



FC Workshop Manual



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Preface

Geely “FC” is an automobile with high performance/price ratio and it meets the requirement of national safety, energy saving, emission regulations and personal use. This automobile is a completely new and excellent model produced by Zhejiang Geely Automobile Co., Ltd with development in self-reliance of Geely group and with self-dominated intellectual property right. It characterizes elegant appearance, energy conservation and environmental protection, safety and comfort. “FC” is a product opening a completely new viewpoint of automobile selection, because it is developed on the basis of creative design thinking that breaks through all established customs and it features perfectly balanced performance of power, space, safety, manipulation and comfort. “FC” is a competitive product for Geely developing brand and exploring mid-level automobile market, which takes over the company philosophy “make good cars that common people can afford, and let Geely cars go to the whole world” of Geely automobile. “FC” is combination of creativity and intelligence of quite a large number of automobile experts, who have been developing and searching with great concentration for more than 30 months, and it fully embodies persistent Geely style of fashion appearance and high performance/price ratio.

“FC” is equipped with engine JL4G18 completely developed and produced by Geely group. Engine JL4G18 applies the following advanced technology such as VVT, full aluminum cylinder body, plastic intake manifold, completely new VVT inside seal method, completely new OCV valve filtering method etc. with M7.9.7 electric injection system of BOSCH, and its index on power efficiency, economical efficiency, and safety efficiency etc. reaches leading level of national model with the same type. This engine features strong power, low fuel consumption, low noise and high power per liter etc.

We start to compile “FC” *Automobile Maintenance Manual*, which is divided into 27 sections with detailed description of overall structure and maintenance of engine 4G18.VVT; inspection and repair of engine BOSCH M7.9.7 electric control fuel injection system; structure and maintenance of chassis; structure and maintenance of FC electrical equipment; structure and maintenance of ABS anti-lock brake system; structure and maintenance of SRS air bag; structure and maintenance of auto air conditioning system; structure and maintenance of vehicle body etc. Information is detailed and accurate, contents are in systematic coherence and description is concise and comprehensive.

This manual is compiled from structure, which prompts “FC” service personnel to master

necessary maintenance, repair and malfunction knowledge on the basis of understanding main structure characteristics and simple principle of *vision* automobile. Electric control system of “FC” automobile is particularly described with detail, and detailed steps and methods are given for trouble shooting process. All kinds of malfunction could be eliminated quickly and efficiently within the shortest time as long as you detect as the repair steps of this manual. In addition, this manual is compiled with the following characteristics: in proper sequence, clear demarcations, easy to understand, excellent in picture and its accompanying essay, simple and clear, which is very applicable for a quite large number of “FC” automobile maintenance technicians and service personnel to refer to.

This manual is mainly compiled by Geely International Corporation; Geely Automobile Engine No. 2 Plant and engineering technicians of service corporation help complete this work. Defects and mistakes are inevitable in this manual for limited level of compiler and limited time, please contact Geely International Corporation if you find mistakes and careless omissions in using and we can correct in time and reverse in next version.

Geely International Corporation
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Note

This manual is mainly for qualified vehicle technicians, but it does not include all items on repair and maintenance.

In order to avoid personnel injury and vehicle damage caused by dangerous operation, please observe the following regulations.

- Please read this manual carefully, and particularly fully master all contents in “Precautions”.
- Maintenance methods described in the manual are quite useful for vehicle maintenance. Please adopt specified or recommended tools in maintaining vehicle as steps described in this manual; maintaining vehicle with tools or methods not specified or recommended in this manual will cause personnel injury or vehicle damage. Therefore, please consider ensuring the safety of technicians and vehicle at first before performing maintenance.
- If it is necessary to replace parts, please replace with parts of the same or similar size with original ones. It is forbidden to use inferior parts.
- In order to effectively avoid technician injury and vehicle damage and hidden danger caused by incorrect operation, it is very important to observe “Warning” and “Notes” in this manual. It particularly needs to mention that not all precautions on safety are included in “Warning” and “Notes” etc. in this manual. Therefore, please fully realize that perform maintenance not as regulations will cause dangerous consequences.

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Brief introduction on Geely model "FC"

Basic parameters

Table 1 Complete vehicle basic parameters

Number	Item name				Unit	Parameters	
1	Dimension parameters	Overall dimension		Length	mm	4602	
				Width		1725	
				Height		1480	
		Wheel track		Front wheel	mm	1482 ±15	
				Rear wheel		1462 ±15	
		Wheel base				mm	2602 ±20
		Front suspension					940 ±10
		Rear suspension					1060 ±10
2	Passenger number				Person	5	
3	Mass parameters	Complete vehicle herb mass			kg	1200 ±30	
		Max. total mass				1610 ±30	
		Weight distribution	No load	Front axle		694	
				Rear axle		436	
			Full load	Front axle		810	
				Rear axle		730	
4	Traverse ability	Min. turning diameter			m	≤ 10.3	
		Min. gound clearance			mm	≥ 125	
		Approach angle (full load)			(°)	15°	
		Departure angle (full load)			(°)	18°	
5	Front wheel alignment parameters	Front wheel camber			(°)	-0° 31′ ± 45′	
		Kingpin inclination angle			(°)	11° 19′ ± 45′	
		caster angle			(°)	2° 42′ ± 45′	
		Convergence of front wheels			mm	0 ± 2	
	Rear wheel alignment parameters	Rear wheel camber			(°)	-1° 25′ ± 45′	
		Convergence of rear wheels			mm	1.7 ± 2.5	
6	Front wheel steering wheel	Left wheel: inside/outside			(°)	37.3 ± 2/34 ± 2	
		Right wheel:inside/outside			(°)	37.3 ± 2/34 ± 2	
7	Head lamp light	Luminous intensity of high beam of head lamp			Candera	>18000	
		High beam optical axis	Left and right inclination	Left lamp		≤ 40′	
				Right lamp		≤ 40′	
			Down inclination	Left lamp		1′ ~48′	
				Right lamp		3′ ~50′	

Table 2 Types and parameters of main assembly

Number	Item name		Unit	Types and parameters
1	Engine	Model		JL4G18
		Type		4-cylinder in-line, four-stroke, water-cooling, double over-head camshaft, 16-valve, CVVT multipoint injection gasoline engine
		Electric injection system model		United Automotive Electronic Systems Co., Ltd. M7.9.7 electric injection system
		Bore	□ □	79
		Stroke	□ □	91.4
		Delivery capacity	□	1.792
		Compression ratio		10:1
		Max. power	□□/□/□□□	102/6200
		Max. torque	□·□/□/□□□	172/4200
		Idling speed	□/□□□	800 ± 50
		Ignition sequence		1-3-4-2
		Min. fuel consumption	□/□□·□	260
2	Transmission	Type		5 gears synchronizer of constant mesh gear
		Each gear ratio	1 st gear	3.182
			2 nd gear	1.895
			3 rd gear	1.25
			4 th gear	0.909
			5 th gear	0.703
			Reverse gear	3.083
		Main gear box ratio		3.928
3	Clutch type			Dry single, diaphragm spring, constant pressure
4	Steering gear			Rack-and-pinion steering gear with hydraulic power
5	Braking system	Type		Double pipeline, vacuum booster with ABS +EBD anti-lock system
		Front brake		Disc brake
		Rear brake		Disc brake
6	Suspension	Front suspension type		Strut-type front independent suspension
		Rear suspension type		Longitudinal swinging arm and anti-twist beam compound rear suspension
7	Tire	Radial tire	Specification	195/60 R15 88H
			Air pressure	□□□
		Rim		15 × 6JJ
8	Drive axle	Type		Breakaway
		Drive shaft		Ball cage and tripot type constant velocity universal joint
9	Body structure			Loaded all-metal body
10	Tail gas	Catalytic converter		Honeycomb cordierite carrier, noble metal catalyst
11	Air conditioning system	Compressor type		Swirl or swash plate compressor
		Nominal refrigerating capacity	□	4200
		Refrigerant		R134a

Table 3 Main performance parameters of complete vehicle

Number		Item name	Unit	Parameters	Remarks
1	Power performance	Max. vehicle speed	km/h	185	GB/T12544
		0-100 km/h accelerating time	s	≤ 12	GB/T12543
		Accelerating time from 30km/h to 100km/h at 4 th gear	s	≤ 18.5	
		Min. stable vehicle speed at 4 th gear	km/h	≤ 25	GB/T12547
		Max. climbing speed	%	≥ 40	GB/T12539
2	Economy performance	Slide Distance (full-load, initial speed 50km/h)	m	≥ 500	GB/T12536
		Fuel consumption with 4 operating modes	L/100 km	≤ 9.5	GB/T12545.1
		Average fuel consumption at specified operating mode	L/100 km	≤ 6.5	GB/T12545
3	Seal performance	Dust sealing degree	%	≥ 95	GB/T12478
		Rain protection seal limit value	分	≥ 93	GB/T12480
4	Ride performance	Weighted acceleration root of mean square	m/s ²	≤ 0.8123	
		Equivalent mean value	dB	≤ 118.0	
		Reduced comfort boundary	h	≥ 0.8	
5	Reliability	Average mileage to first failure	km	≥ 5000	
		Average mileage between failures	km	≥ 4000	
		Efficient degree	%	>95	

Maintenance period

Regular maintenance items

Your precious automobile should be maintained according to maintenance period at normal conditions (see table on maintenance period at normal conditions)



If your precious automobile is mainly driven under one or more of the following conditions, some maintenance items must be performed more frequently (see table on maintenance period at severe conditions).

A. Road conditions

1. Driving on rugged, muddy or melting snow road.
2. Driving on dusty road.

B. Driving conditions

1. Towing tail vehicle, equipped with camp frame or top storage racks.
2. Repeated on short-distance driving within 8 km and the temperature is below 0°C.
3. Vehicles driven for long distance under idle speed or low speed over a long period of time, such as police car, taxi or delivery truck.
4. Continuously driving at high speed for more than 2 hours frequently. (With 80% of max. vehicle speed)
5. Vehicles driven with idle speed or low speed over a long period of time or frequently accelerated or decelerated, such as training car of driving training class.

Table on maintenance period at normal conditions

Maintenance content:

I: Inspection and correction or replacement if necessary R: Replacement

Maintenance period (Odometer readings or operating months, subject to the first coming)	mileage reading × 1000km	7.5	15	22.5	30	37.5	45	53.5	60	67.5	75	82.5	90	months
Engine basic elements														
1. Valve clearance* ¹		.	.	.	I	.	.	.	I	.	.	.	I	96
2. Drive belt		.	I	.	I	.	I	.	I	.	I	.	I	24
3. Engine oil (APLSJ,SL or ILSAC) * ²		R	R	R	R	R	R	R	R	R	R	R	R	12
4. Oil filter* ²		R	R	R	R	R	R	R	R	R	R	R	R	12
5. Cooling and heating system hose and joint* ^{3*4}		.	.	.	I	.	.	.	I	.	.	.	I	24
6. Engine coolant* ^{5*6}		.	I	I	I	I	R	I	I	I	I	I	I	-
7. CVVT oil duct filter screen			I		R		I		R		I		R	
8. Exhaust pipe and fixed mount		.	I	I	I	I	I	I	I	I	I	I	I	12
Ignition system														
9. Spark plug		.	.	.	R		.	.	R	.	.	.	R	-
10. Battery		I	I	I	I	I	I	I	I	I	I	I	I	12
Fuel and exhaust gas control system														
11. Fuel filter		.			R	.		.	R	.	.	.	R	-
12. Air filter core		I	R	I	R	I	R	I	R	I	R	I	R	I:6 R:12
13. Connecting conditions of fuel tank cover, fuel pipe and fuel evaporation control valve* ⁷		.	.	.	I	.	.	.	I	.	.	.	I	24
14. Activated carbon canister		I	.	.	.	I	60
Chassis and vehicle body														
15. Brake pedal and parking brake		I	I	I	I	I	I	I	I	I	I	I	I	6
16. Brake pad and brake disc		I	I	I	I	I	I	I	I	I	I	I	I	6
17. Brake fluid		I	I	I	R	I	I	I	R	I	I	I	R	I:6 R:24
18. Brake Pipe and hose		.	I	I	I	I	I	I	I	I	I	I	I	12
19. Power steering oil		I	I	I	I	I	I	I	I	I	I	I	I	6
20. Steering wheel, steering linkage and gear box oil		.	I	I	I	I	I	I	I	I	I	I	I	12
21. Drive shaft dust cover		I	I	I	I	I	I	I	I	I	I	I	I	24
22. Ball joint and dust cap		.	I	I	I	I	I	I	I	I	I	I	I	12
23. Transmission oil		.	I	I	R	.	I	I	R	.	I	I	R	24
24. Front and rear suspension		I	I	I	I	I	I	I	I	I	I	I	I	12
25. Tire and tire pressure		I	I	I	I	I	I	I	I	I	I	I	I	6
26. All light, horn, wiper and washer		I	I	I	I	I	I	I	I	I	I	I	I	6
27. Air conditioner cleaning filter screen		.	.	R	.	.	R	.	.	R	.	.	R	12
Air conditioning system/ secondary refrigerant		.	I	.	I	.	I	.	I	.	I	.	I	12

Note: *¹ Indicating that check valve noise and engine vibration condition, and adjust them if necessary.

*² It is suggested that see operating modes on page 116 of operating instruction to perform.

*³ Indicating that check once every 20000km or 12 months after 80000km or 48 months.

*⁴ Indicating that check water tank and condenser are blocked by leaves, dust or insects, and clean hose connections.

*⁵ Replace at initial 60000km, and replace every 30000km in future.

*⁶ Only "Geely genuine ultra-long engine coolant" or equivalent high-quality ethylene glycol engine coolant without silicate, amines, nitrite, borate and with long-life compound organic acid technology are allowed to use, and coolant should be repeated several times until it is filled up.

*⁷ Indicating that check once every 20000km or 12 months after 80000km or 48 months.

Table on maintenance period at severe conditions

According to the driving conditions listed below, maintenance should be performed to the items that should be maintained more frequently (for other items not listed, please see Table on maintenance period at normal conditions)

A-1: Driving on rugged, muddy or melting snow road	
<input type="checkbox"/> Inspection of brake pad and brake disc	Every 5,000 km or 3 moths
<input type="checkbox"/> Inspection of brake pipeline and hose	Every 10,000 km or 6 moths
<input type="checkbox"/> Inspection of ball joint and dust cover	Every 10,000 km or 6 moths
<input type="checkbox"/> Inspection of drive shaft dust cover	Every 10,000 km or 12 moths
<input type="checkbox"/> Inspection of the steering wheel, steering linkage and gear box oil	Every 5,000 km or 3 moths
<input type="checkbox"/> Check of front and rear suspension	Every 10,000 km or 6 moths
A-2: Driving on dusty road	
<input type="checkbox"/> Replacement of engine oil	Every 5,000 km or 6 moths
<input type="checkbox"/> Replacement of engine oil filter	Every 5,000 km or 6 moths
<input type="checkbox"/> Inspection or replacement of air filter core	I: Every 2,500 km or 3 moths R: Every 10,000 km or 6 moths
<input type="checkbox"/> Inspection of brake block and brake disc	Every 5,000 km or 3 moths
<input type="checkbox"/> Replacement of air conditioner cleaning filter screen	Every 15,000 km
B-1: Towing tail vehicle, equipped with camp frame or top storage racks	
<input type="checkbox"/> Replacement of engine oil	Every 5,000 km or 6 moths
<input type="checkbox"/> Replacement of engine oil filter	Every 5,000 km or 6 moths
<input type="checkbox"/> Inspection of brake pad and brake disc	Every 5,000 km or 3 moths
<input type="checkbox"/> Inspection or replacement of transmission oil	Every 60,000 km or 24 moths
<input type="checkbox"/> Inspection of front and rear suspension	Every 10,000 km or 6 moths
<input type="checkbox"/> Screwing down the bolts and nuts of the chassis and vehicle body	Every 10,000 km or 6 moths
B-2: Repeated on short-distance driving within 8 km and the temperature is below 0°C	
<input type="checkbox"/> Replacement of engine oil	Every 5,000 km or 6 moths
<input type="checkbox"/> Replacement of engine oil filter	Every 5,000 km or 6 moths
B-3: Vehicles driven for long distance under idle speed or low speed over a long period of time, such as police car, taxi or delivery truck	
<input type="checkbox"/> Replacement of engine oil	Every 5,000 km or 6 moths
<input type="checkbox"/> Replacement of engine oil filter	Every 5,000 km or 6 moths
<input type="checkbox"/> Inspection of PCV valve and pipelines	Every 5,000 km or 6 moths
<input type="checkbox"/> Inspection of brake block and brake disc	Every 5,000 km or 3 moths
B-4: Continuously driving at high speed for more than 2 hours frequently (With 80% of max. vehicle speed)	
<input type="checkbox"/> Replacement of transmission oil	Every 40,000 km or 12 moths
B-5: Vehicles driven with idle speed or low speed over a long period of time or frequently accelerated or decelerated, such as student car of driving training class.	
<input type="checkbox"/> Replacement of engine oil	Every 3,000 km or 3 moths
<input type="checkbox"/> Replacement of engine oil filter	Every 3,000 km or 3 moths
<input type="checkbox"/> Inspection of PCV valve and pipelines	Every 3,000 km or 3 moths

Engine control system

EFI system

On-vehicle inspection

1. Inspection of the voltage of power steering oil pressure sensor

Measure the voltage between PS terminal and E2 terminal with ohmmeter

Conditions	Voltage (V)
Not turning steering wheel with engine at idle speed	8–14
Turning steering wheel with engine at idle speed	0-1.5

2. Inspection of stepping motor

- (a) With engine running at idle speed, pull out the connection harness of stepping motor, and the change of engine rotating speed indicates that the stepping motor operates normally.
- (b) Pull out the connection harness of stepping motor, and measure the terminal current with universal meter. When engine is running, there being impulse current output at the terminal indicates that there is no trouble with ECU and stepping motor control system, and if idling is not stable at the moment and deviates greatly from specified value, the stepping motor should be replaced. If there is no impulse current output at the terminal, turn on air conditioner to test again, and still no impulse current output indicates that there is trouble with ECU and stepping motor control system circuit.
- (c) Check the malfunction of stepping motor circuit with diagnostic instrument.

Inspection

1. VVT control solenoid valve assembly (4G18-1006200)

(a) Resistance inspection

- (1) Measure the resistance between terminals with ohmmeter

Resistance: $10.5 \sim 0.6 \Omega$ at 20°C

(b) Operation inspection

Connect battery positive (+) wire to No.1 terminal and negative (-) wire to No. 2 terminal, and check valve operation.

Note: ensure that the valve is not stuck.

Hint: if there are foreign matters in the valve, the valve could not be closed tightly and will thus result in slight pressure being lifted toward higher direction.

2. Throttle body components (4G18-1001240)

(a) Inspection of throttle body

- (1) Throttle valve shaft should not swing.
- (2) All channels should not be blocked.
- (3) Throttle valve plate should rotate flexibly and act smoothly.
- (4) When the throttle is at closed position, there should be no clearance between throttle stop bolts and throttle lever.

Note: it is not allowed to adjust the throttle stop bolts.

3. Throttle position sensor (4G18-3600080)

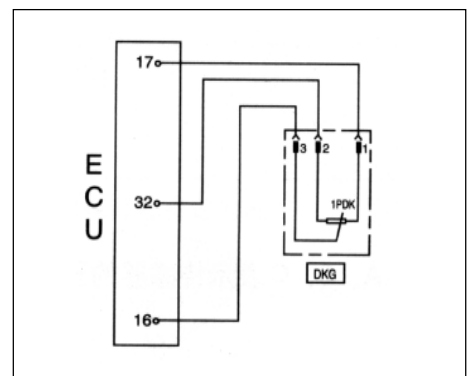
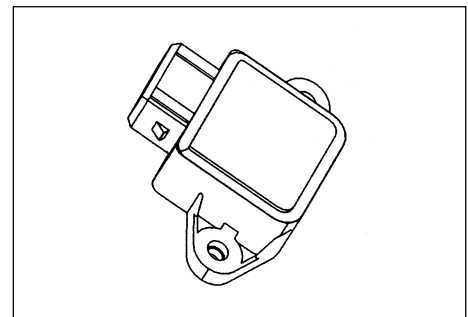
(a) Resistance inspection

- (1) Remove the wiring harness connectors of throttle position sensor.

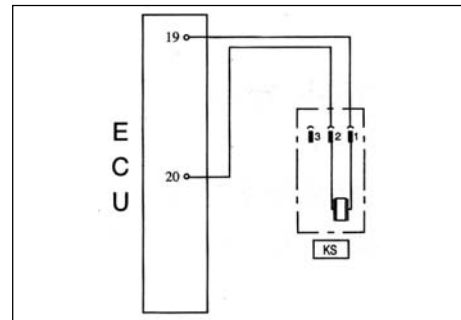
- (2) Measure the resistance between 1# pin and 2# pin with ohmmeter, resistance value: $1.6 \sim 2.4 \text{ k}\Omega$.

- (3) Connect 2 terminals respectively to 1# pin and 3# pin, and turn the throttle, the resistance value varies linearly with the opening of throttle, but 2# pin and 3# pin are contrary to this.

Note: pay attention whether there is great jump with resistance value when observing resistance change.

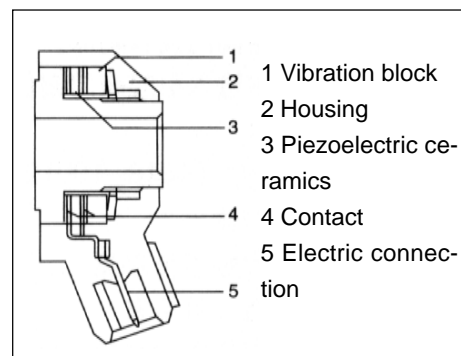


4. Knock sensor (4G18-3600020)



Measuring method:

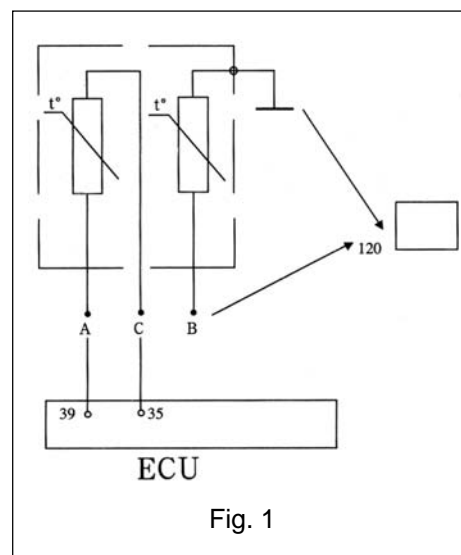
(Removing the joint) place digital universal meter at ohm gear, and connect 2 terminals respectively to 1[#] pin and 2[#] pin, and the resistance under normal temperature should be more than 1M Ω . Place digital universal meter at millivolt gear, and knock around knock sensor with a hand hammer, there should be voltage signal output at the moment.



5. Water temperature sensor (4G18-3600040)

This sensor applies sealing NTC thermal resistor in temperature sensor, and resistance value varies with ambient temperature, thus slight change of outside temperature could be measured. Measuring its output resistance could reflect the temperature of contact media. Signals from A and C are sent to ECU, and Signals from B and earth are sent to instrument.

Operating principle (Fig. 1):



Note: A, B and C represent 3 pins of sensor, and see pin root for the mark.

Use digital universal meter to measure:

Resistance-temperature characteristics of temperature sensor

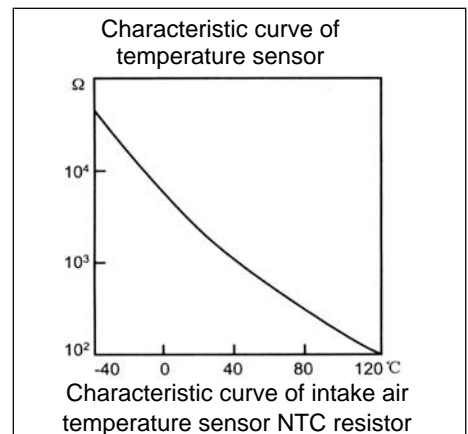
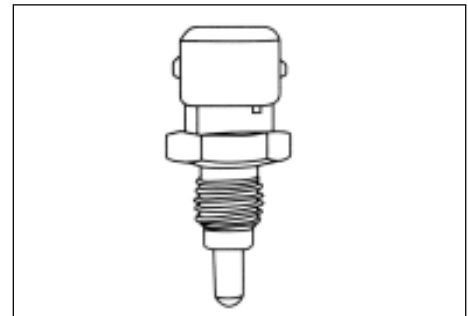
Temperature range(℃)	Resistance at A and C(K Ω)
-20 ± 0.1	13.71–16.49
25 ± 0.1	1.825–2.155
80 ± 0.1	0.303–0.326
110 ± 0.1	0.1383–0.1451
	Resistance at B(Ω)
50 ± 0.2	176–280
80 ± 0.2	63.4–81.4
110 ± 0.2	24.6–30.6

6. Intake air temperature sensor (4G18-3600090)

Intake air temperature sensor is a resistor with negative temperature coefficient (NTC), resistance varies with intake air temperature, and this sensor sends a voltage indicating change of intake air temperature to controller.

Simple measuring method:

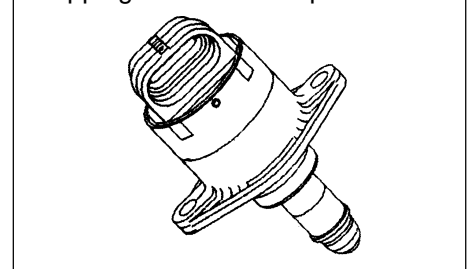
(Removing the joint) place digital universal meter at ohm gear, and connect 2 terminals respectively to 1[#] pin and 2[#] pin of sensor, and rated resistance at 20℃ is $12.5k\ \Omega \pm 5\%$, and other corresponding resistance values could be measured according to the characteristic curve in above drawing. Analog method could also be applied in measurement. Use an electric blower to blow air into the sensor (pay attention not to keep them too near), and observe the change of resistance, which should decrease at the moment.



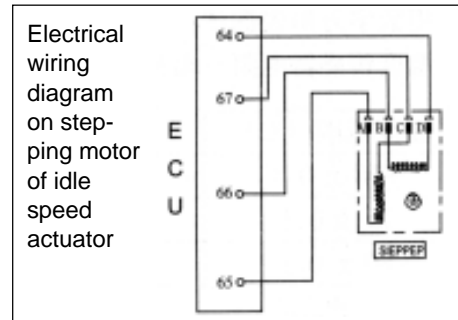
7. Stepping motor (4G18-3600070)

Schematic diagram and pins

Stepping motor of idle speed actuator



Pins: Pin A is connected to ECU No. 65 pin
Pin B is connected to ECU No. 66 pin
Pin C is connected to ECU No. 67 pin
Pin D is connected to ECU No. 64 pin



Maintenance precautions:

1. It is not allowed to apply any force at axial direction with the purpose of pressing into or pulling out the axle;
2. Before idle speed regulator with stepping motor is mounted into throttle body, its shaft must be at fully retractive position;
3. Pay attention to clean and maintain bypass air passage frequently;
4. After removing battery or ECU, pay attention to self-teach stepping motor in time.

Self-teach method of M7 system: turn on ignition switch but not start engine immediately, and start it after 5 seconds. If engine idle speed is found bad at the moment, it is necessary to repeat the above steps.

Simple measuring method: (removing the joint) place digital universal meter at ohm gear, and connect 2 terminals respectively to Ad pin and BC pin of regulator, and rated resistance at 20°C is $53 \pm 5.3 \Omega$.

Throttle body assembly

Removing, installing and disassembling, assembling

- 1. Discharge coolant (see Page 73).**
- 2. Remove air cleaner hose assembly.**
- 3. Remove engine plastic hood components [4G18-1000310].**
- 4. Remove throttle pull cable assembly.**
- 5. remove throttle body assembly [4G18-1008240].**
 - (a) Uncouple throttle position sensor joint and stepping motor joint.
 - (b) Disassemble ventilation hose.
 - (c) Remove 2 bolts and throttle control pull cable bracket.
 - (d) Remove 2 preheating water inlet and outlet hoses of throttle.
 - (e) Remove 2 bolts and 2 nuts, and remove throttle body from intake air manifold.
- 6. Remove stepping motor of throttle body [4G18-3600070].**

Remove 3 screws and stepping motor.
- 7. Install stepping motor of throttle body.**

Install stepping motor.
- 8. Install throttle body assembly.**
 - (a) Install new seal gasket on intake air manifold.
 - (b) Install throttle body, 2 bolts and 2 nuts.

Torque: $25 \pm 5 \text{ N} \cdot \text{m}$
- 9. Refill coolant.**
- 10. Check there is leakage with coolant.**

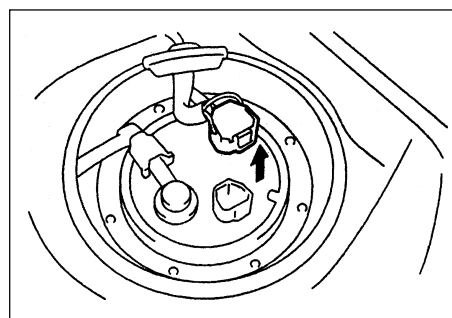
Fuel

Fuel system

Precautions

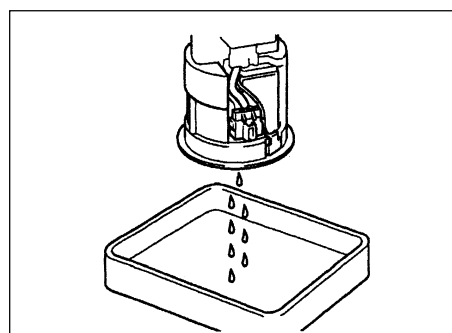
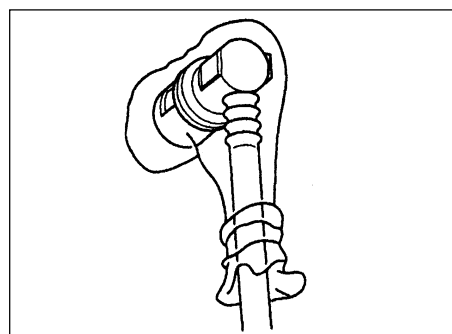
1. Before repairing fuel system, uncouple battery negative (-) wire at first.
2. When operating on fuel system, do not smoke or repair near fire area.
3. Do not let gasoline come into contact with rubber or leather parts.
4. Take measures to prevent gasoline leaking.

- (a) Uncouple electric fuel pump joint.
- (b) Start engine and turn ignition switch to LOCK position after the engine flames out.
- (c) Uncouple battery negative (-) wire.
- (d) Couple electric fuel pump joint.



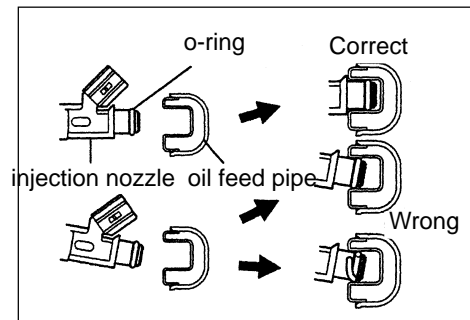
5. Fuel system

- (a) There will be a great amount of gasoline flowing out when disassembling high-pressure fuel pipe, therefore, it is required to observe the following procedures.
 - (1) Take measures to prevent gasoline leaking.
 - (2) Disassemble fuel pipe.
 - (3) Completely discharge the oil in fuel pipe.
 - (4) Cover the fuel pipe with plastic bag to avoid pipe damage and foreign matters entering.
 - (5) Place a container under the joint.

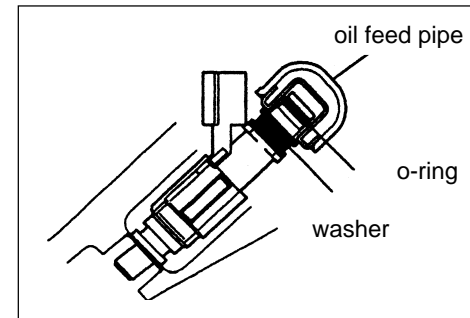


- (b) When removing and installing injection nozzle, always observe the following precautions.

- (1) It is not allowed to use o-ring repeatedly.
- (2) When installing o-ring, always be careful to avoid damaging o-ring.
- (3) Before installing, coat o-ring with spindle oil or gasoline. It is not allowed to coat with engine oil, gear oil or brake fluid.



- (c) As shown in the diagram, install injection nozzle to oil feed pipe and cylinder head. Before installing, ensure that spindle oil and gasoline are coated at the contact position between o-ring and oil feed pipe.



- (d) When disassembling oil feed pipe, always observe the following precautions.
 - (1) Remove oil feed pipe clips.
 - (2) Remove oil feed hose.
 - (3) Cover oil inlet of fuel distribution pipe with plastic bag to avoid foreign materials entering the fuel distribution pipe.

6. Inspection of fuel leakage

- (1) After completing maintenance, check there is leakage with the whole fuel system.
- (2) Connect hand-held tester to diagnostic joint.
- (3) Turn ignition switch to ON and turn main switch of hand-held tester to ON.
- (4) Switch hand-held tester to function test state.
- (5) For further details, please see hand-held tester operating instruction.
- (6) If there is no hand-held tester, connect battery anode and cathode to electric fuel pump joint.
- (7) Ensure that there is no leakage with all parts of electric fuel pump.
- (8) Turn ignition switch to LOCK.
- (9) Disassemble hand-held tester from diagnostic interface joint.

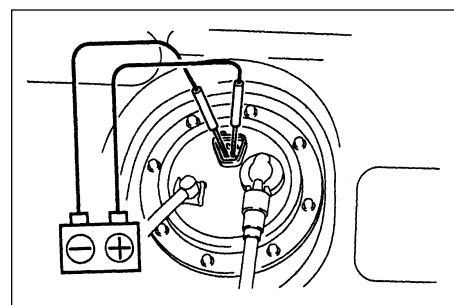
On-vehicle inspection

1. Inspection of fuel pump function

- (a) Connect hand-held tester to diagnostic joint.
- (b) Turn ignition switch to ON and turn main switch of hand-held tester to ON.

Note: do not start the engine.

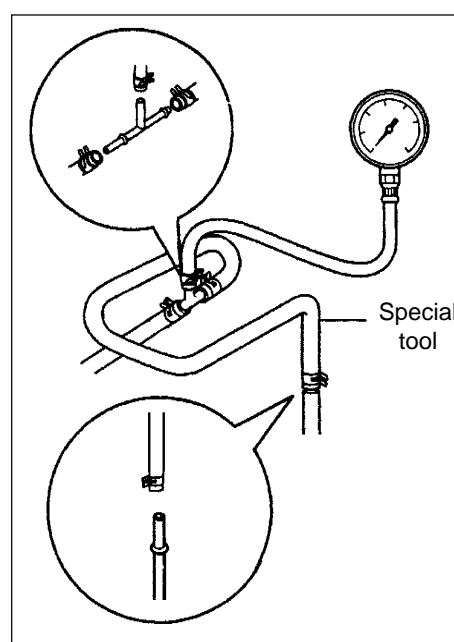
- (c) Switch hand-held tester to function test state.
- (d) For further details, please see hand-held tester operating instruction.
- (e) If there is no hand-held tester, connect battery positive (+) wire to P+ terminal and negative (-) wire to P- terminal.



2. Inspection of fuel pressure

- (a) Preparation of inspection.
Purchase new fuel hose and take out fuel pipe joint.
- (b) Take measures to prevent gasoline leaking.
- (c) Disassemble fuel pipe clamp at fuel pipe joint of fuel rail component.
- (d) Disassemble fuel hose from fuel pipe of fuel rail component.
- (e) As shown in the diagram, install special tool (pressure gauge) with special tool and fuel pipe joint.

- (f) Check there is fuel leakage.
- (g) Start engine.
- (h) Measure the fuel pressure at idle speed state.
Fuel pressure: 390~400Pa
- (i) Take measures again to prevent gasoline leaking.
- (j) After measuring the fuel pressure, remove special tool.
- (k) Connect back fuel hose.
- (l) Install fuel hose fixing clip to fuel pipe joint.
- (m) Check there is fuel leakage.



Inspection

1. Fuel injector components [4G18-1112120]

(a) Check injection nozzle resistance.

(1) Measure the resistance between terminals with ohmmeter.

Resistance: 11~17 Ω at 20°C

Hint: if resistance is not within specification, replace injection nozzle.

(b) Injection nozzle test.

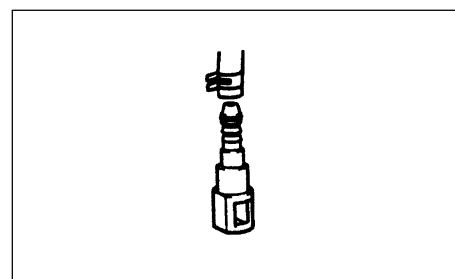
Warning: there should be no sparks during testing.

(1) Purchase new fuel pipe and take out fuel hose joint.

(2) Install special tool and fuel hose joint to fuel pipe.

Note: Only after performing precautions could the connection operation of fuel hose joint (fast-joint mode) be allowed to perform.

Warning: before connecting fuel pipe joint (fast-joint mode), please read precautions carefully

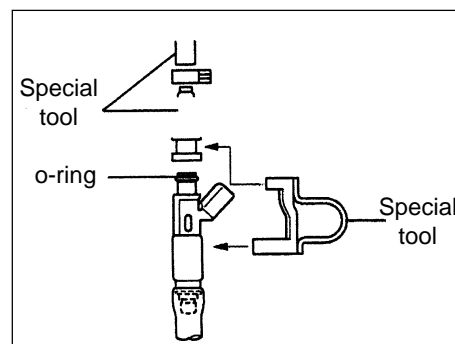


(3) Install o-ring to injection nozzle.

(4) Connect special tool (joint and hose) to injection nozzle, and hold down the injection nozzle to prevent fuel splash.

(5) Place injection nozzle into measuring cup.

Hint: install proper hose on injection nozzle to prevent gasoline injecting out of the cup.



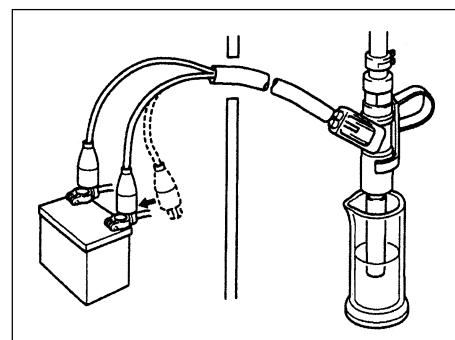
(6) Connect special tool to injection nozzle joint.

(7) Connect special tool to battery for 15 seconds, and measure the injection volume with measuring cup, each injection nozzle should be test for 2~3 times.

Injection volume:

Engine	Injection volume	Uneven volume between each injection nozzle
JL4G18	60~73cm ³ Every 15 seconds	13cm ³ or less

Hint: if injection volume is not within specification, replace injection nozzle.



Injection nozzle assembly

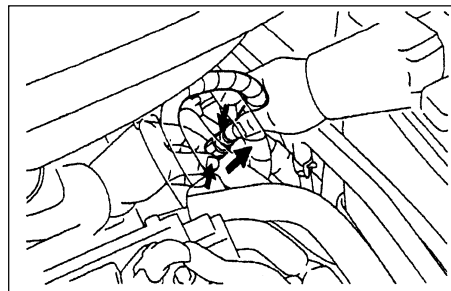
Replacement

1. Take measures to prevent gasoline leaking.
2. Remove engine plastic hood components.
3. Uncouple engine wire harness [4G18-3724100].

- (a) Remove injection nozzle joint.
- (b) Remove exhaust gas hose.

4. Remove fuel pipe assembly

- (a) Loosen oil feed hose clips.
- (b) Pull oil feed hose away from fuse distribution pipe.



Notes:

- Check there is dirt on fuel pipe and its joint before removing, and clean it off in the case of dirt.
- It is only allowed to remove with hands.
- Check there are foreign matters with the removed fuel pipe seal surface, and clean them off in the case of foreign matters.
- Cover the fuel pipe with plastic bag to avoid pipe damage and foreign matters entering.

5. Remove fuel pipe assembly

Remove 2 bolts and oil feed pipe (together with injection nozzle).

6. Remove injection nozzle components.

Pull out 4 injection nozzles from oil feed pipe.

7. Install injection nozzle components.

Coat a thin layer of gasoline on o-ring and rotate left and right to push injection nozzle into oil feed pipe.

Notes:

- Be careful not to rotate o-ring.
- Check injection nozzle could rotate smoothly after it is installed, and if not replace with new o-ring.

8. Install fuel hose assembly.

Install fuel hose to oil feed pipe.

Notes:

- Check there are damage or foreign matters in the binding site of fuel pipe.
- After installing, pull the fuel pump with hands to check the fuel pipe is bound firmly with joint.

9. Install fuel rail component [4G18-1112110].

- (a) Check injection nozzle o-ring and replace if there is damage.
- (b) Install isolator on cylinder head.
- (c) Install fuel rail component together with injection nozzle.

Torque: 19N • m

- (d) Install fuel pipe fixing clip.

Torque: 9N • m

10. Check the function of electric fuel pump and check there is fuel leakage.

Fuel pump assembly

Removing, installing and disassembling, assembling

1. Take measures to prevent gasoline leaking
2. Remove rear seat cushion assembly
3. Remove rear floor repairing hole cover
4. Remove No. 2 fuel evaporation assembly

Notes:

- Check there is contaminant looked like dirt around the joint before operating and clean it off in the case of contaminant.
- Be careful of the contaminant looked like dirt, because fast-joint depends on o-ring to seal fuel pipe and joint.
- Do not perform this operation with tools.
- Do not bend or distort nylon hose.
- Cover the joint with plastic bag after removing the fuel hose.
- When the joint is stuck with fuel pipe, clip the hose with fingers and rotate carefully to release the hose, and then remove it.

5. Remove fuel tank main fuel hose and oil return pipe assembly

Notes:

- Check there is contaminant looked like dirt around the joint before operating and clean it off in the case of contaminant.
- Be careful of the contaminant looked like dirt, because fast-joint depends on o-ring to seal fuel pipe and joint.
- Do not perform this operation with tools.
- Do not bend or distort nylon hose.
- Cover the joint with plastic bag after removing the fuel hose.
- When the joint is stuck with fuel pipe, clip the hose with fingers and rotate carefully to release the hose, and then remove it.

6. Remove fuel pump assembly

- (a) Screw off fuel pump tighten nut (plastic fuel tank) or remove 6 screws (iron fuel tank).
- (b) Pull out fuel pump assembly.

Notes:

- Do not damage fuel pump filter screen.
- Be careful not to bend the measuring oil arm of fuel gauge float unit.

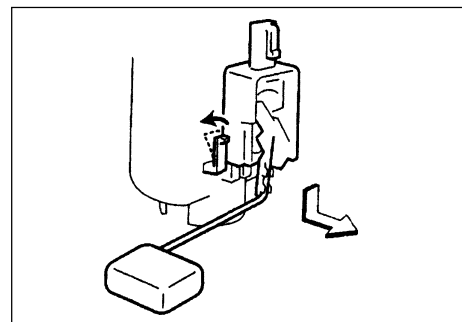
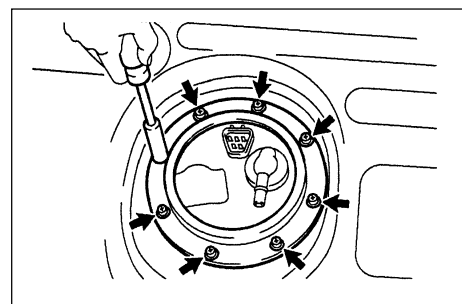
7. Install fuel pump assembly

Torque: 8 N.m

8. Install rear floor repairing hole cover

Install rear floor repairing hole cover with butyl rubber cloth.

9. Check there is fuel leakage.



Fuel tank assembly

Removing, installing and disassembling, assembling

1. Take measures to prevent gasoline leaking
(see Page 14)
2. Remove rear seat cushion assembly
3. Remove rear floor repairing hole cover
4. Remove No. 2 fuel evaporation assembly
5. Remove fuel tank main fuel hose and oil return pipe assembly
6. Remove fuel pump assembly
7. Discharge fuel
8. Remove front floor bracket
9. Remove front exhaust pipe assembly
 - (a) Move away carpet and remove oxygen sensor joint.
 - (b) Remove front exhaust pipe assembly
10. Disassemble the vent pipe of fuel hose
11. Disassemble filler pipe from fuel tank
12. Remove No. 2 fuel evaporator hose assembly

Press fuel hose joint and then pull out the hose.

Notes:

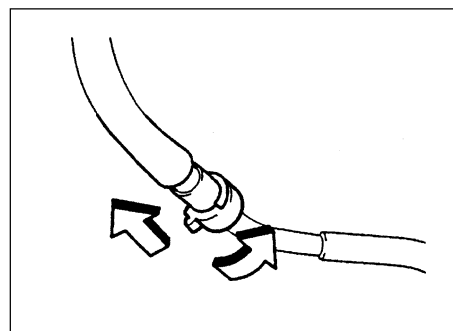
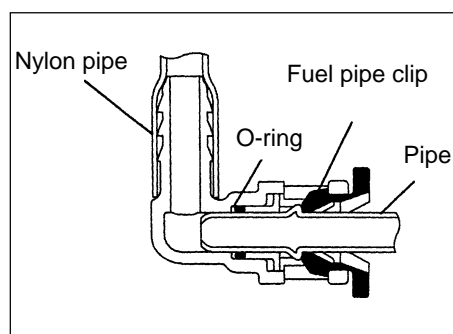
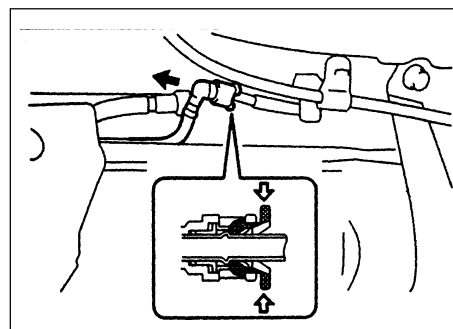
- Check there is contaminant that looked like dirt around the joint before operating and clean it off in the case of contaminant.
- Be careful of the contaminant that looked like dirt, because fast-joint depends on o-ring to seal fuel pipe and joint.
- Do not perform this operation with tools.
- Do not bend or distort nylon hose.
- Cover the joint with plastic bag after removing the fuel hose.
- When the joint is stuck with fuel pipe, clip the hose with fingers and rotate carefully to release the hose, and then remove it.

13. Disassemble fuel tank main fuel hose assembly

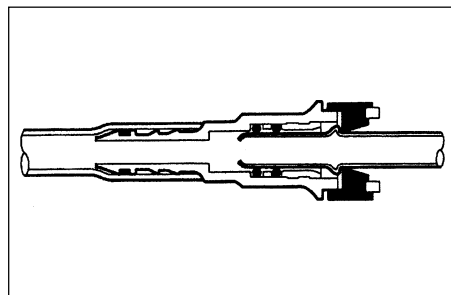
Clip the protrusion part of fixing ring and move lock claw toward open direction, and then pull out the hose as shown in the diagram.

Notes:

- Check there is contaminant looked like dirt around the joint before operating and clean it off in the case of contaminant.



- Be careful of the contaminant that looked like dirt, because fast-joint depends on o-ring to seal fuel pipe and joint.
- Do not perform this operation with tools.
- Do not bend or distort nylon hose.
- Cover the joint with plastic bag after removing the fuel hose.
- When the joint is stuck with fuel pipe, clip the hose with fingers and rotate carefully to release the hose, and then remove it.



14. Remove fuel tank assembly

- Remove parking brake pull cable retaining clip.
- Place jack under fuel tank. Remove fuel tank band harness and fuel tank assembly.

15. Remove fuel tank main fuel hose and oil return pipe assembly

16. Remove No. 2 fuel evaporation hose assembly

17. Remove No. 1 fuel tank gasket

18. Remove No. 1 fuel tank protector

Remove rivet with electric drill and then remove fuel tank protector.

19. Install No. 1 fuel tank protector

Install fuel tank protector with rivet.

20. Install No. 1 fuel tank gasket

As shown in the diagram, install new fuel tank gasket.

21. Install fuel tank assembly

Torque: 39 N.m

22. Install front exhaust pipe assembly

Torque: 40 N.m

23. Install front floor bracket

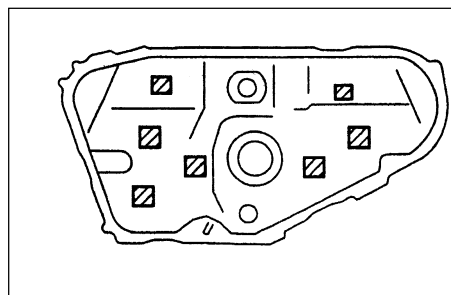
Torque: 30 N.m

24. Install rear floor repairing hole cover

Install rear floor service hole cover with butyl rubber cloth.

25. Check fuel leakage (see Page 14)

26. Check gas leakage of exhaust system



Exhaust gas control

Exhaust gas control system

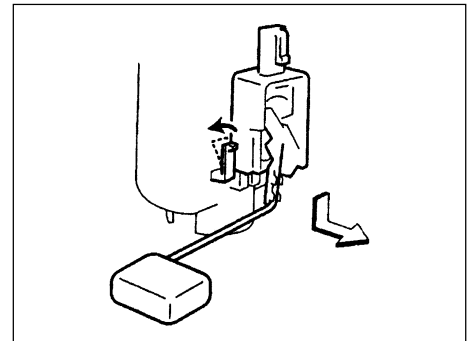
On-vehicle inspection

1. Check oxygen sensor.

- (a) Let the engine run at idle speed for 3 minutes to ensure oxygen sensor reaches operating temperature of 350°C.
- (b) Place digital universal meter at DC voltage gear, and connect 2 terminals respectively to (gray) pin and (black) pin of sensor, and voltage should fluctuate quickly between 0.1-0.9V at the moment.

Warning:

- Perform inspection immediately after warming up vehicle.
- If voltage change could not be confirmed, it is necessary to heat oxygen sensor again.

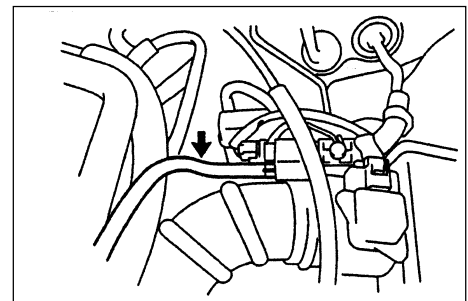


2. Check rotating speed after fuel cut off.

- (a) Accelerate engine at least to 3500rpm.
- (b) Check the operating noise of injection nozzle with listening device.
- (c) When throttle is released, check the operating noise of injection nozzle recovers after stop.

3. Check fuel evaporation exhaust control system.

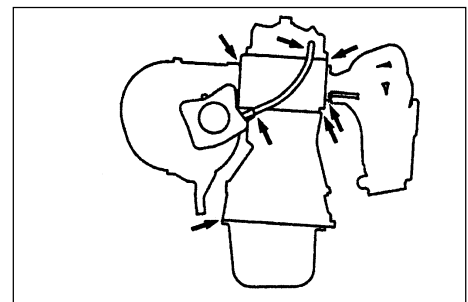
- (a) Check the pipe clamps of connecting pipeline between charcoal canister and carbon canister solenoid valve are firmly clipped and check there is leakage.
- (b) Check there is trouble with fuel evaporation exhaust control system with failure diagnostic instrument.



4. Visually check hose, joint and hot fin.

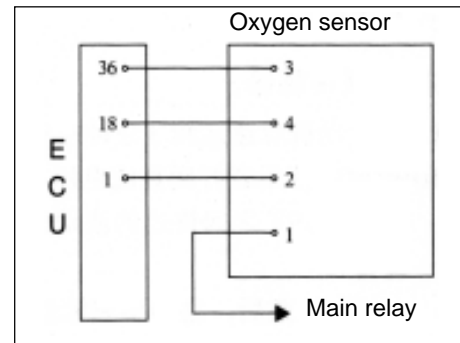
Check cracks, leakage and damage.

Hint: the disconnecting of engine oil level gauge, oil opening cover and PCV hose may cause running failure of engine. The cracks, looseness and not connecting at the intake system between throttle and cylinder head will result in redundant air entering and running failure of engine.



5. Check heater resistance of heated oxygen sensor.

- (a) Uncouple oxygen sensor joint.
- (b) Place digital universal meter at ohm gear, and connect 2 terminals respectively to 1# (white) pin and 2# (black) pin, and the resistance under normal temperature is 1~6 Ω .



6. Check fuel tank cover.

Visually check fuel tank cover and gasket are distorted or damaged.

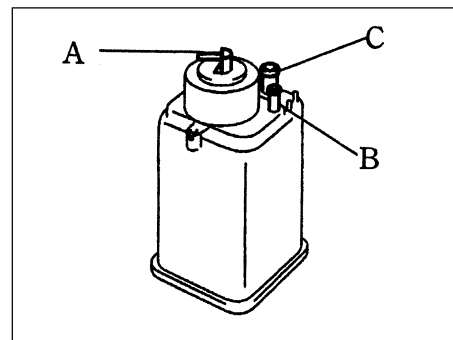
Inspection

1. Carbon canister assembly [4G18-1129020]

Carbon canister assembly. Check the function of carbon canister according to the following tables.

Standard:

Inspection Methods	Standard
Close B hole and C hole and then supply vacuum to A hole	No leakage
Close C hole and then supply vacuum to A hole	Air flown out from B hole
Close C hole and then blow air into A hole	Air flown out from B hole
Blow air into A hole	Air flown out from B hole and C hole



2. Carbon canister control valve

(a) For carbon canister control valve, check the conduction between terminals.

Resistance: 22-30 Ω at 20°C

(b) Check the control valve operates.

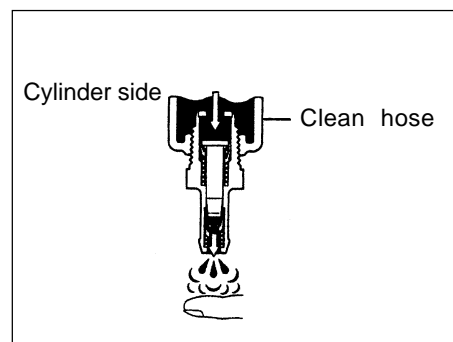
(1) Supply battery voltage to its terminal.

(2) Check air is flown as the arrow direction on valve body.

3. PCV valve assembly [4G18-1014110]

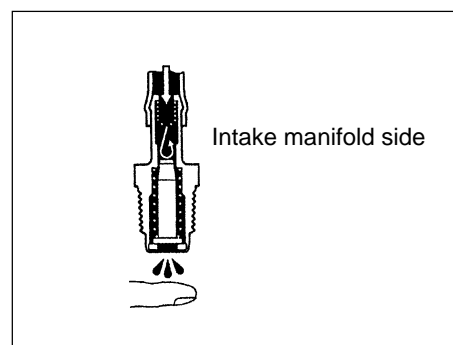
(a) Blow air into valve from cylinder side and check the air is easy to get through.

Warning: do not suck against the valve, because the gasoline left in the valve will make you be injured.



(b) Blow air into valve from intake manifold side and check the air is hard to get through.

Hint: if the function does not conform to the standard, PCV valve should be replaced.



Engine mechanism

Engine assembly

Inspection

1. Check coolant.
2. Check engine oil.
3. Check battery.
4. Check air filter assembly.
5. Check spark plug [4G18-3705113].
6. Check drive belt [4G18-1307107].

Hint: do not check belt tension, because automatic tensioner is applied.

7. Check ignition timing.

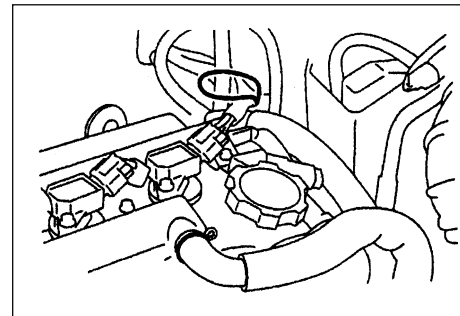
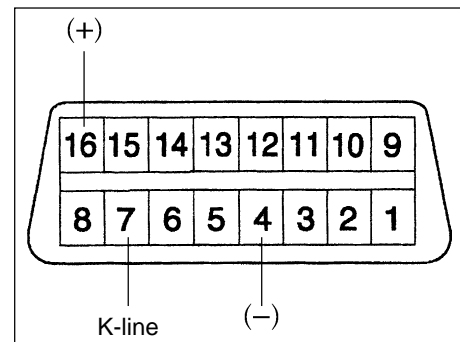
- (a) Warm up engine.
- (b) Connect timing lamp to engine.

- (c) Check ignition timing at idle speed.

Ignition timing: before top dead center 8° - 14°

Note: when checking ignition timing, place transmission at neutral position.

Hint: After run the engine for 5 seconds with rotating speed of 1000-1300rpm, check the engine could recover to idle running.



8. Check engine idle speed.

- (a) Warm up engine and run it at idle speed.
- (b) Read engine rotating number in data flow with diagnostic instrument.
- (c) Check idle speed.

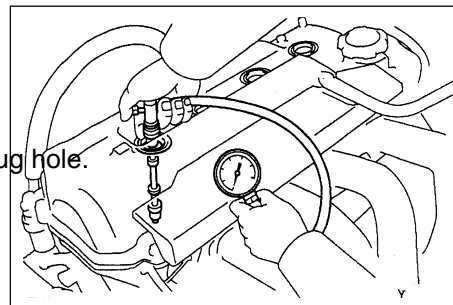
Idle speed: about 750-850rpm

Notes:

- When checking idle speed, place cooling fan at OFF position.
- Turn off all auxiliary devices and air conditioner.

9. Check compression pressure.

- (a) Warm up engine.
- (b) Remove ignition coil.
- (c) Remove spark plug.
- (d) Check cylinder compression pressure.
 - (1) Install cylinder compression pressure gauge on spark plug hole.
 - (2) Wide open throttle.
 - (3) Measure the pressure during crankshaft rotating.



Notes:

- Ensure to use fully charged battery to make the rotating speed of engine reach or exceed 2500rpm.
 - When measuring other items, please repeat steps (1) to (3).
 - Finish the measurement as soon as possible.
- | | |
|-----------------------------|---------|
| Compression pressure: | 1080kPa |
| Min pressure: | 1000kPa |
| Difference among cylinders: | 100kPa |
- (4) If the compression pressure of one or more cylinders is too low, inject a small amount of engine oil from spark plug hole into the cylinder with low pressure, and repeat steps (1) to (3) to check pressure.
 - If the pressure increases after engine oil is injected, the piston ring of this cylinder or the cylinder has been worn or scratched.
 - If the pressure is still too low, the valve may be stuck or not fully closed, or the cylinder head gasket leaks.

10. Check CO/HC.

- (a) Start engine.
- (b) Keep the rotating speed of engine at 2500rpm for about 180 seconds.
- (c) When the engine is idle running, insert the test bar of CO/HC gauge into exhaust pipe at least 40cm.
- (d) Immediately check idle speed and CO/HC concentration at 2500rpm.

Hints:

- Finish test within 3 minutes.
 - Perform the test under 2 analog states (idle speed and 2500rpm) according to measuring methods and sequences specified by Emission Regulations.
- (e) If CO/HC concentration is not within specified value, perform trouble shooting according to the following sequences.
 - (1) Check the function of oxygen sensor.
 - (2) See possible failure causes listed in the table below, and repair and correct if necessary.

CO	HC	Trouble occurrence	Possible causes
Normal	High	Unstable idle speed	<ol style="list-style-type: none"> Ignition system malfunction <ul style="list-style-type: none"> ● Ignition timing incorrect ● Spark plug too dirty, short circuit or clearance incorrect Valve clearance incorrect Air inlet and exhaust valve leaky Cylinder leaky
Low	High	Unstable idle speed (HC readings not stable)	<ol style="list-style-type: none"> Vacuum leak: <ul style="list-style-type: none"> ● PCV hose ● Intake manifold ● Throttle body ● Idle speed stepping motor ● Vacuum booster and pipelines Fire caused by too thin mixing ratio
High	High	Unstable idle speed (black smoke emission)	<ol style="list-style-type: none"> Air filter core blocked PCV valve blocked EFI system malfunction <ul style="list-style-type: none"> ● Fuel pressure regulator malfunction ● Water temperature sensor malfunction ● Intake pressure sensor malfunction ● ECU malfunction ● Injection nozzle malfunction ● Throttle position sensor malfunction

Drive belt

Replacement

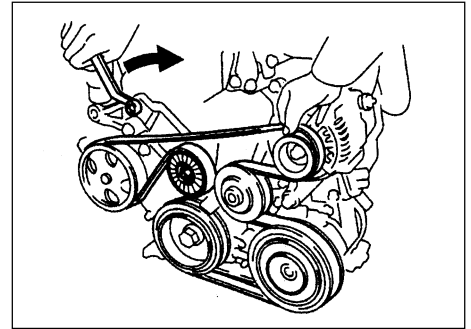
1. Remove engine right bottom shield.

2. Remove drive belt

Slowly turn drive belt tensioner clockwise to loosen it.
Then remove drive belt and put back drive belt tensioner slowly and gently.

3. Install drive belt

Slowly turn drive belt tensioner clockwise to loosen it.
Then install drive belt and put back drive belt tensioner slowly and gently.



Valve clearance

Adjustment

1. Remove engine plastic hood components.
2. Remove ignition coil components [4G18-3705110].
3. Remove cylinder head cover components [4G18-1003130].
4. Remove engine right bottom shield.
5. Turn crankshaft to cylinder 1 compression top dead center position.

- (a) Turn crankshaft pulley to align its groove with "o" mark on timing chain hood.
- (b) Check dot marks on camshaft timing sprocket and VVT timing sprocket, and they should be in a line on timing chain hood surface as shown in the diagram.
Hint: if not, turn crankshaft for one circle (360°) again and align the above marks.

6. Check valve clearance.

- (a) Only check the valves shown in the diagram.
 - (1) Measure the clearance between valve tappet and camshaft with plug gauge.
 - (2) Record valve clearance measuring value exceeding specification, and this value will be used to determine valve tappet thickness that needs change.

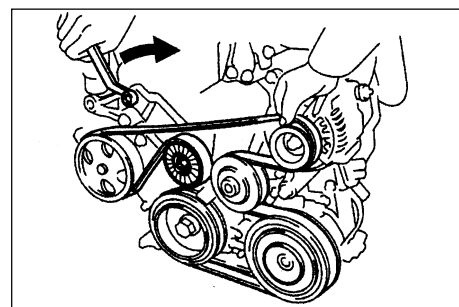
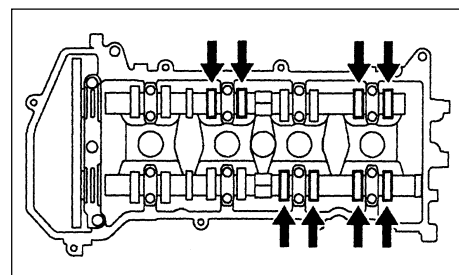
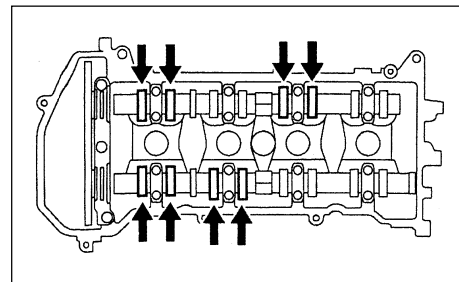
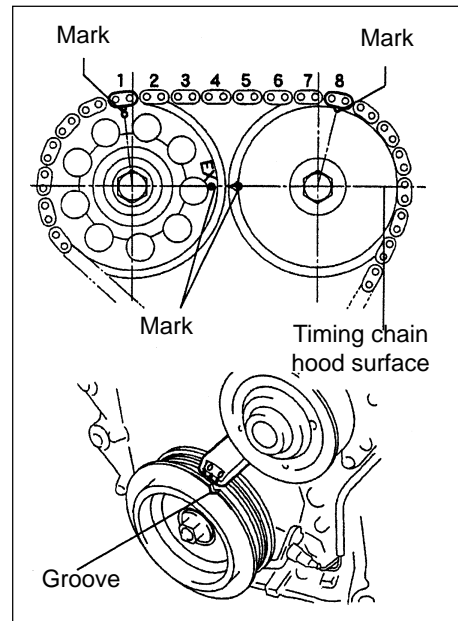
Valve clearance (cold vehicle)

Intake air	$0.23 \pm 0.03\text{mm}$
Exhaust	$0.32 \pm 0.03\text{mm}$

- (b) Turn crankshaft for one circle (360°), and cylinder 4 is turned to compression top dead center position.
- (c) Only check the valves shown in the diagram. Measure valve clearance (see step (a)).

7. Remove drive belt

Slowly turn drive belt tensioner clockwise to loosen it.
Then remove drive belt and put back drive belt tensioner slowly and gently.



8. Remove right engine mounting assembly

- Remove PS oil pump reservoir and put it aside.
- Place wooden block between jack and engine, properly place the jack, and then remove right engine mounting assembly.

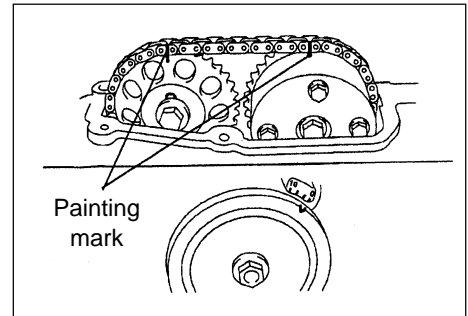
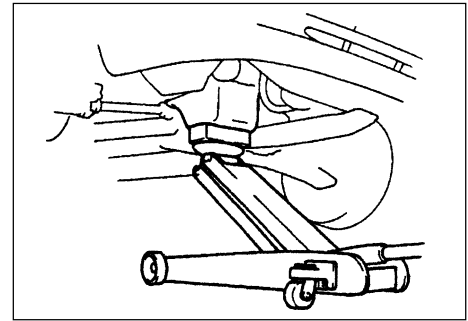
9. Remove drive belt tensioner device [4G18-1300200].

Hint: operate the jack up and down to remove bolts.

10. Adjust valve clearance.

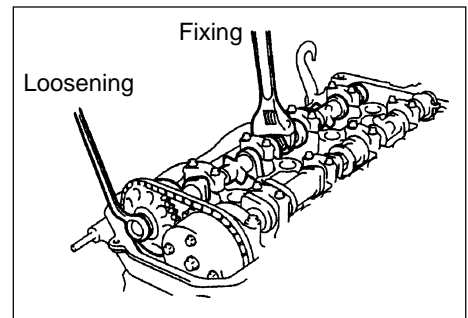
Note: do not turn crankshaft before installing chain tensioner.

- Turn crankshaft to cylinder 1 top dead center position.
- Align the marks on timing chain and camshaft timing sprocket.
- Remove 2 bolts and chain tensioner.

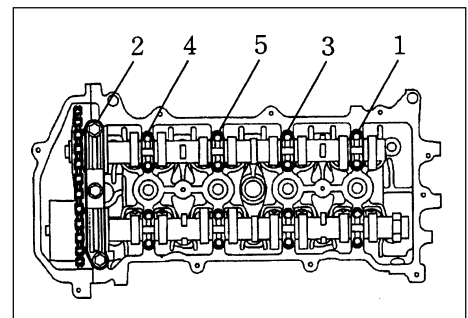


- Fix camshaft with adjustable wrench and then loosen the fixed bolts of exhaust camshaft timing sprocket.

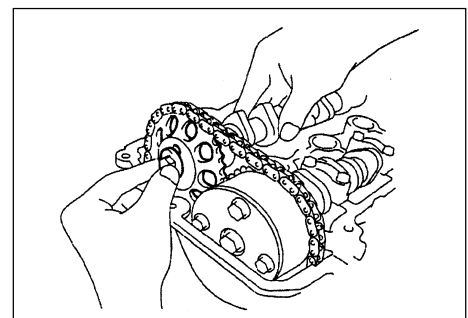
Note: be careful not to damage valve lifter.



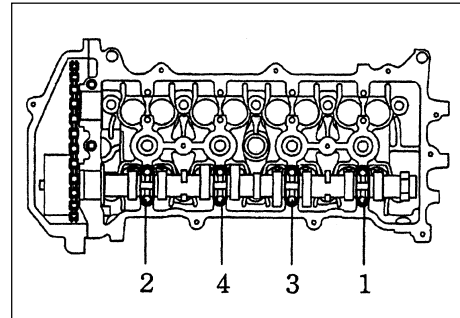
- As sequences shown in the diagram, loosen camshaft bearing cover bolts on exhaust camshaft at several times and remove the bearing cover at the same time.



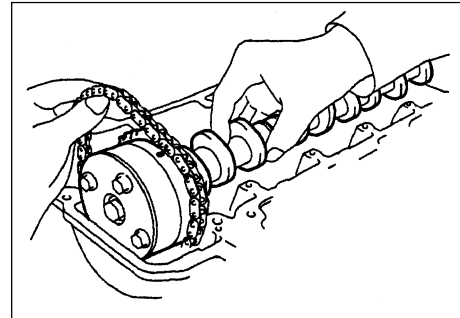
- As shown in the diagram, remove exhaust camshaft timing sprocket.



- (g) As sequences shown in the diagram, loosen camshaft bearing cover bolts on intake camshaft at several times and remove the bearing cover at the same time.



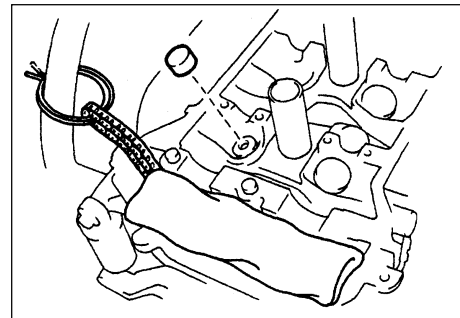
- (h) Hold timing chain with hands and then remove the camshaft.



- (i) As shown in the diagram, tie up the chain with bandage.

Note: be careful not to let anything fall into the timing chain hood.

- (j) Remove valve lifter.



- (k) Measure the thickness of this valve lifter with micrometer.

- (1) Calculate the thickness of new valve tappet and adjust valve clearance within specification.

A	Thickness of new valve lifter
B	Thickness of old valve lifter
C	Measured valve clearance

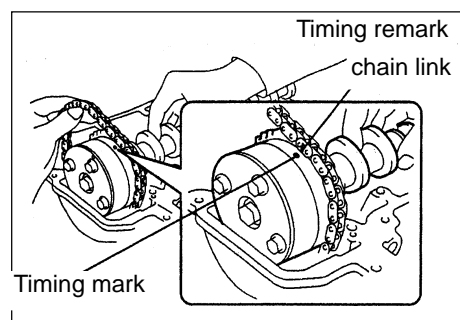
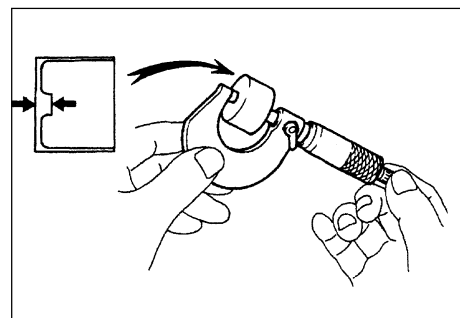
Air intake: $A=B+C-0.23\text{mm}$

Exhaust: $A=B+C-0.32\text{mm}$

Hints:

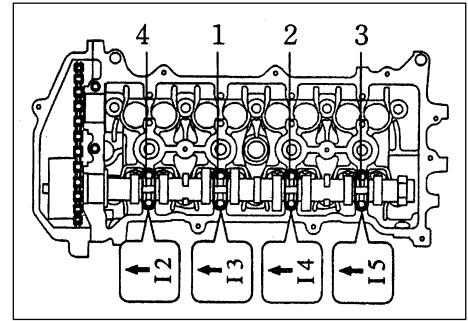
- New valve tappet chosen should be near the value calculated as much as possible.
- The thickness of valve tappet is from 5.06mm to 5.74mm, and there is one specification every 0.02mm, therefore there are totally 35 different dimensions to chose.

- (m) As shown in the diagram, align alignment mark with timing mark on camshaft timing sprocket, and install timing chain on the timing sprocket.

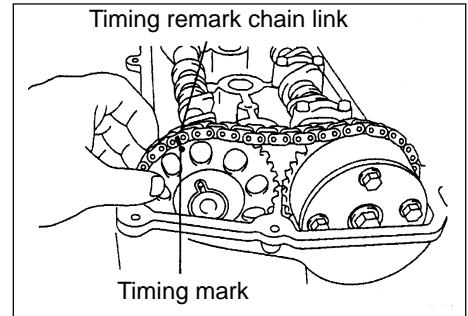


- (n) Check intake side camshaft bearing cover forward remark and figure, and tighten the bolts as sequences shown in the diagram.

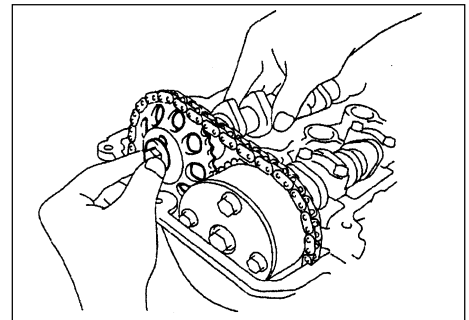
Torque: $13 \pm 0.78 \text{ N} \cdot \text{m}$



- (o) Align alignment mark on the chain with timing mark on camshaft timing sprocket, and place exhaust camshaft in cylinder head.



- (p) Temporarily lock fixed bolts.

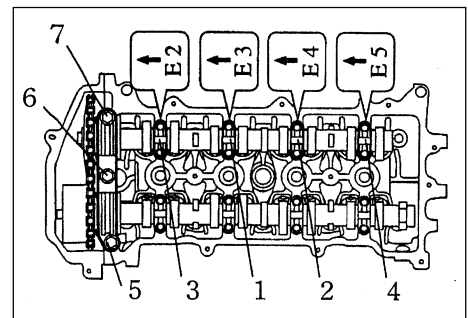


- (q) Check exhaust side camshaft bearing cover forward remark and figure, and tighten the bolts as sequences shown in the diagram.

Torque: $13 \pm 0.78 \text{ N} \cdot \text{m}$

- (r) Install camshaft front bearing cover.

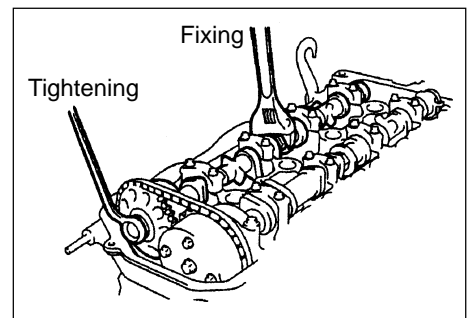
Torque: $23 \pm 1.38 \text{ N} \cdot \text{m}$



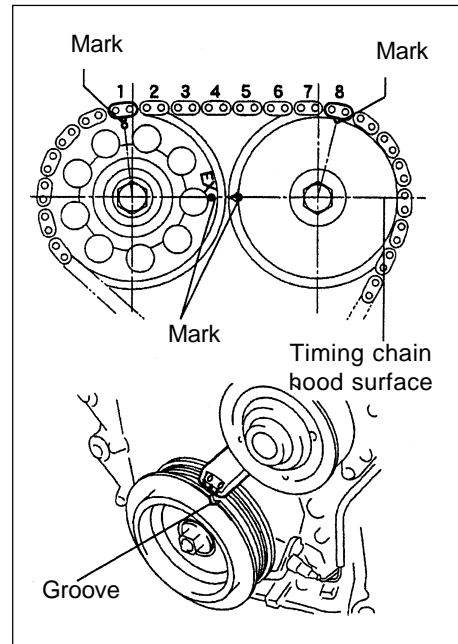
- (s) Fix camshaft with adjustable wrench and then tighten the fixed bolts of camshaft timing sprocket.

Torque: $54 \pm 10.8 \text{ N} \cdot \text{m}$

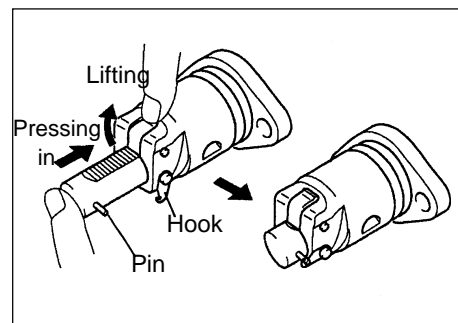
Note: be careful not to damage valve lifter.



- (t) Check the matching marks on timing chain and camshaft timing sprocket, and then align the groove of crankshaft pulley with the timing mark on timing chain hood as shown in the diagram.
- (u) Install chain tensioner.

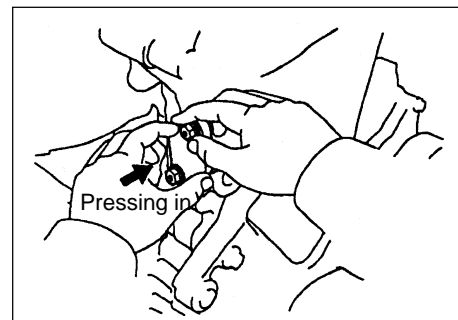


- (1) Check o-ring is clean, and buckle on the hook as shown in the diagram.

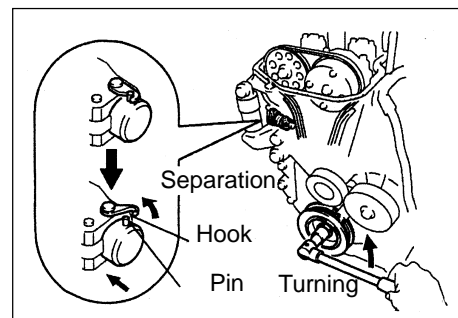


- (2) Coat engine oil on the chain tensioner, and then install it.

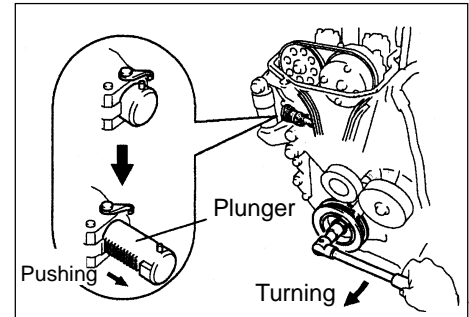
Note: when installing the chain tensioner, buckle on the hook again if plunger has ejected.



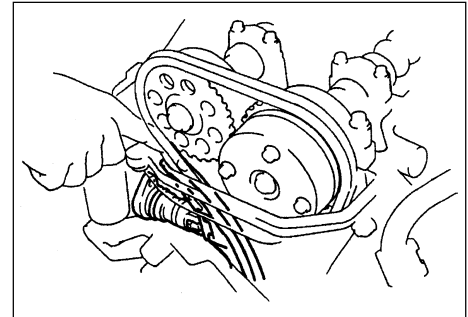
- (3) Turn crankshaft counterclockwise to separate the hook from lock pin on the plunger.



- (4) Turn crankshaft clockwise, and check the sliding parts are blocked by plunger.



Hint: if the plunger does not eject, press the chain tension rail toward chain tensioner with screwdriver or fingers to separate the hook from lock pin and make the plunger eject.

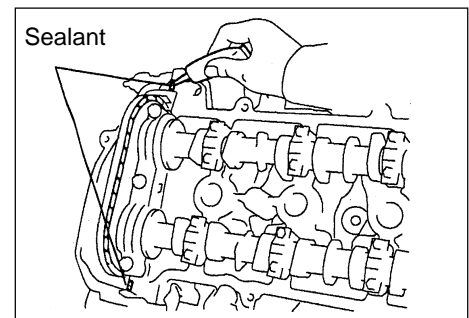


11. Install cylinder head cover components.

- Install cylinder head cover gasket on cylinder head cover.
- Eliminate all old sealant (FIPG) materials.
- Coat sealant on 2 positions shown in the diagram.

Notes:

- Wipe off all the oil stains on junction plane.
- After coating sealant, finish installation of cylinder head cover within 3 minutes.
- After installing, do not refill engine oil within 2 minutes.



- Install cylinder head cover components with 9 bolts, 2 seal washers and 2 nuts. Evenly tighten bolts and nuts at several times.

Torque:

Short bolt: $9 \pm 1.8 \text{ N} \cdot \text{m}$

Nut, long bolt etc.: $11 \pm 2.2 \text{ N} \cdot \text{m}$

12. Install drive belt tensioner device.

Torque: nut: $29 \pm 5.8 \text{ N} \cdot \text{m}$

Bolt: $69 \pm 13.8 \text{ N} \cdot \text{m}$

13. Install fixing bracket absorber on the left of engine.

Torque: $52 \text{ N} \cdot \text{m}$

14. Check there is oil leakage.

Engine assembly

Replacement

1. Take measures to prevent gasoline leaking.
2. Remove engine right bottom shield.
3. Remove engine left bottom shield.
4. Discharge coolant.
5. Remove front wheels.
6. Remove engine plastic hood components.
7. Remove battery.
8. Remove air filter assembly.
9. Remove air filter hose.
10. Remove battery tray.
11. Disassemble fuel hose assembly.
12. Remove throttle cable assembly.
13. Disassemble radiator hose inlet end.
14. Disassemble radiator hose outlet end.
15. Disassemble cold air pipe inlet hose.
16. Disassemble cold air pipe outlet hose.
17. Remove transmission control pull cable assembly.
18. Disassemble warm air water inlet hose [4G18-1300102].
19. Disassemble warm air water outlet hose [4G18-1300108].
20. Disassemble the hoses of all joints to connect vehicle body end.
21. Uncouple engine wire harness.
 - (a) Remove glove compartment door.
 - (b) Remove engine wire harness from engine ECU and junction block.
 - (c) Pull out engine wire harness.
 - (b) Remove engine wire harness from junction block of engine room.
 - (e) Remove vehicle body earth wire.

22. Remove drive belt.

Drive belt tensioner could turn belt tensioner clockwise to loosen it.

23. Remove alternator mounting components [4G18-3701100].

24. Remove compressor assembly.

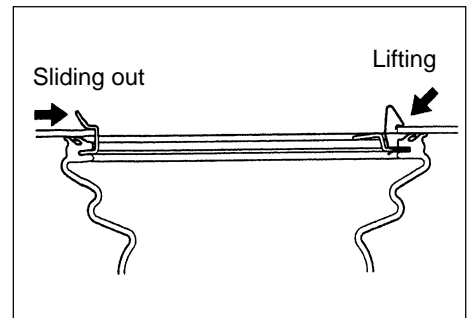
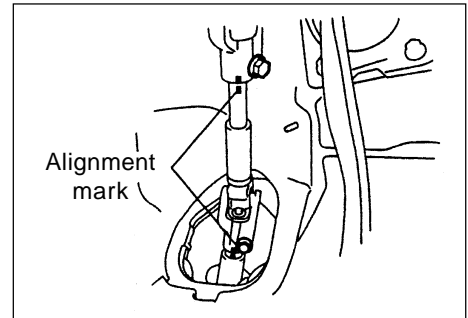
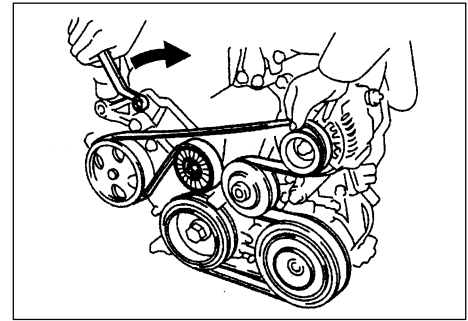
25. Remove front chassis bracket.

26. Remove front exhaust pipe assembly.

27. Remove steering middle shaft assembly.

- (a) Remove steering column seal hole cover.
- (b) Make alignment mark on steering middle shaft.
- (c) Remove 2 bolts and steering middle shaft.

- (d) Remove steering column cover.



28. Remove the nuts on left side of front shaft hub.

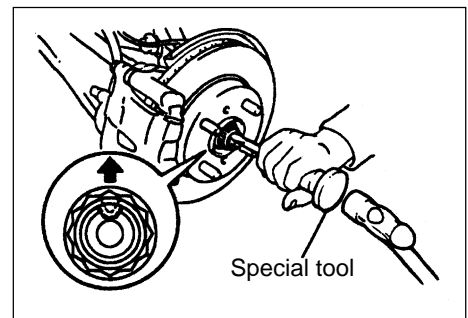
- (a) Completely knock out the concave part of fixed nuts with special tool and hammer.

Notes:

- Completely knock out the concave part of fixed nuts before removing the fixed nuts.
- Do not damage thread of drive shaft.
- Do not sharpen the sharp end of special tool.
- Place the special tool in groove with its plane facing upward.

- (b) Remove fixed nuts with socket wrench (30mm).

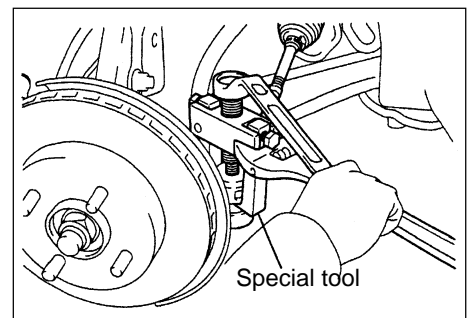
Hint: perform the same steps at another side.



29. Disassemble left side transversal lever assembly.

Disassemble transversal lever assembly from steering knuckle with special tool.

Hint: perform the same steps at another side.



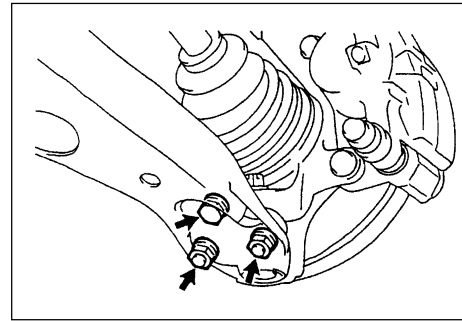
30. Disassemble left end front stabilizer link assembly.

Fix bolts with hex socket wrench, and then remove nuts.

Hint: perform the same steps at another side.

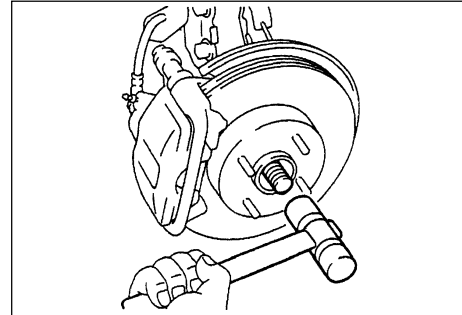
31. Disassemble lower left control arm assembly.

(a) As shown in the diagram, remove bolt and 2 nuts.



(b) Disassemble drive shaft from shaft hub with plastic hammer.

Hint: perform the same steps at another side.



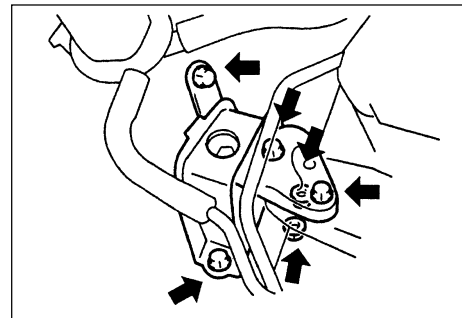
32. Remove oil return pipe assembly.

After removing 3 retaining clips and 2 bolts of power steering oil reservoir, remove the oil return pipe from vehicle.

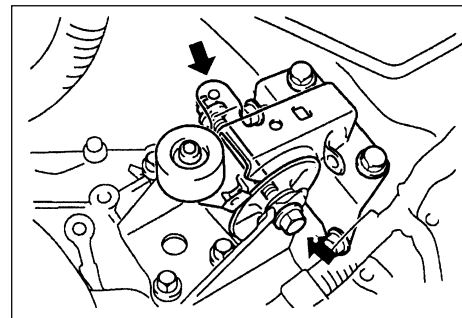
33. Remove engine assembly [4G18-1000000] and transmission assembly.

(a) Erect engine hanger.

(b) Remove 4 bolts, 2 nuts and right engine mounting assembly.

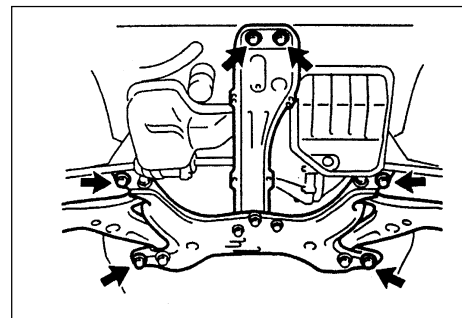


(c) Remove through bolt and nut, and then remove left engine mounting assembly from vehicle.



(d) As shown in the diagram, remove 6 bolts.

(e) Carefully remove engine assembly and transmission assembly from vehicle.

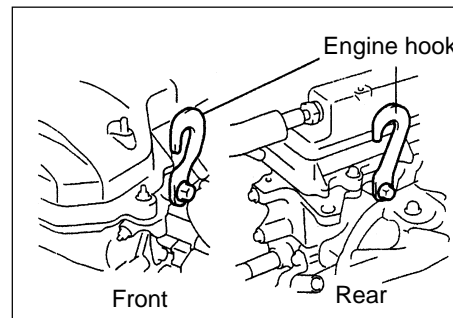


- (f) As shown in the diagram, install front and rear hooks of engine.

Torque: $38 \pm 11.4 \text{ N} \cdot \text{m}$

Hint: install engine hooks to front and rear sides of engine.

- (g) Lift engine assembly with chain pulley block and engine lifting device.



34. Remove power steering pump assembly.

35. Remove sub frame together with side member.

- (a) Remove front engine mounting assembly and rear engine mounting assembly from engine assembly.

- (b) Remove sub frame assembly.

36. Remove starter mounting components [4G18-3708100].

37. Remove transmission assembly.

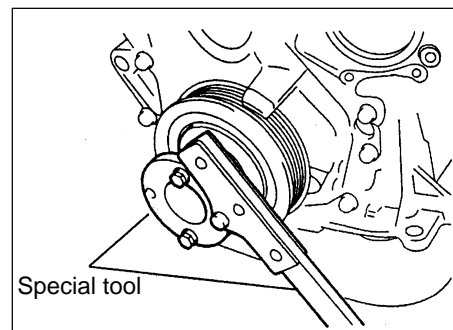
- (a) Fix crankshaft with special tool, and then remove 6 bolts.

- (b) Remove transmission assembly.

38. Remove clutch assembly [4G18-1601000] and flywheel components [4G18-1005120J].

- (a) Fix crankshaft with special tool, and remove clutch assembly at first.

- (b) Then remove flywheel components.



39. Remove throttle supporting plate [4G18-1008202].

40. Remove intake manifold assembly [4G18-1008200].

41. Remove exhaust manifold upper heat shield components [4G18-1008120].

42. Remove exhaust manifold assembly [4G18-1008100].

43. Remove fuel rail injector assembly [4G18-1112100].

44. Remove ignition coil installation components.

45. Remove oil level gauge tube components [4G18-1002140].

46. Remove temperature regulator assembly [4G18-1306100].

47. Disassemble warm air water outlet pipe components [4G18-1300100].

48. Remove oil pressure alerter [4G18-3757100].

Remove oil pressure alerter with SST.

49. Remove the hoses on all hose joint of engine.

Remove clips and hose.

50. Remove drive belt tensioner device.

51. Remove phase sensor [4G18-3600030].

52. Remove speed sensor [4G18-3600010].

53. Remove knock sensor.

Remove knock sensor with special tool.

54. Remove water temperature sensor.

Remove water temperature sensor with special tool.

55. Replace engine assembly.

56. Install water temperature sensor.

(a) Install new gasket to water temperature sensor.

(b) Install water temperature sensor with special tool.

Torque: $20.4 \pm 4.08 \text{ N} \cdot \text{m}$

57. Install knock sensor.

Install knock sensor with special tool.

Torque: $18 \pm 3.6 \text{ N} \cdot \text{m}$

58. Install speed sensor.

Install speed sensor and harness clips.

Torque: $9 \pm 1.8 \text{ N} \cdot \text{m}$

59. Install phase sensor.

Torque: $9 \pm 1.8 \text{ N} \cdot \text{m}$

60. Install drive belt tensioner device.

Torque: nut: $29 \pm 5.8 \text{ N} \cdot \text{m}$

Bolt: $69 \pm 13.8 \text{ N} \cdot \text{m}$

61. Install the hoses on all hose joint of engine.

Install clips and hose.

62. Install oil pressure alerter.

(a) Clean thread of oil pressure alerter and coat adhesive.

Adhesive: anaerobic pipe thread sealing adhesive 1545
(Kesaixin 1545)

(b) Install oil pressure alerter with special tool.

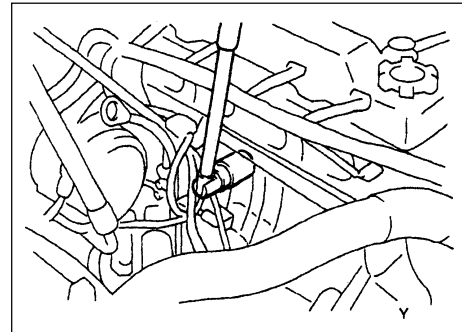
Torque: $15 \pm 4.5 \text{ N} \cdot \text{m}$

63. Install warm air water outlet pipe components.

Install new gasket and warm air water outlet pipe components.

Torque: nut: $9 \pm 1.8 \text{ N} \cdot \text{m}$

Bolt: $9 \pm 1.8 \text{ N} \cdot \text{m}$



64. Install temperature regulator assembly.

- (a) Check temperature regulator assembly o-ring.
- (b) Install temperature regulator assembly as shown in the diagram.

- (c) Install engine water inlet pipe joint components.

Torque: $11 \pm 2.2 \text{ N} \cdot \text{m}$

65. Install oil level gauge tube components.

66. Install ignition coil mounting components.

Torque: $9 \pm 1.8 \text{ N} \cdot \text{m}$

67. Install fuel rail injector assembly.

- (a) Install isolator on cylinder head.

- (b) Install fuel rail injector assembly.

Torque: $9 \pm 1.8 \text{ N} \cdot \text{m}$

- (c) Install fuel pipe retaining clip.

68. Install exhaust manifold gasket and exhaust manifold assembly.

Torque: $25 \pm 5 \text{ N} \cdot \text{m}$

69. Install exhaust manifold upper heat shield components.

Torque: $18 \pm 3.6 \text{ N} \cdot \text{m}$

70. Install intake manifold assembly.

Install new gasket and intake manifold assembly.

Torque: $30 \pm 6 \text{ N} \cdot \text{m}$

71. Install throttle supporting plate.

Torque: $30 \pm 6 \text{ N} \cdot \text{m}$

72. Install flywheel components and clutch assembly.

- (a) Fix crankshaft with special tool.

- (b) Clean bolts and bolt holes.

- (c) Coat bolts with adhesive.

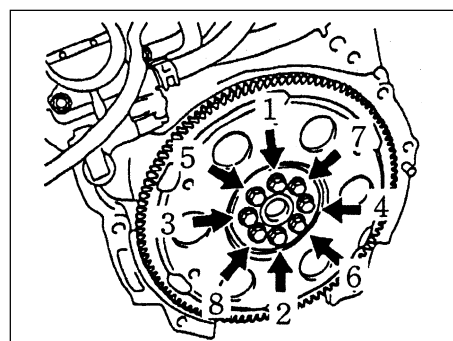
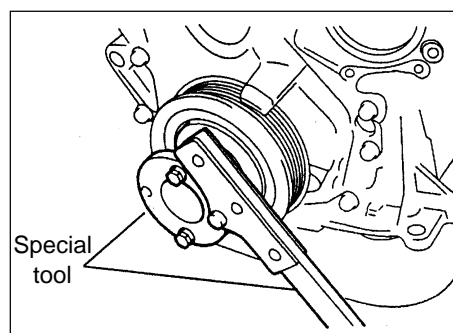
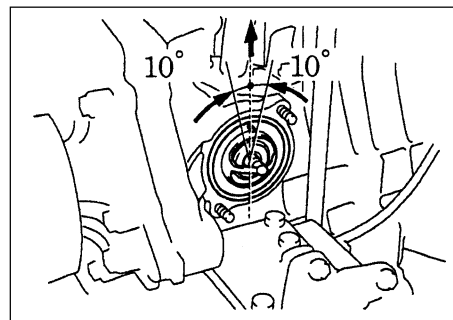
Adhesive: thread locking sealant 1234 (Kesaixin 1234).

- (d) Install flywheel components.

As sequences shown in the diagram, tighten bolts at several times.

Torque: $88 \pm 5 \text{ N} \cdot \text{m}$

- (e) Install clutch assembly.



73. Install transmission assembly.

(a) Install transmission assembly.

Torque: bolt A: $64\text{N} \cdot \text{m}$

Bolt B: $46\text{N} \cdot \text{m}$

Bolt C: $23\text{N} \cdot \text{m}$

(b) Install 6 bolts.

Torque: $25\text{N} \cdot \text{m}$

74. Install starter mounting components.

Torque: bolt: $37\text{N} \cdot \text{m}$

Nut: $10\text{N} \cdot \text{m}$

75. Install sub frame together with side member.

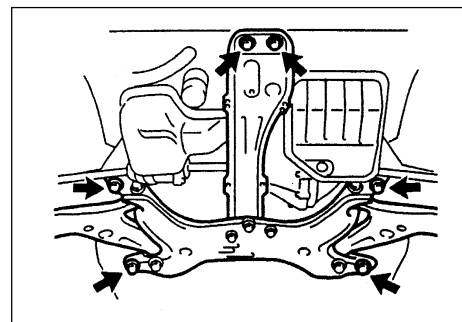
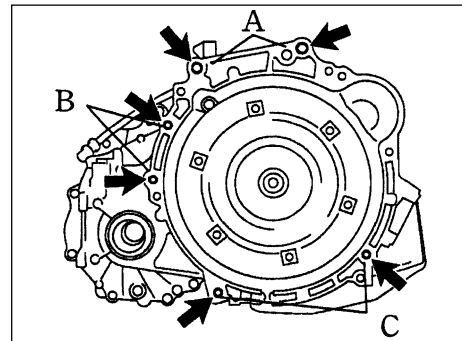
Install front mounting assembly and rear mounting assembly.

Torque: front: $52\text{N} \cdot \text{m}$

Rear: $87\text{N} \cdot \text{m}$

76. Install power steering pump assembly.

Torque: $45 \pm 9\text{N} \cdot \text{m}$



77. Install engine assembly together with transmission assembly.

(a) Erect engine together with transmission assembly on engine crane.

(b) Install engine assembly to vehicle.

(c) Temporarily install side member and 6 bolts.

(d) Install left engine mounting assembly.

Torque: $80\text{N} \cdot \text{m}$

(e) Install right engine mounting assembly.

(f) Insert special tool into location hole on right side of sub frame and vehicle.

(g) Temporarily lock bolt A at first, and then lock bolt B.

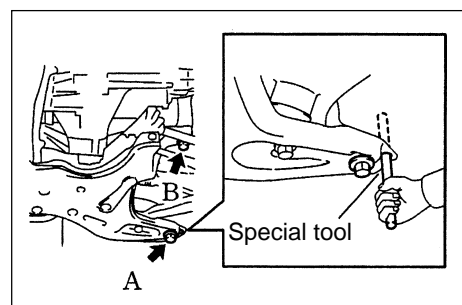
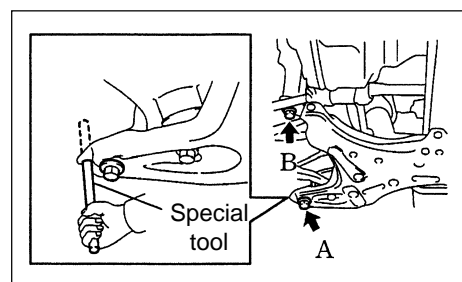
(h) Insert special tool into location hole on left side of sub frame and vehicle.

(i) Temporarily lock bolt A at first, and then lock bolt B.

(j) Insert special tool into location hole on right side of sub frame and vehicle, and then tighten bolts up to specified torque.

Torque: bolt A: $113\text{N} \cdot \text{m}$

Bolt B: $157\text{N} \cdot \text{m}$



- (k) Insert special tool into location hole on left side of sub frame and vehicle, and then tighten bolts up to specified torque.

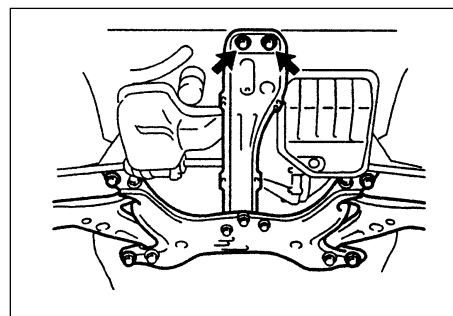
Torque: bolt A: 113N • m

Bolt B: 157N • m

- (l) As shown in the diagram, tighten 2 bolts.

Torque: 39N • m

Note: after installing sub frame, check the sub frame is aligned with location hole on vehicle.



78. Install compressor.

Torque: 25N • m

79. Install lower left control arm assembly.

- (a) Install drive shaft to steering knuckle.

- (b) Install lower left control arm.

Torque: 142N • m

Hint: perform the same steps at another side.

80. Install front left shaft hub nut.

- (a) Install fixed nut with socket wrench (39mm).

Torque: 215N • m

- (b) Drive the cutout part of hub nut into groove with chisel.

Hint: perform the same steps at another side.

81. Install left end front stabilizer link assembly.

Fix bolts with hex socket wrench.

Torque: 74N • m

Hint: perform the same steps at another side.

82. Install left side transversal lever assembly.

- (a) Connect transversal lever assembly to steering knuckle and install new nuts.

Torque: 49N • m

Note:

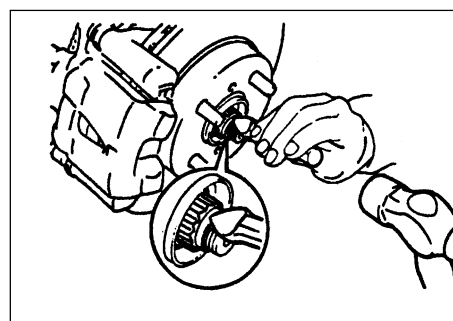
- Do not coat lubricant on thread and conical surface.
- After tightening nuts up to specified torque, continue turning nuts for 60° and insert open pin.

- (b) Insert new open pin.

83. Connect fuel hose assembly.

84. Install battery tray.

Torque: 13N • m



85. Install alternator mounting components.

Torque: 12mm bolt head A: $25 \pm 5 \text{ N} \cdot \text{m}$

14mm bolt head B: $54 \pm 10.8 \text{ N} \cdot \text{m}$

86. Install drive belt.

87. Install engine wire harness and all hoses not connected.

(a) Check and connect all joints of engine wire harness.

(b) Check and connect all hoses.

88. Install transmission control pull cable assembly and valve control pull cable.

89. Install air filter assembly and its hose.

90. Install steering middle shaft assembly.

(a) Align alignment mark on steering middle shaft.

(b) Install 2 bolts.

Torque: $30 \text{ N} \cdot \text{m}$

(c) Install steering column cover.

91. Install front exhaust pipe assembly.

92. Install front chassis bracket.

Torque: $49 \text{ N} \cdot \text{m}$

93. Install battery and connect wire.

94. Install engine plastic hood components.

95. Install front wheel and engine bottom shield.

96. Refill transmission lubricant.

97. Refill engine oil.

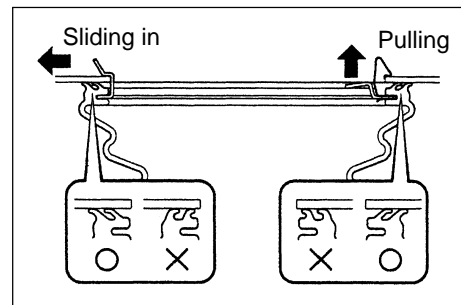
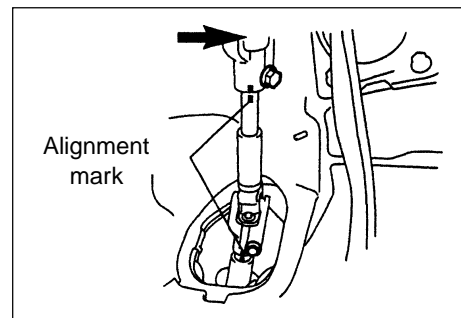
98. Refill coolant.

99. Check there is oil leakage.

100. Check there is coolant leakage.

101. Check idle speed and ignition timing.

102. Check CO/HC.



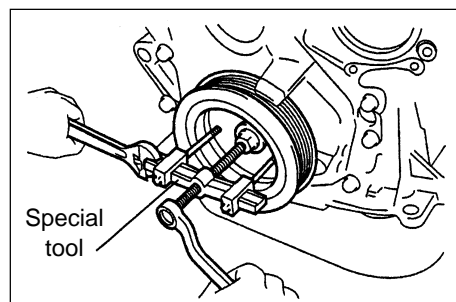
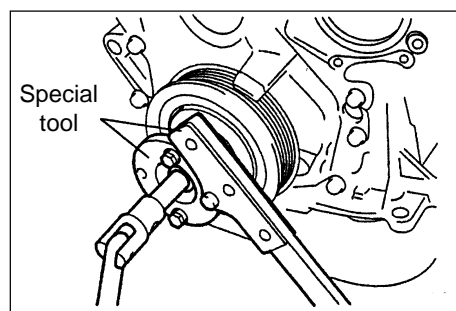
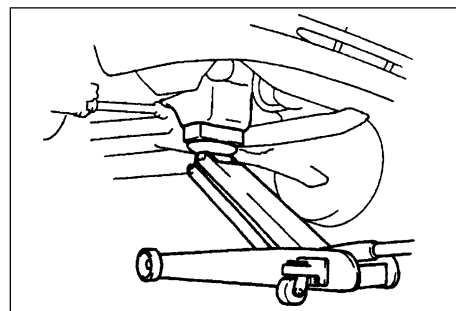
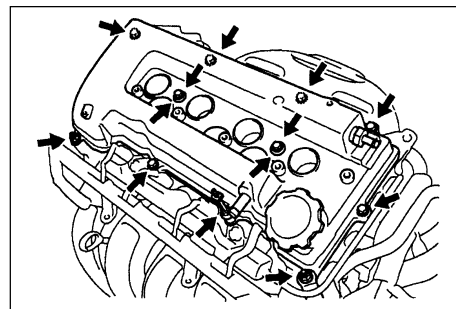
Timing chain assembly

Replacement

1. Remove engine left bottom shield.
2. Remove engine right bottom shield.
3. Discharge coolant.
4. Remove engine plastic hood components.
5. Remove drive belt.
6. Remove power steering pump assembly.
7. Remove alternator assembly.
8. Uncouple engine wire harness.
 - (a) Remove ignition coil joint, PS fuel pressure switch joint, fuel line control joint and speed sensor joint.
 - (b) Remove bolts and nuts of fixed earth wire and put aside engine wire harness.
9. Remove ignition coil assembly.
10. Remove cylinder head cover components.
 - (a) Remove fuel pipe retaining clip and 2 PCV hoses from cylinder head cover.
 - (b) Remove 9 bolts, 2 seal washers, cylinder head cover components and gasket.
11. Remove right engine mounting assembly.
 - (a) Remove PS oil pump reservoir and put it aside.
 - (b) Place wooden block between jack and engine, properly place the jack, and then remove right engine mounting assembly.
12. Turn crankshaft to cylinder 1 compression top dead center position.
13. Remove damping pulley components [4G18-1005110].

Remove pulley bolts with special tool.

Remove damping pulley components with special tool.



14. Remove drive belt tensioner device.

Hint: operate the jack up and down to remove bolts.

15. Remove water pump components [4G18-1307110].

(a) Remove 6 bolts and water pump components.

16. Remove engine stabilizer bracket on engine cross member.

17. Remove compressor.

18. Remove speed sensor.

19. Remove chain tensioner components [4G18-1006160].

Note: do not turn crankshaft before installing chain tensioner components.

20. Remove timing chain hood components [4G18-1006140].

(a) Remove 11 bolts and nuts.

(b) Remove studs with star wrench.

(c) Pry open timing chain hood from timing chain hood protrusion part between cylinder head and body with screwdriver and remove it.

Note: be careful not to damage timing chain hood, the contact surface of cylinder head and body.

21. Remove crankshaft front oil seal assembly [4G18-1006150].

Remove oil seal with screwdriver.

22. Remove speed sensor signal panel [4G18-3600011A].

23. Remove chain tension rail components [4G18-1006120].

24. Remove chain guide rail components [4G18-1006130].

25. Remove timing chain [4G18-1006110].

Remove it with 2 screwdrivers.

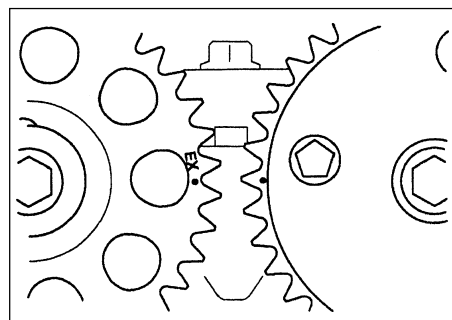
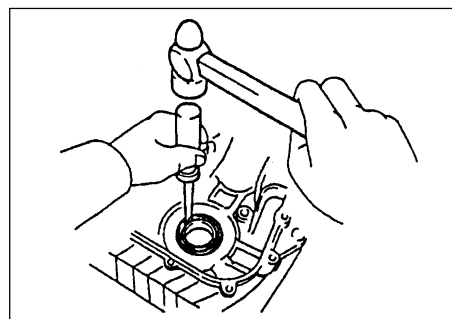
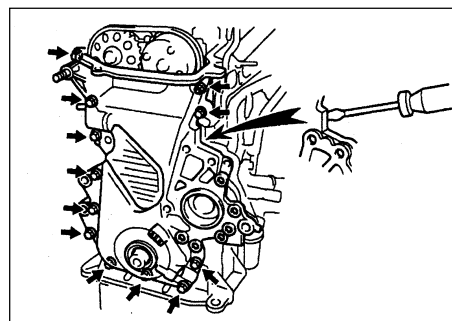
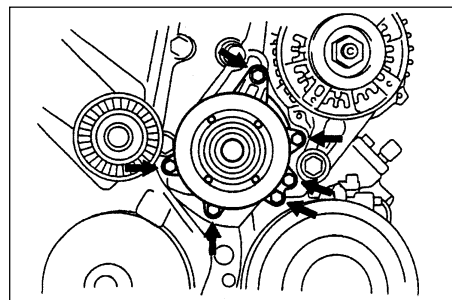
Notes:

- Place a piece of cloth to protect engine.
- In the state of timing chain separating from timing sprocket and turning camshaft, turn crankshaft 1/4 circle to avoid valve contacting with piston.

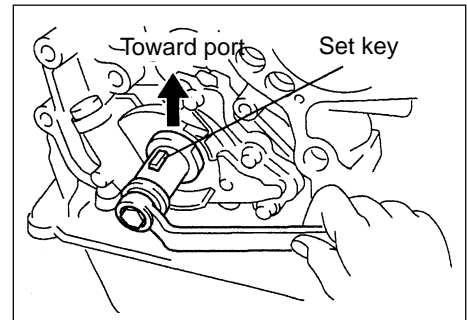
26. Install timing chain.

(a) Turn crankshaft to cylinder 1 compression top dead center position.

(1) Turn camshaft from hexagon head part of camshaft, and align dot marks on camshaft timing sprocket.

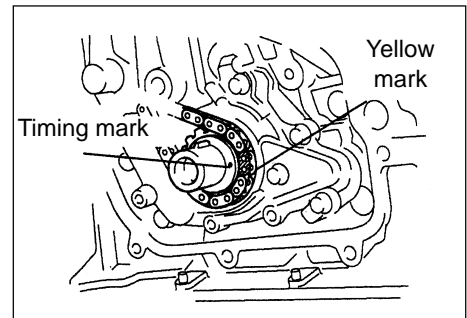


- (2) Use damping pulley bolts to turn crankshaft with its key toward upward.

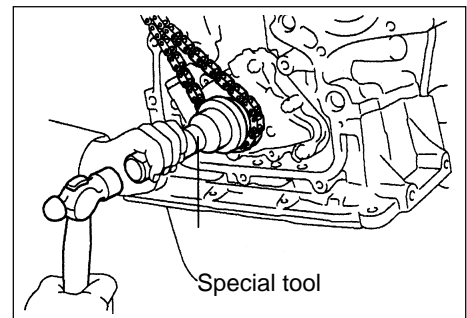


- (b) Install timing chain on crankshaft timing sprocket and align the chain link having yellow mark with timing mark of crankshaft timing sprocket.

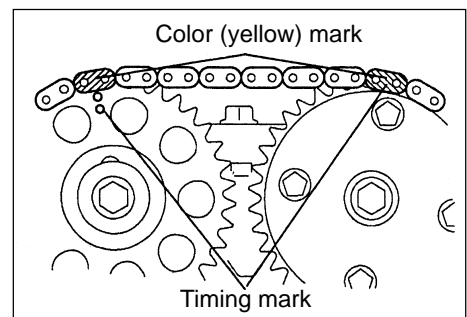
Hint: there are 3 yellow chain links on the timing chain.



- (c) Install crankshaft timing sprocket with special tool.



- (d) Install timing chain on camshaft timing sprocket and align the chain link having yellow mark with camshaft timing sprocket.



27. Install chain guide rail components.

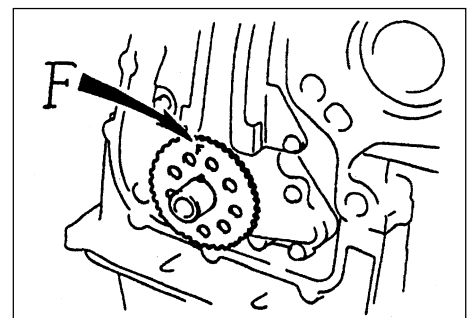
Torque: $9 \pm 1.8 \text{ N} \cdot \text{m}$

28. Install chain tension rail components.

Torque: $18.5 \pm 3.7 \text{ N} \cdot \text{m}$

29. Install speed sensor signal panel.

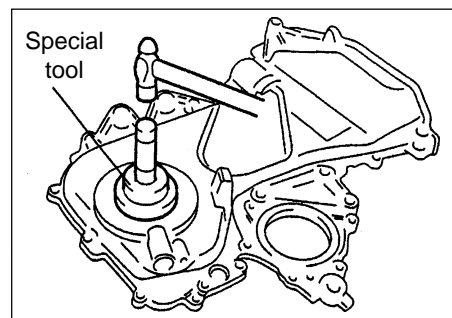
Install signal panel with "F" mark toward forward.



30. Install crankshaft front oil seal assembly.

- Coat a little MP grease on oil seal lip.
- Gently knock new oil seal in with special tool and hammer until the seal surface is parallel and level with the edge of timing chain cover.

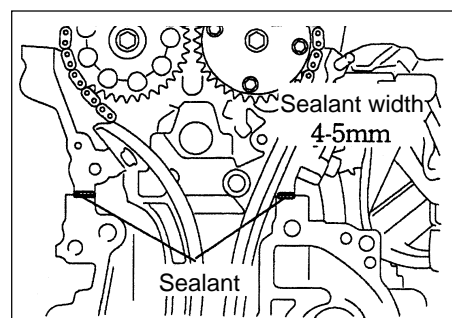
Note: do not let oil seal mouth contact with foreign matters.



31. Install timing chain hood components.

- Eliminate all old seal materials from contact surface.
- As shown in the diagram, coat sealant on the edge (diameter 3.5mm-4.5mm).

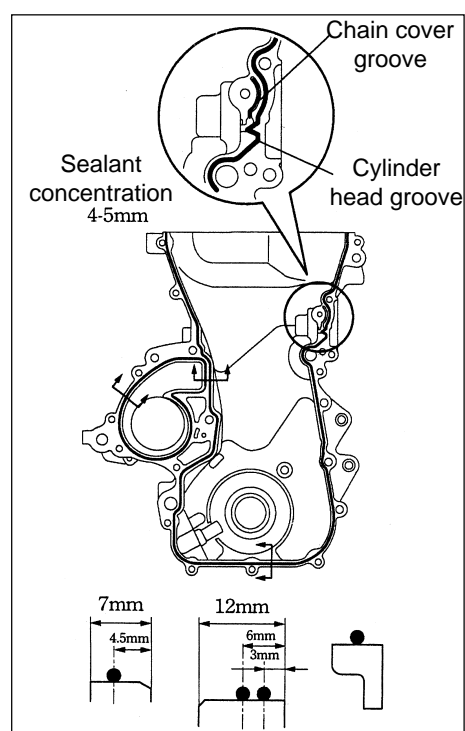
Sealant: silicon rubber flange sealant 1596 (Kesaixin 1596).



- Install timing chain hood with 12 bolts and nuts.

Torque: $11 \pm 2.2 \text{ N} \cdot \text{m}$

$18 \pm 3.6 \text{ N} \cdot \text{m}$ (M8)

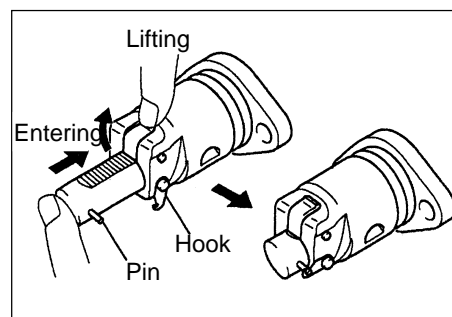


Notes:

- Eliminate all grease on contact surface.
- After coating sealant, finish installation of timing chain hood within 3 minutes.
- After installing, do not refill engine oil within 2 minutes.

32. Install chain tensioner components.

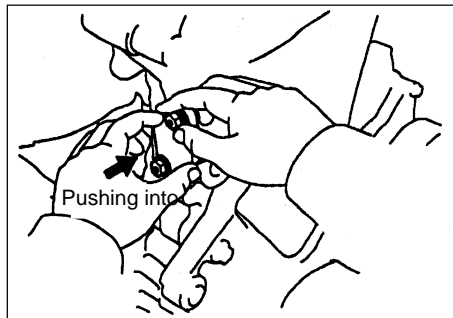
- Check o-ring is clean, and buckle on the hook as shown in the diagram.



- (b) Coat engine oil on the chain tensioner, and then install it.

Torque: $9 \pm 1.8 \text{ N} \cdot \text{m}$

Note: when installing the chain tensioner, buckle on the hook again if plunger has ejected.

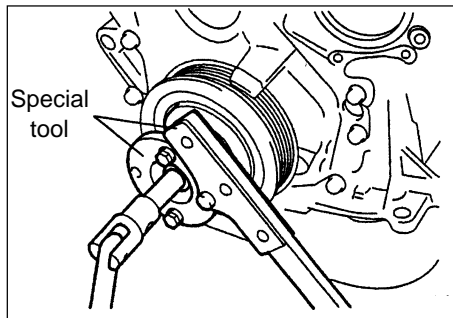


33. Install damping pulley.

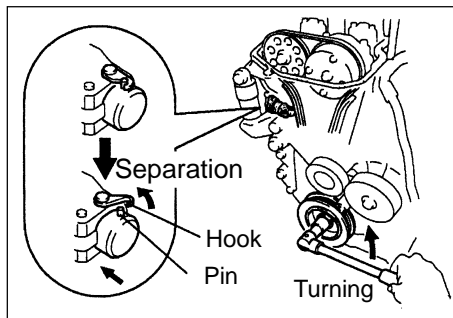
- (a) Align the key groove on the damping pulley with the key on the crankshaft, and slide damping pulley in.

- (b) Install damping pulley bolts with special tool.

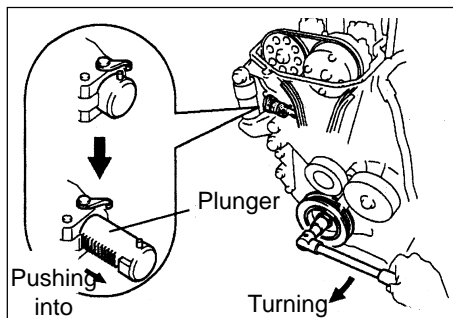
Torque: $138 \pm 8.28 \text{ N} \cdot \text{m}$



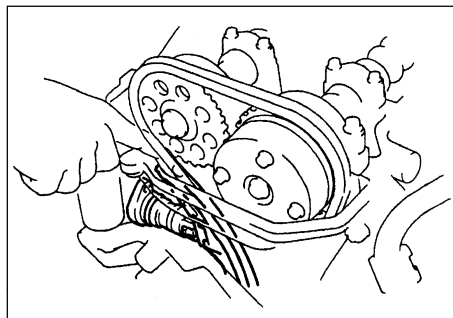
- (c) Turn crankshaft counterclockwise to separate the hook from lock pin on the plunger.



- (d) Turn crankshaft clockwise, and check the chain tension rail is blocked by plunger.



Hint: if the plunger does not eject, press the chain tension rail toward chain tensioner with screwdriver or fingers to separate the hook from lock pin and make the plunger eject.



34. Install speed sensor.

Torque: $9 \pm 1.8 \text{ N} \cdot \text{m}$

35. Install engine fixing bracket

Torque: $47 \text{ N} \cdot \text{m}$

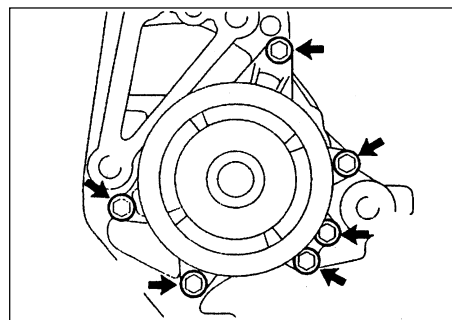
**36. Install water pump mounting components
[4G18-1307100].**

(a) Install new o-ring on water pump.

(b) Install water pump with 6 bolts.

Torque: bolt A: $9 \pm 1.8 \text{ N} \cdot \text{m}$

Bolt B: $11 \pm 2.2 \text{ N} \cdot \text{m}$



37. Install drive belt tensioner device.

Torque: nut: $29 \pm 5.8 \text{ N} \cdot \text{m}$

Bolt: $69 \pm 13.8 \text{ N} \cdot \text{m}$

38. Install right engine mounting assembly.

Torque: $52 \text{ N} \cdot \text{m}$

39. Install cylinder head cover components.

(a) Install gasket to cylinder head cover.

(b) Eliminate all old seal materials.

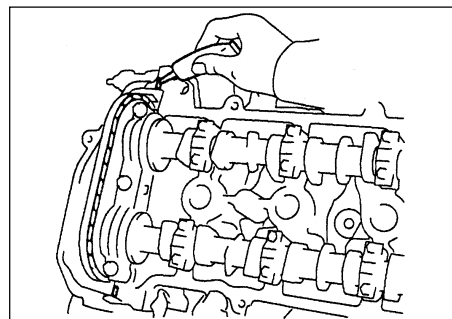
(c) Coat sealant on 2 positions shown in the diagram.

Sealant: silicon rubber flange sealant 1596

(Kesaixin 1596).

Notes:

- Eliminate all grease on contact surface.
- After coating sealant, finish installation of cylinder head cover within 3 minutes.
- After installing, do not refill engine oil within 2 minutes.



(d) Install cylinder head cover and cable bracket with 9 bolts,
2 seal washers and 2 nuts.

Torque: nut: $29 \pm 5.8 \text{ N} \cdot \text{m}$

Bolt: $69 \pm 13.8 \text{ N} \cdot \text{m}$

40. Install ignition coil mounting components.

Torque: $9 \pm 1.8 \text{ N} \cdot \text{m}$

41. Install alternator mounting components.

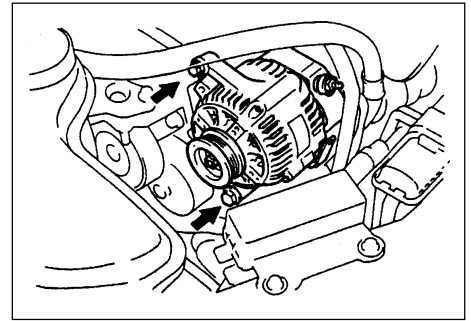
Torque: 12mm bolt head: $25 \pm 5 \text{ N} \cdot \text{m}$

14mm bolt head: $54 \pm 10.8 \text{ N} \cdot \text{m}$

42. Refill coolant.

43. Check there is coolant leakage.

44. Check there is oil leakage.



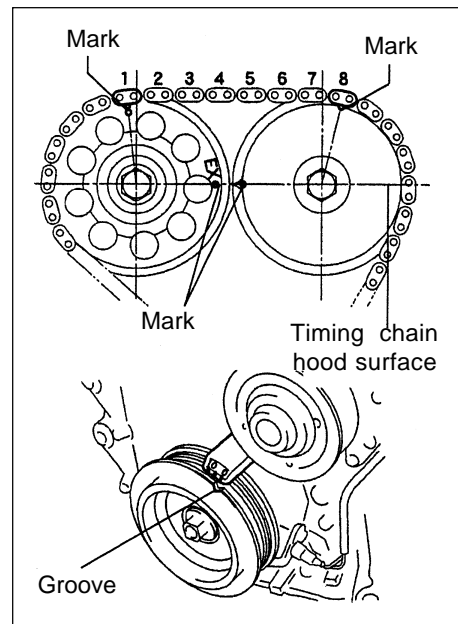
Camshaft Replacement

1. Remove engine hood.
2. Remove ignition coil assembly.
3. Remove cylinder head cover assembly.
4. Remove engine right bottom shield.
5. Turn crankshaft to cylinder 1 compression top dead center position.

(a) Turn damping pulley to align its groove with "o" mark on timing chain hood.

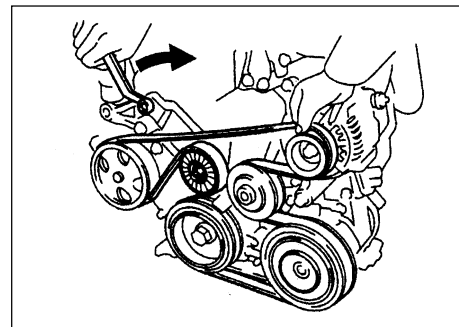
(b) Check dot marks on camshaft timing sprocket and VVT timing sprocket, and they should be in a line on timing chain hood surface as shown in the diagram.

Hint: if not, turn crankshaft for one circle (360°) again and align the above marks.



6. Remove drive belt.

Slowly turn drive belt tensioner clockwise to loosen it. Then remove drive belt and put back drive belt tensioner slowly and gently.

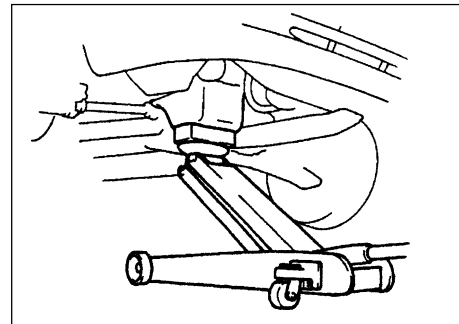


7. Remove right engine mounting assembly.

- (a) Remove PS oil pump reservoir and put it aside.
- (b) Place wooden block between jack and engine, properly place the jack, and then remove engine fixing bracket shock absorber.

8. Remove drive belt tensioner assembly.

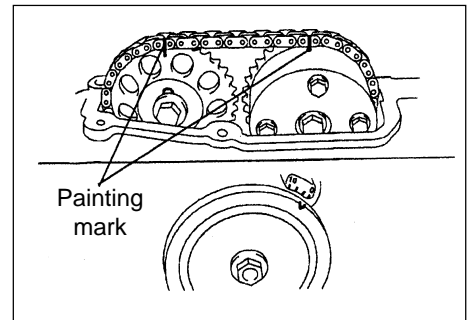
Hint: operate the jack up and down to remove bolts.



9. Remove camshaft.

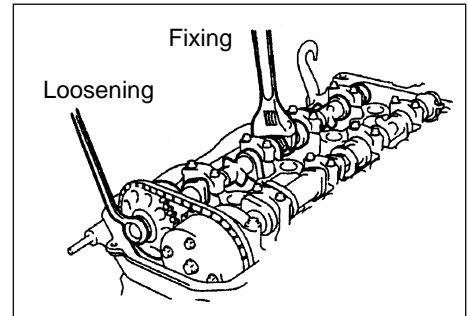
Note: do not turn crankshaft before installing timing chain tensioner.

- (a) Turn crankshaft to cylinder 1 top dead center position.
- (b) Make marks on timing chain and camshaft timing sprocket.
- (c) Remove 2 bolts and chain tensioner.

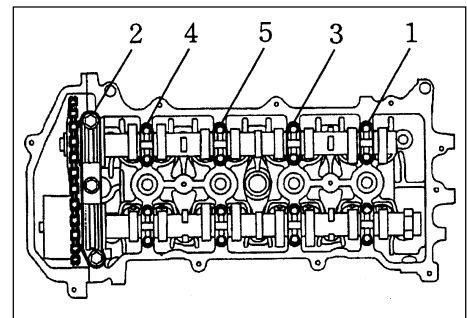


- (d) Fix camshaft with variable wrench and then loosen the fixed bolts of camshaft timing sprocket.

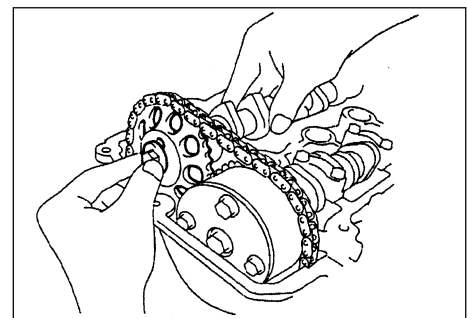
Note: do not damage valve lifter.



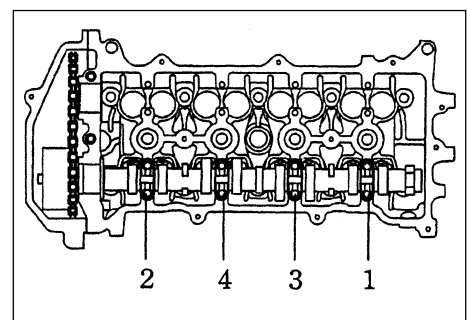
- (e) As sequences shown in the diagram, loosen camshaft bearing cover bolts on exhaust camshaft at several times and remove the bearing cover at the same time.



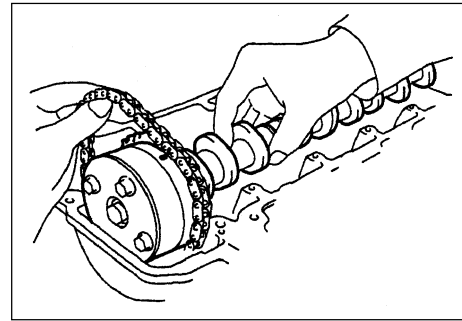
- (f) As shown in the diagram, remove exhaust camshaft timing sprocket.



- (g) As sequences shown in the diagram, loosen camshaft bearing cover bolts on intake camshaft at several times and remove the bearing cover at the same time.

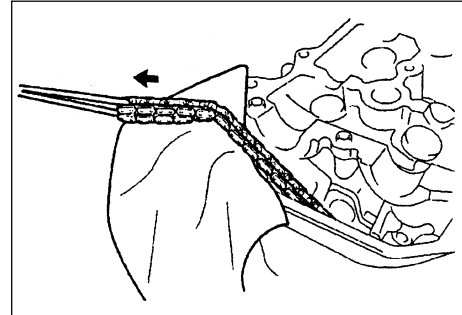


- (h) Hold timing chain with hands and then remove intake camshaft.



- (i) As shown in the diagram, tie up the chain with bandage.

Note: be careful not to let anything fall into the timing chain hood.



10. Check VVT driver assembly [4G18-1006300].

- (a) Check locking state of timing sprocket.

Clip the camshaft with a jaw vice, and ensure VVT driver is locked tightly.

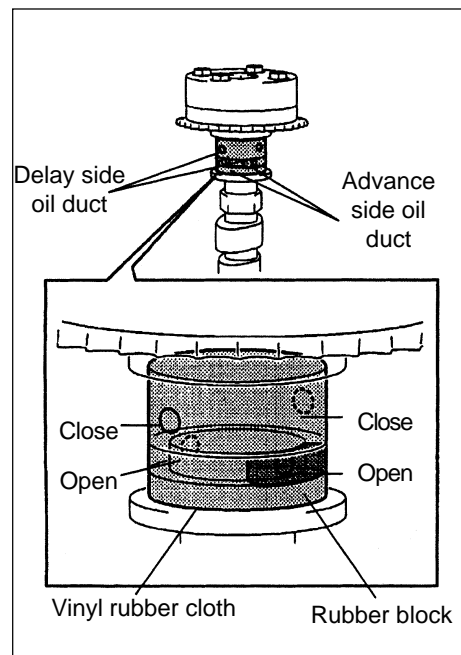
Note: be careful not to damage intake camshaft.

- (b) Release lock pin.

- (1) As shown in the diagram, seal 5 oil ducts of intake camshaft journal with vinyl rubber cloth.

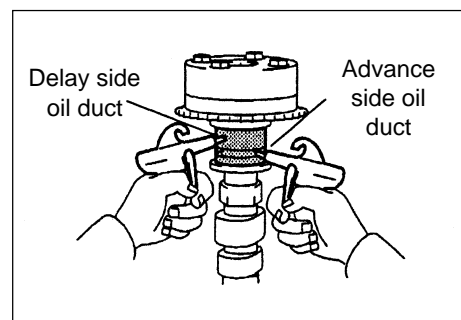
Hint: there are 2 advance side oil ducts in the groove of intake camshaft, and clog one of them with rubber block.

- (2) In opposite side of the groove, prick a hole on vinyl rubber cloth of advance side oil duct surface and delay side oil duct surface.



- (3) Send in 2 oil ducts (advance side oil duct and delay side oil duct) with the surface rubber cloth pricked under the pressure of 150Kpa.

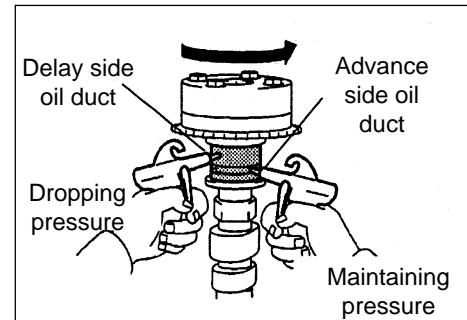
Warning: cover the oil ducts with cloth to avoid oil injecting out in pushing.



- (4) Ensure whether the timing sprocket of VVT driver will turn toward timing advance direction in decreasing the pressure of timing delay oil duct.
- (5) When camshaft timing sprocket turns at max. timing advance position, release the air pressure in timing delay side oil duct, and then release the air in timing advance side oil duct.

Hint: camshaft timing sprocket will turn only after the lock pin is released.

Warning: if the air pressure in timing advance side oil duct is released earlier than that in timing delay side oil duct, VVT driver assembly will move suddenly toward delay side, and the lock pin will be damaged.



- (c) Check rotating is smooth.

Besides max. delay position, turn VVT driver assembly within rotating rang and check rotating is smooth.

Warning: Perform inspection with hands but not with compressed air.

- (d) Check the fixing state of max. delay position.

Ensure camshaft timing sprocket assembly is fixed at max. delay position.

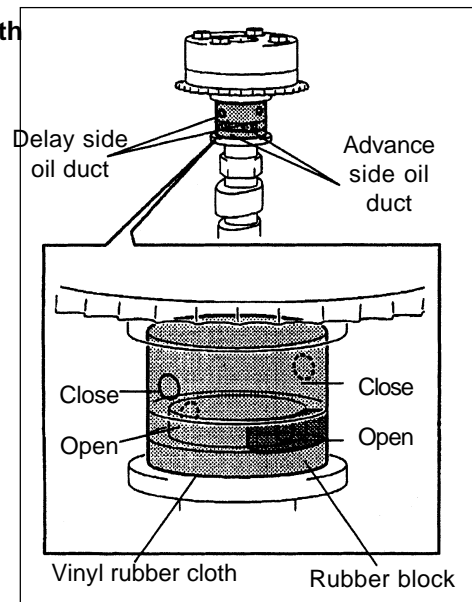
11. Remove VVT driver assembly.

- (a) Clip the camshaft with a jaw vice, and ensure VVT driver is locked tightly.

Warning: be careful not to damage camshaft.

- (b) As shown in the diagram, seal 5 oil ducts of camshaft journal with vinyl rubber cloth.

Hint: there are 2 advance side oil ducts in the groove of camshaft, and clog one of them with rubber block.



- (c) In opposite side of the groove, respectively prick a hole on vinyl rubber cloth of advance side oil duct surface and delay side oil duct surface.

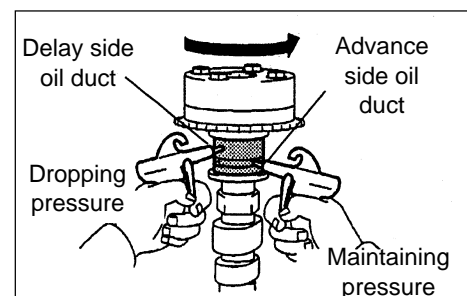
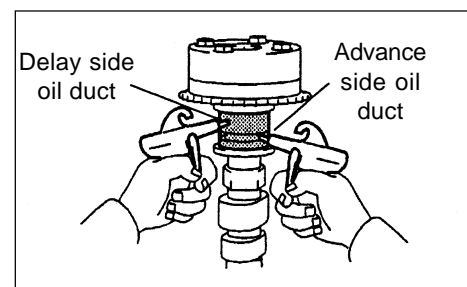
- (d) Send in 2 oil ducts (advance side oil duct and delay side oil duct) with the surface rubber cloth pricked under the pressure of 150Kpa.

Warning: cover the oil ducts with cloth to avoid oil injecting out in pushing.

- (e) Ensure whether the timing sprocket of VVT driver will turn toward timing advance direction in decreasing the pressure of timing delay oil duct.

Hint: camshaft timing sprocket will turn toward advance direction only after the lock pin is released.

- (f) When camshaft timing sprocket turns at max. timing advance position, release the air pressure in timing delay side oil duct, and then release the air in timing advance side oil duct.



Warning: if the air pressure in timing advance side oil duct is released earlier than that in timing delay side oil duct, VVT driver assembly will move suddenly toward delay side. This will cause the damage of lock pin.

- (g) Remove VVT drive fixed bolts.

Notes:

It is strictly forbidden to remove other 4 bolts.
Under the condition of repeating using camshaft timing sprocket, release lock pin at first, and then install sprocket.

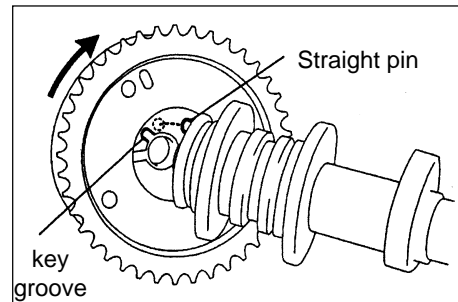
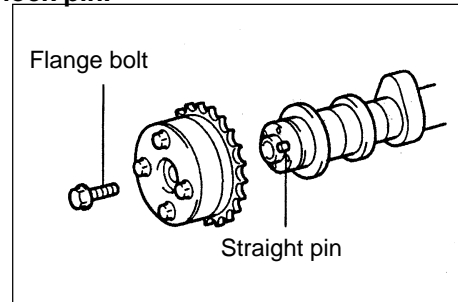
12. Install VVT driver assembly.

13. Install camshaft.

Put VVT driver assembly together with intake camshaft.

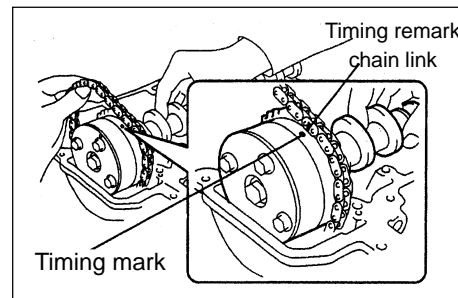
- (a) As shown in the diagram, gently make VVT assembly hold camshaft and turn it toward left until straight pin is inserted into groove.

Warning: it is strictly forbidden to turn camshaft timing sprocket toward timing delay side (toward right).



- (b) Check there is no clearance between sprocket flange and camshaft.
(c) Fix camshaft timing sprocket and then tighten flange bolt.

Torque: $70 \pm 5 \text{ N.m}$

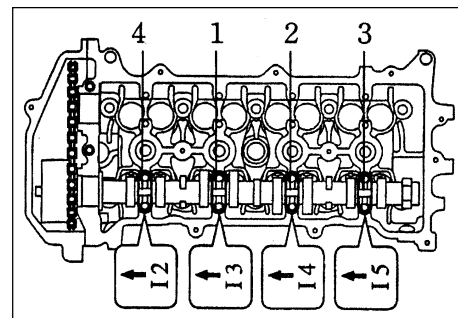


- (d) Check VVT driver assembly could move to timing delay side and is locked at max. timing delay position.

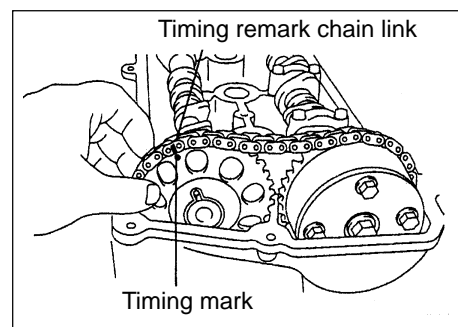
- (f) As shown in the diagram, align alignment mark with timing mark on camshaft timing sprocket, and install timing chain on the timing sprocket.

- (g) Check forward mark and figure, and tighten bolts as sequences shown in the diagram.

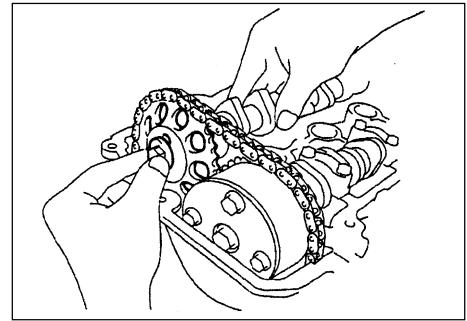
Torque: $13 \pm 0.78 \text{ N.m}$



- (h) Align alignment mark on the chain with timing mark on camshaft timing sprocket, and place exhaust camshaft in cylinder head.

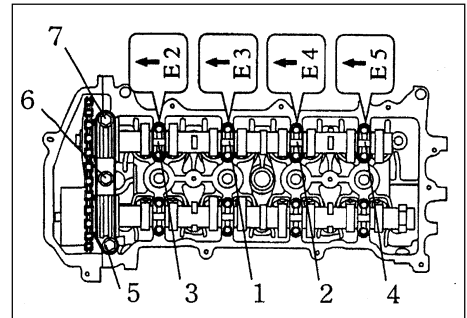


- (i) Temporarily tighten fixed bolts.



- (j) Check forward mark and figure, and tighten bolts as sequences shown in the diagram.

Torque: $13 \pm 0.78 \text{ N.m}$



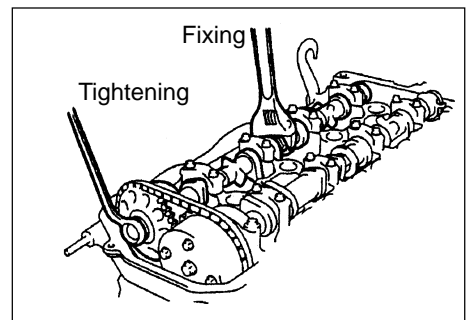
- (k) Install camshaft front bearing cover.

Torque: $23 \pm 1.38 \text{ N.m}$

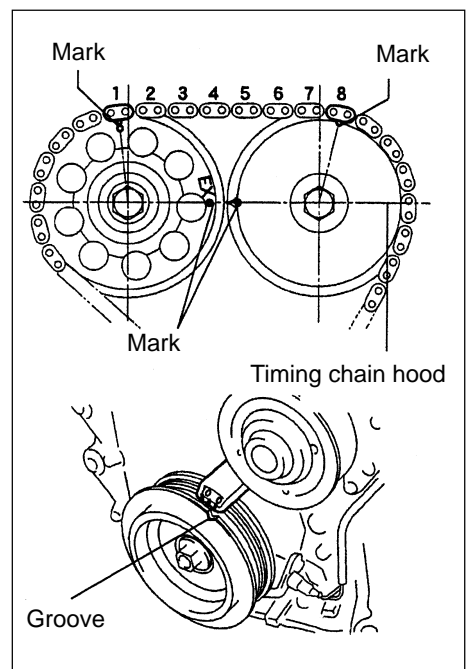
- (l) Fix camshaft with variable wrench and then tighten the fixed bolts of exhaust camshaft timing sprocket.

Torque: $54 \pm 10.8 \text{ N.m}$

Note: be careful not to damage valve lifter.

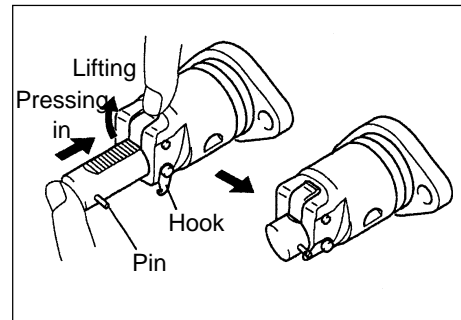


- (m) Check the alignment marks on timing chain and camshaft timing sprocket, and then align the groove of damping pulley with the timing mark on timing chain hood as shown in the diagram.



(n) Install chain tensioner components.

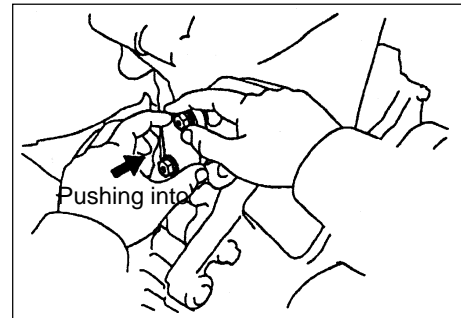
(1) Check o-ring is clean, and buckle on the hook as shown in the diagram.



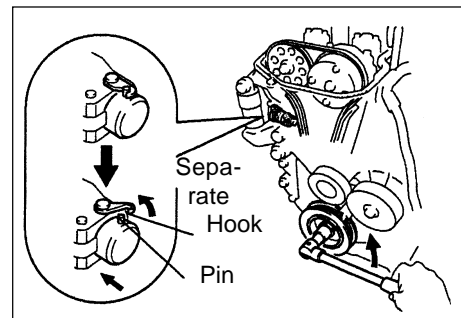
(2) Coat engine oil on the chain tensioner, and then install it.

Torque: $9 \pm 1.8 \text{ N.m}$

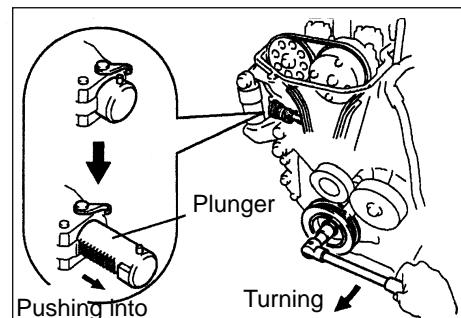
Note: when installing the chain tensioner, buckle on the hook again if plunger has ejected.



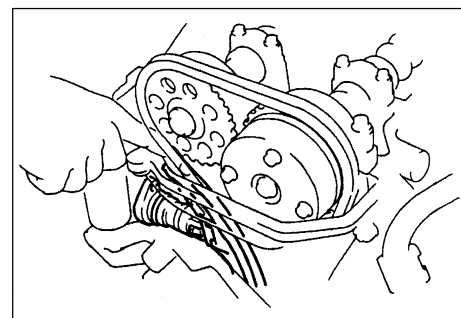
(3) Turn crankshaft counterclockwise to separate the hook from lock pin on the plunger.



(4) Turn crankshaft clockwise, and check the sliding parts are blocked by plunger.



Hint: if the plunger does not eject, press the tension rail toward chain tensioner with screwdriver or fingers to separate the hook from lock pin and make the plunger eject.



14. Adjust valve clearance.

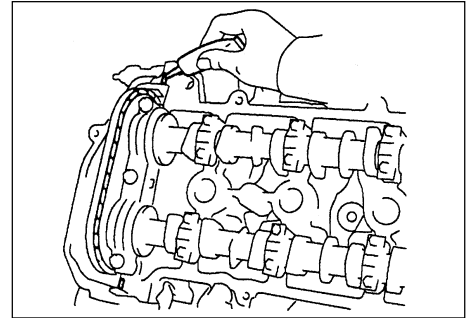
15. Install cylinder head cover components.

- (a) Install gasket to cylinder head cover.
- (b) Eliminate all old sealant (FIPG) materials.
- (c) Coat sealant on position shown in the diagram.
Sealant: silicon rubber flange sealant 1596 (Kesaixin 1596).

Notes:

- Eliminate all oil on contact surface.
 - After coating sealant, finish installation of cylinder head cover within 3 minutes.
 - After installing, do not refill engine oil within 2 minutes.
- (d) Install cylinder head cover and harness bracket with 9 bolts, 2 oil seal washers and 2 nuts.
Evenly tighten bolts and nuts at several times.
Torque: nut: $29 \pm 5.8\text{N.m}$

Bolt: $69 \pm 13.8\text{N.m}$



16. Install drive belt tensioner device.

Torque: nut: $29 \pm 5.8\text{N.m}$

Bolt: $69 \pm 13.8\text{N.m}$

17. Install right engine mounting assembly.

Torque: 52N.m

18. Check there is oil leakage.

Crankshaft front oil seal assembly

Replacement

1. Remove engine right bottom shield.

2. Remove drive belt.

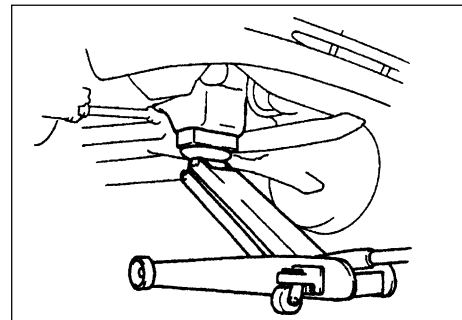
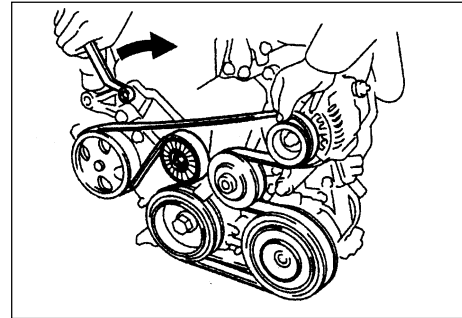
Slowly turn drive belt tensioner clockwise to loosen it. Then remove drive belt and put back drive belt tensioner slowly and gently.

3. Remove right engine mounting assembly.

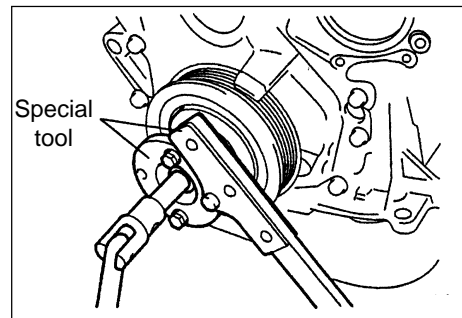
(a) Remove PS oil pump reservoir and put it aside.

(b) Place wooden block between jack and engine, properly place the jack, and then remove right engine mounting assembly.

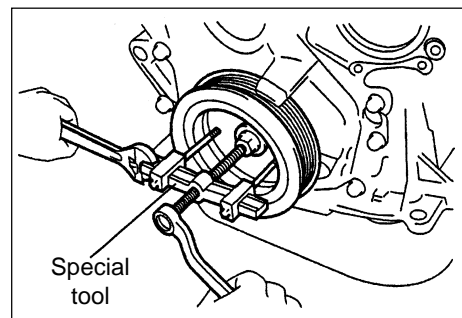
4. remove damping pulley.



(a) Remove pulley bolts with special tool.



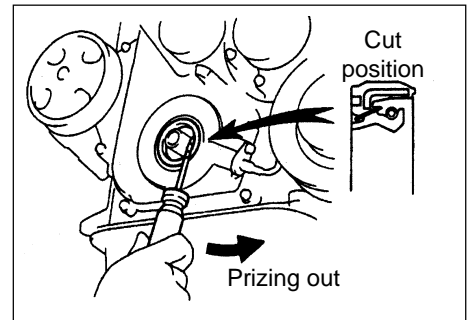
(b) Remove damping pulley with special tool.



5. Remove crankshaft front oil seal.

- (a) Cut oil seal lip with blade.
- (b) Prize out oil seal with flat screwdriver whose sharp end is winded with tape.

Note: check crankshaft is damaged after removing oil seal, and repair with abrasive paper (#400) if it is damaged.



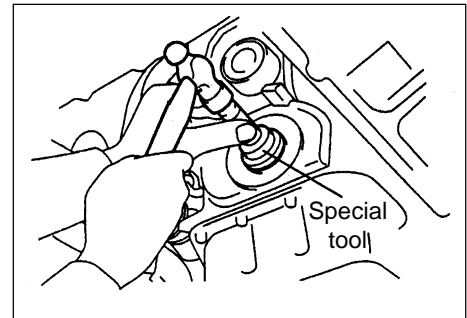
6. Install crankshaft front oil seal.

- (a) Coat a little MP grease on new oil seal lip.

Note: do not let oil seal lip contact with foreign matters.

- (b) Gently knock new oil seal in with special tool and hammer until the seal surface is parallel and level with the end surface edge of mounting hole.

Note: wipe off redundant grease on crankshaft.



7. Install damping pulley.

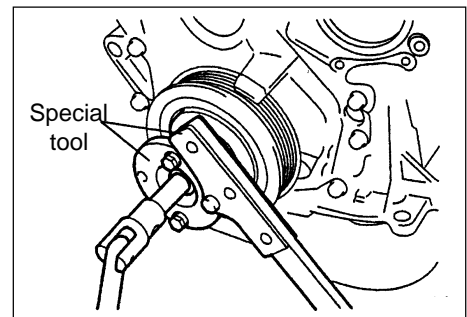
- (a) Align the key groove on the pulley with the key on the crankshaft, and slide pulley in.
- (b) Install pulley bolts with special tool.

Torque: $138 \pm 8.26 \text{ N} \cdot \text{m}$

8. Install right engine mounting assembly.

Torque: $52 \text{ N} \cdot \text{m}$

9. Check there is oil leakage.



Crankshaft rear oil seal assembly

Replacement

1. Remove transmission assembly.

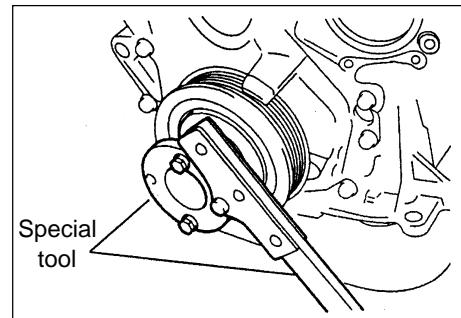
2. Remove clutch assembly and flywheel components.

Fix crankshaft with special tool, remove clutch assembly at first, and then remove flywheel components.

3. Remove crankshaft rear oil seal.

- Cut oil seal mouth with blade.
- Prize out oil seal with flathead screwdriver whose sharp end is winded with tape.

Note: check crankshaft is damaged after removing oil seal, and repair with abrasive paper (#400) if it is damaged.



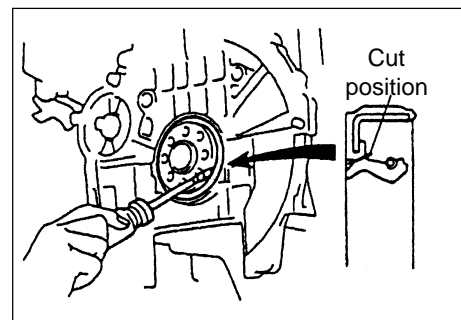
4. Install crankshaft rear oil seal [4G18-1002130].

- Coat a little MP grease on new oil seal lip.

Note: do not let oil seal lip contact with foreign matters.

- Gently knock new oil seal in with special tool and hammer until the seal surface is parallel and level with the end surface edge of mounting hole.

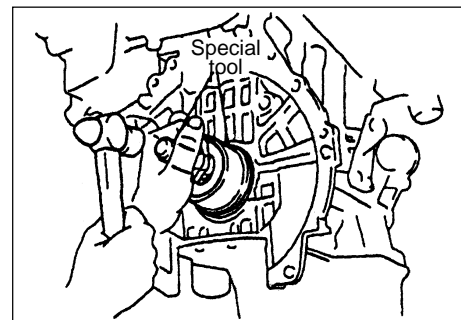
Note: wipe off redundant grease on crankshaft.



5. Install flywheel components and clutch assembly.

- Fix crankshaft with special tool.
- Clean bolts and bolt holes.
- Coat bolts with adhesive.

Adhesive: thread locking adhesive 1234 (Kesaixin 1234)

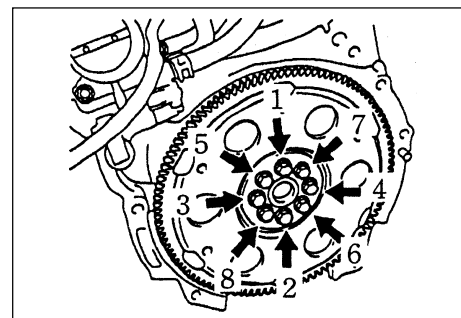


- Install flywheel components.

As sequences shown in the diagram, tighten bolts at several times.

Torque: $88 \pm 5 \text{ N} \cdot \text{m}$

- Install clutch assembly.



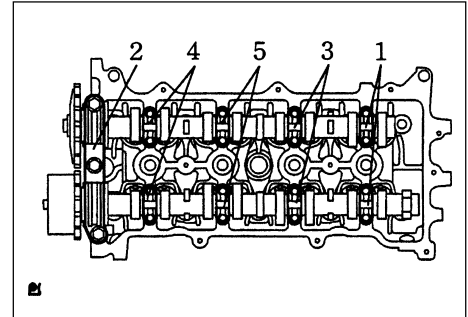
6. Install transmission assembly.

Cylinder cover gasket components

Replacement

1. Take measures to prevent gasoline leaking.
2. Remove timing chain assembly.
3. Remove camshaft.

As sequences shown in the diagram, evenly loosen at several times, and remove 19 bearing cover bolts, and then remove 9 bearing covers of intake camshaft and exhaust camshaft.

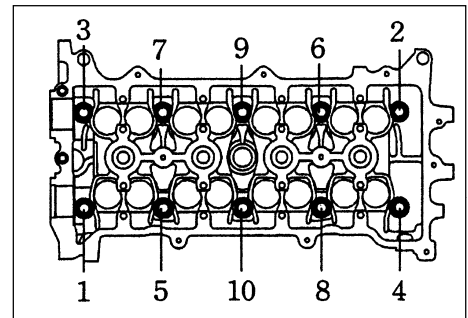


4. Remove cylinder head assembly.

- (a) Remove warm air water outlet pipe from cylinder head.
- (b) As shown in the diagram, evenly loosen 10 cylinder head bolts with 10mm dual hexagonal sleeves at several times, and then remove 10 cylinder head bolts and plain washer.

Notes:

- Be careful not to let washer fall into cylinder head.
- Incorrect disassembling sequence will cause cylinder head warp or chap.



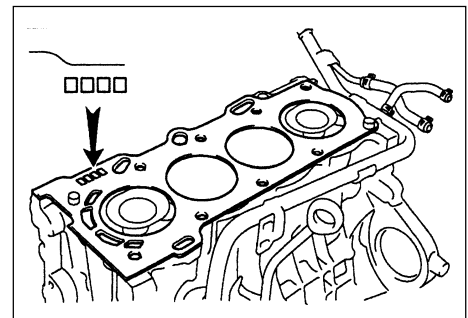
5. Remove cylinder head gasket components [4G18-1003160].

6. Install cylinder head gasket components.

Put new cylinder head gasket on the cylinder body.

Notes:

- Pay attention to installation direction.
- Gently put down cylinder head to avoid damaging cylinder head gasket.

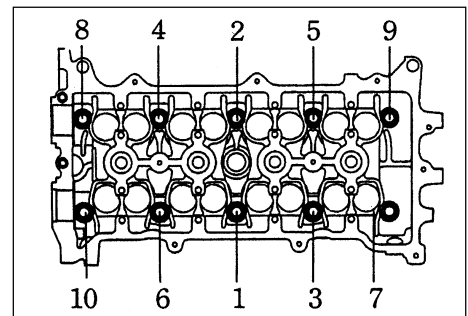


7. Install cylinder head assembly.

Hint: Lock up cylinder head bolts as 2 steps.

- (a) Coat a thin layer of engine oil at bolt thread and the bottom of bolt head.
- (b) As shown in the diagram, evenly tighten 10 cylinder head bolts and plain washer with 10mm dual hexagonal sleeves at several times.

Torque: $49 \pm 3 \text{ N} \cdot \text{m}$



- (c) Tighten each cylinder head bolt in turn again.

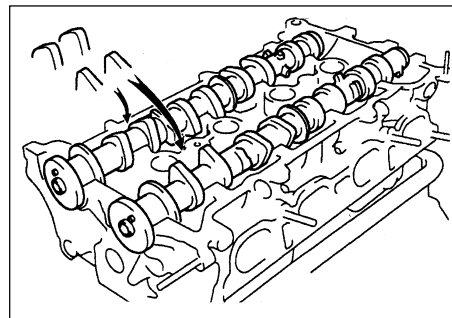
Torque: $80 \pm 4 \text{ N} \cdot \text{m}$

- (d) Install heating air water outlet pipe components.

Torque: $9 \pm 1.8 \text{ N} \cdot \text{m}$

8. Install camshaft.

- (a) Coat engine oil on camshaft journal.
(b) Put 2 camshafts on cylinder head and with cylinder 1 camshaft end toward the direction shown in the diagram.

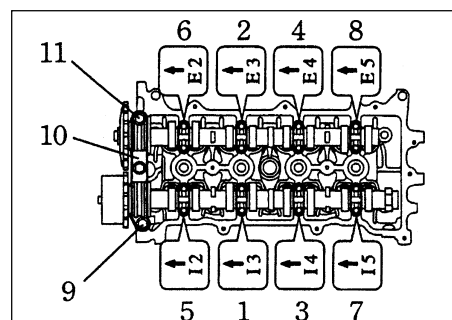


- (c) Check forward remarks and figures of all bearing cover, and tighten the bolts as sequences shown in the diagram.

Torque:

Camshaft front bearing cover: $23 \pm 1.38 \text{ N} \cdot \text{m}$

Camshaft bearing cover: $13 \pm 0.78 \text{ N} \cdot \text{m}$



9. Check idle speed and ignition timing.

10. Check compression pressure.

11. Check CO/HC.

Exhaust

Exhaust pipe assembly

Removing, installing and disassembling, assembling

1. Remove oxygen sensor.

- Uncouple oxygen sensor joint.
- Remove oxygen sensor.

2. Remove exhaust pipe guard [64000051].

3. Remove front exhaust pipe together with three-way catalytic converter assembly [64000042].

4. Remove middle exhaust pipe together with middle silencing device assembly [64000043].

5. Remove rear exhaust pipe together with rear silencing device assembly [64000044].

6. Install front exhaust pipe together with three-way catalytic converter assembly [64000042].

- Measure free length of compression spring with vernier caliper.

Free length: 43mm

Hint: if the free length does not reach the standard value, it is necessary to replace compression spring.

- Gently knock silencing device inlet seal ring to exhaust manifold with hammer and wooden block until the surfaces are parallel and level with each other.

Notes:

- Gently knock gasket toward positive direction.
- Do not repeat using the gasket that has been removed.
- Do not push the gasket in by means of tightening bolt connection.

- Install exhaust pipe.

Torque: 43 N.m

7. Install oxygen sensor.

Torque: 44 N.m

8. Install middle exhaust pipe together with middle silencing device assembly [64000043].

Couple front intake pipe of middle exhaust pipe together with middle silencing device assembly with outlet pipe of front exhaust pipe together with three-way catalytic converter using a new gasket. **Torque: 43 N.m**

9. Install rear exhaust pipe together with rear guard assembly [64000044].

- Measure free length of compression spring with vernier caliper.

Free length: 40mm

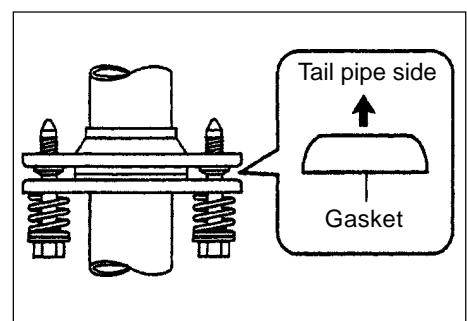
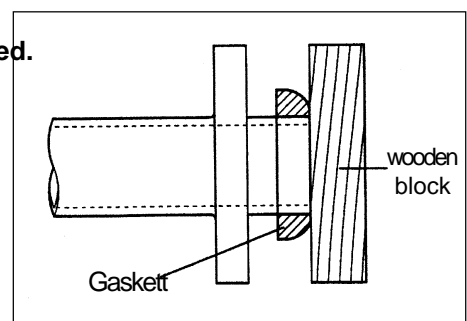
Hint: if the free length does not reach the standard value, it is necessary to replace compression spring.

- Install tail pipe to front pipe using a new gasket.

Torque: 43 N.m

10. Install front exhaust pipe guard [64000051].

11. Check there is gas leakage with exhaust system.



Cooling

Cooling system

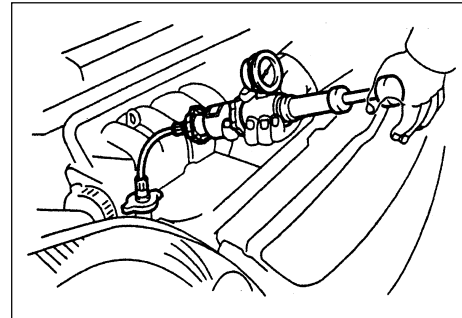
On-vehicle inspection

1. Check there is leakage with cooling system.

Warning: when the temperature of engine and radiator is high, do not remove radiator cap to avoid being scalded, because coolant and steam will spurt under high pressure.

- (a) Refill coolant to radiator, and install radiator cap tester.
- (b) Preheat engine.
- (c) Pump tester to make pressure go up to 118KPa, and check the pressure falls.

Hint: if the pressure falls, check there is leakage with hose, radiator or water pump, and check heater, cylinder body and cylinder head if no external leakage is found.



2. Check engine coolant level in reservoir.

Engine coolant level should be between “Low” and “Full” mark line.

Hint: if the level is too low, check there is leakage and refill coolant to “Full” mark line.

3. Check engine coolant quality.

- (a) Remove radiator cap.

Warning: when the temperature of engine and radiator is high, do not remove radiator cap to avoid being scalded, because coolant and steam will spurt under high pressure.

- (b) Check there is too much rust deposit around radiator cap or at outlet and check there is flake; there should not be oil in the coolant.

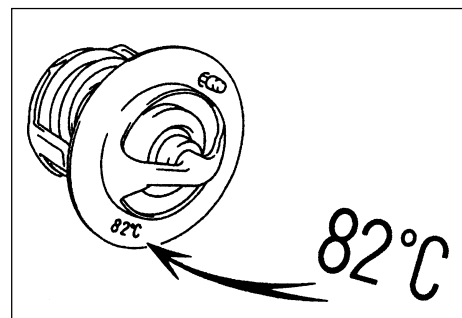
Hint: if coolant is too dirty, it is required to replace coolant.

- (c) Install back radiator cap.

Inspection

1. Temperature regulator

Hint: the figure on temperature regulator is the opening temperature of valve.



(a) Immerse temperature regulator into water and heat gradually.

(b) Check opening temperature of valve.

Opening temperature of valve: $80^{\circ}\text{C} \sim 84^{\circ}\text{C}$

Hint: if opening temperature of valve is not within specified range, it is required to replace temperature regulator.

(c) Check opening of valve.

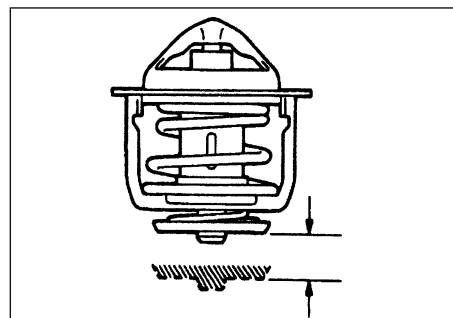
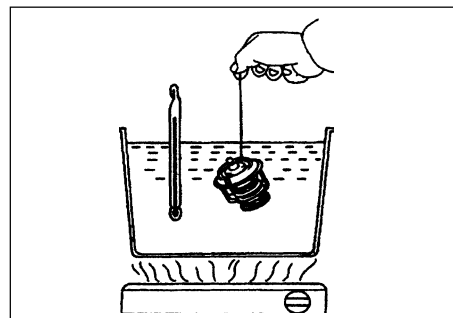
Opening of valve:

Temperature	Degree of valve opening
95°C	8mm

Hint: if degree of valve opening is not within specified range, it is required to replace temperature regulator.

(a) When temperature regulator is at low temperature (below 77°C), check valve is tightly closed.

Hint: if the valve could not be closed, it is required to replace temperature regulator.



2. Radiator cap assembly

Notes:

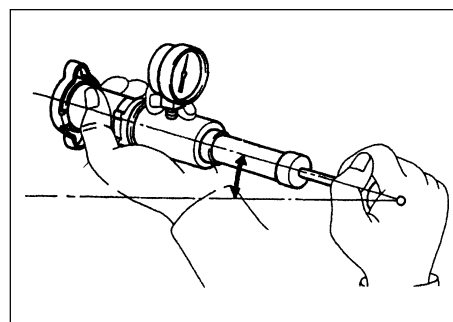
- If radiator is dirty, wash it with clean water.
- Before using radiator cap tester, dampen relief valve and pressure valve with coolant or water.

(a) Use radiator cap tester to slowly pump radiator cap tester, and check the air is released by vacuum valve.
Pumping speed: 1 time /(3 seconds or more)

Note: pump radiator tester with constant speed.

Hints:

- Pumping speed: 1 time /(3 seconds or more)
- If air could not be released by vacuum valve, please replace radiator cap.



(b) Pump tester and check opening pressure of relief valve.

Standard opening pressure: 74-108KPa

Min. opening pressure: 59KPa

Note: pumping speed means that the speed could be increased after the first time pumping speed (to close vacuum valve).

Hints:

- Pumping speed: 1 time within 1 second
- Max. reading of tester is opening pressure.
- If opening pressure is less than min. value, please replace radiator cap.

Cooling fan system

On-vehicle inspection

1. Check cooling fan function at low temperature (below 95°C).

- Turn ignition switch to ON.
- Check cooling fan is stopped.

Hint: if it is not stopped, check cooling fan relay and water temperature sensor, or check the joint or wire harness between them.

- Uncouple water temperature sensor joint.
- Check cooling fan runs.

If it does not run, check fuse, cooling fan relay, engine ECU and cooling fan, or check there is short circuit between them.

- Connect back water temperature sensor joint.

2. Check cooling fan function at high temperature (above 95°C).

- Start engine and increase coolant temperature up to above 95°C.

Hint: water temperature is the value measured by water temperature sensor on water outlet.

- Check cooling fan runs.

Hint: if it does not run, please replace water temperature sensor.

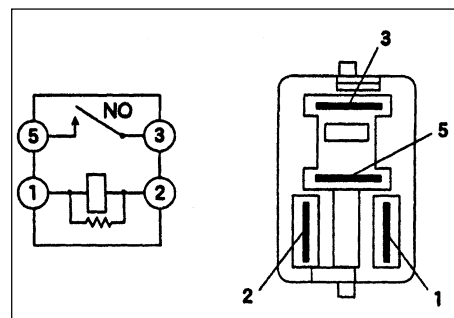
3. Check cooling fan.

- Uncouple cooling fan joint.
- Connect battery and ampere meter to cooling fan joint.
- Check cooling fan runs normally and check ampere meter reading. Standard current: 7~12A
- Connect back cooling fan joint.

Inspection

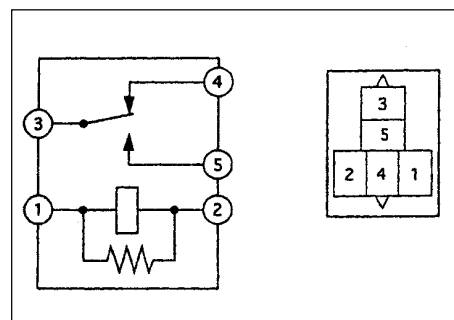
1. Electronic fan relay I [67000064]

Conditions	Terminal connected by three-use meter	Specified conditions
Normal state	1-2	Conduction
Supply battery voltage to No. 1 and No. 2 terminals	3-5	Conduction



2. Electronic fan relay II [67000072]

Conditions	Terminal connected by three-use meter	Specified conditions
Normal state	1-2	Conduction
Supply battery voltage to No. 1 and No. 2 terminals	3-5	Conduction



3. Cooling fan speed adjusting resistance assembly [67000001]

Measure resistance between terminals with ohmmeter.

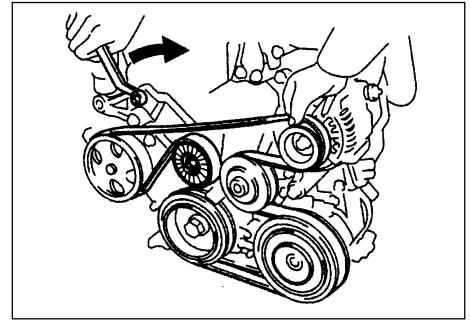
Resistance: at normal temperature: 1.3 Ω

Water pump assembly

Replacement

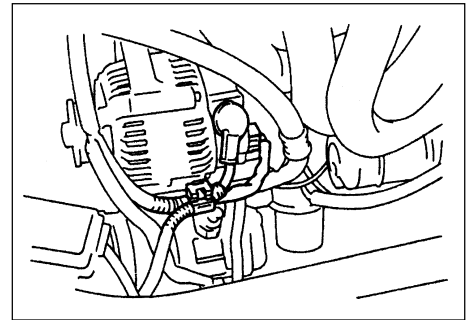
1. **Remove engine right bottom shield.**
2. **Discharge engine coolant.**
3. **Remove drive belt.**

Slowly turn drive belt tensioner clockwise to loosen the belt; then remove drive belt and put back drive belt tensioner slowly to completely loosen the tensioner.

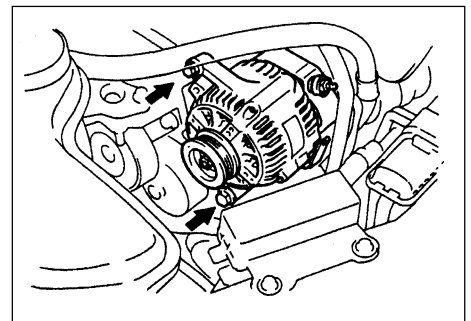


4. **Remove alternator assembly.**

- (a) Remove rubber cover and nuts.
- (b) Uncouple alternator joint.

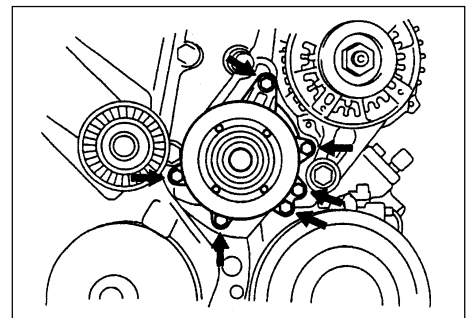


- (c) Remove 2 bolts and alternator.



5. **Remove water pump assembly.**

Remove 6 bolts, water pump and o-ring.



6. Install water pump assembly.

- (a) Install new o-ring on water pump.
- (b) Install water pump with 6 bolts.

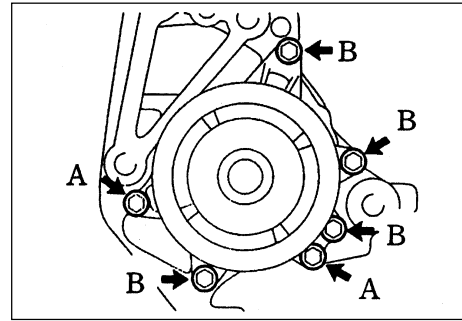
Torque: bolt A: $9 \pm 1.8 \text{ N} \cdot \text{m}$

Bolt B: $11 \pm 2.2 \text{ N} \cdot \text{m}$

7. Install alternator mounting components.

Torque: 12mm bolt head: $25 \pm 5 \text{ N} \cdot \text{m}$

14mm bolt head: $54 \pm 10.8 \text{ N} \cdot \text{m}$



8. Refill engine coolant.

9. Check there is leakage with coolant.

Temperature regulator components

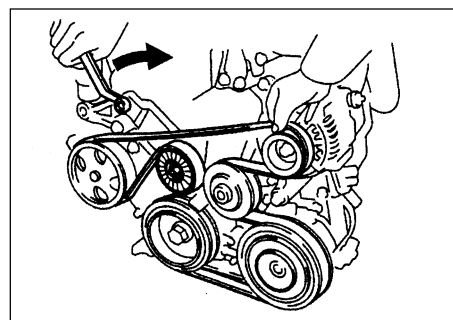
Replacement

1. Remove engine right bottom shield.

2. Discharge engine coolant.

3. Remove drive belt.

Slowly turn drive belt tensioner clockwise to loosen the belt; then remove drive belt and put back the tensioner slowly to completely loosen it.



4. Remove alternator components.

(a) Remove rubber cover and nuts.

(b) Uncouple alternator joint.

(c) Remove 2 bolts and alternator.

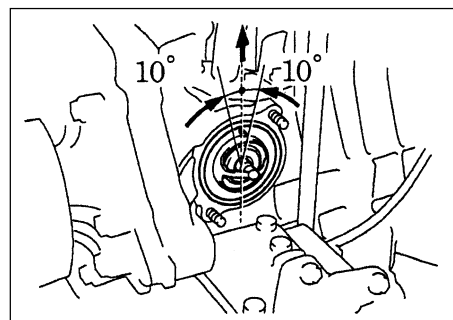
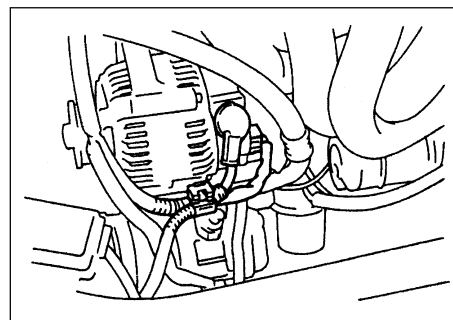
5. Remove water inlet pipe.

6. Remove temperature regulator.

7. Install temperature regulator.

(a) Install new gasket to temperature regulator.

(b) As shown in the diagram, install temperature regulator with inching valve toward upward.



8. Install water inlet pipe and joint.

Torque: $11 \pm 2.2 \text{ N} \cdot \text{m}$

9. Install alternator installation components.

Torque: 12mm bolt head: $25 \pm 5 \text{ N} \cdot \text{m}$

14mm bolt head: $54 \pm 10.8 \text{ N} \cdot \text{m}$

10. Refill engine coolant.

11. Check there is leakage with coolant.

Radiator with electronic fan assembly Replacement

- 1. Discharge coolant (see Page 73).**
- 2. Disassemble radiator water inlet hose [64000062].**
- 3. Disassemble radiator water outlet hose [64000063].**
- 4. Disassemble No.1 oil cooler inlet pipe (auto gear).**
- 5. Disassemble No.1 oil cooler outlet pipe (auto gear).**
- 6. Disassemble fixing clips of 2 wire harnesses from fan cover.**
- 7. Remove mounting bracket assembly on radiator [64000058].**
- 8. Remove radiator together with electronic fan assembly [64000057].**
- 9. Remove electronic fan together with fan cover assembly [64000060].**
 - (a) Screw off fixed nuts connecting electronic fan together with fan cover assembly with radiator.
 - (b) Uncouple fan motor joint.
 - (c) Remove 2 bolts of fan.
 - (d) Remove fan motor at the same time.
- 10. Replace and install as sequences opposite to the above.**
- 11. Refill engine coolant (see Page 73).**
- 12. Check there is leakage with coolant (see Page 66).**

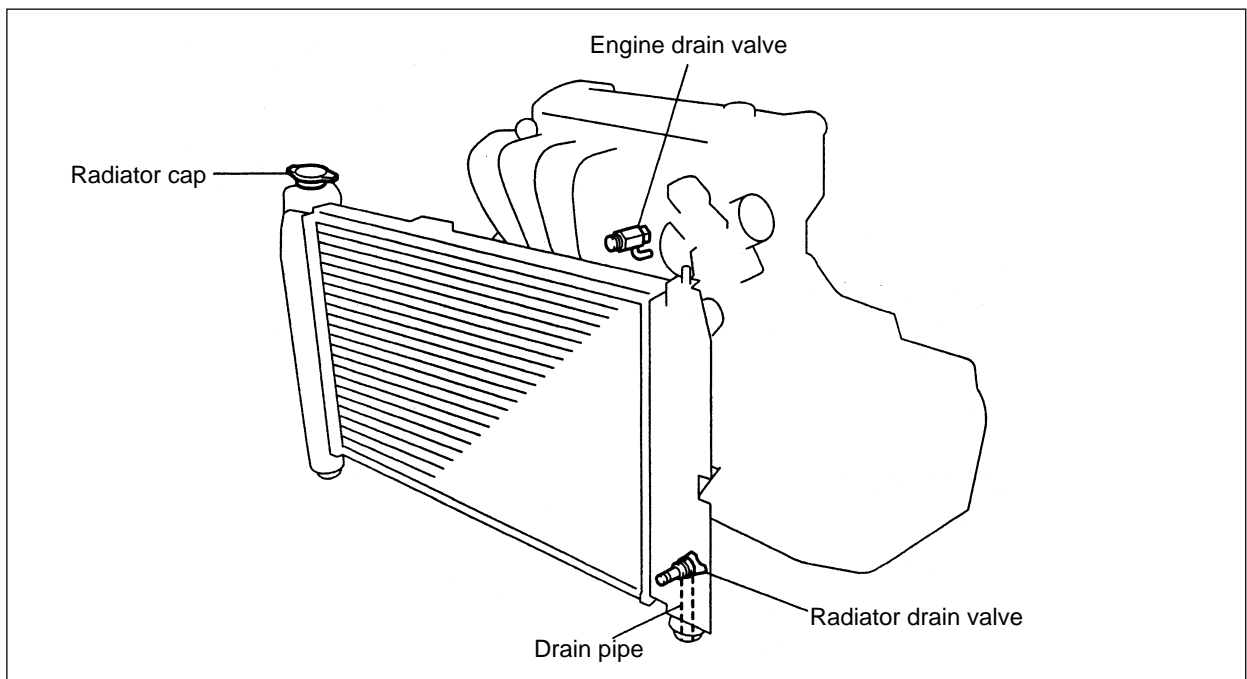
Coolant

Replacement

1. Discharge engine coolant.

Warning: when the temperature of engine and radiator is high, do not remove radiator cap to avoid being scalded, because coolant and steam will spurt under high pressure.

- (a) Remove radiator cap.
- (b) Open radiator drain valve and engine drain valve.



2. Refill engine coolant.

- (a) Lock 2 drain valves and pour coolant into radiator until it is full.

Hints:

- Press radiator water inlet hose and outlet hose with hands several times.
- If coolant level is too low, please refill coolant again.

- (b) Screw down radiator cap.
- (c) Pour coolant into expansion tank until the level is up to "FULL" mark line.
- (d) Run engine with vehicle warning up until thermostat valve is opened.

Hint: During vehicle warning up, press radiator water inlet hose and outlet hose with hands several times.

- (e) Engine flames out until coolant temperature falls to "cold". Then open radiator cap and check coolant level.
- (f) If coolant level is too low, please perform the above steps again.
- (g) If coolant level is not too low, please adjust expansion tank coolant level.

3. Check there is leakage with coolant.

- (a) Refill engine coolant to radiator, and install radiator cap tester.
- (b) Pressurize radiator to 118kPa, and check there is leakage.

Lubrication

Lubricating system

On-vehicle inspection

1. Check oil level.

During engine warming up and after it flames out for 5 minutes, check oil level, and the level should be between two marks on oil dipstick at the moment. If oil level is too low, check there is leakage, and refill oil up to upper mark on oil dipstick.

Note: oil level should not be above upper mark on oil dipstick.

2. Check oil quality.

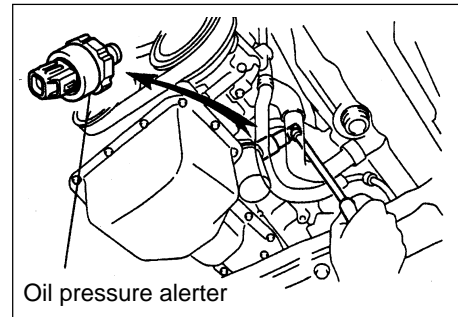
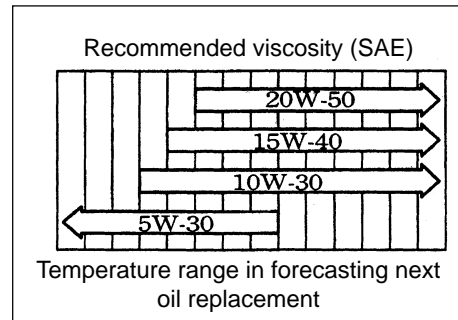
- Check there is deterioration, water penetration, color change or thinning with oil.
- If oil quality becomes poor, please replace with new oil.

Hint: oil grades: API, SH, SJ, SG grade oil or ILSAC multigrade oil. Recommended viscosity is shown as below.

The temperature increases from left to right.

3. Remove oil pressure alerter assembly.

- Uncouple oil pressure alerter joint.
- Install oil pressure alerter with special tool.



4. Install oil pressure gauge.

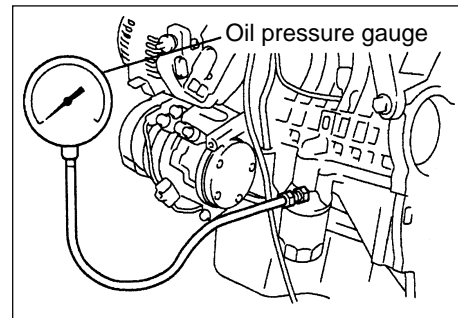
Install oil pressure gauge.

5. Warm up vehicle.

6. Check oil pressure.

Oil pressure:

At idle speed	$\geq 60\text{KPa}$
At 3000 rpm	294 ~ 539 KPa



7. Install oil pressure alerter.

- Coat adhesive on 2nd or 3rd circle thread of oil pressure alerter.

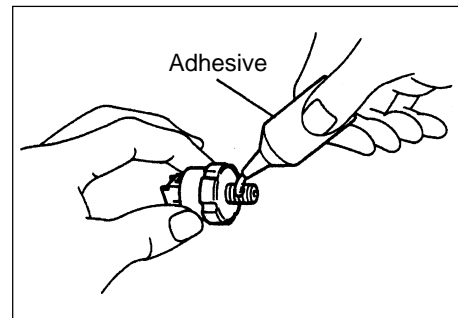
Adhesive: anaerobic pipe thread sealing adhesive 1545 (Kesaixin 1545).

- Install oil pressure alerter with special tool.

Torque: $15 \pm 4.5\text{N} \cdot \text{m}$

- Connect oil pressure alerter joint.

8. Start engine and check there is leakage.



Oil filter assembly

Replacement

Warning:

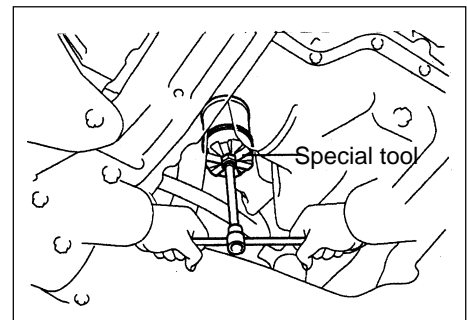
- Long-term or repeat contacting mineral oil will cause decomposing of natural fat on skin, which will result in dry and sensitive skin and skin rankling. Used oil has potential harm and may cause carcinoma cutis.
- When replacing engine oil, always wear protective clothes and gloves to avoid waste oil penetrating, and reduce the frequency and time of skin contacting waste oil, and clean with soapy water or clean water not with gasoline, thinner or solvent if skin contacts waste oil.
- To protect environment, waste oil and oil filter must be abandoned at named place.

1. Remove engine right bottom shield.

2. Discharge engine oil.

3. Remove oil filter assembly [4G18-1012100].

Remove oil filter with special tool.



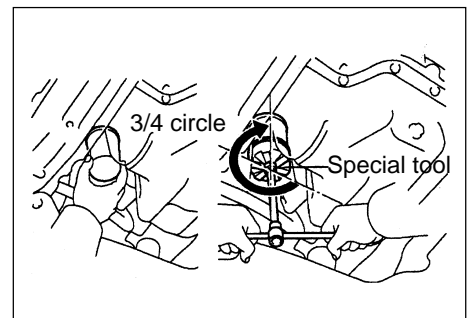
4. Install oil filter assembly.

(a) Check and clean oil filter junction plane.

(b) Coat oil seal of new oil filter with clean oil.

(c) Tighten oil filter with hands to the extent that oil seal just touches fixing base.

(d) Tighten oil filter for another 3/4 circle with special tool.



5. Install oil drain plug [4G18-1009101].

Clean oil drain plug, and install it back after replacing oil drain plug gasket.

Torque: $30 \pm 5 \text{ N} \cdot \text{m}$

6. Refill engine oil.

7. Check there is oil leakage.

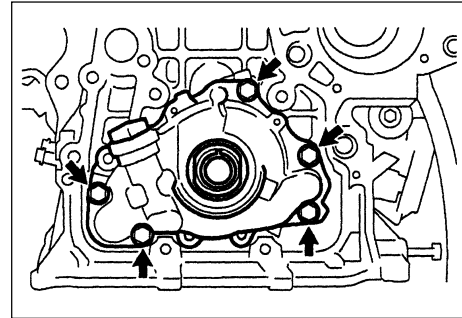
Oil pump assembly

Replacement

1. Remove timing chain assembly (see Page 45).

2. Remove oil pump assembly [4G18-1011100].

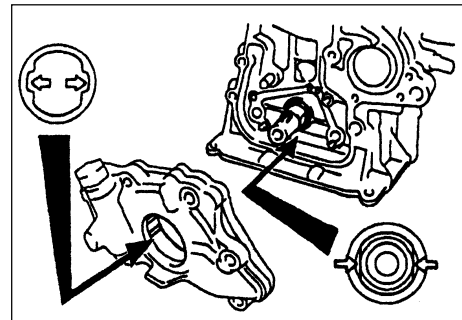
Remove 5 bolts, oil pump and oil pump gasket.



3. Install oil pump assembly.

- (a) Install new gasket on cylinder body.
- (b) Align the guide groove of oil pump drive rotor with the key on crankshaft, and slide the oil pump in.
- (c) Install oil pump with 5 bolts.

Torque: $9 \pm 1.8 \text{ N} \cdot \text{m}$



Ignition

Ignition system

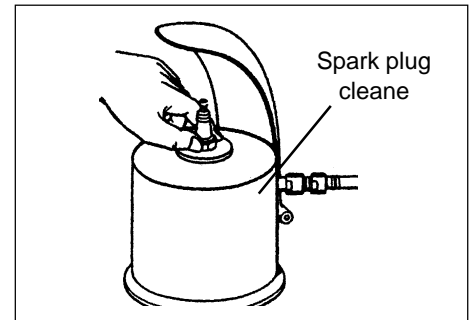
Inspection

1. Spark plug

- (a) Clean spark plug.

Air pressure: below 588kPa.

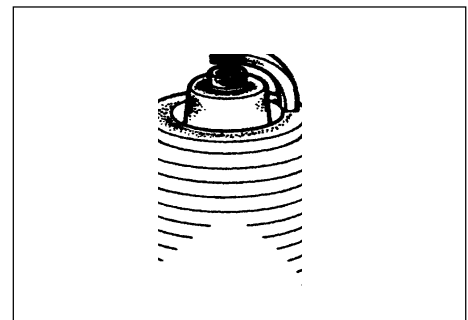
Time: 20 s or less



- (b) Check the damage condition of spark plug and insulator. If there is something abnormal, please replace with new spark plug.

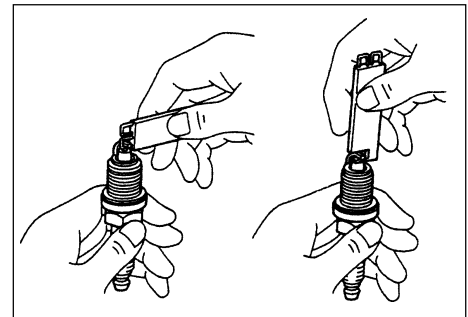
Recommended spark plug specification:

Made in Xianghuoju Company: K6RTC



- (c) Adjust electrode gap.

Electrode gap: 0.8mm



On-vehicle inspection

1. Phase sensor

- (a) Turn on ignition switch but do not start engine, and place digital universal meter at DC voltage gear, then connect 2 terminals respectively to 1[#] pin and 3[#] pin of sensor, and ensure the voltage is 12V.
(b) Start engine, and phase signal is read by 2[#] pin via vehicle oscilloscope.

2. Speed Sensor

- (a) Remove speed sensor joint.
(b) Place digital universal meter at ohm gear, and connect 2 terminals respectively to 2[#] pin and 3[#] pin of sensor, and the resistance at 20°C should be $860\frac{1}{2} \pm 80\frac{1}{2}$.
(c) Connect speed sensor joint.
(d) Place digital universal meter at AC voltage gear, and connect 2 terminals respectively to 2[#] pin and 3[#] pin of sensor, and start engine, there should be voltage output at the moment. (It is recommended to check with vehicle oscilloscope)

3. Inspection of ignition coil (including igniter) and spark test

(a) Check DTC.

Note: if there is display with DTC, perform trouble shooting according to DTC procedure.

(b) Check there is spark.

(1) Remove ignition coil (including igniter).

(2) Remove spark plug with 16mm spark plug sleeve.

(3) Install spark plug to each ignition coil (including igniter), and connect ignition coil joint.

(4) Uncouple joints of 4 injection nozzles.

(5) Earth spark plug.

(6) Check spark with engine running.

Notes:

● **Be sure to earth spark plug during checking.**

● **When there is falling or collision with ignition coil, please replace with a new one**

● **Running engine time for each time should not be more than 2 seconds.**

If there is no spark, please perform test as the following steps.

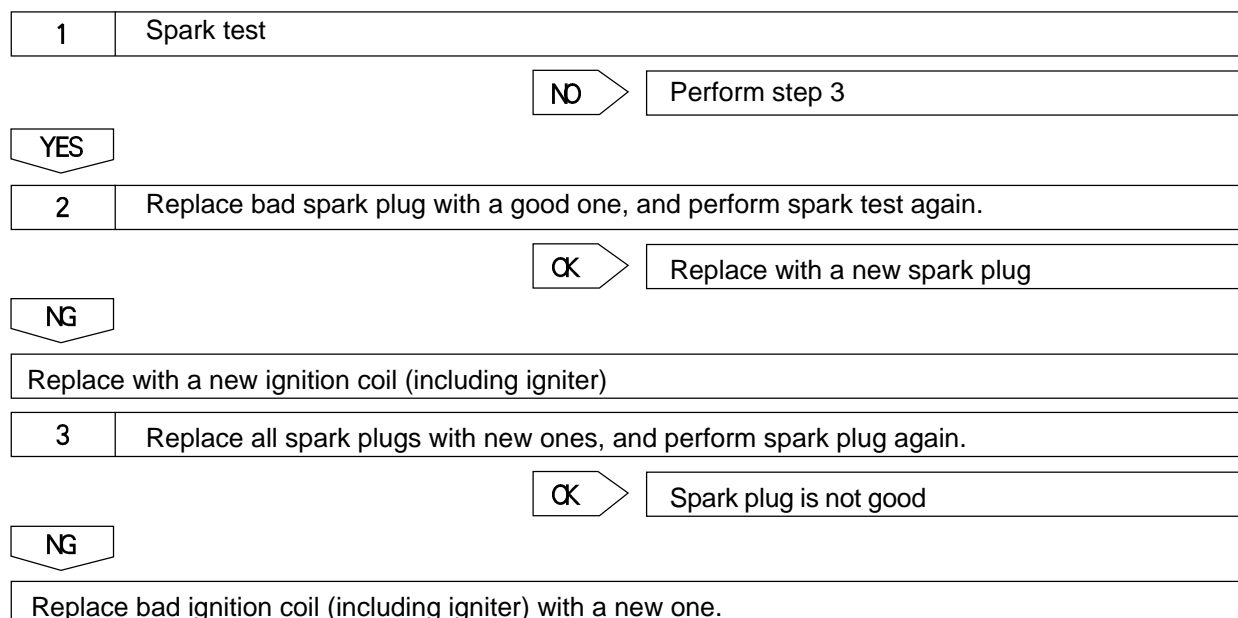
(c) Install spark plug with 16mm spark plug sleeve.

Torque: $25 \pm 5 \text{ N} \cdot \text{m}$

(d) Install ignition coil and igniter.

Torque: $9 \pm 1.8 \text{ N} \cdot \text{m}$

4. Test procedure in the state of not spark



Starting and charging

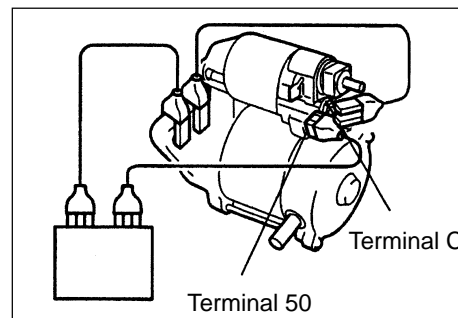
Starting system

Inspection

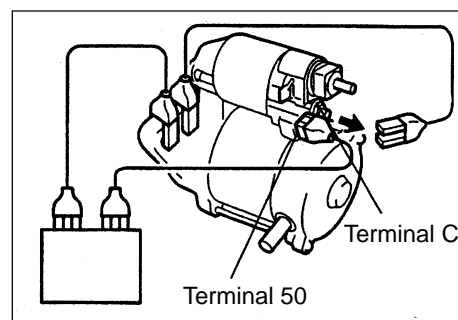
1. Starter installation components

Note: this test must be finished within 3 to 5 seconds to avoid burning out coil.

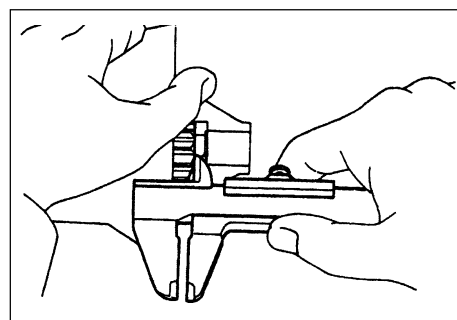
- (a) Remove nut at C terminal to uncouple wire of field coil.
- (b) As shown in the diagram, connect battery wire to electromagnetic switch, and check drive pinion is pushed outside, (pull-in coil and hold-in coil).



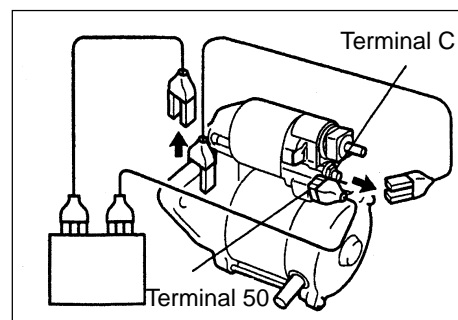
- (c) As shown in the diagram, uncouple negative wire from terminal C after the above connections, and check drive pinion is still at the state of being pushed outside. (Hold-in coil)



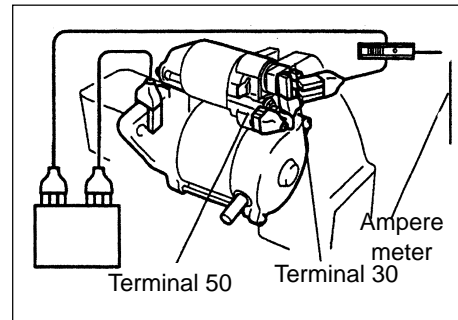
- (d) Push drive pinion toward armature side, and measure the clearance between drive pinion end and stop ring.
Standard clearance: 1.0~5.0mm



- (e) Uncouple negative wire from electromagnetic switch housing, and check drive pinion returns back to original position toward inside.

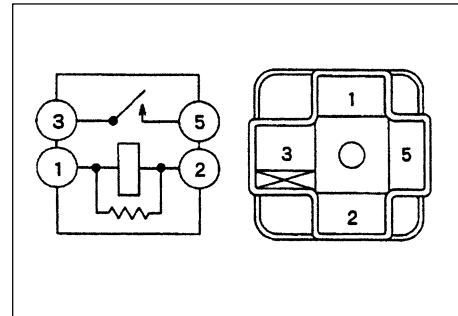


- (f) Connect magnetic field coil wire to terminal C.
- (h) Torque: $9.8 \text{ N} \cdot \text{m}$
- (i) Clamp starter with jaw vice.
- (j) As shown in the diagram, connect battery with amperemeter.
- (k) Read current value displayed on amperemeter.
- (l) Current value specification: 90 A or lower at 11.5 V.



2. Starter relay

Conditions	Terminal connected by three-use meter	Specified conditions
Normal state	1 - 2	Conduction
Supply battery voltage to No. 1 and No. 2 terminals	3 - 5	Conduction



Charging system

Precautions

- 1. Check positive and negative wire of battery is connected correctly.**
- 2. When performing quick charge to battery, please uncouple battery wire.**
- 3. Do not test with high-pressure insulation resistance tester.**
- 4. do not uncouple battery wire during engine running.**

On-vehicle inspection

1. Check battery voltage.

- (a) If extinguishing time of engine is not more than 20 minutes after driving, please turn on ignition switch and electric equipment (head lamp, blower motor and rear window defog line etc.) for about 60 seconds to eliminate surface charging during driving.

- (b) Turn ignition switch to OFF, and then switch off electric equipment system.

- (c) Measure the voltage between battery negative (-) terminal and positive (+) terminal.

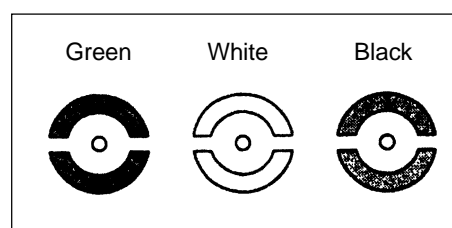
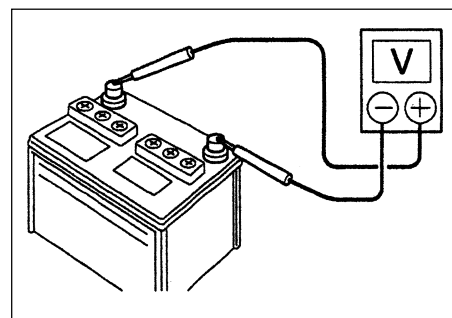
Standard voltage: 12.5~12.9V at 20℃.

Hint: if the voltage is lower than standard specification, please charge battery.

- (d) As shown in the diagram, check battery window.

Hints:

- Green: OK
- White: requiring charge
- Black: replacing battery



2. Check battery joint, fusible link and slow fuse (100A).

- (a) Check battery joint is loose or eroded.

- (b) Check fast fuse and slow fuse (100A) are in conduction.

3. Check drive belt.

- (a) Check belt is excessively worn or cable is broken etc.

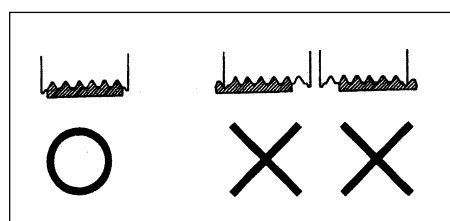
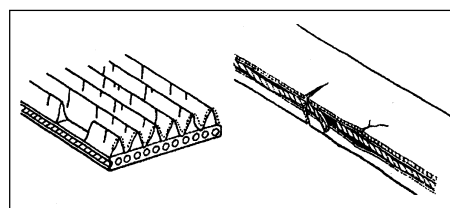
Hints:

- If any inferior part is found, please replace drive belt.
- It is allowable for the crack at the edge of drive belt rib.

If there is block falling with belt rib, please replace with new belt.

- (b) Check the belt is correctly installed in guide groove.

Hint: Check with hands to ensure that the belt does not slide out from the groove of pulley bottom.



4. Visually check alternator wire harness.

Check the condition of wire is perfect.

5. Listen to whether there is abnormal sound with alternator.

There should not be abnormal sound with alternator during engine running.

6. Check the circuit of charge alarm light.

- (a) Turn ignition switch to "ON", and check charge alarm light is on.

- (b) Start engine, and charge alarm light should be off.

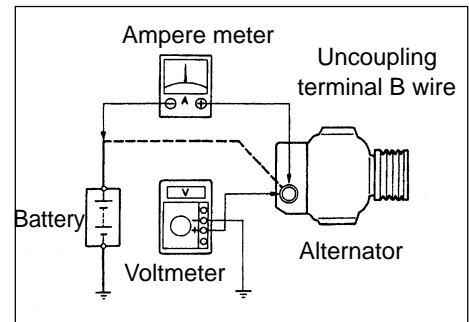
Hint: if the function of charge alarm light does not conform to the regulation, please perform trouble shooting to the circuit of charge alarm light.

7. Check charging system circuit at no load.

(a) If there is battery/alternator tester, please connect tester to charging system circuit as manufacturer instruction.

(b) If there is no battery/alternator tester, please connect voltmeter to charging system circuit as the following way.

- Uncouple wire on engine terminal B, and connect wire on negative (-) test bar of ampere meter.
- Connect positive (+) test bar of ampere meter to alternator terminal B.
- Connect positive (+) test bar of voltmeter to alternator terminal B.
- Connect negative test bar of voltmeter to earth.



(c) Check charge system circuit.

(1) Check the readings of ampere meter and voltmeter with engine from idle speed to 2000rpm.

Standard current: 10A or less.

Standard voltage: 12.9~14.9V.

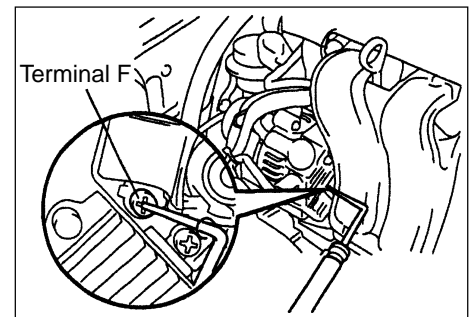
Hints:

- If voltmeter reading is more than standard value, please replace with new voltage regulator.
- If voltmeter reading is less than standard value, please check voltage regulator and alternator as the following way.

(2) Earth terminal F, start engine and check voltage of terminal B.

Hints:

- If voltmeter reading is more than standard value, please replace with new voltage regulator.
- If voltmeter reading is less than standard value, please check alternator.



8. Check charging system circuit at load.

(a) Turn on high beam of front combination lamps with engine running at 2000rpm, and turn blower to "HI" position.

(b) Check the reading of ampere meter.

Standard amperage: 30A or more.

Hints:

- If amperage is less than standard value, please repair alternator.
- If battery is under the state of full charge, amperage may be less than standard value sometimes.

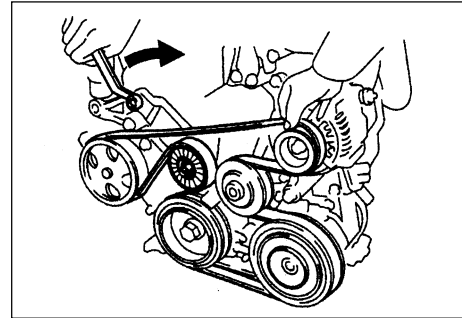
Alternator components

Replacement

1. Remove engine right bottom shield.

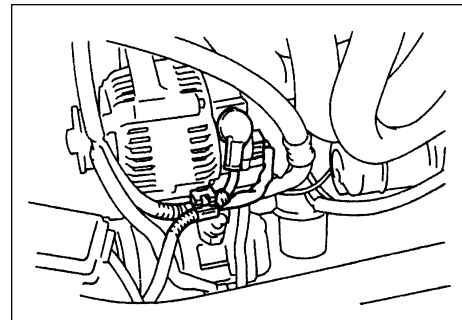
2. Remove drive belt.

Slowly turn drive belt tensioner clockwise to loosen the belt, then remove drive belt and put back the tensioner slowly to completely loosen it.



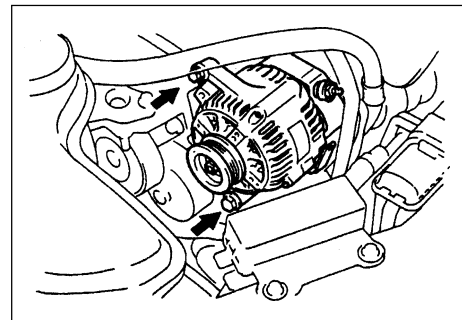
3. Remove alternator components.

- (a) Remove rubber cover and nuts.
- (b) Uncouple alternator joint.
- (c) Remove 2 bolts and alternator.



4. Install alternator components.

Torque: 12mm head bolt : $25 \pm 5 \text{ N} \cdot \text{m}$
14mm head bolt : $54 \pm 10.8 \text{ N} \cdot \text{m}$



Starter components

Replacement

1. Remove engine lower left shield.

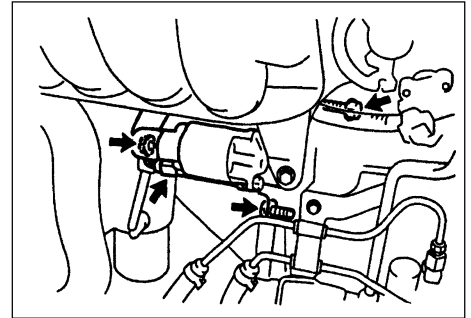
2. Remove starter components.

- (b) Uncouple starter joint.
- (b) Remove nuts, and uncouple starter wire.
- (c) Remove 2 bolts and starter.

3. Install Starter components.

Torque: bolt: 37N • m

Wire harness: 9.8N • m



Front suspension

Front suspension system

Table on trouble occurrence

This table could help you find out failure causes, and each figure in the table indicates the possible sequence of failure causes, please check every part as the sequence, and replace if necessary.

Trouble occurrence	Possible trouble part	Pages to refer to
Deflection/single side	1. Tire (abrasion or improper tire pressure)	109
	2. Wheel alignment (incorrect)	87
	3. Steering linkage (looseness or abrasion)	-
	4. Shaft hub bearing (abrasion)	123
	5. Suspension parts (abrasion)	-
	6. Steering gear (poor adjustment or breakage)	-
Bottoming	1. Vehicle (overload)	-
	2. Spring (elastic fatigue)	90
	3. Absorber (abrasion)	90
Swaying left and right/ shaking forward and backward	1. Tire (abrasion or improper tire pressure)	109
	2. Stabilizer bar (bending or breakage)	96
	3. Absorber (abrasion)	90
Front wheel shimmy	1. Tire (abrasion or improper tire pressure)	109
	2. Wheel (poor balance)	109
	3. Absorber (abrasion)	90
	4. Wheel alignment (incorrect)	87
	5. Ball joint (abrasion)	99
	6. Shaft hub bearing (looseness or abrasion)	123
	7. Steering linkage (looseness or abrasion)	-
	8. Steering gear (poor adjustment or breakage)	-
Abnormal tire abrasion	1. Tire (abrasion or improper tire pressure)	109
	2. Wheel alignment (incorrect)	87
	3. Absorber (abrasion)	90
	4. Suspension parts (abrasion)	-

Front wheel alignment

Adjustment

1. Inspection

(a) Check tire is worn and inflation pressure is proper.

Tire inflation pressure under normal temperature:

Tire size	Front and rear kPa
195/60R15 88H	210*1, 250*2

*1 It is used under the condition of speed below 160 km/h.

*2 It is used under the condition of speed above 160 km/h.

(b) Check tire run-out with dial indicator.

Tire run-out: $\leq 3.0\text{mm}$.

2. Measurement of vehicle height

Vehicle height:

(General road)

Front	A-B; 8mm
Rear	D-C; 8mm

(Coarse road)

Front	A-B; 6mm
Rear	D-C; 2mm

Measuring point:

A. Height for ground and front wheel center

B. Height for ground and bolt center in front of lower control arm

C. Height for ground and fixed bolt center of rear axle beam

D. Height for ground and rear wheel center

Note: adjust vehicle height to standard value before checking front wheel alignment.

If vehicle height does not conform to regulations, please shake upward and downward or lift vehicle body to adjust vehicle height.

3. Inspection of toe-in

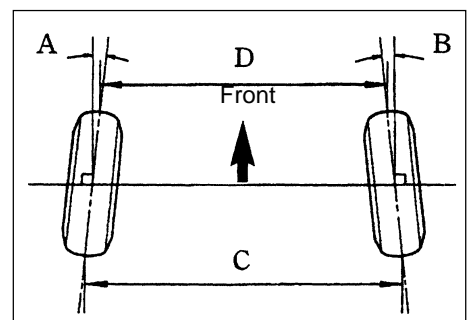
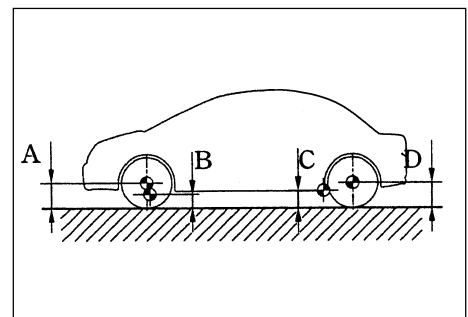
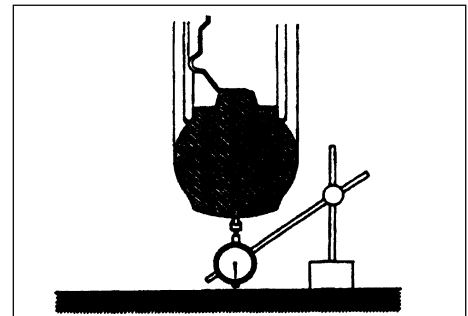
Toe-in:

Toe-in	A+B; $0^\circ \pm 12'$
(Total)	C-D; $0 \pm 2\text{mm}$

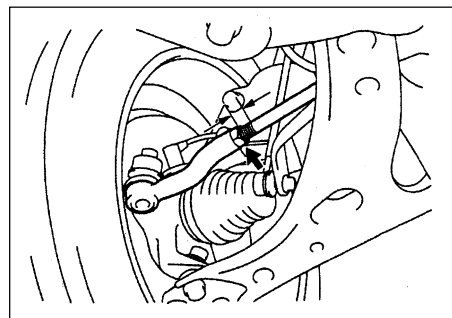
If toe-in is not within specification, please adjust left and right levers of steering gear.

4. Adjustment of toe-in

(a) Remove dust cover fixing clip.



- (b) Loosen lock nuts at the end of transversal lever .
- (c) Evenly rotate end levers of left and right rack to adjust toe-in.
Hint: try adjusting toe-in to medium value.
- (d) Ensure that the end lever length of left rack equals that of right rack.
- (e) Tighten lock nuts at the end of transversal lever.
Torque: $74 \pm 5 \text{ N.m}$
- (f) Install dust cover fixing clip.
Hint: ensure that the dust cover does not distort.



5. Inspection of turning angle

- (a) Completely rotate steering wheel to the bottom and then measure turning angle.

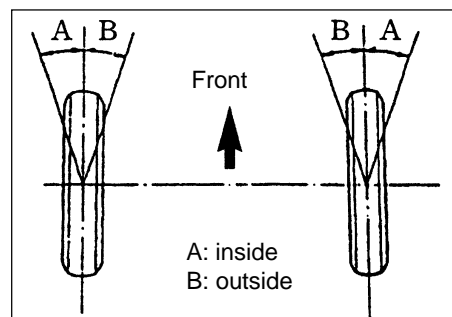
Turning angle:

(General road)

Inside wheel	$38^{\circ}45' \pm 2^{\circ}$
Outside wheel: reference	$32^{\circ}50'$

(Coarse road)

Inside wheel	$39^{\circ}05' \pm 2^{\circ}$
Outside wheel: reference	$33^{\circ}10'$



If left and right inside wheels are not within specification, please check the end lever length of left rack and right rack.

6. Inspection of camber, caster and steering shaft inclination

- (a) Install camber-caster-kingpin gauge or erect wheel alignment tester.
- (b) Check camber, caster and steering-axis inclination.

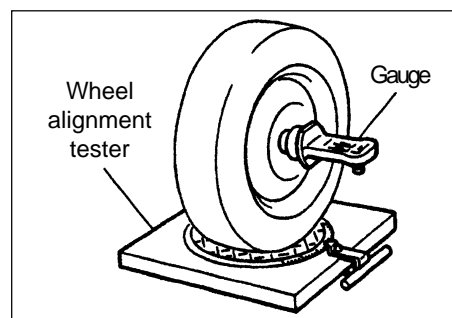
Camber, caster and steering shaft inclination:

(General road)

Camber	$-0^{\circ}31' \pm 45'$
Left-right error	$\leq 45'$
Caster	$2^{\circ}42' \pm 45'$
Left-right error	$\leq 45'$
Steering shaft inclination	$11^{\circ}18' \pm 45'$
Left-right error	$\leq 45'$

(Coarse road)

Camber	$-0^{\circ}18' \pm 45'$
Left-right error	$\leq 45'$
Caster	$2^{\circ}30' \pm 45'$
Left-right error	$\leq 45'$
Steering shaft inclination	$10^{\circ}52' \pm 45'$
Left-right error	$\leq 45'$



If caster and steering axis inclination are not within specification, please adjust the caster and then check parts of lower control arm is damaged or worn.

7. Adjustment of camber

Note: after adjusting the camber, please check toe-in.

(a) Remove front wheels.

(b) Remove 2 nuts under absorber.

If it is necessary to repeat using bolts or nuts, please coat oil to thread of nuts.

(c) Clean nut absorber and attachment face of steering knuckle.

(d) Temporarily install 2 nuts.

(e) Push or pull lower end of absorber in the direction that camber requires adjustment to adjust the camber.

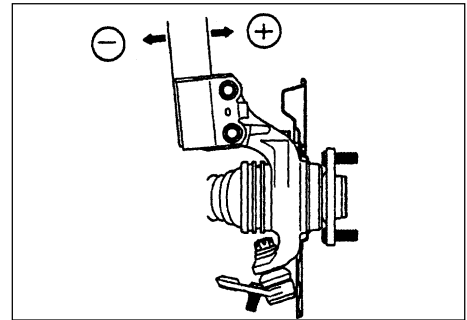
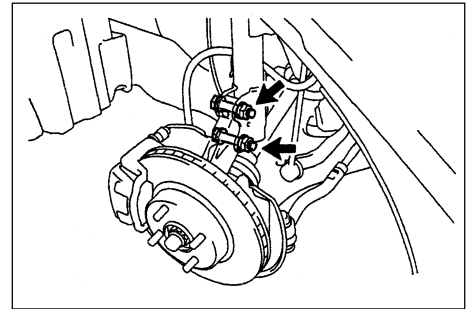
(f) Tighten nut.

Torque: 153 ± 10 N.m

(g) Install front wheels.

Torque: 103 ± 10 N.m

(h) Check camber.



Front absorber and helical spring

Overhaul

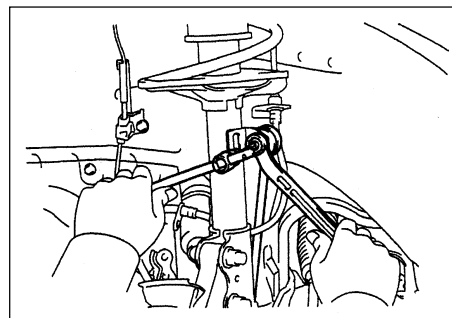
Hint: the following overhaul procedures only aim at left side (FL), and the overhaul procedures of another side (RL) are the same as FL.

1. Remove front wheels.

2. Separate front left stabilizer link assembly [64000097].

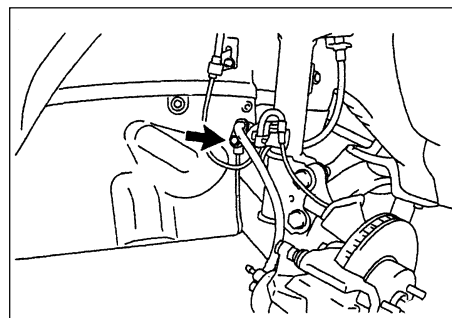
Remove nuts, and disassemble stabilizer link from absorber.

Hint: if ball joint rotates with nuts, please fix bolts with hexagonal wrench (6mm).

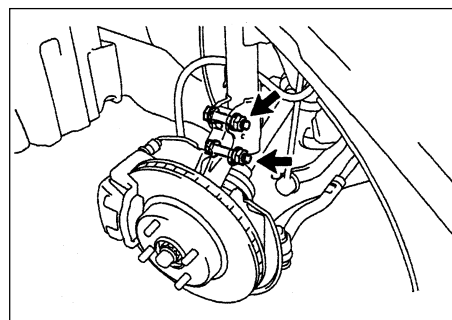


3. Remove front absorber and helical spring.

(a) Remove bolts, and disassemble brake hose and ABS speed sensor wire harness bracket.

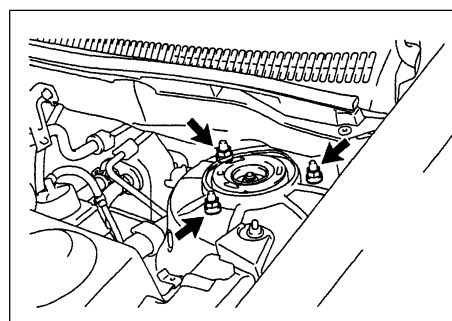


(b) Remove 2 nuts and bolts under absorber.



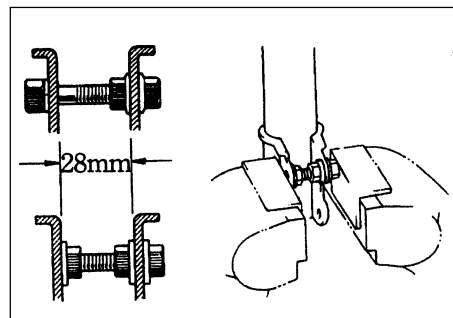
(c) Remove 3 nuts above absorber.

(d) Remove absorber and helical spring.



4. Fix front absorber and helical spring.

Install 2 nuts and 1 bolt to absorber bracket, and then fix it on jaw vice.



5. Remove front left absorber assembly [61001036].

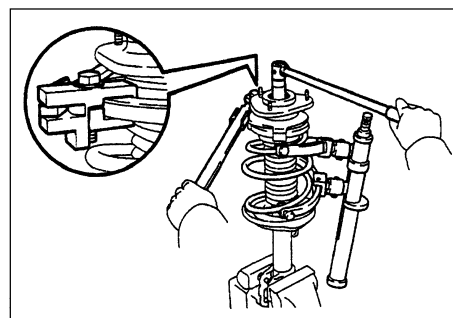
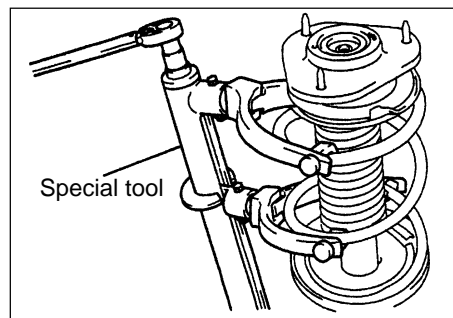
(a) Compress helical spring with special tool.

Note: do not use pneumatic wrench, or the special tool will be damaged.

(b) Remove cover from upper absorber bearing.

(c) Fix spring seat and remove nuts with special tool.

(d) Remove upper absorber bearing, dustproof seal ring, spring seat, upper insulator, spring, limit block and lower insulator.



6. Check front left absorber assembly [61001036].

Press in and pull out absorber piston rod, and check there is abnormal resistance or abnormal sound. If anything unusual occurs, please replace absorber.

Note: When abandoning absorber, please refer to Page 86.

7. Install front left absorber assembly [61001036].

(a) Install lower insulator to absorber.

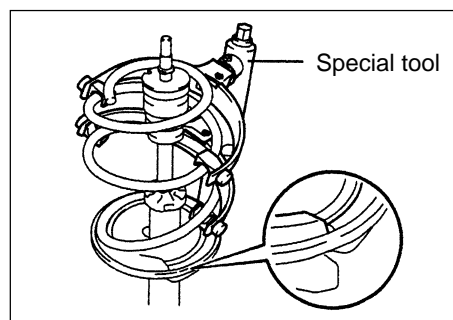
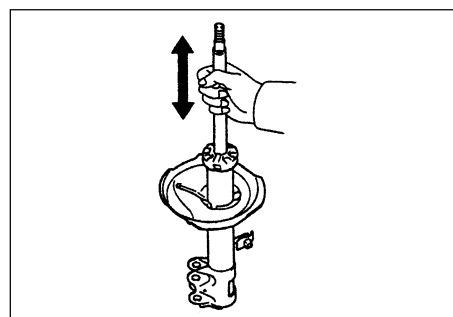
(b) Install limit block to piston rod.

(c) Compress helical spring with special tool.

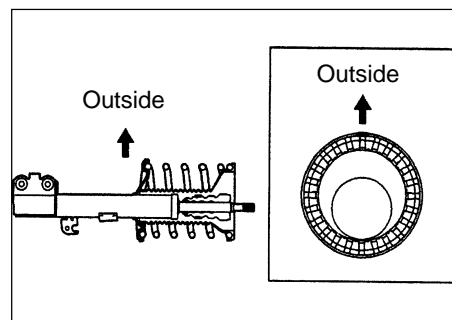
Note: do not use pneumatic wrench, or the special tool will be damaged.

(d) Install helical spring to absorber.

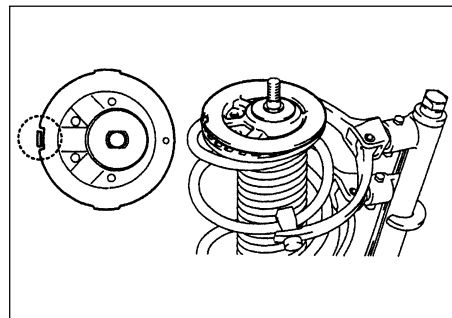
Hint: install lower end of helical spring into notch of absorber spring seat.



- (e) As shown in the diagram, install upper insulator.

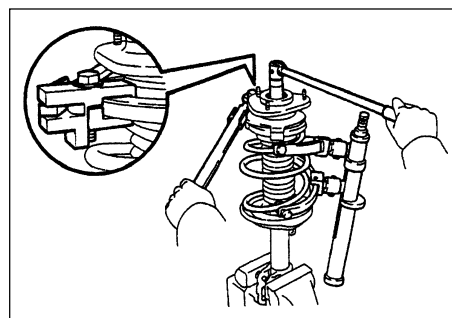


- (f) Install spring seat to absorber with mark toward outside of vehicle.
(g) Install new dustproof seal ring and upper absorber bearing.

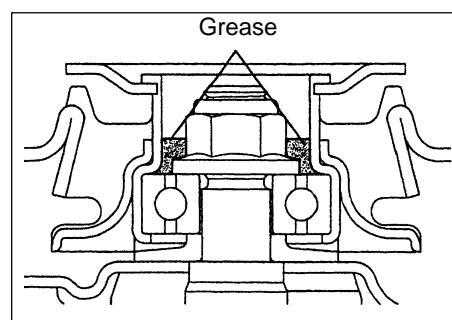


- (h) Fix upper shock absorber bearing with special tool, and install new nuts.
Torque: 47 ± 5 N.m

- (i) Remove special tool.
(j) Install dust cover.

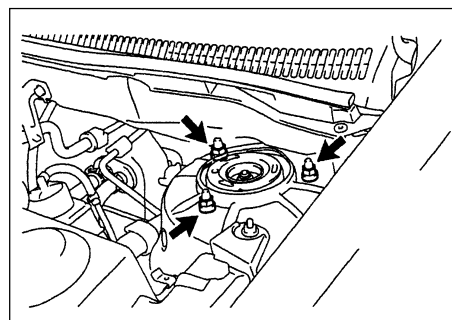


- (k) Coat upper absorber bearing with grease.
Note: do not coat grease on rubber surface of upper shock absorber bearing.



8. Install front shock absorber and helical spring.

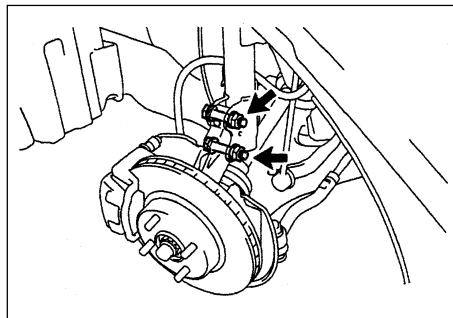
- (a) Install 3 nuts above shock absorber.
Torque: 39 ± 3 N.m
(b) Install 2 fixed bolts of shock absorber.



- (c) Install 2 nuts to lower end of absorber.

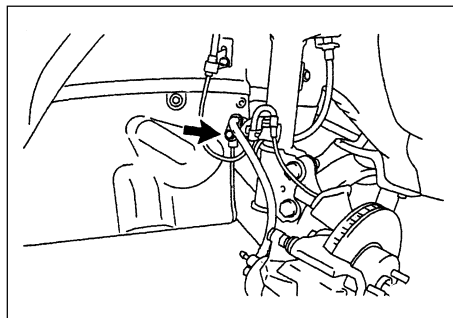
Torque: 153 ± 10 N.m

Hint: coat oil on thread of nuts.



- (d) Install brake hose and ABS speed sensor wire harness bracket with bolts.

Torque: 19 ± 2 N.m

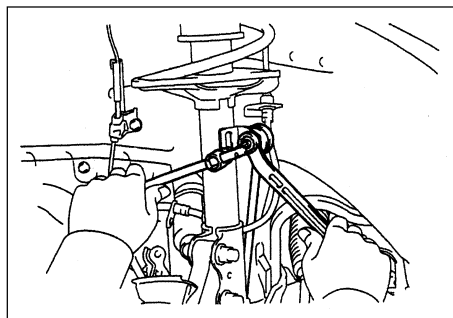


9. Install front left stabilizer link assembly [64000097].

Install stabilizer link with nuts.

Torque: 74 ± 5 N.m

Hint: if ball joint rotates with nuts, please fix bolts with hexagonal wrench (6mm).



10. Install front wheels.

Torque: 103 ± 10 N.m

11. Check and adjust front wheel alignment (see Page 87).

Handling

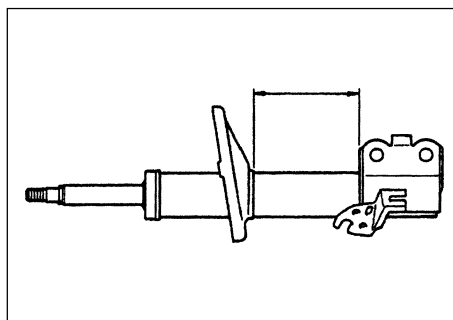
1. Handle front left absorber assembly.

- (a) Completely pull out absorber piston rod.

- (b) As shown in the diagram, drill a small hole on cylinder body between two lines with electric drill to make inside gas flow out

Notes:

- Iron chip may fly out during drilling, please be careful in operating.
- The gas is colorless, odorless and nontoxic.



Lower left control arm assembly

Replacement

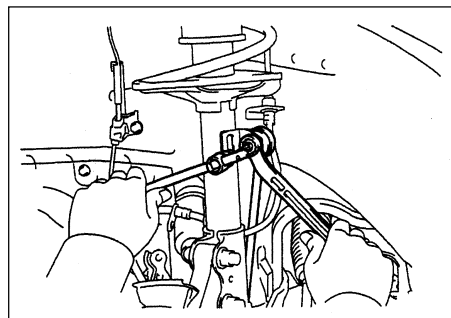
Hint: the replacement procedures of right side are the same as that of left side.

1. Remove front wheels.
2. **Separate front left stabilizer link assembly [64000097].**

Remove nuts, and disassemble stabilizer link from shock absorber.

Hint: if ball joint rotates with nuts, please fix bolts with hex wrench (6mm).

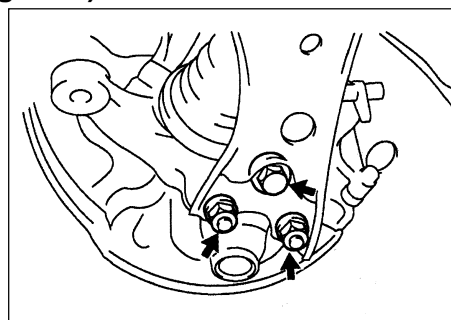
3. **Separate right side front stabilizer link assembly [64000097].**
4. **Remove fixed nuts of front left drive shaft (see Page 123).**
5. **Separate front left wheel speed sensor assembly [67000020].**
6. **Separate front left brake wheel pump assembly (see Page 141).**
7. **Remove front left brake assembly [64000134] (see Page 142).**



8. **Separate left side transversal lever assembly.**
9. **Separate lower left control arm assembly [64000091].**

Remove bolts and 2 nuts, and separate lower control arm from lower end ball joint.

10. **Remove front left shaft hub assembly (see Page 123).**
11. **Remove lower left control arm assembly [64000091].**

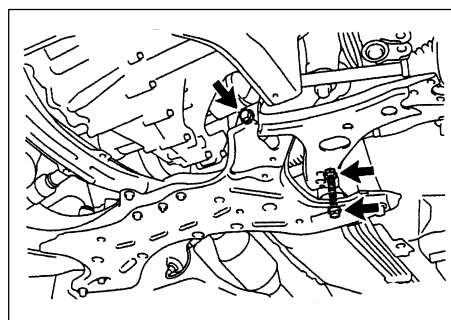


Remove 2 bolts, nuts and lower control arm.

12. **Temporarily lock up lower left control arm assembly [64000091].**

Install lower control arm, and temporarily lock up 2 bolts and nuts.

13. **Install front left shaft hub assembly (see Page 123).**
14. **Install lower left control arm assembly [64000091].**



Connect lower control arm with ball joint with 2 bolts and nuts.

Torque: 142 ± 10 N.m

15. **Install left side transversal lever assembly. (See Page 123)**
16. **Install front left brake assembly. [64000134] (See Page 141)**

17. Install front left brake wheel pump bracket assembly (see Page 141).

18. Install fixed nuts of front left drive shaft (see Page 123).

19. Install front left stabilizer link assembly [64000097].

Install stabilizer link with nuts.

Torque: 74 ± 5 N.m

Hint: if ball joint rotates with nuts, please fix bolts with hex wrench (6mm).

20. Install front right stabilizer link assembly [64000097].

Hint: the installation procedures of right side are the same as that of left side.

21. Align suspension.

(a) Install front wheels and lay down vehicle from the lift.

Torque: 103 ± 10 N.m

(b) Align suspension components by means of lifting vehicle several times.

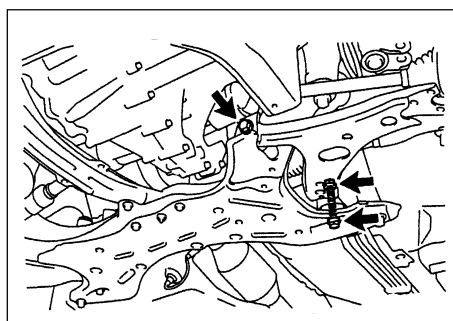
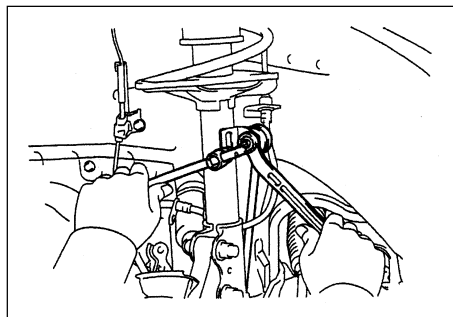
22. Completely lock up lower left control arm assembly [64000091].

Completely tighten 2 bolts and nuts.

Torque: 137 ± 10 N.m

23. Check and adjust front wheel alignment (see Page 87).

24. Check ABS sensor signal.



Front stabilizer bar

Overhaul

1. Remove dust cap inside steering column (see Page 194).
2. Separate steering sliding shaft assembly (see Page 205)
3. Remove front wheels.

4. Remove right engine bottom shield.

5. Remove left engine bottom shield.

6. Remove front left stabilizer link assembly [64000097].

Remove 2 nuts and take down stabilizer link.

Hint: if ball joint rotates with nuts, please fix bolts with hexagonal wrench (6mm).

7. Remove front right stabilizer link assembly [64000097].

Hint: the removal procedures of right side are the same as that of left side.

8. Check front left stabilizer link assembly.

- (a) As shown in the diagram, before installing nuts, shake joint bolts forward and backward 5 times.
- (b) Shake nuts continuously with torque wrench at the speed of one circle per 2~4 s, and then read out torque value at the 5th circle.

Rotating torque: 0.05~1.0 N.m

9. Separate left side transversal lever assembly (see Page 113).

10. Separate right side transversal lever assembly (see Page 113).

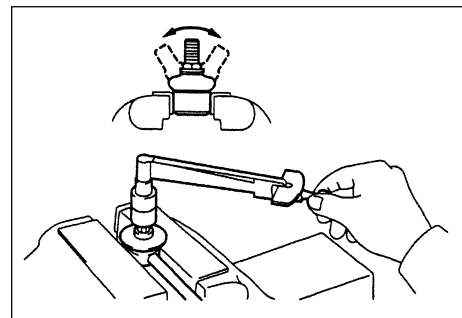
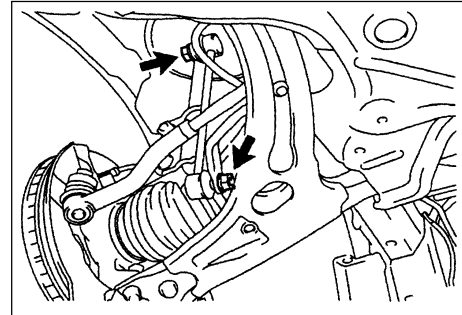
11. Separate oil pipe assembly (see Page 205).

12. Separate steering gear oil return pipe (see Page 205).

13. Separate lower left control arm assembly [64000091] (see Page 94).

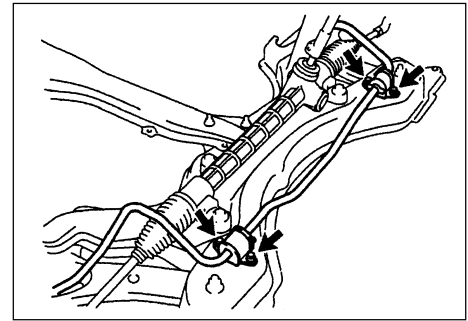
14. Separate lower right control arm assembly [64000092] (see Page 94).

15. Remove sub frame assembly [64000087] (see Page 205).



16. Remove front stabilizer bar.

- (a) Remove 4 bolts, bracket and bush.
- (b) Remove stabilizer bar.

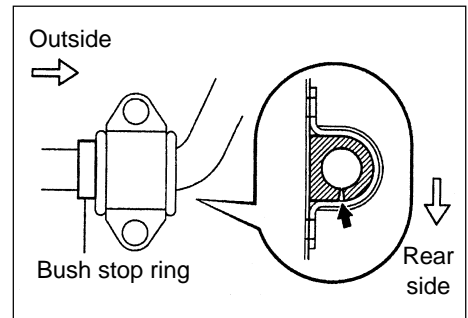


17. Install front stabilizer bar.

- (a) Install bracket and bush with 4 bolts.

Hint: install bush to bush stop ring outside of stabilizer bar.

18. Install sub frame assembly [64000087] (see Page 205).



19. Connect lower left control arm assembly [64000091] (see Page 94).

20. Connect lower right control arm assembly [64000092] (see Page 94).

21. Connect power steering oil pipe assembly (see Page 205).

22. Connect steering oil return pipe (see Page 205).

23. Connect left side transversal lever assembly (see Page 113).

24. Connect right side transversal lever assembly (see Page 113).

25. Install front left stabilizer link assembly [64000097].

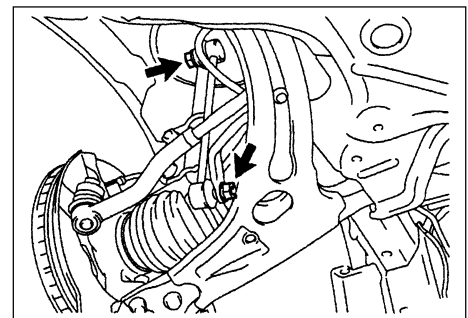
- (a) Install front stabilizer link with 2 nuts.

Torque: 74 ± 5 N.m

Hint: if ball joint rotates with nuts, please fix bolts with hexagonal wrench (6mm).

26. Install front right stabilizer link assembly [64000097].

Hint: the installation procedures of right side are the same as that of left side.



27. Install right engine bottom shield.

28. Install left engine bottom shield.

29. Install front wheels.

Torque: 103 ± 10 N.m

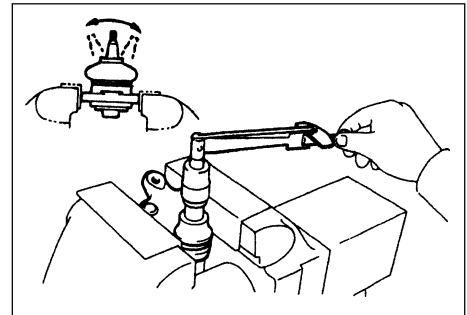
- 30. Connect steering sliding shaft (see Page 205).**
- 31. Check front wheel center line.**
- 32. Install dust cover inside steering column.**
- 33. Refill power steering oil (see Page 200).**
- 34. Discharge air of power steering oil (see Page 200).**
- 35. Check there is oil leakage.**
- 36. Check and adjust front wheel alignment (see Page 87).**

Front left lower control arm ball joint assembly

Replacement

Hint: the replacement procedures of right side are the same as that of left side.

1. Remove front wheels.
2. Remove front left shaft hub nuts (see Page 123).
3. Disassemble front left speed sensor assembly [67000020] (see Page 123).
4. Disassemble front left brake wheel pump assembly and brake block (see Page 141).
5. Remove front left brake assembly [64000134] (see Page 141).
6. Disassemble left side transversal lever assembly (see Page 123).
7. Disassemble lower left control arm assembly [64000091] (see Page 94).
8. Remove front left shaft hub assembly (see Page 123).
9. Remove lower left control arm ball joint assembly [64000093] (see Page 123).
10. **Check lower left control arm ball joint assembly [64000093].**
 - (a) As shown in the diagram, before installing nuts, shake joint bolts forward and backward 5 times.
 - (b) Shake nuts continuously with torque wrench at the speed of one circle per 2~4 s, and then read out torque value at the 5th circle.
Rotating torque: 1.0~4.9 N.m
11. **Install lower left control arm ball joint assembly [64000093] (see Page 123).**
12. **Install front left shaft hub assembly (see Page 123).**
13. **Install lower left control arm assembly [64000091] (see Page 123).**
14. **Install left side transversal lever assembly (see Page 123).**
15. **Install front left brake assembly [64000134] (see Page 141).**
16. **Install front left brake wheel pump assembly and brake block (see Page 141).**
17. **Install front shaft hub nuts (see Page 123).**
18. **Install front wheels.**
Torque: 103 ± 10 N.m
19. **Check and adjust front wheel alignment (see Page 87).**
20. **Check ABS sensor signal.**



Rear suspension

Rear suspension system

Table on trouble occurrence

This table could help you find out failure causes, and each figure in the table indicates the possible sequence of failure causes, please check every part as the sequence, and replace if necessary.

Trouble occurrence	Possible trouble part	Pages to refer to
Wandering	1. Tire (abrasion or improper tire pressure)	109
	2. Wheel alignment (incorrect)	101
	3. Shaft hub bearing (abrasion)	129
	4. Suspension parts (abrasion)	-
Bottoming	1. Vehicle (overload)	-
	2. Spring (elastic fatigue)	102
	3. Absorber (abrasion)	102
Swaying left and right/ shaking forward and backward	1. Tire (abrasion or improper tire pressure)	109
	2. Rear stabilizer bar (bending or breakage)	105
	3. Absorber (abrasion)	102
Rear wheel shimmy	1. Tire (abrasion or improper tire pressure)	109
	2. Wheel (poor balance)	109
	3. Absorber (abrasion)	102
	4. Wheel alignment (incorrect)	101
Abnormal tire abrasion	1. Tire (abrasion or improper tire pressure)	109
	2. Wheel alignment (incorrect)	101
	3. Absorber (abrasion)	102
	4. Suspension parts (abrasion)	-

Rear wheel alignment

Adjustment

1. Check tire (see Page 109).
2. Measure vehicle height (see Page 87).

Note: adjust vehicle height to standard value before checking vehicle tire alignment.

3. Inspection of toe-in

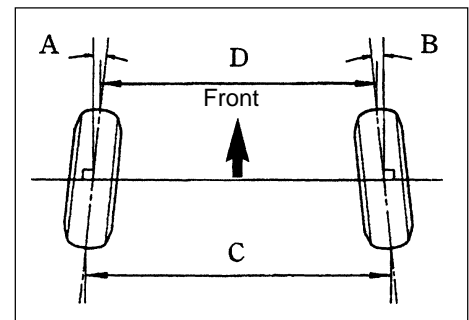
Toe-in:

(General road)

Toe-in (Total)	$A+B:0^{\circ}10' \pm 15'$ $C-D:1.7 \pm 2.5\text{mm}$
-------------------	--

(Coarse road)

Toe-in (Total)	$A+B:0^{\circ}04' \pm 15'$ $C-D:0.7 \pm 2.5\text{mm}$
-------------------	--



If toe-in is not within specification, check and replace relevant suspension parts.

4. Inspection of camber

- (a) Install camber-caster-kingpin gauge or erect wheel alignment tester.
- (b) Check camber.

Camber:

(general road)

Camber	$-1^{\circ}27' \pm 45'$
Left-right error	$\leq 30'$

(Coarse road)

Camber	$-1^{\circ}25' \pm 45'$
Left-right error	$\leq 30'$

For camber could not be adjusted, therefore check suspension components are damaged or worn if camber measuring value is not within specification, and replace parts if necessary.

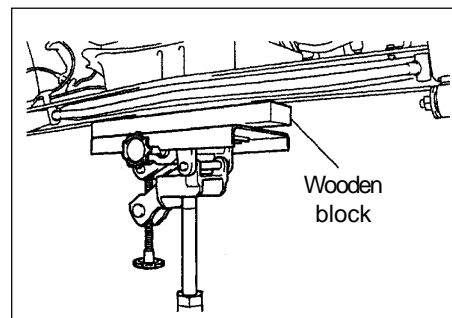
Rear strut assembly

Overhaul

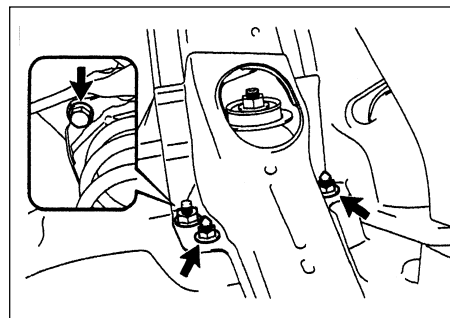
Hint: the following overhaul procedures only aim at left side (LH), and the overhaul procedures of another side (RH) are the same as LH.

1. Remove rear wheels.
2. Remove rear left seat backrest assembly [68010078] (see Page 352).
3. Remove spare tire trim cover assembly.
4. Remove rear floor trim
5. Remove trunk left garnish [68000112].
6. Remove rear left strut assembly [64000098].

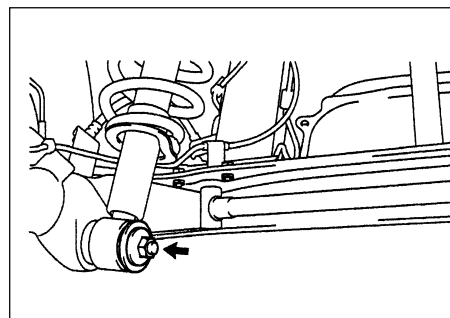
(a) Support rear shaft with a jack.



(b) Remove 2 nuts and bolts.



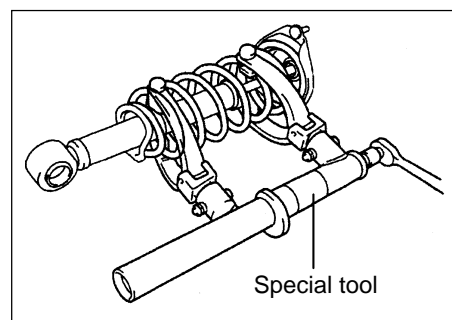
(c) Remove nuts, gasket and rear strut assembly.



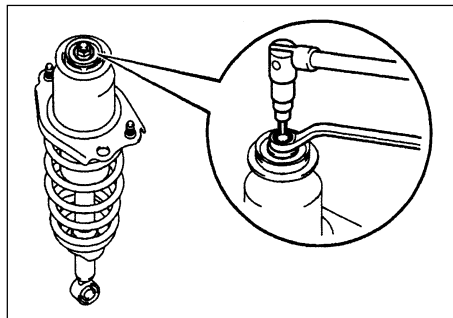
7. Remove rear left strut assembly [64000098].

(a) Compress helical spring with special tool.

Note: do not use pneumatic wrench, or the special tool will be damaged.



- (b) Fix piston rod with a hexagonal wrench of 6mm, and remove nuts.
- (c) Remove bracket plate, washer, spring bracket, upper separator, suspension pedestal, spring absorber and helical spring.

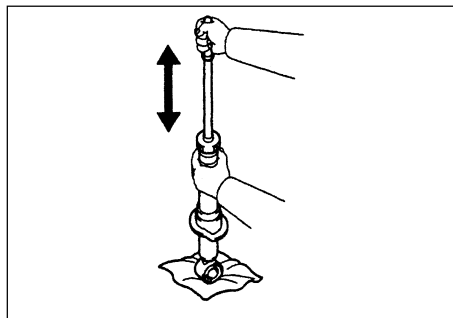


8. Check rear left sliding column assembly [64000098]

Press in and pull out absorber piston rod, and check there is abnormal resistance or abnormal sound.

If anything unusual occurs, please replace absorber.

Note: When abandoning absorber, please refer to Page 97.

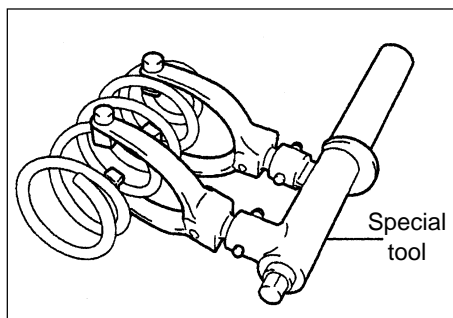


9. Install rear left strut assembly [64000098].

- (a) Compress helical spring with special tool.

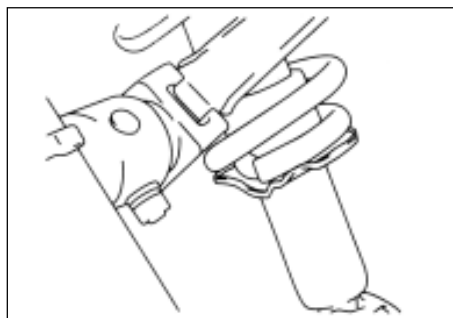
Note: do not use pneumatic wrench, or the special tool will be damaged.

- (b) Install helical spring to absorber.

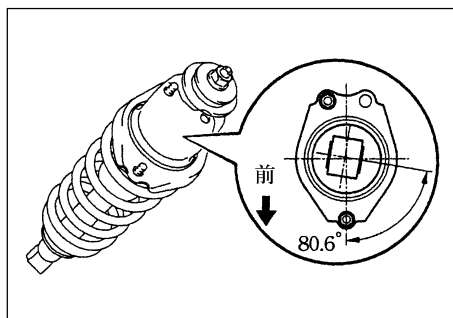


Hint: install lower end of helical spring into notch of lower spring seat.

- (c) Install spring absorber and suspension bracket.
- (d) Encase upper separator into spring bracket.



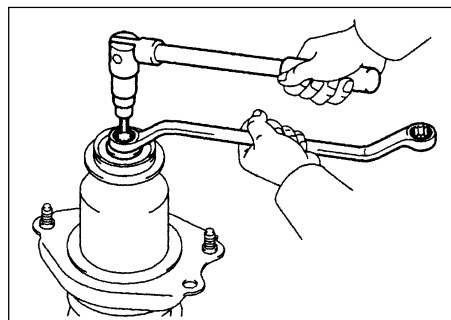
- (e) As shown in the diagram, it is the position of upper separator encased into spring bracket.
- (f) Install washer and bracket plate.
- (g) Temporarily lock up new center nuts.
- (h) Remove special tool.



- (i) Check spring bracket direction again.

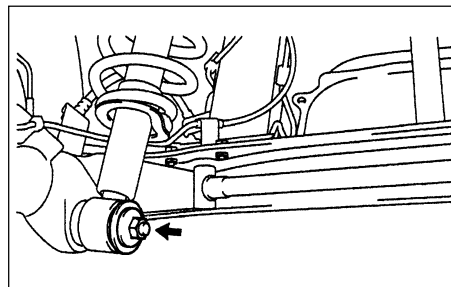
- (j) Fix piston rod with a hexagonal wrench of 6mm, and tighten nuts.

Torque: 56 ± 5 N.m



10. Temporarily lock up rear strut assembly.

- (a) Install rear strut, and temporarily lock up nuts and gasket.



- (b) Install 2 nuts and bolts.

Torque: 80 ± 5 N.m

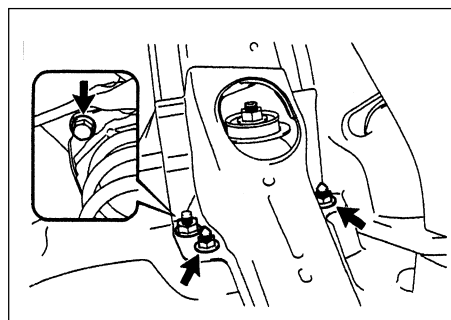
11. Install real left seat backrest assembly [68010078].

12. Align suspension.

- (a) Lay down vehicle from the lift after installing rear wheels.

Torque: 103 ± 10 N.m

- (b) Align suspension components by means of lifting vehicle several times.

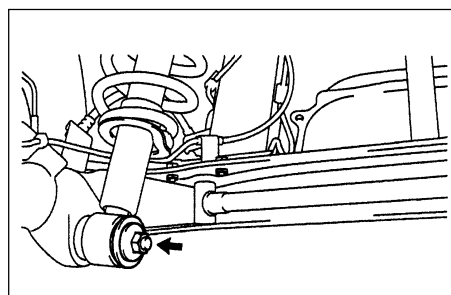


13. Completely lock up rear strut assembly.

Completely tighten nuts.

Torque: 80 ± 5 N.m

14. Check rear wheel alignment (see Page 101).



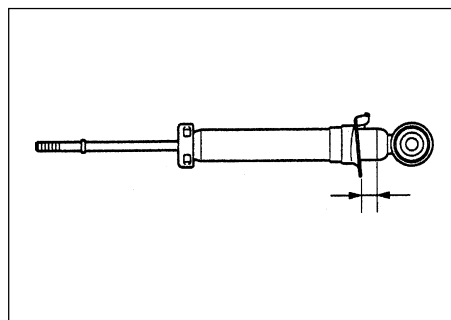
Handling

1. Handle rear left strut assembly [64000098].

- (a) Completely pull out shock absorber piston rod.
- (b) As shown in the diagram, drill a small hole on cylinder body between two lines with electric drill to make inside gas flow out.

Notes

- Iron chip may fly out during drilling, please be careful in operating.
- The gas is colorless, odorless and nontoxic.



Rear stabilizer bar

Overhaul

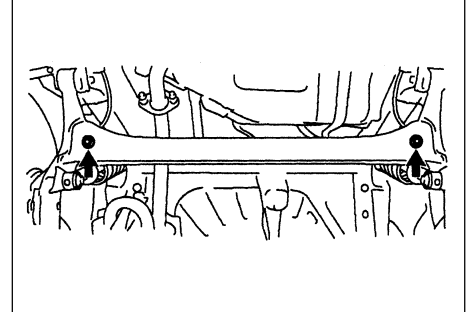
1. Remove rear stabilizer bar assembly.

Remove 2 bolts, nuts and stabilizer bar.

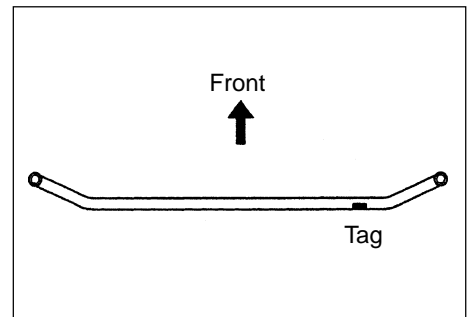
2. Install rear stabilizer bar assembly.

Install 2 bolts, nuts and stabilizer bar.

Torque: 149 ± 10 N.m



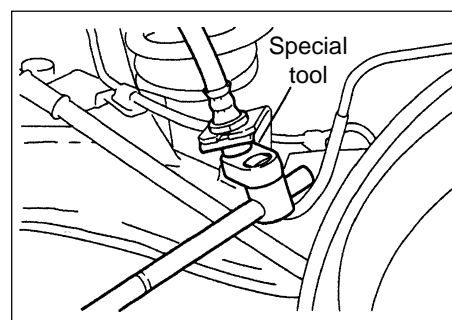
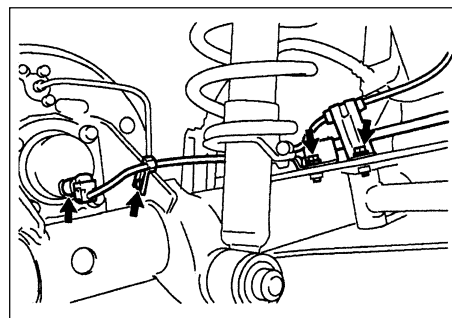
Hint: install the tag on balance bar toward rear right side of vehicle.



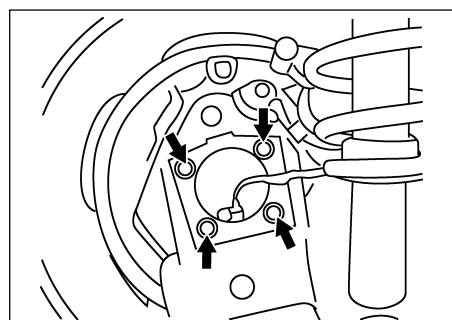
Rear shaft assembly

Overhaul

1. Remove rear wheels.
2. Disassemble rear left brake caliper assembly (see Page 144).
3. Disassemble rear right brake caliper assembly (see Page 144).
4. Disassemble rear wheel speed sensor wire harness
 - (a) Uncouple sensor joint.
 - (b) Remove 2 bolts and disassemble wire harness retaining clip.
5. Remove rear left/right brake assembly [64000137/64000139].
(See Page 144)



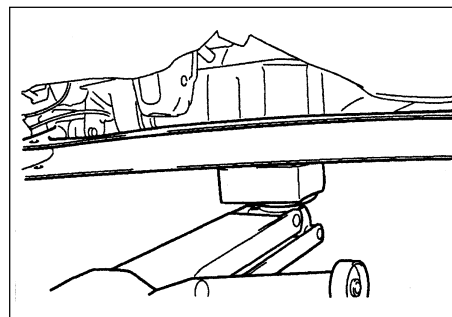
6. Remove rear stabilizer bar assembly (see Page 105).



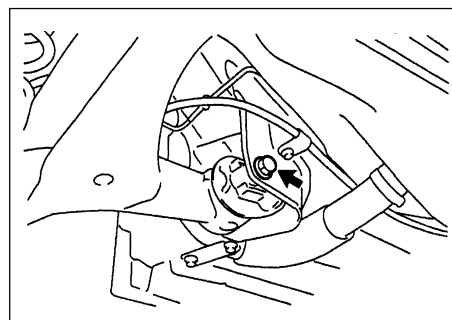
7. Disassemble rear left/right strut assembly (see Page 102).

8. Remove rear shaft assembly [64000120].

(a) Support rear shaft assembly with a jack.



(b) Remove 2 bolts, gasket and rear shaft.



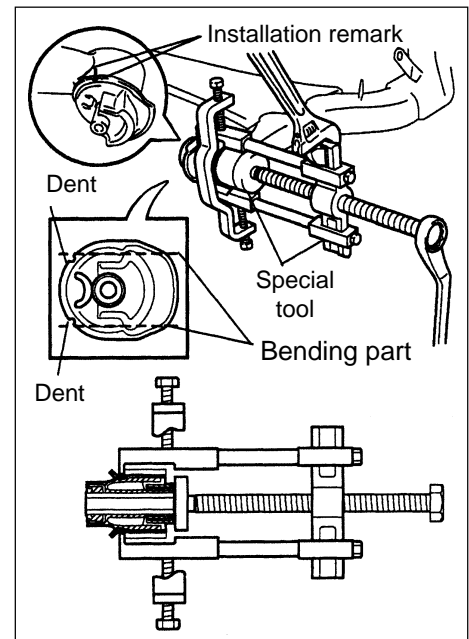
9. Remove left side rear shaft gum cover assembly.

- (a) Inscribe 2 matching marks at the dent part of gum cover and axle beam.
- (b) Bend two parts of bush frame with chisel and hammer.
Hint: bend bush frame until it reaches the hook of special tool.
- (c) Remove gum cover from axle beam with special tool.

Hint: if axle beam is damaged, please spray paint.

10. Remove right side rear shaft gum cover assembly.

Hint: the removal procedures of right side are the same as that of left side.



11. Remove left side rear shaft gum cover assembly.

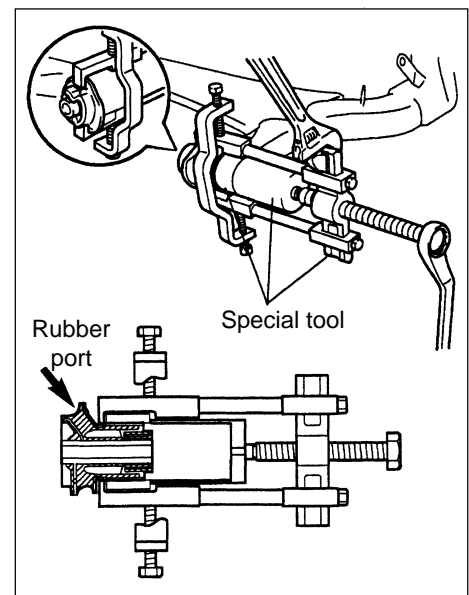
- (a) Align the dent on new bush with the matching mark previously making on axle beam, and then temporarily encase gum cover into axle beam.
- (b) Encase gum cover into axle beam with special tool.

Notes:

- The hook of special tool should be deeply and actually inserted into gum cover.
- Do not damage the rubber port of gum cover.
- + Do not deform gum cover frame.

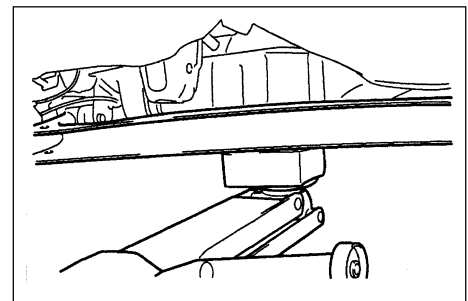
12. Install right side rear shaft gum cover assembly.

Hint: the installation procedures of right side are the same as that of left side.



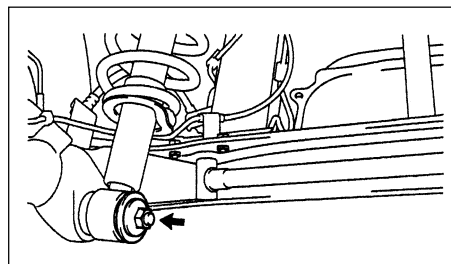
13. Temporarily lock up rear shaft assembly [64000120].

- (a) Support rear shaft with a jack.
- (b) Install rear shaft, 2 bolts and gasket, and then temporarily lock up 2 nuts.



14. Temporarily lock up rear left strut assembly.

- (a) Install rear left strut and gasket, and temporarily lock up nuts.
- (b) Perform to another side in the same way.



15. Install rear stabilizer bar assembly (see Page 105).

16. Install rear left/right brake assembly [64000137/64000139] (see Page 144).

17. Install rear wheel speed sensor wire harness.

Install wire harness and parking brake cable with 2 bolts and retaining clips.

Torque: (A) 5.4 N.m

(B) 5.0 N.m

18. Install rear left brake caliper assembly (see Page 144).

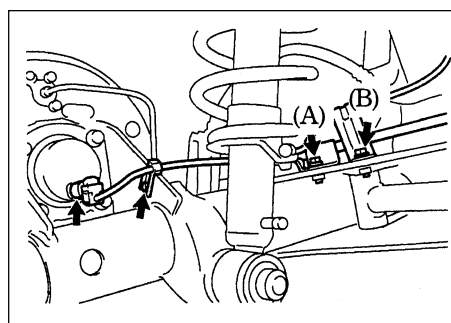
19. Install rear right brake caliper assembly (see Page 144).

20. Align suspension.

- (a) Lay down vehicle from the lift after installing rear wheels.

Torque: 103 ± 10 N.m

- (b) Align suspension components by means of lifting vehicle with a jack several times.

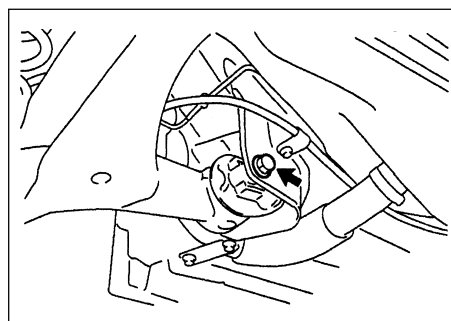


21. Completely lock up rear shaft assembly [64000120].

- (a) Completely tighten bolts and pull on open pin.

Torque: 150 ± 15 N.m

- (b) Perform to another side in the same way.



22. Completely lock up rear left strut assembly.

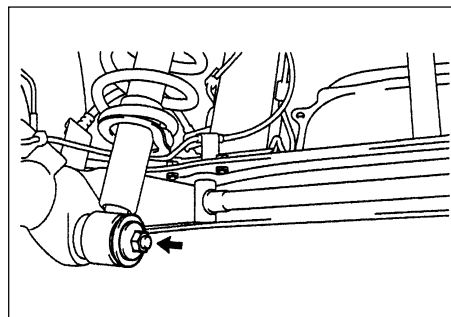
- (a) Completely tighten bolts.

Torque: 80 ± 5 N.m

- (b) Perform to another side in the same way.

23. Check rear wheel alignment (see Page 101).

24. Check ABS sensor signal.



Tire and wheel

Wheel and tire system

Inspection

1. Check tire.

(a) Check tire is worn and inflation pressure is proper.

Cold tire inflation pressure:

Tire size	Front and rear kPa
195/60R15 88H	210 *1

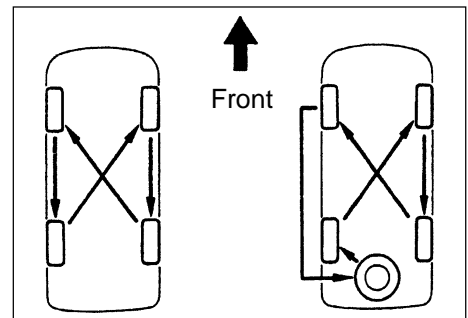
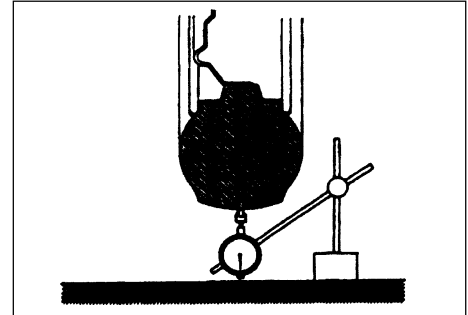
*1 It is used under the condition of speed below 160 km/h.

(b) Check tire run-out with dial indicator.

Tire run-out: ≤ 3.0 mm.

2. Adjust tire position.

Hint: see adjusting position of tire shown in the diagram whether there is spare tire or not.

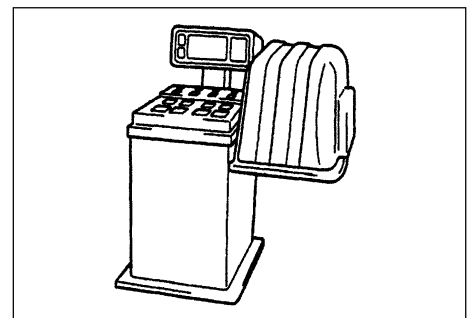


3. Check wheel balance.

(a) Check and adjust with off-the-car balancing machine.

(b) Check and adjust with in-the-car balancing machine if necessary.

Unbalanced mass after adjusting: ≤ 8.0 g.



4. Check axial clearance of front wheel bearing
(see Page 123).

5. Check end surface run-out of front wheel shaft hub
(see Page 123).

6. Check axial clearance of rear wheel bearing
(see Page 129).

7. Check end surface run-out of rear wheel shaft hub
(see Page 129).

8. Check front suspension is loose.

9. Check steering linkage is loose.

10. Check ball joint is loose.

11. Check the function of absorber is normal.

- Check there is oil leakage.
- Check liner clamp is worn.
- Shake the front and rear of vehicle.

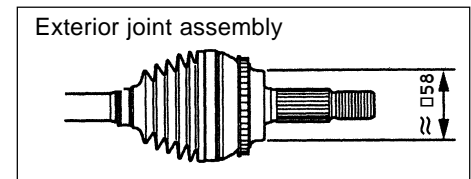
Drive shaft

Drive shaft

Notes

Note: if happening any malfunction, it is necessary to change the exterior joint assembly of transmission shaft.

1. Check front drive shaft assembly.



Malfunction phenomenon table

Malfunction phenomenon	Possible malfunction part	Reference page
Offset	1. Steering connecting rod (loosened or abraded)	-
	2. Bearing of shaft hub (abraded)	123
Shake of front wheels	1. Ball joint (abraded)	123
	2. Bearing of shaft hub (abraded)	123
	3. Steering connecting rod (loosened or abraded)	-
Abnormal noise	1. Inner joint (abraded)	113
	2. Exterior joint (abraded)	113

Inspection on automobile

1. Check the bearing of front wheel hub

- (a) Disassemble the front wheels.
- (b) Disassemble front brake caliper assembly.
- (c) Disassemble front brake.
- (d) Check the axial clearance of bearing (referring to page 123)
- (e) Check the terminal run-out of shaft hub (referring to page 123).
- (f) Assemble front brake.
- (g) Assemble front brake caliper assembly.

Torque: $106 \pm 10 \text{ N}\cdot\text{m}$

- (H) Assemble front wheel.

Torque: $103 \pm 10 \text{ N}\cdot\text{m}$

2. Check the bearing of rear wheel hub.

- (a) Disassemble rear wheels.
- (b) Disassemble rear brake caliper assembly.
- (c) Disassemble rear brake.
- (d) Check the axial clearance of bearing (referring to page 129)
- (e) Check the terminal run-out of shaft hub (referring to page 129).
- (f) Assemble rear brake.
- (g) Assemble rear brake caliper assembly.

Torque: $46 \pm 5 \text{ N}\cdot\text{m}$

- (H) Assemble rear wheel.

Torque: $103 \pm 10 \text{ N}\cdot\text{m}$

Front drive shaft

Overhaul

Hint: overhaul procedure for right side is same as the left side.

1. Check the drive shaft (referring to page 111).

2. Discharge the oil in gearbox.

(a) Disassemble oil plug and gasket to discharge the oil in gearbox.

(b) Change with a new gasket and assemble oil discharging plug.

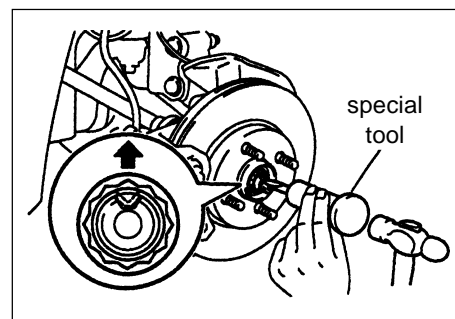
Torque: 45 ± 5 N·m

3. Disassemble front wheels.

4. Disassemble fixing nut of drive shaft [64000083]

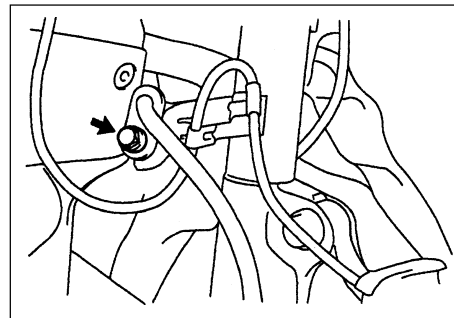
(a) Use special tool and hammer to unclench the concave part of fixing nut.

(b) Disassemble the fixing nut.

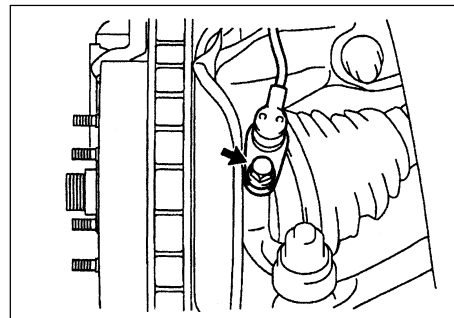


5. Disassemble speed sensor assembly of left front wheels (equipping with ABS) [67000020]

(a) Disassemble the bolt, and disassemble sensor wiring harness and brake hose from the absorber.

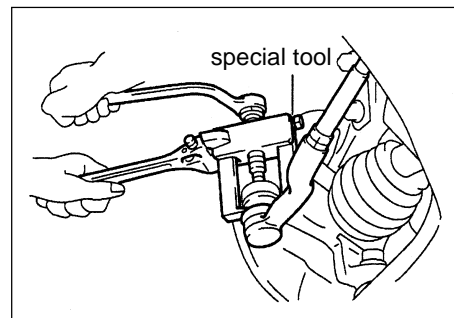


(b) Disassemble the bolt, and disassemble speed sensor from steering knuckle.



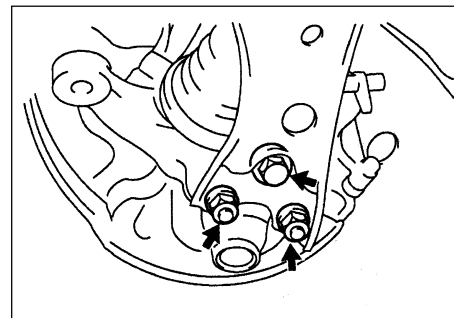
6. Disassemble left transversal lever assembly.

- (a) Disassemble cotter pin and screw cap.
- (b) Use special tool to disassemble terminal assembly from steering knuckle.



7. Disassemble left lower control arm assembly [64000091]

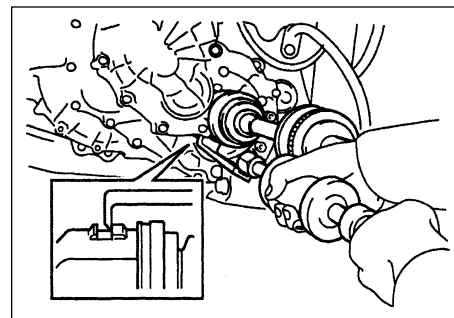
Disassemble the bolt and two nuts, then disassemble lower control arm from lower ball joint.



8. Disassemble wheel hub assembly of left front wheel.

Use plastic hammer to disassemble drive shaft from wheel hub.

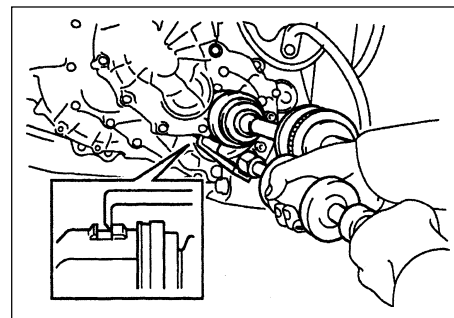
Note: forbid damaging dust-proof cover and the rotator of speed sensor.



9. Disassemble left front drive shaft assembly [64000082]

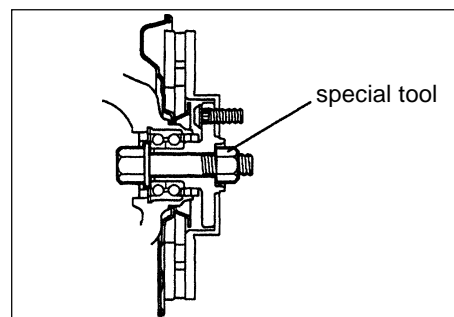
- (a) Disassemble the seal board of left front fender.
- (b) Use special tool to disassemble front drive shaft assembly.

Note: do not damage oil seal.



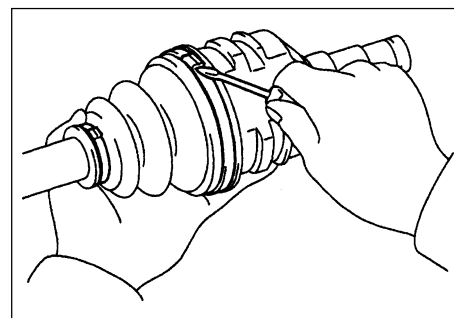
10. Fix left front shaft hub assembly.

Note: if supporting automobile weight only with bearing, shaft hub bearing will be damaged; for example, when moving automobile in process of disassembling drive shaft. So, if it is not necessary to support automobile weight with shaft hub bearing, it is necessary to use special tool to support.



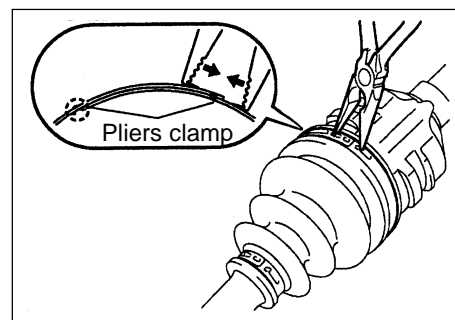
11. Disassemble No.2 fixing clamp of inner joint dust-proof cover of left front drive shaft.

- (a) Single-contact fixing clamp type:
Use screw driver to disassemble No.2 fixing clamp of inner joint dust-proof cover of left front drive shaft.



(b) Mesh clamp type:

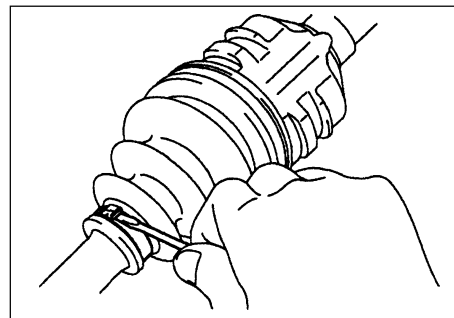
Liking that shown in figure, use pliers to disassemble No.2 fixing clamp of inner joint dust-proof cover of left front transmission shaft.



12. Disassemble fixing clamp of inner joint dustproof cover of left front drive shaft.

(a) Single-contact fixing clamp type:

Use screw driver to disassemble fixing clamp of inner joint dust-proof cover.

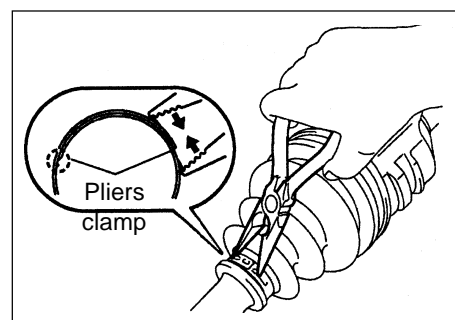


(b) Mesh clamp type:

Liking that shown in figure, use pliers to disassemble No.2 fixing clamp of inner joint dust-proof cover.

13. Disassemble inner joint dustproof cover of left front drive shaft.

Disassemble dustproof cover from left inner joint.



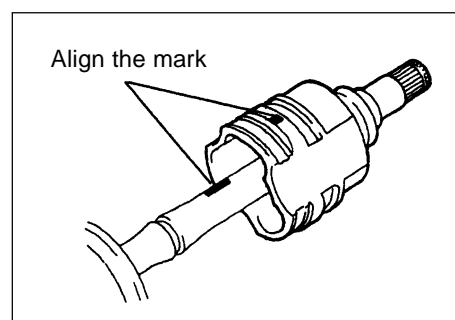
14. Disassemble inner joint of left front drive shaft.

(a) Remove old lubricating grease of inner joint.

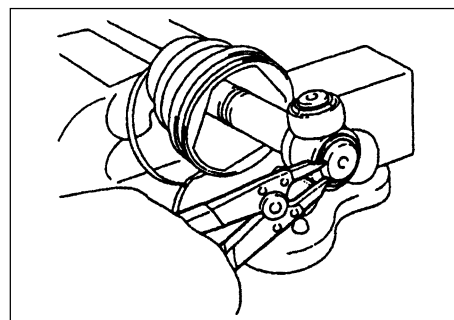
(b) Make mark on inner joint and drive shaft.

Note: do not use punch to make mark.

(c) Disassemble inner joint assembly from drive shaft.



(d) Use clasp spreading pliers to disassemble the clasp.



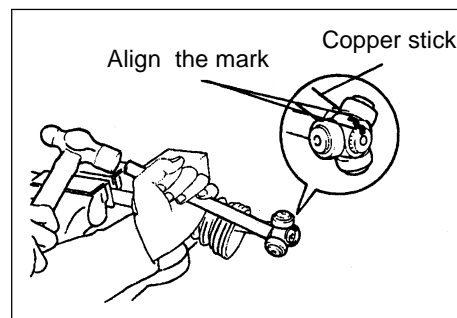
- (e) Make mark on transmission shaft and triangle joint.

Note: do not use the punch to make mark.

- (f) Use copper stick and hammer to disassemble triangle joint.

Note: do not knock the stator position.

- (g) Disassemble No.2 fixing clamp of inner joint dustproof cover and fixing clamp of inner joint dustproof cover.



15. Disassemble the absorber of drive shaft (right transmission shaft).

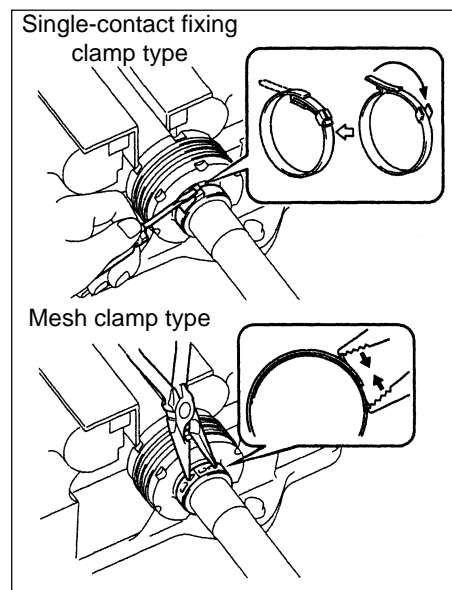
- (a) Single-contact fixing clamp type:

Liking that shown in figure, use screw driver to disassemble fixing clamp.

- (b) Mesh clamp type.

Liking that shown in figure, use pliers to disassemble fixing clamp.

- (c) Disassemble dynamic absorber of drive shaft.

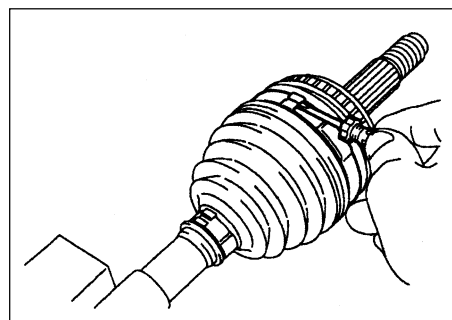


16. Disassemble No.2 fixing clamp of exterior joint dustproof cover of left front drive shaft.

- (a) Use screw driver to disassemble No.2 fixing clamp of exterior joint dustproof cover.

17. Disassemble fixing clamp of exterior joint dustproof cover of left front drive shaft.

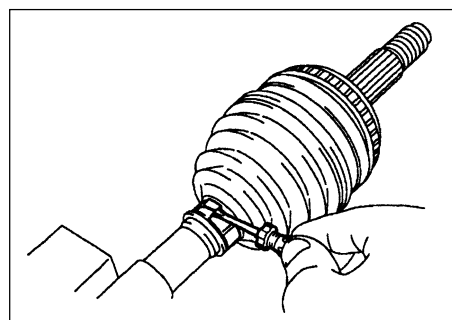
- (a) Use screw driver to disassemble fixing clamp of exterior joint dustproof cover.



18. Disassemble fixing clamp of exterior joint dustproof cover (B type and C type).

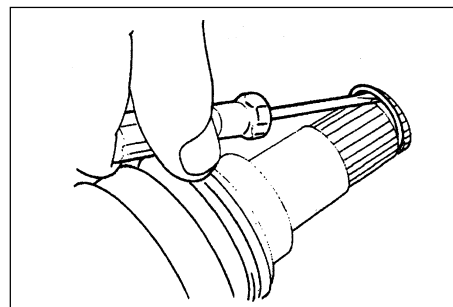
- (a) Disassemble dustproof cover of exterior joint.

- (b) Remove old lubricating grease of exterior joint.



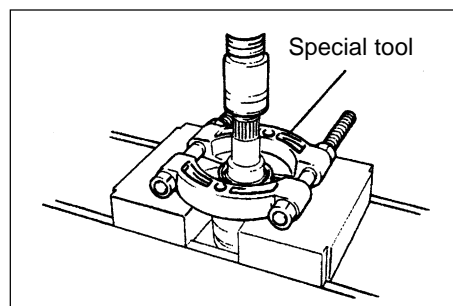
19. Disassemble clasp of inner joint of left front drive shaft.

Use screw driver to disassemble the clasp.



20. Disassemble dustproof cover of left front drive shaft.

Use special tool and press to disassemble dustproof cover .



21. Assemble dustproof cover of left front driveshaft.

Liking that shown in figure, use special tool and press to assemble left dustproof cover

Note: Dustproof cover should be assembled to its position completely.

Do not damage dustproof cover lid.

22. Assemble the clasp of inner joint of left front drive shaft.

Assemble new clasp.

23. Assemble exterior joint dustproof cover (B type and C type).

(a) Twist ethylene adhesive tape on gear slot of exterior joint to prevent damage.

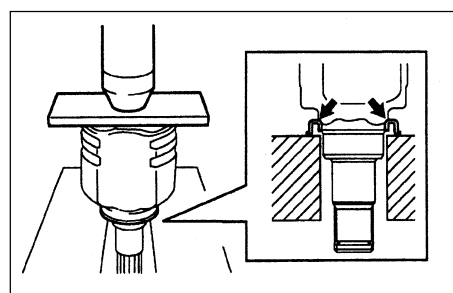
(b) Assemble following parts on drive shaft by sequence.

(1) No.2 fixing clamp of exterior joint dustproof cover.

(2) Exterior joint dustproof cover

(3) Fixing clamp of exterior joint dustproof cover.

(c) Fill lubricating grease in exterior joint assembly.



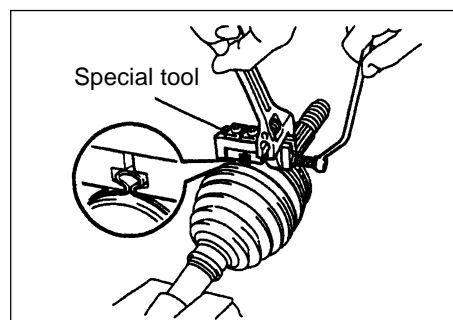
Left and right driving shaft	Capacity of lubricating grease
B type	125-135 grams
C type	190-200 grams

(d) Assemble exterior joint dustproof cover on exterior joint shaft.

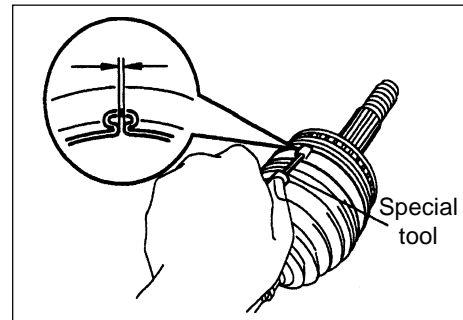
24. Assemble No.2 fixing clamp of exterior joint dustproof cover of left front drive shaft.

(a) AUMIGA fixing type.

Tighten big fixing clamp of exterior joint.

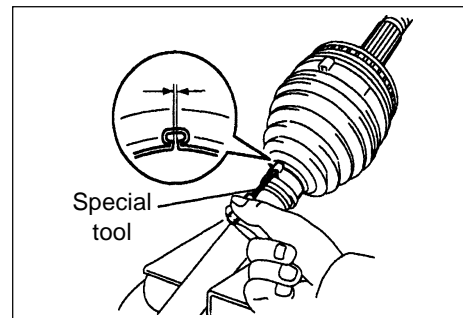
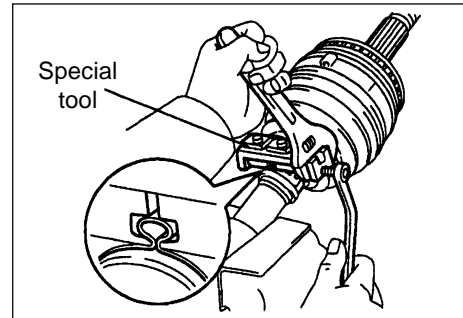


- (1) Put big fixing clamp on dustproof cover firmly.
 - (2) Put special tool on big fixing clamp.
 - (3) Lock special tool to tighten big fixing clamp.
- Note: do not tighten special tool too much.**
- (4) Use special tool to adjust the clearance of big fixing clamp.
- Clearance: $\leq 0.8\text{mm}$**



25. Assemble fixing clamp of exterior joint dustproof cover of left front drive shaft.

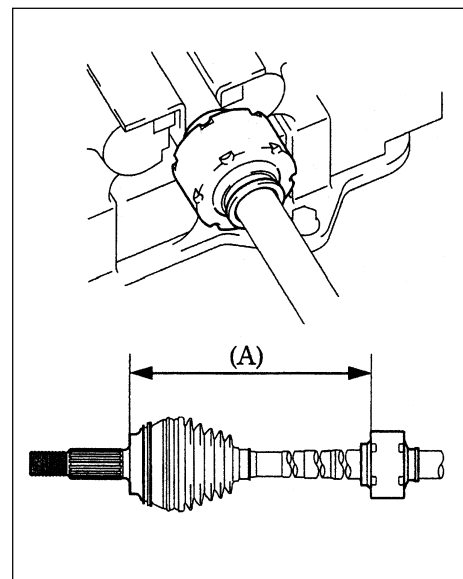
- (a) AUMIGA fixing type.
- Tighten small fixing clamp of exterior joint.
- (1) Put small fixing clamp on dustproof cover firmly.
 - (2) Put special tool on small fixing clamp.
 - (6) Lock special tool to tighten small fixing clamp.
- Note: do not tighten special tool too much.**
- (4) Use special tool to adjust the clearance of small fixing clamp.
- Clearance: $\leq 0.8\text{mm}$**



26. Assemble dynamic absorber of driveshaft (right drive shaft).

- (a) A type and C type
- Liking that shown above, set up the distance of absorber:

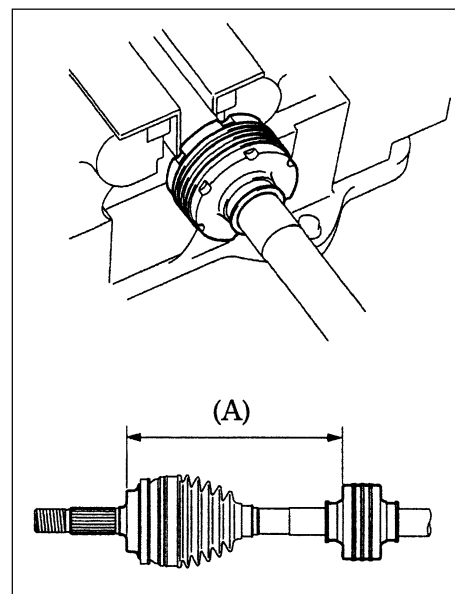
A type and C type	$440 \pm 2\text{mm}$
-------------------	----------------------



(b) B type

Liking that shown above, set up the distance of absorber:

B type and C typ	470 ± 2mm
------------------	-----------



27. Assemble fixing clamp of dynamic absorber of drive shaft.

(a) Single-contact fixing clamp type:

Assemble new fixing absorber clamp on the absorber of drive shaft, then fix the fixing clamp with screw driver.

(b) Mesh clasp type:

Assemble new fixing absorber clamp on the absorber of drive shaft, then fix the fixing clamp with screw driver.

28. Assemble inner joint of left front drive shaft.

(a) Twist ethylene adhesive tape on gear slot of exterior joint to prevent damage.

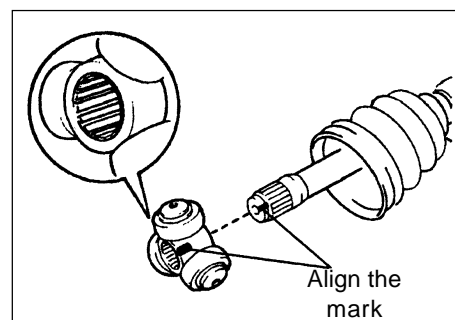
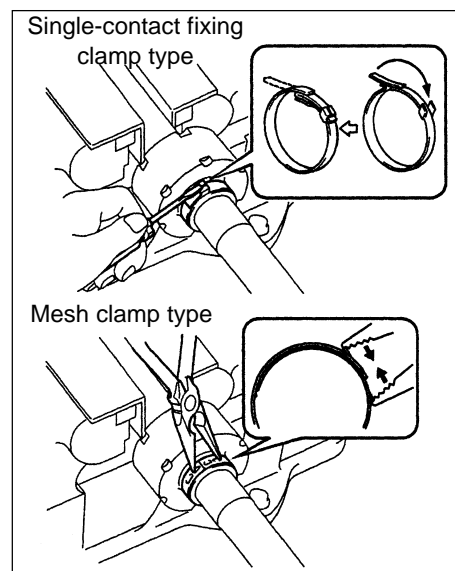
(b) Assemble following parts on drive shaft by sequence.

- (1) No.2 fixing clamp of inner joint dustproof cover.
- (2) Inner joint dustproof cover
- (3) Fixing clamp of inner joint dustproof cover.

(c) Align the mark made before disassembly, and assemble triangle joint in drive shaft.

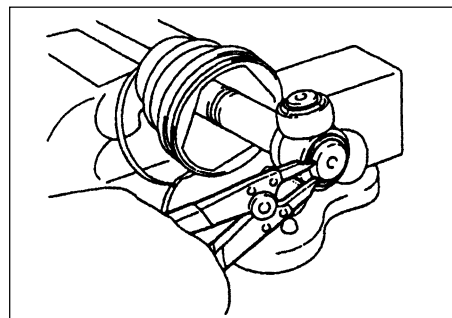
(d) Assemble triangle joint assembly with copper stick and hammer.

Note: do not knock the stator.

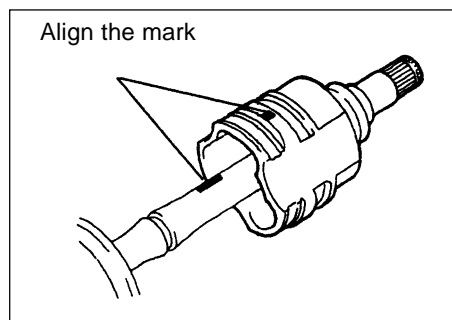


- (e) Use clasp spreading pliers to assemble the clasp.
- (f) Fill lubricating grease in inner joint assembly.

Left transmis- sion shaft	Right trans- mission shaft	Capacity of lubricating grease
A type	A type	180-190 grams
C type	C type	
B type	B type	125-135 grams



- (g) Align the mark before disassembly, and assemble inner joint in drive shaft.



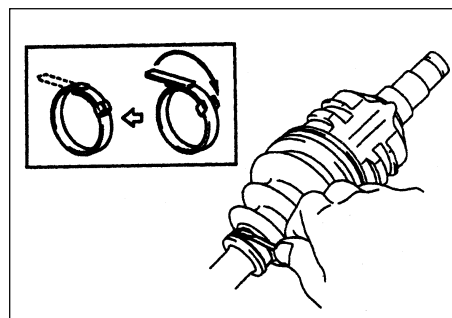
29. Assemble dustproof cover inner joint of left front drive shaft.

Assemble inner joint dustproof cover to inner joint and drive shaft.

30. Assemble fixing clamp of dustproof cover inner joint of left front drive shaft.

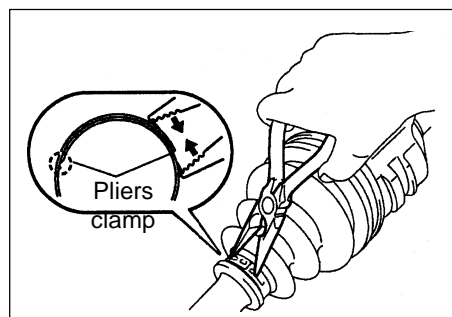
- (a) Single-contact fixing clamp type:

Liking that shown in figure, use screw driver to assemble fixing clamp of dust-proof cover inner joint .



- (b) Mesh clamp type:

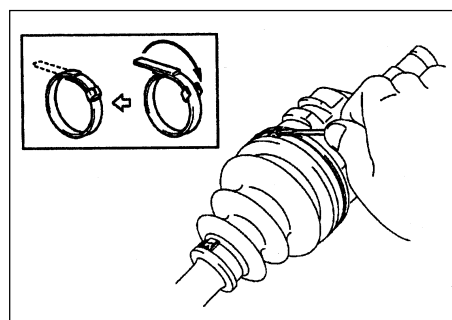
Liking that shown in figure, use pliers to assemble fixing clamp of inner joint dust-proof cover.



31. Assemble No.2 fixing clamp of dust-proof cover inner joint of left front drive shaft.

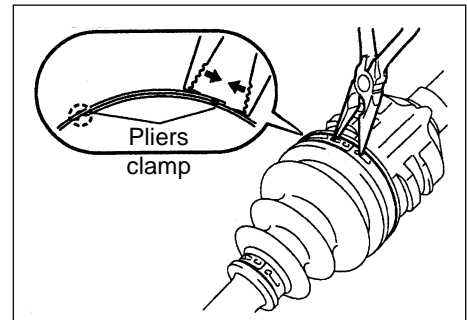
- (a) Single-contact fixing clamp type:

Liking that shown in figure, use screw driver to assemble No.2 fixing clamp of dust-proof cover inner joint.



(b) Mesh clamp type:

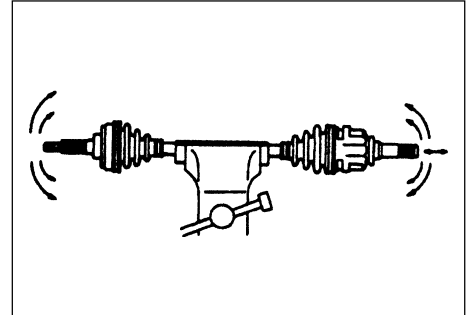
Liking that shown in figure, use pliers to assemble No.2 fixing clamp of inner joint dust-proof cover.



32. Check front drive shaft.

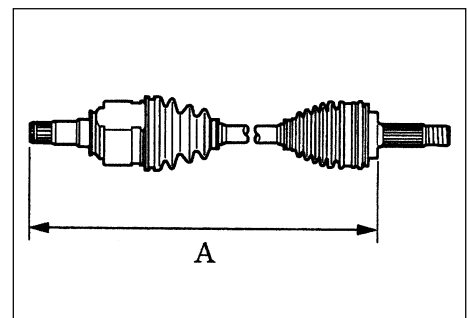
- Check whether there is any obvious clearance on exterior joint.
- Check whether inner joint could slide smoothly in pushing direction.
- Check whether there is any obvious clearance of inner joint in radial direction.
- Check whether the dustproof cover is damaged.

Note: drive shaft assembly should keep moving on horizontal position.



Hint: A size, please referring to following table.

Transmission shaft	Left mm	Right mm
A type	570.2 ± 5	842.7 ± 5
B type	570.2 ± 5	847.3 ± 5
C type	570.2 ± 5	844.7 ± 5



33. Assemble left front drive shaft assembly [64000082]

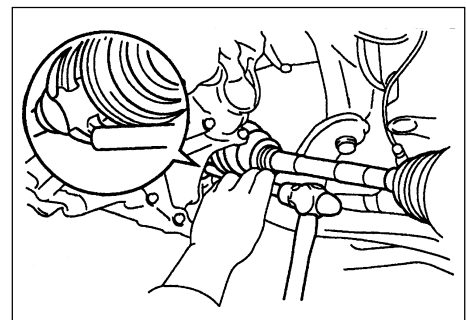
- Spread ATF on gear slot of inner joint shaft assembly.
- Put gear slot of drive shaft in integrated transmission, then use copper stick and hammer to knock drive shaft to its position.

Note:

- make the placket of clasp face the downside to assemble.
- Be careful not to damage the seal oil

Hint: Whether the drive shaft contacts with gear shaft could be felt by the sound or feeling in running process.

- Assemble seal board of left front swing board.



34. Assemble left front shaft hub assembly.

Assemble left front drive shaft assembly to left front hub assembly.

Note:

- Do not damage exterior joint dustproof cover.
- Do not damage the stator of speed sensor.

35. Assemble left lower control arm assembly [64000091]

- (a) Assemble lower ball joint on lower suspension arm with the bolts and screw caps.

Torque: 142 ± 10 N·m

36. Assemble left transversal lever assembly.

- (a) Assemble transversal lever terminal to steering knuckle with screw cap.

Torque: 49 ± 5 N·m

- (b) Assemble new cotter pin.

Note: if hole position of cotter pin could not make a line, lock the screw cap for 60.

37. Assemble speed sensor assembly of left front wheels (equipping with ABS) [67000020]

- (a) Assemble speed sensor absorber with bolts.

Torque: 49 ± 5 N·m

- (b) Assemble speed sensor on the steering knuckle with bolts.

Torque: 8 N·m

Note:

- Do not damage speed sensor.
- Prevent it from contacting with sundries.
- When assembling the sensor, the wiring harness of sensor could not bend.

38. Assemble fixing nuts of drive shaft [68000083]

- (a) Assemble fixing nuts.

Torque: 216 ± 15 N·m

- (b) Use chisel and hammer to knock the fixing nuts concave and fix them.

39. Assemble front wheels.

Torque: 103 ± 10 N·m

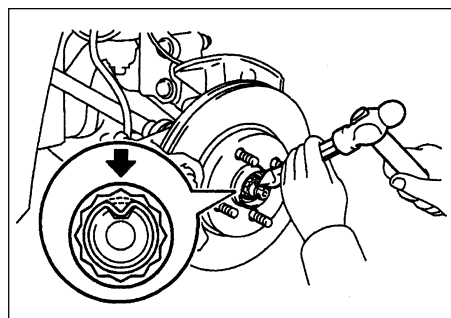
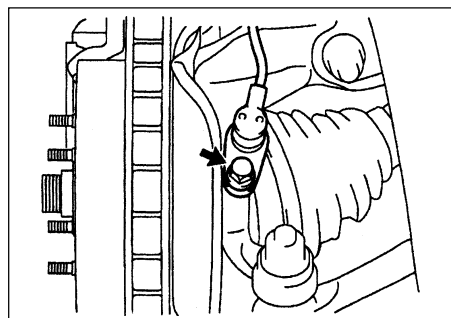
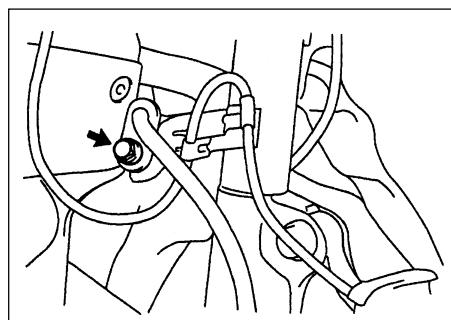
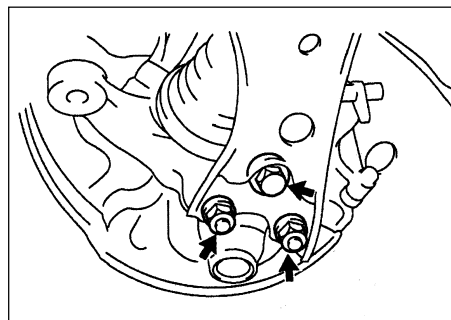
40. Add the oil in gearbox.

41. Check and adjust the oil in gearbox.

42. Check and adjust wheel alignment (referring to page 87)

43. Check the ABS speed sensor (equipping with ABS).

44. Test on road.



Left front shaft hub assembly

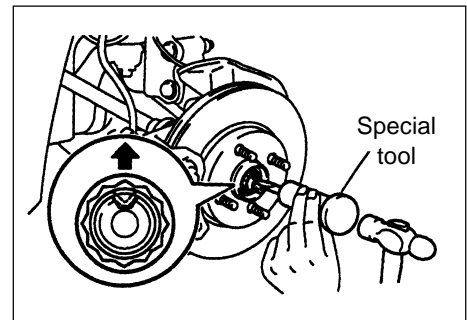
Change

Hint: changing procedure for right side is same as the left side.

1. Disassemble front wheels

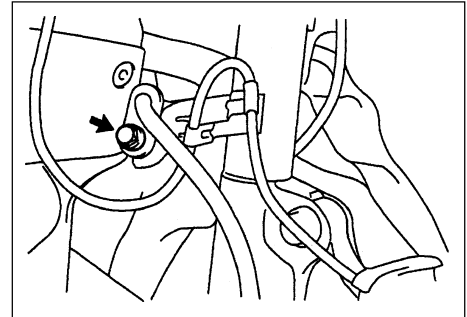
2. Disassemble fixing nuts of left front drive shaft [64000083]

- (a) Use special tool and hammer to unclench concave part of fixing nuts.
- (b) Disassemble fixing nuts.

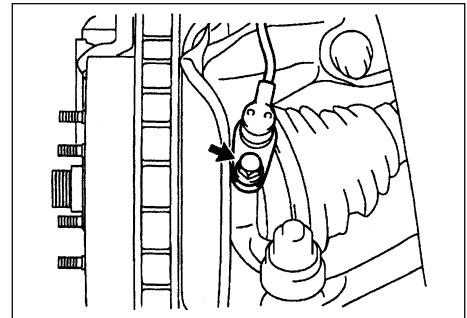


3. Disassemble speed sensor assembly of left front wheel [67000020]

- (a) Disassemble the bolts, then disassemble the wiring harness of sensor and brake hose.

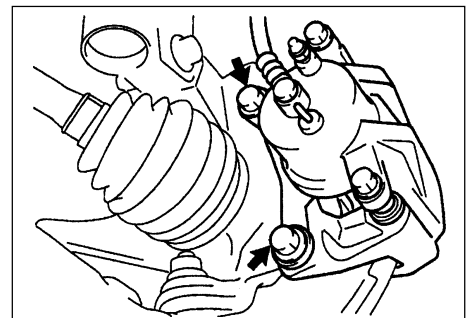


- (b) Disassemble the bolts, then disassemble speed sensor from steering knuckle.



4. Disassemble left front brake caliper assembly

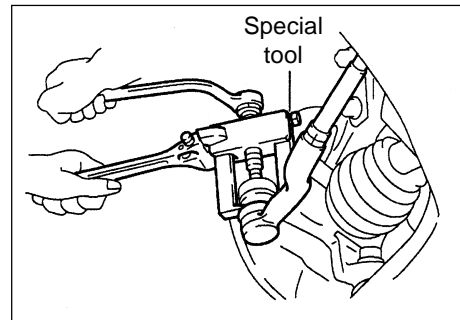
Disassemble two bolts to disassemble brake caliper bracket.



5. Disassemble left front brake assembly [64000134]

6. Disassemble left transversal lever assembly

- (a) Disassemble cotter pin and nuts.
- (b) Use special tool to disassemble transversal lever assembly from steering knuckle.



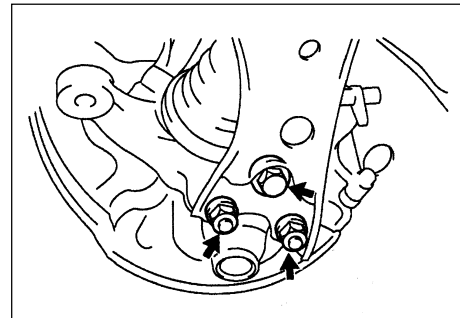
7. Disassemble left lower control arm assembly [64000091]

Disassemble the bolt and two nuts, then disassemble lower control arm from lower ball joint.

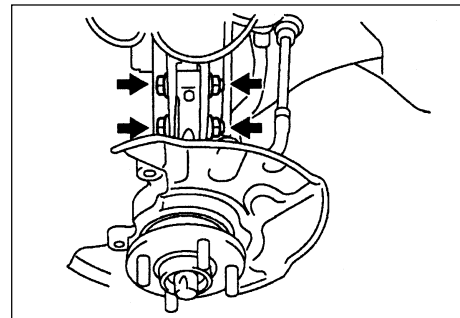
8. Disassemble left front shaft hub assembly.

- (a) Use plastic hammer to disassemble transmission shaft from shaft hub.

Note: do not damage the dustproof cover and the stator of ABS speed sensor.



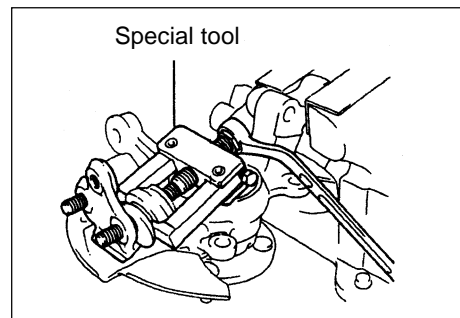
- (b) Disassemble two bolts and nuts, then disassemble steering knuckle with shaft hub.



9. Disassemble left front lower control arm ball head assembly [64000093]

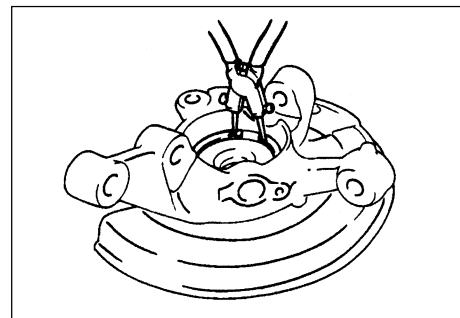
- (a) Disassemble cotter pin and nut.

- (b) Use special tool to disassemble ball head.



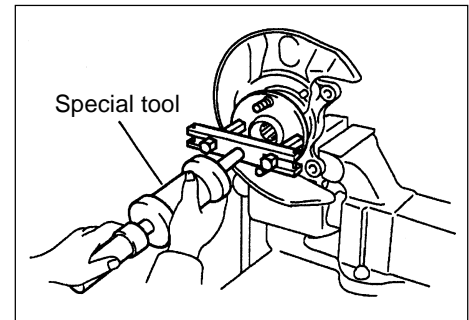
10. Disassemble the clasp in left front shaft hub hole.

Use clasp pliers to disassemble the clasp.

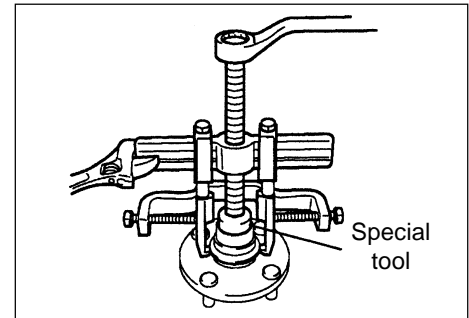


11. Disassemble left front shaft hub assembly.

(a) Use special tool to disassemble shaft hub.



(b) Use special tool to disassemble inner ring (exterior) seat from shaft hub.



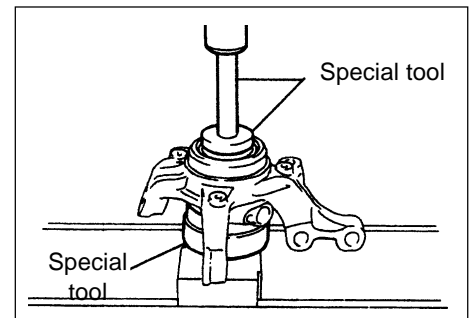
12. Disassemble left front brake bottom board.

Disassemble three bolts, then take down the brake bottom board.

13. Disassemble left front shaft hub bearing

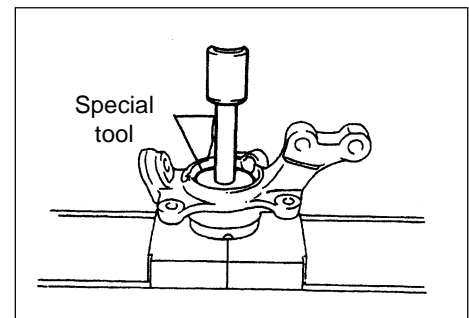
(a) Put inner circle (exterior) on bearing.

(b) Use special tool and press to disassemble the bearing from steering knuckle.



14. Assemble left front shaft hub bearing.

Use special tool and press to assemble the bearing on steering knuckle.

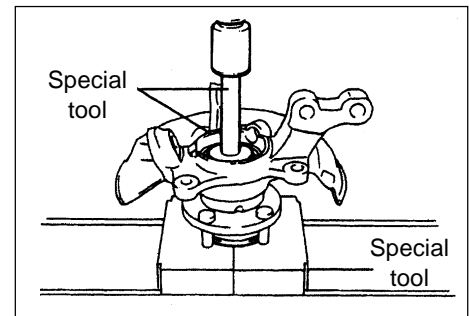


15. Assemble left front brake bottom board.

Assemble bottom board with three bolts.

16. Assemble left front shaft hub assembly.

Use special tool and press to assemble shaft hub.



17. Assemble the clasp of left front shaft hub hole.

Use the clasp pliers to assemble the clasp.

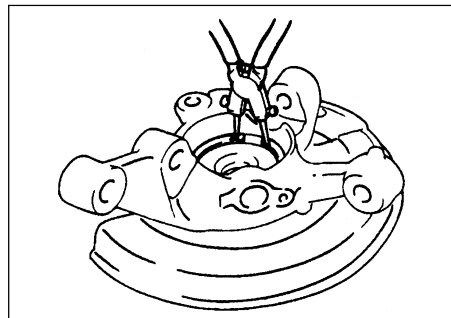
18. Assemble left front lower control arm ball head assembly [64000093]

- (a) Assemble lower ball head and locking nut.

Torque: 103 ± 10 N·m

- (b) Assemble new cotter pin.

If hole position of cotter pin could not make a line, lock the screw cap for 60° again.



19. Assemble left front shaft hub assembly

- (a) Assemble two bolts and nuts, and assemble shaft hub assembly on absorber.

Torque: 153 ± 10 N·m

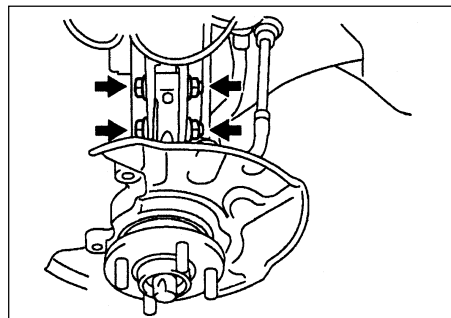
Note: when the bolts and nuts should be used again, spread engine oil on the thread of nuts.

- (b) Push the front shaft hub assembly to the outside of automobile, then assemble transmission shaft assembly in the gear slot of front shaft hub assembly.

Note:

Front shaft assembly could not be pushed to outside too much.

- Do not damage the exterior joint dustproof cover of drive shaft.
- Do not damage the stator of speed sensor.



20. Assemble left lower control arm assembly

[64000091]

Assemble lower control arm and ball head with two nuts and bolts.

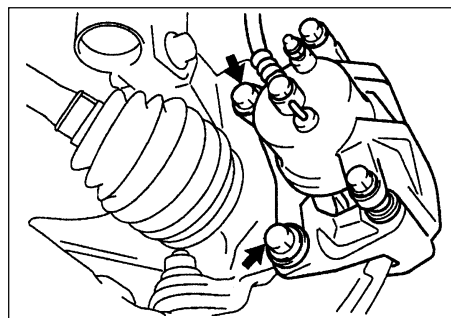
Torque: 142 ± 10 N·m

21. Assemble left transversal lever assembly

- (a) Connect transversal lever to steering knuckle.

- (b) Assemble screw cap and new cotter pin.

Torque: 49 ± 5 N·m



22. Assemble left front brake assembly [64000134]

23. Assemble front brake caliper assembly

- (a) Assemble brake caliper assembly on steering knuckle with two bolts.

Torque: 106 ± 10 N·m

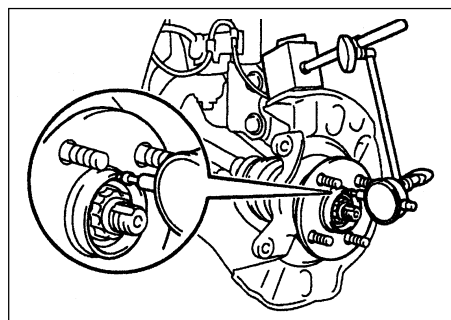
24. Assemble fixing nuts of left front drive shaft [64000083]

Use torque wrench (30mm) to assemble new fixing nuts.

25. Disassemble left front brake branch pump assembly

26. Disassemble left front brake assembly [64000134]

27. Check the axial clearance of bearing



Use centimeter to check the axial clearance of shaft hub center.

Maximal value: 0.05 mm

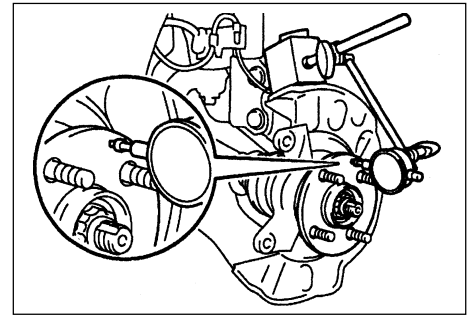
If axial clearance exceeds the maximal value, it is necessary to change the bearing.

28. Check the terminal face run-out of shaft hub.

Use centimeter to check the terminal run-out of exterior surface of shaft hub.

Maximal value: 0.05 mm

If terminal run-out exceeds the maximal value, change the shaft hub.

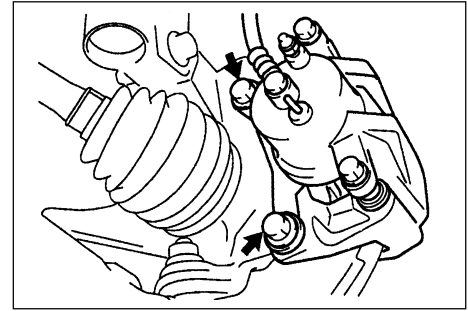


29. Assemble left front brake assembly [64000134]

30. Assemble left front brake branch pump assembly

Use two bolts to assemble brake branch pump assembly on steering knuckle.

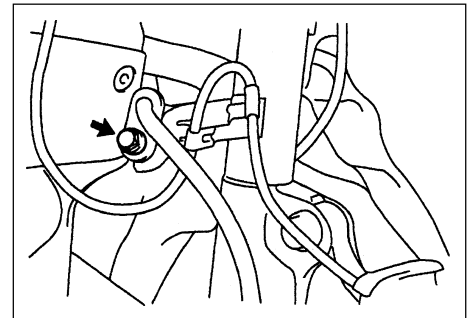
Torque: 106 ± 10 N·m



31. Assemble speed sensor assembly of left front wheel [67000020]

(a) Assemble wiring harness of speed sensor and brake hose on the absorber with bolts.

Torque: 29 N·m

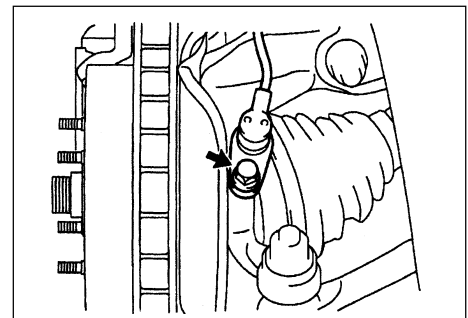


(b) Use the bolts to assemble speed sensor to steering knuckle.

Torque: 8.0 N·m

Note: Do not damage the speed sensor.

- Prevent it from contacting with sundries.
- When assembling the sensor, wiring harness of sensor could not bend.



32. Assemble fixing nut of left front drive shaft [64000083]

(a) Assemble new fixing nuts,

Torque: 216 ± 15 N·m

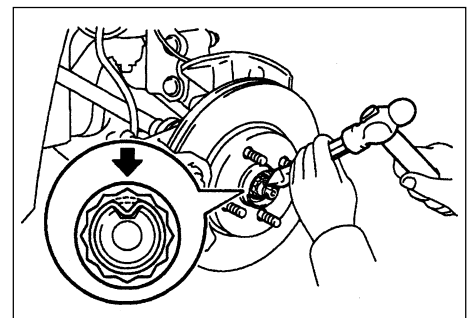
(b) Use chisel and hammer to make fixing nut concave and fix them.

33. Assemble front wheels.

Torque: 103 ± 10 N·m

34. Check and adjust wheel alignment (referring to page 87).

35. Check the ABS speed sensor signal.



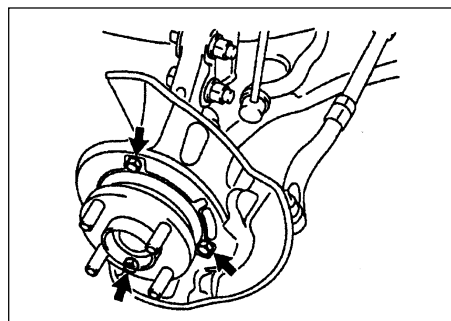
Left front shaft hub bolt

Change

Hint: changing procedure for right side is same as left side.

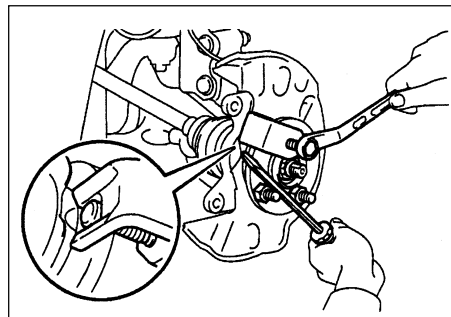
1. Disassemble front wheels
2. Disassemble left front brake branch pump assembly
3. Disassemble left front brake assembly [64000134]
4. Disassemble left front brake bottom board.

Disassemble three bolts, then disassemble the bottom board from steering knuckle.



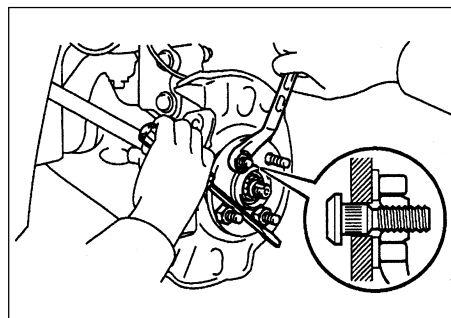
5. Disassemble left front shaft hub bolt.

Use special tool and screw driver to disassemble shaft hub bolt.



6. Assemble left front shaft hub bolt.

- (a) Liking that shown in figure, assemble gasket and screw cap on new shaft hub bolt.
- (b) Use screw driver to fix and lock the screw cap to make the bolt enter the hole.



7. Assemble left front brake bottom board.

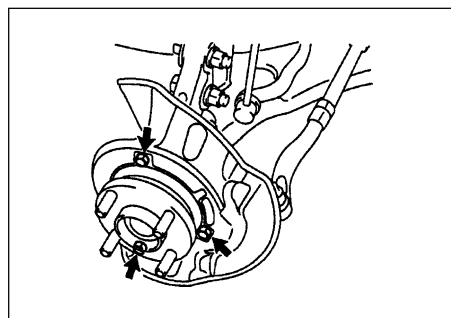
Assemble three bolts, and assemble bottom board in steering knuckle.

8. Assemble left front brake assembly.
9. Assemble left front brake branch pump assembly.

Torque: 106 ± 10 N·m

10. Assemble front wheels.

Torque: 103 ± 10 N·m



Left rear shaft hub and bearing assembly

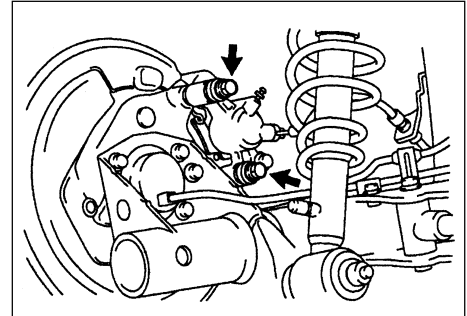
Change

Hint: changing procedure for right side is same as left side.

1. Disassemble rear wheels.

2. Disassemble rear brake caliper assemble

Disassemble two bolts and take down brake caliper.



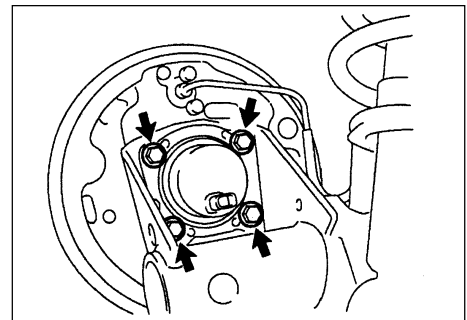
3. Disassemble the wiring harness of rear wheel speed sensor (equipping with ABS).

Disassemble the joint of rear wheel speed sensor.

4. Disassemble left rear brake assembly [64000137]

5. Disassemble left rear shaft hub and bearing assembly.

Disassemble four bolts, then take down lower shaft hub and bearing assembly.

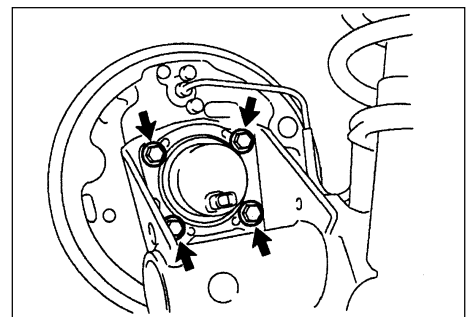


6. Disassemble rear wheel speed sensor assembly (equipping with ABS) [67000023] (referring to page 52)

7. Assemble rear wheel speed sensor assembly (equipping with ABS) [67000023] (referring to page 52)

8. Assemble left rear shaft hub and bearing assembly

Use four bolts to assemble left rear shaft hub and bearing assembly



9. Assemble wiring harness of rear wheel speed sensor (equipping with ABS).

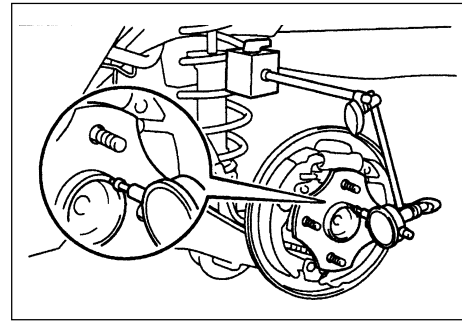
Connect the joint of rear wheel speed sensor.

10. Check the axial clearance of bearing.

Put the centimeter besides shaft hub center, and check the axial clearance of bearing.

Maximal value: 0.05mm

If axial clearance exceeds the maximal value, change the bearing assembly.

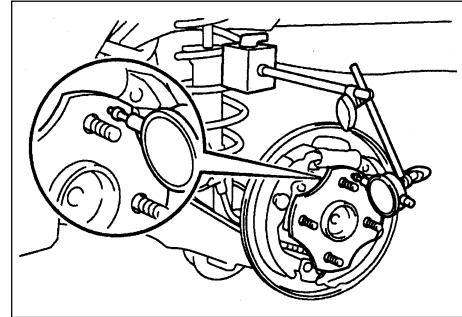


11. Check the terminal face run-out of shaft hub.

Use centimeter to check the terminal run-out of exterior surface of shaft hub.

Maximal value: 0.07m

If terminal run-out exceeds the maximal value, change the shaft hub.



12. Assemble left rear brake assembly [64000137]

13. Assemble left rear brake branch pump assembly

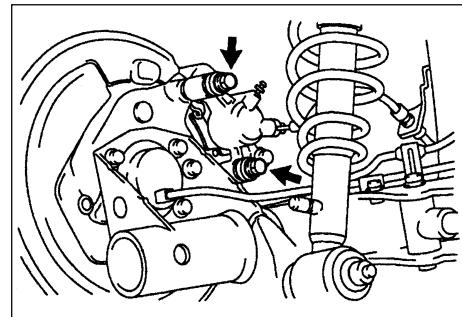
Torque: 46 ± 5 N·m

14. Assemble rear wheels

Torque: 103 ± 10 N·m

15. Check the ABS speed sensor signal.

16. Inspection on road.



Left rear shaft hub bolt

Change

1. Disassemble rear wheels

2. Disassemble left rear brake caliper assemble

Disassemble two bolts and take down brake caliper.

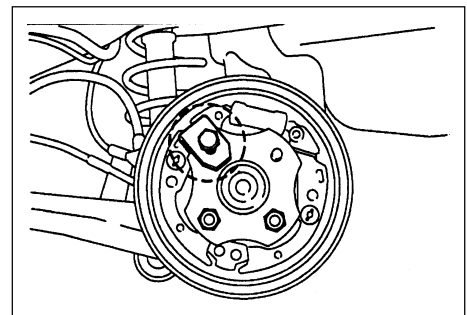
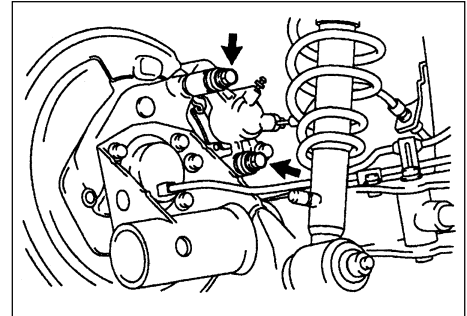
3. Disassemble left rear brake assembly [64000137]

4. Disassemble left rear shaft hub bolt

(a) Screw the shaft to the position in figure, then use special tool to disassemble shaft hub bolt.

Note: shaft hub bolt should be screwed to the position in figure, or you could not change shaft hub bolt.

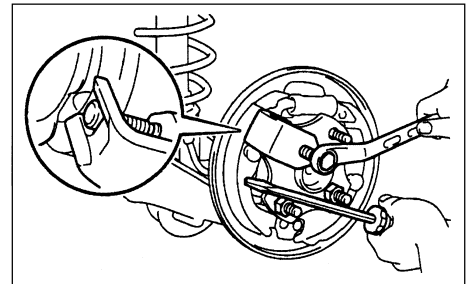
(b) Use special tool and screw driver to disassemble shaft hub bolt.



5. Assemble left rear shaft hub bolt

(a) Liking that shown in figure, assemble new gasket and screw cap on new shaft hub bolt.

(b) Use screw driver to fix and lock screw cap to make the bolt enter hole.



6. Assemble left rear brake assembly [64000137]

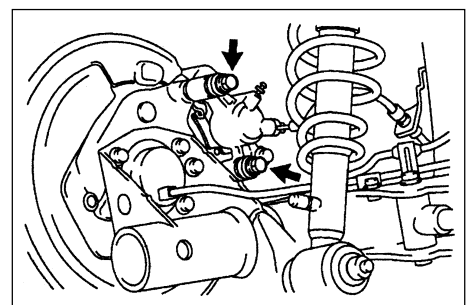
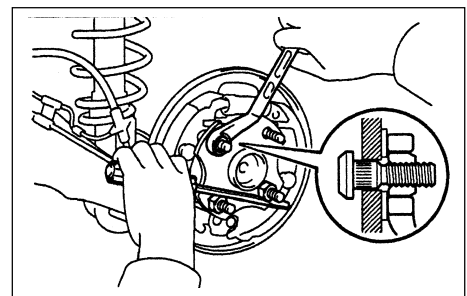
7. Assemble left rear brake branch pump assembly

Use two bolts to assemble rear brake branch pump assembly.

Torque: 46 ± 5 N·m

8. Assemble rear wheels

Torque: 103 ± 10 N·m



Brake

Brake system

Notes

- It is necessary to be very careful when changing any subassembly, for this will influence the performance of brake system and incur the running becomes unsafe. It is necessary to use those parts with same type or same grade when changing.
- When repairing brake system, it is very important to keep the surface of every part clean.

Remove malfunction

Malfunction phenomenon table

Use following table to help you find the reason of malfunction, the number in table indicates the preferred sequence of possible reasons of malfunction. Please check every part by sequence, if necessary, change this part.

Malfunction phenomenon	Possible malfunction part	Reference page
The height of brake pedal is too low or brake pedal is loose.	1. Brake system (leaking oil).	-
	2. Brake system (entering air).	135
	3. Piston oil seal (abraded or damaged).	141, 144
	4. Brake main pump (invalid)	138
	5. Vacuum booster lever (adjusted badly)	138
Brake lag	1. Brake pedal free travel (too small).	136
	2. Parking brake handle travel (adjusted badly).	154
	3. Parking brake pull cable (lag).	156, 158
	4. Brake block (damaged or distorted).	141, 144
	5. Piston (locked).	141, 144
	6. Piston (freezed).	141, 144
	7. Tensility or return spring (invalid).	161
	8. Vacuum booster lever (adjusted badly).	138
	9. Vacuum boosting system (vacuum leakage).	138
	10. Brake main pump (invalid).	138
Brake offset	1. Piston (locked).	141, 144
	2. Brake block (oil dirt).	141, 144
	3. Piston (freezed).	141, 144
	4. Brake disk (scratched).	141, 144
	5. Brake block (abraded or distorted).	141, 144
Brake pedal is too hard to make power lack.	1. Brake system (leaking oil).	
	2. Brake system (entering air).	135
	3. Brake block (abraded).	141, 144
	4. Brake block (damaged or distorted).	141, 144
	5. Brake block (oil dirt).	141, 144
	6. Brake block (sclerosesed).	141, 144
	7. Brake disk (scratched).	141, 144
	8. Vacuum booster lever (adjusted badly).	138
	9. Vacuum boosting system (vacuum leakage).	138

Malfunction phenomenon	Possible malfunction part	Reference page
Brake noise	1. Brake block (damaged or distorted).	141, 144
	2. Assembled nut (loose).	141, 144
	3. Brake disk (scratched).	141, 144
	4. Support sheet of brake block (loose).	141, 144
	5. Sliding pin (abraded).	141, 144
	6. Brake block (oil dirt).	141, 144
	7. Brake block(sclerosesed).	141, 144
	8. Support pin or return spring (invalid).	161
	9. Muffle gasket (damaged).	141, 144
	10. Localizing spring (damaged).	161

Brake liquid

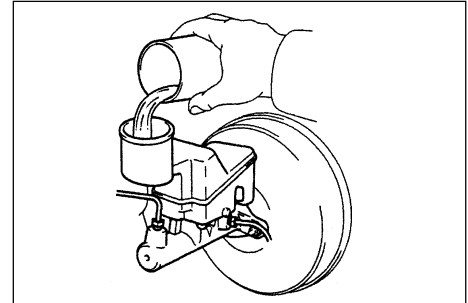
Discharge the air in brake system

Hint: if any part of brake system has been damaged or you disbelieve whether there is any air in brake pipeline, it is necessary to discharge the air in brake system completely.

Note: do not make brake liquid spill on paint surface, if having, wash it cleanly.

1. Add brake liquid in storage tank.

Brake liquid: DOT-4

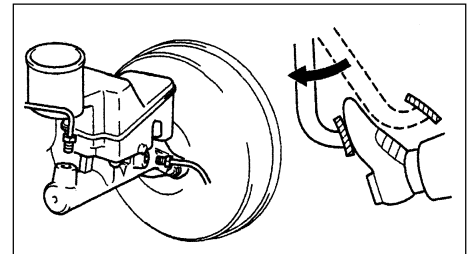


2. Discharge the air in brake main pump.

Hint: if brake main pump or liquid storage tank is disassembled, it is necessary to discharge the air in brake main pump.

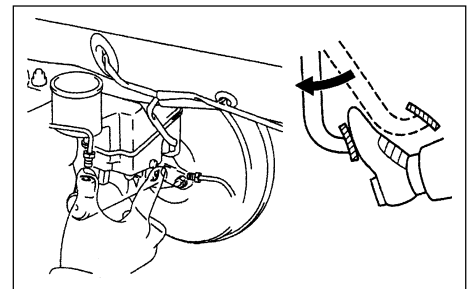
(a) Disassemble brake pipeline of brake main pump.

(b) Step down brake pedal slowly and keep this state.



(c) Plug oil hole with finger, then release brake pedal.

(d) Repeat (b) and (c) three times or four times.



3. Discharge the air in brake pipeline.

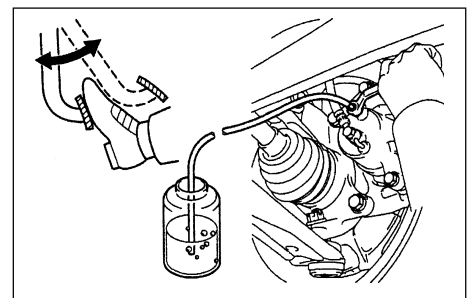
(a) Connect plastic pipe on exhaust bolt of brake branch pump.

(b) After stepping brake pedal several times, and step down brake pedal, then release inflating bolt to discharge air.

(c) Lock exhaust bolt until brake liquid stops flowing out, then release brake pedal.

(d) Repeat (b) and (c) until air is discharged completely.

(e) Repeat the procedure above, and release the air in brake pipeline of every wheel.

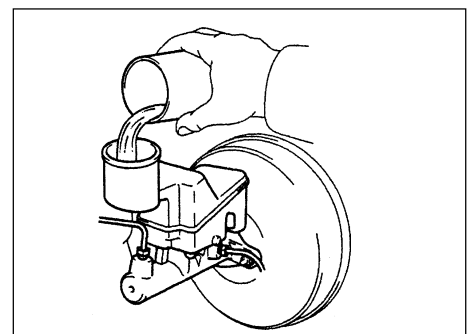


Torque: 12.7-17.6 N·m

4. Check the brake liquid storage tank

Check the liquid level in storage tank, if necessary, add brake liquid.

Brake liquid: DOT-4.



Brake pedal assembly

Adjustment

1. Check and adjust the height of brake pedal.

(a) Check the height of brake pedal.

Pedal distance from floor: 136.0-146.0mm

(b) Adjust the height of brake pedal.

(1) Disassemble lower trim board of panel.

(2) Disassemble switch joint of brake light.

(3) Loosen locking nut of brake switch, and disassemble the switch of brake light.

(4) Loosen U-shaped clasp fixing nut of pedal lever.

(5) Turn pedal lever to adjust the height of pedal.

(6) Lock the fixing nut of lever.

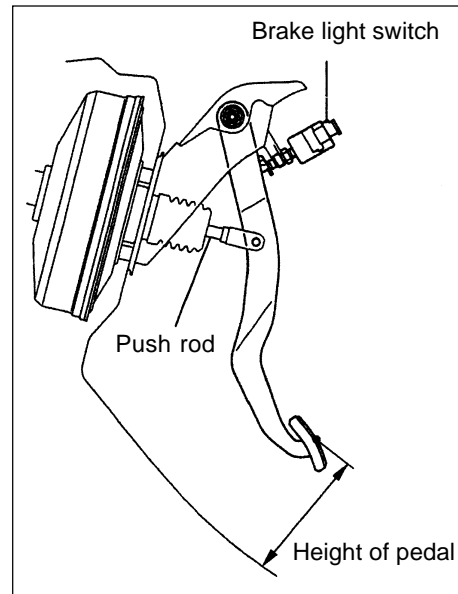
Torque: 26 ± 2 N·m

(7) Assemble the switch of brake switch.

(8) Connect the switch joint of brake light.

(9) Press down the brake pedal for 5-15mm, and turn the switch of brake light to illuminate brake light, then lock the nut.

(10) After assembling, press down the brake pedal for 5-15mm again, and confirm brake light has illuminated.



2. Check the free travel of pedal.

(a) Extinguish the engine, and step brake pedal repeatedly until there is no vacuum in vacuum booster.

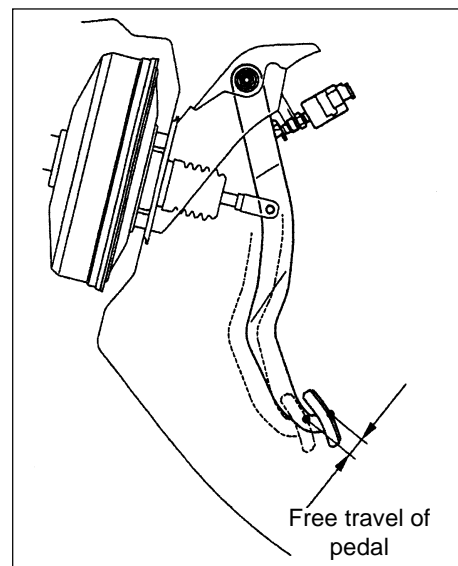
(b) Press down pedal with hand until feeling the resistance, then measure the distance of this section, liking that shown in figure.

Free travel of pedal: 1-6mm.

If it is wrong, check the clearance of brake light switch.

Clearance of brake light switch: 0.5-2.4mm

If the clearance accords with the regulation, remove the malfunction in brake system.



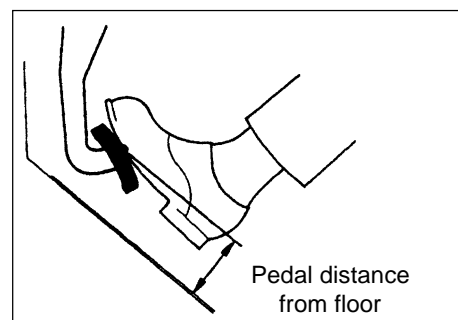
3. Check the distance from pedal to floor.

Release parking brake drag lever

When engine is running, step down brake pedal, then measure the distance from pedal to floor, liking that shown in figure,

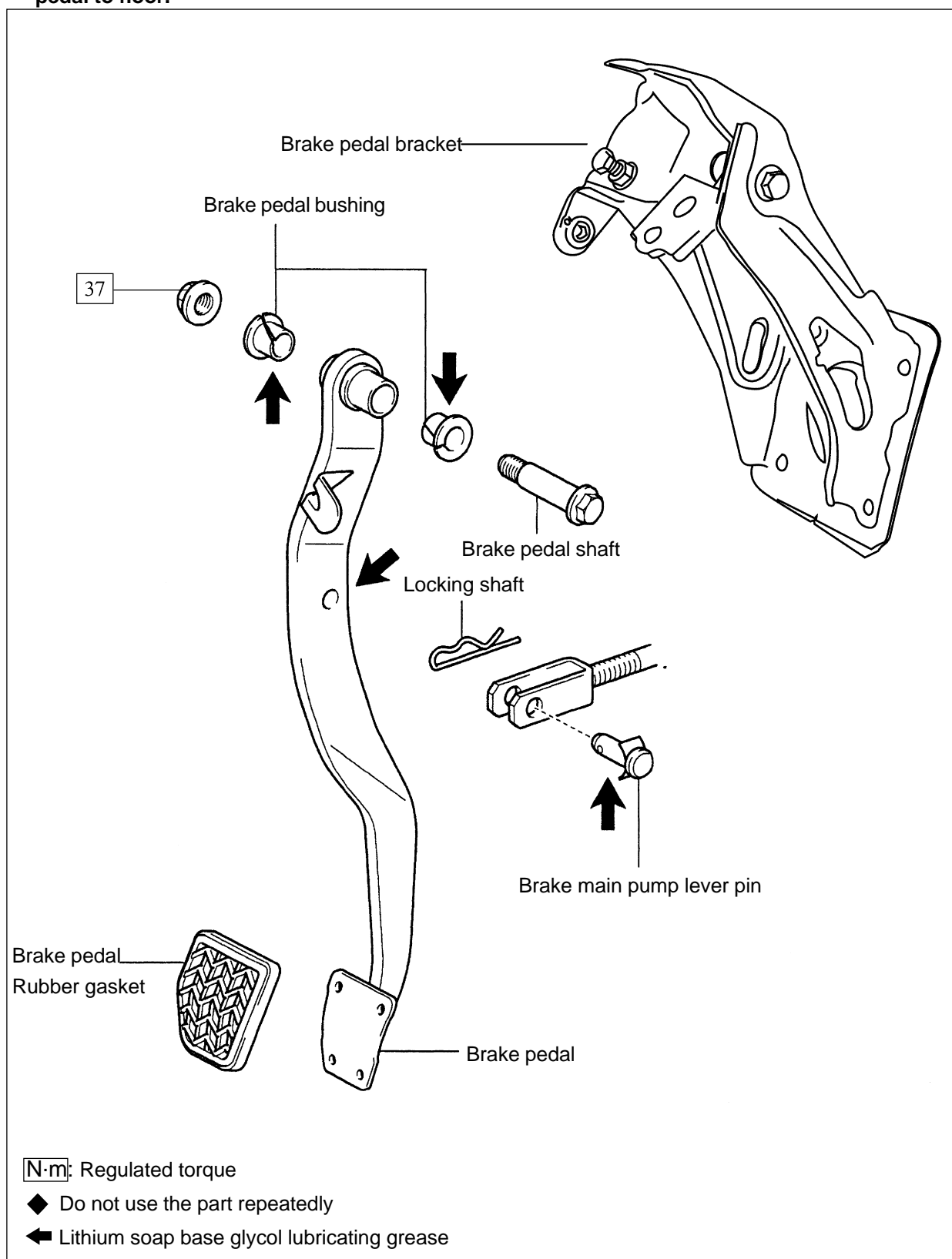
Force 490 N on pedal, its distance from floor should be: over 60mm.

If it is wrong, remove the malfunction in brake system.



Change

Hint: after assembling, check and adjust the height, free travel of brake pedal and the height from pedal to floor.



Vacuum booster assembly

Inspection on automobile

1. Check the vacuum booster

(a) Check the gas sealed performance.

- (1) Start the engine, and extinguish after one or two minutes, then step and release brake pedal slowly several times.

Hint: if the first step is lowest, second and third step rise gradually, and this shows the gas sealed performance of booster is normal.

- (2) Step down brake pedal when engine is running, then extinguish the engine.

Hint: if the distance from pedal to floor does not change in 30 seconds, this shows gas seal performance of booster is normal.

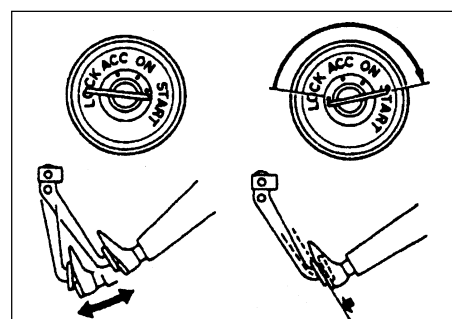
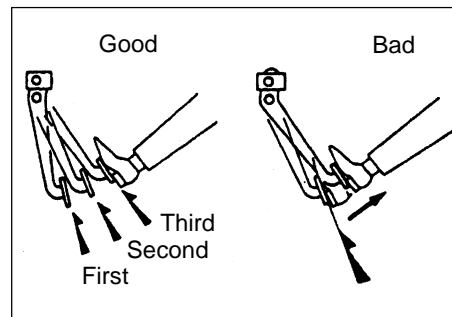
(b) Working inspection.

- (1) When engine is at parking state, step brake pedal several times to check brake pedal.

The height from floor should not change.

- (2) Step down brake pedal, then start the engine.

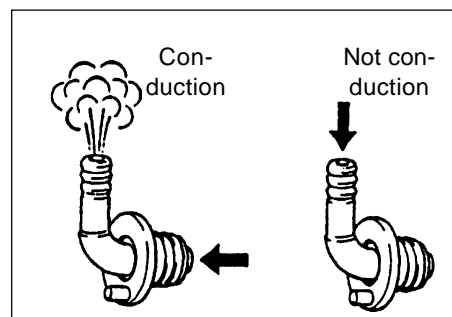
Hint: if pedal drops a little, this shows working is normal.



2. Check vacuum check valve

(a) Check vacuum check valve.

- (1) Remove pipe clamp, and disassemble vacuum pipe.
- (2) Disassemble vacuum check valve.
- (3) Blow air to check: in the direction from booster to engine, the check valve should ventilate, but its opposite direction should not ventilate.
- (4) If finding any malfunction, change vacuum check valve.



Change

1. Discharge brake liquid

Note: do not spill the brake liquid on paint surface of automobile body, if having, wash it cleanly.

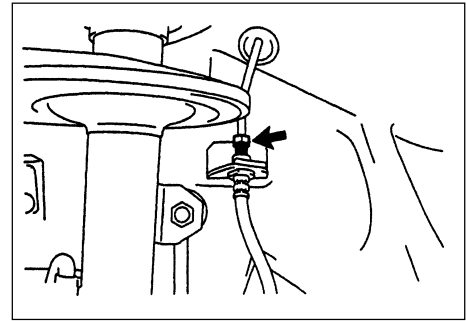
2. Disassemble air filter assembly [64000033]

3. Disassemble carbon canister assembly [4G18-1129020]

4. Disassemble brake main pump subassembly

5. Disconnect the U-shaped joint of brake main pump lever

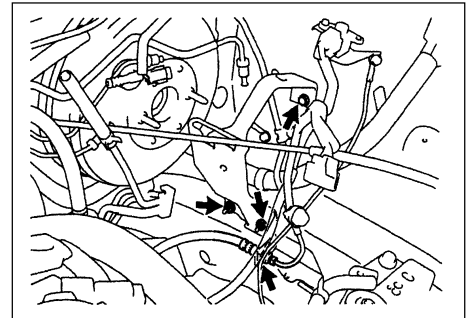
- Release fixing screw cap of lever U-shaped joint.
- Disassemble locking pin of U-shaped joint and lever pin of brake main pump.



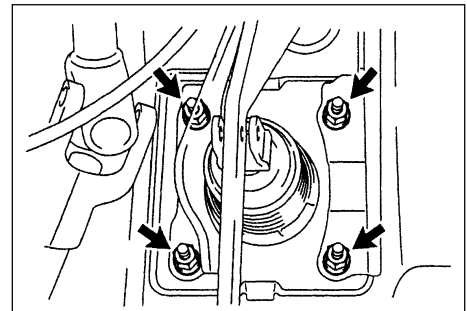
6. Disassemble left front wheel

7. Disassemble vacuum booster

- Use special tool and wrench to disassemble brake hose of left front wheel.



- Disassemble the bolts, two screw caps and activated carbon canister bracket.
- Disassemble vacuum hose on vacuum booster.
- Disassemble four screw caps and U-shaped joint.
- Take out vacuum booster and gasket.



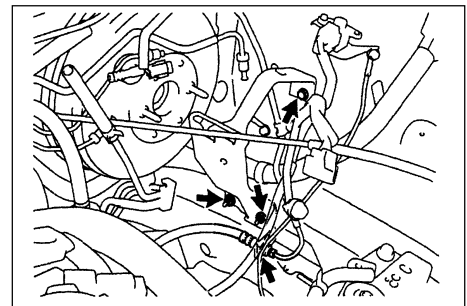
8. Assemble vacuum booster with brake pump assembly [64000164]

- Assemble U-shaped joint on booster lever.
- Assemble new gasket and vacuum booster with four nuts.

Torque: 13 N·m

- Connect vacuum hose to vacuum booster.
- Use the bolts and nuts to assemble carbon canister bracket.

Torque: 5.4 N·m

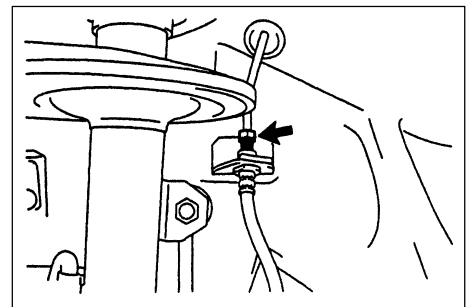


- Use special tool and wrench to connect brake hose of left front wheel.

Torque: 15 ± 2 N·m

9. Assemble left front wheel

Torque: 103 ± 10 N·m



10. Connect brake main pump

Assemble U-shaped joint pin in U-shaped joint and brake pedal, and assemble fixing clamp to U-shaped joint pin.

11. Assemble brake main pump

12. Assemble carbon canister assembly [4G18-1129020]

13. Assemble air filter assembly [64000033]

14. Add brake liquid in liquid storage tank

15. Discharge the air in brake main pump

16. Discharge the air in brake system

17. Check and adjust the height of brake pedal

18. Check the pedal free travel

19. Check the height from pedal to floor

20. Check the liquid level in storage tank

21. Check whether the brake liquid leaks

Front brake assembly

Overhaul

1. Disassemble front wheels.

2. Discharge brake liquid.

Note: do not spill the brake liquid on paint surface of automobile body, if having, wash it cleanly.

3. Disassemble brake branch pump assembly.

- (a) Disassemble the bolts and gaskets of brake hose joint on brake branch pump, then disassemble brake hose.

Hint: the gasket has two types: two sheets type or one type.

- (b) Fix sliding pin of cylinder body to disassemble two bolts.

4. Disassemble brake block of front wheels.

- (a) Disassemble brake block with muffle gasket.

- (b) Disassemble muffle gasket from every brake block.

5. Disassemble support sheet of brake block.

6. Disassemble sliding pin of brake branch pump.

Disassemble sliding pin on branch pump bracket.

7. Disassemble dustproof cover on brake branch pump.

Disassemble two dustproof covers from brake branch pump of disk.

8. Disassemble left front brake branch pump.

Disassemble two bolts and brake branch pump bracket.

9. Disassemble dustproof cover of branch pump.

Use screw driver to disassemble oil seal loop and dustproof cover.

10. Disassemble the piston of brake branch pump.

- (a) Put a cloth or similar thing between piston and branch pump.

- (b) Use compressed air to disassemble piston from branch pump.

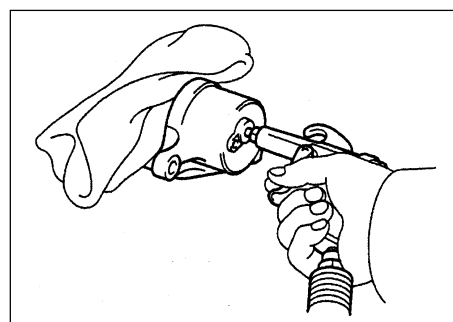
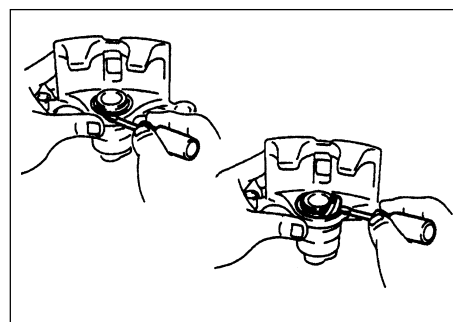
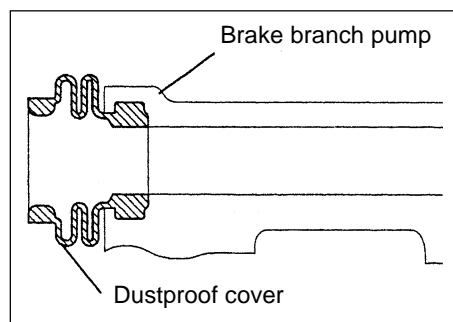
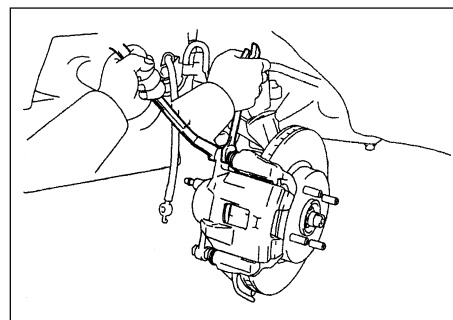
Warning: when using compressed air, do not put your finger at the front of piston.

Note: you could not be splashed by brake liquid.

11. Disassemble oil seal of piston.

Use screw driver to disassemble oil seal of piston from branch pump.

12. Disassemble exhaust bolt of branch pump.



13. Check the brake branch pump and piston

Check whether there is rust or scratch in cylinder of branch pump and piston.

14. Check the thickness of brake block

Use rule to measure the thickness of brake block.

Standard thickness: 11.00mm

Minimal thickness: 1.0mm

15. Check support sheet of brake block

Confirm the support sheet could rebound enough without any distortion, crack or abrasion, and it has removed rust, dust and sundries completely.

16. Check the thickness of brake disk

Use centimeter to measure the thickness of brake disk.

Standard thickness: 25.00mm

Minimal thickness: 23.0mm

17. Disassemble front brake disk

- (a) Make a mark on corresponding position of brake disk and shaft hub.
- (b) Disassemble brake disk.

18. Assemble brake disk

Hint: choose the position with minimal terminal run-out quantity to assemble brake disk.

19. Check the terminal run-out of brake disk

- (a) Lock the brake disk temporarily with shaft hub nut.

Torque: 103 ± 10 N·m

- (b) Use centimeter to measure the terminal run-out of brake disk on the position with 10mm apart from the exterior edge of brake disk.

Maximal run-out quantity: 0.05mm

- (c) If terminal run-out of brake disk exceeds or equals to maximal value, firstly, check the axial clearance of bearing, then check the terminal run-out of shaft hub, if they are both normal, adjust the terminal run-out of brake disk to eligible value or use turning motor to turn terminal surface of brake disk.

20. Lock exhaust bolt temporarily

Lock exhaust bolt temporarily on front brake branch pump.

21. Assemble oil seal of piston

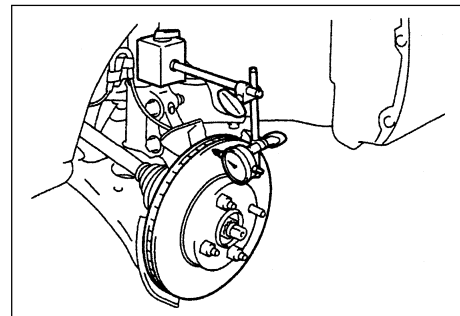
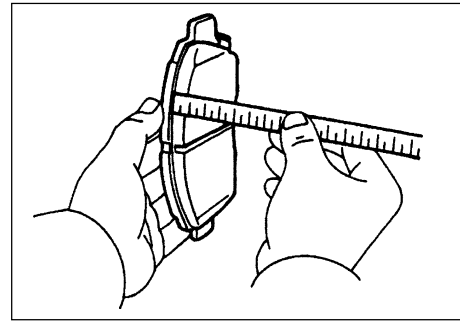
- (a) Spread lithium soap base glycol lubricating grease on new oil seal of piston.
- (b) Assemble oil seal of piston on brake branch pump.

Note: do not force piston to assemble in branch pump compulsively.

22. Assemble piston of front brake branch pump

- (a) Spread lithium soap base glycol lubricating grease on the piston.
- (b) Assemble piston on brake branch pump.

Note: do not force piston to assemble in branch pump compulsively.



23. Assemble dustproof cover of branch pump..

- (a) After spreading lithium soap base glycol lubricating grease on new dustproof cover of branch pump, assembling it in brake branch pump.

Hint: dustproof cover should be assembled in branch pump firmly.

- (b) Use wrench to assemble fixing loop.

Note: do not damage dustproof cover.

24. Assemble brake branch pump bracket.

Use two bolts to assemble brake branch pump bracket.

Torque: 106 ± 10 N·m

25. Assemble dustproof cover of brake branch pump bracket.

- (a) Spread lithium soap base glycol lubricating grease on new dustproof cover.

- (b) Assemble two dustproof covers in front brake branch pump bracket.

26. Assemble sliding pin of front brake branch pump.

- (a) Spread lithium soap base glycol lubricating grease on the surface of sliding part and sliding pin.

- (b) Assemble two sliding pins in front brake branch pump bracket.

27. Assemble support sheet of brake block.

28. Assemble brake block.

Note: when changing brake block, muffle gasket should be changed with brake block at the same time.

- (a) Spread brake lubricating grease on both sides of every muffle gasket.
- (b) Assemble muffle gasket on every brake block.
- (c) When assembling inner brake block, abrasion indicator should face the upside.

Note: do not attach oil dirt or lubricating grease on the surface of brake block and brake disk.

29. Assemble brake branch pump assembly.

- (a) Use two bolts to assemble brake branch pump.

Torque: 34 ± 3 N·m

- (b) Use joint bolt to assemble new gasket and brake hose.

Torque: 30 ± 3 N·m

Hint: Gasket has two types: two sheets type and one type.

Bracket soft pipe should be assembled in localizing hole of branch pump firmly.

30. Add brake liquid in storage tank.

31. Discharge the air in brake main pump.

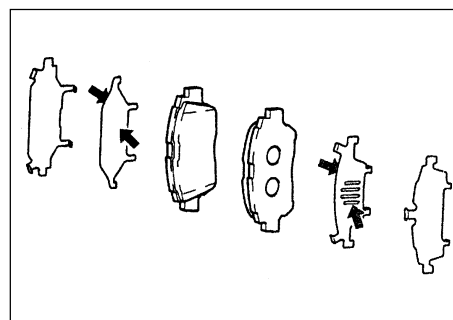
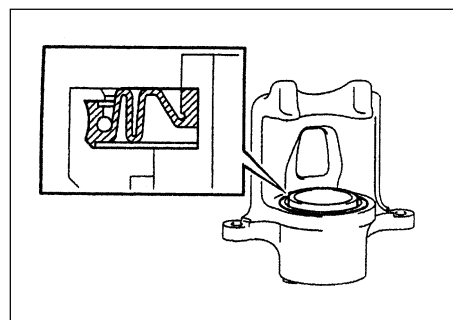
32. Discharge the air in brake pipeline.

33. Check the liquid level of storage tank.

34. Check whether the brake liquid leaks.

35. Assemble front wheels.

Torque: 103 ± 10 N·m



Rear brake assembly

Overhaul

Hint: overhaul procedure for right side is same as the left side.

1. Disassemble rear wheels.

2. Discharge brake liquid.

Note: do not spill the brake liquid on paint surface of automobile body, if having, wash it cleanly.

3. Disassemble brake block of rear wheels.

- (a) Disassemble fixing clamp of anti-vibration spring.
- (b) Disassemble two guide pins of brake block and brake block with muffle gasket.
- (c) Take down muffle gasket from every brake block.

4. Disassemble left rear brake branch pump.

- (a) Disassemble the joint, bolt and gasket of brake hose of brake branch pump, then disassemble brake hose.

Hint: gasket has two types: two sheets type and one sheet type

- (b) Disassemble two bolts and brake branch pump.

5. Disassemble the bushing of brake branch pump.

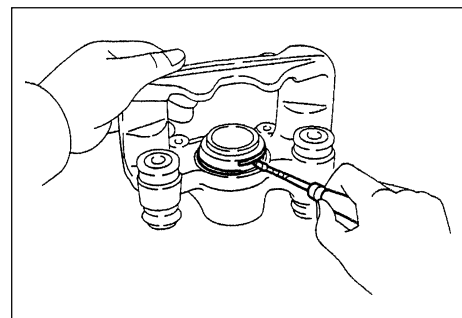
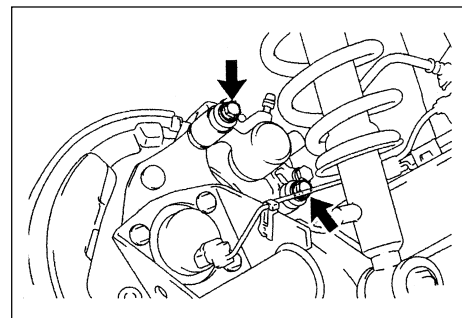
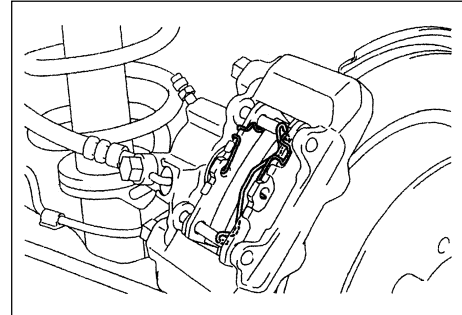
Disassemble two bushings from brake branch pump.

6. Disassemble dustproof bushing of rear brake.

Disassemble three dustproof bushings.

7. Disassemble dustproof cover of branch pump.

Use screw driver to disassemble fixing loop and dustproof cover.



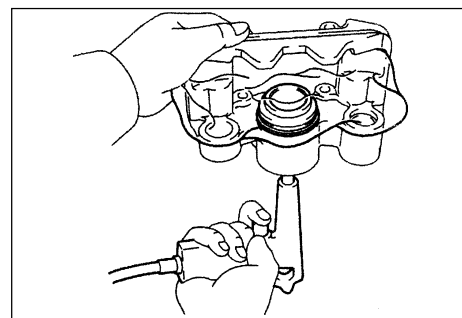
8. Disassemble the piston of brake branch pump.

- (a) Put a cloth or similar thing between the piston and branch pump.
- (b) Use compressed air to disassemble piston from branch pump.

Warning: when using compressed air, do not put your fingers at the front of piston.

Note: do not let brake liquid splash on you.

9. Disassemble oil seal of piston.



Use screw driver to disassemble oil seal of piston from brake branch pump.

Note: do not damage cylinder wall and slot.

10. Disassemble exhaust bolt of branch pump.

11. Check whether there is any dust or scratch on branch pump and piston.

12. Check the thickness of brake block.

Use rule to measure the thickness of brake block.

Standard thickness: 10.0mm

Minimal thickness: 1.0mm

13. Check the thickness of brake disk.

Use centimeter of exterior diameter to measure the thickness of disk.

Standard thickness: 9.0mm

Minimal thickness: 8.0mm

14. Disassemble rear brake disk.

(a) Make a mark on disk and shaft hub.

(b) Disassemble disk.

15. Assemble brake disk.

Hint: choose the position with minimal terminal run-out to assemble brake disk.

16. Check the terminal run-out of disk.

(a) Lock the disk temporarily with screw cap of shaft hub.

Torque: 103-10 N·m

(b) Use centimeter to measure the terminal run-out of brake disk on the position with 10mm apart from the exterior edge of brake disk.

Maximal run-out quantity: 0.15mm

(c) If terminal run-out of brake disk exceeds or equals to maximal value, firstly, check the axial clearance of bearing, then check the terminal run-out of shaft hub, if they are both normal, adjust the terminal run-out of brake disk to eligible value or use turning motor to turn terminal surface of brake disk.

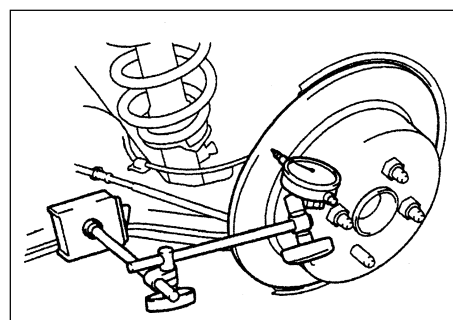
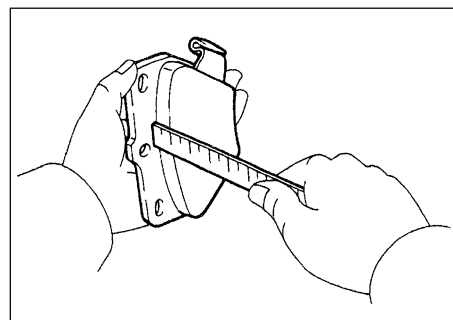
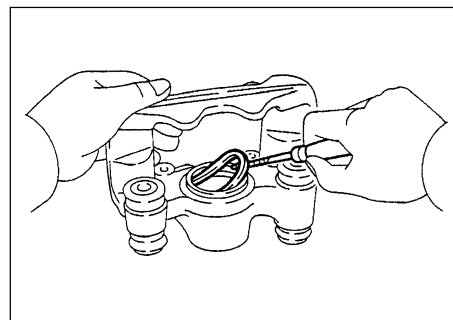
17. Lock exhaust bolt of rear brake branch pump temporarily.

Lock exhaust bolt to rear brake branch pump temporarily.

18. Assemble oil seal of piston.

(a) Spread lithium soap base glycol lubricating grease on new oil seal of piston.

(b) Assemble oil seal of piston to brake branch pump.



19. Assemble piston of Rear brake branch pump

- (a) Spread lithium soap base glycol lubricating grease on the piston.

- (b) Assemble piston on brake branch pump.

Note: do not force piston to assemble in branch pump compulsively.

20. Assemble dustproof cover of branch pump.

- (a) Spread lithium soap base glycol lubricating grease on new dustproof cover of branch pump.

- (b) Assemble dustproof cover in brake branch pump.

Hint: dustproof cover should be assembled in branch pump firmly.

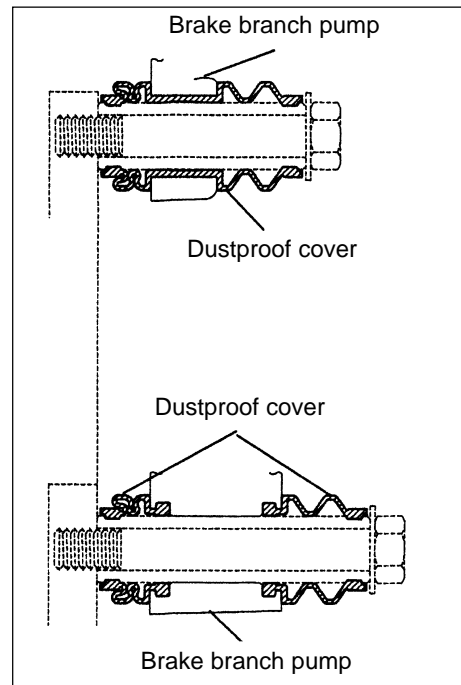
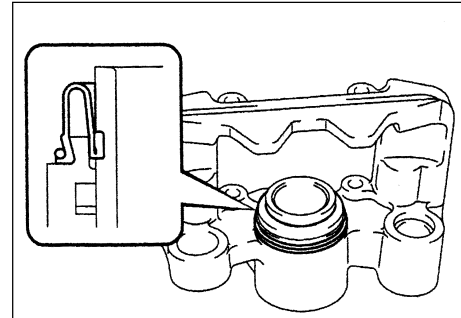
- (c) Use screw driver to assemble fixing loop.

Note: do not damage dustproof cover.

21. Assemble dustproof bushing of rear brake.

- (a) Spread lithium soap base glycol lubricating grease on the surface of three dustproof bushings.

- (b) Assemble three dustproof bushings in brake branch pump.



22. Assemble the bushing of brake branch pump bracket.

Assemble two bushings of brake branch pump bracket.

23. Assemble brake branch pump.

- (a) Assemble branch pump with two bolts.

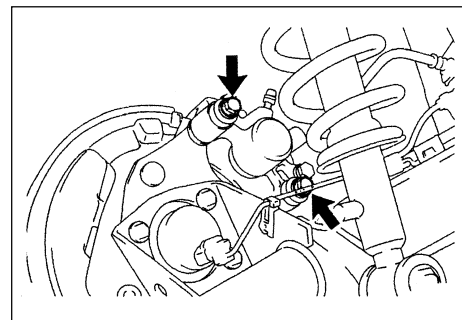
Torque: $47 \pm 4\text{N}\cdot\text{m}$

- (b) Assemble new gasket and brake hose with joint bolt.

Torque: $30 \pm 3\text{N}\cdot\text{m}$

Hint:

- Gasket has two types: two sheets type and one sheet type.
- Brake soft pipe should be assembled in localizing hole of branch pump firmly.



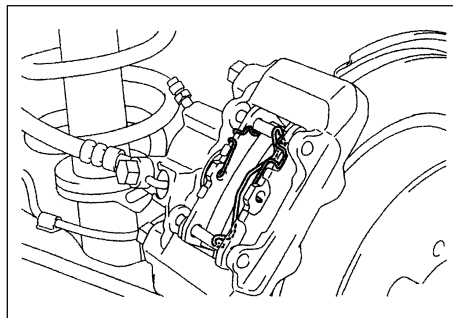
24. Assemble rear brake block.

Note: when changing brake block, the inside of muffle gasket should be changed together.

- (a) When assembling muffle gasket on every brake block, it is necessary to spread brake lubricating grease on the inside of muffle gasket.
- (b) When assembling inner brake block, abrasion indicator should face upside.

Note: do not attach any oil dirt or lubricating grease on the surface of brake block and brake disk.

- (c) Assemble two guide pins of brake block.
- (d) Assemble fixing clamp of anti-abrasion spring.



25. Add brake liquid in storage tank.

26. Discharge the air in brake main pump (referring to page 135).

27. Discharge the air in brake pipeline (referring to page 135).

28. Check the liquid level in storage tank.

29. Check whether brake liquid leaks.

30. Assemble rear wheels.

Torque: $103 \pm 10 \text{ N}\cdot\text{m}$

Hydraulic control unit (equipping with ABS)

Inspection on automobile

1. Connect handle tester

- (a) Connect handle tester to DLC3.
- (b) Start the engine and make it run at idling speed.
- (c) Handle tester should choose "Active test" module.

Hint: details could refer to operating instruction for handle tester.

2. Check the function of hydraulic .

- (a) Start the motor relay, and check hydraulic motor should have working sound.
- (b) Stop the motor relay.
- (c) Step brake pedal for 15 minutes, and check brake pedal should not be stepped down.
- (d) Start the motor relay, and check brake pedal should not have any pulse.

Note: Time when motor relay locates ON could not exceed 5 seconds, when it is necessary to operate continually, interval time should be over 20 seconds.

- (e) Stop the motor relay and release brake pedal.

3. Check the function of right front wheel.

Note: forbid making electromagnetic valve be ON in following situations.

- (a) Make following operation when brake pedal is stepped down.
- (b) Make electromagnetic valve SFRH and SFRR be ON at the same time, and check the brake pedal should not be stepped down.

Note: Time when motor relay locates ON could not exceed 5 seconds, when it is necessary to operate continually, interval time should be over 20 seconds.

- (c) Make electromagnetic valve SFRH and SFRR be OFF at the same time, and check the brake pedal should be able to be stepped down.
- (d) Make electromagnetic valve SFRH and SFRR be ON at the same time, and check whether the brake pedal could return.

Note: Time when motor relay locates ON could not exceed 5 seconds, when it is necessary to operate continually, interval time should be over 20 seconds.

- (e) Make motor relay be OFF and release brake pedal.

4. Check the function of other wheels.

Check the electromagnetic valves of other wheels by same procedure.

Hint:

Left front wheel: SFLH,SFLR

Right rear wheel: SRRH,SRRR

Left rear wheel: SRLH, SRLR

Change

1. Discharge brake liquid.

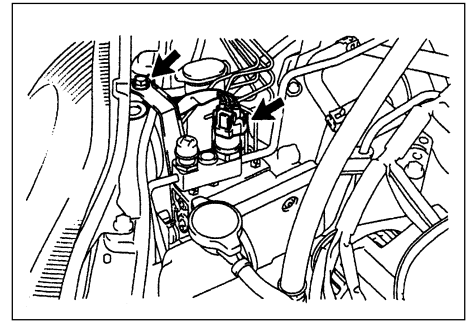
Note: do not leave brake liquid on paint surface of automobile body, if having, wash it cleanly.

2. Disassemble right front wheel.

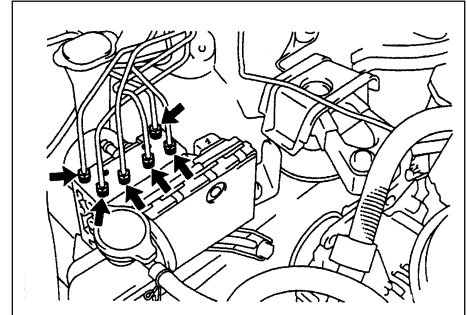
3. Disassemble gasket of right wheel wing.

4. Disassemble hydraulic control unit and bracket.

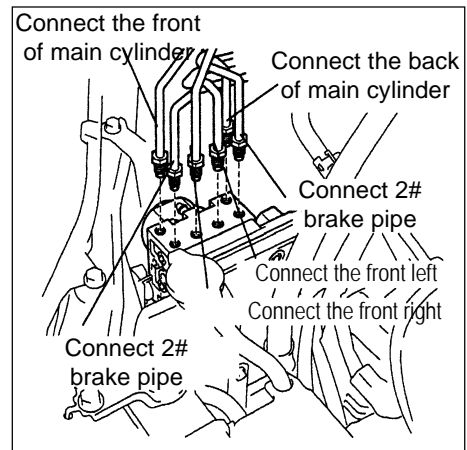
- (a) Disassemble the joint and bolt.
- (b) Turn the locking bolt of joint of hydraulic control unit, and disassemble the joint.



- (c) Use special tool to disassemble the brake oil pipe on hydraulic control unit.

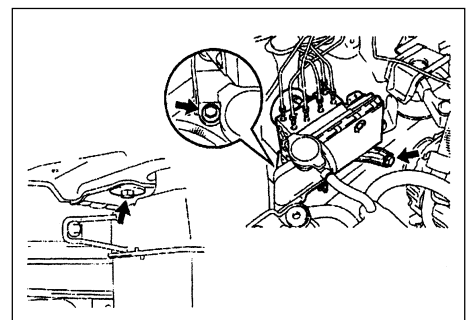


- (d) Use label to mark the name of every oil pipe, and tie it on oil pipe.



- (e) Disassemble screw caps, two bolts and hydraulic control unit and bracket.

5. Disassemble hydraulic control unit assembly.



Disassemble three bolts and hydraulic control unit from the bracket.

6. Assemble hydraulic control unit assembly.

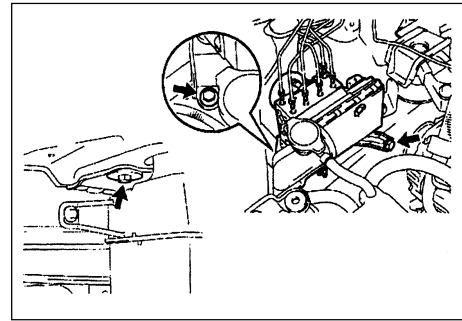
Assemble three bolts and hydraulic control unit on the bracket with three bolts.

Torque: 4.7 N·m

7. Assemble hydraulic control unit and bracket.

- (a) Assemble hydraulic control unit and bracket with screw cap and two bolts.

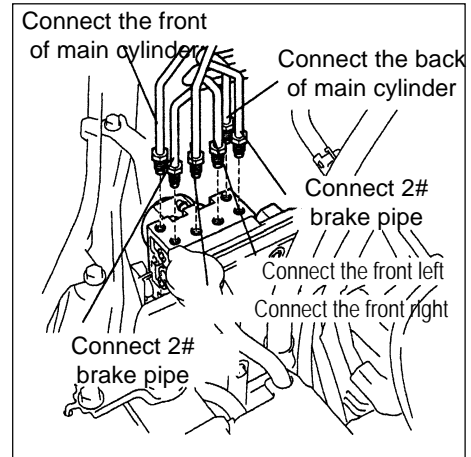
Torque: 19 N·m



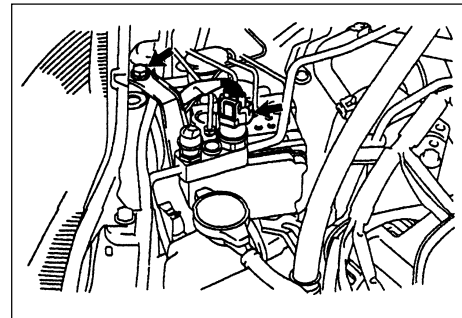
- (b) Liking that shown in figure, use special tool to assemble brake oil pipe on correct position of hydraulic control unit.

Torque: 15 ± 2 N·m

- (c) Connect the joint of hydraulic control unit.



- (d) Assemble bolt and connect the joint.



8. Assemble gasket of right front wing.

9. Assemble right front wheel.

10. Add brake liquid in storage tank.

11. Discharge the air in main pump.

12. Discharge the air in brake pipeline.

13. Check the liquid level of brake liquid.

14. Check whether brake liquid leaks.

15. Use handle tester to check the hydraulic control unit.

Speed sensor of front wheel

Change

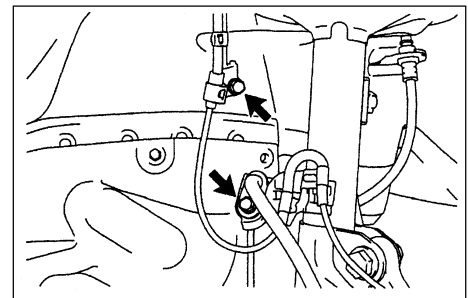
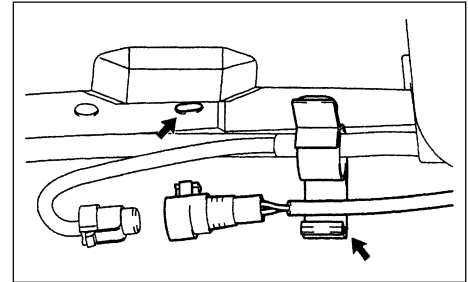
Hint: the process for changing right side is same as the left side.

1. Disassemble front wheels.

2. Disassemble gasket of left front wing.

3. Disassemble speed sensor of left front wheel.

- (a) Disassemble resinous clamp and speed sensor wiring harness from fixing clamp of automobile body.
- (b) Disassemble the sensor joint.
- (c) Disassemble two bolts of fixing clamp of sensor wiring harness from automobile body and absorber.



- (d) Disassemble bolt and left front sensor.

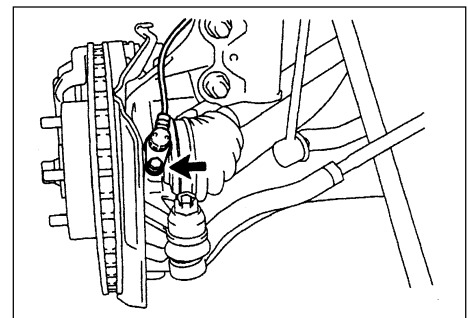
Note: do not attach any sundries on top of sensor.

4. Assemble speed sensor of left front wheel.

- (a) Use bolt to assemble left front sensor.

Torque: 8.0 N·m

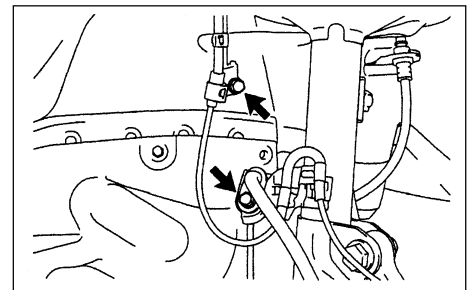
Note: do not attach any sundries on top of sensor.



- (b) Use two bolts to assemble fixing clamp of sensor wiring harness on automobile body and absorber.

Bolt A: 9.0 N·m

Bolt B: 29 N·m



- (c) Connect the joint of speed sensor.

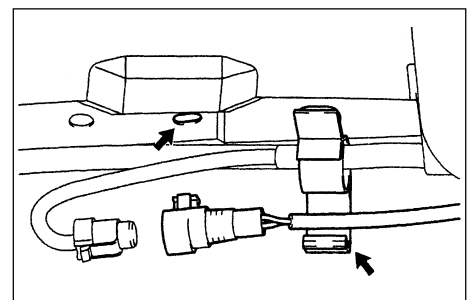
- (d) Connect resinous clamp and speed sensor wiring harness on automobile body and fixing clamp.

5. Assemble gasket of left front wheel wing.

6. Assemble front wheels.

Torque: 103 ± 10 N·m

7. Check the signal of ABS speed sensor.



Speed sensor of rear wheels

Change

Hint: the process for changing right side is same as the left side.

1. Disassemble rear wheels.
2. Disassemble wiring harness of speed sensor of rear wheel.

Disassemble the joint of speed sensor of rear wheel.

3. Disassemble left rear disk brake branch pump assembly.
4. Disassemble rear brake disk.
5. Disassemble left rear shaft hub and bearing assembly (referring to page 129).
6. Disassemble speed sensor of rear wheel.

- (a) Fix rear shaft hub on pliers with soft gasket.

Note: when changing shaft hub assembly, it is necessary to shake intensively to make it break off.

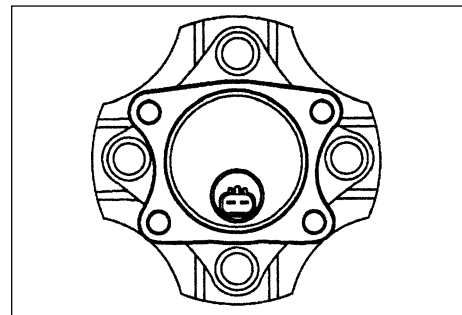
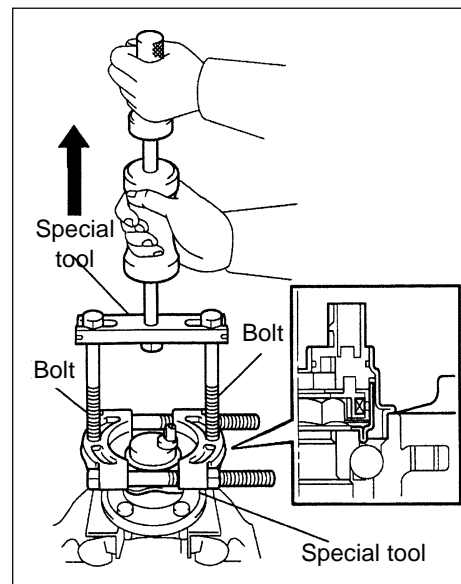
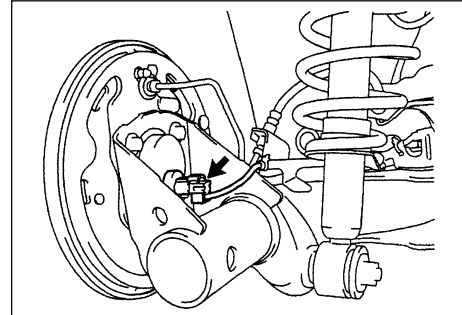
- (b) Use punch pin and hammer to knock out two pins.
- (c) Use special tool and two bolts (M12*1.5) to disassemble speed sensor of rear wheel from rear shaft hub.

Note:

- If sensor stator is damaged, change the shaft hub assembly.
- Do not scratch the surface of shaft hub and speed sensor.

7. Assemble speed sensor of rear wheels.

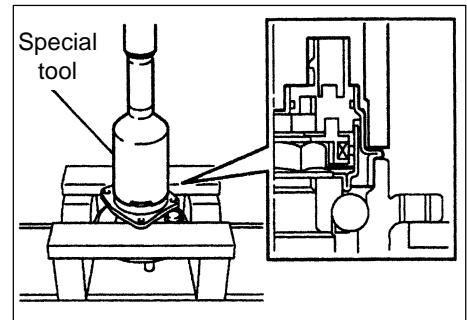
- (a) Wash contacting surface of rear shaft hub and new speed sensor of rear wheels.
- (b) When sensor is assembled in shaft hub, it is necessary to assemble sensor joint facing lower position of automobile.



- (c) Use special tool and press to assemble speed sensor of rear wheels to rear shaft hub.

Note:

- Do not use hammer knock directly in speed sensor of rear wheels.
- Insure no sundries are attached on the supervising part of speed sensor of rear wheels
- Press speed sensor of rear wheels straightly and slowly.



8. Assemble left rear shaft hub and bearing assembly (referring to page 129).
9. Assemble brake disk.
10. Assemble left rear brake branch pump.
11. Assemble wiring harness of speed sensor of rear wheels.
12. Assemble rear wheels.
Torque: $103 \pm 10 \text{ N}\cdot\text{m}$
13. Check and adjust wheel alignment.
14. Check the signal of ABS speed sensor.

Parking brake

Parking brake system

Malfunction phenomenon table

Use following table to find the reason of malfunction, the number in table indicates the preferred sequence of possible reason. Please check each part by sequence, if necessary, change this part.

Malfunction phenomenon	Possible malfunction part	Reference page
Brake lag	1. Travel of parking brake handle (adjusted badly).	154
	2. Pull cable of parking brake (attached).	156, 158
	3. Clearance of parking brake shoe (adjusted badly).	161
	4. Friction plate of parking brake shoe (damaged or distorted).	161
	5. Tension or return spring (damaged).	161

Adjustment

1. Disassemble rear wheels

2. Adjust the clearance of parking brake shoe

3. Assemble rear wheels

Torque: 103 ± 10 N·m

4. Check the travel of parking brake handle.

Pull up the parking brake handle and calculate the sound number of handle.

When parking brake handle locates 196N: 6-9 sounds.

5. Adjust the travel of parking brake handle

(a) Disassemble upper trim board of central box.

(b) Disassemble central box.

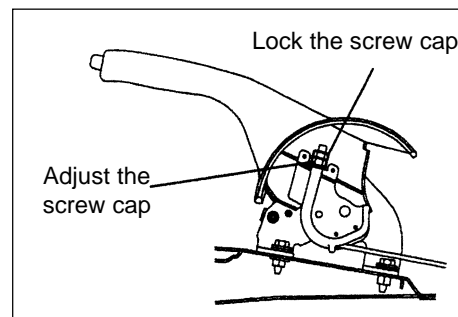
(c) Release locking screw cap, then rotate adjusting screw cap until handle travel accords with the specification.

(d) Tighten locking screw cap.

Torque: 5.0 N·m

(e) Assemble central box.

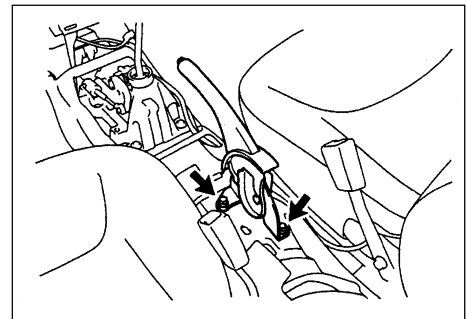
(f) Assemble trim board on central box.



Parking brake handle assembly

Change

1. **Disassemble trim board on central box.**
2. **Disassemble parking brake hole cover.**
3. **Disassemble central box.**
4. **Disassemble parking brake handle assembly.**
 - (a) Disassemble locking screw cap and adjusting screw cap.
 - (b) Disassemble the joint of parking brake switch.
 - (c) Disassemble two bolts and parking brake handle.



5. **Disassemble parking brake switch assembly.**

Disassemble the screw and parking brake switch.
6. **Assemble parking brake switch assembly.**

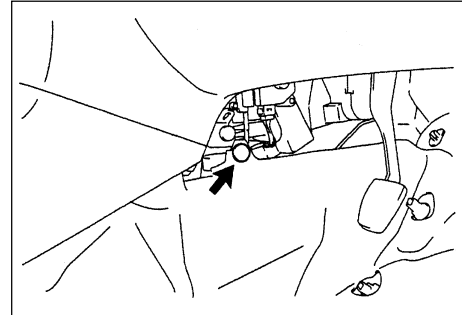
Assemble parking brake switch assembly with screw.
7. **Assemble parking brake pull cable.**
 - (a) Connect parking brake pull cable to handle and assemble adjusting screw cap and locking screw cap.
 - (b) Assemble parking brake handle with two bolts.

Torque: 13 N·m
 - (c) Connect the joint of parking brake switch.
8. **Check the travel of parking brake handle (referring to page 154).**
9. **Adjust the travel of parking brake handle (referring to page 154).**

Parking front brake pull cable assembly

Change

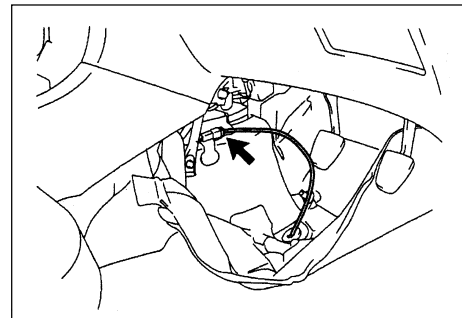
1. Disassemble upper trim board on box.
2. Disassemble parking brake hole cover.
3. Disassemble central box.
4. Disassemble parking brake handle assembly.
5. Disassemble front bottom board bracket.
6. Disassemble front exhaust pipe with Three-Way Catalytic Converter assembly.
 - (a) Disassemble the joint of oxygen sensor.
 - (b) Disassemble four bolts, compressed spring and front exhaust pipe with Three-Way Catalytic Converter assembly.



7. Disassemble heat insulation board of front exhaust pipe.

Disassemble there screw caps and heat insulation board of front exhaust pipe.

8. Disassemble parking front brake pull cable assembly.



9. Assemble parking front brake pull cable assembly.

10. Assemble heat insulation board of front exhaust pipe.

Assemble heat insulation board of front exhaust pipe with there screw caps.

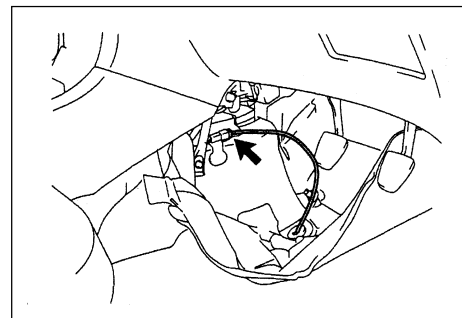
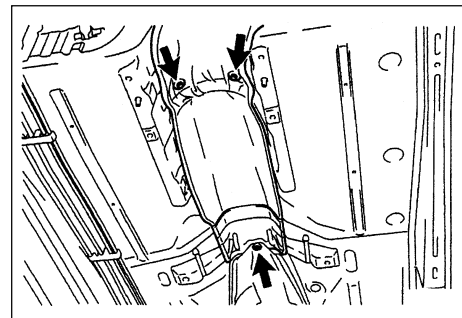
Torque: 5.4 N·m

11. Assemble front exhaust pipe with Three-Way Catalytic Converter assembly.

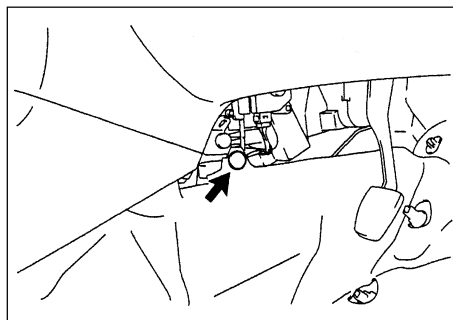
- (a) Assemble two new gaskets and front exhaust pipe with Three-Way Catalytic Converter assembly with four compressed springs and bolts.

Torque: 43 ± 3 N·m

- (b) Connect the joint of oxygen sensor.



- 12. Assemble front bottom board bracket.**
- 13. Assemble parking brake handle assembly.**
- 14. Check the travel of parking brake handle (referring to page 154).**
- 15. Adjust the travel of parking brake handle (referring to page 154).**



Parking rear brake pull cable assembly

Change

Hint: the changing procedure for left rear brake pull cable is same as parking right rear brake pull cable.

1. Disassemble rear wheels.
2. Disassemble rear brake disk brake branch pump bracket assembly(LH).
3. Disassemble brake disk.
4. Disassemble support lever of parking brake shoe (LH).
5. Disassemble adjustor of parking brake shoe.
6. Disassemble parking brake inner shoe assembly (LH).
7. Disassemble parking brake exterior shoe assembly (LH).

8. Disassemble parking brake shoe lever (LH).

9. Disassemble left rear brake pull cable assembly.

Disassemble the bolt and parking left rear brake pull cable assembly from brake back board.

10. Disassemble front bottom board bracket.

11. Disassemble front part exhaust pipe.

12. Disassemble heat insulation board.

13. Disassemble parking left rear brake pull cable assembly.

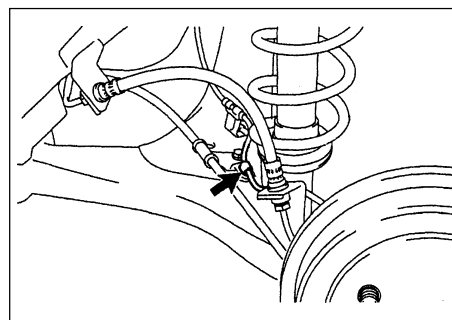
- (a) Disassemble fixing clamp of rear wheel speed sensor wiring harness.
- (b) Disassemble four bolts and parking left rear brake pull cable from automobile.
- (c) Disassemble left rear brake pull cable from parking brake balancer, then disassemble parking left rear brake pull cable.

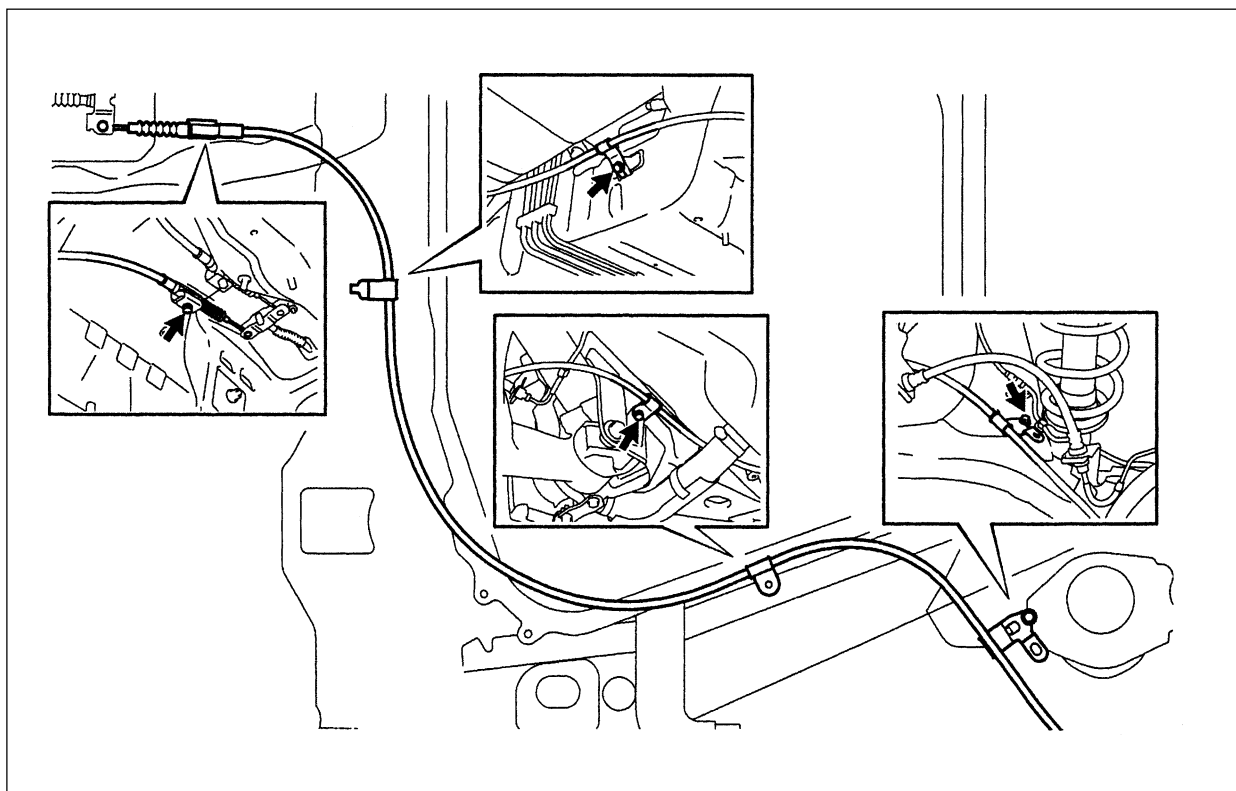
14. Assemble parking left rear brake pull cable assembly.

- (a) Connect parking left rear brake pull cable on parking brake pull cable balancer.
- (b) Assemble parking left rear brake pull cable with four bolts.

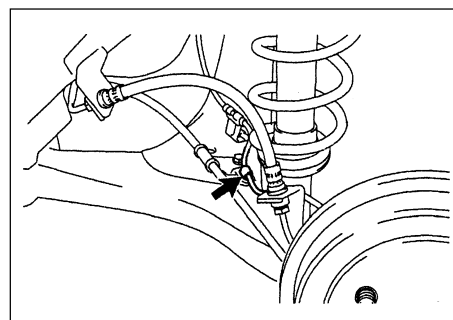
Torque: 5.4 N·m

- (c) Connect resinous clamp of speed sensor wiring harness of





rear wheel to fixing clamp.



15. Assemble No.2 clapboard.

16. Assemble front part exhaust pipe assembly.

17. Assemble front bottom board bracket.

18. Connect parking left rear brake pull cable assembly.

Assemble parking left rear brake pull cable assembly to brake back board with bolt.

Torque: 7.8 N·m

19. Spread high temperature lubricating grease.

20. Assemble support lever of parking brake shoe (LH).

21. Assemble parking brake exterior shoe assembly (LH).

22. Assemble parking brake inner shoe assembly (LH).

- 23. Assemble parking brake shoe adjustor.**
- 24. Assemble drag lever of parking brake shoe (LH).**
- 25. Check the assembly of parking brake.**
- 26. Assemble rear brake.**
- 27. Adjust the clearance of parking brake shoe.**
- 28. Connect brake branch pump bracket assembly.**
- 29. Assemble rear wheels.**
 - Torque: 103 ± 10 N·m**
- 30. Check the travel of parking brake lever.**
- 31. Adjust the travel of parking brake lever.**
- 32. Check whether exhaust system leaks.**

Parking brake assembly

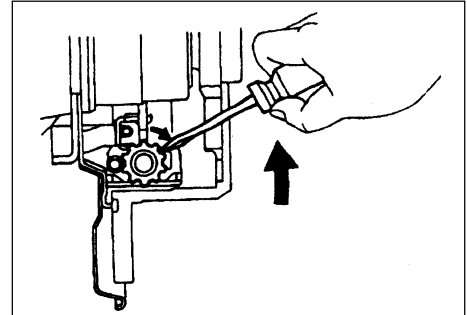
Overhaul

Hint: overhaul process for right side is same as the left side.

1. Disassemble left rear wheel.
2. Disassemble left rear brake branch pump bracket assembly.
3. Disassemble left rear brake.

Hint:

- Make mark on disk and shaft hub.
- If disk is not easy to disassemble, adjust shoe until wheel could rotate freely.

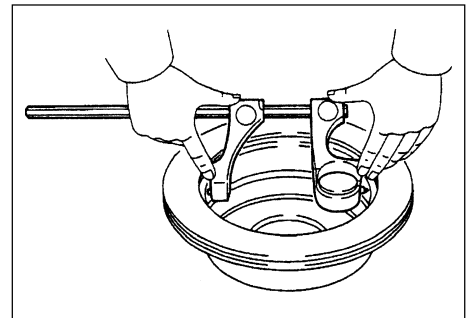


4. Check the inner diameter of brake drum.

Use centimeter or other measures with same grade to measure inner diameter of brake drum.

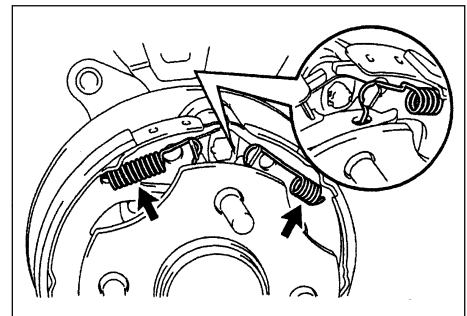
Standard inner diameter: 173mm

Maximal inner diameter: 174mm



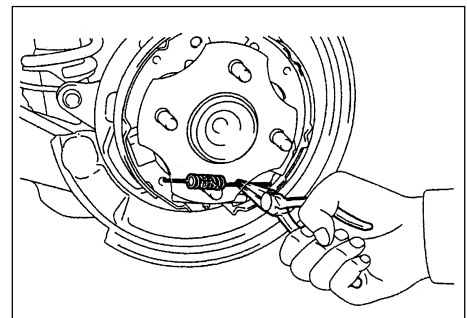
5. Disassemble support lever of parking brake shoe (LH).

- (a) Use needle-nosed pliers to disassemble two springs on upside of shoe.
- (b) Disassemble support lever of parking brake shoe.



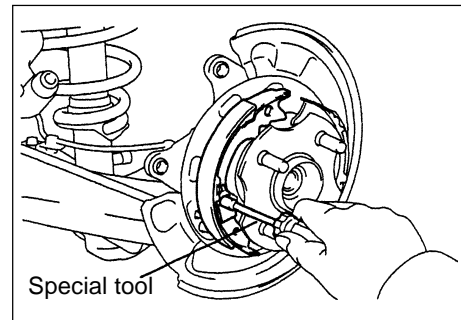
6. Disassemble parking brake shoe adjuster.

- (a) Use needle-nosed pliers to disassemble return spring.
- (b) Disassemble left parking brake shoe adjuster.



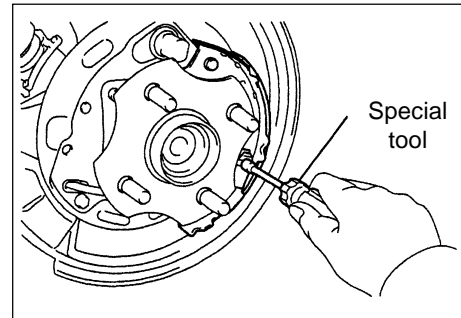
7. Disassemble parking brake shoe assembly (LH).

Use special tool to disassemble parking brake shoe, localizing spring, pin and brake exterior shoe.



8. Disassemble parking brake shoe assembly (LH).

- (a) Use special tool to disassemble parking brake shoe, localizing spring, pin and brake inner shoe.
- (b) Disassemble parking brake lever, then disassemble parking brake inner shoe.



9. Check the thickness of friction plate of parking brake shoe

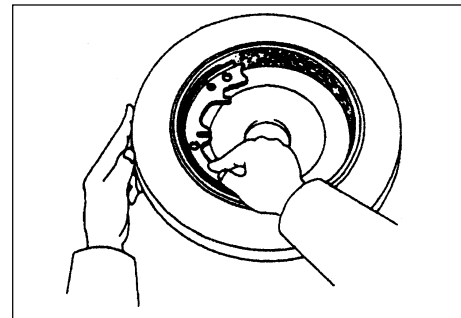
Use ruler to measure the thickness of friction plate of shoe.

Standard thickness: 3.5mm

Maximal thickness: 1.0mm

10. Check whether the contact between brake drum and friction plate of parking brake shoe is applicable.

Spread chalk on inner diameter of brake drum, then mesh it with shoe friction plate. If the contact between brake shoe and brake drum is not applicable, use brake drum to abrade and repair shoe or change brake shoe assembly.



11. Disassemble lever of parking brake shoe (LH).

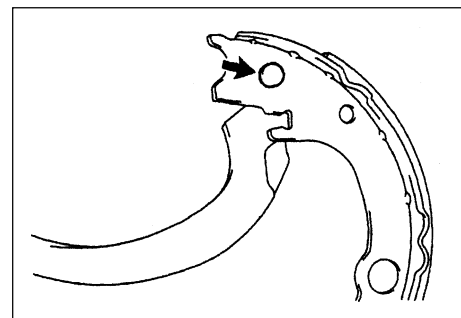
Use needle-nosed pliers to disassemble parking brake pull cable, then disassemble lever of parking brake shoe.

12. Spread high temperature lubricating grease.

Spread high temperature lubricating grease on brake back board of contacting part of shoe.

13. Assemble parking drag lever (LH).

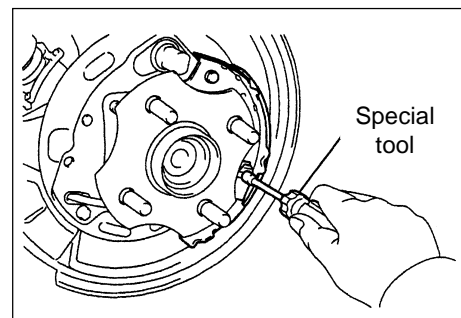
Use needle-nosed pliers to connect parking brake pull cable to lever of left parking brake shoe.



14. Assemble parking brake inner shoe assembly (LH).

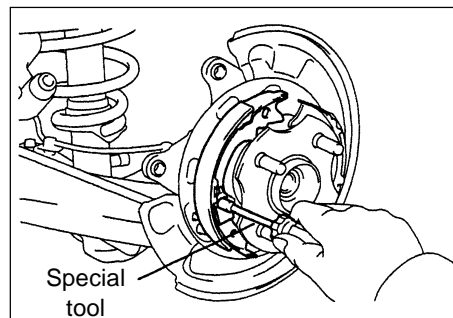
- (a) Spread high temperature lubricating grease on contacting part between parking brake shoe and lever.

- (b) Use special tool to assemble parking brake shoe with parking shoe, localizing spring and pin.



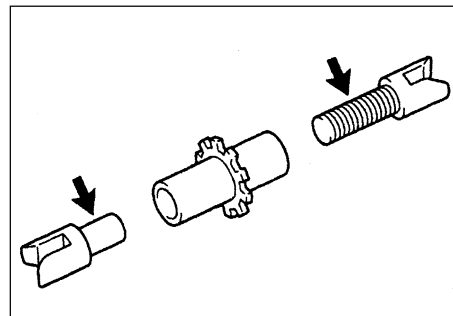
15. Assemble parking brake exterior shoe assembly (LH).

Use special tool to assemble parking brake shoe with parking shoe, localizing spring and pin.

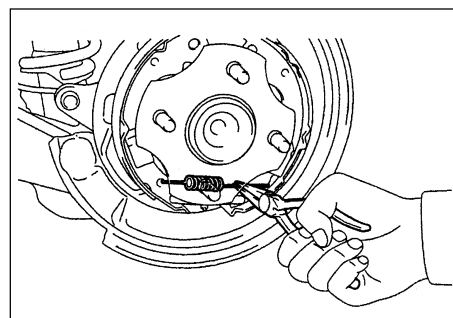


16. Assemble parking brake shoe adjuster.

- (a) Spread high temperature lubricating grease on adjusting bolt.
- (b) Assemble parking brake shoe adjuster.

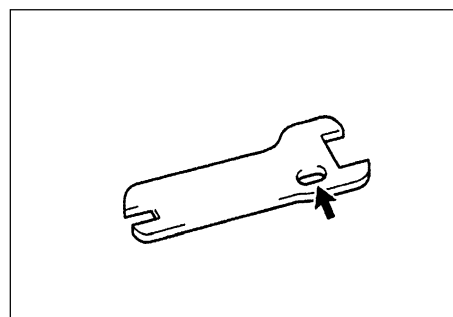


- (c) Use needle-nosed pliers to assemble return spring.

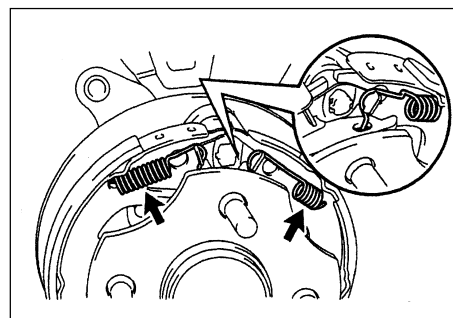


17. Assemble support lever of parking brake shoe (LH).

- (a) Spread high temperature lubricating grease on contacting surface between shoe support lever and tension spring.
- (b) Assemble support lever of parking brake shoe.



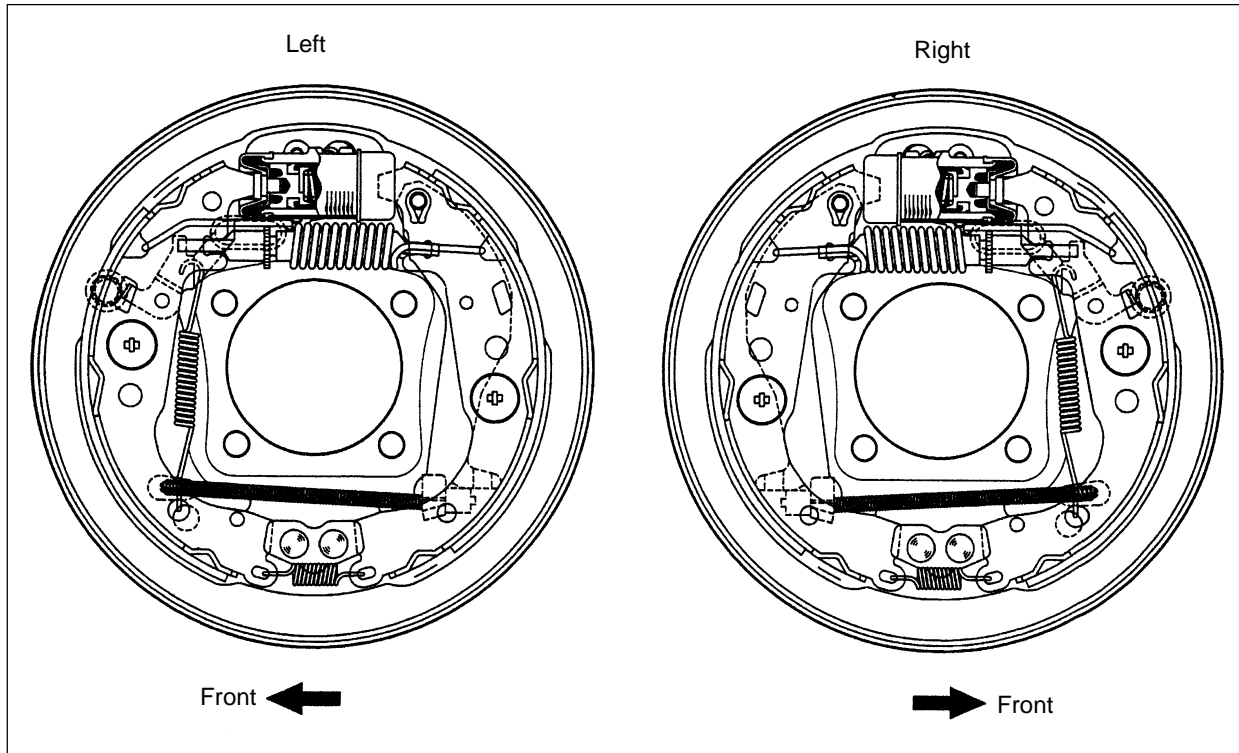
- (c) Use needle-nosed pliers to assemble upper two tension springs.



18. Check the assembly of parking brake system.

Check every part after assembly.

Note: do not attach oil dirt or lubricating grease on contacting surface between shoe friction sheet and brake drum.



19. Assemble the brake

20. Adjust the clearance of parking brake shoe.

- Lock screw cap of shaft hub temporarily.
- Disassemble hole plug, then use screw driver to turn the adjuster until brake drum is locked by shoe.
- Return the adjuster for 8 gears.
- Check whether shoe has lag.
- Assemble hole plug.

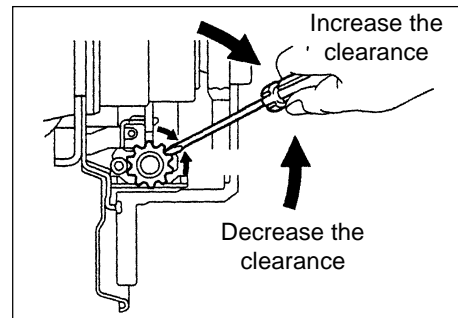
21. Assemble rear disk type brake branch pump assembly (LH).

22. Assemble rear wheels.

Torque: $103 \pm 10\text{N}\cdot\text{m}$

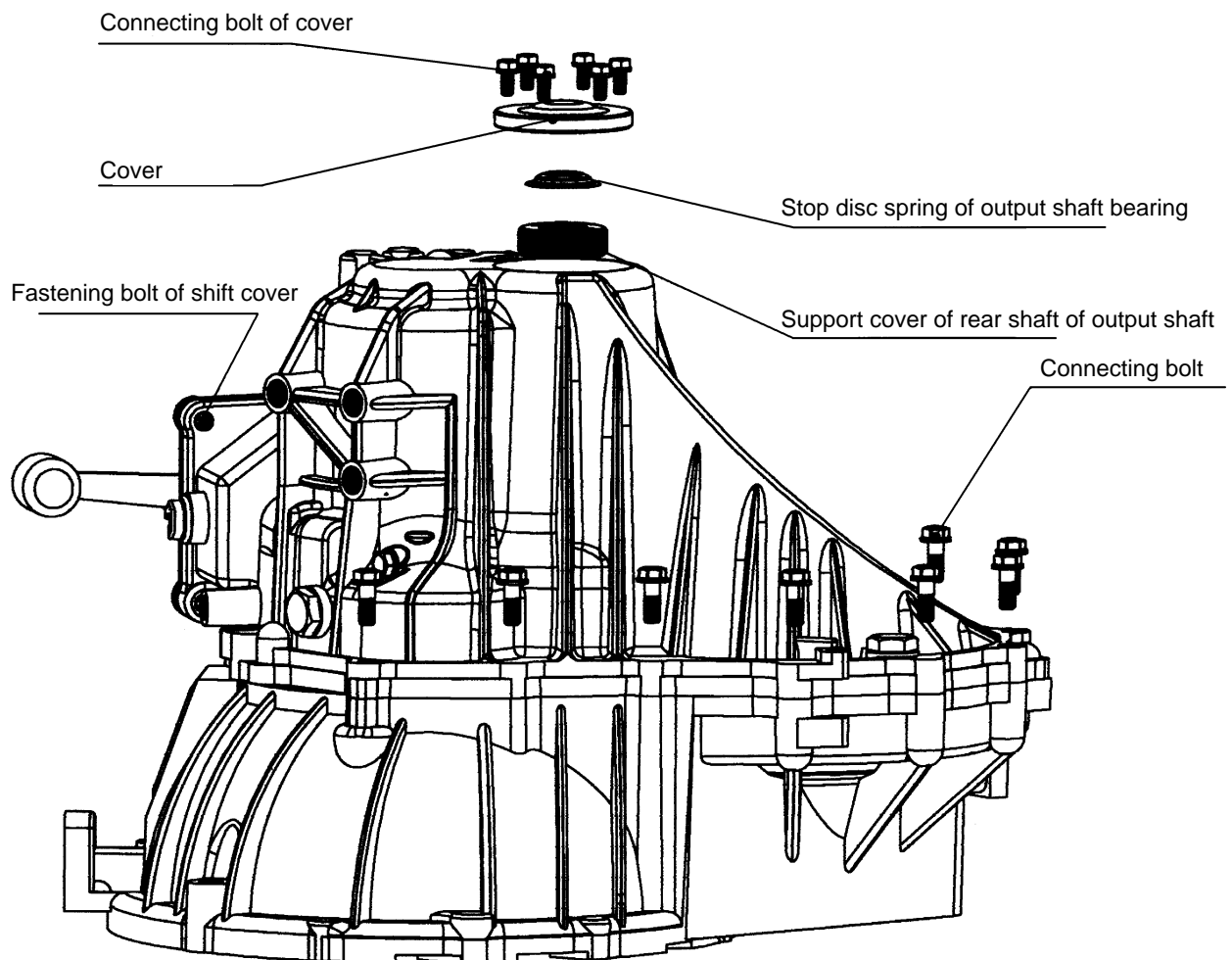
23. Check the travel of parking brake drag lever.

24. Adjust the travel of parking brake drag lever.



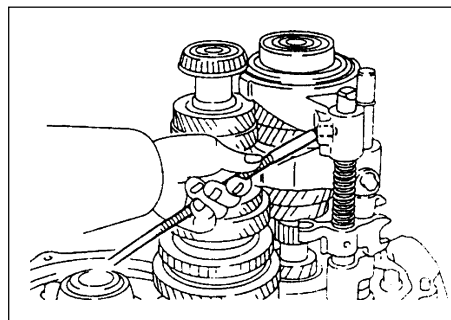
Transmission

Disassemble assembly

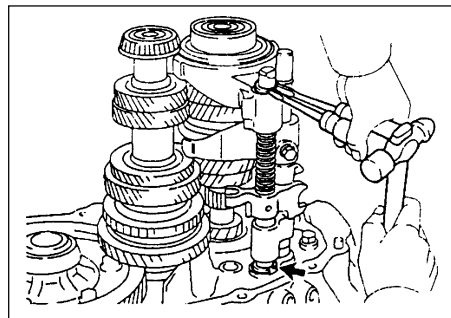


Firstly, loosen the connecting bolt of cover, and take out cover and stop disc spring of output shaft bearing, secondly, put special wrench whose surface has four cylindrical column heaves in four holes of support cover of rear shaft of output shaft and screw it out; lastly, loosen fastening bolt of shift cover, take out shift cover assembly, and loosen connecting bolt of transmission to take out transmission shell.

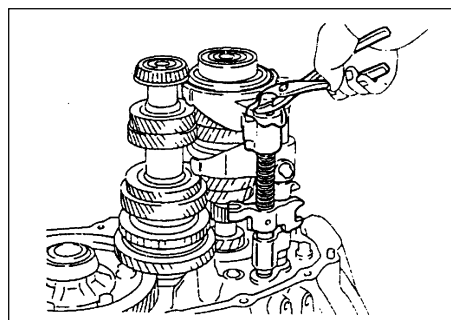
Take out interlocking pin with magnetic stick



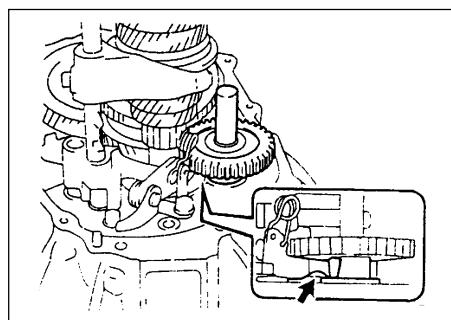
Take out clip spring of fork shaft, liking that shown in figure.



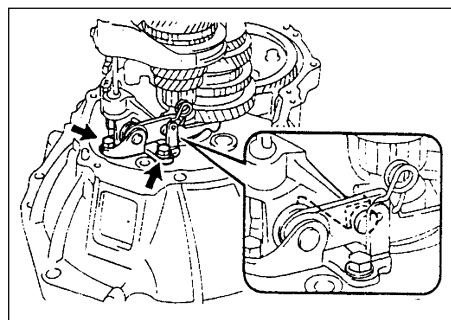
Clamp the upside of fork shaft which is protected by some cloths and take it out, liking that shown in figure.



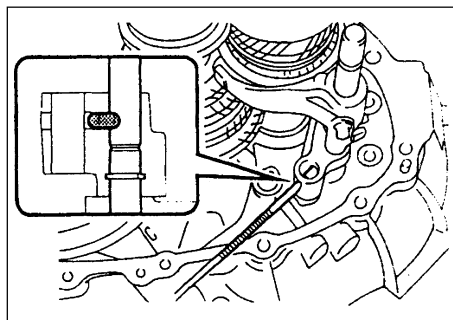
Take out reverse gear and reverse gear shaft



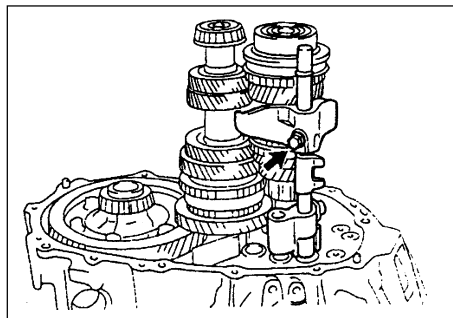
Disassemble two bolts and swing arm bracket of reverse gear, liking that shown in figure.



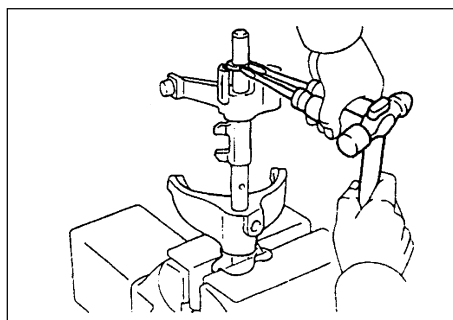
Disassemble interlocking pin with magnetic stick and take out fork shaft and fork.



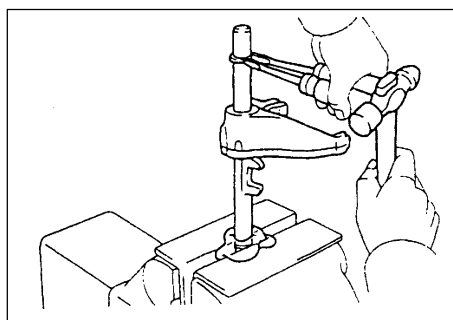
Disassemble bolt and fork shaft liking that shown in figure.



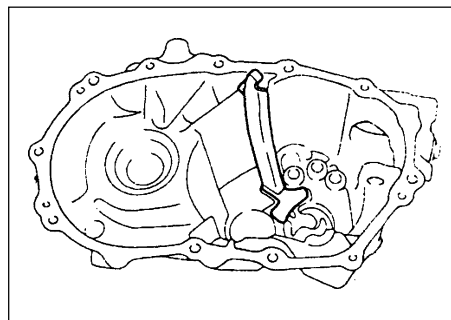
Disassemble clip spring liking that shown in figure.



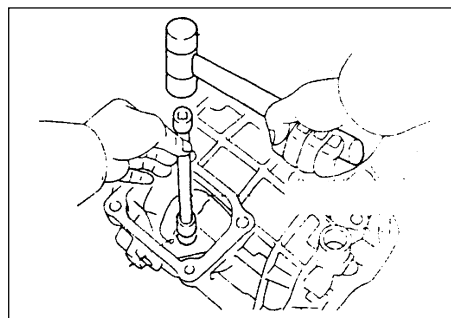
Take out fork by disassembling clip spring.



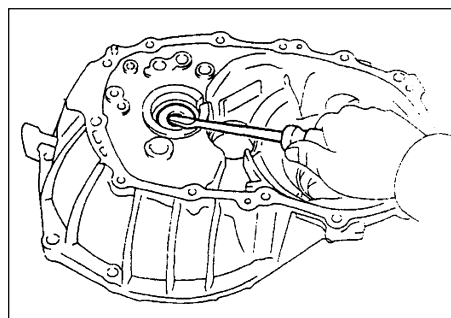
Disassemble lubricating oil pipe.



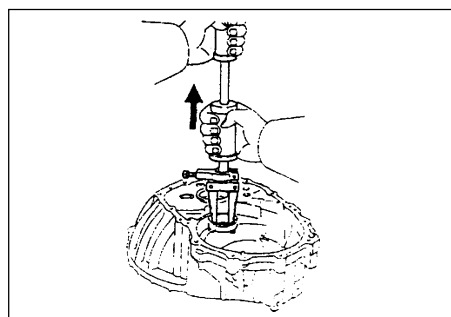
Take our bushing liking that shown in figure.



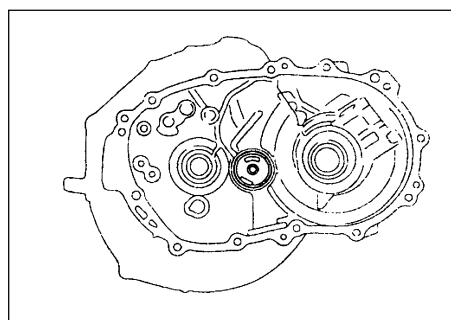
Take our oil seal.



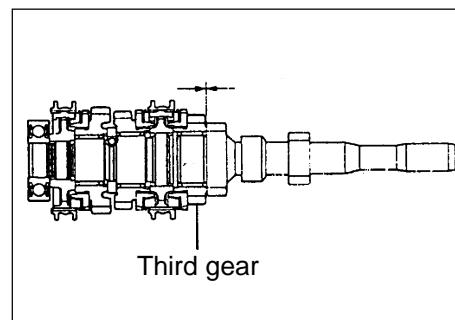
Take our exterior ring of tapered shaft with special tool liking that shown in figure.



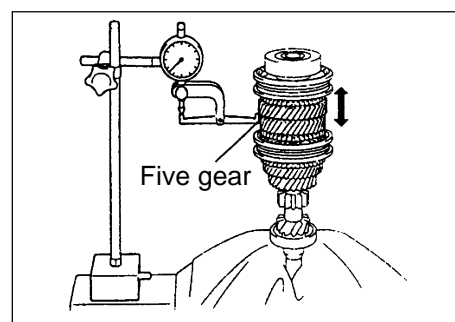
Disassemble oil guide cover.



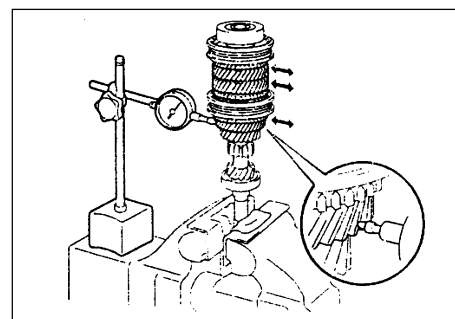
Check the axial clearance of third gear with clearance gauge, its standard value is: 0.1—0.35 mm.



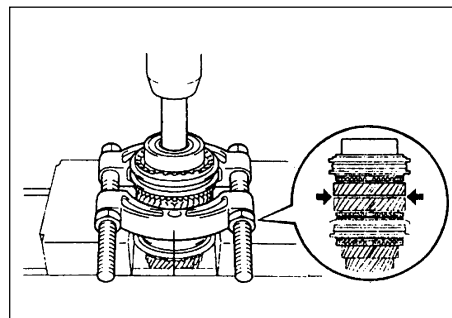
Check the axial clearance of fifth gear liking that shown in figure, its standard value is: 0.1—0.50 mm.



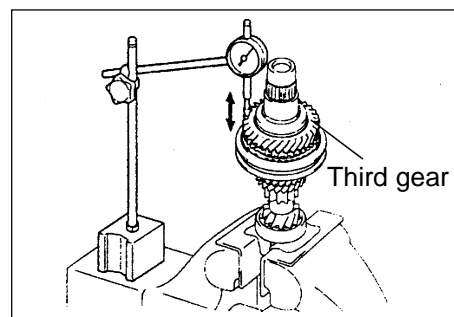
Check the radial clearance of forth gear and fifth gear liking that shown in figure, its standard value is less than 0,058mm.



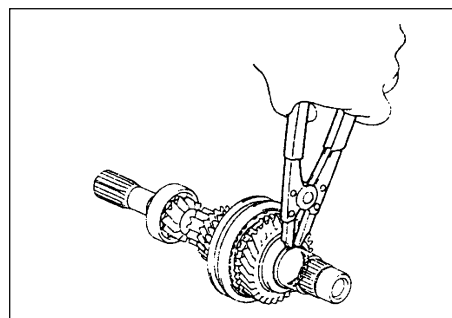
Put input shaft assembly into position with pressure machine like that shown in figure, at the same time, hold the lower end of input shaft to disassemble gear cover, gear hub and five gear.



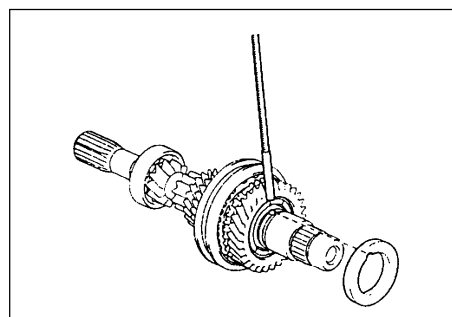
Check the axial clearance of forth gear, its standard value is: 0.1—0.55mm.



Take down clip spring used by shaft with clip spring wrench.
Note: do not hurt shaft surface.

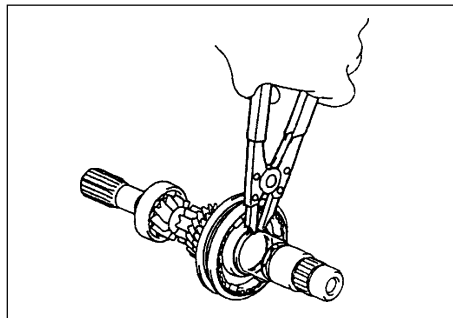


Take out fixing ball with magnetic stick, and take down the gear and third-and-fourth synchronous gear loop.



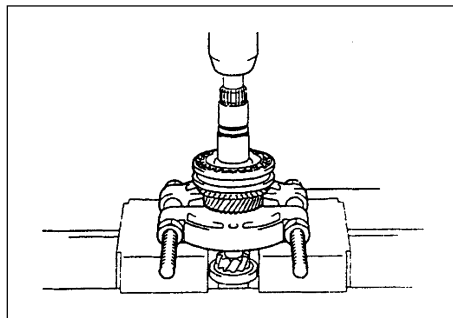
Take down clip spring with clip spring wrench.

Note: do not hurt its surface.

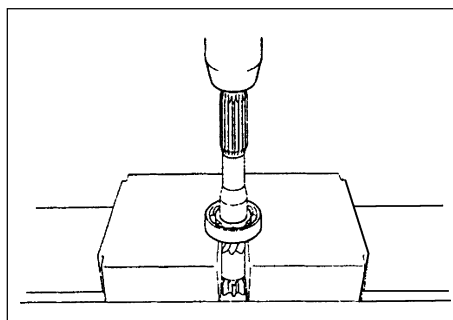


Take down synchronizer assembly, synchronous loop and third gear with pressure machine liking that shown in figure.

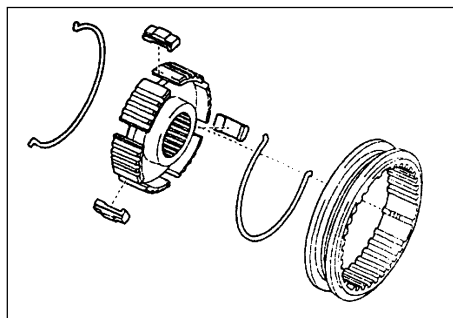
Note: hold lower end of shaft with hand to make it stand.



Take down radial ball bearing with pressure machine, and hold lower end of shaft with hand to make it stand.

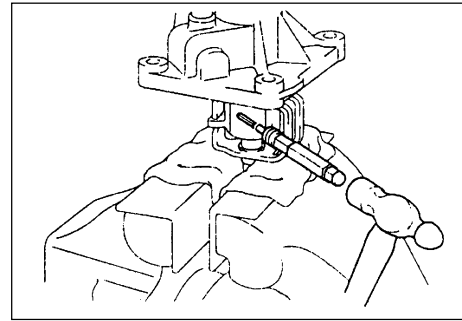


Disassemble synchronizer assembly liking that shown in figure.

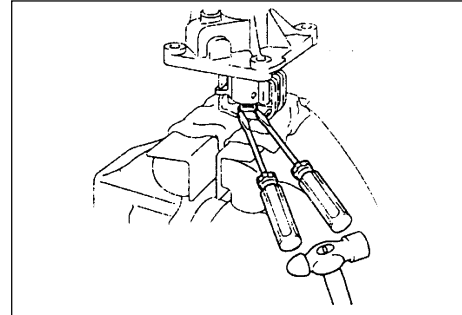


Take our elastic cylindrical pin from shift swing lever with pin taker and hand hammer liking that shown in figure.

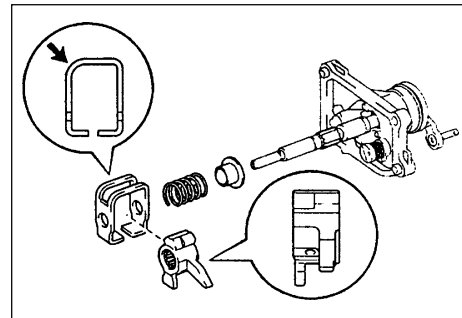
Note: do not hurt its surface.



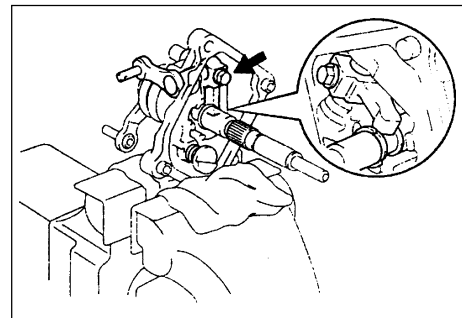
Take down clip spring liking that shown in figure.



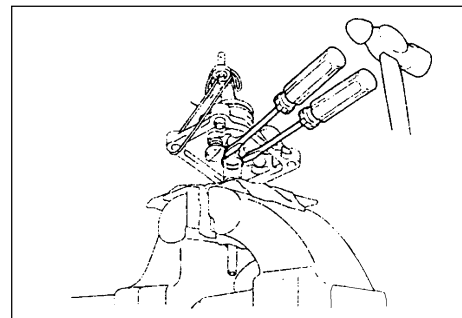
Disassemble interlocking bracket, shift swing lever, spring and A gasket liking that shown in figure.



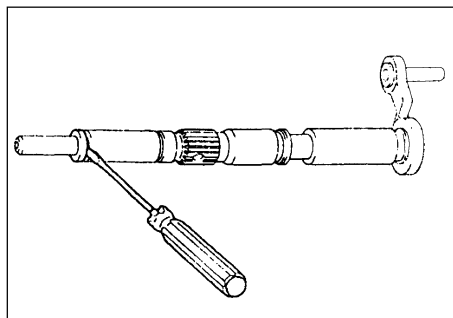
Disassemble shift swing lever and connecting bolt.



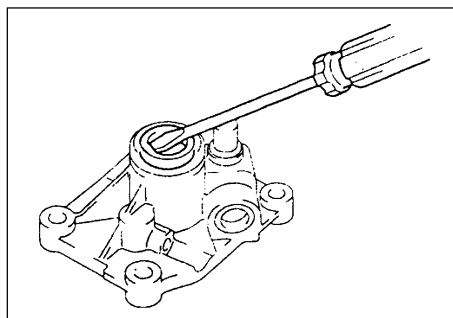
Disassemble clip spring liking that shown in figure, and disconnect it.



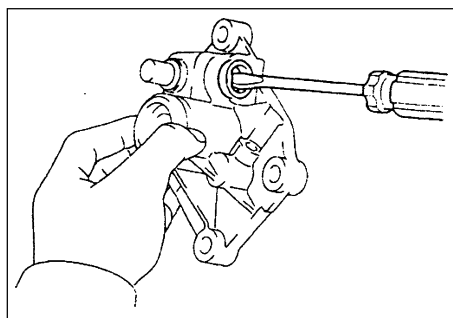
Disassemble shift guide shaft and dust-proof cover from shift cover, and take down gasket liking that shown in figure.



Take out the shift cover oil seal with wrench liking that shown in figure

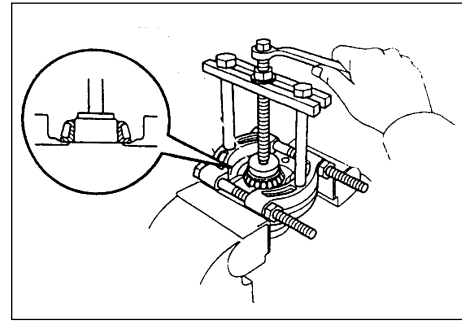


Take out the other oil seal on shift cover with same method.

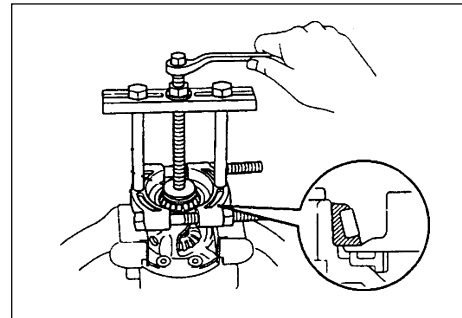


Take down tapered bearing on differential shell liking that shown in figure.

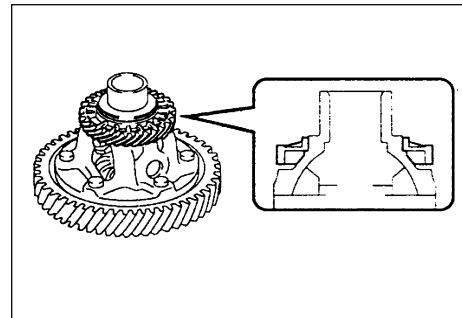
Note: put column end surface in bearing into position reliably.



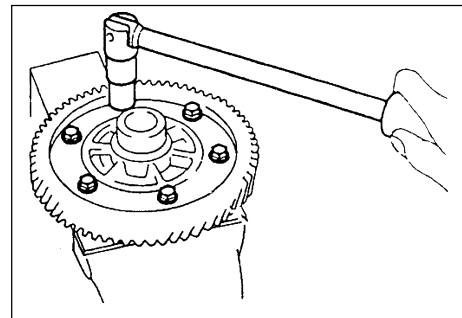
Take down cylindrical bearing of speedometer driving wheel side liking that shown in figure.



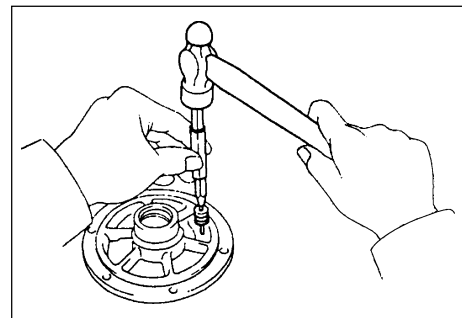
Take down driving gear of speedometer



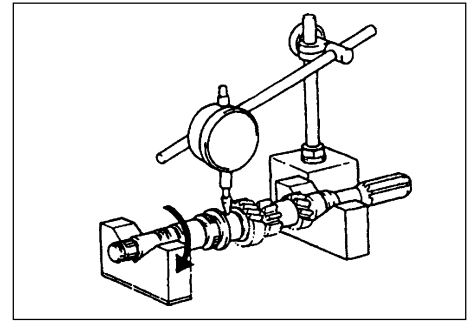
Disassemble by sequence the fastening bolts of differential.



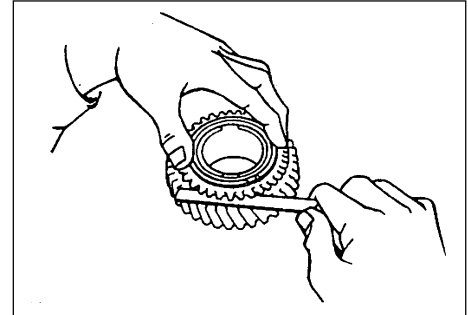
Take out elastic cylindrical pin with pin taker, and take out second planetary gears and gaskets, two axle shaft gears and gaskets and planetary gear shaft by sequence.



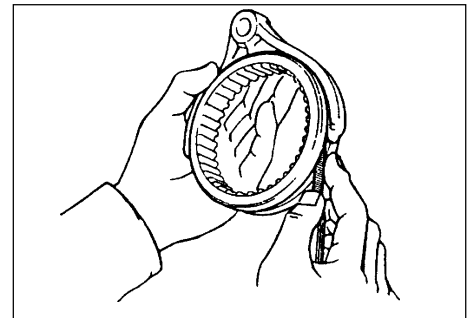
Check the radial run-out of input shaft like that shown in figure, maximal diameter is 0.03mm.



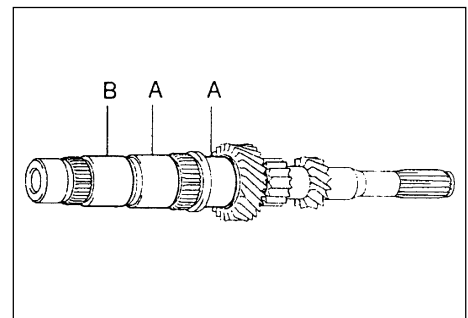
Check the distance from back surface of synchronous loop to gear end surface with clearance gauge, the minimal value should be 0.8mm, if the minimal distance could not reach this value, it is necessary to change synchronous loop.



Check the distance between gear cover and shift fork with clearance gauge, its maximal value is 0.35mm, or it is necessary to change gear cover or shift fork.



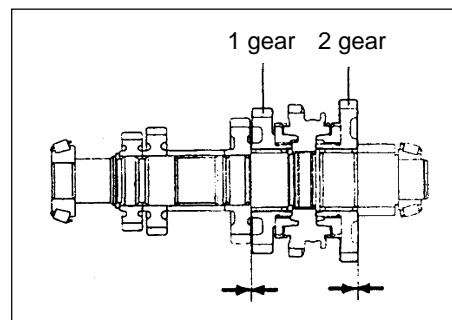
Measure the minimal diameter of abrasion surface A of input shaft with micrometer, its value is 33.985mm, and the minimal diameter of surface B is 30.985mm, if the value exceeds this scope, it is necessary to change input shaft.



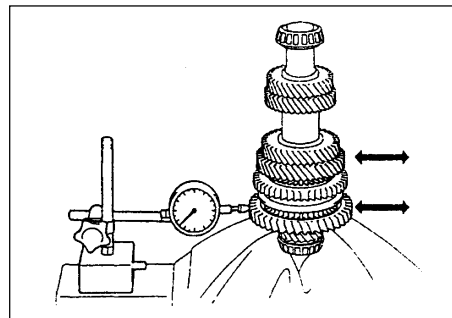
Measure axial clearance of 1 gear and 2 gear with thickness gauge,

1 gear: 0.1—0.35mm

2 gear: 0.1—0.35mm



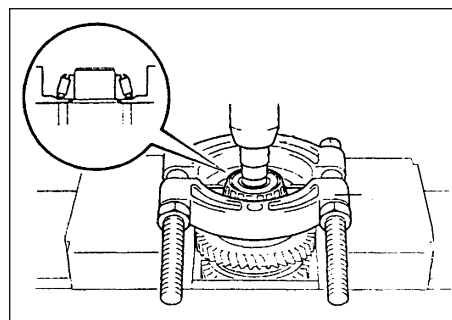
Measure radial clearance of 1 gear and 2 gear liking that shown in figure, the maximal flop value is 0.056mm.



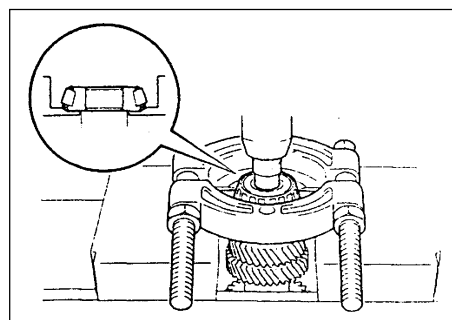
Take down tapered bearing liking that shown in figure

Note:

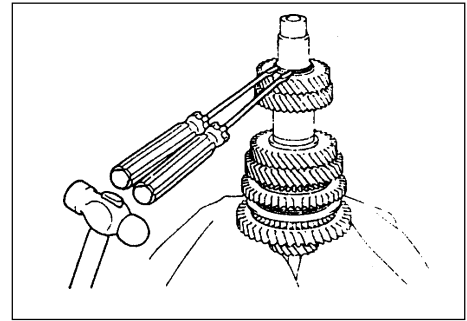
1. Hold the lower end of shaft to prevent it falling.
2. Clamp inner ring of bearing to make it reliable.



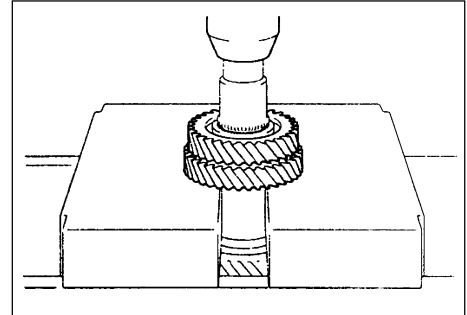
Disassemble tapered bearing on the other end with same method.



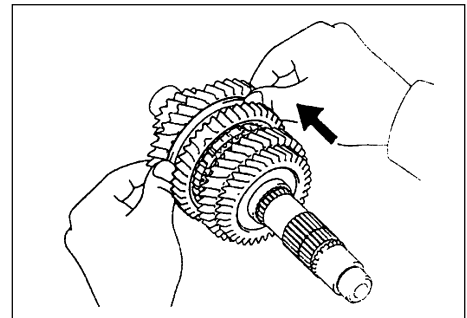
Disassemble spring clamp loop on output shaft liking that shown in figure.



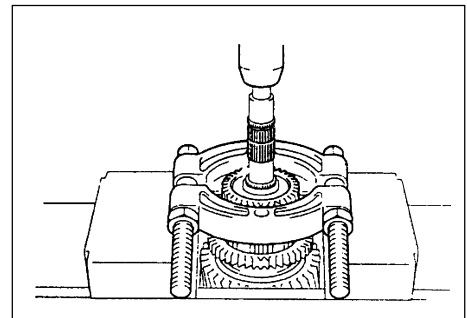
Take down forth and fifth gear wheel with pressure machine.
Note: hold the lower end of shaft to prevent it falling.



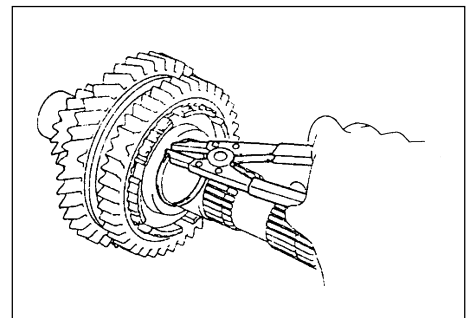
Move first and second gear to first gear.



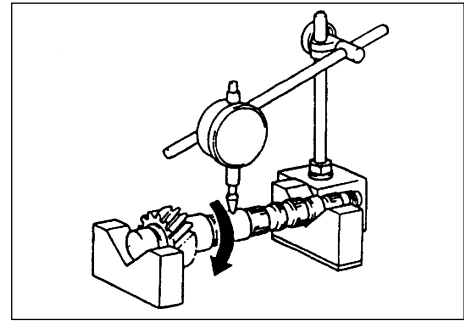
Disassemble third gear with pressure machine, and hold the lower end of shaft to prevent it falling, at this time, disassemble roller bearing, synchronous loop and second gear.



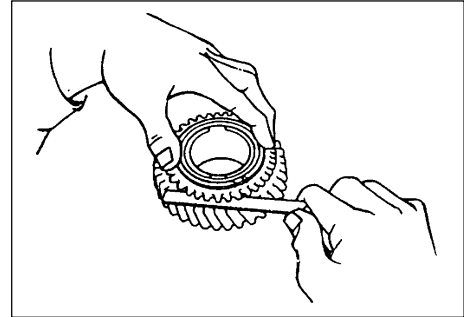
Disassemble clip spring with clamp spring pliers, and do not hurt bearing surface of shaft.



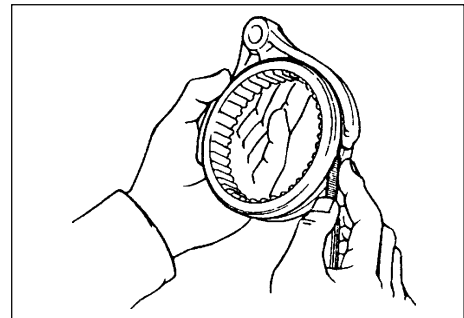
Measure the round flop liking that shown in figure, its maximal allowed flop value is 0.03, if exceeding this value, it is necessary to change the output shaft.



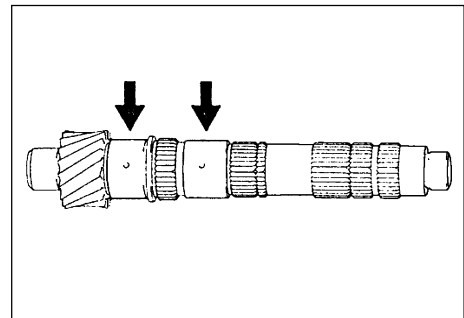
Check the axial clearance between the back surface of synchronous loop and end surface of gear splines with clearance gauge, its minimal value is 0.8mm, if the clearance is less than this value, it is necessary to change the synchronous loop.



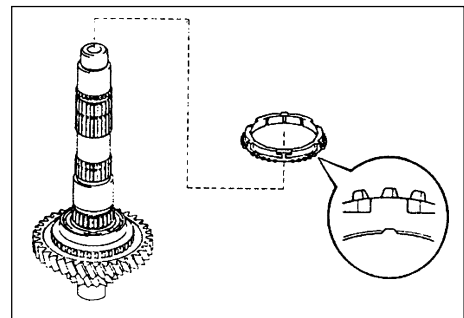
Check the clearance between gear cover fork slot and fork with clearance gauge, its maximal value is 0.35mm, if exceeding this value, it is necessary to change fork.



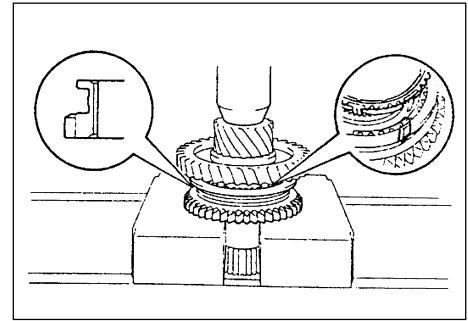
Check the abrasion and damaged situation of output shaft, and measure the exterior diameter of bearing platform with micrometer, its minimal value is 33.985mm, if measured result is less than this value, it is necessary to change the output shaft.



Assemble first gear and synchronous loop liking that shown in figure.

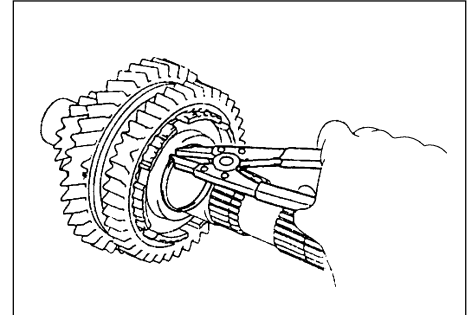


Press first and second gear synchronizer assembly in input shaft with pressure machine, its direction likes that shown in figure.

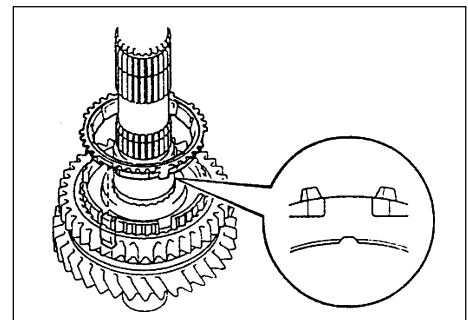


Use new clip spring used for shaft to replace that one which has been stretched.

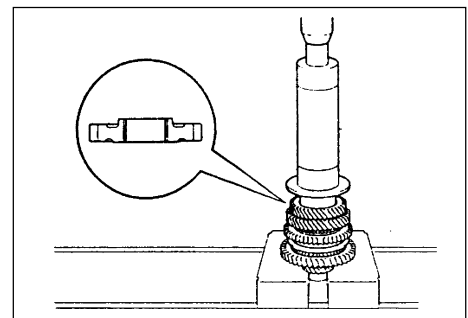
Note: do not hurt the shaft surface.



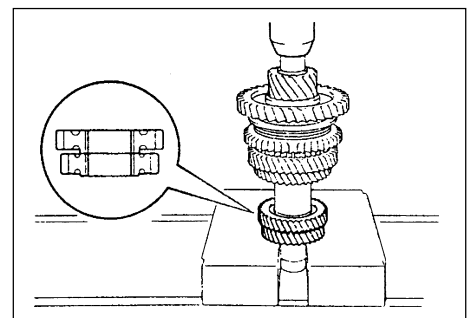
Assemble synchronous ring, roller bearing and second gear.



Press third gear in output shaft with pressure machine liking that shown in figure, its direction likes that shown in figure.

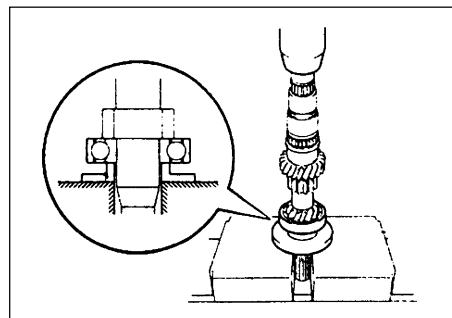


Use pressure machine to press forth and fifth gear in output shaft with the method in figure, its direction likes that shown in figure.

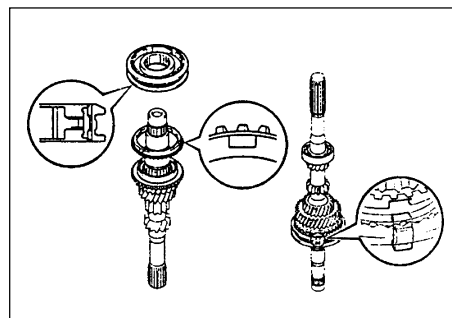


Press bearing in input shaft with pressure machine liking that shown in figure.

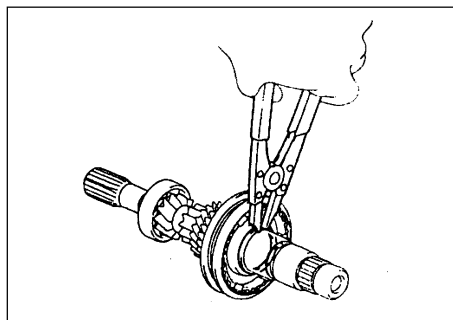
Note: adjust to bearing inner ring and put it into position



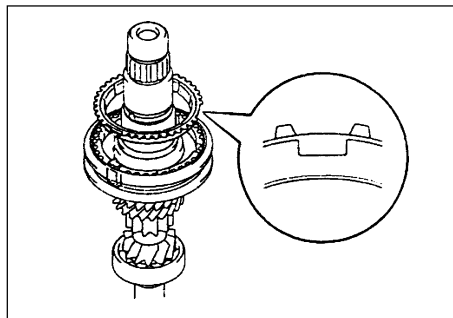
Assemble roller bearing, third gear and third gear synchronizer loop liking that shown in figure, and assemble synchronizer assembly by the direction in figure.



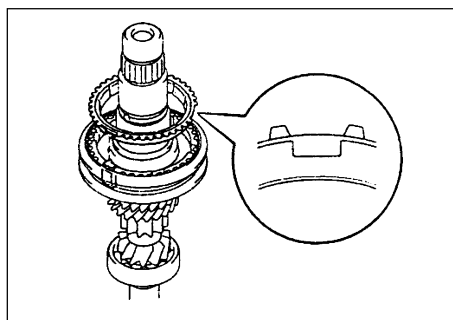
Assemble a new clip spring on input shaft.



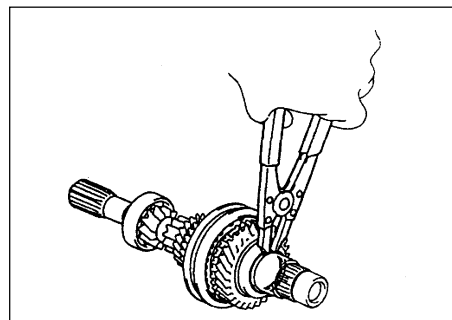
Assemble roller bearing, and assemble third and forth ssynchronizer assemble by the direction in figure, at this time, assemble forth gear on input shaft.



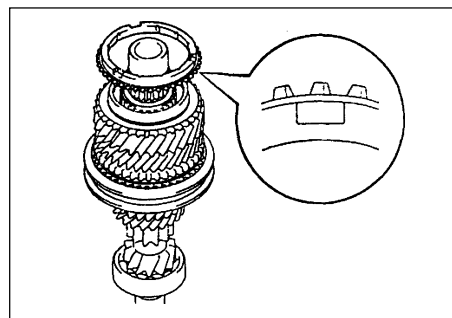
Assemble fixing ball liking that shown in figure, and assemble fifth gear stop gasket in input shaft by this ball.



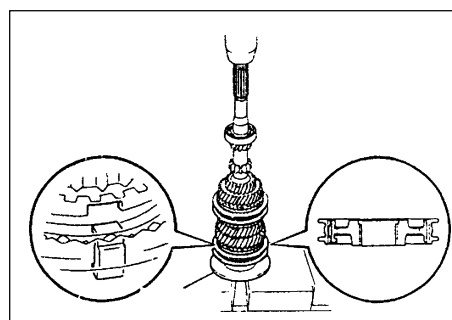
Assemble clip spring with same method.



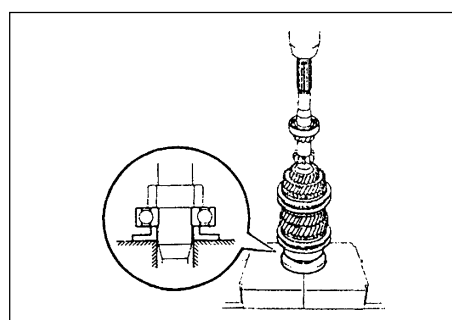
Assemble roller bearing, fifth gear, fifth gear synchronous loop with same method above.



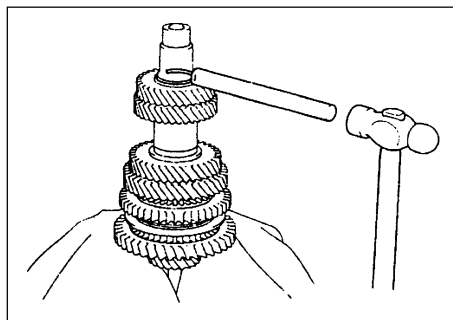
Assemble synchronizer assembly with pressure machine by the direction in figure.



Press radial ball bearing in with pressure machine.

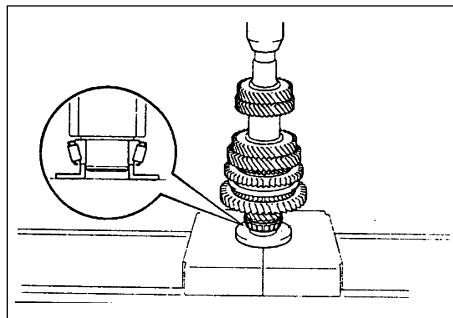


Press a new clip spring in input shaft by the direction in figure.



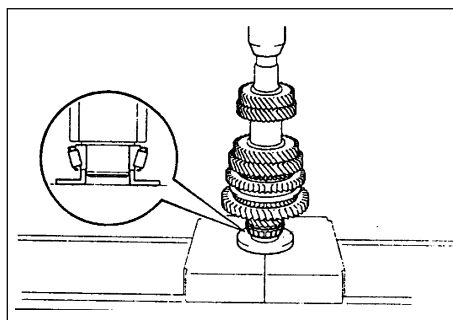
Press front tapered bearing in output shaft with method in figure.

Note: make sure the bearing inner ring has been put into position.

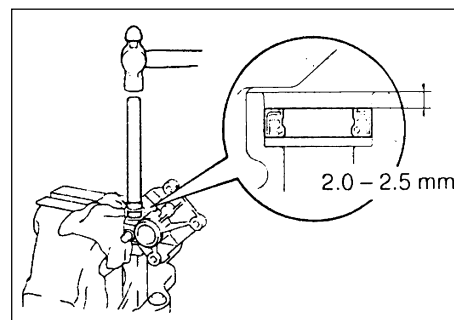


Press rear tapered bearing in output shaft with method above.

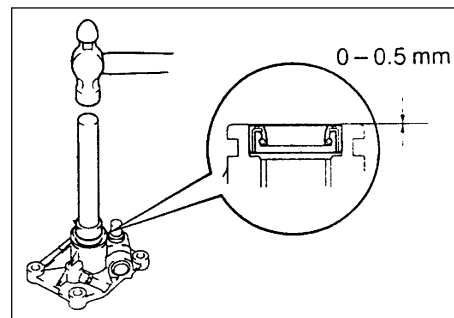
Note: make sure the bearing inner ring has been put into position.



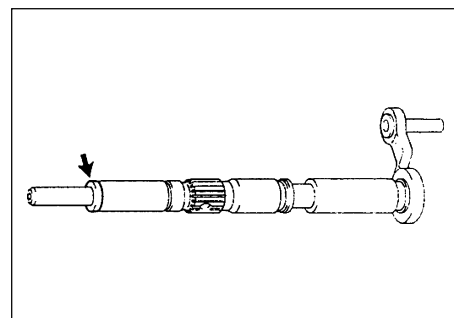
Press shift cover oil seal in with the method in figure, and the distance from oil seal end surface to oil seal hole end surface is 2.0-2.5mm after pressing it in.



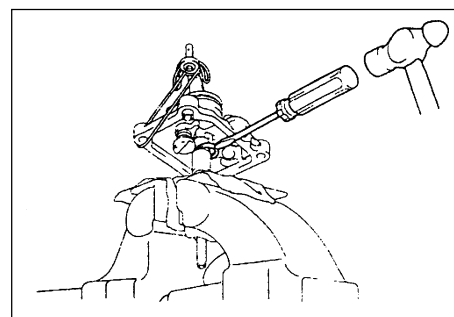
Press in the other oil seal liking that shown in figure, and the distance from oil seal end surface to oil seal hole end surface is 0-0.5mm after pressing it in.



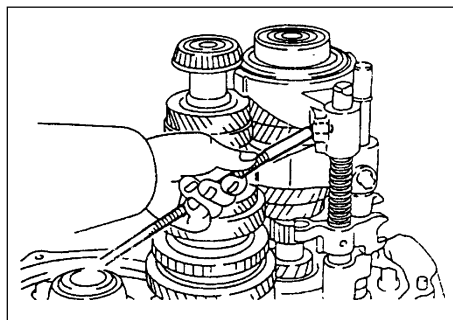
Assemble the gasket on shift guide shaft, and assemble dust-proof cover in shift guide shaft, then assemble them on shift cover.



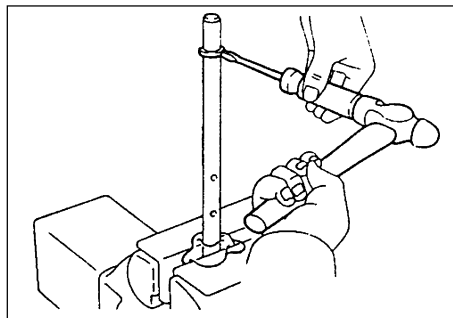
Press a new clip spring on shift reverse shaft liking that shown in figure.



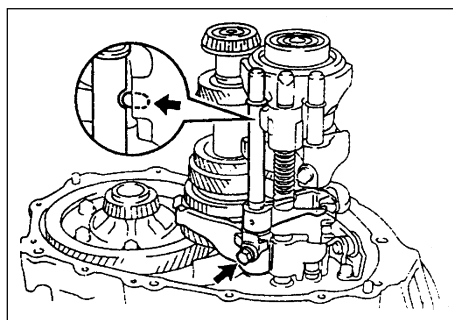
Assemble two new fork shaft clip spring, and assemble interlocking pin in the position in figure.



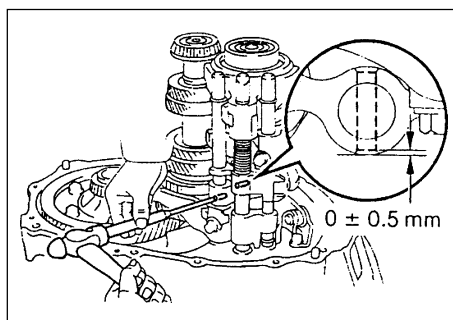
Assemble two new fork shaft clip springs liking that shown in figure.



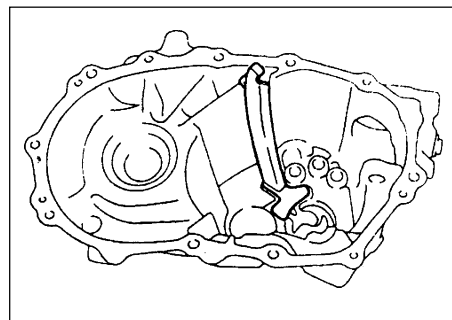
Assemble first and second gear fork on fork shaft, and put fork shaft in first and second gear cover, then assemble first and second guide block, at the same time, tighten the bolts, the torque is 16Nm.



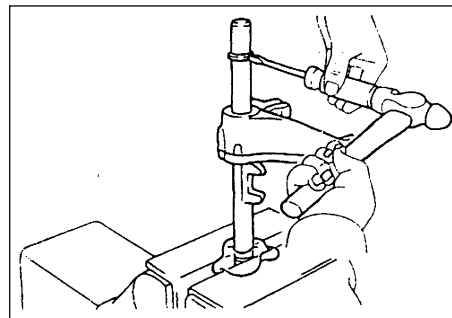
Press elastic cylindrical pin in guide block liking that shown in figure.



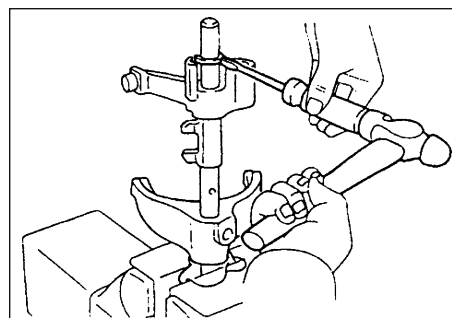
Assemble lubricating oil pipe liking that shown in figure.



Press a new fork shaft clip spring in third and forth gear fork shaft liking that in figure.

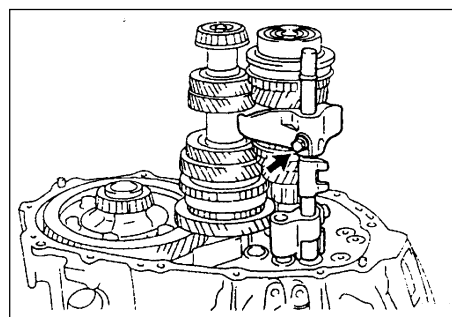


Assemble reverse gear block and fork shaft clip spring liking that shown in figure.

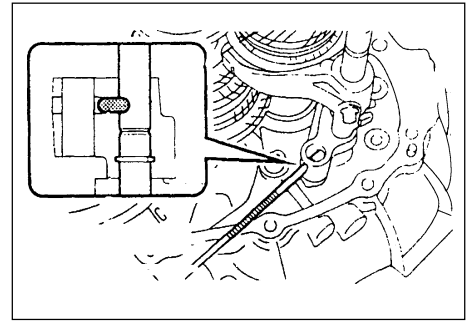


Assemble third and forth gear fork shaft in clutch shell body, and assemble third and forth shift fork in gear cover slot and tighten them.

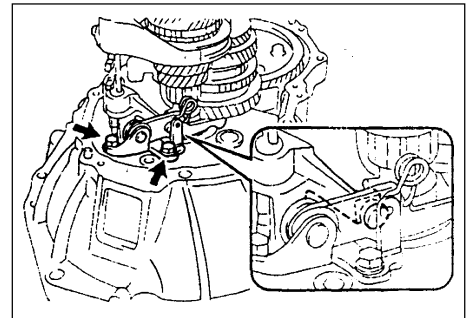
Bolt torque is 16N•m



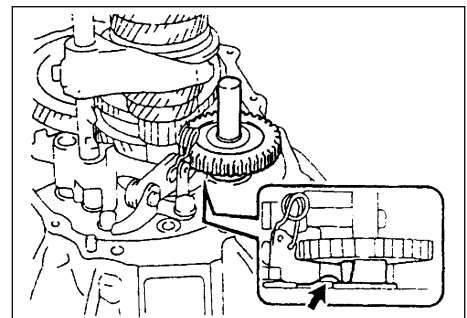
Assemble interlocking pin in reverse gear block liking that shown in figure.



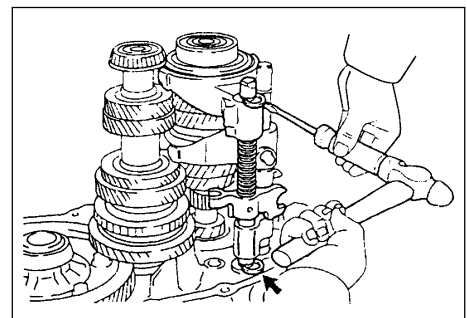
Assemble two connecting bolts on reverse gear swing arm bracket liking that shown in figure, their torque is 17N•m, and put the head of reverse gear block in corresponding hole of reverse gear swing arm bracket.



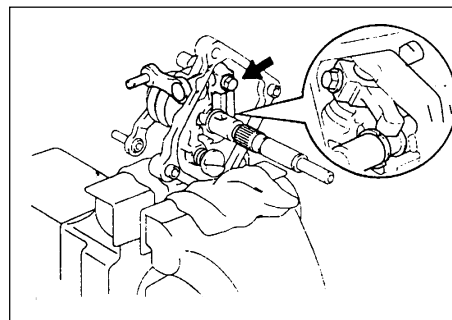
Put the head of reverse gear swing arm in the slot between those reverse gear shafts liking that shown in figure.



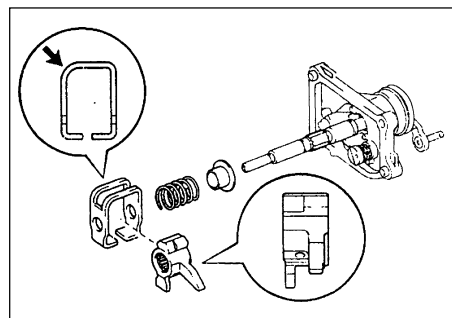
Assemble reverse gear fork, spring and fifth reverse gear guide block on fifth reverse fork shaft, and put fifth reverse gear pulling fork in fifth gear cover, then assemble them in clutch shell.



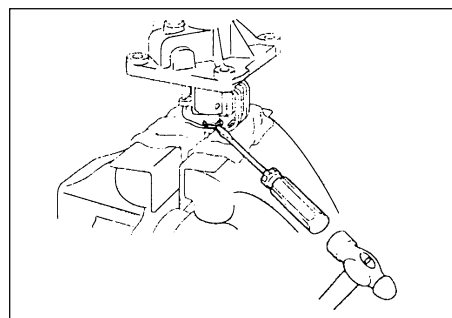
Spread seal fastening glue on the bolts, and connect transposition swing lever and transposition swing lever shaft with transposition cover with bolts, bolt torque is 16N•m



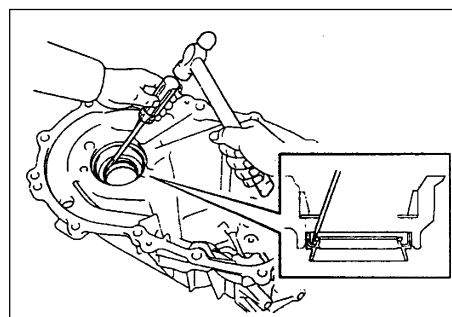
Assemble A gasket, spring, interlocking bracket and shift swing lever on shift reverse shaft by the sequence in figure, then press elastic cylindrical pin in the hole of shift swing lever, at the same time, the distance from its end surface to hole should be 0-0.5mm after pressing it in.



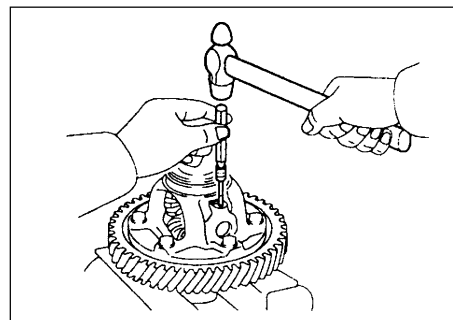
Press in a new clamp spring liking that shown in figure.



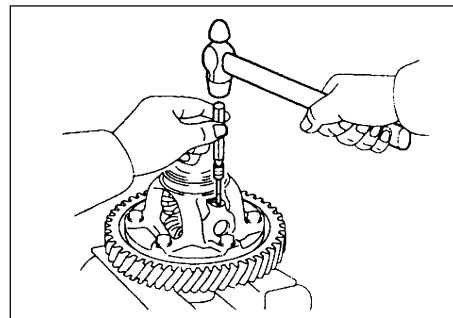
Take out oil with the method in figure, and assemble a new oil seal in transmission shell body.



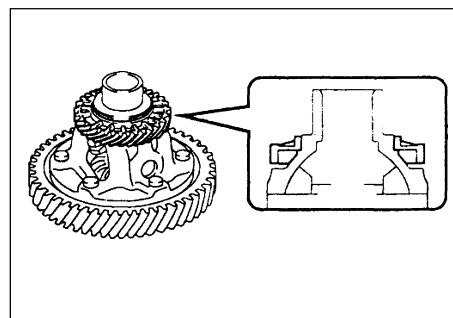
Assemble two axle shaft gears and their gaskets in differential shell by sequence, then screw two planetary gears and their gaskets in differential shell, and put planetary gear shaft, lastly, assemble a new elastic cylindrical pin liking that shown in figure.



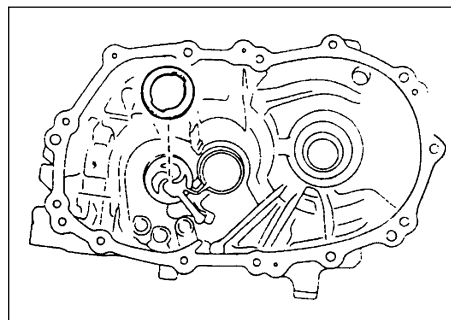
Assemble differential gear ring by the direction in figure, and screw connecting bolts of differential.



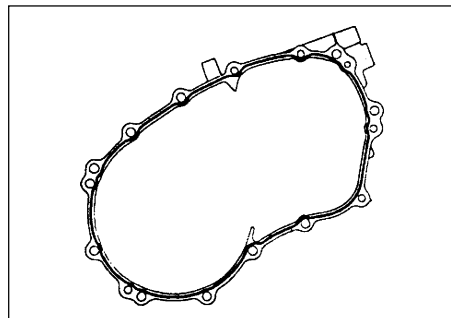
Assemble speedometer driving gear by the direction in figure.



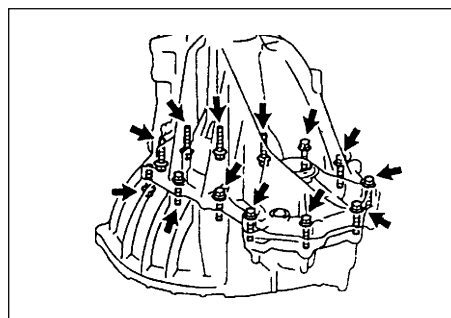
Assemble chosen adjusting gasket in transmission shell.



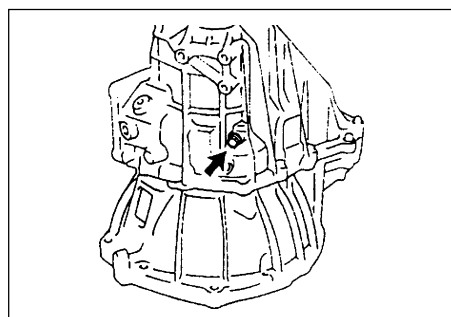
Spread seal glue on joint surface of shell body liking that shown in figure.



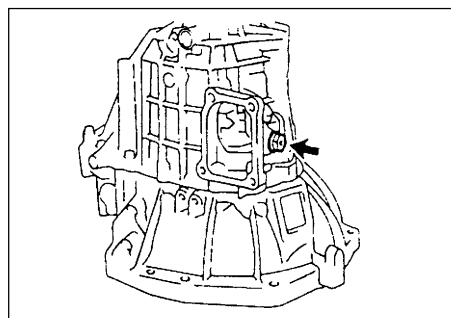
Screw corresponding bolts liking that shown in figure, its torque is 29N•m.



Spread anti-loose fastening glue on connecting bolts of reverse shaft, and use a new gasket to cover on the bolt, then tighten reverse shaft on transmission shell, its torque is 29N•m

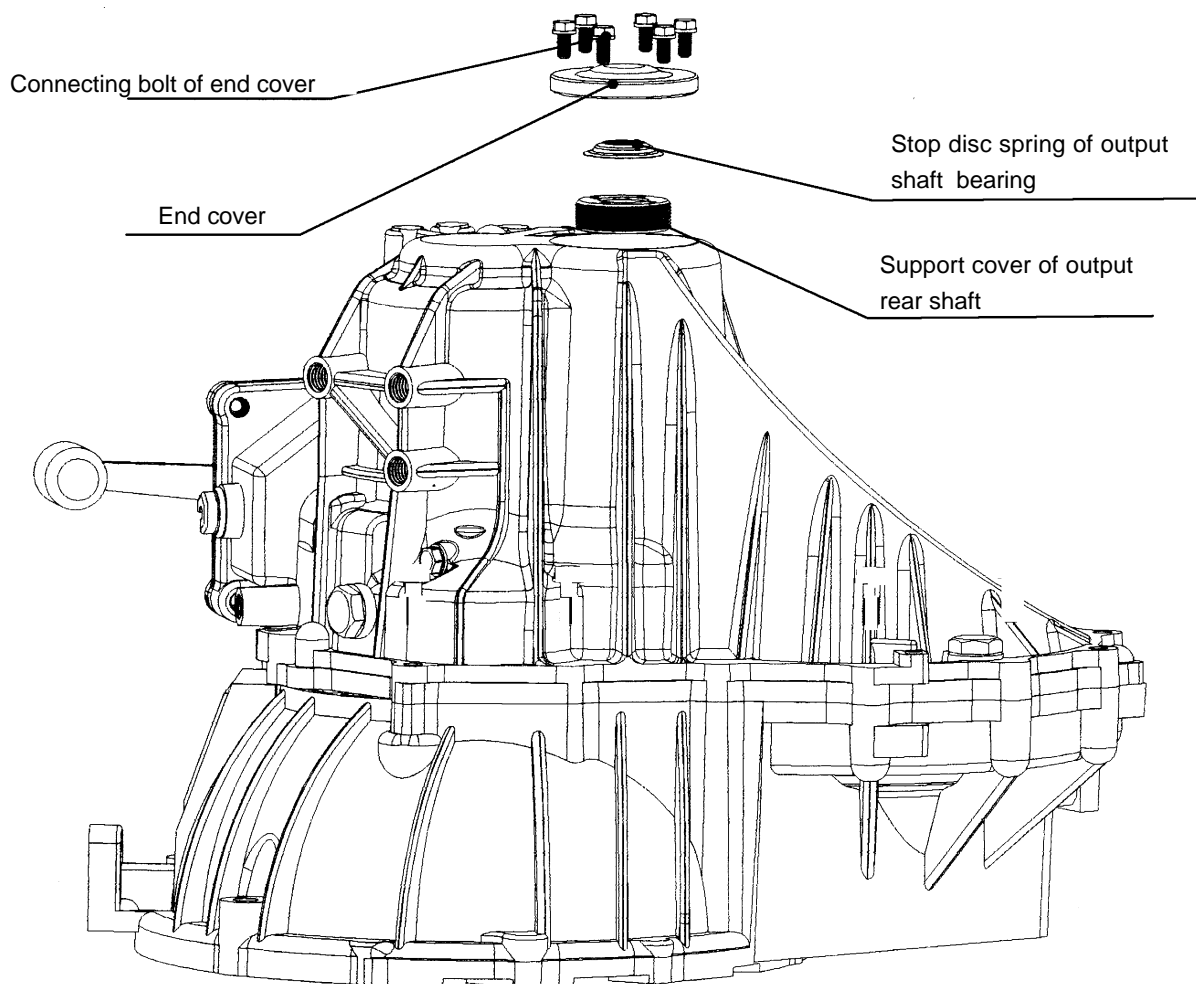


Assemble shift fixing assemble on transmission shell, its torque is 37N•m



Transmission

Assemble the assembly



Screw support cover of output rear shaft in differential shell until reaching screwing torque that is $40\text{N}\cdot\text{m}$, then put stop disc spring of output shaft bearing in support cover of output rear shaft by the direction in figure, lastly, press down end cover and tighten connecting bolts of end cover, their torque is $12\text{N}\cdot\text{m}$

Steering column

Steering system

Note

1. Notes that are necessary for steering system:

- (a) It is necessary to change parts correctly, for they will influence the performance of steering system to make running danger.

2. Notes that are necessary for SRS airbag:

- (a) MR7180 assemblies with SRS (auxiliary protection system) such as safety airbag at the side of driver and safety airbag at the side of passenger.

Maintenance does not accord with correct repair step, this might incur SRS explodes suddenly in repair term to make heavy accident. Before repairing auxiliary protection system (including disassembling, assembling, check or change parts), it is necessary to read the notes in SRS chapter (auxiliary protection system).

Malfunction phenomenon table

Following table could help you find the reason of malfunction. And the number in table is only used for indicating possible preferred sequence. Please check each part by sequence, if necessary, change this part.

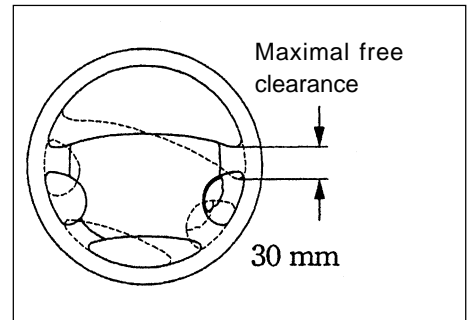
Malfunction phenomenon	Possible malfunction part	Referred page
Steering is heavy	1.Tyre (tyre pressure is wrong).	109
	2.Power steering oil level (low).	200
	3.Driving belt (loose).	-
	4.Wheel alignment (wrong).	87
	5.Steering system joint (abraded).	-
	6.Lower control arm ball joint (abraded).	99
	7.Steering column (bent).	-
	8.Power steering oil pump.	203
	9.Power steering gear.	205
Return is bad	1.Tyre (tyre pressure is wrong).	109
	2.Wheel alignment (wrong).	87
	3.Steering column (bent).	-
	4.Power steering gear.	205
Clearance is too big.	1.Steering system joint (abraded).	-
	2.Lower control arm ball joint (abraded).	99
	3.Middle shaft, sliding fork (abraded).	-
	4.Front wheel bearing (abraded).	123
	5.Power steering gear.	205
Abnormal noise	1.Power steering oil level (low).	200
	2.Steering system joint (abraded).	-
	3.Power steering oil pump.	203
	4.Power steering gear.	205

Inspection on automobile

1. Check the free clearance of steering wheel

- (a) Park the automobile, and the front wheels are towards the front.
- (b) Turn the steering wheel to left and right with your fingers lightly, and check the free clearance.

Maximal free clearance: 30mm



Steering column system

Overhaul

1. Put the front wheels towards the front.
2. Disassemble safety airbag assembly at the side of driver (equipping with SRS) [67000179]

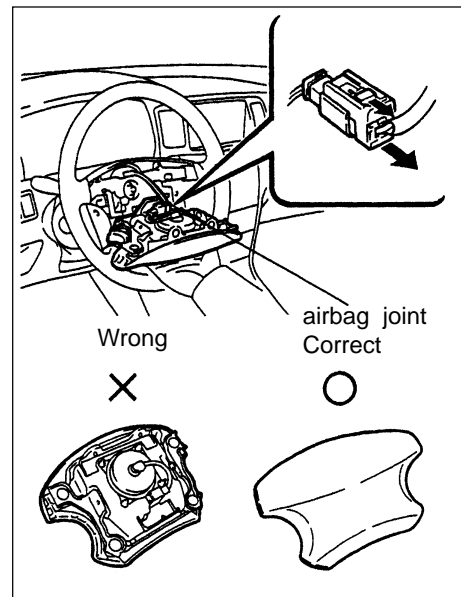
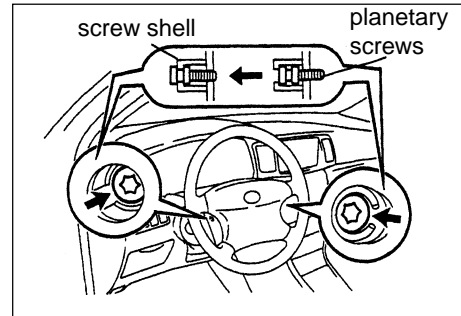
Note: if disconnecting airbag joint when ignition switch locates at ON position, checking number will record it.

- (a) Put the front wheels towards the front.
- (b) Use planetary sleeve wrench to loosen two planetary screws until the concave slot around the screw contacts the screw shell.
- (c) Pull out airbag assemble from steering wheel, and disassemble airbag joint.
- (d) Disassemble the terminal.

Warning:

- When storing safety airbag assembly at the side of driver, it is necessary to put the surface of airbag assembly towards the upside.
- Do not disassemble airbag assembly.

Note: when disassembling airbag assembly, pay attention not to pull airbag wiring harness.

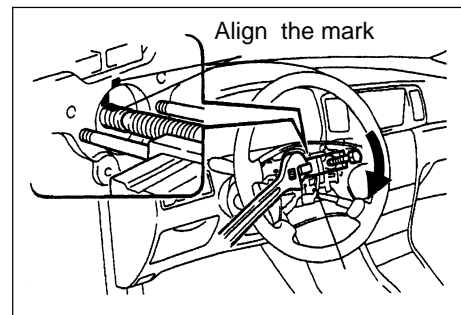


3. Disassemble steering wheel assembly [67100001]

- (a) Disassemble the fixed screw cap of steering wheel.
- (b) Make corresponding marks on steering wheel and main shaft assembly.
- (c) Use special tool to disassemble steering wheel.

4. Disassemble upper/lower decoration plate of steering column [64000128/64000129]

5. Disassemble left combination switch assembly [67000078] (referring to page 298)



6. Disassemble right combination switch assembly [67000079] (referring to page 302)

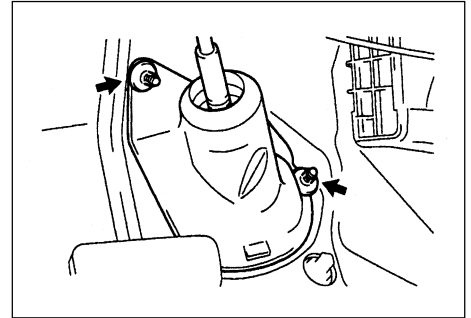
7. Disassemble helix cable assembly (equipping with SRS)

Note: do not disassemble helix cable or spread lubricating grease.

8. Disassemble the middle connecting plate of lower panel [68100006] (referring to page 340)

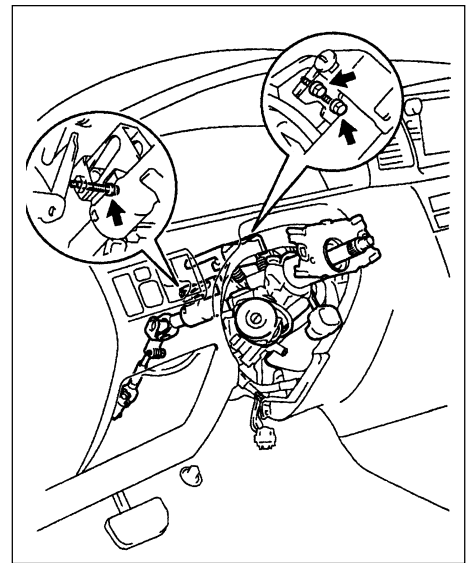
9. Disassemble dust-proof cover in steering column.

Disassemble two screw caps, then take down dust-proof cover in steering column.



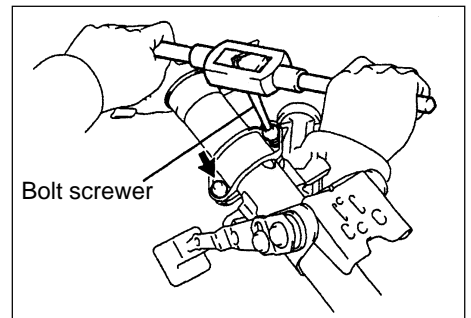
10. Disassemble steering shaft assembly

- (a) Disconnect joint and fixed clasp of wiring harness.
- (b) Loosen three fixed bolts of steering column assembly.



11. Disassemble the clamp of ignition switch [68000020]

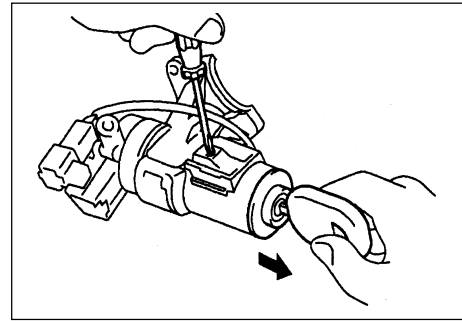
- (a) Use central punch to make hole on the central part between two tapered bolts.
- (b) Use 3-4 mm aiguille to drill two bolts.
- (c) Use bolt screwdriver to disassemble two bolts, then take down ignition switch clamp.



12. Disassemble electronic anti-stealing loop assembly (assembling with enter illumination system) [67000009].

13. Disassemble ignition switch key tank assembly

- (a) Put ignition switch key tank on ACC position.
- (b) Pull down stop pin and pull out key tank assembly with right-angled screwdriver.

**14. Disassemble ignition switch assembly**

Disassemble two screws, and take down ignition switch assembly.

15. Assemble ignition switch with locking core and key assembly [68000019]

Assemble ignition switch with locking core and key assembly with two screws.

16. Assemble ignition switch key tank assembly

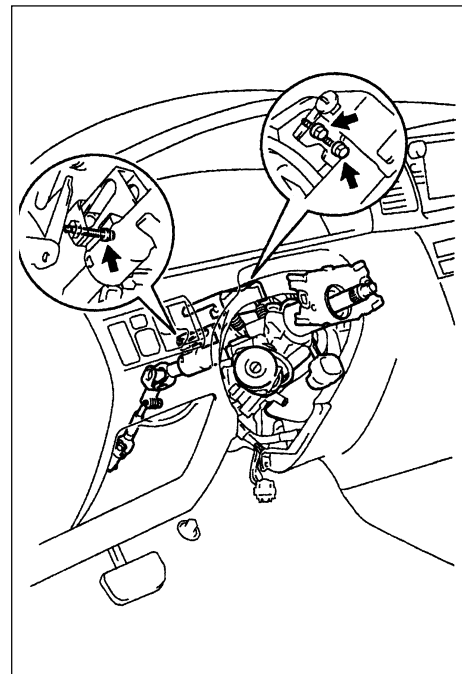
- (a) Make sure ignition switch key tank assembly locates at ACC position.
- (b) Assemble ignition switch key tank.

17. Steering locking function

- (a) When taking out the key, check whether steering locking organization is locked.
- (b) When inserting the key, and turning to ACC, check whether the steering locking organization is released.

18. Assemble electronic anti-stealing loop assembly [67000009]**19. Assemble ignition switch clamp [68000020]****20. Assemble steering shaft assembly**

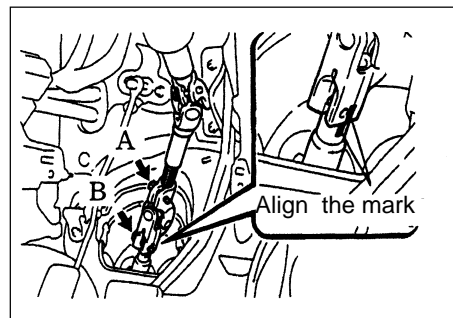
- (a) Assemble steering column assembly with three bolts.
Torque: $21 \pm 2 \text{ N}\cdot\text{m}$



- (b) Align the mark on sliding yoke and middle shaft.
- (c) Assemble B bolt and tighten A bolt.

Torque: $35 \pm 3 \text{ N}\cdot\text{m}$

Hint: When changing new sliding yoke, it is necessary to adjust the front wheel at the front, and make the bolt hole surface of sliding yoke face the back (liking that shown in figure), then assemble the bolt.



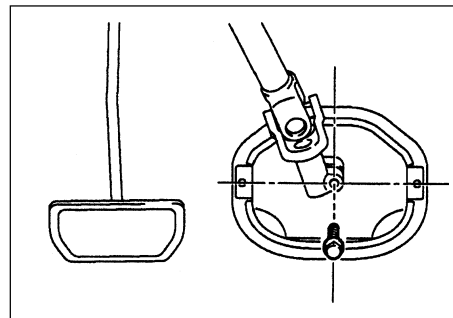
21. Adjust front wheel at the front.

22. Assemble helix cable assembly (equipping with SRS) [67000121]

23. Put the helix cable assembly at central position (equipping with SRS)

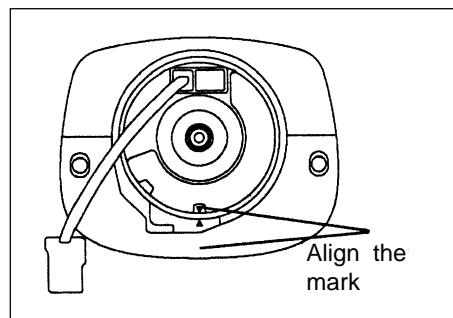
- (a) Check whether the front wheel faces the front.
- (b) Turn helix cable counter-clockwise with hand until it could not turn.
- (c) Then turn helix cable 2.5 clockwise and align the mark.

Hint: helix cable could turn left or right from central position for 2.5 rounds.



24. Assemble steering wheel assembly [67010001]

- (a) Align the mark on steering wheel and main shaft assembly.
- (b) Assemble the fixed screw cap of steering wheel.
- (c) Connect the joint.



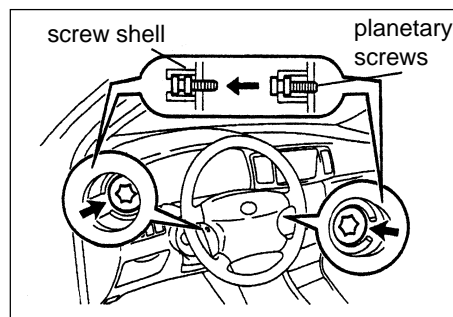
25. Assemble safety airbag assembly at the side of driver [67010011]

Warning:

- Forbid using SRS parts on other automobiles, when changing any part, it is necessary to use new product.
- If safety airbag assembly at the side of driver once dropped or exterior shell and joint has crack, concave or other distortions, it is necessary to change with new product.
- When assembling the airbag assemble at the side of driver, it is necessary to pay attention to airbag wiring harness could not interrupt other parts or be clamped by other parts.

- (a) Connect the end.
- (b) Connect the joint of airbag.
- (c) After assembling the safety airbag assembly at the side of driver, insure planetary screw of concave slot contacts with screw shell.
- (d) Use planetary screwdriver to tighten two screws.

Torque: $8.8 \text{ N}\cdot\text{m}$



26. Check the central point of steering wheel

27. Check SRS warning light (equipping with SRS)

Power steering

Power steering system

Note

1. Notes for steering system:

It is necessary to change parts correctly, for they will influence the performance of steering system to incur running danger.

2. Notes for SRS airbag system

MR7180 equips with SRS (auxiliary protection system), such as safety airbag at the side of driver and safety airbag at the side of passenger, if repairment does not accord with correct sequence, it might incur SRS explodes suddenly in repairing term to make heavy accident. Before repairing (including disassembling or assembling, checking or changing parts), it is necessary to read the notes in chapter SRS (auxiliary protection system) carefully.

Malfunction phenomenon table

Use following table to help you find the reason of malfunction, the number in table only show the possible preference sequence of malfunction, please check each part by sequence, if necessary, change this part.

Malfunction phenomenon	Possible malfunction part	Reference page
Steering is heavy	1.Tyre (tyre pressure is wrong).	109
	2.Power steering oil level (low).	200
	3.Driving belt (loose).	-
	4.Wheel alignment(wrong).	87
	5.Steering system joint (abraded).	-
	6.Lower control arm ball head (abraded).	99
	7.Steering column (bent).	-
	8.Power steering oil pump	203
	9.Power steering gear	205
Return is bad	1.Tyre (tyre pressure is wrong).	109
	2.Wheel alignment (wrong)	87
	3.Steering column (bent)	-
	4.Power steering gear	205
Clearance is too big	1.Steering system joint (abraded)	-
	2.Lower control arm ball head (abraded)	99
	3.Middle shaft, sliding fork (abraded)	-
	4.Front wheel bearing (abraded)	123
	5.Power steering gear	205
Abnormal noise	1.Power steering oil level (low)	200
	2.Power steering joint (abraded)	-
	3.Power steering oil pump	203
	4.Power steering gear	205

Inspection on automobile

1. Check driving belt

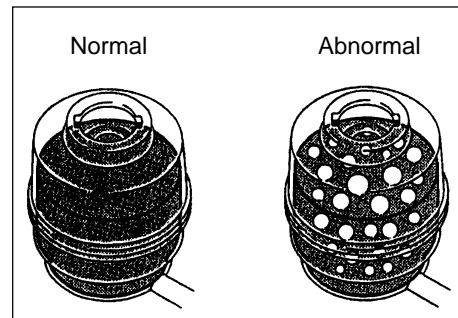
- (a) Check whether the belt has been abraded too much with eyes, and rope is broken.

If finding any defect, change the driving belt.

Hint: Some light crack at the side of belt rib could be approved, but if belt has any crack from its rib, it is necessary to change.

2. Exhaust air of power steering system

- (a) Check the oil level.
 (b) Lift up automobile body, and support it with bracket.
 (c) Turn steering wheel.
 (1) Turn steering wheel slowly from left and right to bottom for several times when engine extinguishes.
 (d) Lay down the automobile.
 (e) Start the engine to make it run at idling speed for several minutes.
 (f) Rotate steering wheel.
 (1) Keep engine at idling speed, and turn the steering wheel from left or right to bottom and keep this state for 2-3 seconds, then turn it to the other direction for 2-3 seconds.
 (2) Repeat (1) for several times.
 (g) Engine extinguishes.
 (h) Check whether there is any foam or emulsification phenomenon.
 If there is any foam or emulsification phenomenon and it is necessary to exhaust air second time, it is necessary to check whether the system has any leakage.
 (i) Check the oil level.



3. Check the oil level

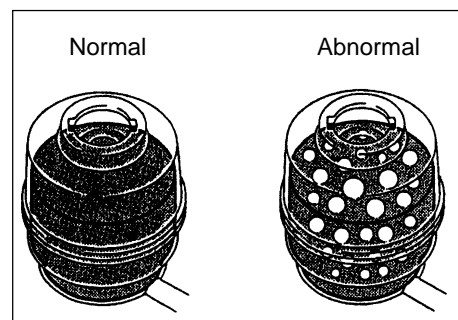
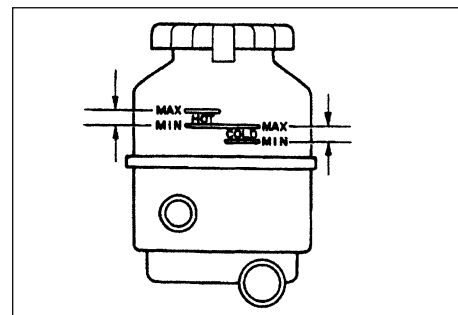
- (a) Keep automobile horizontal.
 (b) Extinguish the engine, and check the oil level of oil storage tank.
 If oil level is too low, add oil.

Power steering oil: automatic transmission oil DEXRON'' II or III

Hint: check whether the oil level is in the HOT mark scope of oil storage tank, if oil is cool, check the oil level is in COLD mark scope.

- (c) Start the engine, and keep it at idling speed.
 (d) Turn steering wheel from left bottom to right bottom for several times to make oil temperature increase.

Oil temperature: 80°C



(e) If there is any foam or emulsification phenomenon, it is necessary to exhaust air in power steering system.

(f) Keep the engine at idling speed, and measure the oil level of oil storage tank.

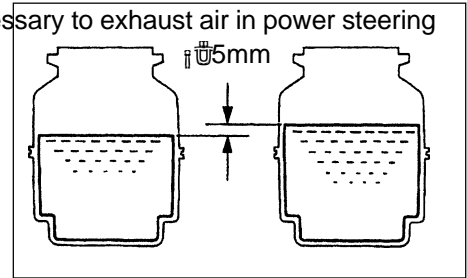
(g) Engine extinguishes.

(h) After waiting for several minutes, measure the oil level of oil storage tank again.

Maximal increased height of oil level: 5mm

If finding any problem, it is necessary to exhaust the air in power steering system.

(i) Check the oil level.



4. Check steering oil pressure.

(a) Disassemble oil pressure supply pipe from power steering gear. (referring to page 205)

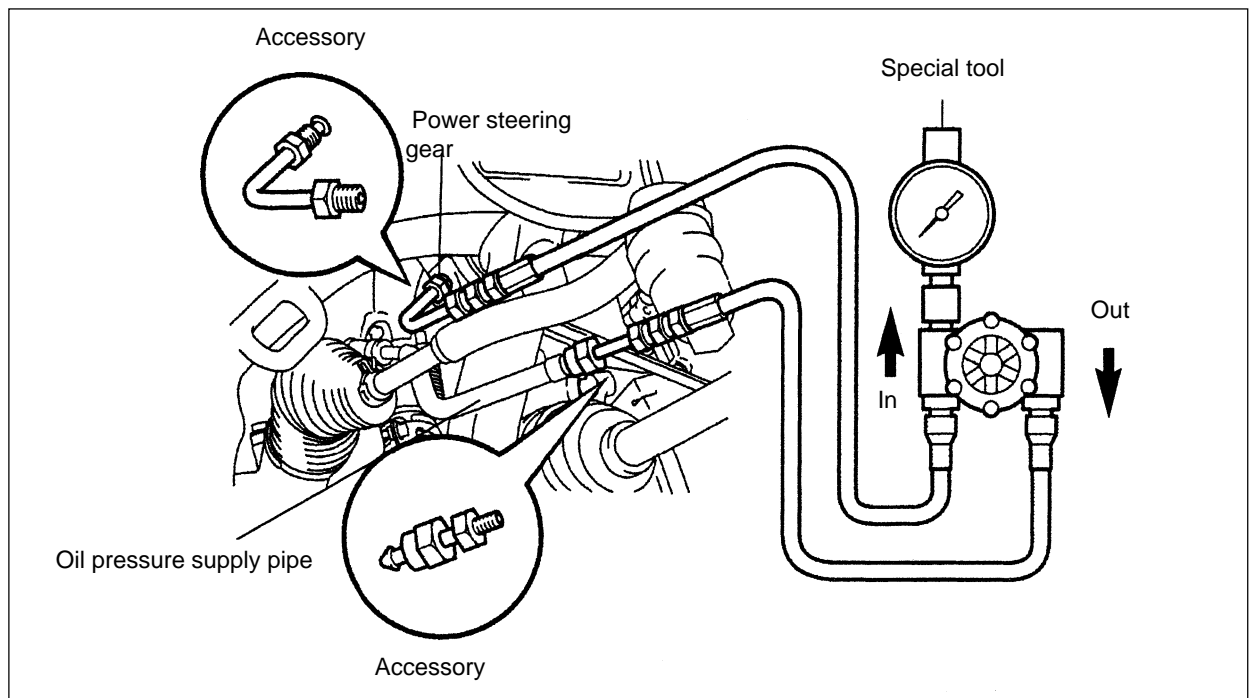
(b) Connect special tool liking that shown in figure.

Note: when checking, the valve of special tool should be opened.

(c) Exhaust the air in power steering system.

(d) Start the engine, and keep it at idling speed.

(e) Turn steering wheel from left bottom to right bottom for several times to make oil temperature



increase.

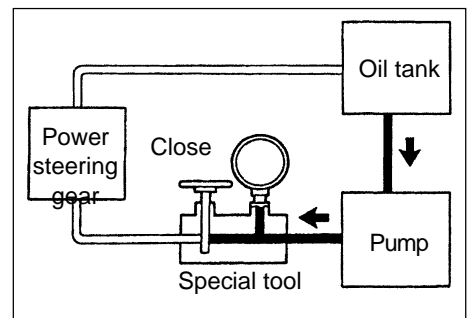
Oil temperature: 80°C

(f) Keep the engine at idling speed, and close the valve of special tool, then observe the reading of special tool.

Minimal oil pressure: 6400kPa

Note:

- The closing time of oil pressure meter valve could not

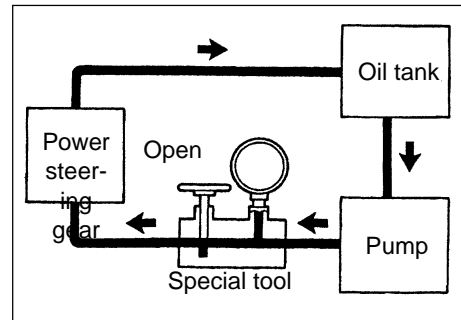


exceed 10 seconds.

- Do not make oil temperature become too high.
- (g) When engine is running at idling speed, open the valve completely.
- (h) Measure the 1.000 rpm and 3.000 rpm oil pressure of engine.

Oil pressure difference: 490 kPa or less

Note: do not turn the steering wheel.

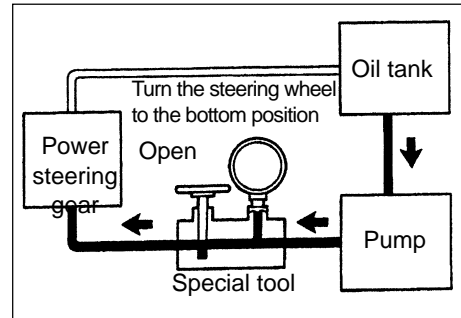


- (i) When engine is running at idling speed, open the valve completely, and turn the steering wheel to bottom.

Minimal oil pressure: 6,400kPa

Note:

- Do not keep the wheel locate at bottom for over 10 seconds.
 - Do not make oil temperature become too high.
- (j) Disassemble the special tool.
- (k) Connect oil pressure supply pipe with power steering gear (referring to page 205)
- (l) Exhaust the air in power steering system.



5. Check the steering force

- (a) Put the steering wheel at central position.
- (b) Disassemble safety airbag assembly at the side of driver.
- (c) Start engine, and make it run at idling speed.
- (d) Measure the steering force of two directions.

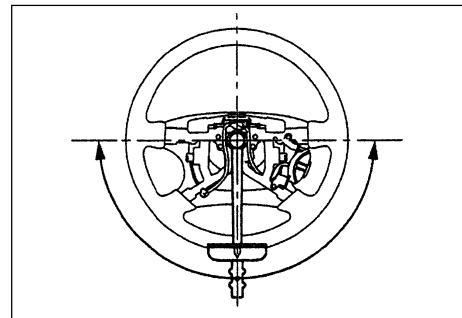
Steering force (reference): 5.5 N·m

Hint: before diagnosing, it is necessary to consider the tyre type, tyre pressure and contacting surface at first.

- (e) Tighten fixed screw cap of steering wheel.

Torque: 50 ± 5 N·m

- (f) Assemble the safety airbag assembly at the side of driver.



Power steering oil pump assembly

Overhaul

1. Disassemble front wheel

2. Disassemble right bottom defender board [68000004]

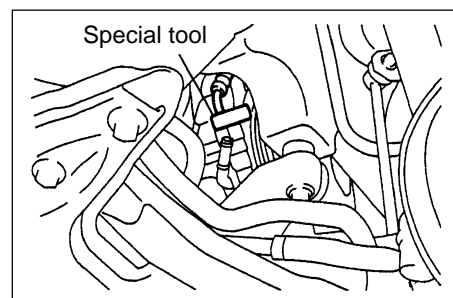
3. Disassemble driving belt.

4. Disassemble oil storage tank to the No. 1 oil pipe of power steering pump

Disassemble fixed clamp, and take down the oil storage tank to the No. 1 oil pipe of power steering pump.

5. Disassemble in-out oil pipe assembly of power steering gear [64000131]

- (a) Use special tool to disassemble in-out oil pipe assembly.
- (b) Disassemble the bolts and disconnect the fixed clamp of in-out oil pipe.

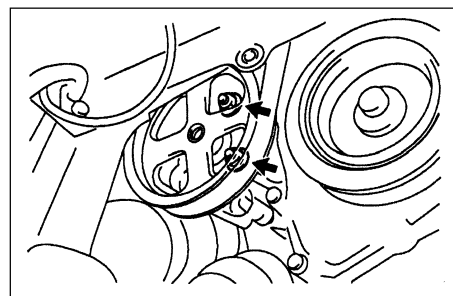


6. Disassemble rear bracket of power steering pump

Disassemble the bolt and rear bracket of power steering pump.

7. Disassemble power steering oil pump assembly [64000132]

- (a) Disconnect the joint of oil pressure switch.
- (b) Disassemble two bolts, two screw caps, then take down the power steering oil pump assembly.



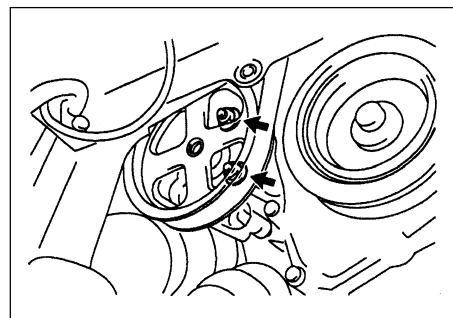
8. Assembly power steering oil pump assembly

- (a) Assemble power steering oil pump assembly with two bolts and two screw caps.

Torque: 37 N·m

- (b) Connect the joint of oil pressure switch.

Note: the joint could not contact any oil.



9. Assemble the rear bracket of power steering oil pump assembly

Assemble rear bracket of power steering oil pump assembly with bolts.

Torque: 37 N·m

Hint: Insure the stop lever of bracket has contacted the body of power steering pump, then tighten the bolt.

10. Connect the in-out oil pipe assembly of power steering gear [64000131]

- (a) Assemble fixed clamp of in-out oil pipe with bolt.

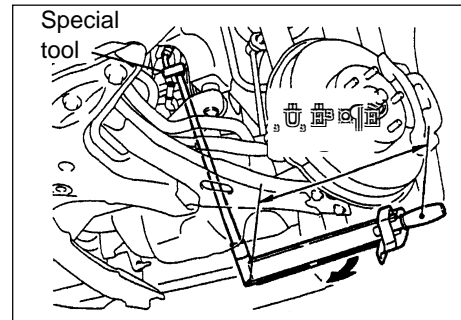
Torque: 7.8 N·m

- (b) Connect in-out oil pipe with special tool.

Torque: 41 N·m

Hint:

- Use torque wrench whose lever length is 345 mm.
- Special tool should be parallel with torque wrench, only this could make practical torque value.



11. Connect the NO. 1 oil pipe of oil storage tank to power steering oil pump assembly.

Connect oil pipe with fixed clamp.

12. Assemble driving belt.

13. Assemble front wheel.

Torque: 103 ± 10 N·m

14. Add power steering oil.

15. Exhaust the air in power steering system.

16. Check whether there is any oil leakage.

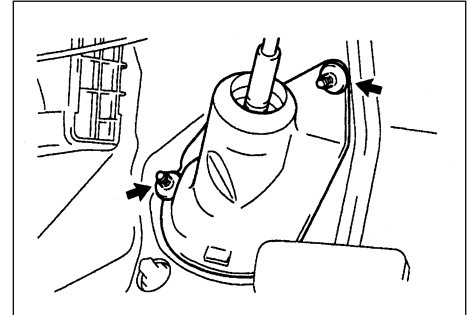
17. Assemble right bottom defender board of engine [68000004].

Power steering gear assembly

Overhaul

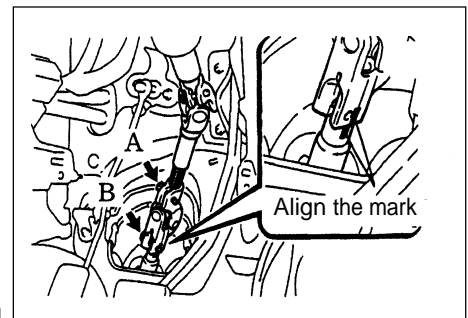
1. Make front wheel face the front
2. Disassemble safety airbag assembly at the side of driver (equipping with SRS) [6701011]
3. Disassemble steering wheel assembly [67010001].
4. Disassemble dust-proof cover in steering column [64000123].

Disassemble two screw caps, then take down the dust-proof cover.



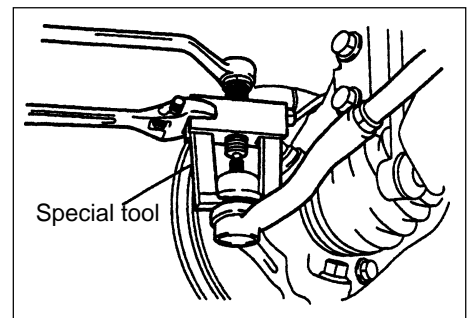
5. Disassemble steering sliding shaft assemble

- (a) Make mark on sliding yoke and steering middle shaft.
- (b) Loosen A bolt and disassemble B bolt, then disassemble sliding shaft.



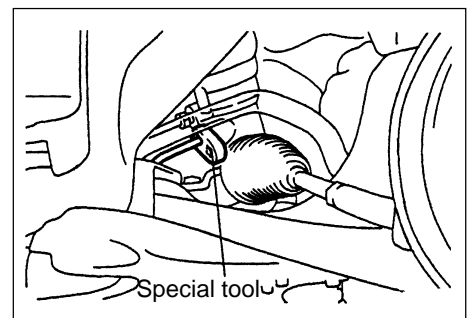
6. Disassemble front wheel
7. Disassemble right bottom defender board [68000004].
8. Disassemble left bottom defender board [68000003].
9. Disconnect left end terminal of transversal lever
 - (a) Disassemble cotter pin and screw cap.
 - (b) Use special tool to disassemble the left end terminal of transversal lever from steering knuckle.

Hint: disassemble the other with same method.
10. Disassemble right end terminal of transversal lever.

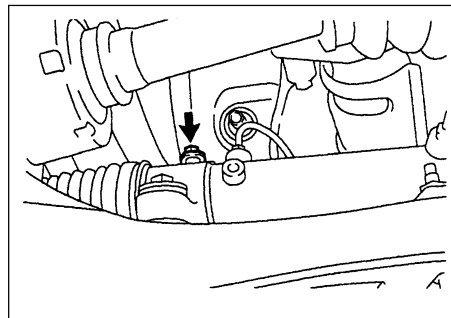


11. Disassemble in-out oil pipe assembly of power steering gear [64000131].

- (a) Use special tool to disassemble in-out oil pipe assembly of power steering gear.



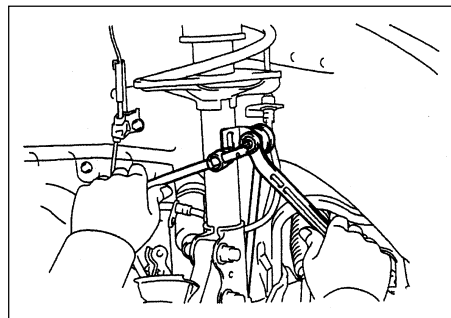
- (b) Disassemble the screw and disconnect the fixed clamp of in-out oil pipe assembly of power steering gear.



12. Disassemble linking lever assembly of front stabilizer bar [64000097].

- (a) Use socket head wrench (5mm) to fix bolt, then disassemble screw cap.
- (b) Disassemble the left linking lever of front stabilizer linking lever assembly.

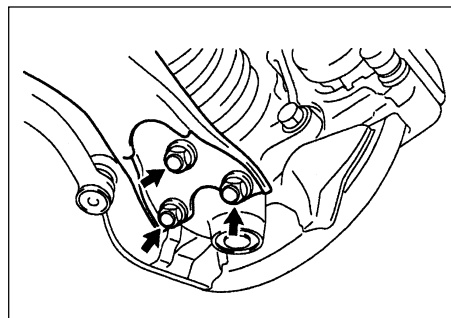
Hint: disassemble the other with same method.



13. Disassemble the coupling bolt and nut of left/right lower control arm ball head and control arm.

Disassemble one bolt and two nuts, and disassemble control arm from left steering knuckle.

Hint: disassemble the other with same method.

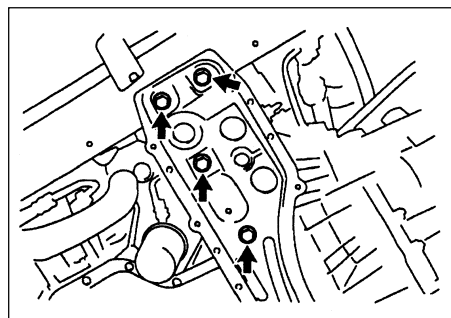


14. Disassemble engine cover assembly

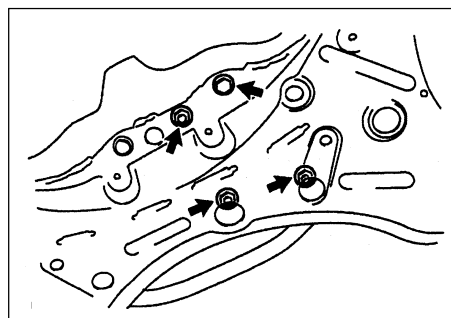
15. Support engine assembly.

16. Disassemble auxiliary automobile bracket assembly [64000087]

- (a) Disassemble two bolts, then disassemble side rail from right front engine suspension.
- (b) Disassemble two bolts, then disassemble carling from automobile body.



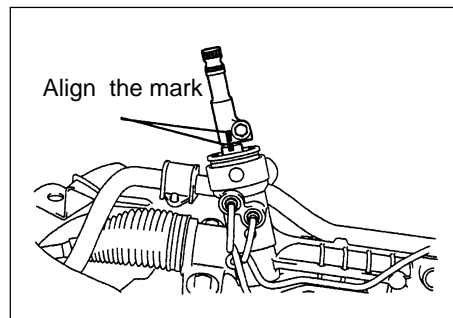
- (c) Disassemble the bolt and three nuts, then disassemble engine rear suspension from auxiliary automobile bracket.
- (d) Use gearbox jack to support auxiliary automobile bracket.
- (e) Disassemble four bolts and auxiliary automobile bracket assembly with steering gear.



17. Disassemble exterior dust-proof cover of steering column.

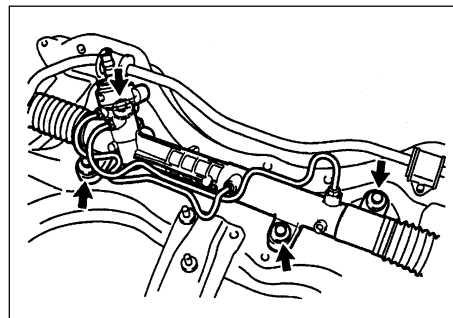
18. Disassemble steering middle shaft.

- (a) Make mark on middle shaft and steering small gear shaft.
- (b) Disassemble bolt and steering middle shaft.



19. Disassemble power steering gear assembly [64000133].

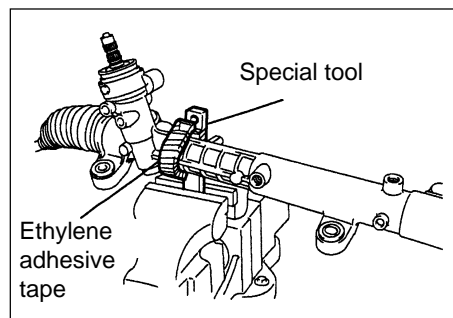
- (a) disassemble four bolts, and disassemble power steering gear from beam.



20. Fix power steering gear assembly [64000133].

- (a) Use special tool to insure power steering gearbox assembly is clamped on pliers.

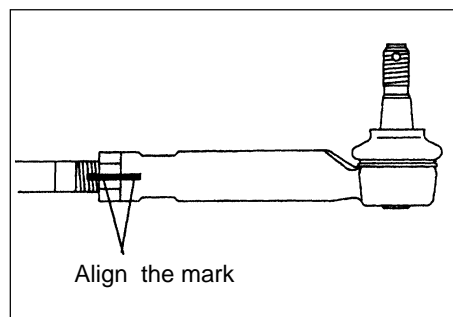
Hint: affix ethylene glue on special tool before using.



21. Disassemble left transversal lever ball head.

- (a) Make mark on transversal lever ball head and gear end.
- (b) Loosen fixed nut, then disassemble transversal lever ball head and fixed nut.

Hint: disassemble the other side with same method.

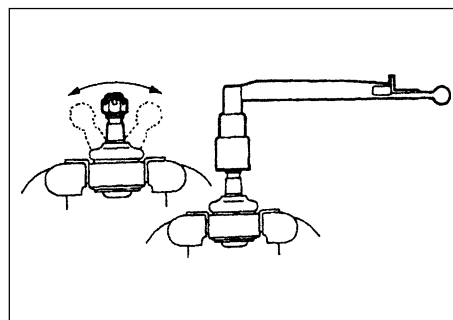


22. Disassemble right transversal lever ball head.

23. Check left transversal lever ball head.

- (a) Insure the left transversal lever ball head is clamped on pliers.
- (b) Assemble nut on bolt.
- (c) Shake the bolt of joint front and back for 4-5 times.
- (d) Use torque wrench to rotate screw cap continually at the speed of 2-4 s/r, then read the torque at fifth rotate.
Rotating torque: 0.49-3.43 N.m

Hint: check the other side with same method.



24. Check right transversal lever ball head.

25. Disassemble No.2 dust-proof cover of steering gear.

- (a) Use pliers to disassemble fixed clamp.
- (b) Use pliers to disassemble iron wire.

Note: do not hurt dust-proof cover.

Hint: make mark on RH and LH dust-proof cover.

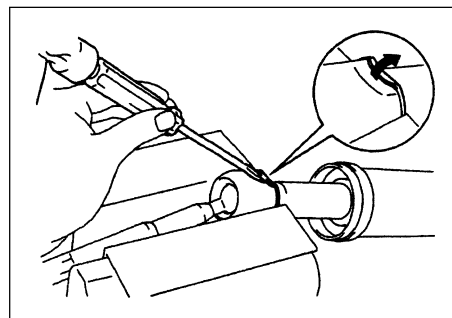
Hint: disassemble the other side with same method.

26. Disassemble No.1 dust-proof cover of steering gear.

27. Disassemble terminal lever of steering gear.

- (a) Use right-angled screwdriver and hammer to unclench claw gasket.

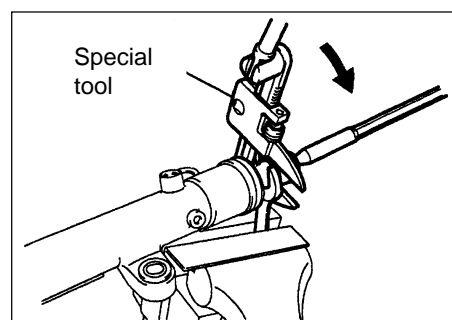
Note: avoid knocking steering gear.



- (b) Use wrench(22mm) to fix steering gear, then use special tool to disassemble gear terminal lever.

Note: use special tool by the direction in figure.

Hint: Make mark on RH and LH gear terminal lever.



28. Assemble the parts of steering gear terminal lever.

- (a) Assemble new claw gasket, and assemble gear terminal lever temporarily.

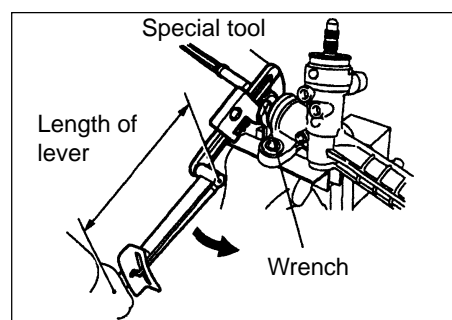
Hint: Align pliers claw of gasket with steering gear concave slot.

- (b) Use wrench to fix steering gear, and use special tool to tighten gear terminal lever.

Torque: 62 N·m

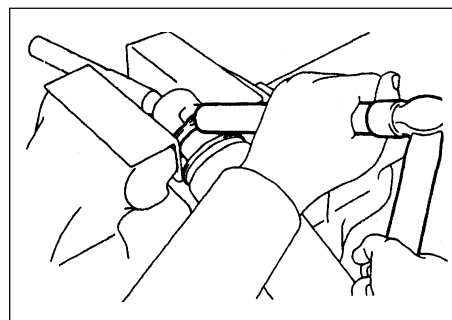
Note: use special tool by the direction in figure.

Hint: use torque wrench whose lever length is 380mm.



- (c) Use copper stick and hammer to concave gasket.

Note: do not hurt the steering gear.



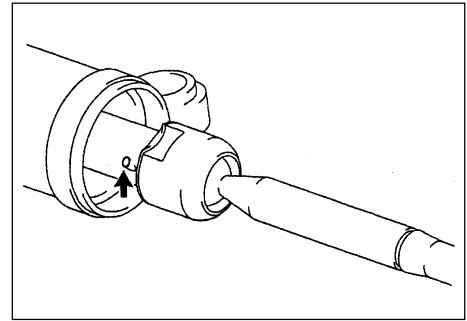
29. Assemble steering No.2 dust-proof cover.

- (a) Insure steering gear hole is not plugged by lubricating grease.

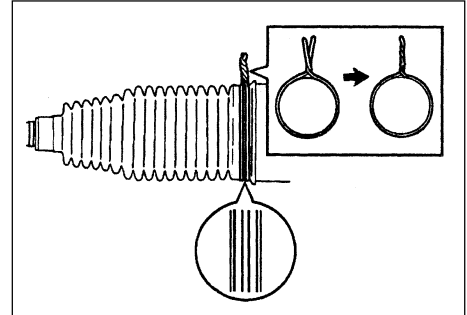
Hint: if hole is plugged, the pressure in dust-proof cover when steering wheel turns after combining will change.

- (b) Assemble dust-proof cover, fixed clamp and new iron wire.

Note: do not hurt or bend dust-proof cover.

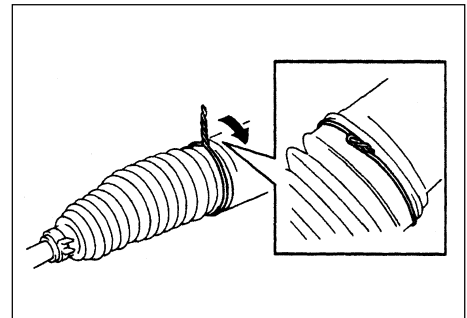


- (c) After coiling dust-proof cover with iron wire for two circles, turn it for several circles to fix it.



- (d) Liking that shown in figure, bend iron wire to rotating direction to prevent it from hurting dust-proof cover.

Hint: assemble the other side with same method.



30. Assemble No.1 dust-proof cover of steering gear.

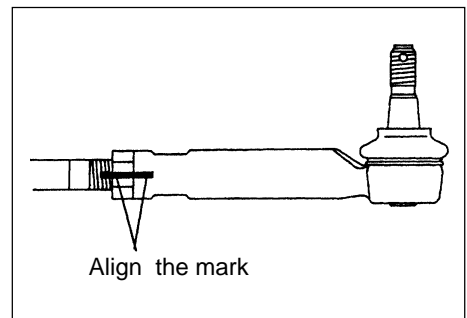
31. Assemble left ball head of transversal lever .

- (a) Screw locking cap and transversal lever ball head in gear terminal lever until aligning the mark.

- (b) After adjusting front wiring harness, tighten the screw cap (referring to page 80).

Torque: $74 \pm 5 \text{ N}\cdot\text{m}$

Hint: assemble the other side with same method.

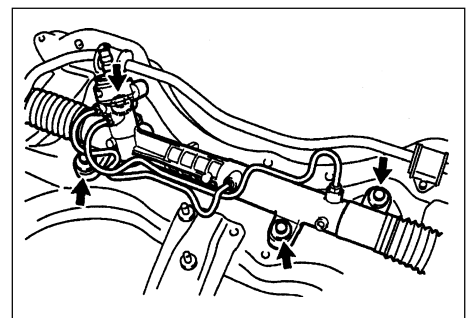


32. Assemble right ball head of transversal lever .

33. Assemble power steering gear assembly [64000133].

- (a) Assemble power steering gear assembly on beam with four bolts.

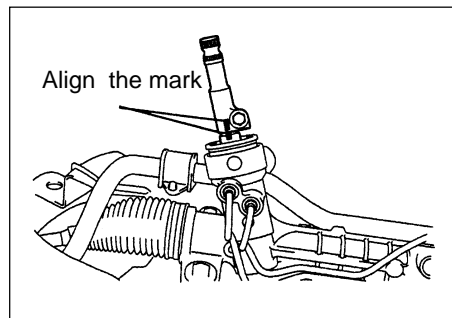
Torque: $58 \text{ N}\cdot\text{m}$



34. Assemble steering middle shaft.

- Align the mark of steering middle shaft and steering small gear shaft.
- Assemble the bolt.

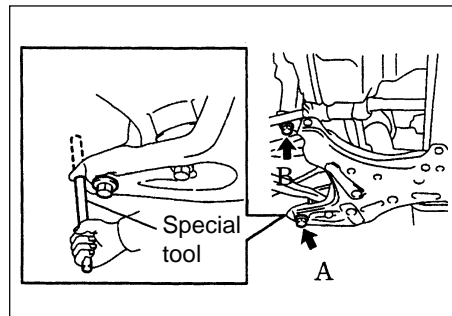
Torque: 35 N·m



35. Assemble exterior dustproof cover of steering column.

36. Assemble auxiliary bracket assembly (64000087).

- Use special tool to align the right side of auxiliary bracket with the hole of body, then lock the A bolt and B bolt temporarily.



- Use special tool to align the left side of auxiliary bracket with the hole of body, then lock the A bolt and B bolt temporarily.

- Use special tool to align the left side of auxiliary bracket with the hole of body, then lock the A bolt and B bolt.

Torque:

A bolt: 157 ± 10 N·m

B bolt: 113 ± 10 N·m

- Use special tool to align the right side of auxiliary bracket with the hole of body, then lock the A bolt and B bolt.

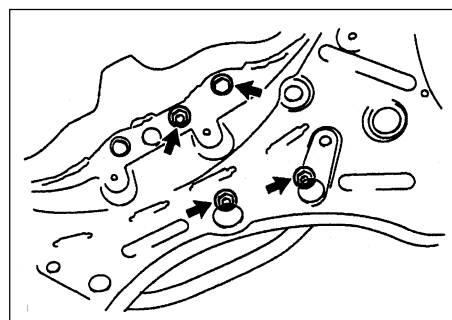
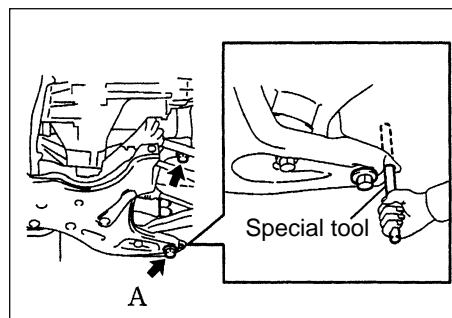
Torque:

A bolt: 157 ± 10 N·m

B bolt: 113 ± 10 N·m

- After connecting with engine with one bolt and three screw caps, hang it to auxiliary bracket.

Torque: 52 N.m ± 5 N·m

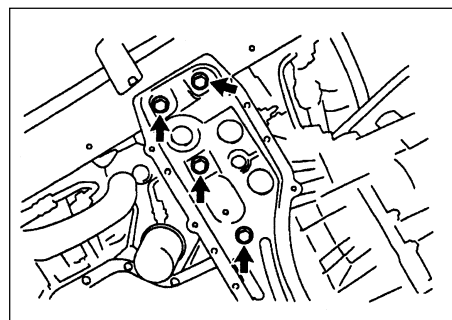


- Assemble carling to body with two bolts.

Torque: 39 ± 3 N·m

- Assemble the front suspension of engine to carling with two screw caps.

Torque: 52 ± 5 N·m

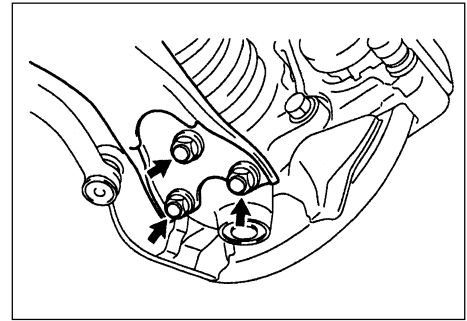


37. Connect the bolts and nuts of left/right control arm and control arm ball head.

Torque: 142 ± 10 N·m

Hint: connect the other side with same method.

Connect left lower control arm to steering knuckle with bolt and two nuts.

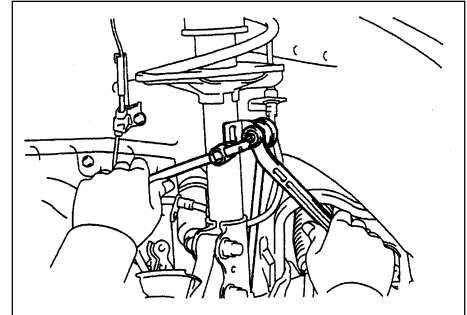


38. Connect linking lever assembly of left/right front stabilizer bar [64000097].

Use socket head wrench (5mm) to fix bolt, then connect stabilizer linking lever with screw cap.

Torque: 74 ± 5 N·m

Hint: connect the other side with same method.

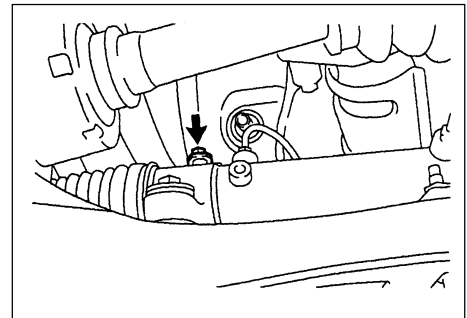


39. Connect the in-out oil pipe assembly of power steering gear [64000131].

(a) Connect the in-out oil pipe fixed clamp of power steering gear with bolt.

Torque: 7.8 N·m

(b) Use special tool to connect the in-out oil pipe assembly of power steering gear.

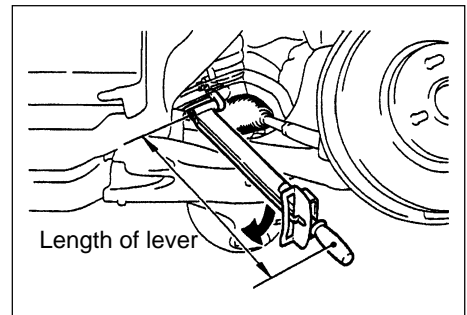


Torque: 41 N·m

Hint:

- Use the torque wrench whose lever length is 345mm.
- Special tool should be parallel with torque wrench, only this could make practical torque value.

Hint: connect the other side with same method.



40. Connect the ball head at the left side of transversal lever.

(a) Connect the ball head at the left side of transversal lever with screw cap.

Torque: 49 ± 5 N·m

(b) Assemble new cotter pin.

Note: if cotter pin hole could not be aligned, tighten the screw cap for 60 again.

Hint: connect the other side with same method.

41. Connect the ball head at the right side of transversal lever .

42. Assemble right bottom defending board of engine [68000004].

43. Assemble left bottom defending board of engine [68000003].

44. Assemble front wheel

Torque: 103 ± 10 N·m

45. Connect steering slide shaft assembly.

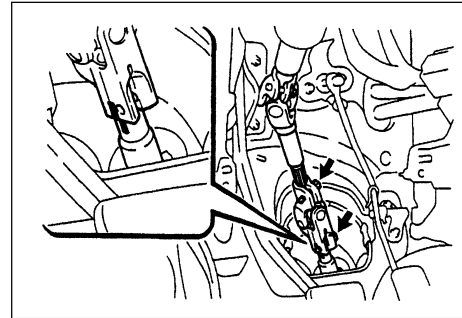
(a) Align the mark between steering middle shaft and sliding shaft.

(b) Assemble B bolt.

Torque: 35 ± 3 N·m

(c) Tighten the A bolt.

Torque: 35 ± 3 N·m



46. Assemble inner dustproof cover of steering column [64000123].

Assemble inner dustproof cover of steering column with two screw caps.

47. Make front wheel face the front

Hint: lift up front wheel shaft.

48. Assemble helix cable assembly (equipping with SRS).

49. Assemble steering wheel assembly [67010001].

(a) Align the mark between steering wheel and main shaft of steering column.

(b) Lock the fixed screw cap of steering wheel temporarily.

50. Add power steering oil (referring to page 200).

51. Exhaust the air in power steering system (referring to page 200).

52. Check the central point of steering wheel.

(a) Check the central point of steering wheel.

(b) Lock the fixed screw cap of steering wheel.

Torque: $50 \pm$ N·m

53. Assemble safety airbag assembly at the side of driver (equipping with SRS) [67010011].

54. Check whether there is oil leakage.

55. Check the engine cover assembly.

56. Adjust the engine cover assembly.

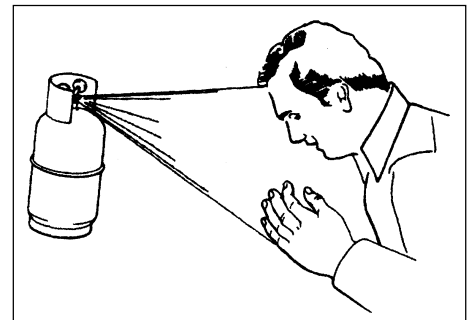
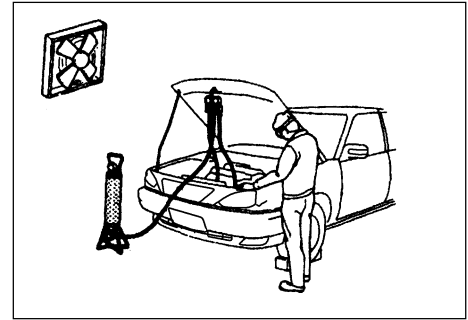
57. Check and adjust the front wheel alignment (referring to page 87).

Air conditioner

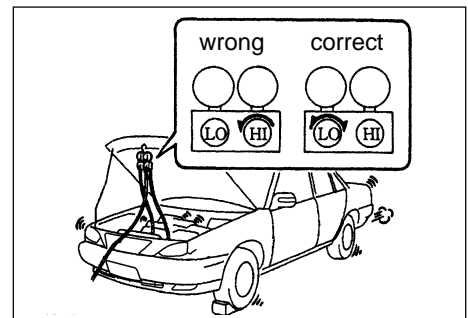
Air conditioning system

Note

1. Do not dispose Refrigerant in sealed space or near flame.
2. Wear glasses to protect your eyes.
3. Do not let liquid Refrigerant contact with your eyes or skin.
If liquid Refrigerant contacts with your eyes or skin:
(a) Wash the contacted part with much water.
Warning: do not knead your eyes or skin.
(b) Spread clean Vaseline on your skin.
(c) Go to doctor or hospital for special cure.
4. Forbid heating it or making it expose the flame.
5. Forbid dropping the Refrigerant tank or shake it intensively.



6. Do not operate compressor when Refrigerant is lack.
If the Refrigerant in cooling system is lack, it will incur compressor burned out for lacking lubrication. So it is necessary to avoid.
7. Do not open the high pressure valve of filling instrument package when compressor is working.



If opening the valve at this time, Refrigerant will flow back into refrigerant tank to incur the tank will break. So only the low pressure valve could be opened or closed.

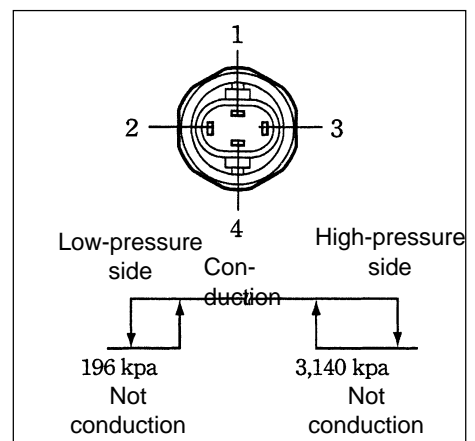
8. Do not fill Refrigerant too much.

Too much refrigerant will make many problems such as lack cooling degree, oil consumption, too hot engine and so on.

Inspection on automobile

1. Check the No.1 pressure switch.

- (a) Control for electromagnetic clutch:
Check the function of pressure switch.
(1) Assembly filling instrument package.
(2) Connect the anode lead of OUM meter to No. 4 terminal and connect cathode lead to No. 1 terminal.
(3) Liking that shown in figure. When refrigerant pressure is changed, check the conduction between terminals.



If the function does not accord with the regulation, it is necessary to change pressure switch.

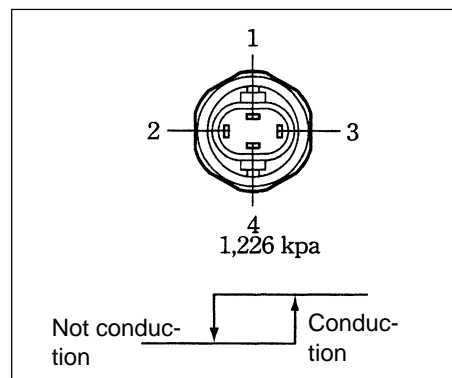
(b) Control for cooling fan:

Check the function of pressure switch.

(1) Connect the anode lead of OUM meter to No. 2 terminal and connect cathode lead to No. 3 terminal.

(2) Liking that shown in left figure. When refrigerant pressure is changed, check the conduction between terminals.

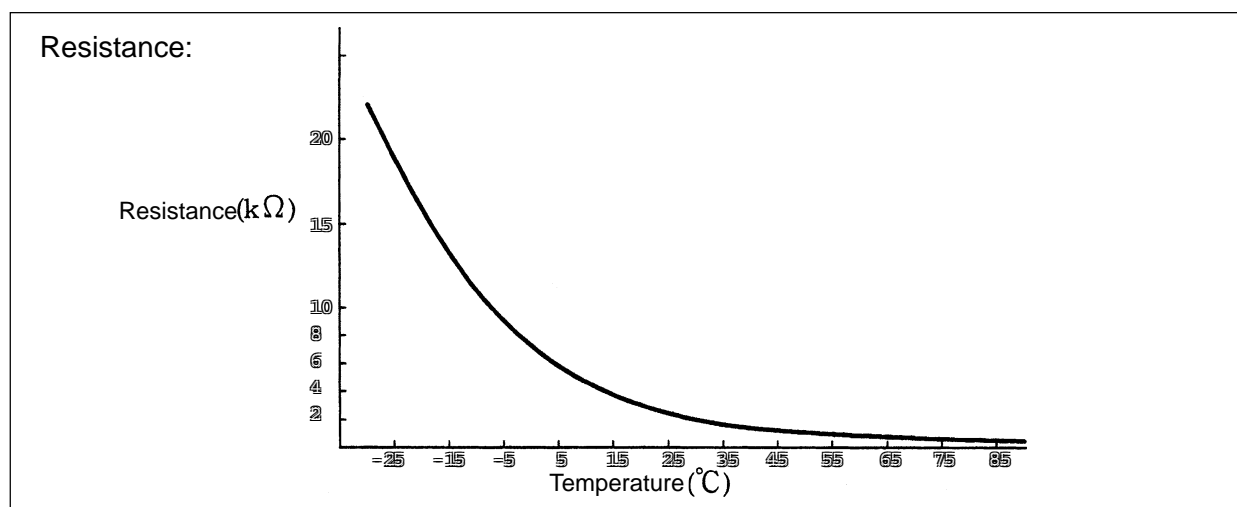
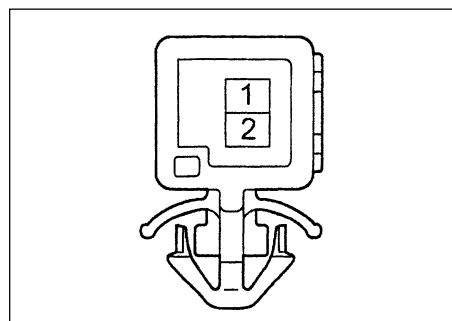
If the function does not accord with the regulation, it is necessary to change pressure switch.



Inspection

1. No.1 thermal resistor

(a) Check the resistance between No.1 terminal and No.2 terminal of No.1 heat sensitive resistance at different temperatures, liking that shown in figure.



If resistance does not accord with the regulation, it is necessary to change heat sensitive resistance.

Refrigerant

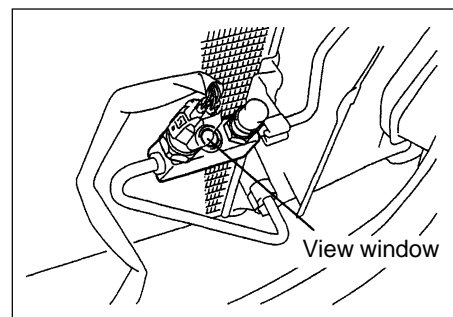
Inspection on automobile

1. Inspection of refrigerant quantity

Observe the visible window on high pressure liquid pipe.

Testing condition:

- ▣ Engine runs at the speed of about 1500 rpm.
- ▣ Fan speed is controlled at “HI” position.
- ▣ A/C switch turns to ON.
- ▣ Temperature control turns to “MAX. COOL” position.
- ▣ Automobile doors are opened.



Item	Phenomenon	Refrigerant quantity	Verify
1	There is air bubble on window.	Lack	(1)Use leakage measurer to check whether there is any leakage, if necessary, repair it. (2)Add refrigerant until air bubble disappears.
2	There is no air bubble on window.	Without, full or too full	Referring to item 3 and 4.
3	There is no temperature difference on outlet and inlet of compressor	Without or little	(1)Use leakage measurer to check whether there is any leakage, if necessary, repair it. (2)Add refrigerant until air bubble disappears.
4	There is obvious temperature difference on outlet and enter of compressor.	Applicable or too much	Referring to item 5 and 6.
5	Window becomes clear after air conditioner is closed.	Too much	(1)Reclaim refrigerant. (2)Exhaust air and supply applicable clean refrigerant.
6	After air conditioner is closed, refrigerant makes bubble, then becomes clear.	Applicable	-

*When environment temperature is normal and refrigerant is enough, it is normal when there is no bubble in window.

2. Use filling instrument package to check the refrigerant pressure.

This is a type to use filling pressure meter to check the malfunction position. In following situations, read the meter.

Testing condition:

- Switch is set up at inner air cycle, and the inlet temperature is 30-50°C.
- Engine runs at the speed of 1500 rpm.
- Set up the speed control switch of fan at “HI” position.
- Temperature control switch is set up at “COOL” position.
- A/C switch turns to “ON”.
- Automobile door is opened completely.

Hint: please pay attention to that the show of meter might change little for environment temperature changes.

(1) Refrigerant system with normal function.

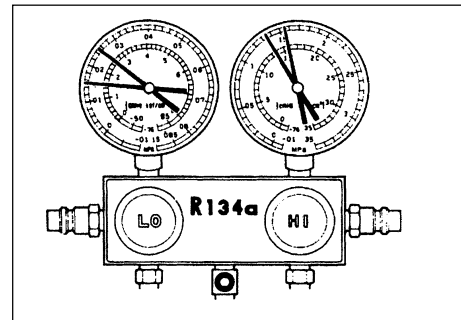
Meter reading

Low pressure end:

0.15-0.25Mpa

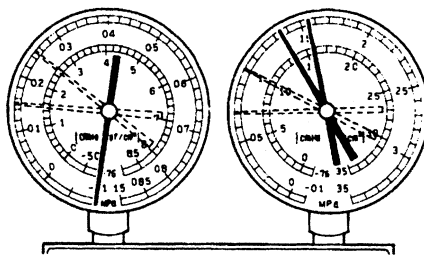
High pressure end:

1.37-1.57Mpa



(2) Water in cooling system.

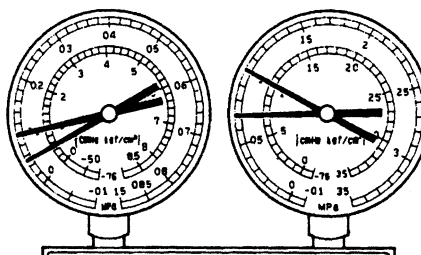
Situation: too cold periodically, then lose cooling degree.



Phenomenon	Possible reason	Diagnose	Method
When cooling system is working, the pressure in low pressure end changes to vacuum or normal periodically.	Water vapor enters refrigerant system, and freezes on the expansion valve, the system stops cycle in short time, when ice melts, it returns to normal again.	<ul style="list-style-type: none"> Dryer locates at full humidity state. Water vapor of refrigerant freezes on the outlet orifice of expansion valve to obstacle freezing cycle. 	(1)Change the condenser. (2)Remove water in pipeline with method of taking out vacuum repeatedly. (3)Fill applicable new refrigerant.

(3) Lack refrigerant

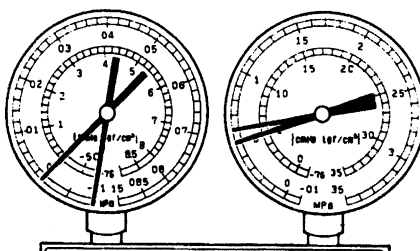
State: lack refrigerant



Phenomenon	Possible reason	Diagnose	Method
<ul style="list-style-type: none"> The pressure of high and low pressure end is low. There is air bubble on window. Refrigerant leaks. 	Some part of refrigerant system leaks.	<ul style="list-style-type: none"> Refrigerant in system lacks. Cooling degree is not enough. 	(1)Check it with leakage measurer, if necessary, repair it. (2)Fill refrigerant to applicable quantity. (3)If meter pressure reading is 0, after checking and repairing leaking position, take out vacuum.

(4) Refrigerant cycle is poor

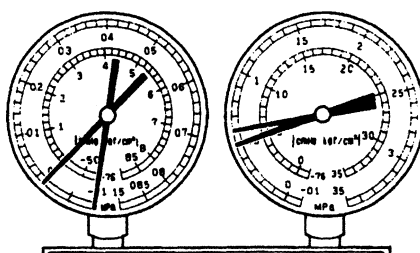
State: cooling degree is not enough



Phenomenon	Possible reason	Diagnose	Method
<ul style="list-style-type: none"> The pressure of high and low pressure end is low. The pipeline from condenser to expansion valve frosts. 	<ul style="list-style-type: none"> Refrigerant flow in adjuster is obstructed by impurity. 	<ul style="list-style-type: none"> Adjuster is obstructed. 	<ul style="list-style-type: none"> Change the condenser.

(5) Refrigerant does not have any cycle.

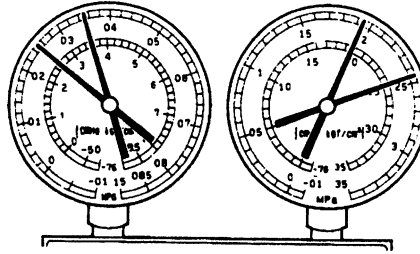
State: not cool (sometime cool)



Phenomenon	Possible reason	Diagnose	Method
<ul style="list-style-type: none"> Low pressure side is vacuum, and pressure at high pressure side is low. The pipeline of front and rear end of expansion valve or adjuster frosts or dews. 	<ul style="list-style-type: none"> Refrigerant flow in cooling system is obstructed by water vapor or dust. Refrigerant flow is obstructed by expansion valve. 	Refrigerant does not flow.	<ol style="list-style-type: none"> (1)Check the expansion valve. (2)Remove the dirt in expansion valve with high pressure air. (3)Change condenser. (4)Take out vacuum and fill applicable refrigerant. (5)If this is caused by expansion valve leakage, change the valve.

(6) Refrigerant is too much or the radiating fin of condenser is bad

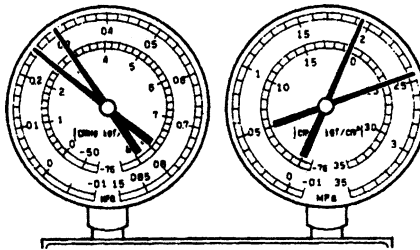
State: cooling degree is not enough.



Phenomenon	Possible reason	Diagnose	Method
<ul style="list-style-type: none"> The pressure of high and low pressure end is high. There is no bubble on window when engine speed decreases. 	<ul style="list-style-type: none"> Too much refrigerant in system incurs this. Heat dispersion of condenser is bad. 	<ul style="list-style-type: none"> Filled refrigerant is too much. Heat dispersion of condenser is bad. If heat dispersion sheet of condenser is obstructed or fan engine has malfunction. 	(1) Clean the condenser. (2) Check the function of cooling fan. (3) If those two items above are normal, check the refrigerant quantity. Fill applicable refrigerant.

(7) Air enters cooling system

State: cooling degree is not enough.

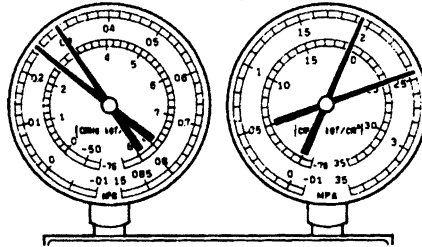


Note: if cooling system is opened, and it does not take out vacuum when filling refrigerant, this state will happen.

Phenomenon	Possible reason	Diagnose	Method
<ul style="list-style-type: none"> The pressure of high and low pressure end is high. Pipeline of low pressure end is too hot to contact. There is bubble on window. 	Air enters cooling system.	<ul style="list-style-type: none"> There is air in cooling system. It does not take out vacuum completely. 	(1) Check whether the Refrigerant oil is too dirt or lack. (2) Take our vacuum and fill new refrigerant.

(8) Expansion valve is bad

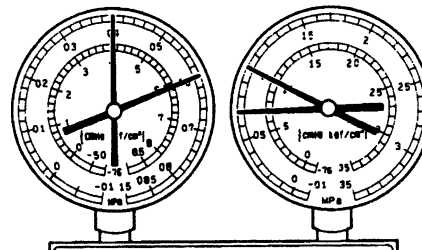
State: cooling degree is not enough



Phenomenon	Possible reason	Diagnose	Method
<ul style="list-style-type: none"> ● The pressure of high and low pressure end is high. ● Pipeline of low pressure end frosts or dews heavily. 	Expansion valve has malfunction.	<ul style="list-style-type: none"> ● Refrigerant in low pressure pipeline is too much. ● Open degree of expansion valve is too big. 	Check the expansion valve.

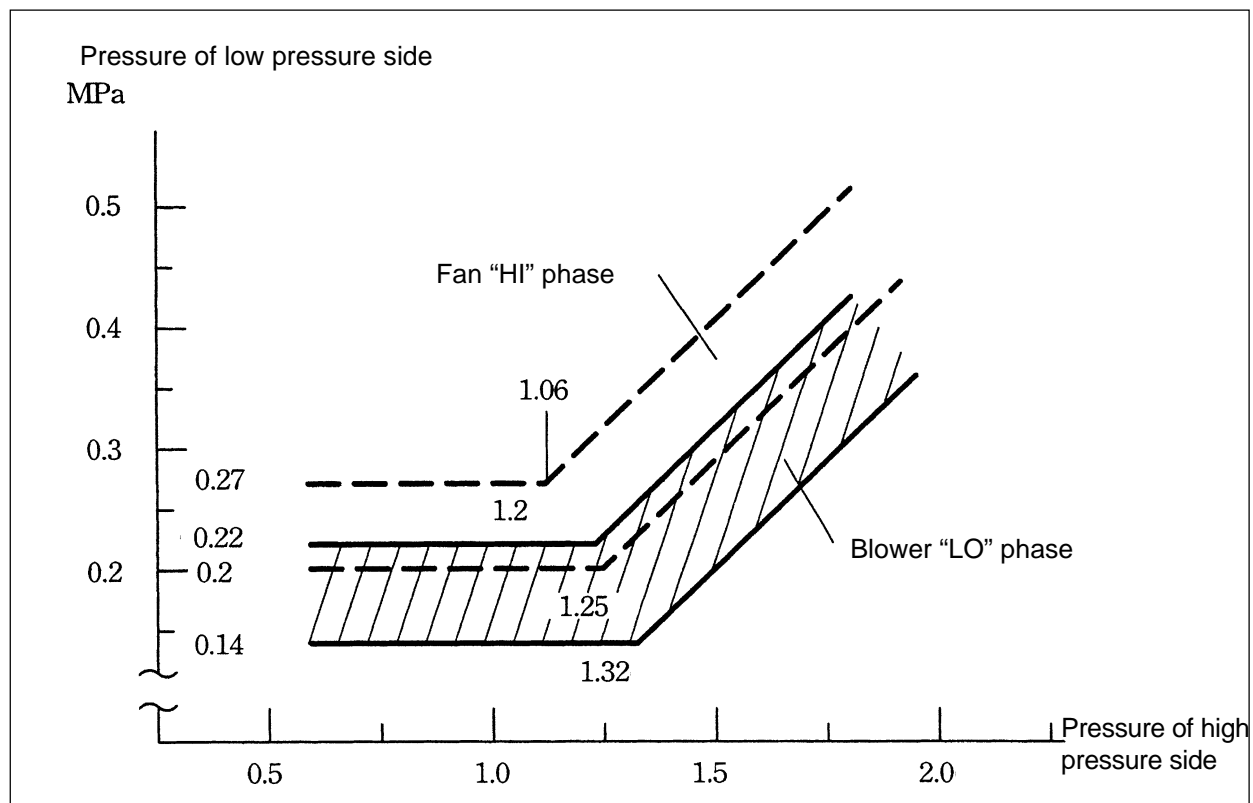
(9) Not cool

State: not cool



Phenomenon	Possible reason	Diagnose	Method
<ul style="list-style-type: none"> ● The pressure of low pressure end is too high. ● The pressure of high pressure end is too low. 	There is inner leakage in compressor.	<ul style="list-style-type: none"> ● Compressor is bad. ● Expansion valve leaks or sliding part is damaged. 	Repair or change the compressor.

Reading of filling meter (referred value)



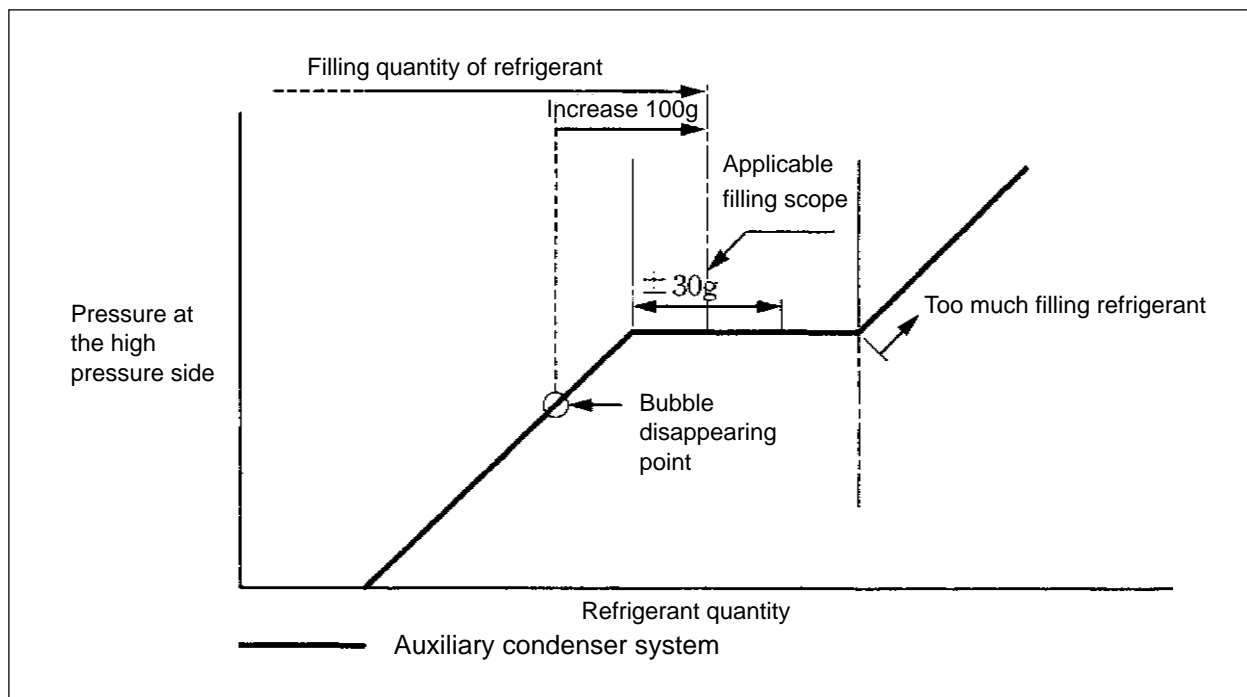
Change

1. Reclaim HFC-134a (R134a)

- Turn A/C switch to ON.
- Keep the engine speed at 1000 rpm, and rotate cooling compressor for 5 to 6 minutes to make refrigerant cycle, this could collect the Refrigerant oil in each part in cooling compressor as possible.
- Extinguish the engine.
- Drain the refrigerant.

2. Fill refrigerant

- Use vacuum pump to take out vacuum.
- Fill the refrigerant HFC-134a (R134a)
Standard quantity: $660 \pm 10\text{g}$

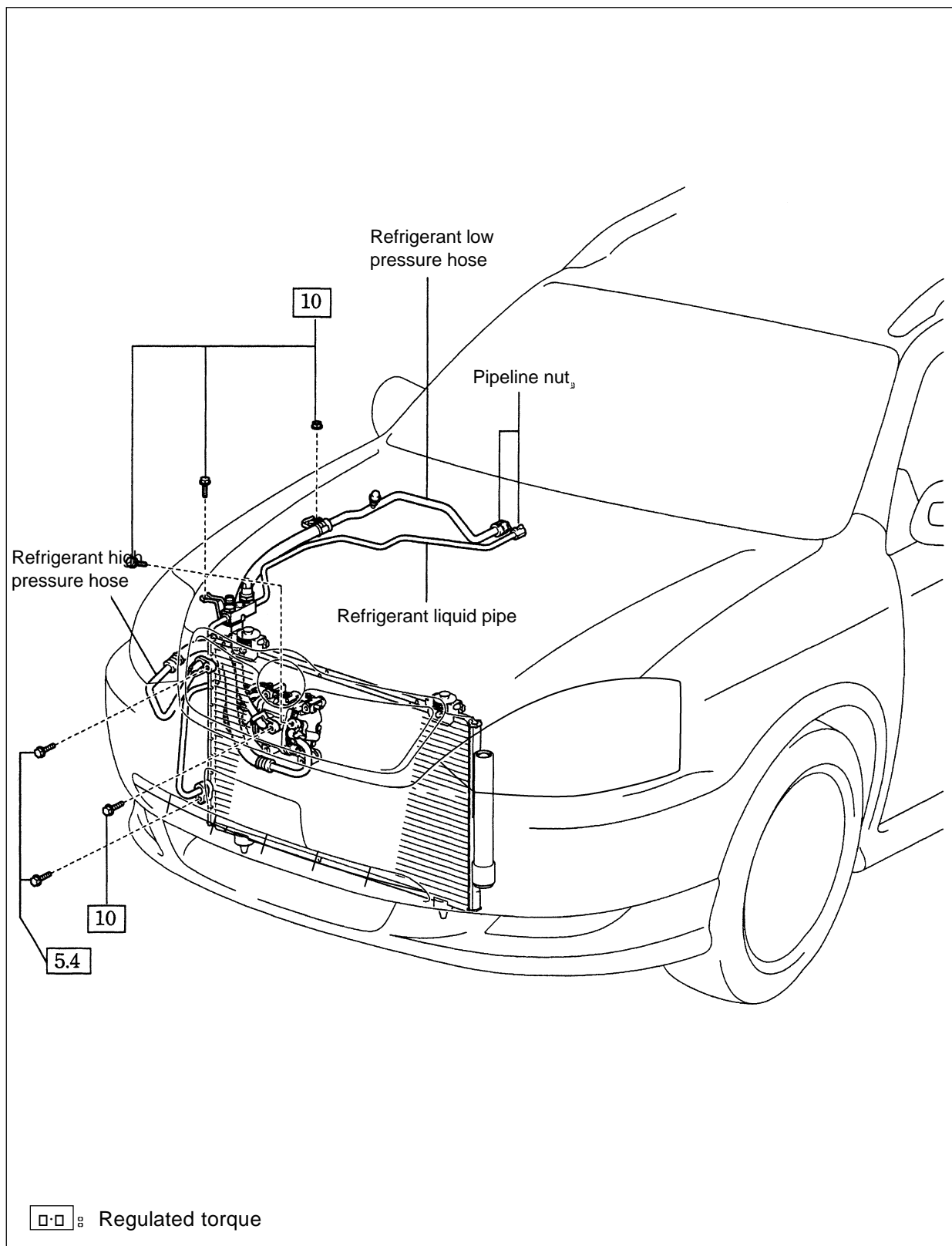


3. Heat the engine

4. Check whether the refrigerant leaks.

Refrigerant pipeline

Parts

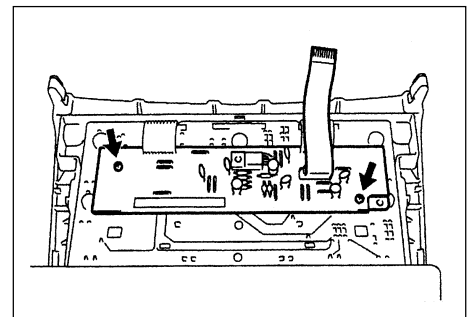
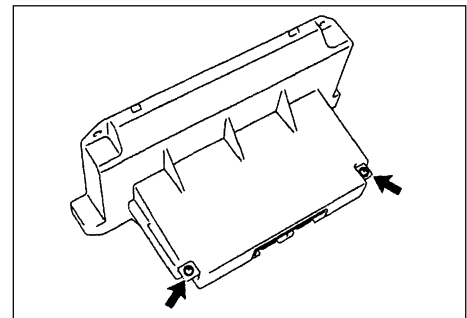
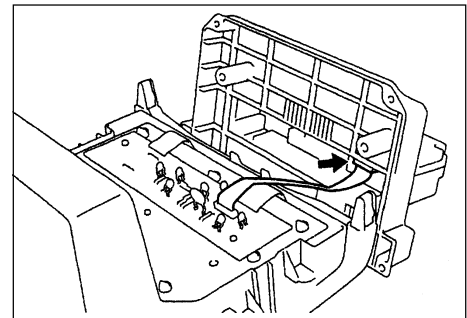
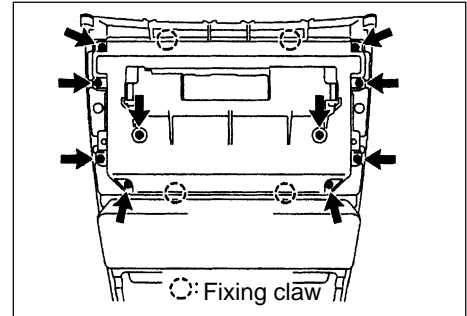


Control assembly, air conditioner control panel (AUTO A/C)

Overhaul

1. Disassemble central wind outlet trim board of panel.
2. Disassemble decoration panel assembly of shift organization. [68000076]
3. Disassemble central storage box.
4. Disassemble control panel assembly of air conditioner. [67000148]
5. Disassemble control assembly and control panel assembly of air conditioner.
 - (a) Disassemble ten screws.
 - (b) Disconnect four fixed claws and disassemble control assembly and control panel of air conditioner.
6. Disassemble control box of air conditioner.

Disconnect flat linking wire and disassemble control box of air conditioner.
7. Disassemble electric circuit board of air conditioner control module.
 - (a) Disassemble two screws.
 - (b) Disassemble electric circuit board from air conditioner control box.
8. Disassemble control panel wiring of air conditioner.
 - (a) Disassemble two screws.
 - (b) Disassemble control panel wiring of air conditioner from air conditioner control box.
9. Disassemble control box assembly of air conditioner.
10. Disassemble switch bulb of air conditioner control panel.
11. Disassemble control button assembly.
12. Disassemble NO.2 warm control button



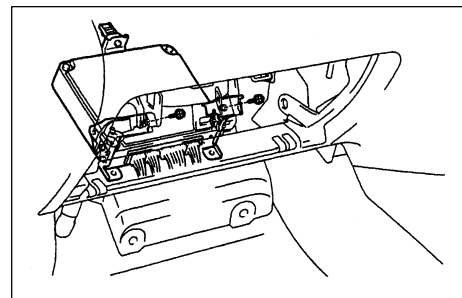
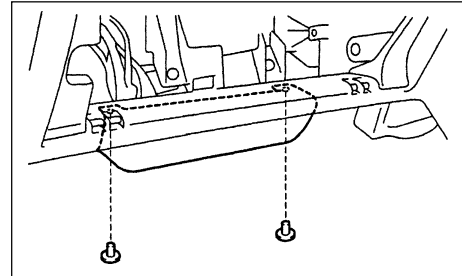
Fan assembly

Overhaul

1. Disassemble left/right front door pedal trim board.
2. Disassemble front lower inner trim board at the left/right side.
3. Disassemble storage box assembly at the right side of panel.
4. Disassemble engine ECU.

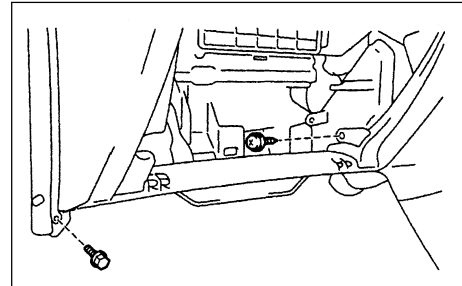
(a) Disassemble two fixed clamps and engine ECU cover.

(b) Disassemble two screws and disconnect engine ECU.

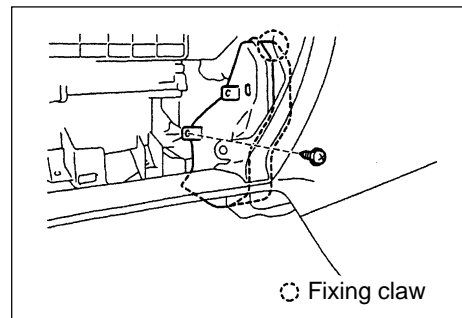


5. Disassemble panel assembly.

(a) Disassemble the bolts and screws from panel.



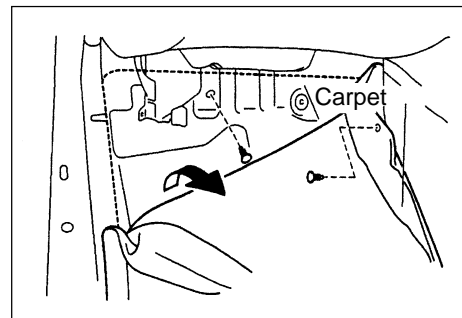
(b) Disassemble the screws and air conduct.



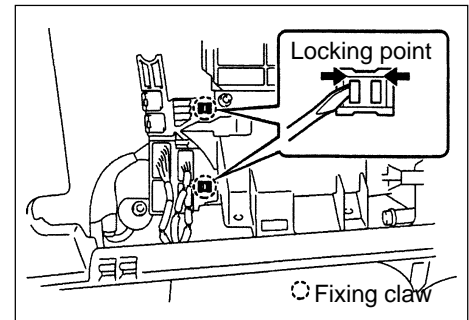
6. Disassemble fan assembly.

(a) Disassemble fixed clamp and turn over the carpet.

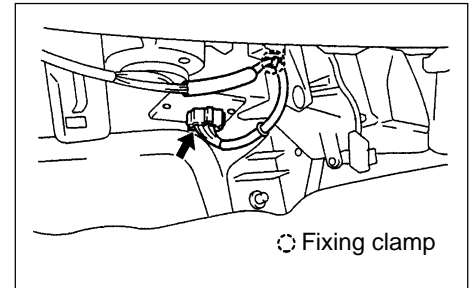
(b) Disassemble fixed claw and disconnect joint plug.



(c) Disconnect joint and fixed clamp.



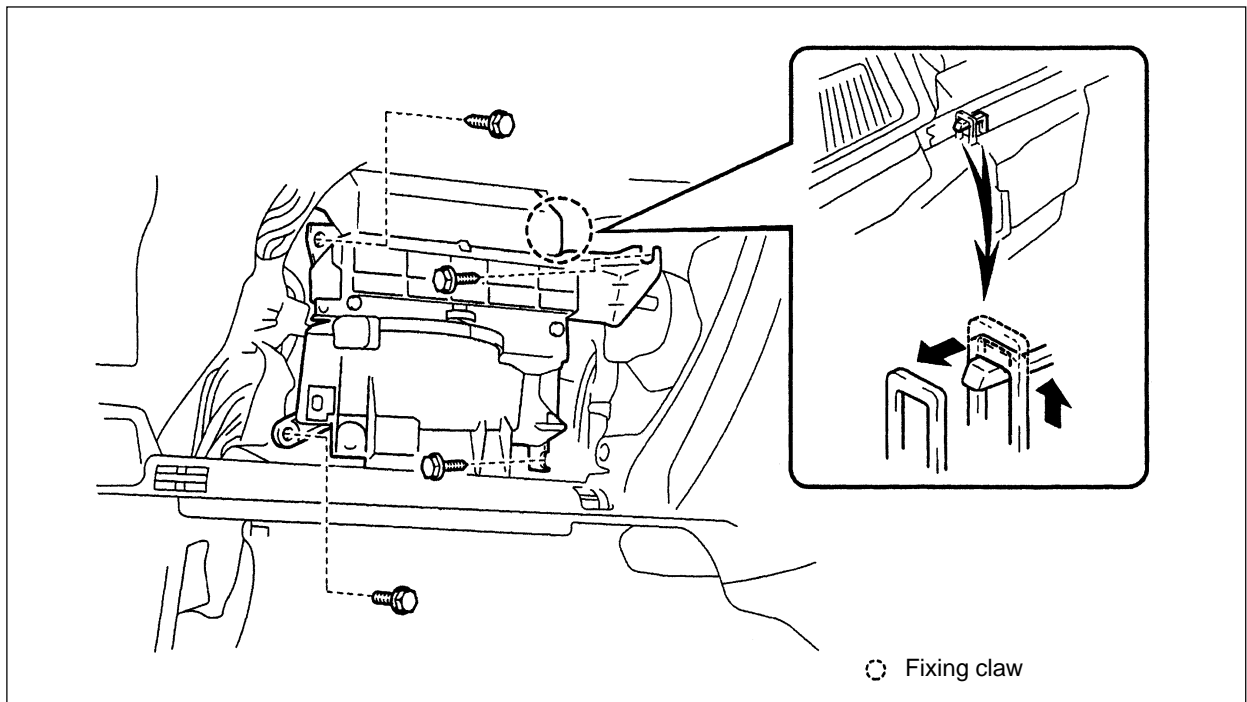
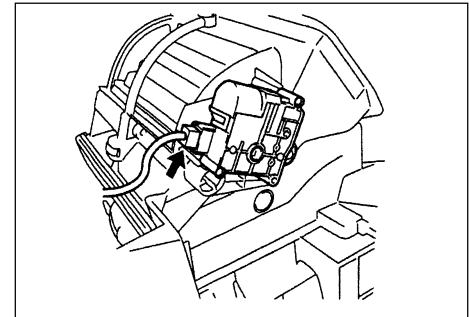
(d) Disassemble servo motor assembly joint of in-out air cycle flow choke.

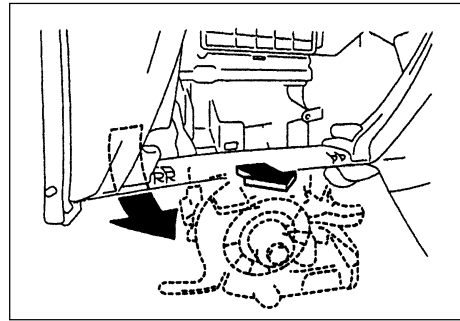


(e) Disassemble three screws and bolts.

(f) Disconnect fixed claw and disassemble electric engine of fan.

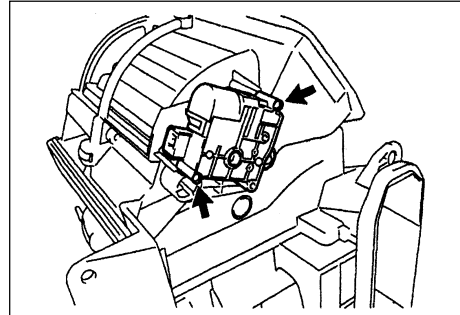
(g) Disassemble fan assembly.





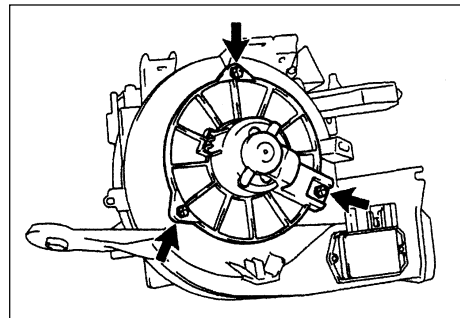
7. Disassemble servo motor assembly of indoor cycle flow choke.

Disassemble two screws and servo electric engine assembly of indoor cycle flow choke.



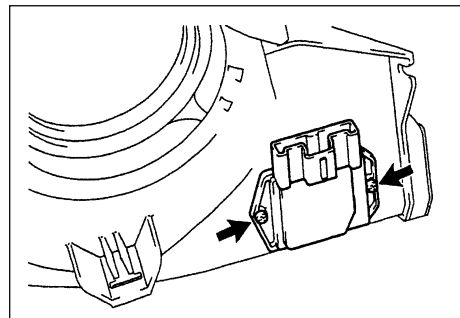
8. Disassemble fan motor assembly.

Disassemble three screws and fan electric engine assembly.



9. Disassemble fan motor control assembly (automatic air conditioner).

Disassemble two screws and fan electric engine control assembly.



Air conditioner central heating core assembly

Overhaul

1. Disassemble radiator cover.

2. Reclaim HFC-134a(R134a)

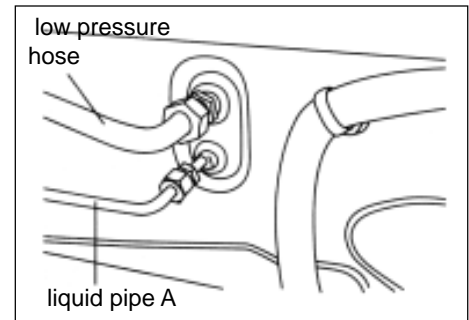
3. Disconnect refrigerant No.1 low pressure hose.

Note:

after disassembling the pipeline, it is necessary to cover the joint to prevent humidity or dust from entering in system.

4. Disconnect refrigerant liquid pipe A.

Hint: disconnect liquid pipe A with the method being same as No.1.

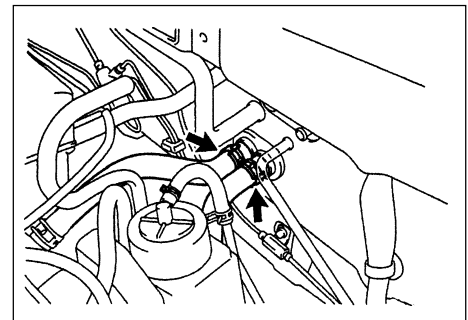


5. Disconnect water outlet hose of heating.

(a) Slide out fixed clamp and disassemble water outlet hose of heating.

6. Disconnect water intake hose of heating.

Slide out fixed clamp and disassemble water intake hose of heating.



7. Disassemble cathode wire of battery.

8. Make front wheels face the front.

9. Disassemble safety airbag assembly at the side of driver.

10. Disassemble steering wheel.

11. Disassemble combination instrument cover [68000077].

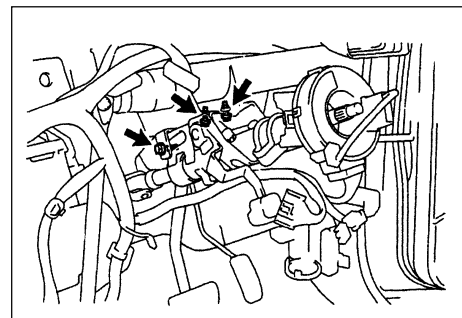
12. Disassemble combination instrument assembly [68000081].

13. Disassemble ventilation orifice assembly at the left side of panel [68010010].

14. Disassemble ventilation orifice assembly at the right side of panel [68010011].

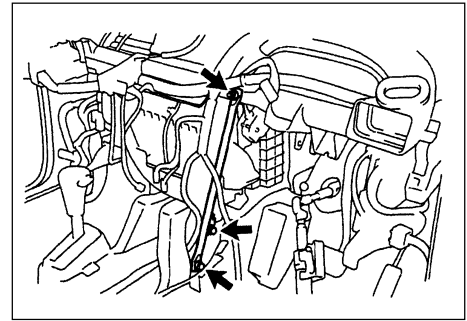
15. Disassemble central ventilation orifice assembly of panel [68010012].
16. Disassemble right storage box assembly of lower panel [68010008].
17. Disassemble inner trim board assembly of right front column [68010017].
18. Disassemble inner trim board assembly of left front column [68010014].
19. Disconnect the joint of safety airbag assembly at the side of passenger.
20. Disassemble upper panel assembly [6801004].
21. Disassemble upper/lower trim board of steering pipe [64000128/64000129].
22. Disassemble left combination switch assembly [67000078].
23. Disassemble right combination switch assembly [67000079].
24. Disassemble air spring assembly of right storage box [68000082].
25. Disassemble decoration panel assembly of shift organization [68000076].
26. Disassemble air conditioner control panel assembly [67000148].
27. Disassemble the assemble bracket of CD machine.
28. Disassemble ventilation pipe assembly of evaporator [67000149].
29. Disassemble air conditioner control assembly.
30. Disassemble parking brake lever hole cover.
31. Disassemble auxiliary panel assembly.
32. Disassemble step trim board of right front door [68010021].
33. Disassemble step trim board of left front door [68010020].
34. Disassemble lower inner trim board of right defender [68010016].
35. Disassemble lower inner trim board of left defender [68010015].
36. Disassemble central linking board of lower panel [68010006].
37. Disassemble lower panel assembly [68010005].
38. Disconnect steering column assembly [64000122].

- (a) Disassemble three bolts.
- (b) Disassemble steering column from panel framework body.



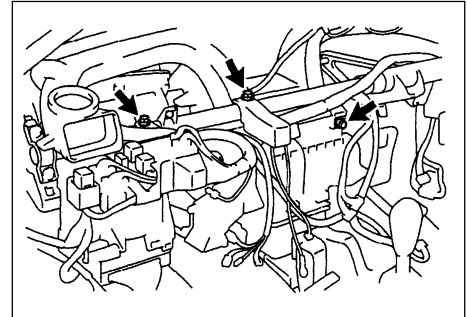
39. Disassemble lower mounting bracket of panel framework [68000074].

- (a) Disassemble the screw and disconnect wiring harness.
- (b) Disassemble the screw cap, bolt and lower assemble bracket of panel framework.



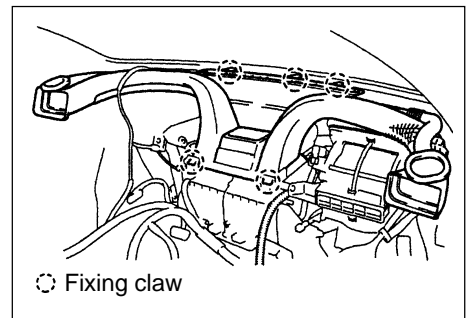
40. Disassemble panel framework body assembly [68000070].

- (a) Disassemble three bolts and disconnect panel junction box and joint fixed plug.
- (b) Release fixed clamp from panel framework body and disconnect the wiring harness.
- (c) Disassemble five bolts and panel framework body assembly.



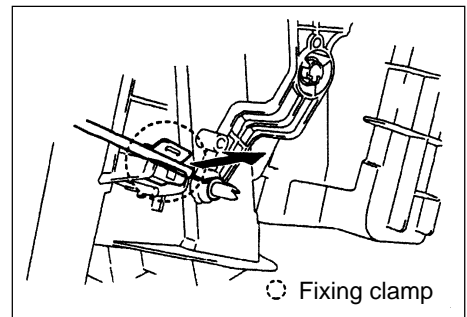
41. Disassemble wind outlet of Defogger.

Release five fixed claws and disassemble wind outlet of defogger



42. Disassemble control cable assembly of air mixing flow choke (manual air conditioner).

- (a) Disassemble pull cable from fixed clamp.
- (b) Disassemble control cable of air mixing flow choke.

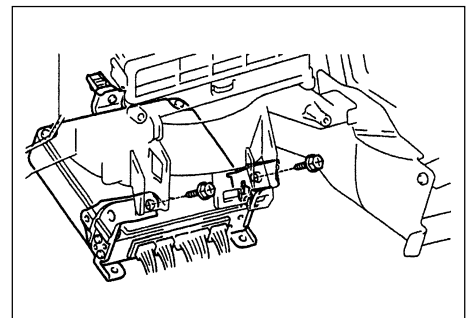


43. Disassemble engine ECU.

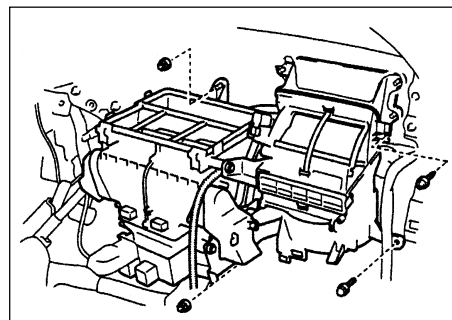
Disassemble two bolts and disconnect engine ECU.

44. Disassemble air conditioner group assembly.

Disassemble two screw caps, screws, bolts and air condi-

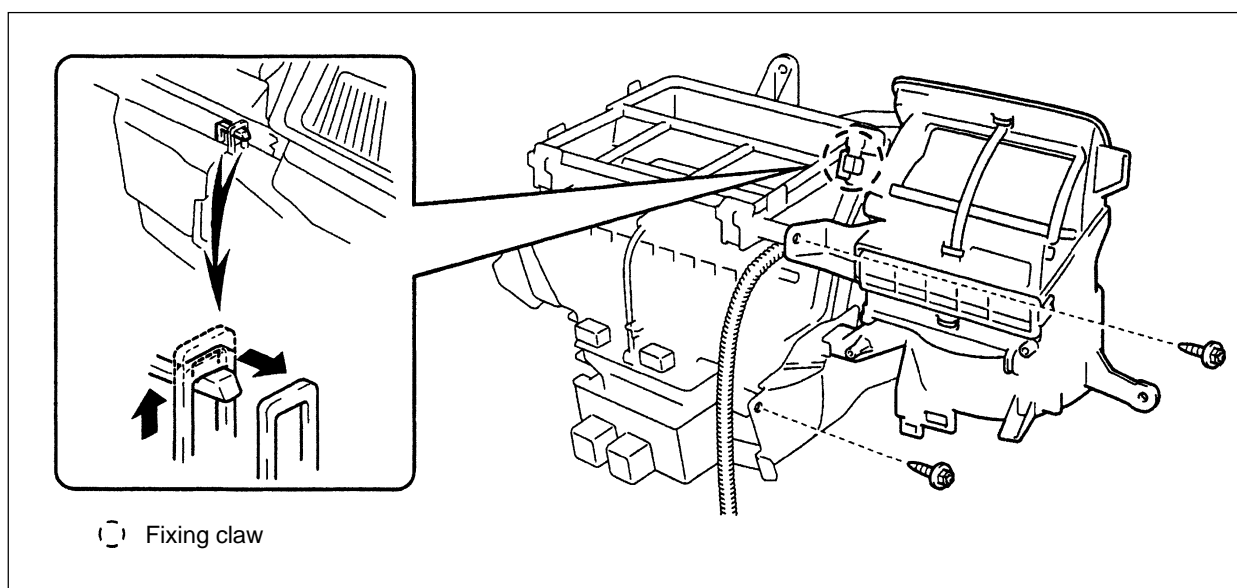
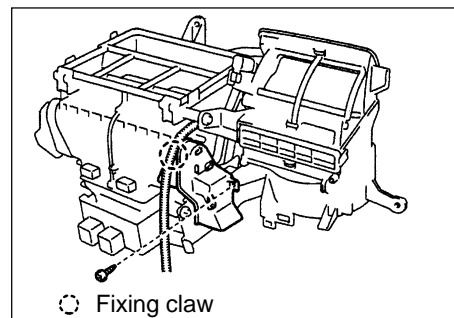


tioner group assembly.



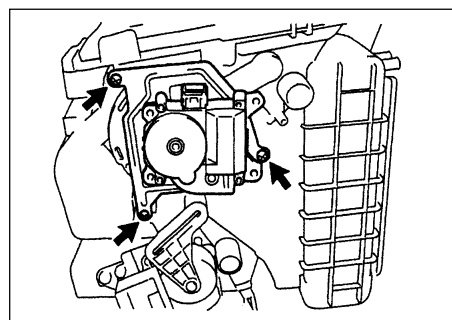
45. Disassemble air conditioner central heating core assembly.

- (a) Disassemble the screw and pull out wind leading pipe.
- (b) Disassemble two screws.
- (c) Disconnect fixed claw and disassemble air conditioner central heating core assembly.



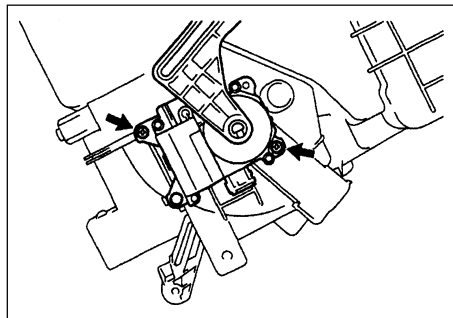
46. Disassemble servo motor of module state flow choke (automatic air conditioner).

Disassemble three screws and servo motor of module state flow choke.



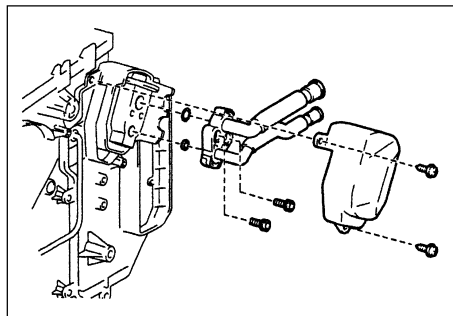
47. Disassemble servo motor of air mixing flow choke (automatic air conditioner).

Disassemble two screws and servo motor of air mixing flow choke.



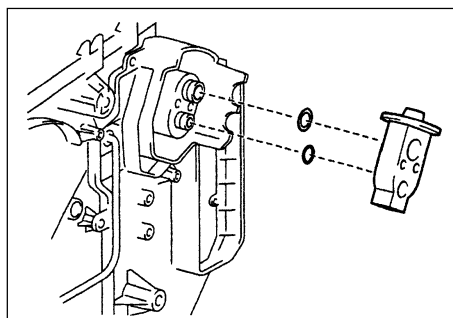
48. Disassemble air conditioner pipeline.

- (a) Disassemble two screws and extending cover.
- (b) Use planetary wrench (5.0mm) to disassemble two planetary bolts and air conditioner pipeline.
- (c) Disassemble two O-shape loops from air conditioner pipeline.



49. Disassemble expansion valve.

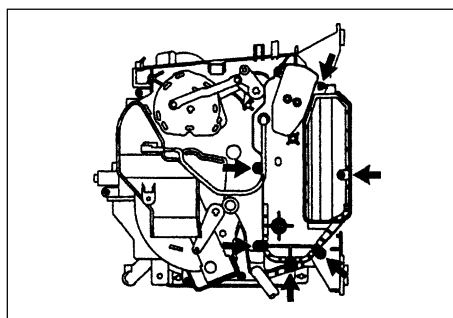
- (a) Disassemble expansion valve from air conditioner group.
- (b) Disassemble two O-shape rings from air conditioner pipeline.



50. Disassemble No.1 air conditioning heat sensitive resistance.

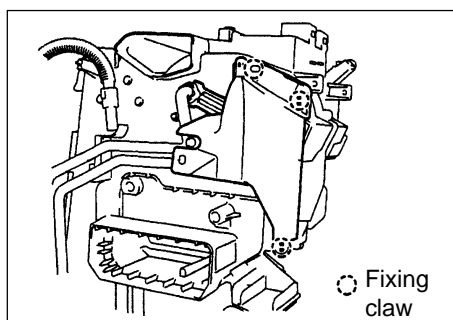
51. Disassemble evaporator.

- (a) Disassemble six screws and air conditioning group parts.
- (b) Pull out evaporator.



52. Disassemble central heating core.

Disconnect fixed claw and central heating water pipe defending cover, then pull out central heating core.

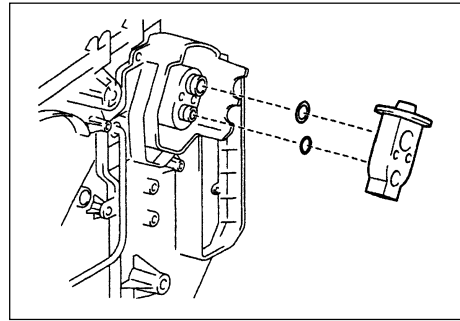


53. Assemble expansion valve.

- (a) Spread Refrigerant oil on two O-shape loops and assemble it on expansion valve.

Refrigerant oil: ND-OIL No. 8 or other products with same grade.

- (b) Assemble expansion valve on evaporator.



54. Assemble air conditioner pipeline.

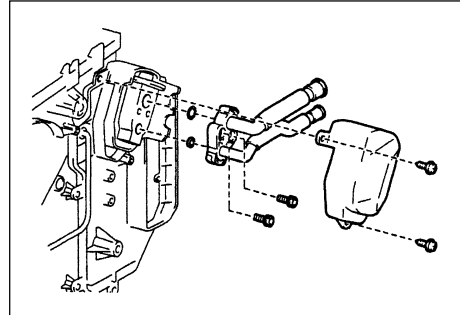
- (a) Spread Refrigerant oil on two O-shape loops and assemble it on air conditioner pipeline.

Refrigerant oil: ND-OIL No. 8 or other products with same grade.

- (b) Use planetary wrench (5.0mm) to assemble air conditioner pipeline with two planetary bolts.

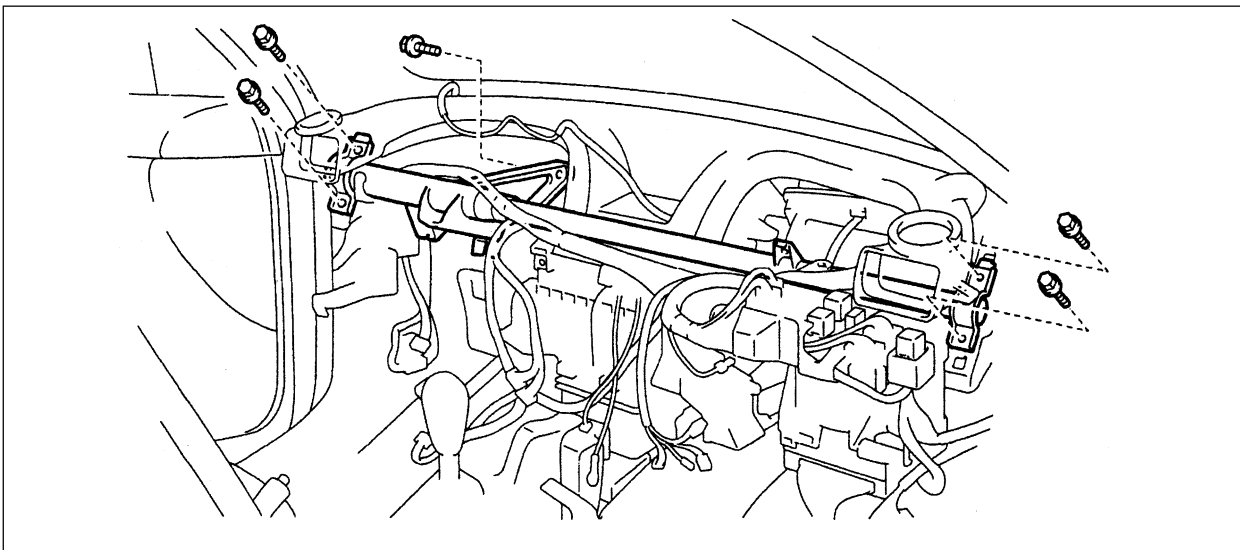
Torque: 3.5 N•m

- (c) Assemble two screws and extending cover.



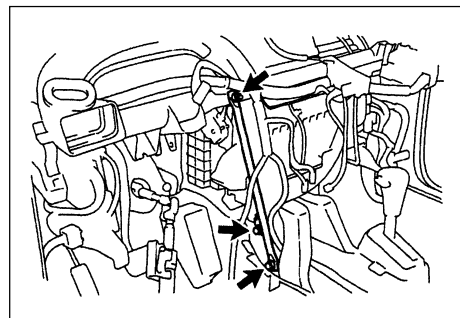
55. Assemble panel framework body assembly

Assemble panel strengthening beam and five bolts.



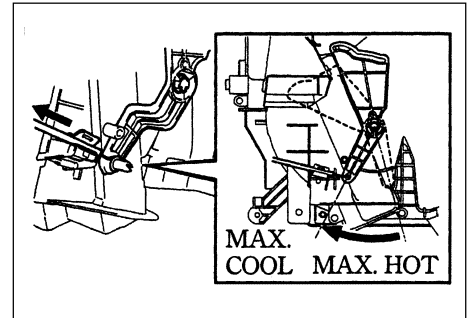
56. Assemble lower assemble bracket of panel framework.

Assemble lower assemble bracket of panel framework, screw cap and bolt.



57. Assemble control cable of air mixing flow choke (manual air conditioner).

- (a) Connect control cable of air mixing flow choke to air conditioner control assembly.
- (b) Set up drag arm at "MAX>COOL" position.
- (c) Assemble inner pull cable terminal to control lever.
- (d) Press down lightly the fixed clamp of pull cable by the arrow direction in left figure, then assemble exterior pull cable to fixed clamp.



Hint: Operate temperature control lever, check whether the control lever keep silent and does not return at the position of "MAX.COOL" and "MAX.HOT".

- (e) Disassemble control cable of air mixing flow choke from air conditioner control assembly.

58. Assemble upper panel assembly.

59. Assemble air conditioner control assembly.

60. Assemble helix cable.

61. Assemble steering wheel.

62. Check whether the steering wheel position is right.

63. Check horn button assembly.

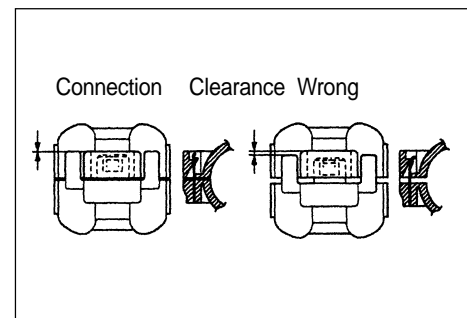
64. Assemble horn button assembly.

65. Check SRS warning light.

66. Assemble refrigerant No.1 low pressure hose.

- (a) Spread Refrigerant oil on new O-shape loop and assemble it on hose.
- (b) Assemble refrigerant No.1 low pressure hose and fixed clamp.

Hint: After installation, check the fixed situation of pipeline fixed clamp claw.



67. Assemble refrigerant liquid pipe A.

- (a) Spread Refrigerant oil on new O-shape loop and assemble it on hose.
- (b) Assemble refrigerant liquid pipe A and fixed clamp.

Hint: After installation, check the fixed situation of pipeline fixed clamp claw.

68. Add cooling water.

69. Heat the engine.

70. Check whether the cooling water leaks.

71. Fill the refrigerant, regulated quantity: $660 \pm 10g$.

72. Check whether the refrigerant leaks.

Compressor assembly

Change

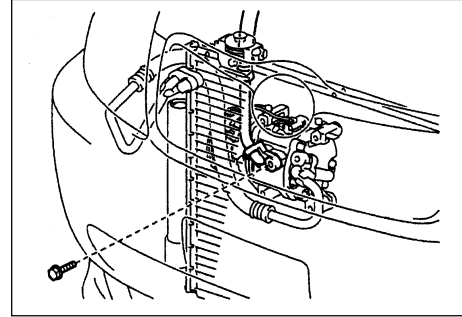
1. Disassemble radiator cover.

2. Reclaim HFC-134a(R134a)

3. Disconnect refrigerant No.1 low pressure hose.

- Disassemble the bolt from compressor and electromagnetic clutch assembly and disconnect refrigerant low pressure hose.
- Disassemble O-shape loop from refrigerant low pressure hose.

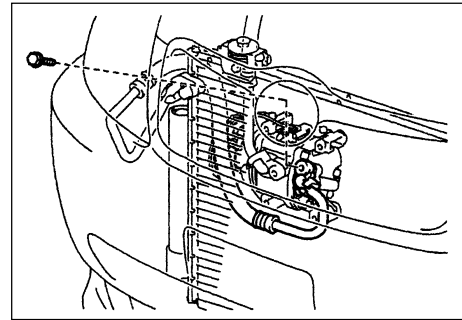
Note: after disassembling the pipeline, it is necessary to cover the joint to prevent humidity or dust from entering in system.



4. Disconnect refrigerant No.1 high pressure hose.

- Disassemble the bolt from compressor and electromagnetic clutch assembly and disconnect refrigerant high pressure hose.
- Disassemble O-shape loop from refrigerant high pressure hose.

Note: after disassembling the pipeline, it is necessary to cover the joint to prevent humidity or dust from entering in system.

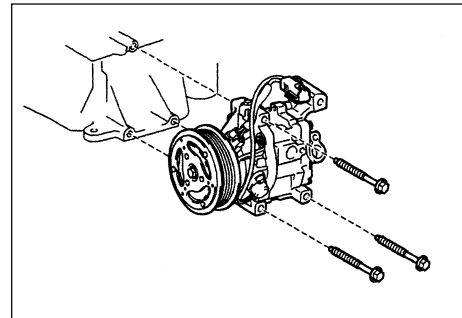


5. Disassemble right bottom defending cover of engine.

6. Disassemble driving belt.

7. Disassemble compressor and electromagnetic clutch.

- Disconnect the joint.
- Disassemble three screws and electromagnetic clutch.



8. Check the Refrigerant oil.

When upgrading compressor assembly, it is necessary to reclaim the refrigerant in system at first. Refrigerant oil quantity added by new compressor should be calculated by following formula.

Refrigerant oil standard quantity of new compressor:

(Inner Refrigerant oil quantity of new compressor: $60 \pm 10\text{ml}$) - (Inner discharged Refrigerant oil quantity of old compressor) = (Refrigerant oil quantity consumed by the system when changing)

Note:

- When checking the Refrigerant oil quantity, please refer to the notes on page 206.
- For there is some Refrigerant oil in automobile pipeline, if some Refrigerant oil is not discharged when assembling new compressor, this will incur the Refrigerant oil in system is too much to make the system heat exchange become bad and air conditioning become invalid.

- If Refrigerant oil quantity in the disassembled old compressor is too little, check whether the system leaks Refrigerant oil.
- Only could use 100PG Refrigerant oil.

9. Assemble compressor and electromagnetic clutch.

- (a) Assemble compressor, electromagnetic clutch and three bolts.

Torque: 24.5 N·m

- (b) Connect the joint.

10. Assemble driving belt.

11. Assemble refrigerant No.1 high pressure hose.

- (a) Disassemble the cover on pipeline joint.
- (b) Spread Refrigerant oil on new O-shape loop and assemble it on No.1 refrigerant high pressure hose.

Refrigerant oil: 100PG

- (c) Connect No.1 refrigerant high pressure hose to compressor and electromagnetic clutch and assemble the bolts.

Torque: 9.8 N·m

12. Assemble refrigerant No.1 low pressure hose.

- (a) Disassemble the cover on pipeline joint.
- (b) Spread Refrigerant oil on new O-shape loop and assemble it on No.1 refrigerant low pressure hose.

Torque: 23 N·m

- (c) Connect No.1 refrigerant low pressure hose to compressor and electromagnetic clutch and assemble the bolts.

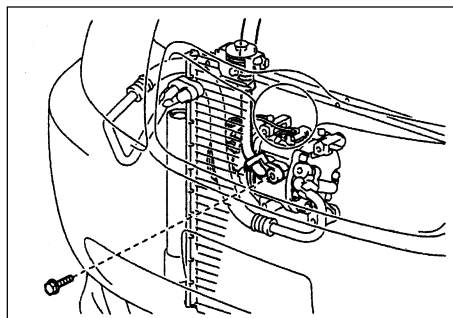
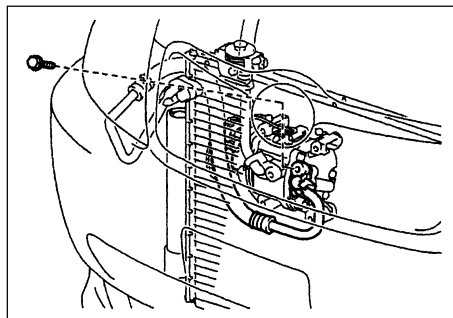
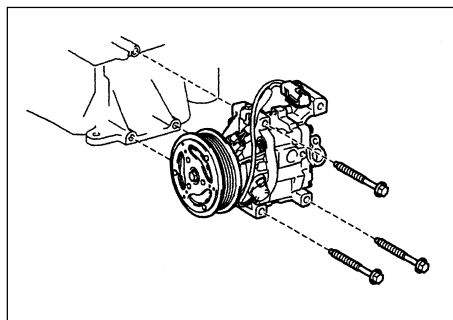
Torque: 9.8 N·m

13. Fill the refrigerant (referring to page 221).

Regulated quantity: $660 \pm 10\text{g}$

14. Heat the engine.

15. Check whether the refrigerant leaks.



Condenser Assembly

Inspection on the automobile

1. Check the Condenser Assembly.

- (a) If the radiating fins of condenser assembly are dirty, wipe it with water and blow it to dry with compressed air.

Notice: Do not damage the radiating fin.

- (b) If the radiating fin is curved, repair it with gad screw driver or pliers.

2. Check whether the Condenser leaks.

- (a) Use leakage detector to check whether the Refrigerant leaks at the joint of the pipelines.
- (b) If it leaks, check the fastening torque of joint part.

Overhaul

1. Disassemble the radiator cover assembly.

2. Recycle the HFC-134a(R134a)

3. Disassemble the Refrigerant liquid pipe A.

- (a) Disassemble the bolt from the condenser assembly and disconnect the Refrigerant liquid pipe A.
- (b) Disassemble the O-shape ring from the Refrigerant liquid pipe.

Notice: The pipeline should be covered immediately to prevent damp or dust from getting into the system.

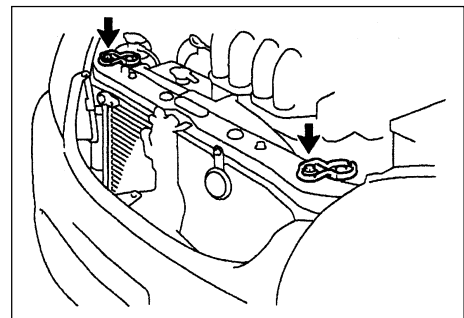
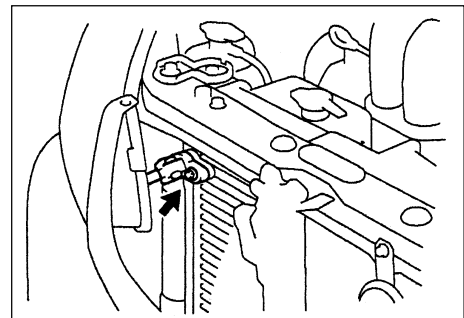
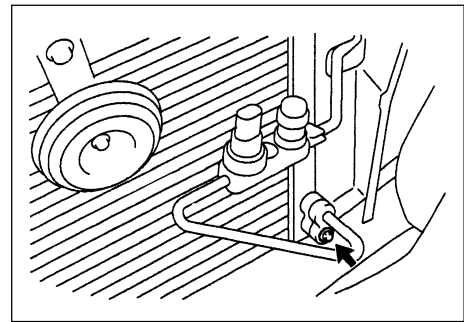
4. Disassemble the Refrigerant NO.1 high pressure hose.

- (a) Disassemble the bolt and the Refrigerant NO.1 high pressure hose from the condenser assembly.
- (b) Disassemble the O-shape ring from the Refrigerant high pressure hose.

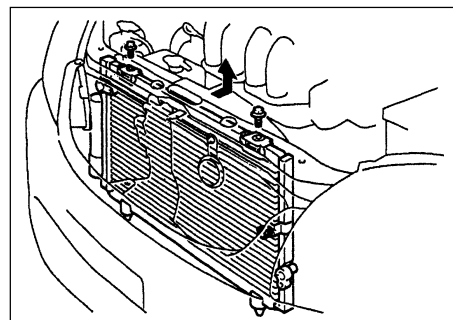
Notice: The pipeline should be covered immediately to prevent damp or dust from getting into the system.

5. Disassemble the condenser assembly.

- (a) Disassemble those two bolts and the bracket on water tank.

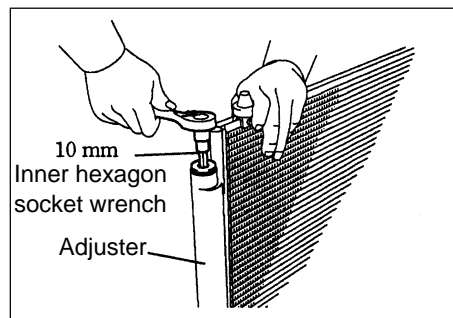


- (b) Disassemble two bolts.
- (c) Pull the component on the top of water tank assembly back to disassemble the condenser assembly.



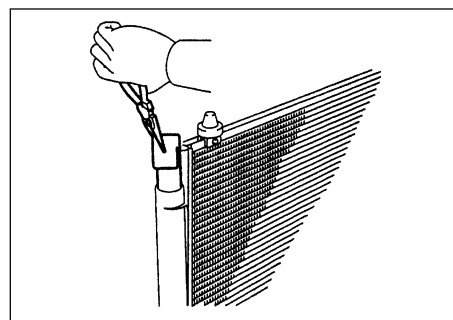
6. Disassemble the drier

- (a) Use 10mm hexagon wrench to disassemble the cover and filter core from regulator.



- (b) Disassemble two O-shape rings from the cover.

- (c) Use the acutilingual pliers to disassemble the drier.



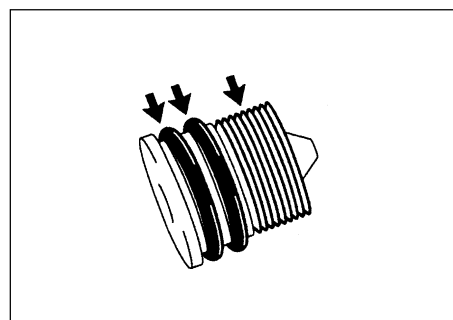
7. Assemble the drier.

- (a) Use the acutilingual pliers to assemble the drier.
- (b) Put the O-shape ring in the cover.
- (c) Spread freezing lubricant at the connecting part between the O-shape ring and the cover.

Refrigerant oil: 100PG

- (d) Use the 10mm hexagon wrench key to assemble the cover to condenser assembly.

Torque: 12.3 N·m



8. Assemble condenser assembly.

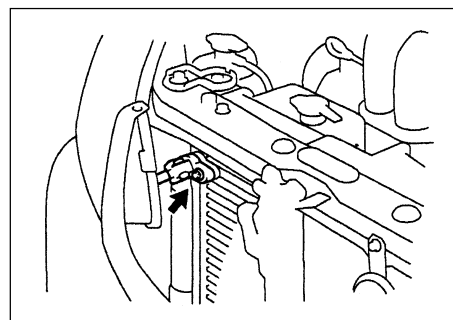
9. Assemble Refrigerant NO.1 high pressure hose.

- (a) Disassemble the cover from the tie-in of the pipe.
- (b) Daub enough Refrigerant oil to lubricate at the connecting part between the O-shape ring and the cover.

Refrigerant oil: 100PG

- (c) Use the bolt to connect Refrigerant high pressure hose with condenser assembly.

Torque: 5.1 N·m



10. Assemble the Refrigerant liquid pipe A.

- (a) Disassemble the cover from the pipeline joint.
- (b) Assemble the O-shape ring to the Refrigerant liquid pipe A.
- (c) Spread enough Refrigerant oil to lubricate at the connecting part between the O-shape ring and the cover.

Refrigerant oil: 100PG

- (d) Use the bolt to connect the Refrigerant liquid pipe A with condenser assembly.

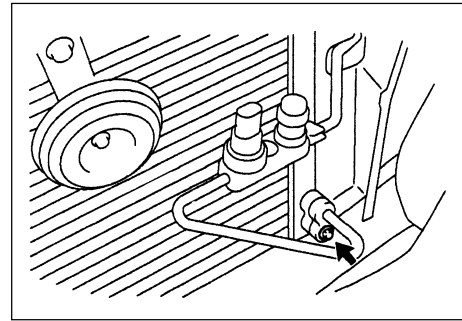
Torque: 5.4 N·m

11. Fill with Refrigerant.

Regulated quantity: $660 \pm 10\text{g}$

12. Warm the engine.

13. Check whether the Refrigerant leaks.



Supplemental restraint system

Note

Warning:

- This product is the SRS (supplemental restraint system) equipped by JILI "YUANJIN vision" type automobile, when the automobile frontal face is impacted heavily, this product could reduce the possible hurt for driver and passenger at the front seat, but this product could not replace the safety belt. For SRS is supplemental restraint safety system, the driver should tie safety belt. This product is single-point electronic dual-airbag system whose characteristic is that all sensors and control circuits are assembled in control box and gas maker is protechny. At the same time, this product accords with the enterprise standard "Automobile safety airbag equipment" (Q/JL001—2001) to product.
- In repairing process, if it does not accord with correct operation sequence to operate, SRS might happen the accidental explosion to make heavy accident. If repair does not accord with correct procedure, even if repair does not incur accident, SRS might disable when automobile happens accident, for example, it could not explode by the requirement. So, when making repair (including disassembling, assembling, checking or changing any part), it is necessary to operate by correct sequence regulated by repair manual.
- It is necessary to confirm following works before repairing: 1. Put the ignition switch at "OFF" state. 2. Disconnect the cathode connection of battery, and make repair after waiting for 60s. In addition, disassembled cathode should be twisted by insulating tape to insulate. (Capacitor in ECU could keep some electric power after battery is cut off to unfold safety airbag in some time. So, when making maintenance, if it does not wait for some time before operating, it might incur heavy hurt accident for wrong expansion of safety airbag.)
- Do not put the parts of SRS directly under the insulation of hot air or flame.

Note:

- When making repair, please make malfunction diagnosis by the flash light and malfunction diagnosing device according with the method regulated in this operation manual at first, at the same time, it is necessary to check whether there is any malfunction code before disassembling battery wire.
- Forbid disassembling or repairing at any non-appointment repair station
- Do not assemble any safety lever or bumper at the front of automobile, this will influence the performance of this airbag.
- People for repairing, disassembling and assembling should be trained specially.
- When disassembling steering wheel assembly, it is necessary to make steering wheel right, only this could disassemble steering wheel assembly and make helix cable locate correct position, or it will damage helix cable assembly.
- ECU matches with the technical parameter of electric system, forbid using the SRS parts of other automobiles, at the same time, it is necessary to use new product to replace any part.
- When repairing automobile (especially electric welding), it is necessary to close key switch, and it is best to cut off the anode of battery.
- After unfolding airbag, safety airbag assembly and helix cable assembly should be changed completely.
- When disassembling or carrying airbag assembly, trim cover should face the upside; safety airbag assembly could not superpose directly to avoid make wrong explosion and make any accident.
- The inner malfunction of controller (ECU) could not repair, if it happens any malfunction, change it.
- Safety airbag assembly should be stored in the environment whose temperature is lower than 40C, relative humidity is lower than 75% and is apart from electromagnetic interruption.
- Forbid disassembling the airbag assembly and gas generator in it.
- Forbid connect AC or DC with over 20V with ECU to avoid damage.

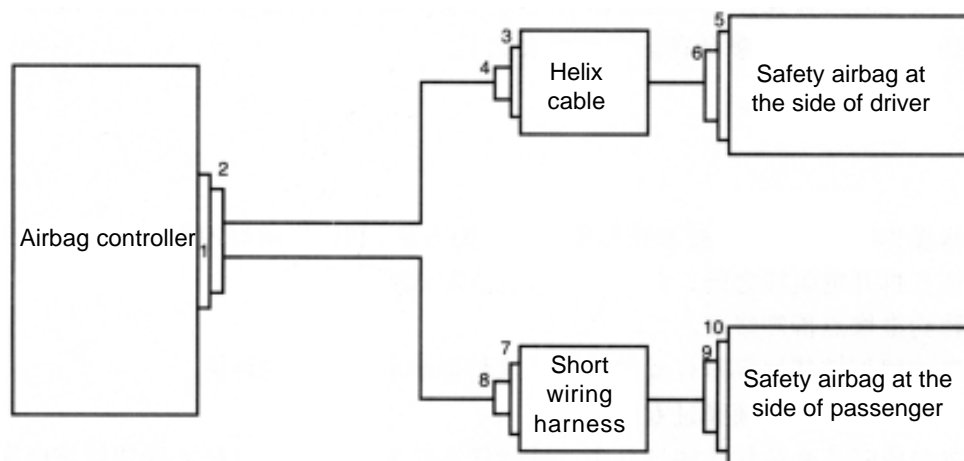
Special tools and measurers which any safety airbag repairing position should have:

Number	Name and type of tool	Function
a	5S hexagon wrench	Disassemble airbag subassembly on steering wheel
b	Socket wrench 18S	Assemble and disassemble big nut on steering column
c	14S socket wrench	Assemble and disassemble ECU and safety airbag assembly at the side of passenger on automobile body.
d	Numeric multi-meter DT 992 type	Used for electric measurement on wiring harness
e	Electric detonator tester QJ992 type	Used for resistance measurement of electric ignition device of airbag subassembly.

Changeable subassembly which safety airbag repairing position should have:

- Safety airbag assembly at the side of driver;
- Safety airbag assembly at the side of passenger;
- Helix cable assembly.
- ECU assembly;
- Steering wheel.

I. Safety airbag joint



No.	Item	Applicable
(1)	Terminal dual-locking organization	
(2)	Airbag anti-explosive organization	Joint 3, 4, 7, 8
(3)	Checking organization of electric circuit connection	
(4)	Inadequacy connection protection organization	Joint 4
(5)	Joint dual-locking organization	Joint 2
(6)	Joint dual-locking organization	Joint 6, 7, 10

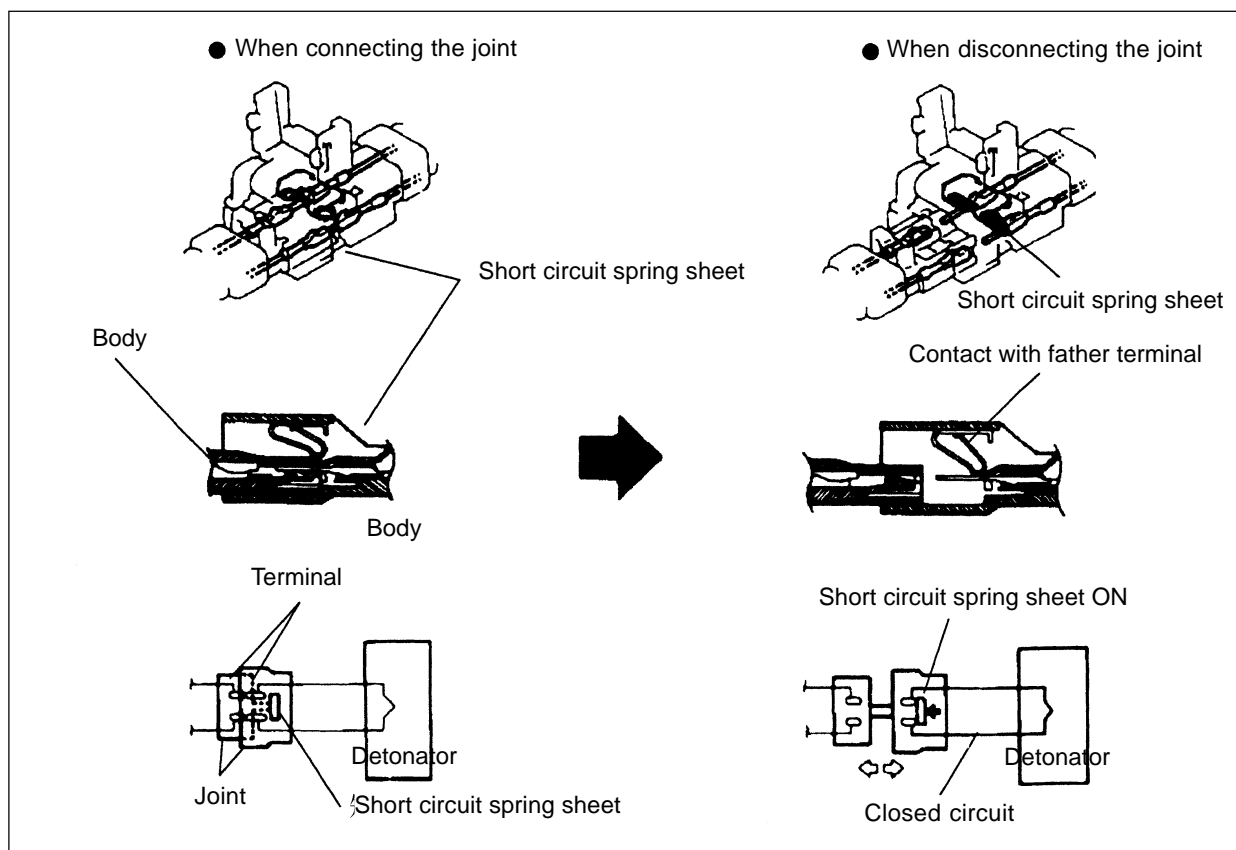
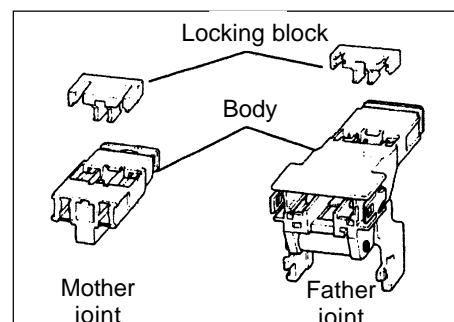
- All safety airbag joints should be yellow to be easy to distinguish the joints on other automobile parts, this could guarantee the safety performance and reliability of safety airbag joint, each kind of joint has special function and design.

(1) Terminal dual-locking organization:

Each joint should be dual-locking organization and combines with joint body and locking block. This design is caused by the reason that dual-locking device (locking block and fixed sheet) could fix the terminal to prevent it from releasing.

(2) Airbag anti-explosive organization

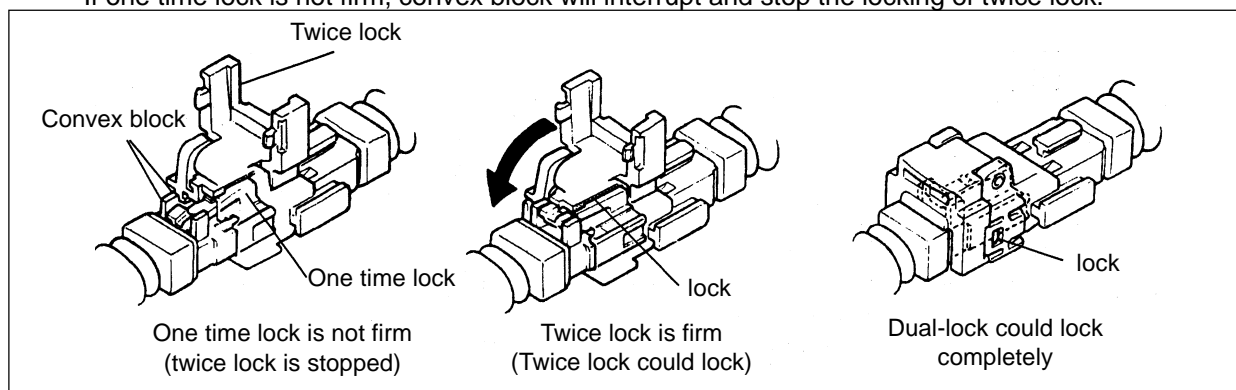
Each joint has a short circuit sheet, when the joint is disassembled, short circuit sheet will connect the terminal of device power supply with that terminal of igniter.



(3) Joint dual-locking organization:

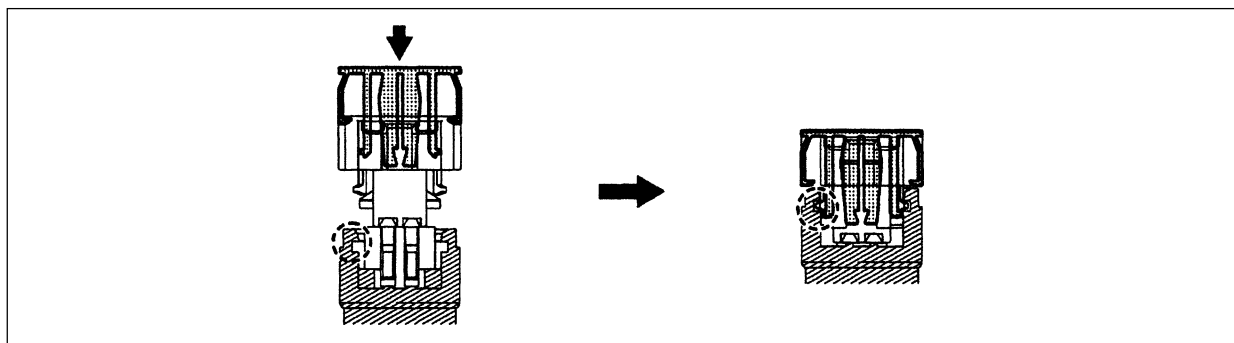
The joint equipping with this organization (male joint and female joint) is locked by dual-locking device to increase the reliability of connection.

If one time lock is not firm, convex block will interrupt and stop the locking of twice lock.



(4) Joint locking organization:

Lock the locking clasp of joint to fasten the connection of joint.

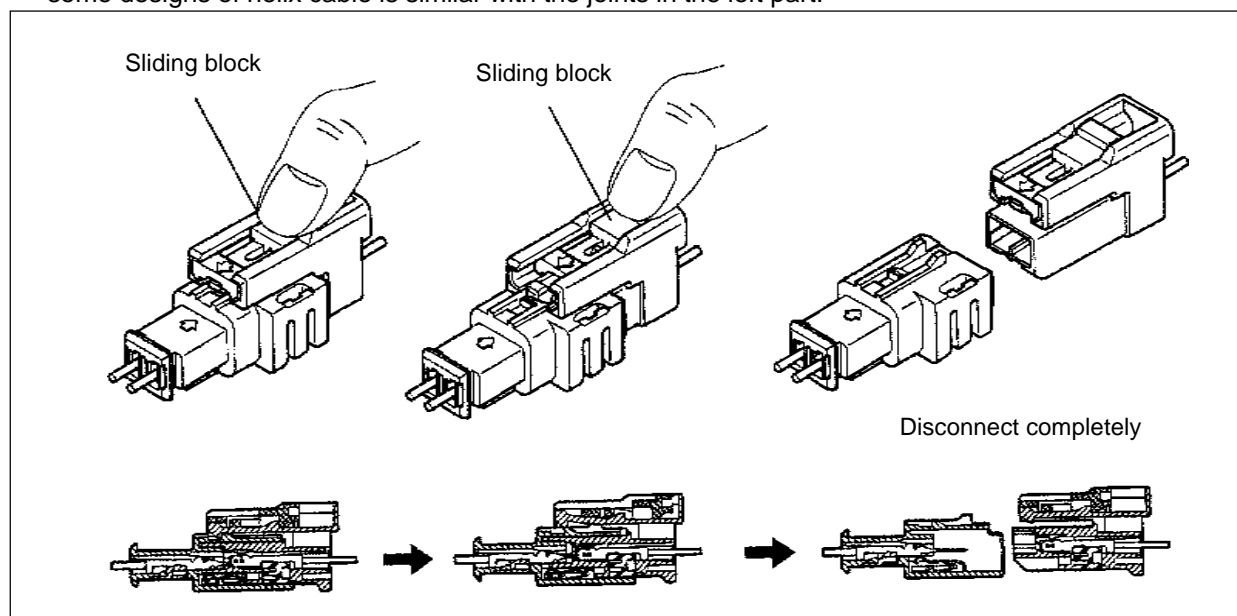


- When the automobile front face is impacted, and generated force is bigger than the standard pre-set, airbag will work automatically. The sensor in safety airbag controller will feel the impact, at the same time, it will judge the generation of impact by inner arithmetic to make ignition electric current. Electric current will flow in gas generator to make explosive function, then two gas generators in airbag at the side of driver and passenger will make gas to increase quickly inner pressure of airbag and rush out the trim cover of steering wheel and instrument panel. After airbag charging is closed, the gas ejects from the gas outlet at the side or at the back of airbag.

II. Disassemble the connecting joint of lower helix cable and wiring harness of steering wheel.

- Put your finger on sliding block.
- Move the sliding block to release the clasp.
- Pull out the male joint.

Liking that shown in figure: some joints of wiring harness use the female joints in the right part of figure, some designs of helix cable is similar with the joints in the left part.



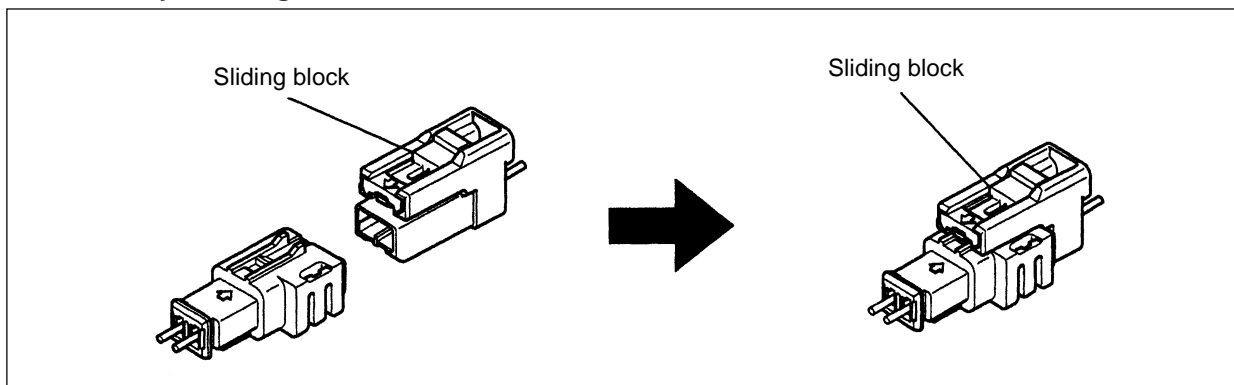
III. Connect the connecting joint of lower helix cable and wiring harness of steering wheel.

- Liking that shown in figure, align locking part of male joint and sliding block of female joint in same direction to avoid mutual friction.

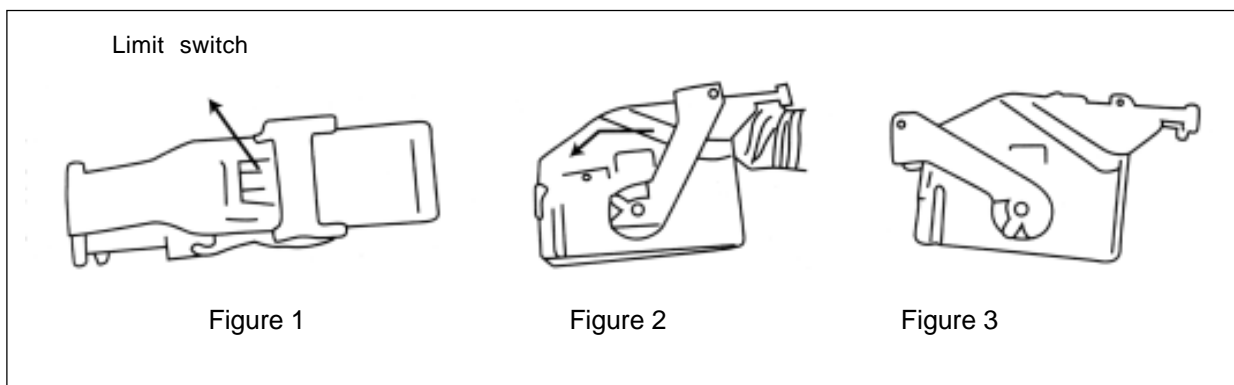
2. Confirm inserting it until locking, after assemble, pull it to check whether it is locked (when locking, confirm exterior joint returns to former position, at the same time, assembling sound could hear).

Hint:

- When moving the sliding block, do not contact it.
- Pay attention to do not distort the release board, if release board is distorted, it is necessary to change it with new helix cable.



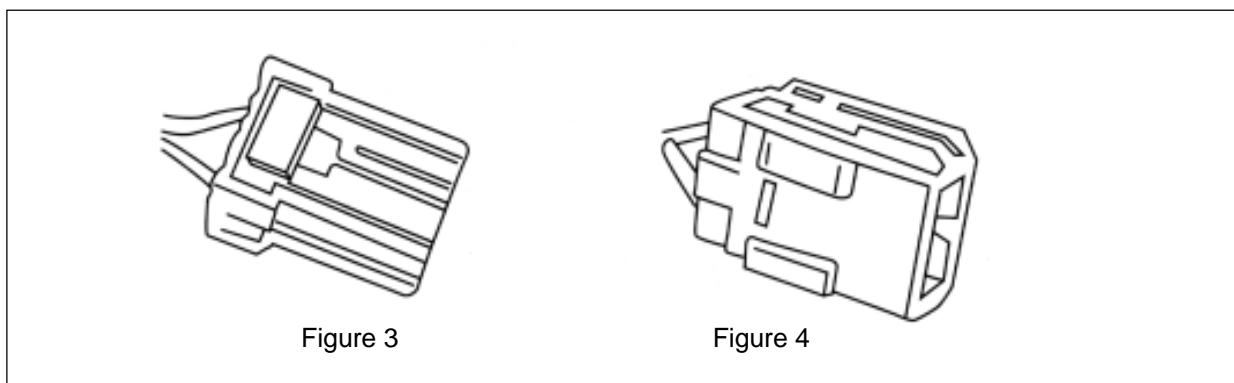
IV. Assemble ECU joint



1. Press down limit switch in figure 1.
2. Dial white switch along the black line in figure 2, dial it to bottom like that shown in figure 3.

Hint: you will hear the assembling sound that shows it is put to position when white switch is put into position.

V. Connect airbag wiring harness and short wiring harness at the side of passenger.

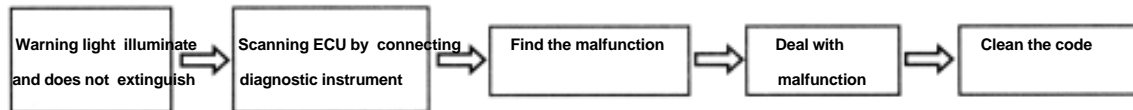


1. Insert the connector in figure 3 in the part in figure, after assemble it into its position, you will hear hint sound.

Malfunction treatment

1. Basic procedure of malfunction diagnosis

- After assembling new electronic control unit of safety airbag system, indicating light of safety airbag system will extinguish forever after flashing for 5 seconds when ignition switch is at state of ON, this shows airbag system works normally. At this time, the system does not need to repair, it is necessary to make system diagnosis and repair when showing any situation except this.
- If indicating light of safety airbag system does not illuminate when ignition switch is at the state of ON, check the related circuits of indicating light, then operate it to make it enter working state.



2. Inspection for indicating light of safety airbag

- (1) When set the ignition switch at ON position, confirm whether the indicating light illuminates.
- (2) After illuminating for five seconds, confirm whether indicating light extinguishes forever.
- (3) If starting ignition switch for five seconds, indicating light does not extinguish (flash or illuminate for long time), confirm the position of system malfunction with special diagnostic tool according to the flash situation of indicating light.

3. System diagnosis

Safety airbag controller (KD4.1) will implement a series of cycle diagnostic testing to check whether the function of airbag system has been prepared completely. This test will prevent restraint system from exploding wrongly and insure the necessary explosion in impact. If finding any malfunction, safety airbag controller (KD4.1) will store a applicable malfunction code and turn on indicating light to indicate a malfunction state to be easy to maintain.

4. Malfunction judgment

(1) Malfunction category

System malfunction could be divided into three categories: power supply malfunction, subassembly assembling malfunction and ECU inner malfunction.

a. Power supply malfunction

Normal working voltage of ECU is 9-18 V, related working voltage is 12 V. When automobile key is turned to ACC gear, ECU connects power and begins to self-check, indicating light extinguishes after illuminating for five seconds, this shows there is not any malfunction in ECU and exterior subassembly, they could work normally. When automobile power voltage is less than 9V or higher than 18V, ECU will self-check again. If self-checking could pass, ECU works normally, and indicating light extinguishes; if self-checking could not pass, it is necessary to self-check again, this self-checking could be made six times, if indicating light illuminates all the time after six times, there is some malfunction in power supply.

b. Assembling malfunction of airbag subassembly

Assembling malfunction of airbag subassembly is that malfunction which only needs to change or repair airbag subassembly without needing to change ECU, including the situation that airbag subassembly is not connected completely. If happening this malfunction when connecting power supply, indicating light will flash N times at first, then it will illuminate all the time until malfunction is removed. If happening impact in malfunction term, ECU could explode the channel of good part and record every malfunction when exploding.

c. Inner malfunction of controller

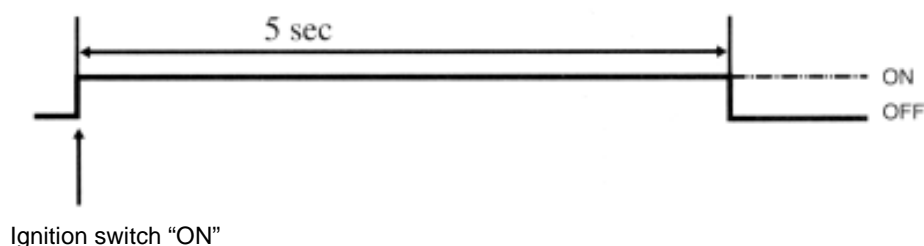
Inner malfunction is the malfunction happening in ECU body, when happening this malfunction, ECU could not explode airbag, and will record the impacting acceleration.

Note: common repairer could not repair this inner malfunction, if happening this malfunction, it is necessary to change ECU.

(2) Malfunction state display

Malfunction display of SRS could confirm originally by the flash of indicating light, detailed information could be gained by malfunction diagnostic tool.

- a. Safety airbag indicating light is driven by ECU, all malfunction displays are finished by ECU. After working voltage is supplied for safety airbag controller (KD4.1) by battery, safety airbag controller (KD4.1) illuminates indicating light to check SRS. To notify driver that there are some malfunctions in system, indicating light will illuminate for long time after working voltage is supplied. If existing SRS does not have any malfunction, indicating light will close after illuminating for five seconds after ignition on. In original phase, safety airbag controller (KD4.1) does not prepare to check the impact and stop the unfold until the wire of safety airbag controller (KD4.1) is reliable. After ignition switch is turned to "ON" gear, the display type of indicating light when there is no any malfunction in SRS is:

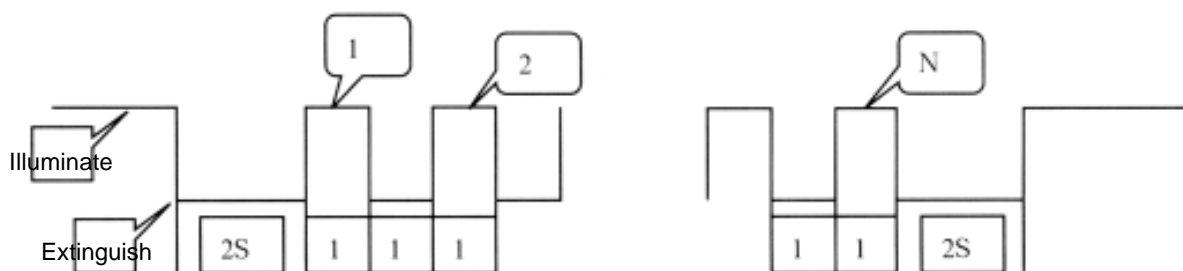


Assembling malfunction information of subassembly could see follow table 1.

Table1: Assembling malfunction information indicating table for airbag subassembly

Number	Malfunction type	Slow flash times (N times)	Remark
1	Igniter at the side of driver happens short circuit	3	or wrong explosion of airbag subassembly will make big hurt for human, its warning reasons should be divided detailedly.
2	Igniter at the side of driver happens open circuit	4	
3	Igniter at the side of driver connects grounding	5	
4	Igniter at the side of driver connects battery	6	
5	Igniter at the side of passenger happens short circuit	7	
6	Igniter at the side of passenger happens open circuit	8	
7	Igniter at the side of passenger connects grounding	9	
8	Igniter at the side of passenger connects battery	10	
9	Safety belt at the side of driver happens pre-tightening malfunction	11	
10	Safety belt at the side of passenger happens pre-tightening malfunction	12	
12	Impact output interface happens malfunction		

Schematic drawing for slow flash indicating light

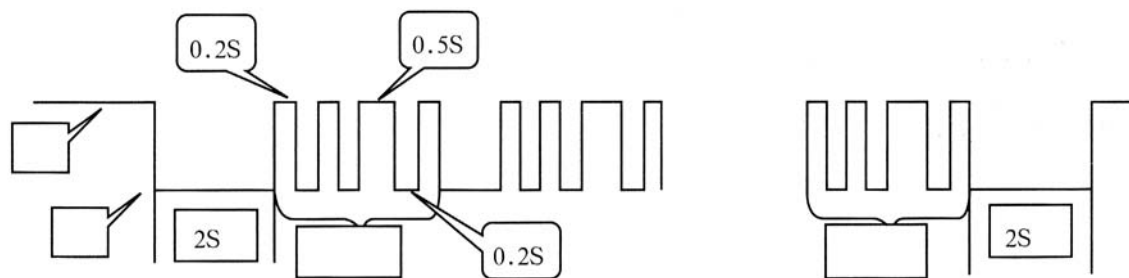


Inner malfunction information could see following table 2.

Table 2: ECU inner malfunction information indicating table

Number	Malfunction type	Fast flash type	Remark
1	Electronic acceleration offset malfunction	Short, short, short and long	0001
2	Electronic acceleration self-checking malfunction	Short, short, long and short	0010
3	SCM inner RAM is wrong	Short, short, long and long	0011
4	Inner parameter is wrong	Short, long, short and short	0100
5	Inner malfunction or acceleration storage space is full and ignition record has been made	Short, long, short and long	0101
6	Mechanical safety sensor happens malfunction	Short, long, long and short	0110
7	Increased pressure is wrong	Short, long, long and long	0111
8	Ignition driving function is wrong	Long, short, short and short	1000
9	Voltage of ignition voltage F12 and F13 is wrong	Long, short, short and long	1001
10	Other parts are wrong	Long, short, long and short	1010

Schematic drawing for fast flash indicating light



Schematic drawing for “short, short, long and short” malfunction

If happening the situations above, it is necessary to turn off key switch of automobile at first, then turn on key switch and start it again, if information hint could not be removed, it is necessary to change ECU.

Repair

- a. In using process, if happening any malfunction of power supply, it shows the voltage of power supply is less than 9V or higher than 18V, or the battery is damaged, at this time, it only needs to charge or change the battery.

- b. Use special malfunction diagnostic tool to test.

Malfunction codes approved by safety airbag controller (KD4.1)

Number	Malfunction specification	Remove
1	Ignition circuit 1 (safety airbag at the side of driver), the resistance is too high or open circuit.	OK
2	Ignition circuit 1 (safety airbag at the side of driver), the resistance is too low or short circuit.	OK
3	Ignition circuit 1 (safety airbag at the side of driver), connects with the grounding	OK
4	Ignition circuit 1 (safety airbag at the side of driver), connects with power supply	OK
5	Ignition circuit 2 (safety airbag at the side of passenger), the resistance is too high or open circuit.	OK
6	Ignition circuit 2 (safety airbag at the side of passenger), the resistance is too low or short circuit.	OK
7	Ignition circuit 2 (safety airbag at the side of passenger), connects with the grounding	OK
8	Ignition circuit 2 (safety airbag at the side of passenger), connects with power supply.	OK
9	Ignition circuit 3 (pre-tension safety belt at the side of driver), the resistance is too high or open circuit.	OK
10	Ignition circuit 3 (pre-tension safety belt at the side of driver), the resistance is too low or short circuit.	OK
11	Ignition circuit 3 (pre-tension safety belt at the side of driver), connects with the grounding	OK
12	Ignition circuit 3 (pre-tension safety belt at the side of driver), connects with the power supply	OK
13	Ignition circuit 4 (pre-tension safety belt at the side of passenger), the resistance is too high or open circuit.	OK
14	Ignition circuit 4 (pre-tension safety belt at the side of passenger), the resistance is too low or short circuit.	OK
15	Ignition circuit 4 (pre-tension safety belt at the side of passenger), connects with the grounding	OK
16	Ignition circuit 4 (pre-tension safety belt at the side of passenger), connects with power supply	OK
17	Voltage of power supply is too high	OK
18	Voltage of power supply is too low	OK
19	Malfunction of indicating light connects with power supply or bulb is short circuit.	OK
20	Malfunction of indicating light connects with the grounding or filament is open circuit.	OK
21	Lack/wrong calculation rule parameters controller (KD4.1))	No (change safety airbag controller (KD4.1))
22	Front impact has been recorded	No (change safety airbag controller (KD4.1))
23	Communication malfunction	OK
24	Inner malfunction	No (change safety airbag controller (KD4.1))
25	Impact output (oil pump) pin connects with the grounding	OK
26	Impact output (oil pump) pin short connects with power supply	OK
27	Impact output (central control door lock) pin connects with the grounding	OK
28	Impact output (central control door lock) pin connects with power supply	OK
29	Pre-tension safety belt ignites independently	OK, but most is five times
30	Pre-tension safety belt ignites six times independently controller (KD4.1))	No (change safety airbag controller (KD4.1))

- ① there are some malfunctions, indicating light will indicate them. If exterior malfunctions are historical, after they are removed, indicate will disappear.
- ② one displayed or historical malfunction is only set up again by server. Inner malfunction or "impact record" of safety airbag controller (KD4.1) could not be set up again, in this situation, it is necessary to change safety airbag controller (KD4.1).
- (3) micro controller, independent indicating light illuminates.

Microprocessor having obvious malfunction state could not work, so it could not control the work of indicating light. In this situation, indicating light will illuminate directly by applicable circuit without considering the micro-processor, liking that shown in following:

- The battery providing electricity for safety airbag controller (KD4.1) disables: indicating light illuminates by the automatic light driving function.
- Inner working voltage loses: indicating light illuminates usually.
- New setup caused by the unsuccessful watchdog trigger: indicating light flashes
- Micro-processor does not work: indicating light illuminates usually
- Insert of connector of safety airbag controller (KD4.1) is wrong: indicating light illuminates usually by short circuit stick.

Take example to specify diagnostic step:

If finding indicating light of safety airbag illuminates usually, even if it extinguishes at last, you could check by follow step. First is to check the part happening malfunction with diagnostic tool.

Then make by the checking step for corresponding position.

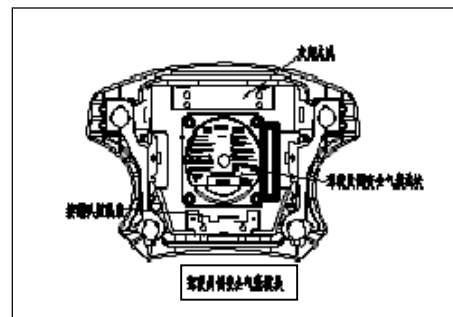
- a. If scan result is inner malfunction or safety airbag has exploded, at this time, change the ECU directly.
- b. Malfunction has been removed.

Inspection

I. The inspection for airbag module at the side of driver could be divided into three situations:

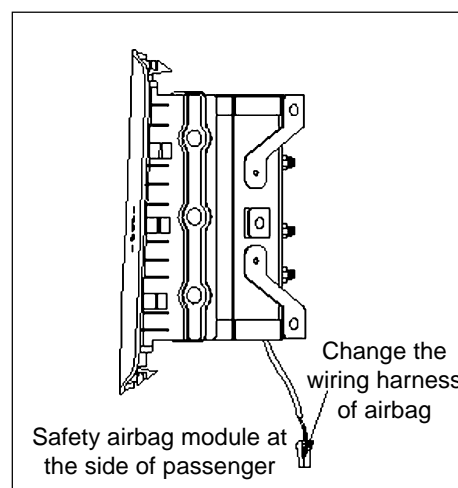
Automobile is not impacted, automobile is impacted but airbag does not explode, and automobile is impacted and airbag explodes.

1. Automobile is not impacted:
 - a. Make malfunction diagnostic inspection,
 - b. Check the safety airbag assembled on steering wheel with your eyes, including following items mainly:
Check whether the airbag has any cut, small crack or the surface and concave slot of airbag has obvious changed color.
2. Automobile is impacted but airbag does not explode:
 - a. Make malfunction diagnostic inspection,
 - b. Check the disassembled safety airbag with your eyes, including following items mainly:
Check whether the airbag has any cut, small crack or the surface and concave slot of airbag has obvious changed color.
Check whether wiring harness has any cut, crack or joint has any flaw,
Check whether steering wheel has distorted,
Check whether the plug and wiring harness of helix cable has been damaged, the loudspeaker wiring harness plug and wiring harness has been damaged or distorted,
Check whether contacting board of steering wheel loudspeaker button has been distorted (if it has been distorted, it is necessary to change with new safety airbag module, forbid repairing it),
Interruption situation could happen between safety airbag module and steering wheel lower defending cover, and when new airbag module is assembled on steering wheel, its surrounding clearance must be even (Assemble and disassemble of driver airbag module should accord with correct step to work).
3. Automobile is impacted and airbag explodes:
 - a. Make malfunction diagnostic inspection,
 - b. Check the disassembled safety airbag with your eyes, including following items mainly:
Check whether the plug and wiring harness of helix cable has been damaged, the loudspeaker wiring harness plug and wiring harness has been damaged or distorted,
Check whether wiring harness has any cut, crack or joint has any flaw,
Check whether steering wheel has distorted,
Interruption situation could happen between safety airbag module and steering wheel lower defending cover, and when new airbag module is assembled on steering wheel, its surrounding clearance must be even (Assemble and disassemble of driver airbag module should accord with correct step to work)



II. The inspection for airbag module at the side of passenger could be divided into three situations:

Automobile is not impacted, automobile is impacted but airbag does not explode, and automobile is impacted and airbag explodes.



1. Automobile is not impacted:
 - a. Make malfunction diagnostic inspection,
 - b. Check the safety airbag assembled on panel framework with your eyes, including following items mainly:

Check whether the airbag has any cut and small crack, the surface and concave slot of airbag has obvious changed color, and connecting bolts are loosened.
2. Automobile is impacted but airbag does not explode:
 - a. Make malfunction diagnostic inspection,
 - b. Check the disassembled safety airbag with your eyes, including following items mainly:

Check whether the airbag has any cut, small crack or the surface and concave slot of airbag has obvious changed color.

Check whether wiring harness has any cut, crack or joint has any flaw.

Check whether connecting bolt between airbag module and panel framework has been loosened, welding part of assemble bracket has any crack or distortion, and Assemble and disassemble of passenger airbag module should accord with correct step to work.
3. Automobile is impacted and airbag explodes:
 - a. Make malfunction diagnostic inspection,
 - b. Check the disassembled safety airbag with your eyes, including following items mainly:

Check whether panel has any distortion and crack;

Check whether wiring harness of safety airbag has any cut, crack or the joint has any flaw;

If there is any crack on connector between panel and safety airbag, it is necessary to change it with new product;

When new airbag module is assembled on its position, its surrounding clearance should be even (Assemble and disassemble of passenger airbag module should accord with correct step to work).

III. Inspection for safety airbag controller could be divided into two situations: automobile is not impacted, and automobile is impacted but airbag does not explode.

1. Automobile is not impacted: make system inspection.
2. Automobile is impacted but airbag does not explode:
 - a. Make system inspection.
 - b. Check safety airbag controller with your eyes:

Whether the bracket has any concave, crack, distortion and so on;

Whether zincification layer of bracket is damaged;

Whether the exterior casing of controller has any crack, concave or distortion;

Whether the joint is damaged, the terminal is distorted, or wiring harness is bitten.

IV. Inspection for wiring harness.

- a. Make system inspection.
- b. Check whether all wiring harnesses of safety airbag (SRS) has been damaged or lead wire are exposed, joint has been damaged, and terminal has any distortion or crack.

Hint: wiring harness of safety airbag combines with the wiring harness of whole automobile, but the wiring harness of safety airbag is yellow.

Remove malfunction

Malfunction table

Number	Malfunction removing item	Specification
1	Indicating light of safety airbag system does not illuminate	Warning circuit of safety airbag system happens malfunction
2	Indicating light of safety airbag system illuminates usually	Warning circuit of safety airbag system happens malfunction or there is exterior malfunction

Malfunction	Test state	Possible reason
Indicating light of safety airbag system does not illuminate	Warning circuit of safety airbag system happens malfunction	<ul style="list-style-type: none"> ┆ The voltage disappears (fuse is cut off) ┆ Combination instrument happens malfunction ┆ Wiring harness between instrument package and ECU unit has malfunction

1. Indicating light of safety airbag system does not illuminate

Diagnostic procedure

When making first malfunction test, we advise shaking wiring harness and plug to test whether there is discontinuous bad contact in wire, if having this problem, please verify whether the connection of plug, terminal and wiring harness is correct and is not damaged, if it is not this problem, please make by next step.

(1) Check other wiring harnesses and indicating lights of instrument package

a. Set ignition switch at ON position,

b. Are other warning indicating lights illuminating?

If illuminating: set ignition switch on LOCK position, then make next operation.

If not: check the power supply system and grounding system of instrument package (fuse), then make step 5.

(2) Check the bulb

Warning: wrong treatment for safety airbag system parts will incur safety airbag and pre-tension safety belt are opened accidentally, this might happen heavy accident. Please read service warning of safety airbag system before disposing safety airbag parts.

a. Set ignition switch at LOCK position,

b. Cut off cathode wire of battery and keep this state for 60 seconds at least,

c. Disassemble combination instrument,

d. Measure whether corresponding two pins of indicating light of safety airbag could conduct,

Yes: make next step,

No: change the bulb of indicating light.

(3) Check the wiring harness connection between ECU unit and instrument package .

a. Set ignition switch at LOCK position,

b. Cut off cathode wire of battery,

c. Cut off the plug of instrument package ,

d. Check whether corresponding circuit of indicating light could conduct,

Yes: make next step,

No: change the wiring harness, then make step 5.

2. Indicating light of safety airbag system illuminates usually

Malfunction	Test state	Possible reason
Indicating light of safety airbag system illuminates usually	Indicating light of safety airbag system illuminates usually	<ul style="list-style-type: none"> • Power supply of battery is lack • ECU has inner malfunction • Indicating light of combination meter safety airbag has malfunction • Plug connection of ECU has malfunction • Plug of combination meter contacts badly • Power supply fuse of ECU is cut off or contacts badly • Plug terminal of ECU contacts badly • Wiring harness between plug terminal and grounding of ECU contacts badly • Safety airbag circuit at the side of driver or passenger has malfunction.

Diagnostic procedure

When starting to check, firstly, use special diagnostic tool and ECU to make diagnostic communication to find the reason of malfunction, if communication could not implement, make following inspection:

(1) Check the battery

- Measure the voltage of battery
- Is the voltage higher than 9V?

Yes: make next operation,

No: Power supply of battery is lack, check the charging/discharging system, then make step 5.

(2) Check the conduction of wiring harness between ECU and combination meter.

- Set ignition switch at LOCK position,
- Cut off cathode of battery,
- Open the defending board of central channel,
- Disconnect the connector of instrument package ,
- Connect the cathode of battery,
- Set ignition switch at ON position,
- Check whether the terminal voltage of corresponding connector of instrument is 12V (connecting wire of power supply and instrument)
Yes: make next step,
No: check the circuit part, then make step 5 after repairing it.
- Set ignition switch at LOCK position,
- Check whether the corresponding terminal of instrument connector conducts with corresponding terminal of diagnostic interface (diagnose two ends of K wire),
Yes: make next step,
No: repair or change the wiring harness, then make step 5.
- Guarantee cathode of battery is cut off and keep this state for one minutes at least, cut off connector of ECU.
- Disconnect the plug of instrument package,
- Check whether it conducts between ECU plug voltage, K wire, airbag indicating light terminal and plug of instrument package ?
Yes: make next operation,
No: change the wiring harness, then make the step 5.
- Disassemble the ECU to check whether the terminal is good, and the short circuit stick is broken.
Yes: change the ECU,
No: connect the ECU connector again, then make next operation.

(3) Confirm the malfunction will not happen again after repairing,

- a. Set ignition switch at LOCK position,
- b. Cut off cathode of battery, and keep this state for one minutes at least,
- c. Connect all ECU plugs,
- d. Connect the subassembly plug of safety airbag at the side of driver,
- e. Connect the subassembly plug of safety airbag at the side of passenger,
- f. Connect the plug of pre-tension safety belt at the side of driver and passenger,
- g. Connect the plug of helix cable,
- h. Connect the cathode of battery,
- i. Set ignition switch at ON position,
- j. Does the indicating light of safety airbag work correctly?

Yes: malfunction has been removed, and the repair procedure should be explained for customers,

No: Check the malfunction state again, then if malfunction happens again, repeat from step 1.

3. Inner malfunction

Inner malfunction of safety airbag system unit

Test condition	<p>Warning</p> <ul style="list-style-type: none"> • Test condition for this malfunction is the malfunction code which does not happen before checking, DTC makes the inspection, it might incur wrong operation to hurt human or system when making this inspection, so it is necessary to make preparation before the inspection. • Inner circuit of electronic control unit of safety airbag system has malfunction.
Possible reason	Inner malfunction in safety airbag system unit
Operation	Change the safety airbag system unit, referring to the disassembling and assembling of safety airbag system and safety airbag system unit.

4. Malfunction of power supply

Power voltage of electronic control unit of safety airbag system is too low.

Test condition	<p>Warning</p> <ul style="list-style-type: none"> • Test condition for this malfunction is the malfunction code which does not happen before checking, DTC makes the inspection, it might incur wrong operation to hurt human or system when making this inspection, so it is necessary to make preparation before the inspection. • The voltage of safety airbag system unit and the grounding connector pin is less than 9V.
Possible reason	<ul style="list-style-type: none"> • The voltage of battery is too low. <p>The wiring harness between battery and electronic control unit of safety airbag system has malfunction.</p>

Diagnostic procedure

(1) Check the battery

- Is the voltage higher than 9V?
Yes: make next operation,
No: The voltage of battery is too low, check the charging/discharging system.
- Refer to chapter 1, Inspection of battery, charging system

(2) Check the wiring harness between battery and safety boox.

- Disassemble fuse panel to set ignition switch at ON position without loosening connector.
- Measure whether the voltage of related two pins of fuse panel is more than 9V?
Yes: make next step
No: check and repair the wiring harness.

(3) Check the wiring harness between fuse panel and the connector of safety airbag system unit.

Warning:

If the treatment is wrong, safety airbag assembly might be triggered to unfold to make heavy human hurt, so, before the treatment, it is necessary to read repairing warnings carefully. Refer to repairing warning of safety airbag system.

- a. Set ignition switch at LOCK position,
- b. Loosen the cathode cable of battery and keep this state for one minute at least,
- c. Disassemble the shell body of steering column,
- d. Loosen the connector of helix cable,
- e. Disassemble glove box (with safety airbag assembly at the side of passenger),
- f. Loosen the connector of safety airbag assembly at the side of passenger,
- g. Disassemble left inner trim board,
- h. Loosen the connectors of all safety airbag system units,
- i. Assemble cathode cable of battery, and set the ignition switch at ON position, then measure whether the voltage of safety airbag system unit and grounding connector pin is more than 9V?
Yes: make next step,
No: change the wiring harness.
- j. Set the ignition switch at LOCK position,
Loosen the cathode cable of battery and keep this for one minute at least.
- k. Disassemble left inner trim board,
- l. Cut off the conversion connector of safety airbag system unit,
- m. Assemble cathode cable of battery, and set the ignition switch at ON position, then measure whether the voltage of safety airbag system unit and grounding connector pin is more than 9V?
Yes: malfunction diagnosis ends,
No: change the wiring harness.

5. Malfunction at the side of driver

	Malfunction of safety airbag at the side of driver (resistance is too big or too small, short circuit, grounding and so on)
Test condition	<p>Warning</p> <ul style="list-style-type: none"> • If the treatment is wrong, safety airbag assembly might be triggered to unfold to make heavy human hurt, so, before the treatment, it is necessary to read repairing warnings carefully. Refer to repairing warning of safety airbag system. • The resistance between connector pins of safety airbag system unit is not in regulated scope. <p>Related wiring harness of driver airbag in safety airbag system happens short circuit or open circuit.</p>
Possible reason	<ul style="list-style-type: none"> • Safety airbag assembly at the side of driver has malfunction. • Helix cable has inner malfunction. • Connector of the circuit between helix cable and electronic control unit of safety airbag system has malfunction. • Wiring harness between helix cable and electronic control unit of safety airbag system happens open circuit or short circuit. • Connector of driver gas generator in safety airbag system is not inserted well.

Diagnostic procedure

(1) Check helix cable

Warning

If the treatment is wrong, safety airbag assembly might be triggered to unfold to make heavy human hurt, so, before the treatment, it is necessary to read repairing warnings carefully.

Refer to repairing warning of safety airbag system.

- Is every related part of helix cable normal? (Whether the relationship between pins is normal, whether there is any unnecessary short circuit, open circuit and other phenomenon)

Normal: make next step

Abnormal: change the helix cable

Refer to safety airbag system, disassembling and assembling of helix cable

(2) Confirm whether the malfunction is on safety airbag assembly at the side of driver or other parts.

- Change it with a good safety airbag assembly at the side of driver,
- Assemble the cathode cable of battery,
- Set ignition switch at ON position,
- Is there the display of malfunction code? Could it be removed?

Yes: change the safety airbag assembly at the side of driver

Refer to safety airbag system, disassembling and assembling of safety airbag assembly at the side of driver.

No: make next step

(3) Check the connector of helix cable wiring harness

- Set ignition switch at LOCK position.
- Loosen the cathode cable of battery and keep this state for one minute at least,
- Disassemble shell body of steering column,
- Loosen connector of helix cable,
- Is the connector of helix cable normal? (Whether the relationship between pins is normal, whether there is any unnecessary short circuit, open circuit and other phenomenon)

Normal: make next step

Abnormal: change the helix cable

Refer to safety airbag system, disassembling and assembling of helix cable

- (4) Check the wiring harness between helix cable and electronic control unit of safety airbag system
 - a. Set ignition switch at LOCK position,
 - b. Loosen the cathode cable of battery and keep this state for one minute at least,
 - c. Disassemble glove box (with safety airbag assembly at the side of passenger),
 - d. Loosen the connector of safety airbag assembly at the side of passenger,
 - e. Disassemble left inner trim board,
 - f. Loosen the connectors of all safety airbag system units,
 - g. Check the wiring harness between connector pole of safety airbag system unit and helix cable connector pin. The wiring harness between safety airbag system at the side of passenger unit connector pin and helix cable connector pin has following situation:
 - Earth
 - Short connection with power supply
 - Short circuit
 - h. Are the wiring harnesses above normal?
 - i. Normal: malfunction diagnosis ends, assemble all parts
 - j. Abnormal: change the wiring harness.

6. Malfunction at the side of passenger

	Malfunction of safety airbag at the side of passenger (resistance is too big or too small, short circuit, grounding and so on)
Test condition	<p>Warning</p> <ul style="list-style-type: none"> • If the treatment is wrong, safety airbag assembly and pre-tension safety belt might be triggered to unfold to make heavy human hurt, so, before the treatment, it is necessary to read repairing warnings carefully. Refer to repairing warning of safety airbag system. • The resistance between connector pin 13 and pin 14 of safety airbag system unit is not in regulated scope. • The wiring harness between connector pin 13 and pin 14 of safety airbag system unit happens short circuit.
Possible reason	<ul style="list-style-type: none"> • Safety airbag assembly at the side of passenger has malfunction. • Connector between safety airbag assembly at the side of passenger and electronic control unit of safety airbag system has malfunction. • Connector between safety airbag system unit and grounding position has malfunction. • The circuit between safety airbag assembly at the side of passenger and electronic control unit of safety airbag system happens open circuit or short circuit. • Circuit between safety airbag system unit and grounding position happens open circuit or short circuit. • Safety airbag system unit has malfunction.

Diagnostic procedure

- (1) Check the connector of safety airbag assembly at the side of passenger
 - If the treatment is wrong, safety airbag assembly and pre-tension safety belt might be triggered to unfold to make heavy human hurt, so, before the treatment, it is necessary to read repairing warnings carefully.
Refer to repairing warning of safety airbag system.

- a. Set ignition switch at LOCK position,
 - b. Loosen the cathode cable of battery and keep this state for one minute at least,
 - c. Disassemble glove box,
 - d. Loosen the connector of safety airbag assembly at the side of passenger,
 - e. Is the connector of safety airbag assembly at the side of passenger normal?
Normal: make next step,
Abnormal: change the wiring harness
- (2) Confirm malfunction reason is on safety airbag assembly at the side of passenger or on other parts.
- a. Connect a good assembly on connector pin A and B of safety airbag assembly at the side of passenger,
 - b. Connect the cathode cable of battery,
 - c. Set the ignition switch at ON position,
 - d. Is there the display of malfunction code? Or could the malfunction code be removed?
No: make next step
Yes: change the safety airbag assembly at the side of passenger.
Refer to safety airbag system, disassembling/assembling of safety airbag assembly at the side of passenger.
- (3) Check the wiring harness between safety airbag assembly at the side of passenger and electronic control unit of safety airbag system.
- a. Set ignition switch at LOCK position,
 - b. Loosen the cathode cable of battery and keep this state for one minute at least,
 - c. Disassemble the shell body of steering column,
 - d. Loosen the connector of helix cable,
 - e. Loosen the connector of safety airbag assembly at the side of passenger and driver,
 - f. Disassemble left inner trim board,
 - g. Loosen the connectors of all safety airbag system units,
 - h. Check the circuit between connector pin of safety airbag system electronic control unit and the circuit between connector pin of safety airbag assembly at the side of passenger, and the circuit between connector pin of safety airbag system unit and safety airbag assembly at the side of passenger has following situation:
 - Earth
 - Short connection with power supply
 - Open circuit
 - i. Are the wiring harnesses above normal?
Normal: malfunction diagnosis ends
Abnormal: change related wiring harness.

7. Malfunction of pre-tension safety belt

	Malfunction of pre-tension safety belt (resistance is too big or too small, short circuit, grounding and so on)
Test condition	<p>Warning</p> <ul style="list-style-type: none"> If the treatment is wrong, safety airbag assembly and pre-tension safety belt might be triggered to unfold to make heavy human hurt, so, before the treatment, it is necessary to read repairing warnings carefully. Refer to repairing warning of safety airbag system. <p>If having pre-tension safety belt</p> <ul style="list-style-type: none"> The resistance between connector pin 1, 2 or pin 3, 4 of safety airbag system unit is not in regulated scope. The wiring harness between connector pin 1, 2 or pin 3, 4 of safety airbag system unit happens short circuit. The wiring harness between connector pin 1, 2 or pin 3, 4 of safety airbag system unit happens open circuit, if there is not safety airbag at the side passenger.
Possible reason	<ul style="list-style-type: none"> Safety belt pre-tension has malfunction. Connector between safety belt pre-tension and electronic control unit of safety airbag system has malfunction. Connector between safety belt pre-tension and grounding position has malfunction. The circuit between safety belt pre-tension and electronic control unit of safety airbag system happens open circuit or short circuit. Circuit between safety airbag system unit and grounding position happens open circuit or short circuit. Safety airbag system unit has malfunction.

Diagnostic procedure

(1) Check the connector warning of safety belt pre-tension

- If the treatment is wrong, pre-tension safety belt might be triggered to unfold to make heavy human hurt, so, before the treatment, it is necessary to read repairing warnings carefully.
Refer to repairing warning of safety airbag system.
- a. Set the ignition switch at the LOCK position,
- b. Loosen the cathode cable of battery and keep this state for one minute at least,
- c. Disassemble B column defending board
- d. Loosen the safety belt pre-tension connector
- e. Is the safety belt pre-tension connector normal?
Normal: make next step
Abnormal: change the wiring harness

(2) Confirm malfunction reason is on pre-tension safety belt or on other parts.

- a. Connect a good pre-tension safety belt on safety belt pre-tension connector,
- b. Connect cathode cable of battery,
- c. Set ignition switch at ON position,
- d. Could the malfunction code be removed?
No: make next step,
Yes: change pre-tension safety belt.
Refer to safety airbag system, disassembling/assembling of pre-tension safety belt.

(3) Check the wiring harness between the pre-tension safety belt at the side of passenger and electronic control unit of safety airbag system

- a. Set ignition switch at LOCK position,
- b. Loosen the cathode cable of battery and keep this state for one minute at least,
- c. Loosen the connector of safety belt pre-tension module,

- d. Loosen the connectors of all safety airbag system units,
- e. Check whether the connector between electronic control unit of safety airbag system and the circuit between connector of safety belt pre-tension have following situations:
 - Earth
 - Short connection with power supply
 - Open circuit
- f. Are the wiring harnesses above normal?
 Normal: malfunction diagnosis ends
 Abnormal: change related wiring harness.

8. Malfunction of impact output

	Malfunction of safety airbag assembly at the side of passenger (resistance is too big or too small, short circuit, grounding and so on)
Resting condition	Warning <ul style="list-style-type: none"> • If the treatment is wrong, safety airbag assembly and pre-tension safety belt might be triggered to unfold and tighten to make heavy human hurt, so, before the treatment, it is necessary to read repairing warnings carefully. Refer to repairing warning of safety airbag system.
Possible reason	<ul style="list-style-type: none"> • Connector between impact output circuit and electronic control unit of safety airbag system has malfunction. • Connector between safety airbag system unit and grounding position has malfunction. • The circuit between impact output circuit and electronic control unit of safety airbag system happens open circuit or short circuit. • Circuit between safety airbag system unit and grounding position happens open circuit or short circuit. • Safety airbag system unit has malfunction.

- (1) Check whether this airbag controller has impact output function
 - a. Set ignition switch at LOCK position
 - b. Loosen the cathode cable of battery and keep this state for one minute at least
- (2) Check whether the connection of impact output connector is good,
- (3) Check whether the impact output connecting wire is earth or is short connecting with other wires,
- (4) Check whether impact output connecting wire is open circuit,
- (5) Check whether the central control door lock control system or electric injection control system of engine has been changed,

Note: If repairing it by the steps above and requirements, indicating light or diagnostic tool could display the mistakes before repairing all the time, please do not change it by yourself, you should contact with the manufacturer as soon as possible avoid wrong explosion or no explosion when using airbag.

Diagnosis of impacted automobile

No matter whether the safety airbag has been unfolded, the inspection and maintenance for impacted automobile should be made by following sequence.

1. Check the ECU diagnostic signal.

- (1) Connect the diagnostic joint of diagnostic tool,
- (2) Use diagnostic tool to read the diagnostic result.

2. Repair sequence

Note: For the impact, when power supply of battery is lack, diagnostic tool could not communicate with ECU, at this time, it is necessary to check and maintain the wiring harness of panel or use exterior power supply.

- (1) When safety airbag has been unfolded,

Following parts should be changed with new ones

- a. Safety airbag assembly at the side of passenger
- b. ECU
- c. Safety airbag assembly at the side of driver
- d. Pre-tension safety belt at the side of driver and passenger

Check the following parts, if they are abnormal, change them with new ones

- a. Helix cable
- b. Steering wheel, steering column, combination switch

Assembling state for steering wheel of safety airbag assembly at the side of driver

- a. Check whether there is any abnormal noise in steering wheel, its action is flexible and clearance is normal.
- b. Check whether the joint of wiring harness is damaged or terminal is distorted.

Disassemble and assemble

Electronic control unit of safety airbag (ECU)

1. Note (referring to chapter 1)

2. Disassembling sequence:

- (1) Disassemble the cover board at the side of central channel (or disassemble auxiliary panel).
- (2) Disassemble the connector connecting with safety airbag ECU.
- (3) Disassemble the ECU.

3. Assembling sequence

- (1) Check the ECU assembly, and make arrow direction on hint card point to running direction of automobile.
- (2) Assemble the connector connecting with safety airbag ECU, the connector should be locked firmly (if you hear a light sound "KA" when press the connector, this shows it has been locked).
 - a. Fix the special bolt used by controller assembly on assembling position of central channel, and confirm it has been assembled firmly.
 - b. Assemble the cover board at the side of central channel (or assemble auxiliary panel).
 - c. Connect the cathode of battery.

4. Main notes of assembling operation:

- (1) When assembling ECU assembly, pay attention to that ECU assembly could not be impacted.
- (2) Inspection after the assembling
 - a. Set the ignition switch at ON position.
 - b. Indicating light illuminates at 7 second, and continues to extinguish.
 - c. If it does not extinguish, it is necessary to check and remove malfunction.

Note: if ECU could not be assembled correctly, safety airbag will not work normally.

5. Inspection: referring to chapter 2.

6. Removing malfunction: referring to chapter 3.

Safety airbag assembly at the side of driver

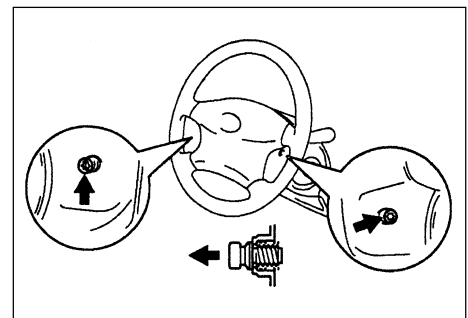
1. Note (referring to chapter 1).

2. Use the flash or malfunction diagnostic tool to test malfunction (referring to chapter 1 and 3).

3. Place the steering wheel and front wheels correctly and make them face the front, and take out ignition switch key, then do not operate it in 60 seconds after disassembling the cathode of battery.

4. Disassemble safety airbag assembly at the side of driver:

- (1) Guarantee the wheels face the front.
- (2) Use 5s hexagon socket-head wrench to loosen the two planetary bolts.
- (3) Pull out the safety airbag assembly at the side of driver from upside of steering wheel.



- (4) Disassemble the joint of loudspeaker and airbag wiring harness.
- (5) Take down safety airbag module at the side of driver.

Note: Disassembled safety airbag assembly at the side of driver should make its bottom surface face the upwards, and it should be stored in clean and dry environment.

5. Check the safety airbag assembly at the side of driver.

6. Disassemble steering wheel:

Disassemble assembling screws to take down steering wheel from the middle position.

Note: For the mesh of spline and column is too tight, steering wheel is hard to disconnect from the column, at this time, pay attention to do not disassemble the steering wheel compulsively, it is necessary to screw the screws on column, then lift the steering wheel up (for steering wheel connects with helix cable at its bottom, if disassembling steering wheel compulsively, helix cable will be damaged).

7. Disassemble the lower cover of combination switch

Disassemble three screws and lower cover of combination switch.

8. Disassemble helix cable:

- (1) Slide the upper cover of combination switch.
- (2) Disassemble airbag joint from helix cable.
- (3) Disassemble three fixed claws and helix cable.

Note: disassembled helix cable should be stored in clean and dry environment.

9. Check the helix cable:

- (1) When assembling new helix cable, check whether the yellow fixed clamp on helix cable is good, if yellow clamp drops, please adjust by the requirement on hint card of helix cable, insure helix cable could turn left and right for 2.5 circles on its existing fixed position.
- (2) If finding following situations, it is necessary to change the helix cable with new one.
 - a. There are some scratches or cracks on joint.
 - b. There are cracks, concaves or flaws on wiring harness of helix cable.

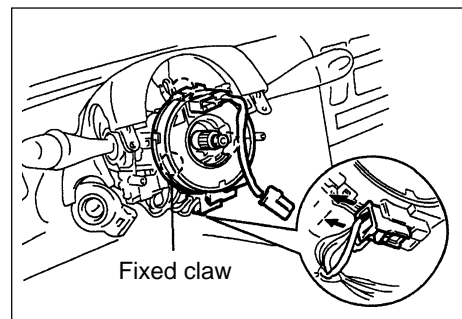
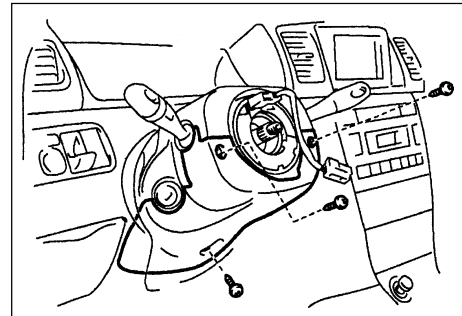
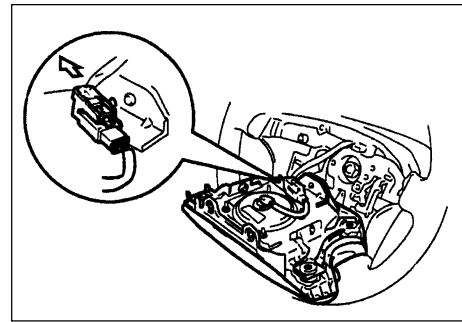
10. Remove malfunction (referring to chapter 3).

11. Make the wheels face the front.

Note: it is necessary to make the front wheels face the front, or the wires in helix cable might break in steering process.

12. Assemble helix cable:

- (1) Inspection before assembling (referring to item 9).
- (2) Set the steering light switch at middle position.
The pin of steering light switch may be broken, so it must be confirmed whether the pin is at central position.



(3) Make three fixed claws mesh steering column.

When changing with new helix cable, it is necessary to disassemble yellow clamp before assembling.

(4) Insert the plug of airbag wiring harness in the plug of helix cable and make this connection firm.

(5) Connect the lower cover of combination switch.

(6) Connect the upper cover of combination switch with the lower cover with special bolts firmly.

13. Set the helix cable at middle position

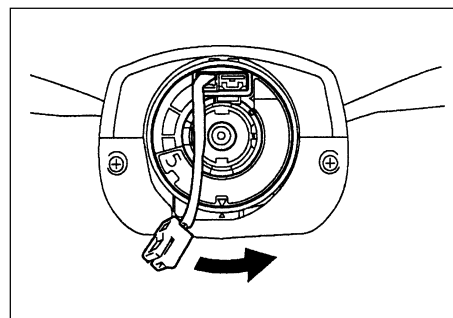
a. Check whether ignition switch locates OFF state.

b. Check whether the cathode end of battery has been disassembled.

Note: do not operate in 60 seconds after disassembling cathode end.

c. Turn helix cable anticlockwise with hand until it could not be turned.

d. Then turn the helix cable clockwise for 2.5 circles to align the mark.



14. Assemble steering wheel

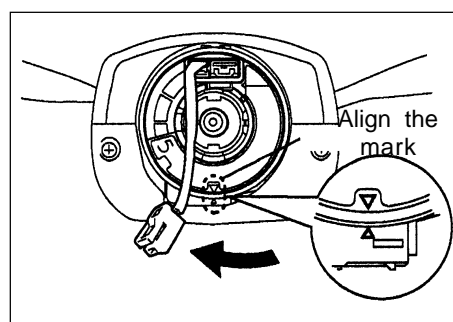
(1) Inspection before assembling:

- Steering wheel
- Connecting wiring harness
- Safety airbag assembly at the side of driver

(2) Tighten the assembling screws at both sides.

(3) Connection of battery terminal "-".

(4) After assembling, use malfunction diagnostic tool or malfunction indicating light to check and confirm the malfunction has been removed.



Safety airbag assemble at the side of passenger

1. Note (referring to chapter 1).

2. Use the flash or malfunction diagnostic tool to test the malfunction (referring to chapter 1 and 3).

3. Disconnect the connection of cathode of battery, and do not operate in 60 seconds after disconnecting.

4. Disassemble the glove box.

5. Disassemble the joint of safety airbag at the side of passenger, and do not damage airbag wiring harness carefully.

6. Disassemble the safety airbag assembly at the side of passenger.

- a. Disassemble three connecting bolts from the bracket of safety airbag assembly at the side of passenger.
- b. Take down the safety airbag assembly from panel.

7. Check the safety airbag assembly at the side of passenger (referring to chapter 2).

8. Assemble airbag assembly.

- a. Check whether the connection between safety airbag module and airbag short wiring harness is firm.
- b. Firstly, insert the module in assembling position from the upside of panel, secondly, align the assembling hole of small bracket on module with the assembling hole on framework of panel, at the same time, the module cover and panel clearance should be even, and the barb on module should be connected to its position.

9. After assembling, use malfunction diagnostic tool or malfunction indicating light to check and confirm the malfunction has been removed.

Scrap treatment for safety airbag

Hint:

- When scraping a automobile with SRS or disposing safety airbag module, it is necessary to explode the airbag by following steps at first.
- If there is any abnormal phenomenon when exploding airbag, please contact with our service store or automobile factory in time.

Note:

- Forbid exploding the safety airbag module that does not explode by yourself.
- When exploding the airbag, it will make much big explosive sound, so it is necessary to operate this out of the automobile, please do not make this operation influence the life of near habitants to avoid their complaints.
- When exploding the airbag, use the battery as power supply whose voltage is $(12\pm 1)V$.
 - When exploding the airbag, operator should be apart from the exploded module and he should confirm there is not anyone in the scope of 10m at least.
- When disposing the exploded airbag module, it is necessary to wear glove and safety glass.
- When airbag is exploded, the temperature of airbag module is too high, and a lot of gas with peculiar smell will be produced, so do not make any treatment for exploded airbag in 30 minutes after exploding it.
- Please wash your hands with water after finishing those operations above.
- Do not sprinkle water on exploded airbag module.
- When scraping a automobile, the safety airbag module assembled on automobile should be exploded.

I. Scrap the safety airbag module on automobile

1. Treatment before exploding:

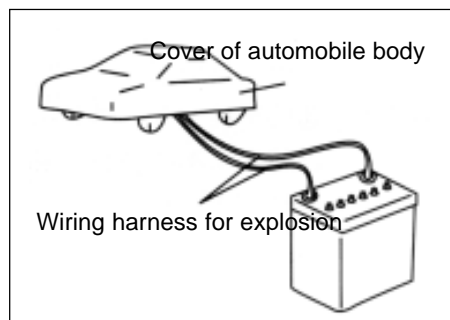
- (1) Park the automobile on flat place.
- (2) Disassemble the cathode and anode of battery and disassemble the battery from automobile.
Note: do not work until disassembling the cathode and anode of battery for 60 seconds.
- (3) Safety airbag assembly should be unfolded by following sequence.

2. Safety airbag assembly at the side of driver

- (1) Disassemble three screws and lower cover of combination switch.
- (2) Disassemble the lower end of helix cable and the joint connecting with panel wiring harness.
- (3) Connect the conversion wiring harness of safety airbag with one wiring harness with over 10 m used for unfolding, and the connecting part should be twisted with insulation adhesive tape to insulate and prevent from wrong unfolding for static.

Note: take down the joint of helix cable from panel wiring harness, the joint of helix cable will be short circuit automatically, this will prevent from exploding the safety airbag assembly at the side of driver for static to make heavy accident.

- (4) Connect conversion wiring harness of safety airbag on yellow joint of helix cable, then lead it out of automobile with unfolding wiring harness (see following figure).
- (5) Close all windows and doors, and assemble automobile cover.
- (6) Cut off the joint of wiring harness used for unfolding of safety airbag assembly at the side of driver at the place apart from the automobile, then connect it with two ends of battery taken from automobile to make it explode (see following figure).



- (7) Safety airbag assembly at the side of driver after explosion should be scrapped by the scrap main points.

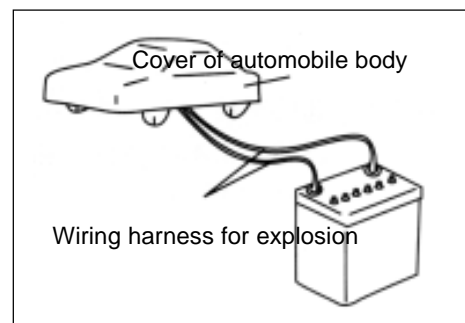
Note: Firstly, confirm whether there are people on automobile and near the automobile, do not operate until confirming none there.

After the safety airbag at the side of driver is unfolded, its gas generator temperature is high, do not make any treatment until putting it for over 30 minutes to wait for it becomes cool.

If safety airbag assembly at the side of driver could not be unfolded, it is necessary to contact with local appointed repairing station.

3. Safety airbag assembly at the side of passenger.

- (1) Disassemble the glove box.
- (2) Disassemble the connector between airbag short wiring harness and airbag wiring harness.
- (3) Connect the conversion wiring harness of safety airbag with one wiring harness with over 10 m used for unfolding, and the connecting part should be twisted with insulation adhesive tape to insulate and prevent from wrong unfolding for static.
- (4) Connect conversion wiring harness of safety airbag on yellow joint of helix cable, then lead it out of automobile with unfolding wiring harness (see following figure).
- (5) Close all windows and doors, and assemble automobile cover.
- (6) Cut off the joint of wiring harness used for unfolding of safety airbag assembly at the side of driver at the place apart from the automobile, then connect it with two ends of battery taken from automobile to make it unfold (see following figure).
- (7) Safety airbag assembly at the side of driver after explosion should be scrapped by the scrap main points.



Note: Firstly, confirm whether there are people on automobile and near the automobile, do not operate until confirming none there.

After the safety airbag at the side of driver is unfolded, its gas generator temperature is high, do not make any treatment until putting it for over 30 minutes to wait for it becomes cool.

If safety airbag assembly at the side of driver could not be unfolded, it is necessary to contact with local appointed repairing station.

2. Only scrap airbag module

1. Explosion of safety airbag assembly at the side of driver.

- (1) Prepare a battery as detonating power (12 ± 1)V.
- (2) Disassemble safety airbag assembly at the side of driver, and connect the airbag short wiring harness on gas generator.

Warning: when storing safety airbag module at the side of driver, it is necessary to keep upper surface face upwards.

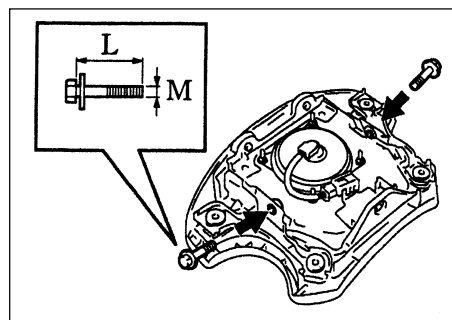
(3) Fix the module on wheel.

- a. Assemble two bolts with gasket on two assembling holes of safety airbag module at the side of driver.

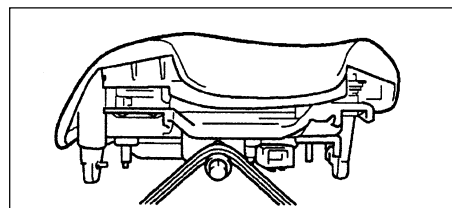
Size of bolt: L 35.0 mm

M 6.0 mm

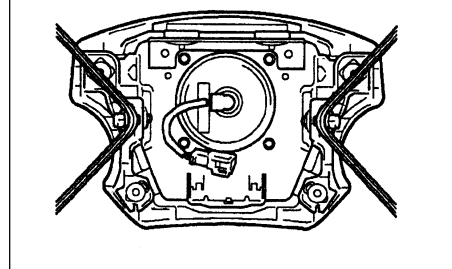
Note: tighten the bolts with hand until they could not be turned in. But they could not be screwed too tightly.



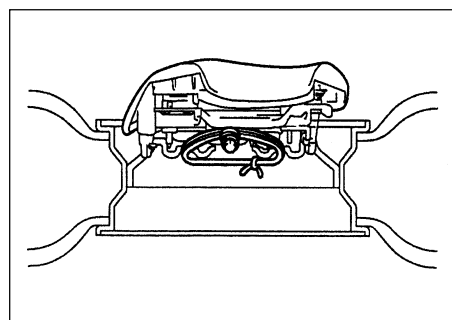
- b. Use maintenance electric wire used for automobile to fix safety airbag module at the side of driver on wheel. Section area of nude wire part of wiring harness is more than 2 mm². If the wiring harness is too thin, it might break for the shake when airbag explodes. This is very dangerous.



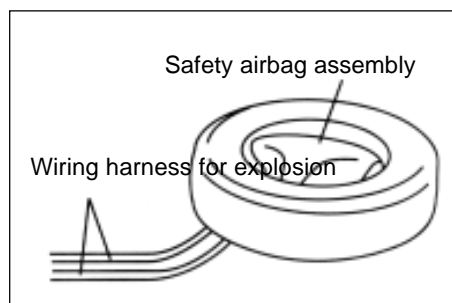
- c. Use three wiring harnesses, and the wiring harness should twist the bolts at the two sides of airbag assembly twice at least. Tighten the wiring harness twisted on fixed bolts to avoid them loosen, if wiring harness loosen, they might incur airbag assemble loosens for shake when airbag explodes. This is very dangerous.



- d. Place the airbag module upwards, and bind the connecting bolts at the two sides of airbag module in wheel hub bolt holes of wheel. Adjust the fixed position of airbag module to make the joint hang in the wheel hub hole of wheel. Wiring harness should be tightened. The metal surface of airbag assembly must face the downside to prevent wiring harness from breaking for airbag explosion, explosive force will throw airbag to air to hurt human or surrounding things. Airbag explosion will leave track for surrounding things, so used wheel should be scraped.



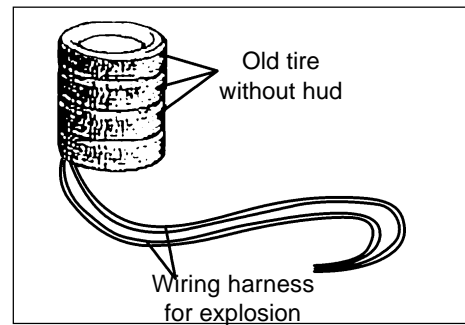
(4) Place wheel on flat ground, and connect the one end of wiring harness used for unfolding with airbag short wiring harness, and connect the other end with short circuit.



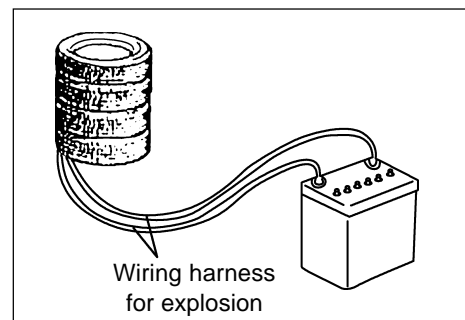
- (5) Fix three scraped old tyres without wheel hub on the fixed tyre of safety airbag assembly at the side of driver. The terminal end of unfolding wiring harness is 10m apart from wheel of fixed airbag at least.

Width: 185mm

Inner diameter: 360mm



- (6) Cut off the joint of wiring harness used for unfolding of safety airbag assembly at the side of driver at the place apart from the automobile, then connect it with two ends of battery.



- (7) Treatment for explosive module.

Disassemble the safety airbag module at the side of driver from wheel, and put it in ethane plastic bag, then bind the bag for treatment with other parts.



2. Explosion of safety airbag assembly at the side of passenger.

- (1) Prepare a battery as detonating power (12 ± 1)V.
- (2) Disassemble safety airbag assembly at the side of passenger, and connect the airbag short wiring harness on gas generator.

Warning: when storing safety airbag module at the side of driver, it is necessary to keep upper surface face upwards.

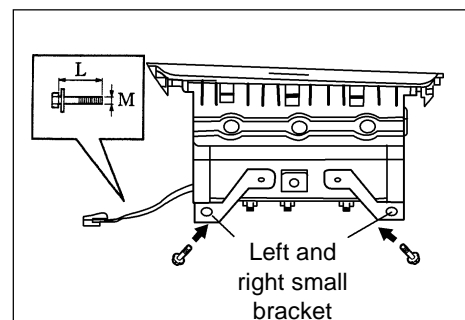
- (3) Fix the module on wheel.

- a. Assemble three bolts with gasket on two assembling holes of left, middle and right support pin of safety airbag module at the side of passenger.

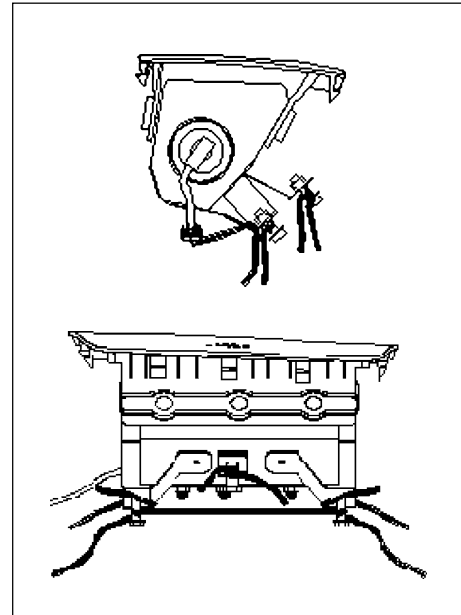
Size of bolt: L 35.0 mm

M 8.0 mm

Note: screw the bolts with hand, but they could not be screwed too tightly, 2/3 L of bolts should expose.

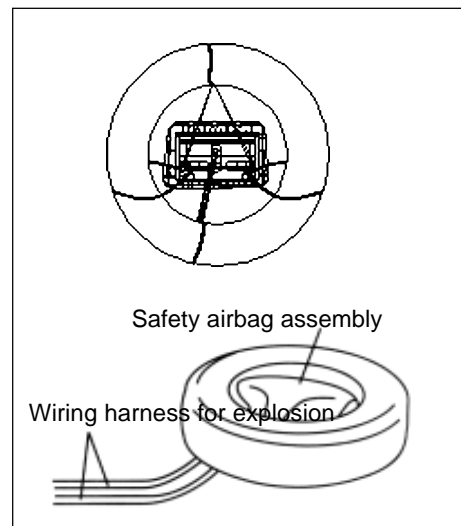


b. Use maintenance electric wire used for automobile to fix safety airbag module at the side of driver on wheel. Section area of nude wire part of wiring harness is more than 2 mm². If the wiring harness is too thin, it might break for the shake when airbag explodes. This is very dangerous.

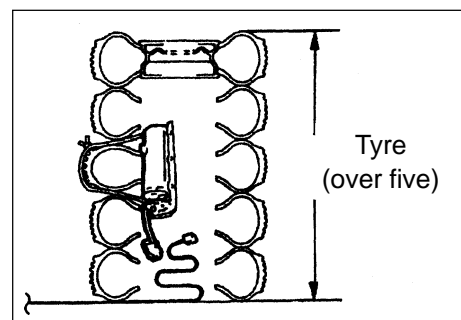


c. Use four wiring harnesses, and the wiring harness should twist the fixed bolts and small bracket of airbag assembly twice at least. Tighten the wiring harness twisted to avoid them loosen, if wiring harness loosen, they might incur airbag assembly loosens for shake when airbag explodes. This is very dangerous.

d. Place the airbag module upwards, and bind the wiring harnesses at the two sides of airbag module in wheel tightly. After twisting the tyre twice with the wiring harness twisted on middle small bracket, bind it on tyre. After twisting the tyre twice with the wiring harness twisted on left and right small bracket, bind it on tyre. Adjust the fixed position of airbag module to make the joint hang in the wheel hub hole of wheel. Then fix the wiring harness getting through the center of left and right small bracket on tyre to prevent the module from shaking left and right, and the wiring harness twisted on bolts of small bracket is fixed on tyre to prevent airbag module from shaking front and back.



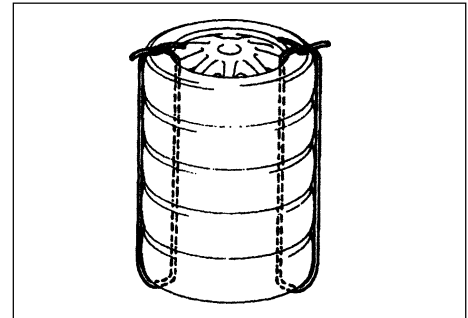
(4) Place the wheel on flat ground, and connect one end of wiring harness used for unfolding with airbag short wiring harness, and connect the other end with short circuit. The terminal end of unfolding wiring harness is 10m apart from wheel of fixed airbag at least.



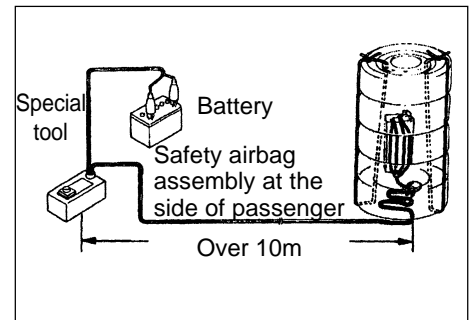
- (5) Put two tyres at least under the tyre fixed with airbag assembly, and put two tyres at least on the tyre fixed with airbag assembly, at the same time, top tyre should have wheel hub. Use two wiring harnesses to bind tyre tightly, if shake is produced when airbag explodes, airbag module will break off to make danger.

Width: 185mm

Inner diameter: 360mm



- (6) Cut off the joint of wiring harness used for unfolding of safety airbag assembly at the side of driver at the place apart from the automobile, then connect it with two ends of battery.



- (7) Treatment for explosive module.

Disassemble the safety airbag module at the side of driver from wheel, and put it in ethane plastic bag, then bind the bag for treatment with other parts.



Safety belt

Note

Hint:

When scraping a automobile equipping with safety belt pre-tension crimper, or disposing the safety belt (equipping with safety belt pre-tension crimper), firstly, it is necessary to make by following steps.

If happening any abnormal phenomenon, please consult with GEELY automobile company.

When disposing a impacted automobile, and its safety belt pre-tension crimper did not explode, its treatment step is same as the "Treatment step 1-(e)".

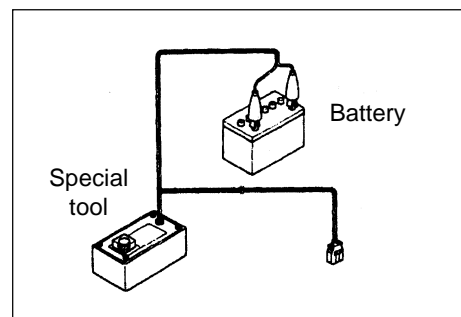
Warning:

- Forbid disposing the safety belt pre-tension crimper that does not work.
- When exploding the safety belt pre-tension crimper, it will produce big explosive noise, so this operation should be made out of automobile and in environment where will not influence near habitants.
- When exploding the safety belt pre-tension crimper, it is necessary to use SRS airbag exploding special tool, at the same time, the environment implementing this operation should be apart from electronic interruption.
- When exploding the safety belt pre-tension crimper, the environment implementing this operation should be 10m apart from safety belt pre-tension crimper assembly.
- When exploding the safety belt pre-tension crimper, safety belt will be very hot, please do not dispose it in 30 minutes after explosion.
- When disposing exploded safety belt pre-tension crimper, it is necessary to wear glove and safety glass.
- After finishing this operation, it is necessary to wash your hand with water.
- Do not sprinkle water on exploded safety belt pre-tension crimper.

Treatment

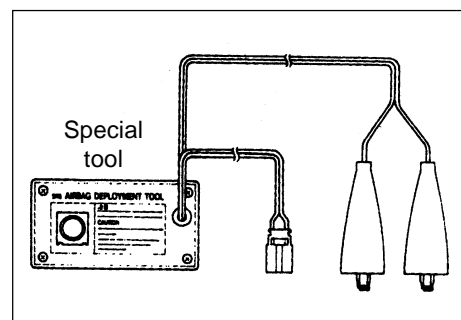
1. Safety belt pre-tension crimper when scraping automobile.

Hint: prepare a battery as the power to explode safety belt pre-tension crimper.



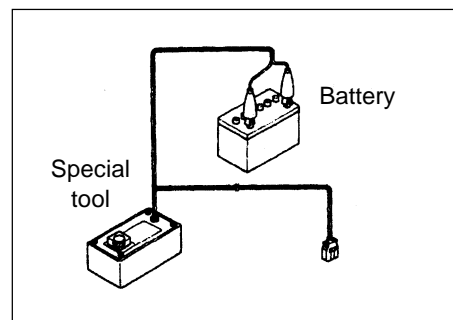
(a) Confirm the function of special tool

Warning: when exploding safety belt pre-tension crimper, it is necessary to use regulated special tool: SRS airbag exploding tool.



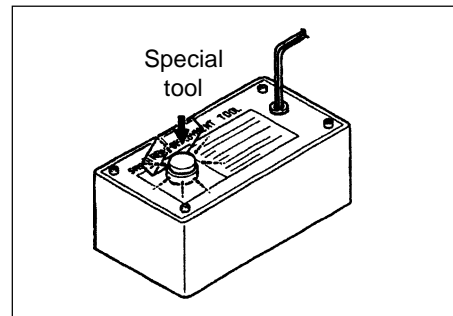
- (1) Connect special tool with battery,
Connect the red clamp of special tool with the anode of battery (+), and black clamp with the cathode of battery (-).

Hint: Do not connect the yellow joint with safety belt pre-tension crimper.

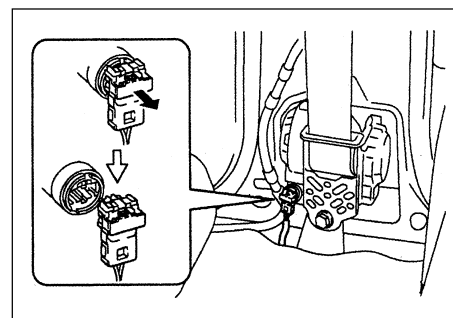


- (2) Confirm the function of special tool.
Press working switch of special tool, then the LED on switch should illuminate.

Warning: if working switch is not pressed, LED illuminates, then special tool might have malfunction, at the this time, do not use the special tool.

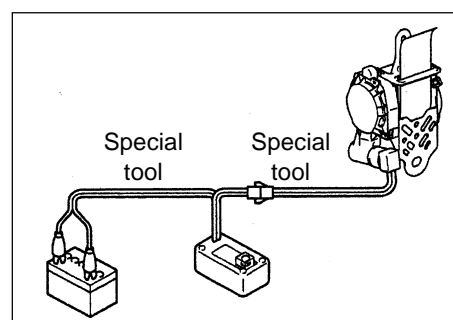


- (b) Disassemble the joint of safety belt pre-tension crimper.
 - (1) Disassemble panel trim board of front door,
 - (2) Disassemble panel trim board of rear door.
 - (3) Disassemble lower fixed bolts and trim cover of safety belt.
 - (4) Disassemble lower inner trim board of middle column.
 - (5) Liking that shown in figure, disassemble the joint of safety belt pre-tension crimper.
- (c) Assemble special tool
 - (1) Assemble lower fixed bolts and trim cover of safety belt.

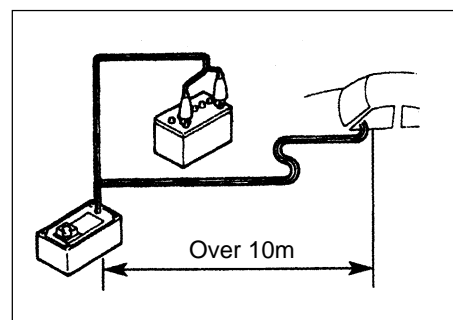


- (2) Connect two special tools with lower fixed bolts and trim cover of safety belt..

Note: to avoid damaging the joint and wiring harness of special tool, do not lock the twice lock of dual-lock organization.



- (3) Move the special tool apart from the front end of automobile for 10m at least.
- (4) Close all doors and windows.
- Note:** do not damage wiring harness of special tool.
- (5) Connect the read clamp of special tool with the anode of battery (+), and black clamp with the cathode of battery (-).



(d) Explode safety belt pre-tension crimper.

(1) Confirm there is no one in automobile and in 10m scope apart from automobile.

(2) Press down working switch of special tool and explode safety belt pre-tension crimper.

Hint: when LED of working switch of special tool illuminates, safety belt pre-tension crimper will explode charged gas at the same time.

(e) Treatment for safety belt pre-tension crimper.

Hint: when scraping automobile, it is necessary to explode safety belt pre-tension crimper, then it could be scraped with automobile.

2. Only treatment for safety belt pre-tension crimper (Treatment type for exploding front seat safety belt).

Note:

- when only exploding safety belt pre-tension crimper, forbid using the automobile belonging to customer to explode safety belt pre-tension crimper.
- When exploding safety belt pre-tension crimper, it is necessary to accord with following step.

(a) Disassemble safety belt.

Hint: cut off safety belt at its position closing to shrinker.

(b) Confirm the function of special tool.

(c) Assemble special tool.

(1) Connect two joints of special tool to the joint of safety belt pre-tension crimper.

Note: to avoid damaging the joint and wiring harness of special tool, do not lock the twice lock of dual-lock organization.

(2) Place the safety belt pre-tension crimper on ground, and cover it with tyre.

Note: Place the safety belt pre-tension crimper liking that shown picturey.

(3) Place the special tool above 10mm away from tyre

Note: do not damage special tool and wiring harness carefully.

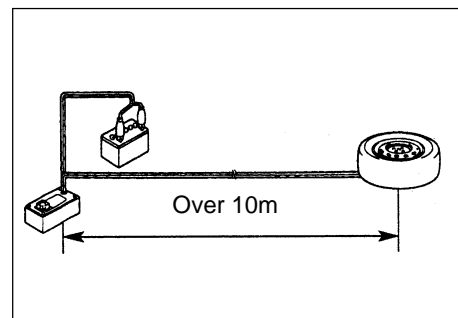
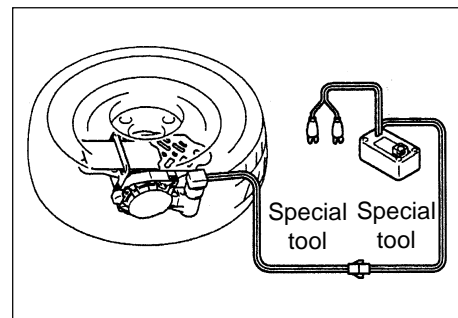
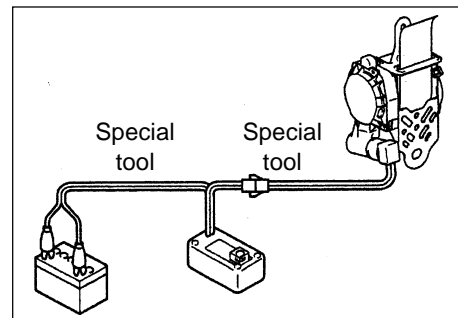
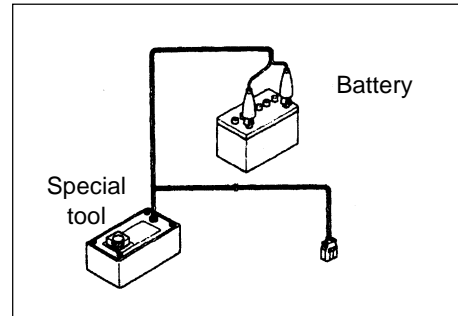
(d) Explode safety belt pre-tension crimper.

(1) Connect red fixed clamp of special tool to the anode of battery (+), black fixed clamp to cathode of battery (-).

(2) Confirm there is not anyone in 10m apart from the tyre binding safety belt pre-tension crimper.

(3) Press down working switch of special tool to explode safety belt pre-tension crimper.

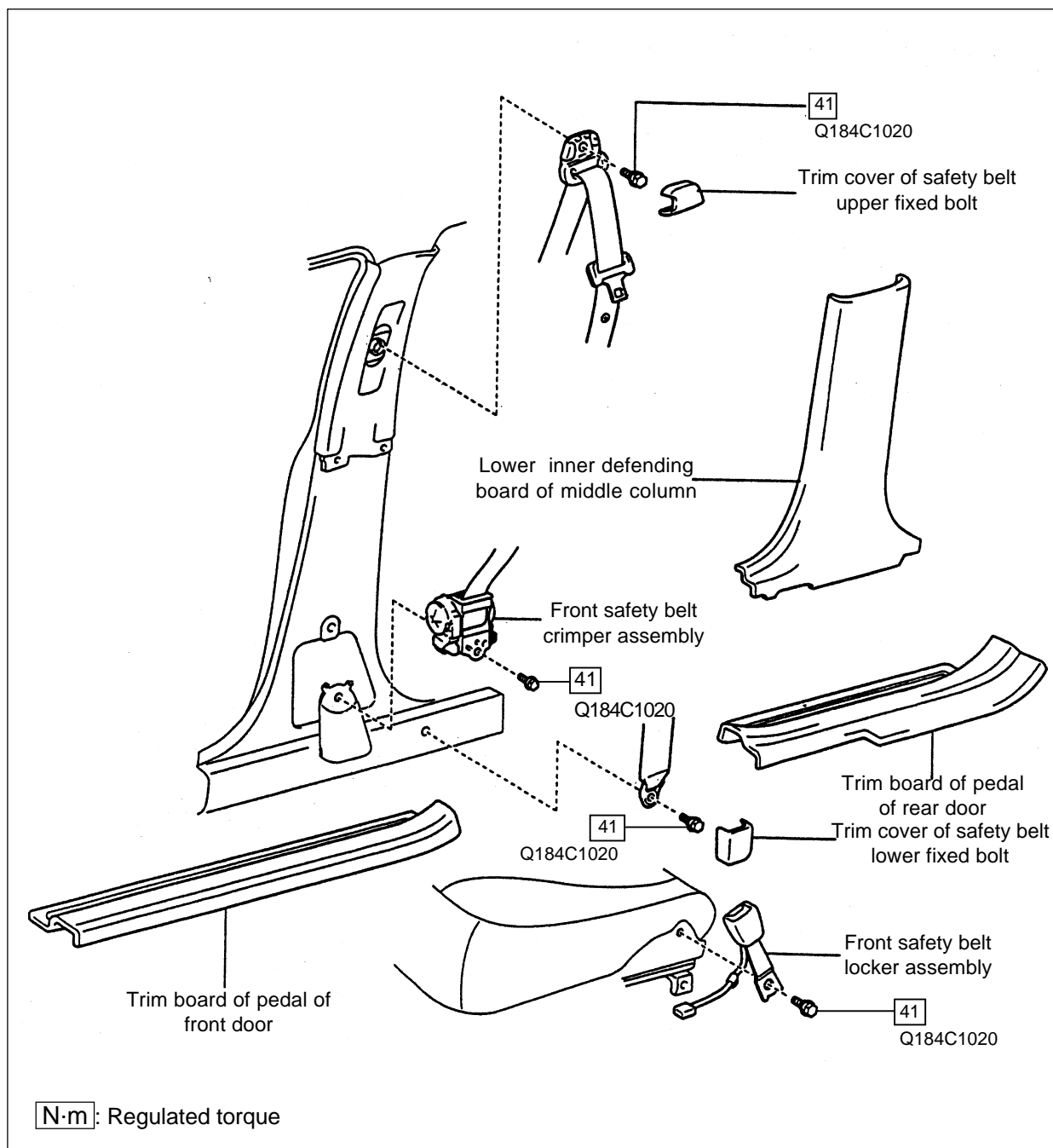
Hint: when LED of working switch of special tool illuminates, safety belt pre-tension crimper will explode at the same time.



- (e) Treatment for safety belt pre-tension crimper.
- (1) Disassemble the tyre and special tool.
 - (2) Put safety belt pre-tension crimper in plastic bag, then bind the bag for treatment with other parts.



Subassembly



Change

Hint:

- When assembling, please work by the sequence that is reverse with disassembling sequence, if necessary, assembling instruction could be got.
- Changing procedure for left side and right side is same.
- Refer to subassembly drawing of front safety belt on page 273.

1. Disassemble cathode wire of battery.

2. Disassemble left front safety belt locker assembly [68010040].

- (a) Disassemble driver seat assembly (referring to page 349).
- (b) Disassemble safety belt locker assembly in side of driver seat gasket (referring to page 349).
- (c) Only driver side: disassemble fixed clamp from gasket bracket of driver seat.
- (d) Disassemble the bolts and safety belt locker assembly in side of front seat.

3. Disassemble trim board of pedal of left front door [68010020].

4. Disassemble trim board of pedal of left rear door [68010022].

5. Disassemble sealed part of doorframe of left front door [68010055].

6. Disassemble sealed part of doorframe of left rear door [68010059].

7. Disassemble lower inner trim board of left middle column [68010018].

8. Disassemble left front safety belt crimper assembly [68010044].

- (a) Use right-angled screwdriver to disassemble trim cover of upper fixed bolt of safety belt.

Hint: use adhesive tape to twist its top end before using.

- (b) Disassemble the bolts and crimper assembly.

- (c) Use right-angled screwdriver to disassemble trim cover of upper fixed bolt of safety belt.

Hint: use adhesive tape to twist its top end before using.

- (d) Disassemble the bolts and lower fixed bolts of floor safety belt.

- (e) Disconnect the joint of crimper liking that shown in figure.

Note: when disassembling the safety belt, it is necessary to turn the ignition switch to LOCK position, and disconnect the cathode of battery for 90 seconds, then it could start to work.

- (f) Disassemble the bolts and crimper.

9. Assemble left front safety belt crimper assembly.

- (a) Check the inclining angle when ELR starts to lock.

- (1) Confirm whether safety belt could be pulled out if the angle exceeds 45°.

Note: do not disassemble the crimper.

- (b) Use the bolts to assemble crimper.

Torque: 41 N·m

- (c) Use two bolts to assemble fixed seat of side shoulder belt and safety belt.

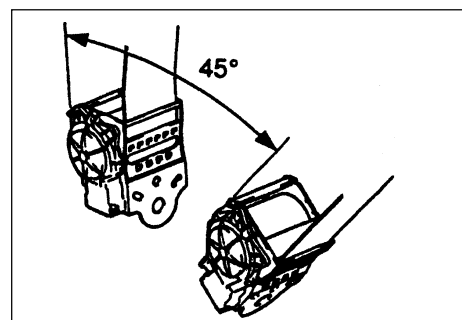
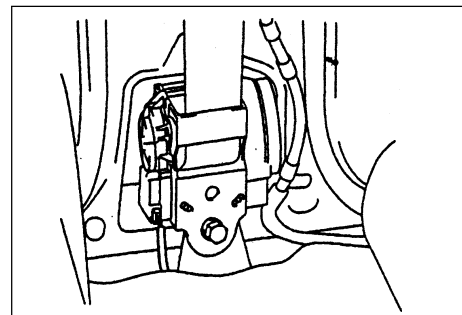
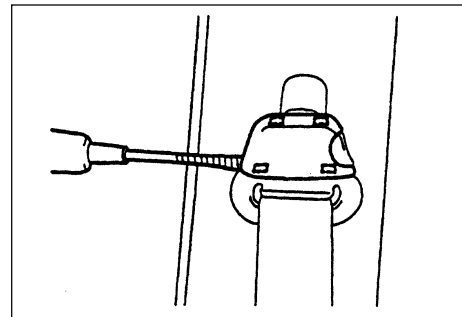
Torque: 41 N·m

- (d) Check the lock of ELR.

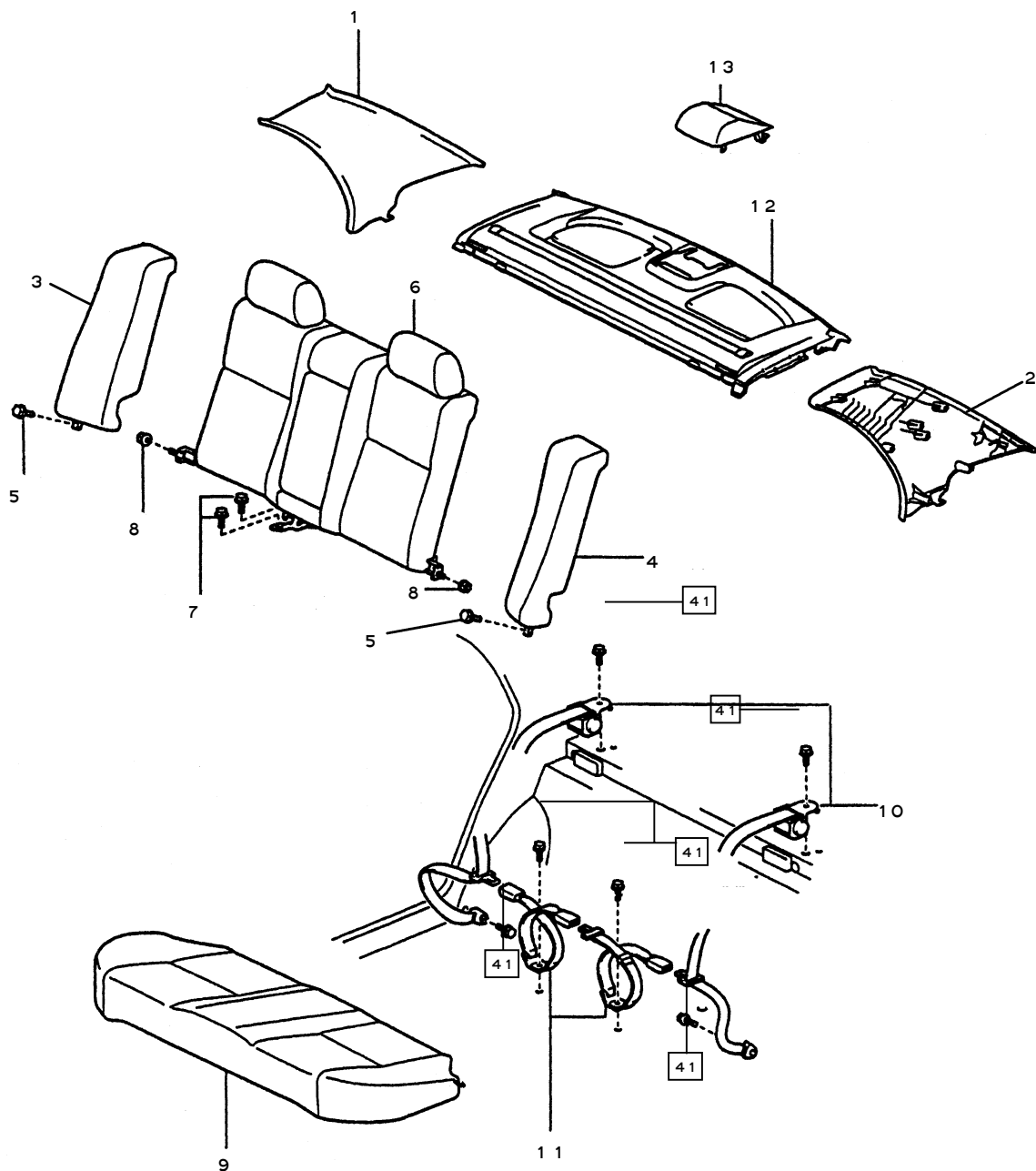
- (e) After safety belt is assembled on automobile, check whether the safety belt could be locked when it is pulled out quickly.

10. Assemble left front inside safety belt clamp.

Torque: 41 N·m



1. Inner trim board assembly of left rear column [68010026]
2. Inner trim board assembly of right rear column [68010027]
3. Left backrest assembly of rear row seat [68010078]
4. Right backrest assembly of rear row seat [68010079]
5. Combination part of Hexagon head bolt and flat washer M6*14 [Q1400614]
6. Backrest assembly of rear row seat [68010076]
7. Step bolt of hexagon flange face [68000203]
8. Combination part of hexagon bolt with flat big washer M10*1.25*22 [Q1401022]
9. Cushion assembly of rear row seat [68010074]
10. Rear safety belt crimper assembly [68010048]
11. Middle waistband of rear row safety belt with locker assembly [68010043]
12. Rear shelf with sun shade assembly [68010032]
13. High mount brake light [68010008]



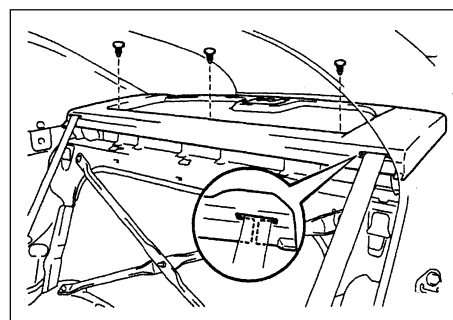
□ □ : Regulated torque

Change

Hint:

- When assembling, please work by the sequence that is reverse with disassembling sequence, if necessary, assembling instruction could be got.
- Changing procedure for left side and right side is same.
- Refer to subassembly drawing of front safety belt on page 275.

1. Disassemble cushion assembly of rear row seat.
2. Disassemble Right backrest assembly of rear row seat [68010079]
3. Disassemble left backrest assembly of rear row seat [68010078]
4. Disassemble cushion assembly of rear row seat [68010074]
5. Disassemble backrest assembly of rear row seat [68010076]
6. Disassemble high mount brake light assembly [68010008]
7. Disassemble inner trim board assembly of right rear column [68010027]
8. Disassemble inner trim board assembly of left rear column [68010026]
9. Disassemble rear platform with sun blind assembly [68010032]
 - (a) Use special disassembling tool to disassemble three fixed clamps.
 - (b) Pull out safety belt from the clearance, then disassemble rear platform with sun blind assembly.



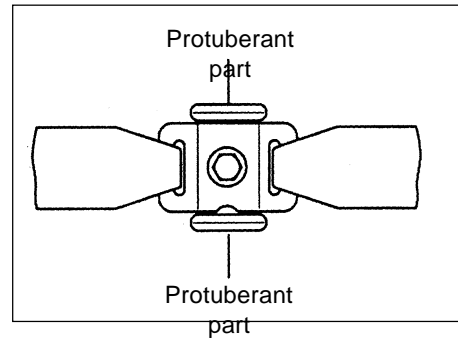
10. Disassemble rear safety belt crimper assembly [68010048]
 - (a) Disassemble the bolts and safety belt clamps.
 - (b) Disassemble the bolts and rear safety belt crimper assembly.
11. Disassemble middle waistband of rear row safety belt with locker assembly. [68010043]
 - (a) Disassemble the bolts and middle waistband of rear row safety belt with locker assembly.

12. Assemble middle waistband of rear row safety belt with locker assembly [68010043]

- (a) Use the bolts to assemble middle waistband of rear row safety belt with locker assembly.

Torque: 41 N·m

Note: insure the clamp part does not press the protuberant part of floor.



13. Assemble rear safety belt crimper assembly.

- (a) Check the inclining angle when ELR starts to lock.

- (1) Confirm whether safety belt could be pulled out if the angle exceeds 45°.

Note: do not disassemble the crimper.

- (b) Use the bolts to assemble rear safety belt crimper assembly.

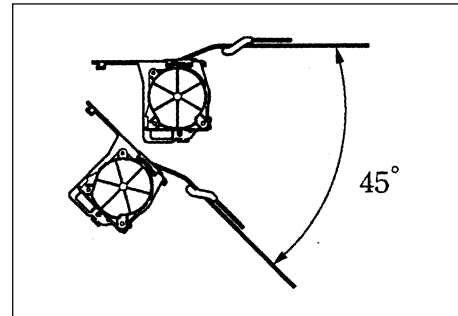
Torque: 41 N·m

- (c) Use the bolts to assemble floor side clamp.

Torque: 41 N·m

- (d) Check the lock of ELR.

- (1) After safety belt is assembled on automobile, check whether the safety belt could be locked when safety belt is pulled out quickly.



Light

Light System

Notes

1. Notes for changing the front combination bulb

- (a) When the surface of halogen bulbs (the bulb of front assembled headlamp and front fog light) touches oil, their working life will be shorten. When it lights, it becomes hot.
- (b) Because of pressured gas in halogen bulbs (the bulb of front assembled headlamp and front fog light), the bulb may explode and pieces of broken glass disperse around. So deal with it carefully.
- (c) If the time after disassembling the bulb from lamp carrier is too long, the mirror may be polluted by dirties or hydrosphere. You should prepare a new bulb, then replace it.
- (d) Replace it with the lamp of same wattage.
- (e) Assemble the changing bulb on the lamp carrier firmly, or it may bring mirror mirage or water intrusion.
- (f) Do not touch the black of the top of glass, or it may shorten its working life.

The phenomena table

1. front combination lights and tail light

Phenomena	Possible part	Reference pages
Only one front combination light lights	1.bulb 2.fuse 3.wiring harness	- - -
Low beam headlights do not light (all)	1.fuse 2.relay 3.left combination switch 4.wiring harness	- - - -
distance lights do not light (all)	1.fuse 2.relay 3.left combination switch 4.wiring harness	- - - -
Distance light do not light (one side)	1.bulb 2.wiring harness	- -
Flare does not light	1.left combination switch 2.flare 3.wiring harness	- - -
Front combination lights are too dark	1.bulb 2.wiring harness	- -
Only one rear combination light lights	1.bulb 2.wiring harness	- -
Rear combination lights do not light (front combination lights are normal)	1.bulb 2.wiring harness 3.left combination switch 4.wiring harness	- - - -
Rear combination lights do not light (front combination lights are abnormal)	1.fuse 2.relay	- -

2. Fog light System

phenomena	Possible part	Reference pages
The light control switch switches on, the front fog lights do not light (front combination lights are normal)	1.(front fog light)fuse 2.fog light relay 3.fog light switch 4.wiring harness	— — — —
Lamp switch turn to "HEAD". front fog lights do not light (front combination light do not light)	1.other parts 2.wiring harness	— —
Only one front fog light do not light	1.bulb 2.wiring harness	— —
Rear fog lights do not light (front combination lights are normal) (front fog lights are normal)	1.fuse 2.rear fog light switch 3.wiring harness 4.bulb	— — — —
Rear fog lights do not light (front fog lights do not light)	1.other parts 2.wiring harness 3.bulb 4.front fog light switch 5.rear fog light switch	— — — — —

3. Turning and emergency warning light system

phenomena	Possible parts	Reference pages
Emergency warning light and turn light does not light	1. (meter) fuse 2. (turn) fuse 3. ignition switch 4. flasher assembly 5. wiring harness	— — — — —
Emergency warning light does not light (turning light is normal)	1. Emergency warning light switch 2. wiring harness	— —
Turn light does not light (Emergency warning light is normal)	1. turn light switch 2. wiring harness	— —
Side turning light does not light (warning light is normal)	1. turn light switch 2. wiring harness 3. bulb	— — —
One side of turning light does not light	1. turn light switch 2. wiring harness 3. bulb	— — —
One side of turning light does not light	1. turn light switch 2. wiring harness	— —
Only one bulb does not light	1. bulb 2. wiring harness	— —

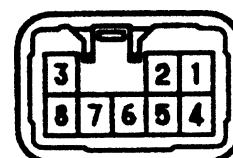
4. Room lights system

phenomena	Possible parts	Reference pages
All lights do not light	1. (room light) fuse	—
When driver cap side door opens, the light does not light	1. driver cap side door control switch 2. wiring harness 3. bulb	— — —
When right front door opens, the light does not light	1. right front door control switch 2. wiring harness 3. bulb	— — —
When right rear door opens, the light does not light	1. right rear door control switch 2. wiring harness 3. bulb	— — —
When left rear door opens, the light does not light	1. left rear door control switch 2. wiring harness 3. bulb	— — —
Only one light can light	1. bulb	—
After all doors are closed, illuminating lamp will not flame out gradually.	1. Door-control switch 2. Wire harness	— —
After all doors closed, the head lamp does not light in 15 seconds, when turn ignition switch to ACC or ON.	1. ignition switch 2. fuse 3. light relay 4. wiring harness	— — — —
Driver side light or passenger cap side light do not light	1. (door) fuse 2. (meter) fuse 3. light relay 4. driver side door control switch 5. bulb 6. wiring harness	— — — — — —
When Driver side door opens, driver side light does not light	1. driver side door control switch 2. wiring harness 3. bulb	— — —
When Passenger side door opens, passenger side light does not light	1. passenger side door control switch 2. wiring harness 3. bulb	— — —

Inspect the car

1. inspect turning flasher wiring

- (a) Disassemble joint from turning flasher and inspect wiring harness side joint as following table.



Avometer terminals	condition	regular situations
7-earth	normal	conduction
1-earth	turn light switch ON	battery voltage
1-earth	turn light switch ON	no voltage
4-earth	normal	battery voltage

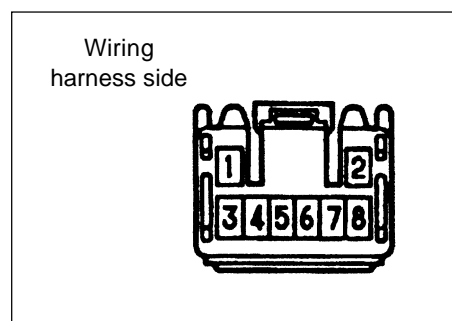
(b) Connect joint to directional switch and inspect from wiring harness's side joint as following table:

Avometer terminals	condition	regular situation
2-earth	warning light switch OFF → ON	0V → 0 ⇔ 9V every min 60 to 120 times
2-earth	turn light switch (right) OFF → ON	0V → 0 ⇔ every min 60 to 120 times
3-earth	warning light switch OFF → ON	0V → 0 ⇔ 9V every min 60 to 120 times
3-earth	turn light (left) switch OFF → ON	0V → 0 ⇔ 9V every min 60 to 120 times
5-earth	turn light(left) switch OFF → ON	over 9V → 0V
6-earth	turn light(right) switch OFF → ON	over 9V → 0V
8-earth	warning light switch OFF → ON	over 9V → 0V

2. Inspect rear fog light switch

(a) inspect rear fog light wiring

(1) Disassemble the joint from switch sides and inspect the joint from wiring harness as following table.



Avometer terminals	condition	regular situation
1-earth	normal	conduction
2-earth	light control switch OFF → ON	0V → 10-14V
3-earth	normal	10-14V
5-earth	light control switch OFF → ON	not conduction → conduction
6-earth	front fog light switch OFF → ON	not conduction → conduction
7-earth	normal	conduction

(b) Inspect function of rear fog light.

(1) Turn the ignition switch to ON.

(2) Inspect rear fog light's situation when every switch works, just as following table.

Situation	rear fog light working situations
Light switch OFF → ON, front fog light switch OFF	rear fog light does not light
Light switch OFF → ON, front fog light switch ON, rear fog light switch ON	rear fog light lights

3. Inspect lighting system function

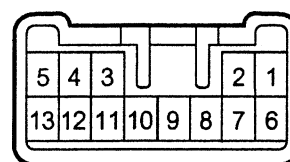
Clues on: key aperture lamp and room light.

- (a) Turn the ignition switch to OFF and open all doors, then lock driver cap side door.
- (b) Unlock the drive's side door and open any door, then inspect whether room light lights. Close the door and inspect whether room light lights off in 15 seconds.
- (c) Turn ignition switch to ON, then open any door to inspect whether room light lights off immediately.
- (d) Turn ignition switch to OFF.
- (e) Open or close any door to light room light. Turn ignition switch to ON before room light turns off (about 15 seconds) to inspect whether room light turns off immediately.
- (f) Turn ignition switch to OFF.
- (g) Open or close any door to light room light. Lock driver cap side door before room light turns off (about 15 seconds) to inspect whether room light turns off immediately.

Inspect

1. Front combination headlight dimmer switch assembly

- (a) Inspect the conduction of light control switch
 - (1) Inspect switch on every positions, the conduction among terminals as following table.



Switch positions	Avometer terminals	regular situations
OFF	-	not conduction
Position light	12-6	conduction
Lamp	12-6	conduction
Lamp	7-10	conduction

- (b) Inspect conduction of front assembled dimmer switch
 - (1) Inspect switch on every parts, the conduction among terminals as following table.

Switch positions	Avometer terminals	regular situations
Flasher	11-10	conduction
Low beam light	9-10	conduction
Distant light	7-10	conduction

- (c) Inspect the conduction of turning light switch
 - (1) Inspect switch on every positions, the conduction among terminals as following table.

Switch positions	Avometer terminals	regular situations
Turn right	4-5	conduction
neutral	-	not conduction
turn left	4-3	conduction

(d) Inspect conduction of front fog light switch

(1) Inspect switch on every positions, the conduction among terminals as following table.

Switch positions	Avometer terminals	regular situation
OFF	1-2	not conduction
ON	1-2	conduction

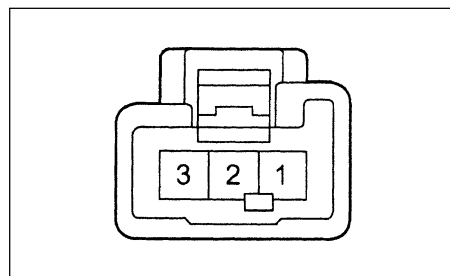
2. Interior rear top light assembly [67010006]

(a) Inspect the conduction of interior rear top light

(1) Inspect switch on every position, the conduction among terminals as following table.

Standard:

Switch positions	Avometer terminals	regular situation
OFF	-	not conduction
DOOR	1-2	conduction
ON	2-bodywork earth	conduction



3. Room front top light assembly [67010007] (equipped with electric sunroof [67010009])

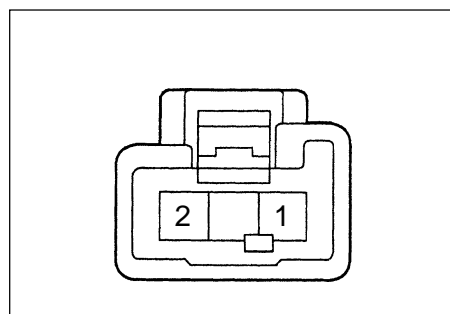
(a) Inspect the conduction of room front roof light

(1) Inspect the conduction between terminal 1 and terminal 2, when switch works.

Standard:

ON: conduction

OFF: not conduction



4. Room front top light assembly [67010005](do not equipped with electric sunroof)

(a) Inspect the conduction of room front roof light

(1) Inspect the conduction between terminal 1 and terminal 2, when switch works.

Standard:

ON: conduction

OFF: not conduction

5. Trunk lighting assemble [67000106]

(a) Inspect the conduction among terminals.

Standard: conduction

6. Inspect the B door pillar control switch assembly [67000075]

- (a) Inspect the conduction of B pillar control switch assembly
 (1) Inspect the conduction between terminal 1 and bodywork earth, when switch works.

Standard:

ON (when press the switch): conduction

OFF (when un-press the switch): not conduction

7. Inspect the C door pillar control switch assembly [67000076]

- (a) Inspect the conduction of C pillar control switch assembly
 (1) Inspect the conduction between terminal 1 and bodywork earth,when switch works.

Standard:

ON (when press the switch): conduction

OFF (when un-press the switch): not conduction

8. Trunk light switch assemble [67000073]

- (a) Inspect the conduction of Trunk light switch

Standard:

ON (when press the switch): conduction

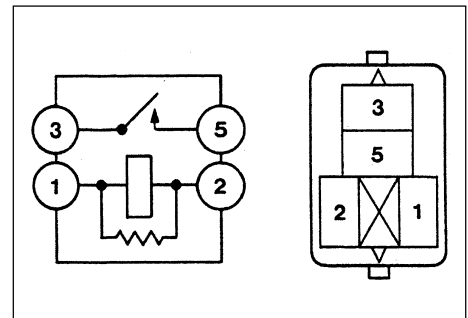
OFF (when un-press the switch): not conduction

9. Front fog light relay [67000071]

- (a) Inspect the conduction of front fog light relay
 (1) Inspect the conduction among terminals

Standards:

Avometer terminals	regular situations
1-2	conduction
3-5	not conduction

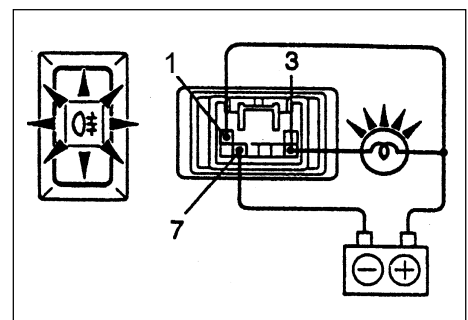


- (2) Supply battery voltage(10-14V) to terminal1 and terminal2, then inspect the conduction between terminal 3 and terminal 5.

Standard: conduction

10. Inspect rear fog light switch of instrument block left switch units [67010003].

- (a) Inspect battery's positive wire connects to terminal 1,negative connects to terminals 7.
 (b) Connect a 3.4W test bulb from battery's positive wire to terminal 3.
 (c) Inspect lighting switch, indicator light of assembled instruments and test bulb should light. If it does not accord with regularizations, replace the switch.

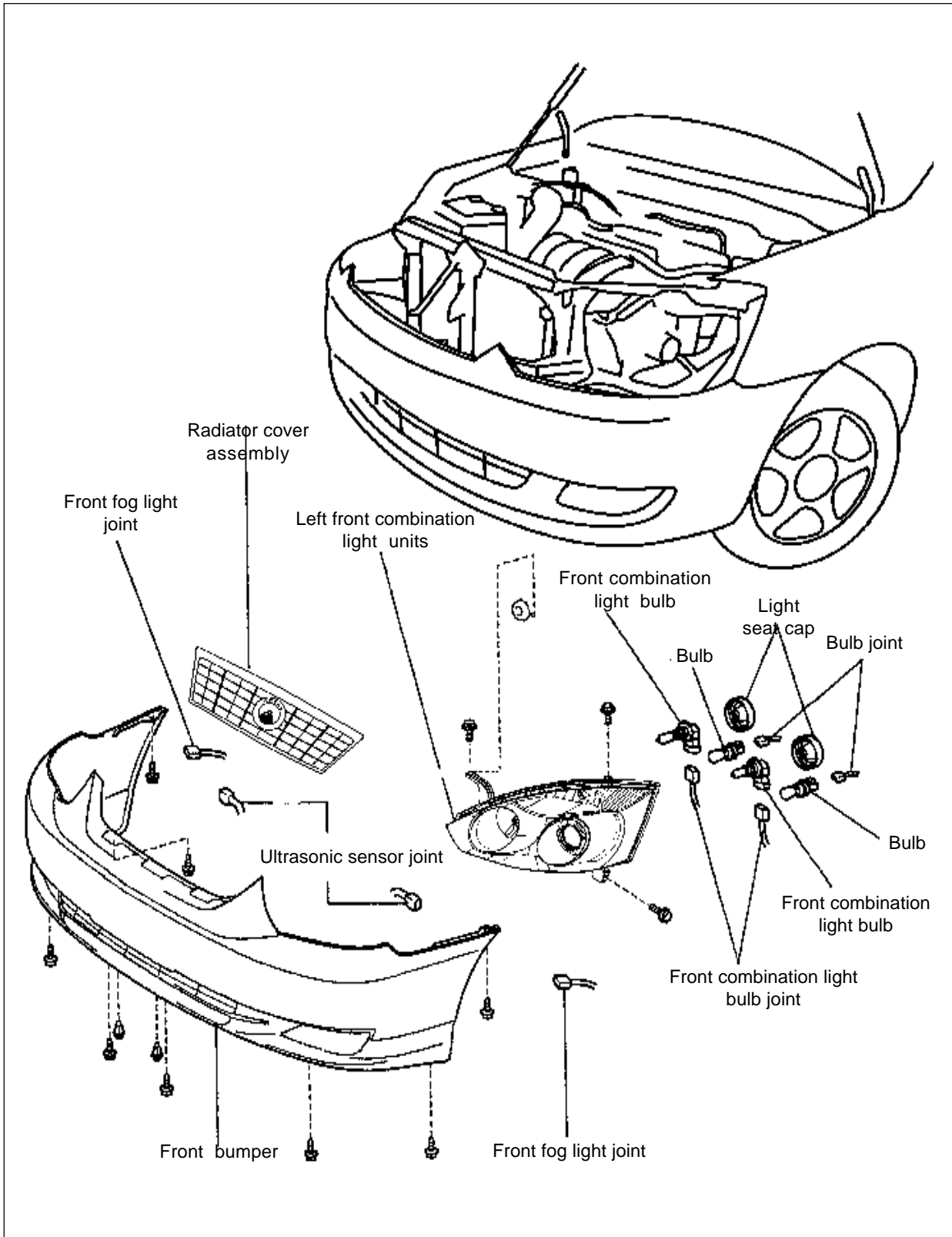


11. Inspect door light assembly [67000107]

Inspect the conduction among terminals.

If the conduction does not accord with regularizations, replace the switch.

Front combination light (LH) Subassembly



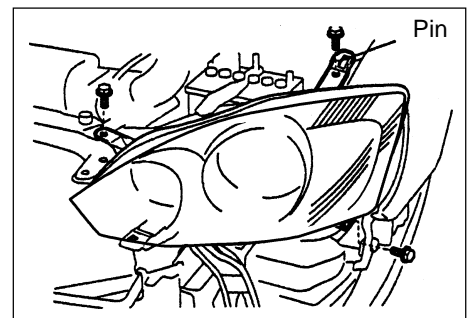
Change

Notes:

- Assemble according to the opposite of disassemble. Instructions comes when necessary.
- The replace procedure are the same on the left and right side.
- Referring to the drawing of front combination light on page 286.

1. Disassemble Radiator cover assembly (reference to page 380)
2. Disassemble left front tyre lining (reference to page 380)
3. Disassemble right front tyre lining (reference to page 380)
4. Disassemble front bumper (reference to page 380)
5. Disassemble left front combination light assembly [67000102]

- (a) Disassemble three bolts
- (b) Disassemble four joints
- (c) Pull combination light ahead
- (d) Disassemble two light seat cap and four bulbs.



Adjustments

1. Adjust front combination light focus only

(a) Parking car should accord to the following situations:

- **Front combination light around does not be distorted or damaged.**
- **Park the car on flat road.**
- **Tyre pressure limits to the regular number value**
- **The driver is on driving seat and the car is ready to go(gasoline tank in full)**
- **The car weaves fore-and-aft for many times.**

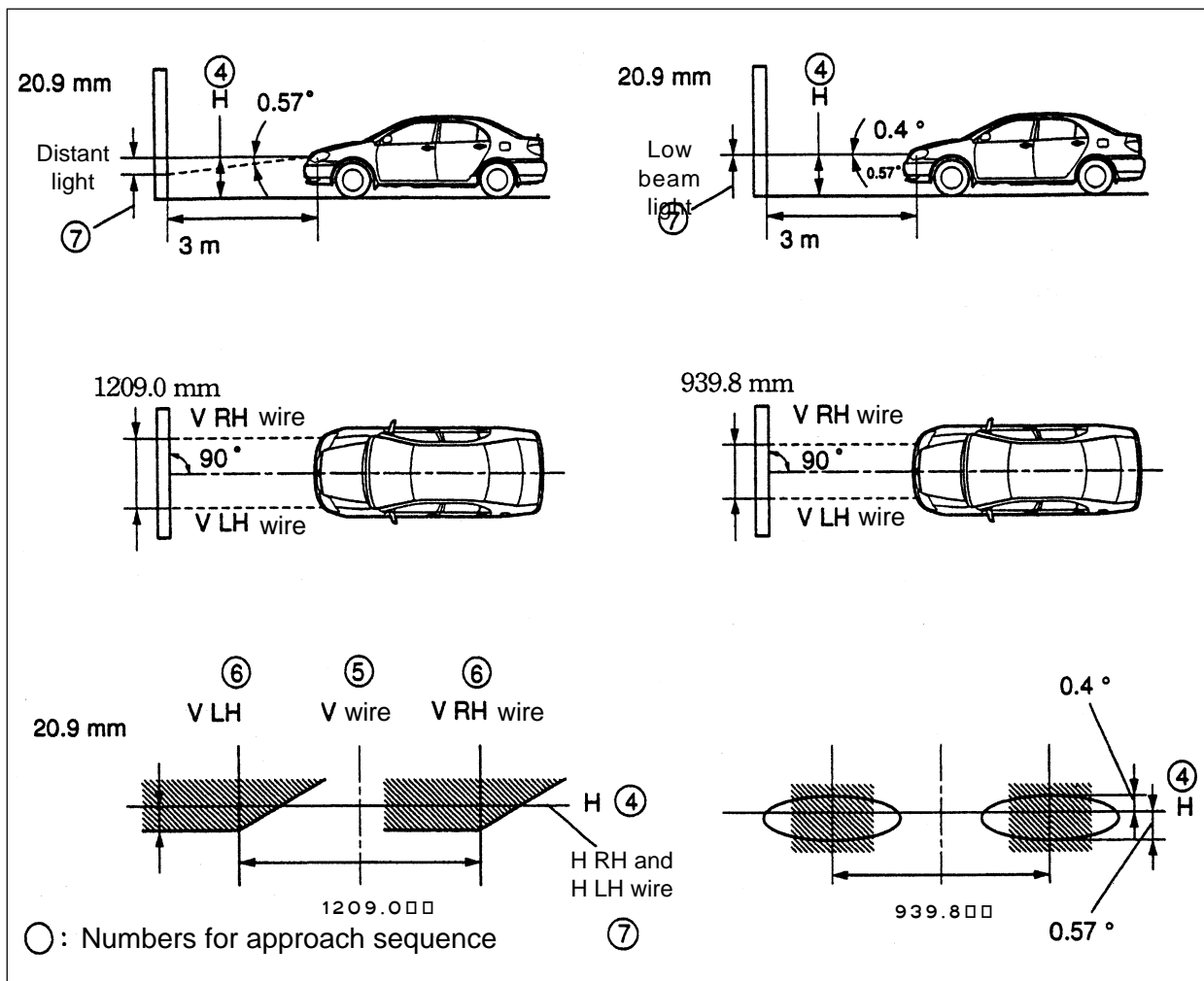
(b) Inspect front combination light focus

- (1) Prepare for thicker white paper
- (2) Arise the paper plumb at the distance of 300cm from headlight.
- (3) Make sure centerline of the car makes 90 degree angle with paper's surface as following drawing.
- (4) Draw a level line (H line) on the paper which headlight can irradiate.
- (5) Draw a plumb line (V line) on the paper to across centerline of the car.
- (6) Draw two level lines (V RH and V LH) in the area where two side lights can irradiate.
- (7) Draw a level line(connect the middle signal of two low beam headlight) to the area where headlight can irradiates.

Clues on: H RH and H LH lines are 0.57 lower than level line(H line)of light.

- (8) Start the engine.
- (9) Turn the front assembled switch to ON.

- (10) Inspect front combination light whether it irradiates on the area as drawing.
 (11) If not, adjust light on vertical line or level line.



Clues on:

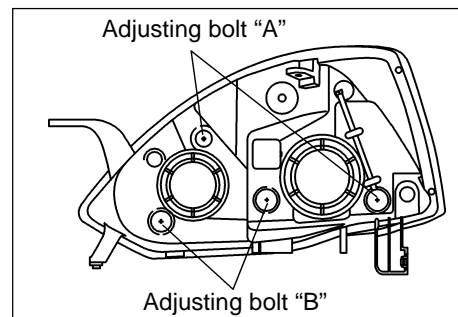
- Adjust the focus between lights of RH and LH as the drawing.
- The value of low beam focal length is reference value for it is impossible to adjust at level direction.

(c) Adjust vertical direction

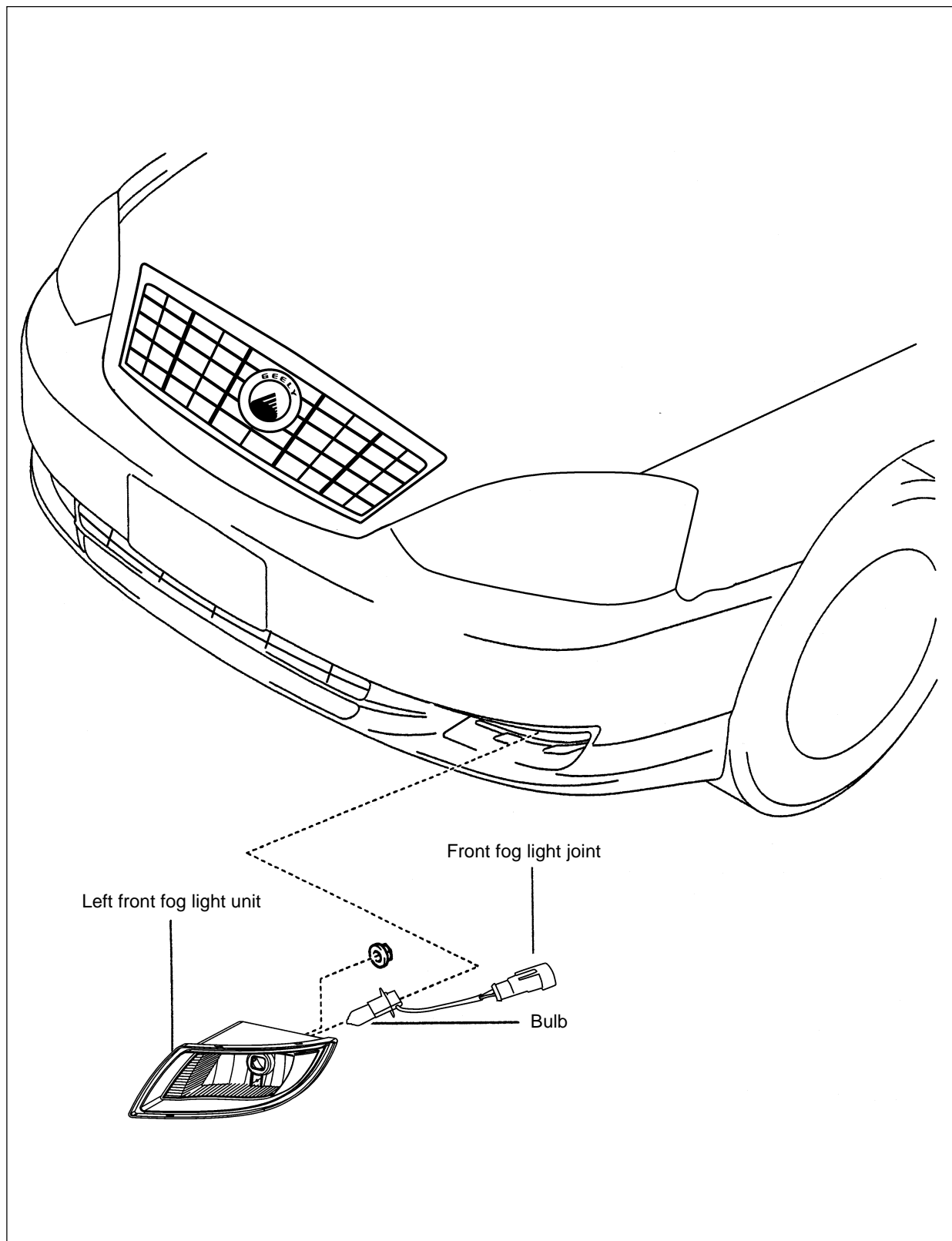
Use the adjustable bolt A to make the headlight focus limits to the regular.

(d) Adjust level direction

Use the adjustable bolt B to make the headlight focus limits to the regular.



Front fog light Components



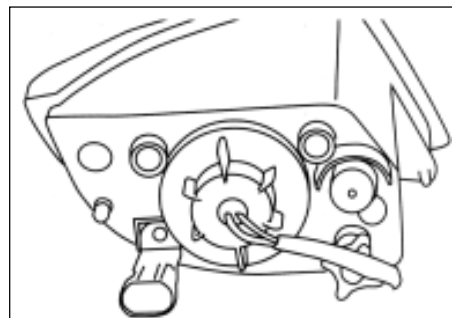
Change

Notes:

- Assemble according to the opposite of disassemble. Instructions comes when necessary.
- The replace procedure are the same, left and right side.
- Referring to the drawing of front combination light on page 286

1. Replace front fog light bulb

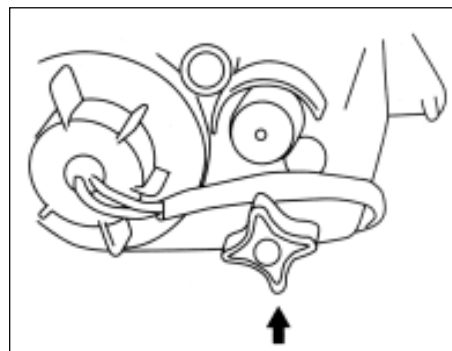
- (a) Disassemble front fog light seal cap
- (b) Press front fog light bulb spring
- (c) Disassemble the bulb



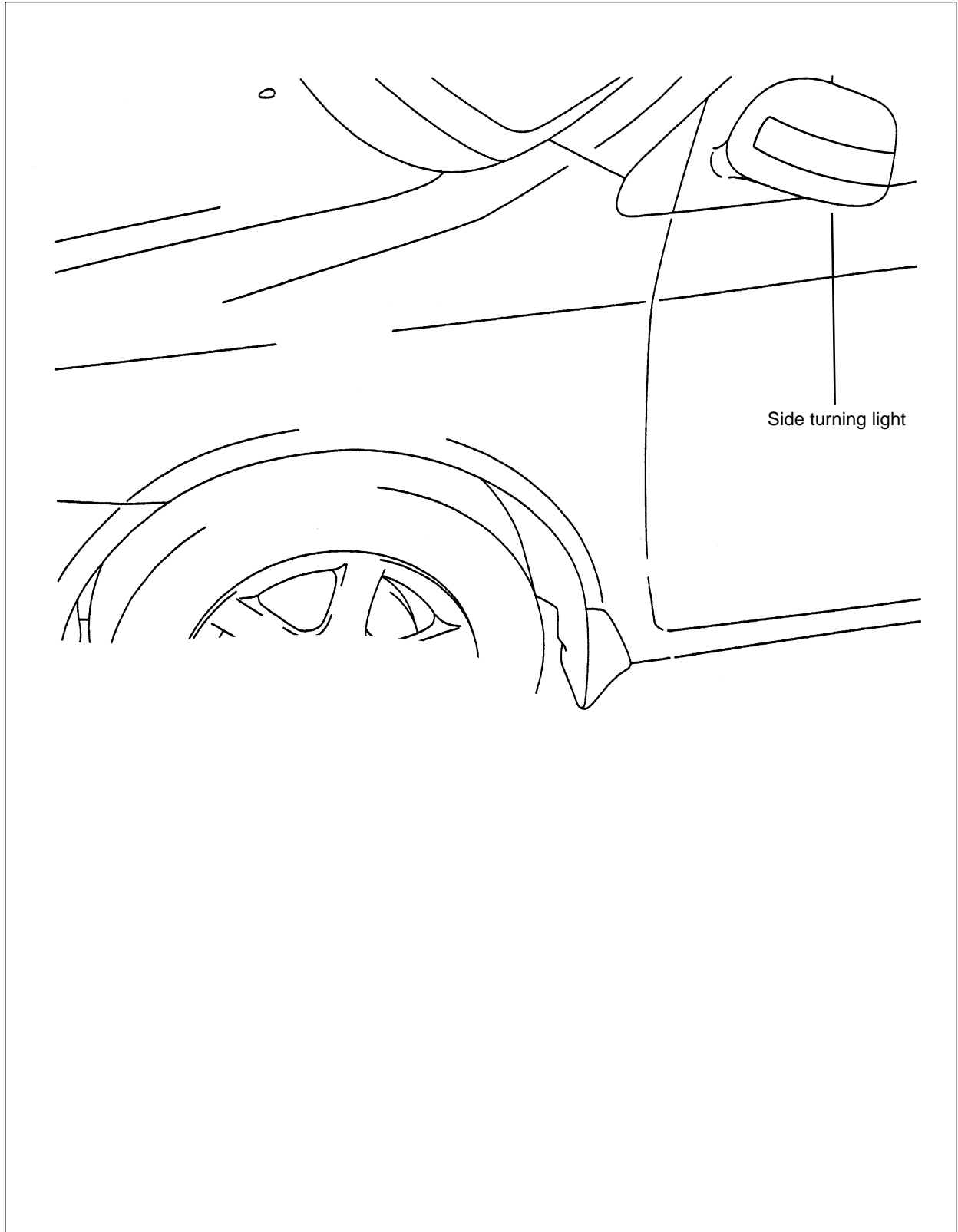
Adjustments

1. Adjust front fog light optic axis

- (a) Tyre pressure limits to regular number values.
- (b) Start the engine.
- (c) Adjust fog light optic axis by turning the optic axis adjustable button on the vertical direction.

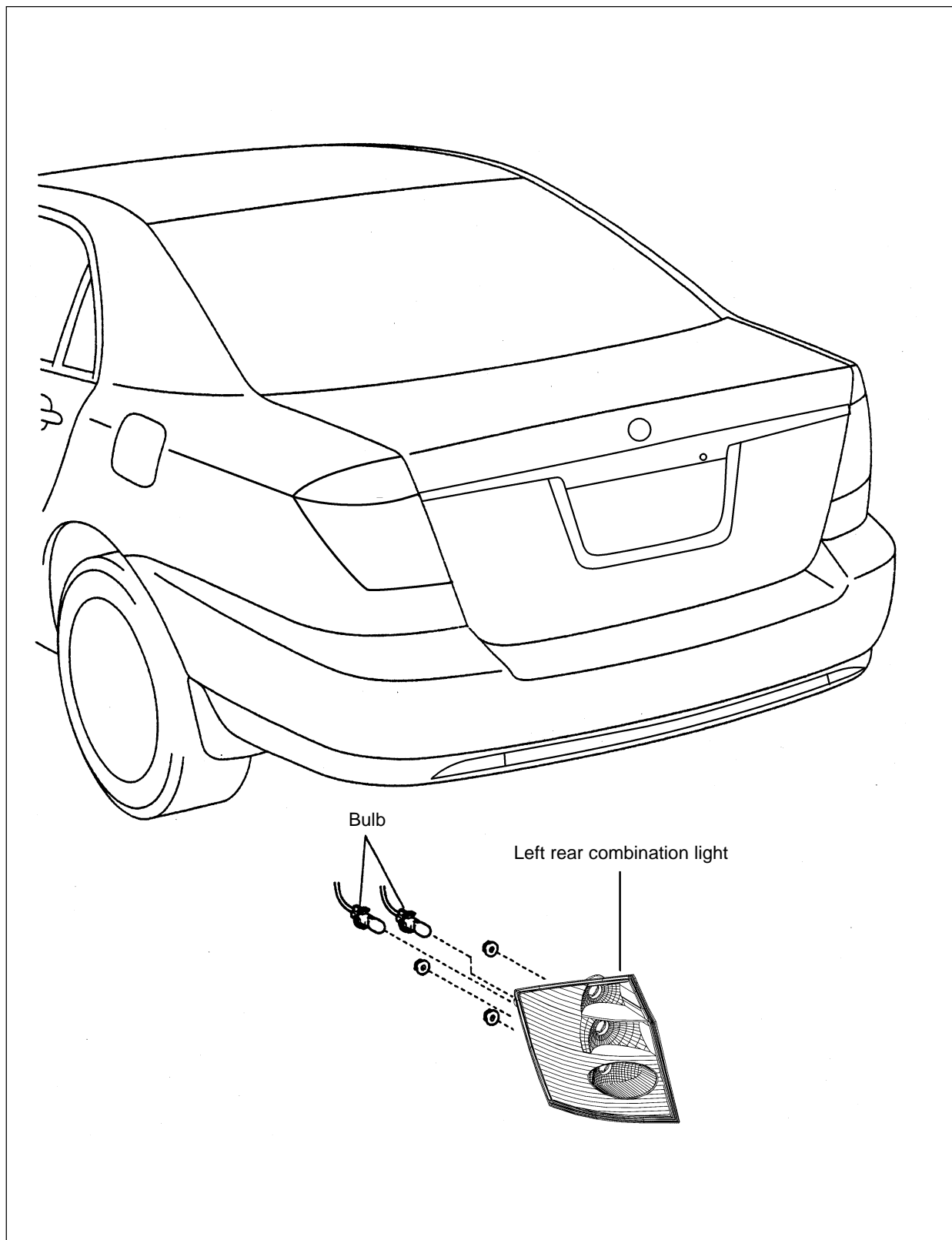


Side turning light Components



Rear combination light (LH)

Components



Change

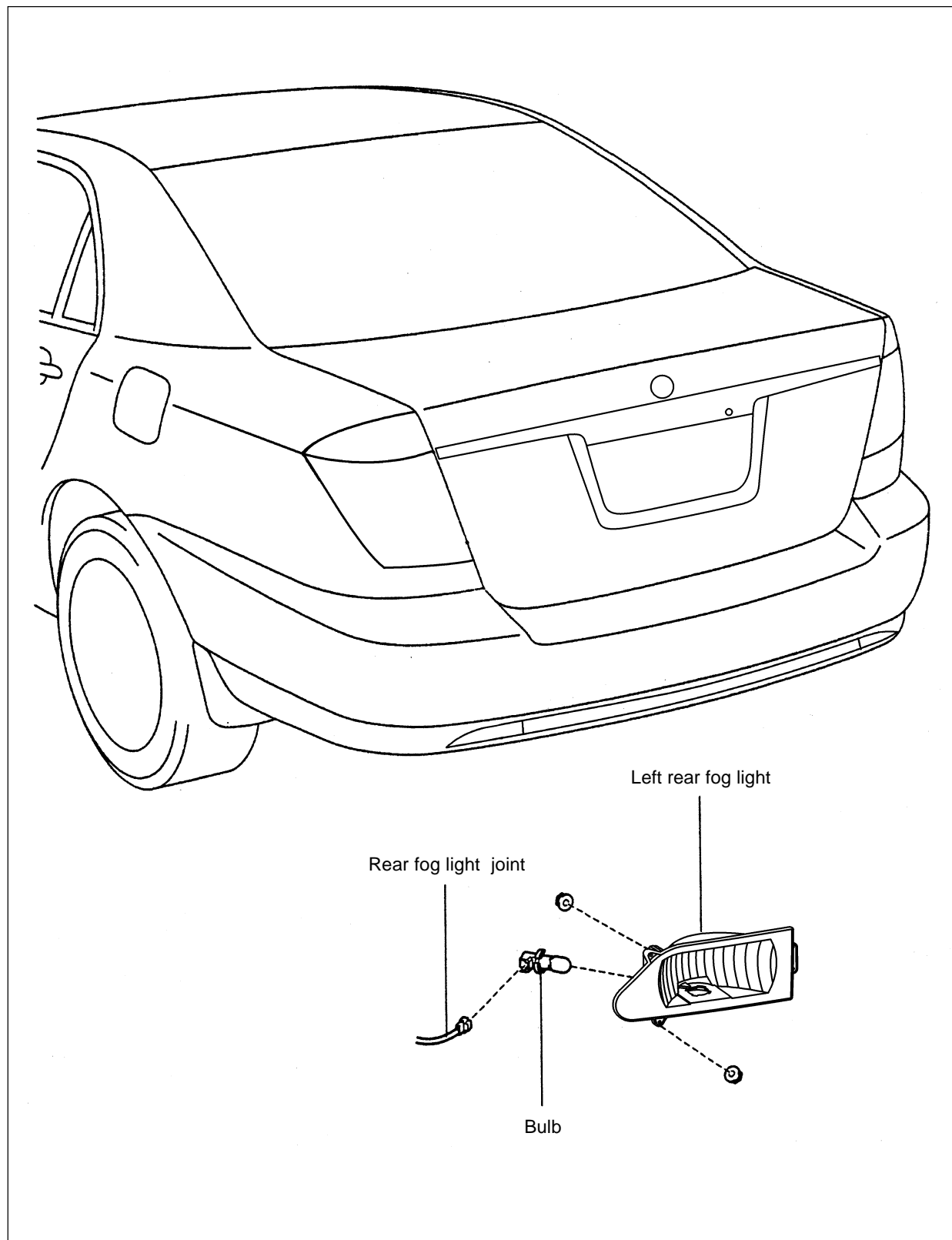
Notes:

- Assemble according to the opposite of disassemble. Instructions comes when necessary.
- The replace procedure are the same on the left and right side.
- Referring to the drawing of front combination light on page 286

1. Disassemble left rear combination light assembly [67000108]

- (a) Disassemble three bolts and rear combination light.
- (b) Disassemble two bulbs

Rear fog light Components



Change

Notes:

- Assemble according to the opposite of disassemble. Instructions comes when necessary.
- The replace procedure is the same on the left and right side.
- Referring to the drawing of front combination light on page 286

1. Disassemble rear fog light.

- (a) Disassemble two bolts.
- (b) Disassemble rear fog light by using vice screw driver

Number plate light

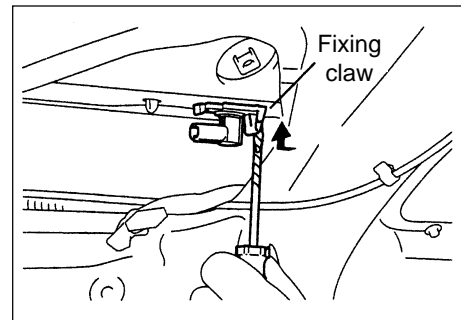
Change

1. Disassemble key aperture of trunk cover and bracket
2. Disassemble number plate light of trunk cover
3. Disassemble number plate light assemble [68000097]

- (a) Disassemble the joints.
- (b) Disassemble number plate light using vice screw driver.

Clues on: Before using vice screw driver, its cusp should enwind adhesive tape.

- (c) Disassemble the bulb.



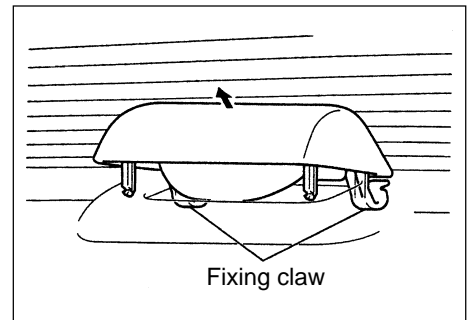
High brake light assembly

Change

1. Disassemble high brake light assembly [67010008]

(a) Loosen two fixed jaw just as drawing.

(b) Loosen two fixed jaw and disassemble high brake light assembly as the drawing, then take the joint apart.



Left combination switch

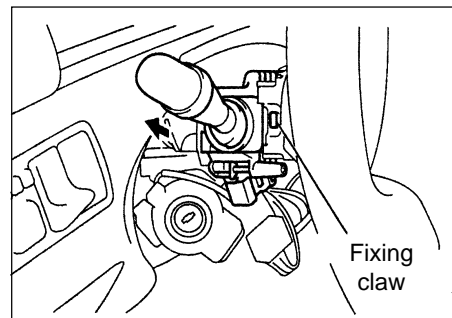
Change

1. Disassemble decorative board under steering column [67000129]

2. Disassemble left combination switch assembly [67000078]

(a) Take the joint apart.

(b) Loosen fixed jaw and pull left combination switch assembly.



Wiper and cleaner

Wiper and cleaner system

Malfunction phenomena table

The underside table can help you to eliminating malfunction in wiring. It sorts as possibilities of malfunction's reasons.

Malfunction	Component names	Reference pages
Wiper and cleaner do not work.	1. ignition switch	-
	2. ignition relay	-
	3. (wiper) fuse (central power distribution box)	-
	4. right assembled switch	302
	5. wiring harness	
Wiper does not work on LO, HI or MIST.	1. right assembled switch	302
	2. wiper generator	303
	3. wiring harness	
Wiper does not work on INT	1. right assembled switch	302
	2. wiper generator	303
	3. wiring harness	
Washer generator does not work	1. (washer) fuse (central power distribution box)	-
	2. wiper switch	-
	3. wiper generator	-
	4. wiring harness	-
When cleaner switch ON, wiper does not work.	1. right assembled switch	302
	2. washer generator	303
	3. wiring harness	-
Wiper cleaner can not spout	1. cleaner hose and nozzle	-
<ul style="list-style-type: none"> Right assembled switch on HI, wiper blade will touch the bodywork. When right combination switches are OFF, washer will not return to original position or stop position is incorrect. 	1. right assembled switch *1	302
	2. wiring harness	-

*1:inspect set position of wiper arm and wiper blade.

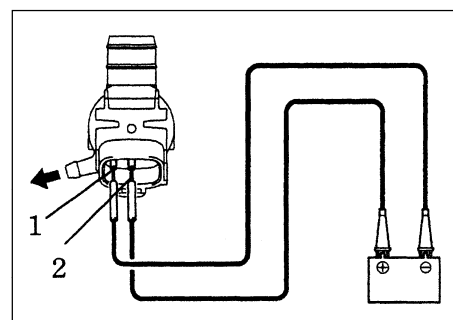
Inspect the car

Inspect the function of cleaner generator

- (1) Add some rinsing to wiper water tank, then disassemble cleaner generator joint.
- (2) Connect battery wire with cleaner generator joint terminal2, negative wire with terminal1, then inspect whether cleaner generator works.

Notes: Be quick(in 20 seconds) to do this test to prevent cleaner generator coil from burning.

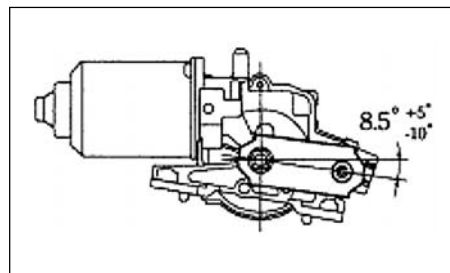
If its function does not in accord with regulations, replace cleaner generator.



Inspect

1. Inspect the conduction of right combination switch [67000079]

(a) Inspect the conduction of every terminal of joints.



Right combination switch

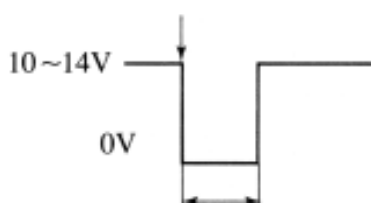
Switch positions	terminals connect with avometer	regular situations
MIST	SWL-WIG	Conduction
OFF	AS-SWL	Conduction
INT	AS-SWL/SWL-WIG	Conduction
LO	SWL-WIG	Conduction
HI	SWH-WIG	Conduction

Sprinkler switch

Switch position	terminals connect with avometer	regular situations
OFF	-	Not conduction
ON	WIG-WS	conduction

(b) Inspect intermittent function of wiper.

- (1) Connect voltmeter positive wire with joint terminal SWL, connect negative to terminal EW.
- (2) Connect battery positive wire with joint terminal WIG, connect negative to terminal EW.
- (3) Turn right assembled switch to INT.
- (4) Connect battery positive wire with terminal AS for 5 seconds.
- (5) Connect battery negative with terminal AS for 5 seconds actuate intermittent relay and check the voltage between terminal SWL and terminal EW .



(c) Inspect the function of cleaner

- (1) Turn right assembled switch to OFF.
- (2) Connect battery positive wire with joint terminal WIG, connect negative to terminal EW.
- (3) Connect voltmeter positive wire with joint terminal WS, connect negative to terminal EW.
- (4) Switch on cleaner switch and inspect its going.

2. Inspect the function of generator

(a) low speed:

Connect battery positive wire with joint terminal SWL, connect negative to terminal ES. Inspect whether generator work at low speed.

If its function does not in conformity with regulations, replace wiper.

(b) high speed

Connect battery positive wire with joint terminal SWH, connect negative to terminal WS. Inspect whether generator work at high speed.

If its function does not in conformity with regulations, replace wiper.

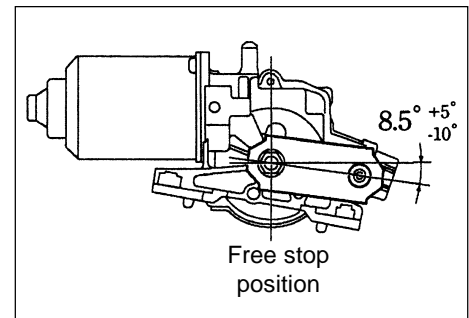
(c) Free stop position

(1) Connect battery positive wire with joint terminal SWL, connect negative to terminals ES to make generator work at low speed. Disassemble terminal SWL lead to make generator stop except stop position.

(2) Connect terminal SWL with terminal AS

(3) Connect battery positive wire with joint terminal SWL to make generator work at low speed again. Inspect generator whether stop at the stop position.

If its function does not in conformity with regulations, replace wiper.



Right combination switch

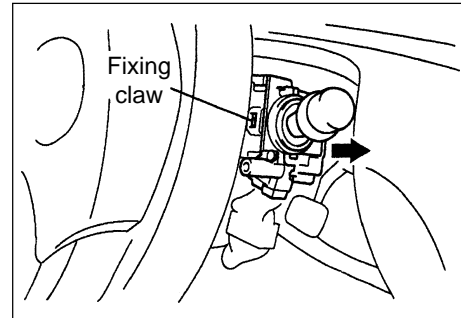
Change

1. Disassemble the lower trim board of the steering gear

2. Disassemble right combination switch assembly
[67000079]

- (a) Disassemble the joints.
- (b) Press fixed jaw to separate meshing then disassemble right combination switch assembly.

Notes: Do not overly press fixed jaw, or it may be damaged.



Wiper generator

Change

1. **Disassemble wiper arm cap.**
2. **Disassemble auxiliary wiper arm assembly [68000059]**

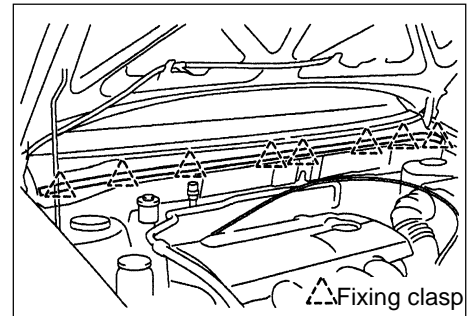
Disassemble screw cap and auxiliary wiper arm assembly.

3. **Disassemble main wiper arm assembly [68000057]**

Disassemble screw cap and main wiper arm assembly.

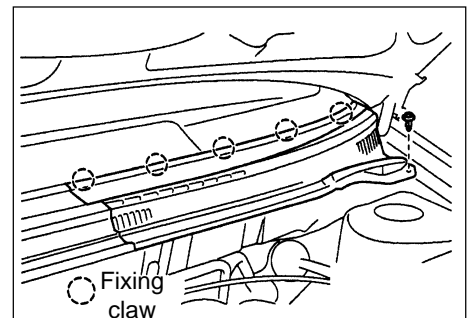
4. **Disassemble generator cap to fire barrier seal.**

Separate eight fixed buckles to disassemble the seal from generator cap to fire barrier.



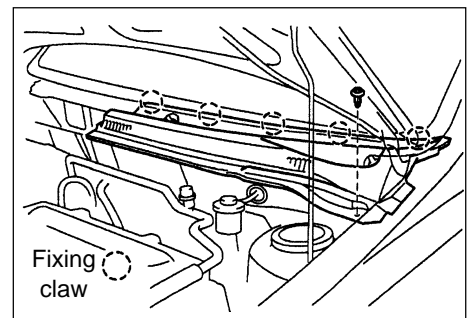
5. **Disassemble ventilation cover on passenger side.**

Disassemble five fixed jaws so as to disassemble ventilation cover on passenger side.



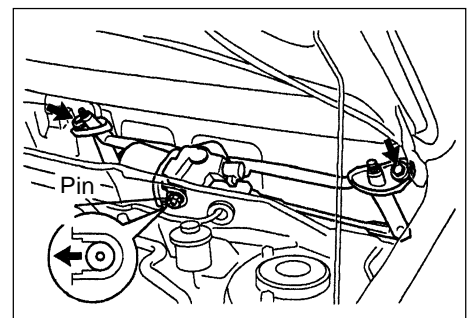
6. **Disassemble ventilation cover on driver side.**

Disassemble five fixed jaw so as to disassemble ventilation cover on driver side.



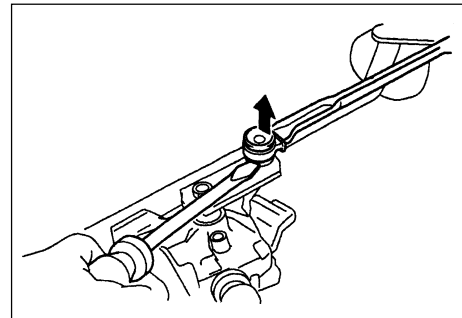
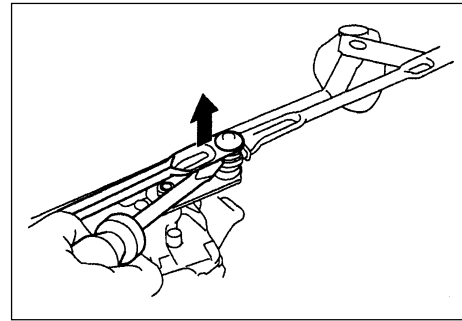
7. **Disassemble wiper connecting rod assembly [68000053]**

- (a) Disassemble the joint.
- (b) Disassemble the bolt.
- (c) Slide wiper connecting rod assembly to passenger side to separate meshing of rubber pin so as to disassemble wiper connecting nod.



8. Disassemble wiper generator

- (a) Separate two connecting rod caps of shaft pins.

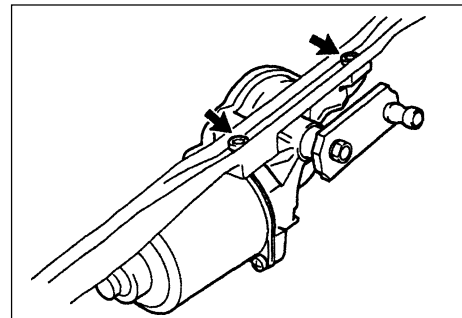


- (b) Separate two star- bolts so as to disassemble wiper generator.

9. Assemble wiper generator

- (a) Daub MP grease to connecting rod caps of wiper generator.
(b) Use two Star-bolts to assemble wiper generator to wiper connecting rod.

Torque: 5.39 N.m

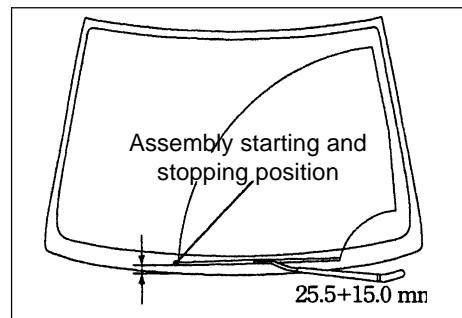


10. Assemble wiper connecting rod assembly [68000053]

- (a) Meshing wiper connecting rod rubber pin
(b) Use two bolts to assemble wiper connecting rod.

Torque: 5.5 N.m

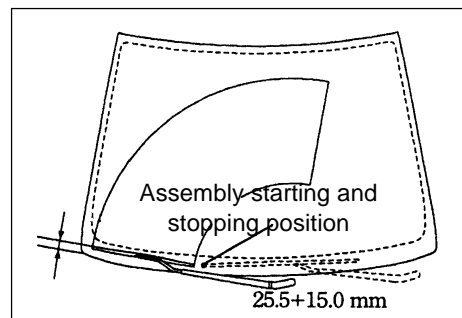
- (c) Connect the joints.



11. Assemble assistant wiper arm assembly [68000059]

- (a) Use steel brush to clean small tooth slot of wiper pivot.
(b) Use bolt cap to fix wiper arm on passenger side to make wiper blade at the position as drawing.

Torque: 20.5 N.m



12. Assemble main wiper arm assembly [68000057]

- (a) Use steel brush to clean small tooth slot of wiper pivot.
(b) Use bolt cap to fix wiper arm on driver side to make wiper vane at the position as drawing.

Wiper

Change

1. Disassemble left wiper shelf.

Disassemble left wiper shelf from left wiper arm.

Note: Do not bend wiper arm adown when disassemble wiper shelf.

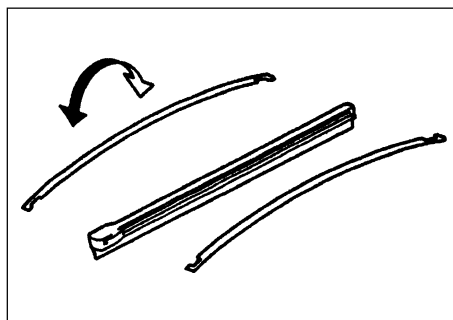
2. Disassemble wiper blade

Disassemble wiper blade from wiper shelf.

3. Disassemble wiper blade fixed branch vane.

4. Assemble wiper blade fixed branch vane.

Note: Be careful, do not assemble front and rear branch blade by mistake.



5. Assemble wiper blade

Put the head of wiper blade(on big end side) on the direction of wiper arm connecting shaft side, when you assemble left wiper blade.

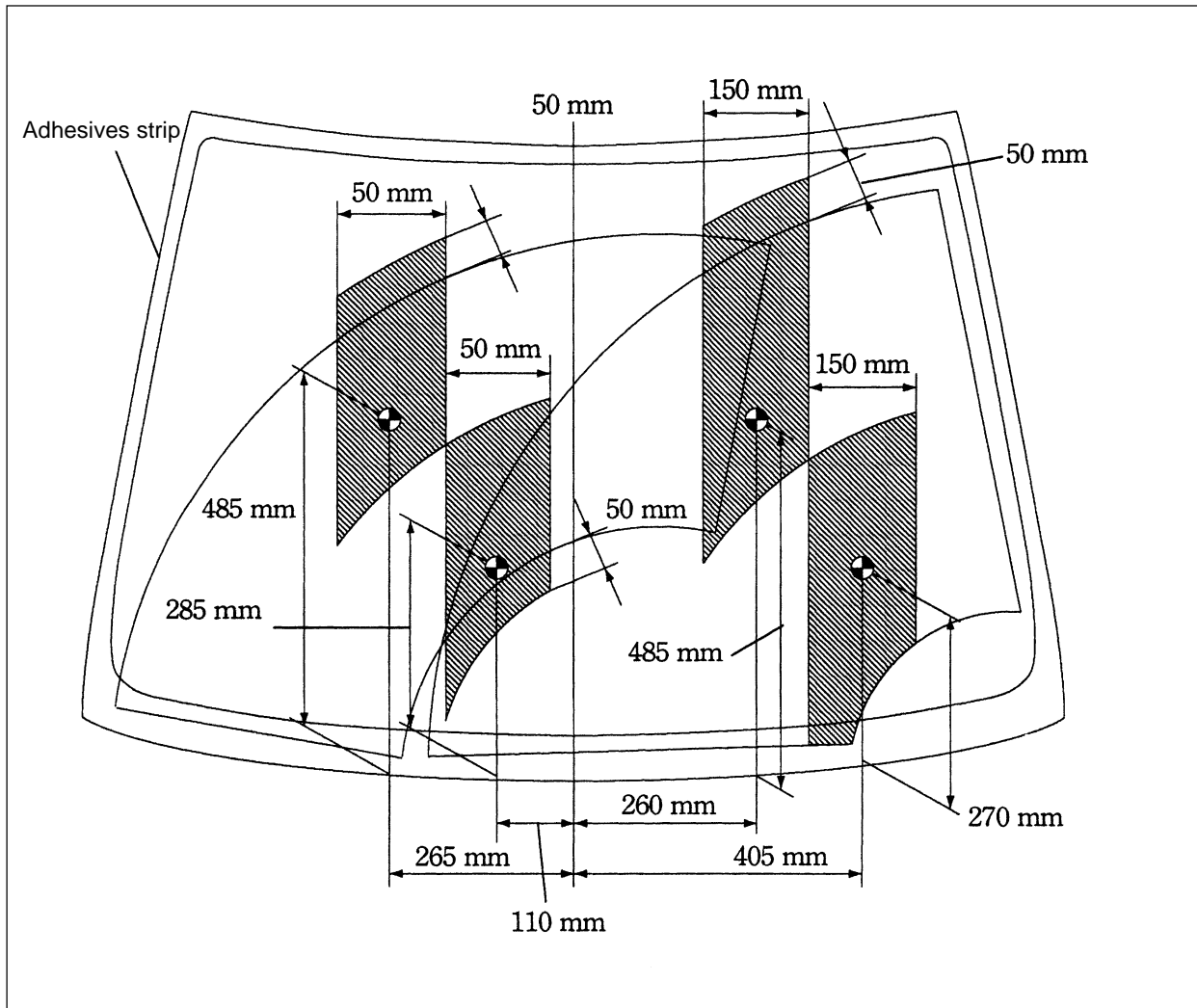
Note: Pull the wiper blade into wiper shelf completely.

Cleaner nozzle

Adjustments

1. Inspect cleaner nozzle

When engine works, inspect whether wiper water blast spurt in the area of wind shield bias as the drawing.



Audio system

Audio system

Notes

1. Observe notes for disposal and operation

- (a) Please explain to customers: when take battery's negative terminal off, the memory broadcasting station on the audio AM/FM set on the radio will be deleted. So, before taking battery's negative terminal off, note the station's information according to your need. After taking back negative terminal, set former station again.
- (b) Before disassemble/assemble the radio, inspect and take cassette and CD out in.
Clues on: the malfunction of disassemble/assemble the radio is because the tape or CD can not take out. Do not take it out by force. Drive the car to the service station.
- (c) Do not touch the audio film of loudhailer

2. Refer to instructions about using and maintaining audio system

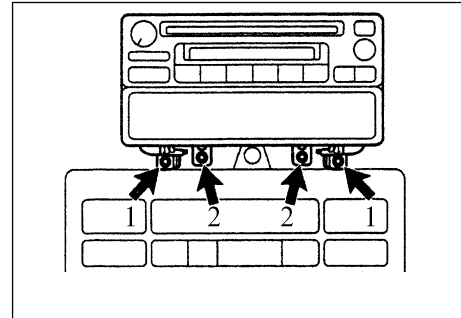
Radio assembly

Change

1. Disassemble the CD machine assembly (referring to page 342)

2. Disassemble radio assembly

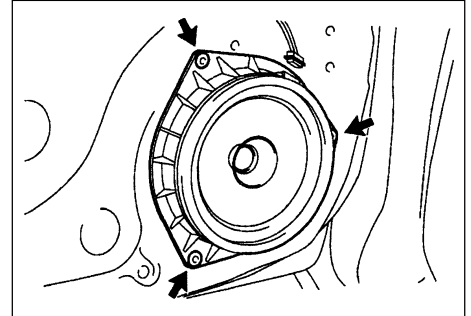
- (a) Disassemble four bolts as the drawing.
- (b) Take the joint apart, then disassemble radio assembly.



Left front door loudhailer

Change

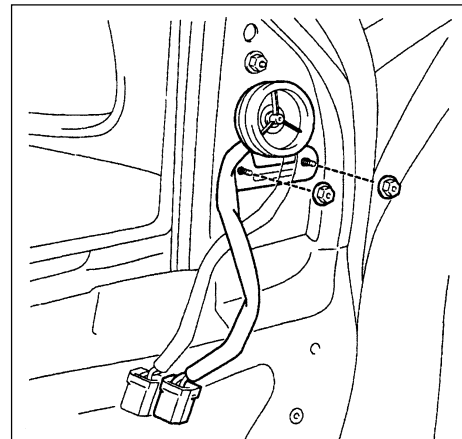
1. Disassemble left front door control panel assembly [68000142]
2. Disassemble left front door inner guard board assembly [68010049]
3. Disassemble left front door water screen assembly [68000140]
4. Disassemble left front door loudhailer assembly [67000127]
 - (a) Disassemble three rivets.
 - (b) Disassemble the joint, then disassemble left front loudhailer.
5. Diasassemble left front door loudhailer assembly [67000127]
 - (a) Use three new rivets to assemble new left front door loudhailer assembly.
 - (b) Connect the joint.
6. Replace right front door loudhailer, just as upper method



Left front small loudhailer

Change

1. Disassemble left front door control panel assembly [68000142]
2. Disassemble left front door inner guard board assembly [68010049]
3. Disassemble left front door water screen assembly [68000140]
4. Disassemble left front door small loudhail cover assembly [67000131]
5. Disassemble left front door small loudhailer assembly [67000129]
 - (a) Disassemble maintenance hole cap, then take the joint apart.
 - (b) Disassemble two nuts and left front small loudhailer assembly.



Rear loudhailer

Change

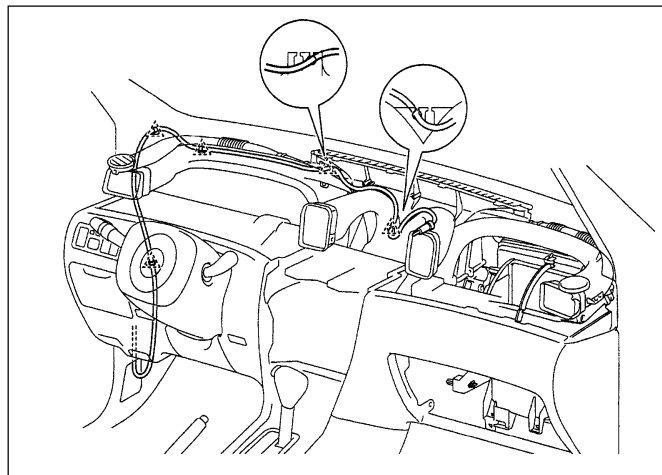
1. **Disassemble rear platform sun blind assembly [68010032] (referring to page 277)**
2. **Disassemble rear loudhailer assembly [67000133]**

Disassemble eight tapping screws and two loudhailers.

Outdoor antenna

Change

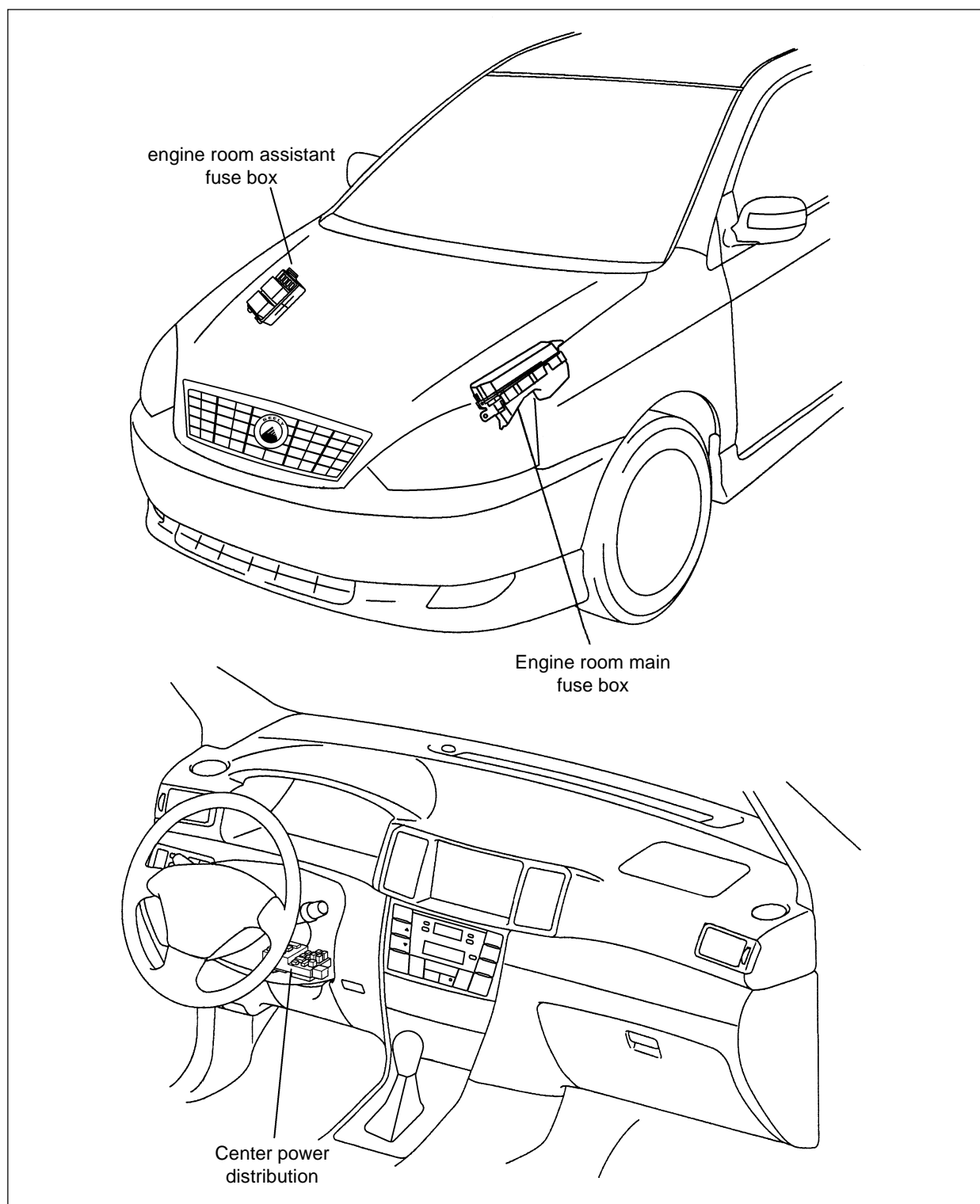
1. Disassemble battery negative wire
2. Put the front tyre forward
3. Disassemble safety airbag assembly at the side of the driver
4. Disassemble steering wheel
5. Disassemble integration instrument cap
6. Disassemble integration instrument
7. Disassemble panel NO.3 air outlet
8. Disassemble panel NO.1 air outlet
9. Disassemble panel center air outlet trim board
10. Disassemble glove box
11. Disassemble right front pillar trim board
12. Disassemble left front pillar trim board.
13. Disassemble the joint of the safety airbag at the side of the passenger
14. Disassemble panel
15. Disassemble right front door trim board.
16. Disassemble right side trim board.
17. Disassemble antenna assembly [67000136]
 - (a) Take removable antenna pillar plug apart from radio.
18. Assemble antenna assembly [67000136]
19. Assemble panel
20. Assemble helix cable.
21. Assemble steering wheel
22. Inspect steering wheel whether it dead against the center.
23. Inspect horn button.
- 24 Assemble horn button
25. Inspect SRS warning light

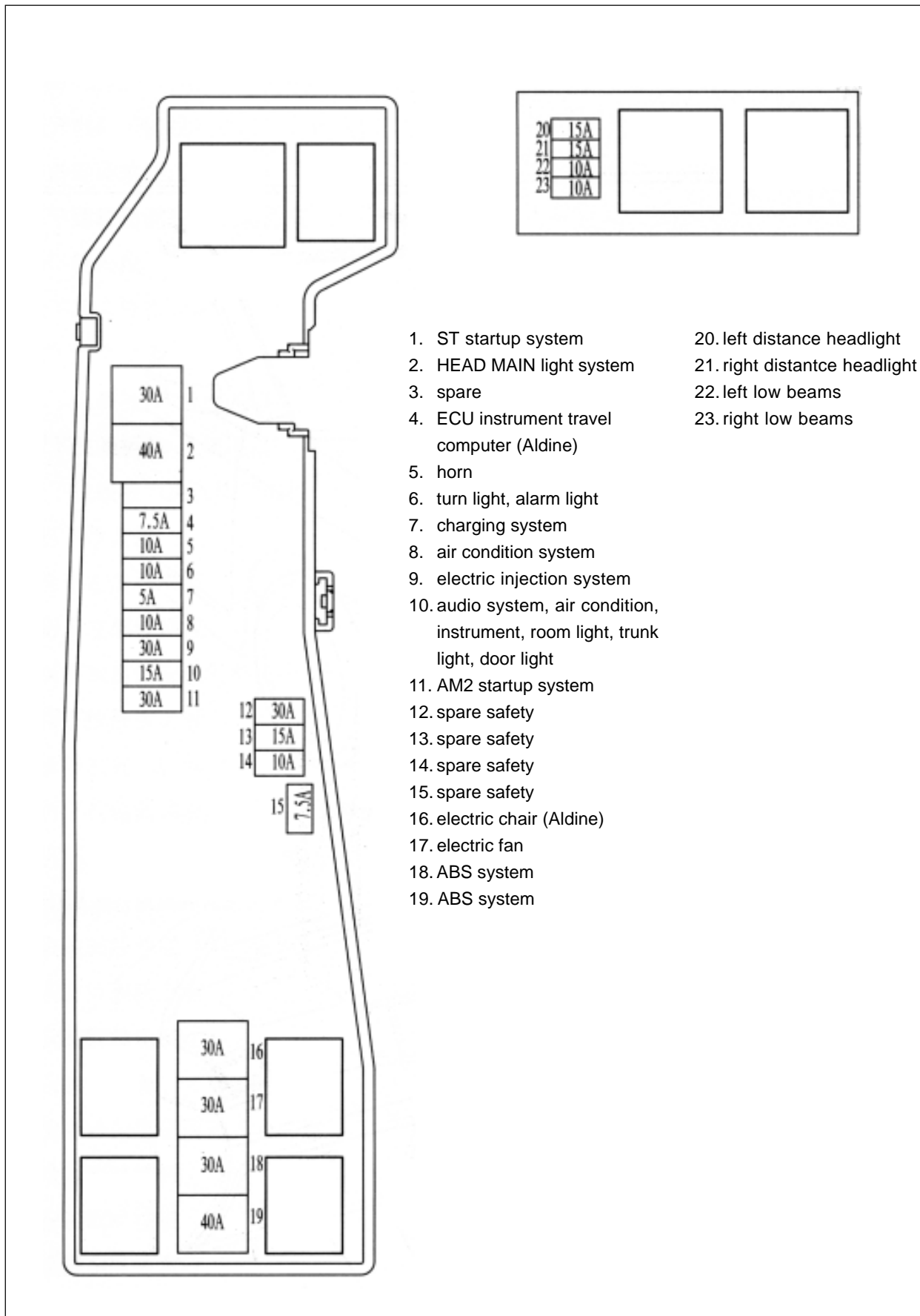


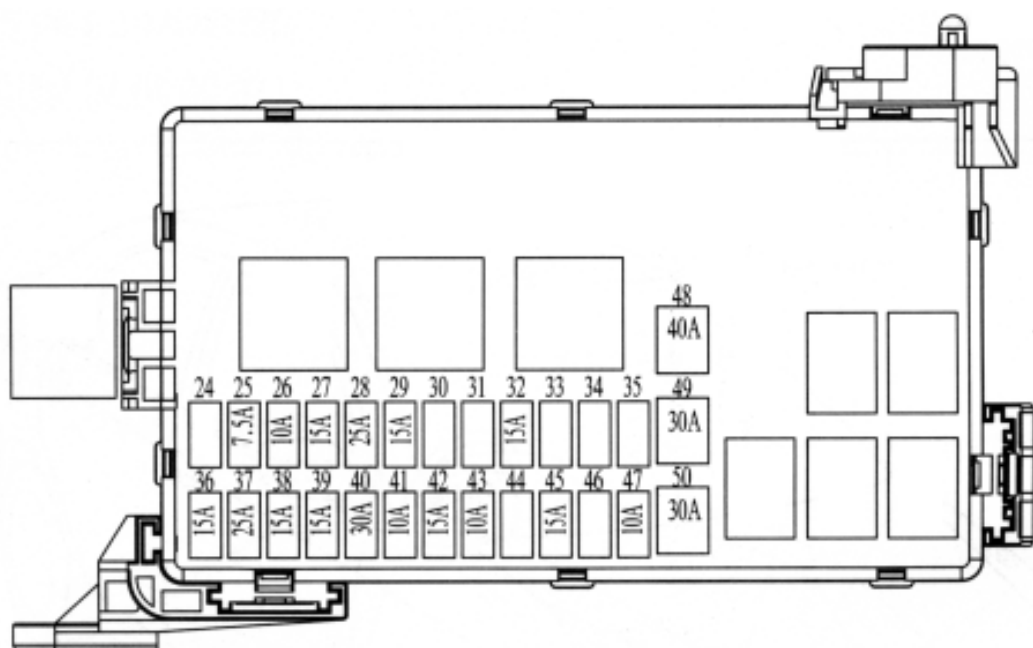
Circuitry

Power supply

Components (For reference only)







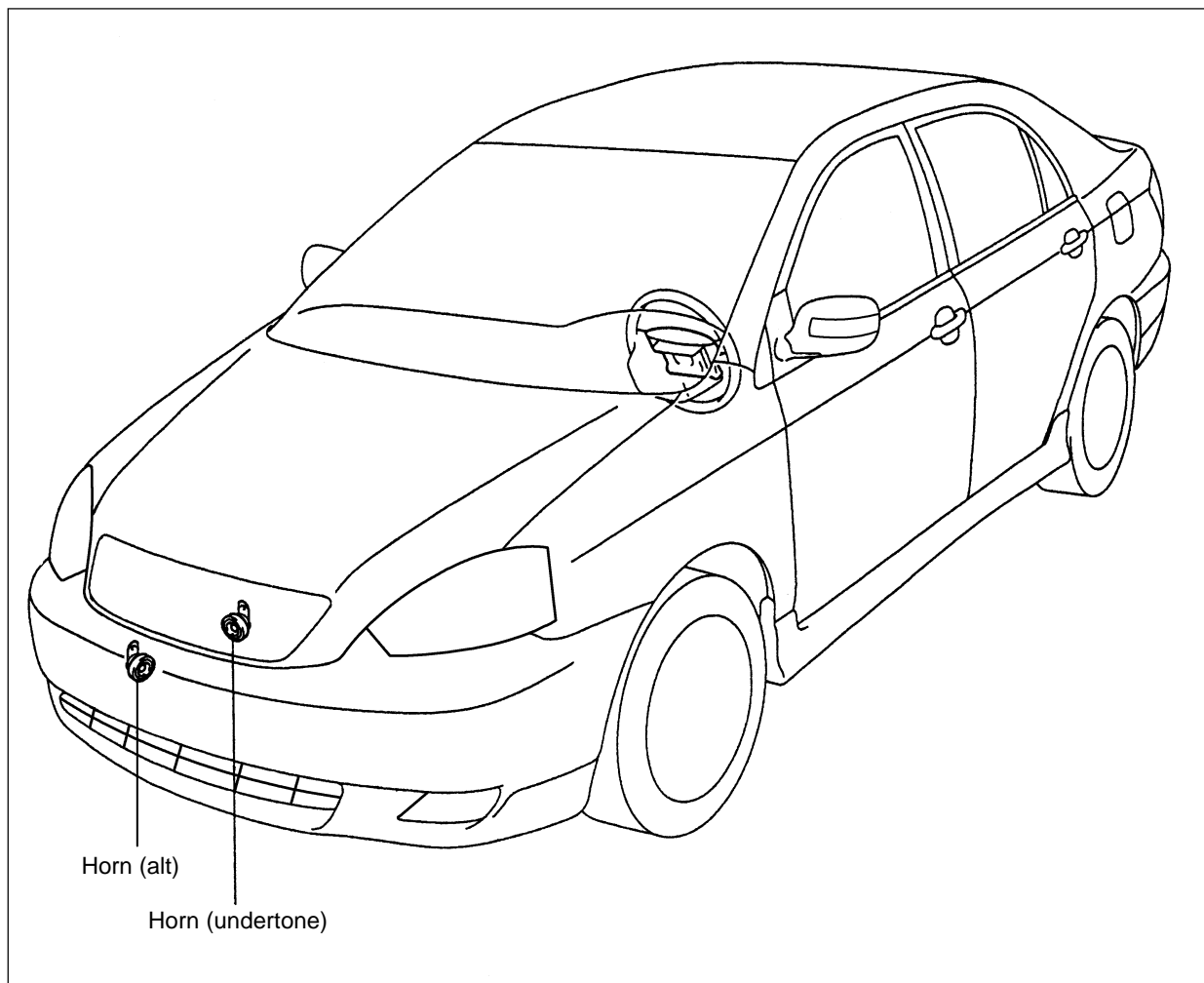
- 24. spare
- 25. OBD discharge test system
- 26. rear fog light
- 27. Anti-burglary
- 28. DOOR center control, light control system
- 29. Defrost load
- 30. spare
- 31. spare
- 32. electric injection system, safety airbag system, anti-burglary system, instrument system
- 33. spare
- 34. spare
- 35. spare
- 36. front fog light
- 37. AMI ignition system
- 38. TAIL position light, number plate

- light
- 39. brake light
- 40. electric sunroof
- 41. instrument system, air condition system, defrost system, Reverse Radar, rear light, turn light.
- 42. CIG air condition system, audio system, electric rear view mirror, cigarette lighter
- 43. washer
- 44. spare
- 45. wiper
- 46. spare
- 47. center control, light control system, anti-burglary system, ABS system
- 48. air condition system
- 49. rear defrost system
- 50. electric glass operator

Horn system

Horn system

Position



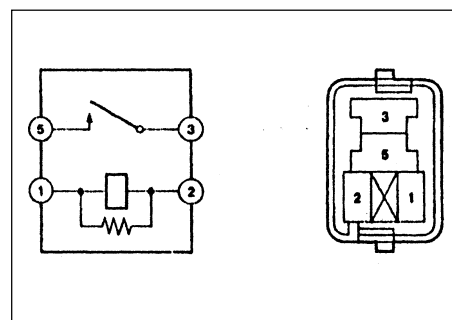
Inspect

1. Inspect the relay

(a) Inspect Whether horn relay (mark: HORN) is conduct

Condition	avometer connection terminal	regular situations
Normal	1-2	conduction
Supply battery voltage to Terminal 1 and 2	3-5	conduction

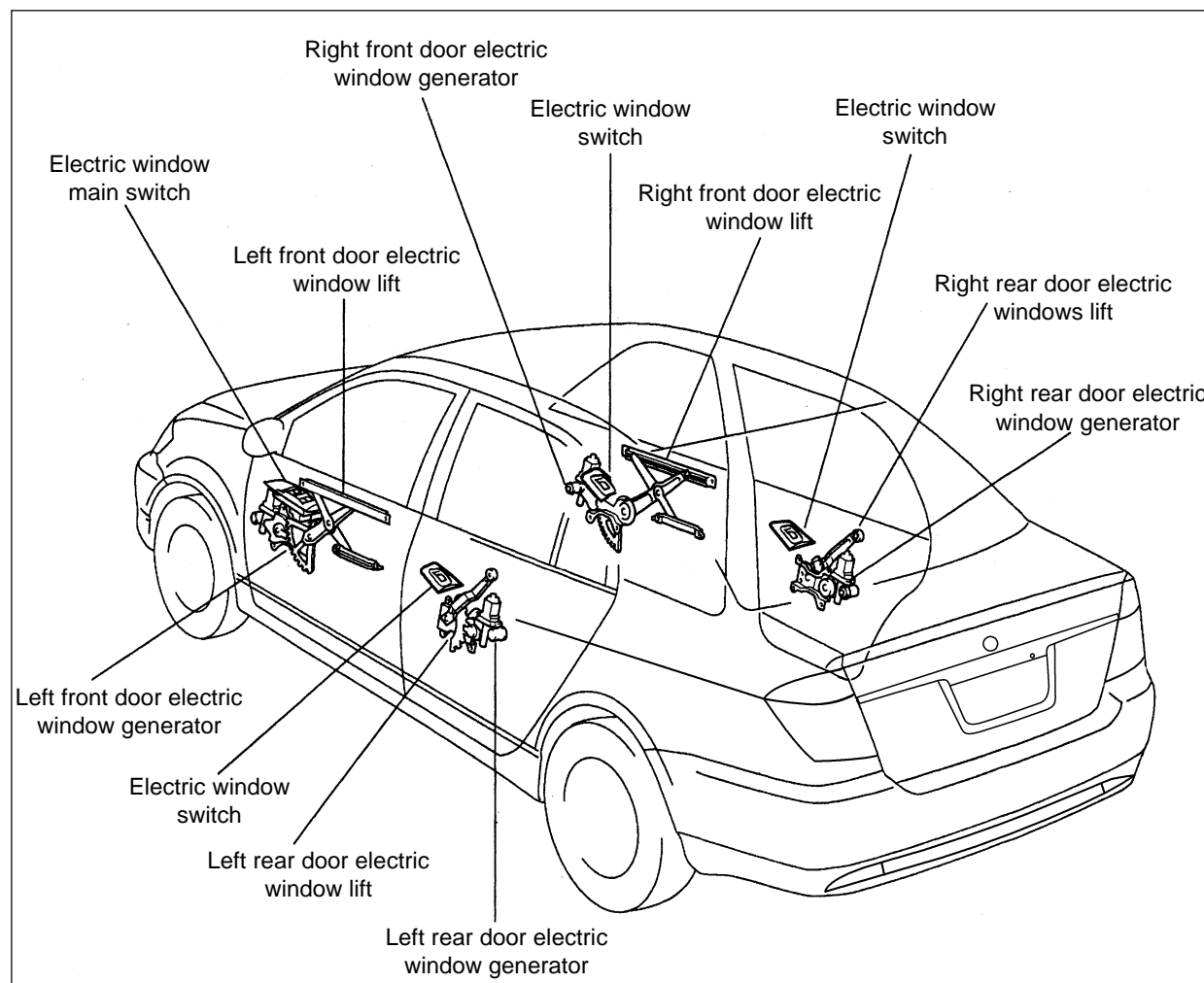
If the conduction situation does not accord with regulations, replace the relay.



Windshield/window glass/wing mirror

Electric window control system

Position drawing (For reference only)



Inspect the car

1. Inspect electric window

(a) Inspect basic function (manual operation function)

- (1) Turn the ignition switch to ON
- (2) Inspect the window whether it descends when you press electric window switch. Pull the switch up and inspect whether it ascends.
- (3) Inspect the window whether it descends when you press electric window switch of every door. Pull the switch up and inspect whether it ascends.

- (4) Inspect other windows whether they can not actuate except window of driver seat room, when the electric window switch locked.

2. Inspect automation function

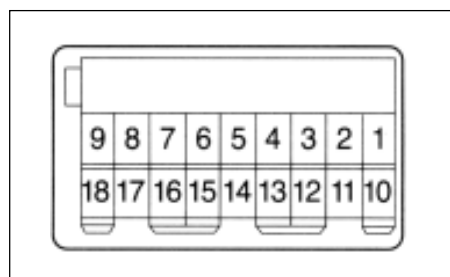
(a) inspect basic function

- (1) Turn the ignition switch to ON
- (2) Inspect whether driver seat window automatic descends completely, when you press electric window main switch.
- (3) Inspect whether driver seat window stop descending when driver seat window automatic descends and press the main switch.

3. Inspect electric window main switch assembly

(a) Inspect operations

- (1) Disassemble the joint of driver seat electric window main switch and inspect the voltage and conduction among terminals.



Avometer terminals	conditions	regular situations
16-earth(input +B signal)	turn ignition switch from OFF to ON	0V → 10-14V
11-earth	always	conduction
12-earth	always	conduction
15-earth(input IG signal)	turn ignition switch from OFF to ON	0V→10-14V

If the voltage and conduction do not accord with the regulations, the input side of electric window main switch may have malfunction.

(b) Inspect the joint terminal voltage when connect the joint.

Avometer terminals	conditions	regular situations
4-earth (output P/W.UP)	turn the ignition switch to ON, turn Driver seat Main switch from OFF to UP (manual operation)	0V→over 9V
9-earth (output P/W.DOWN)	turn the ignition switch to ON, turn Driver seat Main switch from OFF to DOWN (manual operation)	0V→over 9V
9-earth (output P/W.DOWN)	turn the ignition switch to ON, turn Off Driver seat window → driver seat Main switch to DOWN (auto Operation) → windows open completely.	0V→over9V→0V

If the voltage does not accord with the regulations, electric window main switch may have malfunction.

- (c) Inspect whether AUTO headlamp(LED) lights when connect the joint, turn the ignition switch from OFF to ON.

Malfunction phenomena table

Phenomena	impossible positions	wiring harness
Electric window does not Work(all)(electric door lock does Not work)	1. POWER fuse(center power distribution box) 2. window shift main relay (center Distribution box) 3. wiring harness	- - -
Electric window does not work(all) (electric door lock is normal)	1. ignition switch 2. left front door control Panel assembly 3. wiring harness 4. electric window generator	- 319 - 320
Automation system does Not work	1. left front door control panel assembly 2. electric window generator (driver seat)	319 320
Only one window can not Move	1. left front control panel assembly 2. electric window switch 3. electric window generator 4. wiring harness	319 320 320 -
Electric window system Does not work	1. left front door control panel assembly 2. wiring harness	319 -

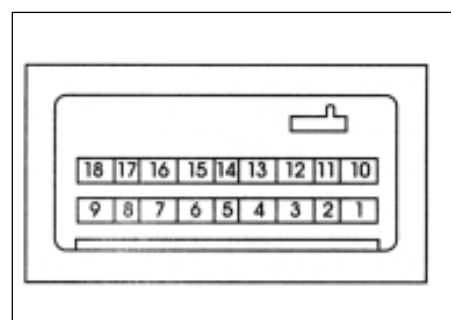
Inspect

1. Inspect left front door control panel assembly [68000142]

Action switch, inspect the conduction among joint terminals.

Notes: Whether it works good or bad ,it can judged by basic function. Because the conduction can not inspect by ascending or descending driver's electric window main switch.

Electric window does not locked



Switch position	right front, avometer terminal	right rear, avometer terminal	Left rear, avometer terminal	situations
UP	4-15, 6-10	9-15, 7-10	3-15, 1-10	Conduction
OFF	4-10, 6-10	9-10, 7-10	3-10, 1-10	Conduction
DOWN	6-15,4-10	7-15, 9-10	1-15, 3-15	Conduction

Electric window locked

Switch position	right front, avometer terminal	right rear, avometer terminal	Left rear, avometer terminal	situations
UP	4-15	9-15	3-15	Conduction
OFF	4-6	7-9	1-3	Conduction
DOWN	6-15	7-15	1-15	Conduction

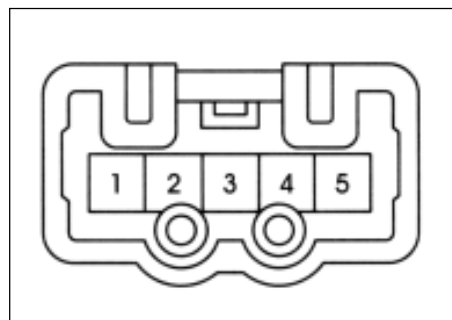
If the conduction does not limit to regulations, replace electric window main switch.

2. Inspect electric window switch assembly

Active switch, inspect the conduction among the joint terminals.

Switch position	avometer terminals	situations
UP	4-5, 2-3	conduction
OFF	4-5, 1-3	conduction
DOWN	2-5, 1-3	conduction

If the conduction does not limit to regulations, replace electric window main switch.



3. Inspect left rear electric window motor assembly.

(a) Inspect the function of left rear electric window assembly.

(1) Inspect whether the motor works calmly.

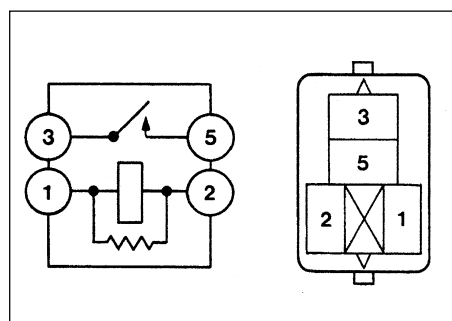
Battery terminals	working direction
Battery anode lead-terminal 5	main driving axis working
Battery cathode lead-terminal 4	as clockwise
Battery anode lead-terminal 4	main driving axis working
Battery cathode lead-terminal 5	as anticlockwise

4. Inspect electric window shift relay [67000061]

Check the conduction of relay (mark: P/W)

If the conduction does not limit to regulations, replace relay.

Conditions	avometer	regular situations
Always	1-2	conduction
Supply battery voltage To that between terminal 1 and terminal 2	3-5	conduction



Front windscreen

Change

Clues on: Please assemble as the disassembly opposite sequence. Assemble directions could be got when necessary.

1. Disassemble right front pillar trim board assembly [68010017] (referring to page 390)
2. Disassemble left front pillar trim board assembly [68010014] (referring to page 390)
3. Disassemble inner rear mirror assembly [67010013] (referring to page 390)
4. Disassemble right sun shade [68010085] (referring to page 390)
5. Disassemble left sun shade [68010084] (referring to page 390)
6. Disassemble interior front headlamp assembly [67010075] (referring to page 390)
7. Disassemble passenger handle (referring to page 390)
8. Disassemble sun shade pothook [68010086] (referring to page 390)
9. Disassemble top interior trim board

Disassemble top interior trim board

10. Disassemble top left trim tape [68000128]
11. Disassemble top right trim tape [68000129]
12. Disassemble front windscreen sealed trim board [68000062]

(a) Use blade to cut trim tape as the drawing.

Note: Do not cut the bodywork.

(b) Disassemble rudimental trim type.

13. Disassemble front windscreen assembly [68000061]

(a) Use a steel wire to drill through windows and bodywork.

(b) Tie something like wood block at both the end of steel wire.

Clues on: Stick adhesive tape on the bodywork at work to prevent paintwork from scraping.

Clues on: When separate window, do not damage paintwork and interior trim board. When disassemble front windscreen, put a plastic board between steel wire and panel to prevent scratching the panel.

(c) Pull steel wire along front windscreen around, remove agglutinant.

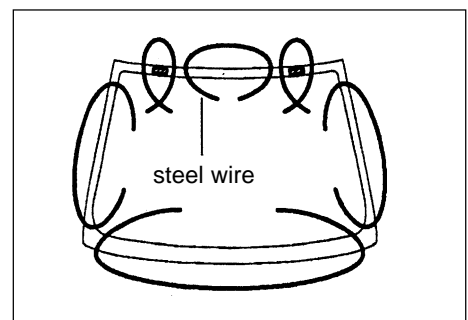
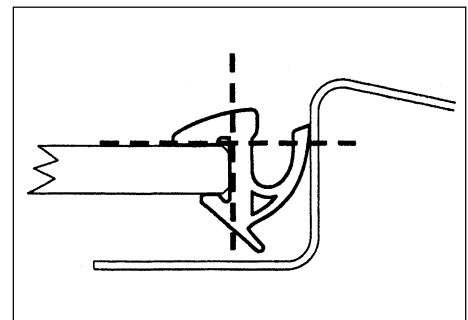
(d) Disassemble front windscreen.

Note: When cut front windscreen down, leave agglutinant as much as possible on the bodywork.

14. Clean front windscreen assembly [68000061]

Use white gasoline to clean front windscreen around.

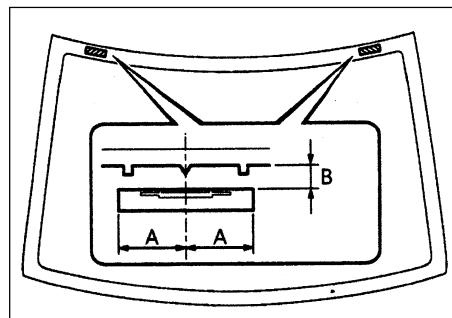
15. Assemble windscreen orientation plastic button



Assemble two orientation block on the windscreen as the drawing.

A: 40mm

B: 8mm



16. Assemble front windscreen in board sealed tape [68000063]

Stick sealed tape with double faced adhesive tape on both sides.

a: 7mm

b: 22.5mm

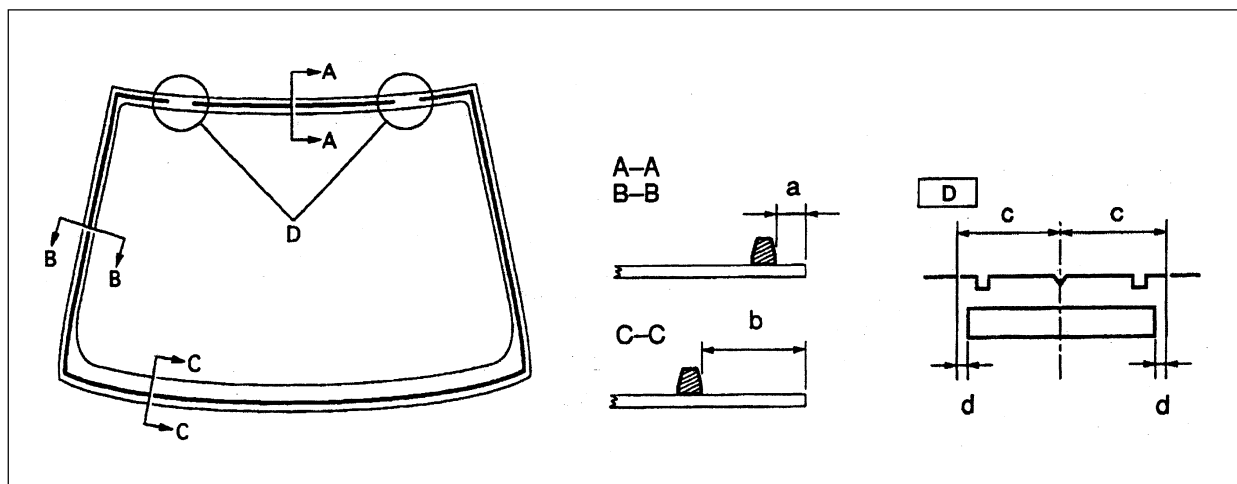
c: 45mm

d: 5mm

17. Assemble front windscreen assembly [68000061]

(a) Put front windscreen at the right position.

(b) Inspect the contacting part of front windscreen brim whether



it is flat

(c) Mark signal between bodywork and glass.

(d) Disassemble front windscreen .

(e) Use blade to remove granulation area.

Note: leave agglutinant as much as possible on the bodywork.

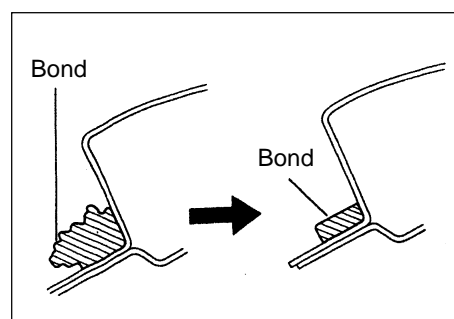
(f) Use duster cloth with cleaner to clean the agglutinant on the incision.

Clues on: When all the agglutinant has been removed completely, clean the bodywork.

(g) Use brush to daub M priming paint on the o contacting part of bodywork.

Notes:

- Dry M priming paint for three minutes.
- Do not daub M priming paint on the agglutinant.
- Opened M priming paint can not use for the next



time.

(h) Use brush or sponge to daub G priming paint on the front windscreen brim and contacting interface.

(i) When daub other areas beside regulations, use clean duster cloth to clean before priming paint gets dry.

Notes:

- Use G priming paint over three minutes.
- Opened G priming paint can not use for the next time.

(j) Cut a hole on glue canister sharp mouth

(k) Put the glue canister in the sealed glue jet gun.

(l) Daub agglutinant on the front windscreen.

A: 12mm

B: 8mm

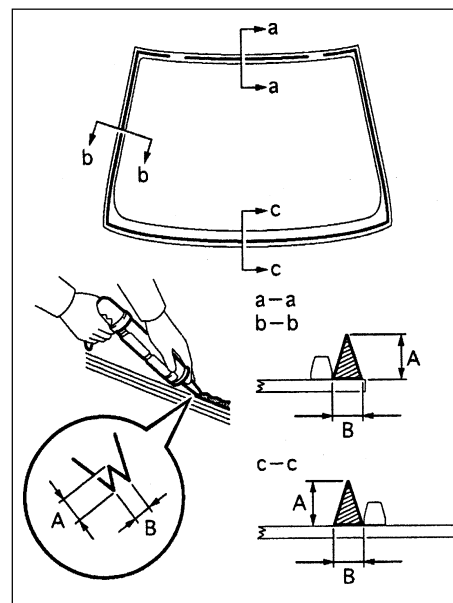
18. Assemble front windscreen sealed trim tape [68000062]

Assemble the new trim tape in the bodywork manually.

19. Inspect water leakage and repair

(a) Actualize water leakage after hardening.

(b) Use agglutinant to seal leak position.



Rear ventilation window

Change

Clues on: Please assemble by the sequence opposite with disassembling sequence. Assemble directions could be got when necessary.

1. Disassemble the step trim board of left rear door [68010022] (referring to page 390)
2. Disassemble the step trim board of right rear door [68010024] (referring to page 390)
3. Disassemble left rear door frame sealed tape [68010059]
4. Disassemble right rear door frame sealed tape [68010060]
5. Disassemble rear seat cushion
6. Disassemble rear seat back assembly (fixed) [68010076] (referring to page 354)
7. Disassemble rear seat right back assembly (fixed) [68010079] (referring to page 352)
8. Disassemble rear seat left side back assembly (separate) [68010078](referring to page 352)
9. Disassemble left rear pillar interior trim board assembly [68010026] (referring to page 390)
10. Disassemble right rear pillar interior trim board assembly [68010027] (referring to page 390)
11. Disassemble high brake light assembly [68010008]
12. Disassemble rear platform front-below trim board [68010034]
13. Disassemble rear wind window sealed trim tape [68000104]

- (a) Use blade to cut the trim tape as the drawing.

Notes: Do not damage the bodywork by blade.

- (b) Disassemble rudimental trim tape.

14. Disassemble rear ventilation window assembly [68000103]

- (a) Use a steel wire to drill through windows and bodywork.
- (b) Tie something like wood block at both the end of steel wire.

Clues on: Stick adhesive tape on the bodywork at work to prevent paintwork from scraping.

Notes: When separate window, do not damage paintwork and interior and exterior trim board.

- (c) Pull steel wire along front windscreen around, removal agglutinant.
- (d) Disassemble front windscreen.

Note: When cut front windscreen down, leave agglutinant as much as possible on the bodywork.

15. Clean rear ventilation window assembly [68000103]
Use white gasoline to clean rear ventilation window around.
16. Assemble windscreen orientation plastic button [68000064]

Assemble two orientation block on the rear windscreen as the

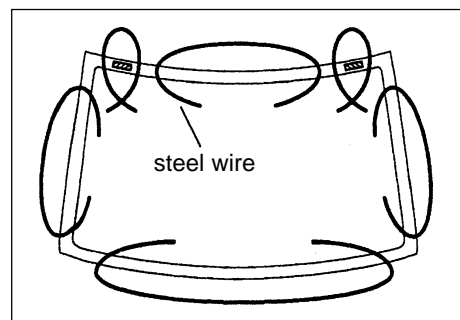
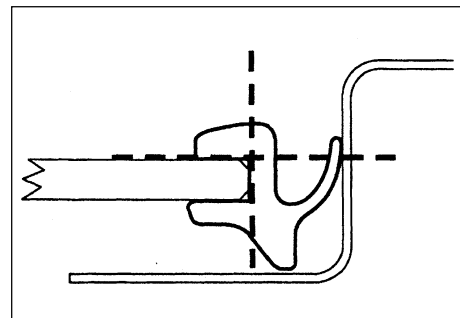


figure.

A: 40mm

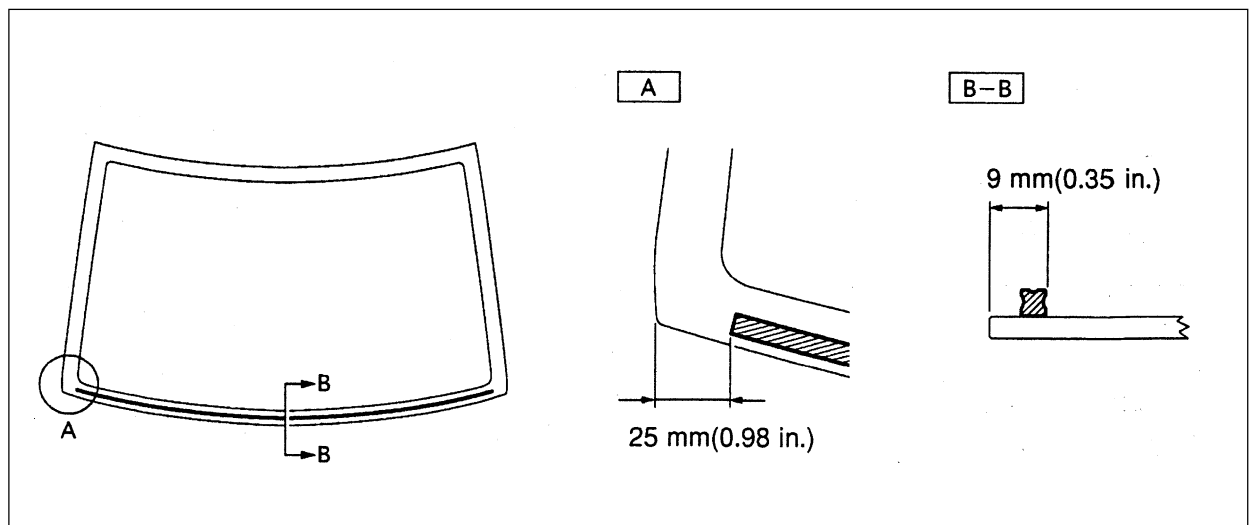
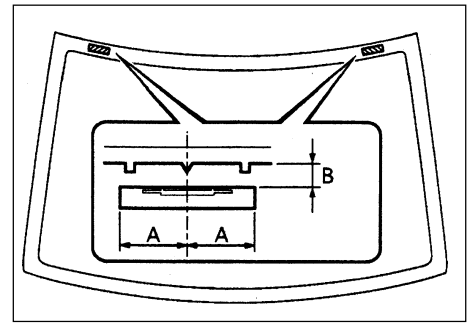
B: 8mm

17. Assemble rear ventilation window inboard sealed tape [68000105]

Stick sealed tape with double faced adhesive tape on both sides.

18. Assemble rear ventilation window assembly [68000103]

- Put rear ventilation window at the right position.
- Inspect the contacting part of rear ventilation window brim whether it is flat.

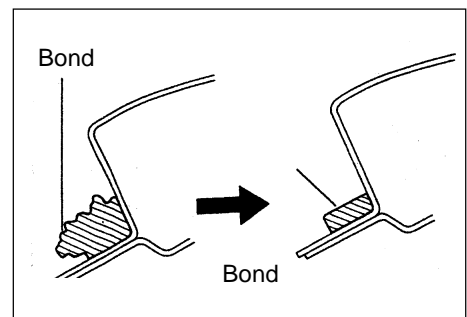


- Mark signal between bodywork and glass.
- Disassemble rear ventilation window
- Use blade to remove coarseness area.
Note: leave agglutinant as much as possible on the bodywork.
- Use duster cloth with cleaner to clean the agglutinant on the cutting surface.
Clues on: When all the agglutinant has been removed completely, clean the bodywork.
- Use brush to daub M priming paint on the contacting part of bodywork.

Notes:

- Dry M priming paint for three minutes.
- Do not daub M priming paint on the agglutinant.
- Opened M priming paint can not use for the next time.

- Use brush or sponge to daub G priming paint on the front windscreen brim and contacting interface.
- When daub other areas beside regulations, use clean duster



cloth to clean before priming paint gets dry.

Clues on:

- Use G priming paint over three minutes.
- Opened G priming paint can not use for the next time.

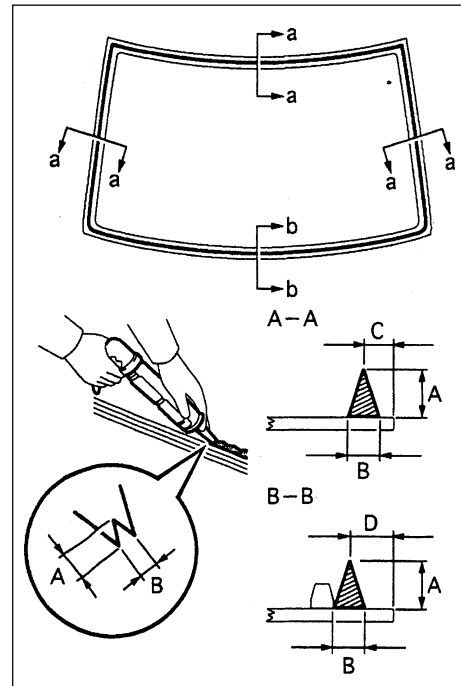
- (j) Cut a hole on glue canister sharp nose.
 (k) Put the glue canister in the sealed glue jet gun.
 (l) Daub agglutinant on the front windscreen.

A: 12mm
 B: 8mm
 C: 6.5mm
 D: 13mm

19. Disassemble rear seat back assembly (fixed)
[68010076] (referring to page 354)

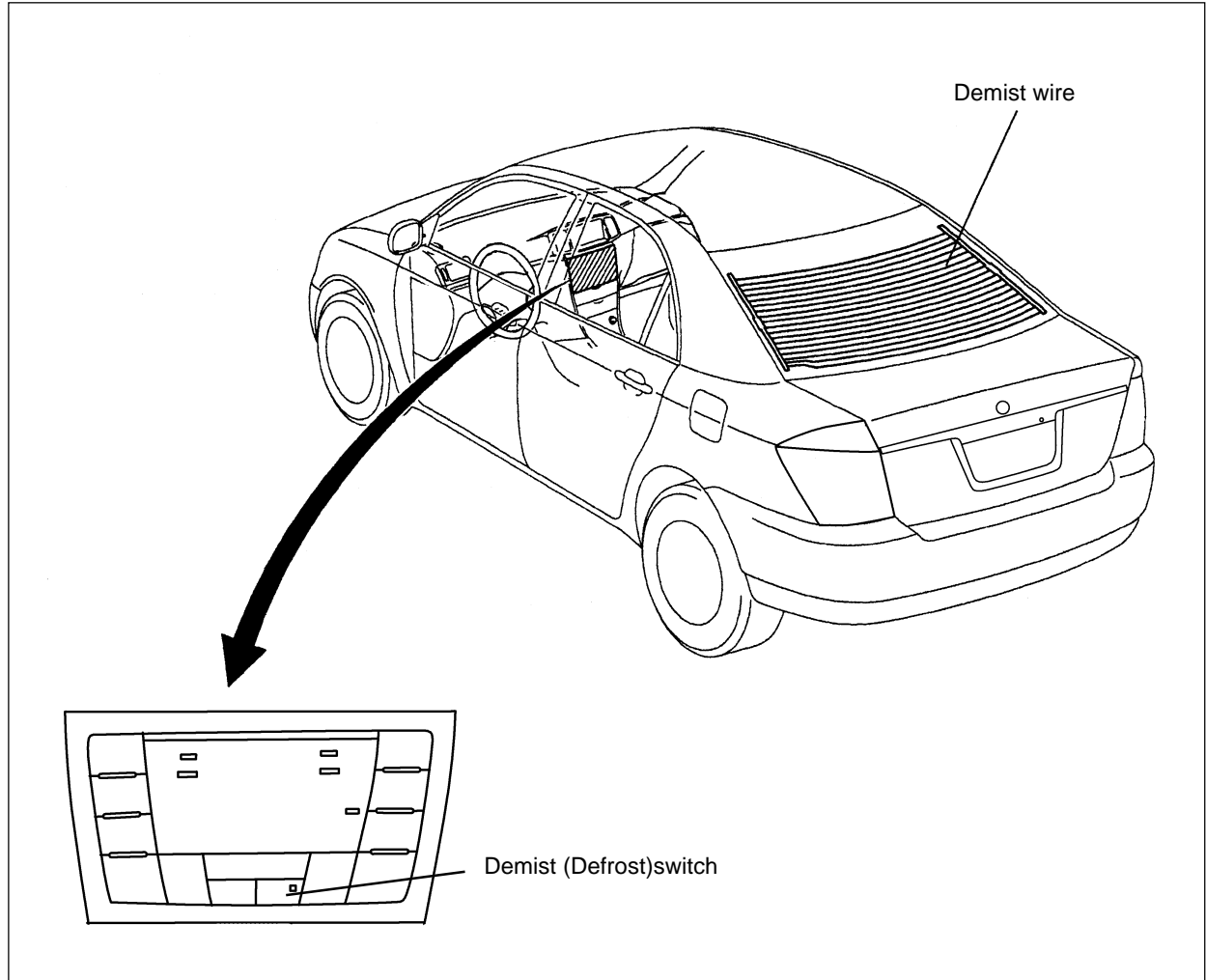
20 Disassemble rear right side back assembly
(separate) [68010079] (referring to page 352)

21. Disassemble rear seat left side back assembly (separate) [68010078] (referring to page 352)



Fog defrost system

Position drawing



Malfunction phenomena table

Malfunction	components name	reference pages
All demists (defrosts) do not work	1. DEF main relay	—
	2. DEF-IP fuse	—
	3. DEF-m fuse	—
	4. demist switch	—
	5. wiring harness	—
Rear ventilation window Demist (defrost) do not work	1. demist wire	—
	2. wiring harness	—
electric rear mirror defrost dose not work	1. electric rear mirror	—

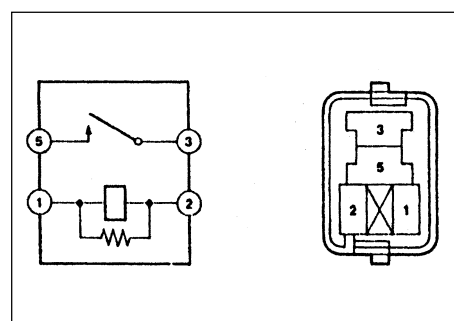
Inspect

1. Inspect the relay

Inspect the conduction of rear window demist(defrost) relay (mark: DEF)

If the conduction does not accord with the regulations, replace relay.

Conditions	avometer terminals	regular situations
Always	1-2	conduction
Supply battery voltage between terminal1 and Terminal2	3-5	conduction



Electric rearview mirror control system(option)

Inspect the vehicle

1. Inspect Electric retractable rearview mirror function

(a) Turn the ignition switch to ACC

(b) Inspect operating electric retractable rearview mirror function, when it at different positions.

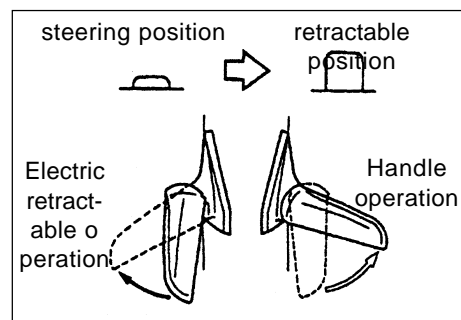
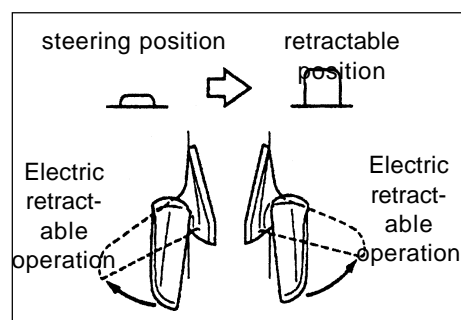
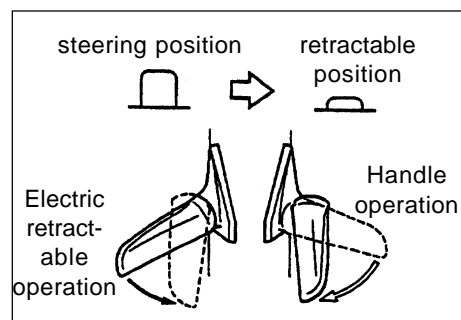
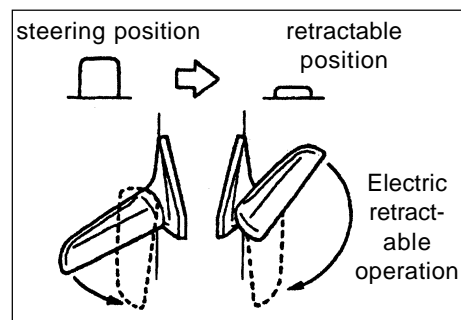
(1) When retractable switch at steering position and left/right rearview mirror at steering position either, press retractable switch, inspect left and right rearview mirrors whether they remove from steering position to retraction position and stop at it.

(2) When retractable switch at steering position and left/right rearview mirror at steering position either, if any one of the rearview mirrors can be pushed back by hand, then press retractable switch to retractable position, inspect left and right rearview mirrors whether they remove from steering position to retraction position and stop at it.

(3) When retractable switch at retractable position and left/right rearview mirror at steering position either, if any one of the rearview mirrors can be pushed back to steering position by hand, then press retractable switch to retractable position, inspect whether rearview mirrors move to restricted position only in steering position and stop at it.

(4) When retractable switch at retractable position and left/right rearview mirror at retractable position either, inspect left and right rearview mirrors whether they remove from retraction position to steering position and stop at it.

(5) When retractable switch at retractable position and left/right rearview mirror at retractable position either, if any one of the rearview mirrors can be pushed back to steering position by hand, then press retractable switch to steering position, inspect whether rearview mirrors move from restricted position to steering position and stop at it.



(c) When operating left and right rearview mirrors, inspect whether ignition switch works when turn it to OFF.

(1) When operating left and right rearview mirrors, turn ignition switch to OFF and inspect rearview mirrors function whether they stop.

(2) Turn ignition switch to ACC again, inspect whether rearview mirrors work

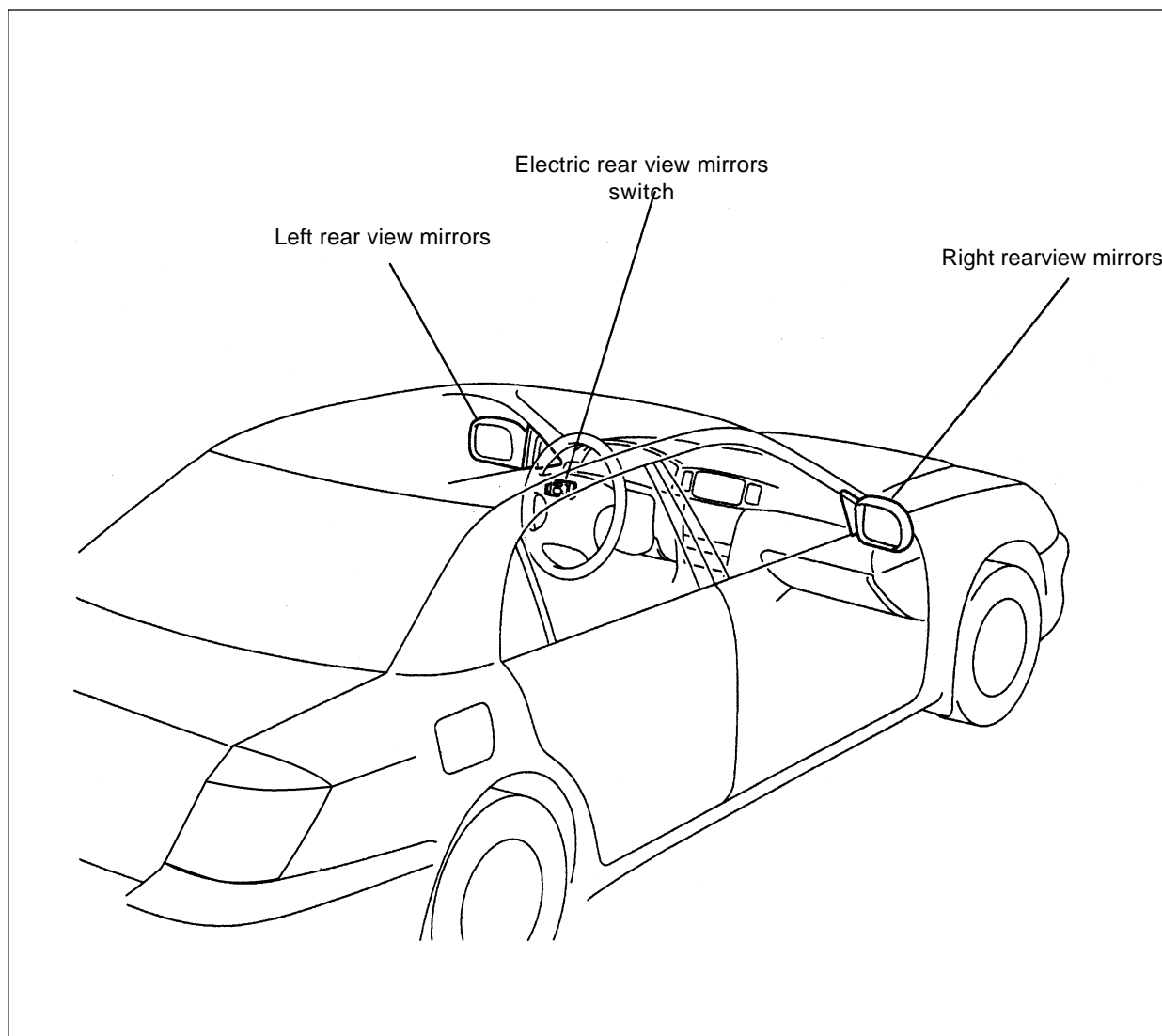
Clues on: Turn ignition switch to OFF, if you press retractable switch and turn ignition switch to ACC, then left and right rearview mirrors will move to opposite position.

(d) Inspect whether rearview mirrors work when restricted by others.

(1) When left and right rearview mirrors move to retractable position or steering position, restrict left and right rearview mirrors manually, inspect retraction stops.

(2) Press retractable switch again, inspect whether it works.(at the opposite direction of stop position)

Positions



Trouble table

Trouble	Components name	Reference page
rearview mirrors do not work	1. (accessory) fuse	-
	2. rearview mirror switch	332
	3. wiring harness	-
rearview mirrors work abnormally	1. rearview mirror switch	332
	2. wiring harness	-

INSPECT

1. Inspect rear view mirrors switch

Inspect conduction of rearview mirror.

(1) Adjust left or right for side of the switch.

Inspect conduction of rearview mirror on left side

Switch positions	Avometer terminals	Regular situations
ON	-	Not conduction
Up	5-8, 6-7	Conduction
Down	5-7, 6-8	Conduction
Left	4-8, 6-7	Conduction
Right	4-7, 6-8	Conduction

Replace the switch if it does not accord with the regulations.

(2) Adjust right side of left and right switch.

Inspect conduction of rearview mirror on right side

Switch positions	Avometer terminals	Regular situations
ON	-	Not conduction
Up	3-8, 6-7	Conduction
Down	3-7, 6-8	Conduction
Left	2-8, 6-7	Conduction
Right	2-7, 6-8	Conduction

Replace the switch if it does not accord with the regulations.

(3) Inspect conduction of retracting switch

Switch positions	Avometer terminals	Regular situations
Position of driving	8-9, 7-10	Conduction
Position of retracting	8-10, 7-9	Conduction

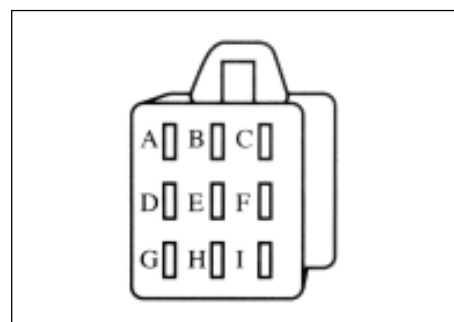
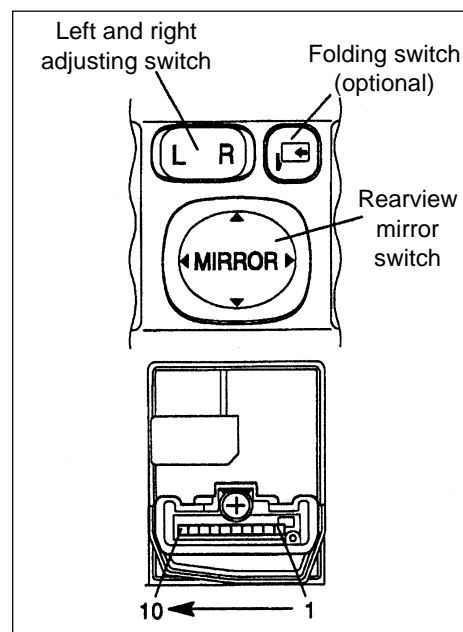
Replace the switch if it does not accord with the regulations,

2. Inspect rear rear view mirror

(a) Inspect motor function of rearview mirror

(b) Inspect function of electric retracted motor

Battery terminals	Positions of rearview mirror
Positive wire (+) -A Negative wire (-) -B	Turn left
Positive wire (+) -B Negative wire (-) -A	Turn right
Positive wire (+) -C Negative wire (-) -B	Turn up
Positive wire (+) -B Negative wire (-) -C	Turn down



Notes:

- When repeat the same inspection, cut off the voltage of battery, then inspect again with same steps.
- When supply battery voltage, the rearview mirror will not retract even if trying to move the crust of rearview mirror.

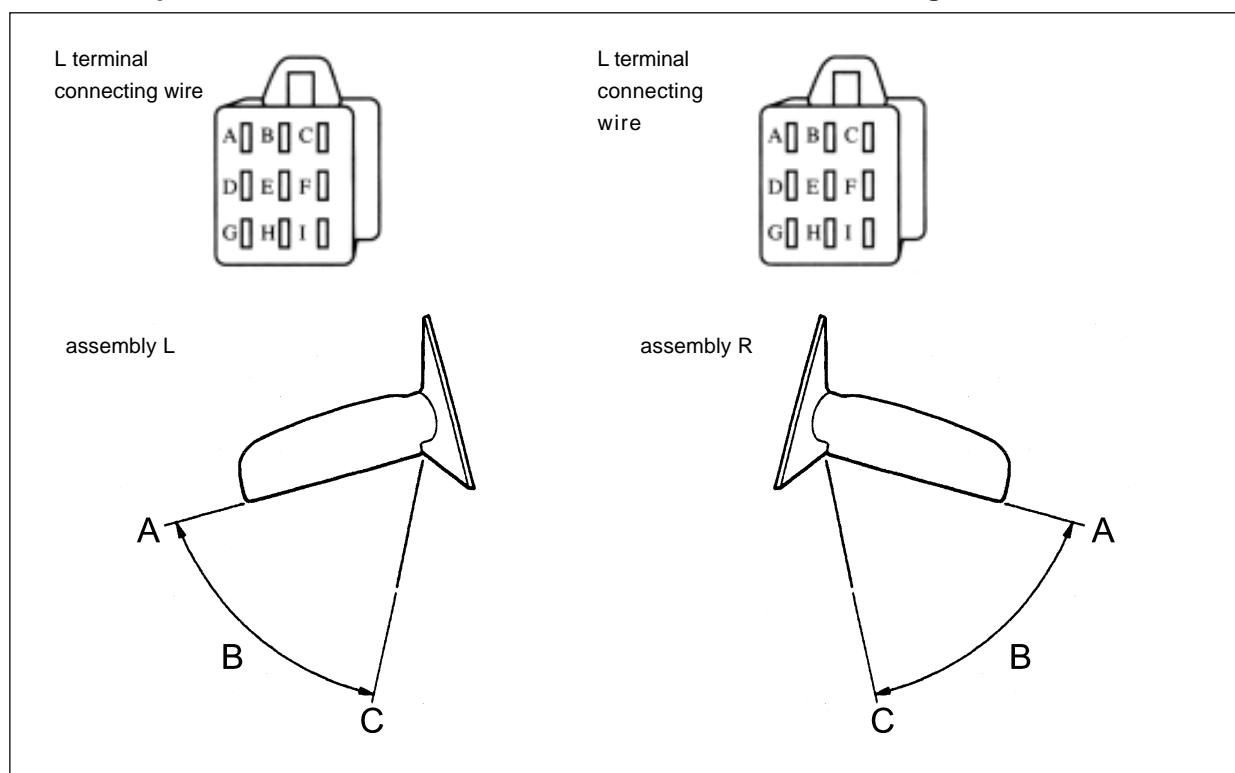
Outer rearview mirror assembly L

Positions of rearview mirror	Connection style	Actuated style
A (position of driving)	Connect wire G to positive Connect wire D to negative	Not actuated
B (between position of driving and retracting)	Connect wire D to positive, connect wire G to negative	A-B-C
	Connect wire G to positive, connect wire D to negative	C-B-A
C (position of retract)	Connect wire D to positive Connect wire G to negative	Not actuated

Outer rearview mirror assembly R

Positions of rearview mirror	Connection style	Actuated style
A (position of driving)	Connect wire D to positive Connect wire G to negative	Not actuated
B (between position of driving and retracting)	Connect wire G to positive, connect wire D to negative	A-B-C
	Connect wire D to positive, connect wire G to negative	C-B-A
C (position of retract)	Connect wire G to positive Connect wire D to negative	Not actuated

Replace the rearview mirror if actuation does not accord with regulations.



Panel / combination instrument

combination instrument

Trouble table

Lightening:

Phenomenon	Possible parts of trouble	Reference pages
All lights fail	1. combination instrument assembly	-
	2. joint or harness	-
Only one light fails	1. combination instrument assembly	-

Indicator light:

Phenomenon	Possible parts of trouble	Reference pages
Trouble light fails	1. harness or joint	-
	2. engine ECU	-
	3. combination instrument assembly	-
Charge light fails	1. harness or joint	-
	2. engine ECU	-
	3. combination instrument assembly	-
Brake system light fails	1. harness or joint	-
	2. ABS ECU	-
	3. combination instrument assembly	335
ABS light fails	1. harness or joint	-
	2. ABS ECU	-
	3. combination instrument assembly	335
SRS lights fails	1. harness or joint	-
	2. airbag sensor assembly	-
	3. combination instrument assembly	-
Door light fails	1. harness or joint	-
	2. door control switch	-
	3. combination instrument assembly	-
low fuel level light fails	1. harness or joint	-
	2. fuel level light switch	335
	3. combination instrument assembly	335
low Oil pressure light fails	1. combination instrument assembly	-
	2. oil pressure light switch	335
	3. harness or joint	335

Indicator light:

Phenomenon	Possible parts of trouble	Reference pages
Turning light fails	1. harness or joint	-
	2. turn light and safety warning light system	-
	3. combination instrument assembly	335
Distant light fails	1. harness or joint	-
	2. left combination switch	-
	3. combination instrument assembly	335

Instrument:

Phenomenon	Possible parts of trouble	Reference pages
Revolution counter, petrol guage and engine water thermometer fail	1. harness or joint	-
	2. (panel) safety fuse	-
	3. combination instrument assembly	335
petrol guage fails or works abnormally	1. harness or joint	-
	2. Fuel guage sensor	335
	3. combination instrument assembly	335

Vehicle inspection

1. inspect speed counter

(1) Use speedometer tester to inspect allowed error of speedometer and action of speedometer

Reference: Km/h

speed indicated by speedometer	actual speed
20km/h	17-23km/h
40km/h	35-40km/h
60km/h	55-60km/h
80km/h	75-80km/h
100km/h	95-100km/h
120km/h	114-120km/h
140km/h	133-140km/h
160km/h	152-160km/h

Notes: tyre wear or tyre pressure too high or too low will increase error.

(2) Inspect speedometer needle offset

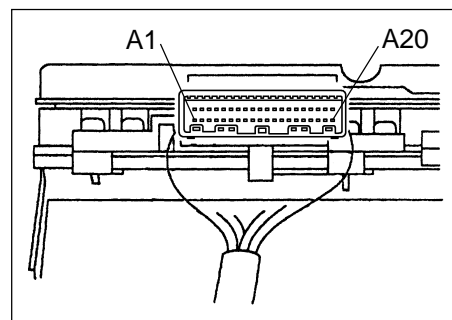
Reference: below 0.5km/h

2. Inspect output signal of vehicle speed.

- (1) When vehicle run at 10km/h, inspect voltage between terminal 10 and terminal A1 of combination instrument assembly.

Standards: the voltage pulsates repeatedly between 0V to 5V for thirteen times.

Notes: Inspect the ignition switch "on" connects the joint



3. Inspect speed gauge

- (1) Connect a test tachometer. then startup the engine.

Notes:

- **Tachometer terminals polarity connects oppositely will damage interior transistors and LEDs.**
- **When move or disassemble tachometer. do not drop on the ground or knock the surface.**

- (2) Compare indicted value test tachometer and combination instrument tachometer.

Standard indicted value (rmp)	permitted values (rpm)
700	630-770
1,000	(900-1,100)
2,000	(1,850-2,250)
3,000	2,850-3,150
4,000	(3,800-4,200)
5,000	4,750-5,250
6,000	(5,700-6,300)
7,000	6,650-7,350

4. Inspect fuel gauge

The fuel gauge has the function of sensor detection (that is failure treatment of oil level tachometer)that is when fuel gauge indicator is at E position, if low oil level warning light doesn't light, first should judge whether there have open-loop trouble of fuel sensor or wiring harness. When sensor fails, fuel indicator should stop at current position. But if failing time is over 20 seconds, the indictor will return to E position quickly, the instrument will at wire break detection. If the normal situation of detection panel is over 20 seconds, indicator will return to normal.

DC 13.5V, 25°C

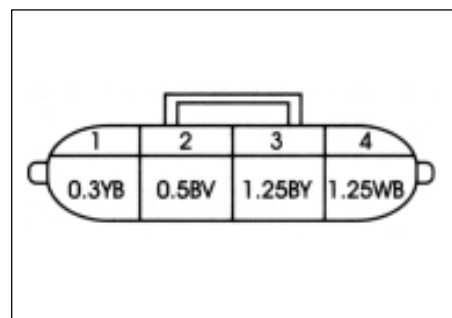
- (1) Disassemble the joint of fuel meter
(2) Turn ignition switch to ON, inspect indictor position of fuel guage.

Indictor position: F

- (3) Connect short terminal1 and terminal2 of wiring harness sides. Turn ignition switch to ON, inspect indictor position of fuel guage.

Indictor position: F

5. Inspect low fuel level indictor



- (1) Disassemble fuel meter joints or break wire, when indicator is at E, fuel indicator does not light.
- (2) Jumper a 300-330 Ω resistor from the corner of terminal1 and terminal2, turn ignition switch to ON, indicator is at E line, the indicator light lights.

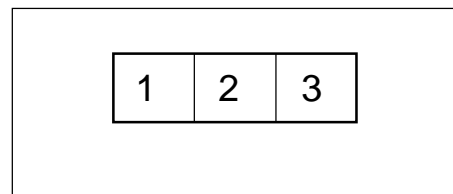
6. Inspect generator water thermometer .

- (1) Disassemble joint of generator water thermometer
- (2) Turn ignition switch to ON, inspect indicator position of generator water thermometer.

Indicator position: COOL

- (3) Earth 2 terminal of the wiring harness side joint to inspect indicator position of generator water thermometer.

Indicator position: HOT



7. Inspect untied indicator light of driver seat belt.

- (1) Turn ignition switch to ON, Inspect untied indicator light of driver seat belt lights.
- (2) Tie the seat belt, inspect untied indicator light seat belt lights off.
- (3) Disassemble the joint of safe belt button switch, earth the terminals of wiring harness
- (4) Turn ignition switch to ON, inspect untied indicator light seat belt lights on.

8. Inspect low oil pressure indicator

- (1) Disassemble the joint of oil pressure switch.
- (2) Turn ignition switch to ON.
- (3) Earth terminals of wiring harness sides, inspect low oil pressure indicator.

Low oil pressure indicator: light

9. Inspect oil pressure switch

- (1) disassemble joints of oil pressure switch,
- (2) Inspect the conduction of oil pressure switch terminals and earth.
Generator extinguishes: conduction
Generator works: not conduction

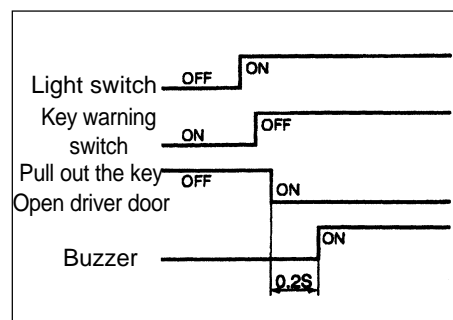
10. Inspect light warning buzzer

- (a) Inspect the function of light warning buzzer

Clues on: light warning buzzer works together, only key reminding buzzer works.

- (1) Front combination light switch switches to ON, extract the key, open driver seat door, inspect light warning buzzer.

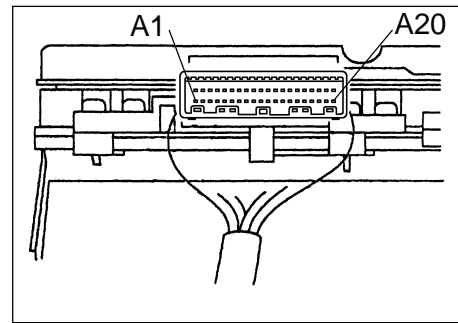
Audio buzzer: Audio for 10 seconds in the night to cut lamp power, in the day cut the lamp instantly.



- (2) When buzzer works, do any one of the followings, inspect whether buzzer stop buzzing.

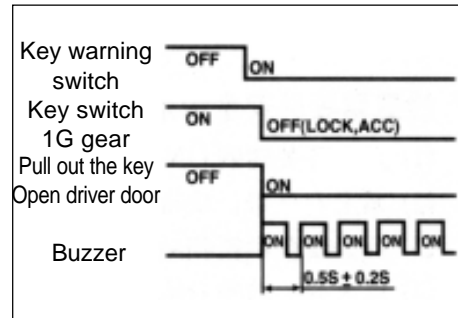
- Turn front combination switch to OFF.
- Close driver seat door.
- Insert the key.

- (b) Inspect light warning buzzer function
 - (1) Disassemble combination instrument.
 - (2) Connect battery positive wire to terminal A5 and negative to terminal A1 and A2.
 - (3) Connect battery positive wire to terminal A18 and negative to terminal A17, inspect buzzer.
- Audio buzzer: long buzzes**
- (4) When buzzer works, connect battery positive wire to terminal A4, inspect whether buzzer stop working.



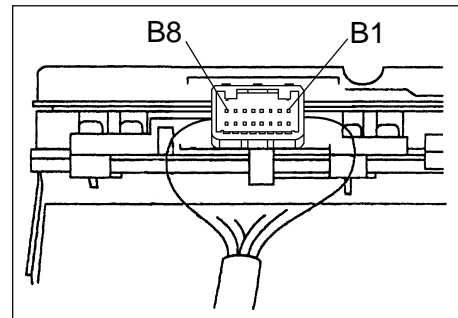
11. Inspect key buzzer

- (a) Inspect when key buzzer and light warning buzzer works together, only key buzzer works.
 - (1) Insert the key, when driver seat door opens, turn ignition switch to OFF (LOCK or ACC). inspect key buzzer works 1HZ discontinuously.
- (b) inspect key buzzer function
 - (1) Disassemble combination instrument.
 - (2) Connect battery positive wire to terminal A5 and negative to terminal A1 and A2.
 - (3) Connect battery negative wire to terminal A17 and B8, inspect buzzer which should work discontinuously.
 - (4) When buzzer works, connect battery positive wire to terminal A4, inspect whether buzzer stop working.



12. Inspect brake system indicator

- (a) Inspect parking brake system indicator



- (1) Disassemble the joint of parking brake switch, and earth terminals of wiring harness side joints.
- (2) Turn ignition switch to ON, inspect brake system indicator light lights.
- (b) Inspect brake oil level indicator light
 - (1) Disassemble the joint of brake oil level indicator light, connect terminal of wiring harness side joints.
 - (2) Turn ignition switch to ON, inspect brake system indicator light lights.

13. Check the switch of indicating light of brake liquid level.

- (1) Disassemble the cover and filter screen of liquid storage tank of brake main pump.
- (2) Disassemble the joint.
- (3) Check the conduction between switch side joints.

Float (switch is OFF): not conduction

- (4) Use siphon and other tools to absorb brake liquid in storage tank.
- (5) Check the conduction between switch side joint terminals.

Sink (switch is ON): conduction

- (6) Pour brake liquid into storage tank.

Inspection

1. Check the switch of indicating light of brake liquid level.

Check the conduction between switch side joint terminals.

Float ((switch is OFF): not conduction

Sink (switch is ON): conduction

2. Check parking brake switch.

Check the conduction between switch side joint terminals.

When switch pin is released: conduction

When switch pin is pressed: not conduction

Panel

Preparation

1. Automobile prepares to equip with SRS airbag and safety belt pre-tension crimper.

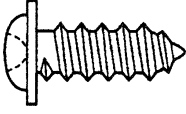
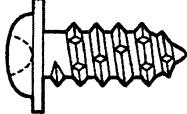
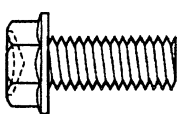
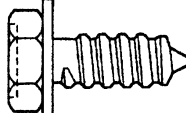
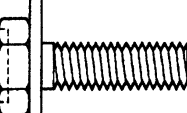
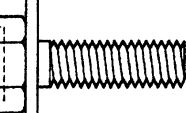
Parking disassembling and assembling works in this chapter might influence SRS airbag. Before implementing these works, it is necessary to read the notes in SRS chapter.

Change

1. Schedule for bolt, screw and screw cap

Note: when using screw driver to unclench fixing clasp or fixing clamp, it is necessary to wrap the needed top of wrench with adhesive tape.

Hint: when disassembling or assembling panel, if necessary, use the figure and code in following table to choose bolt, screw and screw cap.

mm					
Code	Shape	Code	Shape	Code	Shape
< □ >	 $\Phi = 4.8$ $\square = 13$ □2204813	< □ >	 $\Phi = 4.8$ $\square = 19$ □□2754819	< □ >	 $\Phi = 6$ $\square = 20$ □1740620
< □ >	 $\Phi = 4.8$ $\square = 9.5$ □2754895	< □ >	 $\Phi = 6$ $\square = 16$ □1400616	< □ >	 $\Phi = 6$ $\square = 20$ □1400620

2. Preparation

3. Disassemble leading wire of battery cathode

4. Turn front wheel to face the front

5. Disassemble safety airbag assembly at the side of driver [67010011] (Referring to page 261)

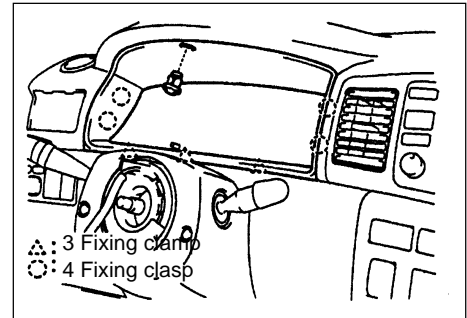
6. Disassemble steering wheel assembly [67010001] (referring to page 194)

7. Disassemble Combination instrument cover [68000077]

(a) Disassemble fixing clamp.

(b) Use screw driver to unclench three fixing clamps and four fixing clasps, then disassemble Combination instrument.

Hint: before using screw driver, it is necessary to wrap its needed top with adhesive tape.

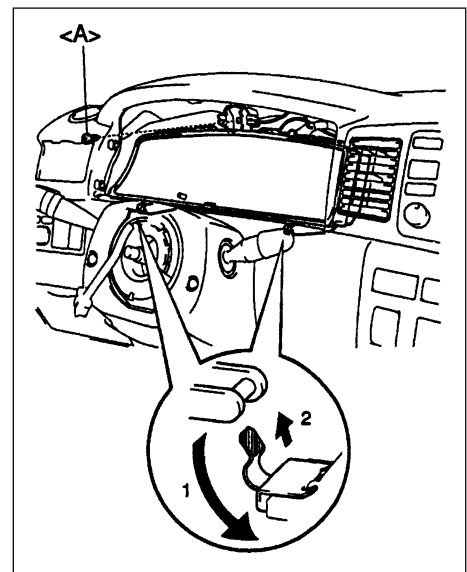


8. Disassemble Combination instrument assembly [67000081]

(a) Disassemble A screw.

(b) Liking that shown in figure, unclench two fixing clamps.

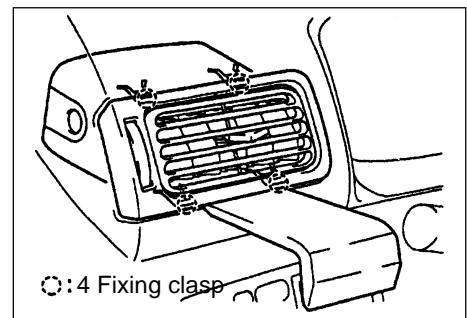
(c) Disassemble the joint, then disassemble Combination instrument assembly.



9. Disassemble panel left ventilation hole assembly [68010010]

Use disassembling tool for trim tape to disassemble panel left ventilation hole assembly.

Hint: before using screw driver, it is necessary to wrap its needed top with adhesive tape.



10. Disassemble panel right ventilation hole assembly [68010011]

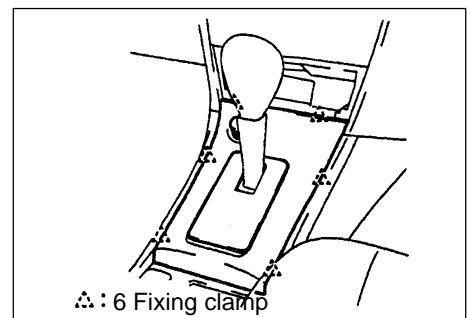
11. Disassemble front ashtray

12. Disassemble shift organization trim board assembly [68000076]

(a) Use screw driver to unclench six fixing clamps.

Hint: before using screw driver, it is necessary to wrap its needed top with adhesive tape.

(b) Disassemble the joint, then disassemble shift organization trimmain board.

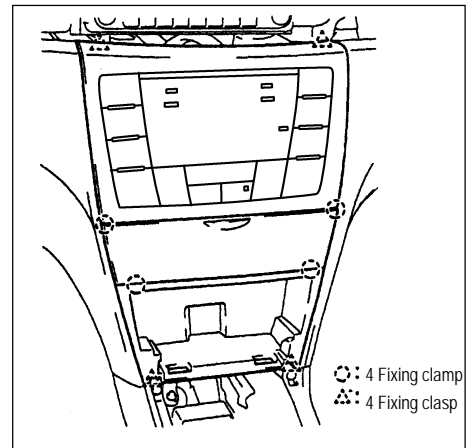


13. Disassemble air conditioner control panel assembly [67000148]

- (a) Use screw driver to unclench four fixing clamps and four fixing clasps, then disassemble air conditioner control panel assembly.

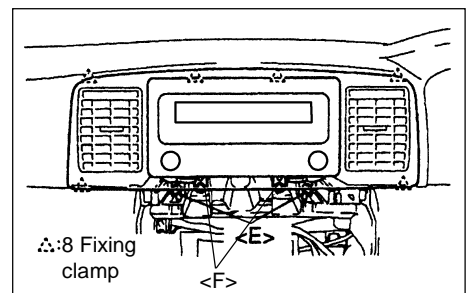
Hint: before using screw driver, it is necessary to wrap its needed top with adhesive tape.

- (b) Disassemble the joint.



14. Disassemble CD machine assembly [67000126]

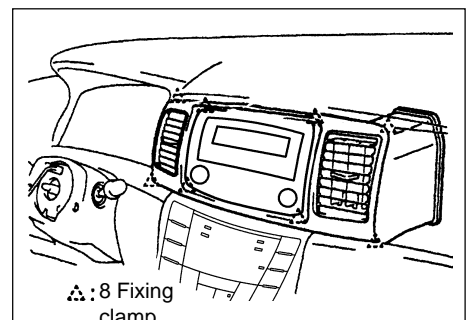
- (a) Disassemble two E self tapping screws and two F bolts.



- (b) Use screw driver to unclench eight fixing clamps, then disassemble DVD assembly and panel central ventilation hole assembly.

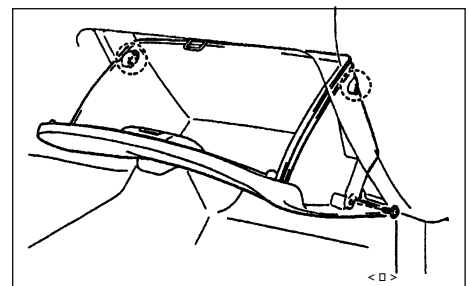
Hint: before using screw driver, it is necessary to wrap its needed top with adhesive tape.

- (c) Disconnect panel central ventilation hole assembly.



15. Disassemble lower panel right storage box assembly [68100008]

- (a) Disassemble A screw and gas spring on storage box.
(b) Bend upper part of storage box to release gas spring.
(c) Pull put storage box upwards.

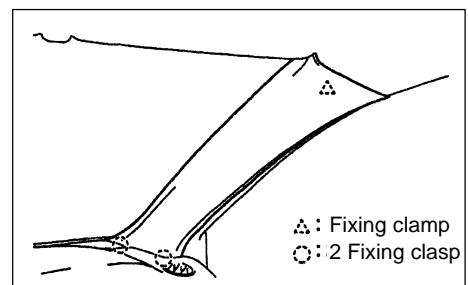


16. Disassemble right front pillar inner trim board assembly [68010017]

- (a) Unclench two fixing clamps.
(b) Pull out right front pole inner trim board upwards.

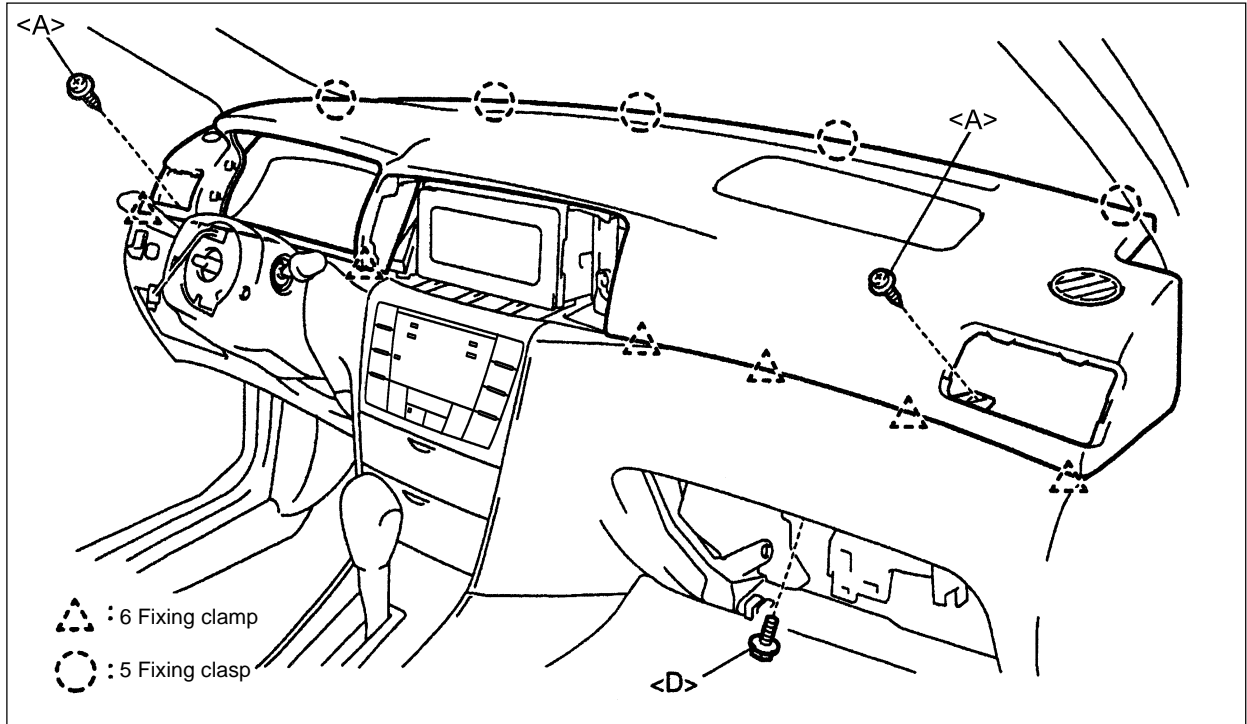
17. Disassemble left front pole inner trim board assembly [68010014]

18. Disassemble the joint of safety airbag assembly at the side of passenger (referring to page 263)



19. Disassemble upper panel assembly [68010004]

- (a) Disassemble D bolt and two A screws.
- (b) Use disassembling tool for trim tape to unclench six fixing clamps.
- (c) Disassemble upper panel assembly.



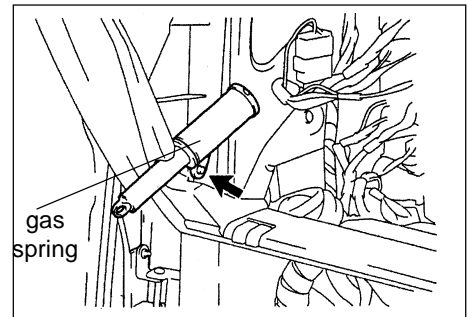
20. Disassemble upper/lower trim board of steering column [64000128/64000129]

21. Disassemble left combination switch assembly [67000078] (referring to page 298)

22. Disassemble right combination switch assembly [64000079] (referring to page 302)

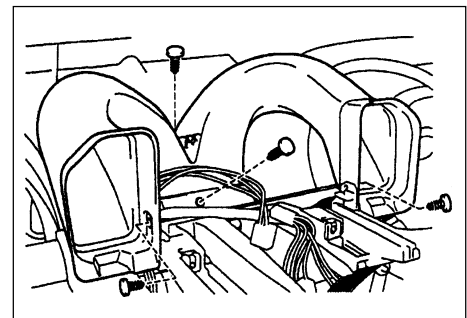
23. Disassemble gas spring

Unclench fixing clamp, then disassemble gas spring.



24. Disassemble evaporator ventilation pipe assembly [67000149]

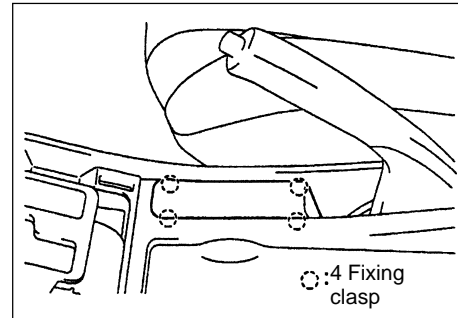
Disassemble four fixing clamps and evaporator ventilation pipe assembly.



25. Disassemble parking brake hole cover.

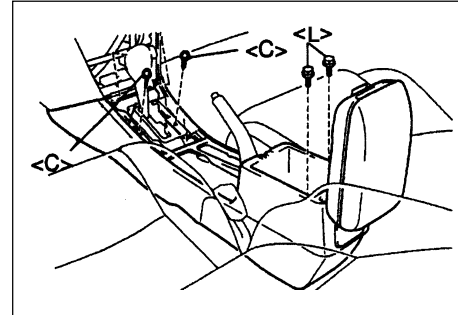
Use screw driver to unclench four fixing clamps, then disassemble parking brake hole cover.

Hint: before using screw driver, it is necessary to wrap its needed top with adhesive tape.



26. Disassemble auxiliary panel assembly [68010002]

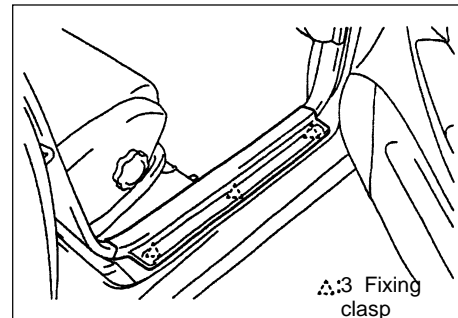
(a) Disassemble two L bolts, two C bolts and auxiliary panel assembly.



27. Disassemble right front door pedal trim board [68010021]

Use screw driver to unclench three fixing clamps, then disassemble right front door pedal trim board.

Hint: before using screw driver, it is necessary to wrap its needed top with adhesive tape.

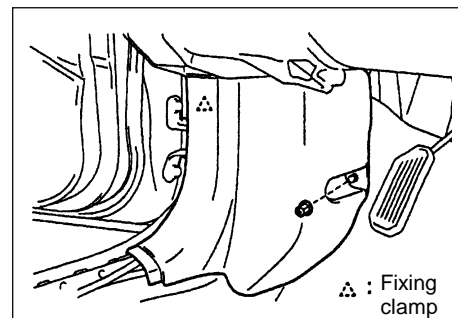


28. Disassemble left front door pedal trim board [68010020]

29. Disassemble lower inner trim board of right defender [68010016]

(a) Disassemble plastic nuts of lower inner trim board of right defender.

(b) Unclench fixing clamp, then disassemble lower inner trim board of right defender liking that shown in figure.



30. Disassemble lower inner trim board of left defender [68010015]

31. Disassemble connecting board at the middle of panel [68010006]

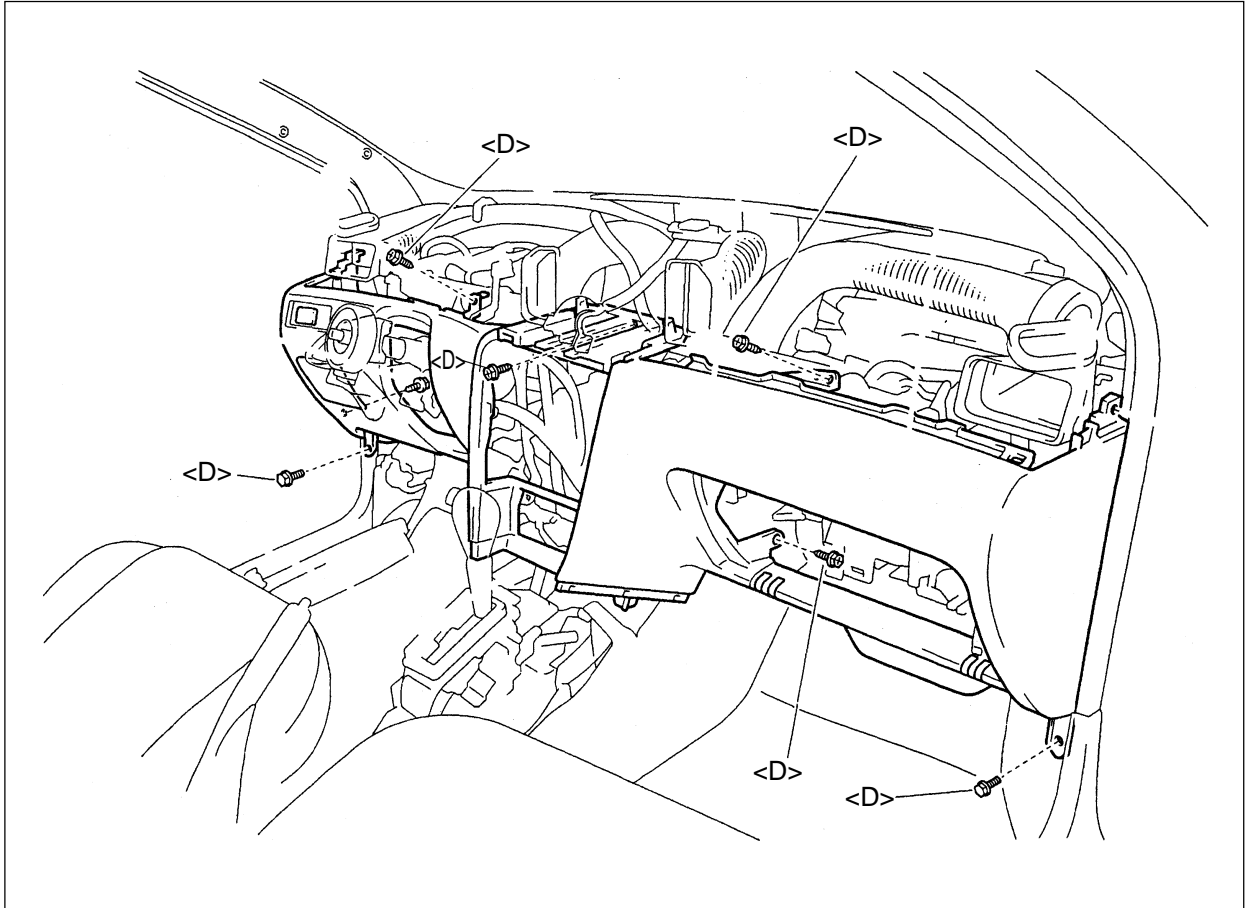
(a) Use screw driver to unclench four fixing clamps, then open the connecting board at the middle of panel.

Hint: before using screw driver, it is necessary to wrap its needed top with adhesive tape.

(b) Disassemble connecting board at the middle of panel.

32. Disassemble lower panel assembly [68010005]

- (a) Disassemble the joint of indoor temperature sensor.
- (b) Disassemble machine cover locking pull cable with handle assembly.
- (c) Disassemble six D bolts.
- (d) Disassemble six fixing clamps and panel lower board.



33. Disassemble left storage box of lower panel [68010007]

34. Assemble upper panel assembly [68010004]

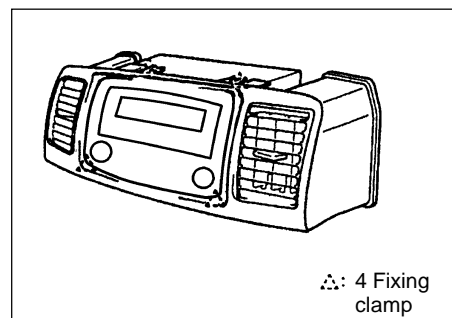
Assemble upper panel assembly with D bolt and two A screws.

D bolt: 18 N·m

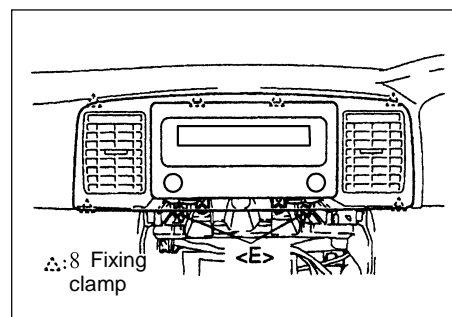
35. Assemble CD machine assembly [67000126]

- (a) Assemble pedal central ventilation hole assembly on CD machine assembly.

- (b) Assemble CD machine assembly and panel central ventilation hole assembly.



36. Assemble helix cable assembly (referring to page 261)
37. Assemble steering wheel assembly [67010001] (referring to page 194)
38. Check the central position of steering wheel.
39. Check the safety airbag assembly at the side of driver [67010011] (referring to page 249)
40. Assemble the safety airbag assembly at the side of driver [67010011]
41. Check the warning light of SRS airbag



Combination instrument assembly

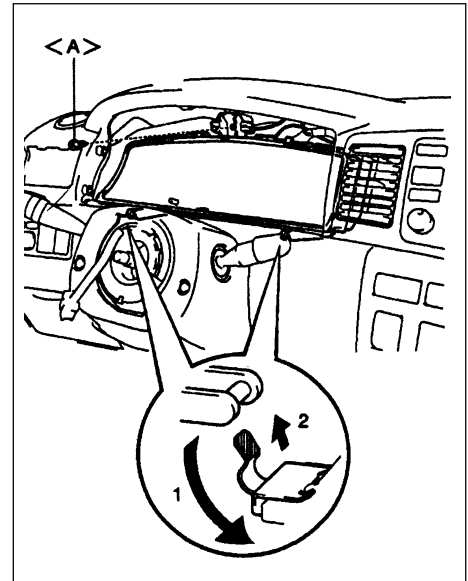
Disassembly and assembly

1. Disassemble Combination instrument cover [68000077]

- (a) Disassemble fixing clamp.
- (b) Use screw driver to unclench three fixing clamps and four fixing clasps, then disassemble combination penal cover.

2. Disassemble Combination instrument assembly [68000081]

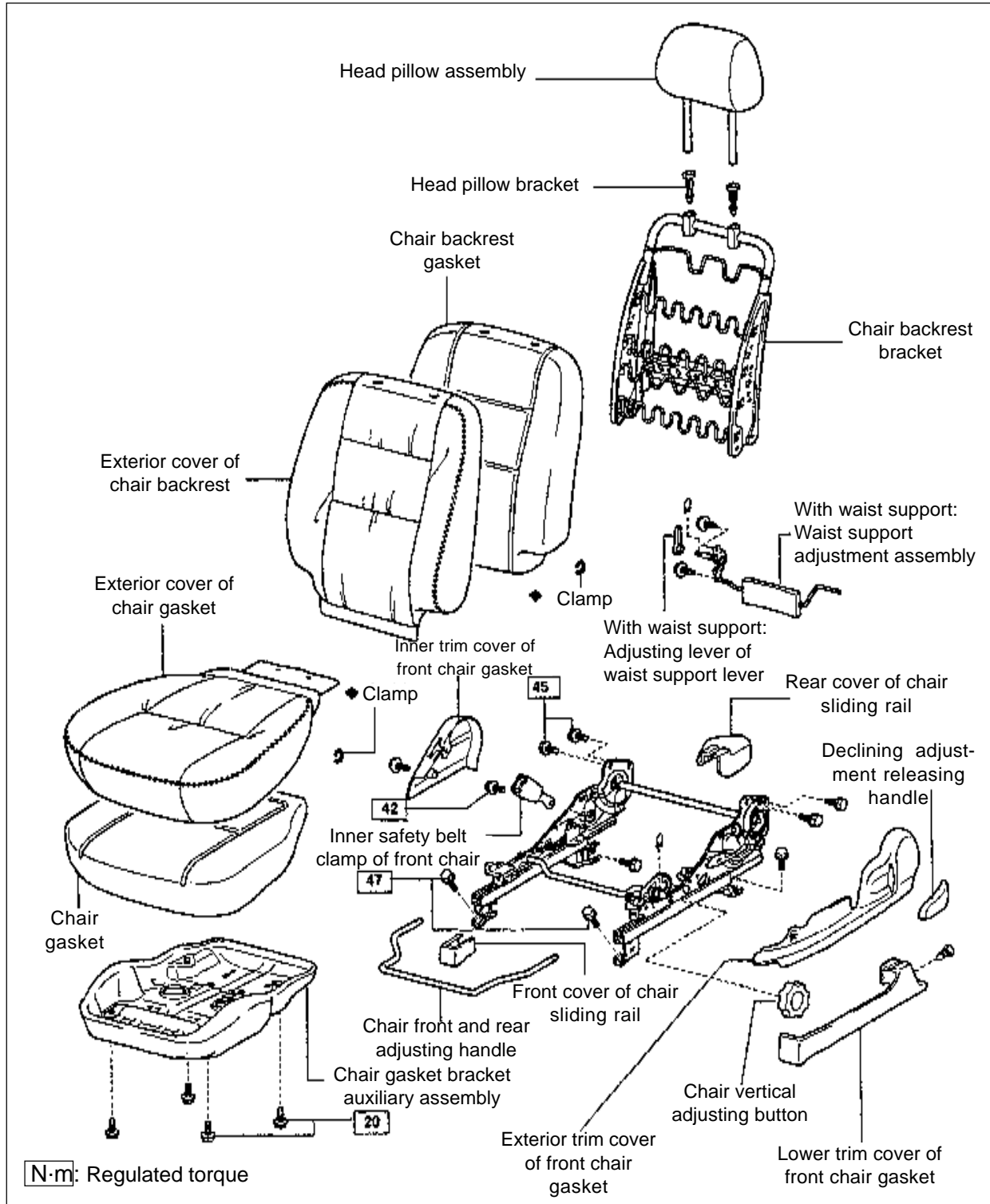
- (a) Disassemble the screw.
- (b) Liking that shown in figure, unclench two fixing clamps.
- (c) Disassemble the joint, then disassemble Combination instrument.



Chair

Front chair

Subassembly



Overhaul

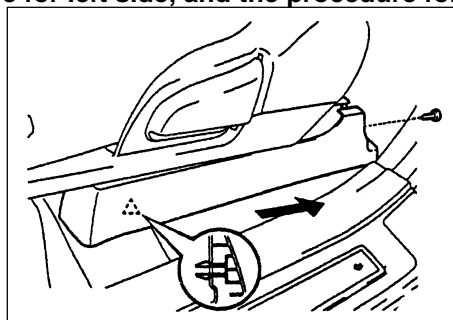
Hint:

- When assembling, please work by the sequence opposite with disassembling sequence, but when it has items that need to pay special attention, it will add special specification.
- This overhaul procedure is the disassembling procedure for left side, and the procedure for right side is same.

1. Disassemble driver chair assembly [68010061]

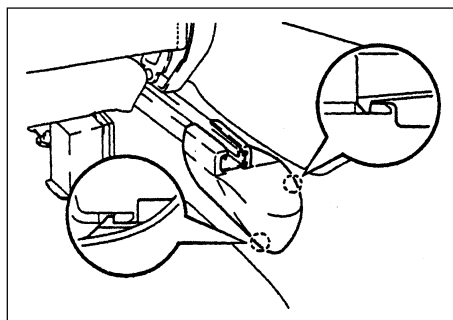
- Disassemble fixing clamp.
- Use screw driver to disassemble left lower trim board of driver chair [68010062].

Hint: before using screw driver, it is necessary to wrap its needed top with adhesive tape.



- Use screw driver to disassemble right rear lower trim board of driver chair [68010065].

Hint: before using screw driver, it is necessary to wrap its needed top with adhesive tape.

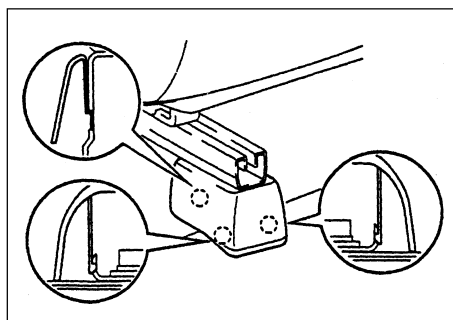


- Use screw driver to disassemble right front lower trim board of driver chair [68010064].

Hint: before using screw driver, it is necessary to wrap its needed top with adhesive tape.

- Disassemble the joint.
- Disassemble four bolts and front chair.

Note: Do not damage automobile body.



2. Disassemble front chair pillow assembly [68010066]

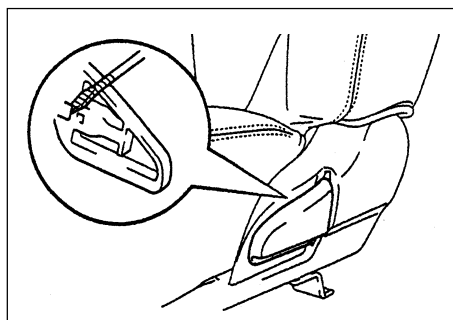
3. Disassemble chair vertical adjusting button

Disassemble fixing clamp and chair vertical adjusting button.

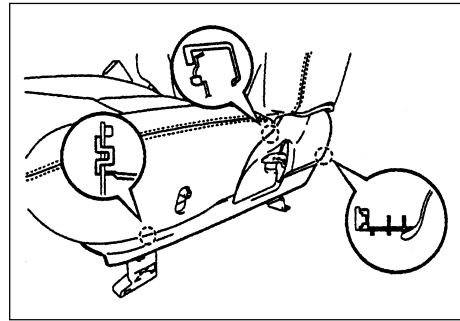
4. Disassemble declining adjustment releasing handle.

Use screw driver to disassemble declining adjustment releasing handle.

Hint: before using screw driver, it is necessary to wrap its needed top with adhesive tape.



5. Disassemble lower trim cover of front chair gasket.

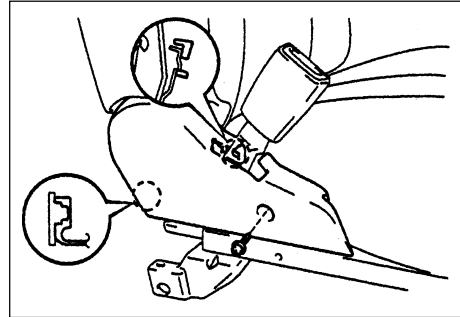


6. Disassemble inner trim cover of front chair gasket.

Disassemble the screw and inner trim cover of front chair gasket.

7. Disassemble left front safety belt locker assembly [68010040]

- (a) Cut off fixing clasp.
- (b) Disassemble the bolt and left/right front safety belt locker assembly.



8. Disassemble chair backrest assembly.

- (a) Disassemble the clasp.
- (b) Over turn exterior cover of chair backrest , then disassemble the clasp.
- (c) Disassemble four bolts and chair backrest assembly.

9. Disassemble exterior cover of chair backrest .

- (a) Disassemble head pillow bracket.
- (b) Disassemble fixing clamp and adjusting lever of waist support lever.
- (c) Disassemble the clamp, then disassemble exterior cover of chair backrest with gasket.
- (d) Disassemble the clamp, then disconnect exterior cover of chair backrest with chair backrest gasket.
- (e) Disassemble two screws and waist support lever.

10. Disassemble exterior cover of chair gasket.

- (a) Disassemble fixing clamp, then disassemble exterior cover of chair backrest with gasket.
- (b) Disassemble the clamp, then disconnect exterior cover of chair backrest with chair backrest gasket.

11. Disassemble chair gasket bracket assembly.

12. Disassemble chair front and rear adjusting handle.

Use screw driver to disassemble chair front and rear adjusting handle.

Hint: before using screw driver, it is necessary to wrap its needed top with adhesive tape.

13. Assemble chair gasket bracket assembly.

Use four bolts to assemble chair gasket bracket on chair adjustment assembly.

Torque: 20 N·m

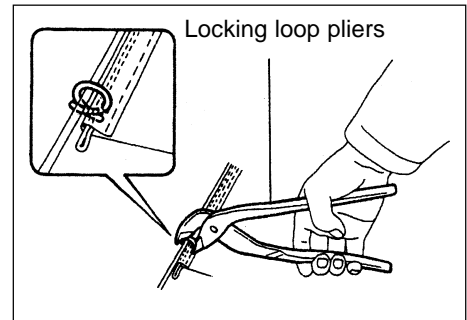
14. Assemble exterior cover of chair gasket.

- (a) Use new clamp to assemble exterior cover of chair gasket in chair gasket.

- (b) Use new clamp to assemble chair gasket on chair gasket bracket.

Hint:

- Do not damage or dirty exterior cover of chair gasket.
- When assembling clamp, it is necessary to prevent exterior cover of chair gasket from crinkling.

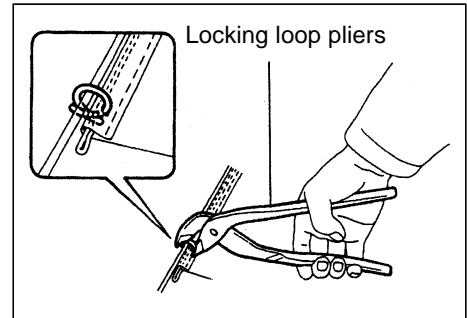


15. Assemble exterior cover of chair backrest .

- (a) Use new clamp to assemble exterior cover of chair backrest in chair gasket.
- (b) Use new clamp to assemble chair backrest on chair backrest bracket.

Hint:

- Do not damage or dirty exterior cover of chair backrest .
- When assembling clamp, it is necessary to prevent exterior cover of chair backrest from crinkling.



16. Assemble chair backrest assembly.

- (a) Use four bolts to assemble chair backrest assembly.

Torque: 45 N-m

- (b) Over turn exterior cover of chair backrest to assemble clamp.
- (c) Assemble the clamp.

17. Assemble left front safety belt locking assembly [68010040]

- (a) Use the bolt to assemble left front safety belt locking assembly.

Torque: 42 N-m

- (b) Assemble fixing clasp.

18. Assemble driver chair assembly.

- (a) Assemble driver chair.

Note: do not damage automobile body.

- (b) Connect the joint.
- (c) Assemble four bolts.

Torque: 47 N-m

- (d) Assemble right front lower trim board, right rear lower trim board and left lower trim board of driver chair.

Rear chair (separating type)

Overhaul

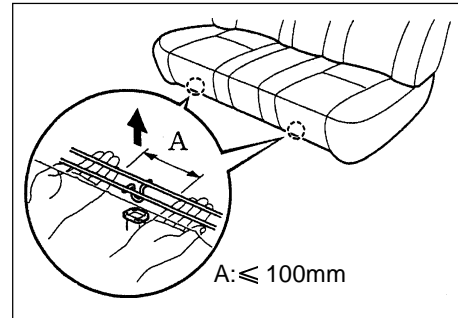
Hint:

When assembling, please work by the sequence opposite with disassembling sequence, but when it has items that need to pay special attention, it will add special specification.

1. Disassemble rear row chair cushion assembly.

Pull rear row chair cushion assembly upwards, then disassemble it.

Note: when disassembling, it is necessary to hold the bracket at two sides of fixing clasp, then pull it upwards to prevent it from distorting.



2. Disassemble rear chair head pillow assembly [68010077]

3. Disassemble rear row chair backrest assembly.

4. Make the backrest face the front, then disassemble four fixing clamps.

5. Disassemble four bolts and rear chair backrest assembly.

6. Disassemble rear row chair right backrest assembly [68010079]

Disassemble the bolt and rear row chair right backrest assembly.

7. Disassemble rear row chair left backrest assembly [68010078]

Disassemble two bolts and central backrest hinge.

8. Disassemble exterior cover of rear row backrest (small).

(a) Disassemble fixing clamp, then disassemble rear row chair gasket cloth.

(b) Disassemble fixing clamp, then disassemble head pillow bracket.

(c) Disassemble exterior cover of rear row backrest with gasket.

(d) Disassemble the clamp, then disconnect exterior cover of rear row backrest with gasket.

9. Disassemble exterior cover of rear row backrest (big).

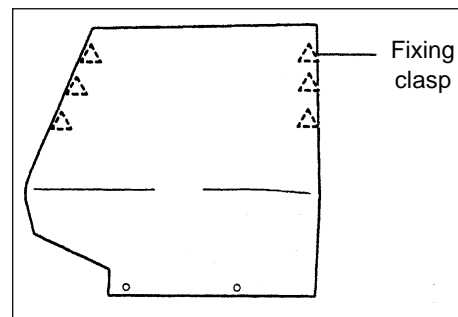
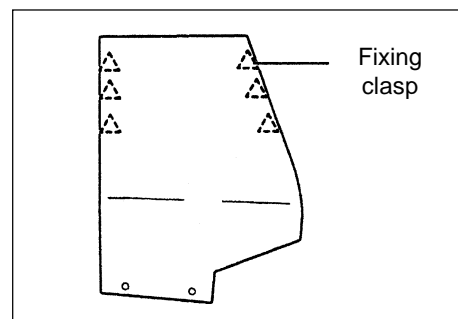
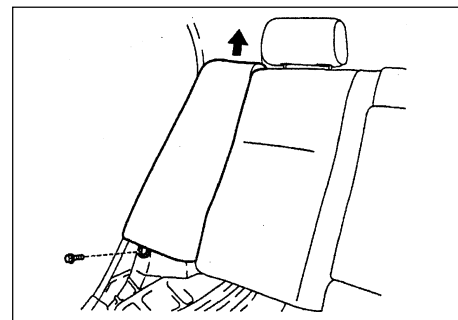
(a) Disassemble central handrail hinge trim cover.

(b) Disassemble the bolt and central handrail.

(c) Disassemble fixing clamp, then disassemble rear row chair gasket cloth.

(d) Disassemble the clamp, then disassemble head pillow bracket.

(e) Disassemble exterior cover of rear row backrest with gasket.



- (f) Disassemble the clamp, then disconnect exterior cover of rear row backrest with gasket.

10. Disassemble exterior cover of rear row chair cushion.

Disassemble the clamp, then disconnect exterior cover of cushion with gasket.

11. Assemble exterior cover of rear row chair cushion.

Use new clamp to assemble exterior cover of rear row chair cushion in gasket.

Hint:

- Do not damage or dirty exterior cover of cushion.
- When assembling clamp, it is necessary to prevent exterior cover of cushion from crinkling.

12. Assemble exterior cover of rear row chair backrest (big).

Hint:

- Do not damage or dirty exterior cover of cushion.
- When assembling clamp, it is necessary to prevent exterior cover of cushion from crinkling.

13. Assemble exterior cover of rear row chair backrest (small).

Use new clamp to assemble exterior cover of rear row chair backrest in gasket.

Hint:

- Do not damage or dirty exterior cover of cushion.
- When assembling clamp, it is necessary to prevent exterior cover of cushion from crinkling.

14. Assemble rear backrest central hinge assembly.

Use two bolts to assemble central hinge assembly.

Torque: 20 N·m

15. Assemble rear chair backrest side hinge assembly.

Use two bolts to assemble two side hinge assemblies.

16. Assemble rear row chair left backrest assembly [68010078]

Use the bolt to assemble left backrest assembly.

Torque: 8.0 N·m

17. Assemble rear row chair right backrest assembly [68010079]

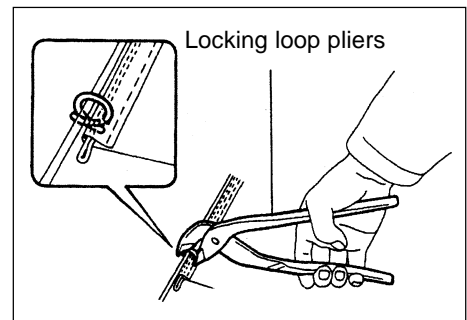
Use the bolt to assemble right backrest assembly.

Torque: 8.0 N·m

18. Assemble rear row chair backrest assembly.

Use four bolts to assemble backrest assembly.

Torque: 18 N·m



Rear chair (fixing type)

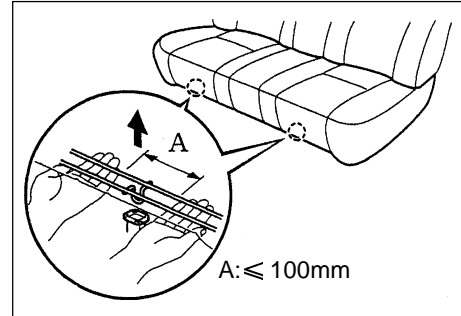
Overhaul

Hint: When assembling, please work by the sequence opposite with disassembling sequence, but when it has items that need to pay special attention, it will add special specification.

1. Disassemble rear row chair cushion assembly.

Pull rear row chair cushion assembly upwards, then disassemble it.

Note: when disassembling, it is necessary to hold the bracket at two sides of fixing clasp, then pull it upwards to prevent it from distorting.



2. Disassemble rear row chair backrest assembly [68010076]

Disassemble three bolts and rear row chair backrest assembly.

3. Disassemble rear chair head pillow assembly [68010077]

4. Disassemble exterior cover of rear row chair backrest.

- (a) Disassemble head pillow bracket.
- (b) Disassemble the clamp, then disconnect exterior cover of rear row chair backrest with gasket.

5. Disassemble exterior cover of rear row chair cushion.

Disassemble the clamp, then disconnect exterior cover of cushion with gasket.

6. Assemble exterior cover of rear row chair cushion.

Use new clamp to assemble exterior cover of rear row chair cushion in gasket.

Hint: Do not damage or dirty exterior cover of cushion.

When assembling clamp, it is necessary to prevent exterior cover of cushion from crinkling.

7. Assemble exterior cover of rear row chair backrest.

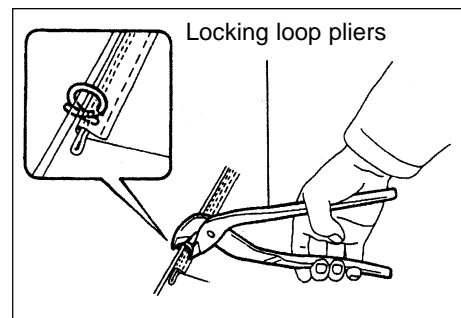
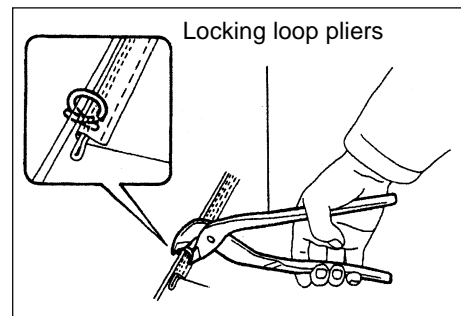
Use new clamp to assemble exterior cover of rear row chair backrest in gasket.

Hint: Do not damage or dirty exterior cover of cushion.

When assembling clamp, it is necessary to prevent exterior cover of cushion from crinkling.

8. Assemble rear row chair backrest assembly [68010076]

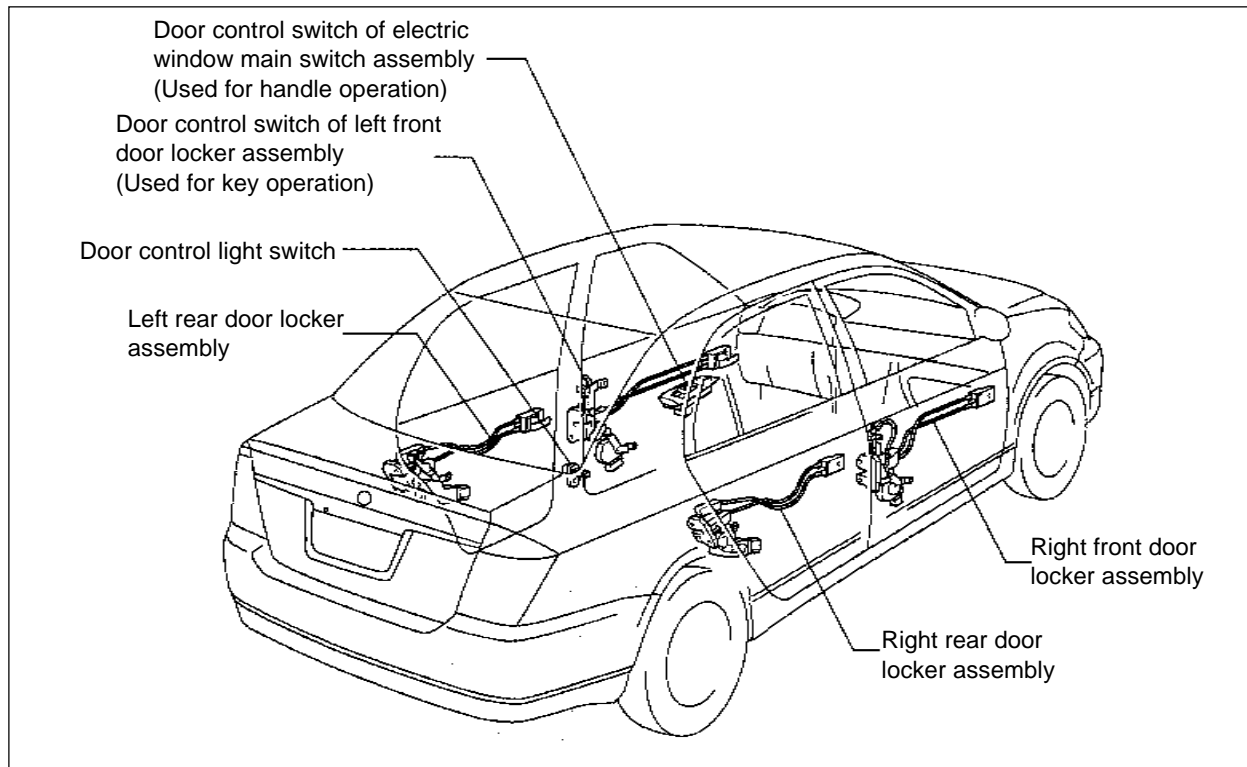
Torque: 8.0 N·m



Anti-stealing and door lock

Electric door lock control system

Position of parts (only for reference)



Inspection on automobile

1. Basic inspection for electric door locker.

- Press middle control switch to locker closing side, and check the all doors should be locked; then press middle control switch to locker opening side, and check all doors should be opened.
- Insert key in door locker and turn it anticlockwise, and check all doors should be locked; then turn the key clockwise, and check all doors should be opened.
- Check the keeping protection function of the key.

Note: When checking the keeping protection function of the key, it is necessary to open electric window at the side of driver to prevent its function from losing and lock the key in automobile.

- Insert key in ignition switch.
- Open the door, and press middle control switch on the door at the side of driver to locker closing side, at this time, door locker could not close.
- Open the door, and press locker button on the door at the side of driver to locker closing side, at this time, door locker could not close.
- After pressing locker button upwards for over two seconds, and locking driver door; when driver door is closed and key is not used to lock, check whether all doors could open automatically.

(d) Check security function:

- (1) When closing all doors, open the driver window to operate door control switch out of automobile.
- (2) Take down the key, open driver door, then close the door and lock (not use key). In this situation above, check that door could not open locker even if door control switch (handle operation) is pressed to locker opening side out of automobile.
- (3) Take down the key, close and use the key to lock driver door. In this situation above, check that door could not open locker even if door control switch (handle operation) is pressed to locker opening side out of automobile.
- (4) Take down the key, close and use remote control key to lock driver door. In this situation above, check that door could not open locker even if door control switch (handle operation) is pressed to locker closing side out of automobile (only applicable for the automobile equipping with remote control door locker control system).

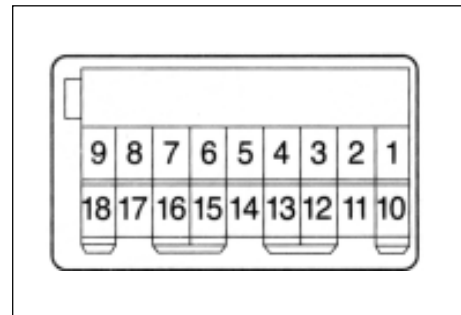
Hint:

- In following situation, check whether security has been canceled.
- Ignition switch is turned to ON.
- Use key operation to open the driver door locker.
- After door locker is pressed to opening side by hand, door control switch (handle operation) is pressed to locker opening side.
- Use remote control locker control to open the door (only applicable for the automobile equipping with remote control door locker control system).

2. Electric window main switch assembly

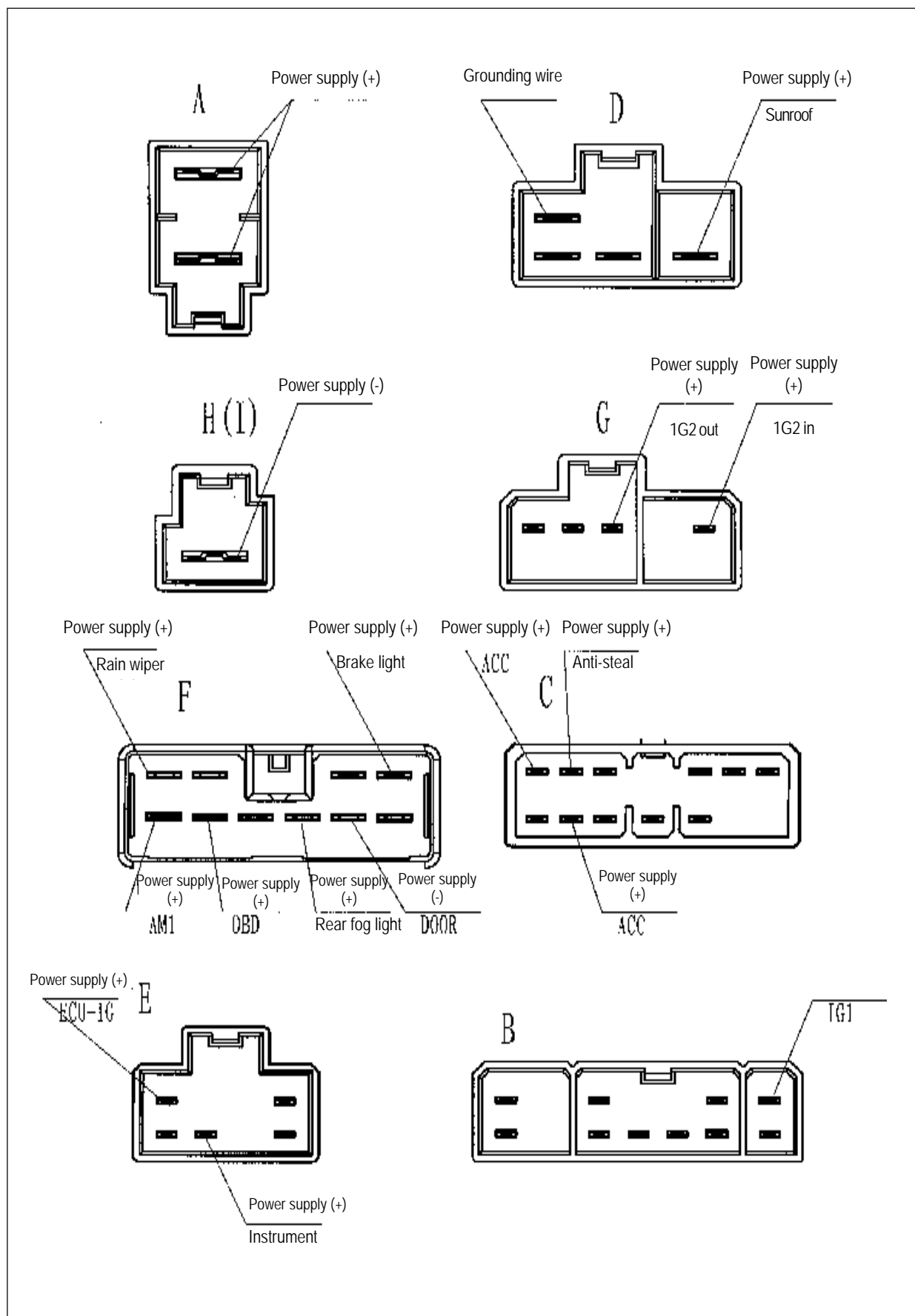
Operate door control switch by hand to check its conduction.

Position of switch	Terminal connected by avometer	Regulated situation
LOCK	5-1 or 5-3	Conduction
UNLOCK	8-1 or 8-3	↑



3. Check panel junction box assembly.

- (a) Check 25A DOOR fuse.
- (b) Check conformity relay.
 - (1) Disassemble F, G, H and I joint on instrument junction box.
 - (2) Check the voltage and conduction of every terminal of joint.



Malfunction phenomenon table

Malfunction phenomenon	Possible malfunction part	Referred page
“Door locker control system” does not work (all).	1. DOOR fuse (panel J/B)	-
	2. Wiring harness	-
Door locking/unlocking malfunction (use handle operation and key operation)	1. Electric window main switch (door control switch)	359
	2. Wiring harness	-
Door locking/unlocking malfunction (use key)	1. Door at the side of driver assembly (door control switch)	359
	2. Wiring harness	-
	3. Door locker connecting rod is loosen	-
Malfunction of key keeping protection function	1. Anti-versa lock supervising switch	359
	2. Door control light switch	-
	3. Wiring harness	-
Only one door locker does not work	1. Door locker electric motor	359
	2. Wiring harness	-

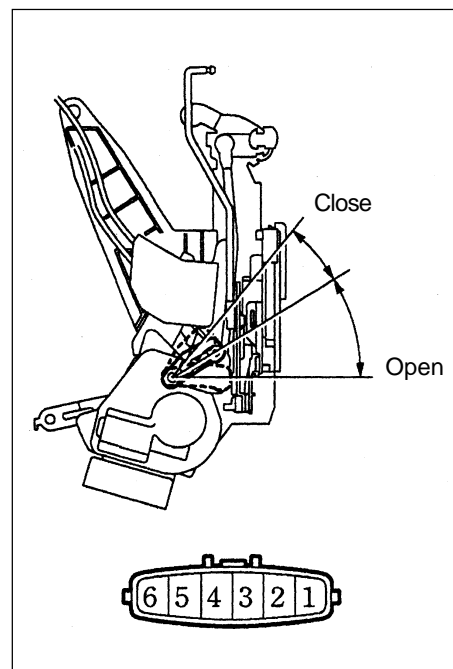
Inspection

1. Check driver seat door locker assembly.

- (a) Liking that shown in figure, check the conduction of every terminal of door key switch.

Position of switch	Terminal connected by avometer	Regulated situation
LOCK	2-4	Conduction
OFF	-	Not conduction
UNLOCK	1-2-3	Conduction

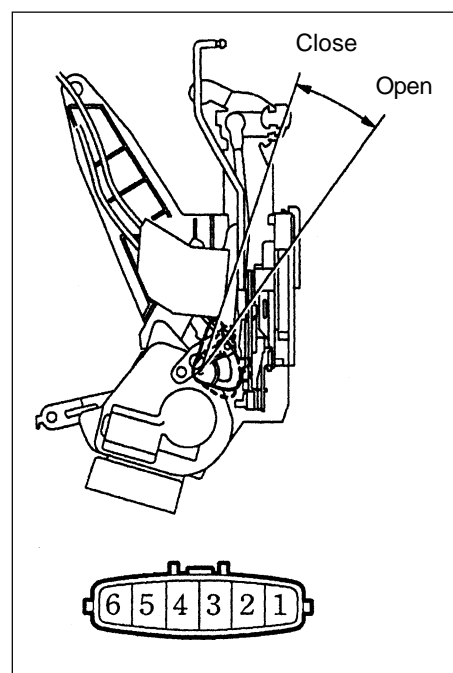
If the conduction does not accord with the regulation, change the switch.



- (b) Liking that shown in figure, supply battery voltage to terminal, and check the function of door locker.

Condition	Function
Supply battery anode to No. 6 terminal, cathode to No.5 terminal	Open
Supply battery anode to No. 5 terminal, cathode to No.6 terminal	Close

If the function does not accord with the regulation, change the door locker assembly.

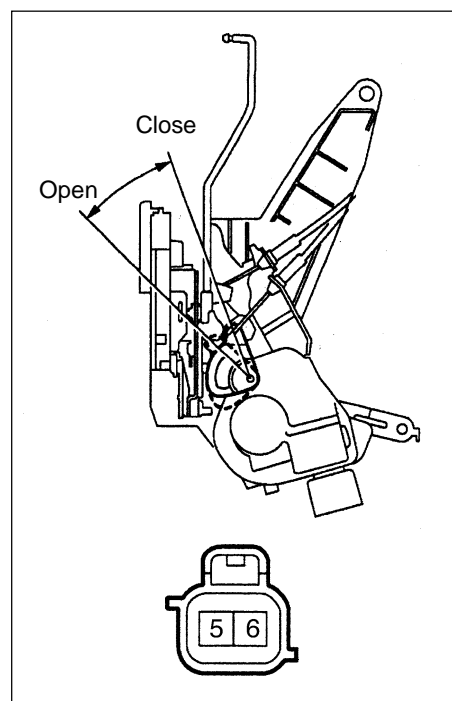


2. Check front passenger seat door locker assembly

Liking that shown in figure, supply battery voltage to terminal, and check the function of door locker.

Condition	Function
Supply battery anode to No. 6 terminal, cathode to No.5 terminal	Open
Supply battery anode to No. 5 terminal, cathode to No.6 terminal	Close

If the function does not accord with the regulation, change the door locker assembly.

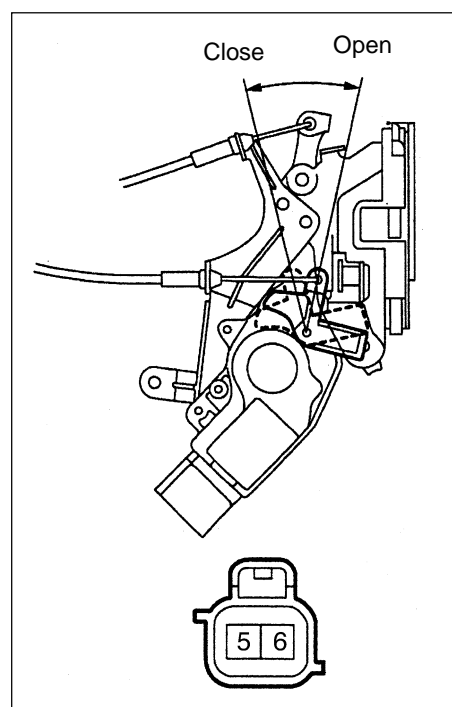


3. Check the left rear and right rear door locker assembly.

Liking that shown in figure, supply battery voltage to terminal, and check the function of door locker.

Condition	Function
Supply battery anode to No. 6 terminal, cathode to No.5 terminal	Open
Supply battery anode to No. 5 terminal, cathode to No.6 terminal	Close

If the function does not accord with the regulation, change the door locker assembly.



Electronic anti-stealing system

Electronic anti-stealing system consists of anti-stealing controller, anti-stealing loop and transmitter. One end of loop covers ignition locker core, the other end connects with anti-stealing controller, and the other end of controller connects with engine ECU, at the same time, transmitter is assembled in key. Memory of transmitter stores only mark (code) showing the legal identity of automobile owner, transmitter, anti-stealing controller and electric injection ECU constitutes a multi-layer effective electronic anti-stealing system verified by password.

If customer key loses, anti-stealing ECU is changed or engine ECU is changed, it is necessary to match again in repairing station. When automobile leaves the factory, safety password is delivered directly to owner for keeping with the type of secrecy. If it is necessary to make a new key, change anti-stealing controller and make other operations, owner should bring the safety password with the automobile to repair in repairing station. Repairing station should keep repairing (make new key, change anti-stealing controller and so on) record for inquiring in future.

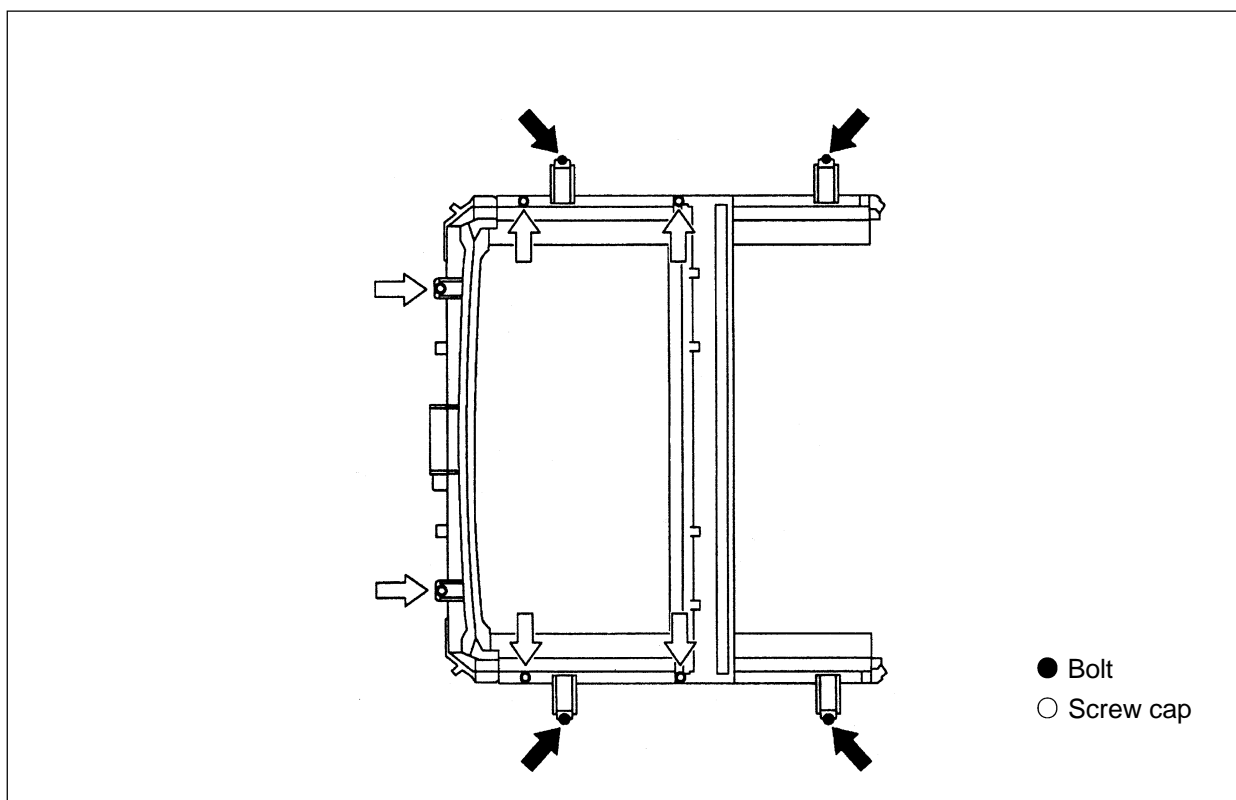
Electric sunroof (optional)

Sunroof

Overhaul

Hint: when assembling, please work by the sequence which is opposite with disassembling sequence; but when it has items that need to pay special attention, it will add special specification.

- 1. Disassemble inner trim board of top (referring to page 390).**
- 2. Disassemble the glass of sunroof.**
 - (a) Use planetary wrench to disassemble planetary screw.
 - (b) Pull the glass upwards to disassemble it.
- 3. Disassemble waterproof adhesive tape of sunroof.**
- 4. Disconnect connection of wiring harness.**
- 5. Disassemble shell body of sunroof.**
 - (a) Disassemble four drain hoses.
 - (b) Liking that shown in figure, disassemble four bolts and six screw caps, then disassemble shell body.



- 6. Disassemble trim sun shade of sunroof.**
 - (a) Disassemble the screw and stopper.
 - (b) Disassemble trim sun shade of sunroof.

7. Use screw driver (twisted by adhesive tape) to align the sunroof driving pull cable with right mark.

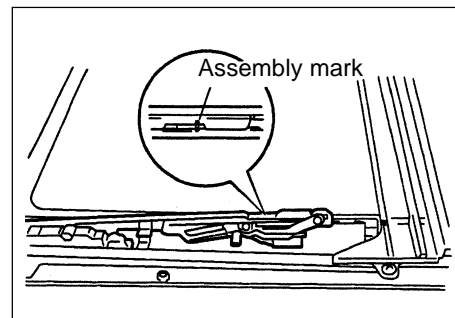
8. Assemble sunroof shell body assembly.

(a) Bolt.

Torque: 5.5 N·m

(b) Screw cap.

Torque: 5.0 N·m



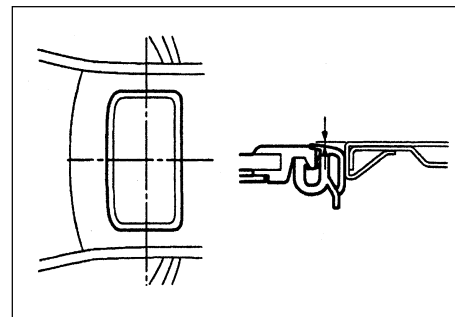
9. Assemble the glass of sunroof.

(a) Check the phase difference between sunroof waterproof adhesive tape and top gasket.

Front end and rear end: $0 \pm 1.5\text{mm}$

Rear corner: $0 \pm 1.5\text{mm}$

$0-1.5\text{mm}$



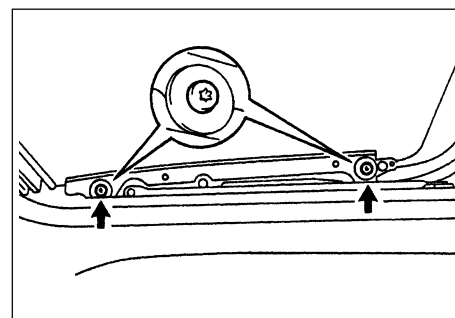
(b) Adjustment

Use T25 planetary wrench to loosen the screw to adjust the sunroof on correct position, then lock the screw.

10. Inspection for water leakage.

(a) After the adjustment, check whether the sunroof leaks water.

(b) If sunroof leaks water, adjust it again.



Sunroof system

Specification for sunroof function

1. Operation category

Spot contact: press the keystroke one time, then release immediately (the time is less than 0.3 seconds).

Long press: press the key stroke for long time (the time is more than 0.3).

2. Specification for function.

Anti-clamping function: spot contact the keystroke to make the sunroof could face 10 Kg resistance in the process of closing from any position, at this time, electric motor turns oppositely, and the sunroof returns turn-up or opening state.

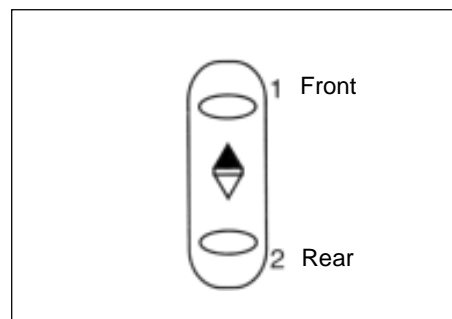
Automatic closing function: when the key is pulled out from ignition locker, at this time, the sunroof is not at closing state, it will close automatically in three seconds.

Inspection for sunroof function

1. Inspection for sliding opening function.

(1) Turns ignition switch to ON, when spot contacting sunroof switch keystroke 2, the sunroof will start automatic sliding opening work, and it does not stop until it is at complete opening state. If spot contacting it in running process, or pressing keystroke 1 or 2 for long time, sunroof glass will stop running immediately.

(2) Turns ignition switch to ON, when pressing keystroke 2 for long time, the sunroof will start automatic sliding opening work, and it does not stop until it is at complete opening state. If releasing keystroke 2 in running process, the sunroof glass will stop running immediately.



2. Inspection for sliding closing function.

(1) Turns ignition switch to ON, if the sunroof is at opening state, when spot contacting sunroof switch keystroke 1, the sunroof will automatically slide to closing state. If spot contacting it or pressing keystroke 1 or 2 for long time in running process, sunroof glass will stop running immediately.

(2) Turns ignition switch to ON, if the sunroof is at opening state, when pressing sunroof switch keystroke 1 for long time, the sunroof will automatically slide to closing state. If releasing keystroke 1 in running process, sunroof glass will stop running immediately.

3. Inspection for turn-up opening function

(1) Turns ignition switch to ON, if the sunroof is at closing state, when spot contacting sunroof switch keystroke 1, the sunroof will automatically move to turn-up opening state. If spot contacting it again or pressing keystroke 1 or 2 for long time in running process, sunroof glass will stop running immediately.

(2) Turns ignition switch to ON, if the sunroof is at closing state, when pressing sunroof switch keystroke 1 for long time, the sunroof will automatically slide to turn-up opening state. If releasing keystroke 1 in running process, sunroof glass will stop running immediately.

4. Inspection for turn-up closing function

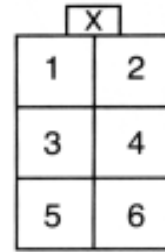
(1) Turns ignition switch to ON, if the sunroof is at turn-up opening state, when spot contacting sunroof switch keystroke 2, the sunroof will automatically move to closing state. If spot contacting it again or pressing keystroke 1 or 2 for long time in running process, sunroof glass will stop running immediately.

(2) Turns ignition switch to ON, if the sunroof is at turn-up opening state, when pressing sunroof switch keystroke 2 for long time, the sunroof will automatically slide to closing state. If releasing keystroke 2 in running process, sunroof glass will stop running immediately.

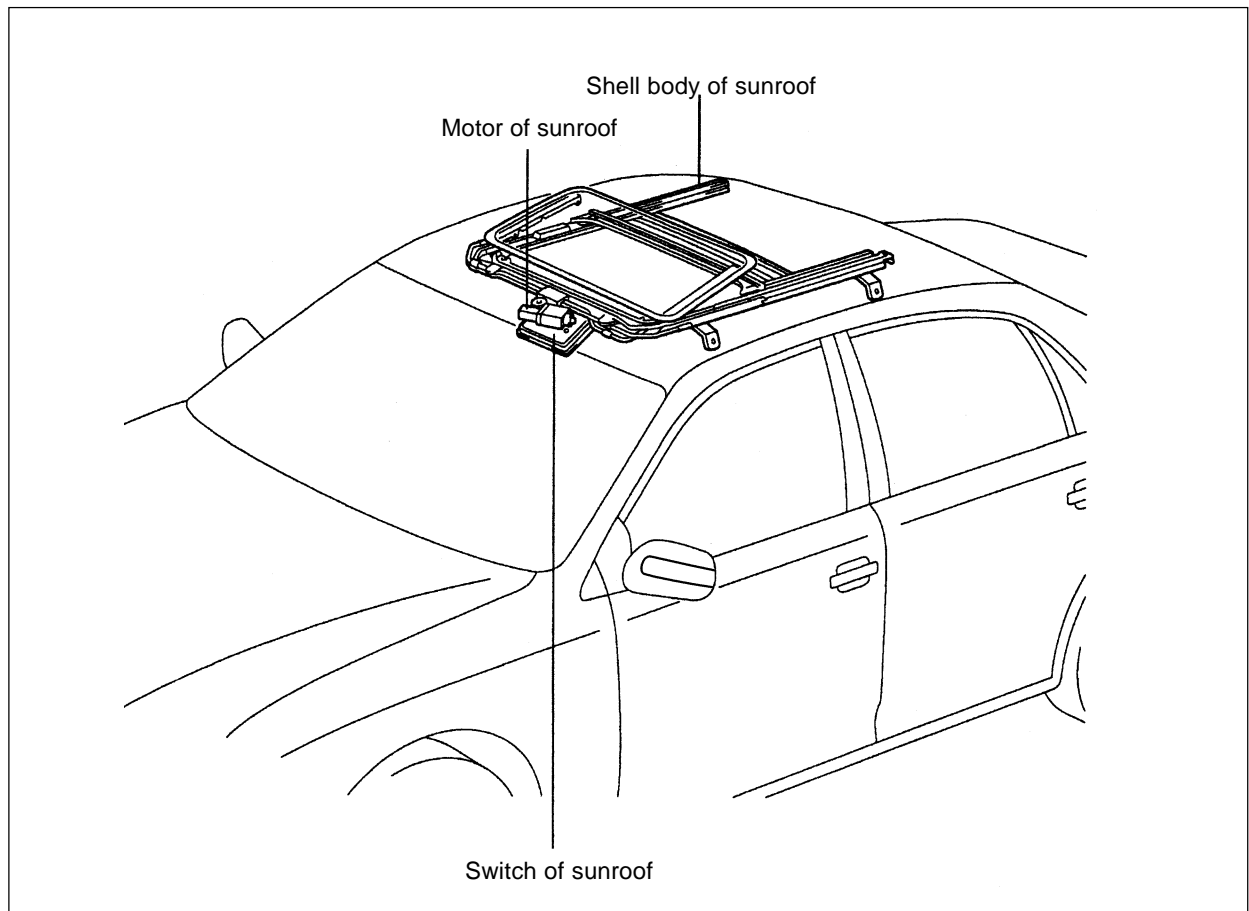
Inspection for sunroof switch

- (a) Check the function of switch. Disassemble front top light, and disassemble the joint of front top light, then check the joint at the side of switch liking that shown in figure.

Terminal connected by avometer	Condition	Regulated situa-
2-4	Spot contact or press keystroke 2 for long time	tion
2-5	Spot contact or press keystroke 1 for long time	Conduction



Position of parts



Malfunction phenomenon table

Malfunction phenomenon	Possible malfunction part	Reference page
Sunroof system does not work	1. Ignition switch.	-
	2. Control switch of sunroof.	-
	3. 25A, 15# fuse.	-
	4. Wiring harness	-
Sunroof system works abnormally	1. Control switch of sunroof.	-
	2. Wiring harness	-

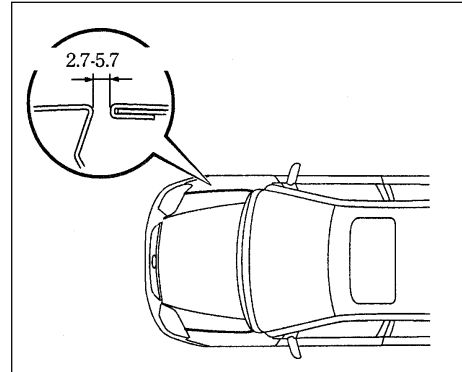
Engine cover/automobile door

Engine cover

Adjustment

1. Check engine cover assembly.

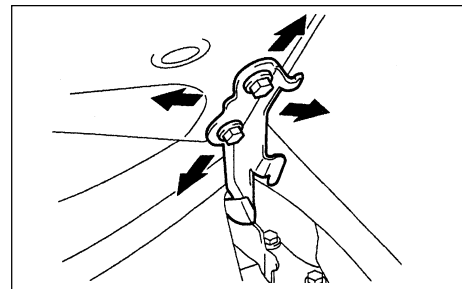
Check whether the clearance of engine cover is in regulated value shown in table.



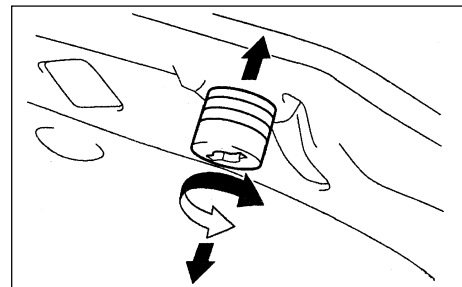
2. Adjust engine cover assembly.

(a) Adjust engine cover assembly by loosening the hinge bolt at the side of engine cover.

Torque: 13 N·m

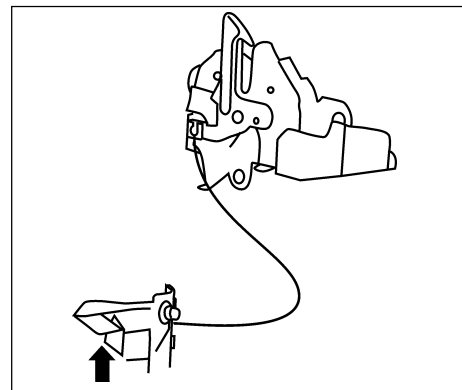


(b) Adjust engine cover assembly by turning the gasket.



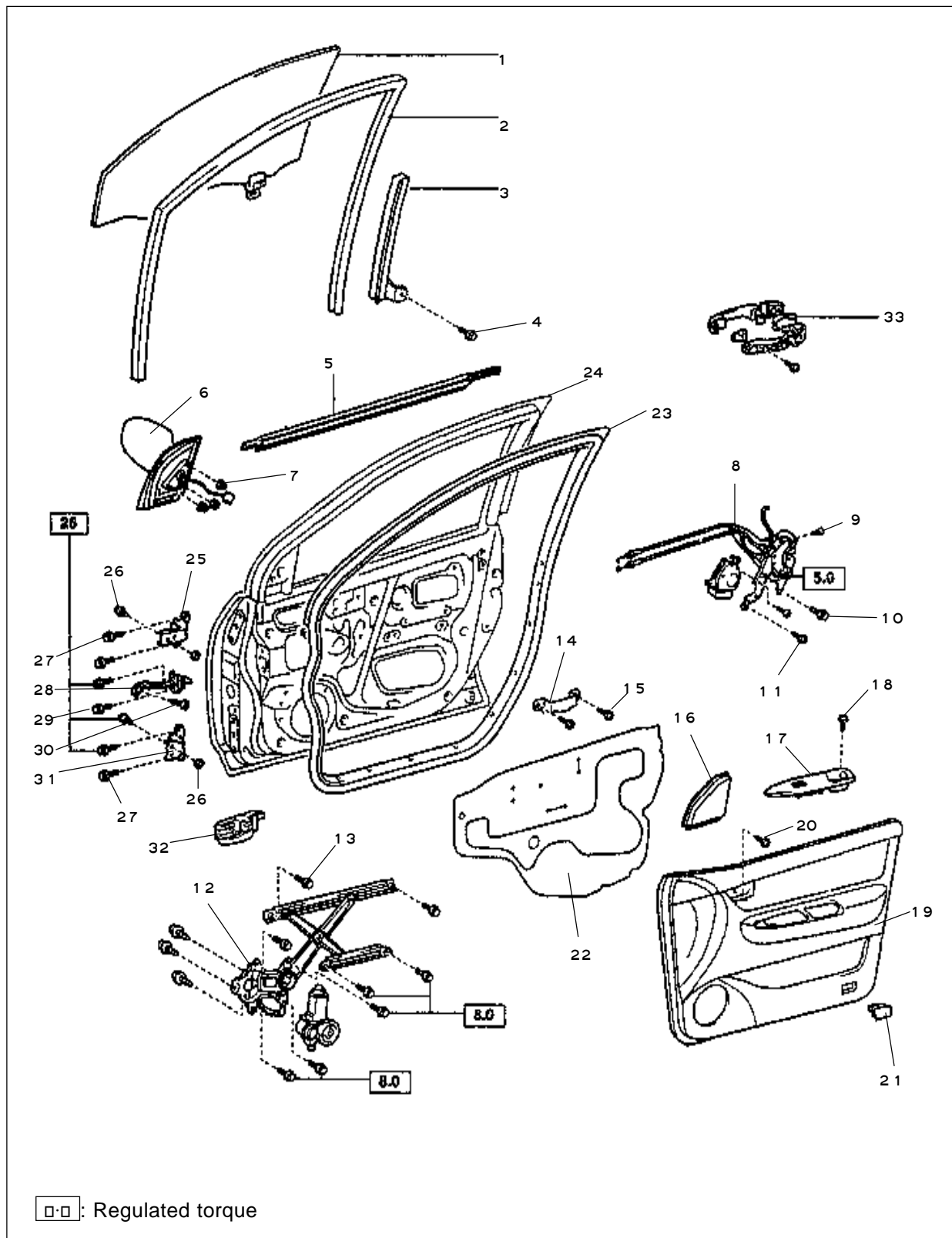
(c) Adjust engine cover assembly by loosening three bolts of engine cover locker.

Torque: 7.0 N·m



Front automobile door

Subassembly



Marked number	Number of parts	Name of parts	Specification	Amount
1	68000147	Right front glass assembly		1
2	68000162	Seal tape of right front glass leading slot		1
3	68000149	Right front glass leading slot assembly		1
4	Q1860610	Hexagon flange face bolt	M6 × 10	1
5	68000159	Exterior seal tape of right front door glass		1
6	67000157	Right exterior electric rearview mirror assembly		1
7	Q32006	Hexagon flange face nut	M 6	3
8	68000153	Right front door locker organization assembly		1
9	Q2580816	Inner hexagon floriated raised countersunk head screw	M6 × 18	3
10	Q1860610	Hexagon flange face bolt	M6 × 10	2
11	JQ2756316	Combination part of hexagon head self-tapping screw with flat gasket	ST6.3 × 16	1
12	67000123	Right front door glass lift assembly		1
13	Q1860610	Hexagon flange face bolt	M6 × 10	6
14	68000145	Right front door board bracket		1
15	Q2716319	Cross slot plate head self-tapping screw	ST6.3 × 19	2
16	67000132	Right front small speaker cover assembly		1
17	68000144	Right front door control panel assembly		1
18	Q2714216	Freerson plate head self-tapping screw	ST4.2 × 16	1
19	68010050	Right front door inner defending board assembly		1
20	Q2204816	Combination part of cross slot plate head self-tapping screw with flat washer	ST4.8 × 16	1
21	67000107	Door light assembly		1
22	68000141	Right front door defender water curtain assembly		1
23	68000160	Right front door seal tape assembly		1
24	62000479	Right front door assembling assembly		1
25	62000025	Right front door upper hinge assembly		1
26	62000024	Hexagon flange face bolt (with step)	M8 × 20	2
27	Q1840820	Hexagon flange face bolt	M8 × 20	4
28	68000163	Front door limiter assembly		2
29	JQ1840816T1F31	Hexagon flange face bolt	M8 × 16	2
30	Q1400616	Combination part of hexagon head bolt with flat washer	M8 × 16	2
31	62000027	Right front door lower hinge assembly		1
32	68010052	Right side door inner handle assembly		2
33	68000151	Right front door exterior handle assembly		1

Overhaul

Hint:

- When assembling, please work by the sequence which is opposite with disassembling sequence; but when it has items that need to pay special attention, it will add special specification.
- Overhaul procedure for right side is same as the left side.
- Please refer to subassembly figure of front door on page 360.

1. Disassemble left front door control panel assembly [68000142]

- (a) Disassemble the screw.
- (b) Use screw driver to disassemble left front door control panel assembly.

Hint: before using screw driver, it is necessary to wrap its needed top with adhesive tape.

- (c) Disassemble the joint.

2. Disassemble left front door inner defending board assembly [68010049]

- (a) Disassemble the screw.
- (b) Without equipping with door control light: use screw driver to disassemble door inner defending board assembly.
- (c) Equipping with door control light: use screw driver to disassemble door inner defending board assembly, then disassemble the joint again.
- (d) Equipping with door control light: use screw driver to disassemble door control light.

3. Disassemble left door inner handle assembly [68010051]

- (a) Disassemble inner handle, and disassemble two pull cables from inner handle.

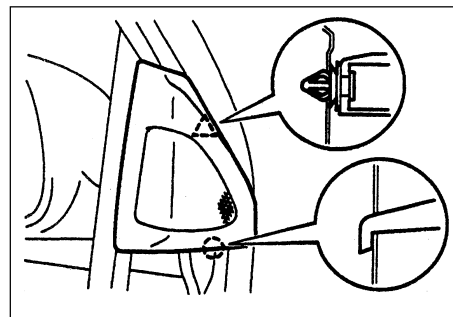
4. Disassemble repairing hole cover of left front door

5. Disassemble left front small loudhail cover assembly [67000131]

6. Disassemble left exterior electric rearview mirror assembly [67000155]

- (a) Disassemble the joint.
- (b) Disassemble three screw caps and left exterior electric rearview mirror.

7. Disassemble exterior seal tape of left front door glass [68000158]



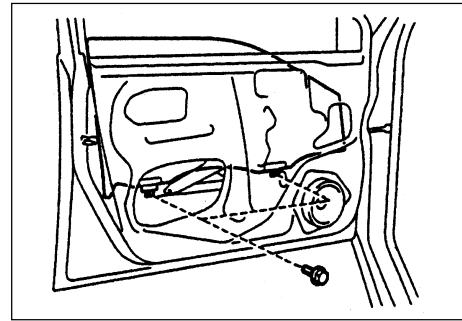
8. Disassemble left front glass assembly [68000146]

Hint: insert the cloth in door steel board to prevent it from scratching the glass.

- (a) Turn the door glass until the bolts happens in repairing hole.
- (b) Disassemble two bolts and door glass.

Note: do not damage the door glass.

Hint: pull the door glass upwards to disassemble it.



9. Disassemble seal tape of left front glass guide slot [68000161]

10. Disassemble left front door glass lift assembly [67000122]

- (a) Disassemble the joint.
- (b) Disassemble six bolts and glass lift.

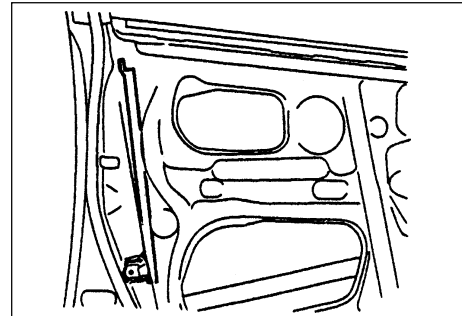
11. Spread lubricating grease on automobile body.

12. Disassemble left front door window glass guide slot assembly [68000148]

Disassemble the screw and door framework rear lower bracket.

13. Disassemble left front door locker organization assembly [68000152]

- (a) Disassemble the joint.
- (b) Disassemble connecting rod from exterior handle.
- (c) Disassemble the bolt and screw.
- (d) Use planetary socket wrench (T30) to disassemble three planetary screws and door locker.
- (e) Disassemble two screws and left front door locker organization driver.

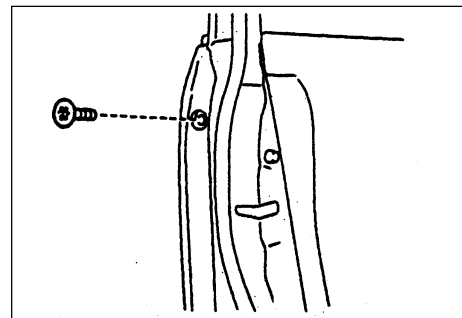


14. Spread lubricating grease on automobile body.

Spread MP lubricating grease on sliding and turning parts of lift assembly.

15. Disassemble left front door exterior handle pedestal.

- (a) Use planetary socket wrench to disassemble the screw and door key tank.
- (b) Disassemble exterior handle from exterior handle pedestal.
- (c) Use planetary socket wrench to disassemble the screw and left front door exterior handle pedestal.



16. Assemble left front door locker organization assembly [68000152]

- (a) Use two screws to assemble left front door locker organization driver.
- (b) Use planetary socket wrench (T30) to assemble three planetary screws and front door locker assembly.

Torque: 5.0 N·m

- (c) Assemble the bolts and screws.
- (d) Connect connecting rod to exterior handle.
- (e) Connect the joint.

17. Assemble left front door glass lift assembly [67000122]

- (a) Use six bolts to assemble left front door glass lift.

Torque: 8.0 N·m

- (b) Assemble electric window lift and door glass.
(c) Connect electric window switch to wiring harness and turn ignition switch to ON.
(d) Operate UP and DOWN several times by hand repeatedly.
(e) Check whether the AUTO UP→AUTO DOWN of automatic operation is normal.

Hint:

- When it is set up again, anti-clamping protection function does not work.
- After implementing AUTO UP operation to close window completely, if automobile window could not be operated downwards, it is necessary to set up the lift again.

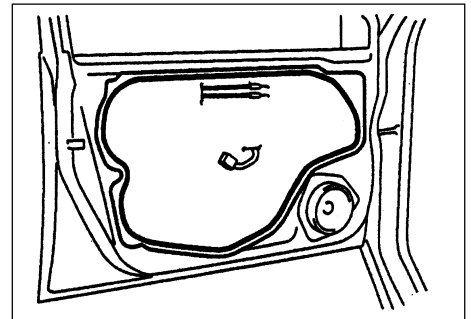
- (f) Check the function of electric window.

18. Check the function of electric window

19. Assemble repairing hole cover of left front door

Hint:

- When assembling repairing hole cover, pull out connecting rod and joint from repairing hole cover.
- After assembling repairing hole cover, connecting rod and joint could not be bent or concaved.
- After assembling repairing hole cover, it is necessary to confirm the affixing situation of adhesive tape.

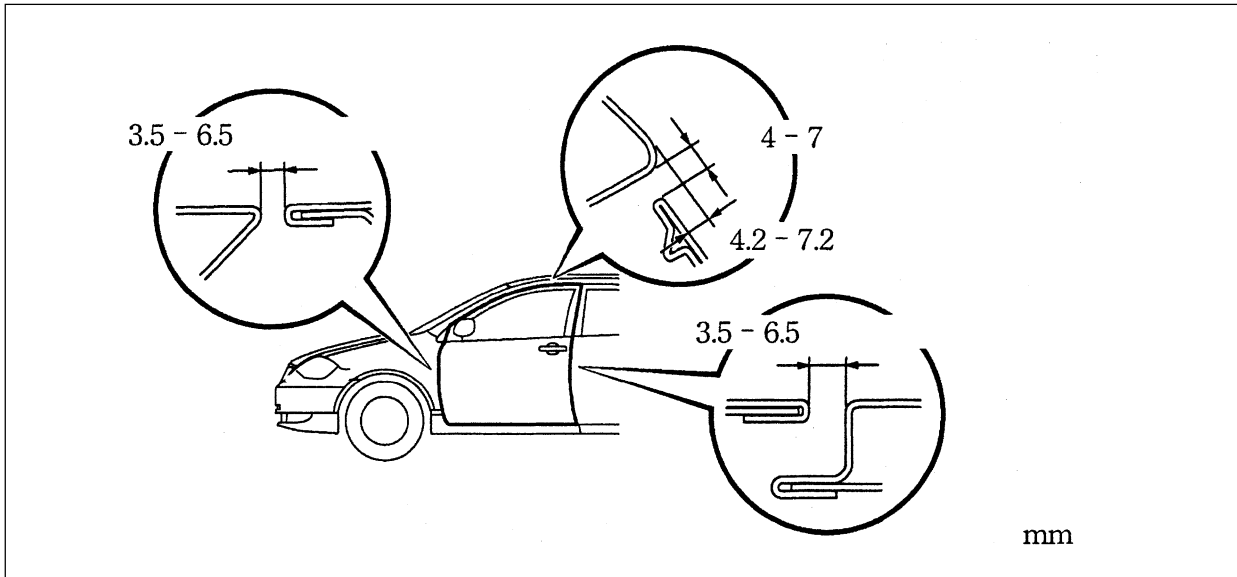


Adjustment

Hint: the working procedure for right side is same as left side.

1. Check the clearance of left front door

(a) Check whether following data is in standard value.



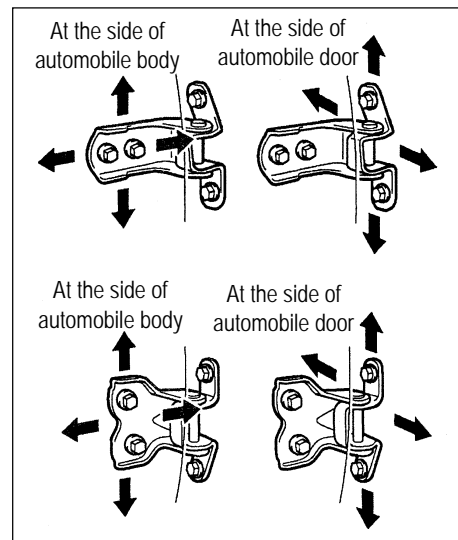
2. Adjust the clearance of left front door.

(a) Use special tool to loosen hinge bolt at the side of automobile body to adjust the door.

Torque: 26 N·m

(b) Loosen hinge bolt at the side of automobile body to adjust the door.

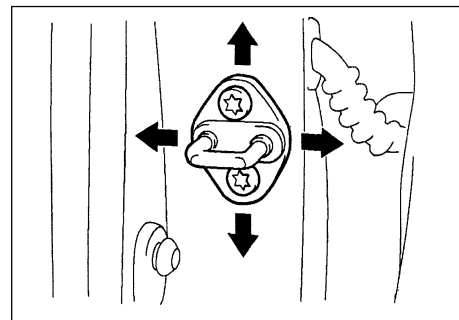
Torque: 26 N·m



(c) Loosen lightly fixing screw of locking pedestal and use plastic hammer to knock lightly locking pedestal to adjust its position.

(d) Lock fixing screw of locking pedestal again.

Torque: 23 N·m



Rear automobile door

Overhaul

Hint:

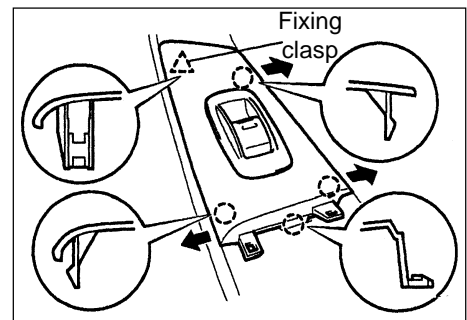
- When assembling, please work by the sequence which is opposite with disassembling sequence; if necessary, it will have assembling instruction..
- Overhaul procedure for right side is same as the left side.

1. Disassemble left rear door control panel assembly [68000176]

Use screw driver to disassemble left rear door control panel assembly.

2. Disassemble left rear door inner trim board assembly [68010057]

- Disassemble three screws.
- Disconnect the fixing clamp, then pull inner trim board upwards to disassemble it.



3. Disassemble left door inner handle assembly [68010051]

Disassemble inner handle and two pull cables from inner handle.

4. Disassemble left rear door repairing hole cover.

Disassemble repairing hole cover.

5. Disassemble exterior seal tape of left rear door glass [68000196]

6. Disassemble seal tape of left rear glass guide slot [68000199]

- Disassemble seal tape of left rear glass guide slot.

7. Disassemble left rear door window glass guide slot assembly [68000187]

Disassemble two bolts and comparting pillar of rear window.

8. Disassemble left rear door triangle glass [68000181]

- Disassemble left rear door triangle glass.

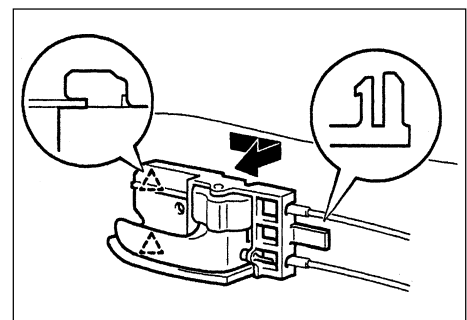
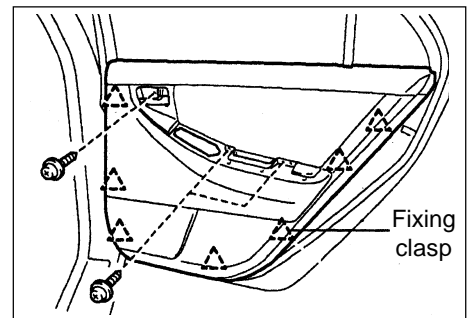
Note: do not damage the glass.

- Disassemble corner window waterproof rubber from the glass.

9. Disassemble left rear glass assembly [68000179]

Hint: insert the cloth in the door steel board to prevent the glass from scratching.

- Drop the door glass.
- Incline door glass and disassemble the roller pole of lift from glass leading slot to disassemble door glass.



10. Disassemble left rear door lift assembly [67000124]

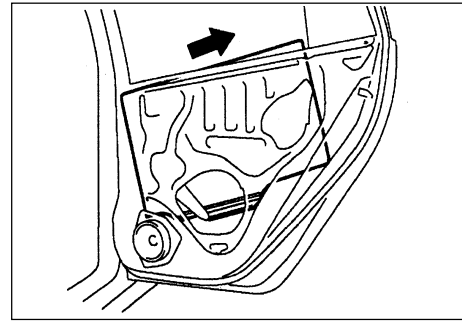
- Disassemble the joint.
- Disassemble four bolts and window lift.

11. Spread lubricating grease on automobile body.

Spread MP lubricating grease on sliding and turning parts of door locker.

12. Disassemble left rear door exterior handle pedestal.

- Use planetary socket wrench to disassemble the screw and left rear door exterior handle cover.
- Disassemble exterior handle.
- Use planetary socket wrench to disassemble the screw and left rear door exterior handle pedestal.



13. Assemble left rear door locker organization assembly [68000191]

- Assemble left rear door locker organization driver and two screws.
- Use planetary socket wrench to assemble left rear door locker organization assembly and three screws.

Torque: 5.0 N·m

- Assemble the bolt.
- Connect the joint.

14. Assemble left rear door glass lift assembly [67000124]

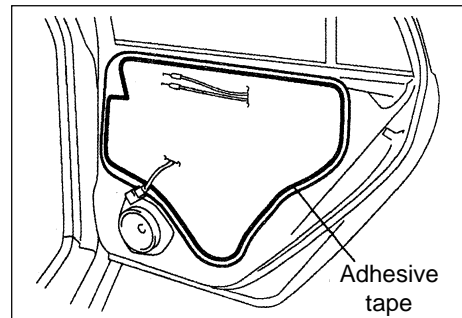
Torque: 5.5 N·m

15. Assemble left rear door repairing hole cover.

- Assemble repairing hole cover on door steel board.

Hint:

- When assembling repairing hole cover, pull out connecting rod and joint from repairing hole cover.
- After assembling repairing hole cover, connecting rod and joint could not be bent or concaved.
- After assembling repairing hole cover, it is necessary to confirm the affixing situation of adhesive tape.



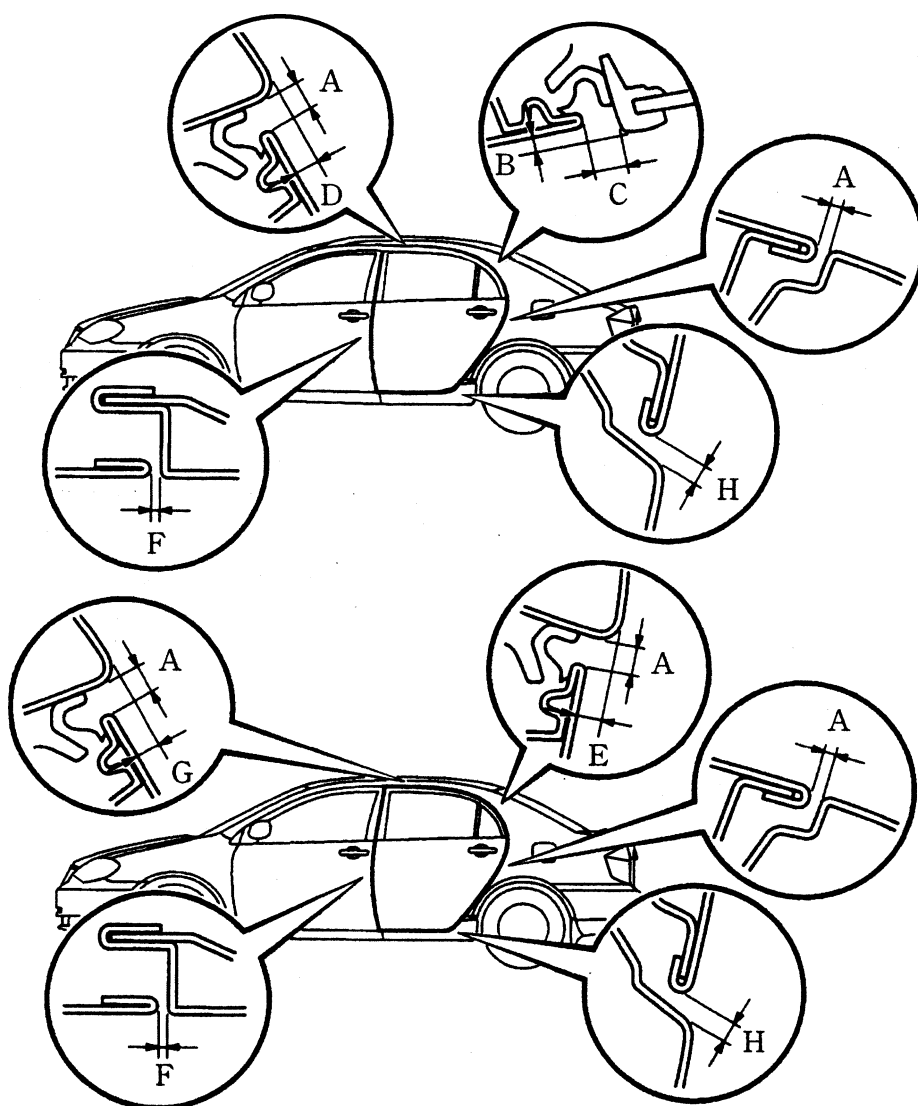
Adjustment

Hint: working procedure for right side is same as the left side.

1. Check the clearance of left rear door.

(a) Check whether following data is in standard value.

- A: 4-7mm
- B: 3.1mm
- C: 5-8mm
- D: 5.7mm
- E: 4.4-7.4mm
- F: 3.5-6.5mm
- G: 4.2-7.2mm
- H: 5.5-8.5mm



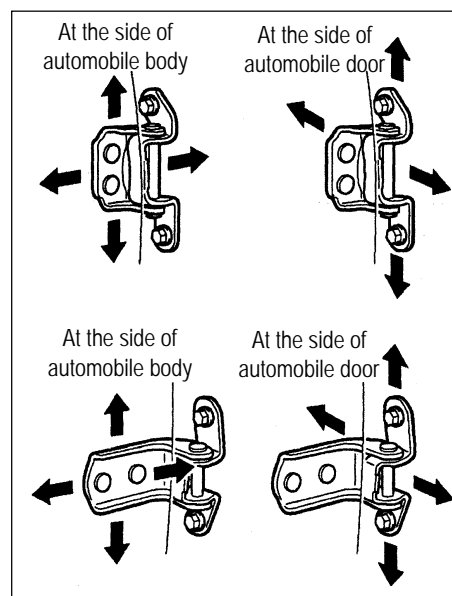
2. Adjust the clearance of left rear door.

- (a) Loosen hinge screw cap at the side of automobile body to adjust the door.

Torque: 26 N·m

- (b) Loosen hinge screw cap at the side of automobile door to adjust the door.

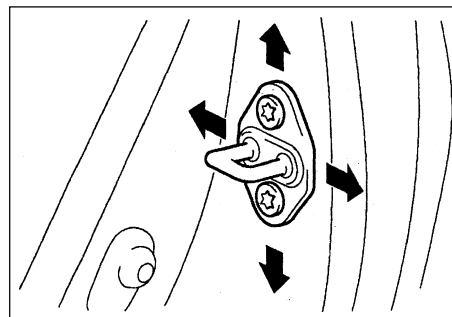
Torque: 26 N·m



- (c) Loosen lightly fixing screw of locker pedestal, and use plastic hammer to knock lightly the locker pedestal to adjust its position.

- (d) Lock the fixing screw of locker pedestal again.

Torque: 23 N·m

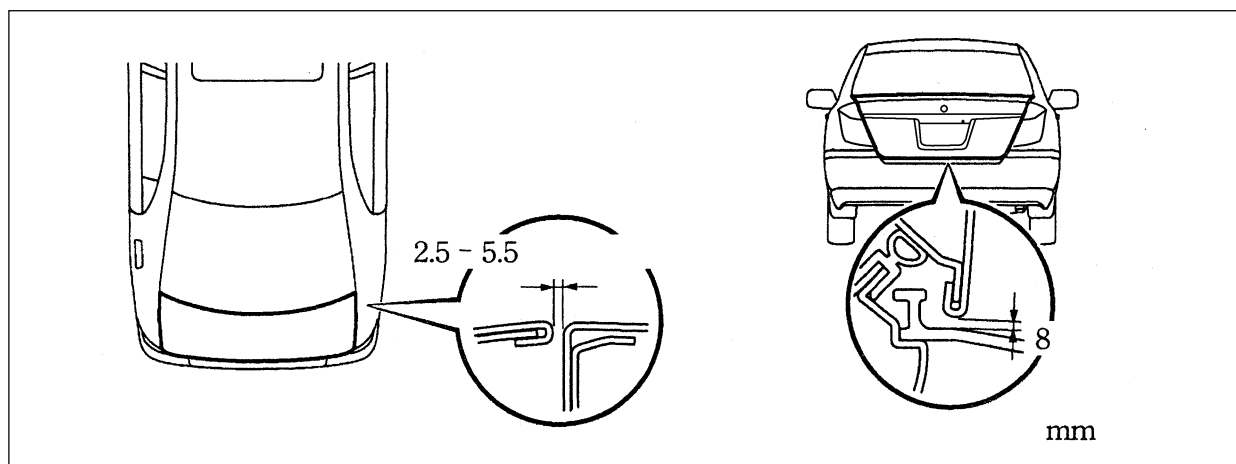


Trunk cover

Adjustment

1. Check the clearance of trunk cover.

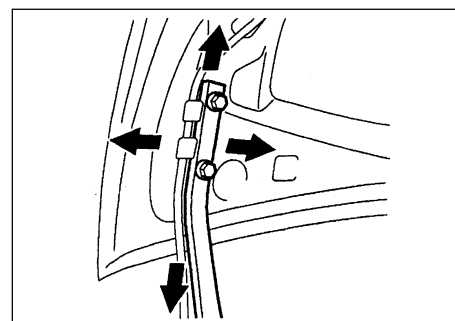
- (a) Check whether following data is in standard value.



2. Adjust the clearance of trunk cover.

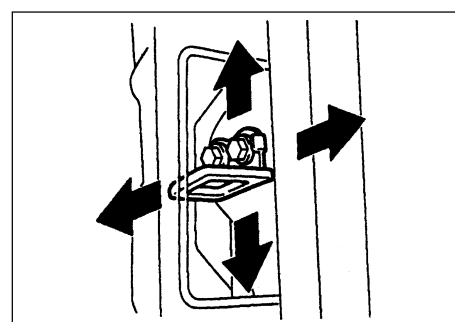
- (a) If you want to make front and rear, left and right adjustment, please loosen the bolt at first.
- (b) If the front end of trunk cover needs to adjust vertically, please increase or decrease the number of washers between hinge and trunk cover.

Torque: 7.0 N·m



- (c) Use the hammer and copper stick to knock lightly the locker pedestal to adjust.

Torque: 5.5 N·m



Torsion spring of trunk cover

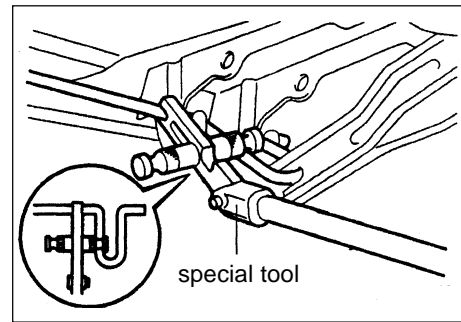
Change

Hint:

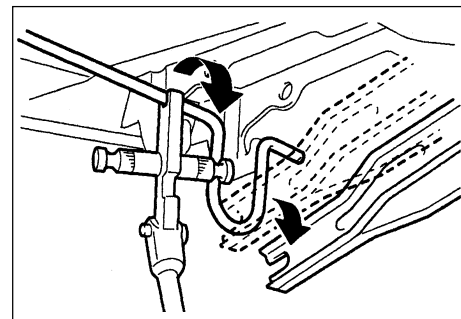
- When assembling, please work by the sequence which is opposite with disassembling sequence; if necessary, it will have assembling instruction.
- Changing procedure for right side is same as the left side.
- For torsion spring is disassembled, trunk cover does not have any tension, at this time, when opening and closing trunk cover, it is necessary to support it with hand to prevent trunk cover from closing for other resistances.
- Torsion spring I of trunk cover locates the upper end, and Torsion spring II of trunk cover locates the lower end, so it is necessary to work from left side to right side when assembling; but it is necessary to work by opposite sequence when disassembling.

1. Disassemble torsion spring of trunk cover [68000100]

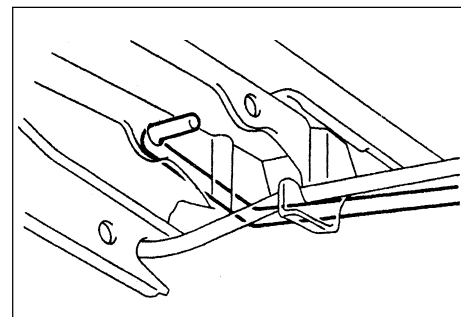
- (a) Disassemble torsion spring I from middle bracket.
- (b) Assemble special tool at the side of hinge.



- (c) Push the special tool downwards, then pull trunk cover hinge upwards from torsion spring I.
- (d) Raise the special tool slowly, then use the special tool to disassemble torsion spring I from the bracket.



- (e) Disassemble torsion spring I from the bracket.
- (f) Implement the work at the other side with same method.



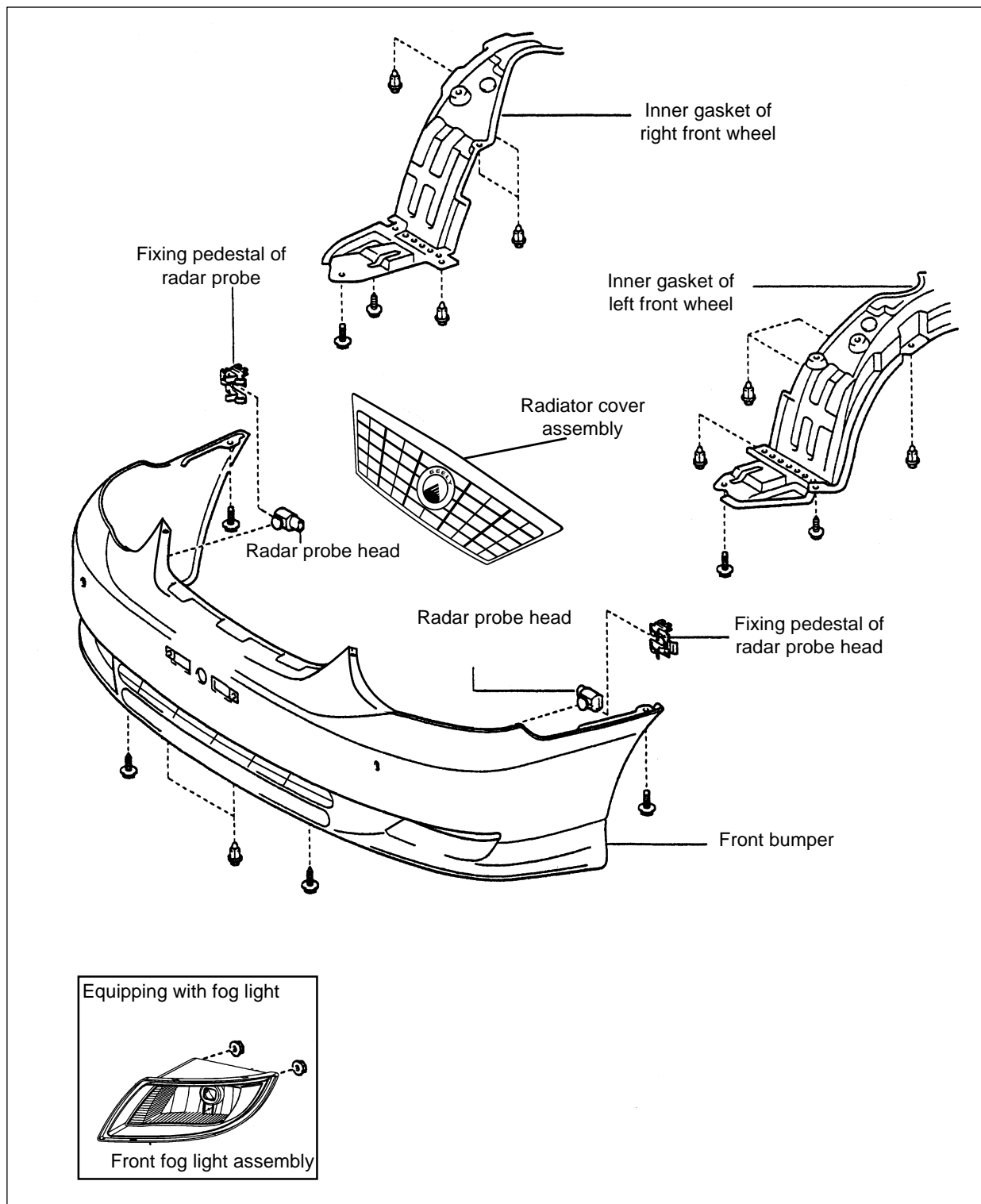
2. Assemble torsion spring I of trunk cover [68000100]

- (a) When assembling torsion spring I, it is necessary to assemble it on fixing clamp stably.

Exterior/inner trim board

Front bumper

Subassembly



Change

Hint:

- When assembling, please work by the sequence which is opposite with disassembling sequence; if necessary, it will have assembling instruction.
- Please refer to subassembly figure of front bumper on page 379.

1. Disassemble radiator cover assembly [68000094]

- (a) Disassemble the bolt and radiator cover assembly.

2. Disassemble inner gasket of left front wheel [68000225]

- (a) Use disassembling tool for fixing clamp to disassemble two fixing clamps.
(b) Disassemble the screw and a part of inner gasket of left front wheel.

Hint: Disassemble the fixing clamp of screw and inner gasket of left front wheel in the scope of front bumper which could be disassembled.

3. Disassemble inner gasket of right front wheel [68000228]

4. Disassemble front bumper [68000005]

- (a) Disassemble four screws and two fixing clamps.
(b) Disassemble fixing clasp and front bumper.
(c) Equipping with fog light: disassemble two joints of fog light.
(d) Equipping with radar probe head: disassemble two radar probe heads (luxury type).

5. Disassemble reversing radar probe head assembly.

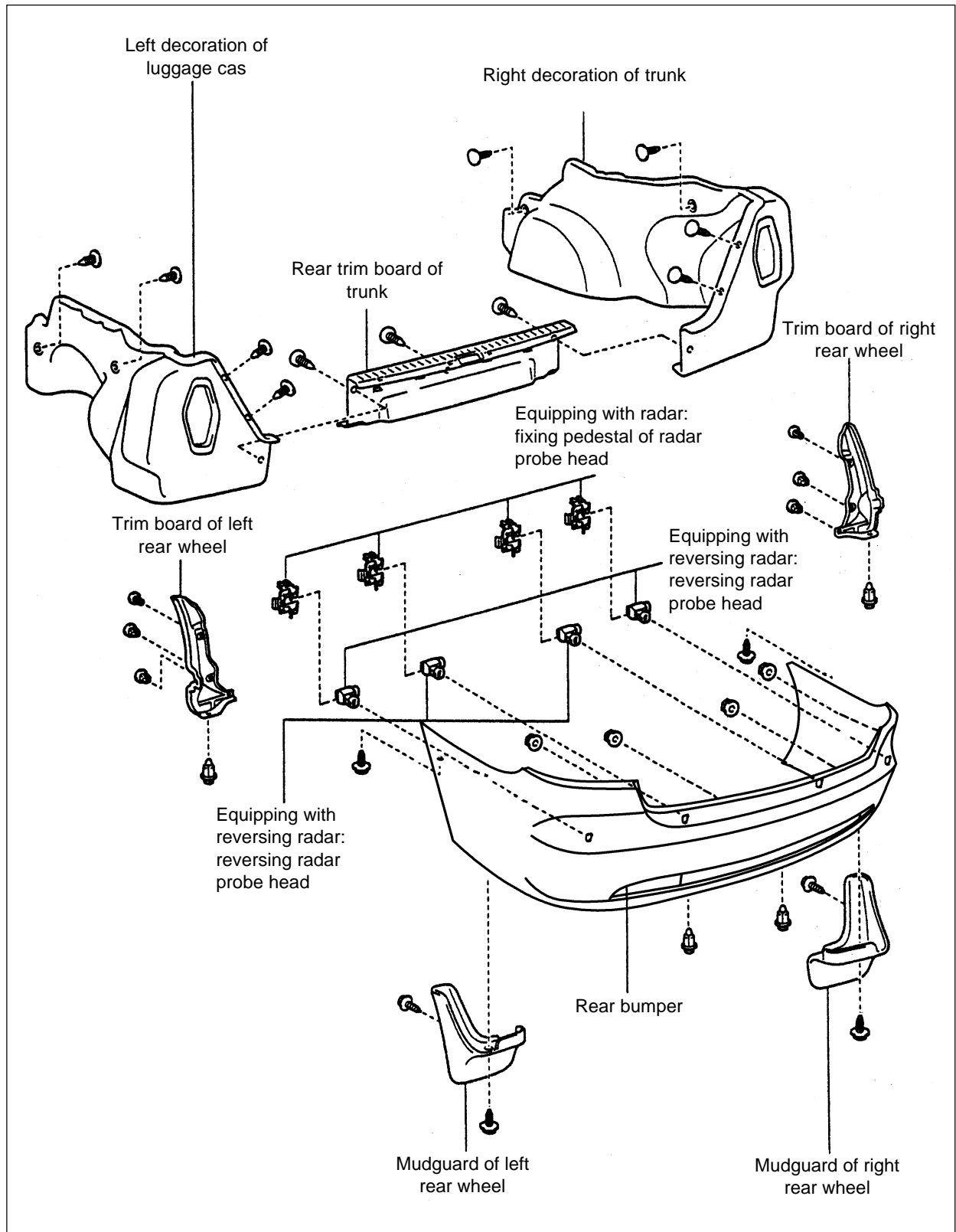
- (a) Disassemble two fixing pedestals of radar probe head and two radar probe heads.

6. Disassemble left front fog light assembly [67000098]

- (a) Disassemble fixing clasp and left front fog light assembly.

7. Disassemble right front fog light assembly [67000099]

Rear bumper Subassembly



Change

Hint:

- When assembling, please work by the sequence which is opposite with disassembling sequence; if necessary, it will have assembling instruction.
- Please refer to subassembly figure of rear bumper on page 381.

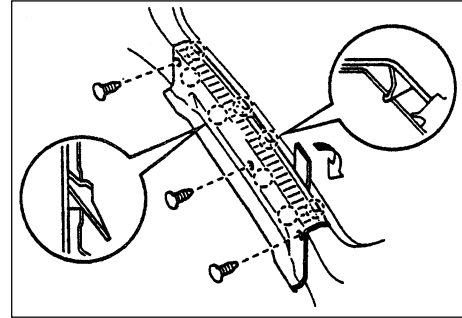
1. Disassemble trunk carpet assembly [68000114]

2. Disassemble rear trim board of trunk [68000118]

- Use two fixing clasps.
- Use disassembling tool for trim tape to disassemble rear trim board of trunk.

3. Disassemble left decoration of trunk [68000112]

- Use disassembling tool for fixing clamp to disassemble fixing clamp and a part of left decoration of trunk.



Hint:

Disassemble the fixing clasp and left decoration of trunk in the scope of screw cap used for fixing rear bumper and trunk which could be disassembled.

4. Disassemble right decoration of trunk [68000113]

5. Disassemble mudguard of left rear wheel [68000223]

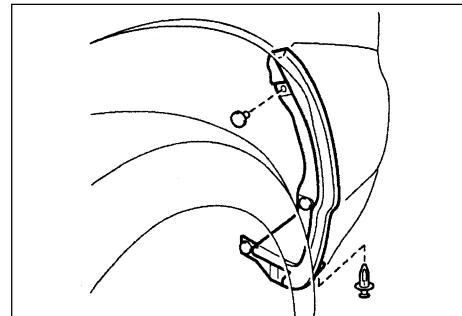
- Disassemble two screws and mudguard of left rear wheel.

6. Disassemble mudguard of right rear wheel [68000224]

7. Disassemble trim board of left rear wheel [68000230]

- Use screw driver to disassemble fixing clasp from rear bumper.
- Use disassembling tool for fixing clasp to disassemble fixing clasp.
- Disassemble trim board of left rear wheel.

Hint: Disassemble trim board of left rear wheel in the scope of screw used for fixing rear bumper which could be disassembled.



8. Disassemble trim board of right rear wheel [68000231]

9. Disassemble rear bumper [68000012]

- Use screw driver to disassemble two fixing clasps.
- Disassemble four screw caps and two screws.
- Disassemble fixing clasp and rear bumper.
- Equipping with radar probe head: disassemble four joints of radar probe head.

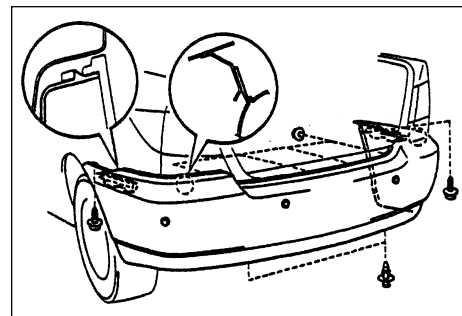
10. Disassemble reversing radar probe head assembly.

- Disassemble fixing pedestal of radar probe and radar probe.

11. Disassemble left rear fog light assembly [67000100]

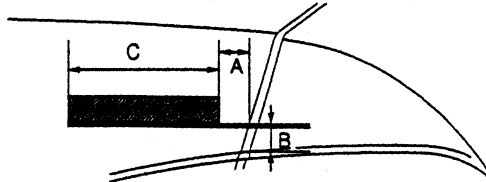
- Disassemble fixing nut and left rear fog light assembly.

12. Disassemble right rear fog light assembly [67000101]

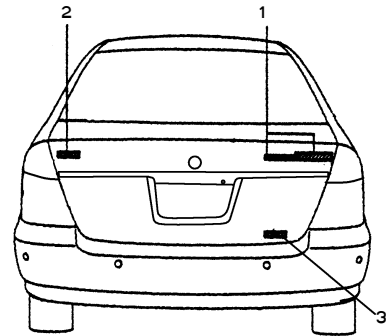


Nameplate Change

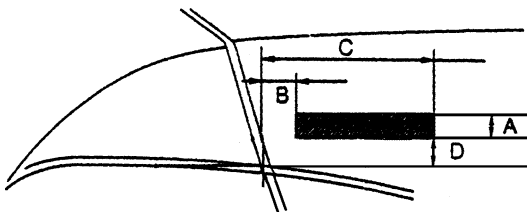
1. No.2 nameplate of trunk cover



A:70mm
B:22mm
C:88mm



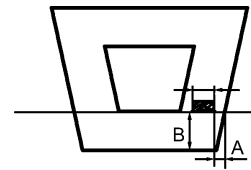
2. No.3 nameplate of trunk cover



C h i n a -
Geely

A:70mm
B:50mm
C:210mm
D:22mm

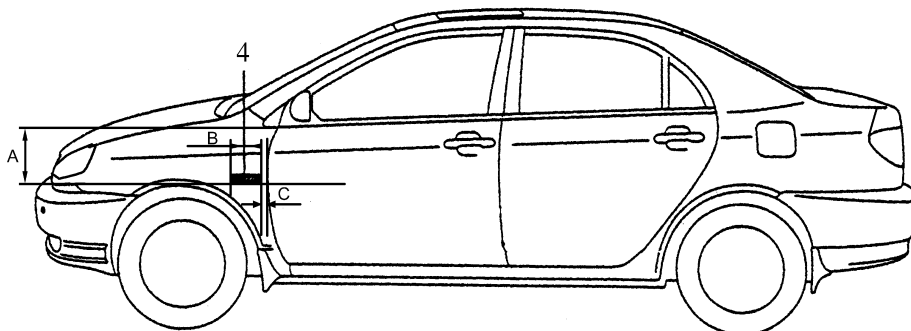
3. No.6 nameplate of trunk cover



A:70mm
B:60mm

ABS+EBD

4. Nameplate of front wing board



1.8CVVT

A:128mm
B:130mm
C:20mm

Exterior seal tape of left front door glass (LH)

Change

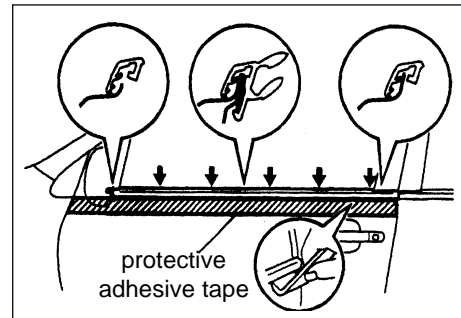
Hint:

- When assembling, please work by the sequence which is opposite with disassembling sequence; if necessary, it will have assembling instruction.
- Changing procedure for right side is same as left side.

1. Disassemble exterior seal tape of left front door glass [68000158]

- (a) Affix protective adhesive tape to the lower part of exterior seal tape of left front door glass.
- (b) Use disassembling tool or scraper for trim tape to disassemble exterior seal tape of left front door glass.

Hint: before using scraper, the needled top of scraper should be twisted with adhesive tape.



Exterior seal tape of left rear door glass

Change

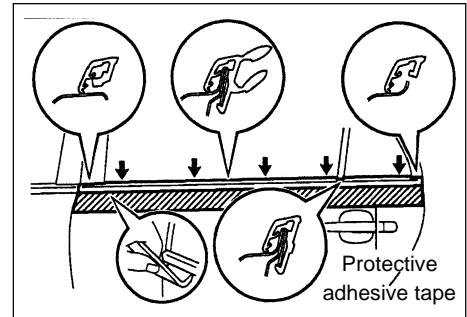
Hint:

- When assembling, please work by the sequence which is opposite with disassembling sequence; if necessary, it will have assembling instruction.
- Changing procedure for right side is same as left side.

1. Disassemble exterior seal tape of left rear door glass [68000196]

- (a) Affix protective adhesive tape to the lower part of exterior seal tape of left rear door glass.
- (b) Use disassembling tool or scraper for trim tape to disassemble exterior seal tape of left rear door glass.

Hint: before using scraper, the needled top of scraper should be twisted with adhesive tape.



Light fender

Change

1. Disassemble locker core and pedestal of trunk.

2. Disassemble number plate light defender [68000107]

Disassemble four screw caps, then disassemble the defender.

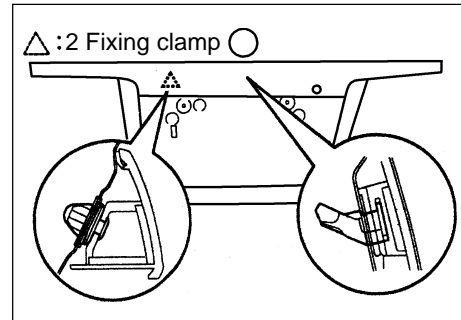
3. Assemble rear logo assembly [61000019]

(a) Use white gasoline to clean the assembling surface of logo.

(b) Use heating light to heat defender and logo.

(c) Assemble the logo.

Note:do not heat logo excessively



Top left trim tape

Change

Hint:

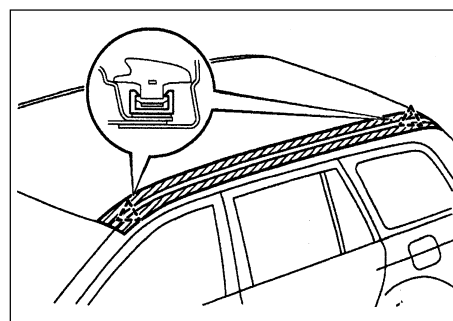
- When assembling, please work by the sequence which is opposite with disassembling sequence; if necessary, it will have assembling instruction.
- Changing procedure for right side is same as left side.

1. Disassemble top left trim tape [68000128]

- Use protective adhesive tape to affix around the trimtape.
- Use disassembling tool for trim tape to release the front and rear fixing clamp of trim tape, then disassemble top left trim tape.

Note:

- Do not disassemble fixing clamp.
- If fixing clamp is damaged when disassembling, change it with new one.



2. Assemble top left trim tape [68000128]

Note: when only changing fixing clamp.

- Disassemble adhesive tape remaining on the surface of body affixed trim tape, then use white gasoline to clean the surface.
- Use heating light to heat the assembling surface of fixing clamp and automobile body.

Automobile body: 40-60°C.

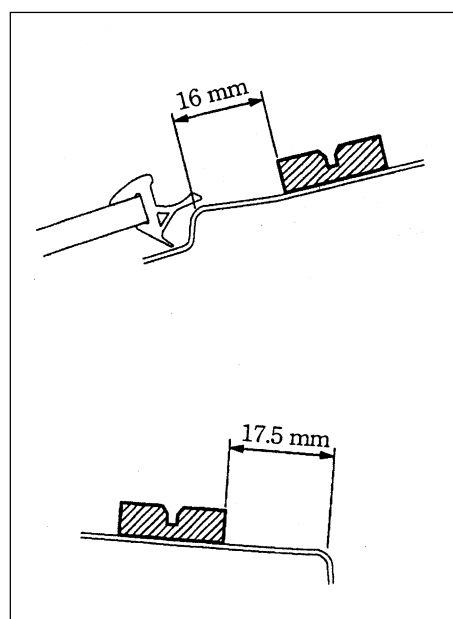
Trimtape: 20-30°C.

Note: do not heat the trim tape and body too much.

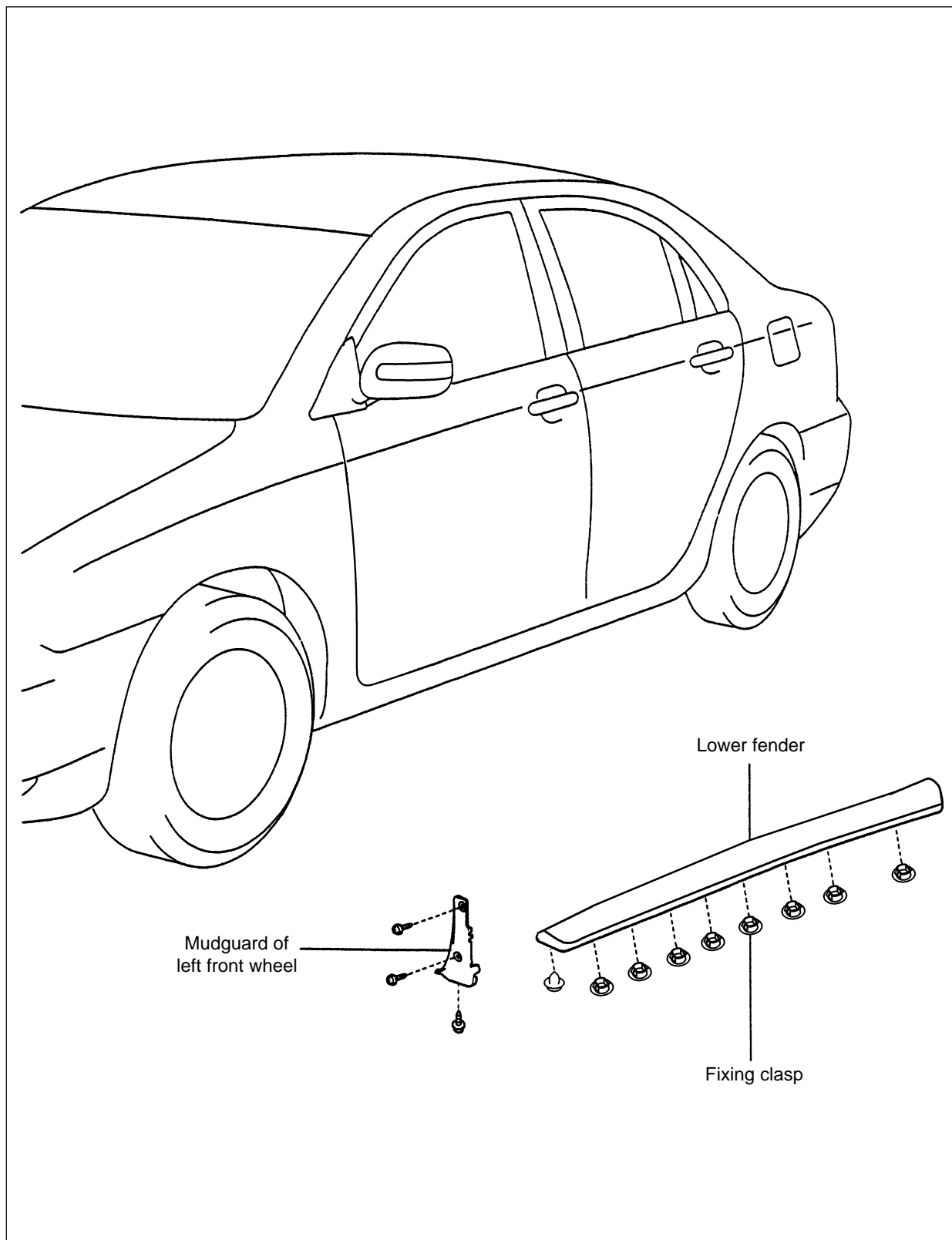
- Put the fixing clamp on the position shown in figure, then press it into position with hand.
- After pressing the fixing clamp into position for over 30 minutes, then assemble top left trimtape.

Hint:

- Surface induration time: 30 minutes.
- Complete induration time: 24 hours.



Left lower fender of automobile body (LH) Subassembly



Change

Hint:

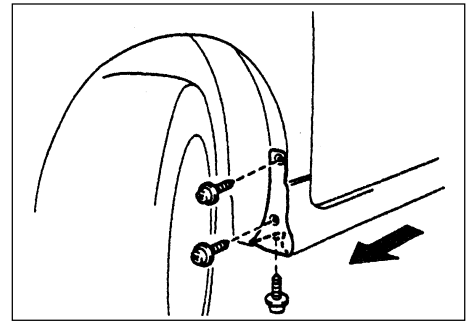
When assembling, please work by the sequence which is opposite with disassembling sequence; if necessary, it will have assembling instruction..

Changing procedure for right side is same as the left side.

Please refer to the subassembly figure of body left lower fender on page 388.

1. Disassemble mudguard of left front wheel [68000221]

(a) Disassemble three screws and mudguard of left front wheel.

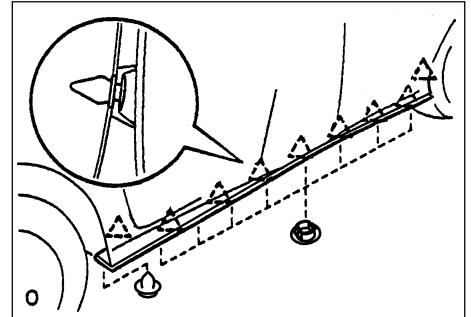


2. Disassemble body left lower fender [68000049]

(a) Use disassembling tool for fixing clamp to disassemble eight fixing clamps.

(b) Disassemble the screw.

(c) Use disassembling tool for trim tape to disassemble body left lower fender.



Inner trim board of top

Change

Hint:

- When assembling, please work by the sequence which is opposite with disassembling sequence; if necessary, it will have assembling instruction.
- Changing procedure for right side is same as the left side.

1. Disassemble trim board of right front door pedal [68010021]

- (a) Use screw driver to disassemble trim board of right front door pedal.

Hint: before using screw driver, its needed top should be twisted by adhesive tape.

- (b) Use same method to disassemble the trim board at the other side.

2. Disassemble stop trim board of left front door [68010020]

3. Disassemble stop trim board of right rear door [68010024]

- (a) Use screw driver to disassemble trim board of right rear door pedal.

Hint: before using screw driver, its needed top should be twisted by adhesive tape.

- (b) Use same method to disassemble the trim board at the other side.

4. Disassemble trim board of left rear door pedal [68010022]

5. Disassemble lower inner trim board at the front of right fender [68010016]

- (a) Disassemble fixing clamp.

- (b) Use screw driver to disassemble right trim board.

Hint: before using screw driver, its needed top should be twisted by adhesive tape.

- (C) Use same method to disassemble the trim board at the other side.

6. Disassemble lower inner trim board at the front of left fender [68010015]

7. Disassemble inner fender assembly of right front door [68010050]

8. Disassemble inner fender assembly of left front door [68010049]

9. Disassemble inner trim board assembly of right rear door [68010058]

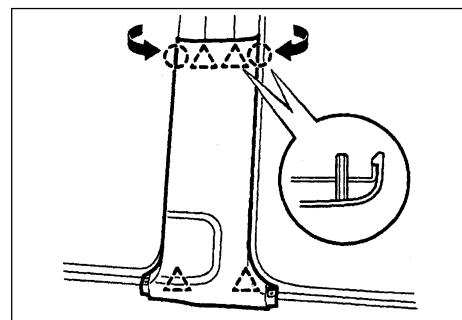
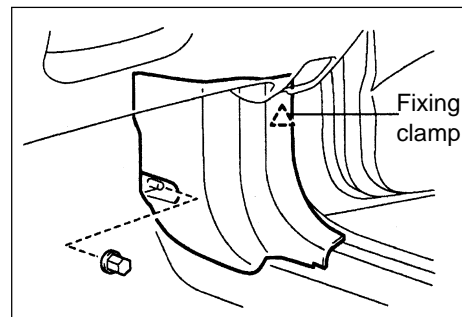
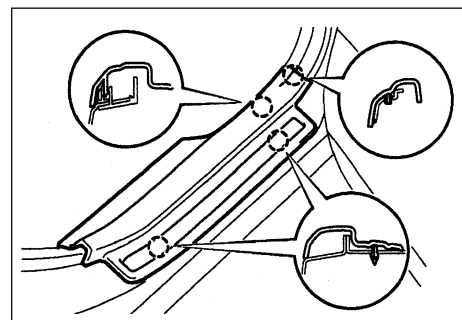
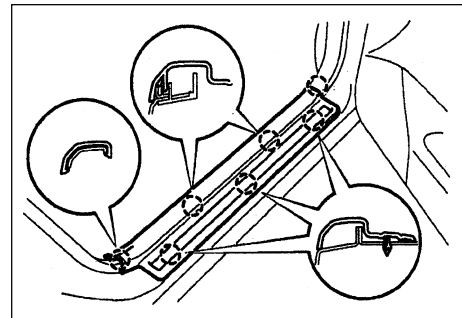
10. Disassemble inner trim board assembly of left rear door [68010057]

11. Disassemble lower inner trim board assembly

- (a) Pull out lower inner trim board assembly of right stand pole to disassemble it.

- (b) Use same method to disassemble the trim board at the other side.

12. Disassemble lower inner trim board assembly of



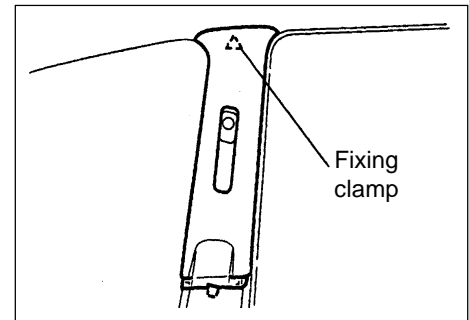
left pillar [68010018]

13. Disassemble upper inner trim board assembly of right pillar [68010025]

- (a) Disassemble the bolt and upper fixing bolt trim cover of front safety belt.
- (b) Use screw driver to disassemble upper inner trim board of right stand pole.

Hint: before using screw driver, its needed top should be twisted by adhesive tape.

- (C) Use same method to disassemble the trim board at the other side.



14. Disassemble upper inner trim board assembly of left pillar [68010023]

15. Disassemble rear row chair cushion (referring to page 352).

16. Disassemble rear row chair backrest (fixing type) (referring to page 354).

17. Disassemble rear row chair right backrest assembly (referring to page 352).

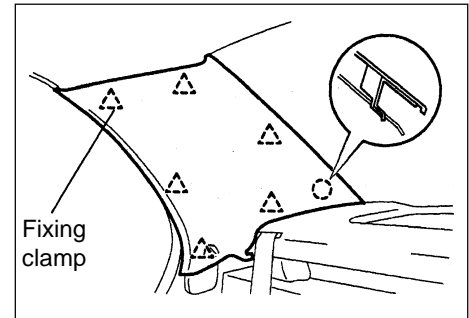
18. Disassemble rear row chair left backrest assembly (referring to page 352).

19. Disassemble inner trim board of right rear pillar assembly [68010027]

- (a) Use screw driver to disassemble inner trim board of right rear pillar assembly.

Hint: before using screw driver, its needed top should be twisted by adhesive tape.

- (b) Use same method to disassemble the trim board at the other side.



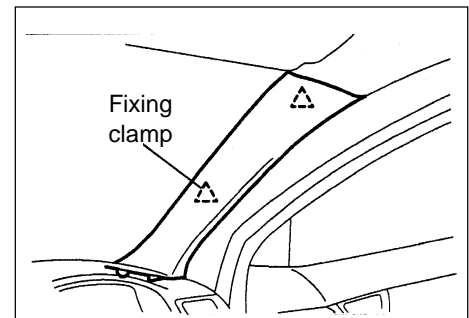
20. Disassemble inner trim board of left rear pillar assembly [68010026]

21. Disassemble inner trim board of right front pillar assembly [68010017]

- (a) Use screw driver to disassemble inner trim board of right front pillar assembly.

Hint: before using screw driver, its needed top should be twisted by adhesive tape.

- (b) Use same method to disassemble the trim board at the other side.



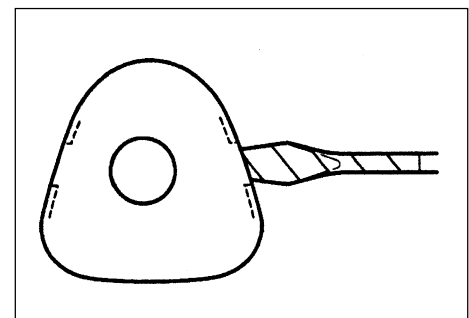
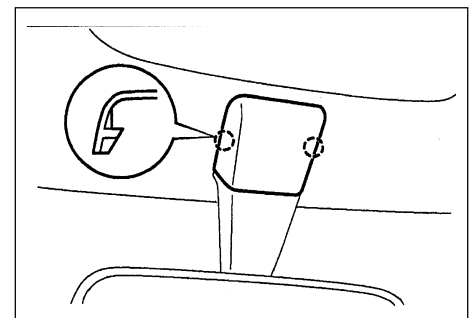
22. Disassemble inner trim board of left front pillar assembly [68010014]

23. Disassemble inner rear view mirror assembly [67010013]

- (a) Use screw driver to disassemble trim cover of inner rearview mirror pedestal.

Hint: before using screw driver, its needed top should be twisted by adhesive tape.

- (b) Disassemble two screws and inner rearview mirror assembly.



24. Disassemble right sun shade assembly [68010085]

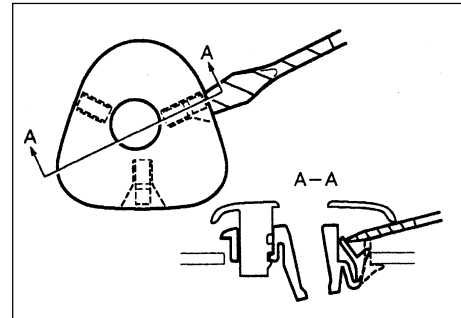
- (a) Liking that shown in figure, use screw driver to unclench the trim cover of fixing pedestal, then pull down the trim cover.

Hint: before using screw driver, its needed top should be twisted by adhesive tape.

- (b) Liking that shown in figure, use screw driver to release fixing claw and disassemble sun shade.

Hint: before using screw driver, its needed top should be twisted by adhesive tape.

- (c) Use same method to disassemble the trim board at the other side.

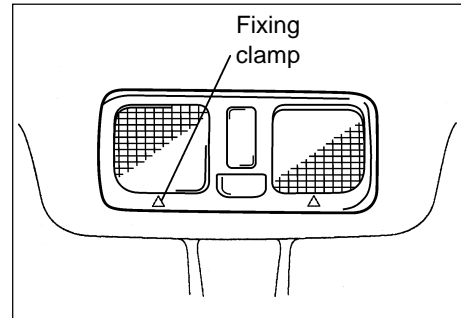


25. Disassemble left sun shade assembly [68010084]

26. Disassemble indoor front top light assembly [67010005]

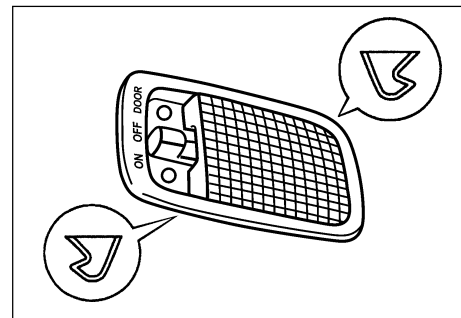
Use screw driver to disassemble front top light cover, and disassemble fixing screw with cross wrench, then disconnect the joint.

Hint: before using screw driver, its needed top should be twisted by adhesive tape.



27. Disassemble indoor rear top light assembly [67010006]

- (a) Disassemble two screws and indoor light, then disconnect the joint.

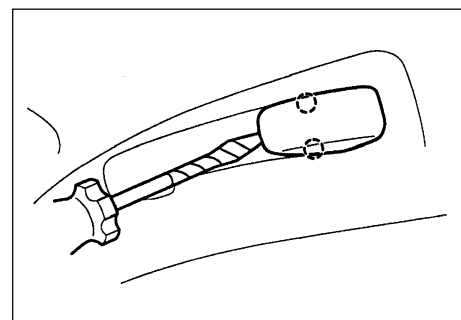


28. Disassemble passenger hand rail [68010088]

- (a) Use screw driver to disassemble trim cover of handrail.

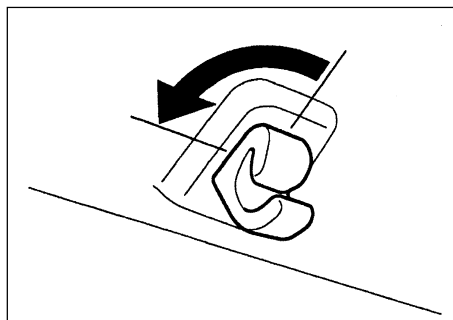
Hint: before using screw driver, its needed top should be twisted by adhesive tape.

- (b) Disassemble two screws and passenger handrail.



29. Disassemble the pothook of sun shade [68010086]

Turn the pothook of sun shade to left for 90°, then disassemble it.



30. Disassemble fixing pedestal of rear window sun blind.

Use screw driver to turn the fixing pedestal of sun blind for 90°, then disassemble it.

31. Disassemble trim tape of top sunroof [67010010]

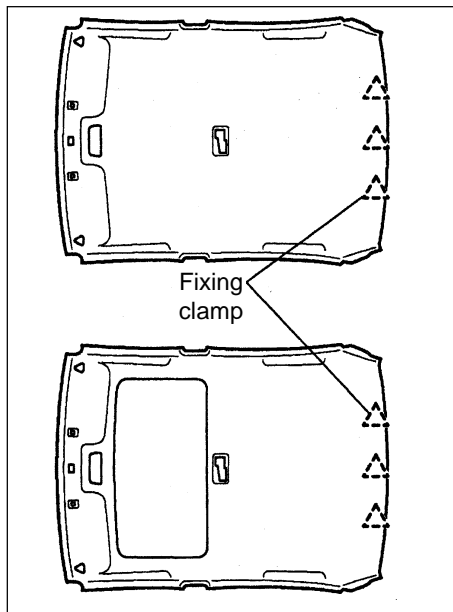
32. Disassemble inner trim board of top [68010035]

(a) Use screw driver to disassemble inner trim board of top.

Hint: before using screw driver, its needed top should be twisted by adhesive tape.

(b) Disassemble three fixing clamps and inner trim board of top.

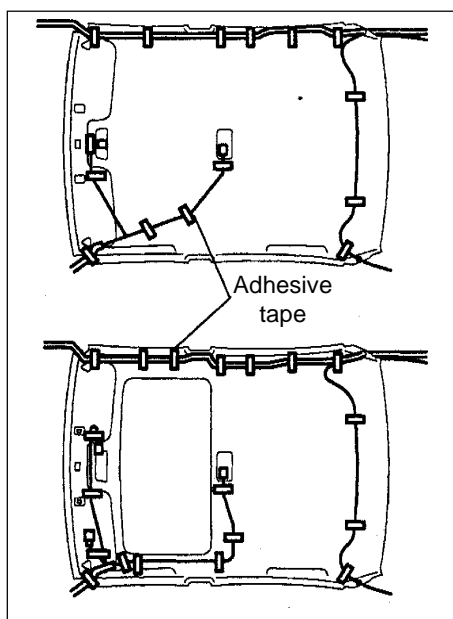
(c) Take out inner trim board of top from rear door.



33. Assemble inner trim board of top [68010035]

(a) Liking that shown in figure, align the mark, then fix the wiring harness of top with adhesive tape.

(b) Use three fixing clamps to assemble inner trim board of top.



34. Assemble the pothook of sun shade [68010086]

Turn the pothook of sun shade to make fixing claw protrude, then assemble sun shade.

35. Assemble rear row chair left backrest assembly [68010078]

36. Assemble rear row chair right backrest assembly [68010079]

37. Assemble rear row chair backrest assembly [68010076]

Automobile control system

Ignition switch and anti-versa lock key warning switch

Malfunction phenomenon table

Phenomenon	Possible malfunction part	Reference page
Ignition switch could not insert on any position	1. Ignition switch 2. Circuit of power supply	394 -

Inspection

1. Check the ignition switch.

Check the conduction of ignition switch joint and terminal

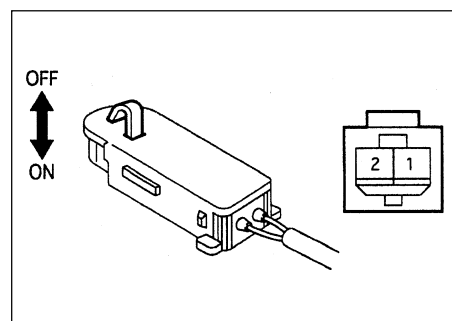
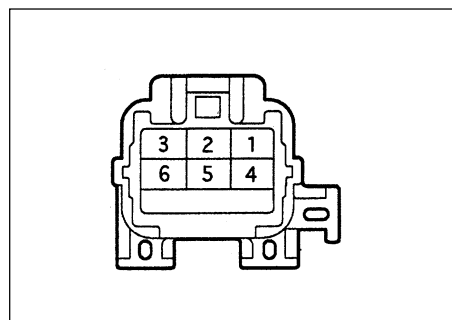
Position of switch	Terminal connected by avometer	Regulated situation
LOCK	-	Not conduction
ACC	1-3	Conduction
ON	1-2-3, 5-6	Conduction
START	1-2, 4-5-6	Conduction

If the conduction does not accord with the regulation, change the switch.

2. Check the anti-versa lock key warning switch.

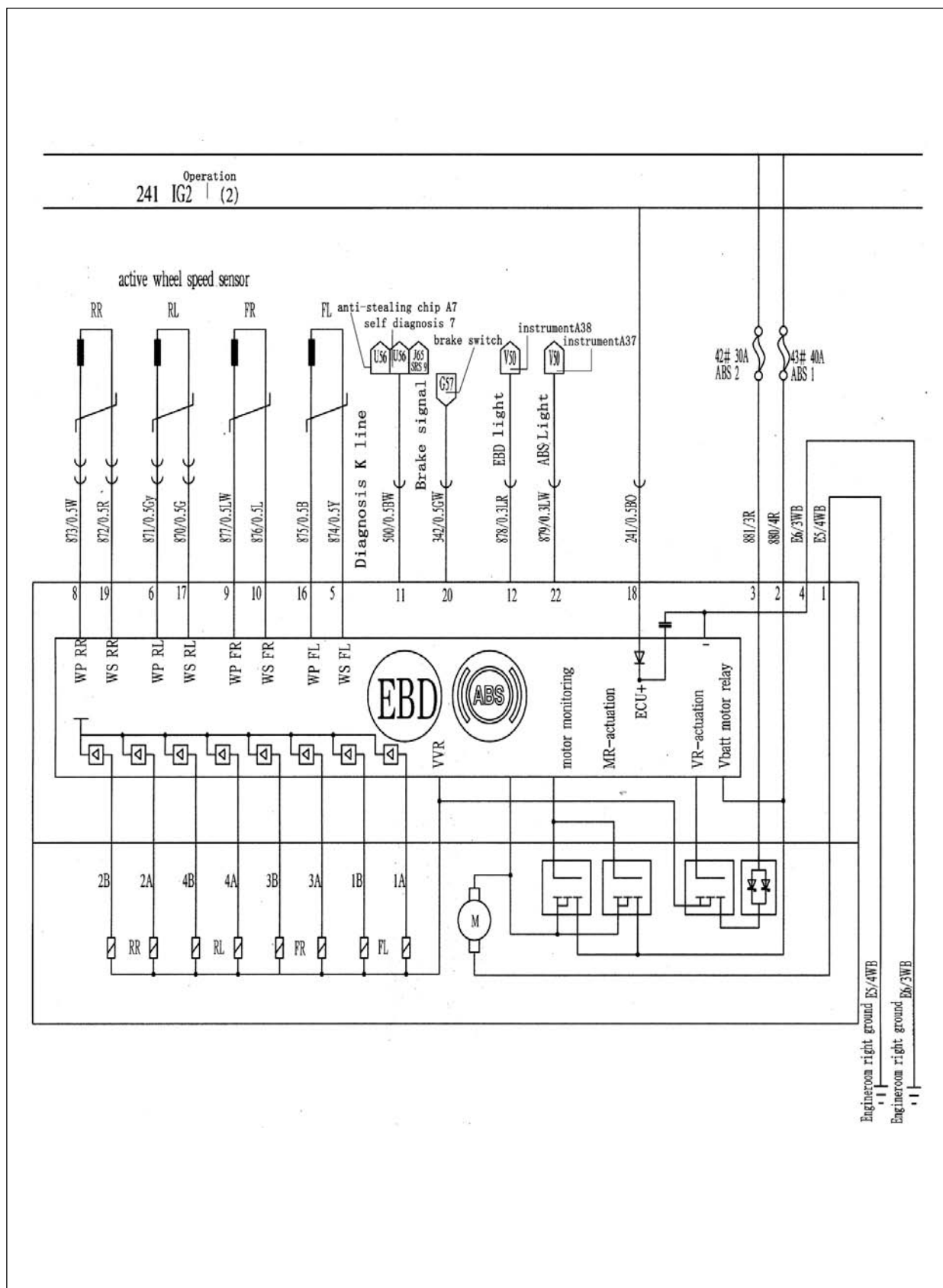
Position of switch	Terminal connected by avometer	Regulated situation
OFF (key does not insert)	-	Not conduction
ON (key inserts)	1-2	Conduction

If the conduction does not accord with the regulation, change the switch.

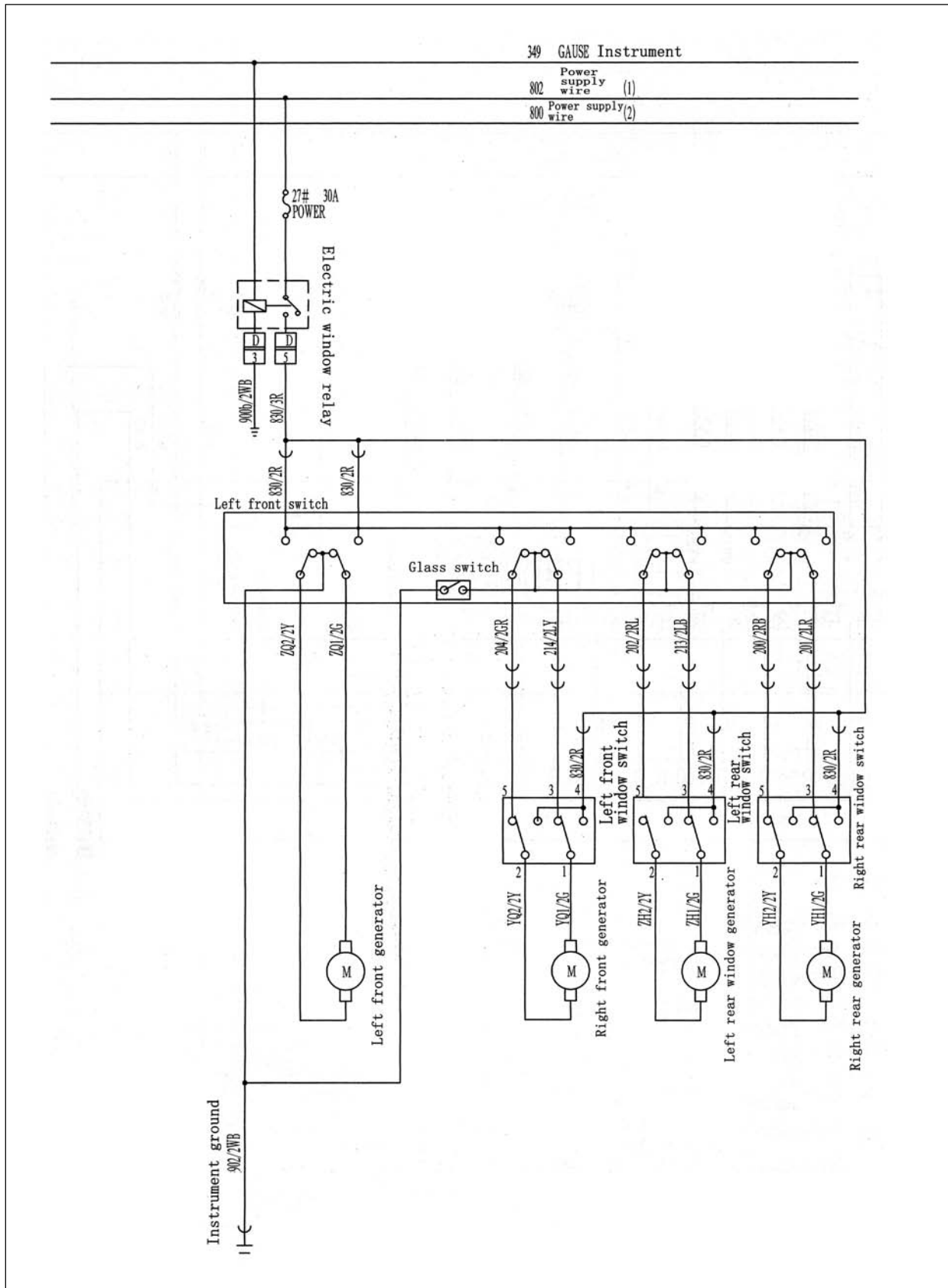




Anti-locking brake system ABS Brake distribution EBD

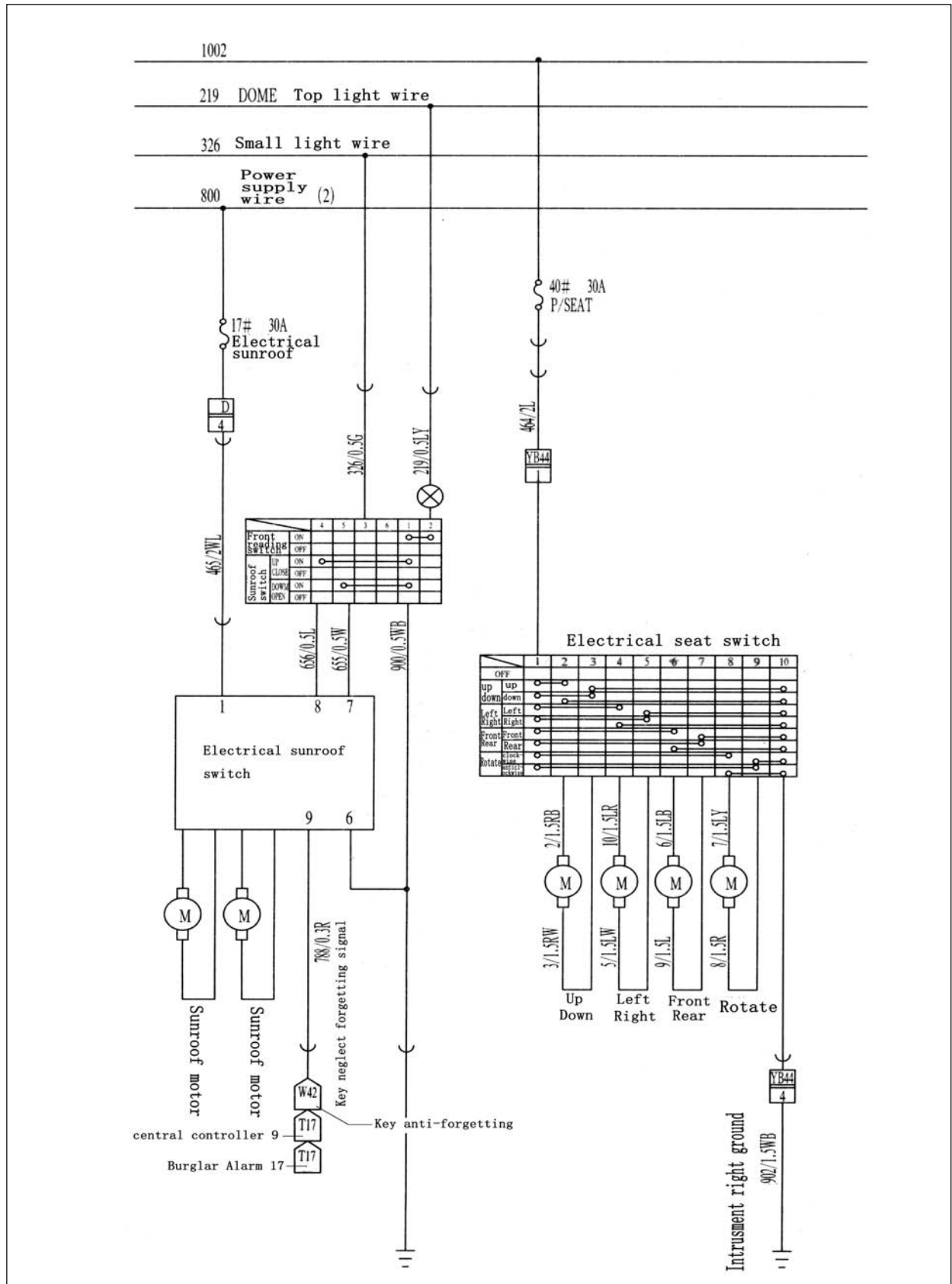


Electric glass lifter



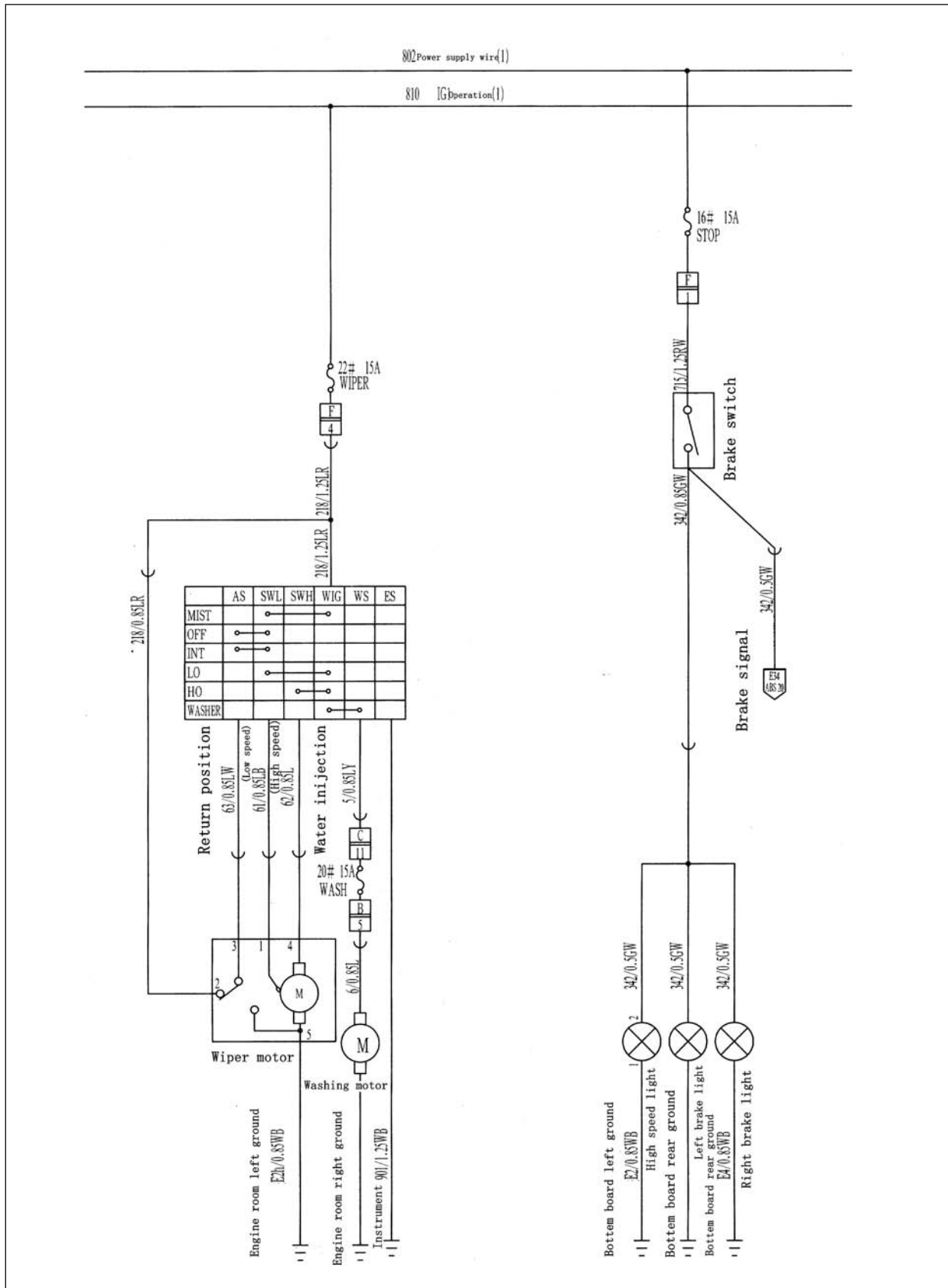
Electric sunroof

Electric chair

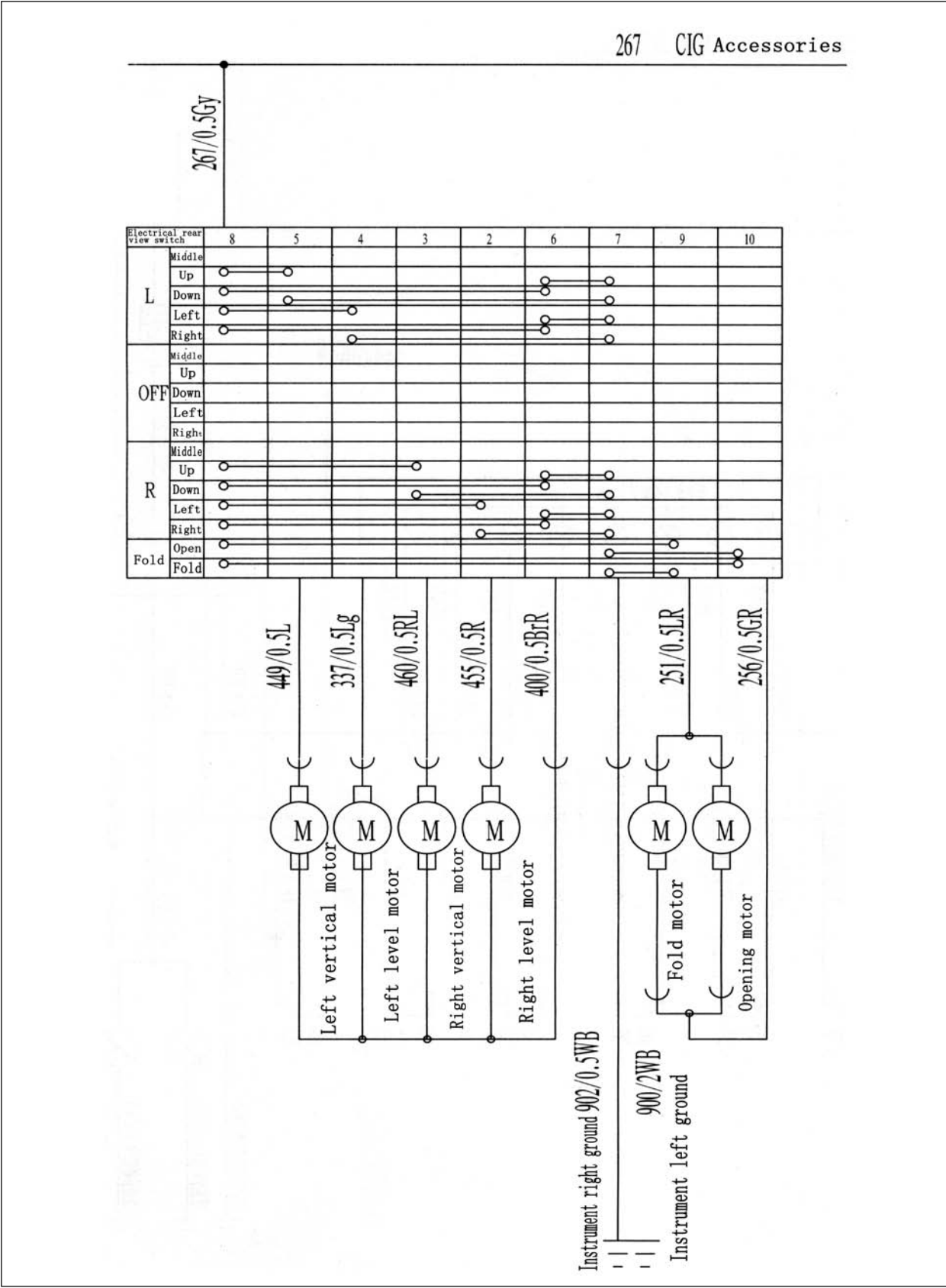


Wiper and water injection

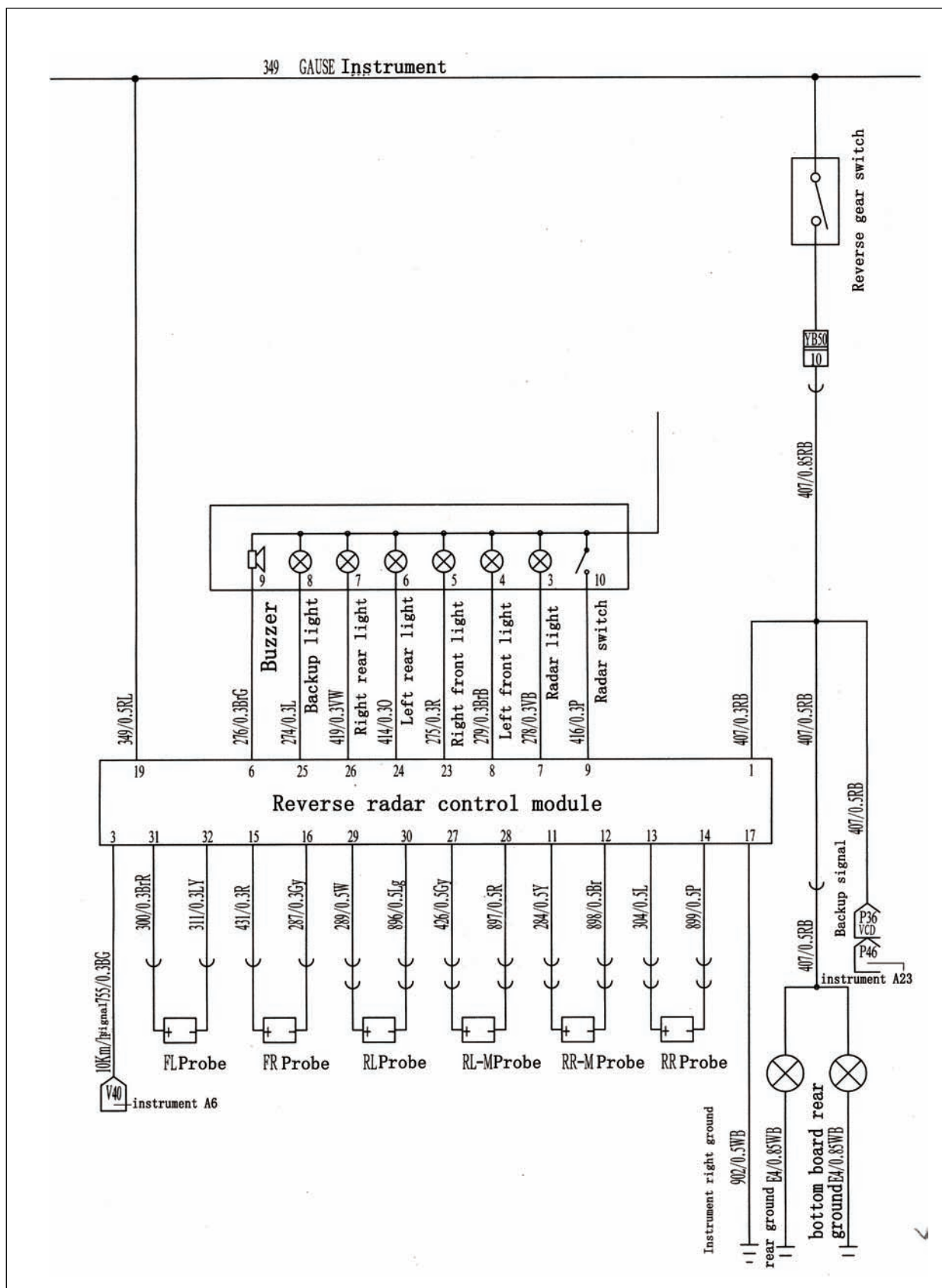
Brake light



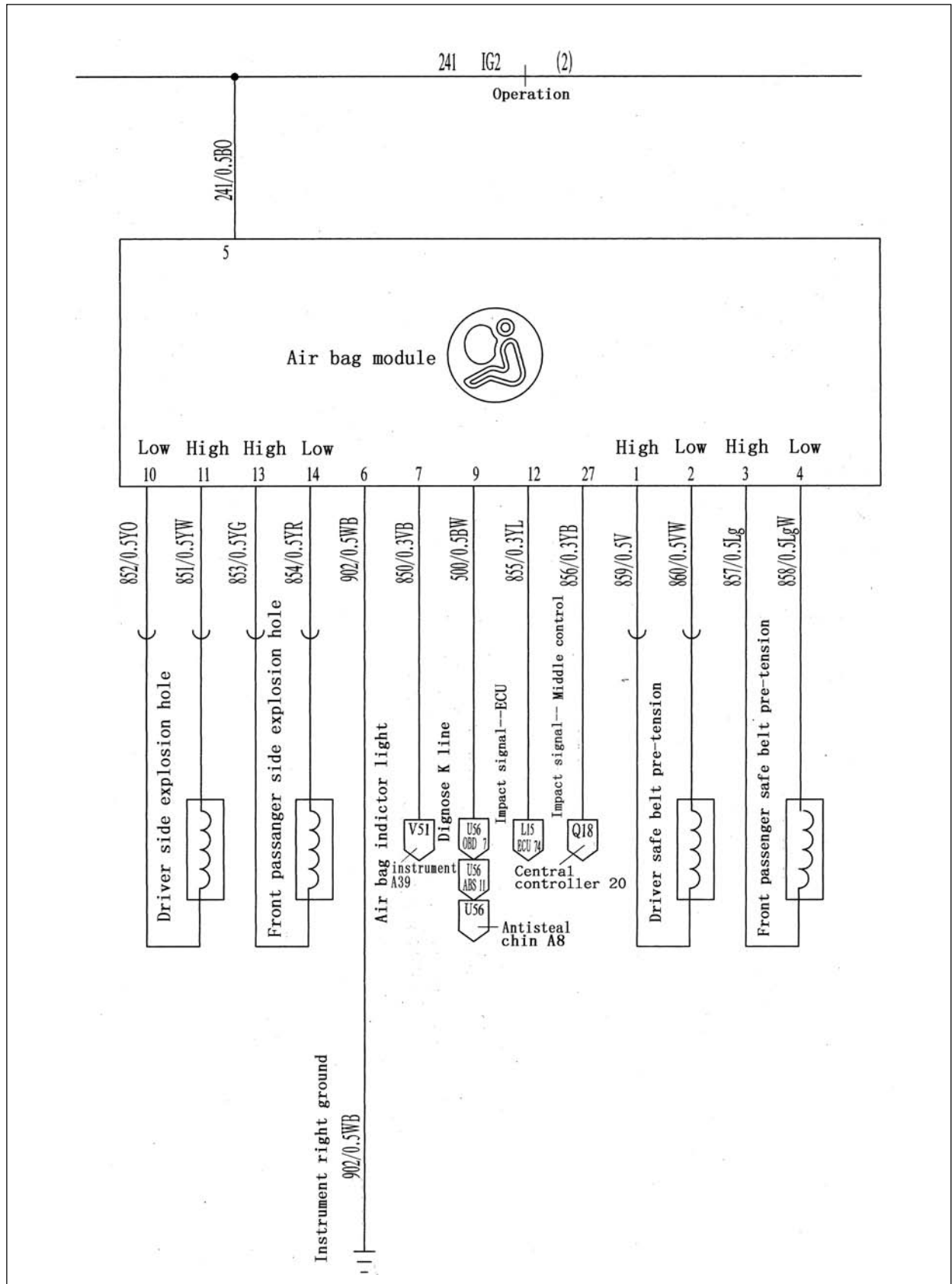
Electric rearview mirror



□ 402 □

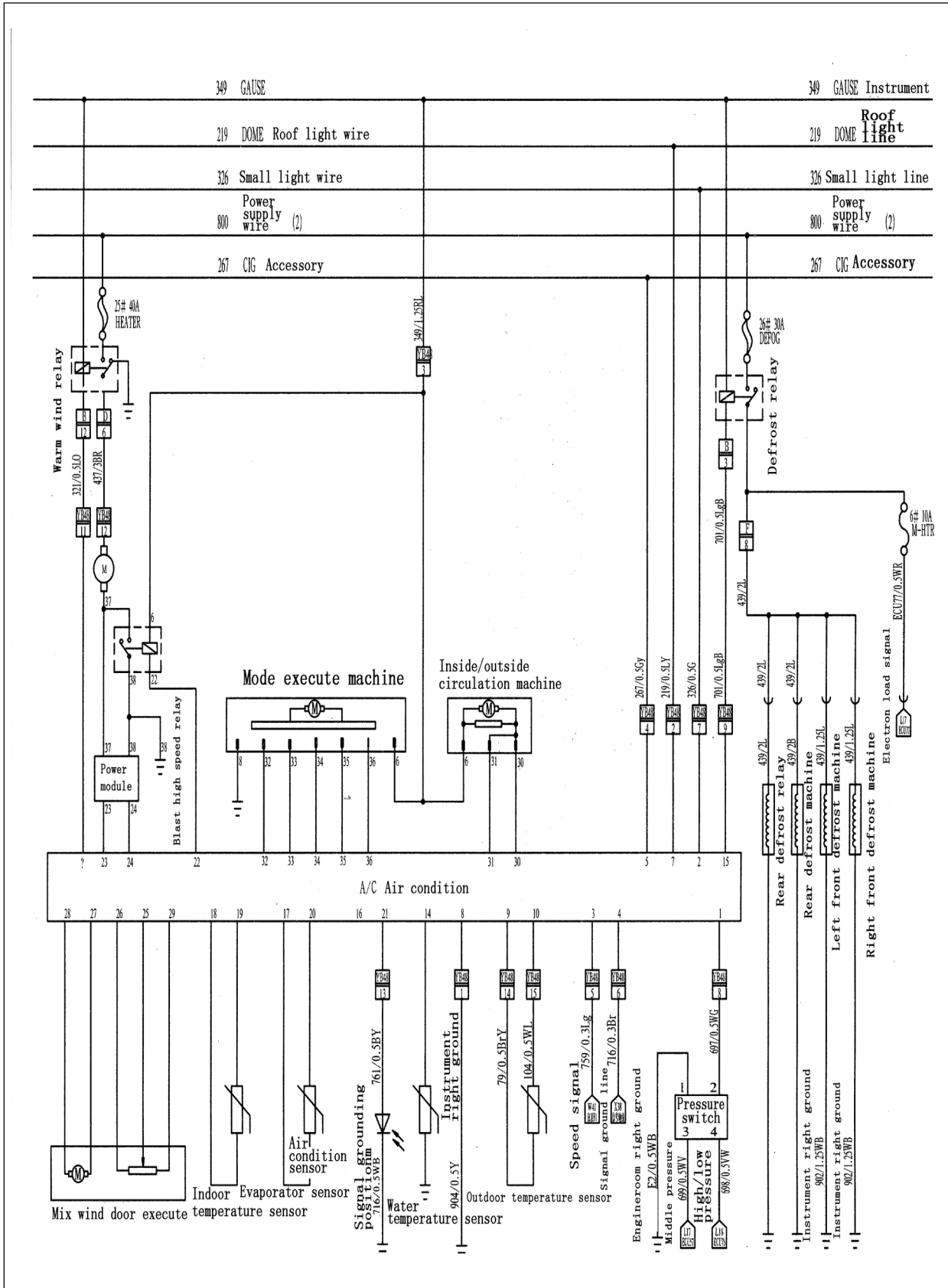


Safety airbag system



Air conditioning system

Defrosting system

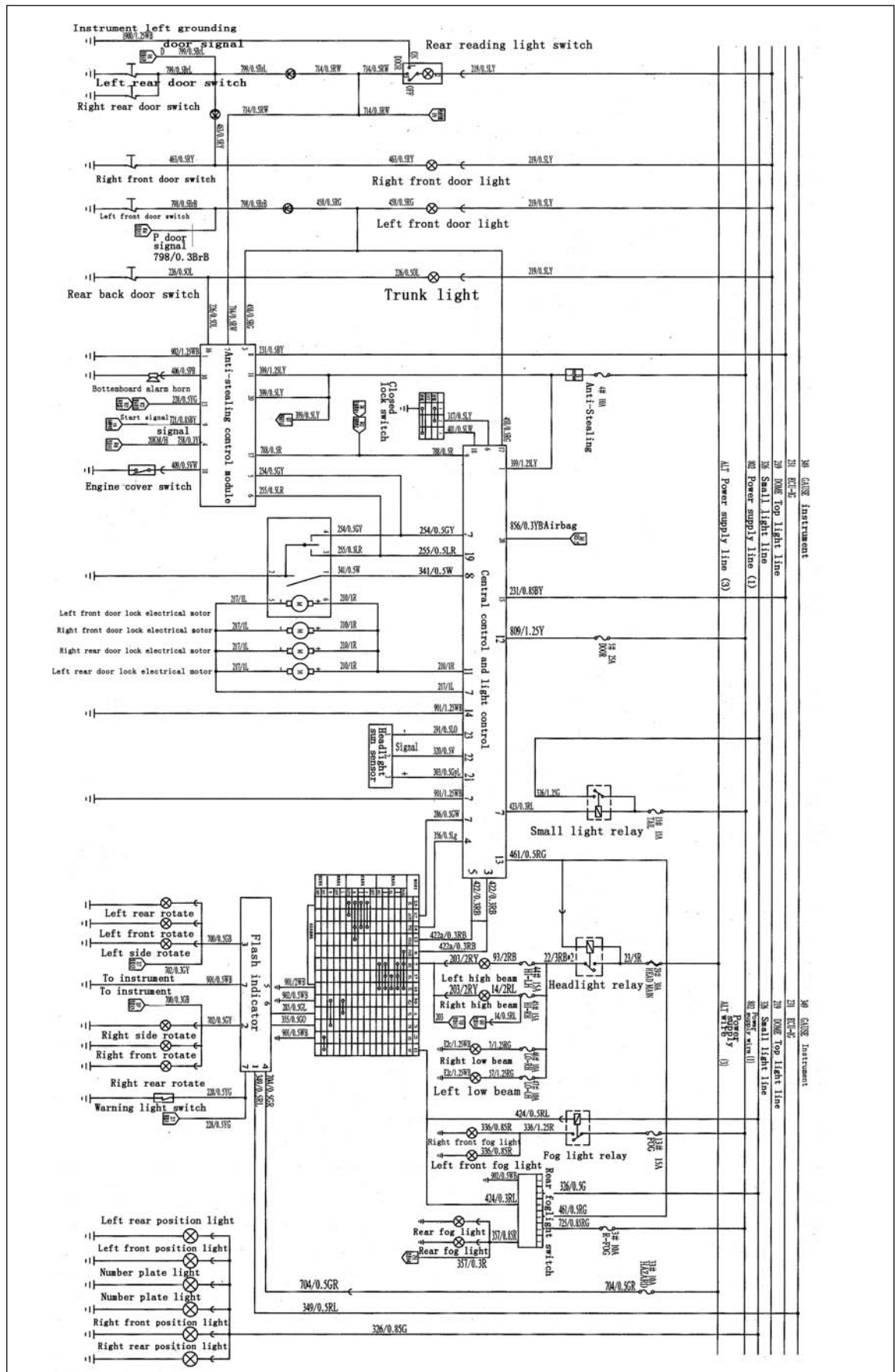


Light system

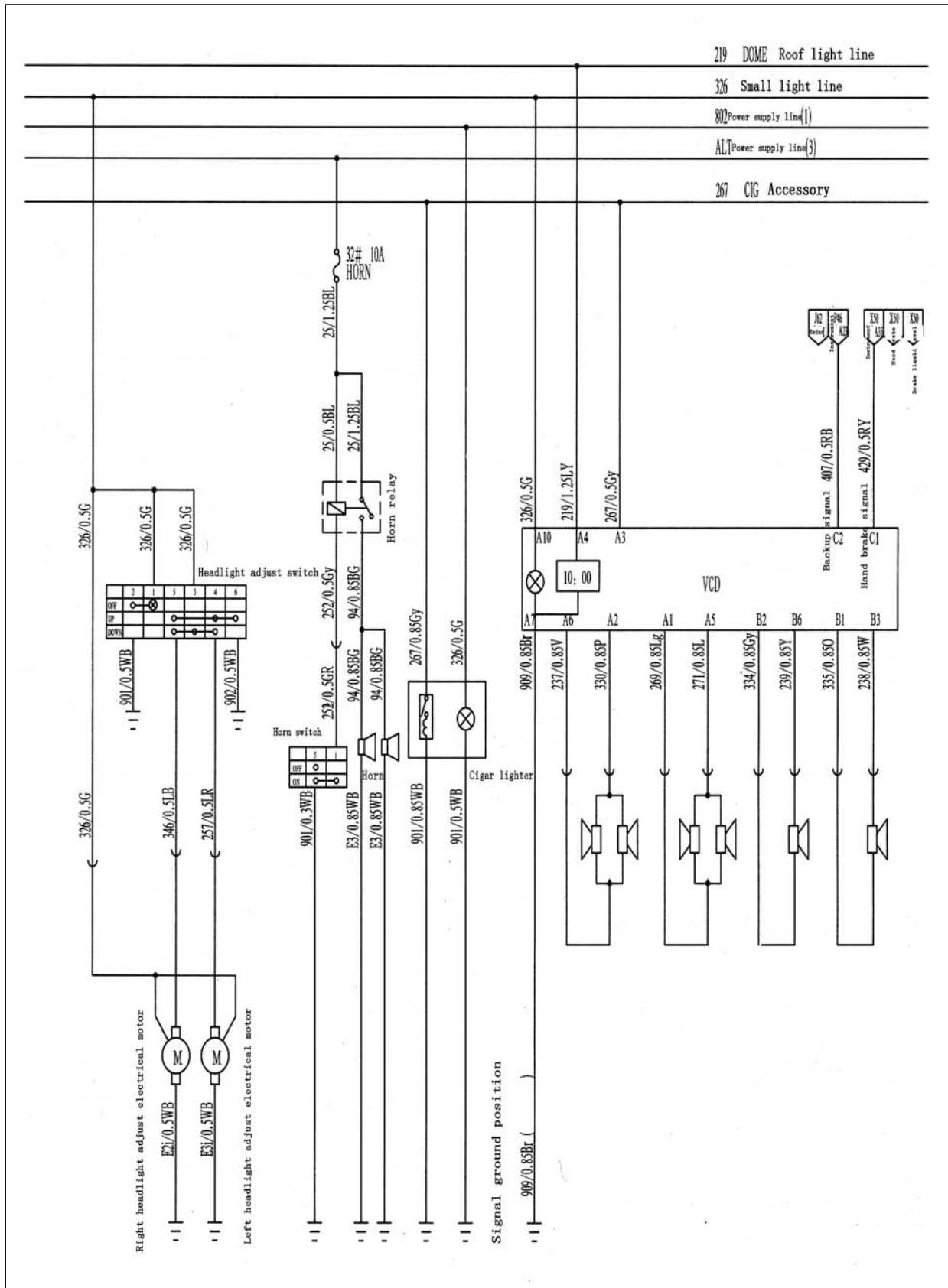
Central control system

Anti-stealing system

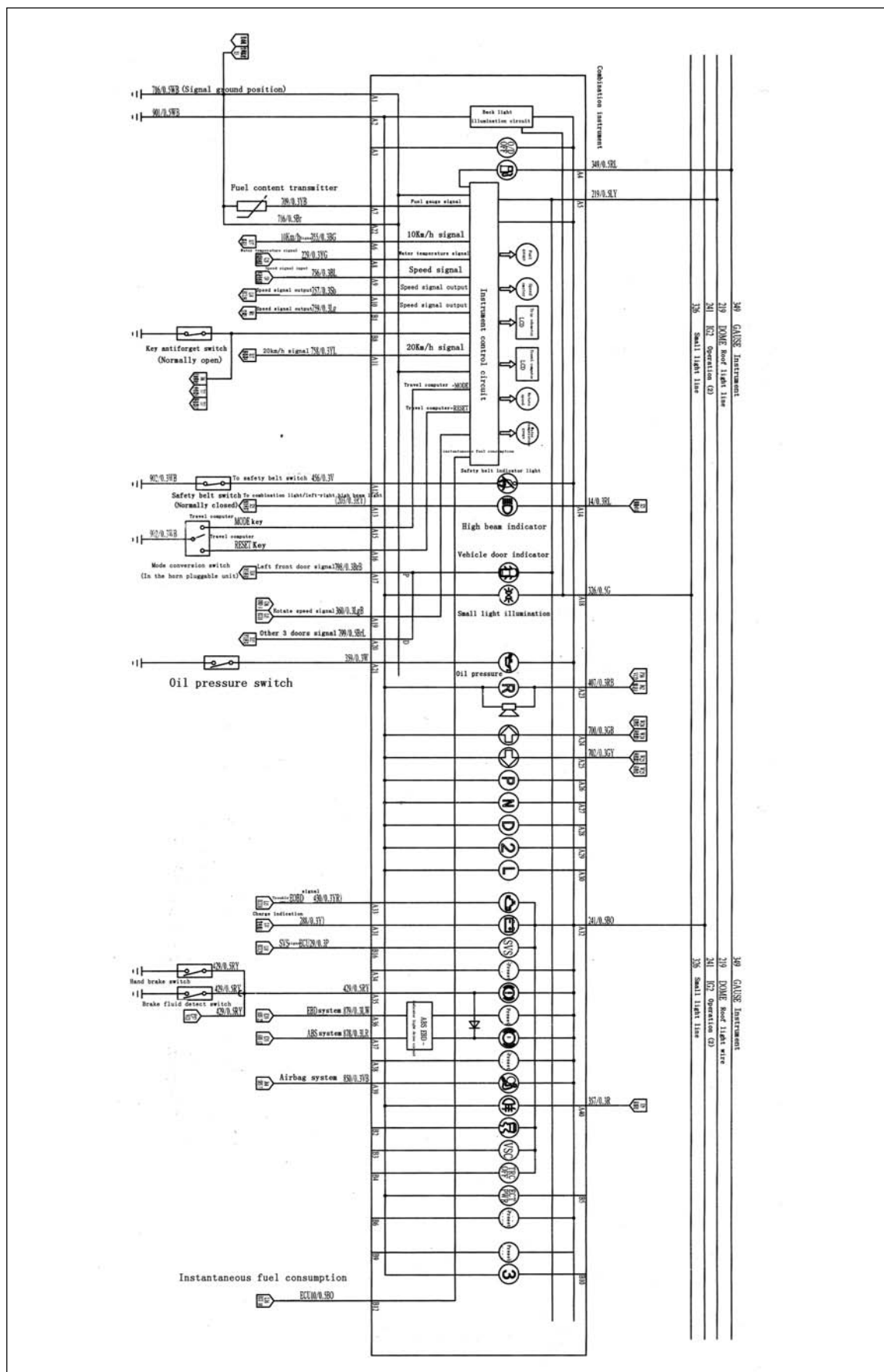
Door control system



Adjustment for headlight height Speaker cigar lighter Audio system



Combination instrument



Self-diagnosis Chip anti-stealing system

