Fill-For-Life in Fleets that Operate Various Sizes of Vehicles

Category: Coolants
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PENRAY®

Introduction:

Many customers have expressed a desire for information and recommendations regarding the use of a Fill-For-Life program in light-duty vehicles.

Penray Recommendations:

Using and maintaining a properly formulated coolant is one of the most important aspects of engine maintenance. The intent of this bulletin is to provide the information required to help light-duty diesel and gasoline engine operators avoid cooling system problems. Coolant used must meet the following basic requirements:

- Provide an adequate heat transfer medium
- Protect against cavitation damage
- Provide a corrosion-resistant environment
- Prevent formation of scale and deposits

To achieve these requirements, coolants must be of good quality. Demineralized or deionized water mixed with a fully-formulated antifreeze is the best choice. Appropriate Fill-For-Life Coolant for light-duty application is fully-formulated, phosphate-free extended service interval (ESI) coolant. EG base coolants should meet the specifications in TMC RP-329, PG coolants should meet TMC RP-330.

Note: Extended-life, carboxylic-acid inhibited coolant such as "Peak® Extended Life" Antifreeze/Coolant is installed in some light-duty vehicles. These coolants are dyed orange. NEVER MIX orange coolants with other types. Engine damage may result. Consult and follow the recommendations of the coolant manufacturer. Fully-Formulated Antifreeze is Preferred.

Antifreeze is used to provide freeze protection for the coolant. It contains chemicals that provide protection against corrosion. Use antifreeze or coolant that meets TMC RP-329 or 330 "Type A" requirements. The maintenance procedures described below for "antifreeze" or "coolant", apply equally to PG and EG. Coolant recycled by reverse osmosis, distillation, or ion exchange, properly re-inhibited to meet RP-329 or 330 requirements has been demonstrated to provide service equivalent to virgin antifreeze. Recycled antifreeze or coolants of these types are preferred.

For best overall performance, use a coolant consisting of 50% fully-formulated antifreeze in water. Fully-formulated antifreeze should be used without the addition of any additional coolant additive. If a pre-diluted fully-formulated coolant is purchased, simply fill the clean cooling system. Always verify that the freeze point and nitrite concentration are correct with a Penray TS 100 or TS 101 test strip, to insure engine protection.

Supplemental Coolant Additive (SCA):

Fully-formulated coolants do not require, and should not receive, an initial charge of Pencool 3000. Other conventional (green) coolants do need to be pre-treated. The proper dosage for initial-fill ASTM D4985 specification coolant is 3.0 percent by volume. Check the nitrite concentration at regular intervals (3 months, 20,000 miles or 250 hours, whichever comes first) with a Penray test strip. Additional Pencool must be added to the coolant if it becomes diluted, as indicated by a nitrite concentration less than or equal to 1,200 PPM. If the nitrite concentration is greater than 1,200 PPM, do not add additional Pencool SCA. Pencool replenishes protection for the cooling system components. The coolant must be maintained with the proper concentration of Pencool to:

- Provide pH control
- Restore Inhibitor levels to prevent corrosion
- Prevent the formation of mineral deposits
- Prevent cavitation of engine blocks

Coolant Test Procedures:

Nitrite concentration is an indication of the overall coolant inhibitor concentration. Penray test strips are recommended. The coolant must be tested for required nitrite levels at intervals of 3 months, 20,000 miles or 250 hours. Nitrite levels must be at least 1,200 ppm.

Test Kit Procedures:

Use a Penray 2-Way Coolant Test Strip (part number TS 100) to measure nitrite and glycol concentrations. Cavitation/corrosion protection is indicated on the strip by the level of nitrite concentration. Freeze/boil-over protection is determined by glycol concentration. Use the test strips as follows:

1. For best results, test while the coolant is between 50° - 140°F (10.0° - 60°C). Dip the strip into the coolant for one second. Remove and shake to eliminate excess fluid. Immediately compare end pad (% Glycol) to the color chart.
2. Sixty seconds (one minute) after dipping, compare the nitrite pad. A laboratory coolant analysis program is available through authorized Penray dealers under part number PTK 103. To verify long term coolant acceptability, submit a sample for coolant analysis every three (3) years, 100,000 miles, or 4,000 operating hours, whichever comes first.

Summary of Coolant Recommendations:

1. Always maintain the engine coolant to meet engine manufacturer's specifications.
2. Only use water that meets ASTM D 4985 water quality specifications
3. For topping-up and initial-fill use 50% fully-formulated antifreeze, and 50% plain water that meets ASTM water quality standards.
4. Test the nitrite concentration with a Penray Test Strip. Add Pencool only if the nitrite concentration is below 1200 ppm.
