



# OWNER'S MANUAL



Holden / HSV LS1 ProCharger System





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Torque Specification Chart	 Grade 5			 Grade 8		
	Thread Size	Torque (lb. ft.)			Torque (lb.ft.)	
1/4-20	11	8	7	16	12	10
1/4-26	13	10	8	18	14	11
5/16-18	23	17	14	33	25	20
5/16-24	26	19	15	36	27	22
3/8-16	41	31	25	58	44	35
3/8-24	47	35	28	66	49	39
7/16-14	66	49	40	93	70	56
7/16-20	74	55	44	104	78	62
1/2-13	101	75	60	142	106	85
1/2-20	113	85	68	160	120	96

## A. Introduction

Congratulations on the purchase of your ProCharger centrifugal supercharger system, and welcome to the world of intercooled supercharging. You are now the owner of the most powerful, reliable and technologically advanced supercharger system available.

If you are performing the installation of this system and this is your first ProCharger installation, you will likely benefit from reading the entire installation instructions prior to proceeding, and then reviewing each section as you go. If you are familiar with supercharging, remember that intercooled supercharging is different from non-intercooled supercharging, and the same rules do not necessarily apply. This is primarily due to the unparalleled airflow and boost generated by the ProCharger, and the substantially cooler intake temperatures that result from intercooling this boost.

Once your system is installed and dialed in, you will experience a performance gain that is much greater than that delivered by non-intercooled supercharger systems. The utilization of intercooling technology allows power gains for multiple reasons, primarily the following three:

- 1) Increased charge air density (lb/cubic ft) over non-intercooled applications. Cooler air is more dense and as such may be more easily delivered to the cylinders.
- 2) Decreased charge air temperature allows total spark advance closer to that which is ideal for peak power production when compared to non-intercooled installations at similar boost levels.
- 3) The use of an intercooler allows higher peak boost levels for a given fuel (e.g. pump fuel). This means charge air densities double that of atmospheric may be utilized on some pump fuel applications, resulting in power output nearly double that obtained when operating un-supercharged.



## **B. Installation Overview**

To obtain the best results from your ProCharger system, we recommend reviewing the installation instructions beforehand, and following the installation instructions closely and in sequence. A detailed packing list has been provided (stapled to your invoice) to assist you in identifying the components of your ProCharger system. The following tools will be required to install your ProCharger system:

### **Required Tools**

- ✓ 3/8" socket set (standard & metric)
- ✓ 1/2" socket set (standard & metric)
- ✓ 1/2" breaker bar and 4" extension
- ✓ Adjustable wrench
- ✓ Open end wrench set (standard & metric)
- ✓ Drill and drill bit set
- ✓ Needle nose pliers
- ✓ Spark plug socket\*
- ✓ Flat screwdriver
- ✓ Phillips screwdriver
- ✓ Large screwdriver or crowbar
- ✓ Factory repair manual
- ✓ Hex bit set
- ✓ Torx bit set
- ✓ 8 spark plugs (not platinum plugs)\*
- ✓ Fuel filter\*\*

\*If current plugs have more than 10,000km or are more than 1 year old or are platinum.

\*\*the fuel filter should also be replaced at this time.

Ideally, you should also have the following gauges available to properly check the finished installation and monitor your vehicle's performance (especially for racing applications):

- ✓ manifold boost pressure gauge (vacuum -15psi)
- ✓ fuel pressure gauge (0-100 psi)

Both gauges should be of a type that can be read by the driver/assistant while the car is on a dyno. Cockpit or bonnet-mounted gauges are preferable, although use of a shop fuel pressure gauge (which has a hose long enough to allow the gauge to be secured to the windshield during testing) is also acceptable. In order to obtain useable readings, the gauges must be installed to read air pressure inside the intake manifold and fuel pressure inside the fuel rail.

**CAUTION:** Never use a mechanical fuel pressure gauge inside the vehicle without a fluid separator, which will keep the fuel isolated to the engine compartment. Serious bodily injury or death could result from fuel inside the vehicle interior.

The engine on which the ProCharger is to be installed must retain the factory compression ratio. If it has been modified in any way, please consult DNA Motorsport technical staff before proceeding with the installation. This supercharger system is intended for use on strong, well maintained engines. Installation on a worn or troublesome engine should be reconsidered. Accessible Technologies will not be held responsible for damage to an engine or powertrain component.

**WARNING:** Read and understand all safety precautions in this manual before installation. Failure to comply with instructions in this manual could result in personal injury, property damage, and/or voiding your warranty.

## C. Preparation

*Completion of this section will configure the vehicle for system installation*

- 1) Remove petrol cap to relieve fuel tank vapour pressure.
- 2) Remove the fuel pump fuse from fuse block. Crank the engine for a few seconds (the engine will not start) to bleed fuel pressure from the fuel lines. Replace the fuse.
- 3) Disconnect the negative battery cable from the battery.
- 4) If the vehicle has had any modifications done to the Powertrain Control Module (computer) other than the original factory programming, return the computer to factory settings before proceeding.

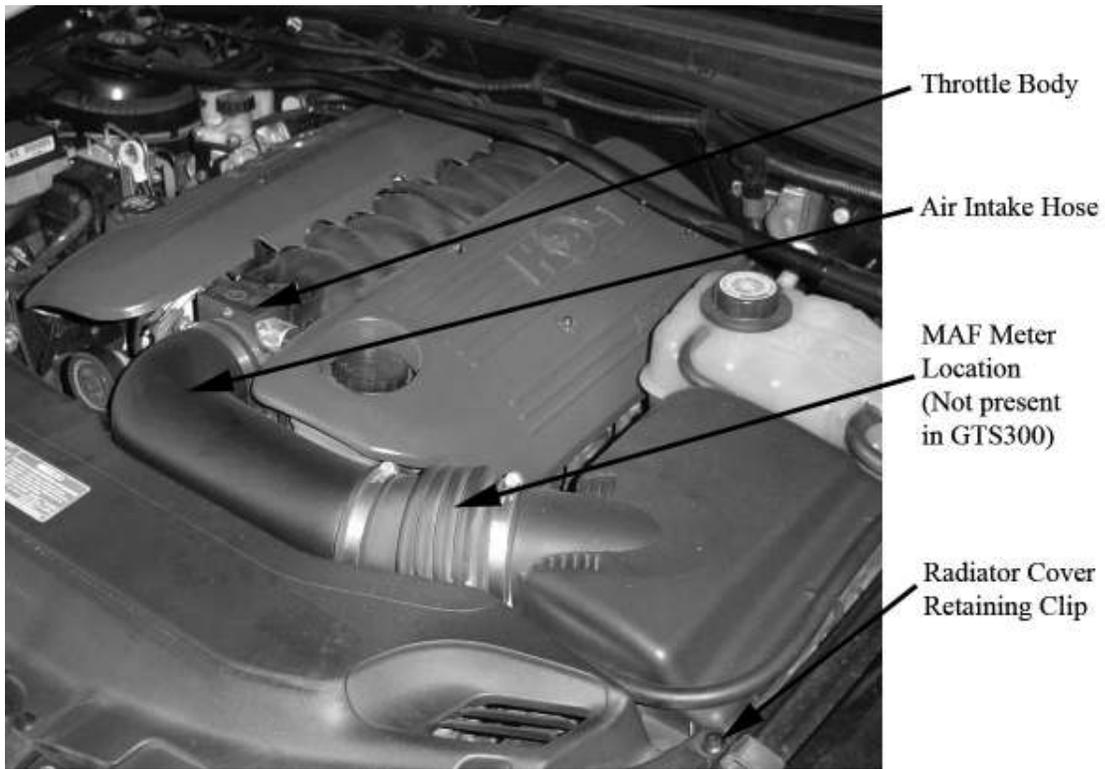


**WARNING: Aftermarket chips/programmers for naturally aspirated motors advance timing at elevated RPM's; this will cause detonation and engine damage if used with a supercharger.** Many aftermarket chips/programmers also extend your rpm range. Since boost is related to engine rpm, **this can produce excessive boost and engine damage.** Boost figures for ProCharger LS 1 pulleys are rated at 6,000 rpm on a stock LS 1.

- 5) Remove the engine cover (2 covers in GTS300)
- 6) Unplug the air temperature sensor and Mass Air Flow (MAF) meter wiring, as shown in Illustration C2. Loosen the hose clamp that attaches the air intake flex-hose to the throttle body using an 8mm nut driver, and pull the flex-hose off of the throttle body. Loosen the hose clamp securing the air intake hose to the MAF meter and remove intake hose.
- 7) Remove the four Phillips head screws which secure the upper section of the air box and remove filter element as shown in Illustration C3.



**Illustration C1 - Fuel Pump Relay Removal**

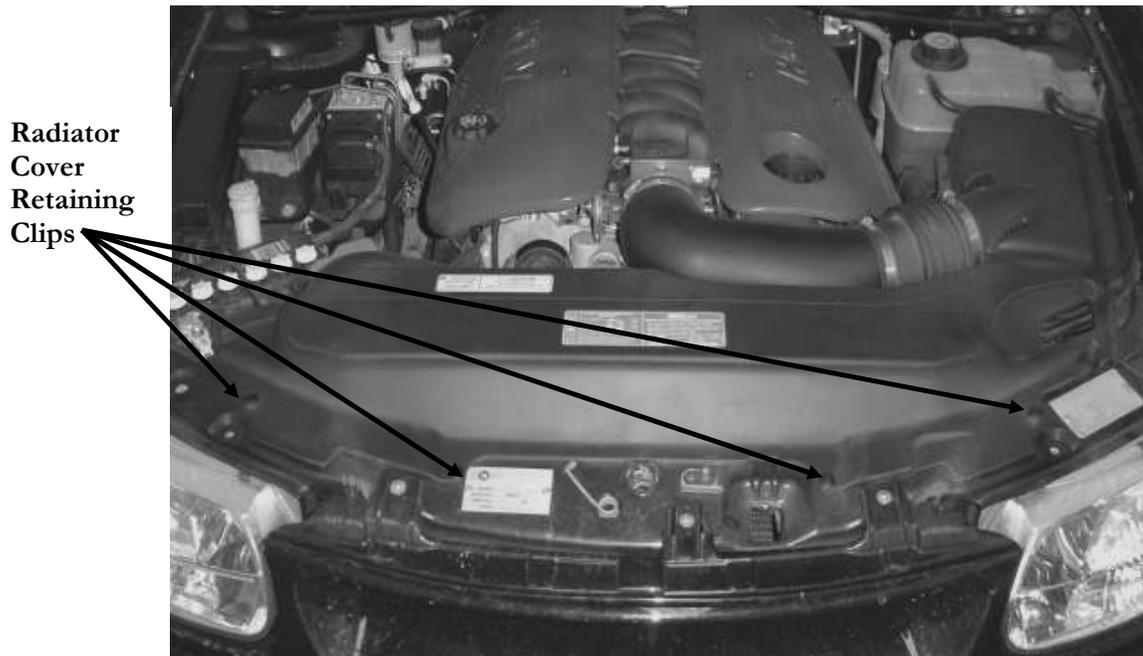


**Illustration C2 - Factory Air Box Removal**



**Illustration C3 - Air Filter Element Removal**

- 8) Remove the plastic radiator cover by gently prying up the locking tabs with a flat screw driver as shown in Illustration C4.



**Illustration C4 - Radiator Cover Removal**

- 9) Gently pull up on the lower section of the air box and remove from engine compartment as shown in Illustration C5.



**Illustration C5 - Lower Air Box Removal**



**Illustration C6 - Air Box Removal**



**Illustration C7 - Radiator Cover and Air Box Removed**

10) Disconnect the factory cooling fan wiring harness.



Cooling Fan  
Wiring Harness

**Illustration C8 - Cooling Fan Assembly and Radiator Removal**

- 11) Drain the engine coolant by carefully removing the lower radiator hose located on the passenger side of the engine compartment. Remove the lower radiator hose from the 1 - 1/2" metal connector located by the radiator core support and remove the factory metal coolant transfer tube.
- 12) Remove the cooling fan and radiator assembly by removing the spring clips on either side of the radiator



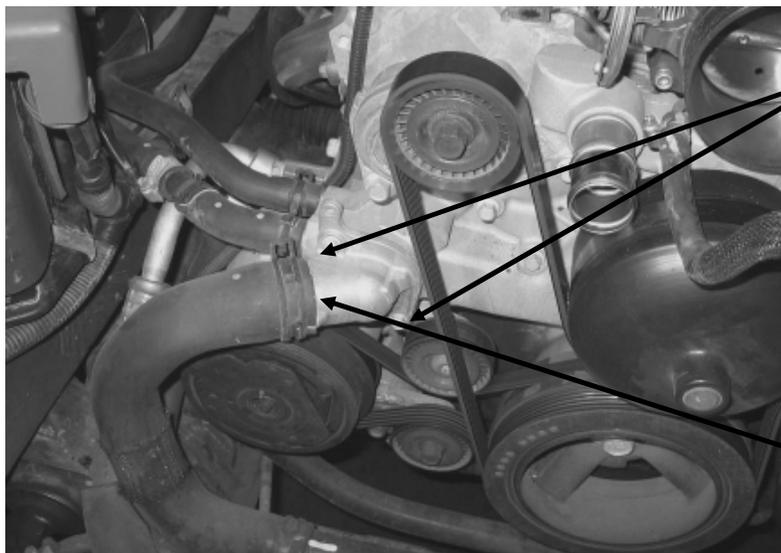
**Illustration C9 - Cooling Fan Assembly and Radiator Removed**



**Remove  
Both  
Hoses**

**Illustration C10 - Lower Radiator Hose**

- 13) Remove the other end of the radiator hose which connects to the thermostat housing.
- 14) Remove the upper radiator hose from the radiator.
- 15) Now remove the two 6mm bolts which retain the thermostat housing to the engine block.
- 16) Remove the thermostat housing from the engine block.

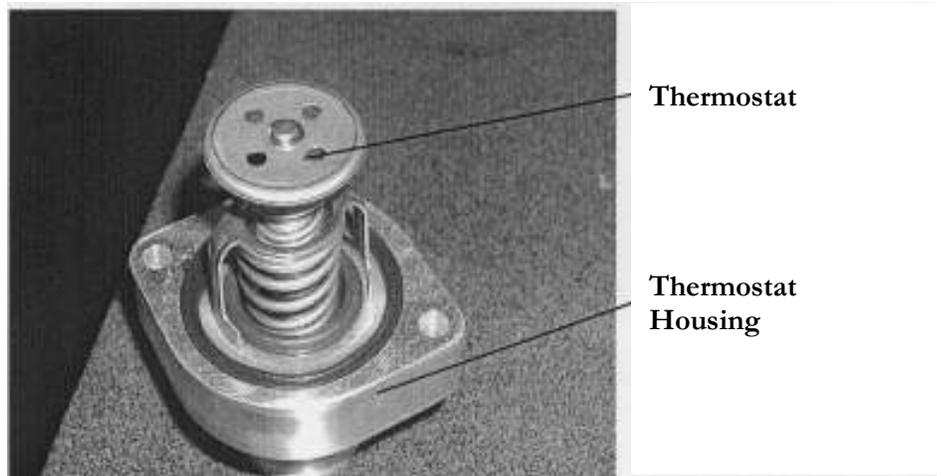


**6mm Bolts**

**Stock  
Thermostat  
Housing**

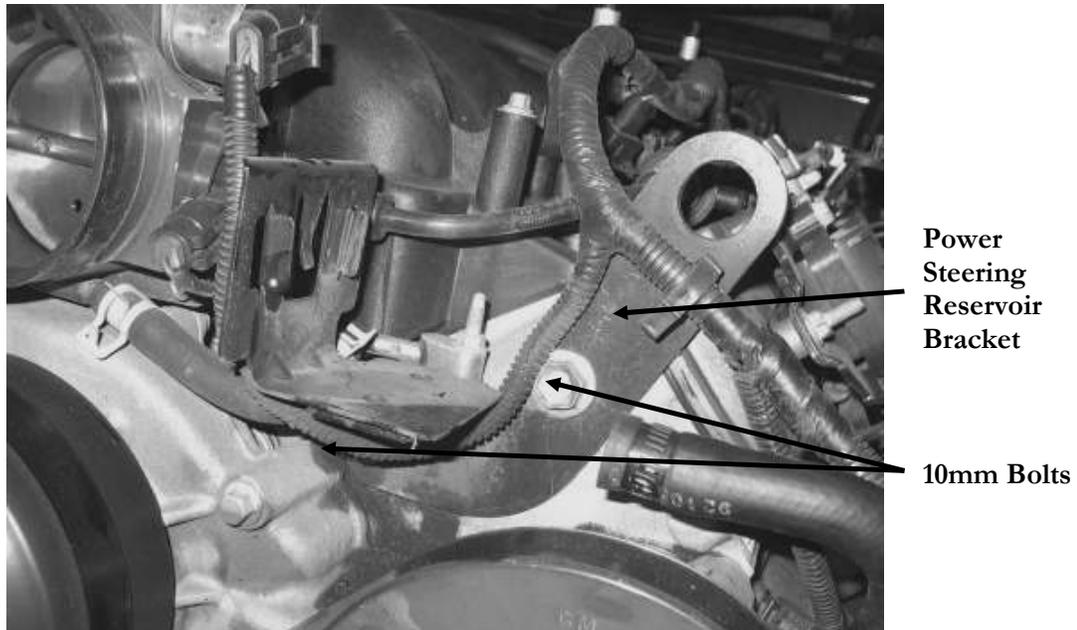
**Illustration C11 - Stock Thermostat Housing Removal**

- 17) Replace the stock thermostat housing with the supplied housing making sure to install the thermostat in the correct position.
- 18) Secure new thermostat housing using the supplied 6mm x 1.0 x 35mm hex bolts and lock washers. **Note: use both gasket and o-ring for sealing, the use of a sealant is highly recommended**



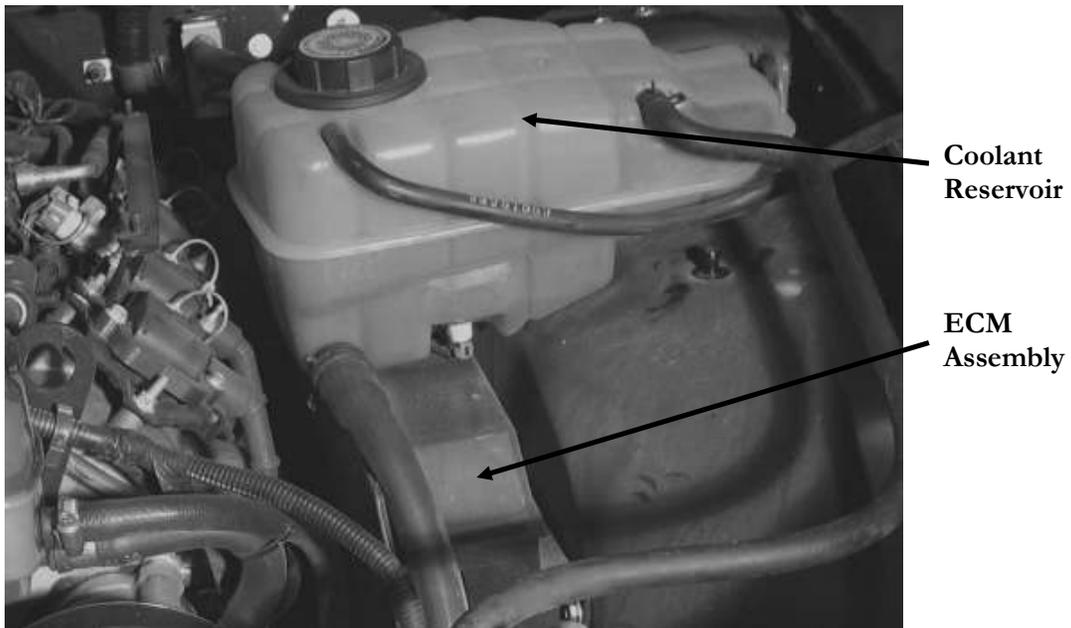
**Illustration C12 - Thermostat Housing Installation**

- 19) Unclip the power steering reservoir from the bracket located on the passenger's side cylinder head.
- 20) Remove the two 10mm hex bolts which retain the power steering bracket and discard bracket; it will not be reused. See Illustration C13 for bracket removal



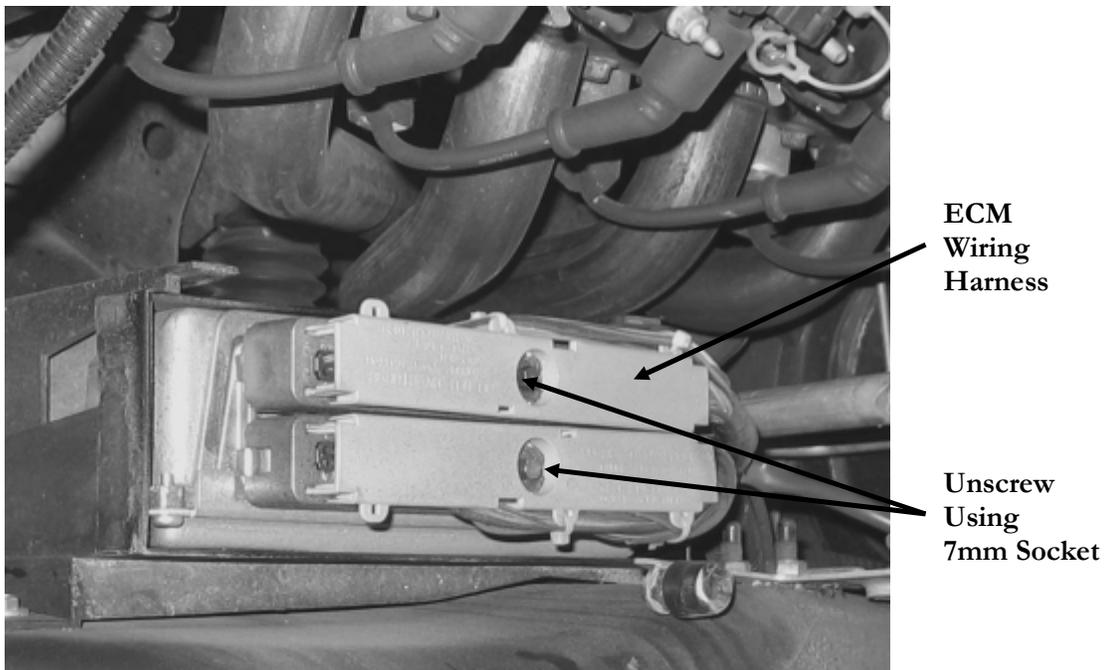
**Illustration C13 - Power Steering Reservoir Bracket Removal**

- 21) Remove the standard power steer return hard-line which runs parallel with the radiator
- 22) Unplug the low coolant sensor from the coolant reservoir.
- 23) Gently pull up and remove the coolant reservoir to gain access to the ECM assembly.



**Illustration C14 - Coolant Reservoir Removal for ECM Access**

- 24) Remove the ECM heat shield.
- 25) Unclip the upper case cover on the ECM housing and remove cover.
- 26) Carefully remove the two wiring harness sockets from the top of the ECM. This can be done using a 7mm socket.



**Illustration C15 - ECM Wiring Harness Sockets**

- 27) Remove the ECM from the plastic case.
- 28) Unbolt the plastic case from the inner fender well. Discard plastic case as it will not be reused , The ECM will now be relocated to inside the cabin.

- 29) Remove passenger side kick panel (inside car)
- 30) From the passenger side floor look up toward the passenger strut tower, you will see the plastic retaining clip for the grommet, unclip this from the firewall
- 31) The grommet and clip will now be loose in the engine bay, splice the grommet down one side, and remove the rubber grommet from the wiring harness (refer illustration C16)



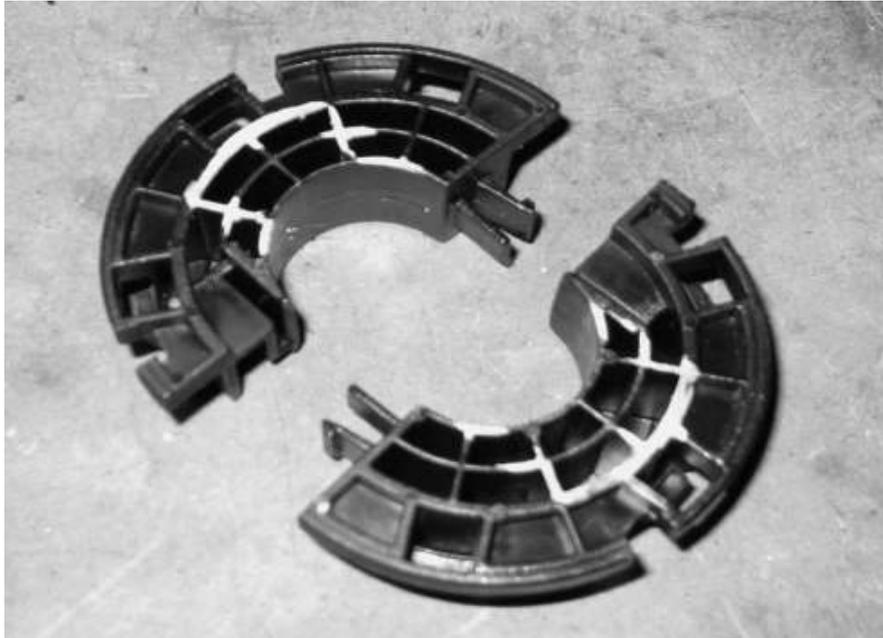
**Illustration C16 - ECM Wiring Harness Grommet**

- 32) The rubber grommet needs to be modified for the main harness to fit inside the cabin



**Illustration C17 - Grommet Modified**

- 33) The plastic grommet retaining clip can be unclipped into two pieces (Illustration C18), it helps to modify this clip so the main harness can be fed inside the cabin (Illustration C19)

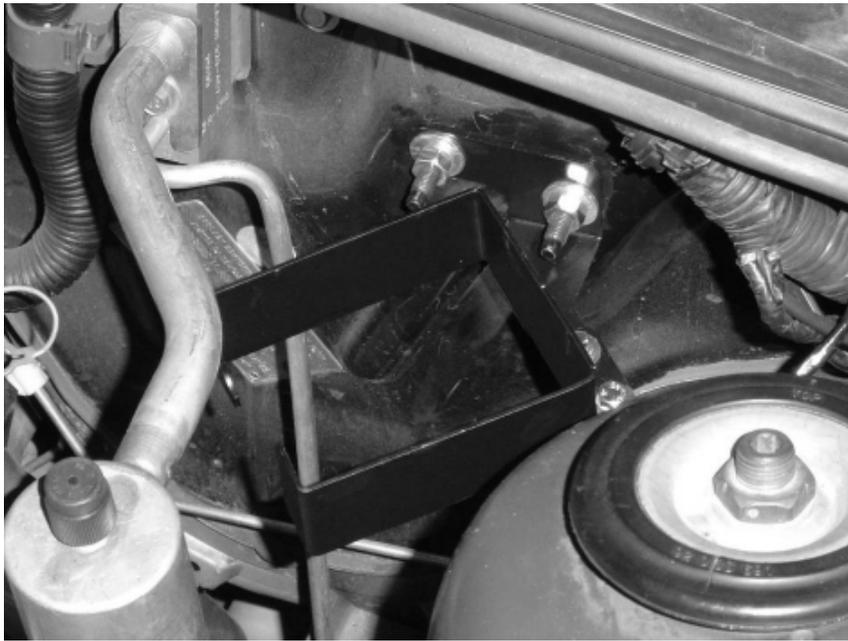


**Illustration C18 - Grommet Retaining Clip**



**Illustration C19 - Grommet Retaining Clip Modified**

- 34) The wires for the coolant reservoir bottle will need to be extended, use the supplied wires and joiners to extend these wires
- 35) Mount the ECU in the space above the kick panel and behind the modified main harness grommet (in cabin)
- 36) Route the necessary wires through the firewall, then assemble the modified grommet retaining clip around the harness as well as the grommet and clip the assembly into the firewall, you may use some adhesive to glue the grommet and cable tie it back together
- 37) Locate the two studs on the passenger side of the firewall and install the supplied P/S relocation bracket.



**Illustration C20 - P/S Relocation Bracket Installation**

- 38) Fit the reservoir in the newly installed bracket. Remove the factory feed hose and replace with the supplied 5/8" oil resistant hose. The return hose for the power steering will be fitted later



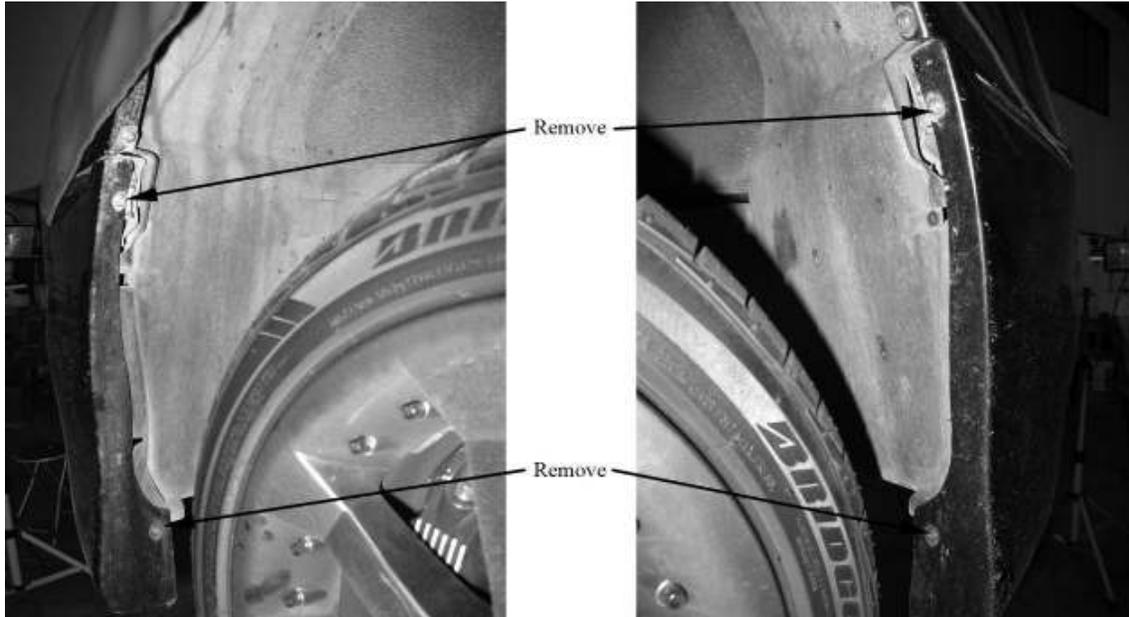
**Illustration C21 - Power Steering Reservoir Hose Extension**

- 39) Reinstall the coolant reservoir.  
40) Proceed to the Section D for front fascia removal

## D. Front Fascia Removal

Completion of this section will configure the front of the vehicle for the intercooler and tubing installation.

- 1) Unscrew the inner fender splashguard to fender connections on both the driver and passenger sides.



**Illustration D1 - Inner Fender Well Screw Removal**

- 2) Remove the three Phillips head screws located at the top of the front grill



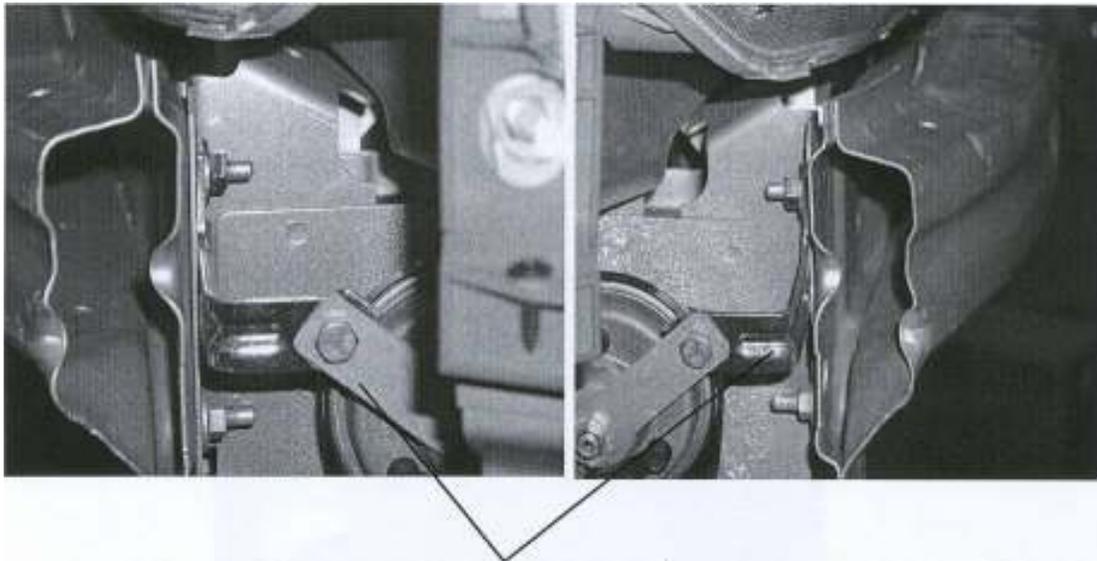
**Illustration D2 - Fascia Upper Retaining Screws**

- 3) Disconnect the horns and the fog light harnesses located on the inside of the front fascia.
- 4) Unclip the front fascia from the body by carefully pulling out at the edge of the fascia.  
**Note:** If you do not pull directly outward, the inner clip on the fascia may break off. If this occurs, the clip may be repaired with superglue.

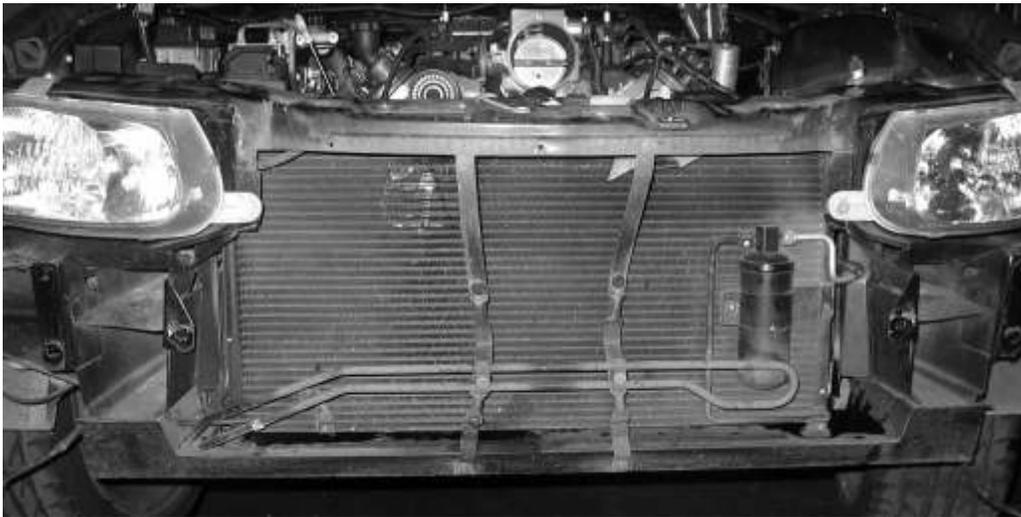


**Illustration D3 - Fascia Removed**

- 5) Unclip the lower air dam from the radiator core support
- 6) Remove the front bumper cover.
- 7) Remove the bumper re-enforcement and horn brackets.



*Horn Brackets (Passenger and Driver Sides Respectively)*  
**Illustration D4 - Bumper and Horn Removal**



**Illustration D5 - Completed Fascia Removal**

8) Proceed to Section E for fuel system modification.

## E. FUEL SYSTEM MODIFICATION

Completion of this section will upgrade the stock fuel system.

**WARNING: Before proceeding, be sure negative battery cable is removed!**

- 1) Install upgraded fuel pump in tank
- 2) Covering the fuel rail with a shop towel, depress the bleeder valve to release any residual fuel pressure in fuel rail. This is a precautionary step as you should have already relieved the fuel pressure in steps 1 and 2 in Section C.

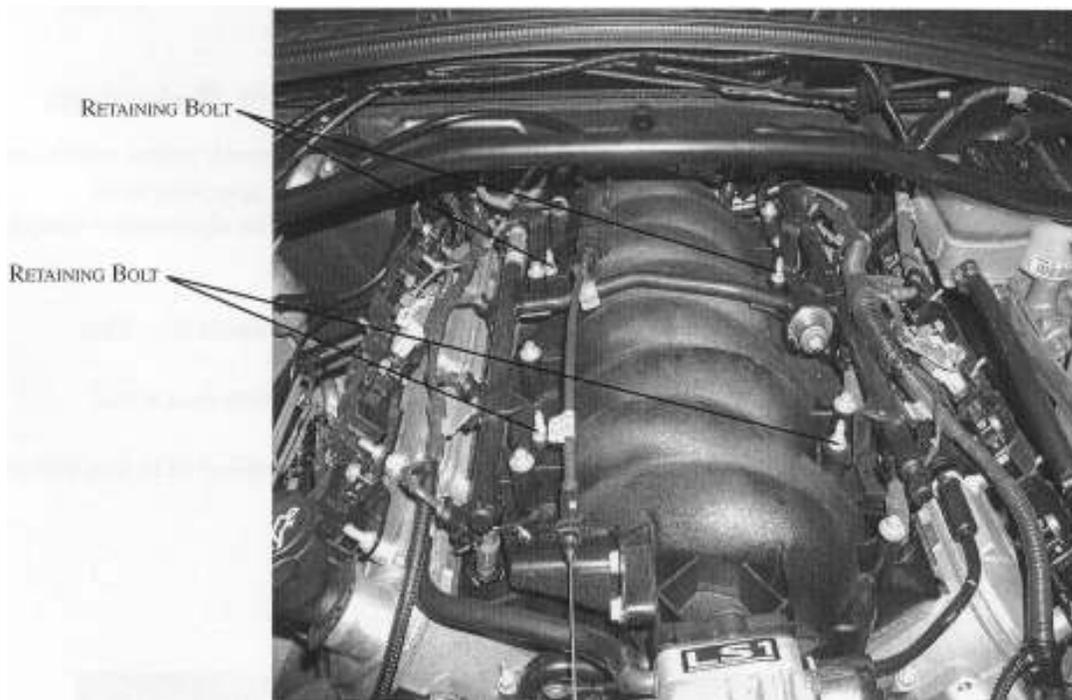
**WARNING:** This is a high pressure fuel system. When working on the fuel system, there will be a small amount of fuel leakage when the injectors are initially disconnected. Precaution should be taken to minimise/contain this leakage. Avoid any exposure of this leakage to spark, flame or any other potential ignition sources.

Depress  
To Bleed  
Off Pressure



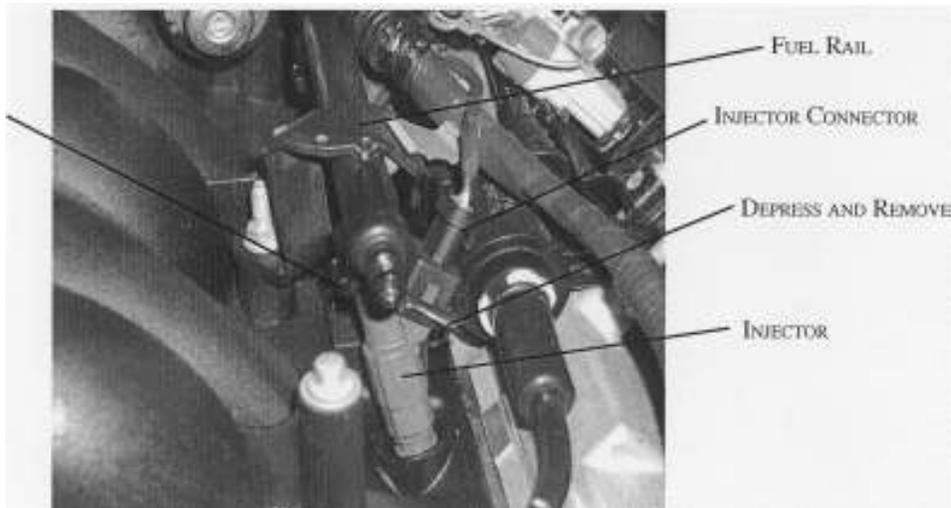
**Illustration E1 - Fuel Rail Bleeder (Passenger Side Fuel Rail)**

- 3) Remove the four fuel rail retaining bolts as shown in Illustration E2.



**Illustration E2 - Fuel Rail Retaining Bolts**

- 4) Depress the fuel injector wiring harness connector clips and unplug each connector.
- 5) Remove the injector retaining clips and remove each injector.
- 6) Replace factory injectors with the larger units.  
Be sure to lubricate the o-rings before installing.
- 7) Reconnect wiring harness and install fuel rail retaining bolts



**Illustration E3 - Injector Removal**

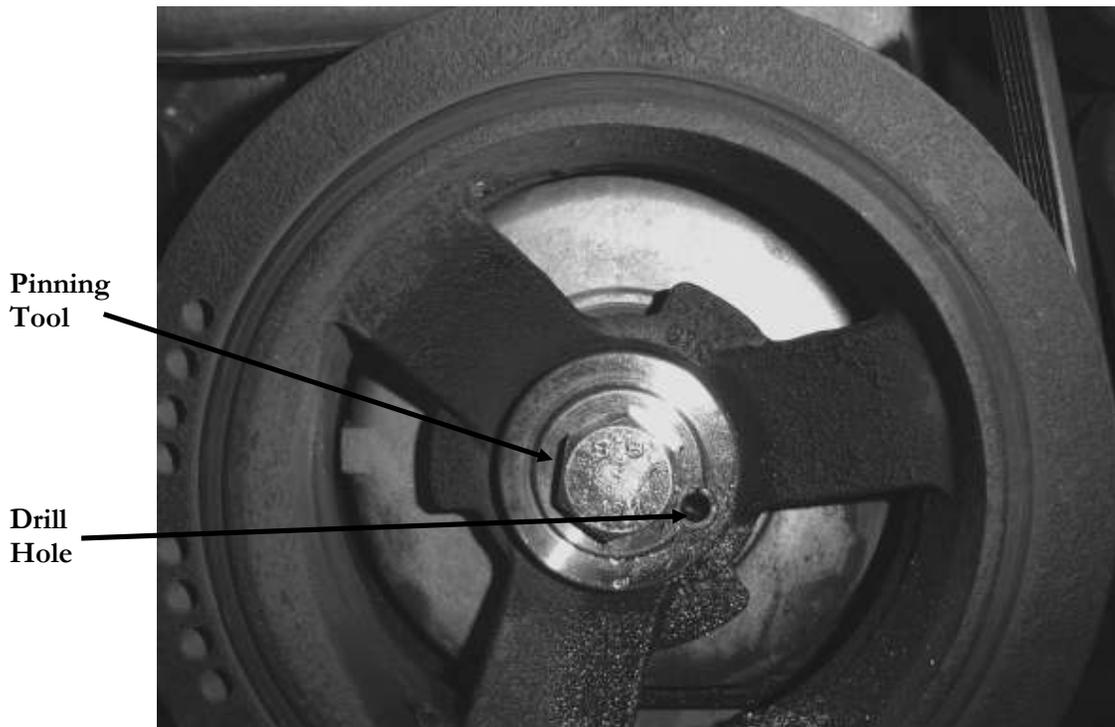
- 8) Proceed to Section F for crank pulley installation.

## F. CRANK PULLEY INSTALLATION

### F1. Crank Pulley Installation: Stock Harmonic Balancer.

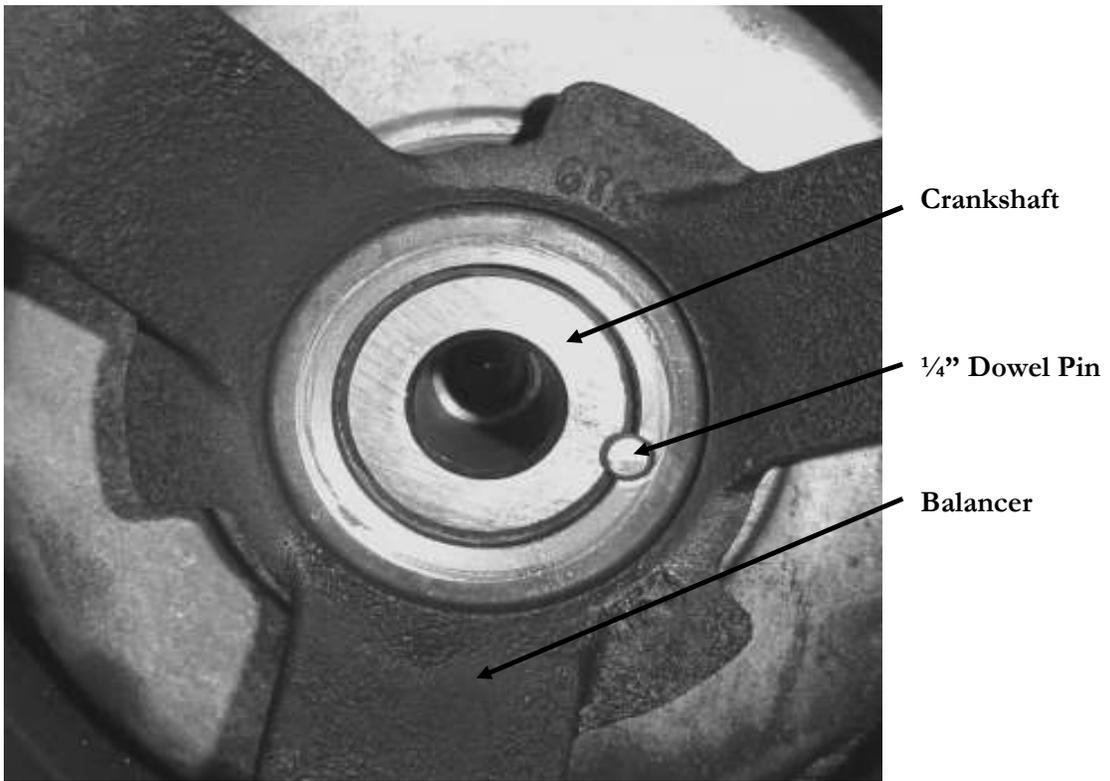
Note: For boost levels not exceeding 8 psi, ATI has designed a crank pulley which integrates with the stock harmonic balancer. If you plan to upgrade your engine or ProCharger at a later date, it is recommended that you purchase an aftermarket damper such as Fluidampr (PN 740102).

- 1) Raise the front of the vehicle using car ramps, jackstands, or a vehicle hoist. This will allow access to the factory harmonic balancer.
- 2) Remove the factory harmonic balancer retaining bolt using a 24mm socket and impact wrench or breaker bar.
- 3) Install the supplied harmonic balancer pinning tool using the supplied M16 hex bolt as shown in Illustration F1.



**Illustration F1 - Pinning the Crankshaft**

- 4) Tighten the bolt to hold the tool in place and prevent spinning during the drilling process.
- 5) Using the supplied 1/4" HSS drill bit, drill a hole in the crankshaft/harmonic balancer 20mm(0.800") deep from the face of the crankshaft. The hole will be centred on the O.D. of the crank shaft. Do not drill deeper than 20mm(0.800"). Remove pinning tool and set aside.
- 6) Using compressed air, blow out the hole to insure no chips or debris is present.
- 7) Install the supplied 1/4" O.D. x 19mm(0.750") long stainless steel dowel pin in the hole.
- 8) Install the supplied 8-rib crank pulley. The pulley has three 3/8" dowel pins which interlock with the webbing on the factory balancer. Rotate the pulley CCW until the dowel pins contact the balancer webbing.
- 9) Install the supplied M16-2.0 x 140mm grade 12.9 hex bolt and cup washer. The cup in the washer will face in towards the crank pulley surface. Note: Add thread locker to the bolt before installing.
- 10) Torque centre bolt to 40 ft-lbs + additional 120 degrees.



**Illustration F2 - Stock Balancer Pinned**



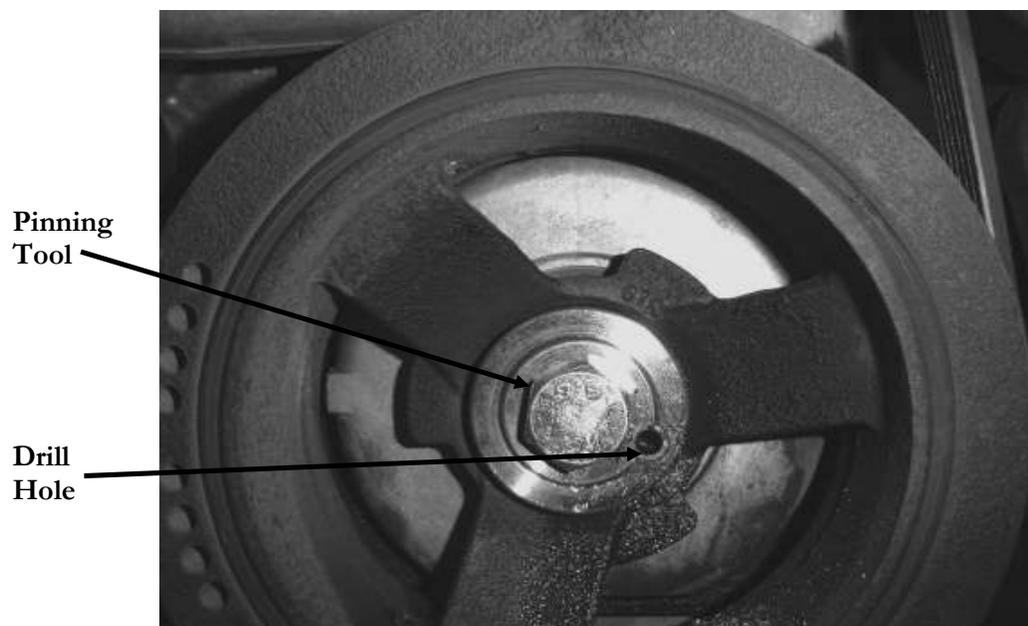
**Illustration F3 - Crank Pulley Installed**

11) Proceed to Section **G** for ProCharger installation.

## F2. Crank Pulley Installation: Aftermarket Harmonic Balancer.

**Note:** For boost levels exceeding 8 psi, ATI requires the purchase of an aftermarket damper such as Fluidampr part number 740102.

1. Raise the front of the vehicle using car ramps, jackstands, or a vehicle lift. This will allow access to the factory harmonic balancer.
2. Remove the factory harmonic balancer retaining bolt using a 24mm socket and impact wrench or breaker bar.
3. Rotate the 4-rib A/C belt tensioner CCW using a 15mm wrench and remove A/C compressor belt.
4. Using a 15mm wrench, rotate the factory 6-rib tensioner CCW and remove the factory belt.
5. Remove the factory harmonic balancer using tool number J41816 and J41816-2 or a standard 3-Jaw puller.
6. Install the Fluidampr following the manufacturer's recommended procedure.
7. Install the supplied harmonic balancer pinning tool using the supplied M16 hex bolt as shown in Illustration F4.
8. Tighten the bolt to hold the tool in place and prevent spinning during the drilling process.
9. Using the supplied 1/4" HSS drill bit, drill a hole in the crankshaft/harmonic balancer 20mm(0.800") deep from the face of the crankshaft. The hole will be centred on the O.D. of the crank shaft. Do not drill deeper than 20mm(0.800"). remove pinning tool and set aside.
10. Using compressed air, blowout the hole to insure no chips or debris are present.
11. Install the supplied 1/4" O.D. x 19mm(0.750") long stainless steel dowel pin in the hole.
12. Install a new factory M16 bolt and torque to 40 ft-Ibs +additional 120 degrees.
13. Attach the supplied 8-rib crank pulley to the after market damper using the supplied 3/8-24 x 1.5" hex bolts and lock washers. Be sure to apply thread locker to bolts before installation.
14. Torque the three 3/8" bolts to 40 ft-Ibs.



**Illustration F4 - Pinning Tool Installation** (Factory Balancer Shown)

15. Proceed to Section **G** for ProCharger Installation.

## G. MAIN BRACKET/PROCHARGER INSTALLATION

### ProCharger Description and Operation

The main components for ProCharger installation are the ProCharger and mounting bracket. The ProCharger is an internally gear-driven centrifugal compressor. It is driven by an eight rib belt system which utilizes a rotary tensioner to maintain proper belt tension. The P-1SC-1 ProCharger uses a billet aluminium helixed impeller, super precision bearings and carburized gears. The impeller speed is dictated by engine rpm, crank pulley-to-driven pulley ratio and the ProCharger's internal gear ratio. As engine speed is increased, both airflow and boost (resulting from engine back-pressure) are increased. The quoted boost levels are rated at 6,000 rpm of the crankshaft. The mounting bracket is a billet aluminium bracket that is CNC machined to assure proper positioning of the ProCharger.

**WARNING: Never strike the ProCharger pulley with a hammer or other tool under any circumstance! Evidence of such force will void the warranty, as serious damage to the precision bearings within the ProCharger could occur.**

- 1) Connect the billet standoff to the passenger's cylinder head using the two supplied 10mm x 1.5 x 90mm hex bolts and flat washers as shown in Illustration G1.

**Note:** Be sure to apply anti-seize compound to all fasteners before installation.

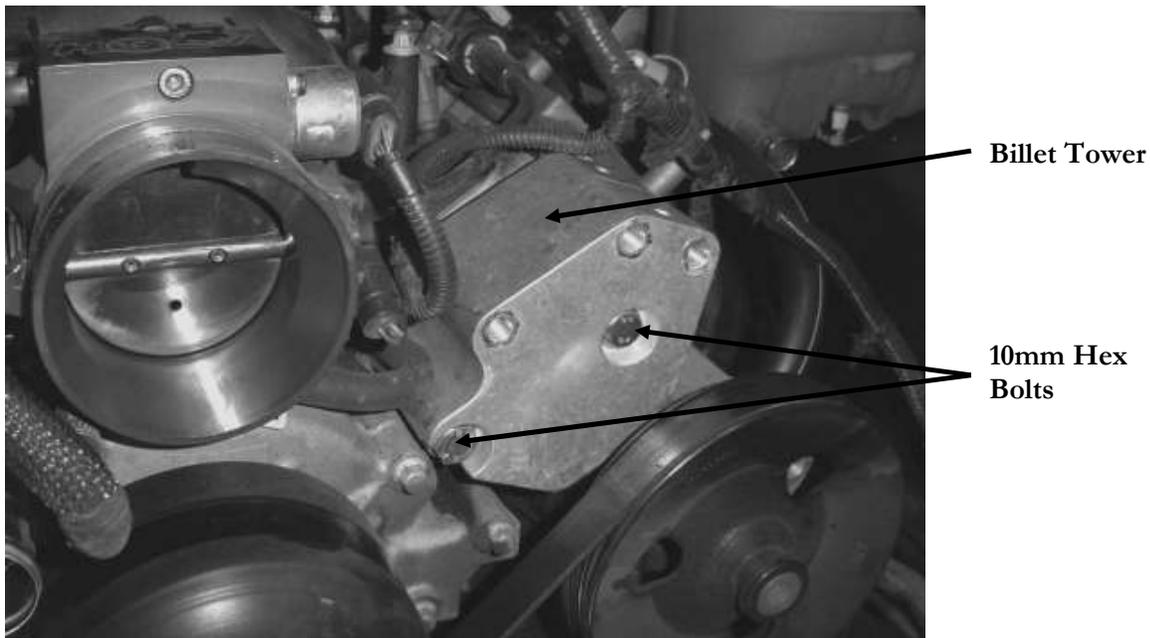
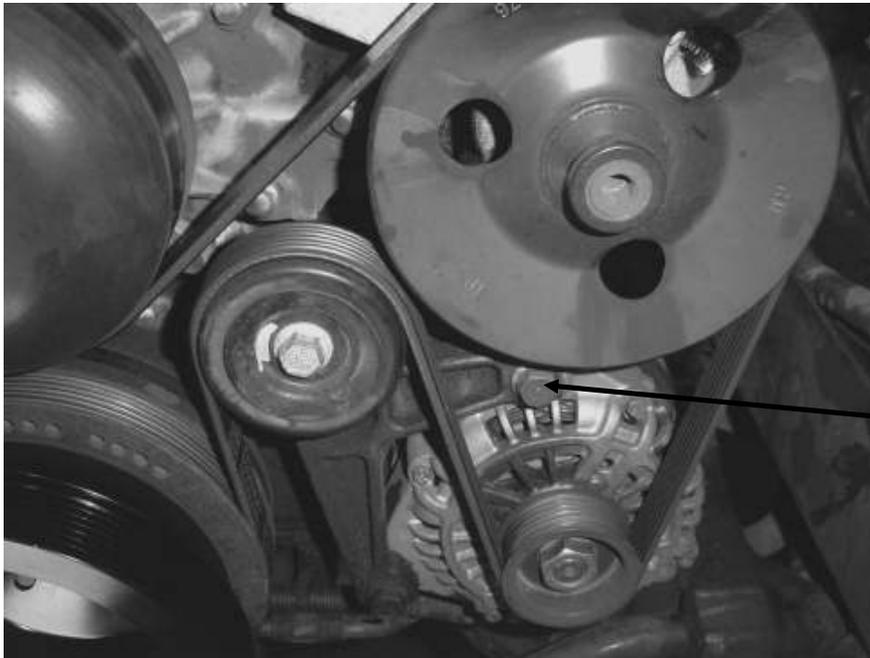


Illustration G1 - Billet Standoff Installation

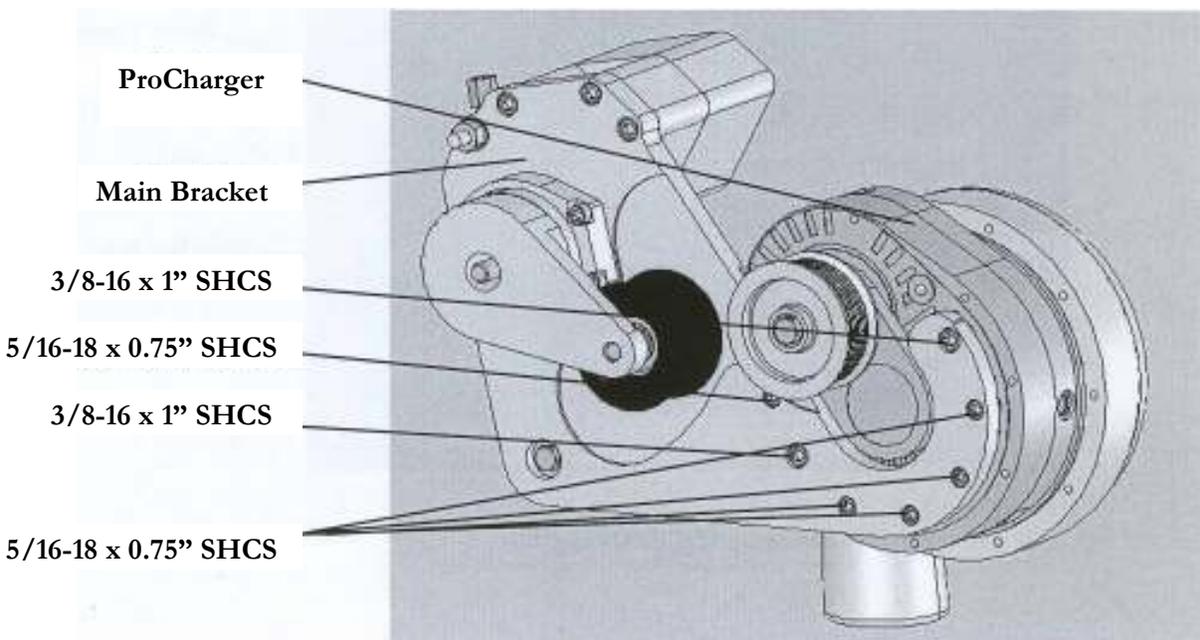
- 2) Remove the 10mm alternator bolt as shown.



Remove  
Alternator  
Bolt Located  
Under Power  
Steering Pulley

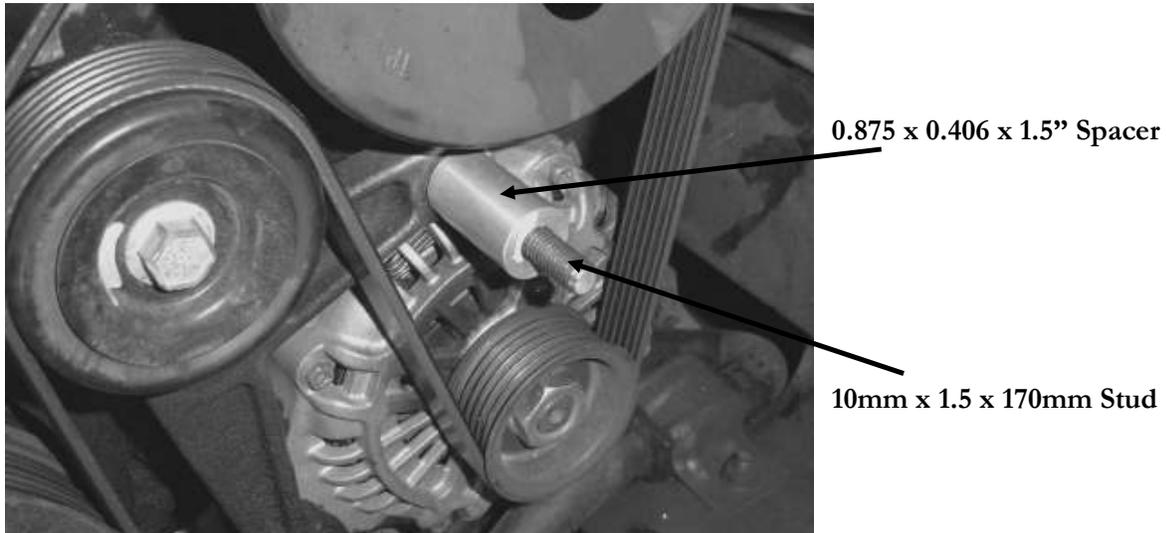
**Illustration G2 - Alternator Bolt Removal**

- 3) Install the ProCharger to the main bracket using the supplied 2(3/8-16 x 1" SHCS) and the 5(5/16-18 x .750" SHCS).



**Illustration G3 - ProCharger to Main Bracket Installation**

- 4) Attach the 3" rubber 90-degree elbow to the ProCharger discharger and loosely secure with a hose clamp. Rotate the rubber elbow so the opening is perpendicular to the main bracket. Leave this hose clamp loose so final tubing adjustment may be made. **(This hose will need to be trimmed approx 15-25mm before attaching to procharger outlet, check that the outlet is pointing between the alternator and the chassis rail, if the compressor housing needs to be rotated a little then do so now)**
- 5) Insert the supplied 10mm x 1.5 x 170mm stud into the alternator bolt hole from Step 2.
- 6) Slide the supplied .875 x .406 x 1.5" spacer onto the 10mm stud installed in Step 5, loosening the lower alternator bolt to aid in the fitment of the main bracket.



**Illustration G4 - 10mm Stud Installation**

- 7) Install both SPAL thermo-fans to the fan shroud using the M6 bolts, washers & locknuts supplied. Install fan shroud to radiator, **Slide fan shroud and radiator assembly back into car**



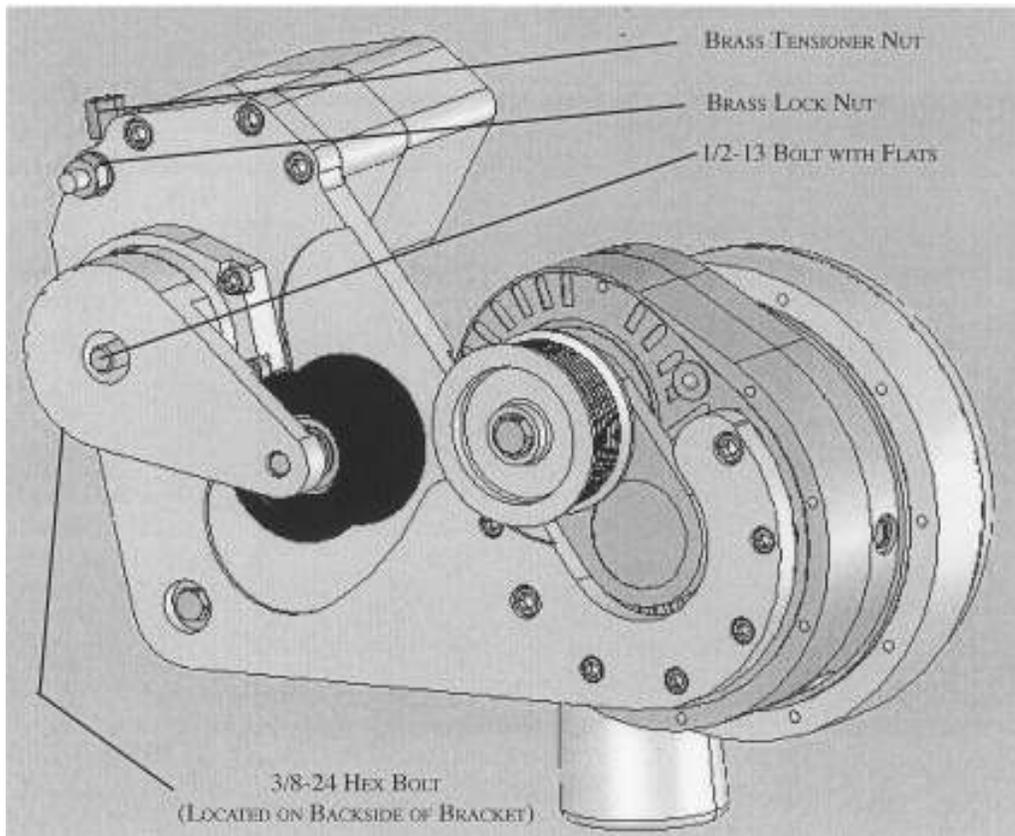
**Illustration G5 - Fan Shroud Assembly**

- 8) Connect the main bracket assembly to the billet standoff using the three supplied 3/8-16 x 3.5" SHCS. Place the single .875 x .406 x 2.3" spacer between the bracket and standoff. This spacer will be bolted through using the farthest left bolt. Install the billet spacer (two holes) between the main bracket and the standoff using the centre and farthest right boltholes.
- 9) Install the 10mm speed nut and flat washer over the stud installed in Step 5.
- 10) Tighten all bolts securely.  
**Note:** the 3" rubber 90-degree elbow attached to the ProCharger discharge will be located between the alternator and the frame rail. Although this is a tight fit and the hose will be slightly deformed, this will not affect performance.



**Illustration G6 - Completed ProCharger Installation**

- 11) Install the supplied 8-rib belt.
- 12) Using a 9/16 wrench, loosen the 3/8"-24 hex bolt which threads into the back side of the rotary tensioner.
- 13) Using a 9/16 wrench, loosen the brass locknut located at the front of the bracket. This will allow the draw bolt to be rotated during tensioning.
- 14) Using a 3/8 wrench, slightly loosen the 1/2-13 hex bolt, which is threaded through the tensioner arm. The threads on the end of this bolt have two flats machined on them to allow a 3/8 open- end wrench to be used. This allows for an easy front access to this bolt.
- 15) Now that everything is slightly loose, rotate the brass tensioner nut located at the very top of the draw bolt clockwise to tension the belt. The belt will be sufficiently tensioned when the 1st groove on the tensioner arm is even with the groove on the tensioner base.
- 16) Tighten the 1/2-13 through bolt using a 3/8 open-end wrench.
- 17) Tighten both the 3/8-24 bolt and the 3/8-brass locknut. The belt is now tensioned. The belt should be re-tensioned after the first 100km



**Illustration G7 - Belt Tensioner Component Location**

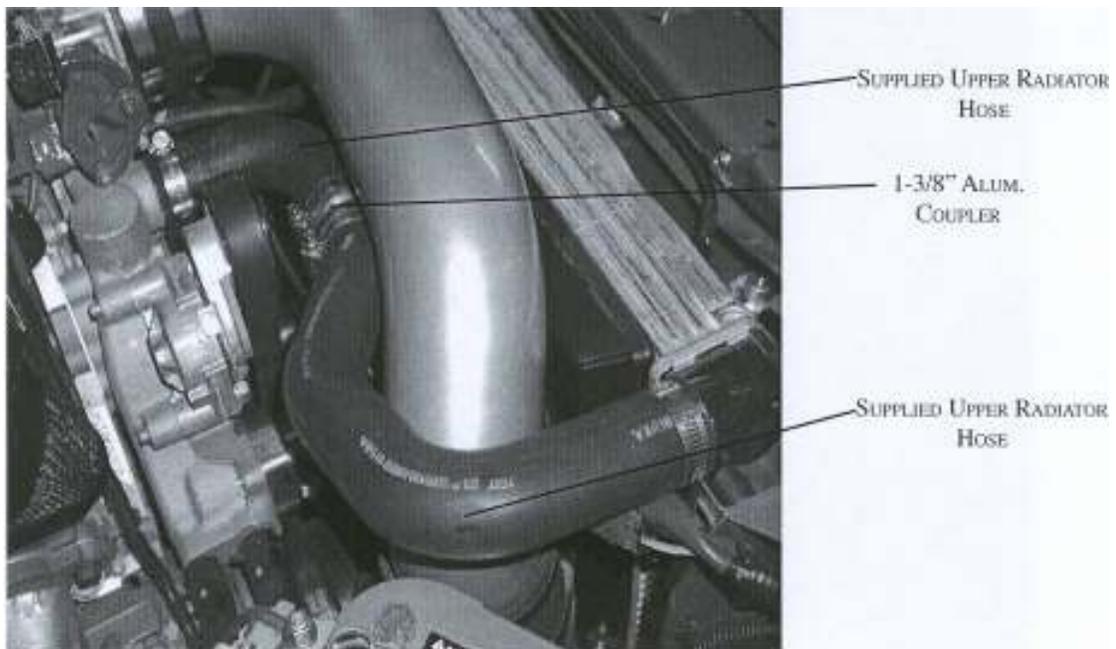
18) Proceed to Section **H** for cooling system modification.

## H. COOLING SYSTEM MODIFICATION:

- 1) Cut the factory wiring harness from the factory fans. Cut the white connectors off of the two Spal fans. The short factory harness will be connected to the 16" fan by splicing the orange/ blue wire from the now removed connector plug to the red wire from the Spal fan.

The two other factory wires from this connector plug (orange/yellow and blue/yellow) will be spliced together and then connected to the black ground from the Spal fan. The longer factory harness will be connected to the 6.5" fan by splicing the orange/black wire from the now removed connector plug to the blue wire from the small Spal fan. The two other wires from the harness plug (orange/yellow and blue/yellow) will be spliced together and then connected to the black ground from the small Spal fan.

- 2) Connect the supplied upper radiator hose to the 1-3/8" aluminium coupler as shown using the supplied hose clamps. Do not fully tighten the radiator side hose clamp, as it will be removed momentarily to help purge the cooling system.
- 3) Refer to Illustration H2, Trim supplied hose, use the short 90deg hose to make the upper radiator hose,



**Illustration H1 - Upper Radiator Hose Assembly**  
(Throttle Body Tube Does Not Need To Be Installed)



**Illustration H2 - Cut Location for Upper Radiator Hose**

- 4) Use the long 90deg hose(from step 3), the supplied lower coolant transfer tube and the supplied radiator hose to connect the thermostat outlet to the lower radiator outlet. (refer to illustration H3)



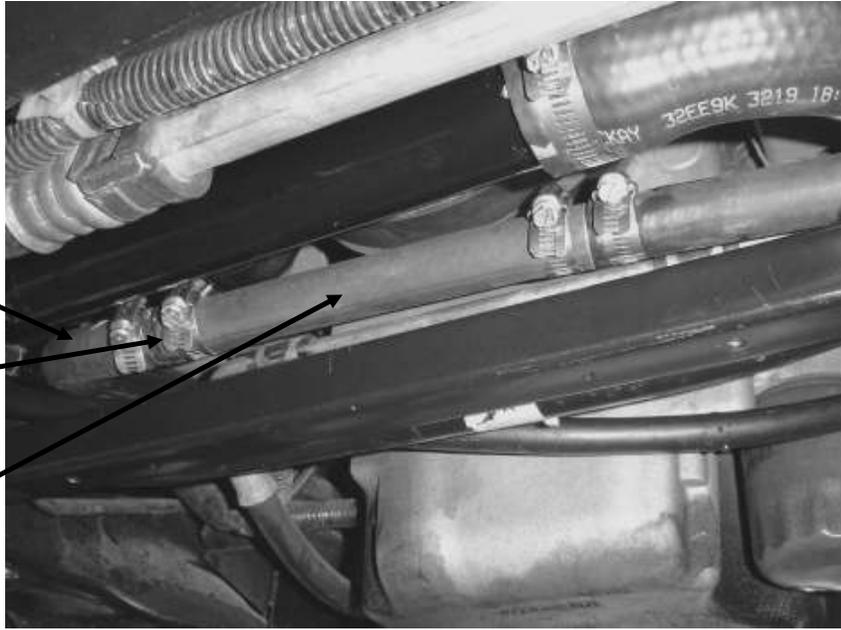
**Illustration H3 - Cut Location for Upper Radiator Hose**

- 5) This trimmed long 90deg section will be used to connect the short end of the lower coolant transfer tube to the thermostat housing.
- 6) Install the trimmed hose and secure with hose clamps. Use supplied radiator hose to connect the other end of lower coolant transfer tube to the lower radiator outlet
- 7) Using the supplied 3/4" brass hose joiners and hose clamps, connect the supplied 3/4" heater hose to the heater hose located near the lower drivers side of engine compartment. (This hose was previously connected to the factory coolant transfer tube.)

Heater Hose

3/4" Hose  
Joiner

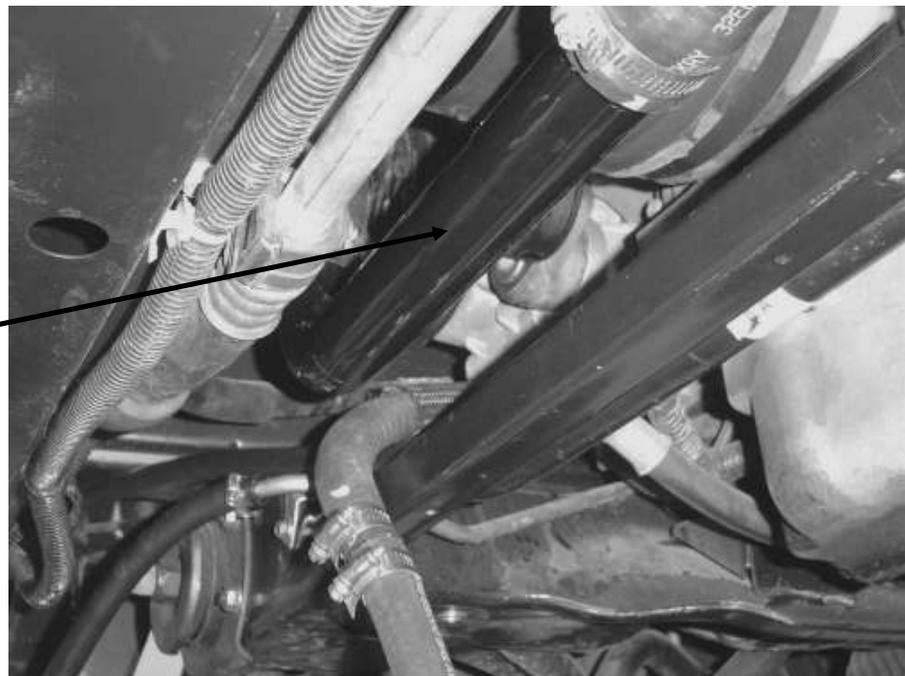
To Coolant



**Illustration H4 - Heater Hose to Coolant Reservoir Connection**

- 8) Route the original hose from the coolant reservoir down through its original position on the passenger side inner fender well located near the bottom of the ProCharger.
- 9) Connect the coolant reservoir hose to the installed 3/4" heater hose using the supplied 3/4" hose joiner and hose clamps.
- 10) Following the factory instructions, fill the coolant reservoir with the recommended coolant. Do not start engine at this time

Lower Coolant  
Transfer Tube



**Illustration H5 - Lower Coolant Transfer Tube**



**Illustration H6 - Lower Coolant Transfer Tube**

11) Proceed to Section **I** for intercooler and tubing installation.

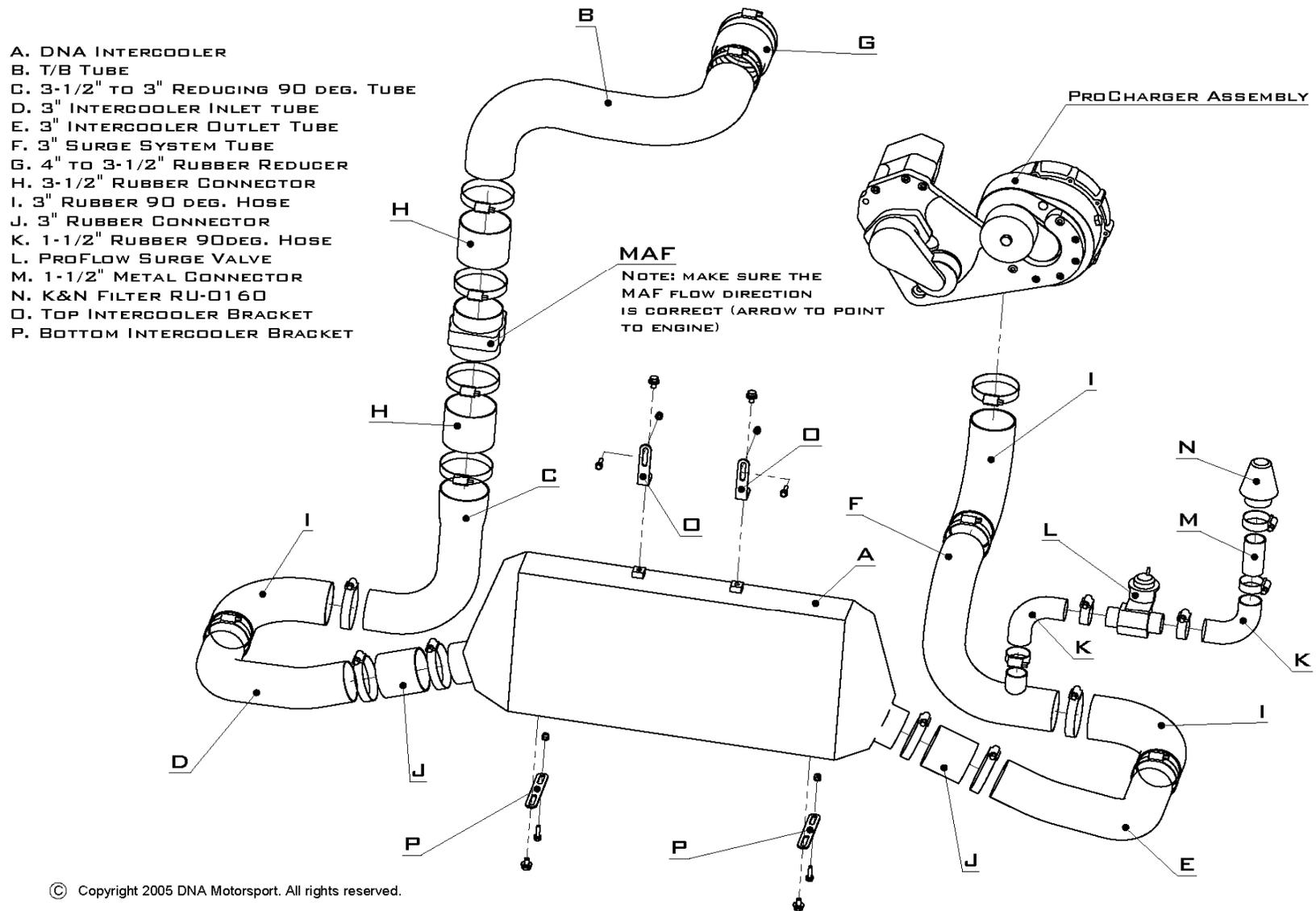


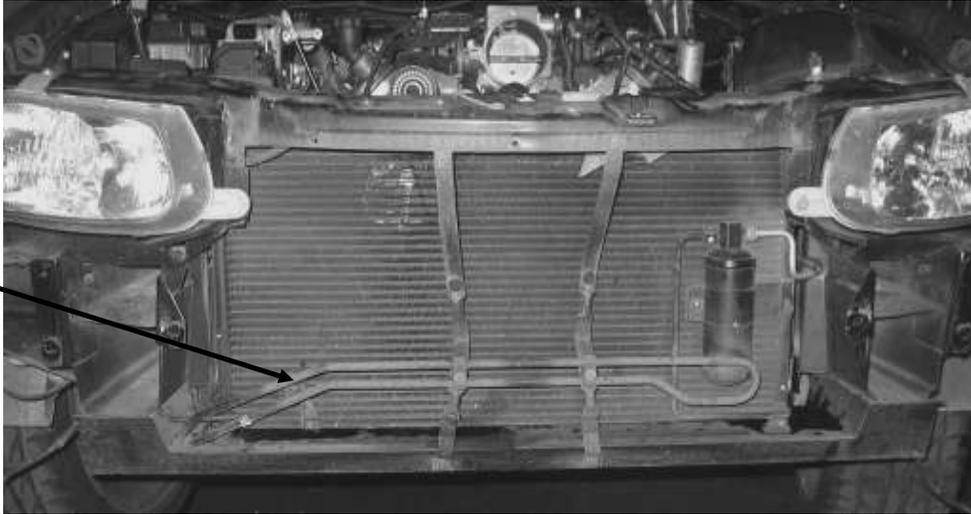
Illustration I1 - DNA Intercooler Kit

## I. Intercooler, Tubing, and Anti-Surge System Installation:

Use Illustration I1 for intercooler tubing installation.

- 1) Remove the factory P/S cooler hoses and drain remaining P/S fluid.
- 2) Remove the P/S cooler from the black stamped brackets located in front of the A/C condenser and remove these brackets.

Power  
Steering  
Cooler

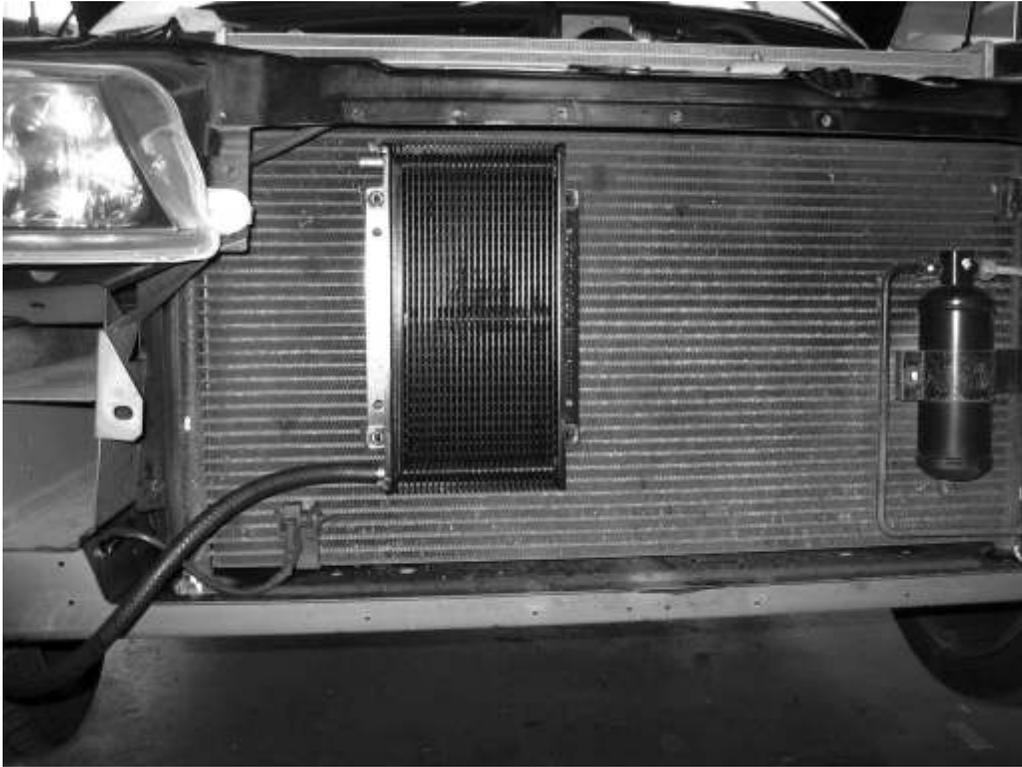


**Illustration I2 - P/S Cooler Removal**



**Illustration I3 - P/S Cooler Removed**

- 3) Install the supplied Power steering cooler. This will be flush mounted onto the AC condenser – see Illustration I4



**Illustration I4 - New Power Steering Cooler Installed**

- 4) Connect the new oil cooler hose from one end of the P/S cooler to the return inlet on the P/S reservoir (which should now be in its new position on the firewall) connect the other end of the P/S cooler to the outlet pipe that comes from the steering rack (this will be in the factory position, near bottom of radiator on drivers' side)
- 5) Use a drill to enlarge the holes on the upper radiator support (where the black stamped brackets were) Connect the two supplied "L" shaped intercooler brackets to the top of the intercooler using the supplied 8mm bolts, spring and flat washers
- 6) Position the intercooler in front of the A/C condenser
- 7) Attach the intercooler to the upper radiator support



**Illustration I5 - Intercooler Mounted**

- 8) Install the lower intercooler brackets to the intercooler, then mark and drill the positions on the lower radiator support and fasten the bracket to the support using the supplied hardware



**Illustration I6 - Intercooler Brackets Installed**

The use of silicon spray between hose connections will aid in the fitment of the intercooler pipes.

- 9) Connect the 3" surge tube (the tube with the surge valve outlet on it) to the 3" 90 degree rubber which should already be installed on the procharger discharge, secure the connections loosely with the supplied hose clamps, fit some rubber hose to the A/C line so the surge pipe does not rub against it
- 10) Install the 3" rubber 90 degree hose to the outlet of the surge tube



**Illustration I7 - Lower Intercooler Tube**

- 11) Slide the 3" DNA hose over outlet tube E (refer diagram), Install pipe between the 90 degree hose from Step 12 and the intercooler. Slide the hose over the intercooler and

- secure all hose connections with the supplied hose clamps
- 12) Install the 3" DNA hose onto the intercooler, install inlet pipe D



**Illustration I8 - Intercooler Tubing Installed**

- 13) Install the 3" rubber 90 degree hose to the other end of inlet pipe
- 14) Insert the 3.5" to 3" reducing metal 90 degree tube up through the bottom of the driver's side of the vehicle and connect to the 90 degree rubber from Step 15, secure connections with hose clamps
- 15) Trim two pieces of 3.5" rubber about 3" in length and insert one 3.5" rubber connector onto the 3.5" end of the tube installed in step 16, secure this connection with a hose clamp
- 16) Insert the MAF sensor into the 3.5" rubber connector from step 17 making sure the flow direction arrow is pointing up and secure with another hose clamp
- 17) Slide the last 3.5" rubber connector onto the open end of the MAF sensor and secure with a hose clamp
- 18) Slide the 4" to 3.5" rubber connector onto throttle body but do not clamp at this point, **this rubber reducer will need to be trimmed**, use the T/B tube to determine the correct amount for trimming
- 19) Slide the rubber reducer over the 3.5" end of the T/B tube until it reaches the flared section of the tube, then insert the 3.5" end of the tube into the rubber connector at the MAF sensor, slide the rubber reducer over the throttle body, secure all connections with hose clamps



**Illustration I9 - Top Intercooler Tube**

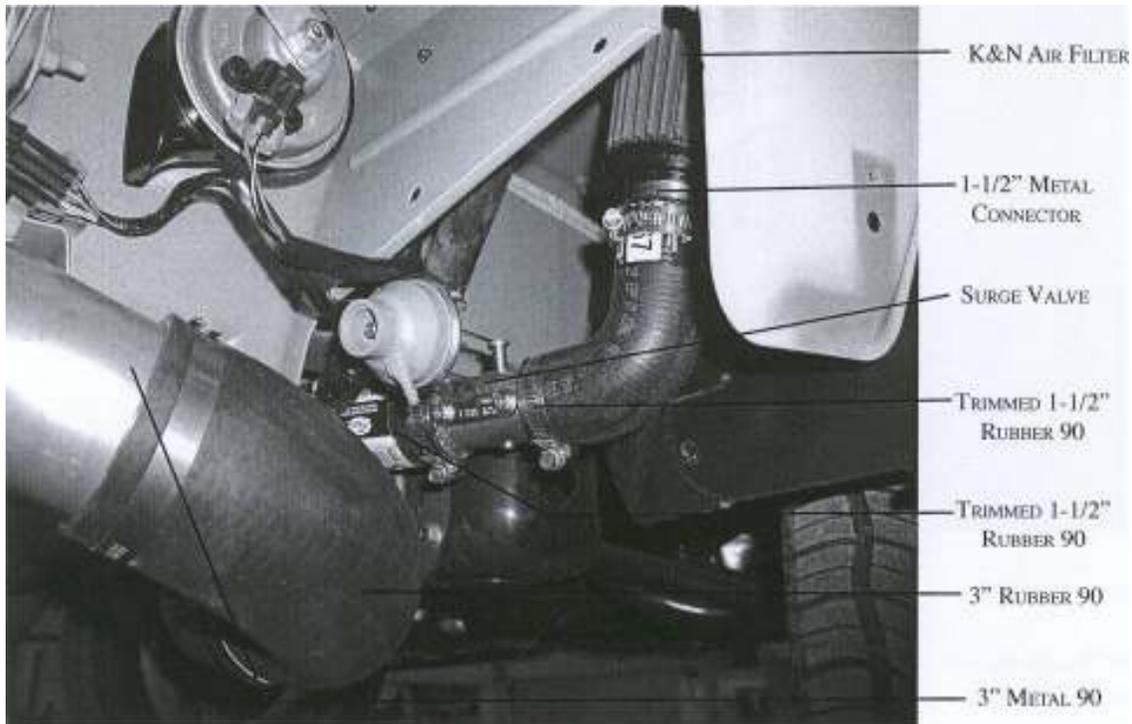
- 20) Finally adjust all tubes for clearance and fitment, do a final tighten on all hose clamps
- 21) Install supplied bumper bar re-enforcement, re-connect horns



**Illustration I10 - Bar Re-enforcement Installed**

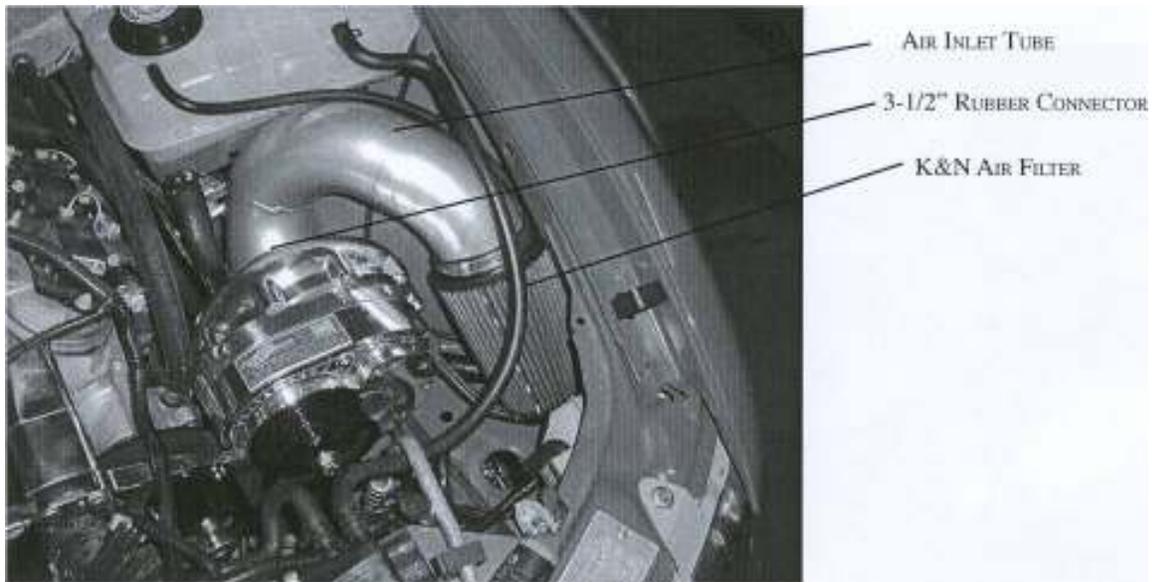
- 22) Connect the supplied 1-1/2" rubber 90-degree hose to the surge port on the surge tube. Do not fully secure this connection, as it may need to be trimmed slightly. Remove and trim this hose if necessary, then reinstall and secure with hose clamp.
- 23) Install the supplied ProFlow surge valve as shown and secure with hose clamp.
- 24) Insert the supplied 1-1/2" metal connector into the long end of the other 1-1/2" rubber 90-degree hose and secure connection with hose clamp. **Alternatively you may attach the filter directly to the surge valve outlet**

- 25) Install the supplied K&N (PN RU-0160) filter onto the other end of the previously installed metal connector. Secure this connection with the K&N supplied hose clamp.
- 26) Connect the open end of the 1-1/2" hose assembly to the open end of the ProFlow valve and secure with a hose clamp. The air filter should be located up inside the space between the front fascia and inner fender well area. Fit vacuum line to surge valve and route into engine bay

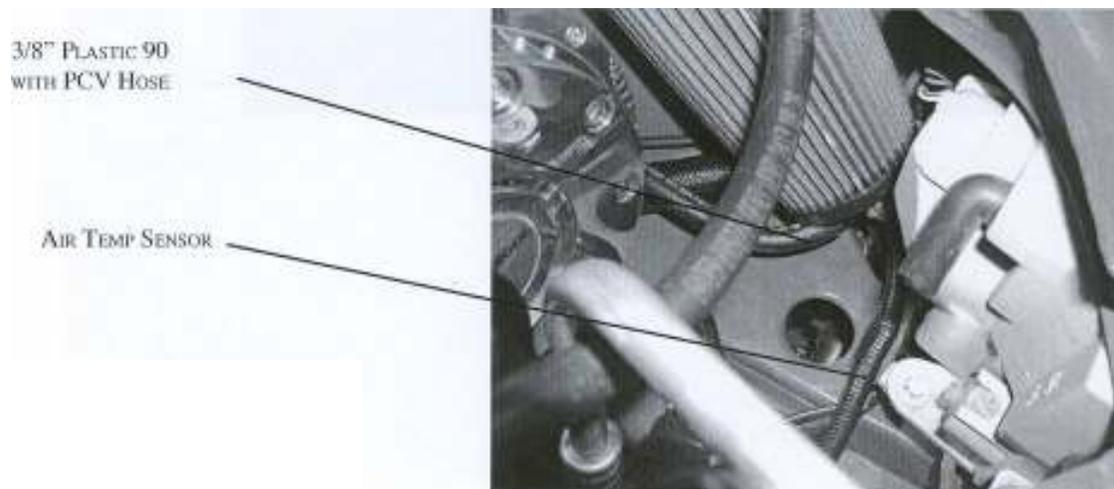


**Illustration I11 - Surge Valve Installation**

- 27) Install the supplied 3-1/2" rubber connector to the inlet of the supercharger and secure with a hose clamp.
- 28) Connect the supplied K&N air filter to the inlet tube as shown.
- 29) Drill a 3/8" hole in the end of the air filter and install the factory air temperature sensor.
- 30) Drill another 3/8" hole in the bottom of the air filter near the air temp sensor. Install the supplied 3/8" plastic 90 barb fitting as shown.
- 31) Connect the inlet tube to the previously installed 3-1/2" rubber section and secure with the supplied hose clamp.
- 32) Plug in the air temperature sensor extension harness to allow the harness to reach the installed sensor.
- 33) Use the supplied hose to connect the breather from the driver's valve cover to the plastic 90 barb in the air filter.



**Illustration I12 - Air Inlet Installation**



**Illustration I13 - Air Inlet Installation**

34) Proceed to Section J for final assembly.

## J. FINAL ASSEMBLY

- 1) Fill the power steering reservoir but do not start engine!!!
- 2) Install the front bumper cover
- 3) Reconnect the horn and fog light wiring harnesses.
- 4) Splice the supplied vacuum manifold inline with the vacuum hose which feeds the brake booster and secure connection with hose clamps as shown in Illustration J1.

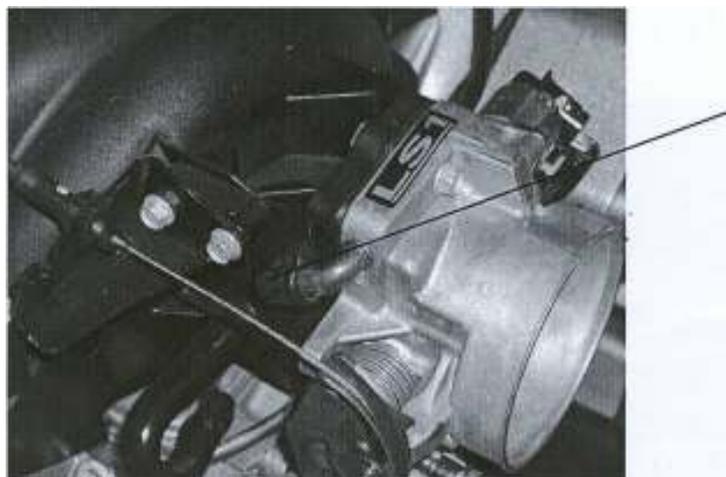


**Illustration J1 - Vacuum Manifold Installation**

- 5) Route the supplied 3/16" vacuum line from the surge valve to the vacuum manifold along the passenger side of the engine compartment. Trim vacuum line if necessary

Note: The vacuum manifold has three possible port locations. One threaded hole will have a thread pipe plug installed and will not be used. The other two (located towards the top) are to be used for the surge valve reference and boost gauge reference. Although DNA Motorsport does not supply a boost gauge with this system, it is highly recommended that one be purchased. It is for this reason that both a 1/8" barb as well as a 1/8" pipe plug has been supplied for this extra hole.

- 6) Disconnect the PCV vent line located at the top of the T /B and install the supplied 3/8" vacuum cap and secure with a zip tie as shown in Illustration J2.



**Install  
Vacuum  
Cap and  
Cable-tie**

**Illustration J2 - Vacuum Cap Installation**

- 7) Reinstall plastic engine cover.
- 8) Connect the female end of the MAP sensor wiring harness extension to the factory MAP sensor wiring harness.
- 9) Route harness extension along the radiator to the MAP sensor and secure connection.  
Note: Be sure to keep harness free from rotating parts!
- 10) Using the factory seam as a guide, trim the plastic radiator cover as shown in Illustration J6.



**Illustration J3 - Factory Radiator Cover Modification**

- 11) Re-install plastic radiator cover.
- 12) Final check of all connections for proper torque.
- 13) Fill coolant
- 14) **Fill the ProCharger with the correct amount of oil**

## **K. ECM REFLASHING AND TUNING**

Proper fuel pressure is the main tuning issue of your system. The ProCharger is nothing more than an efficient air pump used to substantially increase the volumetric efficiency of your engine. Intercooling is utilized to remove the heat caused by compressing the air, and this in turn results in an intake air temperature which is only 25°-35° above ambient at 9 psi (vs 90-150° above ambient with non-intercooled superchargers). Thanks to this efficiency, brake specific fuel consumption (BSFC) is very close to that of a naturally aspirated application. This means that there is no need to run the over-sized (over-rich) fuel injectors frequently seen with non-intercooled forced induction applications, where fuel is being used not only to create horsepower, but to fight detonation as well. However, maintaining the proper air/fuel ratio is still extremely important even in intercooled applications. In order to extract as much power as possible from this increased air flow, the proper amount of fuel must be added. Too much fuel will cause the car to hesitate, be sluggish, emit heavy black smoke and not attain proper boost levels. A lean condition will cause the car to detonate (which, under higher boost conditions, can cause engine damage), run hot or break up.

To get the most out of your system it will prove beneficial to utilize an air fuel ratio meter. The wide band units are most ideal when tuning an engine for maximum performance. Meters that utilize stock oxygen sensors are excellent for tuning under idle and cruise conditions, where fuel economy is the targeted goal, but lack the necessary resolution in the regions where maximum power is made (12.6:1 A/F ratio). Usage of a wide band sensor will provide data that will allow you to achieve optimum performance throughout your engine's operating range.

### **SUPPLEMENTAL OFF-ROAD NOTES:**

Off-road, high boost applications require high energy ignition systems for proper combustion. If using a stock ignition system on such an application, the plug gap must be reduced to approximately 0.8mm(0.030") to avoid "blowing out" the flame/spark. The use of spark plugs one heat range cooler than stock is also advised.

## **L. OPERATION AND MAINTENANCE**

### **Cold Starting**

Never race your engine (and ProCharger) when your engine is cold. Allow the water temperature to climb into operating range for several minutes before driving above 2,500 rpm, to ensure adequate oil lubrication.

### **Fuel Quality**

For best performance and reliability, always use premium grade fuel (95 octane or higher). Always listen for signs of detonation after refueling, and after replacement or modification of any fuel system components. Back off throttle should detonation occur. With a properly installed ProCharger intercooled supercharger system, detonation should not be an issue. Your fuel filter should be changed every 10000 kms.

### **Oil and Filter Maintenance**

Always change your engine oil and filter every 5000kms!

### **Ignition System Maintenance**

Because of the vastly cooler intake temperatures delivered by intercooling, you should be able to run full timing on your intercooled ProCharger application. Also, be aware that with forced induction and full timing your engine will continue to pull hard all the way to the redline, and for maximum performance you should now shift just prior to the redline. If your spark plugs are platinum, more than a year old or have more than 10,000 kms logged, you should consider changing them before driving your vehicle under load. Additionally, spark plug wires should be changed if visibly damaged or whenever resistance exceeds factory specifications.

#### **Air Filter Maintenance**

Your air filters should be cleaned periodically, potentially as often as every 10,000 kms or 6 months, even though a service interval of 50,000 -100,000 kms is quoted by the manufacturer under normal driving conditions. A clogged air filter will result in decreased boost levels and vehicle performance. Always operate your vehicle with an air filter, failure to do so may result in damage to your ProCharger and/or personal injury!

### **Belt Replacement**

The belt which turns your ProCharger will stretch after initial run-in, and should be retightened after the first hundred kms, if not sooner. After possibly one more tightening of the belt with the tensioner, further stretching should not occur. Tighten the belt sufficiently to avoid slippage, but do not overtighten, as this could cause damage to the ProCharger's precision bearings. When removing belts, ensure that they are re-installed to turn in the same direction as before. Should you reuse a thrown belt and find that it needs frequent re-tightening, the belt is damaged and should be replaced. Gates Micro-V belts are recommended

### **Impeller Speed**

Maximum impeller speed should not exceed the impeller redline speed of 60,000 rpm for the P-1SC-1 model. To determine the impeller speed, the following formula is used: Maximum impeller speed = crankshaft pulley diameter (N1) divided by supercharger pulley diameter (N2), multiplied by the step-up ratio (4.10 for the P-1SC-1), multiplied by engine rpm at redline.

$$\text{Impeller RPM} = (N1/N2) \times 4.10 \times \text{engine RPM}$$

## M. SUPERCHARGER MAINTENANCE

**WARNING: All Sc Superchargers Contain No Oil From The Factory. You Must Add The Supplied Procharger Oil Prior To Use.**

Use only ATI supplied oil in your SC ProCharger. The ATI oil has been specially formulated for the bearings in the ProCharger and use of oil other than that supplied by ATI will void your warranty.

### OIL CHANGE INTERVALS

The first oil change should be performed at 500km and at 10000km intervals thereafter. Clean drain plug after every oil change. Drain oil by removing the magnetic drain plug. Clean off the magnetic drain plug before reinstalling. See .figure below

### OIL LEVEL

The oil level must be checked periodically (when cold) to ensure the proper oil level in the ProCharger. The dipstick can be loosened using a flat blade screwdriver or a coin. When installed, the oil level should be between the min and max levels. If the oil level falls below min, fill the ProCharger, through the dipstick hole, until the proper oil level is reached. Warning: Filling the ProCharger higher than the "max" level on the dipstick will lead to bearing and/or seal damage. The SC ProChargers are sealed units and normally will not require the addition of oil between service intervals. If excessive consumption is noted, the unit should be sent to ATI for inspection/repair. Disassembly of the supercharger will void your warranty.

### GENERAL

When removing the dipstick, be sure to retain the nylon washer. A spare washer is provided with each box of SC oil (a box is included with each system). Do not remove or replace either the nylon washer on the dipstick, or the rubber o-ring on the drain plug with anything other than ATI supplied replacements. Evidence of either case may void factory warranty. A discoloration of the oil and residue on the drain plug will be noticed during initial oil changes. This is no cause for concern and will eventually diminish. The serial tag on your SC ProCharger must be pointing upwards for proper orientation. Installing the supercharger in another orientation will result in inadequate oiling and supercharger failure.

