

DAIHATSU

F73, F78

MA

MAINTENANCE

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R7MA00001-00000

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MAINTENANCE SCHEDULE

Selection of schedule

Daihatsu provides two kinds of maintenance schedules: One for NORMAL driving conditions and the other for SEVERE driving conditions.

Please select either schedule for the NORMAL driving or the SEVERE driving according to your driving conditions.

To select schedule for SEVERE driving:

As for the following four maintenance items, there are two kinds of services: NORMAL driving schedule and SEVERE driving schedule, depending upon your driving conditions.

If your driving conditions fall under driving conditions of any maintenance item, the servicing for that item should be conducted according to the SEVERE driving schedule.

Maintenance item	Condition
Engine oil	A, D or F
Engine oil filter	A, D or F
Air cleaner element	D
Exhaust pipe and mounting	A, B, C or E

Condition

- A: Pulling a trailer
- B: Repeated short trips
- C: Driving on rough roads
- D: Driving dusty roads
- E: Driving in extremely cold climate and/or on salted roads
- F: Repeated short trips in extremely cold climate

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SCHEDULE FOR SEVERE DRIVING

Maintenance item	Interval
Engine oil API CD or higher	Change every 2,500 km (1,500 miles)
Engine oil filter	Replace every 2,500 km (1,500 miles)
Air cleaner element	Clean every 2,500 km (1,500 miles) and replace every 20,000 km (12,000 miles)
Exhaust pipe and mountings	Inspect every 5,000 km (3,000 miles)

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SCHEDULE FOR NORMAL DRIVING

Follow the distance and the period the vehicle has been driven whichever comes first, if without any notice. Continue periodic maintenance service after 100,000 km, following the schedule.

○....Check ●....Change or replacement

Section	Inspection	× 1,000 km		1	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	Refer to see page
		× 1,000 miles		0.6	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	
		(Months) Years		—	(3)	(6)	(9)	1	(3)	(6)	(9)	2	(3)	(6)	(9)	3	(3)	(6)	(9)	4	(3)	(6)	(9)	5	
Engine	• Cylinder head, manifold and other	• Tightness		○				○				○				○				○				○	MA-7
	• Air cleaner element	• Cleaning			○	○	○	○	○	○	○	○	●	○	○	○	○	○	○	○	○	○	○	○	MA-7
	• Valve clearance	• Clearance		○				○				○				○				○				○	MA-7
	• Engine oil	• Leakage • Level • Change		○	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	MA-7
	• Oil filter	• Change				●		●		●		●		●		●		●		●		●		●	MA-8
	• Fuel filter	• Change										●								●					MA-8
	• Water sedimenter	• Fuel leakage • Drain water				○		○		○		○		○		○		○		○		○		○	MA-9
	• Fuel lines & connections	• Damage • Crack • Tightness • Leakage		○				○				○				○				○				○	MA-9
		• Fuel hose replacement	Every 4 years																						MA-9
	• Coolant	• Quantity • Leakage • Change		○		○		○		○		●		○		○		○		●		○		○	MA-10
	• V-belt	• Tension • Crack • Damage		○		○		○		○		○		○		○		○		○		○		○	MA-11
	• Timing belt	• Replacement	Every 100,000 km (60,000 miles)																						MA-11
	• Glow plug	• Function		○		○		○		○		○		○		○		○		○		○		○	MA-16
	• Injection nozzle & injection timing	• Injection pressure • Timing						○				○				○				○				○	MA-16

MA-4

○....Check ●....Change or replacement

Section	Inspection	× 1,000 km	1	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	Refer to see page
			0.6	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	
			(Months)	Years	(3)	(6)	(9)	1	(3)	(6)	(9)	2	(3)	(6)	(9)	3	(3)	(6)	(9)	4	(3)	(6)	(9)	5
Engine	• Turbo charger	• Waste gate actuator hose					○				○				○				○				○	MA-18
		• Waste gate actuator operation									○								○					MA-18
Exhaust emission control system	• Blow-by gas ventilation hose	• Connection • Damage					○				○				○				○				○	MA-19
Power transmitting system	• Clutch	• Free play			○		○		○		○		○		○		○		○		○		○	MA-20
	• Transmission & differential	• Oil level • Oil leakage • Oil change	○		○		○		●		○		○		●		○		○		●		○	MA-20
	• Propeller shaft	• Tightness • Rattle • Damage					○				○				○				○				○	MA-21
Suspension system	• Suspension arm, control arm, dust cover	• Tightness • Damage					○				○				○				○				○	MA-21
	• Shock absorber	• Function • Oil leakage • Damage					○				○				○				○				○	MA-21
Running system	• Tire	• Pressure • Damage • Wear	○		○		○		○		○		○		○		○		○		○		○	MA-21
	• Front, rear wheel bearing	• Rattle					○				○				○				○				○	MA-22
	• Front wheel bearing	• Grease change									●								●					MA-22
	• Rear wheel bearing	• Grease change									●								●					MA-29
Steering system	• Steering wheel	• Tightness • Free play					○				○				○				○				○	MA-36
	• Linkage, dust cover	• Tightness • Rattle					○				○				○				○				○	MA-36
	• Wheel alignment	• Toe-in • Camber • Caster					○				○				○				○				○	MA-36
	• Knuckles	• Rattle					○				○				○				○				○	MA-

Section	Inspection		× 1,000 km		1	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	Refer to see page
			× 1,000 miles		0.6	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	
	(Months) Years		—	(3)	(6)	(9)	1	(3)	(6)	(9)	2	(3)	(6)	(9)	3	(3)	(6)	(9)	4	(3)	(6)	(9)	5			
Steering system	• Ball joint dust seal	• Damage			○		○		○		○		○		○		○		○		○		○		○	MA—
	• Steering knuckles	• Grease apply						○				○			○				○					○	MA—	
	• Gear box	• Oil check	○				○					○			○				○					○	MA-39	
		• Tightness						○				○				○				○				○	MA-39	
	• Power steering belt	• Tightness • Damage			○		○		○		○		○		○		○		○		○		○		○	MA-39
	• Power steering fluid	• Check	○		○		○		○		○		○		○		○		○		○		○		○	MA-39
• Fluid hose change		Every 4 years																						MA-40		
Braking system	• Brake pedal & parking brake	• Free play • Reserved working travel	○		○		○		○		○		○		○		○		○		○		○		○	MA-44
	• Disc pad	• Clearance • Wear • Damage					○					○			○				○					○	MA-44	
	• Brake hose, tube	• Leakage • Damage • Loose clamps	○		○		○		○		○		○		○		○		○		○		○		○	MA-45
		• Hose, caliper piston seal and boot change	Every 4 years																						MA-45	
	• Brake fluid	• Level	○		○		○		○		○		○		○		○		○		○		○		○	MA-45
		• Fluid change	Every 1 year																						MA-46	
	• Brake drum, lining	• Wear • Damage					○				○				○				○					○	MA-46	
	• Brake booster	• Function					○				○				○				○					○	MA-47	
		• Vacuum hose replacement	Every 4 years																						MA-48	
• Master & wheel cylinder	• Cup and dust seal replacement	Every 2 years																						MA-49		

MA-6

○....Check ●....Change or replacement

Section	Inspection																						Refer to see page		
			× 1,000 km	1	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90		95	100
			× 1,000 miles	0.6	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54		57	60
		(Months) Years	—	(3)	(6)	(9)	1	(3)	(6)	(9)	2	(3)	(6)	(9)	3	(3)	(6)	(9)	4	(3)	(6)	(9)	5		
Braking system	• Proportioning valve	• Replacement	Every 4 years																				MA-53		
Chassis & body	• Muffler, exhaust pipe, mountings	• Tightness • Damage						○				○			○				○				○	MA-54	
	• All doors, hood	• Rock operation • Tightness						○				○			○				○				○	MA-54	
	• Seat belt	• Operation • Tightness						○				○			○				○				○	MA-54	
	• Chassis grease	• Condition • Apply	○		○		○		○		○		○		○		○		○		○		○	MA-55	
	• Other bolts, nuts & wheel hub nuts	• Tightness	○		○		○		○		○		○		○		○		○		○		○	MA-55	
Electrical system	• Battery	• Electrolyte level		○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	MA-55	
	• Wire harness	• Tightness clamps • Damage	○		○		○		○		○		○		○		○		○		○		○	MA-55	
	• Lighting system, meter & gauge	• Function	○		○		○		○		○		○		○		○		○		○		○	MA-55	
	• Heater	• Heater hose replacement	Every 4 years																						

R7MA00004-00000

MAINTENANCE OPERATIONS

ENGINE

CYLINDER HEAD, MANIFOLD

Check of cylinder head bolts and manifold bolts tightening torque.

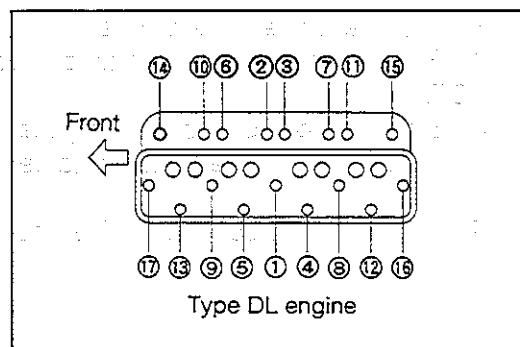
Tightening Torque:

Cylinder Head: 117.6 ± 9.8 N·m
(12.0 ± 1.0 kgf-m, 86.8 ± 7.2 ft-lb)

Manifold:

IN ... 36.75 ± 7.35 N·m
(3.75 ± 0.75 kgf-m, 27.15 ± 5.45 ft-lb)

EX ... 46.55 ± 7.35 N·m
(4.75 ± 0.75 kgf-m, 34.35 ± 5.45 ft-lb)



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NOTE:

- This tightening torque means the torque check of the head bolts, not retightening. Therefore, if you find any looseness during the torque check, retighten the bolt to the torque specified in this table.

AIR CLEANER ELEMENT

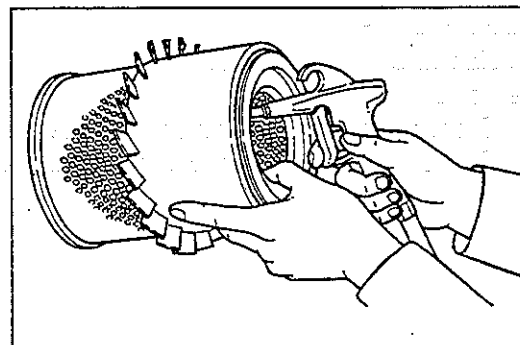
Cleaning of air cleaner element

- Remove the air cleaner element from the air cleaner case.
- Clean the element with compressed air. First blow from the back side thoroughly. Then, blow off the front side of the element.

CAUTION:

- The air pressure to be used for this cleaning operation should not exceed 392 kPa (4.0 kgf/cm²).

- Install the air cleaner element in the air cleaner.



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R7MA00007-99999

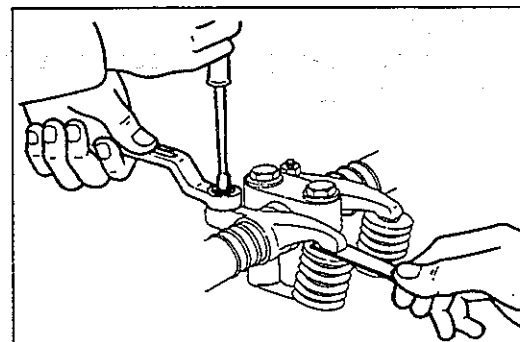
VALVE CLEARANCE (Hot condition).

Adjustment of valve clearance

NOTE:

- Check and adjust the valve clearance while the engine is hot.

Model		DL-42	DL-52
Intake	mm	0.25	
Exhaust	mm	0.25	0.35



R7MA00008-99999

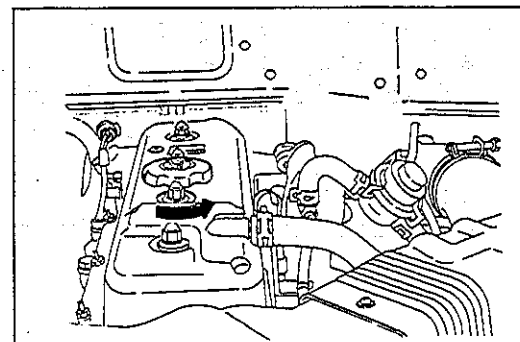
REFERENCE:

- For the valve clearance while the engine is cold, add 0.05 mm to the value for hot engine.

ENGINE OIL AND FILTER

- Engine oil change

Recommended Oil Grade: API CD or higher



R7MA00009-99999

MA-8

2. Replacement of engine oil filter

(1) Remove the oil filter with an oil filter wrench.

NOTE:

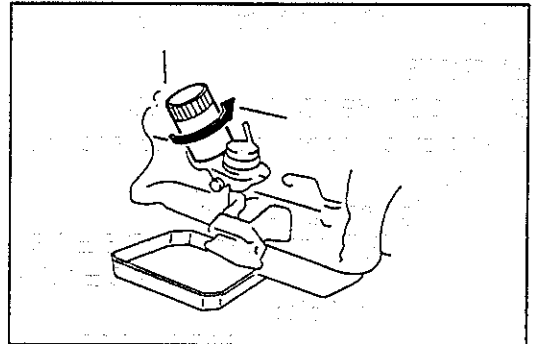
- Since the oil flows out during the replacement, receive the oil with an adequate container.

(2) Inspect and clean the oil filter installation surface.

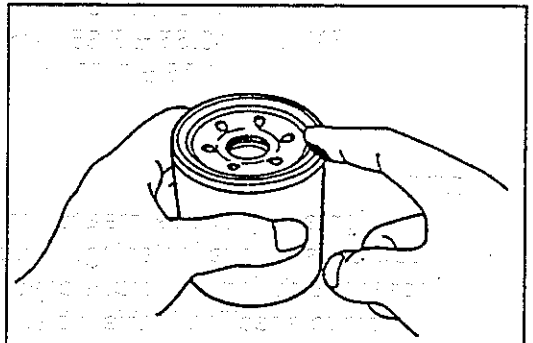
(3) Apply clean engine oil to the gasket of a new oil filter.

(4) Installation of oil filter

Screw a new filter into place and tighten it until the gasket contacts the seat. Then, make about one additional turn to seat the filter.



R7MA00010-99999



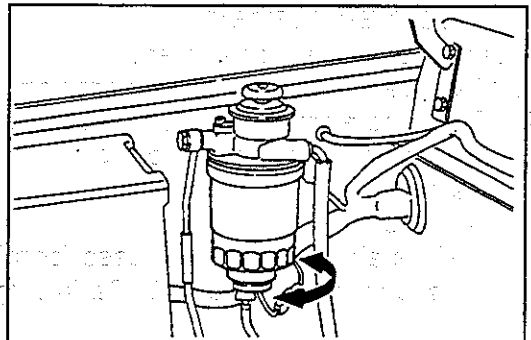
R7MA00011-99999

FUEL FILTER

Replacement of fuel filter

Removal

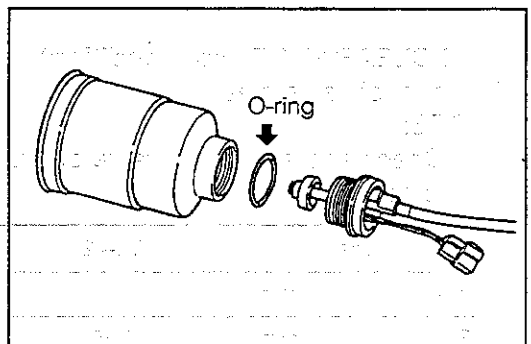
1. Disconnect the connector from the fuel filter.
2. Remove the fuel filter, using a suitable filter wrench.



R7MA00012-99999

Installation

3. With a new O-ring interposed, install the sensor assembly to the fuel filter.



R7MA00013-99999

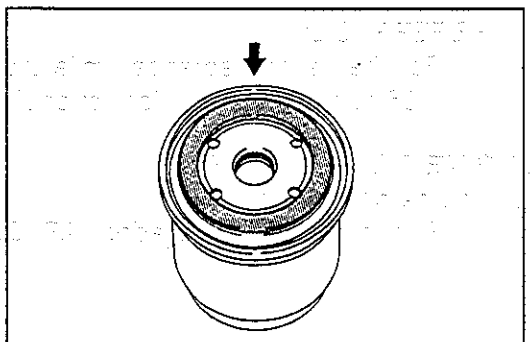
4. Apply a thin film of engine oil to the rubber gasket. Install the fuel filter by hand and tighten it with a filter wrench.

Specified Torque: $12.7 \pm 2 \text{ N}\cdot\text{m}$

$(1.30 \pm 0.2 \text{ kgf}\cdot\text{m}, 9.4 \pm 1.4 \text{ ft}\cdot\text{lb})$

5. Install the connector.

6. Perform air bleeding, using a priming pump.



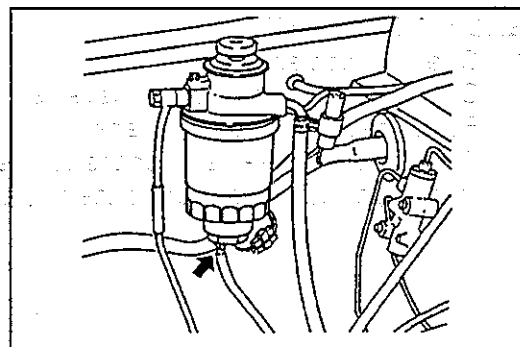
R7MA00014-99999

WATER SEDIMENTER

Draining of the trap water

If fuel drain warning lamp goes on, drain the water from fuel filter.

1. Turn the drain plug counter clockwise about half a turn.

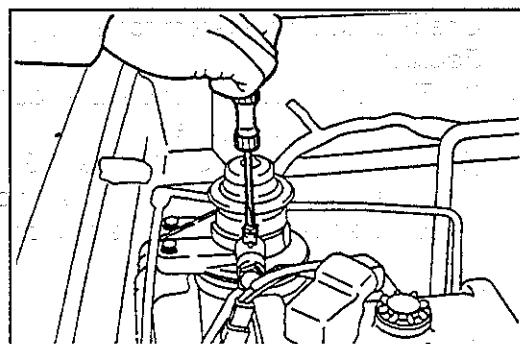


R7MA00015-99999

2. Loosen the air bleeding plug.
Water will then drain from the drain plug.

CAUTION:

- Be sure to stop the engine before draining water.
- Place a container under the drain plug so that the fuel will not splash, and if any fuel is spilled, wipe it off.
- When loosening the air bleeding plug, make sure that the spanner does not touch the plus terminal of the battery.

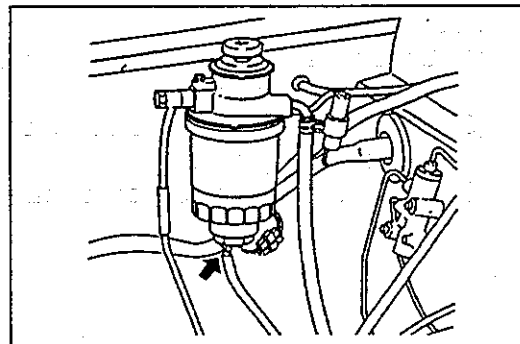


R7MA00016-99999

3. When draining is finished, tighten the drain plug securely.

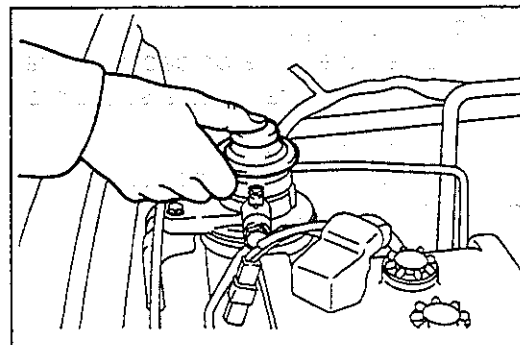
CAUTION:

- After tightening the drain plug, make sure that there is no fuel leakage from the drain plug.



R7MA00017-99999

4. Bleed the air from the fuel filter, and then tighten the air bleeding plug securely.



R7MA00018-99999

FUEL LINES AND CONNECTION

Inspection of fuel lines and connections

Visually inspect the fuel lines for cracks, leakage, loose connections or deformation.

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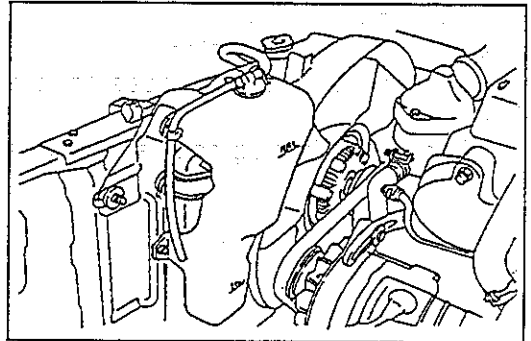
MA-10

ENGINE COOLANT

1. Check of coolant level

Check to see if the coolant level is between the LOW and FULL lines of the reserve tank.

If the coolant level is near the low level or below the low level, add the coolant up to the full level.

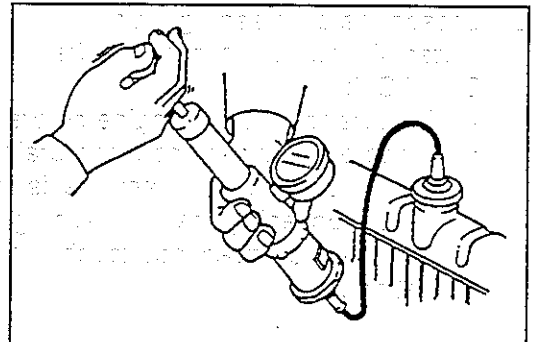


R7MA00019-99999

2. Check of cooling system for leakage

Radiator

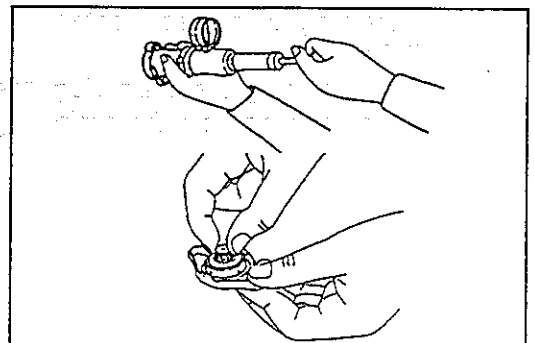
- (1) Fill the radiator with coolant. Attach a radiator cap tester.
- (2) Warm up the engine.
- (3) Apply a pressure of 117 kPa (1.2 kgf/cm²) to the cooling system by means of the radiator cap tester.
- (4) Ensure that no leakage is present.



R7MA00020-99999

Radiator cap

- (1) Check the pressure of the radiator cap valve with the radiator cap tester.
- (2) Check to see if the valve opens or closes by pulling and releasing it by hand.
- (3) Check the sealed section for damage.



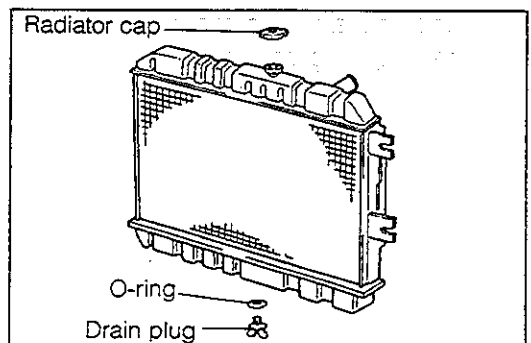
R7MA00021-99999

3. Coolant change

- (1) Open the radiator cap and drain plug and allow the coolant to drain into a suitable container.

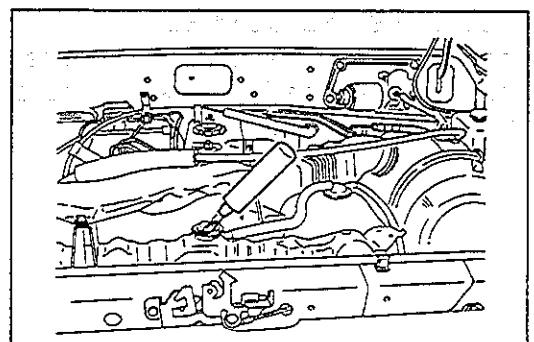
WARNING:

- Never open the radiator cap and/or drain plug when the engine is still hot.



R7MA00022-99999

- (2) Close the drain plug.
- (3) Fill the system with water.
- (4) Start the engine for two or three minutes and stop it.
- (5) Repeat the steps 1 through 4 two or three times.
- (6) Drain the coolant.
- (7) Close the drain plug with a new O-ring interposed.
- (8) Drain the coolant from the reserve tank.



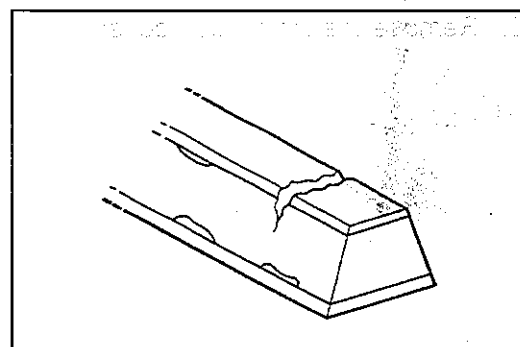
R7MA00023-99999

- (9) Pour antifreeze solution into the radiator and reserve tank in accordance with the instructions of the manufacturer of the antifreeze solution.
- (10) Fill the system with water.
- (11) Start the engine. Check to see if the coolant level in the radiator drops. If the coolant level drops, replenish water.
- (12) Install the radiator cap and reserve tank cap.
- (13) Warm up the engine, until the radiator cooling fan motor starts to rotate. Afterwards, allow the coolant to cool down to the atmospheric temperature. Recheck the coolant level at the reserve tank. Add the coolant to the full level, as required.

V-BELT

Inspection of drive belt

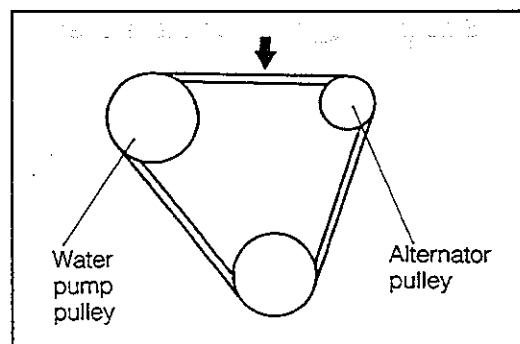
1. Visually check the V belt for separation of the adhesive rubber above and below the core, core separation from the belt side, severed core, separation of the rib from the adhesive rubber, cracks or separation of the ribs, torn or worn ribs or cracks in the inner ridges of the ribs.



R7MA00024-00000

2. Measure the amount of the drive belt deflection when the midpoint of the drive belt between the alternator and the water pump pulley is pushed with a force of 98 N (10 kgf).

Specified Belt Deflection: 10 - 13 mm

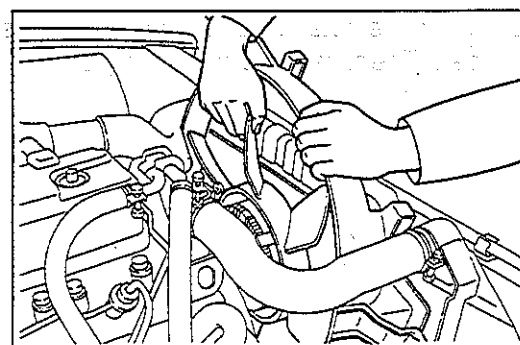


R7MA00025-99999

TIMING BELT

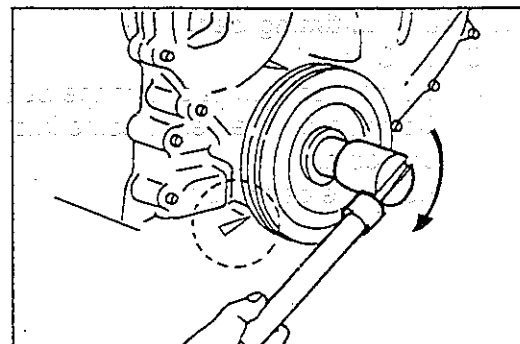
Removal of timing belt

1. Remove the cool air intake duct from air cleaner.
2. Remove the reserve-tank.
3. Temporary remove the fluid coupling with fan by loosen four nuts.
4. Remove the fan shroud and the fluid coupling with the fan.
5. Loosen the alternator attaching bolt.
6. Remove the fan pulley and V-belt.



R7MA00026-99999

7. Remove the glow plug No. 1.
8. Before pulling out the crankshaft pulley, position the piston No. 1 at the top dead center under the compression stroke.



R7MA00027-99999

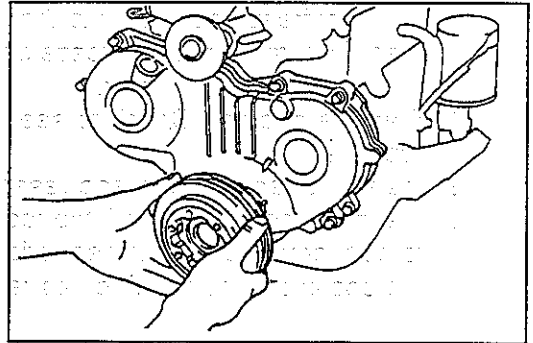
R7MA00028-99999

MA-12

9. Remove the crankshaft pulley.

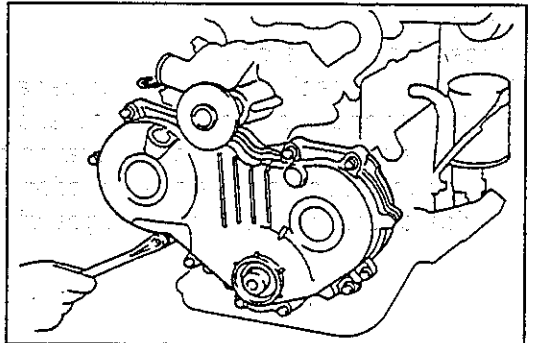
NOTE:

- Place the gear shift lever in the 5-th gear position so as to prevent the rotation of crankshaft.



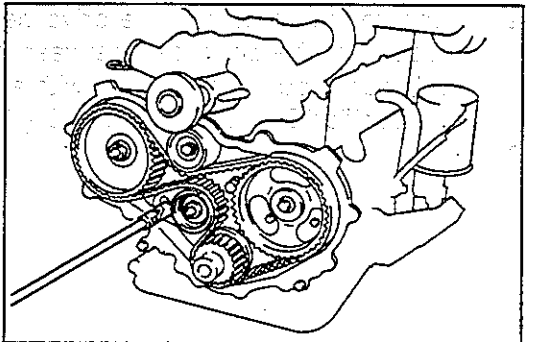
R7MA00029-99999

10. Remove the timing belt cover.



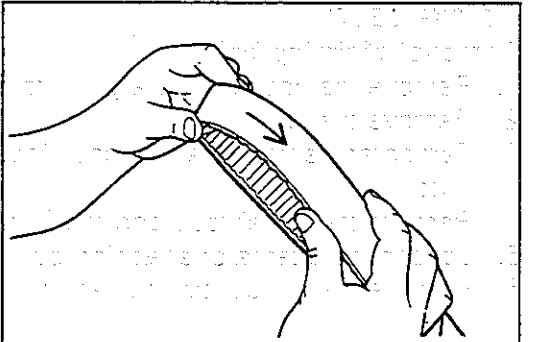
R7MA00030-99999

11. Slacken the timing belt tensioner.



R7MA00031-99999

12. Mark the rotation direction on the back side of the timing belt. Then, remove the timing belt.

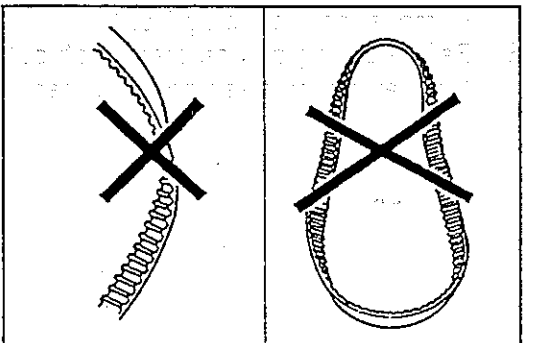


R7MA00032-99999

Inspection of timing belt

CAUTION:

- Do not bend, twist or turn the belt inside out.
- Do not allow the belt to come into contact with oil, water or steam.
- Keep the belt clean.



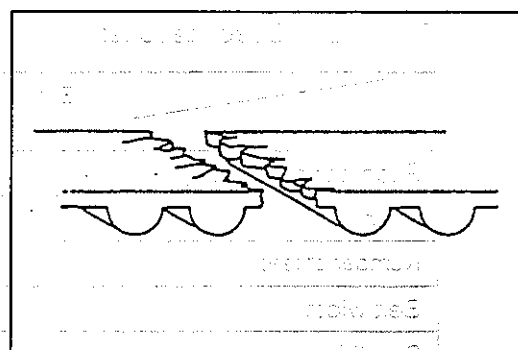
R7MA00033-99999

If there are defects, as shown in the figures, check the following points and replace the timing belt, if necessary.

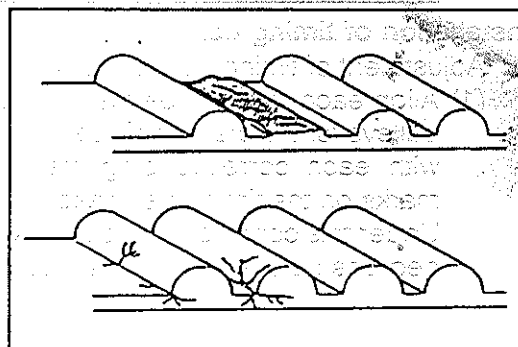
1. Premature separation

Check for proper installation.

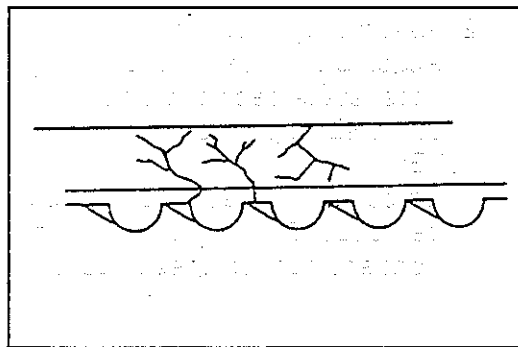
Check the timing gear cover gaskets for damage and check for correct installation.



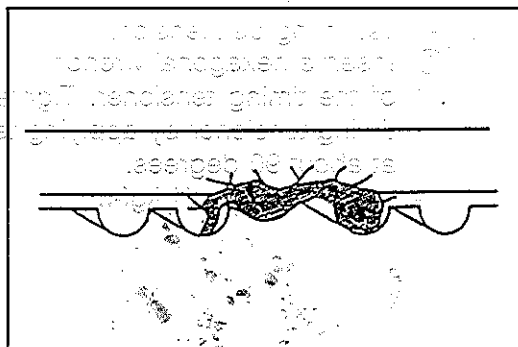
2. If the belt teeth are cracked or damaged, check to see if the camshaft is seized.



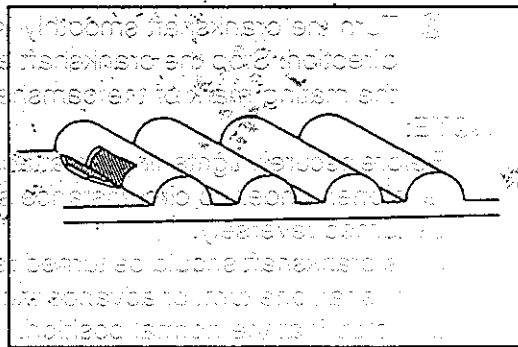
3. If there is noticeable wear or cracks on the belt face, check to see if there are nicks on one side of the idler pulley lock.



4. If there is wear or damage on only one side of the belt, check the pulley flange.



5. If there is noticeable wear on the belt teeth, check the timing cover gasket for damage and check for correct gasket installation. Check for foreign material on the pulley teeth.



MA-14

Timing Belt Specifications:

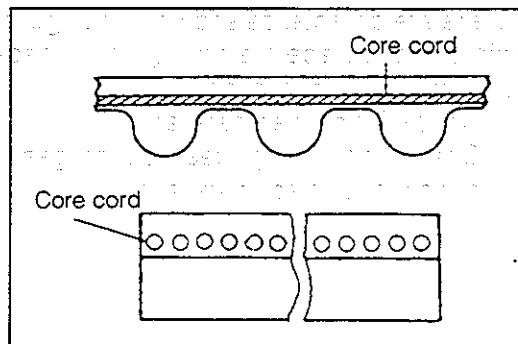
Item	Engine type	DL 42-52
Pitch peripheral length	(mm)	1028.7
Pitch	(mm)	9.525
Number of teeth		108
Belt width	(mm)	31.8
Belt thick	(mm)	5.4

Installation of timing belt

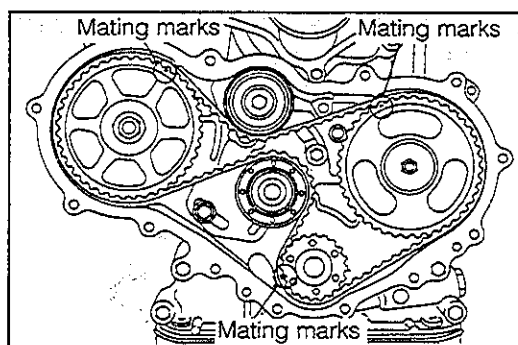
1. Adjustment of timing belt tension

- (1) Align each of the three mating marks of the timing belt pulleys for the crankshaft, camshaft and injection pump with each corresponding mark of the three mating marks on the timing belt case.

Under this condition, the piston No. 1 is set to about 30 degrees before the top dead center.



R7MA00039-99999



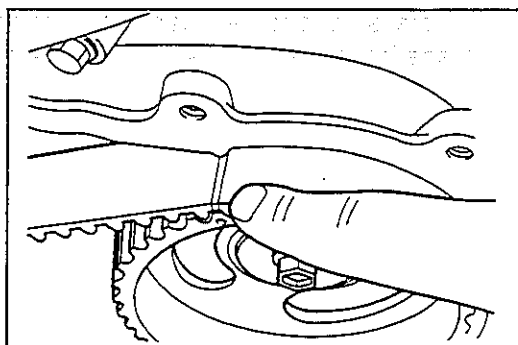
R7MA00040-99999

(2) Assembling of timing belt

Assemble the belt in such a way that the marks (yellow lines) at the back and side of the timing belt may come at the same position on the front.

NOTE:

- Be sure to displace the front end surface of the timing belt about 2 mm toward the timing belt case from the front end surface of each pulley.

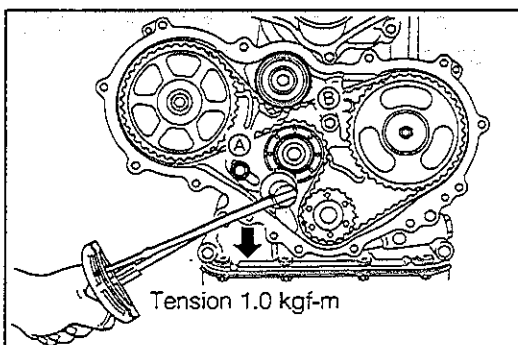


R7MA00041-99999

(3) Adjust timing belt tension.

- ① Insert a hexagonal wrench into the hexagonal hole of the timing tensioner. Tighten the bolt (A) of the timing tensioner by applying tension to the wrench at about 90 degrees.

Tension: 9.8 N·m (1 kgf·m)

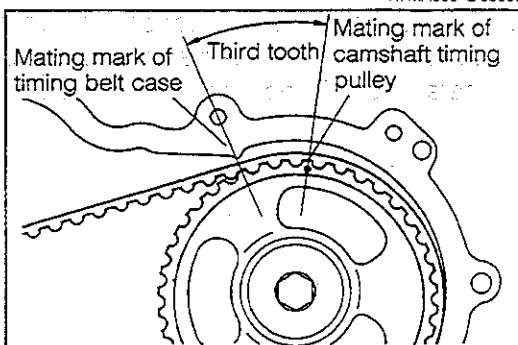


R7MA00042-99999

- ② Turn the crankshaft smoothly in the normal rotating direction. Stop the crankshaft at the third tooth from the mating mark of the camshaft pulley.

NOTE:

- Before securely tightening the attaching bolt of the timing tensioner, under no circumstance should the crankshaft be turned reversely.
- If the crankshaft should be turned reversely, back off the crankshaft one turn, or advance the crankshaft two turns and stop it at the normal position.



R7MA00043-99999

- ③ Loosen the bolt ④ of the timing tensioner. Perform the step (3) again.
- ④ Tighten the bolt ⑤ of the timing tensioner.

- ⑤ To check that the timing belt tension meets the specification, measure the deflection of the timing belt between the crankshaft timing belt pulley and the camshaft timing belt pulley when the specified pushing force is applied.

Specified Deflection: 1.8 mm

Specified Pushing Force: $18.6 \pm 6.9 \text{ N}$
($1.9 \pm 0.7 \text{ kgf}$)

If the measured deflection and pushing force do not meet the specification, perform the steps ① through ⑤ repeatedly to obtain the specified deflection.

2. Install the timing belt cover.

Tightening Torque: $12.5 \pm 3.0 \text{ N}\cdot\text{m}$
($1.27 \pm 0.31 \text{ kgf}\cdot\text{m}$)

3. Install the crankshaft pulley.

Tightening Torque: $215.7 \pm 19.6 \text{ N}\cdot\text{m}$
($22.00 \pm 2.0 \text{ kgf}\cdot\text{m}$)

NOTE:

- Place the gear shift lever in the 5-th gear position so as to prevent the rotation of crankshaft.

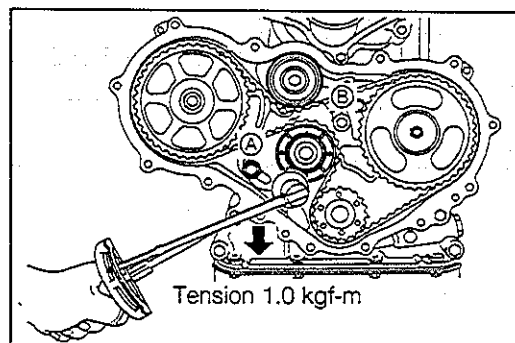
4. Install the radiator fan shroud.
5. Install the fan pulley and V-belt.
6. Install the fluid coupling with fan.

Specified V-belt Tension:

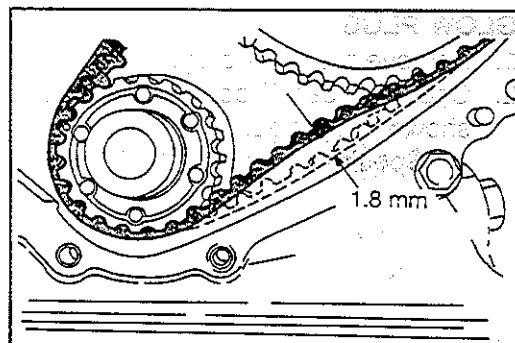
New belt: 8 - 11 mm

Used belt: 10 - 13 mm

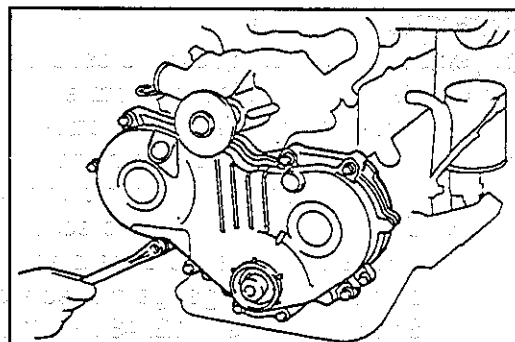
[With a force of 98 N (10 kgf) applied]



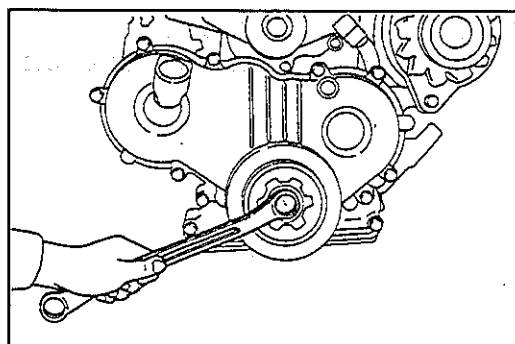
R7MA00044-99999



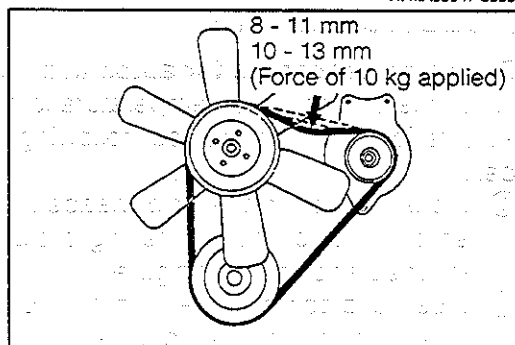
R7MA00045-99999



R7MA00046-99999



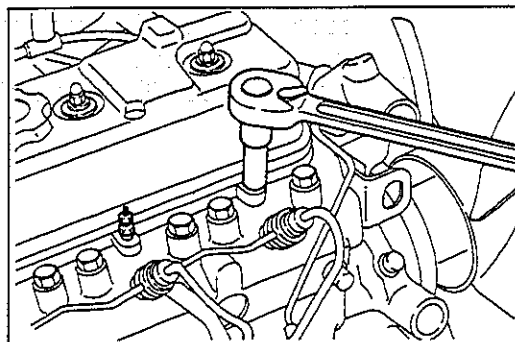
R7MA00047-99999



R7MA00048-99999

MA-16

7. Install the glow plug.
Tightening Torque: $12.8 \pm 2.9 \text{ N}\cdot\text{m}$
($1.30 \pm 0.3 \text{ kgf}\cdot\text{m}$)
8. Install the cool air intake duct in the air cleaner.

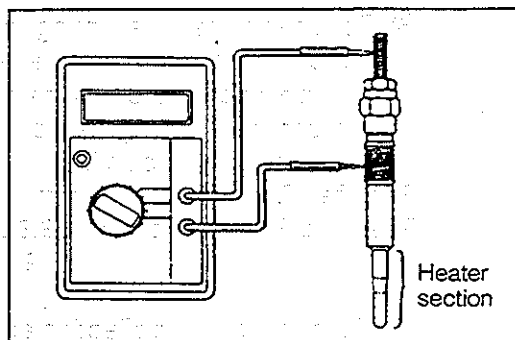


R7MA00049-99999

GLOW PLUG

1. Remove the glow plug.
2. Check to see if continuity exists, using an ohmmeter as shown in the figure.

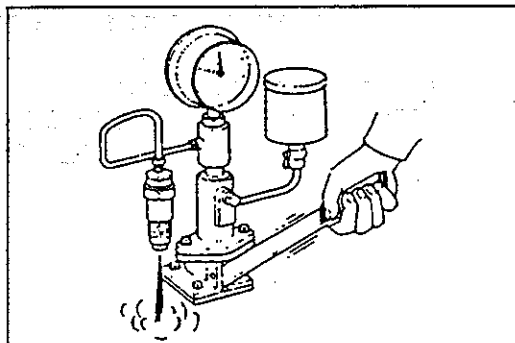
Specified Torque: $12.7 \pm 3 \text{ N}\cdot\text{m}$
($1.3 \pm 0.3 \text{ kgf}\cdot\text{m}$, $9.4 \pm 2.2 \text{ ft}\cdot\text{lb}$)



R7MA00050-99999

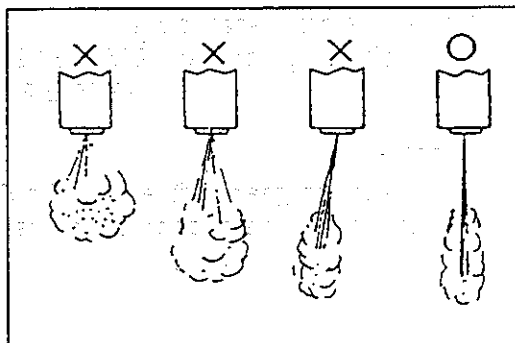
INJECTION NOZZLE

1. Measurement of injection pressure of injection nozzle
 - (1) Remove the injection nozzle.
 - (2) Install the nozzle to the nozzle tester. Inject the nozzle two or three times by moving the tester lever quickly so that any carbon will be blown from nozzle end.
 - (3) Gradually increase the pressure by pushing the tester lever slowly. Measure the pressure at which the pointer of the pressure gauge makes a sharp drop.Specified Value: 12748 kPa (130 kgf/cm^2)



R7MA00051-99999

2. Check of spray condition
Operate the pump lever at a rate of 50 to 60 times per minute.



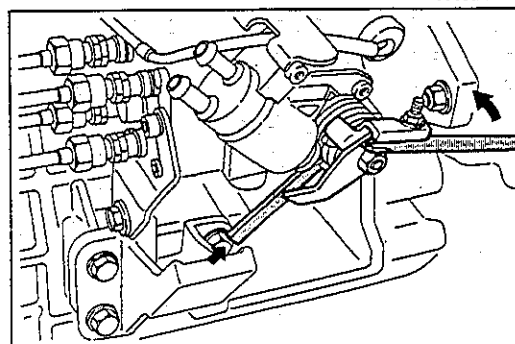
R7MA00052-99999

INJECTION TIMING

Releasing procedure for automatic cold start device

When the engine water temperature is below 60°C , release the automatic cold start device, following the procedures given below.

- ① Make rotation in the arrowheaded direction by inserting a screwdriver or the like having a diameter of 8 mm into the lever as shown in the figure.
- ② Insert a block of 8.5 - 10 mm thickness into between the lever and thermo wax plunger.



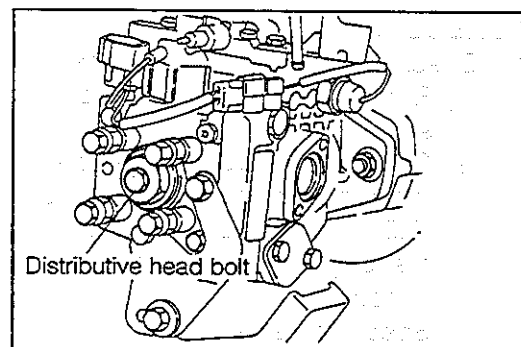
R7MA00053-99999

- (1) Remove the distributive head bolt on the injection pump. Then, install the following SST and set a dial gauge.

SST: 09275-87701-000

NOTE:

- Ensure that the measuring pin of the dial gauge contacts the flat section of the plunger.
- Ensure that no dust gets into the pump.

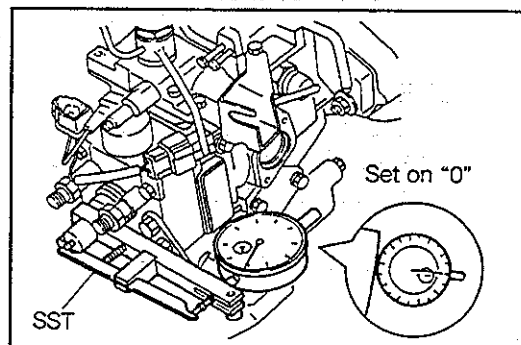


R7MA00054-99999

- (2) Set the dial gauge pointer to the O-position when the crankshaft is set to 60° before the top dead center.

NOTE:

- At this time, turn slightly the crankshaft pulley to the right and left sides and make sure that the pointer is stable at the O-position.



R7MA00055-99999

- (3) Turn the crankshaft in the normal direction, until the pointer is aligned with the 0° BTDC (0° in the case of high altitude specifications). At this setting, note the reading of the dial gauge.

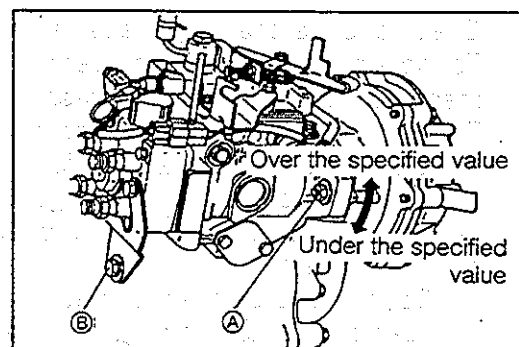
Specified Value: 1.06 ± 0.03 mm

R7MA00056-00000

- (4) Adjust the injection timing as follows:

Slacken the attaching sections of the injection pump proper at the following points given below. Adjust the injection timing by moving the pump proper.

- Injection pump attaching nuts (A)
- Lower bracket attaching bolt (B)



R7MA00057-99999

- (5) Perform the injection timing check again and ensure that the injection timing is proper.
- (6) Remove the SST. Install the distributive head bolt with the new copper washer interposed.

Tightening Torque: 16.7 ± 2.9 N·m

(1.7 ± 0.3 kgf-m, 12.3 ± 2.2 ft-lb)

R7MA00058-00000

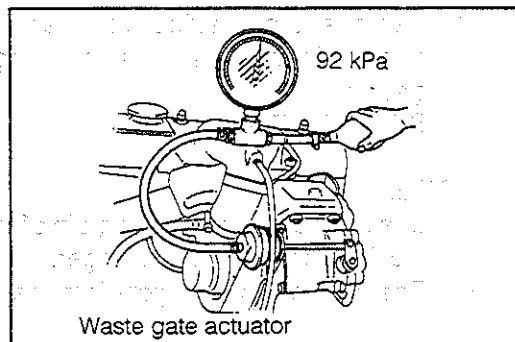
MA-18

TURBOCHARGER

1. Checking operation of turbocharger waste gate valve
 - (1) Remove the waste gate actuator hose at the actuator side.
 - (2) Connect the turbocharger pressure gauge. Ensure that the rod and link operate when a pressure of 92 kPa (0.94 kgf/cm²) is applied and that the valve returns to the original position smoothly when the pressure is released.

Specified Value

Shaft Stroke: About 2 mm With a pressure of 92 kPa (0.94 kgf/cm²)



R7MA00059-99999

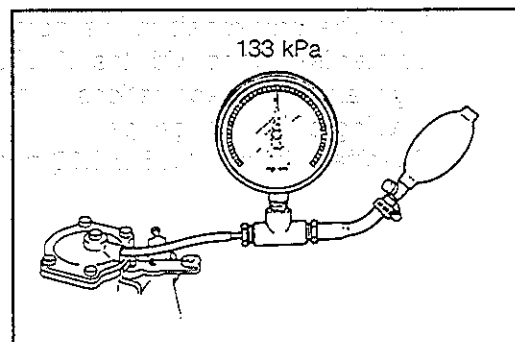
NOTE:

- If the pressure exceeding 117 kPa (1.2 kgf/cm²) should be applied to the waste gate actuator, the diaphragm may be damaged.

- (3) Check the hose for crack and damage.

2. Checking air-tightness of boost compensator
 - (1) Connect the turbocharger to the boost compensator.
 - (2) Apply a positive pressure of 133 kPa (1.36 kgf/cm²) and measure the time required for the pressure to drop to 130 kPa (1.33 kgf/cm²)

Specified Value: Not less than 10 seconds

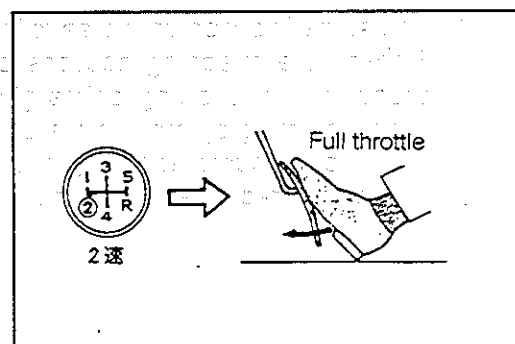


R7MA00060-99999

3. Check of supercharging pressure (running test)
To obtain total evaluation, perform a running test and measure the supercharging pressure.

The running test must be carried out at a place where the vehicle can be accelerated safely with full throttle of the accelerator pedal in the second gear. One person drives a vehicle and the other person performs measurement. (Two persons aboard)

- (1) Connect a turbo charger pressure gauge to the vacuum hose of the intake manifold with a three-way joint interposed. Place the gauge in the vehicle interior.
- (2) After the engine has warmed up, accelerate the vehicle at full throttle up to 3,500 rpm with the second gear.



R7MA00061-99999

- (3) Measure the maximum supercharging pressure generated while the vehicle is accelerated up to 3,500 rpm.

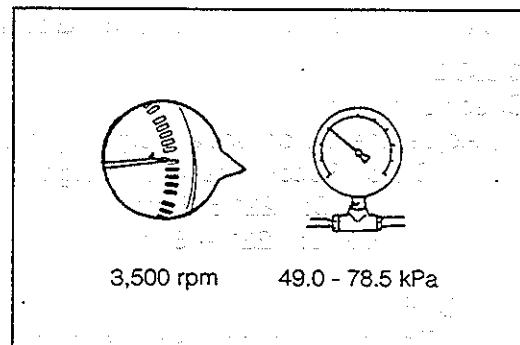
Specified Value: 49 - 78 kPa (0.50 - 0.80 kgf/cm²)

If the measured value is less than the specified value, most likely there exists the following malfunction.

- ① Leakage at waste gate valve
- ② Improper increase in injection amount of boost compensator or bent vacuum hose
- ③ Leakage at intake or exhaust system
- ④ Air cleaner, muffler, fuel filter and so forth restricted
- ⑤ Turbo charger malfunction
- ⑥ The engine proper faulty

If the measured value exceeds the specified value, most likely there exists the following malfunction.

- ① Malfunctioning injection pump



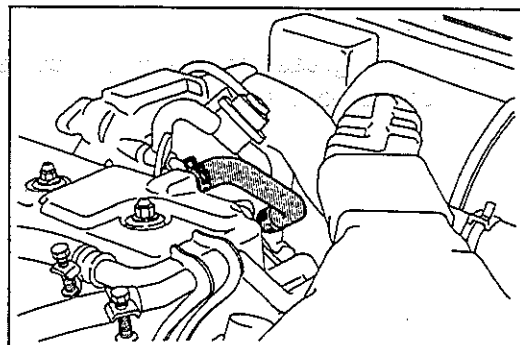
R7MA00062-99999

EXHAUST EMISSION CONTROL SYSTEM

BLOW-BY GAS SYSTEM

Inspection of blow-by gas recirculating system.

Check the hose, connections for cracks, leaks or damage.



R7MA00063-99999

MA-20

POWER TRANSMITTING SYSTEM

CLUTCH

Check of clutch

- (1) Adjust the clutch pedal height by means of the set bolt.

Clutch Pedal Installation Height:

L.H.D: 221 ± 3 mm

R.H.D: $221 + 6$ mm

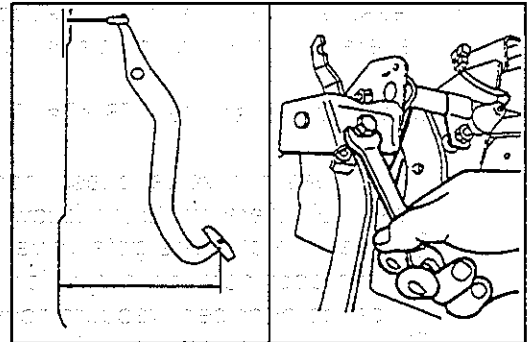
NOTE:

- The clutch pedal height should be measured from the body metal by rolling up the carpet and floor mat.

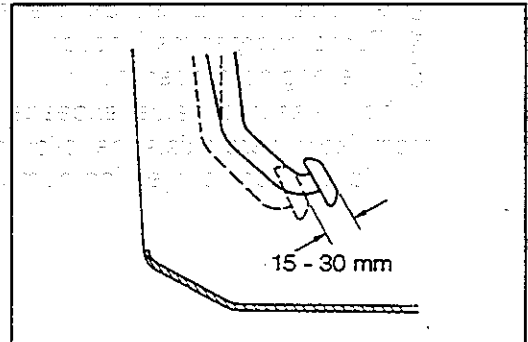
- (2) Connect the clutch cable to the clutch pedal. Adjust the clutch free travel.

Adjust the clutch free travel by moving the E-ring of the clutch cable.

Specified Clutch Free Travel: 15 - 30 mm



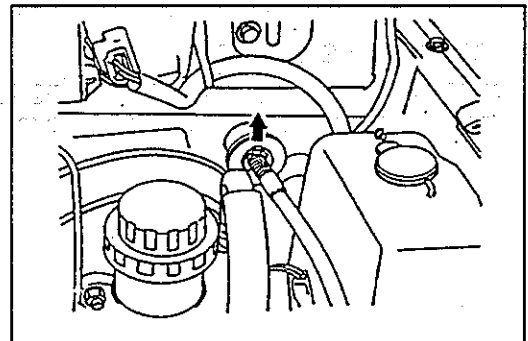
R7MA00060-99999



R7MA00061-99999

NOTE:

- Apply grease to the clutch cable and the installation section of the pedal.



R7MA00062-99999

TRANSMISSION AND DIFFERENTIAL

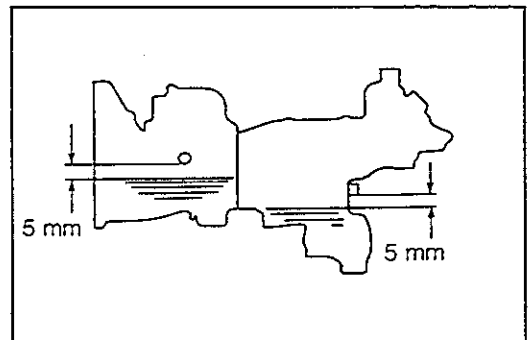
Checking of oil level and leakage

- (1) Checking of oil level and leakage

Oil should be up to the filler plug hole.

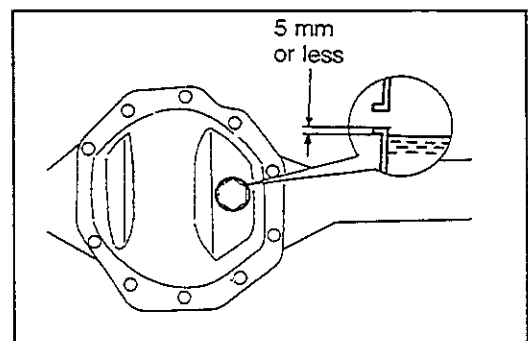
Add oil if low and inspect for oil leakage.

- (2) Oil change



R7MA00063-99999

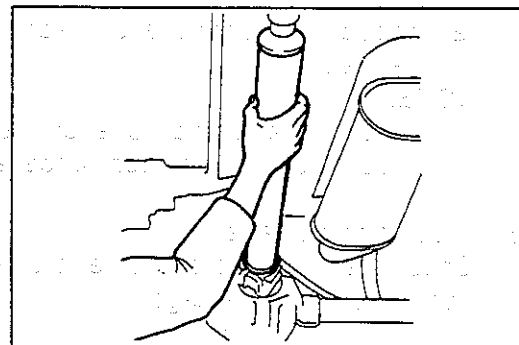
		Grade/Viscosity	liter
Transmission		API GL-3/SAE 75W-85	2.0
Transfer		API GL-3/SAE 75W-85	2.4 w/ PTO 1.4 w/o PTO
Differential	Front	API GL-5/SAE 90	1.5
	Rear	↑	↑



R7MA00064-99999

PROPELLER SHAFT

Check propeller shaft for rattle and damage.



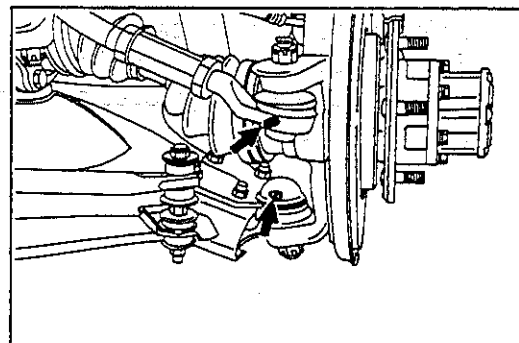
R7MA00065-99999

SUSPENSION SYSTEM

SUSPENSION ARM, CONTROL ARM AND DUST COVER

Check of following parts

- (1) Check the suspension arm for damage.
- (2) Check the control arm, rod for damage.
- (3) Check the dust cover for cracking, damage or tears.
- (4) Check all parts of suspension for tightness.
- (5) Check the arm connecting section for excessive play.
- (6) Supply a grease to the lower ball-joint and the tie-rod end.



R7MA00066-99999

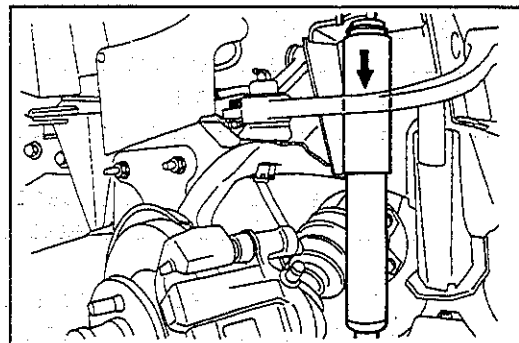
SHOCK ABSORBER

Check of performance

Bounce the front end of the vehicle and check that the bound and rebound action should be quickly damped.

Check of leakage and damage

Check fluid leakage and damage.



R7MA00067-99999

RUNNING SYSTEM

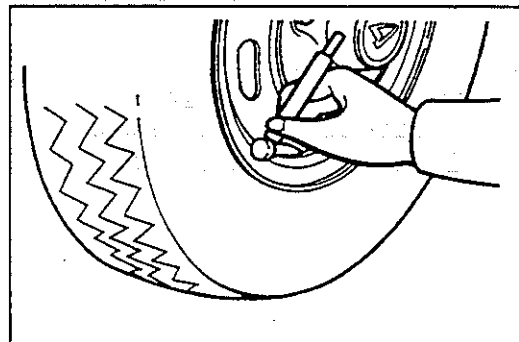
TIRES

1. Air pressure

- (1) Check to see if the tire air pressure conforms to the specification, using a tire gauge.
- (2) Ensure that no air leaks from the tire valve and that the valve cap is attached.

NOTE:

- For the specified air inflation pressure, see the caution plate attached to the vehicle. Be very careful not to overinflate the tires excessively.



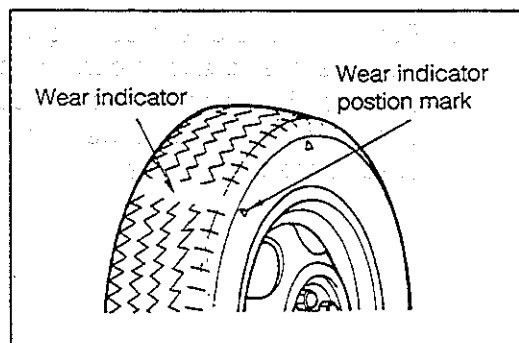
R7MA00067-99999

2. Wear

- (1) Inspect the tread section for wear. Ensure that the groove depth is at least 1.6 mm.

NOTE:

- Care must be exercised as to the wear indicator mark. (When the remaining groove depth is reduced to less than 1.6 mm, the wear indicator mark will become visible.)



R7MA00068-99999

MA-22

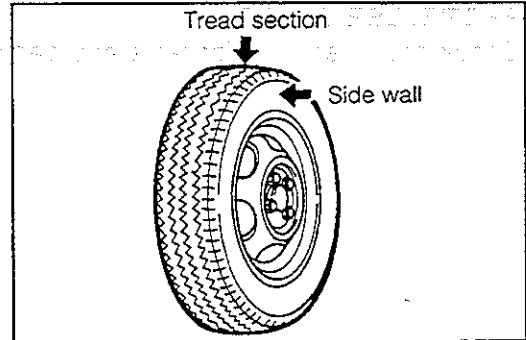
- (2) Inspect the tire for uneven wear, ridge and other abnormal wear.

NOTE:

- If the tires exhibit an uneven wear pattern, check the wheel balancing and front wheel alignment.

3. Crack and damage

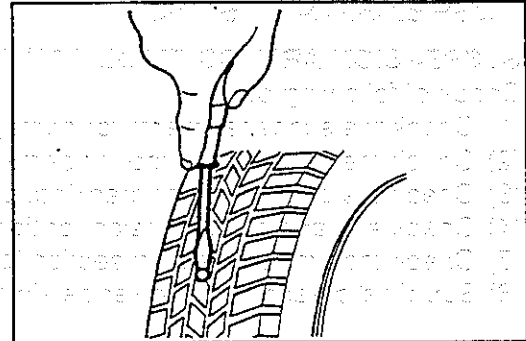
Check that the tread section and side wall section are free from cracks and damage.



R7MA00069-99999

4. Objects caught in tire pattern

Ensure that no nail, metal chip, gravel or other foreign matters lodge at the grooves of each tire, or none of them sticks into the tire.



R7MA00070-99999

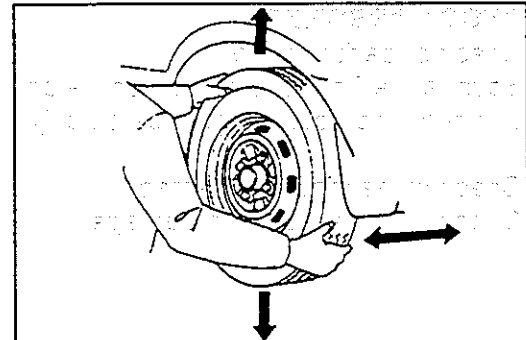
WHEEL BEARING

1. Check of front and rear wheel for rattle

- (1) Jack up the vehicle.
- (2) Alternatively push and pull upper and lower parts of the tire.
- (3) If excessive play is found, perform the check while the brake pedal is being depressed.

If not loose: Wheel bearing is loose.

If still loose: Knuckle section or other suspension parts are loose.

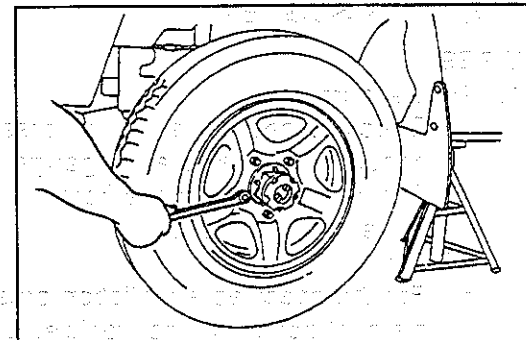


R7MA00071-99999

2. Grease change

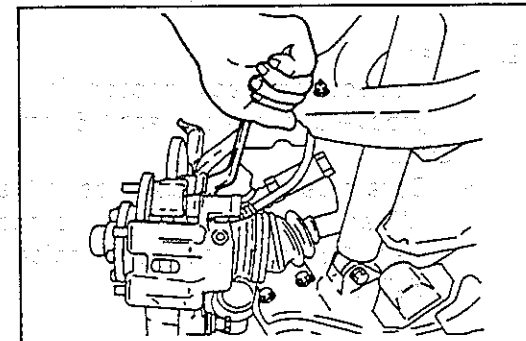
<Front wheel bearing>

- (1) Jack up the vehicle and support it with safety stands.
- (2) Remove the front wheel.



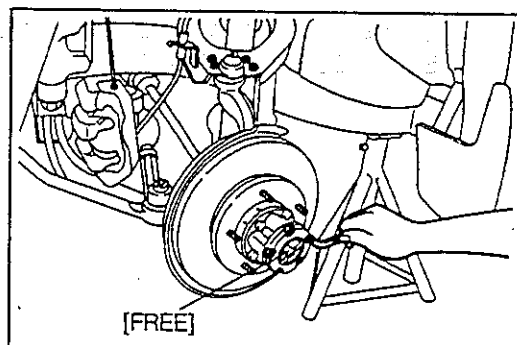
R7MA00072-99999

- (3) Remove the brake mounting support attaching bolts. Remove the brake mounting support together with calipers. Suspend the brake mounting support from the upper frame in such a way that no undue force is applied to the brake hose.



R7MA00073-99999

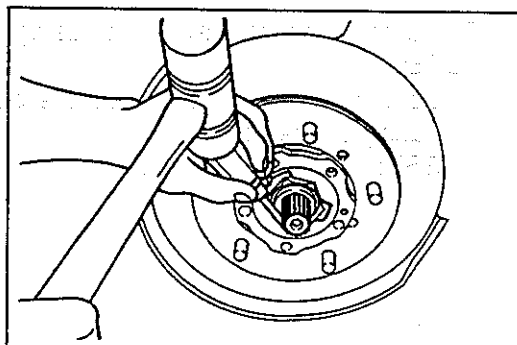
(4) Removal of free wheel hub



R7MA00074-99999

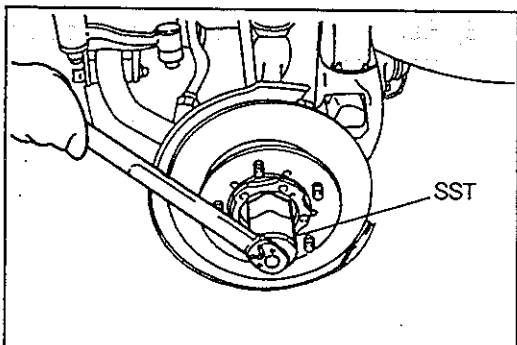
(5) Removal of lock nut (except automatic locking hub-equipped vehicle)

- ① Raise the pawl of the lock washer by means of a chisel or the like.



R7MA00075-99999

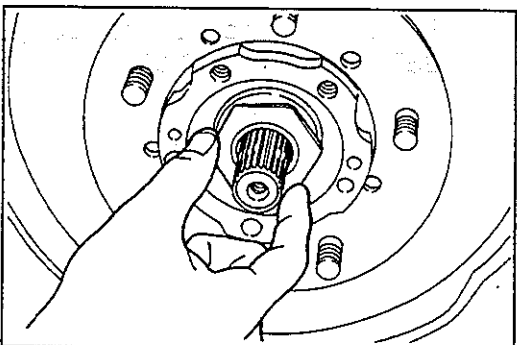
- ② Remove the lock nut, using the following SSTs.
SST: 09607-87602-000



R7MA00076-99999

- ③ Remove the lock washer.

- ④ Remove the lock nut, using the same SSTs as the step ②.

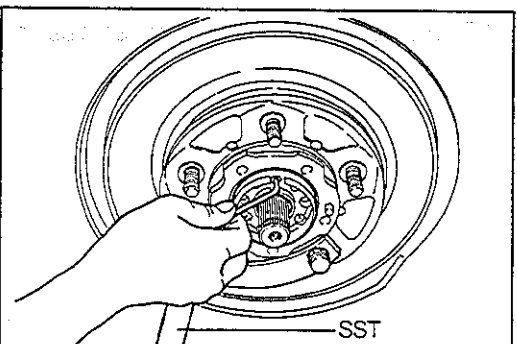


R7MA00077-99999

(6) Removal of lock nut (Automatic locking hub-equipped vehicle only)

- ① While preventing the brake drum from turning, remove the brake drum by means of a torque wrench. For this operation, use the following SST.

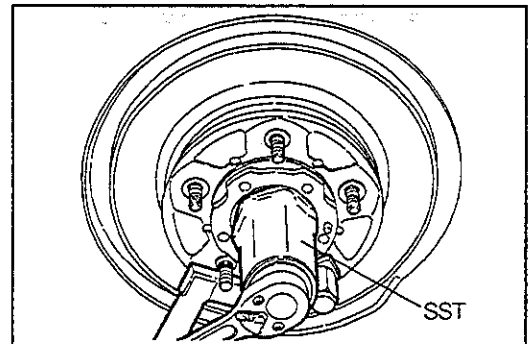
SST: 09511-87202-000



R7MA00078-99999

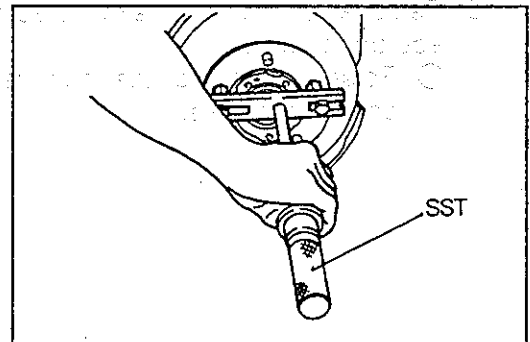
MA-24

- ② Remove the lock nut, using the following SSTs.
SST: 09607-87603-000

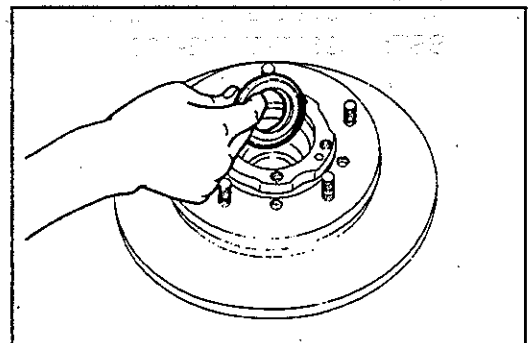


- (7) Remove the front axle hub, using the following SST.
NOTE:

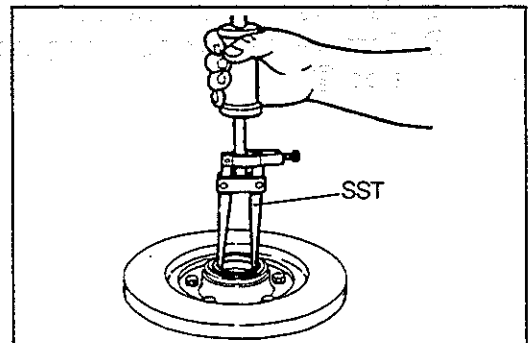
- Be very careful not to drop the outer bearing and hub during the removal.
- SST: 09520-00031-000



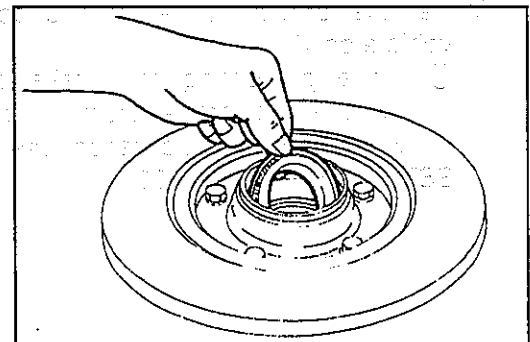
- (8) Remove the tapered roller outer bearing (outer side) from the hub.



- (9) Remove the type T oil seal, using the following SST.
SST: 09308-00010-000

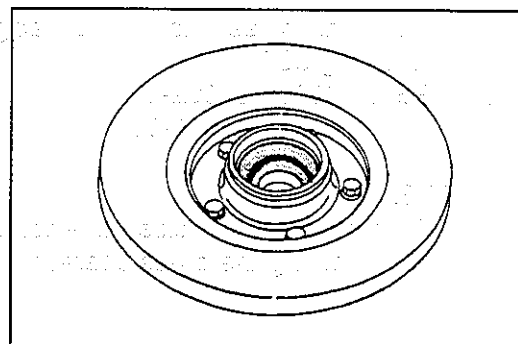


- (10) Remove the tapered roller bearing (inner-side).



- (11) Fill the specified amount of lithium-based MP grease to a space between the outer races of the inner and outer bearings.

Filling Amount: 27 grams or more



R7MA00084-99999

- (12) Fill lithium-based MP grease to the inner and outer bearings.

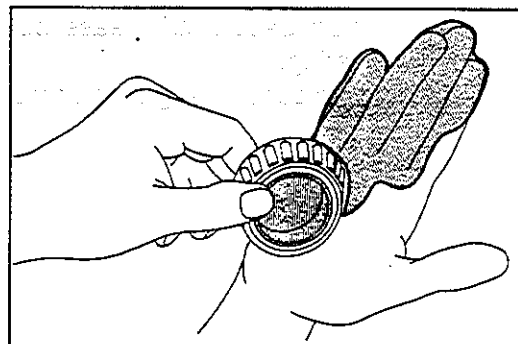
NOTE:

- Fill grease to a space between the inner race and the bearing guide, until the grease oozes from the inside of the bearing guide. Then, apply grease to the surface.

Filling Amount:

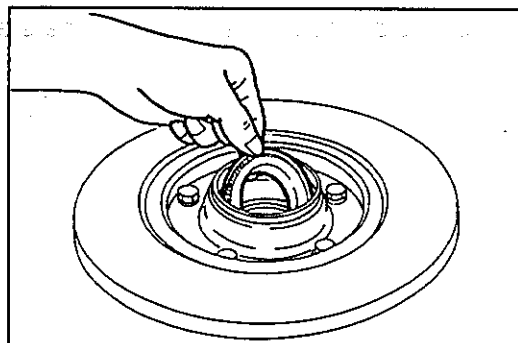
Outer bearing — 14 grams or more

Inner bearing — 16 grams or more



R7MA00085-99999

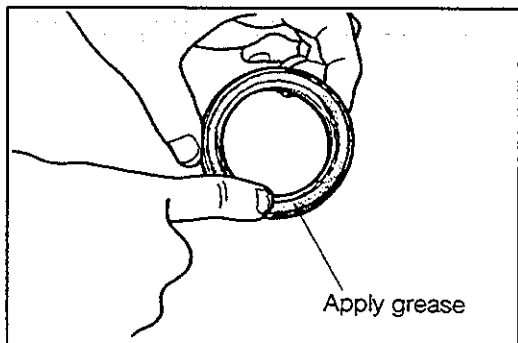
- (13) Install the inner bearing to the hub.



R7MA00086-99999

- (14) Fill the specified amount of lithium-based MP grease to the back side of the oil seal lip section.

Filling Amount: 14 grams or more

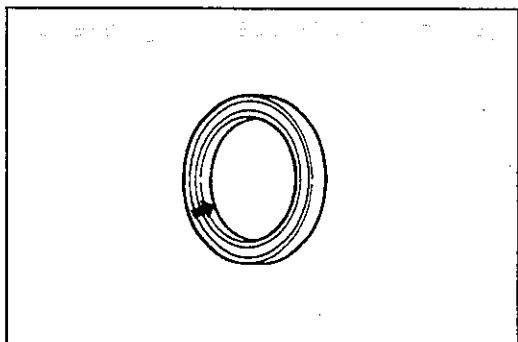


Apply grease

R7MA00087-99999

- (15) Apply lithium-based MP grease to the lip section of the oil seal.

Filling Amount: 2 grams or more



R7MA00088-99999

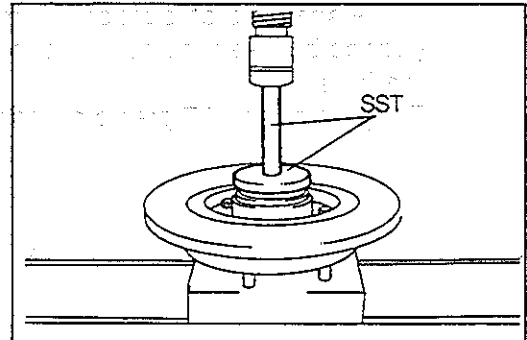
MA-26

- (16) Press the oil seal to the hub edge surface, using the following SST.

SST: 09608-87602-000
09611-87506-000

NOTE:

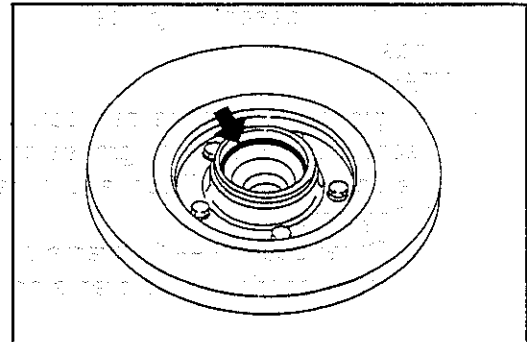
- Care must be exercised to ensure that the oil seal will not tilt during the press operation.



R7MA00089-99999

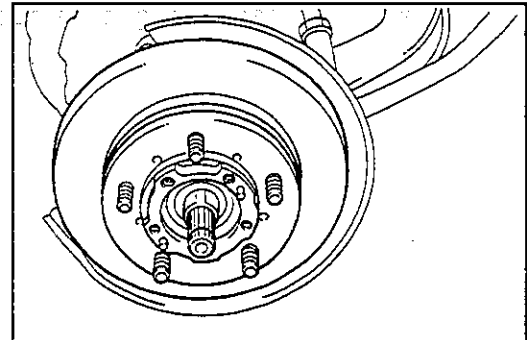
- (17) Fill lithium-based MP grease between the oil seal and the bearing.

Filling Amount: 14 grams or more



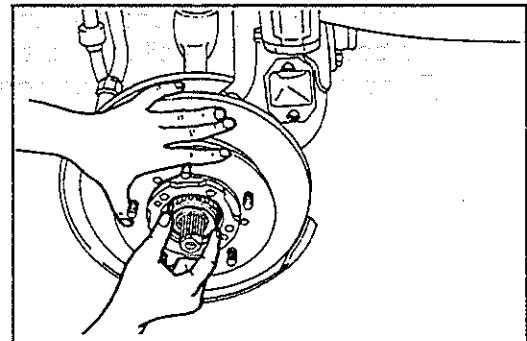
R7MA00090-99999

- (18) Install the front axle hub to the steering knuckle.



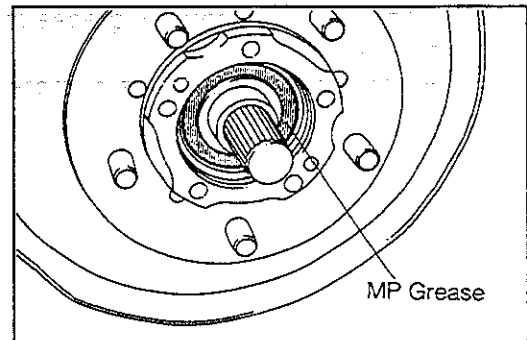
R7MA00091-99999

- (19) Insert the outer bearing into the front axle hub.



R7MA00092-99999

- (20) Fill lithium-based MP grease to the outer bearing.



R7MA00093-99999

- (21) Tighten the lock nut to the specified torque, using the following SST. Then, back off the lock nut one sixth turn.

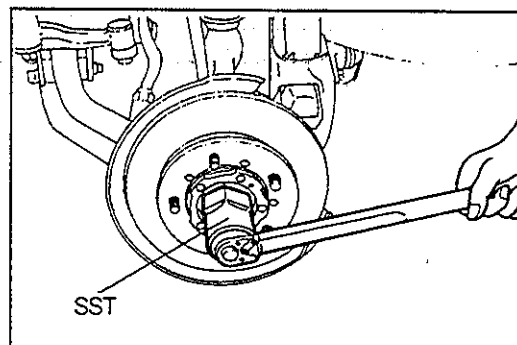
SST: Manual locking hub-equipped vehicle:

09607-87602-000

Automatic locking hub-equipped vehicle:

09607-87603-000

Tightening Torque: 98.0 - 147 N·m (10 - 15 kgf·m)



R7MA00094-99999

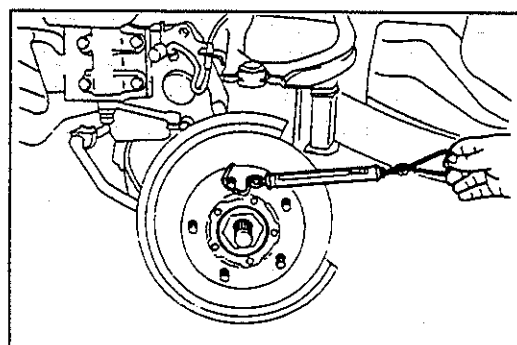
- (22) Rotate the axle hub two or three turns so that the axle hub may be bedded in.

- (23) Adjust the lock nut so that the starting torque may conform to the specified value.

Starting Load: 13.7 - 35.3 N (1.4 - 3.6 kgf)

[Reference]

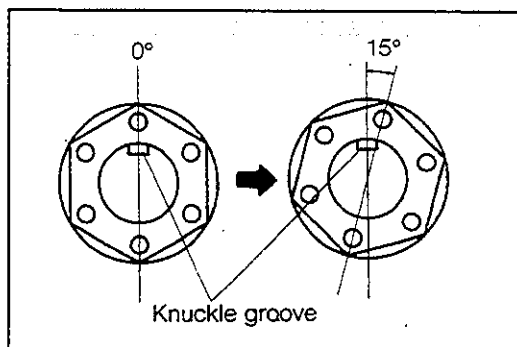
Starting Torque: 1 - 2.5 N·m (10 - 25 kgf·cm)



R7MA00095-99999

NOTE:

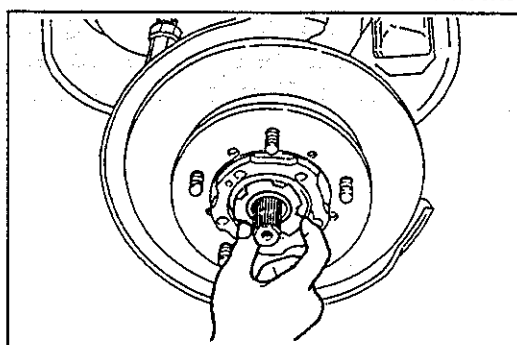
- Adjust the automatic locking hub nut in such a way that the hub nut position comes at the position indicated in the right figure after completion of the adjustment.



R7MA00096-99999

- (24) Installation of lock washer and lock nut (except automatic locking hub-equipped vehicle)

① Install the lock washer.



R7MA00097-99999

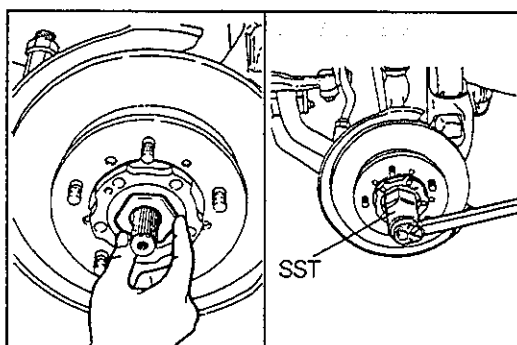
- ② Tighten the lock nut to the specified torque, using the following SST.

SST: 09607-87602-000

Tightening Torque: 98.0 - 147 N·m (10 - 15 kgf·m)

- ③ Ensure that the starting torque is within the specifications.

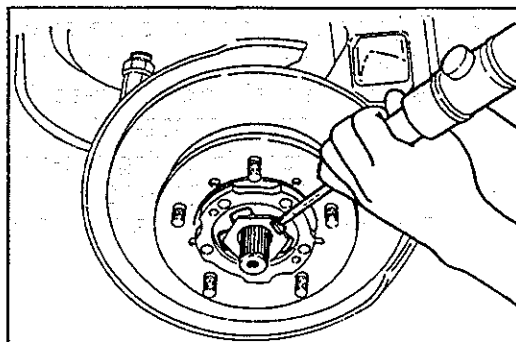
If not, adjust the lock nut back-off amount described at the step 21. Perform the operations from the step 21 onward again.



R7MA00098-99999

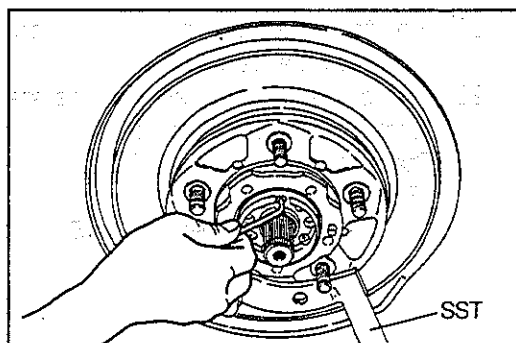
MA-28

- ④ Bend the tang of the lock washer toward the lock nut edge surface at the inner and outer sides.



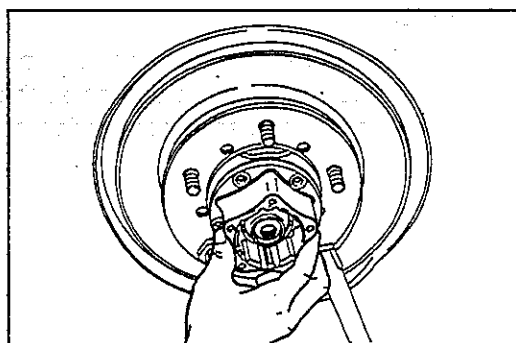
R7MA00099-99999

- (25) Install the brake drum and tighten the attaching screws (torque screws) to the specified torque. (Automatic free wheel hub-equipped vehicle only)
Tightening Torque: 4.9 - 8.8 N·m (0.5 - 0.9 kgf·m)



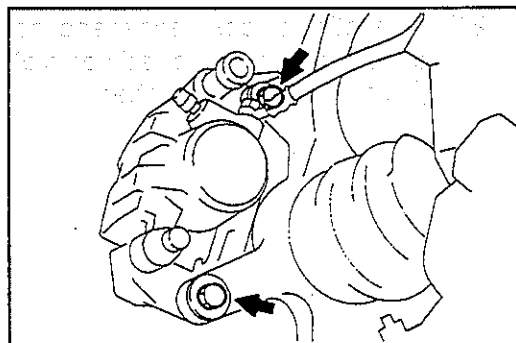
R7MA00100-99999

- (26) Installation of free wheel hub



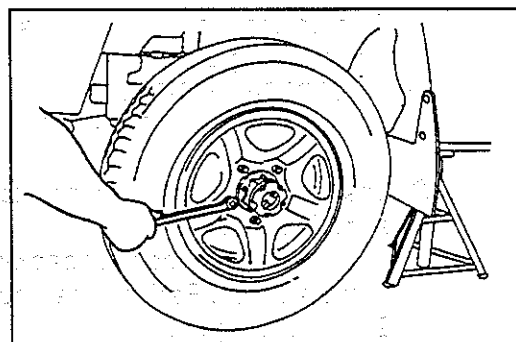
R7MA00101-99999

- (27) Install the brake mounting support together with calipers to the steering knuckle.
Tightening Torque: 68.6 - 88.3 N·m (7.0 - 9.0 kgf·m)



R7MA00102-99999

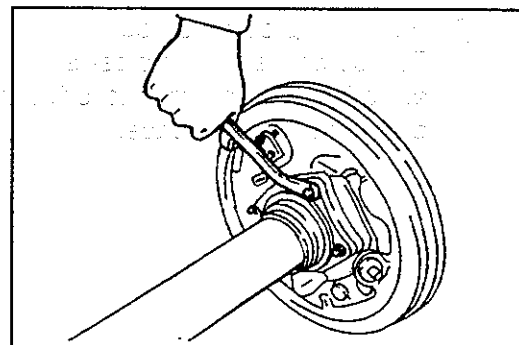
- (28) Install the front wheel.



R7MA00103-99999

<Rear wheel bearing>

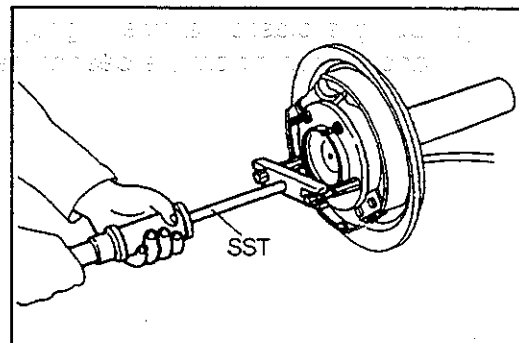
- (1) Disassemble the rear brake.
- (2) Remove the attaching nuts of the backing plate from the rear axle housing.



R7MA00104-99999

- (3) Remove the rear axle shaft, using the following SST.

SST: 09520-00031-000



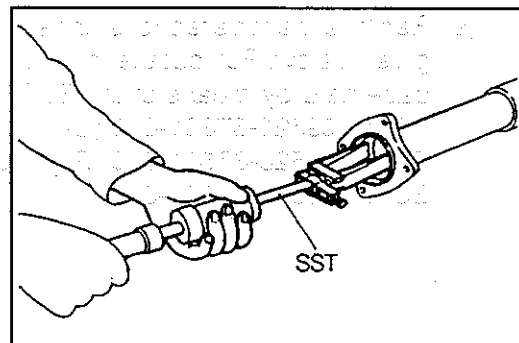
R7MA00105-99999

- (4) Remove the oil seal, using the following SST.

SST: 09308-00010-000

NOTE:

- Never reuse the oil seal.

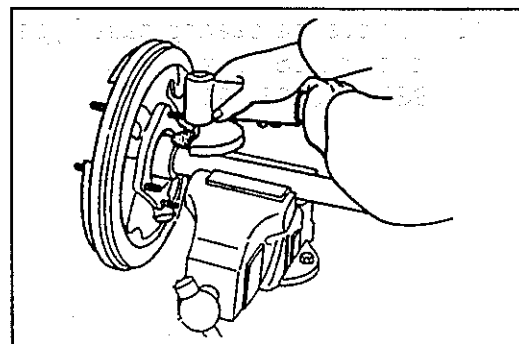


R7MA00106-99999

- (5) Grind off the retainer, using a hand grinder.

WARNING:

- Observe the operating instructions of the hand grinder manufacturer.
- Also, be sure to wear goggles during the grinding operation.



R7MA00107-99999

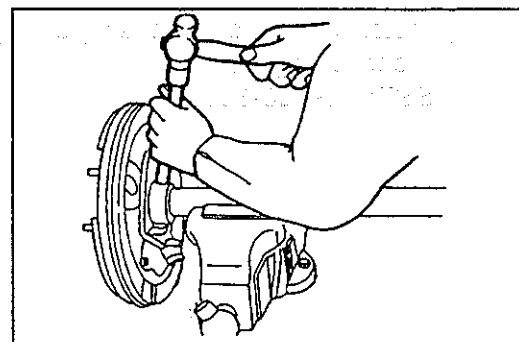
NOTE:

- Do not grind the rear axle shaft, bearing and/or bearing case.

- (6) Split the retainer with a chisel.

WARNING:

- Be sure to wear a pair of gloves and goggles during the operation.

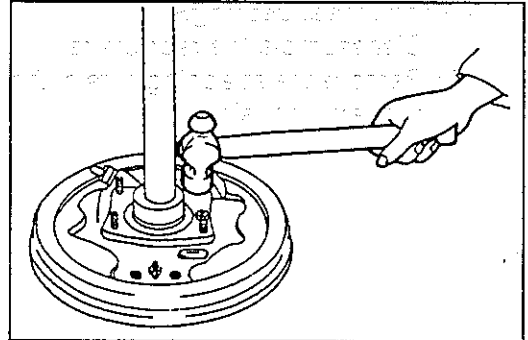


R7MA00108-99999

MA-30

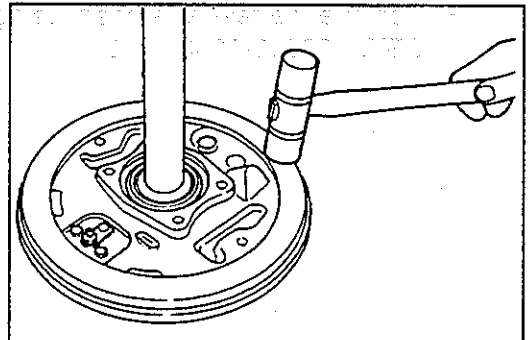
- (7) Pull out the serration bolt.

Temporarily screw in a serration nut onto the end of the serration bolt in order to drive it off from the backing plate and bearing case.



R7MA00109-99999

- (8) Using a plastic hammer, lightly tap the backing plate and detach it from the bearing case.



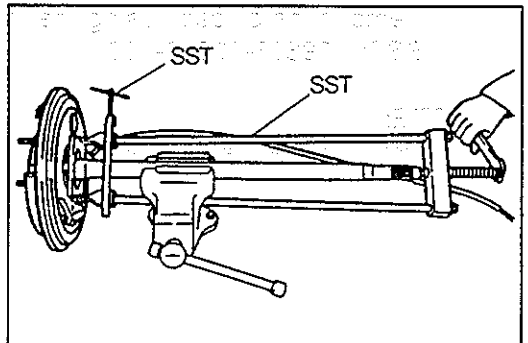
R7MA00110-99999

- (9) Remove the tapered roller inner bearing using the SSTs given below. Pull out the inner bearing with the bearing case held by means of the SST.

SST: 09521-87301-000 (Left hand side)

SST: 09520-87601-000 (Right and side)

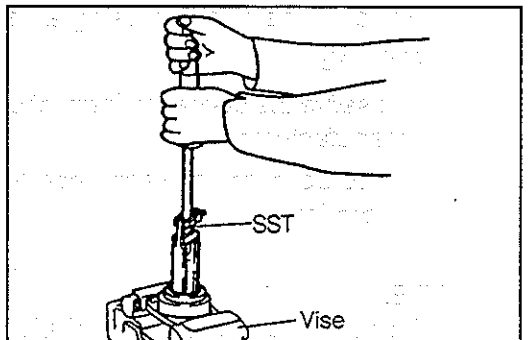
SST: 09351-87601-000



R7MA00111-99999

- (10) Remove the bearing case Type "T" oil seal, using the following SST given below.

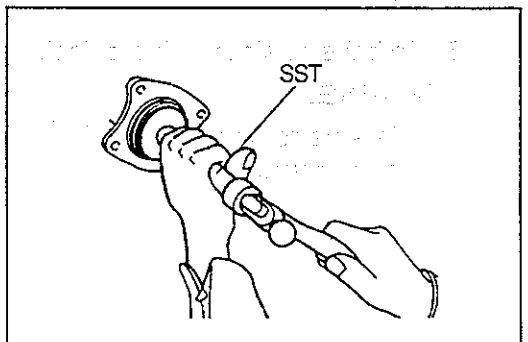
SST: 09308-00010-000



R7MA00112-99999

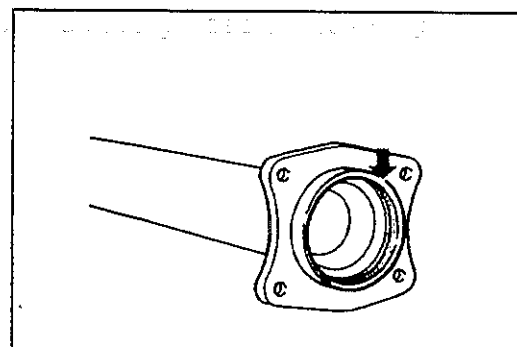
- (11) Install the rear axle housing end type "T" oil seal, using the following SST:

SST: 09608-30012-000



R7MA00113-99999

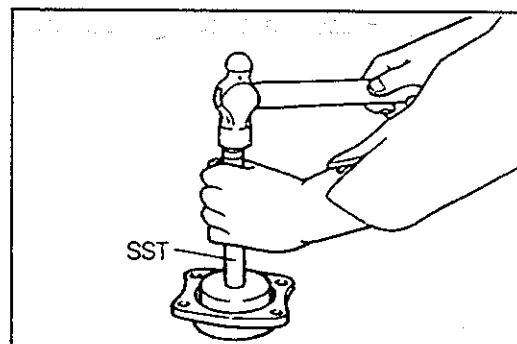
- (12) Apply 15 grams of lithium-based MP grease to the oil seal outer surface.
- (13) Apply lithium-based MP grease to the lip section of the oil seal.



R7MA00114-99999

- (14) Install the bearing outer race into the bearing case, using the following SST given below.

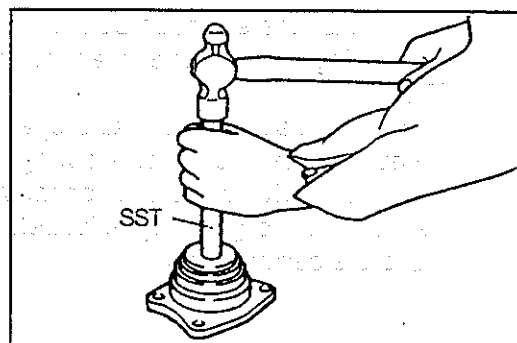
SST: 09608-30012-000



R7MA00115-99999

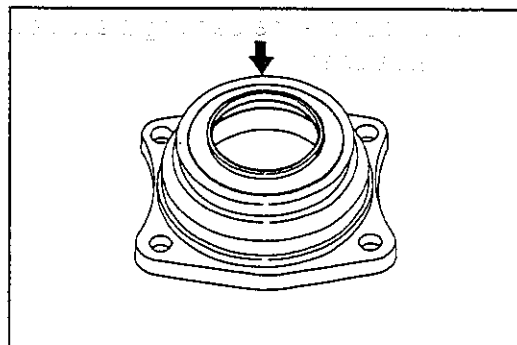
- (15) Install the type "T" oil seal to the bearing case, using the following SST given below.

SST: 09608-30012-000



R7MA00116-99999

- (16) Apply lithium-based MP grease to the lip section of the oil seal.

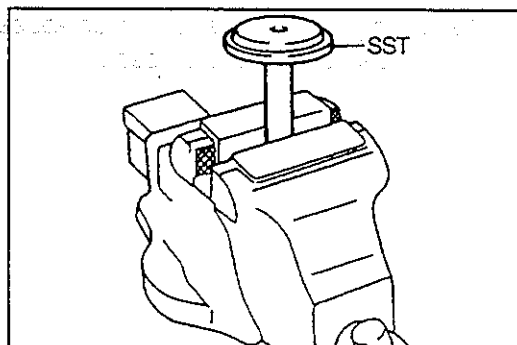


R7MA00117-99999

- (17) Assembly of backing plate and bearing case.

- ① Clamp the SST in a vice, as indicated in the illustration.

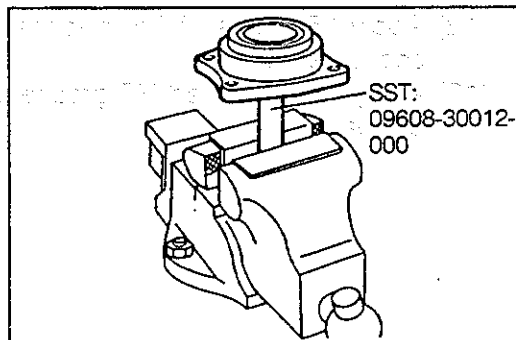
SST: 09608-30012-000



R7MA00118-99999

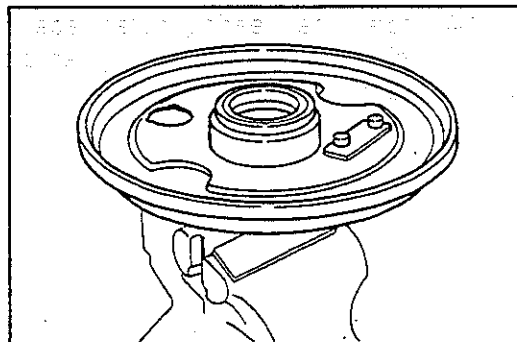
MA-32

- ② Place the bearing case on the SST.



R7MA00119-99999

- ③ Place the backing plate on the bearing case.

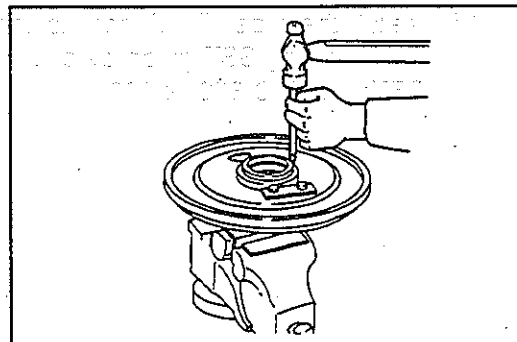


R7MA00120-99999

- ④ Install the serration bolt. Drive the bolt into position, using a hammer and an iron rod.

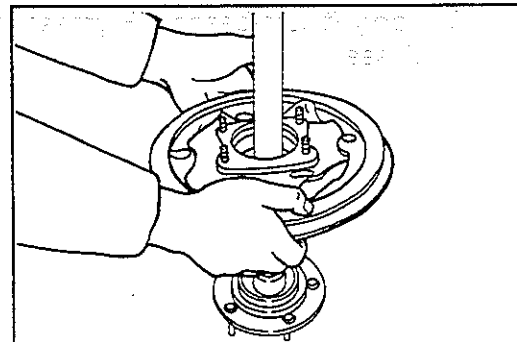
NOTE:

- Hold the backing plate and bearing case by hands so that they may not wobble during the installation.
- Also, this driving into position must be performed in such a way that no gap may exist between the backing plate and the serration bolt.



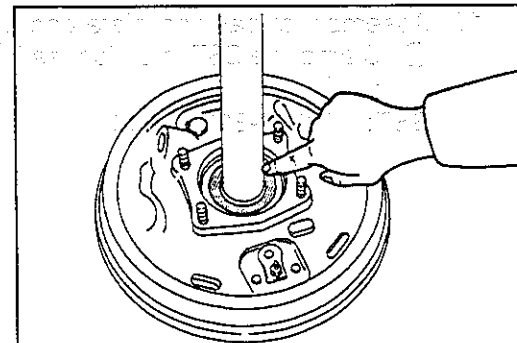
R7MA00121-99999

- (18) Assemble the backing plate bearing case onto the rear axle shaft.



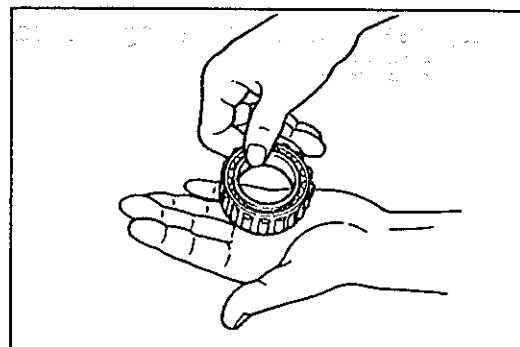
R7MA00122-99999

- (19) Apply 15 grams of lithium-based MP grease to the upper part of the oil seal.



R7MA00123-99999

(20) Pack the bearing with lithium-based MP grease.



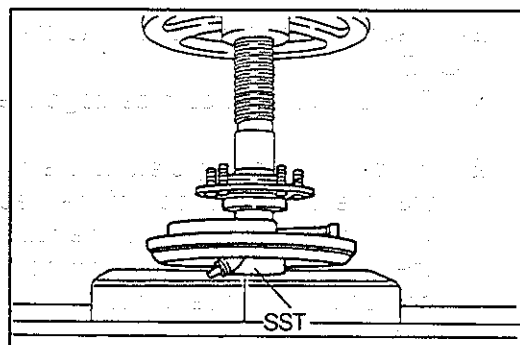
R7MA00124-99999

(21) Press-fit the bearing, using the following SST given below.

SST: 09506-87304-000

NOTE:

- Special caution must be exercised to ensure that no scratch is made to the Type "T" oil seal of the bearing case during the installation.



R7MA00125-99999

(22) Installation of rear axle bearing retainer.

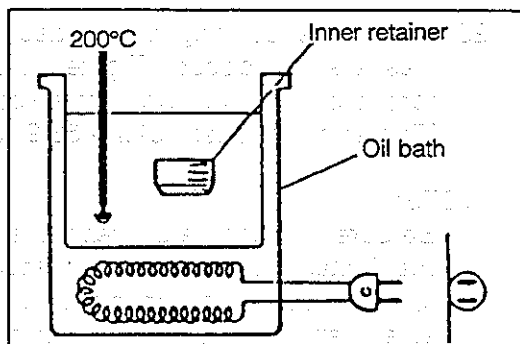
NOTE:

- Perform this operation promptly before the retainer temperature drops.
- When the temperature exceeds 180 - 220°C, the surface of the retainer will be turned to yellow. In this case, be careful not to heat the retainer any further.

CAUTION:

- Special attention must be paid not to burn yourself.

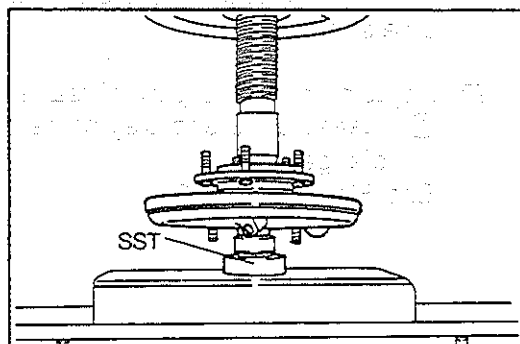
① Heat the retainer to 180 - 220°C.



R7MA00127-99999

② Install the retainer to the rear axle shaft, using a hydraulic press in combination with the following SST.

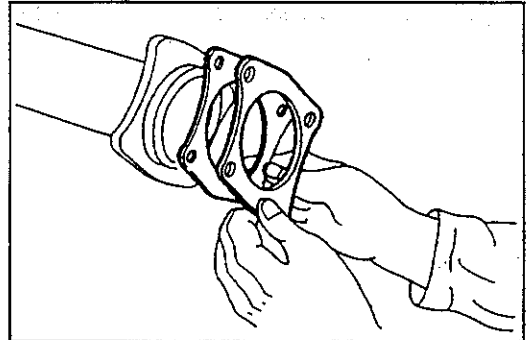
SST: 09506-87304-000



R7MA00128-99999

MA-34

- (23) Insert the shim having the same thickness as the original shim.



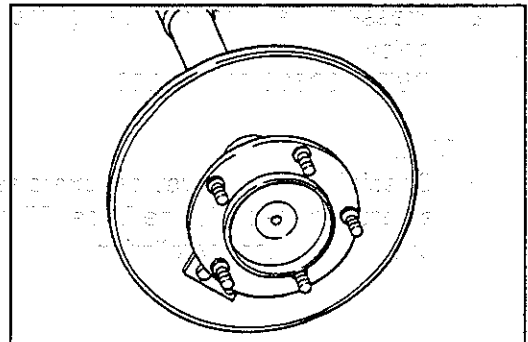
R7MA00129-99999

- (24) Insert the rear axle shaft into the rear axle housing.

NOTE:

- Be very careful not to damage the oil seal.

- (25) Install the backing plate to the rear axle in such a way that the attaching bolt of the backing plate is aligned with the attaching hole of the rear axle housing and that the wheel cylinder installing hole of the backing plate comes at the upper side.



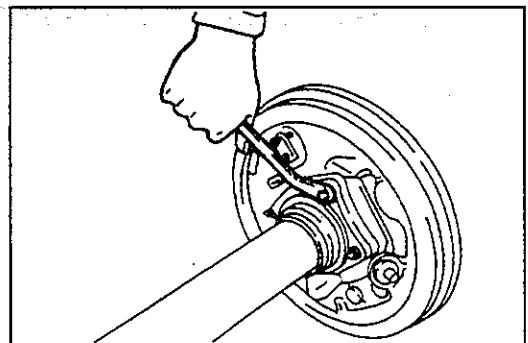
R7MA00130-99999

NOTE:

- (1) Turn the axle shaft so that the spline at the differential side may engage with the spline at the axle shaft side.
- (2) Do not apply impacts beyond the required extent to the bearing.

- (26) Attach the backing plate attaching nuts with spring washers interposed. Tighten them to the specified torque evenly over two or three stages.

Tightening Torque: 39.2 - 53.9 N·m (4.0 - 5.5 kgf·m)



R7MA00131-99999

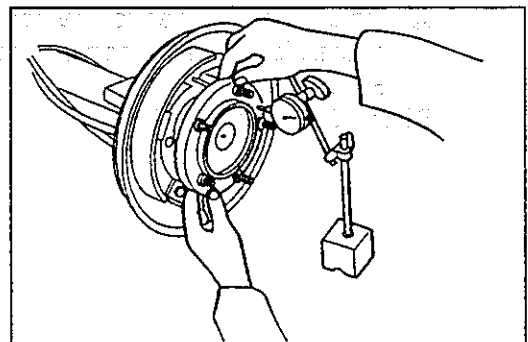
NOTE:

- Be sure to measure the rear axle shaft end play during the tightening. If the end play becomes zero before the torque reaches the specified torque, remove the rear axle shaft. Increase the shim thickness, compared with the shim installed at the step 15. Then, install the rear axle shaft again.

- (27) Adjustment of end play of rear axle shaft

- ① Measure the end play of the rear axle shaft, using a dial gauge.

End Play: 0.1 - 0.2 mm



R7MA00132-99999

- ② Adjust the end play to 0.1 - 0.2 mm by increasing or decreasing the shim thickness. Install the shim in such a way that the cut end may come at the bottom.

NOTE:

- (1) Carry out the adjustment in such a way that the difference in thickness between the right and left shims may not exceed 1.0 mm.
- (2) Special caution must be exercised to ensure that no scratch is made to the oil seal in the end housing while the rear axle shaft is being pulled out.

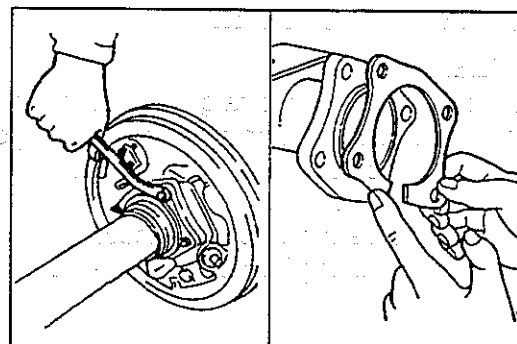
Kind of Shims:

1.0, 0.5, 0.2, 0.15, 0.1 mm

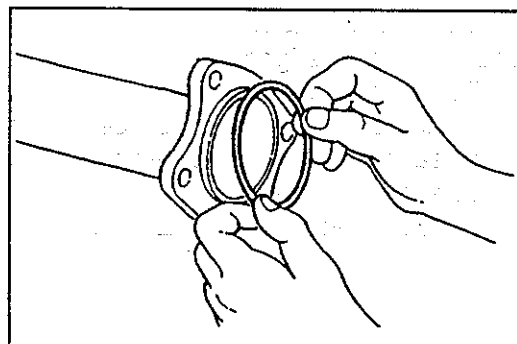
- (28) Pull out the rear axle shaft again. Install the O-ring in the rear axle housing end.

NOTE:

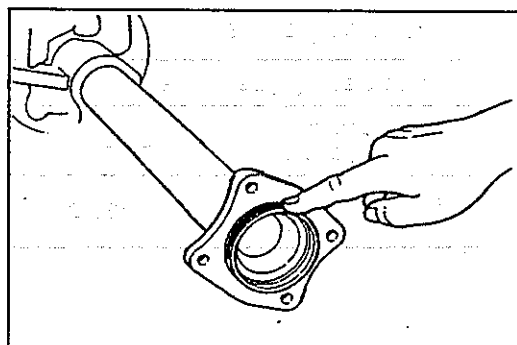
- (1) Be very careful not to scratch the O-ring in the end housing.
 - (2) Utmost attention must be paid so that the shim may not ride on the O-ring or the O-ring may not be installed in a tilted way in the spigot fitting section.
 - (3) Special caution must be exercised to ensure that no scratch is made to the oil seal in the rear axle housing while the rear axle shaft is being pulled out.
- (29) Apply the Three Bond® (1270) sealer to the entire periphery of the spigot fitting section of the rear axle end.



R7MA00133-99999

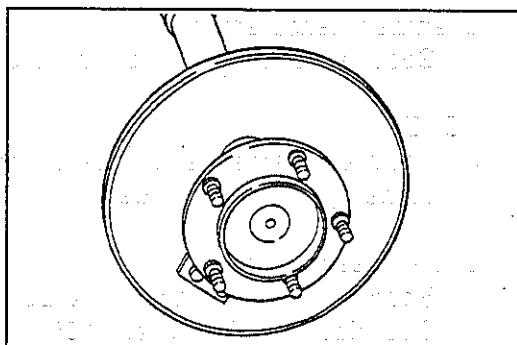


R7MA00134-99999



R7MA00135-99999

- (30) Install the rear axle shaft.

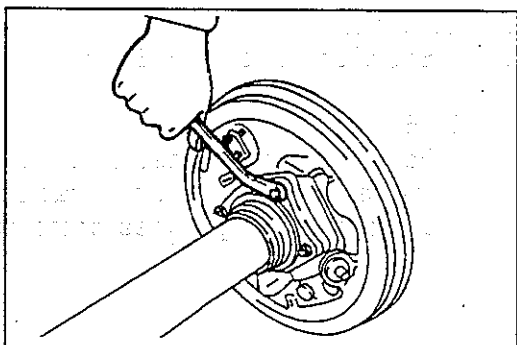


R7MA00136-99999

- (31) Secure the bearing case to the rear axle housing end by means of the four attaching bolts with new spring washers interposed.

Tightening Torque: 39.2 - 53.9 N·m (4.0 - 5.5 kgf·m)

- (32) Install the rear brake.



R7MA00137-99999

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STEERING SYSTEM

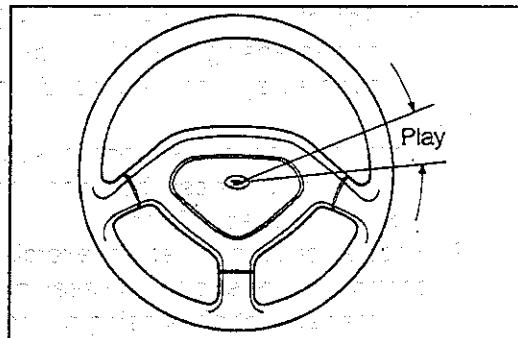
STEERING WHEEL

Set the vehicle in a straight-ahead condition. Check the steering wheel play by turning it lightly with your fingers.

Specified Value: 0 - 30 mm

Check of steering wheel tightness.

Tightening Torque: 29.4 - 49.0 N·m (3.0 - 5.0 kgf·m)



R7MA00138-99999

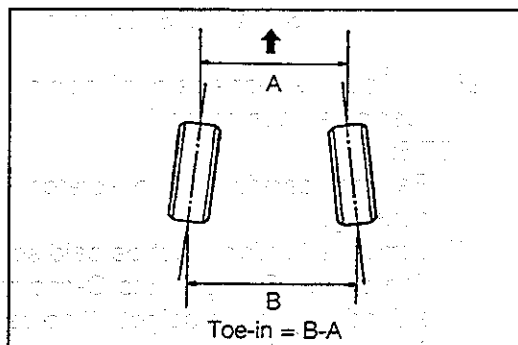
WHEEL ALIGNMENT

Check of wheel alignment

1. Toe-in measurement

Measure the distance between the marks at the front side of each front wheel. Determine the toe-in amount by calculating the difference.

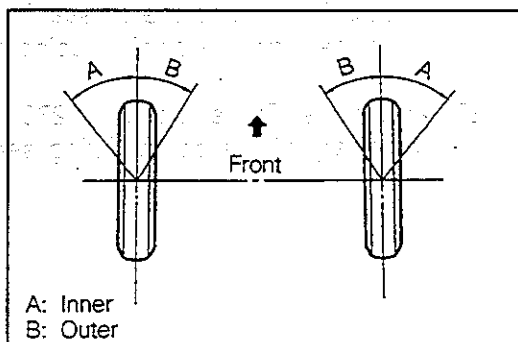
Specified Value: 2 ± 1 mm



R7MA00139-99999

2. Wheel turning angle

Mounted steering type	Inner turning angle	Outer turning angle
Power steering equipped vehicle	$32^{\circ}20' \pm 3^{\circ}$	$28^{\circ}35' \pm 3^{\circ}$
Manual steering equipped vehicle	$30^{\circ}35' \pm 3^{\circ}$	27°



R7MA00140-99999

3. Chamber measurement

Specified Chamber Amount: $0^{\circ}30' \pm 30'$

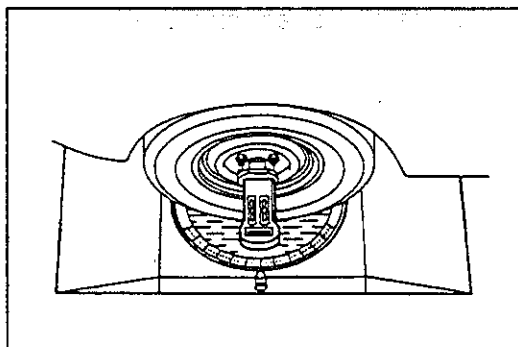
NOTE:

- The measurement should be performed in the same way at the right and left wheels.

4. Caster measurement

Specified Caster Amount: $2^{\circ}20' \pm 45'$

Specified Kingpin Angle: 10°



R7MA00141-99999

5. Side slip test

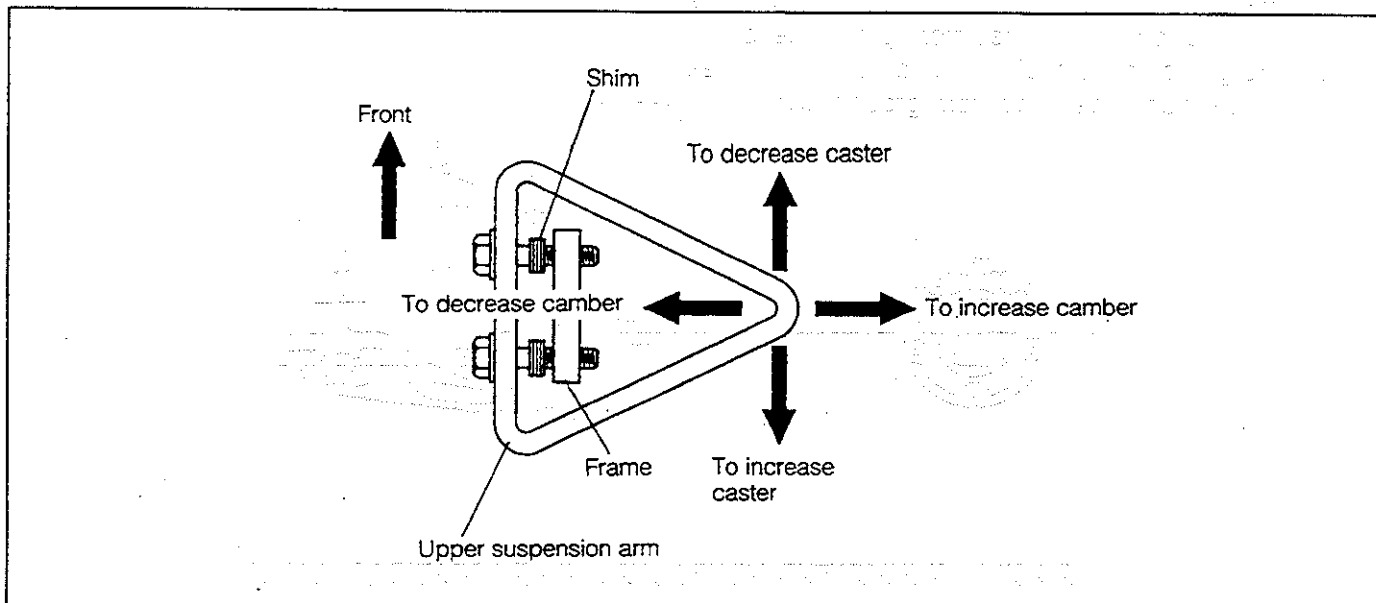
Specified Value: 0 ± 3 mm

NOTE:

- For the alignment checks, turn the steering wheel until the reading of the turning radius gauge becomes 20 degrees at the right wheel or the left wheel, respectively.

Adjusting procedure for camber and caster

The camber and caster vary by increasing the number of the adjusting shims provided at the frame installation surface of the upper shaft.



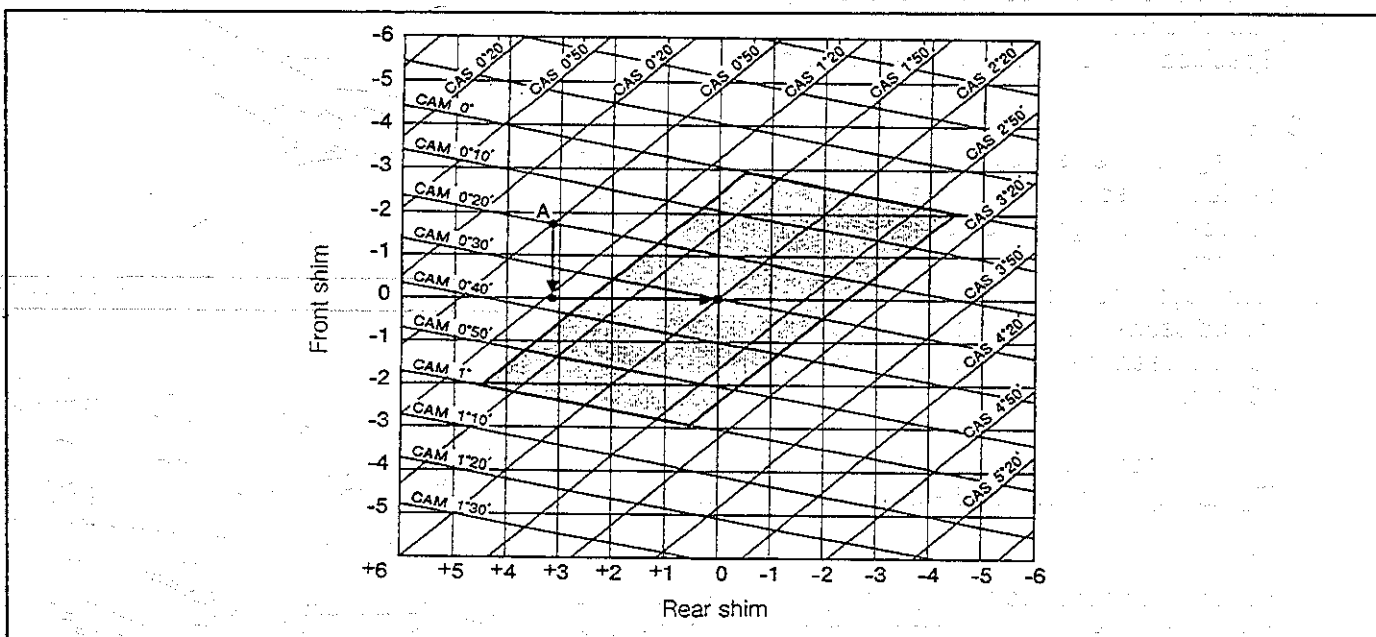
R7MA00142-99999

Selecting method of adjusting shim

1. Select a suitable adjusting shim, using the diagram below.
 - (1) Suppose that the measurement on a vehicle reveals the following results.
 Caster: $2^{\circ} 20' \pm 45'$
 Camber: $0^{\circ} 30' \pm 30'$
 - (2) Plot the intersection of the caster line with camber line in the diagram below. The intersection is designated as the point A.
 - (3) Decrease the front shim thickness by 2 mm and increase the rear shim thickness by 3 mm. Thus, the point A into the specified range.

NOTE:

- The area enclosed by heavy lines () in the below diagram denotes the permissible range for camber and caster angle.

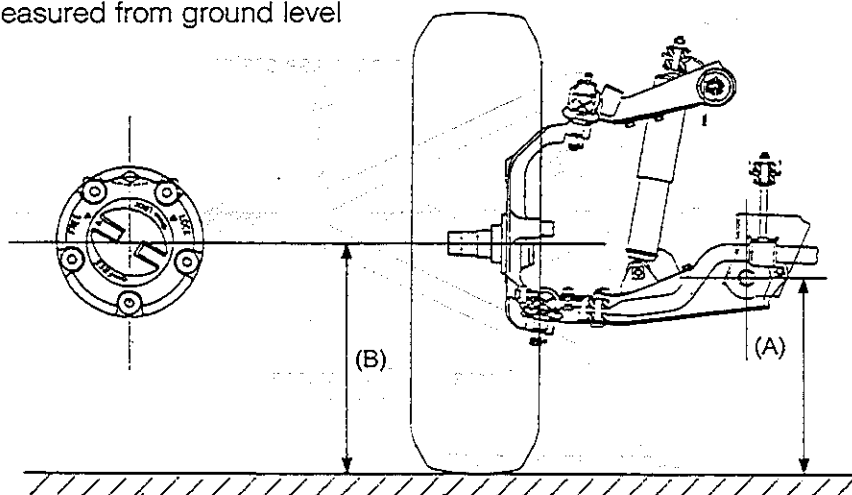


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<Checking and Adjusting Procedures for Vehicle Height>

- (A): Height of center of attaching bolt at front side of lower arm, measured from ground level
- (B): Height of center of wheel ornament or free wheel hub, measured from ground level



Care must be exercised as to the following points before the vehicle height check is carried out.

- (1) The designated tires are installed.
- (2) The tires are inflated to the specified value.
- (3) The vehicle is under no-loaded state.

NOTE:

- The measurement should be conducted with the vehicle under no-loaded state.

- (4) Rock the vehicle several times so as to settle the suspensions.
- (5) Move the vehicle about three meters twice in a fore-and-aft direction.

R7MA00144-99999

Adjusting procedure

1. Adjust the anchor bolt so that the following specified value may be obtained.

Specified Value: $(B) - (A) = 48 \pm 10 \text{ mm}$

NOTE:

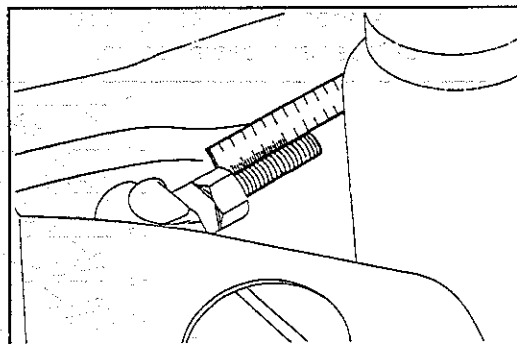
1. As regards the vehicle height, the adjustment should be carried out so that any variation in the specified value between the right and left sides may become within 10 mm.
2. With regard to the protrusion height of the anchor bolt, the adjustment should be carried out so that any variation between the right and left sides may become within 10 mm.

2. Secure the anchor bolt by means of the lock nut.

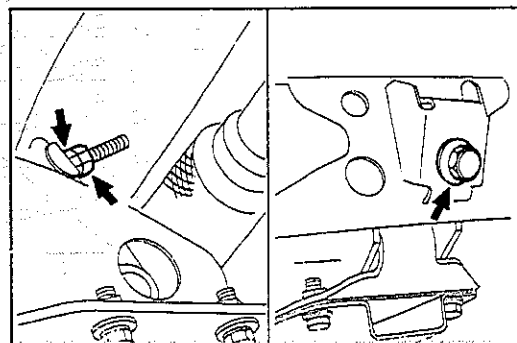
Tightening Torque: 68.6 - 88.3 N-m (7.0 - 9.0 kgf-m)

NOTE:

- Secure the anchor bolt by tightening the upper nut while preventing the lower nut from turning by means of a spanner.



R7MA00145-99999



R7MA00146-99999

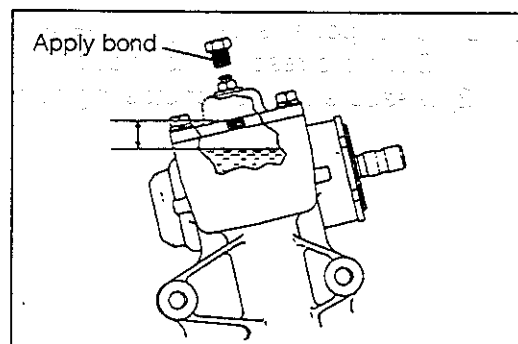
GEAR BOX

Check of oil level of steering gear box
Check the steering gear box for oil level.
Specified Value: 13 - 23 mm

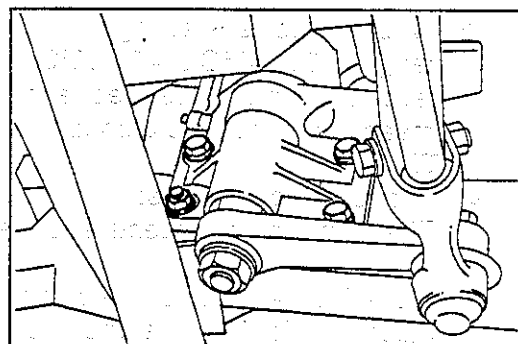
NOTE:

- Apply the following bond to the attaching bolt.
Bond: Daihatsu genuine sealer (999-0480-8U90-00)

Check of steering gear box tightness
Tightening Torque: 73.5 - 103.0 N·m
(7.5 - 10.5 kgf·m)



R7MA00147-99999

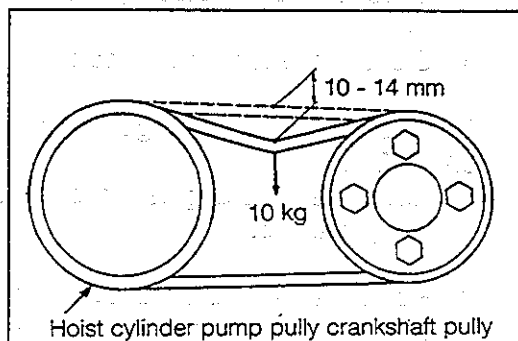


R7MA00148-99999

POWER STEERING

Check of damage.
Check of V-belt tension.
Check the belt tension by measuring the deflection amount of the V-belt.

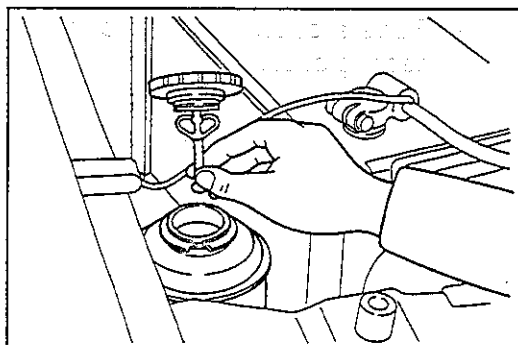
Specified Belt Deflection: 10 - 14 mm



R7MA00149-99999

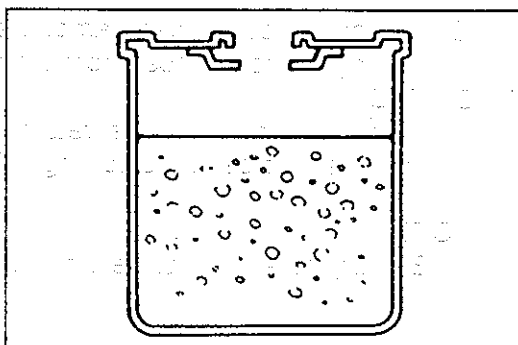
Power steering fluid

1. Check of power steering fluid
 - (1) Open the reservoir tank cap.
 - (2) Ensure that the power steering fluid viscosity is not low abnormally.
If the viscosity is low abnormally, change the power steering fluid.



R7MA00150-99999

- (3) Ensure that no aeration, whitish cloudy state or discoloration is present in the fluid.
If any aeration or whitish cloudy state is observed, check the power steering fluid level.
If the fluid level is low, replenish the power steering fluid.
Then, proceed to perform air bleeding.
Specified Power Steering Fluid: ATF DEXRON® II



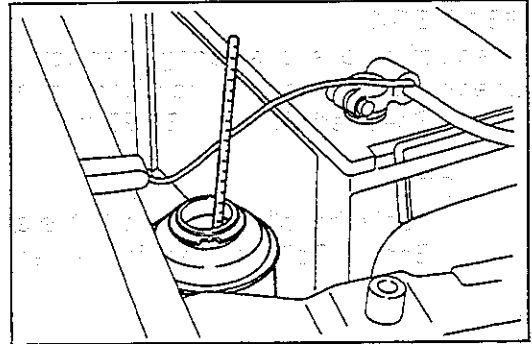
R7MA00151-99999

If the level is within the specified range, change the power steering fluid.

- (4) Close the reservoir tank cap.

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2. Check of power steering fluid level
 - (1) Open the reservoir tank cap.
 - (2) Measure the power steering fluid temperature.



R7MA00152-99999

- (3) When the power steering fluid temperature is within the range of 0 to 40°C or 40 - 80°C, check to see if the fluid level is within the specified range corresponding to the measured temperature condition.

NOTE:

- The term "cold" represents a range of 0 - 40°C.
- The term "hot" represents a range of 40 - 80°C.

If the fluid level is low, replenish the specified power steering fluid up to the upper level.

Specified Power Steering Fluid: ATF DEXRON® II

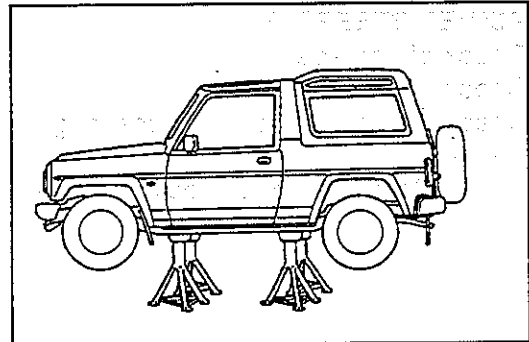
- (4) Close the reservoir tank cap.

3. Power steering fluid change procedure

CAUTION:

- Never start the engine while the power steering fluid is being drained.

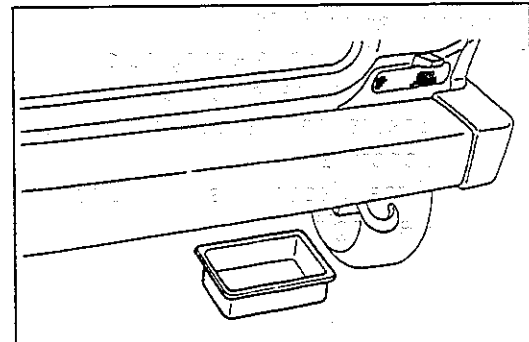
- (1) Place the vehicle on a level floor. Jack up the vehicle and support it with safety stands.



R7MA00153-00000

R7MA00154-99999

- (2) Place a suitable container below the return hose connecting section.



R7MA00155-99999

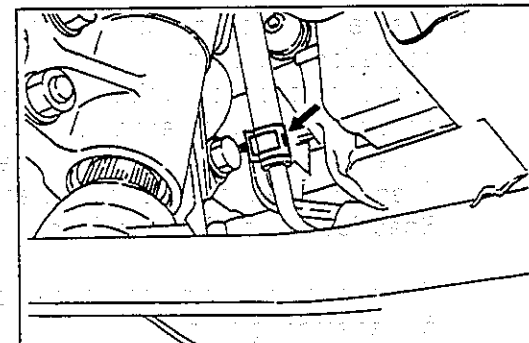
- (3) Detach the return hose clamp. Drain the fluid by disconnecting the return hose from the return pipe.

CAUTION:

- When disconnecting the return hose, special caution must be paid as to the flowing fluid.

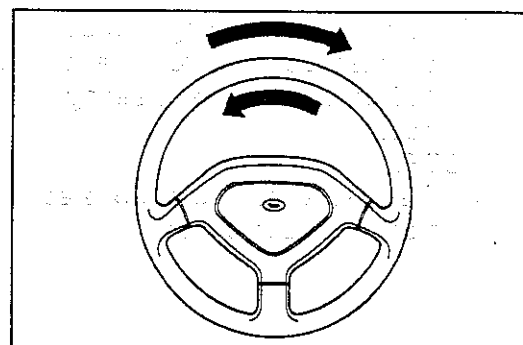
NOTE:

- Be very careful not to deform the return pipe.



R7MA00156-99999

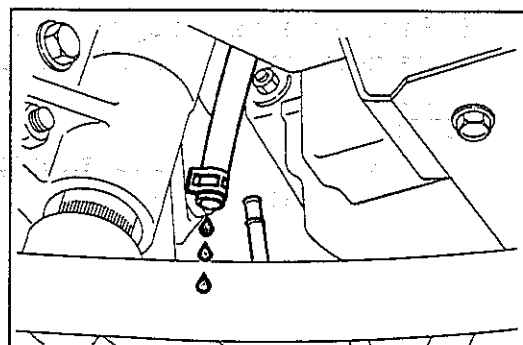
- (4) Turn the steering wheel fully clockwise or counterclockwise from the lock to the lock several times so as to drain the fluid inside the steering gear box.



R7MA00157-99999

NOTE:

- When the steering wheel is turned fully from the lock to the lock, be certain to hold the steering wheel for four to five seconds at the fully turned state.
- Make sure that the fluid no longer flows from the return hose.



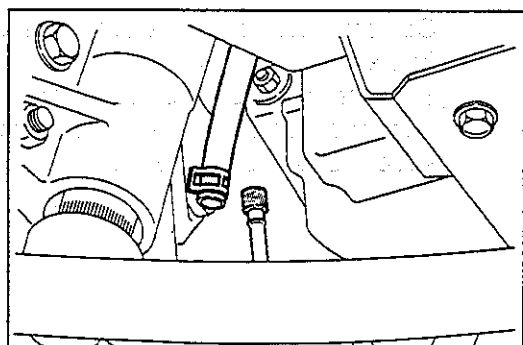
R7MA00158-99999

- (5) Pour the power steering fluid into the reservoir tank, until the fluid starts to flow from the return pipe. When the fluid starts flowing from the return pipe, install a blank plug to the return pipe.

NOTE:

- Make sure that the power steering fluid will not run out from the reservoir tank.
- When the fluid starts flowing from the return pipe, allow about 100 cc of fluid to flow out so that the old fluid may be drained completely.

Specified Power Steering Fluid: ATF DEXRON® II

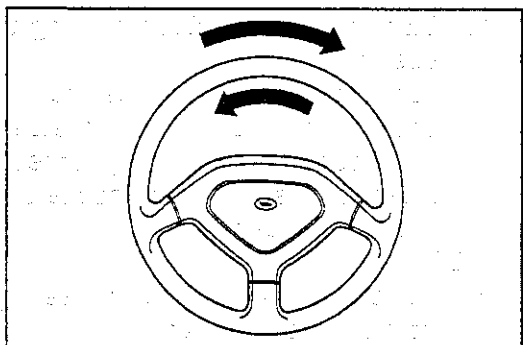


R7MA00159-99999

- (6) While replenishing the power steering fluid to the reservoir tank approximately up to the upper level in the COLD range, keep turning the steering wheel fully clockwise and counterclockwise from the lock to the lock.

NOTE:

- Make sure that the power steering fluid will not run out from the reservoir tank.
- When the steering wheel is turned fully from the lock to the lock, be certain to hold the steering wheel for four to five seconds at the fully turned state.
- Turn the steering wheel as quickly as possible. Do not stop the steering wheel midway nor turn the steering wheel reversely.



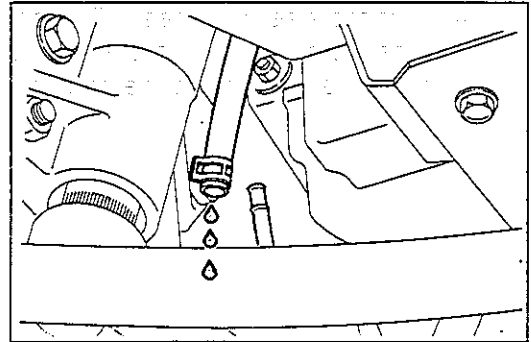
R7MA00160-99999

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- (7) Turn the steering wheel fully clockwise and counterclockwise from the lock to the lock, until about 100 cc of the power steering fluid flows from the return hose.

NOTE:

- Make sure that the power steering fluid will not run out from the reservoir tank.

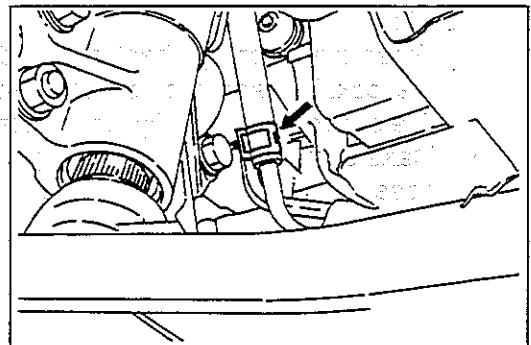


R7MA00161-99999

- (8) Remove the blank plug from the return pipe. Connect the return hose to the return pipe and install the hose clamp.

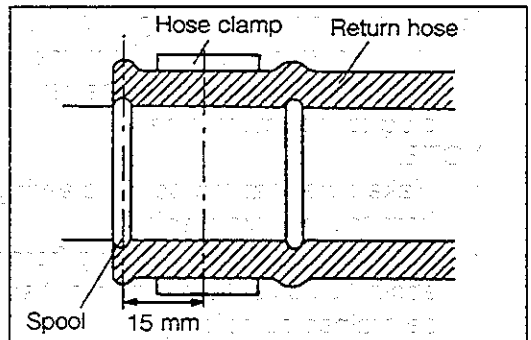
NOTE:

- Make sure that the power steering fluid will not run out from the reservoir tank.



R7MA00162-99999

- Correctly clamp the return hose as shown in the right figure.
- Be sure to install the return hose so that the distance from the center of the hose clamp to the edge of the spool becomes 15 ± 2 mm.

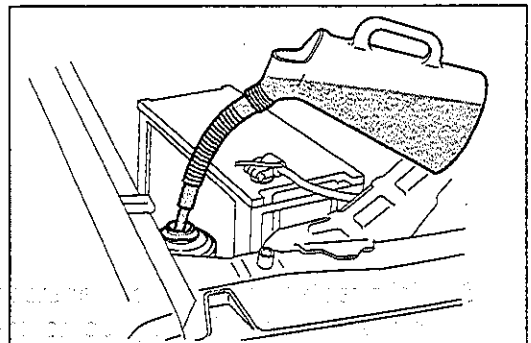


R7MA00163-99999

- (9) Replenish the power steering fluid to the reservoir tank approximately up to the upper level in the COLD range. Specified Power Steering Fluid: ATF DEXRON® II

NOTE:

- If the oil temperature is above 40°C, fill the power-steering fluid up to the upper level in the HOT level.

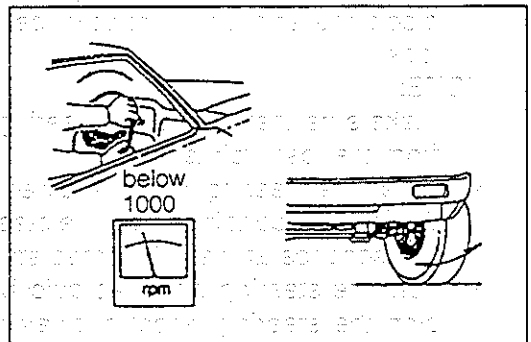


R7MA00164-99999

- (10) Start the engine. Keep running the engine at the idle speed.
- (11) Turn the steering wheel fully either clockwise or counterclockwise. Hold the steering wheel for two to three seconds at the fully turned state. Then, turn the steering wheel in the opposite direction and hold it for two to three seconds.

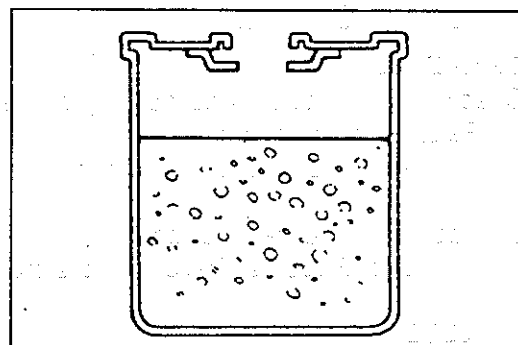
NOTE:

- Make sure that the power steering fluid will not run out from the reservoir tank.



R7MA00165-99999

- (12) Repeat the operations described in the step (11) onward three or four times.
- (13) Ensure that no aeration or whitish cloudy state is present at the power steering fluid in the reservoir tank.
If any aeration and/or whitish cloudy state is observed, stop the engine. Wait for about ten minutes. Again, repeat the operations described in (10) onward.



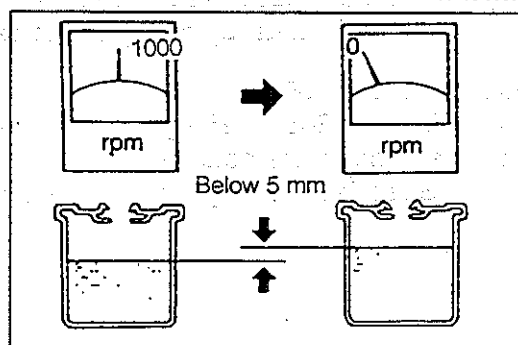
R7MA00166-99999

- (14) Ensure that the difference in fluid level between the time when the engine is stopped and the time when the engine is kept running at the idle speed will not exceed the specified value.

Specified Value: 5 mm

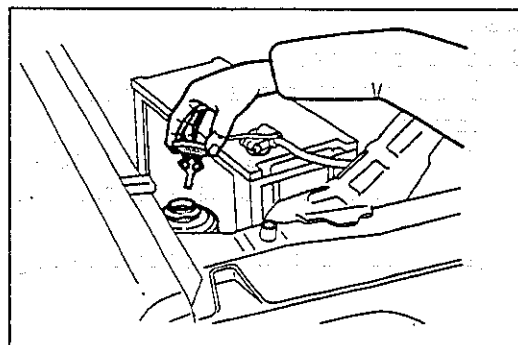
If the difference in fluid level exceeds the specified value, again perform air bleeding.

If the difference in fluid level fails to become within the specified value persistently, check the hydraulic pressure.



R7MA00167-99999

- (15) Check the fluid level.
- (16) Start the engine. Ensure that no fluid leakage is present.



R7MA00168-99999

- (17) Perform the following inspection.
 - ① Ensure that no whitish cloudy state is present in the power-steering fluid when the engine revolution speed is raised quickly.
 - ② Ensure that the steering wheel can be turned smoothly without emanating abnormal noise.
 - ③ Ensure that the oil level will not change more than 5 mm during the engine starting period or when the steering wheel is being turned.
 - ④ Ensure that no abnormal noise is emanated when turning the steering wheel (when the front wheels are being turned) during the running.

If any abnormality is present, perform air bleeding again.

R7MA00169-00000

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BRAKING SYSTEM

BRAKE PEDAL

Check of brake pedal and parking brake

1. Pedal free travel check

Pedal Free Play: 1 - 3 mm

2. Pedal reserve travel check

Pedal Reserve Travel: More than 80 mm

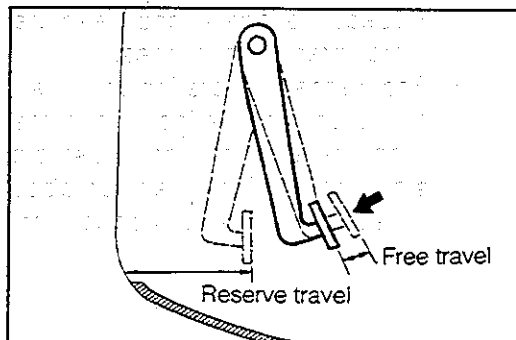
NOTE:

- The brake pedal reserve travel should be measured from the body metal by rolling up the carpet and floor mat.

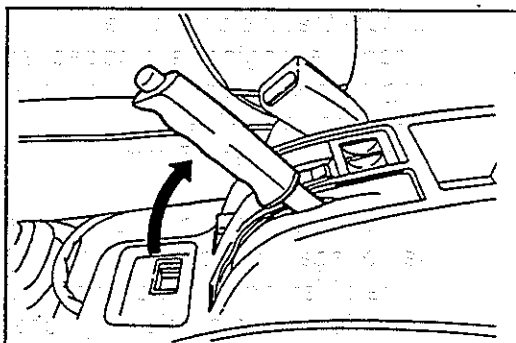
PARKING BRAKE

With a force of 245 N (25 kgf), pull up the parking brake lever slowly and count the notches.

Specified Working Travel: 7 - 8 notches



R7MA00170-99999



R7MA00171-99999

DISC PAD

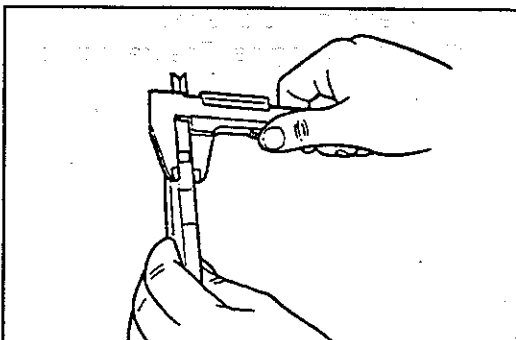
Check of disc pad

1. Checking of brake disc pad for thickness, wear and damage

(1) Measure brake pad thickness.

If the pads thickness is less than 1.5 mm, replace the pad.

(2) Inspect uneven wear and damage.

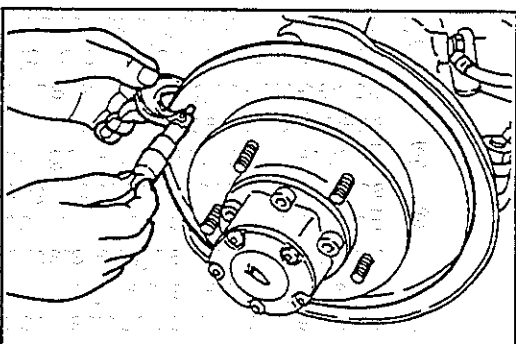


R7MA00172-99999

2. Checking of brake disc for wear, damage

(1) Clean the brake disc surface and measure the disc thickness.

	Standard	Ventilation
Specified thickness	12.5	18.0
Minimum limit	11.5	17.0



R7MA00173-99999

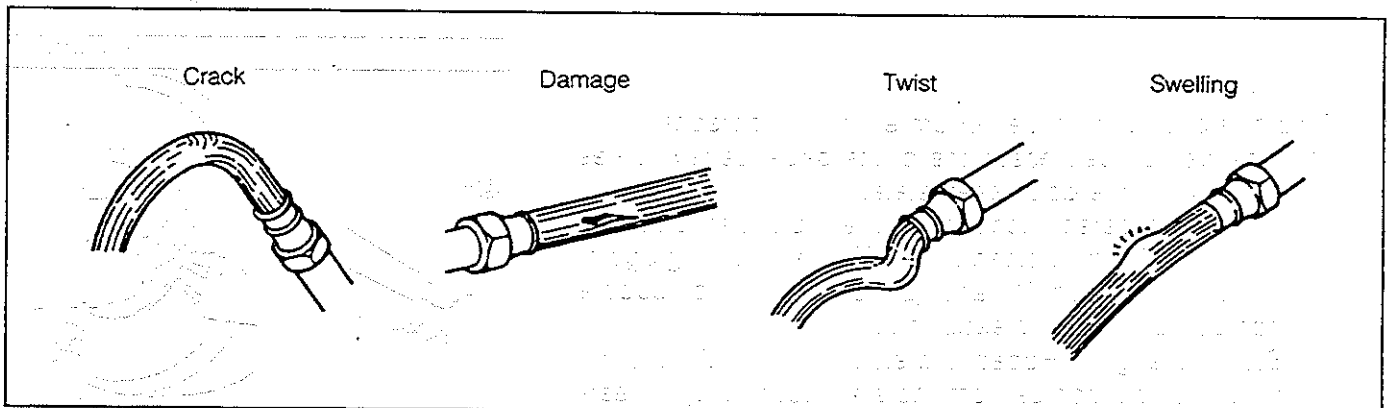
Difference in Stock Thickness on The Same Circumference: Not to exceed 0.015 mm

BRAKE HOSE AND TUBE

Check of brake hose and tube

Checking of following parts

- (1) Hoses and tubes for damage, cracks
- (2) Hoses for deformation or swelling
- (3) Tubes for corrosion or rust
- (4) Connection of fluid leakage
- (5) Tube clamps for tightness
- (6) Hoses for extreme bending, twisting or pulling

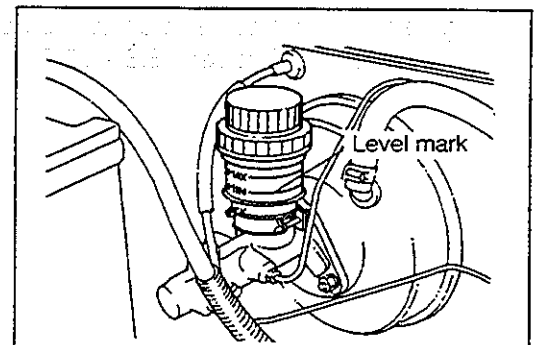


R7MA00174-99999

BRAKE FLUID

Check of brake fluid

If the fluid level is below of the MIN line, check for leak in the hydraulic system and add fluid up to the MAX line.



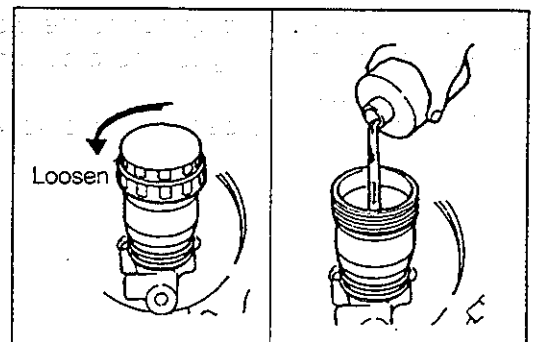
R7MA00175-99999

Air bleeding of brake system

1. Filling brake fluid

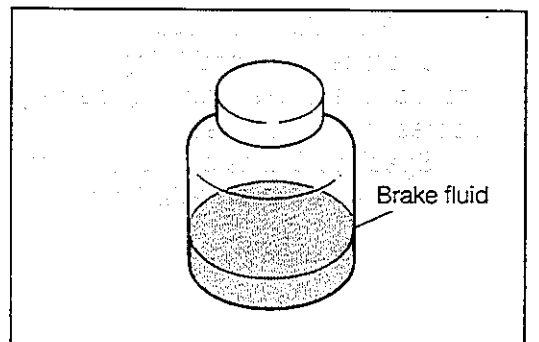
Fill the brake reservoir tank with the specified brake fluid to the full level. Maintain the full level at all times during the brake air bleeding.

Specified Brake Fluid: DOT 3 or SAEJ 1703



R7MA00176-99999

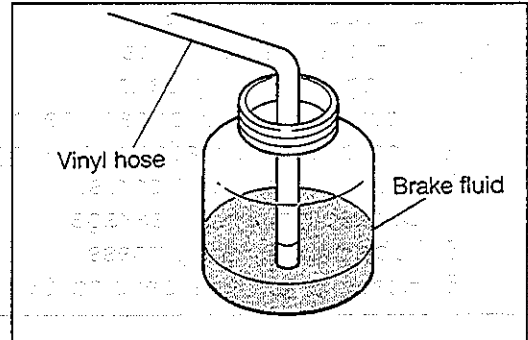
2. Prepare an adequate container for the air bleeding. Fill a small amount of brake fluid in the container.



R7MA00177-99999

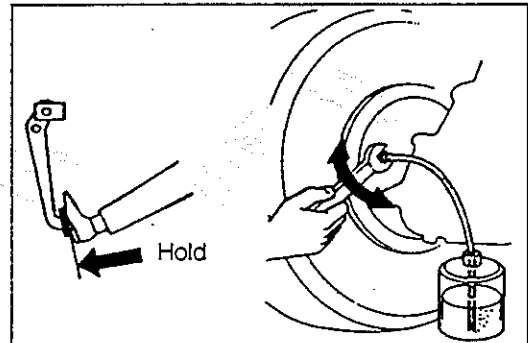
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3. Detach the air bleeder cap connect one end of a suitable vinyl hose to the air bleeder plug. Insert the other end of the vinyl hose into the prepared container in such a way that the vinyl hose may be submerged in the brake fluid in the container. Start this air bleeding operation at the brake which is located at the furthestmost point from the master cylinder.



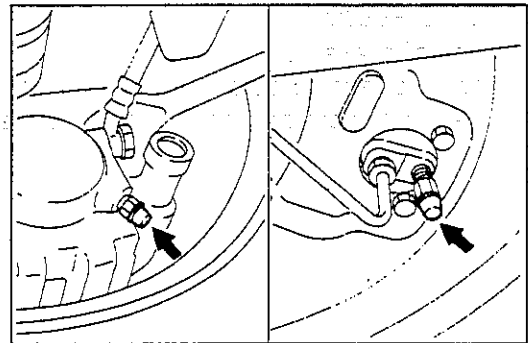
R7MA00178-99999

4. Air bleeding
This operation should be performed by two persons.
 - (1) One person depresses the brake pedal several times and hold it in a depressed state.
 - (2) The other person loosens the air bleeder plug 1/3 through 1/2 turn to bleed the air. Tighten the plug again.
 - (3) Repeat the steps (1) and (2); until no air or bubble comes from the air bleeder plug.
 - (4) Start the engine. Repeat the steps (1) and (2), until no air or bubble comes from the air bleeder plug. (Rear-ABS equipped vehicle only)



R7MA00179-99999

5. Tighten the air bleeder plug to the specified torque.
Tightening Torque: 8.8 - 12.7 N·m (0.9 - 1.3 kgf·m)



R7MA00180-99999

6. Install the bleeder plug cap to the bleeder plug.
7. Perform air bleeding for the other brakes in turn, starting from the step (3).
8. Perform the brake pedal reserve travel check.

R7MA00181-00000

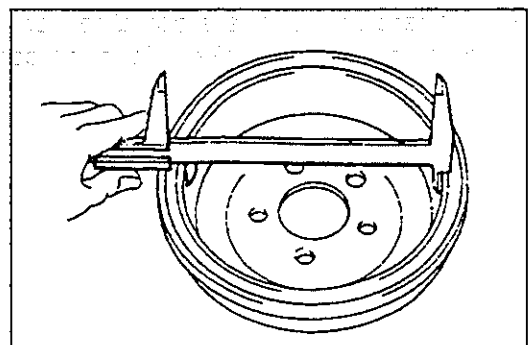
BRAKE DRUM AND LINING

Check of brake drum and lining

1. Inspect the brake drum for damage, inner surface wear, scores, or uneven wear.

Specified Diameter: 270.0 mm

Allowable Limit: 272.0 mm

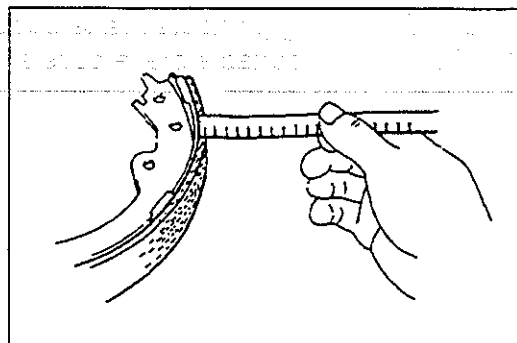


R7MA00182-99999

2. Inspect the brake linings for wear.

Specified Value: 6.0 mm

Allowable Limit: 1.0 mm

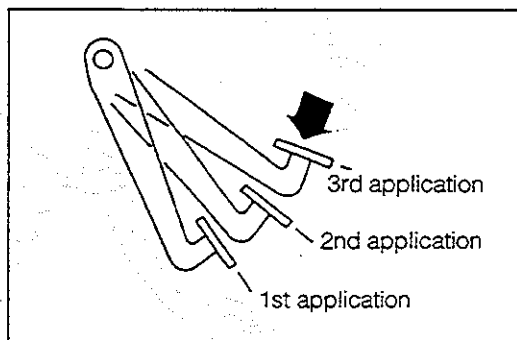


R7MA00183-99999

Check of brake booster

1. Check of brake booster air-tight performance.

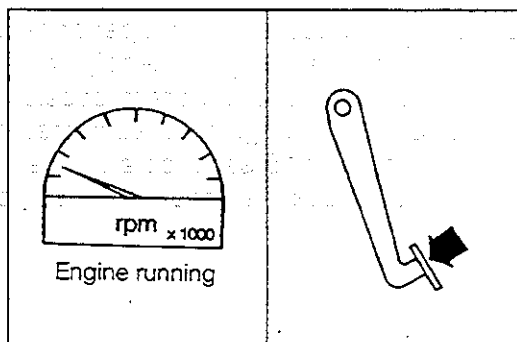
- (1) Start the engine. After allowing the brake booster to hold negative pressure, stop the engine.
- (2) Depress the brake pedal several times, applying force used during normal brake applications and allowing at least five seconds between each application. Ensure that the position of the brake pedal rises progressively at the second and third applications.



R7MA00184-99999

2. Check of brake booster air-tight performance under loaded condition

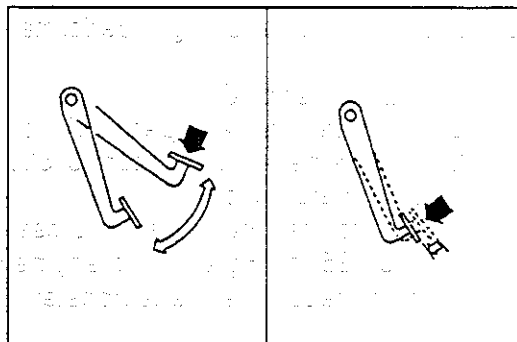
With the engine running, depress the brake pedal. While maintaining this condition, stop the engine. Ensure that no change in the pedal height occurs in about 30 seconds.



R7MA00185-99999

3. Check of booster operation

- (1) With the engine stopped, depress the brake pedal several times, until the brake pedal height will not vary at each application.
- (2) With the engine stopped, depress the brake pedal. While maintaining the same applying force, start the engine. If the brake pedal moves in slightly, it indicates that the booster operates satisfactory.

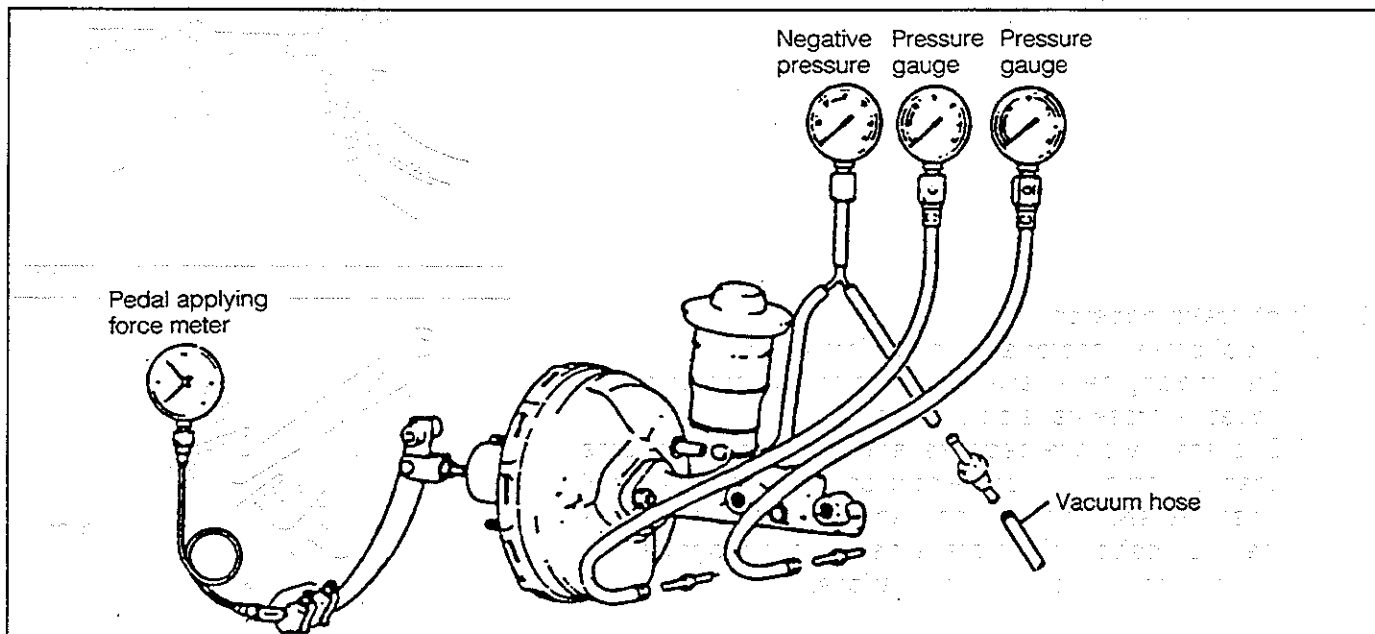


R7MA00186-99999

MA-48

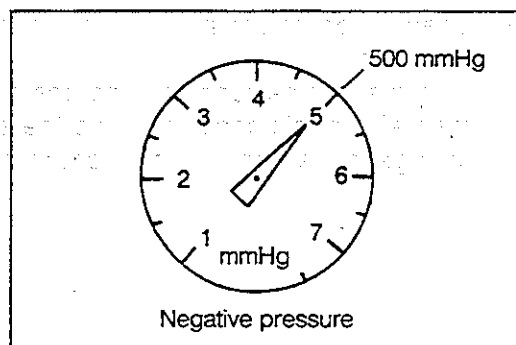
Check employing portable brake booster tester

1. Connect the portable brake booster tester, as indicated in the figure. Perform air bleeding.



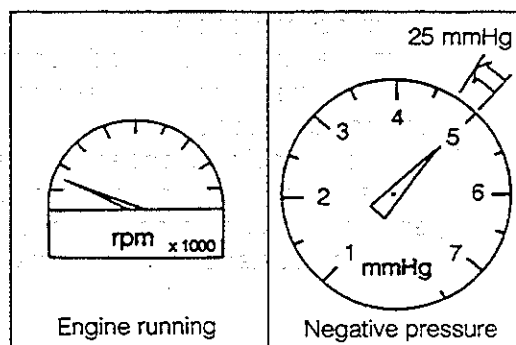
R7MA00187-99999

2. Check of booster air-tight performance
 - (1) Start the engine. Apply a negative pressure of 500 mmHg to the brake booster.
 - (2) Stop the engine. Ensure that no negative pressure drops for 15 seconds after the engine has stopped. If not, check the check valve and brake booster.



R7MA00188-99999

3. Check of booster air-tight performance under loaded condition
 - (1) Start the engine.
 - (2) Depress the brake pedal with a force of 20 kgf.
 - (3) Apply a negative pressure of 500 mmHg to the booster.
 - (4) Stop the engine.
 - (5) Ensure that the negative pressure drop does not exceed 25 mmHg after the engine has stopped. If not, repair the brake booster.



R7MA00189-99999

4. Check of brake hydraulic pressure
 - (1) With the engine stopped, depress the brake pedal several times so that no negative pressure may not apply to the brake booster.
 - (2) Ensure that the hydraulic pressure is obtained in accordance with the pedal applying force, as indicated in the right table.

If not, check the air bleeding condition.

Pedal applying force kgf	Hydraulic pressure MPa
10	0 - 0.8
20	1.0 - 1.6
30	19 - 29

R7MA00190-00000

5. Check of booster operation

- (1) Start the engine.
- (2) Set the booster negative pressure to 500 mmHg. Ensure that the hydraulic pressure is obtained in accordance with the pedal applying force.

If not, repair the brake booster.

Pedal applying force kgf	Hydraulic pressure MPa
5	1.8 - 2.6
10	4.7 - 5.7
20	8.6 - 9.6
30	9.5 - 10.5

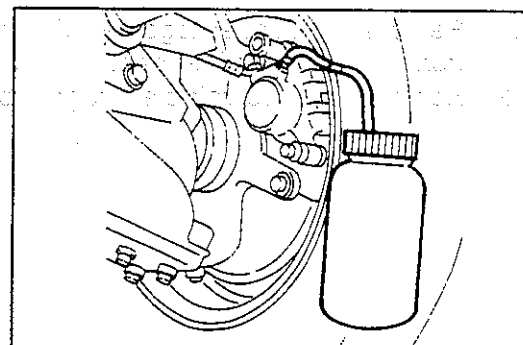
R7MA00191-00000

REMOVAL

CAUTION:

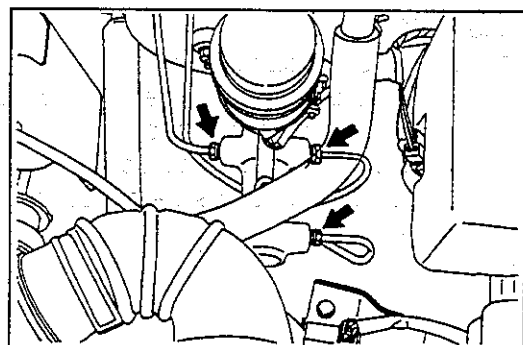
- If the brake fluid is spilled inadvertently over the paint-finish surface of the vehicle, quickly wipe off the brake fluid. In addition, wipe the affected area, using white gasoline or the like.

1. Drain the brake fluid from the rear and front wheel cylinder.



R7MA00192-99999

2. Disconnect the brake fluid level switch connector.
3. Disconnect the brake tubes from the master cylinder, using a flare nut wrench.
4. Remove the brake master cylinder from the brake booster by removing the brake master cylinder attaching nuts.



R7MA00193-99999

5. Remove the piston set bolt.

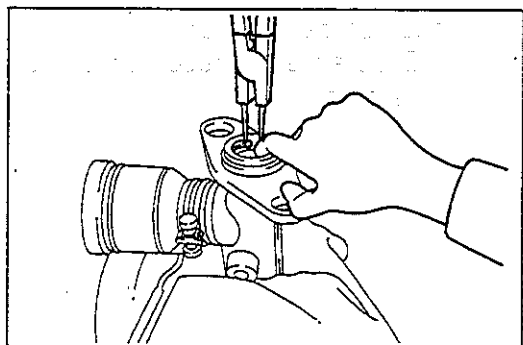
NOTE:

- Do not apply excessive force when installing the cylinder to a vise.

6. While holding the piston by hand, remove the snap ring.

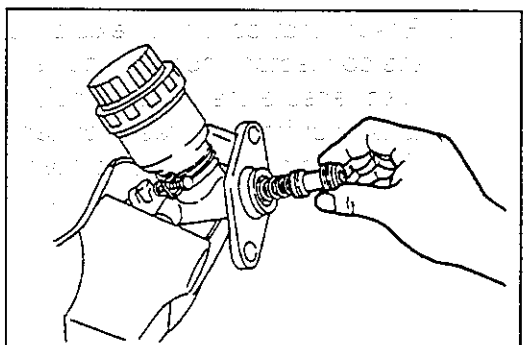
CAUTION:

- Do not scratch the cylinder bore surface.



R7MA00194-99999

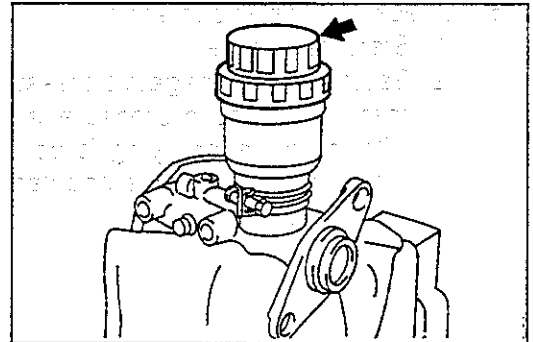
7. Remove the brake master cylinder piston No. 1.
8. Remove the brake master cylinder piston No. 2 by blowing air from the brake pipe connecting hole.



R7MA00195-99999

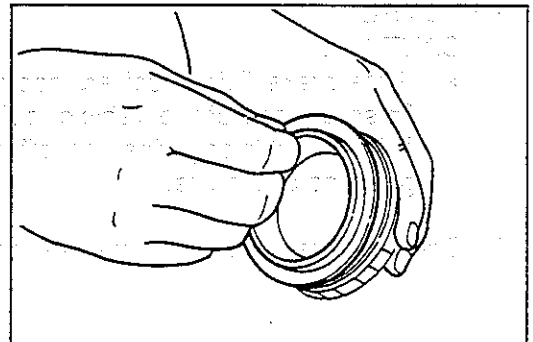
MA-50

9. Remove the reservoir filler cap. Take out the float.
10. Remove the reservoir tank by loosening the reservoir tank hose clamp.



R7MA00196-99999

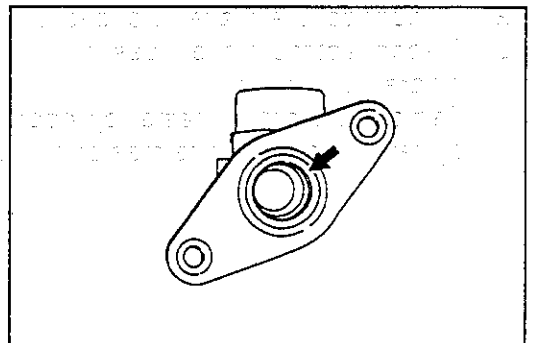
11. Remove the spacer together with the reservoir diaphragm from the reservoir filler cap.
12. Remove the reservoir diaphragm from the spacer.



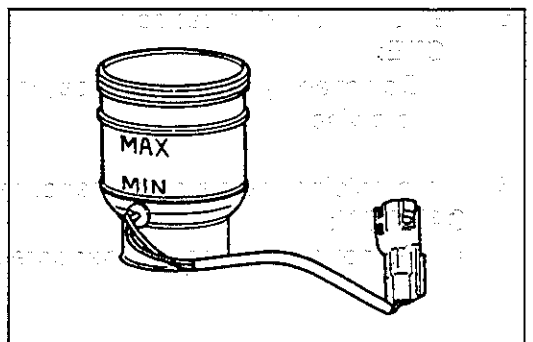
R7MA00197-99999

INSPECTION

1. Check of master cylinder
 - (1) Ensure that the inner surface of the master cylinder exhibits no scratches.
 - (2) Ensure that each part of the master cylinder exhibits no damage, such as deformation.
2. Check of reservoir tank
 - (1) Ensure that the reservoir tank exhibits no damage, such as cracks.

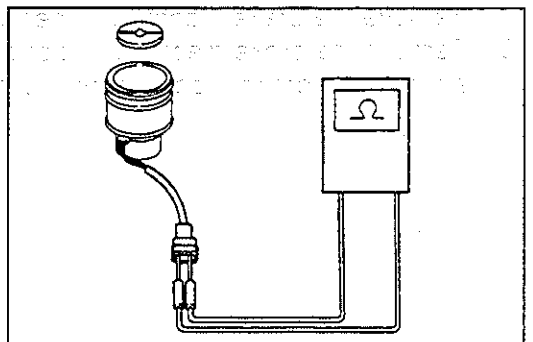


R7MA00198-99999



R7MA00199-99999

- (2) Ensure that continuity exists between the terminals of the connector when the float is put in the reservoir tank. Also, ensure that no continuity exists when the float is taken out from the reservoir tank. If not, replace the reservoir tank.



R7MA00200-99999

ASSEMBLY

1. Install the reservoir diaphragm to the spacer.

NOTE:

- Be sure to fit the reservoir diaphragm to the recessed section of the spacer.

2. Install the spacer together with the reservoir diaphragm to the reservoir tank cap.

NOTE:

- Fit the pawl section of the spacer into the reservoir tank cap securely.

3. Install the reservoir tank to the master cylinder. Tighten the clamp.

Tightening Torque: 5.4 - 6.9 N·m (0.55 - 0.70 kgf·m)

4. Insert the float in the reservoir tank. Install the reservoir tank cap.

5. Apply brake fluid to the piston cups indicated in the right figure.

6. Apply rubber grease to the piston cups indicated in the right figure.

7. Insert the piston No. 2 into the master cylinder.

8. Insert the piston No. 1 into the master cylinder.

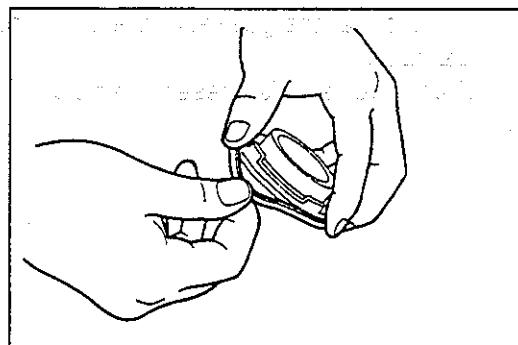
9. While holding the piston No. 1 by hand, install a new snap ring.

NOTE:

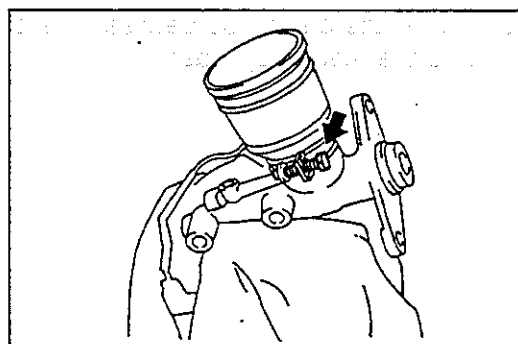
- Never reuse the snap ring.

10. Install the set bolt to the master cylinder with a new gasket interposed.

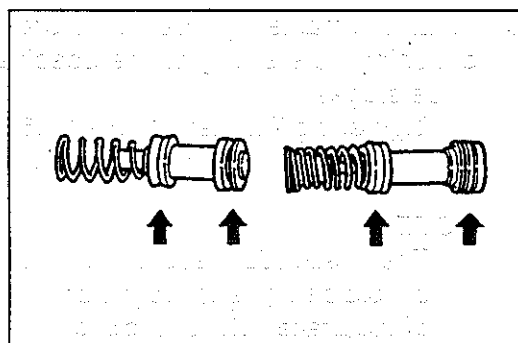
Tightening Torque: 6.9 - 10.8 N·m (0.7 - 1.1 kgf·m)



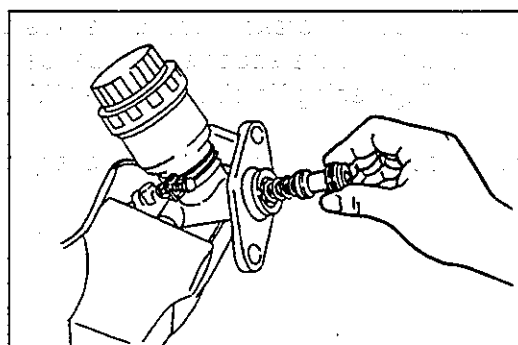
R7MA00201-99999



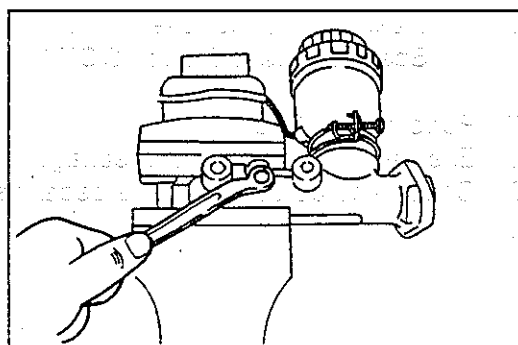
R7MA00202-99999



R7MA00203-99999



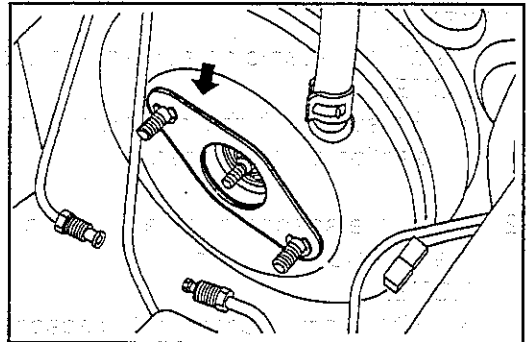
R7MA00204-99999



R7MA00205-99999

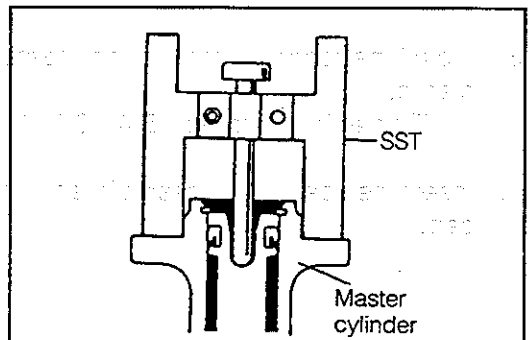
MA-52

11. Ensure that the gasket at the brake booster side exhibits no damage.
If any damage is present, replace the gasket.



R7MA00206-99999

12. Adjust the clearance between the brake booster push rod and the master cylinder.



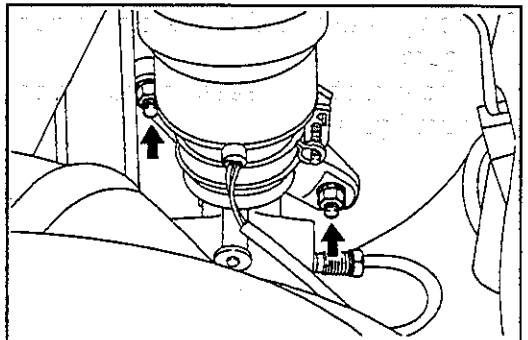
R7MA00207-99999

13. Install the master cylinder to the brake booster. Tighten the attaching nuts evenly to the specified torque over two or three stages.

Tightening Torque: 11.8 - 17.6 N·m
(1.2 - 1.8 kgf·m)

NOTE:

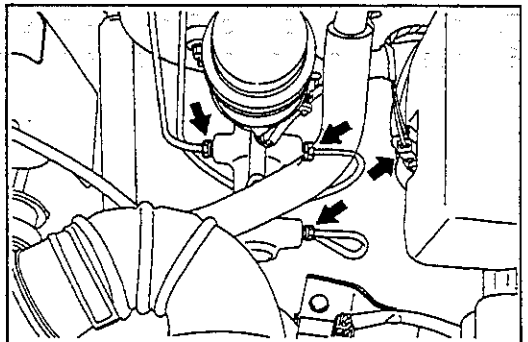
- The installation section at the vehicle exterior side should be tightened together with the connector bracket of the brake fluid level switch.



R7MA00208-99999

14. Connect the brake tubes to the master cylinder. Tighten the flare nut to the specified torque, using a flare nut wrench.

Tightening Torque: 12.7 - 17.7 N·m (1.3 - 1.8 kgf·m)



R7MA00209-99999

15. Reconnect the brake fluid level switch connector.

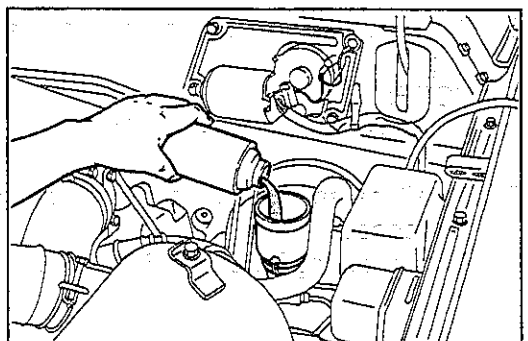
16. Fill brake fluid to the reservoir tank.

Specified Brake Fluid: DOT 3 or SAEJ - 1703

17. Perform air bleeding.

18. Ensure that no brake fluid leakage is present.

19. Check and adjust the brake pedal height.



R7MA00210-99999

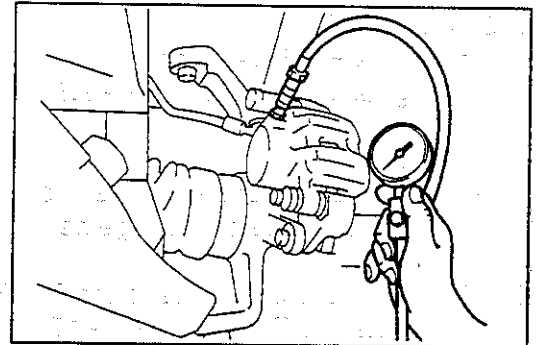
PROPORTIONING VALVE

INSPECTION

1. Connect a suitable brake hydraulic pressure gauge to the front wheel brake. Perform air bleeding.

NOTE:

- Be sure to follow the manufacturer's instructions of the brake hydraulic pressure gauge during the connection.

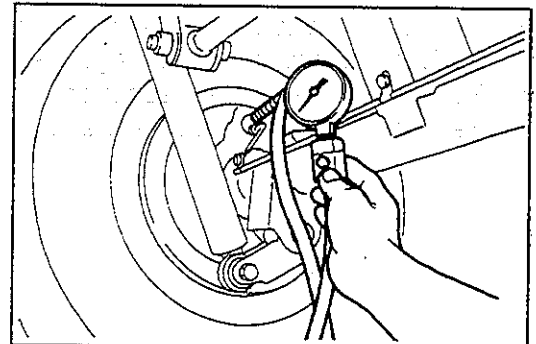


R7MA00211-99999

2. Connect a suitable brake hydraulic pressure gauge to the rear wheel brake. Perform air bleeding.

NOTE:

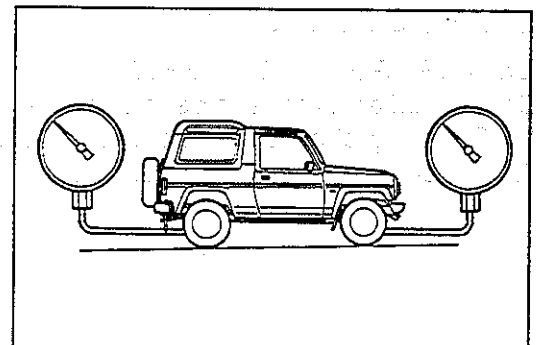
- Be sure to follow the manufacturer's instructions of the brake hydraulic pressure gauge during the connection.



R7MA00212-99999

3. With the brake pedal depressed, set the reading of the hydraulic pressure gauge installed to the front wheel brake to 2.0 MPa (20.4 kgf/cm²). Ensure that the hydraulic pressure gauge installed to the rear wheel brake registers almost the same hydraulic pressure as that applied to the front wheel.

If not, replace the P & B valve.

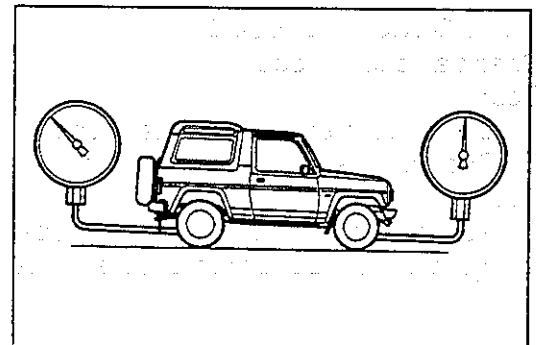


R7MA00213-99999

4. Apply a hydraulic pressure of 2.94 MPa (30 kgf/cm²) or more to the front wheel brake by depressing the brake pedal. Ensure that the hydraulic pressure applied to the rear wheel brake is lower than that applied to the front wheel.

If not, replace the P & B valve.

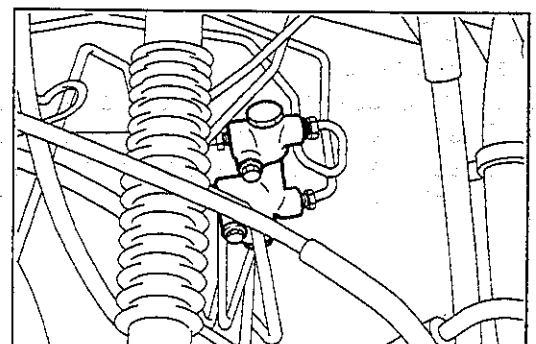
5. Remove the brake hydraulic pressure gauge. Perform air bleeding.



R7MA00214-99999

REMOVAL

1. Drain the brake fluid from the front and rear brake bleeder plugs.
2. Remove the brake pipe from the P & B valve, using a brake tube union nut wrench.
3. Remove the P & B valve by removing the P & B valve attaching bolts.



R7MA00215-99999

MA-54

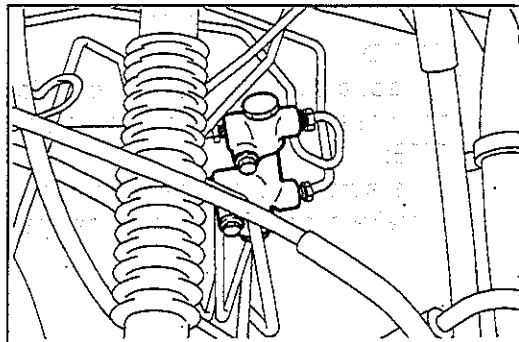
INSTALLATION

1. Install the P & B valve and tighten the attaching bolts.
Tightening Torque: 5.9 - 9.8 N-m (0.6 - 1.0 kgf-m)

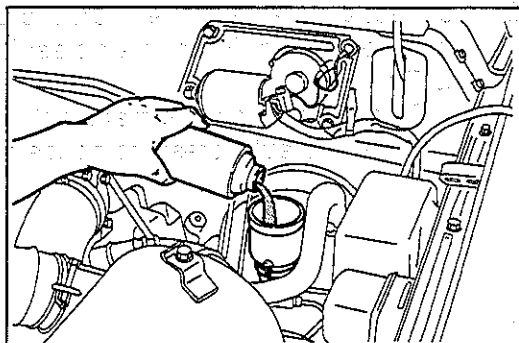
NOTE:

- On air conditioner-equipped vehicles, be sure to tighten the drain hose clamp together with the valve.

2. Connect the brake pipes to the P & B valve.
Tightening Torque: 12.7 - 17.7 N-m (1.3 - 1.8 kgf-m)
3. Fill brake fluid to the master cylinder. Perform air bleeding.
4. Perform the brake fluid leakage test.
5. Perform the in-vehicle inspection.
6. Perform the brake test on a brake tester.



R7MA00216-99999



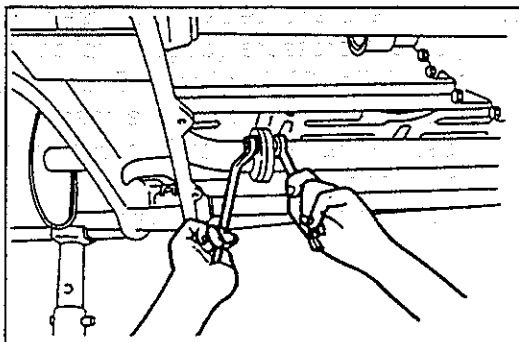
R7MA00217-99999

CHASSIS AND BODY

EXHAUST PIPE AND MUFFLER

Check muffler, exhaust pipe, mountings

1. Checking of exhaust pipe for tightness.
2. Checking of muffler, exhaust pipe, mountings for damage.



R7MA00218-99999

ALL DOORS AND HOOD

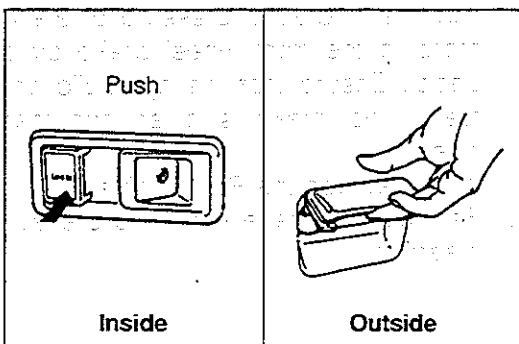
Check all doors, hood

Door

1. Doors locks should operate properly.
2. Door locks should not hit striker.

Hood

1. Auxiliary catch should operate properly.
2. Hood should be locked securely when closed.



R7MA00219-99999

SEAT BELT

Check of seat belt

Checking of seat belts for operation and looseness

1. Check that the belt components are free from damage.
2. Check that the tongue plate can be released smoothly when the buckle button is pressed.
3. Check that the tongue plate can be locked securely when inserted into the buckle.

R7MA00220-00000

CHASSIS GREASE

Check of chassis grease

Apply grease to grease fittings of chassis.

1. Check the each grease fittings of chassis for grease. condition.
2. Apply lithium grease to the grease fittings given bellow.
 - (1) Steering related parts
 - (2) Propeller shaft
 - (3) Suspension related parts

R7MA00221-00000

Check of other bolts, nuts and wheel hub nuts

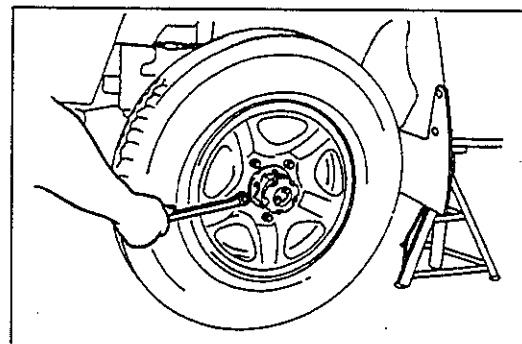
Retightening of bolts and nuts on chassis and body.

1. Front suspension parts
2. Power train parts
3. Rear suspension parts
4. Steering system parts

Check of wheel hub nuts

Retighten the hub nuts.

Tightening Torque: 88.3 - 117.7 N-m
(9.0 - 12.0 kgf-m)



R7MA00222-99999

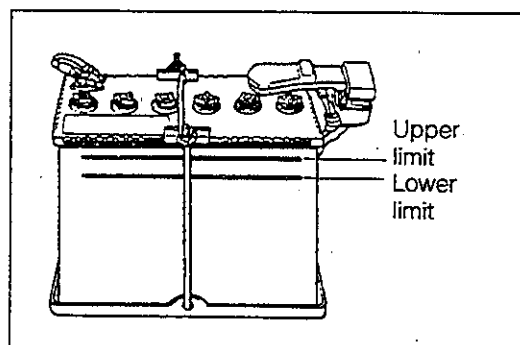
ELECTRICAL SYSTEM

BATTERY

Check of following parts

Check the battery electrolyte level.

The electrolyte level must be between upper and lower levels.



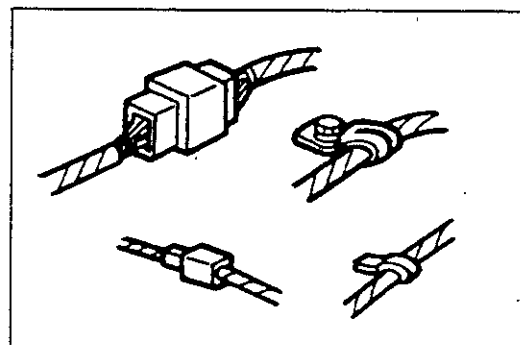
R7MA00223-99999

WIRE HARNESS

Check of wire harness

Check of wire harness for damage

1. Check the wiring for damage or looseness.
2. Check each clamp and connection for looseness.



R7MA00224-99999

LIGHTING SYSTEM METER AND GAUGE

Check of lighting system, meter and gauges

Check of lighting system, meter and gauges for function

1. Check headlamps, turn signal lamps, stop lamps, back-up lamps, tail lamps, licence plate lamps, hazard warning lamps and meter illumination lamps for function.
2. Check fuel gauge, water temperature gauge, charge warning lamp, oil pressure warning lamp, parking brake warning lamp, stop lamp warning lamp, brake fluid warning lamp and speedometer for function.

R7MA00225-00000