Component Procedures: Coolant

Table of Contents

Component Procedures: Coolant

Parts and Labor (itype_189)

Labor

Operation	Qualifier Path	Skill	Std Hrs	Wty Hrs
Replace	Cooling System Service	C	1.3	0.0
Replace	Drain and Refill Only	C	0.5	0.0

Components (itype_392)

COOLANT
The
cooling system
is designed around the coolant. Coolant flows through the engine water jackets absorbing heat produced during engine operation. The coolant carries heat to the
radiator
and
heater core
. Here it is transferred to the ambient air passing through the radiator and heater core fins. The coolant also removes heat from the
automatic transmission fluid
in vehicles equipped with an automatic transmission.

Procedures (itype_376)

Refer to
Cooling System
, Service and Repair for applicable service procedures.

Technician Safety Information (itype_15)

WARNING: Antifreeze is an ethylene glycol base coolant and is harmful if swallowed or inhaled. If swallowed, drink two glasses of water and induce vomiting. If inhaled, move to fresh air area. seek medical attention immediately. Do not store in open or unmarked containers. Wash skin and clothing thoroughly after coming in contact with ethylene glycol. Keep out of reach of children. Dispose of glycol base coolant properly, contact your dealer or government agency for location of collection center in your area. Do not open a
cooling system
when the engine is at running temperature, personal injury can result. Avoid
radiator cooling fan
when engine compartment related service is performed, personal injury can result.

Vehicle Damage Warnings (itype_16)

DO NOT
mix green colored coolant with orange colored coolant.
CAUTION:
Do not use straight antifreeze as engine coolant, inadequate engine running temperatures can result. Do not operate vehicle without proper concentration of recommended ethylene glycol coolant, high running temperatures and
cooling system
corrosion can result.

Capacities (itype_30)

Coolant ..... 9.3 liters (9.8 quarts)
NOTES:
- Nominal refill capacities are shown. A variation may be observed from vehicle to vehicle due to manufacturing tolerances and refill procedures.
- Capacities shown include vehicles with air conditioning and/or heavy-duty
cooling system
s.

Fluid Types (itype_31)

The required ethylene-glycol (antifreeze) and water mixture depends upon the climate and vehicle operating conditions. The recommended mixture of 50/50 ethylene-glycol and water will provide protection against freezing to -37° C (-35° F). The antifreeze concentration
must always
be a minimum of 44%, year round, in all climates.
If percentage is lower than 44%, engine parts may be eroded by cavitation, and
cooling system
components may be severely damaged by corrosion.
Maximum protection against freezing is provided with a 68% antifreeze concentration, which prevents freezing down to -67.7° C (-90° F). A higher percentage will freeze at a warmer temperature. Also, a higher percentage of antifreeze can cause the engine to overheat because the specific heat of antifreeze is lower than that of water.
100 Percent Ethylene-Glycol Should Not Be Used
Use of 100 Percent Ethylene-Glycol will cause formation of additive deposits in the system, as the corrosive inhibitive additives in ethylene-glycol require the presence of water to dissolve. The deposits act as insulation, causing temperatures to rise as high as 149° C (300° F). this temperature is hot enough to melt plastic and soften solder. The increased temperature can result in engine detonation. In addition, 100 % ethylene-glycol freezes at 22° C (-8° F).
Propylene-Glycol Formulations Should Not Be Used
Propylene-glycol formulations do not meet the required specifications.
It's overall effective temperature range is smaller than that of ethylene-glycol. The freeze point of 50/50 propylene-glycol and water is -32° C (-26° F), 5 degrees higher than ethylene-glycol's freeze point. The boiling point (protection against summer boil-over) of propylene-glycol is 125° C (257° F) at 96.5 kPa (14 PSI), compared to 128° C (263° F) for ethylene-glycol. Use of propylene-glycol can result in boil-over and freeze up. Propylene-Glycol also has a poorer heat transfer characteristics than ethylene-glycol. This can increase cylinder head temperatures under certain conditions.
Propylene-Glycol/Ethylene-Glycol Mixtures Should Not Be Used
Propylene-glycol/ethylene-glycol mixtures can cause the destabilization of various corrosion inhibitors, causing damage to the coling system components. Also, once ethylene-glycol and propylene-glycol based coolants are mixed in the vehicle, conventional methods of determining the freeze point will not be accurate. Both the refractive index and specific gravity differ between the ethylene-glycol and propylene-glycol.
CAUTION:
Richer antifreeze mixtures cannot be measured with normal field equipment and can cause problems associated with 100 percent ethylene-glycol.

Fluid Types and Capacities (itype_436)

Fluid Types
Capacities