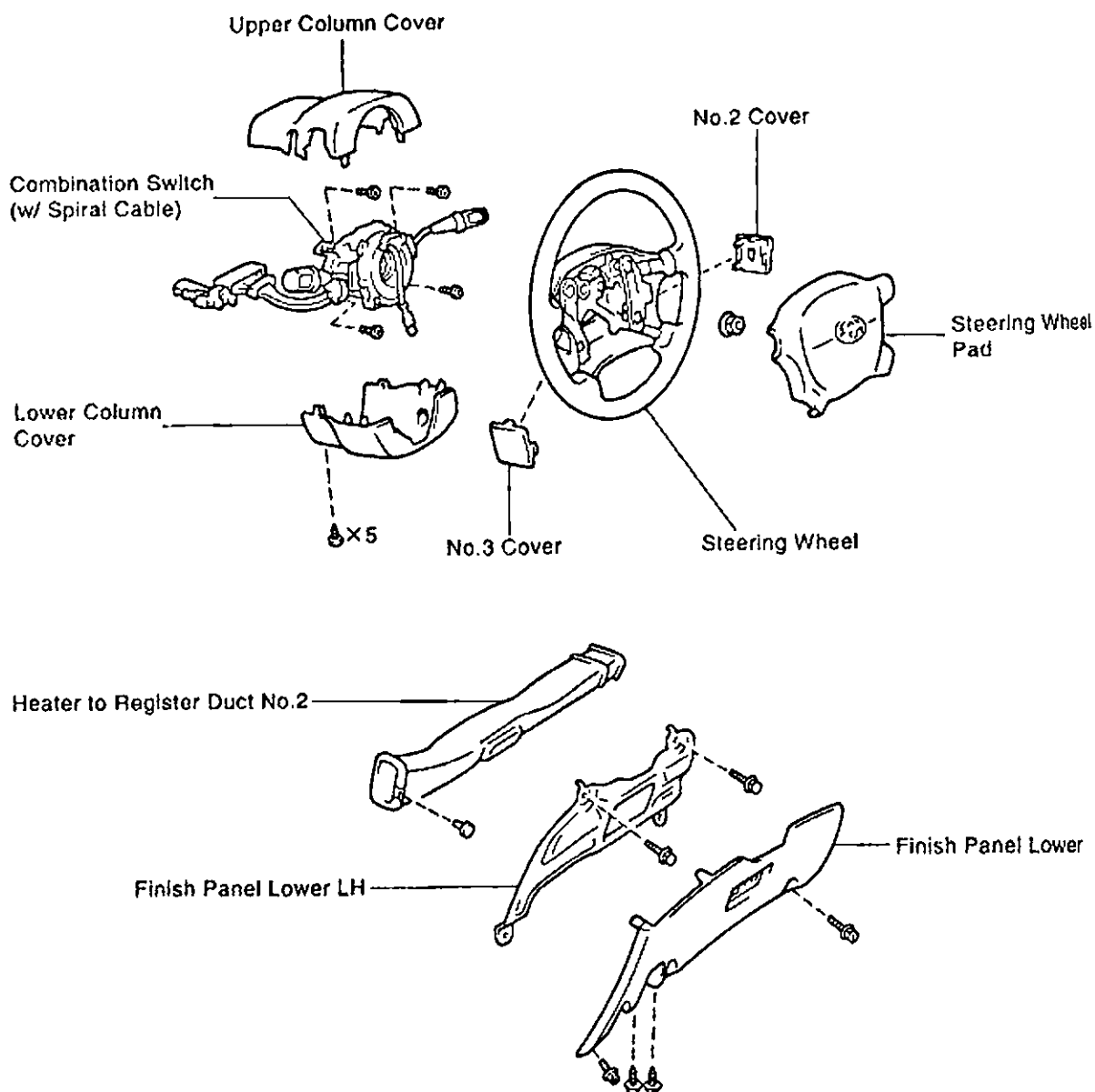
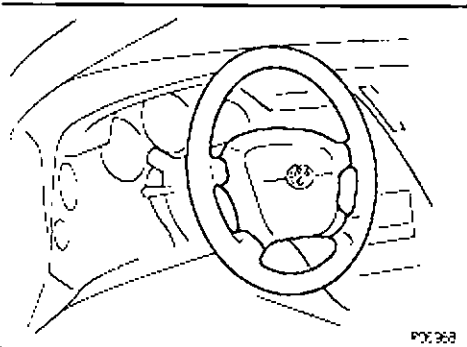


COMPONENTS



STEERING WHEEL PAD AND SPIRAL CABLE REMOVAL AND INSTALLATION

(See SR section)



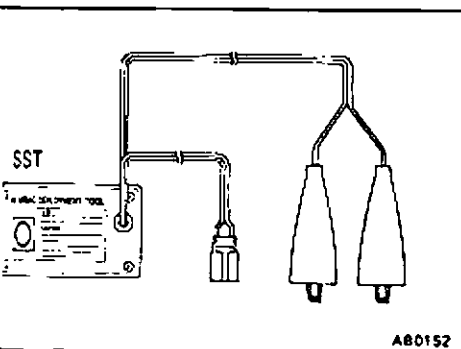
STEERING WHEEL PAD (WITH AIRBAG)^{ASPOP-07} DISPOSAL

When scrapping vehicles equipped with an SRS or disposing of a steering wheel pad (with airbag), always first deploy the airbag in accordance with the procedure described below.

If any abnormality occurs with the airbag deployment, contact the SERVICE DEPT. of TOYOTA MOTOR SALES, U.S.A., INC..

Never dispose of a steering wheel pad which has an undeployed airbag.

When disposing of a steering wheel pad with an airbag deployed in a collision, follow the same procedure given under "When scrapping vehicle, step 4. DISPOSAL OF STEERING WHEEL PAD (WITH AIRBAG)".

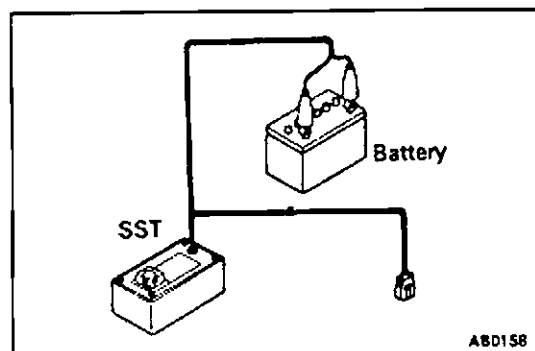


PRECAUTIONS FOR AIRBAG DEPLOYMENT

- The airbag produces a sizeable exploding sound when it deploys, so do the operation out-of-doors and where it will not create a nuisance to nearby residents.
- When deploying the airbag, always use the specified SST: SRS AIRBAG DEPLOYMENT TOOL (SST 09082-00700).

Carry out the operation in a place away from electrical noise.

- When deploying an airbag, do it from at least 10 m (33 ft) away from the steering wheel pad.
- The steering wheel pad is very hot when the airbag is deployed, so leave it alone for at least 30 minutes after deployment.
- Use gloves and safety glasses when handling a steering wheel pad with a deployed airbag.
- Do not apply water, etc. to a steering wheel pad with a deployed airbag.
- Always wash your hands with water after completing the operation.



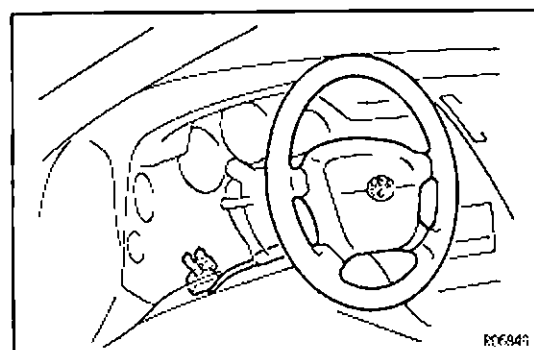
When scrapping vehicle

HINT: Have a battery ready as the power source to deploy the airbag.

1. CONFIRM FUNCTIONING OF SST

(See page RS-19)

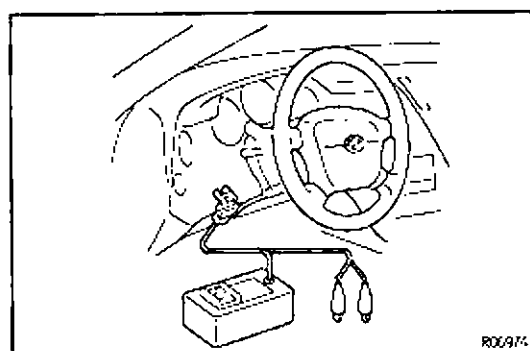
SST 09082-00700



2. INSTALL SST

CAUTION: Check that there is no looseness in the steering wheel and steering wheel pad.

- (a) Disconnect the airbag connector of the spiral cable.



- (b) Connect the SST connector to the airbag connector of the spiral cable.

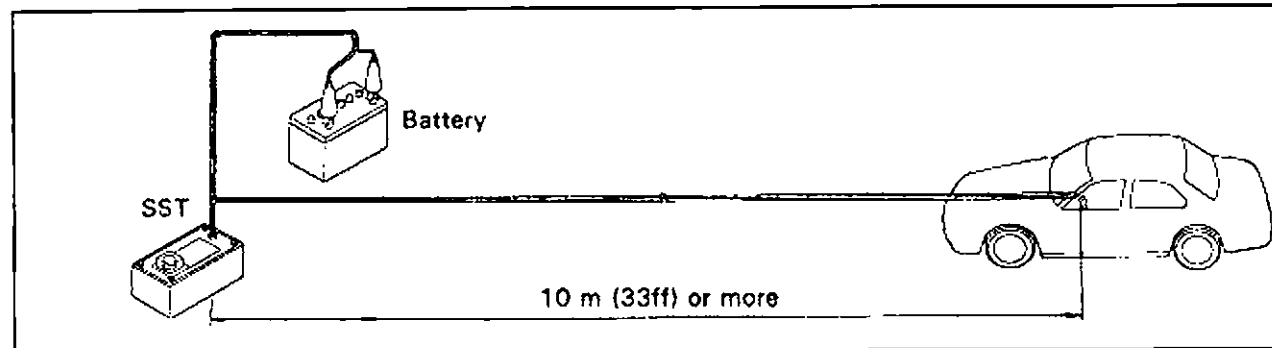
SST 09082-00700

- (c) Move the SST to at least 10 m (33 ft) from the front of the vehicle.

- (d) Close all the doors and windows of the vehicle.

NOTICE: Take care not to damage the SST wire harness.

- (e) Connect the SST red clip to the battery positive terminal and the black clip to the battery negative terminal.

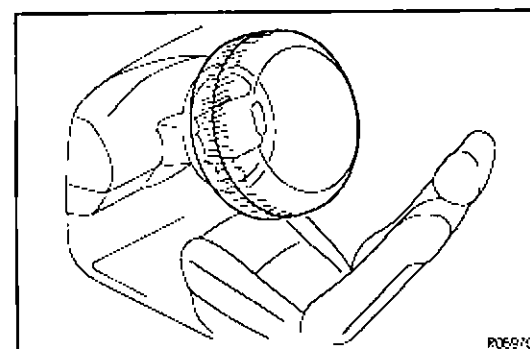


3. DEPLOY AIRBAG

- (a) Confirm that no one is inside the vehicle or within 10 m (33 ft) of the vehicle.

- (b) Press the SST activation switch and deploy the airbag.

HINT: The airbag deploys simultaneously as the SST activation switch lights up.



4. DISPOSAL OF STEERING WHEEL PAD (WITH AIRBAG)

CAUTION:

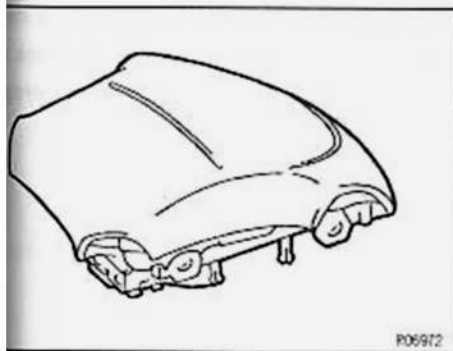
- The steering wheel pad is very hot when the airbag is deployed, so leave it alone for at least 30 minutes after deployment.
 - Use gloves and safety glasses when handling a steering wheel pad with a deployed airbag.
 - Do not apply water, etc. to a steering wheel pad with a deployed airbag.
 - Always wash your hands with water after completing the operation.
- (a) When scrapping a vehicle, deploy the airbag and scrap the vehicle with the steering wheel pad still installed.
- (b) When moving a vehicle for scrapping which has a steering wheel pad with deployed airbag, use gloves and safety glasses.

When disposing of steering wheel pad only

When disposing of the steering wheel pad (with airbag) only, never use the customer's vehicle to deploy the airbag.

Remove the steering wheel pad from the vehicle and be sure to follow the procedure given below when deploying the airbag.

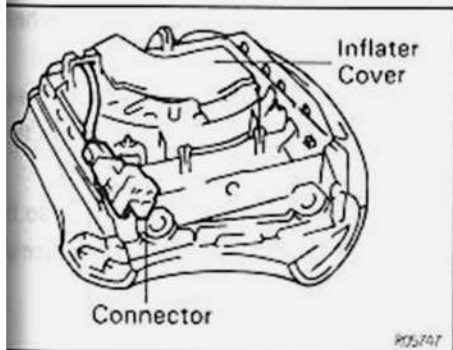
HINT: Have a battery ready as the power source to deploy the airbag.



1. REMOVE STEERING WHEEL PAD (See SR section)

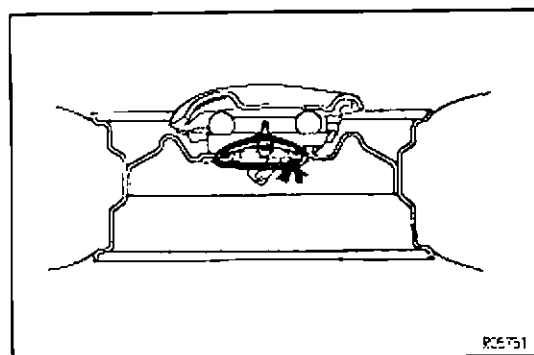
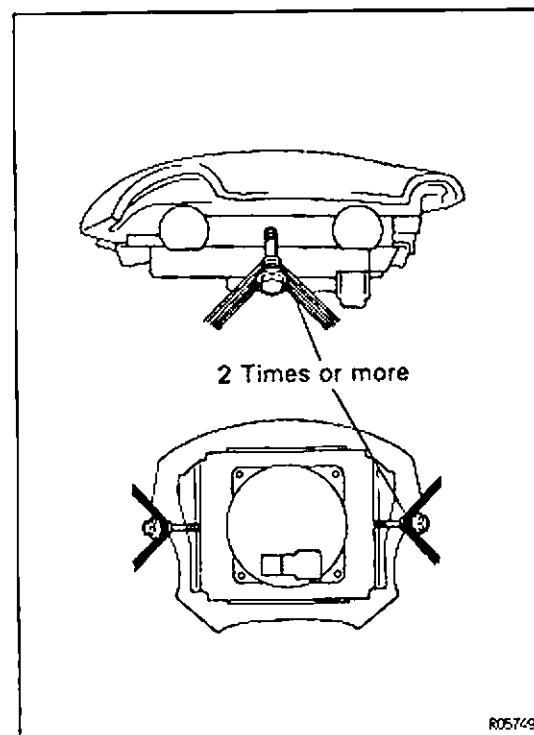
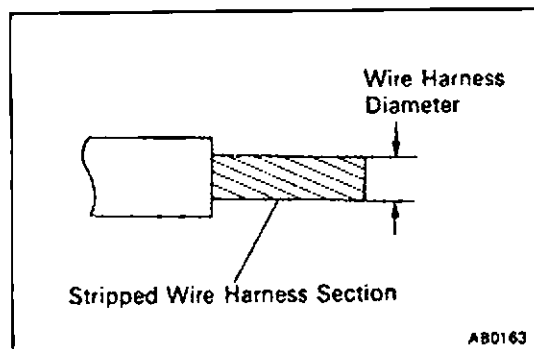
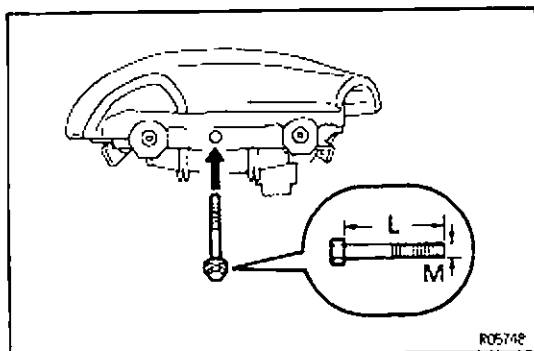
CAUTION:

- When removing the steering wheel pad (with airbag), work must be started after 90 seconds from the time the ignition switch is turned to the "LOCK" position and the negative (–) terminal cable is disconnected from the battery.
- When storing the steering wheel pad, keep the upper surface of the pad facing upward.



2. REMOVE STEERING WHEEL PAD CONNECTOR

Remove the connector on the steering wheel pad rear surface from the inflator cover.



3. FIX STEERING WHEEL PAD TO DISC WHEEL WITH TIRE

- (a) Install the 2 bolts and washers in the 2 bolt holes in the steering wheel pad.

Bolt:

L: 35.0 mm (1.378 in.)

M: 6.0 mm (0.236 in.)

Pitch: 1.0 mm (0.039 in.)

NOTICE:

- Tighten the bolts by hand until the bolts become difficult to turn.
 - Do not tighten the bolts too much.
- (b) Using a service—purpose wire harness for the vehicle, tie down the steering wheel pad to the disc wheel.

Wire harness: Stripped wire harness section

1.25 mm² or more (0.0019 in² or more)

HINT: To calculate the square of the stripped wire harness section—

Square = 3.14 x (Diameter)² divided by 4

CAUTION: If a wire harness which is too thin or some other thing is used to tie down the steering wheel pad, it may be snapped by the shock when the airbag is deployed. This is highly dangerous. Always use a wire harness for vehicle use which is at least 1.25 mm² (0.0019 in²).

- (1) Using 3 wire harnesses, wrap the wire harnesses at least 2 times each around the bolts installed in the left and right sides of the steering wheel pad.

CAUTION:

- Tightly wind the wire harness around the bolts so that there is no slack.
- If there is slackness in the wire harness, the steering wheel pad may come loose due to the shock when the airbag is deployed. This is highly dangerous.

- (2) Face the upper surface of the steering wheel pad upward.

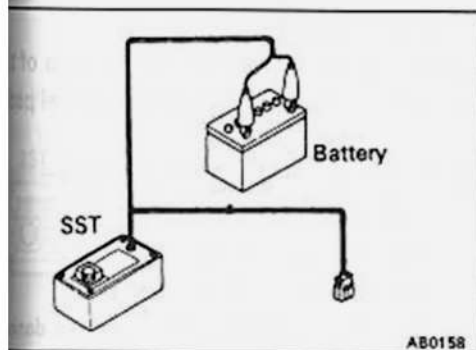
- (3) Separately tie the left and right sides of the steering wheel pad to the disc wheel through the nut holes.

- (c) Position the steering wheel pad connector so that it hangs downward through a hub hole in the disc wheel.

CAUTION:

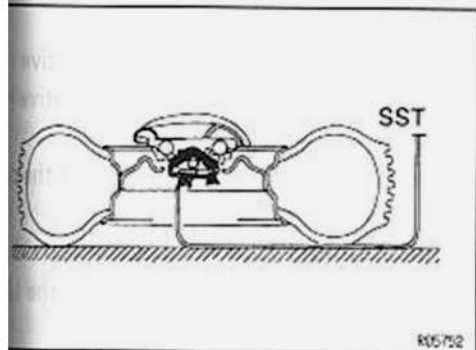
- Make sure that the wire harness is tight. It is very dangerous if looseness in the wire harness results in the steering wheel pad coming free through the shock of the airbag deploying.
- Always tie down the steering wheel pad with the pad side facing upward. It is very dangerous if the steering wheel pad is tied down with the metal surface facing upward as the wire harness will be cut by the shock of the airbag deploying and the steering wheel pad will be thrown into the air.

HINT: The disc wheel will be marked by airbag deployment, so use a redundant disc wheel.

**4. CONFIRM FUNCTIONING OF SST**

(See page RS-19)

SST 09082-00070

**5. INSTALL SST**

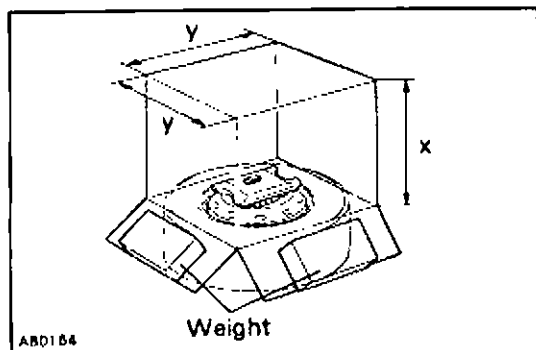
CAUTION: Place the disc wheel on level ground.

- (a) Connect the SST connector to the steering wheel pad connector.

SST 09082-00700

NOTICE: To avoid damaging the SST connector and wire harness, do not lock the secondary lock of the twin lock. Also, provide some slack for the SST wire harness inside the disc wheel.

- (b) Move the SST to at least 10 m (33 ft) away from the steering wheel pad tied down on the disc wheel.



6. COVER STEERING WHEEL PAD WITH CARDBOARD BOX OR TIRES

(Covering Method Using Cardboard Box)

Cover the steering wheel pad with the cardboard box and weigh the cardboard box down in 4 places with at least 196 N (20 kg, 44 lb).

Size of cardboard box:

Must exceed the following dimensions—

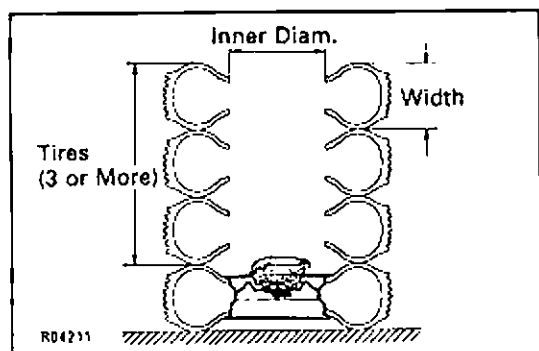
$x = 460 \text{ mm (18.11 in.)}$

When dimension "y" of the cardboard box exceeds the diameter of the disc wheel with tire the steering wheel pad is tied to —

$x = 460 \text{ mm (18.11 in.)} + \text{width of tire}$

$y = 650 \text{ mm (25.59 in.)}$

NOTICE: If a cardboard box smaller than the size specified is used, the cardboard box will be broken by the shock of the airbag deployment.



Covering Method Using Tires:

Place at least 3 tires without disc wheel on top of the disc wheel with tire to which the steering wheel pad is tied.

Tire size: Must exceed the following dimensions—

Width: 185 mm (7.28 in.)

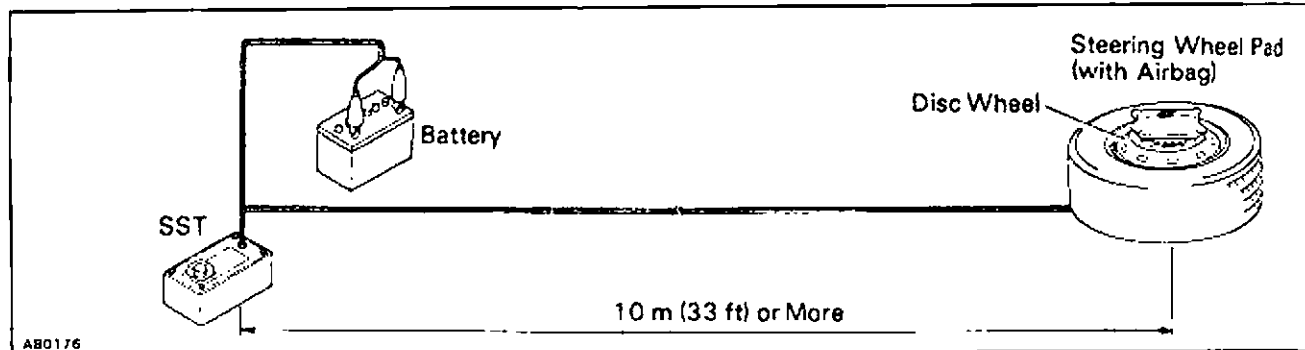
Inner dia.: 360 mm (14.17 in.)

CAUTION: Do not use tires with disc wheels.

NOTICE: The tires may be marked by the airbag deployment, so use redundant tires.

7. AIRBAG DEPLOYMENT

- Connect the SST red clip to the battery positive terminal and the black clip to the battery negative terminal.
- Confirm that no one is within 10 m (33 ft) of the disc wheel the steering wheel pad is tied to.
- Press the SST activation switch and deploy the airbag. **HINT:** The airbag deploys simultaneously as the LED of the SST activation switch lights up.



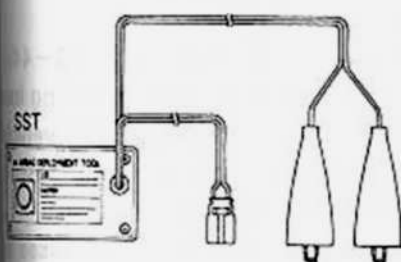


AB0166

8. DISPOSAL OF STEERING WHEEL PAD (WITH AIRBAG)

CAUTION:

- The steering wheel pad is very hot when the airbag is deployed, so leave it alone for at least 30 minutes after deployment.
 - Use gloves and safety glasses when handling a steering wheel pad with a deployed airbag.
 - Do not apply water, etc. to a steering wheel pad with a deployed airbag.
 - Always wash your hands with water after completing the operation.
- (a) Remove the steering wheel pad from the disc wheel.
- (b) Place the steering wheel pad in a vinyl bag, tie the end tightly and dispose of it the same way as other general parts.

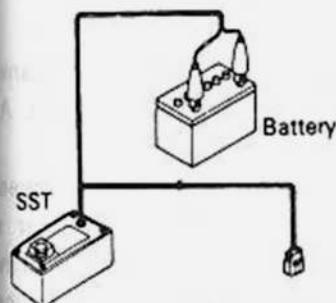


AB0152

CONFIRM FUNCTIONING OF SST

RSC14-03

When deploying the airbag, always use the specified SST: SRS AIRBAG DEPLOYMENT TOOL.
SST 09082-00700



AB0158

1. CONNECT SST TO BATTERY

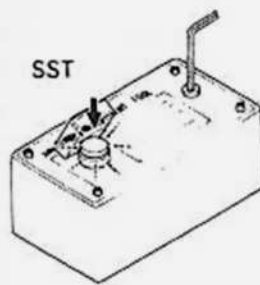
Connect the red clip of the SST to the battery positive (+) terminal and the black clip to the battery negative (-) terminal.

HINT: Do not connect the yellow connector which connects with the supplemental restraint system.

2. CONFIRM FUNCTIONING OF SST

Press the SST activation switch, and confirm the LED of the SST activation switch lights up.

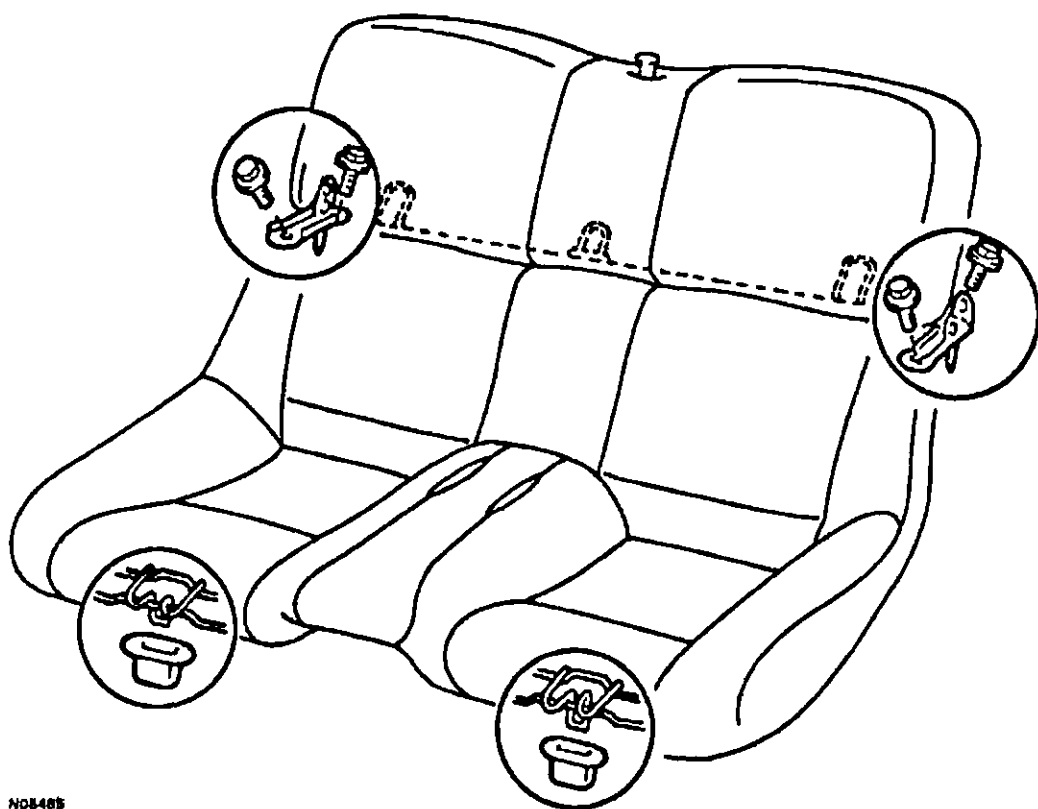
CAUTION: If the LED lights up when the activation switch is not being pressed, SST malfunction is probable, so definitely do not use the SST.



AB0171

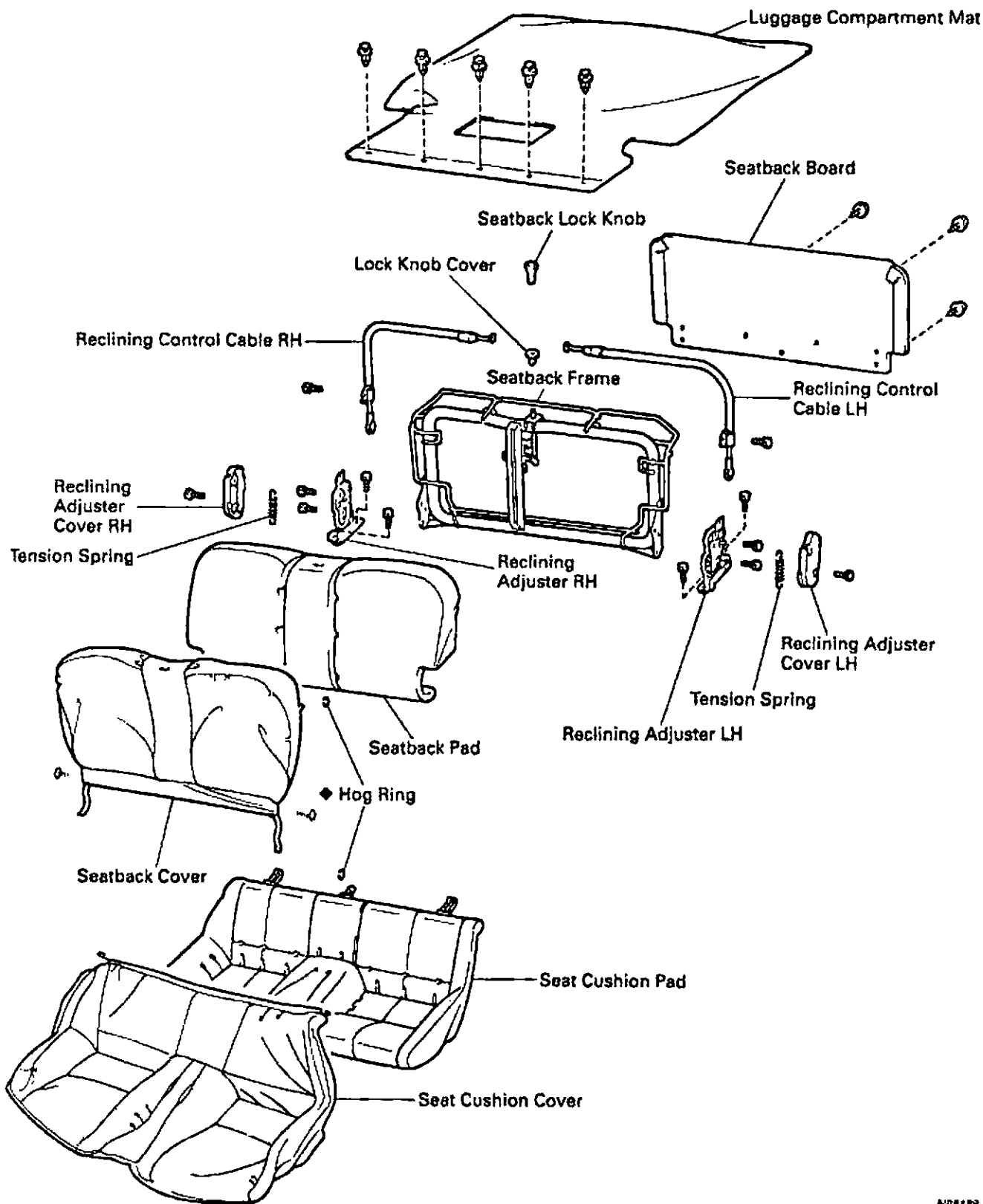
REAR SEAT COMPONENTS

1070-4



NOB405

COMPONENTS (Cont'd)

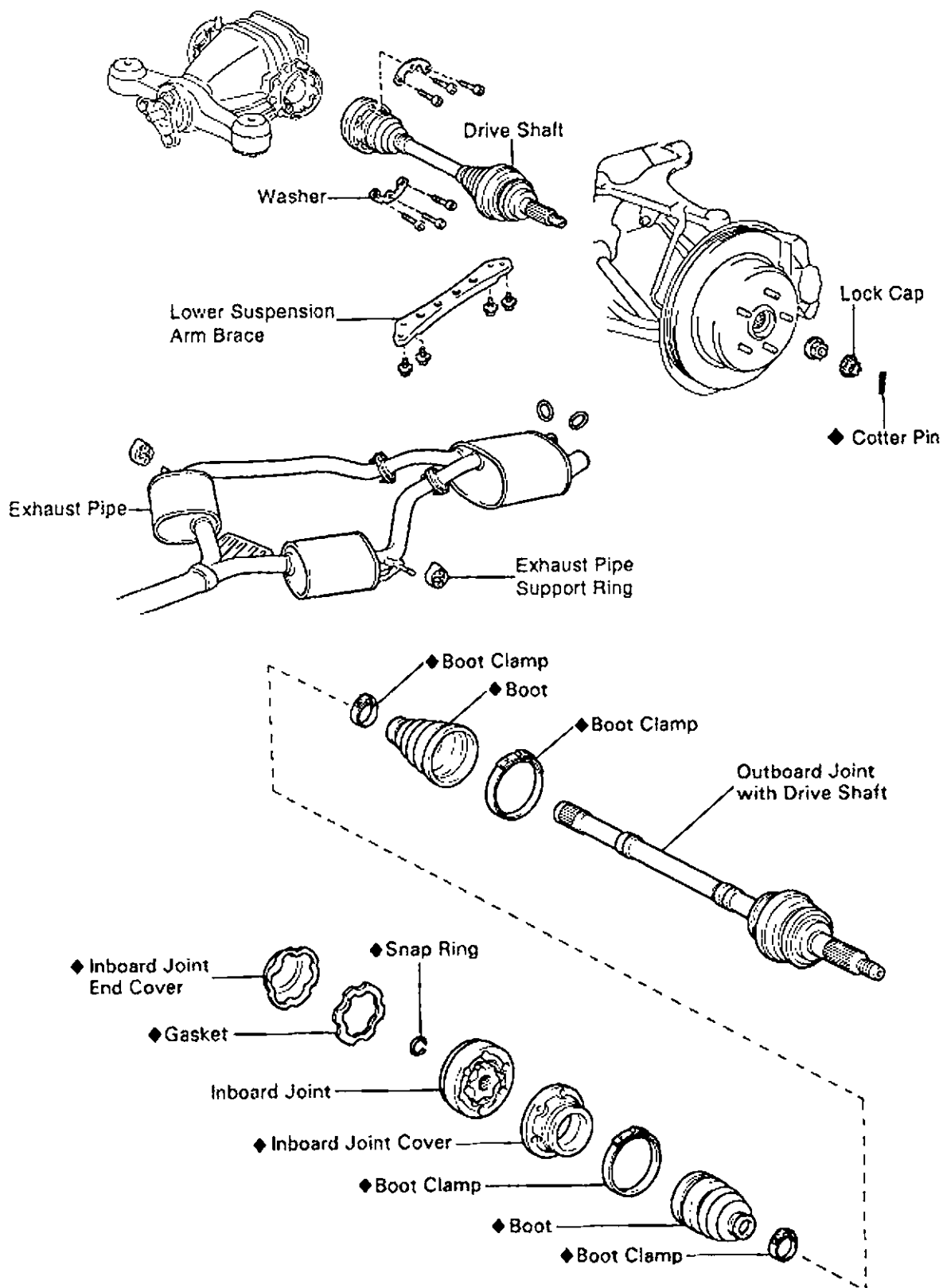


◆ Non-reusable part

N08488

111685

REAR DRIVE SHAFT COMPONENTS



◆ Non-reusable part

REAR DRIVE SHAFT REMOVAL

Installation is in the reverse order of removal.

INSTALLATION HINT: After installation, check ABS speed sensor signal.

(See page BR-62)

1. REMOVE REAR WHEEL

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

2. DISCONNECT EXHAUST PIPE MOUNTING

- Remove the 2 exhaust pipe support rings.
- Support the exhaust pipe securely.
- Remove the 2 exhaust pipe support O-rings.

3. REMOVE COTTER PIN, LOCK CAP AND LOCK NUT

- Remove the cotter pin and lock cap.
 - While depressing the brake pedal, remove the nut.
- Torque: 289 N·m (2,950 kgf·cm, 213 ft·lbf)

4. REMOVE LOWER SUSPENSION ARM BRACE

Remove the 4 bolts and lower suspension arm brace.

Torque: 18 N·m (180 kgf·cm, 13 ft·lbf)

5. REMOVE REAR DRIVE SHAFT

- Place matchmarks on the drive shaft and side gear shaft.

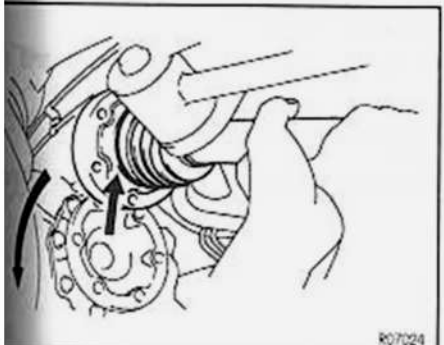
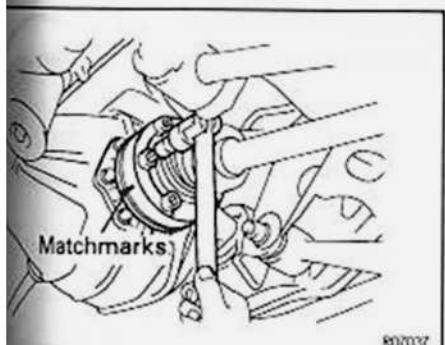
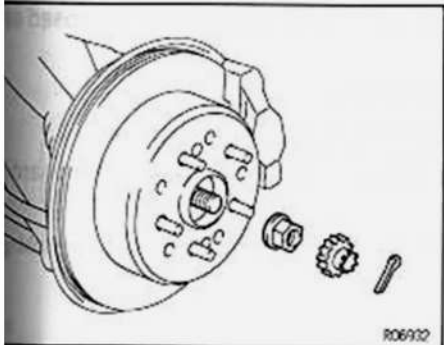
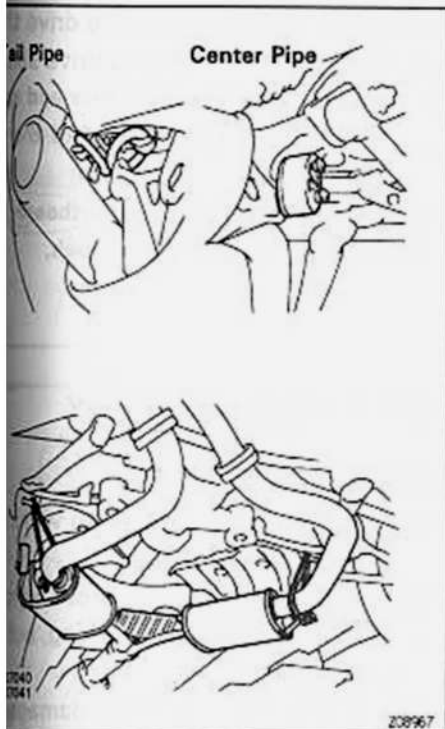
NOTICE: Do not use a punch to mark the matchmarks. Use paint, etc.

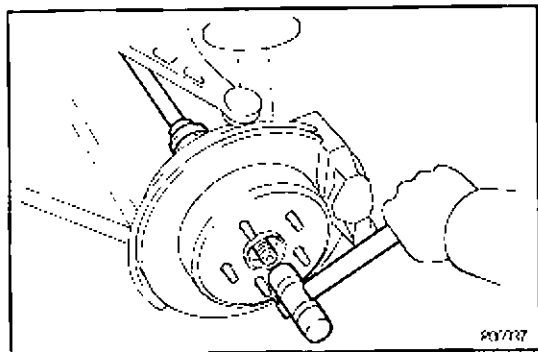
- Using a 10 mm hexagon wrench, remove the 6 hexagon bolts and 2 washers while depressing the brake pedal.

Torque: 83 N·m (850 kgf·cm, 61 ft·lbf)

INSTALLATION HINT: Apply a light coat of engine oil on the threads of the bolts.

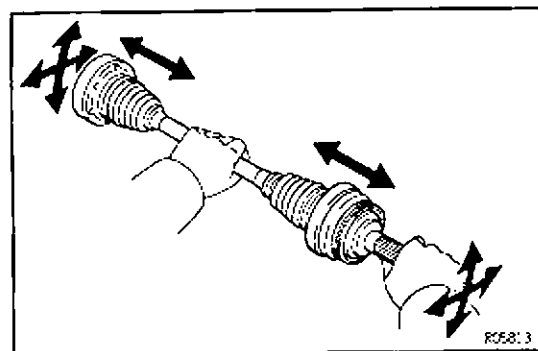
- Disconnect the inboard joint from the differential side gear shaft.
- Hold the inboard joint side of the drive shaft so that the outboard joint side does not bend too much.





- (a) Using a hammer, lightly tap the end of the drive shaft to disengage the axle hub and remove the drive shaft. **NOTICE:** Be careful not to damage the boots and speed sensor rotor of the drive shaft, and oil seal of the axle hub.

INSTALLATION NOTICE: Make sure the outboard joint side of the drive shaft does not bend too much.



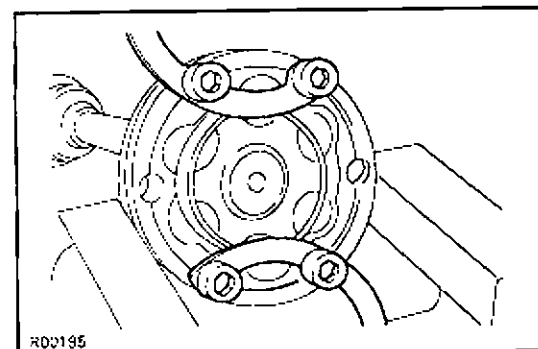
REAR DRIVE SHAFT DISASSEMBLY

1. CHECK DRIVE SHAFT

- (a) Check that operation of the joint is smooth within the sliding region in the axial direction.
HINT: If a large angle is used for the cross-groove type joint, the joint will feel like it is catching, but this does not indicate an abnormality.
- (b) Check that the boots are not cracked, damaged or leaking.
- (c) Check that there are no scratches on the speed sensor rotor.

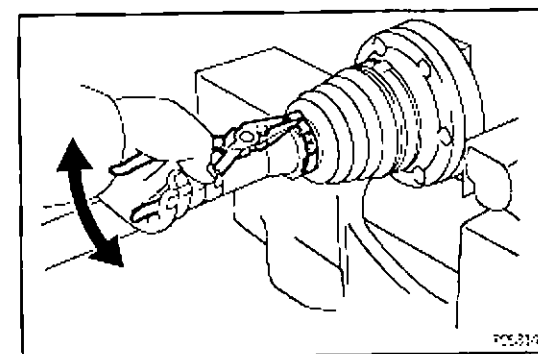
2. REMOVE END COVER

- (a) Using a screwdriver, remove the end cover.
- (b) Use bolts, nuts and washers to keep the inboard joint together.
NOTICE: Tighten the bolt by hand to avoid scratching the flange surface.



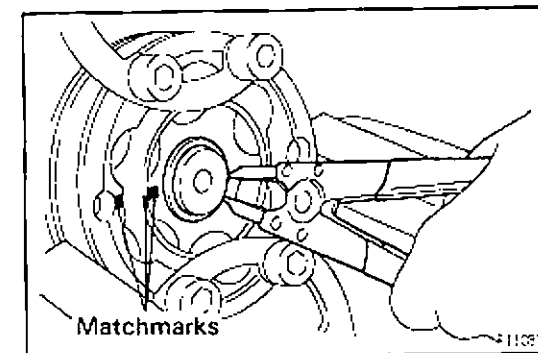
3. REMOVE BOOT CLAMPS

Using a side cutter or pliers, remove the clamps.

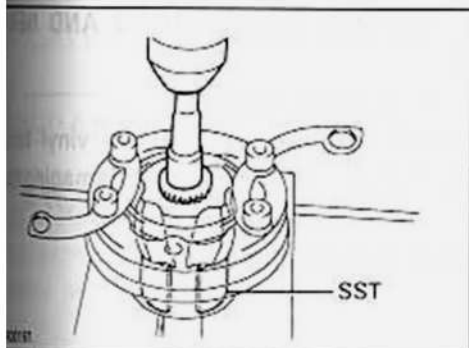


4. REMOVE INBOARD JOINT

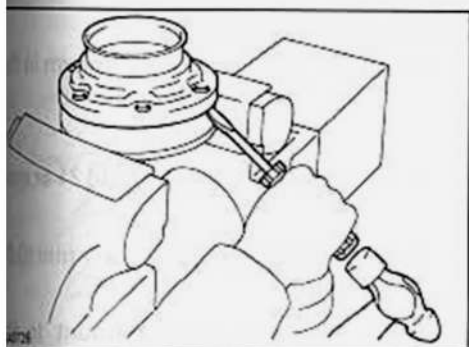
- (a) Place matchmarks on the inboard joint and drive shaft.
NOTICE: Do not punch the marks.
- (b) Using a snap ring expander, remove the snap ring.



Matchmarks



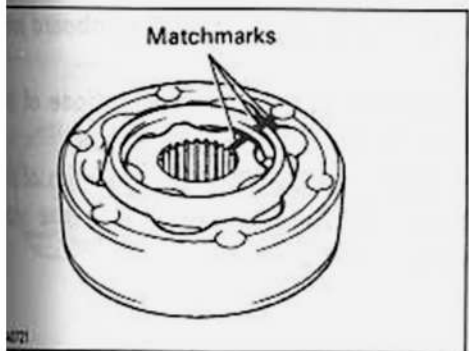
- (c) Using SST, an extension bar and a press, press out the inboard joint from the drive shaft.
SST 09726-12022 (09726-01030)



- (d) Mount the inboard joint in a soft jaw vise.
(e) Using a screwdriver and hammer, tap out the inboard joint cover from the inboard joint.
NOTICE: Make sure the cage and inner race are not positioned too much to one side of the outer race.

5. REMOVE BOOTS FROM DRIVE SHAFT

Remove the inboard joint boot and outboard boot.



REAR DRIVE SHAFT ASSEMBLY

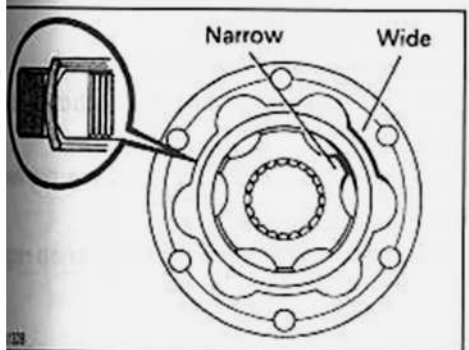
SA128-01

1. ASSEMBLE INBOARD JOINT

If the joint has come apart, reassemble it in the following order.

- (a) Align the matchmarks placed before removal.

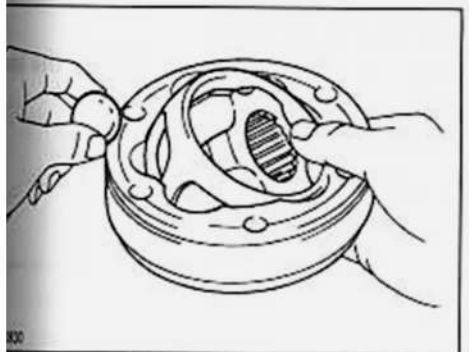
SA

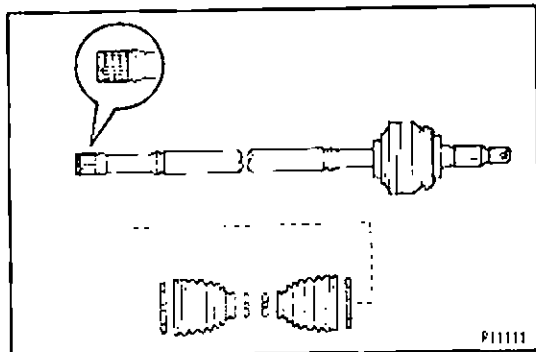


HINT: When the matchmarks have disappeared, do the following procedure.

- (1) Install the inner race to the cage so that the indented bevelled part of the inner race is on the opposite side to the bevelled top of the cage.
 - (2) Install the outer race so that the indented side of the outer race is facing the same side as the bevelled surface of the cage.
 - (3) Match the narrow projections of the inner race with the wide projections of the outer race.
- (b) Tilt the cage and inner race to the side and insert the balls one by one.

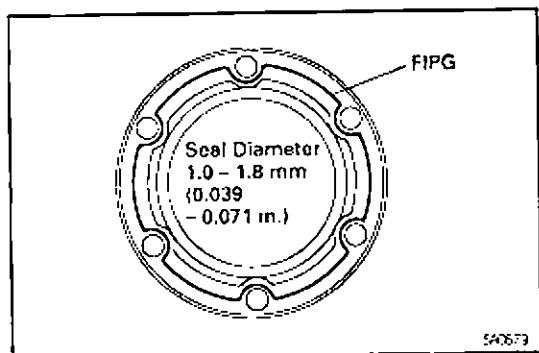
NOTICE: When the cage and inner race are tilted over, support the joint with your hand to prevent the balls from falling out.





2. TEMPORARILY INSTALL NEW BOOTS AND NEW BOOT CLAMPS

- (a) Place 4 new boot clamps to boots.
HINT: Before installing the boots, wrap vinyl tape around the spline of the shaft to prevent damaging the boots.
- (b) Install 2 boots to the drive shaft.



3. INSTALL INBOARD JOINT COVER

- (a) Apply FIPG to the inboard joint cover as shown in illustration.

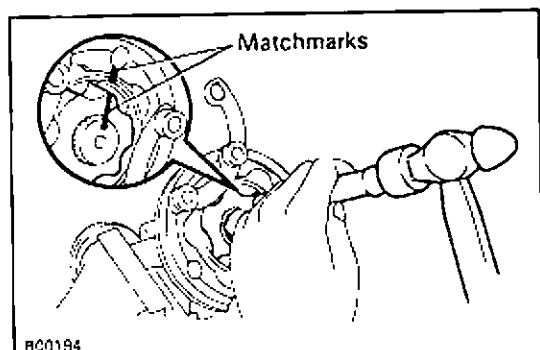
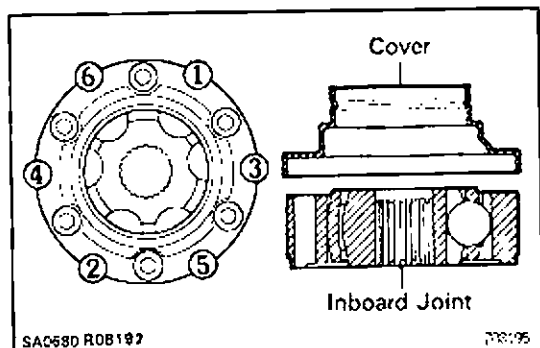
FIPG:

Part No.08826 - 00801, THREE BOND 1121 or equivalent

- Install a nozzle that has been cut to a 1 mm (0.039 in.) opening.

HINT: Avoid applying an excessive amount to the surface.

- (b) Remove grease from the surface of the inboard joint facing the cover.
- (c) Align the bolt holes of the cover with those of the inboard joint, then insert the hexagon bolts.
- (d) Use a plastic-faced hammer to tap the rim of the inboard joint cover into place. Do this in the area shown, and repeat several times.



4. INSTALL INBOARD JOINT

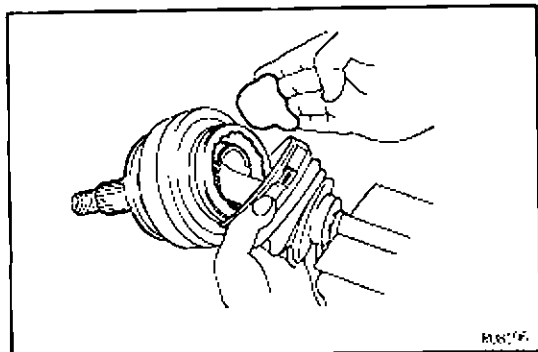
- (a) Align the matchmarks placed before removal.
- (b) Using a brass bar and hammer, tap the inboard joint onto the drive shaft.
NOTICE: Check that the brass bar is touching the inner race, and not the cage.
- (c) Using a snap ring expander, install a new snap ring.

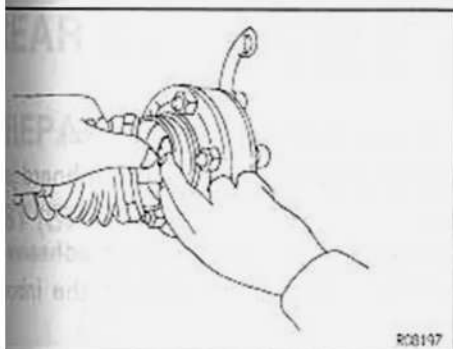
5. ASSEMBLE BOOTS TO JOINTS

Before assembling the boot, pack with only the specified amount of grease that was wiped off.

Grease capacity (Outboard joint):

100 - 105 g (0.22 - 0.23 lb, 3.5 - 3.7 oz.)





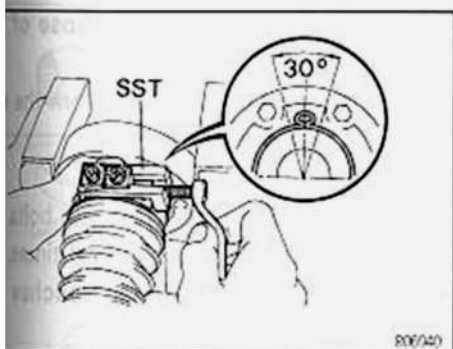
Grease capacity (Inboard joint):

100 – 105 g (0.22 – 0.23 lb, 3.5 – 3.7 oz.)

HINT: Use the grease supplied in the boot kit.

NOTICE:

- Keep grease off the joint connection groove of the boot.
- Pack with grease all over the ball contact surface inside the joint.



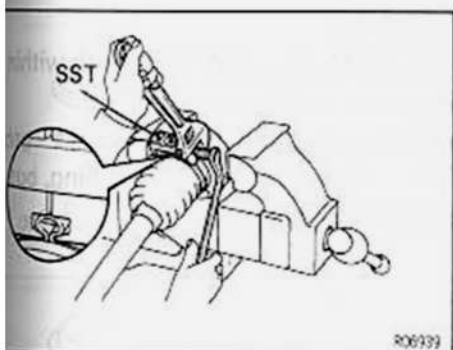
6. INSTALL NEW BOOT CLAMPS TO BOTH BOOTS

- (a) Position the clamp onto the boot.

HINT: Pinch the inboard side of the boot clamp, as shown in the illustration.

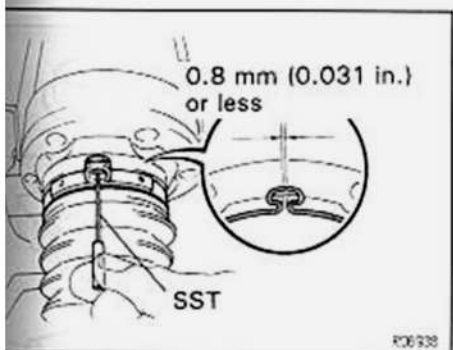
- (b) Place SST onto the clamp.

SST 09521 – 24010



- (c) Tighten SST so that the clamp is pinched.

NOTICE: Do not overtighten the SST.

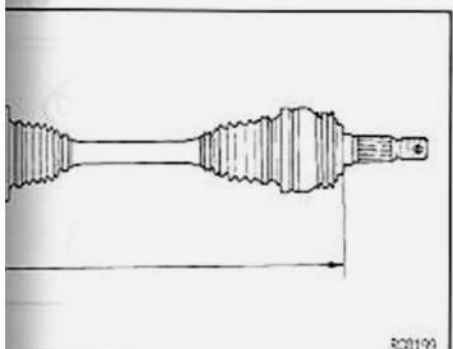


- (d) Using SST, adjust the clearance of the clamp.

SST 09240 – 00020

Clearance:

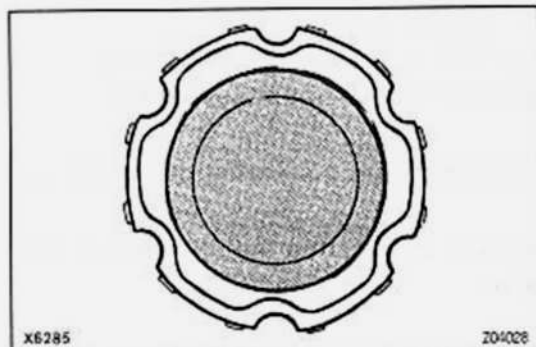
0.8 mm (0.031 in.) or less



- (e) The drive shaft is designed to move ± 20 mm from the normal position.

Drive shaft standard length

	2JZ-GTE (M/T)	Others
RH	598.5 mm (23.602 in.)	598.5 mm (23.602 in.)
LH	547.5 mm (21.555 in.)	553.5 mm (21.791 in.)



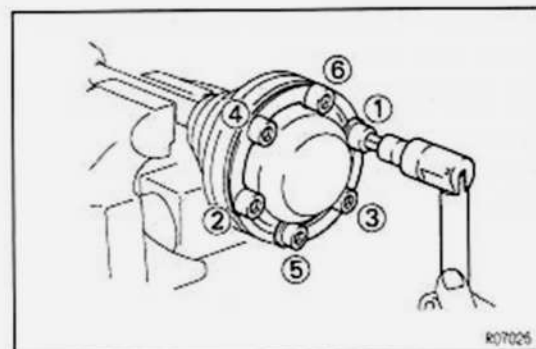
7. INSTALL NEW END COVER

- (a) Pack grease into the end cover.

Grease capacity:

50 — 55 g (0.11 — 0.12 lb, 1.8 — 1.9 oz.)

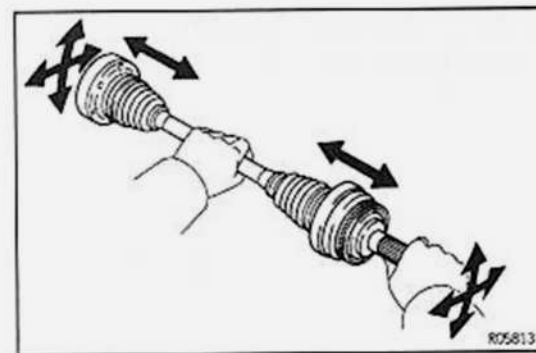
- (b) Remove grease from the surface of the inboard joint facing the cover.
- (c) Glue on a new gasket, with the side with adhesive it facing toward the outer race side of the inboard joint.
- (d) Align the bolt holes of the cover with those of inboard joint.
- (e) Install the 6 hexagon bolts and washer from the cover side.
- (f) Install the 6 nuts to the boot side.
- (g) Using a 10 mm hexagon wrench, tighten the bolts, this in the order shown, and repeat several times.
- (h) Check that the claw of the end cover touches inboard joint.



8. CHECK DRIVE SHAFT

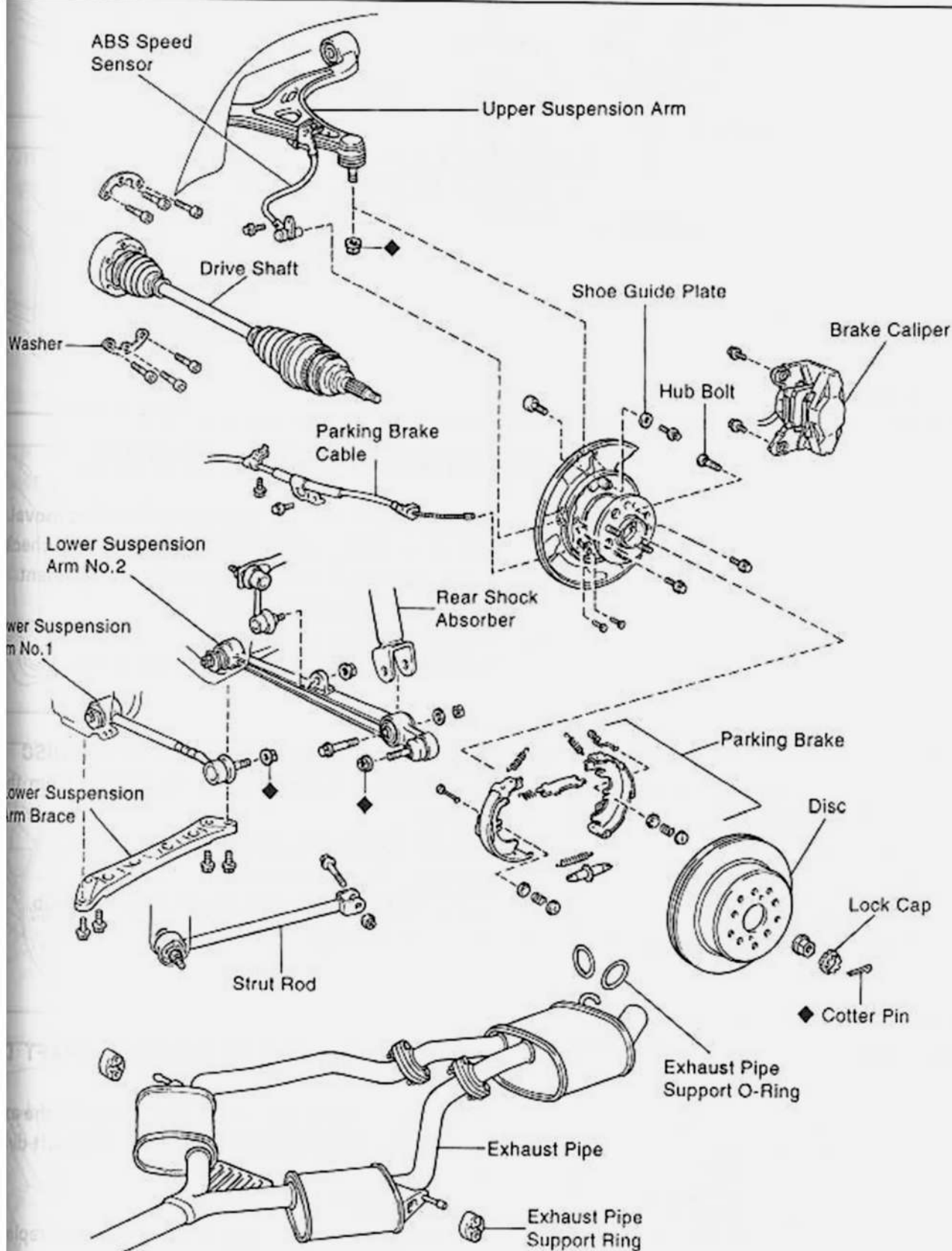
Check that operation of the joint is smooth within sliding region in the axial direction.

HINT: If a large angle is used for the cross-groove type joint, the joint will feel like it is catching, but does not indicate an abnormality.

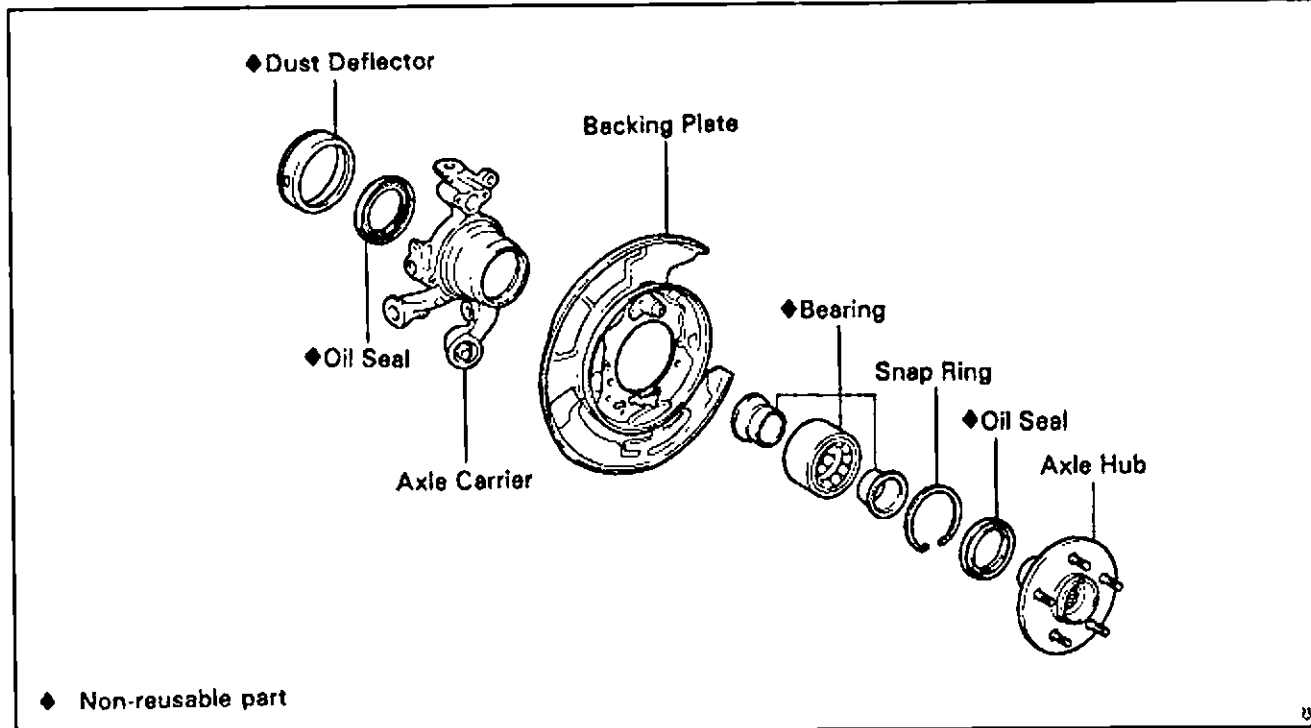


REAR AXLE HUB COMPONENTS

840VU-08



SA

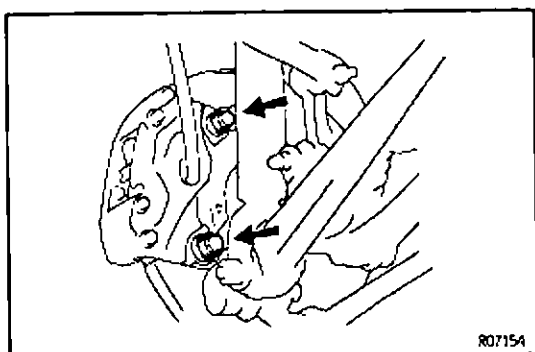


REAR AXLE CARRIER REMOVAL

Installation is in the reverse order of removal.
INSTALLATION HINT: After installation, check the speed sensor signal and rear wheel alignment.
 (See page BR-64 and SA-9)

1. REMOVE REAR WHEEL

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

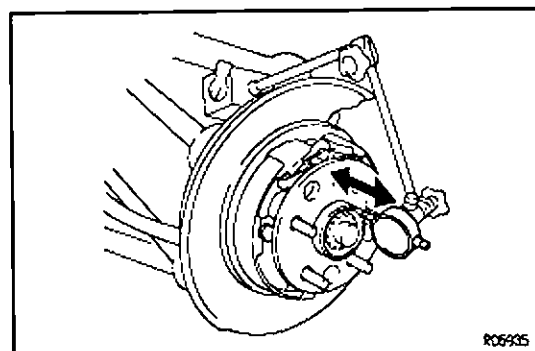


2. REMOVE REAR BRAKE CALIPER AND DISC

- (a) Remove the 2 bolts and brake caliper from the axle hub.

Torque: 104 N·m (1,065 kgf·cm, 77 ft·lbf)

- (b) Support the brake caliper securely.
 (c) Place matchmarks on the disc and axle hub.
 (d) Remove the disc.

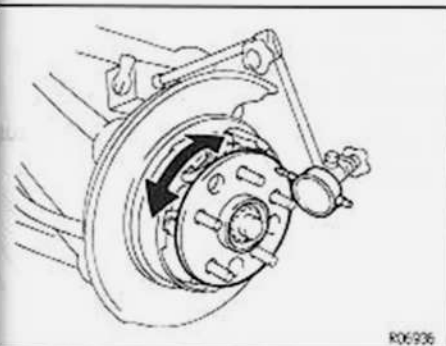


3. CHECK BACKLASH IN BEARING SHAFT DIRECTION

Place the dial indicator near the center of the axle hub and check the backlash in the bearing shaft direction.
Maximum:

0.05 mm (0.0020 in.)

If greater than the specified maximum, replace the bearing.



R06936

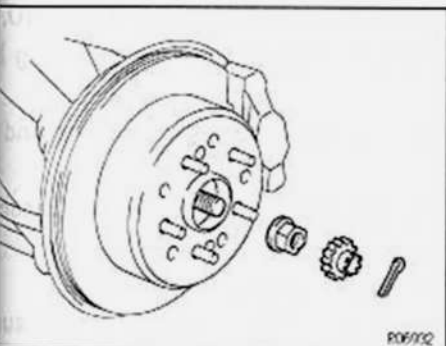
4. CHECK AXLE HUB DEVIATION

Using a dial indicator, check the deviation at the surface of the axle hub outside the hub bolt.

Maximum:

0.05 mm (0.0020 in.)

If greater than the specified maximum, replace the axle hub.



R06932

5. REMOVE DRIVE SHAFT LOCK NUT

- Install the disc and brake caliper.
- Remove the cotter pin and lock cap.
- While depressing the brake pedal, remove the nut.
Torque: 289 N·m (2,950 kgf·cm, 213 ft·lbf)
- Remove the brake caliper and disc.

6. REMOVE DRIVE SHAFT

(See page SA-46)

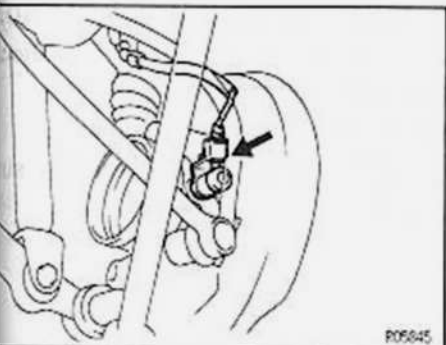
7. REMOVE PARKING BRAKE SHOE

(See page BR-35)

8. DISCONNECT ABS SPEED SENSOR

Remove the bolt and disconnect the ABS speed sensor.

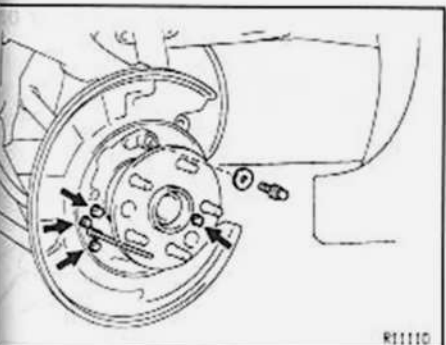
Torque: 8 N·m (80 kgf·cm, 69 in·lbf)



R05645

9. DISCONNECT PARKING BRAKE CABLE

- Remove the 2 parking brake cable set bolts.
Torque: 8 N·m (80 kgf·cm, 69 in·lbf)
- Remove the 2 backing plate set bolts.
Torque: 26 N·m (260 kgf·cm, 19 ft·lbf)
- Remove the bolt and shoe guide plate.
Torque: 18 N·m (185 kgf·cm, 13 ft·lbf)

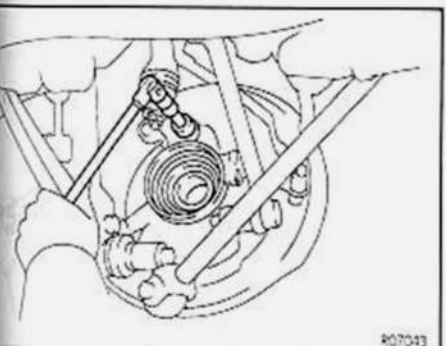


R11110

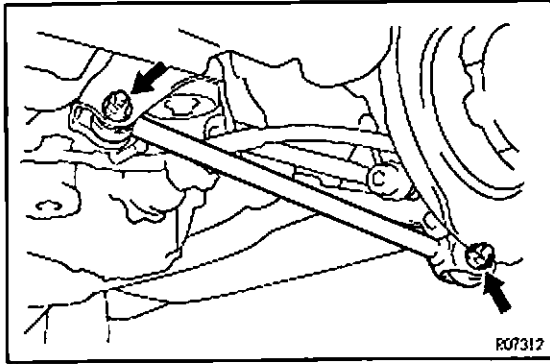
- Using a 14 mm hexagon wrench, remove the hexagon bolt.

Torque: 180 N·m (1,825 kgf·cm, 132 ft·lbf)

- Slide the backing plate to the outside and disconnect the parking brake cable.



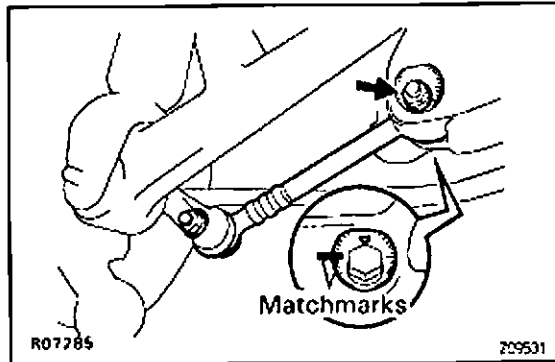
R07043

**10. REMOVE STRUT ROD**

Remove the 2 bolts and nuts.

Torque: 184 N·m (1,880 kgf·cm, 136 ft·lbf)

INSTALLATION HINT: After stabilizing the suspension, torque the bolts.

**11. DISCONNECT LOWER SUSPENSION ARM NO.1**

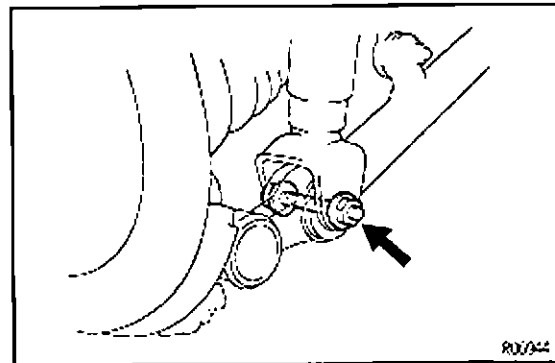
(a) Remove the bolt and disconnect the parking brake cable bracket.

(b) Place matchmarks on the adjusting cam and frame.

(c) Remove the nut, adjusting cam and disconnect lower suspension arm No.1.

Torque: 184 N·m (1,880 kgf·cm, 136 ft·lbf)

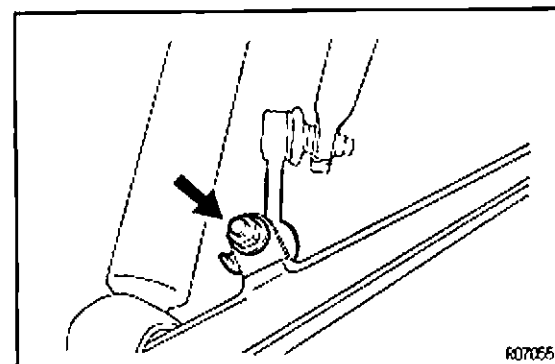
INSTALLATION HINT: After stabilizing the suspension, torque the nut.

**12. DISCONNECT LOWER SUSPENSION ARM NO.2**

(a) Remove the bolt, nut and disconnect the shock absorber from the lower suspension arm No.2.

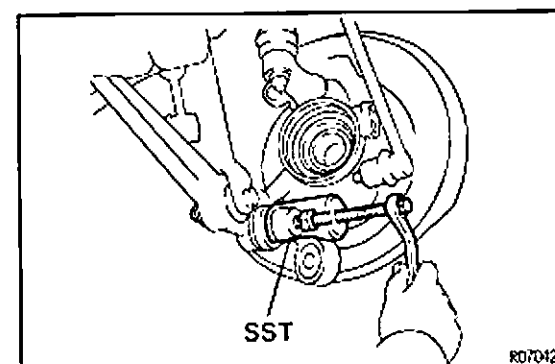
Torque: 137 N·m (1,400 kgf·cm, 101 ft·lbf)

INSTALLATION HINT: After stabilizing the suspension, torque the nut.



(b) Remove the nut and disconnect the stabilizer bar from the lower suspension arm No.2.

Torque: 74 N·m (750 kgf·cm, 54 ft·lbf)



(c) Loosen the nut.

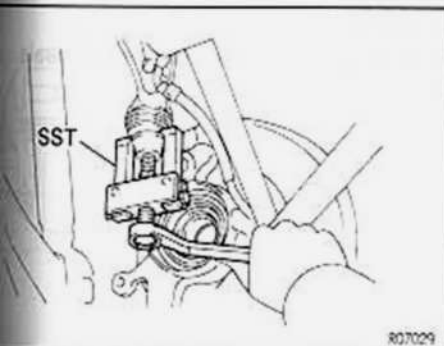
Torque: 150 N·m (1,525 kgf·cm, 110 ft·lbf)

(d) Using SST, disconnect the lower suspension arm from the axle carrier.

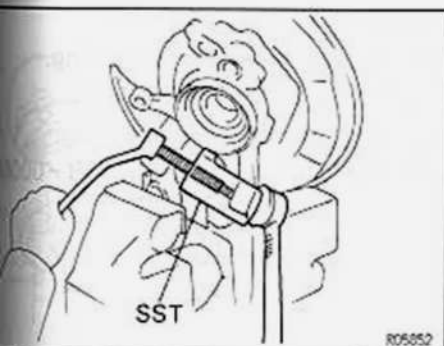
SST 09610-20012

NOTICE: Be careful not to damage the ball joint bolt.

(e) Remove the nut.

**13. REMOVE REAR AXLE CARRIER**

- (a) Remove the nut.
Torque: 108 N·m (1,100 kgf·cm, 80 ft·lbf)
- (b) Using SST, disconnect the upper suspension arm from the axle carrier.
SST 09628-62011
NOTICE: Be careful not to damage the dust boot.
- (c) Remove the rear axle carrier.

**14. REMOVE REAR SUSPENSION ARM NO.1**

- (a) Remove the nut.
Torque: 59 N·m (600 kgf·cm, 43 ft·lbf)
- (b) Using SST, disconnect the lower suspension arm No.1 from the axle carrier.
SST 09610-20012
NOTICE: Be careful not to damage the dust boot.
INSTALLATION HINT: Before install the suspension arm No.1, install the axle carrier to the vehicle.

AXLE HUB DISASSEMBLY

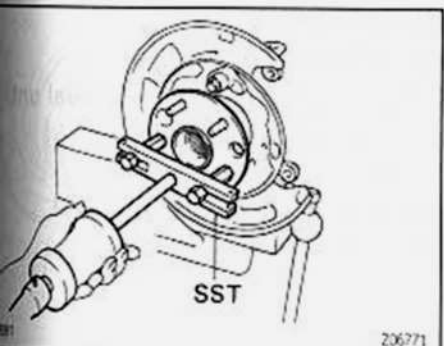
SA12M-01

1. REMOVE DUST DEFLECTOR

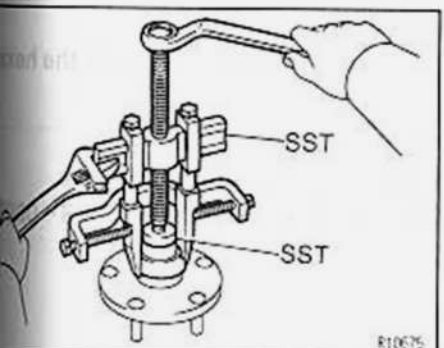
Using a screwdriver, remove the dust deflector.

2. REMOVE AXLE HUB FROM AXLE CARRIER

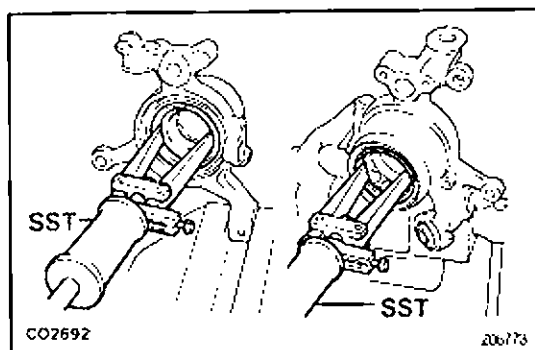
- (a) Mount the axle carrier in a vise.
HINT: Use a set of soft jaws in the vise to protect the axle carrier.
NOTICE: Do not tighten the vise too tight.



- (b) Using SST, remove the axle hub.
SST 09520-00031
- (c) Remove the backing plate.

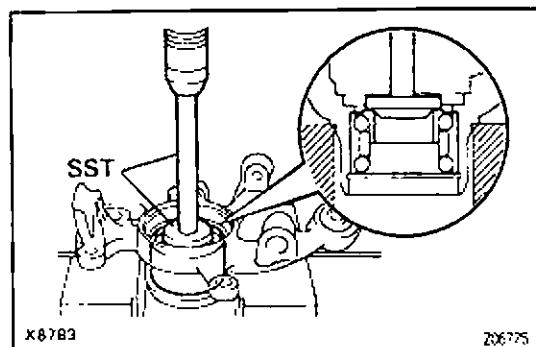


- (d) Using SST, remove the outside inner race from the axle hub.
SST 09608-12010 (09608-00080),
09950-40010



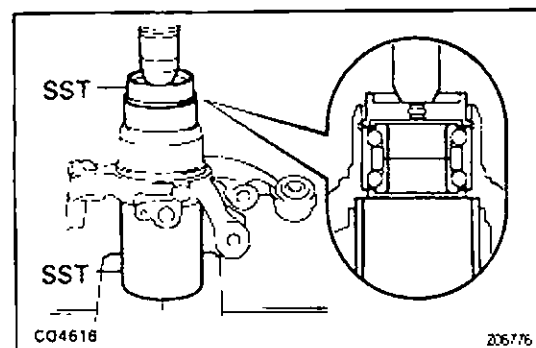
3. REMOVE OIL SEALS

Using SST, remove the inner and outer oil seals.
SST 09308-00010



4. REMOVE BEARING

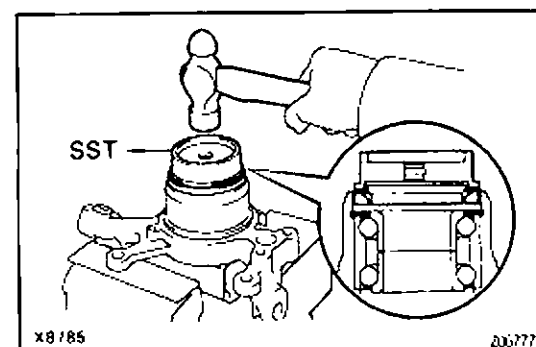
- Using snap ring pliers, remove the snap ring.
- Place the inner race (inside) to the bearing.
- Using SST and a press, remove the bearing.
SST 09608-12010 (09608-00020, 09608-00030)



AXLE HUB ASSEMBLY

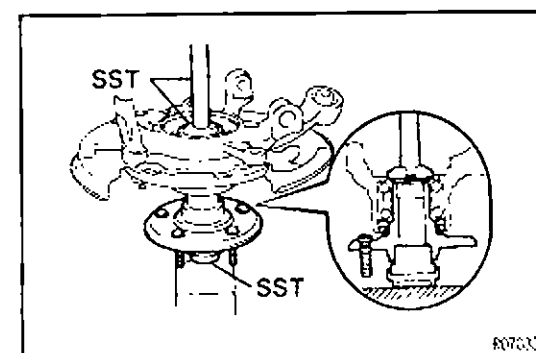
1. INSTALL NEW BEARING

- Using SST, install the bearing to the axle carrier.
SST 09527-17011, 09608-32010
NOTICE: If the inner races come loose from the bearing outer race, be sure to install them on the same side before.
- Using snap ring pliers, install the snap ring.



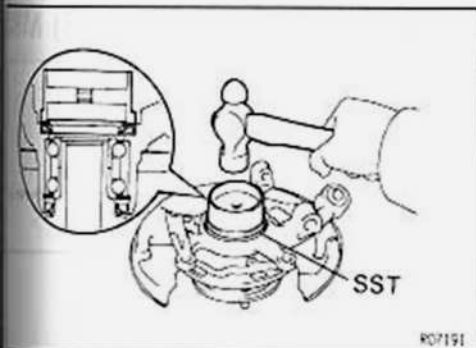
2. INSTALL OIL SEAL (Outer)

- Place the inner race (outside).
- Using SST and hammer, tap in a new oil seal until flush with end surface of the carrier.
SST 09608-32010
NOTICE: Be careful not to damage the oil seal.
- Coat MP grease to the oil seal lip.



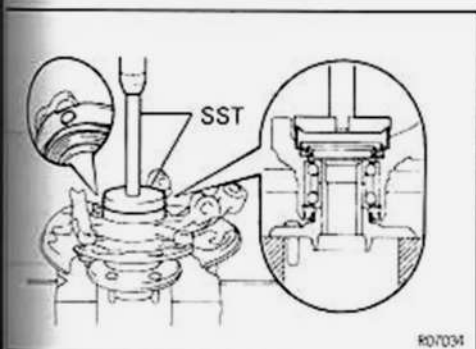
3. INSTALL AXLE HUB

- Temporarily install the backing plate with the hex bolt.
- Place the inner race (inside).
- Using SST and a press, install the axle hub.
SST 09608-12010 (09608-00020, 09608-00030)
09608-32010



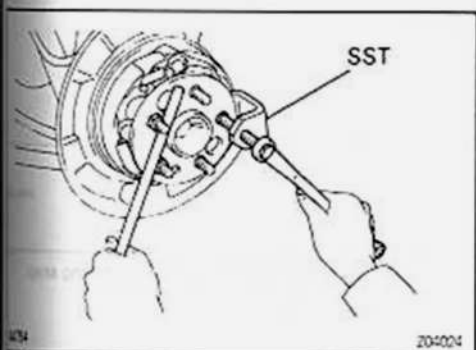
4. INSTALL OIL SEAL (Inner)

- (a) Using SST and a hammer, install a new oil seal.
SST 09223-15020
NOTICE: Be careful not to damage the oil seal.
- (b) Coat MP grease to the oil seal lip.



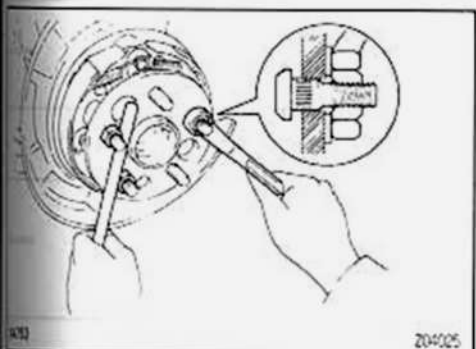
5. INSTALL DUST DEFLECTOR

Using SST and a press, install a new dust deflector.
SST 09608-35014 (09608-06020, 09608-06160)
HINT: Align the holes for the ABS speed sensor in the dust deflector and carrier.



HUB BOLT REPLACEMENT

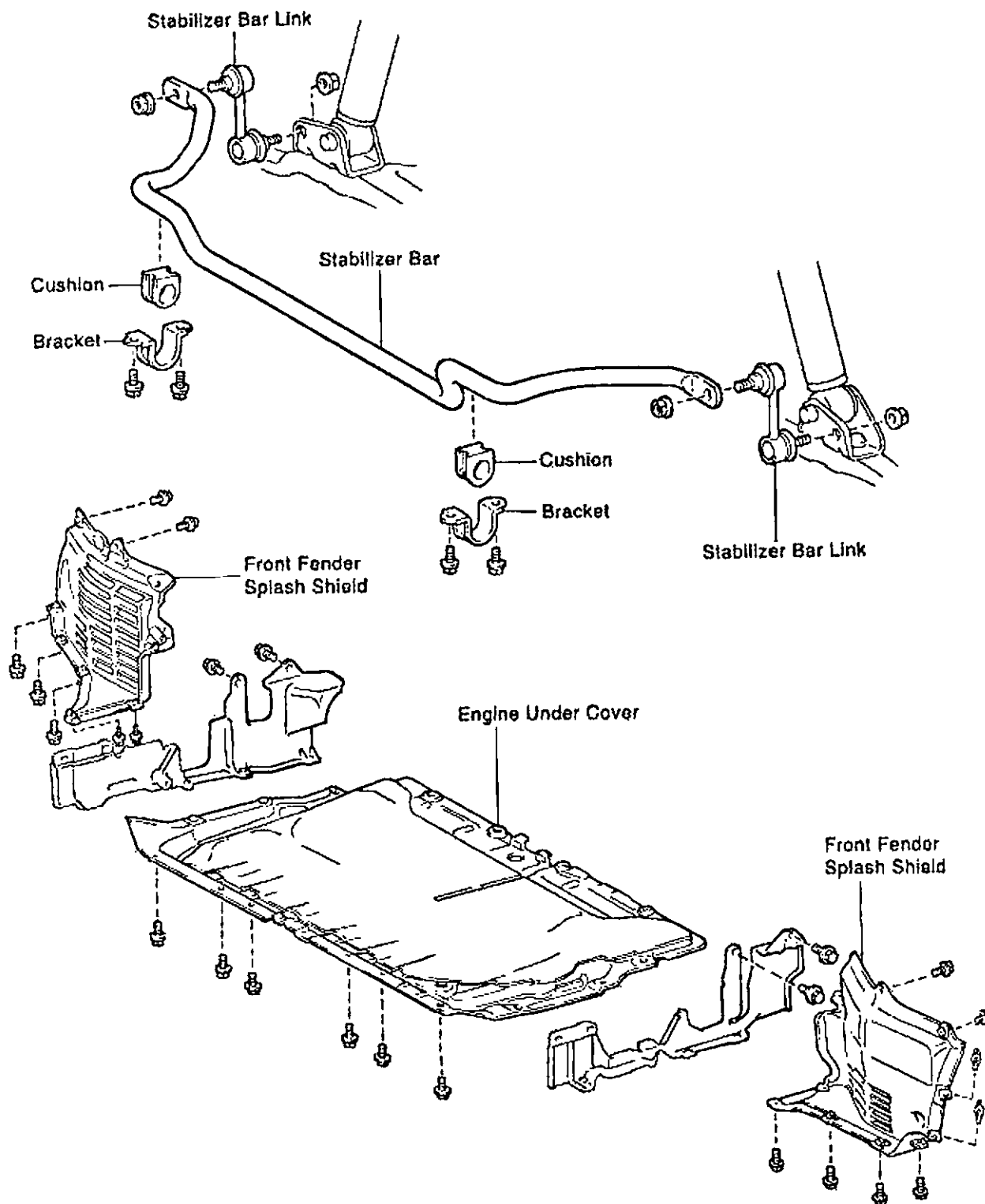
1. REMOVE REAR WHEEL
2. REMOVE REAR BRAKE CALIPER AND DISC
(See page SA-38)
3. REMOVE HUB BOLT
Using SST, remove the hub bolt.
SST 09628-10011



4. INSTALL HUB BOLT

- (a) Install washer and nut to a new hub bolt, as shown in the illustration.
- (b) Turn the wheel nut to pull the hub bolt through until the underside of the hub bolt head touches the axle hub.
5. INSTALL REAR BRAKE DISC AND BRAKE CALIPER
(See page SA-35)
6. INSTALL REAR WHEEL
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

STABILIZER BAR COMPONENTS

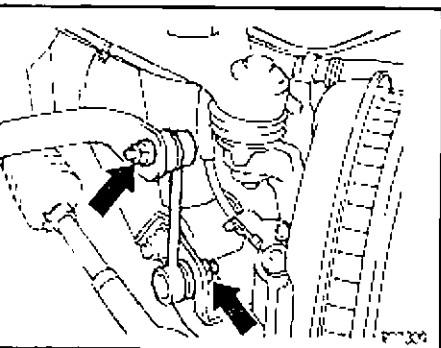


STABILIZER BAR AND LINK REMOVAL

Installation is in the reverse order of removal.

1. REMOVE FRONT WHEELS

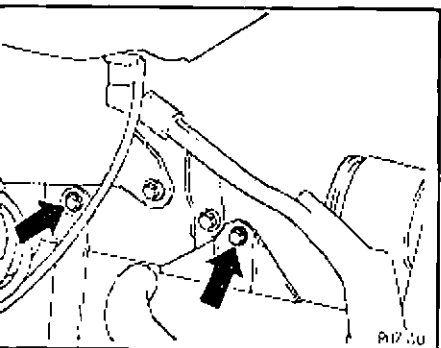
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

2. REMOVE ENGINE UNDER COVER**3. REMOVE BOTH STABILIZER BAR LINKS**

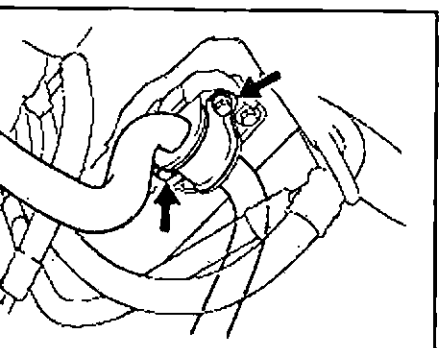
Remove the nuts and stabilizer bar links from the stabilizer bar and the lower suspension arm.

Torque: 74 N·m (750 kgf·cm, 54 ft·lbf)

HINT: If the ball joint stud turns together with the nut, use a hexagon wrench to hold the stud.

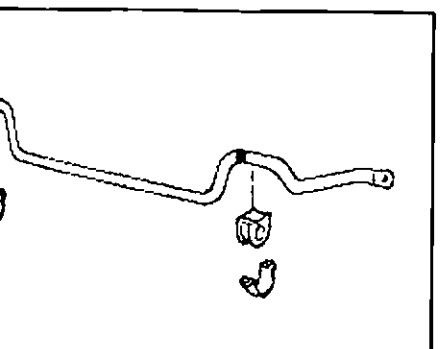
**4. REMOVE STABILIZER BAR**

(a) Remove the left and right apron seal set bolts.



(b) Remove the 4 bracket bolts and the stabilizer bar with the cushions and brackets.

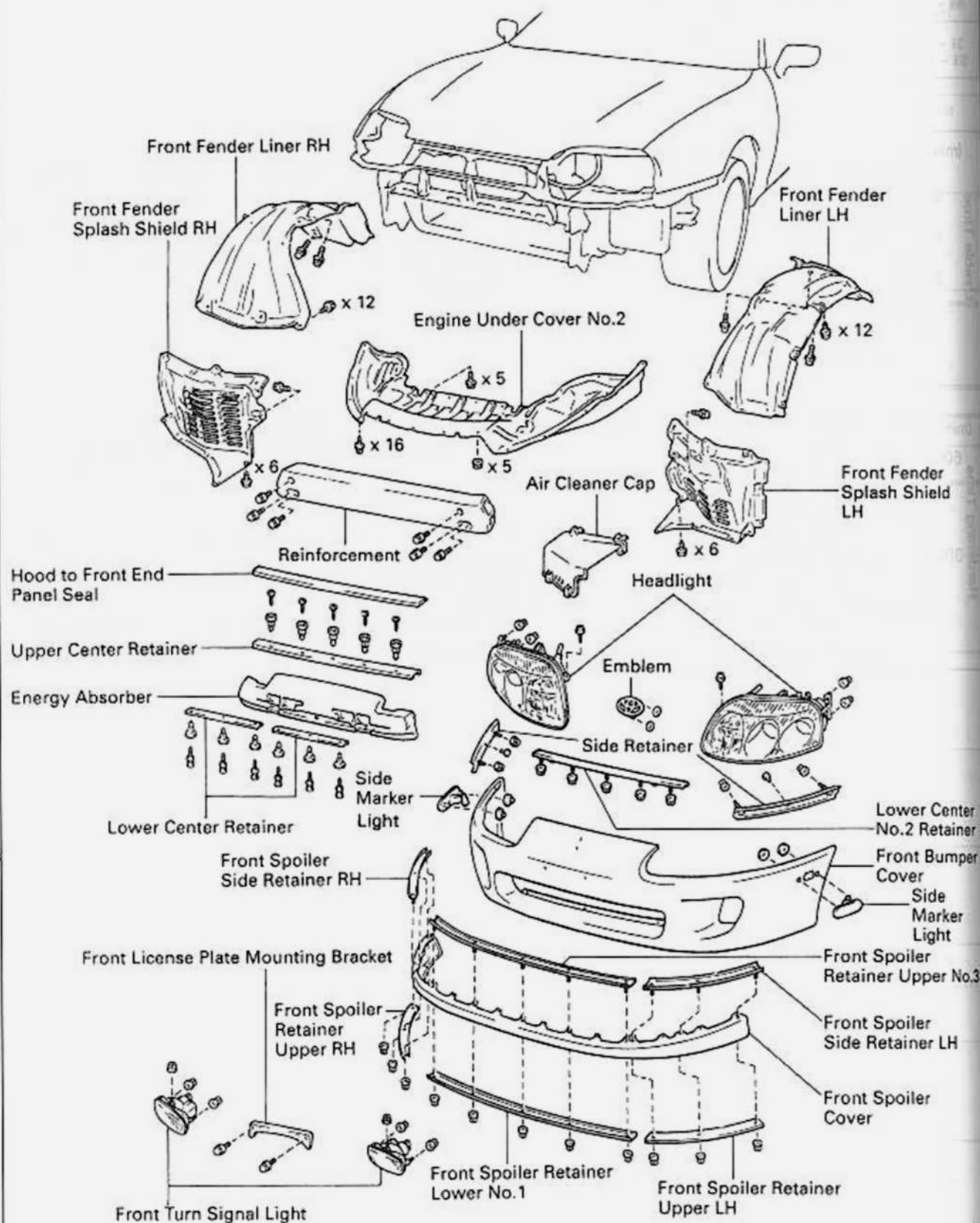
Torque: 18 N·m (180 kgf·cm, 13 ft·lbf)

**5. REMOVE CUSHIONS AND BRACKETS**

INSTALLATION HINT: Install the cushion to the outside of the line.

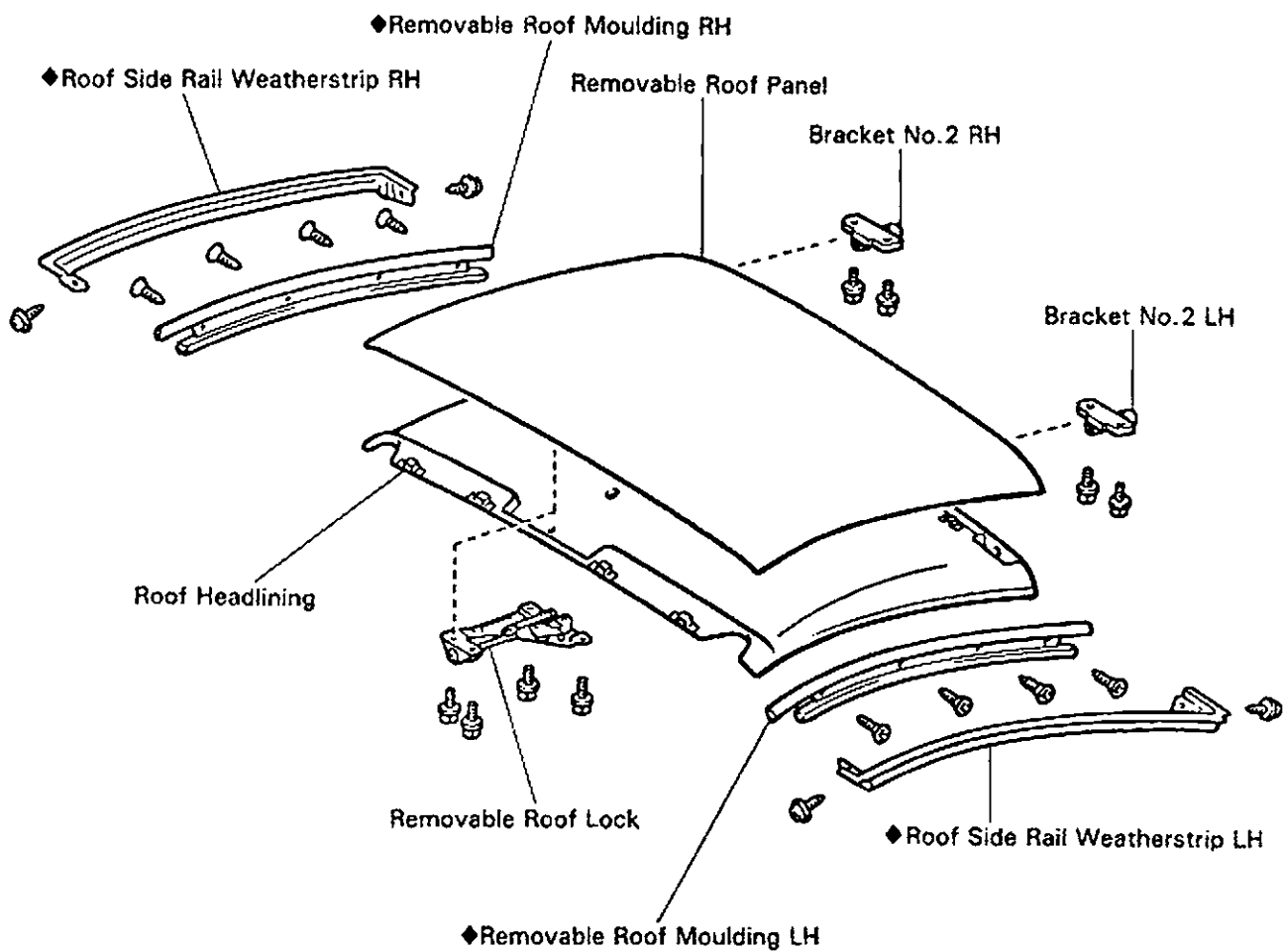
FRONT BUMPER COMPONENTS

B0041-18



SPORT ROOF
COMPONENTS

80031 - 04

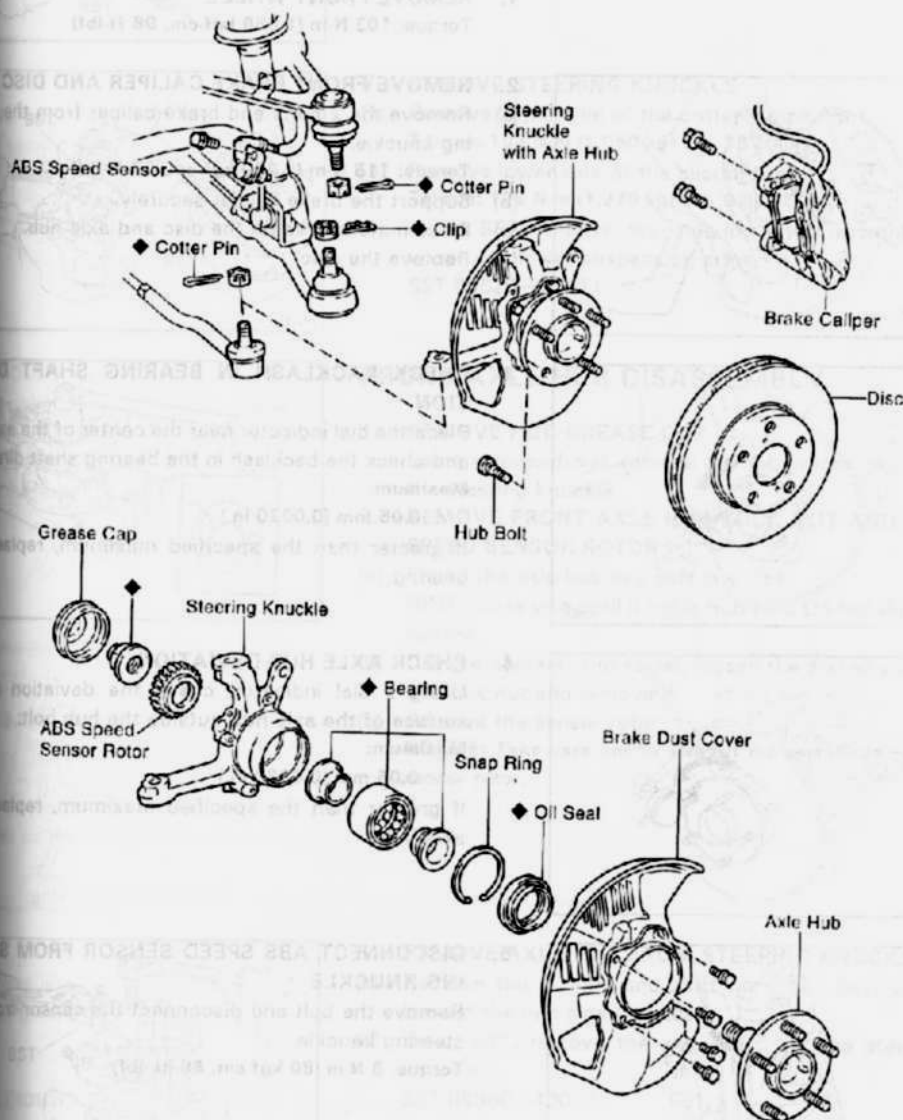


BO

◆ Non-reusable part

FRONT AXLE HUB COMPONENTS

E1002-00

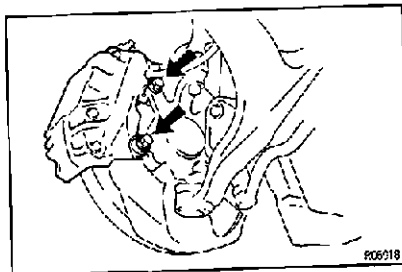


STEERING KNUCKLE WITH AXLE HUB REMOVAL

Installation is in the reverse order of removal.
INSTALLATION HINT: After installation, check ABS speed sensor signal and front wheel alignment.
 (See page BR-62 and SA-4)

1. REMOVE FRONT WHEEL

Torque: 103 N·m (1,050 kgf·cm, 96 ft·lbf)

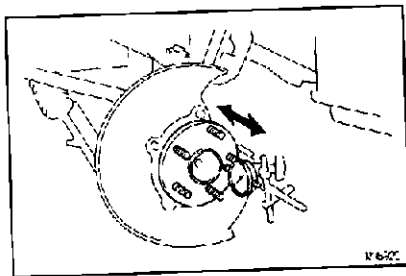


2. REMOVE FRONT BRAKE CALIPER AND DISC

- (a) Remove the 2 bolts and brake caliper from the steering knuckle.

Torque: 118 N·m (1,200 kgf·cm, 87 ft·lbf)

- (b) Support the brake caliper securely.
 (c) Place matchmarks on the disc and axle hub.
 (d) Remove the disc.



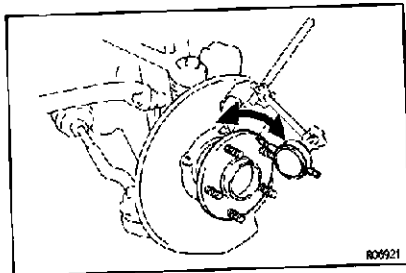
3. CHECK BACKLASH IN BEARING SHAFT DIRECTION

Place the dial indicator near the center of the axle hub and check the backlash in the bearing shaft direction.

Maximum:

0.05 mm (0.0020 in.)

If greater than the specified maximum, replace the bearing.



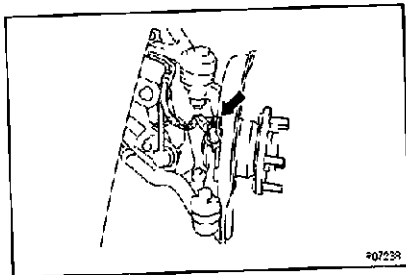
4. CHECK AXLE HUB DEVIATION

Using a dial indicator, check the deviation at the surface of the axle hub outside the hub bolt.

Maximum:

0.05 mm (0.0020 in.)

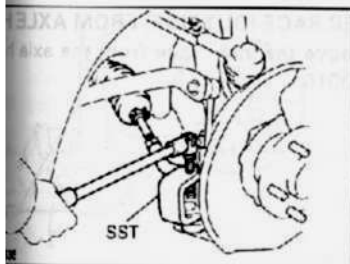
If greater than the specified maximum, replace the axle hub.



5. DISCONNECT ABS SPEED SENSOR FROM STEERING KNUCKLE

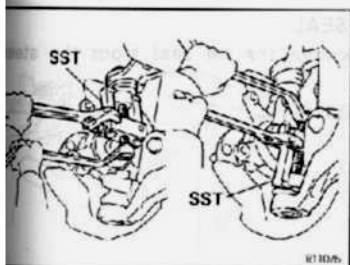
Remove the bolt and disconnect the sensor from the steering knuckle.

Torque: 8 N·m (80 kgf·cm, 69 in·lbf)



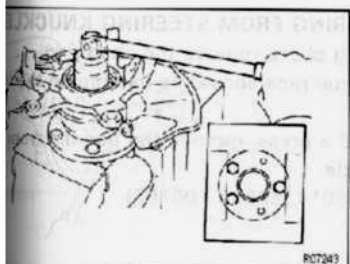
6. DISCONNECT TIE ROD END FROM STEERING KNUCKLE

- (a) Remove the cotter pin and nut.
Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)
- (b) Using SST, disconnect the tie rod end from the steering knuckle.
SST 09611–12010



7. REMOVE STEERING KNUCKLE

- (a) Remove upper side of the cotter pin and nut.
Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)
- (b) Remove lower side of the clip and nut.
Torque: 125 N·m (1,270 kgf·cm, 92 ft·lbf)
- (c) Using SST, remove the steering knuckle from the upper and lower suspension arms.
SST 09628–62011



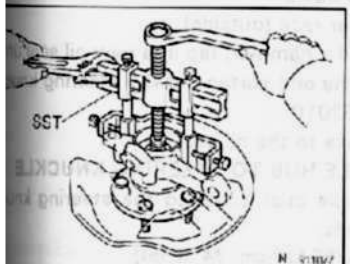
FRONT AXLE HUB DISASSEMBLY

1. REMOVE HUB GREASE CAP

Using a screwdriver, remove the hub grease cap from the steering knuckle.

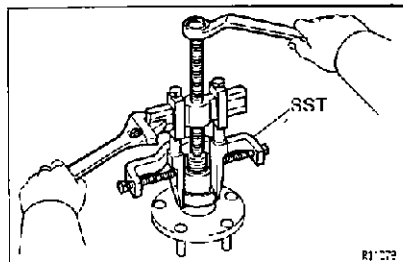
2. REMOVE FRONT AXLE HUB LOCK NUT AND ABS SPEED SENSOR ROTOR

- (a) Clamp the axle hub in a soft jaw vise.
HINT: Close vise until it holds hub bolt. Do not tighten further.
- (b) Using a hammer and chisel, loosen the staked part of the lock nut and remove it.
- (c) Remove the sensor rotor.
NOTICE: Take care not to scratch the serrations of the sensor rotor.

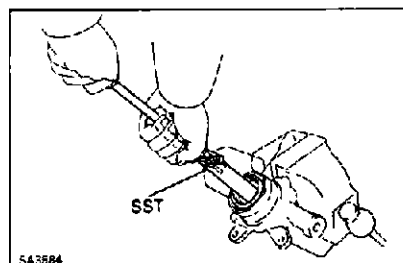


3. REMOVE AXLE HUB FROM STEERING KNUCKLE

- (a) Remove the 4 bolts and shift the brake dust cover toward the hub side (outside).
- (b) Using SST, remove the axle hub from the steering knuckle.
SST 09950–40010

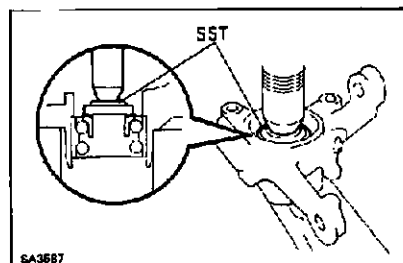
**4. REMOVE INNER RACE (OUTSIDE) FROM AXLE HUB**

Using SST, remove the inner race from the axle hub.
SST 09950-40010

**5. REMOVE OIL SEAL**

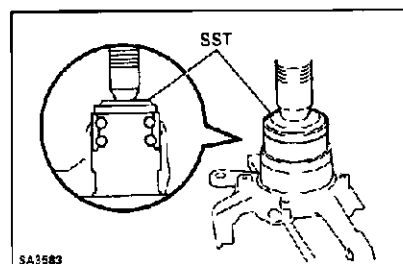
Using SST, remove the oil seal from the steering knuckle.

SST 09308-00010

**6. REMOVE BEARING FROM STEERING KNUCKLE**

- Using snap ring pliers, remove the snap ring.
- Position the inner race above the bearing on the inside.
- Using SST and a press, remove the bearing from the steering knuckle.

SST 09608-35014 (09608-06100)

**FRONT AXLE HUB ASSEMBLY****1. INSTALL BEARING TO STEERING KNUCKLE**

- Using SST, install a new bearing.
SST 09608-35014 (09608-06200)

NOTICE: If the inner race and balls come loose from the bearing outer race, be sure to install them on the inside as before.

- Using snap ring pliers, install the snap ring.

2. INSTALL OIL SEAL

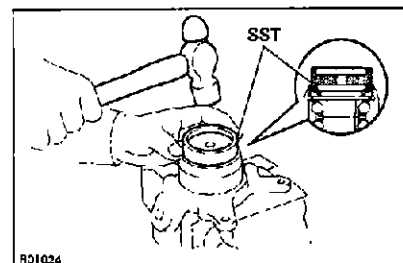
- Install the inner race (outside).
- Using SST and a hammer, tap in a new oil seal until it is flush with the end surface of the steering knuckle.
SST 09608-32010

- Coat MP grease to the oil seal lip.

3. INSTALL AXLE HUB TO STEERING KNUCKLE

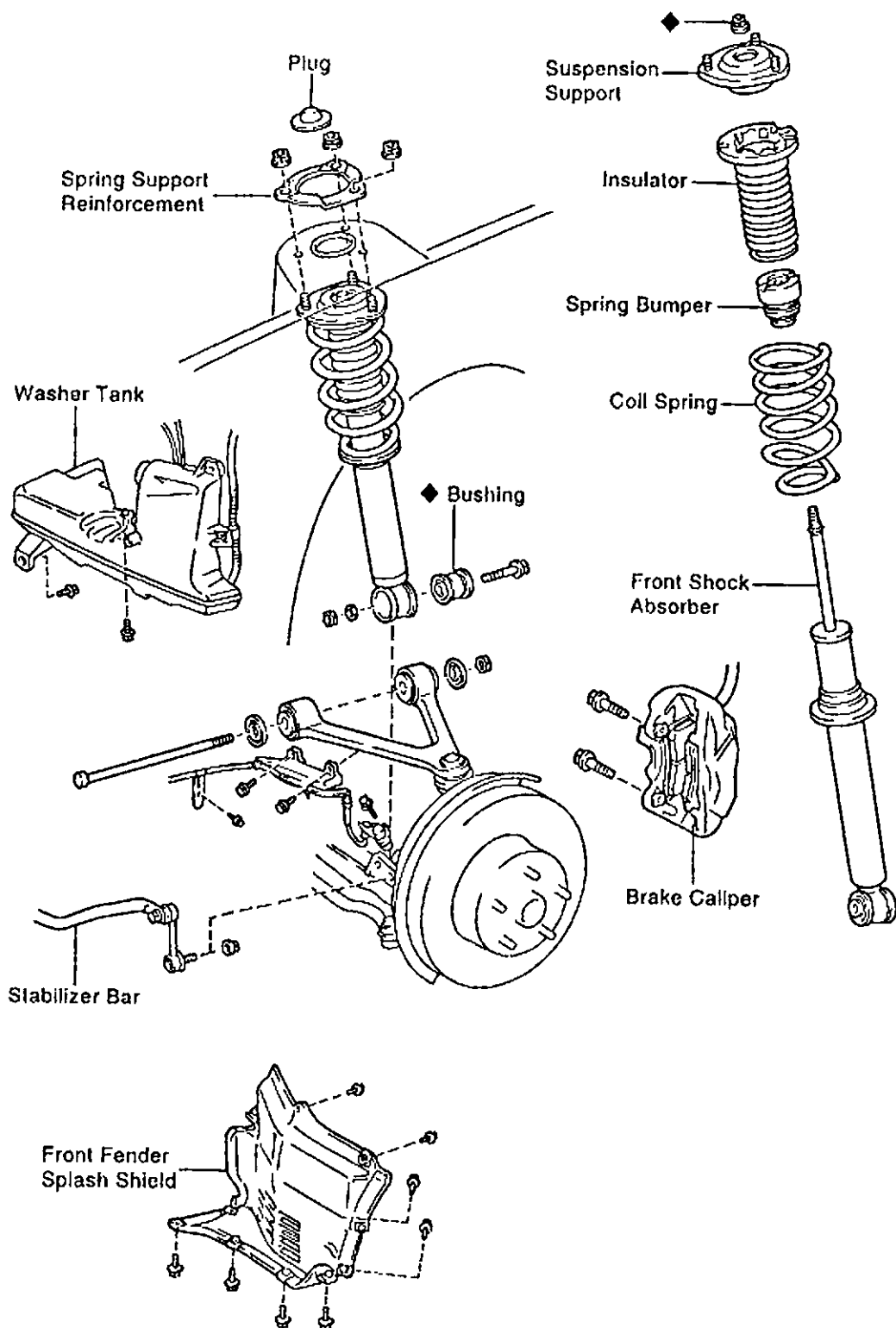
- Install the brake dust cover to the steering knuckle with the 4 bolts.

Torque: 8 N·m (85 kgf·cm, 74 in.-lbft)



FRONT SHOCK ABSORBER
COMPONENTS

SA00A-99



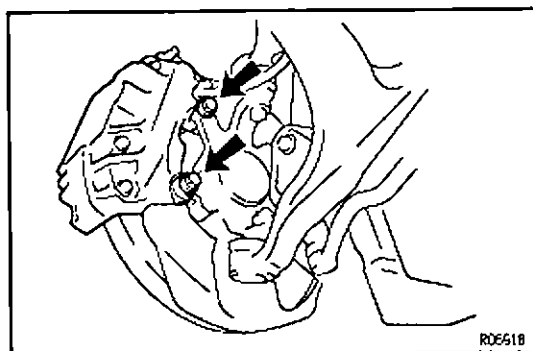
FRONT SHOCK ABSORBER REMOVAL

Installation is in the reverse order of removal.

INSTALLATION HINT: After installation, check ABS speed sensor signal and front wheel alignment.
(See page BR-62 and SA-4)

1. REMOVE FRONT WHEEL

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

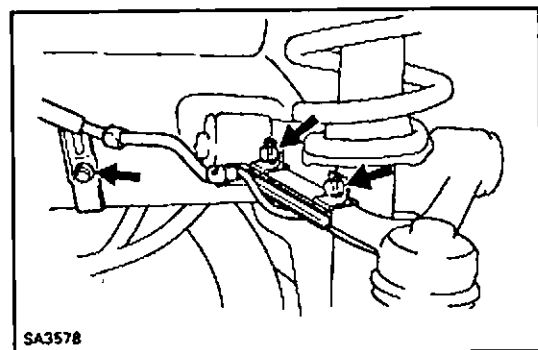


2. REMOVE DISC BRAKE CALIPER

- (a) Remove the 2 bolts and brake caliper from the steering knuckle.

Torque: 118 N·m (1,200 kgf·cm, 87 ft·lbf)

- (b) Support the brake caliper securely.

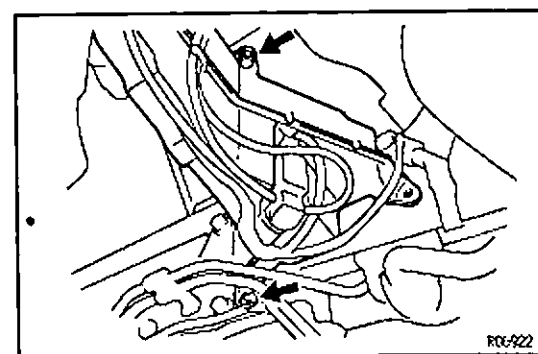


3. DISCONNECT ABS SPEED SENSOR AND WIRE HARNESS

- (a) Remove the bolt and disconnect the speed sensor from the steering knuckle.

Torque: 8 N·m (80 kgf·cm, 69 in·lbf)

- (b) Remove the 3 bolts and disconnect the wire harness clamp to prevent the wire harness being damaged when removing or installing the through bolt.

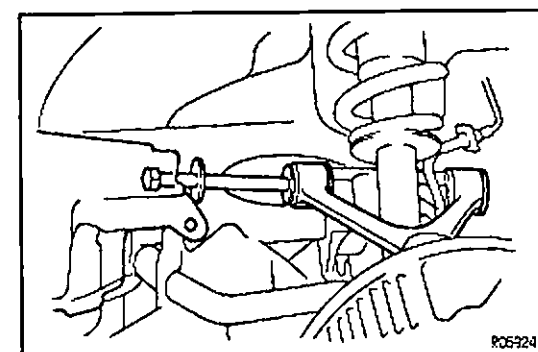


4. REMOVE FRONT FENDER SPLASH SHIELD

5. LH side only:

MOVE WASHER TANK

- (a) Remove the 2 washer tank set bolts.
(b) Move the washer tank from the body.



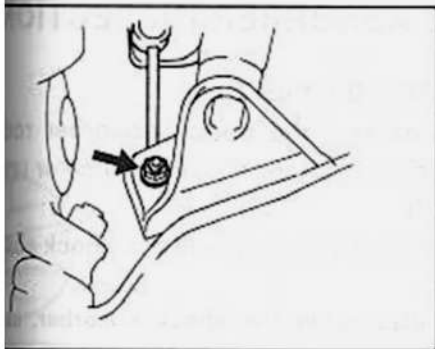
6. DISCONNECT UPPER SUSPENSION ARM

- (a) Remove the bolt and nut and disconnect the upper suspension arm from the subframe.

Torque: 164 N·m (1,670 kgf·cm, 121 ft·lbf)

INSTALLATION HINT: After stabilizing the suspension, torque the nut.

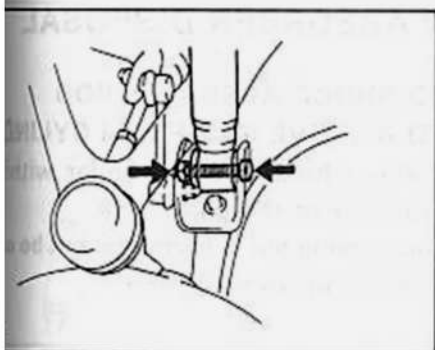
- (b) Support the upper suspension arm securely.

**7. DISCONNECT STABILIZER BAR LINK**

Remove the nut and disconnect the stabilizer link.

Torque: 74 N·m (750 kgf·cm, 54 ft·lbf)

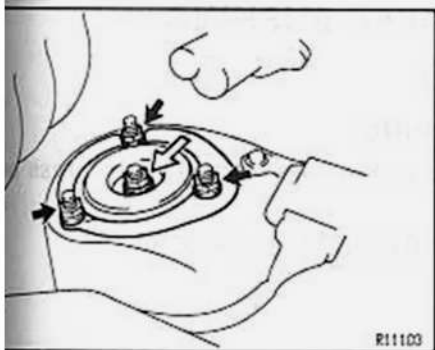
HINT: If the ball joint stud turns together with the nut, use a hexagon wrench to hold the stud.

**8. REMOVE SHOCK ABSORBER**

- (a) Remove the bolt and nut and disconnect the shock absorber from the lower suspension arm.

Torque: 143 N·m (1,460 kgf·cm, 106 ft·lbf)

INSTALLATION HINT: After stabilizing the suspension torque the nut.



- (b) Remove the plug from the support.

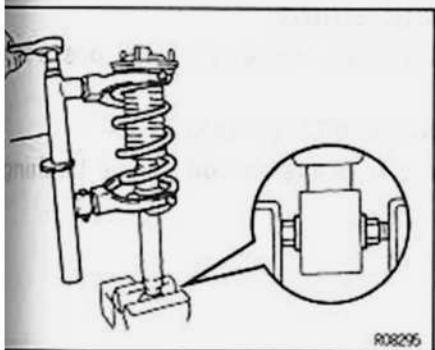
- (c) Loosen the lock nut in the middle of the suspension support.

REMOVAL NOTICE: Do not remove the nut.

Torque: 29 N·m (300 kgf·cm, 22 ft·lbf)

- (d) Remove the 3 nuts, spring support reinforcement and shock absorber from the body.

Torque: 35 N·m (360 kgf·cm, 26 ft·lbf)

**FRONT SHOCK ABSORBER DISASSEMBLY****1. REMOVE SUSPENSION SUPPORT AND COIL SPRING**

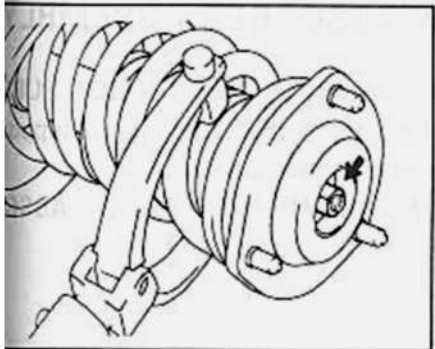
- (a) Using SST, compress the coil spring.

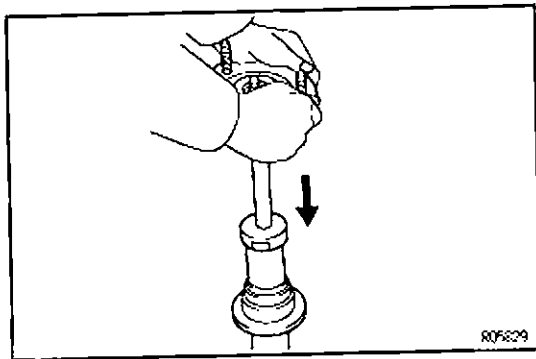
SST 09727-30020

NOTICE: Do not use an impact wrench. It will damage the SST.

- (b) Remove the suspension support center nut.

- (c) Remove the suspension support, coil spring and spring bumper.

2. REMOVE INSULATOR FROM SUSPENSION SUPPORT



R05629

FRONT SHOCK ABSORBER INSPECTION

INSPECT SHOCK ABSORBER

Compress and extend the shock absorber rod and check that there is no abnormal resistance or unusual operation sounds.

If there is any abnormality, replace the shock absorber with a new one.

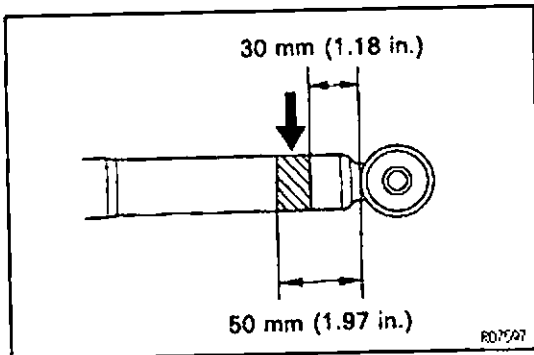
NOTICE: When discarding the shock absorber, use the following procedure.

FRONT SHOCK ABSORBER DISPOSAL

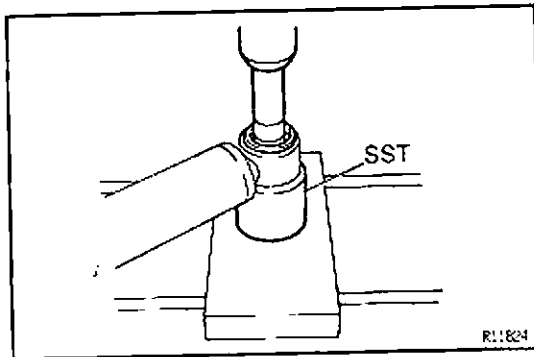
1. FULLY EXTEND SHOCK ABSORBER ROD
2. DRILL HOLE TO REMOVE GAS FROM CYLINDER

Using a drill, make a hole in the cylinder within the shaded region to remove the gas inside.

CAUTION: The gas coming out is harmless, but be careful of chips which may fly up when drilling.



R075/97



R11824

SHOCK ABSORBER BUSHING REPLACEMENT

1. REMOVE BUSHING

Using SST and a deep socket wrench, press out the bushing.

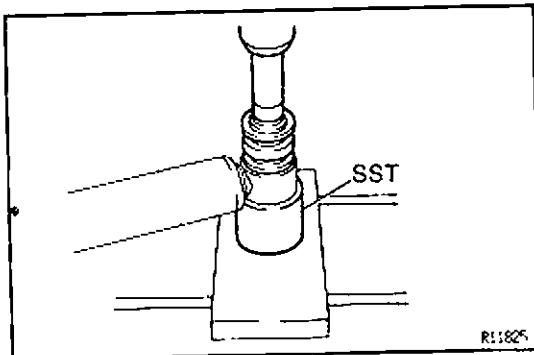
SST 09710-14012 (09710-00020)

2. INSTALL NEW BUSHING

Using SST and a deep socket wrench, press in the new bushing.

SST 09710-14012 (09710-00020)

HINT: Do not apply grease or oil to the bushing.



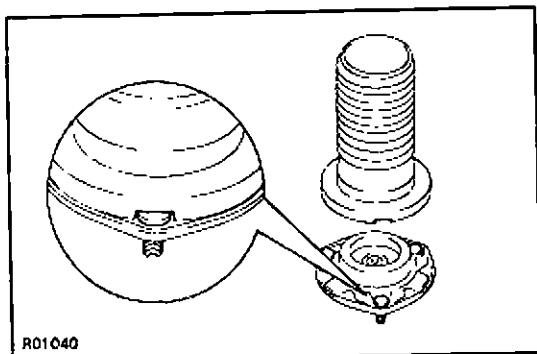
R11825

FRONT SHOCK ABSORBER ASSEMBLY

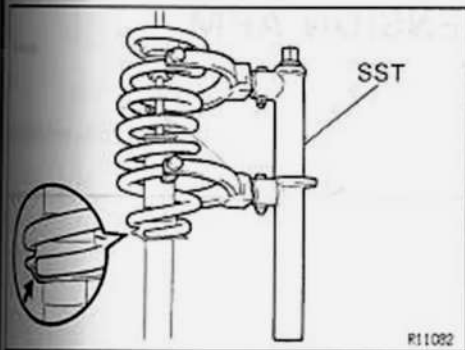
1. INSTALL INSULATOR TO SUSPENSION SUPPORT

HINT: Match the bolt of the suspension support with the cut-out part of the insulator.

2. INSTALL SPRING BUMPER TO SHOCK ABSORBER



R01040



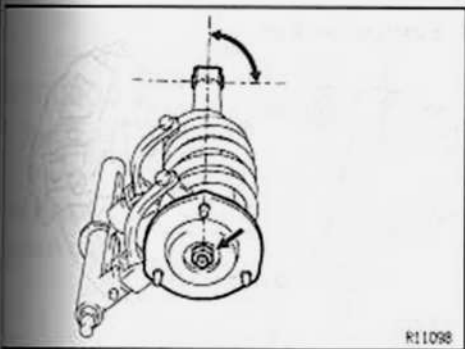
3. INSTALL COIL SPRING TO SHOCK ABSORBER

- (a) Using SST, compress the coil spring.

SST 09727-30020

NOTICE: Do not use an impact wrench.
It will damage the SST.

- (b) Install the coil spring to the shock absorber.
HINT: Fit the lower end of the coil spring into the gap of the spring seat of the shock absorber.



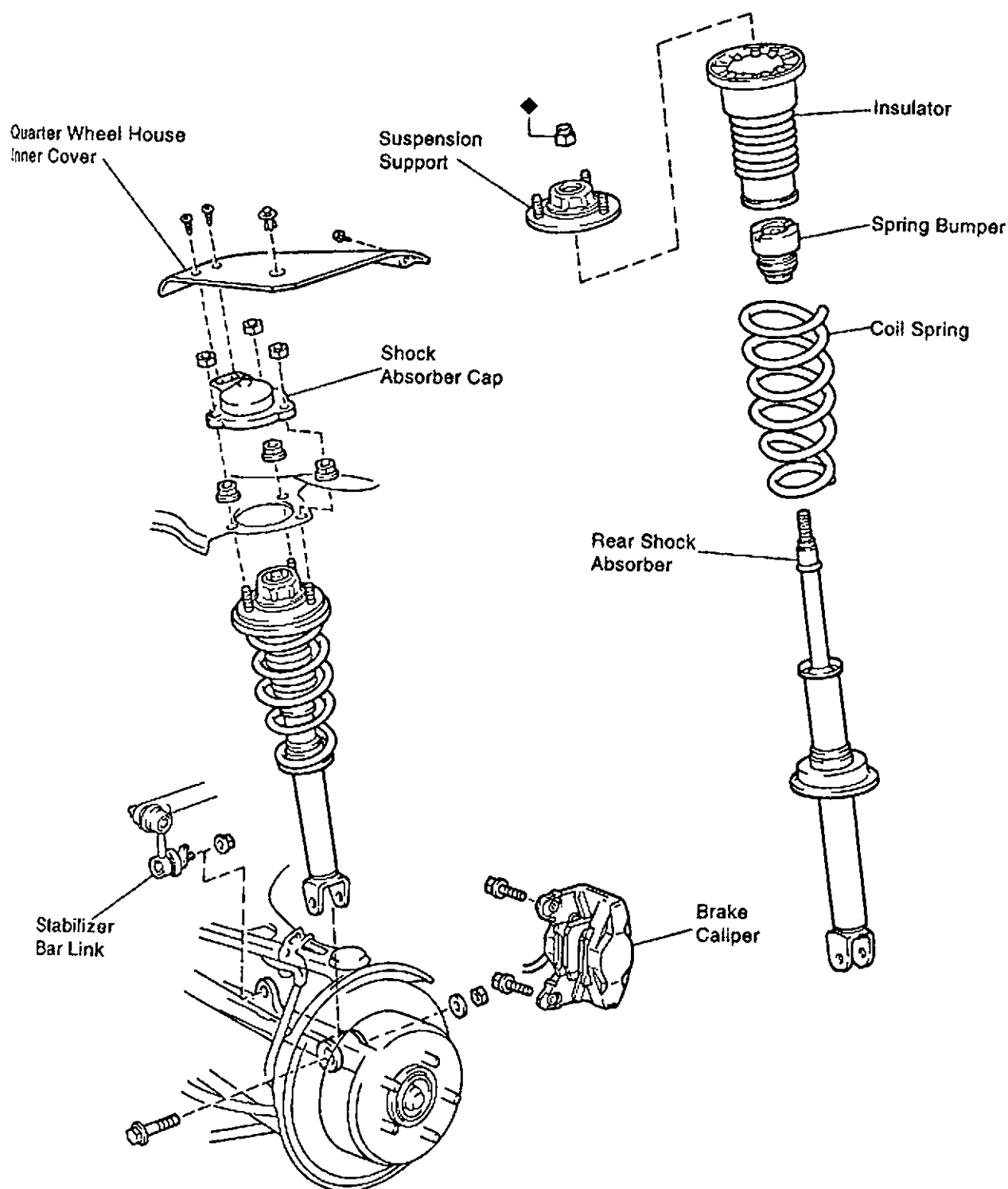
4. INSTALL SUSPENSION SUPPORT

- (a) Install the suspension support to the rod.
(b) Temporarily tighten a new nut.
(c) Turn the suspension support so that one of the bolts on the suspension support faces the same direction, as shown in the illustration.
HINT: Align the bolt so that a line drawn between the rod and the bolt would be 90° to the direction of the lower bushing.
- (d) Remove the SST.

HINT: After removing the SST, again check the direction of the suspension support.

REAR SHOCK ABSORBER
COMPONENTS

EA068-00



REAR SHOCK ABSORBER REMOVAL

Installation is in the reverse order of removal.

INSTALLATION HINT: After installation, check rear wheel alignment.

(See page SA-9)

1. w/ SPORT ROOF:

REMOVE THESE PARTS:

(See BO section)

- Rear seat cushion and Rear seat back
- Tonneau cover retainer
- Holder garnish and Holder
- Speaker grill and Quarter trim

2. REMOVE REAR WHEEL

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

3. REMOVE REAR BRAKE CALIPER

- (a) Remove the 2 bolts and brake caliper from the rear axle carrier.

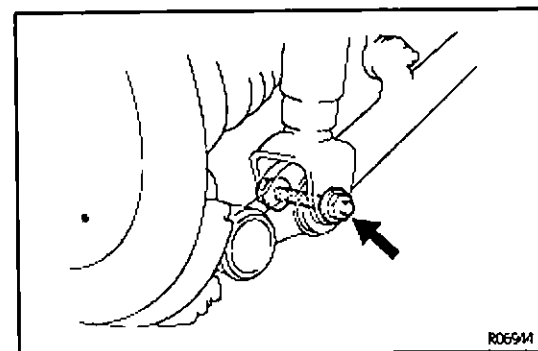
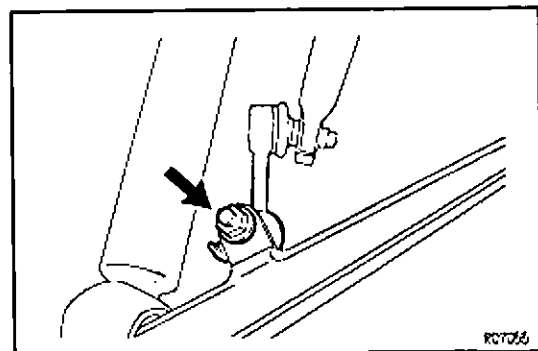
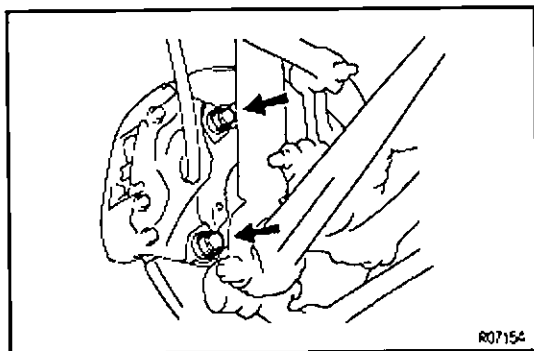
Torque: 104 N·m (1,065 kgf·cm, 77 ft·lbf)

- (b) Support the brake caliper securely.

4. DISCONNECT REAR STABILIZER BAR LINK

Remove the nut and disconnect the stabilizer bar link from the lower suspension arm No.2.

Torque: 74 N·m (750 kgf·cm, 54 ft·lbf)



5. REMOVE SHOCK ABSORBER WITH COIL SPRING

- (a) Remove the nut and bolt on lower side of the shock absorber.

Torque: 137 N·m (1,400 kgf·cm, 101 ft·lbf)

INSTALLATION HINT: After stabilizing the suspension, torque the nut.

- (b) Remove the quarter wheel house inner cover.

- (c) Remove the 3 nuts and the shock absorber cap.

Torque: 10 N·m (105 kgf·cm, 8 ft·lbf)

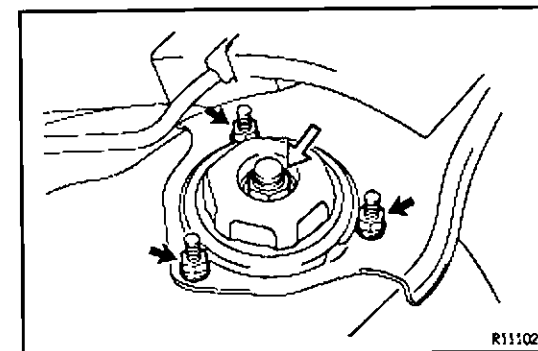
- (d) Loosen the nut in the middle of the suspension support.

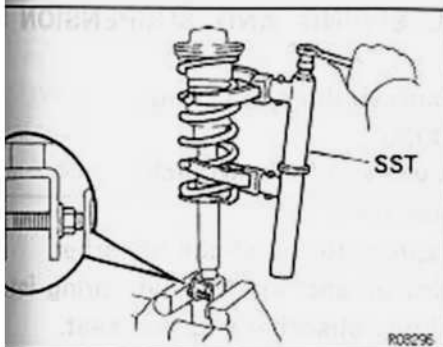
REMOVAL NOTICE: Do not remove the nut.

Torque: 27 N·m (280 kgf·cm, 20 ft·lbf)

- (e) Remove the 3 nuts and shock absorber with the coil spring.

Torque: 26 N·m (260 kgf·cm, 19 ft·lbf)



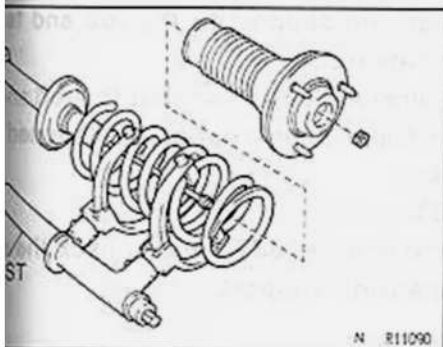


REAR SHOCK ABSORBER DISASSEMBLY

1. REMOVE SUSPENSION SUPPORT AND COIL SPRING

- (a) Using SST, compress the coil spring.
SST 09727-30020

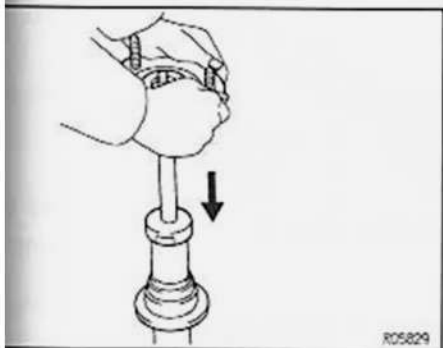
NOTICE: Do not use an impact wrench.
It will damage the SST.



- (b) Remove the suspension support nut.
(c) Remove the suspension support, coil spring and insulator.

2. REMOVE INSULATOR AND SPRING BUMPER

Remove the insulator and spring bumper from the suspension support.



REAR SHOCK ABSORBER INSPECTION

INSPECT SHOCK ABSORBER

Compress and extend the shock absorber rod and check that there is no abnormal resistance or unusual operation sounds.

If there is any abnormality, replace the shock absorber with a new one.

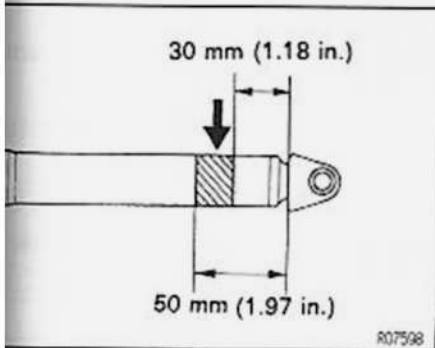
NOTICE: When discarding the shock absorber, use the following procedure.

REAR SHOCK ABSORBER DISPOSAL

1. FULLY EXTEND SHOCK ABSORBER ROD
2. DRILL HOLE TO REMOVE GAS FROM CYLINDER

Using a drill, make a hole in the cylinder within the shaded region to remove the gas inside.

CAUTION: The gas coming out is harmless, but be careful of chips which may fly up when drilling.

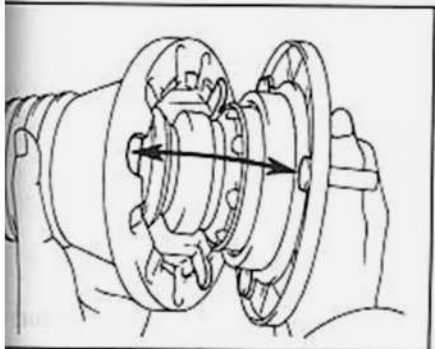


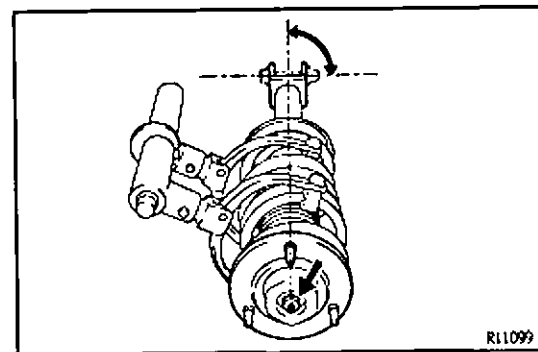
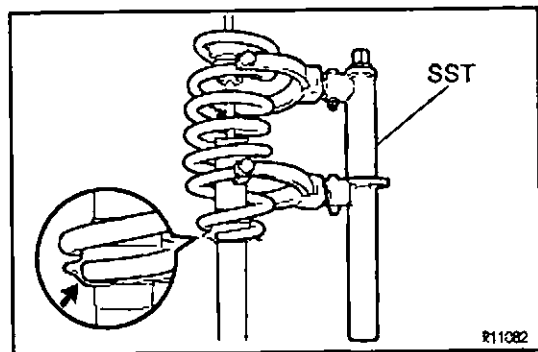
REAR SHOCK ABSORBER ASSEMBLY

1. INSTALL SUSPENSION SUPPORT AND COIL SPRING

- (a) Install the spring bumper to the suspension support.
(b) Install the insulator to the suspension support.

HINT: Match the bolt of the suspension support with the cut-off part of the insulator.





2. INSTALL COIL SPRING AND SUSPENSION SUPPORT

- (a) Using SST, compress the coil spring.
SST 09727-30020

NOTICE: Do not use an impact wrench.
It will damage the SST.

- (b) Install the coil spring to the shock absorber.
HINT: Fit the lower end of the coil spring into the recess of the shock absorber's spring seat.

- (c) Install the suspension support to the rod and temporarily tighten a new nut.

- (d) Rotate the suspension support so that the rod and the bolts on suspension support are aligned with the lower bracket.

- (e) Remove the SST.

HINT: After removing the SST, again check the direction of the suspension support.

TORQUE SPECIFICATIONS (FRONT)

Part tightened	N·m	kgf·cm	ft·lbf
Hub nut	103	1,050	76
Lower suspension arm x Suspension crossmember	226	2,300	166
Lower suspension arm bracket stay	Bolt	43	32
	Nut	59	43
Axle hub lock nut	199	2,030	147
Upper suspension arm x Subframe	164	1,670	121
Lower suspension arm x Shock absorber bracket	52	530	38
Tie rod end x Steering knuckle	49	500	36
Steering knuckle x Upper suspension arm	103	1,050	76
Steering knuckle x Lower suspension arm	125	1,270	92
Disc brake caliper x Steering knuckle	118	1,200	87
ABS speed sensor x Steering knuckle	8	80	69in.-lbf
Front shock absorber x Body	35	360	26
Front shock absorber x Lower suspension arm	143	1,460	106
Front shock absorber x Suspension support	29	300	22
Stabilizer bar link x Lower suspension arm	74	750	54
Stabilizer bar link x Stabilizer bar	74	750	54
Stabilizer bar bracket x Body	18	180	13
Steering knuckle x Dust cover	8	85	74in.-lbf

(REAR)

Part tightened	N-m	kgf-cm	ft-lbf
Hub nut	103	1,050	76
Rear shock absorber x Lower suspension arm No.2	137	1,400	101
Upper suspension arm x Suspension crossmember	164	1,670	271
Rear axle carrier x Disc brake caliper	104	1,065	77
Lower suspension arm No.1 x Rear axle carrier	59	600	43
Lower suspension arm No.1 x Subframe	184	1,880	136
Lower suspension arm No.2 x Rear axle carrier	150	1,525	110
Lower suspension arm No.2 x suspension crossmember	184	1,880	136
Lower suspension arm bracket x Subframe	18	180	13
ABS speed sensor x Rear axle carrier	8	80	69in.-lbf
Strut rod x Rear axle carrier	184	1,880	136
Strut rod x Body	184	1,880	136
Rear drive shaft x Axle hub	289	2,950	213
Upper suspension arm x Rear axle carrier	109	1,110	80
Backing plate x Rear axle carrier	26	260	19
Rear axle carrier x Backing plate (Hexagon bolt)	180	1,825	132
Rear drive shaft x Differential	83	850	61
Differential x Propeller shaft	79	805	58
Differential mounting bolt	Front 123 Rear 142	1,250 1,450	90 105
Ring gear x Differential case	See page SA-71		
Differential carrier retainer set bolt	2JZ – GTE M/T 47 Except 2JZ – GTE M/T 22	480 225	35 16
Differential carrier cover set bolt	2JZ – GTE M/T 78 Except 2JZ – GTE M/T 47	800 475	58 34
Drain (Filler) plug	49	500	36
Breather plug	21	210	15
Shock absorber x Body	26	260	19
Suspension support x Shock absorber	27	280	20
Stabilizer bar link x Lower suspension arm No.2	74	750	54
Stabilizer bar link x Stabilizer bar	74	750	54
Stabilizer bar bracket x Body	31	320	23

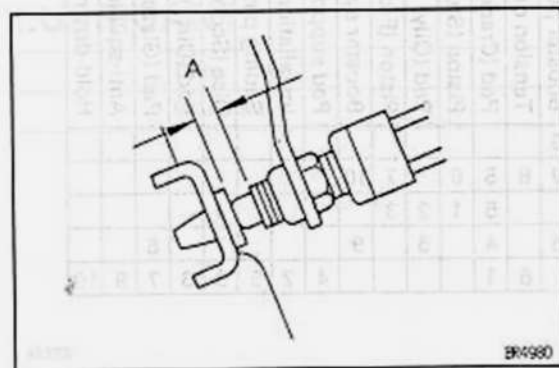
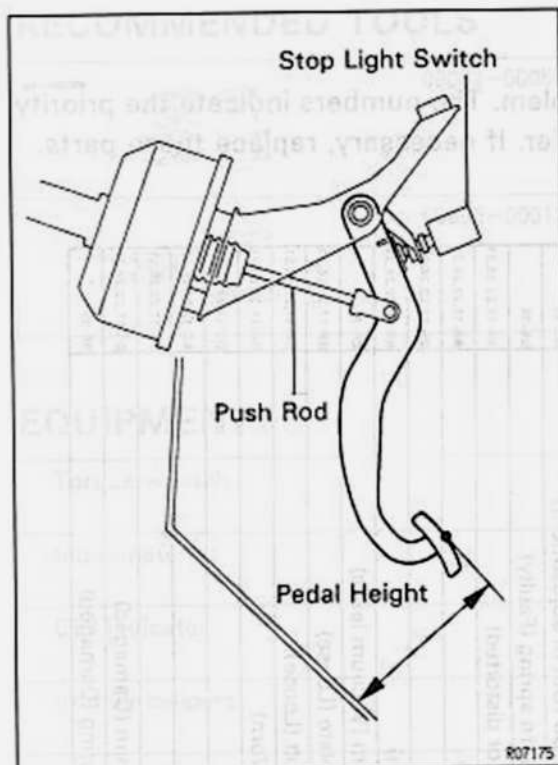
SERVICE SPECIFICATIONS

SERVICE DATA

Brake pedal height from asphalt sheet		154.2 — 164.2 mm (6.07 — 6.46 in.)
Brake pedal freeplay		1 — 6 mm (0.04 — 0.24 in.)
Brake pedal reserve distance at 490 N (50 kgf, 110.2 lbf)		
	2JZ—GTE	More than 70 mm (2.76 in.)
	2JZ—GE	More than 72 mm (2.83 in.)
Brake booster push rod to piston clearance (w/ SST)		0 mm (0 in.)
Front brake pad thickness (2JZ—GTE)	STD	12.0 mm (0.472 in.)
Front brake pad thickness (2JZ—GTE)	Minimum	1.0 mm (0.039 in.)
Front brake pad thickness (2JZ—GE)	STD	11.0 mm (0.433 in.)
Front brake pad thickness (2JZ—GE)	Minimum	1.0 mm (0.039 in.)
Front brake disc thickness (2JZ—GTE)	STD	30.0 mm (1.181 in.)
Front brake disc thickness (2JZ—GTE)	Minimum	28.0 mm (1.102 in.)
Front brake disc thickness (2JZ—GE)	STD	32.0 mm (1.260 in.)
Front brake disc thickness (2JZ—GE)	Minimum	30.0 mm (1.181 in.)
Front brake disc runout	Maximum	0.05 mm (0.0020 in.)
Rear brake disc pad thickness (2JZ—GTE)	STD	11.0 mm (0.433 in.)
Rear brake disc pad thickness (2JZ—GTE)	Minimum	1.0 mm (0.039 in.)
Rear brake disc pad thickness (2JZ—GE)	STD	10.0 mm (0.394 in.)
Rear brake disc pad thickness (2JZ—GE)	Minimum	1.0 mm (0.039 in.)
Rear brake disc thickness	STD	18.0 mm (0.630 in.)
Rear brake disc thickness	Minimum	15.0 mm (0.591 in.)
Rear brake disc runout	Maximum	0.05 mm (0.0020 in.)
Rear brake disc inside diameter	STD	190 mm (7.48 in.)
Rear brake disc inside diameter	Maximum	191 mm (7.52 in.)
Parking brake lining thickness	STD	2.5 mm (0.098 in.)
Parking brake lining thickness	Minimum	1.0 mm (0.039 in.)
Parking brake lever travel at 196 N (20 kgf, 44.1 lbf)		5 — 8 clicks
Parking brake clearance between rear shoe and lever		Less than 0.35 mm (0.012 in.)
Parking brake adjusting shim thickness for rear disc brake		0.3 mm (0.012 in.) 0.6 mm (0.024 in.) 0.8 mm (0.031 in.) 2JZ—GTE only 0.9 mm (0.035 in.) 2JZ—GE only

TORQUE SPECIFICATIONS

Part tightened		N-m	kgf-cm	ft-lbf
Master cylinder x Piston stopper bolts		10	100	7
Master cylinder x Reservoir		1.7	17.5	15.2 in.-lbf
Master cylinder x Brake booster		13	130	9
Brake line union nut	M10	15	155	11
Brake line union nut	M12	20	200	15
Brake booster clevis lock nut		25	260	19
Brake booster x Pedal bracket		13	130	9
Brake plug		11	110	8
Front disc brake caliper x Steering knuckle	2JZ—GTE	118	1,200	87
Front disc brake torque plate x Steering knuckle	2JZ—GE	118	1,200	87
Front disc brake caliper installation bolt	2JZ—GE	34	350	25
Front disc brake caliper x Flexible hose union bolt		30	310	22
Rear disc brake caliper x Axle carrier	2JZ—GTE	104	1,065	77
Rear disc brake torque plate x Axle carrier	2JZ—GE	104	1,065	77
Rear disc brake caliper installation bolt	2JZ—GE	34	350	25
Rear disc brake caliper x Flexible hose union bolt		30	310	22
ABS actuator x Actuator bracket		5.4	55	48 in.-lbf
ABS actuator x 2-way		8.8	90	78 in.-lbf
ABS actuator bracket x Body		19	195	14
Brake control actuator x Body		19	195	14
Brake control actuator x ABS actuator x Body		19	195	14
Front speed sensor installation bolt		7.8	80	69 in.-lbf
Rear speed sensor installation bolt		7.8	80	69 in.-lbf
TRAC actuator bracket x TRAC pump bracket or body		13	130	9
TRAC pump bracket x Body		19	195	14
TRAC pump bracket x Damper		7.8	80	69 in.-lbf
TRAC pump bracket x TRAC pump bracket No.2		7.8	80	69 in.-lbf
TRAC pump x TRAC pump bracket No.2		7.8	80	69 in.-lbf
TRAC pump or damper x Union bolt		48	485	34



CHECK AND ADJUSTMENT

BRAKE PEDAL CHECK AND ADJUSTMENT

1. CHECK THAT PEDAL HEIGHT IS CORRECT

Pedal height from dash panel:

154.2–164.2 mm (6.07–6.46 in.)

If the pedal height is incorrect, adjust it.

2. IF NECESSARY, ADJUST PEDAL HEIGHT

- Remove the lower instrument panel and finish panel.
- Disconnect the connector from the stop light switch.
- Loosen the stop light switch lock nut and remove the stop light switch.
- Loosen the push rod lock nut.
- Adjust the pedal height by turning the pedal push rod.
- Tighten the push rod lock nut.

Torque: 25 N·m (260 kgf·cm, 19 ft·lbf)

- Install the stop light switch and turn it until it lightly contacts the pedal stopper.
- Turn the stop light switch back one turn.
- Check the clearance (A) between stop light switch and pedal.

Clearance:

0.5–2.4 mm (0.02–0.09 in.)

- Tighten the stop light switch lock nut.
- Connect the connector to the stop light switch.
- Check that the stop lights come on when the brake pedal is depressed, and go off when the brake pedal is released.

- After adjusting the pedal height, check the pedal freeplay.

HINT: If clearance (A) between the stop light switch and the brake pedal stopper has been adjusted correctly, the pedal freeplay will meet the specification.

- Install the lower instrument panel and finish panel.

3. CHECK PEDAL FREEPLAY

- Stop the engine and depress the brake pedal several times until there is no more vacuum left in the booster.

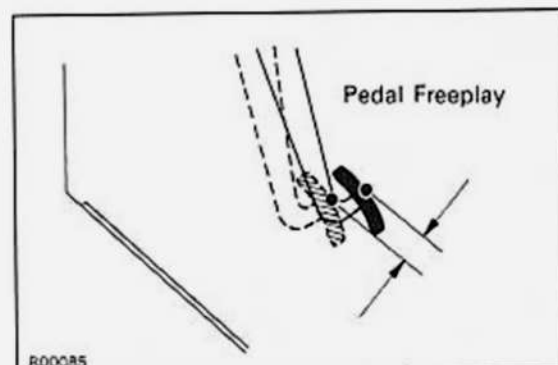
- Push in the pedal by hand until the beginning of the second point of resistance is felt, then measure the distance, as shown.

Pedal freeplay:

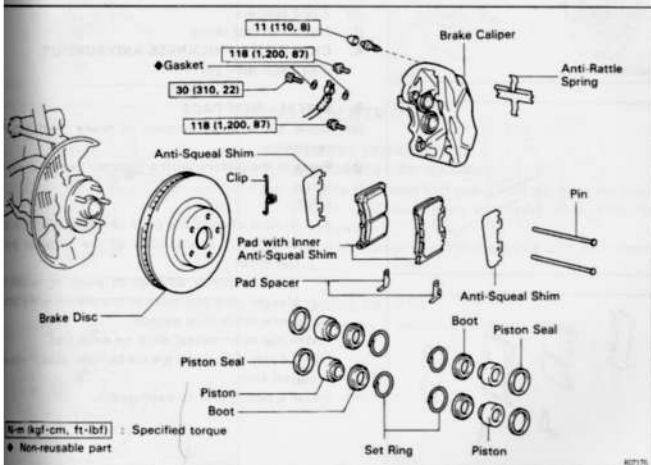
1–6 mm (0.04–0.24 in.)

If incorrect, check the stop light switch clearance. And if the clearance is OK, then troubleshoot the brake system.

HINT: The freeplay to the 1st point of resistance due to the play between the clevis and pin. It is 1–2 mm (0.04–0.12 in.) on the pedal.



FRONT BRAKE (2JZ—GTE) COMPONENTS



K07170

BRAKE PADS REPLACEMENT

1. REMOVE FRONT WHEEL

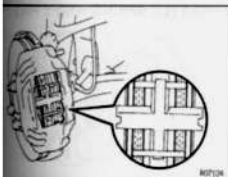
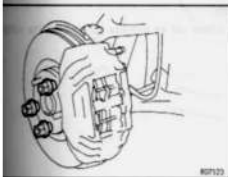
Remove the wheel and temporarily fasten the disc with the hub nuts.

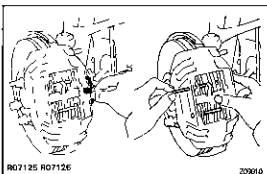
2. INSPECT PAD LINING THICKNESS

Check the pad thickness and replace pads if not within specification.

Minimum thickness:

1.0 mm (0.039 in.)

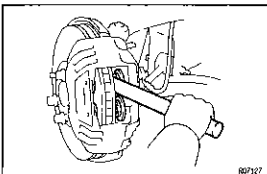




3. REMOVE FOLLOWING PARTS:

- Clip
- 2 pins
- Anti-rattle spring
- 2 pads
- 2 pad spacers
- 2 anti-squeal shims

4. CHECK DISC THICKNESS AND RUNOUT (See page BR-25)



5. INSTALL NEW PADS

- Draw out a small amount of brake fluid from the reservoir.
- Press in the pistons with a hammer handle or equivalent.

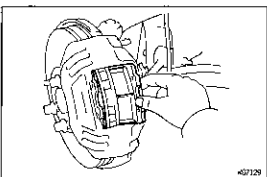
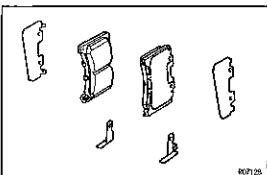
HINT:

- Always change the pads on one wheel at a time as there is a possibility of the opposite piston flying out.
- If the piston is difficult to push in, loosen the bleeder plug and push in the piston while letting some brake fluid escape.

- Install the anti-squeal shim on each pad.

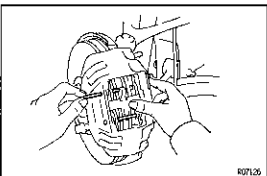
HINT: Apply disc brake grease to inner side of the anti-squeal shim.

- Install a pad spacer to each pad.

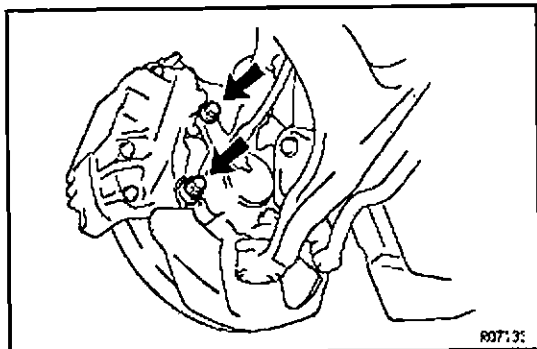


- Install the 2 pads.

NOTICE: Do not allow oil or grease to get on the rubbing face.



6. INSTALL ANTI-RATTLE SPRING AND 2 PINS



3. REMOVE CALIPER

Remove the 2 mounting bolts and caliper.
Torque: 118 N·m (1,200 kgf·cm, 87 ft·lbf)

4. REMOVE THESE PARTS:

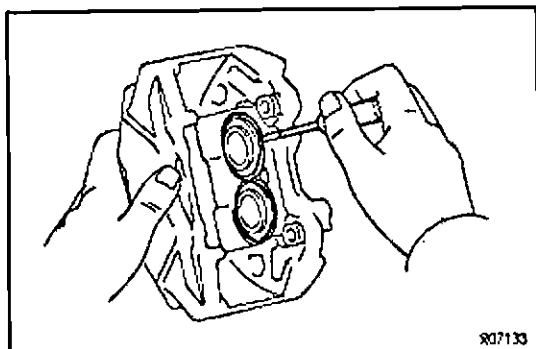
- (a) Clip
- (b) 2 pins
- (c) Anti-rattle spring
- (d) 2 pads
- (e) 2 pad spacers
- (f) 2 anti-squeal shims

CALIPER DISASSEMBLY

Assembly is in the reverse order of disassembly.
ASSEMBLY NOTICE: Apply lithium soap ball grease to the parts indicated by the arrows (See Fig. 1-22).

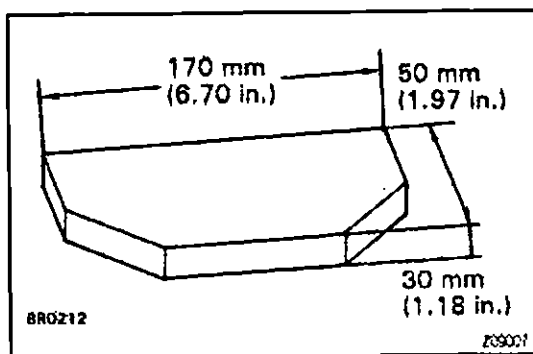
1. REMOVE CYLINDER BOOT SET RINGS AND BOOTS

Using a screwdriver, remove the 4 cylinder boot set rings and 4 boots.



2. REMOVE PISTONS FROM CYLINDER

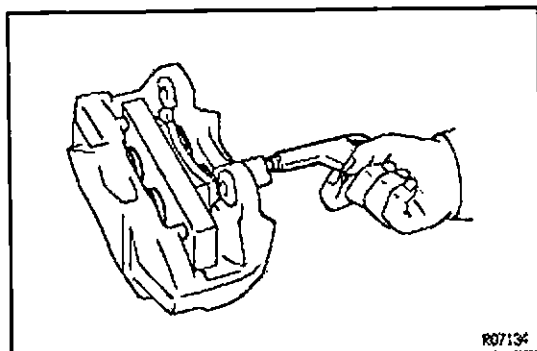
- (a) Prepare a wooden plate to hold the pistons



- (b) Place the plate between the pistons and the cylinder on one side.

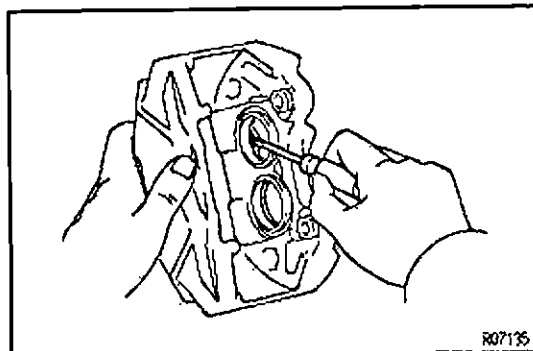
- (c) Use compressed air to remove the pistons from the cylinder.

DISASSEMBLY CAUTION: Do not place your hand in front of the pistons when using compressed air.



3. REMOVE PISTON SEALS

Using a screwdriver, remove the 4 piston seals from the cylinder.



FRONT BRAKE COMPONENTS INSPECTION AND REPAIR

1. MEASURE PAD LINING THICKNESS

Using a ruler, measure the pad lining thickness.

Standard thickness:

12.0 mm (0.472 in.)

Minimum thickness:

1.0 mm (0.039 in.)

Replace the pads if the thickness is less than the minimum (the 1.0 mm slit is no longer visible) or if it shows signs of uneven wear.

2. MEASURE DISC THICKNESS

Using a micrometer, measure the disc thickness.

Standard thickness:

30.0 mm (1.181 in.)

Minimum thickness:

28.0 mm (1.102 in.)

Replace the disc if the thickness of the disc is at the minimum thickness or less. Replace the disc or grind it on a lathe if it is badly scored or worn unevenly.

3. MEASURE DISC RUNOUT

Using a dial indicator, measure disc runout 10 mm (0.39 in.) from the outer edge of the disc.

Maximum disc runout:

0.05 mm (0.0020 in.)

If the disc's runout is at the maximum value or greater, check the bearing play in the axial direction and check the axle hub runout (See page SA-16). If the bearing play and axle hub runout are not abnormal, adjust the disc runout.

4. IF NECESSARY, ADJUST DISC RUNOUT

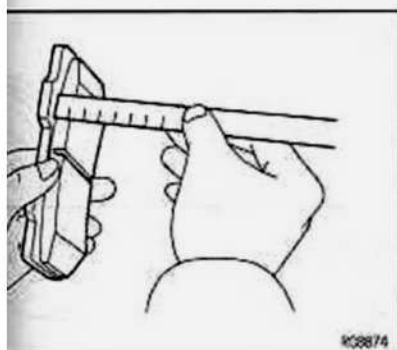
- (a) Remove the hub nuts and the disc. Reinstall the disc 1/5 of a turn round from its original position on the hub. Install and torque the hub nuts.

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

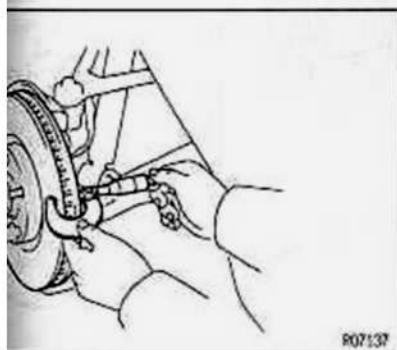
Remeasure the disc runout. Make a note of the runout and the disc's position on the hub.

- (b) Repeat (a) until the disc has been installed on the 3 remaining hub positions.
- (c) If the minimum runout recorded in (a) and (b) is less than 0.05 mm (0.0020 in.), install the disc in that position.
- (d) If the minimum runout recorded in (a) and (b) is greater than 0.05 mm (0.0020 in.), replace the disc and repeat step 3.

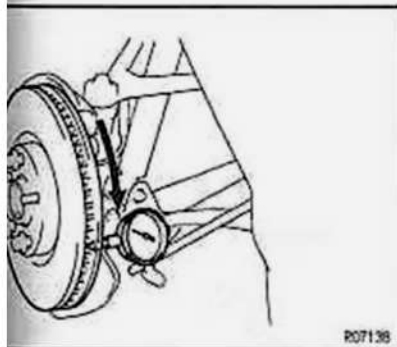
HINT: Install a disc marked with "R" on the right wheel, and a disc marked with "L" on the left wheel.



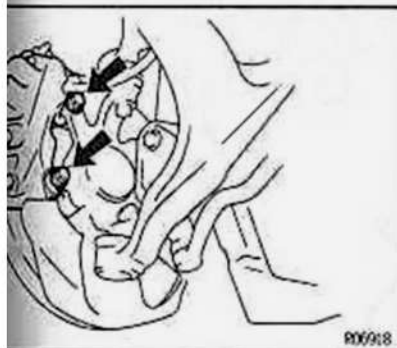
R02874



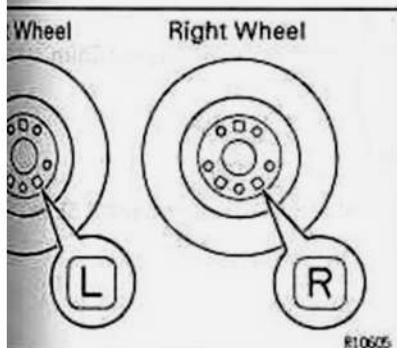
R07137



R07138



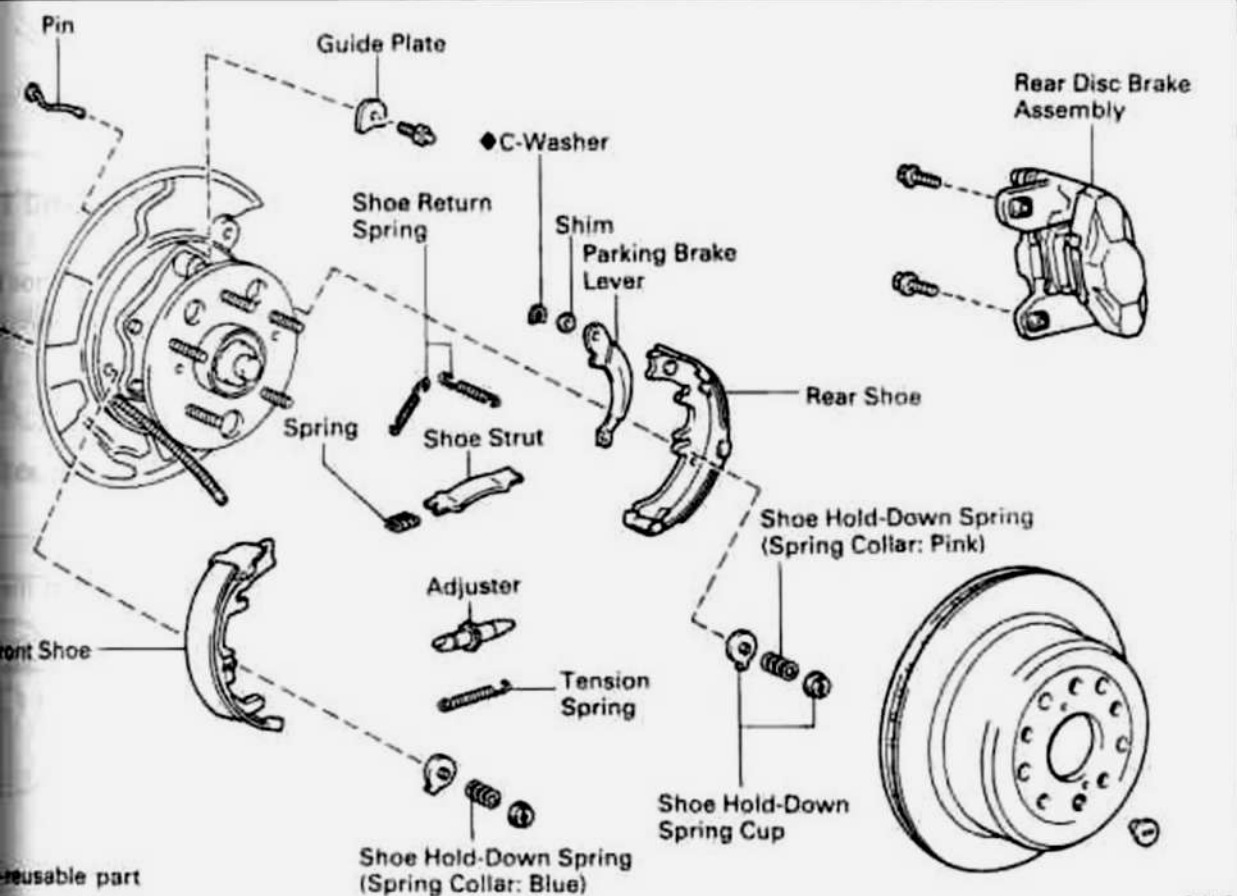
R06918



R10605

REAR BRAKE (Parking Brake) COMPONENTS

BR04E-2A



811167

BR

PARKING BRAKE DISASSEMBLY

BR04E-01

1. REMOVE REAR WHEEL

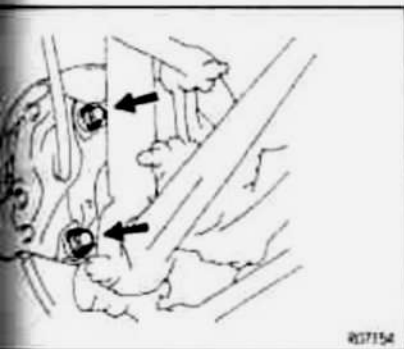
2. REMOVE REAR DISC BRAKE ASSEMBLY

- Remove the 2 mounting bolts and remove the disc brake assembly.
- Suspend the disc brake securely and so the hose is not stretched.

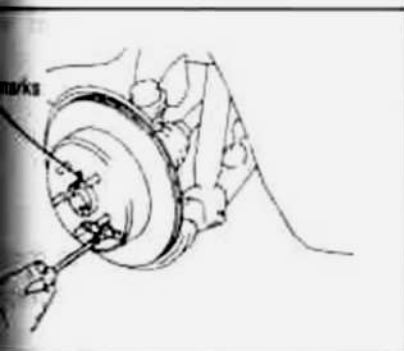
3. REMOVE DISC

- Place matchmarks on the disc and rear axle hub.
- Remove the disc.

HINT: If the disc cannot be removed easily, return the shoe adjuster until the disc turns freely.



R07154





BR5345

4. REMOVE SHOE RETURN SPRINGS

Using needle-nose pliers, remove the 2 shoe return springs.

5. REMOVE SHOE STRUT WITH SPRING

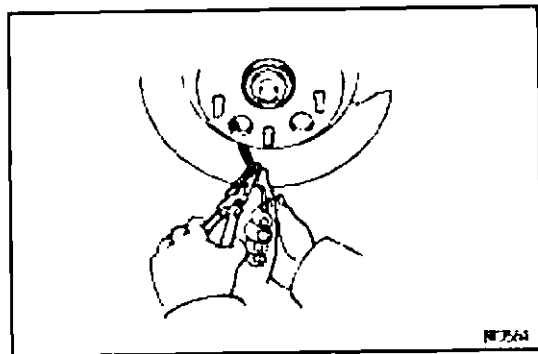
BR5371

6. REMOVE FRONT SHOE, ADJUSTER AND TENSION SPRING

- (a) Slide out the front shoe and remove the shoe adjuster.
- (b) Disconnect the tension spring and remove the front shoe.

7. REMOVE REAR SHOE

- (a) Slide out the rear shoe.
- (b) Remove the tension spring from the rear shoe.



BR5364

- (c) Disconnect the parking brake cable from the parking brake shoe lever.
- (d) Remove the shoe hold-down spring cups, springs, and pins.

PARKING BRAKE COMPONENTS INSPECTION AND REPAIR

1. INSPECT DISASSEMBLED PARTS

Inspect the disassembled parts for wear, rust, and damage.

2. MEASURE BRAKE SHOE LINING THICKNESS

Using a ruler, measure the thickness of the brake lining.

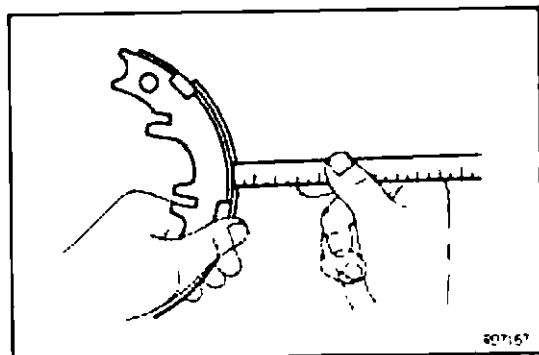
Standard thickness:

2.5 mm (0.098 in.)

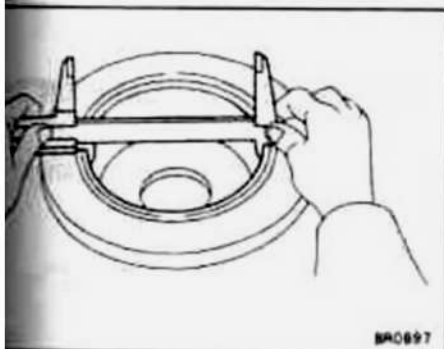
Minimum thickness:

1.0 mm (0.039 in.)

If the lining thickness is at the minimum thickness or less, or if there is severe, uneven wear, replace the brake shoe.



BR7157



3. MEASURE BRAKE DISC INSIDE DIAMETER

Using a vernier caliper, measure the inside diameter of the disc.

Standard inside diameter:

190 mm (7.48 in.)

Maximum inside diameter:

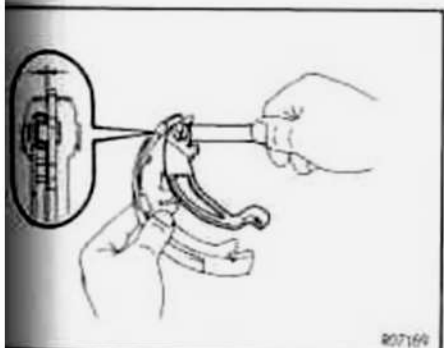
191 mm (7.52 in.)

Replace the disc if the inside diameter is at the maximum value or more. Replace the disc or grind it with a lathe if the disc is badly scored or worn unevenly.



4. INSPECT PARKING BRAKE LINING AND DISC FOR PROPER CONTACT

Apply chalk to the inside surface of the disc, then grind down the brake shoe lining to fit. If the contact between the disc and the brake shoe lining is improper, repair it using a brake shoe grinder or replace the brake shoe assembly.



5. MEASURE CLEARANCE BETWEEN PARKING BRAKE SHOE AND LEVER

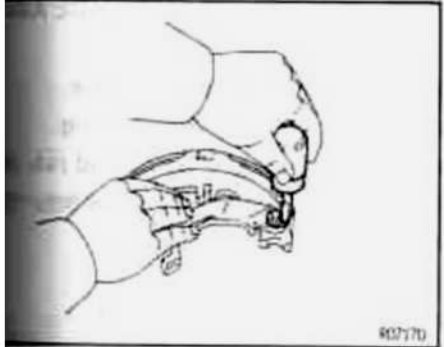
Using a feeler gauge, measure the clearance.

Standard clearance:

Less than 0.35 mm (0.0138 in.)

If the clearance is not within the specification, replace the shim with one of the correct size.

Thickness	mm(in.)	Thickness	mm(in.)
0.3	(0.012)	0.8	(0.031) (2JZ—GTE only)
0.6	(0.024)	0.9	(0.035) (2JZ—GE only)



6. IF NECESSARY, REPLACE SHIM

- (a) Remove the parking brake shoe lever, and install the correct size shim.



- (b) Install the parking brake shoe lever with a new C-washer.
- (c) Remeasure the clearance.

PARKING BRAKE ASSEMBLY

1. APPLY HIGH TEMPERATURE GREASE ON THE PARTS:

- (a) Rubbing surfaces of the backing plate and shoe

- (b) Adjuster

2. CONNECT PARKING BRAKE CABLE TO PARKING BRAKE LEVER

- (a) Install the shoe hold—down springs, cups and pins.
(b) Connect the parking brake cable to the parking brake shoe lever of the rear shoe.

3. INSTALL REAR SHOE

Slide in the rear shoe between the shoe hold—down spring cup and the backing plate.

NOTICE: Do not allow oil or grease to get on the rubbing face.

4. INSTALL TENSION SPRING, FRONT SHOE AND ADJUSTER

- (a) Install the tension spring on the rear shoe.
(b) Install the front shoe on the tension spring.
(c) Install the adjuster between the front and rear shoes.
(d) Slide in the front shoe between the shoe hold—down spring cup and the backing plate.

5. INSTALL STRUT WITH SPRING

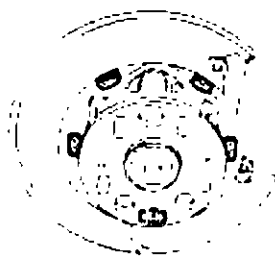
Install the strut with the spring forward.

6. INSTALL SHOE RETURN SPRINGS

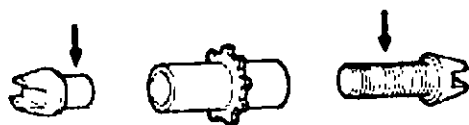
Using SST, install the front shoe return spring, then install the rear shoe return spring.
SST 09718—20010

7. INSTALL DISC

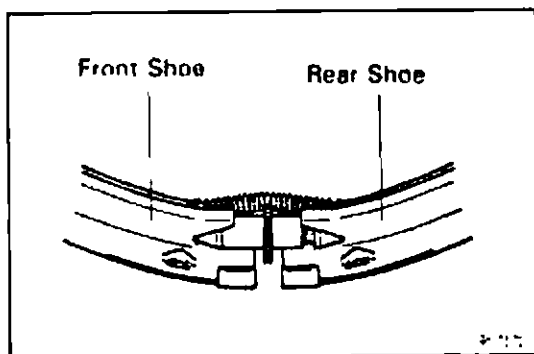
- (a) Before installing, polish the disc and shoe surfaces with sandpaper.
(b) Align the matchmarks and install the disc.



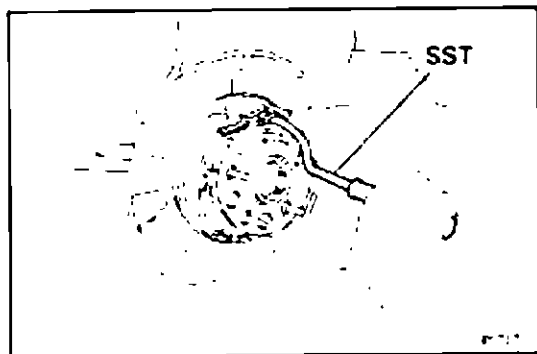
SP-12



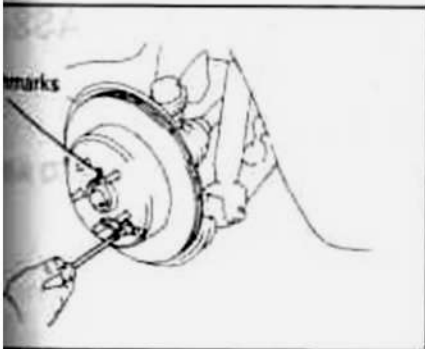
SP-13



SP-14



SP-15



HINT: If there are no matchmarks, temporarily install the disc, then measure the disc runout and install the disc in the position.

(See page BR-30 or BR-34)

8. ADJUST PARKING BRAKE SHOE CLEARANCE

- Temporarily install the hub nuts.
- Remove the hole plug.
- Turn the adjuster and expand the shoes until the disc locks.
- Return the adjuster 8 notches.
- Install the hole plug.

9. INSTALL REAR DISC BRAKE ASSEMBLY

Install the disc brake assembly and torque the 2 mounting bolts.

Torque: 104 N·m (1,065 kgf·cm, 77 ft·lbf)

10. INSTALL REAR WHEEL

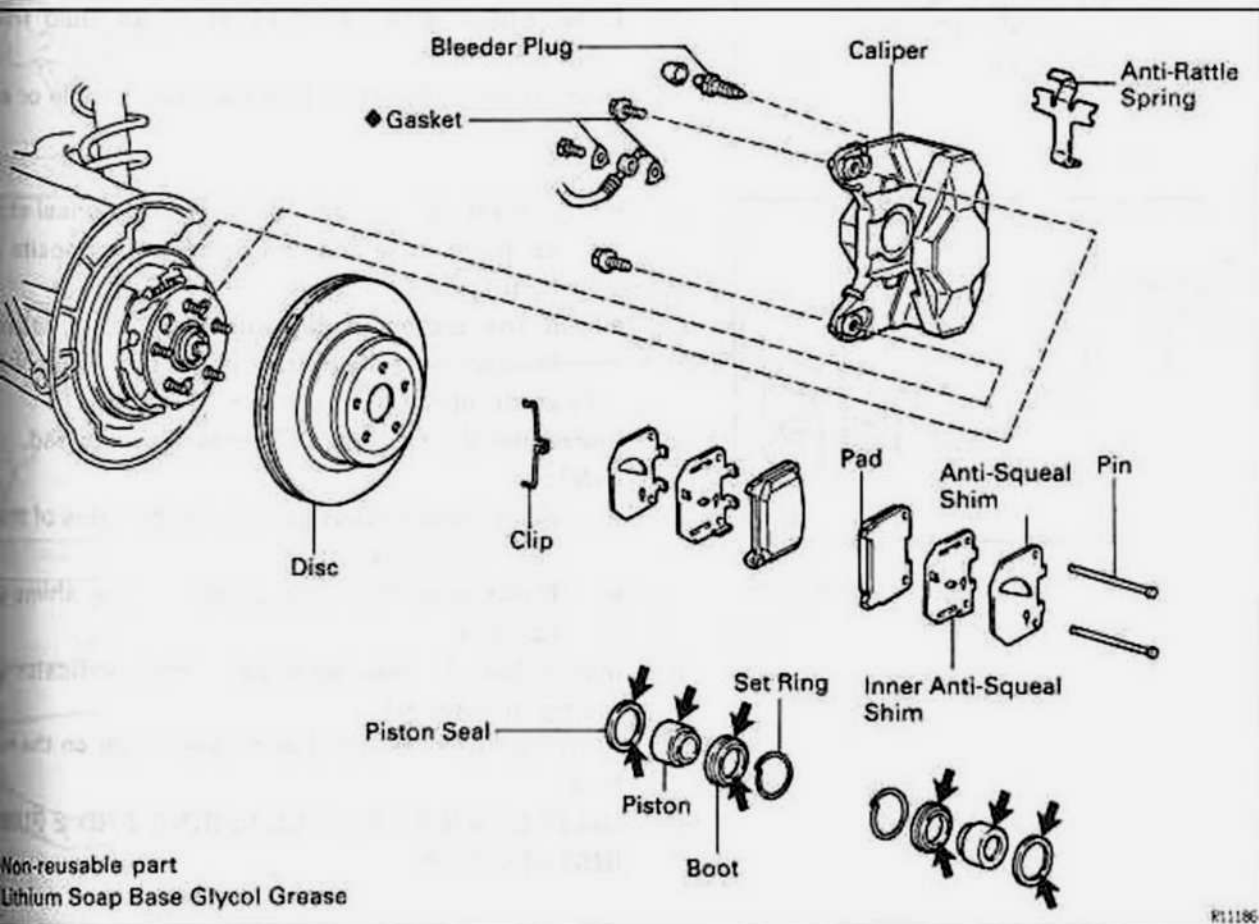
11. SETTLING PARKING BRAKE SHOES AND DISC

- Drive the vehicle at about 50 km/h (31 mph) on a safe, level and dry road.
- With the parking brake release button pushed in, pull on the lever with 88 N (9 kgf, 19.8 lbf) of force.
- Drive the vehicle for about 400 meters (0.25 mile) in this condition.
- Repeat this procedure 2 or 3 times.

12. CHECK AND ADJUST PARKING BRAKE LEVER TRAVEL

REAR BRAKE (2JZ—GTE) COMPONENTS

BR0AX-06



Non-reusable part
Lithium Soap Base Glycol Grease

BR

R11186

BR0UG-02

BRAKE PADS REPLACEMENT

1. REMOVE REAR WHEEL

Remove the wheel and temporarily fasten the disc with the hub nuts.

2. INSPECT PAD LINING THICKNESS

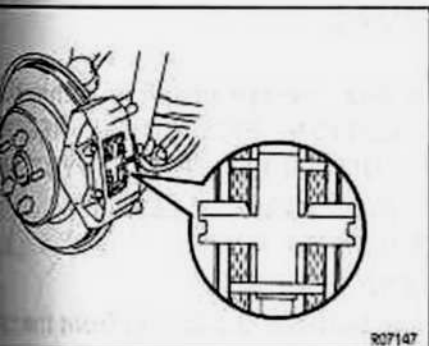
Check the pad thickness and replace pads if not within specification.

Minimum thickness: 1.0 mm (0.039 in.)

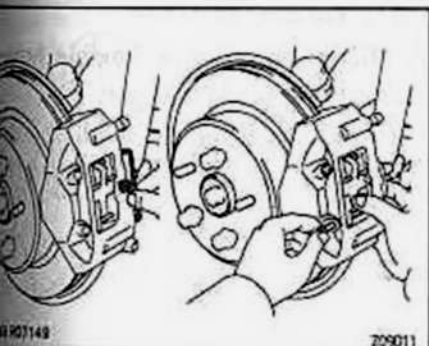
3. REMOVE THESE PARTS:

- Clip and 2 pins
- Anti-rattle spring
- 2 pads
- 4 anti-squeal shims

NOTICE: The anti-rattle springs and clip can be used again provided that they have sufficient rebound, no deformation, cracks or wear, and have had all rust, dirt and foreign particles cleaned off.

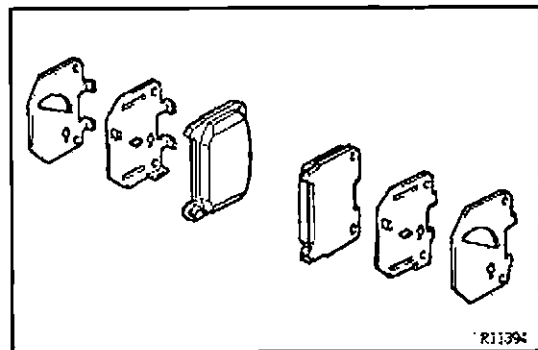
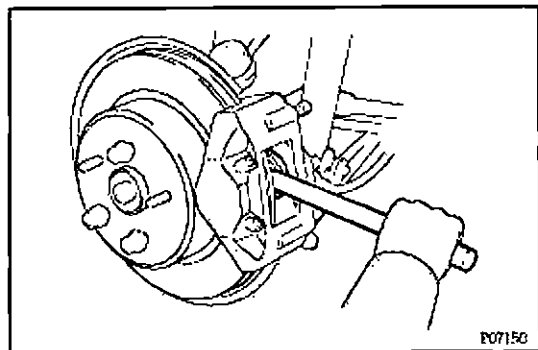


R07147



R07148

Z09011



4. CHECK DISC THICKNESS AND RUNOUT (See page BR—34)

5. INSTALL NEW PADS

NOTICE: When replacing worn pads, the anti-squeal shims must be replaced together with the pads.

- Draw out a small amount of brake fluid from the reservoir.
- Press in the pistons with a hammer handle or equivalent.

HINT:

- Always change the pads on one wheel at a time as there is a possibility of the opposite piston flying out.
- If the piston is difficult to push in, loosen the bleeder plug and push in the piston while letting some brake fluid escape.

- Install the 2 anti-squeal shims on each pad.

HINT:

- Apply disc brake grease to both sides of the anti-squeal shim.
- Make sure that the arrow on the shims points upward.

- Install the 2 pads with pad wear indicator pins facing downward.

NOTICE: Do not allow oil or grease to get on the rubber face.

6. INSTALL ANTI—RATTLE SPRING AND 2 PINS

7. INSTALL CLIP

CALIPER REMOVAL

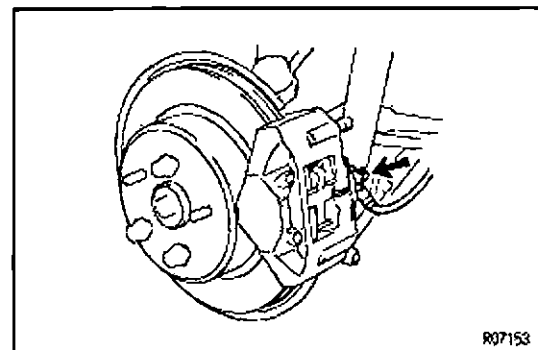
Installation is in the reverse order of removal.
AFTER INSTALLATION, FILL BRAKE RESERVOIR WITH BRAKE FLUID, BLEED BRAKE SYSTEM (See page BR—7) AND CHECK FOR LEAKS

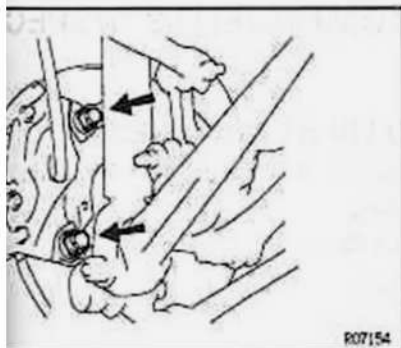
- REMOVE REAR WHEEL
- DISCONNECT BRAKE HOSE

- Remove the union bolt and 2 gaskets from the caliper then disconnect the brake hose from the caliper.
Torque: 30 N·m (310 kgf·cm, 22 ft·lbf)

INSTALLATION HINT: Install the flexible hose securely in the lock hole in the caliper.

- Use a container to catch the brake fluid.

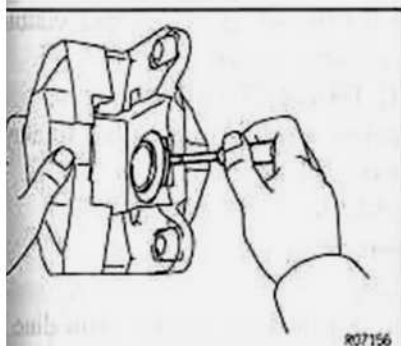


**3. REMOVE CALIPER**

Remove the 2 mounting bolts and caliper.
Torque: 104 N·m (1,065 kgf·cm, 77 ft·lbf)

4. REMOVE THESE PARTS:

- (a) Clip
- (b) 2 pins
- (c) Anti-rattle spring
- (d) 2 pads
- (e) 4 anti-squeal shims

**CALIPER DISASSEMBLY**

Assembly is in the reverse order of disassembly.

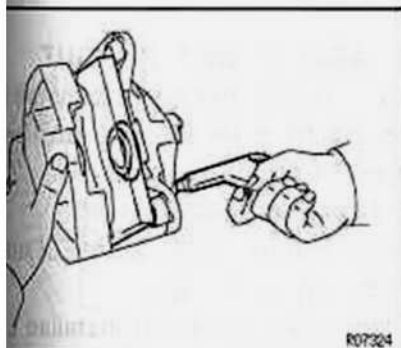
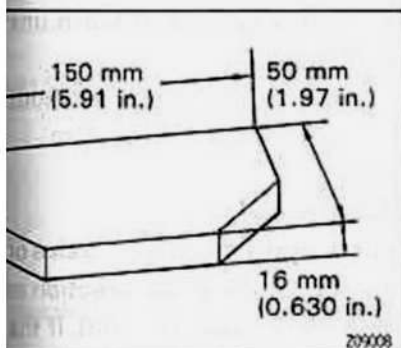
ASSEMBLY NOTICE: Apply lithium soap base glycol grease to the parts indicated by the arrows (See page BR-31).

1. REMOVE CYLINDER BOOT SET RINGS AND BOOTS

Using a screwdriver, remove the 2 cylinder boot set rings and 2 boots.

2. REMOVE PISTONS FROM CYLINDER

- (a) Prepare a wooden plate to hold the pistons.

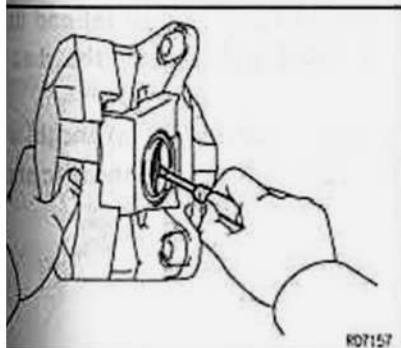


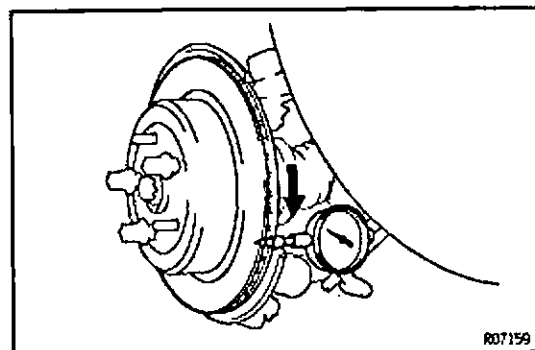
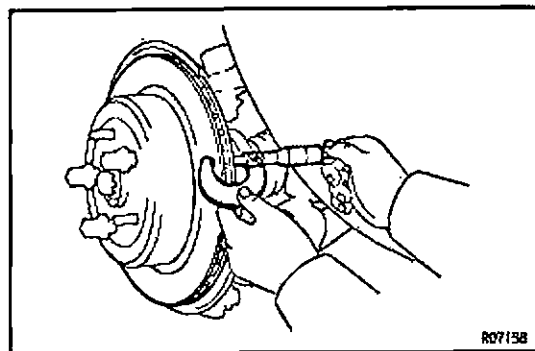
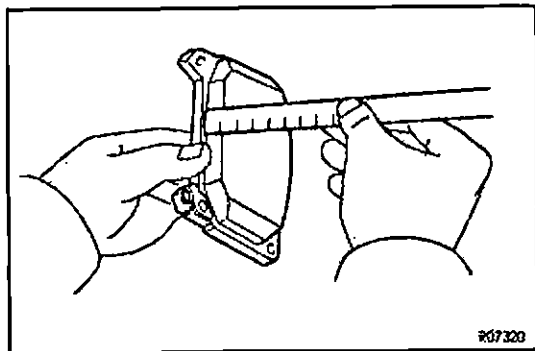
- (b) Place the plate between the pistons and insert a pad on one side.
- (c) Use compressed air to remove the pistons alternately from the caliper.

DISASSEMBLY CAUTION: Do not place your fingers in front of the pistons when using compressed air.

3. REMOVE PISTON SEALS

Using a screwdriver, remove the 2 seals from the cylinder.





REAR BRAKE COMPONENTS INSPECTION AND REPAIR

1. MEASURE PAD LINING THICKNESS

Using a ruler, measure the lining thickness.

Standard thickness:

11.0 mm (0.433 in.)

Minimum thickness:

1.0 mm (0.039 in.)

Replace the pads if the thickness is less than the minimum (the 1.0 mm slit is no longer visible) or shows signs of uneven wear.

2. MEASURE DISC THICKNESS

Using a micrometer, measure the disc thickness.

Standard thickness:

16.0 mm (0.630 in.)

Minimum thickness:

15.0 mm (0.591 in.)

Replace the disc if the thickness of the disc is at the minimum thickness or less. Replace the disc or grind it on a lathe if it is badly scored or worn unevenly.

3. MEASURE DISC RUNOUT

Using a dial indicator, measure disc runout (0.39 in.) from the outer edge of the disc.

Maximum disc runout:

0.05 mm (0.0020 in.)

If the disc's runout is at the maximum value or greater, check the bearing play in the axial direction and the axle hub runout (See page SA—38). If the bearing play and axle hub runout are not abnormal, adjust the disc runout.

4. IF NECESSARY, ADJUST DISC RUNOUT

- (a) Remove the hub nuts and the disc. Reinstall the disc 1/5 of a turn round from its original position on the hub. Install and torque the hub nuts.

Torque: 103 N·m (1,050 kgf·cm, 76 ft·lbf)

Remeasure the disc runout. Make a note of the runout and the disc's position on the hub.

- (b) Repeat (a) until the disc has been installed on all remaining hub positions.
- (c) If the minimum runout recorded in (a) and (b) is less than 0.05 mm (0.0020 in.), install the disc in its original position.
- (d) If the minimum runout recorded in (a) and (b) is greater than 0.05 mm (0.0020 in.), replace the disc and repeat step 3.



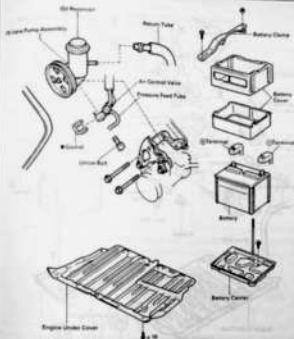
7. INSTALL STEERING WHEEL PAD

- Connect the airbag connector.
- Install the pad after confirming that the circumferential groove of the torx screw is caught on the screw fix.
- Using a torx socket wrench, torque the 2 screws. Torque: 7.5 Nm (72 kgf-cm, 62 in.-lb).

NOTICE:

- Make sure the pad is installed to the specific torque.
- If the pad has been dropped, or there are cracks, dents or other defects in the case or sometimes replace the pad with a new one.
- When installing the pad, take care that the airbag does not interfere with other parts and is not attached between other parts.

8. CHECK STEERING WHEEL CENTER POINT

POWER STEERING VANE PUMP COMPONENTS
2JZ-GE

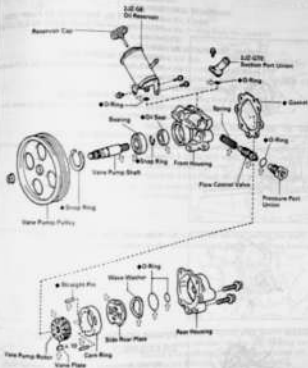
COMPONENTS

2JZ - GTE:

COMPONENTS



● Non-removable part



● Non-removable part

○ Power steering fluid

POWER STEERING VANE PUMP REMOVE

1. REMOVE ENGINE UNDER COVER

Remove the 10 screws.

2. REMOVE BATTERY

3. 2JZ-GTE:

REMOVE AIR HOSE NO.5

4. 2JZ-GTE:

DISCONNECT OIL RESERVOIR TO PUMP HOSE
NOTICE: Take care not to spill fluid on the A/C compressor rotor.

5. 2JZ-GE:

DISCONNECT RETURN TUBE

NOTICE: Take care not to spill fluid on the A/C compressor rotor.

6. 2JZ-GTE:

REMOVE VANE PUMP PULLEY

Using SST to stop the pulley rotating, remove the SST DB860-10010

7. REMOVE PRESSURE FEED TUBE

Using a spanner (24 mm) to hold the pressure union, remove the union bolt and gasket.

8. REMOVE PS VANE PUMP ASSEMBLY

Remove the 2 bolts.

POWER STEERING VANE PUMP DISASSEMBLY

NOTICE: When using a vice, do not overtighten it.

1. 2JZ-GE:

REMOVE VANE PUMP PULLEY

Using SST to stop the pulley rotating, remove the SST DB860-10010



2. MEASURE PS VANE PUMP ROTATING TORQUE

(a) Check that the shaft rotates smoothly without abnormal noise.

(b) Temporarily install the pulley set nut, and using a torque wrench, check the pump rotating torque.
Rotating torque: 6.2 N·m (2.5 kgf·cm, 2.2 lb·ft) or less

3. 2JZ-GE:

REMOVE OIL RESERVOIR

(a) Remove the 3 bolts.

(b) Remove the O-ring from the reservoir.

4. 2JZ-GTE:

REMOVE SUCTION PORT UNION

(a) Remove the bolt.

(b) Remove the O-ring from the union.

5. REMOVE PRESSURE PORT UNION, FLOW CONTROL VALVE AND SPRING

Remove the O-ring from the union.

6. REMOVE REAR HOUSING

Remove the 2 bolts.

7. REMOVE CAM RING, ROTOR AND 10 VANE PLATES

NOTICE: Take care to not drop the vane plates.

8. REMOVE 2 STRAIGHT PINS

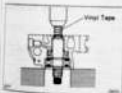
9. REMOVE GASKET

10. REMOVE VANE PUMP SHAFT WITH BEARING

(a) Using snap ring pliers, remove the snap ring from the front housing.

(b) Wind vinyl tape on the separated part of the shaft.

(c) Using a press, press out the shaft with the bearing.



11. REMOVE SIDE REAR PLATE AND WAVE WASHER

(a) Using a plastic hammer, tap the rear housing on the shaded area until the plate and washer come off.

(b) Remove the 2 O-rings from the rear housing.

POWER STEERING VANE PUMP INSPECTION AND REPLACEMENT

1. MEASURE OIL CLEARANCE BETWEEN VANE PUMP SHAFT AND BUSHING

NOTICE: When using a vice, do not overtighten it.

Using a micrometer and caliper gauge, measure the clearance.

	Oil clearance
Standard	0.02 – 0.05 (0.0012 – 0.0020)
Maximum	0.07 (0.0028)

2. INSPECT VANE PUMP ROTOR AND VANE PLATE

(a) Using a micrometer, measure the height, thickness and length of the 10 vane plates.

	Minimum
Height	8.8 (0.350)
Thickness	1.40 (0.0551)
Length	10.95 (0.4310)

(b) Using a feeler gauge, measure the clearance between the rotor groove and plate.

	Clearance
Maximum	0.03 (0.0012)

If more than maximum, replace the plate and/or rotor with one having the same mark stamped on the ring.

Inscribed mark:

1, 2, 3, 4 or None

NOTE: There are 5 vane lengths with the follow rotor and vanes ring marks:

Ring number	Vane plate length (mm/in)
None	14.955 – 15.001 (0.5887 – 0.5906)
1	14.957 – 14.998 (0.5883 – 0.5901)
2	14.950 – 14.987 (0.5881 – 0.5894)
3	14.940 – 14.979 (0.5881 – 0.5891)
4	14.931 – 14.970 (0.5878 – 0.5892)

3. INSPECT FLOW CONTROL VALVE

(a) Coat the valve with power steering fluid and push that it falls smoothly into the valve hole for 25.0N weight.

(b) Check the valve for leakage. Close one of the holes and apply 392 – 490 kPa (4 – 5 kgf/cm², 57 – 71 psi) of compressed air into the opposite side, and confirm that air does not come out from the end holes.

If necessary, replace the valve with one having the same letter as inscribed on the front housing. Inscribed mark:

A, B, C, D, E or F

4. INSPECT SPRING

Using calipers, measure the free length of the spring.

	Free length	min (in)
Minimum	22 (0.86)	

5. IF NECESSARY, REPLACE OIL SEAL

(a) Using SST, tap out the oil seal.

SST 29631 – 10030

NOTICE: Be careful not to damage the bushing of the front housing.

(b) Coat a new oil seal lip with power steering fluid.

(c) Using a socket wrench (24 mm), press in the oil seal. NOTICE: Make sure you install the oil seal facing the correct direction.



- 6. IF NECESSARY, REPLACE BEARING**
- Using a press, press out the bearing.
 - Using snap ring pliers, remove the snap ring from the vane pump shaft.
 - Using snap ring pliers, install a new snap ring.



- Using a press, press in a new bearing.



POWER STEERING VANE PUMP ASSEMBLY

NOTICE: When using a vice, do not overtighten a COAT WITH POWER STEERING FLUID
(See page SR-26)

- INSTALL VANE PUMP SHAFT WITH BEARING**
- Wind vinyl tape on the serrated part of the shaft.
- Using SST, press in the shaft with the bearing in front housing.

SST 09408-30012 (09408-34030)

NOTICE: Be careful not to damage the oil seal.

- Using snap ring pliers, install a new snap ring in front housing.
- INSTALL STRAIGHT PINS**
 - Using a plastic hammer, drive in 2 new straight pins the front housing.

4. INSTALL CAM RING

Align the holes of the ring and straight pins, and install the ring with the inscribed mark facing outward.

5. INSTALL VANE PUMP ROTOR

Install the rotor with the inscribed mark facing outward.



6. INSTALL 10 VANE PLATES

- Install the plate with the round end facing outward.
- INSTALL GASKET**
- Install a new gasket to the front housing.



8. INSTALL SIDE REAR PLATE

Align the holes of the plate and straight pins.

NOTICE: Make sure you install the plate facing the correct direction.



9. INSTALL WAVE WASHER

Install the washer so that its protrusions fit into the slots in the side rear plate.

10. INSTALL REAR HOUSING

- Coat 2 new O-rings with power steering fluid.
- Install the 2 O-rings to the housing.
- Torque the 2 bolts.

Torque: 17 N·m (170 kgf·cm, 12 ft·lb)

11. INSTALL SPRING, FLOW CONTROL VALVE AND PRESSURE PORT UNION

- Coat a new O-ring with power steering fluid and install it to the union.

Torque the union.

Torque: 63 N·m (650 kgf·cm, 41 ft·lb)

12. 2JZ-GTE

INSTALL SUCTION PORT UNION

- Install a new O-ring to the union.

Torque the bolt.

Torque: 13 N·m (130 kgf·cm, 9 ft·lb)

13. 2JZ-GE

INSTALL OIL RESERVOIR

- Coat a new O-ring with power steering fluid and install it to the reservoir.

Torque the 3 bolts.

Torque:

Front side bolts: 13 N·m (130 kgf·cm, 9 ft·lb)

Rear side bolts: 17 N·m (170 kgf·cm, 12 ft·lb)

- MEASURE PS VANE PUMP ROTATING TORQUE**
(See page SR-27)



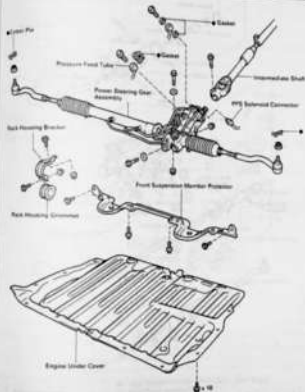
15. **2JZ-GTE:**
INSTALL VANE PUMP PULLEY
 Using SST to stop the pulley rotating, torque the nut SST 09960-10010
 Torque: 43 N·m (440 kgf·cm, 32 ft·lb)



POWER STEERING VANE PUMP INSTALLATION

- 1. INSTALL VANE PUMP ASSEMBLY**
 Torque the 2 bolts.
 Torque: 58 N·m (590 kgf·cm, 42 ft·lb)
- 2. CONNECT PRESSURE FEED TUBE**
 Using a spanner (24 mm) to hold the pressure on union, torque the union bolt with a new gasket.
 HINT: Make sure the stopper is touching the (a) housing as shown, then torque the union bolt.
 Torque: 49 N·m (500 kgf·cm, 36 ft·lb)
- 3. 2JZ-GTE:**
INSTALL VANE PUMP PULLEY
 Using SST to stop the pulley rotating, torque the nut SST 09960-10010
 Torque: 43 N·m (440 kgf·cm, 32 ft·lb)
- 4. 2JZ-GTE:**
CONNECT RETURN TUBE
- 5. 2JZ-GTE:**
CONNECT OIL RESERVOIR TO PUMP HOSE
- 6. 2JZ-GTE:**
INSTALL AIR HOSE NO.5
- 7. INSTALL BATTERY**
- 8. INSTALL ENGINE UNDER COVER**
 Install the 10 screws.

POWER STEERING GEAR COMPONENTS



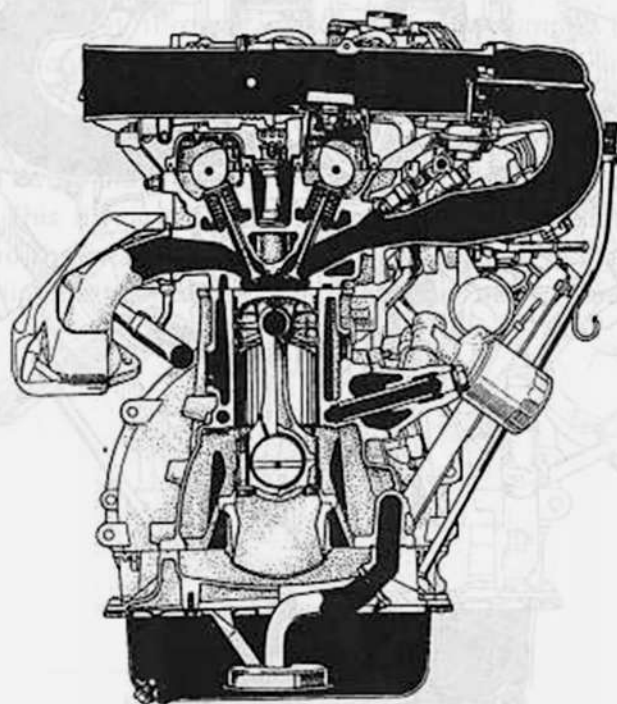
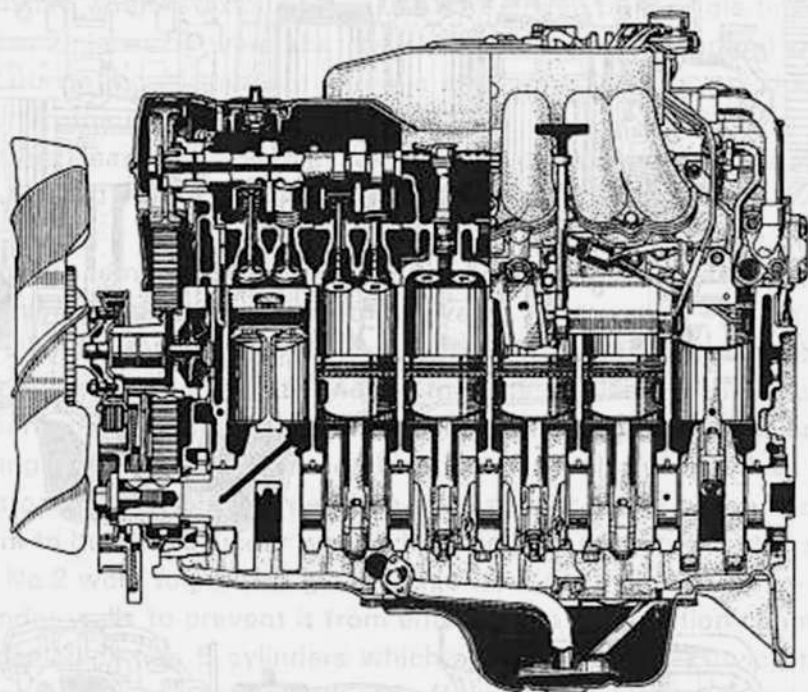
ENGINE MECHANICAL

DESCRIPTION

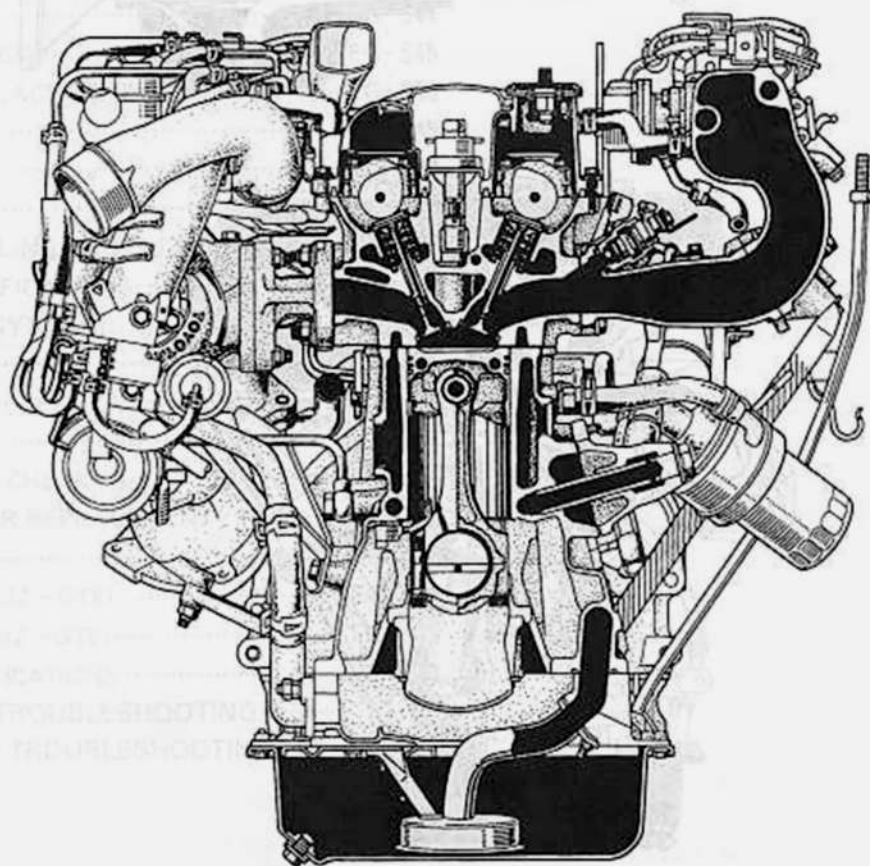
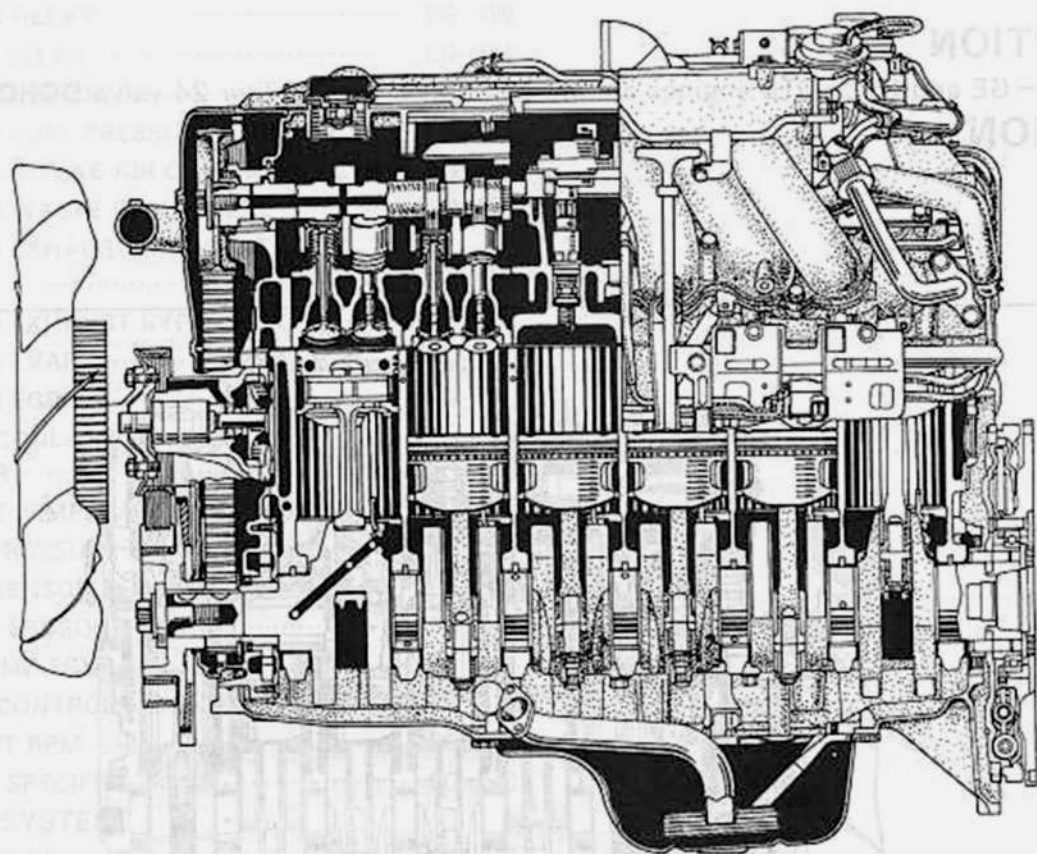
The 2JZ-GE and 2JZ-GTE engines are in-line 6 cylinder, 3.0 liter 24 valve DOHC engines. EG090-03

OPERATION

2JZ-GE



2JZ-GTE



The 2JZ—GE and 2JZ—GTE engines are in—line, 6 cylinder engine with the cylinders numbered 1 — 2 — 3 — 4 — 5 — 6 from the front. The crankshaft is supported by 7 aluminium alloy bearing. The crankshaft is integrated with 12 weights for balance. Oil holes are placed in the center of the crankshaft to supply oil to the connecting rods, bearings, pistons and other components.

The firing order is 1 — 5 — 3 — 6 — 2 — 4. The cylinder head is also made of aluminum alloy, with a cross—flow type intake and exhaust layout and with pentroof type combustion chambers. The spark plugs are located in the center of the combustion chambers to increase anti—knocking performance and combustion efficiency.

The intake manifold has 6 independent long ports and utilizes the inertial super—charging effect to improve engine torque at low and medium speeds.

Both the intake camshaft and the exhaust camshaft are driven by a single timing belt. The cam journal is supported at 7 places between the valve lifters of each cylinder and on the front end of the cylinder head. Lubrication of the cam journals and cams are accomplished by oil supplied through the oiler port in the center of the camshaft.

Adjustment of the valve clearance is done by means of an outer shim type system, in which valve adjusting shims are located above the valve lifters. The shims can be replaced without removing the camshafts.

Pistons are made of high temperature—resistant aluminium alloy, and a depression is built into the piston head to prevent interference with the valves.

Piston pins are the full floating type, with the pins fastened to neither piston boss nor connecting rods. Instead, snap rings are fitted on both ends of the pins, preventing the pins from falling out. The No.1 compression ring is made of stainless steel and the No.2 compression ring is made of cast iron. The oil ring also is made of a combination of steel and stainless steel. The outer diameter of each piston ring is slightly larger than the diameter of the piston and the flexibility of the rings allows them to hug the cylinder walls when they are mounted on the piston. Compression rings No.1 and No.2 work to prevent gas leakage from the cylinder and an oil ring works to clear oil off the cylinder walls to prevent it from entering the combustion chambers.

The cast iron cylinder block has 6 cylinders which are approximately twice the length of the piston stroke. The top of the cylinders are closed off by the cylinder head and the lower end of the cylinders becomes the crankcase, in which the crankshaft is installed. In addition, the cylinder block contains a water jacket, through which coolant is pumped to cool the cylinders.

The No.1 and No.2 oil pans are bolted onto the bottom of the cylinder block. The No.1 oil pan is made of aluminum alloy. The No.2 oil pan is an oil reservoir made of pressed sheet steel. An oil level sensor is installed in the No.1 oil pan (If the oil level drops below a set level, a warning light lights up.). An oil pan baffle plate keeps sufficient oil in the bottom of the No.2 oil pan even when the vehicle is tilted. This dividing plate also prevents the oil from sloshing when the vehicle is stopped suddenly and the oil shifts away from the oil pump suction pipe.

Plastic region tightening bolts are used for the cylinder head, main bearing caps and connecting rods.

SERVICE SPECIFICATIONS

SERVICE DATA

SDPW-07

Engine tune-up	Battery		
	Specific gravity		
	(Except Maintenance-Free Battery)		
		at 20°C (68°F)	1.27 — 1.29
	Voltage (Maintenance-Free Battery)		
		at 20°C (68°F)	12.7 — 12.9 V
	High-tension cord resistance	Limit	25 kΩ per cord
	Valve clearance	Intake	0.15 — 0.25 mm (0.006 — 0.010 in.)
		Exhaust	0.25 — 0.35 mm (0.010 — 0.014 in.)
	Valve clearance adjusting shim (for repair part)		
		Mark 2.500	2.500 mm (0.0984 in.)
		Mark 2.550	2.550 mm (0.1004 in.)
		Mark 2.600	2.600 mm (0.1024 in.)
		Mark 2.650	2.650 mm (0.1043 in.)
		Mark 2.700	2.700 mm (0.1063 in.)
		Mark 2.750	2.750 mm (0.1083 in.)
		Mark 2.800	2.800 mm (0.1102 in.)
		Mark 2.850	2.850 mm (0.1122 in.)
		Mark 2.900	2.900 mm (0.1142 in.)
		Mark 2.950	2.950 mm (0.1161 in.)
		Mark 3.000	3.000 mm (0.1181 in.)
		Mark 3.050	3.050 mm (0.1201 in.)
		Mark 3.100	3.100 mm (0.1220 in.)
		Mark 3.150	3.150 mm (0.1240 in.)
		Mark 3.200	3.200 mm (0.1260 in.)
		Mark 3.250	3.250 mm (0.1280 in.)
		Mark 3.300	3.300 mm (0.1299 in.)
	Ignition timing		10° BTDC @ idle (w/ Terminals TE1 and E1 connected of DLC1)
	Idle speed	2JZ-GE	700 ± 50 rpm
		2JZ-GTE	650 ± 50 rpm
Intake manifold vacuum	at idle speed	2JZ-GE	66.6 kPa (500 mmHg, 19.7 in.Hg) or more
		2JZ-GTE	60 kPa (450 mmHg, 17.7 in.Hg) or more
Compression pressure	at 250 rpm	2JZ-GE STD	1,275 kPa (13.0 kgf/cm², 185 psi) or more
		Limit	1,079 kPa (11.0 kgf/cm², 156 psi)
		2JZ-GTE STD	1,079 kPa (11.0 kgf/cm², 156 psi) or more
		Limit	883 kPa (9.0 kgf/cm², 128 psi)
	Difference of pressure between each cylinder		98 kPa (1.0 kgf/cm², 14 psi) or less
Timing belt tensioner	Protrusion (from housing side)		8.0 — 8.8 mm (0.315 — 0.346 in.)
Valve guide bushing	Inside diameter		6.010 — 6.030 mm (0.2366 — 0.2374 in.)
	Outside diameter (for repair part)	STD	11.033 — 11.044 mm (0.4344 — 0.4348 in.)
		O/S 0.05	11.083 — 11.094 mm (0.4363 — 0.4368 in.)

Cylinder head	Warpage		
	Cylinder block side	Limit	0.10 mm (0.0039 in.)
	Intake manifold side	Limit	0.10 mm (0.0039 in.)
	Exhaust manifold side	Limit	0.10 mm (0.0039 in.)
	Valve guide bore diameter	STD	10.985 — 11.006 mm (0.4325 — 0.4333 in.)
		O/S 0.05	11.035 — 11.056 mm (0.4344 — 0.4353 in.)
	Valve seat		
	Refacing angle		15°, 45°, 60°
	Contacting angle		45°
	Contacting width	Intake	1.0 — 1.4 mm (0.039 — 0.055 in.)
Valve		Exhaust	1.2 — 1.6 mm (0.047 — 0.063 in.)
	Cylinder head bolt diameter	STD	10.6 — 11.0 mm (0.425 — 0.433 in.)
		Limit	10.7 mm (0.421 in.)
	Valve overall length	STD (Intake)	98.29 — 98.79 mm (3.8697 — 3.8894 in.)
		(Exhaust)	98.84 — 99.34 mm (3.8913 — 3.9110 in.)
		Limit (Intake)	98.19 mm (3.8657 in.)
		(Exhaust)	98.74 mm (3.8874 in.)
	Valve face angle		44.5°
	Stem diameter	Intake	5.970 — 5.985 mm (0.2350 — 0.2358 in.)
		Exhaust	5.965 — 5.980 mm (0.2348 — 0.2354 in.)
Valve spring	Stem oil clearance	STD (Intake)	0.025 — 0.060 mm (0.0010 — 0.0024 in.)
		(Exhaust)	0.030 — 0.065 mm (0.0012 — 0.0026 in.)
		Limit (Intake)	0.08 mm (0.0031 in.)
		(Exhaust)	0.10 mm (0.0039 in.)
	Margin thickness	STD	0.8 — 1.2 mm (0.031 — 0.047 in.)
		Limit	0.5 mm (0.020 in.)
	Deviation	Limit	2.0 mm (0.079 in.)
	Free length	Blue painted mark	41.74 mm (1.6433 in.)
		Yellow painted mark	41.70 mm (1.6417 in.)
	Installed tension at 34.5 mm (1.358 in.)		188 — 208 N (19.0 — 21.0 kgf, 41.9 — 46.3 lbf)
Valve lifter	Lifter diameter		30.968 — 30.976 mm (1.2191 — 1.2195 in.)
	Lifter bore diameter		31.000 — 31.016 mm (1.2205 — 1.2211 in.)
	Oil clearance	STD	0.024 — 0.050 mm (0.0009 — 0.0020 in.)
		Limit	0.07 mm (0.0028 in.)
Camshaft	Thrust clearance	STD	0.080 — 0.190 mm (0.0031 — 0.0075 in.)
		Limit	0.30 mm (0.0118 in.)
	Cam lobe height	STD (Intake)	44.570 — 44.670 mm (1.7547 — 1.7587 in.)
		(Exhaust)	44.770 — 44.870 mm (1.7628 — 1.7685 in.)
		Limit (Intake)	44.42 mm (1.7488 in.)
		(Exhaust)	44.62 mm (1.7567 in.)
	Journal diameter		28.948 — 28.985 mm (1.1397 — 1.1404 in.)
	Journal oil clearance	STD	0.035 — 0.072 mm (0.0014 — 0.0028 in.)
		Limit	0.10 mm (0.0039 in.)
	Circuit runout	Limit	0.08 mm (0.0031 in.)
Air intake chamber	Warpage	Limit	0.15 mm (0.0059 in.)
Manifold	Warpage	Limit (Intake)	0.15 mm (0.0059 in.)
		(Exhaust)	0.50 mm (0.0196 in.)

Cylinder block	Cylinder head surface warpage	Limit	0.07 mm (0.0028 in.)
	Cylinder bore diameter	STD	86.000 — 86.013 mm (3.3858 — 3.3863 in.)
		Limit	86.02 mm (3.3866 in.)
	Main journal bore diameter (Reference)	Mark 0	66.020 — 66.022 mm (2.59922 — 2.59929 in.)
		Mark 1	66.022 — 66.024 mm (2.59929 — 2.59936 in.)
		Mark 2	66.024 — 66.026 mm (2.59936 — 2.53344 in.)
		Mark 3	66.026 — 66.028 mm (2.59944 — 2.59952 in.)
		Mark 4	66.028 — 66.030 mm (2.59952 — 2.59960 in.)
		Mark 5	66.030 — 66.032 mm (2.59960 — 2.59968 in.)
		Mark 6	66.032 — 66.034 mm (2.59968 — 2.59976 in.)
		Mark 7	66.034 — 66.036 mm (2.59976 — 2.59984 in.)
	Main bearing bolt diameter	STD	9.96 — 9.97 mm (0.3921 — 0.3925 in.)
		Limit	9.7 mm (0.382 in.)
Connecting rod	Thrust clearance	STD	0.250 — 0.402 mm (0.0098 — 0.0158 in.)
		Limit	0.50 mm (0.0197 in.)
	Connecting bolt diameter	STD	8.1 — 8.3 mm (0.319 — 0.327 in.)
		Limit	8.0 mm (0.315 in.)
	Connecting rod oil clearance	STD (STD)	0.035 — 0.053 mm (0.0014 — 0.0021 in.)
		(U/S 0.25)	0.040 — 0.078 mm (0.0016 — 0.0031 in.)
		Limit (STD)	0.08 mm (0.0031 in.)
	Connecting rod big end inside diameter (Reference)	(U/S 0.25)	0.09 mm (0.0035 in.)
		Mark 1	55.025 — 55.031 mm (2.1633 — 2.1666 in.)
		Mark 2	55.031 — 55.037 mm (2.1666 — 2.1668 in.)
		Mark 3	55.037 — 55.043 mm (2.1668 — 2.1670 in.)
	Connecting rod bearing center wall thickness (Reference)	STD (Mark 1)	1.492 — 1.495 mm (0.0587 — 0.0589 in.)
		(Mark 2)	1.495 — 1.498 mm (0.0589 — 0.0590 in.)
		(Mark 3)	1.498 — 1.501 mm (0.0590 — 0.0591 in.)
		(Mark 4)	1.501 — 1.504 mm (0.0591 — 0.0592 in.)
		(Mark 5)	1.504 — 1.507 mm (0.0592 — 0.0593 in.)
	Bushing inside diameter		22.005 — 22.014 mm (0.8663 — 0.8667 in.)
	Piston pin diameter		21.997 — 22.006 mm (0.8660 — 0.8664 in.)
	Piston pin oil clearance	STD	0.005 — 0.011 mm (0.0002 — 0.0004 in.)
		Limit	0.05 mm (0.0020 in.)
	Rod out-of-alignment per 100 mm (3.94 in.)	Limit	0.05 mm (0.0020 in.)
	Rod twist per 100 mm (3.94 in.)	Limit	0.15 mm (0.0059 in.)
Piston and Piston ring (JZ-GE)	Piston diameter		85.935 — 85.945 mm (3.3833 — 3.3837 in.)
	Piston oil clearance	STD	0.055 — 0.078 mm (0.0022 — 0.0031 in.)
		Limit	0.10 mm (0.0039 in.)
	Piston ring groove clearance	No.1	0.011 — 0.070 mm (0.0004 — 0.0028 in.)
		No.2	0.030 — 0.070 mm (0.0012 — 0.0028 in.)
	Piston ring end gap	STD (No.1)	0.300 — 0.470 mm (0.0118 — 0.0185 in.)
		(No.2)	0.350 — 0.520 mm (0.0138 — 0.0205 in.)
		(Oil)	0.130 — 0.450 mm (0.0051 — 0.0177 in.)
		Limit (No.1)	1.07 mm (0.0421 in.)
		(No.2)	1.12 mm (0.0441 in.)
		(Oil)	1.05 mm (0.0413 in.)

Piston and Piston ring (2JZ—GTE)	Piston diameter		85.917 — 85.927 mm (3.3828 — 3.3830 in.)
	Piston oil clearance	STD	0.073 — 0.096 mm (0.0029 — 0.0038 in.)
		Limit	0.12 mm (0.0047 in.)
	Piston ring groove clearance	No.1	0.040 — 0.080 mm (0.0016 — 0.0031 in.)
		No.2	0.030 — 0.070 mm (0.0012 — 0.0028 in.)
	Piston ring end gap	STD (No.1)	0.300 — 0.400 mm (0.0118 — 0.0157 in.)
		(No.2)	0.350 — 0.450 mm (0.0138 — 0.0178 in.)
		(Oil)	0.130 — 0.380 mm (0.0051 — 0.0150 in.)
		Limit (No.1)	1.00 mm (0.0394 in.)
		(No.2)	1.05 mm (0.0413 in.)
		(Oil)	0.98 mm (0.0386 in.)
Crankshaft	Thrust clearance	STD	0.020 — 0.220 mm (0.0008 — 0.0087 in.)
		Limit	0.30 mm (0.0118 in.)
	Thrust washer thickness	STD	1.940 — 1.990 mm (0.0764 — 0.0783 in.)
	Main journal oil clearance	STD (STD)	0.026 — 0.040 mm (0.0010 — 0.0016 in.)
		(U/S 0.25)	0.025 — 0.061 mm (0.0010 — 0.0024 in.)
		Limit (STD)	0.06 mm (0.0024 in.)
		(U/S 0.25)	0.08 mm (0.0031 in.)
	Main journal diameter	STD	61.984 — 62.000 mm (2.4403 — 2.4409 in.)
		U/S 0.25	61.745 — 61.755 mm (2.4309 — 2.4313 in.)
	Main journal bore diameter (Reference)	Mark 0	66.020 — 66.022 mm (2.59922 — 2.59929 in.)
		Mark 1	66.022 — 66.024 mm (2.59929 — 2.59936 in.)
		Mark 2	66.024 — 66.026 mm (2.59936 — 2.59944 in.)
		Mark 3	66.026 — 66.028 mm (2.59944 — 2.59952 in.)
		Mark 4	66.028 — 66.030 mm (2.59952 — 2.59960 in.)
		Mark 5	66.030 — 66.032 mm (2.59960 — 2.59968 in.)
		Mark 6	66.032 — 66.034 mm (2.59968 — 2.59976 in.)
		Mark 7	66.034 — 66.036 mm (2.59976 — 2.59984 in.)
	Main journal diameter (Reference)	STD (Mark 0)	61.998 — 62.000 mm (2.44086 — 2.44094 in.)
		(Mark 1)	61.998 — 61.998 mm (2.44078 — 2.44086 in.)
		(Mark 2)	61.994 — 61.996 mm (2.44070 — 2.44078 in.)
		(Mark 3)	61.992 — 61.994 mm (2.44063 — 2.44070 in.)
		(Mark 4)	61.990 — 61.992 mm (2.44055 — 2.44063 in.)
		(Mark 5)	61.988 — 61.990 mm (2.44047 — 2.44055 in.)
		(Mark 6)	61.986 — 61.988 mm (2.44039 — 2.44047 in.)
		(Mark 7)	61.984 — 61.986 mm (2.44031 — 2.44039 in.)
	Main bearing center wall thickness (Reference)	Mark 1	1.994 — 1.997 mm (0.0785 — 0.0786 in.)
		Mark 2	1.997 — 2.000 mm (0.0786 — 0.0787 in.)
		Mark 3	2.000 — 2.003 mm (0.0787 — 0.0789 in.)
		Mark 4	2.003 — 2.008 mm (0.0789 — 0.0790 in.)
		Mark 5	2.006 — 2.009 mm (0.0790 — 0.0791 in.)
	Crank pin diameter	STD	51.982 — 52.000 mm (2.0485 — 2.0472 in.)
		U/S 0.25	51.745 — 51.755 mm (2.0372 — 2.0376 in.)
	Crank pin diameter (Reference)	STD (Mark 0)	51.994 — 52.000 mm (2.0470 — 2.0472 in.)
		(Mark 1)	51.988 — 51.994 mm (2.0468 — 2.0470 in.)
		(Mark 2)	51.982 — 51.988 mm (2.0465 — 2.0468 in.)

Crankshaft	Circle runout	Limit	0.06 mm (0.0024 in.)
(cont'd)	Main journal taper and out-of-round	Limit	0.02 mm (0.0008 in.)
	Crank pin taper and out-of-round	Limit	0.02 mm (0.0008 in.)

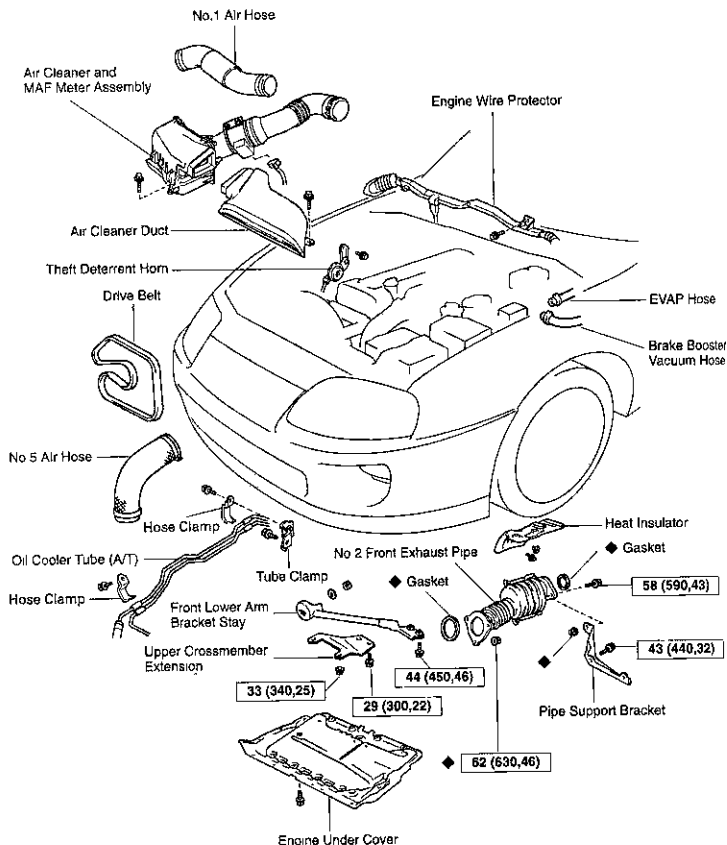
B209L-24

TORQUE SPECIFICATIONS

Part tightened		N-m	kgf-cm	ft-lbf
Cylinder head cover x Cylinder head (2JZ-GE)		8.3	85	74 in.-lbf
Cylinder head cover x Cylinder head (2JZ-GTE)		5.4	55	48 in.-lbf
Timing belt plate x Oil pump (2JZ-GTE)		7.8	80	69
Idle pulley x Oil pump		34	350	25
PS pump front bracket x Cylinder block (2JZ-GE)		58	590	43
PS pump front bracket x Oil pump (2JZ-GE)		52	530	38
Crankshaft pulley x Crankshaft		324	3,300	239
Camshaft timing pulley x Camshaft		79	810	59
Timing belt tensioner x Oil pump		26	270	20
Drive belt tensioner x Cylinder head		21	210	15
Fluid coupling x Water pump		18	185	12
Drive belt tensioner damper x Tensioner arm (2JZ-GTE M/T)		20	200	14
Drive belt tensioner damper x Tensioner bracket (2JZ-GTE M/T)		20	200	14
Upper radiator support x Body		15	155	11
Camshaft bearing cap x Cylinder head		20	200	14
EGR cooler x Cylinder head		8.8	90	78 in.-lbf
ECT sensor x Cylinder head (2JZ-GE)		20	200	14
ECT sender gauge x Cylinder head (2JZ-GE)		20	200	14
Engine hanger x Cylinder head		39	400	29
Camshaft position sensor x Cylinder head (2JZ-GTE)		8.8	90	78 in.-lbf
Cylinder head x Cylinder block	1st	34	350	25
	2nd	Turn 90°		
	3rd	Turn 90°		
No.4 timing belt cover x Cylinder head		8.8	90	78 in.-lbf
Intake manifold x Cylinder head (2JZ-GE)		21	210	15
Intake manifold x Cylinder head (2JZ-GTE)		27	280	20
Fuel inlet pipe x Delivery pipe		42	420	30
Fuel inlet pipe x Intake manifold		8.8	90	78 in.-lbf
Fuel pressure pulsation damper x Fuel pipe support		41	420	30
	for SST	35	350	25
Intake manifold stay x Intake manifold		39	400	29
Intake manifold stay x Cylinder block		39	400	29
Water outlet x Cylinder head		21	210	15
Vacuum control valve set x Intake manifold (2JZ-GE)		21	210	15
Air intake chamber x Intake manifold (2JZ-GE)		21	210	15
Air intake chamber x Intake manifold (2JZ-GTE)		27	280	20
Water bypass outlet x Cylinder head (2JZ-GE)		8.8	90	78 in.-lbf
Spark plug x Cylinder head		18	180	13
Air intake chamber stay x Cylinder head (2JZ-GE)		18	185	13
Air intake chamber stay x Air intake chamber (2JZ-GE)		18	185	13
PS pump housing x PS pump bracket		58	590	43
Exhaust manifold x Cylinder head		39	400	29

Exhaust manifold heat insulator x Exhaust manifold (2JZ—GE Except California)		18	185	13
No.2 front exhaust pipe x Exhaust manifold		62	630	46
Pipe support bracket x Transmission		43	440	32
No 2 front exhaust pipe x Front exhaust pipe		68	580	43
Pressure tank x Intake manifold (2JZ—GE)		21	210	15
Main bearing cap x Cylinder block	1st	44	450	33
	2nd	Turn 90°		
Connecting rod cap x Connecting rod	1st	29	300	22
	2nd	Turn 90°		
Oil nozzle x Crankshaft (2JZ—GTE)		8.8	90	78 in lb
Rear oil seal retainer x Cylinder block		5.9	60	52 in lb
Crankshaft position sensor x Cylinder block (2JZ—GTE)		8.8	90	78 in lb
Engine mounting bracket x Cylinder block		58	590	43
Engine coolant drain plug x Cylinder block		29	300	22
Union for oil cooler x Cylinder block (2JZ—GTE)		39	400	29
Knock sensor x Cylinder block		44	450	33
Oil pressure switch x Cylinder block		14	150	11
Fuel pipe support x Cylinder block		14	145	10
Oil filter bracket x Cylinder block		88	900	65
No 2 water bypass pipe x Water pump		21	210	15
No 2 water bypass pipe x Cylinder block		21	210	15
Flywheel x Crankshaft (M/T)	1st	49	500	36
	2nd	Turn 90°		
Drive plate x Crankshaft (A/T)		83	850	61
Cylinder block x Transmission	14 mm head	39	400	29
	17 mm head	72	730	43
Clutch cover x Flywheel (M/T)		19	195	14
Clutch service hole cover x Clutch housing (2JZ—GTE M/T)		12	120	9
Drive plate x Torque converter clutch (A/T)		33	340	25
Oil cooler tube x Union for transmission (A/T)		34	350	25
Clamp for oil cooler tube x Transmission (A/T)		10	100	7
Clamp for oil cooler tube x Cylinder block (A/T)		10	100	7
Starter x Transmission		38	400	29
Rear support member x Body		26	260	19
Rear support member x Engine rear mounting insulator		13	135	10
Front suspension crossmember x Engine mounting insulator		59	600	43
Transmission shift lever x Shift lever retainer (M/T)		19	195	14
Transmission control rod x Shift lever (A/T)		13	130	9
Clutch release cylinder x Transmission (M/T)		13	130	9
Ground strap x Transmission (M/T)		37	380	27
A/C compressor x Cylinder block	for stud bolt	26	265	19
	for bolt and nut	52	530	38
PS pump bracket x A/C compressor		58	590	43
PS pump bracket x Cylinder block		39	400	29
PS pump rear stay x PS pump bracket		39	400	29
PS pump rear stay x intake manifold stay (2JZ—GE)		39	400	29
Fuel inlet hose x Fuel pipe support		29	300	22
Rear center floor crossmember brace x Body (2JZ—GTE)		28	290	21

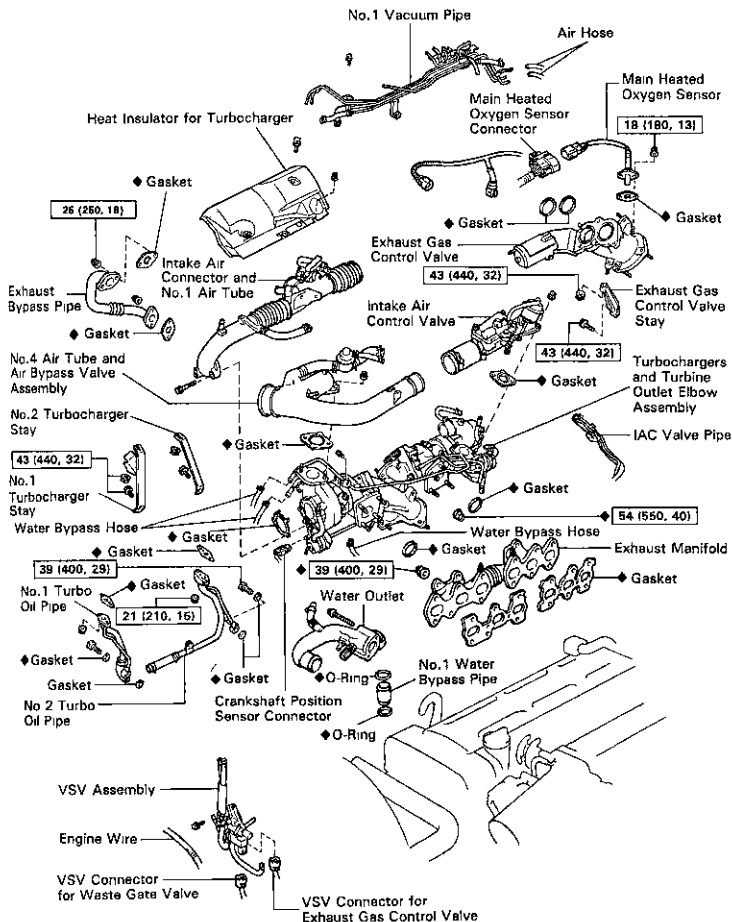
2JZ - GTE



N·m (kgf·cm ft·lbf) · Specified torque

◆ Non reusable part

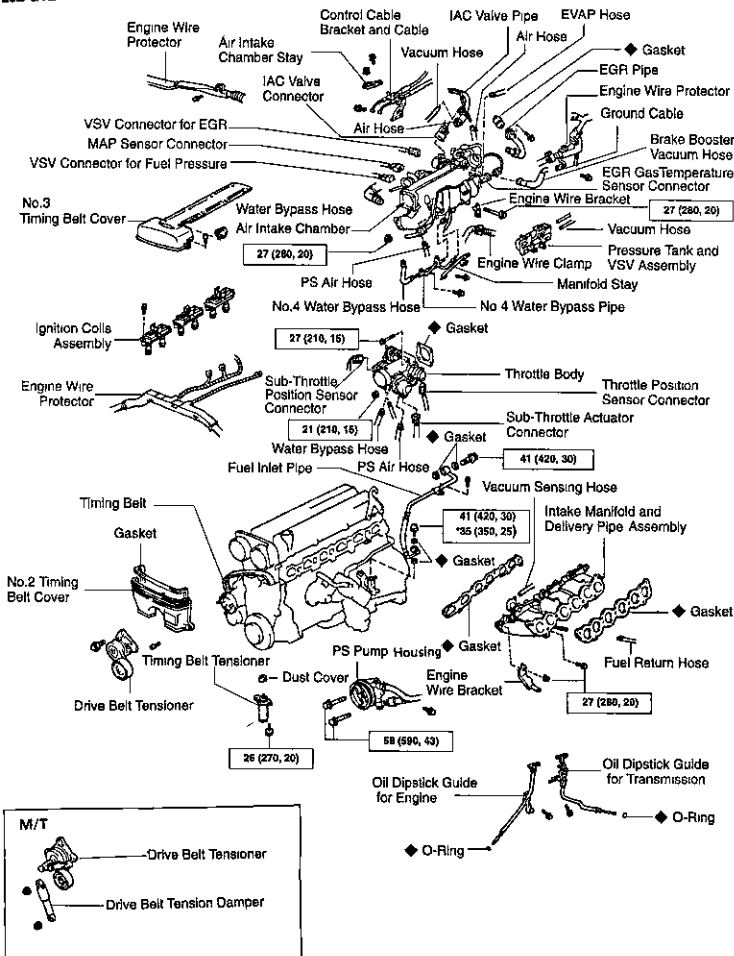
2JZ-GTE



N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part

2JZ-GTE

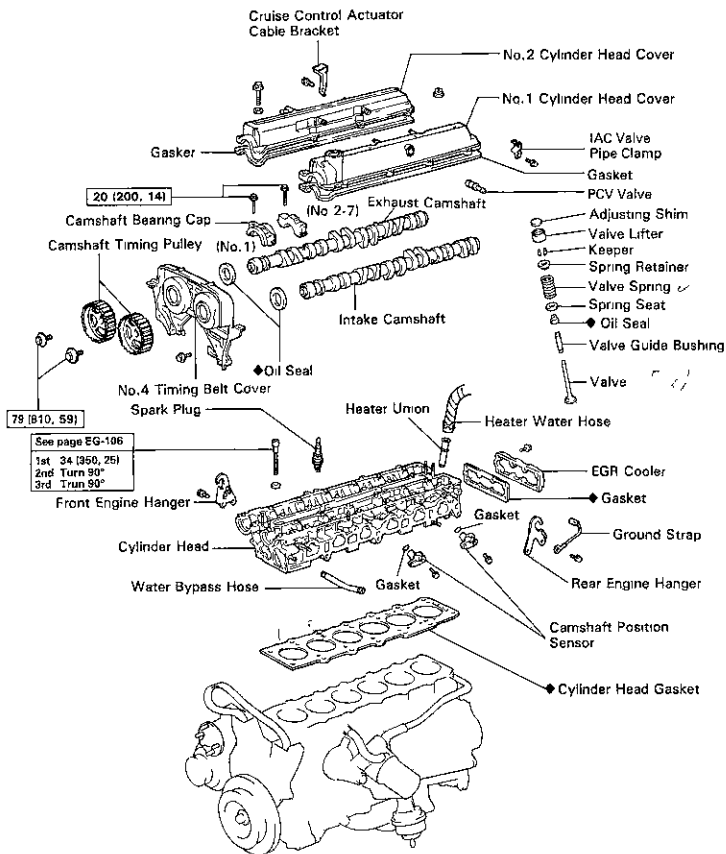


N m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part

* For use with SST

2JZ-GTE

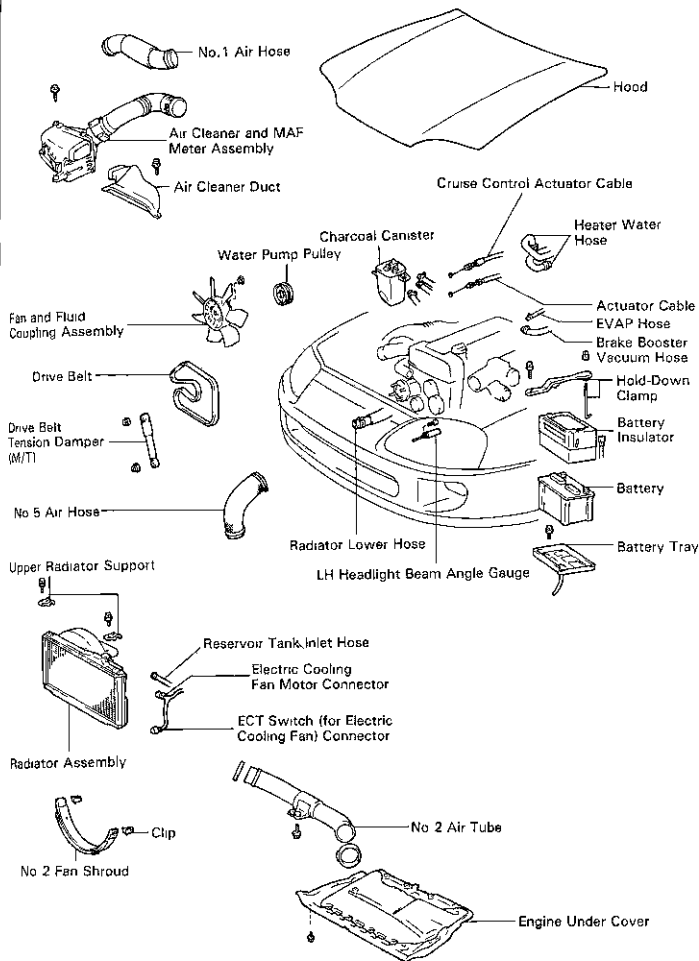


N·m (kgf·cm, ft·lbf)

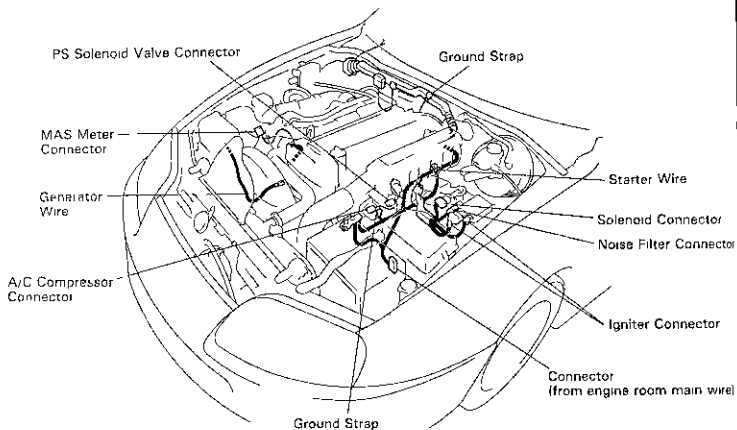
Specified torque

◆ Non-reusable part

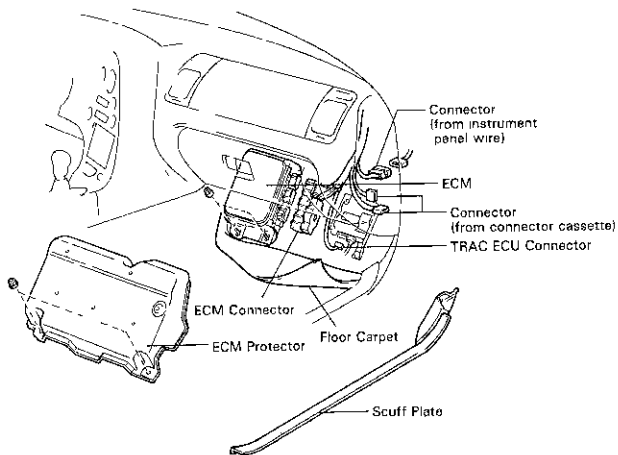
2JZ-GTE



2JZ-GTE

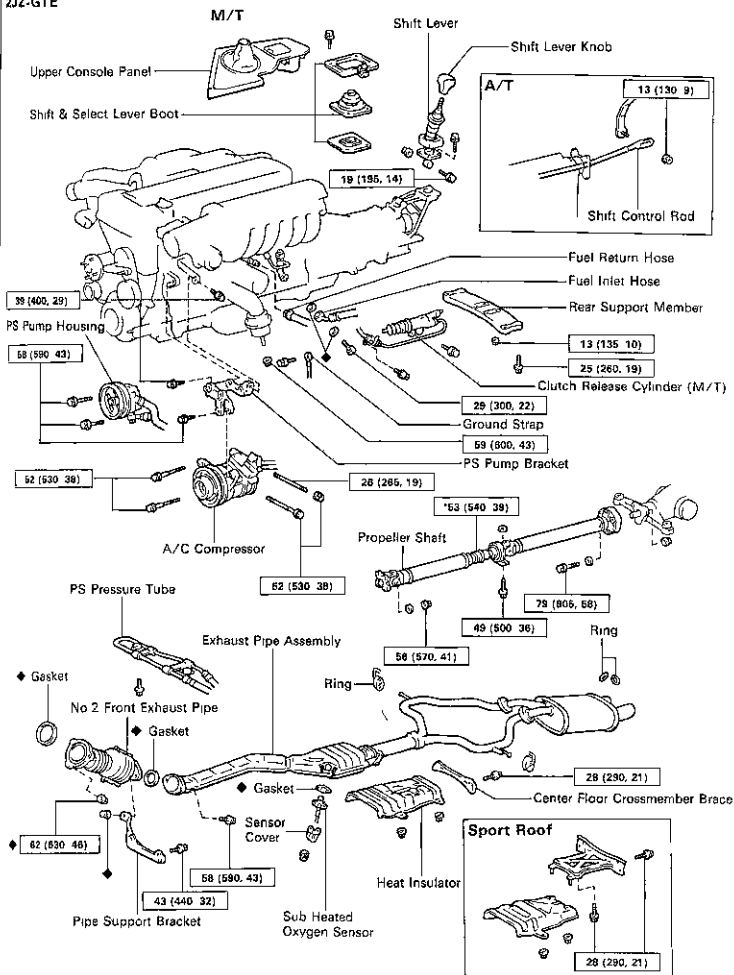


P1307N



P1316J

2JZ-GTE



N·m (kgf·cm ft·lbf)

Specified torque

◆ Non-reusable part

* For use with SST

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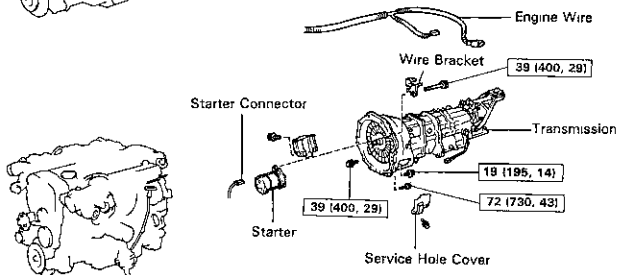
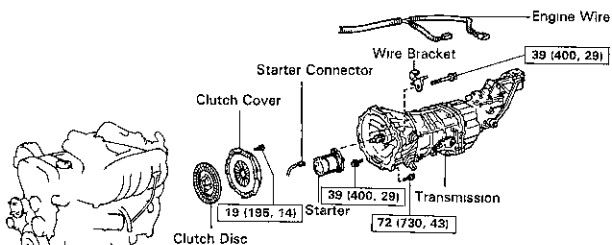
[N·m (kgf·cm, ft·lbf)] . Specified torque

◆ Non-reusable part

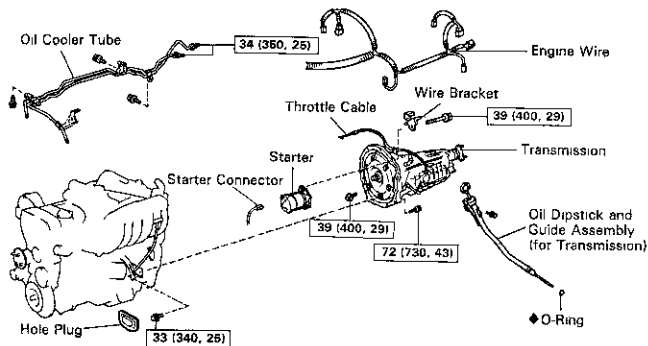
★ Precoated part

COMPONENTS FOR ENGINE & TRANSMISSION SEPERATION AND ASSEMBLY

M/T



A/T



N·m (kgf·cm ft·lbf) · Specified torque

◆ Non reusable part

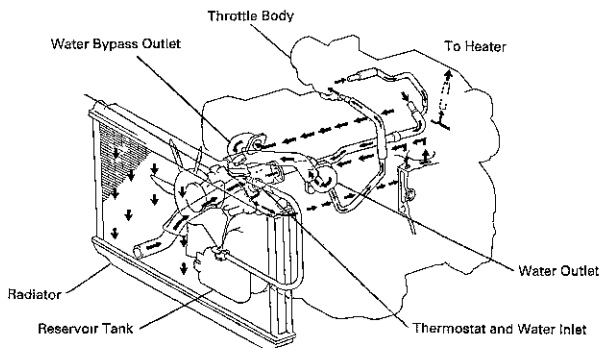
COOLING SYSTEM

DESCRIPTION

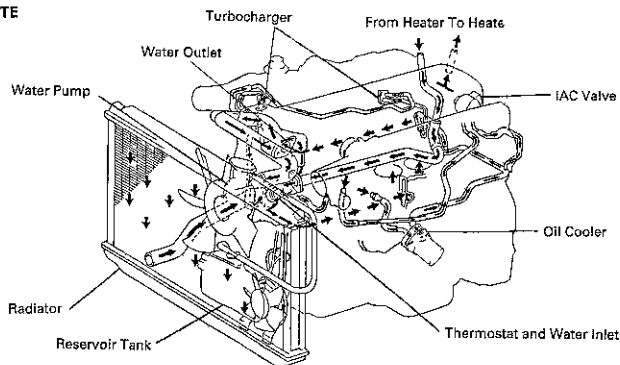
This engine utilizes a pressurized forced circulation cooling system which includes a thermostat equipped with a bypass valve mounted on the inlet side.

OPERATION

2JZ-GE



2JZ-GTE



The cooling system is composed of a water jacket (inside the cylinder block and cylinder head), radiator, water pump, thermostat, cooling fan, hoses and other components.

Coolant which is heated in the water jacket is pumped to the radiator through which a cooling fan blows air to cool the coolant as it passes through. Coolant which has been cooled is then sent back to the engine by the water pump, where it cools the engine.

The water jacket is a network of channels in the shell of the cylinder block and cylinder head through which coolant passes. It is designed to provide adequate cooling of the cylinders and combustion chambers which become heated during engine operation.

RADIATOR

The radiator, mounted in the front of the vehicle, performs the vehicle function of cooling the coolant which has passed through the water jacket and become hot. The radiator consists of an upper tank and lower tanks, and a core which connects the two tanks. The upper tank contains the inlet for coolant from the water jacket and the filler inlet. It also has a hose attached through which excess coolant or steam can flow. The lower tank has an outlet and drain plug for the coolant. The core contains many tubes through which coolant flows from the upper tank to the lower tank as well as cooling fins which radiate heat away from the coolant in the tubes. Models with automatic transmission include an automatic transmission fluid cooler built into the lower tank of the radiator.

RADIATOR CAP

The radiator cap is a pressure-type cap which seals the radiator resulting in pressurization of the radiator as the coolant expands. The pressurization prevents the coolant from boiling even when the coolant temperature exceeds 100°C (212°F). A relief valve (pressurization valve) and a vacuum valve (negative pressure valve) are built into the radiator cap. The relief valve opens and lets steam escape through the overflow pipe when the pressure generated inside the cooling system exceeds the limit (coolant temperature: 110 — 120°C (230 — 248°F) pressure: 93 — 123 kPa (0.95 — 1.25 kgf/cm², 13.5 — 17.8 psi). The vacuum valve opens to alleviate the vacuum which develops in the coolant system after the engine is stopped and the coolant temperature drops. The valve's opening allows the coolant in the reservoir tank to return to the cooling system.

RESERVOIR TANK

The reservoir tank is used to catch coolant which overflows the cooling system as a result of volumetric expansion when the coolant is heated. The coolant in the reservoir tank returns to the radiator when the coolant temperature drops thus keeping the radiator full at all times and avoiding needless coolant loss. Check the reservoir tank level to learn if the coolant needs to be replenished.

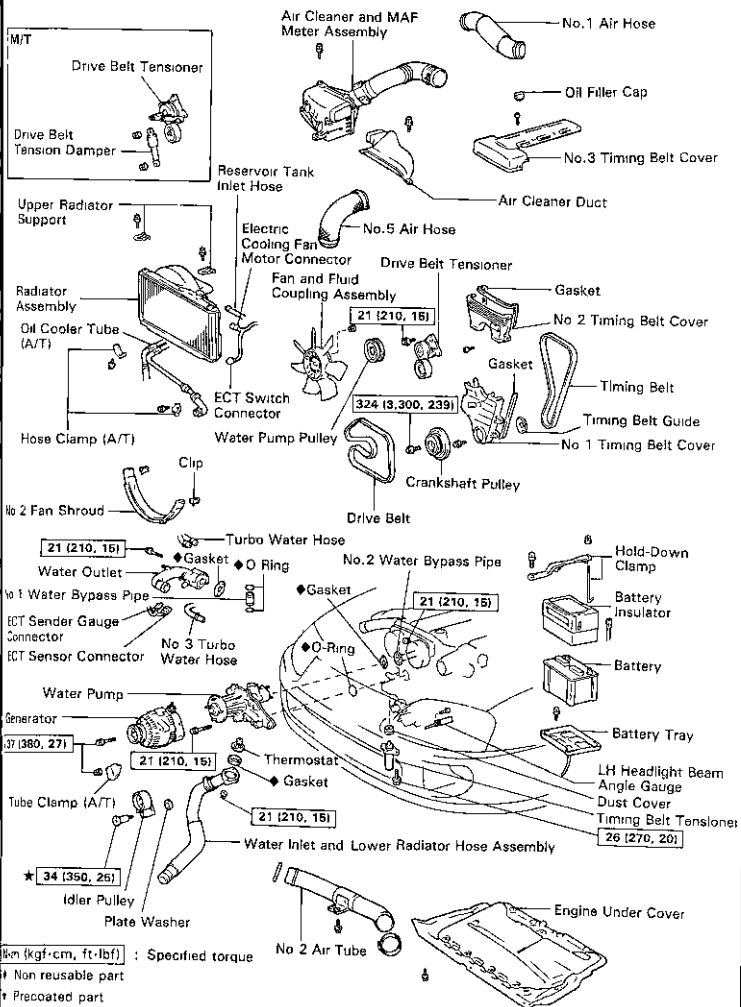
WATER PUMP

The water pump is used for forced circulation of coolant through the cooling system. It is mounted on the front of the cylinder block and driven by a drive belt.

THERMOSTAT

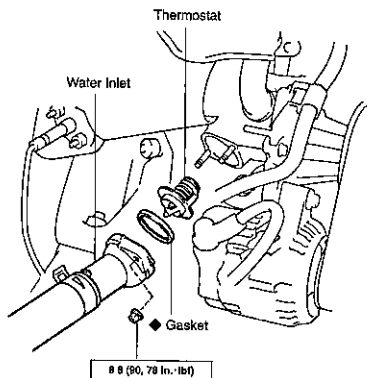
The thermostat has a wax type bypass valve and is mounted in the water inlet housing. The thermostat includes a type of automatic valve operated by fluctuations in the coolant temperature. This valve closes when the coolant temperature drops, preventing the circulation of coolant through the engine and thus permitting the engine to warm up rapidly. The valve opens when the coolant temperature has risen, allowing the circulation of coolant. Wax inside the thermostat expands when heated and contracts when cooled. Heating the wax thus generates pressure which overpowers the force of the spring which keeps the valve closed, thus opening the valve. When the wax cools, its contraction allows the force of the spring to take effect once more, closing the valve. The thermostat in this engine operates at a temperature of 82°C (180°F).

2JZ GTE

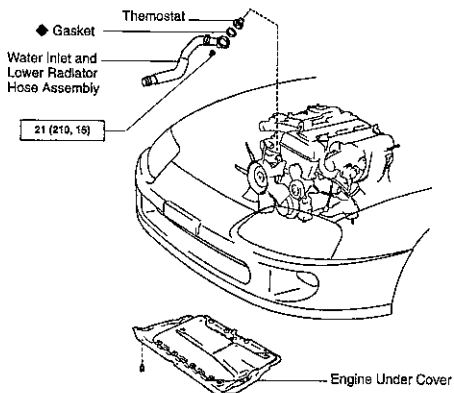


THERMOSTAT COMPONENTS FOR REMOVAL AND INSTALLATION

2JZ-GE



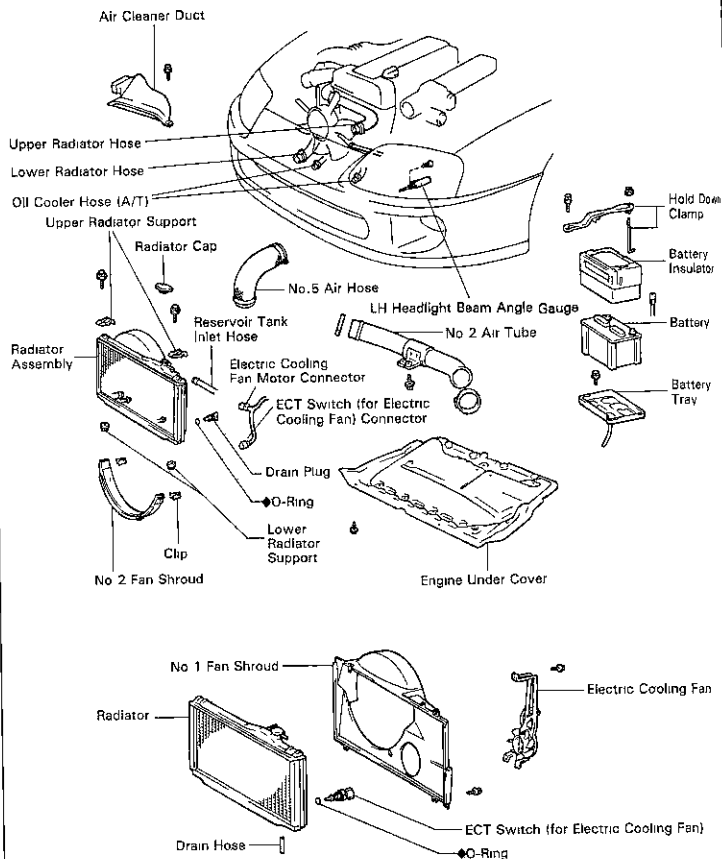
2JZ-GTE



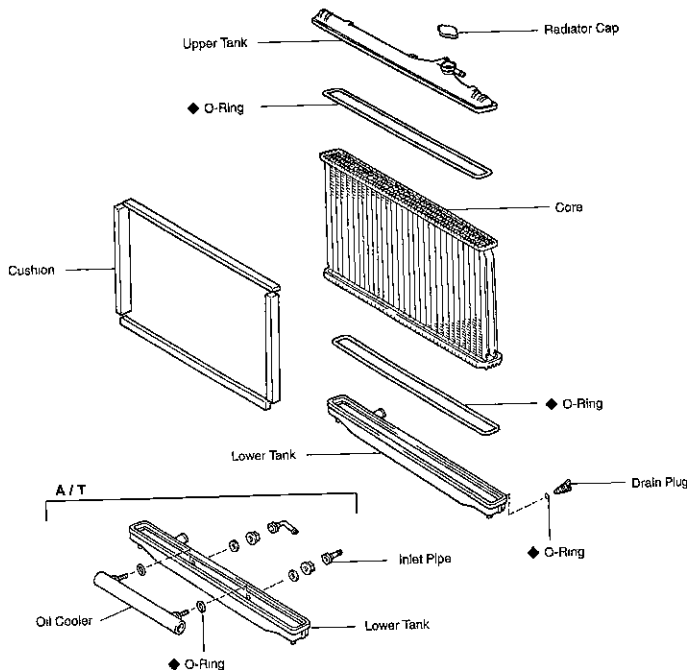
N·m (kgf cm, ft lbf)

◆ Non-reusable part

2JZ-GTE

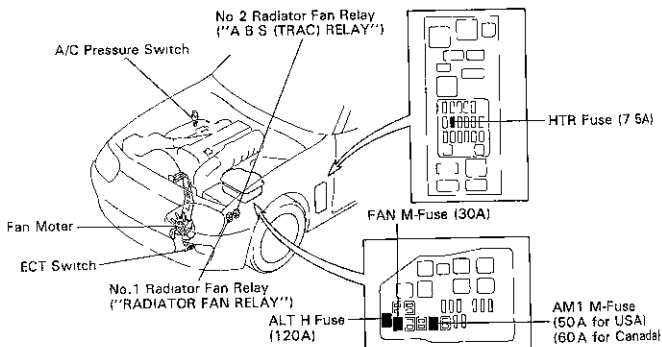


COMPONENTS FOR DISASSEMBLY AND ASSEMBLY (2JZ-GTE)

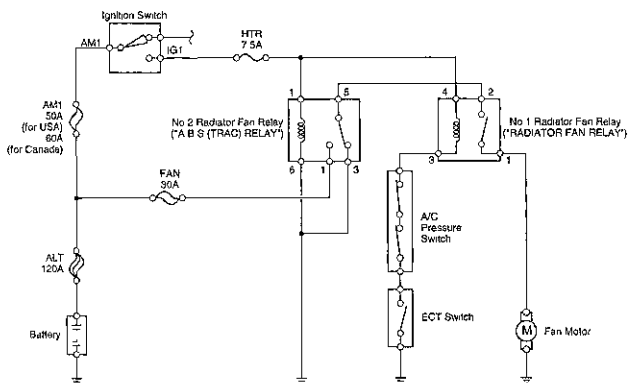


◆ Non-reusable part

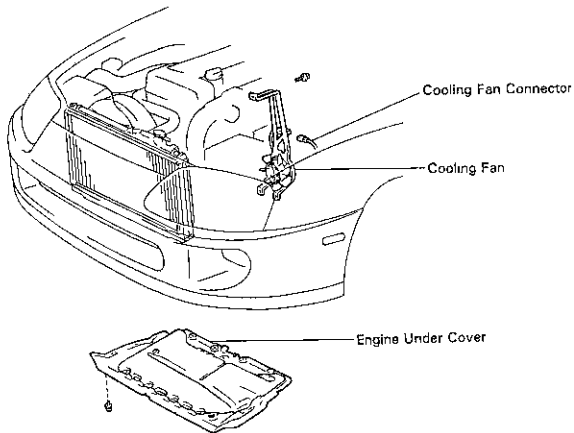
ELECTRIC COOLING FAN (2JZ—GTE) Parts Location



System Circuit



Cooling Fan COMPONENTS FOR REMOVAL AND INSTALLATION



SERVICE SPECIFICATIONS

SERVICE DATA

Thermostat	Valve opening temperature	80 — 84°C (176 — 183°F)
	Valve lift at 95°C (203°F)	8.5 mm (0.335 in.) or more
Radiator cap	Relief valve opening pressure STD	93 — 123 kPa (0.95 — 1.25 kgf/cm ² , 13.5 — 17.8 psi)
	Limit	78 kPa (0.8 kgf/cm ² , 11.4 psi)
Electric cooling fan	Rotating amperage	2.5 — 4.5 A

TORQUE SPECIFICATIONS

Part tightened	N·m	kgf·cm	ft·lbf
Engine drain plug x Cylinder block	29	300	22
Fan x Fluid coupling	7.4	75	65 in. lbf
Water pump x Cylinder block	21	210	15
Water pump x No. 2 water bypass pipe	21	210	15
Generator x Water pump	37	380	27
Generator x Cylinder block	37	380	27
Idler pulley x Oil pump	34	350	25
Water bypass outlet x Cylinder head (2JZ—GE)	8.8	90	78 in. lbf
Water outlet x Cylinder head (2JZ—GTE)	21	210	15
Exhaust manifold heat insulator x Exhaust manifold (2JZ—GE Except California)	18	185	13
Drive belt tensioner damper x Tensioner arm (2JZ—GTE M/T)	20	200	14
Drive belt tensioner damper x Tensioner bracket (2JZ—GTE M/T)	20	200	14
Water inlet x Water pump (2JZ—GE)	8.8	80	78 in. lbf
Water inlet x Water pump (2JZ—GTE)	21	210	15
Upper radiator support x Body	15	155	11
ECT switch x Radiator (2JZ—GTE)	7.4	75	65 in. lbf
Fluid coupling x Water pump	16	165	12
Oil cooler x Radiator lower tank (A/T)	8.3	85	74 in. lbf
Oil cooler x Oil cooler pipe (A/T)	15	150	11

EMISSION CONTROL SYSTEMS

(2JZ-GTE)

DESCRIPTION

The emission control systems are installed to reduce the amount of HC, CO and NO_x emitted from the engine, and to also prevent release of evaporated fuel from the gasoline tank and prevent atmospheric release of blow-by gas.

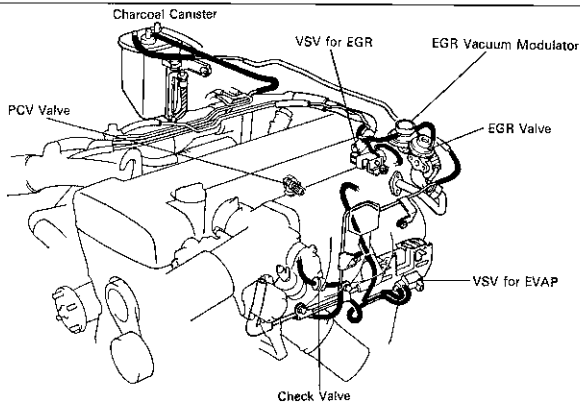
The system consists of the PCV, EVAP, EGR and TWC.

The function of each system is shown in the following table.

System	Abbreviation	Purpose
Positive crankcase ventilation	PCV	Reduces blow-by gas (HC)
Evaporative emission control	EVAP	Reduces evaporative HC
Exhaust gas recirculation	EGR	Reduces NO _x
Three way catalytic converter	TWC	Reduces CO, HC and NO _x
Sequential multiport fuel injection*	SFI	Regulates all engine conditions for reduction of exhaust emissions

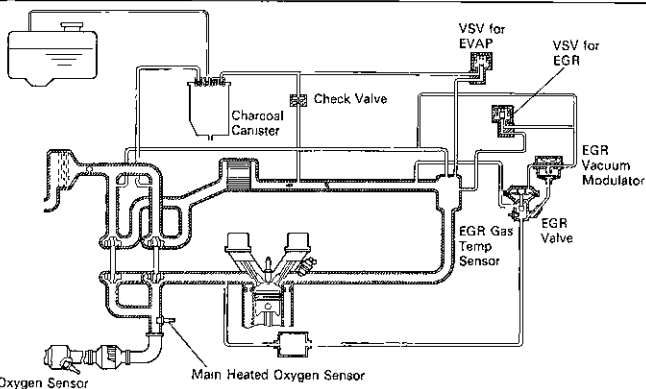
* For inspection and repair of the SFI system refer to the SFI section

COMPONENT LAYOUT



P12174

SCHEMATIC DRAWING



P12246

POSITIVE CRANKCASE VENTILATION (PCV) SYSTEM DESCRIPTION

EG277-01

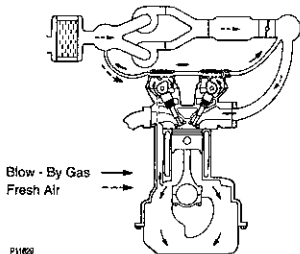
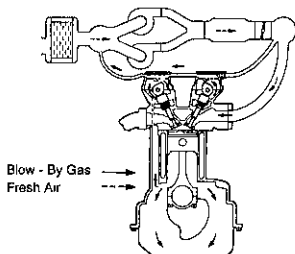
To reduce HC emission, crankcase blow-by gas (HC) is routed through the PCV valve to the air intake chamber for combustion in the cylinders.

EG277-01

OPERATION

Turbocharging

Not Turbocharging



P11829

P11829

Z0942R

Engine not Running or Backfiring— Turbocharging

Air Intake Chamber Side



○ PCV VALVE IS CLOSED

Cylinder Head Side

P11830

Idling or Decelerating



○ PCV VALVE IS OPEN.
○ VACUUM PASSAGE IS SMALL

P11832

Normal Operation



○ PCV VALVE IS OPEN
○ VACUUM PASSAGE IS LARGE

P11835

Acceleration or Heavy Load— Not Turbocharging



○ PCV VALVE IS FULLY OPEN

P11835

EVAPORATIVE EMISSION (EVAP) CONTROL SYSTEM

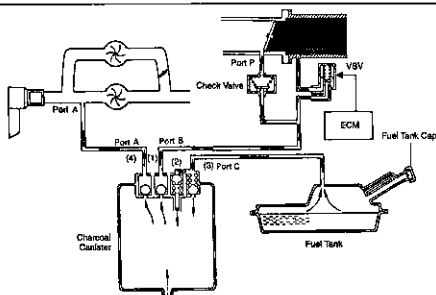
80208-02

DESCRIPTION

To reduce HC emission, evaporated fuel from the fuel tank is routed through the charcoal canister to the intake manifold for combustion in the cylinders.

2004801

OPERATION



P1817

2004802

Water Temp.	Manifold Pressure. kpa (mmHg In.Hg)	VSV	Throttle Position	Canister Check Valve				Evaporated Fuel (HC)
				(1)	(2)	(3)	(4)	
Below 50°C (122°F)	—	CLOSED	Below Purge port	CLOSED	—	—	—	—
			Above Purge port	OPEN	—	—	—	HC from canister to purge port
Above 50°C (122°F)	26.7 - 93.3 (200 - 700 7.9 - 27.6)	VARIABLE OPEN	—	VARIABLE OPEN	—	—	—	HC from canister to air intake chamber
	26.7 or less (200 7.9) or 93.3 or less (700 27.6)	CLOSED	Below Purge port	CLOSED	—	—	—	—
			Above Purge port	OPEN	—	—	—	HC from canister to purge port
	—	—	—	—	—	—	CLOSED	—
Low Load	—	—	—	—	—	—	CLOSED	—
High Load	—	—	—	—	—	—	OPEN	HC from canister to port C
High pressure in tank	—	—	—	—	OPEN	CLOSED	—	HC from fuel tank is absorbed into the canister
High vacuum in tank	—	—	—	—	CLOSED	OPEN	—	HC from canister to fuel tank and Air from check valve is led into the fuel tank

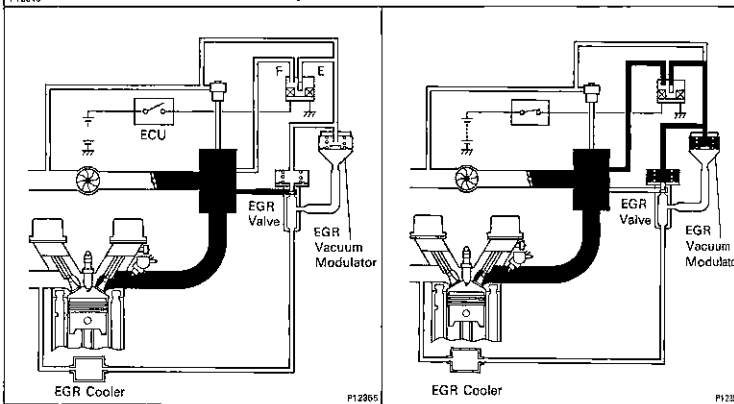
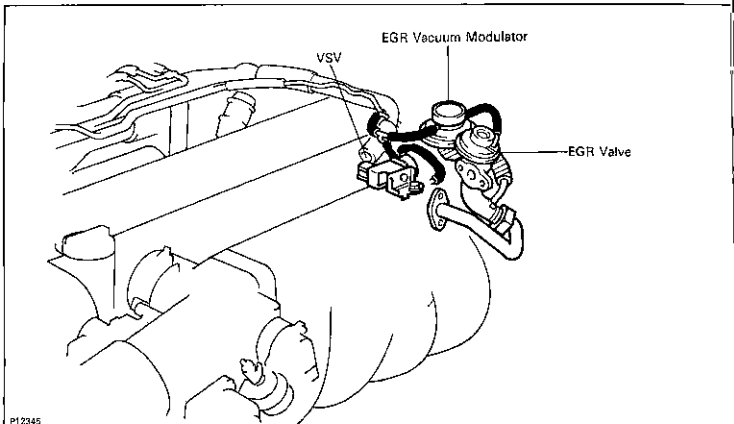
* The ECU controls the on off period of the VSV to adjust the EVAP purge quantity in accordance with the engine load.

V04684

EXHAUST GAS RECIRCULATION (EGR) SYSTEM DESCRIPTION

To reduce NO_x emission, part of the exhaust gases are recirculated through the EGR valve to the intake manifold to lower the maximum combustion temperature.

OPERATION



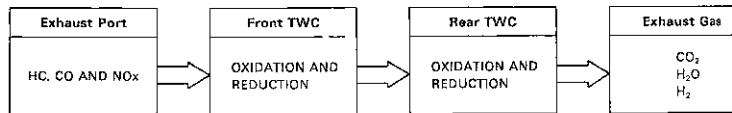
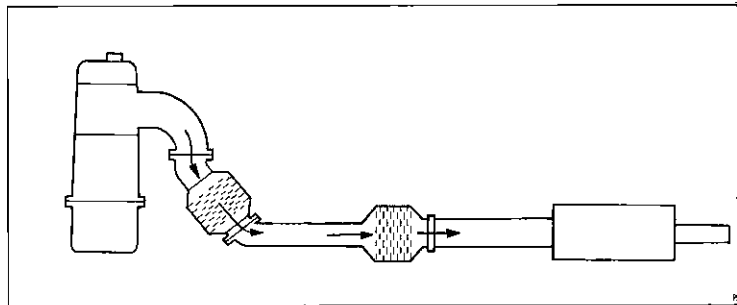
Coolant temp.	VSV	Pressure in the EGR Valve Pressure Chamber	EGR Vacuum Modulator	EGR Valve	Exhaust Gas
Below 50°C (122°F)	CLOSED	—	—	CLOSED	Not recirculated
Above 50°C (122°F)	OPEN	*	CLOSED passage to atmosphere	OPEN	Recirculated (increase)

Remarks: * When the VSV is Open, the EGR vacuum modulator will close the atmosphere passage and open the EGR valve to increase the EGR gas, even if the exhaust pressure is insufficiently low.

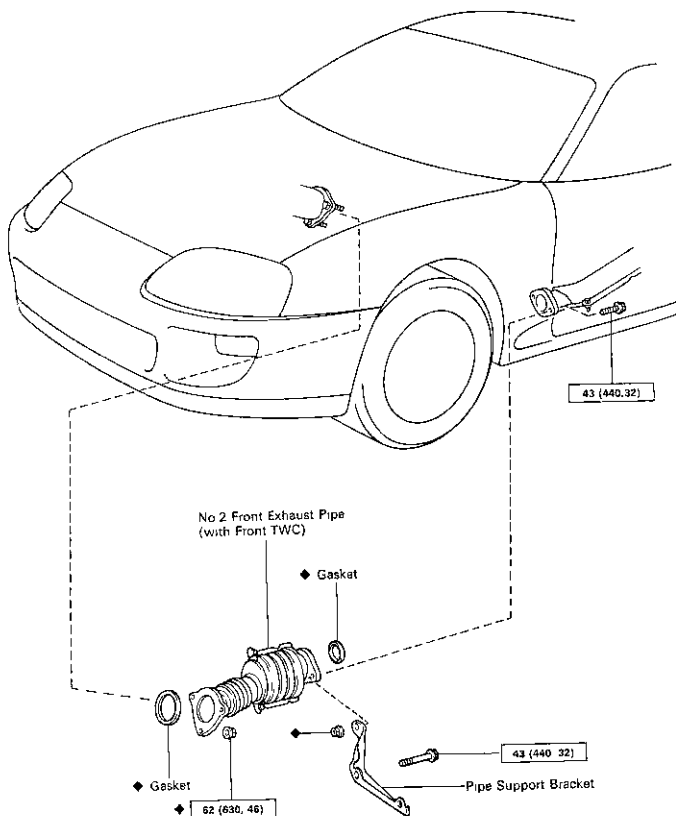
THREE — WAY CATALYTIC CONVERTER (TWC) SYSTEM DESCRIPTION

To reduce HC, CO and NO_x emissions, they are oxidized, reduced and converted to nitrogen, carbon dioxide (CO₂) and water (H₂O) by the TWC converter.

OPERATION



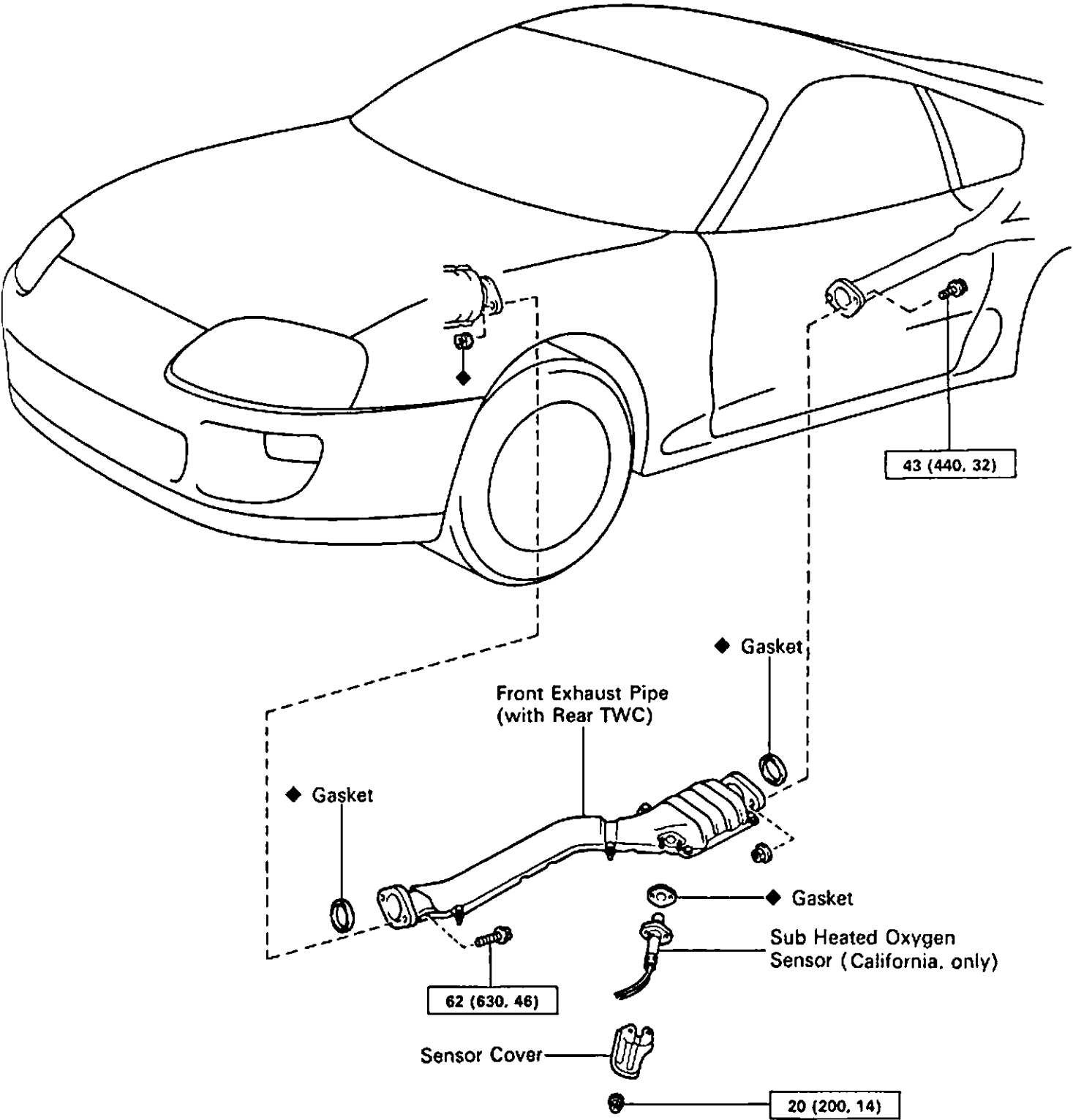
COMPONENTS FOR FRONT TWC REPLACEMENT



N·m (kgf·cm, ft·lbf) · Specified torque

◆ Non reusable part

COMPONENTS FOR REAR TWC
REPLACEMENT



N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part

SERVICE SPECIFICATIONS

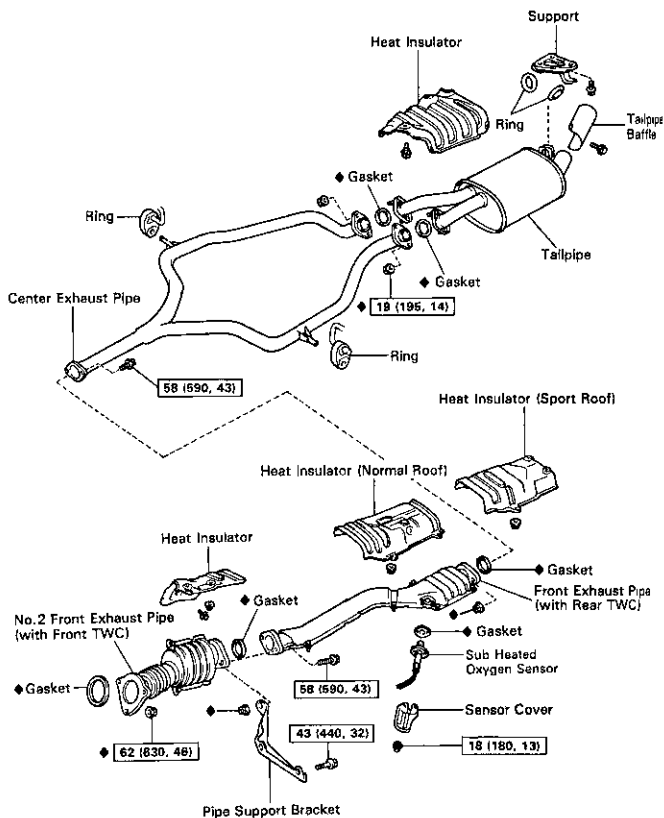
SERVICE DATA

VSV for EVAP	Resistance	at 20°C (68°F)	30 — 34 Ω
VSV for EGR	Resistance	at 20°C (68°F)	33 — 34 Ω

TORQUE SPECIFICATIONS

Part tightened	N·m	kgf·cm	ft·lbf
EGR valve x Intake air connector	21	210	15
EGR gas temperature sensor x EGR valve	20	200	14
EGR pipe x Cylinder head	21	210	15
EGR valve x EGR pipe	64	650	47
No 2 front exhaust pipe (Front TWC) x Exhaust manifold	62	630	46
Pipe support bracket x Transmission	43	440	32
No 2 front exhaust pipe (Front TWC) x Front exhaust pipe (Rear TWC)	43	440	32
Front exhaust pipe (Rear TWC) x Center exhaust pipe	43	440	32
Sub heated oxygen sensor x Front exhaust pipe	20	200	14

2JZ-GTE



[N·m (kgf·cm, ft·lbf)] : Specified torque

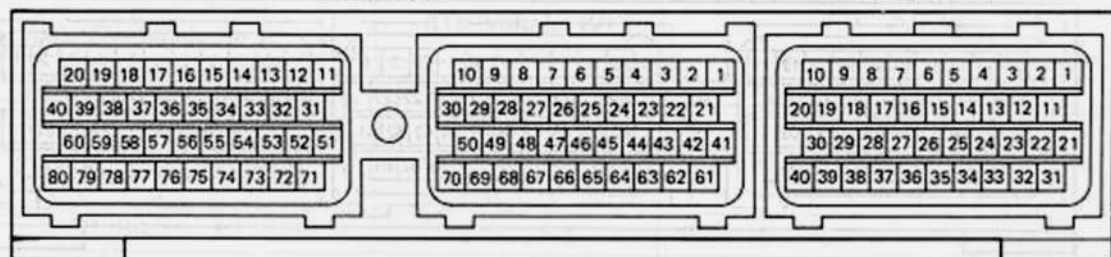
◆ Non-reusable part

TERMINALS OF ECM

ECM Terminals

(E9) (B)

(E10) (A)



F8460

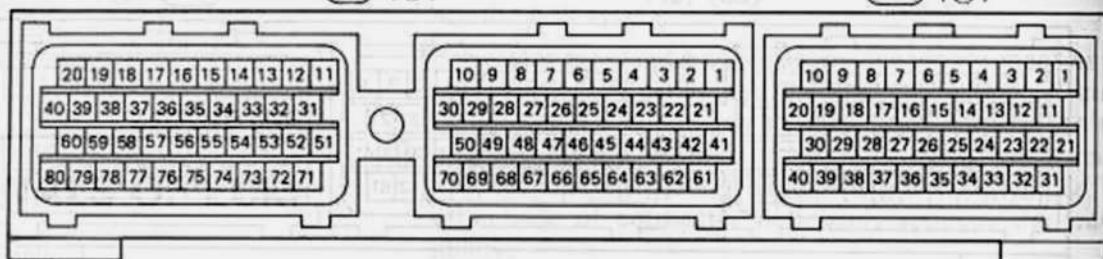
Terminal No.	Symbol	Connection	Terminal No.	Symbol	Connection
E10- 1	IGSW	Ignition switch	E10-31	+B	EFI main relay
2	SP1	No. 1 vehicle speed sensor	32	+B1	EFI main relay
3	KD	Kick-down switch	33	BATT	Battery
4	STP	Stop light switch	34	A/C	A/C amplifier
5	—	—	35	—	—
6	W	Malfunction indicator lamp	36	—	—
7	R	Park/neutral position switch	37	—	—
8	—	—	38	NEO	TRAC ECU
9	2	Park/neutral position switch	39	—	—
10	L	Park/neutral position switch	40	—	—
11	ABS	ABS & TRAC ECU	E9- 1	NCO ⊖	O/D direct clutch speed sensor
12	OD1	Cruise control ECU	2	—	—
13	TRC ⊖	TRAC ECU	3	SP2 ⊖	No. 2 vehicle speed sensor
14	TRC ⊕	TRAC ECU	4	E11	ECM ground
15	ELS	Defogger relay, Taillight relay	5	G2 ⊖	Camshaft position sensor No.2
16	TACO	Tachometer	6	G1 ⊖	Camshaft position sensor No.1
17	TT	Data link connector 2	7	NE ⊖	Crankshaft position sensor
18	M	A/T pattern select switch	8	—	—
19	TE2	Data link connector 2	9	S2	A/T No. 2 solenoid
20	TE1	Data link connector 1 and 2	10	S1	A/T No. 1 solenoid
21	DI	Fuel pump ECU	11	—	—
22	FPC	Fuel pump ECU	12	SLT ⊖	A/T solenoid SLT
23	ACMG	A/C magnet clutch relay	13	SLN ⊖	A/T No.4 solenoid
24	M-REL	EFI main relay	14	SLU ⊖	A/T No.3 solenoid
25	MI	Manual indicator light	15	# 60	No. 6 injector
26	EFI ⊖	TRAC ECU	16	# 50	No. 5 injector
27	EFI ⊕	TRAC ECU	17	# 40	No. 4 injector
28	OD2	O/D main switch	18	# 30	No. 3 injector
29	—	—	19	# 20	No. 2 injector
30	—	—	20	# 10	No. 1 injector

TERMINALS OF ECM (Cont'd)

ECM Terminals

(E9) (B)

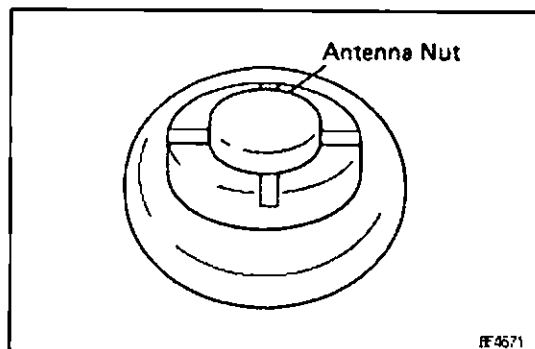
(E10) (A)



F16400

Terminal No.	Symbol	Connection	Terminal No.	Symbol	Connection
E9-21	NC0 ⊕	O/D direct clutch speed sensor	E9-51	—	—
22	—	—	52	IGT6	Igniter
23	SP2 ⊕	No. 2 vehicle speed sensor	53	IGT5	Igniter
24	OIL	A/T oil temp. sensor	54	IGT4	Igniter
25	G2	Camshaft position sensor No. 2	55	IGT3	Igniter
26	G1	Camshaft position sensor No. 1	56	IGT2	Igniter
27	NE	Crankshaft position sensor	57	IGT1	Igniter
28	E21	Mass air flow meter	58	IGF	Igniter
29	VF1	Data link connector 1	59	—	—
30	—	—	60	PMC	VSV for waste gate valve
31	SLT ⊕	A/T solenoid SLT	61	—	—
32	ISC4	IAC valve	62	PM1	Turbo pressure sensor
33	ISC3	IAC valve	63	IDL2	Sub-throttle position sensor
34	ISC2	IAC valve	64	IDL1	Throttle position sensor
35	ISC1	IAC valve	65	E2	Sensor ground
36	—	—	66	VG	Mass air flow meter
37	—	—	67	—	—
38	VSV3	VSV for exhaust bypass valve	68	—	—
39	VSV2	VSV for exhaust gas control valve	69	E1	ECM ground
40	VSV1	VSV for intake air control valve	70	—	—
41	VCC	• Throttle position sensor • Turbo pressure sensor	71	HT1	Main heated oxygen sensor
42	VTA2	Sub-throttle position sensor	72	HT2	Sub heated oxygen sensor
43	VTA1	Throttle position sensor	73	FPU	VSV for fuel pressure control
44	THW	Engine coolant temp. sensor	74	EVAP	VSV for EVAP
45	THA	Intake air temp. sensor	75	EGR	VSV for EGR
46	THG	EGR gas temp. sensor	76	NSW	Park/neutral position sensor
47	OX2	Sub heated oxygen sensor	77	STA	Starter relay
48	OX1	Main heated oxygen sensor	78	—	—
49	KNK2	No. 2 knock sensor (rear side)	79	EO2	Power ground
50	KNK1	No. 1 knock sensor (front side)	80	EO1	Power ground

This section was corrected by mkiv.com due to a printing mistake by the publisher.

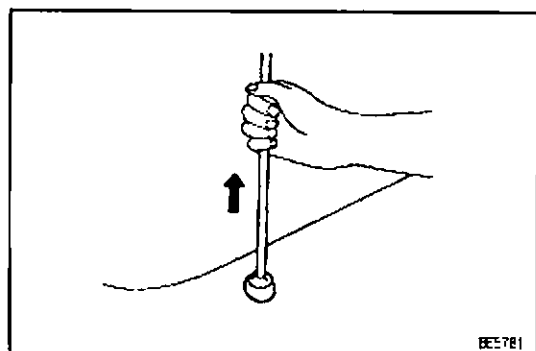


ANTENNA ROD REMOVAL AND INSTALLATION

1. REMOVE ANTENNA ROD

HINT: Do this operation with the negative (–) terminal cable connected to the battery.

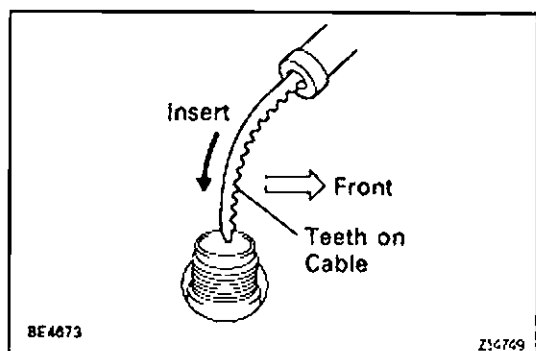
- Turn the ignition switch to "LOCK" position.
- Remove the antenna nut.
- Press the "AM" button on the radio receiver, and simultaneously turn the ignition switch to "ACC" position.



HINT:

- The rod will extend fully and be released from the motor antenna.
- After removing the antenna rod, leave the ignition switch at "ACC".

NOTICE: To prevent body damage when the antenna rod is released, hold the rod while it comes out.



2. INSTALL ANTENNA ROD

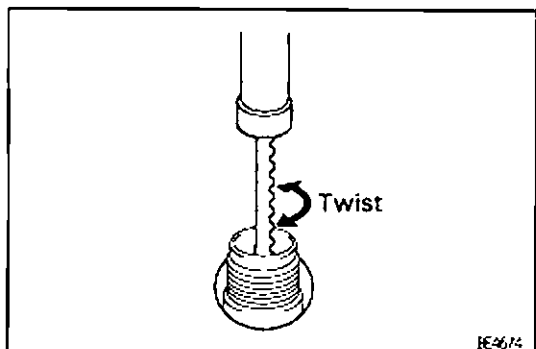
- Insert the cable of the rod until it reaches the bottom.

HINT:

- When inserting the cable, the teeth on the cable must face toward the rear of the vehicle.
 - Insert the cable approx. 400 mm.
- Wind the cable to retract the rod by turning the ignition switch to "LOCK" position.

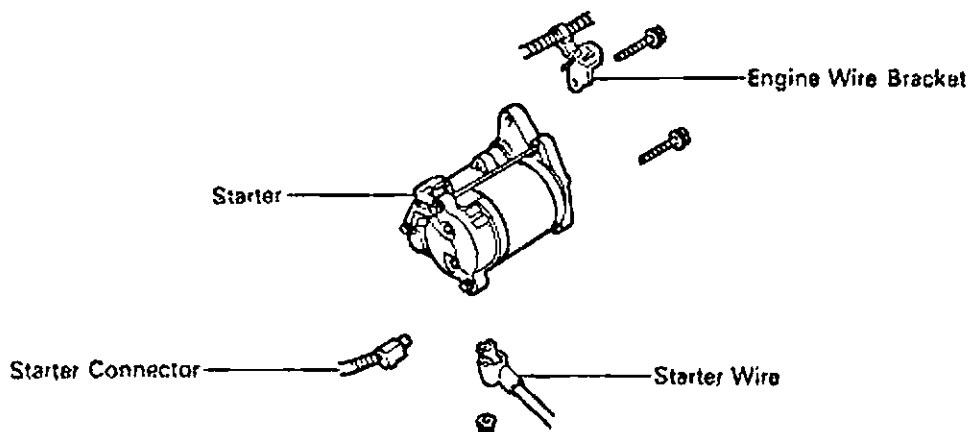
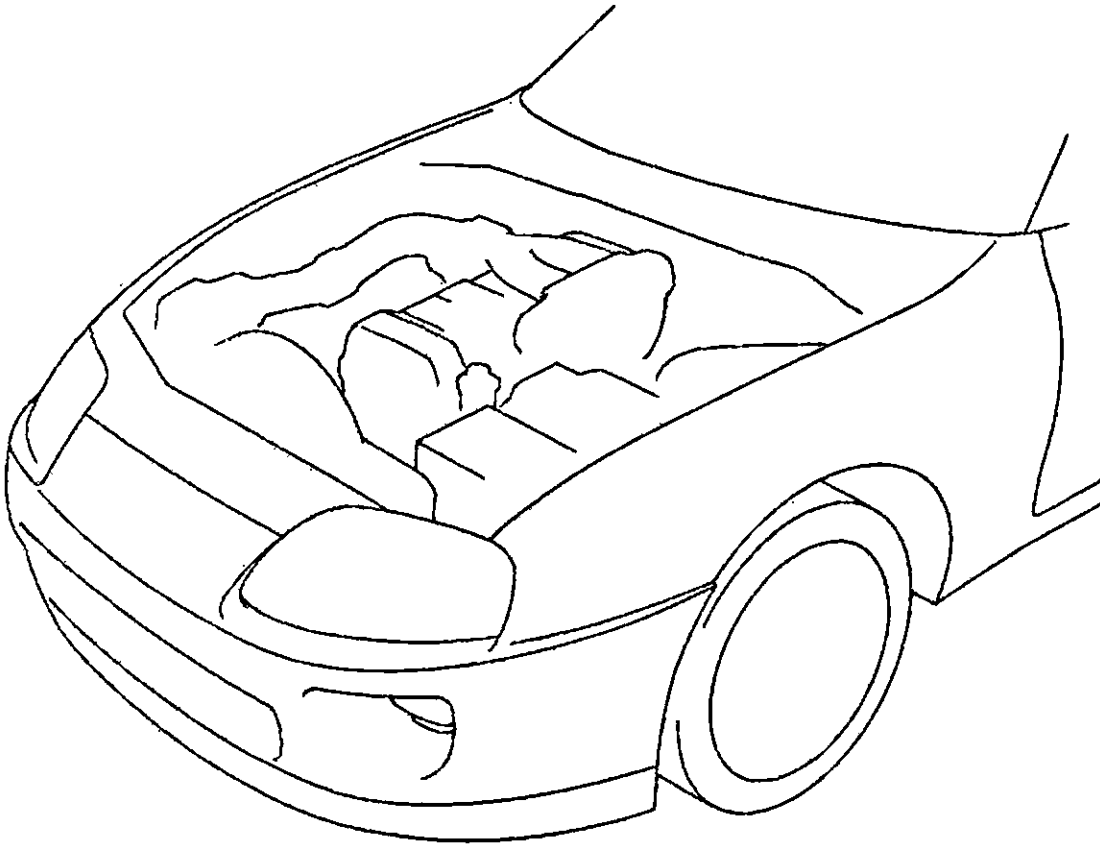
HINT:

- If the ignition switch is already in "LOCK" position, do step 1 (c) first, then turn the ignition switch to "ACC" position.
 - In case the cable is not wound, twist it as shown in the illustration.
 - Even if the rod has not retracted fully, install the antenna nut and inspect the antenna rod operation. It will finally retract fully.
- Inspect the antenna rod operation by pushing the radio wave band select buttons.



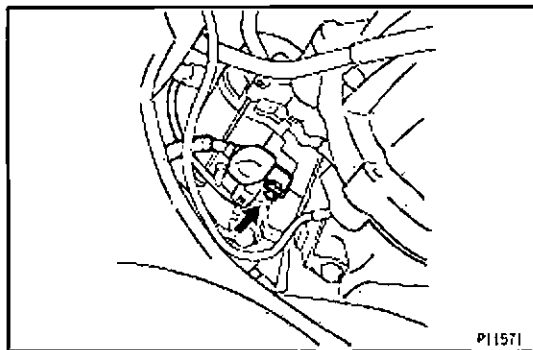
STARTER COMPONENTS FOR REMOVAL AND INSTALLATION

81040-00



P11810

A339

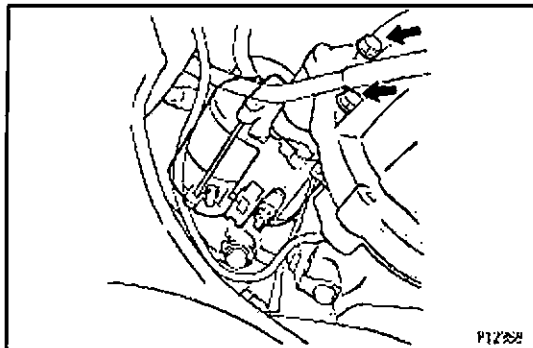


STARTER REMOVAL

Installation is in the reverse order of removal.

REMOVE STARTER

- (a) Remove the rubber cap and nut, and disconnect the starter wire.
- (b) Disconnect the starter connector.
- (c) Remove the 2 bolts and starter.
Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)



SERVICE SPECIFICATIONS

SERVICE DATA

ST01P-06

Starter	Rated voltage and output power		12 V 1.4 kW
	No-load characteristics	Current	90 A or less at 11.5 V
		rpm	3,000 rpm or more
	Brush length	STD	15.5 mm (0.610 in.)
		Minimum	10.0 mm (0.394 in.)
	Spring installed load		18 — 24 N (1.79 — 2.41 kgf, 3.9 — 5.3 lbf)
	Commutator		
	Diameter	STD	30.0 mm (1.181 in.)
		Minimum	29.0 mm (1.412 in.)
	Undercut depth	STD	0.6 mm (0.024 in.)
		Minimum	0.2 mm (0.008 in.)
	Circle runout	Maximum	0.05 mm (0.0020 in.)

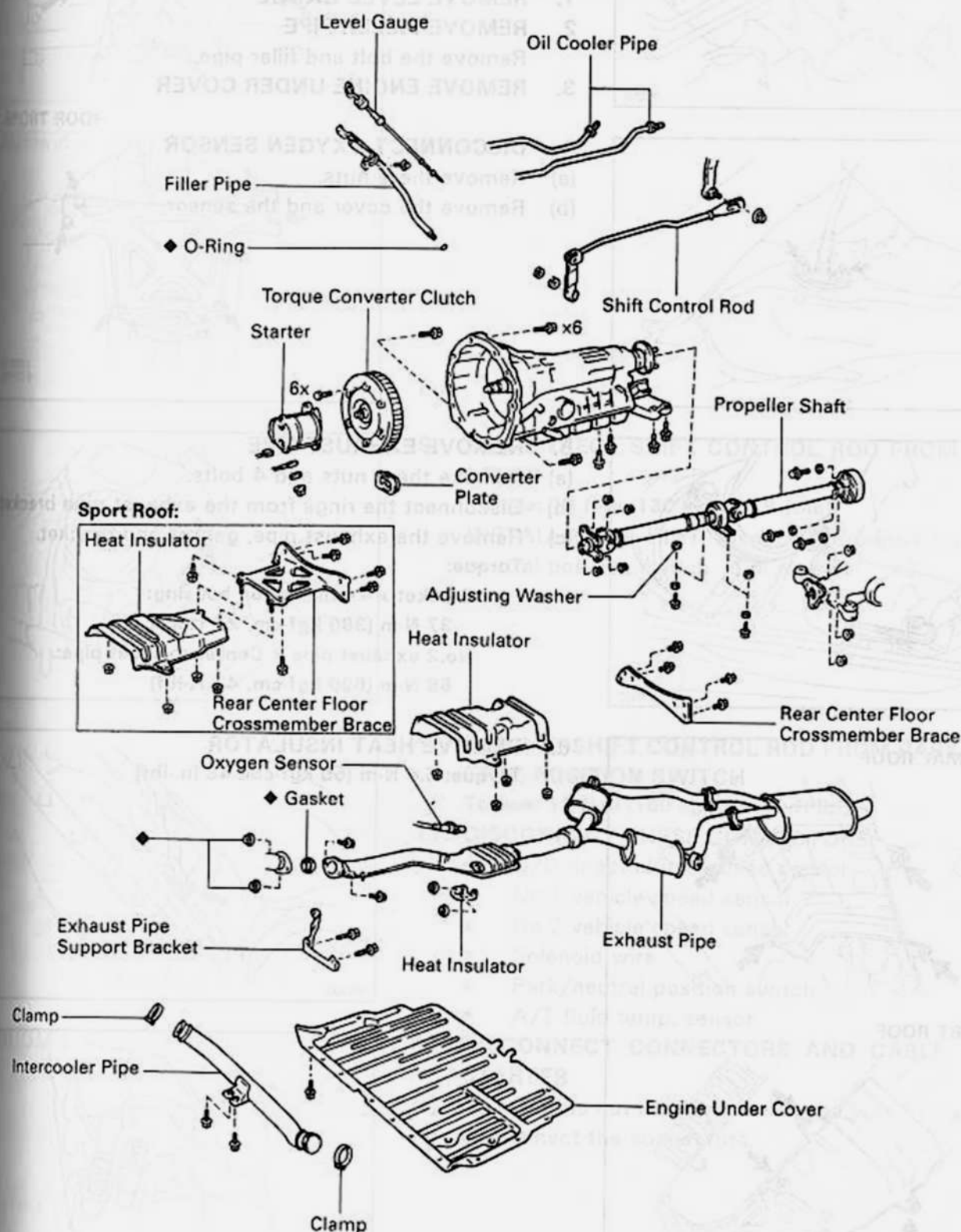
TORQUE SPECIFICATIONS

ST01B-06

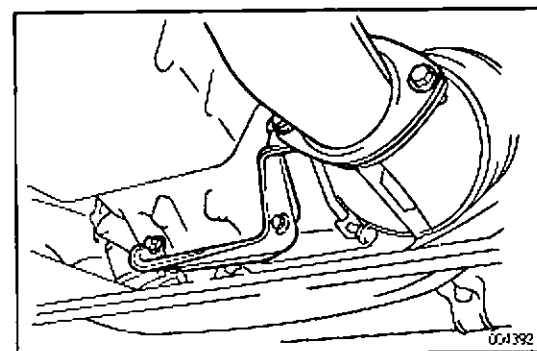
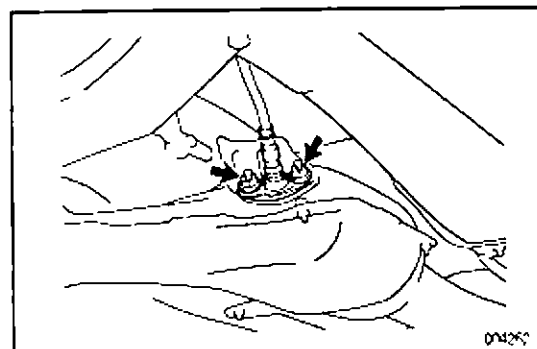
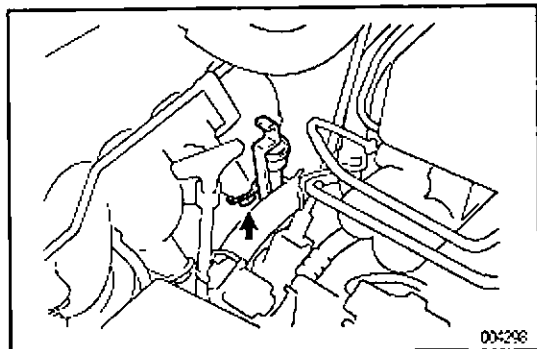
Part tightened	N-m	kgf-cm	ft-lbf
End cover x Brush holder	1.5	15	13 in.-lbf
Starter housing x Magnetic switch	5.9	60	52 in.-lbf
End cover x Starter housing	5.9	60	52 in.-lbf
Lead wire of field frame x Magnetic switch	7.9	81	70 in.-lbf
Starter x Clutch housing	39	400	29

ASSEMBLY REMOVAL AND INSTALLATION COMPONENTS

AXD12-0C



AT



TRANSMISSION REMOVAL

Installation is in the reverse order of removal.
INSTALLATION HINT: After installation, fill A/T fluid and check fluid level. (See page AT-42)

1. REMOVE LEVEL GAUGE
2. REMOVE FILLER PIPE
Remove the bolt and filler pipe.
3. REMOVE ENGINE UNDER COVER

4. DISCONNECT OXYGEN SENSOR
 - (a) Remove the 2 nuts.
 - (b) Remove the cover and the sensor.

5. REMOVE EXHAUST PIPE
 - (a) Remove the 2 nuts and 4 bolts.
 - (b) Disconnect the rings from the exhaust pipe bracket.
 - (c) Remove the exhaust pipe, gasket and bracket.

Torque:

Bracket x Transmission housing:

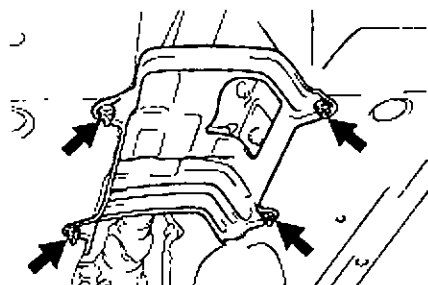
37 N·m (380 kgf·cm, 27 ft·lbf)

No.2 exhaust pipe x Center exhaust pipe:

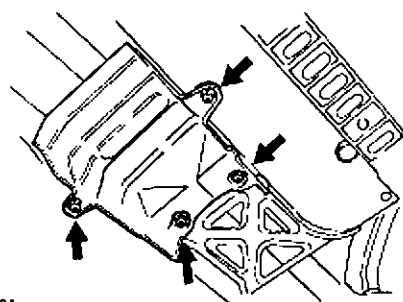
58 N·m (590 kgf·cm, 43 ft·lbf)

6. REMOVE HEAT INSULATOR
Torque: 5.4 N·m (55 kgf·cm, 48 in·lbf)

NORMAL ROOF



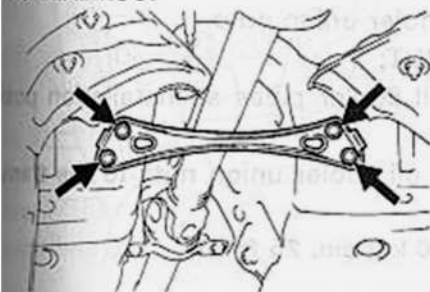
SPORT ROOF



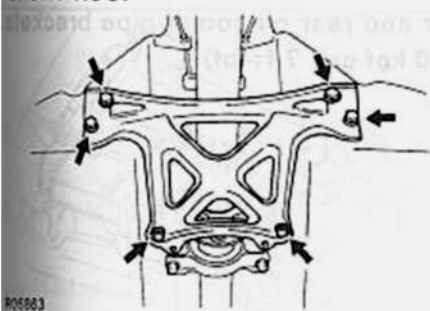
ROB661
004100

203265

NORMAL ROOF



SPORT ROOF

R01003
004009

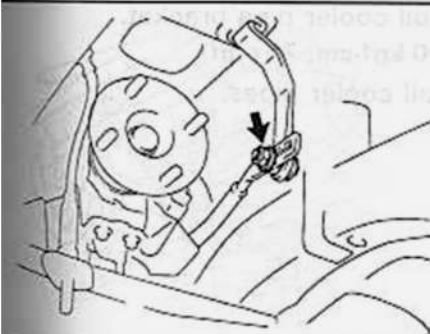
209966

7. REMOVE REAR CENTER FLOOR CROSSMEMBER BRACE

Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

8. REMOVE PROPELLER SHAFT

(See page PR-7)



004259

9. DISCONNECT SHIFT CONTROL ROD FROM SHIFT LEVER

Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

INSTALLATION HINT: Inspect and adjust the park/neutral position switch. (See page AT-43)

AT



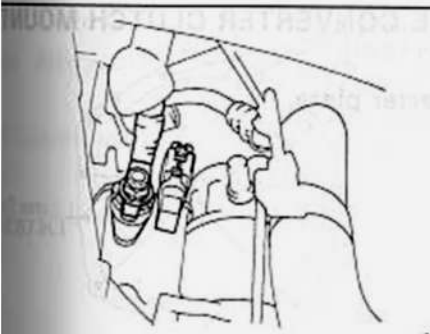
004343

10. REMOVE SHIFT CONTROL ROD FROM PARK/NEUTRAL POSITION SWITCH

Torque: 16 N·m (160 kgf·cm, 12 ft·lbf)

11. DISCONNECT THESE CONNECTORS:

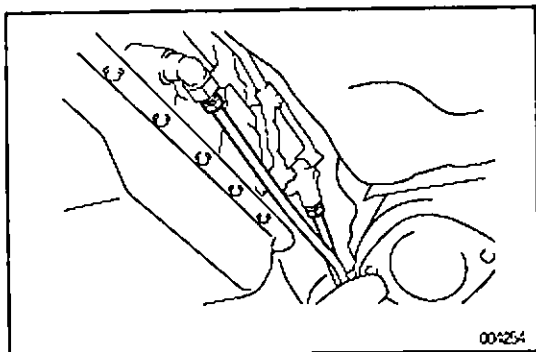
- O/D direct clutch speed sensor
- No.1 vehicle speed sensor
- No.2 vehicle speed sensor
- Solenoid wire
- Park/neutral position switch
- A/T fluid temp. sensor



003702

12. DISCONNECT CONNECTORS AND CABLE FROM STARTER

- (a) Remove the nut and disconnect the wire harness.
- (b) Disconnect the connectors.

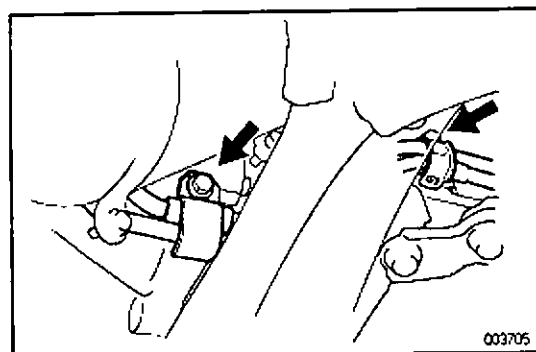
**13. REMOVE OIL COOLER PIPES**

- (a) Loosen the 2 oil cooler union nuts.

INSTALLATION HINT:

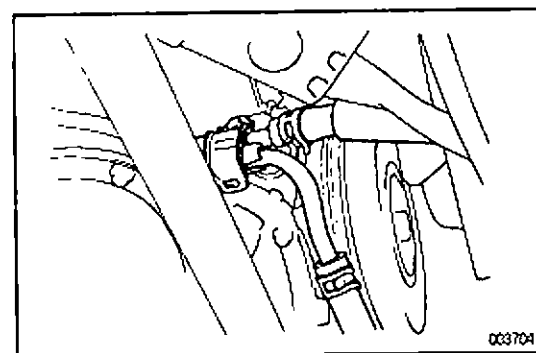
- Place the 2 oil cooler pipes at installation position.
- Tighten the 2 oil cooler union nuts to the transmission.

Torque: 34 N·m (350 kgf·cm, 25 ft·lbf)



- (b) Remove the center and rear oil cooler pipe brackets.

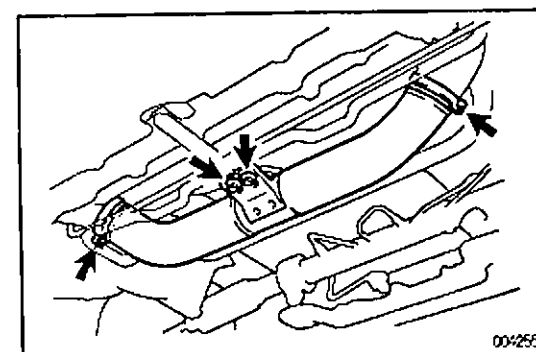
Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)



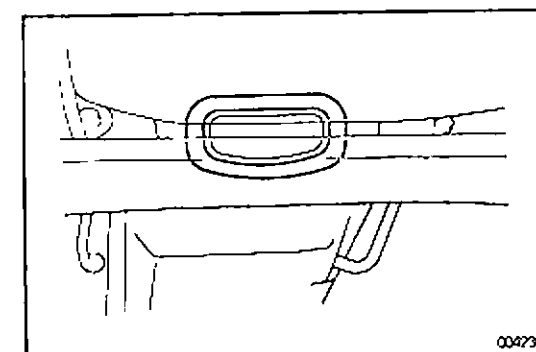
- (c) Remove the front oil cooler pipe bracket.

Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)

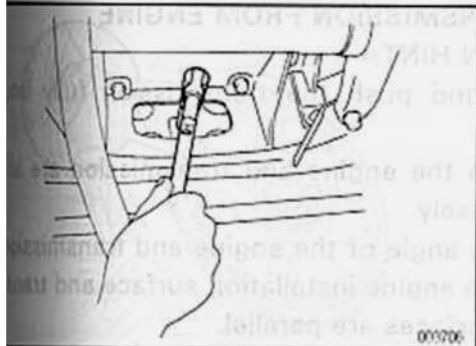
- (d) Disconnect the 2 oil cooler pipes.

**14. REMOVE INTERCOOLER PIPE**

- (a) Remove the 2 bolts.
(b) Loosen the 2 clamps.
(c) Remove the pipe.

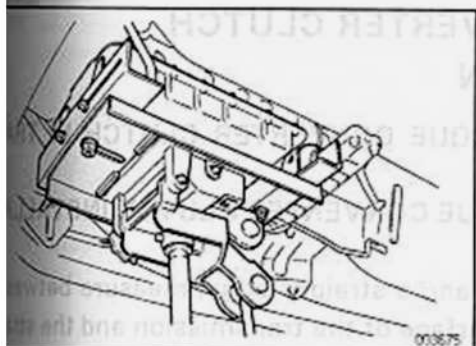
**15. REMOVE TORQUE CONVERTER CLUTCH MOUNTING BOLTS**

- (a) Remove the converter plate.

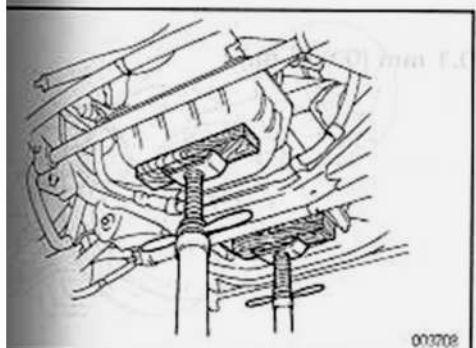


- (b) Turn the crankshaft to gain access and remove the 6 bolts.

Torque: 33 N·m (340 kgf·cm, 25 ft·lbf)

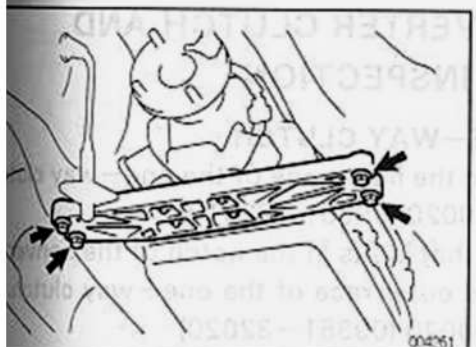


16. SET TRANSMISSION JACK



17. SUPPORT ENGINE

NOTICE: Use a wooden block so not to damage the engine oil pan.

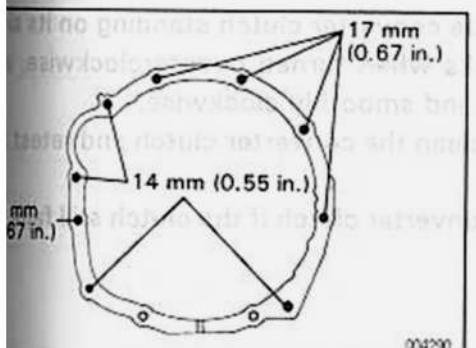


18. REMOVE TRANSMISSION REAR SUPPORT

Torque: 25 N·m (250 kgf·cm, 19 ft·lbf)

19. REMOVE 4 WIRE HARNESS CLAMPS

Lower the transmission and remove the 4 wire harness clamps from the retainer.



20. REMOVE STARTER AND TRANSMISSION SET BOLTS

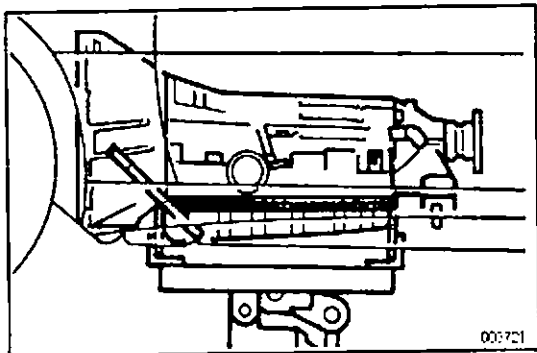
Torque:

17 mm head bolt:

72 N·m (730 kgf·cm, 53 ft·lbf)

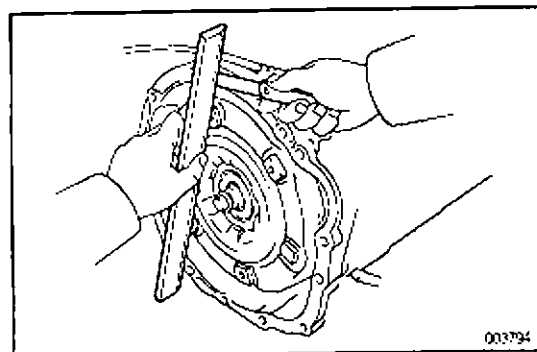
14 mm head bolt:

37 N·m (380 kgf·cm, 27 ft·lbf)



21. REMOVE TRANSMISSION FROM ENGINE INSTALLATION HINT:

- Jack up and push the transmission fully in position.
- Make sure the engine and transmission are aligned precisely.
- Adjust the angle of the engine and transmission so that the engine installation surface and transmission surfaces are parallel.



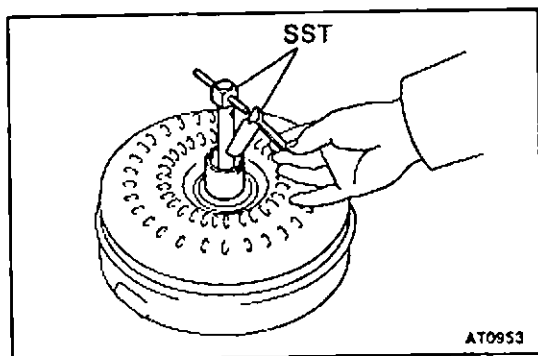
TORQUE CONVERTER CLUTCH INSTALLATION

1. INSTALL TORQUE CONVERTER CLUTCH IN TRANSMISSION
2. CHECK TORQUE CONVERTER CLUTCH INSTALLATION

Using calipers and a straight edge, measure between the installed surface of the transmission and the straight edge.

Clearance:

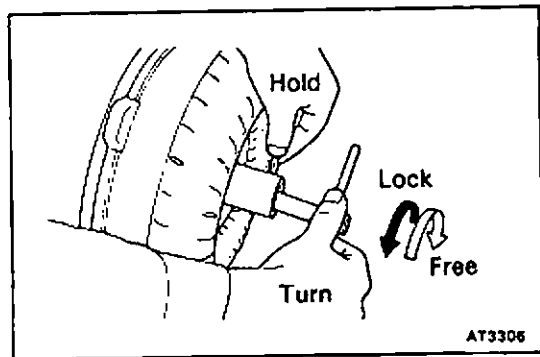
Less than 0.1 mm (0.004 in.)

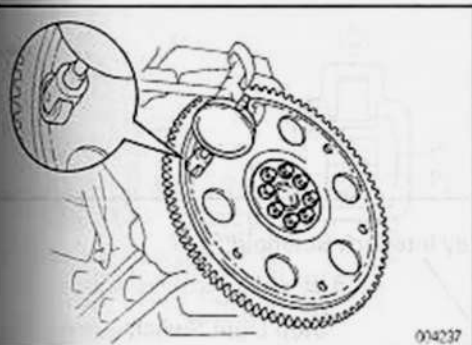


TORQUE CONVERTER CLUTCH AND DRIVE PLATE INSPECTION

1. INSPECT ONE-WAY CLUTCH

- (a) Install SST into the inner race of the one-way clutch. SST 09350-30020 (09351-32010)
- (b) Install SST so that it fits in the notch of the converter clutch hub and outer race of the one-way clutch. SST 09350-30020 (09351-32020)
- (c) With the torque converter clutch standing on its side, the clutch locks when turned counterclockwise, and rotates freely and smoothly clockwise. If necessary, clean the converter clutch and retest clutch. Replace the converter clutch if the clutch still fails the test.





2. MEASURE DRIVE PLATE RUNOUT AND INSPECT RING GEAR

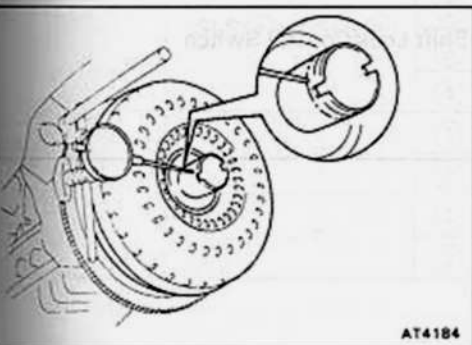
Set up a dial indicator and measure the drive plate runout.

Maximum runout:

0.20 mm (0.0079 in.)

If runout exceeds 0.20 mm (0.0079 in.) or if the ring gear is damaged replace the drive plate. If installing a new drive plate, note the orientation of spacers and tighten the bolts.

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



3. MEASURE TORQUE CONVERTER CLUTCH SLEEVE RUNOUT

- (a) Temporarily mount the torque converter clutch to the drive plate. Set up a dial indicator.

Maximum runout:

0.30 mm (0.0118 in.)

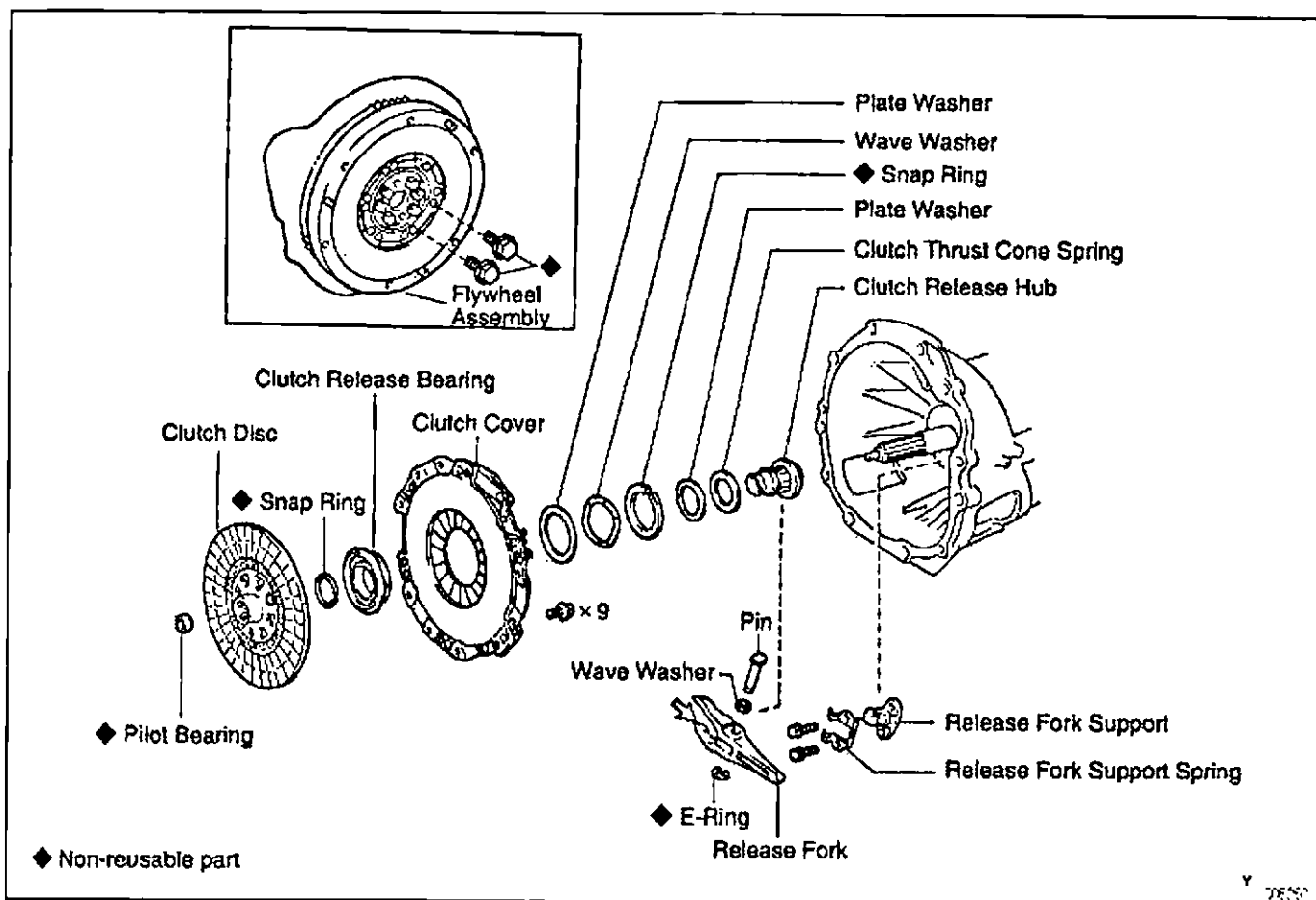
If runout exceeds 0.30 mm (0.0118 in.), try to correct by reorienting the installation of the converter clutch. If excessive runout cannot be corrected, replace the torque converter clutch.

HINT: Mark the position of the converter clutch to ensure correct installation.

- (b) Remove the torque converter clutch.

CLUTCH UNIT (2JZ—GTE) COMPONENTS

CL-11A-04



Y 70500

CL-11A-02

CLUTCH UNIT REMOVAL

1. REMOVE TRANSMISSION FROM ENGINE
(See page MT-5)

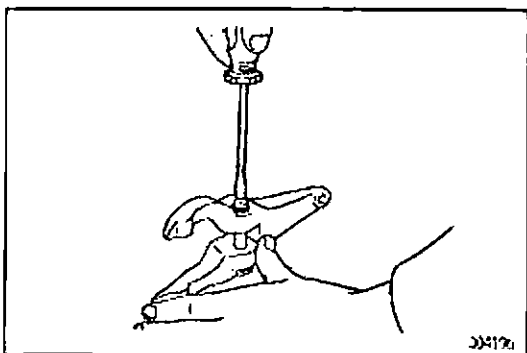
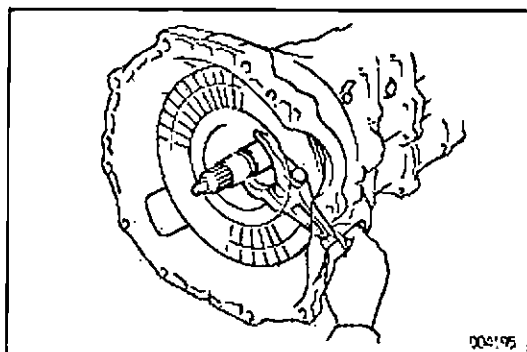
HINT: Do not drain the transmission oil.

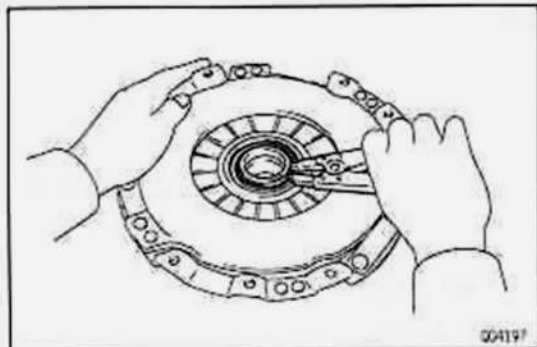
2. REMOVE RELEASE FORK ASSEMBLY

(a) Remove the release fork assembly from the left side of clutch housing service hole.

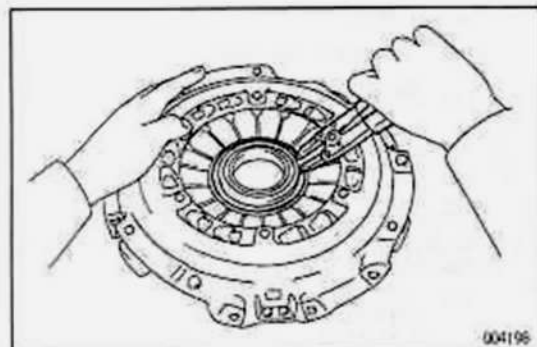
(b) Remove the E-ring from the release fork.

(c) Remove the pin and wave washer from the release fork.



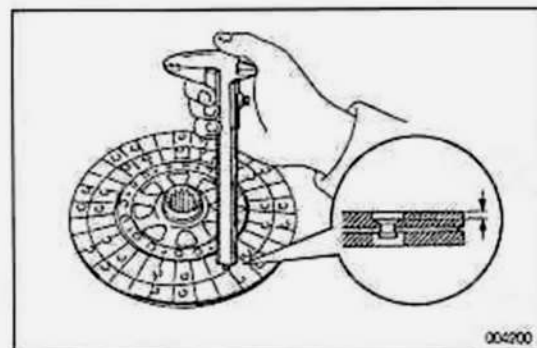


3. REMOVE CLUTCH DISC
4. REMOVE CLUTCH COVER ASSEMBLY
5. REMOVE CLUTCH RELEASE BEARING HUB
 - (a) Using a snap ring expander, remove the snap ring.
 - (b) Remove the release bearing hub, thrust cone spring and plate washer.



6. REMOVE CLUTCH RELEASE BEARING
 - (a) Using a snap ring expander, remove the snap ring.
 - (b) Remove the release bearing, wave washer and plate washer.

CL



CLUTCH PARTS INSPECTION AND REPAIR

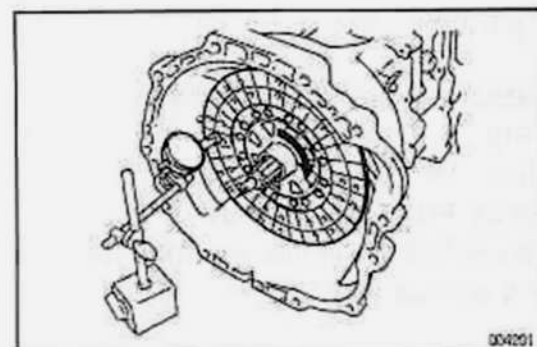
1. INSPECT CLUTCH DISC FOR WEAR OR DAMAGE

Using calipers, measure the rivet head depth.

Minimum rivet depth:

0.3 mm (0.012 in.)

If a problem is found, replace the clutch disc.



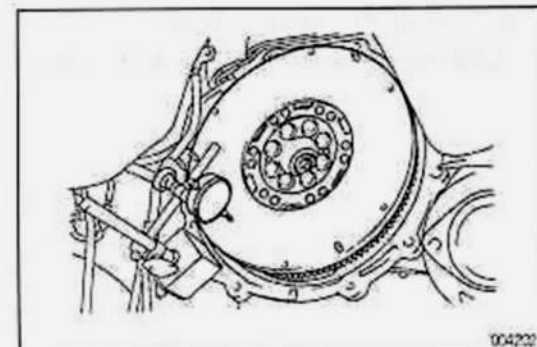
2. INSPECT CLUTCH DISC RUNOUT

Using a dial indicator, check the disc runout.

Maximum runout:

0.8 mm (0.031 in.)

If runout is excessive, replace the clutch disc.



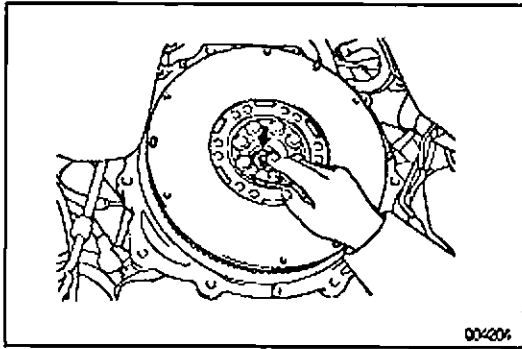
3. INSPECT FLYWHEEL RUNOUT

Using a dial indicator, check the flywheel runout.

Maximum runout:

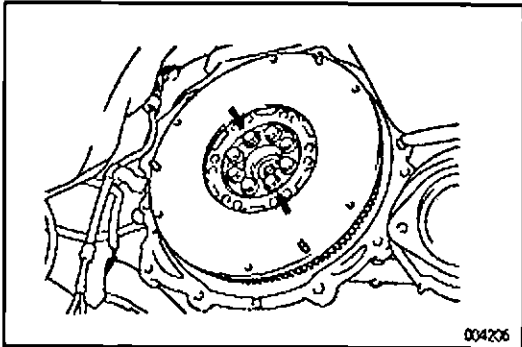
0.1 mm (0.004 in.)

If runout excessive, replace the flywheel.

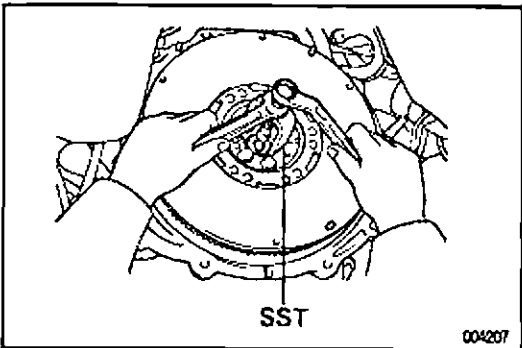
**4. INSPECT PILOT BEARING**

Turn the bearing by hand while applying force in the axial direction.

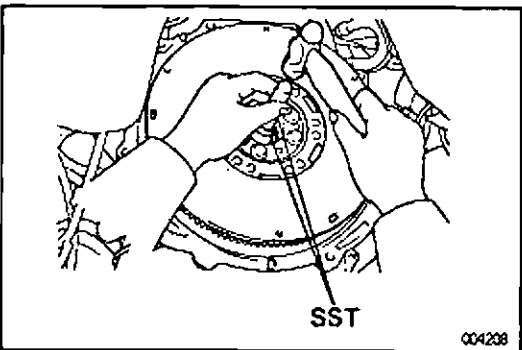
If the bearing sticks or has much resistance, replace the pilot bearing.

**5. IF NECESSARY, REPLACE PILOT BEARING**

- (a) Remove the 2 bolts at diametrically opposite points.

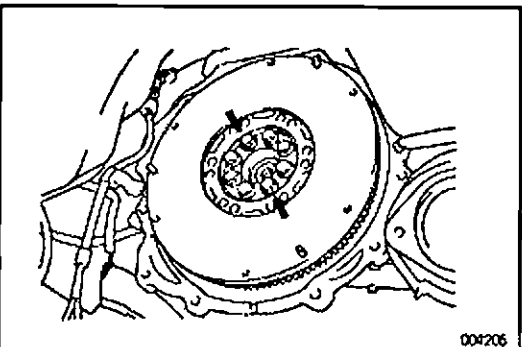


- (b) Using SST, remove the pilot bearing.
SST 09303-35011



- (c) Using SST and a hammer, drive in a new pilot bearing.

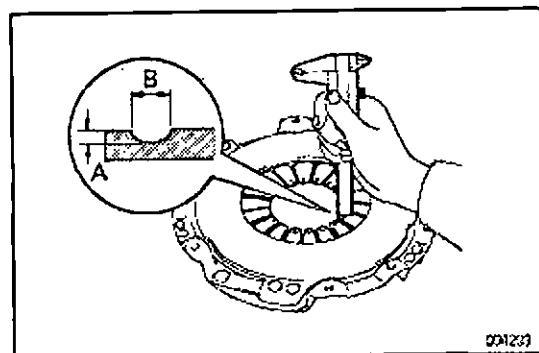
SST 09301-00110



- (d) Install 2 new bolts.

- (e) First, torque the 2 bolts uniformly a little at a time.
Torque: 49 N·m (500 kgf·cm, 36 ft·lbf)

- (f) Then tighten the 2 bolts an additional 80–100°.



6. INSPECT DIAPHRAGM SPRING FOR WEAR

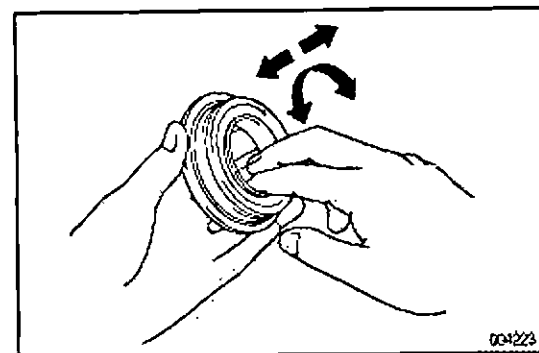
Using calipers, measure the diaphragm spring for depth and width of wear.

Maximum:

A: Depth 0.6 mm (0.024 in.)

B: Width 5.0 mm (0.197 in.)

If necessary, replace the clutch cover.

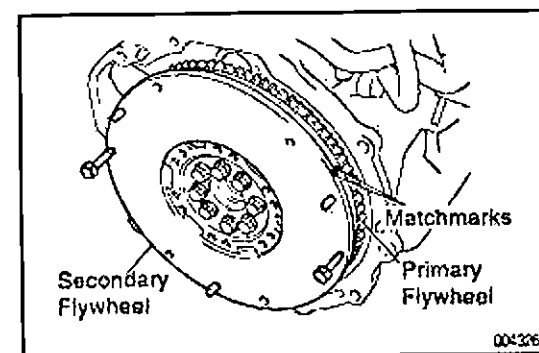


7. INSPECT RELEASE BEARING

Turn the bearing by hand while applying force in the axial direction.

HINT: The bearing is permanently lubricated and requires no cleaning or lubrication.

If a problem is found, replace the bearing together with the hub.



8. INSPECT FLYWHEEL DAMPER FOR GREASE LEAKAGE

If grease has sprayed onto the clutch housing, replace the flywheel assembly.

9. INSPECT FLYWHEEL DAMPER ROTATIONAL FREELAY

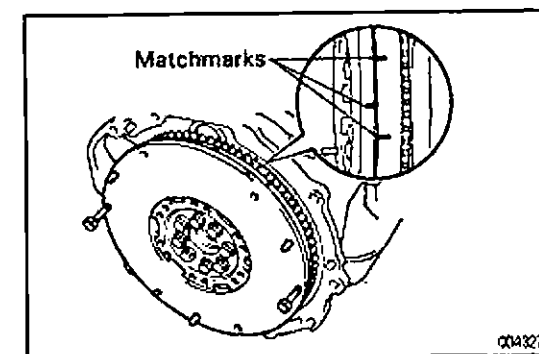
- Install the 2 bolts to the secondary flywheel at diametrically opposite positions.
- Holding both the bolts, turn the secondary flywheel clockwise until it stops.
- Put matchmarks on the primary and secondary flywheels at this position.
- Then rotate the primary flywheel counterclockwise by hand until it stops.
- Put matchmarks on the primary flywheel at this position.
- Measure the circumferential length between the 2 matchmarks on the secondary flywheel.

Standard:

105 mm (4.134 in.)

- Repeat the preceding steps (d) to (f) 4 times and if the measurement is greater than the maximum length replace the flywheel assembly.

(See page EG-122)



CLUTCH UNIT INSTALLATION



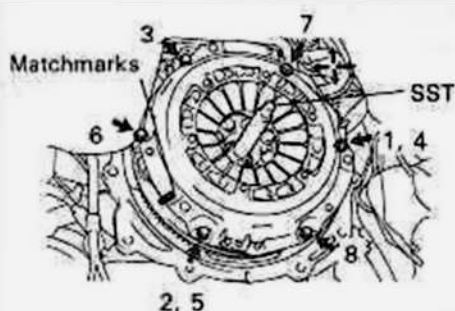
004209

Z13786

1. INSTALL CLUTCH DISC AND COVER ON FLY-WHEEL

- (a) Insert SST in the clutch disc, and then set them and the cover in position.

SST 09301-00110



004210

- (b) Align the matchmarks on the clutch cover and fly-wheel.

- (c) Tighten the bolts evenly and gradually while pushing the SST. Make several passes around the cover until it is snug.

- (d) Torque the bolts on the clutch cover in the order shown.

Torque: 19 N·m (195 kgf·cm, 14 ft·lbf)

HINT: Temporarily tighten the No.1 and No.2 bolts.

2. CHECK DIAPHRAGM SPRING TIP ALIGNMENT

Using a dial indicator with roller instrument, check the diaphragm spring tip alignment.

Maximum non-alignment:

0.5 mm (0.020 in.)

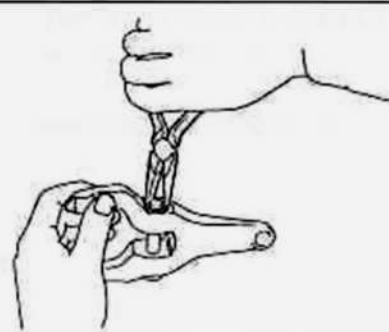
If alignment is not as specified, use the SST to adjust the diaphragm spring tip alignment.

SST 09333-00013

3. REMOVE CLUTCH COVER AND CLUTCH DISC

4. INSTALL CLUTCH RELEASE FORK

- (a) Install the wave washer and pin to release fork.
(b) Install a new E-ring.

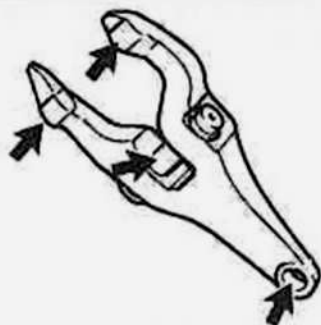


004219

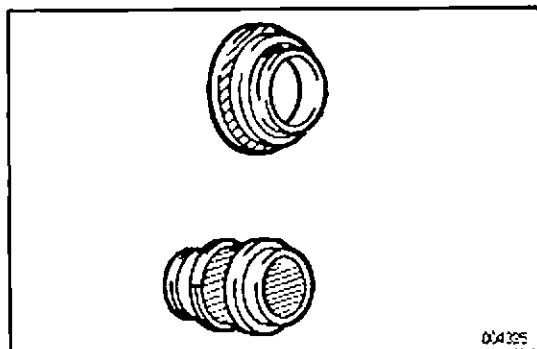
5. APPLY MOLYBDENUM DISULPHIDE LITHIUM BASE GREASE (NLGI NO.2)

- (a) Apply release hub grease to these parts:

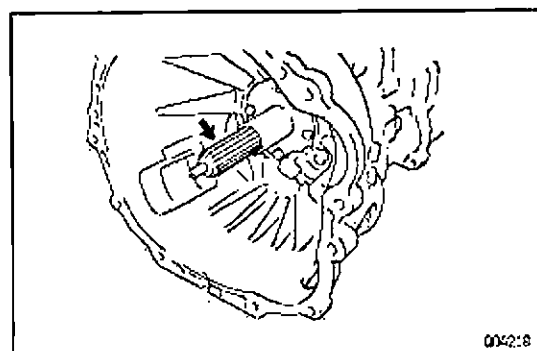
- Release fork and hub contact point
- Release fork and push rod contact point
- Release fork pivot point



004220



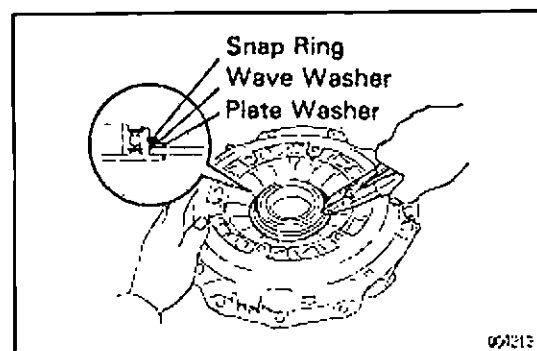
- Release bearing hub inside groove
- Release bearing front surface



(b) Apply clutch spline grease.

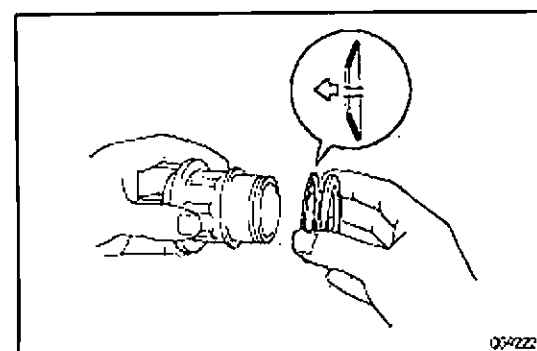
- Clutch disc spline

HINT: Recommended grease part number 08887-01706.



6. INSTALL CLUTCH RELEASE BEARING

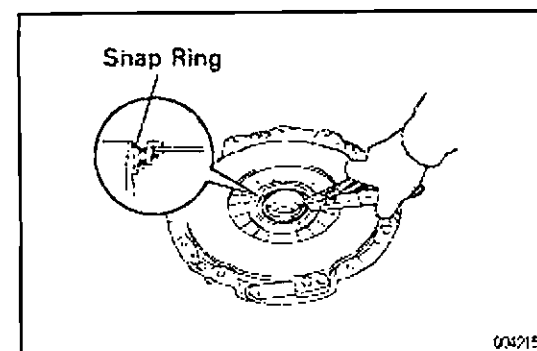
- (a) Install the release bearing hub, wave washer and plate washer.
- (b) Using a snap ring expander, install a new snap ring.



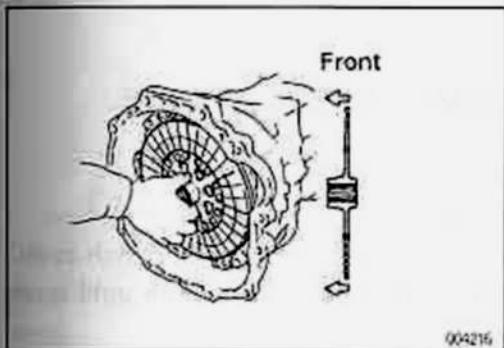
7. INSTALL CLUTCH RELEASE BEARING HUB

- (a) Install the thrust cone washer and plate washer to release bearing hub.

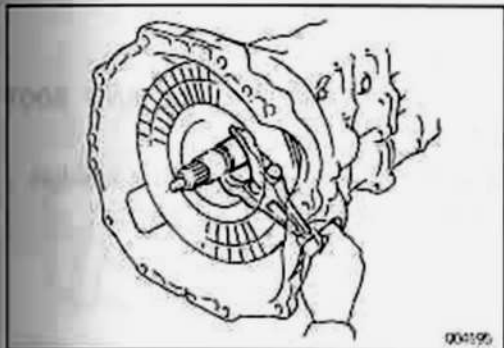
NOTICE: Install the thrust cone washer in correct direction.



- (b) Install the release bearing hub to release bearing.
- (c) Using a snap ring expander, install a new snap ring.

**8. INSTALL CLUTCH COVER ASSEMBLY****9. INSTALL CLUTCH DISC**

NOTICE: Install the clutch disc in the correct direction.

**10. INSTALL RELEASE FORK ASSEMBLY**

Install the release bearing assembly to the release fork assembly, and then install them to the transmission.

11. INSTALL TRANSMISSION TO ENGINE

(See page MT-5)

SERVICE SPECIFICATIONS

SERVICE DATA

CL-22-81

Pedal height from asphalt sheet		146.2—156.2 mm (5.75—6.15 in.)
Pedal freeplay		5.0—15.0 mm (0.197—0.591 in.)
Push rod play at pedal top		1.0—5.0 mm (0.039—0.197 in.)
Full pedal stroke		132.0—138.0 mm (5.20—5.43 in.)
Clutch release point from pedal full stroke end position		25 mm (0.98 in.) or more
Disc rivet head depth	Maximum	0.3 mm (0.012 in.)
Disc runout	Maximum	0.8 mm (0.031 in.)
Diaphragm spring out run—alignment	Maximum	0.5 mm (0.020 in.)
Diaphragm spring finger wear	Depth Maximum	0.8 mm (0.024 in.)
Diaphragm spring finger wear	Width Maximum	5.0 mm (0.197 in.)
Flywheel runout	Maximum	0.1 mm (0.004 in.)
Flywheel damper rotational freeplay (2JZ—GTE)	Standard	105 mm (4.134 in.)

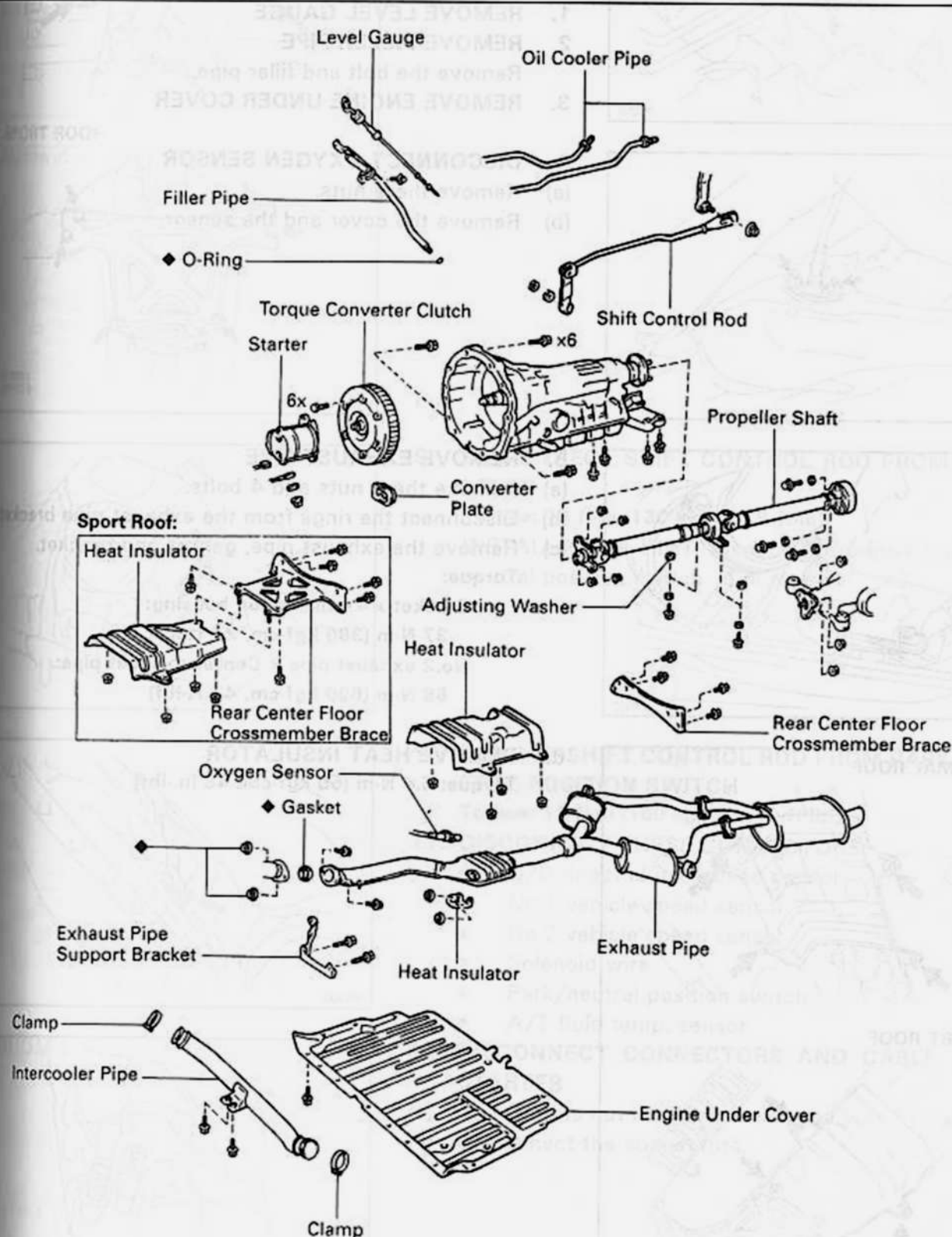
CL-22-81

TORQUE SPECIFICATIONS

Part tightened	N-m	kgf-cm	ft-lbf
Clutch cover x Flywheel	19	195	14
Master cylinder set nut	12	125	9
Release cylinder set bolt	12	120	9
Clutch tube bracket (2JZ—GE)	4.9	50	43 in.-lbf
Clutch line union	15	155	11
Bleeder plug	11	110	8
Flywheel set bolt	49	500	36
Release fork support (2JZ—GTE)	25	260	18
Release fork support (2JZ—GE)	39	400	28
Clutch housing cover LH (2JZ—GTE)	12	120	9

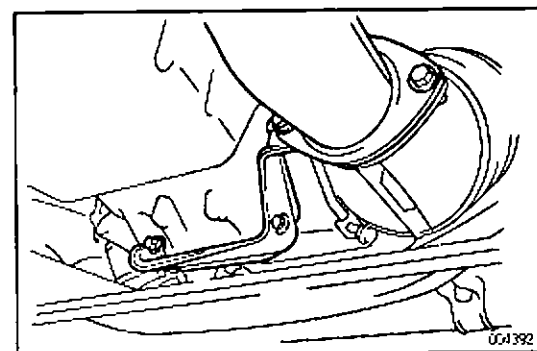
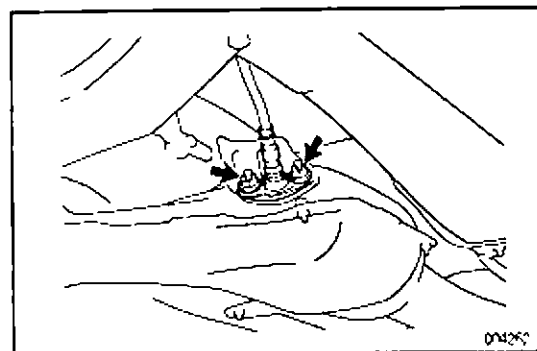
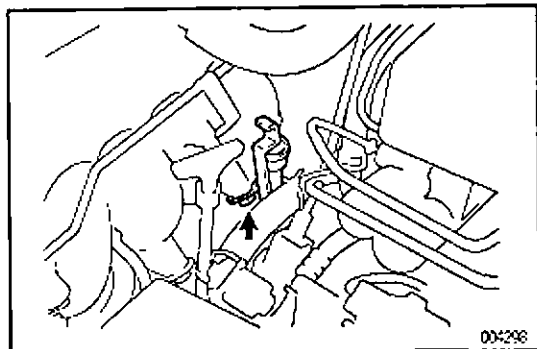
ASSEMBLY REMOVAL AND INSTALLATION COMPONENTS

AXD12-0C



AT

Q06282



TRANSMISSION REMOVAL

Installation is in the reverse order of removal.
INSTALLATION HINT: After installation, fill A/T fluid and check fluid level. (See page AT-42)

1. REMOVE LEVEL GAUGE
2. REMOVE FILLER PIPE
Remove the bolt and filler pipe.
3. REMOVE ENGINE UNDER COVER

4. DISCONNECT OXYGEN SENSOR
 - (a) Remove the 2 nuts.
 - (b) Remove the cover and the sensor.

5. REMOVE EXHAUST PIPE
 - (a) Remove the 2 nuts and 4 bolts.
 - (b) Disconnect the rings from the exhaust pipe bracket.
 - (c) Remove the exhaust pipe, gasket and bracket.

Torque:

Bracket x Transmission housing:

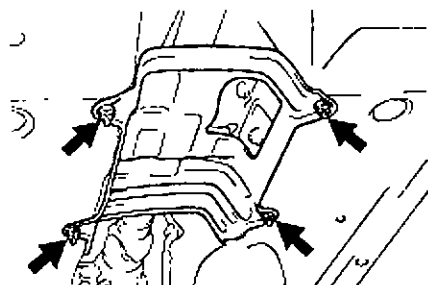
37 N·m (380 kgf·cm, 27 ft·lbf)

No.2 exhaust pipe x Center exhaust pipe:

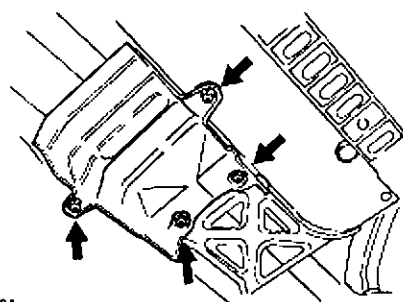
58 N·m (590 kgf·cm, 43 ft·lbf)

6. REMOVE HEAT INSULATOR
Torque: 5.4 N·m (55 kgf·cm, 48 in·lbf)

NORMAL ROOF



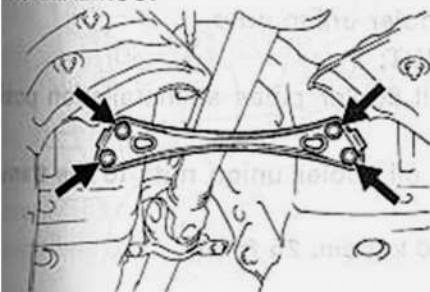
SPORT ROOF



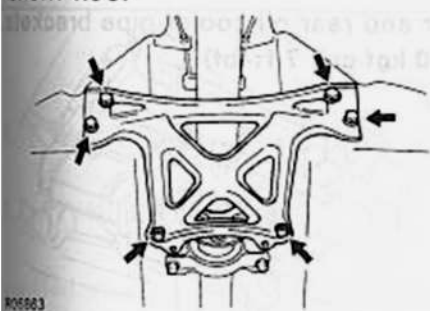
ROB661
004100

203265

NORMAL ROOF



SPORT ROOF

R01003
004009

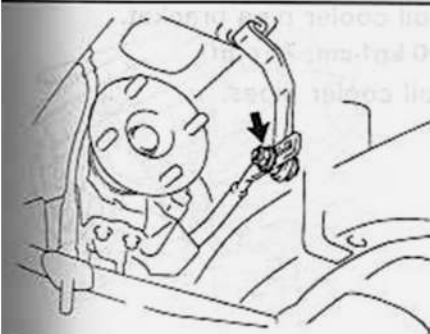
209966

7. REMOVE REAR CENTER FLOOR CROSSMEMBER BRACE

Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

8. REMOVE PROPELLER SHAFT

(See page PR-7)



004259

9. DISCONNECT SHIFT CONTROL ROD FROM SHIFT LEVER

Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

INSTALLATION HINT: Inspect and adjust the park/neutral position switch. (See page AT-43)

AT



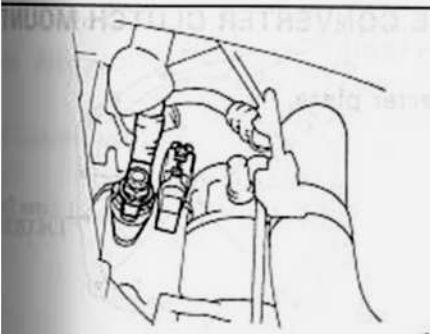
004343

10. REMOVE SHIFT CONTROL ROD FROM PARK/NEUTRAL POSITION SWITCH

Torque: 16 N·m (160 kgf·cm, 12 ft·lbf)

11. DISCONNECT THESE CONNECTORS:

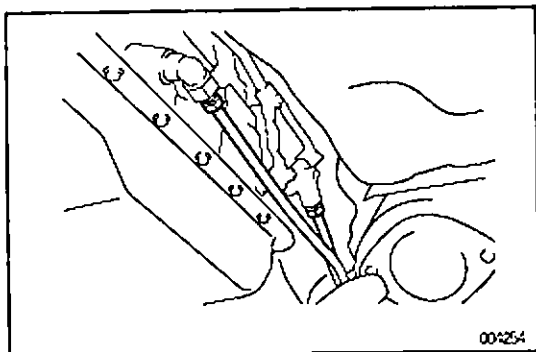
- O/D direct clutch speed sensor
- No.1 vehicle speed sensor
- No.2 vehicle speed sensor
- Solenoid wire
- Park/neutral position switch
- A/T fluid temp. sensor



003702

12. DISCONNECT CONNECTORS AND CABLE FROM STARTER

- (a) Remove the nut and disconnect the wire harness.
- (b) Disconnect the connectors.

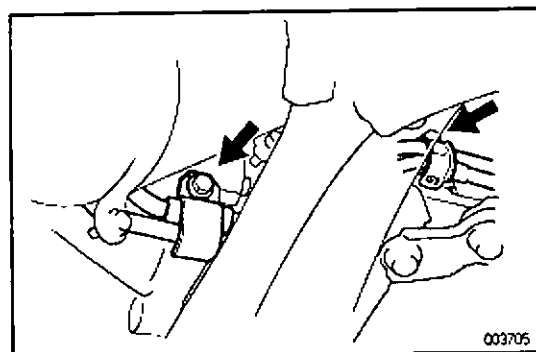
**13. REMOVE OIL COOLER PIPES**

- (a) Loosen the 2 oil cooler union nuts.

INSTALLATION HINT:

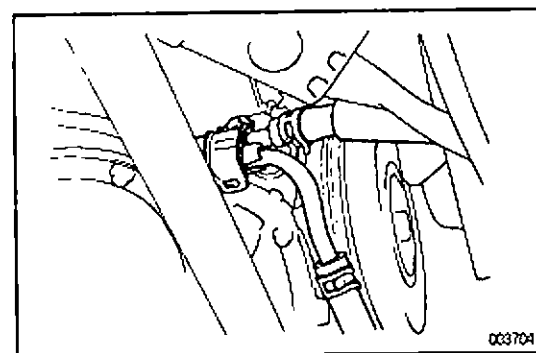
- Place the 2 oil cooler pipes at installation position.
- Tighten the 2 oil cooler union nuts to the transmission.

Torque: 34 N·m (350 kgf·cm, 25 ft·lbf)



- (b) Remove the center and rear oil cooler pipe brackets.

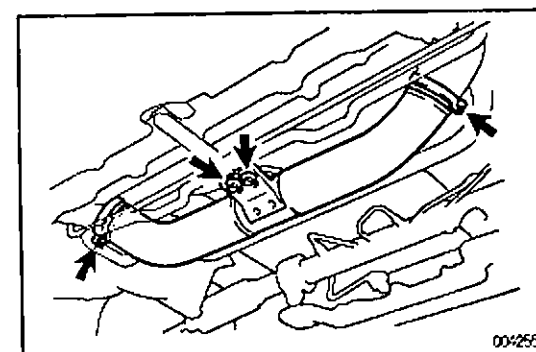
Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)



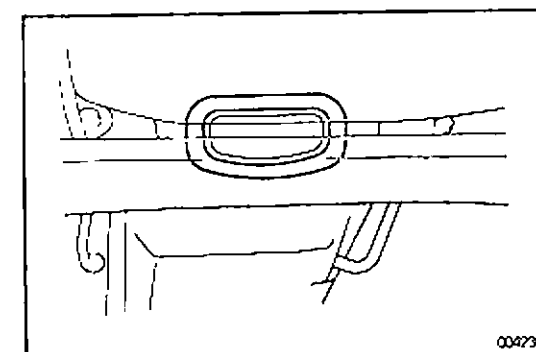
- (c) Remove the front oil cooler pipe bracket.

Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)

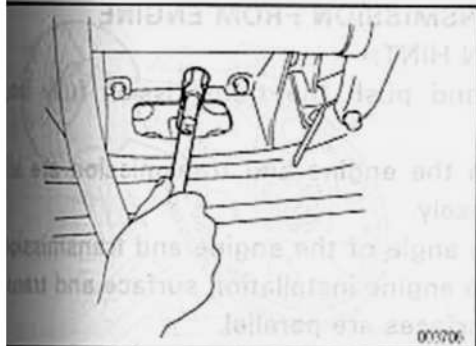
- (d) Disconnect the 2 oil cooler pipes.

**14. REMOVE INTERCOOLER PIPE**

- (a) Remove the 2 bolts.
(b) Loosen the 2 clamps.
(c) Remove the pipe.

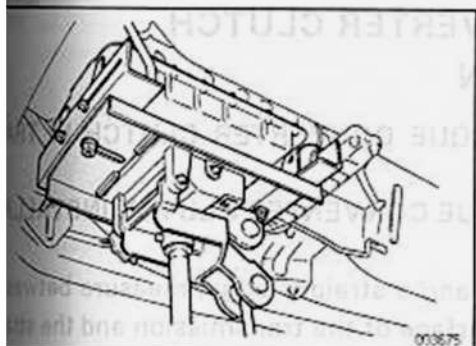
**15. REMOVE TORQUE CONVERTER CLUTCH MOUNTING BOLTS**

- (a) Remove the converter plate.

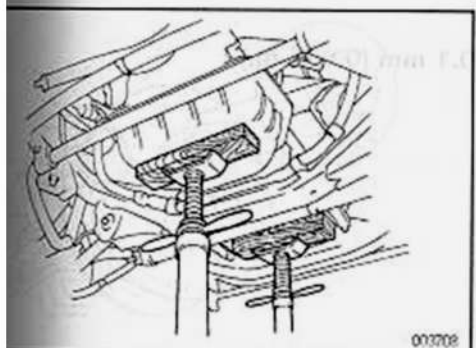


- (b) Turn the crankshaft to gain access and remove the 6 bolts.

Torque: 33 N·m (340 kgf·cm, 25 ft·lbf)

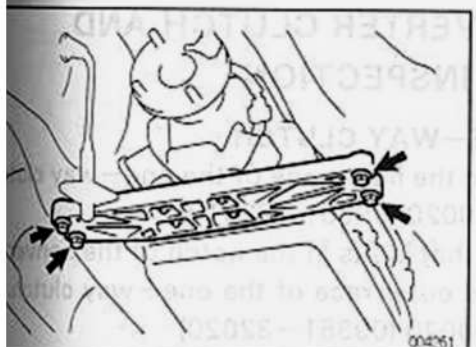


16. SET TRANSMISSION JACK



17. SUPPORT ENGINE

NOTICE: Use a wooden block so not to damage the engine oil pan.

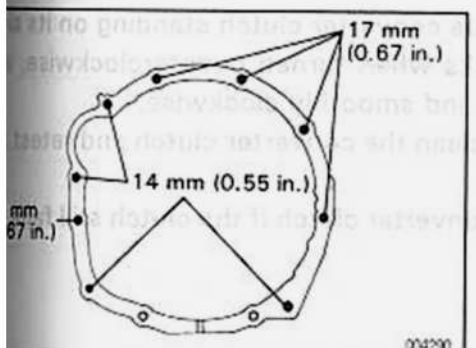


18. REMOVE TRANSMISSION REAR SUPPORT

Torque: 25 N·m (250 kgf·cm, 19 ft·lbf)

19. REMOVE 4 WIRE HARNESS CLAMPS

Lower the transmission and remove the 4 wire harness clamps from the retainer.



20. REMOVE STARTER AND TRANSMISSION SET BOLTS

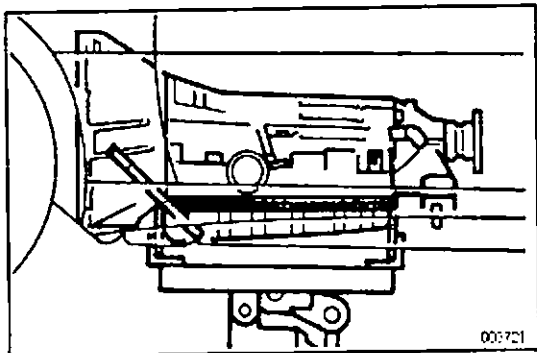
Torque:

17 mm head bolt:

72 N·m (730 kgf·cm, 53 ft·lbf)

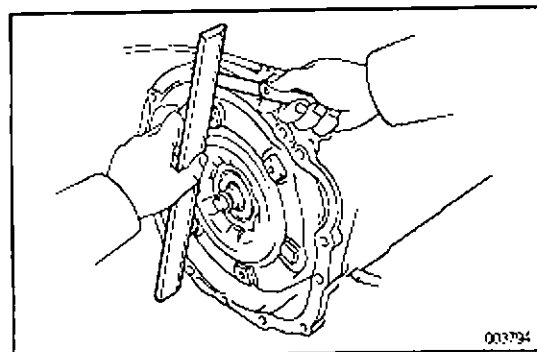
14 mm head bolt:

37 N·m (380 kgf·cm, 27 ft·lbf)



21. REMOVE TRANSMISSION FROM ENGINE INSTALLATION HINT:

- Jack up and push the transmission fully in position.
- Make sure the engine and transmission are aligned precisely.
- Adjust the angle of the engine and transmission so that the engine installation surface and transmission surfaces are parallel.



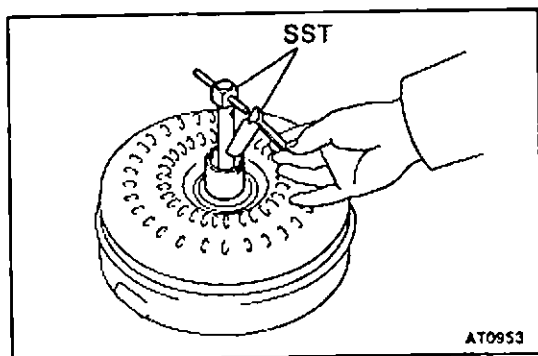
TORQUE CONVERTER CLUTCH INSTALLATION

1. INSTALL TORQUE CONVERTER CLUTCH IN TRANSMISSION
2. CHECK TORQUE CONVERTER CLUTCH INSTALLATION

Using calipers and a straight edge, measure between the installed surface of the transmission and the straight edge.

Clearance:

Less than 0.1 mm (0.004 in.)

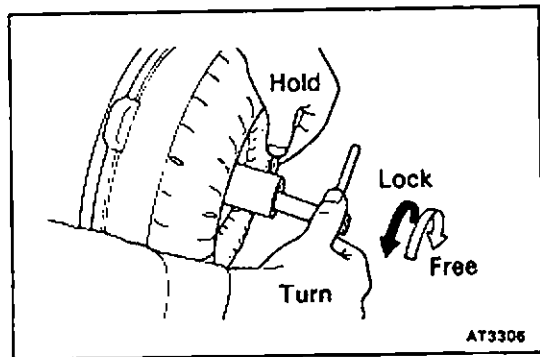


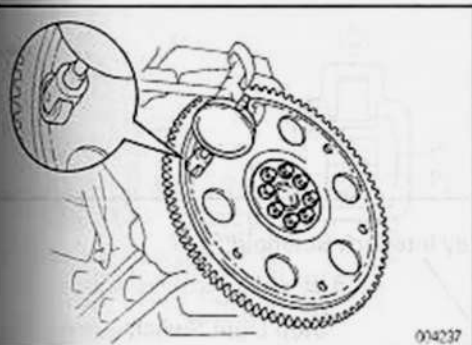
TORQUE CONVERTER CLUTCH AND DRIVE PLATE INSPECTION

1. INSPECT ONE-WAY CLUTCH

- (a) Install SST into the inner race of the one-way clutch. SST 09350-30020 (09351-32010)
- (b) Install SST so that it fits in the notch of the converter clutch hub and outer race of the one-way clutch. SST 09350-30020 (09351-32020)

- (c) With the torque converter clutch standing on its side, the clutch locks when turned counterclockwise, and rotates freely and smoothly clockwise. If necessary, clean the converter clutch and retest clutch. Replace the converter clutch if the clutch still fails the test.





2. MEASURE DRIVE PLATE RUNOUT AND INSPECT RING GEAR

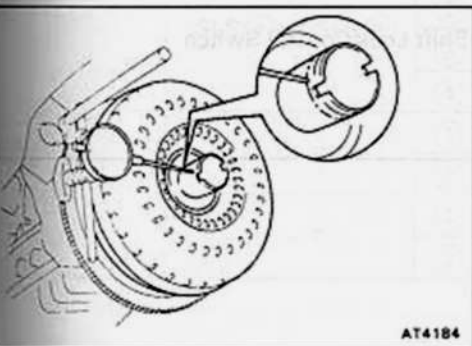
Set up a dial indicator and measure the drive plate runout.

Maximum runout:

0.20 mm (0.0079 in.)

If runout exceeds 0.20 mm (0.0079 in.) or if the ring gear is damaged replace the drive plate. If installing a new drive plate, note the orientation of spacers and tighten the bolts.

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



3. MEASURE TORQUE CONVERTER CLUTCH SLEEVE RUNOUT

- (a) Temporarily mount the torque converter clutch to the drive plate. Set up a dial indicator.

Maximum runout:

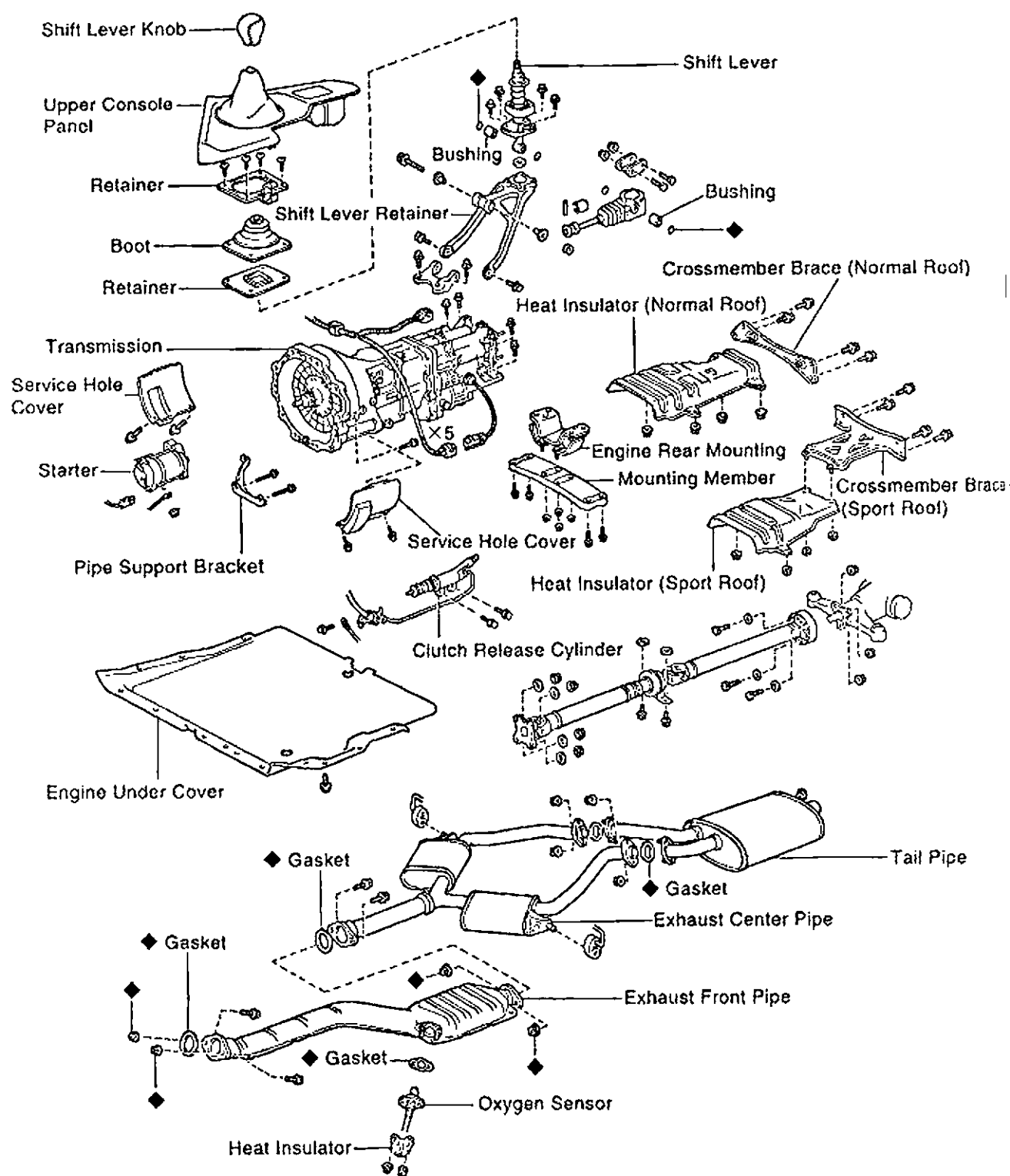
0.30 mm (0.0118 in.)

If runout exceeds 0.30 mm (0.0118 in.), try to correct by reorienting the installation of the converter clutch. If excessive runout cannot be corrected, replace the torque converter clutch.

HINT: Mark the position of the converter clutch to ensure correct installation.

- (b) Remove the torque converter clutch.

ASSEMBLY REMOVAL AND INSTALLATION



TRANSMISSION REMOVAL

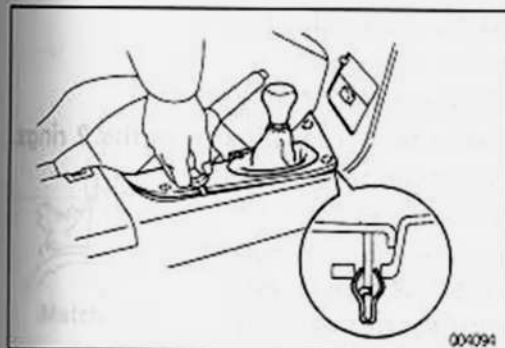
Installation is in the reverse order of removal.

INSTALLATION HINT: After installation, check and inspect item as follow.

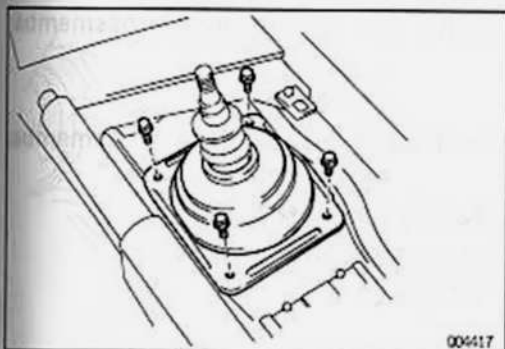
- Road test the vehicle.

1. REMOVE UPPER CONSOLE PANEL, SHIFT LEVER BOOT AND SET BOLTS

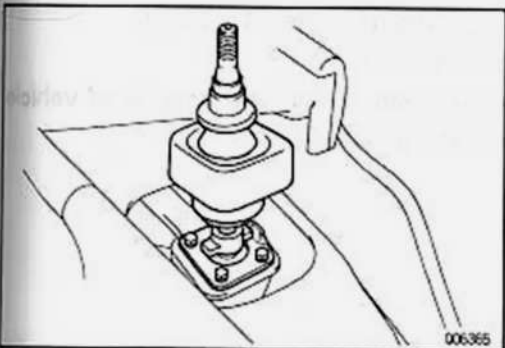
- (a) Remove the shift lever knob.
- (b) Using a screwdriver, pry out the upper console panel.
- (c) Remove the 4 set bolts.
- (d) Remove the shift and select lever boot No.1 and No.2.



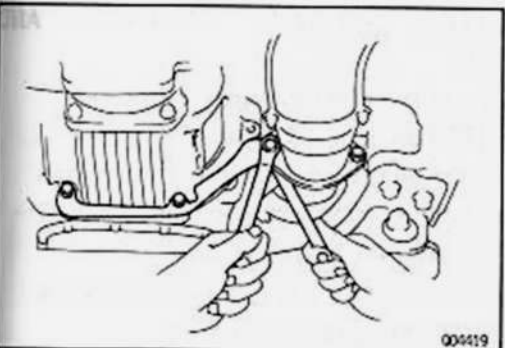
004094



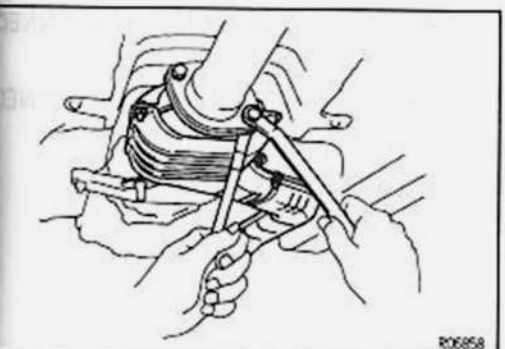
004417



006365



004419



R06858

- (e) Remove the 4 set bolts.

Torque: 7.8 N·m (80 kgf·cm, 69 in·lbf)

2. RAISE VEHICLE

NOTICE: Be sure the vehicle is securely supported.

3. DRAIN TRANSMISSION OIL

Oil type:

TOYOTA GEAR OIL V160 or
ESSO ATF DEXRON®D-21065

Capacity:

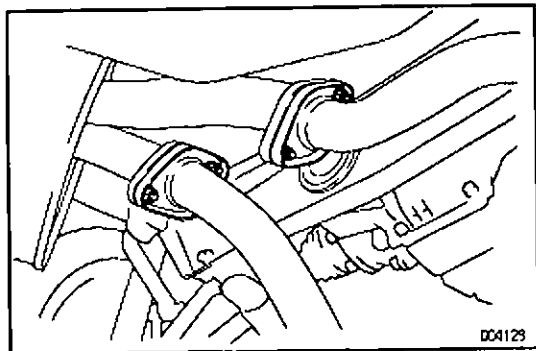
1.8 liters (1.9 US qts, 1.6 Imp.qts)

4. REMOVE EXHAUST FRONT PIPE AND PIPE SUPPORT BRACKET

- (a) Remove the 2 nuts, heat insulator, oxygen sensor and gasket.
 - (b) Remove the 2 bolts and nuts.
 - (c) Remove the 2 bolts and pipe support bracket.
- Torque: 43 N·m (440 kgf·cm, 32 ft·lbf)

- (d) Remove the 2 bolts and nuts.

- (e) Remove the exhaust front pipe and gasket.
- Torque: 58 N·m (590 kgf·cm, 43 ft·lbf)

**5. REMOVE EXHAUST CENTER PIPE**

- (a) Remove the 4 nuts.

Torque: 19 N·m (195 kgf·cm, 14 ft·lbf)

- (b) Disconnect the exhaust center pipe from the 2 rings.

- (c) Remove the exhaust center pipe.

6. REMOVE HEAT INSULATOR

Remove the 4 nuts and heat insulator.

Torque: 5.4 N·m (55 ft·lbf, 48 in·lbf)

7. REMOVE CROSSMEMBER BRACE

Normal Roof:

Remove the 4 bolts and center floor crossmember brace.

Sport Roof:

Remove the 6 bolts and center floor crossmember brace.

Torque: 13 N·m (130 kgf·cm, 9 ft·lbf)

8. REMOVE PROPELLER SHAFT

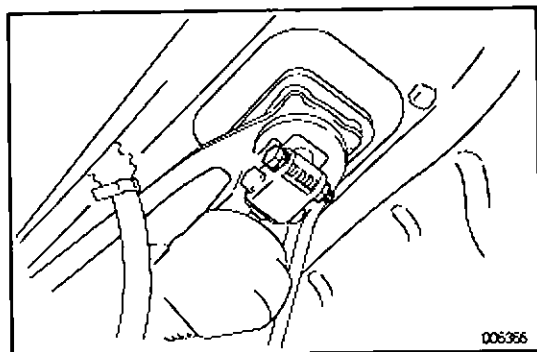
(See page PR-7,13)

9. REMOVE TRANSMISSION SHIFT LEVER

- (a) Remove the bolt and nut.

- (b) Remove the transmission shift lever, inside of vehicle.

Torque: 19 N·m (195 kgf·cm, 14 ft·lbf)

**10. REMOVE CLUTCH RELEASE CYLINDER AND GROUND CABLE**

- (a) Remove the bolt, clamp and ground cable.

Torque: 72 N·m (730 kgf·cm, 53 ft·lbf)

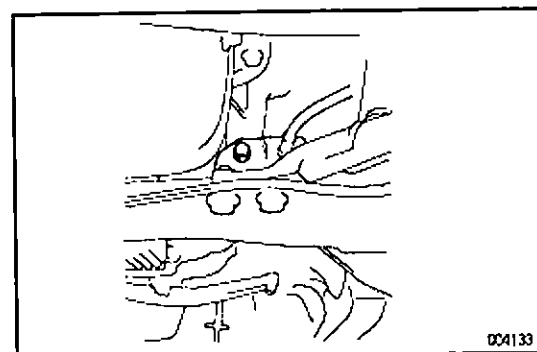
- (b) Remove the 2 bolts and clutch release cylinder.

Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)

11. DISCONNECT STARTER WIRE

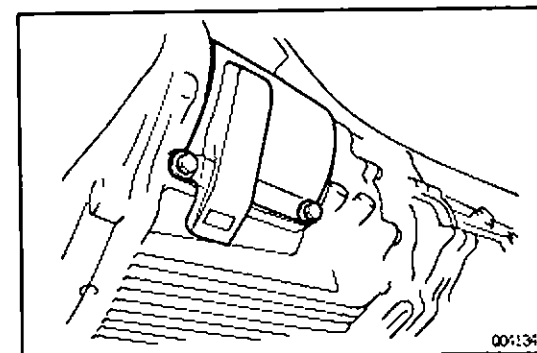
- (a) Remove the nut and disconnect the starter wire.

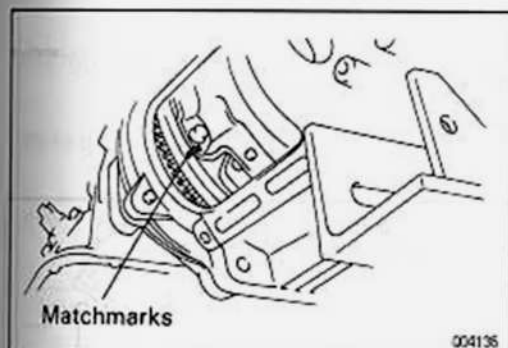
- (b) Disconnect the starter wire connector.

**12. DISCONNECT VEHICLE SPEED SENSOR CONNECTOR****13. DISCONNECT BACK-UP LIGHT SWITCH CONNECTOR****14. REMOVE CLUTCH COVER SET BOLTS**

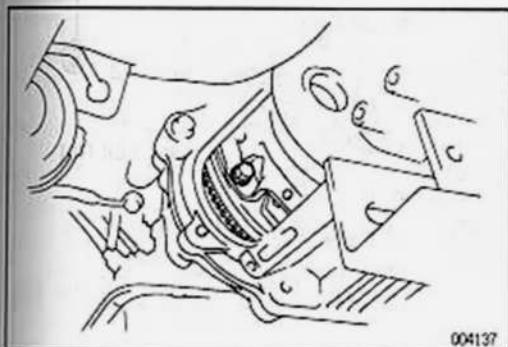
- (a) Remove the 2 bolts and service hole cover.

Torque: 12 N·m (120 kgf·cm, 9 ft·lbf)





- (b) Place matchmarks on the flywheel and clutch cover.



- (c) Remove the 6 bolts.

Torque: 19 N·m (195 kgf·cm, 14 ft·lbf)

15. JACK UP TRANSMISSION SLIGHTLY

Using a transmission jack, support the transmission.

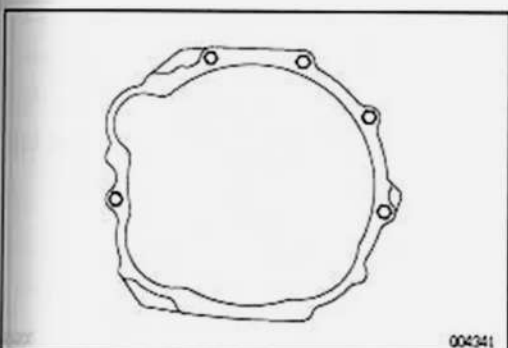
16. REMOVE REAR ENGINE MOUNTING MEMBER

Remove the 4 nuts, bolts and rear engine mounting member.

Torque:

Nut: 13 N·m (135 kgf·cm, 10 ft·lbf)

Bolt: 25 N·m (260 kgf·cm, 19 ft·lbf)



17. REMOVE STARTER

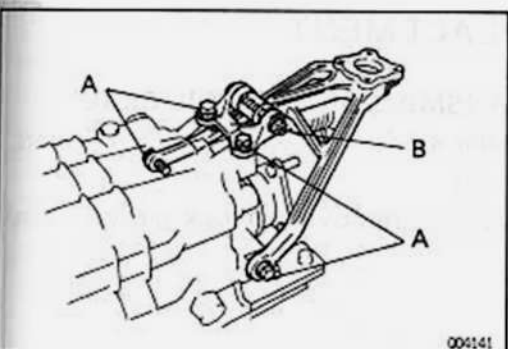
Lower the engine rear side and remove the 2 bolts and starter.

Torque: 39 N·m (400 kgf·cm, 29 ft·lbf)

18. REMOVE TRANSMISSION

Remove the transmission mounting 5 bolts and transmission from the engine.

Torque: 72 N·m (730 kgf·cm, 53 ft·lbf)



19. REMOVE SHIFT LEVER RETAINER

Remove the 4 bolts and shift lever retainer from the transmission.

Torque:

Bolt A: 19 N·m (195 kgf·cm, 14 ft·lbf)

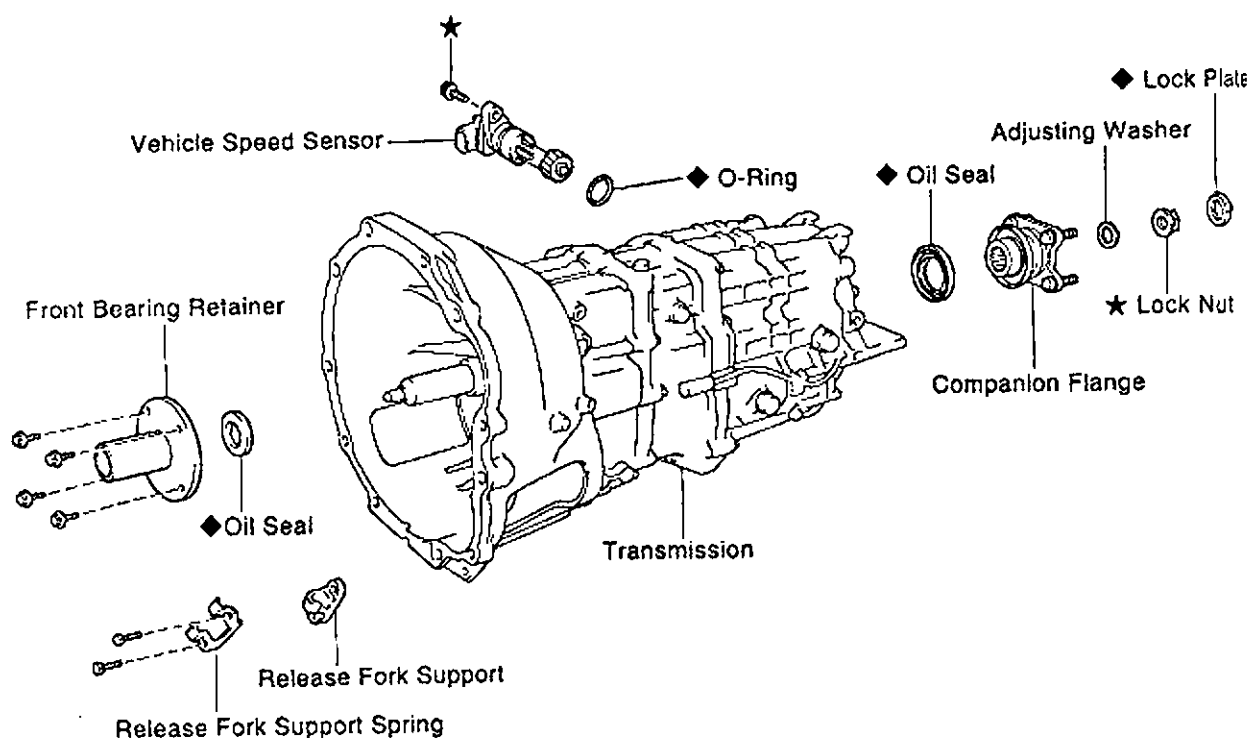
Bolt B: 25 N·m (250 kgf·cm, 18 ft·lbf)

20. REMOVE ENGINE REAR MOUNTING

Remove the 4 bolts and engine rear mounting from the transmission.

Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)

OIL SEALS COMPONENTS



◆ Non-reusable part

★ Precoated part

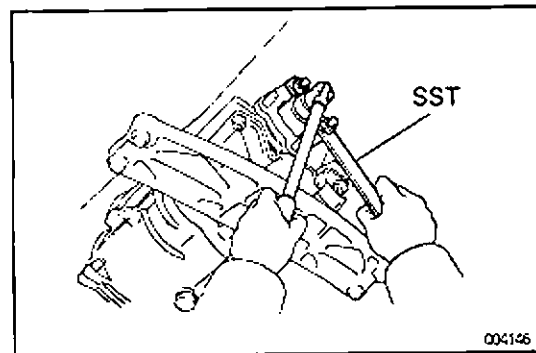
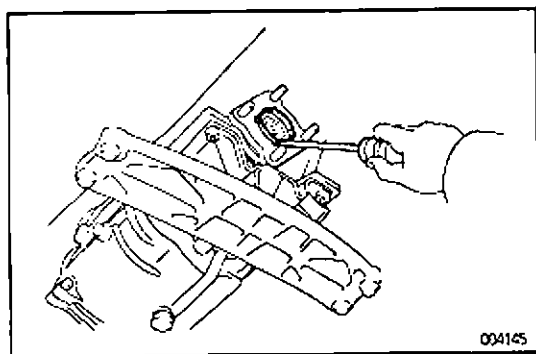
093

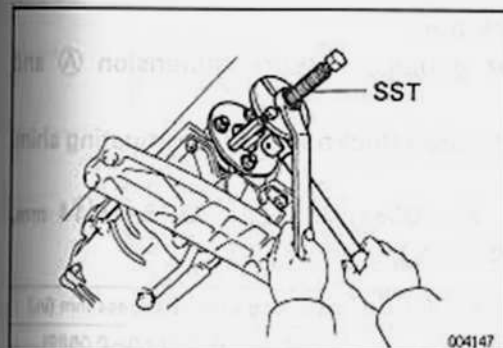
M1541 1

OIL SEAL REPLACEMENT

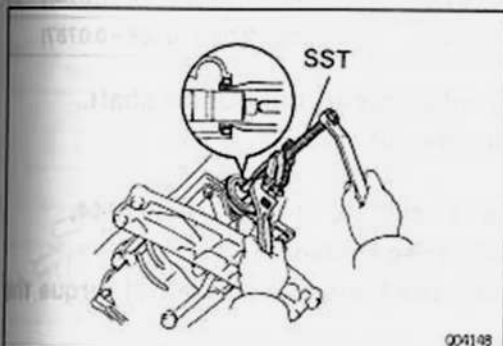
1. REPLACE TRANSMISSION REAR OIL SEAL

- (a) Remove propeller shaft.
(See page PR-7)
- (b) Using a screwdriver, remove the lock plate.
- (c) Using SST to hold the flange, remove the lock nut.
SST 09330-00021
- (d) Remove the 2 adjusting washers.

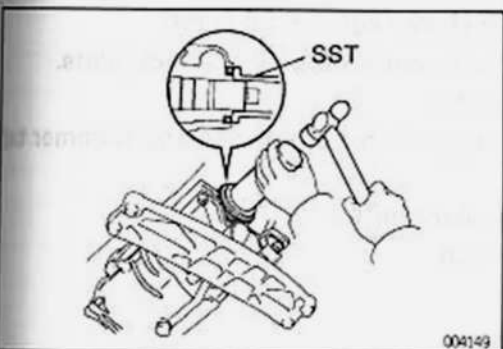




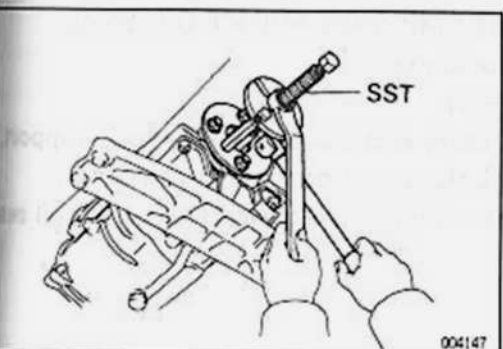
- (e) Using SST, remove the companion flange.
 SST 09950-30010 (09951-03010, 09953-03010,
 09954-03010, 09955-03030, 09956-03030)



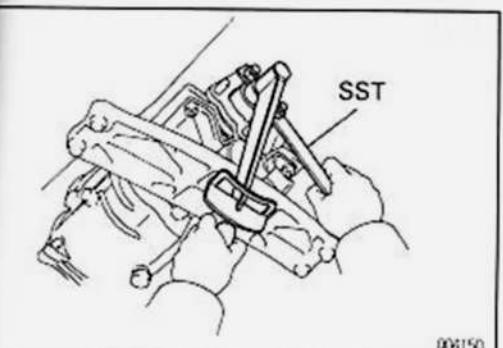
- (f) Using SST, remove the oil seal.
 SST 09308-10010



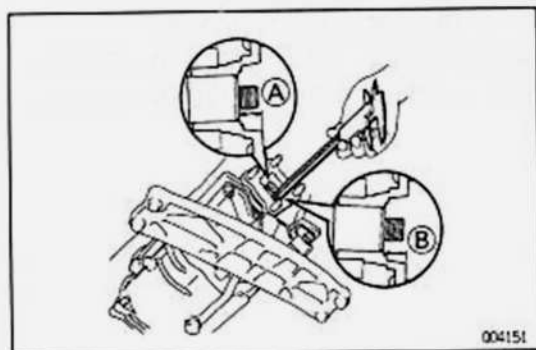
- (g) Using SST and a hammer, install a new oil seal.
 SST 09308-14010, 09309-14040



- (h) Heat the companion flange in an oven.
 80-90°C (176-194°F)
 (i) Apply gear oil to the output shaft and install the
 companion flange.
 (j) Using SST, install the companion flange to the output
 shaft.
 SST 09950-30010 (09951-03010, 09953-03010,
 09954-03010, 09955-03030, 09956-03030)



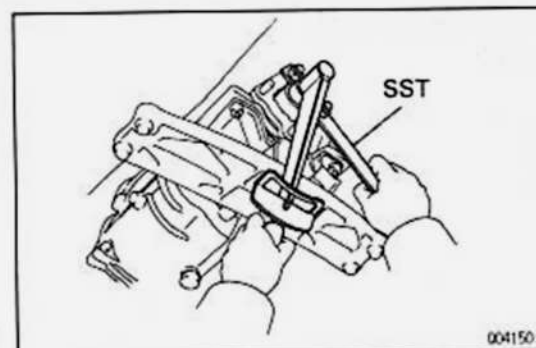
- (k) Using SST to hold the flange, install and torque the
 lock nut.
 SST 09330-00021
 Torque: 190 N·m (1,940 kgf·cm, 140 ft·lbf)



- (l) Remove the lock nut.
 (m) Using a caliper gauge, measure dimension A and dimension B.
 (n) Calculate the required thickness of the adjusting shim.
 Thickness:

$$(\text{Dimension A} - \text{Dimension B}) - (0.05 \sim 0.14 \text{ mm}, 0.0020 \sim 0.0055 \text{ in.})$$

Adjusting shim thickness mm (in.)	Adjusting shim thickness mm (in.)
1.15–1.20 (0.0453–0.0472)	1.65–1.70 (0.0650–0.0669)
1.25–1.30 (0.0492–0.0512)	1.85–1.90 (0.0729–0.0748)
1.45–1.50 (0.0571–0.0591)	1.95–2.00 (0.0768–0.0787)



- (o) Install the selected shims to the output shaft.
 (p) Apply sealant to the nut threads.

Sealant:

Part No.08833–00080, THREE BOND 1344,
 LOCTITE 242 or equivalent

- (q) Using SST to hold the flange, reinstall and torque the lock nut.

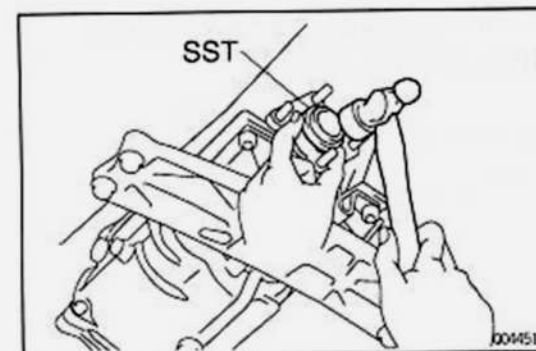
SST 09330–00021

Torque: 120 N·m (1,220 kgf·cm, 88 ft·lbf)

- (r) Using SST and a hammer, install the lock plate.
 SST 09309–14010

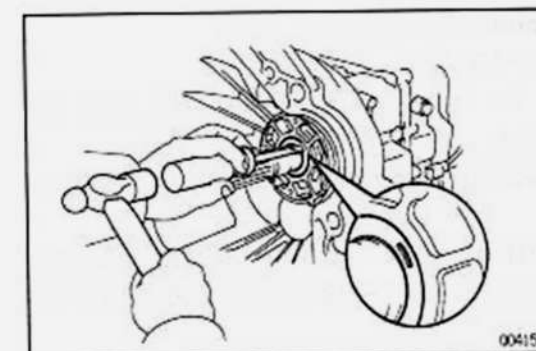
HINT: If necessary, using a pin punch and hammer tap the lock plate.

- (s) Install the propeller shaft.
 (See page PR–13)

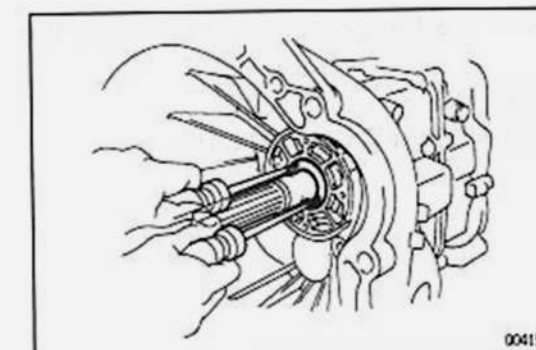


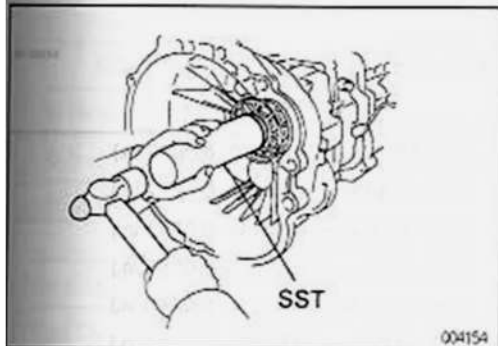
2. REPLACE TRANSMISSION FRONT OIL SEAL

- (a) Remove the transmission.
 (See page MT–4)
 (b) Remove the 2 bolts and clutch release fork support.
 (c) Remove the 4 bolts and front bearing retainer.
 (d) Using a hammer, tap in the screwdriver to the oil seal.

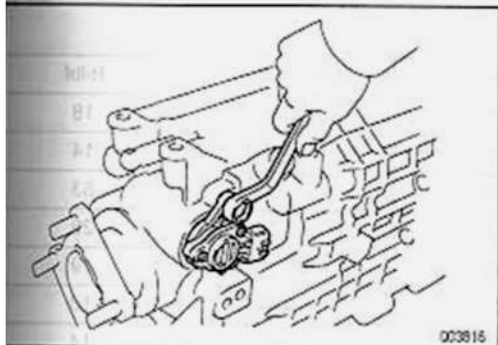


- (e) Pry out the oil seal.





- (f) Using SST and a hammer, install a new oil seal.
SST 09308-14010, 09309-14040
- (g) Install the transmission.
(See page MT-4)
- (h) Install the front bearing retainer with the 4 bolts.
Torque: 10 N·m (100 kgf·cm, 7 ft·lbf)
- (i) Install the clutch release fork support with the 2 bolts.
Torque: 26 N·m (260 kgf·cm, 19 ft·lbf)



O-RING REPLACEMENT

MT079-04

REPLACE VEHICLE SPEED SENSOR OIL SEAL

- (a) Remove the transmission.
(See page MT-4)
- (b) Remove the set bolt and driven gear.
- (c) Remove the O-ring from the driven gear.
- (d) Install a new O-ring to the driven gear.
- (e) Apply sealant to the bolt threads.

Sealant:

Part No.08833-00080, THREE BOND 1344,
LOCTITE 242 or equivalent

- (f) Install the driven gear with a bolt.
Torque: 11 N·m (110 kgf·cm, 8 ft·lbf)

SERVICE SPECIFICATIONS

SERVICE DATA

M100-0

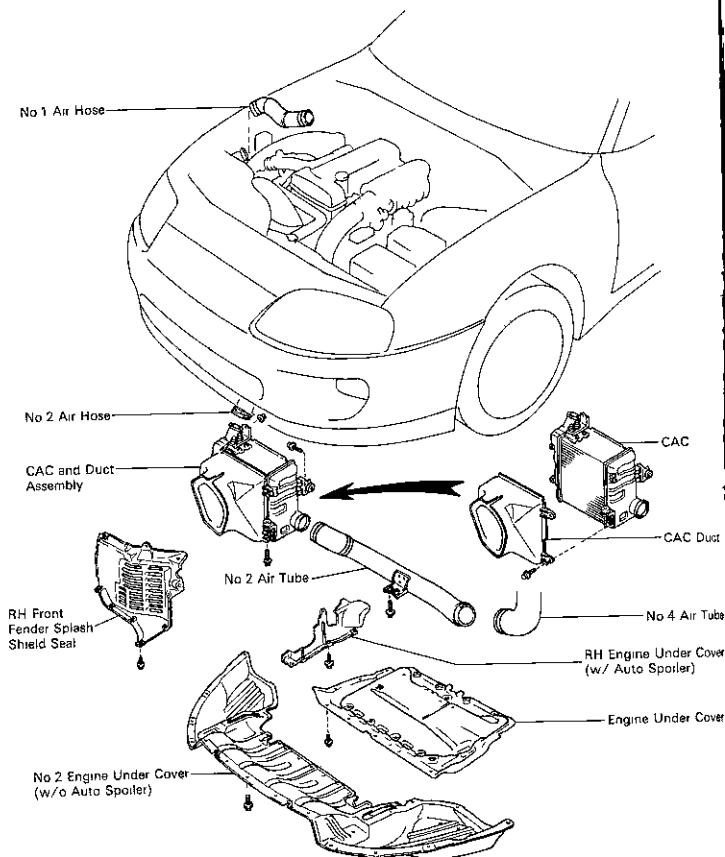
Companion flange adjusting shim thickness	1.15-1.20 mm (0.0453-0.0472 in.)
	1.25-1.30 mm (0.0492-0.0512 in.)
	1.45-1.50 mm (0.0571-0.0591 in.)
	1.65-1.70 mm (0.0650-0.0669 in.)
	1.85-1.90 mm (0.0729-0.0748 in.)
	1.95-2.00 mm (0.0768-0.0787 in.)

M101A-0

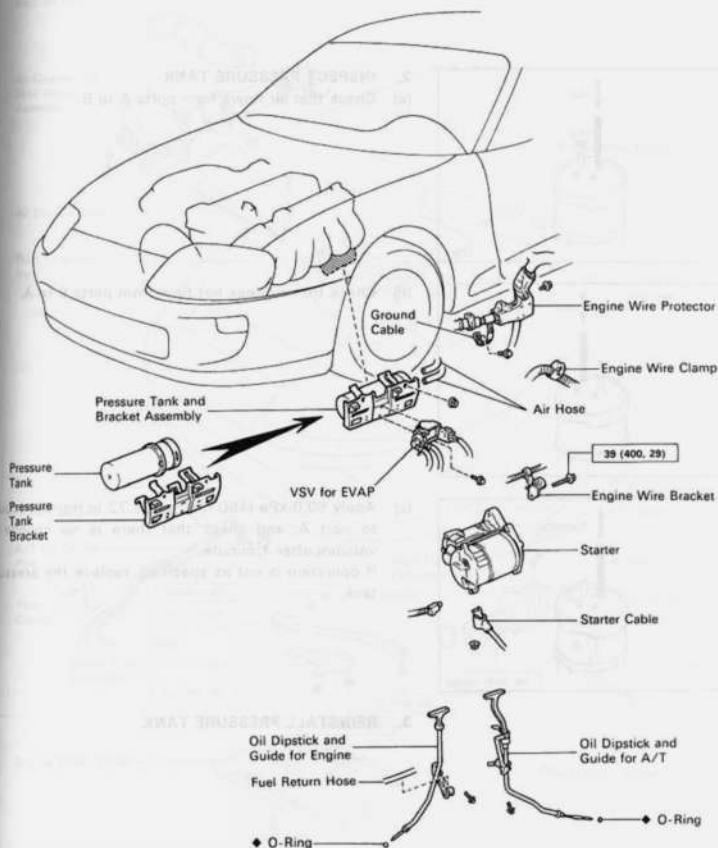
TORQUE SPECIFICATIONS

Part tightened	N-m	kgf-cm	ft-lbf
Engine rear mounting x Transmission	25	250	18
Shift lever retainer x Transmission	19	195	14
Transmission x Engine	72	730	53
Starter x Transmission	39	400	29
Rear engine mounting member x Body	25	260	19
Rear engine mounting member x Transmission	13	135	10
Clutch cover x Flywheel	19	195	14
Service hole cover set bolt	12	120	9
Clutch release cylinder set bolt	12	120	9
Shift lever x Control rod	19	195	14
Crossmember brace x Body	13	130	9
Heat insulator x Body	5.4	55	48 in.-lbf
Exhaust center pipe x Tail pipe	19	195	14
Exhaust front pipe x Exhaust center pipe	43	440	32
Pipe support bracket x Transmission	37	380	27
Exhaust front pipe x Exhaust manifold	58	590	43
Oxygen sensor set bolt	18	180	13
Shift lever x Shift lever retainer	7.8	80	69 in.-lbf
Clutch release fork support x Transmission	26	260	19
Vehicle speed sensor set bolt	11	110	8
Companion flange lock nut	120	1,220	88
Front bearing retainer set bolt	10	100	7
Clutch release fork support set bolt	26	260	19
Vehicle speed sensor set bolt	11	110	8

CHARGE AIR COOLER (CAC) COMPONENTS FOR REMOVAL AND INSTALLATION

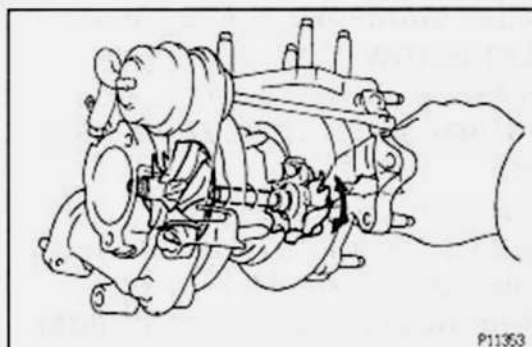


Pressure Tank COMPONENTS FOR REMOVAL AND INSTALLATION



N·m (kgf·cm, ft·lbf) : Specified torque

◆ Non-reusable part



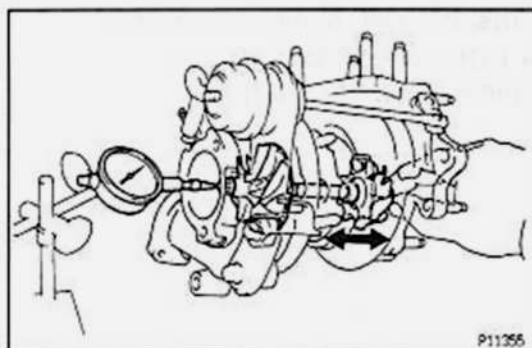
P11353

TURBOCHARGER COMPONENTS INSPECTION

Turbochargers

1. INSPECT TURBINE SHAFT 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 drag, replace the turbocharger assembly.



P11355

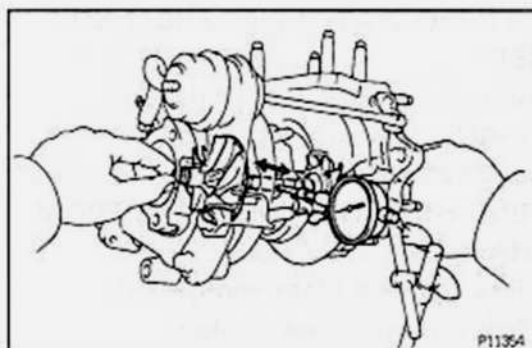
2. INSPECT AXIAL PLAY OF TURBINE SHAFT

- Using a dial indicator, insert the needle of the dial indicator into the air tube side.
- Move the turbine shaft in an axial direction, measure the axial play of the turbine shaft.

Maximum axial play:

0.110 mm (0.0045 in.)

If the axial play is greater than maximum, replace the turbocharger assembly.



P11354

3. INSPECT RADIAL PLAY OF TURBINE SHAFT

- Using a dial indicator, insert the needle of the dial indicator into the oil outlet hole and set it in the center of the turbine shaft.
- Move the turbine shaft in a radial direction, measure the radial play of the turbine shaft.

Maximum radial play:

0.162 mm (0.0064 in.)

If the axial play is greater than maximum, replace the turbocharger assembly.

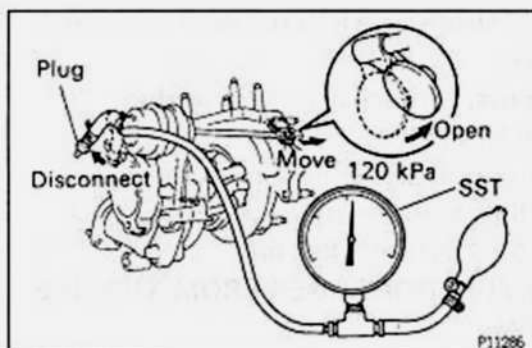
4. INSPECT WASTE GATE VALVE OPERATION

- Disconnect the actuator air hose from the housing and plug the hose end.
- Using SST, apply approx. 120 kPa (1.22 kgf/cm², 17.2 psi) of pressure to the actuator.
SST 09992-00241
- Move the actuator push rod, and check that the waste gate valve is open.

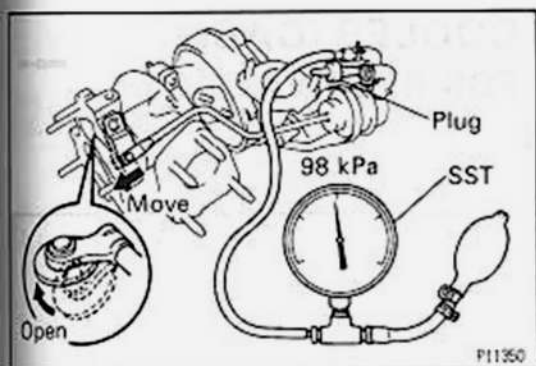
If operation is not as specified, replace the No.1 turbocharger assembly.

NOTICE: Never apply more than 187 kPa (1.91 kgf/cm², 27.2 psi) of pressure to the actuator.

- Reconnect the actuator air hose to the housing.



P11286

**5. INSPECT EXHAUST BYPASS VALVE OPERATION**

- Plug one side of the actuator air hose end.
- Using SST, apply approx. 98 kPa (1.00 kgf/cm², 14.2 psi) of pressure to the actuator.
SST 09992-00241

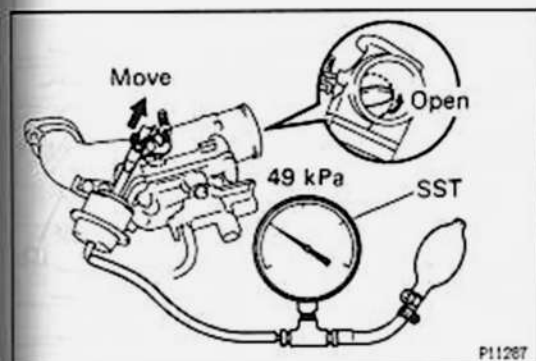
- Move the actuator push rod, and check that the exhaust bypass valve is open.

If operation is not as specified, replace the No.2 turbocharger assembly.

NOTICE: Never apply more than 187 kPa (1.91 kgf/cm², 27.2 psi) of pressure to the actuator.

- Remove the plug from the actuator air hose end.

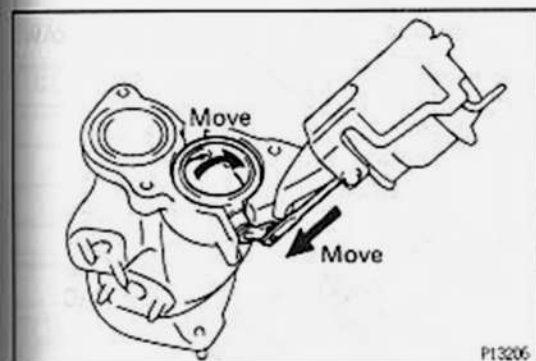
EG

**Intake Air Control Valve****INSPECT CONTROL VALVE OPERATION**

- Using SST, apply approx. 49 kPa (0.50 kgf/cm², 7.1 psi) of pressure to the actuator.
SST 09992-00241

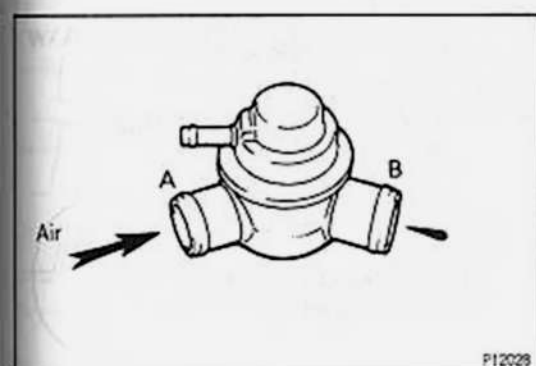
- Move the actuator push rod, and check that the control valve is open.

If operation is not as specified, replace the control valve assembly.

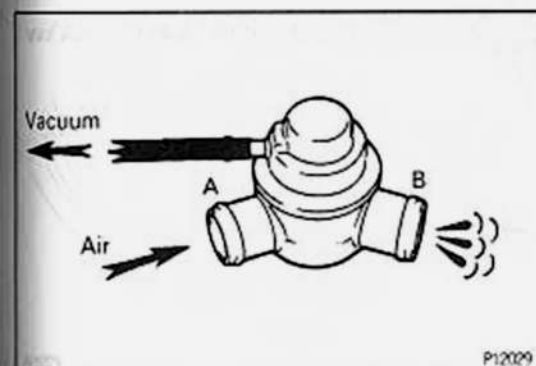
**Exhaust Gas Control Valve****INSPECT CONTROL VALVE FOR DAMAGE**

Move the actuator push rod and control valve, and check the control valve for damage.

If the valve is damaged, replace the control valve assembly.

**Air Bypass Valve****INSPECT AIR BYPASS VALVE OPERATION**

- Check that air does not flow from port A to B.



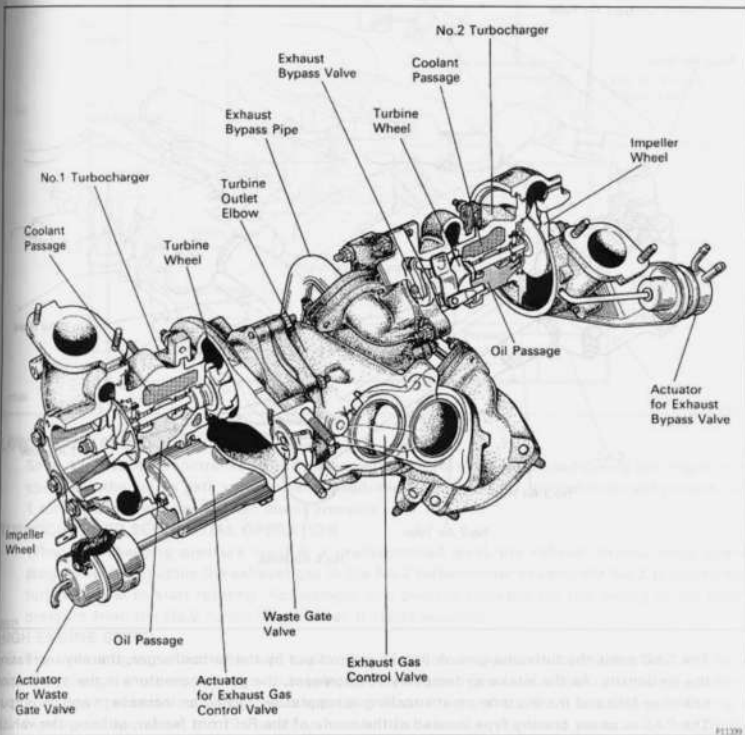
- Apply vacuum to the actuator.
 - Check that air flows from port A to B.
- If operation is not as specified, replace the valve.

TURBOCHARGER SYSTEM

(2JZ—GTE)

DESCRIPTION TURBOCHARGER

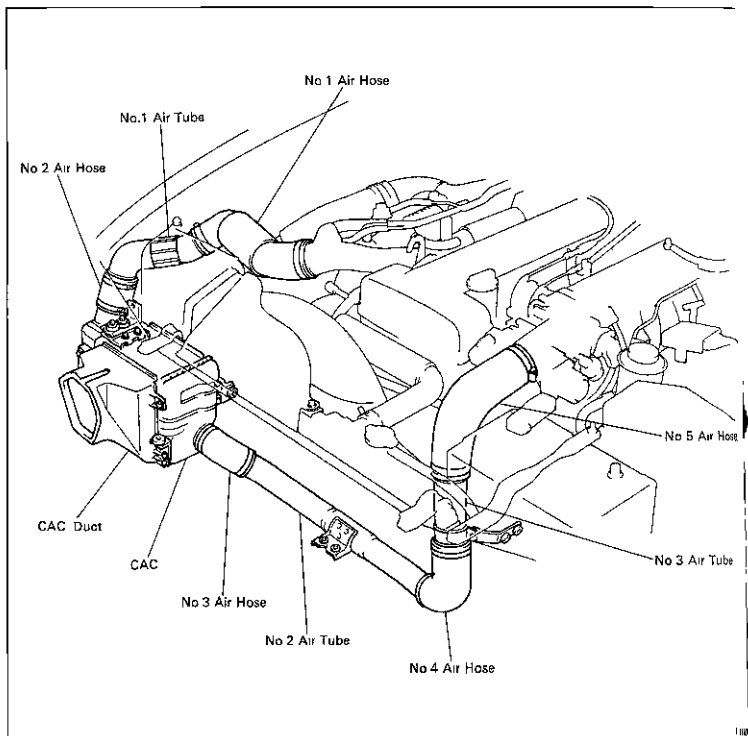
E810-01



E81100

The 2JZ—GTE engine adopts the Two—Way Twin Turbo System which uses 2 turbochargers. Under this system, the 2 compact turbochargers provide separate functions according to the engine running conditions. While 1 turbocharger gives boost at low rpm and low engine load conditions, the 2 turbochargers together give boost at high rpm and high engine load conditions.

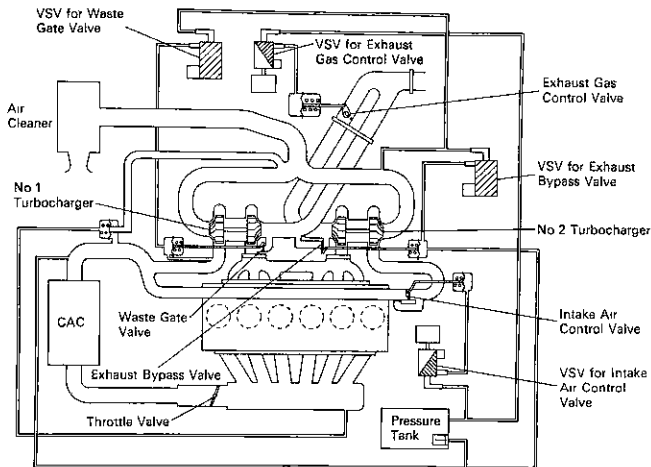
CHARGE AIR COOLER (CAC)



The CAC cools the turbocharged air (intake air) put out by the turbocharger, thereby increasing the air density. As the intake air temperature decreases, the gas temperature in the combustion chamber falls and the occurrence of knocking is suppressed, giving an increase in engine output. The CAC is an air cooling type located at the inside of the RH front fender, utilizing the vehicle windstream to cool the turbocharged air.

Systems which increase the amount of air sent to the engine are either turbocharging type (using exhaust gas to turn the turbine) or supercharging type (using the engine crankshaft etc. to mechanically turn the pump). For 2JZ—GTE engine, the turbocharging type been adopted.

OPERATION



LOW ENGINE SPEED

Since the intake air control valve and exhaust gas control valve are closed during low engine rpm operation, the waste gate valve is also closed, there only the No.1 turbocharger will provide the boost pressure.

TURBOCHARGER SEQUENTIAL OPERATION

When the charging pressure reaches a predetermined level, the exhaust bypass valve opens progressively to supply the exhaust gas to the No.2 turbocharger causing the No.2 turbocharger turbine wheel to start rotating. Accordingly, this process smooths out the joining of the boost pressure from the No.2 turbocharger when it starts boosting.

HIGH ENGINE SPEED

The exhaust gas control valve and intake air control valve are open, allowing the No.1 and No.2 turbochargers to boost. At this time, even if the exhaust bypass valve operates, it cannot effect any boost pressure control, since it is located downstream of the No.2 turbocharger. During a high speed operation, it is the waste gate valve that executes the boost pressure control of the entire system, in place of the exhaust bypass valve.

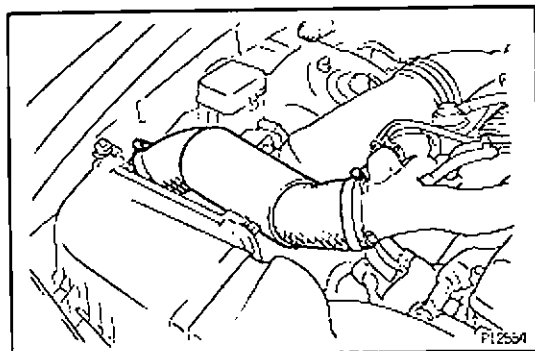
SERVICE SPECIFICATIONS

SERVICE DATA

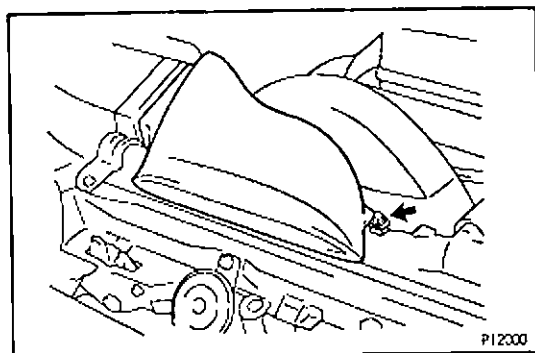
Turbocharger	Turbocharging pressure		61 — 75 kPa (0.62 — 0.76 kgf/cm ² , 8.8 — 10.8 psi)
	Impeller wheel axial play	Limit	0.162 mm (0.0064 in.)
	Impeller wheel radial play	Limit	0.110 mm (0.0045 in.)

TORQUE SPECIFICATIONS

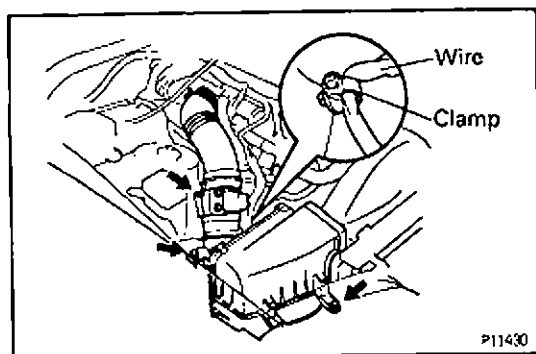
Part tightened		N m	kgf cm	ft lbf
Turbocharger x Turbine outlet elbow		25	250	18
Turbo water pipe x Turbocharger		8.8	90	78 in.-lbf
Side bearing housing plate x Turbocharger		8.8	90	78 in.-lbf
No.2 air tube x No.2 turbocharger		21	210	15
Turbocharger x Exhaust manifold		54	550	40
Turbo oil pipe x Turbocharger		21	210	15
Turbo oil pipe x Cylinder block		39	400	29
Turbocharger stay x Turbocharger		43	440	32
Turbocharger stay x Cylinder block		43	440	32
Exhaust gas control valve x Turbine outlet elbow		69	700	51
Main heated oxygen sensor x Exhaust gas control valve		20	200	14
Exhaust gas control valve stay x Exhaust gas control valve		43	440	32
Exhaust gas control valve stay x Cylinder block		43	440	32
Exhaust bypass valve x Turbine outlet elbow		25	250	18
Exhaust bypass valve x Exhaust gas control valve		25	250	18
Intake air control valve x No 2 turbocharger		21	210	15
No 4 air tube x No.1 turbocharger		21	210	15
No 1 air tube x No.1 turbocharger		21	210	15
No.2 front exhaust pipe x Exhaust gas control valve		62	630	46
Front exhaust pipe x No 2 front exhaust pipe		58	580	43
Pipe support bracket x Transmission		43	440	32
Upper front crossmember extension x Front suspension	Bolt	29	300	22
	Nut	33	340	25
Front lower arm bracket stay x Front suspension	Bolt	44	450	33
	Nut	59	600	43
CAC duct x CAC		4.9	50	43 in.-lbf
CAC x Body		13	135	10

**5. REMOVE NO.1 AIR HOSE**

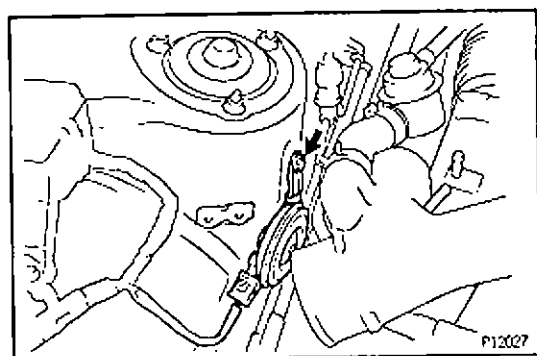
Loosen the 2 hose clamps, and remove the air hose.

**6. REMOVE AIR CLEANER DUCT**

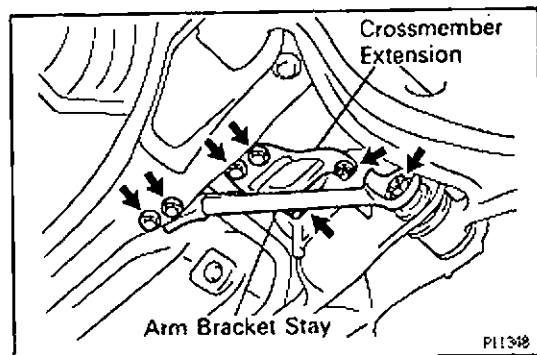
Remove the bolt and air cleaner duct.

**7. REMOVE AIR CLEANER AND MAF METER ASSEMBLY**

- Remove the 3 bolts.
- Loosen the hose clamp, disconnect the air hose from the intake air connector.
- Disconnect the MAF meter wire from the clamp on the air cleaner case.
- Disconnect the MAF meter connector, and remove the air cleaner and MAF meter assembly.

**8. DISCONNECT THEFT DETERRENT HORN FROM BODY**

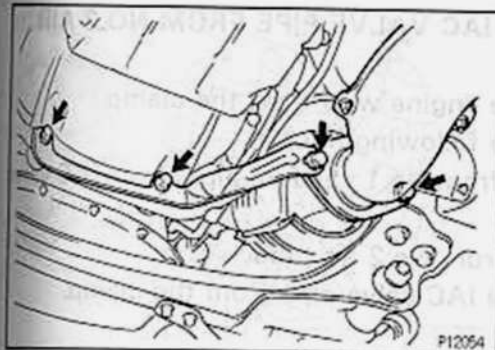
Remove the bolt, and disconnect the horn from the body.

**9. REMOVE FRONT LOWER ARM BRACKET STAY**

Remove the 2 bolts, nut, plate washer and arm bracket stay.

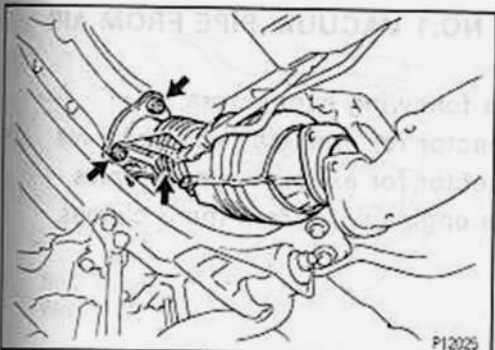
10. REMOVE UPPER FRONT CROSSMEMBER EXTENSION

Remove the 2 bolts, 2 nuts and crossmember extension.

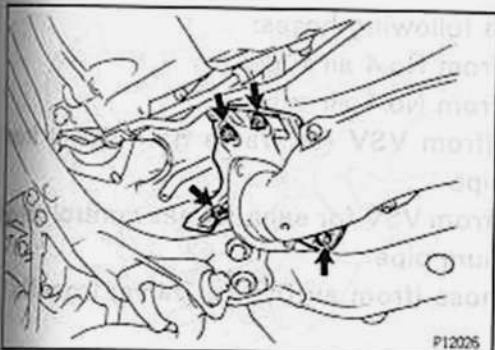
**11. REMOVE NO.2 FRONT EXHAUST PIPE**

- Remove the 2 bolts and nuts holding the front exhaust pipe to the No.2 front exhaust pipe.
- Remove the 2 bolts and pipe support bracket.
- Disconnect the front exhaust pipe from the No.2 exhaust pipe. Remove the gasket.

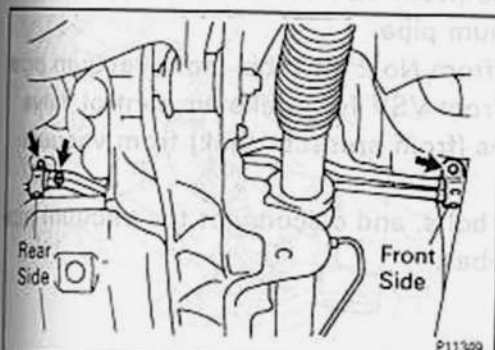
- Remove the 3 nuts, No. 2 front exhaust pipe and gasket.

**12. REMOVE HEAT INSULATOR FOR NO.2 FRONT EXHAUST PIPE**

Remove the 2 bolts, 2 nuts and heat insulator.

**13. DISCONNECT AT OIL COOLER TUBES FROM ENGINE**

- Remove the bolt and tube clamp, and disconnect the oil cooler tubes from the bracket (front side) on the generator.
- Remove the bolt and tube clamp, and disconnect the oil cooler tubes from the bracket (rear side) on the cylinder block.
- Remove the bolt and tube bracket (rear side) from the cylinder block.

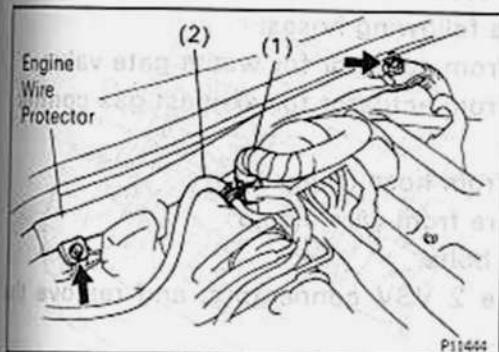
**14. DISCONNECT ENGINE WIRE PROTECTOR FROM BODY**

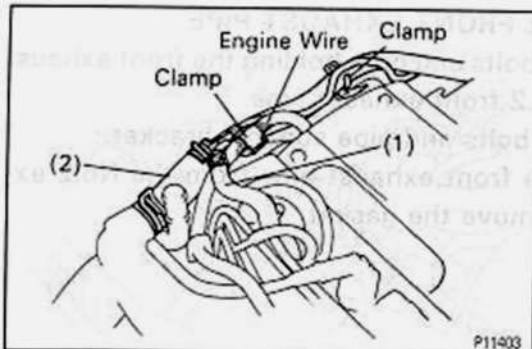
Remove the 2 bolts, and disconnect the wire protector from the body.

15. DISCONNECT HOSES

Disconnect the following hoses:

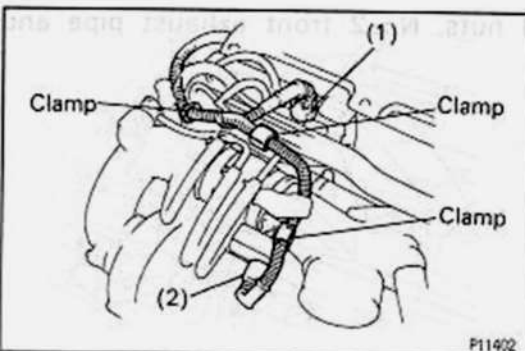
- Heater hose from No.3 water bypass pipe
- EVAP hose from No.1 vacuum pipe





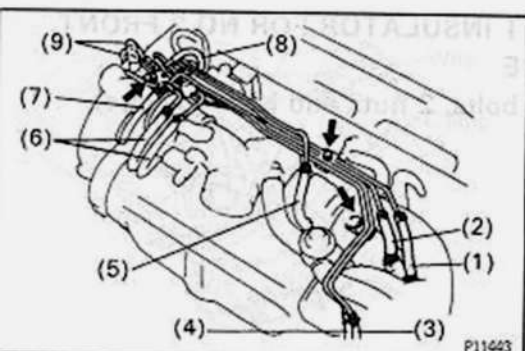
16. DISCONNECT IAC VALVE PIPE FROM NO.2 AIR TUBE

- (a) Disconnect the engine wire from the clamp.
- (b) Disconnect the following hoses:
 - (1) Air hose (from No.1 vacuum pipe) from IAC valve pipe
 - (2) Air hose from No.2 air tube
- (c) Disconnect the IAC valve pipe from the clamp.



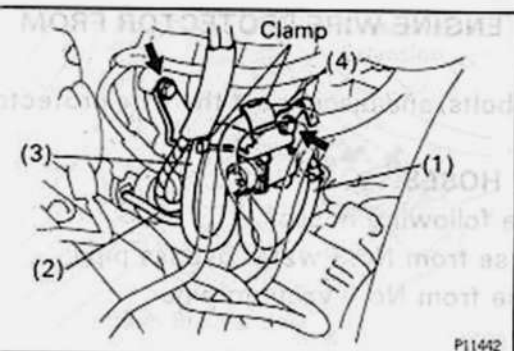
17. DISCONNECT NO.1 VACUUM PIPE FROM AIR TUBES

- (a) Disconnect the following connectors:
 - (1) VSV connector for intake air control valve
 - (2) VSV connector for exhaust bypass valve
- (b) Disconnect the engine wire from the 3 clamps.
- (c) Disconnect the following hoses:
 - (1) Air hose from No.4 air tube
 - (2) Air hose from No.1 air tube
 - (3) Air hose (from VSV for waste gate valve) from vacuum pipe
 - (4) Air hose (from VSV for exhaust gas control valve) from vacuum pipe
 - (5) Vacuum hose (from air bypass valve) from No.1 air tube
 - (6) 2 air hoses (from VSV for exhaust bypass valve) from vacuum pipe
 - (7) Air hose (from No.2 air tube) from vacuum pipe
 - (8) Air hose from VSV for intake air control valve
 - (9) 2 air hoses (from pressure tank) from vacuum pipe
- (d) Remove the 3 bolts, and disconnect the vacuum pipe from the air tubes.



18. REMOVE VSV ASSEMBLY

- (a) Disconnect the following hoses:
 - (1) Air hose from actuator for waste gate valve
 - (2) Air hose from actuator for exhaust gas control valve
 - (3) Air hose from hose clamp
 - (4) Engine wire from wire clamp
- (b) Remove the 2 bolts.
- (c) Disconnect the 2 VSV connectors, and remove the VSV assembly.



19. REMOVE AIR TUBES AND INTAKE AIR CONNECTOR

(a) Disconnect the following connector and hoses:

- (1) Crankshaft position sensor connector from clamp
- (2) Water bypass hose (from water pump) from No.1 turbo water pipe
- (3) Water bypass hose (from water outlet) from No.1 turbo water pipe
- (4) Water bypass hose (from water outlet) from No.2 turbo water pipe

(b) Remove the bolt, and disconnect the No.2 turbo water pipe from the No.4 air tube.

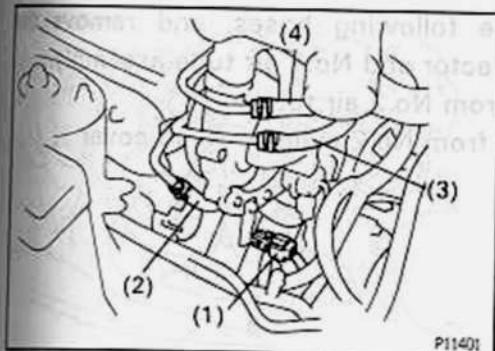
(c) Remove the 2 bolts, and disconnect the No.1 air tube from the No.1 turbocharger. Remove the gasket.

(d) Remove the 2 bolts, and disconnect the No.4 air tube from the No.1 turbocharger. Remove the gasket.

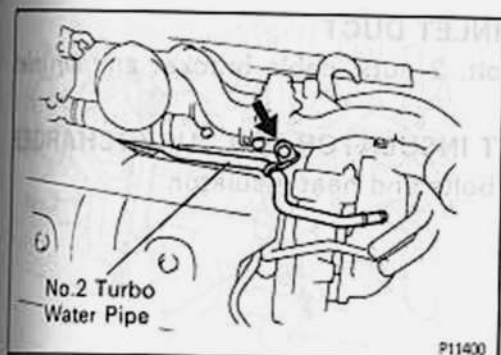
(e) Disconnect the following hoses, and remove the No.4 air tube and air bypass valve assembly.

- (1) Air hose from No.4 air tube
- (2) Air hose from intake air connector

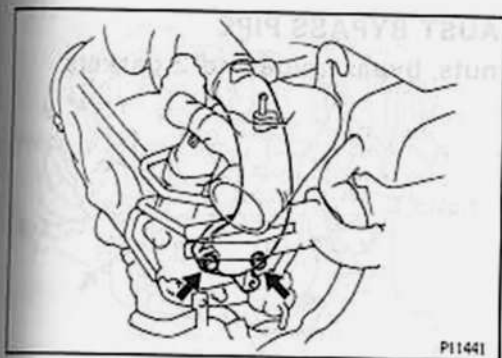
(f) Remove the 2 nuts, intake air control valve and gasket.



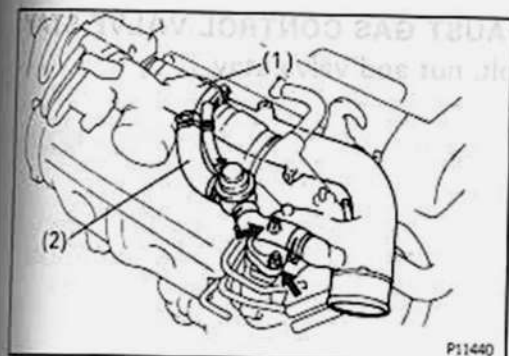
P11401



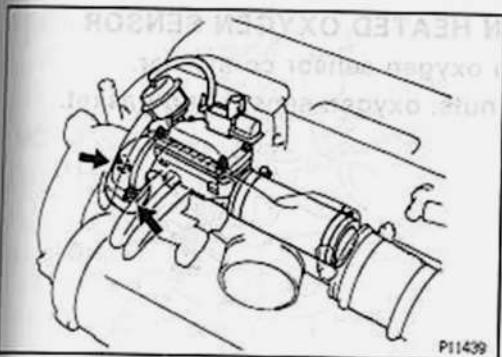
P11400



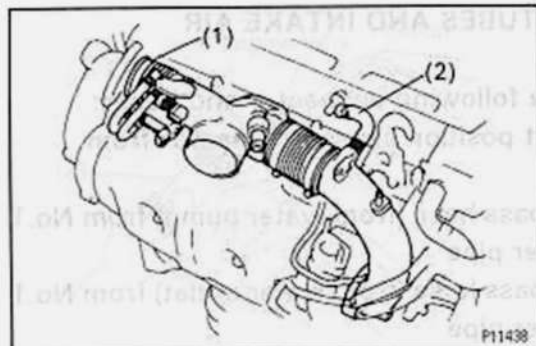
P11441



P11440



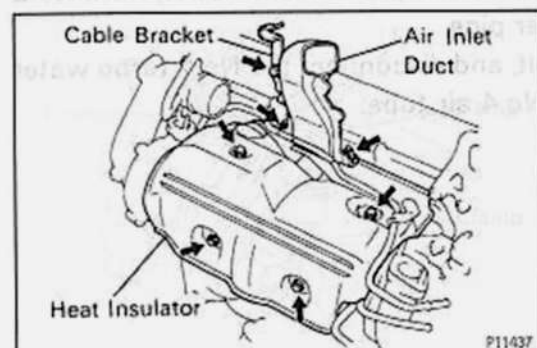
P11439



- (g) Disconnect the following hoses, and remove the intake air connector and No.1 air tube assembly.

- (1) Air hose from No.2 air tube
- (2) PCV hose from No.2 cylinder head cover

EG

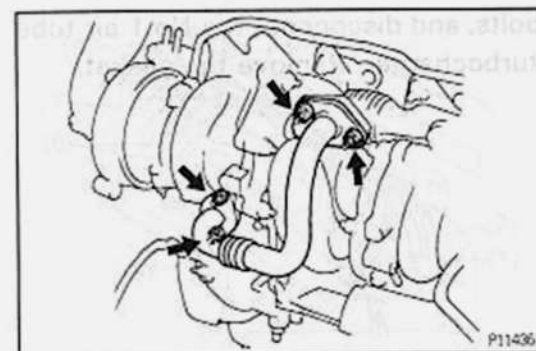


20. REMOVE AIR INLET DUCT

Remove the bolt, 2 nuts, cable bracket and air inlet duct.

21. REMOVE HEAT INSULATOR FOR TURBOCHARGER

Remove the 4 bolts and heat insulator.



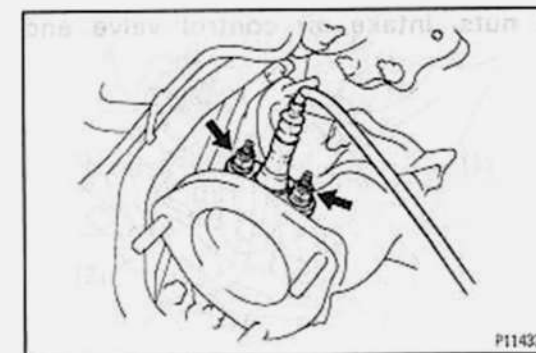
22. REMOVE EXHAUST BYPASS PIPE

Remove the 4 nuts, bypass pipe and 2 gaskets.



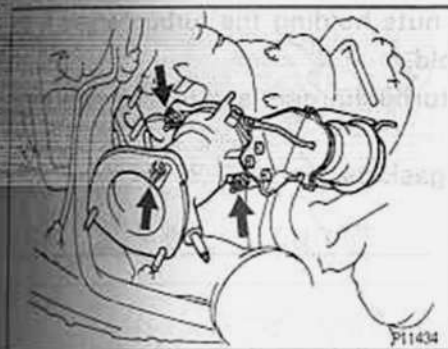
23. REMOVE EXHAUST GAS CONTROL VALVE

Remove the bolt, nut and valve stay.



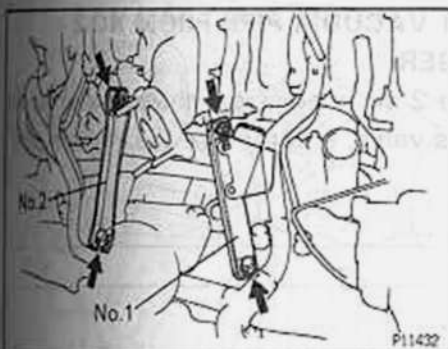
24. REMOVE MAIN HEATED OXYGEN SENSOR

- (a) Disconnect the oxygen sensor connector.
- (b) Remove the 2 nuts, oxygen sensor and gasket.

**25. REMOVE EXHAUST GAS CONTROL VALVE**

Remove the 3 nuts, control valve and 2 gaskets.

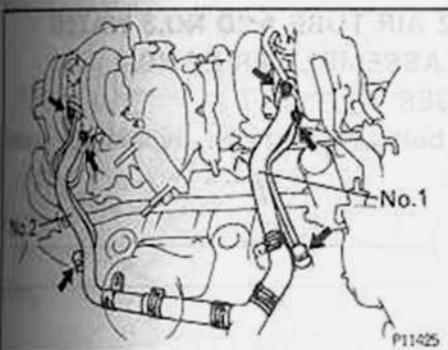
NOTICE: The control valve is ceramic. Do not drop or knock the control valve.

**26. REMOVE NO.1 TURBOCHARGER STAY**

Remove the bolt, nut and turbocharger stay.

27. REMOVE NO.2 TURBOCHARGER STAY

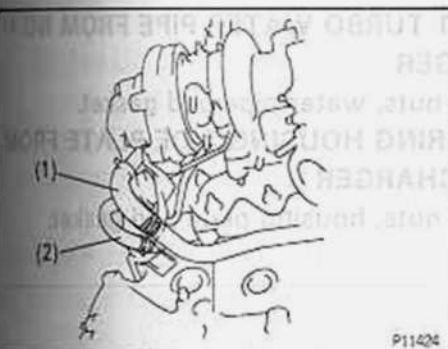
Remove the bolt, nut and turbocharger stay.

**28. REMOVE NO.1 TURBO OIL PIPE**

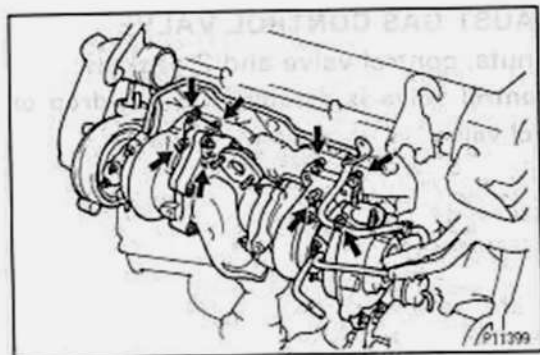
- Remove the union bolt holding the turbo oil pipe to the cylinder block. Remove the 2 gaskets.
- Remove the 2 nuts, and disconnect the turbo oil pipe from turbocharger. Remove the gasket.
- Disconnect the turbo oil hose from the turbo oil outlet on the No.1 oil pan, and remove the turbo oil pipe.

29. REMOVE NO.2 TURBO OIL PIPE

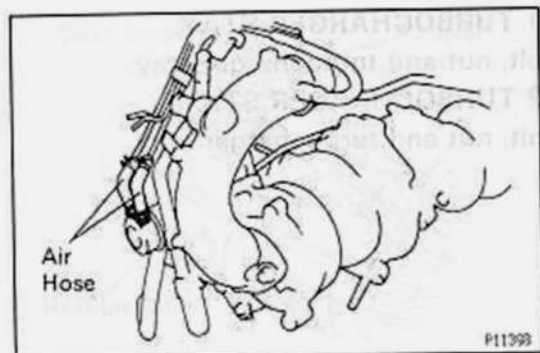
- Remove the union bolt holding the turbo oil pipe to the cylinder block. Remove the 2 gaskets.
- Remove the 2 nuts, and disconnect the turbo oil pipe from turbocharger. Remove the gasket.
- Disconnect the turbo oil hose from the turbo oil outlet on the No.1 oil pan, and remove the turbo oil pipe.

**30. REMOVE TURBOCHARGERS AND TURBINE OUTLET ELBOW ASSEMBLY**

- Disconnect the following hoses:
 - Heater hose (from No.3 water bypass pipe) from No.2 water bypass pipe
 - Water bypass hose (from No.2 turbo water pipe) from No.2 water bypass pipe

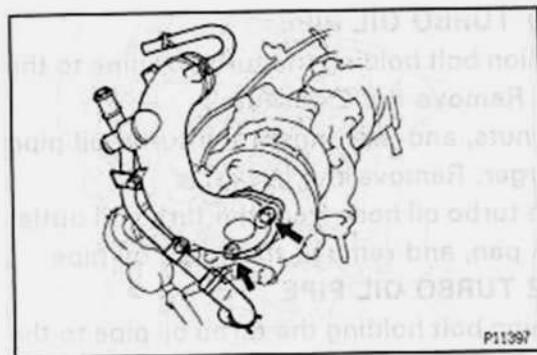


- (b) Remove the 8 nuts holding the turbochargers to exhaust manifold.
- (c) Remove the 2 turbochargers and turbine outlet assembly.
- (d) Remove the 2 gaskets.



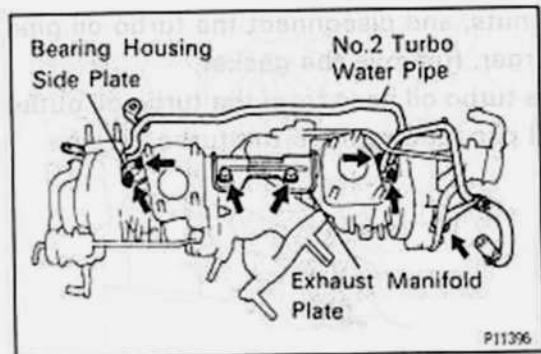
31. REMOVE NO.1 VACUUM PIPE FROM NO.2 TURBOCHARGER

Disconnect the 2 air hoses from the actuator for exhaust bypass valve, and remove the vacuum pipe.



32. REMOVE NO.2 AIR TUBE AND NO.3 WATER BYPASS PIPE ASSEMBLY FROM NO.2 TURBOCHARGER

Remove the 2 bolts, the air tube, bypass pipe assembly and gasket.



33. REMOVE EXHAUST MANIFOLD PLATE FROM TURBINE OUTLET ELBOW

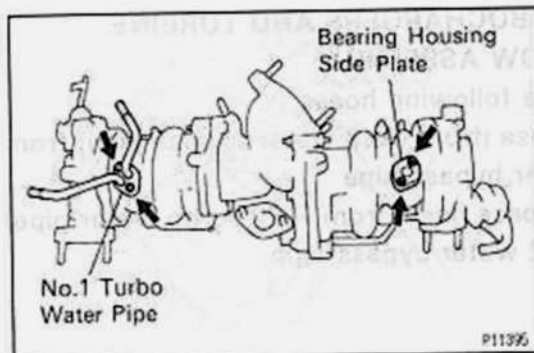
Remove the 2 bolts and manifold plate.

34. REMOVE NO.2 TURBO WATER PIPE FROM NO.1 TURBOCHARGER

Remove the 2 nuts, water pipe and gasket.

35. REMOVE BEARING HOUSING SIDE PLATE FROM NO.1 TURBOCHARGER

Remove the 2 nuts, housing plate and gasket.



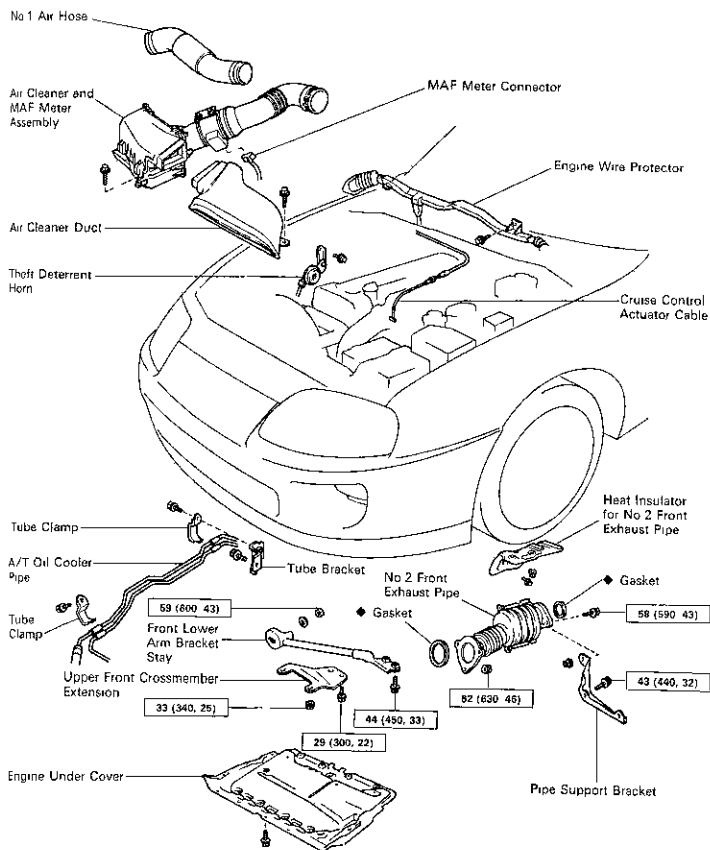
36. REMOVE NO.1 TURBO WATER PIPE FROM NO.2 TURBOCHARGER

Remove the 2 nuts, water pipe and gasket.

37. REMOVE BEARING HOUSING SIDE PLATE FROM NO.2 TURBOCHARGER

Remove the 2 nuts, housing plate and gasket.

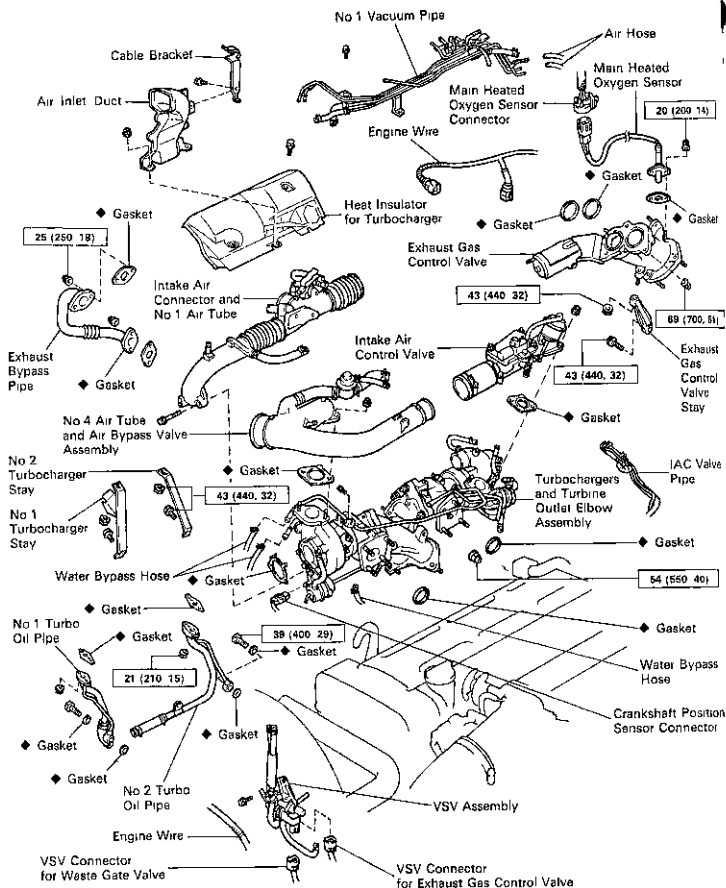
Turbocharger COMPONENTS FOR REMOVAL AND INSTALLATION



1 Nm (kgf cm, ft lbf)

Specified torque

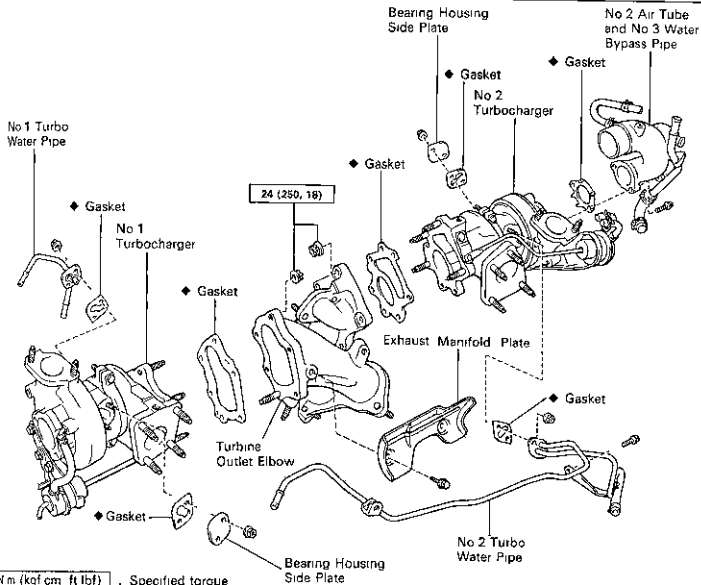
◆ Non reusable part



N m (kgf cm, ft lbf)

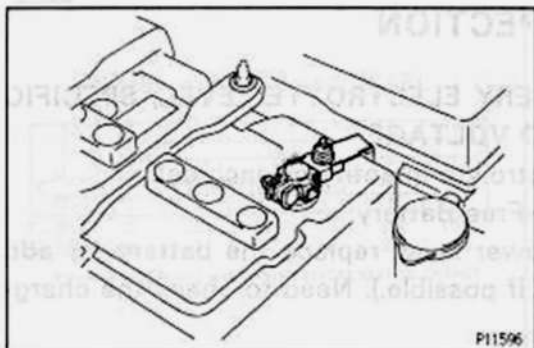
Specified torque

◆ Non-reusable part



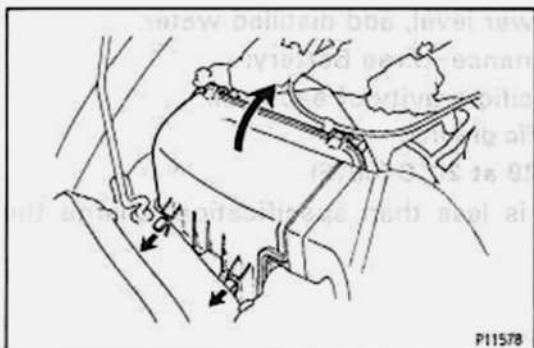
N m (kgf cm ft lbf) . Specified torque

◆ Non reusable part



2. CHECK BATTERY TERMINALS AND FUSES

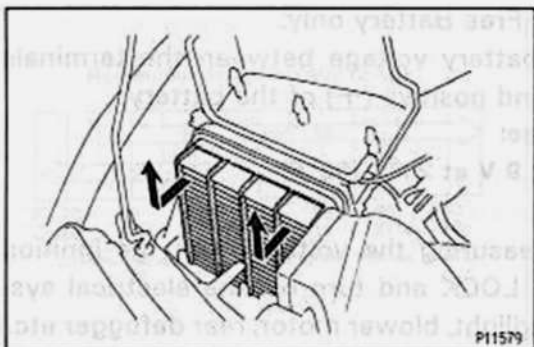
- (a) Check that the battery terminals are not loose or corroded.
If the terminals are corroded, clean the terminals.
- (b) Check the fuses for continuity.



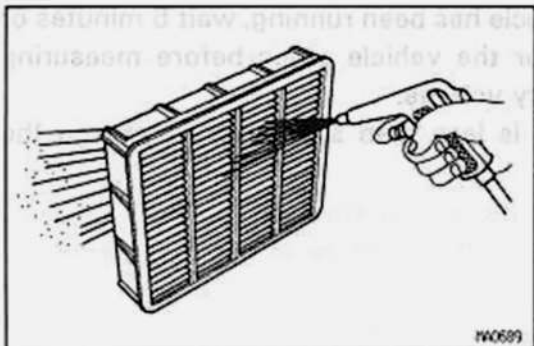
AIR FILTER INSPECTION AND CLEANING

1. REMOVE AIR FILTER

- (a) Open the air cleaner cap.



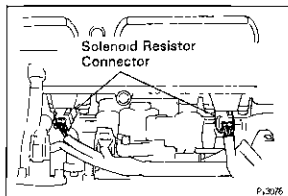
- (b) Remove the air filter.



2. INSPECT AND CLEAN AIR FILTER

- (a) Visually check that the air filter is not excessively damaged or oily.
If necessary, replace the air filter.
- (b) Clean the air filter with compressed air.
First blow from the inside thoroughly, then blow from the outside of the air filter.

3. REINSTALL AIR FILTER

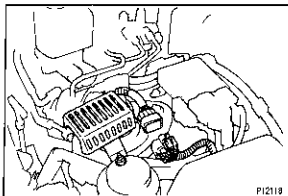


2JZ—GTE:

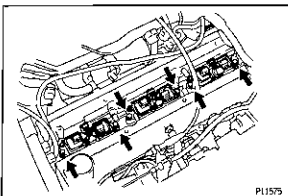
1. WARM UP AND STOP ENGINE

Allow the engine to warm up to normal operating temperature.

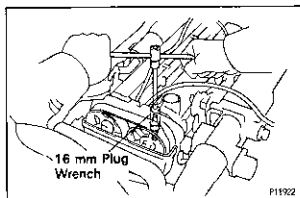
2. DISCONNECT CAMSHAFT POSITION SENSOR CONNECTORS



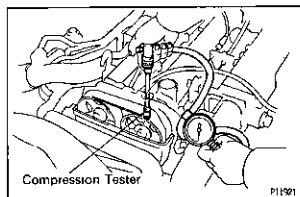
3. DISCONNECT SOLENOID RESISTOR SENSOR CONNECTOR



4. REMOVE IGNITION COILS ASSEMBLIES (See steps 1 to 5 on pages IG—41 and 42)

**5. REMOVE SPARK PLUGS**

Using a 16 mm plug wrench, remove the 6 spark plugs.

**6. CHECK CYLINDER COMPRESSION**

(See step 8 on page EG-34)

Compression:

1,079 kPa (11.0 kgf/cm², 156 psi) or more

Minimum pressure:

883 kPa (9.0 kgf/cm², 128 psi)

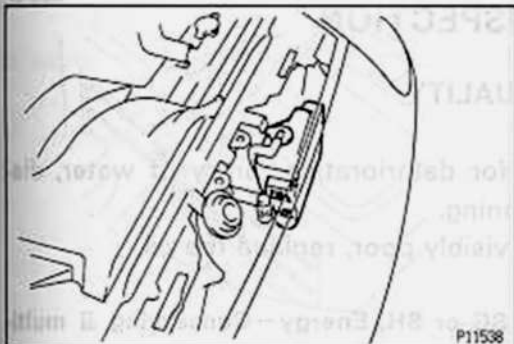
Difference between each cylinder:

98 kPa (1.0 kgf/cm², 14 psi) or less

7. REINSTALL SPARK PLUGS**8. REINSTALL IGNITION COILS ASSEMBLIES**

(See page IG-42)

9. RECONNECT SOLENOID RESISTOR CONNECTOR**10. RECONNECT CAMSHAFT POSITION SENSOR CONNECTORS**



TUNE-UP

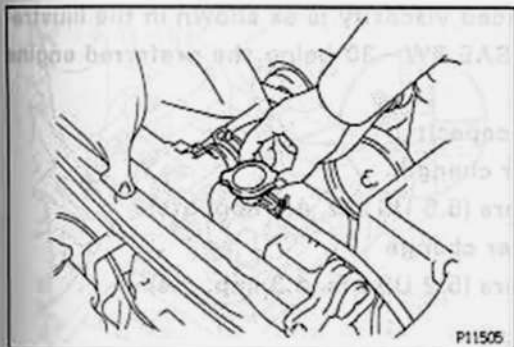
ENGINE COOLANT INSPECTION

EGME-01

1. CHECK ENGINE COOLANT LEVEL AT RESERVOIR TANK

The engine coolant level should be between the "LOW" and "FULL" lines.

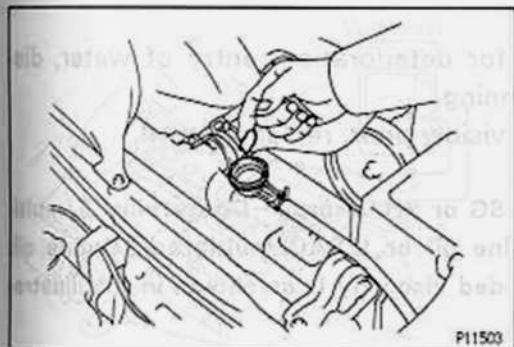
If low, check for leaks and add engine coolant up to the "FULL" line.



2. CHECK ENGINE COOLANT QUALITY

(a) Remove the radiator cap.

CAUTION: To avoid the danger of being burned, do not remove the radiator cap while the engine and radiator are still hot, as fluid and steam can be blown out under pressure.



(b) There should not be any excessive deposits of rust or scale around the radiator cap or radiator filler hole, and the coolant should be free from oil.

If excessively dirty, clean the coolant passages and replace the coolant.

Capacity (w/ Heater):

2JZ-GE M/T

7.3 liters (7.7 US qts, 6.4 Imp. qts)

2JZ-GE A/T

8.3 liters (8.8 US qts, 7.3 Imp. qts)

2JZ-GTE M/T

9.5 liters (10.0 US qts, 8.4 Imp. qts)

2JZ-GTE A/T

9.4 liters (9.9 US qts, 8.3 Imp. qts)

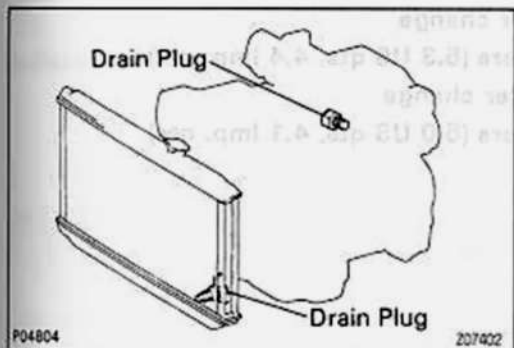
HINT:

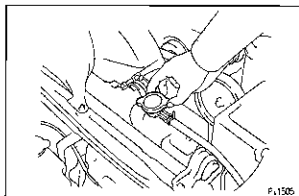
- Use a good brand of ethylene-glycol base coolant and mix it according to the manufacturer's directions.
- Using coolant which includes more than 50 % ethylene-glycol (but not more than 70 %) is recommended.

NOTICE:

- Do not use an alcohol type coolant.
- The coolant should be mixed with demineralized water or distilled water.

(c) Reinstall the radiator cap.





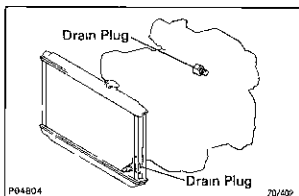
P11505

COOLANT REPLACEMENT

1. DRAIN ENGINE COOLANT

- (a) Remove the radiator cap.

CAUTION: To avoid the danger of being burned, do not remove the radiator cap while the engine and radiator are still hot, as fluid and steam can be blown out under pressure.



P04804

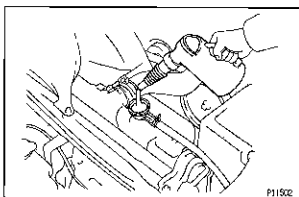
701402

- (b) Loosen the 2 drain plugs (for the engine and radiator) and drain the coolant.

- (c) Close the drain plugs.

Torque:

29 N·m (300 kgf·cm, 22 ft·lbf) for engine



P11502

2. FILL ENGINE COOLANT

- (a) Slowly fill the system with coolant.

- Use a good brand of ethylene—glycol base coolant and mix it according to the manufacturer's directions.
- Using coolant which includes more than 50% ethylene—glycol (but not more than 70 %) is recommended.

NOTICE:

- Do not use an alcohol type coolant.
- The coolant should be mixed with demineralized water or distilled water.

Capacity (w/ Heater):

2JZ—GE M/T

7.3 liters (7.7 US qts, 6.4 Imp. qts)

2JZ—GE A/T

8.3 liters (8.8 US qts, 7.3 Imp. qts)

2JZ—GTE M/T

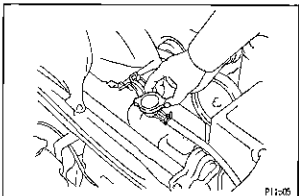
9.3 liters (10.0 US qts, 8.4 Imp. qts)

2JZ—GTE A/T

9.4 liters (9.9 US qts, 8.3 Imp. qts)

- (b) Install the radiator cap.

- (c) Start the engine, and bleed the cooling system.



P11505

DRIVE BELT INSPECTION

INSPECT DRIVE BELT

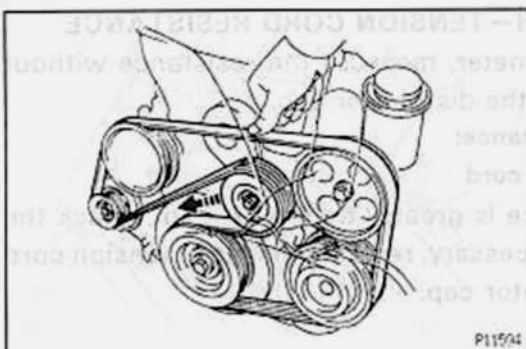
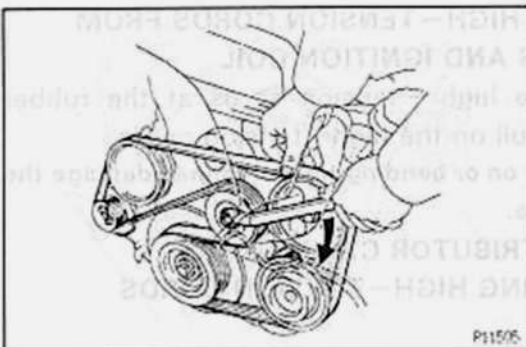
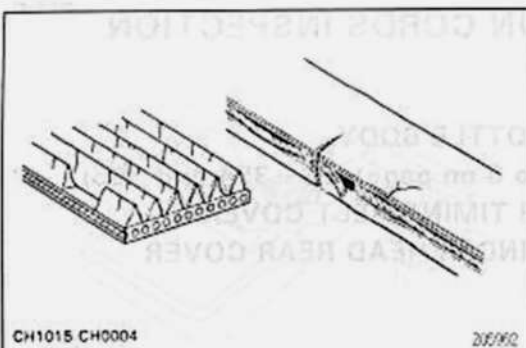
HINT: A belt tensioner is used, so checking the belt tension is not necessary.

- (a) Visually check the drive belt for excessive wear, frayed cords, etc.

If necessary, replace the drive belt.

HINT:

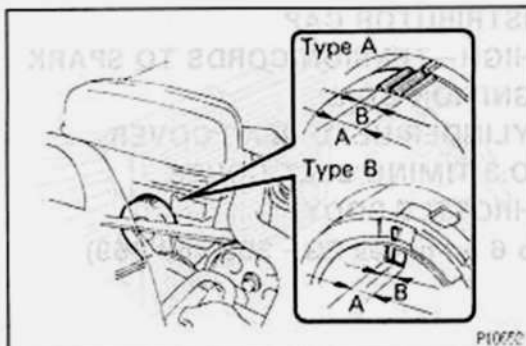
- Cracks on the rib side of a drive belt are considered acceptable. If the drive belt has chunks missing from the ribs, it should be replaced.
- The drive belt tension can be released by turning the belt tensioner clockwise.



- (b) Check the belt tensioner operation.

- Check that the belt tensioner moves downward when the drive belt is pressed down at the point indicated in the illustration with approx. 98 N (10 kgf, 22.0 lbf) of force.
- Check the alignment of the belt tensioner pulley to make sure the drive belt will not slip off the pulley.

If necessary, replace the belt tensioner.

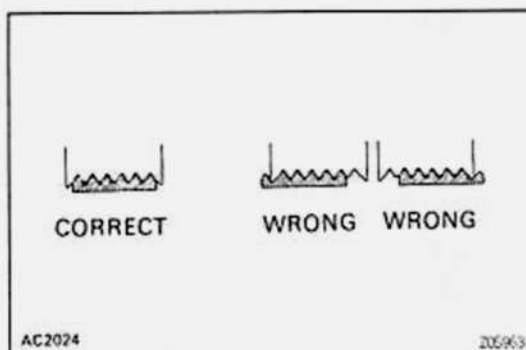


- Check that the arrow mark on the belt tensioner falls within area A of the scale.

If it is outside area A, replace the drive belt.

HINT:

- When a new belt is installed, it should be within area B. If not, the drive belt is not correct.

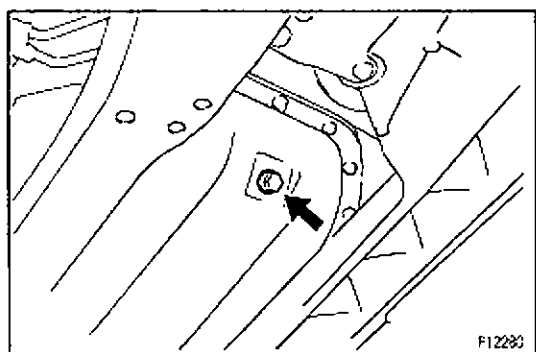


- After installing a drive belt, check that it fits properly in the ribbed grooves.
- Check by hand to confirm that the belt has not slipped out of the groove on the bottom of the pulley.

OIL AND FILTER REPLACEMENT

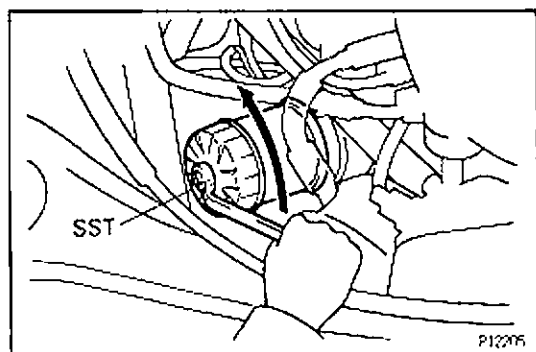
CAUTION:

- Prolonged and repeated contact with mineral oil will result in the removal of natural fats from the skin, leading to dryness, irritation and dermatitis. In addition, used engine oil contains potentially harmful contaminants which may cause skin cancer.
- Exercise caution in order to minimize the length and frequency of contact of your skin to used oil. Wear protective clothing and gloves. Wash your skin thoroughly with soap and water, or use waterless hand cleaner, to remove any used engine oil. Do not use gasoline, thinners, or solvents.
- In order to preserve the environment, used oil and used oil filters must be disposed of only at designated disposal sites.



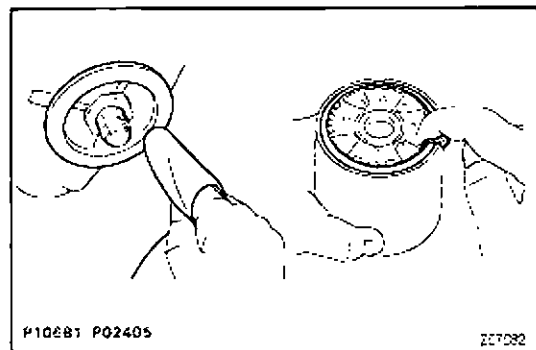
1. DRAIN ENGINE OIL

- Remove the oil filler cap.
- Remove the oil drain plug, and drain the oil into a container.

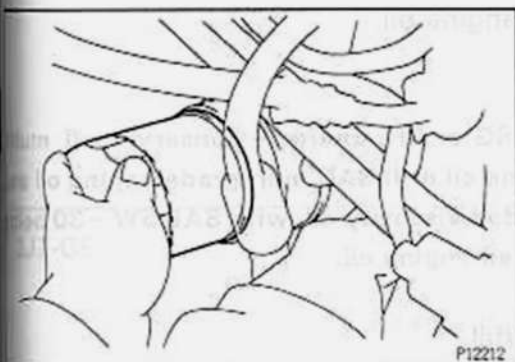


2. REPLACE OIL FILTER

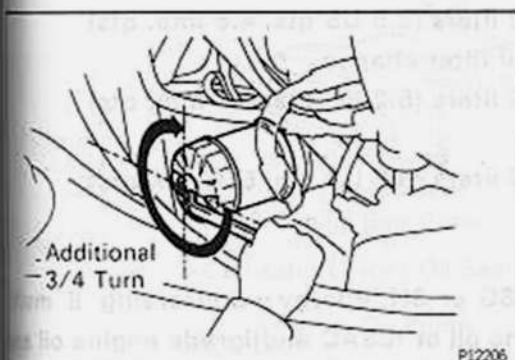
- Using SST, remove the oil filter.
SST 09228-07500



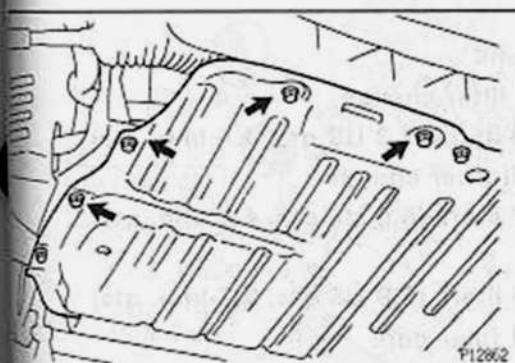
- Check and clean the oil filter installation surface.
- Apply clean engine oil to the gasket of a new oil filter.



- (d) Lightly screw the oil filter into place, and tighten it until the gasket contacts the seat.



- (e) Using SST, tighten it an additional 3/4 turn.
SST 09228-07500

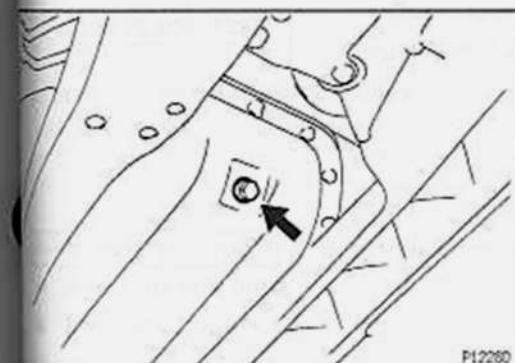
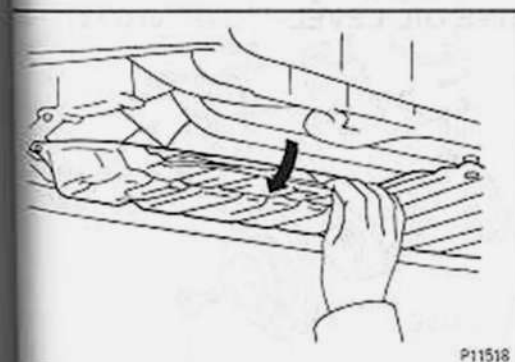


3. REFILL WITH ENGINE OIL

- (a) To wipe off oil that has dripped onto the engine under cover, under the 4 screws and bend the under cover downward.

NOTICE:

- To avoid damaging the silencer, do not bend the engine under cover more than 150 mm.
- If oil gets on the silencer, wipe it off with a dry rag.



- (b) Clean and install the oil drain plug with a new gasket.
Torque: 25 N·m (250 kgf·cm, 18 ft·lbf)

ENGINE — LUBRICATION SYSTEM

(c) Fill with fresh engine oil.

2JZ—GE:

Oil grade:

API grade SG or SH, Energy—Conserving II multi-grade engine oil or ILSAC multigrade engine oil and recommended viscosity oil, with SAE 5W—30 being the preferred engine oil.

Capacity:

Drain and refill

w/ Oil filter change

5.2 liters (5.5 US qts, 4.6 Imp. qts)

w/o Oil filter change

4.9 liters (5.2 US qts, 4.3 Imp. qts)

Dry fill

6.5 liters (6.9 US qts, 5.7 Imp. qts)

2JZ—GTE:

Oil grade:

API grade SG or SH, Energy—Conserving II multi-grade engine oil or ILSAC multigrade engine oil and recommended viscosity oil.

Capacity:

Drain and refill

w/ Oil filter change

5.0 liters (5.3 US qts, 4.4 Imp. qts)

w/o Oil filter change

4.7 liters (5.0 US qts, 4.1 Imp. qts)

Dry fill

6.5 liters (6.9 US qts, 5.7 Imp. qts)

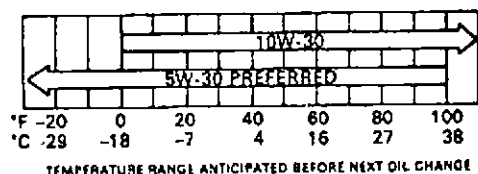
(d) Reinstall the oil filler cap.

4. START ENGINE AND CHECK FOR OIL LEAKS

5. RECHECK ENGINE OIL LEVEL

ENGINE OIL INSPECTION

Recommended Viscosity (SAE):



1U0817

1. CHECK OIL QUALITY

2JZ—GE:

Check the oil for deterioration, entry of water, discoloring or thinning.

If oil quality is visibly poor, replace the oil.

Oil grade:

API grade SG or SH, Energy—Conserving II multi-grade engine oil or ILSAC multigrade engine oil. Recommended viscosity is as shown in the illustration, with SAE 5W—30 being the preferred engine oil.

Drain and refill capacity:

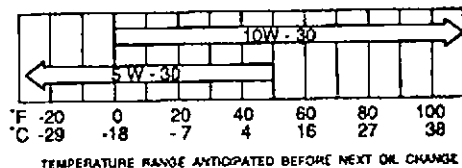
w/ Oil filter change

5.2 liters (5.5 US qts, 4.6 Imp. qts)

w/o Oil filter change

4.9 liters (5.2 US qts, 4.3 Imp. qts)

Recommended Viscosity (SAE):



P13211

2JZ—GTE:

Check the oil for deterioration, entry of water, discoloring or thinning.

If oil quality is visibly poor, replace the oil.

Oil grade:

API grade SG or SH, Energy—Conserving II multi-grade engine oil or ILSAC multigrade engine oil. Recommended viscosity is as shown in the illustration.

Drain and refill capacity:

w/ Oil filter change

5.0 liters (5.3 US qts, 4.4 Imp. qts)

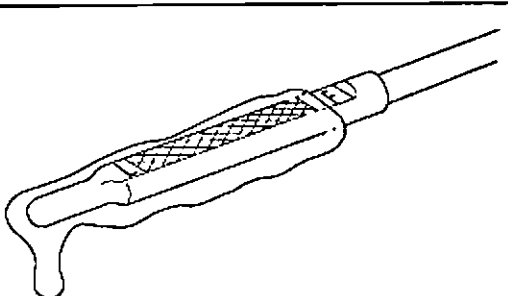
w/o Oil filter change

4.7 liters (5.0 US qts, 4.1 Imp. qts)

2. CHECK ENGINE OIL LEVEL

The oil level should be between the "L" and "F" marks on the dipstick.

If low, check for leakage and add oil up to the "F" mark.



P14600

LUBRICANT

Item	Capacity	Classification
Engine oil (Drain and refill) (2JZ—GE) w/ Oil filter change w/o Oil filter change	5.2 liters (5.5 US qts, 4.6 Imp. qts) 4.9 liters (5.2 US qts, 4.3 Imp. qts)	API grade SG or SH, Energy—Conserving II multigrade engine oil or ILSAC multigrade engine oil and recommended viscosity oil, with SAE 5W—30 being preferred engine oil
Engine oil (Drain and refill) (2JZ—GTE) w/ Oil filter change w/o Oil filter change	5.0 liters (5.2 US qts, 4.3 Imp. qts) 4.7 liters (5.0 US qts, 4.1 Imp. qts)	API grade SG or SH, Energy—Conserving II multigrade engine oil or ILSAC multigrade engine oil and recommended viscosity oil.
Brake fluid	—	SAE J1703 or FMVSS No.116 DOT3
Manual transmission oil 2JZ—GE 2JZ—GTE	2.6 liters (2.7 US qts, 2.3 Imp. qts) 1.8 liters (1.9 US qts, 1.6 Imp. qts)	API GL—5 SAE 75W—90 Castle gear oil V160
Automatic transmission fluid (Drain and refill) 2JZ—GE 2JZ—GTE	1.6 liters (1.7 US qts, 1.4 Imp. qts) 1.9 liters (2.0 US qts, 1.7 Imp. qts)	ATF DEXRON® II ATF TYPE T—II
Differential oil	1.35 liters (1.43 US qts, 1.19 Imp. qts)	API GL—5 Above —18°C (0°F) SAE 90 Below —18°C (0°F) SAE 80W—90 or 80W

COOLANT

Item	Capacity	Classification
Engine coolant (w/ Heater) 2JZ—GE M/T A/T 2JZ—GTE M/T A/T	7.3 liters (7.7 US qts, 6.4 Imp. qts) 8.3 liters (8.8 US qts, 7.3 Imp. qts) 9.5 liters (10.0 US qts, 8.4 Imp. qts) 9.4 liters (9.9 US qts, 8.3 Imp. qts)	Ethylene—glycol base

SERVICE SPECIFICATIONS

SERVICE DATA

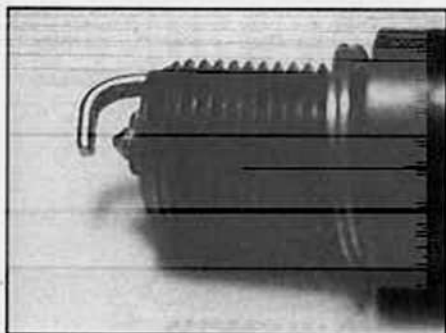
MA001-6

Engine	Spark plug		
	Recommended spark plug	ND for 2JZ—GE for 2JZ—GTE NGK for 2JZ—GE for 2JZ—GTE	PK16R11 PK20R11 BKR5EP11 BKR6EP11
	Correct electrode gap		1.1 mm (0.043 in.)
	Firing order		1 — 5 — 3 — 6 — 2 — 4
	Valve clearance	Intake Exhaust	0.15 — 0.25 mm (0.006 — 0.010 in.) 0.25 — 0.35 mm (0.010 — 0.014 in.)
Brake	Front and rear brakes		
	Pad thickness	Limit	1.0 mm (0.039 in.)
	Disc thickness	Limit (Front for 2JZ—GE) (Front for 2JZ—GTE) (Rear)	30.0 mm (1.181 in.) 28.0 mm (1.102 in.) 15.0 mm (0.591 in.)
	Disc runout	Limit	0.05 mm (0.0020 in.)
	Parking brake		
	Lining thickness	Limit	1.0 mm (0.039 in.)
	Drum inside diameter	Limit	191 mm (7.520 in.)
Chassis	Steering linkage		
	Steering wheel freeplay	Limit	30 mm (1.18 in.)
	Ball joint		
	Vertical play	Limit	0.3 mm (0.012 in.)

TORQUE SPECIFICATIONS

MA001-6

Part tightened	N·m	kgf·cm	ft·lbf
Spark plug x Cylinder head	18	180	13
Front seat x Body	37	375	27
Front suspension member x Body	125	1,280	92
Front suspension member x Body	200	2,040	148
Rear suspension member x Body	175	1,790	129
Rear suspension member rear cushion x Body	58	590	43



Center electrode ground to a point, thereby lowering required arc-over voltage by approximately 30%.

teach him how to make his own best judgments, he'll be a winner under all conditions for the rest of his life." "Increasing Engine Power, Efficiency, Mileage and Longevity Using Upgraded Ignition Equipment" (Chapter 2, pp. 24-50), tells you how to see if your tuning is improving or hurting. Here I'm going to address most of my attention to the tuning rules which generally apply to all engines under all conditions. Using these rules, not only will you be sure your engine is producing all the horses its got, but you'll get it to this optimum in the shortest time and with the least wear and tear on its bearings, rings and valves.

Thermal Mapping of the Engine Compartment

Before discussing the various types of engine adjustments you can make, I'd like to offer a word of caution about heat patterns inside an engine compartment. When the vehicle was made the engineers mapped out the various hot and cold spots of the engine compartment. Naturally, they mounted the heat-sensitive parts, such as ignition amplifiers, in the cooler spots. When you install extra-bulky equipment, such as superchargers or water injectors—winches that change radiator air flow patterns—you change the engine air flow patterns and completely disrupt the thermal map of the engine compartment. On some models—we found Fords particularly susceptible—you can raise the surrounding (ambient) temperature on the electronic amplifier by 200 degrees F simply by installing a water-injection bottle in some critical location. I've personally observed

How to gap spark plugs for maximum mileage and performance

There is an optimum spark plug gap for your engine. When the spark plugs are gapped at this optimum, you will be achieving the maximum possible gasoline mileage and/or engine performance. The spark plug gap which is optimum for light throttle, easy driving, i.e., high-gasoline-mileage type operation, usually will be slightly larger than the optimum where high power, ultra-high performance is of primary concern. If you have aftermarket ignition equipment, start with the instructions provided (i.e., Jacobs Electronics recommends 0.055" as a good starting point), which should always give substantial improvements in both mileage and power; however, **THE ONLY WAY TO DETERMINE THE OPTIMUM GAP FOR YOUR APPLICATION IS BY TRIAL AND ERROR.**

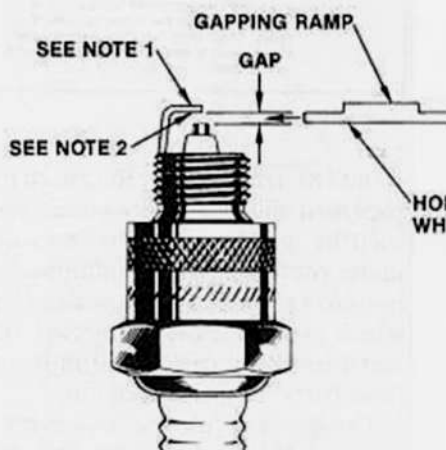
PROCEDURE

Start at the factory spark plug gap. Drive the car and determine the mileage and/or performance. If you are primarily concerned about gasoline mileage with performance increases only a rewarding by-product, you should drive at least 1,000 miles between gap changes and allow mileage figures to "settle out."

If performance is your primary concern, you could change gaps after each performance trial. (For fleet applications, determine the optimum for one engine-vehicle combination. This optimum almost always applies to all similar combinations in your fleet.)

After you have determined the mileage and/or performance at the gap, increase the gap another 0.010" (ten thousandths of an inch) and measure mileage and/or performance again. If an improvement resulted from the gap increase, increase the gap another 0.010" and take new measurements. Keep increasing the gap by 0.010" as long as there is an improvement accompanying each increase. The first time increasing the gap causes a reduction in mileage or performance, reduce the gap by 0.010". This is your optimum! Always set plugs to this optimum.

When gapping plugs, remember the side electrode must be flat and centered as shown in the figure below. Jacobs CUSTOM GAPPING PLIERS (P/N 380700) assures you a perfect gap every time.



NOTE: Before increasing spark plug gaps, be sure your ignition wires can support the increased energy. If there is any doubt, replace your ignition wires with ENERGY CORE wires, available from your dealer, or factory direct.

NOTE 1: When using ENERGY PAK, ignition side electrode does not have to continue past center electrode

NOTE 2: Side electrode — perfectly flat and directly over center electrode

PERFECTLY GAPPED AND ALIGNED ELECTRODES

Remember, increases in plug gap will give improvements up to the optimum gap. After that, further gap increases will cause a deterioration. However, only your experimenting can determine what your optimum gap is.

How to gap sparkplugs for maximum mileage and performance.

several cases where people have installed a trick air cleaner, never associating it with the fact they have started blowing out ignition amplifiers every six months. When Jacobs technicians moved the amplifier to a cool spot, it remained func-

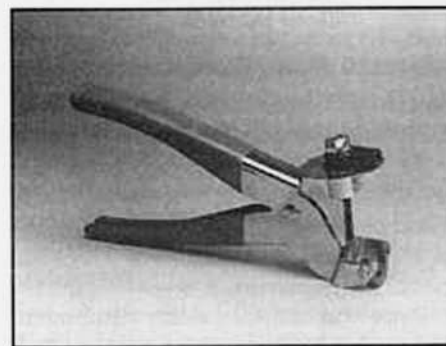
tional from then on.

Once you've added bulky equipment, you must check the temperature of all electronic parts. Unless you have access to a thermocouple thermometer, or a "Thermal Mapping Kit, you will have to

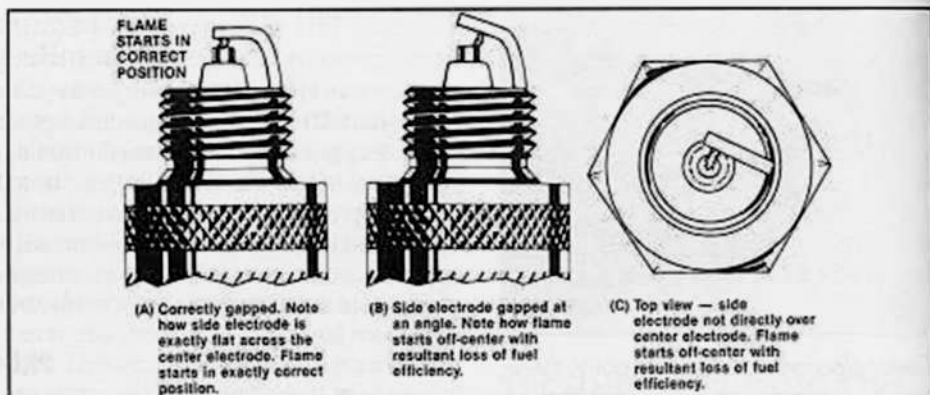


Heat has always been the main enemy of batteries, electrical components, and fuel systems (particularly in high-performance vehicles). This "Thermal Mapping Kit," consisting of self-adhesive strips, features "permanent peak temperature detectors" that change color to record the highest temperature of whatever surface they are placed on.

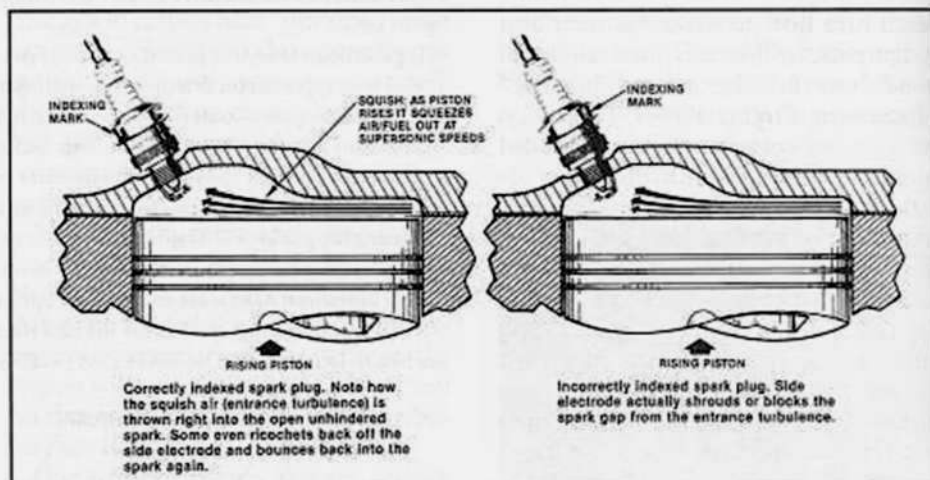
use your sense of touch and the 10 second rule. A Thermal Mapping Kit is a package of papers about 1/2" x 1-1/2". On these papers are a series of dots that permanently change color depending on the highest temperature the paper was subjected to. That is, if the 180 degrees F dot turned color, but the 185 degrees F did not, you know that the paper, and whatever it was attached to, was subjected to



Sparkplug gapping pliers. Gaps and assures side electrode is perfectly flat over center electrode.



Examples of correctly and incorrectly gapped plugs.



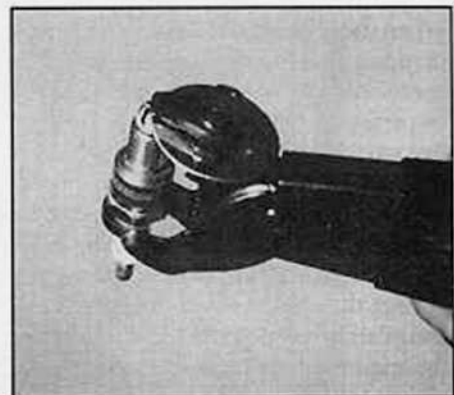
Indexing sparkplugs.

about 182-1/2 degrees F. You attach these papers to all temperature critical parts, such as ignition modules, and drive under your worst case conditions. Then by looking at these papers, you can know which parts have been subjected to the worst heat. You can then simply move these parts to a cooler location.

The general rule is, "For every 18 degrees F (10 degrees C) you cool a part, you double its life." If you cool it 36

degrees F, you increase its life 4 times; 64 degrees F cooler gives 8 times the life, and so on.

If you don't have a Thermal Mapping Kit, the 10-second rule states that after



Proper way to gap a sparkplug using a floating head gapping pliers. To use gapping pliers, plugs are inserted into front and by squeezing pliers, plug gap and electrode alignment are set automatically.



Indexed sparkplug. Black line made with ink marker, not pencil, shows opening in the side electrode.



CARBON DEPOSITS

Symptoms: Dry sooty deposits indicate a rich mixture or weak ignition. Causes misfiring, hard starting and hesitation.

Recommendation: Check for a clogged air cleaner, high float level, sticky choke and worn ignition points. Use a spark plug with a longer core nose for greater anti-fouling protection.



OIL DEPOSITS

Symptoms: Oily coating caused by poor oil control. Oil is leaking past worn valve guides or piston rings into the combustion chamber. Causes hard starting, misfiring and hesitation.

Recommendation: Correct the mechanical condition with necessary repairs and install new plugs.



TOO HOT

Symptoms: Blistered, white insulator, eroded electrode and absence of deposits. Results in shortened plug life.

Recommendation: Check for the correct plug heat range, over-advanced ignition timing, lean fuel mixture, intake manifold vacuum leaks and sticking valves. Check the coolant level and make sure the radiator is not clogged.



PREIGNITION

Symptoms: Melted electrodes. Insulators are white, but may be dirty due to misfiring or flying debris in the combustion chamber. Can lead to engine damage.

Recommendation: Check for the correct plug heat range, over-advanced ignition timing, lean fuel mixture, clogged cooling system and lack of lubrication.



HIGH SPEED GLAZING

Symptoms: Insulator has yellowish, glazed appearance. Indicates that combustion chamber temperatures have risen suddenly during hard acceleration. Normal deposits melt to form a conductive coating. Causes misfiring at high speeds.

Recommendation: Install new plugs. Consider using a colder plug if driving habits warrant.



GAP BRIDGING

Symptoms: Combustion deposits lodge between the electrodes. Heavy deposits accumulate and bridge the electrode gap. The plug ceases to fire, resulting in a dead cylinder.

Recommendation: Locate the faulty plug and remove the deposits from between the electrodes.



NORMAL

Symptoms: Brown to grayish-tan color and slight electrode wear. Correct heat range for engine and operating conditions.

Recommendation: When new spark plugs are installed, replace with plugs of the same heat range.



ASH DEPOSITS

Symptoms: Light brown deposits encrusted on the side or center electrodes or both. Derived from oil and/or fuel additives. Excessive amounts may mask the spark, causing misfiring and hesitation during acceleration.

Recommendation: If excessive deposits accumulate over a short time or low mileage, install new valve guide seals to prevent seepage of oil into the combustion chambers. Also try changing gasoline brands.



WORN

Symptoms: Rounded electrodes with a small amount of deposits on the firing end. Normal color. Causes hard starting in damp or cold weather and poor fuel economy.

Recommendation: Replace with new plugs of the same heat range.



DETONATION

Symptoms: Insulators may be cracked or chipped. Improper gap setting techniques can also result in a fractured insulator tip. Can lead to piston damage.

Recommendation: Make sure the fuel anti-knock values meet engine requirements. Use care when setting the gaps on new plugs. Avoid lugging the engine.



SPLASHED DEPOSITS

Symptoms: After long periods of misfiring, deposits can loosen when normal combustion temperature is restored by an overdue tune-up. At high speeds, deposits flake off the piston and are thrown against the hot insulator, causing misfiring.

Recommendation: Replace the plugs with new ones or clean and reinstall the originals.



MECHANICAL DAMAGE

Symptoms: May be caused by a foreign object in the combustion chamber or the piston striking an incorrect reach (too long) plug. Causes a dead cylinder and could result in piston damage.

Recommendation: Remove the foreign object from the engine and/or install the correct reach plug.

MAINTENANCE OPERATIONS ENGINE

MA590-01

Cold Engine Operations

1. REPLACE TIMING BELT

- Remove the timing belt.
(See page EG-38)
- Install the timing belt.
(See page EG-47)

2. INSPECT DRIVE BELT

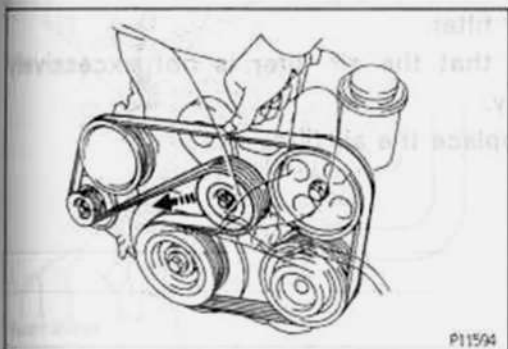
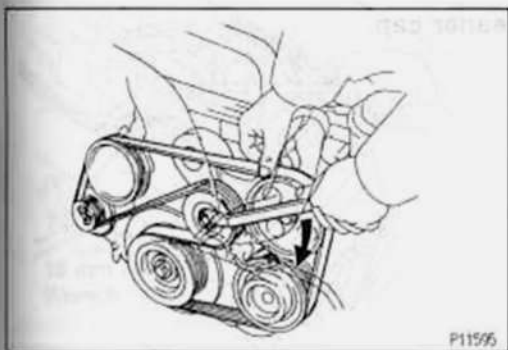
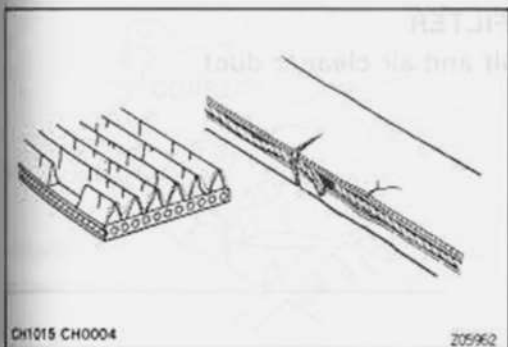
HINT: A belt tensioner is used, so checking the belt tension is not necessary.

- Visually check the drive belt for excessive wear, frayed cords, etc.

If necessary, replace the drive belt.

HINT:

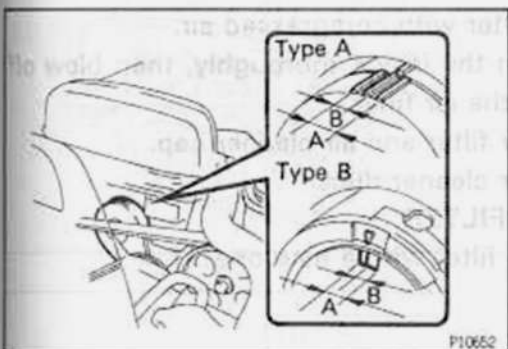
- Cracks on the rib side of a drive belt are considered acceptable. If the drive belt has chunks missing from the ribs, it should be replaced.
- The drive belt tension can be released by turning the belt tensioner clockwise.



- Check the belt tensioner operation.

- Check that the belt tensioner moves downward when the drive belt is pressed down at the points indicated in the illustration with approx. 98 N (10 kgf, 22.0 lbf) of force.
- Check the alignment of the belt tensioner pulley to make sure the drive belt will not slipped off the pulley.

If necessary, replace the belt tensioner.

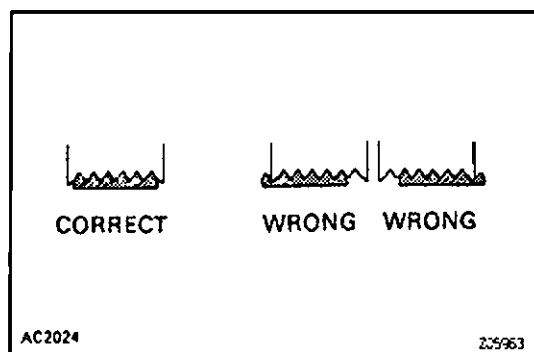


- Check that the arrow mark on the belt tensioner falls within area A of the scale.

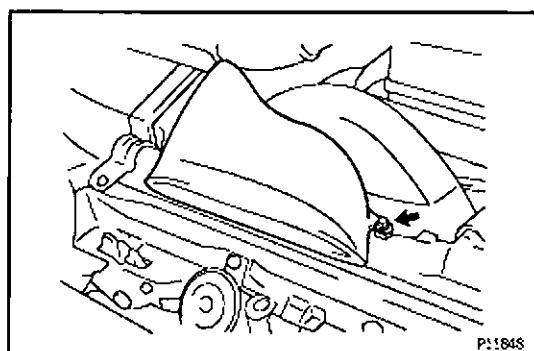
If it is outside area A, replace the drive belt.

HINT:

- When a new belt is installed, it should be within area B. If not, the drive belt is not correct.

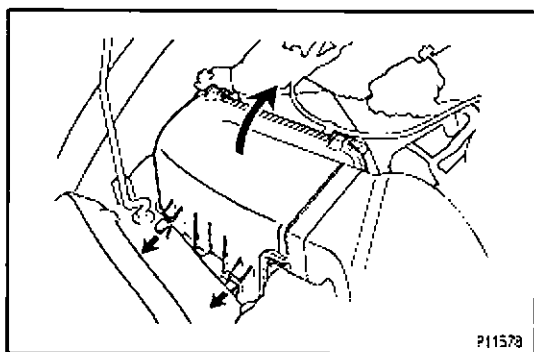


- After installing a drive belt, check that it fits properly in the ribbed grooves.
- Check by hand to confirm that the belt has not slipped out of the groove on the bottom of the pulley.

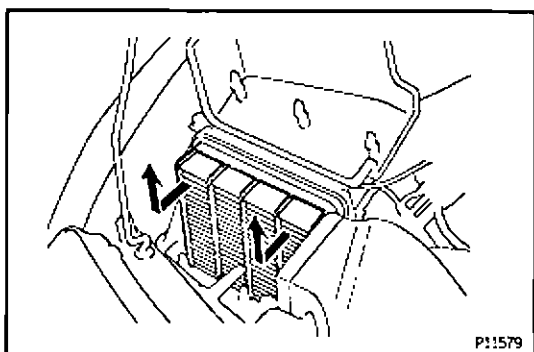


3. INSPECT AIR FILTER

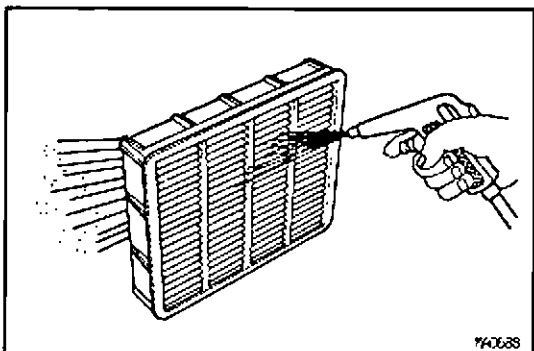
- (a) Remove the bolt and air cleaner duct.



- (b) Open the air cleaner cap.



- (c) Remove the air filter.
- (d) Visually check that the air filter is not excessively damaged or oily.
If necessary, replace the air filter.



- (e) Clean the air filter with compressed air.
First blow from the inside thoroughly, then blow off the outside of the air filter.
- (f) Reinstall the air filter and air cleaner cap.
- (g) Reinstall the air cleaner duct.

4. REPLACE AIR FILTER

- Replace the air filter with a new one.

5. REPLACE SPARK PLUGS

(a) 2JZ—GE:

Remove the throttle body.

(See SFI System on page EG—354)

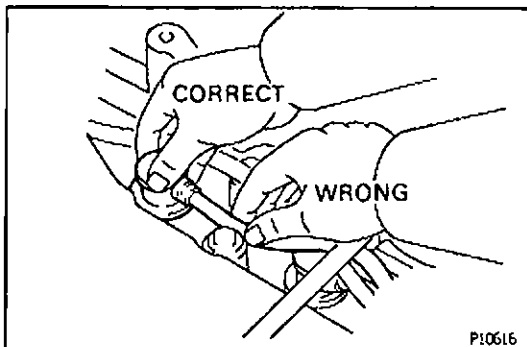
(b) Remove the No.3 timing belt cover.

(c) 2JZ—GE:

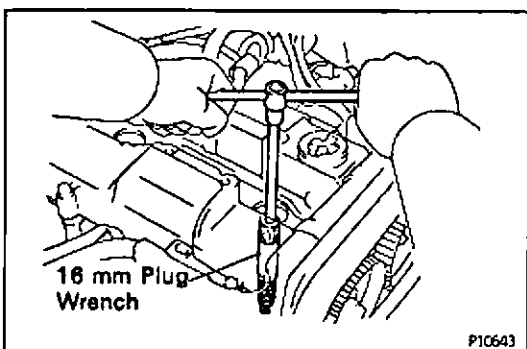
Remove the cylinder head rear cover.

(d) Disconnect the high — tension cords at the rubber boot. Do not pull on the high—tension cords.

NOTICE: Pulling on or bending the cords may damage the conductor inside.



(e) Using a 16 mm plug wrench, remove the 6 spark plugs.



(f) Check the electrode gap of new spark plugs.

Correct electrode gap:

1.1 mm (0.043 in.)

Recommended spark plug:

2JZ—GE

PK16R11 for ND

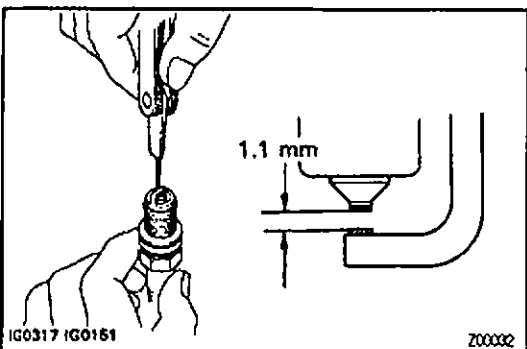
BKR5EP11 for NGK

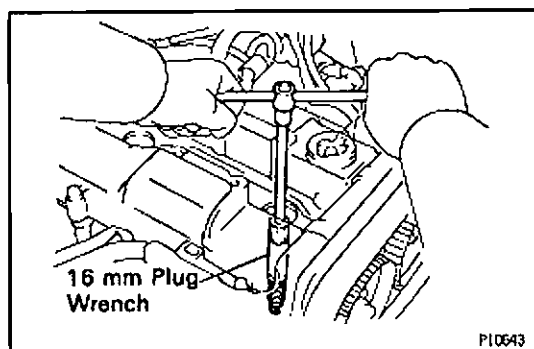
2JZ—GTE

PK20R11 for ND

BKR6EP11 for NGK

NOTICE: If adjusting the gap of a new spark plug, bend only the base of the ground electrode. Do not touch the tip.





- (g) Using a 16 mm plug wrench, reinstall the 6 spark plugs.

Torque: 18 N·m (180 kgf·cm, 13 ft·lbf)

- (h) Reconnect the high-tension cords.

- (i) 2JZ-GE:

Reinstall the cylinder head rear cover.

- (j) Reinstall the No.3 timing belt cover.

- (k) 2JZ-GE:

Reinstall the throttle body.

(See SFI System on page EG-358)

6. REPLACE ENGINE OIL AND OIL FILTER

(See Lubrication System on page EG-598)

2JZ-GE:

Oil grade:

API grade SG or SH Energy – Conserving II or ILSAC multigrade engine oil.

Recommended viscosity is as shown in the illustration, with SAE 5W-30 being the preferred engine oil.

Drain and refill capacity:

w/ Oil filter change

5.2 liters (5.5 US qts, 4.6 Imp. qts)

w/o Oil filter change

4.9 liters (5.2 US qts, 4.3 Imp. qts)

2JZ-GTE:

Oil grade:

API grade SG or SH Energy – Conserving II or ILSAC multigrade engine oil.

Recommended viscosity is as shown in the illustration.

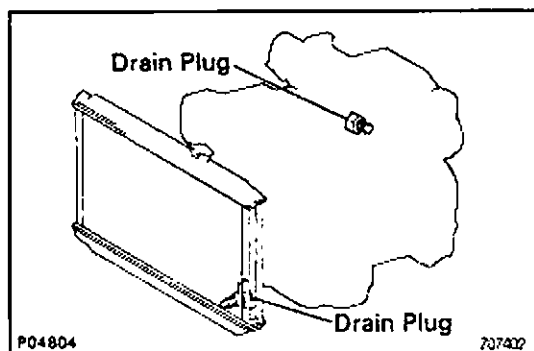
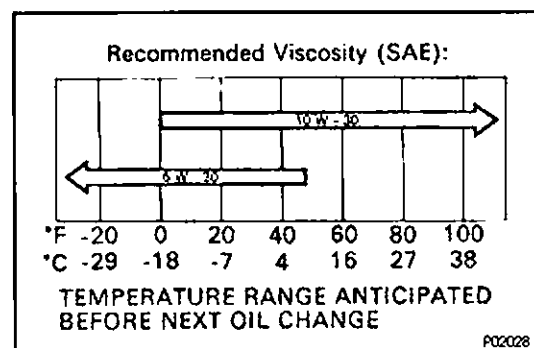
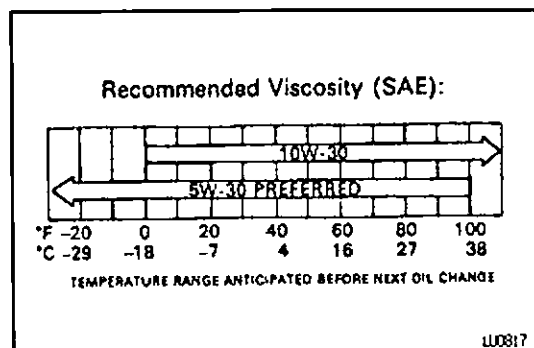
Drain and refill capacity:

w/ Oil filter change

5.0 liters (5.3 US qts, 4.3 Imp. qts)

w/o Oil filter change

4.7 liters (5.0 US qts, 4.1 Imp. qts)



7. REPLACE ENGINE COOLANT

(See Cooling System on page EG-546)

Capacity (w/ Heater):

2JZ-GE M/T

7.3 liters (7.7 US qts, 6.4 Imp. qts)

2JZ-GE A/T

8.3 liters (8.8 US qts, 7.3 Imp. qts)

2JZ—GTE M/T

9.3 liters (10.0 US qts, 8.4 Imp. qts)

2JZ—GTE A/T

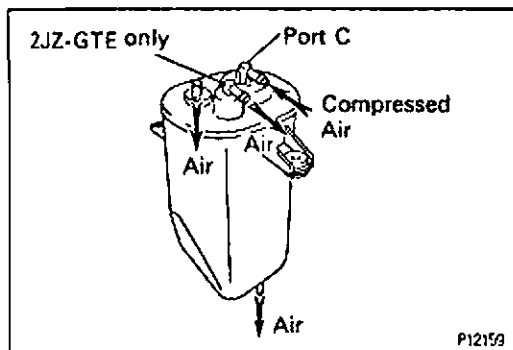
9.4 liters (9.9 US qts, 8.3 Imp. qts)

HINT:

- Use a good brand of ethylene—glycol base coolant and mix it according to the manufacturer's directions.
- Using coolant which includes more than 50 % ethylene—glycol (but not more than 70 %) is recommended.

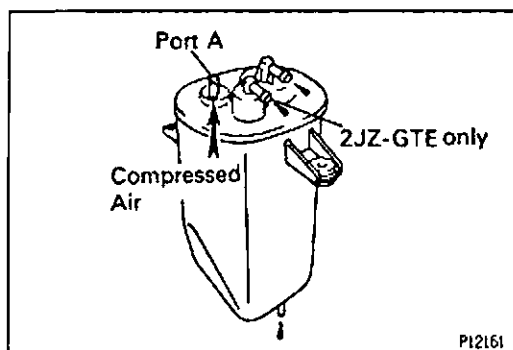
NOTICE:

- Do not use a alcohol type coolant.
- The coolant should be mixed with demineralized water or distilled water.



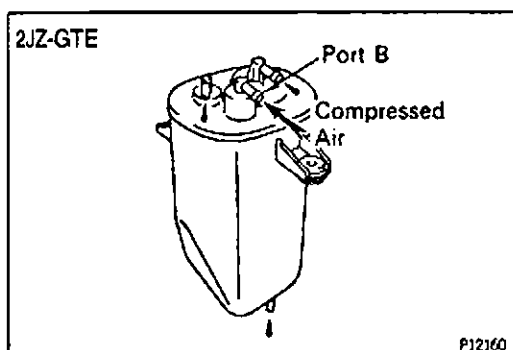
8. INSPECT CHARCOAL CANISTER

- Remove the charcoal canister.
- Visually inspect the canister case.
- Check for clogged each port and stuck check valve.
 - Using low compressed air (4.71 kPa (48 gf/cm², 0.68 psi)), blow into port C and check that air flows without resistance from the other ports.



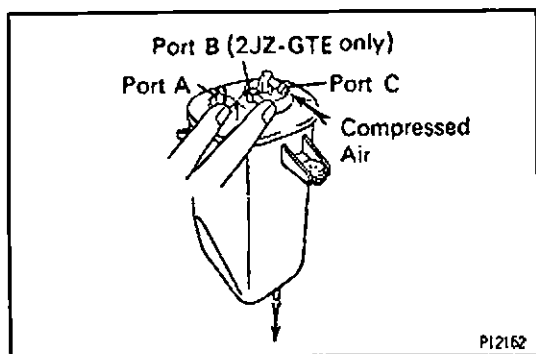
- Blow low compressed air (4.71 kPa (48 gf/cm², 0.68 psi)) into port A and check that air does not flow from the other ports.

If operation is not as specified, replace the charcoal canister.



- 2JZ—GTE:
Blow low compressed air (4.71 kPa (48 gf/cm², 0.68 psi)) into port B and check that air does not flow from the other ports.

If operation is not as specified, replace the charcoal canister.

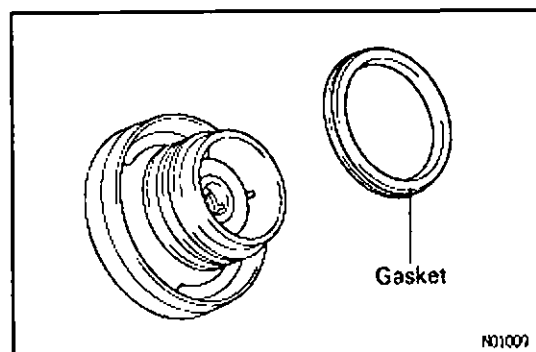


- (d) Clean the filter in the canister.
Clean the filter by blowing 294 kPa (3 kgf/cm², 43 psi) of compressed air into port C while holding port A and B (2JZ-GTE only) closed.

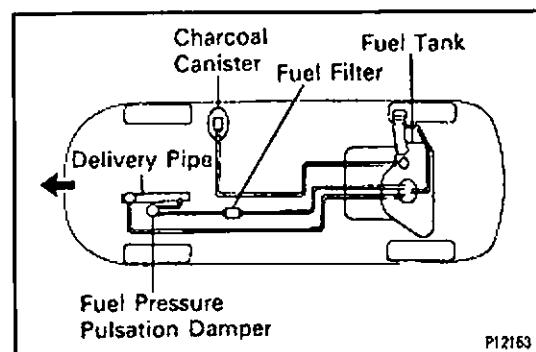
NOTICE:

- Do not attempt to wash the canister.
- No activated carbon should come out.

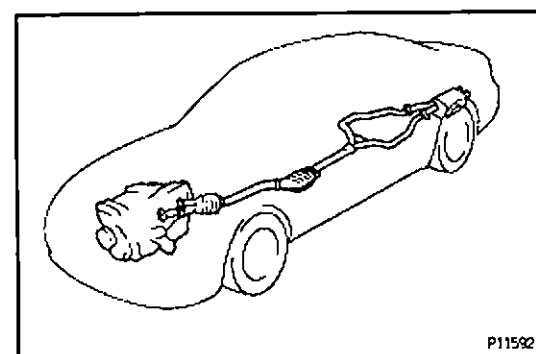
- (e) Reinstall the charcoal canister.

**9. REPLACE GASKET IN FUEL TANK CAP**

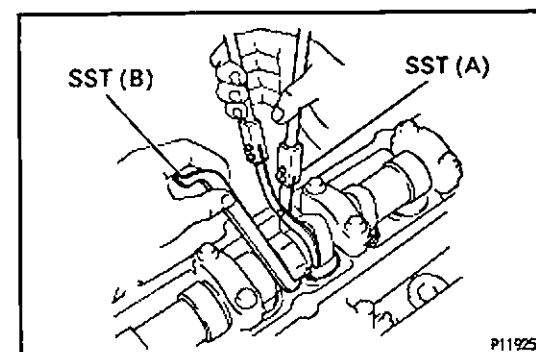
- (a) Remove the old gasket from the tank cap. Do not damage the cap.
(b) Install a new gasket by hand.
(c) Check the cap for damage or cracks.
(d) Install the cap and check the torque limiter.

**10. INSPECT FUEL LINES AND CONNECTIONS**

Visually check the fuel lines for cracks, leakage, loose connections, deformation or tank band looseness.

**11. INSPECT EXHAUST PIPES AND MOUNTINGS**

Visually check the pipes, hangers and connections for severe corrosion, leaks or damage.

**12. ADJUST VALVE CLEARANCE**

(See Engine Mechanical on page EG-16)

Valve clearance (Cold):

Intake

0.15 — 0.25 mm (0.006 — 0.010 in.)

Exhaust

0.25 — 0.35 mm (0.010 — 0.014 in.)

BRAKES

13. INSPECT BRAKE LINE PIPES AND HOSES

HINT: Check in a well lighted area. Check the entire circumference and length of the brake hoses using a mirror as required. Turn the front wheels fully right or left before checking the front brake.

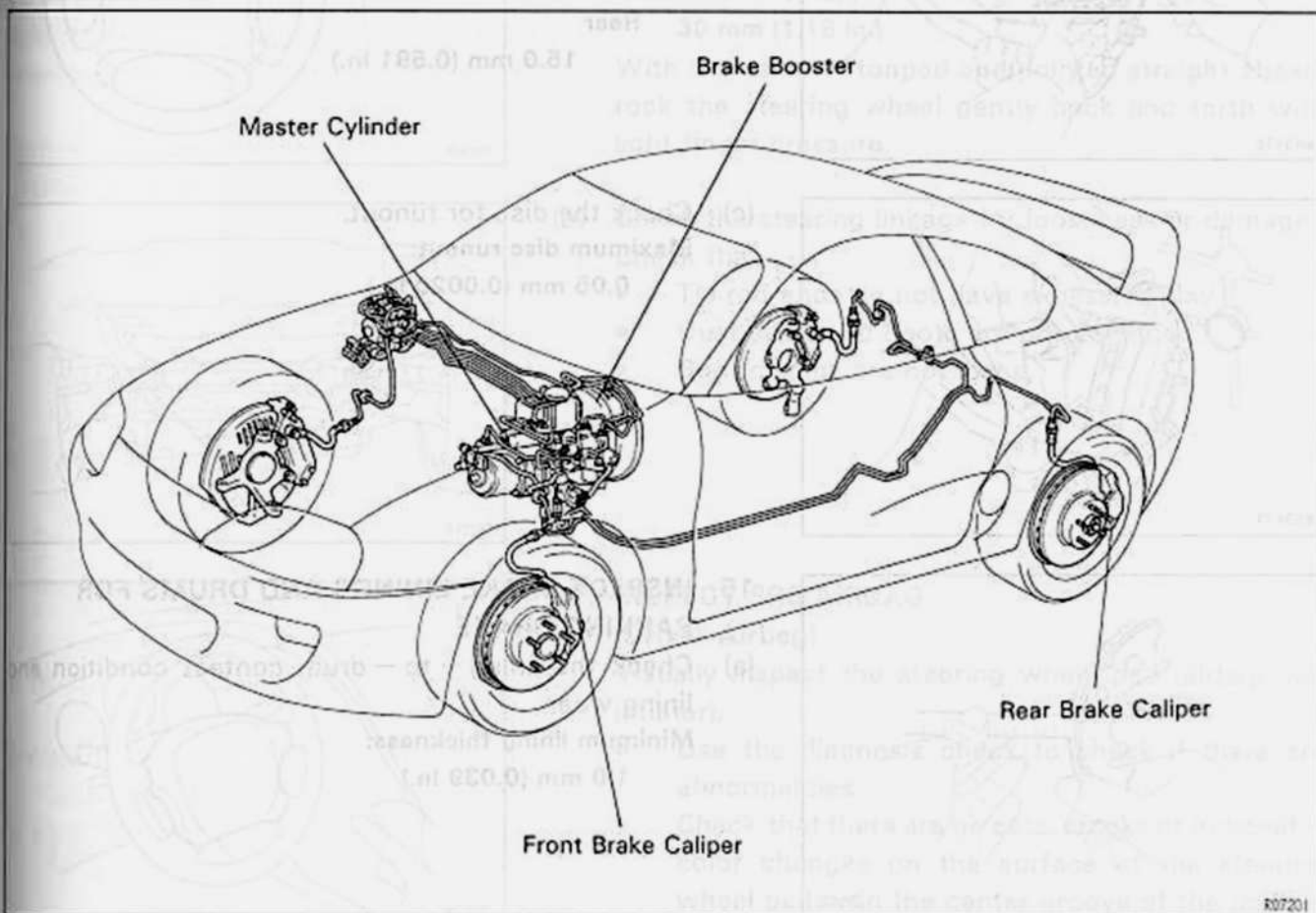
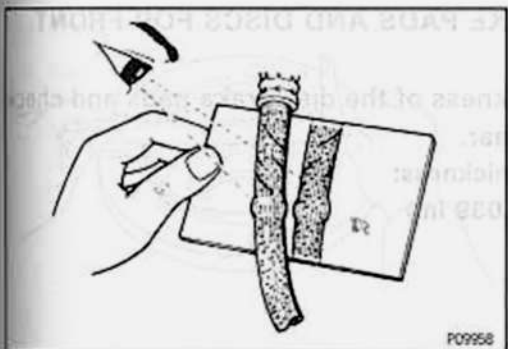
(a) Check all brake lines and hoses for:

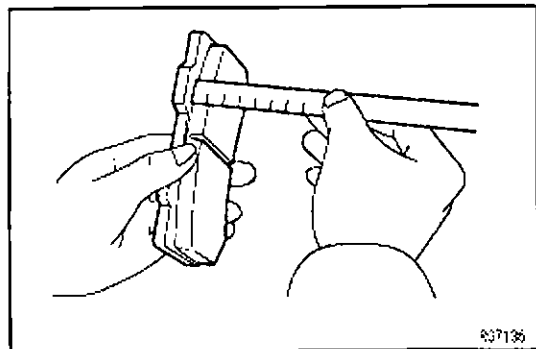
- Damage
- Wear
- Deformation
- Cracks
- Corrosion
- Leaks
- Bends
- Twists

(b) Check all clamps for tightness and connections for leakage.

(c) Check that the hoses and lines are clear of sharp edges, moving parts and the exhaust system.

(d) Check that the lines installed in grommets pass through the center of the grommets.



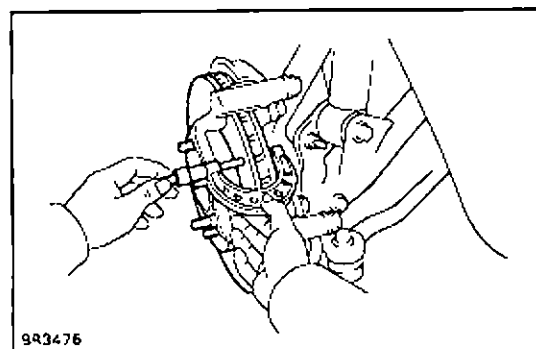


14. INSPECT BRAKE PADS AND DISCS FOR FRONT AND REAR

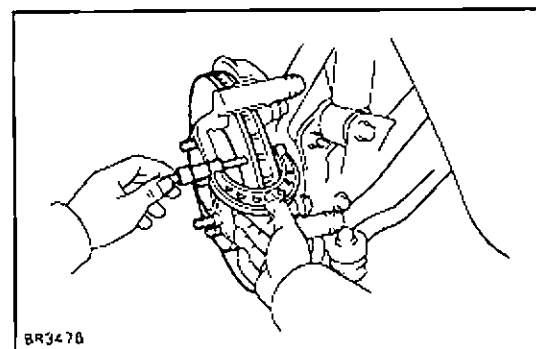
- (a) Check the thickness of the disc brake pads and check for irregular wear.

Minimum pad thickness:

1.0 mm (0.039 in.)



HINT: If a squealing or scraping noise comes from the brake during driving, check the pad wear indicator to see if it is contacting the disc rotor. If so, the disc pad should be replaced.



- (b) Check the disc for wear or runout.

Minimum disc thickness:

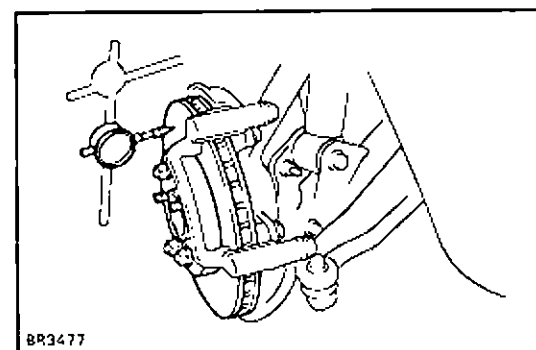
Front

30.0 mm (1.181 in.) for 2JZ-GE

28.0 mm (1.102 in.) for 2JZ-GTE

Rear

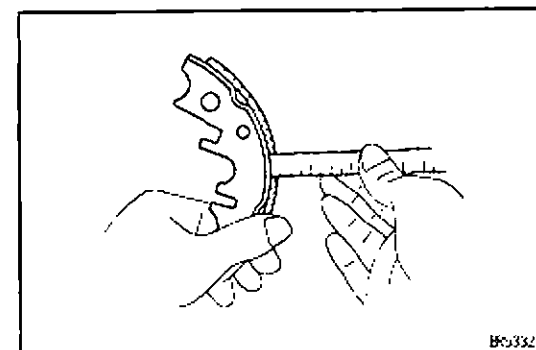
15.0 mm (0.591 in.)



- (c) Check the disc for runout.

Maximum disc runout:

0.05 mm (0.0020 in.)

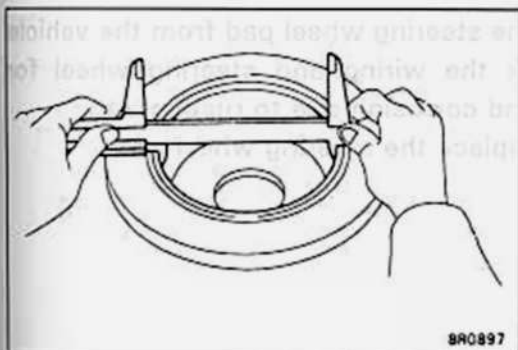


15. INSPECT BRAKE LININGS AND DRUMS FOR PARKING BRAKE

- (a) Check the lining — to — drum contact condition and lining wear.

Minimum lining thickness:

1.0 mm (0.039 in.)



- (b) Check the brake drums for scoring or wear.

Maximum drum inside diameter:

191 mm (7.520 in.)

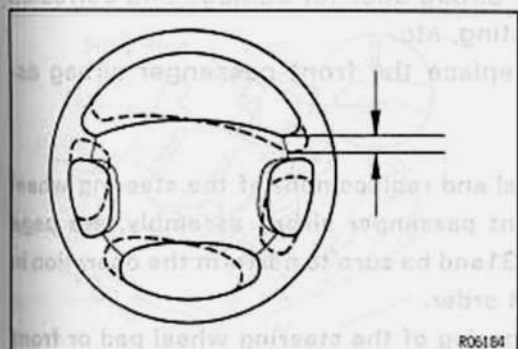
- (c) Clean the brake parts with a damp cloth.

NOTICE: Do not use compressed air to clean the brake parts.

- (d) Settle the parking brake shoes and drum. When performing the road test in item 25, do the following:

- Drive the vehicle at approx. 50 km/h (30 mph) on a safe, level and dry road.
- With the parking brake lever pushed in, pull on the lever with 88 N (9 kgf, 20 lbf) of force.
- Drive the vehicle for approx. 400 meters (1/4 mile) in this condition.
- Repeat this procedure 2 or 3 times.
- Check parking lever travel.

If necessary, adjust the parking brake.



CHASSIS

16. INSPECT STEERING LINKAGE

- (a) Check the steering wheel freeplay.

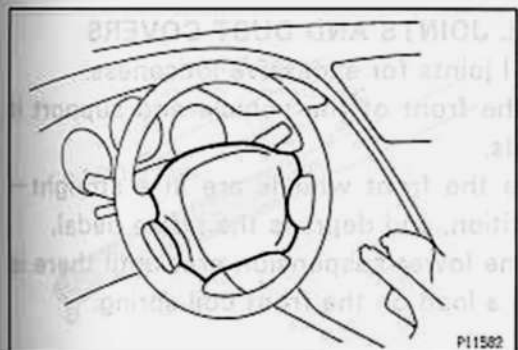
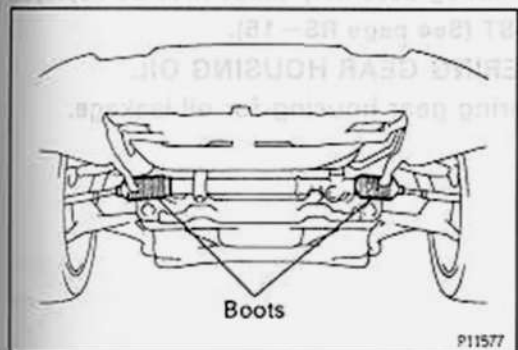
Maximum freeplay:

30 mm (1.18 in.)

With the vehicle stopped and pointed straight ahead, rock the steering wheel gently back and forth with light finger pressure.

- (b) Check the steering linkage for looseness or damage. Check that:

- Tie rod ends do not have excessive play.
- Dust seals and boots are not damaged.
- Boot clamps are not loose.



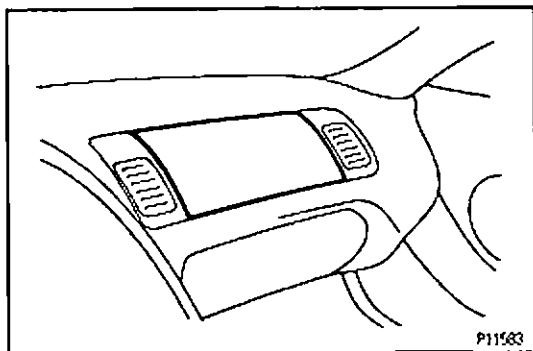
17. INSPECT SRS AIRBAG

(Driver Airbag)

Visually inspect the steering wheel pad (airbag and inflator).

- Use the diagnosis check to check if there are abnormalities.
- Check that there are no cuts, cracks or noticeable color changes on the surface of the steering wheel pad or in the center groove of the pad.

- Remove the steering wheel pad from the vehicle and check the wiring and steering wheel for damage and corrosion due to rusting, etc. If necessary, replace the steering wheel pad.



(Front Passenger Airbag)

Visually inspect the front passenger airbag assembly (airbag and inflator).

- Use the diagnosis check to check if there are abnormalities.
- Check that there are no cuts, cracks or noticeable color changes in the front passenger airbag door.
- Remove the front passenger airbag assembly from the vehicle and check the wiring and front passenger airbag door for damage and corrosion due to rusting, etc.

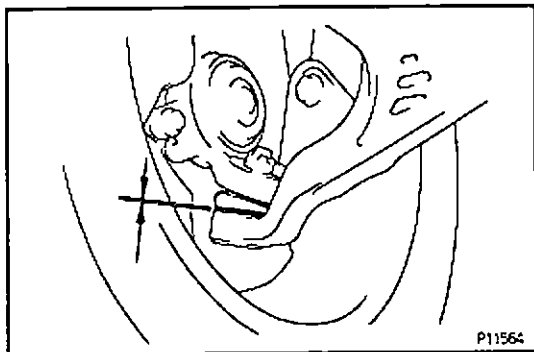
If necessary, replace the front passenger airbag assembly.

CAUTION:

- For removal and replacement of the steering wheel pad or front passenger airbag assembly, see page RS-19 or 31 and be sure to perform the operation in the correct order.
- Before disposing of the steering wheel pad or front passenger airbag assembly must first be deployed by using SST (See page RS-15).

18. INSPECT STEERING GEAR HOUSING OIL

Check the steering gear housing for oil leakage.



19. INSPECT BALL JOINTS AND DUST COVERS

(a) Inspect the ball joints for excessive looseness.

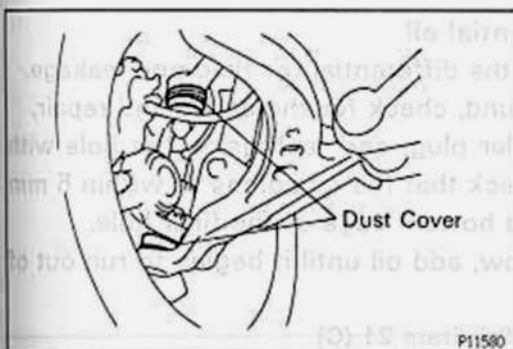
- Jack up the front of the vehicle and support it with stands.
- Make sure the front wheels are in a straight-ahead position, and depress the brake pedal.
- Jack up the lower suspension arm until there is about half a load on the front coil spring.

- Move the front wheel up and down and check that the ball joint has no excessive play.

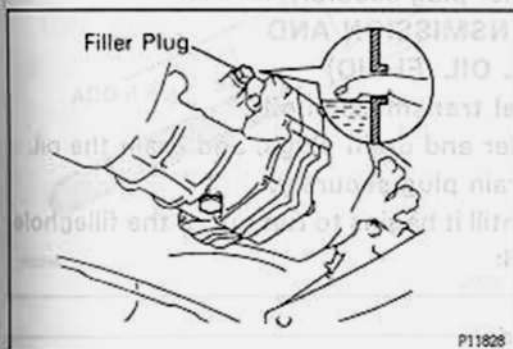
Maximum lower ball joint vertical play:

0.3 mm (0.012 in.)

If the play is greater than maximum, replace the ball joint.



- (b) Visually check the dust covers for damage.



20. INSPECT TRANSMISSION AND DIFFERENTIAL OIL

A. Inspect manual transmission oil

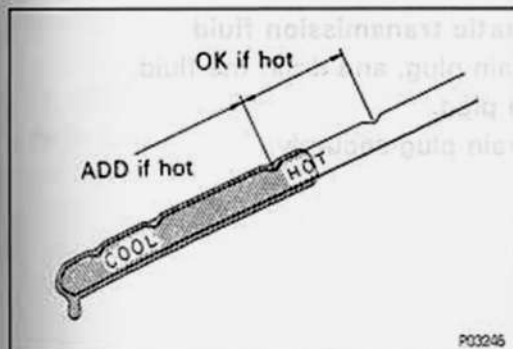
- (a) Visually check the transmission for fluid and leakage. If leakage is found, check for the cause and repair. *

- (b) Remove the filler plug, and feel inside the hole with your finger. Check that the oil comes to within 5 mm (0.20 in.) of the bottom edge of the filler hole.

If the level is low, add oil until it begins to run out of the filler hole.

Transmission oil: See item 21 (A)

- (c) Reinstall the filler plug securely.



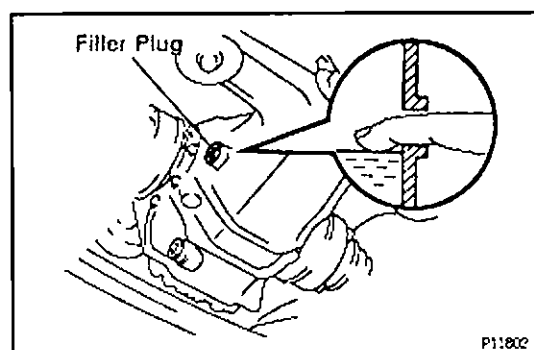
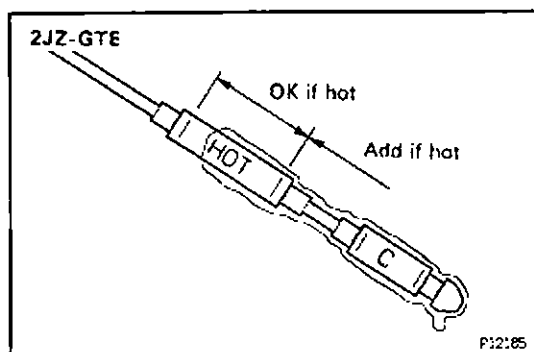
B. Inspect automatic transmission fluid

- (a) Visually check the transmission for fluid and leakage. If leakage is found, check for the cause and repair.

- (b) Check the fluid level with the engine idling and shift lever at "P" position.

If the level is low, add fluid.

Transmission fluid: See item 21 (B)



C. Inspect differential oil

- (a) Visually check the differential for fluid and leakage. If leakage is found, check for the cause and repair.
- (b) Remove the filler plug, and feel inside the hole with your finger. Check that the oil comes to within 5 mm (0.20 in.) of the bottom edge of the filler hole. If the level is low, add oil until it begins to run out of the filler hole.

Differential oil: See item 21 (C)

- (c) Reinstall the filler plug securely.

21. REPLACE TRANSMISSION AND DIFFERENTIAL OIL (FLUID)

A. Replace manual transmission oil

- (a) Remove the filler and drain plugs, and drain the oil.
- (b) Reinstall the drain plug securely.
- (c) Add fresh oil until it begins to run out of the filler hole.

Transmission Oil:

2JZ-GE

Oil grade

API GL-5

Viscosity

SAE 75W-90

Capacity:

2.6 liters (2.7 US qts, 2.3 Imp. qts)

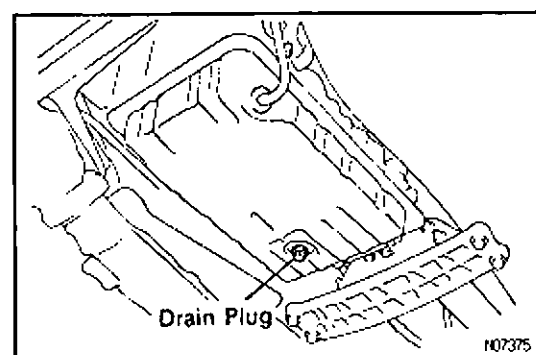
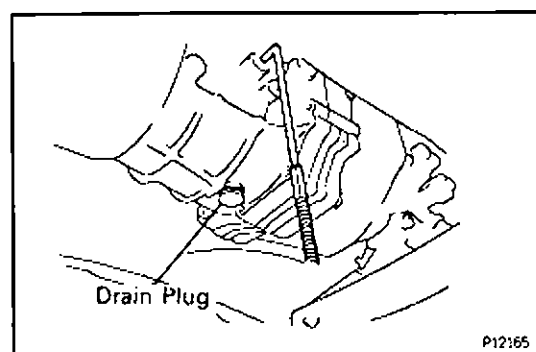
2JZ-GTE

Oil:

Castle gear oil V160

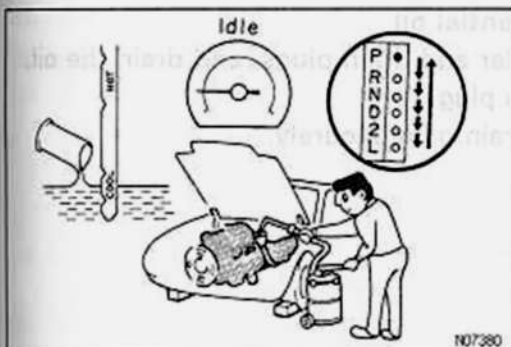
Capacity:

1.8 liters (1.9 US qts, 1.6 Imp. qts)



B. Replace automatic transmission fluid

- (a) Remove the drain plug, and drain the fluid.
- (b) Clean the drain plug.
- (c) Reinstall the drain plug securely.



- (d) With the engine "OFF", add new fluid through the dipstick tube.

Transmission fluid:

2JZ—GE

Fluid type

ATF DEXRON® II or equivalent

Drain and refill capacity:

1.6 liters (1.7 US qts, 1.4 Imp.qts)

2JZ—GTE

Fluid type

ATF Type T— II or equivalent

Drain and

refill capacity:

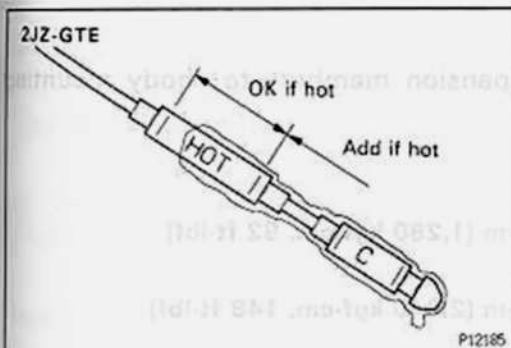
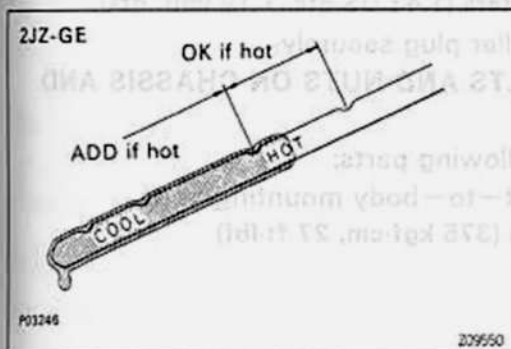
1.9 liters (2.0 US qts, 1.7 Imp. qts)

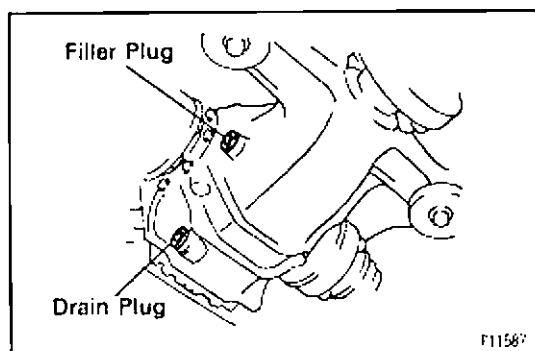
- (e) Start the engine and shift the selector into all positions from "P" through "L", and then shift into "P" position.

- (f) With the engine idling, check the fluid level. Add fluid up the "COOL" range on the dipstick.

- (g) Check that the fluid level is in the "HOT" range at the normal operating temperature (70 — 80 °C (158 — 176 °F)) and add as necessary.

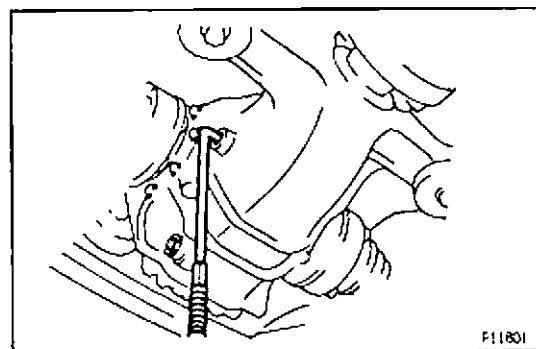
NOTICE: Do not overfill.





C. Replace differential oil

- Remove the filler and drain plugs, and drain the oil.
- Clean the drain plug.
- Reinstall the drain plug securely.



- Add new oil until it begins to run out of the filler hole.

Differential oil:

Oil grade

API GL-5

Viscosity

Above -18°C (0°F) SAE 90

Below -18°C (0°F) SAE 80W-90 or 80W

Capacity:

1.35 liters (1.43 US qts, 1.19 Imp. qts)

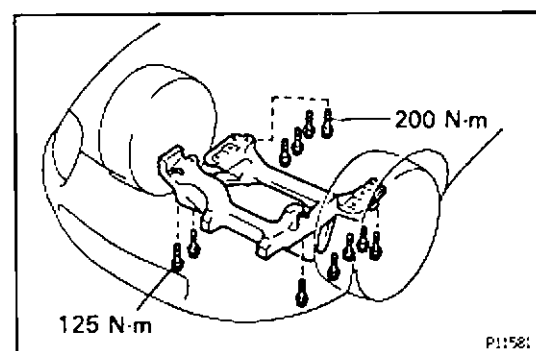
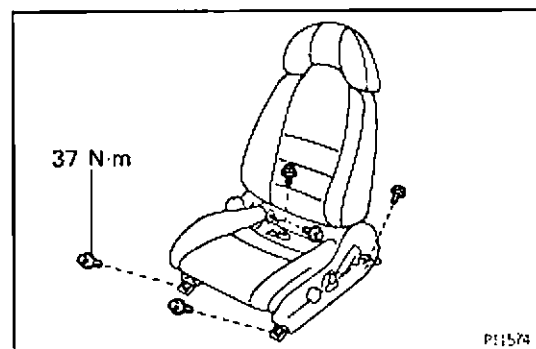
- Reinstall the filler plug securely.

22. TIGHTEN BOLTS AND NUTS ON CHASSIS AND BODY

Tighten the following parts:

- Front seat-to-body mounting bolts

Torque: 37 N·m (375 kgf·cm, 27 ft·lbf)



- Front suspension member-to-body mounting bolts

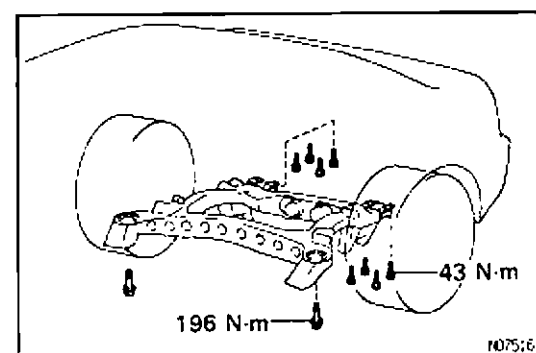
Torque:

Front side

125 N·m (1,280 kgf·cm, 92 ft·lbf)

Front side

200 N·m (2,040 kgf·cm, 148 ft·lbf)



- Rear suspension member-to-body mounting bolts

Torque: 175 N·m (1,790 kgf·cm, 129 ft·lbf)

- Rear suspension member rear cushion-to-body mounting bolts

Torque: 58 N·m (590 kgf·cm, 43 ft·lbf)

23. BODY INSPECTION

- (a) Check the body exterior for dents, scratches and rust.
- (b) Check the underbody for rust and damage.
If necessary, replace or repair.

24. ROAD TEST

- (a) Check the engine and chassis for abnormal noises.
- (b) Check that the vehicle does not wander or pull to one side.
- (c) Check that the brakes work properly and do not drag.
- (d) Perform setting of the parking brake shoes and drum.

25. FINAL INSPECTION

- (a) Check the operation of the body parts:
 - Hood
Auxiliary catch operates properly
Hood locks securely when closed
 - Front and rear doors
Door locks operate properly
Doors close properly
 - Luggage compartment door
Door lock operates properly
 - Seats
Seat adjusts easily and locks securely in any position
Front seat back locks securely in any position
Folding—down rear seat backs lock securely
- (b) Be sure to deliver a clean car. Especially check:
 - Steering wheel
 - Shift lever knob
 - All switch knobs
 - Seats

GENERAL MAINTENANCE

MAJOR -03

There are some maintenance and inspection items which are considered to be the owner's responsibility. They can be performed by the owner or he can have them done at a service shop. These items include those which should be checked on a daily basis, those which, in most cases, do not require (special) tools and those which are considered to be reasonable for the owner to perform. Items and procedures for general maintenance are as follows:

MAJOR -06

OUTSIDE VEHICLE

1. TIRES

- (a) Check the pressure with a gauge. Adjust if necessary.
- (b) Check for cuts, damage, uneven or excessive wear.

2. WHEEL NUTS

When checking the tires, check the nuts for looseness or for missing nuts. If necessary, tighten them.

3. WINDSHIELD WIPER BLADES

Check for wear or cracks whenever they do not wipe clean. Replace if necessary.

4. FLUID LEAKS

- (a) Check underneath for leaking fuel, oil, water or other fluid.
- (b) If you smell gasoline fumes or notice any leak, have the cause found and corrected.

5. DOORS AND ENGINE HOOD

- (a) Check that all doors including the trunk lid operate smoothly, and that all latches lock securely.
- (b) Check that the engine hood secondary latch secures the hood from opening when the primary latch is released.

MAJOR -06

INSIDE VEHICLE

6. LIGHTS

- (a) Check that the headlights, stop lights, taillights, turn signal lights, and other lights are all working.
- (b) Check the headlight aiming.

7. WARNING LIGHT AND BUZZERS

Check that all warning lights and buzzers function properly.

8. HORN

Check that it is working.

9. WINDSHIELD GLASS

Check glass for scratches, pits or abrasions.

10. WINDSHIELD WIPER AND WASHER

- (a) Check operation of the wipers and washer.
- (b) Check that the wipers do not streak.

11. WINDSHIELD DEFROSTER

Check that the air comes out from the defroster outlet when operating the heater air conditioner at defroster mode.

12. REAR VIEW MIRROR

Check that it is mounted securely.

13. SUN VISORS

Check that they move freely and are mounted securely.

14. STEERING WHEEL

Check that it has the specified freeplay. Be alert for changes in steering condition, such as excessive steering effort, excessive freeplay or strange noise.

15. SEATS

- (a) Check that all front seat controls such as seat adjusters, seatback recliner, etc. operate smoothly.
- (b) Check that all latches lock securely in any position.
- (c) Check that the locks hold securely in any latched position.
- (d) Check that the head restraints move up and down smoothly and that the locks hold securely in any latched position.
- (e) For folding-down rear seat backs, check that the latches lock securely.

16. SEAT BELTS

- (a) Check that the seat belt system such as buckles, retractors and anchors operate properly and smoothly.
- (b) Check that the belt webbing is not cut, frayed, worn or damaged.

17. ACCELERATOR PEDAL

Check the pedal for smooth operation and uneven pedal effort or catching.

18. CLUTCH PEDAL

- (a) Check the pedal for smooth operation.
- (b) Check that the pedal has the proper free-play

19. BRAKE PEDAL

- (a) Check that pedal for smooth operation.
- (b) Check that the pedal has the proper reserve distance and freeplay.
- (c) Check the brake booster function.

20. BRAKES

At a safe place, check that the brakes do not pull to one side when applied.

21. PARKING BRAKE

- (a) Check that the pedal has the proper travel.
- (b) On a safe incline, check that the vehicle is held securely with only the parking brake applied.

22. AUTOMATIC TRANSMISSION PARK MECHANISM

- (a) Check the lock release button of the selector lever for proper and smooth operation.
- (b) On a safe incline, check that the vehicle is held securely with the selector lever in the "P" position and all brakes released.

MAINT-02

UNDER HOOD

23. WINDSHIELD WASHER FLUID

Check that there is sufficient fluid in the tank.

24. ENGINE COOLANT LEVEL

Check that the coolant level is between the LEVEL lines on the see-through reservoir at normal temperature (20°C (68°F)).

25. RADIATOR AND HOSES

- (a) Check that the front of the radiator is clean and not blocked with leaves, dirt or bugs.
- (b) Check the hoses for cracks, kinks, rot or loose connections.

26. BATTERY ELECTROLYTE LEVEL

Check the indicator.

When the indicator color is blue, the condition is satisfactory. A red color indicates that distilled water must be added, and white indicates that charging is necessary.

27. BRAKE FLUID LEVEL

Check that the brake fluid level is near the upper level line on the see-through reservoir.

28. ENGINE DRIVE BELT

Check drive belt for fraying, cracks, wear or oil contamination.

29. ENGINE OIL LEVEL

Check that level on the dipstick with the engine turned off.

30. POWER STEERING FLUID LEVEL

Check the level on the dipstick.

The level should be in the "HOT" or "COLD" range depending on the fluid temperature.

31. AUTOMATIC TRANSMISSION FLUID LEVEL

- (a) Park the vehicle on a level surface.
- (b) With the engine idling and the parking and foot brake applied, shift the selector into all positions from "P" to "L", and then shift into "P" position.
- (c) Turn and pull out the dipstick and wipe off the fluid with a clean rag.

Re-insert the dipstick fully and check that the fluid level is in the "HOT" range.

- (d) Perform this check with the fluid at normal driving temperature (70 — 80°C (158 — 176°F)).

If the level is at the low side, add fluid.

NOTICE: Do not overfill.

HINT: Wait about 30 minutes before checking the fluid level after extended driving at high speeds in hot weather, driving in heavy traffic or with a trailer.

32. EXHAUST SYSTEM

Visually inspect for cracks, holes or loose supports.

If any change in the sound of the exhaust or smell of the exhaust fumes is noticed, have the cause located and corrected.

SERVICE SPECIFICATIONS

SERVICE DATA

MAM-6A

Engine	Spark plug		
	Recommended spark plug	ND for 2JZ-GE for 2JZ-GTE NGK for 2JZ-GE for 2JZ-GTE	PK16R11 PK20R11 BKR5EP11 BKR6EP11
	Correct electrode gap		1.1 mm (0.043 in.)
	Firing order		1 - 5 - 3 - 6 - 2 - 4
	Valve clearance	Intake Exhaust	0.15 - 0.25 mm (0.006 - 0.010 in.) 0.25 - 0.35 mm (0.010 - 0.014 in.)
Brake	Front and rear brakes		
	Pad thickness	Limit	1.0 mm (0.039 in.)
	Disc thickness	Limit (Front for 2JZ-GE) (Front for 2JZ-GTE) (Rear)	30.0 mm (1.181 in.) 28.0 mm (1.102 in.) 15.0 mm (0.591 in.)
	Disc runout	Limit	0.05 mm (0.0020 in.)
	Parking brake		
	Lining thickness	Limit	1.0 mm (0.039 in.)
	Drum inside diameter	Limit	181 mm (7.120 in.)
Chassis	Steering linkage		
	Steering wheel freeplay	Limit	30 mm (1.18 in.)
	Ball joint		
	Vertical play	Limit	0.3 mm (0.012 in.)

MAM-6B

TORQUE SPECIFICATIONS

Part tightened		N-m	kgf-cm	ft-lbf
Spark plug x Cylinder head		18	180	13
Front seat x Body		37	375	27
Front suspension member x Body	Front side	125	1,280	92
	Rear side	200	2,040	148
Rear suspension member x Body		175	1,790	129
Rear suspension member rear cushion x Body		58	590	43

IDLE SPEED INSPECTION

1. INITIAL CONDITIONS

- (a) Engine at normal operating temperature
- (b) Air cleaner installed
- (c) All pipes and hoses of air induction system connected
- (d) All accessories switched OFF
- (e) All vacuum lines properly connected
HINT: All vacuum hoses for EGR system, etc. should be properly connected.
- (f) SFI system wiring connectors fully plugged
- (g) Ignition timing set correctly
- (h) Transmission in neutral position

2. CONNECT TACHOMETER

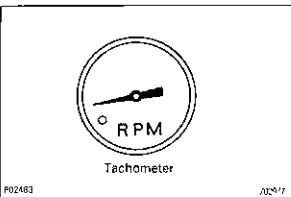
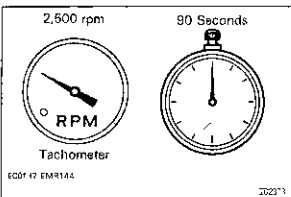
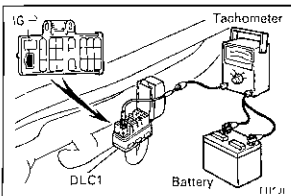
Connect the tester probe of a tachometer to terminal IG $\ominus$ of the DLC1.

NOTICE:

- Never allow the tachometer terminal to touch ground as it could result in damage to the igniter and/or ignition coil.
- As some tachometers are not compatible with this ignition system, we recommend that you confirm the compatibility of your unit before use.

3. INSPECT IDLE SPEED

- (a) Race the engine speed at 2,500 rpm for approx. 90 seconds.



- (b) Check the idle speed.

Idle speed:

2JZ-GE

700 ± 50 rpm

2JZ-GTE

650 ± 50 rpm

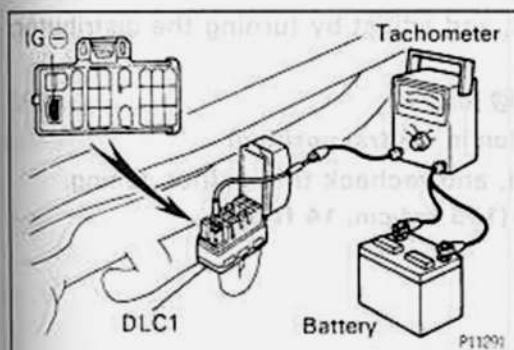
If the idle speed is not as specified, check the IAC valve.

4. DISCONNECT TACHOMETER

IGNITION TIMING INSPECTION AND ADJUSTMENT (2JZ-GE)

1. WARM UP ENGINE

Allow the engine to warm up to normal operating temperature.



2. CONNECT TACHOMETER AND TIMING LIGHT TO ENGINE

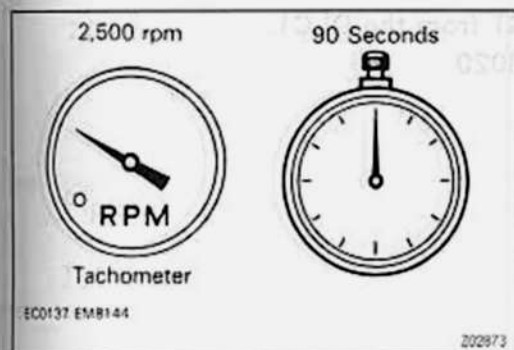
Connect the tester probe of a tachometer to terminal IG of the DLC1.

NOTICE:

- Never allow the tachometer terminal to touch ground as it could result in damage to the igniter and/or ignition coil.
- As some tachometers are not compatible with this ignition system, we recommend that you confirm the compatibility of your unit before use.

3. CHECK IDLE SPEED

- (a) Race the engine speed at 2,500 rpm for approx. 90 seconds.



- (b) Check the idle speed.

Idle speed:

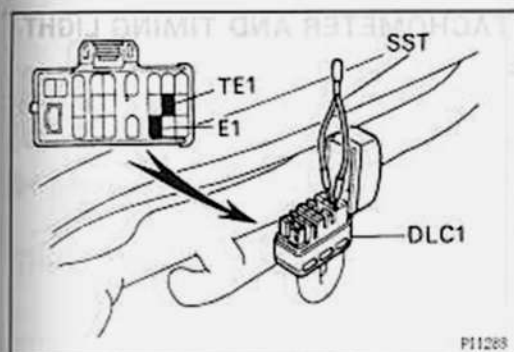
700 ± 50 rpm

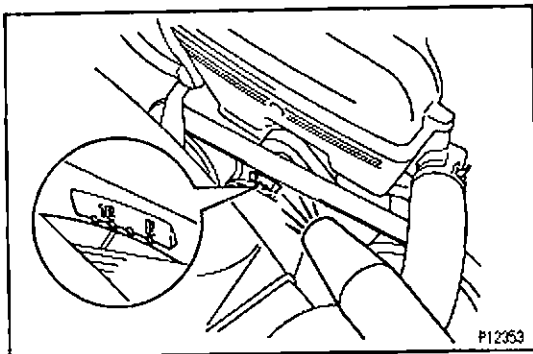


4. ADJUST IGNITION TIMING

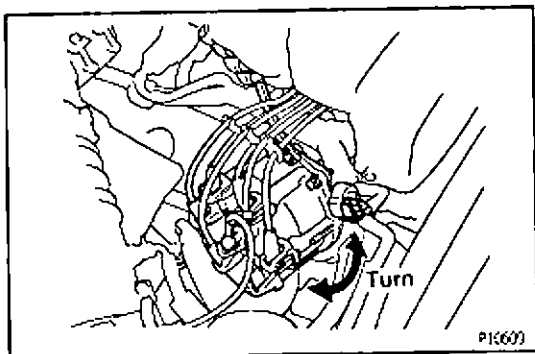
- (a) Using SST, connect terminals TE1 and E1 of the DLC 1.

SST 09843-18020

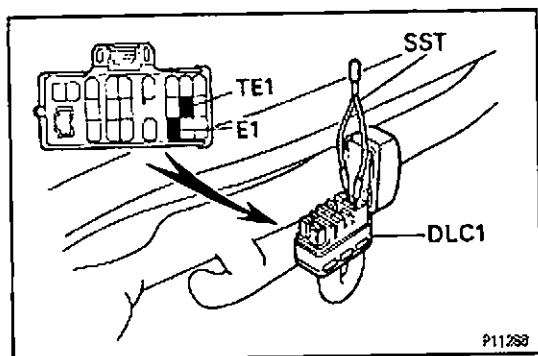




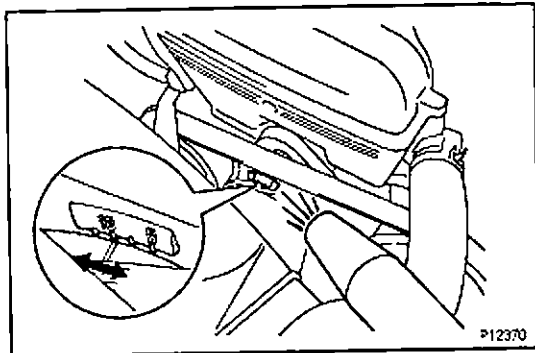
- (b) Using a timing light, check the ignition timing.
 Ignition timing:
 $10 \pm 2^\circ$ BTDC @ idle
 (Transmission in neutral position)



- (c) Loosen the nut, and adjust by turning the distributor.
 Ignition timing:
 10° BTDC @ idle
 (Transmission in neutral position)
- (d) Tighten the nut, and recheck the ignition timing.
 Torque: 19 N·m (195 kgf·cm, 14 ft·lbf)



- (e) Remove the SST from the DLC1.
 SST 09843-18020



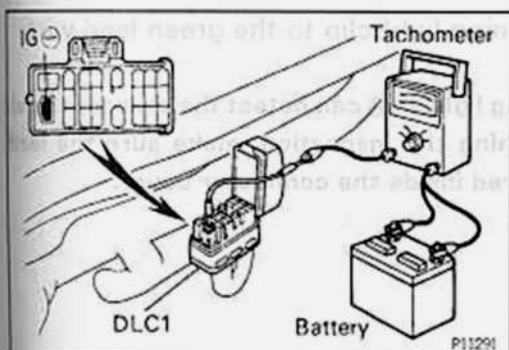
5. FURTHER CHECK IGNITION TIMING

- Ignition timing:
 $7 - 19^\circ$ BTDC @ idle
 (Transmission in neutral position)
- HINT: The timing mark moves in a range between 7° and 19° .

6. DISCONNECT TACHOMETER AND TIMING LIGHT FROM ENGINE

IGNITION TIMING INSPECTION (2JZ — GTE)**1. WARM UP ENGINE**

Allow the engine to warm up to normal operating temperature.

**2. CONNECT TACHOMETER AND TIMING LIGHT TO ENGINE**

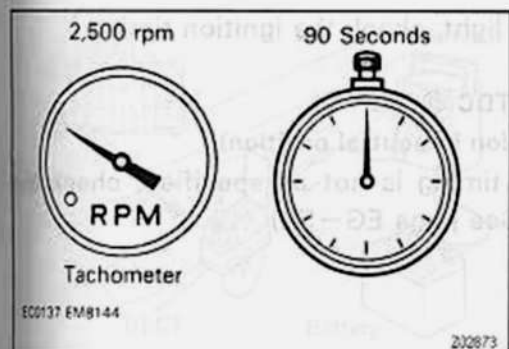
Connect the tester probe of a tachometer to terminal IG- of the DLC1.

NOTICE:

- Never allow the tachometer terminal to touch ground as it could result in damage to the igniter and/or ignition coil.
- As some tachometers are not compatible with this ignition system, we recommend that you confirm the compatibility of your unit before use.

3. CHECK IDLE SPEED

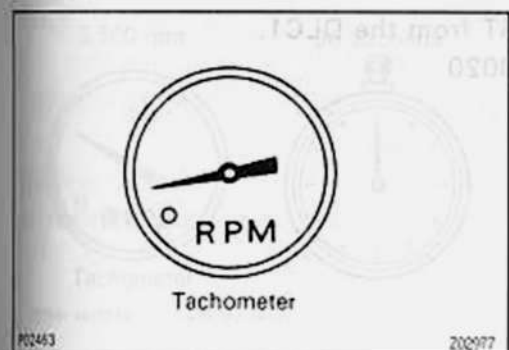
- (a) Race the engine speed at 2,500 rpm for approx. 90 seconds.



- (b) Check the idle speed.

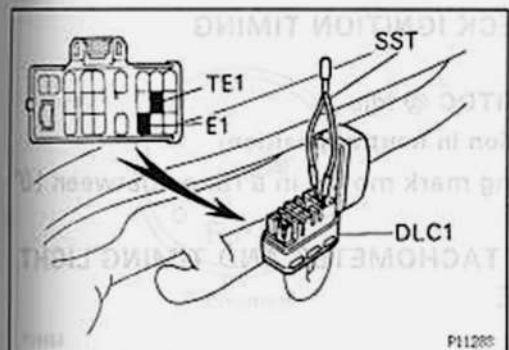
Idle speed:

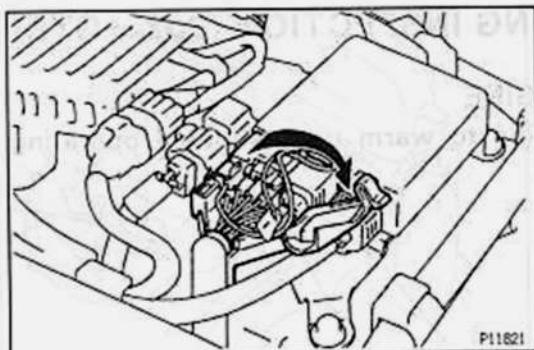
650 ± 50 rpm

**4. CHECK IGNITION TIMING**

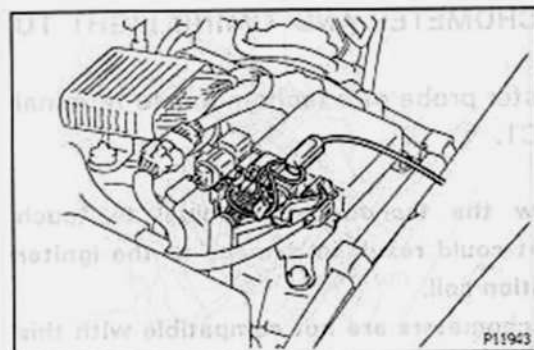
- (a) Using SST, connect terminals TE1 and E1 of the DLC1.

SST 09843 — 18020

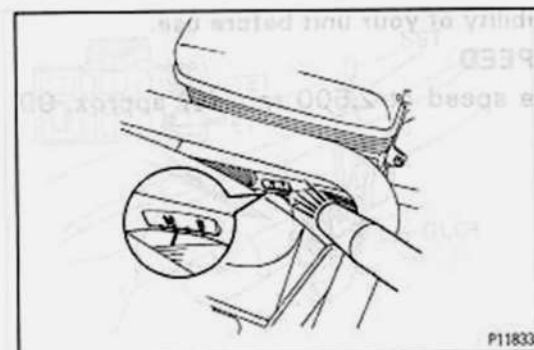




- (b) Open the igniter connector cover and remove the green lead wire.



- (c) Connect the timing light clip to the green lead wire.
NOTICE:
- Use a timing light that can detect the primary signal.
 - After finishing the inspection, make sure the lead wire is stored inside the connector cover.



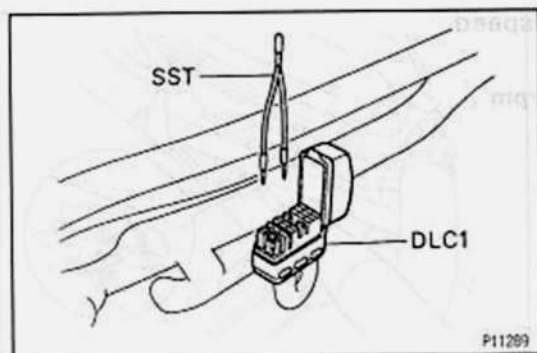
- (d) Using a timing light, check the ignition timing.
 Ignition timing:

$10 \pm 2^\circ$ BTDC @ idle

(Transmission in neutral position)

If the ignition timing is not as specified, check the valve timing. (See page EG-52)

- (e) Remove the SST from the DLC1.
 SST 09843-18020



5. FURTHER CHECK IGNITION TIMING

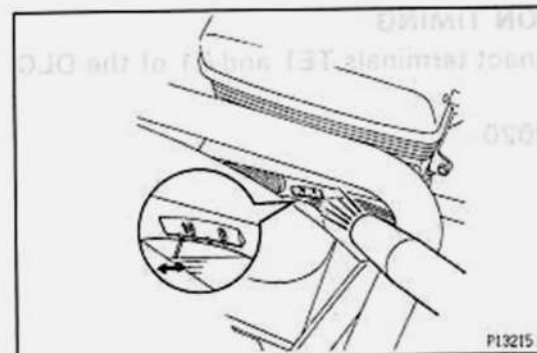
Ignition timing:

$10 - 20^\circ$ BTDC @ idle

(Transmission in neutral position)

HINT: The timing mark moves in a range between 10° and 20° .

6. DISCONNECT TACHOMETER AND TIMING LIGHT FROM ENGINE



MAINTENANCE SCHEDULE

SCHEDULE A

MA552-06

CONDITIONS:

- Towing a trailer, using a camper or car top carrier.
- Repeated short trips of less than 8 km (5 miles) with outside temperature remaining below freezing.
- Extensive idling and/or low speed driving for long distances, such as police, taxi or door-to-door delivery use.
- Operating on dusty, rough, muddy or salt spread roads.

Maintenance operation: A = Check and adjust if necessary.

R = Replace, change or lubricate.

I = Inspect and correct or replace if necessary.

System	Service interval (Use odometer reading or months, whichever comes first)	Maintenance services beyond 96,000 km (60,000 miles) should continue to be performed at the same intervals shown for each maintenance schedule.																	Months	See page (item No.)	
		x 1,000 km	1.6	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90			96
		x 1,000 miles	1	3.75	7.5	11.25	15	18.75	22.5	26.25	30	33.75	37.5	41.25	45	48.75	52.5	56.25			60
ENGINE	Timing belt (1)																		R	-	MA-7 (item 1)
	Valve clearance																		A	A: Every 72 months	MA-12 (item 12)
	Drive belt	I: First period 96,000 km (60,000 miles) or 72 months. I: After that every 12,000 km (7,500 miles) or 12 months.																		MA-7 (item 2)	
	Engine oil	2JZ-GE engine	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R: Every 6 months	MA-10 (item 6)
		2JZ-GTE engine	R: Every 2,500 miles (4,000 km) or 3 months																		
	Engine oil filter	2JZ-GE engine	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R: Every 6 months	MA-10 (item 6)
		2JZ-GTE engine	R: Every 5,000 miles (8,000 km) or 6 months																		
Engine coolant	R: First period 72,000 km (45,000 miles) or 36 months R: After that every 48,000 km (30,000 miles) or 24 months.																		MA-10 (item 7)		
	Exhaust pipes and mountings					I				I				I				I	I: Every 24 months	MA-12 (item 11)	
FUEL	Air filter (2)*			I	I	I	I	I	I	I	R	I	I	I	I	I	I	I	R	I: Every 6 months R: Every 36 months	MA-8 (item 3, 4)
	Fuel lines and connections (3)										I								I	I: Every 36 months	MA-12 (item 10)
	Fuel tank cap gasket																		R	R: Every 72 months	MA-12 (item 9)
IGNITION	Spark plugs (Platinum tipped type)																		R	R: Every 72 months	MA-9 (item 5)
EVAP	Charcoal canister	New York and California only																	I	I: Every 72 months	MA-11 (item 8)
BRAKES	Brake linings and drums (4)				I		I		I		I		I		I		I		I	I: Every 12 months	MA-14 (item 15)
	Brake pads and discs (Front and rear)				I		I		I		I		I		I		I		I	I: Every 12 months	MA-14 (item 14)
	Brake line pipes and hoses						I				I				I				I	I: Every 24 months	MA-13 (item 13)
CHASSIS	Steering linkage				I		I		I		I		I		I		I		I	I: Every 12 months	MA-15 (item 16)
	SRS airbag	I: First period 10 years. I: After that every 2 years.																		MA-16 (item 17)	
	Ball joints and dust covers				I		I		I		I		I		I		I		I	I: Every 12 months	MA-17 (item 19)
	Automatic transmission, manual transmission and differential oil						R				R				R				R	R: Every 24 months	MA-17, 18 (item 20, 21)
	Steering gear housing oil (5)						I				I				I				I	I: Every 24 months	MA-16 (item 18)
	Bolts and nuts on chassis and body (6)				I		I		I		I		I		I		I		I	I: Every 12 months	MA-20 (item 22)

MAINTENANCE — MAINTENANCE SCHEDULE

MA-3

★ mark indicates maintenance which is part of the warranty conditions for the Emission Control Systems. The warranty period is in accordance with the owner's guide or the warranty booklet. (★: California and New York specification vehicles)

- (1) Applicable to vehicles operated under conditions of extensive idling and/or low speed driving for long distances such as police, taxi or door-to-door delivery use.
- (2) Applicable when operating mainly on dusty roads.
- (3) Includes inspection of fuel tank band and vapor vent system.
- (4) Also applicable to drum lining for parking brake. For other usage conditions, refer to SCHEDULE B.
- (5) Check for oil leaks from steering gear housing.
- (6) Applicable only when operating mainly on rough, muddy roads. The applicable parts are listed below. For other usage conditions, refer to SCHEDULE B.
 - Front and rear suspension member to cross body.
 - Bolts for sheat installation.

SCHEDULE B

CONDITIONS

Conditions others than those listed for SCHEDULE A

Maintenance operation A = Check and adjust if necessary
 R = Replace, change or lubricate
 I = Inspect and correct or replace if necessary

System	Service interval (Use odometer reading or month, whichever comes first)	Maintenance services beyond 95,000 km (60,000 miles) should continue to be performed at the same intervals shown for each maintenance schedule										See page (item No.)			
		Maintenance items													
		x 1,000 km	5	10	15	20	25	30	35	40	45				
ENGINE	Valve clearance											A, A, Every 72 months	MA 12 (item 12)		
	Oil level												MA 7 (item 2)		
	Engine oil	2.2L GE engine	R	R	R	R	R	R	R	R	R	R	Every 12 months	MA 10 (item 5)	
		2.2L GTE engine	R	Every 5,000 miles (8,000 km) or 6 months										MA 10 (item 5)	
	Engine oil filter	2.2L GE engine	R	R	R	R	R	R	R	R	R	R	Every 12 months	MA 10 (item 5)	
		2.2L GTE engine	R	Every 6,000 miles (10,000 km) or 12 months										MA 10 (item 3)	
	Engine cooling fan		R	First period 72,000 km (45,000 miles) or 36 months R After that every 48,000 km (30,000 miles) or 24 months										MA 10 (item 7)	
	Exhaust pipes and mountings												I	Every 36 months	MA 2 (item 11)
	Air filter								R	R	R	R	R	Every 36 months	MA 8 (item 4)
	FUEL	Fuel lines and connections (1)							I	I	I	I	I	Every 36 months	MA 12 (item 9)
Fuel tank cap gasket													R	Every 72 months	MA 12 (item 5)
Spark plugs (For multi-point type)													R	Every 72 months	MA 9 (item 5)
IGNITION	Charcoal canister													Every 72 months	MA 1 (item 8)
EVAP	Brake linings and drums (2)												I	Every 24 months	MA 4 (item 15)
	Brake pads and discs (For front and rear)												I	Every 24 months	MA 4 (item 4)
	Brake line pipes and hoses												I	Every 24 months	MA 13 (item 3)
CHASSIS	See alignments												I	Every 24 months	MA 15 (item 16)
	SRS bag													First period 10 years I After that every 2 years	MA 16 (item 17)
	Ball joints and dust covers												I	Every 24 months	MA 7 (item 9)
	Automatic transmission oil maintenance or oil level check (3)												I	Every 24 months	MA 17 (item 20)
	Differential (LSD)												R	Every 48 months	MA 17 (item 20)
	Steering gear housing oil (4)												I	Every 24 months	MA 15 (item 8)
	Bolts and nuts on chassis and body (5)												I	Every 24 months	MA 20 (item 22)

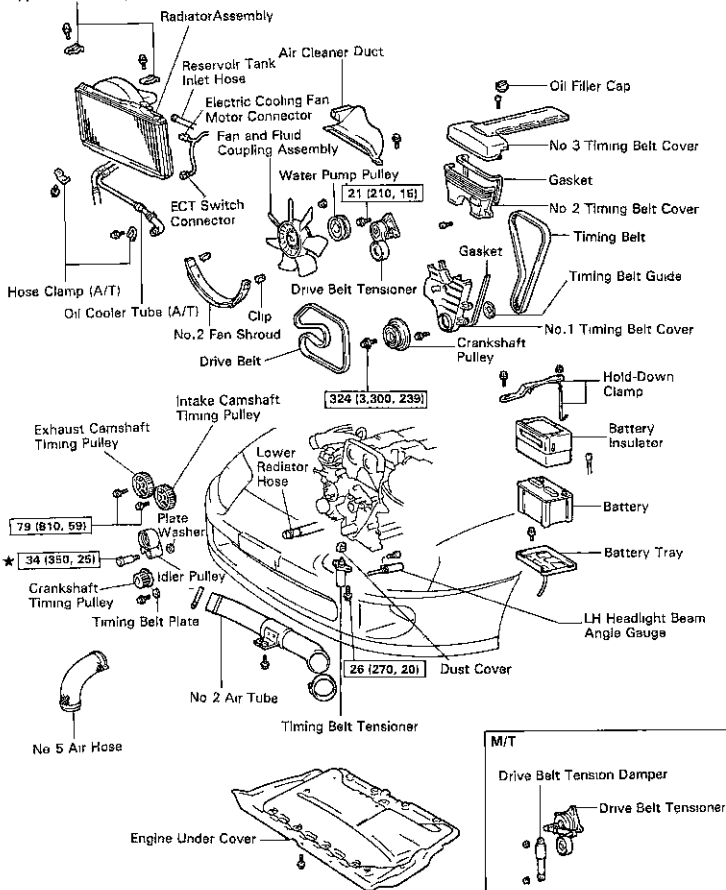
★ mark indicates maintenance which is part of the warranty conditions for the Emss on Control Systems. The warranty period is in accordance with the owner's guide or the warranty booklet.
 (★ California and New York specification vehicles)

- (1) Includes inspection of fuel tank band and vapor vent system
- (2) Also applicable to drum lining for parking brake
- (3) Check for leakage
- (4) Check for oil leaks from steering gear housing
- (5) The applicable parts are listed below

- Front and rear suspension member to cross body
- Bolts for sheet installation

2JZ-GTE

Upper Radiator Support



M/T

Drive Belt Tension Damper

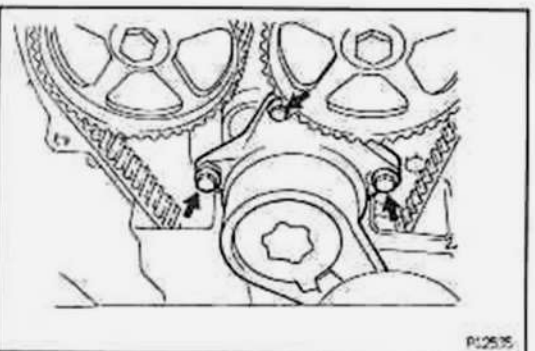
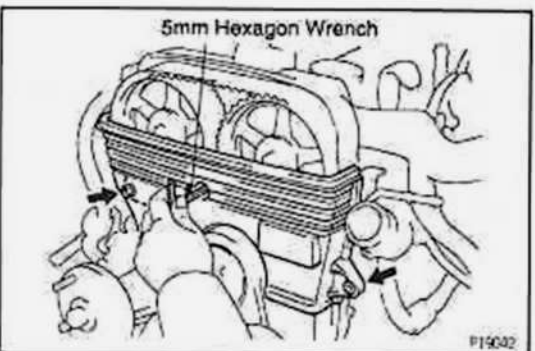
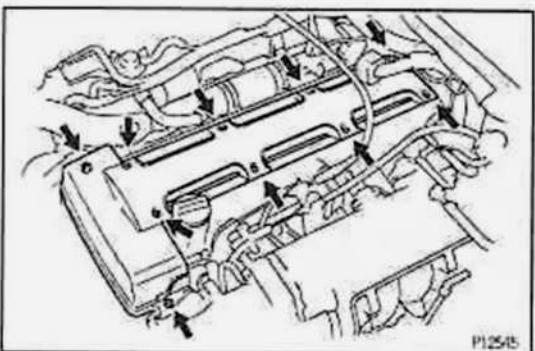
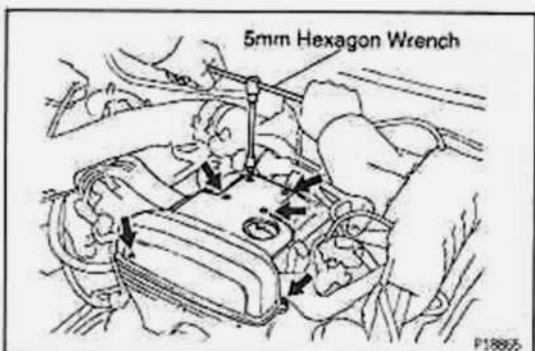
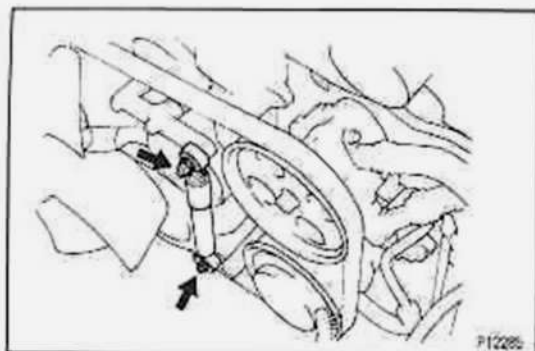
Drive Belt Tensioner

N·m (kgf·cm, ft·lbf)

Specified torque

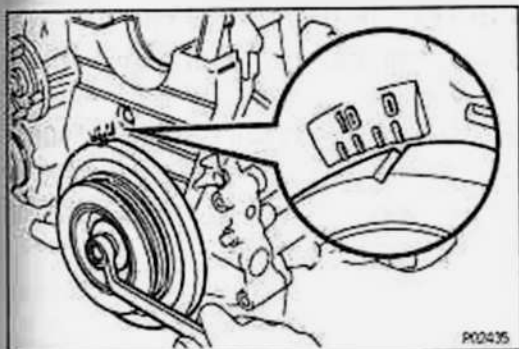
◆ Non-reusable part

★ Precoated part



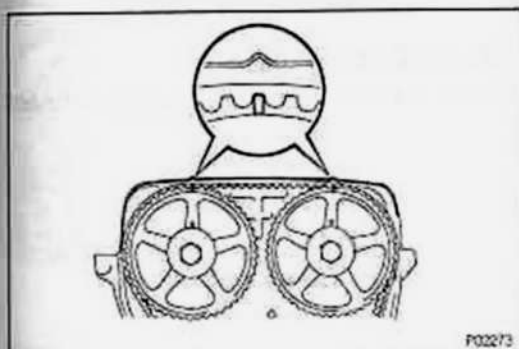
TIMING BELT REMOVAL

1. REMOVE RADIATOR ASSEMBLY
(See radiator removal in Cooling System)
2. 2JZ-GTE M/T:
REMOVE DRIVE BELT TENSIONER DAMPER
Remove the 2 nuts and tensioner damper.
3. REMOVE DRIVE BELT, FAN, FLUID COUPLING ASSEMBLY AND WATER PUMP PULLEY
(See step 6 in water pump removal in Cooling System)
4. REMOVE NO.3 TIMING BELT COVER
 - (a) Remove the oil filler cap.
 - (b) 2JZ-GE:
Using a 5 mm hexagon wrench, remove the 6 bolts and belt cover.
 - (c) 2JZ-GTE:
Using a 5 mm hexagon wrench, remove the 10 bolts and belt cover.
5. REMOVE NO.2 TIMING BELT COVER
Using a 5 mm hexagon wrench, remove the 3 bolts, belt cover and gasket.
If you are unable to loosen the bolt on the right because the PS pump pulley interferes with the hexagon wrench, first remove the pulley.
6. REMOVE DRIVE BELT TENSIONER
Remove the 3 bolts and tensioner.

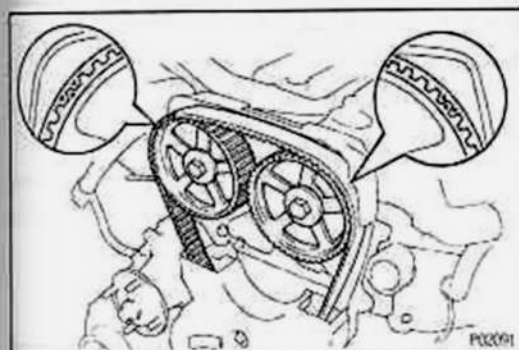


7. SET NO.1 CYLINDER TO TDC/COMPRESSION

- (a) Turn the crankshaft pulley, and align its groove with timing mark "0" of the No.1 timing belt cover.
NOTICE: Always turn the crankshaft clockwise.

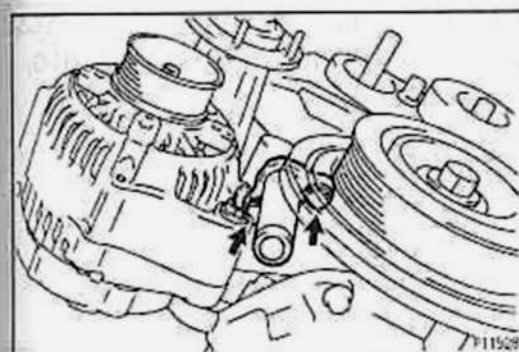


- (b) Check that the timing marks of the camshaft timing pulleys are aligned with the timing marks of the No.4 timing belt cover.
 If not, turn the crankshaft 1 revolution (360°).

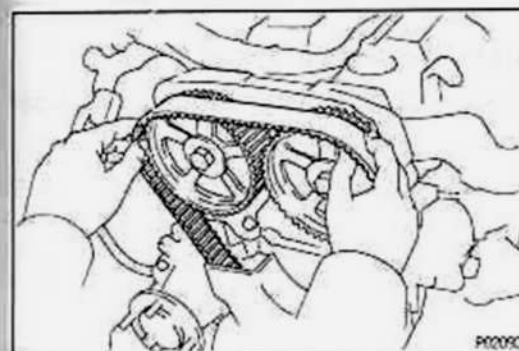


8. REMOVE TIMING BELT FROM CAMSHAFT TIMING PULLEYS

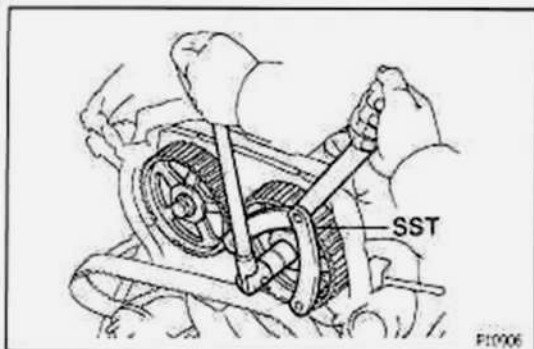
HINT (Re—using timing belt): Place matchmarks on the timing belt and camshaft timing pulleys as shown in the illustration.



- (a) Alternately loosen the 2 bolts, and remove them, the tensioner and dust boot.

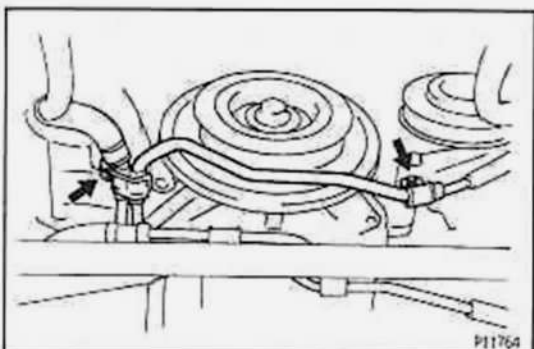


- (b) Disconnect the timing belt from the camshaft timing pulleys.

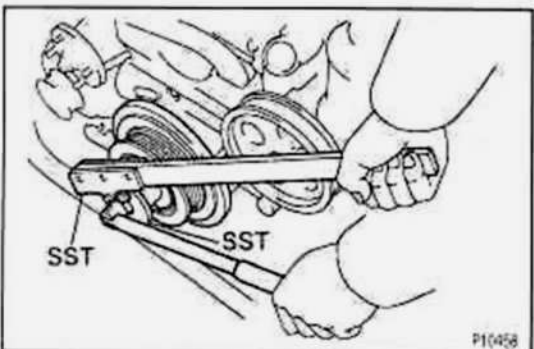
**9. REMOVE CAMSHAFT TIMING PULLEYS**

Using SST, remove the pulley bolt. Remove the 2 timing pulleys.

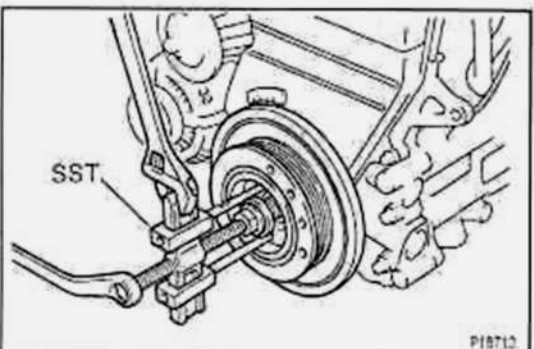
SST 09960-10010 (09962-01000, 09963-01000)

**10. A/T:****DISCONNECT OIL COOLER TUBES**

Remove the 2 bolts and hose clamps, and disconnect oil cooler tubes.

**11. REMOVE CRANKSHAFT PULLEY**

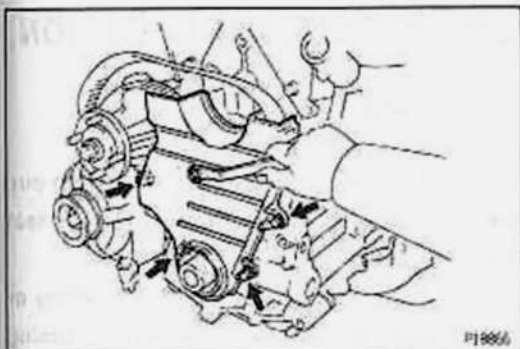
- (a) Using SST, loosen the pulley bolt.
SST 09213-70010, 09330-00021
- (b) Remove the pulley bolt.



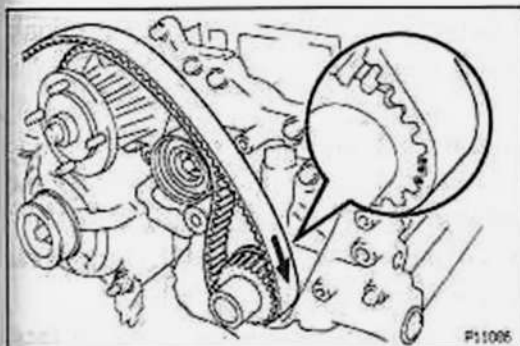
- (c) Using SST, remove the pulley.
SST 09950-50010 (09954-05030, 09551-05010, 09552-05010, 09553-05020)

**12. 2JZ-GE:****REMOVE PS PUMP FRONT BRACKET**

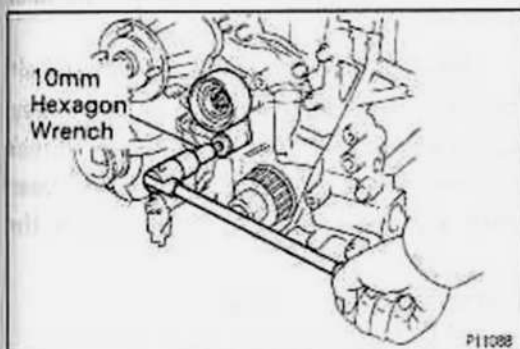
Remove the 3 bolts, plate washer and pump front bracket.

**13. REMOVE NO.1 TIMING BELT COVER**

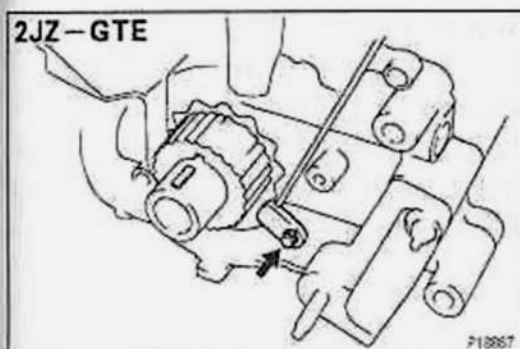
Remove the 5 bolts, timing belt cover and gasket.

14. REMOVE TIMING BELT GUIDE**15. REMOVE TIMING BELT**

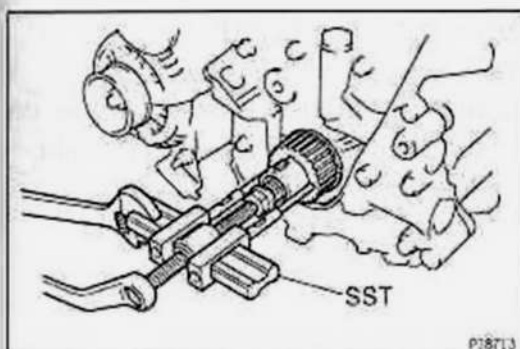
HINT (When re-using timing belt): Draw an arrow on the timing belt in the direction of engine revolution, and place matchmarks on the timing belt and crankshaft timing pulley.

**16. REMOVE IDLER PULLEY**

Using a 10 mm hexagon wrench, remove the pivot bolt, plate washer and idler pulley.

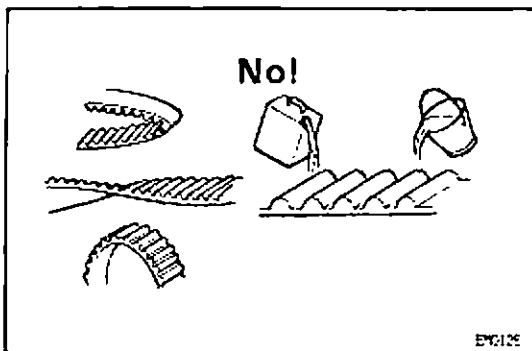
**17. REMOVE CRANKSHAFT TIMING PULLEY****(a) 2JZ-GTE:**

Remove the bolt and timing belt plate.

**(b) Remove the crankshaft timing pulley.**

If the pulley cannot be removed by hand, use SST to remove the crankshaft timing pulley.

SST 09950-50010 (09951-05010, 09952-05010, 09953-05020, 09954-00010)



TIMING BELT COMPONENTS INSPECTION

1. INSPECTION TIMING BELT

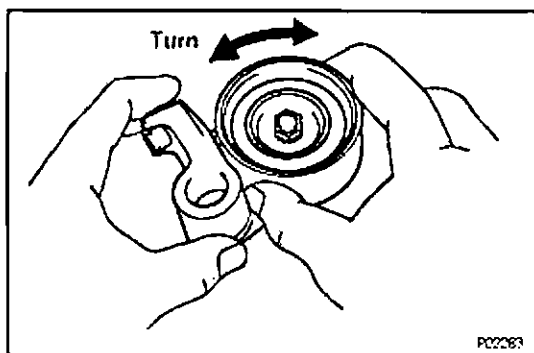
NOTICE:

- Do not bend, twist or turn the timing belt inside out.
- Do not allow the timing belt to come into contact with oil, water or steam.
- Do not utilize timing belt tension when installing or removing the mount bolt of the camshaft timing pulley.

If there are any defects, as shown in the illustrations, check the following points.

- (a) Premature parting
 - Check for proper installation.
 - Check the timing cover gasket for damage and proper installation.
- (b) If the belt teeth are cracked or damaged, check to see if either camshaft is locked.
- (c) If there is noticeable wear or cracks on the belt face, check to see if there are nicks on the side of the idler pulley lock.
- (d) If there is wear or damage on only one side of the belt, check the belt guide and the alignment of each pulley.
- (e) If there is noticeable wear on the belt teeth, check timing cover for damage and check gasket has been installed correctly and for foreign material on the pulley teeth.

If necessary, replace the timing belt.

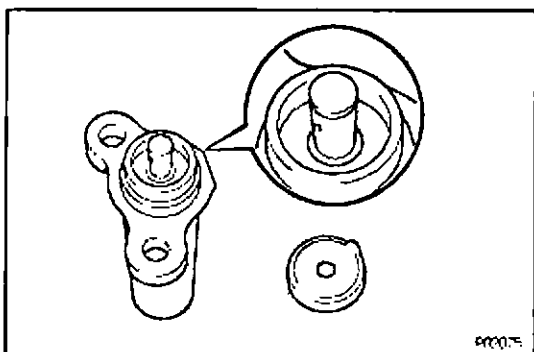


2. INSPECT IDLER PULLEY

Check the turning smoothness of the idler pulley.
If necessary, replace the idler pulley.

3. INSPECT DRIVE BELT TENSIONER

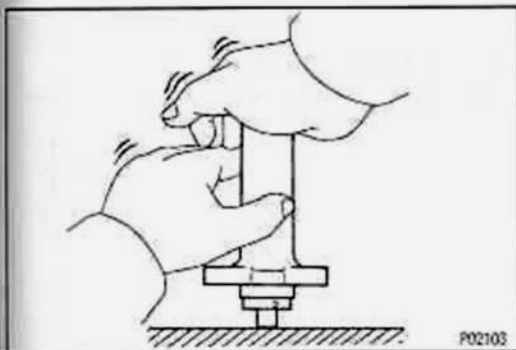
Check the turning smoothness of the tensioner.
If necessary, replace the tensioner.



4. INSPECT TIMING BELT TENSIONER

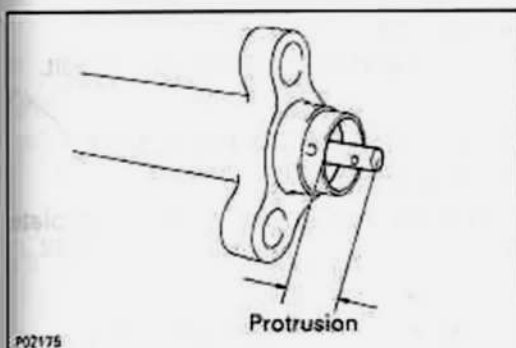
- (a) Visually check tensioner for oil leakage.

HINT: If there is only the faintest trace of oil on the seal on the push rod side, the tensioner is all right.
If leakage is found, replace tensioner.



- (b) Hold the tensioner with both hands and push the push rod strongly against the floor or wall to check that it doesn't move.

If the push rod moves, replace the tensioner.

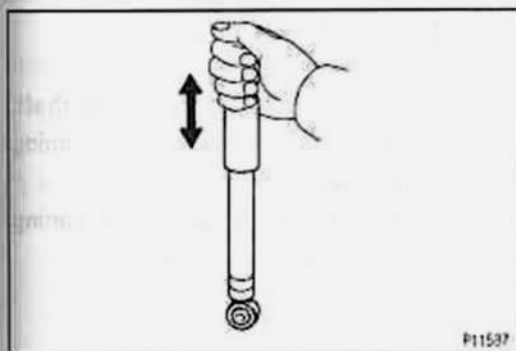


- (c) Measure the protrusion of the push rod from the housing end.

Protrusion:

8.0 – 8.8 mm (0.315 – 0.346 in.)

If the protrusion is not as specified, replace the tensioner.

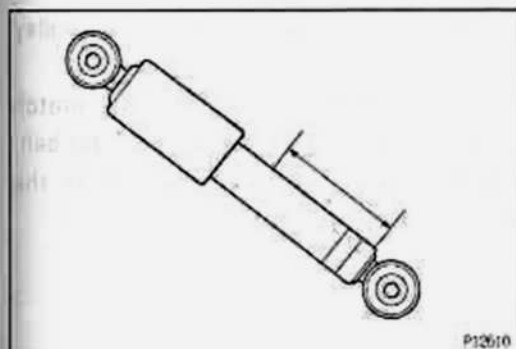


5. 2JZ – GTE M/T:

INSPECT DRIVE BELT TENSION DAMPER

Compress and extend the tension damper rod and check that there is no abnormal resistance or unusual operation sounds.

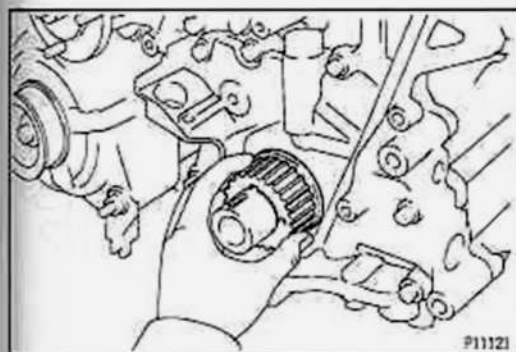
If there is any abnormality, replace the tension damper with a new one.



NOTICE: When discarding the tension damper, use the following procedure.

- Fully extend the damper rod.
- Using a drill, make a hole in the cylinder as shown to release the gas inside.

CAUTION: The gas coming out is harmless, but be careful of the chips which may fly up when drilling.

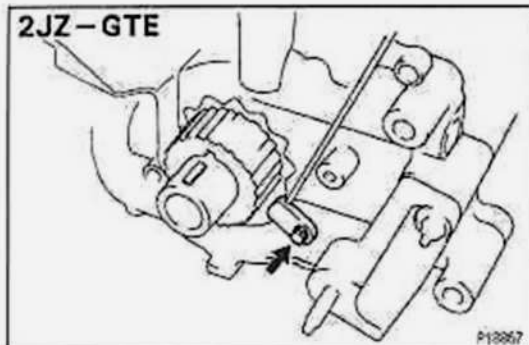


TIMING BELT INSTALLATION

1. INSTALL CRANKSHAFT TIMING PULLEY

- (a) Align the pulley set key with the key groove of the pulley.
- (b) Slide on the timing pulley facing the flange side inward.

2JZ-GTE



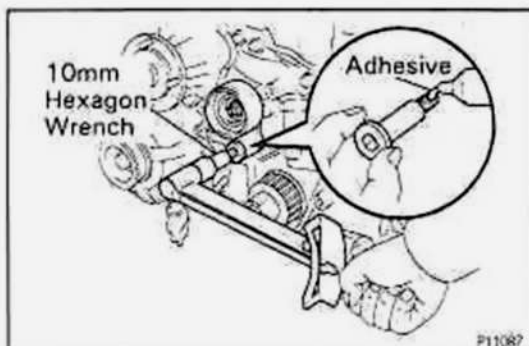
(c) 2JZ-GTE:

Install the timing belt plate with the bolt.

Torque: 7.8 N·m (80 kgf·cm, 69 in.-lbf)

10mm
Hexagon
Wrench

Adhesive



2. INSTALL IDLER PULLEY

- (a) Apply adhesive to 2 or 3 threads of the pivot bolt.

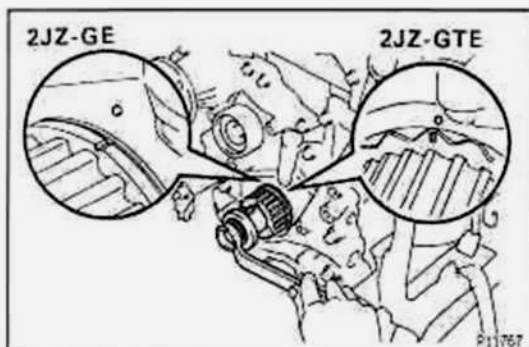
Adhesive:

Part No. 08833-00080, THREE BOND 1344,
LOCTITE 242 or equivalent

- (b) Using a 10 mm hexagon wrench, install the plate washer and pulley with the pivot bolt.
Torque: 34 N·m (350 kgf·cm, 25 ft-lbf)
- (c) Check that the pulley bracket moves smoothly.

2JZ-GE

2JZ-GTE



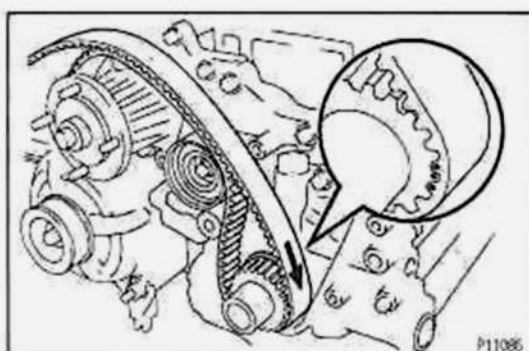
3. TEMPORARILY INSTALL TIMING BELT

NOTICE: The engine should be cold.

- (a) Using the crankshaft pulley bolt, turn the crankshaft, and align the timing marks on the crankshaft timing pulley and on the oil pump body.
- (b) Remove any oil or water on the crankshaft timing pulley and idler pulley, and keep them clean.

- (c) Install the timing belt on the crankshaft timing pulley and idler pulley.

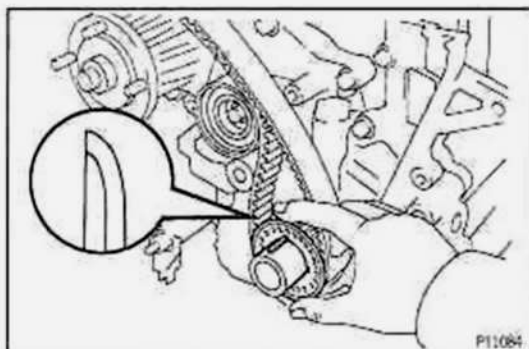
HINT (When re-using timing belt): Align the match marks of the crankshaft timing pulley and timing belt, and install the belt with the arrow pointing in the direction of engine revolution.



4. INSTALL TIMING BELT GUIDE

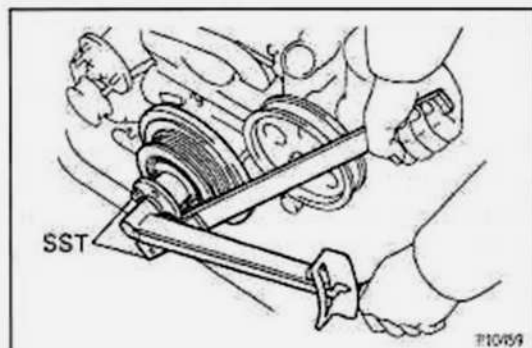
Install the guide, facing the cup side outward.

5. INSTALL NO.1 TIMING BELT COVER

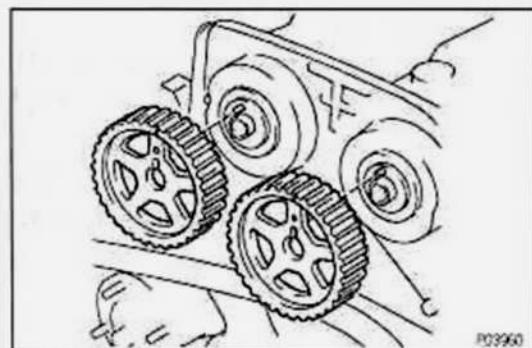


**6. 2JZ-GE:****INSTALL PS PUMP FRONT BRACKET**

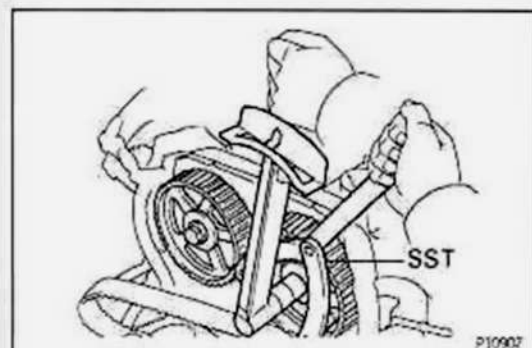
- (a) Install the pump front bracket with the 2 bolts (A).
Torque: 58 N·m (590 kgf·cm, 43 ft·lbf)
- (b) Install the plate washer and bolt (B) to the oil pump.
Torque: 52 N·m (530 kgf·cm, 38 ft·lbf)

**7. INSTALL CRANKSHAFT PULLEY**

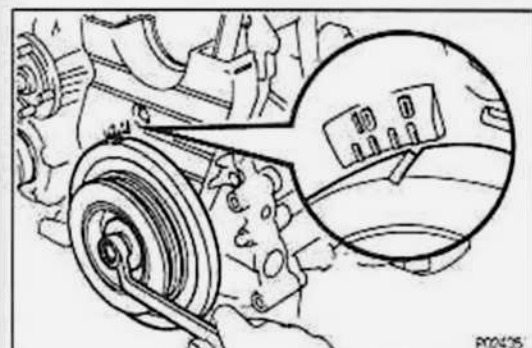
- (a) Align the pulley set key with the key groove of the pulley, and slide on the pulley.
- (b) Using SST, install the bolt.
SST 09213-70010, 09330-00021
Torque: 324 N·m (3,300 kgf·cm, 239 ft·lbf)

8. A/T:**CONNECT OIL COOLER TUBES****9. INSTALL CAMSHAFT TIMING PULLEYS**

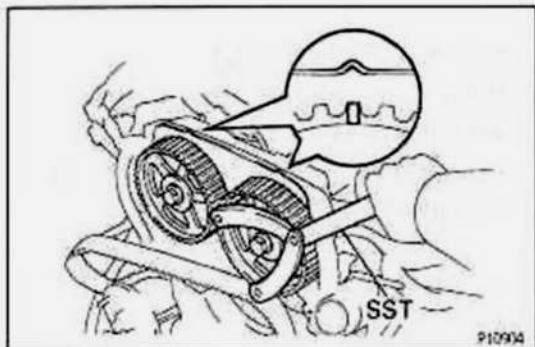
- (a) Align the camshaft knock pin with the groove of the pulley, and slide on the timing pulley.
- (b) Temporarily install the timing pulley bolt.



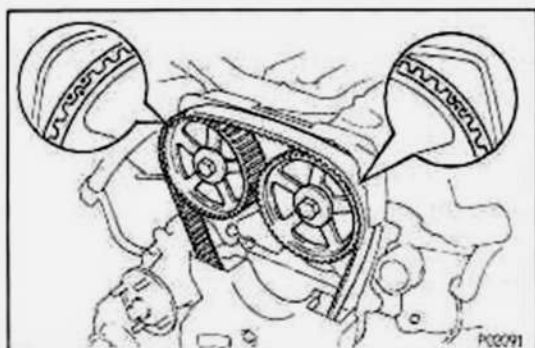
- (c) Using SST, tighten the pulley bolt.
SST 09960-10010 (09962-01000, 09963-01000)
Torque: 79 N·m (810 kgf·cm, 59 ft·lbf)

**10. SET NO.1 CYLINDER TO TDC/COMPRESSION**

- (a) Turn the crankshaft pulley, and align its groove with timing mark "0" of the No.1 timing belt cover.
NOTICE: Always turn the crankshaft clockwise.



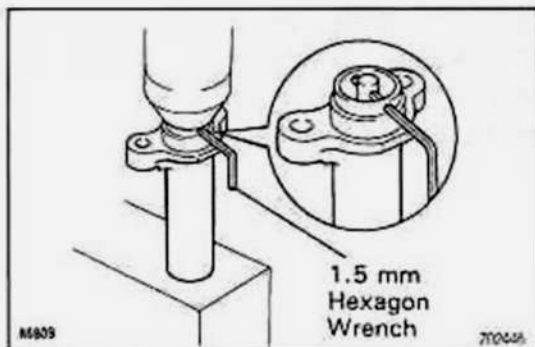
- (b) Using SST, align the timing marks of the camshaft timing pulleys and No.4 timing belt cover.
SST 09960-10010 (09962-01000, 09963-01000)



11. INSTALL TIMING BELT

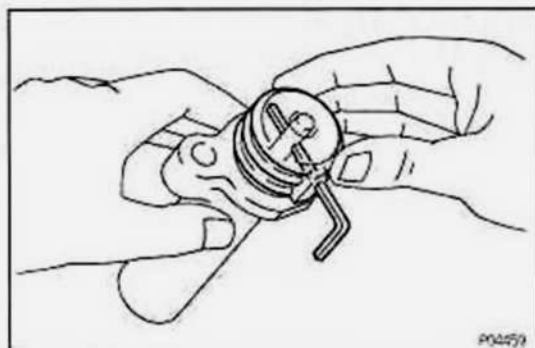
HINT (When re—using timing belt): Align the match-marks of the timing belt and camshaft timing pulleys.

- (a) Remove any oil or water on the camshaft timing pulley, and keep it clean.
- (b) Install the timing belt, checking the tension between the crankshaft timing pulley and exhaust camshaft timing pulley.

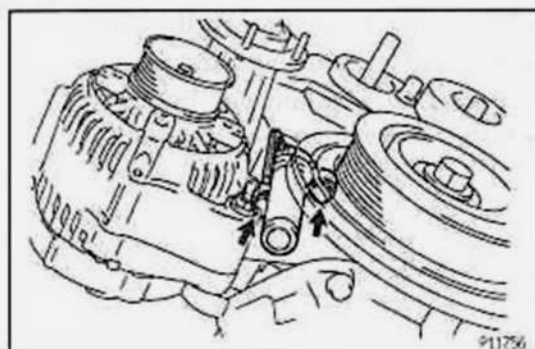


12. SET TIMING BELT TENSIONER

- (a) Using a press, slowly press in the push rod using 981 — 9,807 N (100 — 1,000 kgf, 220 — 2,205 lbf) of force.
- (b) Align the holes of the push rod and housing, pass a 1.5 mm hexagon wrench through the holes to keep the push rod retracted.
- (c) Release the press.

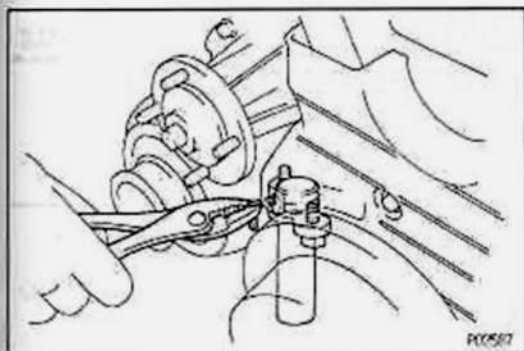


- (d) Install the dust boot onto the tensioner.

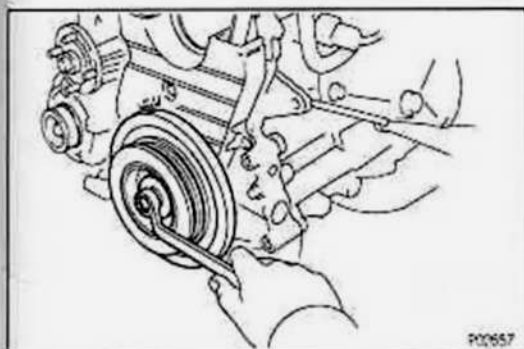


13. INSTALL TIMING BELT TENSIONER

- (a) Temporarily install the tensioner with the 2 bolts.
- (b) Alternately tighten the 2 bolts.
Torque: 26 N·m (270 kgf·cm, 20 ft·lbf)



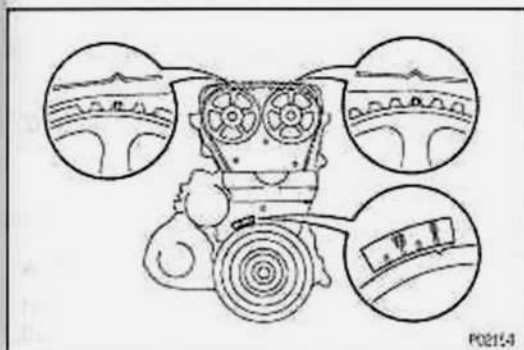
- (c) Remove the 1.5 mm hexagon wrench from the tensioner.



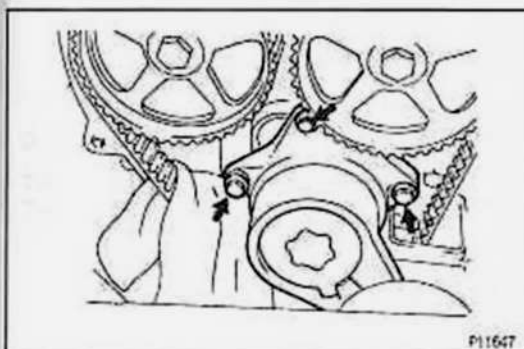
14. CHECK VALVE TIMING

- (a) Slowly turn the crankshaft pulley 2 revolutions from TDC to TDC.

NOTICE: Always turn the crankshaft clockwise.



- (b) Check that each pulley aligns with the timing marks as shown in the illustration.
If the marks do not align, remove the timing belt and reinstall it.



15. INSTALL DRIVE BELT TENSIONER

Install the tensioner with the 3 bolts.

Torque: 21 N·m (210 kgf·cm, 15 ft·lbf)

NOTICE: Be careful not to drop the bolts inside the timing belt cover.

16. INSTALL NO.2 TIMING BELT COVER

17. INSTALL NO.3 TIMING BELT COVER

18. INSTALL WATER PUMP PULLEY, FAN, FLUID COUPLING ASSEMBLY AND DRIVE BELT

(See step 10 in water pump installation in Cooling System)

19. 2JZ-GTE M/T:

INSTALL DRIVE BELT TENSIONER DAMPER

Torque: 20 N·m (200 kgf·cm, 14 ft·lbf)

20. INSTALL RADIATOR ASSEMBLY

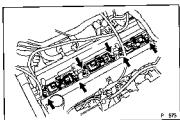
(See radiator installation in Cooling System)

21. ROAD TEST VEHICLE

Check for abnormal noise, shock, slippage, correct shift points and smooth operation.

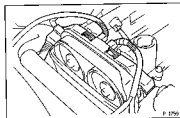
2JZ - GTE.

- 1 REMOVE IGNITION COILS ASSEMBLIES
(See steps 1 to 5 on pages IG-41 and 42)



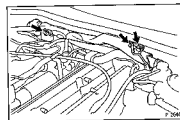
- 2 DISCONNECT ENGINE WIRE PROTECTOR FROM NO 4 TIMING BELT COVER

- (a) Disconnect the engine wire from the 4 wire clamps
- (b) Lift out the engine wire protector from the cylinder head covers



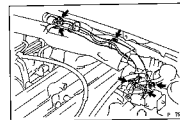
- 3 DISCONNECT ENGINE WIRE PROTECTOR FROM COWL TOP PANEL

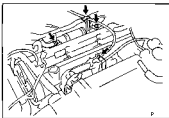
- (a) Remove the bolt and disconnect the ground strap
- (b) Remove the 2 bolts and lift up the engine wire protector



- 4 REMOVE IAC VALVE PIPE

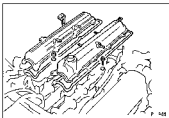
- (a) Disconnect the 5 air hoses from the IAC valve pipe
- (b) Remove the IAC valve pipe from the pipe clamp on the No 1 cylinder head cover





5 REMOVE NO 1 AND NO 2 CYLINDER HEAD COVERS

- (a) Disconnect the cruise control actuator cable from the cable bracket
- (b) Remove the bolt holding the VSV to the turbo outlet duct
- (c) Disconnect the 2 PCV hoses from the cylinder head covers
- (d) Remove the 6 bolts 2 nuts 8 seal washers No 1 cylinder head cover and gasket
- (e) Remove the 6 bolts 2 nuts 8 seal washers No 2 cylinder head cover and gasket



6 SET NO 1 CYLINDER TO TDC/ COMPRESSION

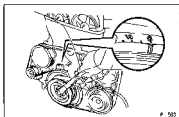
(See step 5 on page EG – 18)

7 INSPECT VALVE CLEARANCE

(See step 6 on page EG – 18)

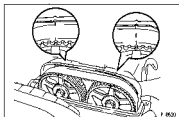
8 ADJUST VALVE CLEARANCE

(See step 7 on page EG – 19)

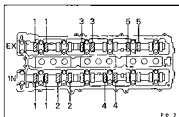


5 SET NO 1 CYLINDER TO TDC/COMPRESSION

- (a) Turn the crankshaft pulley and align its groove with the timing mark "0" of the No 1 timing belt cover
NOTICE Always turn the crankshaft clockwise



- (b) Check that the timing marks of the camshaft timing pulleys are aligned with the timing marks of the No 4 timing belt cover
 If not turn the crankshaft 1 revolution (360°)



6 INSPECT VALVE CLEARANCE

- (a) Check only those valves indicated in the illustration:
- Using a feeler gauge measure the clearance between the valve lifter and camshaft
 - Record the valve clearance measurements of those that are out of specification. They will be used later to determine the required replacement adjusting shim

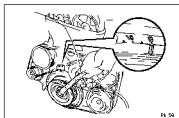
Valve clearance (Cold)

Intake

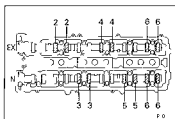
0.15 — 0.25 mm (0.006 — 0.010 in.)

Exhaust

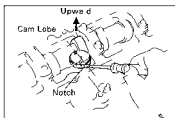
0.25 — 0.35 mm (0.010 — 0.014 in.)



- (b) Turn the crankshaft pulley 1 revolution (360°) and align the groove with timing mark "0" of the No 1 timing belt cover



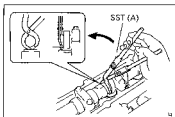
- (c) Check only the valves indicated as shown. Measure the valve clearance. (See procedure in step (a))



7 ADJUST VALVE CLEARANCE

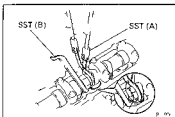
- (a) Remove the adjusting shim

- (1) Turn the camshaft so that the cam lobe for the valve to be adjusted faces up
- (2) Turn the valve lifter with a screwdriver so that the notches would be perpendicular to the cam shaft



- (3) Using SST (A) hold the camshaft as shown in the illustration

SST 09248-55040 (09248-05410)

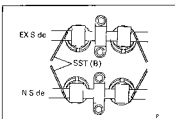


- (4) Using SST (A) press down the valve lifter and place SST (B) between the camshaft and valve lifter. Remove SST (A)

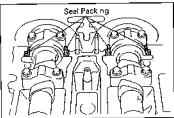
SST 09248-55040 (09248-05410 09248-05420)

HINT

- Apply SST (B) at slight angle on the side marked with "7" at the position shown in the illustration
- Insert SST (B) gently from the inside as shown in the illustration



Seal Packing

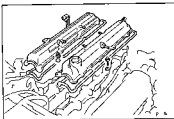


9 REINSTALL NO 1 AND NO 2 CYLINDER HEAD COVERS

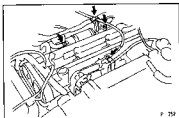
- (a) Remove any old packing (FIPG) material
- (b) Apply seal packing to the cylinder head as shown in the illustration

Seal packing

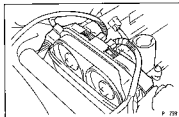
Part No. 08826-00080 or equivalent



- (c) Install the gaskets to the No 1 and No 2 cylinder head covers
- (d) Install the 12 seal washers to the bolts
- (e) Install the No 2 cylinder head cover with the 6 bolts, 4 seal washers and 4 nuts
Torque 5.4 N·m (55 kgf·cm, 48 in·lbf)
- (f) Install the No 1 cylinder head cover with the 6 bolts, 4 seal washers and 4 nuts
Torque 5.4 N·m (55 kgf·cm, 48 in·lbf)

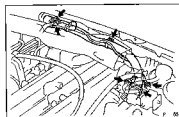


- (g) Connect the 2 PCV hoses to the cylinder head cover
- (h) Install the bolt holding the VSV to the turbo outlet duct
- (i) Connect the cruise control actuator cable to the cable bracket



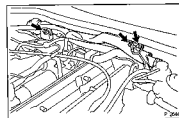
10 RECONNECT ENGINE WIRE PROTECTOR TO NO 4 TIMING BELT COVER

- (a) Install the engine wire protector to the cylinder head covers
- (b) Secure the engine wire to the 4 wire clamps



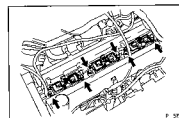
11 REINSTALL IAC VALVE PIPE

- (a) Install the IAC valve pipe to the pipe clamp on the No 1 cylinder head cover
- (b) Connect the 5 air hose to the IAC valve pipe



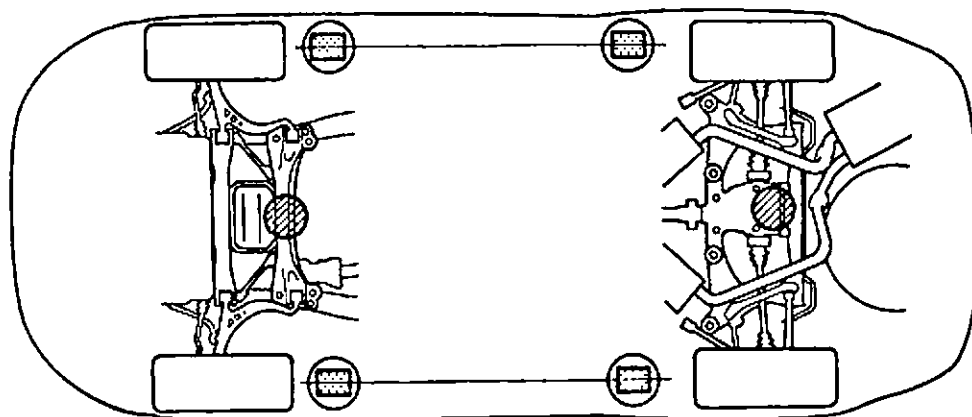
12 RECONNECT ENGINE WIRE PROTECTOR TO COVER TOP PANEL

- (a) Install the engine wire protector with the 2 bolts
- (b) Install the ground strap with the bolt

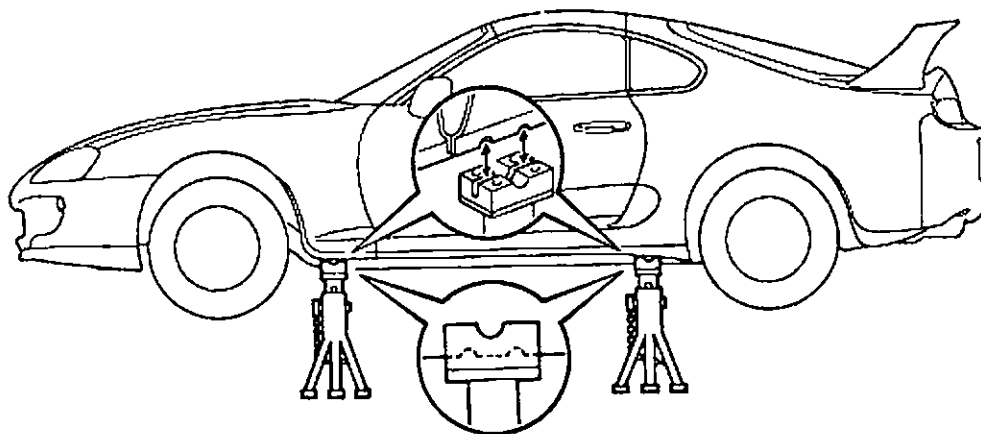


13 REINSTALL IGNITION COILS ASSEMBLIES (See page IG-42)

VEHICLE LIFT AND SUPPORT LOCATIONS



← Front



JACK POSITION _____ ●

Front Front crossmember

Rear Rear axle beam

CAUTION: Before jacking-up the rear and front, make sure the car is not carrying any extra weight.

PANTOGRAPH JACK POSITION _____ ○

SUPPORT POSITION

Safety stand and swing arm type lift ■