

Thank you for purchasing our TDR supercharger kit for 99-05 Mazda Miata. Our supercharger (SC) mount fits both the 1.6 and 1.8 liter engines and uses the factory power steering mount for assembly, see Photo 1. Also both left hand and right hand drive cars are compatible except mounting of the reservoir and catch can. The Rotrex SC comes in three sizes for our application, see Photo 2. We call the C30-84 our STREET model as it has more mid-range power and is ideal for around 10-13 PSI using stock internals. The Street setup will work with and without your mass air flow MAF unit.

The C30-94 is our TRACK model and is capable of 14-16 PSI, but forged internals are strongly recommended. This SC uses a larger 3 inch (76 mm) intake opening and works well with a Standalone fuel management such as our Mega Squirt PNP2 systems. Your mass air flow MAF unit has a diameter of 2 ¾ inch (70 mm) and would be a restrictor to the Rotrex intake. We can custom configure either blower to meet your current and future needs. Installation of either model is similar as outlined in these instructions.

We have street and track tested several configurations for 2 years on different year models before releasing what we think is the best kit in the industry. Since 2003 we have been designing and developing supercharger systems exclusively for Miata's and our experience shows in every one of our kits. We want you to be proud to lift your hood. If at any time you have any questions during the installation, please do not hesitate to contact us. Picture below is an '01 Miata with stock internals and using the C30-84 blower at around 10 PSI. Fuel management uses our TDR fuel card. The 99-00 model produces about 230 RWHP.



NOTE: Our SC kit mounts to the factory power steering mount as shown below in Photo 1. If you do not have power steering then you will be required to buy one of these mounts. Check with us first or contact a salvage yard.



Photo 1: Factory power steering mount all year models



Photo 2: C30-74 on left and C30-84 and C30-94 on right

99-05 Model Intercooler Installation

We will begin installation with the intercooler mounting. Our installation instructions have been developed so that even the average weekend mechanic can install our system. It should take a little over an afternoon to install the TDR Intercooler using standard hand, air and or electric tools. The instructions include over 70 pictures to help detail the eleven steps involved in installing the TDR Intercooler.

Due to the Intercooler piping, the Factory Hood Prop cannot be stored in its normal latched position across the front of the engine. Include with our kit are our dual pneumatic hood struts as shown in Photo D. You can also keep the hood prop in your trunk and bring out when necessary. Install these first to eliminate propping the hood.

The TDR Intercooler unit installs in front of the air conditioning condenser and bolts in using factory mounting holes. The TDR Intercooler does require some modifications in the engine bay and radiator area, but the modifications are not extensive.

The brushed stainless steel mandrel-bent intercooler piping are designed to keep the length of the airway as short as possible to maintain quick throttle response and reduce pressure drop. All TDR panels are CAD-designed and cut on a CNC router to ensure a perfect fit. Additionally, the radiator shield is powder-coated in a beautiful black crinkle finish on the radiator support area. This panel supports the radiator top mount.

As you can see from Photos 3 thru 6, the TDR components are of the highest quality. Our design was engineered to be the most efficient Intercooler system on the market. We believe our instructions are extremely thorough, and we have provided pictures of every step of the installation.

Photo 3 are the intercooler components. Photo 4 are the intercooler panel components. Photo 5 is the supercharger and oil cooler components. Photo 6 is the hood struts.



Photo 3: 99-05 Intercooler components

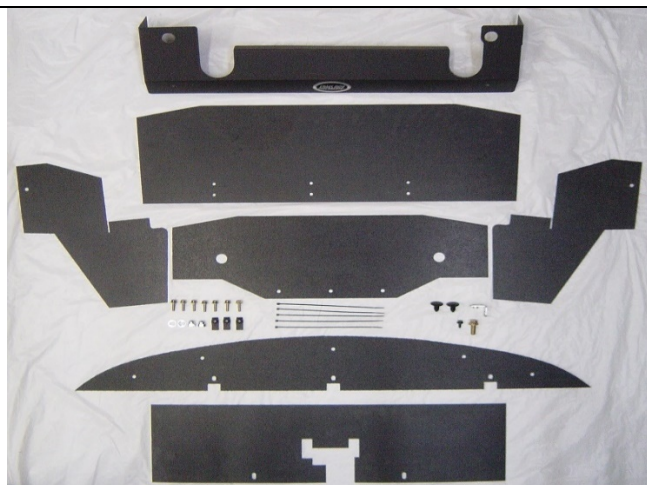


Photo 4: 99-05 Radiator shroud panels



Photo 5: 99-05 Supercharger kit



Photo 6: Hood struts

Required Tools

The chart below lists some of the tools required or may help in the supercharger and intercooler installation. Feel free to use tools other than what we recommend to help in the installation.

- Open-end wrenches and sockets: 8, 10, 12, 13, 14, 17mm
- Air-operated reciprocating saw or electric jig saw
- Phillips and flat head screwdrivers
- Wire crimp tool
- Large crescent wrench
- Electric drill - air-operated models are smaller and will simplify installation
- 7/16 in. open wrench
- 5 mm Allen wrench or socket
- 4 mm Allen wrench or socket
- Socket wrenches
- Allen wrenches
- Metal files: rat tail and flat file
- Rivet gun
- Zip-Ties
- Wire cutters
- Power steering fluid
- Hacksaw
- Masking tape
- Spray bottle with soapy water
- Touch-up paint
- 1/8" and 1/4" drill bit
- Lighter

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STEP 1: REMOVAL OF FACTORY PARTS

Drive your car onto a level surface, keep the car in gear and apply the parking brake. Jack up the car and secure with four jack stands. Remove both front wheels. The following instructions are the same for 99-05 models.

1.1 Removal of Factory Intake Setup

- Remove the factory tie-down hooks that are located in the radiator area as shown in Photo 1-1. You do not need to remove the right side, but the plastic side panel will require cutting for additional clearance. TDR offers a flat plate model tow hook that does not require additional panel clearances. There are three M10 bolts requiring a 14mm wrench.



Photo 1-1: Left side tie-down



Photo 1-2: Upper radiator bracket

- Remove the upper radiator bracket using a 14 mm wrench as shown in Photo 1-2.
- Loosen the two clamps on the Intake and MAF using a Phillips screw driver or 10 mm wrench as shown in Photo 1-3 and 1-4.
- Remove the two M6 bolts holding the MAF to the filter box shown in Photo 1-4 using a 10 mm wrench.
- Remove the air temperature sensor in the filter box as shown in Photo 1-5 by pulling with a little effort. The sensor will be installed later onto the harness.



Photo 1-3: Plastic intake at the throttle body

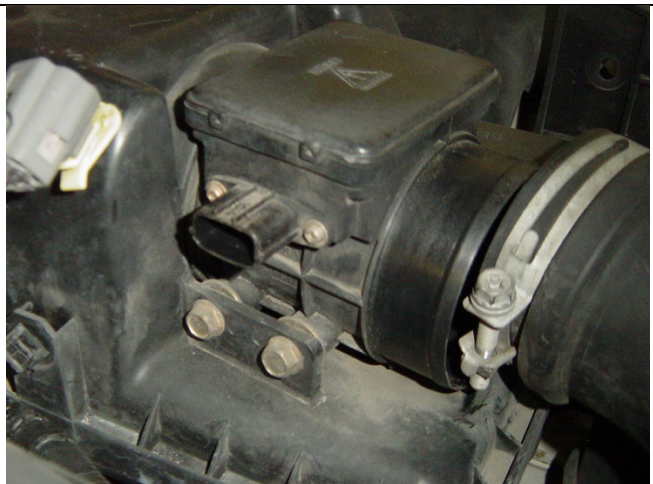


Photo 1-4: Bolts holding MAF unit

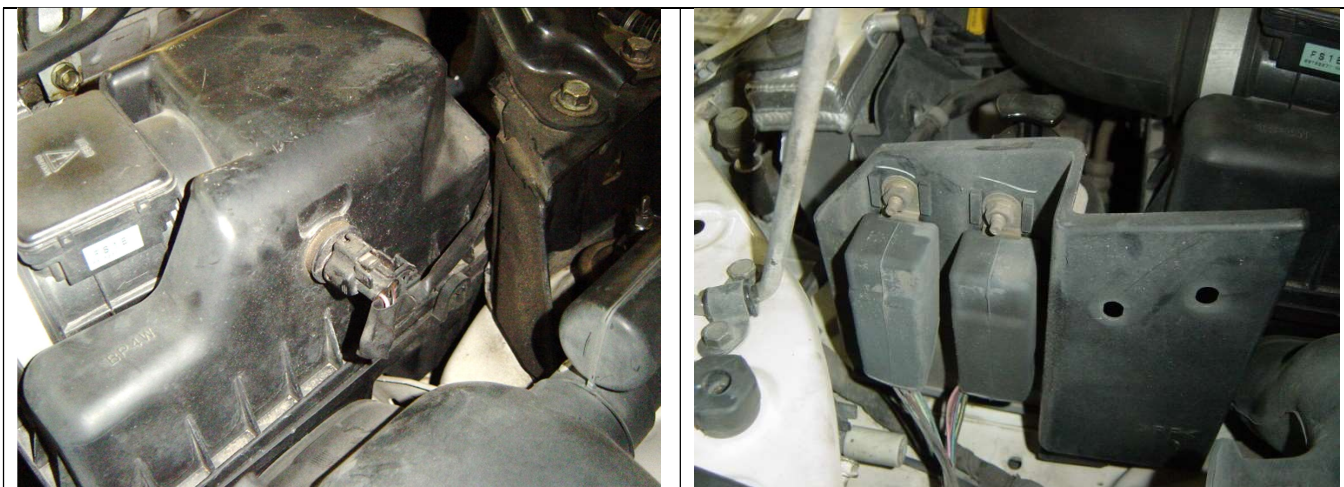


Photo 1-5: Air temperature sensor in air filter box

Photo 1-6: Relays mounted to plastic panel

- There are two and sometimes three relays to be removed from the plastic mount as shown in Photo 1-6. You can tie the relays together and place behind the headlight and fender area for safe keeping. There is a pocket area that is perfect for placing.

1.2 Belly Pan and Fender Liner Removal

Remove the factory belly pan and left and right bumper liners. We will not use the left side bumper liner with the SC oil cooler. The hardware uses M6 bolts and Phillips screws as shown in Photo 1-7. The plastic snaps undo with either a Phillips or flat-head screwdriver. Use your finger to hold the plastic insert while turning the screw.

1.3 Front Spoiler Lip Removal

Under the front bumper is a small spoiler lip to be removed as shown in Photo 1-9. It is held on by five M6 bolts that will be used later to attach a new replacement panel. Remove using a 10 mm wrench.

1.4 Radiator Removal

If the radiator fluid is still good, drain it into a container for reuse. Radiator fluid is toxic so keep the fluid away from children and pets.

- From below the car, remove the radiator drain plug. After the radiator fluid begins to drain, remove the radiator cap to increase the fluid flow.
- Disconnect the lower radiator hose and have a bucket handy to catch the radiator fluid leaking out from the hose as shown in Photo 1-10.
- Using a 10 mm socket, remove the bolt that holds the bracket for the A/C pipes as shown in Photo 1-11.



Photo 1-7: Bumper liner attached to bumper



Photo 1-8: Belly pan side view

- Squeeze the spring clamps on the upper radiator hose and slide back. Remove hose from both the radiator and thermostat housing. This will be trimmed in a later step before reattaching.
- Remove the radiator overflow hose from the radiator and place into the overflow bottle to prevent draining.
- Unplug the two power connections for the radiator fans. To remove the A/C fan connector, pull the tab out with your finger nail. The main fan you press the tab to remove.
- Once everything is disconnected, lift the radiator out and place it in a safe location as shown in Photo 1-12.



Photo 1-9: Front lip spoiler under the bumper



Photo 1-10: Lower radiator hose and support

1.5 A/C Condenser Coil Removal

The A/C condenser is removed to modify the mounting brackets. If you don't have A/C you can pass on this step.

- Remove the two M6 bolts using a 10 mm wrench from the two black brackets that held the condenser coil. There is one on each side as shown in Photo 1-13.



Photo 1-11: A/C bracket removed

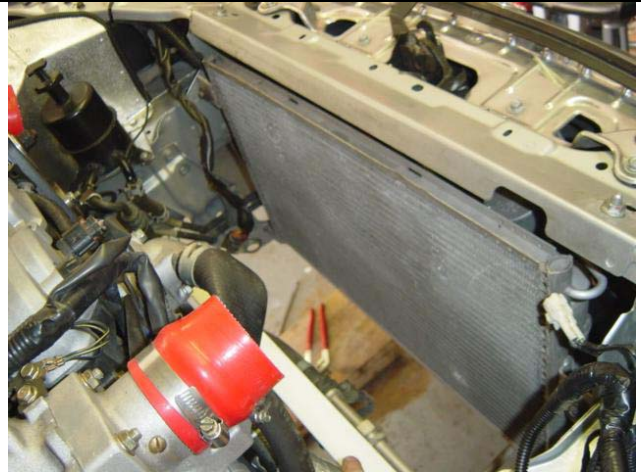


Photo 1-12: Radiator removed

- Gently pull up on the A/C condenser to remove it from the lower mounts, then push it towards the engine being careful not to damage the unit. Use a bungee cord or similar strap to gently hold back the A/C condenser coil out of the way as shown in Photo 1-14. NOTE: Leave the rubber grommet on the condenser coil, but remove the metal insert attached to the frame.
- Remove the factory horn. You can reinstall it after the Intercooler is installed.



Photo 1-13: A/C condenser coil bracket one on each side



Photo 1-14: A/C condenser strapped back

1.6 Front Intake Cowling Removal

Remove the plastic surround/cowling in the mouth of the car. It will be replaced by new ABS plastic pieces.

- There are several plastic screw clips that hold this cowling in place as shown in Photos 1-15 thru 1-18.
- Using a Phillips screwdriver and remove the plastic screws in the top cowling as shown in Photo 1-15.
- Remove the M6 nut on both sides of the cowling as shown in Photo 1-16.
- Remove the M6 bolt on both sides of the front as shown in Photo 1-17.
- Pry the cowling clips from the bumper area as shown in photo 1-18.
- When all the screws, clips, nuts and bolts are removed, pull the cowling unit out through the bottom of the car.



Photo 1-15: Cowling screws removed

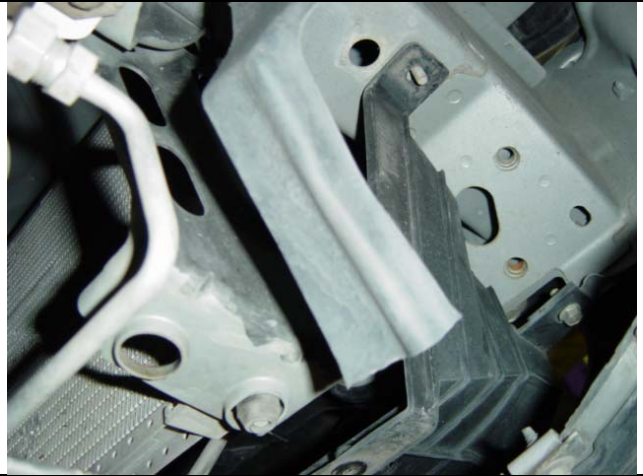


Photo 1-16: Stud holding cowling in place



Photo 1-17: Cowling front bolts



Photo 1-18: Cowling clips in bumper

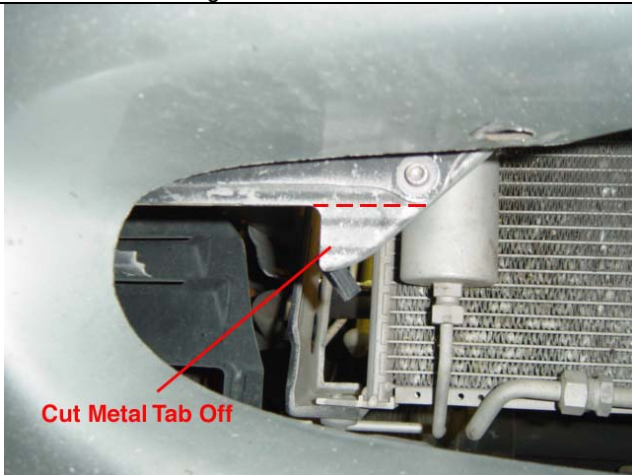


Photo 1-19: Remove metal tab



Photo 1-20: Plastic tabs removed from bumper

- Using a hacksaw blade, cut away the two metal tabs that are blocking the opening as shown in Photo 1-19. They serve no purpose. A single-ended hacksaw works best, but a Jig-Saw will work as well. The photo indicates the portion of the cut with a red dashed line.
- The 3 tabs on the bumper as shown in Photo 1-20 can be cut off for appearance. If reinstalling the cowling in the future the tabs do not affect the integrity of the mounting.

1.7 Power Steering Cooler Removal

If you have power steering you'll see the cooling tube that needs to be removed. This will be modified later on. If you do not have power steering or a cooling tube, then skip this step.

- Remove the two M6 bolts using a 10 mm wrench that hold the cooling tube in position as shown in Photo 1-21.
- Remove the M6 bolt that holds the side bracket to the radiator support as shown in Photo 1-22. Bend open the bracket and remove from the cooling tube.
- Remove the two mounting brackets as seen in Photos 1-23. Use a flat head screwdriver to bend open the clamps and remove. The clamp and rubber insert will not be reused. Use a pair of pliers to bend back the tabs off the double tube bracket.



Photo 1-21: Power steering cooling tube

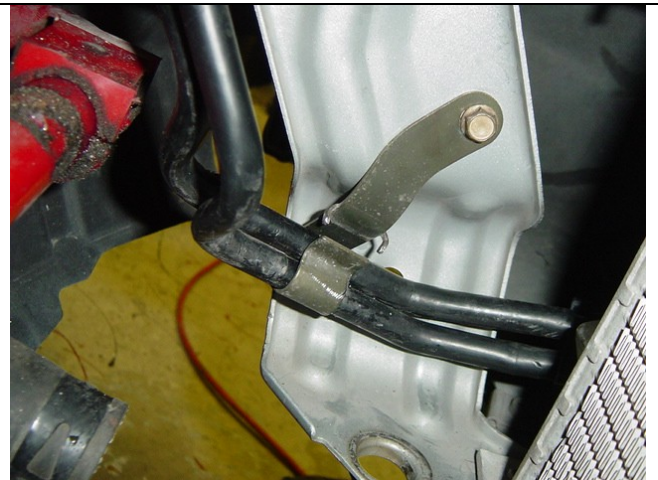


Photo 1-22: Clamp removed from radiator mount



Photo 1-23: Clamps removed from cooling tube



Photo 1-24: P/S fluid sucked from the reservoir.

- Drain the fluid from the PS reservoir using a Mighty Vac or similar siphon pump as shown in Photo 1-24. If you do not have means to suck the P/S fluid out then install a medium size pan below the reservoir on the floor as shown in Photo 1-25.
- Remove the spring clamps on the hoses. Leave the short section of rubber hose that is connected to the reservoir, it will be used on the reinstallation.
- Lay the cooling tube to the side with the tube downwards to drain in a pan. Suggest using new P/S fluid on the reinstallation. The cooling tube will be modified in STEP 8 of the installation.



Photo 1-25: Cooling tube fluid removed with drip pan



Photo 1-26: Blank

STEP 2: INSTALLING THE RADIATOR BRACKETS

There are two radiator brackets, left and right that hold the lower half of the radiator and A/C condenser in place. These will be replaced with the two factory radiator mounts with the holes modified supplied in the kit. The OEM passenger side bracket is shown in Photo 2-1. Photo 2-2 shows how the new bracket is installed in the new lower position. This shall be done on both sides.

Hardware Package B1



- Remove the two M6 bolts that hold the radiator brackets into place using a 10 mm socket. Be sure the A/C condenser is supported when you remove the brackets.
- Remove the two M6 bolts that are attached to sway bar mount
- Install the modified brackets using the supplied M6 x 25 mm long bolts from Package B1 in the mounting holes that the sway bar brackets used, as seen in Photos 2-2. When tightening the bolts make sure the new modified radiator brackets are to the rear- most position. Adjustment may be required after you install the radiator.



Photo 2-1: Stock mounted radiator mount



Photo 2-2: Radiator mount in new position

STEP 3: MODIFYING THE RADIATOR CROSS MEMBER

The front cross member has to be modified to allow access to the intercooler. The simplest tool to use is an electric Jig-saw, but a hack-saw will work as well. This cut will be covered up by the aluminum radiator shield that will be installed later.

- Install masking tape on both ends of the brace as shown in Photos 3-3 and 3-5.
- The right side cut will be at the cut out as shown in Photos 3-2 and 3-3.
- The left side cut will be 2 in. (50 mm) from the seam as shown in Photos 3-4 and 3-5.
- Mark about 1/8 in. (1.5 mm) from the radius as shown in Photo 3-3 on both ends.
- Using a jig-saw or hack-saw, cut each end up to the 1/8 in. (1.5 mm) mark as shown in Photo 3-6.



Photo 3-1: Cross member to be modified

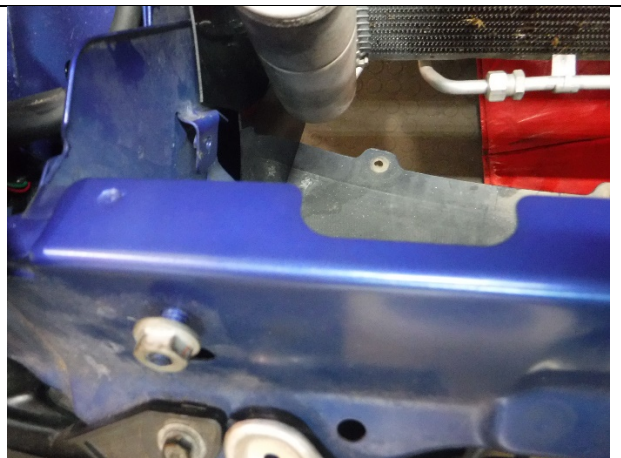


Photo 3-2: Right section of the cross member



Photo 3-3: Taped for cutting



Photo 3-4: Left section of the cross member

- After cutting both ends, use a rubber mallet and tap the cross member downwards as shown in Photos 3-7 and 3-8. Keep forming the cross member downward until it is vertical.
- The cut out area on the right as shown in Photo 3-2 is bent easily using a Crescent wrench as shown in Photo 3-9.

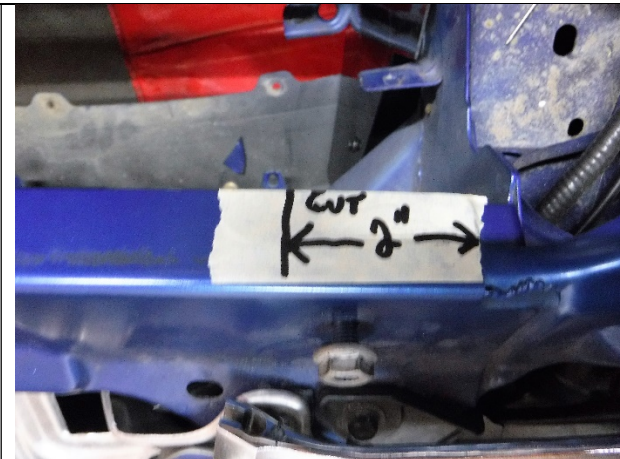


Photo 3-5: Marked for cutting from seam



Photo 3-6: Jig-saw cutting the cross member



Photo 3-7: Left section cut



Photo 3-8: Rubber mallet used to bend cross member

- Continue tapping the cross member until the vertical section looks like Photos 3-10 and 3-11.
- The cut areas will be sharp, use a file or die-grinder to radius the edge as required as shown in Photo 3-12.



Photo 3-9: Crescent wrench used to bend left end



Photo 3-10: Cross member bent vertical



Photo 3-11: Cross member complete

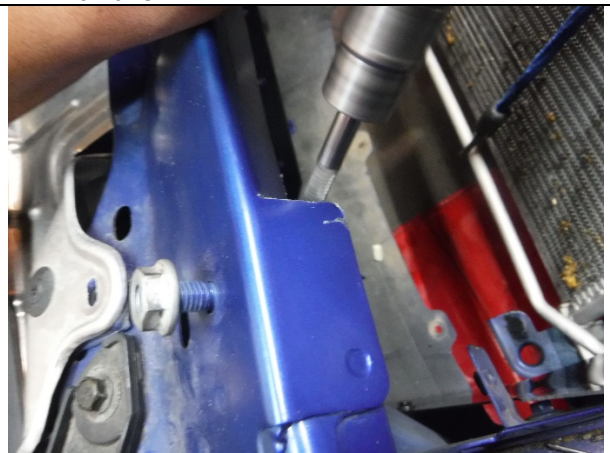
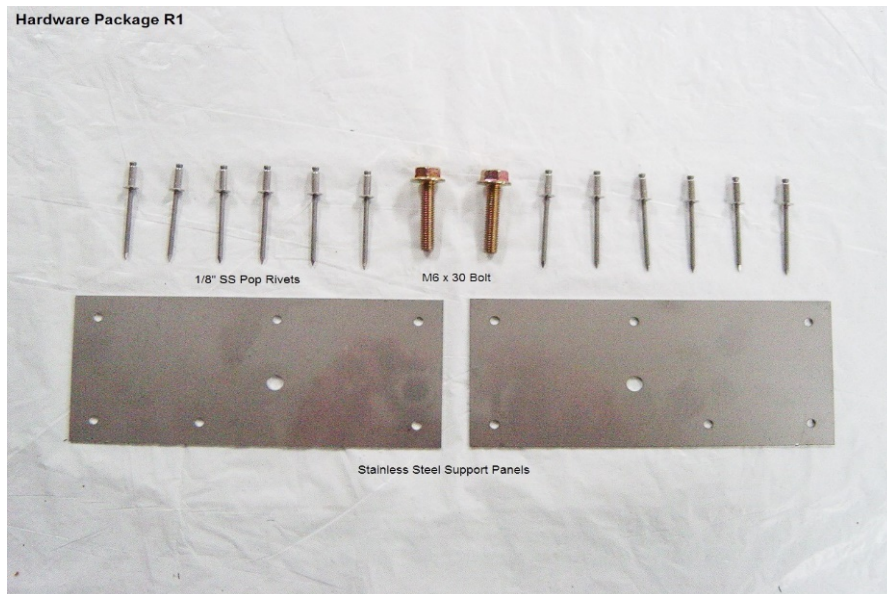


Photo 3-12: Sharpe edges removed

STEP 4: INSTALLING INTERCOOLER MOUNTING SUPPORT PANELS

The stainless steel support panels mount to the subframe for added structural strength. The rivets supplied are stainless steel for strength. Do not replace them with aluminum rivets. Clearance between the A/C condenser coil and the subframe is minimal. Using a bungee cord, relocate the condenser to give more room for drilling. Be careful to not overstress the A/C condenser coil when relocating.

Hardware Package R1



- The larger center hole is offset a little and mounts toward the top. The longer side of the panel from the bolt hole goes toward the middle of the frame as shown in Photo 4-1. The top and bottom surfaces should be flush with the subframe.
- Attach both mounting plates using the supplied M6x25 mm long bolt as shown in Photo 4-1.
- Using a 1/8" drill bit, drill one pilot hole and then rivet that hole to help keep the plate in place. Use the stainless steel rivets supplied. The stainless steel rivets are considerably harder than aluminum to press, but add additional strength over aluminum rivets.
- Drill remaining holes and attach rivets. Remove the M6 bolt until attachment of the Intercooler.



Photo 4-1: Drill 1/8" holes using the plate as a guide

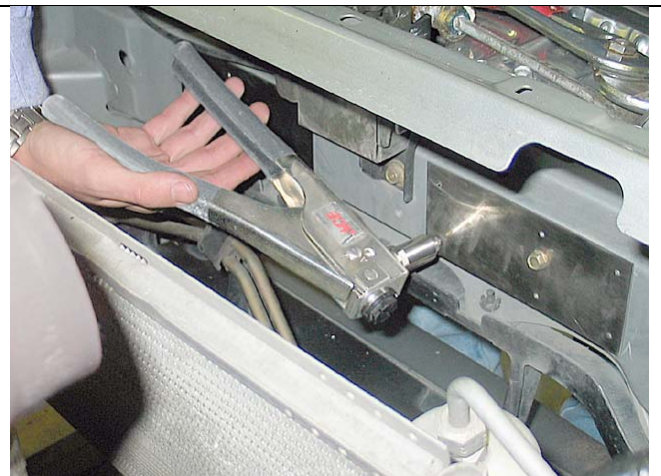


Photo 4-2: Rivet mounting panel

STEP 5: MODIFYING THE DRYER CANISTER

The 1999-2000 models use a different A/C condenser coil from the 2001+ models. Refer to section 5.2 for modification on the 2001+ models.

5.1 Modify the 1999-2000 Model A/C Condenser Coil

The dryer canister on the front passenger side of the A/C condenser coil has to be bent for more clearance as shown in Photo 5-2 to make room for the intercooler. Take caution when bending the dryer canister and bracket.

- Bend the tab on the passenger side close to flat as shown in Photo 5-1 as compared to Photo 5-2. This tab bends pretty easily. Use the handle of a hammer and push it over. Note: the A/C unit was removed for photo purposes.
- Use a large Crescent wrench and clamp onto the aluminum bracket as shown in Photos 5-4 and 5-5.
- Stick a screwdriver through the hole at the end of the wrench for leverage and rotate clockwise. The bracket will bend around.
- Rotate from the top and bottom as you bend in small increments until the canister has rotated approximately 90 degrees as shown in Photo 5-3.

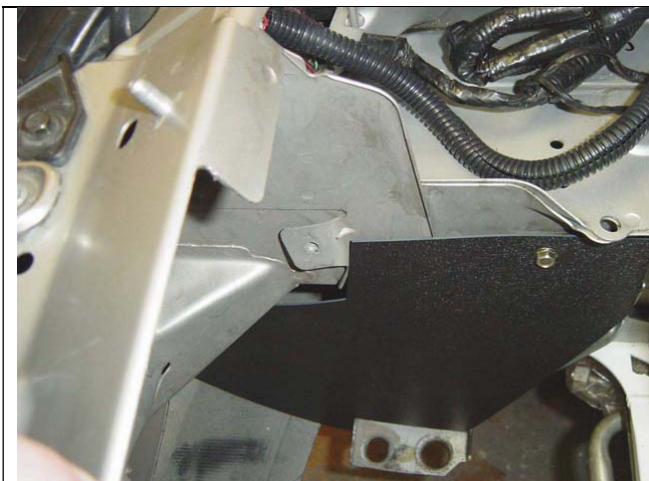


Photo 5-1: Bent tab

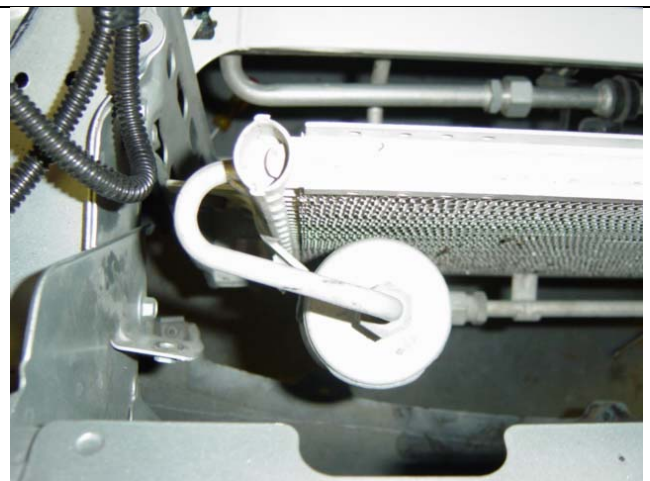


Photo 5-2: Canister In original position



Photo 5-3: Canister in bent position



Photo 5-4: Bending canister using crescent wrench on top



Photo 5-5: Bending canister using crescent wrench on bottom

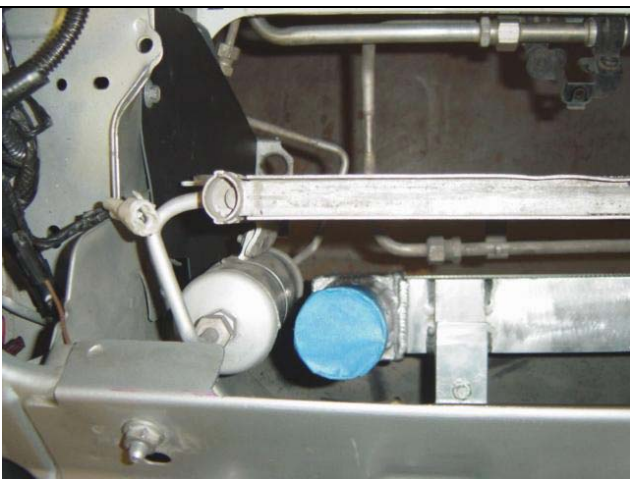


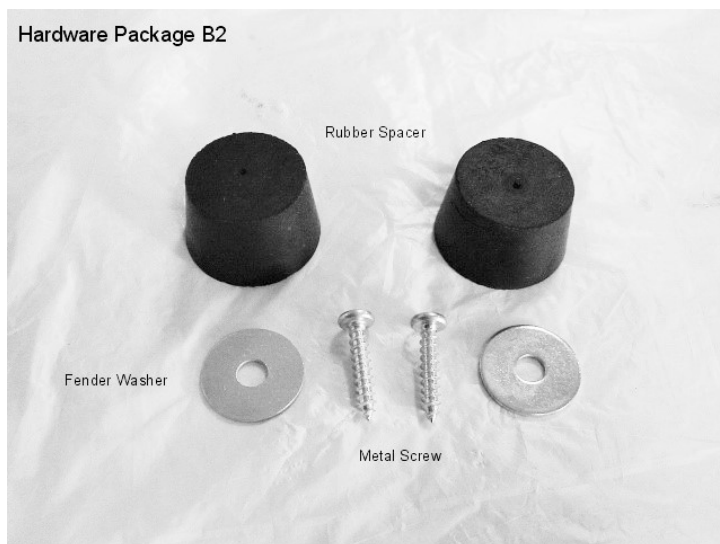
Photo 5-6: Canister clearance with intercooler installed

- Don't overdo it. Bend in small increments, making sure you don't damage anything. You might have to go back and add a little more bend after the intercooler is in place for additional clearance, as shown in Photo 5-6. You do not want the A/C unit and the Intercooler to rub.
- Next, bend the lower tube downwards on the condenser coil as shown in Photo 5-5.

5.2 Modify the Upper Brackets for the 2001+ Model A/C Condenser Coil

The upper bracket modification requires modifying the two side brackets to support the rubber stops. The A/C condenser coil will be moved over about 1/2" to the left to add additional clearance required around the supercharger/intercooler inlet pipe.

Hardware Package B-2



- Cut off about a 1/4" (6 mm) of the driver's side (left) bracket as shown in Photo 5-8 to remove flared section.
- Using Channel Locks or some other tool as shown in Photo 5-9, bend the passenger side bracket back towards the engine about a 1/4" (6 mm) or as required after you install the rubber support.

- Use the Phillips head screws and washers supplied in Package B-2 to attach the 1" thick rubber support as shown in Photos 5-10 and 5-11.
- When the radiator is placed in the lower mount, check for clearances between the A/C condenser coil and the radiator and adjust as required as shown in Photo 5-12.

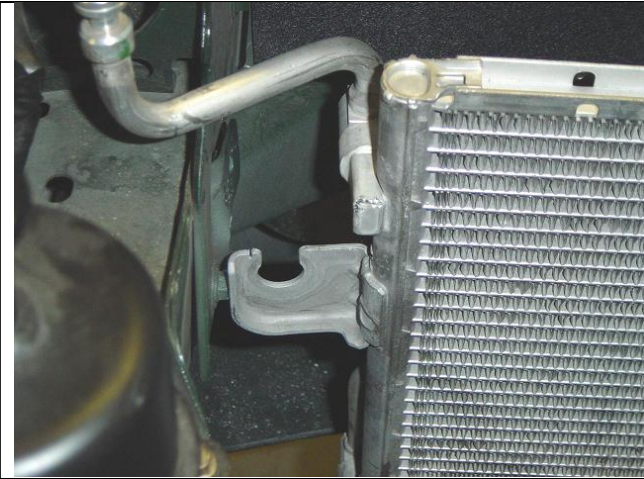


Photo 5-7: Cut 1/4" off the driver's side A/C support bracket

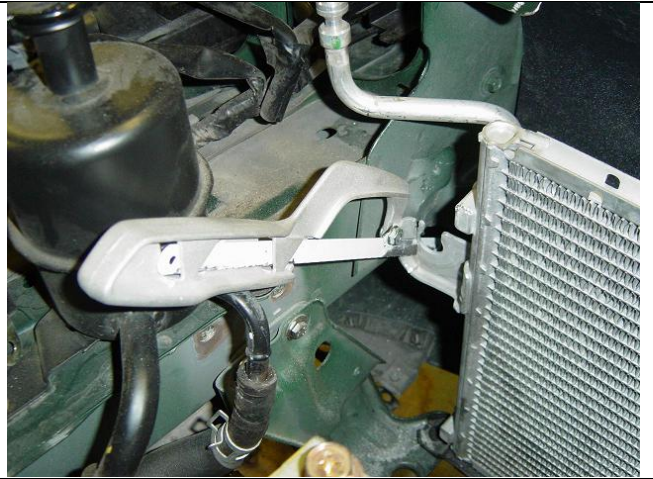


Photo 5-8: Use a saw blade to cut the aluminum bracket

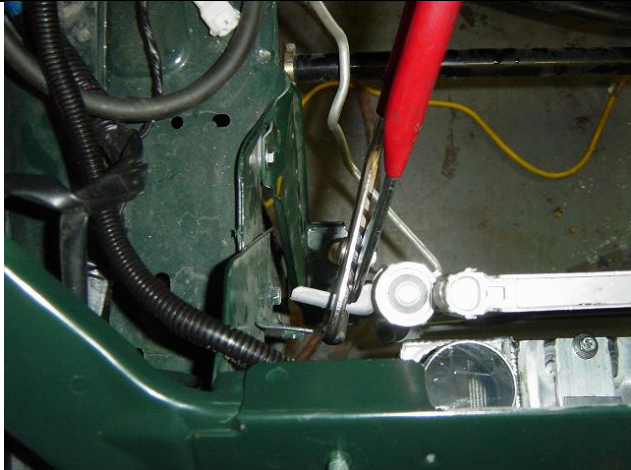


Photo 5-9: Bend the passenger side bracket towards back

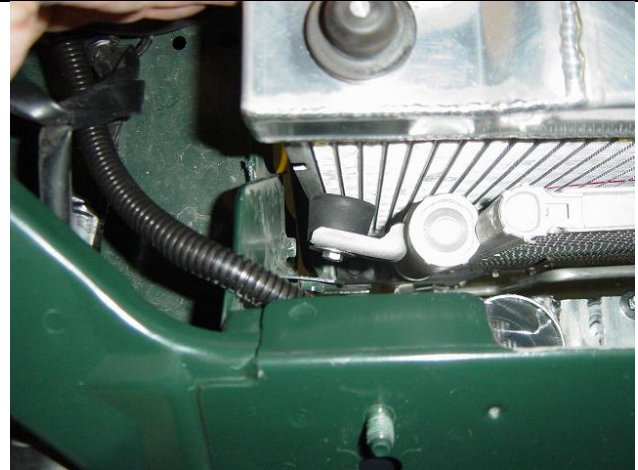


Photo 5-10: Install rubber support

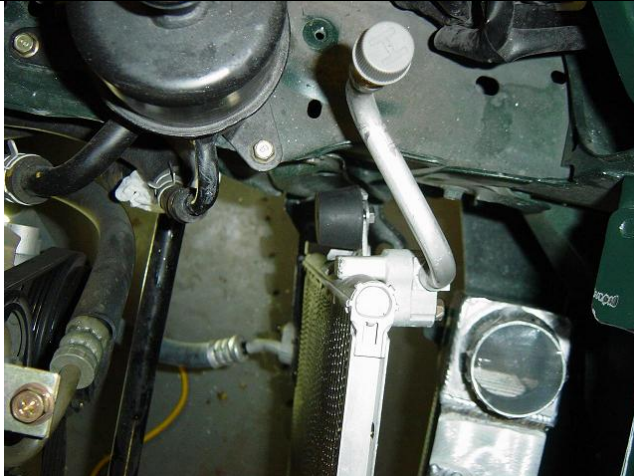


Photo 5-11: Install rubber support



Photo 5-12: Check clearance and bend the A/C line under the radiator

5.3 Modify the Lower Brackets for the 2001+ Model A/C Condenser Coil

The condenser coil for the 2001+ models will be relocated about 1/2" (12 mm) toward the left, driver's side to add additional clearance for the upper hose filler tube. The lower bracket supports can be removed and reinstalled after drilling new holes into the u-channel. Photos are taken looking from the back side.

- Using a 10 mm wrench remove the lower bracket on left side only as shown on the driver's side in Photo 5-13 and 5-14. Leave the other bracket on to help support the A/C evaporator coil while you modify.
- Measure a 1/2" (12 mm) to the RIGHT of the factory holes for the two new holes. Use a 1/8" drill bit to pilot the holes or use a snap-punch to scribe a starter position.
- Use a 1/4" drill bit and drill carefully into the u-channel as shown in Photo 5-15.
- Reinstall the lower bracket and adjust the lower hose as required to fit the new position.
- Modify the right side bracket using the same methods described above. The condenser when reinstalled will be placed over to the left for additional clearance.
- After the intercooler is installed, press the condenser core toward the intercooler to bend the A/C tube as shown in Photo 5-16 for additional clearances.
- The filler tube mount may be close to touching or rubbing the intercooler pipe as shown in Photo 5-17.

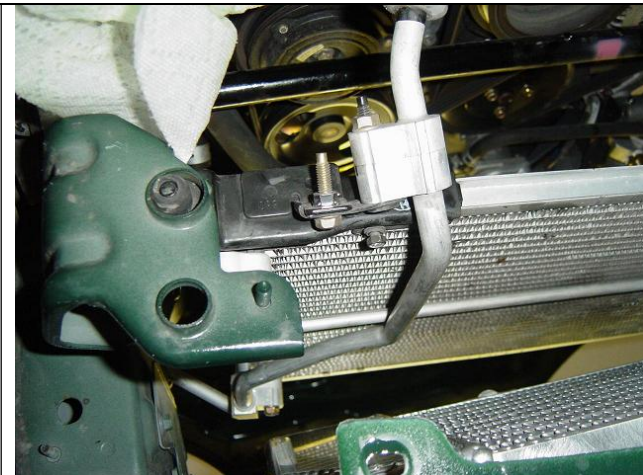


Photo 5-13 : Remove the two bolts hold the lower bracket

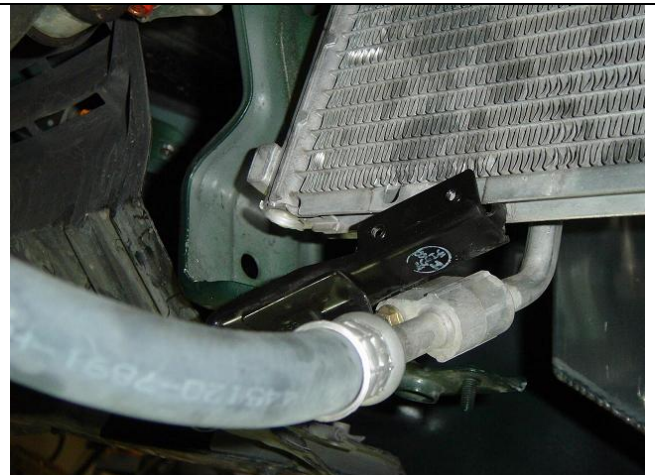


Photo 5-14: Pull the bracket off the coil

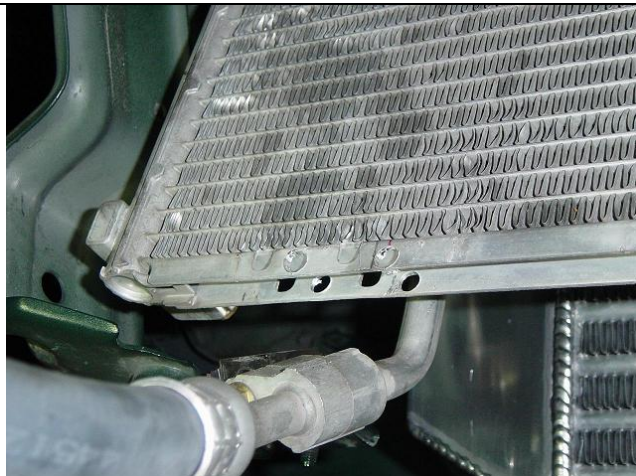


Photo 5-15: Holes drilled in condenser coil

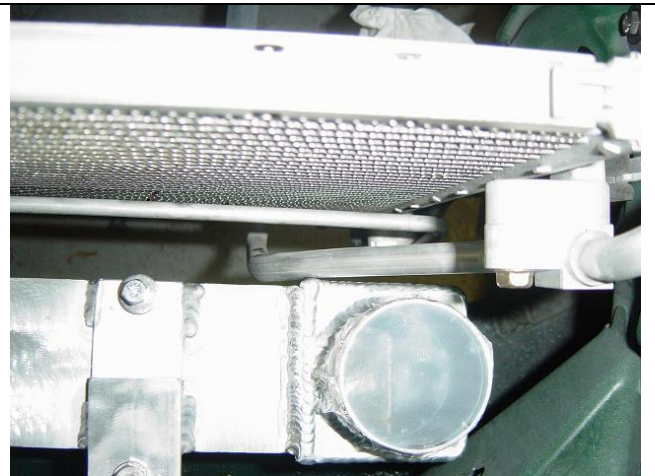


Photo 5-16: Bend the A/C tube by pressing against the intercooler

- Using a small pry bar or large screw driver and carefully install in the mount area as shown in Photo 5-18. Be careful to not penetrate the fin area. Bend the mount as necessary and test fit the pipe.
- The top of the condenser can be bent to add additional pipe clearances as shown in Photos 5-19
- Using a pair of needle nose pliers, bend the lip inwards as shown in Photo 5-20.

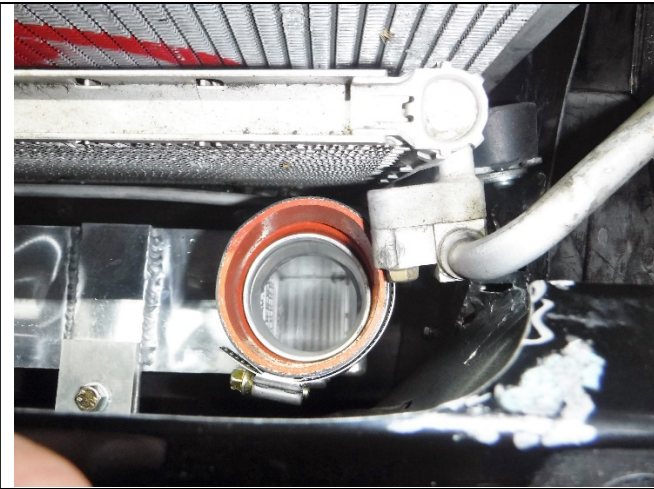


Photo 5-17: Freon mounting block clearance issue

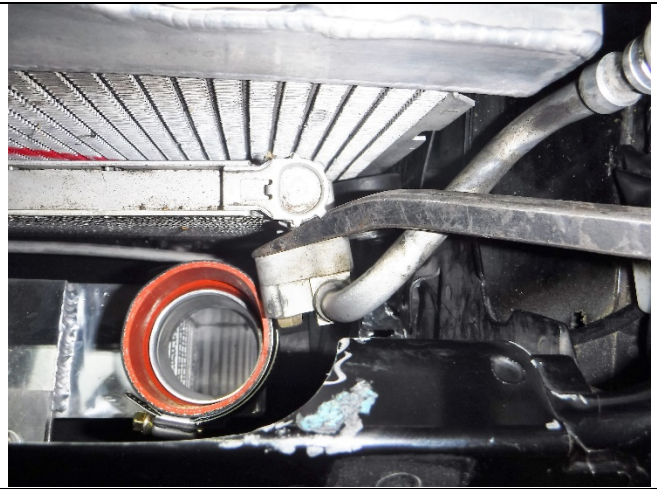


Photo 5-18: Pry bar used to bend filler tube block



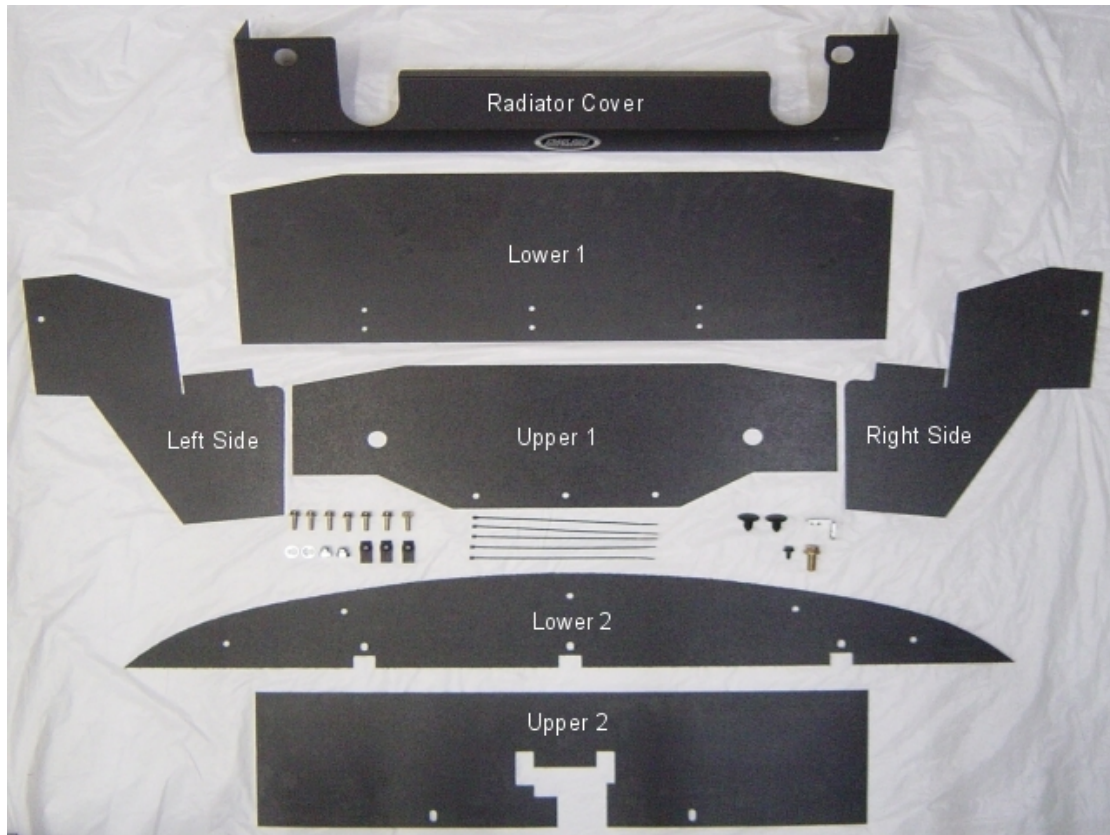
Photo 5-19: Top of condenser rub area at top



Photo 5-20: Top area bent back using needle nose pliers

STEP 6: INSTALLING THE RADIATOR SHROUD PANELS

The kit comes with six ABS plastic panels. They are Upper Panels 1 and 2, Left & Right Side Panels and Lower Panels 1 and 2. These panels help seal off the air passage and improve the efficiency of the Intercooler and cooling system. The increase in the frontal area improves air flow compared to the factory shrouding. The sides are closed off with the new panels providing better airflow through the A/C condenser and the radiator. If the panels require any additional trimming, use Tin-Snips or heavy duty scissors to cut the plastic.



6.1 Modifying the Side Bracket 99-00 Model

After removal of the front cowling, the mounting tabs on each side will get modified for side panel installation. The 01-05 model radiator opening is sized differently and does not require modification. If you are NOT using the plastic side panel as an air deflector for the Rotrex oil cooler then proceed with the following steps.

- The front side brackets need to be modified for the side panels as shown in Photos 6-1 and 6-2.
- The bracket is "L" -shaped with a small half that is about 1/4" (6 mm) high. Cut the bracket only on this edge so that the tab can be easily bent downwards.
- Using your hand, bend the bracket downwards about 90 degrees. This will allow the plastic side panel to lodge between the bracket and the front bumper as shown in Photos 6-4.



Photo 6-1: Metal bracket cut with hack-saw



Photo 6-2: Metal bracket bent back 90 degrees



Photo 6-3: Right side plastic panel installed



Photo 6-4: Side panel installed with no airflow to oil cooler

6.2 Left and Right Side Panels

The left and right side panels install in the same manner. If you are NOT using the left panel as an Air Deflector for the Rotrex oil cooler, continue with the instructions below. You can remove your fog light for air flow.

- If you have a factory tow-hook you will need to modify the plastic some for additional clearance.
- Install the passenger (right) side panel by feeding it into the front area of the car from the engine bay. It may take a bit of wiggling and forcing to get this to fit but the flexibility of the plastic will help get the panel into place. Be sure that the front is wedged between the newly cut bracket (99-00 model) and the front bumper as shown in Photo 6-3. Note that the radiator and A/C condenser coil have been removed for photo purposes only.
- The hole in the upper section will line up with the original radiator bracket bolt hole. Use one of the OEM M6 bolts from the radiator bracket you removed to secure the panel in place as shown in Photos 6-3.
- The driver's side (left) panel is secured using a M6 bolt as shown in Photo 6-8.

6.3 Left Side Panel Modification

The left side panel can be modified as an Air Deflector for the Rotrex oil cooler or in the standard mounting position. If the panel will be used as an Air Deflector, cut the panel at the white line and drill the marked hole

- If using fog light openings or some other method of airflow for the oil cooler, install the left side panel the same as the right side panel using an M6 bolt that was removed from the radiator mount. Push the front section between the mouth opening and the frame as shown in Photo 6-4.
- To mount the side panel as an Air Deflector, start by cutting the end of the panel off where the white line is as shown in Photo 6-5. Drill a 1/4 inch (6 mm) hole where the white circle is indicated on the panel. This hole is for the mounting bracket.
- Install the L-bracket from Hardware Package B-5. This bracket is the long style with a large opening for a 10 mm bolt. Install with the captive nut toward the plastic side panel using an M6x12 mm bolt as shown in Photo 6-7. Hand tighten until the M10 bolt is installed on the mount.

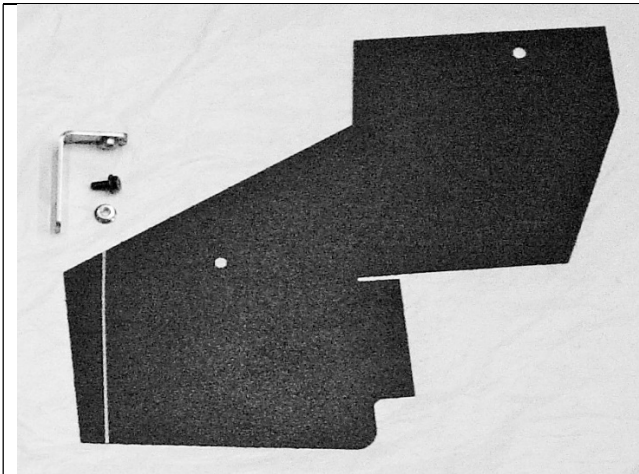


Photo 6-5: Left side panel with white cut line



Photo 6-6: Panel cut to be used as air diffuser

- Install the side panel into the radiator and bumper area and install an M6x20 mm bolt as shown in Photo 6-8.
- Install the M10x25 mm bolt into the L-bracket and frame as shown in Photo 6-7. When the side panel is lined up, tighten the M10 bolt using a 14 mm wrench.
- Tighten the M6 bolt in the L-bracket using a 10 mm wrench from the front as shown in Photo 6-9.
- When complete the side panel air deflector should look like Photo 6-10.



Photo 6-7: L-bracket location



Photo 6-8: Side panel bolted with P/S oil lines



Photo 6-9: Front M6 bolt tighten on side panel

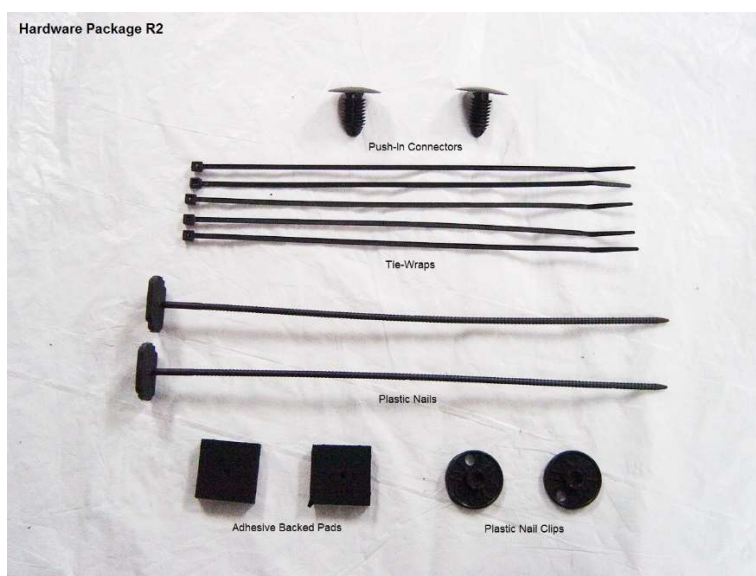


Photo 6-10: Side panel installed as air diffuser

6.4 Upper 1 Panel

The Upper 1 panel mounts in the front opening between the bumper and the bumper support of the car.

Hardware Package R2



- Mount the panel so the textured side is visible and that the three small mounting holes are at the back as shown in Photo 6-11. Pull the bumper down a little so that you can slide the panel into position.
- Push the two new plastic mounting plugs from Hardware Package R2 into the bumper upper section mounting holes as shown in Photo 6-11. Do not lock the plugs in until the tie-wraps are installed on the other mount.
- Use the tie-wraps supplied from Hardware Package R2 and loosely attach the back section to the panel.
- Bend the tabs up using your hands as far as you can, as seen in Photo 6-12 and 6-13. Tighten the tie-wraps and cut off the remainder of the tie-Wraps.
- Push the plastic plugs securely in place.



Photo 6-11: Upper 1 panel slipped into bumper



Photo 6-12: Upper 1 panel tie-wrapped to tabs

6.5 Upper 2 Panel

The Upper 2 panel mounts in the location of the hood latching mechanism under the newly cut cross member, as shown in Photo 6-13. The 2001+ models have a different hood latch attachment that requires cutting off a tab as shown in Photo 6-14. The horn should already be removed and will be reinstalled later.

- Install the panel with the textured surface facing outwards and hold it in position temporarily by inserting the cut-out section into the top of the hood latching mechanism as shown in Photo 6-13. The panel will be permanently mounted using two bolts from the next step of the Intercooler installation.
- The 01+ models have an electrical switch on the hood latch. Cut off the bottom section of the panel near the latch to clear the switch unit using Tin-Snips or scissors. The panel will be permanently mounted using two bolts from the intercooler installation. The panel may not stay in position, if necessary lay off to the side until the intercooler is being mounted.



Photo 6-13: Upper 1 panel bent at tabs and Upper 2 panel

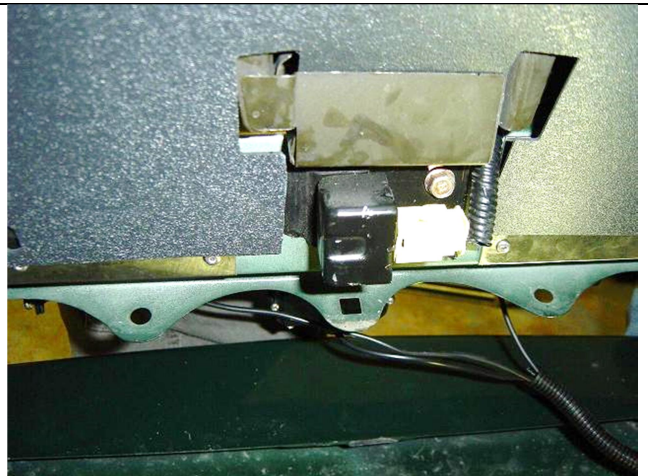


Photo 6-14: Upper 2 panel modified cutout on 01+ models

STEP 7: INSTALLING THE INTERCOOLER

Before installing the Intercooler, make sure there are no foreign objects in it. The intercooler comes with plastic caps. Use them during the installation and keep in case you need to seal the intercooler.

The TDR Intercooler is supported by two brackets using the mounting locations where the factory power steering cooler tube used to attach to the car. Some photos below are shown with the A/C condenser coil removed for photo purposes only.

The 2001-2005 model with condenser coil placement requires that you offset the intercooler toward the right passenger side, this will add additional clearance for the condenser filler tube.

Hardware Package B3



- There are two aluminum L-brackets using two M8 x 30 bolts, washers, lock washers and nuts in Hardware Package B3. The non-slotted opening goes on the Top of the intercooler mount as shown in Photo 7-2. Attach the L-brackets, make sure they are straight and tighten firmly.
- Pull the A/C condenser coil back toward the engine. A bungee cord will help with this step.
- From the top, insert the Intercooler between the A/C condenser coil and the sub frame. Be careful not to scratch the finish.
- Using the two M6 x 25 bolts from Hardware Package R1, mount the intercooler into position Be sure the plastic panel is in place between the intercooler brackets and the sub frame, as shown in Photo 7-2. Hand-tighten the bolts.
- You can move the intercooler to the left or right for additional clearances. The intercooler pipes will adjust to wherever the intercooler is mounted.

- If you need more clearance from the dryer canister (99-00 model), refer back to STEP 5 on how to proceed in bending the A/C dryer unit as shown in Photo 7-4.
- Note: The factory horn can be relocated to the passenger side intercooler bracket bolt as seen in Photo 7-4. Install this last. If you are using aftermarket horns you'll need to decide where they will work best for you. A common mounting area is the front fender well area behind the bumper.



Photo 7-1: Intercooler mounting location



Photo 7-2: Intercooler mounting bracket

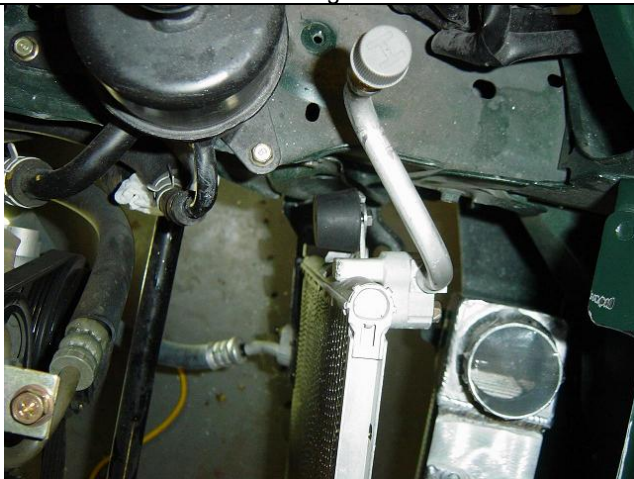


Photo 7-3: 2001+ models A/C to intercooler clearance

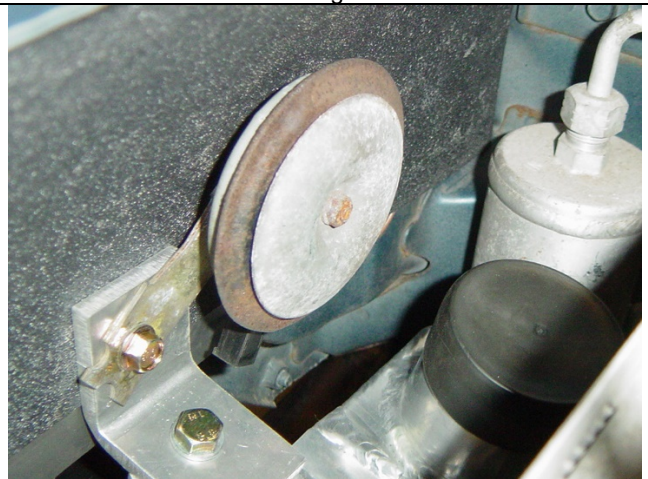


Photo 7-4: Factory horn mounting location

STEP 8: INSTALLING THE POWER STEERING COOLER

If your car has power steering you'll have to modify the factory cooling tube. The power steering fluid should already be drained before modifying the cooling tubing. If your car does not have power steering, move on to STEP 9.

Hardware Package B4



8.1 Modifying the Power Steering Cooling Tube

- Viewing Photo 8-1, notice the area of the tube that you will cut. Draw two cut lines, offset about an inch. Use a plumber's tube cutter or hack-saw to cut the two tube ends off and discard. Be sure there are no burrs on the tube. If you suspect metal shavings or other foreign materials have entered the tube, be sure to clean it out before installing.



Photo 8-1: Plumber's tube cutter

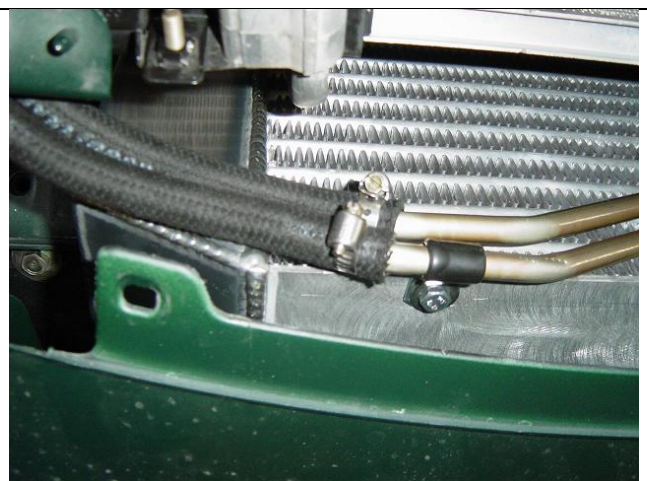


Photo 8-2: Hoses attached to the P/S tube

- Attach the cloth covered rubber hose over the P/S tube about 1.5 inches (35 mm) and secure it with the supplied clamps. Applying a little bit of P/S oil to the hose or tube will help in attaching the hose. Leave the rubber hose as a loop, one piece. It will be cut to length after the P/S cooler is installed.
- Mount the two P/S cooler pipe clamps onto the cooling tube as shown in Photos 8-2.
- Install the modified power steering cooling tube as shown in Photo 8-3. Use the M6x12 bolts from Hardware Package B4. Add a little Loctite would be recommended.
- There are two 3/8" pipe clamps in Package B4 that will attach the new hose to the existing P/S hose. Insert one into the return line and one into the factory short hose that is attached to the P/S reservoir with and secure with the supplied clamps as shown in Photo 8-4. Use some grease on the coupling to help insert it into the hose. Also it would help to heat the rubber with a lighter to soften the rubber.



Photo 8-3: P/S tube installed on bottom of intercooler

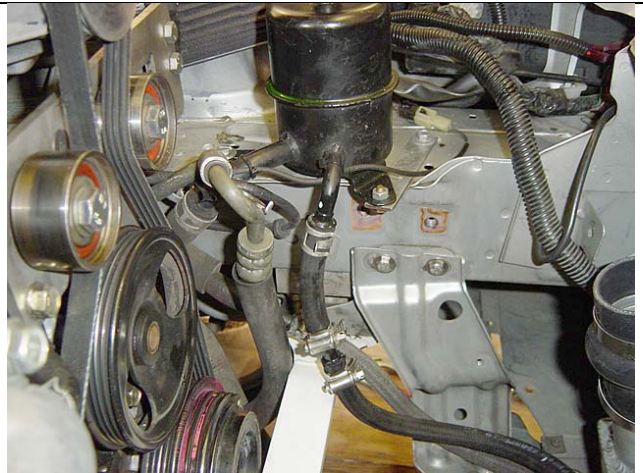


Photo 8-4: Hose connection at the P/S reservoir

- Run the P/S hoses up next to the radiator support bracket as shown in Photo 8-4. The new plastic side panel is removed only to show the placement of the P/S hoses in relation to the radiator bracket. Measure the hoses to the proper length and using the supplied clamps, attach them to the hose couplings. Again, a little bit of P/S oil will help in attaching the hoses to the couplings.
- After the supercharger installation, fill the P/S reservoir with a good quality power steering fluid, preferably a higher temperature model such as Red Line. After the SC oil setup is complete and the engine running, turn the steering full left then right several times. You may notice a little bit of jerking in the steering wheel until all the air has escaped from the system. Check the fluid again after the P/S pump has had a chance to recirculate and warm. Check for leaks.

8.2 Lower 2 Panel

The lower 2 panel mounts underneath the car and replaces the OEM cowling. The panel uses the five OEM mounting locations and hardware that was on the original factory air dam as shown in Photo 8-5. The belly pan will mount to the rear of this panel using the three supplied Speed-Nut clips provided with the kit using the factory 10 mm bolts.

- Before mounting the Lower-2 panel to the front bumper, install the hardware that was used on the factory air dam into the front bumper's five holes as shown in Photo 8-6. Mount so that the threaded side is on the top or inside.
- Install the three supplied Speed-Nut clips from Hardware Package B1 where the notches are present as shown in Photo 8-6 on the 1999-2000 models. Install with the threaded side on the inside and the texture side on the panel down.

- Install the Lower-2 panel to the front bumper using the factory bolts as shown in Photo 8-6.
- The 01+ models have an additional bracket mounted to the lower bumper as shown in Photo 8-7.
- Install the Lower-2 panel to the bumper and to the bracket as shown in Photo 8-8.



Photo 8-5: Lower factory air dam to be removed



Photo 8-6: Lower 2 panel installed

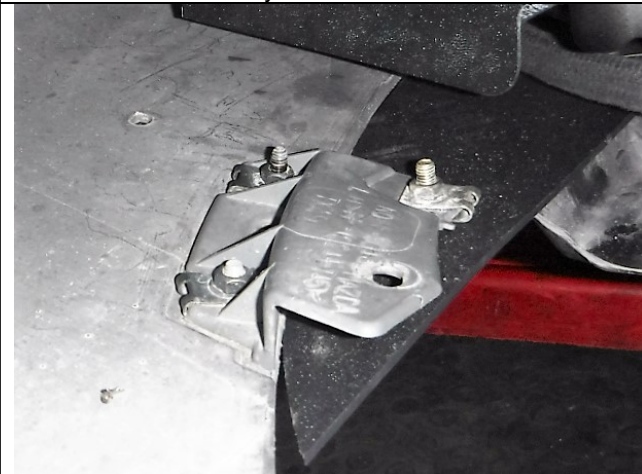


Photo 8-7: Model 01-05 bumper mount

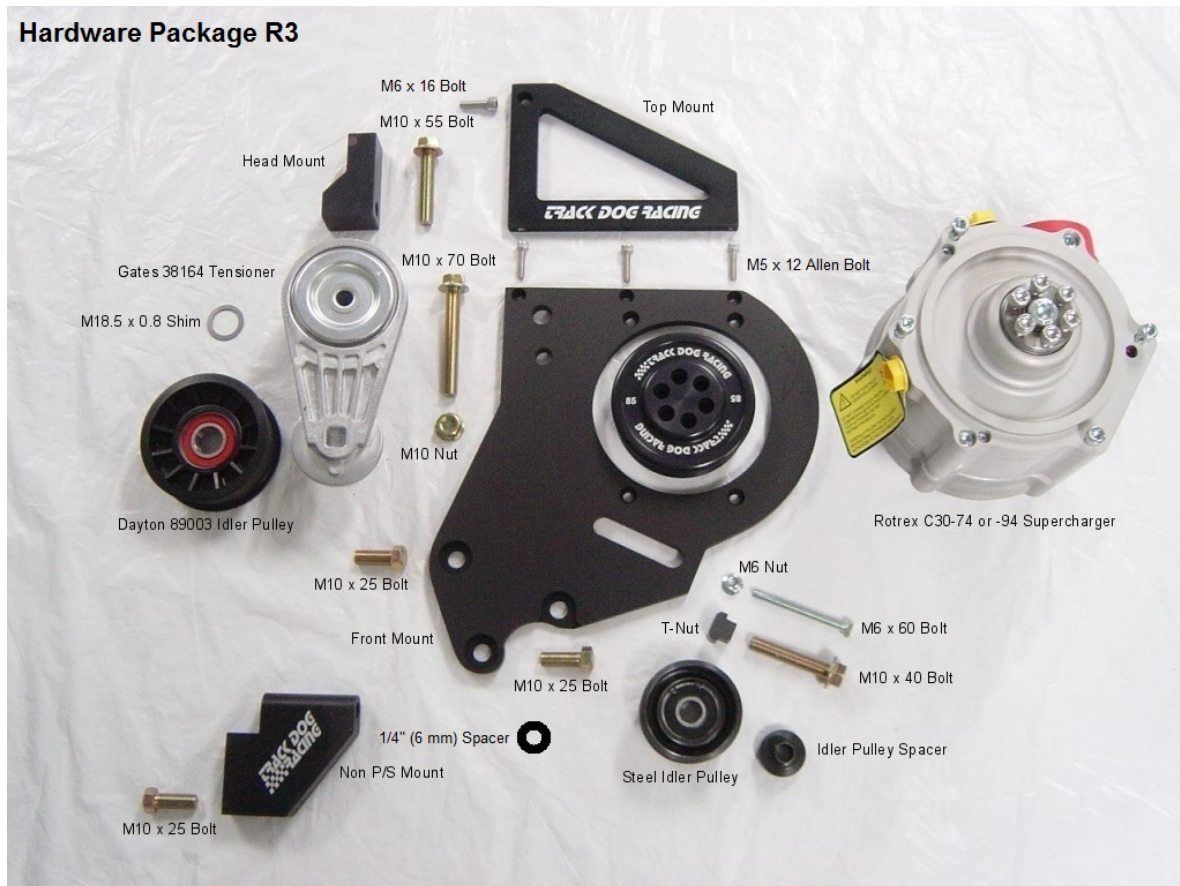


Photo 8-8: Lower-2 panel installed

STEP 9: INSTALLING THE SUPERCHARGER BRACKET

If you are eliminating your P/S pump then you can go to STEP 9.2 for installing the P/S delete block. Hardware Package R3 shows the power steering delete block in the lower left. This block is not included with powering steering setups.

Hardware Package R3



9.1 Supercharger Bracket

We need to prepare the power steering pump assembly for the new SC bracket. The radiator should be out to simplify installation.

- Loosen the P/S tensioner and remove and store power steering P/S belt as shown in Photo 9-1.
- Remove the P/S return hose attached to the mounting out front using a 12 mm wrench as shown in Photo 9-1.
- Remove the bracket by bending the tabs back and then bend open. We will not reuse this bracket.
- Using a 12 mm socket, remove both the upper and lower bolts that hold the factory tensioner on to the P/S pump and the swivel section bracket as shown in Photo 9-2. Store in a dry place with hardware.
- Loosen the P/S hose as shown in Photo 9-3 and turn the hose toward the rear for additional clearance.
- The M10 P/S bolt has a nut on the inside. Use a 17mm wrench to hold the nut and loosen the bolt as shown in Photo 9-4. You may have to have the radiator removed to remove the bolt.



Photo 9-1 P/S hose bracket to be removed



Photo 9-2: P/S bracket



Photo 9-3: Loosen P/S hose and push back

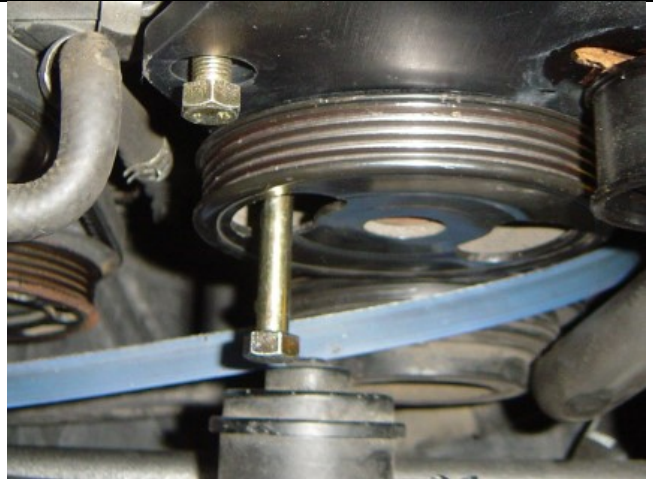


Photo 9-4: Lower bolt pulled out for bracket

- The TDR bracket when used with P/S reuses the long M10x65 mm bolt and nut.
- Using the hardware from Package R3, install the SC mount with the M10x25 bolt just above the P/S as shown in Photo 9-4 and loose fit.
- There are 2 bolts that are used in the P/S assembly. The upper bolt in Photo 9-4 is a non-flanged version for lower clearance.

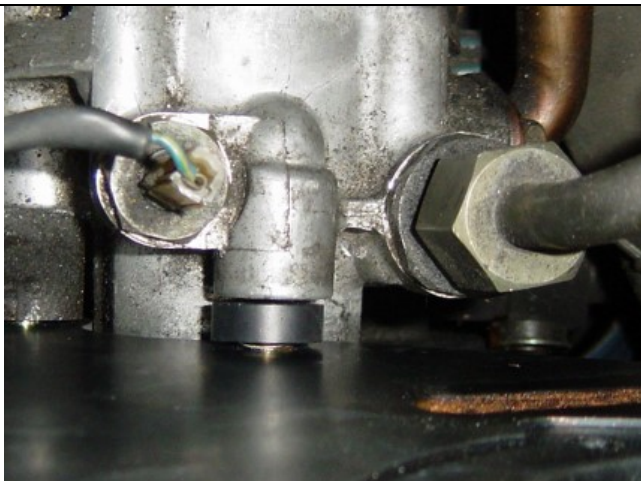


Photo 9-5 Spacer between P/S pump and bracket



Photo 9-6: Tighten lower bolts on bracket



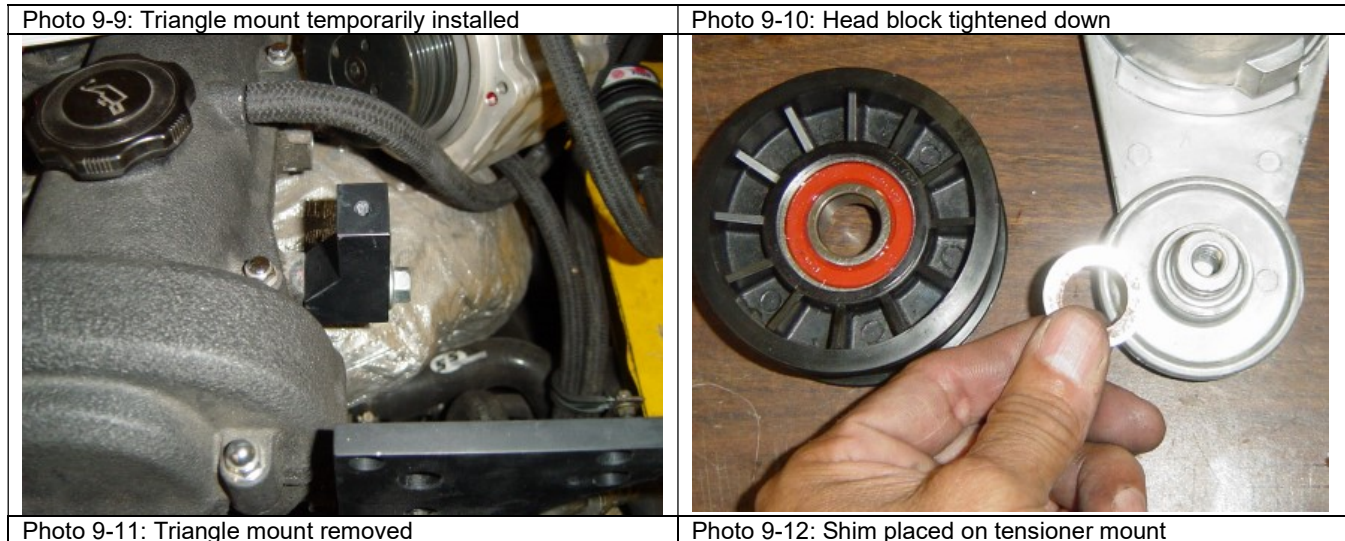
Photo 9-7: Head block assembly



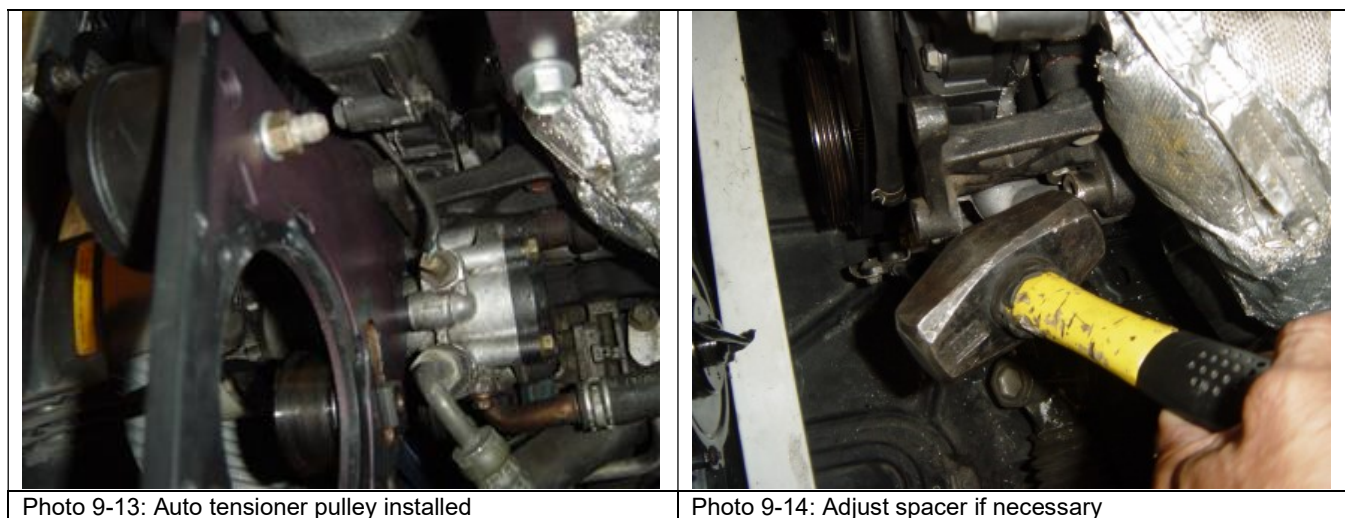
Photo 9-8: Triangle mount positioned

- Install spacer between bracket as shown Photo 9-5 and upper P/S assembly using M10x25 bolt and hand tighten.
- Install the nut on the long bolt and tighten as shown in Photo 9-6.
- Hand-tighten all three bracket bolts. After the top mount is installed for alignment, you can tighten the main 3 bolts.
- Install the head block assembly in Photo 9-7 using the M10x55 bolt and hand tight.
- Install the triangle mount using three M5 Allen bolts on the front and one M6 Allen bolt at the rear as shown in Photo 9-8 and 9-9 and hand-tighten.
- Tighten the head block assembly as shown in Photo 9-10.
- Tighten the three M10 bolts that hold the front mount.
- **NOTE: THERE IS A SEQUENCE FOR PROPERLY TIGHTENING THE BRACKET FOR ALIGNMENT. AFTER THE SUPERCHARGER IS INSTALLED. LOOSEN THE FRONT BOLTS, THE 6MM ALLEN BOLT ON TOP AT THE HEAD AND THE HEAD BLOCK BOLT. WIGGLE THE ASSEMBLY SOME BEFORE TIGHTENING.**
 1. FIRST TIGHTEN THE LOWER FRONT MAIN BRACKET BOLTS
 2. SECOND TIGHTEN THE M6 ALLEN BOLT AT THE HEAD BLOCK
 3. LAST YOU WILL TIGHTEN THE HEAD BLOCK.





- Remove the top triangle mount for the supercharger installation as shown in Photo 9-11.
- The auto-tensioner comes assembled with a M18.5 x 0.8 mm shim installed under the flanged pulley as shown in Photo 9-12. If the pulley is replaced be sure the shim stays on the tensioner. We also use a flanged pulley that is not part of the Gates tensioner. Contact TDR for replacement pulley or tensioner.
- Install the auto-tensioner using the M10 x 70 bolt and nut into the front mount as shown in Photo 9-13.



9.2 Installing the Non Power Steering Delete Block

If you are not using power steering then you will install the optional P/S delete block in its place. If you never had P/S then you will need to install the factory P/S bracket.

- Once you remove the P/S pump and installing the P/S block for the first time installation, the spacer as shown in Photo 9-14 may require pushing back a small amount for the non P/S block to fit. Be sure to test fit first before installing the front SC plate as shown in Photo 9-15.
- Install the supercharger front mount using the factory M10x65 mm bolt threw the block and add the lock washer and nut as shown in Photo 9-15. Loose fit until all bolts are attached.
- Install the M10x25 mm bolt from the front into the block and the upper P/S mount. Tighten down all the supercharger bracket hardware.



Photo 9-15: P/S block installed



Photo 9-16: Front bolt installed in P/S block

9.3 Installing Tensioner Pulley

We supplied a small packet of anti-seize to use on the pulley and adjustment bolt as shown in Photo 9-17.

- Locate the tensioner pulley. The stand-off is to be installed on the side with the C-clip as shown in Photo 9-18.



Photo 9-17: Anti-seize packet supplied



Photo 9-18: Pulley standoff on the C-clip position

- Install anti-seize on the T-nut and the slide area as shown in Photo 9-19.
- Install anti-seize on the M6 x 60 adjustment bolt as shown in Photo 9-20.
- Thread the M6 nut with the flange facing towards the SC mount as shown in Photo 9-20.
- Install the adjustable pulley using M10x40 bolt and t-nut as shown in Photo 9-21. Be sure the M6 adjustable bolt is out to allow maximum belt adjustment. Hand tight until belt is installed.



Photo 9-19: Anti-seize on T-nut and slide area



Photo 9-20: Anti-seize on adjustment bolt.



Photo 9-21: Tensioner pulley installed



Photo 9-22: Clearance checked P/S hard line

- The hard tube from the power steering may be close to the adjustment screw as shown in Photo 9-22.
- Use a Crescent wrench and bend the hard tube downwards as shown in Photo 9-23.
- Try to adjust around a 1/2" (12 mm) clearance below the adjustment bolt as shown in Photo 9-24.

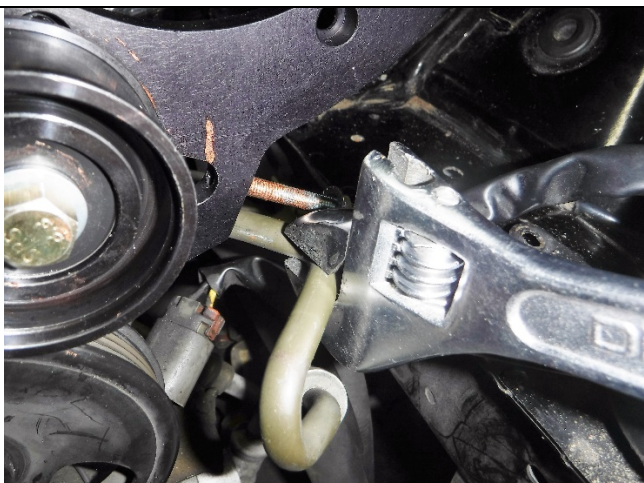


Photo 9-23: Crescent wrench used to bend hard tube



Photo 9-24: Good clearance between hard tube

STEP 10: HARNESS CLEARANCE

The harness on front of the engine needs to be repositioned for clearance.

- Near the valve cover on the front is a bracket with a white connector that goes to the A/C compressor for 01-05 models. Remove the metal bracket and discard as shown in Photo 10-1. Plug the electrical connector afterwards. The 99-00 model does not use this bracket.
- The crank sensor connector needs to be removed from the factory bracket and stretched further toward the water outlet neck as shown in Photo 10-2.
- The lower crank bracket as shown in Photo 10-3 needs to be removed so the harness will stretch further for more clearance.



Photo 10-1: A/C switch bracket removed



Photo 10-2: Crank sensor connector to be repositioned

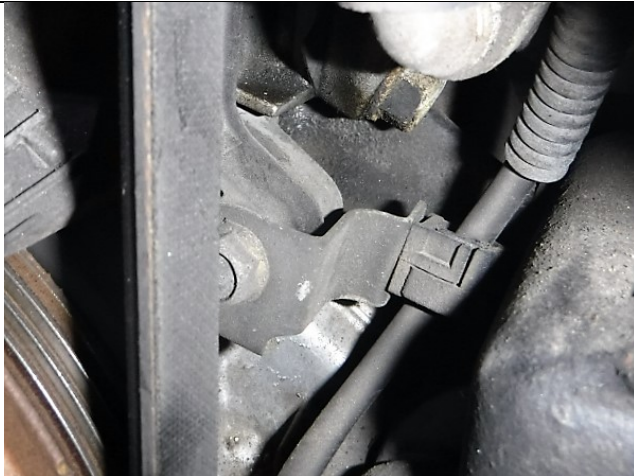


Photo 10-3: Lower crank sensor bracket



Photo 10-4: Lower crank sensor bracket removed

- Using a 10 mm socket, remove the lower crank bracket and separate the bracket from the harness as shown in Photo 10-4.
- Check for clearances, pull the harness upwards and tie-wrap the harness to the coolant hose as shown in Photo 10-5.
- You do not need to remove the crank sensor plug push-in fitting as shown in Photo 10-6, but it will allow the plug to lay flatter against the engine.
- There is a bracket mounted on the valve cover that attached a hose from the valve cover to the intake as shown in Photo 10-7. Keep the metal bracket attached to the valve cover, but remove the plastic fitting.

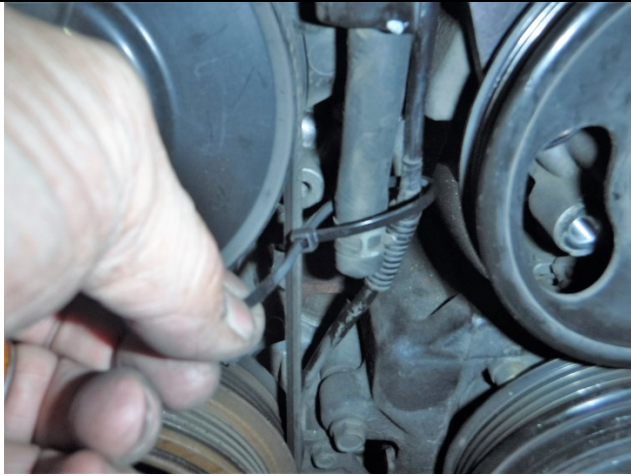


Photo 10-5: Crank sensor wiring tie-wrapped to hose



Photo 10-6: Push-in mount cut off for clearance

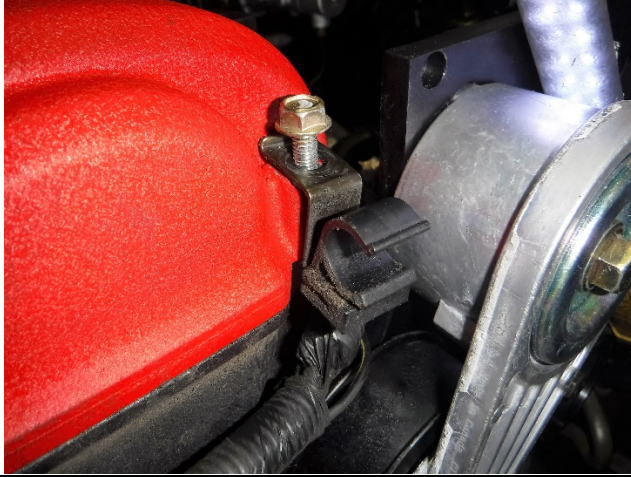


Photo 10-7: Hose bracket plastic mount to be removed



Photo 10-8: Harness pulled up and tie-wrapped

- Pull the harness up to the bracket, checking for clearances and tie-wrap the harness to the bracket as shown in Photo 10-8. This part of your harness has the MAF, air temperature sensor and power steering connectors.
- We need to extend the crank sensor harness toward the intake direction for additional pulley clearance. Open up the wire loom as shown in Photos 10-9 and 10-10. Use a razor blade to cut the old electrical tape off about 3 in. (76 mm) worth and open the harness so you can rearrange the crank sensor portion.



Photo 10-9: Wire loom opened to separate wiring



Photo 10-10: Crank sensor wiring pulled out of harness



Photo 10-11: Crank sensor harness



Photo 10-12: Crank harness tie-wrapped

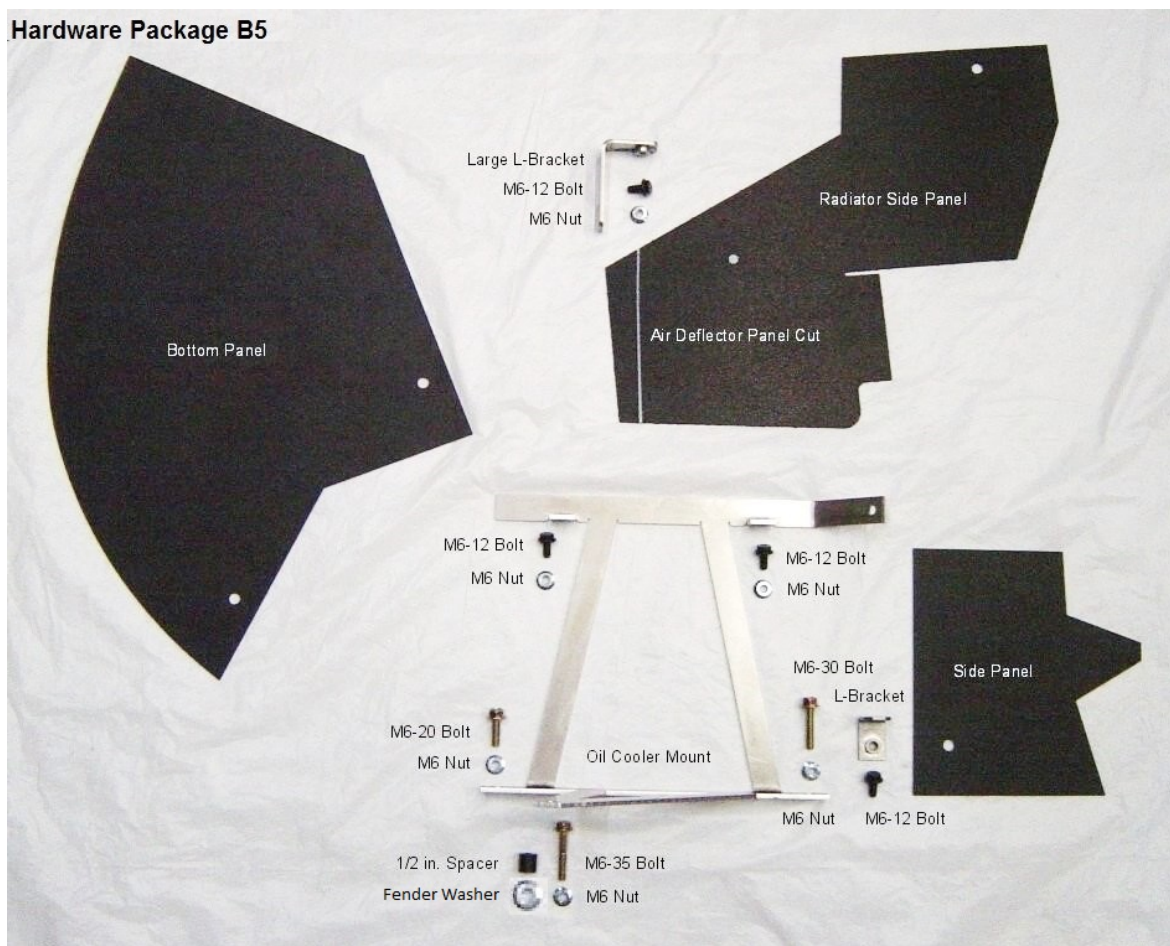
- Pull the crank sensor out enough that you can arrange the connector away from the pulley as shown in Photo 10-11.
- Using a tie-wrap, pull the crank sensor away from the pulley area and secure to the existing harness as shown in Photo 10-12.
- Double check all of the wiring to make sure that none will be touched by the pulleys or the drive belt.
- Reinstall wire loom on to the harness. Use some electrical tape to cover the wire loom when complete.

STEP 11: INSTALLING THE ROTREX OIL COOLER

There are three plastic panels to aid the oil cooler and the radiator cooling. The stainless steel oil cooler mount is laser cut and precisely bent to fit the large oil cooler in the Miata fender area. All hardware is supplied including oil/gas resistant cloth wrapped hose that is kink proof and abrasion resistant.

Custom made L-brackets with captive nuts are used to mount the panels securely. If you have a custom brake duct setup, you can route the tubing between the oil cooler and the radiator area. Plastic panels can be modified with Tin-Snips or a good pair of scissors for a custom fit.

Hardware Package B5



11.1 Running Oil Cooler Hose

- If you have not removed the factory tow hook as shown in Photo 11-1 on the driver's (left) side, do so at this time using 14 mm wrench. You can leave the right side mounted, but you will be required to modify the TDR plastic side panel a small amount for additional clearance. If necessary use a pair of Tin-Snips or scissors to cut the plastic.
- Remove the driver's (left) side inner fender panel shown in Photo 11-2. Some of the mounting hardware are plastic using a Phillips screw. This screw can strip very easily so be careful. If you do strip the head, use a pair of wire cutters and remove it the best you can. We will not reuse this hardware on the fender panel.



Photo 11-1: Left side tow hook removed



Photo 11-2: Remove inner fender panel

- Before feeding the oil hose down to the cooler area, **cut off a length of about 12 in. (305 mm) off one end**, this will be used for the reservoir as shown in Photo 11-3.
- Push the hose through the sway bar mount from the top as shown in Photo 11-4 and out from the sway bar mount as shown in Photo 11-5. Pull as much as you need for the installation as cutting will be done in the engine bay later.



Photo 11-3: 12 inch hose piece to be used for the reservoir



Photo 11-4: Cloth hose pulled through the sway bar mount



Photo 11-5: Oil cooler hose



Photo 11-6: Grease applied to the fitting



Photo 11-7: Apply heat to soften the rubber



Photo 11-8: Push connector on with extreme pressure

- Find the two brass barb fittings that go on the oil cooler. Install a spring clamp from hardware package R5 on the hose before installing the brass fitting. The fitting is a tight fit in the hose and works best if you will apply a small amount of oil or grease to the barb fitting first as shown in Photo 11-7.
- With a cigarette lighter, soften the inside rubber some with the flame as shown in Photo 11-6 and immediately press on the fitting using the floor for leverage as shown in Photo 11-8. Keep applying pressure until seated at the bottom.

11.2 Belly Pan Modification

If you do not have a belly pan or under tray pan you should have one to improve cooling. In our kit we will remove the side panels from the belly pan and use our new plastic side panels.

- The easiest way to cut the belly pan sides is with Tin-Snips as shown in Photo 11-10, but a good pair of scissors or power saw will work.
- Cut the belly pan about a 1 inch (25 mm) above the base front to back as shown in Photo 11-11.
- Mount the belly pan using your existing mounting hardware. There are 3 bolts in front and 2 bolts in the rear as shown in Photo 11-12. Notice the open area to allow heat to be removed much easier.



Photo 11-9 Belly pan before modification



Photo 11-10: Using tin-snips cut side panels off both sides



Photo 11-11: Side panel removed about 1 inch from bottom

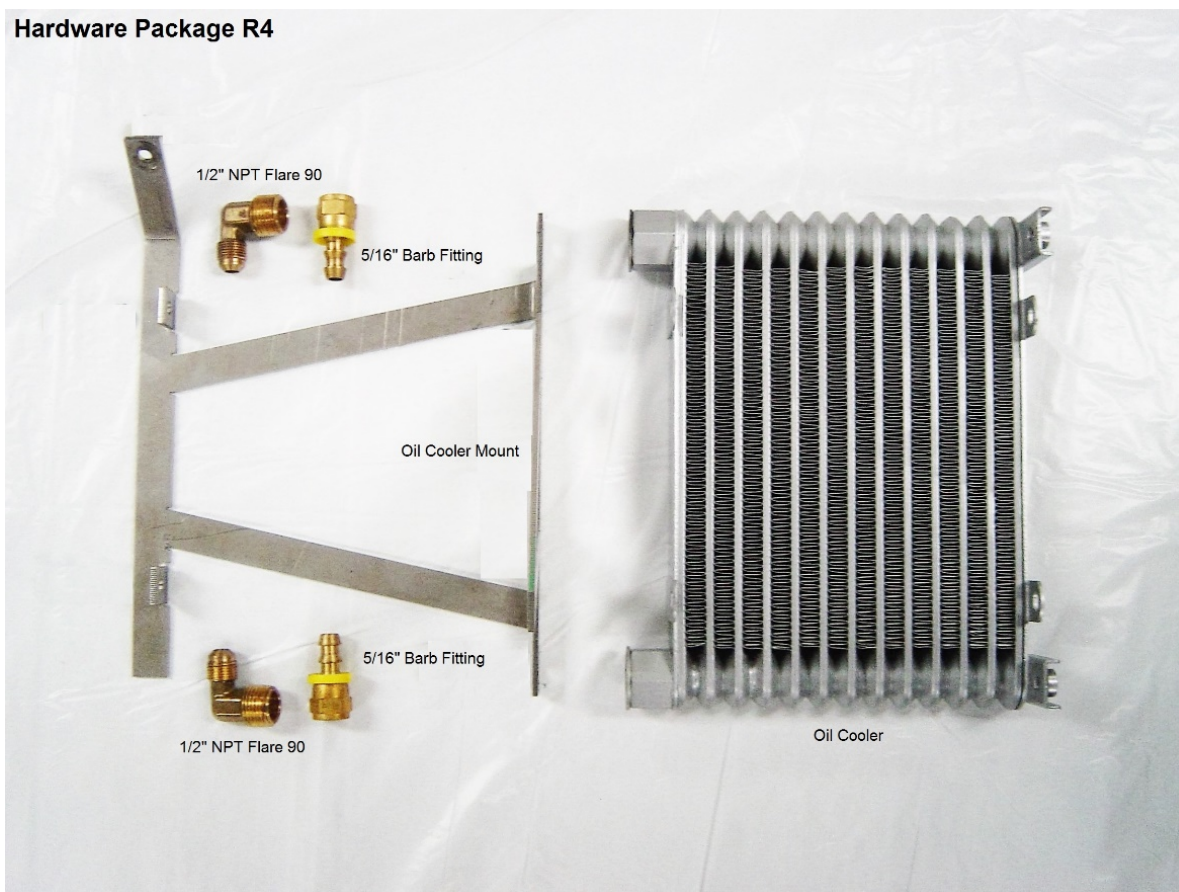


Photo 11-12: Belly pan in stalled

11.3 Installing the Oil Cooler

Our high quality oil cooler setup uses a custom bent stainless steel mount that is held in by upper and lower bolts. The large volume dissipates the Rotrex supercharger oil to prolong life. The added plastic panels aid in directing airflow. The SS bracket installs on the inside of the cooler. Refer to Hardware Package B5 for component hardware layout.

Hardware Package R4



- The 99-00 oil cooler bracket mounts in the upper, rearward hole. This is required for the bracket to mount to the bumper properly. The 01-05 oil cooler bracket mounts to the lower, forward hole as shown in Photo 11-13.
- Remove the plastic speed nut from the bumper as shown in Photo 11-14.
- The bottom panel is mounted to the bumper at the bumpers end and installed with the cooler when ready to be mounted. Photo 11-14 shows the bottom panel laid in position on the bumper.
- The bracket will easily slide into the cooler mount. If one of the mounts is bent a little, straighten as required. Install the upper mount using M6x12 bolt and nut as shown in Photo 11-15.

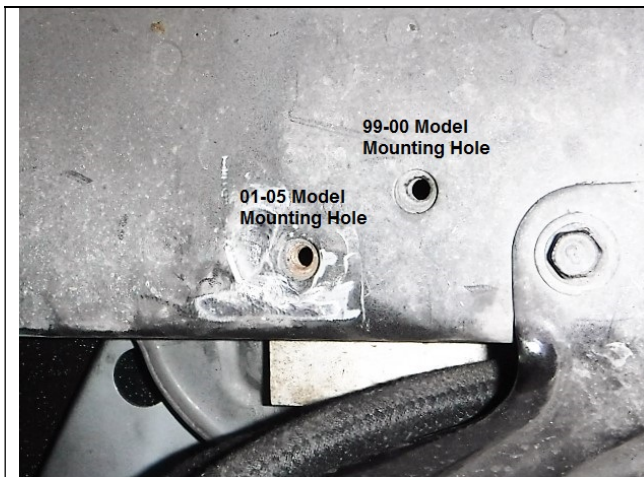


Photo 11-13: Oil cooler mounting hole model dependent



Photo 11-14: Install upper bolts



Photo 11-15: Upper hardware mounted to oil cooler



Photo 11-16: Left bottom bolt mounted

- On the bottom mount, install the M6x20 bolt and nut only on the left rear as shown in Photo 11-16. The right bottom mount will be installed later with an L-bracket.
- The fittings should already be installed from earlier instructions as shown on Photo 11-17, if not refer back to Section 11.1.
- The two 90 degree flare fittings on the cooler are preinstalled and should be angled as shown in Photo 11-18, this will allow the hoses to bend freely.



Photo 11-17: Fitting installed on the oil hose

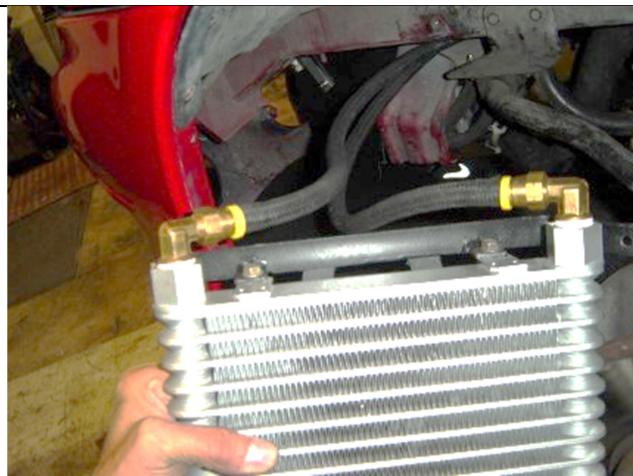


Photo 11-18: Hoses attached to cooler

- The flare fittings are SAE, not Metric and use a 3/4" open wrench or adjustable wrench to tighten.
- Allow extra slack in the hose for accessibility, but not so much that it binds or causes obstruction in airflow as shown in Photo 11-18.
- Mount the cooler frame to the chassis frame using the M6x20 mm bolt as shown in Photo 11-19. Refer back to Photo 11-13 to determine which hole to mount based on year model.



Photo 11-19: Cooler mounted to frame



Photo 11-20: Cooler bracket mounted to bumper



Photo 11-21: Small L-bracket for side panel



Photo 11-22: Installed L-bracket with nut

- Mount the oil cooler to the bumper as shown in Photo 11-20 using the M6x35 mm bolt with 1/2 in. (12 mm) spacer. Use the washer under the bumper to help support the plastic bumper area.
- Install the L-bracket using the M6x30 mm bolt and nut as shown in Photo 11-21. Hand-tighten until the side panel is attached as shown in Photo 11-22.
- Using an M6x12 mm bolt, attach the side panel as shown in Photo 11-23. Position so the side panel is up against the side to close off air.
- Confirm all the hardware is tight. The oil cooler installation should look like Photo 11-24.



Photo 11-23: Side panel in position

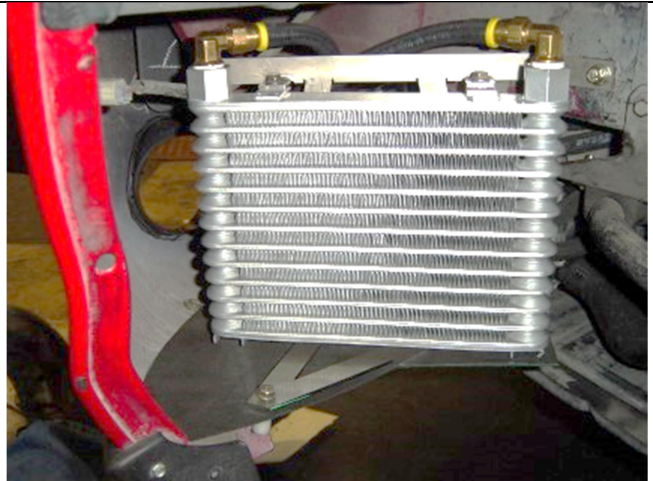


Photo 11-24: Oil cooler complete

STEP 12: CRUISE CONTROL REMOVAL

A lot of the 99-05 Miatas have cruise control. If you don't have this feature then you can skip these following steps. These instructions are for removal now and replacement after the intake hose arrangement is in installed.

- There is an electrical connector for the brake master cylinder as show in in Photo 12-1. Unplug while you are installing the reservoir. Afterwards you can plug the harness back together.
- Remove the two M6 bolts with a 10 mm socket wrench as shown in Photo 12-3.
- Place the unit on top of the valve cover as shown in Photo 12-4.



Photo 12-1: Electrical connection on 01-05 model



Photo 12-2: Cruise control

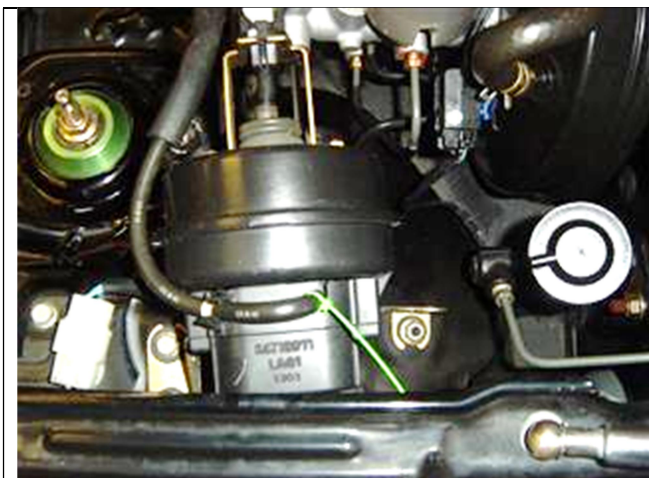


Photo 12-3: Cruise control fittings



Photo 12-4: Cruise control removed

- Remove the M6 bolt using a 10 mm wrench from the diagnostic mount as shown in Photo 12-5.
- Remove the cruise control harness from the diagnostic mount as shown in Photo 12-6.



Photo 12-5: Diagnostic mount removed

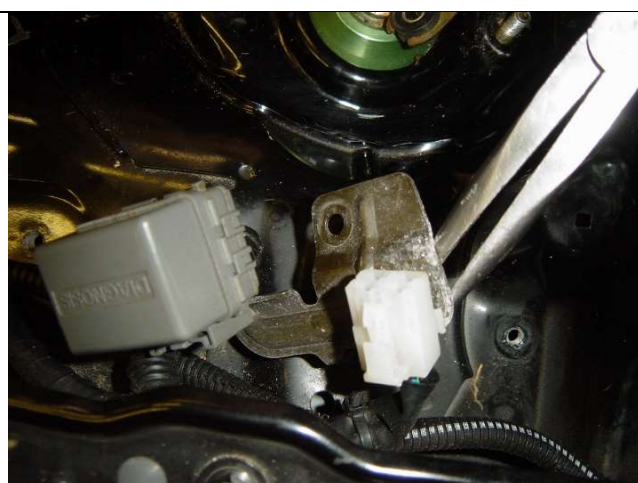


Photo 12-6: Cruise control harness removed

STEP 13: INSTALLING THE RESERVOIR AND OIL LINES

The reservoir canister mounts to the brake booster using the SS bracket supplied. Before installing you need to temporarily remove the cruise control module if you have so equipped in your car for accessibility.

Hardware Package R5



- The Rotrex oil reservoir has a SS mount that you will install as seen in Photo 13-1. Hardware Package R5 contains necessary components for this step of the installation.
- You should have the oil hose pulled up into the engine bay at this time. It does not matter which hose from the cooler goes to the supercharger or reservoir.
- The two clamps that surround the oil cooler will allow the cooler to slide for adjustment.
- Install the two oil reservoir clamps using supplied hardware with the mounting tabs placed downwards as shown in Photo 13-1.
- Install the SS mount using the M6x12 mm bolt and nut in the position as shown in Photo 13-1. The mount has two smaller 6mm holes and one larger 8mm hole for the brake boost mount. Set aside to install in another step.



Photo 13-1: Reservoir with mount installed



Photo 13-2 Small 12 in. bottom hose on reservoir

- Earlier in the installation, we suggested cutting off 12 in. (300 mm) length of oil line. If you did not cut a section off then continue with the top mounted reservoir hose installation and then cut off your 12 in. section of hose afterwards.
- Install a banjo fitting and spring clamp to the hose as shown in Photo 13-3. Apply grease to the fitting to ease installation.
- Install the short hose to the bottom of the reservoir with a banjo bolt and two crush washers as shown in Photo 13-2. Tighten using a 14 mm wrench with the hose facing toward the engine as shown in Photo 13-5.



Photo 13-3: Fitting installed with spring clamp



Photo 13-4: Banjo fitting with crush washers



Photo 13-5: Brake booster showing reservoir mounted



Photo 13-6: Brake reservoir connector

- There is an electrical plug that goes to the brake reservoir. It is a loose connection on the 99-00 model. The 01-05 is clipped to the reservoir. Unplug the connection for now as shown in Photo 13-6.
- Remove the 12 mm nut from the brake booster as shown in Photo 13-7.
- The 99-00 model will bolt up without brake line modifications. The 01-05 model brake lines need to be widened for reservoir clearance as shown in Photos 13-8 and 13-9. Bend by hand and test fit.



Photo 13-7: Rotrex SC reservoir location

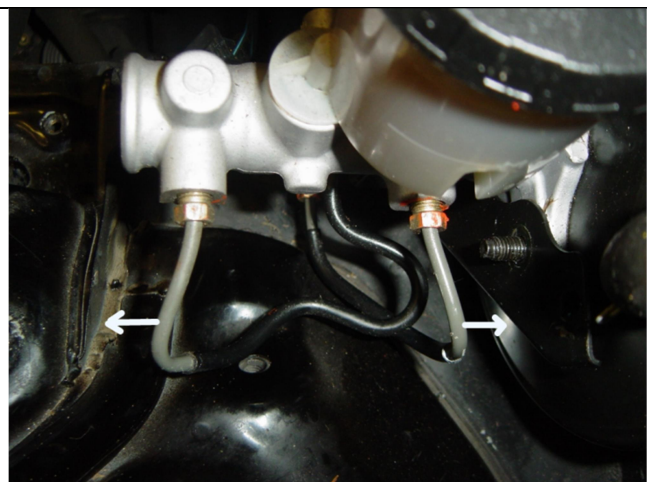


Photo 13-8: 01-05 model brake lines bent for reservoir



Photo 13-9: Reservoir tightened down to the reservoir



Photo 13-10: Oil cooler to reservoir hose attached

- Install the reservoir mount with the hose toward the engine. Test fit the reservoir for clearance and adjust as necessary before tightening the 12 mm nut as shown in Photo 13-9.
- If necessary, loosen and slide the reservoir so that you have about a 1/4-3/8 inch (7-10 mm) clearance at the fender.
- Bring the looped hose from the oil cooler up to and around the brake master cylinder. Cut to length for mounting on top of the reservoir as shown in Photo 13-10.
- Install the banjo fitting and spring clamp to the hose. Install banjo bolt and two crush washers using a 14 mm wrench on to the top of the reservoir as shown in Photo 13-10.



Photo 13-11: Oil filter location



Photo 13-12: Oil direction with filter mounted

- The Rotrex oil filter mounts to the frame using the 8mm threaded hole as shown in Photo 13-11.
- The oil filter has an arrow showing the direction of the flow as shown in Photo 13-12.
- Cut the hose to length long enough to attach to the oil filter as shown in Photo 13-12. Attach hose with spring clip.
- Install oil filter to chassis using clamp provided and M8x20 mm bolt using a 12 mm wrench as shown in Photo 13-12.



Photo 13-13: Oil hose from oil cooler



Photo 13-14: Oil hose in position

- Pull the other hose from the oil cooler toward the head as shown in Photo 13-13.
- Install the Rotrex SC to the mount using one bolt with a few threads at the top as shown in Photo 13-14. This will allow the SC to have more gap from the mount for installing the outlet hose.
- Bring the hose up to the SC oil line OUTLET and with additional slack, cut the hose as shown in Photo 13-15.



Photo 13-15: SC outlet hose cut



Photo 13-16: Burning off the threads



Photo 13-17: Bayonet fitting installed with clamp

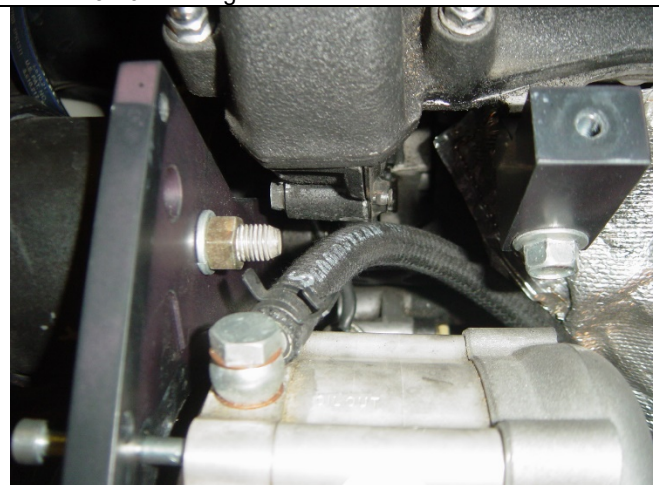


Photo 13-18: SC oil cooler hose attached to SC

- Burn the threads off the hose after cutting as shown in Photo 13-16.
- Install the bayonet fitting and clamp on the hose as shown in Photo 13-17. Add some grease to the fitting will help installation.
- Install the bayonet bolt to the fitting using two copper crush washers. Angle the fitting away from the SC mount as shown in Photo 13-18 and tighten using a 14 mm wrench.
- Cut another section of hose to go from the filter to the INLET of the SC as shown in Photo 13-19. Attach spring clamp on the filter end and a banjo fitting and spring clamp on the other end. Install banjo bolt with two crush washers and mount hose as shown in Photo 13-20.
- Do Not Tighten the INLET banjo fitting at this time. When the oil is installed we will need to bleed from this fitting. After bleeding the fitting should be at the angle shown in Photo 13-20.



Photo 13-19: Hose installed from filter to SC



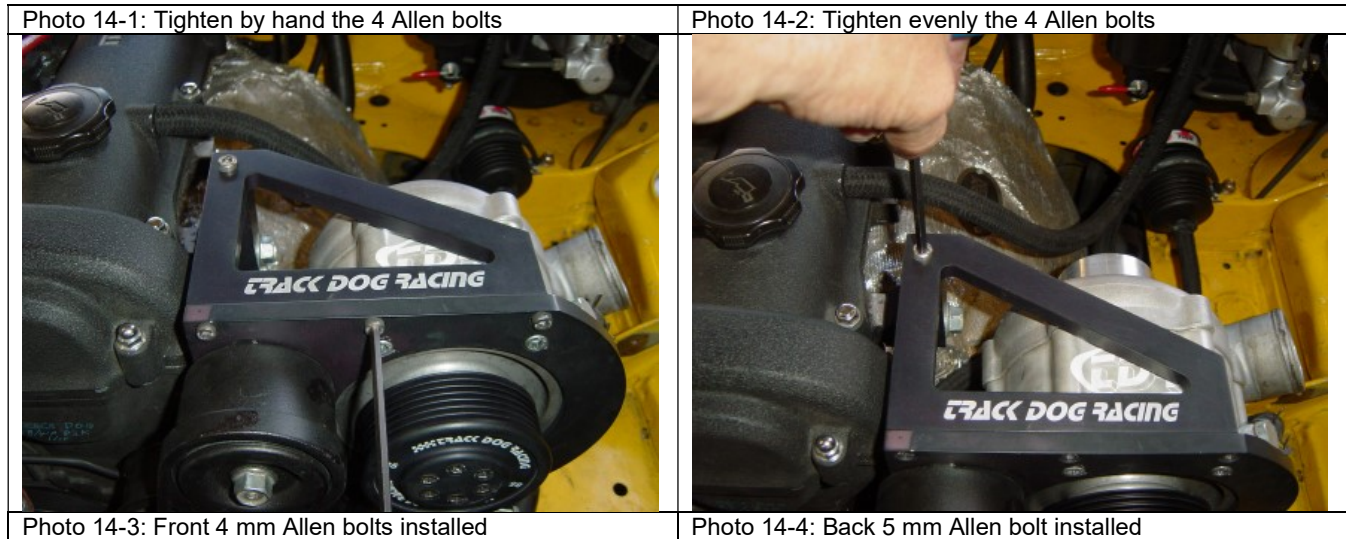
Photo 13-20: Filter hose attached the SC

STEP 14: INSTALLING THE SUPERCHARGER TO THE MOUNT

The Rotrex supercharger use 4 long SS Allen bolts requiring a 5 mm Allen wrench. You can use standard Allen wrenches, but we would prefer to use a 3/8" socket with 5 mm Allen as shown in Photo 14-1. Maximum torque should be 90-100 inch lbs. which is a good snug fit. Loctite is not necessary.

- Place the supercharger into the mount as shown in Photo 14-1.
- Reinsert four M6 bolts and tighten uniformly around the mount using 5 mm Allen as shown in photo 14-2
- Install the triangle mount using the three M5 Allen bolts in the front plate as shown in Photo 14-3.
- Start the M6 Allen bolt at the back mount location as shown in Photo 14-4.
- NOTE: THERE IS A SEQUENCE FOR PROPERLY TIGHTENING THE BRACKET FOR ALIGNMENT. AFTER THE SUPERCHARGER IS INSTALLED. LOOSEN THE FRONT BOLTS, THE 6MM ALLEN BOLT ON TOP AT THE HEAD AND THE HEAD BLOCK BOLT. WIGGLE THE ASSEMBLY SOME BEFORE TIGHTENING.
 1. FIRST TIGHTEN THE LOWER FRONT MAIN BRACKET BOLTS
 2. SECOND TIGHTEN THE M6 ALLEN BOLT AT THE HEAD BLOCK
 3. LAST YOU WILL TIGHTEN THE HEAD BLOCK.





- Mount the SC pulley using the M6x12 Allen head bolts. Loctite can be used on these bolts. Tighten while holding the pulley in your hand. After the drive belt gets installed and tightened you can use this as leverage to hold the pulley while tighten the SC pulley bolts.

STEP 15: INSTALLING THE SUPERCHARGER PULLEY

The supercharger pulley mounts using 6 each Allen head bolts from Package R3. Both the 4-rib and 6-rib setups are the same.

- The center mount is preinstalled on the supercharger as shown in Photo 15-1.
- Mount the SC pulley using the M6x12 Stainless Steel Allen head bolts. Loctite can be used on these bolts. Only turn the pulley if necessary clockwise.
- Hand-tighten each bolt while holding the pulley in your hand as shown in Photos 15-2 and 15-3.
- After the drive belt gets installed and tightened you can use this as leverage to hold the pulley while tighten the 6 each Allen bolts on the pulley as shown in Photo 15-4.

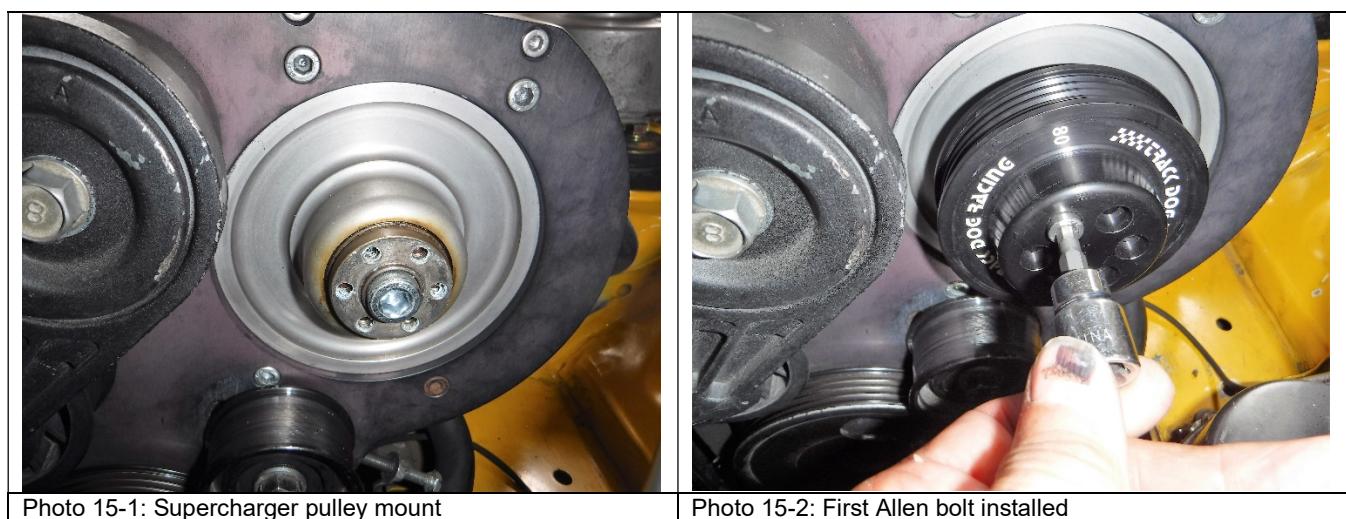




Photo 15-3: Remaining Allen bolts installed



Photo 15-4: After belt installed bolts tightened

STEP 16: INSTALLING THE SUPERCHARGER DRIVE BELT

Most setups will include power steering and air conditioning which uses a Gates K040510 or 514 belt. If you do not have one or the other, the drive belt installation is similar. The 6-Rib setup is also similar except uses a 7-rib pulley. The 6-rib setup the front 6 teeth on the SC pulley.

- Pull the sliding pulley toward the adjustment bolt to give full access when installing the drive belt as shown in Photo 16-2. Loosen the 10 mm bolt and jam nut if necessary.
- The sliding pulley uses a 14 mm wrench to tighten as shown in Photo 16-3. Make sure there is no more than about 1 turn out on the sliding pulley bolt while installing the belt. Leaving the pulley too loose during tensioning can misalign the t-nut and gouge the bracket during tensioning.



Photo 16-1: Turn tightener bolt out to install belt



Photo 16-2: Sliding pulley 10 mm adjustment bolt



Photo 16-3: Sliding pulley uses 14 mm wrench



Photo 16-4: 3/8" breaker bar used to remove tension

- You may require pulling back the auto tensioner to install the drive belt. Use a 3/8 inch socket wrench or breaker bar as shown in Photo 16-4. Release after the belt is on.
- Install the drive belt on all pulleys. Mount on the supercharger pulley as shown in Photo 16-1. The 6-rib configuration uses the front six ribs as shown in Photo 16-9 and 16-10.

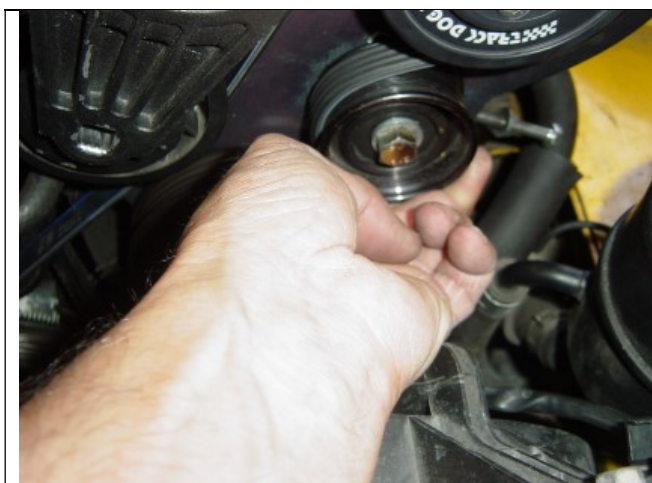


Photo 16-5: Sliding pulley pulled inwards



Photo 16-6: Tighten slider pulley with 14 mm wrench



Photo 16-7: Tighten the sliding pulley to tension the drive belt. Lock jam nut when complete

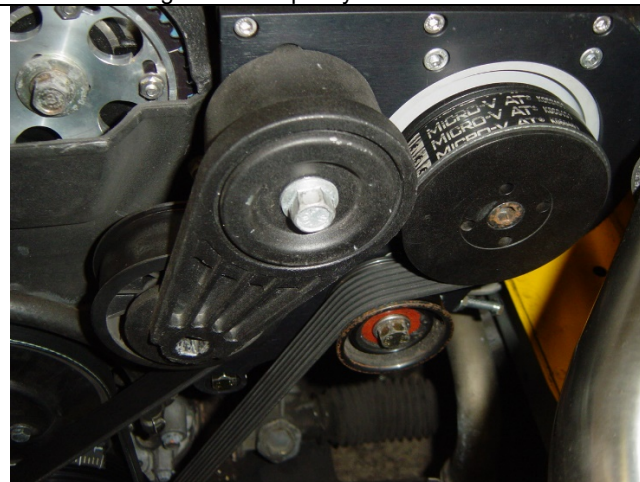


Photo 16-8: 6-rib belt mounted to front of 7-rib pulley

- Pull in the slider pulley to remove the drive belt slack as shown in Photo 16-5 and tighten the sliding pulley adjustment bolt by hand initially followed by using a 10 mm wrench.
- Adjust the belt tension sliding pulley. Watch for the auto tensioner to start moving and continue until the tensioner pulley moves about 1/4" (6 mm). On the long section of the belt the belt tension takes about 20 pound force to push about a 1/4 inch (6 mm).
- Tighten the slider pulley with the 14 mm wrench as shown in Photo 16-6.
- Tighten the jam nut on the slider pulley adjuster with a 10 mm wrench a shown in Photo 16-7.
- Adjusting the drive belt is easiest if you will remove the return air hose from the BOV and bend the hose out of the way of the tensioner bolt.
- The drive belt stretches throughout its life. Check the belt tension often.
- The 6-rib setup requires replacing the crank pulley with our aluminum 6-rib crank pulley. Remove the alternator belt and then the four M6 bolts from the pulley. Install the new aluminum.



Photo 16-9: 6-rib crank pulley



Photo 16-10: 6-rib setup installed

STEP 17: INSTALLING THE RADIATOR

The radiator is now positioned lower and angled back a little toward the engine. Depending on the type of radiator you are using, the plastic support arms for the fans might need to be trimmed to clear the sway bar. The stock radiator usually does not require additional trimming. Some aftermarket radiators such as our TDR, Koyo and others may require trimming.

If you are using the Racing Beat Sway Bar Brace you may have to discontinue using the brace member or modify it for clearance. The 01-05 model fans are lower profile and may clear the brace with no issues. To modify, you can cut out the side of the RB brace member where the fan support was touching. You can, however, still use the hardware block support in the frame bracket which will add some additional sway bar support and is the better option. Autocross racers use the blocks only. Lay the radiator in its support and check for clearances.

Photo 16-2 shows how much was trimmed away from one of our test vehicles with a Koyo radiator. The fan motor braces use a very strong plastic allowing considerable amount of plastic removal. Start with a small amount of removal and test fit. Don't overdo it!

Note: This is an important step to installing the radiator properly. When installed correctly, the black textured aluminum radiator cover should match close to the rubber supports on the top of the radiator without having to move the radiator very much. If not, readjust.

17.1 Trimming the Fan Shroud

The A/C condenser will be mounted into the front holes of the lower radiator bracket. After the A/C condenser is installed the radiator will be installed and test fitted.

- Make sure the rubber grommets are installed on the bottom of the A/C condenser and install into the lower bracket front position.
- Make sure the rubber grommets are installed on the upper and lower mounting supports on the radiator.

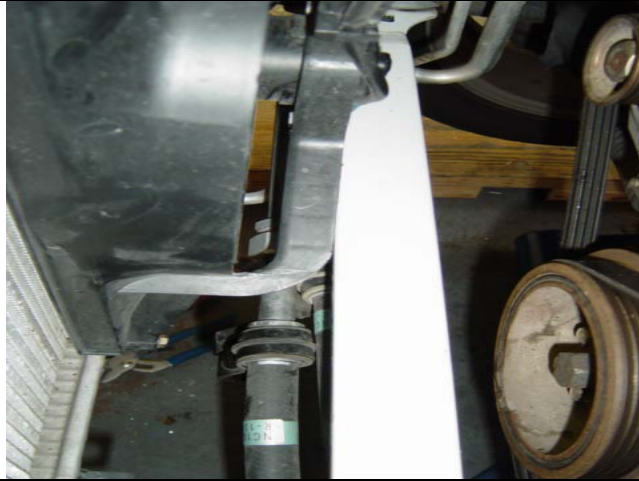


Photo 17-1: Radiator fan housing clearance check



Photo 17-2: Radiator support trimmed for clearance

- Lay the radiator into position and check how the radiator fits. Check to see if the radiator fan braces are binding on the sway bar. Mark the areas that needs trimming. Use a Dermal or jig saw to cut away the plastic. Keep test-fitting the radiator until it slides in without rubbing the sway bar.
- Install the black textured aluminum radiator cover for the final test fitting, as shown in Photo 16-3. Install over the rubber grommets on top of the radiator and the threaded studs on the frame that will hold the shield in place. Trim the fan support braces if necessary and refit.
- Once the clearances are sufficient, attach the lower radiator hose to the bottom outlet of the radiator. Reattach the M6 bolt to the bracket that secures the A/C plumbing on the bottom of the fan housing.

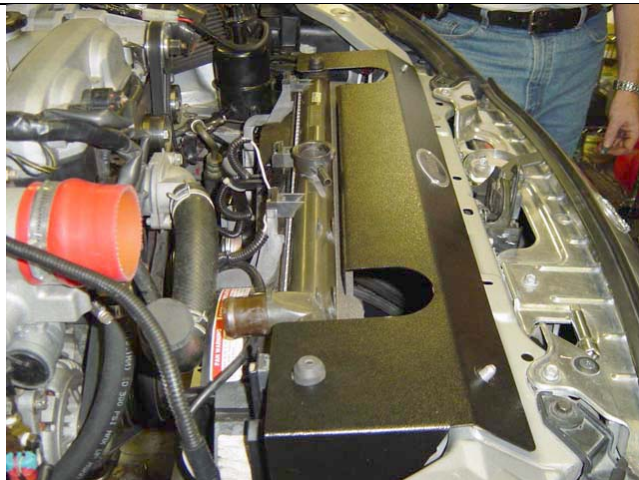


Photo 17-3: Top radiator support in place



Photo 17-4: Upper radiator hose trimmed to fit

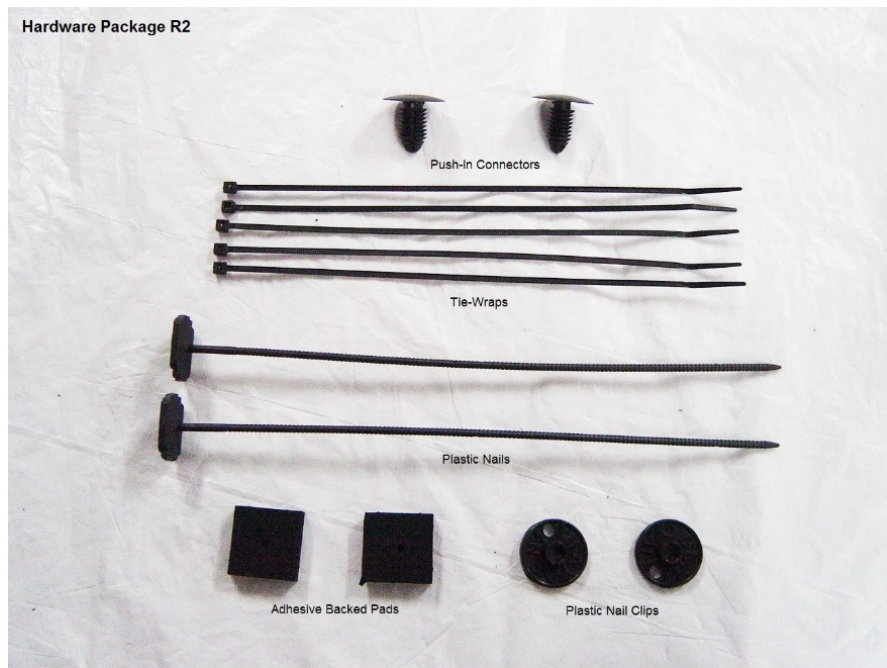
- The upper radiator hose requires removal of about 1 1/2 inch (37 mm) at the radiator end. Lay the hose on top of the radiator fittings and cut as required, as seen in Photo 17-4. Attach the radiator hose using original factory clamps. Attach the overflow tube.
- Make sure the radiator drain is back in place and all hoses are connected. You can refill the radiator now, but we would suggest waiting until the installation is complete.

17.2 Attaching the A/C Condenser Coil to the Radiator

The condenser coil has a bracket with a rubber grommet on each side as shown in Photo 17-5. To help with clearance between the evaporator coil and the radiator you will need to bend the brackets toward the radiator. An automotive push-on type tie-wrap known as a plastic nail is used to support the A/C condenser coil in place at the top. Even though the condenser coil is close to the radiator, the A/C fans are always turned on, pulling cool air through it. Efficiency might be reduced a little in stop-and-go situations, but highway driving cooling should be normal.

The 2001+ models attachment is similar to the 1999-2000 model. The photos below are for the 1999-2000 model. Refer to STEP 5 for additional photos of the 2001+ model rubber supports on the A/C evaporator coil and any adjustments that might be required.

Hardware Package R2



- Using an adjustable wrench or other tool, bend the aluminum bracket toward the radiator as shown in Photo 17-6. Make sure the rubber meets the radiator, not the bracket.
- Depending on the type of radiator you are using, you may have to bend the tips of the bracket first so the rubber will better meet the radiator.

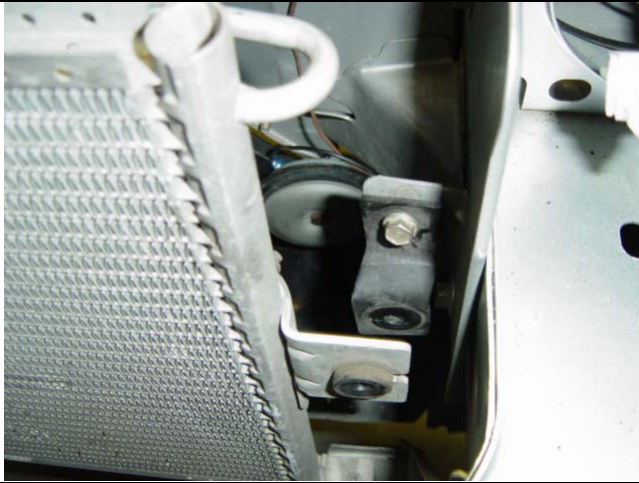


Photo 17-5: Condenser coil bracket

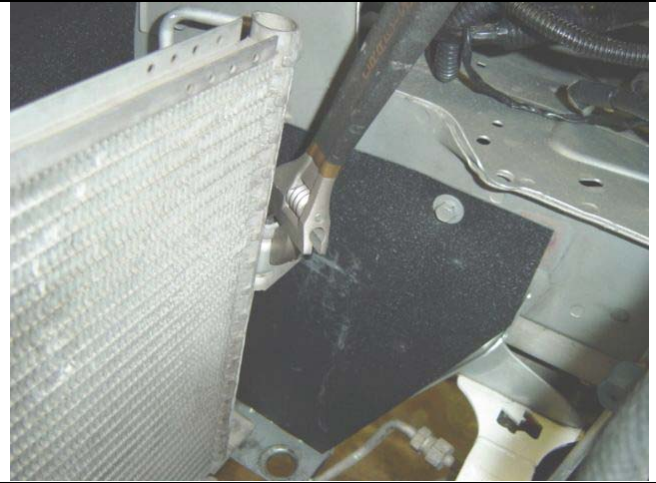


Photo 17-6: Wrench bending the A/C bracket

- The plastic nail base may be too large to fit between the radiator housing. Using wire cutters, cut the base to make it narrower as shown in Photo 17-8.
- Install the supplied plastic nail about 2 inches from the top of the radiator by pushing it through the coil and between the fans as shown in Photo 17-8. The plastic nail will go through both the radiator and evaporator coils. Remove the tape on the pad and attach it on the plastic nail with the sticky side toward the condenser coil.
- Attach the locking clip by pushing the locking device on to the plastic nail as shown in Photo 17-10. If the rubber grommets on the side brackets are not touching the radiator, readjust. Again we do not want any metal contact.
- Pull the plastic nail just enough to pull the evaporator coil against the rubber grommets. Do not over-tighten and place unnecessary stress on the radiator or condenser. The Hardware Package B5 comes with one Spare plastic nail. These are common items available at any auto parts store.



Photo 17-7: Bracket bent towards radiator

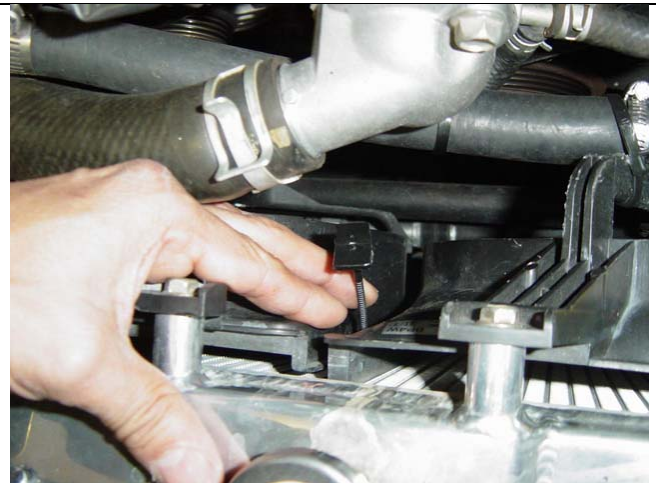


Photo 17-8: Install the supplied plastic nail

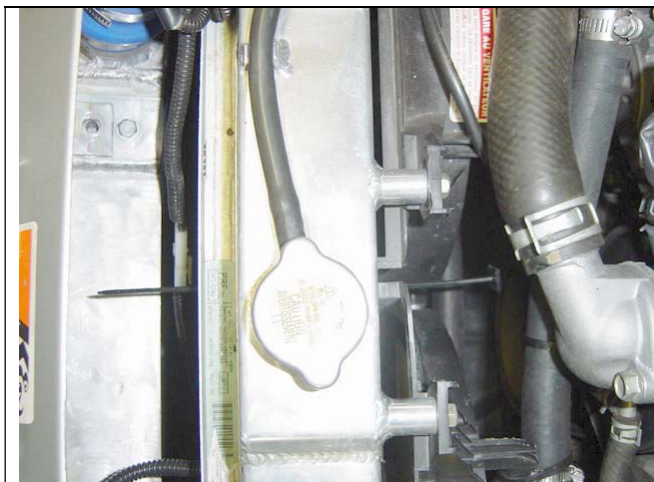


Photo 17-9: Push plastic nail through radiator and condenser coil



Photo 17-10: Locking clip installed. Note pad should be installed on the condenser coil.

17.3 Installing Lower 1 Radiator panel

This is an optional panel, but will close up the lower gaps under the radiator to improve cooling efficiency. To improve air flow to the radiator we provide a plastic panel that can be installed under the radiator to reduce air losses. This panel uses a thin 1/16 inch plastic that can be modified to fit as required. Tie-wraps are used to mount at the rear of the panel and to the radiator.

Before installing you might want to verify there are no water leaks after the SC completion before continuing this installation.

- Install the Lower 1 panel in position by sliding under the radiator and above the bumper.
- Using a marker pin, draw where modifications will be required to fit your application.
- Use tin-snips to cut the plastic as shown in Photos 17-11 and 17-12.
- Using tie-wraps to support the panel at the rear as shown in Photo 17-13. You can use the radiator fan support brackets to tie the panel.



Photo 17-11: Lower 1 panel modified and tie-wrapped



Photo 17-12: Lower 1 panel modified and tie-wrapped

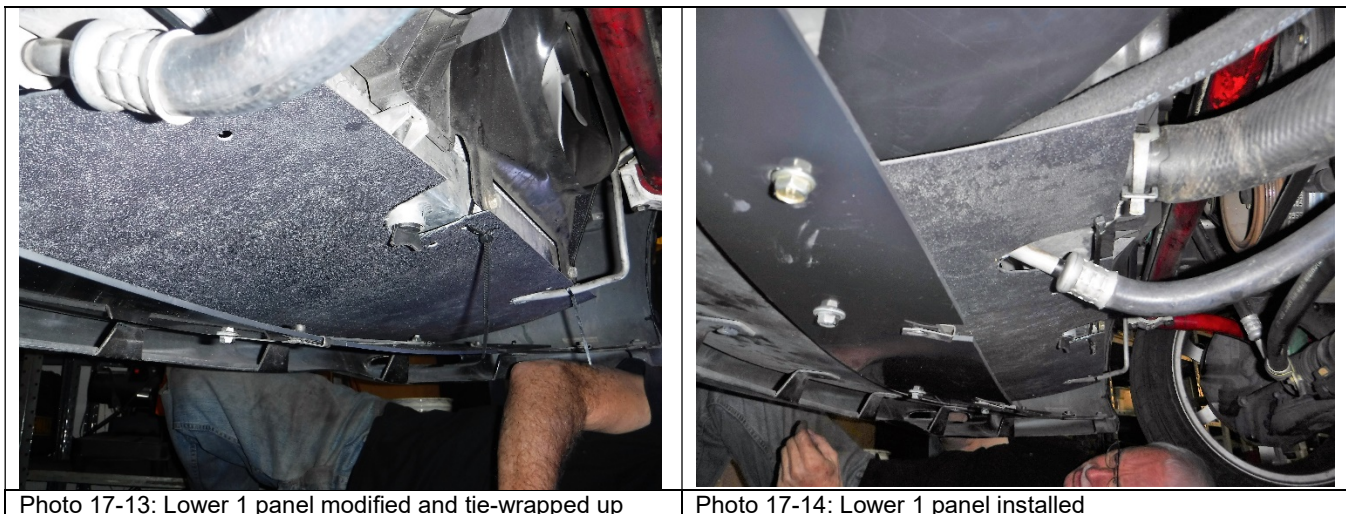


Photo 17-13: Lower 1 panel modified and tie-wrapped up

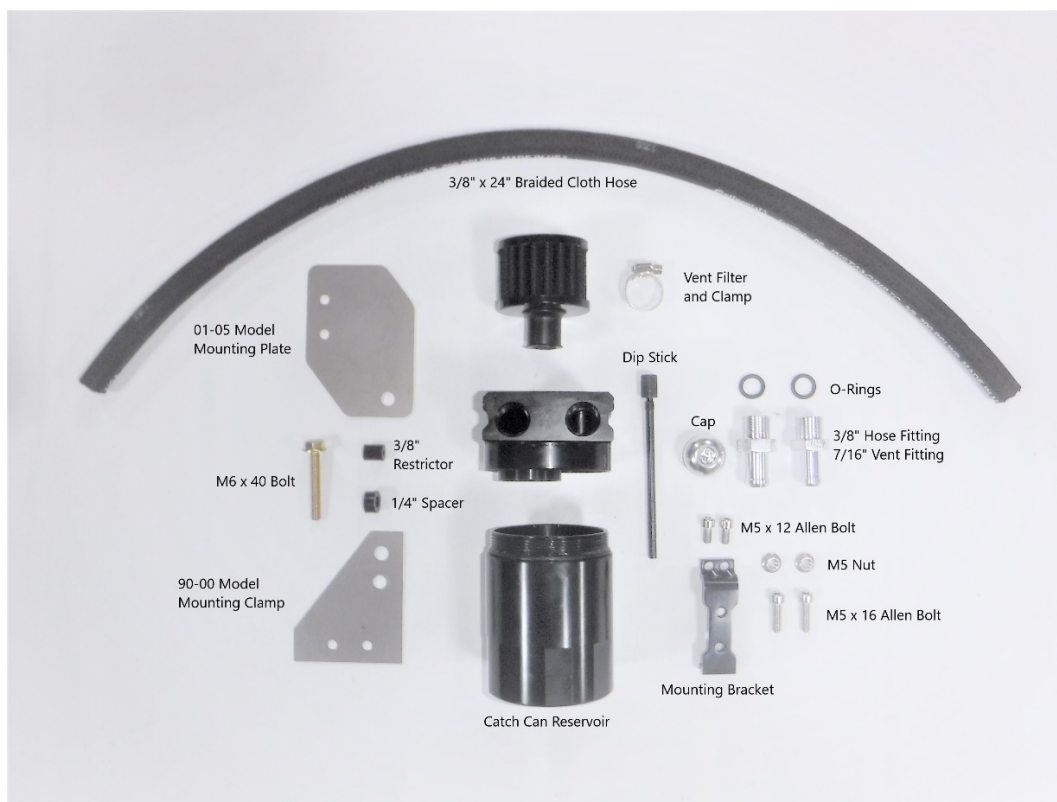
Photo 17-14: Lower 1 panel installed

STEP 18: INSTALLING THE CATCH CAN

Your crank case builds up high pressure with RPMs and with high boost. The breather hose relieves this pressure normally back into the intake track. We do not want oil vapor being sucked into the supercharger and into the intercooler as this will reduce its cooling efficiency. For this reason we include an oil catch can. The catch can is open to atmosphere through a cleanable filter. At boost levels of 10-12 PSI you should see little to no amounts of oil accumulation. On a track day you may see more accumulation, this is normal.

There are two different SS mounting panels. The 99-00 mounting panel is the triangle shaped model as seen below. The 01-05 mounting panel is the rectangular shaped model. The 99-00 model installs on the brake proportional valve. The 01-05 model installs on the brake booster.

Hardware Package R6



18.1 Preparing the Catch Can

The catch can needs to have the aluminum barb fittings, mounting plate and filter installed.

- Remove the plug on top using an 8 mm Allen wrench as shown in Photo 18-1. There is an O-ring on the plug, be careful not to lose it.
- Install the plug into the left threaded port as shown in Photo 18-2.



Photo 18-1: Cap removed from top with Allen wrench



Photo 18-2: Cap installed on left side of catch can

- Locate the 3/8 inch (10 mm) aluminum barb fitting and install an O-ring as shown in Photo 18-3.
- Install the barb fittings on the side port as shown in Photo 18-4.
- Locate the 7/16 inch (12 mm) aluminum barb fitting and install an O-ring as shown in Photo 18-3.
- Install the barb fittings on the top port as shown in Photo 18-4.



Photo 18-3: 3/8" hose fitting with O-ring



Photo 18-4: 3/8" hose fitting front, 7/16" hose fitting top

- Remove the mounting clamp using a 4 mm Allen wrench as shown in Photo 18-5.
- Determine which location you are going to mount the catch can. The triangle mounting bracket is angled to the left for the brake booster mounting as shown in Photo 18-7.
- Install the SS plate onto the mount using the 5 mm Allen bolts supplied with the nuts on the outside as shown in Photo 18-6.
- Reinstall the mounting clamp use the two M5 bolts with the 4 mm Allen wrench as shown in Photo 18-7.
- Install oil filter on the top barb fitting using the clamp supplied to secure as shown in Photo 18-8.



Photo 18-5: Mounting clamp removed

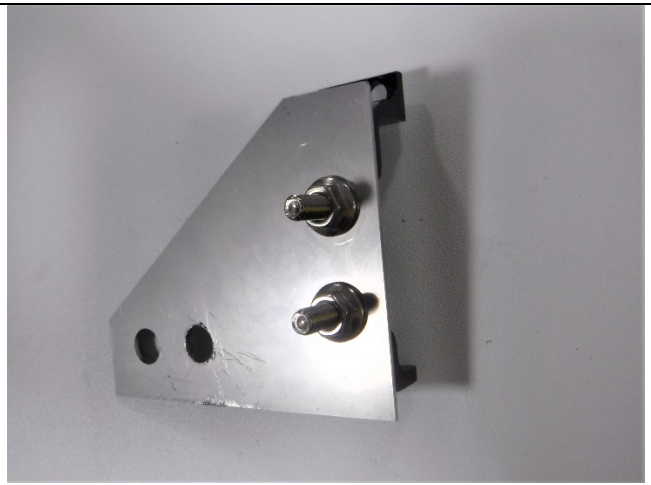


Photo 18-6: Clamp mounted to SS plate

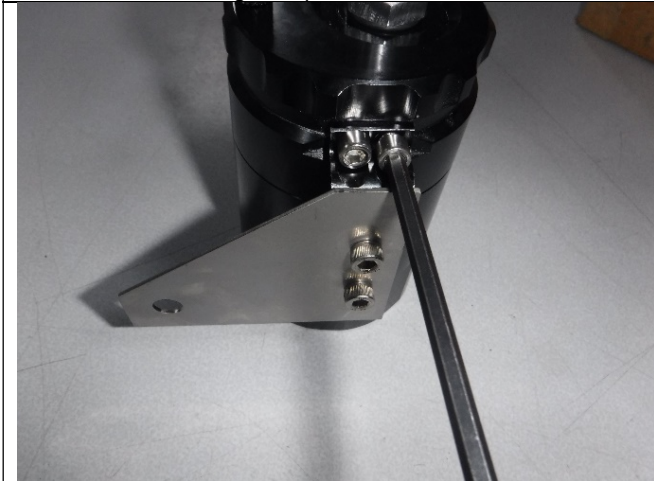


Photo 18-7: Mounting clamp installed with SS plate



Photo 18-8: Oil filter installed

18.2 Installing Catch Can on the Proportioning Valve on 99-00 Models

Installing the catch can on the proportioning valve offers more room to remove the bottom reservoir for draining. The 01-05 model proportion valve is located in a different position therefore see 18.3 for instructions.

- Remove the lower M6 bolt on the proportioning valve using a 10 mm wrench as shown in Photo 18-9.
- Locate the supplied M6 x 40 mm bolt and ¼ inch spacer as shown in Photo 18-10.
- Install new bolt and spacer onto the bracket mounted on the catch can and install into the proportioning valve as shown in Photo 18-10.

- The catch can bracket has two mounting holes. Use the hole closest to the catch can as the first option. This will bring the catch can further inwards as shown in Photo 18-11.
- Straighten the catch can and tighten the M6 bolt as shown in Photo 18-12.

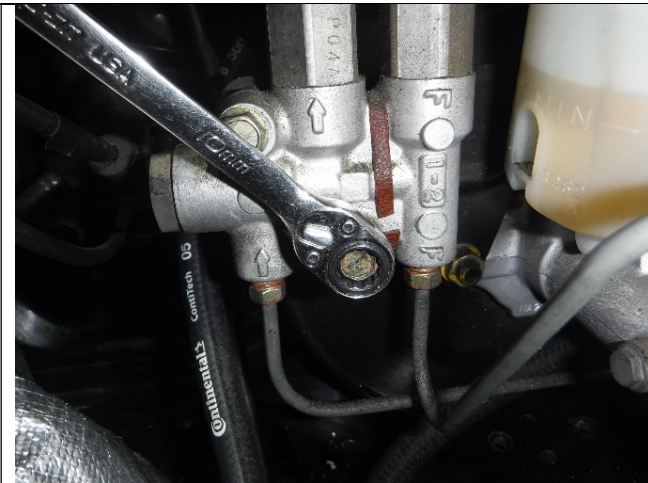


Photo 18-9: Proportioning valve location

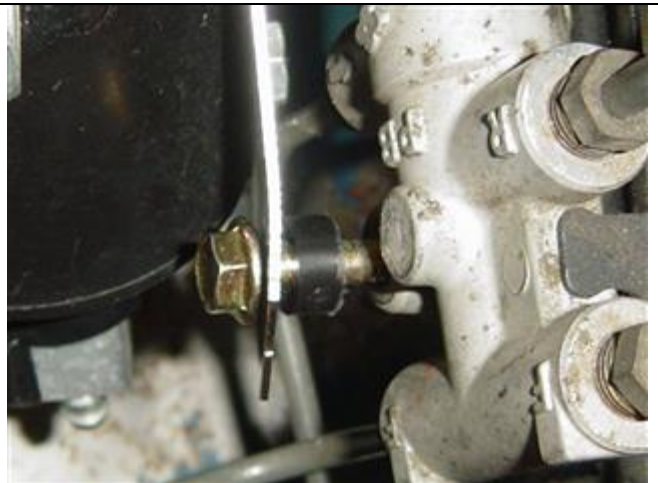


Photo 18-10: Spacer on proportioning valve



Photo 18-11: Catch can mounted to inside hole



Photo 18-12: Catch can installed

18.3 Installing Catch Can on the Brake Booster on 01-05 Models

The 01-05 models use the rectangular shaped bracket as shown in Photo 18-13. The catch can will be mounted on the brake booster mounting bracket.

- Begin with removing the mounting bracket from the catch can using a 4 mm Allen wrench.
- Locate the two 5 mm Allen bolts and nuts supplied.
- Install the bracket onto the SS plate with the nuts on the outside of the SS plate as shown in Photos 18-13 and 18-14.
- Reinstall the bracket onto the catch can as shown in Photo 18-14.
- The brake booster bracket shown in Photo 18-15 normally holds the cruise control plastic fitting for the throttle cable layout. You can remove the plastic fitting and leave the cruise control cable loose. The brake lines may require bending inwards toward the engine for additional clearance.



Photo 18-13: 01-05 SS plate mounted to bracket

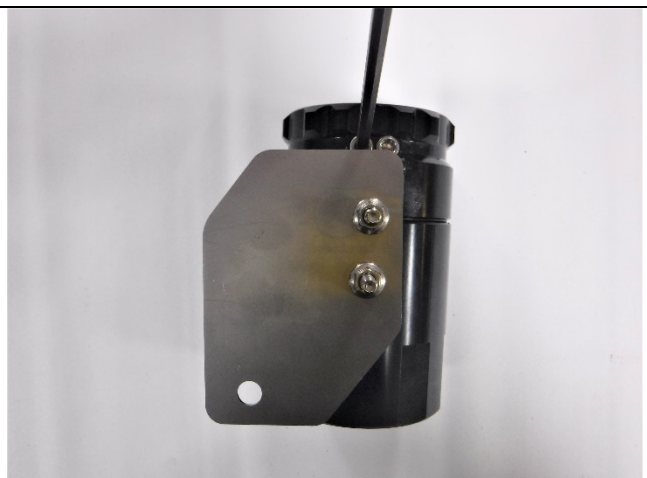


Photo 18-14: Mounting bracket installed



Photo 18-15: Brake booster location



Photo 18-16: Wrench on 12 mm nut

- Install the catch can onto the brake booster's 8 mm stud. Start with your fingers to install the nut and then use a 12 mm open/boxed wrench to tight the nut as shown in Photo 18-16. It works easiest to leave at an angle while tightening and then push up straight on the final tightening of the nut.
- When complete the catch can should look like Photos 18-17 and 18-18.



Photo 18-17: Catch can on brake booster location



Photo 18-18: Catch can complete

18.4 Installing the Cloth Braided Hose

The cloth braided hose is 24 inches in length and expected to be cut to length per your installation.

- Lay out the braided hose and cut to length using a knife cutter to fit between the valve cover and the catch can port.
- After trimming the braided hose to length, consider burning the frayed threads with a cigarette lighter as shown in Photo 18-19.
- Locate the black plastic restrictor (white in the photo) included in the kit. Press the restrictor into the end of the braided hose closes to the valve cover port as shown in Photo 18-20.
- Press the braided hose onto the catch can and on to the valve cover port as shown in Photo 18-21. Lube hose if necessary.
- Make sure the braided hose is not in a position where it can get damaged from heat.



Photo 18-19: Burn fraying on the hose end



Photo 18-20: Restrictor fitting being installed



Photo 18-21: Press breather hose onto the valve cover fitting



Photo 18-22: Braided hose attached

20.4 Servicing the Catch Can

As your crank case increases in RPMs the crank case pressure increases. Normally only oil vapor comes through to the catch can. However, in high boosted applications and or weak cylinder rings, this will increase crank case pressures and push excessive oil into the catch can.

- The catch can oil level can be checked by unthreading the oil dip stick as shown in Photo 18-23.
- The marks on the dip stick help show the level as shown in Photo 18-24.
- The bottom reservoir unthreads from the base as shown in Photo 18-23. There is an O-ring at the threaded section to seal the reservoir.
- Depending on where the catch can is mounted, you may not have an easy access to removing the reservoir. In this case you would have to unbolt the unit to empty. If your forced induction setup pushes a lot of oil into the catch can then consider changing the location for easier accessibility.
- The oil filter can be removed and cleaned with any cleaning solvent.



Photo 18-23: Catch can reservoir and dip stick removed



Photo 18-24: Dip stick oil level marks

STEP 19: MODIFYING THE MAF WIRING

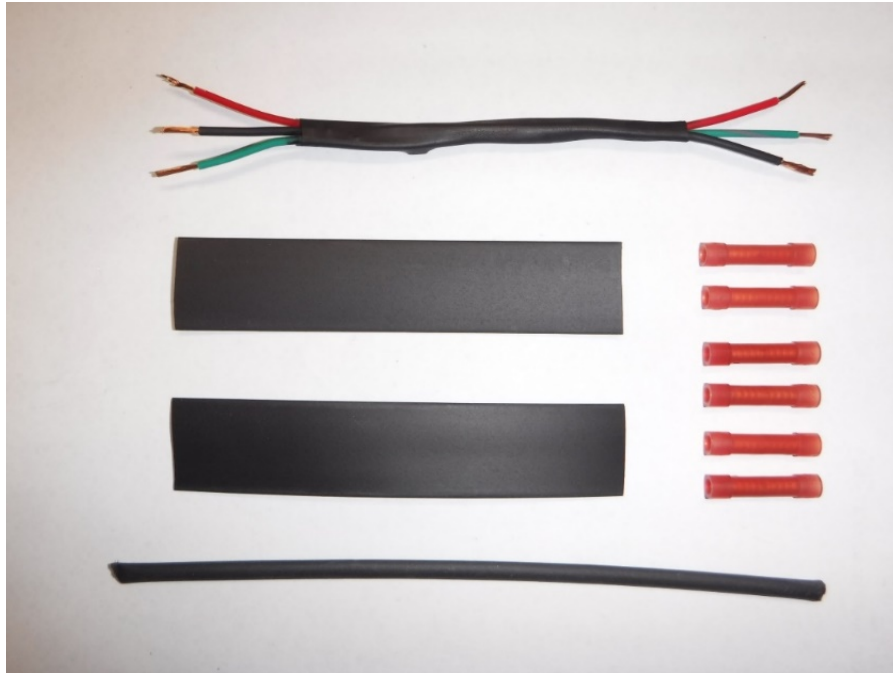
If you are using a standalone fuel management and eliminating the use of your mass air flow MAF unit you can skip this modification. The MAF provides an analog voltage signal to the ECU. As the flow increases the voltage increases. The increased flow rate by the Rotrex supercharger causes the voltage signal to exceed the ECU threshold. This does not affect performance, but can cause a check engine light CEL to come on stating the voltage was higher than normal. The voltage limit is 4.9 volts.

Our wiring modification which we call the VCC, voltage cut circuit uses a 4.7 Volt Zener Diode and a couple of resistors to cut the voltage signal at 4.7 volts. As airflow increases the voltage signal to the ECU increases. When it reaches 4.7 volts, the VCC provides a continuous 4.7 volts to the ECU during max airflow. The VCC tricks the ECU to thinking the airflow limit has stopped at 4.7 volts. If you decide to remove the Rotrex setup, you do not need to remove the VCC. Your stock engine will never exceed the airflow voltage signal that would trip the CEL.

We have included butt connectors for the VCC to simplify wiring. The following instructions show the installation using butt connectors, however you can also solder the wires if you prefer. We have included smaller shrink tubing for soldering installation. The complete setup will use shrink tubing to cover all exposed wiring.

The 99-00 model and the 01-05 model use a different color signal wire, however the power White-Red and ground Black-Blue remain the same for both models. The Green wire is the signal wire on the VCC.

Hardware Package B6



- Move the MAF wiring behind the Rotrex SC so you will have access to cutting the harness as shown in Photo 19-1.
- Using a razor blade, remove the electrical tape from the MAF harness as shown in Photo 19-2 and 19-3.
- Cut all three wires about 2 in. (50 mm) from the plug as shown in Photo 19-4.



Photo 19-1: MAF harness access



Photo 19-2: Tape cut for removal



Photo 19-3: Tape removed from harness



Photo 19-4: Wires cut about 2" from plug

The color coded wires should be connected by the following model below:

99-00 Model

Green to Green-Black (Signal)
Red to Red-White (Pos.)
Black to Black-Blue (Neg.)

01-05 Model

Green to Pink (Signal)
Red to Red-White (Pos.)
Black to Black-Blue (Neg.)

- The VCC can be wired from either end.
- Strip the three wires about 1/4 in. (8-10 mm).
- Start with wiring the MAF connector. With the color codes above, crimp or solder the three wires from the VCC to the connector as shown in Photo 19-5. Photo 19-5 shows wiring of the 99-00 model. Photo 19-6 shows the wire color for the 01-05 model.

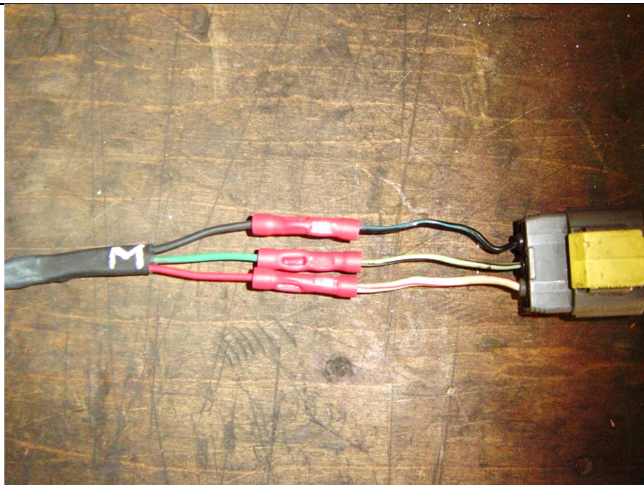


Photo 19-5: VCC crimped to MAF plug, 99-00 harness with Green sensor wire

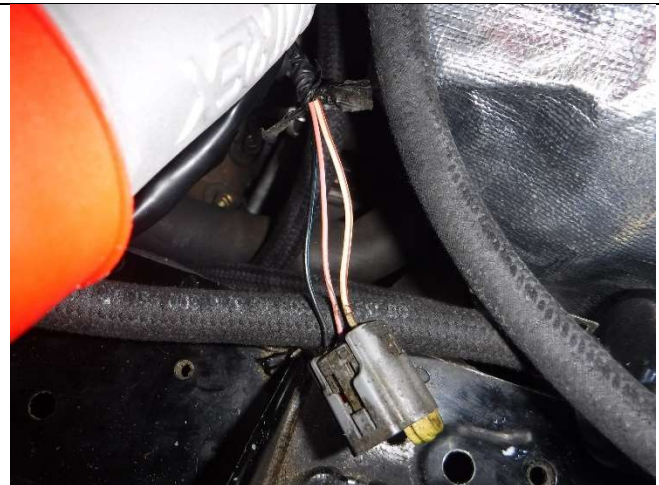


Photo 19-6: 01-05 harness with Pink sensor wire

- Slide the 1/2 in. shrink tubing over the crimp connectors and up to the connector as shown in Photo 19-7.
- Using a lighter, rotate as you shrink the tubing over the VCC as shown in Photo 19-8.
- Slide the second piece of 1/2 in. shrink tubing over the VCC after the tubing has cooled off as shown in Photo 19-9 and 19-10. This will be used over the ECU crimp connection.

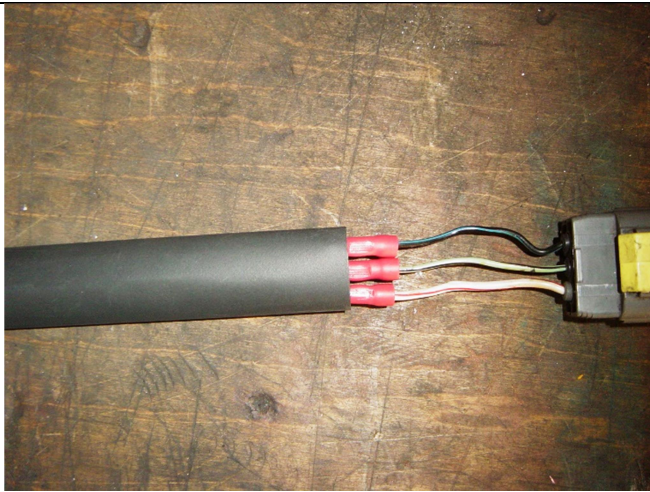


Photo 19-7: Shrink tubing placed over harness



Photo 19-8: Tubing shrunk over harness



Photo 19-9: Connector end complete

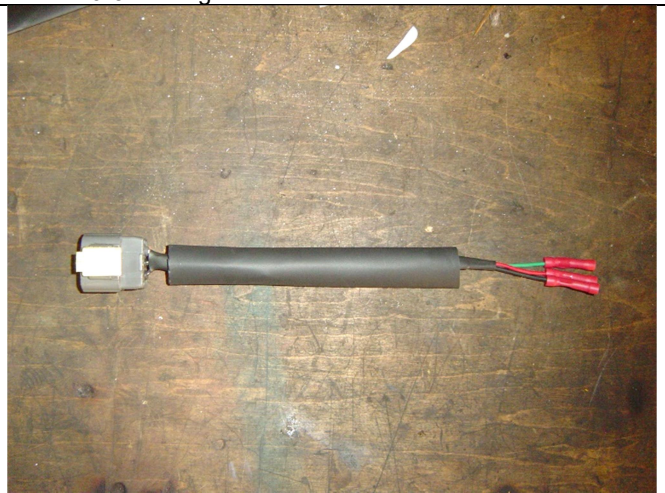


Photo 19-10: Shrink tubing slipped over harness

- Strip the three wires about 1/4 in. (8-10 mm) as shown in Photo 19-11.
- Make sure the shrink tubing is over the plug side of the VCC and crimp the three wires matching the color codes as shown on Photo 19-12.
- Slide the shrink tubing over the crimp connectors as shown in Photo 19-13.
- Heat the shrink tubing as shown in Photo 19-14. This completes the modification.



Photo 19-11: ECU side harness wires stripped

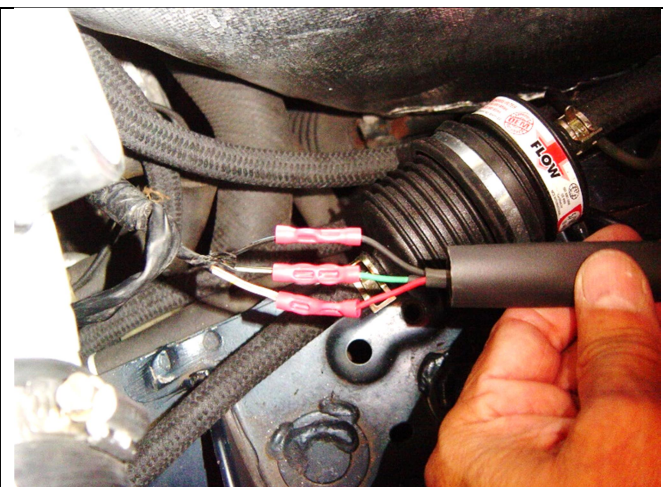


Photo 19-12: Plug harness crimped to ECU harness



Photo 19-13: Shrink tubing slid over crimp connectors

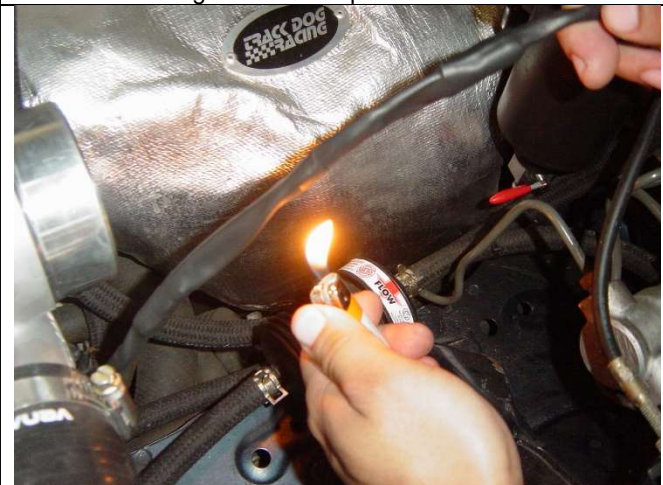


Photo 19-14: Tubing shrunk over crimp connectors

STEP 20: INSTALLING THE SUPERCHARGER PIPING

The intercooler piping installation is similar on all year models. Majority of the applications will use our TDR Fuel and/or Timing card for fuel management. This will require the use of your Mass Air Flow MAF unit for the 99-05 models. When using this setup you will use a recirculating blow off valve BOV for proper idling.

If you are going to use a standalone fuel management setup such as our Mega Squirt PNP we suggest you keep the recirculating section of the BOV. The BOV can be vented to atmosphere, but under vacuum it still leaks to atmosphere so suggest venting back to the inlet. We have different silicone hoses for this setup, but you can also modify your existing hoses.

Hardware Package B7



20-1 Installing the Intercooler Lower Hoses

The intercooler uses two silicone hump hoses as it allows for additional movement due to engine torque. The clamps provided on each hose are sized properly for each hose application. The SS clamps are special lined clamps that do not pinch into the hose and should be the only clamp style used.

- As with ALL hose attachments, use some soapy water to help the hose slide on as shown in Photo 20-4. The soapy water also acts as a sealant when dried.
- Spray some soapy water on the two silicone Hump hoses and install onto the intercooler with clamps #36. The clamps should be on the front side as shown in Photo 20-1. Press the hose down to wear the intercooler pipe meets the beginning of the hump as shown in Photo 20-2.
- Install both hoses and tighten the bottom clamps snugly using an 8 mm nut driver.



Photo 20-1: Hose installed with clamps



Photo 20-2: Hump above the aluminum fitting

20.2 Installing the SS Intake Piping

Install the intake SS pipe first and align. The clamps provided on each hose are sized properly for each hose application. The SS clamps are special lined clamps that do not pinch into the hose and should be the only clamp style used.

- Install the 2 ½" straight silicone hose to the pipe end going to the TB as shown in Photo 20-3.
- As with ALL hose attachments, use some soapy water to help the hose slide on as shown in Photo 20-4. This also acts as a sealant when dry.
- Install the two SS clamps #40 with the tightener hardware on the same side as shown in Photo 20-3.
- Install the intake pipe into hose on the intercooler and position toward the TB as shown in Photo 20-3.
- Slide hose over and position up against the TB. Don't fully tighten yet as shown in Photo 20-5.
- Position the radiator cover over the mounting studs as shown in Photo 20-6, but don't install the nuts as you will remove the cover after alignment.



Photo 20-3: Silicone hose and clamps on pipe



Photo 20-4: Soapy water applied on pipe

- Align pipe clearance around opening of the radiator cover as shown in Photo 20-6.
- While holding the pipe in position, tighten down the second clamp as shown in Photo 20-7. Tighten both clamps at this time.
- Remove the radiator cover and tighten down the clamps on the intercooler outlet as shown in Photo 19-8.



Photo 20-5: Tighten TB clamp first and align



Photo 20-6: Radiator cover clearance checked



Photo 20-7: Tighten clamp while holding in position

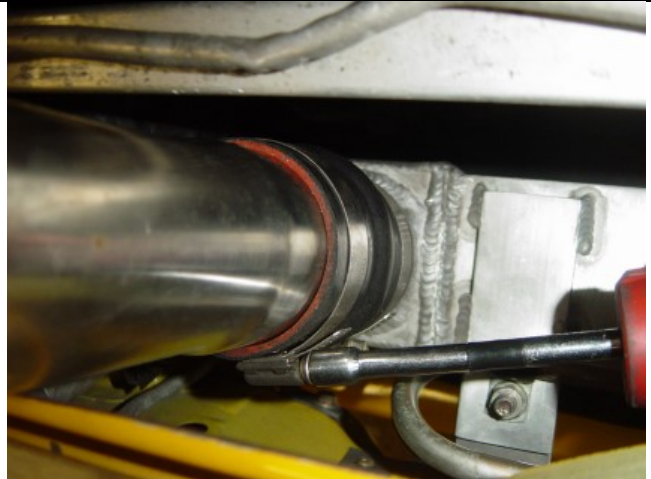


Photo 19-8: Tighten clamp on intercooler outlet

20.3 Installing the BOV

Locate the Blow-Off Valve BOV, 3 inch hose, return hose and clamps.

- With the hose clamps #16, install the BOV using the 1 x 3 inch (25 x 75 mm) long hose in the direction shown in Photo 20-9.
- The BOV return hose connects to the Rotrex intake. The hose is made to length and will connect to the intake hose without binding.
- Attach the Return hose to the BOV using the clamp #16 provided as shown in Photo 20-9. Position the clamps for easy access. Do not tighten completely until you are satisfied with the alignment.
- Run return hose above the fans and around the SC setup as shown in Photo 20-10 and 20-11. Install a clamp #16 as shown in Photo 20-12.
- Install the vacuum hose to the intake vacuum port and the BOV as shown in Photo 20-12. If this port is not available you can use supplied Tee and adapt the hoses. Cut hose length and use Tie-wraps as necessary.



Photo 20-9: BOV return air system



Photo 20-10: BOV return hose



Photo 20-11: BOV return hose with clamp



Photo 20-12: Vacuum line from BOV to intake manifold

20-4 Installing Supercharger Intake Hose

The intake hose arrangement consist of two hoses. The MAF unit may rest on the fender. The stainless steel clamps provided on each hose are sized properly for each hose application. The SS clamps are special lined clamps that do not pinch into the hose and should be the only clamp style used.

Hardware Package B8



- Before installing the silicone hose arrangement, we need to attach the factory air sensor. If you have not attach the air sensor back to the harness connector do so at this time. The ambient air temperature the sensor reads is about the same temperature as what the air intake is receiving so installing the sensor into the intake hose is not necessary.
- Mount the sensor using one of the tie-wrap supplied on the harness near the headlight assembly as shown in Photos 20-15 and 20-16.
- Add soapy water to aid installation on all silicone hose and pipe insert as shown in Photo 20-17.
- Install the BOV return hose with clamp #16 as shown in Photo 20-18. Position clamps as shown, but don't tighten until all of the intake setup is complete. Make sure to turn the clamp for accessibility.

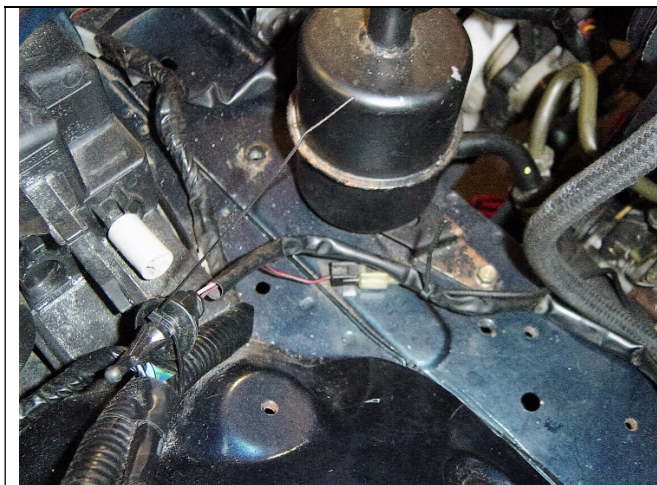


Photo 20-15: Factory air sensor placed on harness

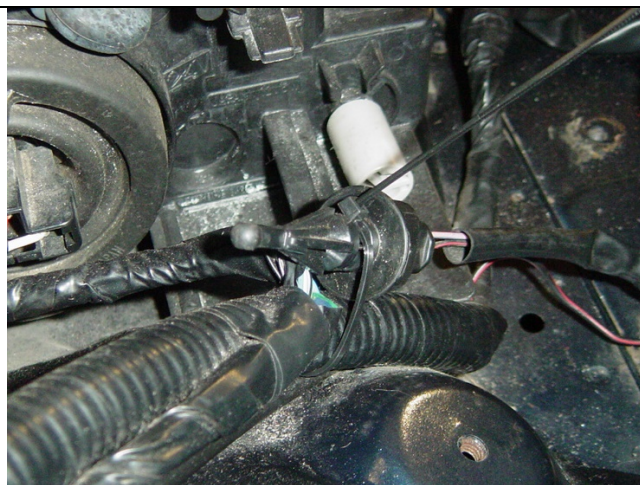


Photo 20-16: Air sensor tie-wrapped to harness



Photo 20-17: Add soapy water to aid installation



Photo 20-18: BOV return hose attached to intake hose

- With clamp #48, position the intake hose as shown in Photo 20-19.
- Place clamp #44 onto the intake hose and then install the aluminum pipe insert as shown in Photo 20-20.
- Tighten the hose clamp down so when you press the 90 degree hose on it will not push the insert inwards as shown in Photo 20-21



Photo 20-19: Supercharger intake hose



Photo 20-20: Metal pipe insert



Photo 20-21: Clamp tightened onto pipe insert



Photo 20-22: 90 degree hose installed



Photo 20-23: MAF installed

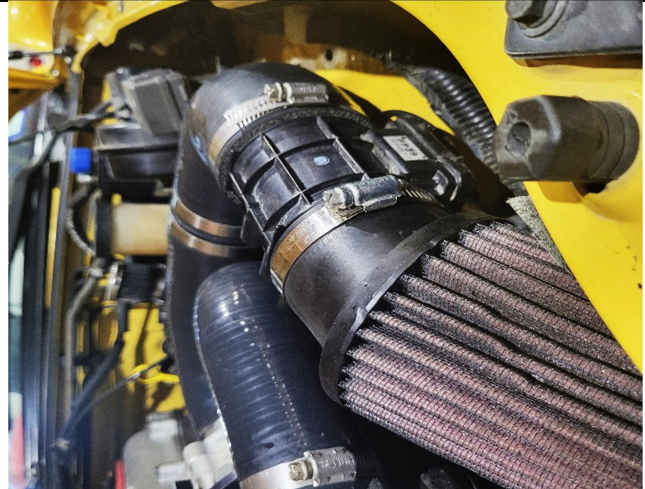


Photo 20-24: Air filter installed

- Place clamp #44 onto the 90 degree hose long side. Press the hose onto the pipe insert as shown in Photo 20-22. Loosely tighten the clamp until you are comfortable with the position.
-
- There is an arrow on the MAF showing airflow direction, however if you will put the terminal connection toward the engine, that will be the proper direction.
- Connect the electrical connection to the MAF as shown in Photo 20-23.
- Install the clamps #44 to the 90 degree hose and then install the MAF unit as shown in Photo 20-23.
- Install the air filter as shown in Photo 20-24 and rotate as required for clearance. The air filter should angle downwards as shown in Photos 20-24 and 20-25.
- Adjust all hoses and clamps on the intake setup and tighten all clamps. Your setup should be arranged as shown in Photo 20-26.
- Photo 20-27 shows the opening around the radiator area that allows cool airflow to enter the intake area.
- For standalone fuel management system that eliminates the MAF unit, we have a custom one-piece intake setup using a 3 in (76 mm) silicone hose and air filter as shown in Photo 20-28.

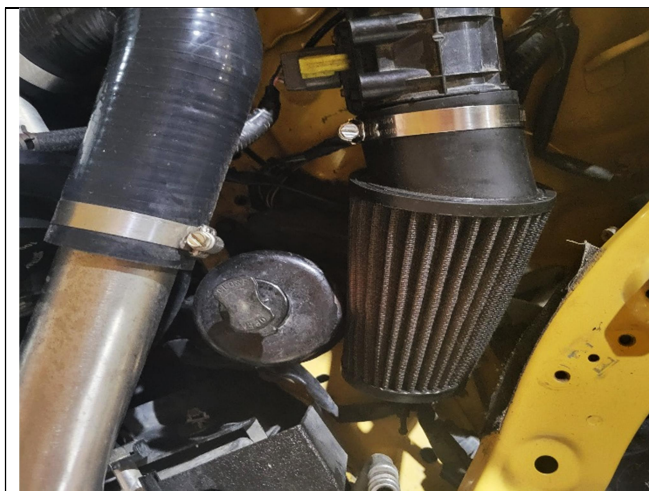


Photo 20-25: MAF in position



Photo 20-26: Complete intake setup with MAF

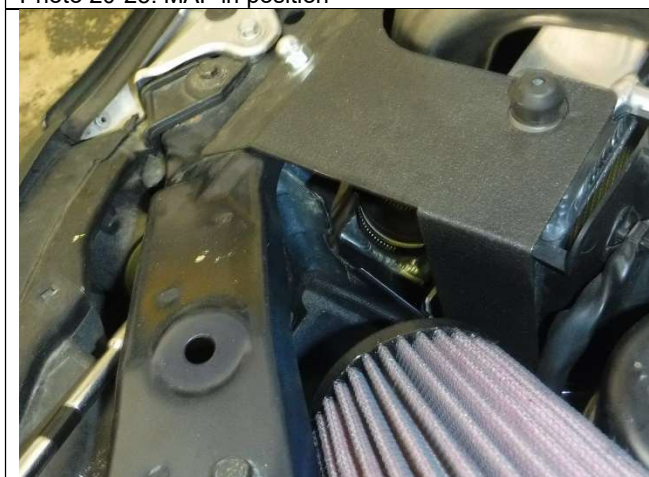


Photo 20-27: Air inlet from radiator opening



Photo 20-28: NON-MAF intake setup

- An optional rubber pad 4" x 8" (101 x 202 mm) with adhesive tape is supplied to keep the MAF from rubbing on the fender as shown in Photo 20-29. Pad is larger than necessary. Cut pad to desired size based on area to protect.
- Clean and prepare surface of the fender, confirm position and press down firmly while conforming to the fender as shown in Photo 20-29.



Photo 20-29: Rubber pad installed



Photo 20-30: MAF over rubber pad

20-5 Installing Supercharger Outlet Hose

Install the Rotrex SS outlet pipe and hose. Use soapy water on the pipe to aid the silicone hose installation.

- Slide the long side of the 135 deg. hose over the pipe with loose clamps #32 as shown in Photo 20-31.
- Install the SS pipe into the intercooler hose and then to the SC outlet as shown in Photo 20-32.



Photo 20-31: Supercharger outlet hose

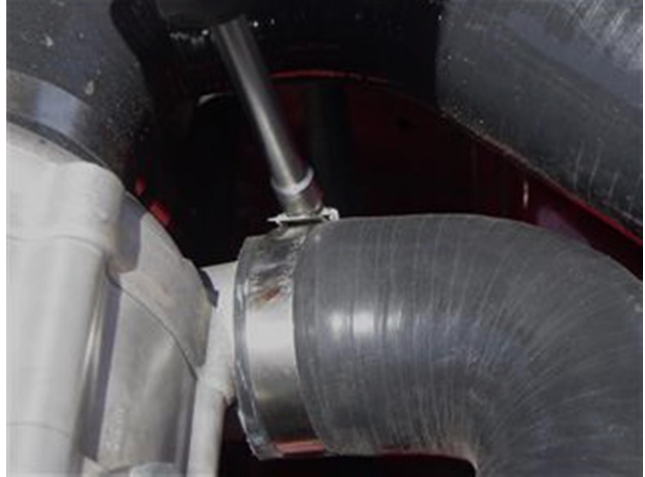


Photo 20-32: Hose attached to outlet

- With all connections loose, temporarily install the radiator cover as shown in Photo 20-33.
- Adjust the pipe for alignment as shown in Photos 20-33 and 20-34.
- Tighten down the silicone hose at the Rotrex outlet first and then at the pipe to hold pipe in position while checking the clearance. Also make sure the radiator under the pipe has clearance.



Photo 20-33: Pipe not centered



Photo 20-34: Pipe centered through radiator cover



Photo 20-35: Lower clamp tightened



Photo 20-36: Radiator cover installed

- Remove the radiator cover and tighten the clamps on the intercooler as shown in Photo 20-35 using an 8 mm nut driver.
- Install the radiator cover with the 2 washers and 2 acorn nuts using a 13 mm wrench as shown in Photo 20-36.

STEP 21: CRUISE CONTROL RELOCATION

The reinstallation should be done after the Catch Can and the Supercharger Intake is installed. The cruise control unit will be placed further back into the fender when reinstalled. We will install using a single bolt on the fender.

- Remove the rubber grommet and metal insert as shown in Photos 21-1 and 21-2.
- Locate the new L-shaped diagnostic mount. Install the M6x20 mm bolt through both the front mounting hole of the cruise control and the diagnostic box mount as shown in Photo 21-2.
- Install the diagnostic box on the mount by pushing down on the back mount as shown in Photo 21-3.
- Reconnect the electrical connection for the cruise control and place behind the unit as shown in Photo 21-4.



Photo 21-1: Grommet and insert to be removed

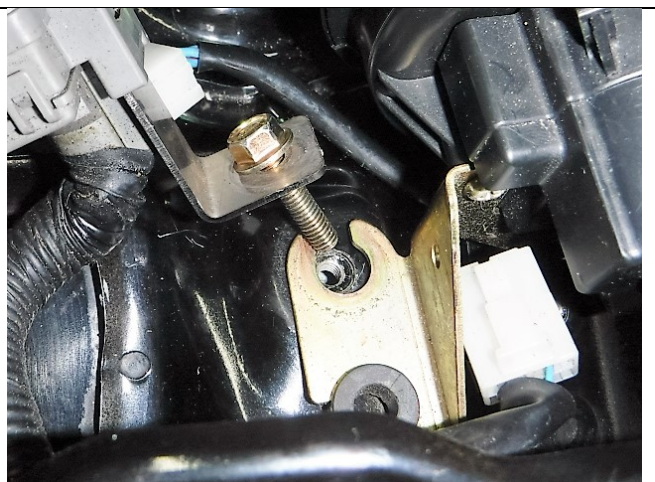


Photo 21-2: Grommet removed



Photo 21-3: New diagnostic mount with cruise control



Photo 21-4: Cruise control reconnected

- The cruise control cable layout is a little tight as it comes around the catch can. Remove the cable connector as shown in Photo 21-5. You can cut off if you prefer.
- Run the cruise control cable around the catch can as shown in Photo 21-6.

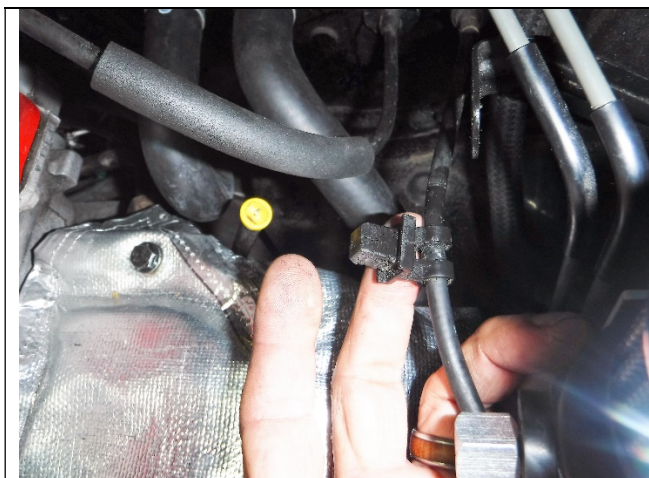


Photo 21-5: Cruise control cable connector removed



Photo 21-6: Cruise control cable positioned

STEP 22: INSTALLING THE ROTREX SUPERCHARGER OIL

The Rotrex SX-150 Supercharger Traction Fluid is a one of kind oil and the only oil that can be used in a Rotrex supercharger. There is not a substitute. A liter cost around \$125, so do not drip or waste any fluid. If you need to drain the system, do so into a clean container so that you can reuse the fluid.

When used within specifications, the Rotrex supercharger does not wear due to the traction design that has no metal to metal contact. The life span of a Rotrex supercharger is thousands of miles or kilometers, assuming operating conditions are within specifications and recommended oil change frequencies are followed.

The recommended oil and filter change interval for the Rotrex supercharger is 50,000 miles (80,000 km) or two years. I would look at your driving habits as consideration to when you change your oil. One or two track day weekends a year; I would change the oil after two seasons. A daily driver with minimal hard driving perhaps longer, maybe around 3 years. Like changing your motor oil, a rougher environment requires oil changes more often. If the pretty blue oil is getting dark, consider changing. Be smart and not frugal.

To ensure proper traction fluid circulation and adequate lubrication, it is important to prime the oil system before the engine is started for the first time after the supercharger installation.

Hardware Package R7



NOTE: Measure the oil with the dip stick threaded in. In normal operation, measure the oil when it is warm. There are hash marks on the dip stick to hold oil and makes it easier to read. Oil expands when heated and if checked cold and oil added, it could overflow as it warms up. From cold it takes about 10-15 minutes to warm up. Normal oil level for the TDR setup is between the MAX and LEVEL marks on the dipstick. We prefer the oil level to be closer to the LEVEL mark as shown in Photo 22-9.

- Remove the dip stick from the reservoir and install the funnel as shown in Photo 22-2.
- Fill the reservoir about 3/4 full of the traction fluid or oil. Use the dipstick or a flashlight so you can see the level.



Photo 22-1: Rotrex oil to be poured into reservoir



Photo 22-2: Reservoir filled about 3/4 to start

- Loosen the banjo bolt a couple of turns at the oil INLET line as shown in Photo 22-3. This will allow air to escape the system.
- The blue bulb as shown in Photo 22-4 is used to pressurize the system by pushing oil into the Inlet of the Rotrex supercharger.
- Insert the blue bulb into the top of the reservoir as shown in Photo 22-5.
- Squeeze pressure on the blue bulb as shown in Photo 24-6. While the blue bulb is collapsed, remove from the reservoir. If you release the pressure while the bulb is in the reservoir, it might suck oil back into the blue bulb. Allow the blue bulb to expand and place back on the reservoir if necessary, to apply pressure again to the system.



Photo 22-3: Hose connector loose for bleeding oil



Photo 22-4: Reservoir pressure fitting with bulb



Photo 22-5: Pressure fitting pressed into reservoir opening



Photo 22-6: Pressure applied with the bulb

- As shown in Photo 22-7, the pressurized system should be pushing oil out of the SC INLET fitting. If you are not seeing oil coming out, continue to apply pressure to the blue bulb.
- As soon as oil seeps out on the Inlet fitting, tighten with a 14 mm wrench as shown in Photo 22-8.
- Check the oil in the reservoir and bring the reservoir oil level up to 3/4 full. Use the dip stick to measure as shown in Photo 22-10.



Photo 22-7: Oil pushed into Rotrex inlet

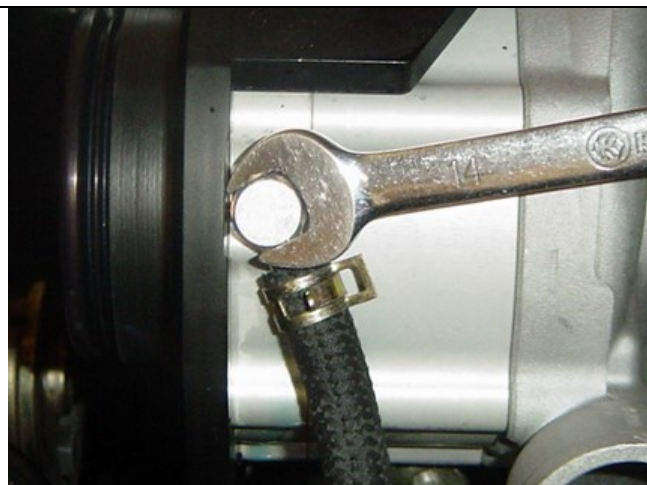


Photo 22-8: Fitting tightened after priming



Photo 22-9: Oil on dip stick maintain at Level Mark



Photo 22-10: Dip stick reading

STEP 23: INSTALLING SPARK PLUGS

Before starting the motor, we need to replace the spark plugs with one step cooler plug and smaller gap. Your stock spark plugs are NGK BKR-6E11 or equivalent manufacture. These plugs are gapped at around .040 - .042" gap. Using forced induction, you are required to reduce the gap at the electrode to prevent blow out of the flame. We have supplied the NGK BKR6E which are pregapped at .030 - .032".



STEP 24: STARTING THE ENGINE AND PRIMING THE SYSTEM

Forced induction runs richer than normally aspirated engines. Consider replacing the spark plugs yearly. For this reason, using Platinum or Iridium plugs does not benefit enough to pay the much higher expense. Be sure to use anti-seize on the plugs before installing and tighten down properly.

- Start the engine and hold around 2000 RPM. With a flashlight, watch the oil level as it should be dropping slowly. As the level drops, bring the car to an idle.
- Place the funnel back in the reservoir and add more oil, but don't fill more than about 1/2 full.
- Continue monitoring the oil level for about 5 minutes or so. We would estimate you will use a little over 3/4 of the liter of friction oil.
- If you overfill the reservoir, use the bulb unit to suck some oil out. If you remove too much you can always add more.
- Check the oil level regularly with a warm engine. Always keep the oil level between MAXIMUM and LEVEL WHILE RUNNING mark, see Photo 22-9. We prefer to keep the oil on the high side of the FULL MARK. Over filling the canister may cause oil to exit the top of the reservoir and too little oil may cause severe damage to the supercharger.
- It is recommended you break-in the Rotrex system a minimum of 65 miles (100 km). During this run-in period, drive the vehicle carefully and avoid unnecessary revving and heavy acceleration. Other wards hop on the freeway and head to the farthest Starbucks, stop and admire your work and head back home. She is ready to be tuned.
- Upon completion, identify any leaks, noise, drive belt alignment, overheating or other faults in the installation. Ensure the engine is running properly with the correct air/fuel ratio AFR and ignition timing. Incorrect installation or use of the supercharger can cause severe damage to the product and/or the engine.

If at any time you have questions during or after the installation, please do not hesitate to contact us by phone or by email at support@trackdogracing.com. As the developer of this kit, you should address your questions and comments to us and not the Forums, you will usually get bad information.

We hope you will be proud of our TDR Rotrex supercharger setup and will be proud to show it off.

Thanks again,

The Track Dog Team