PERIODIC INSPECTION AND MAINTENANCE

CONTENTS

PERIODIC INSPECTION AND MAINTENANCE SCHEDULE

For items which indicate both distance and time (in months), the inspection should be made at whichever (distance or time) comes first.

Maintenance operation code

I : Inspection **L : Lubrication** **None : Not applicable**

R : Replace or change **C : Clean** **● : Applicable**

Items			Service Intervals (Odometer reading or months, whichever occurs first)																				OUTLANDER
	Months		12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	
	Odometer Reading	× 1000 km	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270	285	300	
OPERATIONS INSIDE THE ENGINE COMPARTMENT																							
A1	Check V-belt for cracks, fraying, wear, and adjust its tension		I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	●
A2	Check condition of distributor, cap and rotor					I				I				I				I				I	
A3	Check ignition cables for damage			I		I		I		I		I		I		I		I		I		I	●
A4	Check vacuum pump oil hose for damage (diesel - powered vehicles)		I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
A5	Check intake air hose and turbocharger oil hose for damage (vehicles with turbocharger)			I		I		I		I		I		I		I		I		I		I	
A6	Replace engine timing belt *1 (except vehicles with timing chain)		R : Every 90,000 km																				●
A7	Check operation of crankcase emission control system (petrol-powered vehicles)			I		I		I		I		I		I		I		I		I		I	●
A8	Replace spark plugs	Standard type	R : Every 45,000 km																				●
		Platinum-tipped type or Iridium-tipped type	R : Every 90,000 km																				
A9	Check radiator hoses for damage and proper connection			I		I		I		I		I		I		I		I		I		I	●
A10	Check engine coolant level in reservoir			I		I		I		I		I		I		I		I		I		I	●
A11	Change engine coolant					R				R				R				R				R	●
A12	Check air cleaner element for clogging and damage	Normal usage	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	●
		Severe usage	I : Every 7,500 km or every 6 months																				●
A13	Replace air cleaner element	Normal usage			R			R			R			R			R			R			●
		Severe usage		R : More frequently																			●
A14	Check fluid level in brake reservoir and clutch reservoir (for hydraulic type clutch)		I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	●
A15	Change brake fluid			R		R		R		R		R		R		R		R		R		R	●
A16	Check battery electrolyte level		I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	●
A17	Check injection nozzle [If dark smoke is exhausted or engine power is low] (diesel-powered vehicles)					I				I				I				I				I	
A18	Replace fuel filter	Petrol-powered vehicles										R										R	●
		Diesel-powered vehicles		R		R		R		R		R		R		R		R		R		R	
A19	Removal of water from the fuel filter (vehicle with F9Q engine)			Removal : Every 15,000 km																			
A20	Clean brake booster vacuum nipple (PAJERO PININ with GDI engine)				C			C			C			C			C			C			

NOTE:

*1: Including timing belt B with 4G6/4D5 engine

Maintenance operation code
I : Inspection L : Lubrication None : Not applicable
R : Replace or change ● : Applicable

Items				Service Intervals (Odometer reading or months, whichever occurs first)																				OUTLANDER
		Months		12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	
		Odometer Reading	× 1000 km	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270	285	300	
OPERATIONS UNDER THE VEHICLE																								
B1	Check suspension system for damage and looseness				I		I		I		I		I		I		I		I		I		I	●
B2	Check suspension arm ball joints for play, and dust covers for damage				I		I		I		I		I		I		I		I		I		I	●
B3	Lubricate suspension arm, steering linkage and propeller shaft with grease fitting				L		L		L		L		L		L		L		L		L		L	
B4	Check drive shaft boots for damage	Normal usage			I		I		I		I		I		I		I		I		I		I	●
		Severe usage		I : Every 7,500 km																				●
B5	Check steering linkage for damage and loose connections (including seals and boots)						I				I				I				I				I	●
B6	Check gear oil level in manual transmission			I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	●
B7	Check gear oil level in transfer case (4WD)			I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	●
B8	Change gear oil in manual transmission	Normal usage								R							R							●
		Severe usage				R			R			R			R			R			R			●
B9	Change gear oil in transfer case (4WD)	Normal usage								R							R							
		Severe usage				R			R			R			R			R			R			
	Change gear oil in transfer case (4WD) (OUTLANDER/SPACE WAGON)							R					R					R					R	●
B10	Check gear oil level in front and rear differential				I		I		I		I		I		I		I		I		I		I	●
B11	Change gear oil in front and rear differential	Conventional differential or VCU type LSD	Normal usage						R						R						R			●
			Severe usage			R			R			R			R			R			R			●
		Mechanical type LSD or Hybrid type LSD	Normal usage				R				R				R				R				R	
			Severe usage		R		R		R		R		R		R		R		R		R		R	
B12	Check exhaust pipe connections for gas leakage, and check pipe installation				I		I		I		I		I		I		I		I		I		I	●
OPERATIONS INSIDE THE VEHICLE																								
C1	Check brake pedal and clutch pedal for free play			I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	●
C2	Check parking brake lever stroke and play			I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	●
C3	Replace air purifier filter (pollen filter)			R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	●
C4	Check SRS airbag system			I : At 10 years																				●
OPERATIONS OUTSIDE THE VEHICLE																								
D1	Check uneven tyre wear				I		I		I		I		I		I		I		I		I		I	●
D2	Check front wheel bearings for play						I				I				I				I				I	●
D3	Check brake hoses and pipes for leakage				I		I		I		I		I		I		I		I		I		I	●

Maintenance operation code
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OUTLANDER

Items				Service Intervals (Odometer reading or months, whichever occurs first)																				
		Months		12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240	
		Odometer Reading	× 1000 km	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270	285	300	
D4	Check brake pads and discs for wear		Normal usage	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	●
			Severe usage	I : Every 7,500 km or every 6 months																				●
D5	Check brake shoe linings and drums for wear		Normal usage		I		I		I		I		I		I		I		I		I		I	●
			Severe usage	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	●
D6	Check fuel hoses and pipes for leakage or deterioration				I		I		I		I		I		I		I		I		I		I	●
OPERATIONS AFTER ENGINE IS WARMED UP																								
E1	Check fluid level in automatic transmission			I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	
E2	Change automatic transmission fluid	2WD *1	Normal usage						R						R						R			
			Severe usage			R			R			R			R			R			R			
		4WD	Normal usage						R						R						R			
			Severe usage			R			R			R			R			R			R			
		4WD				R			R			R			R			R			R			
E3	Change engine oil (petrol-powered vehicles)	ACEA and API classifications "ACEA A1, A2, A3" / "For service SG" or higher	Normal usage	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	●
			Severe usage	R : Every 7,500 km																				●
	Change engine oil (Diesel-powered vehicles)	ACEA and API classifications "ACEA B1, B2, B3, B4" / "For service CD" or higher	Normal usage	R : Every 7,500 km or every 6 months																				
			Severe usage	R : Every 4,000 km																				
E4	Replace engine oil filter (petrol-powered vehicles)	ACEA and API classifications "ACEA A1, A2, A3" / "For service SG" or higher	Normal usage	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	●
			Severe usage	R : Every 7,500 km																				●
	Replace engine oil filter (Diesel-powered vehicles)	ACEA and API classifications "ACEA B1, B2, B3, B4" / "For service CD" or higher	Normal usage	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	
			Severe usage	R : Every 8,000 km																				
E5	Check engine idling speed			I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	●
E6	Check CO concentration (petrol-powered vehicles)			I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	●
E7	Check ignition timing (vehicle with distributor) (except vehicle with crankshaft-mounted crankshaft angle sensor)						I				I				I				I				I	
E8	Check exhaust gas recirculation (EGR) system			I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	●
E9	Check valve clearance (except vehicles with auto-lash adjuster)			I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	

NOTE:

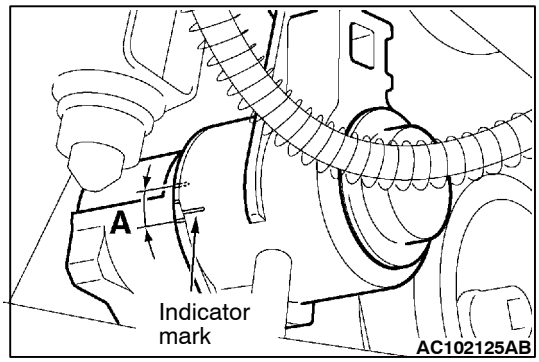
*1: Replacement is not required for RWD vehicles used in normal operating conditions.

Maintenance operation code
I : Inspection **L : Lubrication** **None : Not applicable**
R : Replace or change **● : Applicable**

OUTLANDER

Items			Service Intervals (Odometer reading or months, whichever occurs first)																			
	Months		12	24	36	48	60	72	84	96	108	120	132	144	156	168	180	192	204	216	228	240
	Odometer Reading	× 1000 km	15	30	45	60	75	90	105	120	135	150	165	180	195	210	225	240	255	270	285	300
OTHERS																						
F1	Check body condition for damage		I : Every years																			●
F2	Road test		I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	●

NOTE:
"Severe usage" specifications apply to only vehicles used under severe operating conditions.
Severe operating conditions include the following:
(1) Driving in a dusty area.
(2) Driving on rough roads, on submerged roads, or hilly areas.
(3) Driving in cold zones.
(4) Engine idling for a long time or short-distance travel during cold weather.
(5) Frequent, sudden application of brakes.
(6) Towing of a trailer.
(7) Use as a taxi or as a rent-a-car.
(8) When more than 50% of driving is in heavy city traffic and the ambient temperature is 32°C or more.
(9) When more than 50% of driving is at 120km/h or more and the ambient temperature is 30°C or more.



OPERATIONS INSIDE THE ENGINE COMPARTMENT

A1. CHECK V-BELT FOR CRACKS, FRAYING, WEAR, AND ADJUST ITS TENSION

V-BELT CONDITION

Check the whole rounds of the V-belt for cracks, fraying and wear.

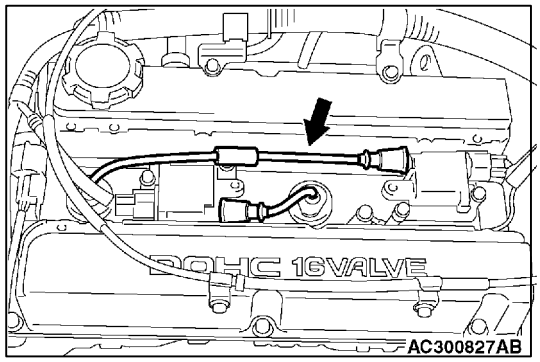
V-BELT TENSION

(1) Check that the indicator marking of the auto-tensioner is within the range as shown in the illustration A of the tensioner bracket.

Caution
Inspection must be carried out after turning the crankshaft clockwise for more than once.

(2) If the marking is outside the range as shown in the illustration A, replace the drive belt.

NOTE
Due to the adoption of the auto-tensioner, no adjustment for belt tension is required.

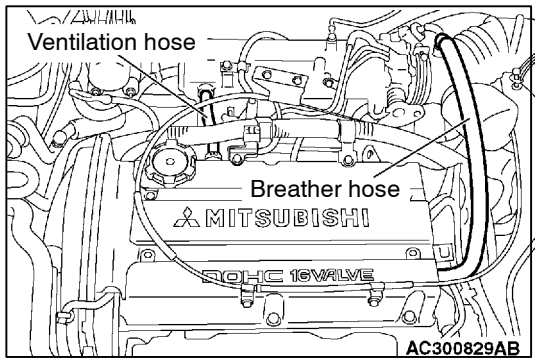


A3. CHECK IGNITION CABLES FOR DAMAGE

(1) Check the ignition cable and rubber cap for damage or weakness, and check the installation condition.
(2) Check the ignition cable and spark plug, distributor, and ignition coil connections for contamination, dirt, etc.
(3) If dirty, clean it; if damaged, replace it.

A6. REPLACE ENGINE TIMING BELT (EXCEPT VEHICLES WITH TIMING CHAIN)

For information concerning the replacement procedures, refer to the Workshop Manual.



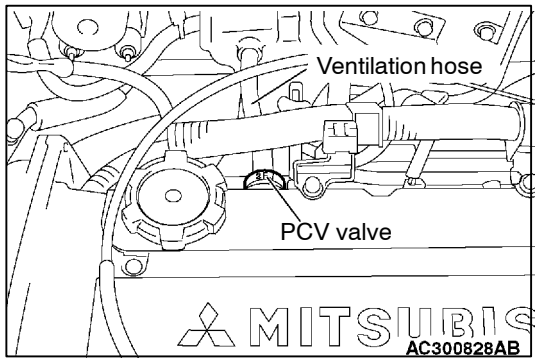
A7. CHECK OPERATION OF CRANKCASE EMISSION CONTROL SYSTEM (PETROL-POWERED VEHICLES)

BREATHER HOSE

(1) Inspect the blow-by hose for cracks or damage.
(2) Clean the inside of the blow-by gas hoses if necessary.
(3) Inspect the ventilation filter for clogging.

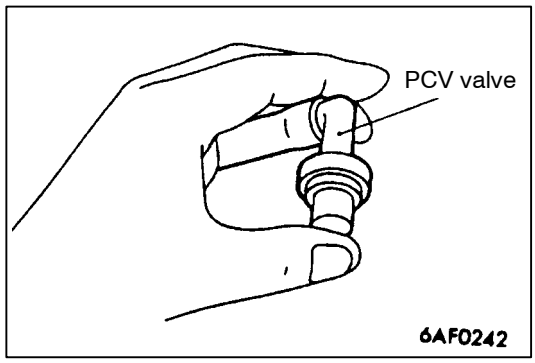
VENTILATION HOSE

(1) Check entire circumference and length of hoses using a mirror as required.
(2) Check all clamps for tightness and the connections for leakage.
(3) Hoses should be replaced immediately if there is any evidence of deterioration or damage.



POSITIVE CRANKCASE VENTILATION SYSTEM CHECK

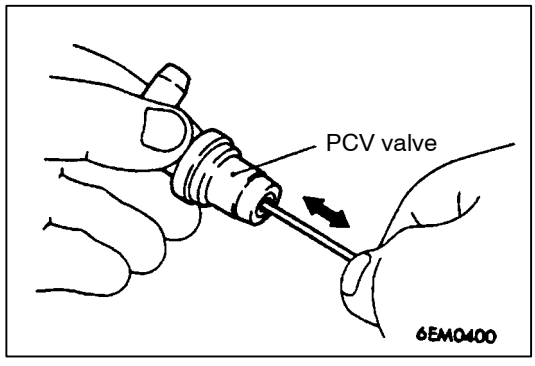
(1) Remove the ventilation hose from the PCV (Positive crankcase ventilation) valve.
(2) Remove the PCV valve from the rocker cover.
(3) Reinstall the PCV valve at the ventilation hose.
(4) Start the engine and run at idle.



(5) Place finger at the opening of the PCV valve and check that vacuum of the intake manifold is felt.

NOTE
At this moment, the plunger in the PCV valve moves back and forth.

(6) If vacuum is not felt, clean the PCV valve or replace it.

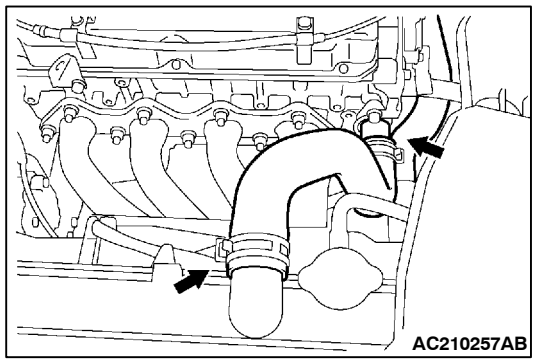


PCV VALVE CHECK

(1) Insert a thin rod into the PCV valve from the side shown in the illustration (rocker cover installation side), and move the rod back and forth to check that the plunger moves.
(2) If the plunger does not move, there is clogging in the PCV valve. In this case, clean or replace the PCV valve.

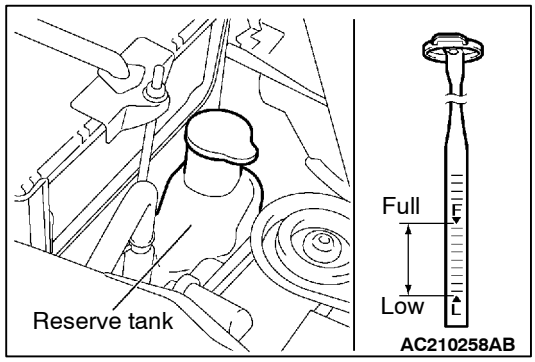
A8. REPLACE SPARK PLUGS

After removing old spark plugs, install new ones and tighten them at the specified torque.



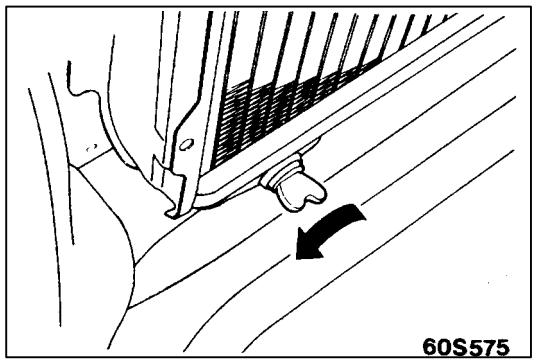
A9. CHECK RADIATOR HOSES FOR DAMAGE AND PROPER CONNECTION

(1) Check entire circumference and length of hoses, using a mirror as required.
(2) Check that hoses installed in grommets pass through the centre of the grommets.
(3) Check all clamps for tightness and connections for leakage.



A10. CHECK ENGINE COOLANT LEVEL IN RESERVOIR

Check that the coolant level is between the “FULL” and “LOW” lines when the engine is at the normal operating temperature.



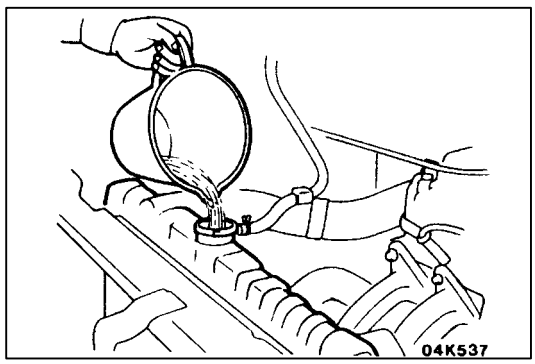
A11. CHANGE ENGINE COOLANT

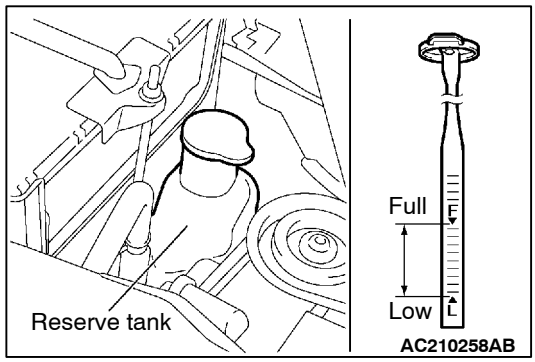
(1) Stop the engine after it is fully warmed up.
(2) Add detergent to the engine coolant in order to flush the cooling system, and start the engine.
(3) Loosen the drain plug, remove the radiator can and drain the coolant.
(4) Feed fresh water into the cooling system through the filler port of the radiator in order to wash the cooling system, and then tighten the drain plug.
(5) Drain the coolant from the reserve tank.
(6) Install the reserve tank.
(7) Depending upon conditions of operation, determine the amount of long life coolant, antifreeze or antirust to be added to the coolant.

Recommended antifreeze:
DIA QUEEN SUPER LONG LIFE COOLANT or equivalent

Caution
Do not use alcohol or methanol anti-freeze or any engine coolants mixed with alcohol or methanol anti-freeze. The use of an improper anti-freeze can cause the corrosion of the aluminium components.

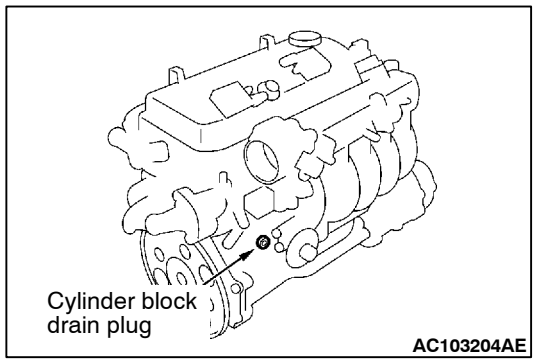
(8) Fill the cooling system with soft water through the filler port, and add long life coolant, if necessary.





(9) Fill the reserve tank with coolant.
(10) Install the radiator cap and the reserve tank cap.
(11) Recheck the engine coolant level after a road test.

Caution
When removing the radiator cap, be careful to blow out steam and boiling water.



REMOVAL OF ENGINE COOLANT FROM THE CYLINDER BLOCK DRAIN PLUG

(1) Drain the engine coolant by removing the drain plug and then the radiator cap.
(2) Remove the cylinder block drain plug from the cylinder block to drain the engine coolant.
(3) Remove the reserve tank to drain the engine coolant.
(4) When the engine coolant has drained, pour in water from the radiator cap to clean the engine coolant line.
(5) Coat the thread of the cylinder block drain plug with the specified sealant and tighten to the specified torque.

Specified sealant:
3M Nut Locking Part No.4171 or equivalent

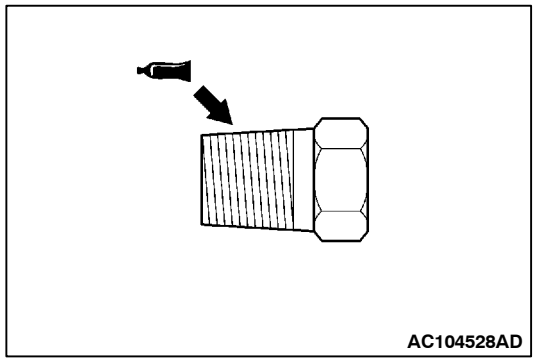
Tightening torque:
44 ± 5 N·m

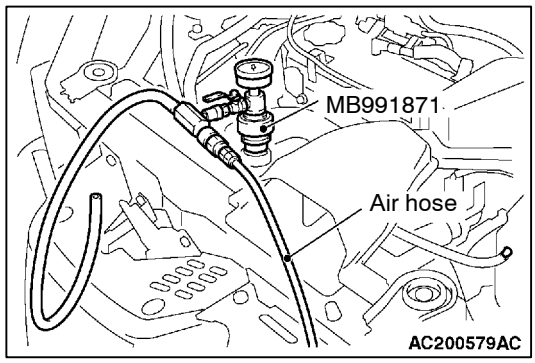
(6) Securely tighten the radiator drain plug.
(7) Install the reserve tank.
(8) Use special tool LLC changer (MB991871) to refill the coolant.

NOTE
For how to use special tool MB991871, refer to its manufacturer's instructions.

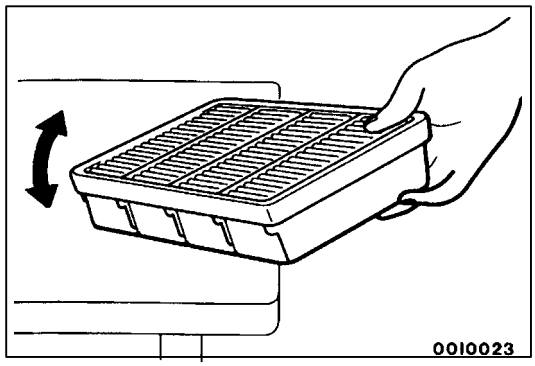
Recommended antifreeze:
DIA QUEEN SUPER LONG LIFE COOLANT or equivalent
Quantity: 7.0 L

Caution
Do not use alcohol or methanol anti-freeze or any engine coolants mixed with alcohol or methanol anti-freeze. The use of an improper anti-freeze can cause the corrosion of the aluminium components.



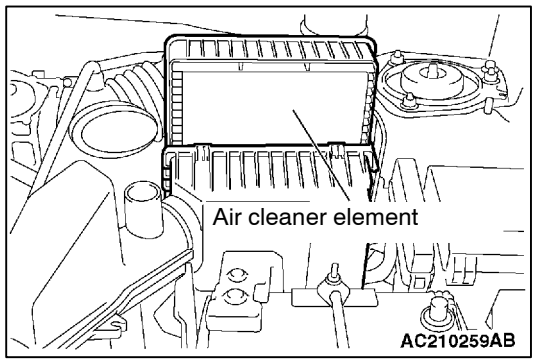


(9) Install the radiator cap securely.
(10) Start the engine and warm the engine until the thermostat opens. (Touch the radiator hose with your hand to check that warm water is flowing.)
(11) After the thermostat opens, race the engine several times, and then stop the engine.
(12) Cool down the engine, and then pour engine coolant into the reserve tank until the level reaches the FULL line. If the level is low, repeat the operation from step 9.



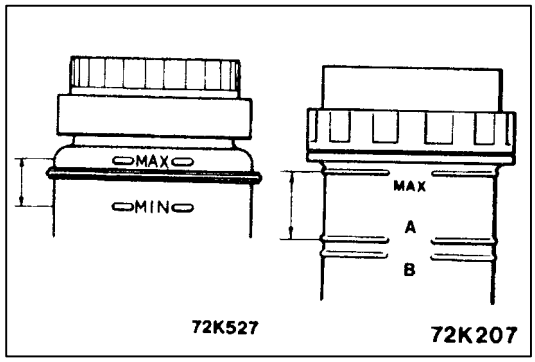
A12. CHECK AIR CLEANER ELEMENT FOR CLOGGING AND DAMAGE

(1) Check air cleaner element for clogging and damage.
(2) Clean deposited dust from the element in the following manner.
    1) Lightly tap the element against the top of a bench.
    2) Blow compressed air from inside the element.
(3) Wipe off dust on the air cleaner interior.
(4) Install the air cleaner body.



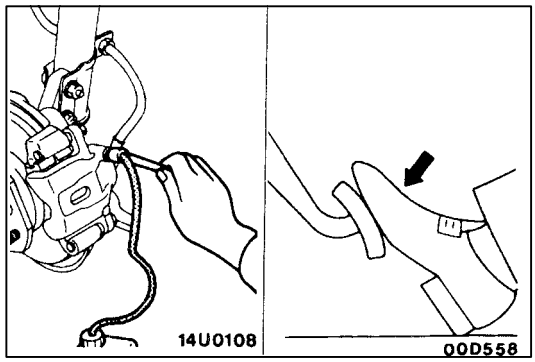
A13. REPLACE AIR CLEANER ELEMENT

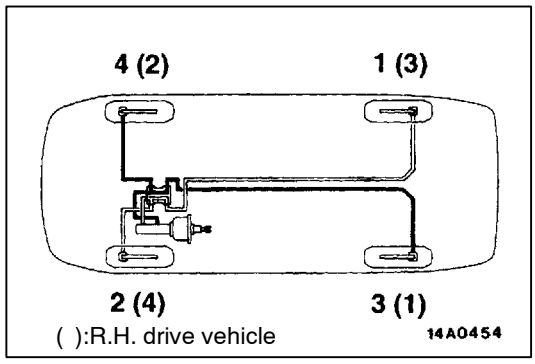
The air cleaner element will become dirty and loaded with dust during use, and the filtering effect will be substantially reduced. Replace it with a new one.
(1) Unclasp the air cleaner cover clip.
(2) Remove the air cleaner element and install a new one.
(3) Be sure to close the air cleaner cover completely when clamping it.



A14. CHECK FLUID LEVEL IN BRAKE RESERVOIR AND CLUTCH RESERVOIR (for hydraulic-type clutch only)

(1) Check that the fluid level is between the “MAX” and “MIN” or “A” marks.
(2) If it is below the “MIN” or “A” marks, replenish with fresh brake fluid up to the “MAX” mark.





A15. CHANGE BRAKE FLUID

(1) Remove the cap of the bleeder screw, connect a vinyl tube, and place its other end in a receptacle.
(2) Loosen the bleeder screw and depress the brake pedal; supply new brake fluid when the level of the fluid within the reservoir tank decreases.

Caution
If the reservoir tank completely runs out of fluid during operation, air will find way into the brake line. Pay attention, therefore, to the fluid level and replenish as necessary.

Specified brake fluid: DOT3 or DOT4

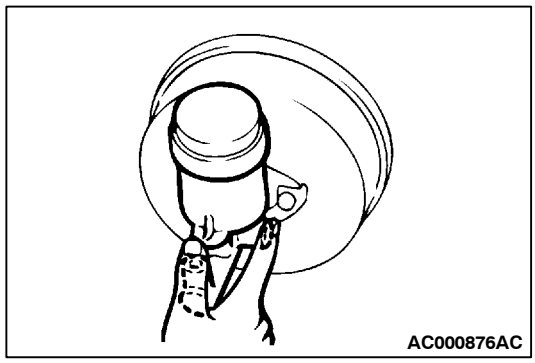
Caution
Use the specified brake fluid. Avoid using a mixture of the specified brake fluid and other fluid. If brake fluid is exposed to the air, it will absorb moisture; as water is absorbed from the atmosphere, the boiling point of the brake fluid will decrease and the braking performance will be seriously impaired. For this reason use a hermetically sealed 1 lit. or 0.5 lit. brake fluid container. Firmly close the cap of the brake fluid container after use.

(3) When fresh fluid has come to flow out from the vinyl tube, tighten the bleeder screw.

NOTE
This change from existing to fresh fluid can be judged by change in color of fluid that flows out.

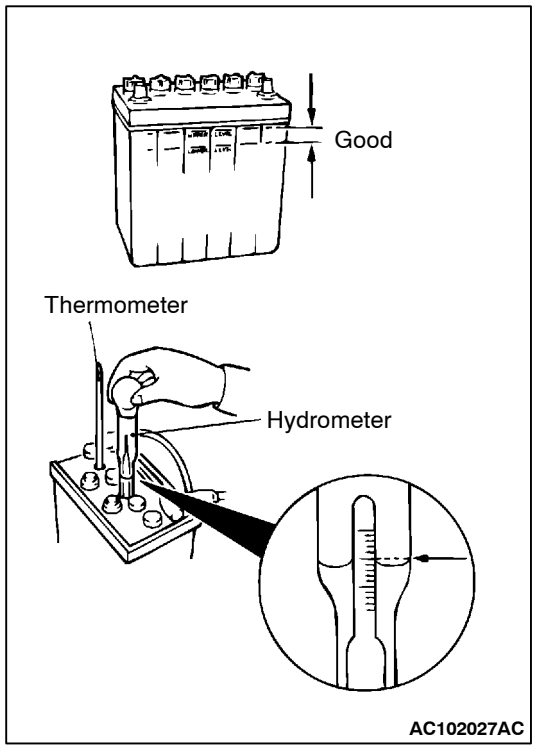
(4) Repeat above steps for other bleeder screws.

NOTE
The operating steps for each bleeder screws are illustrated on this page.



MASTER CYLINDER BLEEDING

The master cylinder used has no check valve, so if bleeding is carried out by the following procedure, bleeding of air from the brake pipeline will become easier. (When brake fluid is not contained in the master cylinder.)
(1) Fill the reserve tank with brake fluid.
(2) Keep the brake pedal depressed.
(3) Have another person cover the master cylinder outlet with a finger.
(4) With the outlet still closed, release the brake pedal.
(5) Repeat steps (2) – (4) three or four times to fill the inside of the master cylinder with brake fluid.



A16. CHECK BATTERY ELECTROLYTE LEVEL

(1) Inspect whether or not the battery fluid is between the UPPER LEVEL and LOWER LEVEL marks.

Caution
(1) If the battery fluid is below the LOWER LEVEL, the battery could explode in using.
(2) If the battery fluid is over the UPPER LEVEL, leakage could result.

(2) Use a hydrometer and thermometer to check the specific gravity of the battery fluid.

Standard value: 1.220 - 1.290 [20°C]

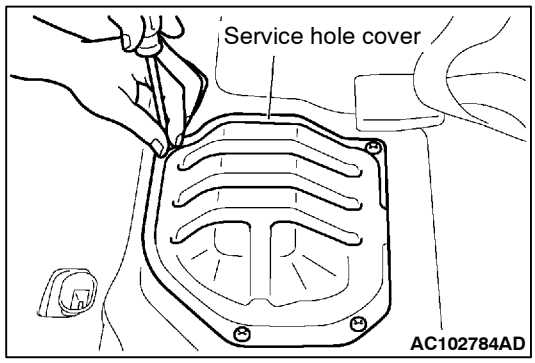
The specific gravity of the battery fluid varies with the temperature, so use the following formula to calculate the specific gravity for 20°C. Use the calculated value to determine whether or not the specific gravity is satisfactory.

D20 = (t - 20) × 0.0007 + Dt

D20: Specific gravity of the battery fluid calculated for 20°C.

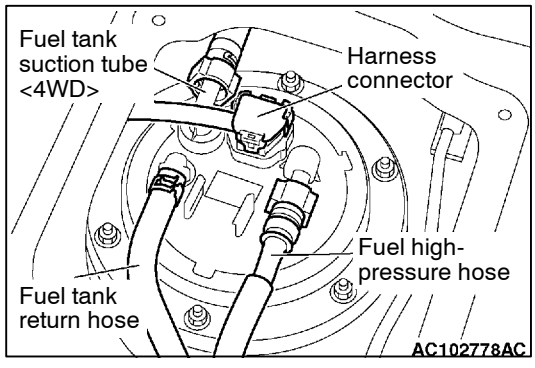
Dt: Actually measured specific gravity

t: Actually measured temperature



A18. REPLACE FUEL FILTER

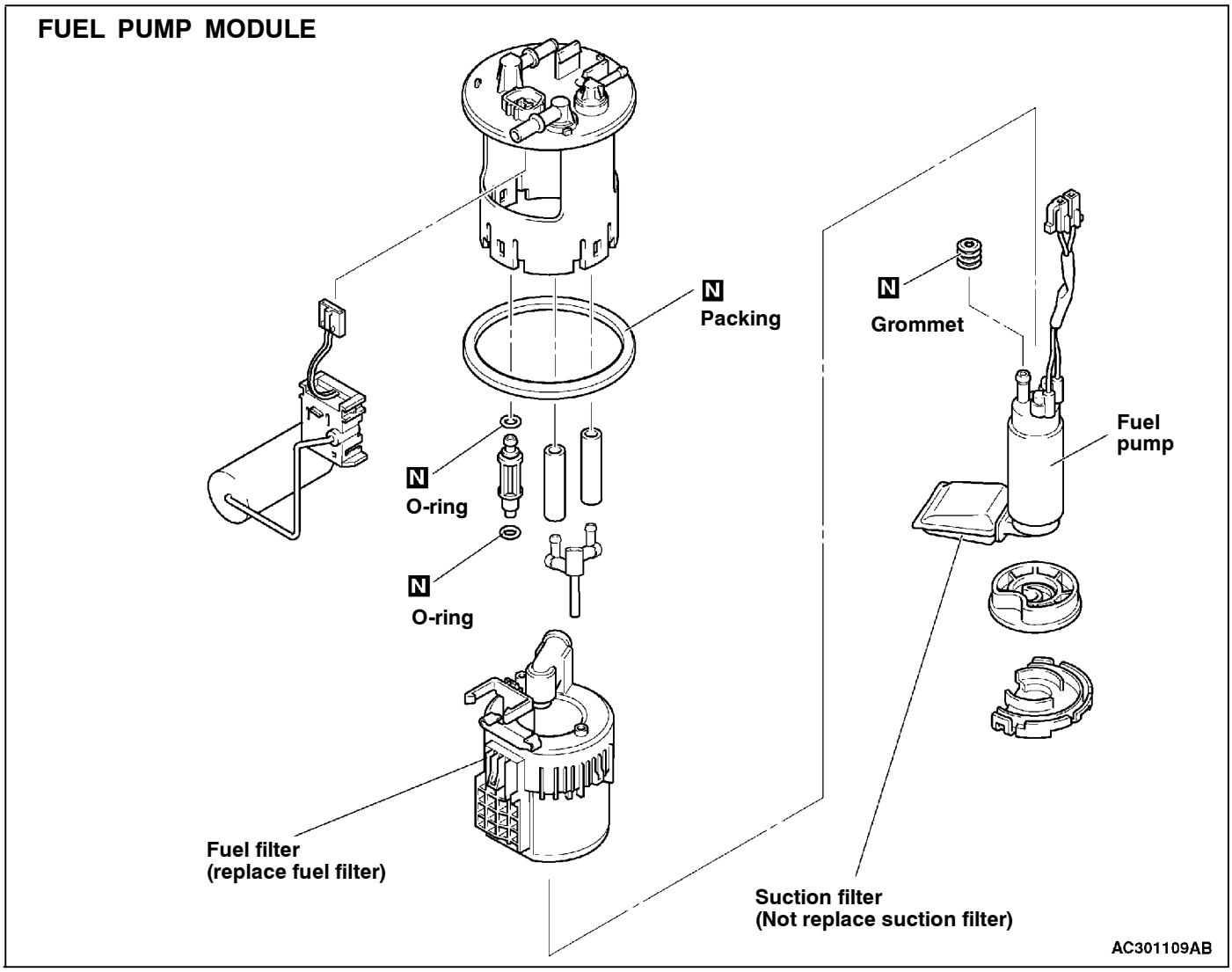
(1) Remove the rear seat cushion assembly.
(2) Remove the service hole cover.

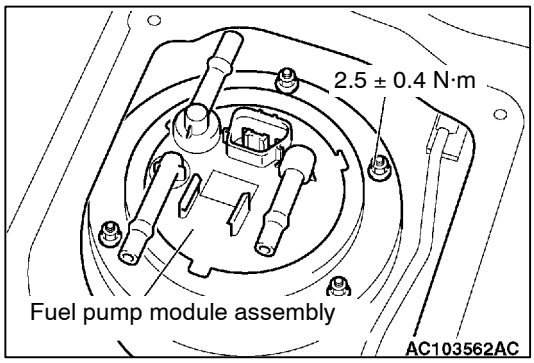


(3) Disconnect the harness connector, fuel hose and fuel tube.
(4) Unscrew the mounting nuts to remove the fuel pump module.
(5) Remove the fuel filter from fuel pump module.
(6) Install the new fuel filter.

Caution
Apply a unleaded petrol to the grommet and O-ring before installing them in order to prevent damage.

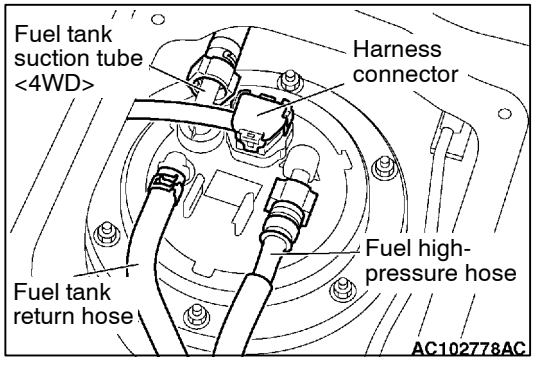
FUEL PUMP MODULE





(7) Install the fuel pump module. Tighten the mounting nuts to the specified torque.

Specified torque: 2.5 ± 0.4 N·m

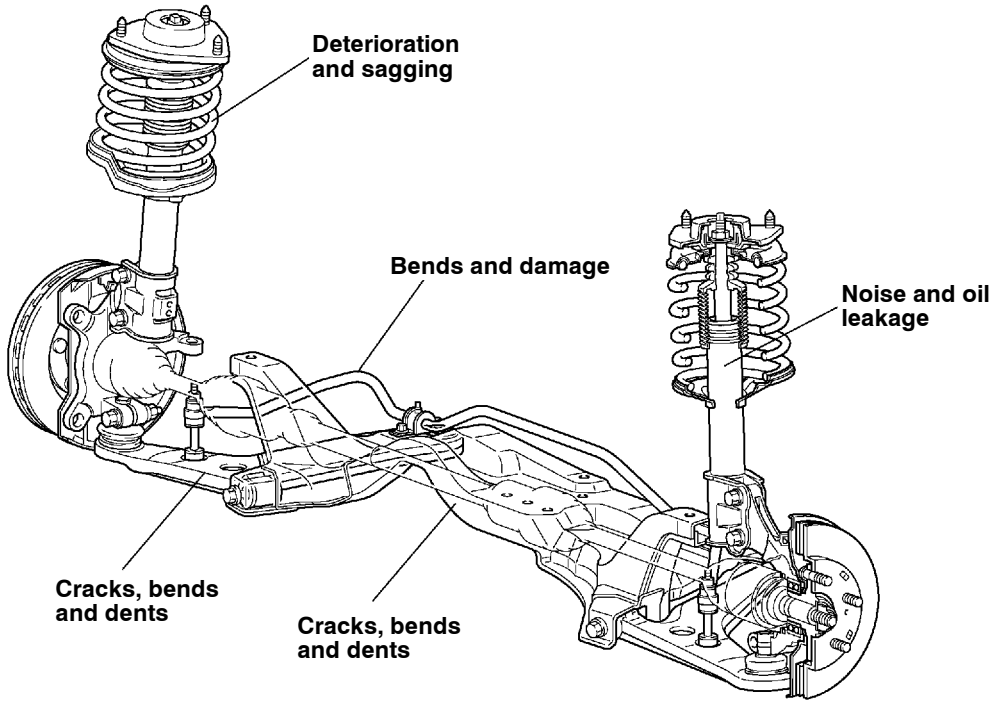


(8) Connect the fuel hose, fuel tube and harness connector.
(9) Install the service hole cover.
(10) Install the rear seat cushion assembly.

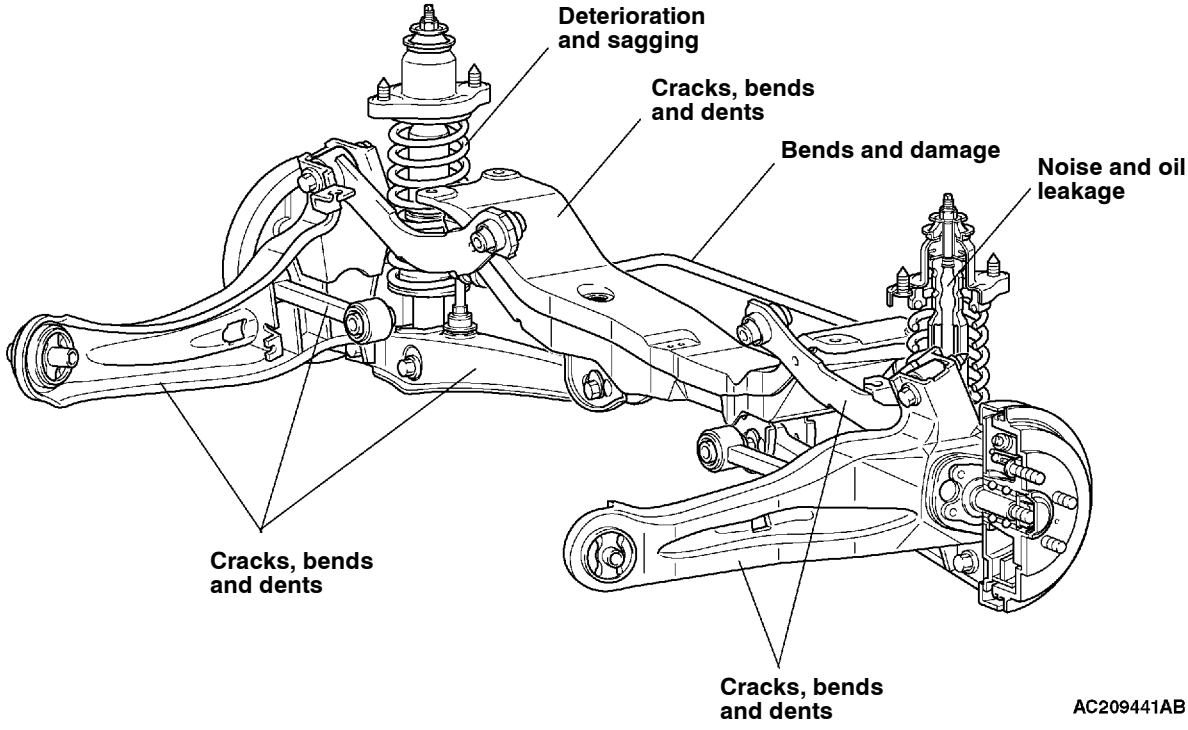
OPERATIONS UNDER THE VEHICLE

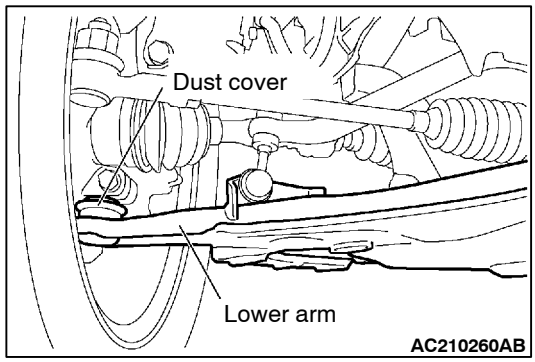
B1. CHECK SUSPENSION SYSTEM FOR DAMAGE AND LOOSENESS

FRONT SUSPENSION



REAR SUSPENSION





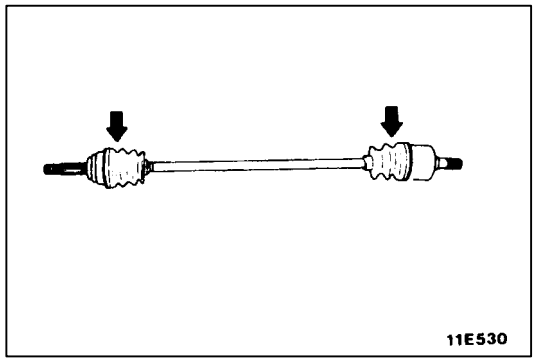
B2. CHECK SUSPENSION ARM BALL JOINTS FOR PLAY, AND DUST COVERS FOR DAMAGE

LOWER ARM BALL JOINT END PLAY CHECK

(1) Raise the vehicle.
(2) Remove the stabilizer bar from the lower arm assembly.
(3) Move the lower arm up and down with your hands to check for an excessive play in the axial direction of the ball joint. If there is an excessive play, replace the lower arm assembly.

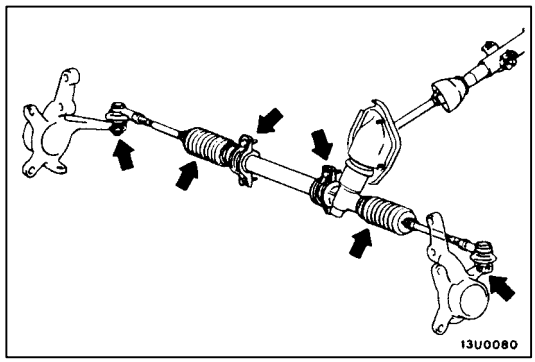
DUST COVERS FOR DAMAGE

Check dust covers for damage.



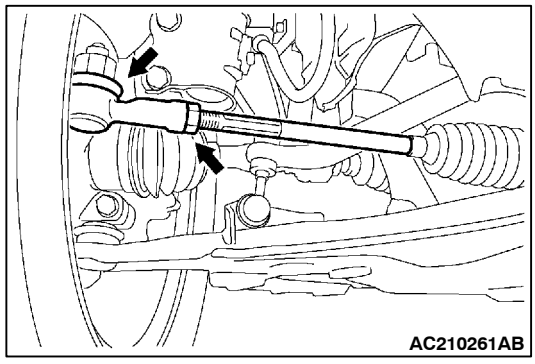
B4. CHECK DRIVE SHAFT BOOTS FOR DAMAGE

Check the drive shaft boots for damage.



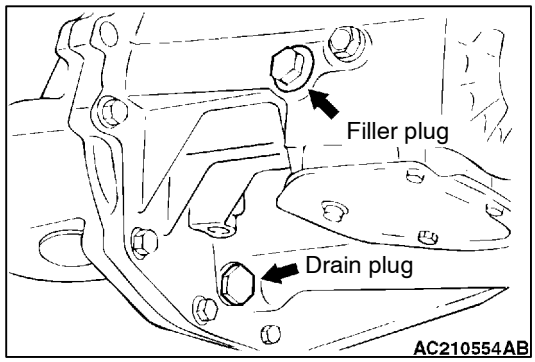
B5. CHECK STEERING LINKAGE FOR DAMAGE AND LOOSE CONNECTIONS (INCLUDING SEALS AND BOOTS)

(1) Move the steering wheel bit by bit to the left or right, and check to be sure that there is no play or looseness in the linkage coupling, that the installation is not loose, and that the rod or arm is not bent or damaged.



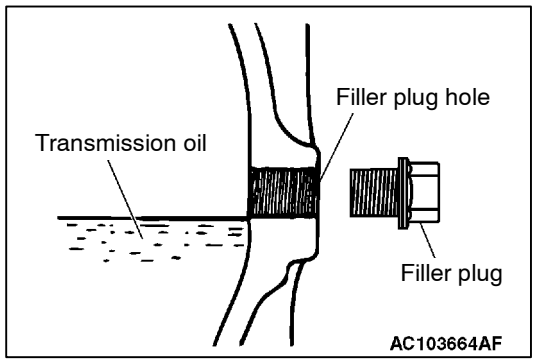
(2) Check to be sure that the seal and boot of the ball joint are correctly installed (in the correct position), and that they are not damaged.
(3) Check tie-rod end lock nut for looseness. If lock nut is loose, adjust toe-in and then tighten lock nut to the specified torque.

Tightening torque: 52 ± 2 N·m



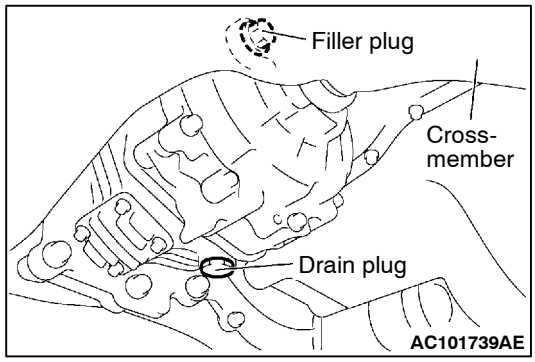
B6. CHECK GEAR OIL LEVEL IN MANUAL TRANSMISSION

(1) Remove the filler plug of the transmission case.



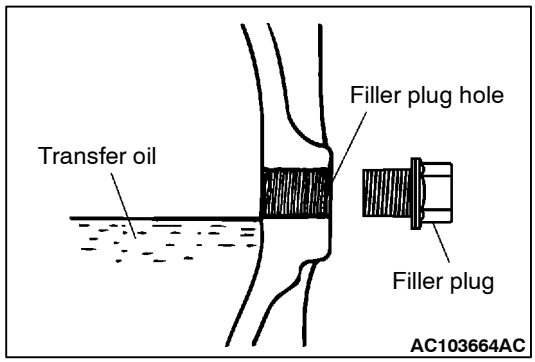
(2) Oil level should be at the lower portion of the filler plug hole.
(3) Check that the transmission oil is not noticeably dirty, and that it has a suitable viscosity.
(4) Tighten the filler plug to the specified torque.

Tightening torque: 32 ± 2 N·m



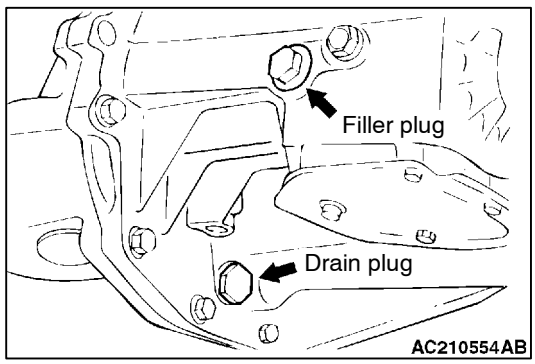
B7. CHECK GEAR OIL LEVEL IN TRANSFER CASE (4WD)

(1) Remove the filler plug of the transfer case.



(2) Oil level should be at the lower portion of the filler plug hole.
(3) Check that the transfer oil is not noticeably dirty, and that it has a suitable viscosity.
(4) Tighten the filler plug to the specified torque.

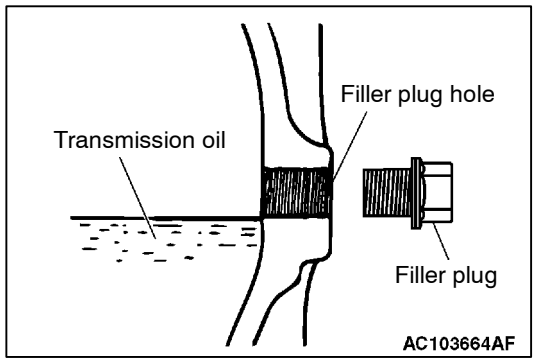
Tightening torque: 32 ± 2 N·m



B8. CHANGE GEAR OIL IN MANUAL TRANSMISSION

(1) Remove oil filler plug and oil drain plug.
(2) Drain the gear oil.
(3) Before installing the plug, remove iron powder attached to the magnet of the drain plug.
Tighten the oil drain plug to the specified torque.

Tightening torque: 32 ± 2 N·m

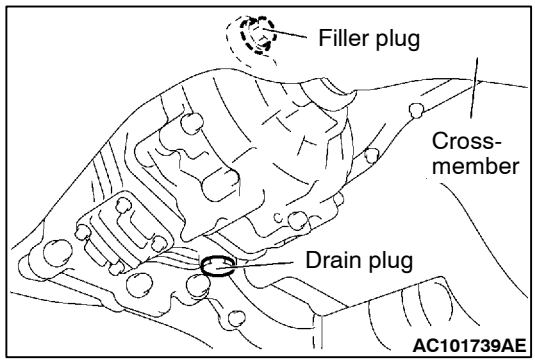


(4) Fill the transmission fresh oil by using a lubricator.
(5) Fill with specified oil till the level comes to the lower portion of oil filler plug hole.

Specified transmission oil:
Gear oil API classification GL-4 or higher
SAE 75W-85W or 75W-90
Quantity: 2.2 L <2WD>, 2.3 L <4WD>

(6) Tighten the oil filler plug to the specified torque.

Tightening torque: 32 ± 2 N·m



B9. CHANGE GEAR OIL IN TRANSFER CASE (4WD)

(1) Remove oil filler plug and oil drain plug.
(2) Drain the gear oil.
(3) Before installing the plug, remove iron powder attached to the magnet of the drain plug.
Tighten the oil drain plug to the specified torque.

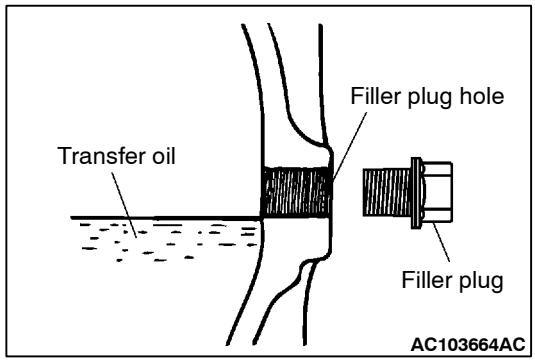
Tightening torque: 32 ± 2 N·m

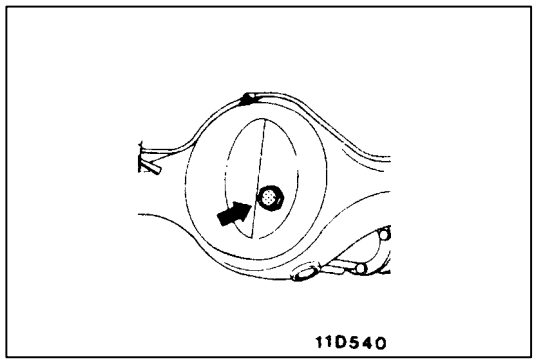
(4) Fill the transfer case fresh oil by using a lubricator.
(5) Fill with specified oil till the level comes to the lower portion of oil filler plug hole.

Specified transfer oil:
Gear oil API classification GL-5 SAE 90
Quantity: 0.53 L

(6) Tighten the oil filler plug to the specified torque.

Tightening torque: 32 ± 2 N·m





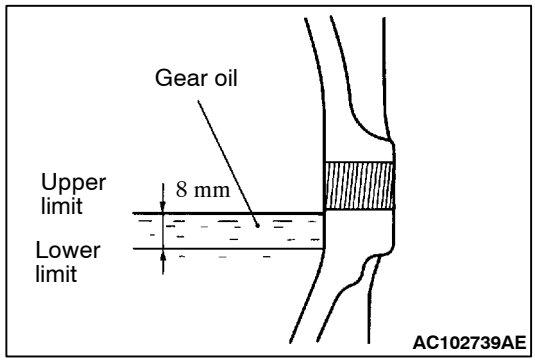
B10. CHECK GEAR OIL LEVEL IN FRONT AND REAR DIFFERENTIAL

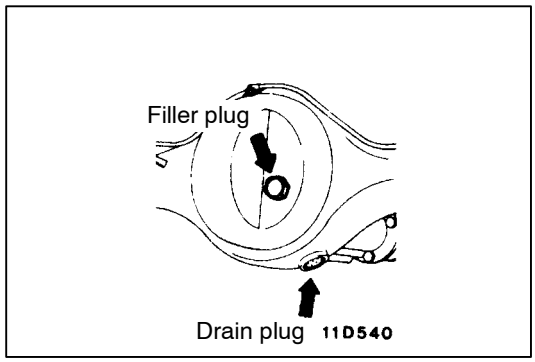
(1) Remove the filler plug.
(2) Check that the gear oil level is within the specified range from the bottom end of the filler plug hole.
(3) If the gear oil level exceeds the standard value, add the specified gear oil up to the bottom end of the filler plug hole.

Specified gear oil:
Gear oil API classification GL-5 or higher
Above 10°C SAE 90
Below 10°C SAE 80W

(4) Fit the filler plug and tighten it to the specified torque.

Tightening torque: 49 ± 9 N·m





B11. CHANGE GEAR OIL IN FRONT AND REAR DIFFERENTIAL

(1) Remove the drain plug to discharge the gear oil.
(2) Fit the drain plug and tighten it to the specified torque.

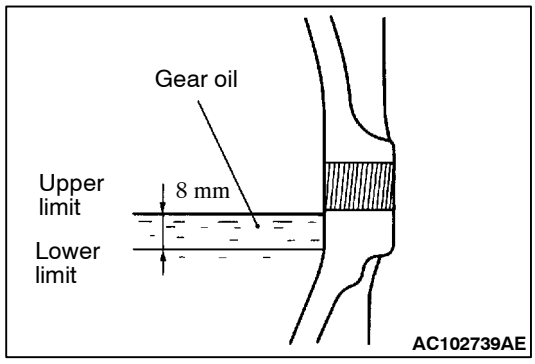
Tightening torque: 64 ± 4 N·m

(3) Remove the filler plug and add the specified gear oil up to the bottom end of the filler plug hole.

Specified gear oil:
Gear oil API classification GL-5 or higher
Above 10°C SAE 90
Below 10°C SAE 80W
Quantity: 0.55 L

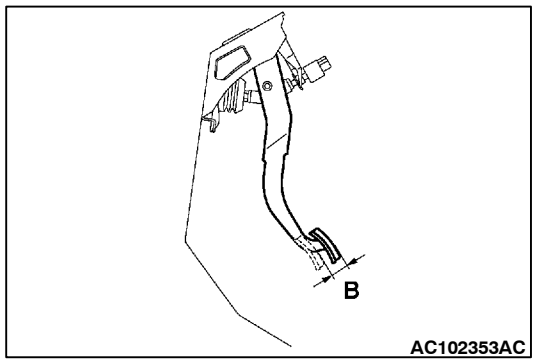
(4) Fit the filler plug and tighten it to the specified torque.

Tightening torque: 49 ± 9 N·m



B12. CHECK EXHAUST PIPE CONNECTIONS FOR GAS LEAKAGE, AND CHECK PIPE INSTALLATION

(1) Confirm that the exhaust pipe does not interfere with any body components.
(2) Check the exhaust pipe for damage by stones, etc.
(3) Start the engine and check for gas leaks from the exhaust pipe connections.



OPERATIONS INSIDE THE VEHICLE

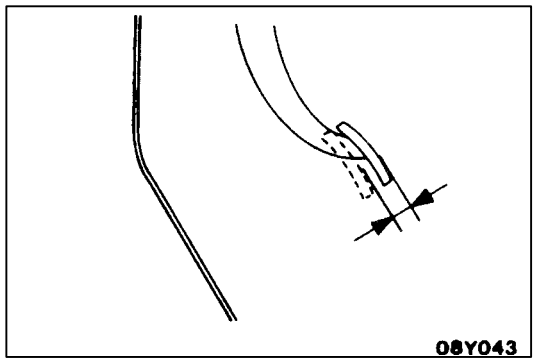
C1. CHECK BRAKE PEDAL AND CLUTCH PEDAL FOR FREE PLAY

BRAKE PEDAL FREE PLAY

(1) With the engine stopped, depress the brake pedal two or three times. After eliminating the vacuum in the power brake booster, press the pedal down by hand, and confirm that the amount of movement before resistance is met (the free play) is within the standard value.

Standard value (B): 3 – 8 mm

(2) If the brake pedal play is not within the standard value, check the following, and adjust or replace if necessary:
- Excessive play between the brake pedal and the clevis pin, or between the clevis pin and the brake booster operating rod
- Brake pedal height
- Installation position of the stop lamp switch, etc.

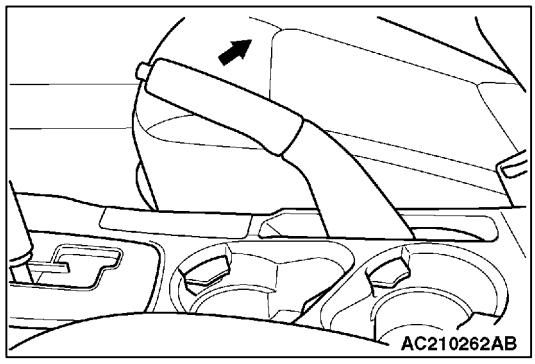


CLUTCH PEDAL FREE PLAY

(1) Measure the clutch pedal free play (including the play at the clutch pedal clevis pin).

Standard value: 4 - 13 mm

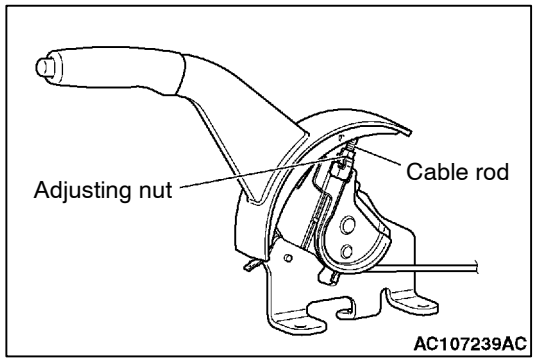
(2) If the clutch pedal free play do not meet the standard value, probably there is air in the hydraulic system or a malfunction of the clutch itself, so bleed out the air or disassemble and inspect the clutch.



C2. CHECK PARKING BRAKE LEVER STROKE AND PLAY

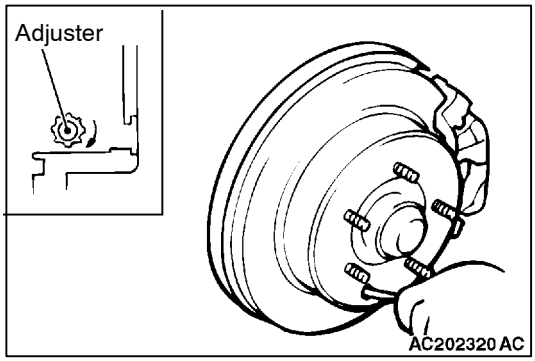
(1) Pull the parking brake lever with a force of approx. 200 N and count the number of notches.

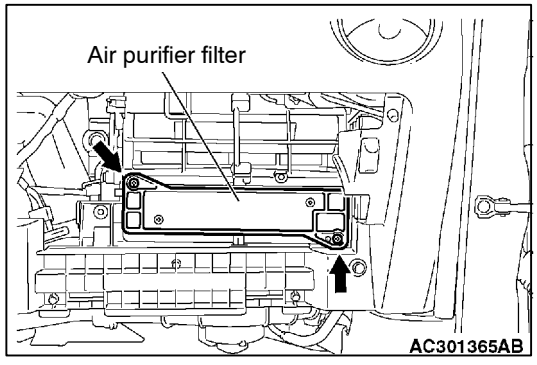
Standard value: 4 - 5 notches



(2) If the parking brake lever stroke is not the standard value, adjust as described below.
   1) Remove the floor console assembly.
   2) Loosen the adjusting nut to move it to the cable rod end so that the cable will be free.
   3) Remove the rear brake adjusting hole plug. Then insert a flat-tipped screwdriver to turn the adjuster to the arrow direction (to expand the shoe) until the parking brake shoe makes contact and the disc can no longer be turned.
      Back off the adjuster to the opposite direction by five notches.
   4) Adjust the parking brake lever stroke to the standard value by turning the adjusting nut. After the adjustment, ensure that there is no free play between the adjusting nut and the parking brake lever.

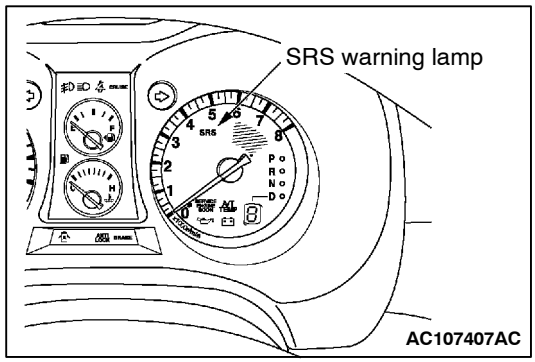
      Caution
      If the parking brake lever stroke is below the standard value and the braking is too firm, the rear brakes may drag.
   5) After the parking brake lever stroke is adjusted, raise the rear of the vehicle. Release the parking brake, turn the rear wheels to confirm that rear brakes are not dragging.





C3. REPLACE AIR PURIFIER FILTER (POLLEN FILTER)

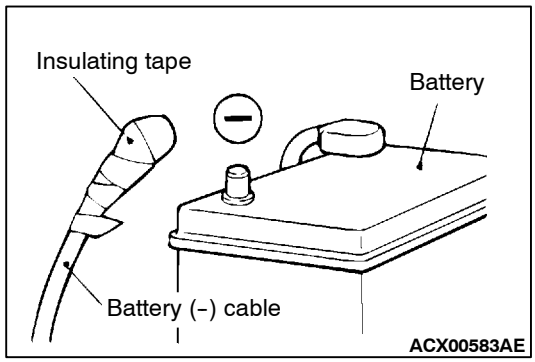
(1) Remove the glove box.
(2) Remove the two screws as shown, and replace the air purifier filter.
(3) Install the glove box.



C4. CHECK SRS AIRBAG SYSTEM

SRS WARNING LAMP CHECK

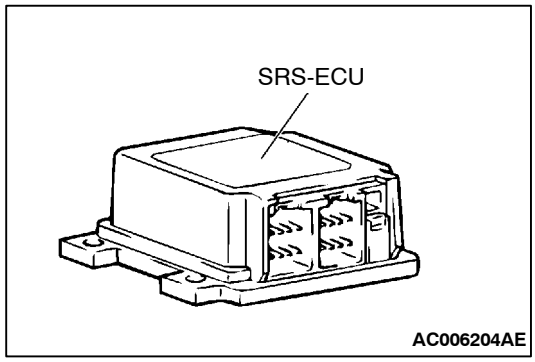
Turn the ignition key to the ON position. Does the SRS warning lamp illuminate for about 7 seconds, turn off and then remain extinguished for at least 5 seconds? If yes, SRS system is functioning properly.



SRS COMPONENT VISUAL CHECK

Turn the ignition key to the LOCK position, disconnect the negative battery cable and tape the terminal.

Caution
Wait at least 60 seconds after disconnecting the battery cable before doing any further work.

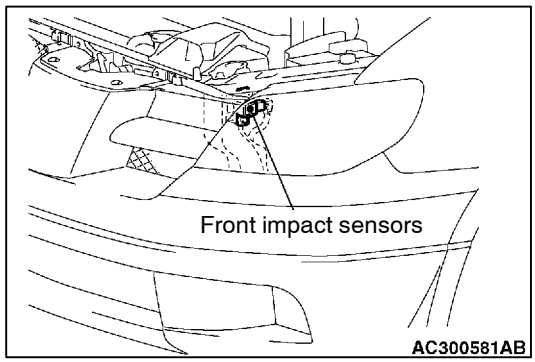


SRS CONTROL UNIT (SRS-ECU)

(1) Check SRS-ECU case and brackets for dents, cracks, deformation or rust.

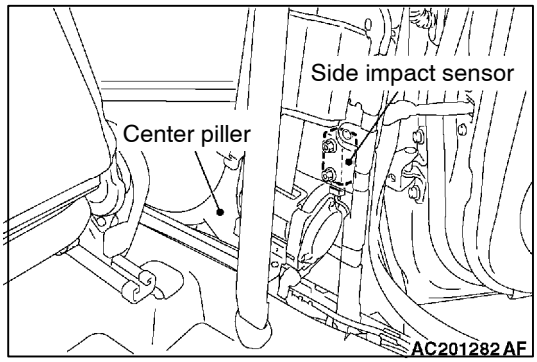
Caution
The SRS may not activate if the SRS-ECU is not installed properly, which could result in serious injury or death to the vehicle's driver or front passenger.

(2) Check connector for damage, and terminals for deformation or rust.
Replace SRS-ECU if it fails visual check.



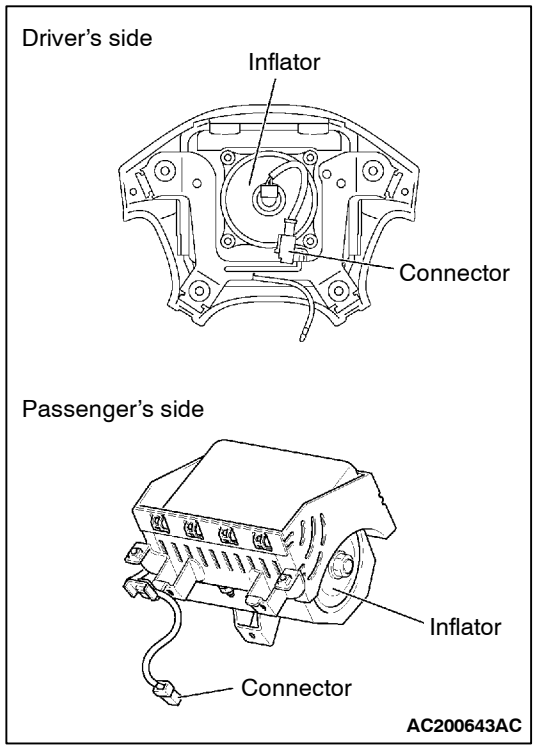
FRONT IMPACT SENSORS

(1) Check the front side member and front impact sensor for deformation or rust.
(2) Check the front impact sensor for dents, cracks, deformation or rust.
(3) Check the sensor harnesses for binding, the connectors for damage, and the terminals for deformation.



SIDE IMPACT SENSORS

(1) Check the center piller for deformation or rust.
(2) Check the side impact sensors for dents, cracks, deformation or rust.
(3) Check the connectors for damage and the terminals for deformation.

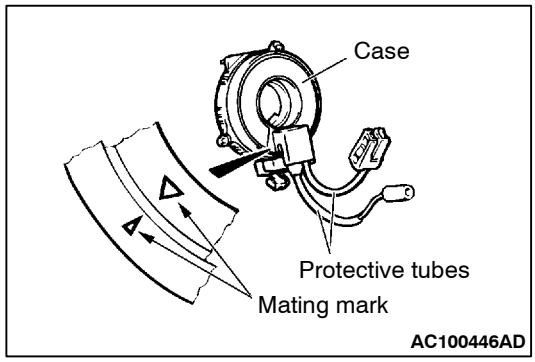


AIR BAG MODULES, STEERING WHEEL AND CLOCK SPRING

(1) Remove the air bag modules, steering wheel and clock spring.

Caution
The removed air bag modules should be stored in a clean, dry place with the pad cover face up.

(2) Check pad cover for dents, cracks or deformation.
(3) Check connector for damage, terminals for deformation, and harness for binds.
(4) Check air bag inflator case for dents, cracks or deformation.
(5) Check harness and connectors for damage, and terminals for deformation.

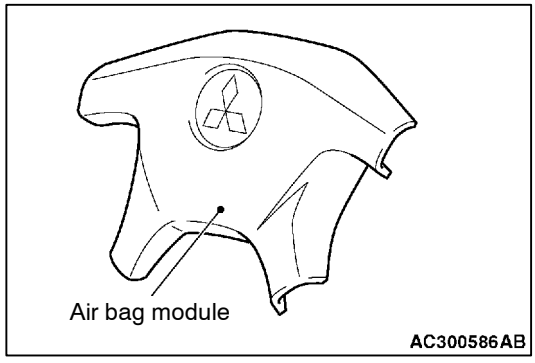


(6) Check clock spring connectors and protective tube for damage, and terminals for deformation.
(7) Visually check the clock spring case for damage.
(8) Align the mating marks of the clock spring, and after turning the vehicle's front wheels to straight-ahead position, install the clock spring to the column switch.

Mating Mark Alignment

Turn the clock spring clockwise fully, and then turn it back approx. 3 3/4 turns counterclockwise to align the mating marks.

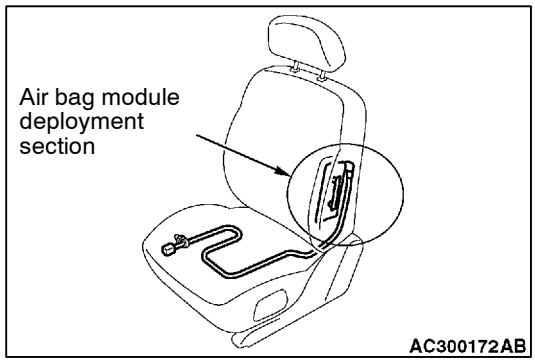
Caution
If the clock spring's mating mark is not properly aligned, the steering wheel may not be completely rotational during a turn, or the flat cable within the clock spring may be severed, obstructing normal operation of the SRS and possibly leading to serious injury to the vehicle's driver or front passenger.



(9) Install the steering column covers, steering wheel and the air bag module.
(10) Check steering wheel for noise, binds of difficult operation.
(11) Check steering wheel for excessive free play.

REPLACE ANY VISUALLY INSPECTED PART IF IT FAILS THAT INSPECTION.

Caution
The SRS may not activate if any of the above components is not installed properly, which could result in serious injury or death to the vehicle's driver or front passenger.



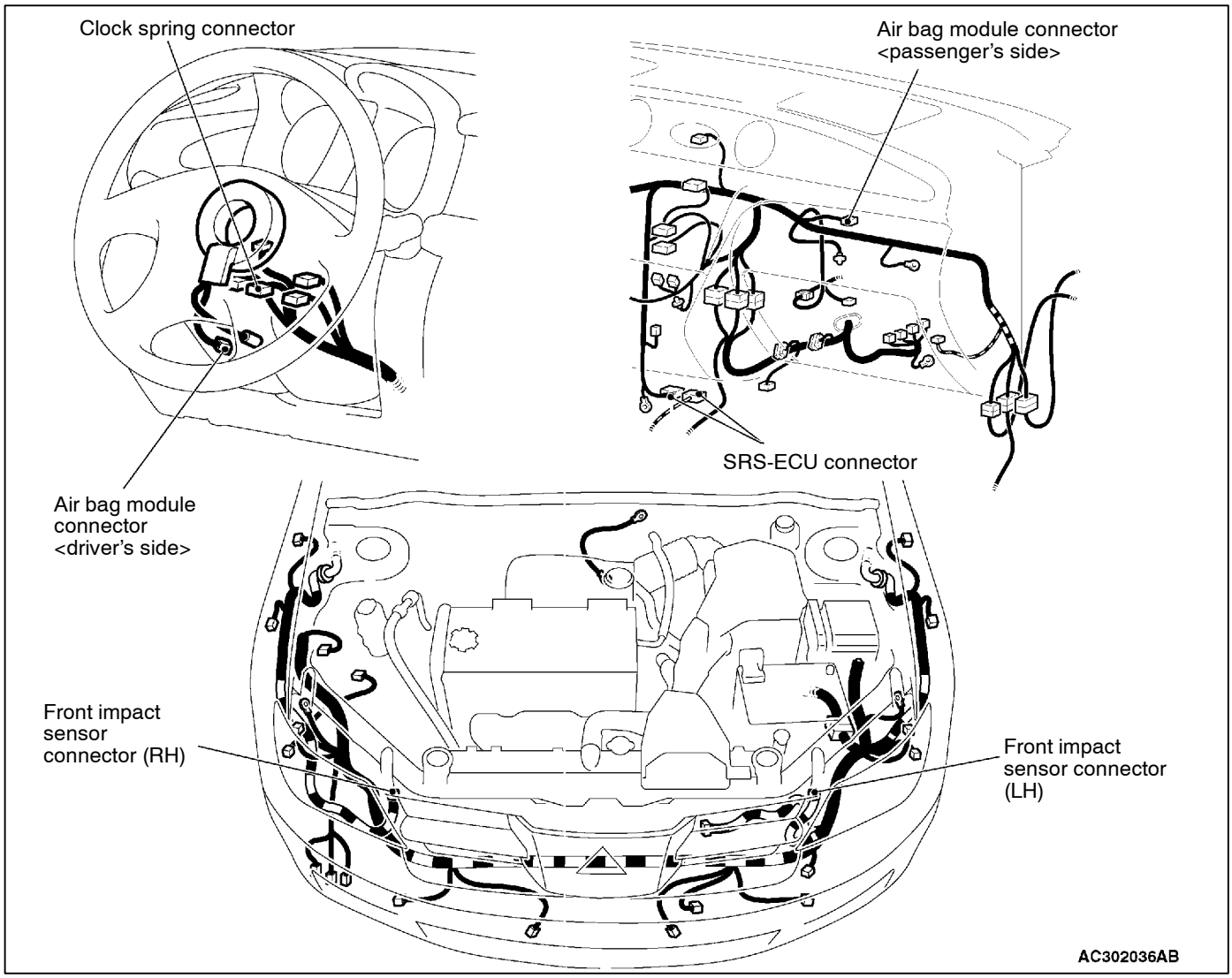
FRONT SEATBACK ASSEMBLY WITH SIDE AIR BAG MODULE

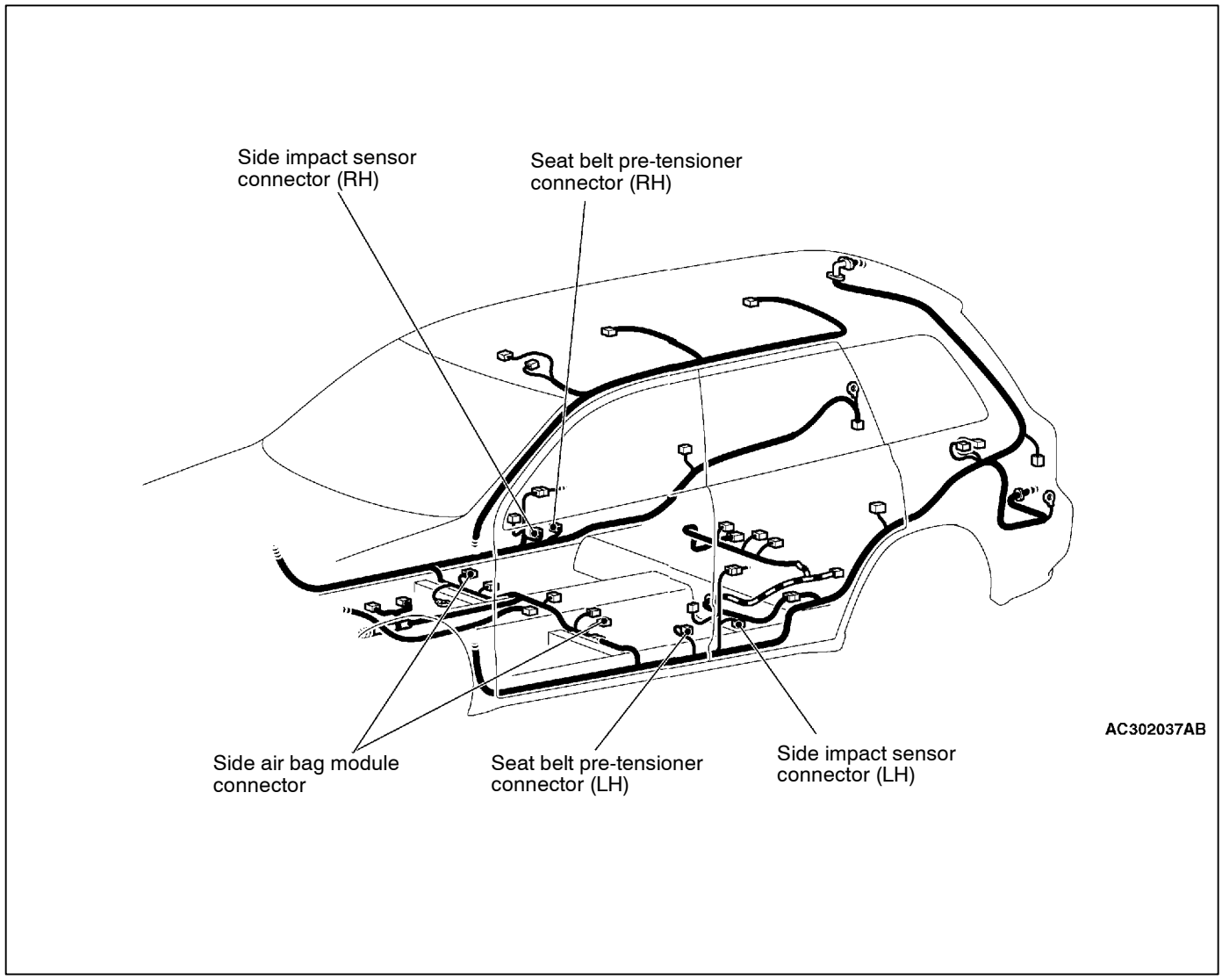
(1) Check the side air bag module deployment section in the seat for dents and deformation.
(2) Check the harness for binds, the connector for damage and the terminals for deformation.

SEAT BELT WITH PRE-TENSIONER

(1) Check the seat belt pre-tensioner for dents or deformation.
(2) Check that the seat belt pre-tensioner is installed correctly to the vehicle body.

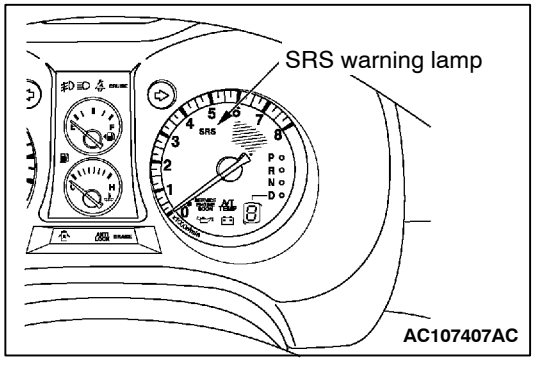
INSTRUMENT PANEL WIRING HARNESS/FRONT WIRING HARNESS/FLOOR WIRING HARNESS





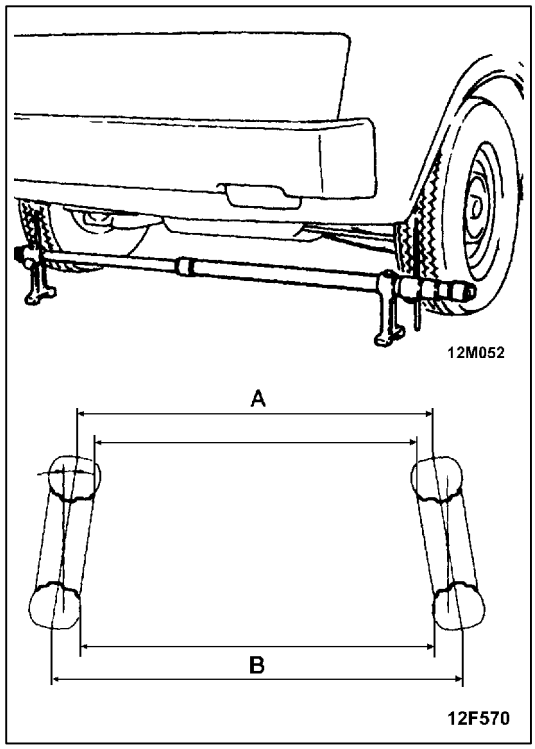
(1) Check connector for poor connection.
(2) Check harnesses for binds, connectors for damage, and terminals for deformation.
REPLACE ANY CONNECTORS OR HARNESS THAT FAIL THE VISUAL INSPECTION.

Caution
The SRS may not activate if SRS harnesses or connectors are damaged or improperly connected, which could result in serious injury or death to the vehicle's driver or front passenger.



POST-INSTALLATION INSPECTION

Reconnect the negative battery terminal. Turn the ignition key to the ON position. Does the SRS warning lamp illuminate for about 7 seconds, turn off and then remain extinguished for at least 5 seconds? If yes, SRS system is functioning properly.



OPERATIONS OUTSIDE THE VEHICLE

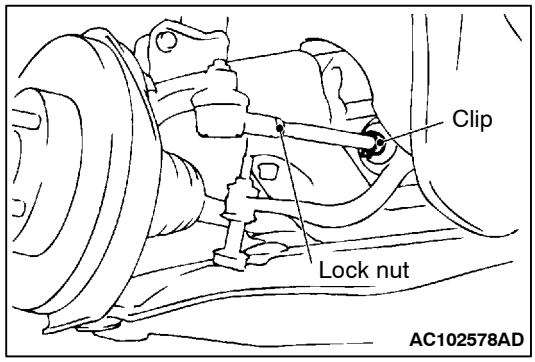
D1. CHECK UNEVEN TYRE WEAR

Check the entire periphery of the tyres for uneven wear. If any tyre shows uneven wear, check the toe-in and toe-out, and adjust as necessary.

TOE-IN

Using a toe-in gauge, measure toe-in.
Toe-in = B – A

Standard value:
At the centre of tyre tread: 1 ± 2 mm
Toe angle (per wheel): 0° 03' ± 05'



(1) Adjust the toe-in by undoing the clip and lock nut, and turning the left and right tie rod turnbuckles by the same amount (in opposite directions).

NOTE
The toe will move out as the left turnbuckle is turned toward the front of the vehicle and the right turnbuckle is turned toward the rear of the vehicle.

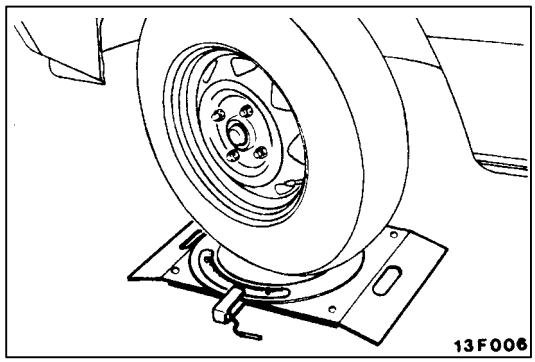
(2) Install the clip and tighten the lock nut to the specified torque.

Tightening torque: 52 ± 2 N·m

(3) Confirm that the toe-in is at the standard value.
(4) Use a turning radius gauge to check that the steering angle is at the standard value.

Standard value:

Item	Specifications
Inner wheels	34°50' ± 1°30'
Outer wheels (for reference)	29°20'



TOE-OUT ANGLE ON TURNS

To check the steering linkage, especially after the vehicle has been involved in an accident or if an accident is presumed, it is advisable to check the toe-out angle on turns in addition to the wheel alignment.
Conduct this test on the left turn as well as on the right turn.

Standard value:

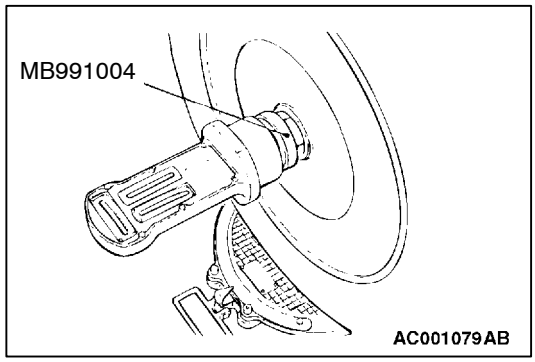
Item	Specifications
Toe-out angle on turns (inner wheel when outer wheel at 20°)	22°00' ± 1°30'

CAMBER, CASTER AND KINGPIN INCLINATION

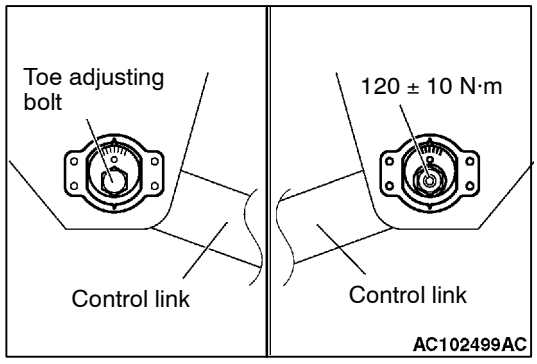
Standard value:

Item	Specifications
Camber	−0°10' ± 30'*
Caster	3°15' ± 30'*
Kingpin inclination	12°25' ± 1°30'

NOTE
(1) *: difference between right and left wheels must be less than 30'.
(2) Camber and caster are preset at the factory and cannot be adjusted.
(3) For vehicles with aluminium wheels, attach the camber/caster/kingpin gauge to the driveshaft by using special tool wheel alignment gauge attachment (MB991004).
Tighten the special tool to the same torque 245 ± 29 N·m as the driveshaft nut.



Caution
To prevent the wheel bearing from damage, never subject the wheel bearings to the vehicle load when the driveshaft nuts are loosened.



REAR TOE-IN

Standard value:
At the centre of tyre tread: 3 ± 2 mm
Toe angle (per wheel): 0°08' ± 05'

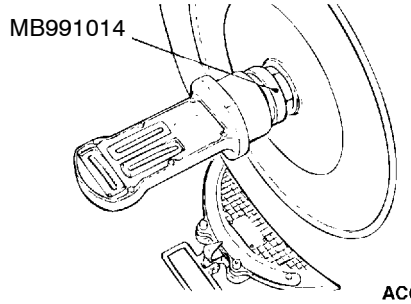
(1) Be sure to adjust the camber before making toe adjustment.
(2) Carry out adjustment by turning the toe adjusting bolt (control link mounting bolt which is located on the inner side of the body).

Left wheel: Turning clockwise (+) toe-in

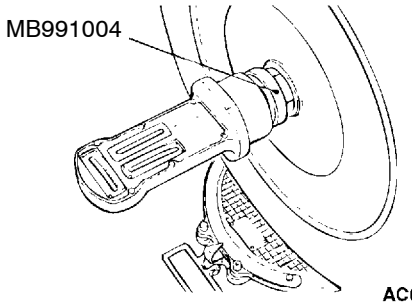
Right wheel: Turning clockwise (−) toe-in

NOTE
The scale has gradations of approximately 2.6 mm (single side toe angle equivalent to 16').

<2WD-vehicles with aluminium wheels>



<4WD-vehicles with aluminium wheels>



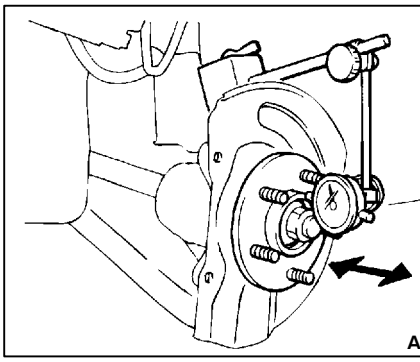
REAR CAMBER

Standard value: -0°40' ± 30'

(difference between right and left wheel: less than 30')

NOTE
Camber is preset at the factory and cannot be adjusted.
For 2WD-vehicles with aluminium wheels, attach the camber/caster/kingpin gauge to the trailing arm spindle by using special tool wheel alignment gauge attachment (MB991014). Tighten the special tool to the same torque 175 ± 25 N·m as the trailing arm spindle self-locking nut.

For 4WD-vehicles with aluminium wheels, attach the camber/caster/kingpin gauge to the drive shaft by using special tool wheel alignment gauge attachment (MB991004). Tighten the special tool to the same torque 245 ± 29 N·m as the drive-shaft nut.



D2. CHECK FRONT WHEEL BEARINGS FOR PLAY

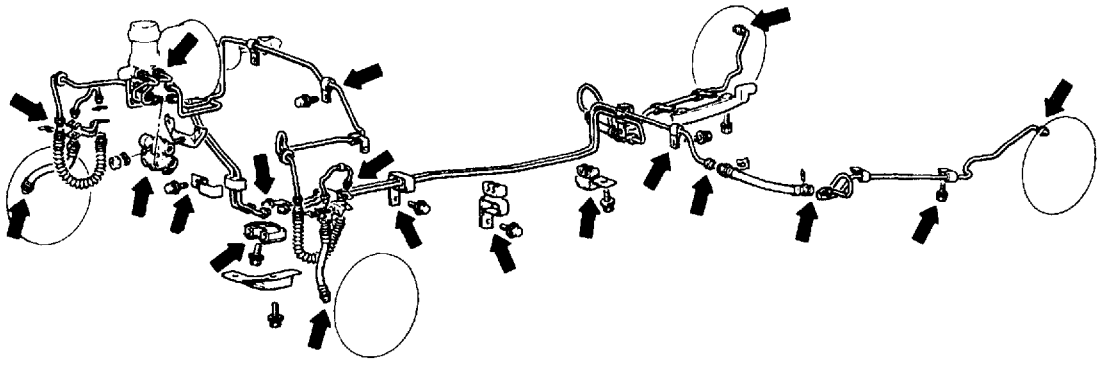
(1) Remove the disc brake caliper and suspend it with a wire.
(2) Remove the brake disc from the front hub.
(3) Attach a dial gauge as shown in the illustration, and then measure the axial play while moving the hub in the axial direction.

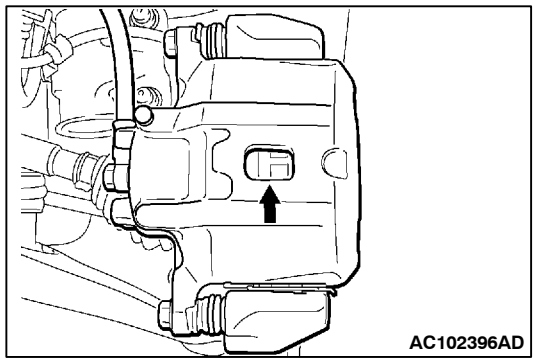
Limit: 0.05 mm

(4) If axial play exceeds the limit, replace the front hub assembly.

D3. CHECK BRAKE HOSES AND PIPES FOR LEAKAGE

(1) Check entire circumference and length of hoses and pipes.
(2) Check all clamps for tightness and connections for leakage.




AC102396AD

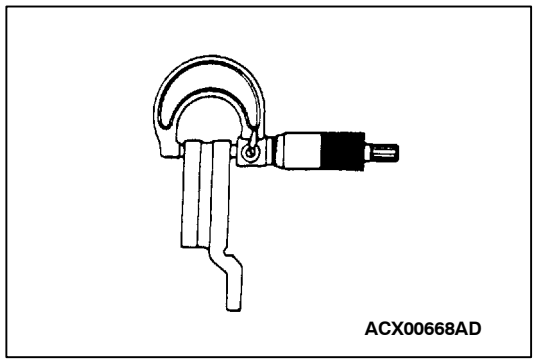
D4. CHECK BRAKE PADS AND DISCS FOR WEAR

(1) Check the brake pad thickness through the caliper body check port.

Standard value: 10.0 mm

Limit: 2.0 mm

(2) When the thickness is less than the limit, always replace the pads at an axle set.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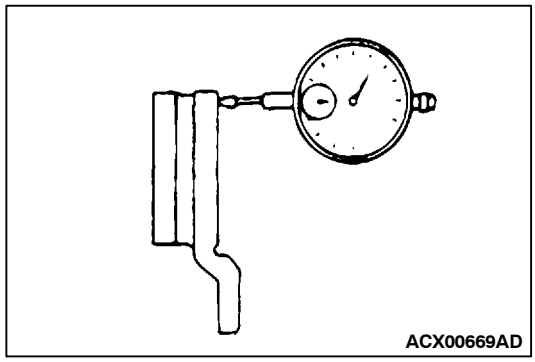
(3) Using a micrometer, measure disc thickness at eight positions, approximately 45° apart and 10 mm in from the outer edge of the disc.

Standard value:
24.0 mm <Front>
10.0 mm <Rear>
Limit:
22.4 mm <Front >
8.4 mm <Rear>

(4) If the disc thickness is less than the limits, replace it with a new one.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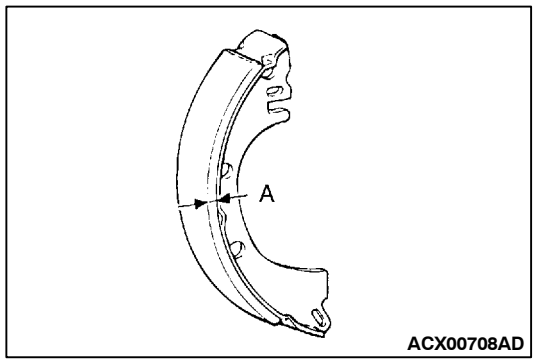
BRAKE DISC RUN-OUT CHECK

(1) Remove the brake assembly, and then hold it with wire.
(2) Temporarily install the disc with the hub nut.
(3) Place a dial gauge approximately 5 mm from the outer circumference of the brake disc, and measure the run-out of the disc.

Limit: 0.04 mm <Front>
0.05 mm <Rear>



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D5. CHECK BRAKE SHOE LININGS AND DRUMS FOR WEAR

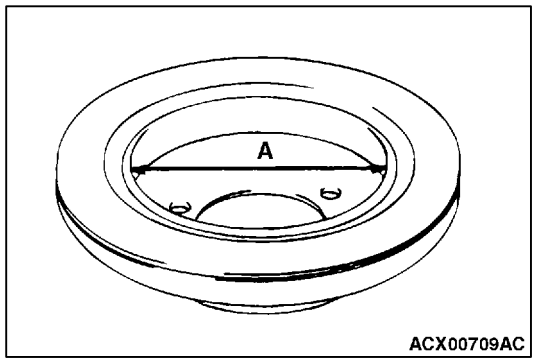
BRAKE LINING THICKNESS CHECK

(1) Remove the brake disc.
(2) Measure the thickness of the brake lining at several places.

Standard value (A): 2.8 mm

Limit (A): 1.0 mm

(3) If the thickness of the brake lining is below the limit, replace the shoe and lining assemblies on both sides of the vehicle. Never replace only one side.



BRAKE DRUM INSIDE DIAMETER CHECK

(1) Remove the brake disc.
(2) Measure the inside diameter of the brake disc in two places or more.

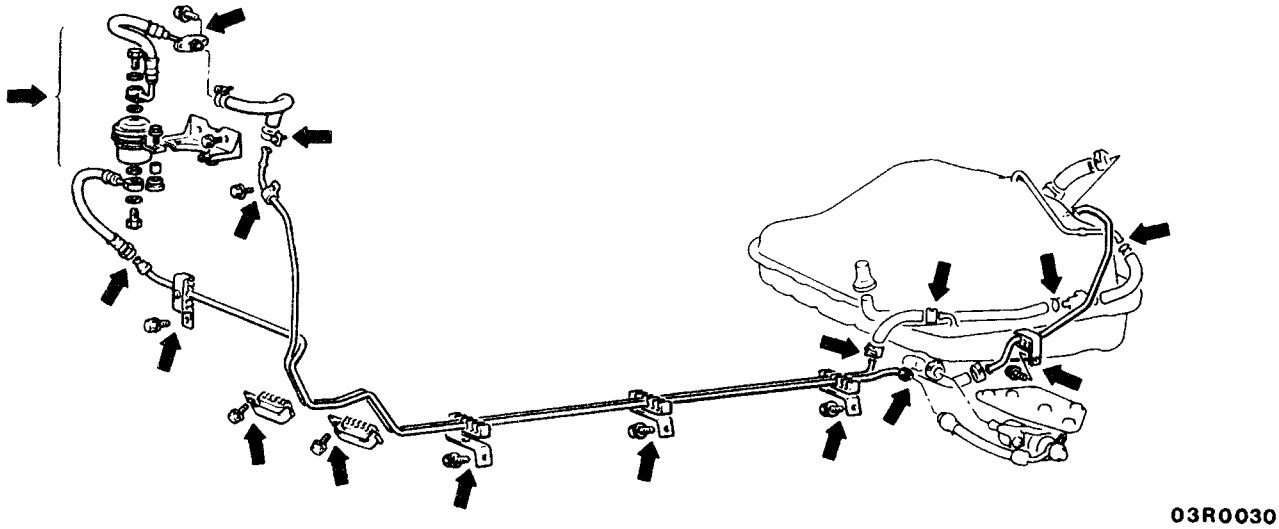
Standard value (A): 168.0 mm

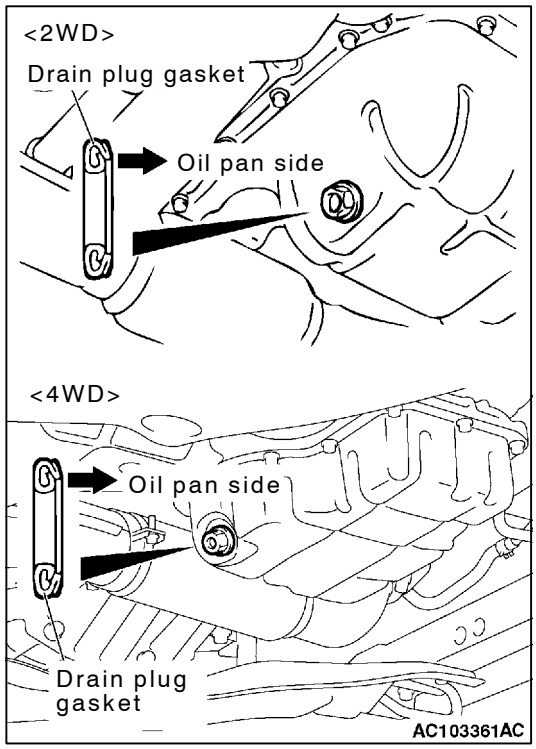
Limit (A): 169.0 mm

(3) If the inside diameter exceeds the limit, or if it is excessively worn on one side, replace the brake disc.

D6. CHECK FUEL HOSES AND PIPES FOR LEAKAGE OR DETERIORATION

(1) Check entire circumference and length of hoses and pipes.
(2) Check all clamps for tightness and connections for leakage.





OPERATIONS AFTER ENGINE IS WARMED UP

E3.CHANGE ENGINE OIL

(1) Start the engine and allow it to warm up until the temperature of the coolant reaches 80°C to 90°C.
(2) Stop the engine and remove the engine oil filler cap.
(3) Remove the drain plug to drain oil.

Caution
Use care as oil could be hot.

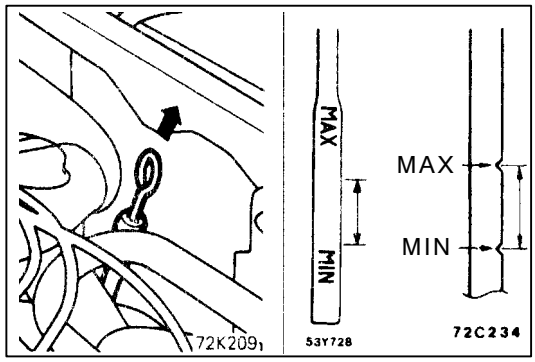
(4) Install a new drain plug gasket so that it faces in the direction shown in the illustration, and then tighten the drain plug to the specified torque.

Tightening torque: 39 ± 5 N·m

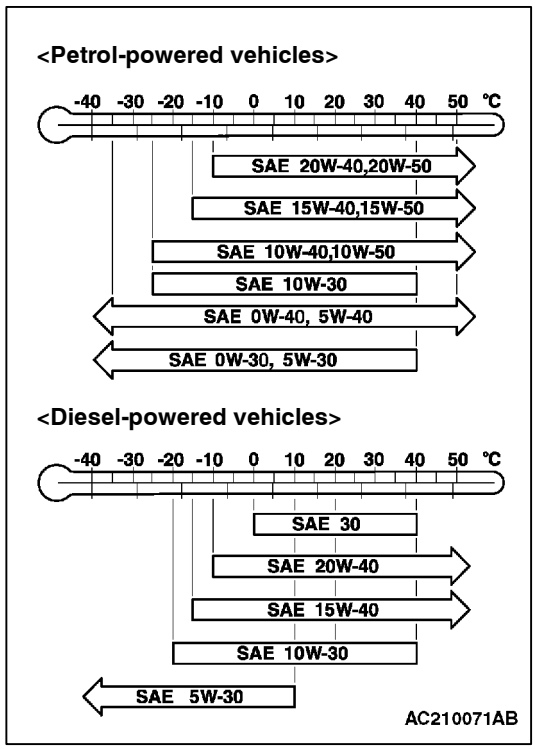
(5) Refill with specified quantity of oil.

Specified Engine Oil

Total quantity (Includes volume inside oil filter): 4.3 L



(6) Remove the dipstick from the engine, and check whether or not the engine oil level is within the range between MAX and MIN.
(7) Install the engine oil filler cap.
(8) Start the engine and run it for a few minutes.
(9) Stop the engine and check the oil level.

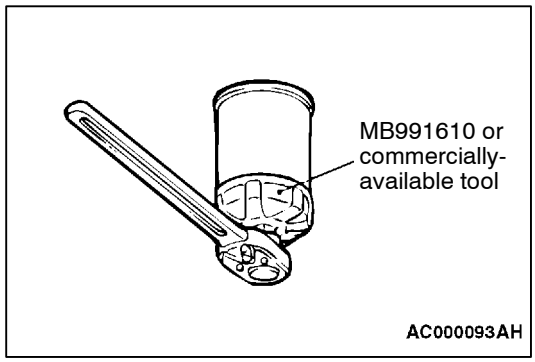


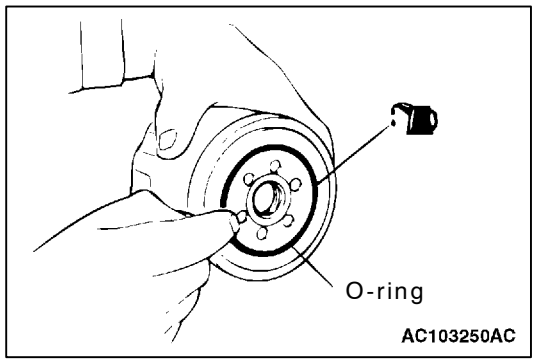
Selection of engine oil

(1) Use engine oil conforming to the following classification:

ACEA and API classifications
"ACEA A1, A2, A3"/ "FOR SERVICE SG" or higher

(2) Select engine oil of the proper SAE viscosity number according to the atmospheric temperature.





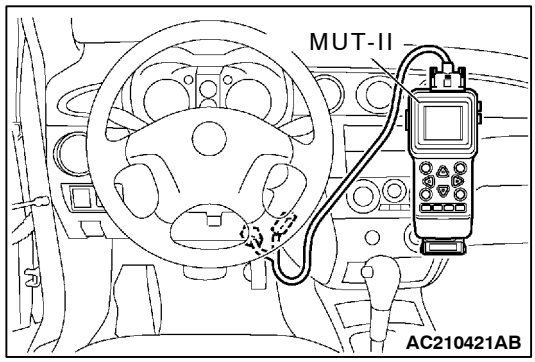
E4. REPLACE ENGINE OIL FILTER

(1) Start the engine and allow it to warm up until the temperature of the coolant reaches 80°C to 90°C.
(2) Remove the engine oil filler cap.
(3) Remove the drain plug to drain oil.

Caution
Use care as oil could be hot.

(4) Remove the under cover.
(5) Use the respective tool in the following table to remove the engine oil filter.
(6) Clean the filter bracket side mounting surface.
(7) Apply a small amount of engine oil to the O-ring of the new oil filter.
(8) Once the O-ring of the oil filter is touching the flange, use the respective tool in the following table to tighten to the specified torque.
(9) Install the drain plug and refill the engine oil.
(10) Race the engine 2-3 times, and check to be sure that no engine oil leaks from installation section of the oil filter.

Number	Tool	Tightening torque
MD136466, MD322508	Commercially-available tool	Approx. 3/4 turn (17 ± 3 N·m)
MD356000	Oil filter wrench (MB991610) or equivalent	Approx. 3/4 turn (14 ± 2 N·m)



E5. CHECK ENGINE IDLING SPEED

(1) Before inspection, set the vehicle to the pre-inspection condition.
(2) Turn the ignition switch to "LOCK" (OFF) position.
(3) Connect the MUT-II to the diagnosis connector or connect a tachometer to the engine speed detection connector.
(4) Connect a timing light.
(5) Start the engine and let it run at idle.
(6) Check that ignition timing is at the standard value.

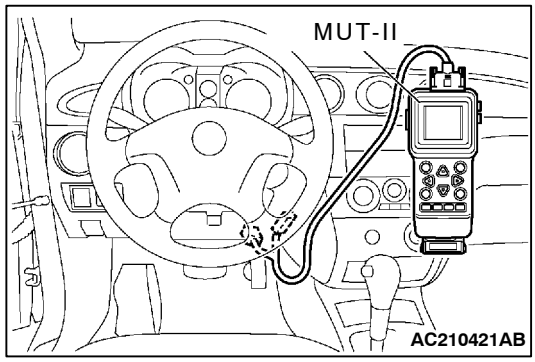
Standard value: approximately 10° BTDC

(7) Check the idle speed.

Standard value: 750 ± 100 r/min

NOTE
1. The idle speed is controlled automatically by the idle speed control system.
2. When using the MUT-II, select item No.22 and take a reading of the idle speed.

(8) If the idle speed is outside the standard value, inspect the MPI system (Refer to WORKSHOP MANUAL GROUP 13-Troubleshooting).



E6. CHECK CO CONCENTRATION

(1) Before inspection, set the vehicle to the pre-inspection condition.
(2) Turn the ignition switch to "LOCK" (OFF) position.
(3) Connect the MUT-II to the diagnosis connector or connect a tachometer to the engine speed detection connector.
(4) Connect a timing light.
(5) Start the engine and let it run at idle.
(6) Check that ignition timing is at the standard value.

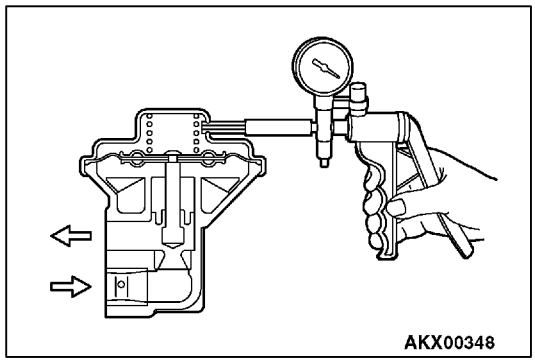
Standard value: approximately 10° BTDC

(7) Run the engine at 2,500 r/min for 2 minutes.
(8) Set the CO, HC tester.
(9) Check the CO contents and the HC contents at idle.

Standard value
CO contents: 0.5% or less
HC contents: 100 ppm or less

(10) If there is a deviation from the standard value, check the following items:
- Diagnosis output
- Fuel pressure
- Injector
- Ignition coil, spark plug cable, spark plug
- EGR control system
- Evaporative emission control system
- Compression pressure

NOTE
Replace the three way catalyst when the CO and HC contents are not within the standard value, even though the result of the inspection is normal on all items.



E8. CHECK EXHAUST GAS RECIRCULATION (EGR) SYSTEM

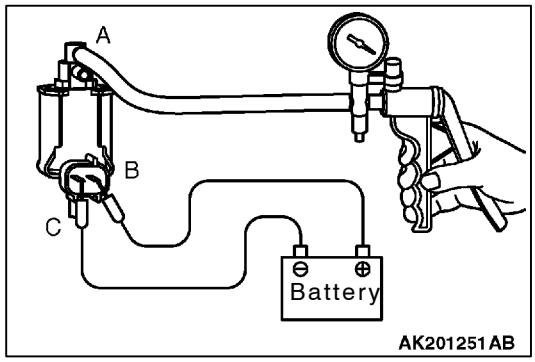
EGR CONTROL VALVE CHECK

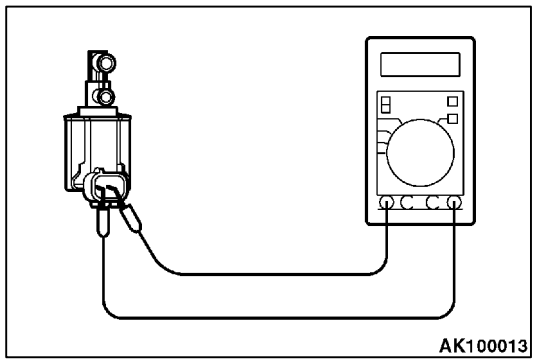
(1) Remove the EGR valve and inspect for sticking, carbon deposits, etc. If found, clean with a suitable solvent so that the valve seats correctly.
(2) Connect a hand vacuum pump to the EGR valve.
(3) Apply 67 kPa of vacuum, and check that the vacuum is maintained.
(4) Apply a vacuum and check the passage of air by blowing through one side of the EGR passage.

Vacuum	Passage of air
5.3 kPa or less	Air is not blown out
27 kPa or more	Air is blown out

(5) Replace the gasket, and tighten to the specified torque.

Tightening torque: 20 ± 2 N·m





EGR CONTROL SOLENOID VALVE CHECK

NOTE
When disconnecting the vacuum hose, always make a mark so that it can be reconnected at original position.

(1) Disconnect the vacuum hose from the solenoid valve.
(2) Disconnect the harness connector.
(3) Connect a hand vacuum pump to nipple (A) of the solenoid valve (refer to the illustration at left).
(4) Check air tightness by applying a vacuum with voltage applied directly from the battery to the EGR control solenoid valve and without applying voltage.

Battery voltage	B nipple condition	Normal condition
Not applied	Open	Vacuum maintained
Applied	Open	Vacuum leaks
	Closed	Vacuum maintained

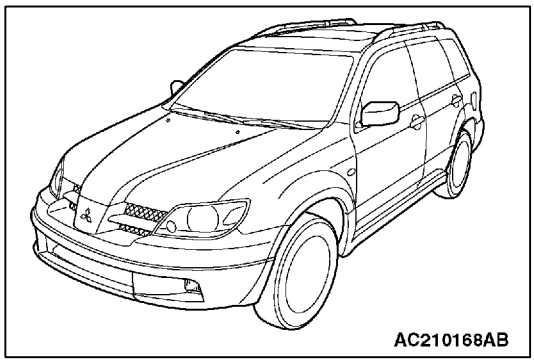
(5) Measure the resistance between the terminals of the solenoid valve.

Standard value: 29 – 35 Ω (at 20 °C)

OTHERS

F1. CHECK BODY CONDITION FOR DAMAGE

(1) Check underbody coating for damage.
(2) Check body painting for damage.



F2. ROAD TEST

Drive the vehicle and check for conditions.
(1) Check free play of steering wheel.
(2) Check efficiency of service brakes and parking brakes system.
(3) Check driveability of engine.
(4) Check condition of instruments, gauges indicators, exterior lamps, heater and ventilators.
(5) Check abnormal noise of each part.
(6) Check the tyres for wear and for the correct air pressure.