



PLEASE CAREFULLY READ BEFORE BEGINNING INSTALLATION

There are many types of vehicles, equipment and machinery that have a variety of cooling systems. Therefore, only generic installation procedures are provided in this manual.

All engines (L4, V6, V8, V10, V12) require the block to be drained. Please read these instructions before converting and installing Freezetone Waterless Coolant.

Please make sure that before you start the conversion process, you have the proper amount of Freezetone Waterless Coolant needed for your equipment. Please read your owner's manual to check the capacity required by your cooling system.

When you are converting your cooling system from a water-based coolant to our Freezetone Waterless Coolant, please make sure that during the installation process that all of the old coolant is removed. When you have finished the conversion, the water content of the fluid should not be more than 3% to have the best performance of our waterless technology.

Please pay special attention to the following statements:

Water Content in Cooling System: The water content of our Freezetone Waterless Coolant should not be more than 3% after installation. The coolant in the vehicle previously to installation should be completely drained and removed from all areas of the cooling system. It is recommended that after draining the system that water not be used.

Cooling System Flush: When installing our Freezetone Waterless Coolant please make sure that the cooling system is free of all rust and sediment. When removing old fluid if the systems shows signs of contamination a chemical flush should be performed. Please follow the flush products instruction carefully. The system must be flushed with water after using the radiator flush. Care must be taken to remove all of the water from the cooling system before installing Freezetone Waterless Coolant.

Coolant Filters and Supplemental Coolant Additives (SCA's): Freezetone Waterless Coolant is not intended to be used with SCA's or coolant life extenders. All chemical filters used in heavy equipment and machinery should be replaced with non-chemical filters before installation of Freezetone Waterless Coolants. **WHEN A COOLING SYSTEM NEEDS TOPPING UP, THE ONLY PRODUCT THAT CAN BE USED IS FREEZETONE WATERLESS COOLANT. IF OTHER PRODUCTS ARE USED THIS WILL VOID THE WARRANTY OF OUR PRODUCT.** If other products are used in your cooling system a cooling flush and re-installation is mandatory.

Freezetone Waterless Coolant tends to remove old cooling system deposits which are then trapped by coolant filters. It is recommended that coolant filters be checked on a monthly basis and replaced until they appear free of debris.

Recommended Equipment to be used in installing Freezetone Waterless Coolant

1. It is preferable that you use a high volume air source instead of a high pressure source.

We find that hand held blowers are the most effective for cleaning out the cooling system.

2. Brix scale handheld refractometer

When testing the water content of Freezetone Waterless Coolant a Brix scale refractometer is the best option. Please make sure to note that Brix refractometers are different than those that are used to measure freezing point.

CAUTION

WARNING: MAKE SURE TO NEVER REMOVE THE RADIATOR CAP FROM A HOT PRESSURIZED COOLING SYSTEM. PLEASE ALLOW SYSTEM TO COOL COMPLETELY BEFORE STARTING COOLANT CONVERSION.

FIRE WARNING:

All Glycol based products will burn in extreme conditions.

Freezetone Waterless Coolants are not combustible fluids as classified by the United States Department of Transportation. However, our coolants will burn above 240°F (115°C) if a flame source is present. Freezetone Waterless Coolant and all glycol-based coolants will self-ignite at approximately 725°F (385°C).

HANDLING, STORAGE, AND DISPOSAL INSTRUCTIONS

Freezetone Waterless Coolants are considered toxic and great care should be taken when handling. Please collect and properly dispose in accordance with federal, state and local environmental laws and regulations. **FREEZETONE WATERLESS COOLANT SHOULD BE TIGHTLY CAPPED, SECURED AND STORED. PLEASE KEEP AWAY FROM CHILDREN AND PETS.** Freezetone Waterless Coolant is a hygroscopic fluid (absorb water from air) so please avoid leaving partially-used containers open.

INSTALLATION INSTRUCTIOS

1. Drain the cooling system:

- Remove the radiator cap (make sure vehicle is not hot or pressurized) Open all the drain valves and plugs. Open petcock or bleeder valves.
- Drain all of the parts of the cooling system (radiator, coolant reservoir, heater core and engine block. In heavy duty applications, make sure to drain also the fuel tank heaters, DEF tanks and APU's.
- Using a blower blow, out all of the parts of the cooling system.
- Heating system blow out.
- Blow only in the direction from the hot coolant source (generally the engine cylinder head) toward the coolant return (generally the inlet to the coolant pump) Please make sure that the heater control valve is open before applying air.
- Remove the thermostat and blow through cavity to empty out the block. Block drains are sometimes inaccessible or non-existent. Considerable amounts of coolant/water can remain in the block. Removal of the thermostat provides an opening to the engine where high volume air can be blown through the cylinder head and block, pushing old coolant past the coolant pump and out by the bottom radiator hose or drain.
- Engines that have an "inlet side" thermostat and a good block drain do not require removal thermostat. With the block drain open, air blown toward the engine through the top radiator hose will purge the remaining coolant in the block.
- Empty the coolant overflow bottle and if a pressurized expansion tank is present blow air into it.

2. Purge Cooling System

- Close all valves, plugs, and vents and reconnect hoses and heating circuit. If the equipment has a coolant filter, please proceed to replace with a filter that does not introduce coolant additives.
- Make sure the cooling system is free of water and vent if needed to ensure a complete fill.
- Replace the radiator cap and run the engine with the heater on, set to the highest temperature for at least 10 minutes after it reaches operating temperature.

3. Refill System

- Close all valves, plugs, and vents and reconnect hoses and heating circuit.
- Proceed to fill the cooling system with Freezetone Waterless Coolant, and start the engine. Add coolant as needed to fill the cooling system. If the cooling system is equipped with a coolant system reservoir, leave empty for now.
- Replace the radiator cap and run the engine with the heater on, set to the highest temperature for at least 10 minutes after it reaches operating temperature. Turn off engine and allow system to cool.

4. Test the Coolant in Cooling System

- Take a sample of well-circulated coolant from the radiator or coolant reservoir. Check the water content using a refractometer as outlined in **APPENDIX 1**. Freezetone Waterless Coolant should be tested at room temperature before testing. **CAUTION: Minimize exposure of coolant to air during the testing.**
- If the above instructions and procedures have been followed the water content of the coolant in the cooling system should be below the recommended level (3%). If the water content is higher than 3%, run the system again up to operating temperature, and allow time for the thermostat to open and the fluid to circulate through the radiator. Repeat test. If the water content is still higher than 3%, see water content correction steps below.

WATER CONTENT CORRECTION PROCEDURES

0 TO 3% WATER CONTENT: GOOD CONVERSION- NO further action required.

3 to 5% WATER CONTENT: ACTION REQUIRED

1. Drain half of the cooling system and please dispose of properly.
2. Repeat Step 3 of the Installation Instructions.
3. Re-run water test procedure.

IF TEST SHOWS 5% OR ABOVE WATER CONTENT: CONVERSION MUST BE RE-DONE

1. Re-check water content to confirm first measurement is correct.
 2. If the conversion must be redone, please follow steps 1-4 of the Installation Instructions.
 3. Re-test water.
- If the water content is 3% or less, the conversion has been done successfully and the equipment is ready for use. Make sure that the coolant reservoir is filled to the “cold” water mark with Freezetone Waterless Coolant. Place Freezetone warning stickers in strategic locations (radiator cap, radiator shroud, overflow bottle, coolant reservoir tank) to warn against adding water or water-based coolant to the system.
 - After the system has cooled down, for several days after small amounts of coolant may need to be added if necessary. Whether the system has a pressurized coolant reservoir or an overflow bottle, the coolant level should always be at the cold line when the engine is cold.

MIXING COOLANTS

FREEZETONE WATERLESS COOLANTS SHOULD NOT BE MIXED WITH WATER BASED COOLANTS. In case of significant waterless coolant loss from the system during operation and no waterless coolant is available to fill the cooling system, water-based coolant may be used. After repairs are performed, the system should be drained, purged and re-filled with new Freezetone Waterless Coolant.

RADIATOR STOP-LEAK ADDATIVES

Radiator leaks should be repaired. Radiator stop-leak products are not intended to be permanent repairs. However, they may be used as a temporary measure. Please follow instructions on the stop leak product label. Permanent use of radiator stop leaks may clog radiators and heater core passageways.

APPENDIX 1

HOW TO DETERMINE WATER CONTENT OF A WATERLESS COOLANT

BRIX HAND-HELD ANALOG REFRACTOMETER

INSTRUCTIONS

Read before performing reading

- All Readings are temperature sensitive, so calibration must be performed before each session.
- Before every reading, wipe the glass with a paper towel.
- Use a glass or metal rod to transfer coolant specimen. Wipe it off between measurements.
- Conduct measurements immediately. Ambient humidity can affect measurements.
- Repeat measurements until readings are consistent.

DIRECTIONS:

CALIBRATE THE REFRACTOMETER:

- A. WIPE THE GLASS AND DAYLIGHT PLATE CLEAN WITH A PAPER TOWEL.**
- B. PLACE 2-3 DROPS OF NEW FREEZETONE WATERLESS COOLANT ON THE REFRACTOMETER GLASS.**
- C. AIM REFRACTOMETER TOWARD BRIGHT LIGHT AND ADJUST FOCUS.**
- D. USE THE SMALL SCREWDRIVER SUPPLIED WITH THE INSTRUMENT AND THE SET THE READING TO 57.0**

TAKE THE READING:

- A. WIPE THE GLASS AND DAYLIGHT PLATE CLEAN WITH PAPER TOWEL.**
- B. PLACE 2-3 DROPS OF FREEZETONE WATERLESS COOLANT, OBTAINED FROM A LOCATION IN THE COOLING SYSTEM WHERE THE COOLANT IS WELL-CIRCULATED, ONTO GLASS AND CLOSE THE DAYLIGHT PLATE.**

C. MEASURE THE WATER CONTENT WITH THE REFRACTOMETER. THE READING MUST BE 55.7 OR HIGHER TO CONFIRM THE WATER CONTENT IS 3% OR LESS.

BRIX	WATER %
57.0	0.0
56.5	1.0
56.1	2.0
55.7	3.0
55.2	4.0
54.8	5.0
54.3	6.0
53.9	7.0