Evans Waterless Coolant Installation Instructions

July 2018

Due to the variety of equipment and cooling system configurations, only generic installation procedures are provided in this document. Specific information is available for some vehicles and engines at www.evanscooling.com. Thoroughly review these instructions before starting your installation of Evans Waterless Coolant (EWC).

Also, at the beginning of the installation process, have on hand enough supplies of the appropriate EWC (Heavy Duty, High Performance, Powersports, or Arctic) and Evans Prep Fluid to complete the project. See your owner’s manual for cooling system capacity.

When converting an engine from a water-based coolant to EWC, great care should be given during the installation (conversion) process to insure that all of the old water-based coolant is removed before installing new EWC. When the conversion is complete, the water content of the fluid should be no more than 3% to take best advantage of the waterless coolant technology.

SPECIAL CONSIDERATIONS

1. WATER CONTENT: As stated previously, the water content of EWC after installation should not exceed 3.0%. The existing water-based coolant must be completely drained from the system. It is recommended that Evans Prep Fluid be used to absorb and remove residual water and coolant after draining the system. Water should NOT be used to flush the system after draining the coolant. The sole exception is if the system requires chemical cleaning prior to coolant changeover. See next section.

2. COOLING SYSTEM CLEANERS: New EWC should not be installed into a dirty system. If the system or the drained used coolant shows signs of contamination (oily film, rust or sediment, etc.), a chemical flush should be performed. Follow the cleaner product instructions closely. The system must be thoroughly flushed with water after using the cleaner. Keep in mind that flushing with water makes residue that is 100% water. (Residual 50/50 coolant is only half water.)

3. SCA’s/COOLANT FILTERS: Evans waterless coolants are not intended to be used in conjunction with supplemental coolant additives (SCA) or extenders. Chemical filters used in heavy duty applications should be replaced with non-chemical filters prior to installation of EWC. **No additions of any kind should be made to the system with the exception of topping off the system with new waterless coolant.** If compromised by addition of other coolants or fluids, including water, a coolant replacement should be performed.

Because EWC tends to remove old cooling system deposits which are then trapped by the filter, the filter on higher mileage vehicles should be inspected monthly and changed as needed until they appear essentially clean.
SPECIAL EQUIPMENT

1. A high-volume air source (rather than high pressure)
   If compressed air is used to help remove the old coolant and water, be aware that it can damage cooling system components. The use of high volume, low pressure air is preferred because it is safer, and in most cases, more effective. Recommended air sources include the Makita UB1103 hand-held blower, or a clean, powerful shop vacuum cleaner, used in the blower mode. A shop doing commercial installations should consider a larger, more rugged unit such as a Metro Vacuum MB 3CD Air Force Master Blaster.

2. Brix scale hand held refractometer or water test strips
   Testing the water content of the installed EWC requires the use of one of the methods shown in Appendix 1. Note that the Brix Refractometers used to measure water content are not the same as those used to determine freeze point.

SPECIAL PRECAUTIONS

WARNING: NEVER WORK ON OR REMOVE THE PRESSURE CAP FROM A HOT PRESSURIZED COOLING SYSTEM. ALLOW TO COOL COMPLETELY BEFORE STARTING COOLANT CONVERSION.

HANDLING, STORAGE, AND DISPOSAL CONSIDERATIONS

As with water-based coolants, EWC and Prep Fluid should be considered toxic. Used coolant and Prep Fluid should be collected and disposed of in accordance with federal, state, and local environmental regulations. EWC should be tightly capped for storage and kept away from children and pets. EWC and Prep Fluid are hygroscopic (can absorb water from the air), which is another reason to avoid leaving partially-used containers open.

INSTALLATION PROCEDURE

1. Drain the System:
   - Remove the pressure cap (SEE WARNINGS ABOVE). Open all drain valves and plugs. Open bleeder or petcock vents if there are any.
   - Drain all parts of the system, including radiator, coolant reservoir, engine block, and heater. Draining the system only from the bottom of the radiator removes less than half of the system capacity. Note: Ancillary systems in heavy duty applications that may contain coolant include APU’s, fuel tank heaters, and DEF tank heaters. These sub-systems need to be drained as well.
   - Use high-volume/low pressure air to gently blow out various parts of the system. If accessible, blow out heater circuit, blowing only in the direction from the hot coolant source (generally, the cylinder head) toward the coolant return (generally, the inlet to the coolant pump). Ensure that the heater control valve is open before applying the air.
   - Block drains are frequently inaccessible, ineffective, or non-existent, and considerable amounts of coolant can remain in the block. Removal of the thermostat provides an opening to the engine where high volume air can be blown through the head and block, pushing old coolant past the coolant pump and out the bottom radiator hose or radiator drain.
• Engines having an “inlet side” thermostat and a good block drain (e.g., DD15) do not require removal of the thermostat. With the block drain open, air blown toward the engine through the top radiator hose will purge the residual coolant in the block.

• Completely empty the overflow bottle if the vehicle is equipped with one. If the system has a pressurized expansion tank, blow air into it to make sure it is empty.

2. **Purge the System:**

• Close all drain valves, plugs, and vents, and reconnect circuits. If the engine is equipped with a coolant filter (heavy duty systems), replace the filter with one that does not introduce coolant additives.

• Fill the system with Prep Fluid to flush parts of the cooling system suspected of harboring residual coolant or water. DO NOT use water. Vent as needed to ensure complete fill.

• Replace the pressure cap and run the engine with the heater on, at full hot, for 10 minutes after reaching operating temperature (thermostat open).

• Repeat the sequence given in step 1 to drain out the used Prep Fluid.

3. **Refill the System:**

• Close all drain valves, plugs and vents, and reconnect all circuits.

• Fill system completely with the appropriate EWC, and start engine. Add coolant as needed to keep system full. If system is equipped with a vented overflow bottle, leave it empty for now.

• Replace the pressure cap and run engine with the heater on, at full hot, for 10 minutes after reaching operating temperature (thermostat open). Shut the engine off and allow the system to cool.

4. **Test the Coolant:**

• Draw a sample of well-circulated coolant from the radiator or pressurized overflow reservoir. Check the water content using a refractometer or test strips as outlined in Appendix 1. The coolant being tested must be at room temperature before testing. Caution – minimize exposure of the coolant to air during testing.

• If the above procedure has been rigorously followed, the water content of the coolant should be within specification (below 3 percent). If the water content exceeds 3%, run the system again to operating temperature, and allow sufficient time for the thermostat to open and fluid to circulate through the radiator. Repeat sampling and water content test. If the water content still exceeds the limit, see remediation procedure under Test Strips in Appendix 1.

• If the water content is 3% or less, the equipment is ready for use. Ensure the overflow bottle or expansion tank is filled to the “cold” mark with EWC. Place Evans warning stickers in strategic locations (radiator cap, radiator shroud, overflow bottle, expansion tank) to warn against adding water or water-based coolant to the system.

• Upon cool-down and for a few days thereafter, small amounts of coolant addition may be necessary. Whether the system has a pressurized expansion tank or an overflow bottle, the coolant level should be at the cold line when the engine is cold.
MIXING COOLANTS

Waterless and water-based coolants **should not** be mixed. In the event that significant waterless coolant is lost from the system during operation and no waterless coolant is available to fill the system and reach a repair facility, water-based coolant or water may be used. However, repairs should be made as soon as possible, and the system should be drained, purged and re-filled with new waterless coolant.

STOP LEAK USE

Stop-leak type products are not recommended to repair leaks. However, they may be used as a temporary measure. Carefully follow the instructions on the stop leak product label. Have the leak permanently repaired as soon as possible.
DETERMINING WATER CONTENT OF A WATERLESS COOLANT

Evans Refractometer Part# E2196
Use for Reading Water Content of Waterless Coolant

- Readings are temperature sensitive, so calibrate before each use:
  - Calibrate the refractometer by placing a drop of new Evans Waterless on the refractometer glass. Use the small screwdriver supplied with the instrument to turn the calibration screw until the boundary between the upper blue field and the lower white field meet at 57.0.
- Always clean the glass and the daylight plate with a clean, soft cloth after each use and before each reading. Do not place under running water or submerge instrument while cleaning. Store unit in its original case in a cool, dry, area.
- Place a small amount of coolant, obtained from a location in the cooling system where the coolant is well-mixed, on the glass and close the daylight plate.
- Ideal is 3% or 55.7 BRIX; acceptable is 5% or 54.8 BRIX; below 54.4 BRIX, call (888) 990-2665 (M-F 9 to 4:30 EST) for technical assistance. Vehicle may be driven with water content 7% or higher - technical intervention is strongly suggested to bring water content into recommended range for optimal performance.

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