
Pantera Electronics Radiator Installation Manual

Details of Installation

DO NOT USE A PRESSURE CAP THAT EXCEEDS 15 PSI. It is possible to damage the radiator with pressure caps above this pressure. The original factory pressure cap was 13 psi.

Only use the upper radiator sensor port with 22mm x 1.5 threads. Standard temperature switches or temperature sensors with sealing washers can be used. **DO NOT USE SEALANT OR THREAD SEALING TAPE** the fittings are designed for washer type sealing.

The metric adapter with 22mm threads on the outside diameter and 3/8 NPT threads on the inside diameter is available from Pantera Electronics and is used with the Radiator Fan Controller temperature sensor.

There are (2) upper mounting tabs and (2) lower mounting pins that mount the radiator. The pins are 10mm in diameter, use 0.375" (3/8") ID grommet.

These mounting points **MUST** have flexible grommets installed. The mounting points cannot be hard mounted to the body as this causes structural stress and damage to the radiator during expansion and contraction.

Two mounting straps will have to be fabricated, these will determine the degree of leaning forward. The mounting straps mount to the upper tabs on the radiator. The radiator is 6.8" thick so this is the proper amount of clearance needed by tilting the radiator forward. **DO NOT TILT THE RADIATOR ANY MORE THAN WHAT IS NECESSARY FOR CLEARANCE.** It will reduce the efficiency of the radiator the more it is tilted.

The coolant inlet and outlet tubes are 1 3/8" (35mm) ID and match the factory tube size. In order to connect to the cooling system (2) 90 degree metal sweeping elbows will be needed. By using separate elbows this allows rotation and eases in the installation. Short sections of 1 3/8" hose will be needed to connect the elbows to the inlet and outlet radiator tubes.

The 90 degree elbow material can be the following:

- Steel
- Brass
- Copper
- Stainless steel

Alternately molded rubber elbows can be used instead of the metal elbows for 1 3/8" (35mm) outside diameter tubes.

Details of Installation Continued

Hose Clamps

Worm Gear Hose Clamp Interlocked type are used to retain the 1 3/8" hoses. 9/16" wide clamp band, 400 or 300 series stainless steel.
Size: SAE 24

**USE ONLY ONE HOSE CLAMP PER HOSE CONNECTION !
DO NOT USE (2) HOSE CLAMPS PER HOSE CONNECTION !**

If more than one hose clamp is used, condensation will accumulate between the hose clamps and cause corrosion on the tube. Even 400 series stainless steel tube will corrode from constant moisture at elevated temperatures.
There are no advantages to two hose clamps, the pressure in the cooling system is only 13 to 15 lbs.

Two hose clamps has an appearance of an unprofessional installation.

Anti-freeze (for non-racing applications)

Ethylene Glycol (green) anti-freeze and water mixed to a 50/50 ratio should be used or pre-mixed Ethylene Glycol (green) anti-freeze is a good choice since the water that is used has the proper ionic level.

Coolant should be changed at regular intervals typically every 5 years due to deterioration. ***Glycol controls the temperature and does not deteriorate, it's the corrosion inhibitors that deteriorate.***

For improved heat transfer characteristics, a mixture of 40% Ethylene Glycol antifreeze to 60% water is optimal, additional antifreeze will move less heat and lower efficiencies.

Ethylene Glycol (green) anti-freeze contains wetting agents and does not need additional wetting agents, additional additives upset the proper ratio of water to antifreeze and will change heat transfer characteristics.

***** **DO NOT USE ANY COOLANT ADDITIVES !** *****

DO NOT USE Evans Water-less Coolant.

Evans coolant requires the water content must be less than 97%, this very difficult to achieve. If the water content exceeds 97% it is very corrosive.

Evans coolant has a combustion flash point of 225 F (107 C) to 232 F (111 C). If it contacts the exhaust manifold instant ignition will occur.

Evans coolant viscosity is 0.28 cp. (thick) compared to 50/50 mix ethylene glycol viscosity of 0.70 cp. (thin) This means it flows slower through the cooling system and requires more engine power to move the coolant.

Evans coolant has a specific heat of 0.640 to 0.680 compared to 50/50 mix ethylene glycol which has a specific heat 0.815 to 0.820. *This means the coolant will have to flow proportionally faster to remove the same amount of heat.*

Details of Installation Continued

Coolant Tubes

Avoid using stainless steel coolant tubes. The factory used steel tubes for a reason, the steel tubes transfer heat to the air.

Thermal conductivity (k) of steel = 54 BTUs/(ft h F)

Thermal conductivity (k) of stainless steel = 15 BTUs/(ft h F)

Stainless steel tubes have approximately 3.6 times less thermal conductivity!

This is 15 times better --> aluminum tubes: (k) = 237 BTUs/(ft h F)

Hose

Size: 1 3/8" (35mm) inside diameter.

Material: EPDM, superior resistance to ethylene glycol anti-freeze permeation.

Temperature rating: -40°F to +257°F (-40°C to +125°C)

Brand: Gates Green Stripe

Note, Avoid using silicone hose, because it's lower in strength and permeates ethylene glycol anti-freeze.

Coolant Pump

The Ford 351 Cleveland factory water pump should be replaced with a water pump with an enclosed impeller design. This is a higher efficiency pump and will circulate more coolant for the same engine RPM than the factory water pump.

The recommended water pump for the Ford 351 Cleveland is:

FlowKooler, P/N-1648 or FlowKooler, P/N-1648S.

The proper thermostat for the Ford 351 Cleveland requires a particular thermostat. The factory Ford water by-pass orifice plate is necessary to complete the by-pass valve.

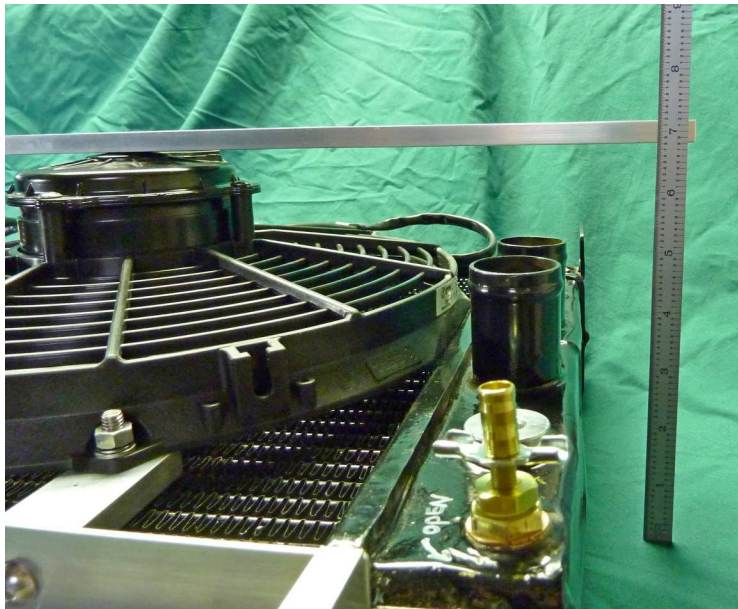
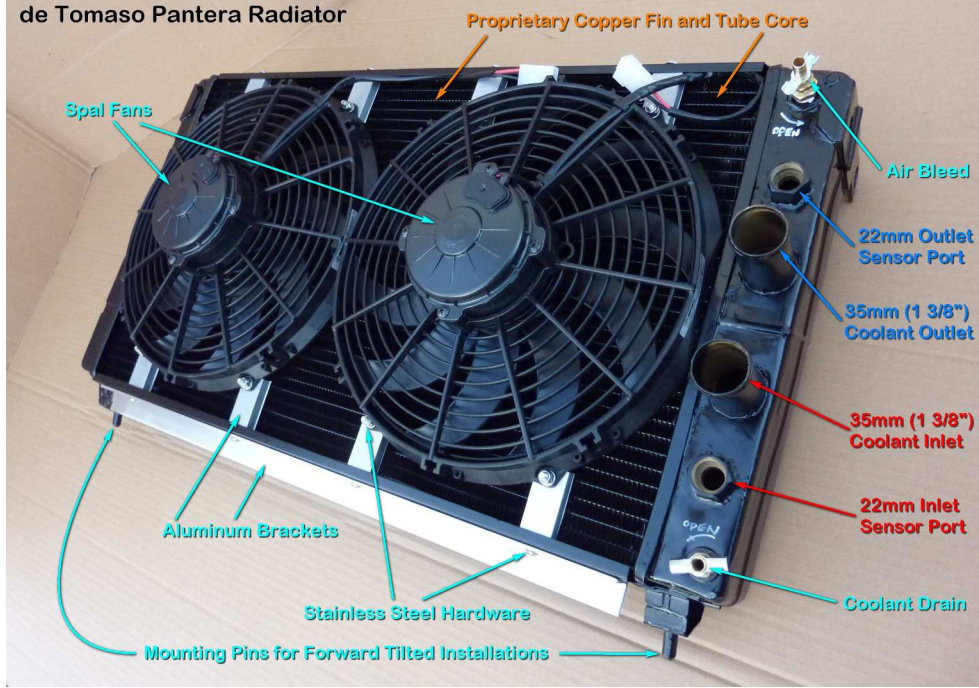
Cutting holes in the front hood to install grills does **NOT** improve air flow and provides **NO** cooling advantage. The Panteras' unibody extracts the air from the back of the radiator to the bottom of the car via the tunnel geometry of the trunk floor. Cutting holes in the front hood defeats the original design.

Fans

Fans are available from many sources but the best quality and most efficient fans are manufactured by Spal. These are the optimal fan to use with the RFC, and all thermal and electrical testing was performed with Spal fans.

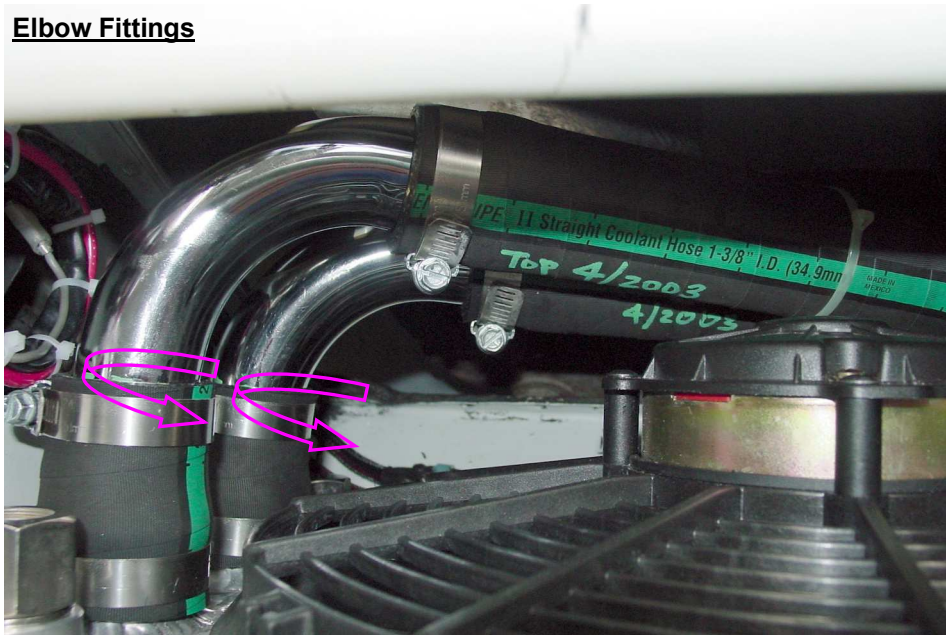
Spal USA	Spal part number: 30102029,
1731 SE Oralabor Road	Type VA10-AP70/LL-61A (suction)
Ankeny, IA. 50021	12" Fan blade diameter, (305mm)
(800) 654-7725	3.5" deep, (87mm)
www.spalusa.com	13.5 Amps @ 13.0 volts

**Improved and Restored
de Tomaso Pantera Radiator**



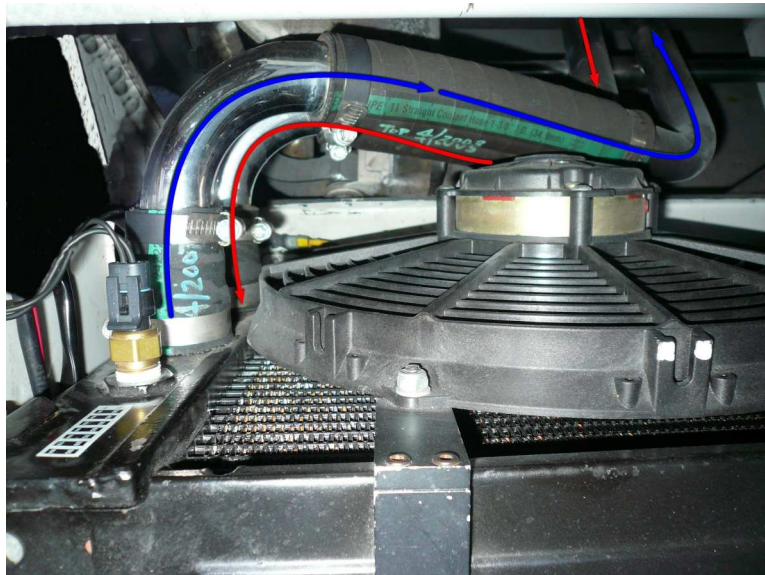
Radiator over
all thickness
6.8" (173mm)

Elbow Fittings



The advantage of separate and independent elbows instead of fixed radiator elbows, is the ability to rotate to an optimum position. Molded hoses can be used as well but they are not as durable. This is also much easier to install the radiator and perform maintenance in the future.

Coolant Flow Direction



Red = Higher temperature coolant Blue = Lower temperature coolant

Items needed in addition to the Pantera Radiator
(Pantera Electronics part numbers)

Grommet for (2) upper mounting tabs, P/N: GRMT-TP.

Grommet for (2) lower mounting pins, P/N: GRMT-BTM.

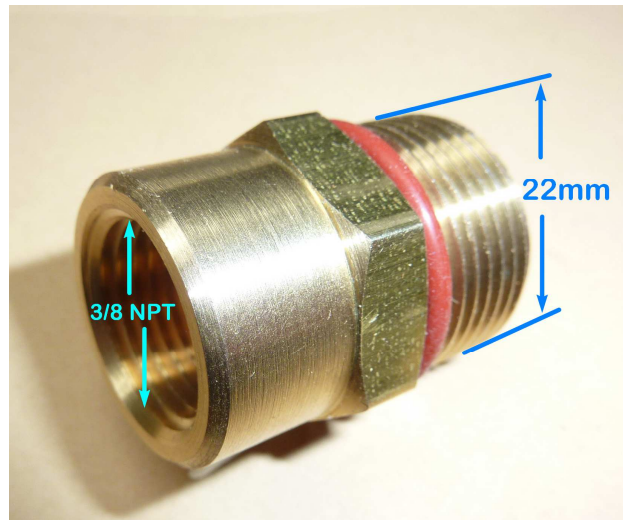
Adapter for 22mm sensor port to 3/8 NPT pipe thread, P/N: # FSA.

Steel Elbows, P/N: CE90

Or Molded hose 90 degree 1 3/8" ID (35mm)



P/N: GRMT-TP



P/N: FSA

Pantera Electronics RFC Temperature Sensor

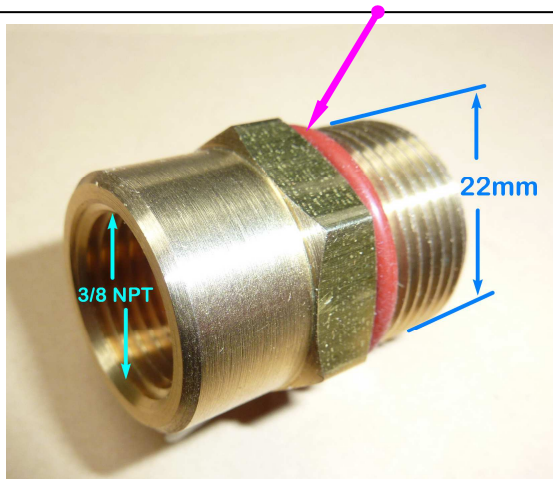
Install 22mm adapter into ONLY the **TOP** sensor port radiator **without** Teflon tape, the **O-ring seals the fitting**. (the adapter has straight threads, not pipe threads)

It's beneficial to use silicon grease on the O-ring so that it is not damaged when tightened.

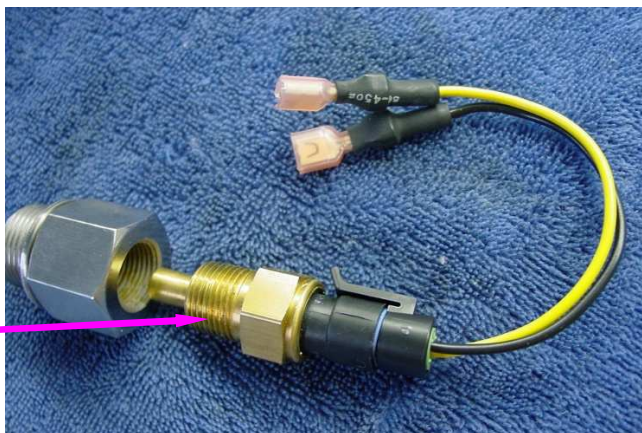
Wrap Teflon tape about 2 turns around the temperature sensor threads, and install the temperature sensor. Do not over-tighten, the Teflon tape will seal the threads.

Adapter - P/N: # FSA.

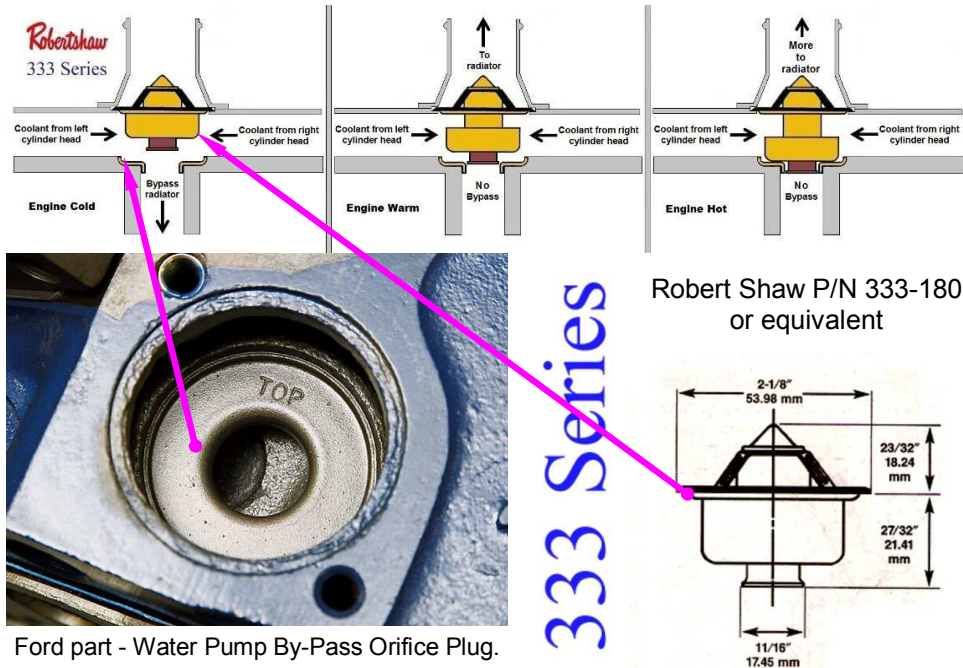
Note the 22mm threads are straight and sealing is accomplished by the "O" ring. No need for sealing tape. Use silicon grease on the O-ring.



The threads on the Temperature sensor are 3/8" NPT. Thread sealant or Teflon tape can be used on these threads.



Thermostat



Engine Settings

Engine idle speed can have a large effect on proper engine temperature when idling for long periods. Even if the engine can idle at 600 to 700 RPM the volume of coolant moving is insufficient to maintain the proper engine temperature.

An idle speed of 900 to 1000 RPM is necessary to regulate the proper engine temperature.

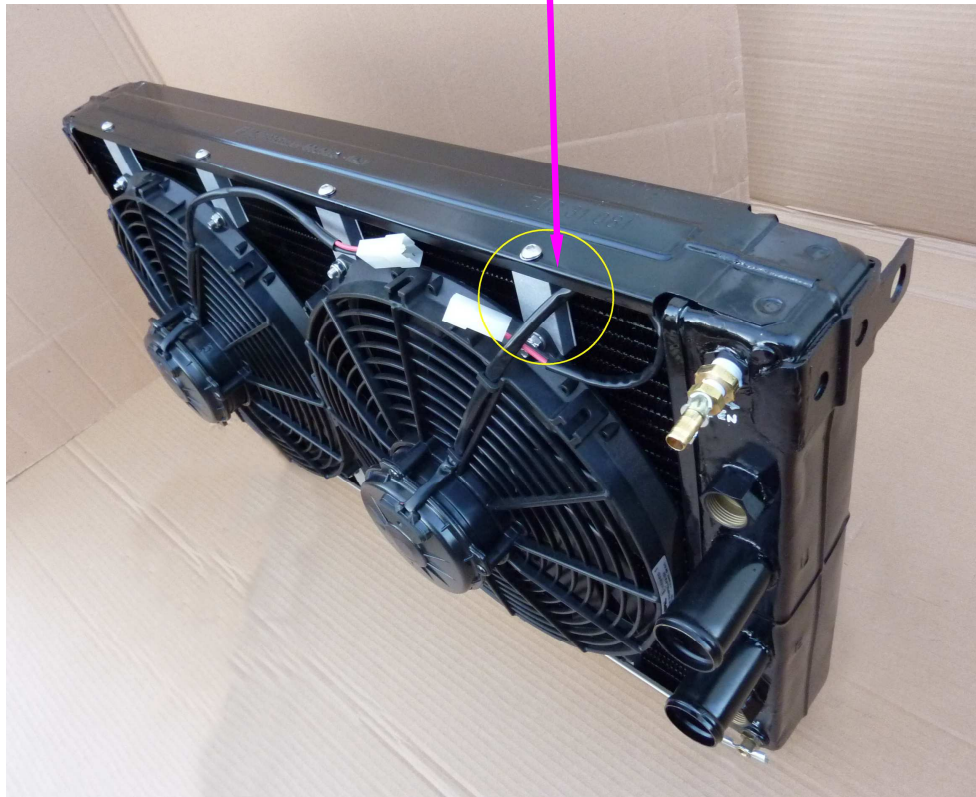
NOTE: It's important to keep this installation manual for future reference since revisions to this product change the contents of the installation manual.

Disclaimer

The products from Pantera Electronics have been design and manufactured with the best quality components known to the engineer. The installation instructions have been written to assist the owner in the proper use and installation of the products. Pantera Electronics can not be held responsible or held liable for the interpretation or incorrect implementation of the products.



*Integrated Spal fan mounting brackets within the top and bottom core plates to allow for a compact assembly.
It also sets the proper "fan blade to core" distance for maximum air flow.*



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