

ENGINE LUBRICATION & COOLING SYSTEMS

SECTION LC

LC

MODIFICATION NOTICE:

SR engine

- An oil cooler has been added.
- The oil tube for camshaft lubrication has been eliminated.

CD engine

- A crankshaft position sensor (TDC) has been added to the oil pump.
- The water pump gasket has been changed from a liquid type to a metal type.
- The vacuum pump lubrication circuit has been changed. Refer to "VACUUM PUMP" in BR section.

CONTENTS

SR

ENGINE LUBRICATION SYSTEM	2
Lubrication Circuit.....	2
Oil Cooler	3
ENGINE COOLING SYSTEM	4
Cooling Circuit	4

CD

ENGINE LUBRICATION SYSTEM	5
Oil Pump.....	5
ENGINE COOLING SYSTEM	6
Water Pump.....	6

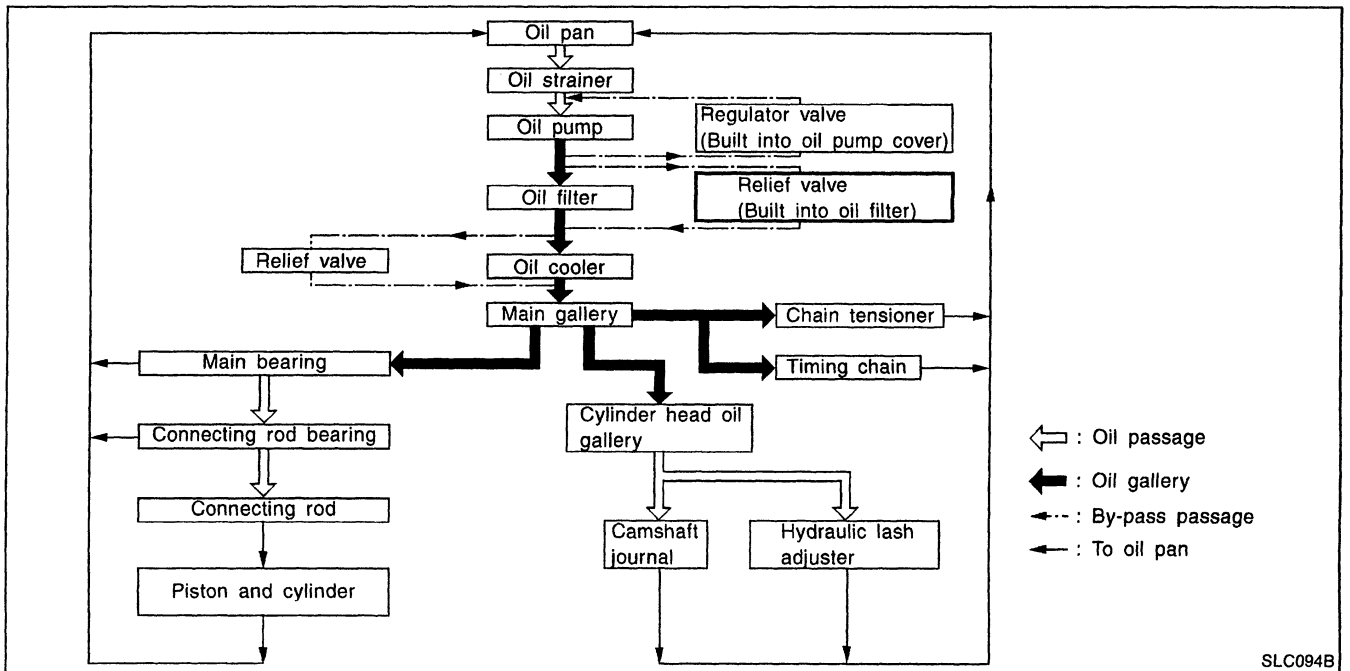
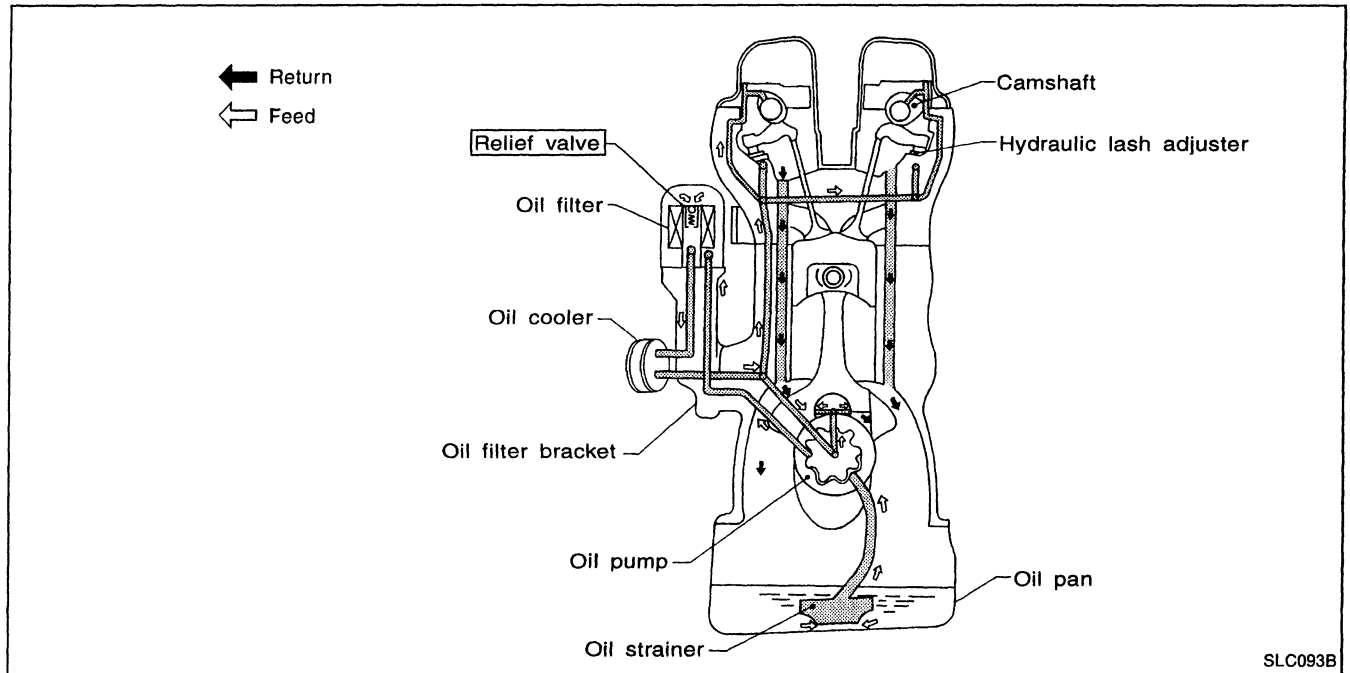
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ENGINE COOLING SYSTEM	7
Overheating Cause Analysis.....	7

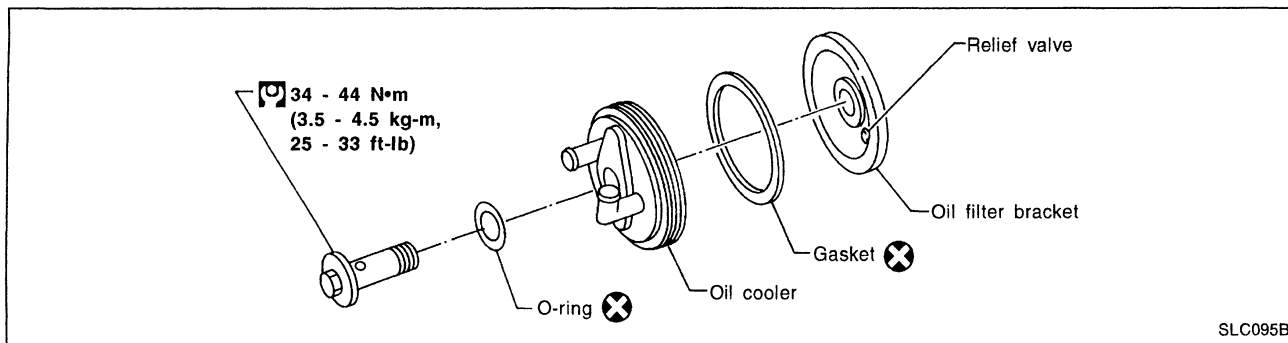
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SERVICE DATA AND SPECIFICATIONS (SDS)	8
Engine Lubrication System.....	8

Lubrication Circuit



Oil Cooler



LC

REMOVAL AND INSTALLATION

1. Drain engine oil and coolant.
2. Remove oil cooler.
3. Installation is in reverse order of removal.

INSPECTION

Oil cooler

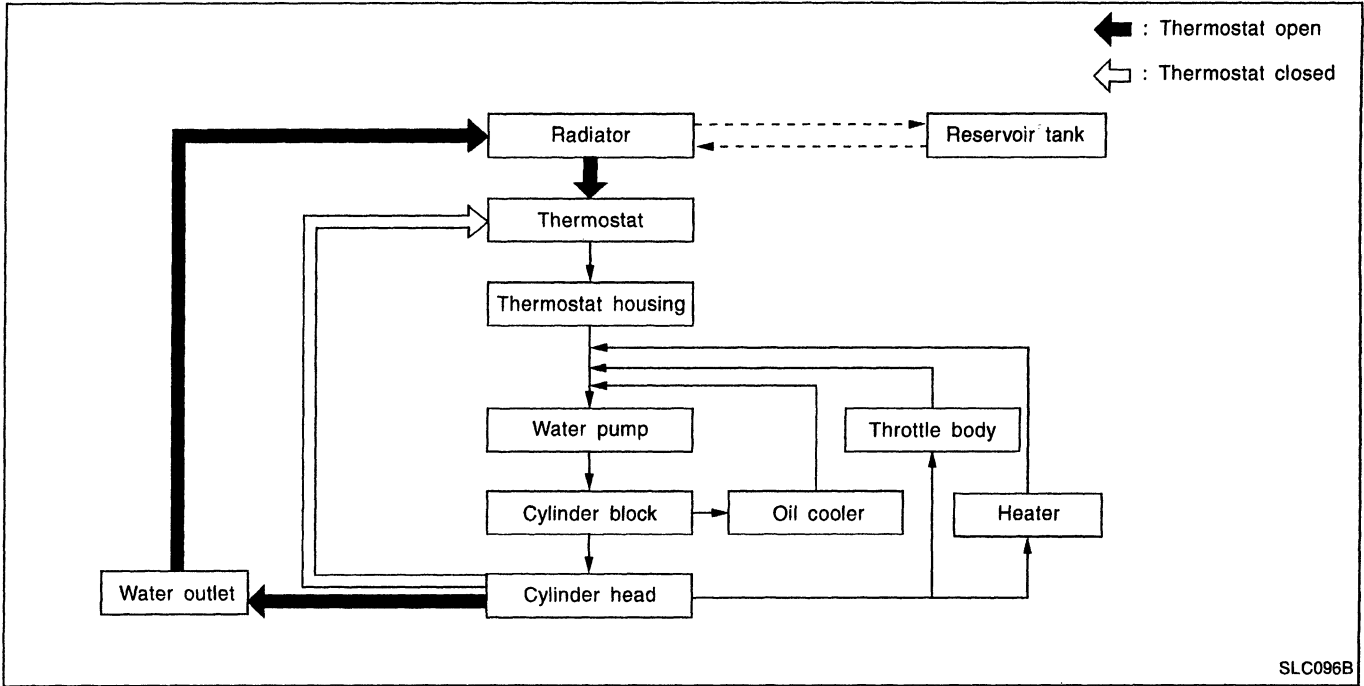
1. Check oil cooler for cracks.
2. Check oil cooler for clogging by blowing through coolant inlet.

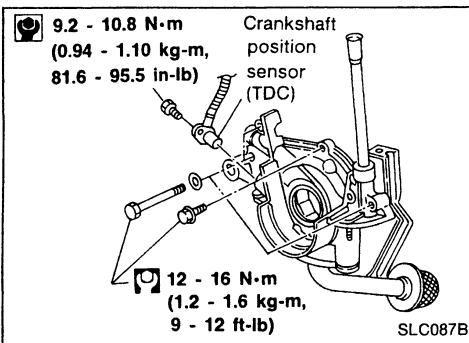
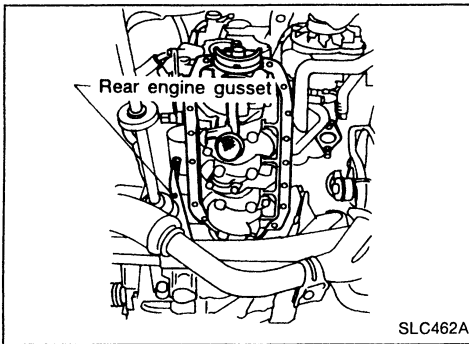
If necessary, replace oil cooler assembly.

Oil pressure relief valve

Inspect oil pressure relief valve for movement, cracks and breaks by pushing the ball. If replacement is necessary, remove valve by prying it out with a suitable tool. Install a new valve in place by tapping it.

Cooling Circuit





Oil Pump

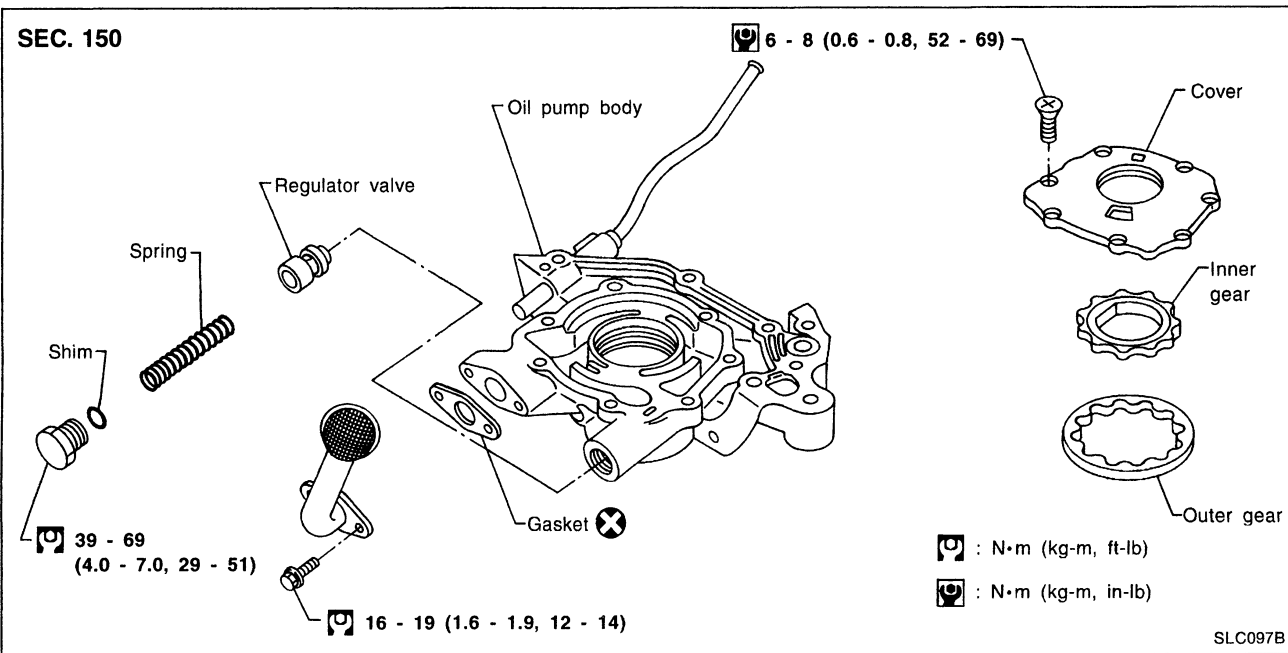
REMOVAL AND INSTALLATION

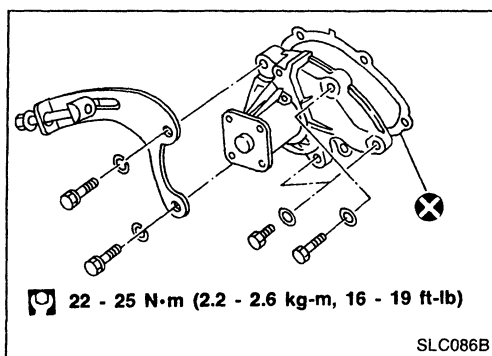
1. Drain engine coolant and engine oil.
 2. Remove upper radiator hose, drive belts, crank pulley, timing belt covers and timing belt.
 3. Remove exhaust front tube, timing belt pulley and rear engine gusset (bar type), then remove oil pan.
 4. Remove crankshaft position sensor (TDC).
 5. Remove oil pump assembly with oil strainer.
 6. Reinstall any part removed. Refill engine oil and engine coolant.
- Apply liquid gasket to oil pump.
 - Apply liquid gasket to oil pan.
 - Apply liquid gasket to both ends of oil pan oil seals.
 - Install oil pan, fitting oil seals in the correct position.

LC

DISASSEMBLY AND ASSEMBLY

When installing oil pump, apply engine oil to inner and outer gears.





Water Pump

INSTALLATION

- When installing water pump, replace the gasket with a new one.

Overheating Cause Analysis

	Symptom		Check items		
Cooling system parts malfunction	Poor heat transfer	Water pump malfunction	—	—	
		Thermostat stuck closed	—		
		Water control valve stuck closed	—		
		Damaged fins	Dust contamination or paper clogging		—
			Mechanical damage		
		Clogged radiator cooling tube	Excess foreign material (rust, dirt, sand, etc.)		
	Reduced air flow	High resistance to fan rotation	—	—	
		Damaged fan blades			
	Damaged radiator shroud	—	—		
	Improper coolant mixture ratio	—	—	—	
	Poor coolant quality	—	—	—	
	Insufficient coolant	Coolant leaks	Cooling hose	Loose clamp	
				Cracked hose	
			Water pump	Poor sealing	
			Radiator cap	Loose	
				Poor sealing	
			Radiator	O-ring for damage, deterioration or improper fitting	
				Cracked radiator tank	
				Cracked radiator core	
		Reservoir tank	Cracked reservoir tank		
		Overflowing reservoir tank	Exhaust gas leaks into cooling system	Cylinder head deterioration	
				Cylinder head gasket deterioration	
Except cooling system parts malfunction	—	Overload on engine	Abusive driving	High engine rpm under no load	
				Driving in low gear for extended time	
				Driving at extremely high speed	
			Powertrain system malfunction	—	
		Installed improper size wheels and tires			
		Dragging brakes			
		Improper ignition timing.			
		Blocked or restricted air flow	Blocked bumper	—	—
	Blocked radiator grille		Installed car brassiere		
			Mud contamination or paper clogging		
	Blocked radiator		—		
	Blocked condenser		—		
	Installed large fog lamp				

LC

Engine Lubrication System

Oil pump inspection

Unit: mm (in)

Body to outer gear clearance	0.114 - 0.200 (0.0045 - 0.0079)
Outer gear to inner gear clearance	Less than 0.18 (0.0071)
Housing to inner gear clearance	0.05 - 0.09 (0.0020 - 0.0035)
Housing to outer gear clearance	0.05 - 0.11 (0.0020 - 0.0043)
Inner gear to housing clearance	0.045 - 0.091 (0.0018 - 0.0036)
