Component Procedures: Cooling System

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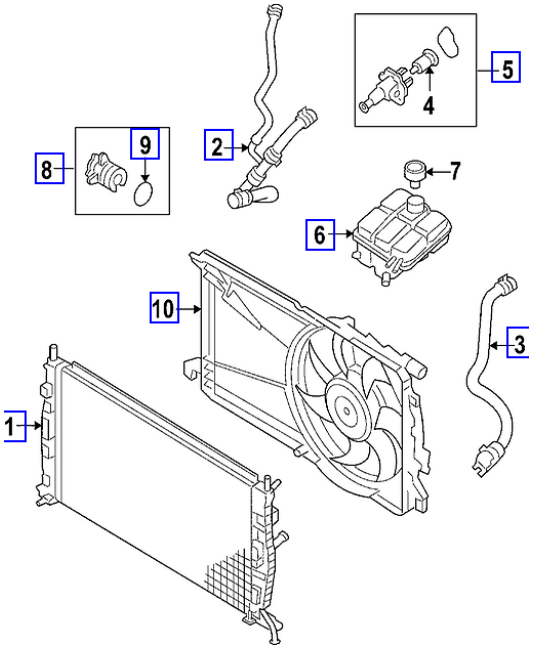
Exploded Parts Diagram (itype_83)



Parts and Labor (itype_189)

Labor

Operation	Qualifier Path	Skill	Std Hrs	Wty Hrs
Service or Charge	Cooling System, Service	C	1.3	0.0
Diagnose/Test	Cooling System Pressure, Test	C	0.3	0.0

Cooling System Location Index (Article 1413211)

COOLING SYSTEM LOCATION INDEX[LF, L3]

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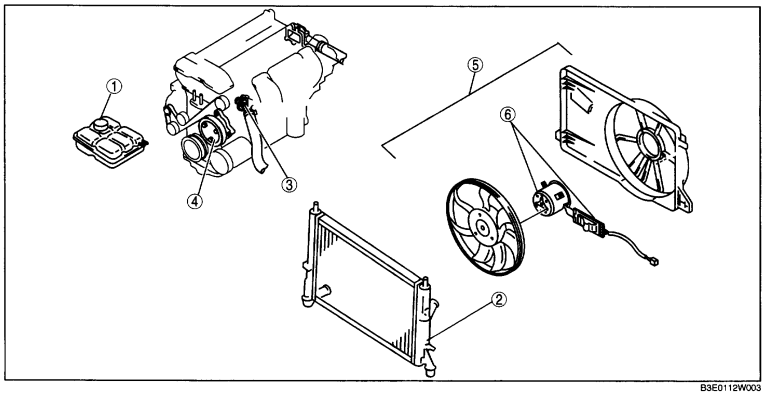


1	Cooling system cap
2	Radiator
3	Thermostat

4	Water pump
5	Cooling fan component
6	Cooling fan motor component

Cooling System Service Warnings (Article 1376887)

COOLING SYSTEM
SERVICE WARNINGS [LF, L3]
Warning:

- Remove and install all parts when the engine is cold, otherwise they can cause severe burns or serious injury.
- Turn off the engine and wait until it is cool. Even then, be very careful when removing the cap. Wrap a thick cloth around it and slowly turn it counterclockwise 2.5 turns. Step back while the pressure escapes.
- When you are sure all the pressure is gone, turns the cap using the cloth, and remove it.

All Technical Service Bulletins (itype_100)

Tsbs
- WATER PUMP COOLANT LEAK (01-022/19, 2019/12/13)
- Cooling Sys - FL22 Engine Coolant Info (0100216, 2016/02/05)
- Engine Controls/Cooling System - MIL ON/DTC P0128 Set (0100711, 2011/02/07)
- Cooling System - Coolant Leak From Water Outlet (0102610, 2010/04/23)
- Body - Engine Compartment Shroud Appearance (0903409, 2009/07/10)

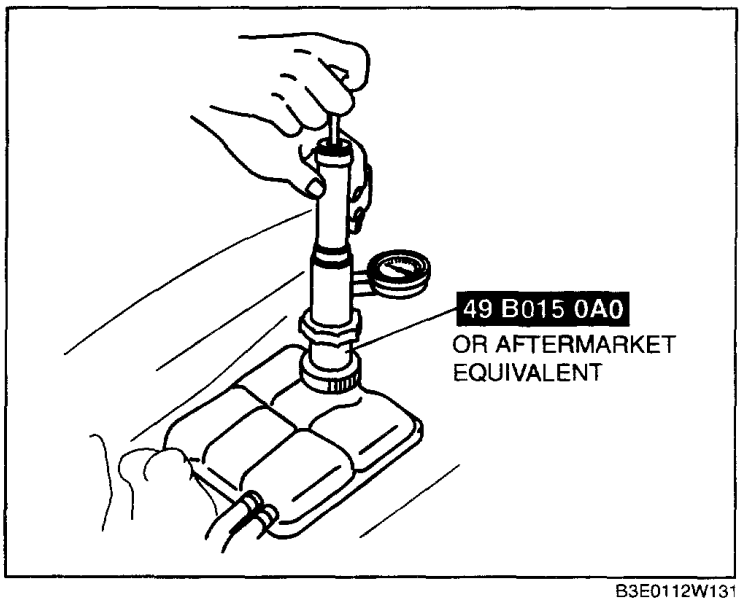
Customer Interest Bulletins (itype_109)

Tsbs
- Engine Controls/Cooling System - MIL ON/DTC P0128 Set (0100711, 2011/02/07)
- Cooling System - Coolant Leak From Water Outlet (0102610, 2010/04/23)

Repair Tips (itype_110)

Tsbs
- Body - Engine Compartment Shroud Appearance (0903409, 2009/07/10)

Engine Coolant Leakage Inspection (Article 1366682)



Cooling System Concerns - Overheating (Article 1416964)

17	COOLING SYSTEM CONCERNS -OVERHEATING
DESCRIPTION	Engine runs at higher than normal temperature/overheats.
POSSIBLE CAUSE	• Improper coolant level • Blown fuses • Coolant leakage • Excessive A/C system pressure • A/C system operation is improper • Improper water/anti-freeze mixture • Fans reverse rotation • Poor radiator condition • Thermostat malfunction • Radiator hoses damage • Improper or damaged radiator cap • Cooling fan is inoperative. • Coolant overflow system malfunction • Improper tension of drive chain • Drive belt damage

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Inspect the following: • Engine coolant level • Coolant leakage • Water and anti-freeze mixture • Radiator condition • Collapsed or restricted radiator hoses • Radiator pressure cap • Overflow system • Fan rotational direction • Fuses Are all items normal?	Yes	Go to the next step.
		No	Service if necessary. Repeat Step 1.
2	Connect the M-MDS to the DLC-2. Turn the ignition switch to the ON position (Engine off). Retrieve any DTCs. Are there any DTCs displayed?	Yes	**DTC is displayed:** Go to the appropriate DTC inspection. (See DTC TABLE [LF, L3].)
		No	**No DTC is displayed:** Go to the next step.

STEP	INSPECTION	RESULTS	ACTION
3	Start the engine and idle it. Turn the A/C switch on and set blower fan to any speed. Does the A/C compressor engage?	Yes	Go to Step 5.
		No	Inspect for the following and repair or replace if necessary: • Refrigerant charging amount • Open circuit in wiring harness between A/C relay and PCM terminal 1I*1, 1AN*2, 1I*3 • Seized A/C magnetic clutch • A/C magnetic clutch malfunction If all items are normal, go to the next step.
4	Start the engine and idle it. Turn the A/C switch on and set blower fan any speed. Measure voltage at PCM terminal 1AP. (SeePCM INSPECTION [LF, L3].) Is voltage normal?	Yes	Go to the next step.
		No	Inspect the following: • Refrigerant pressure switch operation • The A/C switch is stuck open. • Open or short circuit between refrigerant pressure switch and PCM terminal 1AU*1, 1AP*2, 1AU*3 • Open circuit of blower motor fan switch and resistor (if blower motor does not operate) • The evaporator temperature sensor and A/C amplifier
5	Inspect cooling fan control system operation. (See ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF, L3].) Does the cooling fan control system function properly?	Yes	Go to the next step.
		No	Repair or replace the malfunctioning part.
6	Is the drive belt normal?	Yes	Go to the next step.
		No	Replace the drive belt.
7	Is there leakage around the heater unit in passenger compartment?	Yes	Inspect and service heater for leakage.
		No	Go to the next step.
8	Is there leakage at the coolant hoses and/or radiator?	Yes	Replace the malfunctioning part.
		No	Go to the next step.
9	Cool down the engine. Remove thermostat and inspect operation. Is thermostat normal?	Yes	The engine coolant temperature and thermostat are normal, inspect engine block for leakage or blockage.
		No	Access ECT PID. Inspect for both ECT PID and temperature gauge readings. If temperature gauge on instrument cluster indicates normal range but ECT PID is not same as temperature gauge reading, inspect ECT sensor. If temperature gauge on instrument cluster indicates overheating but ECT PID is normal, inspect temperature gauge and heat gauge unit.
10	• Verify test results. — If normal, return to diagnostic index to service any additional symptoms. (See SYMPTOM DIAGNOSTIC INDEX [LF, L3].) — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, replace the PCM.		

*1 : California emission regulation applicable model
*2 : Except for California emission regulation applicable model with LF engine ATX
*3 : Except for California emission regulation applicable model with LF engine MTX and L3 engine

Cooling System Concerns - Runs Cold (Article 1416965)

18	COOLING SYSTEM CONCERNS-RUNS COLD
DESCRIPTION	Engine takes excessive time to reach normal operating temperature.
POSSIBLE CAUSE	• Thermostat malfunction • Cooling fan system malfunction

Diagnostic procedure

STEP	INSPECTION	RESULTS	ACTION
1	Is customer complaint "Lack of passenger compartment heat" only?	Yes	Inspect A/C and heater system.
		No	Go to the next step.
2	Does the engine speed continue at fast idle?	Yes	Go to symptom troubleshooting "No.9 Fast idle/runs on" (See NO.9 FAST IDLE/RUNS ON [LF, L3].)
		No	Go to the next step.
3	Remove the thermostat and inspect operation. Is thermostat normal?	Yes	Go to the next step.
		No	Replace the thermostat.
4	Inspect cooling fan control system operation. (See ENGINE CONTROL SYSTEM OPERATION INSPECTION [LF, L3].) Does the cooling fan control system function properly?	Yes	Access ECT PID. Inspect for both ECT PID and temperature gauge on instrument cluster readings. If the temperature gauge on the instrument cluster indicates normal range but ECT PID is not the same as temperature gauge reading, inspect the ECT sensor. If the temperature gauge on the instrument cluster indicates cold range but ECT PID is normal, inspect the temperature gauge and heat gauge unit.
		No	Repair or replace the malfunctioning part.
5	• Verify test results. — If normal, return to diagnostic index to service any additional symptoms. (See SYMPTOM DIAGNOSTIC INDEX [LF, L3].) — If malfunction remains, inspect related Service Bulletins and/or On-line Repair Information and perform repair or diagnosis. • If vehicle is repaired, troubleshooting completed. • If vehicle is not repaired or additional diagnostic information is not available, replace PCM.		

Leaks (itype_149)

Tsbs

- WATER PUMP COOLANT LEAK (01-022/19, 2019/12/13)
- Cooling System - Coolant Leak From Water Outlet (0102610, 2010/04/23)

Vehicle / Component Identification (itype_118)

Tsbs

- Cooling Sys - FL22 Engine Coolant Info (0100216, 2016/02/05)