General Description

PENRAY 201549 Twin Pack is a special combination of a cleaner (PENRAY 2010) and a conditioner (PENRAY 2011) that are designed to clean your system of harmful mineral scale and oxide deposits. PENRAY 2010 removes scale, rust, and green slime while PENRAY 2011 removes oil, neutralizes PENRAY 2010 and conditions your engine.

Product Benefits

Combines PENRAY 2010 Cleaner and PENRAY 2011 Conditioner.

- Removes harmful scale and sludge deposits from the entire cooling system
- Removes corrosion deposits
- Removes green slime
- Removes oil deposits
- Flushes the cooling system of loosened debris

Usage Notes

- Cleaning of new engines is not required or recommended.
- Safe on engine components when used according to this cleaning procedure.
- Antifreeze concentrations should be checked to assure proper freeze protection after any flush and fill service.

Directions & Dosage

CLEANING PROCEDURE

1. Completely drain cooling system including the block and radiator. (We highly recommend removing the thermostat to ensure free circulation of cleaning solutions to all parts of the system.)
2. Flush with clean water (through the radiator inlet) for 5 minutes.
3. Replace drain fittings.*
4. Mix required amount of Penray 2010 in a 5 gallon pail of water and pour into radiator inlet.

DOSAGE CALCULATION – PENRAY 2010

- **High strength for heavy scale and plugging** - 1 pound of Penray 2010 for every 1 gallon of system capacity.
- **Medium strength for scale and deposit removal** - 1 pound of Penray 2010 for every 2 gallons of system capacity.
- **Low strength for light scale and cleaning** - 1 pound of Penray 2010 for every 3 gallons of system capacity.

5. Fill system completely with clean water.
6. Re-circulate cleaning solution by idling engine for 2 hours after top hose is hot (thermostat opens if it wasn’t removed). Temperature should be 160 - 190°F.
7. Drain cleaning solution from the system. (The radiator and block must both be drained.)
8. Flush with clean water (through the radiator inlet) for 3-5 minutes.
9. Replace drain fittings.
10. Mix required PENRAY 2011 in a 5 gallon pail and pour into radiator inlet (1 pound per 4 gallons cooling system capacity).
11. Fill system completely with clean water.
12. Re-circulate the PENRAY 2011 conditioning solution by idling engine for 15 minutes after the top hose is hot (thermostat opens if it wasn’t removed).
13. Drain the PENRAY 2011 solution from the system. (The radiator and block must both be drained.)
14. Flush with clean water for 3-5 minutes. Keep flushing as long as water looks “rusty” or “turbid.”
15. Replace drain fittings and thermostat.
16. Recharge cooling system with the appropriate ratio of clean water and the proper antifreeze for your application.
17. When using a conventional Fully Formulated coolant, test system with a Penray test strip every 15,000 miles / 250 hours. Maintain nitrite level between 1200-2400ppm. Adjust with Penray liquid supplemental coolant additives (Pencool 2000 or Pencool 3000) or Penray Pencool coolant filters. * If system is contaminated with oil, first do steps 10-15 then start over with steps 4-17.

Handling

Wash thoroughly after handling. Do not get into eyes, on skin or on clothing. Do not smoke while using this product.

Physical Data

APPEARANCE/ODOR: 2010 - Pale orange / White 2011 - White

BASE TYPE: 2010 - Acidic 2011 - Basic

DENSITY: 2010 - 65.4 lb./cu. ft. 2011 - 67.0 lb./cu. ft.

VAPOR DENSITY: Not Volatile

PERCENT VOLATILES: Not Volatile

FLAMMABILITY: Not combustible

DOT PROPER SHIPPING NAME: Domestic: (CFR49): COMPD, Cleaning Granular NOI NMFC 48580 SUB 3
Export: (IMDG): UN 3261, corrosive solid, acidic, organic, N.O.S. (SULFAMIC ACID), 8, III, Limited quantity

Distributed by:
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