

SECTION **EM**

EM

MODIFICATION NOTICE:

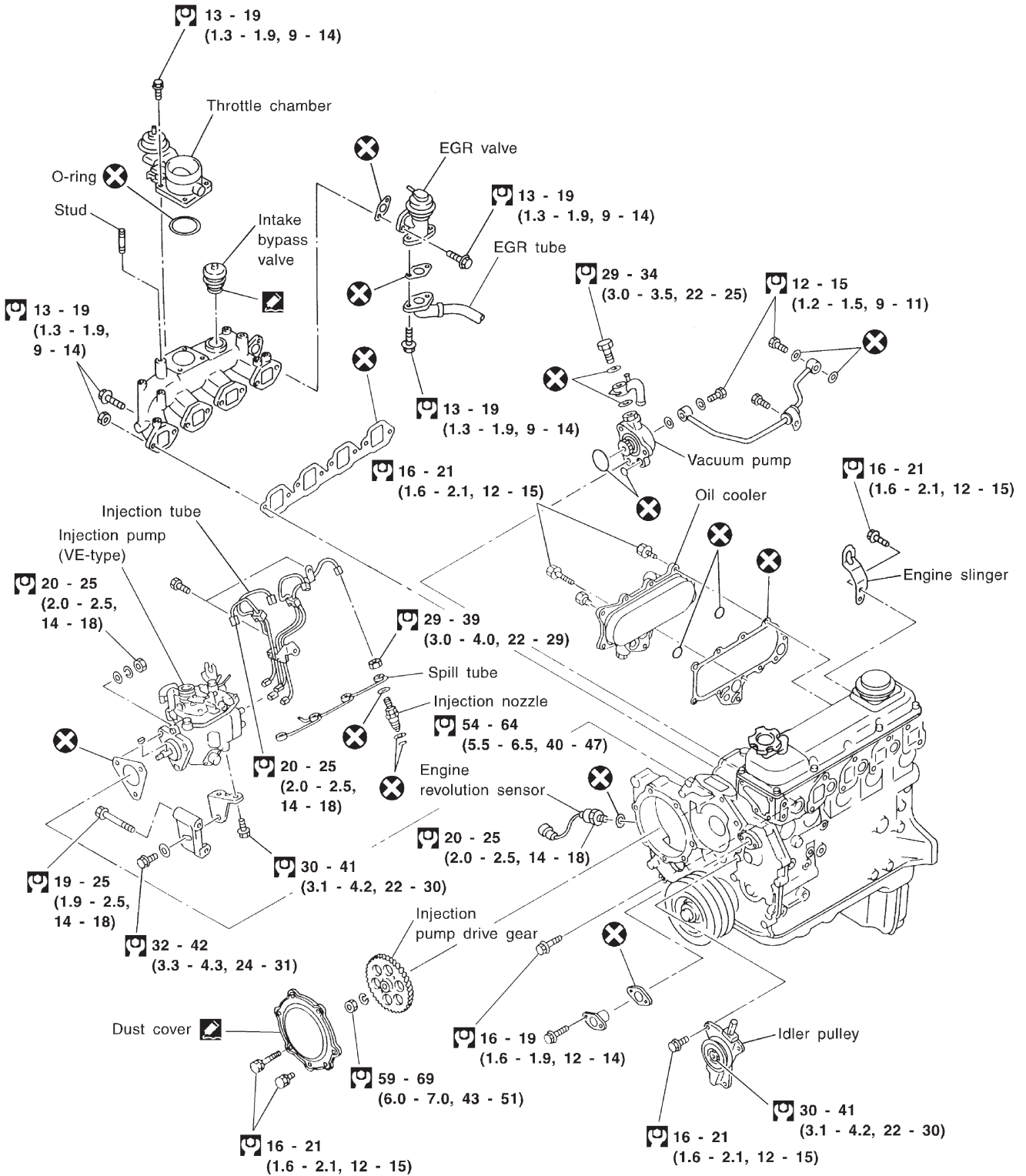
TD series engine

- TD25Ti engine has been added for Europe. For specifications other than those described here, refer to the TD25 engine.

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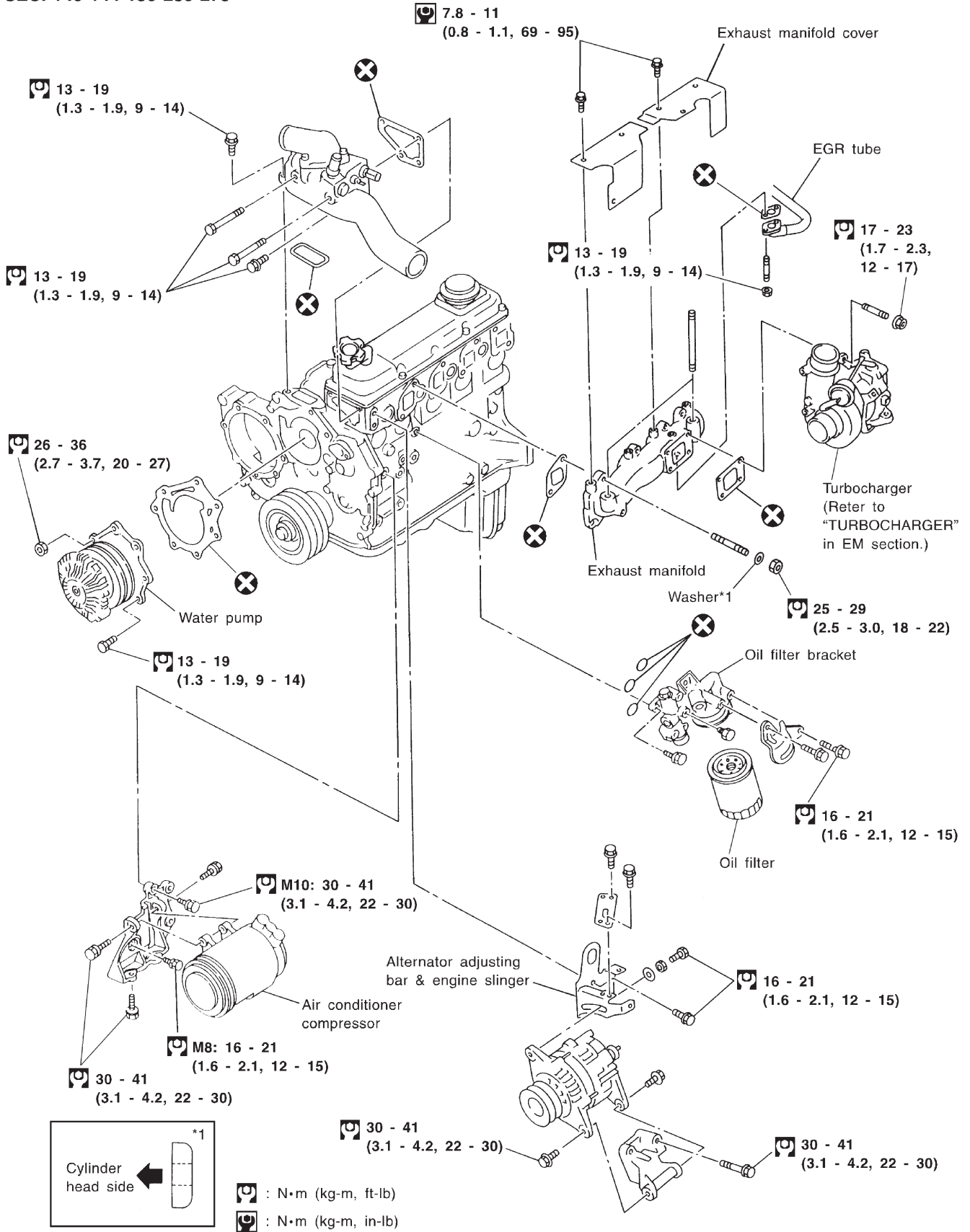
SEC. 135•140•185•186•213



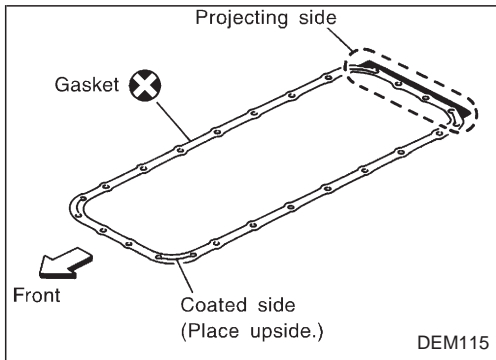
: N·m (kg-m, ft-lb)

: Apply recommended sealant (Nissan genuine part: KP610-00250) or equivalent.

SEC. 140•144•150•230•275



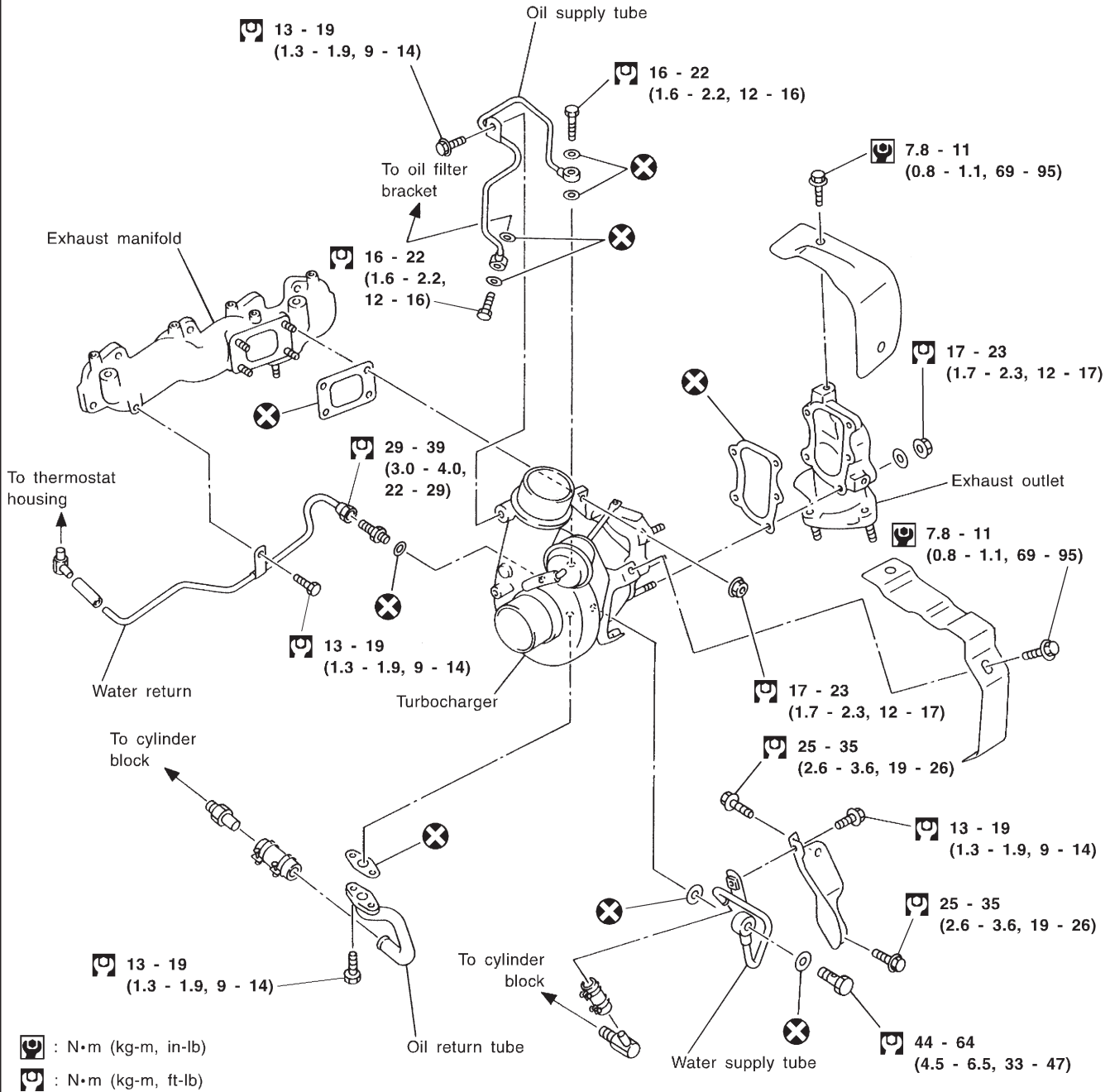
DEM114



Installation

1. Install the oil pan gasket with the coated surface facing the cylinder block and the projecting side facing the rear of the engine.
2. Tighten all bolts in reverse order of removal. For tightening torque of oil pan and correct installing direction of drain plug washer, refer to EM-1016.

SEC. 144



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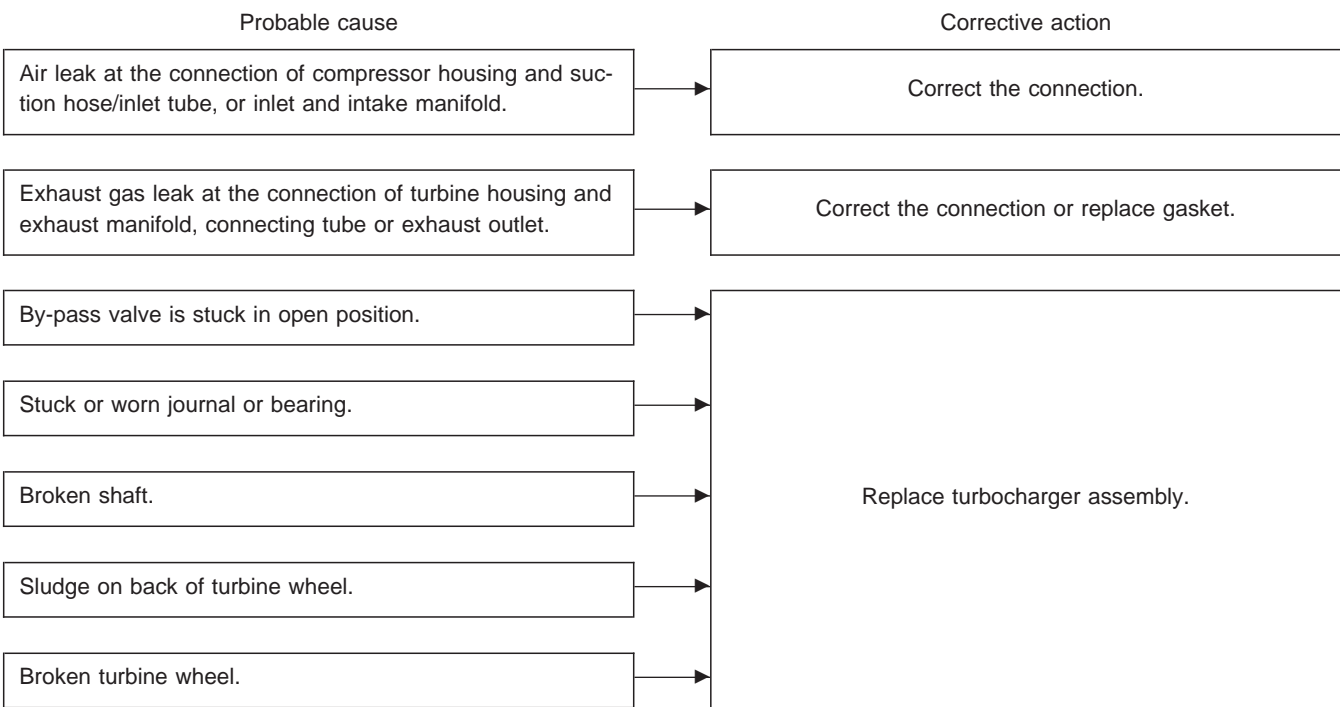
Removal and Installation

Turbocharger should not be disassembled.

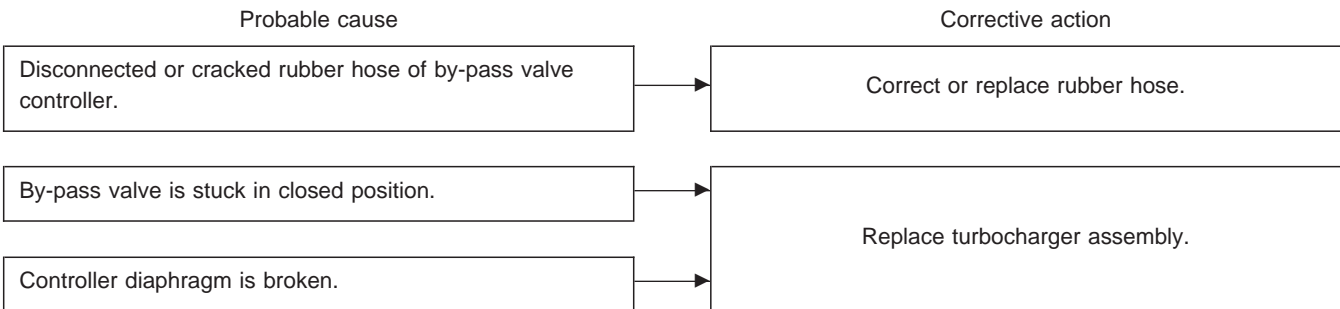
1. Drain engine coolant.
2. Remove the following.
 - Air duct and intercooler components
 - Heat shield plates
 - Exhaust front tube
 - Oil tubes
 - Water tubes
3. Remove turbocharger from exhaust manifold.
4. Remove turbocharger bracket bolts.

Inspection

Condition 1: Low engine power



Condition 2: Excessively high engine power



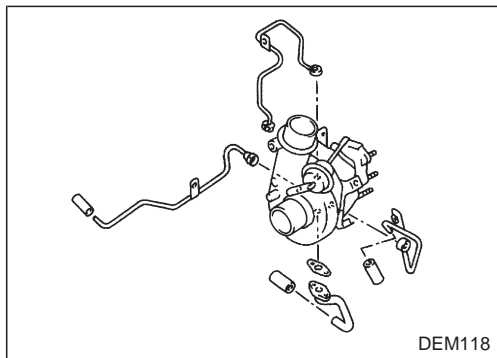
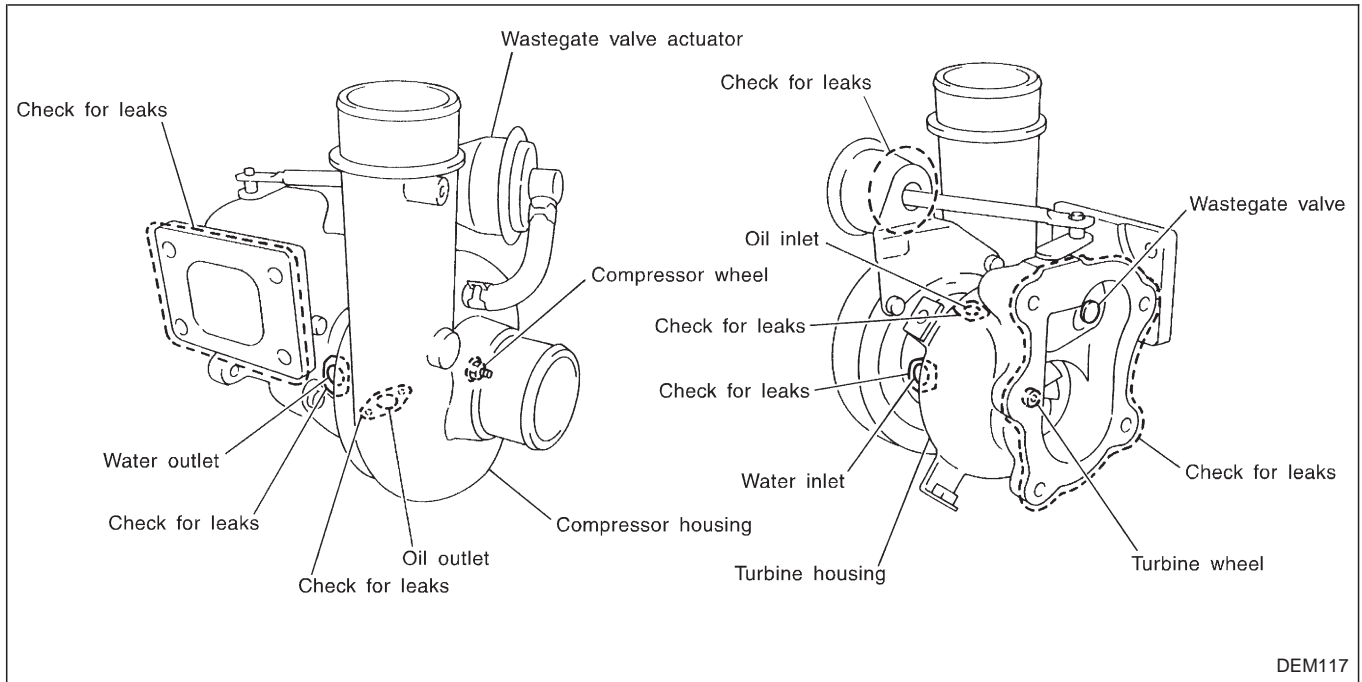
TURBOCHARGER Inspection (Cont'd)

TD25Ti

Condition 3: Excessively high oil consumption, or exhaust shows pale blue smoke

Probable cause	Corrective action
Oil leak at the connection of lubricating oil passage.	Correct the connection.
Oil leak at oil seal of turbine.	Replace turbocharger assembly.
Oil leak at oil seal of compressor.	
Worn journal or bearing.	

Perform the following checks. If NG, replace turbocharger unit.



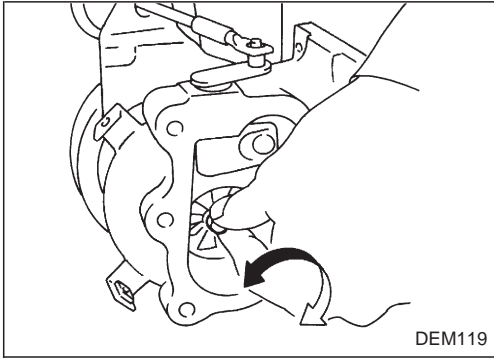
OIL AND WATER TUBES

Check tubes for clogging.

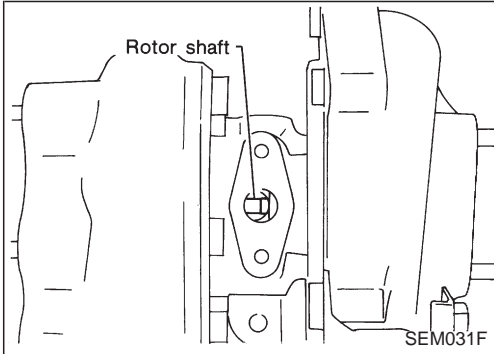
Inspection (Cont'd)

ROTOR SHAFT

1. Check rotor shaft for smooth rotation.



2. Check rotor shaft for carbon deposits.

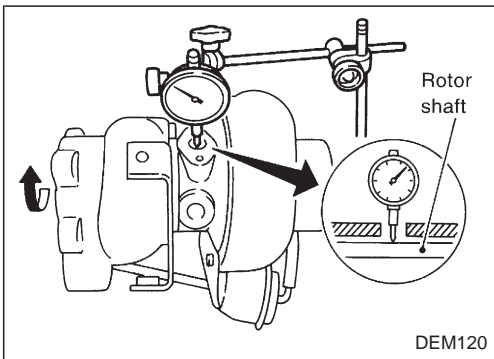


3. Measure rotor shaft runout.

Runout (Total indicator reading):

Standard

0.092 - 0.128 mm (0.0036 - 0.0050 in)



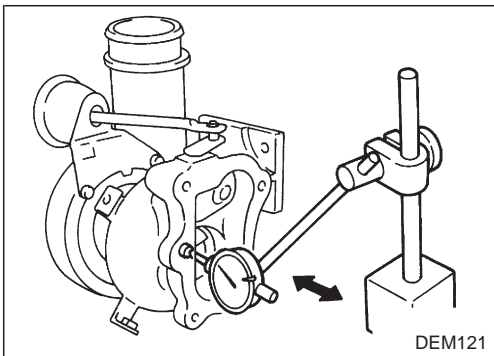
4. Measure rotor shaft end play.

End play:

Standard

0.02 - 0.06 mm (0.0008 - 0.0024 in)

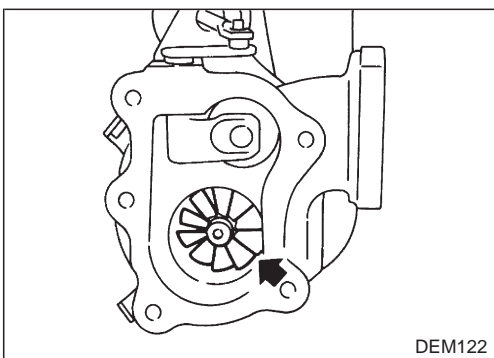
- Do not allow wheels to turn when axial play is being measured.



TURBINE WHEEL

Check turbine wheel for the following.

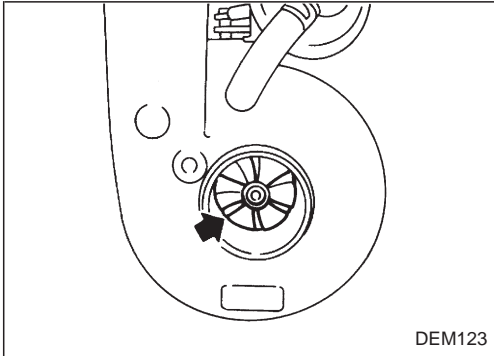
- Oil
- Carbon deposits
- Deformed fins
- Contact with turbine housing



Inspection (Cont'd) COMPRESSOR WHEEL

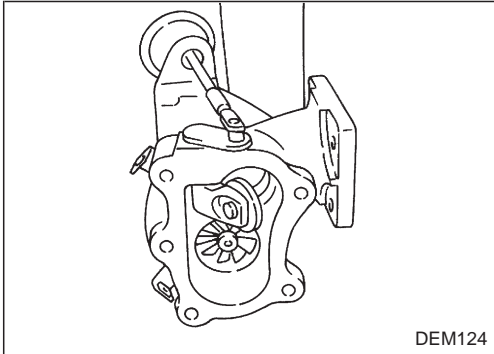
Check compressor wheel for the following.

- Oil
- Deformed fins
- Contact with compressor housing



WASTEGATE VALVE

Remove rod pin and check wastegate valve for cracks, deformation and smooth movement. Check valve seat surface for smoothness.



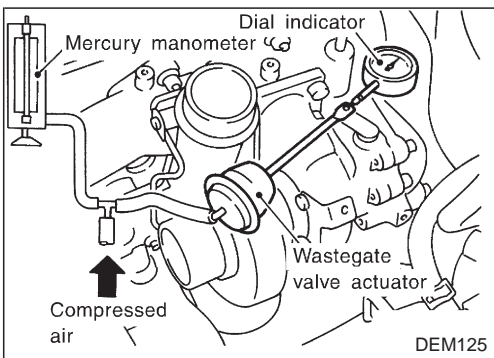
WASTEGATE VALVE ACTUATOR

Check operation of wastegate valve actuator.

Do not apply more than 96.0 kPa (960 mbar, 720 mmHg, 28.35 inHg) pressure to actuator diaphragm.

Wastegate valve actuator stroke/pressure:

**1.5 mm (0.059 in)/80.0 - 85.3 kPa
(800 - 853 mbar, 600 - 640 mmHg,
23.62 - 25.20 inHg)**

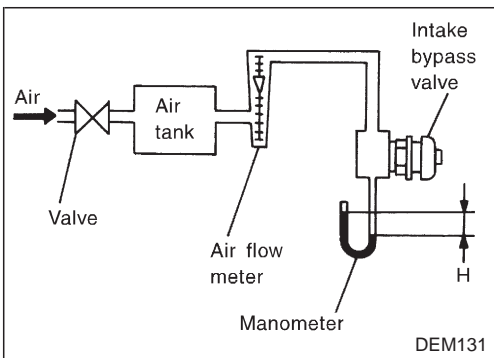


INTAKE BYPASS VALVE

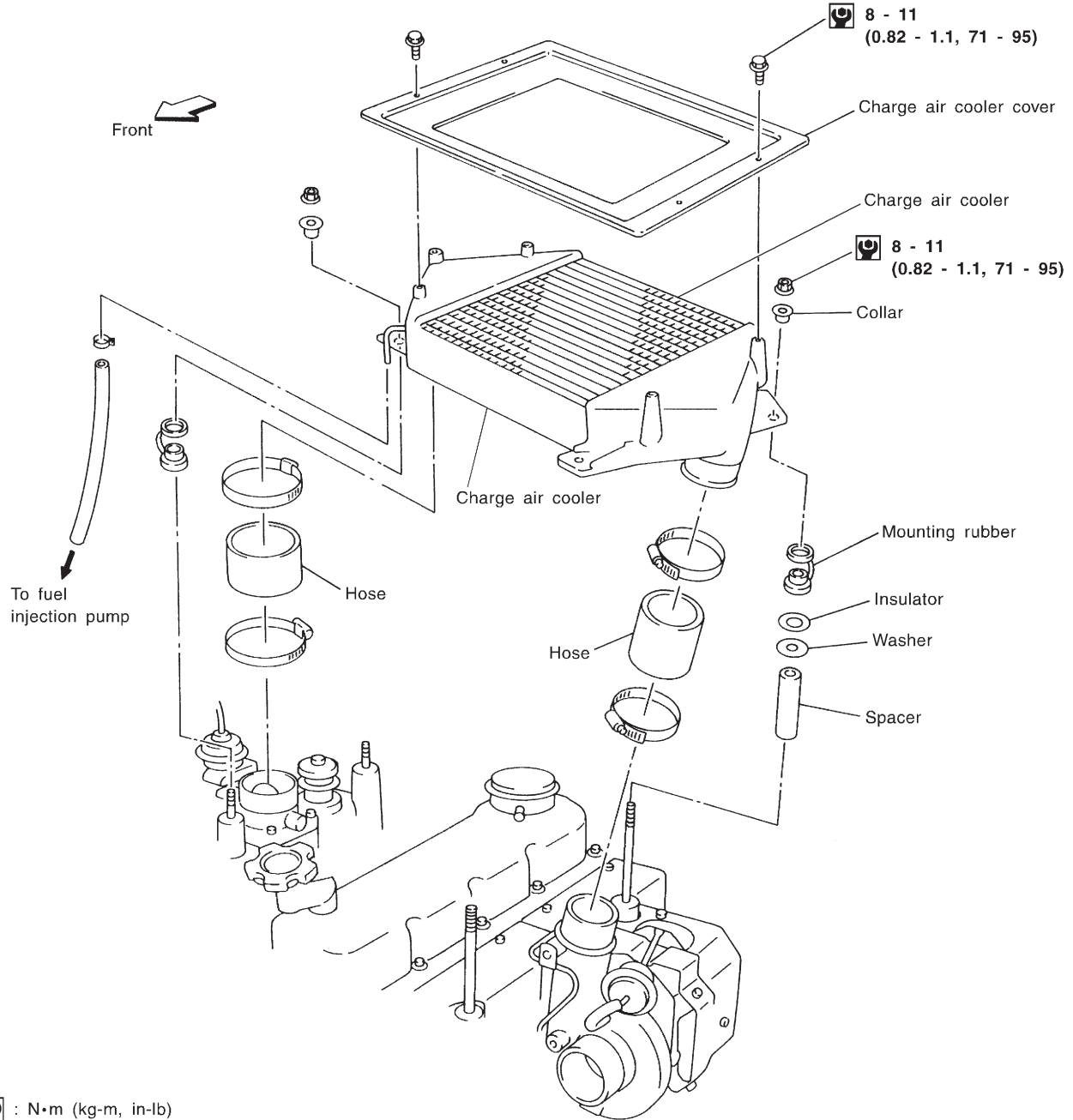
Check air relief pressure of intake bypass valve.

Manometer reading H:

**84.0 - 94.6 kPa (840 - 946 mbar, 630 - 710 mmHg,
24.80 - 27.95 inHg) at air flow of 20 ℓ/min.**



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: N·m (kg-m, in-lb)

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Inspection

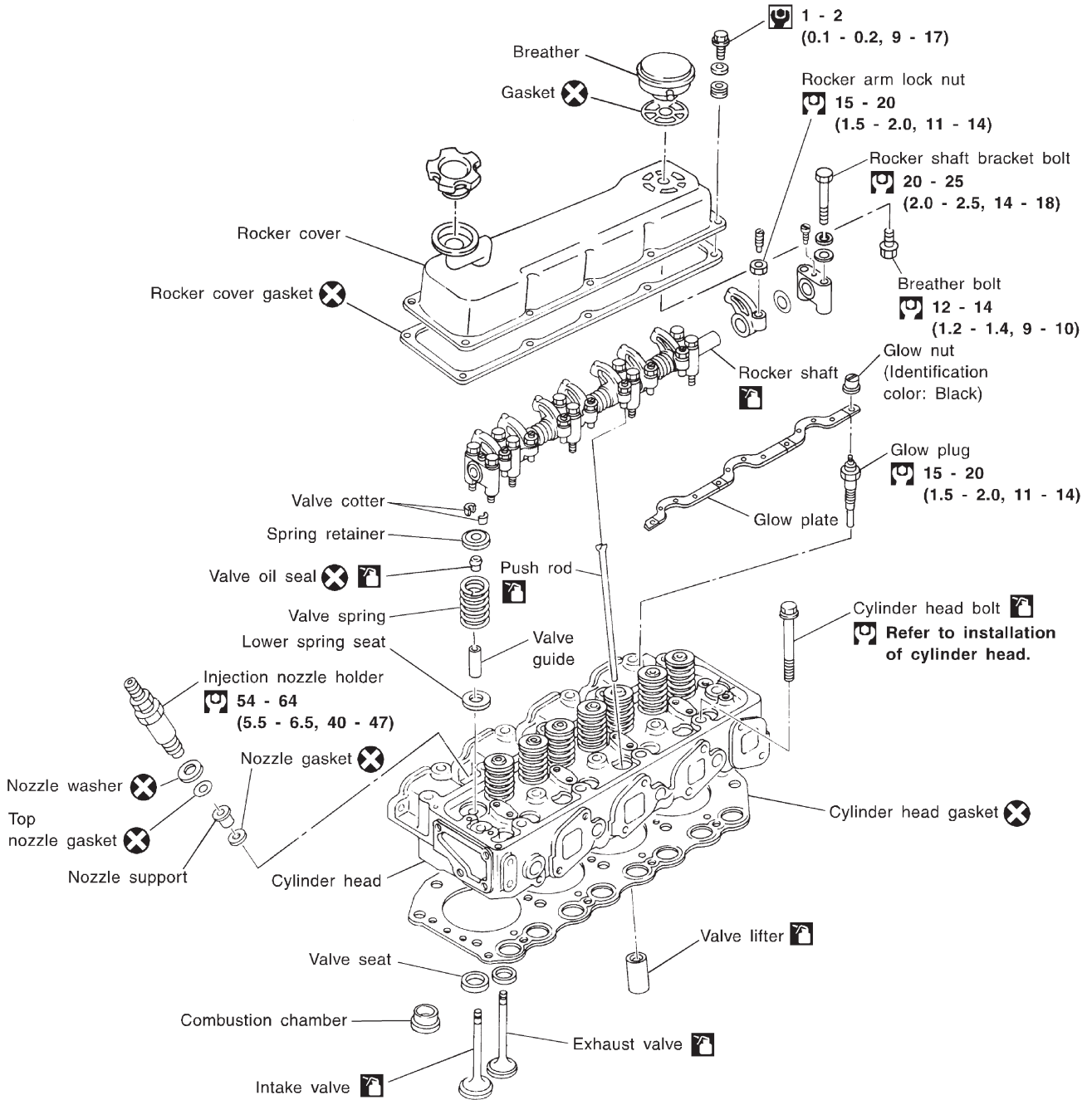
Check air passages of charge air cooler core and fins for clogging, leaks or deformation. Clean or replace charge air cooler if necessary.

Be careful not to deform core fins.

CYLINDER HEAD

TD25Ti

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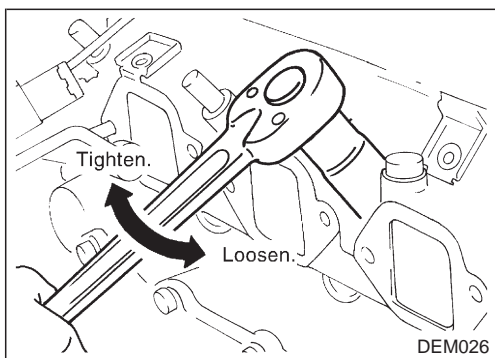
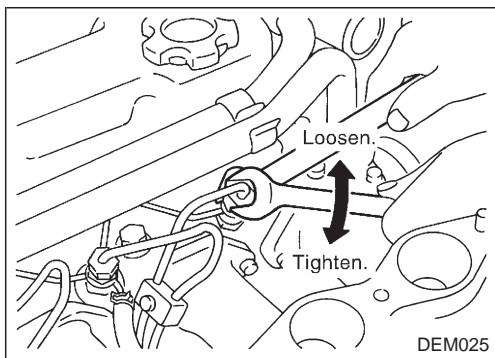
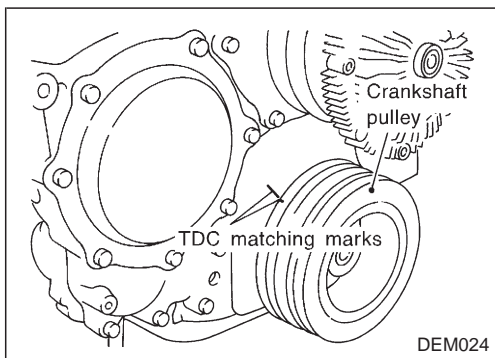
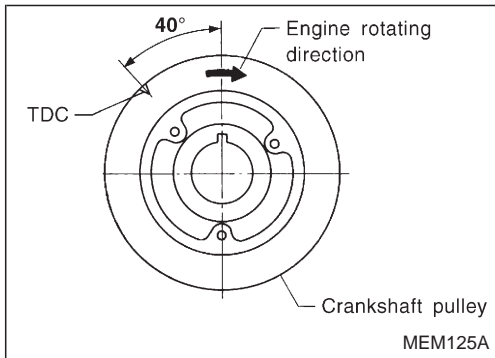
- : N•m (kg-m, ft-lb)
- : N•m (kg-m, in-lb)
- : Lubricate with engine oil.

DEM116

Inspection

CAUTION:

- When installing sliding parts such as rocker arms, camshaft and oil seal, be sure to apply new engine oil on their sliding surfaces.
- When tightening cylinder head bolts and rocker shaft bolts, apply new engine oil to thread portions and seat surfaces of bolts.



Removal

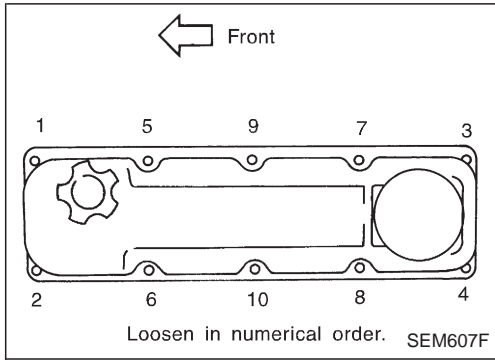
1. Set No. 1 cylinder at TDC (top dead center) on its compression stroke.
2. Drain engine coolant from drain plugs on cylinder block and radiator.
3. Remove air duct and charge air cooler component parts.
4. Remove alternator adjusting bolt.
5. Remove exhaust outlet cover.
6. Disconnect from exhaust tube at exhaust outlet.
7. Remove oil tubes and water tubes of turbocharger.
8. Remove turbocharger from exhaust manifold.
9. Disconnect radiator outlet hose and thermostat housing water inlet hose.

10. Remove fuel injection tube assembly and spill tube.

11. Remove injection nozzle holder and top nozzle gasket using deep socket wrench.

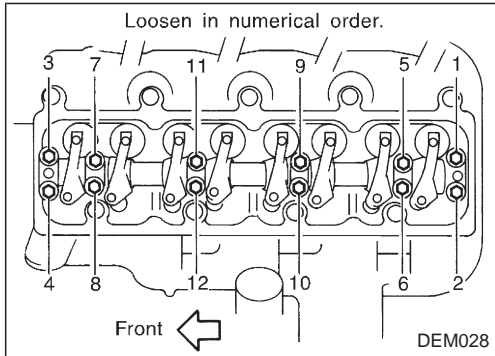
Removal (Cont'd)

12. Remove rocker cover.



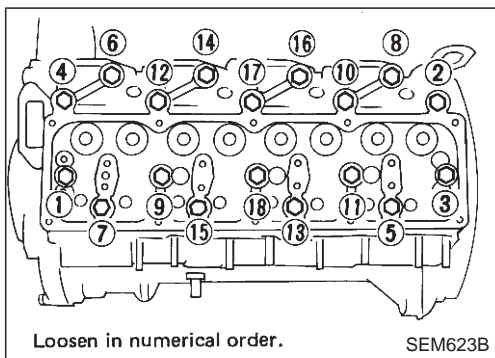
13. Remove rocker shaft with rocker arms.

14. Remove push rods.



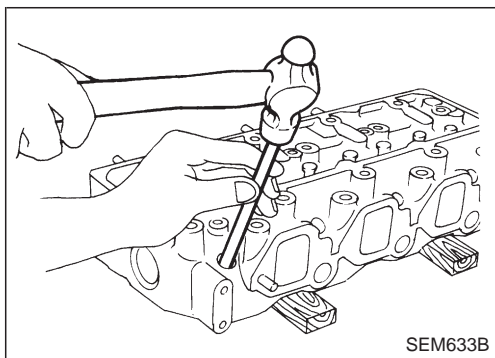
15. Remove cylinder head bolts in numerical order and remove cylinder head.

Head warpage or cracking could result from removing in incorrect order.

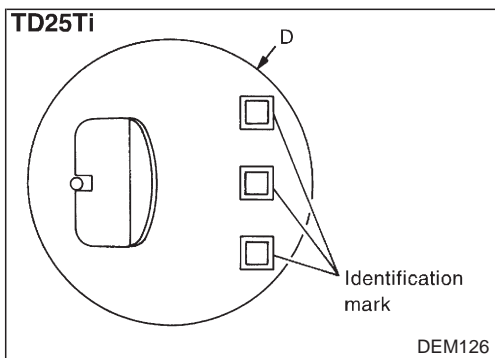


Inspection

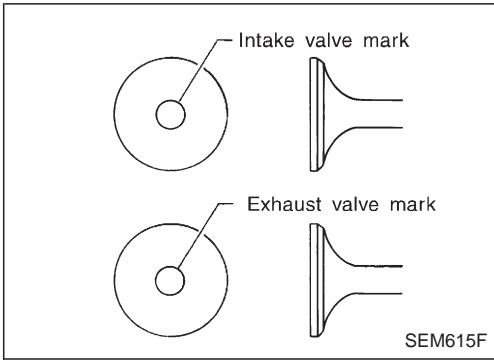
REPLACING COMBUSTION CHAMBER



Identification of combustion chambers



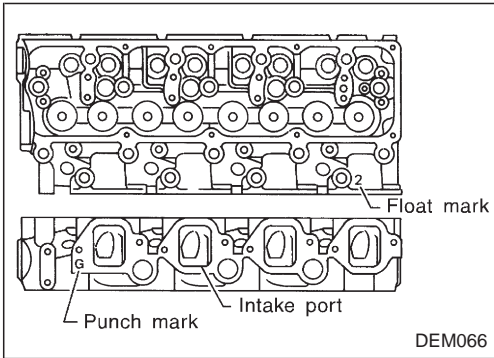
Identification mark (on combustion chamber)	Outer diameter "D" mm (in)	Engine
3 places	37 (1.46)	TD25Ti



Assembly

Identification of valves

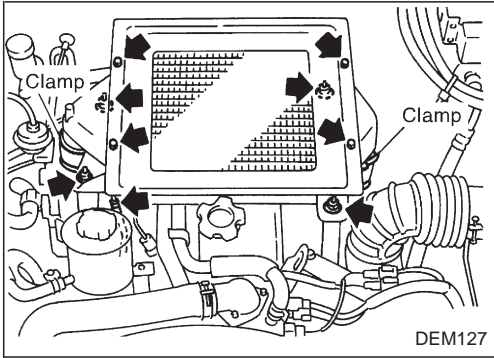
Identification mark (on intake and exhaust valve)		Engine
Intake valve	Exhaust valve	
2	M	TD25Ti



Installation

Cylinder head identification mark

Identification number (on cylinder head)		Engine
Float mark	Punch mark	
W	M	TD25Ti

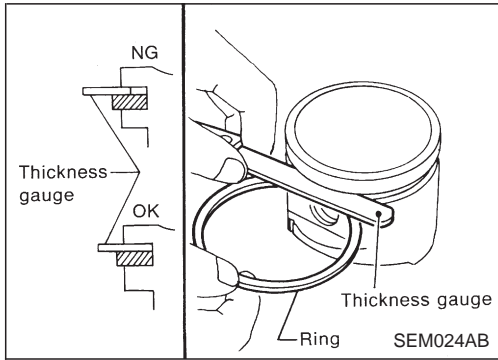


VALVE STEM OIL SEAL

Remove following parts before removing rocker cover.

- Charge air cooler
- Blow-by hose

Be careful not to drop parts into throttle chamber and turbocharger outlet.



Inspection and Replacement

PISTON RING SIDE CLEARANCE

Side clearance: mm (in)

Top ring
0.05 - 0.07 (0.0020 - 0.0028)

2nd ring
0.04 - 0.08 (0.0016 - 0.0031)

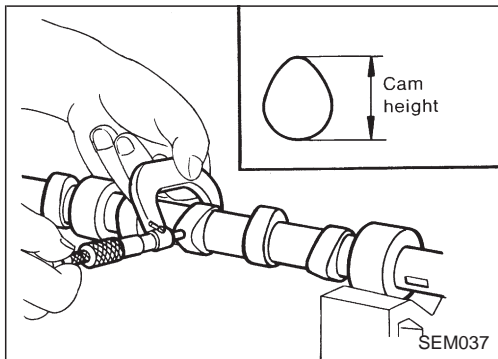
Oil ring
0.02 - 0.06 (0.0008 - 0.0024)

Max. limit of side clearance: mm (in)

Top ring 0.50 (0.0197)

2nd ring 0.30 (0.0118)

Oil ring 0.15 (0.0059)



CAMSHAFT ALIGNMENT

Cam height: mm (in)

Standard

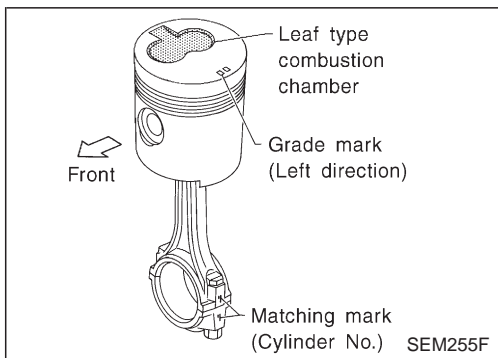
Intake
41.55 - 41.59 (1.6358 - 1.6374)

Exhaust
41.88 - 41.92 (1.6488 - 1.6504)

Limit

Intake
Less than 41.00 (1.6142)

Exhaust
Less than 41.40 (1.6299)



Assembly

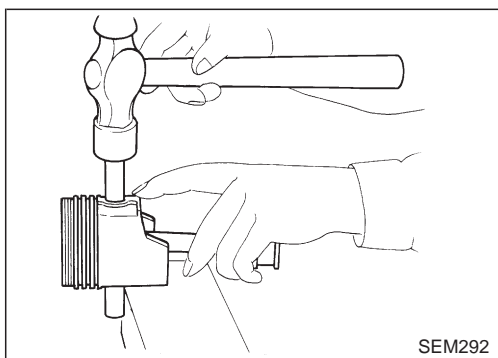
PISTON

Assemble pistons, piston pins, snap rings and connecting rods.

a. Numbers are stamped on the connecting rod and cap corresponding to each cylinder. Care should be taken to avoid a wrong combination including bearing.

b. When inserting piston pin in connecting rod, heat piston with a heater or hot water [approximately 60 to 70°C (140 to 158°F)] and apply engine oil to pin and small end of connecting rod.

c. After assembling, ascertain that piston swings smoothly.

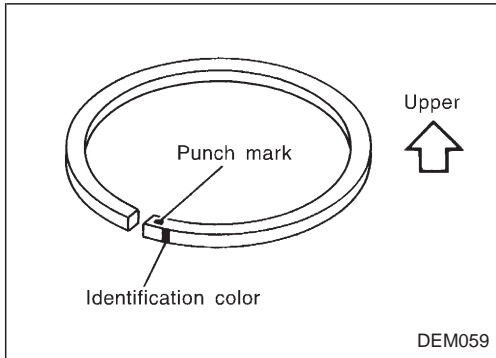


Assembly (Cont'd)

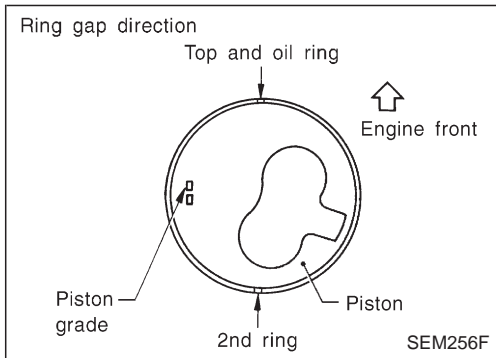
Install piston assembly.

CAUTION:

- Stretch the piston rings only enough to fit them in the piston grooves.
- Always install new piston rings with the position marks facing up.



	Identification color
Top ring	Yellow
2nd ring	Red



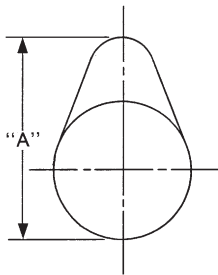
- Install No. 1 piston ring in such a way that its gap faces the direction of the piston pin; and then install piston rings so that their gap positioned at 180° to one another.

Inspection and Adjustment

CAMSHAFT AND CAMSHAFT BEARING

Unit: mm (in)

	Standard	Limit
Camshaft journal to bushing clearance [Oil clearance]	0.020 - 0.109 (0.0008 - 0.0043)	0.15 (0.0059)
Camshaft journal diameter		
Front	50.721 - 50.740 (1.9969 - 1.9976)	—
2nd	50.521 - 50.540 (1.9890 - 1.9898)	—
3rd	50.321 - 50.340 (1.9811 - 1.9819)	—
4th	50.121 - 50.140 (1.9733 - 1.9740)	—
Rear	49.921 - 49.940 (1.9654 - 1.9661)	—
Camshaft bend (Total indicator reading)	Less than 0.02 (0.0008)	0.06 (0.0024)
Camshaft end play	0.08 - 0.28 (0.0031 - 0.0110)	0.50 (0.0197)



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	Standard	Limit
Cam height "A"		
Intake	41.55 - 41.59 (1.6358 - 1.6374)	41.00 (1.6142)
Exhaust	41.88 - 41.92 (1.6488 - 1.6504)	41.40 (1.6299)

Piston ring

Unit: mm (in)

	Standard	Limit
Side clearance		
Top	0.05 - 0.07 (0.0020 - 0.0028)	0.50 (0.0197)
2nd	0.04 - 0.08 (0.0016 - 0.0031)	0.30 (0.0118)
Oil	0.02 - 0.06 (0.0008 - 0.0024)	0.15 (0.0059)
Ring gap		
Top	0.30 - 0.45 (0.0118 - 0.0177)	1.5 (0.059)
2nd	0.20 - 0.35 (0.0079 - 0.0138)	
Oil (rail ring)	0.15 - 0.35 (0.0059 - 0.0138)	