

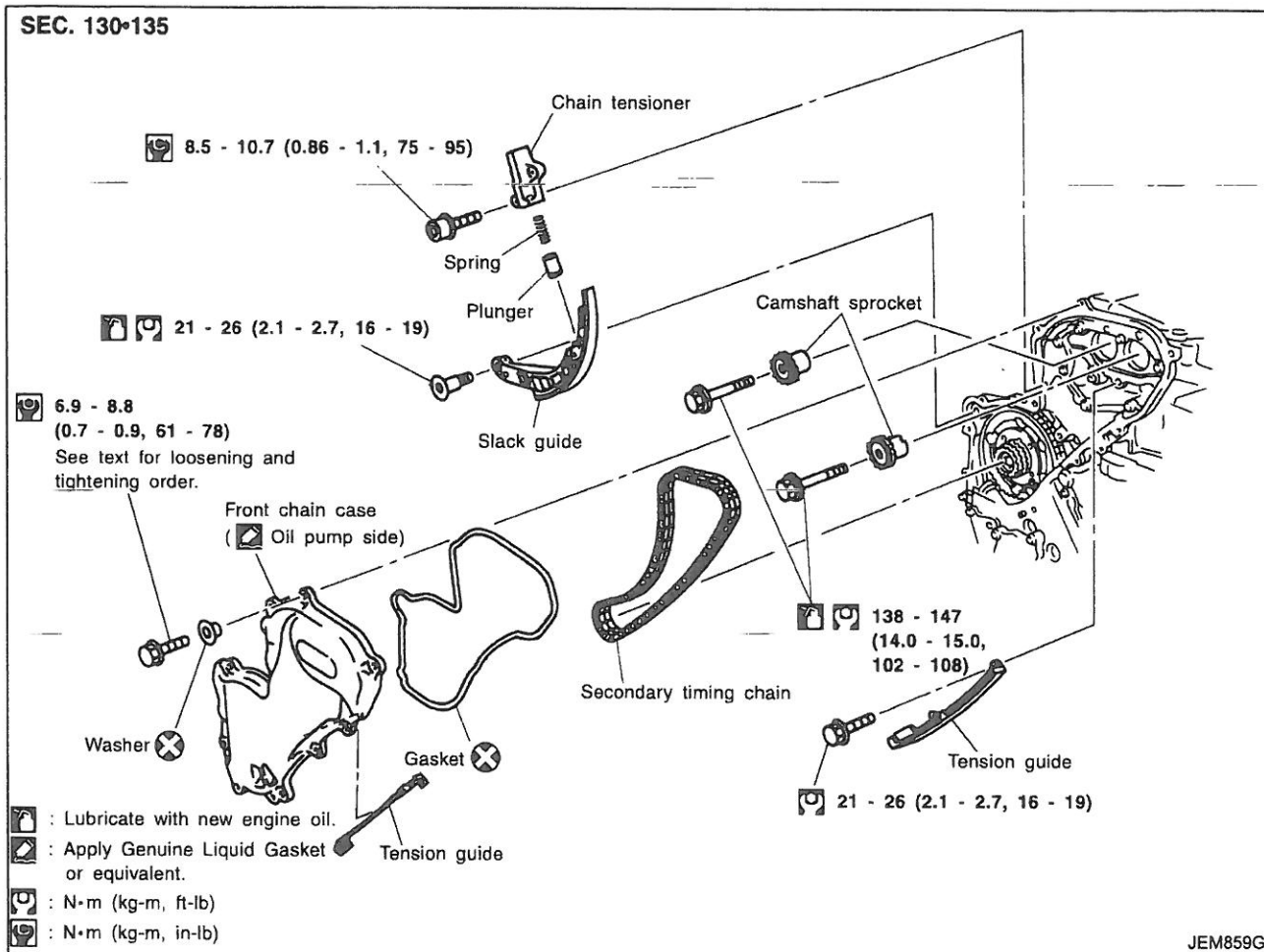
**FITTING
INSTRUCTIONS**

**NISSAN
YD2500TI**

Secondary Timing Chain

CAUTION:

- After removing timing chain, do not turn crankshaft and camshaft separately, or valves will strike piston heads.
- When installing camshafts, chain tensioners, oil seals, or other sliding parts, lubricate contacting surfaces with new engine oil.
- Apply new engine oil to bolt threads and seat surfaces when installing camshaft sprockets, crankshaft pulley, and camshaft brackets.
- Do not spill engine coolant on drive belts.

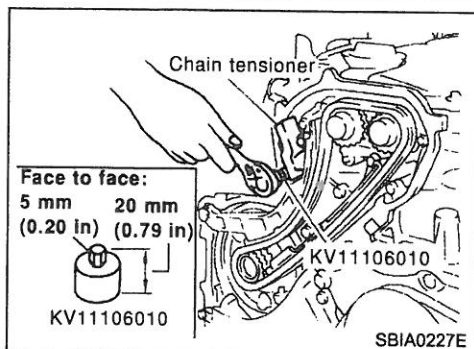
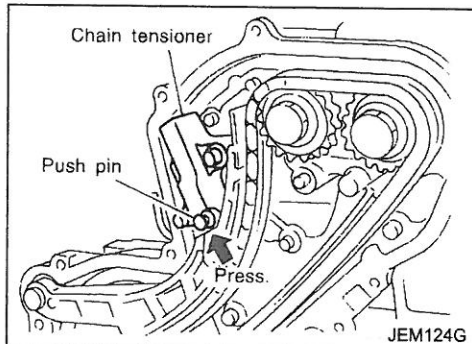
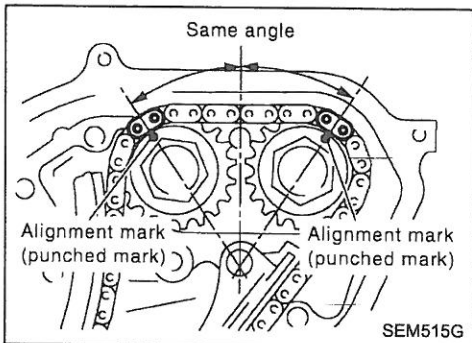
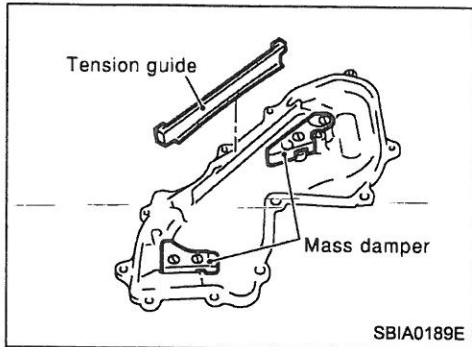
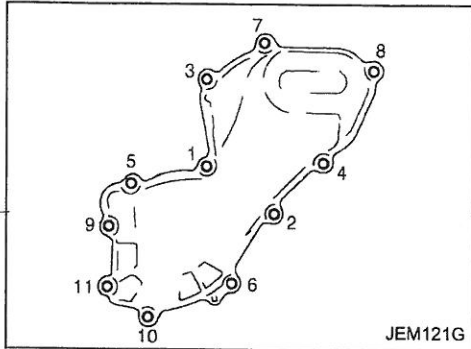


REMOVAL

- For preparative work for removing/installing secondary timing chain to remove/install fuel injection pump, refer to EC section, "Electronic control fuel injection pump".
 - To prepare for removing/installing secondary timing chain to remove/install camshaft, refer to EM-3047, "CAMSHAFT".
1. Drain engine oil.
 2. Drain coolant by removing cylinder block drain plugs. Refer to LC section, "Changing Engine Coolant".
 3. Remove EGR guide tube.
 4. Remove radiator upper and lower hoses.
 5. Remove radiator shroud and radiator. Refer to LC section, "REMOVAL AND INSTALLATION", "Radiator".

EM-3021

Secondary Timing Chain (Cont'd)



6. Remove front chain case.
 - Move power steering fluid reservoir tank from the bracket.
 - Loosen fixing bolts in the reverse order of that shown in the figure and remove them.
 - Remove all bolts with the rubber washer as space is limited for pulling them out.

CAUTION:

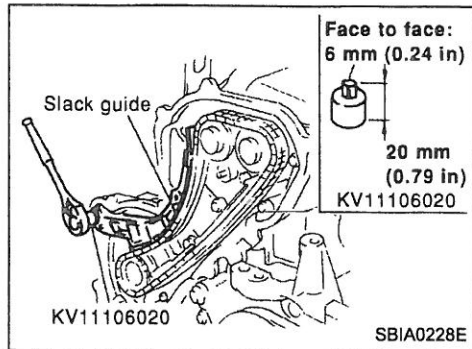
- While front chain case is removed, cover openings to prevent entry of foreign material into engine.
- Do not remove two mass dampers on the back of cover.

7. Set the No. 1 piston to TDC on its compression stroke.
 - Turn crankshaft pulley clockwise so that the alignment mark (punched mark) on each camshaft sprocket is positioned as shown in the figure.
 - **No position indicator is provided on the crankshaft pulley.**
 - **When installing, color coded links on the secondary timing chain can be used as alignment marks. Marking may not be necessary for removal; however, make alignment marks as required because the alignment mark on fuel injection pump sprocket may not be easy to see.**
8. Remove chain tensioner.
 - a. Push the plunger of chain tensioner and keep it pressed with a push pin.
 - b. Using a hexagon-head wrench [face to face: 5 mm (0.20 in), SST], remove bolts to remove chain tensioner.

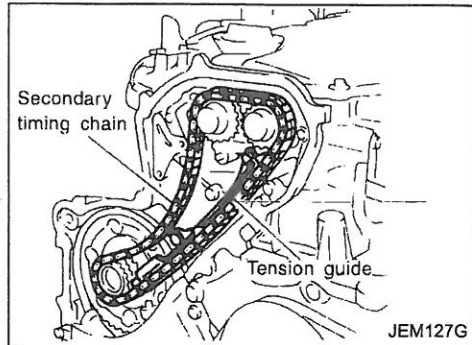
TIMING CHAIN

YD25DDTi

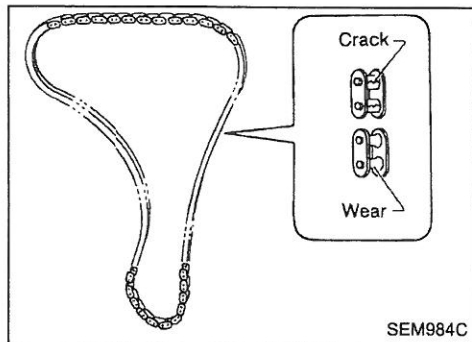
Secondary Timing Chain (Cont'd)



9. Remove timing chain slack guide.
 - Using a hexagon-head wrench [face to face: 6 mm (0.24 in), SST], remove bolt to remove timing chain slack guide.

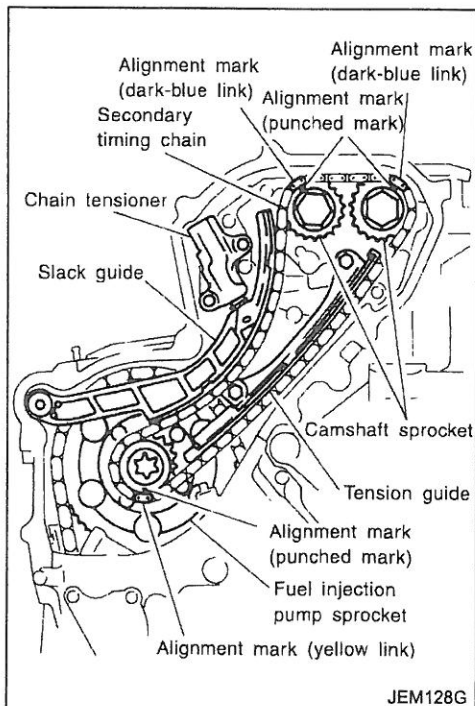


10. Remove timing chain tension guide.
11. Remove secondary timing chain.
 - Timing chain alone can be removed without removing sprockets.



INSPECTION

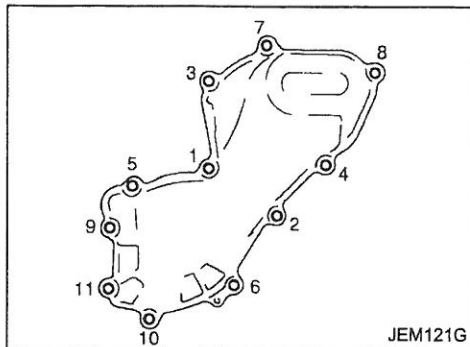
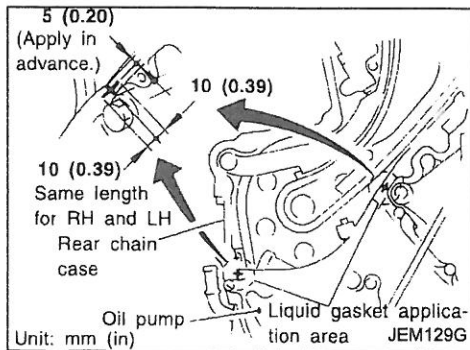
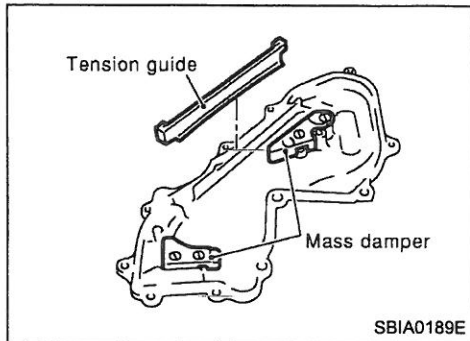
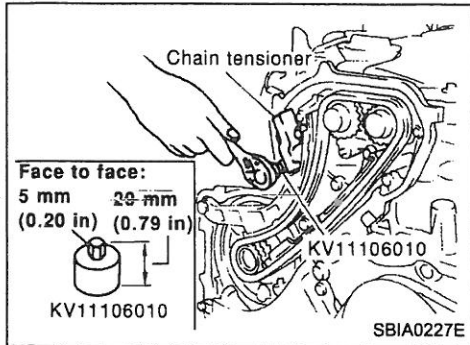
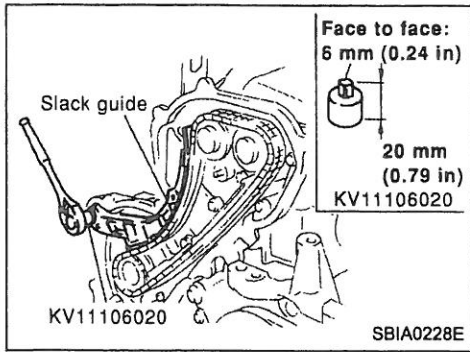
Check for cracks and excessive wear at roller links. Replace chain if necessary.



INSTALLATION

1. Install secondary timing chain.
 - When installing, match the alignment marks on sprockets with color coded alignment marks (colored links) on the chain.
2. Install timing chain tension guide.
 - The upper bolt has a longer shank than the lower bolt.

Secondary Timing Chain (Cont'd)



3. Using a hexagon-head wrench [face to face: 6 mm (0.24 in), SST], install timing chain slack guide.
4. Install chain tensioner.
 - a. Push the plunger of the chain tensioner. While holding it with a push pin, install the chain tensioner.
 - b. Using a hexagon-head wrench [face to face: 5 mm (0.20 in), SST], tighten bolts.
 - c. Pull out the push pin, etc. holding the plunger.
 - **Check again that the alignment marks on the sprockets and the colored alignment marks on the timing chain are aligned.**
5. Install front chain case.
 - a. Install tension guide on the back surface of front chain case.
 - Hold front chain case vertically when installing. Tension guide may come off if front chain case is tilted.
 - b. Apply specified liquid gasket (Refer to EM-3003, "Liquid Gasket Application Procedure".) on both ends of arched area (locations where rear chain case is adjoined) as shown in the figure.
 - c. Install new chain case gasket to chain case groove.
 - d. Install front chain case.
 - When installing, align dowel pin on oil pump case with the pin hole.
 - e. Install all bolts with the rubber washer to the front chain case.
 - f. Tighten fixing bolts in the numerical order shown in the figure.
 - f. After tightening all the bolts, re-tighten in the No. 1, 2, and 6 bolts.

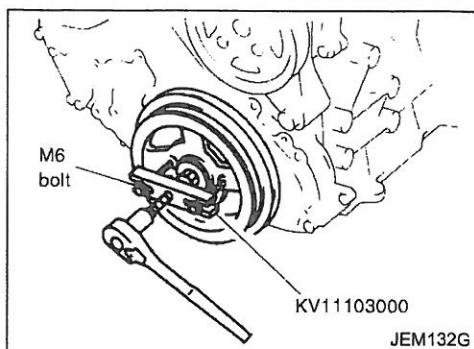
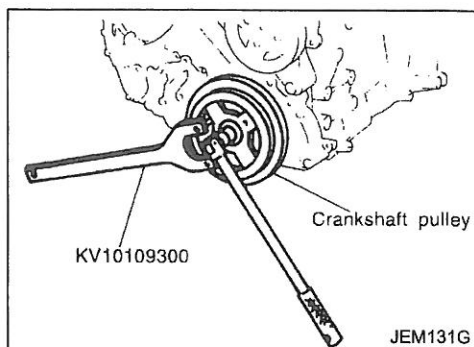
Primary Timing Chain (Cont'd)

CAUTION:

- After removing timing chain, do not turn crankshaft and camshaft separately, or valves will strike piston heads.
- When installing camshafts, chain tensioners, oil seals, or other sliding parts, lubricate contacting surfaces with new engine oil.
- Apply new engine oil to bolt threads and seat surfaces when installing camshaft sprockets, crankshaft pulley, and camshaft brackets.
- Do not spill engine coolant on drive belts.

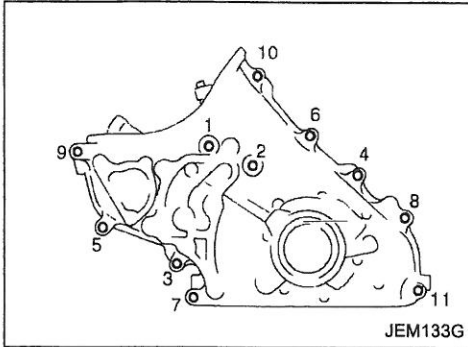
REMOVAL

1. Remove charge air cooler and bracket.
2. Remove rocker cover. Refer to EM-3045, "Removal and Installation", "ROCKER COVER".
3. Remove EGR guide tube.
4. Remove radiator shroud and radiator. Refer to LC section, "REMOVAL AND INSTALLATION", "Radiator".
5. Remove idler pulley, idler pulley bracket and drive belts.
6. Remove upper and lower oil pans. Refer to EM-3015, "Removal and Installation", "OIL PAN".
7. Remove injection tube.
Refer to EC section, "Injection Tube and Injection Nozzle".
8. Remove secondary timing chain and associated parts.
Refer to EM-3021, "Secondary Timing Chain".
9. When removing rear chain case, remove camshaft sprockets.
Refer to EM-3047, "CAMSHAFT".

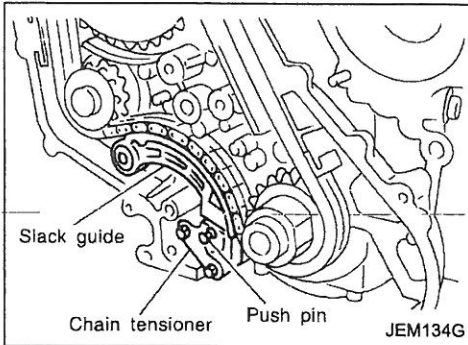


10. Remove crankshaft pulley.
 - a. Hold crankshaft pulley with the pulley holder (SST).
 - b. Loosen crankshaft pulley fixing bolt and pull out the bolt approximately 10 mm (0.39 in).
 - c. Using pulley puller (SST), remove crankshaft pulley.
 - Use two M6 (0.24 in) bolts with approx. 60 mm (2.36 in) shank length for securing crankshaft pulley.

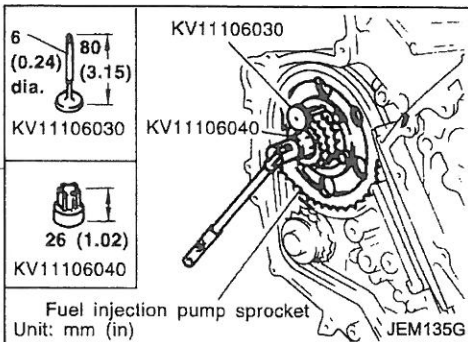
Primary Timing Chain (Cont'd)



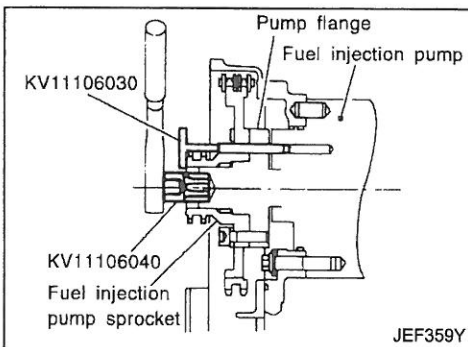
11. Remove oil pump.
 - Loosen bolts in the reverse order of that shown in the figure and remove them.
 - Use seal cutter (SST) etc. for removal.
12. Remove front oil seal from oil pump.
 - Punch out the seal off from the back surface of the oil pump using a flat-bladed screwdriver.
 - **Be careful not to damage the oil pump.**



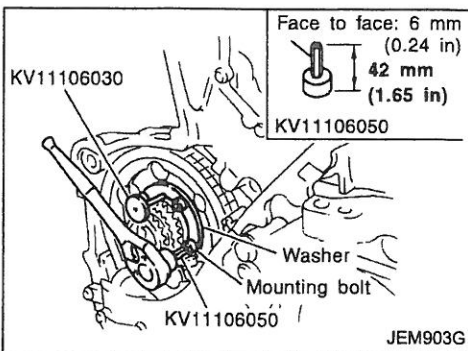
13. Remove chain tensioner.
 - When removing chain tensioner, push the sleeve of chain tensioner and keep it pressed with a push pin, etc.
14. Remove timing chain slack guide.



15. Hold fuel injection pump sprocket.
 - a. Insert positioning stopper pin (SST) into the hole 6 mm (0.24 in) in the diameter on the fuel injection pump sprocket.
 - b. Using a TORX wrench (SST), turn pump shaft little by little to adjust the position of fuel injection pump sprocket so that the holes align.
 - c. Insert the positioning stopper pin through fuel injection pump sprocket to the fuel injection pump body to fix the sprocket.
 - Insert the positioning stopper pin until its flange contacts the fuel injection pump sprocket.

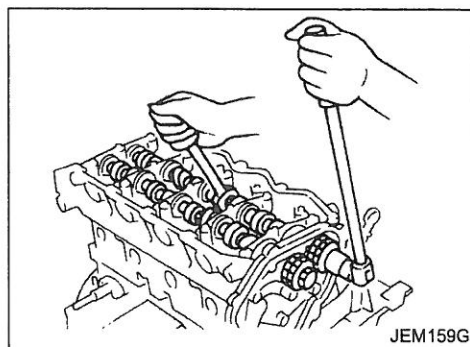
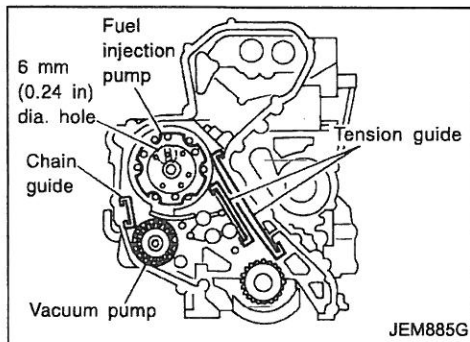
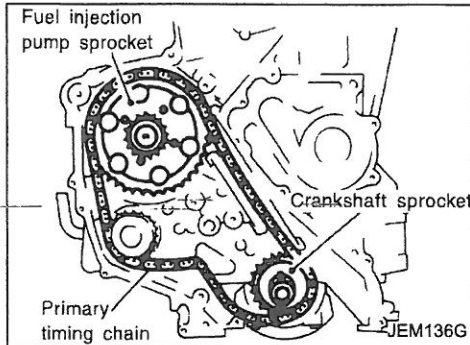
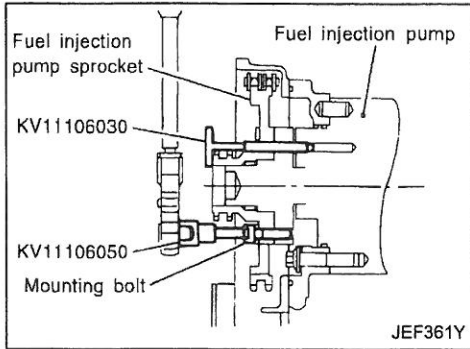


- d. Remove the torx wrench (SST).



16. Using the hexagon wrench [face to face: 6 mm (0.24 in), long-type] (SST), remove the mounting bolts of the fuel injection pump sprocket.
 - It is not necessary to remove the washer of the fuel injection pump sprocket.

Primary Timing Chain (Cont'd)



17. Remove primary timing chain with fuel injection pump sprocket and crankshaft sprocket.

18. Remove chain guide and tension guides.

19. Remove vacuum pump.

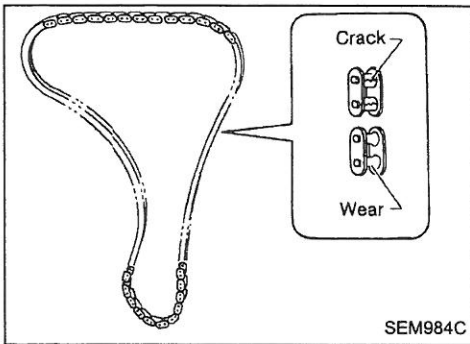
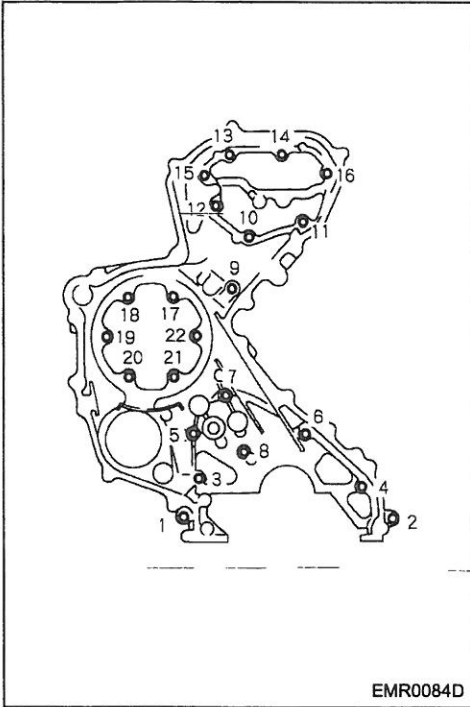
20. Remove camshaft sprockets.

- Loosen the camshaft sprockets installation bolts by fixing the hexagon portion of the camshaft.

Primary Timing Chain (Cont'd)

21. Remove rear chain case.

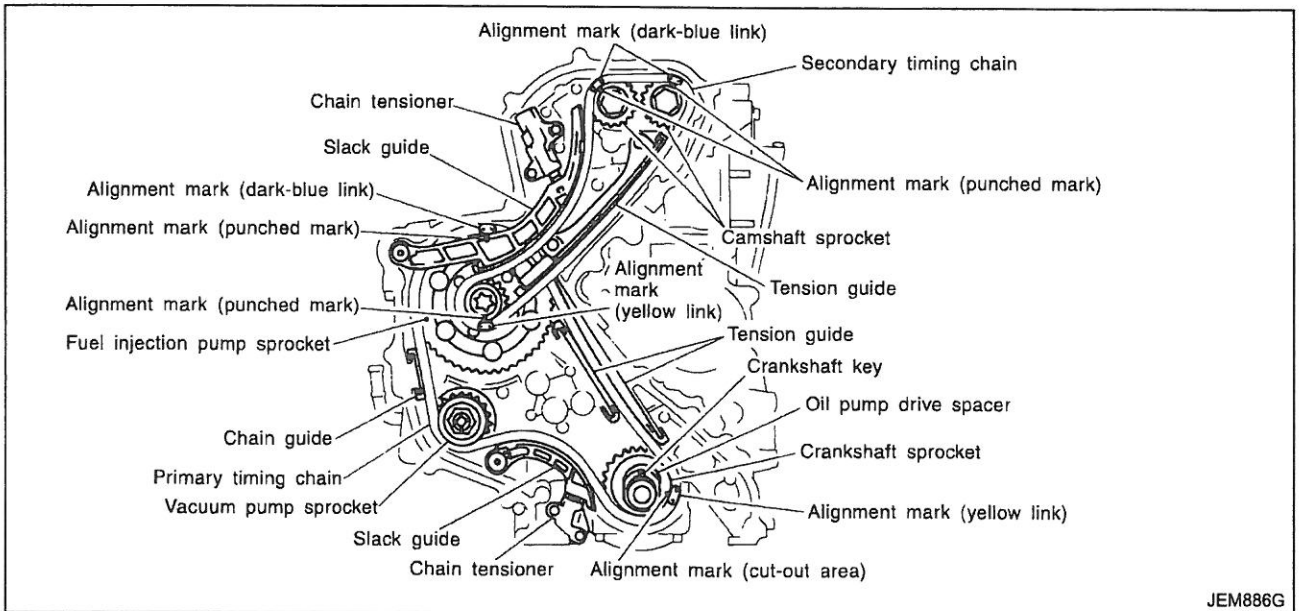
- Loosen fixing bolts in the reverse order of that shown in the figure and remove them.
- Use seal cutter (SST) for removal.



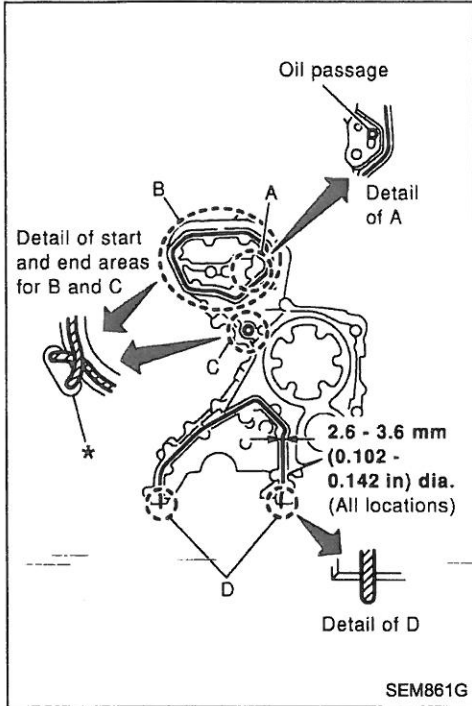
INSPECTION

Check for cracks and excessive wear at roller links. Replace chain if necessary.

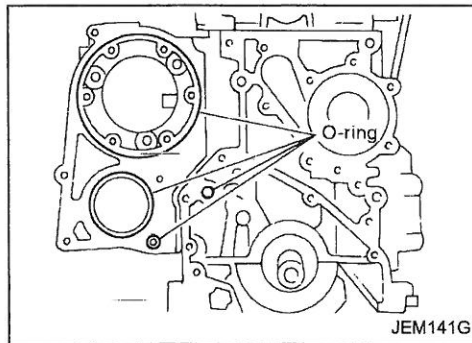
INSTALLATION



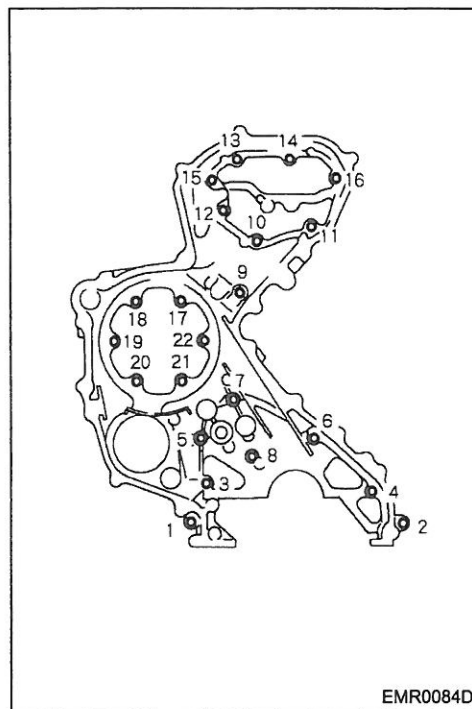
Primary Timing Chain (Cont'd)



1. Install rear chain case.
 - a. Apply a continuous bead of specified liquid gasket (Refer to EM-3003, "Liquid Gasket Application Procedure".) on locations shown in the figure.
 - A: Apply bead so that it does not protrude into the oil passage.
 - B, C: Minimize overlapping area of bead, by start and end areas of bead as shown in the figure. Apply so that the portion marked * comes at an external location but cannot be viewed externally after engine assembly.
 - D: Leave the start and end areas of the bead slightly protruding from the case surface.

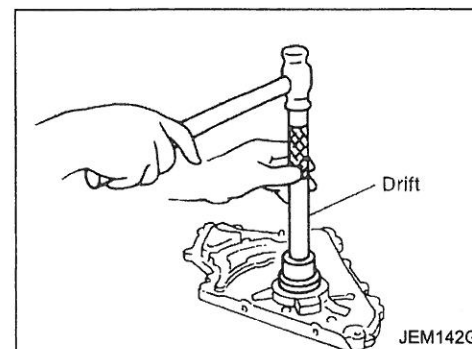
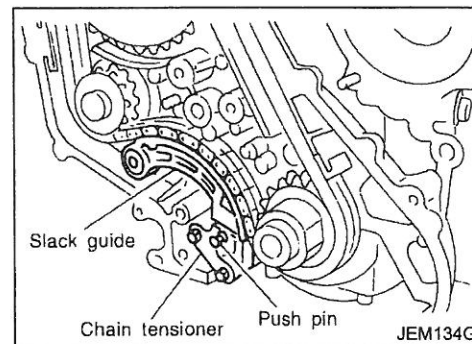
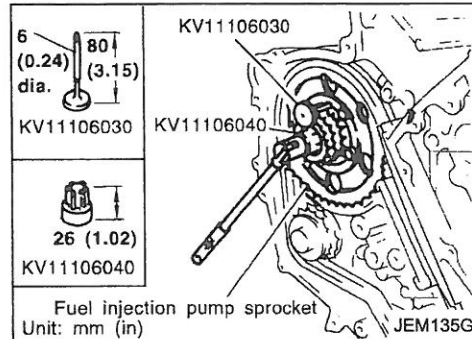
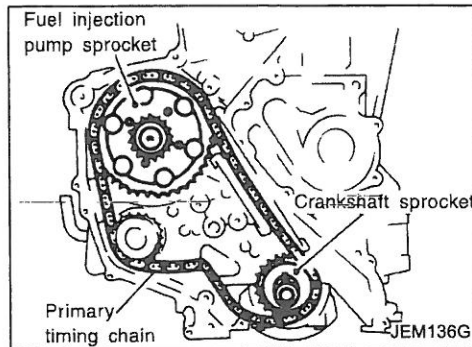
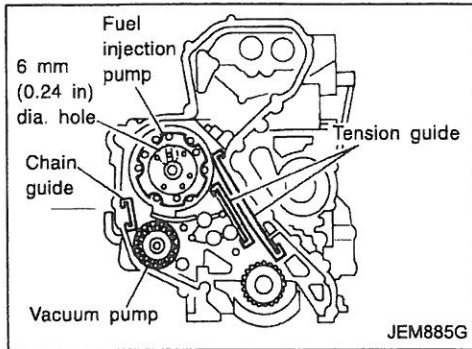


- b. Install four O-rings to the grooves of the cylinder block and fuel injection pump bracket.



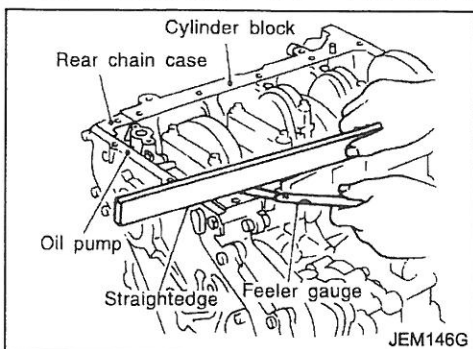
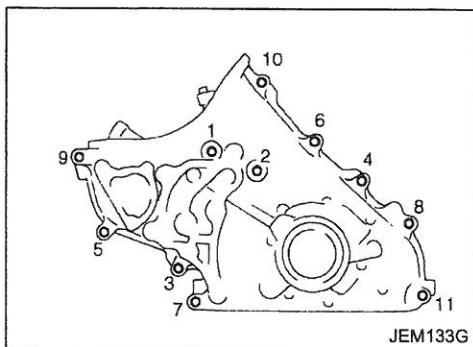
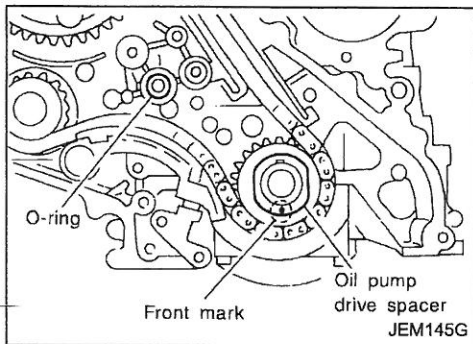
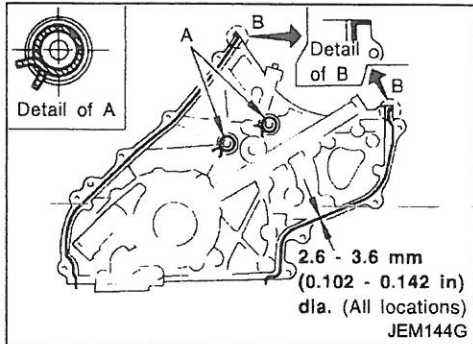
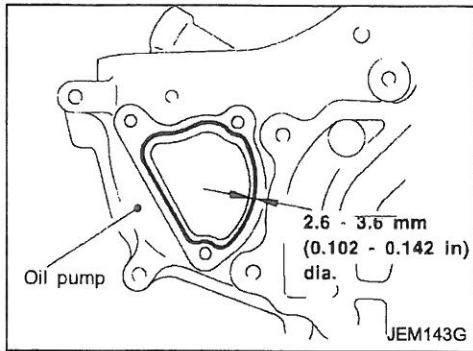
- c. Install rear chain case.
 - When installing, align the dowel pin with the pin hole.
- d. Tighten bolts in the numerical order shown in the figure.
 - Install the following four types of bolts, referring to the figure.
 - 16 mm (0.63 in): Bolt No. 1, 2, 16, 17, 18, 19, 20, 21, 22
 - 20 mm (0.79 in): Bolt No. 3, 4, 6, 9, 10, 11, 13, 14
 - 25 mm (0.98 in): Bolt No. 12, 15
 - 35 mm (1.38 in): Bolt No. 5, 7, 8
 - The shank length under the bolt neck above is the length of threaded part (pilot portion not included).
- e. After tightening all the bolts, re-tighten in the same order.

Primary Timing Chain (Cont'd)



2. Install vacuum pump.
 - Before installing, make sure the notch on the fuel injection pump flange and the hole 6 mm (0.24 in) in diameter on the pump body are aligned.
3. Install chain guide and tension guides.
4. Install crankshaft sprocket, aligning it with the crankshaft key on the far side. _____
5. Install primary timing chain with fuel injection pump sprocket.
 - When installing, match the alignment marks on sprockets with color coded alignment marks (colored links) on the chain.
 - Install fuel injection pump sprocket washer with the surface marked "F" (front mark) facing the front of the engine.
6. Install timing chain onto vacuum pump sprocket and through chain guide.
7. Use the positioning stopper pin (SST) to hold the fuel injection pump sprocket and install the bolt for mounting the sprocket.
 - Using a TORX wrench (SST), turn the pump shaft little by little to adjust the position of the pump flange. Insert positioning stopper pin (SST) into the hole 6 mm (0.24 in) in diameter on the fuel injection pump sprocket so that the stopper pin goes through the pump flange to the pump body. While the stopper pin is in place, install the bolt.
8. Install timing chain slack guide.
9. Install chain tensioner.
 - Push the plunger of the chain tensioner. While keeping plunger pressed down with a push pin, etc., install the chain tensioner.
 - After installation, pull out the push pin holding the plunger.
 - **Check again that the alignment marks on the sprockets and the colored alignment marks on timing chain are aligned.**
10. Install front oil seal to oil pump.
 - Using a suitable drift [62 mm (2.44 in) dia.], force fit the seal until it hits the bottom.
 - **Do not touch lips of oil seal. Make sure seal surfaces are free of foreign materials.**

Primary Timing Chain (Cont'd)



11. Install vacuum pump cover (for vacuum pump removal/installation opening) to oil pump if cover is removed.

- Apply a continuous bead of specified liquid gasket (Refer to EM-3003, "Liquid Gasket Application Procedure".) as shown in the figure.
- Apply liquid gasket on oil pump-side surface.

12. Install oil pump.

a. Apply a continuous bead of specified liquid gasket (Refer to EM-3003, "Liquid Gasket Application Procedure".) on locations shown in the figure.

A: Leave the start and end areas of the bead slightly protruding from the surface.

B: Apply liquid gasket along upper end surface of oil pump.

b. Install oil pump drive spacer to crankshaft.

- Install with the front mark (punched mark) facing the front of the engine.

c. Install O-ring into the groove of rear chain case.

d. Install oil pump.

- When installing, align the inner rotor in the direction of the two facing flats of the oil pump drive spacer.
- When installing, align the dowel pin with the pin hole.

e. Tighten fixing bolts in the numerical order shown in the figure.

f. After tightening all the bolts, re-tighten in the same order.

13. Check gaps on upper oil pan mounting surface.

- Using straightedge and feeler gauge, measure gaps between the locations of the following parts:

Standard:

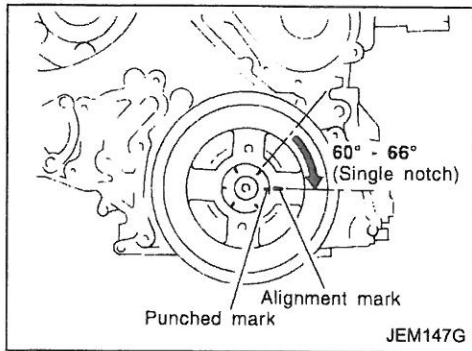
Oil pump and rear chain case

-0.14 to 0.14 mm (-0.0055 to 0.0055 in)

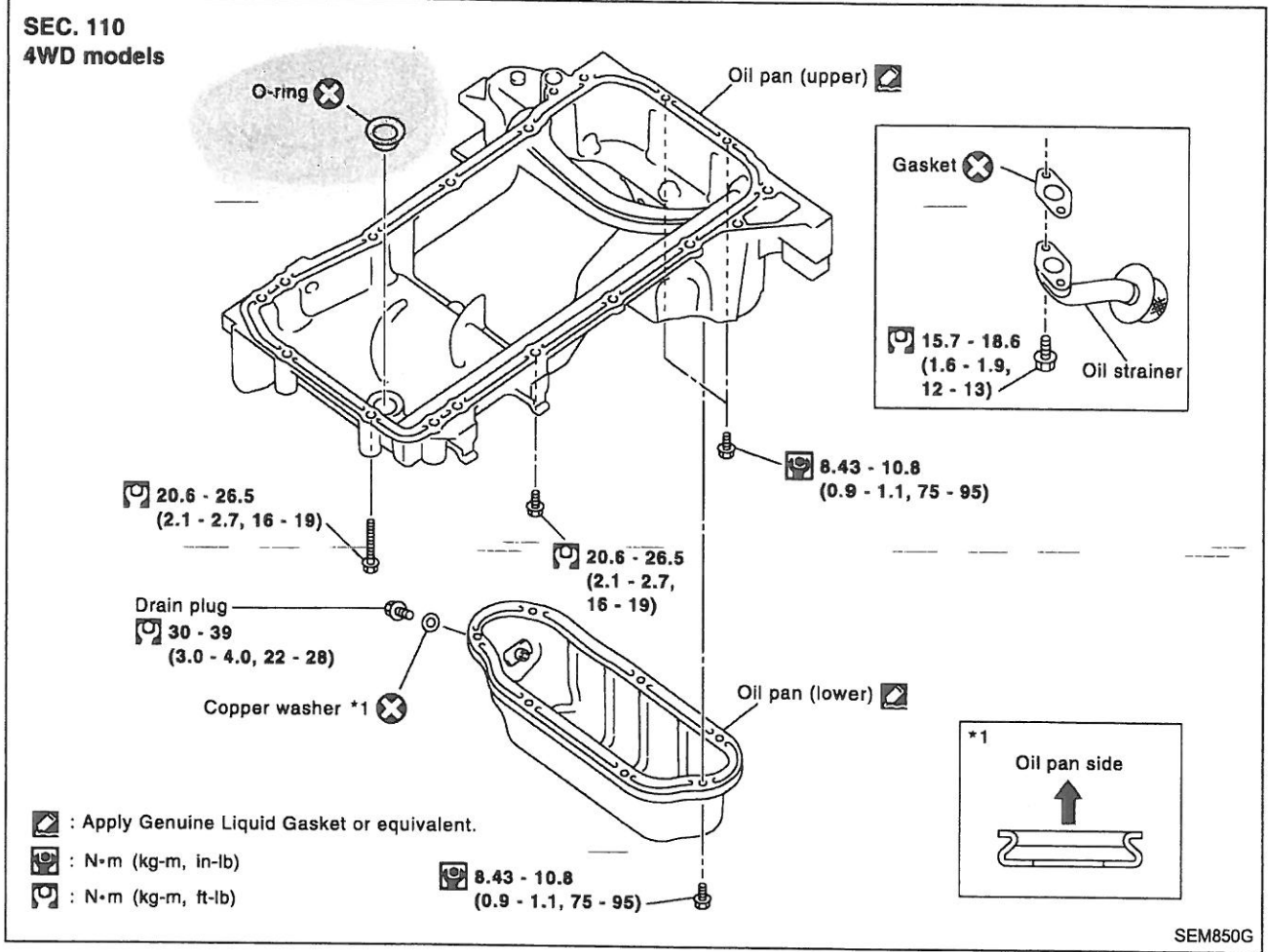
Rear chain case and cylinder block

-0.25 to 0.13 mm (-0.0098 to 0.0051 in)

- If the measured value is out of the above range, install again.

**Primary Timing Chain (Cont'd)**

14. Install crankshaft pulley.
 - a. Install crankshaft pulley to crankshaft.
 - b. Hold crankshaft pulley with the pulley holder (SST).
 - c. Tighten bolt to 20 to 29 N·m (2.0 to 3.0 kg·m, 15 to 21 ft·lb).
 - d. Put an alignment mark on crankshaft pulley that aligns with one of the punched marks on the bolt.
 - e. Tighten fixing bolt another 60° - 66° [target: 60° (turn by one notch)].
15. Install secondary timing chain and the associated parts. Refer to EM-3023, "Secondary Timing Chain", "INSTALLATION".
16. Install in the reverse order of removal hereafter.

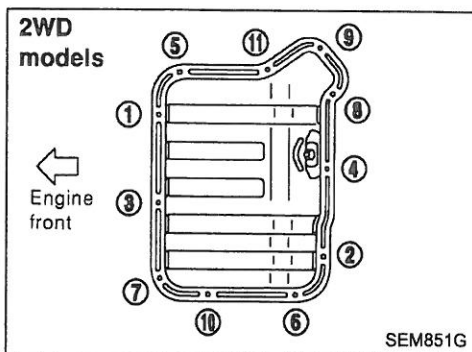


Removal

WARNING:

To avoid danger of being scalded, never drain engine oil when engine is hot.

1. Raise vehicle and support it with safety stands.
2. Remove engine under cover.
3. Drain engine oil.



4. Remove lower oil pan bolts.
 - Loosen bolts in the reverse order of that shown in the figure.

INJECTION TUBE AND FUEL INJECTOR

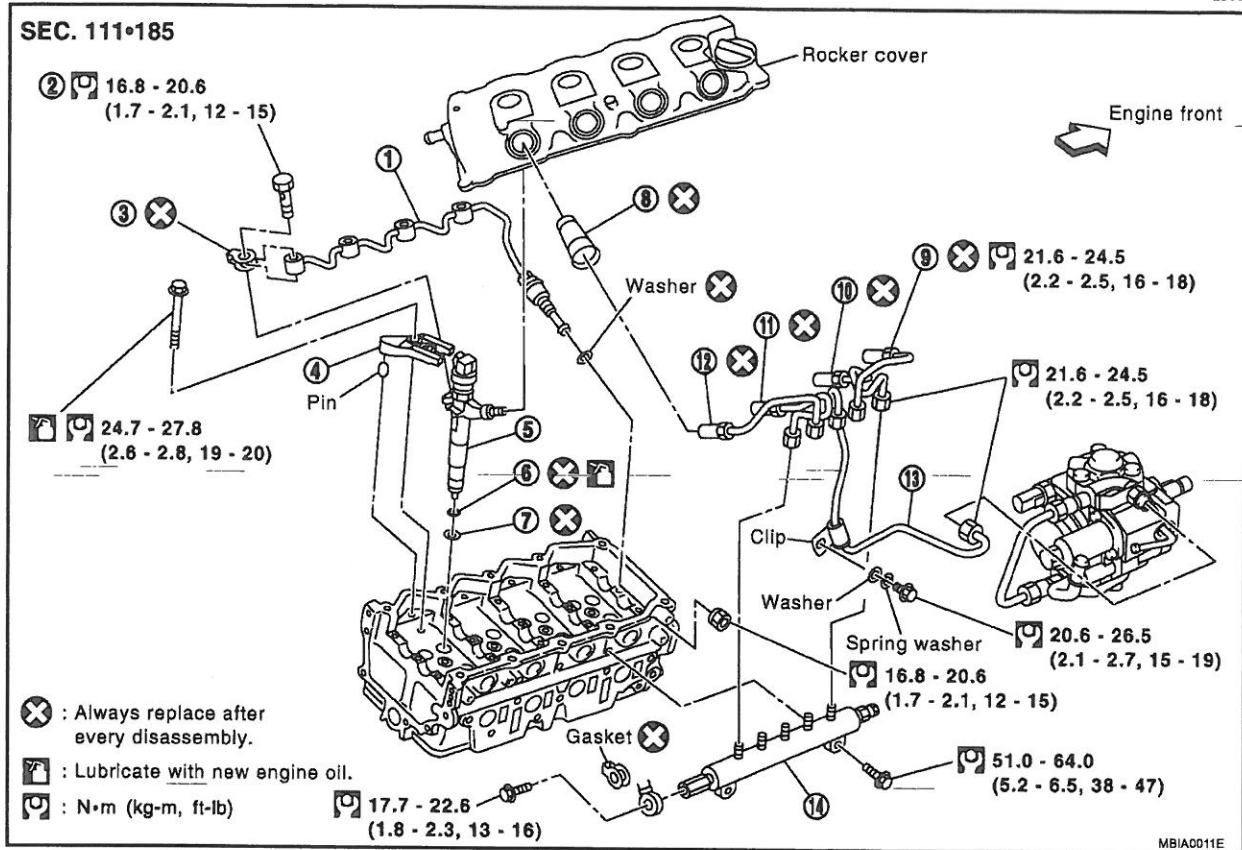
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INJECTION TUBE AND FUEL INJECTOR

PFP:00018

Removal and Installation

EBS005NT



- | | | |
|---------------------------|--------------------------|--------------------------|
| 1. Spill tube | 2. Eye-bolt | 3. Spill tube gasket |
| 4. Nozzle support | 5. Fuel injector | 6. O-ring |
| 7. Nozzle gasket | 8. Nozzle oil seal | 9. Injection tube No. 1 |
| 10. Injection tube No. 2 | 11. Injection tube No. 3 | 12. Injection tube No. 4 |
| 13. Injection tube center | 14. Fuel rail assembly | |

CAUTION:

Apply new engine oil to parts marked in illustration before installation.

REMOVAL

- Remove engine cover. Refer to EM-261, "Removal and Installation".
- Remove harness connector from fuel injector.
- Remove spill hose.
- Following steps below, remove injection tubes.
 - Put a paint mark or tag on injection tubes to identify each cylinder.
 - Use a fuel-resistant method.
 - Remove injection tubes in order of 2-1-4-3 individually.

CAUTION:

Be careful not to allow leaked fuel to contaminate engine compartment. Especially, ensure to keep engine mount insulator clear of fuel.

NOTE:

Removal procedure of fuel injector is shown right.

