TURBOCHARGER

ON–VEHICLE INSPECTION

1. INSPECT INTAKE AIR SYSTEM

Check for leakage or clogging between the air cleaner and turbocharger inlet and between the turbocharger outlet and cylinder head.

- Clogged air cleaner ..... Clean or replace filter
- Hoses collapsed or deformed ..... Repair or replace
- Leakage from connections ..... Check each connection and repair
- Cracks in components ..... Check and replace

2. INSPECT EXHAUST SYSTEM

Check for leakage or clogging between the cylinder head and turbocharger inlet and between the turbocharger outlet and exhaust pipe.

- Deformed components ..... Repair or replace
- Foreign material in passages ..... Remove
- Leakage from components ..... Repair or replace
- Cracks in components ..... Check and replace

3. INSPECT ACTUATOR OPERATION .

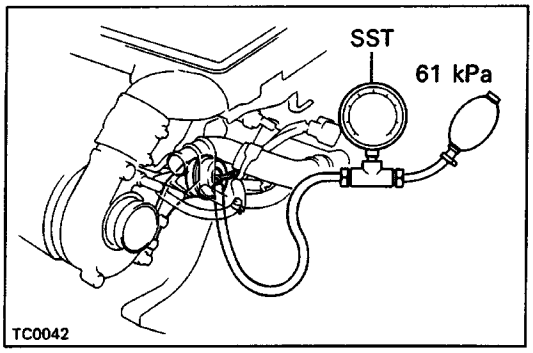
(a) Disconnect the actuator hose.

(b) Using SST (turbocharger pressure gauge), apply approx. 61 kPa (0.62 kg¿¿cm2, 88 psi) of pressure to the actuator and check that the rod moves.

If the rod does not move, replace the turbocharger assembly.

SST 09992–00241

NOTICE: Never apply more than 81 kPa (0.83 kgf/cm2, 11.8 psi) of pressure to the actuator.



4. CHECK TURBOCHARGING PRESSURE

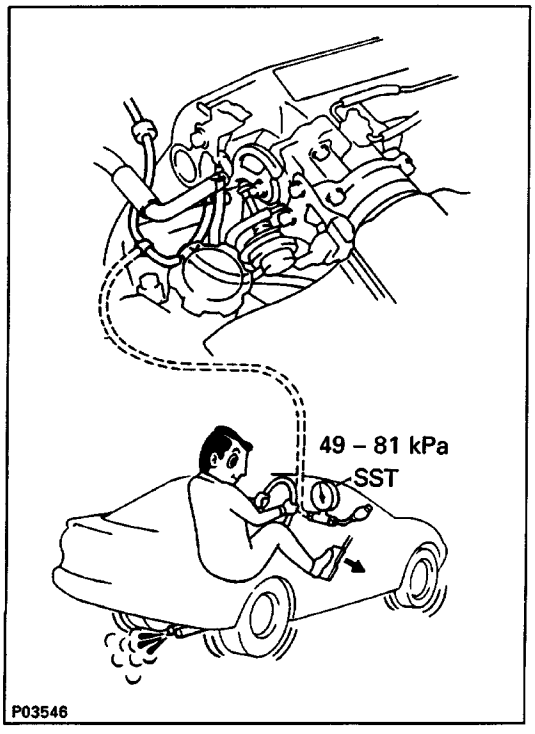
(a) Using a 3–way connector, connect SST (turbocharger pressure gauge) to the hose between the intake manifold and turbocharging pressure sensor.

SST 09992–00241

(b) While driving with the engine running at 2,800 rpm or more with the throttle valve fully open in the 2nd gear, check the turbocharging pressure.

Standard pressure: 49 – 81 kPa

(0.50 – 0.83 kgf/cm^2, 7.1 – 11.8 psi)

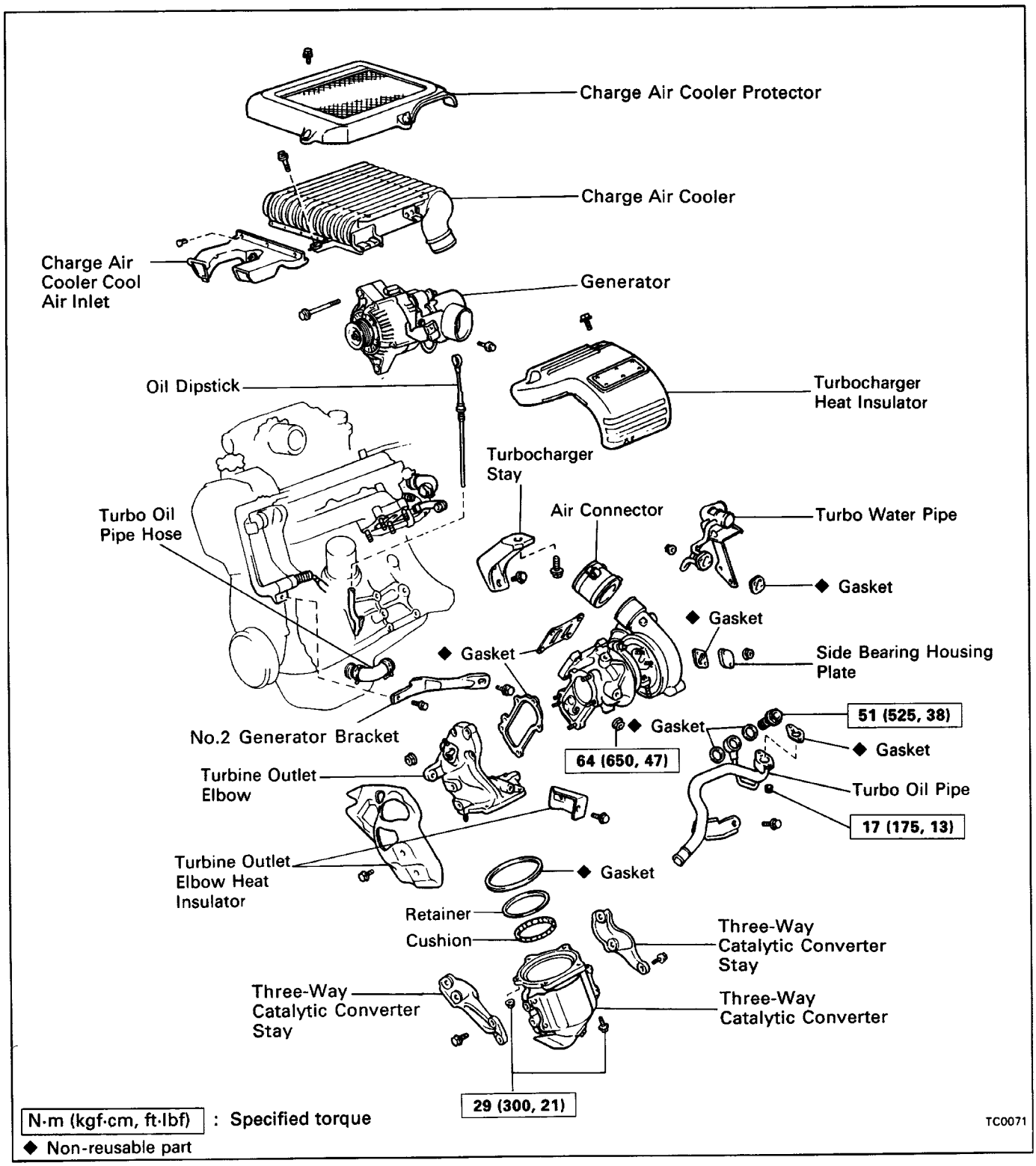


If the pressure is less than that specified, check the intake air and exhaust systems for leakage. If there is no leakage, replace the turbocharger assembly.

If the pressure is above specification, check if the actuator hose is disconnected or cracked. If not, replace the turbocharger assembly.

5. INSPECT IMPELLER WHEEL ROTATION
(See step 1 on page TC–13)
6. INSPECT TURBOCHARGING PRESSURE VSV
(See page FI–226)
7. INSPECT TURBOCHARGING PRESSURE SENSOR
(See page FI–235)

COMPONENTS



REMOVAL OF TURBOCHARGER

1. DISCONNECT CABLE FROM NEGATIVE TERMINAL OF BATTERY

CAUTION: Work must be started after approx. 20 seconds or longer from the time the ignition switch is turned to the ”LOCK” position and the negative (–) terminal cable is disconnected from the battery.

2. REMOVE ENGINE UNDER COVERS

3. DRAIN ENGINE COOLANT (See page CO–6)

4. REMOVE AIR CLEANER CAP

(See step 7 on page EM–224)

5. REMOVE SUSPENSION LOWER CROSSMEMBER

(See step 33 on page EM–228)

6. REMOVE FRONT EXHAUST PIPE

(See step 34 on page EM–229)

7. REMOVE ENGINE MOUNTING CENTER MEMBER

(See step 42 on page EM–229)

8. REMOVE FRONT MOUNTING INSULATOR AND BRACKET (See step 43 on page EM–230)

9. REMOVE CLUTCH RELEASE CYLINDER WITHOUT DISCONNECTING TUBE

(See step 26 on page EM–227)

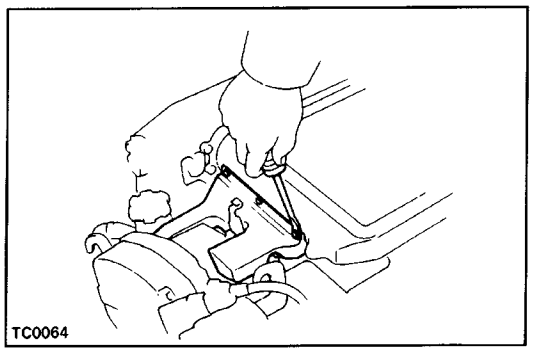
10. REMOVE GENERATOR (See page CH–7)

11. REMOVE IDLER PULLEY BRACKET AND A/C COMPRESSOR WITHOUT DISCONNECTING HOSES

(See step 39 on page EM–80)

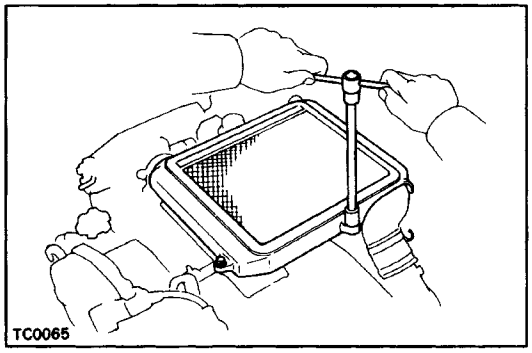
12. REMOVE THREE–WAY CATALYTIC CONVERTER

(See step 45 on page EM–230)



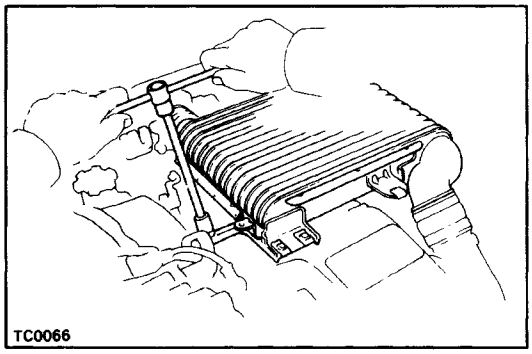
13. REMOVE CHARGE AIR COOLER COOL AIR INLET

Using a clip remover, remove the seven clips and air inlet.



14. REMOVE CHARGE AIR COOLER PROTECTOR

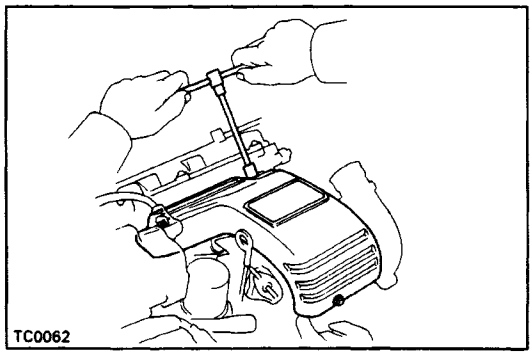
Remove the three bolts and protector.



15. REMOVE CHARGE AIR COOLER

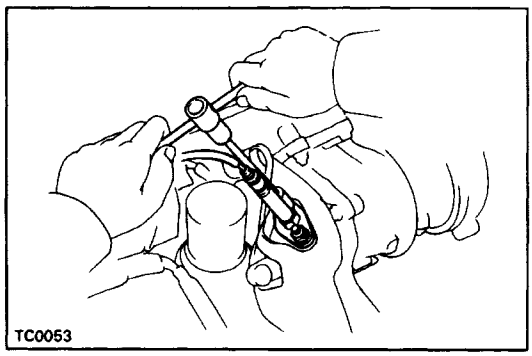
(a) Remove the two bolts.

(b) Disconnect the charge air cooler from the turbocharger and intake air connector, and remove the charge air cooler and air connector.



16. REMOVE TURBOCHARGER HEAT INSULATOR

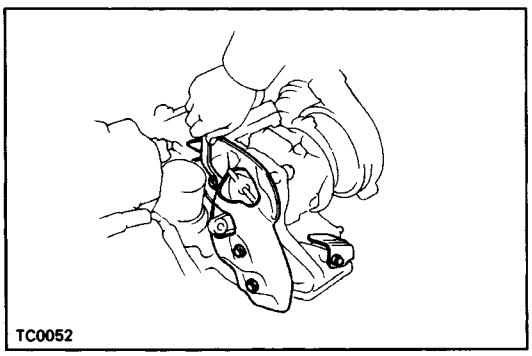
Remove the three bolts and heat insulator.



17. REMOVE OXYGEN SENSOR

(a) Disconnect the oxygen sensor connector.

(b) Remove the two nuts, oxygen sensor and gasket.

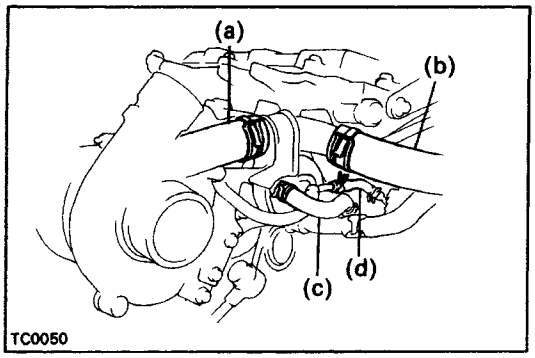


18. REMOVE HEAT INSULATORS OF TURBINE OUTLET ELBOW

(a) Remove the oil dipstick.

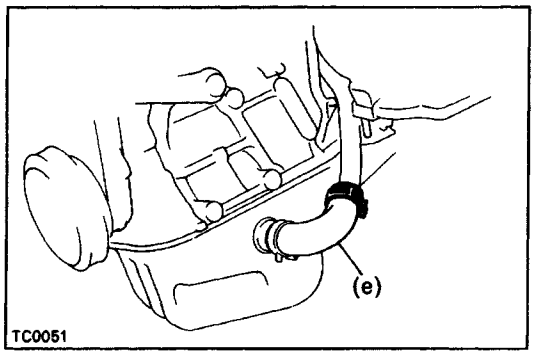
(b) Remove the three bolts and RH heat insulator.

(c) Remove the two bolts and LH heat insulator.

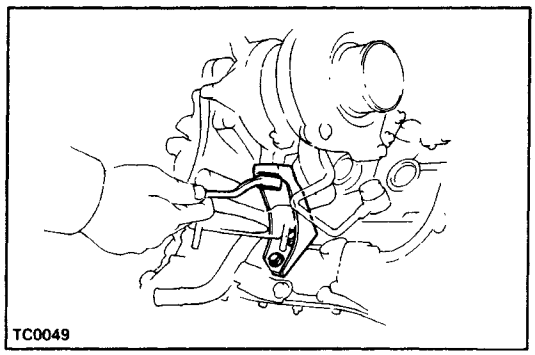


19. DISCONNECT HOSES

(a) Water hose from radiator
(b) Water hose from water inlet
(c) Water by–pass hose from turbo water pipe
(d) Vacuum hose from actuator

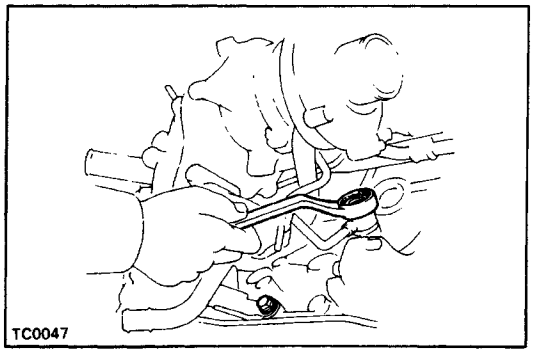


(e) Oil hose from turbo oil pipe



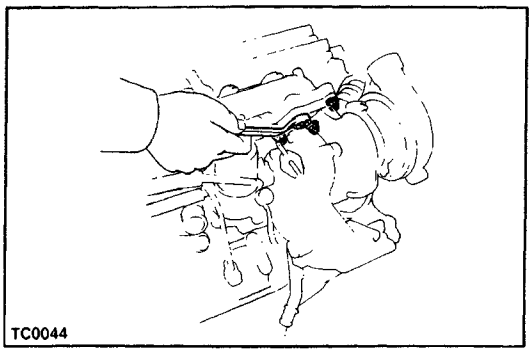
20. REMOVE TURBOCHARGER STAY

Remove the three bolts and turbocharger stay.

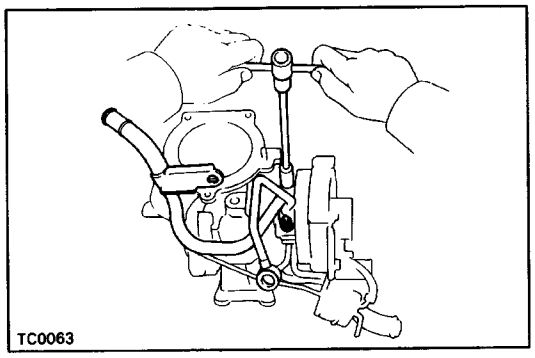


21. REMOVE TURBOCHARGER

(a) Remove the bolt and union bolt holding the No.1 turbo oil pipe to the cylinder block. Remove the two union bolt gaskets.

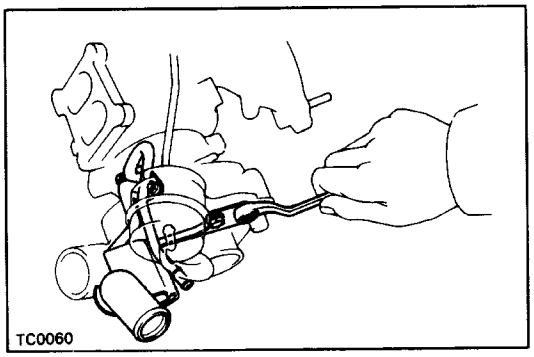


(b) Remove the four nuts, turbocharger and gasket.



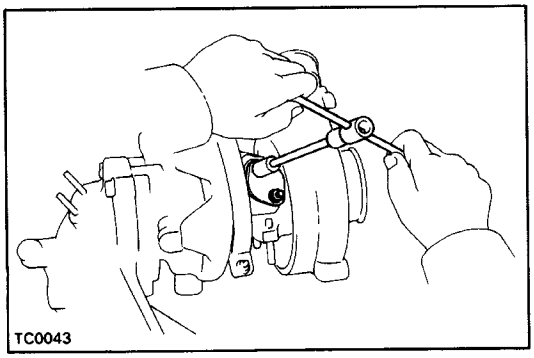
22. REMOVE TURBO OIL PIPE

Remove the two nuts, oil pipe and gasket.



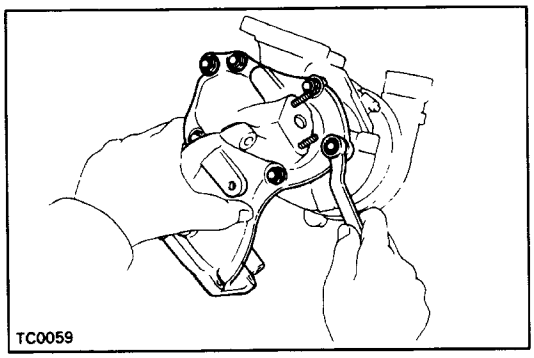
23. REMOVE TURBO WATER PIPE

Remove the two nuts, two bolts, water pipe and gasket.



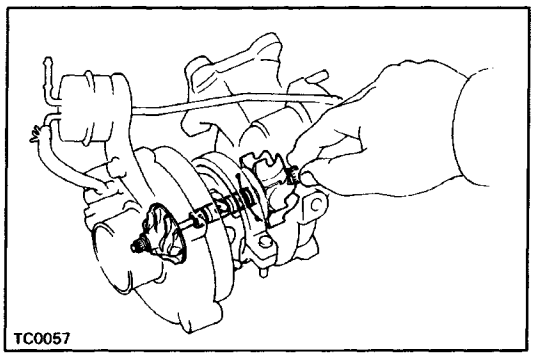
24. REMOVE SIDE BEARING HOUSING PLATE

Remove the two nuts, housing plate and gasket.



25. REMOVE TURBINE OUTLET ELBOW

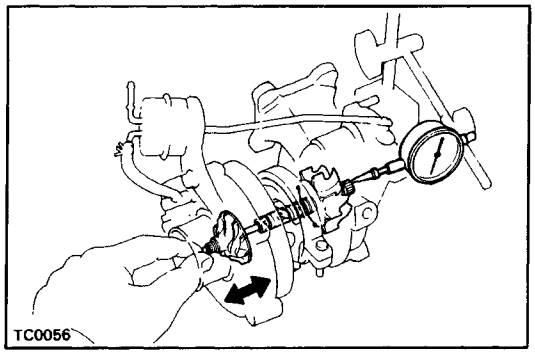
Remove the six nuts, outlet elbow and gasket.


TC0057

INSPECTION OF TURBOCHARGER

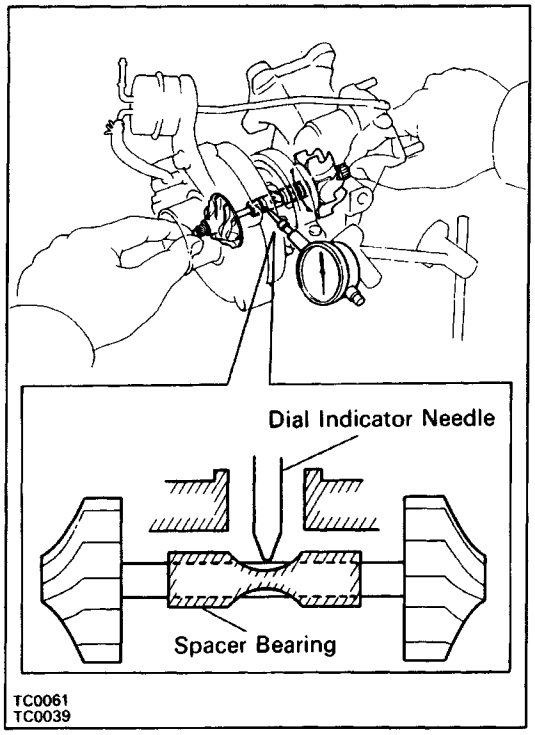
1. INSPECT IMPELLER WHEEL ROTATION

Grasp the edge of the turbine wheel and turn it. Check that the impeller wheel turns smoothly.
If the impeller wheel does not turn or if it turns with a drag, replace the turbocharger assembly.


TC0056

2. INSPECT AXIAL PLAY OF IMPELLER WHEEL

Insert a dial indicator into the intake side, hold the turbine wheel edge by hand, and check the axial play.
Standard clearance: 0.13 mm (0.0051 in.) or less
If the axial play is not as specified, replace the turbocharger assembly.



TC0061
TC0039

3. INSPECT RADIAL PLAY OF IMPELLER WHEEL

(a) From oil outlet hole, insert a dial indicator through the hole in the spacer bearing and set it in the center of the impeller shaft.
(b) Move the impeller shaft in a radial direction, and measure the radial play of the impeller shaft.

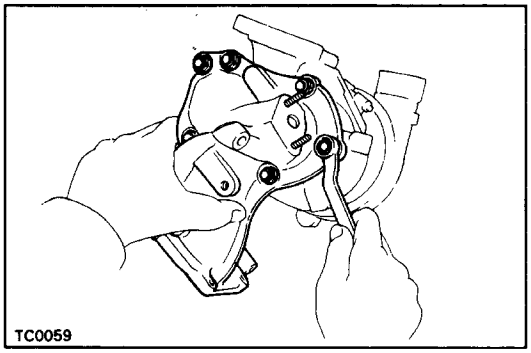
Standard clearance: 0.18 mm (0.0071 in.) or less

If the radial play is not as specified, replace the turbocharger assembly.

INSTALLATION OF TURBOCHARGER

(see page TC–8)

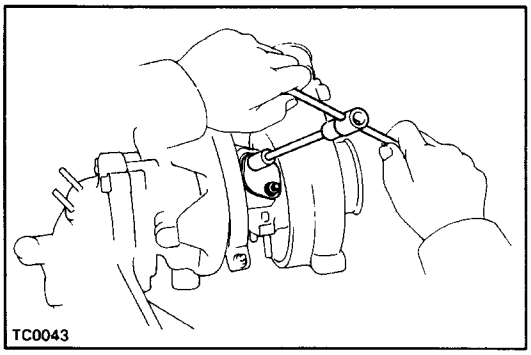
NOTICE: After replacing the turbocharger assembly, pour approx. 20 cc (1.2 cu in.) of new oil into the oil inlet and turn the impeller wheel by hand to splash oil on the bearing.



1. INSTALL TURBINE OUTLET ELBOW

Install a new gasket and the outlet elbow with the six nuts.

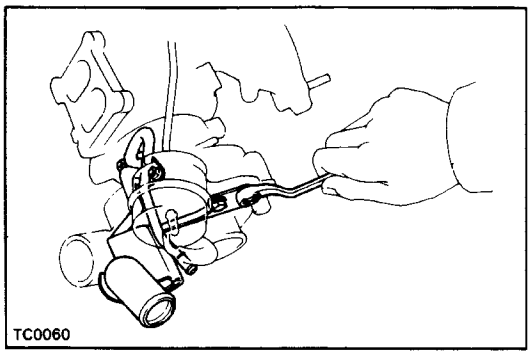
Torque: 64 N–m (650 kgf–cm, 47 ft–lbf)



2. INSTALL SIDE BEARING HOUSING PLATE

Install a new gasket and the housing plate with the two nuts.

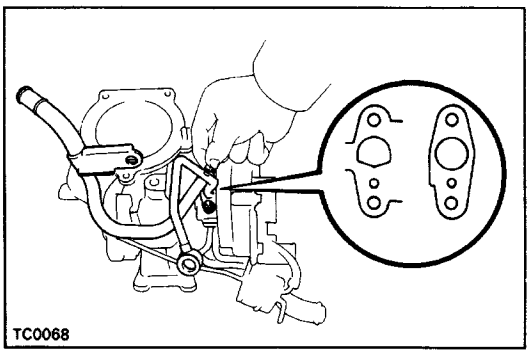
Torque: 11 N–m (120 kgf–cm, 9 ft–lbf)



3. INSTALL TURBO WATER PIPE

Install a new gasket and the water pipe with the two nuts and two bolts.

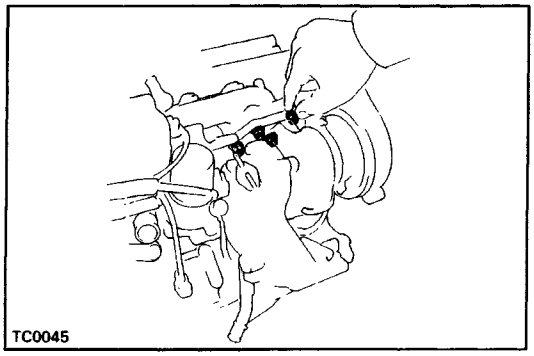
Torque: 11 N–m (120 kgf–cm, 9 ft–lbf)



4. INSTALL TURBO OIL PIPE

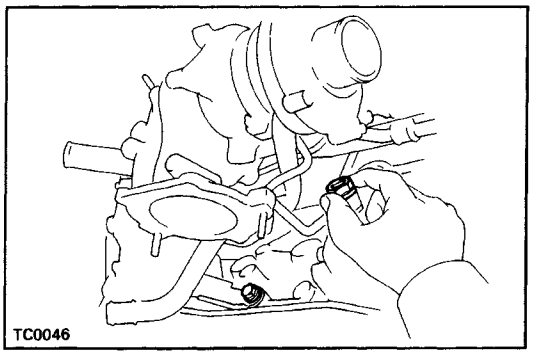
(a) Align the oil holes of a new gasket and the turbocharger housing.

(b) Install the gasket and oil pipe with the two nuts. Do not torque the nuts yet.

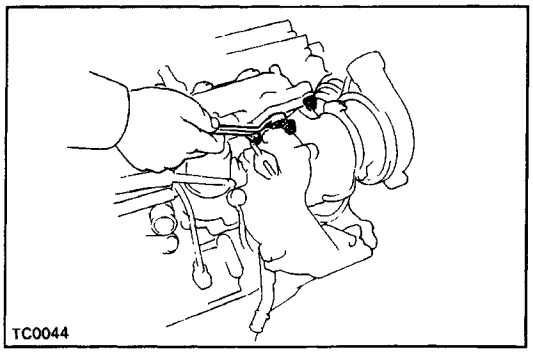


5. INSTALL TURBOCHARGER

(a) Install a new gasket and the turbocharger with the four nuts. Do not torque the nuts.

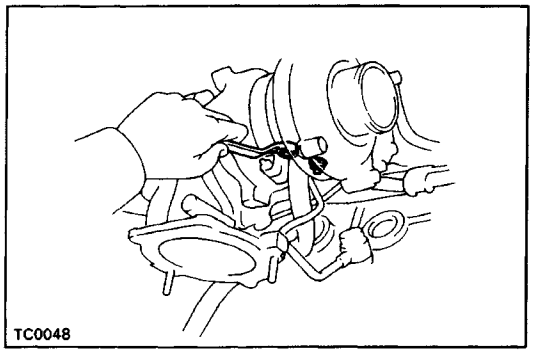


(b) Install the oil pipe with the bolt, two new gaskets and union bolt. Do not torque the bolt and union bolt.



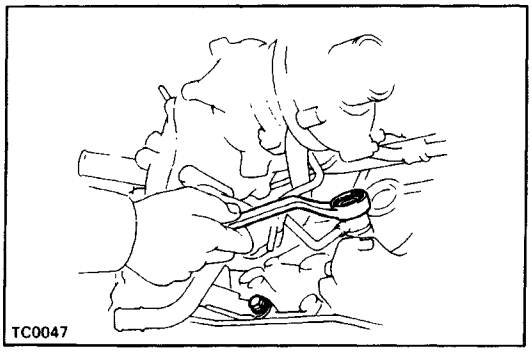
(c) Tighten the four nuts holding the turbocharger to the exhaust manifold.

Torque: 64 N–m (650 kgf–cm, 47 ft–lbf)



(d) Tighten the two nuts holding the oil pipe to the turbocharger.

Torque: 17 N–m (775 kgf–cm, 13 ft–lbf)

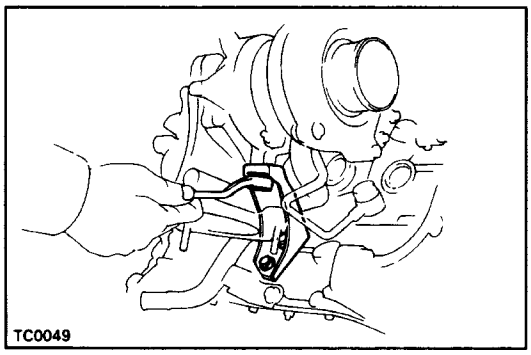


(e) Tighten the union bolt holding the oil pipe to the cylinder block.

Torque: 51 N–m (525 kgf–cm, 38 ft–lbf)

(f) Tighten the bolt holding the bracket of the oil pipe to the cylinder block.

Torque: 43 N–m (440 kgf–cm, 32 ft–lbf)



6. INSTALL TURBOCHARGER STAY

Install the turbocharger stay with the three bolts.

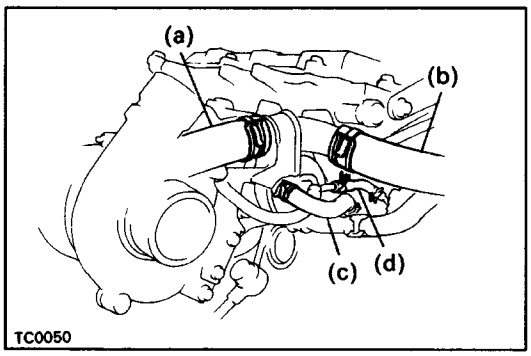
Torque:

To turbocharger

69 N–m (705 kgf–cm, 51 ft–lbf)

To cylinder block

59 N–m (600 kgf–cm, 43 ft–lbf)



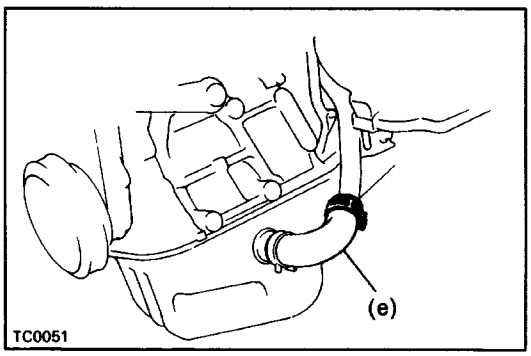
7. CONNECT HOSES

(a) Water hose from radiator

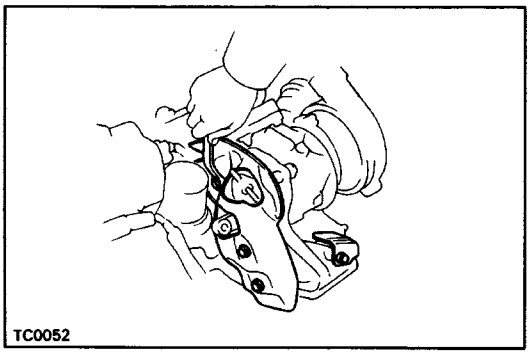
(b) Water hose from water inlet

(c) Water by–pass hose from turbo water pipe

(d) Vacuum hose from actuator



(e) Oil hose from turbo oil pipe

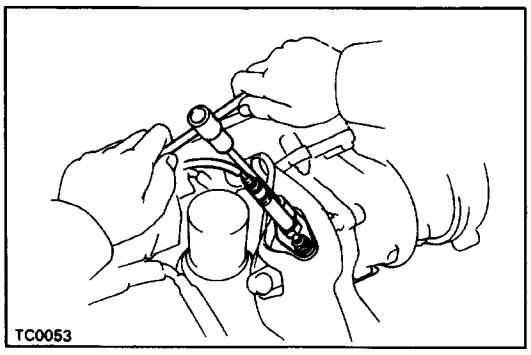


8. INSTALL HEAT INSULATORS OF TURBINE OUTLET ELBOW

(a) Install the RH heat insulator with the three bolts.

(b) Install the LH heat insulator with the two bolts.

(c) Install the oil dipstick gauge.

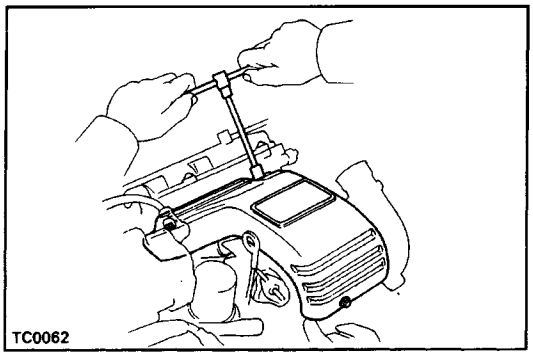


9. INSTALL OXYGEN SENSOR

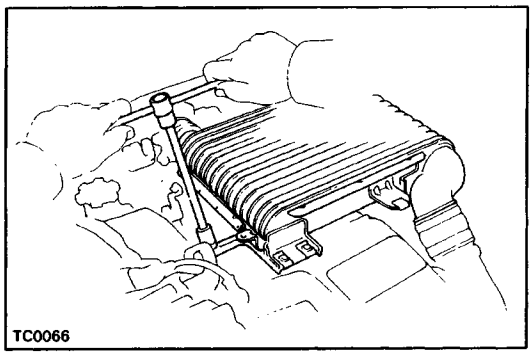
(a) Install a new gasket and the oxygen sensor with the two nuts.

Torque: 44 N–m (450 kgf–cm, 33 ft–lbf)

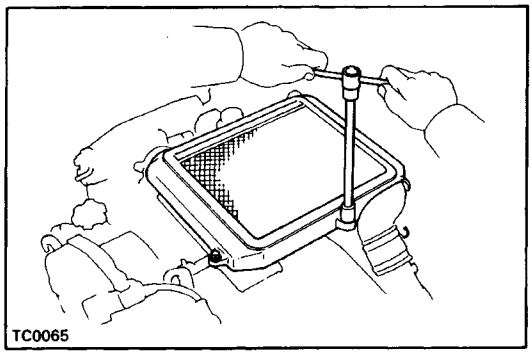
(b) Connect the oxygen sensor connector.



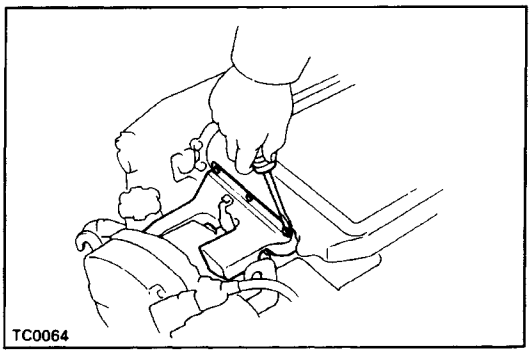
10. INSTALL TURBOCHARGER HEAT INSULATOR
Install the heat insulator with the three bolts.



11. INSTALL CHARGE AIR COOLER
Connect the charge air cooler to the turbocharger and intake air connector, and install the charge air cooler with the two bolts.



12. INSTALL CHARGE AIR COOLER PROTECTOR
Install the protector with the three bolts.



13. INSTALL CHARGE AIR COOLER COOL AIR INLET
Install the cool air inlet with the seven clips.

14. INSTALL THREE–WAY CATALYTIC CONVERTER
(See step 6 on page EM–259)
15. INSTALL A/C COMPRESSOR AND IDLER PULLEY BRACKET (See step 12 on page EM–261)
16. INSTALL GENERATOR (See page CH–23)
17. INSTALL CLUTCH RELEASE CYLINDER (See step 26 on page EM–263)

18. INSTALL FRONT MOUNTING BRACKET AND INSULATOR (See step 7 on page EM–260)
19. INSTALL ENGINE MOUNTING CENTER MEMBER (See steps 9 and 10 on page EM–260)
20. INSTALL FRONT EXHAUST PIPE (See step 18 on page EM–261)
21. INSTALL SUSPENSION LOWER CROSSMEMBER (See step 19 on page EM–262)
22. INSTALL AIR CLEANER CAP (See step 45 on page EM–266)
23. FILL ENGINE WITH COOLANT (See page CO–6)
    Capacity (w/ Heater):
    6.5 liters (6.9 U S qts, 5.7 Imp. qts)
24. CONNECT CABLE TO NEGATIVE TERMINAL OF BATTERY
25. START ENGINE AND CHECK FOR LEAKS
26. CHECK ENGINE OIL LEVEL (See page LU–5)
27. REMOVE ENGINE UNDER COVERS