

Fluid for Thought

Race Car Cooling System Design

Coolant Fill & Recovery System

Incorporates a Portable Coolant Storage Reservoir, [2] Clear Flexible Transfer Lines, [3] Dual Shut-off Quick Disconnect Fittings, and a Pump / Filter Assembly with reversible connections. Provides for quick fill into, or evacuation of coolant from, the cooling system. Provides a positive means to purge entrapped air from cooling system. *(To remove air, simply circulate the fill system while running the engine and monitor removed air on clear return line).* Provides a means to filter the coolant within the cooling system anytime the race car is idle. Eliminates the need to locate a swirl tank above the cooling system, thereby permitting a lower center of gravity for the cooling system.

Pressure Cell

Maintains a predetermined volume of captive air on an adjacent DEAD-END CIRCUIT to allow for thermal and vaporization expansion of coolant. Captive air is isolated from coolant by an Elastomeric Bladder. Returns coolant to the circulation system during cool-down. Includes an Air Charging Valve to pre-load the cooling system pressure, and a Pressure Gauge to monitor system gauge pressure, COLD or HOT. The Expansion Chamber is not used to fill the system, and can therefore be installed at a lower remote location than a standard fill / swirl tank. This system is not in direct fluid communication with pump suction, and insures problematic air is not introduced into the pump.

Pressure Control System

An accurate and reliable pressure relief system is provided with a Rebuildable Cartridge Pressure Relief Valve, rather than a standard radiator cap. The Pressure Release System is not routed through the Expansion Chamber. This system does not release the vital captive air needed for thermal expansion as does a conventional swirl pot system. We recommend a pressure release threshold of 25 PSI with propylene glycol, and 35-40 PSI with water. Rebuildable Safety Interrupter Valve instantly depressurizes coolant in the event of an emergency system rupture.

Coolant

With water, we recommend to pressurize the system with a 5-10 PSI air charge with the system COLD. With propylene glycol, set the system pressure at 2-4 PSI with the system COLD.

Tempering Valve

Continually adjusts the proportion of divided coolant flowstreams between the radiator for heat dissipation, and the by-pass circuit for heat retention, so as to maintain a constant predetermined optimum operating temperature.

Radiator

The flowstream through the Radiator is routed downward as illustrated to insure an air-free source of coolant for the Pump, thereby preventing unwanted homogenized air.

Cooling System Features

- *FAST COOLANT FILL* and *RECOVERY*: Plug-in System
- *POSITIVE PURGING* of System *AIR* with Verification
- Coolant is *FILTERED*
- Cooling System has *LOWER CENTER* of *GRAVITY*
- *COOLANT* Can Be *EASILY RECOVERED* and Reused
- Problematic *AIR* is *KEPT OUT* of Pump Suction
- System *PRESSURE* is Continuously *DISPLAYED*
- *CAPTIVE AIR* Volume is Isolated and *PRESERVED*
- Accurate and *RELIABLE PRESSURE RELIEF* System
- *SAFER*: Hot Coolant is *INSTANTLY DEPRESSURIZED* in emergencies
- *NO Radiator Cap*

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