

# Maxflow® Power Cooler®

## Installation Instructions

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### 1999-2001 Ford 4.6 Mustang COBRA (4 Valve)

P/N: 8N301-050 CARB EO #D-213-15



### ENGINEERING, LLC

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# FOREWORD

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Proper installation of this supercharger kit requires general automotive mechanic knowledge and experience. Please browse through each step of this instruction manual prior to beginning the installation to determine if you should refer the job to a professional installer/technician. Please call Vortech Engineering for installers in your area.

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# NOTICES

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## **(Read before installation is started)**

Included in this kit is a smaller than originally supplied supercharger pulley. This new pulley is recommended to achieve the best performance results. Removal of the factory sealed pulley will reduce the supercharger warranty from three years to one year unless the supercharger unit (with the original pulley still attached) and new pulley are sent into Vortech for removal, installation and re-sealing. If the supercharger warranty is not a concern or if the supercharger warranty has expired, the pulley may simply be removed and replaced with the new part supplied. Hammering/prying etc. on the supercharger and/or pulley will cause damage to the parts. Light heating of the supercharger pulley with a propane torch (if the pulley is tight on the shaft) will aid removal. A return authorization number is required before the supercharger and pulley are sent into Vortech. Call the Vortech service department at (805) 247-0226 for a return authorization number. Return freight (ground) will be paid by Vortech.

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*This product may not be legal for use on public roads in all 50 states.*

# Vortech Maxflow® Power Cooler® Installation Instructions

## 1999 Ford 4.6 Mustang Cobra (4 Valve)

***Congratulations on selecting the best performing and most efficient aftercooler today... the Vortech Maxflow Power Cooler!***

**Before beginning this installation,  
please read through this entire instruction booklet**

The Vortech Maxflow Power Cooler system was designed as a street/strip oriented aftercooler, specifically for use on 1999 Ford 4.6 Mustang Cobra vehicles equipped with a Vortech supercharger producing up to approximately 580 horsepower.

As with any power enhancing product, this system is intended for use on healthy, well-maintained engines. *Vortech Engineering is not responsible for engine damage.* Installation on new vehicles will not harm or adversely affect the break-in period so long as factory break-in procedures are followed.

**For best performance and continued durability, please take a note of the following key points:**

1. Use only premium grade fuel 92 octane or higher (R+M/2).
2. Always listen for any sign of detonation (pinging) and discontinue hard use (no boost) until problem is resolved.

**IMPORTANT:** *If the vehicle still has the battery located in the factory position, it must be relocated into the trunk to make room for the water tank assembly. Vortech part number 8N150-010 is a Heavy-Duty Battery Relocation Kit that may be purchased separately. Commonly available "universal" relocation kits may be used but they will most likely contain a smaller cable. Additional fabrication may also be necessary when using a "universal" kit.*

### TOOL & SUPPLY REQUIREMENTS:

- Open End Wrenches (7/16", 9/16", 5/8", 11/16")
- 3/8" Ratchet
- 8mm, 13mm, 9/16" and 18mm Sockets
- 5/32", 3/16", 9/16" Allen Wrenches
- Flat #2 Screwdriver
- Phillips #2 Screwdriver
- Utility Knife
- Torque Wrench (in/lbs)
- Wire Cutters, Strippers and Crimpers
- Drill Motor
- 1/8", #21, 1/4" Drill Bits
- Tape Measure
- Ford Springlock 3/8" Fuel Fitting Disconnect Tool
- Pipe Tape (Teflon)
- Adjustable Wrench



# Vortech Maxflow® Power Cooler® Part No. 8N301-050

## 1999 Ford 4.6 Mustang Cobra (4 Valve)

### PARTS LIST

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

#### Air/Water Aftercooler Assembly (8N201-060)

PART NUMBER	DESCRIPTION	QUANTITY
8N101-060	Welded Core Assy "99 4.6 4V	1
7R002-048	#48 goldenseal Hose Clamp	1
7P500-078	1/2NPT x 3/4 Hose Fit	2
7S350-301	Reducer, 3.50-3.00	1
008341	Power Cooler Decal	1

#### Water Cooler Assembly (8N106-030)

PART NUMBER	DESCRIPTION	QUANTITY
8N006-010	Water Cooler	1
7P500-026	90° Brass Fittings	2
8N010-050	Mounting Tabs	2
7E010-075	#12 x 3/4 HXHD Sheet Metal	4
7J010-001	#10 Flat Washer	4
7A250-075	1/4-20 x 3/4 SHCS	5
7F250-021	1/4-20 Nylock	5
7J250-001	1/4" Flat Washer	10

#### Water Pump Assembly (8N107-020)

PART NUMBER	DESCRIPTION	QUANTITY
5W001-011	14-16 GA Eyelet	1
5W001-012	18-22 GA Butt Connector	1
5W018-010	18 GA Wire Red (99")	8.25'
5W001-019	12 GA Butt Connector	2
5W001-014	Fuse Holder	1
5W001-015	Fuse Blade Style	1
5W001-002	Fuse Tap	1
5W001-040	12-10 GA Female Slide	1
8F001-402	Pump, Water	1
7E010-075	#12 x 3/4" Sheet Metal Screw	2
7J010-001	#10 Flat Washer	2
7U133-060	3/4" x 90° Hose Elbow	1
7R003-027	Adel Clamp	1
5W001-024	Mini ATC Fuse Tap	1
5W001-025	18-22 GA Mini Female Slide	1

#### Water Tank Assembly (8N105-030)

PART NUMBER	DESCRIPTION	QUANTITY
8N105-010	Water Tank w/Fittings	1
7U038-000	3/4" Heater Hose (228")	19'
7R007-001	Plastic Double Grip Clamps	7
7R003-016	15/16" Adel Clamps	3
7E010-075	#12 x 3/4 HXHD	3
7J010-001	#10 Flat Washer	3
7U100-044	Nylon Tie Wraps 4"	16
7U100-066	Nylon Tie Wraps 11"	6

#### Support Components

PART NUMBER	DESCRIPTION	QUANTITY
2A036-325	S/C Pulley, 3.25" 6-Groove	1
4FR012-030	Duct Discharge B	1

# INSTALLATION INSTRUCTIONS

# 1. Preparation and Removal

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- A. Disconnect and remove the battery (if located in the factory position, the battery will need to be relocated to the trunk).
- B. Remove the supercharger discharge tube and bypass valve assembly.
- C. Remove the belt, supercharger and bracket.
- D. Disconnect line from the air inlet that connects to the valve cover vent.

**NOTE:** *Temporarily cap oil feed and oil drain to protect your engine from foreign particles.*

- E. If you are returning the supercharger assembly to Vortech for a pulley change, remove the supercharger from the bracket.

\* Ignore these steps if the kit is being originally installed onto the vehicle with the supercharger kit at the same time. Refer to the supercharger kit instruction manual.

## 2. Supercharger Pulley Replacement

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***Disregard This Section If Installing The Kit For The First Time.***

- A. Remove original 3.60" supercharger pulley from the supercharger and install the supplied 3.25" pulley.

**NOTE:** *Included in this kit is a smaller than originally supplied supercharger pulley. This new pulley is recommended to achieve best performance results. Removal of the factory sealed pulley will reduce the supercharger warranty from three years to one year unless the supercharger unit (with the original pulley still attached) and new pulley are sent into Vortech for removal, installation and re-sealing. If supercharger warranty is not a concern or if the supercharger warranty has expired, the pulley may simply be removed and replaced with the new part supplied. Hammering/prying etc. on the supercharger and/or pulley will cause damage to the parts. Light heating of the supercharger pulley with a propane torch (if the pulley is tight on the shaft) will aid removal. A return authorization number is required before the supercharger and pulley are sent into Vortech. Call the Vortech service department at (805) 247-0226 for return authorization number. Return freight (ground) will be paid by Vortech.*

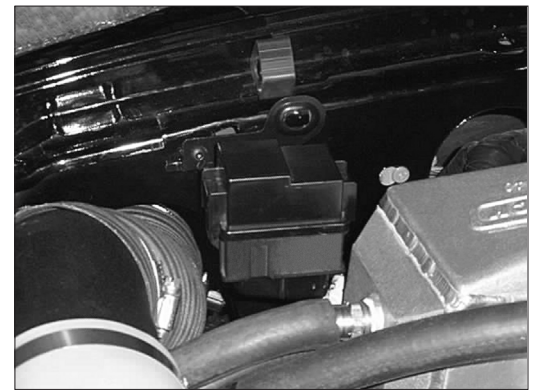
- B. Mount the supercharger onto the bracket and reconnect oil feed and drain lines.
- C. Reinstall the supercharger and bracket onto the vehicle.
- D. Reinstall the Vortech Accessory Drive Belt.

# 3. Power Cooler and Discharge Tube Mounting

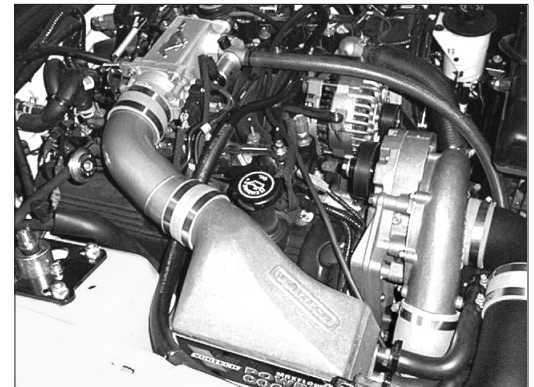
- A. Remove the fuse box located near the passenger's side strut tower with a 10mm wrench and detach the two plastic wiring harness anchors. Separate the bracket from the fuse box. Drill a 1/4" hole in the bracket as shown (see *Fig. 3-a*). Secure the bracket to the inner fender using the factory airbox bolt and clip-nut (see *Fig. 3-b*).
- B. Install the bypass valve onto the 1" cooler inlet barb using the original hose. Secure the assembly to the Power Cooler.
- C. Remove the silicone sleeves and clamps from the original discharge tube.
- D. Install the 2 3/4" diameter silicone sleeve onto the supercharger outlet and slide the sleeve back as far as possible, leaving the two #44 hose clamps loose.
- E. Slide the supplied 3-1/2" to 3" silicone reducer sleeve and clamp onto the aftercooler outlet. Put the #56 hose clamp on the other end of the reducer. Leave the two hose clamps loose.
- F. Reinstall the original 4-1/2" sleeve onto the throttle body leaving the two #72 hose clamps loose.
- G. With cooler into position, slide the silicone sleeve and clamps from the supercharger outlet onto the aftercooler inlet and secure.
- H. Install the discharge tube between aftercooler and throttle body and secure sleeves and clamps. (See *Fig. 3-c*.)
- I. Reconnect the bypass valve outlet to the 90° plastic elbow on the air inlet and secure with the original hose clamps. A small amount of trimming to the 1" hose may be necessary to ensure proper fit.



*Fig. 3-a*



*Fig. 3-b*



*Fig. 3-c*

## 4. Valve Cover Vent Line

- A. Using the 3/4" 90° elbow slide the shortest end onto the 3 1/2" x 45° inlet elbow and insert the 3/4" hose union into the opposite end.
- B. Cut a piece of 3/4" hose 34" in length and attach to the 3/4" hose union and to the idle air control motor.
- C. Attach the short end of the 5/8" x 24" 90° hose to the 3 1/2" x 45° inlet elbow and install the 5/8" hose union into the free end (see *Figure 4-a*).

**NOTE:** Trimming the 90° elbow may also be required to avoid any possible kinks in the line.

- D. Connect the valve cover vent line to the 5/8" hose union and trim the excess line as needed (see *Figure 4-b*).

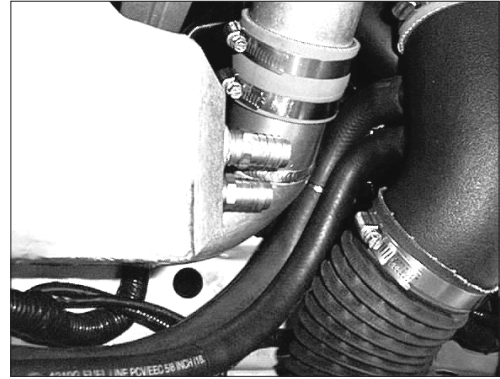


Fig. 4-a  
1996-1998 Models



Fig. 4-b

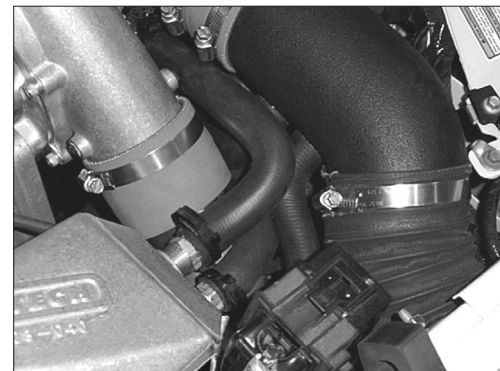


Fig. 4-c  
1999-2000 Models

## 5. Water Tank Mounting (Plumbing Schematic)

- A. Remove battery tray and notch to allow tank to sit flush with bottom of tray and reinstall (see *Figure 5-a*).
- B. Place the water tank in the tray previously occupied by the battery and secure using the original battery hold down (see *Figure 5-b*).
- C. Cut a piece of the 3/4" hose 50" in length and attach to the 3/4" 90° fitting (located at the lower rear of the water tank). Route downward and toward the front of the car (see *Figure 5-e* on the next page).
- D. Cut a piece of the 3/4" hose 98" in length and attach it to the water return fitting on the tank. Route the hose downward and secure with the supplied adel clamps and #12 hardware to the bottom of the radiator core support (see *Figure 5-c*). Connect the hose to the outlet fitting on the aftercooler routing it up and through the headlight well (see *Figure 5-d*).

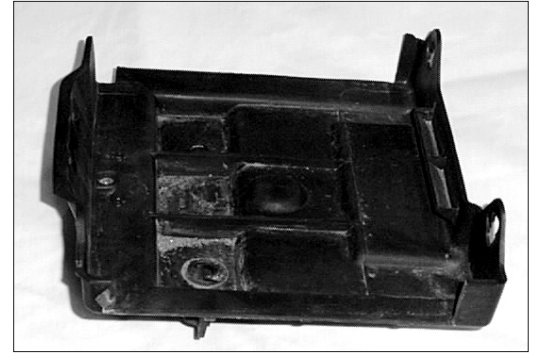


Fig. 5-a

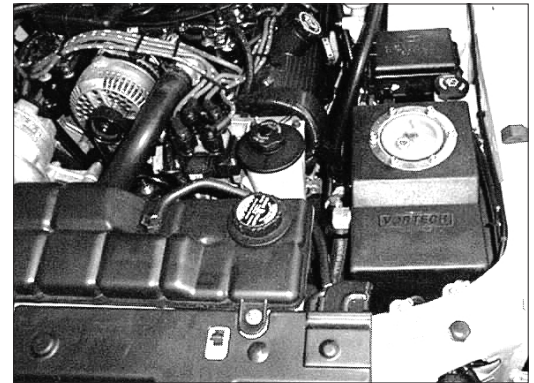


Fig. 5-b

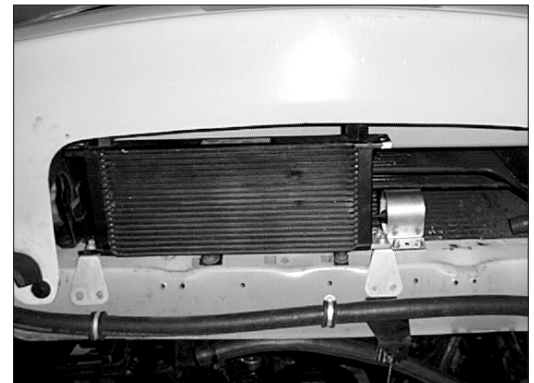


Fig. 5-c

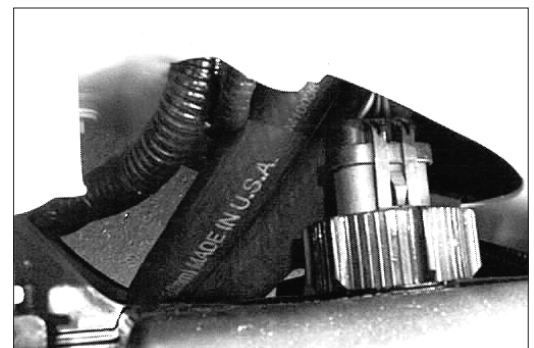


Fig. 5-d

## 5. Water Tank Mounting, cont'd (Plumbing Schematic)

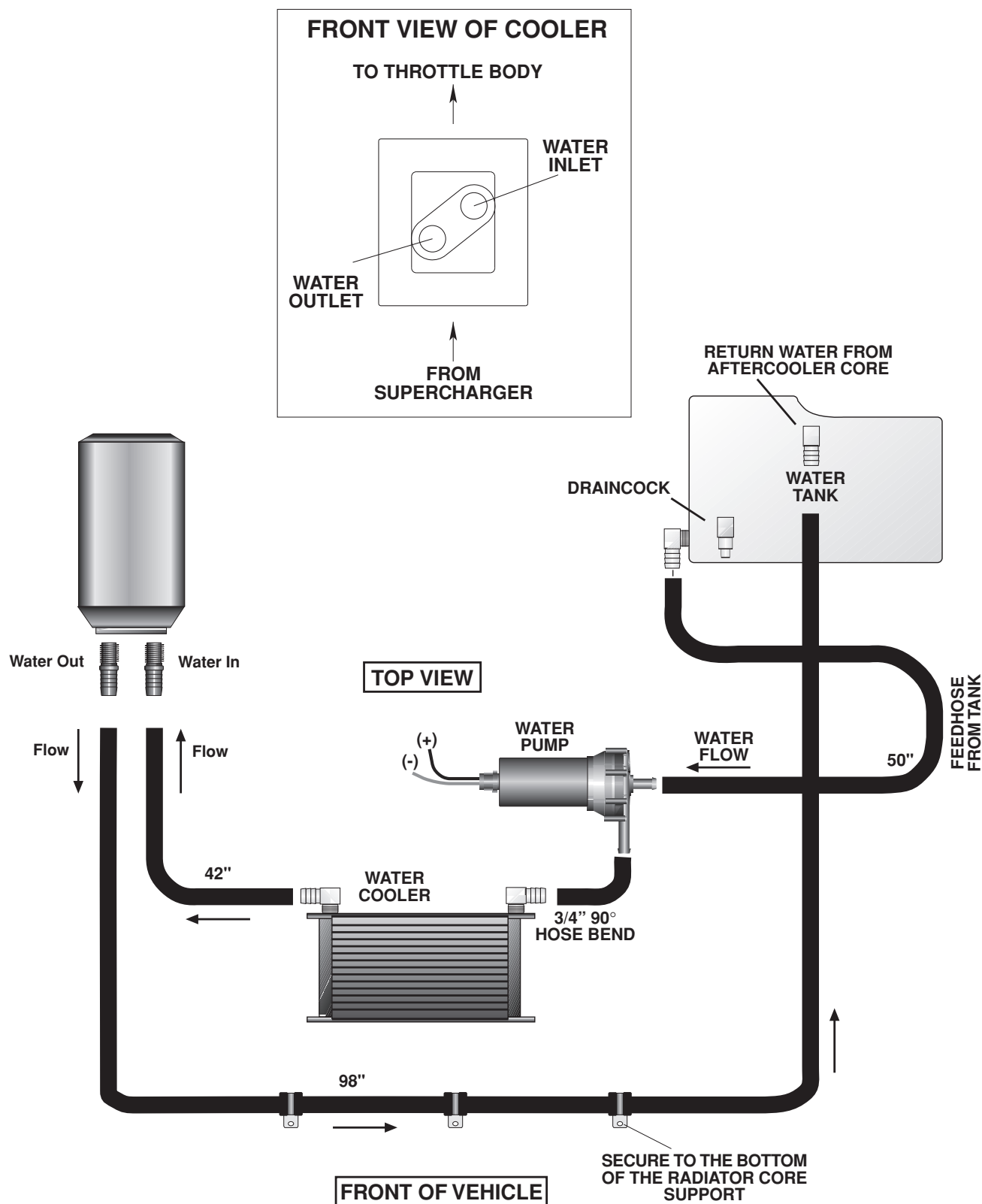


Fig. 5-e

## 6. Water Cooler and Pump Installation

- A. Remove the air dam from the lower radiator core support.
- B. Loosely attach the supplied water cooler brackets to the cooler using the supplied 1/4" hardware (see Fig. 6-b). Following the photo, position the cooler on the core support as far towards the passenger side as possible. Using the mounted cooler brackets as a guide, mark the position on the lower radiator core support where the bracket mounting holes must be drilled (see Fig. 6-a). Drill the four mounting holes and attach the cooler assembly to the core support with #12 hardware.
- C. Notch the air dam to allow clearance for the cooler mounting brackets and reinstall.
- D. Route the previously attached 50" section of hose extending downward from the lower 90° fitting on the water tank to the inlet of the water pump. Secure hose with nylon ratchet clamps.
- E. Secure the hoses to the chassis with provided tie wraps.

**NOTE:** Hoses must not be kinked or restricted. Route away from moving parts and direct engine heat.

- F. Cut a piece of the 3/4" hose 42" in length and attach to the outlet fitting of the water cooler. Connect hose to the inlet fitting on the aftercooler. The line should run parallel with the return line. Trim the ends appropriately and secure both with nylon ratchet clamps.
- G. Following photos 9 and 10, attach the supplied rubber 90° hose bend to the water cooler inlet. Slide the water pump bracket onto the water pump and position the outlet of the pump in line with the 90° hose bend. Using the bracket as a guide, mark and drill holes in core support and attach with the supplied hardware. Trim the 90° hose if necessary, and secure with nylon ratchet clamps.

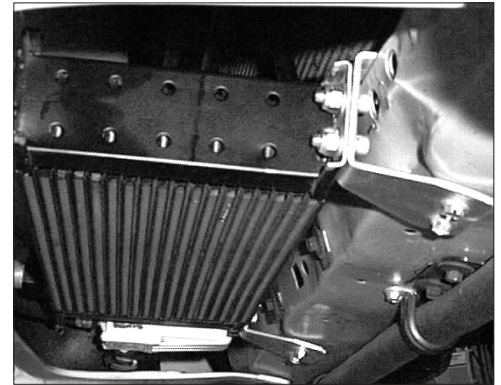


Fig. 6-a

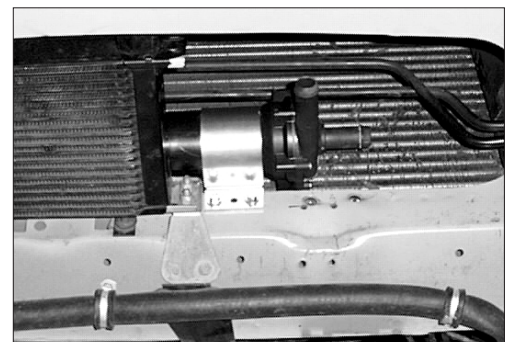


Fig. 6-b  
Water Pump Inlet

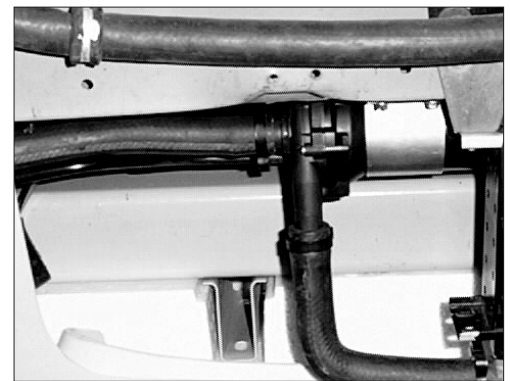


Fig. 6-c

# 7. Water Pump Wiring

- A. Cut the supplied wiring harness plug from the end at the water pump harness. Attach a 16 GA eyelet to the black wire (negative) and route to a clean ground free from paint and vehicle undercoating. A cooler mounting tab works well for this.
- B. Route the red wire from the water pump through the firewall to the fuse panel. Connect to fuse #18 using the supplied fuse tap, fuse and fuse holder (make sure that the supplied secondary fuse is spliced into the power wire). Secure the red wire to the chassis using the provided tie wraps. Connect the red wire using a solderless connector to the positive wire on the wiring harness of the water pump.

**NOTE:** In some cases, the water pump must be primed on initial start-up. This may be accomplished by turning on the pump, removing the RETURN line from the tank and providing light suction on the hose to remove the air in the system.

- C. Fill the water tank with 25% antifreeze and 75% water to approximately 3" from the top. Do not fill past the water return fitting (doing so will not allow system to purge itself of air).
- D. Turn the ignition key to the "ON" position and check that the water is flowing through the system. Once water is flowing, allow to run for approximately one minute. This will allow any trapped air to be purged from the system. Once all the air is removed, fill the tank to one inch below the filler ring.

**NOTE:** Do not attach the red wire to the power until the water tank is full of water, running the water pump without water will lead to premature failure and void your warranty.



Fig. 7-a

## 8. FMU Recalibration

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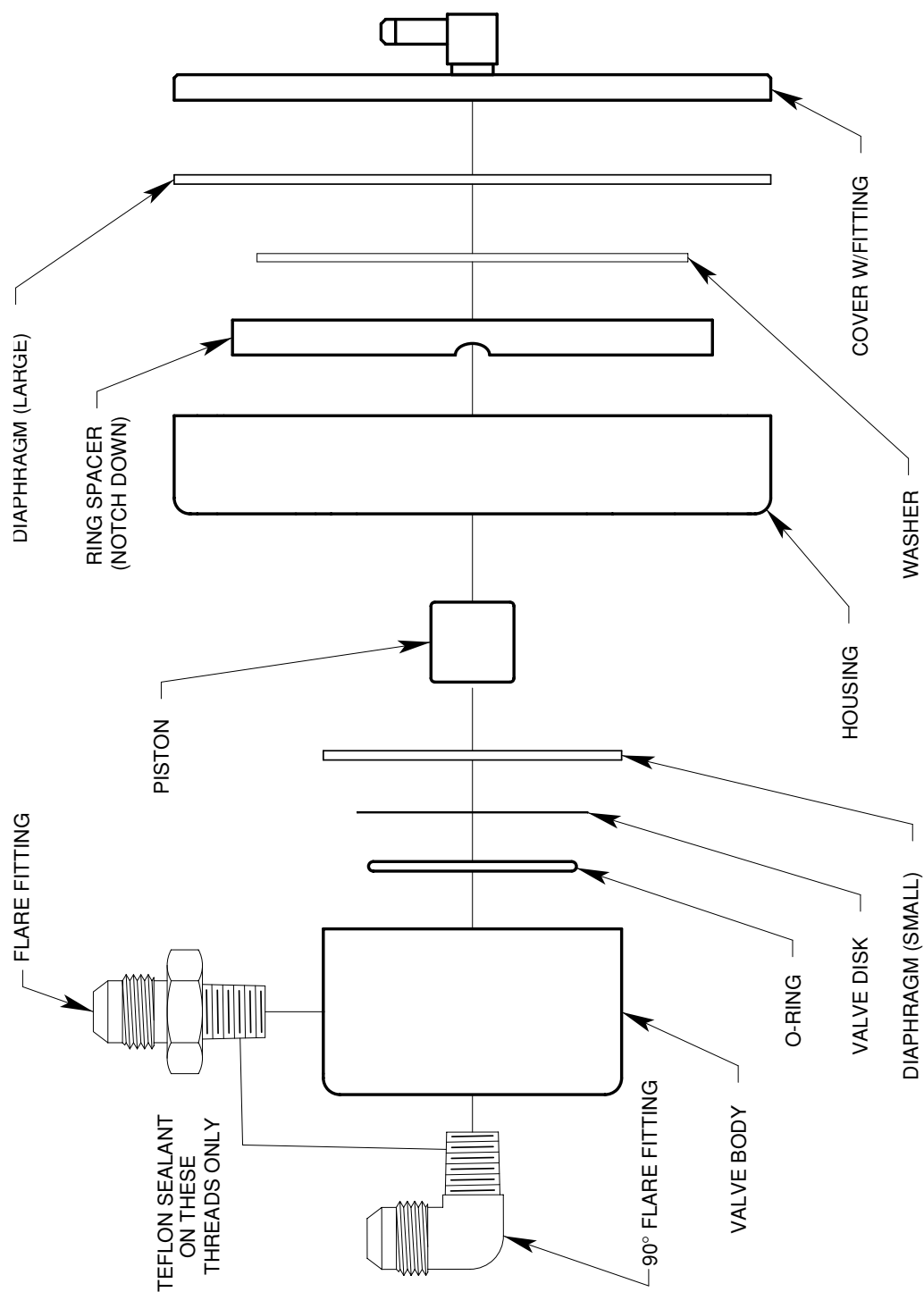
*NOTE: Ignore this section if the kit is being originally installed into the vehicle with the supercharger kit at the same time.*

- A. Remove the six (6) allen head screws on top of the fuel management unit (FMU).
- B. Remove the diaphragm and washer (and the ring, if equipped) from inside of the FMU.
- C. Remove the four screws holding the valve body. Once taken apart, remove the piston, small diaphragm, disk and O-ring.
- D. Remove and exchange fittings on the valve body. A small amount of Teflon sealant (not silicone or RTV) may be used on the fittings. Excessive sealant may damage the FMU.
- E. Install the new O-ring, disk and small diaphragm as shown. The disk must be centered on the valve body. The disk should not be allowed to make contact with the screws as this can damage it, resulting in FMU leakage and/or malfunction.
- F. Before tightening the valve bodyscrews, install the piston with the radius side down. Apply a small amount of pressure on the piston to eliminate any possibility of an air bubble being trapped between the disk and diaphragm.
- G. Tighten the four screws to 24in/lbs (2ft/lbs) in a crisscross pattern to ensure a proper seal.
- H. Install the replacement ring (with the notched part facing down) around the four screws inside the FMU.
- I. Place the new washer inside the ring on top of the piston.
- J. Install the new diaphragm and carefully line up holes to the body.
- K. Reinstall the FMU cover with the six (6) allen head screws. **DO NOT OVERTIGHTEN THE SCREWS.** The correct torque is 24in/lbs (2ft/lbs).

*NOTE: If you are unsure of your ability to correctly complete these steps, please contact Vortech Engineering at (805)247-0226 and ask for the Service Department.*

## 8. FMU Recalibration, cont'd (FMU Assembly)

1996-1998 Models Only



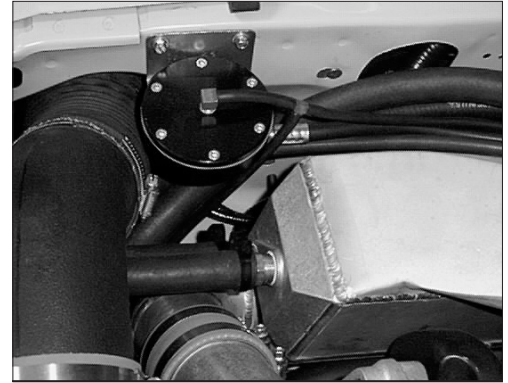
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Fig. 8-a

## 9. FMU Mounting

- A. Install the new 30" long male FMU line to the fuel rail and to the FMU.
- B. Remount the FMU next to the air inlet (see *Figure 9-a*).
- C. Connect the supplied length of 5/32" vacuum hose to the FMU and the original manifold vacuum source.
- D. Route the 5/32" vacuum line from the bypass valve and TEE into the FMU vacuum line with the original 5/32" TEE. Make sure vacuum line to bypass valve is not kinked.



*Fig. 9-a*

# 10. Final Check

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**WARNING:** *Do not attempt to operate the vehicle until ALL components are installed and ALL operations are completed including the final check.*

- A.** Check all fittings, hose and clamps for tightness and leaks. Make sure all wires and lines are properly secure with clamps or tie wraps.
- B.** Make sure all wires and hoses are routed away from hot, moving or sharp objects.
- C.** Double check to ensure water is flowing through the system.



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