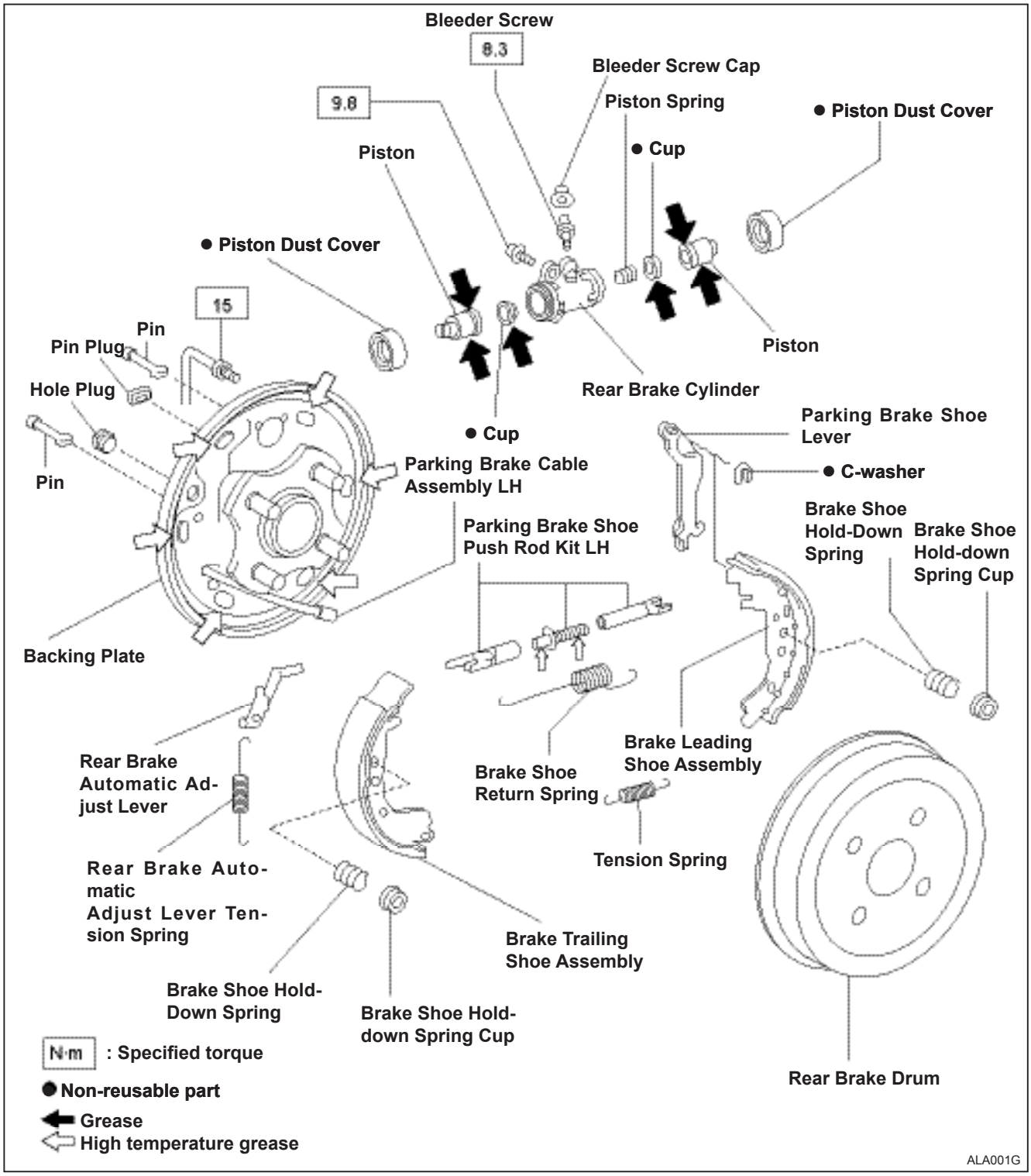
SERVICE MANUAL

GREAT WALL
COOLBEAR
2009 thru 2013

- Drive system
- Suspension
- Brakes
- Steering

MOTO RIST

Example:


Bleeder Screw
8.3
Bleeder Screw Cap
9.8
Piston Spring
● Piston Dust Cover
Piston
● Cup
● Piston Dust Cover
15
Pin
Pin Plug
Hole Plug
Pin
Piston
Rear Brake Cylinder
● Cup
Parking Brake Shoe Lever
● C-washer
Parking Brake Cable Assembly LH
Parking Brake Shoe Push Rod Kit LH
Brake Shoe Hold-Down Spring
Brake Shoe Hold-down Spring Cup
Backing Plate
Brake Leading Shoe Assembly
Rear Brake Automatic Adjust Lever
Brake Shoe Return Spring
Tension Spring
Rear Brake Automatic Adjust Lever Tension Spring
Brake Trailing Shoe Assembly
Brake Shoe Hold-Down Spring
Brake Shoe Hold-down Spring Cup
Rear Brake Drum
N·m : Specified torque
● Non-reusable part
Grease
High temperature grease
ALA001G

Symptom Simulation

Hint:

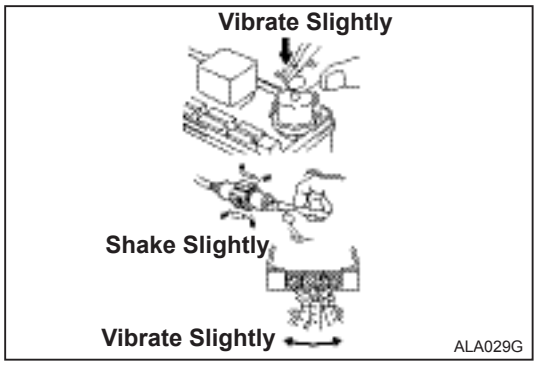
The most difficult case in troubleshooting is that no problem symptoms occur. In such cases, a thorough customer problem analysis must be carried out. A simulation of the same or similar conditions and environment in which the problem occurred in the customer's vehicle should be carried out. No matter how much skill or experience a technician has, troubleshooting without confirming the problem symptoms will lead to important repairs being overlooked and lead to mistakes or delays.

Example:

With a problem that only occurs when the engine is cold or occurs as result of vibration caused by the road during driving, the problem can never be determined as long as the symptoms are being checked on a stationary vehicle or a vehicle with a warmed-up engine. Vibration, heat, or water penetration (moisture) is difficult to reproduce. The symptom simulation tests below are effected substitutes for the conditions and can be applied on a stationary vehicle.

Important points in the symptom simulation test:

In the symptom simulation test, the problem symptoms as well as the problem area or parts must be confirmed. First, narrow down the possible problem circuits according to the symptoms. Then, connect the tester and carry out the symptom simulation test, judging whether the circuit being tested is defective or normal. Also, confirm the problem symptoms at the same time. Refer to the problem symptoms table for each system to narrow down the possible causes.



1. Vibration method: When vibration seems to be the major cause.

(a) Part and sensor

(1) Apply a slight vibration with a finger to the part of the sensor considered to be the cause of the problem and check whether or not the malfunction occurs.

HINT:

Applying a strong vibration to relays may result in open relays.

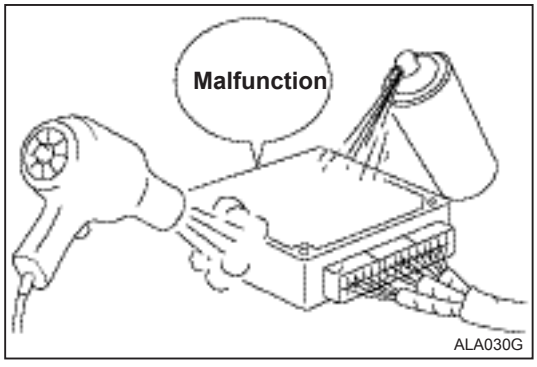
(b) Connectors

(1) Slightly shake the connector vertically and horizontally.

(c) Wire harness

(1) Slightly shake the wire harness vertically and horizontally.

The connector joint and fulcrum of the vibration are the major areas that should be checked thoroughly.



2. Heat method: If the problem seems to occur when the area in question is heated.

(a) Heat the component that is the possible cause of the malfunction with a hair dryer or similar device. Check whether or not the malfunction occurs.

Note:

- Do not heat to more than 60°C (Exceeding this temperature may damage components).
- Do not apply heat directly to the parts in the ECU.

Horn System

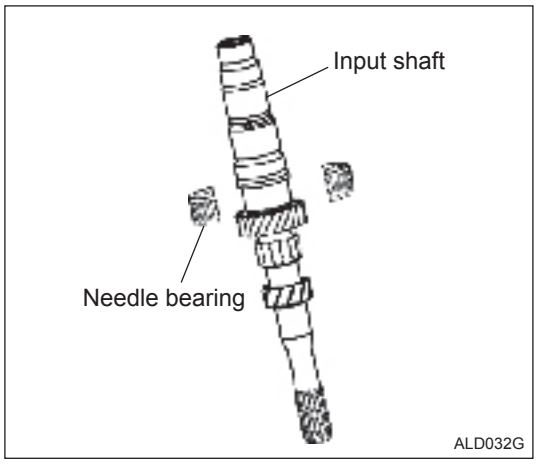
Torque Specifications

Part tightened	N·m
Low tone horn assembly	
Low tone horn assembly × Body	19.5
High tone horn assembly	
High tone horn assembly × Body	19.5

Engine Hood/Door

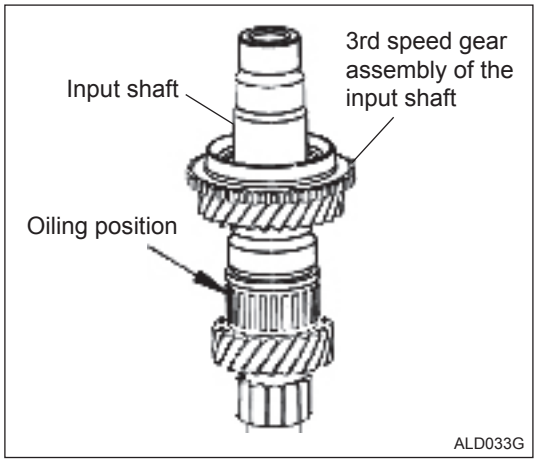
Torque Specifications

Part tightened	N·m
Engine hood	
Engine hood × Engine hinge	23
Engine hood × Engine hood lock	7.0
Front door	
Door retainer × Body	30
Door retainer × Door panel	5.5
Rear lower frame sub-assembly × Door panel	6.2
Door glass × Front door regulator sub-assembly	8.0
Door hinge × Body	23
Door hinge × Door panel	23
Door lock × Door panel	5.0
Door lock striker × Body	23
Door outside handle × Door panel	5.5
Outside rear view mirror × Door panel	8.0
Power glass regulator motor × Glass regulator	5.4
Glass regulator × Door panel	8.0
Rear door	
Door retainer × Body	30
Door retainer × Door panel	5.5
Door window division bar sub-assembly × Door panel	5.0

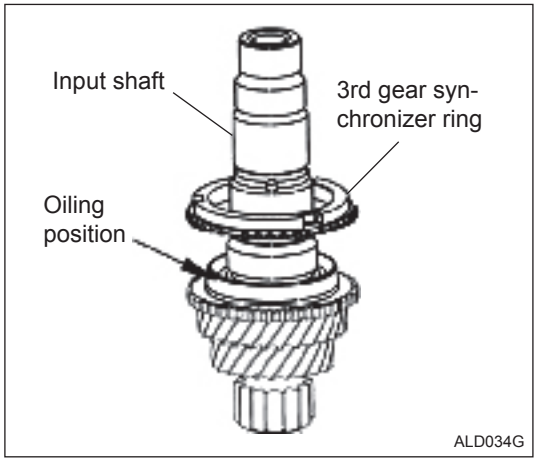


Input Shaft Subassembly Installation

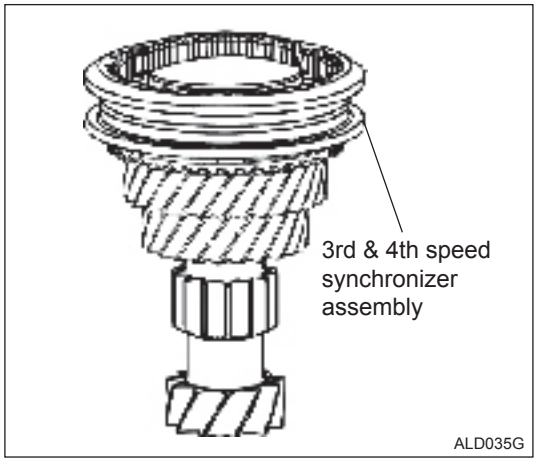
1. Needle bearing



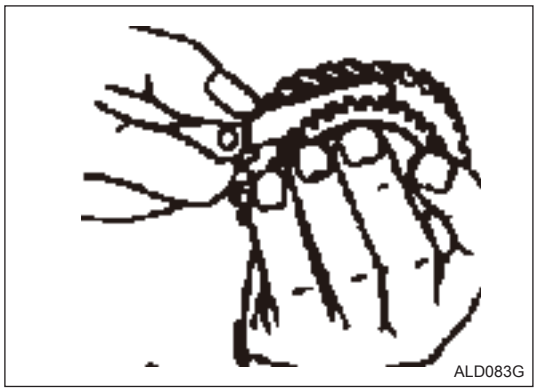
2. Mount the 3rd Speed Gear Assembly of the Input Shaft
Caution: Coat oil on the conical surface of the 3rd speed gear and needle bearing before installing.



3. Mount the 3rd gear synchronizer ring gears
Caution:
1) Apply oil on the conical surface of the 3rd speed gear before assembly.
2) The 3rd speed synchronizer ring gear is marked with "7W3." Do not make a mistake at the time of assembly.



4. Mount the 3rd/4th gear synchronizer assembly by pressing.
Caution:
1) At the time of assembly, align the groove of the synchronizer ring gears with the synchronizer slider;
2) Keep the big bevel face of the 3rd-4th speed synchronizer gear sleeve facing up.



Axial play (δ) between the synchronizer ring and the gear

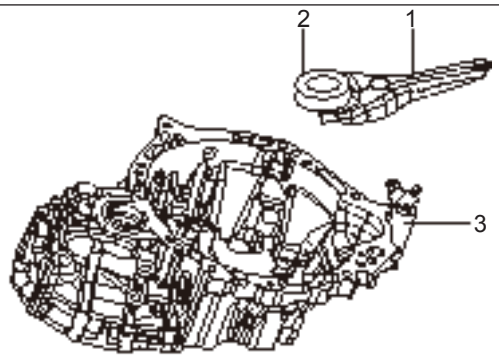
Shift position	Ⅰ(δ1)	Ⅱ(δ2)	Ⅲ(δ3)	Ⅳ(δ4)	Ⅴ(δ5)
Standard clearance (mm)	0.8-1.6	0.8-1.6	0.8-1.6	0.8-1.6	0.8-1.6

Axial play (δ) between each gear

Shift position	Ⅰ(δ1)	Ⅱ(δ2)	Ⅲ(δ3)	Ⅳ(δ4)	Ⅴ(δ5)
Axial play (mm)	0.1-0.3	0.205-0.455	0.125-0.275	0.175-0.425	0.175-0.445

Tightening torque table

Parts Used	Bolt code	Quantity	Tightening torque N·m	Specification
Clutch housing × Cable bracket	1706124-001	3	11.3±3.4	M8×1.25
Clutch housing × Release fork support nail	1601013-001	1	36.8±7.4	M10×1.25
Clutch housing × Guide plate	1701027-001	1	11.3±3.4	M8×1.25
Clutch housing × Output shaft's roller bearing plate	Q1420812	1	11.3±3.4	M8×1.25
Transmission case × Lock plug	1702583-001	2	24.5±3.4	M12×1.25
Shift fork shaft × Shift fork	1702115-001	4	15.7±3.1	M6×0.75
Clutch housing × Lock plug	1702583-001	1	24.5±3.4	M12×1.25
Clutch housing × Reverse gear arm bracket subassembly	1702435-001	2	17.2±3.4	M8×1.25
Transmission case × Neutral position locating seat	1702550-001	1	29.4±5.9	M18×1.5
Transmission case × Reverse gear lock plug	1702574-001	1	12.7±3.4	M10×1.25
Transmission case × Input (output) shaft guide plate	1701021-001	2	17.2±3.4	M8×1.25
Transmission case × Reverse gear locating seat subassembly	1702560-001	1	39.2±11.7	M14×1.5
Transmission case × Back-up lamp switch	1701014-001	1	40.2±12	M18×1.5
Transmission case × Oil filling/drain plug	1701013-001	2	39.2±11.7	M18×1.5
Transmission case × Clutch housing	1701022-001	13	29.4±5.9	M8×1.25
Transmission case × Clutch housing	Q1840845	3	29.4±5.9	M8×1.25
Transmission case × Rear housing	Q1420820	9	18.1±3.4	M8×1.25
Transmission case × Gear shifting arm bracket	Q1841025TF2	2	24.5±3.4	M10×1.25
Transmission case × Manipulation lid subassembly	Q1421025-1.25	2	19.6±3.4	M10×1.25
Transmission case × Manipulation lid subassembly	Q1421030-1.25	2	19.6±3.4	M10×1.25
Transmission case × Bearing plate	1701030-001	5	27.4±5.9	M8×1.25
Transmission case × Reverse gear idler shaft	1701493-001	1	29.4±8.8	M8×1.25
Output shaft × Output shaft lock nut	1701253-001	1	118 ±7.4	M18×1.5
Gear shifting arm bracket × Gear shifting arm subassembly	1703113-001	1	11.8±2.4	M8×1.25
Differential case × Differential gear ring	2303110-001	8	77.4±7.4	M11×1
Clutch housing × Release cylinder assembly	1609021-001	2	11.8±2.4	M8×1.25

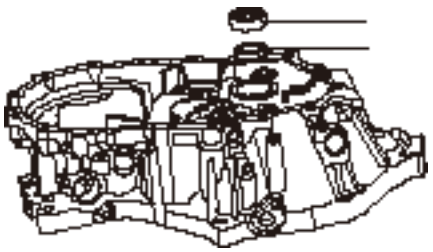


1. Release fork subassembly
2. Release bearing subassembly
3. Clutch slave cylinder subassembly

ALD138G

Clutch housing assembly removal

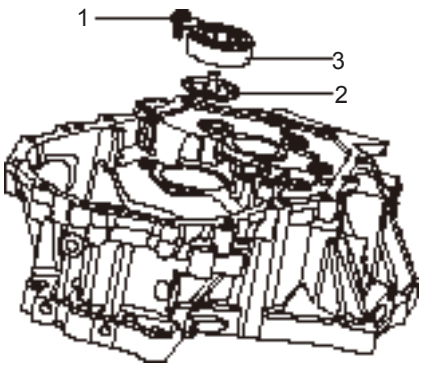
1. Remove the clutch slave cylinder subassembly, release bearing assembly and release fork subassembly.



1. Cylindrical roller bearing of input shaft
2. Input shaft oil seal

ALD139G

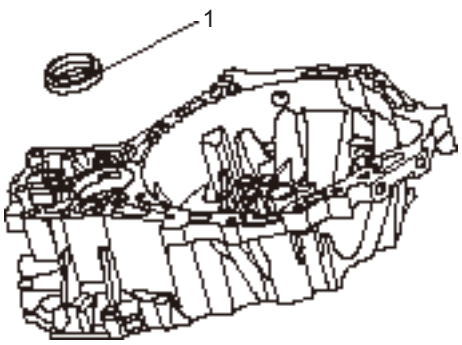
2. Use the SST to remove the cylindrical roller bearing of the input shaft and input shaft oil seal.
Caution: Replace the new bearing and oil seal.



1. Bearing plate, plate bolt and flat washer subassembly
2. Cylindrical roller bearing of output shaft
3. Output shaft guide nozzle

ALD140G

3. Use the SST to remove the bearing plate, plate bolt and flat washer subassembly, cylindrical roller bearing of output shaft, and remove the guide nozzle of the output shaft.



1. Front oil seal of differential

ALD141G

4. Use the SST to remove the front oil seal of the differential
Caution: Replace with the new oil seal.

Driving Mode

Status under special condition

The context below will explain the status under special condition for vehicles with stepless transmission.

1. Parking lock claw 2. Driven conical wheel

1. Parking and neutral gear funtion feature

The engine can only be started when the shift lever is in parking or neutral position regardless of the transmission type. The mechanical lock in the parking position will prevent the vehicle from moving. Engage the parking gear when the vehicle is stationary, as to prevent damaging to the transmission. If the parking gear is engaged carelessly when the vehicle is driving in high speed, the parking device will not work untill the speed is decelerated to 5 km/h.

TCU will control the starter lock relay when the vehicle starts. This relay can start the engine. The vehicle gear is controlled by internal driving mode sensor which is connected to shift lever directly.

It is necessary to depress the brake pedal when move the shift lever from parking (p) or neutral (N) position to driving (D) or reverse (R) position. If the brake pedal is not depressed, the shift lever will be locked in the starting position.

2. Functions of D and R gear

• Routine operation

The operation of the transmission is totally different from that of the traditional automatic transmission when driving the vehicle, so you should adapt yourself to it. For example: If you step on the accelerator pedal too hard, the engine speed will increase obviously, while the vehicle speed will not change much. This function is normal for stepless transmission; however, it is possible that a driver erroneously thinks there is a transmission failure if he does not understand this transmission. There also might be other circumstances similar to the conventional automatic transmission.

Adaptive update

Either for drive or reverse, the corresponding clutches are to be re-calibrated to achieve best results in the period of its use. In the following text self-adaptive update will be discussed.

• Crawling

From the performance of the automatic transmission, it can be known that when the shift lever is in Drive (D) or Reverse (R), if the driver releases the brake pedal, the vehicle will begin to crawl (level road). If the road gradient does not exceed 8°, the vehicle can also crawl; if the road gradient is greater than 8°, the vehicle will back up slightly, as in the case with the vehicle equipped with the hydraulic torque converting transmission, the vehicle will not back up if the gradient is not heavy. Whether the road gradient is heavy or not, the maximum vehicle speed will be less than a limit (e.g. 8kph) when the vehicle crawls. Especially when the vehicle goes down a slope, the control system will make the clutch change from separation to “joint” mode, and in this way the engine can be used to brake during sliding.

• Idle stop (drive status only)

VT2 transmission can realize idle stop.Idle stop can occur when both the vehicle (battery status, air conditioner on/off) and the transmission side (without prejudice to the durability of the transmission) meet certain conditions. If all conditions are met, the internal combustion engine is turned off under the stationary state. Only if the brake pedal is released, the engine is restarted, and the transmission works rapidly, can the vehicle move back and forth.

Idle stop function applies in particular to a hybrid drive unit, but for a standard power drive device without any special starter or starting motor, transmission idle stop is of no use.

• Acceleration and Deceleration

In a speed-up process, acceleration is mainly provided based on a driver's requirement and driving conditions, so at this time, the trends of engine speed changes correspond to the initial speed and thus the best driving comfort is achieved.

Remove the drain plug

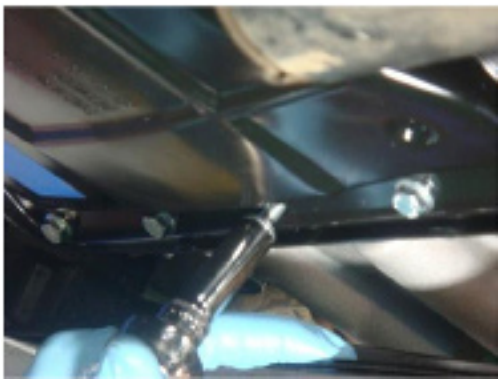
9. Replace the oil filter

Malfunction: replace the oil filter every 60,000 km, it depends specific conditions.

Maintenance method:

(a) Open the drain plug and drain the oil.
(b) Discard the drain plug when there is no oil dripping.
(c) Tighten a new drain plug.

Torque: (11±1) N•m



Remove the oil pan

(d) Remove all of the 13 bolts on the oil pan.
(e) Discard the oil pan gasket.
(f) Take out the oil filter gently and discard it.

Lubricate the O-ring.

(g) Take a oil filter with O-ring and lubricate it with ESSO EZL799(A).

Install the oil filter into position.

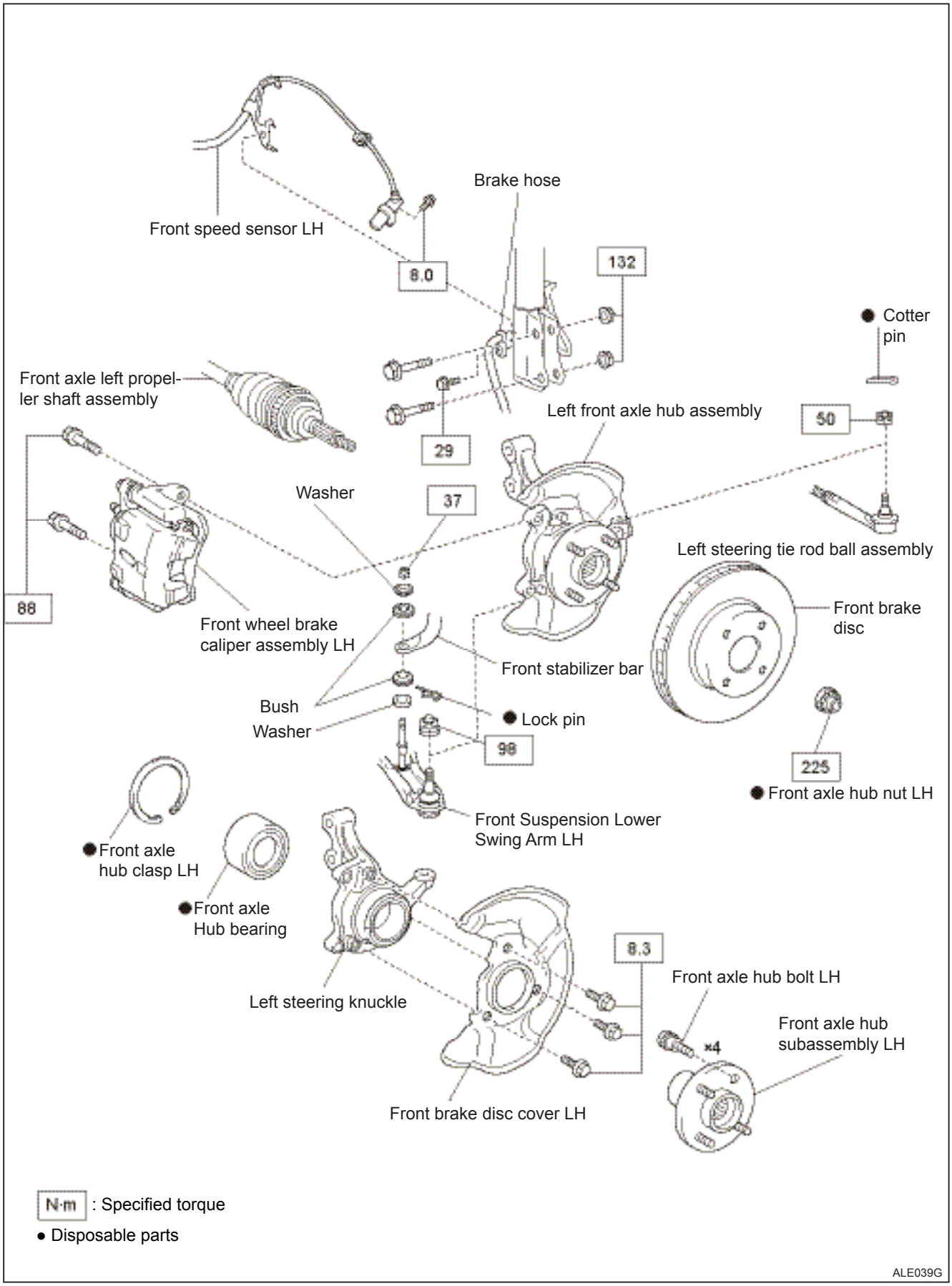
(h) Gently press the oil filter into position (match the oil filter central hole with the hydraulic pressure control unit central bolt).
(i) Clean the magnet and oil pan.
(j) Install the new gasket and oil pan and tighten the 13 bolts.

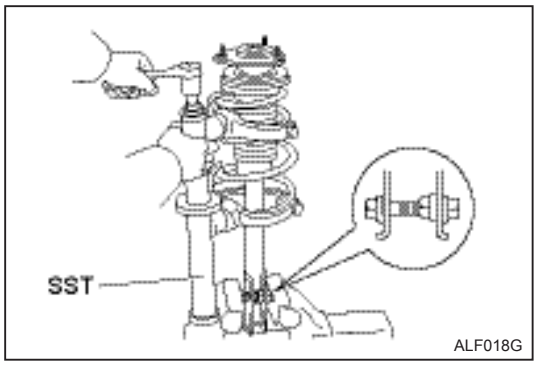
Torque: (9.5±1) N•m

(k) Refill the transmission case according to the instructions.

Front axle hub subassembly LH

Components





12. Secure the front shock absorber with coil spring assembly.

(a) Install 2 nuts and bolts on the bracket at the lower side of the shock absorber and secure it in a vice.

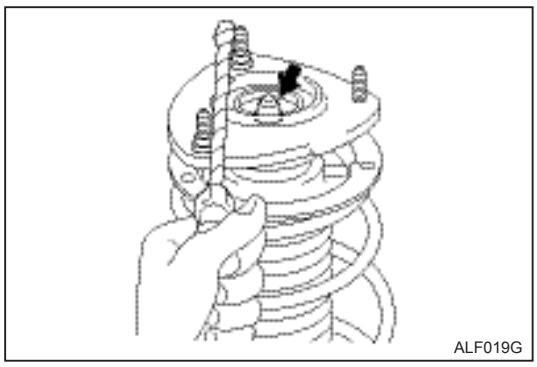
(b) Compress the coil spring with SST.

Note:

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

13. Remove the dust cover of the front shock absorber.

(a) Remove the dust cover from the front shock absorber pillar upper mounting seat.



14. Remove the center nut.

(a) Use the 2 nuts and a screwdriver or similar tools to secure the front shock absorber and remove the center nut.

Note:

Be careful not to damage the front shock absorber pillar upper mounting seat stud bolts.

15. Remove the mounting seat on the front shock absorber pillar.

16. Remove the grommet.

17. Remove the mounting seat on the front coil spring.

18. Remove the dust cover.

19. Remove the front coil spring LH.

20. Remove the front bumper.

21. Remove the front shock absorber assembly LH.

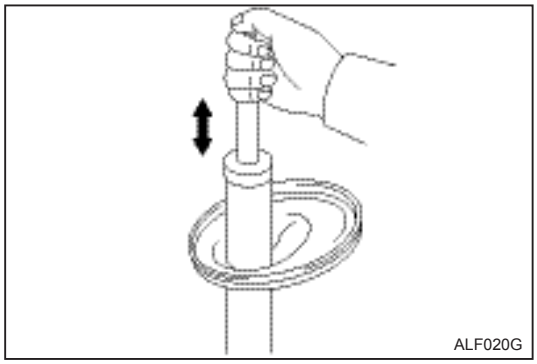
22. Inspect the front shock absorber assembly LH.

(a) Contract and expand the shock absorber bar. Inspect and make sure there are no abnormal resistance or noise during the operation.

If anything is abnormal, use a new shock absorber instead.

Note:

When discarding the shock absorber, see the "Disposal" section onpage SP-13.



23. Install the front shock absorber assembly LH.

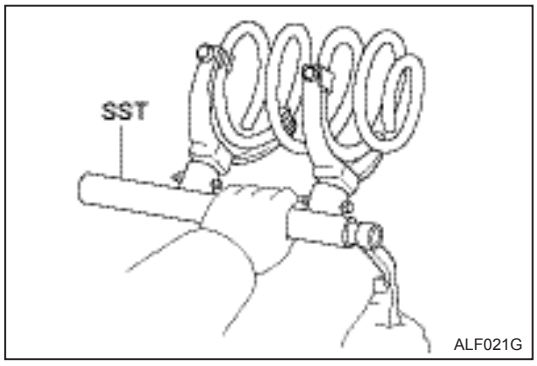
24. Install the front bumper.

25. Install the front coil spring LH.

(a) Compress the coil spring with SST.

Note:

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



Rear wheel rotation speed sensor LH

Replacement

Hint:

The procedures for replacing on the right side are the same as the left side.

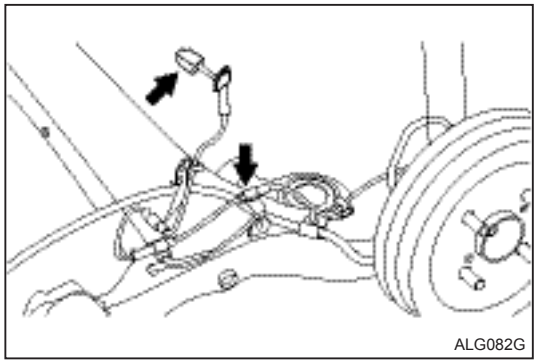
1. Set the ignition switch to the OFF position

2. Remove the rear wheel LH

3. Disconnect the rear wheel speed sensor connector LH

(a) Disconnect the wheel speed sensor's connector.

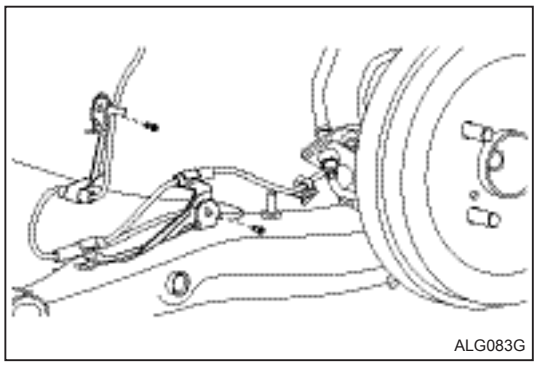
(b) Remove the rubber bushing of the rear wheel speed sensor LH with bracket assembly.


ALG082G

4. Remove the rear speed sensor set bracket LH

(a) Remove the No.1 set bracket.

(b) Remove the No.2 set bracket.


ALG083G

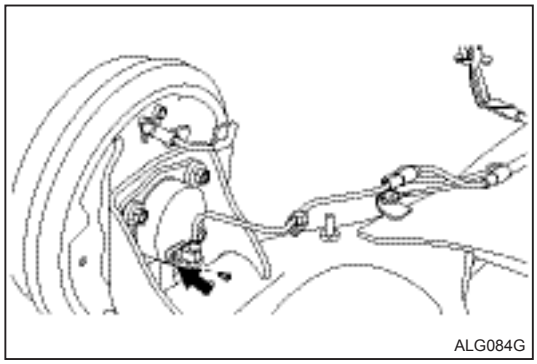
5. Remove the rear wheel speed sensor assembly LH

(a) Remove the set clip of rear speed sensor LH.

(b) Install the rear speed sensor LH with the bolt.

Caution:

Foreign material on the sensor ends should be avoided.


ALG084G

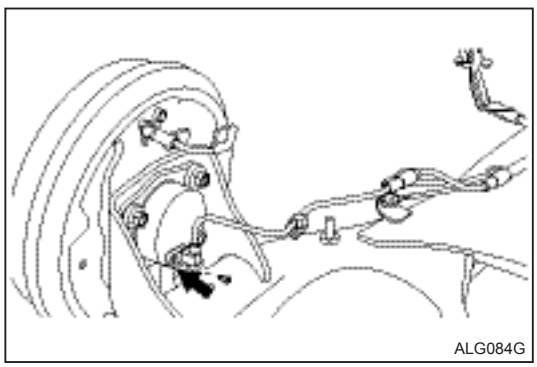
6. Install the rear wheel speed sensor

(a) Install the rear wheel speed sensor LH with the bolt.

Torque: 8.0 N·m

Caution:

Foreign material on the sensor ends should be avoided.


ALG084G

Antenna Wire Harness Assembly

Replacement

Hint:

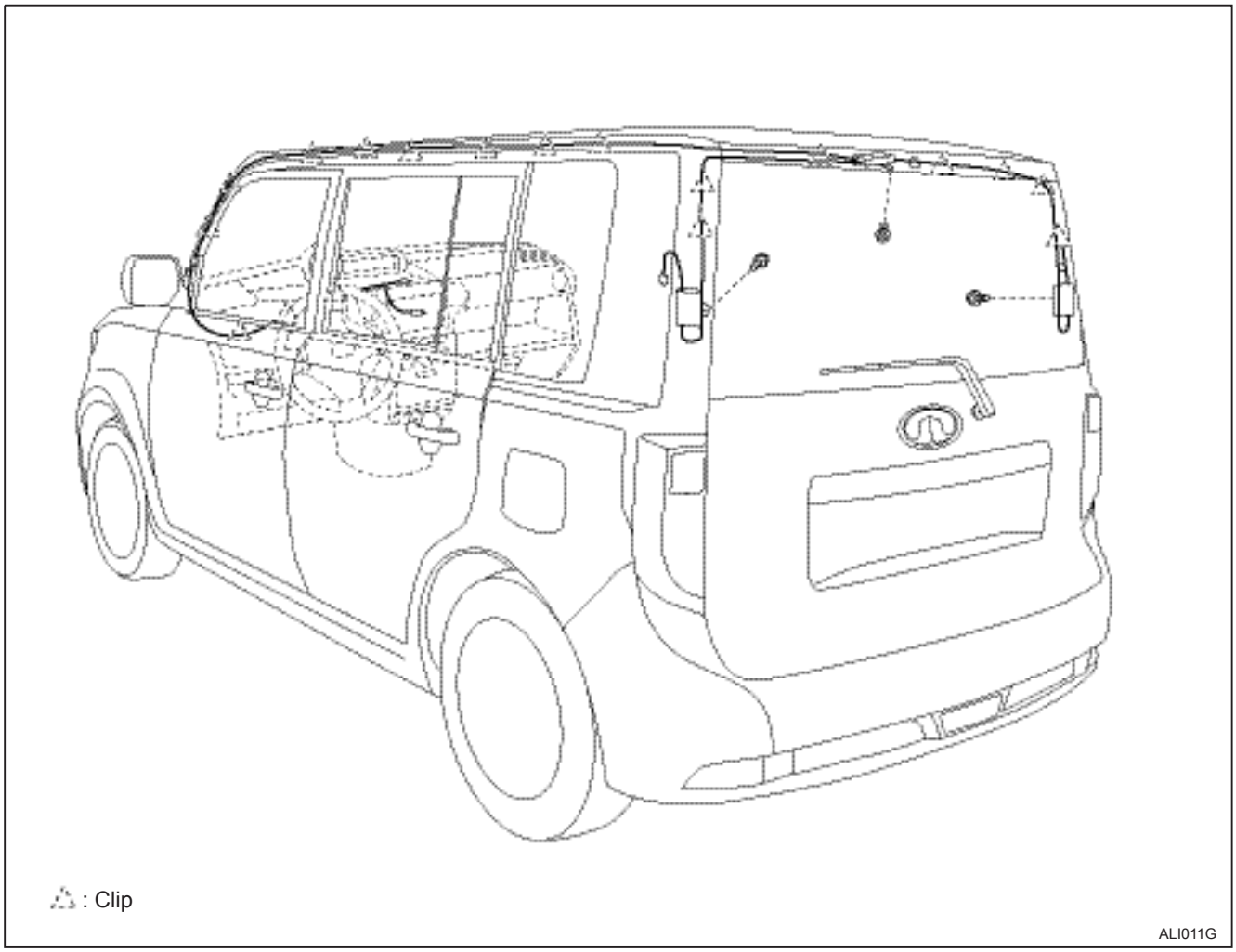
Location: see page AV-7

1. **Remove the roof headlining assembly (see page IR-64)**
2. **Remove the instrument panel body (see page IR-28)**
3. **Remove w/holder antenna wire harness assembly**

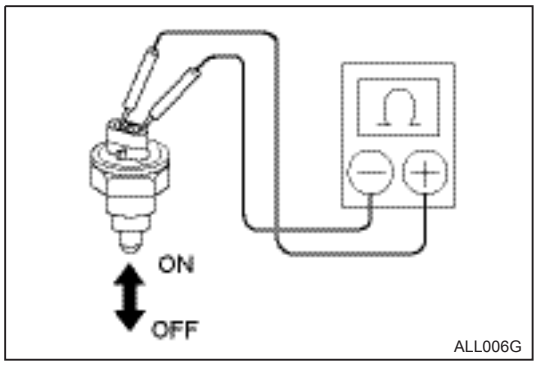
(a) Disconnect the connector.

(b) Remove the relevant clips and bolts.

(c) Remove w/holder antenna wire harness assembly.



4. **Install roof headlining assembly**



2. Back-up lamp switch assembly

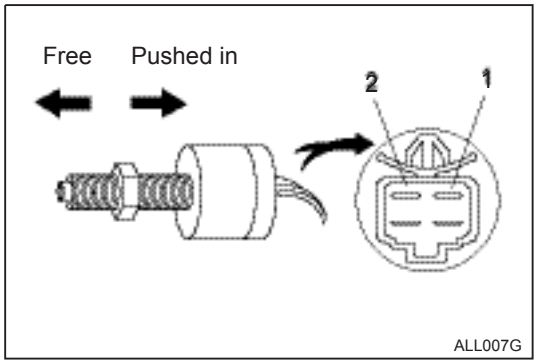
(a) Inspect the back-up lamp switch assembly continuity.

(1) Measure the resistance according to the value in the following table.

Standard:

Switch operation	Testing instrument connection	Specified condition
ON	1 - 2	Below 1 Ω
OFF	1 - 2	10 kΩ or higher

Replace the switch as necessary.



3. Brake lamp switch assembly

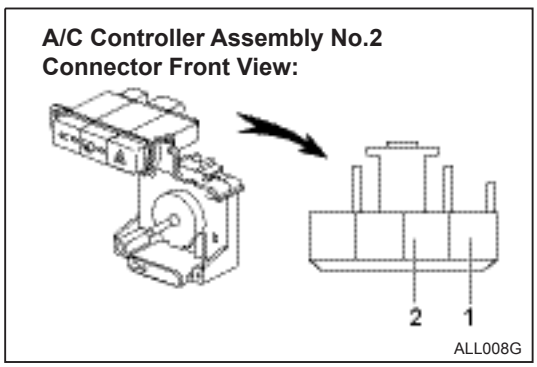
(a) Inspect the brake lamp switch assembly continuity.

(1) Measure the resistance according to the value in the following table.

Standard:

Switch operation	Testing instrument connection	Specified condition
Switch pin pushed in (Pedal released)	1 - 2	10 kΩ or higher
Switch pin free (Pedal depressed)	1 - 2	Below 1 Ω

Replace the switch as necessary.



4. A/C controller assembly No.2

(a) Inspect the hazard warning signal switch continuity.

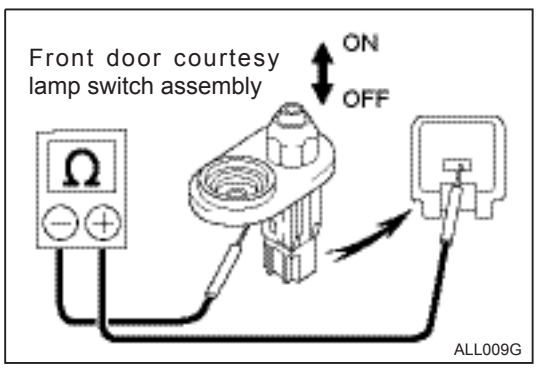
(1) Measure the resistance according to the value in the following table.

Standard:

Switch operation	Testing instrument connection	Specified condition
ON	1 - 2	Below 1 Ω
OFF	1 - 2	10 kΩ or higher

Replace the switch as necessary.

If the value is not as specified, replace the integration control & panel assembly.



5. Front door courtesy lamp switch assembly

(a) Inspect the front door courtesy lamp switch assembly continuity.

(1) Measure the resistance according to the value in the following table.

Standard:

Switch operation	Testing instrument connection	Specified condition
ON	1 - Body ground	Below 1 Ω
OFF	1 - Body ground	10 kΩ or higher

Replace the switch as necessary.

6. Rear door courtesy lamp switch assembly

(a) Inspect the rear door courtesy lamp switch assembly continuity.

(1) Check the rear door courtesy lamp switch assembly using the same procedures as for the front door courtesy lamp switch assembly.

Standard: Same as the front door.

Replace the switch as necessary.

Rear Seat Assembly
Components