

MAINTENANCE OPERATIONS

ENGINE

Cold Engine Operations

1. REPLACE TIMING BELT

(a) Remove the timing belt.

4A-FE (See pages EM-33 to 37)

3S-GTE (See pages EM-46 to 51)

5S-FE (See pages EM-67 to 72)

(b) Install the timing belt.

4A-FE (See pages EM-40 to 45)

3S-GTE (See pages EM-55 to 61)

5S-FE (See pages EM-75 to 80)

2. INSPECT DRIVE BELT

(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.

(b) Using a belt tension gauge, measure the drive belt tension.

Belt tension gauge:

Nippondenso BTG-20 (95506-00020)

Borroughs No. BT-33-73F

Drive belt tension:

(4A-FE)

Alternator	New belt 160 + 20 lbf
	Used belt 130 + 20 lbf
PS pump	New belt 125 ±25 lbf
	Used belt 80 ±20 lbf
A/C compressor	New belt 160 + 20 lbf
	Used belt 100 + 20 lbf

(3S-GTE and 5S-FE):

Alternator (3S-GTE)

w/ A/C	New belt 175 f 5 lbf
	Used belt 115 + 20 lbf
w/o A/C	New belt 150 ±25 lbf
	Used belt 130 + 25 lbf

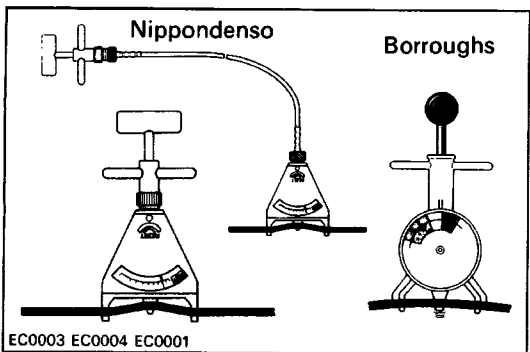
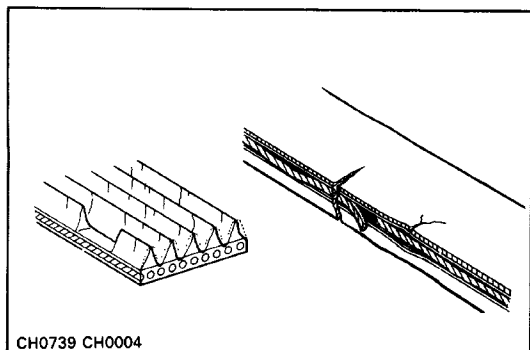
Alternator (5S-FE)

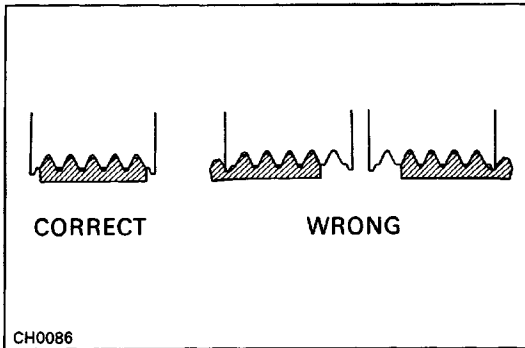
w/ A/C	New belt 175 ±5 lbf
	Used belt 130 ±10 lbf
w/o A/C	New belt 125 + 25 lbf
	Used belt 95 + 20 lbf

PS pump

New belt 125 + 25 lbf
Used belt 80 ±20 lbf

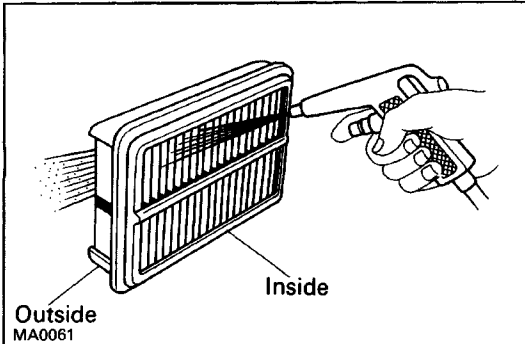
If necessary, adjust the drive belt tension.





HINT:

- "New belt" refers to a belt which has been used less than 5 minutes on a running engine.
- "Used belt" refers to a belt which has been used on a running engine for 5 minutes or more.
- After installing the 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.
- After installing a new belt, run the engine for about 5 minutes and recheck the belt tension.



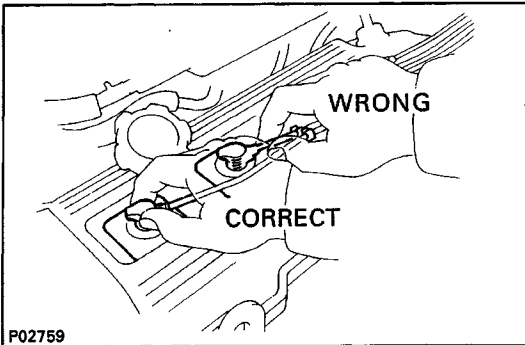
3. INSPECT AIR FILTER

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

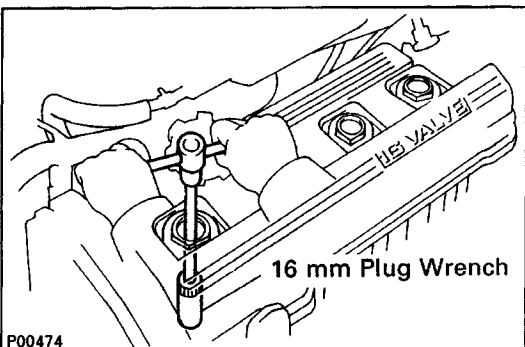
4. REPLACE AIR FILTER

Replace the element with a new one.

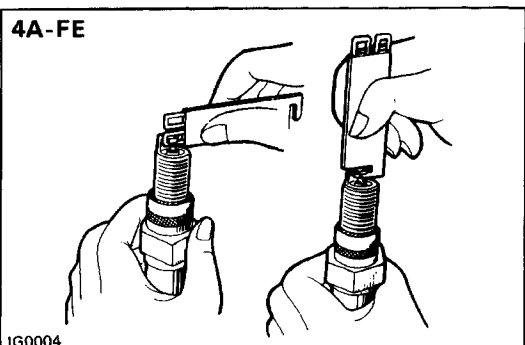
5. REPLACE SPARK PLUGS



- (3S-GTE)
Remove the intercooler.
(See pages [TC-9](#) and 10)
- Disconnect the spark plug cords at the rubber boot.
DO NOT pull on the cords.



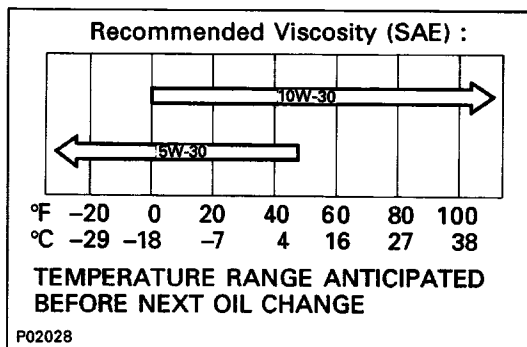
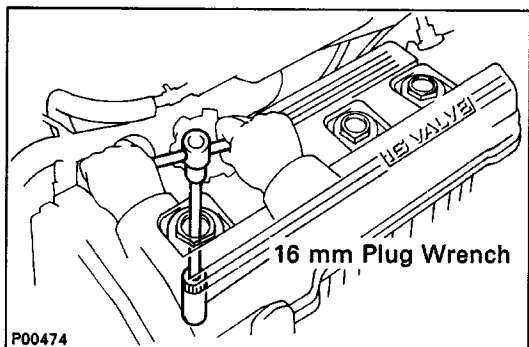
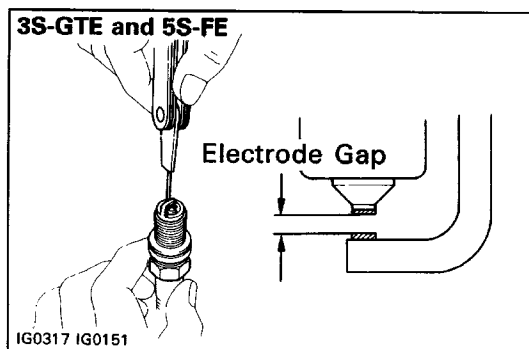
- Using a 16 mm plug wrench, remove the spark plugs.



- (4A-FE)

Adjust the electrode gap of new spark plugs.

Correct electrode gap: 0.8 mm (0.031 in.)
Recommended spark plugs: ND Q16R-U
 NGK BCPRSEY



(e) (3S-GTE and 5S-FE)

Check the electrode gap of new spark plugs.

Correct electrode gap:

3S-GTE 0.8 mm (0.031 in.)

5S-FE 1.1 mm (0.043 in.)

Recommended spark plugs:

3S-GTE ND PK20R8

NGK BKR6EP8

5S-FE ND PK20R17

NGK BKR6EP-11

HINT: If adjusting the gap of a new plug, bend only the base of the ground electrode.

(f) Using a 16 mm plug wrench, reinstall the spark plugs.

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

(g) Reconnect the spark plug cords.

(h) (3S-GTE)

Reinstall the intercooler. (See page [TC-17](#))

6. REPLACE ENGINE OIL AND OIL FILTER

(See page [LU-7](#))

Oil grade: API grade SG, multigrade and fuel-efficient oil

Recommended viscosity: Refer to illustration

Drain and refill capacity:

(4A-FE)

w/ Oil filter change

3.2 liters (3.3 US qts, 2.8 Imp. qts)

w/o Oil filter change

3.0 liters (3.1 US qts, 3.4 Imp. qts)

(3S-GTE)

w/ Oil filter change

3.9 liters (4.1 US qts, 3.4 Imp. qts)

w/o Oil filter change

3.6 liters (3.8 US qts, 3.2 Imp. qts)

(5S-FE w/ Oil cooler)

w/ Oil filter change

4.2 liters (4.4 US qts, 3.7 Imp. qts)

w/o Oil filter change

3.8 liters (4.0 US qts, 3.3 Imp. qts)

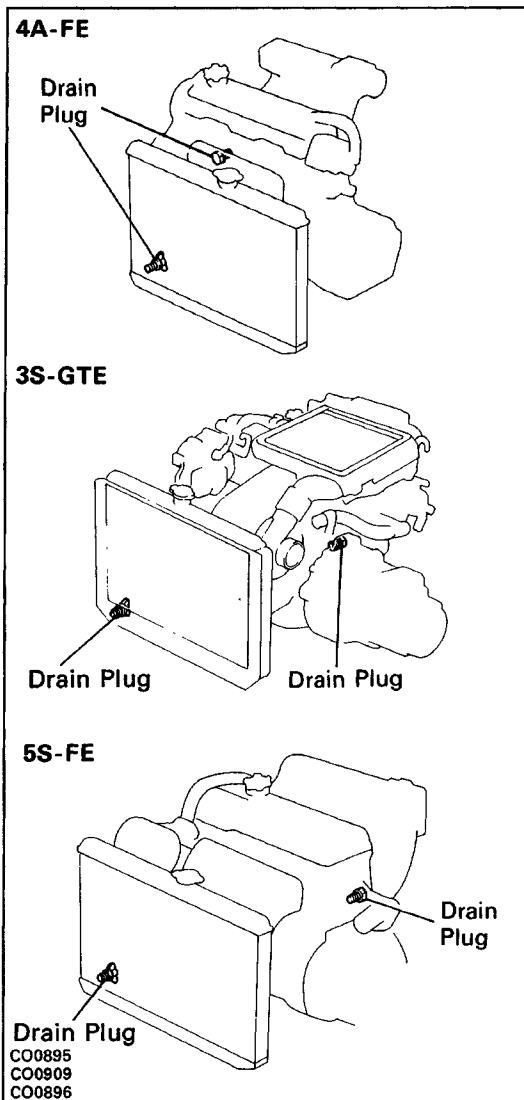
(5S-FE w/o Oil cooler)

w/ Oil filter change

4.1 liters (4.3 US qts, 3.6 Imp. qts)

w/o Oil filter change

3.7 liters (3.9 US qts, 3.3 Imp. qts)



7. REPLACE ENGINE COOLANT

(See page CO-6)

HINT:

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

NOTICE:

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

Coolant capacity (w/ Heater):

(4A-FE)

M/T 5.2 liters (5.5 US qts, 4.6 Imp. qts)

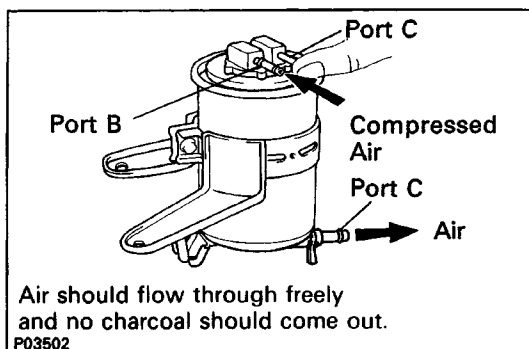
A/T 5.6 liters (5.9 US qts, 4.9 Imp. qts)

(3S-GTE) 6.5 liters (6.9 US qts, 5.7 Imp. qts)

(5S-FE)

M/T 6.2 liters (6.6 US qts, 5.5 Imp. qts)

A/T 6.1 liters (6.4 US qts, 5.4 Imp. qts)



8. INSPECT CHARCOAL CANISTER

- Disconnect the hoses from the charcoal canister. Label hoses for correct installation.
- Plug port C with your finger, and blow compressed air (294 kPa (3 kgf/cm², 43 psi)) through port B (fuel tank side).

- Check that the air comes out of the bottom of port A without resistance.

- Check that no activated charcoal comes out.

If necessary, replace the charcoal canister.

NOTICE: Do not attempt to wash the charcoal.

- Reconnect the hoses to the charcoal canister.

9. REPLACE GASKET IN FUEL TANK CAP

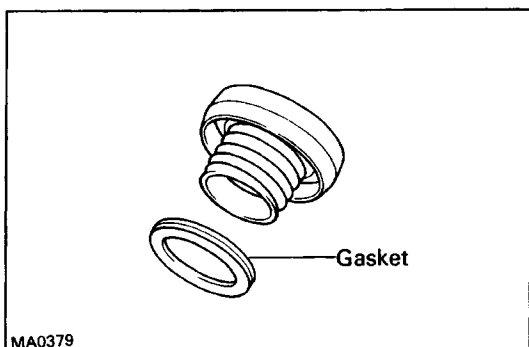
- Remove the old gasket from the tank cap.

NOTICE: Do not damage the tank cap.

- Install a new gasket by hand.

- Check the cap for damage or cracks.

- Reinstall 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

4A-FE (See page EM-13)

3S-GTE (See page EM-17)

5S-FE (See page EM-22)

Valve clearance (Cold):

4A-FE Intake 0.15 – 0.25 mm

(0.006 – 0.010 in.)

Exhaust 0.20 – 0.30 mm

(0.008 – 0.012 in.)

3S-GTE Intake 0.15 – 0.25 mm

(0.006 – 0.010 in.)

Exhaust 0.28 – 0.38 mm

(0.011 – 0.015 in.)

5S-FE Intake 0.19 – 0.29 mm

(0.007 – 0.011 in.)

Exhaust 0.28 – 0.38 mm

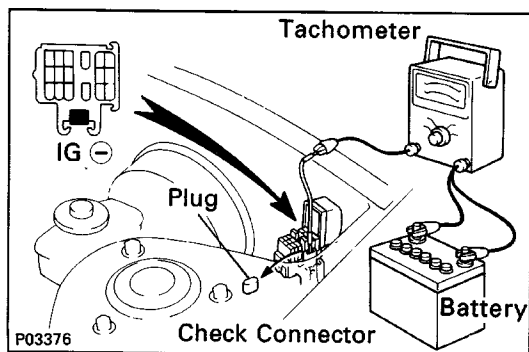
(0.011 – 0.015 in.)

Hot Engine Operations**13. (4A-FE)****ADJUST IDLE SPEED****(a) Preparation**

- Engine at normal operating temperature
- Air cleaner installed
- All pipes and hoses of air induction system connected
- All vacuum lines connected

HINT: All vacuum hoses for EGR systems, etc. should be properly connected.

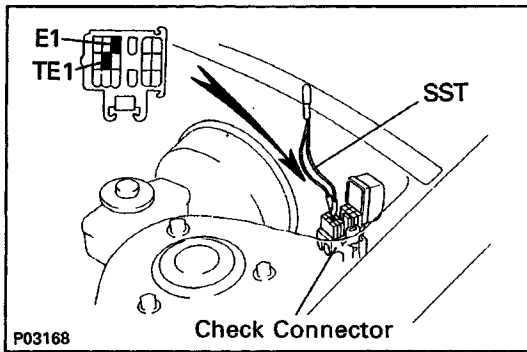
- EFI system wiring connector fully plugged
- All accessories switched OFF
- Transmission in neutral position

**(b) Connect a tachometer to the engine.**

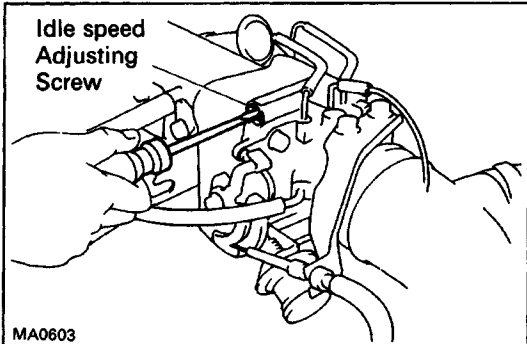
Connect the test probe of a tachometer to terminal IG (-) of the check connector.

NOTICE:

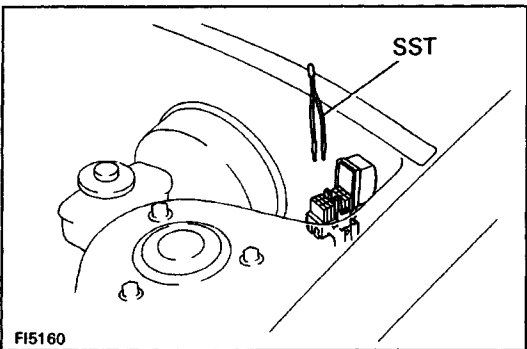
- **NEVER** allow the tachometer terminal to touch ground as it could result in damage to the igniter and/or igniter coil.
- As some tachometers are not compatible with this ignition system, we recommend that you confirm the compatibility of your unit before use.



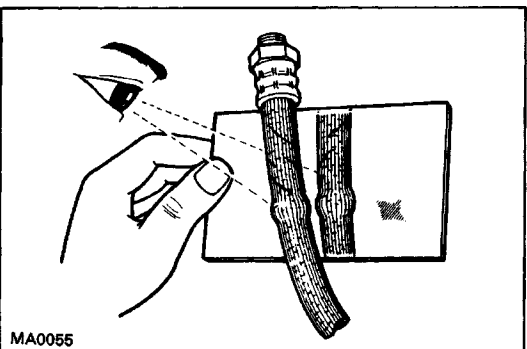
- (c) Race the engine at 2,500 rpm for approx. 2 minutes.
 (d) Using SST, connect terminals TE1 and E1 of the check connector.
 SST 09843-18020



- (e) Adjust the idle speed by turning the IDLE SPEED ADJUSTING SCREW.
Idle speed: 800 rpm (w/ Cooling fan OFF)
 HINT: Make adjustments with the engine cooling fan OFF.



- (f) Remove the SST from the check connector.
 SST 09843-18020

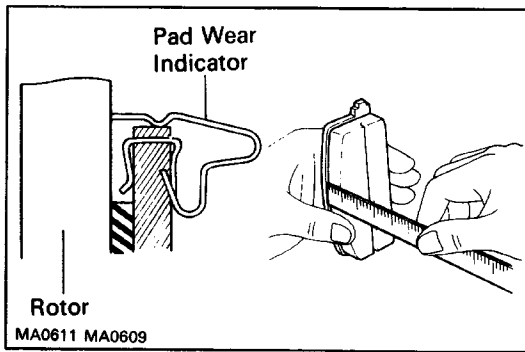


BRAKES

14. 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.

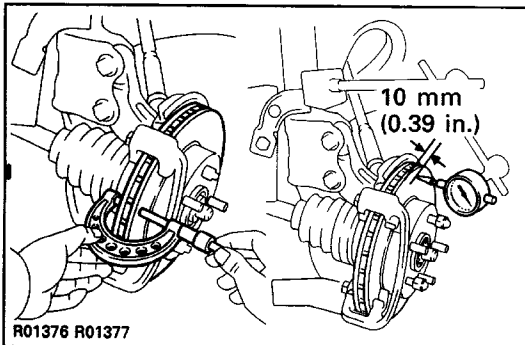


15. INSPECT BRAKE PADS AND DISCS

- (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:

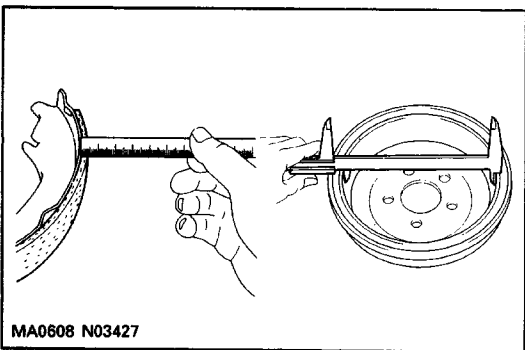
Front 23.0 mm (0.906 in.)

Rear 9.0 mm (0.354 in.)

Maximum disc runout:

Front 0.07 mm (0.0028 in.)

Rear 0.15 mm (0.0059 in.)



16. INSPECT BRAKE LININGS AND DRUMS

- (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:

Drum brake 201.0 mm (7.913 in.)

Disc brake 171.0 mm (6.732 in.)

- (c) Clean the brake parts with a damp cloth.

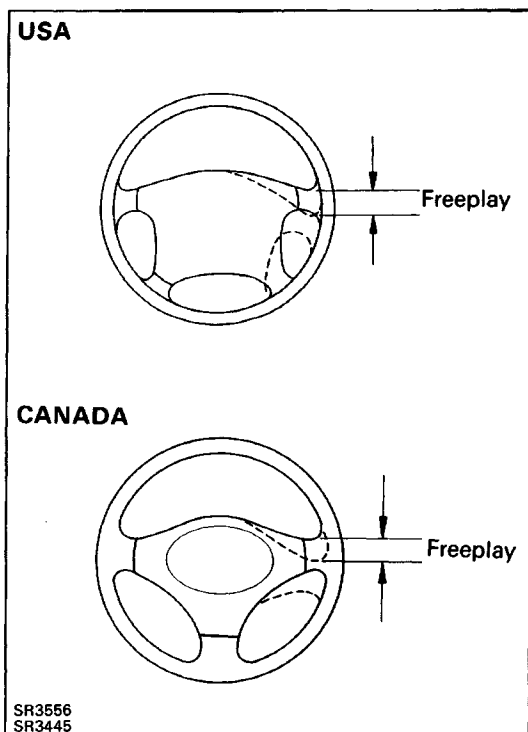
NOTICE: Do not use compressed air to clean the brake parts.

- (d) (Disc Brake)

Settle the parking brake shoes and drum. When performing the road test in item 27, do the following:

- Drive the vehicle at approx. 50 km/h (30 mph) on a safe, level and dry road.
- With the parking brake release lever pushed in, pull on the lever with 88 N (9 kgf, 20 lbf) of force.
- Drive the vehicle for approx. 400 m (1 / 4 mile) in this position.
- Repeat this procedure 2 or 3 times.
- Check parking lever travel.

If necessary, adjust the parking brake.



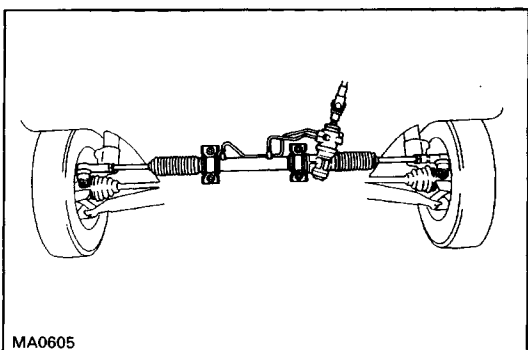
CHASSIS

17. INSPECT STEERING LINKAGE

(a) Check the steering wheel freeplay.

Maximum steering wheel freeplay: 30 mm (1.18 in.)

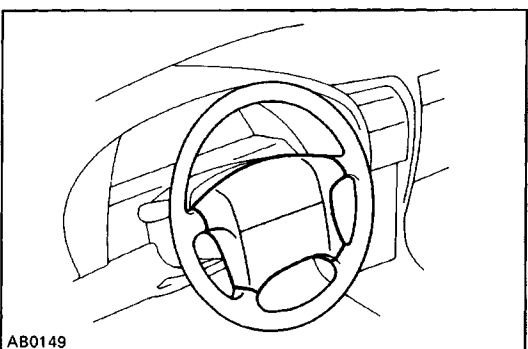
With the vehicle stopped and pointed straight ahead, rock the steering wheel gently back and forth with light finger pressure.



(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.



18. INSPECT SRS AIRBAG

Visually check 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.

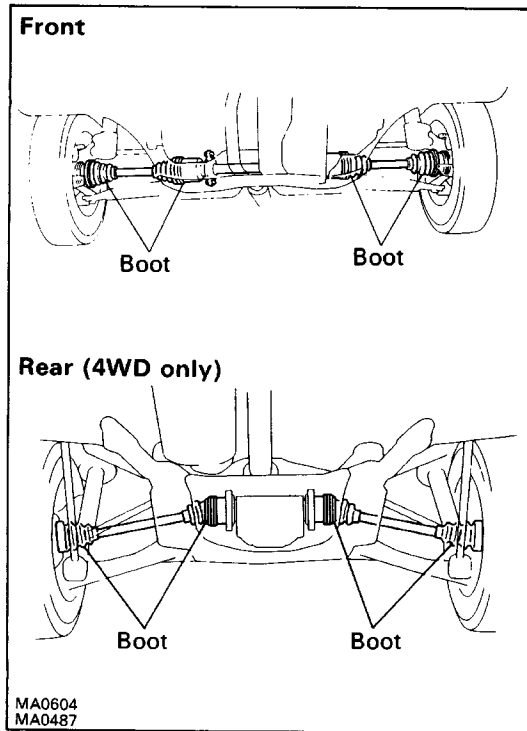
If necessary, replace the pad.

CAUTION:

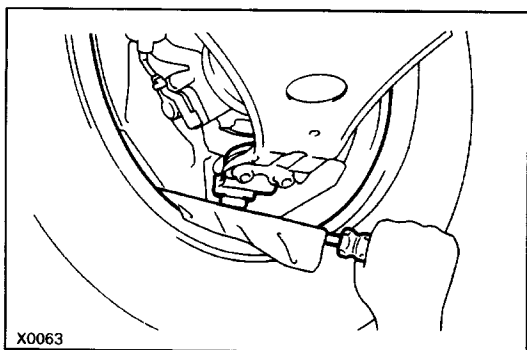
- **For removal and replacement of the steering wheel pad, see Steering Wheel Pad and Spiral Cable on AB section and be sure to perform the operation in the correct order.**
- **Before disposing of the steering wheel pad, the airbag must first be deployed by using SST (see Disposal of Steering Wheel Pad on AB section).**

19. INSPECT STEERING GEAR HOUSING OIL

Check the steering gear box for oil leakage.

**20. INSPECT DRIVE SHAFT BOOTS**

Check the drive shaft boots for clamp looseness, leakage or damage.

**21. INSPECT BALL JOINTS AND DUST COVERS**

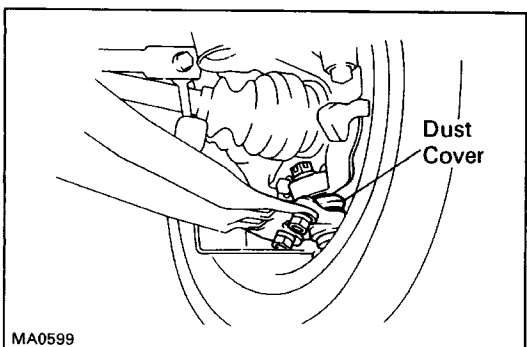
(a) Inspect the ball joints for excessive looseness.

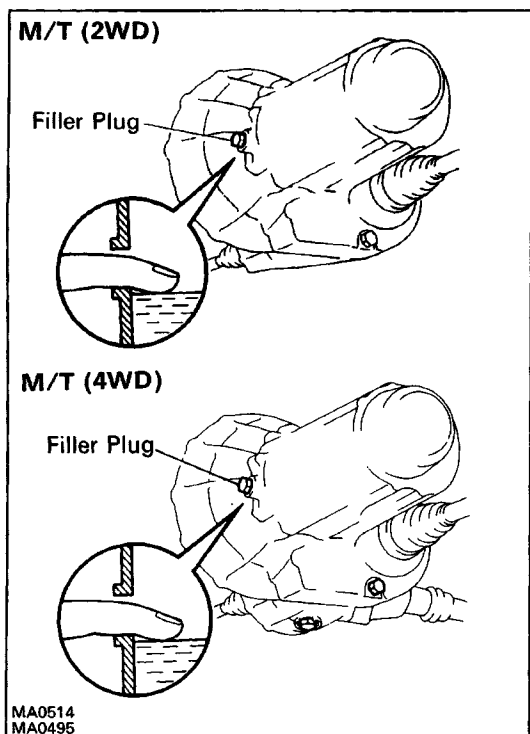
- Jack up the front of the vehicle and place wooden blocks with a height of 180 – 200 mm (7.09 – 7.87 in.) under the front tires.
- Lower the jack until there is about half a load on the front coil springs. Place stands under the vehicle for safety.
- Check that the front wheels are in a straight forward position, and block them with chocks.
- Using a lever, pry up the end of the lower arm, and check the amount of play.

Maximum ball joint vertical play: 0 mm (0 in.)

If there is play, replace the ball joint.

(b) Check the dust cover for damage.





22. CHECK TRANSAXLE FLUID

A. (M/T)

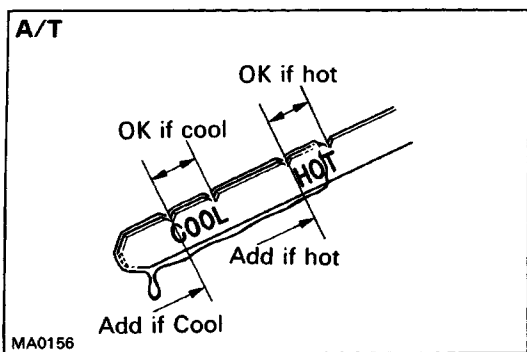
Check manual transaxle fluid

- (a) Remove the LH engine under cover.
- (b) Visually check the transaxle for fluid leakage.
If leakage is found, check for the cause and repair.
- (c) Remove the filler plug and feel inside the hole with your finger. Check that the fluid comes to within 5 mm (0.20 in.) of the bottom edge of the filler hole.
If the level is low, add oil fluid until it begins to run out of the filler hole.

Transaxle fluid: 2WD See item 23 (A)

4WD See item 23 (B)

- (d) Reinstall the filler plug securely.
- (e) Reinstall the LH engine under cover.



B. (A/T)

Check automatic transaxle fluid

- (a) Remove the LH engine under cover.
- (b) Visually check the transaxle for fluid leakage.
If leakage is found, check for the cause and repair.
- (c) Check the fluid level.
If the level is low, add fluid.

Transmission fluid: See item 23 (C)

- (d) Reinstall the LH engine under cover.

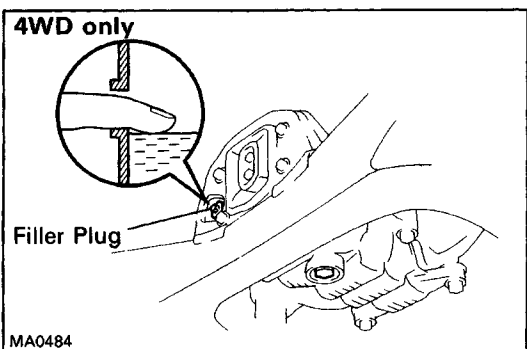
C. (4WD only)

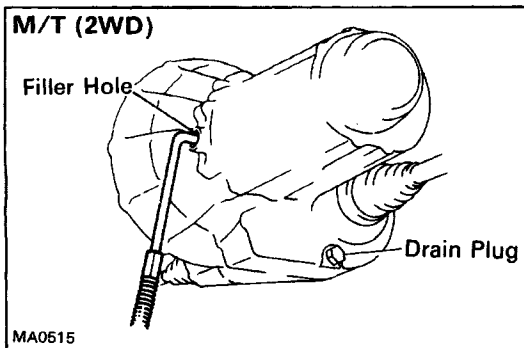
Check rear differential oil

- (a) Visually check the differential for oil 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.

Transaxle oil: See item 23 (D)

- (c) Reinstall the filler plug securely.





23. REPLACE TRANSAXLE FLUID

A. (M/T (2WD))

Replace transaxle fluid

- Remove the LH engine under cover.
- Remove the filler and drain plugs, and drain the fluid.
- Reinstall the drain plug securely.
- Add new fluid until it begins to run out of the filler hole.

Recommended transaxle oil:

Oil grade API GL-3

Viscosity SAE 75W-90

Capacity: 2.6 liters (2.7 US qts, 2.3 Imp. qts)

In case the above oil grade is unavailable, use type A or B.

Type A:

Oil grade API GL-4

Viscosity SAE 75W-90

Type B:

Oil grade API GL-5

Viscosity SAE 75W-90

- Reinstall the filler plug securely.
- Reinstall the LH engine under cover.

B. (M/T (4WD))

Replace transaxle oil (Incl. transfer oil)

- Remove the LH engine under cover.
- Remove the filler and drain plugs, and drain the oil.
- Reinstall the drain plugs securely.
- Add new oil until it begins to run out of the filler hole.

Transaxle oil: Transaxle oil E50 (08885-80206)
or equivalent

Recommended transaxle oil:

Oil grade API GL-5

Viscosity SAE 75W-90 or 80W-90

Above -18°C (0°F) SAE 90

Below -18°C (0°F) SAE 80W

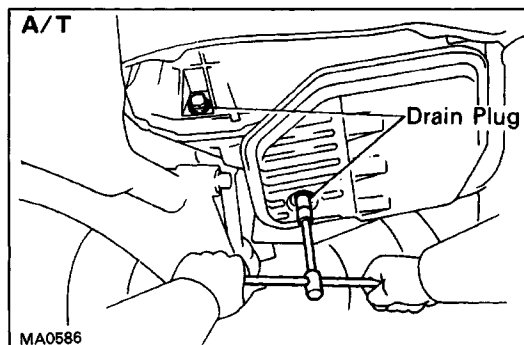
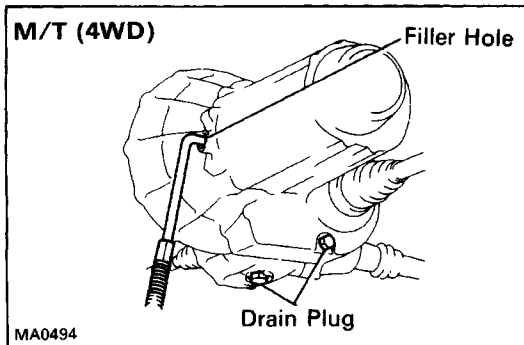
Capacity: 5.2 liters (5.5 US qts, 4.6 Imp. qts)

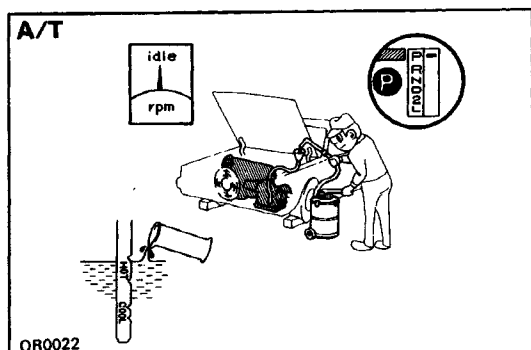
- Reinstall the filler plug securely.
- Reinstall the LH engine under cover.

C. (A/T)

Replace transaxle fluid

- Remove the LH engine under cover.
- Remove the drain plugs, and drain the fluid.
- Reinstall the drain plugs securely.





(d) With the engine OFF, add new fluid through the dipstick tube.

Transaxle fluid: ATF DEXRON[®] II

Drain and refill capacity:

3.3 liters (3.5 US qts, 2.9 Imp. qts)

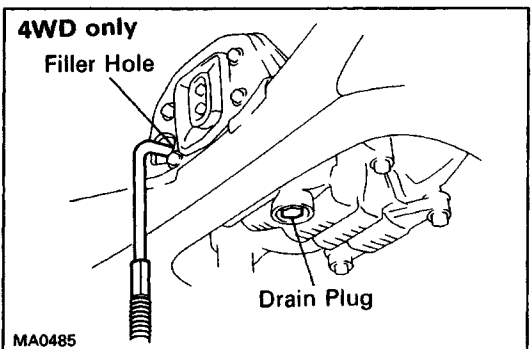
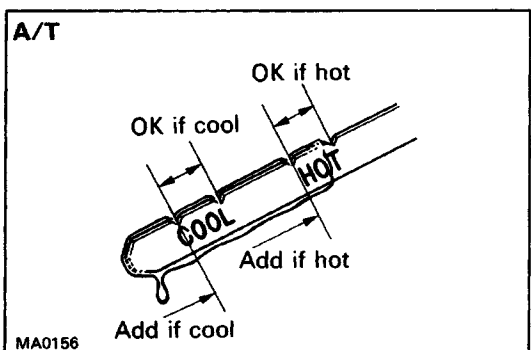
(e) Start the engine and shift the selector into all positions from "P" through "L", and then shift into "P".

(f) With the engine idling, check the fluid level. Add fluid up to the "COOL" level on the dipstick.

NOTICE: Do not overfill.

(g) Recheck the fluid level with the normal temperature (70 – 80°C (158 – 176°F)) and add as necessary.

(h) Reinstall the LH engine under cover.



D. (4WD only)

Replace rear differential oil

- (a) Remove the filler and drain plugs, and drain the oil.
- (b) Reinstall the drain plugs securely.
- (c) Add new oil until it begins to run out of the filler hole.

Rear differential oil:

Oil grade API GL-5 hypo[^]d gear oil

Viscosity Above -18°C (0°F) SAE 90

Below -18°C (0°F) SAE 80W-90 or 80W

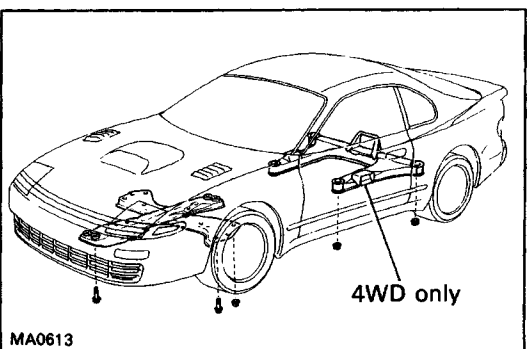
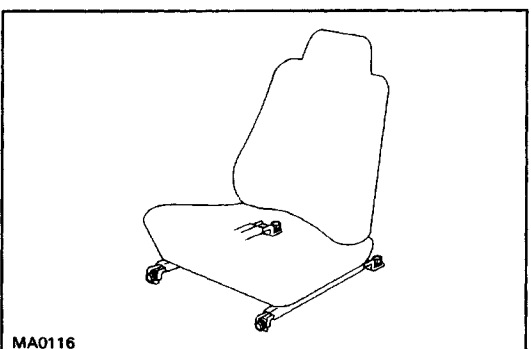
Capacity: 1.1 liters (1.2 US qts, 1.0 Imp. qts)

(d) Reinstall the filler plug securely.

24. TIGHTEN BOLTS AND NUTS ON CHASSIS AND BODY

Tighten the following parts:

- Front seat mounting bolts
Torque: 37 N-m (375 kgf-cm, 27 ft-lbf)
- Engine mounting center member-to-body mounting bolts
Torque: 52 N-m (530 kgf-cm, 38 ft-lbf)
- Front suspension lower crossmember-to-body mounting bolts
Torque: 152 N-m (1,550 kgf-cm, 112 ft-lbf)
- (4WD only)
Rear suspension lower crossmember-to-body mounting bolts
Torque: 159 N-m (9,620 kgf-cm, 117 ft-lbf)



25. BODY INSPECTION

- (a) Check the body exterior for dents, scratches and rust.
- (b) Check the underbody for rust and damage.

26. 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 down of the parking brake shoes and drum. (See page [MA-1 0](#))

27. 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 and back 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
 - Door handles
 - Seats