ENGINE MECHANICAL

SECTION EM

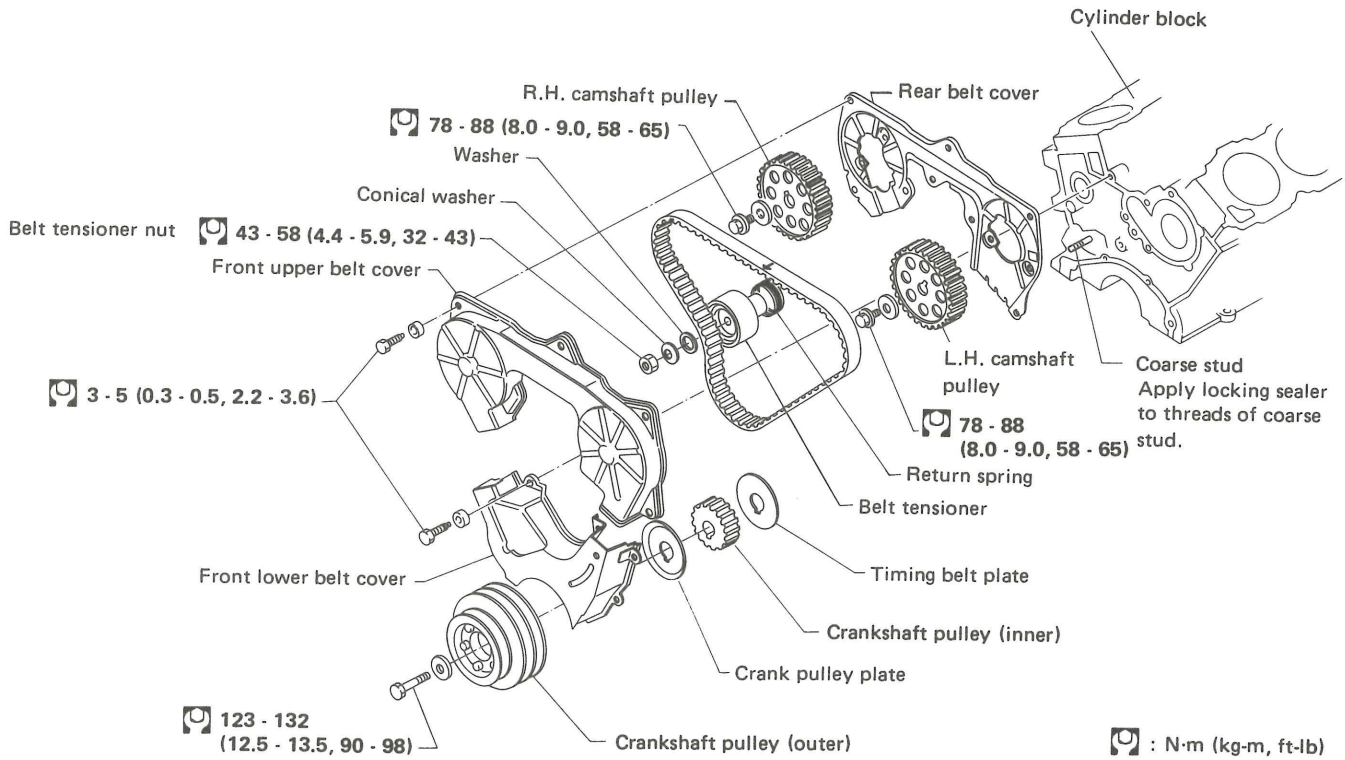
CONTENTS

TIMING BELT EM-2

TIMING BELT

Timing belt

a. **Ensure timing belt is clean and free from oil or water.**
b. **Before installing timing belt, confirm that No. 1 cylinder is set at T.D.C. on compression stroke.**
c. **Align arrow on timing belt forward.**
d. **Adjust belt tension with all spark plugs removed and both rocker shafts loosened completely.**
e. **Align white lines on timing belt with punch mark on camshaft pulleys and crankshaft pulley.**



Removal

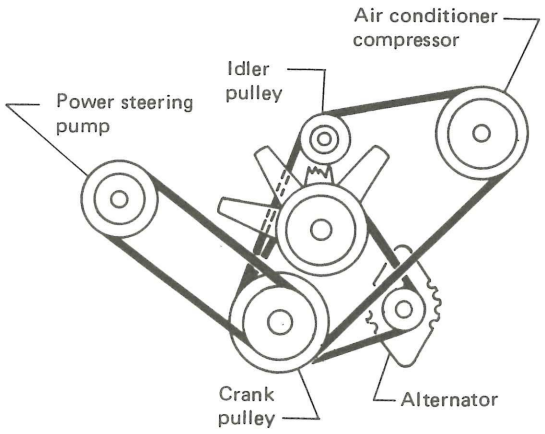
CAUTION:
After removing timing belt, do not rotate crankshaft and camshaft separately, because valves will hit piston heads.

1. Remove engine undercover and drain coolant from radiator.
2. Remove air intake duct, radiator upper hose and radiator upper shroud. Then remove radiator lower hose.

   Be careful not to allow coolant to contact drive belts.

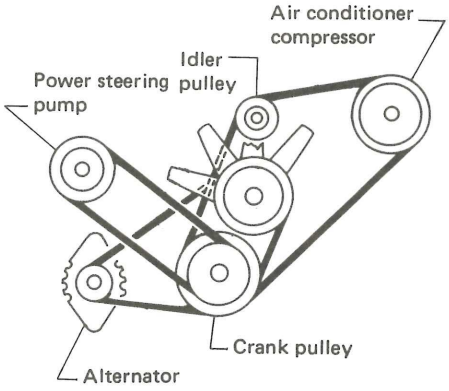
Removal (Cont'd)

3. Remove the following belts.
- Power steering drive belt
- Compressor drive belt
- Alternator drive belt



SEM658A

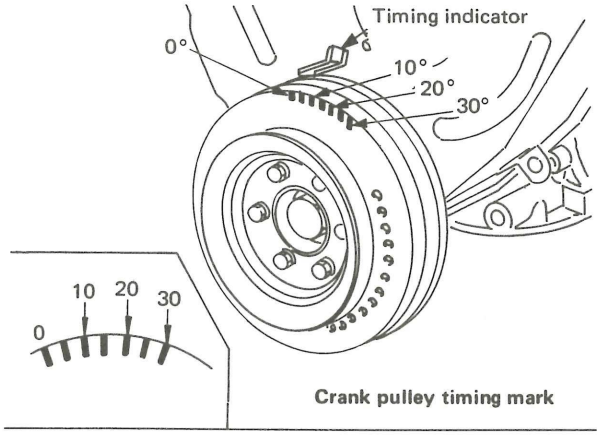
VG30ET



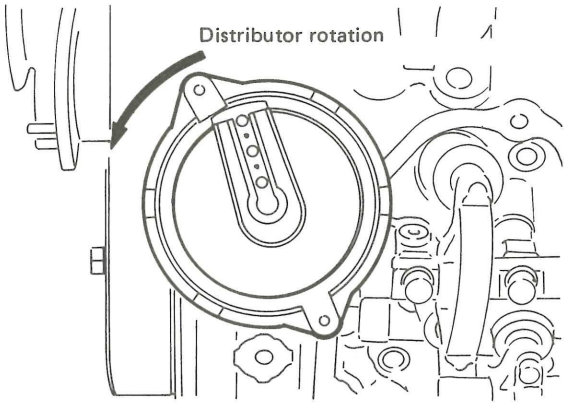
SMA458B

4. Remove fan and fan pulley.
5. Remove the compressor from the compressor bracket and secure the compressor to the body with a suitable wire or rag.
6. Remove idler pulley bracket of the compressor drive belt.
7. Remove spark plugs.

8. Set No. 1 cylinder at T.D.C. on its compression stroke.



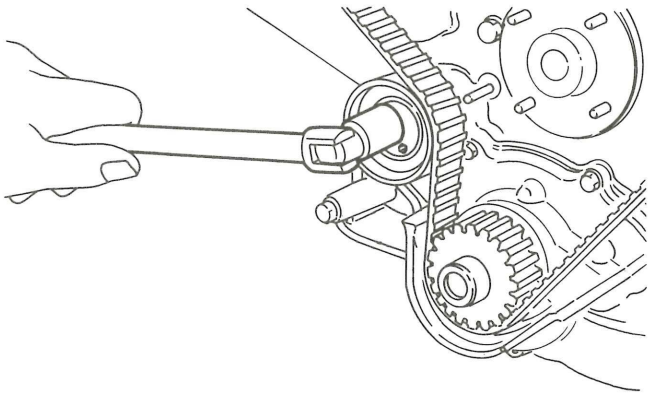
Crank pulley timing mark



Distributor rotor position

SEM530A

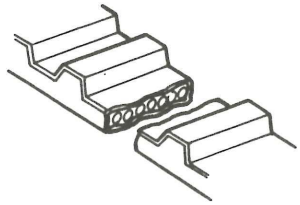
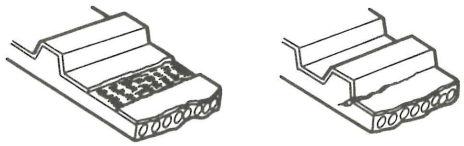
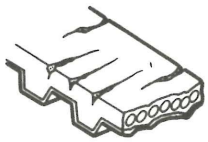
9. Remove crank pulley.
10. Remove front upper and lower belt covers.
11. Loosen timing belt tensioner and return spring then remove timing belt.



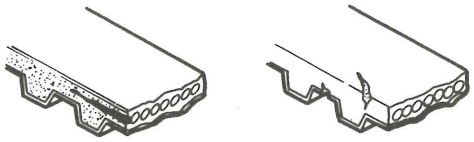
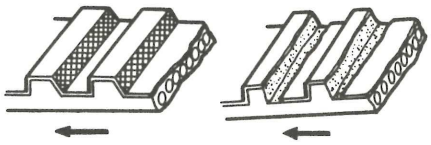
SEM240A

Inspection

Visually check the condition of the timing belt.
Replace if any abnormality is found.

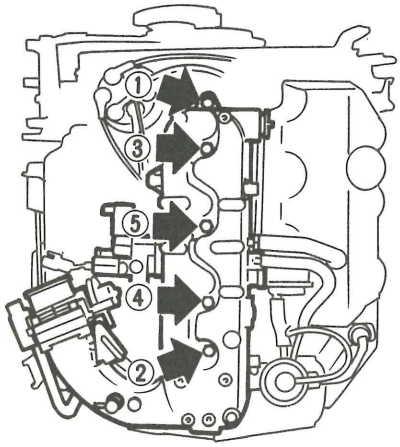
Item to check	Problem	Cause
Belt is broken.	 SEM393A	• Improper handling • Poor belt cover sealing • Coolant leakage at water pump
Tooth is broken/ tooth root is cracked.	 SEM394A	• Camshaft jamming • Distributor jamming • Oil leakage at camshaft/crankshaft oil seal
Back surface is cracked/worn.	 SEM395A	• Tensioner jamming • Overheated engine • Interference with belt cover

Inspection (Cont'd)

Item to check	Problem	Cause
Side surface is worn.	 • Side surface of belt is worn to such an extent that there is no trace of cutoff performed during manufacturing process. • Belt corners are worn and round. • Wicks are frayed and coming out. SEM396A	• Improper installation of belt • Malfunctioning crank pulley plate/timing belt plate
Teeth are worn.	 • Canvas on tooth face is worn down. • Canvas on tooth is fluffy, rubber layer is worn down and faded white, or fiber is worn down and invisible. SEM397A	• Poor belt cover sealing • Coolant leakage at water pump • Camshaft not functioning properly • Distributor not functioning properly • Excessive belt tension
Oil/Coolant or water is stuck to belt.		• Poor oil sealing of each oil seal • Coolant leakage at water pump • Poor belt cover sealing

Installation

1. Remove accelerator wire, hoses and harness connectors attached to the intake collector.
2. Remove collector cover and collector.



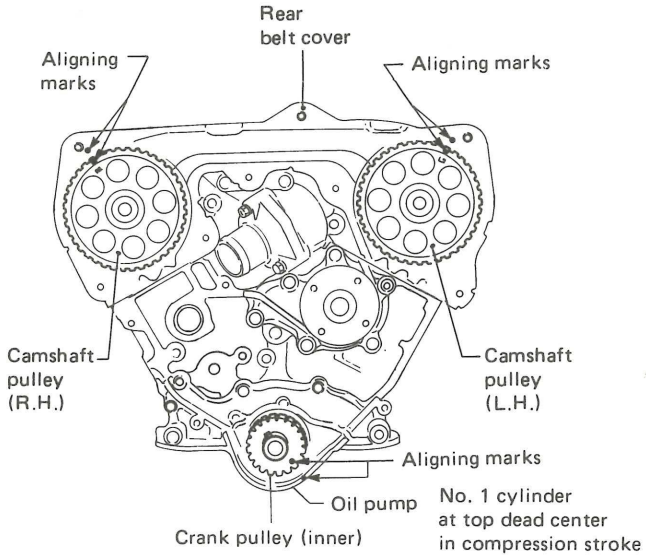
Loosen in numerical order and tighten in reverse order of removal.

SEM251A

3. Remove both rocker covers and loosen all rocker shaft securing bolts.

Loosen all rocker shaft securing bolts thoroughly so that timing belt tension can be adjusted correctly. Otherwise, proper belt tension cannot be obtained.

4. Confirm that No. 1 cylinder is set at T.D.C. on its compression stroke.

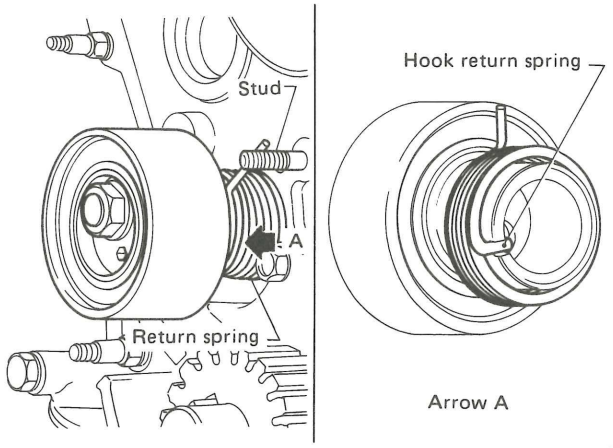


SEM241A

5. Install tensioner and return spring.

If the coarse stud is removed, apply locking sealer to threads of stud before installing.

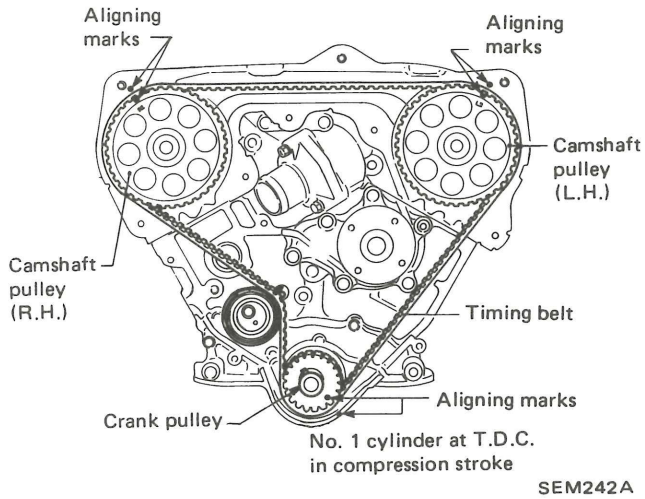
6. Turn tensioner clockwise with hexagon wrench and temporarily tighten tension lock nut.



SEM243A

7. Set timing belt.

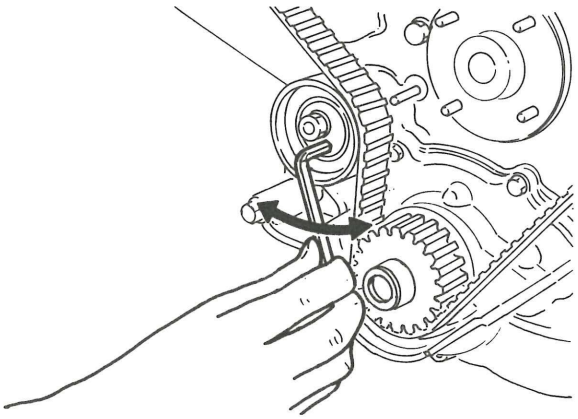
a. **Ensure that timing belt is clean and free of oil or water. Do not bend it.**
b. **Align white lines on timing belt with punch mark on camshaft pulleys and crankshaft pulley.**
c. **Have arrow on timing belt pointing toward front belt covers.**
d. **Ensure that all rocker shaft scuring bolts are loosened and spark plugs are removed.**



SEM242A

Installation (Cont'd)

8. Loosen tensioner lock nut.
9. Slowly turn tensioner with hexagon wrench clockwise and counterclockwise two or three times. The last turn of the wrench should be in the clockwise direction.



SEM244A

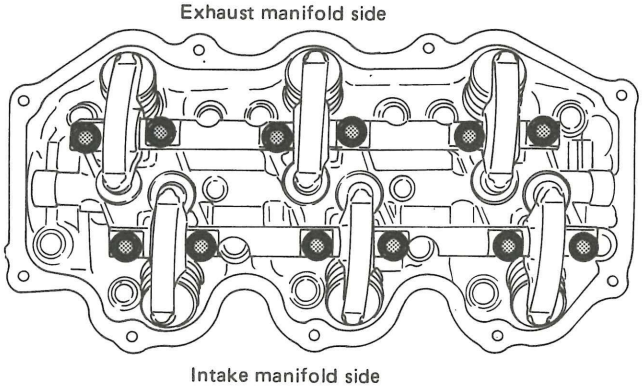
10. Tighten tensioner lock nut.

: **43 - 58 N·m**
(4.4 - 5.9 kg-m, 32 - 43 ft-lb)

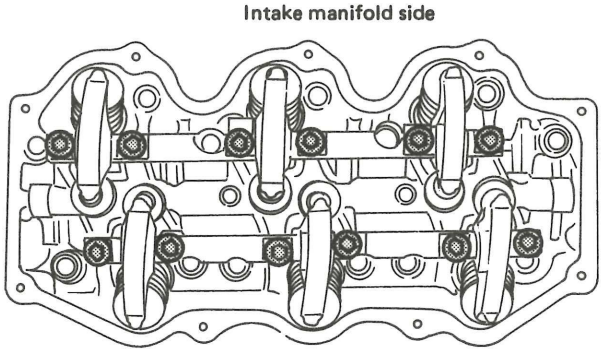
11. Tighten rocker shaft securing bolts in two or three stages.

18 - 22 N·m
(1.8 - 2.2 kg-m, 13 - 16 ft-lb)

R.H. rocker shafts



L.H. rocker shafts

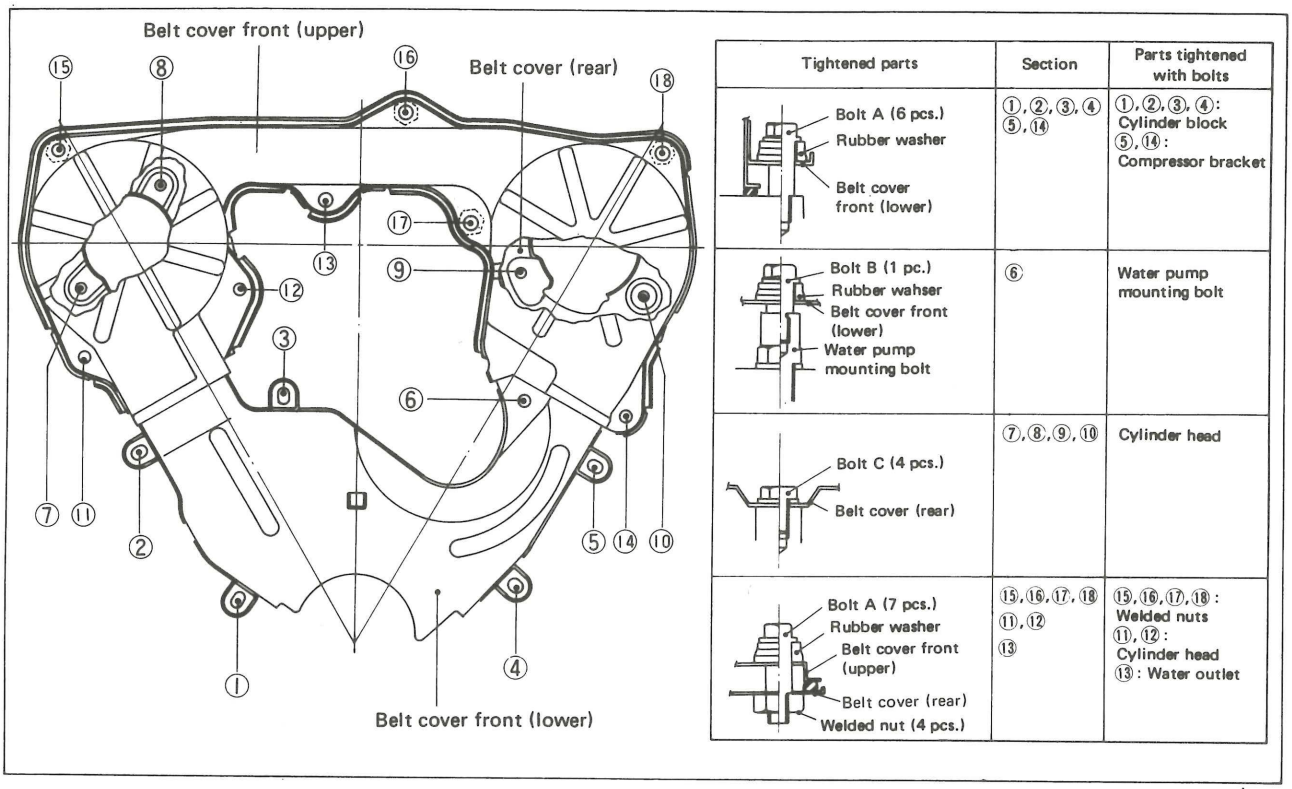


SEM245A

Before tightening, be sure to set camshaft lobe at the position where lobe is not lifted.

Installation (Cont'd)

12. Install rocker covers.
13. Install intake collector and collector cover.
14. Connect accelerator wire, hoses and harness connectors attached to the intake collector.
15. Install lower and upper belt covers.

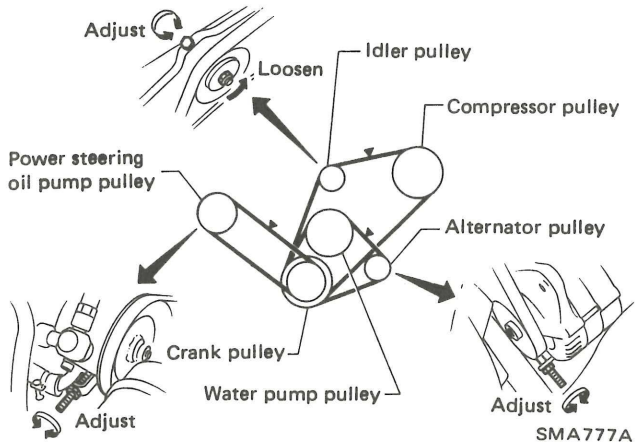


Tightened parts	Section	Parts tightened with bolts
Bolt A (6 pcs.) Rubber washer Belt cover front (lower)	①, ②, ③, ④ ⑤, ⑭	①, ②, ③, ④: Cylinder block ⑤, ⑭: Compressor bracket
Bolt B (1 pc.) Rubber wahser Belt cover front (lower) Water pump mounting bolt	⑥	Water pump mounting bolt
Bolt C (4 pcs.) Belt cover (rear)	⑦, ⑧, ⑨, ⑩	Cylinder head
Bolt A (7 pcs.) Rubber washer Belt cover front (upper) Belt cover (rear) Welded nut (4 pcs.)	⑮, ⑯, ⑰, ⑱ ⑪, ⑫ ⑬	⑮, ⑯, ⑰, ⑱: Welded nuts ⑪, ⑫: Cylinder head ⑬: Water outlet

SEM248A

Installation (Cont'd)

16. Install the following.
- Crankshaft pulley
- Idler pulley bracket of the compressor drive belt
- Compressor
- Fan pulley and fan
- Drive belts
- Spark plugs



Unit: mm (in)

	Adjusted deflection	Set deflection of new belt
Alternator	6 - 8 (0.24 - 0.31)	5 - 7 (0.20 - 0.28)
Air conditioner compressor	9 - 11 (0.35 - 0.43)	7 - 9 (0.28 - 0.35)
Power steering oil pump	13 - 16 (0.51 - 0.63)	10 - 13 (0.39 - 0.51)
Applied pushing force	98 N (10 kg, 22 lb)	

17. Install radiator hoses, radiator upper shroud, air intake duct and engine undercover.
18. Refill radiator with engine coolant.
19. Fill reservoir tank up to "MAX" level. Then close radiator cap.
20. Run the engine at approximately 2,000 rpm for about one minute.
21. Check area around radiator hose and radiator drain plug for any sign of leakage.
22. Stop the engine and after it cools down, refill the radiator and engine with coolant up to the filler opening. Fill the reservoir tank with coolant up to "MAX" level.