

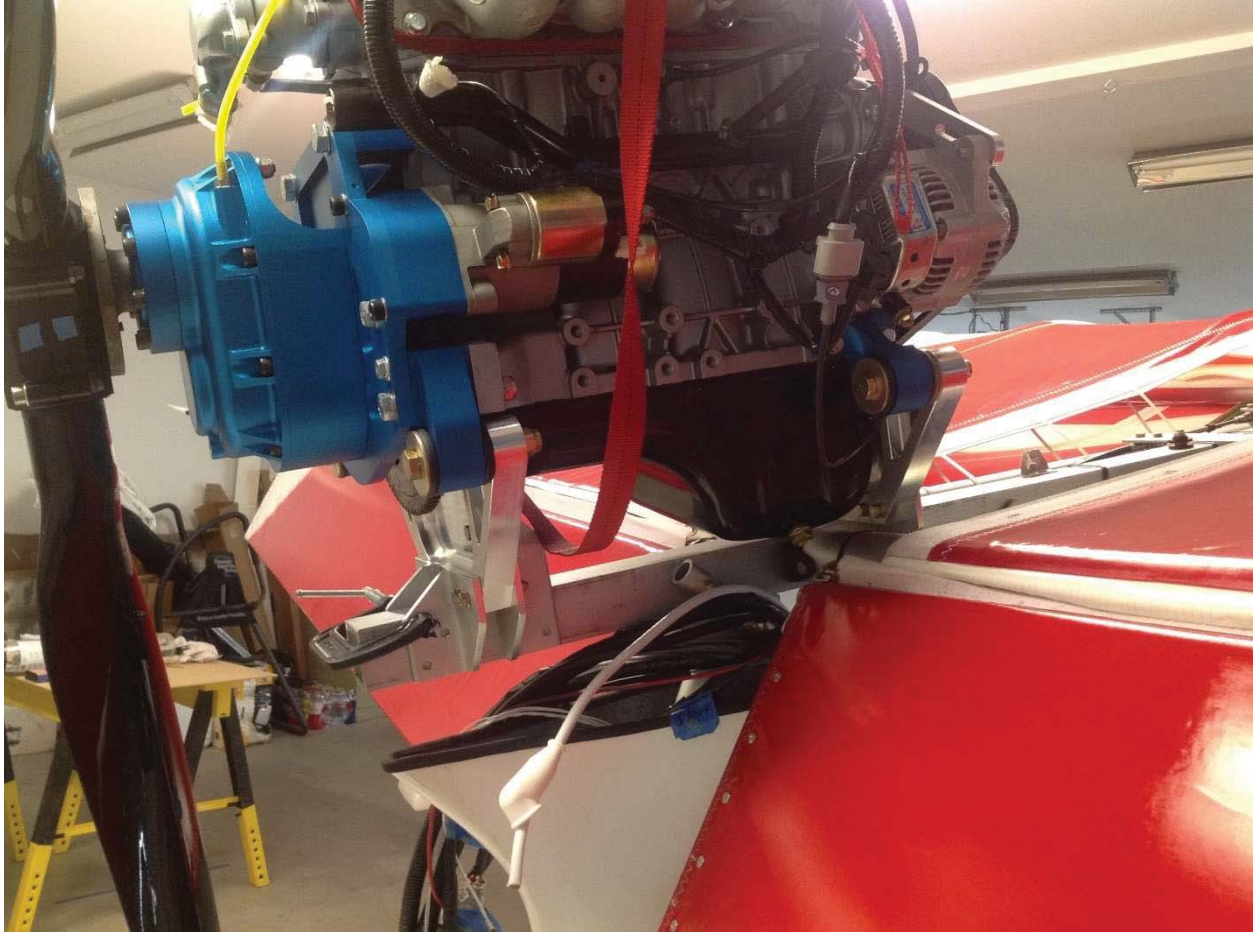


Figure 4 Upright Mounting

COOLING SYSTEM

In any engine cooling is critical and the AM family is no exception. Cooling is via liquid and a radiator. If the radiator is mounted below the engine there is also an expansion tank. The radiator (expansion tank) cap must be at the highest point in the system. It is absolutely critical that all air is removed from the cooling system for the engine to cool properly. If you do not remove all the air from the system the engine will overheat and could seize. The warrantee is void if the engine overheats.

The cooling system MUST have one low point and one high point and all hoses must be routed monotonically. No ups and downs to trap air bubbles. You must remove all air from the system. One method is to fill the system and mark the level in the overflow tank. Then run the engine up to temperature but do not let it overheat. When hot the level should be higher in the overflow tank. Then let the engine cool to ambient. The system will suck the coolant from the overflow tank back into the engine. Do this until both the hot and cold levels stabilize with no change from cycle to cycle. This method is described below. Another method is via vacuum filling. If using this method follow the instructions that come with the vacuum filling equipment.

The radiator must be mounted so that there is a minimum of 3 inches of H₂O differential air pressure between the front and back. If you do not have this differential air pressure there will not be adequate airflow for cooling. You can use a water manometer to verify this required pressure and airflow. In general, the inlet should have ram air and the outlet should be in a low-pressure area. The inlet area must be no less than 40% the area of the radiator (more for slower aircraft) and the outlet should be about twice the total inlet area. Keep in mind aerodynamics and how they affect the airflow both in and out of the cowling. Sharp corners at the lower edge of the firewall can have a profoundly reduce the exit airflow. High pressure at the bottom of the aircraft especially during climb can reduce the exit airflow. Obstructions like the tailpipe can reduce the exit area and airflow.



Figure 5 Cooling Inlet

If there are auxiliary air inlets care must be taken so that they do not pressurize the cowling reducing airflow through the radiator. For example, in the RV-12 cowling that is part of our FWF package there are two additional inlets. Duct and seal these so that one goes to the induction and the other to the optional oil cooler or is used for cooling blast tubes.

The outlet from the thermostat cover connects to the inlet of the radiator. The outlet of the radiator goes to the water pump inlet. All of these connections must be monotonic and are 1" diameter.

The expansion tank is plumbed into the small line on the water neck and the small line into the water pump. The line from the water neck goes into the upper inlet on the expansion tank. If you are installing a heater core it is place in this line. The line from the lowest (outlet) on the expansion tank goes to the inlet on top of the water pump inlet tube. You must also install an overflow tank that connects to the top connection of the expansion tank.



Figure 6 Radiator Mounting



Figure 7 Radiator Connections Left Side



Figure 8 Radiator Connections Left Upper

The radiator must be mounted so that the air pressure cannot force it back and allow it to hit and rub on anything especially the plate mounting bolts.

The best coolant mix is dependent on your ambient temperature. Water has a higher heat capacity than antifreeze so provides better cooling. In warm areas use 30% ethylene glycol antifreeze and 70% distilled/deionized water and Water Wetter or equivalent. Do not use propylene glycol. Do not mix coolant types. Some coolant types are not compatible and can clog or coat your system causing overheating. In cooler areas use 50/50 and Water Wetter or equivalent.

All hoses, tube, pipes and the radiator need to be well secured using standard aircraft practice or vibration will lead to failure.



Figure 9 Heater Hose

The radiator must be firmly mounted so that the ram air cannot push it back.



Figure 10 Radiator Upper Mount



Figure 11 Radiator Lower Mount

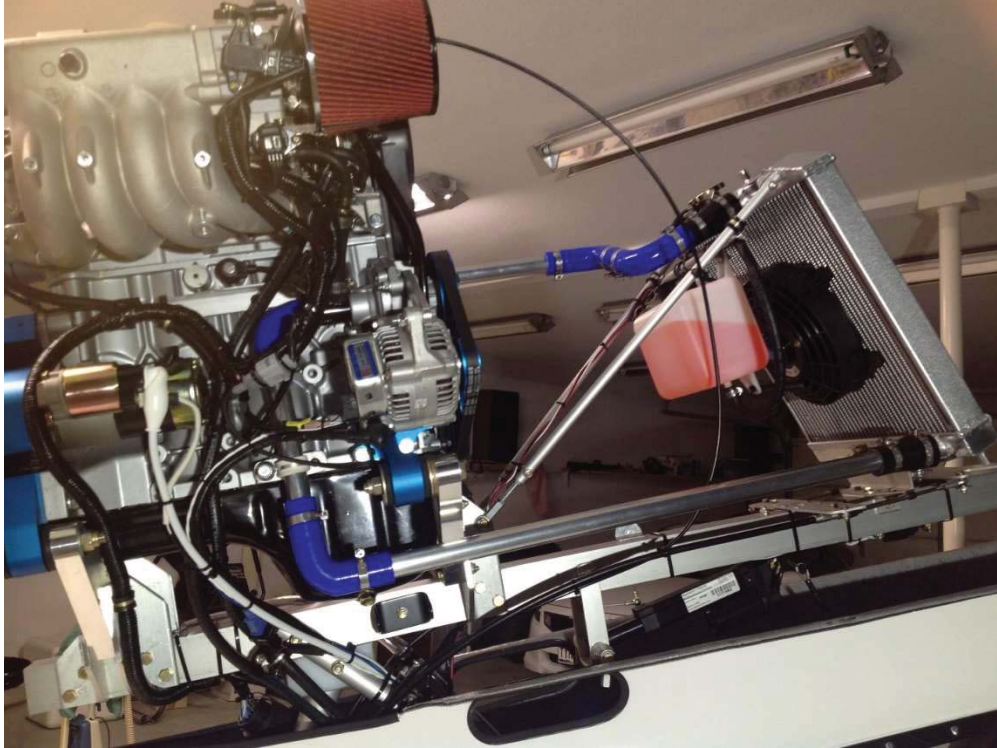


Figure 12 Large Area Radiator Mount Right



Figure 13 Large Area Radiator Mounting Left