GROUP 0

GENERAL

CONTENTS

HOW TO USE THIS MANUAL

M6000000100026

This manual contains Pre-delivery inspection and Periodic inspection and maintenance.

Group 0 and 1 have the contents for all vehicle models, and Group 2 has contents for the relevant vehicle models.

PRECAUTIONS BEFORE SERVICE

PROTECTING THE VEHICLE

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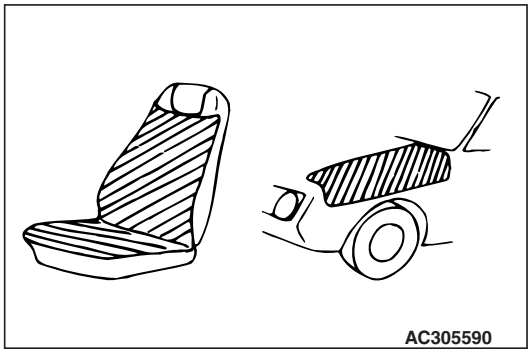

If there is a likelihood of damaging interior or exterior parts during service operations, protect them with suitable covers (such as seat covers, fender covers, etc.).

DOING SERVICE WORK IN GROUPS OF TWO OR MORE MECHANICS

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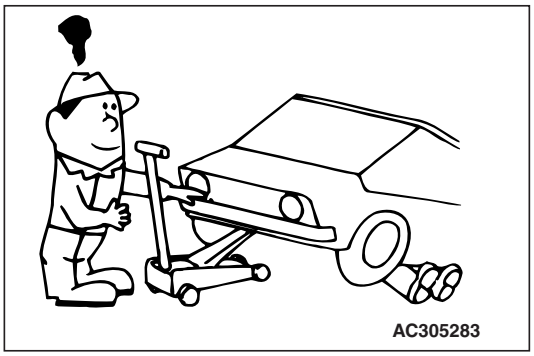

If the service work is to be done by two or more mechanics working together, all the mechanics involved should take safety into consideration while they work.

REMOVAL AND DISASSEMBLY

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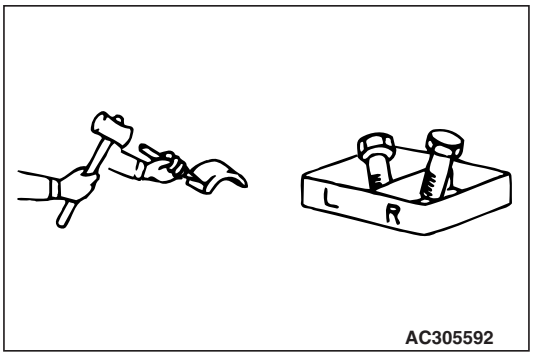
When checking a malfunction, find the cause of the problem. If it is determined that removal and/or disassembly is necessary, perform the work by following the procedures contained in this manual.



If punch marks or mating marks are made to avoid error in assembly and facilitate the assembly work, be sure to make them in locations which will have no detrimental effect on performance and/or appearance. If an area having many parts, similar parts, and/or parts which are symmetrical right and left is disassembled, be sure to arrange the parts so that they do not become mixed during the assembly process.

1. Arrange the parts removed in the proper order.
2. Determine which parts are to be reused and which are to be replaced.
3. If bolts, nuts, etc., are to be replaced, be sure to use only the exact size specified.

SPECIAL TOOLS

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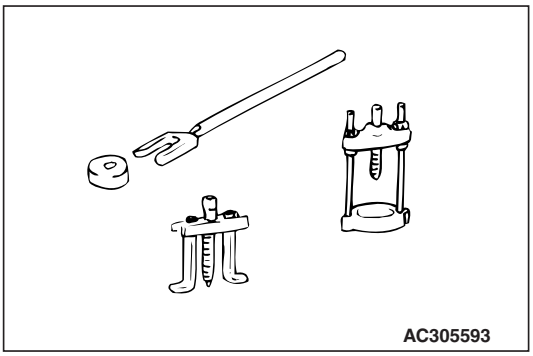

If other tools are substituted for the special tools to do service of repair work, there is the danger that vehicle parts might be damaged, or the technician might be injured; therefore, be sure to use the special tool whenever doing any work for which the use of one is specified.

PARTS TO BE REPLACED

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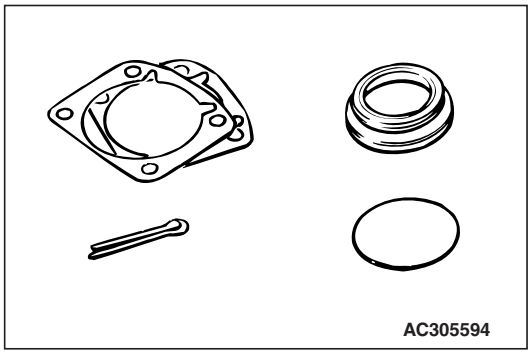
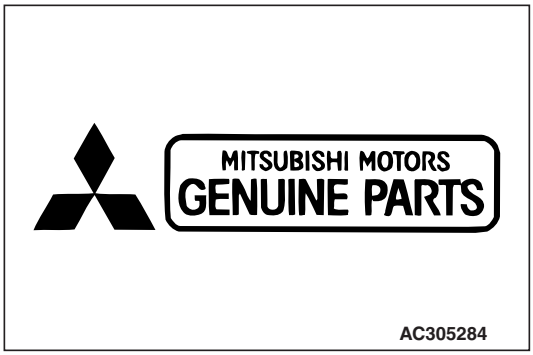


If any of the following parts are removed, they must be replaced with new parts.

- Oil seals
- Gaskets (except rocker cover gasket)
- Packings
- O-rings
- Lock washers
- Split pins
- Self-locking nuts

PARTS

M6001000600024



When replacing parts, use MITSUBISHI genuine parts.

TUBES AND OTHER RUBBER PARTS

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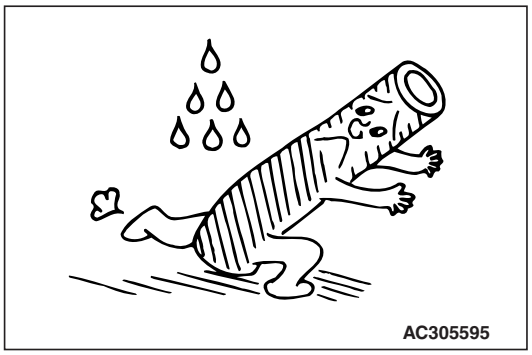

Be careful to avoid spilling any petrol, oil, etc., because if it adheres to any tubes or other rubber parts, they might be adversely affected.

LUBRICANTS

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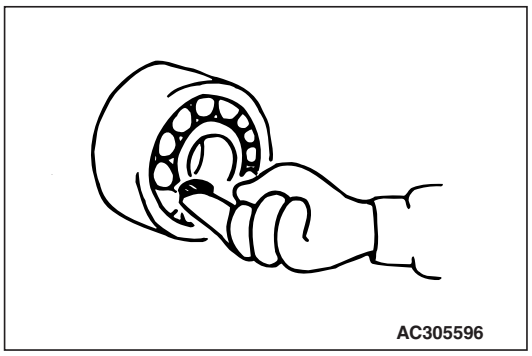

In accordance with the instructions in this manual, apply the specified lubricants in the specified locations during assembly and installation.

BRAKE FLUID

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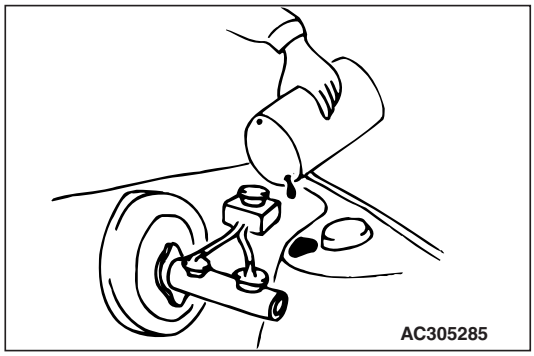

Be careful to avoid spilling any brake fluid, because if it adheres to the vehicle body, the paint coat might be discoloured.

SERVICING THE ELECTRICAL SYSTEM

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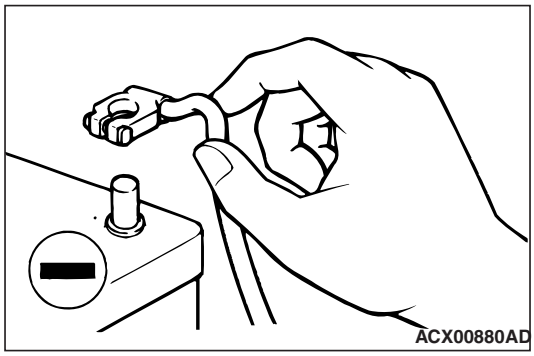


Before replacing a component related to the electrical system and before undertaking any repair procedures involving the electrical system, be sure to first disconnect the negative (-) cable from the battery in order to avoid damage caused by short-circuiting.

⚠ CAUTION

Before connecting or disconnecting the negative (-) cable, be sure to turn off the ignition switch and the lighting switch. (If this is not done, there is the possibility of semiconductor parts being damaged.)

APPLICATION OF ANTI-CORROSION AGENTS AND UNDERCOATS

M6001001100022

If oil or grease gets onto the oxygen sensor, it will cause a drop in the performance of the sensor. Cover the oxygen sensor with a protective cover when applying anti-corrosion agents and undercoats.

PRE-INSPECTION CONDITION

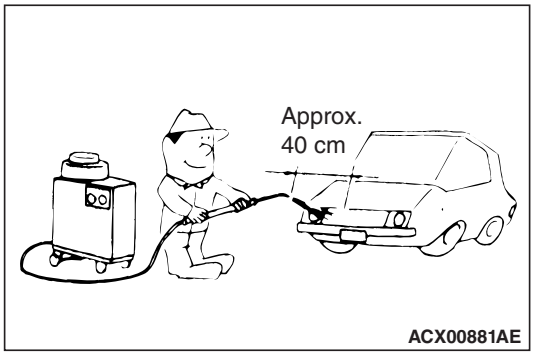
M6001001200029

"Pre-inspection condition" refers to the condition that the vehicle must be in before proper engine inspection can be carried out. If you see the words "Set the vehicle to the pre-inspection condition" in this manual, it means to set the vehicle to the following condition.

- Engine coolant temperature: 80 to 90° C
- Lamps, electric cooling fan and all accessories: OFF
- M/T: Neutral
- A/T: P range

VEHICLE WASHING

M6001001300037



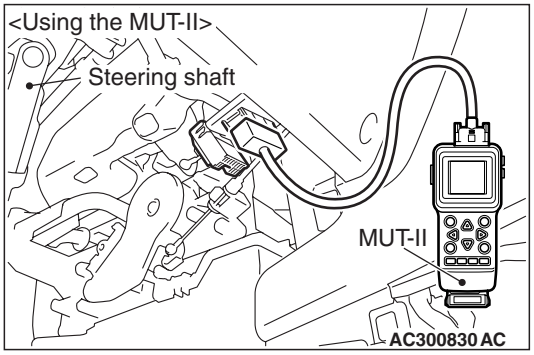
If high-pressure car-washing equipment or steam car-washing equipment is used to wash the vehicle, be sure to note the following information in order to avoid damage to plastic components, etc.

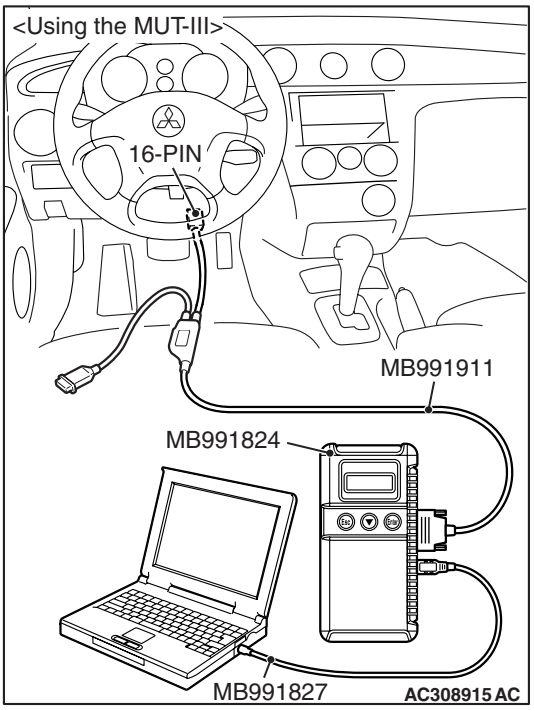
- Spray nozzle distance: Approx. 40 cm or more
- Spray pressure: 3,900 kPa or less
- Spray temperature: 82° C or less
- Time of concentrated spray to one point: within 30 sec.

MULTI USE TESTER (M.U.T.-III) SUB ASSEMBLY

M6001001900028

Refer to the "M.U.T.-II/III OPERATING INSTRUCTIONS" for instructions on handling the M.U.T.-II/III.





Connect the M.U.T.-II/III to the diagnosis connector as shown in the illustration.

⚠ CAUTION

Turn the ignition switch to the LOCK (OFF) position before connecting or disconnecting the M.U.T.-II/III.

IN ORDER TO PREVENT VEHICLES FROM FIRE

M6001001500020

"Improper installation of electrical or fuel related parts could cause a fire. In order to retain the high quality and safety of the vehicle, it is important that any accessories that may be fitted or modifications/ repairs that may be carried out which involve the electrical or fuel systems, MUST be carried out in accordance with MMC's information/Instructions".

ENGINE OILS

M6001001600027

Health Warning

Prolonged and repeated contact with mineral oil will result in the removal of natural fats from the skin, leading to dryness, irritation and dermatitis. In addition, used engine oil contains potentially harmful contaminants which may cause skin cancer. Adequate means of skin protection and washing facilities must be provided.

Recommended Precautions

The most effective precaution is to adapt working practices which prevent, as far as practicable, the risk of skin contact with mineral oils, for example by using enclosed systems for handling used engine oil and by degreasing components, where practicable, before handling them.

Other precautions:

- Avoid prolonged and repeated contact with oils, particularly used engine oils.
- Wear protective clothing, including impervious gloves where practicable.
- Avoid contaminating clothes, particularly underpants, with oil.
- Do not put oily rags in pockets, the use of overalls without pockets will avoid this.
- Do not wear heavily soiled clothing and oil-impregnated foot-wear. Overalls must be cleaned regularly and kept separately from personal clothing.
- Where there is a risk of eye contact, eye protection should be worn, for example, chemical goggles or face shields; in addition an eye wash facility should be provided.
- Obtain First Aid treatment immediately for open cuts and wounds.
- Wash regularly with soap and water to ensure all oil is removed, especially before meals (skin cleansers and nail brushes will help). After cleaning, the application of preparations containing lanolin to replace the natural skin oils is advised.
- Do not use petrol, kerosine, diesel fuel, gas oil, thinners or solvents for cleaning skin.
- Use barrier creams, applying them before each work period, to help the removal of oil from the skin after work.
- If skin disorders develop, obtain medical advice without delay.

NOTES

GROUP 1

PRE-DELIVERY INSPECTION

CONTENTS

Continued on next page

NOTES CONCERNING ENTRIES

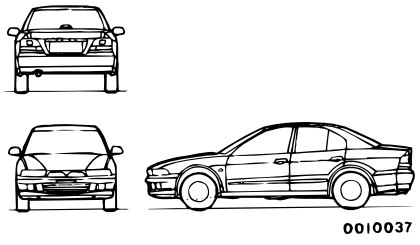
M6010100100121

This section describes the details and the inspection methods employed for the pre-delivery inspection of vehicles.
The inspection should be conducted according to the sequence described in the TABLE OF PRE-DELIVERY INSPECTION.
Inspection methods are described following the TABLE OF PRE-DELIVERY INSPECTION.

NOTE:

1. *The spaces for model, C/# (Chassis number), E/# (engine number), aggregate distance travelled in kilometres (miles), date of inspection, name of person conducting the inspection, and body colour must be completed without fail.*
2. *The spaces for place of inspection, and name of owner should be completed as required.*

TABLE OF PRE-DELIVERY INSPECTION



Model	
Chassis number	
Engine number	
Distance Travelled	km
Owner	
Date of inspection	
Place of inspection	
Inspector	
Body colour	

Symbols to be used					
√	Good	A	Needs adjustment	T	Needs retightening
C	Needs cleaning	L	Needs replenishment of lubricant, water, etc.	X	Needs replenishment of repair

INSPECTION PROCEDURE

First Step

1. ☐ Connection of the dark current connector

Body

2. ☐ Wrap film
3. ☐ Exterior
4. ☐ Operation of door locking systems and door hinges
5. ☐ Operation of door mirrors, windows and sunroof

Under Hood

6. ☐ Engine oil level
7. ☐ Brake master cylinder fluid level
8. ☐ Clutch master cylinder fluid level
9. ☐ Washer fluid level
10. ☐ Battery condition and connections
11. ☐ Power steering fluid level
12. ☐ Electrical wiring

Under Vehicle

13. ☐ Tyre and spare tyre pressures
14. ☐ Suspension system
15. ☐ Steering linkage and split pins
16. ☐ Under body

Before Road Test

17. ☐ Seat adjusters and seat back latches
18. ☐ Choke system and inhibitor switch
19. ☐ Idle control knob
20. ☐ Instrument panel controls
21. ☐ Meters, gauges, warning lamps and indication lamps
22. ☐ Air conditioning, heater and defroster systems
23. ☐ Wipers and washers
24. ☐ Operation of service brakes and parking brakes
25. ☐ Clutch operation
26. ☐ Operation of seat belts, shoulder belts and retractors

Road Test

27. ☐ Engine performance and exhaust gas
28. ☐ Transmission in all ranges
29. ☐ Brakes
30. ☐ Steering control
31. ☐ Vibration and rattles
32. ☐ Electrical equipment

After Road Test

33. ☐ Idle speed
34. ☐ Ignition timing
35. ☐ Radiator coolant level
36. ☐ Hoses, fluid lines and connections located under hood
37. ☐ Manual transmission and transfer (4WD) oil level
38. ☐ Automatic transmission fluid level
39. ☐ Engine, transmission, steering gear box and differential for leaks
40. ☐ Front and rear differential oil levels
41. ☐ Hoses, fluid lines and connections located under vehicle

Final Steps

42. ☐ Headlamp aiming
43. ☐ Equipment
44. ☐ Exterior and interior
45. ☐ Owner instructions

PAINTWORK TERMS

M6010200100032

Term	Definition	Remarks
Blister	A raised bubble in the paint (from the base or the undercoat) caused by abnormal moisture. The bubble may contain either water or air.	
Change in tone	The colour tone of the painted surface is not uniform.	Including wrong colour, discoloration and decoloration.
Contact mark	A mark on the painted surface as a result of contact by hands or clothing at the time of paint application.	
Crack	A crack in the painted surface.	Cracks may be either shallow or deep.
Dirt in paintwork	Rough surface resulting from foreign material in the paint or from dust deposited on wet paint during painting or storage.	
Filed or ground traces	Deep scratches in sheet metal surface, resulting from improper use of buffer or sander, are not completely covered, and are visible through paint coating.	
Orange peel	The painted surface has the appearance of an orange peel.	
Peeling	The paint flakes off (partly or over a wide area).	The peeling may be minor, medium, or major.
Pin holes	Tiny holes in the painted surface.	
Runs	A visible trickle of dried paint on the surface.	Either undercoat or top-coat.
Scratches	Scratches on the painted surface.	
Shrink	The painted surface "shrinks", causing wrinkles.	
Smears	Spots of soot or other material deposited on the painted surface.	Including stains and water spots.
Spray mist	The painted surface includes fine particles of other paint.	
Uneven lustre	The lustre of the painted surface is not uniform.	
Uneven metallic dispersion	The metallic dispersion of the painted surface is not uniform.	
Visibly incomplete topcoating	A part of the undercoating visible.	

FIRST STEP

1. CONNECTION OF DARK CURRENT CONNECTOR

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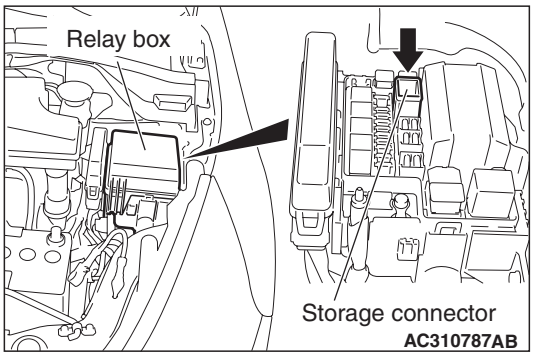
Connecting Procedure



Press down the storage connector.

BODY

2. WRAP FILM

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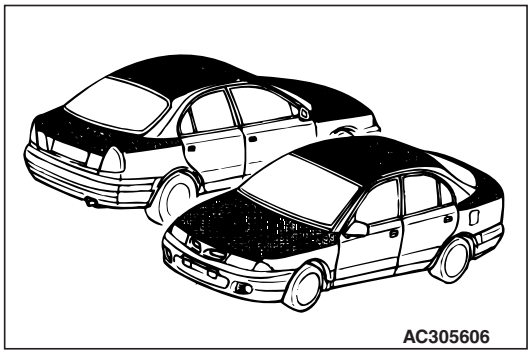
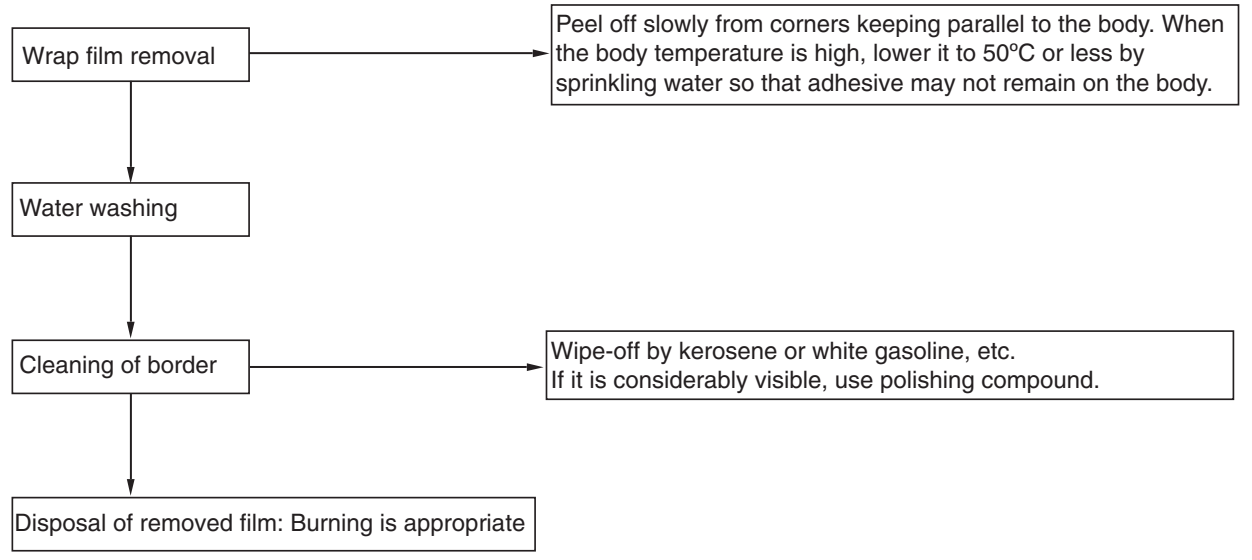


To protect the exterior finish of vehicles prior to dealer delivery, a protective coating is used. The coating is a thin white resin film. It is applied to all painted exterior horizontal surfaces of the vehicle and is held in place with a tacky adhesive backing.

Removal procedure



Wrapping work

No.	Process	Operation Content
1	Continuous peeling of film	The film is peeled off.
2	Water rinse	Sand and dust are removed from the vehicle body and it is dried thoroughly.
3	Parts where the film is to be reapplied are checked.	There should be no leftover adhesive, swelling or discoloration of the paint film, or other defects.
4	Treatment of parts where film is to be reapplied.	Treat the defects on the parts where film is to be reapplied. If a solvent is used to remove leftover adhesive, wipe off the solvent thoroughly.
5	Reapplication	1. Basically, the parts where the film is to be applied should be the same as the film that is to be applied. 2. Apply the film from the lower portion of the body, working upward progressively. Apply pressure using a plastic squeegee or similar tool. 3. As necessary, cut the film at the various parts such as windshield washer nozzles, hood and trunk lid.

⚠ CAUTION

1. **Apply the film with the body at a temperature of 10 – 40° C. (Workability is good in this temperature range.)**
2. **If the outside surface of the film (the side with no adhesive) is brought into direct contact with the paint film and left in that state, it may result in loss of paint gloss, so make sure the film does not get folded under or otherwise make contact with the paint film.**
3. **Air bubbles and wrinkles do not have a particularly bad influence on the pain film, but every effort should be made to prevent air bubbles from being trapped under the film by applying pressure from the center of the film outward toward the edges during application.**
4. **To prevent intrusion of rainwater, be sure to press down the overlapping portions and cut ends of the film securely.**

3. EXTERIOR

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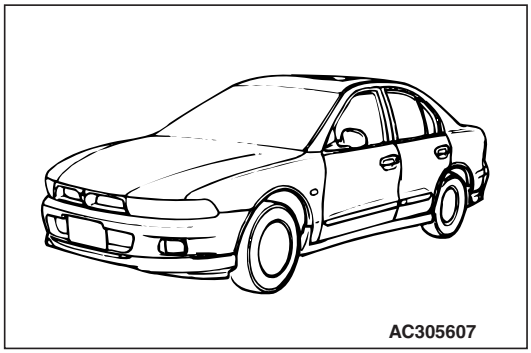

1. Visually inspect the entire exterior.
   (1) Paint condition
   (2) Corrosion, scratches
   (3) Bent edges, dented panels
2. Coated surfaces maintenance
   Touch up minor paint chips and flaws.

NOTE:
For terms of paintwork, refer to P.1-5.

4. OPERATION OF DOOR LOCKING SYSTEMS AND DOOR HINGES

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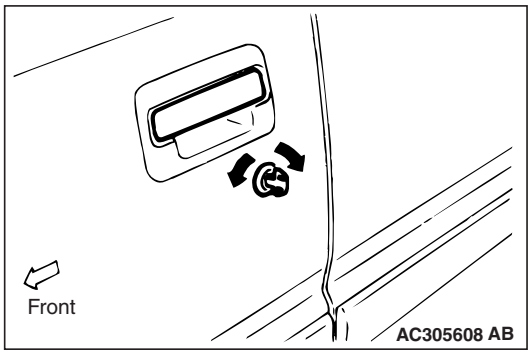
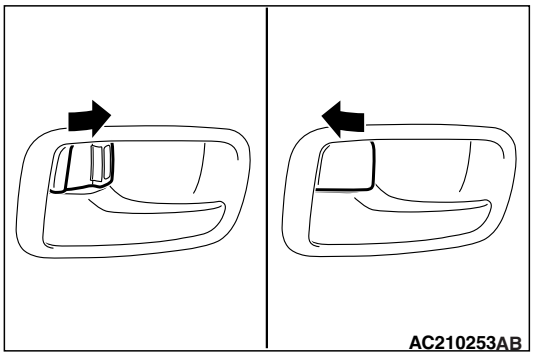
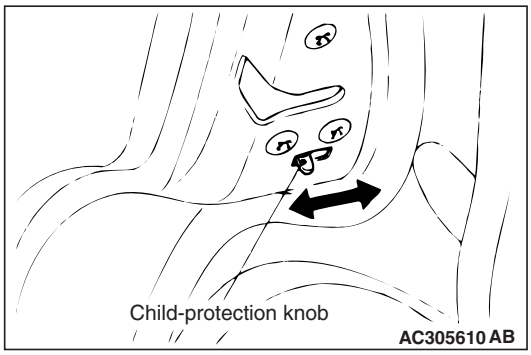




1. Open each door to check the release mechanism and ease of operation.
2. Close the door to check the latch and striker.
3. Open the door, operate the lock lever and close the door to check the lock.
4. Partially close the door to check the open-door detent.
5. Unlock each door with the key to check lock operation.
6. Verify that all doors can be locked by the lock buttons.

NOTE:
Adjust and lubricate the door latches, strikers and locks as required.



7. Verify that the rear doors can't be opened by the inner door handle when the child protection knob at the end of the door is shifted to the "LOCK" position with the inside lock plunger raised.

⚠ CAUTION
Set the lock to the "FREE" position on child protection of both rear doors. (For four door models)

5. OPERATION OF DOOR MIRRORS, WINDOWS AND SUNROOF

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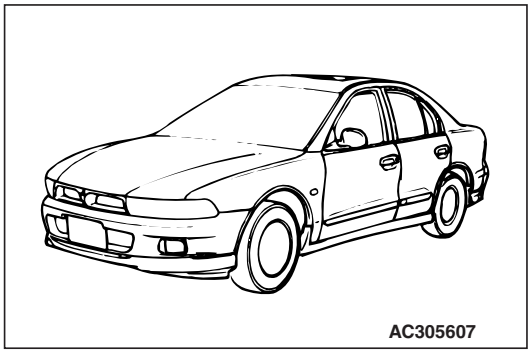

1. Door mirrors

   Check that the mirror operate properly.
2. Door windows

   Close all door windows to the fully closed position to check ease of operation.
3. Power windows

   Check that the door windows operate when the respective switches are operated. Check that when the lock switches are depressed, the respective door windows can no more be opened or closed.
4. Slide window

   Close the slide window to the fully closed position to check operation.
5. Sunroof

   Close the sunroof to the fully closed position to check operation.

UNDER HOOD

6. ENGINE OIL LEVEL

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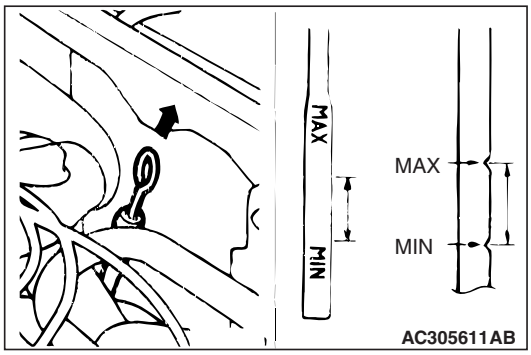

Check that the oil level is between "MAX" and "MIN". If it is at or below MIN, add the necessary amount of the specified engine oil referring to GROUP 2, Periodic Inspection and Maintenance P.2-3.

7. BRAKE MASTER CYLINDER FLUID LEVEL

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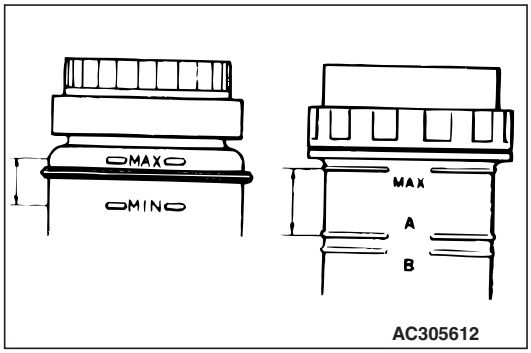
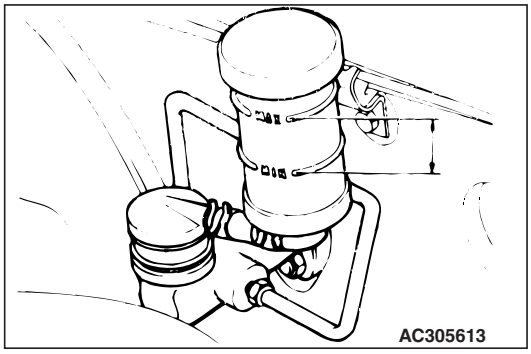


Check the fluid level.
If it is below the "MIN" mark, replenish fresh brake fluid up to the "MAX" mark.

Specified Brake Fluid: DOT3 or DOT4

8. CLUTCH MASTER CYLINDER FLUID LEVEL

M6010500300026



Check the fluid level.
If it is below the "MIN" mark, replenish fresh brake fluid up to the "MAX" mark.

Specified Brake Fluid: DOT3 or DOT4

9. WASHER FLUID LEVEL

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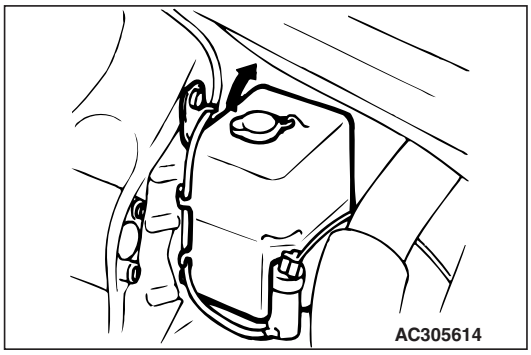
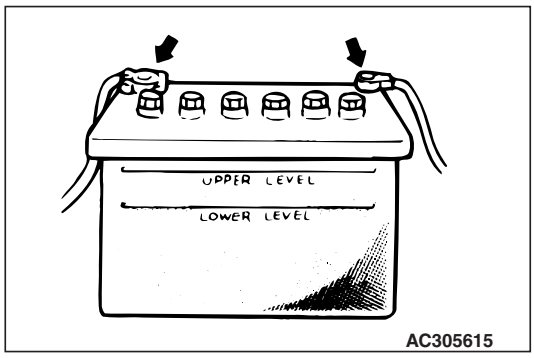


Check the fluid level; if it is low, replenish the washer fluid at the up to MAX mark.

1. Windshield washer reservoir
2. Rear window washer reservoir

10. BATTERY CONDITION AND CONNECTIONS

M6010500500020



Inspect the battery connections. Verify that they are tightened.

NOTE:
Do not wipe the lubricant from the battery posts and cable clamps.

11. POWER STEERING FLUID LEVEL

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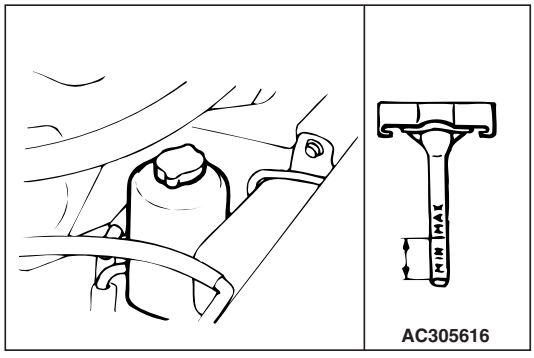
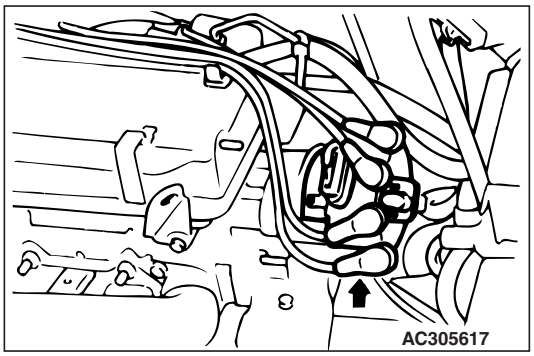


1. Check that the fluid level is between "MAX" and "MIN".
2. If the fluid is added, start the engine and turn the steering wheel from stop to stop several times to expel air from the system.

   Specified gear oil: Automatic transmission fluid DEXRON III or DEXRON II

12. ELECTRICAL WIRING

M6010500700024

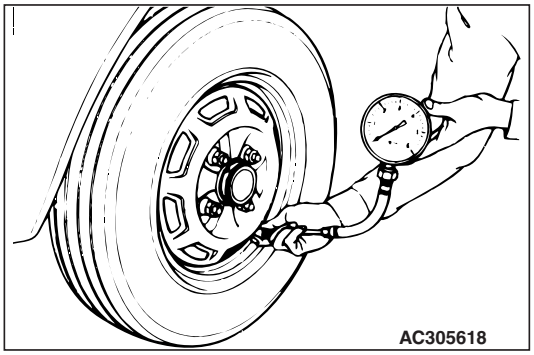


1. Each electrical wiring harness and connector
   (1) Check each harness to be correctly routed and securely clipped.
   (2) Confirm that all connections are tight.
2. Ignition cable
   Be sure that all ignition cables are firmly attached to the spark plugs, distributor cap (or crank angle sensor) and ignition coil.

UNDER VEHICLE

13. TYRE AND SPARE TYRE PRESSURES

M6010600100029



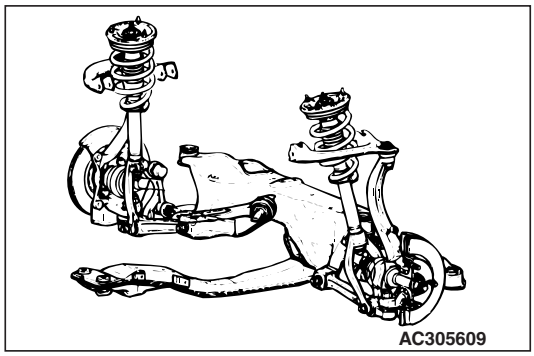
1. Tyre specification
   Check the correct tyre specification.
2. Tyre pressures
   Adjust each tyre pressure.

NOTE:
Recommended pressure is shown on the tyre pressure label.

3. Valve stem extensions
   Verify that the valve stem extensions are installed where necessary.
4. Install the wheel covers, wheel rings and hub caps.

14. SUSPENSION SYSTEM

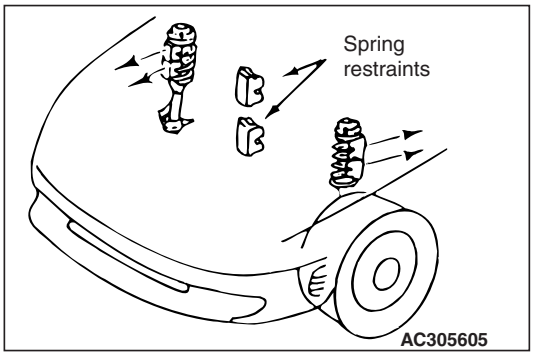
M6010600200026



Check to be sure that each installation bolt and nut is tightened. If split pins are used, make sure that they are properly installed.

1. Lower arm, Upper arm
2. Stabilizer bar
3. Strut assembly

REMOVE FRONT SPRING RESTRAINTS



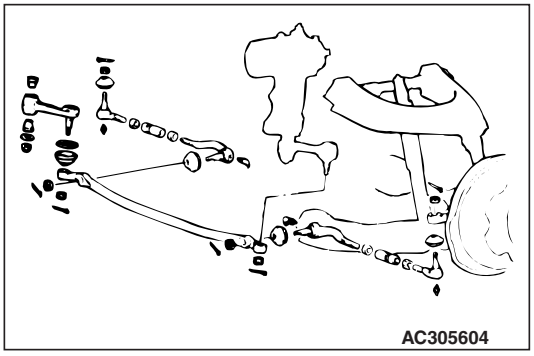
With the vehicle correctly positioned on the sub-frame contact points, and the suspension fully extended, remove the rubber restraints from the front springs.

⚠ CAUTION

It is very important that these restraints must be removed during predelivery-inspection. Failure to do so could cause ride and handling complaints.

15. STEERING LINKAGE AND SPLIT PINS

M6010600300023



1. Steering linkage retaining nuts and split pins
   Check visually and by feel that the steering linkage retaining nuts are correctly tightened and the split pins are correctly installed.
2. Tie rods and relay rod
   Check that the tie rods and relay rod of the steering linkage are not bent and that the tie rod end lock nuts are securely tightened.
3. Steering components
   (1) Check that each of the steering components is tightened.
   (2) Check the tie rod end, nuts and split pins for proper installation.
   (3) Check the condition of bellows-type dust seals.
4. Split pins
   Check the front axle nuts and rear wheel spindle nuts for split pins.

16. UNDER BODY

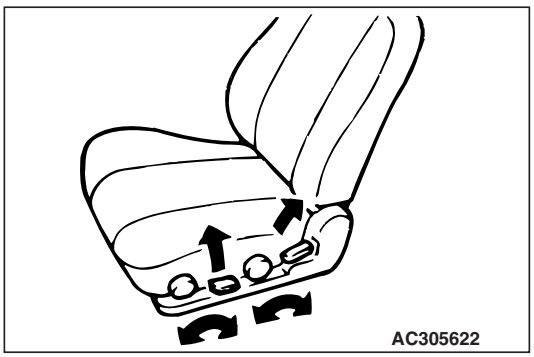
M6010600400020

Check under body and under body coating for damage.

BEFORE ROAD TEST

17. SEAT ADJUSTERS AND SEAT BACK LATCHES

M6010700100026



Check the operation of the various parts of the seats.

1. Mechanical adjusters of the seats
2. Operation of the latch for tilting the seatbacks forward and backward.

18. INHIBITOR SWITCH

M6010701100029

On models with an automatic transmission, be sure the engine starts in both "P" and "N" position, and does not start in other positions.

19. IDLE CONTROL KNOB

M6010700300020

Verify that the diesel engine revolution increases when the idle control knob is pulled out.

20. INSTRUMENT PANEL CONTROLS

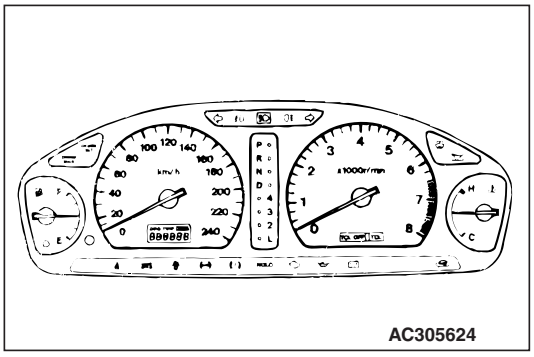
M6010700400027

Check the operation of the following

1. Horn
2. Head lamps
3. Exterior and interior lamps
4. Instrument panel lamps
5. Instrument brightness control

21. METERS, GAUGES, WARNING LAMPS AND INDICATION LAMPS

M6010700500024

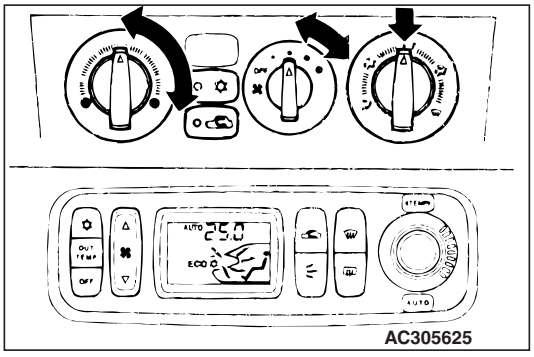


1. Check the meters and gauges are functioning properly.
2. Check each indicator lamp and warning lamp functions properly.

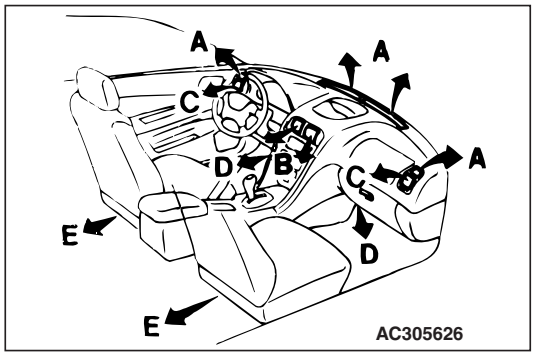
22. AIR CONDITIONING, HEATER AND DEFROSTER SYSTEM

M6010700600021

Check the systems for proper operation.



1. Air conditioning
   (1) Operate the air conditioning system.
   (2) Operate the air conditioning light.
   (3) Operate the control lever in all ranges.
   (4) Operate the blower motor switch in all ranges.

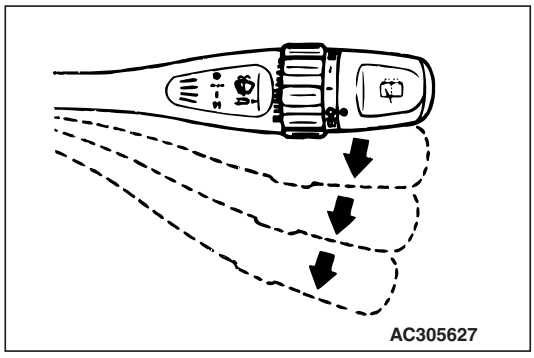


2. Heater and defroster
   (1) After the engine has warmed up, turn on the heater.
   (2) Operate the blower motor switch in all ranges.
   (3) Move the control to "Defrost" position.

A: From front and side defroster
B: From centre ventilators
C: From side ventilators
D: From under the instrument panel
E: From under the front seat (some models only)

23. WIPERS AND WASHERS

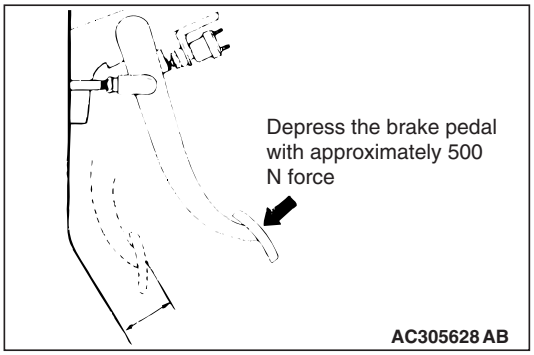
M6010700700028



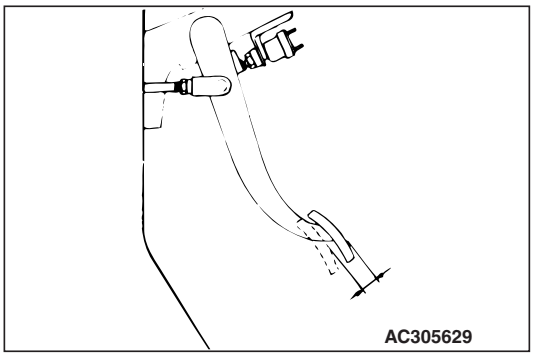
1. Front wiper and washer
   (1) Check operation of the front wipers in all ranges.
   (2) Check the aim of the front washer stream.
   (3) Check the wiper blade-stop positions.
   (4) Verify that the interval between cycles of wiping is shifted when timer knob is turned to any position.
   (5) Verify that the front wipers function by operating the washer switch.
2. Rear wiper and washer
   (1) Check the operation of the rear wiper.
   (2) Check the aim of the rear washer stream.
   (3) Check the wiper blade-stop positions.

24. OPERATION OF SERVICE BRAKES AND PARKING BRAKES

M6010700800133



1. Service brakes
   (1) Check the clearance between the brake pedal and the floor board when the brake pedal is depressed.



   (2) Verify correct brake pedal free play.

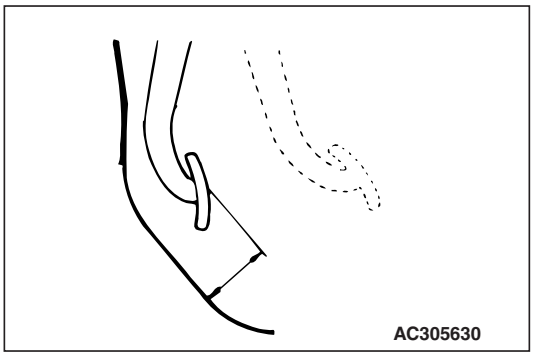
   NOTE: For inspection and adjustment of the service brake, refer to GROUP 2, Periodic Inspection and Maintenance P.2-3.

2. Parking brake
   Check the parking brake drag and lever travel.

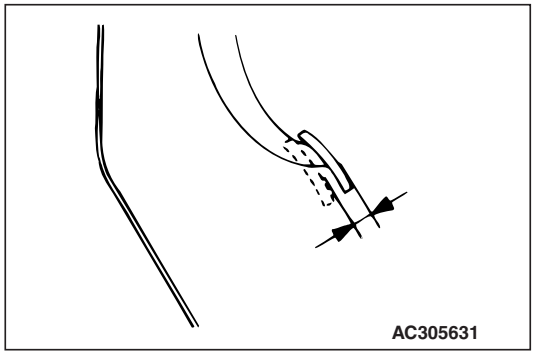
   NOTE: For inspection and adjustment of the parking brake, refer to GROUP 2, Periodic Inspection and Maintenance P.2-3.

25. CLUTCH OPERATION

M6010700900130



1. Check the clutch operation in all driving ranges.
2. Check the pedal-to-floor board clearance when the clutch is just disengaged.

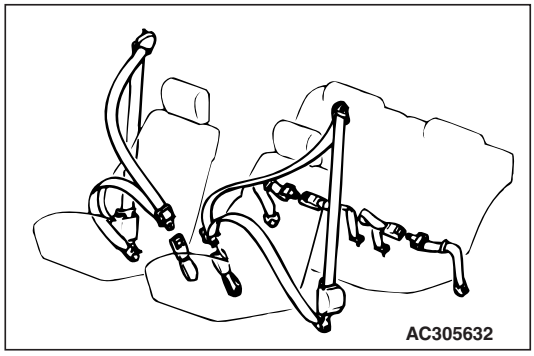


3. Verify correct clutch pedal free play.

   NOTE:
   For inspection and adjustment of the clutch pedal, refer to GROUP 2, Periodic Inspection and Maintenance P.2-3.

26. OPERATION OF SEAT BELTS, SHOULDER BELTS AND RETRACTORS

M6010701000022

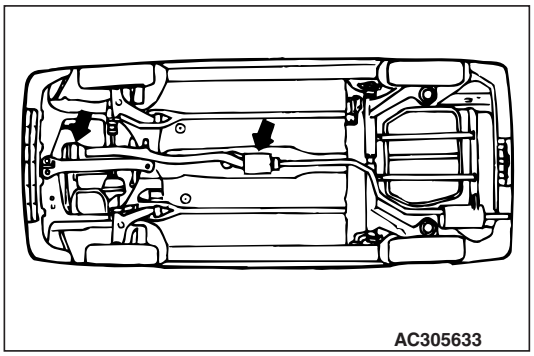


1. Verify that the seat belt warning lamp operates properly.
2. Check all seat belts and harnesses to assure that they connect and hold properly.
3. Lean forward to check that the shoulder harnesses allow movement.
4. Check the condition of the belts and anchors.
5. Check for proper seat belt retraction.

ROAD TEST

27. ENGINE PERFORMANCE AND EXHAUST GAS

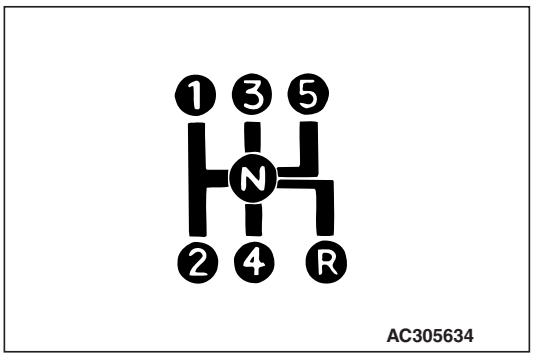
M6010800100023



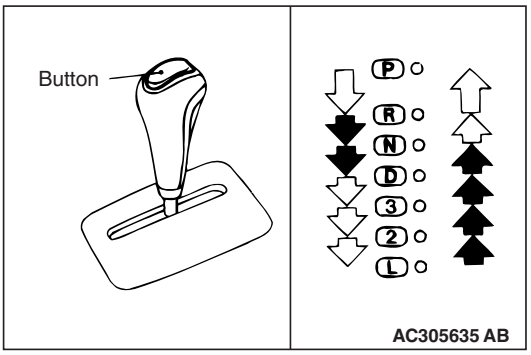
1. Engine performance
   Check the engine for proper performance and accelerator pedal for smooth operation.
2. Exhaust system
   (1) Check the exhaust system components for gas leaks.
   (2) Verify that no black smoking is emitted from the end of the exhaust pipe (diesel-powered vehicles).

28. TRANSMISSION IN ALL RANGES

M6010800200020



1. Manual transmission
   Check the transmission in all forward ranges and in reverse.



2. Automatic transmission
   (1) Make sure shift indicator lines up properly in all ranges.
   (2) Depress the accelerator completely to check that the manual kickdown is operating correctly.
   (3) Stop the vehicle on a steep incline.
   Put the automatic transmission in "P" position and slowly release the service brakes to see if "P" position lock holds. If it does not hold, the transmission requires further service.

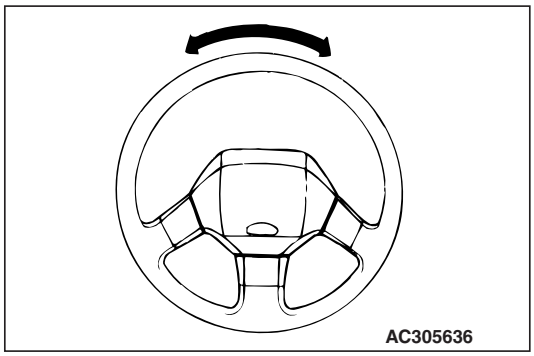
29. BRAKES

M6010800300027

1. Service Brake
   Put the vehicle in gear and apply the brakes while the vehicle is in motion. Be sure brake operation is smooth and positive.
2. Parking Brake
   (1) Stop the vehicle on a steep incline.
   With the service brakes firmly applied, place the transmission in "N" position, and set the parking brakes.
   (2) Slowly release the service brakes to see if the parking brakes will hold.

30. STEERING CONTROL

M6010800400024



1. Check for excessive play or looseness.
2. Check the steering wheel centre.

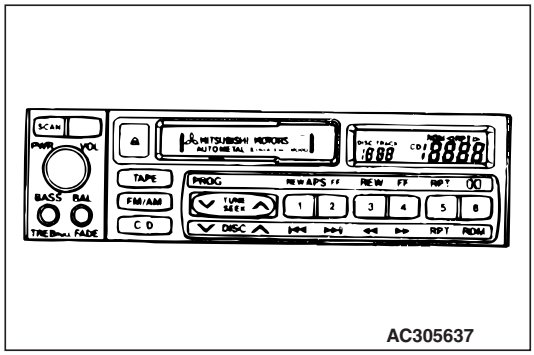
31. VIBRATION AND RATTLES

M6010800500021

1. Locate squeaks, rattles and unusual vibrations.
2. Verify that no noise occurs from the engine, transmission, axle and body.

32. ELECTRICAL EQUIPMENT

M6010800600028



1. Radio

   Tune the radio to a local broadcasting station and check the following:
   (1) Operate the volume, tone, balance and fader controls, etc.
   (2) Pull out the pushbuttons, dial another station and set each pushbuttons.
   (3) Operate the AM/FM switch.
2. Tape player

   Insert a cassette tape in the tape player and check as follows:
   (1) Check the operation of the tape feeder and rewind.
   (2) Check the ejection.
   (3) Check the operation of volume, tone, balance and fader controls, etc.

AFTER ROAD TEST

33. IDLE SPEED

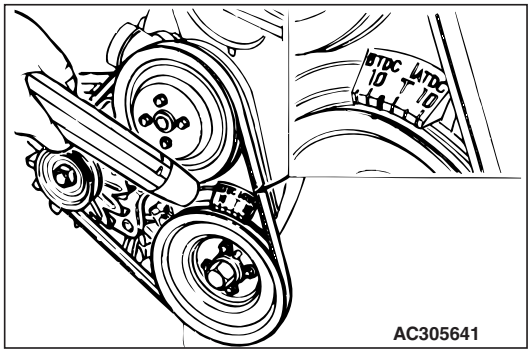
M6010900100105

Check the engine idle speed.

NOTE: For specific idle speed adjustment procedure, refer to GROUP 2, Periodic Inspection and Maintenance P.2-3.

34. IGNITION TIMING

M6010900200102

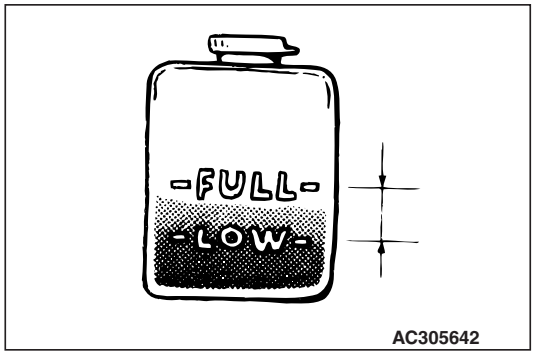


Check the ignition timing. Except MPI vehicles with crankshaft-mounted crankshaft angle sensor.

NOTE: For the inspection and adjustment of the ignition timing, refer to GROUP 2, Periodic Inspection and Maintenance P.2-3.

35. RADIATOR COOLANT LEVEL

M6010900300109

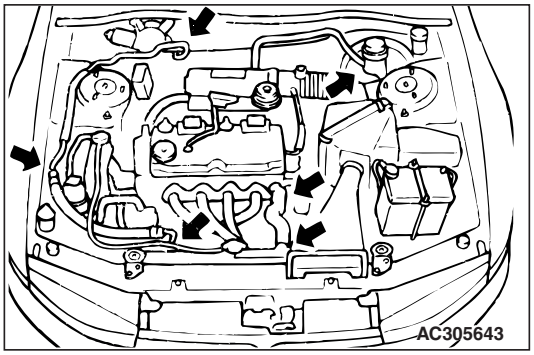


1. Check that the coolant level in the reserve tank is at or above "LOW" mark at normal engine operating temperature. And check cooling system for leaks.
2. Check that the coolant concentration is 30% to 60%.

⚠ CAUTION
Do not remove the radiator cap while the cooling system is under pressure.
When removing the radiator cap, be careful of steam and boiling water. Add coolant only to the reserve tank if it is required.

36. HOSES, FLUID LINES AND CONNECTIONS LOCATED UNDER HOOD

M6010900400106



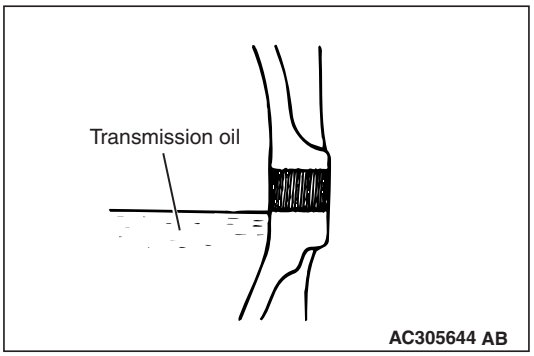
1. Check all brake, fuel, power steering and air conditioner lines and connections; verify proper routing, check connections for leaks, tighten loose connector as required.
2. Inspect routing and connections of all vacuum, and radiator and heater houses.

⚠ CAUTION
Remember that the air conditioner system is under pressure.

NOTE:
Keep in mind that an oily residue around an air conditioner connector does not necessarily indicate a leak. Oil is used to lubricate fittings during assembly. Be sure lines are not twisted or kinked.

37. MANUAL TRANSMISSION AND TRANSFER (4WD) OIL LEVEL

M6010900500136

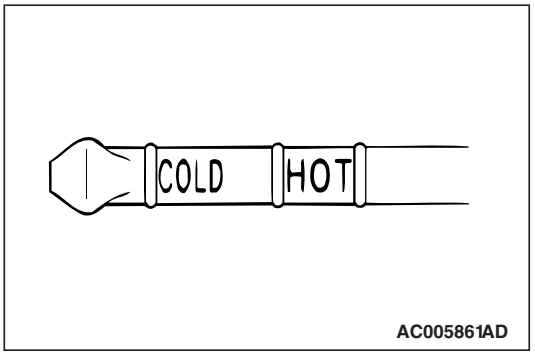


1. Remove the filler plug.
2. Check the oil level. If the oil level is at or slightly below the filler hole, it is in satisfactory condition.
3. If the level is low, replenish the transmission and transfer case with fresh oil by using a lubricator.

NOTE: For the specified oil, refer to GROUP 2, Periodic Inspection and Maintenance P.2-3.

38. AUTOMATIC TRANSMISSION FLUID LEVEL

M6010900600122



1. Remove the dipstick and check the fluid level.
2. Fluid level is okay if it is in the specified range as illustration at normal engine operating temperature.
3. If the level is below the lower notch, replenish fluid until the level reaches the upper notch.

Automatic transmission fluid: DIA QUEEN ATF SP III

⚠ CAUTION
Do not overfill.

39. ENGINE, TRANSMISSION, STEERING GEAR BOX AND DIFFERENTIAL FOR LEAKS

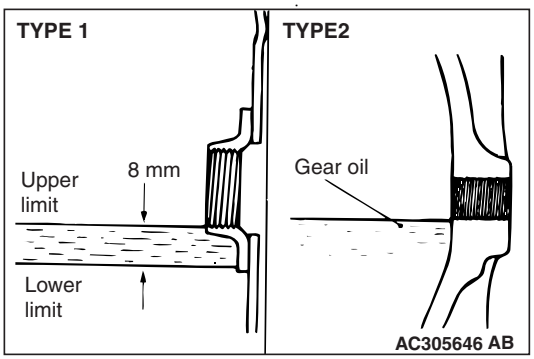
M6010900700107

Check the engine, transmission, steering gear box and differential for oil leaks.

40. FRONT AND REAR DIFFERENTIAL OIL LEVELS

M6010900800104

1. Remove the filler plug.
2. Check the oil level. If the oil level is at or slightly below the filler hole, it is in satisfactory condition.



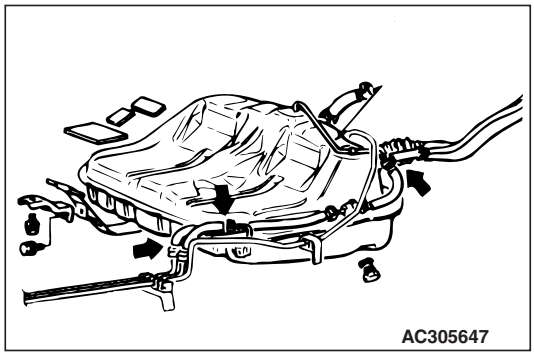
Type 1 only: Remove the filler plug, and check the gear oil level. Check that gear oil level is not 8 mm below the bottom of filler plug hole.

3. If the level is low, replenish the front and/or rear differential with fresh oil by using a lubricator.

NOTE:
For the specified oil, refer to GROUP 2, Periodic Inspection and Maintenance P.2-3.

41. HOSES, FLUID LINES AND CONNECTIONS LOCATED UNDER VEHICLE

M6010901000101

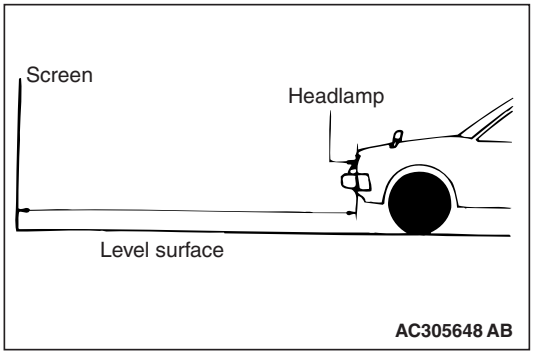


1. Check all hoses, fluid lines and connections for leaks.
2. Check all hoses and fluid lines for proper routing away from sharp edges and moving components.

FINAL STEPS

42. HEADLAMP AIMING

M6011000100105

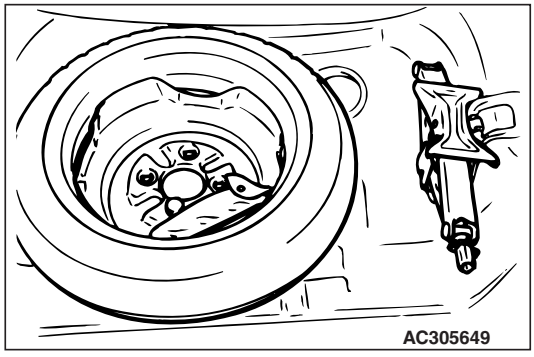


Check condition for headlamp aiming.

NOTE:
For headlamp aiming procedures, refer to the Workshop Manual for that model.

43. EQUIPMENT

M6011000200102

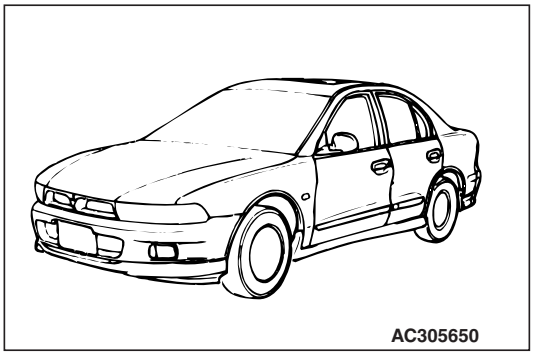


Check the installation of the various equipment.

1. Floor mats
2. Spare tyre
3. Jack, jack handle and tool set

44. EXTERIOR AND INTERIOR

M6011000300109



Finally check and clean the exterior and interior.

1. Wash the vehicle to remove all traces of road grime and other dirt on the vehicle as a result of new vehicle preparations.
2. Clean exterior and interior glass surface.
3. Remove all protective covers.
4. Remove undercoat overspray, excess window sealer, and excess weatherstrip adhesive.
5. Verify that the secondary key can not unlock the glove box and tailgate/boot lid (if so equipped).
6. Remove shipping and inspection stickers.

45. OWNER INSTRUCTIONS

M6011000400106

1. Verify that the owner's manual and service booklet is in the glove box.
2. Place the spare keys in envelope in the glove box before delivery.

GROUP 2

PERIODIC INSPECTION AND MAINTENANCE

CONTENTS

Continued on next page

PERIODIC INSPECTION AND MAINTENANCE SCHEDULE

M6020100100229

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

•: Applicable for GRANDIS

Maintenance item			Maintenance operation	Maintenance interval		Application
OPERATIONS INSIDE THE ENGINE COMPARTMENT						
A1	Check V-belt for cracks, fraying, wear, and adjust its tension		Inspection	Every 15,000 km or every 12 months		•
A2	Check intake air hose and turbocharger oil hose for damage (vehicles with turbocharger)		Inspection	Every 30,000 km or every 2 years		•
A3	Replace engine timing belt [including timing belt B] (except vehicles with timing chain)	Except vehicles with BSY engine	Replace	Every 90,000 km		•
		Vehicles with BSY engine	Replace	Every 120,000 km		•
A4	Check operation of crankcase emission control system (petrol-powered vehicles)		Inspection	Every 30,000 km or every 2 years		•
A5	Replace spark plugs	Platinum-tipped type or Iridium-tipped type	Replace	Every 90,000 km		•
A6	Check radiator hoses for damage and proper connection		Inspection	Every 30,000 km or every 2 years		•
A7	Check engine coolant level in reservoir		Inspection	Every 30,000 km or every 2 years		•
A8	Change engine coolant		Change	Every 60,000 km or every 4 years		•
A9	Check air cleaner element for clogging and damage		Inspection	Normal usage	Every 15,000 km or every 12 months	•
				Severe usage	Every 7,500 km or every 6 months	•
A10	Replace air cleaner element		Replace	Normal usage	Every 45,000 km or every 3 years	•
				Severe usage	More frequently	•
A11	Check fluid level in brake reservoir and clutch reservoir (hydraulic type clutch)		Inspection	Every 15,000 km or every 12 months		•
A12	Change brake fluid		Change	Every 30,000 km or every 2 years		•
A13	Check battery electrolyte level		Inspection	Every 15,000 km or every 12 months		•
A14	Replace fuel filter	Petrol-powered vehicles	Replace	Every 150,000 km or every 10 years		•
		Diesel-powered vehicles	Replace	Every 30,000 km or every 2 years		•

Maintenance item			Maintenance operation	Maintenance interval		Application
OPERATIONS UNDER THE VEHICLE						
B1	Check suspension system for damage and looseness		Inspection	Every 30,000 km or every 2 years		•
B2	Check suspension arm ball joints for play, and dust covers for damage		Inspection	Every 30,000 km or every 2 years		•
B3	Check drive shaft boots for damage		Inspection	Normal usage	Every 30,000 km or every 2 years	•
				Severe usage	Every 7,500 km	•
B4	Check steering linkage for damage and loose connections (including seals and boots)		Inspection	Every 60,000 km or every 4 years		•
B5	Check gear oil level in manual transmission		Inspection	Every 15,000 km or every 12 months		•
B6	Change gear oil in manual transmission	Except F6MBA model	Change	Normal usage	Every 105,000 km or every 7 years	•
				Severe usage	Every 45,000 km or every 3 years	•
		F6MBA model	Change	Normal usage	Every 195,000 km or every 13 years	•
				Severe usage	Every 90,000 km or every 6 years	•
B7	Check exhaust pipe connections for gas leakage, and check pipe installation		Inspection	Every 30,000 km or every 2 years		•
OPERATIONS INSIDE THE VEHICLE						
C1	Check brake pedal and clutch pedal for free play		Inspection	Every 15,000 km or every 12 months		•
C2	Check parking brake lever stroke and play		Inspection	Every 15,000 km or every 12 months		•
C3	Replace air purifier filter		Replace	Every 15,000 km or every 12 months		•
OPERATIONS OUTSIDE THE VEHICLE						
D1	Check uneven tyre wear		Inspection	Every 30,000 km or every 2 years		•
D2	Check front wheel bearings for play		Inspection	Every 60,000 km or every 4 years		•
D3	Check brake hoses and pipes for leakage		Inspection	Every 30,000 km or every 2 years		•
D4	Check brake pads and discs for wear		Inspection	Normal usage	Every 15,000 km or every 12 months	•
				Severe usage	Every 7,500 km or every 6 months	•

Maintenance item			Maintenance operation	Maintenance interval		Application
D5	Check brake shoe linings and drums for wear		Inspection	Normal usage	Every 30,000 km or every 2 years	•
				Severe usage	Every 15,000 km or every 12 months	•
D6	Check fuel hoses and pipes for leakage or deterioration		Inspection	Every 30,000 km or every 2 years		•
OPERATIONS AFTER ENGINE IS WARMED UP						
E1	Check fluid level in automatic transmission		Inspection	Every 15,000 km or every 12 months		•
E2	Change automatic transmission fluid	2WD	Change	Normal usage	Every 90,000 km or every 6 years	•
				Severe usage	Every 45,000 km or every 3 years	•
E3	Change engine oil (petrol-powered vehicles)	ACEA and API classifications "ACEA A1, A2, A3" / "For service SG" or higher	Change	Normal usage	Every 15,000 km or every 12 months	•
				Severe usage	Every 7,500 km	•
	Change engine oil (diesel-powered vehicles)	VW 50300 / 50600 / 50601	Change	Every 15,000 km or every 12 months		•
E4	Replace engine oil filter (petrol-powered vehicles)	ACEA and API classifications "ACEA A1, A2, A3" / "For service SG" or higher	Replace	Normal usage	Every 15,000 km or every 12 months	•
				Severe usage	Every 7,500 km	•
	Replace engine oil filter (diesel-powered vehicles)	VW 50300 / 50600 / 50601	Replace	Every 15,000 km or every 12 months		•
E5	Check engine idling speed		Inspection	Every 15,000 km or every 12 months		•
E6	Check CO concentration (petrol-powered vehicles)		Inspection	Every 15,000 km or every 12 months		•
E7	Check exhaust gas recirculation (EGR) system	Except vehicles with BSY engine	Inspection	Every 15,000 km or every 12 months		•
		Vehicles with BSY engine	Inspection	Every 60,000 km or every 4 years		•
E8	Check valve clearance (except vehicles with auto-lash adjuster)		Inspection	Every 15,000 km or every 12 months		•
OTHERS						
F1	Check body condition for damage		Inspection	Every year		•
F2	Road test		Inspection	Every 15,000 km or every 12 months		•

NOTE:

- *"Severe usage" specifications apply to only vehicles used under severe operating conditions. Severe operating conditions include the followings:*
  1. *Driving in a dusty area.*
  2. *Driving on rough roads, on submerged roads, or hilly areas.*
  3. *Driving 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 120 km/h or more and the ambient temperature is 30°C or more.*

OPERATIONS INSIDE THE ENGINE COMPARTMENT

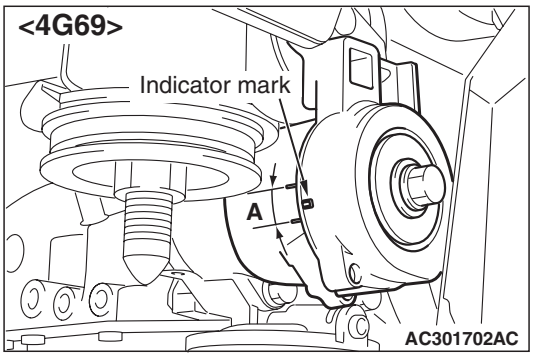
A1. CHECK V-BELT FOR CRACKS, FRAYING, WEAR, AND ADJUST ITS TENSION

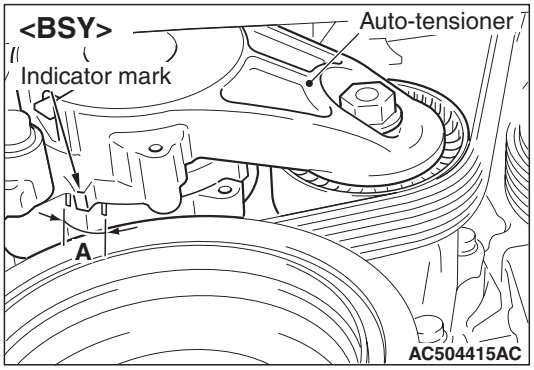
M6020200100196

V-BELT CONDITION

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

V-BELT TENSION





1. Make sure that the indicator mark is within the area marked with A in the illustration.

⚠ CAUTION

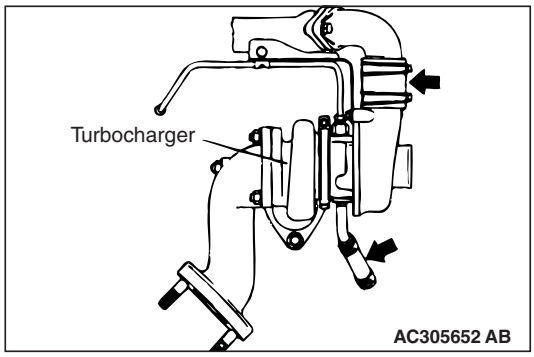
Check the drive belt tension after turning the crankshaft clockwise one turn or more.

2. If the mark is out of the area, replace the drive belt.

   NOTE: The drive belt tension check is not necessary as auto-tensioner is adopted.

A2. CHECK INTAKE AIR HOSE AND TURBOCHARGER OIL HOSE FOR DAMAGE

M6020200500149



Inspect the intake air hoses for cracks or damage.

A3. REPLACE ENGINE TIMING BELT <EXCEPT VEHICLES WITH TIMING CHAIN>

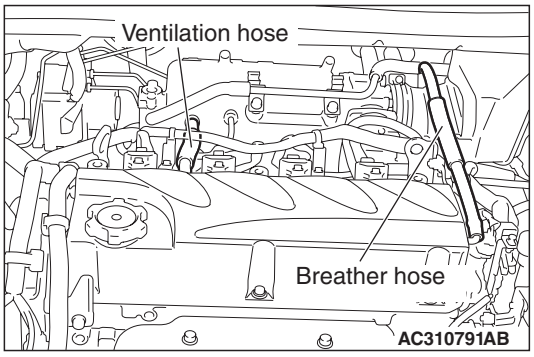
M6020200600135

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

A4. CHECK OPERATION OF CRANKCASE EMISSION CONTROL SYSTEM <PETROL-POWERED VEHICLES>

M6020200700187

BREATHER HOSE

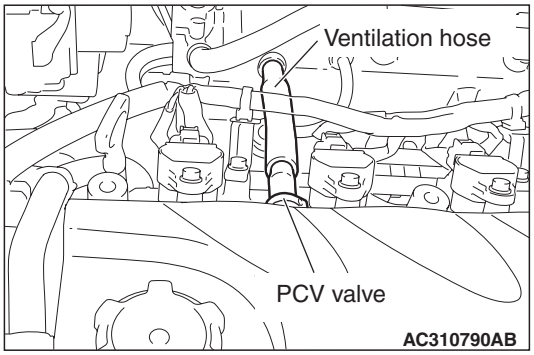


1. Inspect the breather hose for cracks or damage.
2. Clean the inside of the breather hose if necessary.
3. Inspect the ventilation filter for clogging.

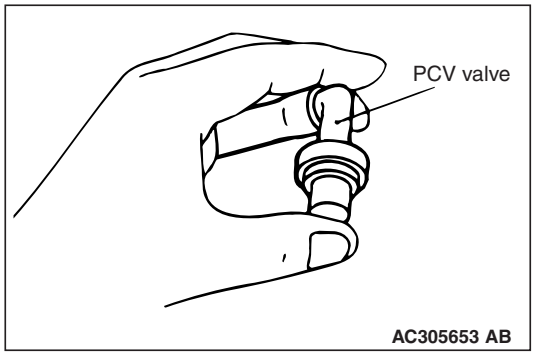
VENTILATION HOSE

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

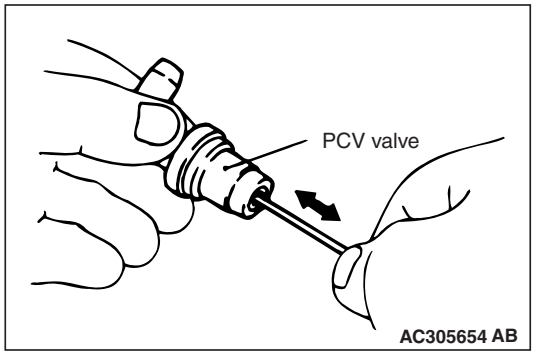


1. Remove the ventilation hose from the PCV (Positive crankcase ventilation) valve.
2. Remove the PCV valve from the rocker cover.
3. Reinstall the PCV valve at the ventilation hose.
4. Start the engine and run at idle.



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.

A5. REPLACE SPARK PLUGS

M6020200800139

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

A6. CHECK RADIATOR HOSES FOR DAMAGE AND PROPER CONNECTION

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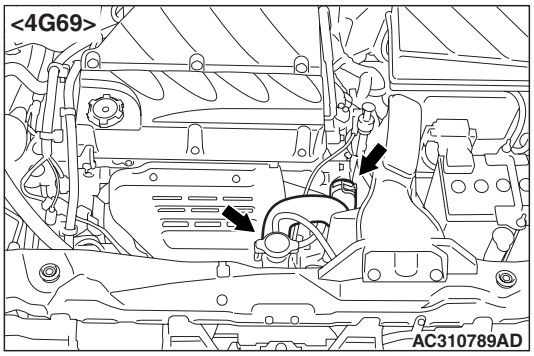
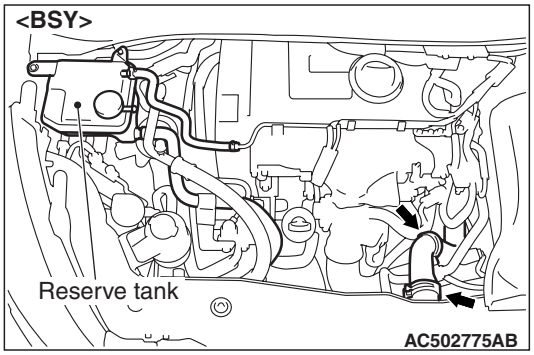
<4G69>



<BSY>

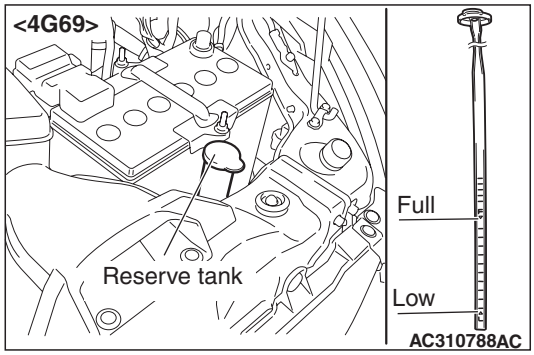


1. Check entire circumference and length of hoses, using a mirror as required.
2. Check that hoses installed in grommets pass through the centre of the grommets.
3. Check all clamps for tightness and connections for leakage.

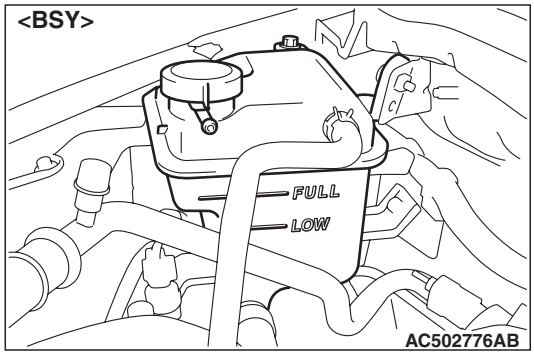
A7. CHECK ENGINE COOLANT LEVEL IN RESERVOIR

M6020201000170

<4G69>



<BSY>

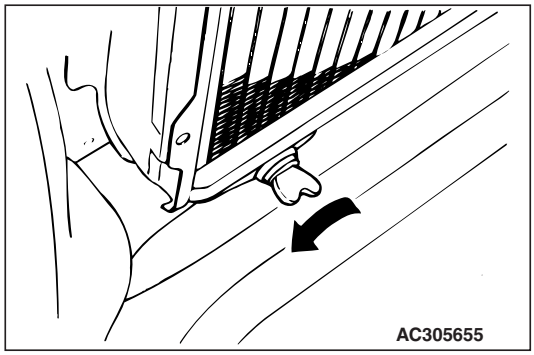


Check that the coolant level is between the "FULL" and "LOW" lines when the engine is at the normal operating temperature.

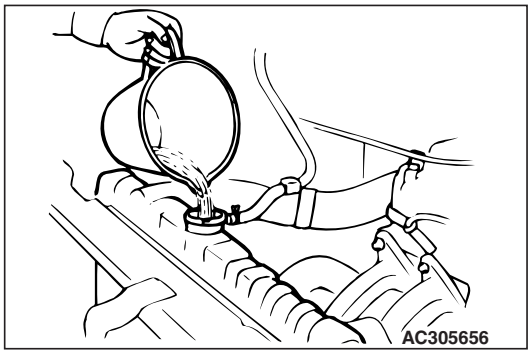
A8. CHANGE ENGINE COOLANT

M6020201100230

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:
   <4G69> DIA QUEEN SUPER LONG LIFE COOLANT or equivalent
   <BSY> BASF Glysantin Alu Protect Premium / G30

⚠ 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.

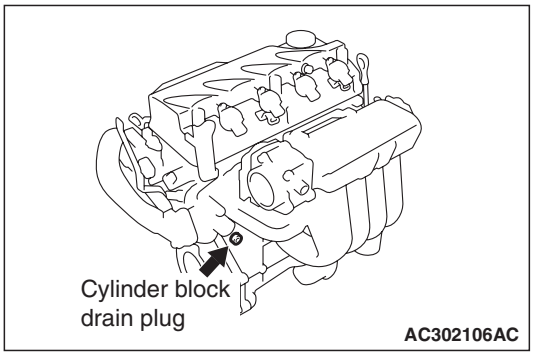
8. Fill the cooling system with soft water through the filler port, and add long life coolant, if necessary.
9. Fill the reserve tank with coolant.
10. Install the radiator cap and the reserve tank cap.
11. Recheck the engine coolant level after a road test.

⚠ CAUTION

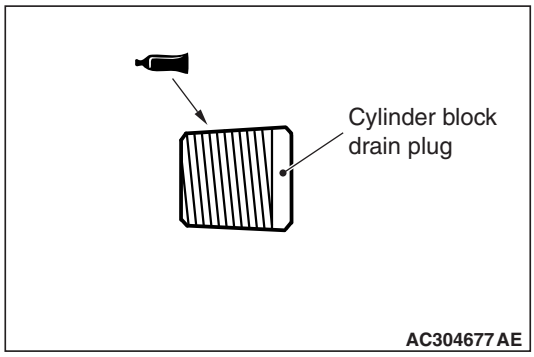
When removing the radiator cap, be careful to blow out steam and boiling water.

REMOVAL OF ENGINE COOLANT FROM THE CYLINDER BLOCK DRAIN PLUG <4G69>

1. Drain the engine coolant by removing the drain plug and then the radiator cap.



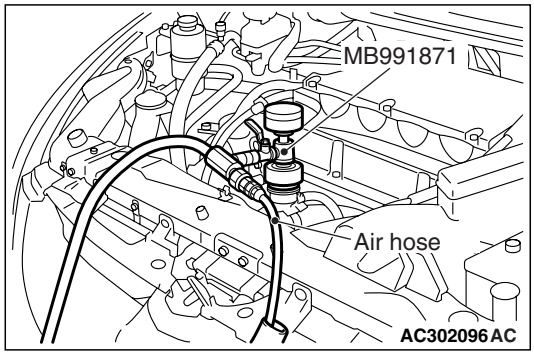
2. Remove the cylinder block drain plug from the cylinder block to drain the engine coolant.
3. Remove the reserve tank to drain the engine coolant.
4. When the engine coolant has drained, pour in water from the radiator cap to clean the engine coolant line.



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. By referring to the section on coolant, select an appropriate concentration for safe operating temperature within the range of 30 to 60%. Use special tool LLC changer (MB991871) to refill the coolant. A convenient mixture is a 50% water and 50% antifreeze solution (freezing point: – 31° C)

   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:
   <without rear heater> 8.0 L
   <with rear heater> 9.5L

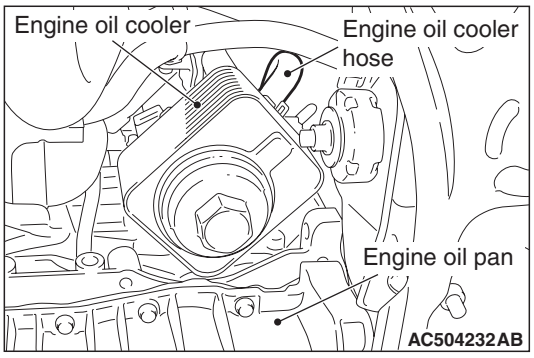
⚠ CAUTION

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.

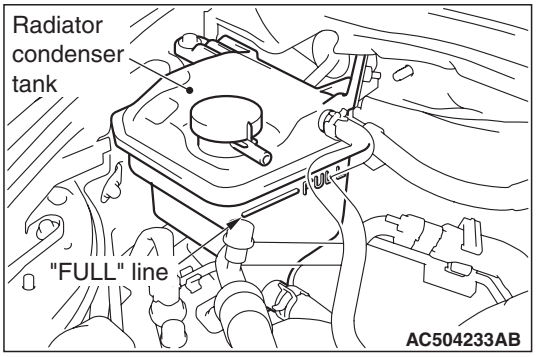
9. Install the radiator cap securely.
10. Start the engine and warm the engine until the thermostat opens. (Touch the radiator hose with your hand to check that warm water is flowing.)
11. After the thermostat opens, race the engine several times, and then stop the engine.
12. Cool down the engine, and 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 10.

REMOVAL OF ENGINE COOLANT FROM THE CYLINDER BLOCK DRAIN PLUG <BSY>

1. Drain the water from the radiator, heater core and engine after unplugging the radiator plug and removing the radiator condenser tank cap.



2. Drain the water in the water jacket by disconnect the engine oil cooler hose.
3. Remove the radiator condenser tank and drain the coolant.
4. Install the radiator condenser tank.
5. Drain the coolant then clean the path of the coolant by injecting water from the radiator condenser tank cap area.
6. Connect the engine oil cooler hose.
7. Securely tighten the radiator plug.



8. By referring to the section on coolant, select an appropriate concentration for safe operating temperature within the range of 50%. Refill the coolant to the "FULL" line of the radiator condenser tank as slowly as possible. A convenient mixture is a 50% water and 50% antifreeze solution.

   Recommended antifreeze: BASF Glysantin Alu Protect Premium/G30
   Quantity:
   <Without rear heater> 8.0 L
   <With rear heater> 9.5 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 corrosion of the aluminium components.

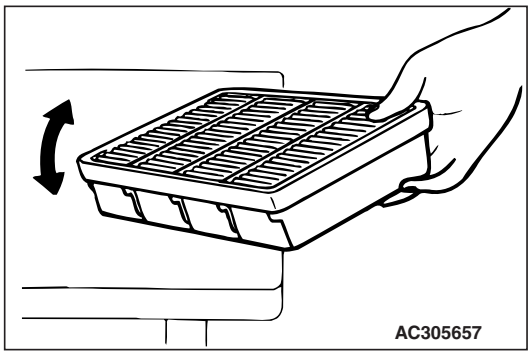
9. Start the engine and let the engine run at 2,000 r/min (heater temperature adjustment: MAX COOL, air volume adjustment: OFF).
10. When the coolant in the radiator condenser tank is gone, refill the coolant again to the "FULL" line of the radiator condenser tank as slowly as possible.
11. Repeat steps 9 and 10 until the coolant in the radiator condenser tank stops reducing.
12. If the coolant in the radiator condenser tank stopped reducing, let the engine run at 2,000 r/min (heater temperature adjustment: MAX COOL, air volume adjustment: OFF) until the cooling fan starts running.
13. When the cooling fan starts running, let the engine idle until the cooling fan stops running.
14. When the cooling fan has started running, let the engine run at 2,000 r/min (heater temperature adjustment: MAX HOT, air volume adjustment: MAX) for 3 minutes and check that the coolant in the radiator condenser tank is not reducing. If the coolant reduces, refill the coolant to the "FULL" line of the radiator condenser tank.

15.Stop the engine and wait until the coolant cools down. Check that the coolant in the radiator condenser tank is not reduced excessively.

NOTE: If the reduction is approximately 10 mm, the change can be attributed to hot and cold statuses of the coolant. Thus, it is judged good.

A9. CHECK AIR CLEANER ELEMENT FOR CLOGGING AND DAMAGE

M6020201200141

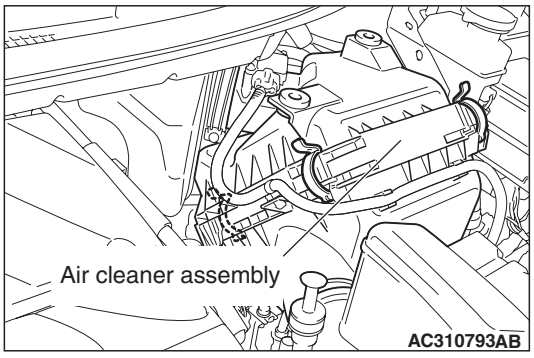


1. Check air cleaner element for clogging and damage.
2. Clean deposited dust from the element in the following manner.
   (1) Lightly tap the element against the top of a bench.
   (2) Blow compressed air from inside the element.
3. Wipe off dust on the air cleaner interior.
4. Install the air cleaner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

A10. REPLACE AIR CLEANER ELEMENT

M6020201300171

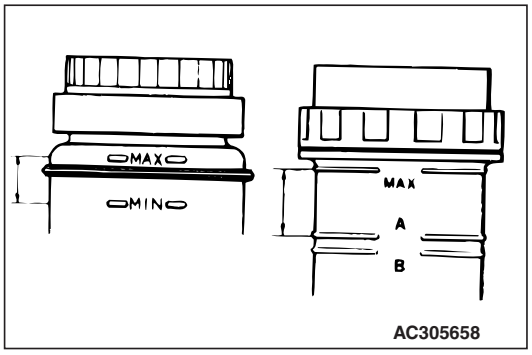
The air cleaner element will become dirty and loaded with dust during use, and the filtering effect will be substantially reduced. Replace it with a new one.



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.

A11. CHECK FLUID LEVEL IN BRAKE RESERVOIR AND CLUTCH RESERVOIR (hydraulic type clutch)

M6020201400145



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

A12. CHANGE BRAKE FLUID

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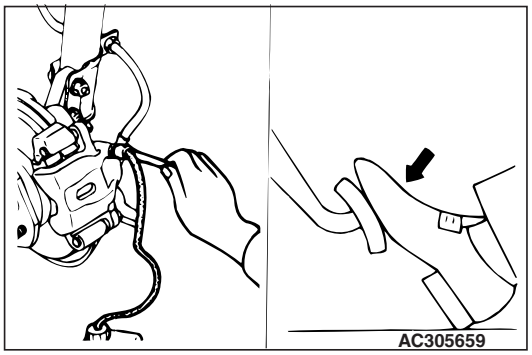


1. Remove the cap of the bleeder screw, connect a vinyl tube, and place its other end in a receptacle.
2. Loosen the bleeder screw and depress the brake pedal; supply new brake fluid when the level of the fluid within the reservoir tank decreases.

⚠ 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.

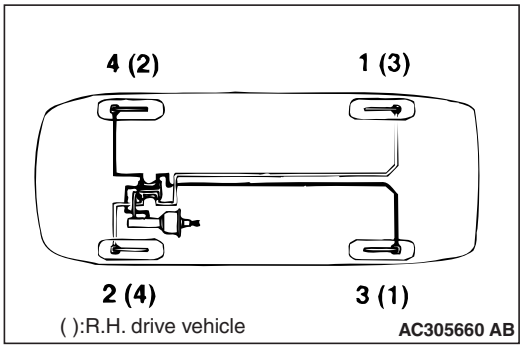
Specified brake fluid: DOT3 or DOT4

⚠ 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 colour of fluid that flows out.



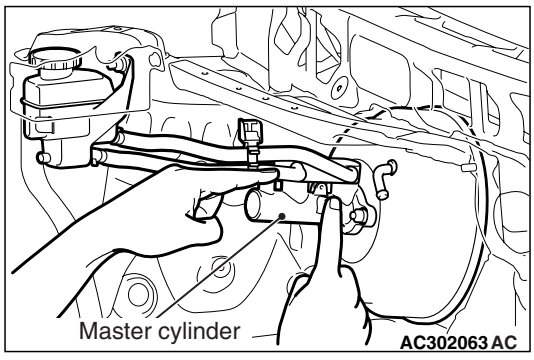
4. Repeat above steps for other bleeder screws.

   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.)

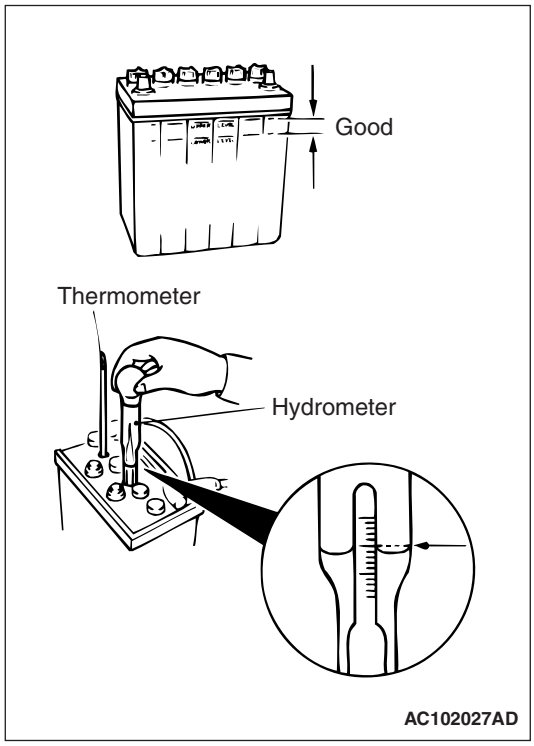
1. Fill the reserve tank with brake fluid.
2. Keep the brake pedal depressed.



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.

A13. CHECK BATTERY ELECTROLYTE LEVEL

M6020201700209



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]

3. 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.

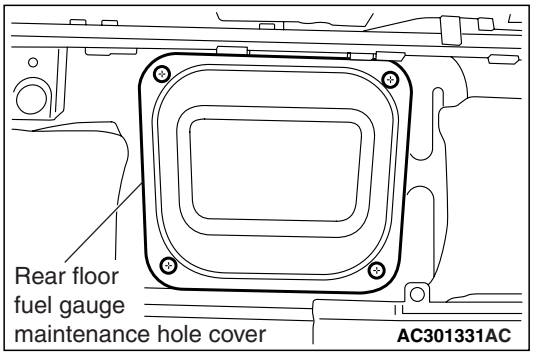
   D20 = (t - 20) × 0.0007 + Dt
   D20: Specific gravity of the battery fluid calculated for 20° C.
   Dt: Actually measured specific gravity
   t: Actually measured temperature

A14. REPLACE FUEL FILTER

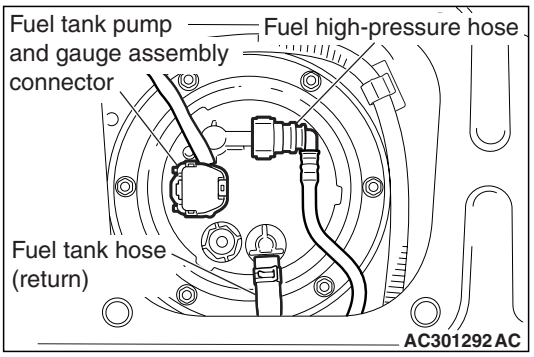
M6020201900214

<4G69>

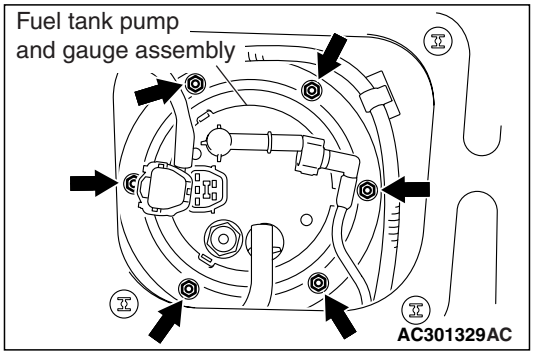
1. Reduce fuel line pressure.
2. Remove the second seat assembly, the rail cover outer and the rail cover inner.
3. Remove the rear scuff plate, and turn up the floor mat.



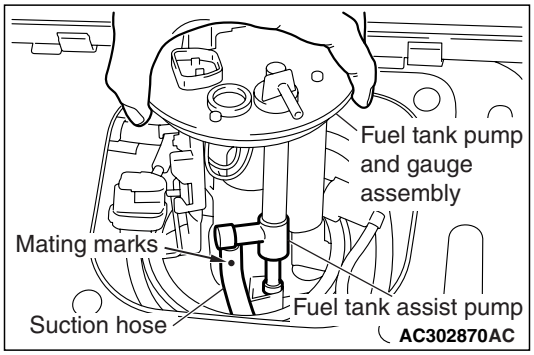
4. Remove the rear floor fuel gauge maintenance hole cover (LH).

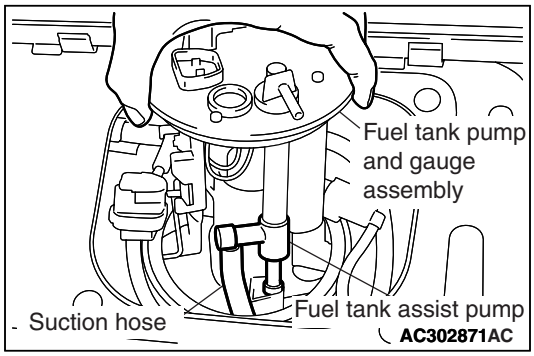


5. Disconnect the fuel tank pump and gauge assembly connector, fuel high-pressure hose and fuel tank hose (return).



6. Remove the fuel tank pump and gauge assembly mounting nuts.





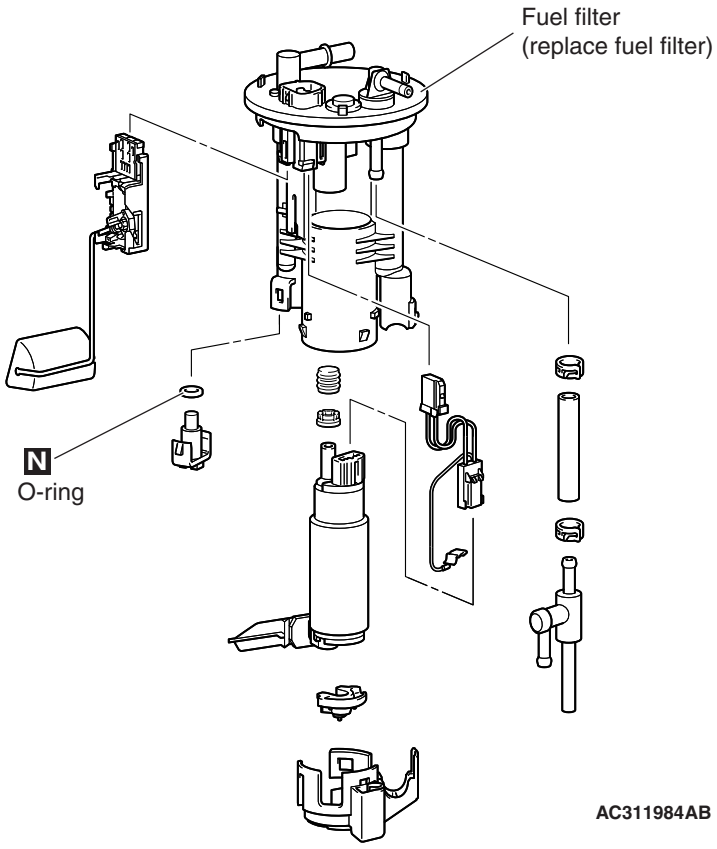
7. While removing the fuel tank pump and gauge assembly from service hole, disconnect the suction hose from fuel tank assist pump, and remove the fuel tank pump and gauge assembly from service hole completely.

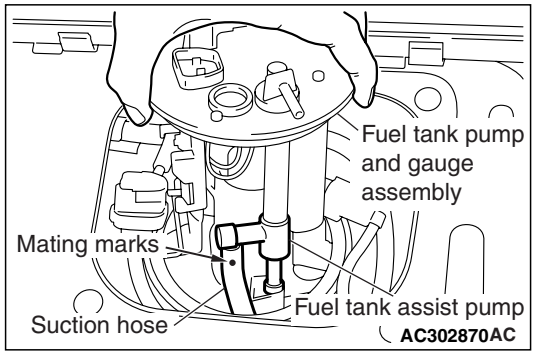
⚠ CAUTION

1. **The suction hose connecting fuel tank assist pump has factory preset mating marks. However, if the marks have been dropped out because of gasoline adherence, make the mating marks and remove the suction hose.**
2. **When withdrawing the fuel tank pump and gauge assembly via the service hole, be careful not to damage the gauge and the float.**

8. Replace the fuel filter.

FUEL PUMP MODULE





9. While inserting the fuel tank pump and gauge assembly from the service hole to fuel tank, connect the suction hose to the fuel tank assist pump and install the fuel tank pump and gauge assembly to the fuel tank.

⚠ CAUTION

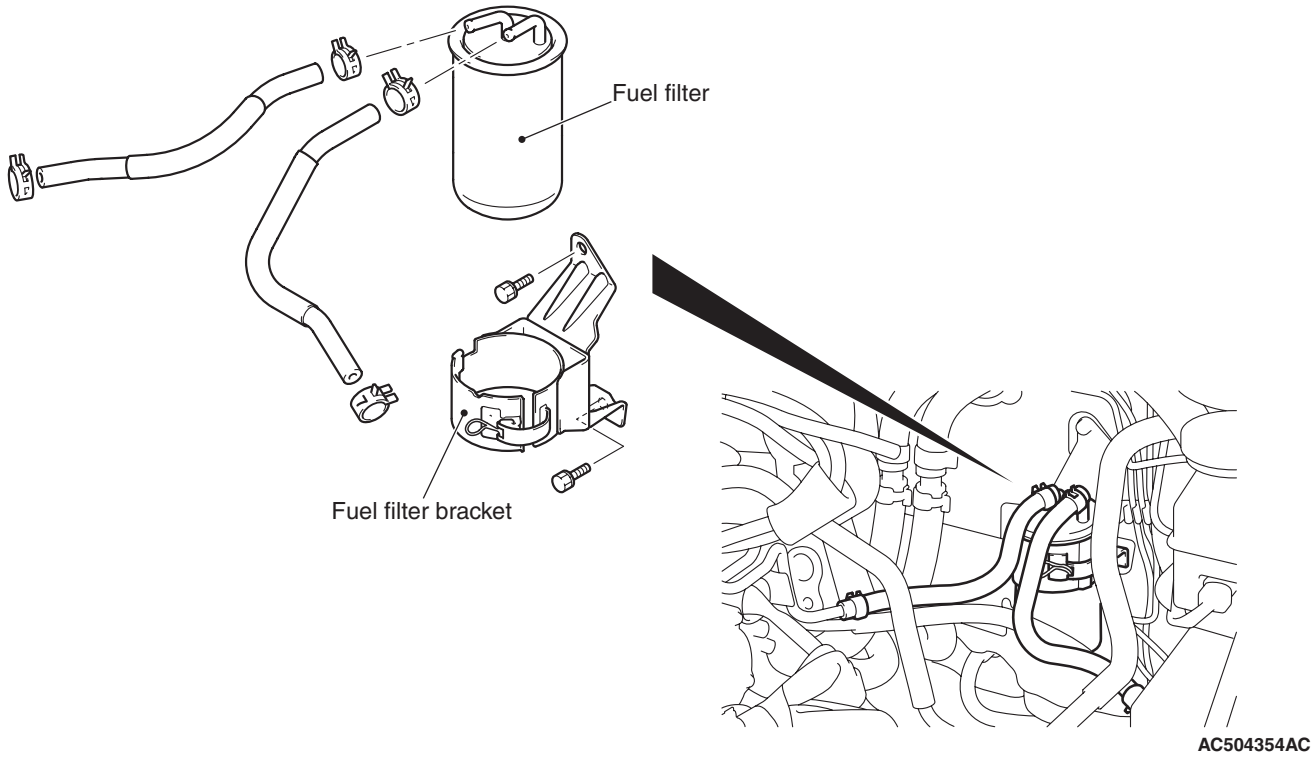
1. **When installing the fuel tank pump and gauge assembly from service hole to fuel tank, install it with suction hose mating mark facing as shown in the illustration not to twist the suction hose.**
2. **When installing the fuel tank pump and gauge assembly from the service hole to the fuel tank, be careful not to damage the gauge of fuel tank pump and gauge assembly and the float. In addition, be careful that the float of fuel gauge does not catch the suction hose in the fuel tank.**
3. **When installing the fuel tank pump and gauge assembly from service hole to fuel tank, make sure that the gauge moving area can move smoothly.**

10. Connect the fuel tank pump and gauge assembly connector, fuel high-pressure hose and fuel tank hose.
11. Install the rear floor fuel gauge maintenance hole cover (LH).

12.Return the floor carpet back to the original state and install the rear scuff plate.

13.Install the rail cover inner, the rail cover outer and second seat assembly.

<BSY>



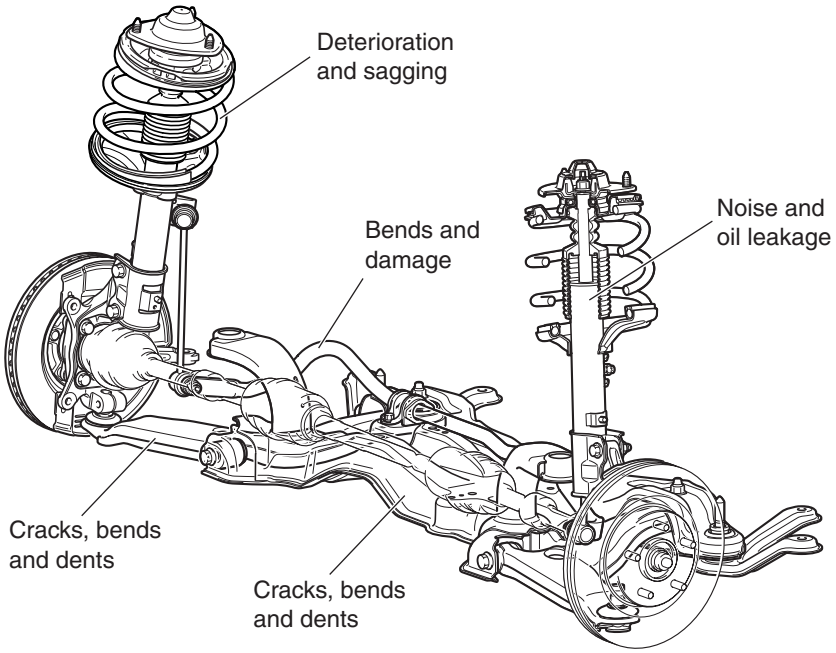
- Unclasp the fuel filter bracket clamp.

OPERATIONS UNDER THE VEHICLE

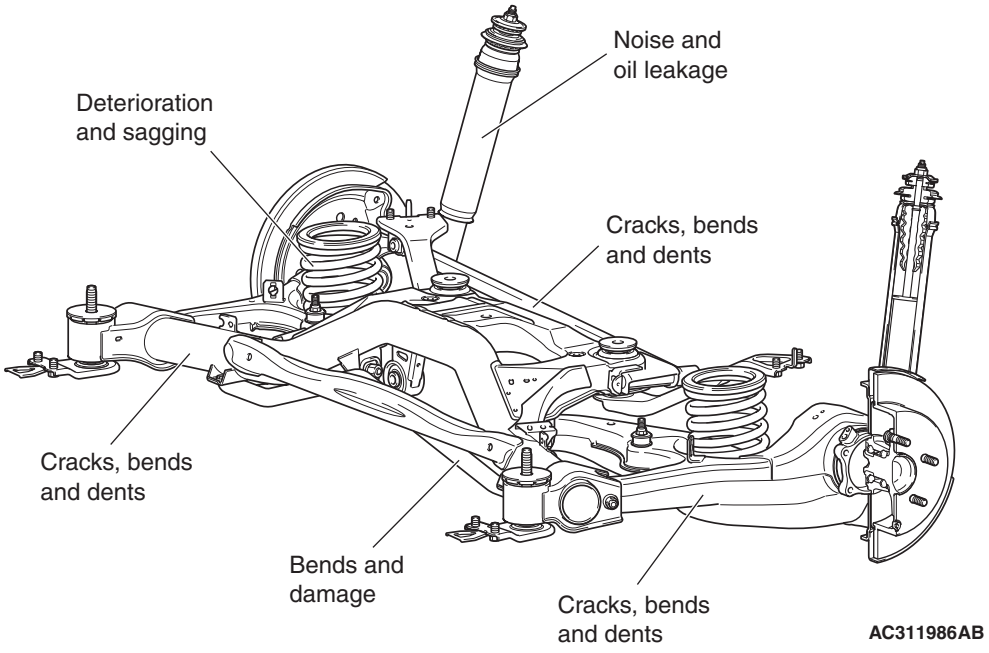
B1. CHECK SUSPENSION SYSTEM FOR DAMAGE AND LOOSENESS

M6020300100159

FRONT SUSPENSION



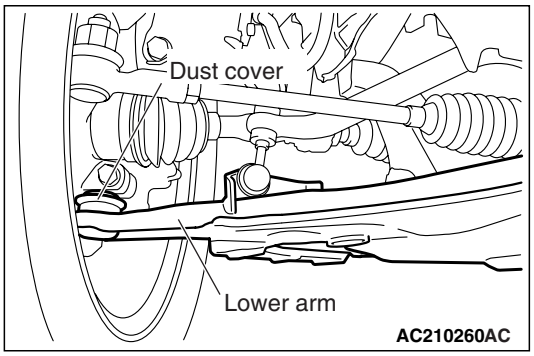
REAR SUSPENSION



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

M6020300200134

LOWER ARM BALL JOINT AXIAL PLAY CHECK



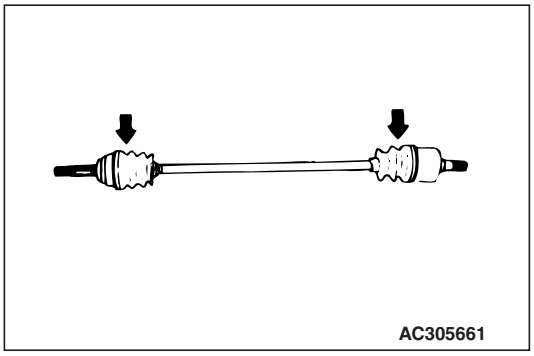
1. Raise the vehicle.
2. Remove the stabilizer bar from the lower arm assembly.
3. Move the lower arm up and down with your hands to check for an excessive play in the axial direction of the ball joint. If there is an excessive play, replace the lower arm assembly.

DUST COVERS FOR DAMAGE

Check dust covers for damage.

B3. CHECK DRIVE SHAFT BOOTS FOR DAMAGE

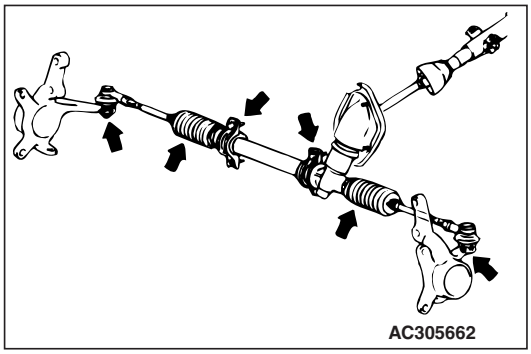
M6020300400116



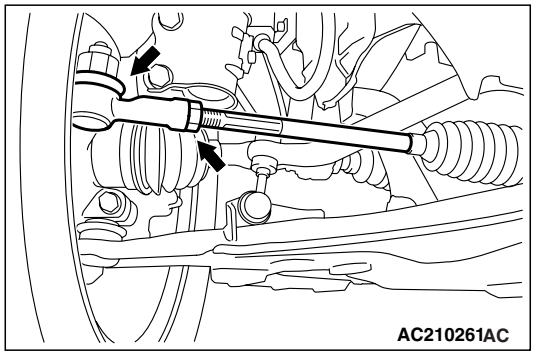
Check the drive shaft boots for damage.

B4. CHECK STEERING LINKAGE FOR DAMAGE AND LOOSE CONNECTIONS (INCLUDING SEALS AND BOOTS)

M6020300500168



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.



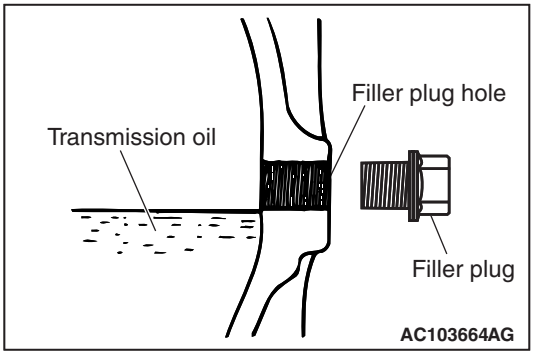
2. Check to be sure that the seal and boot of the ball joint are correctly installed (in the correct position), and that they are not damaged.
3. Check tie-rod end lock nut for looseness. If lock nut is loose, adjust toe-in and then tighten lock nut to the specified torque.

Tightening torque: 52 ±2 N·m

B5. CHECK GEAR OIL LEVEL IN MANUAL TRANSMISSION

M6020300600091

1. Remove the filler plug of the transmission case.

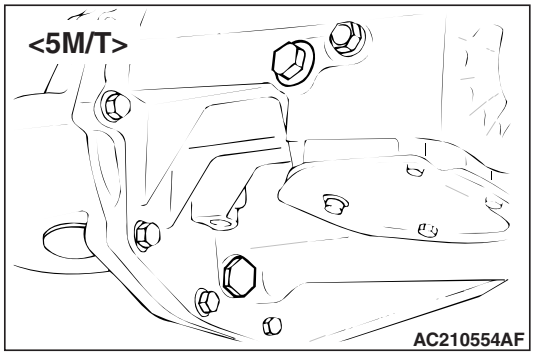


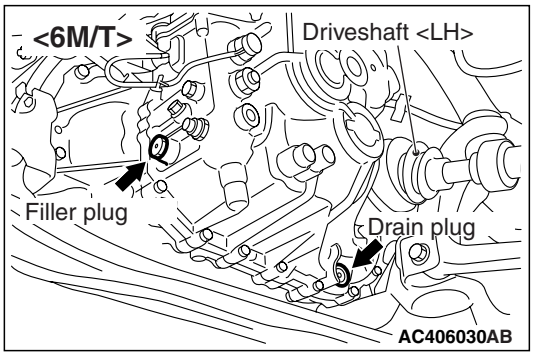
2. Oil level should be at the lower edge of the filler plug hole.
3. Check that the transmission oil is not noticeably dirty, and that it has a suitable viscosity.
4. Tighten the filler plug to the specified torque.

Tightening torque: 32 ± 2 N· m

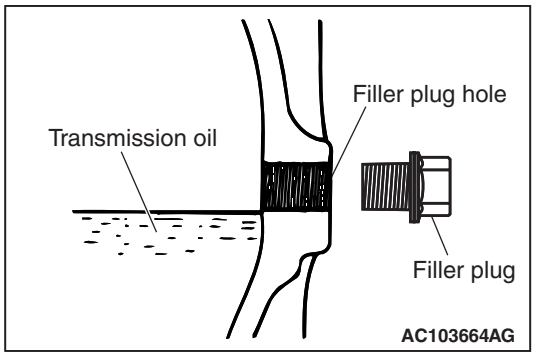
B6. CHANGE GEAR OIL IN MANUAL TRANSMISSION

M6020300800125





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 edge of oil filler plug hole.

Specified transmission oil:
<5M/T> Dia Queen NEW MULTI GEAR OIL API classification GL- 3, SAE 75W – 80 or Gear oil API classification GL- 4, SAE 75W – 85W / 75W 90
<6M/T> Dia Queen NEW MULTI GEAR OIL API classification GL-3, SAE 75W – 80
Quantity: 2.2L

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

Tightening torque: 32 ± 2 N· m

B7. CHECK EXHAUST PIPE CONNECTIONS FOR GAS LEAKAGE, AND CHECK PIPE INSTALLATION

M6020301200159

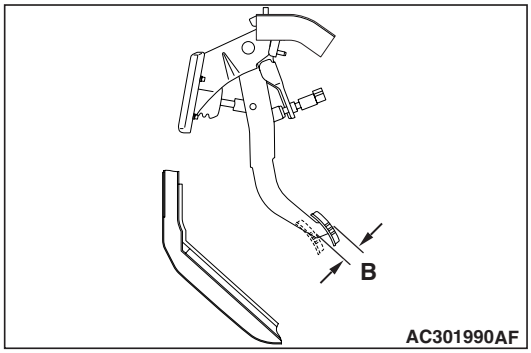
1. Confirm that the exhaust pipe does not interfere with any body components.
2. Check the exhaust pipe for damage by stones, etc.
3. Start the engine and check for gas leaks from the exhaust pipe connections.

OPERATIONS INSIDE THE VEHICLE

C1. CHECK BRAKE PEDAL AND CLUTCH PEDAL FOR FREE PLAY

M6020400100145

Brake pedal free play



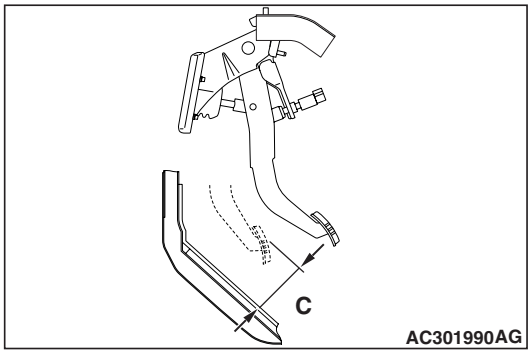
1. Turn the ignition switch to the "LOCK" (OFF) position, depress the brake pedal two or three times. After eliminating the vacuum in the brake booster, press the pedal down by hand, and confirm that the amount of movement before resistance is met (free play) is within the standard value range.

   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.

Clearance between brake pedal and floor board

1. Turn up the carpet, etc. under the brake pedal.



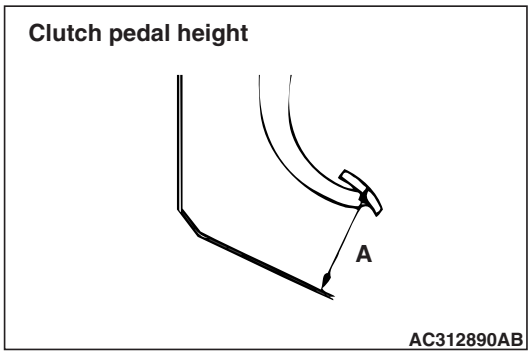
2. Start the engine, depress the brake pedal with approximately 500 N of force, and measure the clearance between the brake pedal and the floor board.

   Standard value (C): 140 mm or more
   [From the surface of floor board to the face of pedal pad]

3. If the clearance is outside the standard value, check for air trapped in the brake line, thickness of the disc brake pad, clearance between the lining and the drum and dragging in the parking brake. And then adjust and replace defective parts as required.
4. Return the carpet etc. to its original position.

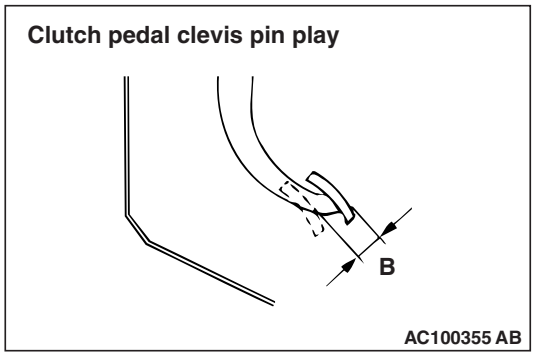
Clutch pedal check and adjustment

1. Turn up the carpet, etc. under the clutch pedal.



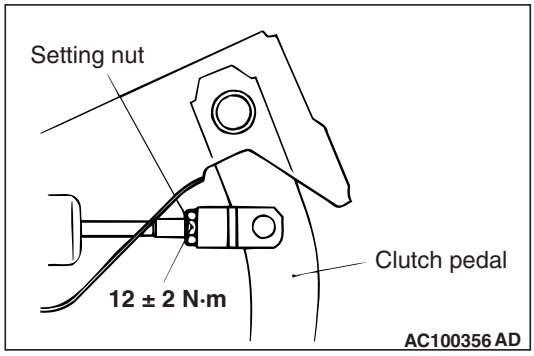
2. Measure the clutch pedal height.

   Standard value (A): 226 – 229 mm <LH drive vehicles>, 254 – 257 mm <RH drive vehicles>



3. Measure the clutch pedal clevis pin play.

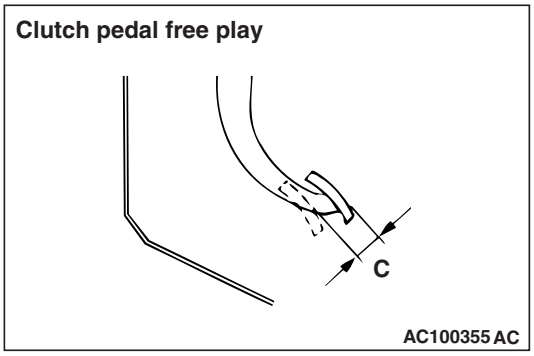
   Standard value (B): 1 – 3 mm

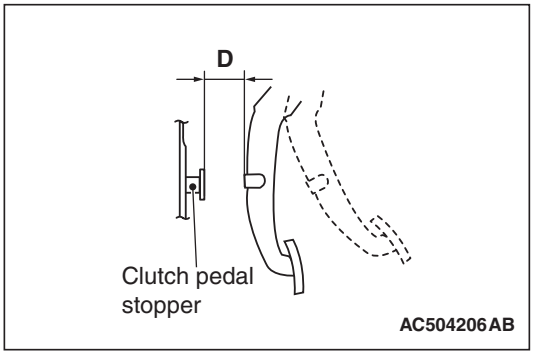


4. If the clutch pedal height and clutch pedal clevis pin play are not within the standard value, loosen the setting nut to adjust the clutch pedal height and clevis pin play to the standard value.

⚠ CAUTION

Do not push in the master cylinder pushrod at this time, otherwise the clutch will not operate properly.





5. After completing the adjustments, confirm that the clutch pedal free play (measured at the face of the pedal pad) and the distance between the clutch pedal and the clutch pedal stopper when the clutch is disengaged are within the standard value ranges.

   Standard value (C): 4 – 13 mm
   Standard value (D):
   24 mm or more <LH drive vehicles>
   16 mm or more <RH drive vehicles>

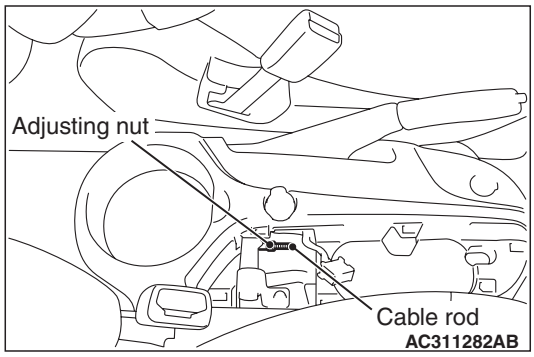
6. If the clutch pedal free play and the distance between the clutch pedal and the clutch pedal stopper when the clutch is disengaged do not agree with the standard values, it is probably the result of either air in the hydraulic system or a faulty master cylinder, release cylinder or clutch. Bleed the air, or disassemble and inspect the master cylinder, release cylinder or clutch.

C2. CHECK PARKING BRAKE LEVER STROKE AND PLAY

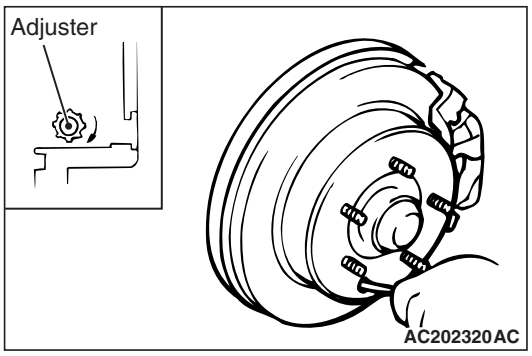
M6020400200197

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

   Standard value: 3 – 5 notches



2. If the parking brake lever stroke is not the standard value, adjust as described below.
   (1) Remove the floor console panel.
   (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.

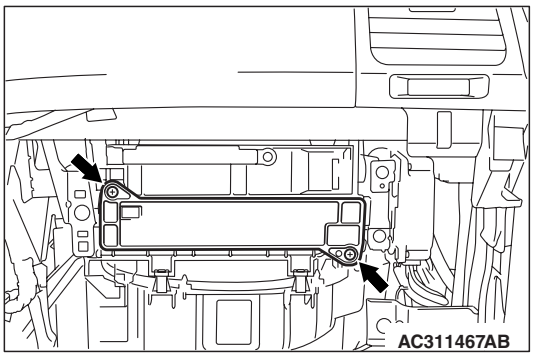
⚠ CAUTION

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 and turn the rear wheels to confirm that the rear brakes are not dragging.

C3. REPLACE AIR PURIFIER FILTER

M6020400300172



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

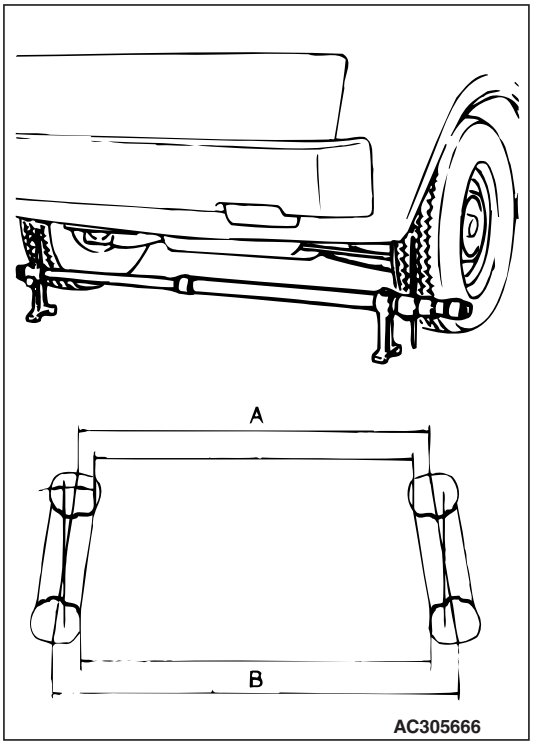
OPERATIONS OUTSIDE THE VEHICLE

D1. CHECK UNEVEN TYRE WEAR

M6020500100197

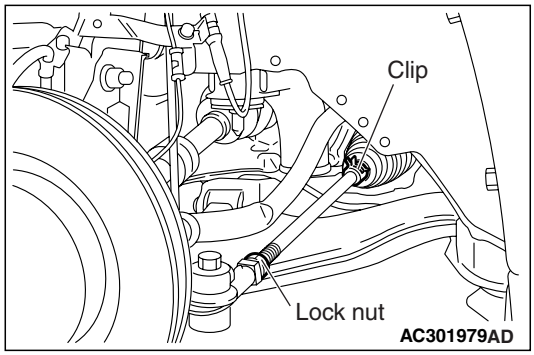
Check the entire periphery of the tyres for uneven wear. If any tyre shows uneven wear, check the toe-in and toe-out, and adjust if necessary.

TOE-IN

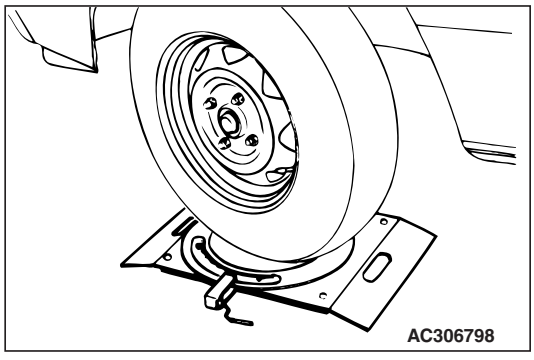


Using a toe-in gauge, measure toe-in.
Toe-in = B - A

Standard value:
At the centre of tyre tread: 0 ±3 mm
Toe angle (per wheel): 0° 00' ±0° 08'



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	
	Vehicles with 16 inch wheel	Vehicles with 17 inch wheel
Inner wheels	39° 30' ±2° 00'	36° 30' ± 2° 00'
Outer wheels (for reference)	32° 30'	30° 50'

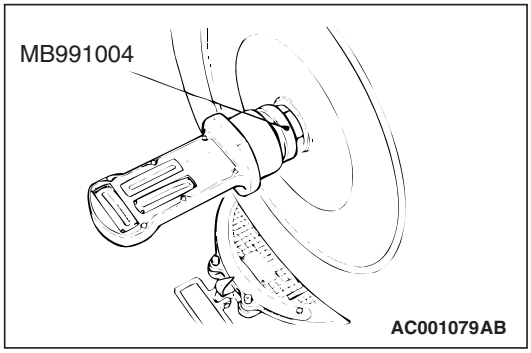
TOE-OUT ANGLE ON TURNS

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°)	21° 40'

CAMBER, CASTER AND KINGPIN INCLINATION



Standard value:

Item	Specifications	
	Normal suspension	High ground clearance suspension
Camber	0° 00' ±0° 30'*	0° 10' ±0° 30'*
Caster	2° 46' ±1° 00'*	2° 41' ±1° 00'*
Kingpin inclination	13° 12' ± 1° 30'	12° 54' ±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.*

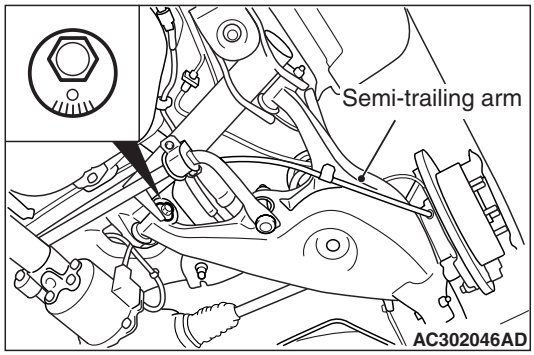
⚠ CAUTION

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

REAR TOE-IN

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

1. Be sure to adjust the camber before making toe adjustment.

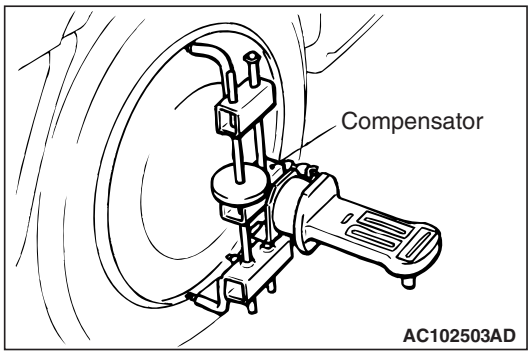


2. Carry out adjustment by turning the toe adjusting bolt (semi-trailing arm mounting bolt which is located on the inner side of the body).

Left wheel: Turning clockwise (+) toe-in
Right wheel: Turning clockwise (–) toe-in

NOTE:
When the toe adjusting bolt is turned by one groove of the scale, the toe will be changed by approximately 1.8 mm (single side toe angle equivalent to 0.16°).

REAR CAMBER



Standard value:

Item	Specification	
	Normal suspension	High ground clearance suspension
Camber	– 0° 45'+45'/–15'*	– 0° 05'±30'*

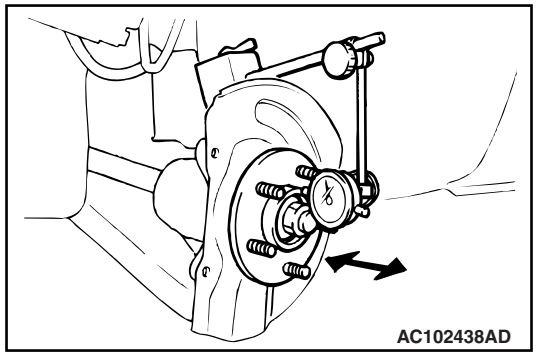
NOTE:

1. **: difference between right and left wheel must be less than 30'.*
2. *Camber is preset at the factory and cannot be adjusted.*

D2. CHECK FRONT WHEEL BEARINGS FOR PLAY

M6020500200116

1. Remove the disc brake caliper and suspend it with a wire.
2. Remove the brake disc from the front hub.



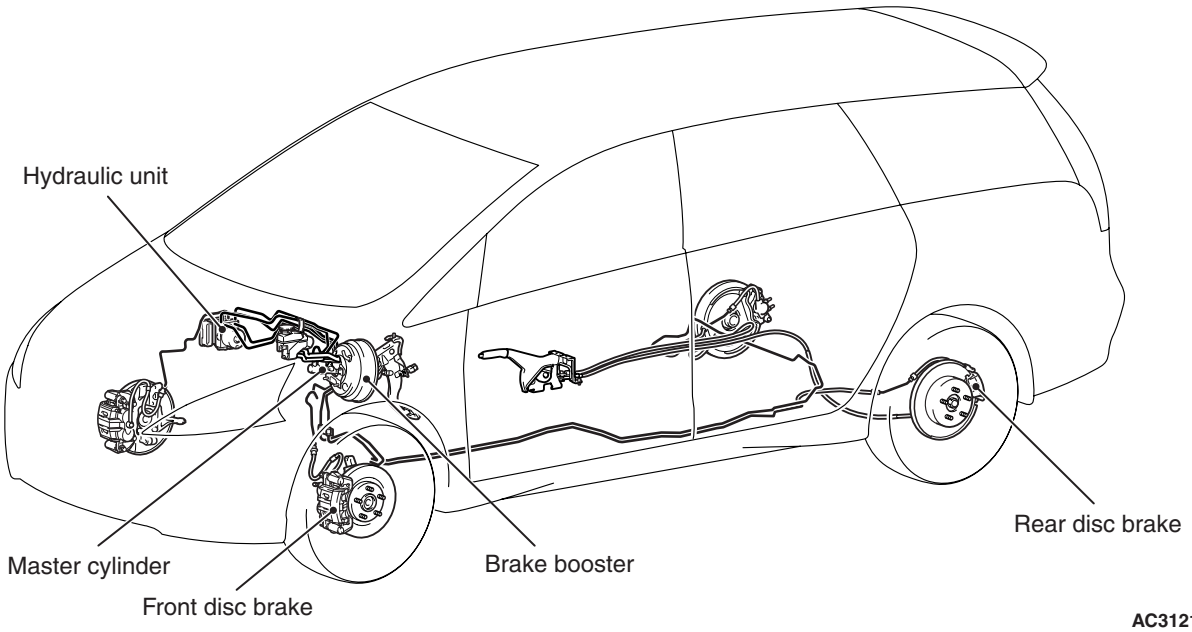
3. Attach a dial gauge as shown in the illustration, and then measure the axial play while moving the hub in the axial direction.

   Limit: 0.05 mm

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

D3. CHECK BRAKE HOSES AND PIPES FOR LEAKAGE

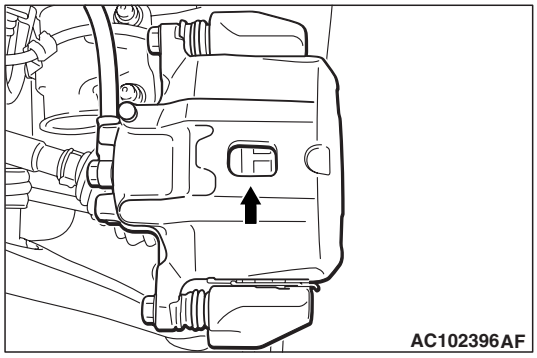
M6020500300180



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

D4. CHECK BRAKE PADS AND DISCS FOR WEAR

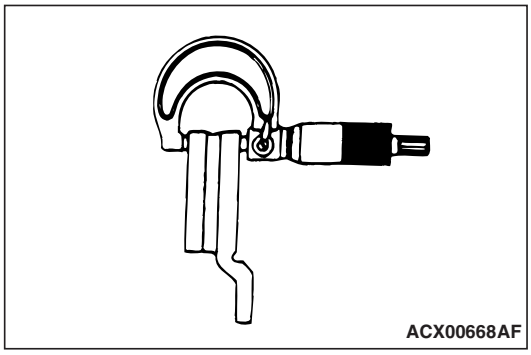
M6020500400187



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.



3. Using a micrometer, measure disc thickness at eight positions, approximately 45° apart and 10 mm in from the outer edge of the disc.

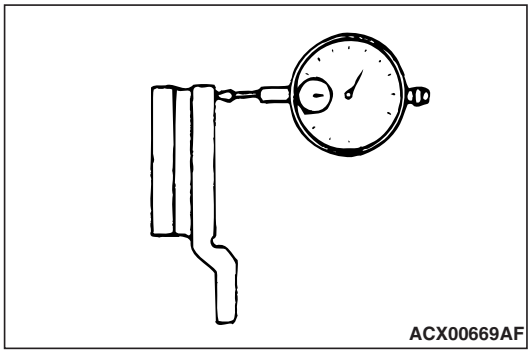
   Standard value:
   <Front> 26.0 mm
   <Rear> 10.0 mm

   Limit:
   <Front> 24.4 mm
   <Rear> 8.4 mm

4. If the disc thickness is less than the limits, replace it with a new one.

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.

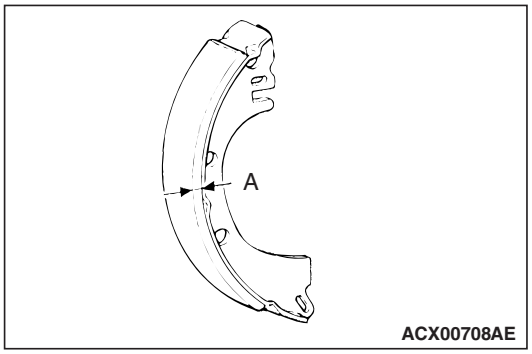
   Limit:<Front> 0.03 mm
   <Rear> 0.04 mm

D5. CHECK BRAKE SHOE LININGS AND DRUMS FOR WEAR

M6020500500139

BRAKE LINING THICKNESS CHECK

1. Remove the brake disc.



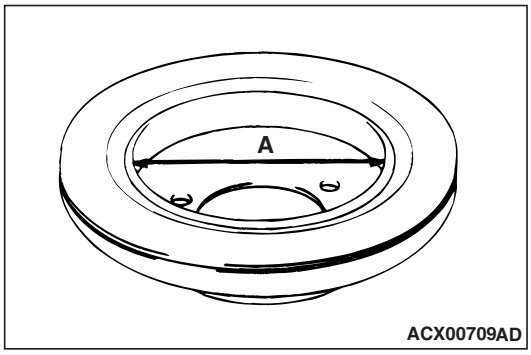
2. Measure the thickness of the brake lining at several places.

   Standard value (A): 2.8 mm
   Limit (A): 0.8 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

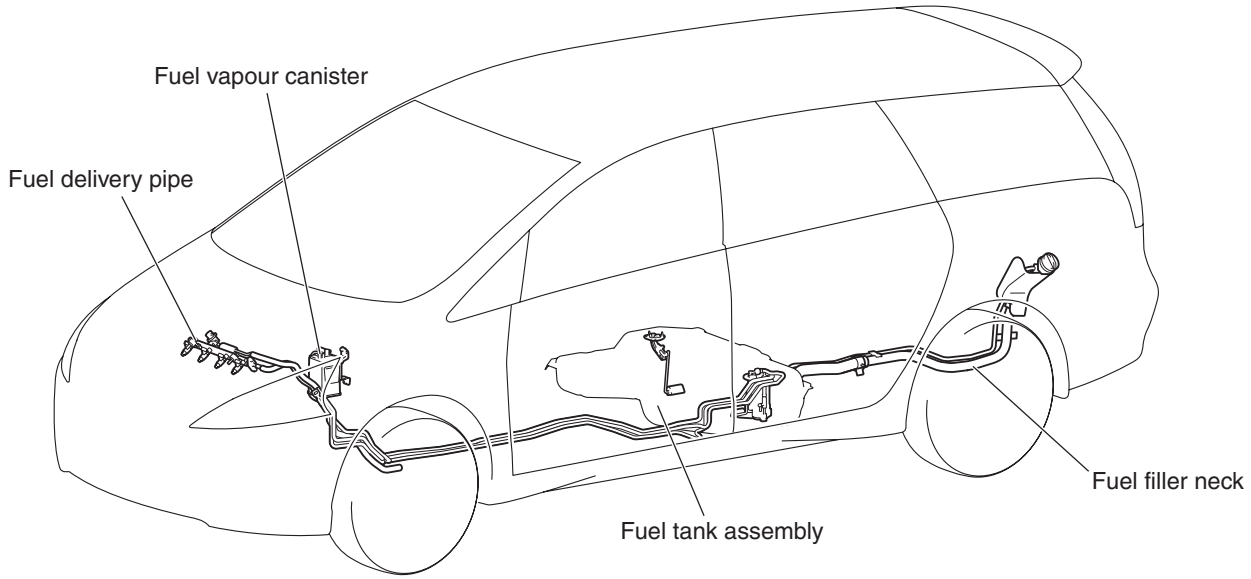
1. Remove the brake disc.



2. Measure the inside diameter of the brake disc in two places or more.
   Standard value (A): 190.0 mm
   Limit (A): 191.0 mm
3. If the inside diameter exceeds the limit, or if it is excessively worn or one side, replace the brake disc.

D6. CHECK FUEL HOSES AND PIPES FOR LEAKAGE OR DETERIORATION

M6020500600181



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

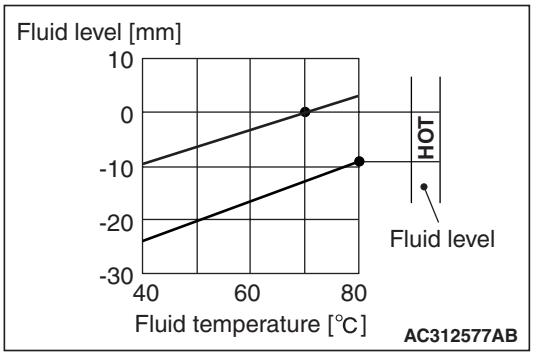
E1. CHECK FLUID LEVEL IN AUTOMATIC TRANSMISSION

M6020600100161

1. Drive the vehicle until the ATF temperature reaches the normal temperature (70 – 80° C).

   NOTE:

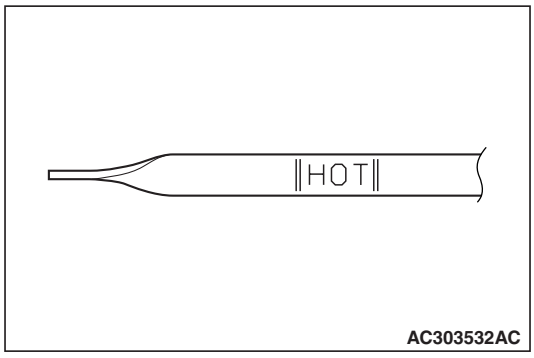
   1. Measure ATF temperature using M.U.T.-III.



   2. Check the oil level referring to the characteristics chart if it takes some time to reach the normal operation temperature of ATF (70– 80°C.)

2. Park the vehicle on a level surface.
3. Move the selector lever to all positions to fully charge the torque converter and the fluid lines with ATF, and then move the selector lever to the N position.
4. After wiping away any dirt from around the oil level gauge, pull out the oil level gauge and check the level of ATF.

   NOTE: If the ATF has a burnt smell, or if it has become very contaminated or dirty, it means that the ATF has become contaminated by minute particles from bushings (metal) or worn parts. In such a case, the transmission needs to be overhauled and the ATF cooler line needs to be flushed out.



5. Check that the ATF level is between the HOT marks on the oil level gauge. If the ATF level is too low, add more ATF until the level reaches between the HOT marks.

   Automatic transmission fluid:
   DIA QUEEN ATF SP III

   NOTE:
   If the ATF level is too low, the oil pump draws air into the system along with the ATF, and air bubbles will thus form in the fluid circuit. This will cause a drop in fluid pressure and cause the shift points to change and the clutches and brakes to slip. If the ATF level is too high, the gear will churn the ATF and cause bubbles to develop, which can then cause the same problems as when the ATF is too low. In either case, the air bubbles can cause overheating and oxidation of the ATF, and also prevent the valves, clutches and brakes from operating normally. In addition, if bubbles develop in the ATF, the ATF can overflow from the transmission vent holes and be mistaken for leaks.

6. Securely re-insert the oil level gauge.

E2. CHANGE AUTOMATIC TRANSMISSION FLUID

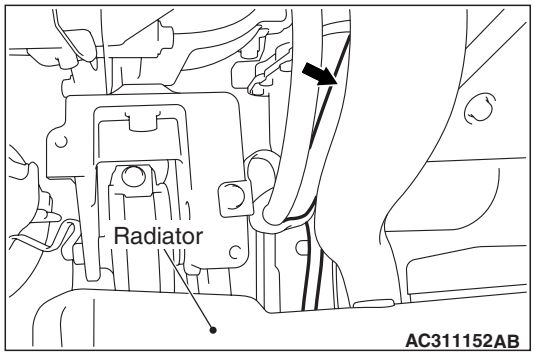
M6020600200209

SPECIFICATIONS

Automatic transmission fluid	Quantity	Remark
DIA QUEEN ATF SP III	7.7 L	F4A4B

CHANGE PROCEDURE

If you have an ATF changer, use the ATF changer to flush the ATF. If you do not have an ATF changer, follow the procedure given below.

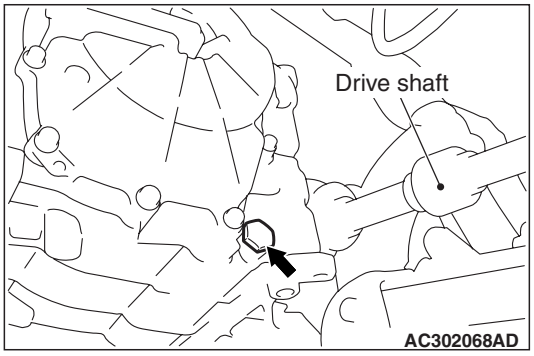


1. Remove the hose shown in the illustration which allows the ATF to flow from the ATF cooler (built into the radiator) to the transmission.
2. Start the engine and discharge the ATF.
   Driving conditions: N range, idling

⚠ CAUTION

The engine should be stopped within one minute of it being started. If the ATF has all been discharged before this, stop the engine at that point.

Discharge amount: Approx. 3.5 L



3. Remove the drain plug at the bottom of the transmission case to drain out the remaining ATF.

   Discharge amount: Approx. 2.0 L

4. Install the drain plug with a gasket in between, and tighten it to the specified torque.

   Tightening torque: 32 ± 2 N· m

5. Pour in new ATF through the oil filler tube.

   Amount to add: Approx. 5.5 L

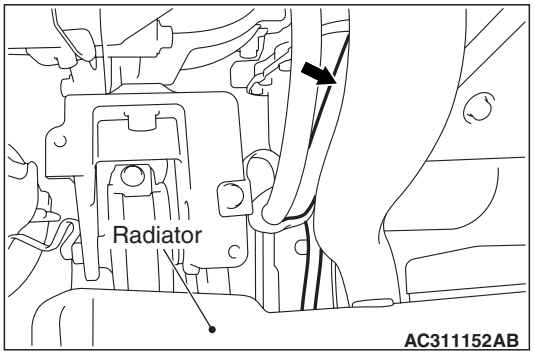
⚠ CAUTION

Stop pouring in the ATF once 5.5 L has been poured in.

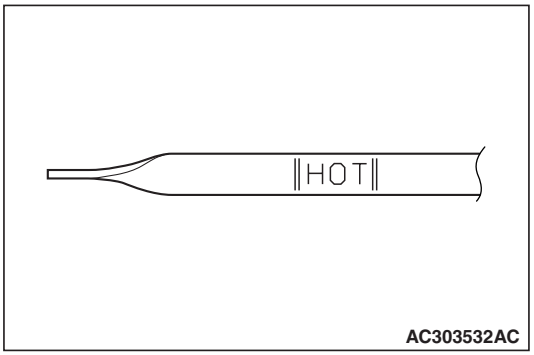
6. Repeat the operation in step 2.
7. Pour in new ATF through the oil filler tube.

   Amount to add: Approx. 3.5 L

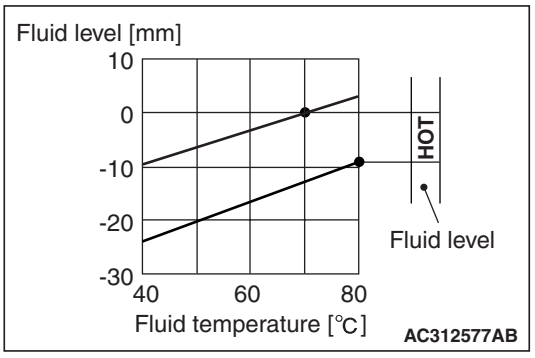
   NOTE: Carry out steps 2 and 7 so that at least 8.0 L has been discharged from the cooler hose. After this, discharge a small quantity of ATF and check for contamination. If the ATF is contaminated, repeat steps 6 and 7.



8. Connect the hose which was disconnected in step 1, and then securely re-insert the oil level gauge.
9. Start the engine, and let it run at idle for 1 – 2 minutes.
10. Move the selector lever to all positions once, and then return it to the N position.
11. Check that the ATF level on the oil level gauge is at the COLD mark. If it is not up to this mark, add more ATF.



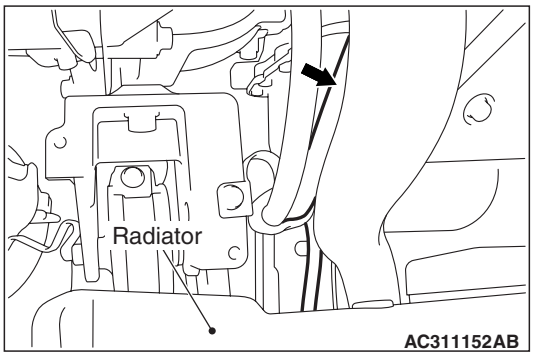
12. Drive the vehicle until the ATF temperature reaches the normal temperature (70 – 80° C), and then re-check the ATF level.
    The ATF level must be between the HOT marks.
    NOTE:
    1. *The COLD mark is for reference only; the HOT marks should be used as the standard for judgment.*
    2. *Measure ATF temperature using M.U.T.- III.*



    3. *Check the oil level referring to the characteristics chart if it takes some time until reaching the normal operation temperature of ATF (70–80 °C.)*

13. When ATF is under the specified level, top up ATF. When ATF is over the specified level, drain the excessive ATF from the drain plug to adjust ATF level to the specified level.
14. Securely insert the oil level gauge into the oil filler tube.

AUTOMATIC TRANSMISSION FLUID COOLER LINE FLUSHING



1. Remove the hose shown in the illustration which allows the ATF to flow from the ATF cooler (built into the radiator) to the transmission.
2. Start the engine and discharge the ATF.
   Driving conditions: N range, idling

⚠ CAUTION

The engine should be stopped within one minute of it being started. If the ATF has all been discharged before this, stop the engine at that point.

Discharge amount: Approx. 3.5 L

3. Pour in new ATF through the oil filler tube.

   Amount to add: Approx. 3.5 L

⚠ CAUTION

Stop pouring in the ATF once 3.5 L has been poured in.

4. Repeat the operation in steps 2 and 3.

   NOTE: Carry out steps 2 and 3 so that at least 8.0 L has been discharged from the cooler hose. After this, discharge a small quantity of ATF and check for contamination. If the ATF is contaminated, repeat steps 2 and 3.
5. Carry out the procedure in "CHANGE PROCEDURE" from step 2 onwards.

E3. CHANGE ENGINE OIL

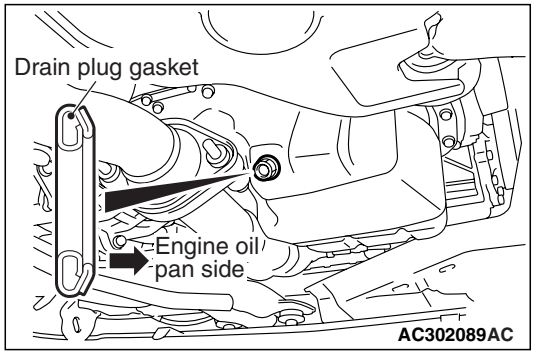
M6020600300240

<4G69>

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 engine oil.

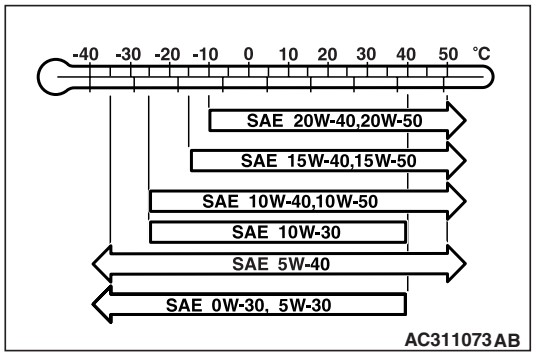
⚠ WARNING

Use care as engine 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



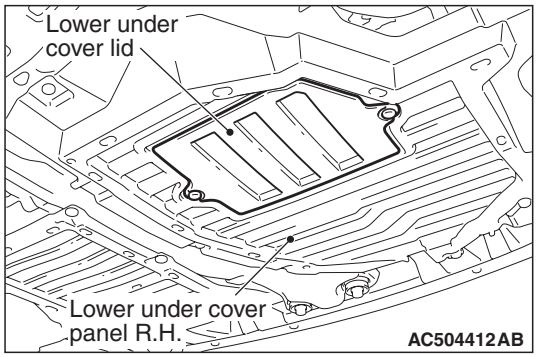
5. Refill with specified quantity of engine oil.

   Specified Engine Oil (ACEA and API classification):ACEA A1, A2 or A3 / API SG or higher
   Total quantity (Includes volume inside oil filter):4.3 L

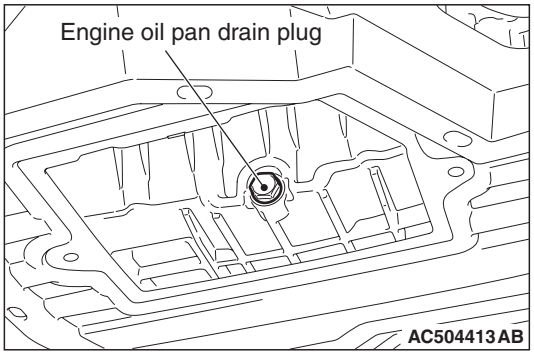
   NOTE: SAE 0W-30, and 5W- 40 engine oils can only be used if they meet ACEA A3 and API SG (or higher) specification.
6. Remove the dipstick from the engine, and check whether or not the engine oil level is within the range between MAX and MIN.
7. Install the engine oil filler cap.
8. Start the engine and run it for a few minutes.
9. Stop the engine and check the oil level.

<BSY>

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 lid of the lower under cover panel R.H.



4. Remove the engine oil pan drain plug to drain engine oil.

⚠ ***WARNING***

Use care as engine oil could be hot.

5. Tighten the engine oil pan drain plug to the specified torque.

   Tightening torque: 30 N· m

6. Install the lid of the lower under cover panel R.H.
7. Refill with specified quantity of engine oil.

   Specified Engine Oil: VW 50300/50600/50601
   Total quantity (Includes volume inside engine oil filter): 5.5 L

8. Install the engine oil filler cap.
9. Check engine oil level.

E4. REPLACE ENGINE OIL FILTER

M6020600400162

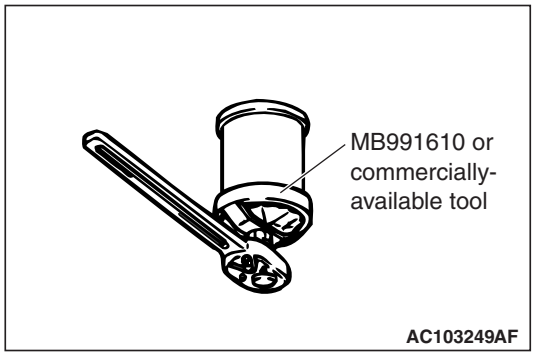
<4G69>

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.

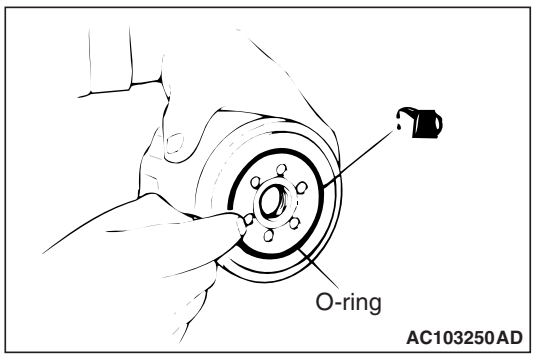
⚠ ***WARNING***

Use care as engine 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.

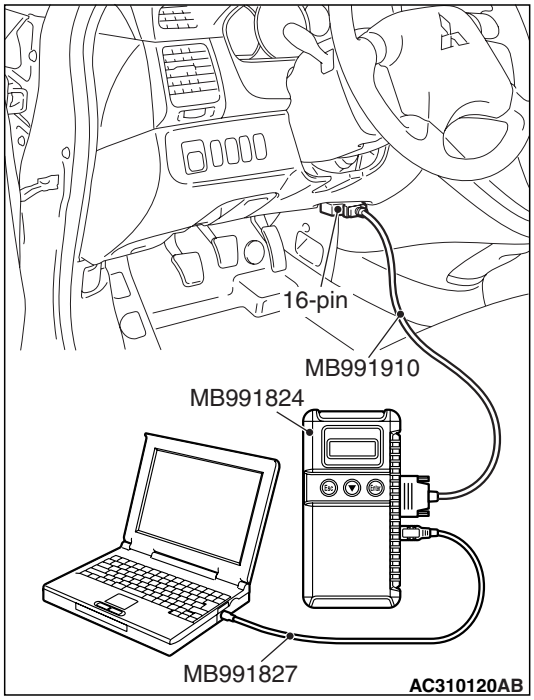
Number	Tool	Tightening torque
MD136466, MD322508	Commercially-available tool	Approx. 3/4 turn (17 ± 3 N· m)
MD356000	Oil filter wrench (MB991610) or equivalent	Approx. 3/4 turn (14 ± 2 N· m)

E5. CHECK ENGINE IDLING SPEED

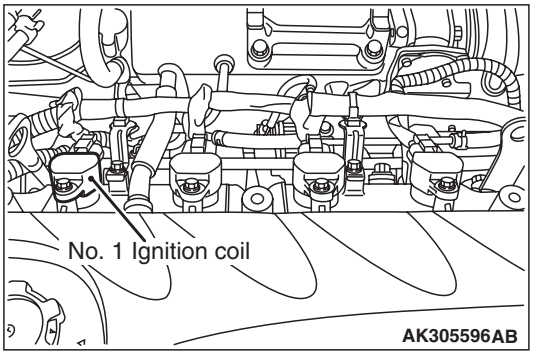
M6020600500211

<4G69>

1. Before inspection, set the vehicle to the pre-inspection condition.
2. Turn the ignition switch to "LOCK" (OFF) position.



3. Connect the M.U.T.-III to the diagnosis connector.



4. Set a timing light to the power supply line (terminal No.1) of the ignition coil No.1.

   NOTE: The power supply line is looped and also longer than the other ones.
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: 700 ±100 r/min

NOTE:

1. The idle speed is controlled automatically by the idle speed control system.

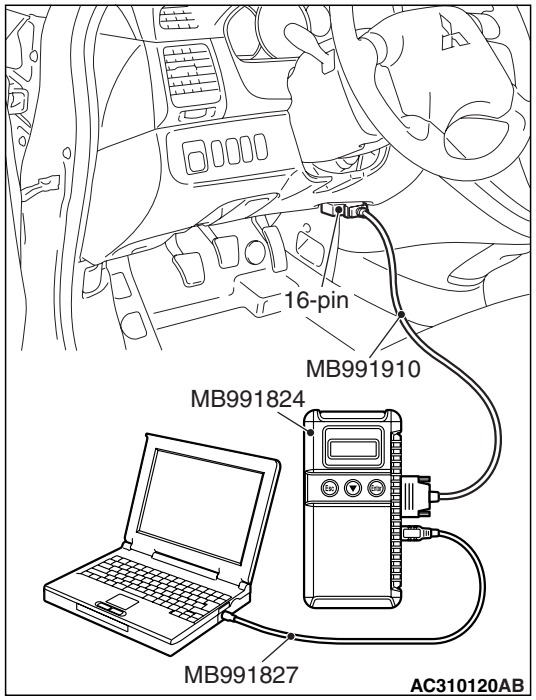
2. When using the M.U.T.- III, select item No.22 and take a reading of the idle speed.

8. If the idle speed is outside the standard value, inspect the MPI system (Refer to WORKSHOP MANUAL GROUP 13).
9. Turn the ignition switch to the "LOCK" (OFF) position and then remove the M.U.T.-III.

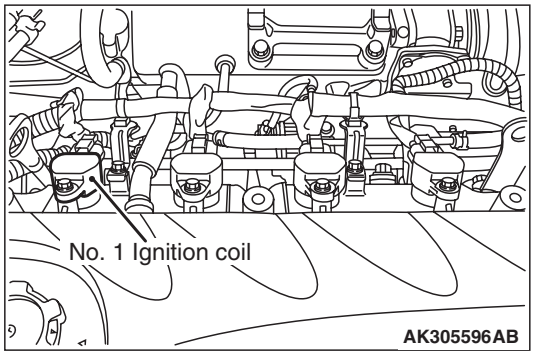
E6. CHECK CO CONCENTRATION

M6020601000112

1. Before inspection, set the vehicle to the pre-inspection condition.
2. Turn the ignition switch to "LOCK" (OFF) position.



3. Connect the M.U.T.-III to the diagnosis connector.



4. Set a timing light to the power supply line (terminal No.1) of the ignition coil No.1.

NOTE: The power supply line is looped and also longer than the other ones.

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

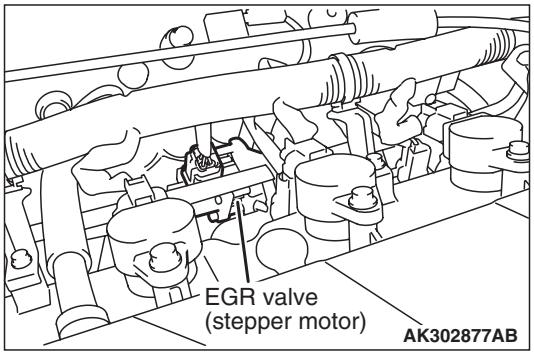
10. If there is a deviation from the standard value, inspect the MPI system (Refer to WORKSHOP MANUAL GROUP 13).
11. Turn the ignition switch to the "LOCK" (OFF) position and then remove the M.U.T.-III.

E7. CHECK EXHAUST GAS RECIRCULATION (EGR) SYSTEM

M6020600800212

EGR VALVE (STEPPER MOTOR) CHECK <4G69>

Checking the Operation Sound

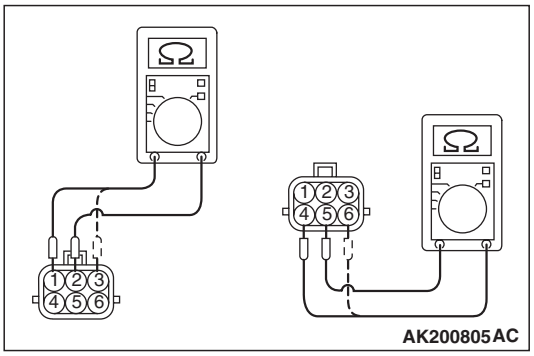


1. Check that the operation sound of the stepper motor can be heard from the EGR valve when the ignition switch is turned ON (without starting the engine).
2. If the operation sound cannot be heard, inspect the drive circuit of the stepper motor.

NOTE: If the circuit is normal, either the stepper motor or the engine-ECU <M/T> or engine-A/T-ECU <A/T> may have failed.

Checking the Coil Resistance

1. Remove the EGR valve.



2. Measure the resistance between terminal No. 2 and either terminal No. 1 or terminal No. 3 of the connector at the EGR valve.

   Standard value: 20 – 24 Ω (at 20° C)

3. Measure the resistance between terminal No. 5 and either terminal No. 6 or terminal No. 4 of the connector at the EGR valve.

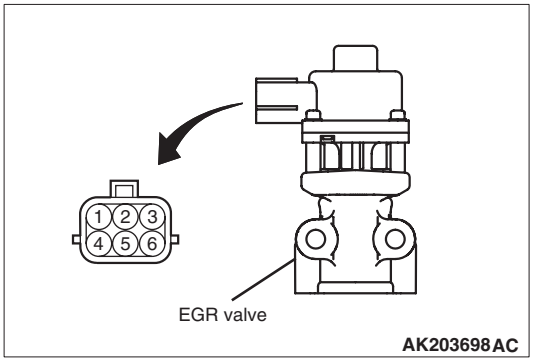
   Standard value: 20 – 24 Ω (at 20° C)

4. Using a new gasket, install the EGR valve by tightening its mounting bolts to the specified torque.

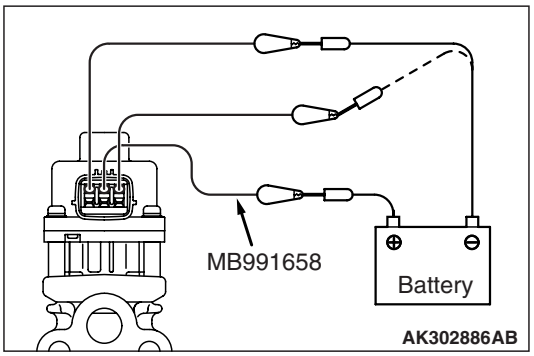
   Tightening Torque: 24 ±4 N· m

Operation Check

1. Remove the EGR valve.



2. Attach a test wiring harness (special tool MB991658) to the connector at the EGR valve.

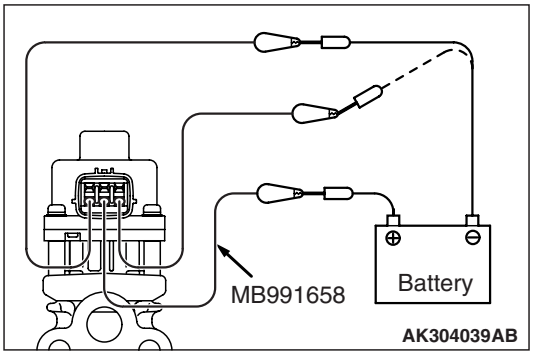


3. Connect the positive (+) terminal of the battery to terminal No. 2.

⚠ CAUTION

Connecting battery voltage to the EGR valve for a long term could damage the coil.

4. Connect terminals No. 1 and No. 3 to the negative (-) terminal of the battery, in order to test whether the stepper motor vibrates (with a slight shudder), indicating that the stepper motor is operating.



5. Connect the positive (+) terminal of the battery to terminal No. 5.

⚠ CAUTION

Connecting battery voltage to the EGR valve for a long term could damage the coil.

6. Connect terminals No. 4 and No. 6 to the negative (–) terminal of the battery, in order to test whether the stepper motor vibrates (with a slight shudder), indicating that the stepper motor is operating.
7. If a vibration can be felt during the test, the stepper motor is normal.
8. Using a new gasket, install the EGR valve by tightening its mounting bolts to the specified torque.

Tightening torque: 24 ±3 N· m

Cleaning the EGR Valve

1. Remove the EGR valve and check that the EGR valve is not stuck or clogged with carbon deposits. Use a wire brush to clean the valve if necessary.

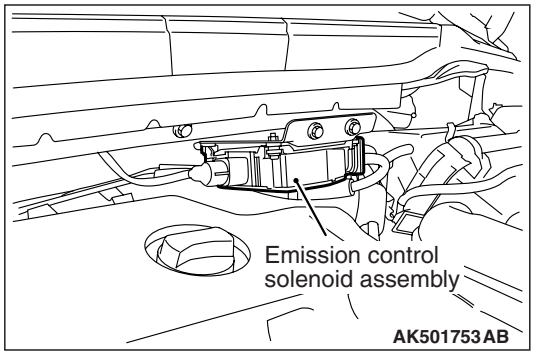
⚠ CAUTION

Do not use a solvent or detergent, which could enter the motor and cause it to malfunction.

2. Using a new gasket, install the EGR valve by tightening its mounting bolts to the specified torque.

Tightening torque: 24 ± 3 N· m

EGR CONTROL SOLENOID VALVE CHECK <BSY>

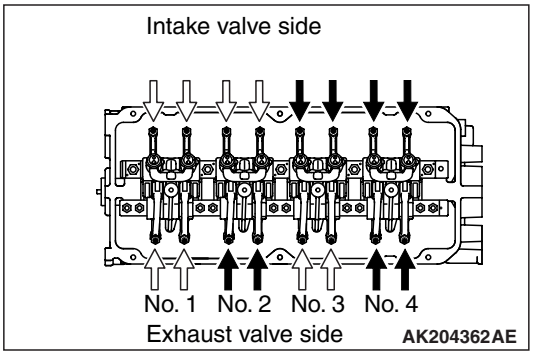


1. Visually check the emission control solenoid assembly and vacuum hose for damage.

E8. CHECK VALVE CLEARANCE (EXCEPT VEHICLES WITH AUTO-LASH ADJUSTER)

M6020600900134

1. Before inspection, set the vehicle to the pre-inspection condition.
2. Turn the ignition switch to the "LOCK" (OFF) position.
3. Remove all of the ignition coils.
4. Remove the rocker cover.
5. Turn the crankshaft clockwise until the notch on the pulley is lined up with the "T" mark on the timing indicator.
6. Move the rocker arms on the No.1 and No.4 cylinders up and down by hand to determine which cylinder has its piston at the top dead centre on the compression stroke. If both intake and exhaust valve rocker arms have a valve lash, the piston in the cylinder corresponding to these rocker arms is at the top dead centre on the compression stroke.



7. Valve clearance inspection and adjustment can be performed on rocker arms indicated by white arrow mark when the No.1 cylinder piston is at the top dead centre on the compression stroke, and on rocker arms indicated by black arrow mark when the No.4 cylinder piston is at the top dead centre on the compression stroke.
8. Measure the valve clearance. If the valve clearance is not as specified, loosen the rocker arm lock nut and adjust the clearance using a thickness gauge while turning the adjusting screw.

   Standard value (hot engine):
   Intake valve: 0.20 mm
   Exhaust valve: 0.30 mm
9. While holding the adjusting screw with a screwdriver to prevent it from turning, tighten the lock nut to the specified torque.

   Tightening torque: 9 ±1 N· m
10. Turn the crankshaft through 360° to line up the notch on the crankshaft pulley with the "T" mark on the timing indicator.
11. Repeat steps (8) and (9) on other valves for clearance adjustment.
12. Install the rocker cover.
13. Install the ignition coils.

OTHERS

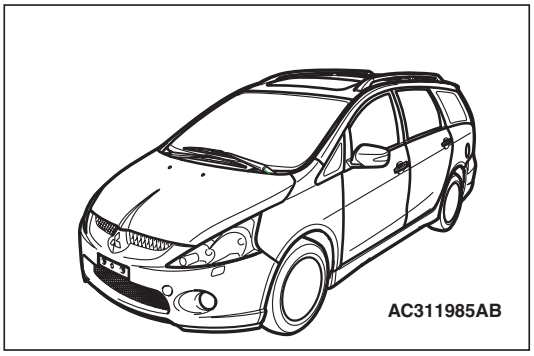
F1. CHECK BODY CONDITION FOR DAMAGE

M6020700100102

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

F2. ROAD TEST

M6020700200165



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.

NOTES