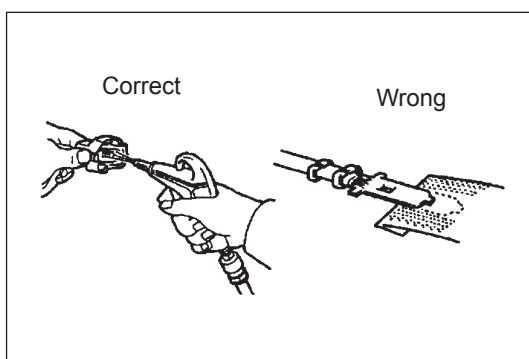
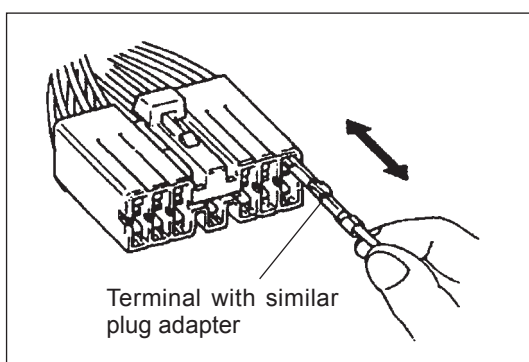
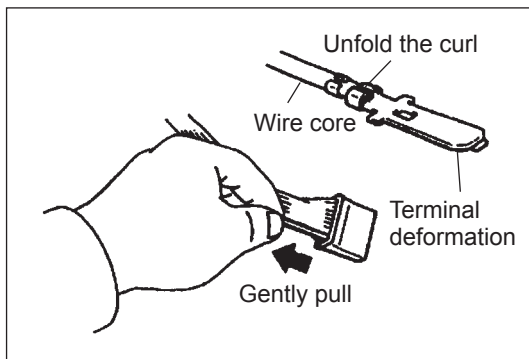
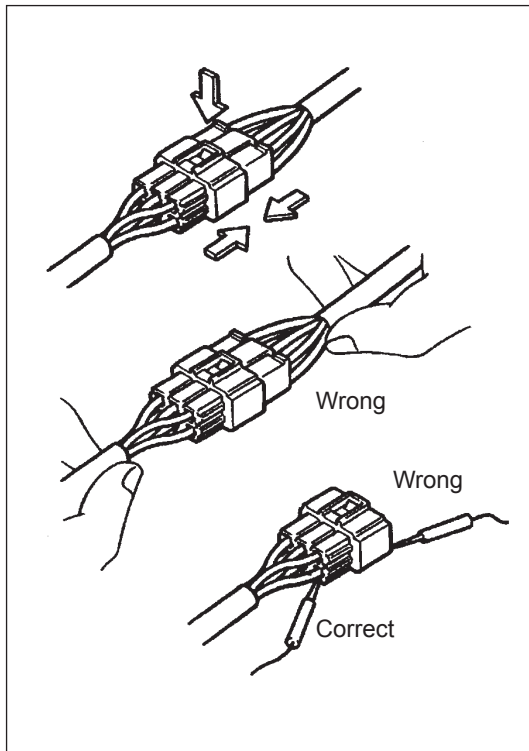


# Chassis and Car Body Maintenance Manual

General Introduction	
Complete Vehicle Parameters	
Engine Mechanical System	
Engine Electronic Fuel Injection System	
Fuel System and Exhaust System	
Clutch Control System	
Transmission	
Suspension and Axle	
Braking System	
Steering System	
Electrical System of the Car Body	
Electrical Accessories	
Safety airbag	
Air-Conditioning System	
Car Body	



(b) If the connection of the earth wire of the battery is comparatively loose, attempt to start the engine isn't allowed; or else, the wire will be badly damaged.

(c) Check the belt tension of the alternator.

#### • Basic operation

### 1. Assembly/disassembly of the wire harness connector

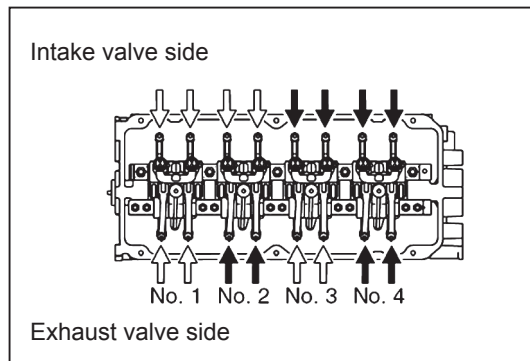
- When disconnecting the connector, first press both ends of the connector with hand, release the lock and then press the pawl to disengage the connector.
- When disconnecting the connector, one should not pull the wire harness and directly hold the connector to disengage it.
- Before connecting the connector, one should check and make sure the connector isn't distorted or damaged and the terminal port isn't lost.
- When connecting the connector, one should hear the crack sound that indicates the successful connection.

### 2. Check of the wire harness connector

- Check when connecting the connector  
Press both ends of the connector to make sure it is completely inserted and locked.
- Check when disconnecting the connector  
Gently pull the wire harness from the back of the connector to check. Find out whether there is unengaged terminal, dropped terminal, loose clip or damaged wire. Perform visual inspection to check whether there is metal scrap, foreign matters and water, and whether corrosion, bent, rustiness, overheating, pollution or terminal deformation occurs.
- Check the contact pressure of terminals:  
Prepare a plug adapter that matches the connector terminal and plug it into the plug socket, and then check whether the tension is favorable both when they are inserted and after they are totally engaged.

### 3. Repair method of wire harness connector terminal

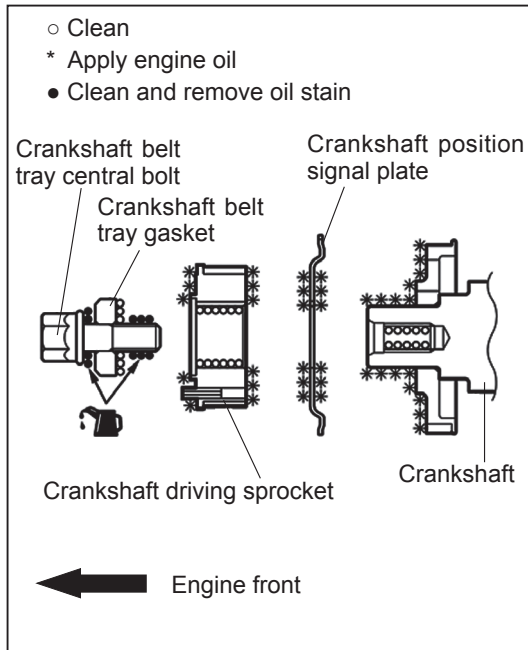
- If the terminals are polluted with dust, the contacts should be cleaned with air gun or wiping cloth. Don't use tissue paper to clean, for fear of damage to the galvanized coating.
- If the contact pressure is abnormal, replace the plug socket with an equivalent one.
- All the terminals damaged, deformed or corroded should be replaced. In case the terminal isn't locked into the hosing, replace the hosing too.



## Maintenance on Vehicle

### Inspection and Adjustment of Valve Clearance

1. Before the inspection, check and confirm that the engine oil, the starter and the battery are all in normal condition, and simultaneously set the vehicle into the following status:
  - Engine coolant temperature: (80-95) °C
  - Lights and all the auxiliary facilities: OFF
2. Disassemble all the ignition coils.
3. Disassemble the swing arm chamber cover.
4. Turn the crankshaft clockwise, until the notch on the belt tray aims at the sign T on the timing indicator.
5. Move the No.1 and No.4 cylinder swing arms upward and downward manually to determine whether the cylinder piston is at the top dead center of the compression stroke. If both the intake and exhaust valve swing arms have valve clearance, the piston in the cylinder corresponding to this swing arm is at the top dead center of the compression stroke.
6. When the No.1 cylinder piston is at the top dead center of the compression stroke, inspect and adjust the valve clearance of the swing arm indicated with the white arrowhead; when the No.4 cylinder piston is at the top dead center of the compression stroke, inspect and adjust the valve clearance of the swing arm indicated with the black arrowhead.
7. **Measure the valve clearance**  
 If the valve clearance doesn't accord with the specification, loosen the swing arm locking nut and turn and adjust the screw adjusting clearance with a feeler gauge.  
**Standard value (hot engine):**  
 Intake valve: 0.20 mm  
 Exhaust valve: 0.30 mm
8. Fix the adjusting screw with a screwdriver to avoid being turned, and lock the fixing nut to regulated torque.  
**Tightening torque: (9±1) N·m**
9. Turn the crankshaft to 360°, to make the notch line up with T mark on timing indicator.
10. Repeat the steps of (7) and (8) for the clearance adjustment of other valves.
11. Install the swing arm cover.
12. Install the ignition coils.

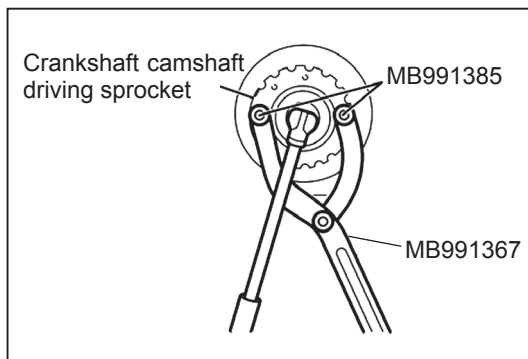


### >>B<< Crankshaft position signal plate/crankshaft driving sprocket/crankshaft belt tray gasket/crankshaft belt tray central bolt installation

1. Clean the crankshaft, crankshaft position signal plate, crankshaft driving sprocket and crankshaft belt tray gasket and or remove oil stain as shown in the figure.

Remarks: clean oil stained surface.

2. Install the crankshaft position signal plate, crankshaft driving sprocket in the direction as shown in the figure.
3. Place the crankshaft belt tray gasket into the bigger groove side in the direction as shown in the figure, and assemble the crankshaft belt tray central bolts.
4. Apply a small amount of engine oil onto the surface of the crankshaft belt tray central bolt bearing and bolt thread.



5. Fix the crankshaft driving sprocket with the special tools of MB991367 and MB991385 in the same disassembling method.

6. Lock the crankshaft belt tray central bolt to the regulated torque.

Tightening torque: 167 N•m

### >>C<< Timing belt tensioner adjustor installation

1. When the timing belt tensioner adjustor stem is outstretched completely, set according to the following procedure.

If the compression process is too rapid, the stem will be damaged, so pay attention to press in slowly and completely.

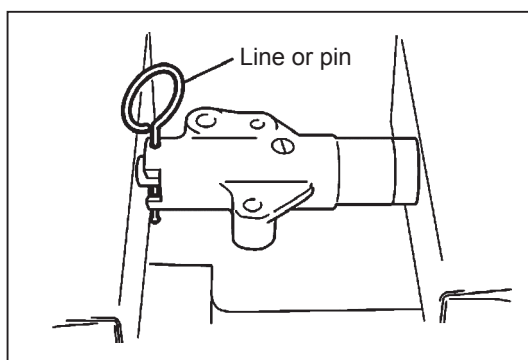
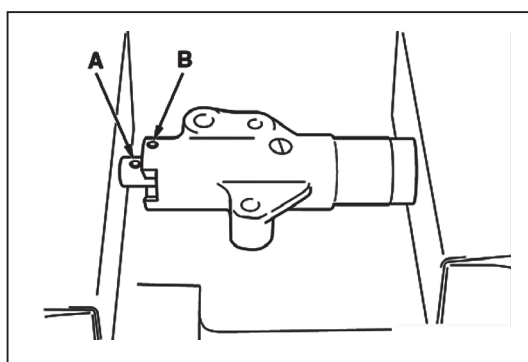
- (a) Press in the timing belt tensioner adjusting stem with a press machine or jaw vice slowly, and align the stem setting hole A and the setting hole B of the timing belt tensioner adjuster.

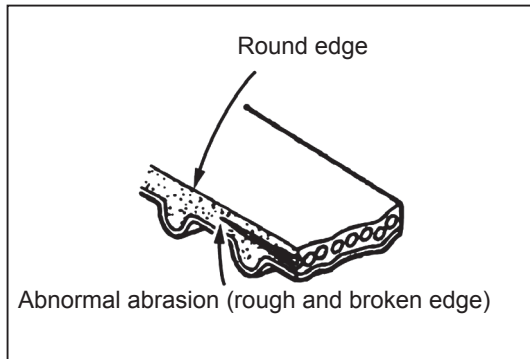
- (b) Insert a line or pin into the aligned setting hole.

Remarks: When replacing with a new timing belt tension adjuster, the belt tensioner adjuster has already been fixed with a pin.

2. Install the timing belt tensioner adjuster onto the engine, and then lock the fixing bolts to the regulated torque. The line or pin shall not be disassembled until the tension of the valve timing belt is adjusted.

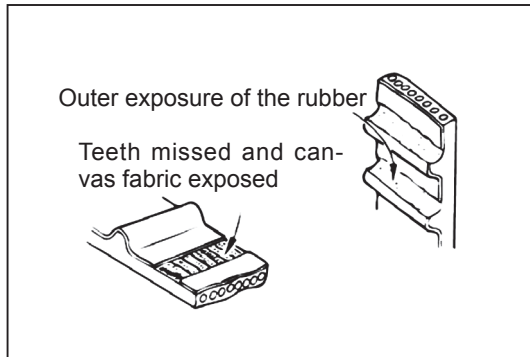
Tightening torque: (23±3) N•m





#### 6. The belt side has abnormal abrasion.

- The normal abrasion means that the side edge has the cut shape.
- The abnormal abrasion means that the side edge has the sawtooth shape.

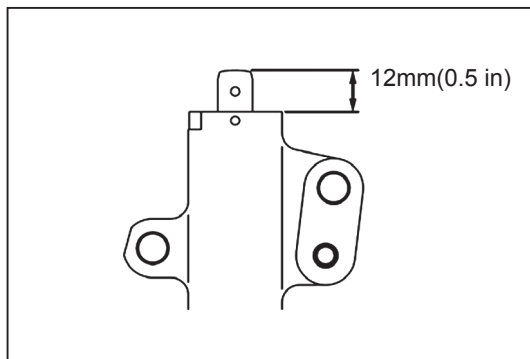


#### 7. Abnormal tooth abrasion

The preliminary stage: canvas abrasion (flock canvas fabric, disappeared elastic structure, albefaction and vague canvas structure).

The final stage: canvas abrasion, rubber exposure (decreased tooth width).

#### 8. Missing teeth.



### Automatic Tensioner

#### 1. Oil leakage inspection.

If there is obvious oil leakage, replace the automatic tensioner.

#### 2. Inspect the abrasion or damage of the stem end, and replace the automatic tensioner if necessary.

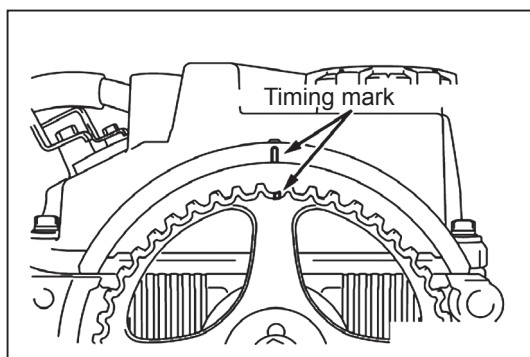
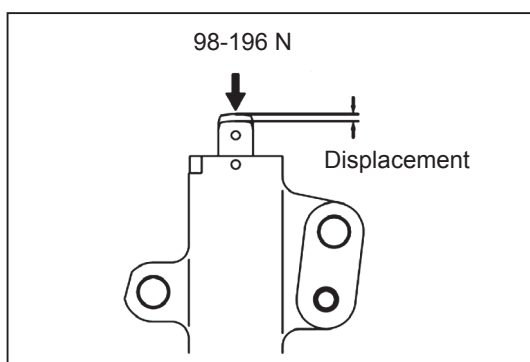
#### 3. Measure the protrusion part of the stem.

If the protrusion is beyond the regulated value, replace the automatic tensioner.

**Standard value: 12 mm**

#### 4. Press the stem by exerting the force of (98-196) N, and measure the movement value of the stem. If the measured value is beyond the standard value, replace the automatic tensioner.

**Standard value: less than 1.0 mm**



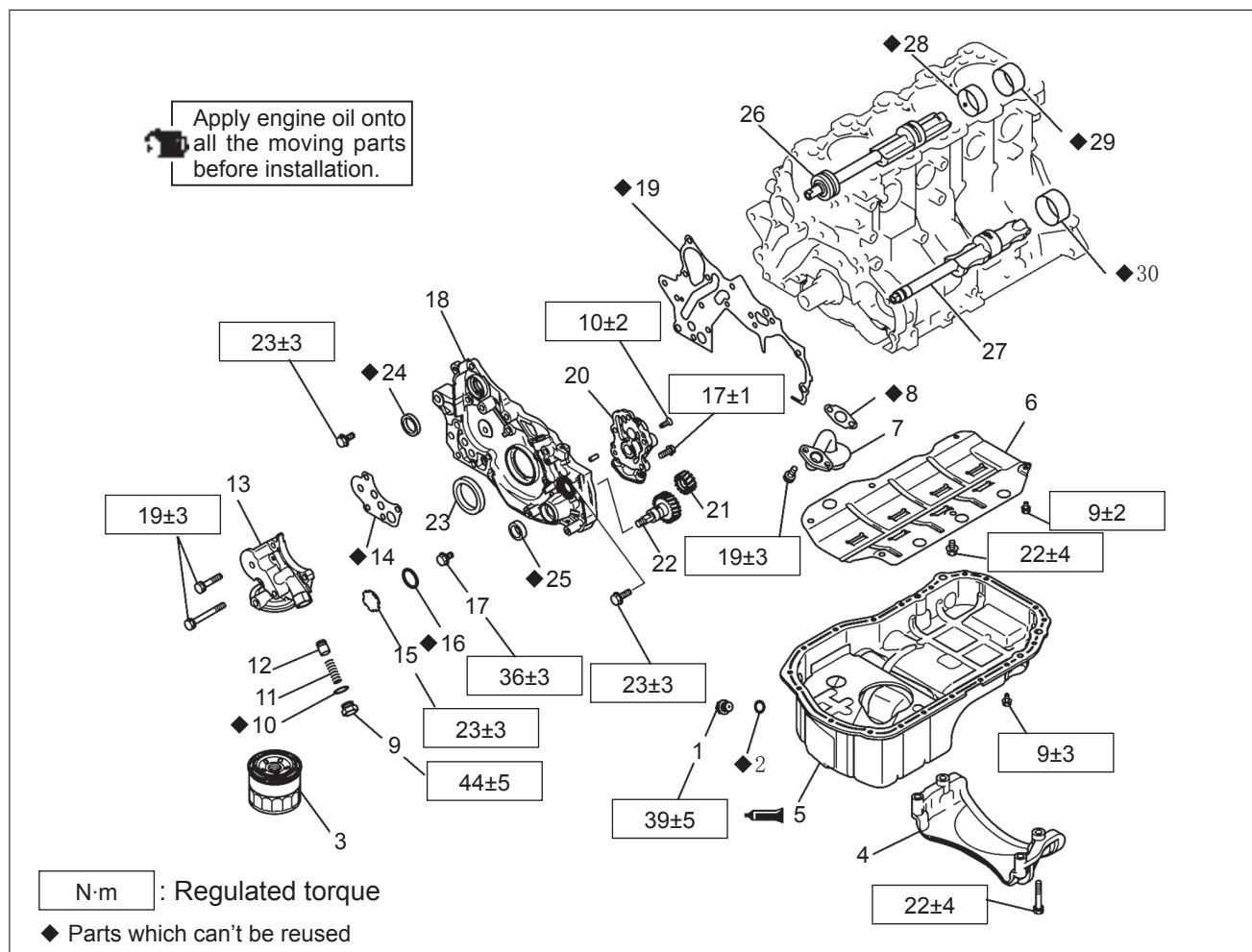
### Valve Clearance Adjustment

**Notice:** Turn the crankshaft clockwise.

- Turn the crankshaft clockwise, and then align the timing mark on the camshaft sprocket to the timing mark on the swing arm cover (place it at the top dead center of the compression stroke of the first cylinder).
- Disassemble the swing arm chamber cover.

## Oil pan and Oil Pump

### Disassembling and Assembling



#### Disassembly Procedure

- |             |                                 |
|-------------|---------------------------------|
|             | 1. Releasing plug               |
| >>M<<       | 2. Releasing plug gasket        |
| <<A>> >>L<< | 3. Oil filter                   |
|             | 4. Transmission partition board |
| <<B>> >>K<< | 5. Oil pan                      |
|             | 7. Oil filter                   |
|             | 8. Oil filter gasket            |
|             | 9. Releasing plug               |
|             | 10. Gasket                      |
|             | 11. Releasing spring            |
|             | 12. Releasing plunger           |
|             | 13. Oil filter bracket          |
|             | 14. Oil filter bracket gasket   |
| <<C>> >>J<< | 15. Oil pan                     |
|             | 16. O-ring                      |
| <<D>> >>I<< | 17. Flange bolt                 |
| >>H<<       | 18. Front casing                |

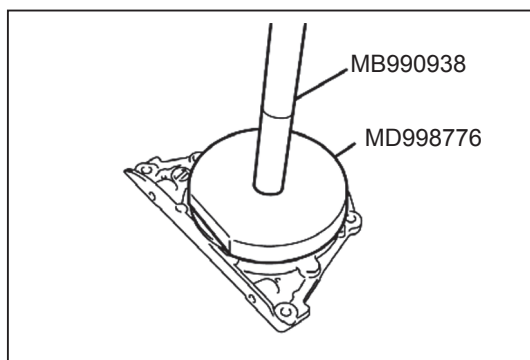
#### Disassembly Procedure (continued)

- |             |   |
|-------------|---|
|             | 19. Front casing gasket                 |
|             | 20. Oil pump protective cover           |
| >>G<<       | 21. Oil pump driving gear               |
| >>G<<       | 22. Oil pump driving gear               |
| >>F<<       | 23. Crankshaft front oil seal           |
| >>E<<       | 24. Oil pump oil seal                   |
| >>D<<       | 25. Balancing axis oil seal             |
|             | 26. Balancing axis, left                |
|             | 27. Balancing axis, right               |
| <<E>> >>C<< | 28. Left balancing axis, front bearing  |
| <<F>> >>B<< | 29. Left balancing axis, rear bearing   |
| <<F>> >>A<< | 30. Balancing axis, rear bearing, right |

#### Required Special Tools

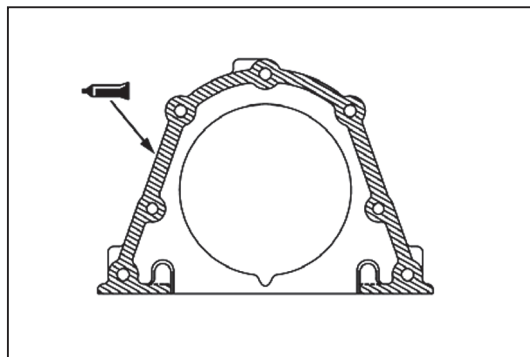
- MB991603: Bearing erector stopper
- MD998162: Plug spanner
- MD998285: Crankshaft front oil seal guiding pipe
- MD998371: Silent axis bearing puller
- MD998372: Silent axis bearing puller
- MD998375: Crankshaft front oil seal erector
- MD998705: Silent axis bearing erector
- MD998727: Oil pan scraper
- MD998783: Plug spanner fixer





### >>D<< Oil seal installation

Press the oil seal into the casing with the special tools of MD998776 and MB990938.



### >>E<< Applying sealing adhesive onto the casing oil seal

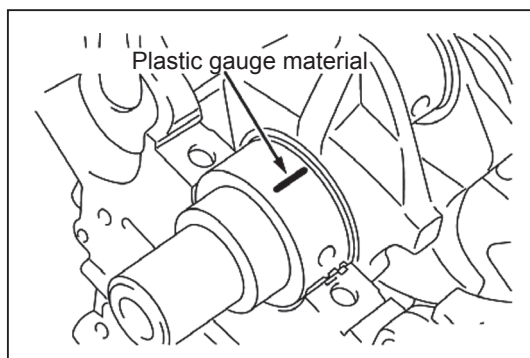
1. Apply sealing adhesive of MITSUBISHI genuine product with part number MD970389 or equivalent products onto the oil seal casing surface at the position shown in the figure.

Remarks: within 15 minutes after applying sealing adhesive, install rapidly.

2. Apply engine oil onto the oil seal lip, and then install the casing oil seal onto the cylinder body.

**Bolt tightening torque: (11±1) N·m**

Remarks: keep the sealing adhesive away from oil for about one hour.



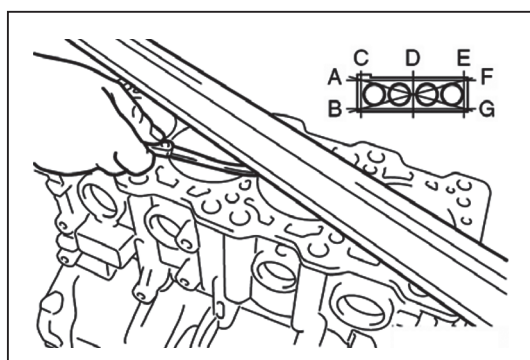
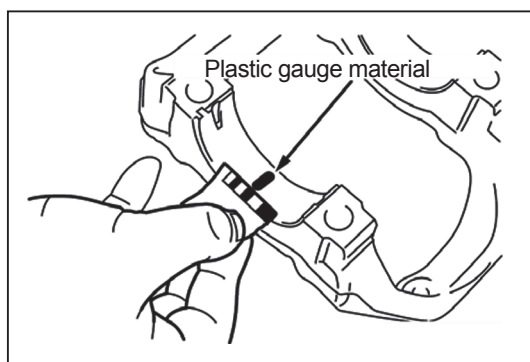
### Inspection

#### Oil Film Clearance of Crankshaft Journal <plastic gauge material method>

1. Clean the oil film on the crankshaft journal and the crankshaft bearing.
2. Install the crankshaft.
3. Cut off the plastic gauge material with the same length as the bearing width, and place it on the crankshaft journal, parallel with the journal.
4. Install the crankshaft bearing cover carefully, and lock the locking nuts tightly to the regulated torque.
5. Disassemble the crankshaft bearing cover carefully.
6. Measure the width of the plastic gauge at the widest part with the scale printed on the plastic gauge wrappage.

**Standard value: (0.02-0.04) mm**

**Limit value: 0.1 mm**



### Cylinder Body

1. Inspect scratch, rust and corrosion visually. The checking agent can be also used in the inspection. If there is obvious fault, correct or replace.
2. Inspect the planeness of the cylinder body upper surface with a line tool and a feeler gauge.

Confirm that there are no gasket bits and foreign matter on the surface.

**Standard value: 0.05 mm**

**Limit value: 0.1 mm**

## Intake Manifold Absolute Pressure and Temperature Sensor

### General Introduction

- The intake manifold absolute pressure and temperature sensor is one of the main elements in the engine management system elements which indicates the actual engine intake condition during the engine running, and subsequently indicates the working condition and the load condition of the engine. Therefore, an intake manifold absolute pressure and temperature sensor is a particularly important component in the air fuel supply control subsystem of the engine management system.
- The intake manifold absolute pressure and temperature sensor developed by Delphi Company has integrated the functions of both an intake manifold absolute pressure sensor and an intake manifold absolute temperature sensor to make them one sensor. At the same time, it achieves the goal of detecting the engine intake manifold absolute pressure and the air temperature in the intake manifold. The sensor applies to naturally aspirated engines.
- In the mechanism configuration of the engine management system adopting speed density principle, the intake air temperature sensing element is used for providing the intake air temperature test data in the engine intake manifold for the system, to make the engine electronic control module calculates the actual air density after it entering the engine according to the system software, and the system subsequently reckons the actual air supply (actual charge) entering the engine for combustion, according to other related parameter states of the engine.
- The engine management system, basing on the fluid mechanics principle, reckons the actual charge state of the engine according to the actual test data of the air temperature and pressure in the intake manifold, and considering comprehensively the influencing factors of other related parameters, provides fuel injection supply at an ideal ratio for the engine. Therefore, an intake manifold absolute pressure and temperature sensor is one of the important elements constituting the air flow metering mode of the speed density engine management system.

### Operation Principle

- The intake manifold absolute pressure and temperature sensor integrates the functions of both an intake manifold absolute pressure sensor and an intake manifold absolute temperature sensor into a whole.
- The intake manifold absolute pressure sensor is designed based on the piezoelectric technology principle. The sensor is mainly composed of a well-sealed elastic diaphragm and an iron magnetic core. The diaphragm and the magnetic core are accurately placed into the micro coil, and when pressure is sensed, an output signal proportional to the input signal and in proportion to the reference voltage is created.

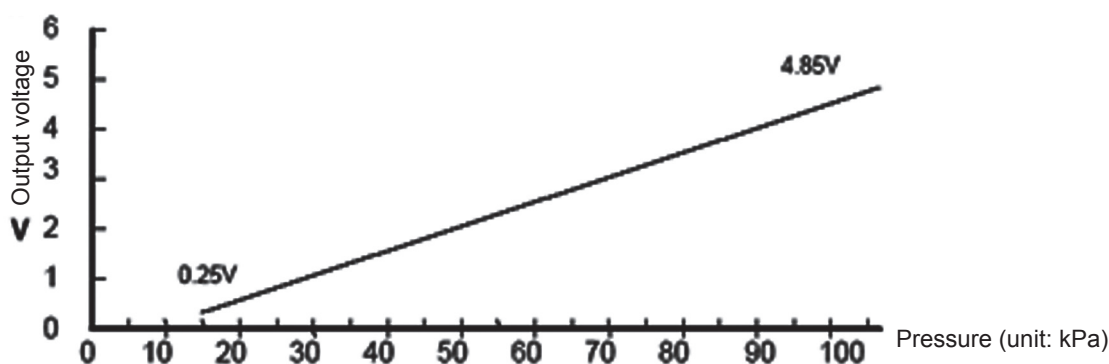
The functional relation between the pressure signal voltage output of the intake manifold absolute pressure and temperature sensor is:

$$V_{out} = V_{ref} (0.01059 * P - 0.10941)$$

P refers to the actual test value of the intake pressure, unit: kPa.

V<sub>ref</sub> refers to the system signal reference voltage, which is 5V.

Air pressure and voltage transformation curve characteristic curve (when V<sub>ref</sub> = 5.0 V)





## Form-in-place gasket (FIPG) Precautions

The form-in-place gasket (FIPG) is used in many parts of the transmission. When using this sealant, particular attention should be paid to the applying amount, the applying position and the state of the adhesive applying surface so as to achieve the purpose of full sealing. Inadequate applying amount will cause leakage, while excessive applying amount will cause the overflow of the sealant, the blocking of the passage of water or oil or the narrowing of the passage. Therefore, in order to prevent the junction surface from leakage, it is absolutely necessary to ensure correct applying amount and continuous application. RTV (room temperature vulcanizing) sealant is hardened after reacting with the moisture in the atmosphere, and thus is often used on metal flanged parts.

## Tips for Application

The precautions to be noticed when assembling parts with FIPG.

Apply the sealing adhesive evenly on the regulated diameter, and surround the installing hole completely. The sealing adhesive not hardened could be erased. When the sealing adhesive is in wet condition (within 15 minutes), install the parts at the fixed position. When it is installed, remember not to stick the sealing adhesive to the unnecessary places. After installing the parts, wait till the sealing adhesive is fully hardened (about one hour). In the process, don't apply oil onto the applying parts or wet the part, or start the engine. The apply procedure of the FIPG is different because of the parts' shape.




## Disassembly

The parts assembled with sealing adhesive will be easily disassembled without special method. But in some cases, it is necessary to use a wooden mallet or similar tools to knock the parts gently to destroy the sealing adhesive on the connecting surface, or punch a smooth and thin sealing adhesive scraper into the connecting surface, and pay special attention not to damage the connecting surface.

## Cleaning of the Sealing Surface

Remove the sundries on the sealing surface with a sealing adhesive scarper or steel brush. Confirm the sealing surface is smooth without oil stain and foreign matter. Don't forget to remove the used sealing adhesive in the installing hole and the threaded hole.

## Legend

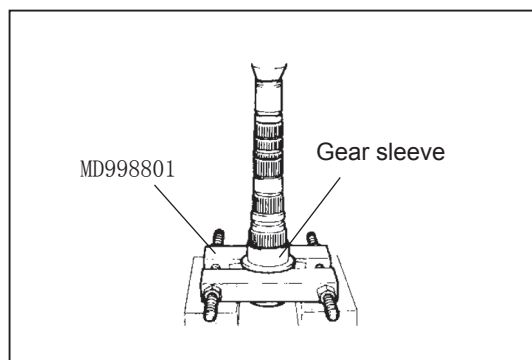
-  ..... Lubricating grease (multi-purpose lubricating grease when there is no special designation)
-  ..... Sealing adhesive and adhesive agent
-  ..... Engine oil or gear lubricating oil

## Sealant and Adhesive Agent

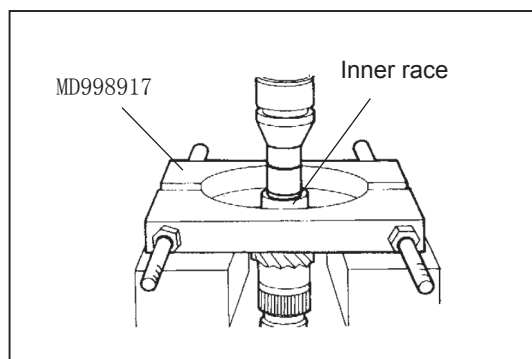
Item	Regulated Sealant and Adhesive Agent
Clutch Casing -- Matching Surface of Transmission Casing	Mitsubishi Genuine Sealant with Part Number of MD997740 or Equivalent Products
Control Device Casing -- Matching Surface of Transmission Casing	
Bottom Cover -- Matching Surface of Transmission Casing	
Air Outlet	3M SUPER WEATHERSTRIP NO.8001 or Equivalent Products
Differential Driving Gear Bolt	3M STUD LOCKING NO.4170 or Equivalent Products

## Lubricating Grease

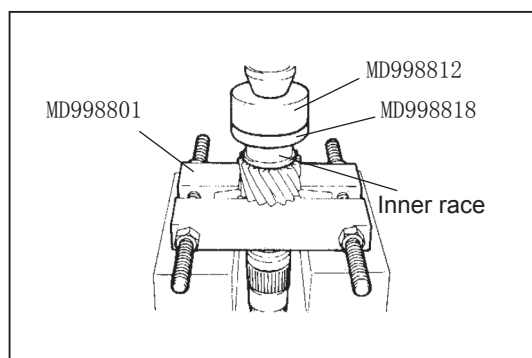
Item	Regulated Lubricating Grease
Driving Axis Oil Seal Lip	Hypoid gear oil SAE above GL-4 in accordance with API classification
Input Axis Oil Seal Lip	Mitsubishi Genuine Lubricating Grease with Part Number of 0101011 or Equivalent Products
Selecting Rod Support Block	



## 6. Disassembly of the 1-speed gear sleeve

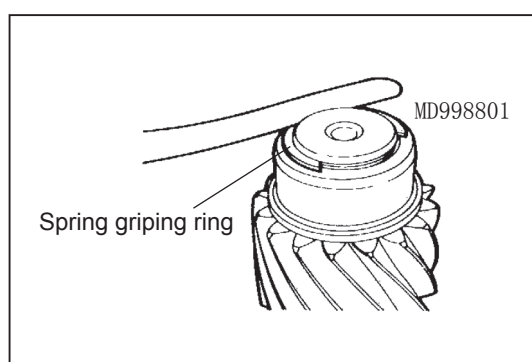


## 7. Disassembly of the ball bearing inner race



## Assembly Directions

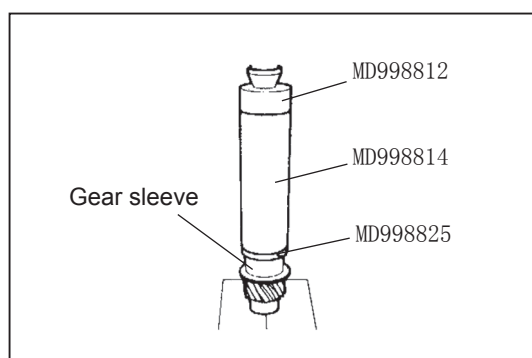
### 1. Installation of the ball bearing inner race



### 2. Installation of the spring gripping

Select and install the spring snap ring, to make the output axis front bearing axial accord with the standard value.

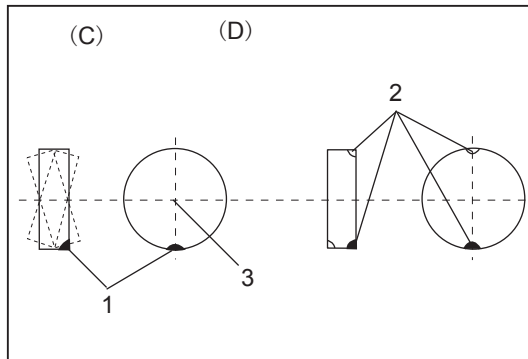
**Standard value: (-0.01-0.12) mm**



### 3. Installation of the 1-speed gear

## Tightening Torque

System Serial Number	Code	Installation Position of Standard Parts	Tightening Torque	Quantity Used on Suspension	Surface Rubber Coating
Front Suspension	Q1841490+Q40114(d2=32)(M14×1.5) FD	Sub-frame and Vehicle Body (rear)	133±12	2	Red Rubber
	Q32014(M14×1.5) FD	Sub-frame and Vehicle Body (front)	133±12	2	Red Rubber
	Q1421230(Q403)(M12×1.25)FD	Bracket and Vehicle Body	80±8	6	Red Rubber
	2904011-V08	Swing arm and Steering Knuckle	123±12	2	Red Rubber
	Q1401495(Q401)(M14×1.5) FD	Swing arm and Sub-frame	137±12	4	Red Rubber
	Q32014(M14×1.5)FD	Swing arm and Sub-frame	\	2	Red Rubber
	2905102-V08	Front Shock Absorber and Wheel Cowl	80±8	6	
	2905103-V08	Front Shock Absorber and Steering Knuckle	220±20	4	Red Rubber
	2905104-V08	Front Shock Absorber and Steering Knuckle	\	4	
	Q1400825 FD	Stabilization Bar Bracket and sub-frame	21±2	4	Red Rubber
	Q32012( M12×1.25) FD	Pension Link and Shock Absorber	74±6	4	Red Rubber
Rear Suspension	Q18414140 (M14×1.5) FD	Twist Beam and Vehicle Body	135±12	2	Red Rubber
	Q32014 (M14×1.5) FD	Twist Beam and Vehicle Body	\	2	
	Q1401025(Q400)(M10×.25)FD	Supporting Plate and Cross Beam	63±6	2	Red Rubber
	Q1841430+Q40214(M14×1.5)FD	Rear Shock Absorber and Twist Beam	160±15	2	Red Rubber
		Rear Shock Absorber and Vehicle Body	31±3	2	Red Rubber
Wheel	3101014-K00	Wheel Nut (M12×1.25)	103±10	20	
	Q1840820	Spare Tyre Bracket and Vehicle Body	23±2	2	
	Q1840820	Spare Tyre Bracket and Vehicle Body	23±2	1	



1. Jerking point of the vehicle	[A]: Balancing block not added
2. Place to add balancing block	[B]: Balancing block added
3. Axle center	

1. Jerking point of the vehicle	[C]: Balancing block not added
2. Place to add balancing block	[D]: Balancing block added
3. Axle center	

## Wheel Balancing

There are two methods for the wheel and tyre balancing: static and dynamic.

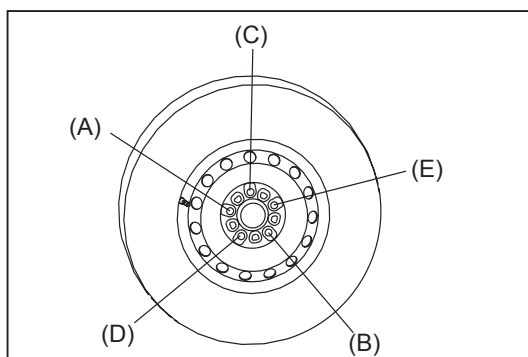
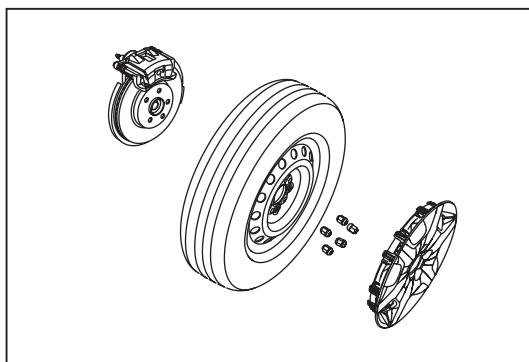
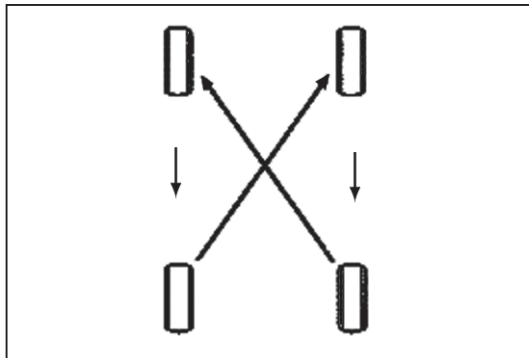
Static balancing means that the weight distribution around the wheel is equal. If the wheel is unbalanced in the static state, this will cause violent jerking upward and downward, or so-called “bounce”, and the phenomenon will finally cause uneven tyre abrasion.

Dynamic balancing means weight distribution on both sides of the tyre central line is equal, which will cause the tyre to move to one side from the other in rotation. The tyre’s dynamic unbalancing will cause “bounce”.

## Tyre Transposition

In order to make the abrasion equal, perform the tyre transposition according to the figure. Perform the tyre transposition regularly for the radial tyre, and charge the pressure according to the regulation.

**Notice: because of the structure, the shoulder part of the radial tyre will be abraded rapidly, especially the front tyre. Perform the tyre transposition once per 8,000 km or 12,000 km, to increase 20% of the tyre service life. This makes the regular tyre transposition more important.**



## Disassembly and Installation of Wheel

### Disassembly

1. Disassemble the wheel cover, and loosen the nuts.
2. Lift the vehicle
3. Disassemble the wheel.

**Warning: never loosen the fixed wheel by heating, or the wheel’s service life will be reduced because of heat and the wheel bearing will be also damaged.**

### Installation

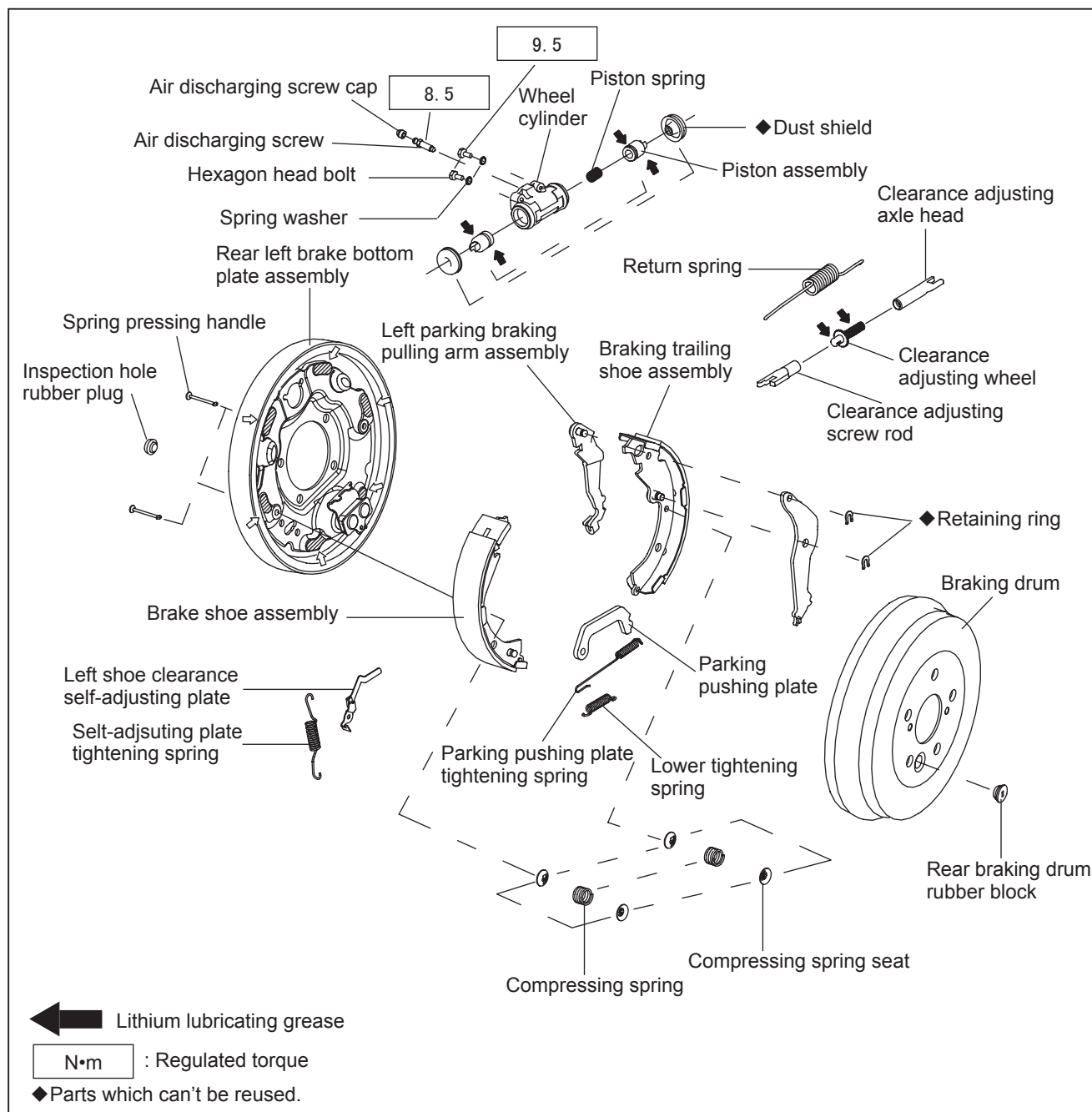
Install the wheel according the reverse disassembly procedure and perform according to the following requirements.

The wheel nuts must be loosened in 2-3 times in turn to the regulated torque so as to avoid the distortion of the wheel or the braking disc.

**Notice: before installing the wheel, scrape clean the corrosive from the installation surface of the wheel and the installation surface of the braking drum and the braking disc with a steel bush. If the contact between metals of the installation surfaces is poor when installing the wheel, it will cause the loosened wheel nuts; as a result, the wheel may drop out during the running in the future.**

**Tightening sequence: (A)--(B)--(C)--(D)--(E)**

## Rear brake Component diagram



### Disassembly of the rear brake

#### 1. Inspect the thickness of the brake pads

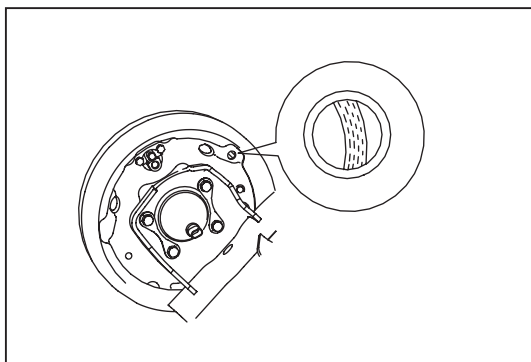
Disassemble the clearance inspection hole rubber block, and observe the thickness of the friction disc from the inspection hole. If it is less than the minimum value, the braking collar and the trailing shoe assembly should be replaced.

**Minimum thickness: 1.0 mm**

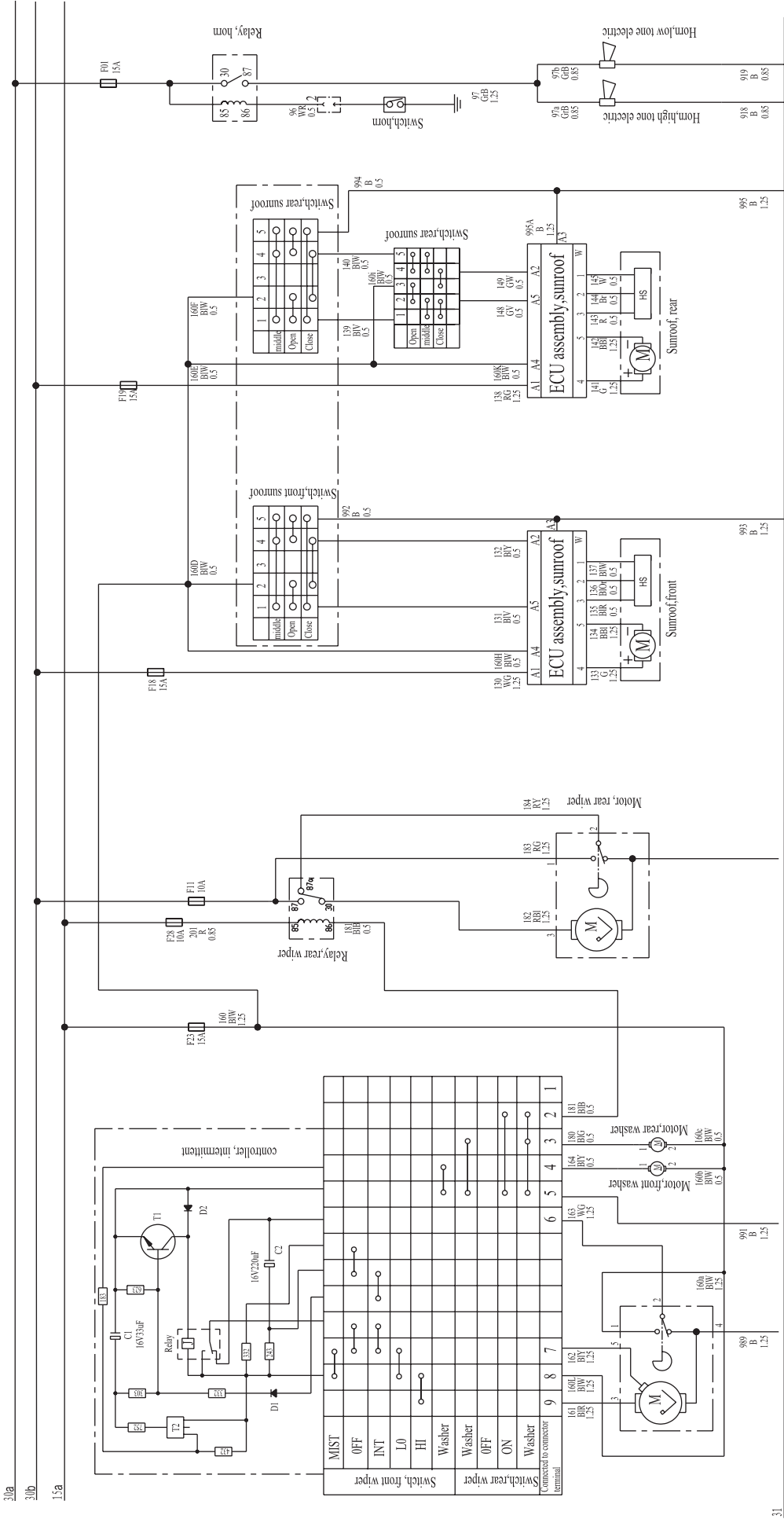
#### 2. Disassemble the rear wheel

#### 3. Drain the braking fluid

**Notice:** never make the braking fluid spray onto the paint surface.



Washer & Sunroof circuit



Motor, front  
wiper QZ4

Motor, rear wiper MZ7

Motor, front  
washer QZ10

Motor, rear  
washer QZ11

Switch, combination,  
RH (for wiper) YZ17

Spring assembly, clock, No.1  
(driver air bag horn) YZ22

Horn, low tone  
electric QZ13

Horn, high tone  
electric QZ12

160a	163	161
B1W	WG	B1R
1.25	1.25	1.25
989	162	
B	B1W	
1.25	1.25	

183	184	182
RG	RY	RB1
1.25	1.25	1.25

180	B1G	
0.5	160c	
	B1W	
	0.5	

181	180	164	991	163	162	160L	161
B1B	B1G	B1Y	B	WG	B1Y	B1W	B1R
0.5	0.5	0.5	1.25	1.25	1.25	1.25	1.25

96	383	384
WP	B1R	B1Y
0.5	0.5	0.5

97b	919
GrB	B
0.85	0.85

97a	918
GrB	B
0.85	0.85



## Airbag-6

Serial number	Fault Instruction	Removing
10	Driver side preloader, resistor too low	Possible
11	Driver side preloader, GND short circuit	Possible
12	Driver side preloader, VBATT short circuit	Possible
13	Passenger side preloader safety belt, resistor too high	Possible
14	Passenger side preloader safety belt, resistor too low	Possible
15	Passenger side preloader safety belt, GND short circuit	Possible
16	Passenger side preloader safety belt, VBATT short circuit	Possible
17	Power voltage too high	Possible
18	Power voltage too low	Possible
19	Warning light fault- join to the power bulb short circuit	Possible
20	Warning light fault-ground or filament short circuit	Possible
21	Algorithm parameter lack/ error	Impossible (replace SRS-ECU)
22	Forward collision recorded	Impossible (replace SRS-ECU)
23	Communication fault	Possible
24	Internal fault	Impossible (replace SRS-ECU)

The fault code transmission is outputted by the SRS-EUC through the serial port of the maintenance procedure to the appointed diagnosis detector(X-431 diagnosis detector) to accomplish.

## 2. Fault code diagnosis

Description of the flashing code.

Serial number	Fault	Fault code	Flashing code
1	No storage error		\$12
2	Front airbag driver, resistor too high	\$9,021	\$21
3	Front airbag driver, resistor too low	\$9,022	\$22
4	Front airbag driver, GND short circuit	\$9,024	\$24
5	Front airbag driver, WBATT short circuit	\$9,025	\$25
6	Driver side preloader, resistor too high	\$9,015	\$15
7	Driver side preloader, resistor too low	\$9,016	\$16
8	Driver side preloader, GND short circuit	\$9,018	\$18
9	Driver side preloader, VBATT short circuit	\$9,019	\$19
10	Front airbag driver, resistor too high	\$9,041	\$41
11	Front airbag driver, resistor too low	\$9,042	\$42
12	Front airbag driver, GND short circuit	\$9,043	\$43
13	Front airbag driver, VBATT short circuit	\$9,044	\$44