

Part #'s 150-12-1300/ 1300B/1301/1301B:

2013- PRESENT SCION FRS/ SUBARU BRZ SUPERCHARGER KIT

CARB E.O. # Pending



This supercharger kit must be used with an aftermarket tuning device. Kraftwerks recommends and sells EcuTek.

THE VEHICLE THAT THIS SUPERCHARGER SYSTEM IS INSTALLED ON MUST HAVE AN ENGINE REV LIMITER SET AT 7800 RPM OR BELOW. OVER SPINNING THE ROTREX SUPERCHARGER WILL VOID THE WARRANTY. (Based on standard pulley combo of 100mm on the crankshaft and 75mm on the supercharger)

The Kraftwerks Scion FRS/ Subaru BRZ Supercharger kit is designed to install with ease. If you are a competent mechanic with a good set of tools, the installation will be relatively simple. This is a general installation guide for the Kraftwerks kit; however, each installation may vary slightly. Please keep these key factors in mind before installing:

- Please review the entire installation guide before attempting install. If you have any questions about your ability to perform this installation, we recommend you take your vehicle to a performance shop for installation.

- You will be doing a minimal amount of work under the car during this installation. If you do not have a workshop with lifts, you will need a good floor jack and secure jack stands. These jack stands will need to raise the car up enough so that you can get yourself under the chassis. Never work under a car without secure jack stands to support the vehicle.

- For tools you will need:
 - A full set of metric wrenches from 8mm to 19mm
 - A full set of metric sockets from 8mm to 22mm
 - A screwdriver set
 - A set of metric Allen wrenches
 - Needle nose pliers
 - Hose Cutters

- If you have not changed your oil and filter recently, this will be a good time to do so. High quality synthetic oil would be a good choice considering how much additional horsepower your engine will now be producing.

- Although your vehicle requires Premium fuel from the manufacturer, we have seen some people fill their tanks with less than Premium fuel. Make sure that your vehicle has at least premium gasoline in the tank (91 Octane or more) and run with it for at least several tanks to ensure that there is good Premium grade fuel throughout the system. If you are using a discount brand of fuel, we suggest you switch to a “top tier” gasoline. It is a good practice to get into.

- We recommend one step colder spark plugs when running our supercharger system. Talk to your Kraftwerks representative about our line of NGK Iridium spark plugs.

- Always wear safety glasses when working on your vehicle.

NOTE: BE VERY CAREFUL TO KEEP ALL PIPES AND HOSES SEALED AND CLEAN UNTIL YOU ARE READY TO INSTALL THEM. THE ROTREX SUPERCHARGER RUNS AT SPEEDS AS HIGH AS 100,000 RPM ON THE SCION FRS/ SUBARU BRZ. ANY DEBRIS THAT INADVERTENTLY GETS INTO THE INLET PIPES OR STUCK TO THE SILICONE HOSES WILL GET SUCKED INTO THE ROTREX SUPERCHARGER AND WILL DAMAGE THE COMPRESSOR BLADES. COMPRESSOR BLADE DAMAGE IS NOT COVERED BY THE ROTREX 2 YEAR WARRANTY.

- The Kraftwerks Supercharger does not require any break-in time or warm up. But we do recommend a proper warm up period before operating the engine at full boost.

SECTION 1: PRE-INSTALLATION AND REMOVAL:

Step 1: Remove the negative battery cable. Before removing the battery cable, verify that you have the “anti theft” radio code. It is usually located in your owner’s manual. If you cannot find the radio code, take your car to your local dealer so that they can retrieve the code for you.

Step 2: Jack your car up, or put the car up in the air if you are working in a shop. Support your car with Jack Stands or Ramps if you are working on the ground. Never work under a car without some type of reliable support.

For the following steps, please refer to the factory service manual. Do not discard any parts because they may be reused during installation.

Step 3: Remove the front bumper. The front bumper is secured by a number of fasteners. Take precaution to make sure all fasteners and electrical connectors are removed before pulling bumper off of car.

Step 4: Remove the MAF sensor from the factory air intake tube. Retain the MAF sensor as it will be needed in later steps of the installation of the supercharger kit.

Step 5: Remove the crankcase breather hose and the plastic fitting from the rubber air intake tube.

Step 6: Remove the factory air intake box along with all associated piping and ducts. None of the factory air intake box components will be reused.

Step 7: Remove cover from top of A/C compressor.

Step 8: Remove engine cover from top of intake manifold. This will be reinstalled once the MAP sensor is replaced.

Step 9: Remove factory MAP sensor for top of intake manifold.

Step 10: Empty and remove the factory windshield washer reservoir along with the filler neck. Use caution when removing the electrical connector.

Step 11: Make sure the engine bay is clear of all loose parts and cleaned.



Figure 1: Front bumper removed

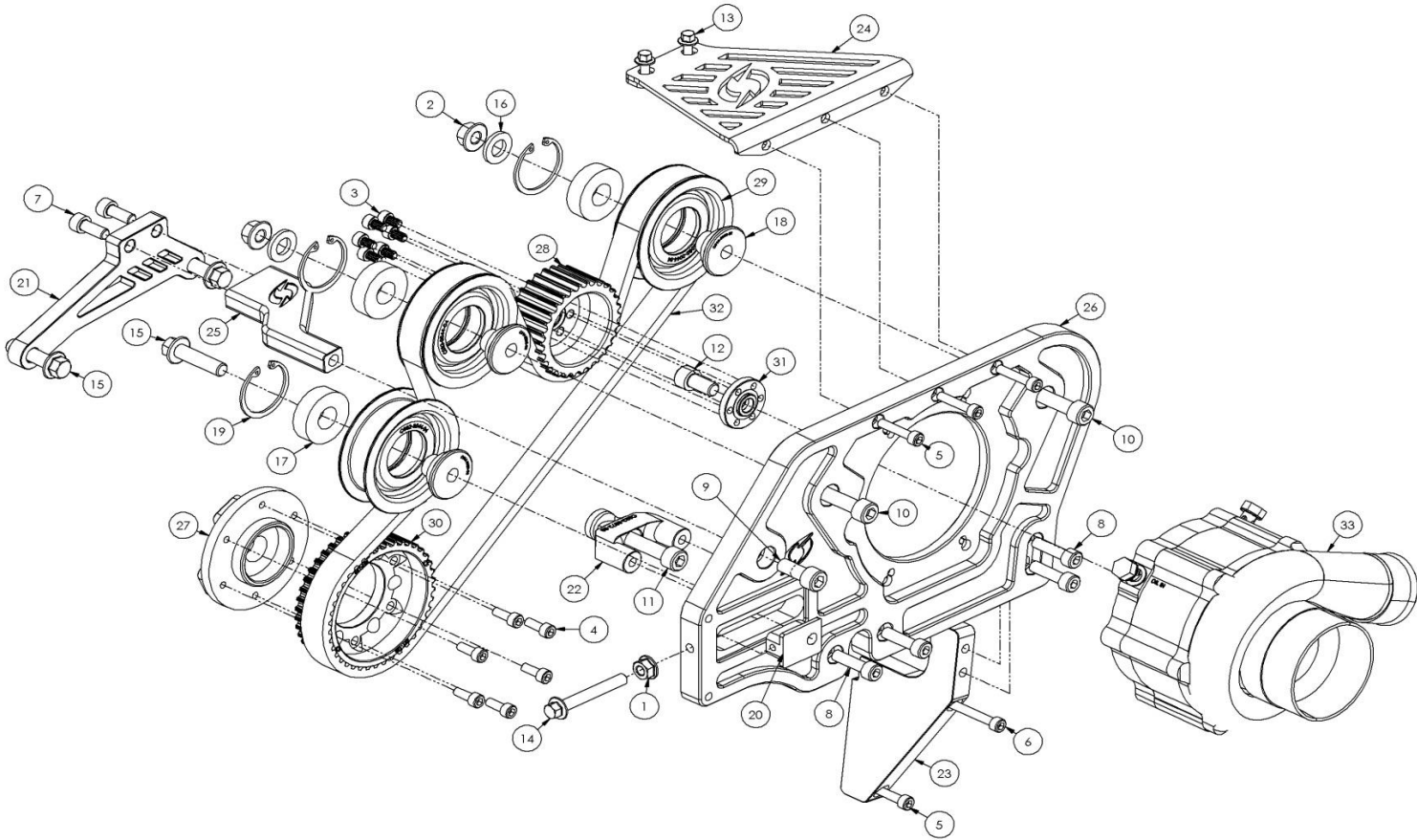


Figure 2: Factory air intake box removed



2013-PRESENT SCION FRS/ SUBARU BRZ SUPERCHARGER KIT INSTALLATION INSTRUCTIONS

ITEM NO.	PART NUMBER	QTY
1	C1FN-0825-BS - NUT, FLANGE, M8x1.25 12AF	1
2	C1FN-1025-CZ - NUT, FLANGE, M10x1.25	2
3	C2AC-0600-10 - AHCS, M6 X 1.0 X 10	6
4	C2AC-0600-15 - SCREW, AHCS M6X1.0X15MM	6
5	C2AC-0600-30 - AHCS M6x1.0x30MM	4
6	C2AC-0600-80 - AHCS M6x1.0x80MM	1
7	C2AC-0825-20 - SCREW, ALLEN HEAD, M8 x 20MM	2
8	C2AC-0825-30 - AHCS M8x1.25x30MM	4
9	C2AC-1025-25 - AHCS M10X1.25X25	1
10	C2AC-1025-45 - SCREW, AHCS M10X1.25X45MM	2
11	C2AC-1025-60 - AHCS M10x1.25x60	1
12	C2AC-1050-20 - AHCS, M10X1.50X20	1
13	C2FH-0600-20 - BOLT, FLANGE, M6 x 1.0 x 20MM	2
14	C2FH-0825-60 - BOLT, FLANGE, M8x1.25x60 12AF	1
15	C2FH-1025-40 - BOLT, FLANGE, M10x1.25x40 14AF	3
16	C3FT-2413-030 - WASHER, FLAT, M12, 24MM OD x 13MM ID x 3MM	2
17	C004-0018-05 - Bearing, Ball, 62032RD	3
18	C014-0065-06 - SPACER, 38MM OD X 10MM ID X 21.35MM	3
19	C031-0013-01 - Retaining Ring, Internal, 43.5mm OD, 1.75mm THK	3
20	C032-0013-06 - TENSION ADJUSTOR, B SC BRACKET	1
21	C032-0071-06 - BRACKET, SC SUPPORT, BRZ	1
22	C032-0072-07 - BRACKET, SC Y SUPPORT, BRZ	1
23	C032-0073-06 - BRACKET, SC LOWER, BRZ	1
24	C032-0075-04 - BRACKET, TOP COVER, BRZ	1
25	C032-0078-06 - BRACKET, SC Z, BRZ	1
26	C032-0079-06 - PLATE, BRZ SC	1
27	C092-0030-01 - CRANK PULLEY, INNER HUB, BRZ	1
28	C092-0043-04 - PULLEY, ROTREX, 75MM, 25MM WIDTH, 30 TEETH, HTD8	1
29	C092-0044-04 - PULLEY, IDLER, 71MM OD X 27MM, FLAT, OFFSET	3
30	C092-0049-04 - CRANK PULLEY, OUTER HUB, 100MM, 31MM WIDTH, 40 TEETH, GT2	1
31	C092-IHUB-KW - PULLEY HUB, ROTREX	1
32	C119-1200-09 - BELT, HTD8 GT2, 1200MM, 20MM WIDTH	1
33	C121-0005-01 - C30-94 ROTREX S/C	1



SECTION 2: INSTALLATION OF SUPERCHARGER DRIVE SYSTEM:

Step 1: Install crank hub adapter onto crank pulley. Remove the crank pulley bolt (22mm) and install adapter. Reinstall crank pulley bolt and torque bolt to 94 ft-lbs. (See figure 4 and 5)

Step 2: Install the lower supercharger drive pulley on to crank hub adapter. Use the (6) M6x15MM Allen bolts provided. Apply red Loctite to bolts and torque to 10 ft-lbs. (See figure 6)

Step 3: Install upper support bracket on to engine. There is two pieces to this bracket, they are held together by (2) M8x20MM Allen head bolts torqued to 20 ft-lbs. Remove the factory bolts that secure the alternator and A/C compressor and place the upper support bracket in place. Use the (2) M10x40MM bolts provided and secure the bracket to the engine. Torque bolts to 38 ft-lbs. (See figure 7)

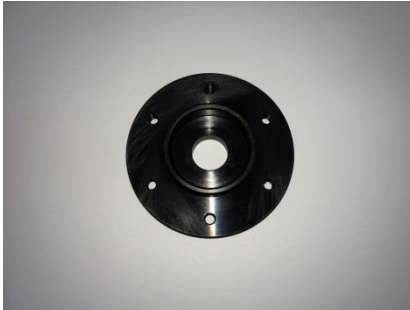


Figure 4: Crank hub adapter



Figure 5: Crank hub installed



Figure 6: Lower drive pulley installed

Step 4: Install the “Y” support bracket on to engine. Remove the factory M10 bolt that secures the idler pulley. Install the “Y” support bracket and use the supplied M10x60 Allen head bolt to hold bracket in place. Do not tighten the bolt yet as we may need to adjust bracket in the upcoming steps. Make sure you retain the factory washer between the idler pulley and support bracket. (See figure 8 and 9)

Step 5: Install lower support bracket on to engine. Use the supplied bolts to hold the bracket on to engine. (1) M6x80 Allen head and (1) M6x30 Allen head. Do not tighten the bolts yet as we may need to adjust bracket in the upcoming steps. (See figure 10 and 11)

Step 6: Install Rotrex supercharger onto the supercharger plate. Remove yellow caps from supercharger oiling holes. Install the (4) supplied bolts through the plate into the supercharger. Use red Loctite and torque bolts to 10 ft-lbs. Also torque two idler pulleys on plate to 38 ft-lbs.



Figure 7: Upper support bracket installed



Figure 8: Remove the factory bolt from the idler pulley



Figure 9: “Y” support bracket installed (Do not tighten bolt yet)



Figure 10: Where the lower support bracket will bolt to.



Figure 11: Lower support bracket installed (Do not tighten bolts yet)



Figure 12: Supercharger installed onto supercharger plate

Step 7: Install supercharger pulley onto the supercharger. Use the (6) M6x10MM Allen bolts provided. Make sure you do not spin the supercharger when you are tightening the bolts. You can wrap the belt around the pulley and hold it to help prevent the supercharger from spinning. Use locking compound and torque bolts to 8 ft-lbs. (See figure 14 and 15)

Step 8: Route belt around the pulleys as shown in figure 3 and 16.

Step 9: Install supercharger plate onto the engine. Use the M10x25MM Allen head bolt to secure the plate to the upper support bracket. Then use the (4) M8x30MM Allen head bolts to secure the plate to the “Y” bracket and lower bracket. (They were left loose so you will be able to adjust them to fit) Once all bolts are inserted torque the M8 bolts to 20 ft-lbs and the M10 bolt 38 ft-lbs. Now you can torque the bolt holding the “Y” support bracket to the engine to 38 ft-lbs. You can also torque the two M6 bolts that hold the lower bracket to the engine to 8 ft-lbs. (See figures 17, 18, 19, 20, 21, and 22)

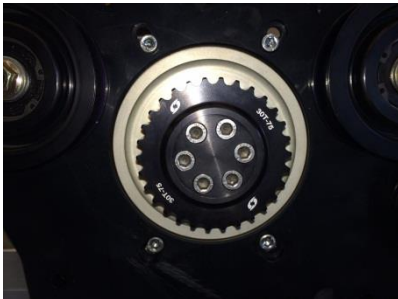


Figure 14: Supercharger pulley installed



Figure 15: How to hold pulley from spinning using the belt

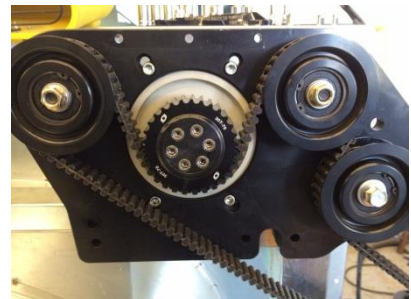


Figure 16: Belt routing



Figure 17: Torque M10 bolt to 38 ft-lbs that goes into upper support bracket



Figure 18: Torque (2) M6 bolts to 20 ft-lbs that goes into the “Y” support bracket



Figure 19: Torque (2) M6 bolts to 20 ft-lbs that goes into lower support bracket



Figure 20: Torque the M10 bolt that holds the “Y” bracket to block to 38 ft-lbs



Figure 21: Torque the (2) M6 bolts that hold the Lower support bracket to block to 9 ft-lbs



Figure 22: Plate Installed

Step 10: Install belt around the lower drive pulley. Make sure the belt is routed correctly. (See figure 3 and 23)

Step 11: Now it is time to tension the belt. You will be driving the M8x60MM bolt in on the side of the plate until desired amount of tension is set. We have done testing and have come up with an easy way to set the correct amount of tension. You will drive the bolt in until you have 21MM between the plate and under the head of the bolt. Once you are done with setting the bolt you can secure the bolt by tightening the retaining nut. (See figures 24 and 25)

NOTE: You can also use a frequency measuring tool to gauge the correct amount of tension. Set to 60.70 Hz.

Step 12: Tighten the M10x40MM bolt to secure the tensioner idler pulley with an open end wrench. (See figure 26)

Step 13: Install the belt cover. Take the upper belt cover and install the (3) M6x30MM Allen head bolts from supercharger plate into the cover. Take the (2) M6x20MM bolts and install the cover onto the A/C compressor. Torque all bolts to 9 ft-lbs. (See figures 27, 28, and 29)



Figure 23: Belt routed around the lower pulley



Figure 24: Adjust Tensioner bolt until you have 21MM between plate and bolt

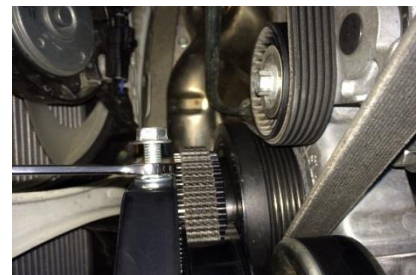


Figure 25: Tighten the retaining nut to secure the tensioner



Figure 26: Tighten the Idler pulley



Figure 27: Cover



Figure 28: Cover



Figure 29: Drive System Complete

SECTION 3: INSTALLATION OF ROTREX OIL SYSTEM:

Step 1: Install the Rotrex oil reservoir. Disconnect and remove your battery. Remove the plastic battery tray. Remove the 10MM bolt that holds down the battery support. Install the Rotrex oil reservoir mounting bracket with the supplied M6x25MM bolt and 10mm spacer. Next take the oil reservoir and install the brackets. Install the fittings on to the reservoir. (There is one barbed banjo, banjo bolt, and two crush washers on each side) Take the two 38mm spacers and install the reservoir to the mounting bracket with the supplied M6x90mm bolt. (See figures 30, 31, and 32)

Step 2: Mount the oil cooler. You will need the oil cooler, mounting brackets, mounting tabs, and all M6 hardware. Tighten the mounting tabs on to base of oil cooler with the provided M6 bolts. Take the mounting brackets and install them on the bottom of you A/C condenser on the outer lip. Use the remaining M6 bolts and attach the mounting tabs to the mounting brackets. As you tighten the bolts it will secure itself to the A/C condenser. (See figures 33, 34, and 35)

Step 3: Mount the Rotrex oil filter. You will need the oil filter, insulated P clamp, and M6 bolt. You will be mounting the oil filter to the old support bracket for your factory air intake box. It is located on the driver side frame rail between the radiator and engine. Install the oil filter into the clamp paying attention to which way the flow arrow is pointed and secure the clamp to the bracket.

Step 4: Install the fittings onto the Rotrex supercharger. The fitting will include one barbed banjo, one banjo bolt, and two crush washers for each the inlet and outlet of the supercharger. Leave the bolts loose so you can route the hose in the next step. (See figure 38)

Step 5: Run all hoses for system. Included in the oil kit are 4 lengths of hose. You may need to make small adjustments to the lengths but they should be close out of the box. The first hose you will run will be from the bottom of the Rotrex oil reservoir to the Rotrex oil filter. The hose is 84" long. You will route the hose from the reservoir along the frame rail around the radiator support along the bumper support to the driver side frame rail where you will connect it to the oil filter. Use one spring clamps at each end of the hose. The next hose will be from the oil filter to the inlet of the supercharger. The hose is 15" long. Use one spring clamps at each end of the hose. The next hose will be from the outlet of the supercharger to the oil cooler. The hose is 38" long. You will route hose from supercharger along the driver side frame rail around the radiator support along the bumper support to the oil cooler. Use one spring clamps at each end of the hose. The final hose is from the oil cooler back to the oil reservoir. This hose is 45" long. You will route this hose from the oil cooler along the bumper support around the radiator support along the frame rail back to the top of the oil reservoir. Use one spring clamps at each end of the hose. Use the 8 supplied zip ties to secure the oil lines. (Figures 36, 37, 38, and 63)

Step 6: Tighten the two banjo bolts on the Rotrex supercharger and the two on the Rotrex oil reservoir.

Step 7: Once you finish with the kit install fill up Rotrex oil system and prime the system following the instructions below (also note page 17 &18 for more detail)



Figure 30: Reservoir support bracket bolted to car



Figure 31: Reservoir spacers and brackets installed



Figure 32: Rotrex oil reservoir installed



Figure 33: Oil cooler with mounting hardware



Figure 34: Mounting tabs installed



Figure 35: Oil cooler installed on A/C condenser



Figure 36: Oil line routing



Figure 37: Oil line routing



Figure 38: Oil line routing and fittings in supercharger

SECTION 4: INSTALLATION OF WHINDSHILD WASHER RESERVOIR:

Step 1: Remove factory reservoir. Drain fluid from reservoir. Disconnect the electrical connector from the side of the washer motor. Also disconnect the line form the washer motor. Remove the factory mounting hardware and remove the reservoir from the car.

Step 2: Install the washer motor in the new windshield washer reservoir. Take the factory washer motor out of the factory reservoir and install it along with the seal into the new windshield washer reservoir.

Step 3: Install the new windshield washer reservoir. Take the reservoir and install it in to the factory location with the new hardware provided in the kit. Connect the electrical connector to the side of the washer motor. Also connect the washer line to the side of the washer motor.

Step 4: Connect the factory fill neck. Connect the fill neck along with its seal to the new windshield washer reservoir. Refill the reservoir with fluid.



Figure 39: Windshield washer motor



Figure 40: New reservoir installed



Figure 41: Factory fill neck installed in new reservoir

SECTION 5: INSTALLATION OF INTERCOOLER:

Step 1: Install the intercooler brackets. Take the intercooler and connect the brackets to the sides with the supplied hardware.



Figure 42: Intercooler brackets installed

Step 2: Connect the upper brackets to the lower brackets with the supplied bolts.

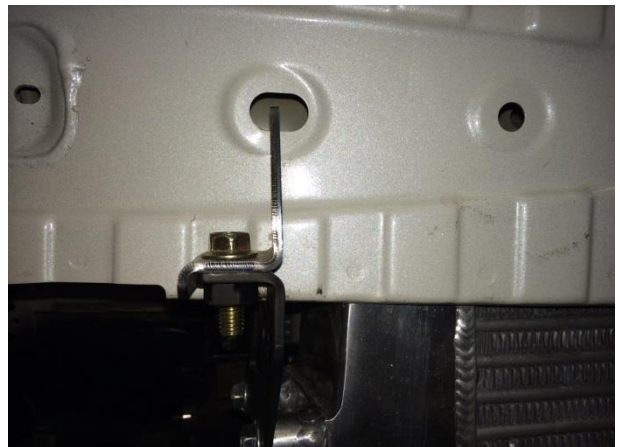


Figure 43: Upper and lower brackets installed

Step 3: Install the intercooler assembly on to the bumper support and tighten the bolts to clamp intercooler in place.



Figure 44: Intercooler installation complete

SECTION 6: INSTALLATION OF CHARGE TUBING AND AIR INTAKE:

Step 1: Install molded coupler from outlet of Rotrex supercharger and route between the driver side frame rail and headlight. Use one 2" clamp to secure the molded coupler to the Rotrex supercharger outlet.

Step 2: Install the hot side charge tube. Connect the hot side charge tube to the molded coupler. Use a 2.5" clamp to secure molded coupler to charge tube. Connect the hot side charge tube to the intercooler using a 2.5" straight coupler along with two 2.5" clamps. Secure all clamps.

Step 3: Install cold side charge tubing. Install a 2.5" straight coupler onto intercooler along with two 2.5" clamps. Install the first cold side charge tube onto intercooler. Install a 2.5" straight coupler along with two 2.5" clamps to the end of the first cold side charge tube. Install the second cold side charge tube to the end of the first cold side charge tube. Install the 2.5" to 3" reducer along with one 2.5" clamp and one 3" clamp to the end of the second cold side charge tube. Install a 3" straight coupler along with two 3" clamps onto the throttle body. Install the third cold side charge tube, which will connect the second cold side charge tube to the throttle body. Secure all clamps.

Step 4: Install MAF sensor onto charge tube. Install MAF sensor (Goes in one direction) and secure with the two bolts provided. Reconnect electrical connector to sensor.

Step 5: Install bypass valve onto the molded coupler that is attached to the supercharger. Use a 1" clamp to secure the bypass valve in coupler.

Step 6: Install intake tube and air filter. Install a 3" straight coupler to the inlet of the Rotrex supercharger along with two 3" clamps. Install intake tube onto the inlet of the supercharger. Install air filter to the end of the intake tube. Install the two provided intake support brackets. They will connect the intake tube to the radiator support. Secure all clamps and bolts.

NOTE: With some aftermarket radiators trimming of the fan shroud will be needed to install intake tube.

Step 7: Install bypass valve recirculation hose. Connect the hose from the outlet of the bypass valve to the air intake tube. Use two 1" clamps to secure the hose.

Step 8: Connect a vacuum source to bypass valve. Cut the factory brake booster hose and install the vacuum "T" in place. Secure the ends of each hose with the supplied 4" zip ties. Run the new vacuum line from the "T" and route line under the intake manifold around any rotating parts and connect to bypass valve. Secure line with the provided 4" zip ties.

Step 9: Connect the crank case breather tube to the air intake. Use the supplied 1/2" hose and connect the factory breather line to the air intake. Secure hose ends with the supplied 4" zip ties.

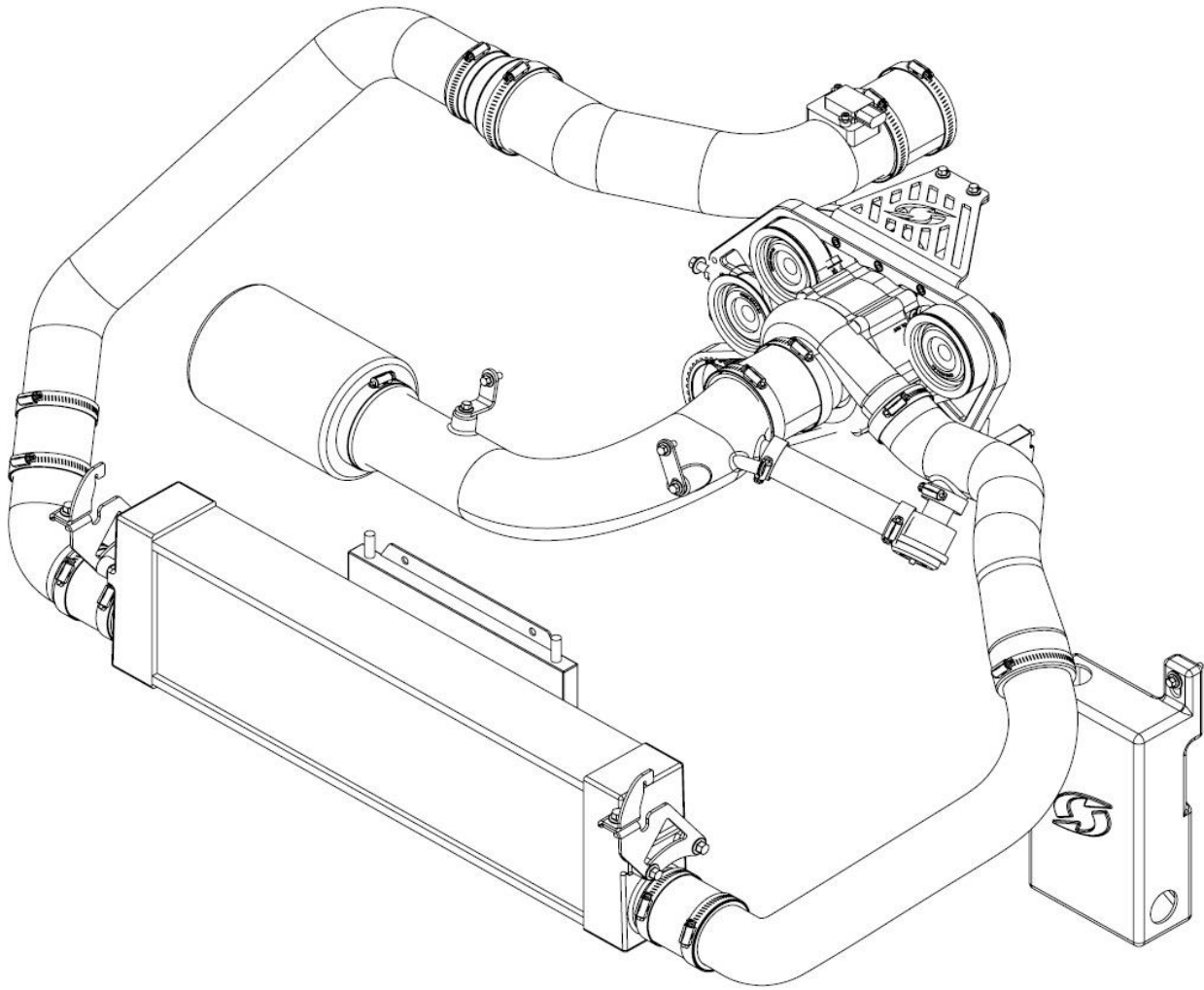


Figure 45: Detailed view of charge piping and air intake



Figure 46: Molded coupler installed



Figure 47: Hot side charge tube installed



Figure 48: First cold side charge tube installed



Figure 49: Second charge tube connected to first charge tube



Figure 50: 2.5" to 3" reducer between second and third charge tube



Figure 51: Third cold side charge tube installed



Figure 52: MAF sensor installed



Figure 53: 3" coupler connecting supercharger inlet to intake tube

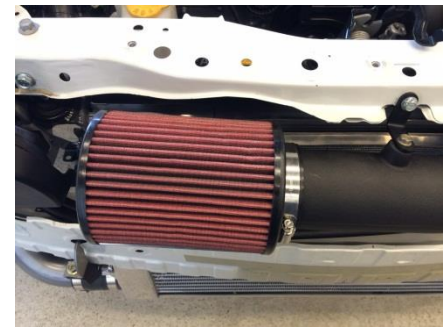


Figure 54: Air filter installed on intake tube

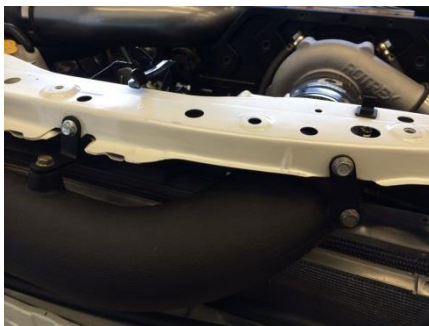


Figure 55: Intake support brackets installed



Figure 56: Intake tube installed



Figure 57: Bypass valve installed with recirculation hose



Figure 58: Vacuum "T" installed



Figure 59: Crank case breather extended



Figure 60: Crank case breather and bypass valve recirculation hose connected to intake

SECTION 7: FINAL ASSEMBLY

Step 1: Install new MAP sensor. Install sensor using factory hardware. Reconnect electrical connector. (For kits that were purchased with the tuning package)

Step 2: Reinstall bumper and all covers removed.

Step 3: Reconnect battery

Step 4: Install the ECUTEK re-flash. (For kits that were purchased with the tuning package)

NOTE: Installation instructions can be found on ECUTEK's website.



Figure 61: New MAP sensor installed



Figure 62: ECUTEK tuning cable and dongle

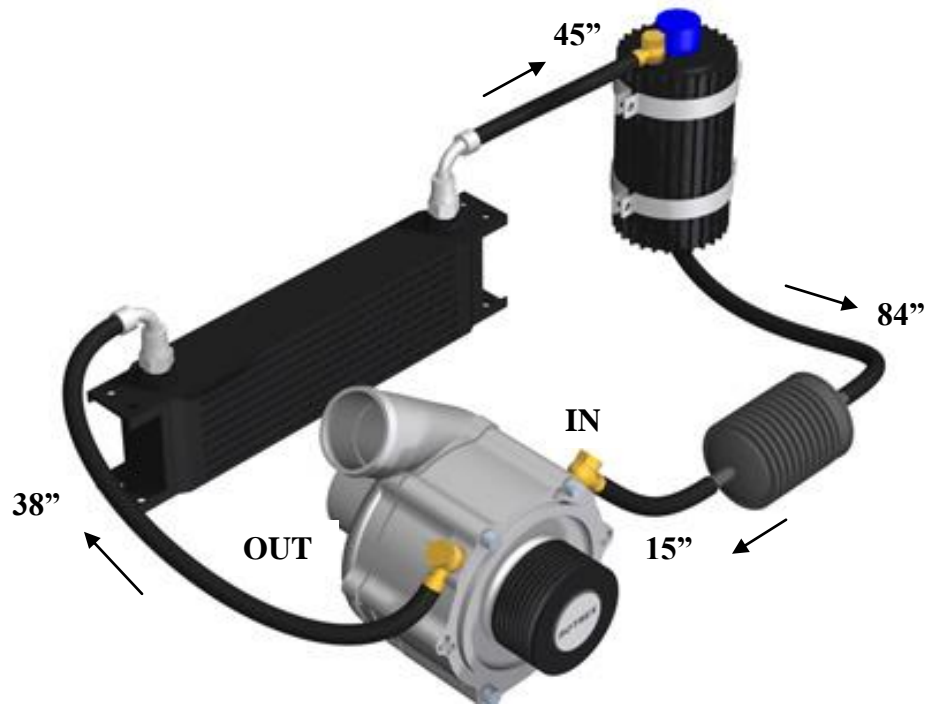


Figure 63: Rotrex Oiling System

SECTION 8: PRIMING YOUR ROTREX SUPERCHARGER

Step 1: It is time to prime the Rotrex supercharger. Unplug all the fuel injector connectors. Loosen the Rotrex “OUT” oil fitting on the supercharger. Have a helper watch the “OUT” fitting to verify when oil starts leaking from this fitting. Have someone crank the engine for 10 seconds. If you do not see oil leak from the “OUT” fitting, continue this 10-second procedure 5 more times letting the starter cool between intervals. If you still haven’t seen oil come from the “OUT” fitting, plug the fuel injector connectors back in and start the car; let it run for 3 seconds. Repeat this procedure until you see oil leak from the “OUT” fitting. Once oil leaks from the “OUT” banjo fitting, tighten the “OUT” banjo fitting and start the car. Watch the Rotrex reservoir carefully during this initial start up, as it will be filling the oil cooler and lines during this initial start up. Do NOT allow the Rotrex reservoir to run dry.

Step 2: Check the Rotrex oil level once the engine has warmed up completely. ALWAYS CHECK THE ROTREX OIL LEVEL WHEN THE ENGINE IS COMPLETELY WARMED UP. RAISE THE RPM TO 2000 RPM AND HOLD IT THERE FOR 15 SECONDS. ALLOW THE CAR TO COME TO AN IDLE AND CHECK THE OIL LEVEL AFTER THE CAR HAS COME BACK TO AN IDLE AND COMPLETELY WARMED UP.

THE ROTREX OIL LEVEL SHOULD BE ABOUT HALFWAY BETWEEN THE MIN AND MAX ON THE ROTREX DIP STICK ONCE THE OIL SYSTEM IS LEVEL.*

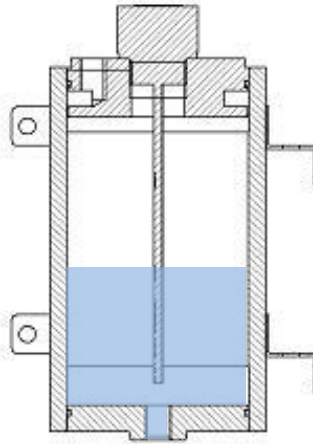


Figure 64: Proper Rotrex Oil Level

*Do not overfill the Rotrex oil reservoir. If you overfill the Rotrex oil reservoir, it will leak from the vented cap when you are in the upper RPM ranges. The Rotrex system draws oil through the supercharger and sends it, at low pressure and volume, to the oil cooler. It takes some time for the system to find its “normal” operating level. Follow the instructions for bringing the engine to 2000RPM and then check the oil immediately after bringing it to an idle with the engine completely warmed up.

Step 3: Double-check all the connections at the coolant hoses, intercooler piping, Rotrex oil lines and vacuum hoses. Check your engine oil level and fill if necessary.

Enjoy your Kraftwerks Supercharger System!