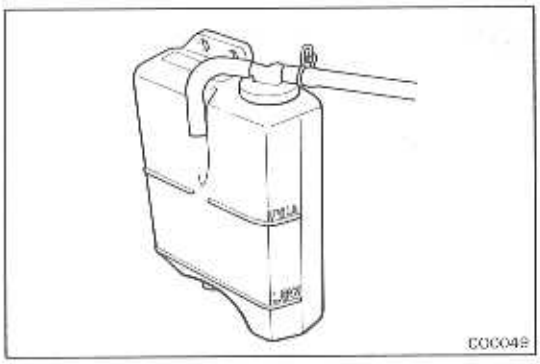
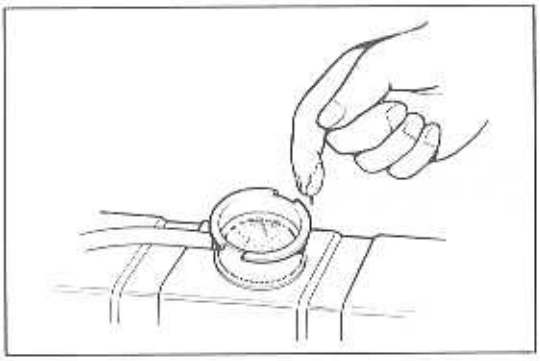
COOLING SYSTEM

TROUBLESHOOTING

Problem	Possible cause	Remedy	Page
Engine overheats	Fan belt loose or missing	Adjust or replace belt	CH-5
	Dirt, leaves or insects on radiator or condenser	Clean radiator or condenser	CO-8
	Hoses, water pump, thermostat housing, radiator, heater, core plugs or head gasket leakage	Repair as necessary	
	Thermostat faulty	Check thermostat	CO-7
	Injection timing retarded	Set timing	EM-15
	Fluid coupling faulty	Replace fluid coupling	
	Radiator hose plugged or rotted	Replace hose	
	Water pump faulty	Replace water pump	CO-4
	Radiator plugged or cap faulty	Check radiator	CO-8
	Cylinder head or block cracked or plugged	Repair as necessary	

NOTE: The thermostat on the L, 2L and 2L-T engines is equipped with a by-pass valve. Therefore, if the engine tends to overheat, removal of the thermostat would have an adverse effect, causing a lowering cooling efficiency.





CHECK AND REPLACEMENT OF ENGINE COOLANT

1. CHECK ENGINE COOLANT LEVEL AT RESERVE TANK

The coolant level should be between the "LOW" and "FULL" lines.

If low, check for leaks and add coolant up to the "FULL" line.

2. CHECK ENGINE COOLANT QUALITY

There should not be any excessive rust deposits or scales around the radiator cap or radiator filler hole, and the coolant should be free from oil.

If excessively dirty, replace the coolant.

3. REPLACE ENGINE COOLANT

(a) Remove the radiator cap.

(b) Drain the coolant from radiator and engine drain cocks. (Engine drain cock is at left rear of engine block.)

(c) Close the drain cocks.

Torque (Engine drain cock):
300 kg-cm (22 ft-lb, 29 N·m)

(d) Fill the system with coolant.

Use a good brand of ethylene-glycol base coolant, mixed according to the manufacturer's directions.

Capacity (w/ Heater):

LF, LH, LN
10.6 liters (11.2 US qts, 9.3 Imp.qts)
LS 8.8 liters (9.3 US qts, 7.7 Imp.qts)
LX 9.0 liters (9.5 US qts, 8.0 Imp.qts)
LY 9.7 liters (10.3 US qts, 8.5 Imp.qts)

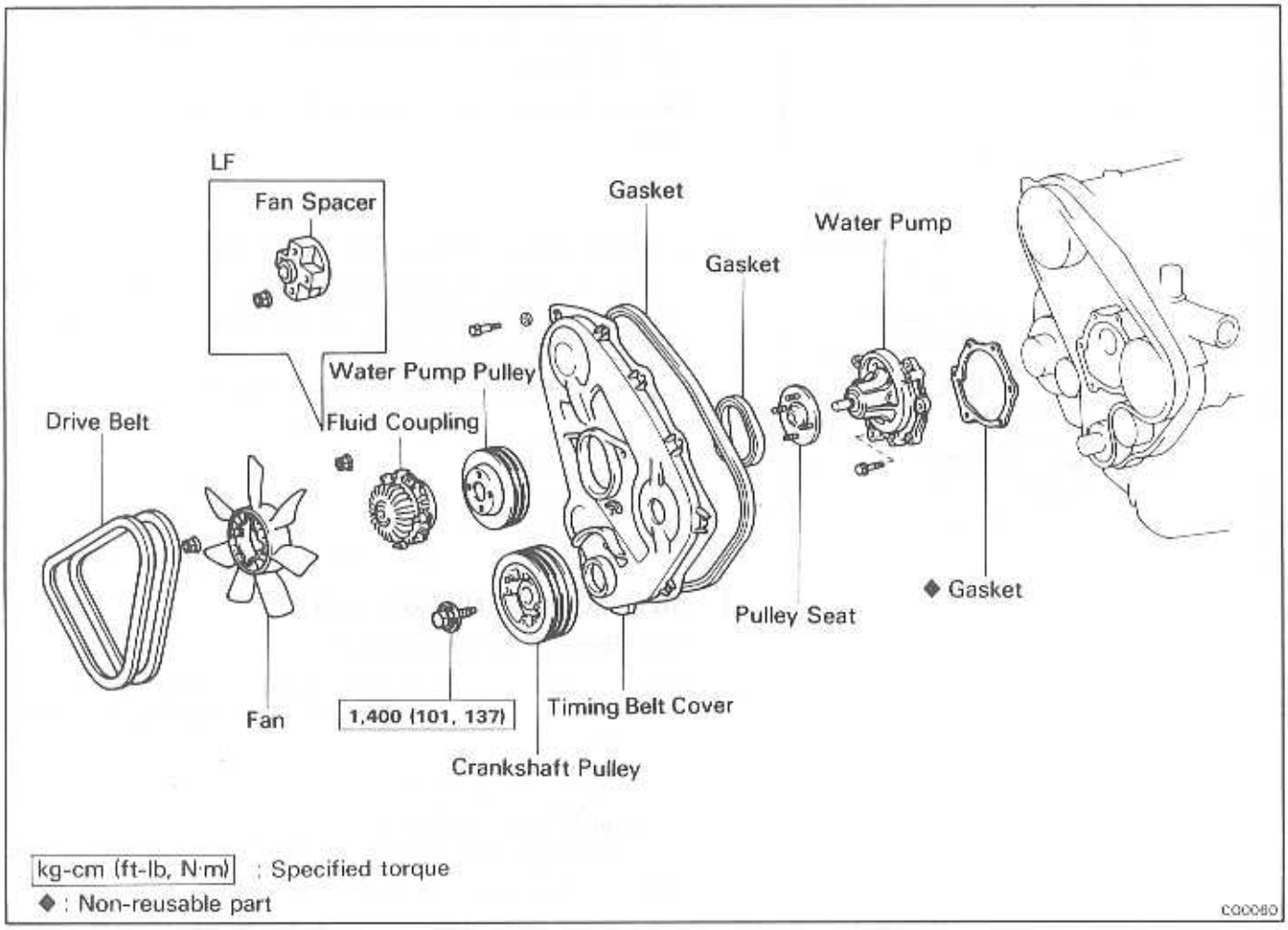
(e) Install the radiator cap.

(f) Start the engine and check for leaks.

(g) Recheck the coolant level and refill as necessary

WATER PUMP

COMPONENTS



kg-cm (ft-lb, N·m) : Specified torque
◆ : Non-reusable part

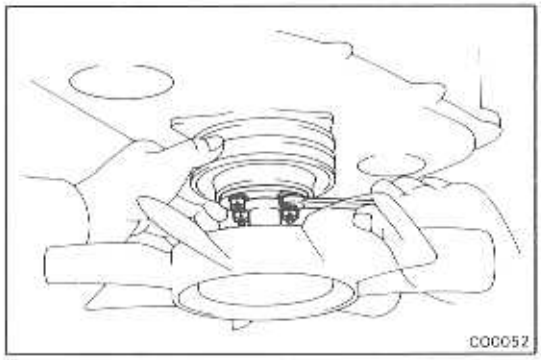
CO0080

REMOVAL OF WATER PUMP

1. **DRAIN COOLANT**

   Open the radiator and engine drain cocks, and allow the coolant to drain into a suitable container.

2. **REMOVE DRIVE BELTS**



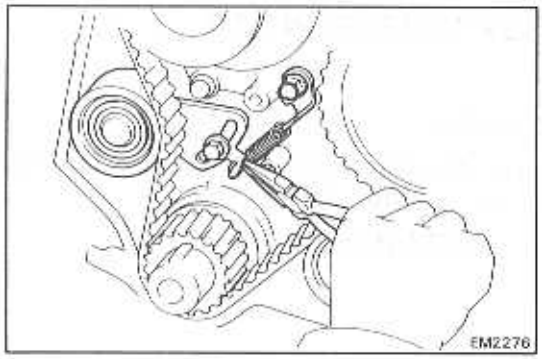
CO0052

3. [ex. LF]
   REMOVE FLUID COUPLING AND WATER PUMP PULLEY WITH FAN

   Remove the four nuts mounting the fluid coupling and pulley, and remove the fluid coupling and pulley with the fan.

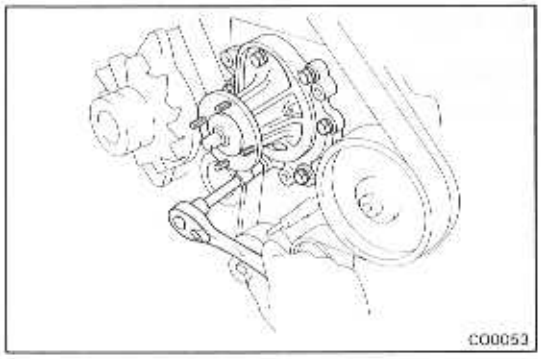
   [LF]
   REMOVE FAN SPACER AND WATER PUMP PULLEY WITH FAN

   Remove the four nuts mounting the spacer and pulley, and remove the spacer and pulley with the fan.



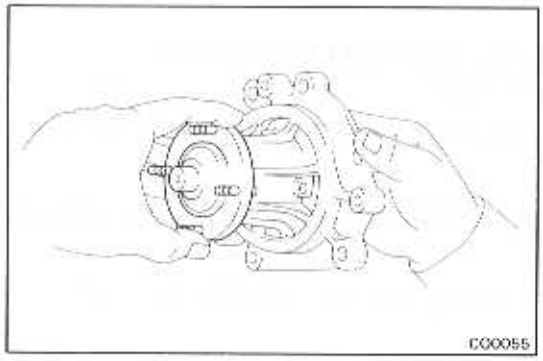
4. **REMOVE TIMING BELT COVER**
(See steps 1 to 4 on pages EM-20 and 21)

5. **REMOVE TIMING BELT TENSION SPRING**



6. **REMOVE WATER PUMP**

Remove the six bolts, spring bracket, water pump and gasket.

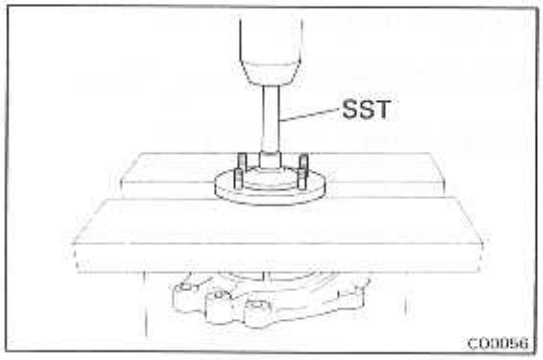


INSPECTION AND REPAIR WATER PUMP

1. **INSPECT WATER PUMP BEARING**

Check that the water pump bearing operation is not rough or noisy.

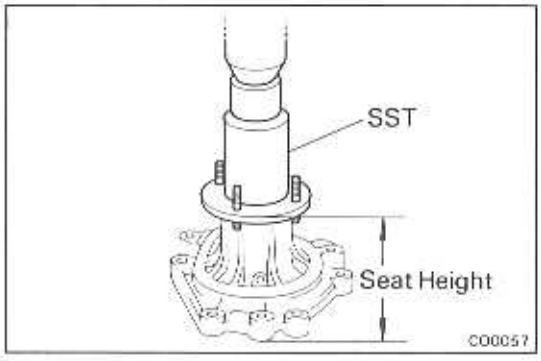
If necessary, replace the water pump.



2. **IF NECESSARY, REPLACE PULLEY SEAT**

(a) Using SST, press out the pulley seat.

SST 09236-00101

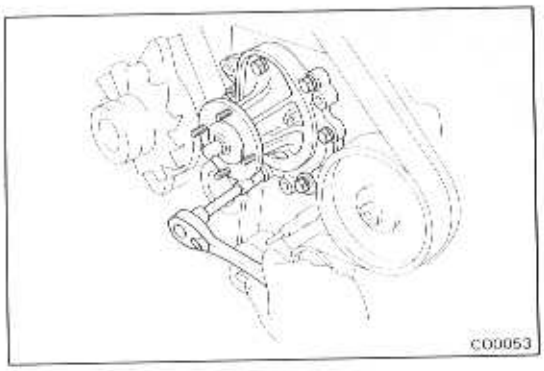


(b) Using SST, press in a new pulley seat to specified seat height.

SST 09236-00101

Seat height:

LF	**66 mm (2.60 in.)**
ex. LF	**77 mm (3.03 in.)**



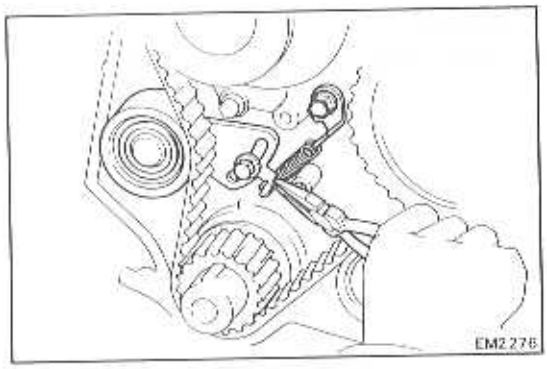
INSTALLATION OF WATER PUMP

(See page CO-4)

1. **INSTALL WATER PUMP**

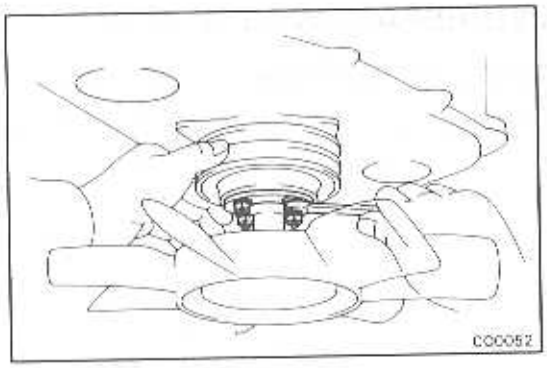
   Install a new gasket, the water pump and spring bracket with the six bolts. Torque the bolts.

   Torque: 195 kg-cm (14 ft-lb, 19 N·m)



2. **INSTALL TIMING BELT TENSION SPRING**

3. **INSTALL TIMING BELT COVER**
   (See steps 13, 14 on pages EM-29, 30)



4. **[ex. LF]**
   INSTALL WATER PUMP PULLEY AND FLUID COUPLING WITH FAN

   Install the pulley, fluid coupling and fan with the four nuts.

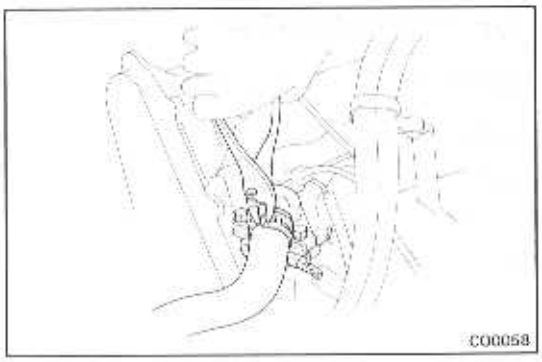
   [LF]
   INSTALL WATER PUMP PULLEY AND FAN SPACER WITH FAN

   Install the pulley, spacer and fan with the four nuts.

5. **INSTALL DRIVE BELTS (See page EM-30)**

6. **FILL ENGINE WITH COOLANT (See page CO-3)**

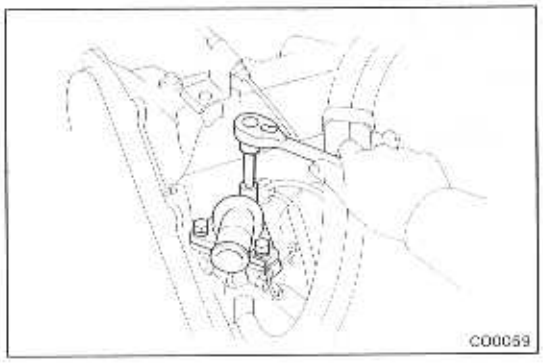
7. **START ENGINE AND CHECK FOR LEAKS**



THERMOSTAT

REMOVAL OF THERMOSTAT

1. **DRAIN ENGINE COOLANT (See page CO-3)**
2. **DISCONNECT RADIATOR INLET HOSE FROM WATER OUTLET**

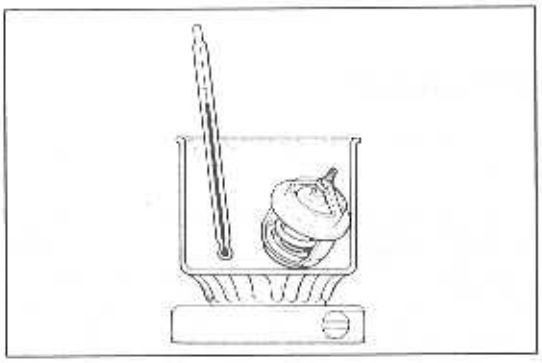


3. **REMOVE WATER OUTLET**

   Remove the three bolts, water outlet and gasket.

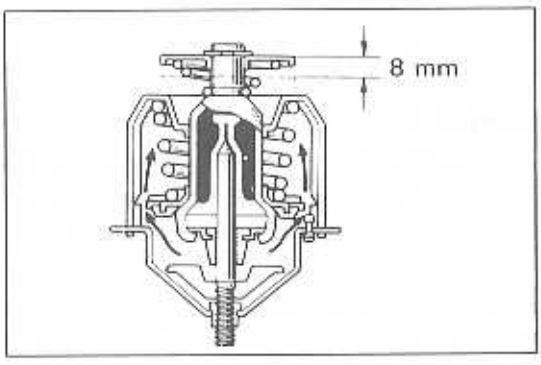
4. **REMOVE THERMOSTAT**

INSPECTION OF THERMOSTAT



NOTE: The thermostat is numbered with the valve opening temperature.

(a) Immerse the thermostat in water and heat the water gradually.



(b) Check the valve opening temperature and the valve lift.

If the valve opening temperature and valve lift are not within the following specifications, replace the thermostat.

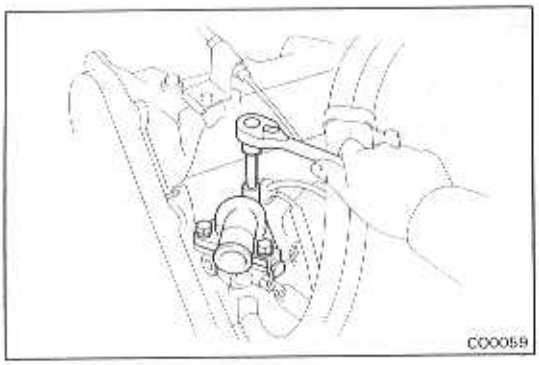
Valve opening temperature: **86 – 90°C (187 – 194°F)**

Valve lift:

More than 8 mm (0.31 in.) at 100°C (212°F)

(c) Check that the valve spring is tight when the thermostat is fully closed.

If not closed, replace the thermostat.

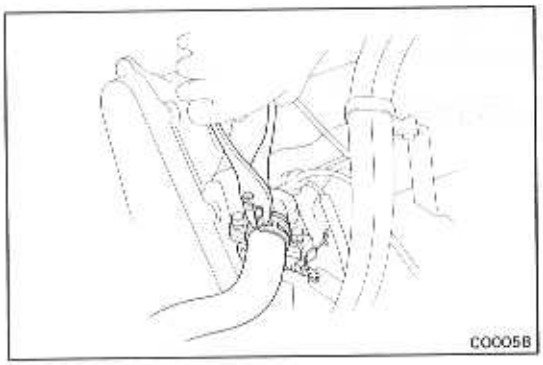


INSTALLATION OF THERMOSTAT

1. **PLACE THERMOSTAT IN WATER OUTLET**
2. **INSTALL WATER OUTLET**

   Install a new gasket and the water outlet with the three bolts. Torque the bolts.

   Torque: 195 kg-cm (14 ft-lb, 19 N·m)



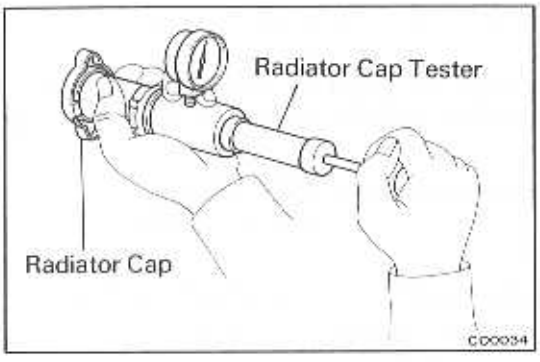
3. **CONNECT RADIATOR INLET HOSE**
4. **FILL ENGINE WITH COOLANT (See page CO-3)**
5. **START ENGINE AND CHECK FOR LEAKS**

RADIATOR

CLEANING OF RADIATOR

Using water or a steam cleaner, remove any mud or dirt from the radiator core.

CAUTION: If using a high pressure type cleaner, be careful not to deform the fins of the radiator core. If the cleaner nozzle pressure is 30 – 35 kg/cm² (427 – 498 psi, 2,942 – 3,432 kPa), keep a distance of at least 40 – 50 cm (15.75 – 19.69 in.) between the radiator core and cleaner nozzle.



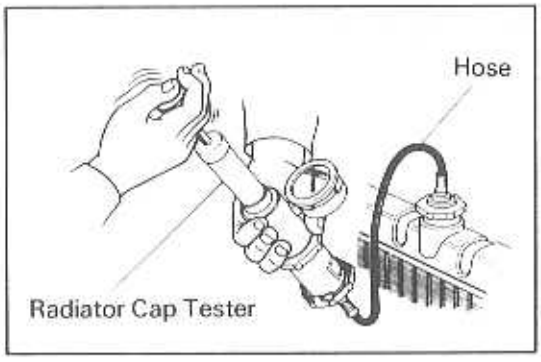
INSPECTION OF RADIATOR

1. **CHECK RADIATOR CAP**

   Using a radiator cap tester, pump the tester until the relief valve opens. Check that the valve opens between 0.75 kg/cm² (10.7 psi, 74 kPa) and 1.05 kg/cm² (14.9 psi, 103 kPa).

   Check that the pressure does not drop rapidly when pressure on the cap is below 0.6 kg/cm² (8.5 psi, 59 kPa).

   If either check is not within limits, replace the cap.



2. **CHECK COOLING SYSTEM FOR LEAKS**

   Attach a radiator cap tester to the radiator, and pump the tester to 0.9 kg/cm² (12.8 psi, 88 kPa). Check that pressure does not drop.

   If the pressure drops, check for leaks from the hoses, radiator or water pump. If no external leaks are found, check the heater core, block and head.