INTAKE AND EXHAUST

CONTENTS

E15AA--

SPECIFICATIONS

GENERAL SPECIFICATIONS

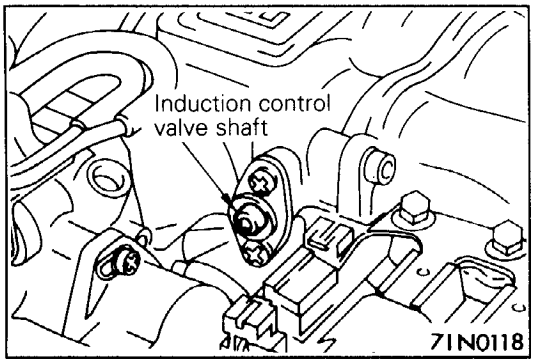
E15CA--

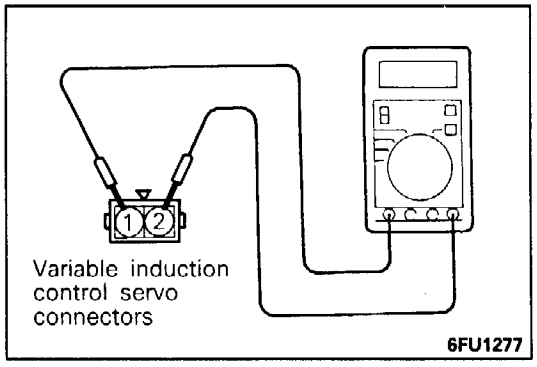
Items	Specifications
Air cleaner	
Element	Unwoven cloth type
Exhaust system	
Front exhaust pipe	Dual type
Muffler	Expansion resonance type
Coupling	Flat coupling
Suspension system	Rubber hangers

SERVICE SPECIFICATIONS

E15CB--

Items	Standard value	Limit
Intake manifold and air intake plenum		
Distortion of the installation surface mm (in.)	0.15 (0.006) or less	0.2 (0.008)





SERVICE ADJUSTMENT PROCEDURES

E15FGAAa

VARIABLE INDUCTION CONTROL SYSTEM INSPECTION <Vehicles built up to November, 1991>

SYSTEM INSPECTION

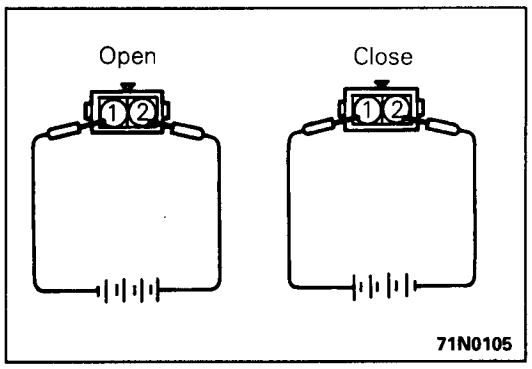
(1) Warm up the engine.
(2) Connect the tachometer. (Refer to GROUP 11 - Service Adjustment Procedures.)
(3) Make sure that when the engine speed is increased from the idle speed to 5,000 r/min., the induction control valve shaft turns.

VARIABLE INDUCTION CONTROL SERVO INSPECTION

(1) Disconnect the variable induction control servo connectors.
(2) Check the variable induction control servo coil for continuity.

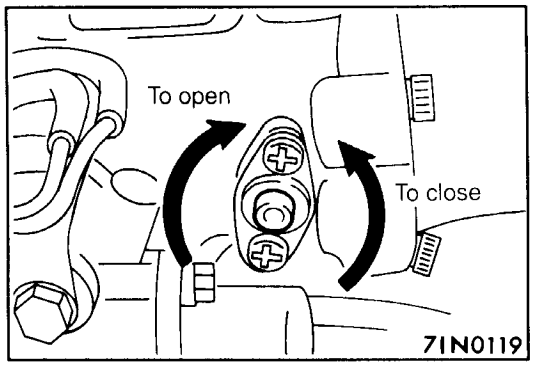
Standard value

Measured terminal	Continuity
Between terminals ① and ②	Present [5 – 35 Ω: 20°C (68°F)]

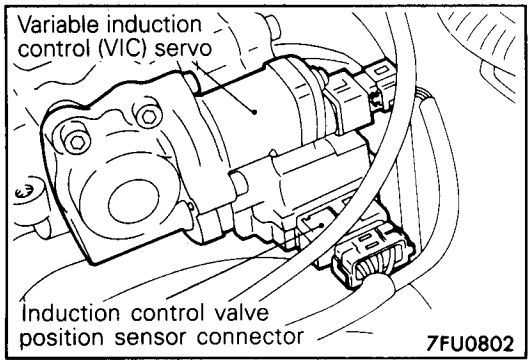


(3) Make sure that when DC 6V is applied to terminals ① and ② of the variable induction control servo connector, the induction control valve shaft turns smoothly.

Caution
Be sure to apply a voltage of not higher than DC 6V to the variable induction control servo connector terminals since application of high voltage may lock the servo gears.



(4) If deviation from the standard value occurs or the variable induction control valve shaft does not turn smoothly replace the air intake plenum assembly.

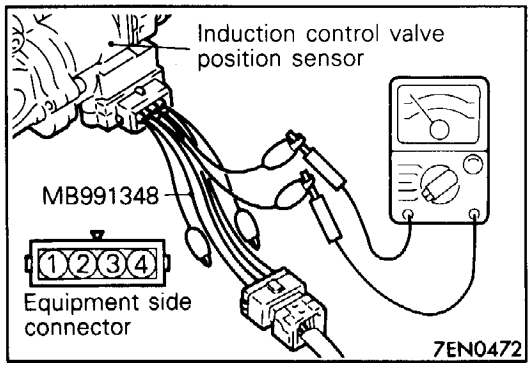


<Vehicles built from December, 1991>
SYSTEM INSPECTION

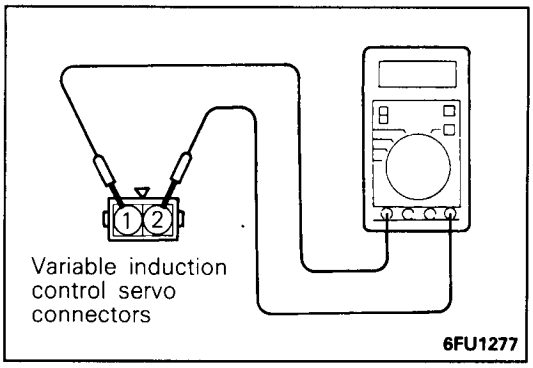
(1) Disconnect the induction control valve position sensor connector.
(2) Connect the special tool (test harness set) between the disconnected connectors. (All terminals should be connected.)
(3) Connect a circuit tester between terminal ② and terminal ③ of the induction control valve position sensor and measure the voltage. In addition, measure the voltage between terminal ③ and terminal ④ in the same way.

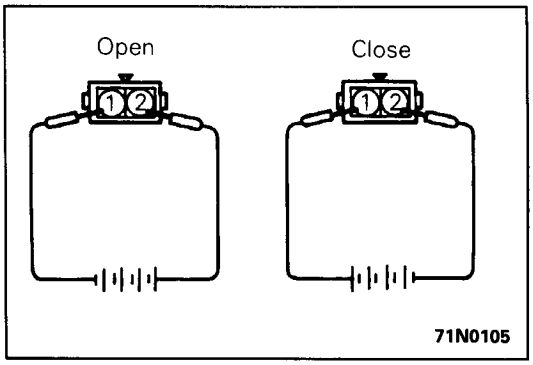
Standerd value

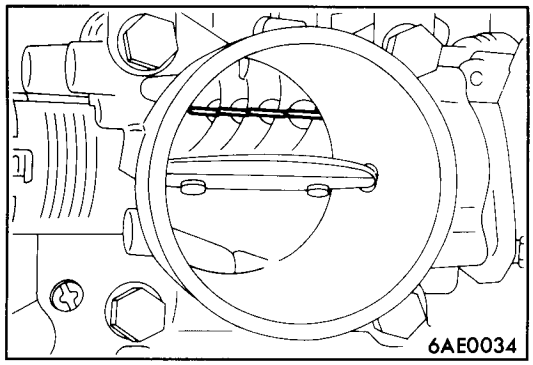
Engine condition	Voltage [V]
Idle	0–1 or 4.5–5.5
Engine speed gradually increases to 5,000 r/min.,	1.5–4.0 (momentarily)
5,000 r/min.	0–1 or 4.5–5.5



(4) If the voltages are outside the standard values, inspect the induction control valve position sensor, variable induction control (VIC) servo and the related harnesses.







VARIABLE INDUCTION CONTROL SERVO INSPECTION

(1) Disconnect the variable induction control servo connectors.
(2) Disconnect the air intake hose from the throttle body.
(3) Check the variable induction control servo coil for continuity.

Standard value

Measured terminal	Continuity
Between terminals ① and ②	Present [5 – 35 Ω: 20°C (68°F)]

(4) Make sure that when DC 6V is applied to terminals ① and ② of the variable induction control servo connector, the induction control valve opens and closes smoothly

Caution
Be sure to apply a voltage of not higher than DC 6V to the variable induction control servo connector terminals since application of high voltage may lock the servo gears.

(5) If outside the standard value, or if the variable induction valve does not open and close smoothly, replace the air intake plenum assembly.

INTAKE MANIFOLD VACUUM INSPECTION E15FBAB

Refer to GROUP 11- Service Adjustment Procedures.

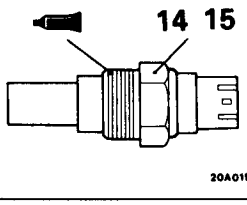
INTAKE MANIFOLD

E15MA-A

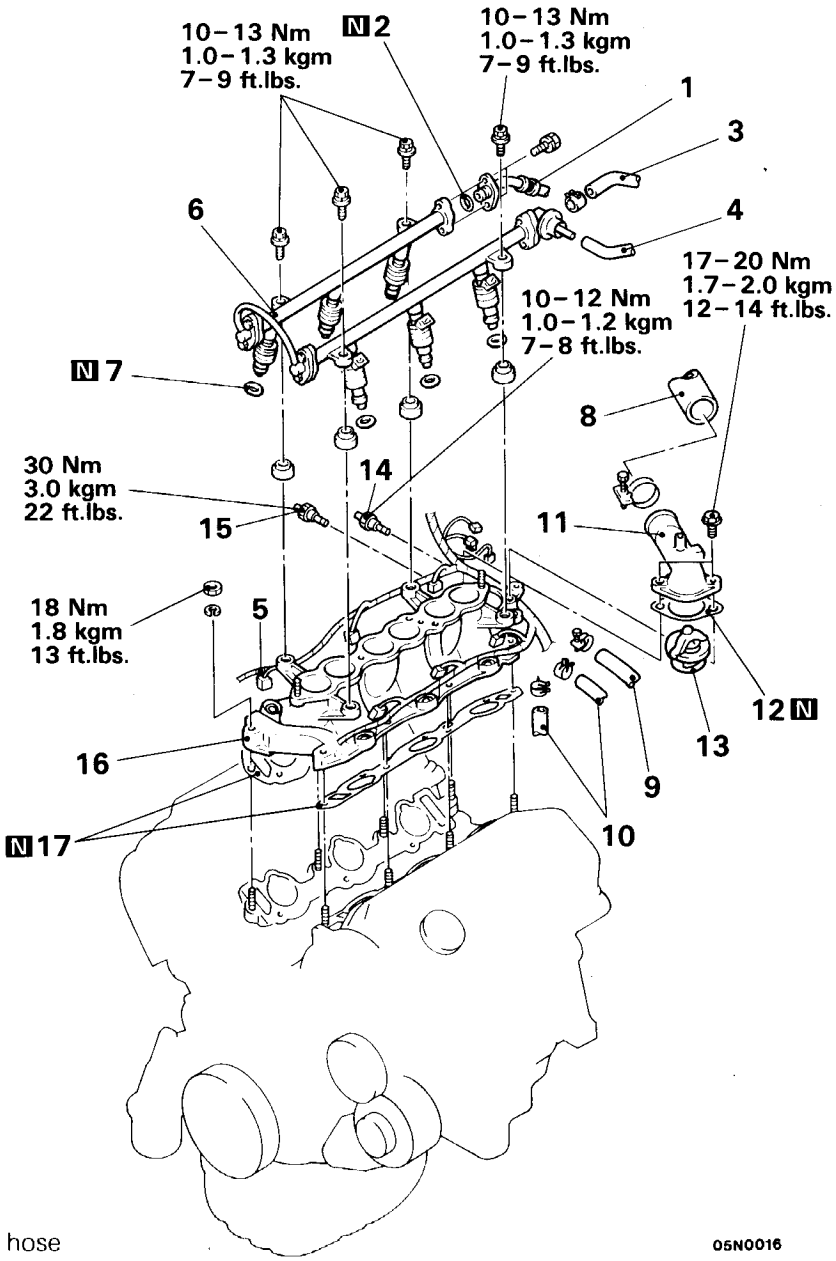
REMOVAL AND INSTALLATION <SOHC>

Pre-removal Operation
- Releasing of Residual Fuel Pressure (Refer to GROUP 13 – Service Adjustment Procedures.)
- Draining of Coolant (Refer to GROUP 14 – Service Adjustment Procedures.)
- Removal of Intake Manifold Plenum

Post-installation Operation
- Installation of Intake Manifold Plenum
- Supplying of Coolant (Refer to GROUP 14 – Service Adjustment Procedures.)
- Adjustment of Accelerator Cable (Refer to GROUP 13 – Service Adjustment Procedures.)

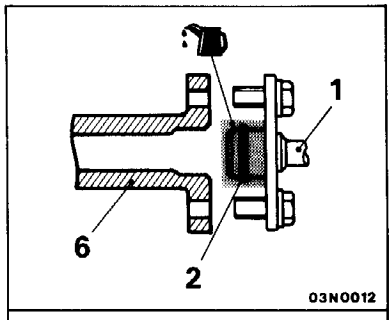


Sealant: 3M Nut Locking No. 4171 or equivalent

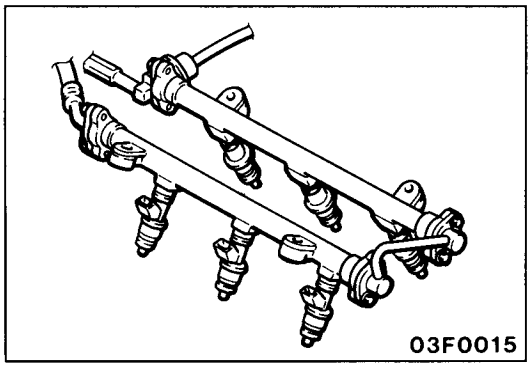


Removal steps

- ◆◆ 1. Connection for high-pressure fuel hose
- ◆◆ 2. O-ring
- 3. Connection for fuel return hose
- 4. Connection for vacuum hoses
- 5. Wiring harness connector
- ◆◆ 6. Delivery pipe, injector and pressure regulator assembly
- 7. Insulators
- 8. Connection for radiator upper hose
- 9. Connection for heater hose
- 10. Connection for water hose
- 11. Water outlet fitting
- 12. Water outlet fitting gasket
- 13. Thermostat
- 14. Engine coolant temperature sensor
- 15. Engine coolant temperature gauge unit
- 16. Intake manifold
- 17. Intake manifold gasket



Engine oil



SERVICE POINTS OF REMOVAL E15MBAS 1

6. REMOVAL OF DELIVERY PIPE, FUEL INJECTOR AND PRESSURE REGULATOR

Remove the delivery pipe with fuel injectors and pressure regulators on.

Caution
Do not drop the injectors when removing the delivery pipe.

SERVICE POINTS OF INSTALLATION

2. INSTALLATION OF O-RING/1. HIGH PRESSURE FUEL HOSE

(1) Apply a little amount of new engine oil to the O-ring.

Caution
Be sure to prevent the engine oil from entering into the delivery pipe.

(2) Insert the hose, being careful not to damage the O-ring, and tighten securely.

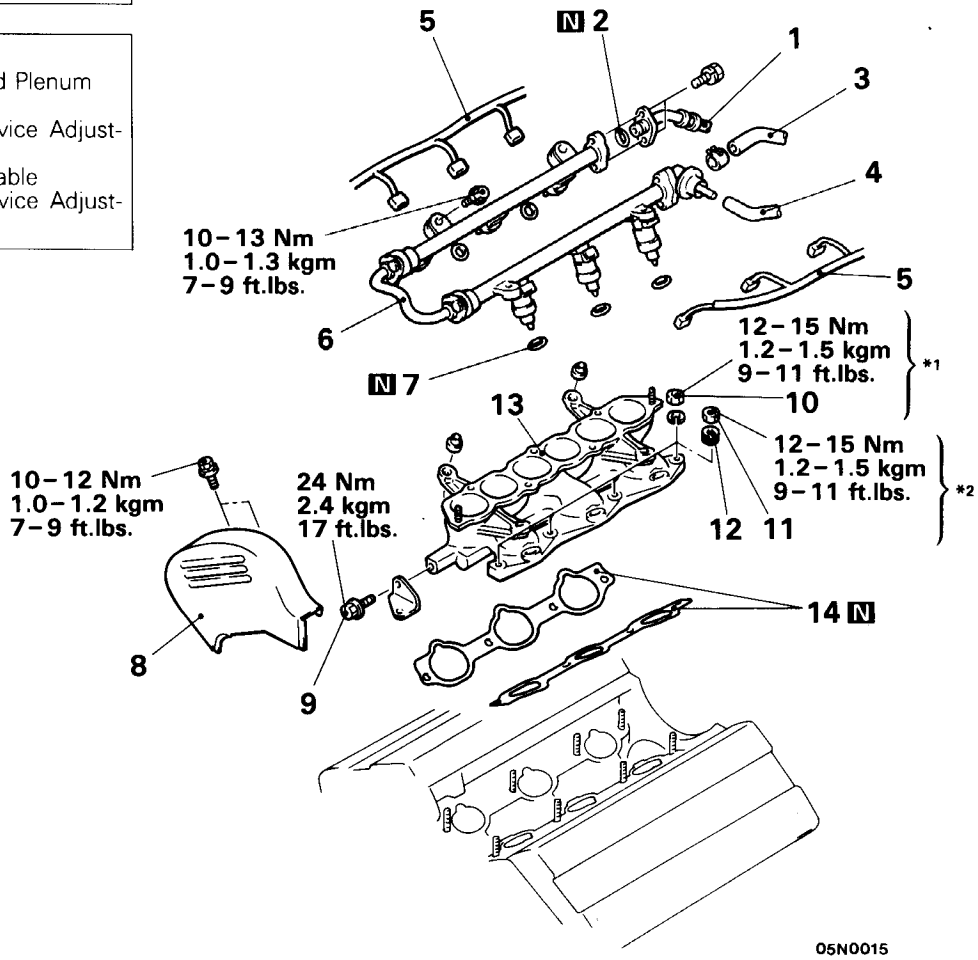
NOTE
Be sure to tighten securely to prevent fuel leaks so that there will be high pressure between the fuel pump and the delivery pipe.

REMOVAL AND INSTALLATION <DOHC>

E15MA-B

Pre-removal Operation
- Releasing of Residual Fuel Pressure (Refer to GROUP 13 – Service Adjustment Procedures.)
- Draining of Coolant (Refer to GROUP 14 – Service Adjustment Procedures.)
- Removal of Intake Manifold Plenum

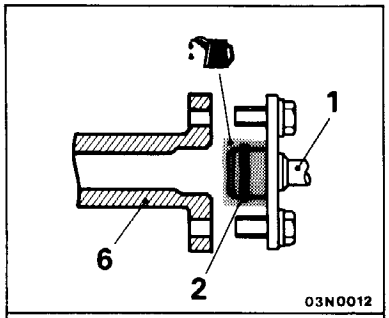
Post-installation Operation
- Installation of Intake Manifold Plenum
- Supplying of Coolant (Refer to GROUP 14 – Service Adjustment Procedures.)
- Adjustment of Accelerator Cable (Refer to GROUP 13 – Service Adjustment Procedures.)



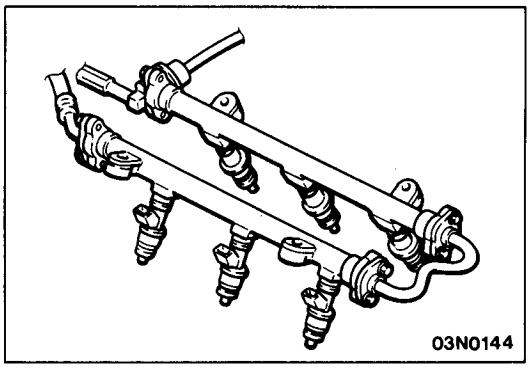
Removal steps

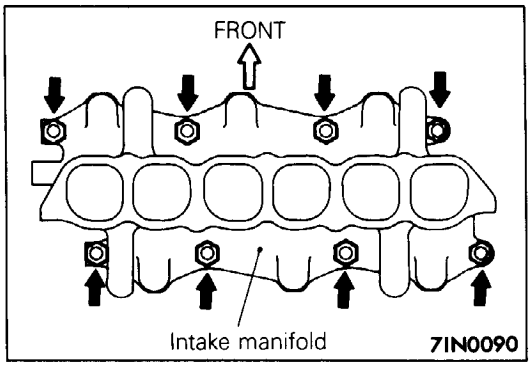
- ◆◆ 1. Connection for high-pressure fuel hose
- ◆◆ 2. O-ring
- 3. Connection for fuel return hose
- 4. Connection for vacuum hoses
- 5. Wiring harness connector
- ◆◆ 6. Delivery pipe, injector and pressure regulator assembly
- 7. Insulators
- 8. Timing belt upper cover
- 9. Water pump stay mounting bolt
- 10. Intake manifold mounting nut*1
- ◆◆ 11. Intake manifold mounting nut*2
- 12. Cone disc spring*2
- 13. Intake manifold
- 14. Intake manifold gasket

NOTE
*1 <Vehicles built up to October, 1992>
*2 <Vehicles built from November, 1992>



Engine oil





SERVICE POINTS OF REMOVAL E15MBAS2

6. REMOVAL OF DELIVERY PIPE, FUEL INJECTOR AND PRESSURE REGULATOR

Remove the delivery pipe with fuel injectors and pressure regulators on.

Caution
Do not drop the injectors when removing the delivery pipe.

SERVICE POINTS OF INSTALLATION

11. INSTALLATION OF INTAKE MANIFOLD MOUNTING NUT <Vehicles built from November, 1992>

Tighten the intake manifold mounting nuts one bank after the other by the following procedure.

<Vehicles built from November, 1992 up to November, 1993>

(1) Tighten the nuts in the front bank to 3 – 5 Nm (0.3 – 0.5 kgm, 2.2 – 3.6 ft.lbs.).
(2) Tighten the nuts in the rear bank to 12 – 15 Nm (1.2 – 1.5 kgm, 9 – 11 ft.lbs.).
(3) Tighten the nuts in the front bank to 12 – 15 Nm (1.2 – 1.5 kgm, 9 – 11 ft.lbs.).
(4) Repeat steps (2) and (3) one more time respectively.

<Vehicles built from December, 1993>

(1) Tighten the nuts in the front bank to 5–8 Nm (0.5–0.8 kgm, 4–6 ft.lbs.)
(2) Tighten the nuts in the rear bank to 20–23 Nm (2.0–2.3 kgm, 14–17 ft.lbs.).
(3) Tighten the nuts in the front bank to 20–23 Nm (2.0–2.3 kgm, 14–17 ft.lbs.).
(4) Repeat steps (2) and (3) one more time respectively.

2. INSTALLATION OF O-RING/1. HIGH PRESSURE FUEL HOSE

(1) Apply a little amount of new engine oil to the O-ring.

Caution
Be sure to prevent the engine oil from entering into the delivery pipe.

(2) Insert the hose, being careful not to damage the O-ring, and tighten securely.

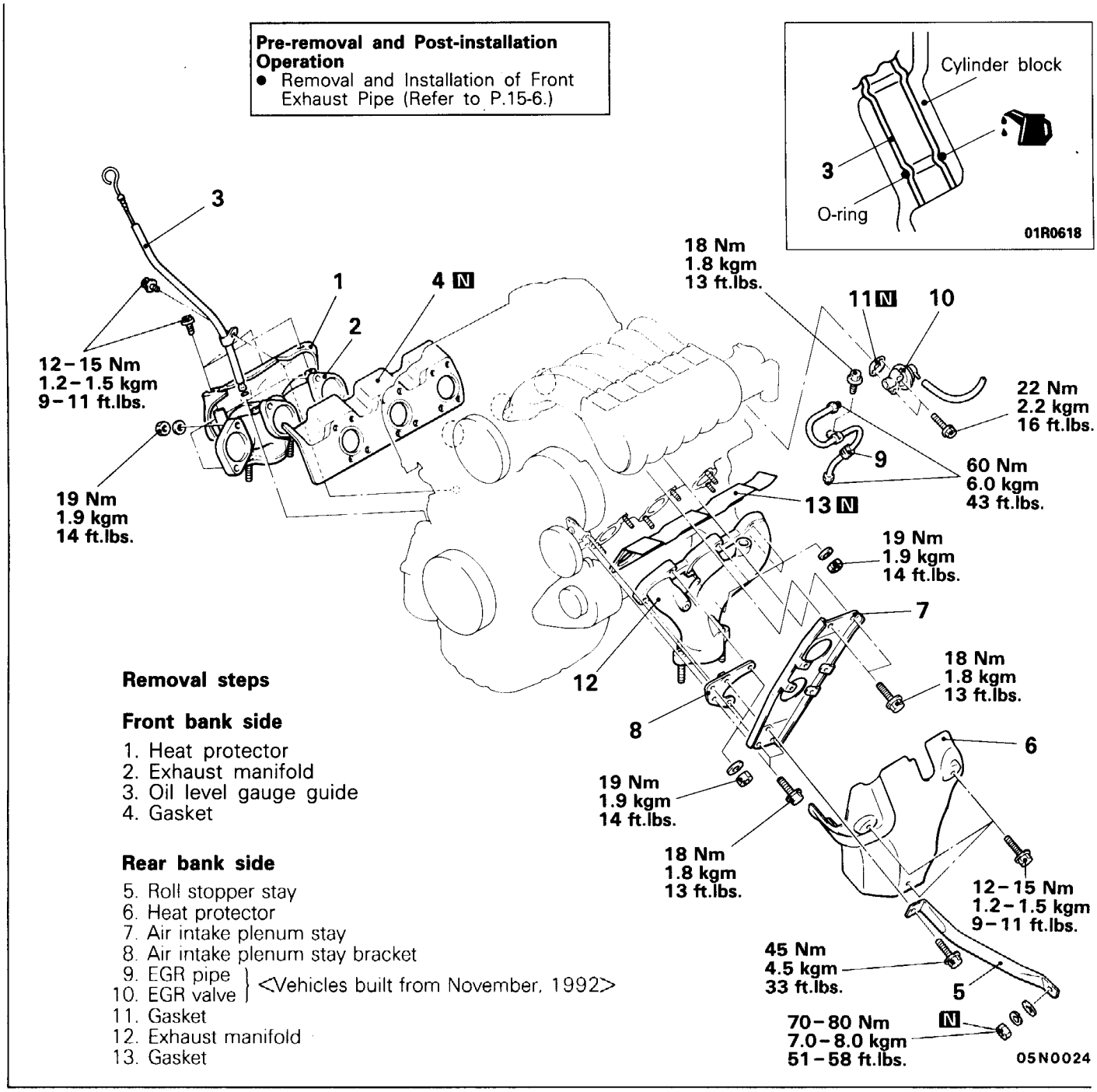
NOTE
Be sure to tighten securely to prevent fuel leaks so that there will be high pressure between the fuel pump and the delivery pipe.

NOTES

EXHAUST MANIFOLD

REMOVAL AND INSTALLATION <SOHC>

E15NA--



Removal steps

Front bank side

1. Heat protector
2. Exhaust manifold
3. Oil level gauge guide
4. Gasket

Rear bank side

5. Roll stopper stay
6. Heat protector
7. Air intake plenum stay
8. Air intake plenum stay bracket
9. EGR pipe
10. EGR valve
<Vehicles built from November, 1992>
11. Gasket
12. Exhaust manifold
13. Gasket

INSPECTION

E15NCAD1

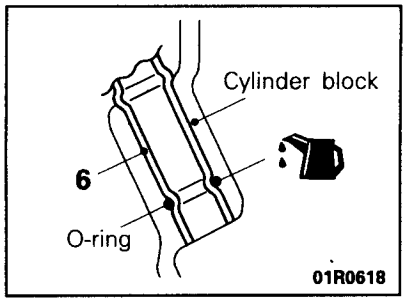
EXHAUST MANIFOLD

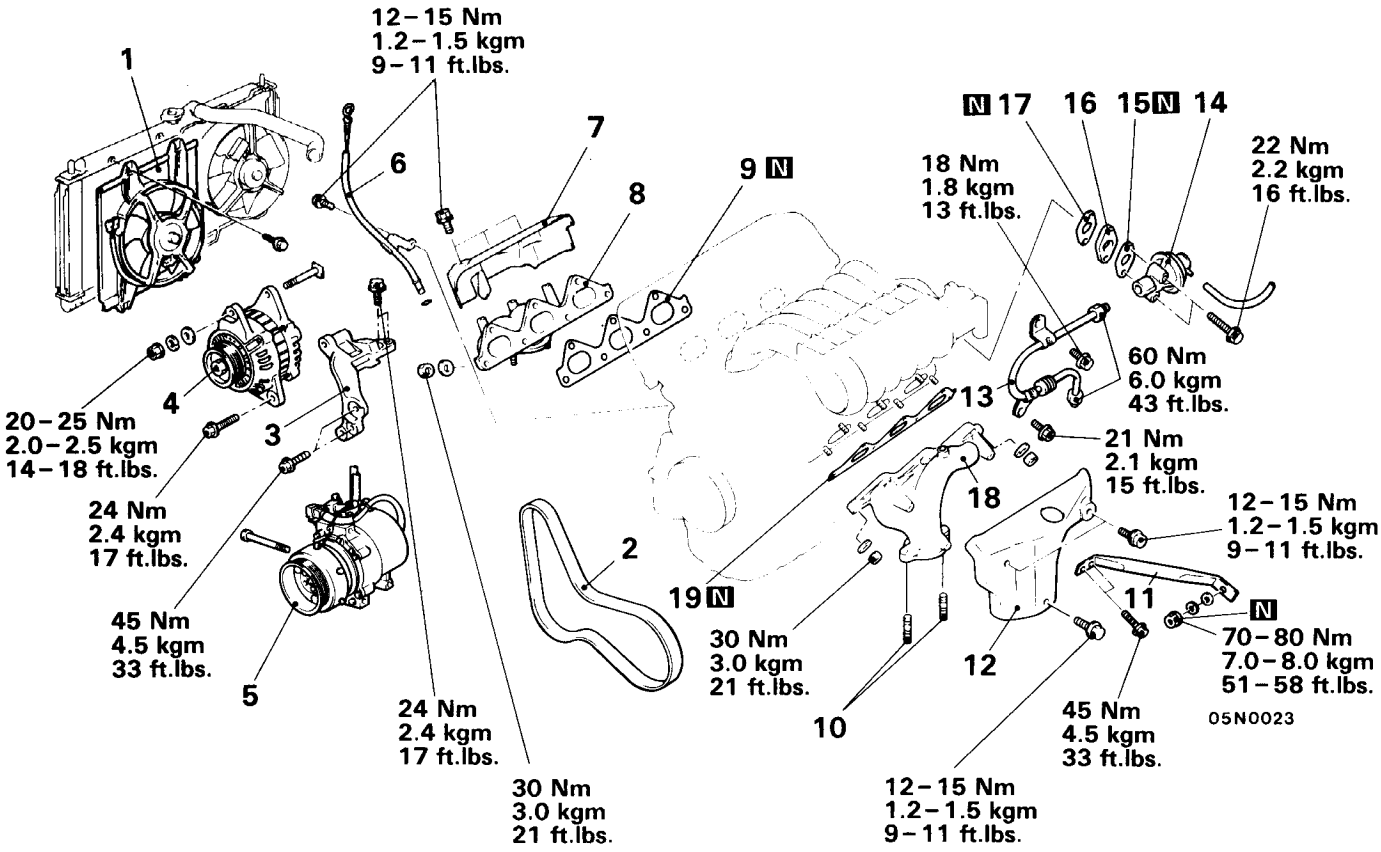
Check for damage or cracking of any part.

REMOVAL AND INSTALLATION <DOHC>

E15NA-A

Pre-removal and Post-installation Operation
- Removal and Installation of Front Exhaust Pipe (Refer to P.15-6.)





Removal steps

Front bank side

1. Condenser fan assembly (Vehicles with air conditioner)
2. Drive belt (Refer to GROUP 11 – Service Adjustment Procedures)
3. Alternator bracket (Refer to GROUP 16 – Engine Electrical)
4. Alternator (Refer to GROUP 16 – Engine Electrical)
◀▶ 5. Compressor (Vehicles with air conditioner)
6. Oil level gauge guide
7. Heat protector
8. Exhaust manifold
9. Gasket

Rear bank side

10. Stud
11. Roll stopper stay
12. Heat protector
13. EGR pipe
14. EGR valve
15. Gasket
16. Spacer <Vehicles with TCL>
17. Gasket <Vehicles with TCL>

<Vehicles built from November, 1992>

18. Exhaust manifold
19. Gasket

SERVICE POINTS OF REMOVAL E15NBAE

5. REMOVAL OF COMPRESSOR

Remove the air conditioning compressor from the bracket with the hoses still attached.

NOTE
Move the compressor to a place where it will not be an obstruction.

INSPECTION E15NCAD2

EXHAUST MANIFOLD

Check for damage or cracking of any part.

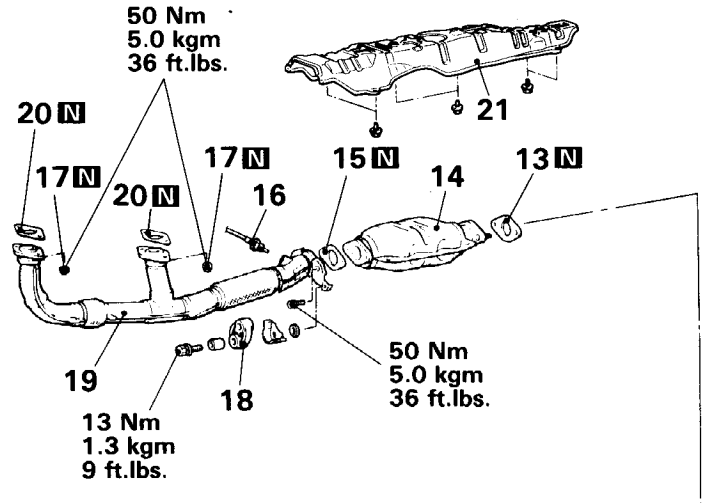
NOTES

EXHAUST PIPE AND MAIN MUFFLER

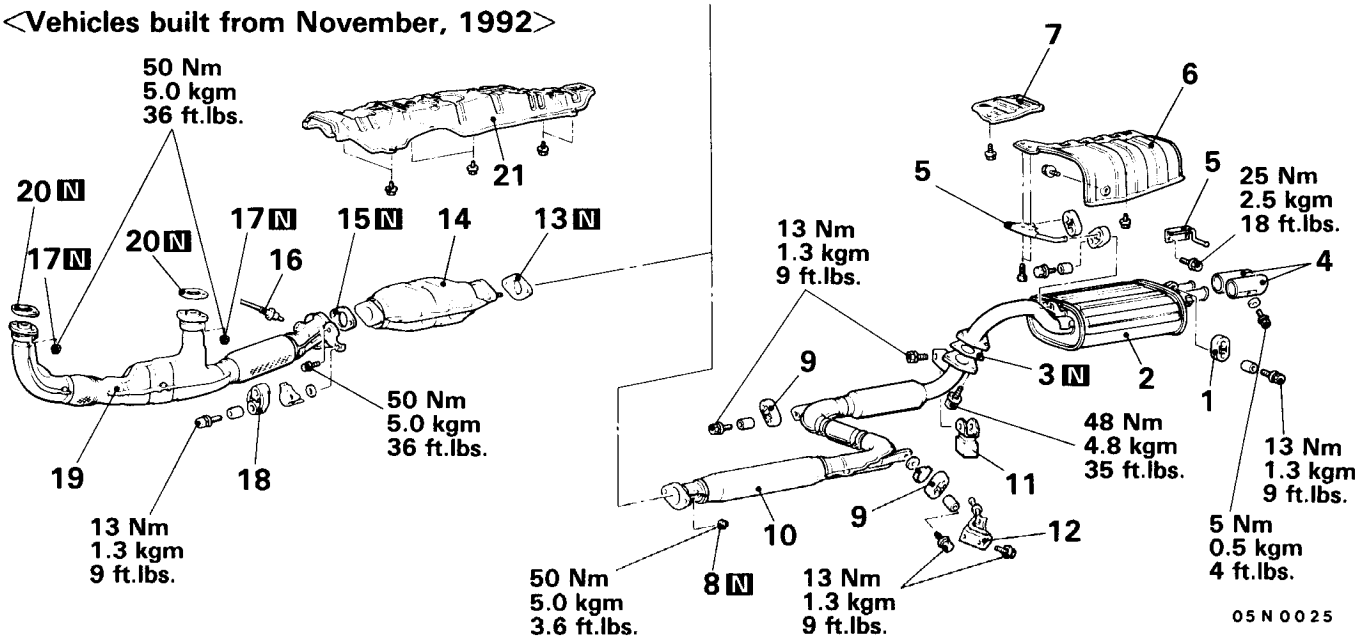
E15RA--

REMOVAL AND INSTALLATION

<Vehicles built up to October, 1992>



<Vehicles built from November, 1992>



Removal steps

1. Hanger
2. Main muffler
3. Gasket
4. Muffler cutter
5. Hanger bracket
6. Rear floor heat protector
7. Rear floor heat protector front
8. Self-locking nut
9. Hanger
10. Center exhaust pipe
11. Dynamic damper
12. Hanger bracket
13. Gasket
14. Catalytic converter
15. Gasket
16. Oxygen sensor
17. Self-locking nut
18. Hanger
19. Front exhaust pipe
20. Gasket
21. Front floor heat protector

INSPECTION

E15RCAH

- Check the mufflers and pipes for corrosion or damage.
- Check the rubber hangers for deterioration or damage.
- Check for gas leakage from mufflers and pipes.