



928 Motorsports Supercharger Installation

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L-Jetronic System





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Toll-Free Tech Hot Line:

877-FOR-928M

877-367-9286

Please do not copy this manual and give copies to your friends. Our ability to bring you this supercharger kit at this price relies on our customers coming to us for our knowledge and experience in supercharging these cars. Much of this information is hard fought and the product of multiple trials and errors. Please do not give any section of this manual to your friends, but rather, encourage them to contact 928 Motorsports, LLC for their own kit. THANK YOU!

Thank you for your purchase. We have included an entire set of silicone vacuum hoses and a 928 Motorsports coffee cup at no charge for you.



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For 16v L-Jetronic Motors

We recommend that you steam clean or power wash your motor before beginning the supercharger installation. It's more fun to work on a clean motor than a greasy one.

NOTE: "Left" and "Right" are used in this manual frequently. Left and Right are always as seen from the driver's seat-as you sit in the car.

Phase 1: Disassembly and Preparation of your Motor

In these pictures we've removed the radiator to get better photographs for you. Removing the radiator to install the supercharger kit is optional, but you might find that it's a good time Anyway to replace your lower radiator hose and or the oil lines that go from the radiator to the oil filter area, if you have them on your 928. Euro models have the external oil lines that go to the radiator from the engine, US models don't.

The first thing we want to do is to make sure your 928 has the correct upper radiator hose on it. See photo 3. If you have the wrong hose, it will not go around the supercharger correctly later. The correct hose can be ordered from us if you need it.





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Radiator Removal:

To remove the radiator, (optional step) start by removing the fan shrouds top and bottom of the fan. (Photo 4) You will find two 10mm bolts hold the upper half of the fan shroud in place on the top, and two 10mm bolts hold the bottom half to the radiator on the bottom. You drain the radiator by loosening (but not removing) the BLUE plastic plug located in the bottom of the radiator on the passenger side. Remove both the upper and lower radiator hoses. It is recommended that you remove the hoses from the engine, rather than at the radiator itself so as to not damage the radiator hose nipples. (See Photo 5).



Disconnect the oil lines to the radiator (if you have them) – always using two wrenches in opposition to loosen the lines so you do not break the radiator nipples! Then you can remove the 6MM hex-headed bolts that secure the rubber hold-down clamps (photo 6) on each side of the radiator, and pull the radiator out thru the top.





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Next, we want to remove all the belts from the motor. I recommend that you label the air conditioning belt, the power steering belt and the alternator belt so that you remember to put them back on the right pulleys when we're reassembling the front of the motor. The alternator belt is the smallest belt and unlikely to get confused, but the A/C compressor belt and the power steering belt are of the same gauge and can get mixed up if you're not careful. Labeling the belts with a yellow marker or a string or anything you want will help you keep them straight. The air pump belt will not be going back onto the motor.

Removing the Fan Assembly:

The next step is to remove the fan assembly by removing the three 13 mm bolts that hold it to the front of the block. (Photo 7).





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The front of your motor should look just like this, at this time. (Photo 9).



Adjusting the Dip Stick Tube:

This is a good time to adjust the dip stick tube a little bit to make insertion and removal later after the supercharger is installed much easier. All you need to do is grab the top of the dip stick tube and gently bend it towards the front of the vehicle by about 1". That will facilitate checking your oil when the supercharger tubing is all in place. Don't go further than about 1" or the Air Conditioning belt may rub on the dip stick tube. Remove the stock dipstick and insert the shortened dipstick supplied with your kit now.

Removal of the Crankshaft Pulleys:

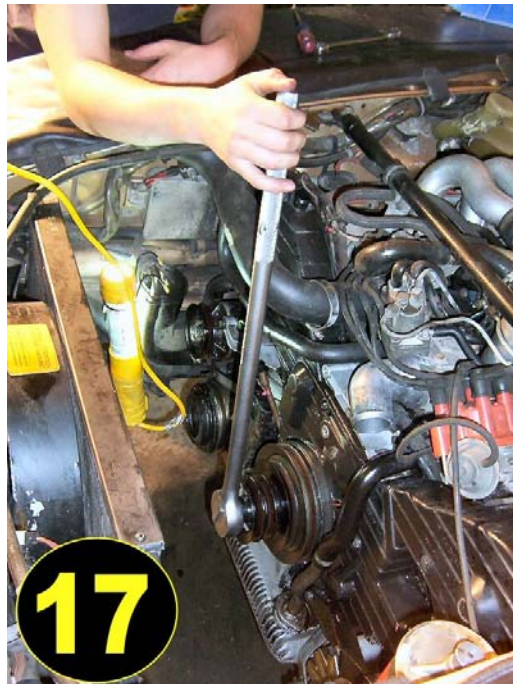
The next step is to remove the crankshaft pulleys. They are held in place by a single 27mm bolt in the center. You will need a 27mm socket and a big breaker bar or as in this picture (Photo17), we're using a 3/4" drive socket set and a 1 1/16" socket which works pretty good. But, read to the end of this section before trying to break torque on that crankshaft bolt.



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You will need to borrow a flywheel lock tool from a Porsche dealer to hold the crank shaft while you break torque on the crankshaft pulley bolt. The tool looks like the picture in photo 18. We also have flywheel lock tools for sale and for rent if you need one. Just call.





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Manual Transmission Cars:

Remove the slave cylinder with a 13mm socket or wrench and just pull it out of the way and over to the side a little. You will have to pull out the clutch release rod temporarily, but you do not have to disconnect any hydraulic lines. Slide in the special tool to engage the ring gear and bolt it in place with the slave cylinder bolts you just removed. (Photo 19).



Automatics:

Remove the cover plate over the access hole on the bell housing and install the fly wheel lock in the same place as the manual trans cars. NOW you will be able to break torque on that crankshaft bolt, and remove the two pulleys – the power steering/alternator assembly and the Air Conditioner pulley. (Photo 20). **Pay attention to the direction the special washer faces under that big bolt as you need to put it back facing the same way again later.** The Air Conditioner pulley will be going back on the car later.



At this point, your motor should look like this: (Photo 21).



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Removal of Air Filter Box:

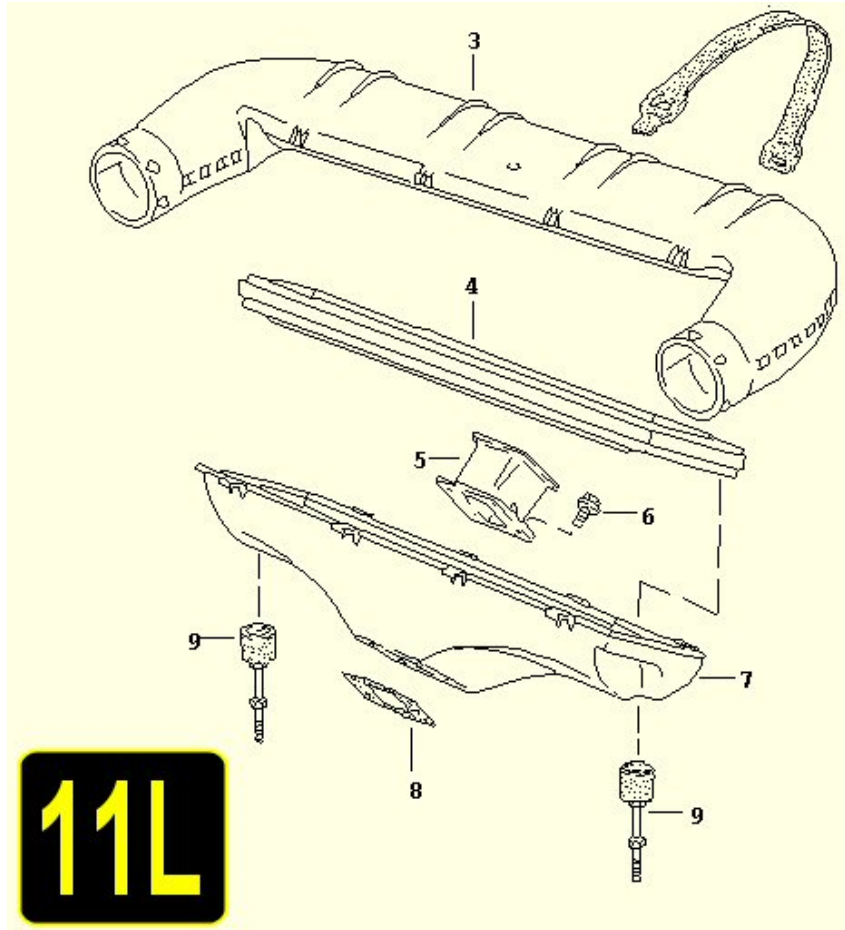
Now it is time to remove the air box cover and air filter and set it aside. Inside the air box cover you'll find two 13mm bolts in each corner of the air box. These have to be removed.

(#9 in picture 11L).

Then remove the four smaller bolts that hold on the intake funnel. Keep track of these 4 bolts - we use them again later.

(#6 in picture 11L).

There may also be hoses about one inch in diameter for the air breather assembly stuffed in both ends of the lower air box; those will have to be removed.



With the airbox completely removed, it will look like **picture 12L**.





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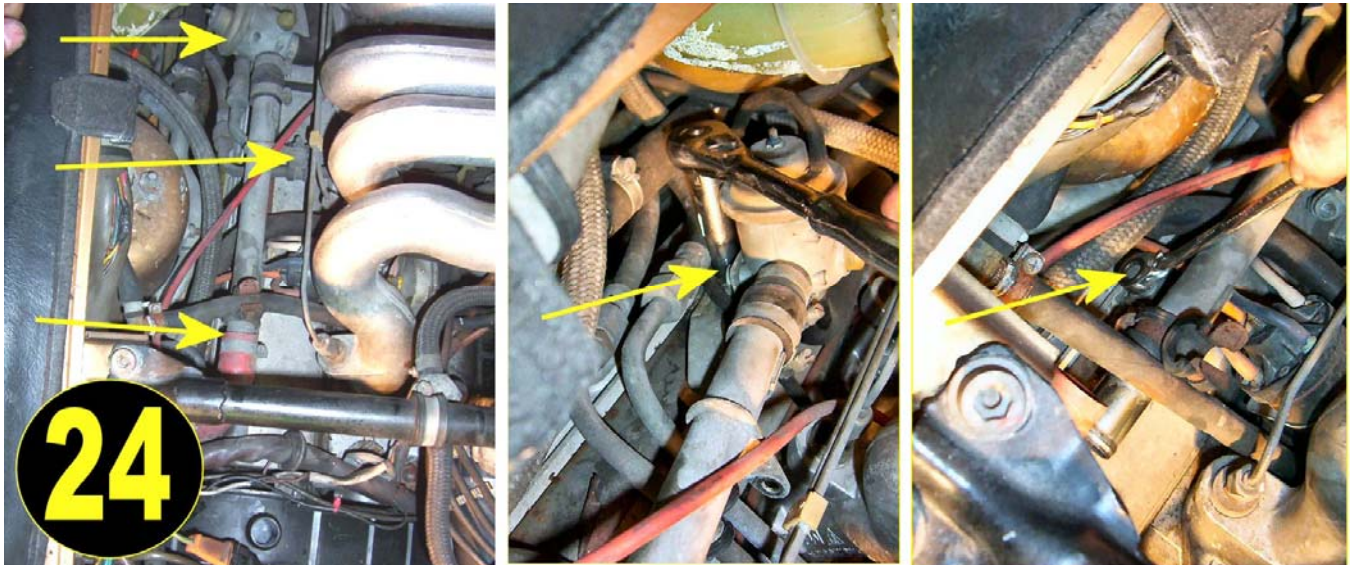
Removal of EGR Air Lines:

Now that the air filter box is out of our way, we can remove the air pump and air rail assemblies. These systems represent the very first attempts at reducing PPM (parts per million) of noxious gases in order to comply with EPA emissions laws here in the States. They simply took fresh outside air and pumped it into the exhaust system to dilute the percentage of bad gases found in the exhaust! On most of the 928s I have seen, the air hoses in this system are cracked and open and the system has stopped working years ago. They were only intended to help get the car thru emissions checks during its original warranty period anyway.

NOTE: You can either remove the air rail completely (recommended if you will not be having a visual emissions equipment inspection in the future) or, you can leave the air rail where it is and just plug it (good for emissions inspection states).

EGR OPTION 1 - Removing the air rail:

The air rail is held in place by three 10mm bolts. (Photo 24). One goes horizontally through a bracket that holds the two fuel lines and is right on top in the center of the passenger side valve cover. The other two bolts are located below the air pump rail as these pictures show. A 10mm deep socket will just sneak under that air rail and remove them.





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Removing the smog pump rail will leave two openings that need to be plugged. One at the back of the head, 3/4 inch in diameter, which you will plug with the cap provided. (Photo 26).



EGR OPTION 2: Leaving the air rail and capping it. Install 3/4" caps as shown in Picture 26L Option 1 and 26L Option 2.



The third is the 1/2 inch braided hose as shown in Photo 25. This hose exits the engine compartment on most models into the right front fender. Take off the right front inner fender liner (three 10mm screws hold it on to expose the windshield washer reservoir and the air canister). Pull the hose through the fender as in Photo 25, trim about 8 inches off the end, and stuff it behind the windshield washer reservoir. It will stay nice and dry and very safe back there, it is just a gas tank vent. Put your inner fender liner back on. Also, if you removed the air rail, go back and replace that bolt you removed on the fuel line support bracket a moment ago. (Photo 24).



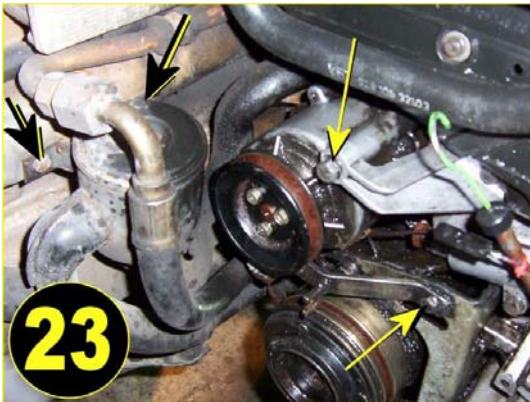


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Removal of EGR Air Pump:

Remove the smog pump itself by taking out the 13mm bolts, (as shown in picture 23) at the front of the air conditioner mount and the timing belt tensioner bracket. The air supply for the air pump system is mounted to the inner frame rail on the passenger side of the vehicle just in front of the smog pump pulley, as shown in this picture. It is held in place by two 10mm bolts, which we will remove and it will bring the air filter canister for the air pump system free in your hand.



Now we have the air pump assembly removed and all the lines have been plugged, the crank shaft pulley is removed and all the belts obviously with it, and the air filter air box has been removed and its mounts. We have completed the disassembly portion of the installation. This is a good time to clean the engine up a bit before we begin the assembly of actually installing the supercharger kit to the motor.





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ALTERNATOR PULLEY CHANGE:

Remove the 6-Rib pulley from your alternator and replace it with the V-Rib pulley supplied in your kit. See pictures 29L and 30L. This can be done with the alternator in the car.





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Phase 2: Installation of the Supercharger

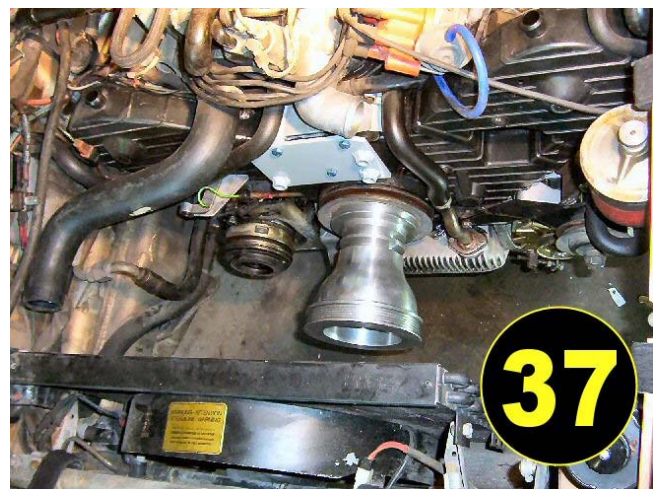
Crankshaft Pulley Installation:

Place the air conditioning pulley back on the crank shaft as shown in picture 35. It remains loose until sandwiched in place, so do not be concerned if it wobbles at this point. Now take the large aluminum 928 Motorsports pulley and press it on the end of the crank shaft.

Take the 27mm bolt and washer we removed in photo 17, replace the bolt with the one provided in your kit (as shown in photo 36) and mount up your crank pulley. Be sure you re-use the original washer that you removed and face it in the same direction as before. Remember to put a little anti-seize or loctite blue (supplied) on the threads of this bolt to get a true torque, and then tighten it to 218 ft/lbs. Note, some crankshafts are threaded deeper than others. If the new bolt we supplied bottoms out in the hole before clamping the pulleys tight, just insert the hardened washer we have supplied beneath it.



Now, remove the locking tool from the flywheel if you installed one, and replace the clutch slave cylinder and push rod.





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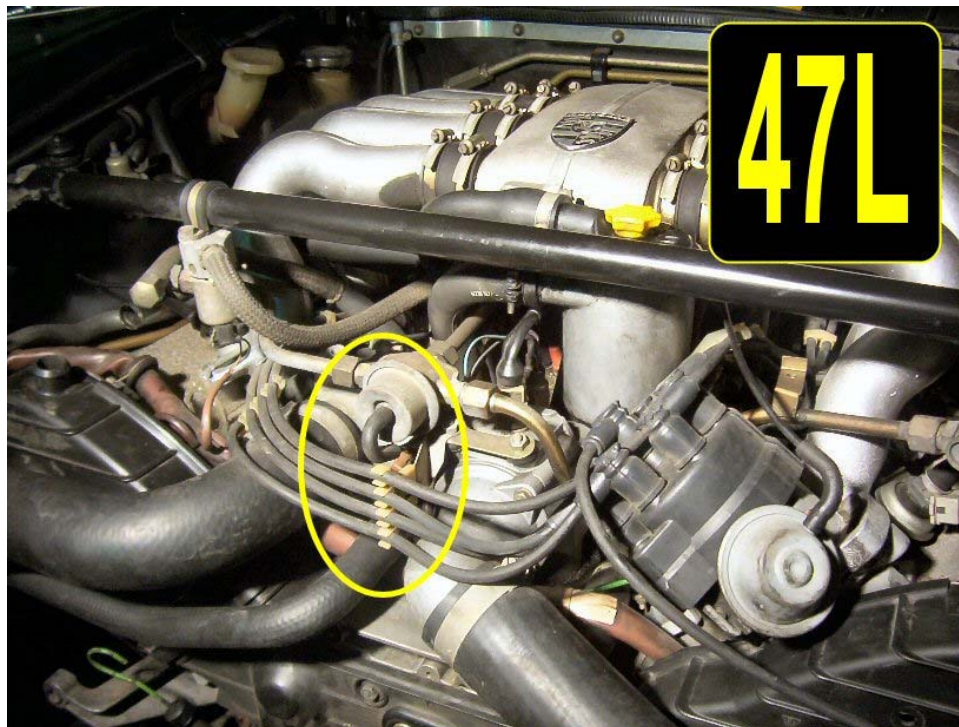
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To make more room for the supercharger air intake, remove the heater hose where it connects as shown in picture 54L, cut about 1" out of it, and put it back on. Be sure to clean the aluminum nipple with emery paper before hooking the hose back up so it doesn't leak.

Making Room For The Air Intake:

To make room for the supercharger air intake we need to relocate the items within the circle as shown in picture 47L.

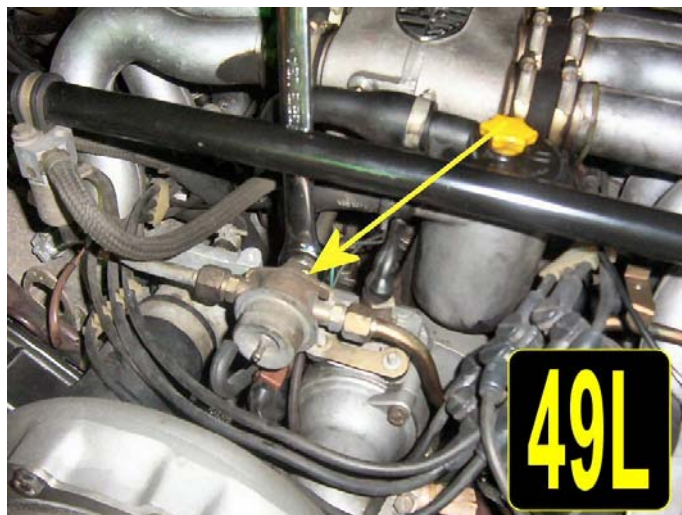
Let's start with the Diaphragm Damper in Picture 48L. Remove the 10mm bolts that hold it in place, follow the fuel lines that connect to it and loosen them. ALWAYS use two wrenches in opposition when you loosen these fuel fittings as shown in pictures 49L, 50L, 51L and 52L. After all the fuel fittings are off, remove the 10mm bolts that hold the assembly down, and remove it from the vehicle. When laid on your workbench, it should look like picture 53L. You will be replacing the old fuel lines with the stainless braided lines we provide in the kit and remounting the damper in a new location out of the way.





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The fuel pressure damper gets re-mounted just to the side and slightly rear-ward of where it used to sit as shown in photo 55L and held in place with just one of the 10mm bolts you removed earlier.



Install the braided fuel lines with the metric fittings as shown in pictures 56L and 57L.





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The third fuel line (picture 58L, arrow) connects to the fuel line at the fender where you disconnected it in picture 51L.



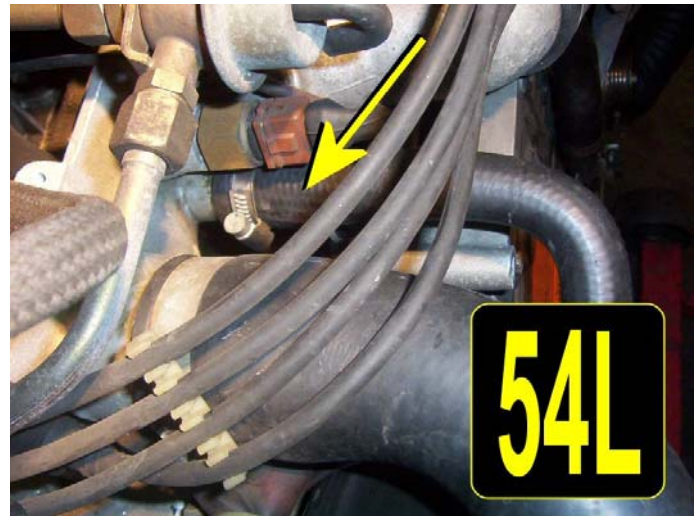


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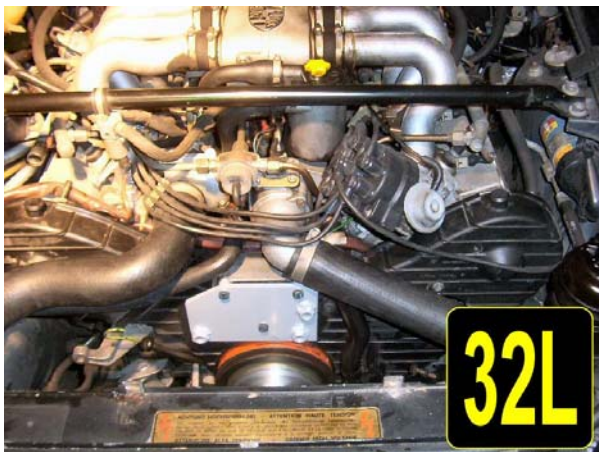
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Mounting Inner Supercharger Mount:

The Second step in the assembly is to mount the steel inner supercharger plate to the front of the engine. Hold the supercharger plate in your hand so that you have it oriented as shown in picture 32. From the kit select the three 40 mm long by 6 mm metric bolts. They are blue in color and can be seen in picture 33.



We recommend that you coat these bolts with loctite red which you will find in your kit, to keep them from backing out. You may want to clean up the threaded holes in your motor with a metric tap if you see signs of corrosion before proceeding. Because of the precise drilling and machining in the 928 Motorsports mount, you will have to turn in each bolt several times and then move to the next bolt, turn it several times, move to the next bolt, turn it several times and so on, until the supercharger mounting plate is flush up against the motor before you can begin to torque them.



Washers are not necessary underneath the bolt heads as we used washered bolts that do not require separate washers. Torque to 25 ft. lbs.

Your motor should look like Photo 32L now.



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Mounting the Outer Supercharger Mount and the Head Unit:

The 7 hex headed bolts that mount the supercharger bracket to the head unit are already torqued by the people at 928 Motorsports and should not be loosened or adjusted. However, the 7/16" headed bolts behind that are only snug so that you can turn the outlet port of the head unit up and down to adjust it's final position later. Photo 38 is the assembled head unit and front mount ready to go on the car. Now find the three 19mm bolts supplied from your kit and the three stainless steel spacers as shown in photo 39.



These are grade 8 aircraft quality bolts, extremely strong. Slide them through the forward mount of the supercharger bracket and slide the spacers on the back of them, as shown in photo 40.

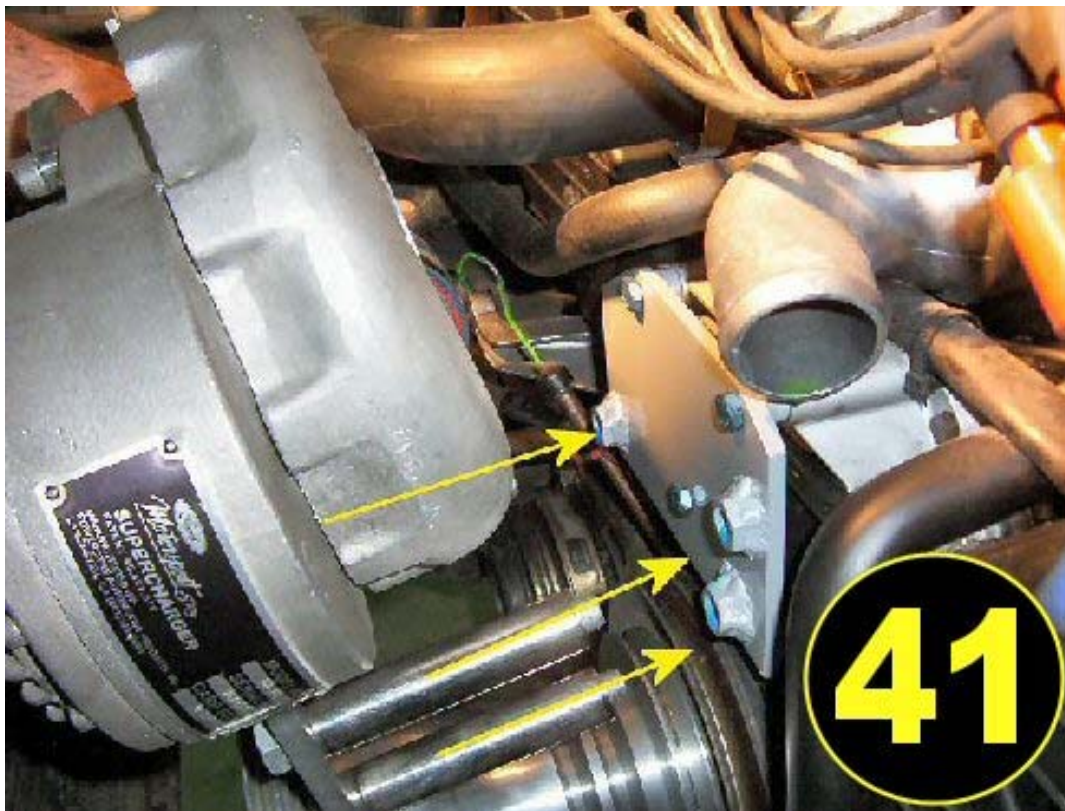




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Get the tube of loctite blue supplied with the kit, and put a drop of the loctite blue in each of the threaded nuts welded to the steel engine mount that we have already attached to our motor. Line up the bolts, through the spacers, and into those welded nuts as shown in photo 41. Torque to 96 ft/lbs.





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Supercharger Top Mount:

Now we are going to install the top mount for the supercharger. This is the strap that prevents it from being pulled down by the force of the supercharger belt. Find the upper supercharger mount that looks like photo 44.



You will remove the engine lift hook located at the front of the right head, as shown in photo 43.



Replace the engine lift hook with the upper mount as in photo 45, with the same bolt and washer. **Do not tighten it down at this time.**





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See photo 58 and 59. The top strap is mounted at the front with two M6 stainless steel allen head bolts with the matching stainless steel nylock nuts. Put the bolts with nuts in place, but do not tighten them yet. Be careful not to scratch the steel top strap as you install it. It has been powder coated with rust resistant paint, but if it gets scratched, it will rust in the scratched area. We use steel for optimum strength. The tool that you will need for the two stainless steel allen head bolts is a 4mm allen wrench. At the back, we are using M8 zinc-plated screws and M8 nylock nuts to mount the strap to the top mount we installed earlier in photo 45. These will be tightened with a 13mm wrench. Now you can go through every fastener on this top strap and put a finish tightening on them, and tighten the large 17mm bolt that goes into the head as in photo 45.



Now that we have mounted the supercharger head unit to the motor, we're going to take a straight edge across the crankshaft pulley and see if it lines up with the front of the supercharger pulley. They have to be perfectly in the same plane. See photograph 42.

The supercharger can be moved in or out if needed by adjusting the stainless steel spacers we installed in step 40.

You may now put the auxiliary belts back on. That would be the alternator belt, power steering belt and the air conditioning belt. The supercharger belt does not get installed yet.



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Installing Blow-Off Valve:

If the radiator is still in the car, remove the upper radiator hose at the radiator end and fold it out of the way.

Rotate the rear casing of the head unit after it is installed on the motor so that the output port is directly sideways. Put on the 3" silicone sleeve provided and the intake elbow with the blowoff valve assembly that looks like photo 56a. You will use two of the 8 t-bolt clamps supplied right here. Set it up so that the installation looks like photos 56 and 57.



After the 3" blow-off valve elbow is properly positioned and pointing straight up in front of the right camshaft tower, you can now tighten the 7/16" hex head bolts that go around the perimeter of the head unit to hold the head unit in that position. (See photo 49).

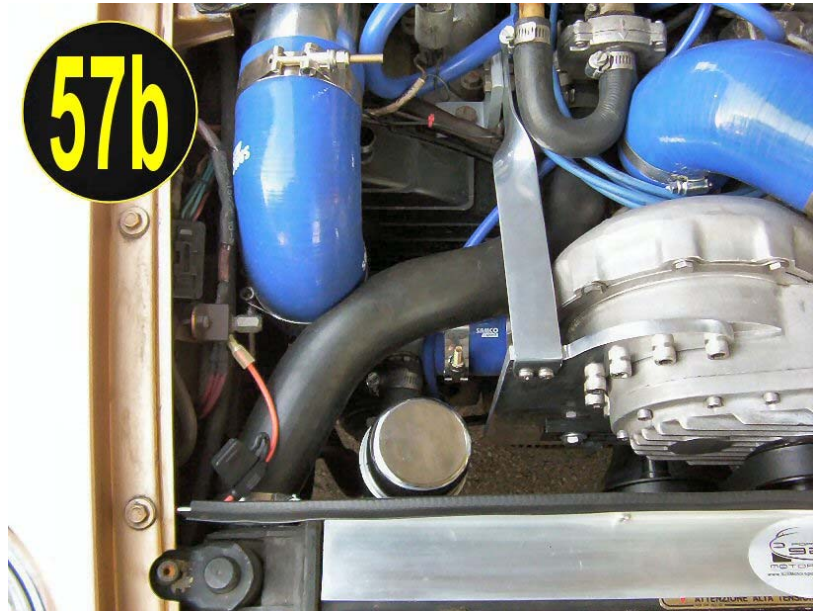




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Trim about 1.5" from the end of your upper radiator hose and put it back on. See picture 57a.
*Note, the route of the finished upper radiator hose in picture 57b.



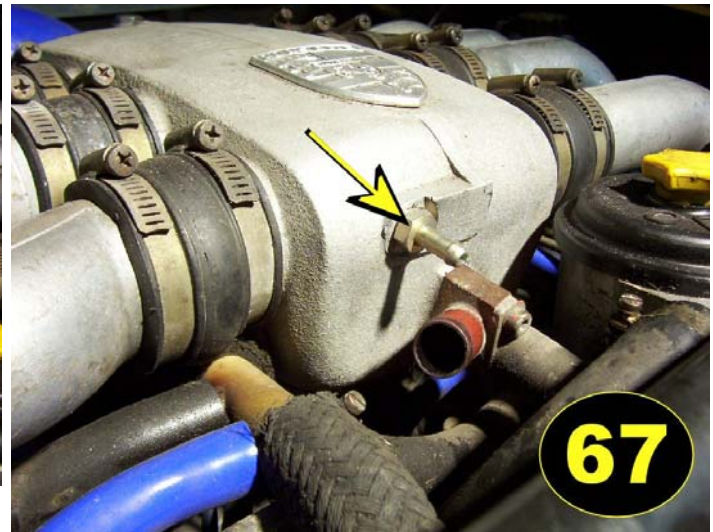
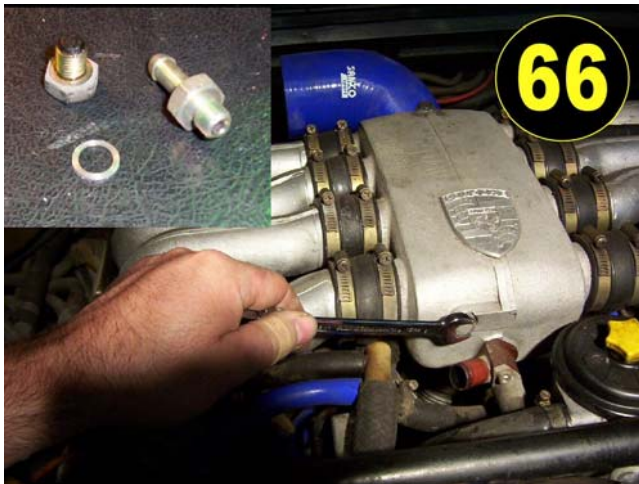


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Running Vacuum to the Blow-Off Valve:

The supercharger system has to have a blow-off valve so that the engine knows what to do with all that extra boost when you step off the accelerator suddenly, like down shifting for a corner. In that set of circumstances the engine gets a high vacuum and it opens our blow-off valve which releases the excess boost to the atmosphere. On manual transmission cars, we will be removing the bolt from the front of the intake plenum and installing our fitting, (see photo 66) in it's place and putting a vacuum line in there. It looks like photo 67 when installed.



If your car is an automatic, you will be installing a T there instead in the vacuum line that comes out of the very same fitting. Take a vacuum hose from the kit of blue silicone vacuum hoses provided and run it from the intake manifold nipple or tee to the connection on the bottom of the blow-off valve. A cable-tie will keep it up near the radiator hose and away from the belts. See photo 67a.

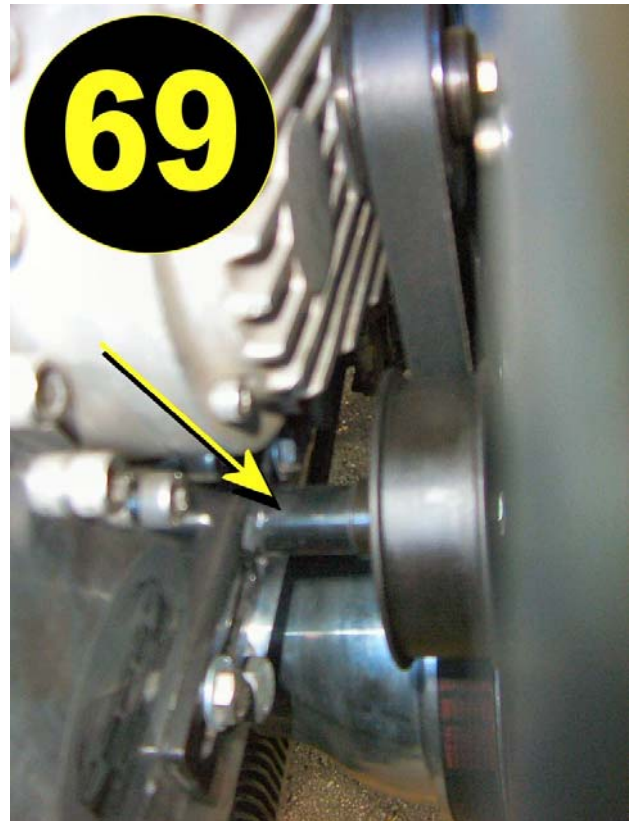


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Installing the Belt Tensioner:

The belt tensioner for the supercharger is mounted with two bolts, washers and nuts provided in the kit. See photo 68. Go through the front of the 928 Motorsports forward supercharger bracket as shown in photo 69 and the nut goes on the back. Put the supercharger 6-rib belt on now.



Tensioning the belt:

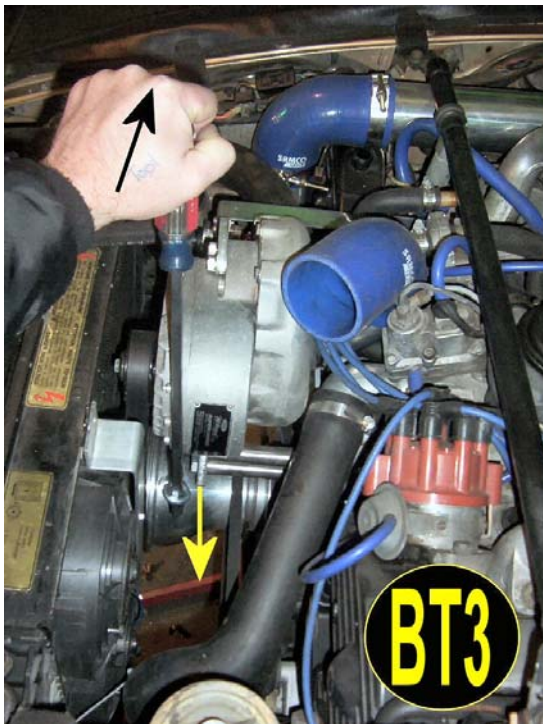
As for tensioning the belt, you want to tension the belt so that there is less than a 1/4" of play on the left hand side, when pressed in the middle of the span, as shown in photo 70.



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To achieve this, take the belt tensioner tool that is supplied in your kit, photo BT1, and drape the hooked end over the belt tensioner as shown in photo BT2. Insert a large screw driver or pry bar in the ring end of the belt tensioner tool and use the side of the supercharger case itself as the fulcrum.



It is recommended that your pry bar be square so that it does not dent or crush the side of the supercharger case. If the pry bar is round, insert a wooden block between the pry bar and the supercharger case at the fulcrum point. Now, as shown in picture BT3 you can simply press or pull the pry bar handle towards the right side of the car and the belt tensioner will be pulled to the left side of the car, tightening the belt. While holding tension on the pry bar, snug up the bolts and then check your belt tension as shown in picture 70. If it is correct it should have about 1/4 to 1/2" of lateral movement in the belt mid-way between the supercharger pulley and the crankshaft pulley as shown in picture 70. If it is correct, put a final tightening on your belt tensioner bolts and you're all set.

Be sure to return here and check the belt tensioning again after about 300 miles as the supercharger belt will have stretched a little bit.



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Installation of the L-Jet Intake Adapter:

It's time to prepare your intake adapter according to which gauges you have.

This kit from 928 Motorsports comes with boost pressure and air fuel ratio gauges. At this time we will install the boost pressure gauge sender into the adapter before we put the adapter on the car. Please study photo 60L.

Screw the boost sender unit into your intake adapter with loctite red on the threads, as shown.





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Test-fit the intake adapter with the senders installed to make sure the senders do not hit anything on either side before you put the final tightening on them.

If the test fit is good, then tighten the adapter down to the L-Jet Mass air sensor. Use the bolts and gasket from picture 11L when you removed the air filter box, and coat it with a light film of silicone gasket sealant. (Photos 61L and 62L).



The boost pressure sender will need to be grounded to work correctly. Take the small ground wire as shown in picture 63L and use it under one of the four mounting bolts to ground the adapter as shown in picture 64L.





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Also, notice the arrow in picture 64L pointed at the black rubber return fuel line coming out of the fuel pressure regulator in that picture.

There are two of these fuel pressure regulators on some cars, and only one on others. In either event, it is important to replace that fuel line with the new hi-pressure hose line that we have provided with your kit.

Now we need to install the L-Jet clamp so that the mass air sensor does not back out of the intake when under boost.

Find the part in your kit that looks like picture 65L.

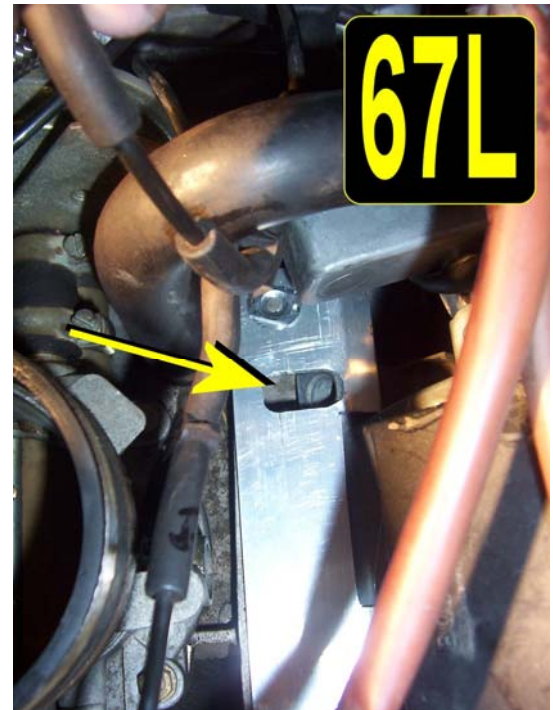




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It installs as shown in pictures 66L and 67L with the two T-Top Nuts provided.



The easiest way to install it is to loosen all the clamps on your intake plenum, slide the rubber hoses out, and remove the center section. As shown in picture 68L. This makes installing the L-Jet clamp easy, and allows easy access to replace all your old vacuum lines while you are at it.

Just replace old, brittle vacuum lines one-at-a-time with new silicone hoses from your kit, and put your intake center section back on.

Note, the location of the air/fuel adjustment screw within the hole in picture 67L. You may want to know where that is later!



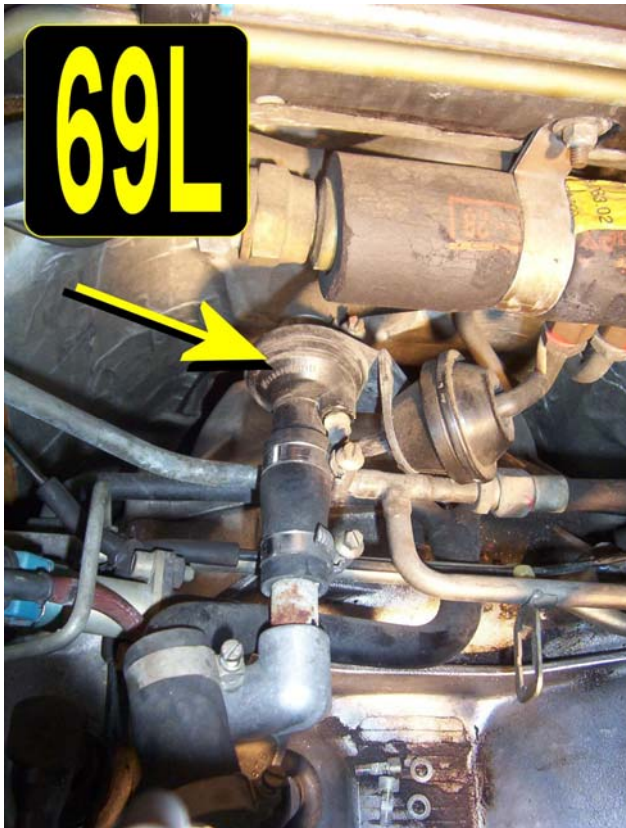
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This is also an excellent time to replace a plastic heater valve if you have one. See picture 69L. We have had customers who, after supercharging, have accelerated so hard that the plastic heater valve split open and they dropped all of their coolant! A replacement steel heater valve is available at 928 Motorsports if you would like to replace it now.

Installing the Fuel Management Unit:

The fuel management unit supplied with your kit is used to increase the fuel pressure to the injectors as the boost developed by the supercharger also increases. This provides a steady enrichment in fuel delivered to every combustion chamber as those chambers are also at the same time getting more air. This prevents damage to your motor and increases the horse power tremendously. The fuel management unit is mounted on the firewall at the back of the left head as shown in picture 70L.





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Take the fuel management unit now and hold it up on the firewall and mark the holes where you are going to drill to mount the mounting bracket. Make sure you locate it low enough to allow the hood to close and within reach of the fuel lines we will be adding as in picture 74L and 75L. The mount bracket is shown in picture 71L. If you have a cover over top of your cowl that covers the cowl in between the firewall and the base of the windshield, you can lift that cover and get your hand on the backside of the firewall, and that you are mounting the FMU low enough so that the hood will still close.

Please make sure that where you drill through the firewall, you are drilling through in such a place that you are not going to hit an air conditioning line or a wire harness on the back side of the firewall. You can use the small bolts provided in the kit. The nuts go on the inside. Mount the bracket to the firewall as in picture 71L and 70L. After the bracket is mounted, go ahead and mount the FMU on the bracket as shown in picture 70L. Then install the 1/4" NPT to 6-AN adapters into the FMU as shown.



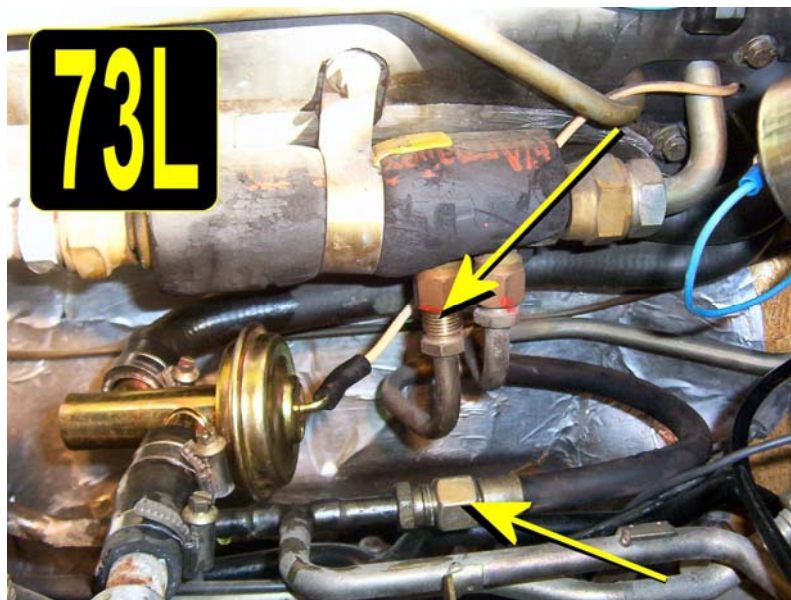


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Next, turn your attention to picture 72L where you will see the black fuel line that we're going to remove and the two steel braided fuel lines that we're going to put in its place. Disconnect the factory fuel line that you will see identified in picture 73L at the two locations shown by the arrows.

Be sure to use two wrenches in opposition on each of the fittings as shown in picture 73L so that you do not damage anything. Just for your information, that horizontal tube at the back of the firewall that has the black insulation foam around it is actually a fuel cooler where Porsche uses the air conditioning system to chill the gasoline, before it returns to the gas tank!





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Now take the new hoses and install them in the locations shown between your FMU and the two openings in the fuel system you just created. Refer to pictures 74L, 75L and 76L.





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Use opposing wrenches to tighten every fitting. DO NOT OVER TIGHTEN. One of the first things we will do when we start the engine for the first time, is watch these fittings and check them for fuel leaks.

Vacuum for the FMU

A barbed nipple is provided on the L-Jet adapter that we installed in step 61 and 62. Run a vacuum line from that barbed nipple to the FMU. Follow the instructions with the FMU for adjustment.



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Installing The Intake Tubing:

Stage 1 System: Looking at photo 75, we are going to install three 90 degree elbows now and 2 straight pipes. Elbow #1 in the photo has a short and a long leg. Install it with the short leg down. Elbow #2 is symmetrical. Elbow #3 goes to the CIS Intake Elbow we installed earlier and has one short and one long leg. The short leg goes to the CIS Intake Elbow. Every



ry joint gets a T-Bolt clamp, tightened with a 7/16" wrench.

Stage 2 System: Instructions for the intake tubing for the stage 2 kit is included in the section on Intercooler



Installation.



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Installation of the Upper Radiator Shroud:

Remove the threaded clips that are located on the top of the radiator as shown in photo 71 using a screw driver as shown. We will be using bolts here and we don't want to use those threaded clips. Find the two stainless steel allen head bolts that are 6mm x 14mm long and insert them through the fan shroud/radiator shroud on top. On the drivers side it also inserts through the upper fan (described on the next page) as shown on photo 72 and snug up, tightening with the #10 nylock screws on the back.



Next, remove the rubber gasket from the top of the old fan shroud, see photo 73 and carefully place it on top of your new aluminum 928 radiator shroud, so that the end products looks like photo 74.

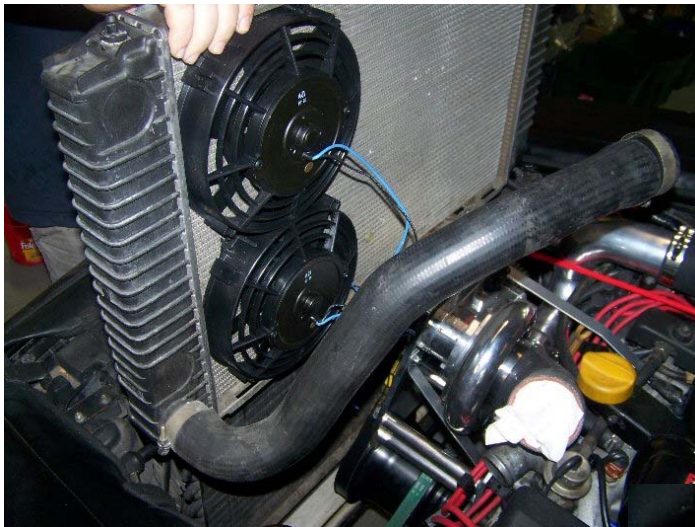




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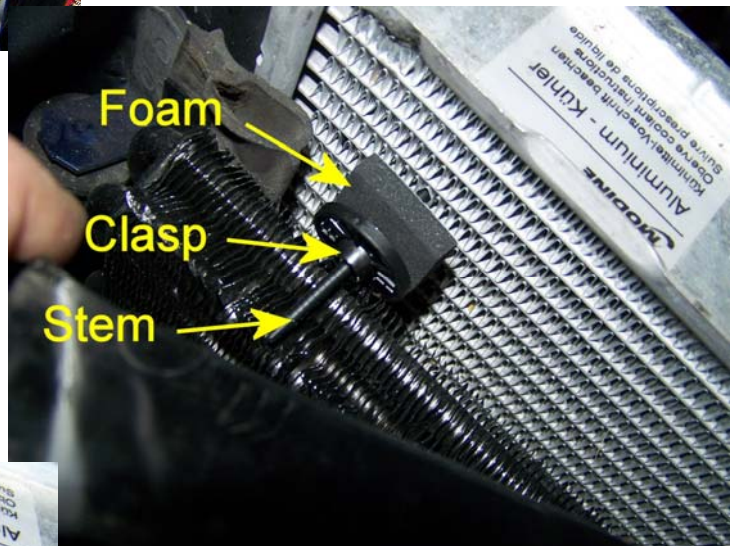
Mounting the fans to the radiator:



Take a look at the two 8" hi-volume electric fans included in your kit. They each have one flat side. They need to be mounted so the flat sides face each other to fit on the radiator correctly. The top fan will have the flat side down, the lower fan will have the flat side up.

Starting with the bottom fan, mount it to the left side of the radiator core with the special fan retainers provided. Insert the retainer stem through the mounting holes in the fan shroud and through the cooling core of the radiator.

On the front, add the foam squares provided and the retaining clip.



Locate all of the retainers before adding the retaining clips. You can tip the radiator top toward the engine to make this process easier.

After they are all pulled tight, trim off the excess stem with a wire cutter.



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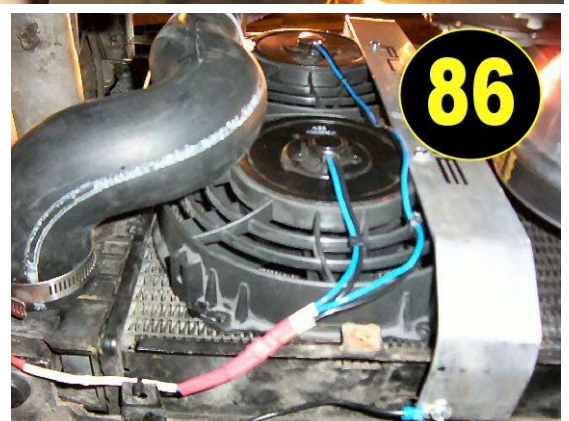
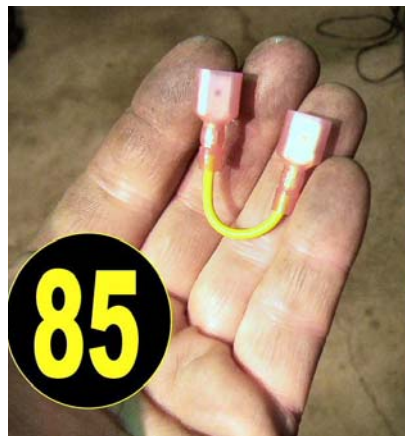
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Wiring the electric fans:

Using the yellow electrical splice and the red wire provided in the kit, you will splice into the red wire that leads to the auxiliary fan near its junction (photo 87) and route that wire underneath the radiator and connect it to the blue wire from the two muffin fans we've just installed. Be sure to route the wires along with the other wires in looms and away from all moving parts, including the mechanism to raise and lower the headlights.

Take the rubber plug off of the temperature sensor that is located in the lower left hand corner of the radiator, (lower right hand corner if you're looking at the radiator from the front of the car) and take the jumper shown in photo 85 and jumper that wire. This will turn on the auxiliary fan, and use it all the time in replacement of the belt driven fan that we've removed. By wiring the fan in this way, we're using the factory fuse and relay system that Porsche engineered to supply the fans with power.

After the wires are routed, you can test this circuit by turning the key on. When you turn the key to the "run" position all three electrical fans should operate. Then loom the wires together with cable tied again to prevent them from working loose or getting into a belt or mechanism and getting pinched. Looking at photo 86 you can see the completed wiring for the fans and how it is loomed up tight against the bottom of the car, being secured and out of harms way.





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Because we removed the fan shroud from your radiator, we've lost a lower radiator hose bracket that helped keep the lower radiator hose away from the power steering pulley. Please look at picture 88 and you'll see that we want you to take a drill and drill through the plastic bracket on the radiator. Use the #28 stainless steel hose clamp provided, and the longest cable tie in your kit. Center the hose clamp about midway in the lower radiator hose and tie from the hose clamp to the radiator, pulling the whole radiator hose gently away from the power steering pulley so that it doesn't get cut. You do not need to pull it away hard, this is just to keep the hose from going in toward the motor.



Now it's time to install the air filter assembly onto your supercharger kit. Take the K&N air filter with the intake elbow hose attached to it, as shown in photo 79L and slip the end over the intake elbow at the back of the supercharger head unit making sure you get it down and least 1/2" over the metal elbow and then clamp it. The air filter lays on top of the lower radiator hose and is surrounded on all sides and is not clamped in place.





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Installing the Crankcase Ventilation System:

It is very important to augment the oil separator within the 16v Porsche 928 for the boosted engine.

The following instructions will help you improve the oil separator and return the oil back to the crankcase and allow you to vacuum out or depressurize the crankcase on your supercharged Porsche 928. First, we need to remove cam tower plug #1 or #2 on the right side of the engine. (Remember the left side of the engine is as you sit in the drivers seat, and we're counting from the front of the motor back).

Your shop will need to be at 50 degrees or warmer for the next step. Locate the cam tower elbow as shown in picture OC6 and the two tubes of J.B. Weld metallic epoxy provided in the kit. You will need to take brake cleaner or carb spray and clean out the hole where you've just removed the cam tower plug.

As in OC6, layout two equal-sized striped of the J.B. Weld metallic epoxy, one of the hardener and one of the liquid metal. Then mix them together to where they become a consistent gray color. Coat the threads of the cam tower barbed nipple as shown in OC6 and screw it into your cam tower.





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Make sure that the barbed hose nipple point straight up like the picture LOC5 below, when you're done. This will have to set 1 hour before we can use the nipple so we will move on to another project and come back to this after the epoxy has hardened. We use the J.B. Weld epoxy specifically because of it's ability to withstand high temperatures and also oil. It is not softened by oil or temperature. While we wait for that to harden, lets move on to the oil separator itself.





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The oil separator is the aluminum canister at the front of the motor with the black cap and the yellow knob on it that says "OEL". Please remove the top of the oil canister, and inside you will find a wire screen that comes out. It will not be going back into the car. Let's locate the three parts you will need here that are shown in picture OC7, 2 aluminum baffles and a large steel washer.

Looking into the end of that oil filler cap where the hose was attached, you will find a very small hole, we want you to take a drill and drill bit and drill that out to approximately twice it's size. It is not necessary, nor recommended to drill out that hold as large as the hose boss itself. An opening that size would be too large. Simply increase the size of the oil breather hole as shown in picture OC8 to about twice its current size. Use the size of the hole in picture OC8 as your guide.



If the baffle on the inside of your OEL cap is so long it covers the holes in our inner baffle, shorten it with a hacksaw to just above our air holes in the center baffle.



Now turn the top of the oil breather cap upside down on a block of wood, as shown in picture OC9 and install the two aluminum baffles provided as shown. You will need to take a rubber mallet and pound them into the cap. They are a very tight fit. They will slide down with persuasion and it's important that they slide down and in all the way to the top of the cap.

The small aluminum sleeve with the three holes drilled in it, goes on the inside of the large aluminum sleeve goes around it to the outside. There is no chance that you can get this wrong, they only fit one way. There is a plastic sleeve cast into the oil cap and these aluminum baffles go within it and just outside it.



They fit very snugly and you will have to pound them down and into place with the rubber mallet. They fit flush at the end when you are done.



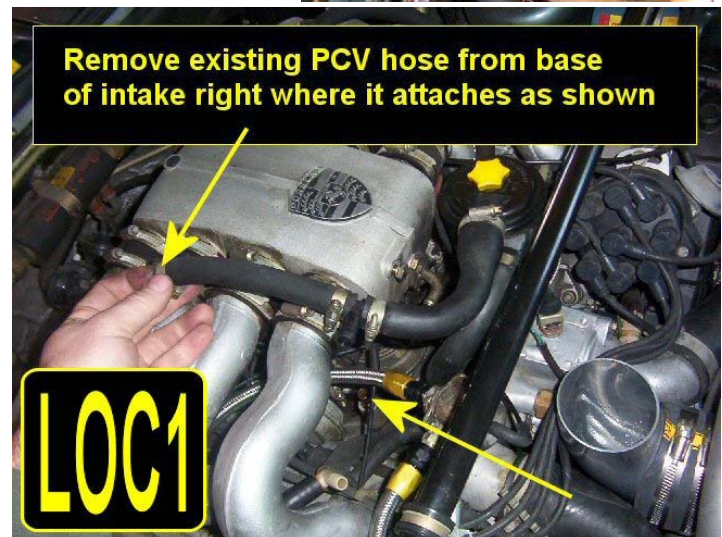
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Picture OC10 shows the completed assembly with both baffles installed, ready to go back in. Before it gets put back into the oil separator assembly, put the washer provided into the base of the oil canister, as shown in picture OC11. After this washer is put into place, you can put the cap on and tighten the cap. The outlet of the oil separator should point directly at the barbed elbow you put in the #2 cam tower access hole.



Now, disconnect the oil hose from the top of the oil separator to the intake manifold as shown in LOC1.

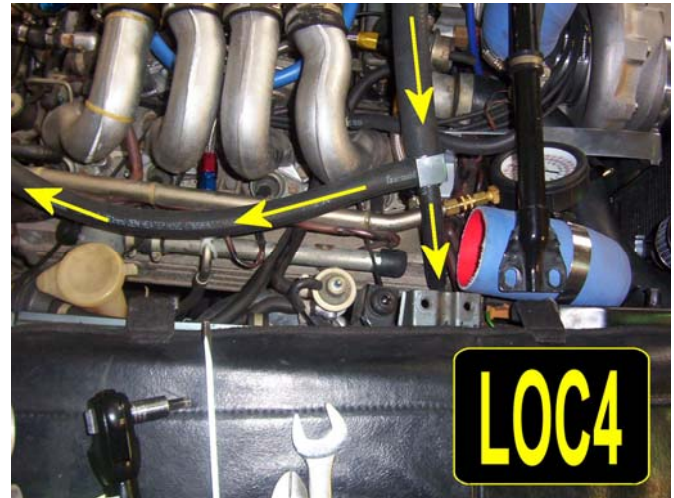
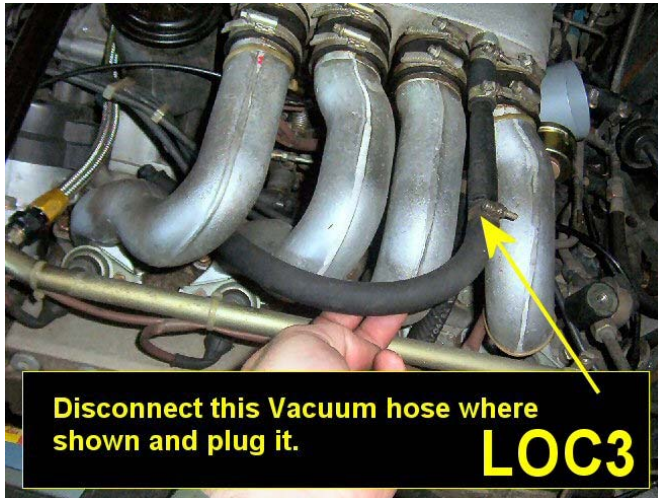


Plug the opening you just created as in LOC2.

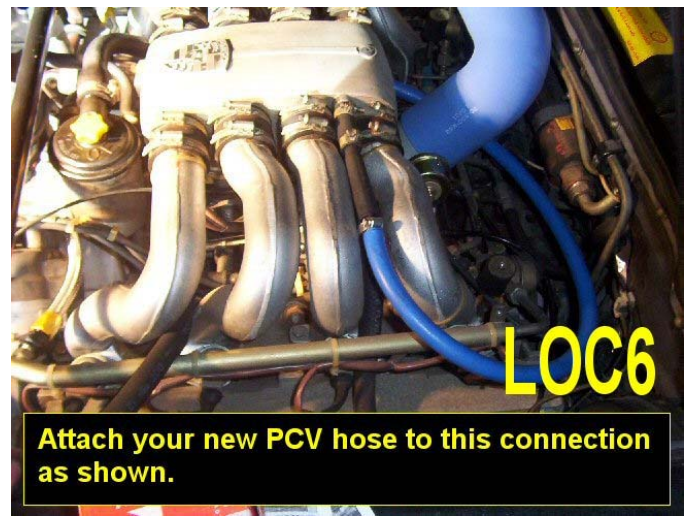
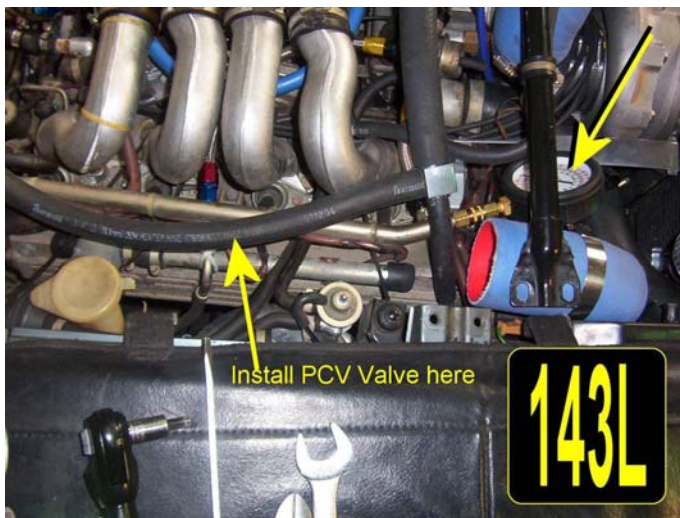


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Move on to Picture LOC3. Install the aluminum tee and hosing as in picture LOC4. Take the 1" hose provided, about 12" long, and put it between the top of the oil separator cap and down to the aluminum oil tee, as provided. The bottom of the oil tee has a 1/2" nipple and a small piece of hose on it that goes directly to the cam tower plug you have already installed. The nipple on the side of the tee holds a 1/2" hose that runs around the motor to the other side and connects as shown picture LOC 6.



Install the PCV valve in this long 1/2" hose. Make sure you install it in the correct direction: so the air can flow *to* the intake manifold, but not *from* the intake manifold. Suck and blow on the PCV valve before installing it to learn which way to put it in.

If you are racing, you would run this hose to a catch can instead of into the intake manifold.⁴⁹

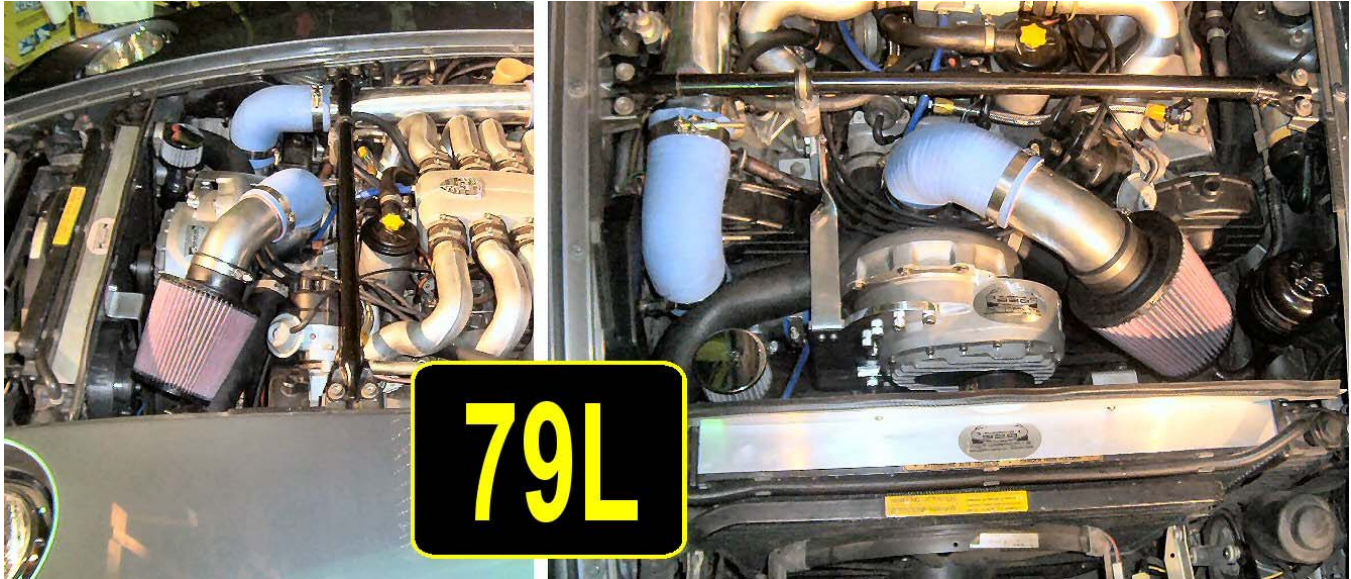


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Air Filter:

The air filter assembly gets installed as in picture 79L.



Air Dam:

Place the air dam above the radiator as shown. This is an important part of the cooling system. Without the air dam, the air can go *around* the radiator, instead of *through* it. Remove the rubber weatherstrip from your old radiator fan shroud and transfer it to the top of this new air dam as shown.





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Installation and Wiring of the Gauges (optional) : **If not installing gauges, jump to page 55.**

Locate these items from your kit:

- 13 feet of 20 gauge, blue wire-boost wiring sender
- 3 feet of 20 gauge, green wire-air fuel gauge between the buffer and the gauge
- 3 feet of 20 gauge, yellow wire-air fuel gauge between the buffer and the gauge
- 4 feet of 20 gauge, black wire-ground for both gauges and buffer
- 9 feet of 20 gauge, red wire-Power supply for both gauges
- 8 feet of 20 gauge, white-From the O2 line to the air/fuel sensor

(Also in your kit there was 12 feet of heavy red wire that should have already been used for the intercooler power supply for the intercooler pump and heat exchanger fan assembly).

Take the 928 Motorsports A-pillar gauge pod unit and snap it in place on the drivers side A-pillar. Review the separate A-pillar Installation Instructions, but do not use any adhesive or glue at this time. You should be able to just press it in place, it will stay there. This is just to give you a reference point of where the gauges are to go.

We recommend that you now go in the right front fender well, by the passenger seat and pull back the carpet and plywood that covers the fuse panel.

We want to pass some wires over the transmission tunnel, between the right front foot well and the left side foot well. There is ample space to pass these wires from the right foot well to the left foot well just behind the heating duct. Take the blue wire, red wire and white wire and tape them to the end of a long screwdriver or straightened out coat-hanger, as shown in picture 134.





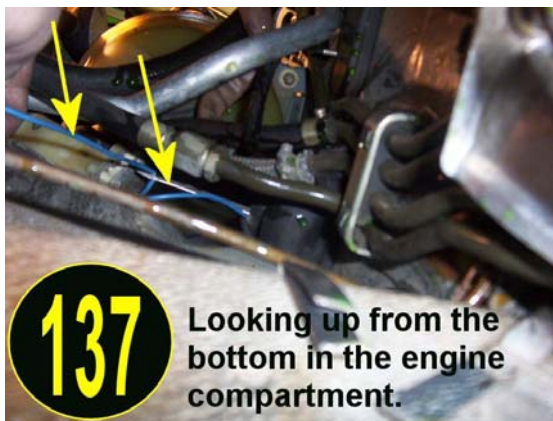
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Now take the screwdriver with the wires attached and from the right side foot well, pass it behind the heater duct, over to the left side and it will come out over top of the accelerator pedal, as shown in picture 135. Remove the tape and pull the wires through with enough cord so that you can reach the gauges. Go over the top of the pedal assembly, stay away from moving parts.

Returning to the right front fender well, we need to pass the other end of the blue wire through the firewall to the engine side. Above the fuse panel you will find a large rubber pass-through where all the wires from the engine compartment pass-through into the fuse panel area as shown in picture 136.

Take your long screw driver and carefully push that through the grommet so that you can pass a new wire through the existing thru-wall. Now remove your screw driver, tape the end of the blue wire to it and put it through the thru-wall grommet to the other side.



Pull enough through so that it reaches the boost pressure sending unit that you previously installed in your CIS intake elbow. You can go ahead at this time and put a ring terminal connector on it and mount it to the boost sender. You want to wire tie the wire up and away to make it look attractive and also kept it from contacting any hot exhaust manifold.





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Back in the right front fender well above the fuse panel, pull any excess out of the engine compartment that you don't need. Route this wire along the top of the transmission tunnel (bell housing tunnel) to the front left foot well and up to the A-pillar and out through the A-pillar gauge pod. See picture 138.

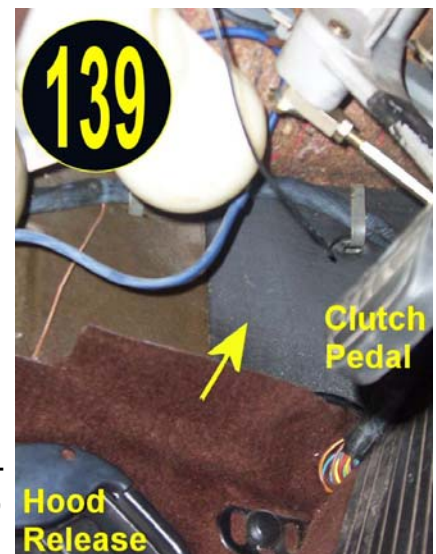
We've learned that one of the easiest ways to route the wires from behind the dash to the gauges is, if you will open the drivers side door, you will find that you can slide a screw driver in behind the dash just below where the A-pillar meets the fender. See picture 141. You can actually push a screw driver from the outside and have it go through to the other side. Now that the screw driver is on the inside, we want you to tape the blue wire, the yellow wire, and the green wire and pull them all up through.



Now the blue, yellow and green wires will be out on the instrument panel side of the car door and you truck them in behind the dash and they run up the A-pillar gauge pod. See picture 141. Decide now whether you want the boost gauge to be the top gauge and the air/fuel gauge below or the other way around (this is your personal preference). You can press the gauges in place, lightly, as shown in picture 138. (We have not yet permanently affixed the A-pillar gauge pod. Until we're done here, we will not permanently affix the A-pillar gauge pod.

You have run the wires generally where they need to go, it is now time to turn you over to the instructions for wiring the gauges that came with each gauge. You will notice that with the air/fuel gauge, there is a buffer unit, (a small black box with three wires leading into it and two wires leading out of it), this is because although your sending unit measures your air/fuel richness, at 6 times a second, we don't want the gauge to move that quickly, or the gauge becomes very hard to read.

The little black box is so that the needle and the gauge sweeps and you get a chance to read it and it doesn't just sit there and vibrate. The best place to mount this little electronic gauge buffer is in the left front foot well, high above the clutch pedal and to the outside. Please look at picture 139.





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Please note in the instructions for the air/fuel meter, that out of the buffer box, they're taking a grey wire over to the O2 sensor and you will connect that to our white wire. We previously ran a white wire over the transmission hump from the right front fender-well to the left front fender-well and that white wire gets connected to the wire coming out of your lambda sensor, as shown in picture 140.

Most of the early 928s will already have an O2 sensor installed in the exhaust pipe and it comes into the car next to the fuse panel at the bottom. Your 928 Motorsports, LLC supercharger kit may need an oxygen sending unit for early cars and also those Euros that may not have an O2 sensor in the exhaust system. For those vehicles, the O2 sensing kit has to be installed in order for the gauge to function. Let's assume in these instructions that you already have a factory O2 sensor installed. (Call us if you need one)



You will find a connector that looks like the one at the bottom of picture 140 that has a very small black silicone wire coming to it. That is the wire from your O2 sensor. Two things: 1) follow that wire loom up to where it plugs in to your LMB computer and unplug it. It remains unplugged from now on. 2) back at the O2 connector, splice in to the small black silicone wire on the side of the connector away from the LMB with a red scotch lock connector (supplied) to our white wire.

Also, in picture 140 you will see a red wire which is going to supply power to the gauges, but only when the ignition key is on. This must be spliced into a power supply in the fuse panel. Take a 12 volt test light and probe the fuse panel, looking for a power supply that comes on only when the ignition key is in the running position. Splice in your red wire using one of the blue scotch locks provided. The other end of the red wire attaches according to the manufacturer's instructions with your gauges. It is not necessary to run a separate red or black wire up the A-pillar to the gauges, but rather you can run one red and one black wire up to the back of the lower gauge, and just daisy-chain them up to the upper gauge also. Do this now, crimping on all your wire ends as you go. Start the car and test the operation of the gauges. The boost gauge may move when you turn on the key, but not again until about 3,000 RPM.

If the gauges are working correctly, finish the A-pillar installation according to the instructions included.



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Note:

The next section describes the intercooler installation for Stage 2 Kits.

If you are installing a Stage 1 Kit be sure to continue past that section, there is more for you to read at the back.



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Phase 3: Installation of the Optional Intercooler System: (Stage 2 Kit Only)

Before we start installing parts for your intercooler system, let's get comfortable with the location of everything. Please take a look at pictures 90, 91 and 92. The intercooler goes on top and behind the right head. Air comes out of the intercooler and goes into the intake elbow we've already installed.



The pump for the water system for the intercooler will be installed behind the right front head light.

The heat exchanger for the intercooler system is mounted behind the left front head light.

The direction of the coolant flow in this system is optimal and has been designed to use as few running feet of hoses as possible. Hot air will enter the intercooler and cold air will exit the intercooler. The hot air will give off it's heat into the water with-in the intercooler.

The hot water leaves the intercooler through the top front port to travel into the right front inner fender well and into the top of the windshield washer reservoir. The water moves down through the windshield washer reservoir, comes out the bottom and goes over to the pump intake behind the RF headlight. The water then comes out under pressure out of the pump, goes around the front of the car and into the heat exchanger behind the LF head light. It comes out of the heat exchanger, through the engine compartment and into the bottom of the intercooler, thus completing the entire cycle.



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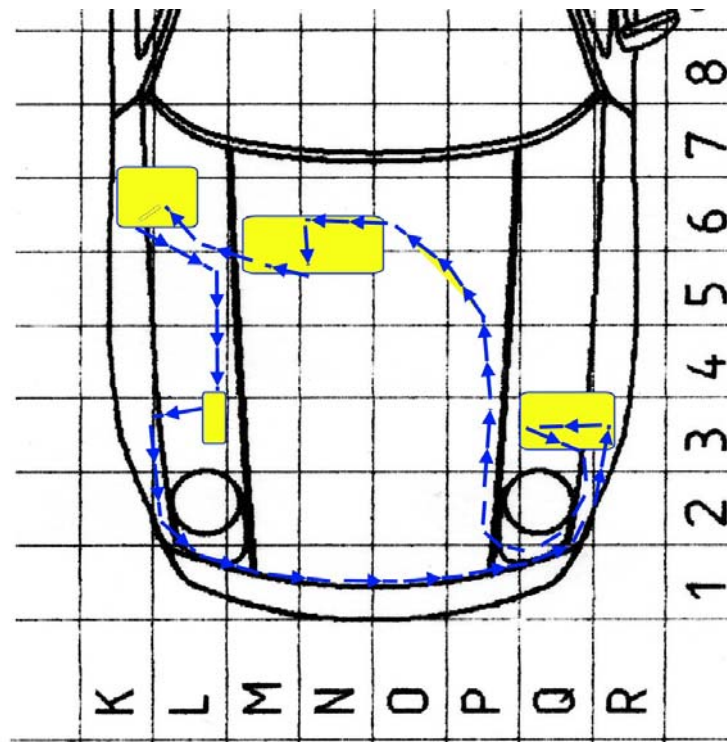
Phase 3: Installation of the Optional Intercooler System (Stage 2 Kit Only)

In this procedure we're going to install and mount all the hardware first and run all the hoses last. This is deliberate and makes for a simpler installation.

Let's start by installing the intercooler itself. The intercooler is going to sit at the back of the motor on the right bank. We don't want the intercoolers aluminum and the steel fuel lines to rub on each other causing a failure in either one, neither do we want a rattle in the engine compartment. We have provided you with a black semi-rectangular insulative skid pad that we want you to put over top of the fuel lines. It just rests there so that the intercooler can sit on top. This is high-density poly-ethylene and it will provide a nice skid pad so that neither the fuel lines or the intercooler come into contact with each other. You can test fit the intercooler now by setting it in it's spot on top of the black skid pad. Do not attach any hoses to it, just yet.

It is time to jack the car up and put it on sturdy jack stands. Remove both front tires and remove the forward and rear inner fender liner from the right front and the forward inner fender liner from the left front.

Intercooler System Schematic





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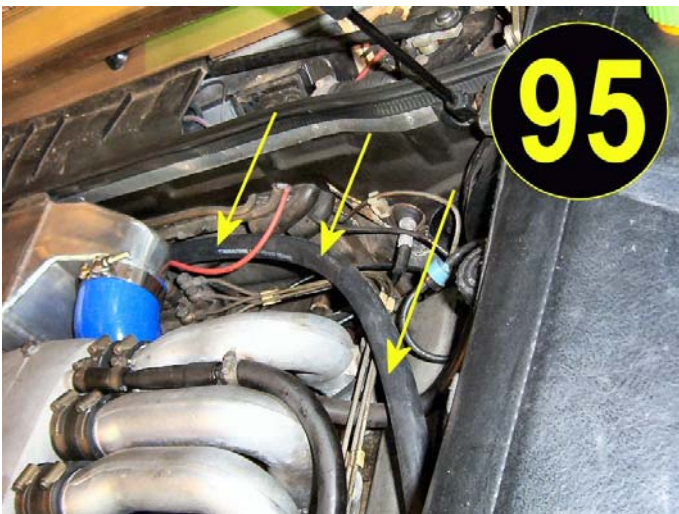
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The next step is to open a path for the intercooler hose that we're about to lay in. Go to the front of the 928 and look between the louvers in front of the car. See picture 95a. In the upper right hand corner as you look through the louvers you can see a piece of black sheet metal trim just to the side of the radiator that is put there to prevent the air from going around the radiator. It is below the bumper mount. All we have to do is bend that out of the way. This makes a very nice run for one of our intercooler water lines. The "tool" I use to bend that in is actually a broom handle. It fold the metal back the perfect amount for a 3/4" heater hose to pass through.

This small metal plate gets bent back.



Put the broom down and pick up the 9' foot long section of 3/4" heater hose provided and run it through that port, to the side of the power steering pump, among the top of the left head, over the fuel distributor and into the intercooler. See photo 95. It is important that you connect the lower intercooler water line (heater hose) to the back of the intercooler before you put the intercooler in place. See photo 96. Once the intercooler is in place, you won't easily get at that elbow to attach a hose anymore. Go ahead and clamp this with a #12 hose clamp.





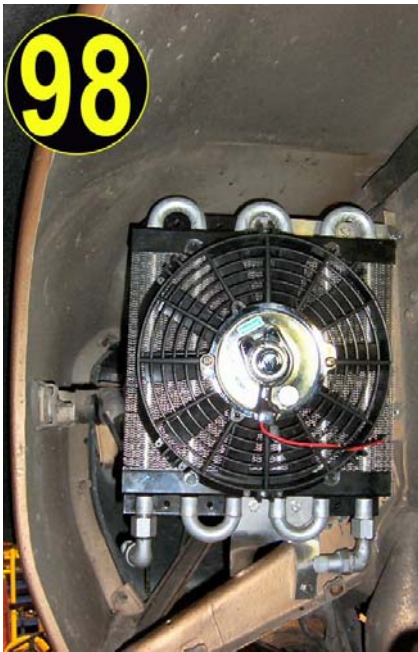
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Phase 3: Installation of the Optional Intercooler System (Stage 2 Kit Only)

MOUNTING THE HEAT EXCHANGER:

Now we're going to mount the heat exchanger in the left front fender well. As requested before, your car should be on jack stands and the front tires have been removed. The left front inner fender liner has been removed. Your fender well will look like picture 97.



Your heat exchanger and fan assembly came shipped from 928 Motorsports, LLC. with the bottom mounting bracket and upper mounting bracket already attached. The U shaped mounting bracket and the inlet and outlet for the heat exchanger are at the bottom. Place the heat exchanger assembly on top of your fender strut so that the U shaped bracket straddles it with a leg on each side. As shown in picture 98.

Since 2012, we have been using new, larger heat exchangers, so no electric fan is needed.



Remove the screw shown. Place the upper mount under it and replace the screw.



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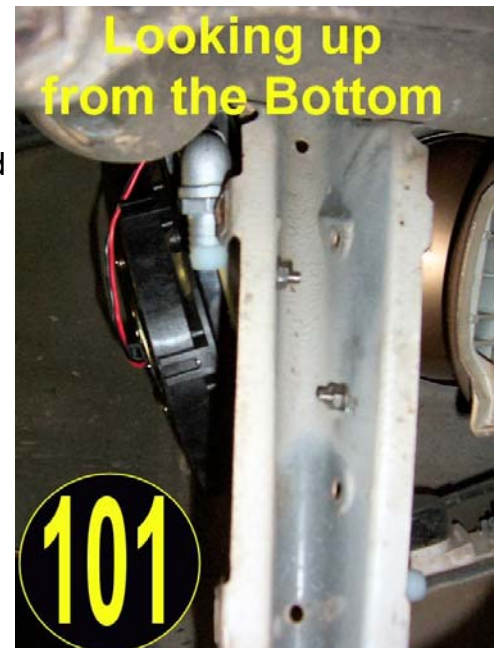
Phase 3: Installation of the Optional Intercooler System (Stage 2 Kit Only)

At the bottom, you're going to use the 10 MM bolts supplied and drill two holes through your lower fender brace and the nuts go underneath as shown in pictures 100 and 101. After you have mounted the heat exchanger and electric fan unit in the left front fender with the parts supplied, tighten with two 10 MM bolts and nuts into the lower fender support. *Note, the heat exchanger sits in the inner fender well at an angle, not square. The outer part of the heat exchanger is farther forward than the part of the heat exchanger that is near the fender well. That is the correct positioning of the heat exchanger.



Now that we've got the heat exchanger assembly mounted in the left front fender, I want you to check for proper tire clearance by putting your left front tire back on with just two lug nuts and have an assistant turn the steering wheel all the way to the right and all the way to the left. Keep in mind that if your car is up on jack stands, your suspension is un-sprung right now, but you will be able to tell that even when there is load on the car and the tire comes up into the fender well, you will be able to tell that you do have proper clearance between the electric fan and the tire.

Now we're going to go to the right front fender well behind the right front head lamp. It should look like picture 103.



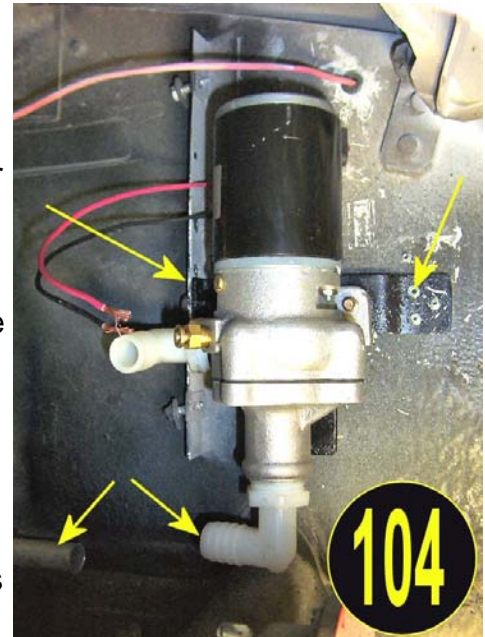


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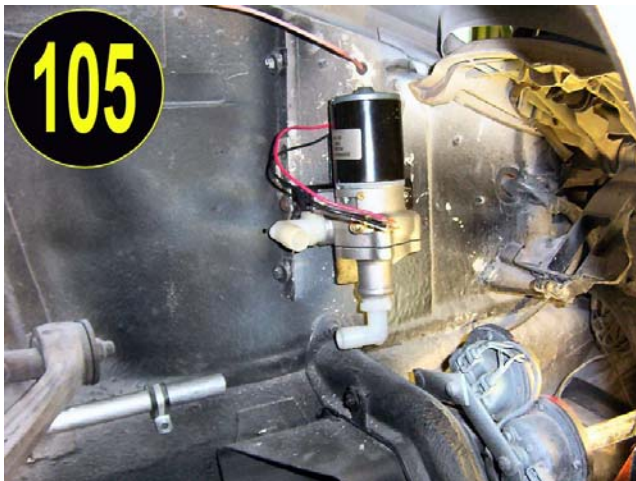
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Phase 3: Installation of the Optional Intercooler System (Stage 2 Kit Only)

Your water pump will mount vertically just behind the head lamp, as shown in picture 104 and 105. Notice that the height of the inlet elbow at the bottom of the water pump is very near the height of the water line that will be coming to it, also shown in picture 104. Position the pump on the inner fender wall as shown in picture 104 and you will need to cut a notch in the nose shaped bracket that is mounted to the inner fender of your Porsche that was holding the inner fender liner just moments ago. The notch will allow the hose nipple as shown in 104 to provide clearance for that hose nipple. Before permanently affixing the pump to the inner fender well, take your hand to the bottom of your head lamp and lift it up into the fully raised position and down making sure there is adequate clearance and that the head lamp doesn't hit the pump in that location, then you have it. Then mount the water pump to the inner fender well with the rivets provided.



***Special note!** When drilling the holes in the inner fender well for the rivets, be very careful to go no further than you need to through the metal. Directly on the other side of this location is the ignition module for the 928. It stands off the inner fender in the engine compartment about 1/4". It is on the other side of this inner fender well so be careful when you push the drill through for this water pump installation that you don't penetrate the engine bay too far. This is also the reason we're using steel rivets to affix the water pump to the inner fender well.



We don't use bolts and nuts because the other side of the fender well is not available to us, and we can't use sheet metal screws because they penetrate too far and also sheet metal screws vibrate loose over time. So these steel rivets are a good way to go. You will use two or three rivets on the right hand side of the water pump when you mount it to the fender well and you will use one or two rivets on the 90 degree L-shaped angle on the left side as shown.

The finished water pump installation can be seen in picture 105.



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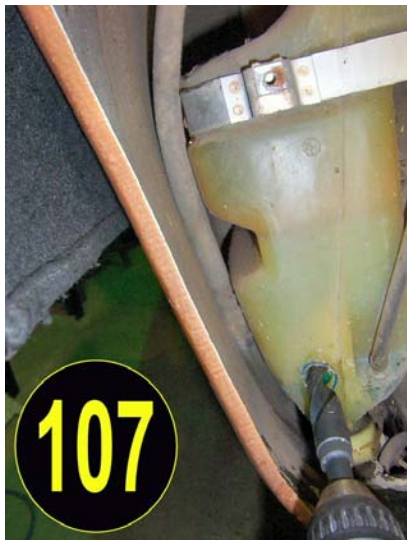
Phase 3: Installation of the Optional Intercooler System (Stage 2 Kit Only)

The next step is the modification of the windshield washer reservoir. We use the windshield washer reservoir to be the heat sink for up to 3 gallons of water so that the heat exchanger and this kit can never get what they call “thermally soaked”. That is to say, it has absorbed the maximum amount of heat or thermal energy it can.

The windshield washer reservoir will continue to perform it’s role as the reservoir for the windshield washer fluid and the windshield washers will still function when we are done. The coolant we use for the supercharger kit intercooler system is common windshield washer fluid. That also helps provide the antifreeze capabilities that we want to insure that the heat exchanger never freezes.

The process we’ve selected for you to modify your windshield washer reservoir has two distinct advantages. 1) We don’t need to have you remove the windshield washer reservoir from the car. 2) The windshield washer reservoir low fluid indicator light switch, which is a float switch located in the bottom of the plastic reservoir, is going to remain in place and continue to operate correctly with this procedure. However, we are going to drill a hole in the windshield washer reservoir for our hose nipple. If you would prefer an alternate method of installing a hose nipple in the windshield washer reservoir, please call 928 Motorsports, LLC and we will tell you how to remove the windshield washer reservoir and remove the float switch from the windshield washer reservoir and put the hose nipple there.

Toward the bottom of the windshield washer reservoir there is a flat spot facing directly forward about 2” up from the absolute bottom, and this is where we want you to drill our hole. Please see picture 106. If your reservoir has fluid in it, that’s OK. Simply place a bucket under the reservoir. Your first hold should be about 1/4” in dia.



After we drilled a small pilot hole, take the drill bit that is sized for the tap you will use, and drill out the remainder of the hole as shown in picture 107. The fluid in the windshield washer reservoir will drain down to the hole I just drilled, of course.

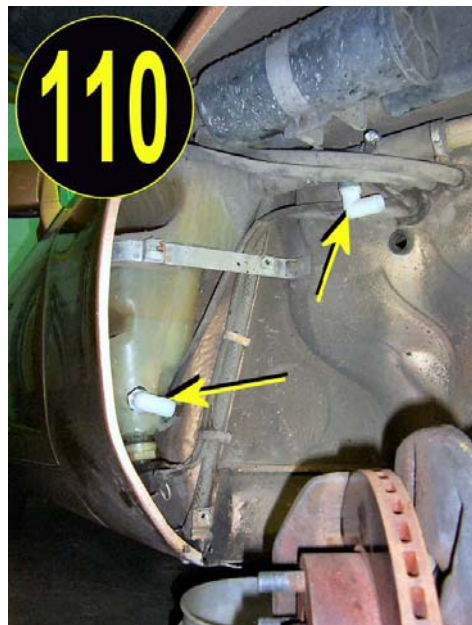
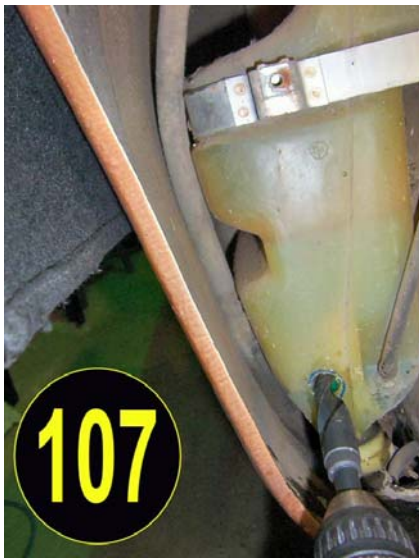


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See picture 108. Tap the hole you just drilled to match the 90 degree fitting provided. Place paper towels in the hold and clean it up, making sure the hole is dry and the fluid level is a little below your tapped hole. The reason for this is because we are going to put in a nipple with epoxy adhesive, and the epoxy won't usually seal under water, so you must lower the water level in the windshield washer reservoir below this hole so that the sealant can cure.

Now coat the threads of the barbed 90 degree nipple provided with the kit with J.B. Weld epoxy provided. See picture 109. Spin in the 90 degree nipple and let it come to rest in the direction of the inner fender as shown in picture 110 so that it can cure in that position.





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The last piece of the windshield washer modification is to drill a 1-1/8" hole in the fender well so that we can run a hose from the engine compartment.

***Note,** the location of the hole where I have marked it in picture 113. If you have removed the exhaust gas circulation system then you can also use one of the holes previously used for the EGR system. In this case, we decided to leave the charcoal canister in front of the right front fender well intact and in place to make emissions testing easier later on. Otherwise, we could have enlarged the hole that routed hoses from the engine compartment to the charcoal canister.



We cut a 1-1/8" hole as shown in picture 113 and then rounded it with the grommet provided so that the sharp edges would not cut our new water hose. See pictures 114 and 115. We cut a 1-1/8" hole because by the time we put a grommet around it to prevent chafing, a 3/4"



water line is going to run perfectly through that grommeted area.



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Now locate the one inch rubber hose that leads from the filler neck for the windshield washer reservoir to the top of the windshield washer reservoir. You will cut out a 2" section, as you can see in picture 111 and 112 and insert a T supplied within your kit. Add the two clamps and put it in place. This is going to be the beginning of the return line for the intercooler. Warm water will be entering from the intercooler through this connection.

Maintenance Tip: Check that this 1" line is free from rust residue in the two places with the RED arrows in picture 111 before proceeding. If you do find rusty metal there, call 928 Motorsports for the procedure to remove it.



Your finished modification should look like picture 115.



Please locate all the remaining 3/4" heater hoses provided. Lay them out, you should find a 7' piece, a 3' section and two 1' sections. We tend to cut them long-just trim off what you do not need.



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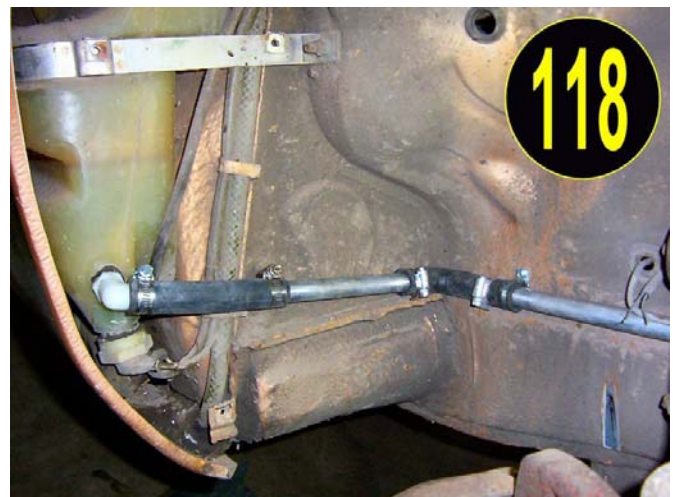
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Now we will install the metal coolant line in the right front fender well. We used metal coolant line to add durability because it is a environment where it is going to get stones and rocks thrown up. You will find in your kit a 2 foot section of aluminum tubing and you will also find a 8 inch long section of aluminum tubing. The 2 foot section goes underneath the upper A-Arm and just above the chassis in the little crease that is made in the body. See picture 116. To do this you will take your hands to the metal front brake line and give them a little lift. You will find that they will bend gently and safely out of the way, allowing you to put this tubing beneath the brake line. This is demonstrated in picture 117.



Remember, because we have the car in the air and the wheel off the car, the lower A-Arm is at its lowest most point as the caliper and brake assembly is hanging completely down. That is very unusual and will never happen again unless the car goes airborne. Under normal circumstances, the upper A frame is even further from this conduit than it is at this time.

From your kit, go get the 2-1 foot long sections of 3/4" hose and several of the #12 hose clamps, the 3 hose straps and the black rubber 3/4 90 degree pre-formed elbow. That elbow goes in the corner of the fender well, as you can see in picture 118 with two clamps around it. The small 8" section of solid aluminum tubing goes next and one of the 1' sections of the 3/4" hose continues on and connects to the elbow we installed in your windshield washer reservoir with two clamps on it. Again as shown in picture 118.

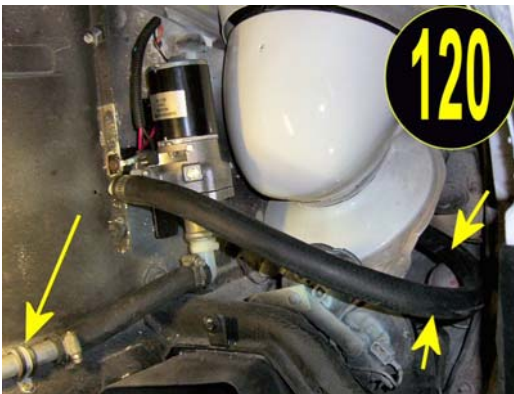




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On the other end of this metal tubing, please refer to picture 120, we have the other 1' section of 3/4" hose that comes out of the metal tube and over to the pump inlet, (which is the bottom nipple) and it gets two #12 hose clamps on it. Finally, picture 119 and 120 also show the location of the clamps that secure the aluminum rod in place so that they don't move. The sheet metal screws we want you to use are included in your kit. You can tighten all the hose clamps at this time.



Now, please take the 7' long piece of 3/4" heater hose and the long, heavy red wire supplied and fasten the ends of them together with some electrical tape (temporarily).

Starting in the right front fender, next to the water pump, we want to run that 7' hose and Red Wire from the water pump around the bottom of the head light in front of the radiator and just behind the louvers, across the entire car, behind the bumper, all the way to the left front where it sweeps out the left front bumper and around to the second nipple of the heat exchanger. Attach a #12 hose clamp on each end. You may have to trim the hose slightly if we have given you too much. Make sure that it is routed in such a way that it doesn't interfere with the headlamps going up or down. When it reaches the left side, you can break that electrical tape. We will be wiring the fan in the left front fender with that red wire in just a moment. But for now, just do the hose. Connect the hoses on both ends for this run as shown in picture 120 and 121.



Earlier in these instructions, we attached the 9' long piece of heater hose to the bottom of the intercooler as we laid the intercooler in place at the back of the motor. That hose should be running behind the motor, over the top of the bell housing, right to left, over the left cam tower, along the left cam tower, down behind the power steering pump, out the front of the motor, along the left side, between the radiator and the left side of the engine bay, and out the front of the grille. It is now time to take that and tuck in under the bumper, next to the hose coming from the right side of the car and follow along the left front bumper, around the back to the heat exchanger. It connects to the other nipple on the heat exchanger. The heat exchanger is not specific as to which end is the in-let and which end is the out-let. You can do it either way depending on your preference.



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We want to turn this to the left for this heater hose to be as large a radius as possible. A nice sweeping turn so as to avoid kinking the hose. Attach it to the heater exchanger and put another #12 clamp on it there.

Now, at the top of the motor, you will find at the front of the intercooler, there is a 3/4" hose nipple pointed towards the right front fender. This is for your 3' long section of heater hose. Please put your one end of the heater hose on there with a #12 hose clamp. See picture 122. It goes over or under the aluminum inlet pipe and out the fender well through the hole with grommet that we put in place a little while ago. Through the fender well and connects to the T that you installed at the top of the windshield washer reservoir which you can see in photograph 115 (previously).

Now, it is time to follow all the hoses around the car and make sure every #12 clamp is secure and also to take the wire ties that have been provided, (the black plastic cable ties), and loom our heater hose away from anything that might chafe or cut them. In the left front fender, loom the heater hoses together as they exit the heat exchanger and around behind the left front bumper. Make sure the left front head light goes up and down correctly and does not interfere with the heater hoses. In the right front fender, you may want to use a wire tie to loom the heater hose again away from the head light as it moves up and down.





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Now, it is time to add windshield washer fluid back into the windshield washer reservoir and fill it.

If you still have your car up on jack stands in the front, it is a good idea not to town on the pump just yet, because you would be running the pump dry. Wait until you lower the front of the car. You will find with this design, a normal amount of windshield washer fluid in the reservoir will put the pump under water so that the pump cannot run dry under normal circumstances. The pump is mounted lower than the windshield washer reservoir and will always have fluid.

Also with this design, the system is self-bleeding. As the water circulates through the intercooler system, it drops into the top of the windshield washer reservoir at the top, and any air bubbles in the system are automatically vented out. The system does not have to be purged or bled.

However, on this first fill with windshield washer fluid, there will be some air trapped in the electric water pump that has to be purged. Look closely on the electric water pump that you have installed and you will find a small brass valve that you simply press in (or pull a small ring out) to bleed the air out of the pump. The air will exit, and when water exits you can let go of the valve and you have successfully bled the air out of your pump. You can now hook up jumper wires to the two electrical leads out of your water pump. Power goes to red, ground goes to black.

The fastest way to get power to this water pump is directly on the other side of the fender where it is mounts, there is a forward positive battery terminal on the inside of the right front fender. It is a very convenient place to get power. Jumper the water pump, run it, check for leaks in the entire intercooler system. When there are no leaks, it is ok to put in the inner fender liner behind the right front tire that covers the windshield washer reservoir. Once installed, the rear fender liner will look like picture 124.





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Intercooler Wiring Overview: We have to supply power to the fan in the left front fender and the pump in the right front fender. We do this by use of a 12 volt relay provided in your kit that we mount in the right front fender well above the pump. We're going to wire to that and splice into a circuit. This particular electrical system on the car has it's own independent power and doesn't stress any of the existing electronics in the car or the fuse panel.

For wiring, let's start in the left front fender for the fan assembly. The black wire out of the fan gets a circular terminal clamped onto it and it gets screwed directly into the fender wall, providing the ground. The red wire coming out of that fan assembly gets the 8 foot 12 gauge red wire crimped onto it and that we pulled the width of the car following the same path as the 3/4" heater hose. Now let's take some of the black cable ties provided and tie up that red wire that runs the width of the car as well as the 3/4" heater hose to the bottom of the grille and the bumper so that it doesn't drop down and look unsightly.

This concludes the left front fender. You can put the left front tire back on. The left front inner fender liner does not go back on.

Disconnect the battery at this time!

Of the two horns that are mounted to the right front fender support strut, loosen the 13 MM bolt on the innermost horn mount. We are going to put our ground strap for that relay and the water pump underneath that horn mount. Put the ground clamp underneath that horn bolt and tighten it back down as shown in picture 125.





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Power for the system comes from the forward positive terminal in the right front inner fender underneath the hood. Find the in-line fuse holder from your kit as shown in picture 126. Take an 11 MM wrench and remove the stud of the bolt. Then put the new wire for your relay underneath that bolt, through all the previous lines and thread the bolt back in and tighten. See picture 127.



Drill the fender to run your wire as shown in picture 128, and be sure to line the hole with the small grommet provided.





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Mount the relay high in the LF fender as shown in picture 128 with one of the sheet metal screws provided. ***Note**, It is important when you're putting these screws towards the inner fender well to mount the relay and the pump to be very away of your location on the other side so that you don't mistakenly drive screws into the ignition computer.

The relay wiring instructions are as follows:

- Attach the ground wire that goes from the bottom of the horn bracket to spade terminal number 85.
- Attach the power supply that comes from under the hood, through the 15 amp fuse holder assembly that we ran through the fender well and attach that through the relay to spade terminal number 30.
- The next wire is the red power wire that will supply power to the water pump and to the fan on the radiator. It goes to spade terminal number 87.
- You will have one spade terminal left now and that will be number 86 and that wire goes to our switching supply that turns this system on and off. The best place to tap this power as you recall in our installation of the electric fans, is the air conditioning fan supply right at the fan connector. This way the ignition switch controls the whole circuit without any draining on the battery when the switch is off and yet every time the car is running, we know absolutely that the fans are on as well as the pump and the intercooler radiator fan.



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Tuning The Installation:

The L-Jet system has an adjustment that will allow you to enrich the air/fuel mixture ACROSS THE ENTIRE RPM RANGE right on the air sensor assembly. At the factory, this is set to run in a moderate-to-lean condition, to improve emissions and gas mileage. You may want to adjust it a little richer to pick up more performance and HP.

The adjustment screw is a 3mm allen socket located on the air sensor, and we discussed it and showed it in picture 67L. A very small adjustment has a rather large impact, so you want to be conservative with your adjustments. To turn the screw IN will RICHEN it, OUT will LEAN IT OUT.

We sell a special tool that makes this adjustment easier.

We want to start up your supercharged 928 now and check for fuel leaks, especially all those braided lines that we attached earlier and the high pressure rubber lines on the pressure regulators. Run your fingers around every fitting as the engine runs and when you remove your fingers, they should come up dry. If there is any gasoline on your fingers when you removed them from the fitting, shut off the engine and re-tighten those fittings.



If you look at picture 143L and 144L you will see where we have temporarily attached a fuel pressure gauge to the front of the fuel rail. This is a portal provided by Porsche to adjust fuel rail pressures at the factory and provide testing and tuning assistance. It is not required that you install a fuel pressure gauge in that fuel rail to tune your supercharged 928, but it is recommended. Be very careful if you remove the nut on the front of the fuel rail. There is a small ball bearing in there that actually performs the sealing function. Be sure not to drop it and to put the ball bearing back into the cap when this test is finished to make sure that it seals correctly. Adjusting your fuel system pressure is done by the allen screw on top of the FMU as shown in picture 145L. Turn the adjustment screw with the engine running in or out to achieve and idle speed fuel pressure of about 38 to 40 psi, wherever your car runs better. Then lock the adjusting screw in place on top of the FMU and leave it alone. That should be adequate and then thumb screw on the side of the FMU adjusts how quickly your fuel comes in once the FMU starts to engage.





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Replacing Old Vacuum Lines

Your kit came with a set of silicone hoses from us without charge. Check over your vacuum lines now and replace any that look suspicious. The rubber in the factory vacuum lines has been under attack by heat and ozone and they may be cracked and brittle.

The key is to remove only one vacuum hose at a time, compare it to a hose from the kit and cut a length to match. Put the new hose back on to the car, and repeat. Do only one vacuum hose at a time and you will not have nay errors.

Do not use silicone hose for fuel or fuel vapor. Gasoline dissolves silicone. Use silicone hoses for vacuum and small water lines only. The silicone is very durable and will never harden or crack.

Timing T-Bolt Clamps (optional)

You have installed several T-bolt clamps during this build. After these clamps were tightened, you will have long threaded ends sticking out. It is safe to trim these back a bit to improve the appearance of the installation.

Place a shop towel or two beneath the bolts and use an air-powered cut-off tool, a hacksaw or even a bolt cutters to lop off an inch or so. Do not remove too much - you want to be able to remove and re-install these clamps again in the future. Finish the ends of the bolts with a file to remove the burrs.

Checking the Installation:

Just a couple of words about driving your new supercharged Porsche 928. We recommend for the first 100 miles, you don't take the car all the way to red line as you are seating the bearings in your new supercharger. Make some nice runs with it and run it up to about 4,000 rpm or so and enjoy it. At the end of 100 miles, we want you to check your intercooler fluid level, check all your belts for tension including the alternator belt, the power steering belt and now your new supercharger belt. It is probable that the supercharger belt will have stretched and will need to be re-tightened. Simply refer back to the section on tensioning your supercharger belt and snug it up a little bit more.



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Regular Maintenance Items:

The Powerdyne BD-11a we use is typically good for about 30,000 miles between rebuilds with no maintenance whatsoever. The only thing that damages the BD-11a is running at speeds above 6,000 rpm, where it is not designed to go. There is no maintenance necessary for the BD-11a.

If you use the windshield washer sprayers to wash the windshield, keep in mind you're also spraying intercooler coolant on your windshield. So to prevent your intercooler system running low, keep your windshield washer reservoir topped off.

Gasoline: Use Premium gasoline now, 91 Octane or better. Avoid Ethanol mixes if you can as the actual octane rating received before additives is lower, and the ethanol is hard on the rubber diaphragms in the fuel system.

Octane Booster: Add octane Booster if you are going to go auto crossing or racing just to be safe. A bottle of "Octane Performance Booster" by Solder Seal is about \$1.50 and treats a tank of 20 gallons. It raises 91 octane gas to 110 octane and is cheap insurance.

Intercooler Fluid: Use windshield washer solvent/antifreeze as you would normally, and do NOT use just plain water. Keep it full.

Watch the Redline: Pay attention to your dyno results or the dyno charts of others with cars just like yours. Observe where the air/fuel ratio rose above 13.0 to one – and remember to shift before that point for the safety of your motor. If you want a higher shift point contact us – we make pulleys for your kit in several sizes just so we can adjust your shift point to where you want it to be.

Oil Level: Check your oil level more frequently. There is more air passing through your crankcase than before, and more oil is consumed as oil vapor. This is common with supercharged cars. Check your oil level more often.

Oil Type: Change to Synthetic Oil if your motor is all broken in (> 7,000 miles on it). The reason: we are employing positive crankcase ventilation on this supercharger kit, and actively evacuating the crankcase pressure by sucking it back into the intake.

So, some oil/crankcase vapor is being ingested by the motor (as it was before the SC kit was installed) Synthetic motor oils do not lower the octane rating of the air/fuel mixture much at all, however traditional motor oils do. That's why switching to synthetic can be another good safety factor to help prevent detonation in your engine.



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Driving your 928SC:

As far as driving your supercharged 928, the first couple times you run it, we recommend you be on dry pavement on a straight road until you get the feel of the boost coming in and how the car takes off. You will notice that if you're in mid-corner and the boost came in, that it is likely it would kick your rear tires out. You want to be aware of this. You can no longer slap the gas peddle to the floor because you will make the car unsettle in its weight distribution and may break the rear tires free. The drivers in supercharged cars refer to this technique as a 'Rolling Throttle', you roll into the throttle as you slowly and steadily depress it to the floor to that the weight transfer can take place to the rear wheels and you can launch correctly.

Under boost, the air/fuel gauge should remain to the rich-side always. If it goes "Lean" under boost, get out of the throttle and call us. We will want to adjust the fuel system to get you more fuel.

On steady-state driving, like under cruise-control on the highway, the air/fuel ratio will "hunt", and the needle will slowly swing back and forth. This is normal and correct.

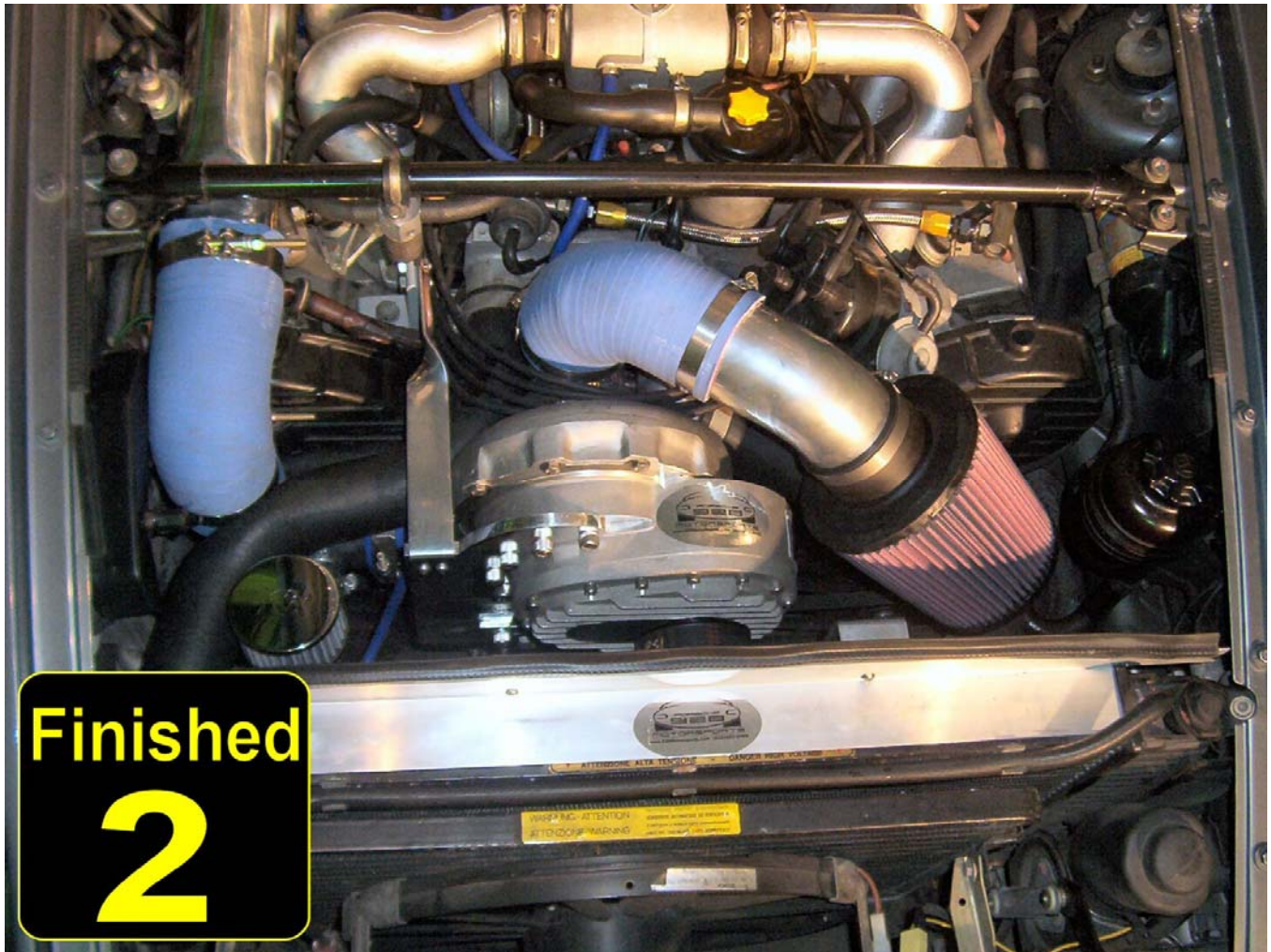
Enjoy your supercharged Porsche 928 and call us if you have any questions.





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Finished
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