SAE TYPE F SS HOSE CLAMP	1
7S500-351	INLET SLEEVE, 5 X 3.5	1
7U008-010	Q-TURN FASTENER	2
7U008-012	PLATE, Q-TURN FASTENER	2
7U008-014	RETAINER, Q-TRN FSTNR	2
7U030-050	12MM (1/2") FUEL HOSE	0.762M
7U100-004	RIVET, 3/16 X 3/16, ALUMINUM	2
7U100-006	RIVET, 1/8 X 3/16, ALUMINUM	4

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

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

PARTS LIST
CONTINUED

PART NO.	DESCRIPTION	QTY
4TF112-010	**AIR INLET ASSY, 2013 SCION FR-S**	**cont'd.**
7U100-065	GROMMET, .5"ID, .812"OD, .187" GRV	1
7U188-375	TAPE, FOAM, 3/16" X 3/8" W	36"
8H040-050	AIR FILTER 3.5"FLG X 7"L	1
4TF110-044	**MNTG BRKT ASSY, 2013 SCION FR-S**	**1**
2A017-462	SPACER,IDLER SMOOTH 6RIB	1
2A017-750-016	SPACER .75 OD X .328 ID X .160	2
2A046-970	BELT, K060970	1
4FR016-150	IDLER PLY, STEEL 3" 6 RIB SMOOTH	1
4TF010-011	BRKT, ALT TILT	1
4TF010-021	PLATE, S/C MOUNT	1
4TF010-031	STAY, MTG BRKT	1
4TF010-041	MOUNT, BASE	1
4TF010-050	STIFFENER, MTG PLT	1
4TF017-011	BUSHING, ALT BRKT	1
4TF017-021	SPACER, DUAL THRD	1
4TF017-031	SPACER, MAIN BRKT	2
4TX016-150	IDLER, 2.75 DIA, SMOOTH, 7 RIB	1
7A312-124	5/16-18 X 1.25 FLG HD	2
7A312-500	5/16-18 X 5" HX HD	1
7A375-127	3/8-16 X 1.25 SHCS	1
7A375-129	3/8-16 X 1.25 FLG HD	7
7C010-027	M10 X 1.25 X 25 FLG HD	1
7C010-059	M10 X 1.25 X 50 FLG HD	2
7C010-093	M10 X 1.25 X 90 FLG HD	2
7C012-040	M12 X 1.75 X 40 FLG HD	1
7C060-020	M6 X 1.0 X 20MM HHCS	2
7C060-026	M6 X 1.0 X 25MM, FLG HD	2
7F312-017	5/16-18 NYLOCK NUT	1
7J006-093	6MM WASHER, PLATED	4
7J312-875	5/16" WASHER, 7/8" OD, CUSTOM	2
7U375-055	5/8" VACUUM CAP FOR .625 NIP	1
4TF155-021	**WASHER RESERVOIR ASY, SCION FR-S**	**1**
4CJ017-021	SPACER, COIL, .625" X .45" LO	1
4TF010-190	BRKT, WASHER RES, UPPER	1
4TF010-200	BRKT, WASHER RES, LOWER	1
4TF014-010	TUBE, 1.25" WASHER FILL PIPE	1
4TF055-021	WASHER RES CAP, SCION FR-S	1
PART NO.	**DESCRIPTION**	**QTY**

4TF155-021	WASHER RESERVOIR ASY, SCION FR-S	cont'd.
4TF055-041	WASHER RESERVOIR, SCION FR-S	1
7C060-013	M6 X 1.0 X 12MM FLG HD CL10.9+	3
7C060-026	M6 X 1.00 X 25MM FLG HD, PLATE	1
7C080-022	M8 X 1.25 X 20 BHCS, PLTD	4
7F006-093	NUT, M6 X 1.0, NYLOCK, PLATED	1
7F008-023	NUT, M8 X 1.25 NYLOCK NUT	4
7J250-001	1/4 WASHER, SAE, PLTD	1
7J312-000	5/16 FLAT WASHER-SAE	8
7R002-020	#20 SAE TYPE F SS HOSE CLAMP	2
7U034-020	HOSE, 1.25 DIA RUBBER RAD.	4
4TF130-026	***OIL FEED ASSEMBLY, 2013 SCION FR-S**	**1**
7P125-004	1/8 NPT 90° X -4 JIC FTG STL	1
7P125-034	1/8 NPT X 1/8 NPT STRT T	1
7P125-101	1/8 NPT 45° X -4 JIC FTG STL	1
7P125-125	3FTG, 1/8 NPT FEM X 1/8 BSPT MALE	1
7U250-090-240	OIL FEED HOSE, 24" -4X90°	1
4TF155-021	***OIL DRAIN ASSEMBLY, SCION FR-S**	**1**
4TF010-210	OIL DRAIN SUPPORT BRACKET	1
4TF012-005	OIL DRAIN TUBE, ½" ALUMINUM, CUSTOM BENT	1
7C060-026	M6 x 1.0 x 25MM, FLG HD	2
7P375-024	WELD BUNG, SCION FR-S OIL DRAIN	4
7P375-055	3/8 NPT X 90 X 1/2"BARB	1
7P500-080	8 X 3/8 NPT FTG.	1
7P500-500	8 X 90° AL.HOSE END, PSHLOC	1
7R001-006	#6 STNLS HOSE CLAMP, NARROW	4
7R003-008	ADEL CLAMP, ½" ID	1
7U030-036	½" OIL DRAIN HOSE.	9"

*** COMPETITION KITS ONLY (4TF218-124)**

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

1. SOFTWARE INSTALLATION AND ECU RE-FLASH

(COMPLETE KITS ONLY. TUNER KITS SKIP AHEAD TO STEP 2)

Note: Prior to attempting to install any portion of the supercharger system and re-flash the ECU, it is important to confirm that your vehicles' ECU is supported by the EcuTek components included in your kit and to get any available updates. This will require that you have a computer with an internet connection so that you can download and install the free EcuTek software. A laptop is suggested, as you will need to connect the computer to the vehicles' OBD2 port using the supplied cable after the downloads have completed. Please read through and understand this step COMPLETELY before proceeding with anything related to the installation.

A. Visit the EcuTek Website: www.ecutek.com. Click on the [Downloads] tab. See arrow in Fig 1A.

Fig. 1A

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

1. SOFTWARE INSTALLATION AND ECU RE-FLASH

(COMPLETE KITS ONLY. TUNER KITS SKIP AHEAD TO STEP 2)

B. After you have selected the [Downloads] tab, select [EcuTek App Downloader] in the next window. See arrow in fig 1B.

C. After you have selected [EcuTek App Downloader], you will be prompted with a new window. Select [Next] to continue. Fig 1C.

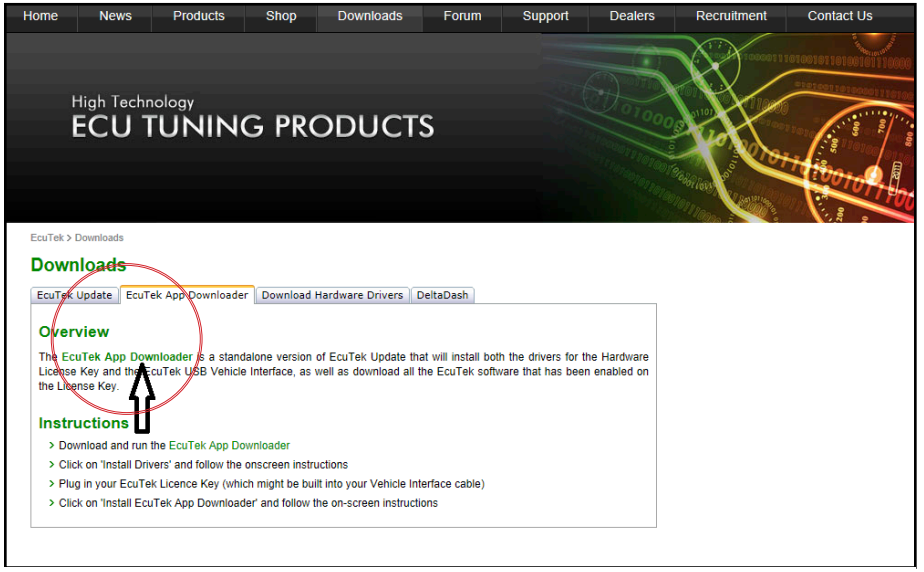


Fig. 1B

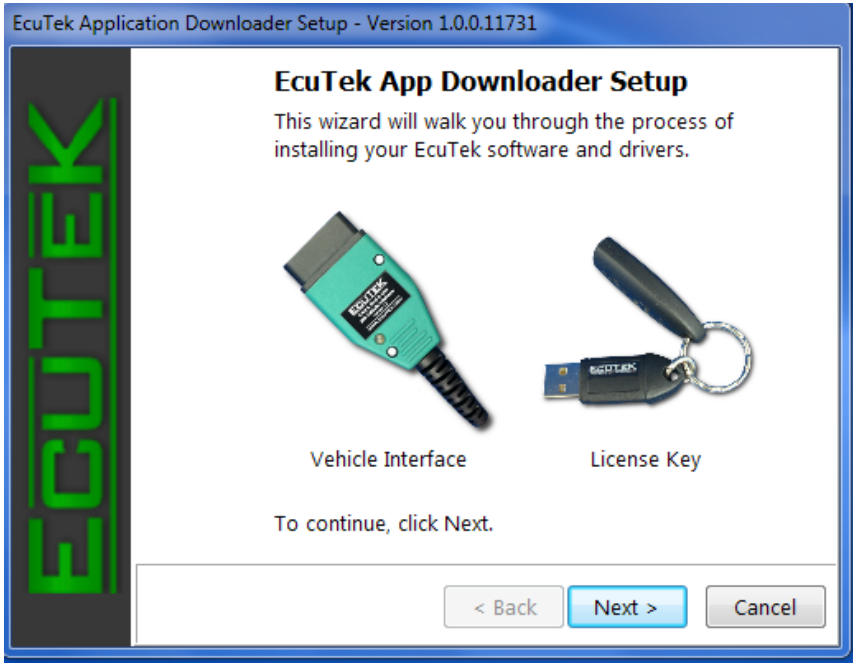


Fig. 1C

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

1. SOFTWARE INSTALLATION AND ECU RE-FLASH

(COMPLETE KITS ONLY. TUNER KITS SKIP AHEAD TO STEP 2)

D. Next, you will be prompted to install the necessary software and drivers. It is recommended to use the default settings. If you have Adobe Reader installed, you can uncheck this part of the installation. Select [Next] to continue. See Fig 1D.

E. It is recommended that you agree with Windows security warnings if they appear as shown below. Select [Install] to continue. See Fig 1E.

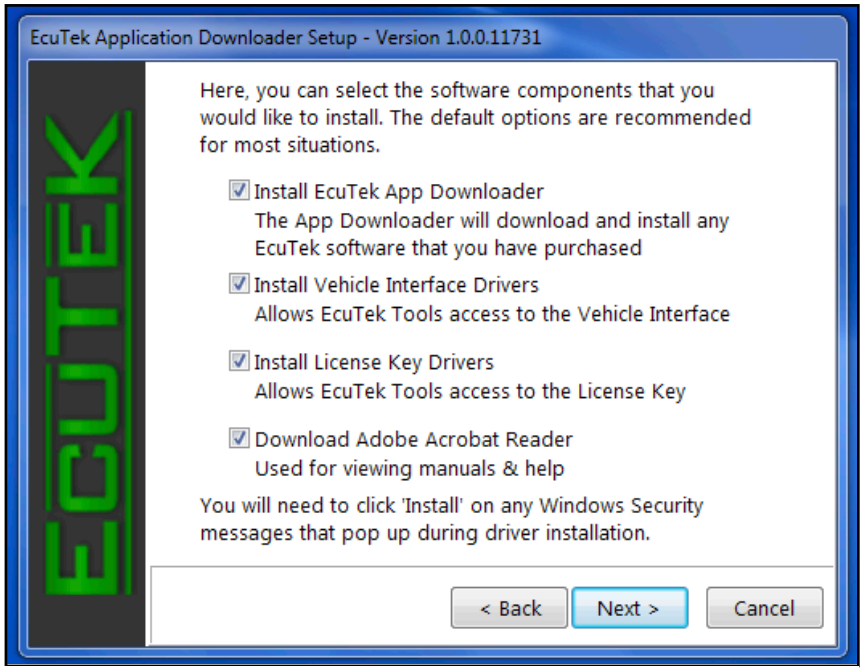


Fig. 1D

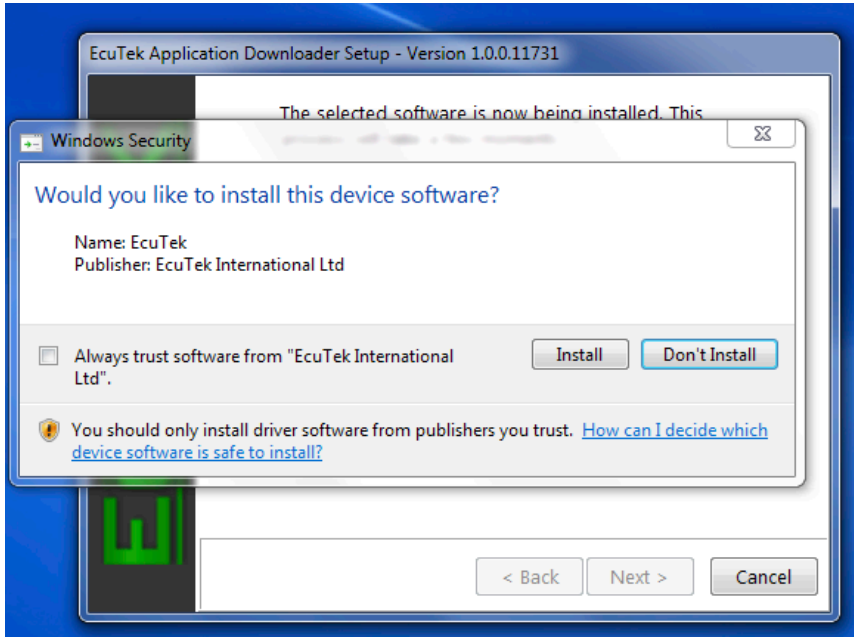


Fig. 1E

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

1. SOFTWARE INSTALLATION AND ECU RE-FLASH

(COMPLETE KITS ONLY. TUNER KITS SKIP AHEAD TO STEP 2)

F. Once you have installed the EcuTek application and drivers, you will be prompted to plug in the vehicle interface cable. Select [Next] to continue. See Fig 1F.

G. After selecting [Next], you will be prompted to insert the license key. See Fig. 1G

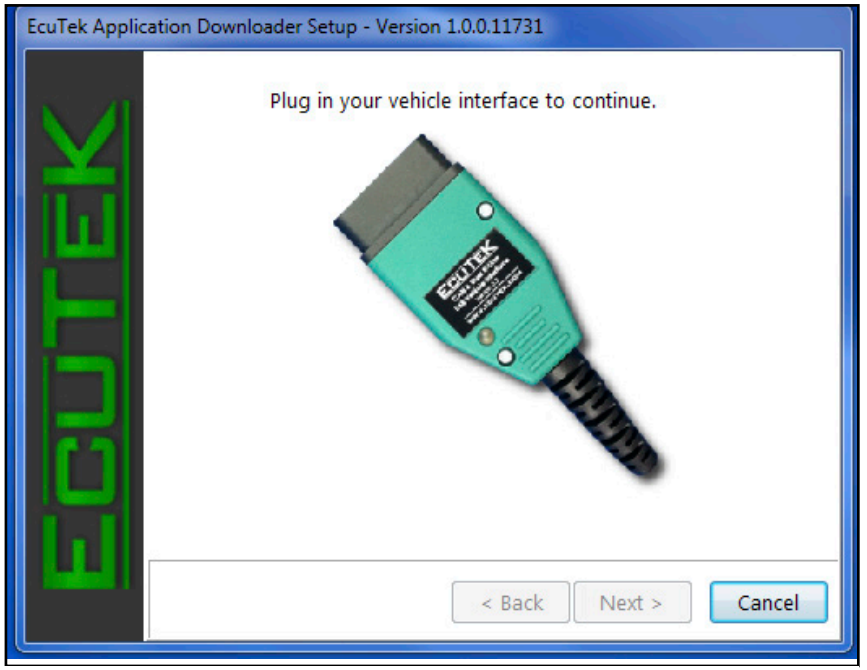


Fig. 1F

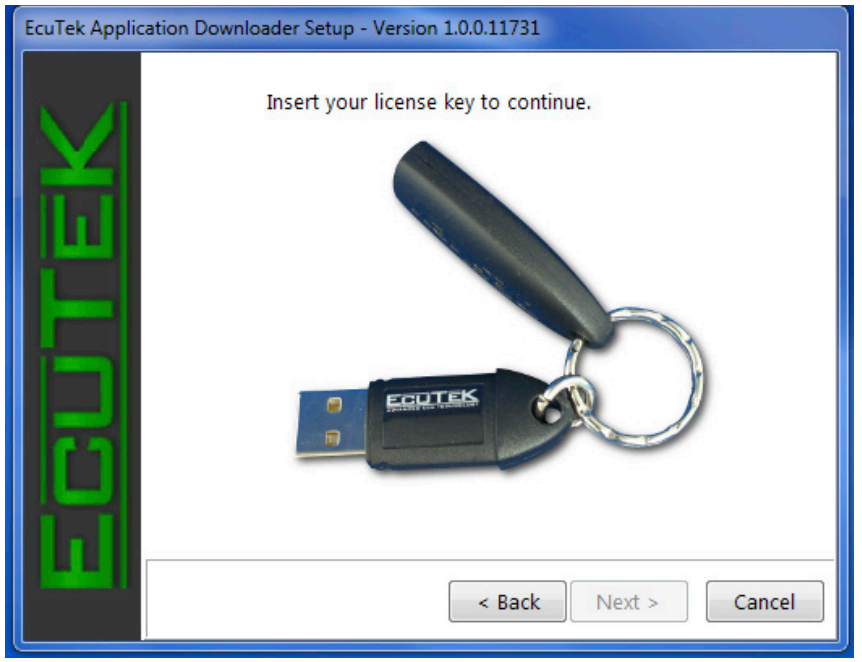


Fig. 1G

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

1. SOFTWARE INSTALLATION AND ECU RE-FLASH

(COMPLETE KITS ONLY. TUNER KITS SKIP AHEAD TO STEP 2)

H. After the EcuTek license key has been inserted, select [Next] to continue.

I. You will be prompted with “Installation is now complete”. Select [Finish] to complete the process. See Fig. 1I.

J. After selecting [Finish], you will be prompted by a new window. Make note of the Dongle ID and the Registration Code shown on your screen. Keep this information safe, for future reference. See Fig. 1J.

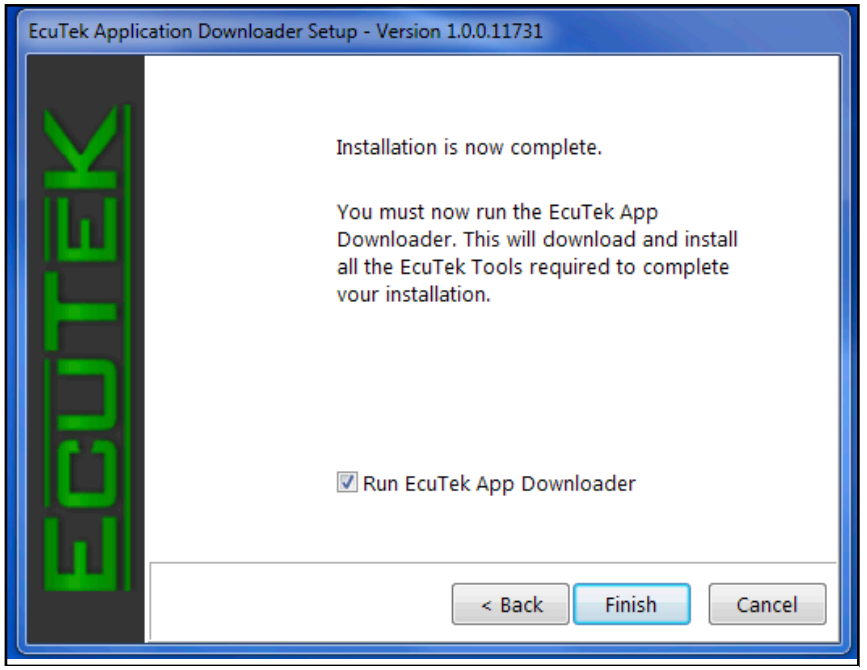


Fig. 1I

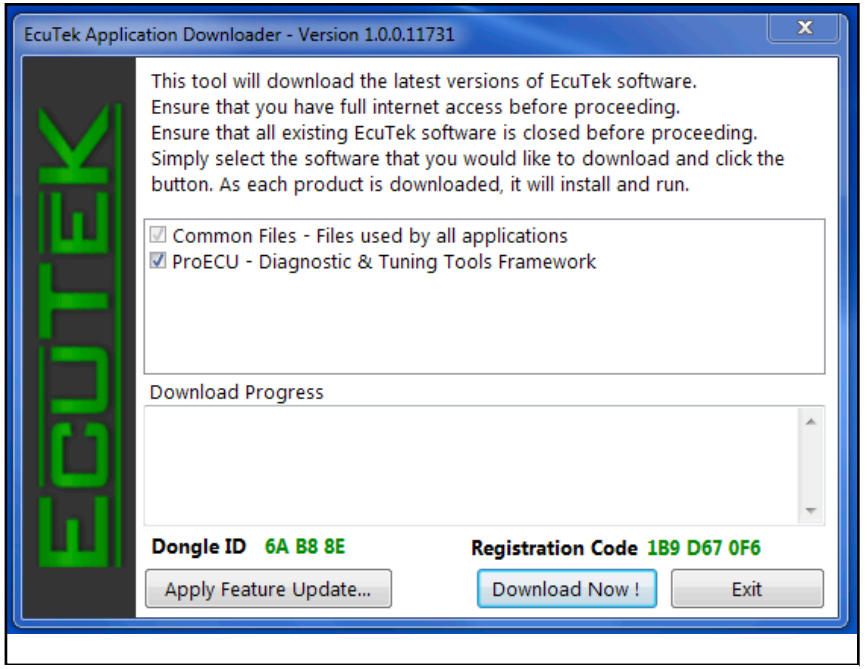


Fig. 1J

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

1. SOFTWARE INSTALLATION AND ECU RE-FLASH

(COMPLETE KITS ONLY. TUNER KITS SKIP AHEAD TO STEP 2)

K. Select [Download Now!]. You will see a new window appear that will show progress and details of what is being downloaded. This can take a few minutes, so please be patient. See Fig. 1K.

L. When the download has completed, you will be prompted with a new window.

M. Select [OK] to continue. Installation of the EcuTek ProECU software is now complete. See Fig. 1L

ECU re-flash:

Note: Programming an ECU is the process of taking a ROM file and placing it into permanent storage inside the ECU. It is highly recommended that all non-essential vehicle devices are switched off before attempting to program an ECU. This helps to minimize electrical interference to vehicle systems that may conflict with communication between the EcuTek components and the ECU. For devices within the car, this includes: headlights, interior lights, A/C, HVAC fan and any other powered devices.

N. Confirm that your laptop computer is booted up and the EcuTek ProECU application is running. The laptop must be plugged into a power source. Do not rely on the laptop battery power.

O. Insert the supplied USB flash drive inth the laptop computer. Copy and save the file located on the flash drive onto your computer in the following folder location: C:\EcuTek\ProECURomFiles\Subaru\BRZ

P. Plug the EcuTek OBD2 vehicle interface cable into the vehicles OBD2 diagnostic socket. The socket is located beneath the lower section of the dashboard just above the drivers throttle pedal.

Q. Connect the other end of the EcuTek vehicle interface cable to a USB port on the laptop computer.

R. 'Key-On' the vehicle ignition. DO NOT START the engine.

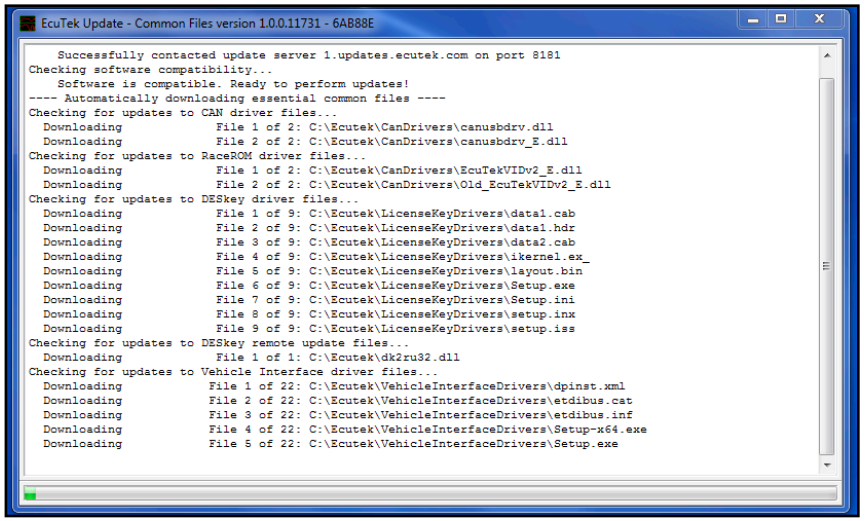


Fig. 1K

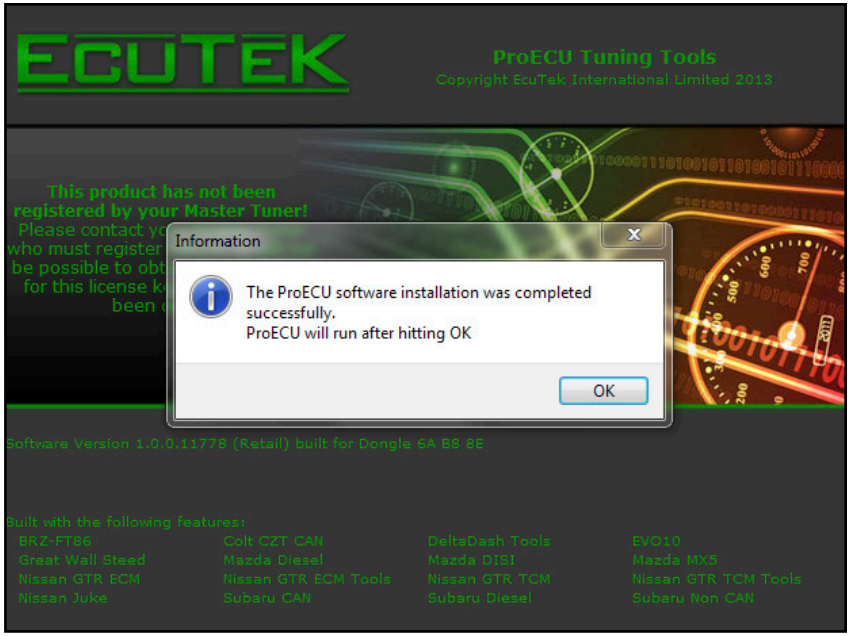


Fig. 1L

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

1. SOFTWARE INSTALLATION AND ECU RE-FLASH

(COMPLETE KITS ONLY. TUNER KITS SKIP AHEAD TO STEP 2)

S. In the ProECU software menu bar (at the top of the window): Select 'Tools', then > 'Detect Vehicle'. A new window will appear with 'Program Engine ECU' highlighted. Select [OK].

T. Select [Program ECU] in the following window. It will take a few minutes for this process to complete. After programming the ECU, follow the on-screen instructions to cycle the ignition ON, OFF etc. It is important that this is done in sequence with the appropriate time delays as directed.

U. The message 'Programming Sequence completed' should appear. Select [Ok]. The re-flash step is now complete.

Note: It is possible that you will come across an ECU version that EcuTek has not seen. It will not be possible for you to program this ECU until EcuTek has been supplied with certain information about the specific ECU. The 'Dump Details for EcuTek' button saves certain information from this ECU. The information is stored in a file that will be saved into the 'C:\EcuTek\ RomDumps' folder. The name of the file will be displayed as it is saved.

This information should be sent to EcuTek using the Website Form, together with a clear photograph of the ECU label and details of the type of car (please include Model Year and Manual or Auto gearbox) from which the ECU originates. EcuTek will then supply an updated version of ProECU that will be capable of programming the ECU. You will then need to send the new file received from EcuTek over to Vortech with your Dongle ID and License Key to have the revised calibration completed.

Please note that it is not something that can be done while-you-wait. Turnaround time is likely to be 3 to 7 days for support of a new ECU. It is therefore important for the tuner to check that the ECU version is supported well before the car is scheduled to be reprogrammed – this will avoid a panic situation for all parties involved.

Please note that it is not possible to open ROM Dumps in ProECU until the file has been emailed to EcuTek.

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

2. PREPARATION/REMOVAL

A. Place car on vehicle lift.

B. Raise hood and use appropriate fender covers for paint protection.

C. Unpack the new accessory drive belt to let the “bends” relax. This is best done in a warm room rather than a cold shop.

D. Locate the hose coming from the firewall that leads to the air filter resonator system and disconnect at the first 90° fitting near the firewall. Cap fitting with supplied 5/8” vinyl cap. See Fig. 2A.

E. Disconnect the opposite end at the resonator. Remove the entire assembly from the vehicle, as it will no longer be used.

F. Disconnect the crankcase breather hose from the 90° plastic fitting in the rubber air inlet duct.

G. Unplug the Mass Air Flow (MAF) connector from the MAF sensor located on the air filter lid. Disconnect the rubber inlet duct from the throttle and remove it with the air filter lid and set aside. Unfasten the air filter box at the three mounts and remove. Remove and save the rubber cushion mount assemblies and hardware for reinstallation in a later step. The duct and other air filter box components will not be reused.

H. Remove the plastic belt covers from both the alternator and the A/C compressor. Set aside covers and mounting hardware for re-installation in a future step.

I. De-tension the belt tensioner and remove the accessory drive belt. The belt will not be used with the supercharger system.

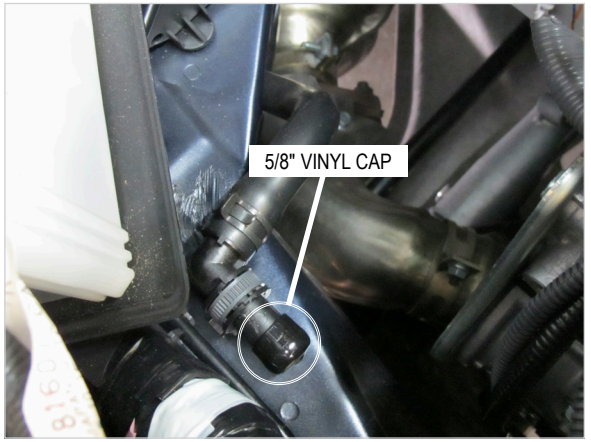


Fig. 2A

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

2. PREPARATION/REMOVAL

Scion FR-S models only:

J. This procedure is to make room for the charge cooler ducts to pass through. The connectors should be secured with nylon tie-wraps after the modification has been made and the ducts are in place.

K. Behind each headlight assembly, the main electrical connector lays in a cradle extending from the assembly.

L. Pull the connector from the assembly and place aside (do not disconnect the connector).

M. With a one-inch drum grinder [in a drill or Dremel], remove 80-90% of the cradle. See Fig. 2B.

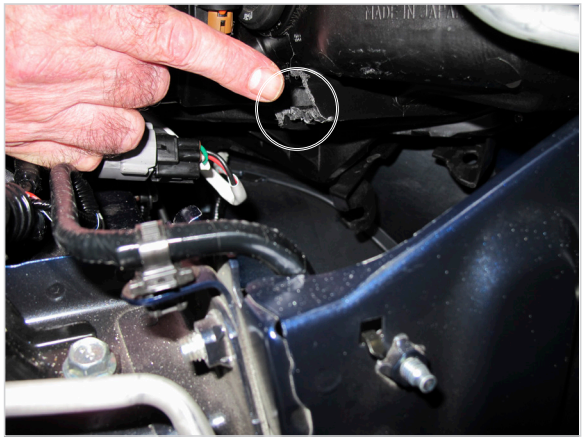


Fig. 2B

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

3. MOUNTING BRACKET AND SUPERCHARGER INSTALLATION

Note: Apply a drop of thread-lock compund to the threads of each fastener prior to installation.

A. Remove the two 12mm alternator screws. Unclip the alternator harness support from the support bracket & set alternator aside. Modify (file or carefully grind) the OEM alternator bracket boss. See Fig. 3A.

B. Place the supplied alternator tilt bracket into position. See Fig. 3B.

C. Loosely install the supplied alternator tilt bracket using the supplied 5/16 x 5” long screw with the thick washer provided into the lower position. Insert the supplied bushing into the rear of the lower tilt bracket hole. Slide the remaining thick washer and nylon lock nut onto the end of the 5/16 x 5” long screw. Reinstall the alternator & lightly snug the screws. Torque screws to 15-19 ft-lbs.

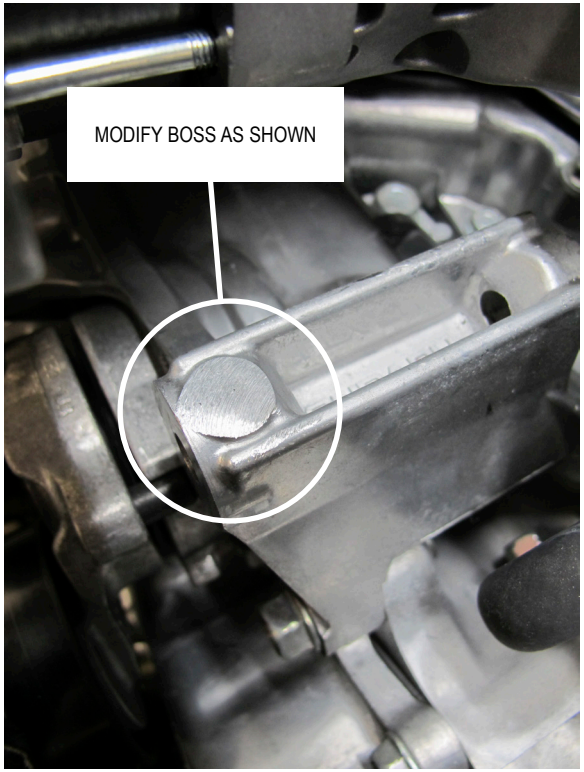


Fig. 3A

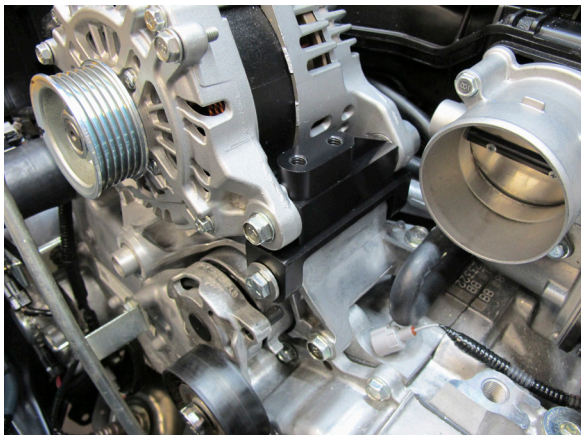


Fig. 3B

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

3. MOUNTING BRACKET AND SUPERCHARGER INSTALLATION

D. Remove the two lower 14mm OEM A/C mount screws. Attach the mounting bracket support, with the spacer positioned towards the left side of the support, using the provided M10 x 50mm long screws. Torque screws to 30-36 ft-lbs. See Fig. 3C.

E. Remove the grooved idler pulley (directly below the alternator pulley) and the two smooth idler pulleys from the front engine cover and set aside. See Figs. 3D, 3E.

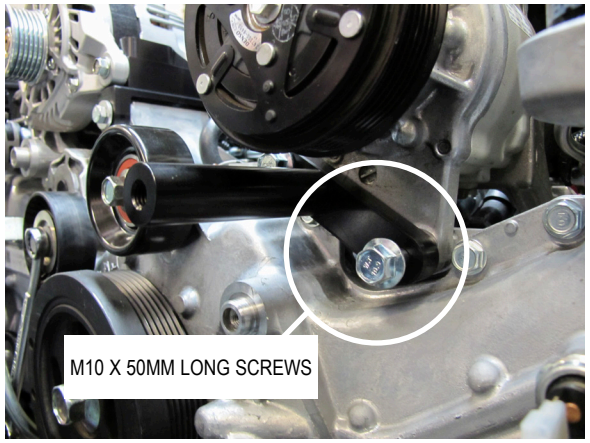


Fig. 3C

Fig. 3D

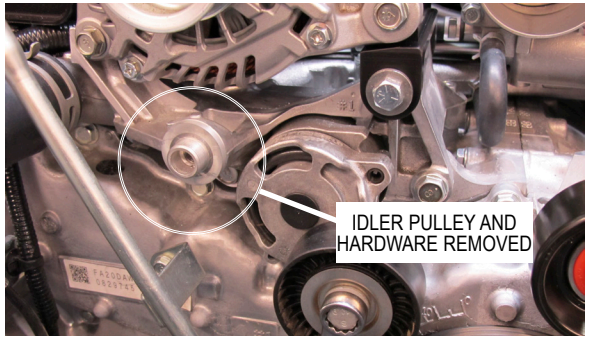


Fig. 3E

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

3. MOUNTING BRACKET AND SUPERCHARGER INSTALLATION

F. Replace the smooth idler located just above the crank damper pulley with the supplied 2.75” diameter steel pulley. The OEM smooth idler pulley originally in this location will not be reused. Secure the pulley with the supplied M10 x 25mm long flange head screw (for clearance purposes, do not re-use the OEM washer & screw). Torque to 30-36 ft-lbs. See Fig. 3F.

G. The supercharger assembly comes mounted to the supercharger mounting plate with a smooth steel idler installed along with a drain hose connected. There is a captured screw in one of the mounting plate holes as well. See Figs. 3G, 3H.

Fig. 3F

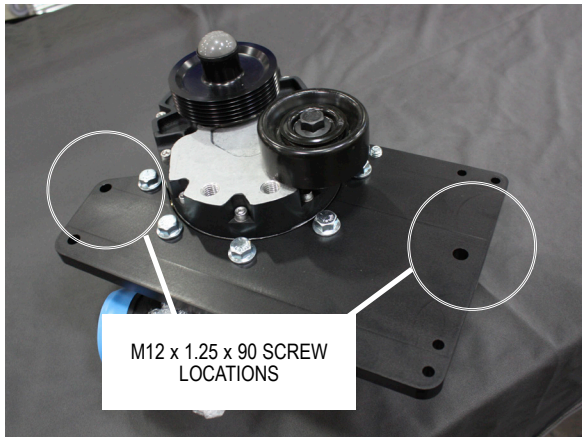


Fig. 3G

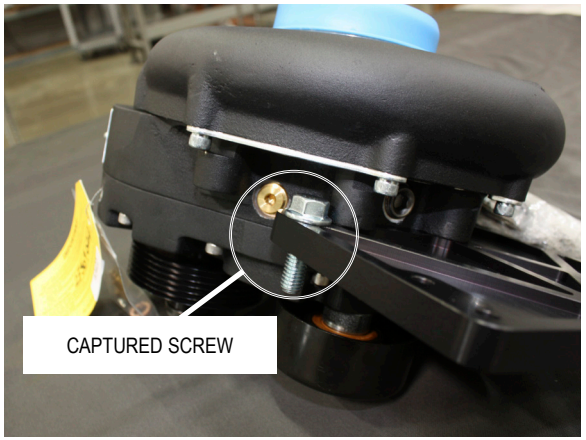


Fig. 3H

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

3. MOUNTING BRACKET AND SUPERCHARGER INSTALLATION

H. Check over the supercharger bracket assembly for loose screws & fittings. The captured screw previously mentioned will remain loose at this time (pictured in Fig. 3H). Place the previously removed grooved idler pulley & remaining OEM smooth idler pulley back onto their original locations (grooved idler beneath the alternator pulley, OEM smooth idler beneath the A/C compressor pulley) without the dust covers or screws. Using the belt routing diagram and photo as a guide, route the belt around the accessory pulleys as shown, leaving slack for the supercharger and its attached smooth flanged idler pulley. See Figs. 3I, 3J, 3K.

Fig. 3J

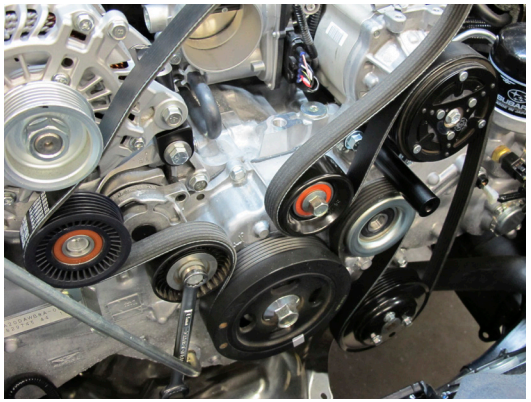
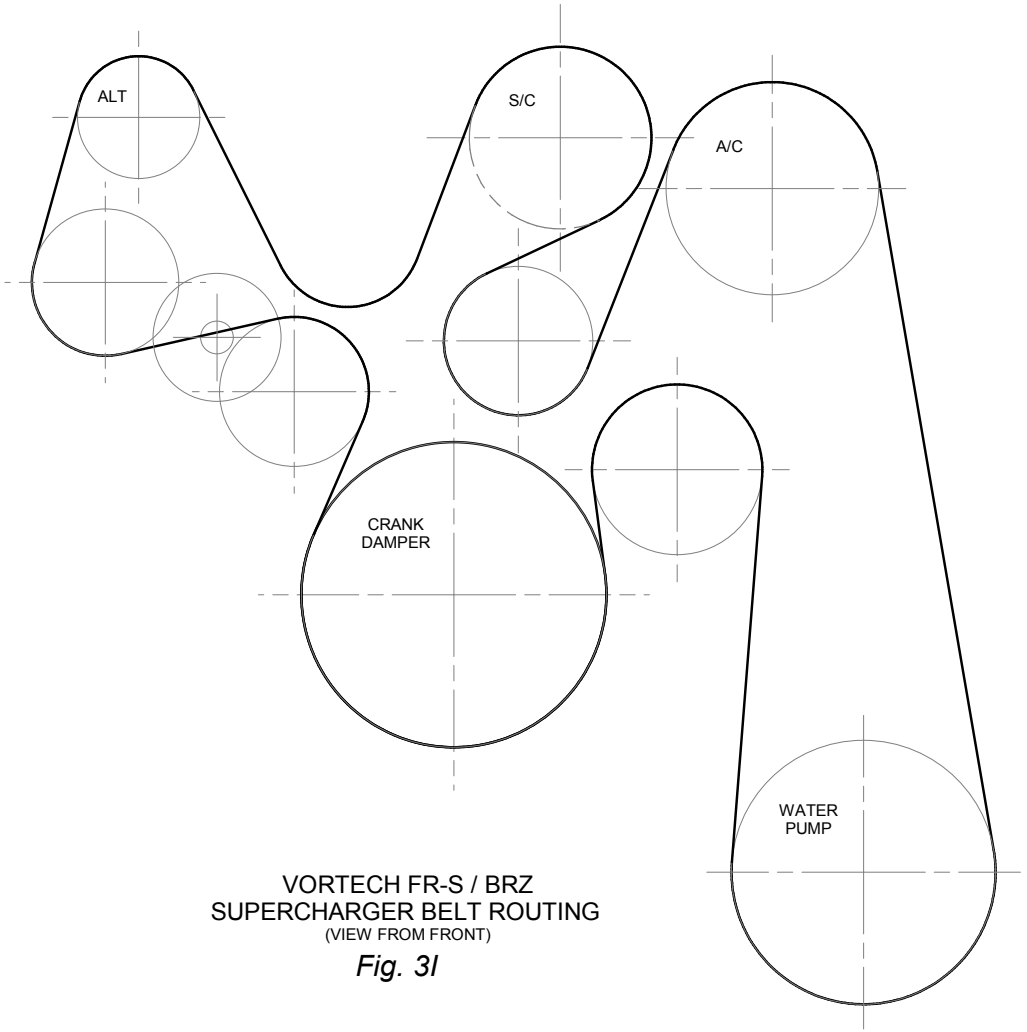


Fig. 3K



VORTECH FR-S / BRZ
SUPERCHARGER BELT ROUTING
(VIEW FROM FRONT)

Fig. 3I

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

3. MOUNTING BRACKET AND SUPERCHARGER INSTALLATION

I. Temporarily hold the supercharger/plate assembly in front of the engine and familiarize yourself with the relative placement of the components. Leaving the idler pulleys in place, attach the main bracket spacers and M10 x 90mm screws to the mounting bracket as previously shown in Fig. 3G. Place the assembly onto the engine, loosely route the belt around the supercharger and idler pulleys (minus the alternator) and thread the M10 x 90mm screws into their pulley supports and lightly snug the screws. Thread the 3/8 x 1.25" screw into the support located beneath the A/C clutch. Loosely attach the mounting bracket support onto the alternator tilt bracket with the two 5/16 x 1.25" fasteners (lightly snug; do not tighten). Thread the 3/8 x 1.25" screw (captured in the mouting plate) into the end of the support and tighten. See Figs. 3L, 3M, 3N.

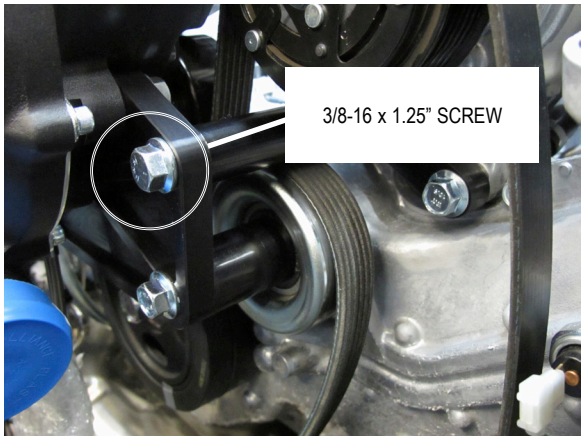


Fig. 3L

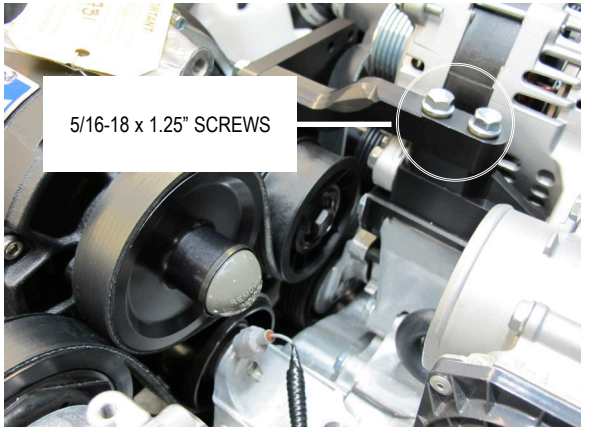


Fig. 3M

Fig. 3N

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

3. MOUNTING BRACKET AND SUPERCHARGER INSTALLATION

J. Torque all mounting screws to the following specs:

M10 x 90mm = 30-36 ft-lbs.
3/8 x 1.25 = 25-30 ft-lbs.
5/16 x 1.25 = 15-19 ft-lbs.

Finish installing the accessory drive belt by fully retracting the tensioner and correctly routing per the belt routing diagram. Ensure the belt is seated and aligned on each one of the pulleys/idlers. Inspect each one individually. See Fig. 3O.

Note: Final installation of the belt is made easiest by routing over the top of the alternator pulley LAST. You may need assistance getting the belt on as the belt is a tight fit.

K. Remove the two OEM screws near the cam covers as shown. See Fig. 3P.

L. Loosely attach the supplied steel mounting plate stiffener behind the supercharger mounting plate with the supplied M6 x 25mm screws. Sandwich the supplied .16" thick aluminum spacers (1 per hole) between the other side of the stiffener bracket and the threaded holes near the cam covers with the M6 x 20mm long bolts and washers provided. Torque bolts to 5-7 ft-lbs. See Fig. 3Q.

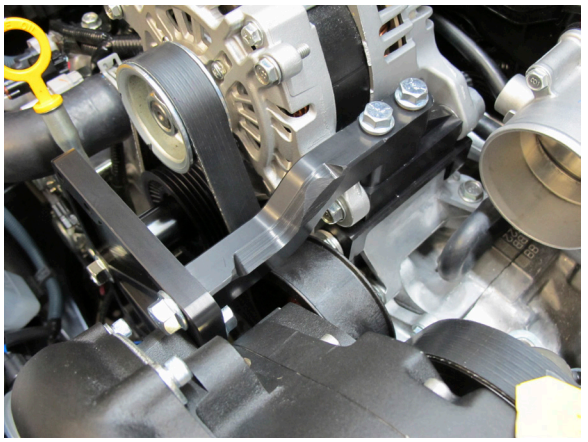


Fig. 3O

Fig. 3P

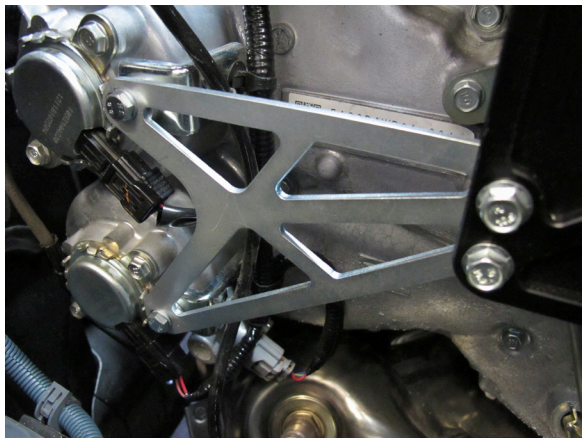


Fig. 3Q

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

3. MOUNTING BRACKET AND SUPERCHARGER INSTALLATION

M. Mount the supplied airbox support bracket to the tab located on the driver side frame rail using the supplied M6 x 12 screw. See Fig. 3R

N. Locate the supplied hood prop rod relocation bracket assembly. See Figs. 3S and 3T for final position. Temporarily locate the bracket onto the fender mount flange with the OEM prop rod inserted into the clip. Using the bracket as a drill template, align the assembly into the desired position for the best fit and using a center punch, mark where the center of the mounting holes are to be drilled into the fender mount flange. Carefully drill two 1/4" holes. Remove sharp edges and mount the hood prop rod relocation bracket assembly as shown using the supplied M6 x 12mm screws.

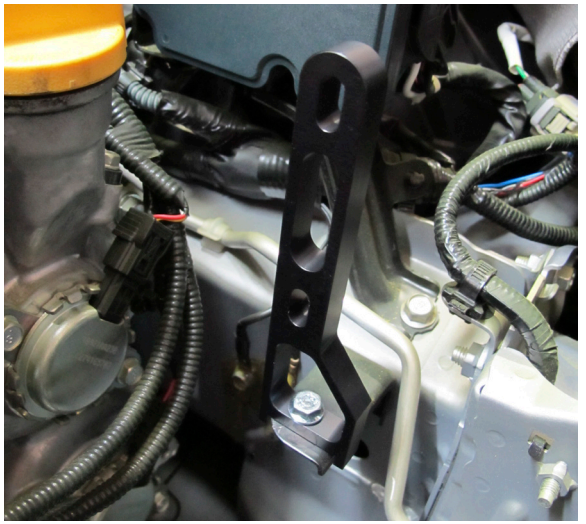


Fig. 3R

Fig. 3S

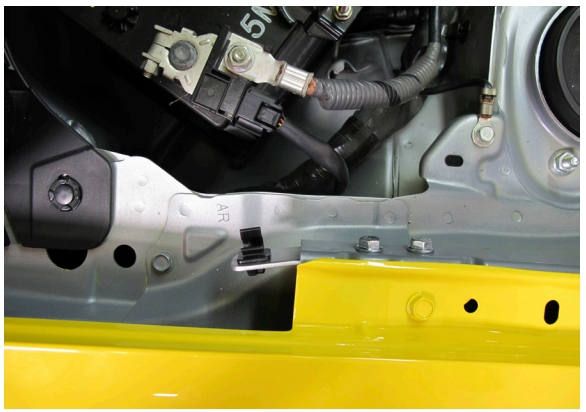


Fig. 3T

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

3. MOUNTING BRACKET AND SUPERCHARGER INSTALLATION

O. Locate the plastic OEM belt covers previously removed from the A/C compressor & alternator. Re-install the alternator cover using the original hardware. The A/C cover will require modification so as to clear the supercharger and belt. Modify the cover and re-install using the original hardware. See Fig. 3U

Fig. 3U

FOR COMPETITION KIT 4TF218-124, SKIP TO SECTION 11 FOR OIL FEED/OIL DRAIN LINE INSTALLATION.

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

4. CHARGE AIR COOLER INSTALLATION

A. Raise the car and remove the lower plastic cover panels from below the engine and front bumper cover. See Fig. 4A.

B. Using a round file, lengthen the three fastener slots in the panel rearward about 1/8th of an inch (3mm), as the panel sits in the car. See Fig. 4B.

C. Carefully remove the front bumper cover from the vehicle (retain all hardware and note location of each screw for future re-installation):

1. Remove four (4) fasteners each side attaching the inner fender liner to edge of the front bumper cover. Remove the fasteners securing each fender liner to the bottom side of the bumper cover.

2. Reach up and un-plug the side marker and fog light connectors from behind the front bumper cover.

3. Carefully remove the side marker lights (secured with 2 spring clips) from where each side of the fender meets the bumper cover. Remove the fastener securing the corner of the bumper cover to the fender.

4. Remove the hardware attaching the top edge of the front bumper cover to the vehicle.

5. Ensure that all hardware securing the bottom portion of the front bumper cover has been removed. Carefully remove the front bumper cover and place it in a safe location.

D. Drain the windshield washer fluid into a container by removing the small rubber hose attached to the electric pump. Detach the filler neck from above & slide it out from the tank. Remove the fasteners securing the tank to the vehicle & remove. The electric pump, rubber grommets & filler neck will be reused. Discard the tank.

Fig. 4A

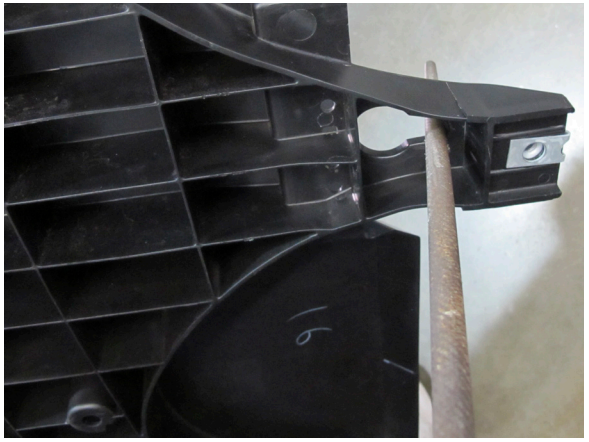


Fig. 4B

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

4. CHARGE AIR COOLER INSTALLATION

E. Temporarily remove the two plastic side panels from either side of the cooling air feed cavity. These panels need to be modified to accommodate the CAC ducts. Find the two (left and right-side) 1:1 paper templates in the back of this manual. Use the templates to mark the modifications and then, using heavy-duty shears, modify the panels per the markups. Set aside. See Figs. 4C, 4D.

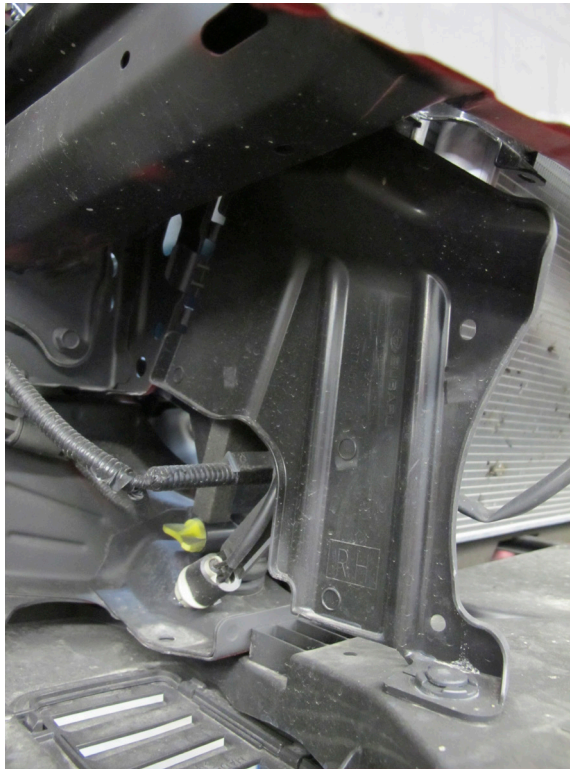


Fig. 4C

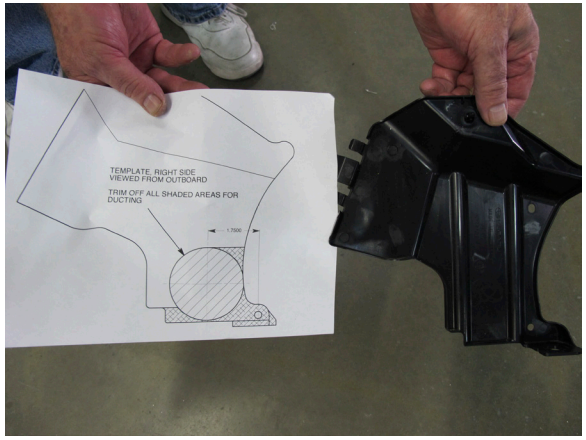


Fig. 4D

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

4. CHARGE AIR COOLER INSTALLATION

F. Remove the horn from in front of the A/C condenser.

G. Flatten the OEM horn locating tab. See Figs. 4E, 4F, 4G.

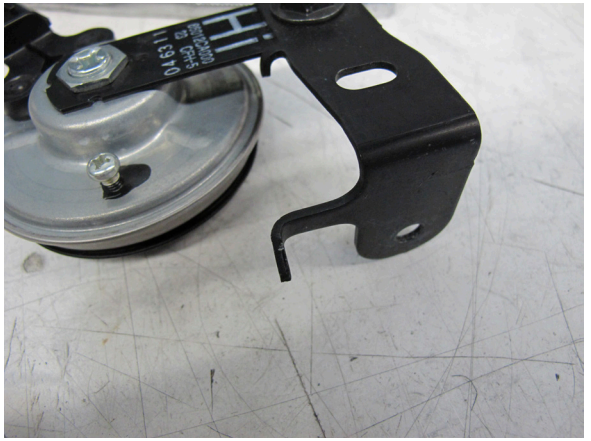


Fig. 4E

Fig. 4F

Fig. 4G

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

4. CHARGE AIR COOLER INSTALLATION

K. With the slot mount at the bottom rear of the charge-cooler, temporarily lift the charge-cooler into place. Have an assistant pull down on the OEM support to allow the cooler to fit in place. Place the slot mount on the CAC over the support upper flange. Replace the lower bolt on the support. See Fig. 4M.

L. On the top, outboard corners of the charge-cooler are the upper mounting brackets. Carefully position the cooler so as to be centered left/right from the front of the vehicle, then adjust the upper mounting brackets (they are slotted for adjustment). See Figs. 4N, 4O, 4P (on the next page) for reference on where the upper mounts should be positioned on the bumper beam.

M. Mark the holes to be drilled for the upper mounts into the bottom of the OEM bumper beam. Reverse the process with the center support and remove the charge-cooler. Center-punch the marks and drill four 3/16" mounting holes into the OEM bumper beam. Be sure to use a sharp drill bit & cutting oil as the OEM bumper beam is high-strength.

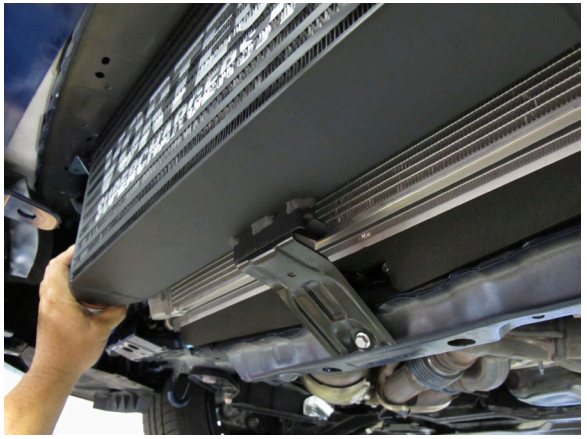


Fig. 4M

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

4. CHARGE AIR COOLER INSTALLATION

N. Again, lift the cooler into place and secure with the four #14 hex-head self-tapping fasteners provided. Secure the upper mounting bracket fasteners and center support. Adjusting the Ambient Air Temp Sensor mounting tab may be necessary for proper clearance. See Figs. 4N, 4O, 4P.

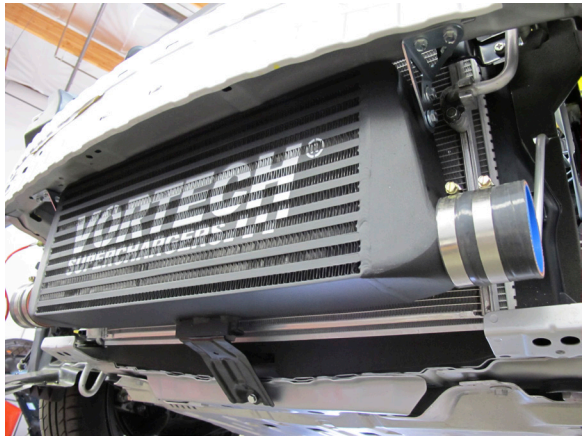


Fig. 4N

Fig. 4O

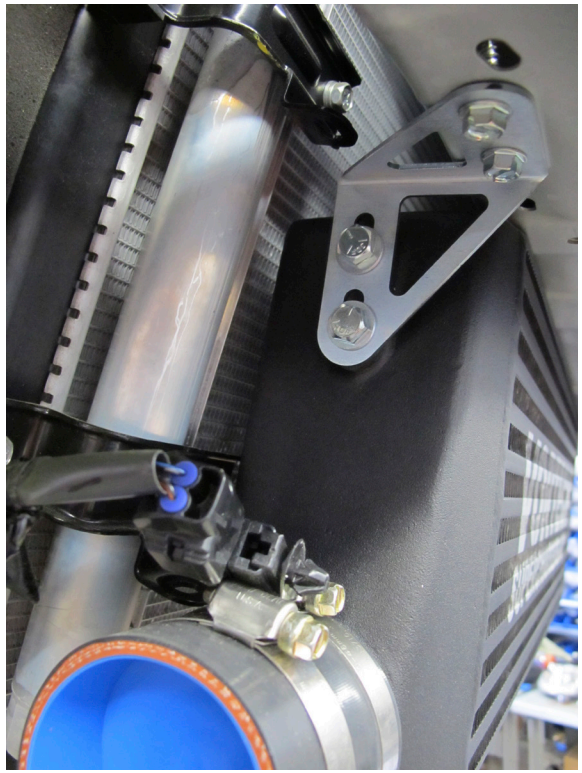


Fig. 4P

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

5. MAF HARNESS EXTENSION

A. Plug the supplied MAF extension into the vehicle harness. See Fig. 5D

B. Route the MAF extension harness under the throttle body and under the intake manifold, away from the alternator. See Fig. 5E

C. Continue to route the harness and connector over to the passenger side headlight and down behind the bumper cover.

D. Secure the harness with nylon zip ties, insuring that the harness is away from hot or sharp objects.

Fig. 5D

Fig. 5E

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

6. WINDSHIELD WASHER RESERVOIR INSTALLATION

A. Locate the OEM windshield washer reservoir assembly removed in a previous step.

B. Separate the filler neck, filler neck grommet, washer pump and washer pump grommet from the OEM tank. The tank will not be re-used.

C. Cut the excess length from the filler neck. Remove any plastic burrs from the cut edge. Discard the portion no longer connected to the cap end of the tube. See Fig. 6A, 5B.

D. Install the supplied length of Ø1.25" hose onto the end of the filler neck and secure with supplied #20 clamp. See. Fig. 6C.

Note: Trimming of the Ø1.25" hose may be necessary for proper fitment on Subaru BRZ vehicles.

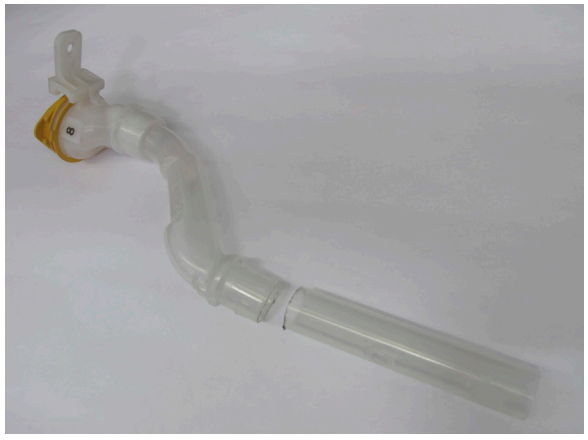


Fig. 6A

Fig. 6B

Fig. 6C

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

6. WINDSHIELD WASHER RESERVOIR INSTALLATION

E. Remove the OEM hood release cable retainer from the chassis mounting hole. See Fig. 6C.

F. Attach the modified filler neck and hose to the vehicle. Use the supplied M6 x 12 screw with washer and nut to secure the assembly into to the hole previously occupied by the hood release cable. Align as shown. See Fig. 6D.

SUBARU BRZ APPLICATIONS ONLY:

- Instead of the M6x12 screw, use the supplied M6x25 screw and .45" spacer between the filler neck tab and chassis mount. See Fig. 6D-1.
- Use a file to lightly clearance corner of headline housing as shown See Fig. 6D-2.

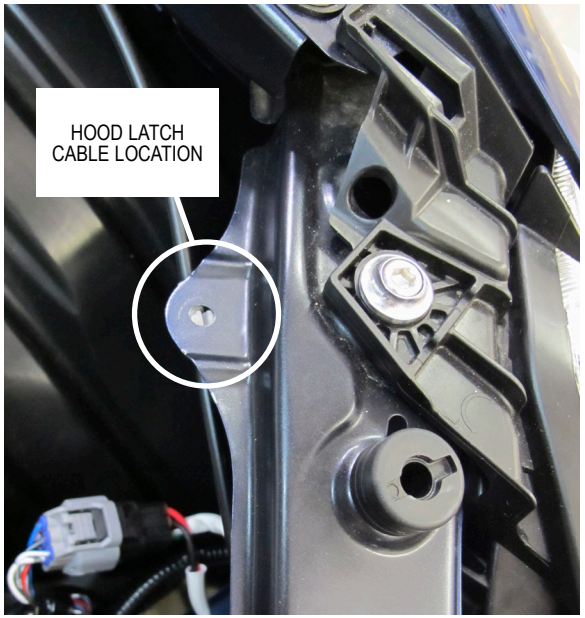
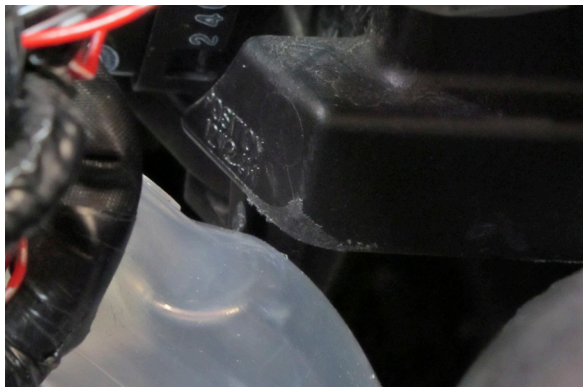


Fig. 6C

(SUBARU BRZ ONLY) Fig. 6D-1



(SUBARU BRZ ONLY) Fig. 6D-2

Fig. 6D

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

6. WINDSHIELD WASHER RESERVOIR INSTALLATION

G. Insert the OEM filler neck grommet into the 1.43” hole in the supplied tank. Ensure that it is seated properly. Apply a very small amount of white grease or similar lube onto the inside diameter of the grommet. Insert the non-beaded end of the supplied metal tube into the grommet just far enough until the end starts to push through the grommet on the inside of the tank. See Fig. 6E.

H. Using the supplied M8 screws, nuts and washers, install the new mounting brackets to the reservoir. See Fig. 6F.

I. Insert the OEM washer pump grommet into the 1.37” hole in the supplied tank cap. Ensure that it is seated properly. Apply a very small amount of white grease or similar lube onto the inside diameter of the grommet. Insert the OEM washer pump into the grommet until seated. Install the cap/pump assembly onto the tank. Ensure that the cap gasket is in place and the cap is snug. Rotate the pump and orient as shown. See Fig. 6G.

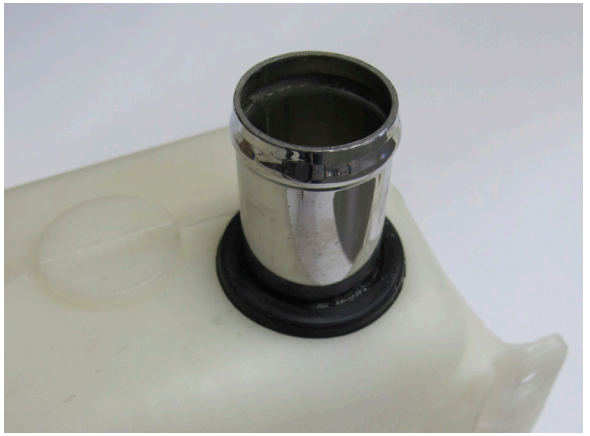


Fig. 6E

Fig. 6F

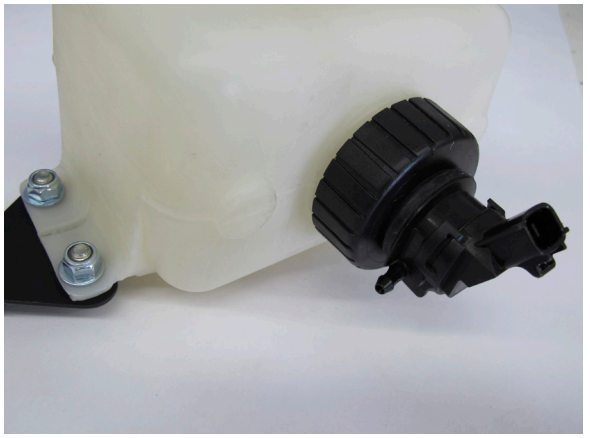


Fig. 6G

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

6. WINDSHIELD WASHER RESERVOIR INSTALLATION

J. Drop the remaining #20 hose clamp over the metal tube. Attach the new tank assembly to the vehicle using two of the original chassis mount locations and the supplied M6 x 16 screws. See Figs. [6H, 6I). As the assembly is being installed, ensure that the metal filler tube is inserted into the rubber filler hose. Secure the connection with the #20 hose clamp.

K. Re-attach the OEM washer hose and connector to the washer pump. The pump wiring harness may need to be separated from the main harness in order to get the connector to reach the new pump location. Do this by carefully opening up the plastic harness cover with a razor blade. Be careful not to cut into any of the wire insulation. Re-tape and cover the original harness.

L. Fill the reservoir with appropriate washer fluid until the level can be seen in the filler neck.

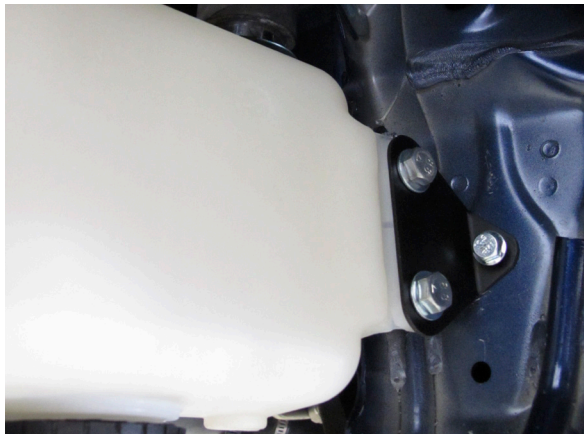


Fig. 6H

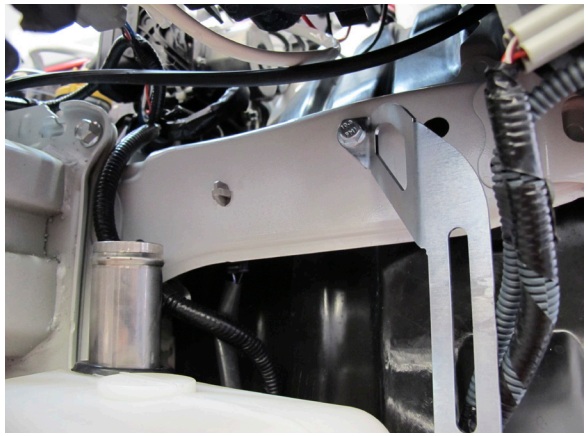


Fig. 6I

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

7. CHARGE AIR COOLER TUBE INSTALLATION

Note: On Subaru BRZ models, the passenger side headlight must be removed in order to properly install the charge cooler tubes.

A. Locate the supplied discharge tube 'B' (simple 90 degree bend) and slide a 2-1/2" silicone sleeve and pair of #36 clamps on each end of the tube. Attach the long leg of the tube to the driver side of the CAC. Temporarily snug the clamps so the tube does not fall out, but can still be moved slightly. See Fig. 7A.

B. Locate the supplied discharge tube 'A' (with welded 1" boss attached). From the top, slide discharge tube 'A' behind the left (driver side) headlight and into the sleeve on discharge tube 'B'. Attach discharge tube 'A' to the supercharger with the "bump" sleeve and #36 clamp provided. See Fig. 7B.

C. Secure tube 'A' to the previously installed airbox support bracket using the #36 clamp, mount tab, M6 screw, washers and nuts. See Fig. 7C.

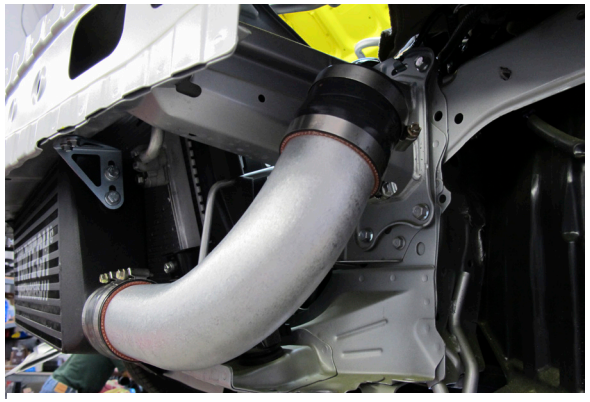


Fig. 7A

Fig. 7B

Fig. 7C

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

7. CHARGE AIR COOLER TUBE INSTALLATION

D. Locate the supplied discharge tube 'C' (MAF flange attached) and OEM MAF module previously removed. Ensure that the o-ring is intact on the MAF module. Insert the MAF sensor module into the flange and secure with the supplied M4 fasteners. On the passenger side, connect discharge tube 'C' to the CAC using the supplied 3” x 2-1/2” reducer sleeve and clamps. Install a “bump” sleeve onto the remaining open end of the tube after it is in place. See Fig. 7D.

E. Attach the supplied mounting tab to the supercharger mounting bracket using the screws and nut plate. See Fig. 7E.

F. Thread the supplied rubber mount into tube 'D'. See fig. 7F.

Fig. 7D

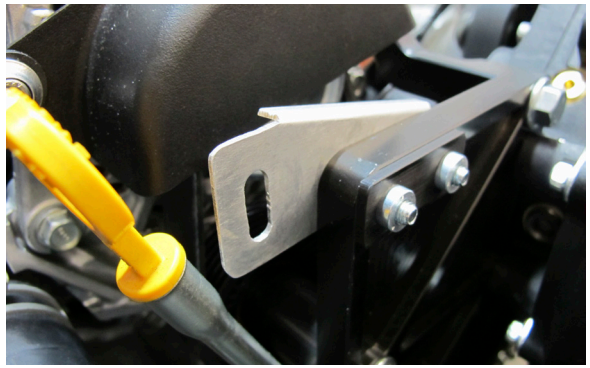


Fig. 7E

Fig. 7F

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

7. CHARGE AIR COOLER TUBE INSTALLATION

G. Install the supplied 3” dia. x 1.75” sleeve and #48 clamps onto the throttle body. Locate the supplied discharge tube 'D'. Attach the tube between the throttle body sleeve and the “bump” sleeve. The stud on the rubber mount will mate with the previously installed mounting tab. Adjust tube to ensure adequate clearance to the drive belt. Install the M6 locknut with washer onto the mount stud. Tighten all clamps after all tubes have been aligned and proper clearance adjustments have been made throughout the charge tube route. See Fig. 7G.

H. Re-install the two previously modified plastic OEM side panels from into the cooling air feed cavity into their OEM positions. Secure the bottom portion of the panels to the CAC tubes using the supplied mount tabs, M6 x 16 screws, nuts, washers and clamps. See Figs. 7H, 7I.

I. Connect extended MAF harness connector to MAF module on tube ‘C’.

J. Reinstall the headlight (if removed), bumper cover and lower plastic cover panels.

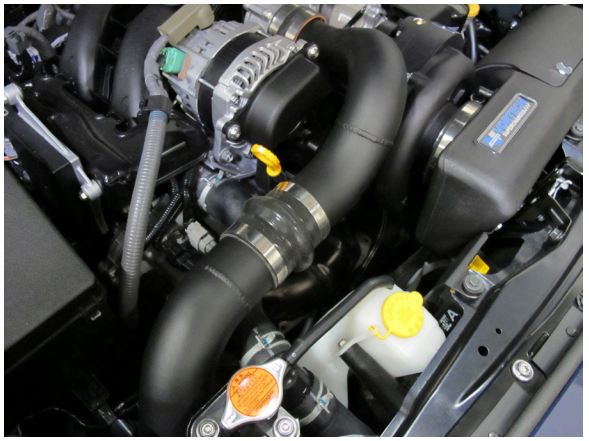


Fig. 7G

Fig. 7H

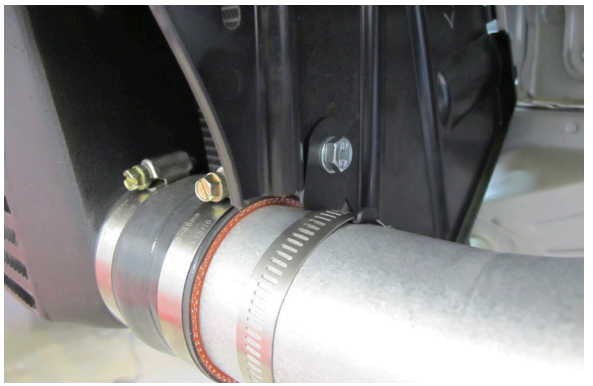


Fig. 7I

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

8. COMPRESSOR BYPASS VALVE INSTALLATION

A. Install the supplied compressor bypass valve onto the 1” nipple on discharge tube A using the short section of 1” hose provided. Secure with #16 clamps. Attach 1” filter to open end of bypass valve and secure. See Fig. 8A.

B. Attach the supplied length of 5/32” hose to the small port on the bypass valve. Route the hose over to where the OEM brake booster hose attaches to the intake manifold.

C. **MANUAL TRANSMISSION ONLY** - Using the supplied brass branch tee, splice into the brake booster hose approximately 2” from where it attaches to the manifold. Reconnect hose. Attach 5/32” bypass hose to the open port in the tee. See Fig. 8B.

D. **AUTOMATIC TRANSMISSION ONLY** - Remove the OEM vaccum cap located at the top of the intake manifold on the driver side. Attach the supplied 5” length of 3/8” rubber hose to the open manifold port. Insert one of the 3/8” legs of the supplied tee into the hose and then cap the remaining 3/8” leg on the tee with the OEM cap previously removed. Attach the 5/32” bypass hose to the open port in the tee. See Fig. 8C.

Fig. 8A

(Manual transmission models only) Fig. 8B

(Auto transmission models only) Fig. 8C

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

9. PCV VALVE & MAP SENSOR INSTALLATION

A. Locate the OEM breather hose connecting the top on the intake manifold to the passenger side of the engine.

B. Splice-in the supplied breather hose check valve into the OEM hose. **NOTE FLOW DIRECTION** on the valve (flow direction is toward the intake manifold). Secure with stepless clamps provided.
See Fig. 9A,9B, 9C.

C. **COMPLETE (NON-TUNER) SYSTEMS ONLY**: Replace the OEM MAP Sensor with the supplied unit. See Fig. 9D.

Fig. 9A

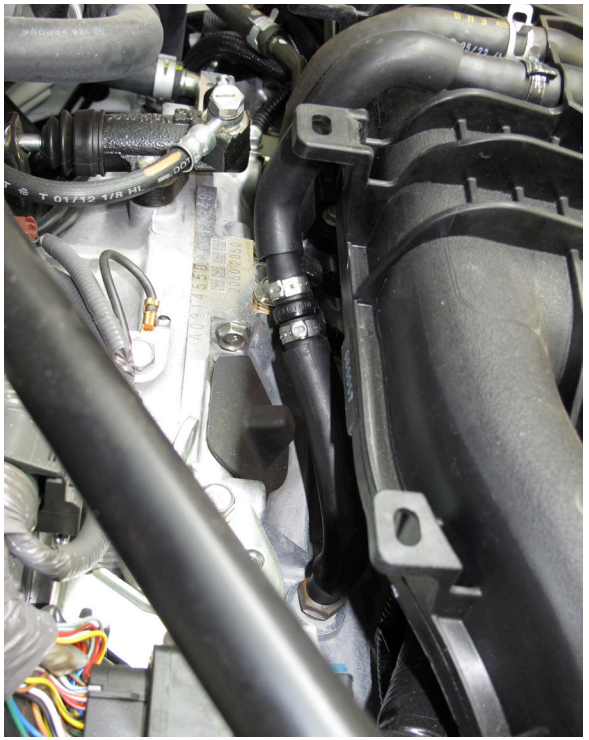


Fig. 9C

Fig. 9B

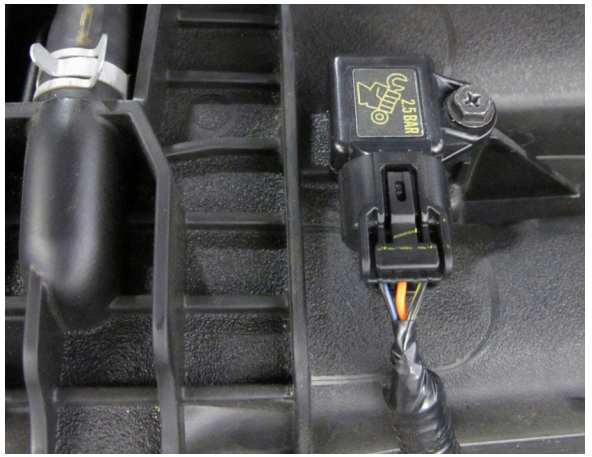


Fig. 9D

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

10. AIR INLET INSTALLATION

A. Locate the supplied airbox assembly and two of the rubber cushion mount spacers and screws originally installed in the OEM airbox.

B. Temporarily remove the steel inserts from the rubber cushion mount spacers. Install the cushion mounts into the center of the two supplied 5/8" ID spacers. See Fig. 9A.

C. Insert two of the rubber cushion mounts into the mounting tabs attached to the supplied airbox assembly. See Fig. 9B.

D. Attach the supplied 5" x 3-1/2" rubber coupler to the inlet of the supercharger. Loosely place one each of the supplied #80 and #56 clamps onto the sleeve.

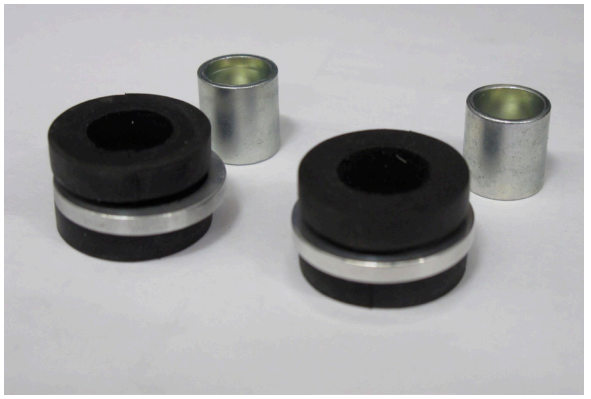


Fig. 10A

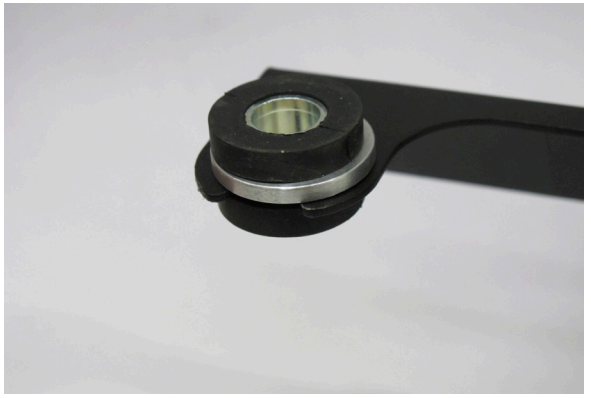


Fig. 10B

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

10. AIR INLET INSTALLATION

E. Install the airbox assembly onto the supercharger inlet and vehicle. Align the airbox to the mounting holes, forward facing inlet duct and previously installed airbox mounting bracket. See Figs. 10C, 10D, 10E. Use two (2) of the OEM screws to secure the airbox to the forward OEM mount locations. Secure the tab located on the driver side using the supplied M6 x 20 screw and nut.

F. Tighten hose clamps at supercharger interface.

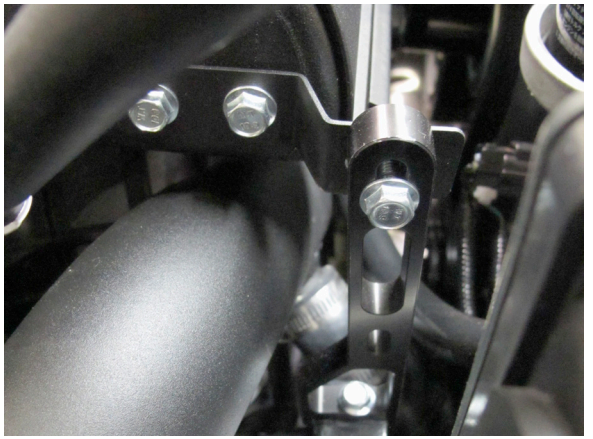


Fig. 10C

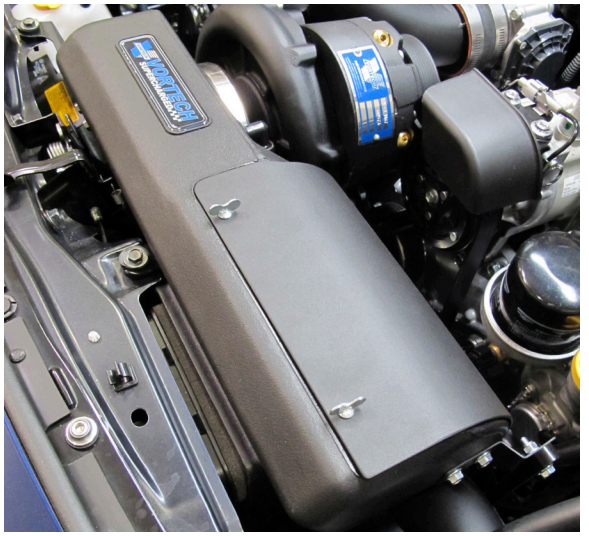


Fig. 10D

Fig. 10E

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

10. AIR INLET INSTALLATION

G. Insert the supplied ½" hose union into the end of the OEM breather hose. Attached the supplied length of ½" breather hose to the ½" hose union and route the hose over to the 90° fitting located on the rear of the airbox. Route the hose away from sharp edges and moving objects. Trim hose length if necessary. See Figs. 10F, 10G.

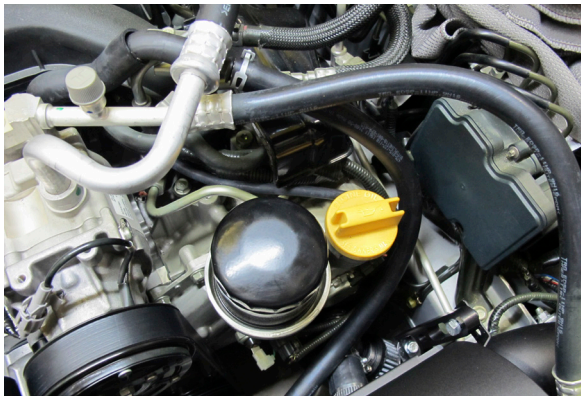


Fig. 10F

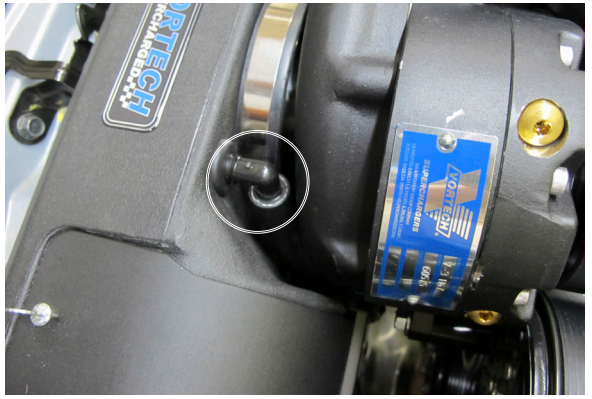


Fig. 10G

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

11. OIL FEED / DRAIN INSTALLATION (COMPETITION KIT ONLY)

V-3 applications skip ahead to Step 12.

Note: Installation of the oil drain assembly is best done using a vehicle lift. If a lift is not readily available, lift the front of the vehicle & secure it with jack stands.

A. Disconnect negative (-) battery terminal.

B. Unplug connectors from the ECU. See Fig. 11A

C. Using a 10mm wrench, remove the 3 screws securing the ECU to the engine. Set ECU & screws aside. See Fig. 11B
Note: 1 of the 10mm screws is located on the bottom side of the ECU (Not shown).

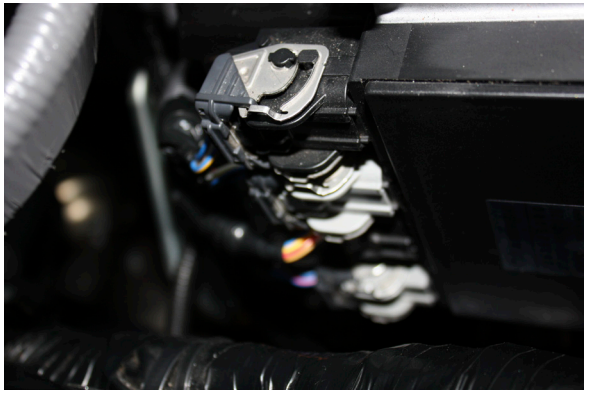


Fig. 11A

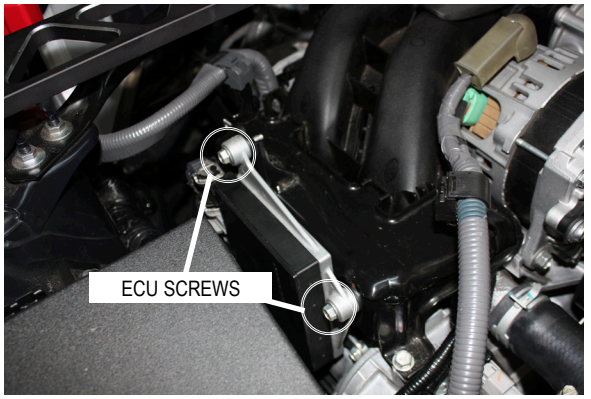


Fig. 11B

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

11. OIL FEED / DRAIN INSTALLATION (COMPETITION KIT ONLY)

D. Remove lower ECU support bracket using a 10mm socket and wrench. See Fig. 11D

E. Remove the 10mm screws securing the coil packs to the valve cover.

F. Unplug the coil packs & remove them from the vehicle. Set them aside for re-installation.

G. Remove the lower metal splash guard from the vehicle by removing the (8) 12mm screws, (4) 10mm screws & (6) plastic push clips. See Fig. 11E

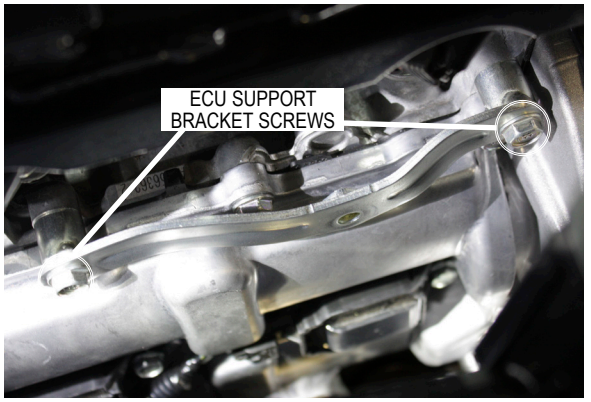


Fig. 11D

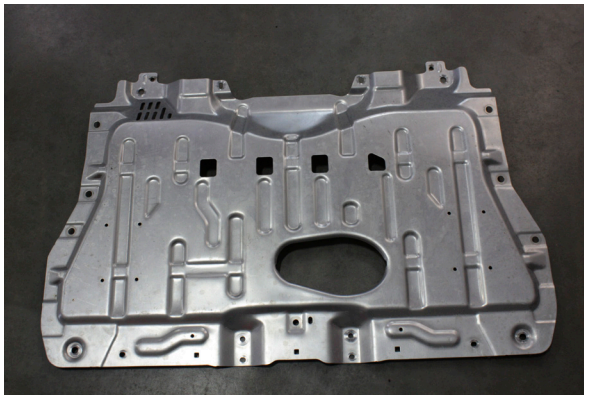


Fig. 11E

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

11. OIL FEED / DRAIN INSTALLATION (COMPETITION KIT ONLY)

H. Remove the passenger side plastic splash guard (held in place to the metal splash guard by 3 of the 6 plastic push clips previously removed). There are 3 smaller plastic push clips located at the top of the plastic splash guard that secure it to the wheel well. Remove those 3 smaller plastic push clips. See Fig. 11F

I. Remove the (8) 10mm screws securing the passenger side valve cover to the engine. See Fig. 11G

Note: To easily access some of the lower valve cover screws, the over-pipe of the exhaust system may need to be unbolted from both ends & pushed aside. See Fig. 11H

Fig. 11F

Fig. 11G

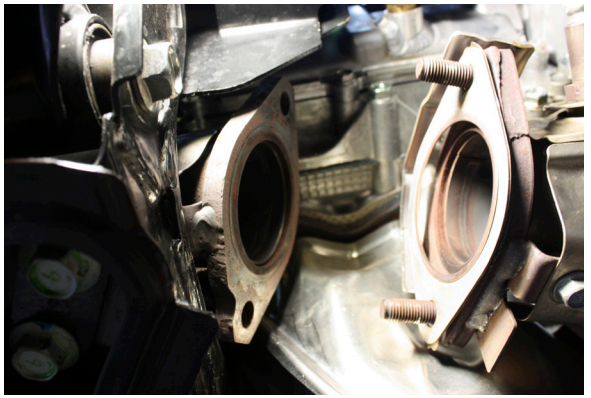


Fig. 11H

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

11. OIL FEED / DRAIN INSTALLATION (COMPETITION KIT ONLY)

Note: The following steps are recommended to be done with the help of a professional welder/fabricator.

J. With the valve cover removed from the vehicle, make the following marks on the bottom of the valve cover. See Fig. 11I

Note: Proper placement of the oil drain bung is crucial. Be sure to make your marks as close as possible to the measurements we have provided.

K. Using a scribe tool, mark the lines as pictured in Fig. 11I. (The red dye is only used for reference). The center of the cross will be where you need to drill the valve cover. Use a punch to mark the center.

L. Use a small diameter drill bit to create a pilot hole at the center mark.

M. Drill through the pilot hole using a 11/16 drill bit or cutter. Be sure to clean off any shavings or burrs from the drilled hole. See Fig. 11J

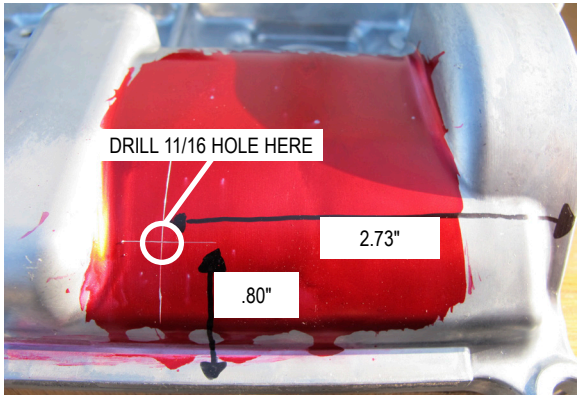


Fig. 11I

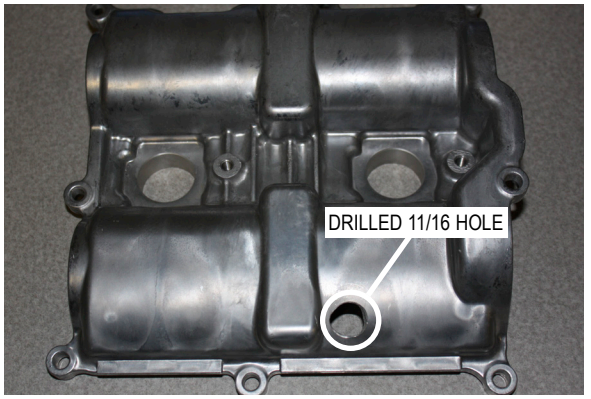


Fig. 11J

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

11. OIL FEED / DRAIN INSTALLATION (COMPETITION KIT ONLY)

Note: The following steps are recommended to be done with the help of a professional welder/fabricator.

N. Locate the provided weld-on oil drain bung. The oil drain bung is already contoured to match the valve cover contour. Place the oil drain bung onto the valve cover, making sure that the threaded portion of the oil drain bung is level & square to the valve cover. Once the oil drain bung is level & centered over the hole, weld it onto the valve cover. See Fig. 11K

O. Once the bung is welded on, check the back side of the valve cover to make sure that the bung lines up to the previously drilled hole. Be sure not to damage the threads in the bung while sanding. **Note: If the hole is a bit off, use a small drum sander to widen up the hole to match the path of the oil drain bung.**

P. Thoroughly clean the valve cover & reinstall the previously removed valve cover gasket into the valve cover.

Q. Place a light coat of RTV onto the valve cover gasket & reinstall the valve cover to the engine. Secure the valve cover to the engine using the (8) 10mm screws previously removed. **Note: Be sure that the seating surface of the valve cover gasket on the engine is clean & clear of any old RTV.**

R. Locate the provided oil drain fitting & apply a small amount of pipe sealant prior to installation. Be sure that the oil drain fitting is facing up at about a 35° angle. Use a 3/4" open end wrench to help tighten the oil drain fitting. Removal of the o2 sensor will be necessary to provide adequate working space. Be sure to unplug the o2 sensor prior to removal and set aside. See Fig. 11L

S. Unplug the black o2 sensor plug located at the top of the engine, left of the upper coolant hose. See Fig. 11M

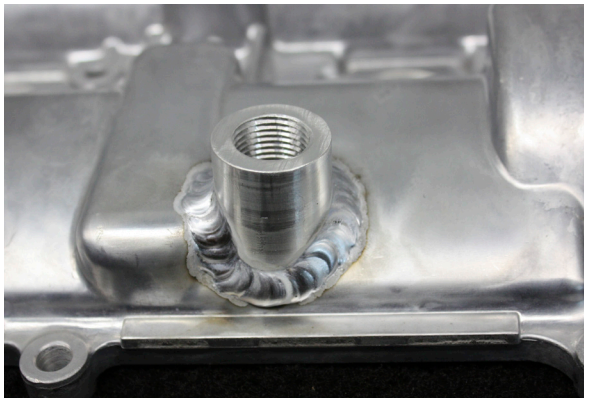


Fig. 11K

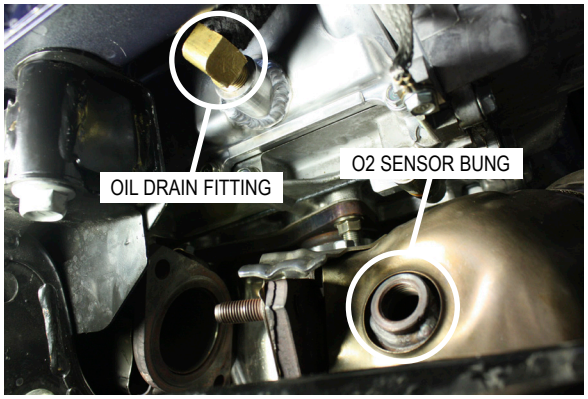


Fig. 11L

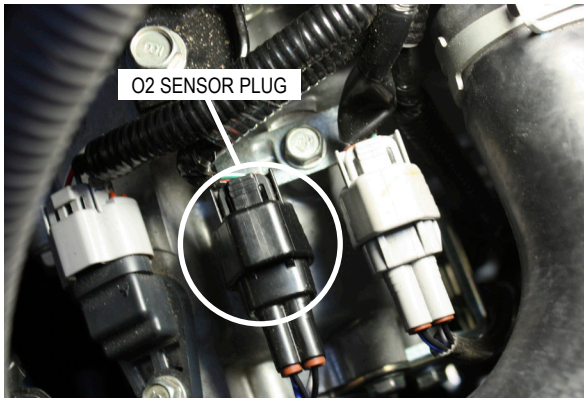


Fig. 11M

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

11. OIL FEED / DRAIN INSTALLATION (COMPETITION KIT ONLY)

T. Located the provided 9” oil drain hose & cut into a 3” section & 6” section. See Fig. 11N

U. Attach the 3” section of hose onto the oil drain fitting on the supercharger unit & secure with the provided #6 hose clamp. At this point, only the fitting side of the hose needs to be secured with the #6 hose clamps. The oil drain tube side of the hose will be secured in a later step.

V. Re-install & connect the previously removed o2 sensor.

W. If the over-pipe was removed, it may be re-installed at this point.

X. Unplug the oil pressure sensor & oil temperature sensor. Remove the factory oil pressure sensor using a 15/16 socket & set aside. See Fig. 11O

Fig. 11N

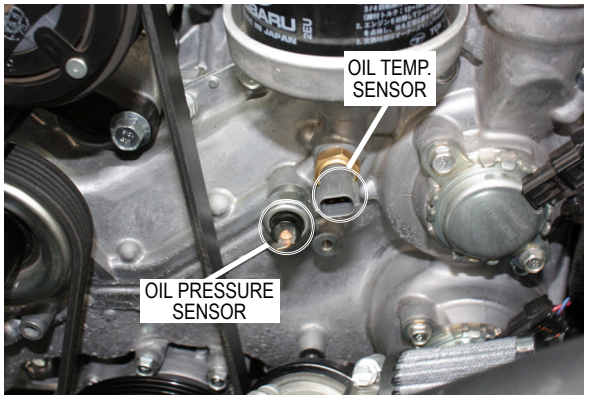


Fig. 11O

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

11. OIL FEED / DRAIN INSTALLATION (COMPETITION KIT ONLY)

Y. Locate the following fittings & assemble them as in the picture shown below: See Fig. 11P

1/8 NPT X 1/8 NPT STRT TEE
1/8 NPT FEM X 1/8 BSPT MALE
1/8 NPT 90° X -4 JIC FTG

Z. Using a small amount of pipe sealant, install the fitting assembly into the OEM location of the oil pressure sensor. See Fig. 11Q

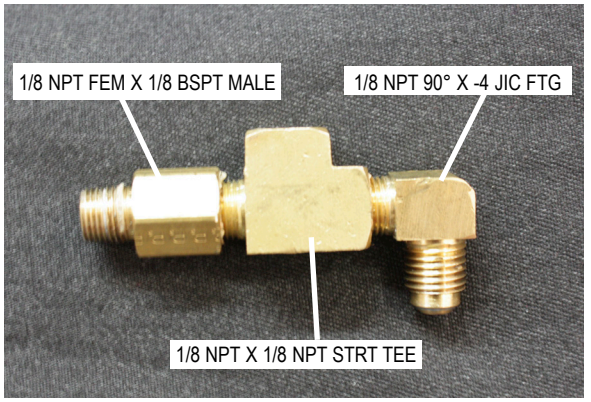


Fig. 11P

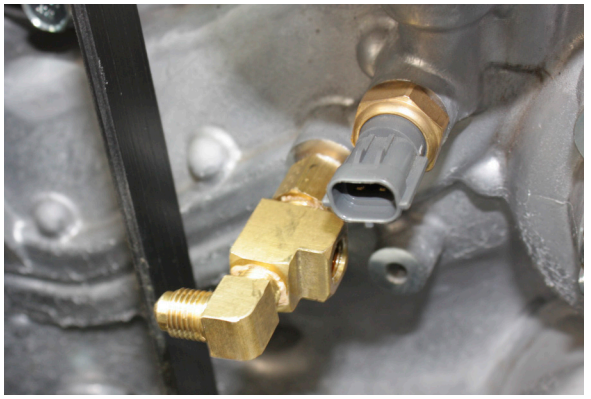


Fig. 11Q

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

11. OIL FEED / DRAIN INSTALLATION (COMPETITION KIT ONLY)

AA. Proceed to install the factory oil pressure sensor into the open port on the fitting assembly. See Fig. 11R

BB. Install the 1/8 NPT 45° x -4 JIC fitting onto the oil feed nozzle. Be sure to hold the nozzle in place while attaching the fitting. Once installed, attach the 90° end of the oil feed line to the fitting. Do not over tighten. Make sure the oil feed line or any of the oil feed fittings are not pressed up against the mounting bracket. See Fig. 11S

CC. Route the other end of the oil feed line to the open fitting on the oil pressure sensor fitting assembly & tighten. Be sure the line isn't kinked & is clear of any obstruction that may result in damage to the line. See Fig. 11T

DD. Locate the provided oil drain tube. Place the long leg of the tube into the oil drain hose of the supercharger unit & the other end of the tube into the previously cut 3" hose on the oil drain fitting. Secure with provided hose clamps.

Note: As no two engine compartments are exactly the same, slight bending of the oil drain tube may be necessary for proper clearance. Be sure that the oil drain tube is free & clear of any obstructions that may result in damage to the tube.

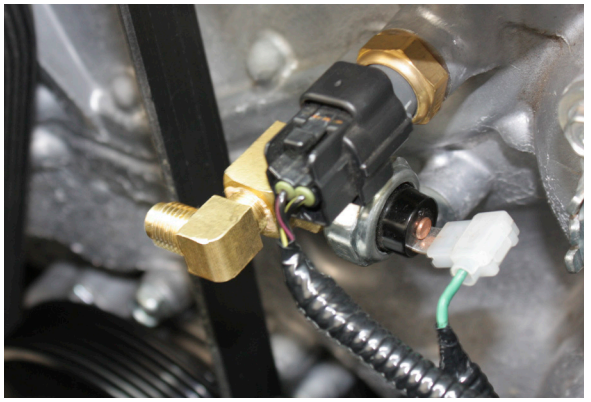


Fig. 11R

Fig. 11S

Fig. 11T

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

11. OIL FEED / DRAIN INSTALLATION (COMPETITION KIT ONLY)

EE. Locate the provided oil drain tube support bracket & (2) M6x25mm screws. Using the lower mounting hole of the engine side of the stiffener bracket, insert one of the provided M6x25mm screws through the oil drain tube support bracket & the stiffener bracket, then tighten it back into the hole where the previous bolt was removed. Slide the adel clamp around the oil drain tube & tighten the other provided M6x25mm screws to the oil drain tube support bracket. See Fig. 11U, 11V

FF. Verify that all hose clamps & fittings are secure.

GG. Once verified, proceed to re-install the coil packs, ECU and splash guards.

When complete, return back to Section 4.

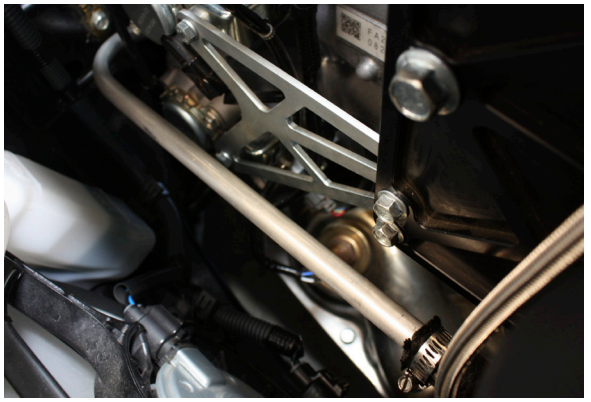


Fig. 11U

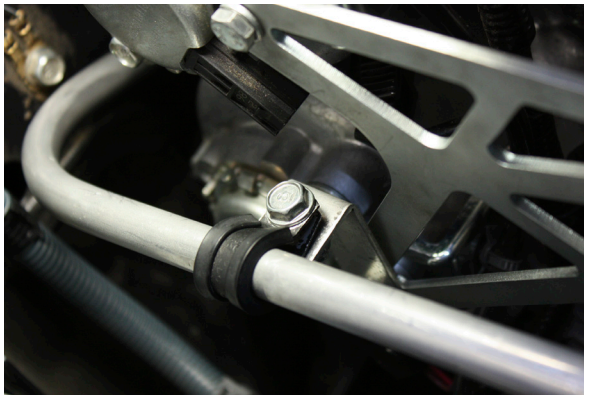


Fig. 11V

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

12. 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 30,000 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, nuts, bolts and clamps for tightness. 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 tie-wraps.

C. Check all fluid levels, making sure that your tank is 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 of 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 using the dipstick as follows:

Fluid level checking procedure:

1. 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.

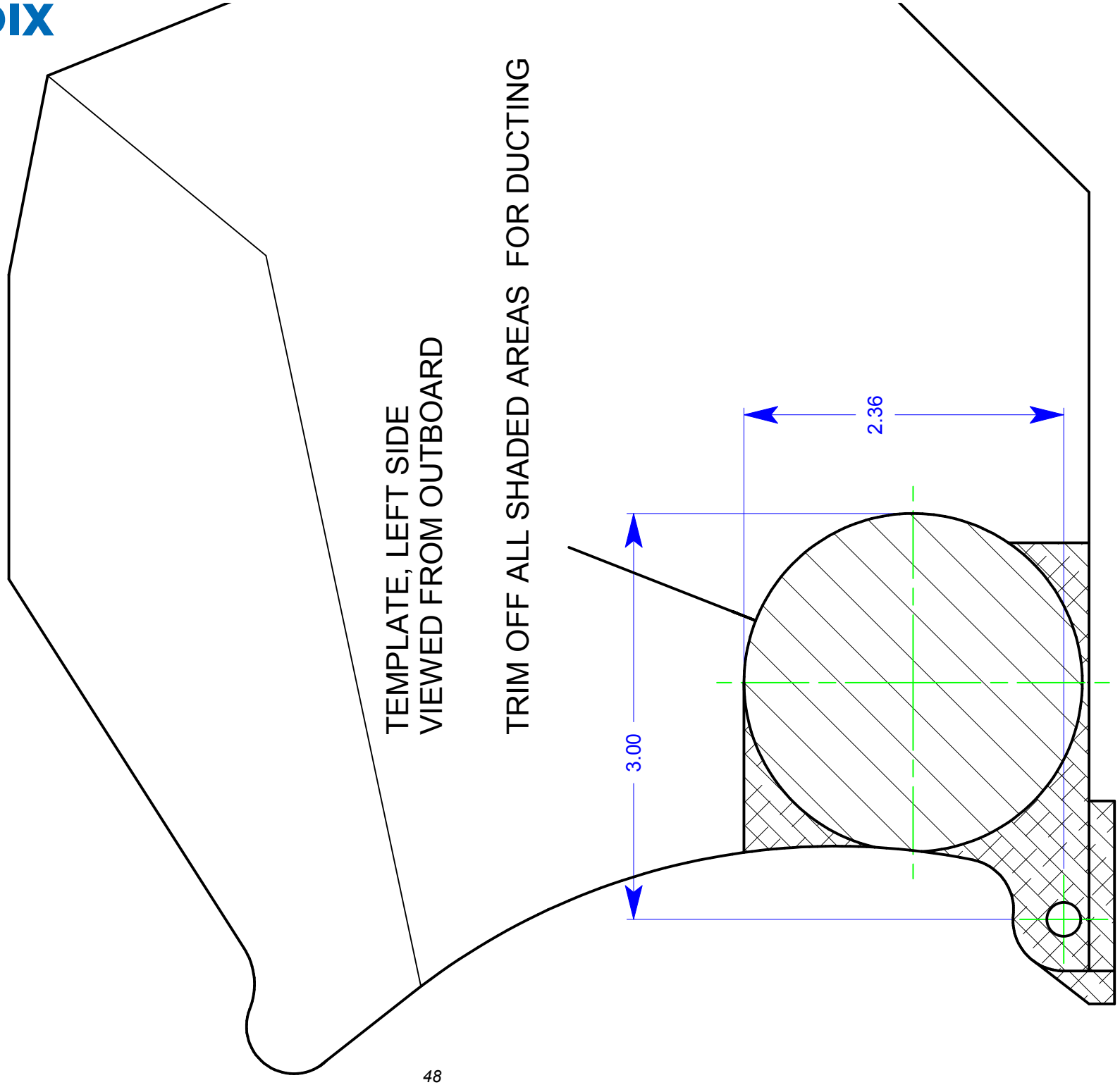
Initial supercharger fluid change must be performed at 2,500 miles. The supercharger fluid must be changed every 7,500 miles maximum thereafter.

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

WARNING: *Use of any fluid other than the special Vortech lubricant will void the warranty and may cause component failure*

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

13. APPENDIX

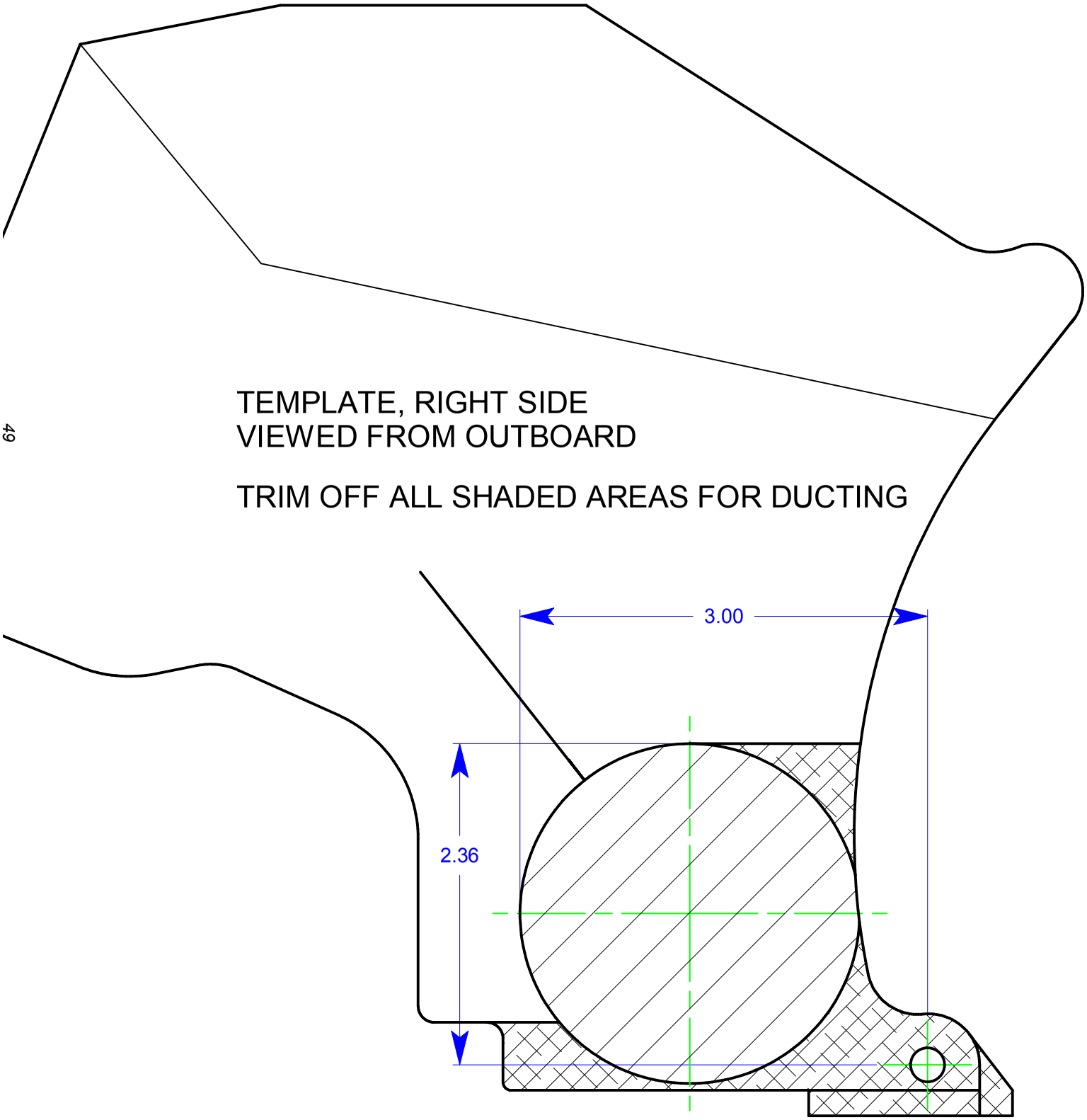


P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc
All Rights Reserved, Intl. Copr. Secured

P/N: 4TF020-010 v3.0, 09/08/2014
©2014 Vortech Engineering, Inc.
All Rights Reserved. Intl. Copr. Secured

TEMPLATE, RIGHT SIDE
VIEWED FROM OUTBOARD

TRIM OFF ALL SHADED AREAS FOR DUCTING



VORTECH
SUPERCHARGERS
1650 Pacific Avenue, Channel Islands, CA., 93033-9901 • Phone: 805 247-0226 • Fax: 805 247-0669 • vortechsuperchargers.com • M-F 7:00AM - 3:30PM (PST)