



# ***SERVICE MANUAL***

***DEER SAILOR SO COOL***

***SAFE SING PEGASUS***

# Preface

With the increase of automobile demand in China, our automobile industry also experiences a rapid development. The trucks including SUV, manufactured by Great Wall Motor Co., Ltd, which are sold all over China, are in the leading place in terms of their sales volume, in order to satisfy the demands of various maintaining staff, technicians and managing staff of Changcheng Co., Ltd, we compile this maintenance manual according to the latest technological data. This manual covers six vehicle models including Deer, Safe, Sailor, Sing, So Cool and Pegasus, its main content includes:

Part I is general introduction, which introduces the application index of this manual.

Part II introduces the chassis system, which mainly includes the technologies of dismantle, inspection, adjustment, repairing, assembly and mount of the clutch, gear box, transfer box, drive shaft, suspension system and automobile axle, braking system and steering system, etc. each operation approach is illustrated with figure, which not only presents the maintenance procedure, but also clearly describes the technical requirements and application limit.

Part III introduces the electric system and air-conditioning system of the automobile body, which mainly covers such items as the location and content of protective box, power supply system, starting system, lighting system, combination instrument, backup radar system, wiping and washing system, center control locking and power window system, acoustical equipment system, full wire harness and air-conditioning system, etc. Electricity diagrams for those electric systems are given in this manual so as to facilitate the maintaining technicians to find out the problem easily and quickly.

Part IV introduces the external and internal body decoration, which mainly covers the dismantling, inspecting and assembling requirements of the engine cover, front and rear doors, adhesive strip of body collision avoidance, wheel shield, wrapping angle of wheel-shield and exterior trim panel, front and rear windshields, side-window glass, rear-door glass, rear platform of cargo compartment, rear door, instrument panel, safety belt, seat, tail-fin, luggage rack, and reserve tire bracket etc. The dimensions of vehicle body and frame are also given to maintaining staff for reference during their repairing.

During the narrations of each part, items such as troubleshooting, maintenance notice, maintenance data and application limit, fastening torques of bolts and nuts for special purpose, SST, SSM and lubricant materials and so on are also introduced. Various maintenance data are briefed in attachment for reference.

Altogether, this manual is comprehensive in content, visual in illustration, clarifying in requirement and plain in language. It can be referred by the maintaining staff, technicians and professional managing staff.

Even though we try our best to compile this manual in a strict earnest manner, we cannot guarantee that all contents in this manual are correct. Therefore, users shall not put forward any claim with Great Wall Company according to this manual; we are not in the position to hold the responsibility for the loss caused by usage of this manual. Due to our limited knowledge, it is unavoidable to find error in this manual, any criticism and correction from you is welcomed.

The final explanation power for this manual is subject to Great Wall Motor Co., Ltd

Compiler  
May 2006



# Service manual for chassis and body

General	IN
Clutch	CL
Gear box	MT
Transfer box	TF
Drive shaft	PR
Suspension system and automobile axle	SA
Braking system	BR
Steering system	SR
Body electric system	BE
Air-conditioning system	AC
Vehicle body	BO
Maintenance and Up-keeping	A
Special Tool	B



# Introduction

	Page
How to use this manual .....	IN-2
Instruction for overall repairing .....	IN-4
Body lifting height and support position .....	IN-5

## How to use this manual

In order to help you to look in this manual, we marked the chapter name and main theme at the top of each page.

In order to introduce the repairing items to you, we make the **index** on the first page of each chapter, and **notices** need to be taken during all repairing operation are also given in the related chapter.

Please read these notices carefully before the repairing work.

The troubleshooting form for each system will help you to diagnose the system trouble and its cause.

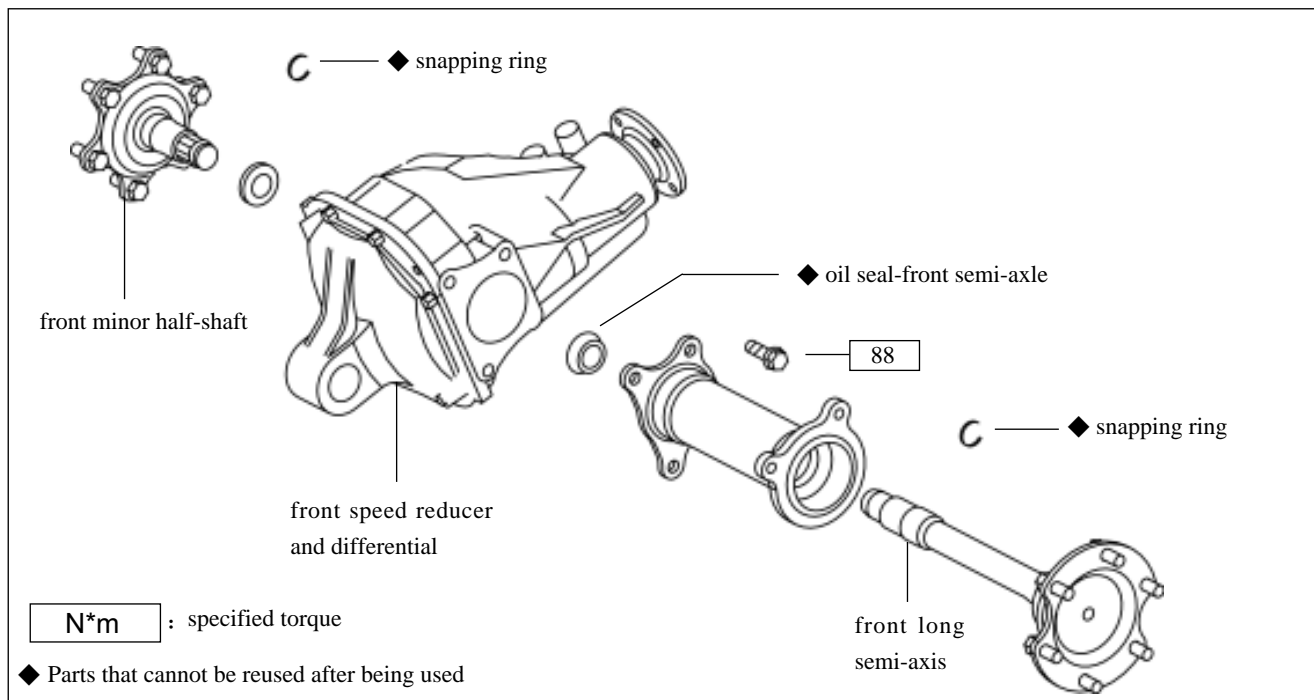
We furnish with the repairing approaches for each possible cause in the repairing approach column, which will help you to acquire the solution in a short time.

## Repairing approach

Most repairing operation can begin with referring to these illustrations.

These illustrations can help you identify the parts and their coordination situation

Example:



### Introduction of how to use this manual

The repairing approaches are described step by step:

- The illustrations show you what to do and at which position.
- The theme of repairing operation tell you what you need to do.
- The detailed instruction show you how to accomplish the repairing and introduce to you other related affairs, such as specification, warning etc.

Example:

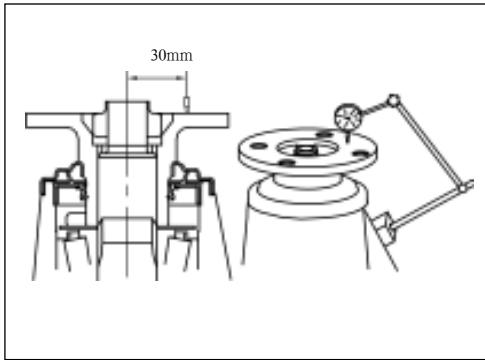


Illustration:  
what to do and at which position

Topic: what to do ?

### Check and adjust the flange bounce

- (a) Attach the dial indicator seat to the reducer housing, and touch the flange face with the measuring head of dial indicator, run the flange and observe the pendular range of the indicator carefully.

Full bounce tolerance of face : 0.10mm

Specification

Detailed introduction: How to do?

This formula can help the experienced technicians find out the failure causes in short time. Overhauling staff can browse the operation theme and refer to the detailed description thereunder where necessary; important specifications and warnings are written out in boldface.

### Specification

The corresponding specifications are given in boldface in each repairing approach of this manual, which allows the overhauling staff to check the specification while keeping on repairing work.

### Warning, Notice and Remark

- Warning written out in boldface means there is possibility of self-injury or harm to others.
- Notice written out in boldface means there is possibility of damage to parts under repairing.
- Remarks singled out independently, but not in boldface, serve as supplementary descriptions to help you accomplish the work more efficiently.

### Vehicle Code

There are six vehicle models in this manual, the model codes are as follows:

- Deer model: Dr
- Sailor model: SL
- SO COOL model: SK
- Safe model: SF
- Sing model: SY
- PEGASUS model: SJ

### Abbreviation used in this manual

- A/C: air-conditioner
- ECU: electronic controller unit
- SST: special service tool
- 2WD: two-wheel drive
- 4WD: four-wheel drive

## Overall Repairing Description

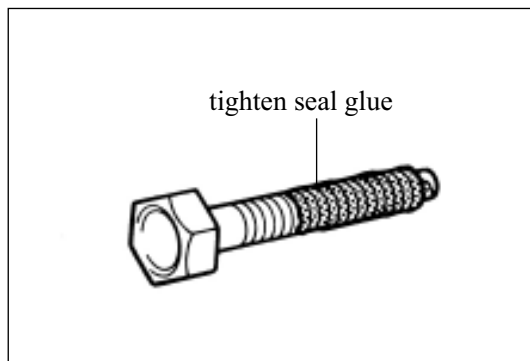
1. Keep the vehicle clean and prevent it from damage with guard plate, seat and floor cover cloth.
2. Put down the dismantled parts in order during the dismantle process so as to facilitate the re-assembly
3. Observe the following items:
  - a) Disconnect the cable cathode from the accumulator terminal before the electric operation;.
  - b) Disconnect the cable from the cathode connected to the vehicle body when checking or repairing the accumulator where necessary.
  - c) In order to avoid the damage of terminal post of accumulator, loose the bolts first, then pull up the cable vertically when dismantling, don't wring it or prize it.
  - d) Clean the terminal posts of the accumulator with dishcloth, and do not scrape them with file or other similar tools to avoid damage.
- e) Mount the cable terminal on the post with loosened nut, then fasten the nut. don't tap the terminal onto the post with hammer.
- f) Be sure to check whether the cover of positive terminal (+) is well located or not.

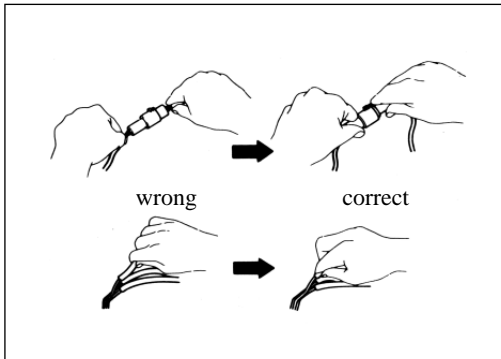
4. Check all hoses and wire plugs to verify whether they are connected solidly and correctly.
5. Parts that cannot be reused after being used.
  - a) The following parts should be changed with new one regularly: split pin, sealing washer, O-ring and oil seal, etc.
  - b) parts that cannot be reused after being used is marked with "◆" in the element figure.

### 6. Pre-coated parts

The pre-coated parts including the bolt and nut are coated with locking seal glue in factory.

- a) In case the pre-coated parts are moved due to its fastening, loosening or other causes, they must be coated again with the specified seal glue.
- b) Coating procedure of pre-coated parts
  - 1) Clear away the former seal glue from the screw thread of the said parts.
  - 2) Dry the parts with compressed air.
  - 3) Coat the screw thread of the parts with the specified locking seal glue.
- c) The pre-coated parts are marked with the "★" in element figure.
7. When necessary, sealing agent or sealing ring to prevent the leakage.
8. Each specification shall be followed strictly. And the torque spanners should be used.
9. Determine the necessity of using the special service tools (SST) or special service materials (SSM) according to the real situation. SST and SSM must be used where necessary and the repairing should be in accordance with the repairing approach. SST list and SSM list are attached to this manual.
10. Be sure to check whether the rated current of the new fuse is correct when changing the fuse. The fuse rated current should not larger than that of securing fitting and the fuse of smaller rated current must not be used.
11. Be careful to hang or support the vehicle on the suitable place when propping up or raising it.
  - a) In case prop up the vehicle at the front or back part, the wheels must be blocked to guarantee the safety work.



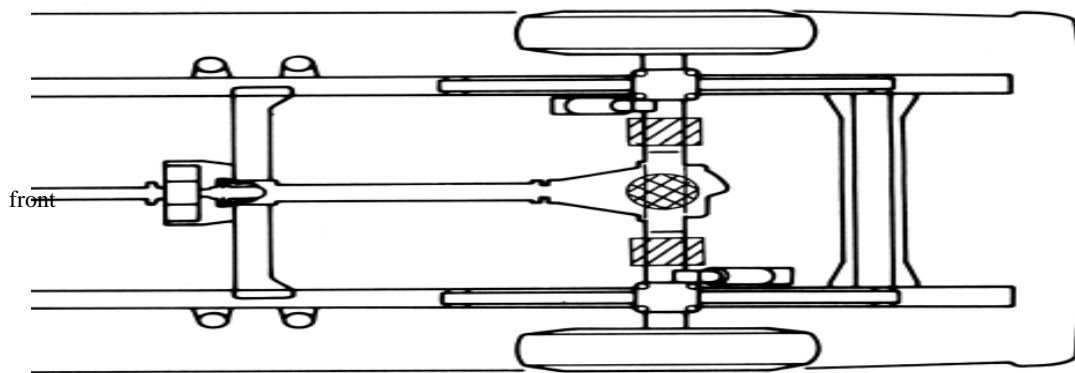



b) The raised vehicle must be supported with the bracket; it is dangerous to conduct the repairing work on the vehicle propped up with one jack, even though such repairing can be finished in short time.

12. The following items shall be taken notice to avoid the parts damage:

- a) Do not open the covers of ECU and various computers where not necessary absolutely. (if the IC terminal is touched, it be leaded into static damage) .
- b) Pull the hose at its ends when dismantling it, do not pull it at the center section.
- c) Pull the wire joint instead of the wire when pulling the joint away.
- d) Take notice to avoid of the drop of electric parts such as the sensors or repeaters. In case those parts drop to the hard ground, they must be changed instead of being reused.
- e) Do not use the striking spanner to dismantle or mount the thermostatic switch or thermostatic sensor.
- f) Plug the needles of the multi-meter into the wire connector carefully when checking its conductance and do not bend the terminals.
- g) Do not sheath the hose of the vacuum gauge into the very large connector when using the gauge, instead, the stage joint shall be used because once the hose expands, it is possible to lead into the leakage.

## Body lifting height and supporting position




Jack lifting position ..... 

Front.....the front the beam center

Rear.....rear differential

Supporting position

● safety bracket ..... 

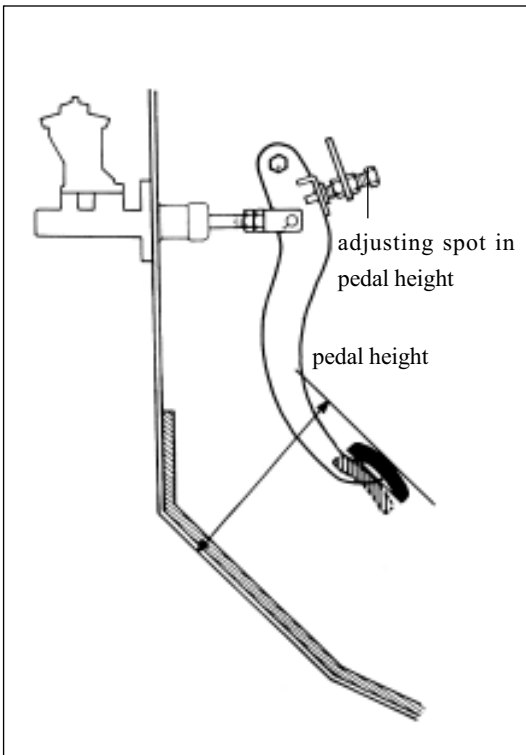
---

# Clutch

	Page
Troubleshooting .....	CL-2
Inspection and adjustment of clutch pedal .....	CL-3
Air exhausting of clutch .....	CL-3
Clutch master cylinder .....	CL-4
Clutch wheel-brake cylinder .....	CL-6
Clutch cluster .....	CL-7

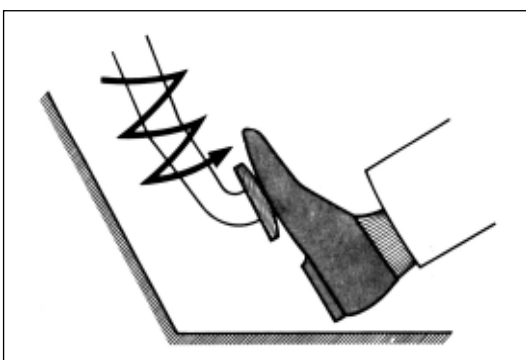
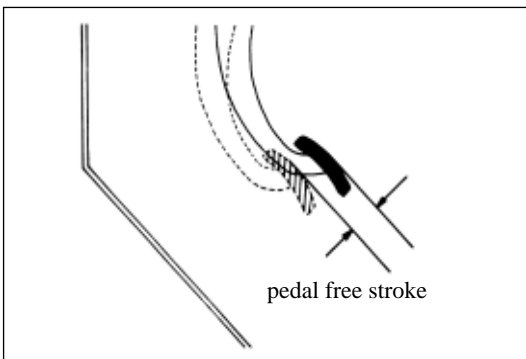
## Troubleshooting

Trouble	Causes	Repairing approaches
Difficulty in gearshift or non-gearshift	Overlarge free stroke of clutch pedal There is air in clutch pipe Failure of clutch brake-wheel cylinder Failure of clutch master cylinder Overlarge clutch pendulum difference due to incorrect mounting, the friction liner is stained with oil or is breaking There is dirty or adhesive materials on spline of input shaft or clutch rib Failure of clutch pressure plate	Adjust the free stroke of pedal Exhaust the air in clutch pipe Change the clutch brake-wheel cylinder Change the master cylinder Check the clutch rib Repair according to requirement Change the clutch pressure plate
Disengagement of gear box or clutch slip	Abrasion of clutch guide shaft Insufficient free stroke of clutch pedal The friction liner of clutch rib is stained with oil or is worn Failure of clutch pressure plate Seize up of separation fork	Change the guide shaft Adjust the free stroke of pedal Check the clutch rib Change the clutch pressure plate Check the separation fork
Clutch seize-up or shaking	The friction liner of clutch rib is stained with oil or is worn Failure of clutch pressure plate Looseness of engine seat	Check the clutch rib Change the clutch pressure plate Repair according to requirement
Looseness of clutch pedal	There is air in clutch pipe Failure of clutch brake-wheel cylinder Failure of clutch master cylinder	Exhaust the air in clutch pipe Change the clutch brake-wheel cylinder Change the master cylinder
Over-loud clutch noise	Seize up of separation fork; Abrasion or stained spot of separation bearing Abrasion of guide bearing Parts looseness in clutch pressure plate	Repair according to requirement Change the separation bearing Change the guide bearing Change the clutch pressure plate



## Inspection on and adjustment of clutch pedal

1. Check whether the pedal height is correct  
Pedal height that begins from front wall board:  
Dr SF:  $(165 \pm 5)\text{mm}$   
SL SK SY SJ:  $(190-200)\text{mm}$
2. Adjust the pedal height where necessary  
Loosen the locking nut and screw off the adjusting bolts until the pedal height is correct. Then screw up the locking nut.  
Pedal free stroke
3. Check whether the pedal free stroke is correct  
Press the pedal lightly until the resistance generated by clutch occurs.  
pedal free stroke:  $(5-15)\text{mm}$
4. Adjust the pedal free stroke where necessary;
  - a) Loosen the locking nut and rotate the push-rod until the stroke is correct;
  - b) Screw up the locking nuts;
  - c) Check the pedal height after the adjustment of pedal free stroke.



## Air-exhausting of clutch

Remark: in case operation needs to be conducted for the clutch system or if there is air in clutch, exhaust the air.

Notice : Do not stain the painted surface with brake liquid, if any brake liquid is left, wash it away immediately.

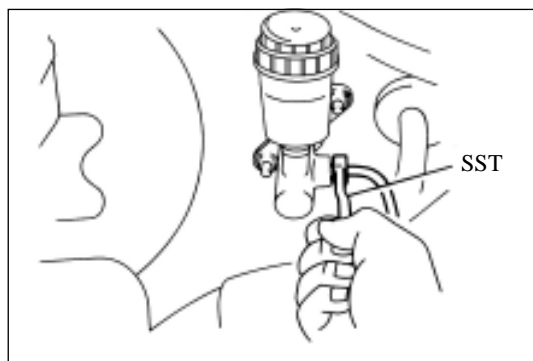
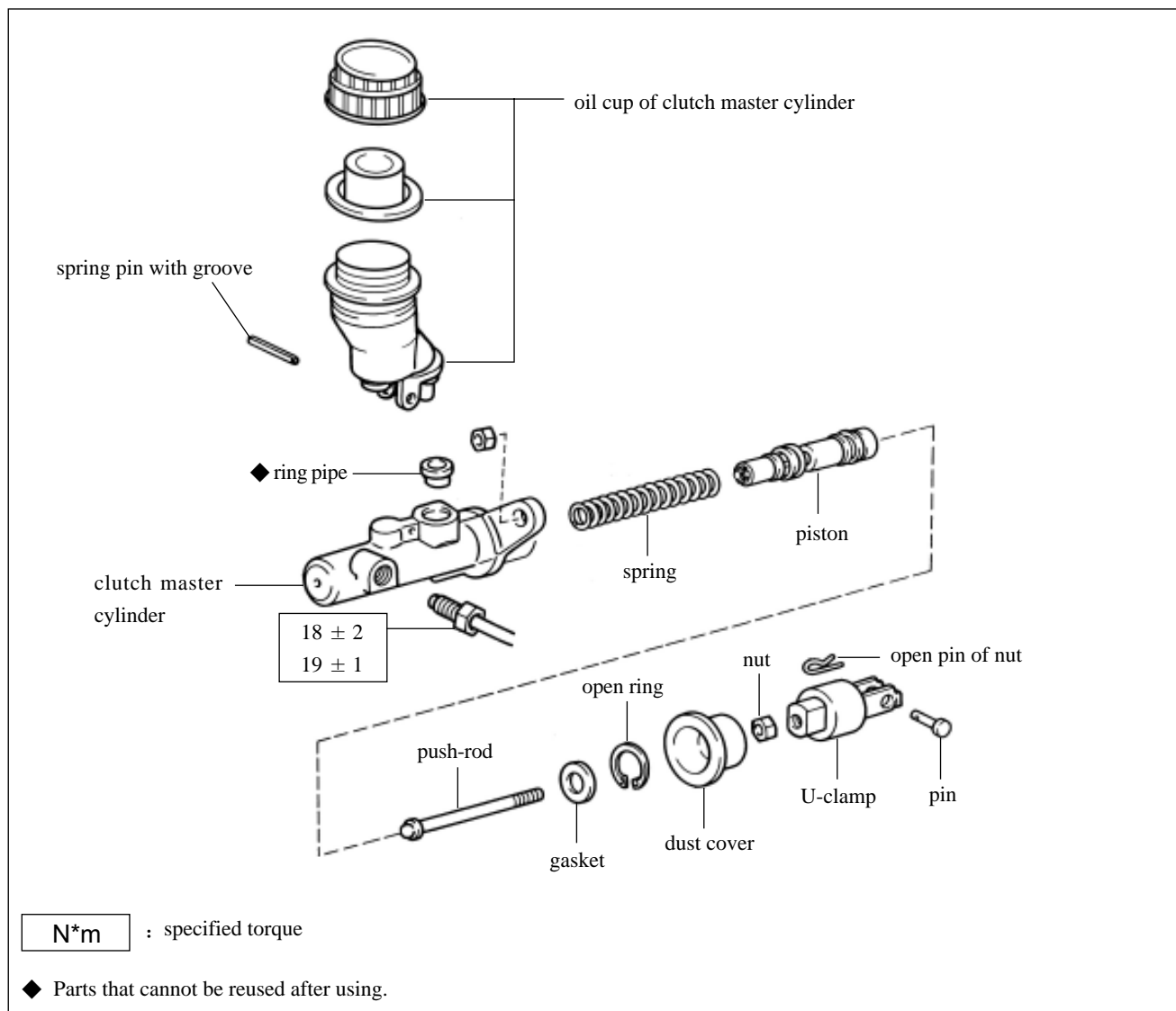
1. Fill the brake liquid into the oil cup of clutch master cylinder;  
The oil cup of master cylinder shall often be checked and, if necessary, added with brake liquid.
2. Connect the ethene resin pipe to the air-exhausting valve.  
Insert the other end of the pipe into the container, half of which is filled with brake liquid.
3. Air-exhausting in clutch system
  - a) Move the clutch pedal up and down slowly for several times.
  - b) Loosen the air-exhausting valve when pressing the pedal increasingly until there is brake liquid overflowing, then tighten the air-exhausting valve.
  - c) Repeat this operation until the bubble in brake liquid disappears.





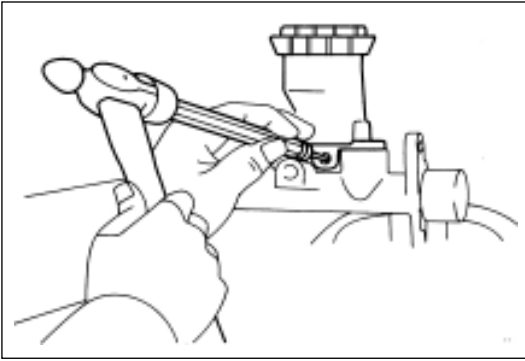
## Clutch Master Cylinder

### Element drawing



### Disassembly of master cylinder

1. Tear down the pin of push-rod
2. Tear down the clutch pipe  
Disconnect the jointed pipe nuts with SST
3. Tear down the master cylinder
  - a) Tear down the fixing nuts;
  - b) Pull out the master cylinder.



## Disassembly of oil cup of master cylinder

1. Tear down the oil cup
  - a) Use the pinch and hammer to tap out the spring pin with groove;
  - b) Tear down the oil cup and ring pipe.

## Assembly of master cylinder

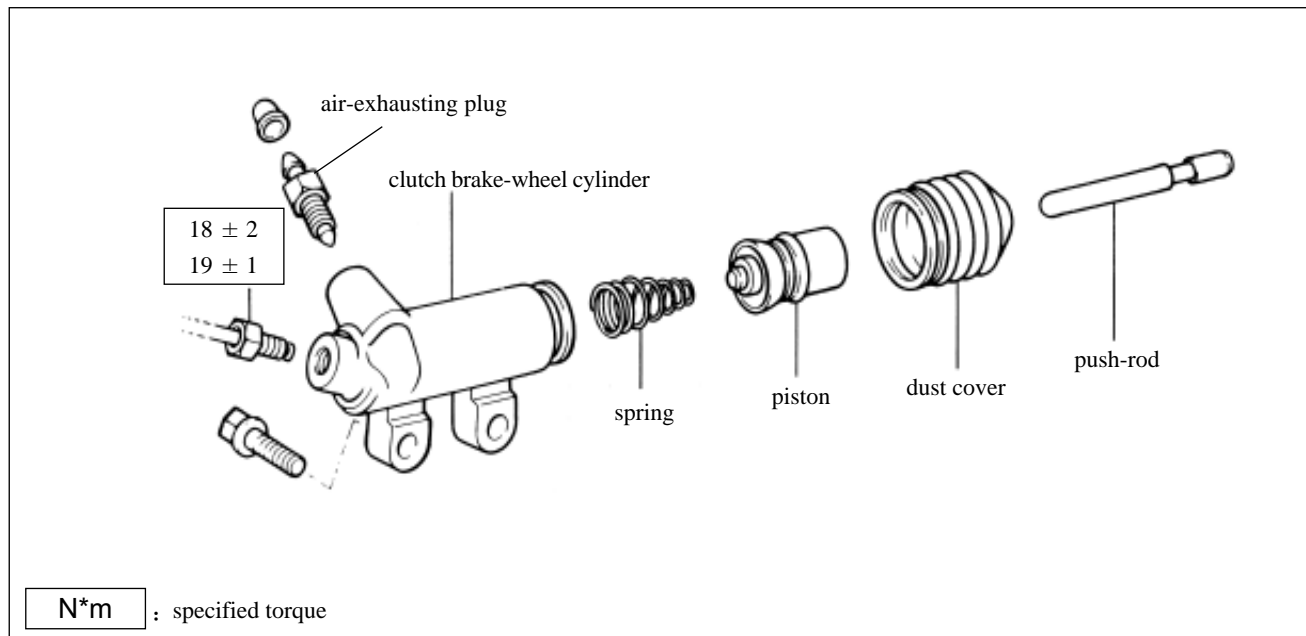
1. Mount the oil cup
  - a) Mount the oil cup and the new ring pipe.
  - b) Use the pinch and hammer to tap in the spring pin with groove.

## Mount of master cylinder

1. Mount the master cylinder  
Mount the fixing nuts and screw them up.
2. Connect the clutch pipes;  
Connect the clutch pipes with SST
3. Connect the push-rod and mount the pin;  
Encase the pin of push-rod with clamping pliers.
4. Exhaust the air in clutch system and adjust the clutch pedal.

## Clutch brake-wheel cylinder

### Element drawing



### Disassembly of brake-wheel cylinder

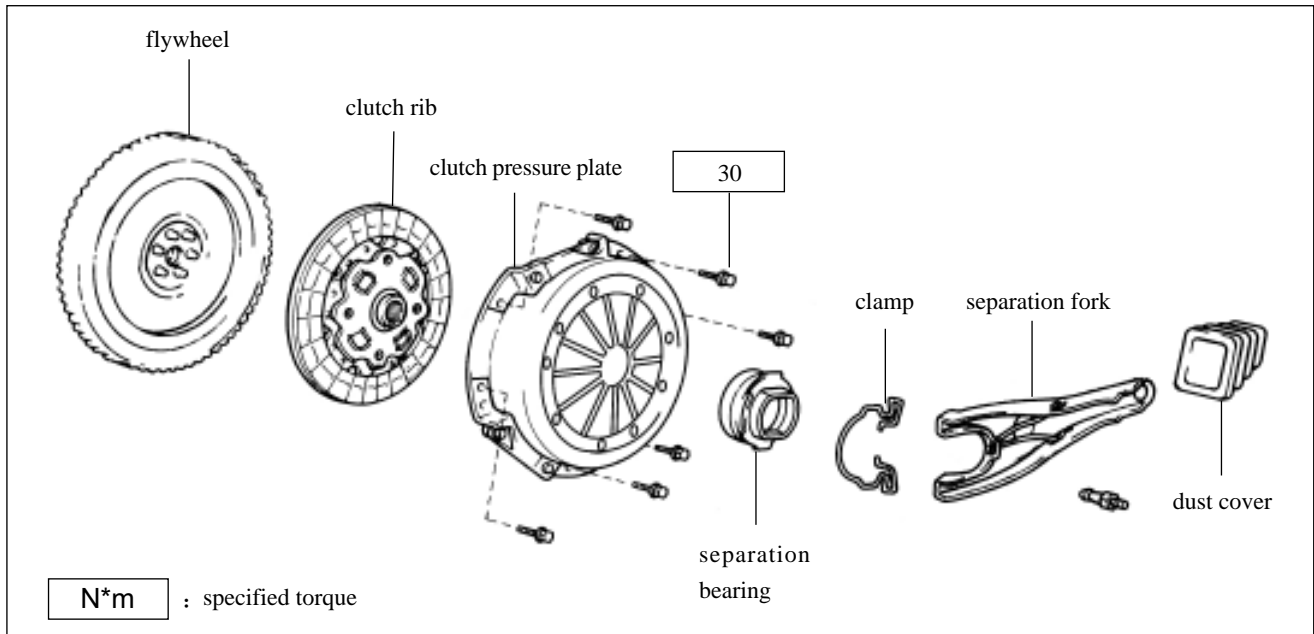
1. Tear down the clutch pipeline.  
Remove the pipeline with SST
2. Tear down the two bolts to take down the clutch brake-wheel cylinder

### mount of brake-wheel cylinder

1. Mount the brake-wheel cylinder with two bolts;
2. Connect the clutch pipeline;  
Connect the pipeline with SST;
3. Exhaust the air in clutch system.

## Clutch cluster

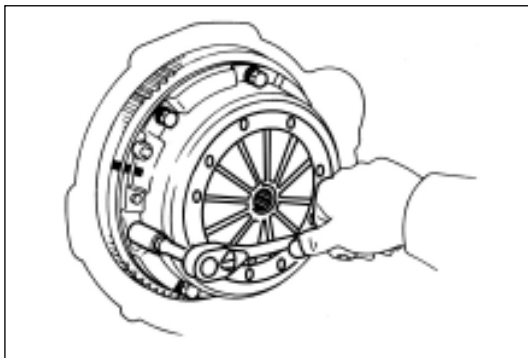
### Element drawing



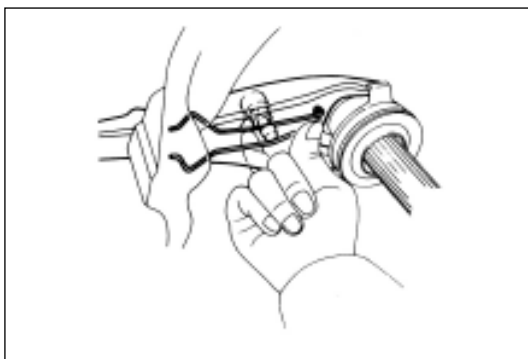
### Disassembly of clutch cluster

1. Tear down the gear box;

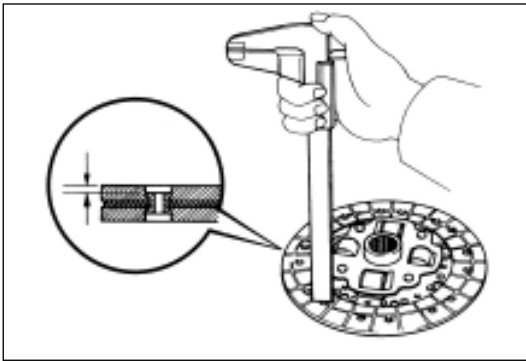
Remark: do not leave the gear oil in drying



2. Tear down the clutch pressure plate and the clutch rib
  - a) Make aligning marks on the clutch pressure plate and the flywheel.
  - b) Loosen the fixing bolts gradually until the spring tension is released;
  - c) Tear down the fixing bolts to pull out the clutch pressure plate and clutch rib.



3. Tear down the bearing and separation fork from the gear box;
  - a) Tear down the clamp to pull out the bearing;
  - b) Tear down the separation fork and dust cover.

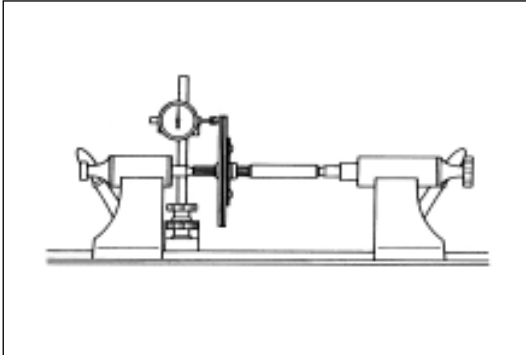


### Inspection on clutch parts

1. Check whether there is abrasion or damage of clutch rib;  
Measure the depth of the rivet head with calipers.

Min depth of rivet head: 0.3mm

If the depth of rivet head exceeds the limit value, change the clutch rib.

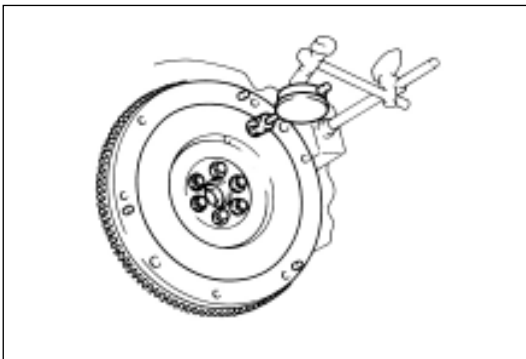


2. Check the radial pendulum difference of the clutch

Check the radial pendulum difference of the clutch rib with multi-meter.

Max radial pendulum difference: 0.8mm

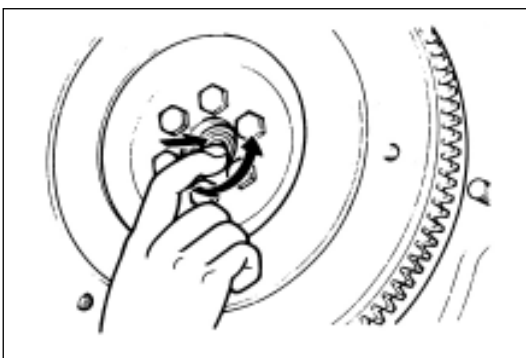
If the radial pendulum difference exceeds the max value, change the clutch rib.



3. measure the rdial pendulum difference of the flywheel;  
Check the radial pendulum difference of flywheel with multi-meter;

Max radial pendulum difference: 0.2mm

If the radial pendulum difference exceeds the max value, change the flywheel.

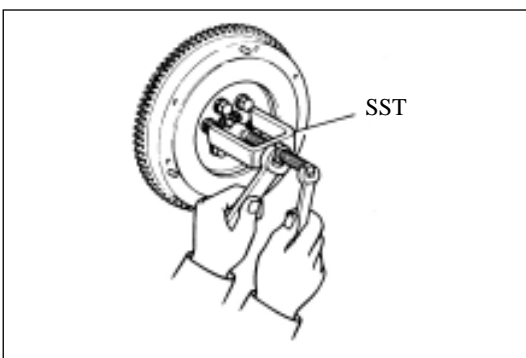


4. Check the guide bearing

Exert the force in radial direction to rotate the bearing by hand.

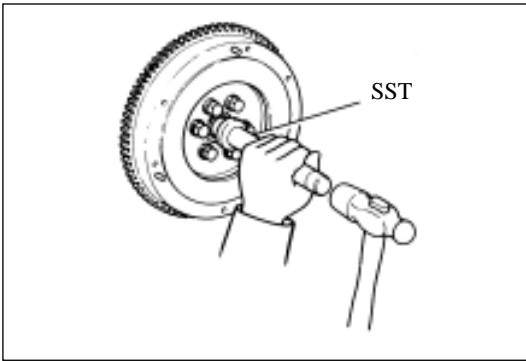
If the guide bearing doesn't run or if there is great resistance, change the guide bearing.

Remark: as this bearing is lubricated permanently, it needs not to be cleaned or lubricated.



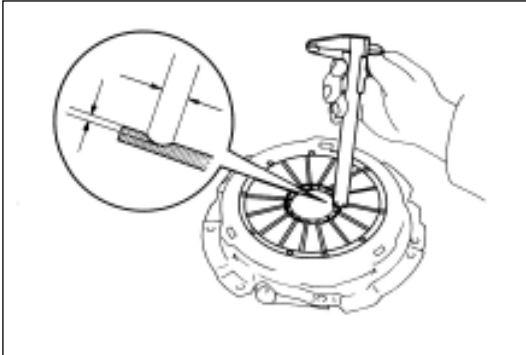
5. Change the guide bearing where necessary.

a) Tear down the guide bearing with SST;



b) Mount the guide bearing with SST.

Remark: the bearing shall be verified in good running after it is encased in the flywheel hub.

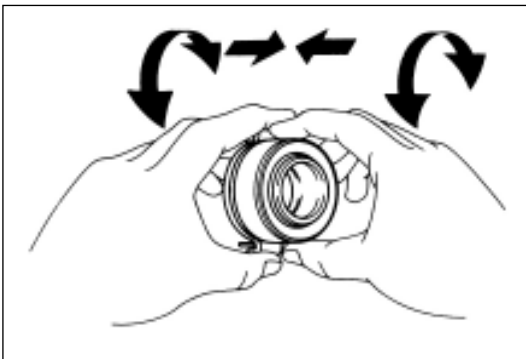


2. Check whether there is abrasion on the diaphragm spring. Check the abrasion depth and width of diaphragm spring with calipers.

Limit value: Max depth: 0.6mm

Max width: 5mm

If the abrasion depth or width of the diaphragm spring exceeds the limit value, change the diaphragm spring .



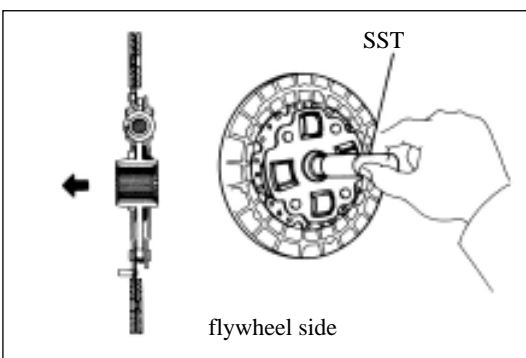
3. Check the separation bearing

Exert force in radial direction by hand to rotate the bearing.

If it cannot be rotated or if the resistance is too large, change the separation bearing.

Remark:

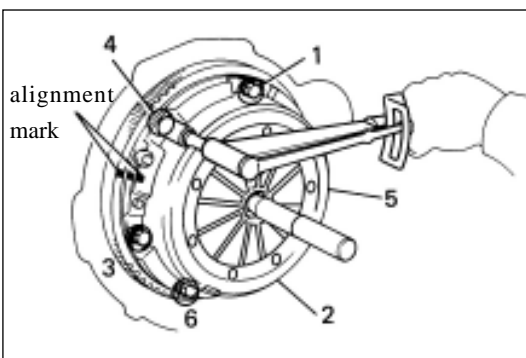
Remark: as this bearing is lubricated permanently, it doesn't need to be cleaned or lubricated.



## Mount of clutch cluster

1. Mount the clutch rib on flywheel;

Mount the clutch rib on flywheel with SST.



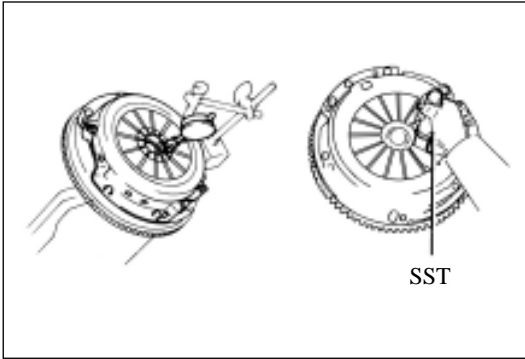
2. Mount the clutch pressure plate

a) Align the marks on clutch pressure plate and that on flywheel;

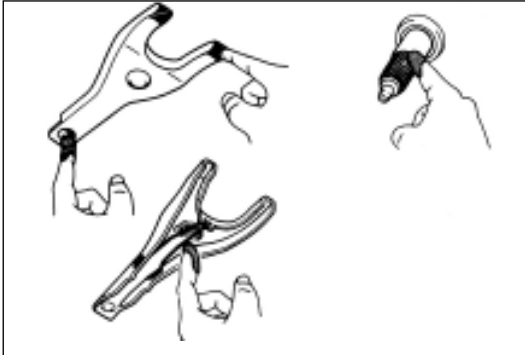
b) Screw up the bolts in even manner around the clutch pressure plate until pressure plate and the flywheel contact closely, then tighten the bolts.

Tightening moment: 30 N · m

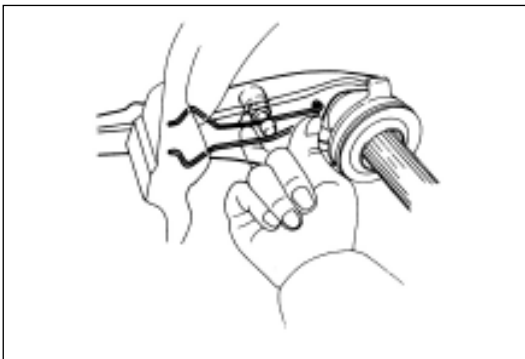
Remark: tighten the uppermost bolt of the three that is near to the locating pin.



3. Check the alignment of the diaphragm spring end.  
Check the alignment of diaphragm spring end with SST.  
Max dislocation: 0.5mm  
if the difference is more than the specified value, adjust the alignment of diaphragm spring end with SST.



4. Coat the lithium base grease;  
Coat the lithium base grease on the following parts:
  - Contact spot of separation fork and bearing
  - Contact spot of separation fork and push-rod;
  - Support spots of separation fork
  - Spline of clutch rib



5. Encase the dust cover, separation fork, separation bearing seat and bearing into the gearbox;
6. Mount the gearbox.

# Gear box

	page
Notice .....	MT-2
Troubleshooting .....	MT-3
Dismantle of Gear Box .....	MT-4
Mount of Gear Box .....	MT-7
Disassembly of Gear Box .....	MT-10
Input Shaft Assembly .....	MT-18
Element Drawing .....	MT-18
Inspection on Synchronizing Ring .....	MT-18
Bearing Change .....	MT-18
Output Shaft Assembly .....	MT-20
Element Drawing .....	MT-20
Disassembly of Output Shaft Assembly .....	MT-21
Inspection on Output Shaft Assembly .....	MT-23
assembly of Output Shaft Assembly .....	MT-25
Countershaft Assembly And Reverse Idle Gear	
Assembly .....	MT-29
Element Drawing .....	MT-29
Disassembly Inspection and Assembly of	
Countershaft Assembly .....	MT-29
Assembly of Reverse Gear .....	MT-31
Rear Housing assembly .....	MT-33
Element Drawing .....	MT-33
Change of Oil Seal .....	MT-33
Change of Shaft Bush .....	MT-33
Inspection on and change of Position-Limit	
Mechanism Cluster .....	MT-34
Front Cover of Bearing .....	MT-36
Element Drawing .....	MT-36
Change of Oil Seal .....	MT-36
Assembly of Gear Box .....	MT-37



## Notice

### Notice for disassembly and assembly of gearbox

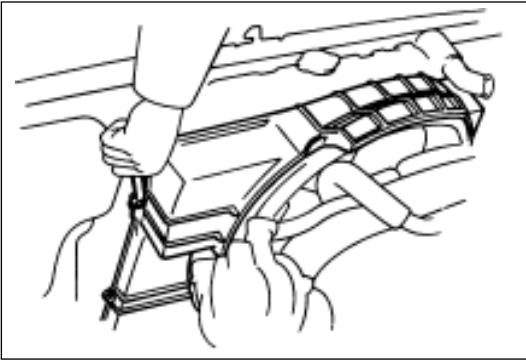
Notice shall be taken during the gear disassembly and assembly on the soft handle for the parts, especially for the coupling faces so as to avoid the collision; each part shall be put down in order to avoid the missing or mistaking.

Notice shall not only be taken in the aforesaid aspects, but also in the following items

1. Wash all parts before assembly (rubber fittings and washers excluded).
2. Various oil seals, retainer rings for shafts, spring-type pins shall not be reused.
3. Lubricating oil shall be coated on the friction surfaces, and lubricating grease shall be coated on the lips of oil seals.
4. Rolling elements shall not be used to transfer the pressure during the various bearing assembly.
5. Lip-type oil seal must not be sloping when assembling it.
6. The openness at the two ends of the spring collar shall be misfit when assembling the component elements of the synchronizing instrument, and
7. No part is allowed to leak the lubricating oil when the gearbox locating at its working place.

## Troubleshooting

Common Failures	Causes	Methods for troubleshooting
Difficulty in gear engagement	Non-use of clutch Non-full separation of clutch Severely worn tooth rings of synchronizing fittings Over-hard locating spring	Use the right driving approach Checking for adjustment Change Change
Over-loud or abnormal noise	Over-low oil level Lubricating oil of inferior quality Non-timely oil change Unsuitable axial location or clearance of gears Bearing damage Burr or collision on gear	Add oil to the specified level Change it with the specified oil Change the oil and damaged parts Check for adjustment Change Repair or change the gear
Oil leakage, oil penetration	Oil added above the specified level Loss or missing of bolts  Vent plug trouble Sealing element damage	Adjust oil to the given level Reassembling or fasten the bolt according to the specified torque Change Change
Damage of synchronizer	Overexert in gear shift Non-use of clutch Damage on spring collar of synchronizer Incorrect mounting of drive shaft	Change Use the right driving approach Change Check for adjustment
Non-engagement of gear	Trouble in controlling mechanism Incorrect assembling the locating spring or steel ball Invalidation of locating spring Severely worn gear sleeve or fork groove Seriously worn toggle fork	Check for adjustment Reassembly  Change Change Change
Burning bearing, burning gear	Over-low oil level Inferior lubricating grease Non-timely oil change, over-dirty oil Inter-use of differential oil or usage of additive	Change damaged parts and add oil Change the damaged parts and lubricating oil Change damaged parts and lubricating oil Change damaged parts and lubricating oil
Difficult in gear disengagement	Spring invalidation of synchronizer Worn inner groove of tooth ring of synchronizer Tooth ring of synchronizer choked on conical face Toggle fork deformation or toggle fork axle deformation Severely worn toggle fork	Change Change Change Change Change

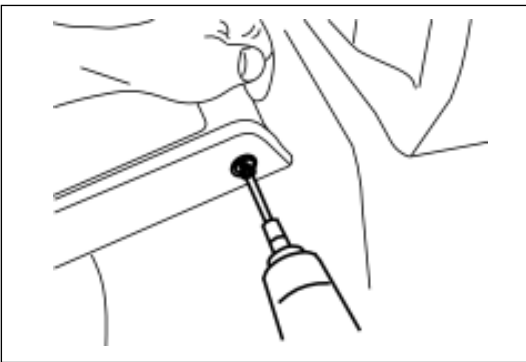


## Dismantle of gearbox

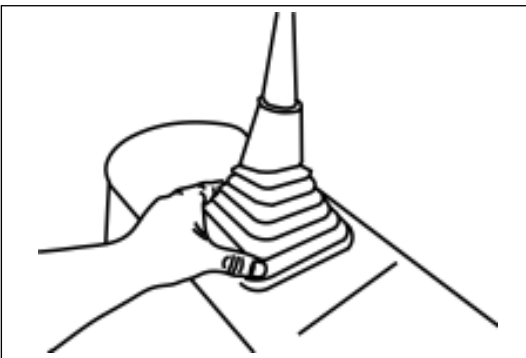
1. Disconnect the cathode wire from the cathode of storage cell.
2. Tear down the setting bolts of fan cover.  
Tear down 4



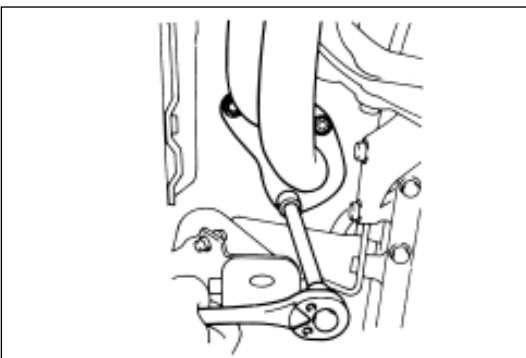
3. Tear down the shifting ball of gear change lever  
Loose the locking nuts by dextrorotating the ball.



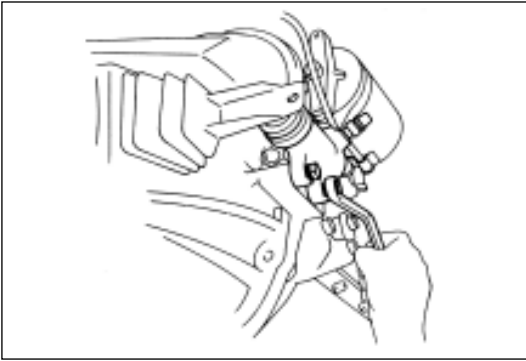
4. Tear down the glove box  
Dismantle the four bolts of the glove box and put the glove box into the suitable place.



5. Tear down the dust cover.
6. Tear down the gear change lever.
7. Raise the vehicle to discharge the oil in gearbox.  
Warning: the reliability of vehicle shall be verified.
8. Tear down the drive shaft.  
(See page PR-5)
9. Tear down the odometer sensor and the plugging elements of backup switch



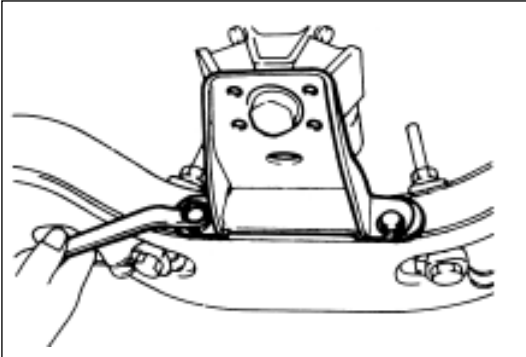
10. Tear down the vent pipe.  
Tear down the heading exhaust pipe from branch exhaust pipe



11. Tear down the wheel-brake cylinder of clutch.

- (a) Dismantle the setting bolts of the wheel-brake cylinder of clutch with spanner.
- (b) Hang the wheel-brake cylinder with a thread on the side of engine without oscillation.

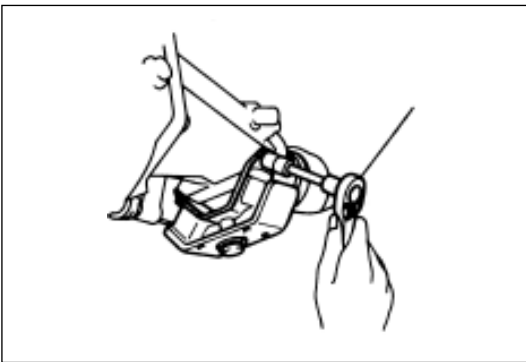
Remark: Do not disconnect the pipeline of the wheel-brake cylinder.



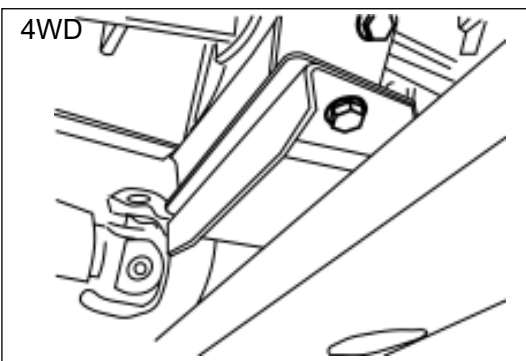
12. Tear down the pawl washer and bracket of the rear part of gearbox:

Two-wheel driving:

- (a) Dismantle the four bracket bolts (skip over this process for the welding structure).
- (b) Lift the engine with jack to raise the gearbox a little.

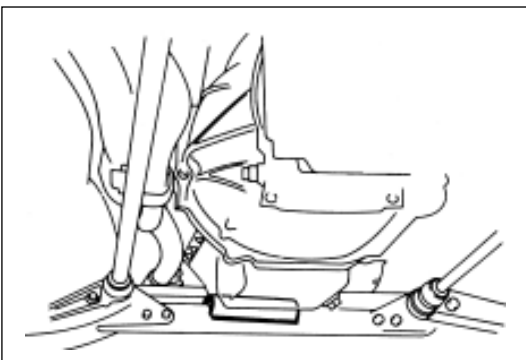


- (c) Dismantle the pawl washer from the rear part of gearbox.

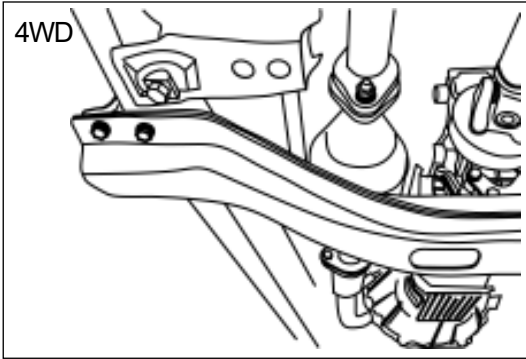


Four-wheel driving:

Dismantle the bolts from the pawl washer and bracket of the rear part of gearbox to tear down the pawl washer and bracket.

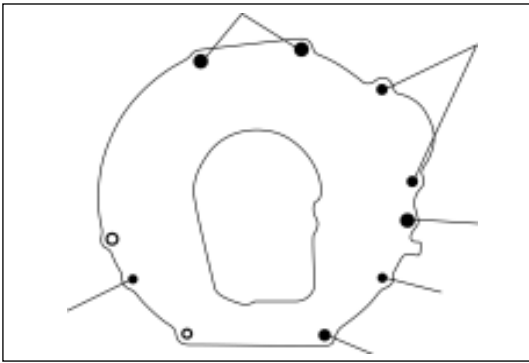


13. Insert the wooden plate between the bottom frame and the beam.



14. Dismantle the eight bolts that fasten the beam of gearbox.
15. Tear down the starter  
Put the starter on the side of engine.
16. Dismantle the bolts of clutch frame and bracket (wrapping angle).
17. Tear down the remaining bolts of gear box
18. Tear down the gear box
  - (a) Pull out the gear box in backward direction;
  - (b) Put down the engine at the front and tear down the gearbox from the vehicle.

Notice: be careful not to damage the dust cover of expansion shell.

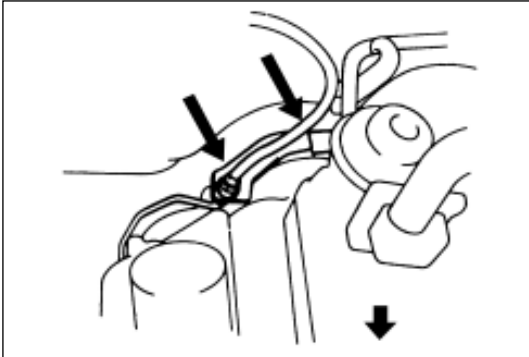


## Mount of gear box

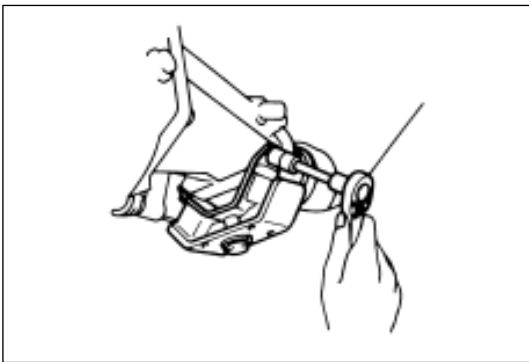
1. Put down the gearbox at the mounting place.
2. Mount the bolts of gearbox, clutch bracket and starter.

Tightening moment:

- (a) Setting bolt of gear box  $(82 \pm 10)\text{N} \cdot \text{m}$
- (b) Enforcement plate bolt  $(37 \pm 5)\text{N} \cdot \text{m}$
- (c) starter bolt  $(39 \pm 5)\text{N} \cdot \text{m}$



Notice: the bolts of gear box and clutch shall be mounted with the clutch pipe clip together.



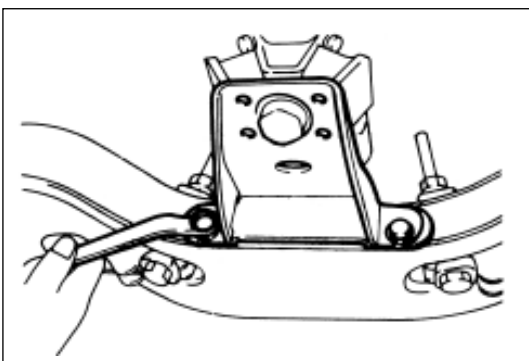
3. Mount the pawl washer and bracket of gearbox

Two-gear driving:

- (a) Mount the gearbox pawl washer and fasten the relative bolts.

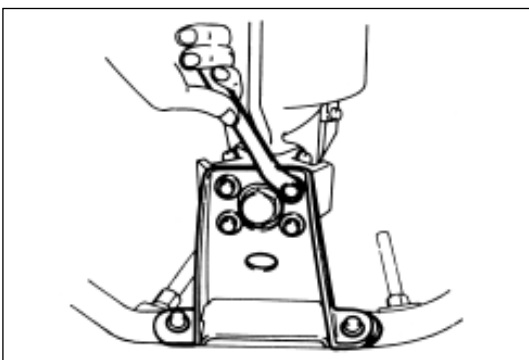
Tightening moment:  $23 \pm 3\text{N} \cdot \text{m}$

- (b) Lift the rear part of engine with jack and wooden block so that the gearbox is raised a little.



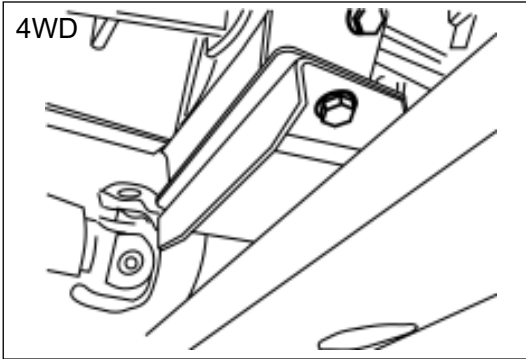
- (c) Mount the bracket of gear box on beam and fasten the relevant bolts (this process may skip over in welding structure)

Tightening moment:  $(23 \pm 3)\text{N} \cdot \text{m}$



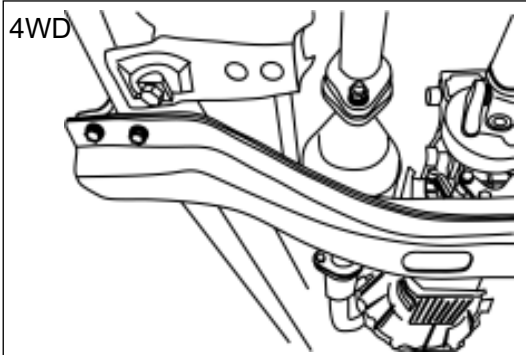
- (d) Connect the gearbox bracket and supporter with bolts, then tighten the bolts.

Tightening moment:  $(23 \pm 3)\text{N} \cdot \text{m}$

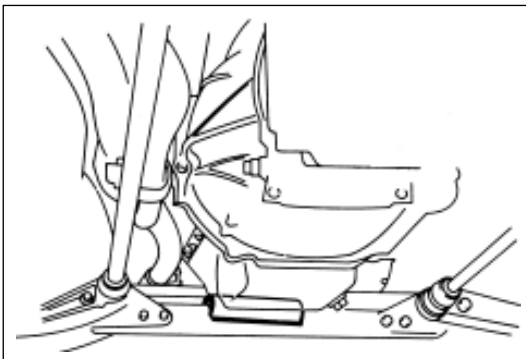


4WD:

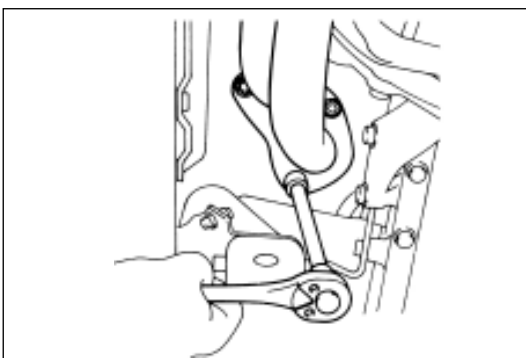
- (a) Mount the bracket and supporter of leg washers of rear engine in 4WD vehicle;(SF)



- (b) Mount and tighten the third beam of 4WD vehicle. (SF)



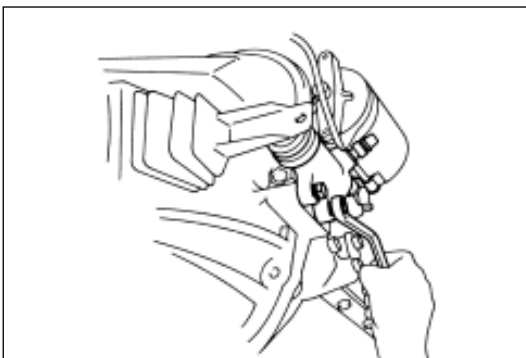
4. Remove the wooden spill.



5. Mount exhaust pipe.

Mount the exhaust pipe on the branch exhaust pipe.

Tightening moment:  $(62 \pm 3) \text{N} \cdot \text{m}$



6. Mount the wheel-brake cylinder of clutch.

Tightening moment:  $(18 \pm 2) \text{N} \cdot \text{m}$

7. Mount odometer sensor and plugging elements of backup switch.

8. Connect the drive shaft.

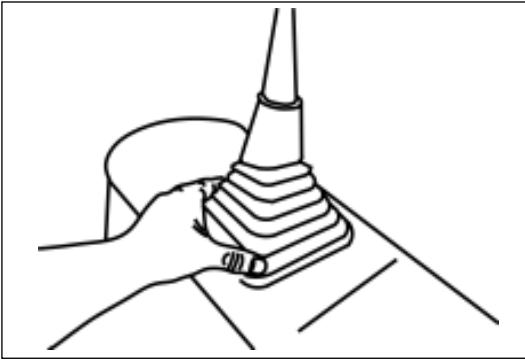
(See page PR-12)

9. Add oil into the gearbox.

Lubricating oil grade: GL-5 85W/90

Volume: 2.4L(dry)

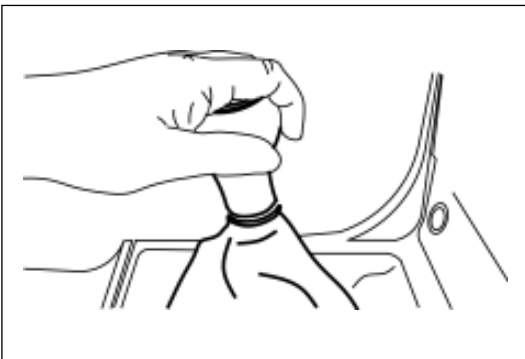
Remark: the Tightening moment of oil filling/draining plug:  $(30 \sim 50) \text{N} \cdot \text{m}$



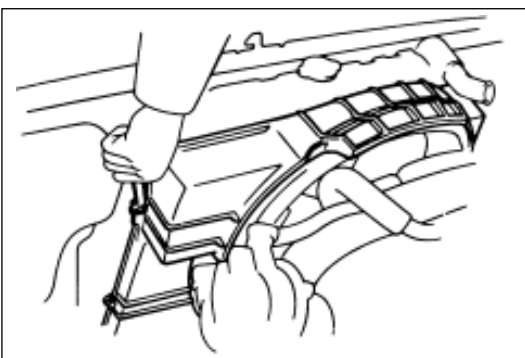
10. Drop the vehicle.
11. Mount the dust cover and gear change lever.



12. Mount storage box.

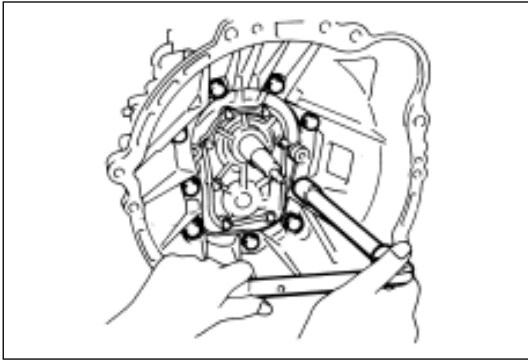


13. Mount the manual ball, and



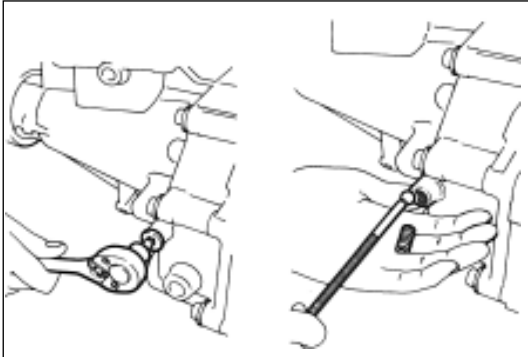
14. Mount the fan cover and fasten the bolts.  
Mount on them and screw up the four bolts.
15. Connect the cell cable to the cathode of storage cell; and
16. Conduct the load test  
Check whether there is abnormal noise and whether the operation is stable.



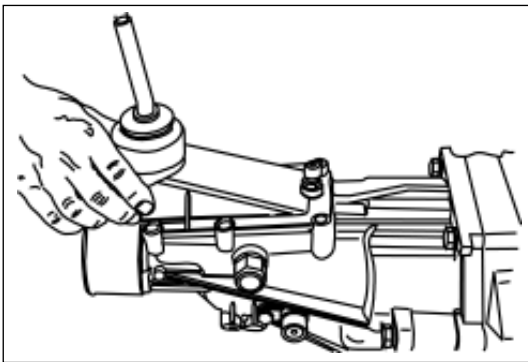


## Disassembly of Gear Box

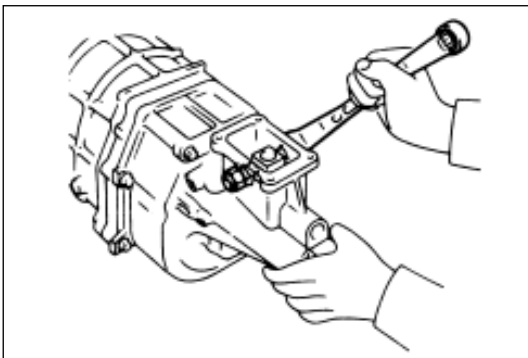
1. Tear down the separation toggle fork and separation bearing.
2. Tear down the backup switch, the driven gear of speedometer.
3. Tear down the clutch from the gearbox frame.  
Take apart the nine bolts.



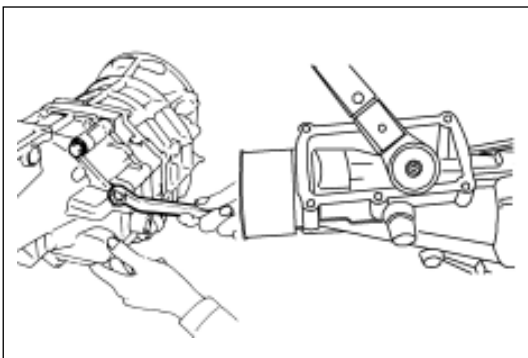
4. Tear down bolts of locating spring of the five-speed toggle fork, locating spring and locking ball.
  - (a) Dismantle the bolts from the rear cover with the torque socket spanner.
  - (b) Take out the spring and locking ball with magnetic rod.



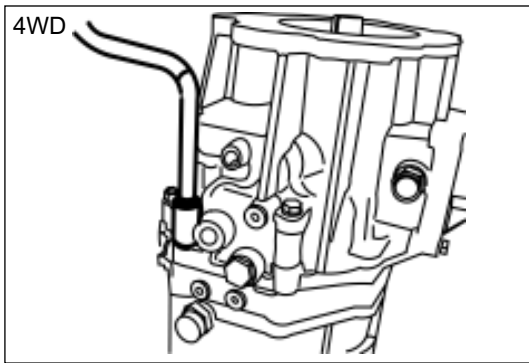
5. Tear down the operating seat of gear change lever.
  - (a) Dismantle the setting bolts of the operating seat of gear change lever.
  - (b) Take away the operating seat lightly and put it at the suitable place.



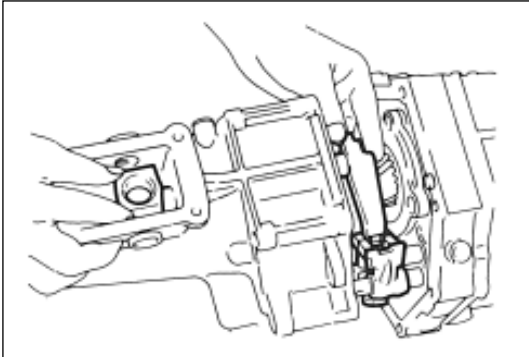
6. Tear down axial locating pin assembly of shifting gear.



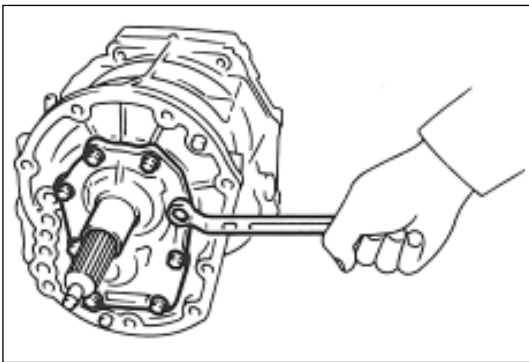
7. Tear down the fastening nuts of extension frame.
  - (a) Tear down the fixing bolts of gearshift shaft.
  - (b) Tear down the fastening nuts of expansion shell.



(c) Dismantle the nuts of the four-gear driven extension fram.

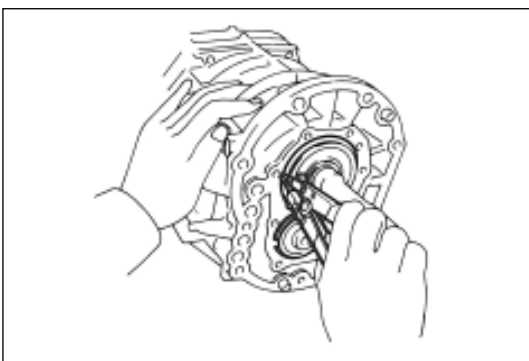


(d) Tap the extension frame lightly with rubber hammer to tear down the selective gearshift shaft and selective rocker arm.

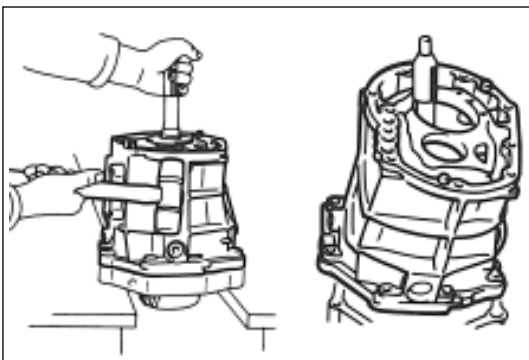


8. Tear down front cover.

Dismantle the eight bolts and front cover and axial oil seal.



9. Tear down the input shaft, axial/bearing open ring and countershaft bearing open ring.

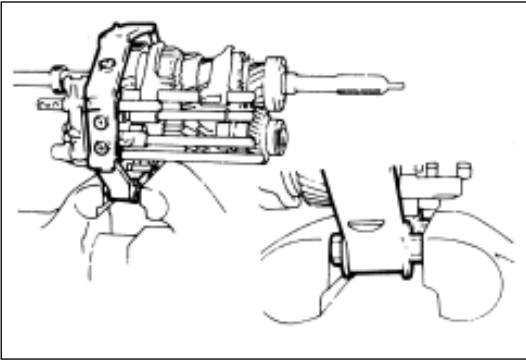


10. Dismantle the gearbox frame from the central link plate,

(a) Put the gearbox straightly as shown in the drawing.

(b) Tap out the gearbox frame out carefully with the rubber hammer. And

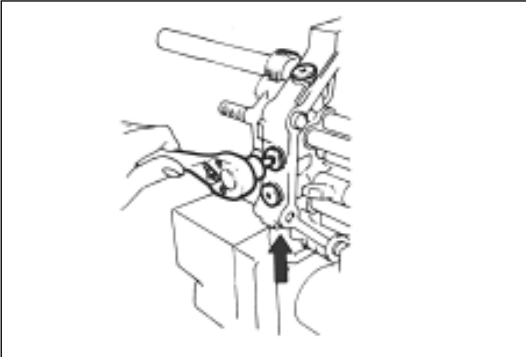
(c) Pull out the gearbox frame out from the central link plate as the drawing shows



11. Grip the central link plate in the table vice,
  - (a) Use two clutch bolts, washers and suitable nuts as shown in the drawing.

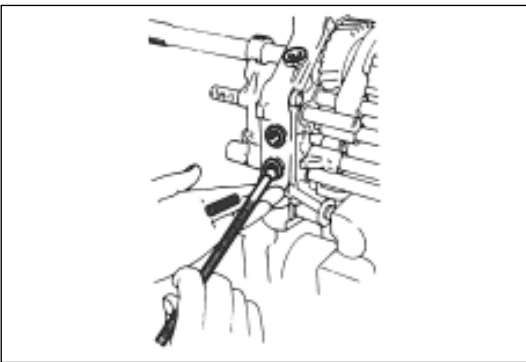
Remark: mount the washer in the reverse direction, increase and decrease the washer quantity to flush the bolts terminal with the external face of the washer.

- (b) Grip the central link plate in the table vice.

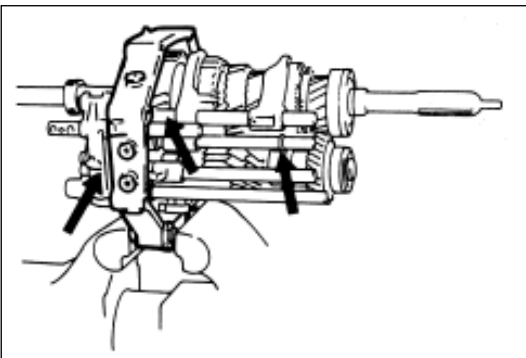


12. Tear down the locating spring bolts, locating spring and locking ball,

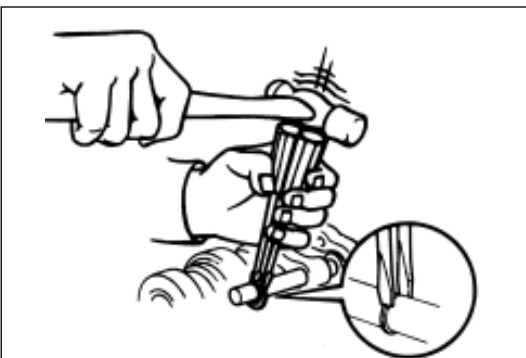
- (a) Dismantle each locating spring bolts with the torque socket spanner.

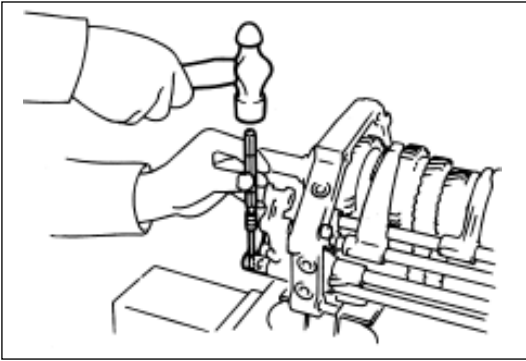


- (b) Take out the toggle fork axles of the first, second, third, fourth and reverse as well as the axial locating spring and locking ball of the fifth-gear toggle fork.

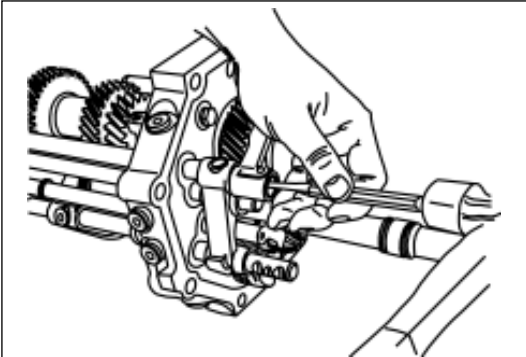


13. Tear down the axial retainer ring of the gearshift fork  
Tap the axial retainer ring of gearshift fork lightly with two screwdrivers and one hammer.

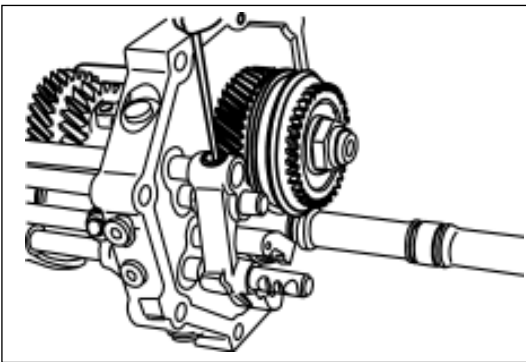




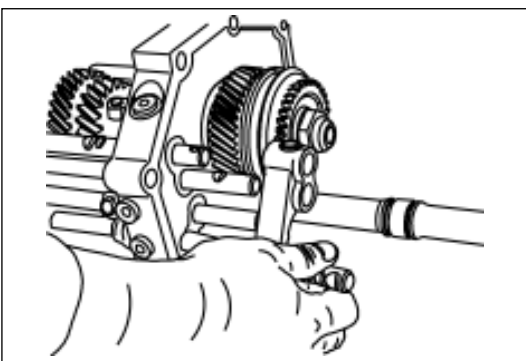
14. Tear down the five-speed gearshift toggle fork,  
(a) Punch out the spring pin with impact head and hammer.



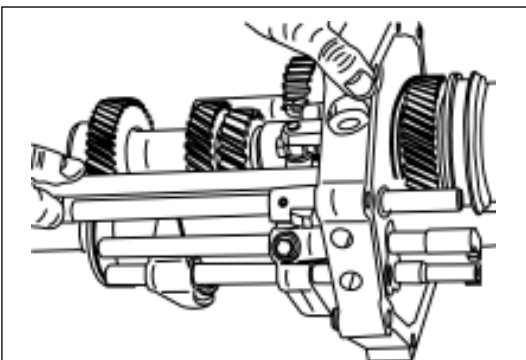
- (b) Tap the five-speed gearshift fork until take it out.  
Notice: It must be the neutral location this time.



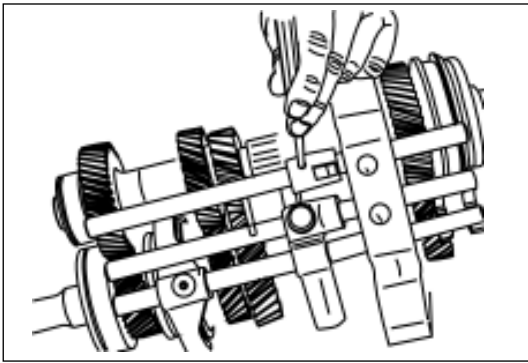
15. Tear down the guiding module of the five-speed gear-shift and five-speed reverse shift fork axle.  
(a) Take out the inter-locking steel ball from the guiding module of the fifth reverse shift-shaft.



- (b) Tear down the fifth reverse shift guiding module and fifth reverse shift fork axle.

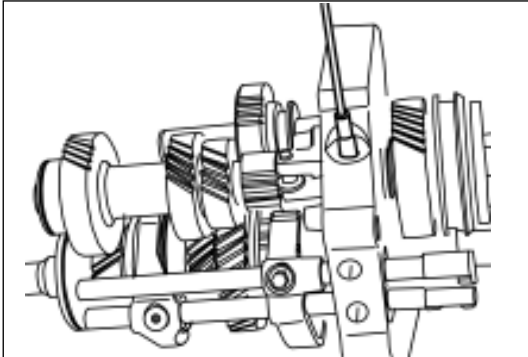


16. Take out the five-speed gearshift fork axle



17. Tear down the reverse shift fork axle, reverse rocker arm, reverse toggle lever and toggle block

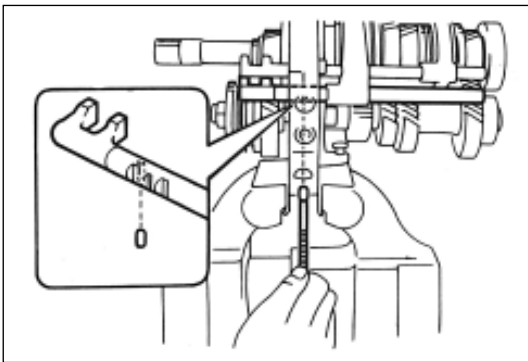
(a) Tap out the spring pin with the nail punch and hammer.



(b) Take out the interlocking ball and interlocking guidepost between the reverse shift fork axle and the five-speed gearshift fork axle.

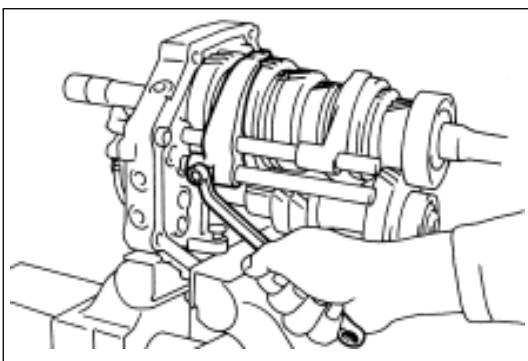
(c) Tear down the reverse shift fork axle, and

(d) Tear down the reverse rocker arm and yoke block.

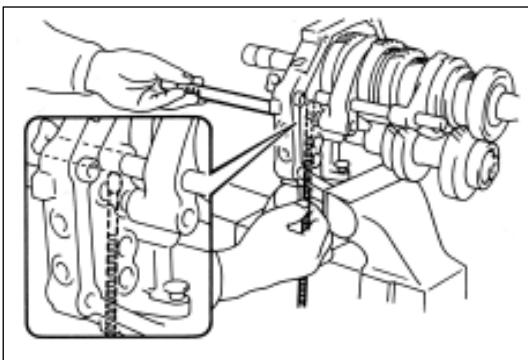


18. Tear down the first-second-speed gearshift fork axle.

(a) Take out the interlock pin and interlock guide post between the reverse shift fork axle and the five-speed gearshift fork axle.

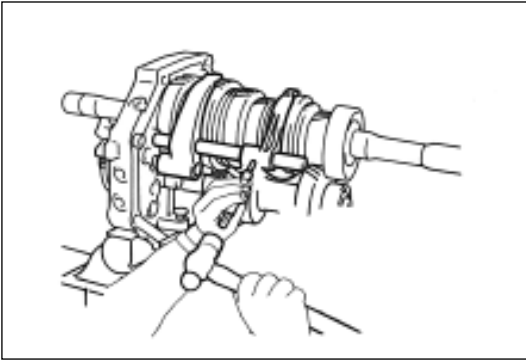


(b) Dismantle the locating bolts of the toggle fork of the first-second-speed gearshift toggle fork.



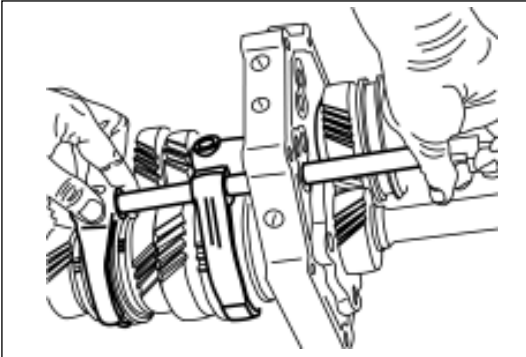
(c) Dismantle the fork axis of the first-second-speed gearshift.

(d) Take out the short interlock pin between the first-second-speed gearshift fork axle and the third-fourth-speed gearshift fork axle

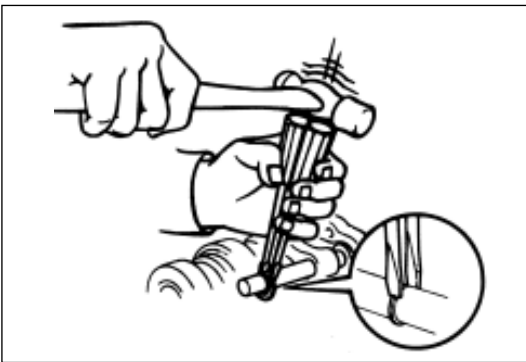


19. Tear down the third-fourth-speed gearshift fork axle and the toggle forks of first-second speed gear and third-fourth speed gear.

(a) Tap out the spring pin with the nail punch and hammer.

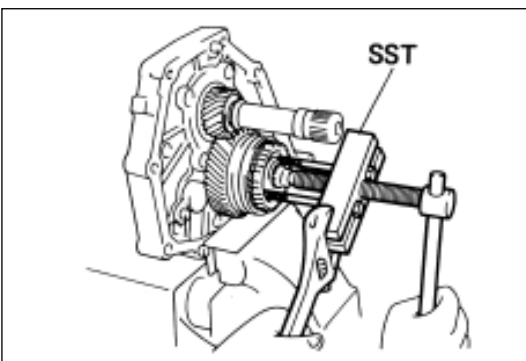


- (b) Tear down the toggle forks of the third-fourth and first-second-speed gearshift.

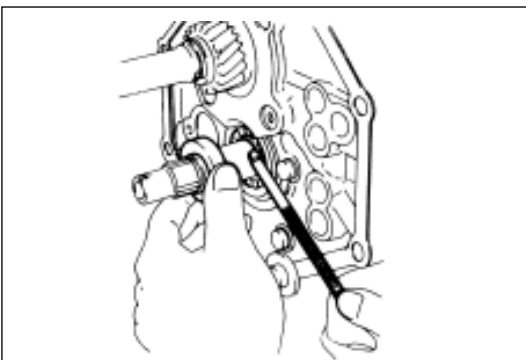


20. Tear down the coupling gear, synchronizer, gear cluster, thrust washer and needle bearing of the five-speed gearshift

(a) Tap down the retainer ring of the rear countershaft with two screwdrivers and one hammer.



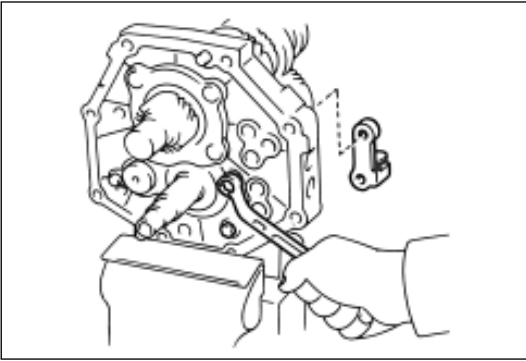
- (b) Tear down the synchronizer assembly, coupling gear and gear cluster of the five-speed gearshift. And  
(c) Dismantle the five-speed needle bearing.



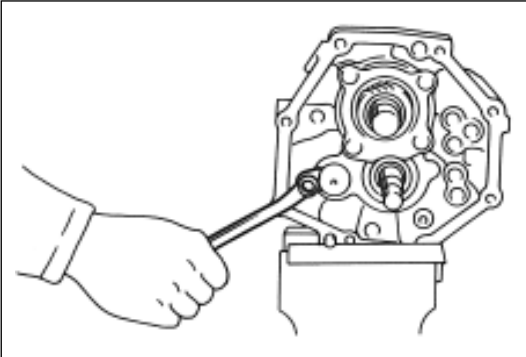
21. Tear down the thrust washer and five-speed lock ball.

(a) Tear down the thrust washer of five-speed gear.

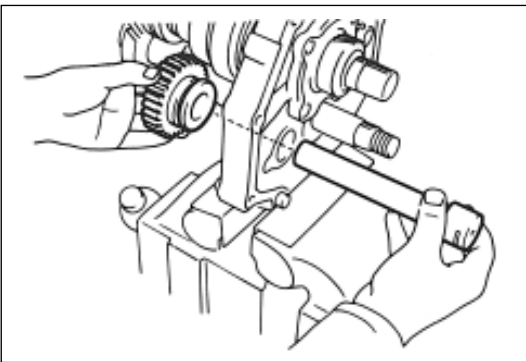
(b) Take out the lock ball with magnetic rod.

**22. Tear down the reverse rocker arm bracket**

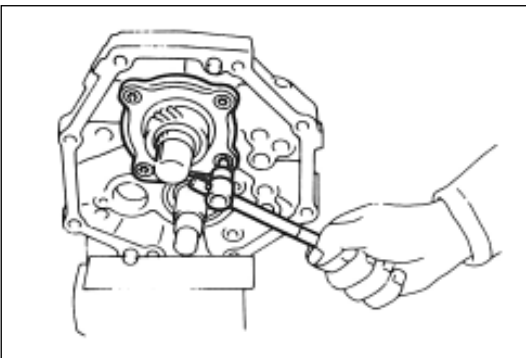
Dismantle the two bolts and the reverse rocker arm bracket.

**23. Tear down the reverse idle gear and reverse idle gear axle**

(a) Dismantle the setting bolts of idle gear and the pressing plate of reverse idle gear axle.

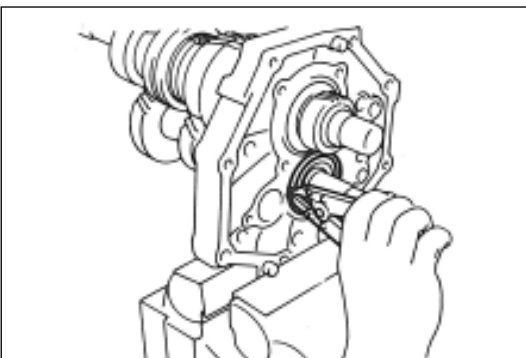


(b) Dismantle the reverse idle gear and the reverse idle gear shaft.

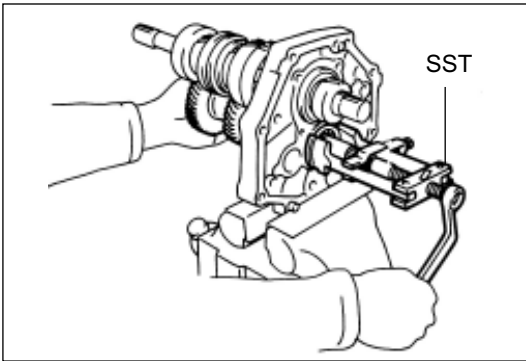
**24. Take down the bearing baffle of the output shaft.**

(a) Dismantle the four bolts with torque socket spanner.

(b) Take down the bearing baffle of the output shaft.

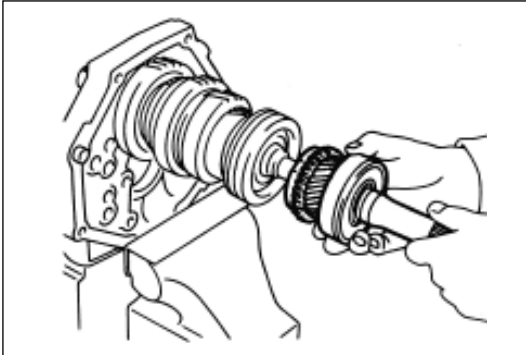
**25. Dismantle the intermediate-gear shaft.**

(a) Pry out the split ring of the rear bearing of the intermediate-gear shaft with the split-ring-type pliers.



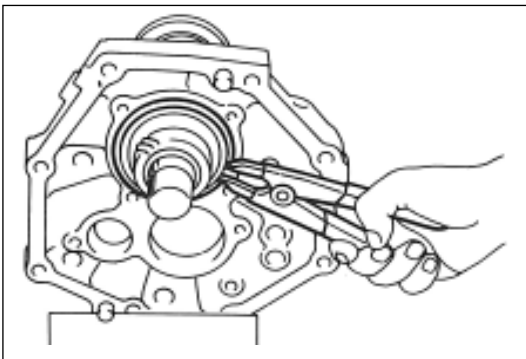
(b) Take apart the rear bearing of intermediate shaft with SST tool and wrench.

(c) Take down the intermediate shaft.



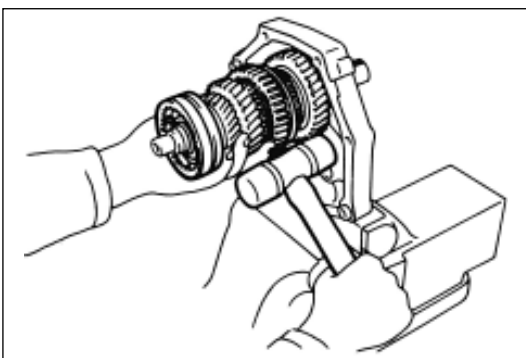
## 26. Tear down the input shaft

Tear down the bearing with 13 needles and synchronizing ring from the input shaft.

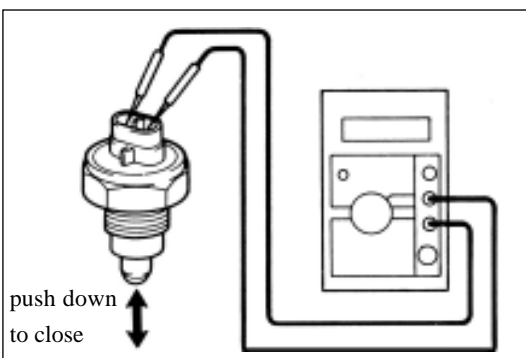


## 27. Tear down the output shaft

(a) Dismantle the stop ring from the output bearing with split-ring-type pliers.



(b) Tap lightly the central link plate with rubber hammer while pulling the output shaft manually to tear down the output shaft.

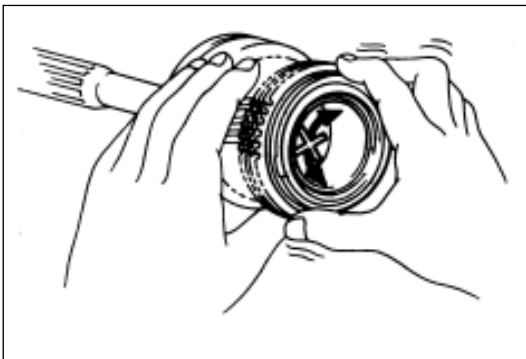
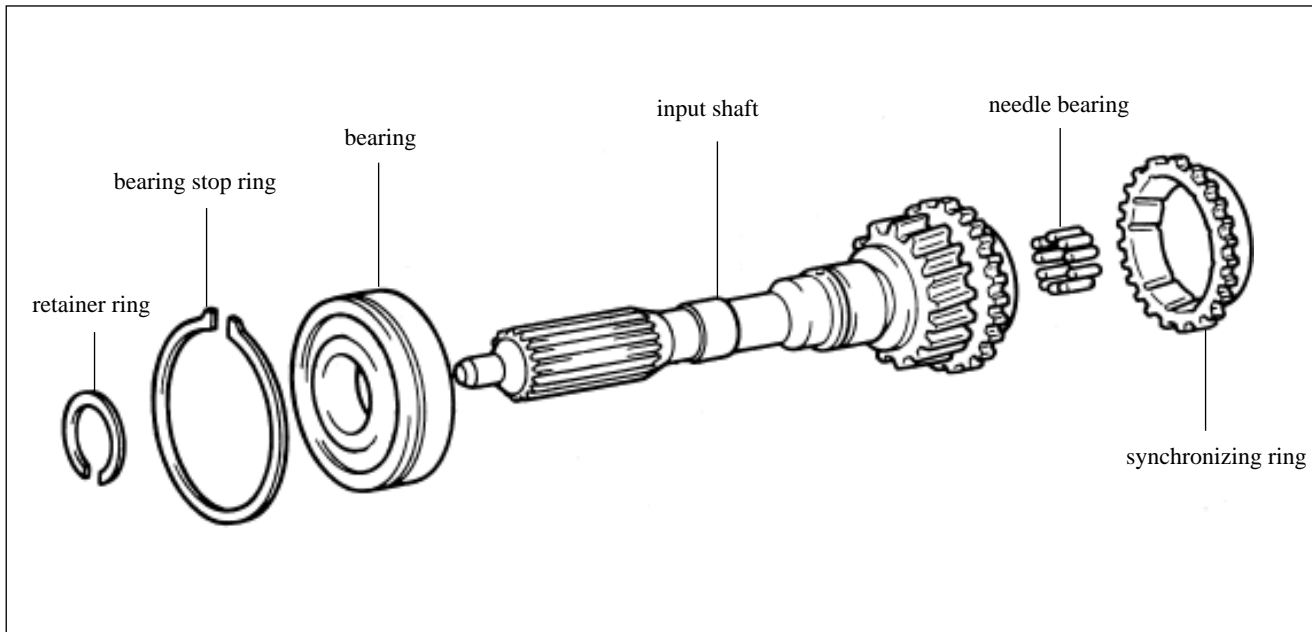


## 28. Check the back-up lamp switch

Check the terminal connection, when the switch is pressed down, as shown in the drawing, it is connected, otherwise is disconnected, in case the switch is not in conformity with this, it shall be changed.

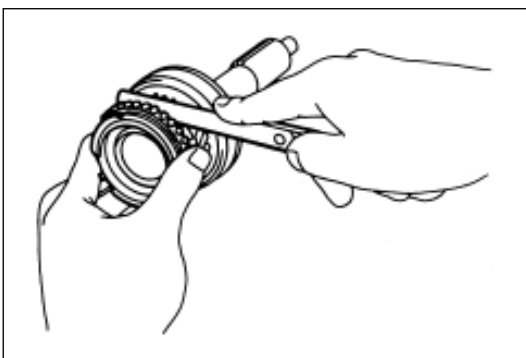


## Input Shaft Assembly element drawing



### Inspection on Synchronizing Ring

1. Run the synchronizing ring and put it into the assembly to check its stopping performance



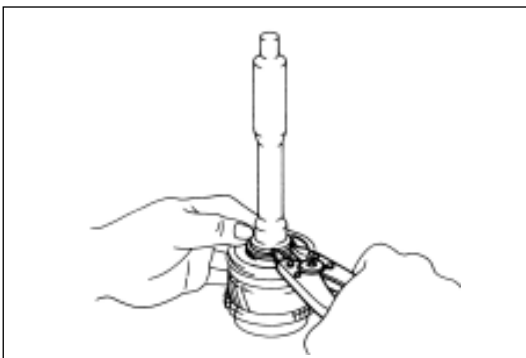
2. Check the clearance between the rear face of synchronizing ring and the gear.

Standard clearance:

Tung tooth: (1 ~ 1.6)mm

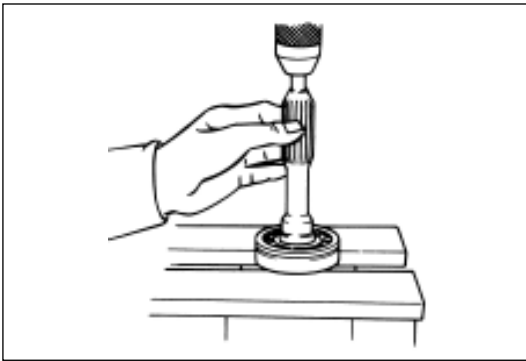
Upper tooth: (1.5 ~ 1.8)mm

Limit clearance: 0.8mm

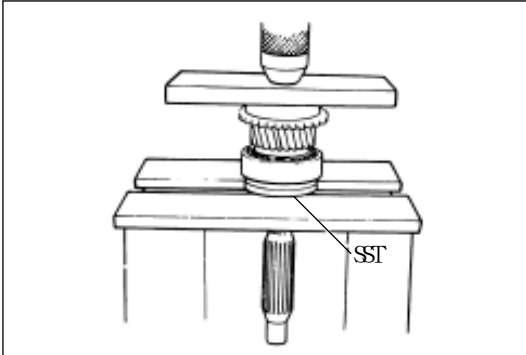


### Bearing Change

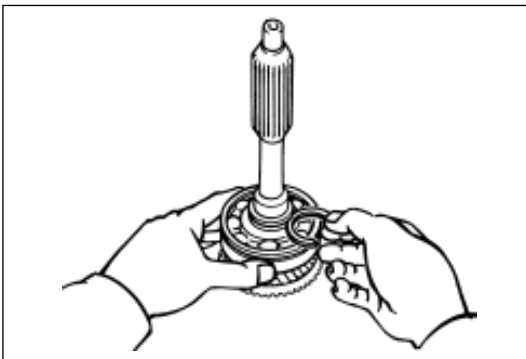
1. Tear down the input shaft bearing with the pressure machine.



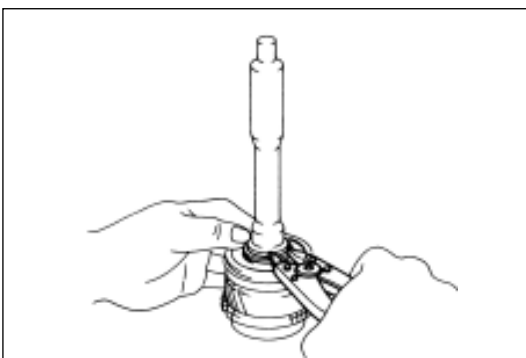
2. Mount the new bearing with pressure machine and SST.



3. Select the retainer ring to obtain the minimum axial clearance



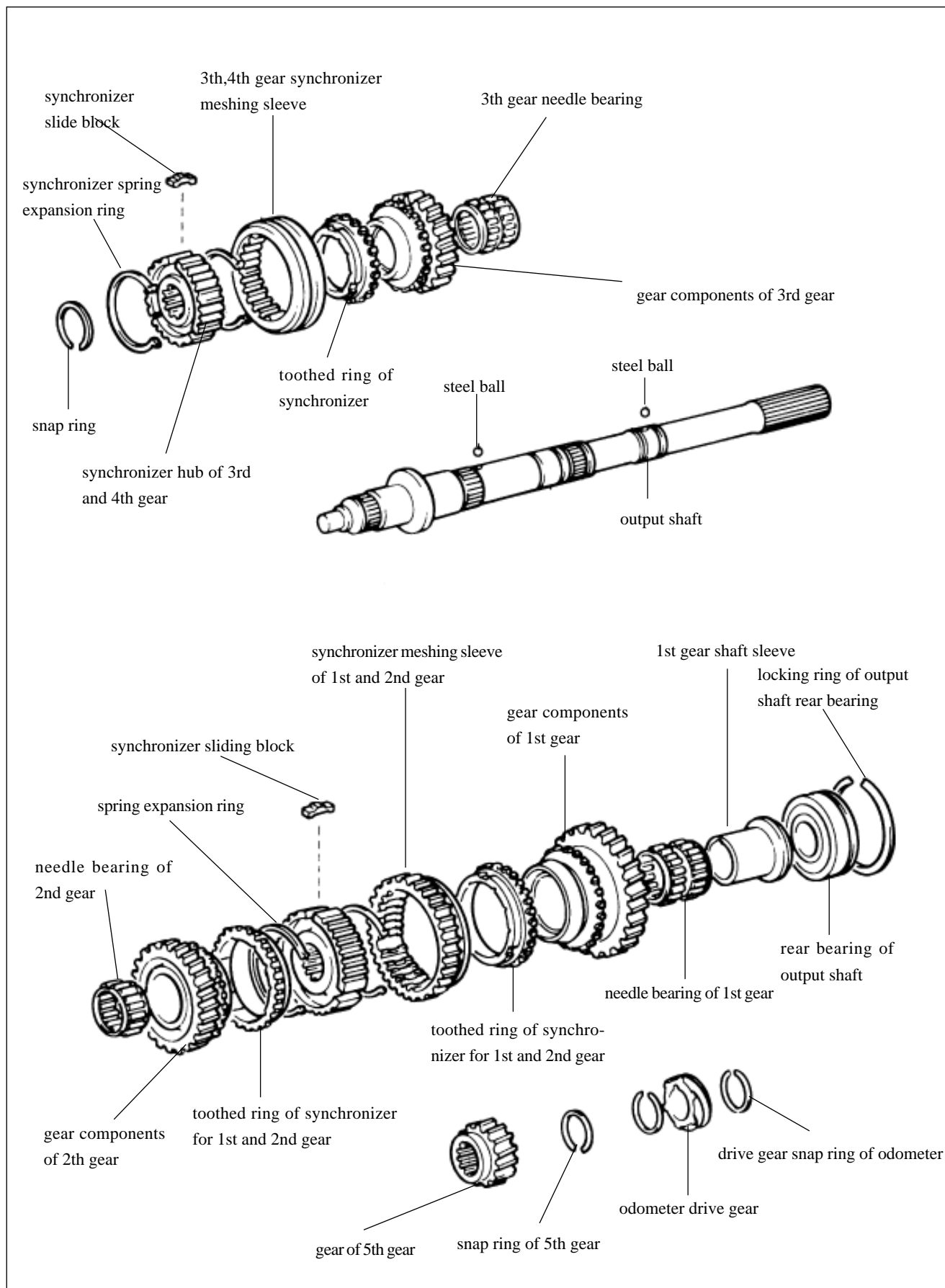
4. Mount the retainer ring with the split-ring-type pliers.

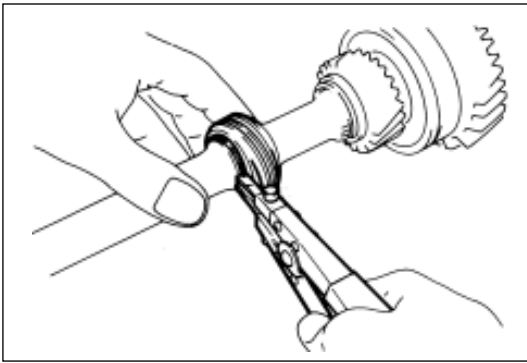


5. Mount the retainer ring with the split-ring-type pliers.

## Output shaft assembly

### Components figure

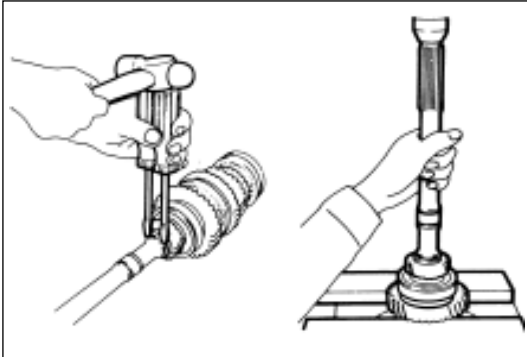




## Disassembly of output shaft assembly

### 1. Remove the drive gear of speedometer

- (a) Pry down the two shield rings with open end ring plier
- (b) Dismantle the drive gear of tachometer.
- (c) Take out the steel ball with magnetic stick.



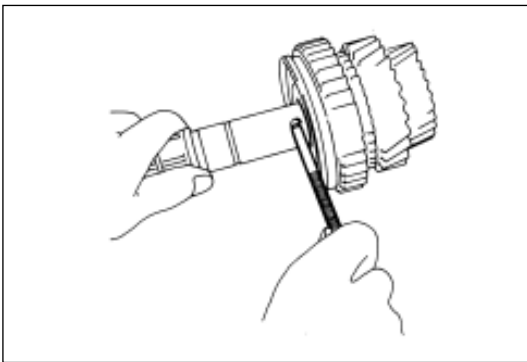
### 2. Remove the 5th gear, rear bearing of output shaft, 1st gear assembly, 1st gear shaft sleeve and needle bearing of 1st gear

- (a) Take down the circlip of 5th gear with two screwdrivers and one hammer.
- (b) Dismantle the rear bearing of output shaft, 1st gear assembly and 1st gear sleeve with press machine.
- (c) Remove the needle bearing of 1st gear.

### 3. Remove the synchronized ring

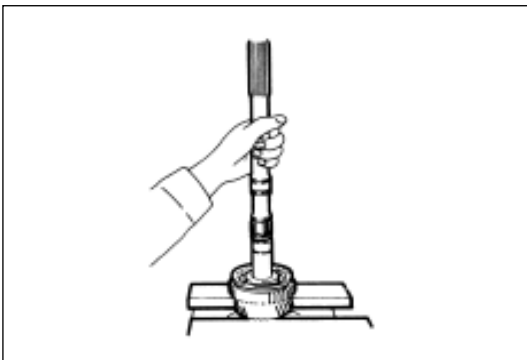
### 4. Take down the steel ball

Take out the steel ball with magnetic rod.

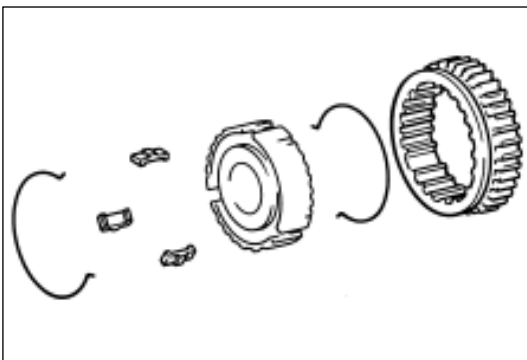


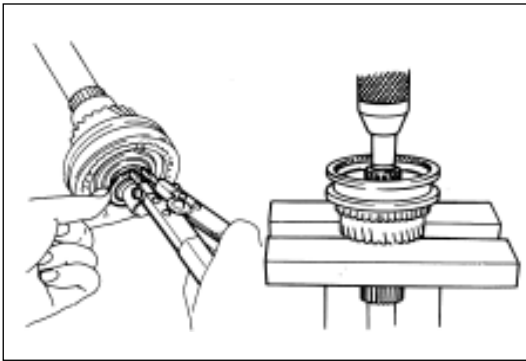
### 5. Take down the 1st and 2nd gear synchronizer assembly, 2nd gear assembly, and 2nd gear needle bearing.

- (a) Remove the 1st and 2nd synchronizer assembly and 2nd gear components.
- (b) Take off the needle bearing of the 2nd gear.

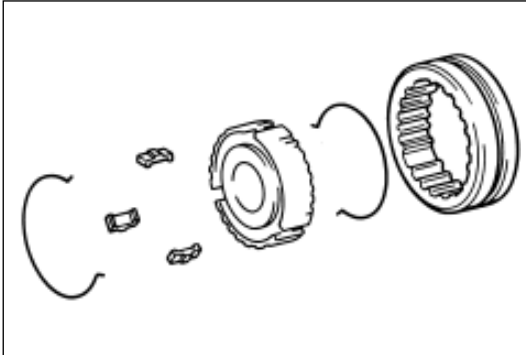


### 6. Take down the meshing sleeve, sliding block and spring. Remove the three sliding blocks and two springs from the synchronizer assembly with one screwdriver.

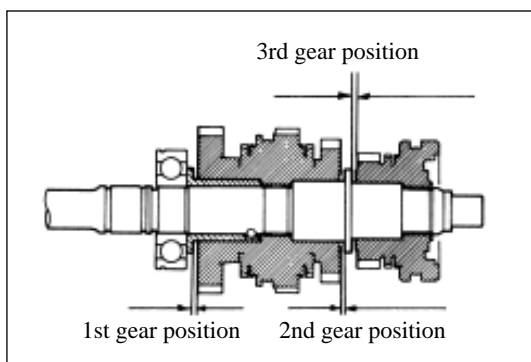




7. Take down the 3rd and 4th gear synchronizer assembly, 3rd gear and needle bearing .
  - (a) Remove the snap ring with plier for snap ring.
  - (b) Take down the 3rd and 4th gear synchronizer assembly and 3rd gear with press machine.
  - (c) Remove the needle bearing .



8. Take off the meshing sleeve ,sliding block and spring from 3rd and 4th synchronizer.  
Remove the three sliding blocks and spring from the meshing sleeve with one screwdriver.

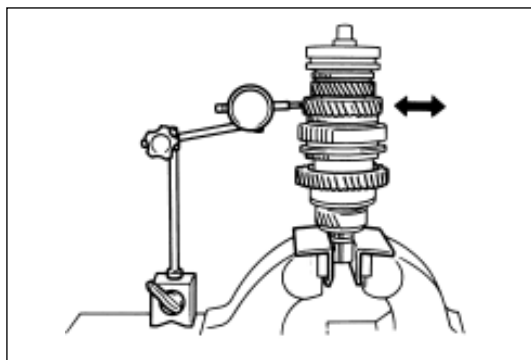


## Inspection of output shaft assembly

1. Check the axial clearance of every gear:

For the transmission made by Shang Chi:(0.15~0.33) mm(1st,2nd,and 3rd gear position)

For the transmission made by Tang Chi:(0.1~0.25)mm (1st gear position)(0.09~0.26)mm,(2nd and 3rd gear position)



2. Measure the idle clearance of every gear.

Check the radial clearance of every gear with micrometer.

Standard clearance:

For the transmission made by Shang Chi:0.05mm (1st,2nd,and 3rd gear position)

For the transmission made by Tang Chi:

(0.009~0.033)mm(2nd and 3rd gear position)

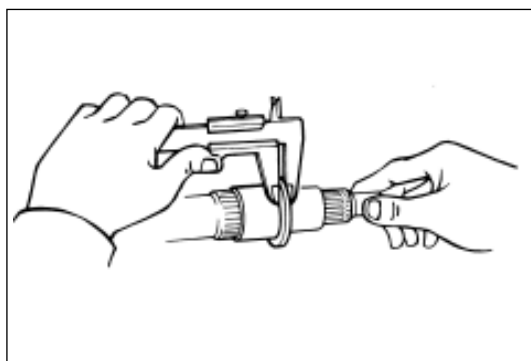
(0.009~0.032)mm(1st gear position)

Max clearance:

For the transmission made by Shang Chi:0.05mm

For the transmission made by Tang Chi:0.033mm (2nd,and 3rd gear position);0.032(1st gear position)

If the clearance value exceeds the limit above , the gear, needle bearing or shaft should be changed.



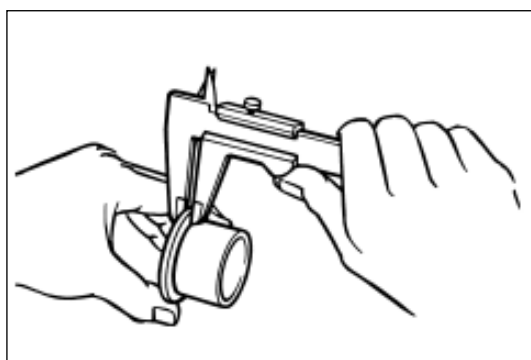
3. Inspection for output shaft and 1st gear shaft sleeve

(a) Measure the thickness of output shaft flange with callipers

Min thickness:

For the transmission made by Shang Chi:4.75mm

For the transmission made by Tang Chi:4.65mm

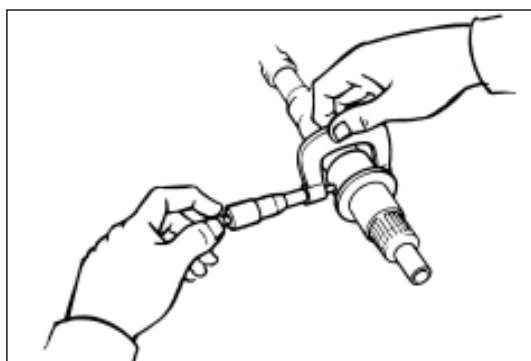


(b) Measure the thickness of flange of 1st gear shaft sleeve with callipers

Min thickness:

For the transmission made by Shang Chi:3.87mm

For the transmission made by Tang Chi:3.795mm

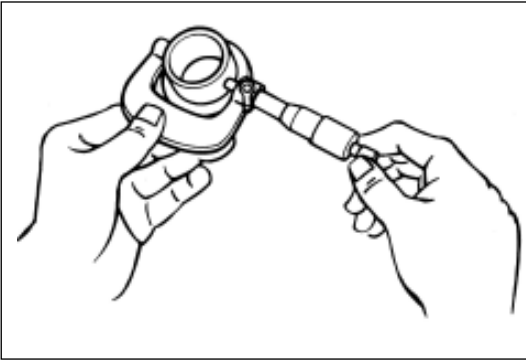


(c) Measure the outside diameter of the journal of output shaft with micrometer.

Min diameter:19.216mm

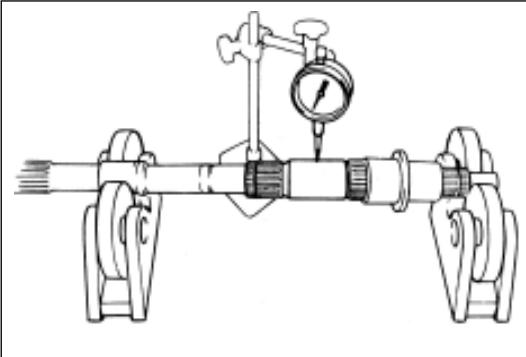
Gear of 2nd gear:37.984mm

Gear of 3rd gear:34.984mm



- (d) Measure the outside diameter of the gear sleeve of 1st gear with micrometer.

Min diameter:38.984mm.

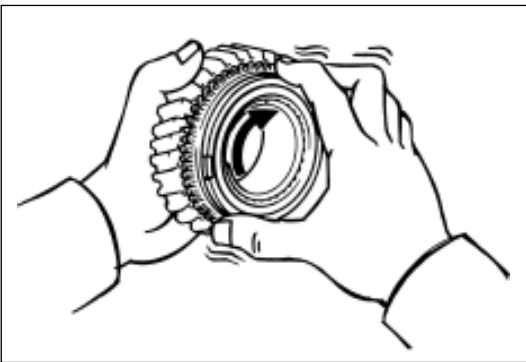


- (e) Measure the radial run out tolerance of the shaft with micrometer.

Max radial run out tolerance:

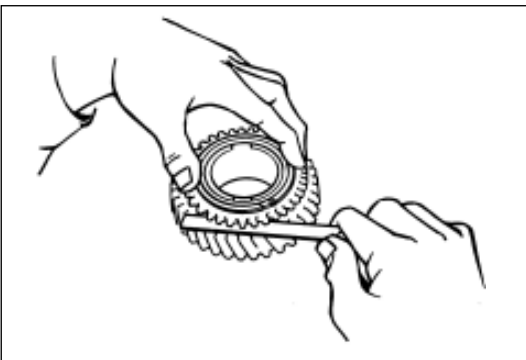
For the transmission made by Shang Chi:0.015mm

For the transmission made by Tang Chi:0.05mm



#### 4. Check the synchronized ring

- (a) Turn the ring ,and put it into to check the brake action.



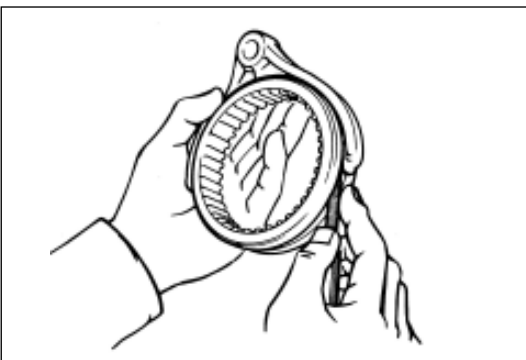
- (b) Measure the gap between the rear of the synchronized ring and gear end.

Standard clearance:

For the transmission made by Shang Chi:(1.5~ 1.8)mm

For the transmission made by Tang Chi:(1.2 ± 0.4)mm

Limit clearance:0.8mm



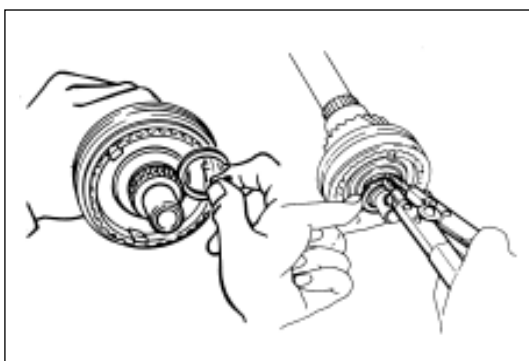
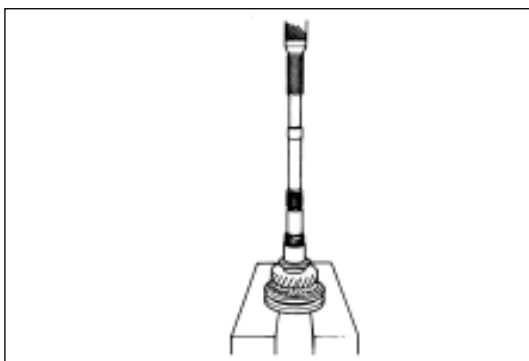
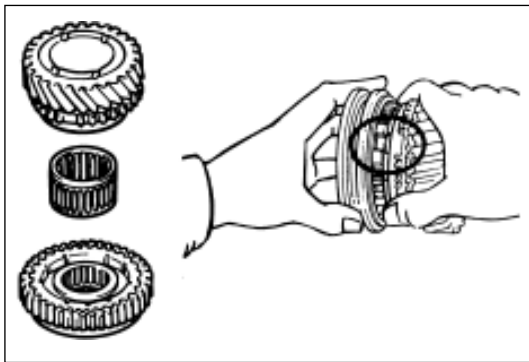
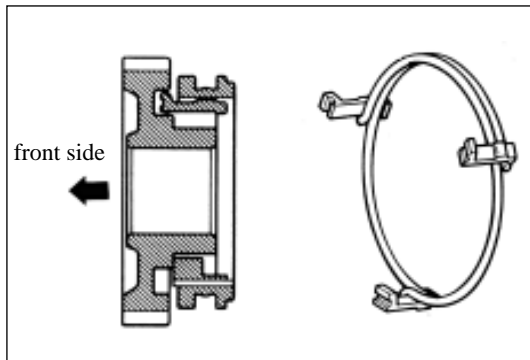
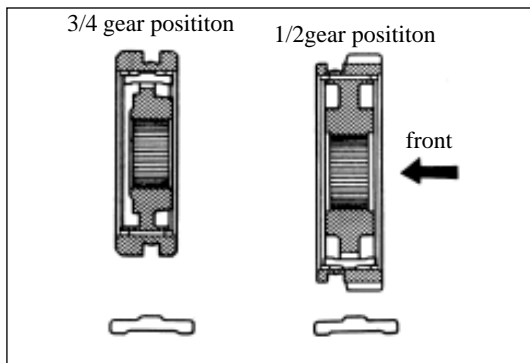
#### 5. Measure the clearance between the gear shifting fork and meshing sleeve

Check the clearance between the gear sleeve and gear shifting fork with feeler gauge.

Max clearance:

For the transmission made by Shang Chi: 0.54mm

For the transmission made by Tang Chi: 0.7mm



## Assembly of output shaft assembly

### 1. Assembly of synchronizer

- (a) Insert the synchronizer hub and sliding block into the gear sleeve.

- (b) Install the spring expansion ring under the sliding block.  
Note: The openings of spring expansion ring should be staggered during installation.

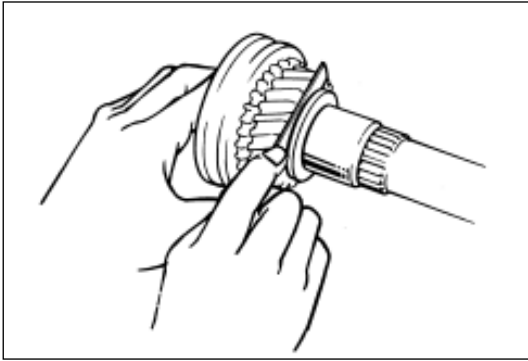
### 2. Install the gear components of 3rd gear and synchronizer of 3rd and 4th gear on the output shaft.

- (a) Smear the gear oil on the shaft and the needle bearing of 3rd gear.
- (b) Put the synchronized ring on the components of gear of 3rd gear, and align the notch of synchronized ring and sliding block.
- (c) Install the needle bearing into gear components of 3rd gear.
- (d) Assemble the gear components of 3rd gear and synchronizer of 3rd and 4th gear with pressing machine.

### 3. Assembly of snap ring for shaft

To choose one snap ring which make the axial clearance be Min, and install it on the shaft.

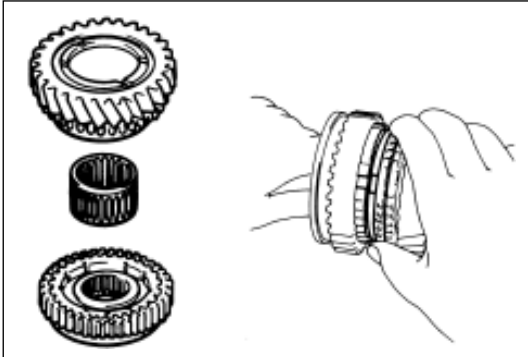




Standard clearance:

For the transmission made by Shang Chi: (0.15~0.33)mm

For the transmission made by Tang Chi: (0.09~0.33)mm

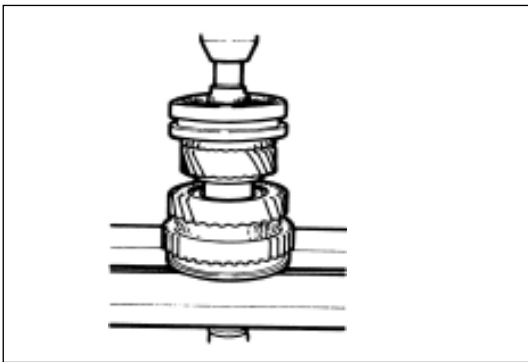


5. Assembly for the gear components of 2nd and synchronizer of 1st and 2nd gear

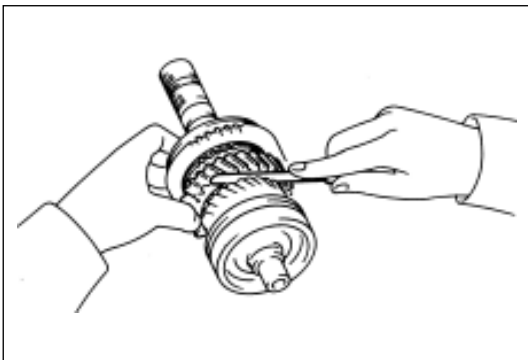
(a) Smear the gear oil on the needle bearing of gear of 2nd gear.

(b) Put the synchronized ring on the gear, and align the notch and shift key.

(c) Install the needle bearing into the gear components of 2nd gear.



(d) Assembly the gear components of 2nd gear and meshing sleeve of synchronizer of 1st and 2nd gear with pressing machine.



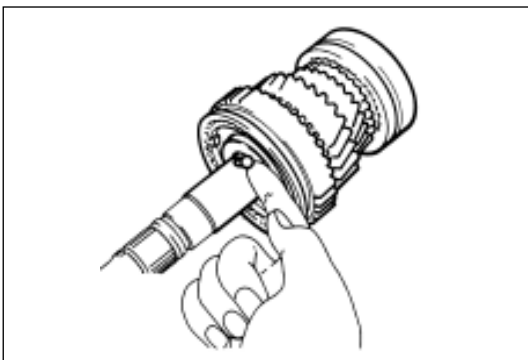
6. Check the axial clearance of gear components of 2nd gear

Measure the axial clearance of gear components of 2nd gear with feeler gauge.

Standard clearance:

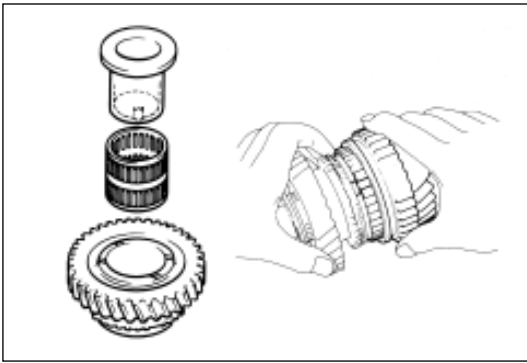
For the transmission made by Shang Chi: (0.15~0.33)mm

For the transmission made by Tang Chi: (0.09~0.33)mm

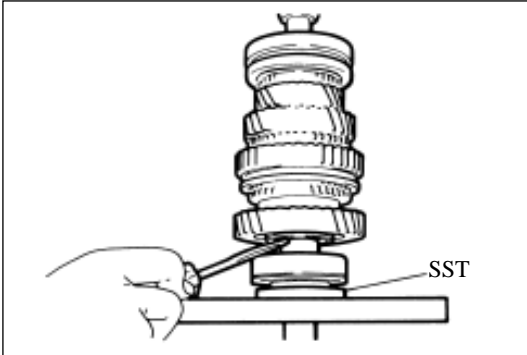


7. Assembly the locking ball and gear components of 1st gear

(a) Install the locking ball into the shaft.



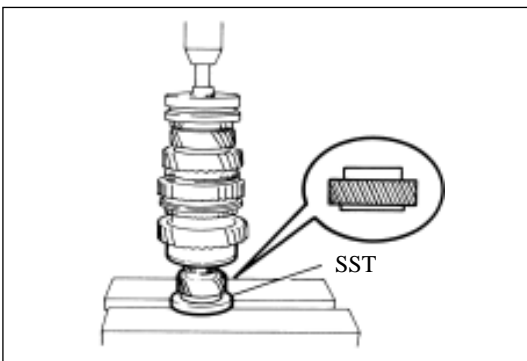
- (b) Smear the gear oil on the needle bearing of gear of 1st gear.
- (c) Assembly the gear components of 1st gear,synchronized ring,needle bearing and sleeve of gear of 1st gear.
- (d) Install the assembly on the output shaft,and align the notch of synchronized ring and sliding block .
- (e) Turn the sleeve of 1st gear shaft to align the it with the locking ball.



#### 8. Installation for rear bearing of output shaft

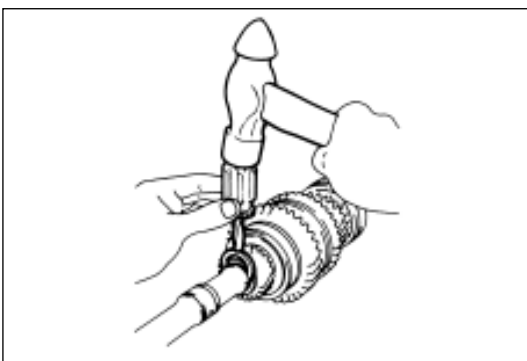
Fix the bearing of output shaft to the output shaft with SST and pressing machine, make the notch of locking ring of output shaft rear bearing expose to the tail.

Remark: Hold the sleeve of gear of 1st gear and don't let it fall off.



#### 9. Install the gear of 5th gear

Fix the gear of 5th gear with SST and pressing machine.

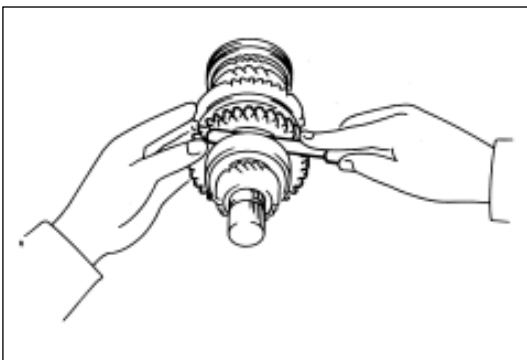


#### 10. Assembly the snap ring of shaft

- (a) To choose one snap ring which make the axial clearance be Min, and install it on the shaft.

Max clearance  $\leq 0.1\text{mm}$ .

- (b) Knock the snap ring of shaft of 5th gear tightly with screwdriver and hammer.



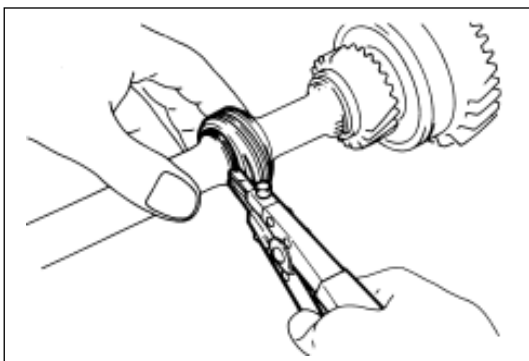
#### 11. Measure the axial clearance of gear of 1st gear

Measure the axial clearance of gear of 1st gear with feeler gauge

Standard clearance:

For the transmission made by Shang Chi:(0.15~0.33)mm

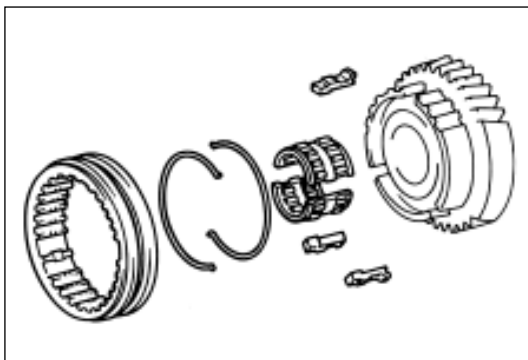
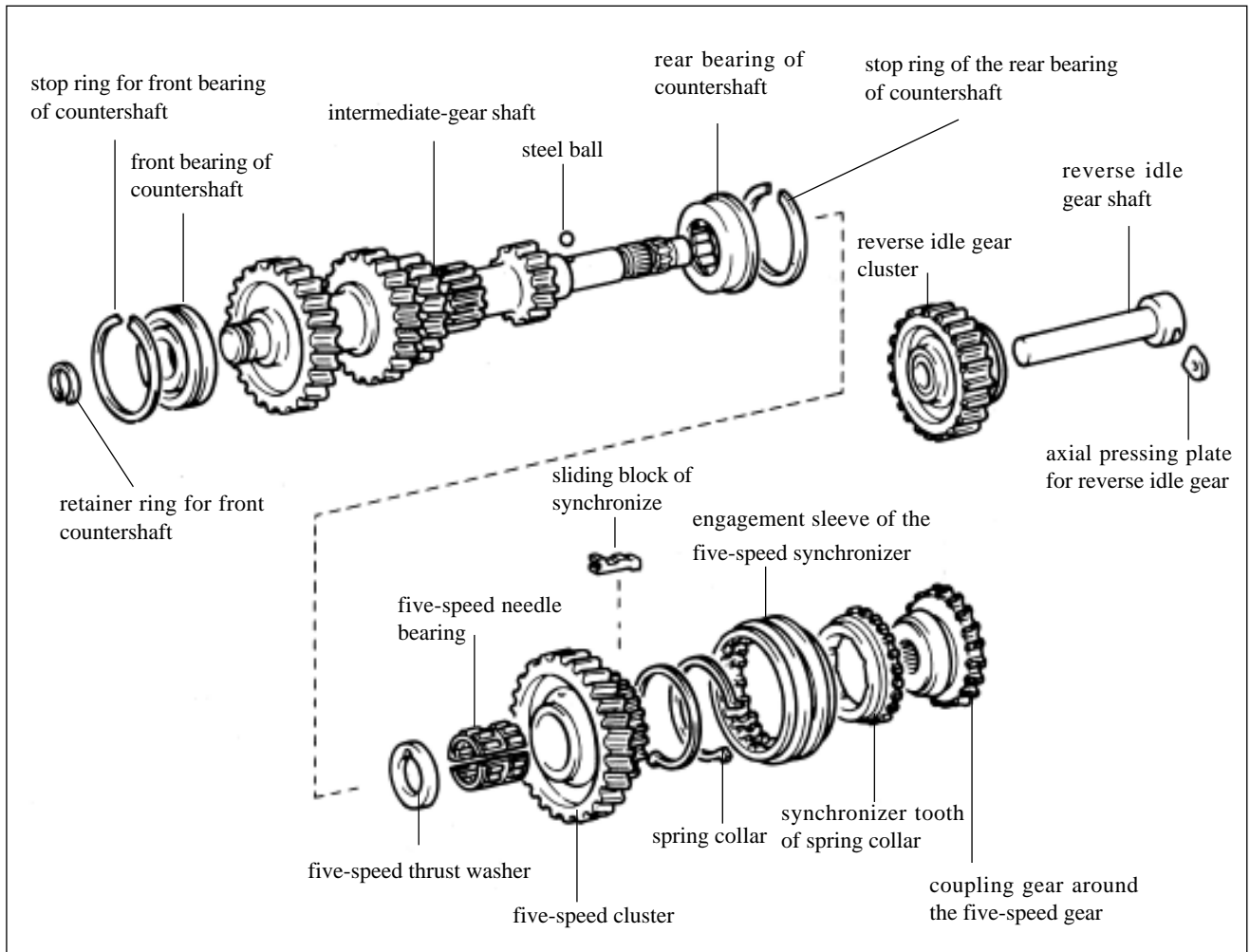
For the transmission made by Tang Chi:(0.09~0.33)mm

**12. Fix the drive gear of speedometer**

- (a) Install the locking ball and drive gear.
- (b) Install the drive gear of tachometer with plier for shaft shield ring

## Countershaft Assembly and Reverse Idle Gear Assembly

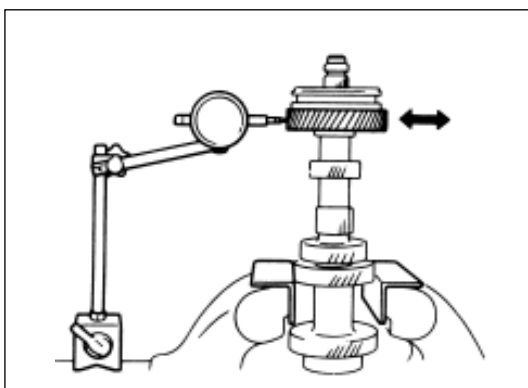
### Element drawing



### Disassembly, Testing and Assembly of Countershaft

1. Tear down the coupling gear, sliding block and the five-speed spring collar.

Tear down the coupling collar, three sliding blocks and the two five-speed spring collars with screwdriver.



2. Measure the radial clearance of the reverse idle gear with dial gauge

Standard clearance:

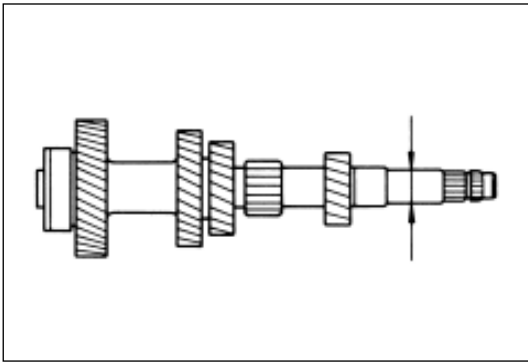
Shang chi: 0.05mm

Tang chi: (0.10~0.30)mm (Tang chi is the close Spline match, which belongs to radial clearance)

Max clearanle:

Shang chi: 0.05mm

Tang chi: (0.10~0.30)mm (Tang chi is the close spline match, which belongs to radial clearance)



### 3. Reverse gear inspection

Measure the diameter of needle bearing with micrometer.

Standard diameter:

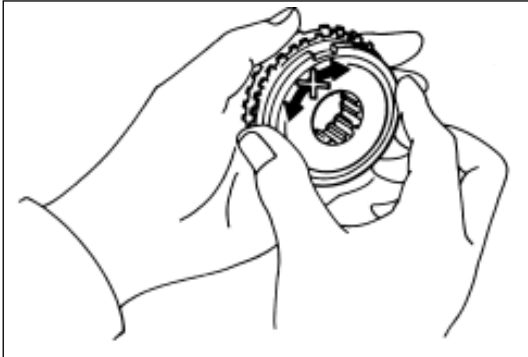
Shang Chi: 26.000mm

Tang Chi: (25.98 ~ 26.00)

Limit Diameter:

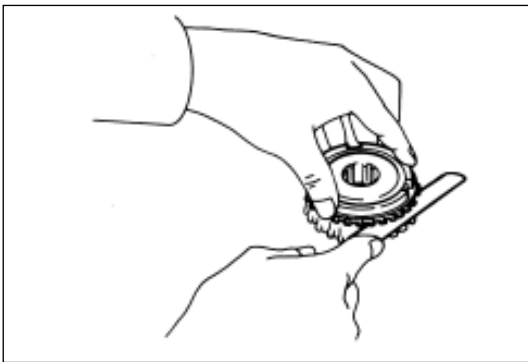
Shang Chi: 25.984mm

Tang Chi: 25.86mm



#### 4. Check the synchronizing ring

- (a) Run the retainer ring for shaft and put it onto the shaft to check its stopping performance



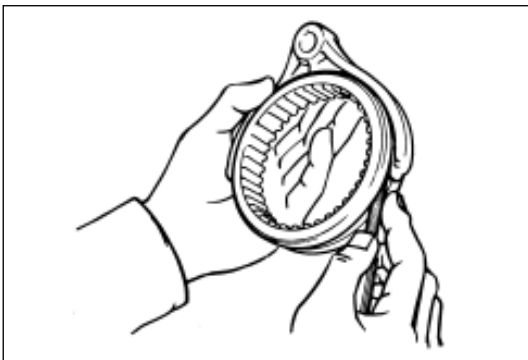
- (b) Measure the clearance between the rear section of the synchronizing ring and the spline.

Standard clearance:

Shang Chi: (1.5~1.8)mm

Tang Chi: (1 ~ 2)mm

Limit clearance: 0.8mm



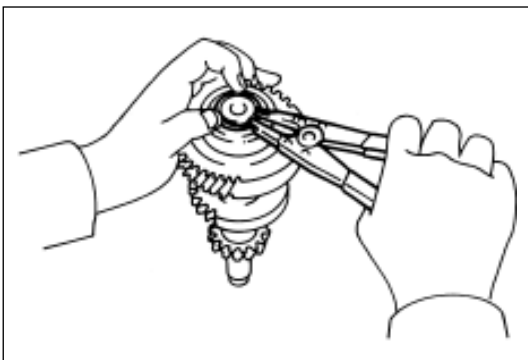
5. Measure the clearance of the shift fork and gear sleeve.

Test the clearance of the shift fork and gear sleeve with the feeler gauge.

Max clearance:

Shang Chi: 0.54mm

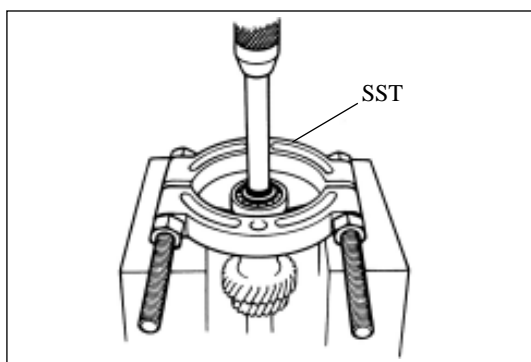
Tang Chi:1.0mm



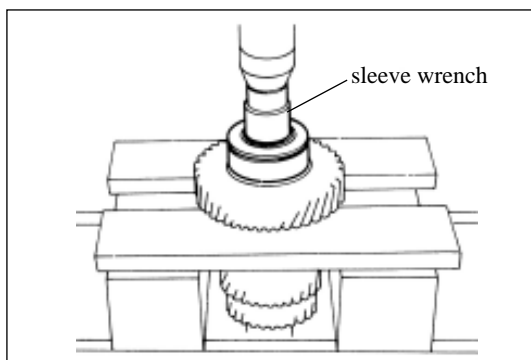
## 6. Change the bearing

The front bearing of the reverse gear shall be changed when necessary

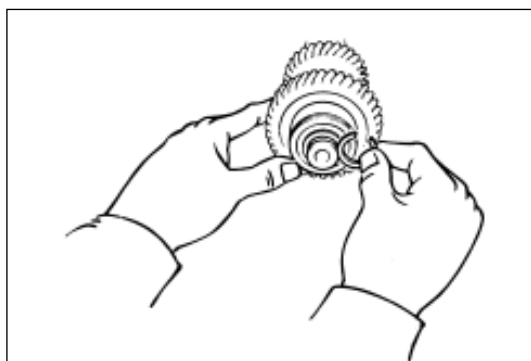
- (a) Pry down the retainer ring for shaft with a split-ring-type pliers.



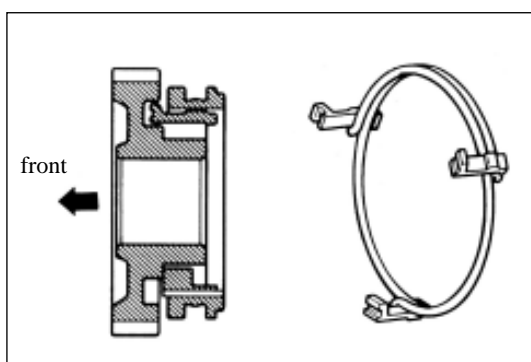
(b) Press out the bearing with SST.



(c) Press in the bearing, side race and inner race with the socket spanner.



(d) Select the split ring that leave the radial clearance to minimum level, and mount it on the shaft.



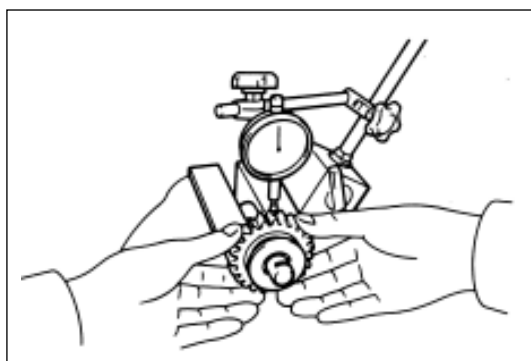
7. Mount the engagement sleeve of synchronizer, sliding block and the five-speed spring collar.

Remark: the opens of the spring collar shall be in non-alignment

Encase the sliding pad into the gear hub and then cover the gear sleeve.

Mount the spring retainer under the sliding pad.

Notice, the opening direction of the spring retainer shall not face-to-face.



## Mount of Reverse Gear Assembly

1. Check the reverse idle gear

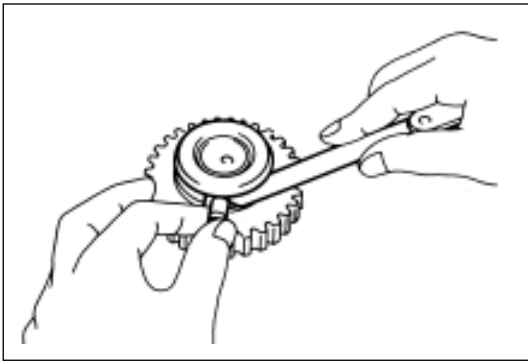
Measure the radial clearance of the reverse idle gear with dial gauge.

Standard clearance:

Shang Chi: 0.05mm; Tang Chi: (0.04~0.08)mm

Max clearance:

Shang Chi: 0.05mm; Tang Chi: 0.13mm



2. Measure the clearance between the reverse idle gear and gearshift yoke block

Measure the clearance between the reverse idle gear and the gearshift yoke block with feeler.

Standard clearance:

Shang Chi: 0.2mm

Tang Chi: (0.05~0.27)mm

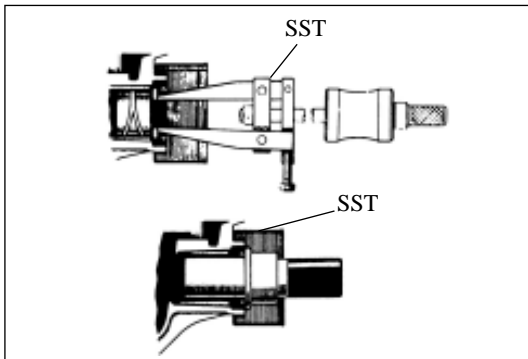
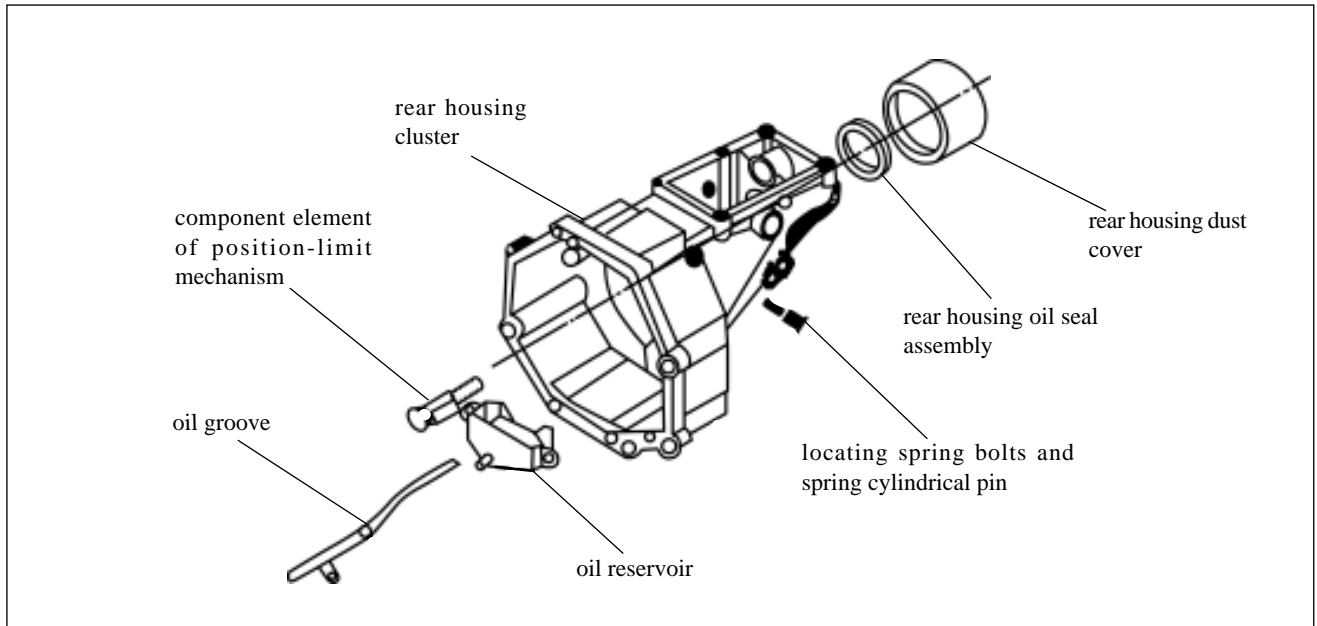
Max clearance:

Shang Chi: 0.35mm

Tang Chi: 0.5mm

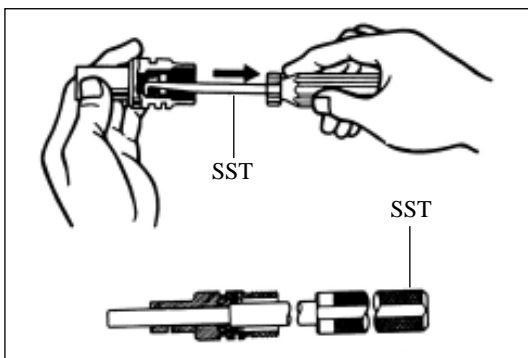
## Rear Housing Assembly

### Element drawing

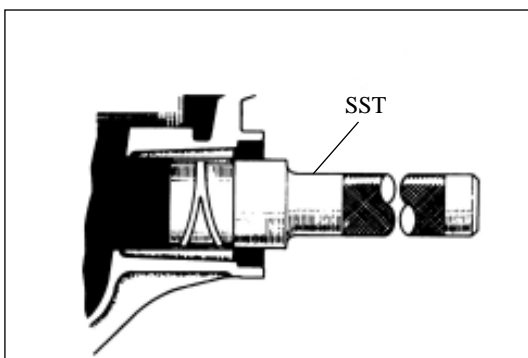


### Change of Oil Seal

1. The rear housing oil seal shall be changed where necessary.
  - (a) Dismantle the oil seal with SST.
  - (b) Press in the new oil seal with SST



2. The driven oil seal of speedometer shall be changed where necessary
  - (a) Pry out the oil seal with SST.
  - (b) Tap the new oil seal into the shaft bracket with SST.

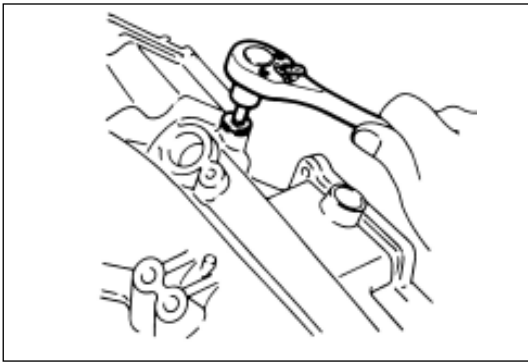


### Change of Shaft Bush

The shaft bush shall be changed where necessary

- (a) Tear down the oil seal and dust bush.
- (b) Heat the ending parts of extension frame to 80°C-100°C in the oil groove.
- (c) Tear down the shaft bush with SST and mount on the new shaft bush.

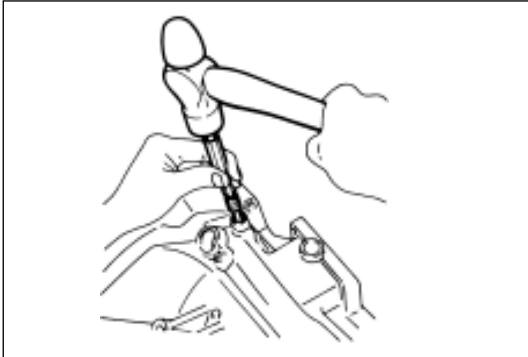




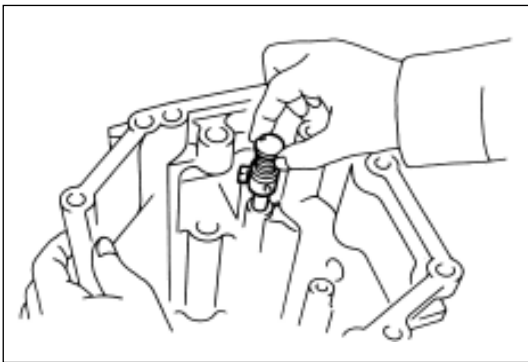
## Inspection on and change of the component elements of position-limit mechanism

### 1. Tear down the component elements of position-limit mechanism

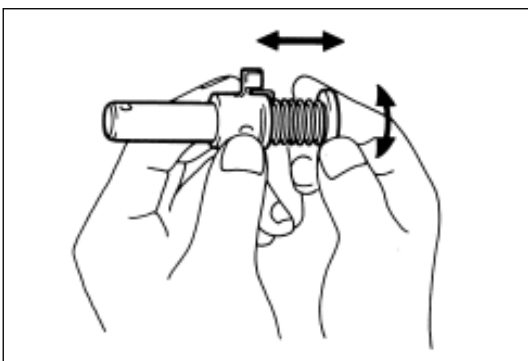
(a) Dismantle the bolts with the torque socket spanner.



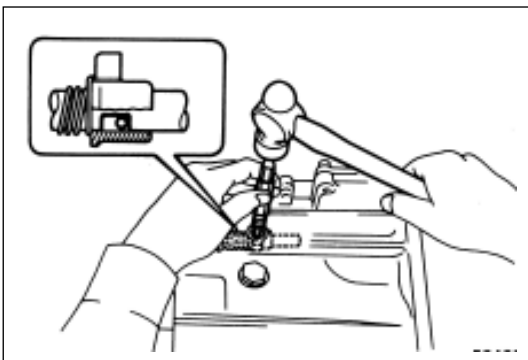
(b) Punch out the spring cylindrical pin with the drift punch and hammer.



(c) Tear the component elements of position-limit mechanism down.



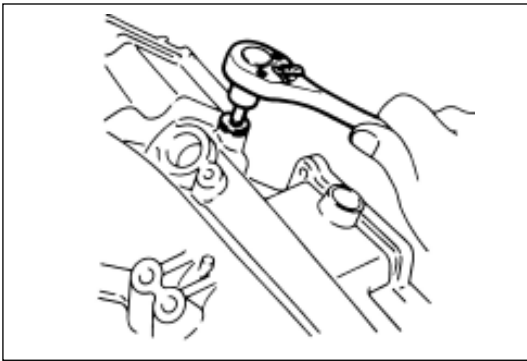
2. Check the component element of position-limit mechanism. Run and propel the limit stop and the limit stop can return to the original location automatically, otherwise, change the limit stop.



### 3. Mount the component element of position-limit mechanism

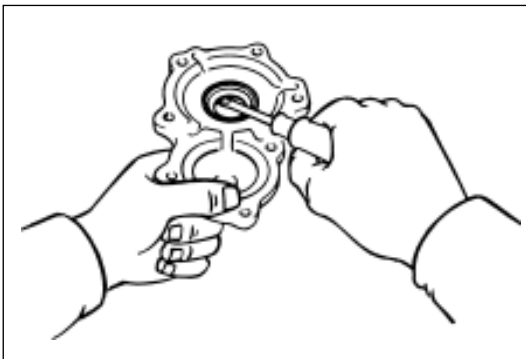
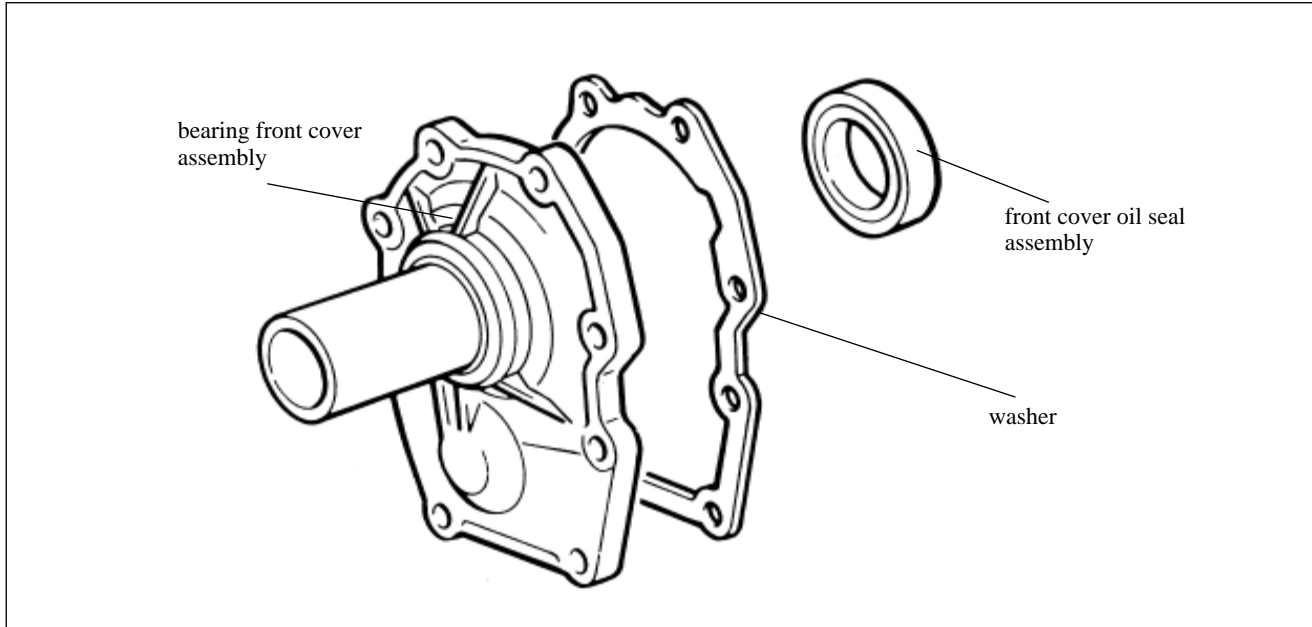
(a) Mount the component elements of position-limit mechanism in the rear housing.

(b) Tap the spring cylindrical pins in with drift punch and hammer as shown in the drawing.



- (c) Coat the sealing agent on the bolt thread.
- (d) Propel the plug with the torque socket spanner.

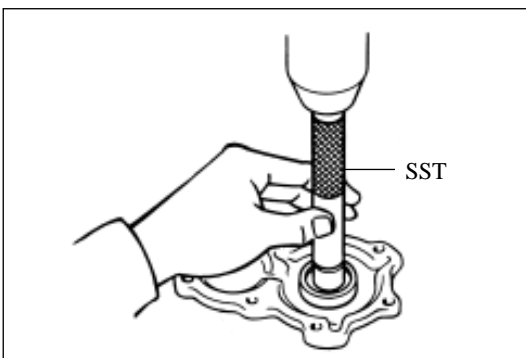
## Bearing Front Cover Assembly element drawing



### Change of oil seal

The oil seal of the bearing front cover shall be changed where necessary

- (a) Pry out the oil seal with screwdriver

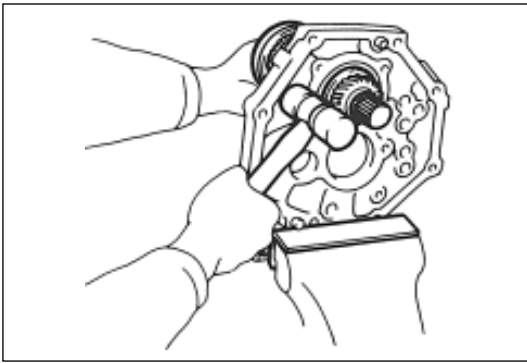


- (b) Press in the new oil seal with SST.

Depth of oil seal:

Upper tooth: 9.5mm

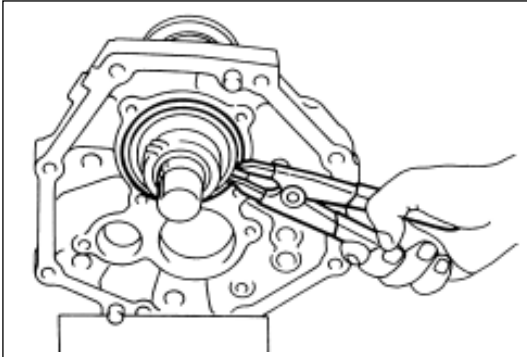
Tang tooth:  $(12.4 \pm 0.4)$ mm



## Assembly of Gearbox

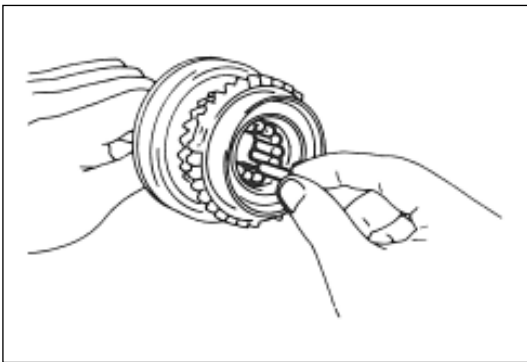
### 1. Mount the output shaft in the central link plate

- (a) Tap the output shaft in the central link plate while pulling it, until mounting it in the central link plate.



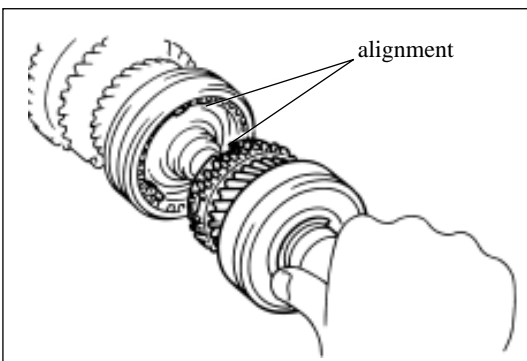
- (b) Mount the stop ring of the rear bearing of output shaft in with the split-ring-type pliers.

Remarks: The stop ring shall flush with the surface of central link plate.

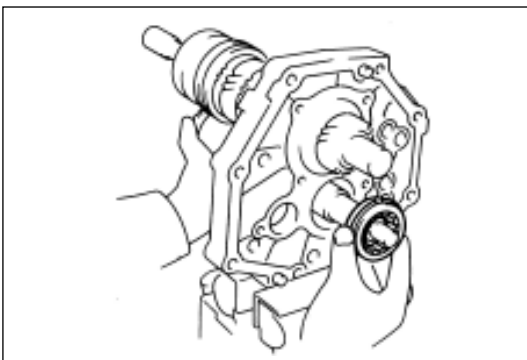


### 2. Mount the input shaft in output shaft

- (a) Coat the MP lubricant on the bearing with 13 needle rollers, and mount the needle rollers in input shaft.

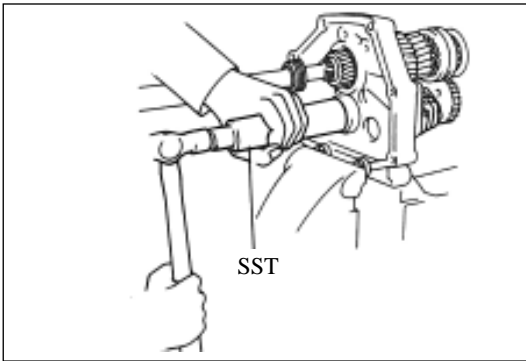


- (b) Propel the input shaft in the output shaft and flush the groove of synchronizing ring with the sliding block.

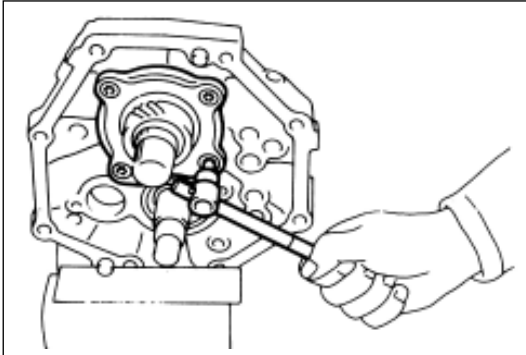


### 3. Mount the countershaft in the central link plate

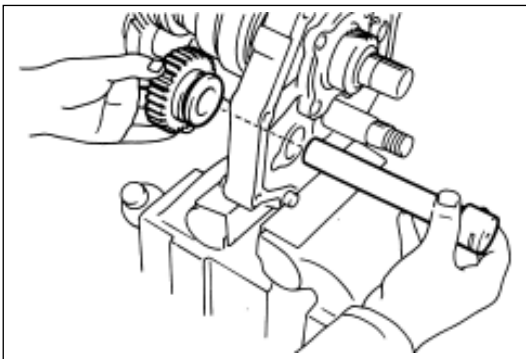
- (a) Mount the stop ring on the rear bearing of countershaft with split-ring-type pliers.



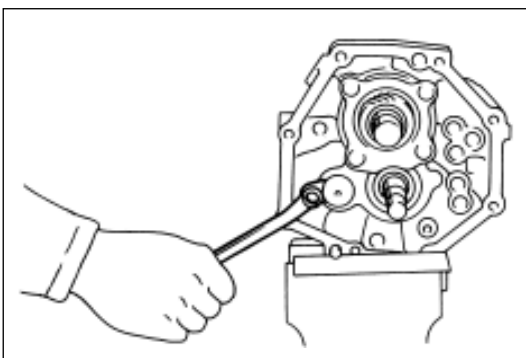
- (b) Mount the intermediate-gear shaft in the central link plate, and mount the backup rear bearing with SST while holding the intermediate-gear shaft.



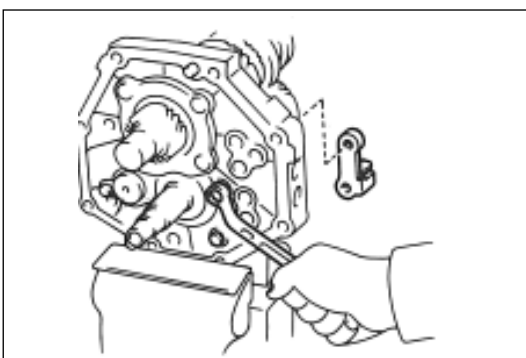
4. Mount the baffle of rear bearing of output shaft  
Mount and propel the bolts with torque socket spanner.  
Tightening moment:  
Tang tooth:  $(17 \sim 22)\text{N} \cdot \text{m}$   
Upper tooth:  $(12 \sim 17)\text{N} \cdot \text{m}$



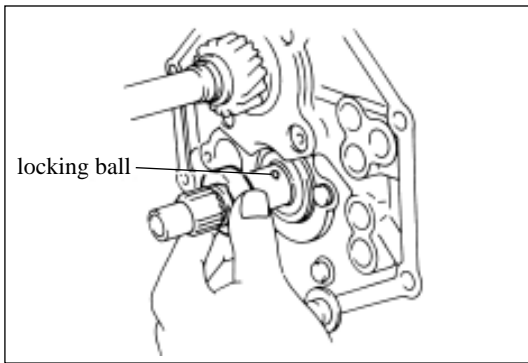
5. Mount the reverse idle gear and shaft  
(a) Mount the reverse idle gear and shaft.



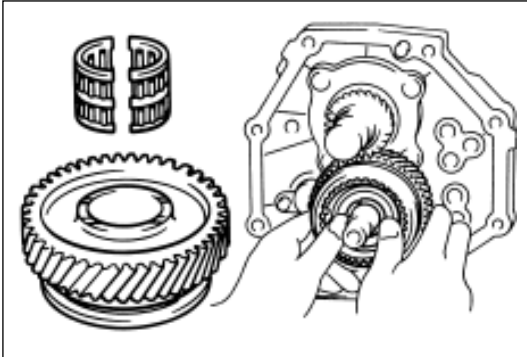
- (b) Mount the axial pressing plate of the reverse idle gear, and then propel the bolts tightly.  
Tightening moment:  $(15 \sim 20)\text{N} \cdot \text{m}$



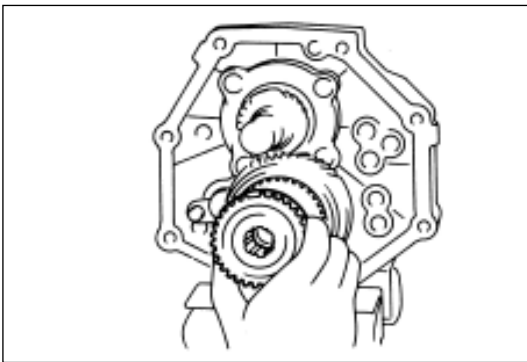
6. Mount the bracket cluster of reverse rocker arm  
Mount the reverse rocker arm bracket and propel the two bolts tightly.



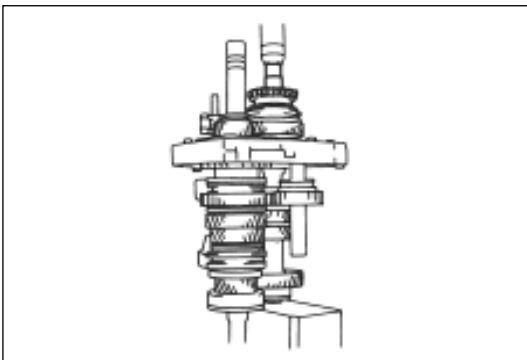
7. Mount the steel ball and the five-speed thrust washer.



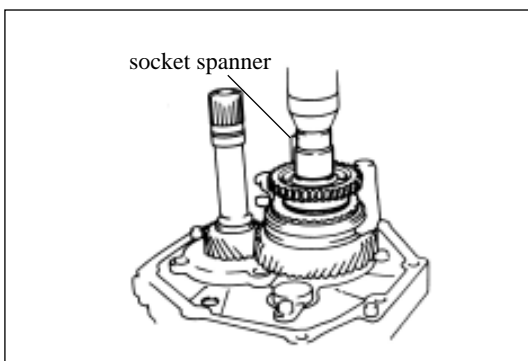
8. Mount the five-speed gear cluster
- Coat the gear oil on the needle bearing.
  - Mount the five-speed gear cluster.



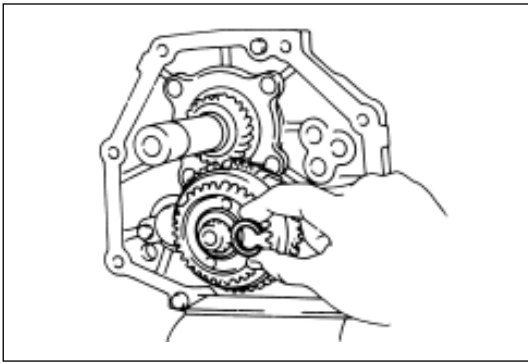
9. Mount the synchronizing ring and the fifth coupling gear
- Mount in the synchronizing ring and the fifth coupling gear.



- Dismantle the old central link plate from the table vice.
- Put the gearbox straightly as shown in the drawing.

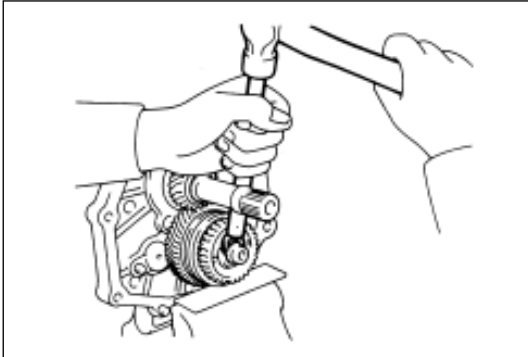


- Flush the groove of synchronizing ring with the sliding block and mount the fifth coupling gear with pressure machine.
- Mount the new central link plate in the table vice.

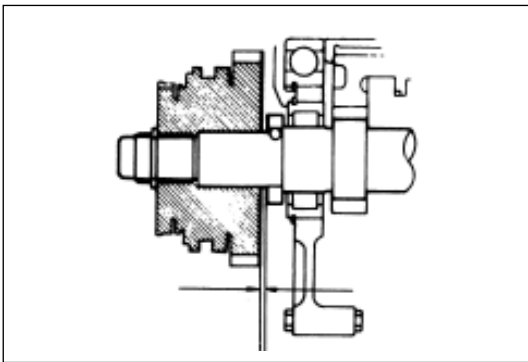


#### 10. Mount the split ring

- (a) Select the retainer for shaft that leaves the minimum radial clearance, which is not larger than 0.1mm.



- (b) Mount in the retainer for shaft with copper bar and hammer.



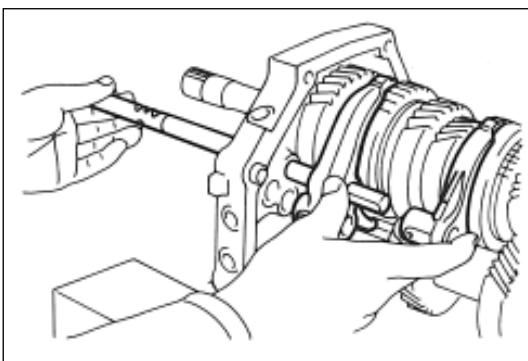
#### 11. Measure the radial clearance of the five-speed gear cluster.

Measure the radial clearance of the five-speed gear cluster with the measuring gauge.

Standard clearance:

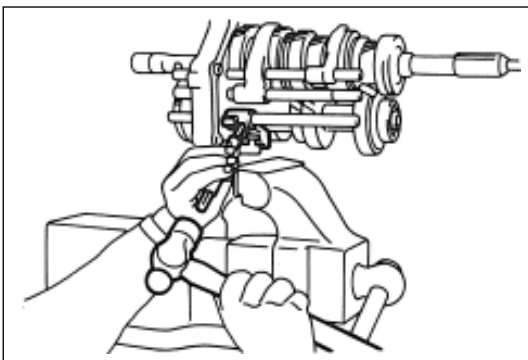
Shang chi: (0.135 ~ 0.325)mm

Tang chi: (0.1 ~ 0.3)mm



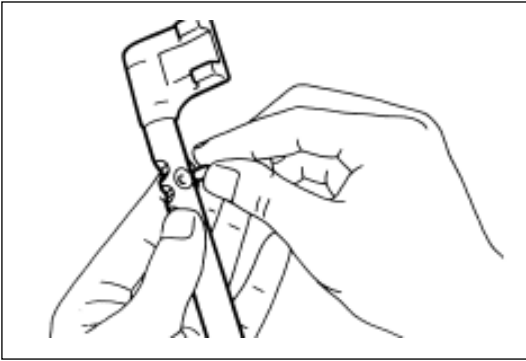
#### 12. Mount the third-fourth-speed gearshift fork axle and the first-second-speed gearshift toggle fork as well as the third-fourth-speed gearshift toggle fork

- (a) Mount the first-second speed and third-fourth speed gearshift toggle forks.
- (b) Mount the third-fourth-speed gearshift fork axle in the central link plate and the gearshift toggle fork.



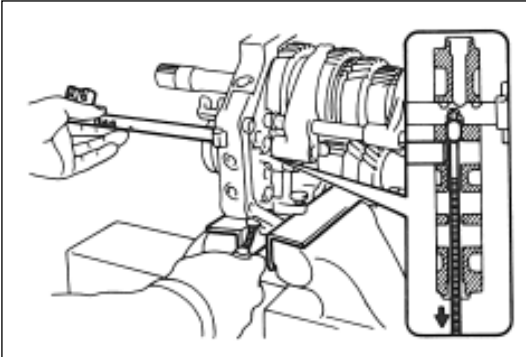
- (c) Mount the spring cylindrical pin of third-fourth-speed gearshift fork.

Notice: The pin port should align with the direction of the shaft.(Same sa below)

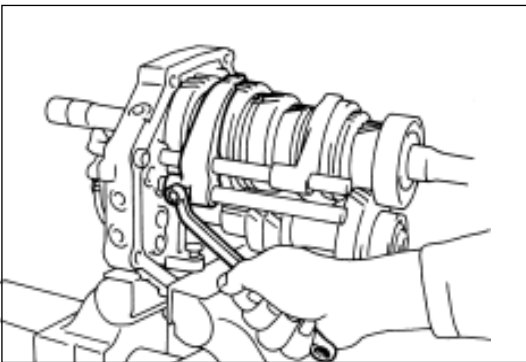


### 13. Mount the first gearshift fork axle and first gearshift fork

- (a) Coat the MP lubricating on the interlocking guidepost and mount the interlocking guidepost on the first-second-speed gearshift fork axle.



- (b) Mount the interlocking pin in the central link plate with the magnetic bar.
- (c) Mount first-second gearshift fork axle in the first gear-shift toggle fork and central link plate.

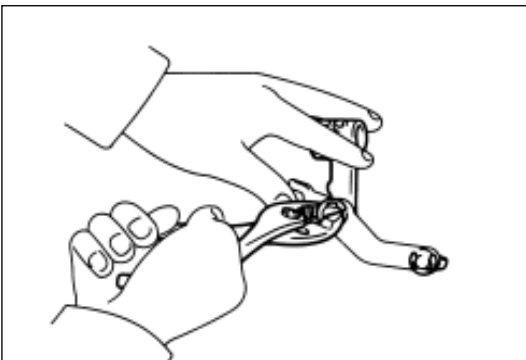


- (d) Mount the setting bolts of the first toggle fork and tighten them.

Tightening moment:

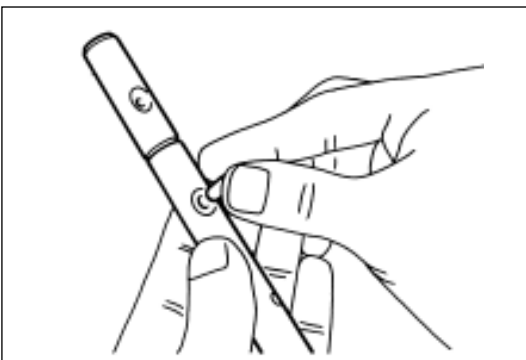
Upper tooth:  $(15 \sim 20) \text{N} \cdot \text{m}$

Tang tooth:  $(13 \sim 17) \text{N} \cdot \text{m}$



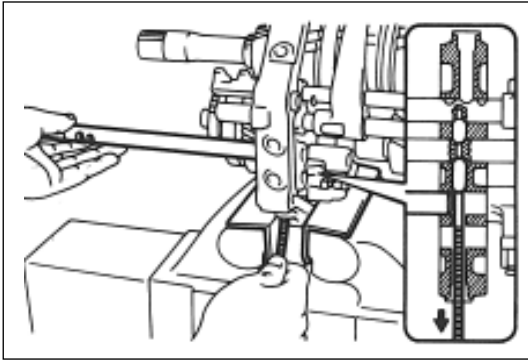
### 14. Mount the reverse yoke rod, reverse rocker arm and reverse yoke block

- (a) Mount the reverse yoke rod, reverse rocker arm and reverse yoke block together.
- (b) Mount the reverse rocker arm on the reverse rocker arm bracket.

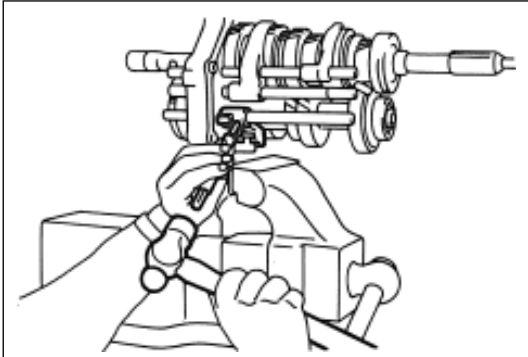


- (c) Coat the MP lubricant on the interlocking guidepost and mount the guidepost on the reverse gearshift fork axle.

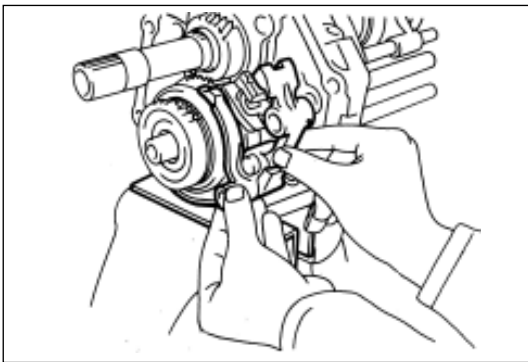




- (d) Mount the interlocking pin in the central link plate with the magnetic bar.
- (e) Mount the reverse gearshift fork axle in the reverse yoke rod and central link plate.

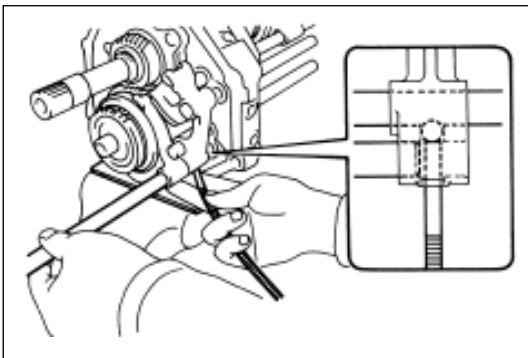


- (f) Mount the spring cylindrical pin with the drift punch and hammer.

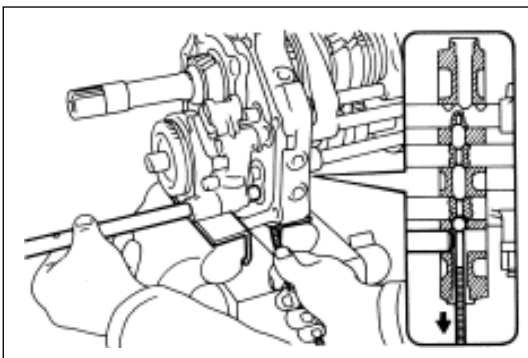


15. Mount the five-speed reverse gearshift guide block and five-speed reverse gearshift fork axis.

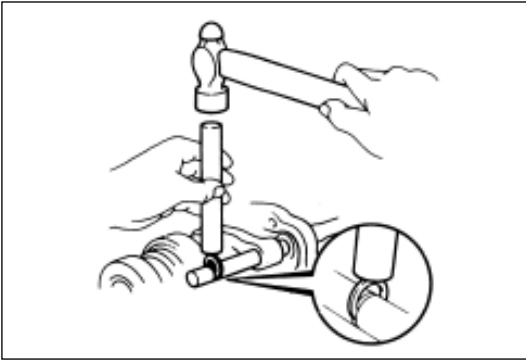
- (a) Mount the five-speed reverse gearshift guide block in the five-speed reverse gearshift guide shaft.
- (b) Mount the reverse gearshift fork axle in the next step.



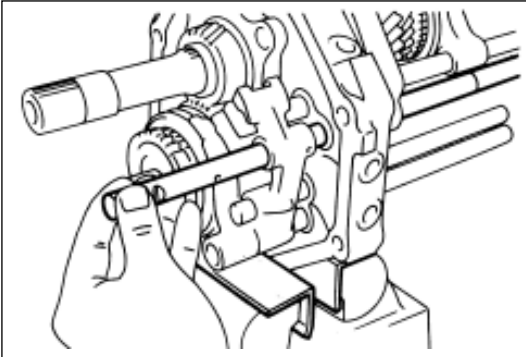
- (c) Mount the steel ball in the five-speed gearshift guide block with the magnetic bar.
- (d) Mount the five-speed gearshift fork axle as shown in the drawing.



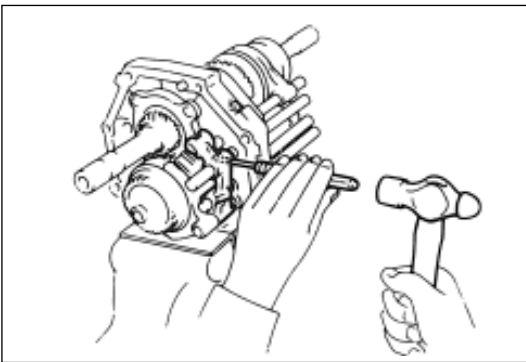
- (e) Mount the steel ball in the central link plate with magnetic bar.
- (f) Mount the five-speed gearshift fork axle in the central link plate.



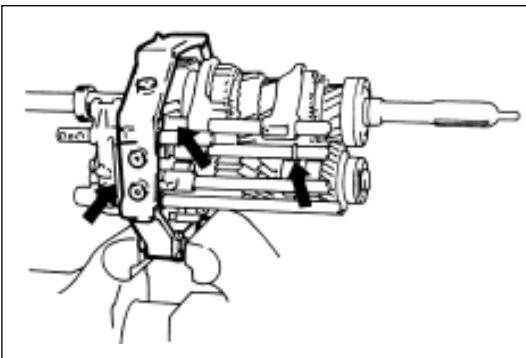
- (g) Tap the pin in the five-speed gearshift toggle fork with the drift punch and hammer.



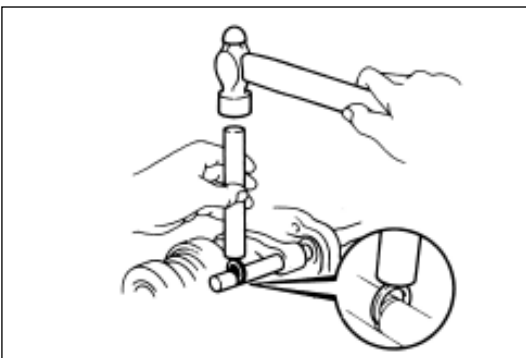
- (h) Mount the five reverse gearshift guide shaft in the five-speed reverse guide block and central link plate, and

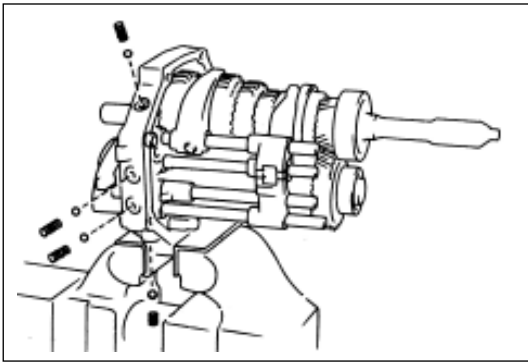


- (i) Tap the spring cylindrical pin in the five-speed reverse guide block with drift punch and hammer.



16. Mount the retainer ring gripped by the gearshift fork axle.  
Mount the clamp retainer ring with the steel bar and hammer



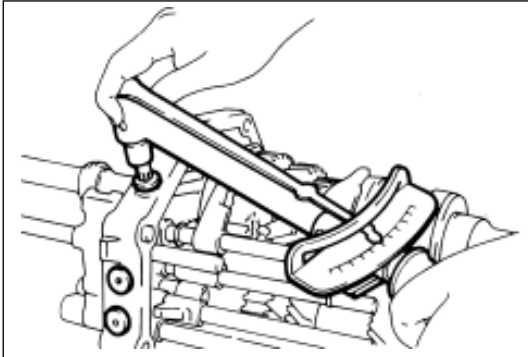


17. Mount the steel ball, locating spring and locating spring plug

- (a) Mount the steel ball and locating spring.

Remarks:

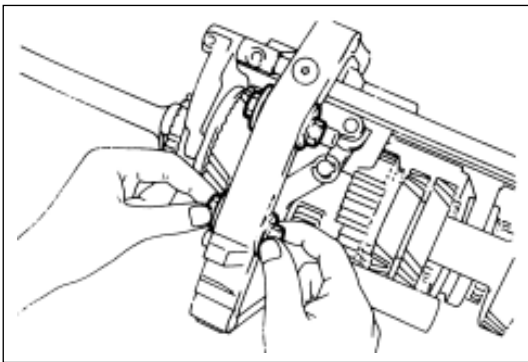
Mount the short spring at the bottom of the central link plate.



- (b) Coat the sealing agent on the plug thread.

- (c) Mount the plug and tighten them with the torque socket spanner.

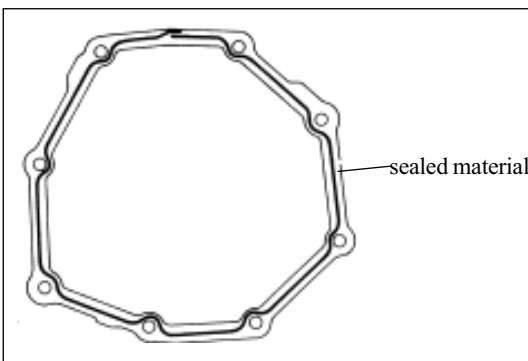
Tightening moment:  $(17 \sim 22) \text{N} \cdot \text{m}$



18. Tear down the central link plate from the table vice

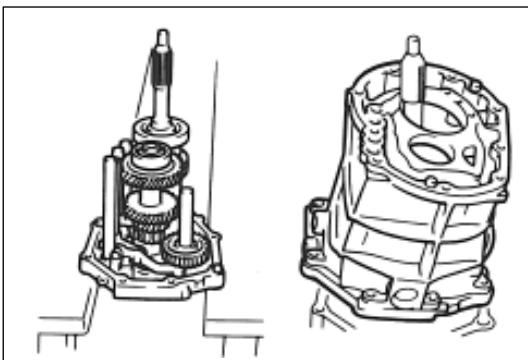
- (a) Tear down central link plate from the table vice.

- (b) Dismantle the bolts, nuts and washers



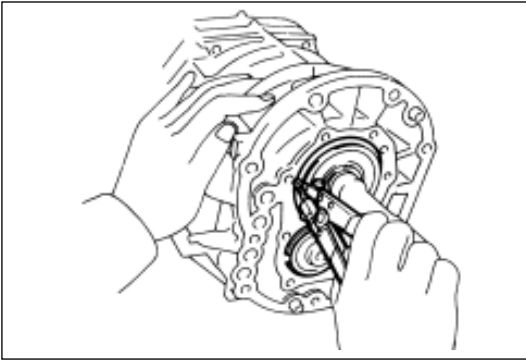
19. Mount the gearbox frame

- (a) Coat the sealing material on the coupling face of the gearbox frame as shown in the drawing.



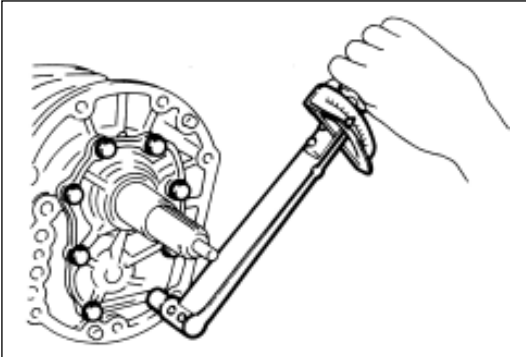
- (b) Put down the central link plate straightly as shown in the drawing.

- (c) Mount the gearbox frame on the central link plate as shown in the drawing.



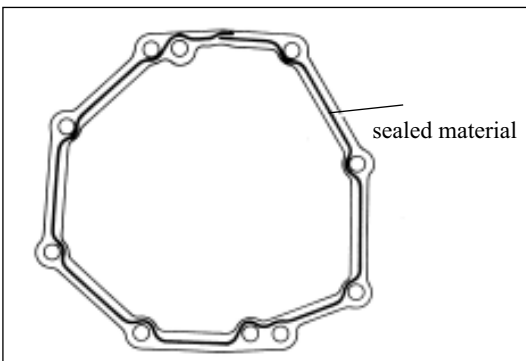
## 20. Mount the stop ring of the front bearing

- (a) Mount the two stop rings in the input shaft bearing and countershaft front bearing with the split-ring-type pliers.



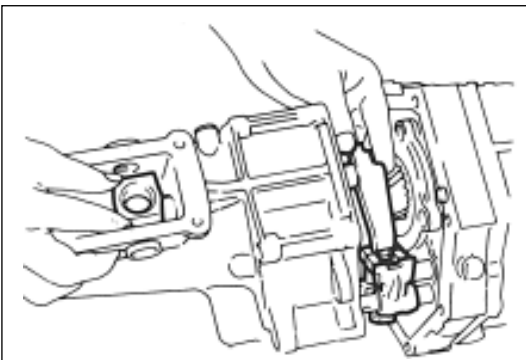
- (b) Mount the coated component elements of front cover.
- (c) Coat the sealing agent on the bolt thread, and
- (d) Mount and propel tightly the bolts.

Tightening moment:  $(15 \sim 20)\text{N} \cdot \text{m}$

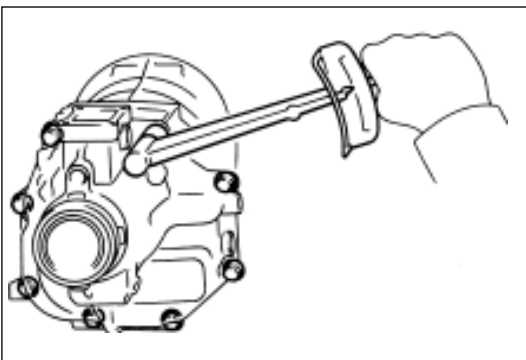


## 21. Mount the rear body, gear-change bar and selection bar and their housings

- (a) Coat the sealing materials on the rear body as shown in the drawing.



- (b) Mount the gearshift shaft and gearshift yoke block in the rear body.
- (c) Mount the gearshift catching head in the groove of guide block, and
- (d) Mount the catching head with the rear body together.



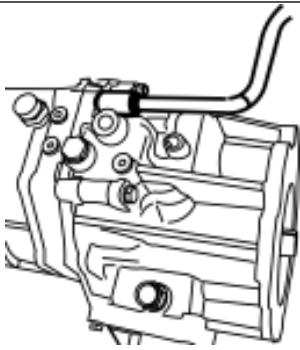
- (e) Mount and propel tightly the bolts.

Tightening moment:

Shang chi:  $(30 \sim 40)\text{N} \cdot \text{m}$

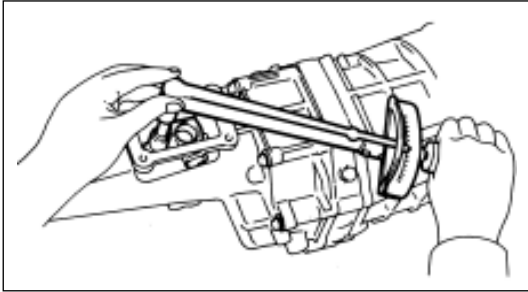
Tang chi:  $(30 \sim 45)\text{N} \cdot \text{m}$

4WD



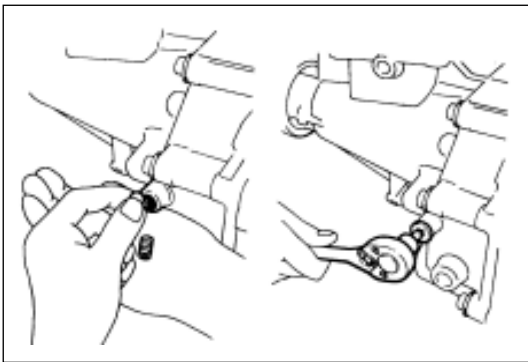
- (f) Fasten the rear cover bolts of the four-gear driving gearbox

Tightening moment:  $(30 \sim 45) \text{N} \cdot \text{m}$  (Tang tooth)



- (g) Mount and propel tightly the setting bolts of the gearshift yoke block.

Tightening moment:  $(17 \sim 22) \text{N} \cdot \text{m}$



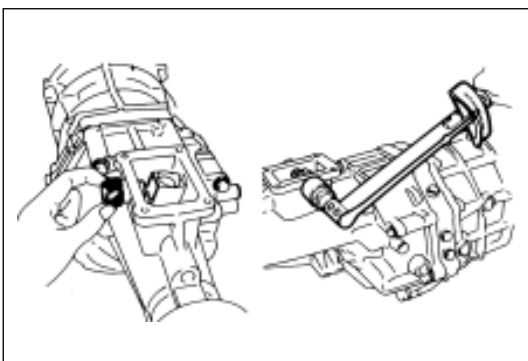
## 22. Mount the steel ball spring and plug

- (a) Coat the sealing agent on the plug thread.  
(b) Mount the steel ball, setting spring and setting spring plug.

Tightening moment:  $(17 \sim 22) \text{N} \cdot \text{m}$

## 23. Check the following items after mounting the rear body or gearbox

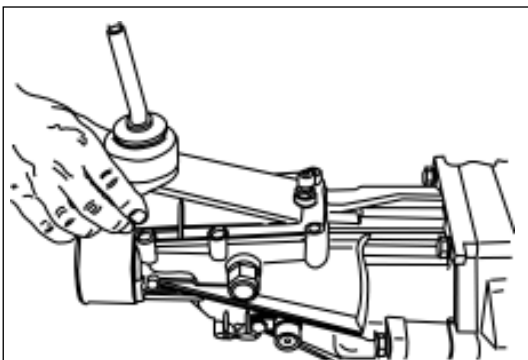
- (a) Check the stability of the running input shaft and output shaft.  
(b) Check the gearshift stability of each speed



## 24. Mount the component elements of the locating mechanism

- (a) Mount the black component elements of the locating mechanism on the side of the five-speed reverse gear.  
(b) Mount another component element of locating mechanism and propel it tightly.

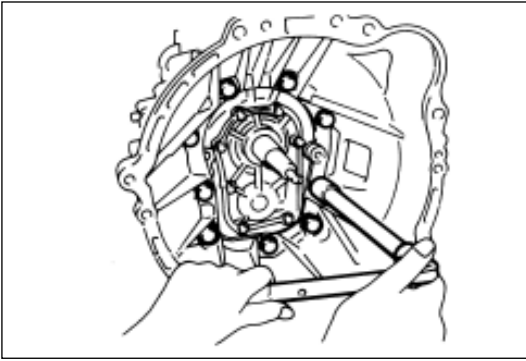
Tightening moment:  $(30 \sim 40) \text{N} \cdot \text{m}$



## 25. Mount the gearshift cover of the gearbox.

- (a) Mount the gearshift cover coated with sealing agent.  
(b) Mount six bolts and then tighten them.

Tightening moment:  $(15 \sim 20) \text{N} \cdot \text{m}$

**26. Mount the clutch frame**

- (a) Mount the clutch frame.
- (b) Coat the sealing agent on the bolt thread.
- (c) Mount the nine bolts and then tighten them.

Tightening moment:

Upper tooth:  $(60 \sim 70)\text{N} \cdot \text{m}$

Tang tooth:  $(30 \sim 45)\text{N} \cdot \text{m}$

**27. Mount the back-up lamp switch.**

Tightening moment:  $(20 \sim 40)\text{N} \cdot \text{m}$

**28. Mount the driven gear of odometer**

- (a) Mount the driven gear of odometer.
- (b) Mount the bolts and tighten them.

Tightening moment:  $(10 \sim 15)\text{N} \cdot \text{m}$

# Transfer Box

	page
Notice .....	TF-2
Troubleshooting .....	TF-3
Product Description and Simple Maintenance .....	TF-5
Dismantle and Mount of Transfer Box .....	TF-7
Disassembly of Transfer Box .....	TF-9
Assembly of Transfer Box .....	TF-14
Washing, Inspection, Maintenance and Change .....	TF-24
Washing .....	TF-24
Inspection .....	TF-25
Maintenance and Change of Gear and Chain gear ..	TF-28
Attachment for Inspection, Maintenance and Change of Parts .....	TF-30

## Notice

### Notice on transfer box disassembly and assembly

Notice shall be taken on the soft handling of the parts (coupling face in particular) during the process of transfer box disassembly to avoid the collision; each parts shall put down in order so as to avoid of missing or mistaking.

Notice shall, during assembly process, not only on the aforesaid items, but also on the following items:

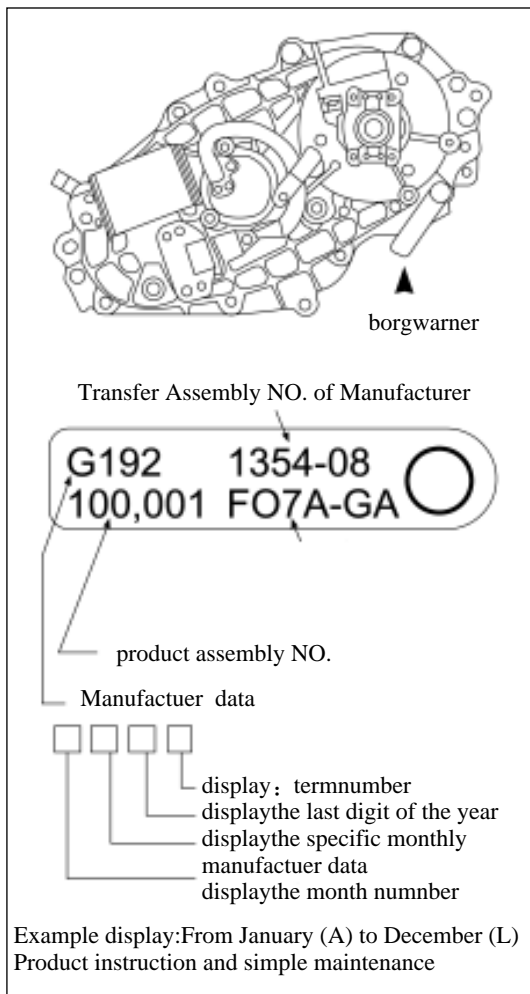
1. Wash all parts and fittings before assembly (rubber element and washer excluded).
2. Oil seal, clip for shaft and spring pin of various kinds shall not be reused.
3. Lubricating oil is required to coat on the various friction surface and lubricant on lips of various oil seal.
4. Rolling body is not allowed to use for pressure transmission when mounting various bearings.
5. Lip-type oil seal is not allowed to mount slantwise.
6. The openness on the two sides of spring collar shall not be coupled face-to-face when assembling the component elements of synchronizer. And
7. No parts is allowed the lubricant leakage and penetration when the transfer box locates at the working location.



## Troubleshooting

Common troubles	Causes	Resolving approaches
Electric gearshift trouble	Damage or failure of electrically controlled element, electric module, speed sensor, electric motor, electric clutch, or built-in wire harness. Damage or worn of shifting cam, joint cover, locking sleeve, toggle fork or shift guide axle. Adhesive bonding shift	Refer to the vehicle usage manual to diagnose the failure element and change it as requirement. Dismantle the weary or damaged parts and change it as requirement. Dismantle and check the free movement of sliding element, and change it as requirement
Mechanic gearshift failure under the movement of shifting handle	Break or damage of the shift rocker arm or shift lever. Damage of the guide plate of shifting cam;	Change the damaged element.  Open the rear cover of the transfer box to check the damaged element and change it.
Difficulty in mechanic gearshift or outplace gear engagement	Incorrect operation.  Lubricant of inferior quality or insufficient volume. Adhesive bonding of shift toggle fork.  Adhesive bonding of the sliding joint cover, locking sleeve or gear.	Refer to the vehicle manual for correct operation. Add the specified oil of given volume.  Open the rear cover of transfer box to check and changer the damaged parts. Open the rear cover of the transfer box to check whether the sliding parts can slide freely along the axle, if not, dismantle it and change the damaged parts.
Engagement failure of the mechanically shift transfer box	Damage or unsuitable adjustment of the shifting mechanism. Damage or serious wear of the inner shifting parts, or looseness or attainment of the shift toggle fork assembly on the guide shaft. Unsuitable adjustment of shift lever.	Adjust or repair the shift lever mechanism.  Change the seriously wearied parts.  Change the loose or weary parts.
Mechanic gearshift seizing at a certain location	Overlarge loose fit clearance of the shift toggle fork on the shift guide shaft. Wear of the shift toggle fork assembly including pin and contact roller. Wear of the shift cam hub and the liner. Attainment of coupling gear	Adjust or repair shift lever. Open the transfer box to check the toggle fork and guide shaft, and change the parts as requirement. Open the transfer box to check whether the parts is wearied or not, and, if any, change the weary parts. Open the transfer box to check whether the parts is wearied or not, and, if any, change the weary parts. Open the transfer box to check whether the parts is wearied or not, and, if any, change the weary parts.
No driving of front wheel in the four-gear engagement	Drive chain break	Disassemble and check the damage of inner parts, and change the chain.
Noise, which is spreader by the transfer box instead of clutch, engine, drive shaft and other parts, occurs in each speed.	Incorrect lubricant or insufficient lubricant volume. Looseness of connecting bolt or other connecting element. Noise from the transfer box bearing	Change the lubricant or supplement the lubricant volume. Guarantee the torque of all connecting elements stand at the specified value. Open the transfer case to check the bearing and othe parts whether is wearied or daamaged, if this happened, change the parts.

Common troubles	Causes	Resolving approaches
Noise, which is spread by the transfer box instead of the clutch, engine or other parts, occurs at each speed.	Gear noise. Damage or wear of chain gear or chain.	Open to check whether there is weary element or damaged element (including the odometer gear) and, if any, change them
Noise occurs in the high-speed or low-speed four-gear driving.	Unsuitable tire pressure.	Open to check whether there is wear or damage, and if any, adjust the tire pressure to suitable value.
Oil leakage in transfer box.	Frame Break of transfer box. Oil leakage of other element. Ventilation pipe block  Over-added lubricant or lubricant of unsuitable brand Looseness of the bolts on sealing face. Sealing glue of different brand or unused sealing glue. Oil seal wear or damage.	Change the frame. Check the leakage by wiping dry. Open and clean it and, if necessary, change it. Use the specified lubricant and adjust the lubricant to suitable volume. Propel the bolts tightly as requirement.  Use the specified sealing glue and propel the bolts tightly as required.



## Product instruction and simple maintenance

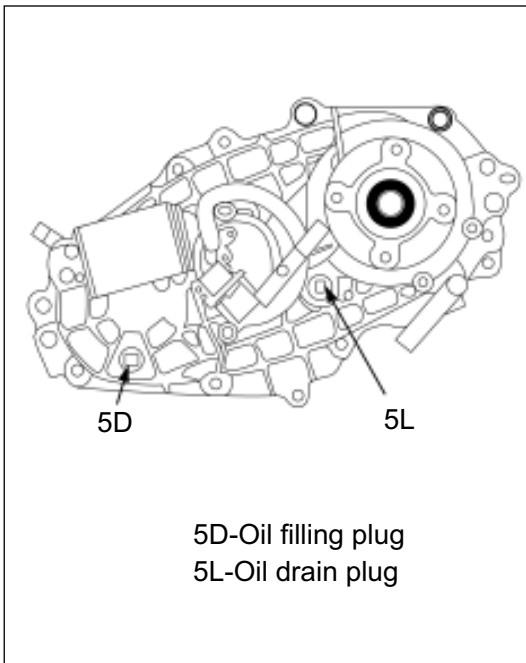
### 1. Product Introduction

The transfer box adapted by our company is the transfer box of 45-55 manufactured by Bogeguana, which is two-speed and time driving, a set of planetary mechanism used is to obtain the speed-reducing performance, while the driving force is transmitted to the front driving gear by a highly precise chain. The planetary gear train and rear output shaft element of transfer box is lubricated initiatively through oil bath and oil pump. This transfer box has four gears:

- 2H-stands for the two high gears, in which, only the two rear wheel are driven, and the gear ratio of the transfer box is 1:1.
- 4H-stands for the four high gears, in which, all of the four wheel are driven, and the gear ratio of the transfer box is 1:1.
- N- neutral location (this location only exists in the transfer box of manual gearshift), No driving force is transmitted to the wheel when the input shaft and output shaft are disconnected.
- 4L-stands for low gears, the four wheels are all driven, and the gear ratio of transfer box is 2.48:1.

The gearshift of the mechanical gearshift transfer box is obtained through the shifting-cam-type guide plate that is operated by the shift rocker arm.

Sign board: which is fastened at the obvious external location of transfer box, and on which the detailed data are marked.



## 2. Regular lubricant change

- (a) The oil level of lubricant in transfer box shall be checked when exchanging the engine lubricant or after the vehicle covers 8000 kilometers, and the lubricant shall be added as requirement.
- (b) The lubricant shall be changed with the specified one every year or after the vehicle covers 48000 kilometers.  
lubricant grade: ATF--3

## 3. Lubricant inspection approach

- (a) Clean the oil filling plug and the around area.
- (b) Open the oil-filling plug to check whether the lubricant can flows out or not.
- (c) if the lubricant can flow out, which means the real lubricant volume is under the prescribed value, and the specified lubricant shall be added into the transfer box until the lubricant can flow from the oil filler hole.
- (d) Propel the oil-filling plug tightly according to the given Tightening moment.

Tightening moment:  $(19 \sim 30) \text{N} \cdot \text{m}$

Notice: The vehicle shall run for a certain time before checking or exchanging the lubricant so that the temperature of lubricant in transfer box may be a little higher. Do not use hammer or other punching tools to open or propel the oil drain plug or oil filling plug, otherwise, the thread hole on the frame will be damaged

## 4. Lubricant change

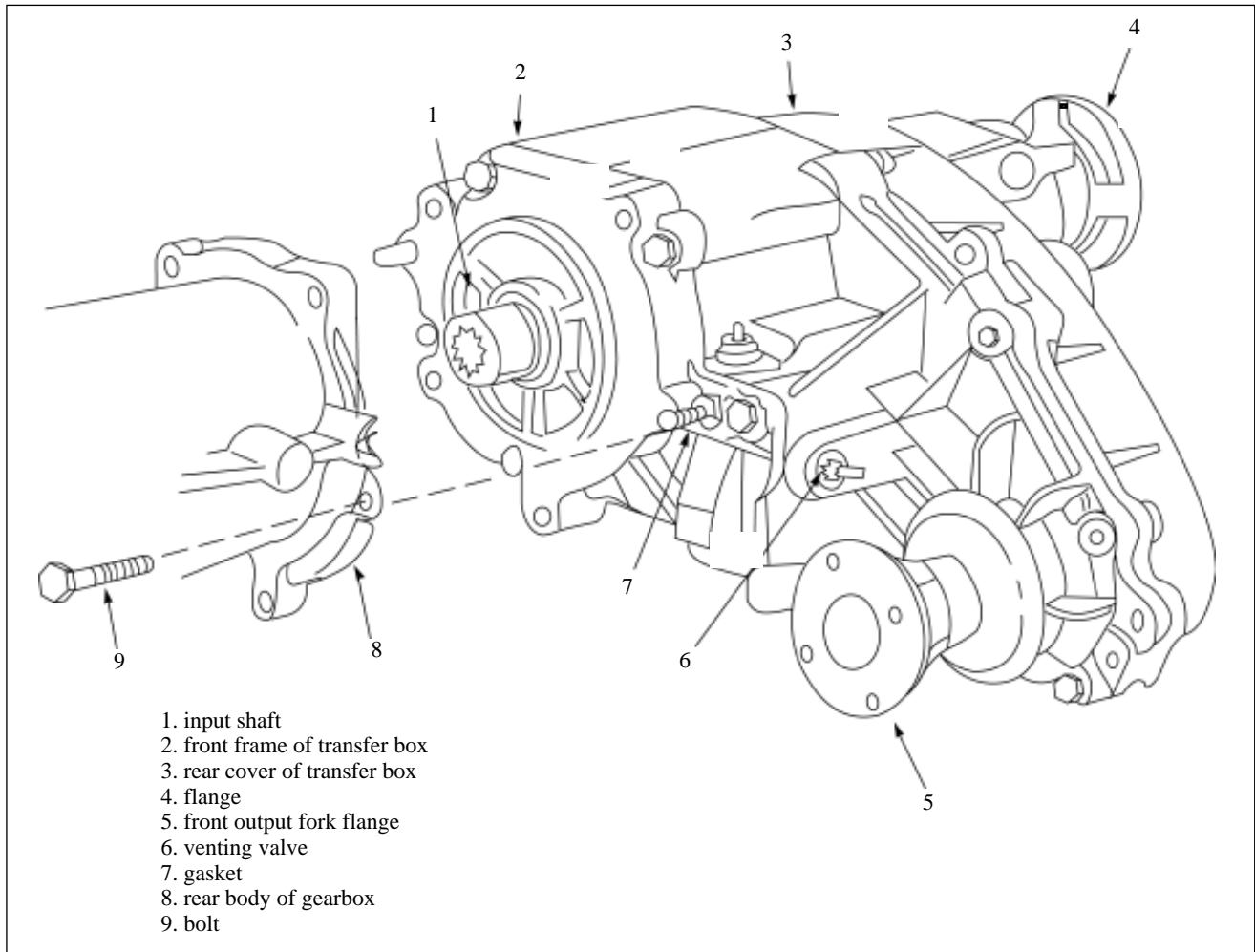
- (a) Clean the oil filling plug and oil drain plug and the around area.
- (b) Put down a oil container under the transfer box.
- (c) Open the oil drain plug.
- (d) Open the oil-filling plug.
- (e) Drain the lubricant up.
- (f) Mount the oil drain plug and screw it up according to the given Tightening moment.

Tightening moment:  $(19 \sim 30) \text{N} \cdot \text{m}$

- (g) Add the lubricant through the oil filler hole until the lubricant overflows. Mount the oil-filling plug and tighten it according to the Tightening moment.

Tightening moment :  $(19 \sim 30) \text{N} \cdot \text{m}$

## Disassembly and Mount of Transfer Box



### 1. Transfer Box Disassembly

- (a) Drive the vehicle on the lifting jack.
- (b) Locate the gear of transfer box at the neutral position, shift the transfer box to the 2H and extinguish the engine.
- (c) Disconnect the cell cathode.
- (d) Lift the vehicle.
- (e) Put down an oil disc under the transfer box, tear down the oil drain plug and oil filling plug of the transfer to drain all the lubricant up, then re-mount the two plugs.
- (f) Disconnect all wires and wire harnesses that connected with the transfer box.
- (g) Take apart the hose on the venting valve of transfer shaft.
- (h) Disconnect the linkage of the front drive shaft with the front flange of the transfer box.
- (i) Disconnect the linkage of the rear drive shaft with the rear flange of the transfer box.
- (j) Raise the transfer box up with the jack.

**Notice:** The transfer box shall be guaranteed to support by the lifting jack before tearing down the sets of bolt and nut that connected with the transfer box and gearbox. The transfer box is not allowed to hang directly on the gearbox through spline because such operation will damage the transfer box parts.

- (l) Tear down the connecting nuts between the transfer box and gearbox and take down the transfer box.
- (m) Move the transfer box backward directly until the linkage between the input shaft of transfer box and the gearbox spline.
- (n) Put down the lifting jack of the transfer box, and
- (o) Tear down the gasket between the transfer box and gearbox. Clean the gasket or glue on the coupling face of front body of transfer box with rear body of the gearbox. Take notice not to damage the coupling face.

## 2. Transfer box mount

- a) Coat the lubricant grease on the output axial spline of the gearbox with a thin sleeve containing lubricant grease.
- b) Mount a new gasket on the mounting face of the transfer box.
- c) Lift the lifting bracket of transfer box and align it to the same axle with the gearbox.

Notice: The transfer shall be guaranteed to flush with the gearbox before connecting the spline. Do not handle it forcefully to press the transfer box spline into the gearbox. Otherwise, damage will be caused, run the rear output shaft where necessary to aim at the spline.

- (d) Move the transfer box forward slowly so that the spline and pin of the input shaft of gearbox reach the front body of the transfer box, and the gasket attaches on the gearbox completely.
- (e) Ensure that the mounting holes of the front body of transfer box, gasket, and gearbox are in alignment and then mount the sets of bolt and nut.

Fastening torque: (35-48)N • m

- (f) Connect the rear drive shaft and the rear output flange of the transfer box.
- (g) Connect the front drive shaft and the front output fork flange of the transfer box.

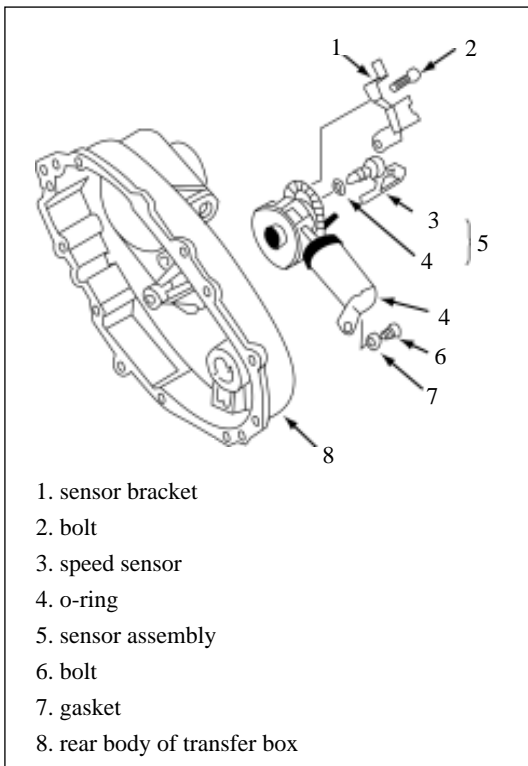
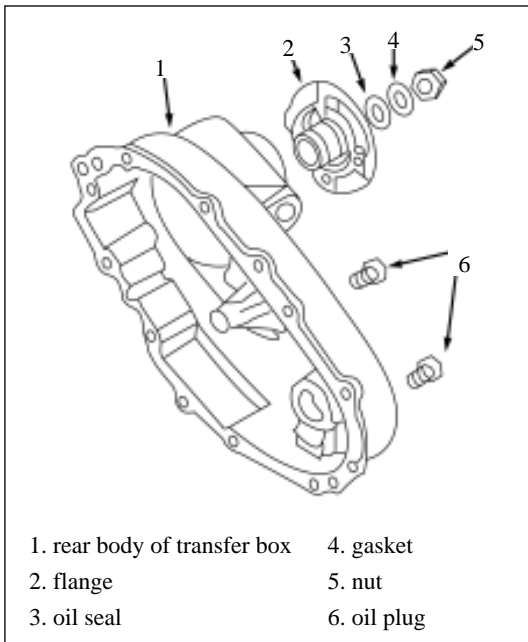
- (h) Connect the venting valve and the soft ventilation pipe.
- (i) Connect the cables of odometer that locates nearby the transfer box.
- (j) Connect all wire harnesses that connected with the transfer box, and
- (k) Add the lubricant of right brand.

Notice: when starting the engine, if the lubricant is added incorrectly or in unsuitable volume, which may lead the transfer box to damage.

Notice: as for the transfer box mounted on vehicle, oil pump shall be used when adding oil for it.

Notice: In case the transfer box is taken apart for maintenance or inspection, there will be no lubricant supplied by oil pump in the oil passage on the top of transfer box. Therefore, it is not accurate to control the oil volume by opening the oil filling plug, in such condition, the oil passage will be filled with oil once the oil pump runs. If the wheel can run, such operation can be conducted on the lifting jack. The oil level shall be rechecked once the oil pump runs.

- (l) Put down the vehicle after finishing the lubricant inspection, and connect the cell cathode.



## Disassembly of Transfer Box

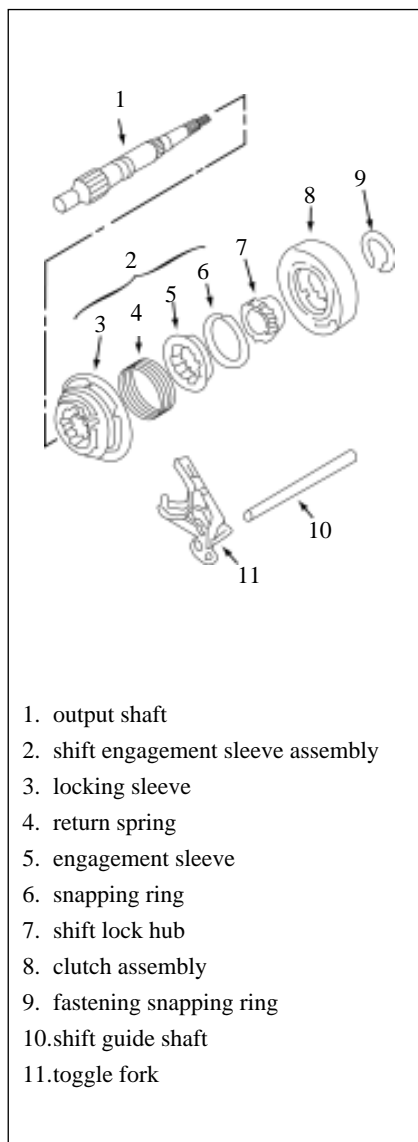
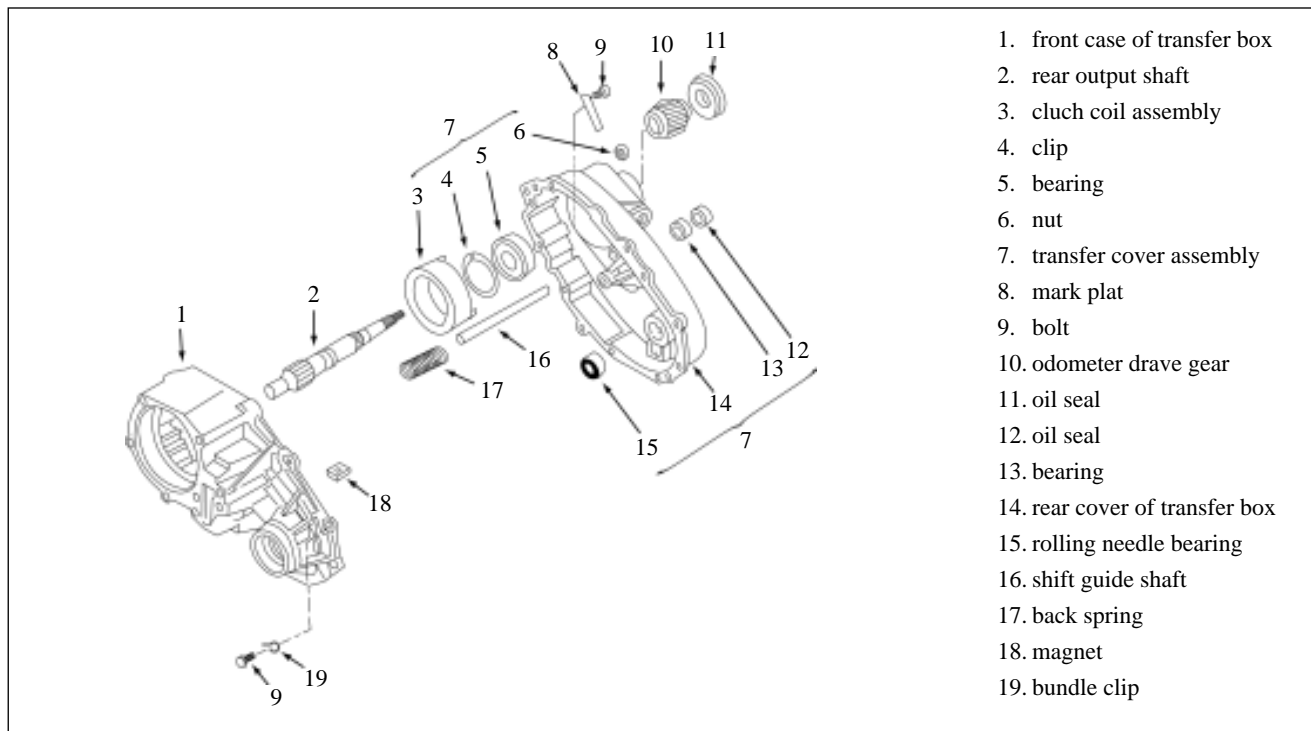
### 1. Brief instruction

In case the transfer box is required to be repaired for the damaged specific element, it shall be taken apart to the degree on which the damaged element is taken out. And the parts taken apart from the transfer box, if it doesn't include the damage element, can exist in the form of sub-assembly or group instead the individual form, otherwise, the parts will be taken apart individually.

### 2. Transfer Box Disassembly

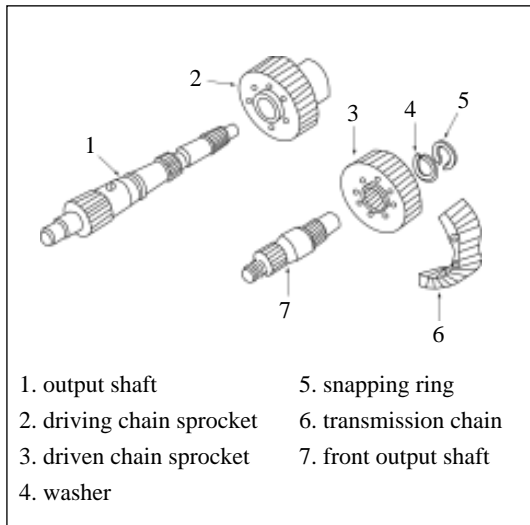
Put the transfer box on the worktable and ensure the rear part or the rear cover faces upward. Put the wooden block under the front part of transfer box to keep the transfer box stands horizontally. The disassembly process is as follows:

- (a) Fasten the flange with the torque arm typed T-13-54-002, screw off the nut to take down the gasket, then take apart the flange and oil seal.
- (b) Take down the two oil plugs from the transfer box body. As for the electric gearshift transfer box, tear down the electric shifting element according to the following disassembly approach:
  - (a) Tear down the three bolts, gaskets, sensor and clip for wire harness.
  - (b) Tear down the sensor assembly and take apart the O-ring.
  - (c) Tear down the motor assembly.



3. The disassembly approach for rear cover is as follows (above figure)
  - (a) Dismantle the nine screws and take down the clip of wire harness and signboard in the same time.  
 Notice shall be taken to good keeping for the signboard, which includes the information for the substitutes to be changed.
  - (b) Pry the frame lightly so that the sealing glue on the surface disengages, and then take up the transfer box rear cover assembly directly.
  - (c) As for the electric gearshift transfer box, tear down the oil seal, bearing and three nuts and clutch coil assembly.
  - (d) Tear down the snapping ring, pull out the bearing from the rear cover and take apart the odometer meanwhile.
  - (f) Pull out the oil seal from the rear cover of the transfer box.
  - (g) Tear down the magnet from the front body of transfer box.
  - (h) Take apart the return spring from the shift guide shaft
  - (i) Clear away the sealing glue on the coupling face of the front housing and rear cover of transfer box, take notice not to damage the coupling face of the two housings or cause the materials removed dropping into the transfer box.
4. Tear down the shifting element connected with the front axle.  
 Tear down the following parts from the remaining transfer box housing assembly (electric gearshift).
  - (a) Electric gearshift assembly, tear down the snapping ring and sliding clutch sleeve from the shift locking hub.
  - (b) Tear down the shift-locking hub from the rear output shaft.
  - (c) Tear down the shift engagement sleeve assembly and shift toggle fork from the rear output shaft and shift guide shaft. Separate the assemblies one another and tear down the shift guide shaft.
  - (d) Disassemble the shift engagement sleeve assembly by taking apart the snapping ring, engagement sleeve, return spring, and locking sleeve.
  - (e) A plastic toggle fork that substitutes the metal toggle fork assembly and a independent contact roller in earlier time.

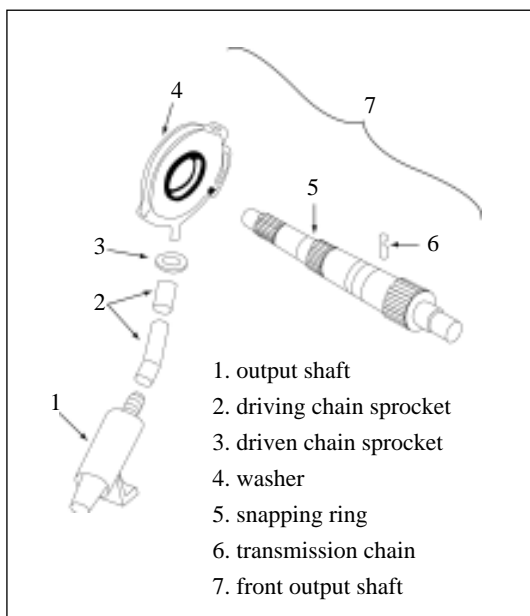




## 5. Tear down the Chain drive system

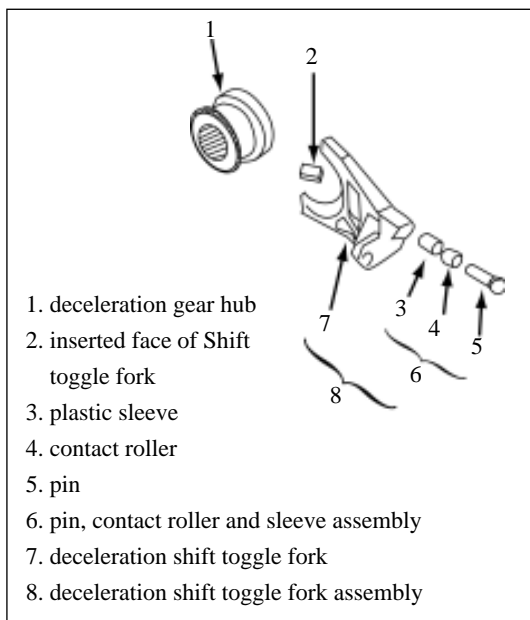
Take apart the following parts from the transfer box housing assembly.

- Take apart the snapping ring and washer from the front output shaft.
- Take apart the driving chain sprocket, driven chain sprocket and drive chain together from the two output shafts.
- Separate the chain sprocket from the chain.



## 6. Oil pump assembly

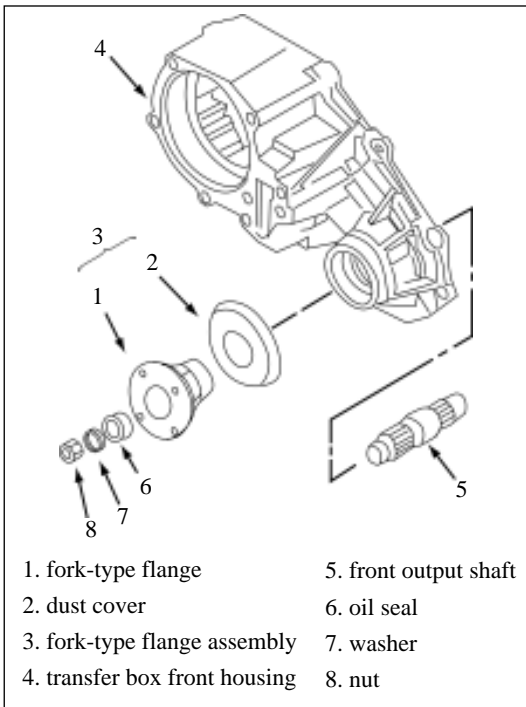
Take apart the shaft and pump assembly, pipe clip, oil pipe and filter from the remaining transfer box housing assembly.



## 7. Deceleration shifting element disassembly

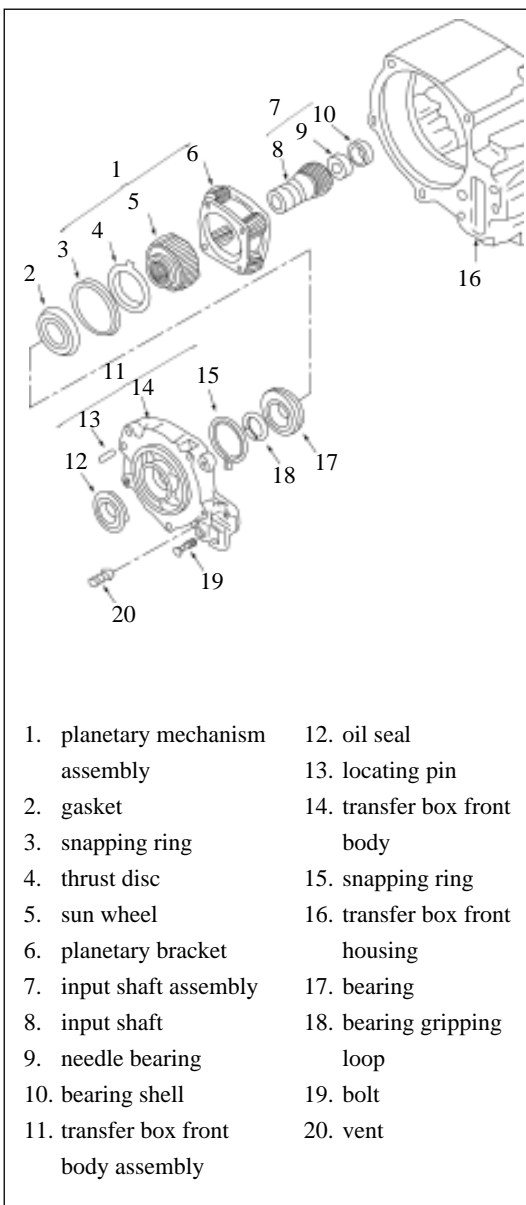
Tear down the following parts from the remaining transfer box housing assembly.

- Take apart the deceleration hub, and deceleration shift fork assembly from the housing.
- Take apart two plastic inserted faces from the deceleration shift fork assembly
- Disassembly the deceleration shift fork assembly only if it were broken. Cut the plastic cover, and take out the pin and truckle.



8. Take apart the following parts from the remaining transfer box housing assembly

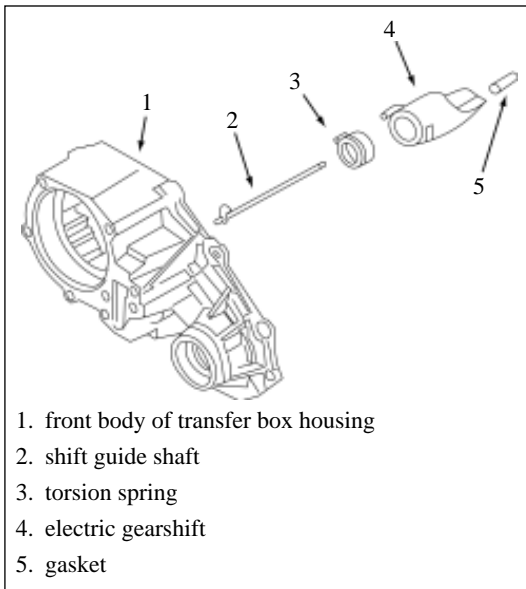
- Fasten the front fork-type flange with the torque arm of T-13-54-002 and screw off the nuts to take apart the gasket, pull out the front fork-type flange assembly and sealing ring.
- The dust cover may also be pressed down from the front fork-type flange where necessary, and
- Take apart the front output shaft.



9. Tear down the front body, input shaft assembly and planetary mechanism assembly

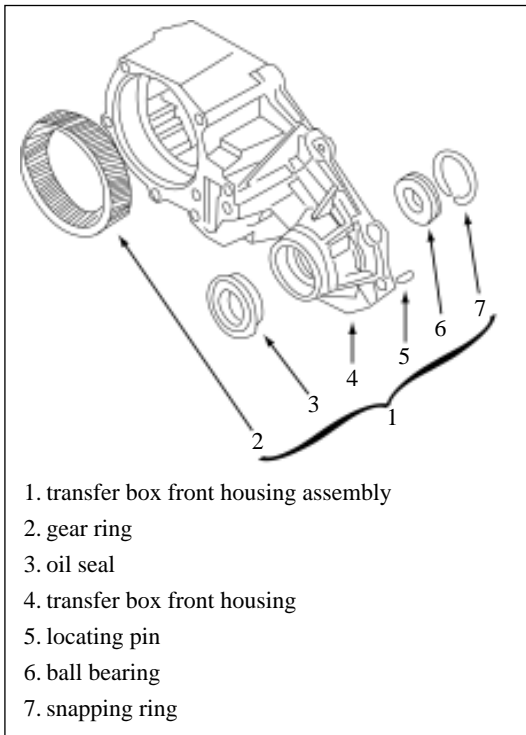
Tear down the following parts from the remaining transfer box housing assembly

- Take apart the venting valve.
- Take apart the six bolts to separate the front body from the transfer box housing and take down the front body (take notice not to damage the front-end cover and the transfer housing).
- Take apart the front body assembly, input shaft assembly and planetary mechanism assembly in grouping manner (loose the snapping ring to take apart the input shaft from the front end cover).
- Hold one end of the input shaft on the worktable while open the long end of the snapping ring, press the front body tightly to disassemble the front body assembly from the remaining assembly.
- Take apart the snapping ring and oil seal from the front body, the pin is only be taken apart where change is necessary.
- Take apart the bearing and gasket from the input shaft assembly after the bearing gripping loop is taken apart; and take apart the input shaft assembly from the planetary mechanism assembly.
- Take apart the needle bearing and bearing shell from the input shaft assembly, and
- Take apart the snapping ring, thrust disc and sun wheel from the planetary assembly, and
- Do not try to disassemble the planetary bracket.



**10. Take apart the shift convex plate parts (for the electric shift transfer box)**

- (a) Take apart the integrated electric shifting cam from the transfer box housing.
- (b) Take apart the electric shifting cam from the shift guide shaft.
- (c) Grip the end of shift guide shaft with soft-jaw vices, and tap the shaft with a screwdriver until the torsion spring drops off.



**11. Disassemble the transfer box housing assembly**

Disassemble the transfer box housing assembly in the manner as follows.

- (a) Take apart the oil seal.
- (b) Take apart the snapping ring, and pull out the bearing.
- (c) The locating pin may only be taken apart from the transfer box front housing in the case that the pin is loose or damaged, and
- (d) Where the gear ring needs to be changed, it may be pressed out from the transfer box housing.

## Transfer box assembly

### 1. Introduction

Please refer to the given instruction of this chapter during assembly process. And the following items shall be taken notice on:

- (a) In case that the torque of the threaded parts is required, torque spanner shall be used to screw up the parts.
- (b) The small parts shall be coated with the lubricant grease during the mounting process, so that they are immobilized at the mounting locations.
- (c) SST such as thimble of T-13-54-001 shall be used to press the oil seal and bearing during the oil seal mount and bearing mount, do not use the hammer to strike the oil seal or bearing directly.

### 2. Lubricating during assembling

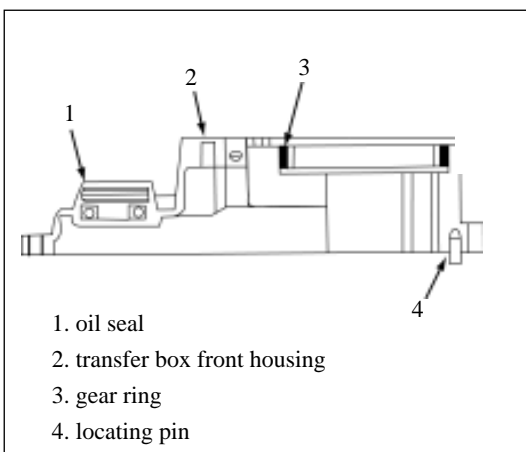
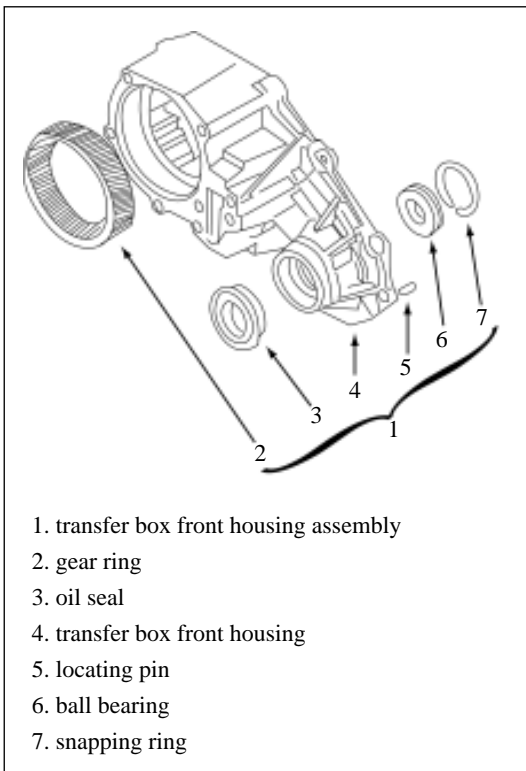
All inner parts without lubricant shall be lubricated with the suitable lubricant before mounting, so that they can be assembled easily and can supply the original lubricant performance.

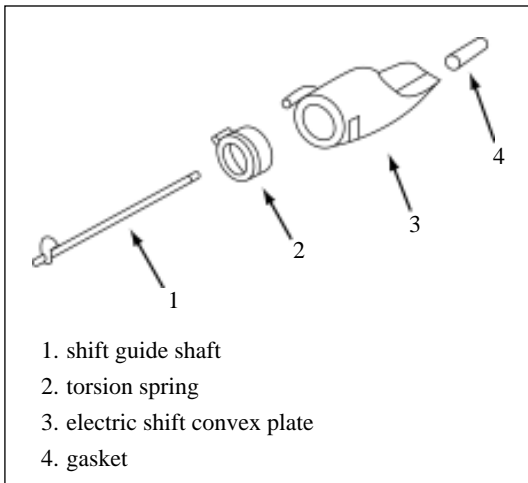
- (a) If the O-ring and oil seal were not lubricated before mounting, they may be damaged.
- (b) Be sure that the bearing or liner is lubricated completely before mounting. Because the bearing or liner may be leaded into damage even though they are run for a very short time.
- (c) The lips of oil seal and the metal elements that match with lips shall be lubricated before mounting.

### 3. Transfer box housing assembly

Parts taken apart from the transfer box shall be mounted according to the following approaches:

- (a) If the gear ring needs to be changed, the tooth-type saddle rear of new gear ring shall be flushed with the gullet of the transfer box front housing when pressing the new gear ring. Press in the gear ring as shown in the left bottom drawing, in which, the chamfering end is firstly pressed in. if it is ensured the gear ring is not tilted, then fasten the gear ring tightly on the housing.
- (b) In case there are two locating pins taken apart, mount two new locating pins into the housing.
- (c) Press the bearing into the transfer box front housing and mount the snapping ring correctly, and
- (d) Put down the new oil seal as shown in the left bottom drawing and press it into the housing.

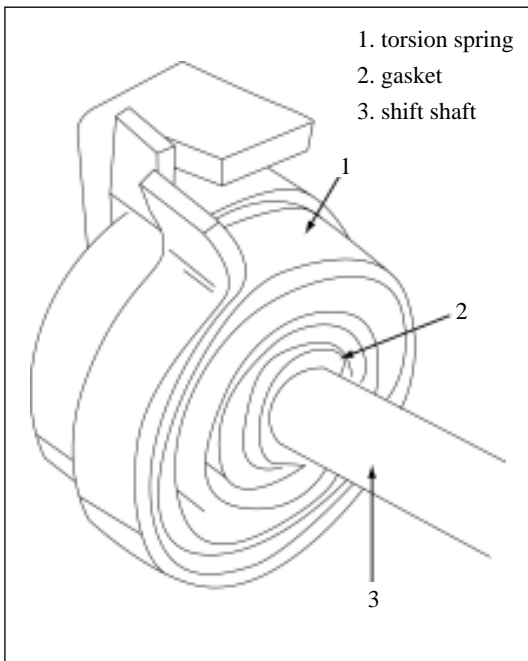




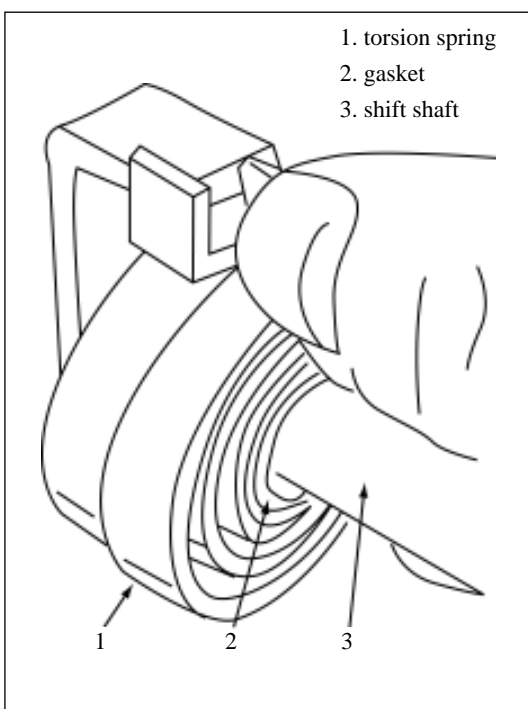
#### 4. Mechanic shift convex plate assembly (for electric shift transfer box)

The mounting process for the electric shifting element is as follows:

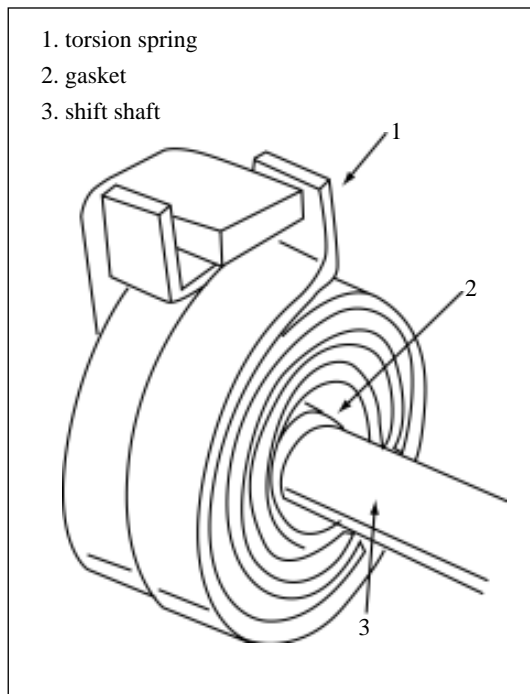
- (a) Insert the gasket into the inside of free end of the torsion spring.



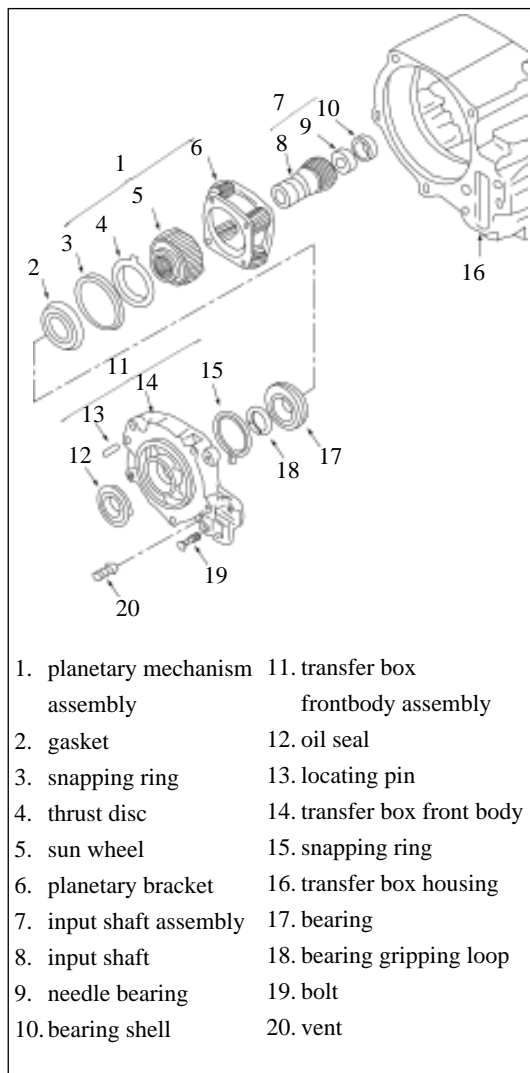
- (b) Slide the torsion spring and gasket along with the shift shaft to the driving tongue and put down the first spring ring at the left side of the driving tongue (from the direction of free end of shift shaft).



- (c) Twist the second spring ring of the torsion spring on shift shaft to the right side of the driving tongue.



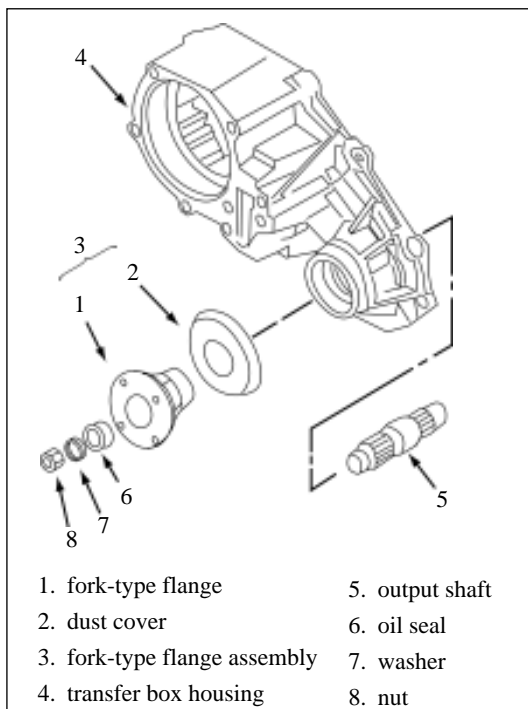
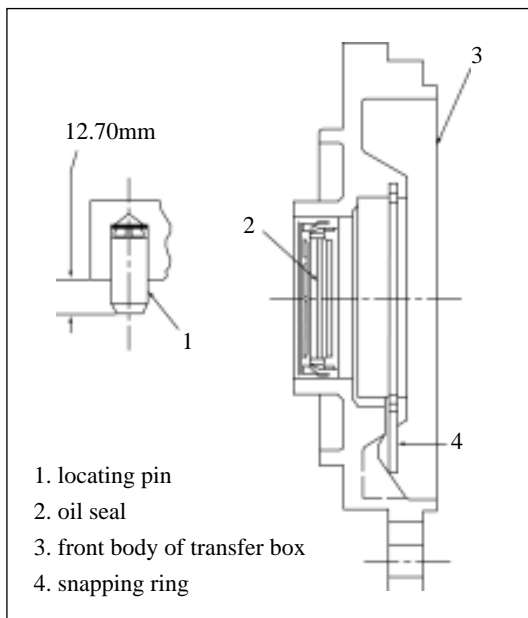
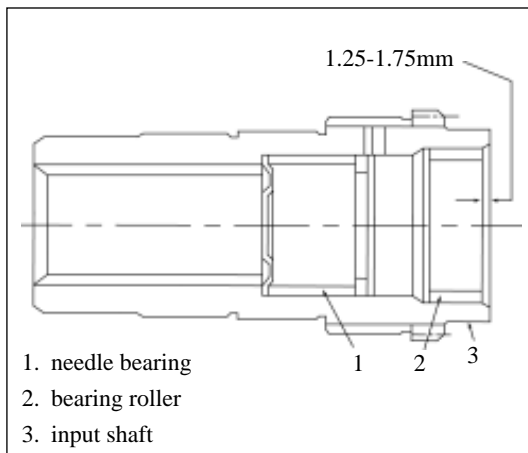
- (d) Push the torsion spring and gasket backward together as can as possible
- (e) Mount the electric shifting cam on the shift shaft in such way that the free end of the driving tongue of the cam is put in first, fasten the cam driving tongue, which shall be between the two spring ring of two torsion spring, under the driving tongue of shift shaft and put it innermost as can as possible.
- (f) After mounting the toggle fork, then mount the electric shifting cam assembly in the transfer box housing assembly



#### 5. Assemble for front body, input shaft assembly and planetary component element.

Mount the following element on the worktable:

- (a) Put the planetary bracket assembly on worktable, and the end with snapping ring groove shall face upward.
- (b) Mount in the sun wheel and let the part with projecting end upward, run the gear of the planetary bracket assembly until it completely engages with the sun wheel.
- (c) Flush the projecting teeth, and then mount the thrust disc into the planetary bracket assembly.
- (d) Mount in the snapping ring to complete the whole planetary bracket assembly.



- (e) In the case that the input shaft is taken apart, what need to do is to fill the needle bearing as shown in the drawing and press it in the input shaft, meanwhile, press the new sliding bearing to complete the whole input shaft assembly.
- (f) Raise the planetary mechanism assembly to mount it into the input shaft assembly; encase the thrust gasket and press in the bearing through the input shaft end. Encase the fixed bearing in the snapping ring groove of the input shaft with a snapping ring.

- (g) If the transfer box front body is taken apart, press the new located pin in the front body, and the pressing dimensions are shown in the drawing.
- (h) Put down the oil seal as the drawing shows, and press it in the front body according to the dimensions shown in the drawing.
- (i) Put down the front body assembly on two wooden blocks in the way that the coupling face of the front body and the housing faces upward, so that there is clearance left between the input shaft assembly and the worktable. Put down the input shaft and planetary mechanism assembly in the front body, in which the input shaft shall be downward. Open the long ends of the snapping ring to encase input shaft and planetary mechanism assembly until the snapping ring enters into the external snapping ring groove of the bearing.
- (j) Coat the sealing glue of 1.6mm on the coupling locations of the front end cover and transfer box assembly, The glue shall be coated continuously without break and steer clear of the screwed hole.

- (k) Screw up the six bolts.

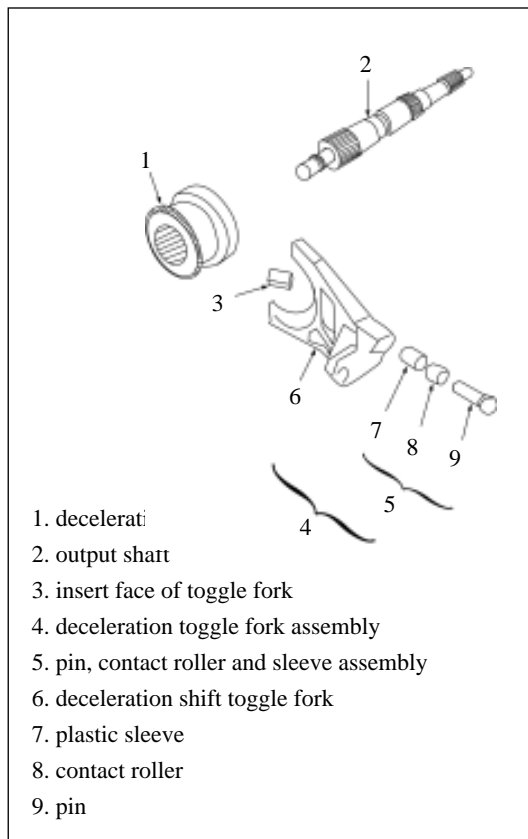
Fastening torque: (27 ~ 46)N · m

## 6. Assembly of front output shaft

Mount the following parts:

- (a) If the dust cover is taken apart, mount it by pressing.
- (b) Encase the input shaft, sealing ring, gasket and nuts in the transfer front housing.
- (c) Insert the torque arm of T-13-54-002 in the flange hole to screw up the nuts.

Fastening torque: (203 ~ 244)N · m

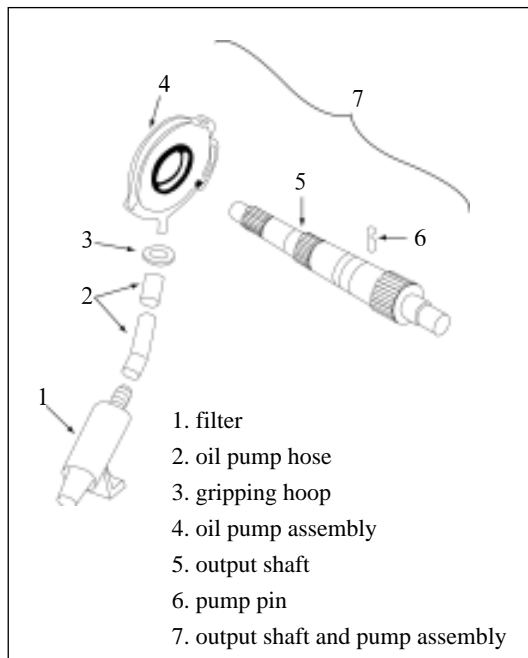


## 7. Deceleration shift parts assembly

The mounting process is as follows:

- If the parts are taken apart for change, assemble the shift toggle fork assembly with a new pin-contact roller assembly. Press the pin-contact roller in the deceleration fork hole until the detent passes the hole completely and seizes the right location. Ensure that the contact roller can run freely.
- Mount two inserted faces of toggle fork on the deceleration toggle fork assembly.
- Engage the deceleration fork assembly and deceleration gear sleeve and put them in the housing, and the deceleration gear sleeve shall be put in the planetary mechanism assembly that is assembled already. Mount the rear output shaft and joint the bearings at the ends of output shaft and input shaft as well as the spline of the gear sleeve.

Remarks: the output shaft assembly can be delayed until the oil pump is mounted on the output shaft. The oil pump may be dipped into the lubricant through the oil pump screen, turn the output shaft in clockwise from the output shaft direction to see whether there is lubricant pumped out so as to check whether the oil pump can work normally or not. The parts mounted readily may be encased in the transfer box housing as an assembly

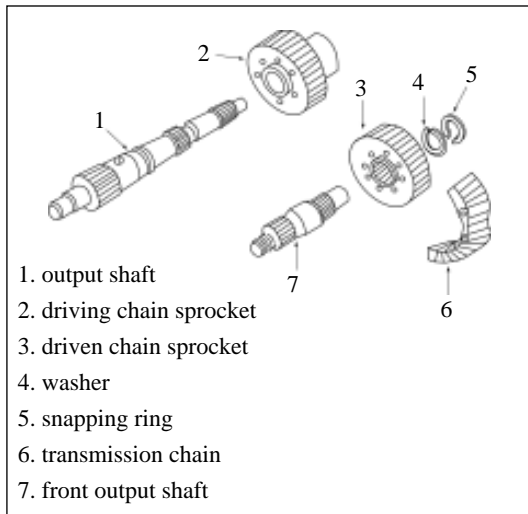


## 8. Oil pump assembly

Ensure the parts of oil pump are completely lubricated when assembling, and the oil can be pumped out from the conical hole of the oil pump front cover. The mount of oil pump is as follows:

- Mount the pin on the rear output shaft.
- Slide the oil pump assembly on the rear output shaft along with the pin.
- Put the gripping hoop at the end of oil pipe that is mounted on the oil nozzle of the pump housing, screw up the gripping hoop.

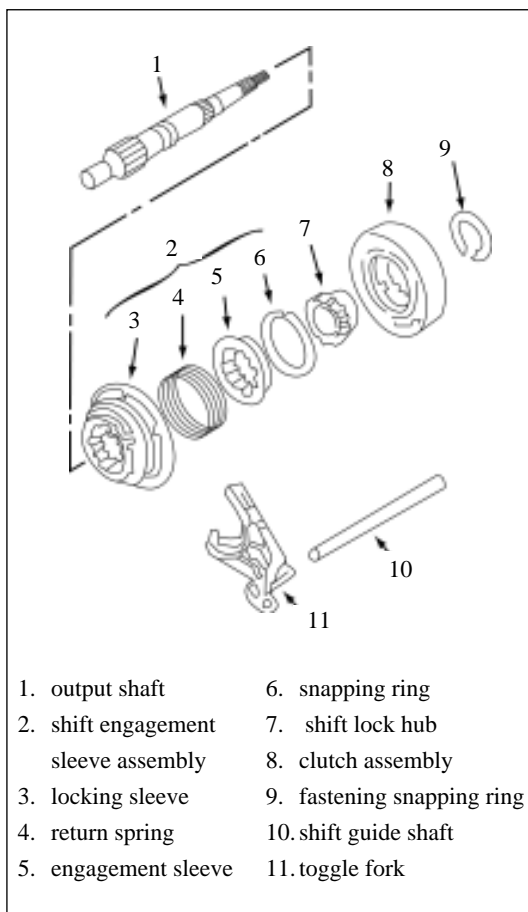




## 9. Assembly of driving chain

The parts assembly process is as follows:

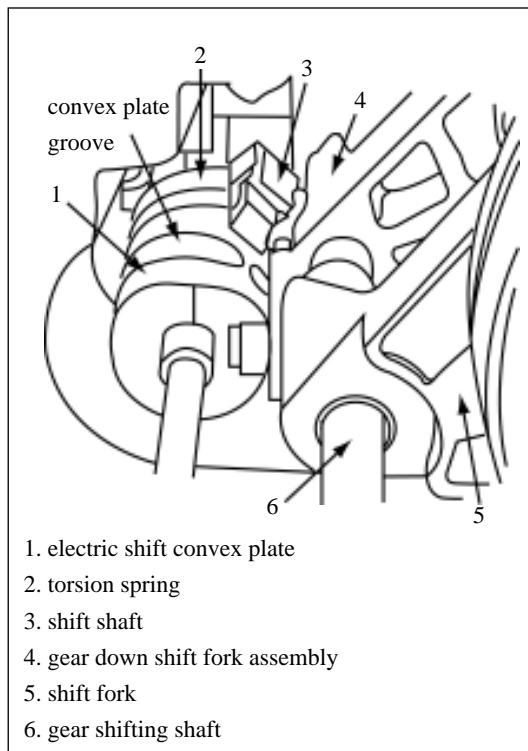
- (a) Put the driving chain sprocket at the rear end of the output shaft, and the driven chain sprocket is put at the rear end of the front output shaft on the worktable after the transfer box housing assembly mount.
- (b) Mount the chain on the sprocket.
- (c) Holding the two chain sprockets parallel with the transfer box in the space that the chain on the two sprockets are straightened, and encase the chain and sprocket assembly through the output shaft, it is required to run the chain sprocket slowly to ensure that they engage with the front output shaft and the spline.
- (d) Mount the gasket and snapping ring on the front output shaft.



## 10. Shift locking element assembly

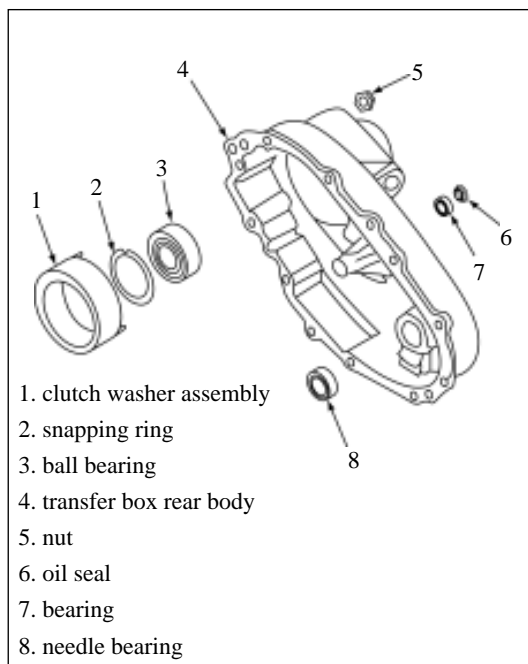
The parts mounting process is as follows (for the electric shift transfer box):

- (a) Mount the return spring and locking hub on the locking sleeve and fasten them with snapping ring to finish the 2W-4W locking sleeve assembly.
- (b) Encase the shift guide shaft in the blind hole of the housing through the deceleration toggle fork assembly that is already assembled.
- (c) Mount the shift toggle fork on the 2W-4W locking sleeve assembly, which will slide through the shift guide shaft and rear output shaft.
- (d) Joint the combined external gear sleeve spline and the rear output shaft spline as well as the 2W-4W locking sleeve.



(e) As for the electric shift transfer box, encase the assembled electric shifting cam group and clutch shell in the process as follows:

- (1) Put down the electric shifting cam group as shown in the drawing.
- (2) Hold the shift guide shaft downward and raise lightly the toggle fork assembly. Run the electric shifting cam group in place, so that the contact roller on deceleration toggle fork assembly enters in the groove of shifting cam, and the projecting part of lock toggle fork is at the rear end of the shifting cam, and then take reduce the component elements in the transfer box housing, meanwhile, joint the shift shaft on the pin in transfer box housing.
- (3) Locate the clutch shell well through the shift external gear sleeve and mount on the snapping ring.



## 11. Rear cover Assembly

Mount the parts into the rear cover according to the following process:

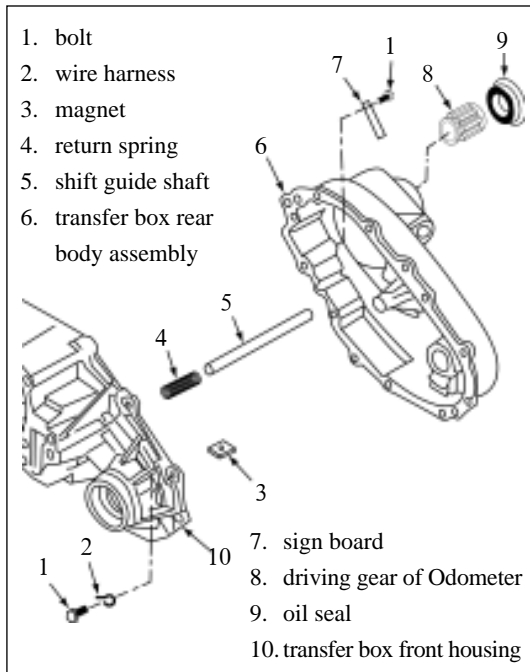
- (a) Locate the rear cover on the suitable press machine, the coupling face of the rear cover shall face upward and parallel with the work face of the press machine.
- (b) Locate the needle bearing, of which the marked end facing upward, and press it in the rear cover until the upper end of needle bearing is 40.47 ~ 40.97 lower than the coupling face of the rear cover that matches with the front housing.
- (c) Press the ball bearing in the rear cover and mount the snapping ring well.
- (d) As for the electric shift transfer box, the parts shall be encased according to the following process:

- (1) Confirm the four O-rings are set on the clutch washer assembly (one O-ring is located on the coil, the other three on studs).

Mount on the clutch coil assembly, of which the wire and stud shall protrude out the rear cover, take notice not to damage the wire when screwing up the nuts.

Fastening torque: (8 ~ 11)N · m

- (2) Encase the motor bearing and oil seal in the rear cover.

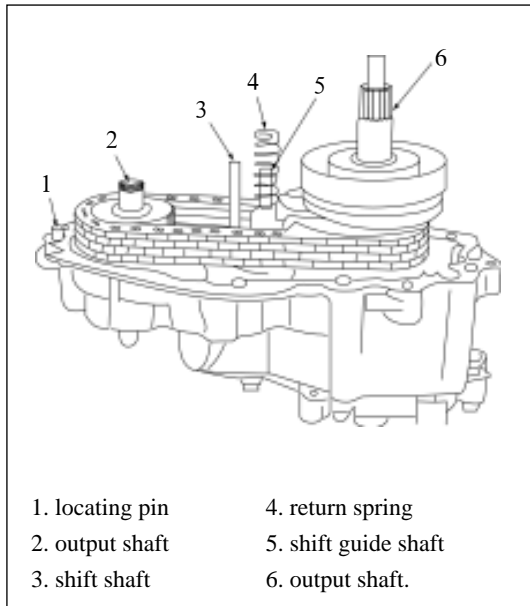


## 12. Assembly of Rear Cover

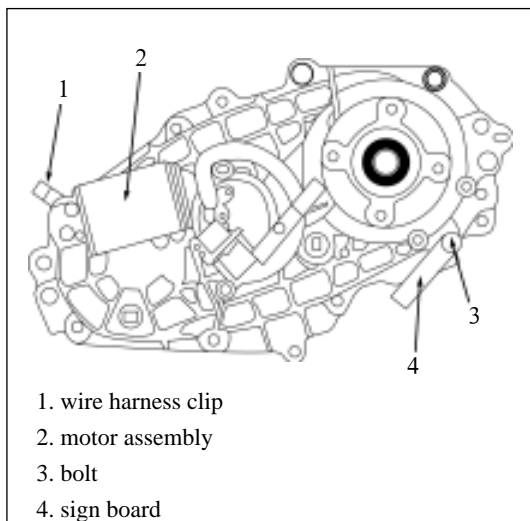
Mount the aforesaid accomplished cover assembly on the transfer box housing according to the following process:

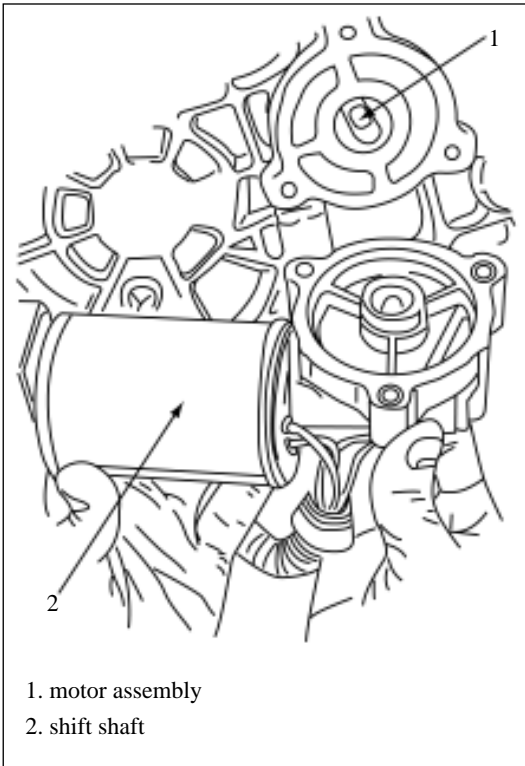
- Mount the return spring on the shift guide shaft of the transfer box.
- Mount the magnet in the groove of the housing.
- Coat the Letai glue 598 of 1.6mm on the coupling face of housing, steer clear of the screwed hole when coating continuously.

Notice: try to button the rear cover on the transfer box front housing with the moderate force during the following process. Not too much force is required when mounting the rear cover on the front housing when all aligning conditions are satisfied, in case the rear cover cannot be mounted on the front housing, take down the rear cover assembly to check the aligning condition



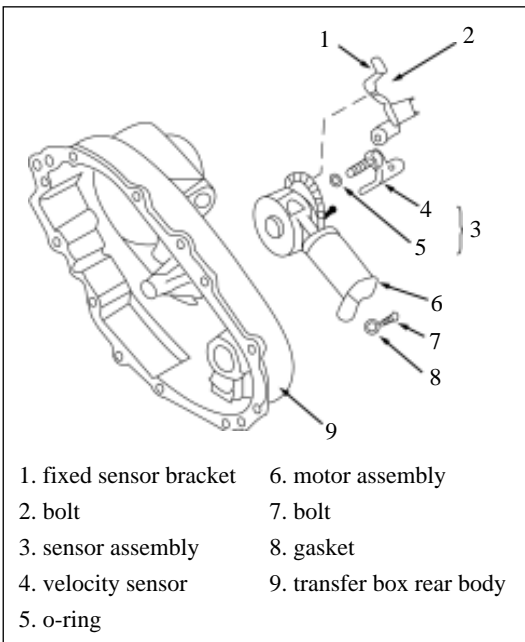
- All of the following aligning conditions shall be satisfied when the rear cover assembly is mounted on the transfer box front housing:
  - Align the pin hole in the rear cover to the pin on the housing.
  - Align the rear output shaft to the inner bearing in cover rear hole.
  - Align the blind hole in the rear cover and the shift guide shaft; ensure the return spring is not tilted. Check the hole in velocity sensor of the rear cover with a pen.
  - Align the shift shaft and the inner bearing in rear cover.
- Screw up the nine bolts after locating the sign bolts correctly.
- Encase the gear of odometer in the rear cover assembly through the spline of the rear output shaft.
- Press the new oil seal in the cover assembly





12. Mount the external electric shifting element (for the electric shift transfer box)

- (a) Locate the motor assembly by aligning the triangle groove on motor to the shift shaft.

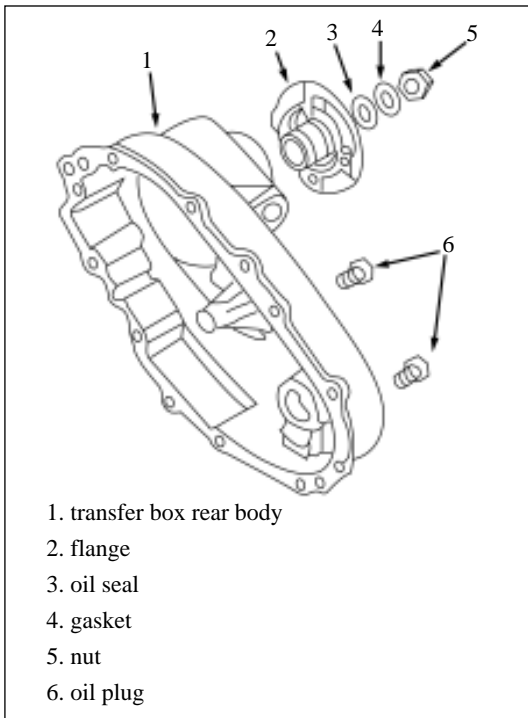


- (b) Move the motor to combine the shift shaft and keep it close to the rear cover. Then run the motor clockwise until the motor locates the correct place and the mounting holes are aligned.
- (c) Mount the O-ring on the velocity sensor and encase the velocity sensor assembly in rear cover. A clip and three bolts shall be mounted on the velocity sensor.

Fastening torque: (8 ~ 11)N • m

- (d) Mount the bolts and gaskets on the end of motor clip.

Fastening torque: (8 ~ 11)N • m



### 13. Flange assembly

The parts mount process is as follows:

- (a) Encase the two oil plugs in the rear cover.
- (b) Encase the flange, sealing ring and gasket, and then screw up the nuts.

Fastening torque: (203~244)N • m

## Washing, Inspection, Maintenance or Change

### 1. Washing

Notice: check the metal rag around the magnet first before washing, large granule or irregular metal granule shows the disintegration or similar damage. Small or fine metal granule shows the uneven or serious wear. If the metal rag is founded, notice shall be taken on damage and wear inspection during checking the rotating parts and the element matched with the rotating parts.

#### (a) Common washing

Wash the parts in cleaning agent to clean away the old lubricant and deposit. Clean away the deposit in oil hole with brush. Take notice not to scrape the metal coupling face when washing the parts cannot be cleaned with brush.

#### (b) Dry the washed parts by blowing

Dry the washed parts by blowing the low-pressure compressed air (max pressure is 137.9kPa), because cloth thread may be left during cleaning the parts with cloth. The bearing shall be held by hand to prevent it from rotating when blowing it.

#### (c) Bearing lubrication

The ball bearing and needle bearing shall be lubricated with the lubricant for transfer box after washing. As the non-lubricated bearing may cause damage when be dry. Cover the lubricated bearing to prevent dust entering in.

## Checking

### 1. Common Checking process

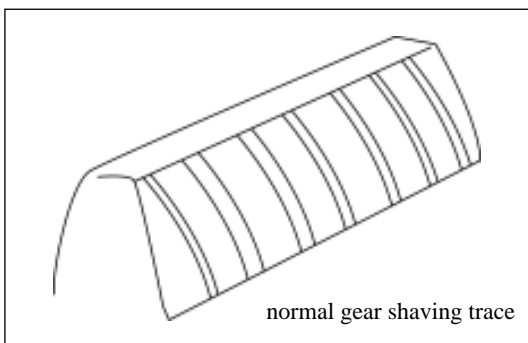
Check all parts by visual check to see whether there is damage or serious or uneven wear (parts needed be substituted by new parts such as O-ring, oil seal and etc. shall be excluded). Abandon the damaged or weary parts that will affect on their performance. The check items are as follows:

- Burr: tips protruded from the material regionally
- Rag: broken small blocks or particles
- Crack: surface thread showing the material is partly or completely separated.
- Excessive abrasion: Refer to the serious or obvious abrasion beyond of application limit.
- Reduction change: Material slip caused by the heavy pressure on part of it.
- adhesive bonding: Granules of the soft metal are dispersed and bonded on the hard metal surface.
- Ditch trance: partial crack or trough that means the material transfer instead of material loss.
- Pitting corrosion: Damages to the metal surface caused by pressure, which are displayed due to color change caused by heat generated by metal friction.
- Step wear: a weary step may be seen or felled between the neighboring interface or between the non-touching face due to the excessive wear.
- Uneven wear: Partially, unevenly distributed wear, which includes holes, bright spots, uneven polishing or other visual drawbacks.

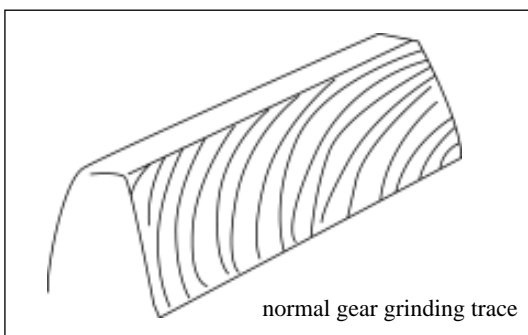
### 2. Gear or Chain sprocket tooth inspection

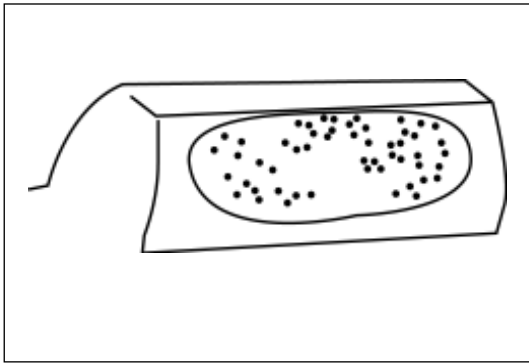
Check the gear and chain sprocket tooth according to the following process:

(a) Normal gear shaving trace.

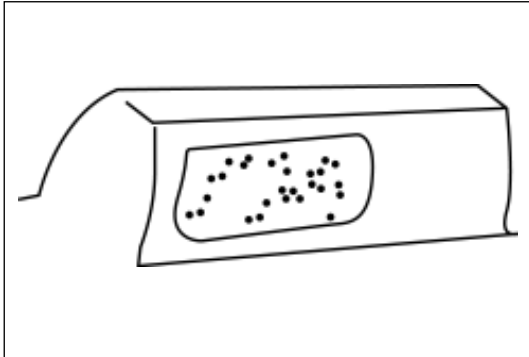


(b) Normal gear grinding trace.

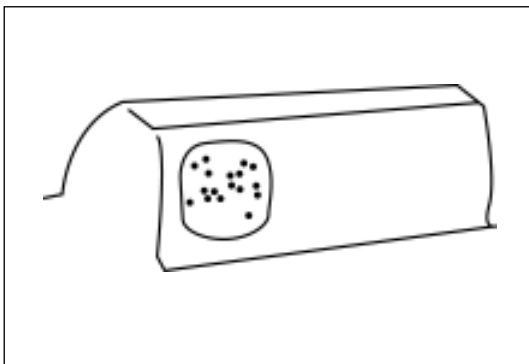




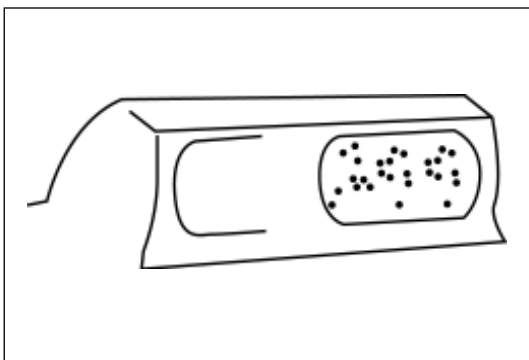
(c) Ideal engagement contact area



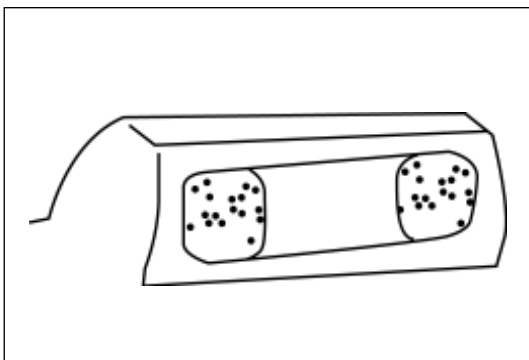
(d) Acceptable side-deflective contact area



(e) Unacceptable side deflective contact area that must be changed.

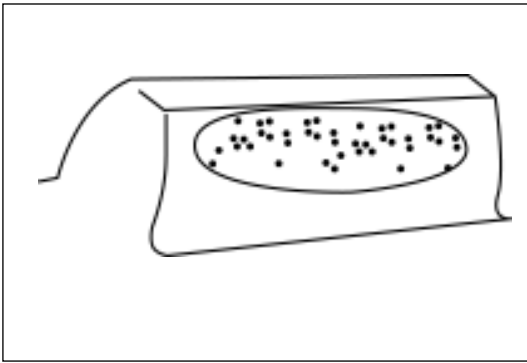


(f) Acceptable side-deflective contact area

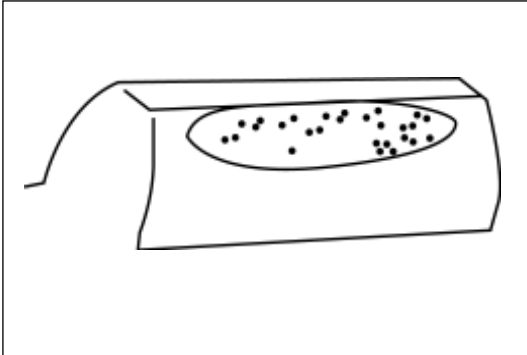


(g) Unacceptable side deflective contact area that must be changed.

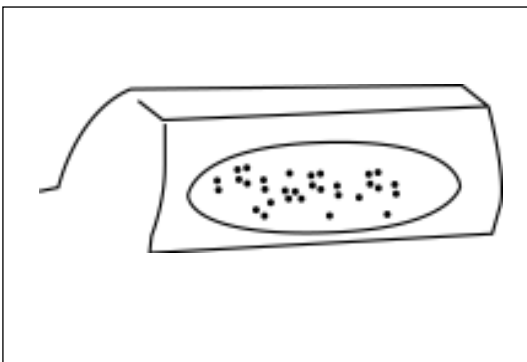




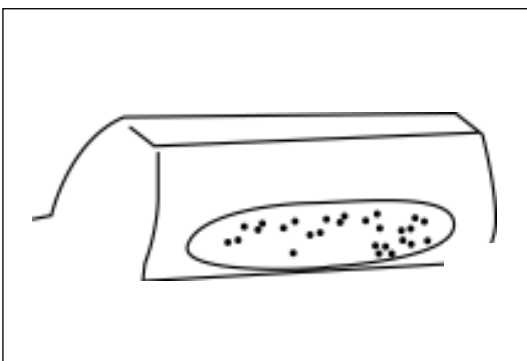
(h) Acceptable contact area deflecting to the tooth top.



(i) Unacceptable contact area deflecting to the tooth top, which must be changed.



(j) Acceptable contact area deflecting to tooth root.



(k) Unacceptable contact area deflecting to tooth root, which must be changed.

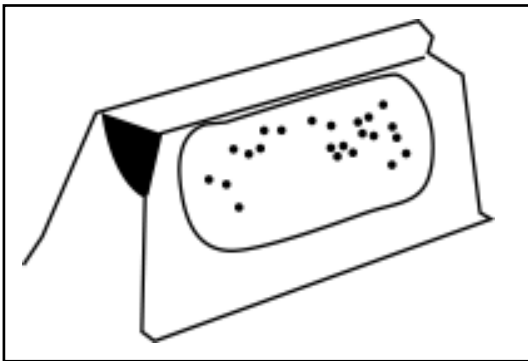
#### 4. Key tooth inspection

Check the broken or peeled spline teeth. The spline teeth may, if only small part is peeled off, be repaired in the same way as that for the gear teeth, and can be reused. In case the spline tooth is broken, the spline must be abandoned. The contact type of spline is not the same as that for gear; however, spline that shows step sliding must be abandoned.

## Maintenance or Change of Gear or Chain Sprocket Gear

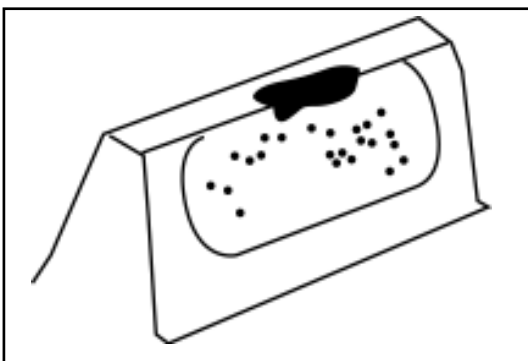
### 1. Maintenance principle

- (a) Conduct the maintenance for the partial, small peel off with the suitable manual high-speed grinding tool.
- (b) Do not clear away the metal as can as possible when grinding the matrix metal.
- (c) All pointed angles and sides must be repaired as the slippery contour line. Because the pointed angle or edges may be peeled off again or developed into crack.
- (d) Clear away the burr with the suitable grinding stone. Take notice not to damage the matrix when clearing away the projecting materials, and
- (e) When substituting the non-repaired parts (such as bearing), if the part is doubted in its re-application capability, it must be changed.

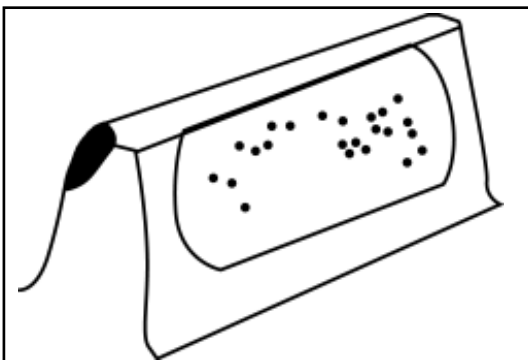


### 2. Cases for gear or chain sprocket maintenance or substituting

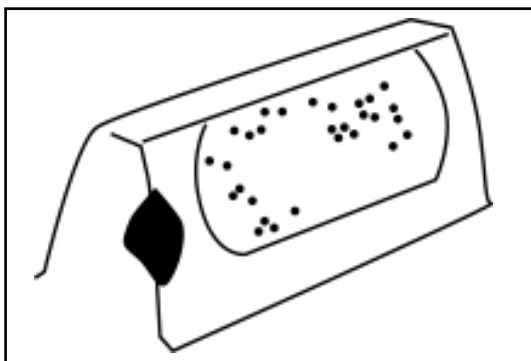
- (a) The gear, being peeled off at the two sides of tooth top in contact face, may be repaired for reuse.



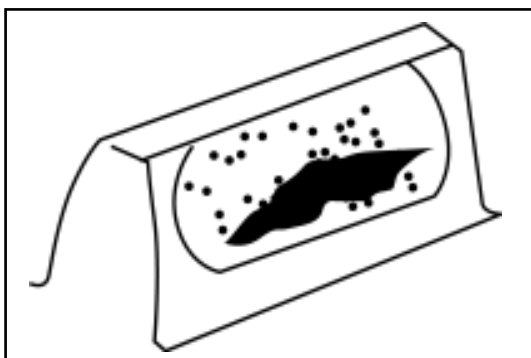
- (b) The gear, being peeled off at the central tooth top of contact face, may be repaired for reuse.



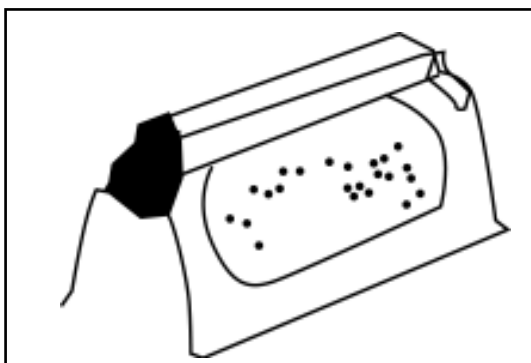
- (c) The gear, being peeled off at one side of the non-contact face, may be repaired for reuse.



- (d) The gear, being peeled off at the center of one side of contact face, may be repaired for reuse



- (e) The gear, being peeled off in the center of contact area, shall be changed.



- (f) The gear, being peeled off at two sides of tooth top, shall be changed.

## Attachment for Inspection Maintenance or Change of Parts

Parts (items)	Checking items	Acceptance/Refusal
All parts (including all springs)	Crack inspection, distortion inspection and erosion inspection	All parts with crack, all parts that are bended, distorted or poor in round bouncing are refused.
All threaded parts	Thread inspection for buckle missing or other damage	Those parts cannot be threaded or bottomed in overlap manner shall be refused.
Flange and fork flange	Please refer to the paragraph of “inspection” to check the spline.	Please refer to the “inspection paragraph” for spline inspection.
Velocity sensor, motor assembly Parts of electric clutch system	Please refer to the part of electric appliance	Change the parts and fittings as requirement
Sliding bearing	Inside surface inspection for the sliding bearing	In the case that the bearing has pitting corrosion or other damage, refuse it.
Ball bearing	Check visually the ball and track of the ball bearing to see whether there is damage such as adhesive bonding, pitting corrosion, etc. Ensure that the bearing are all lubricated, run the outer race of the bearing while holding the inner one to feel whether there is poor running or corrosion, the bearing shall be run smoothly without excessive clearance.	Refuse to use the damaged bearing; Refuse to use the damaged or loose bearing; or Check the axial clearance to see whether it exceeds 0.23mm.
Needle bearing	Check the bearing needle roller and track to see whether there is damage such as adhesive bonding, pitting corrosion, etc.	Refuse to use the damaged bearing.
The rear cover, front body and front housing of transfer box	Check to see whether there is burr on the coupling face or other damage that impedes assembling or sealing.	Clear away the burr according to the paragraph of “inspection”, otherwise, change the damaged element
Rear cover of transfer box	Check the bearing hole	Refuse to use the assembly that has pitting corrosion
Odometer gear	Check the gear teeth referring to the Inspection Paragraph	Refer to the gear or chain sprocket inspection in “inspection paragraph”.
Clutch shell, joint outer gear sleeve and joint cover	Check the spline according to the Inspection paragraph	Refer to the spline inspection of “inspection paragraph”
Locking sleeve	Check the wear or damage of the toggle fork groove	Refuse the parts with step slipping or damage.
Shift guide shaft	Check the deformation situation Check the burr or other damage on outer race Check the wear of outer race	Refuse to use the bend shaft; clear away the burr according to the “inspection” paragraph, otherwise refuse to use. Refuse to use the shaft with step slipping or other damage.
Shift toggle fork	Check whether there is wear or damage at the location where the toggle fork combines with the shifting cam and gear sleeve.	If any step slipping or damage is found, refuse to use it.

## Attachment for Inspection Maintenance or Change of Parts

Parts (items)	Checking items	Acceptance/Refusal
Shift toggle fork assembly	Check the wear and damage of the inserted face that is combined with gear sleeve; Check to see whether the contact roller can rotate freely or is damaged or not	If any step wear or damage is found, the inserted face shall be refused to use. If the contact runs difficultly or is damaged, a new pin-contact roller and new cage assembly shall be used.
Driving and driven chain sprocket	Check the sprocket teeth according to the “inspection” paragraph	Refer to the sprocket teeth inspection of “inspection” paragraph
Shift toggle fork assembly	Check the inner diameter that matches with the output shaft	If any pitting corrosion or damage is found, refuse to use it.
Driving chain	Check the step sliding, looseness or damage of pin or connecting element	Refuse to use the weary or damaged driving chain
Filtering screen	Check to see the filtering screen is clean or with small hole or damage	Clean it where necessary, and abandon the damaged one.

## Maintenance or Change of Parts

Pump shell	Check to see whether there is pitting corrosion or step slipping	Abandon it in case it is seriously damaged or worn
Output shaft	Check the spline, check the surface that matches with bearing and check the distortion according to “inspection” paragraph	Refer to the spline inspection of “inspection” paragraph; Refuse to use the one with pitting corrosion or damage; Refuse to use the one that is bending or poor in round bouncing.
Deceleration hub	Check the spline of chain sprocket and check the wear or damage of the location where matches with the toggle fork according to the “inspection” paragraph	Refer to the spline inspection of “inspection” paragraph; refuse to use the one with step sliding or damage.
Front output shaft	Check the surface where matches with the bearing; Check the spline according to the “inspection” paragraph	Refuse to use the one with pitting corrosion or damage
Input shaft	Check the spline according to the “inspection” paragraph Check the distortion	Refer to the spline inspection of “inspection” paragraph; Refuse the one that is bending or poor in round bouncing.
Thrust washer and thrust disc	Check the pitting corrosion	Refuse to use the one with pitting corrosion or damage
Sun wheel	Check the gear teeth and spline according to the “inspection” paragraph	Refer to the gear teeth inspection and spline inspection of “inspection” paragraph.
Planetary mechanism assembly	Check the gear teeth according to the “inspection” paragraph; Check the wear and looseness of the planetary gear pin; check the wear of thrust gasket	Refer to the gear teeth inspection of “inspection” paragraph; If any step sliding or pitting corrosion is found, refuse to use it
Electric shifting cam	Check to see whether there is step slipping or pitting corrosion	If any step sliding or pitting corrosion is found, refuse to use it
Shift guide shaft	Check to see whether there is step slipping or pitting corrosion Check the distortion situation	If any step sliding or pitting corrosion is found, refuse to use it Refuse to use the bending one
Planetary gear ring	Check the match performance of it with the transfer box housing  Check the gear teeth according to the “inspection” paragraph	Check the transfer box housing assembly to see whether the gear ring is loose or not in the housing Refer to the gear teeth inspection of “inspection” paragraph
Transfer box housing	Check the holes matches with the bearing	Abandon the one with pitting corrosion or damage.

# Drive shaft

	page
Notice .....	PR-2
Troubleshooting .....	PR-2
Drive shaft .....	PR-3

## Notice

Notice: do not grip the drive shaft sleeve too tight with vice so as to avoid the deformation.

## troubleshooting

Trouble	Causes	Resolving approaches
Noise	Wear of universal joint yoke spline; Wear of central bearing; Wear or seize-up of cross shaft bearing	Change the drive shaft; Change the central bearing; Change the bearing of cross shaft
Vibration	Oscillation difference of the drive shaft; Drive shaft imbalance; Wear of the liner of rear bearing in the lengthening shell of gear box; Spline seize-up of the universal joint yoke	Change drive shaft Change drive shaft Change the liner  Change drive shaft

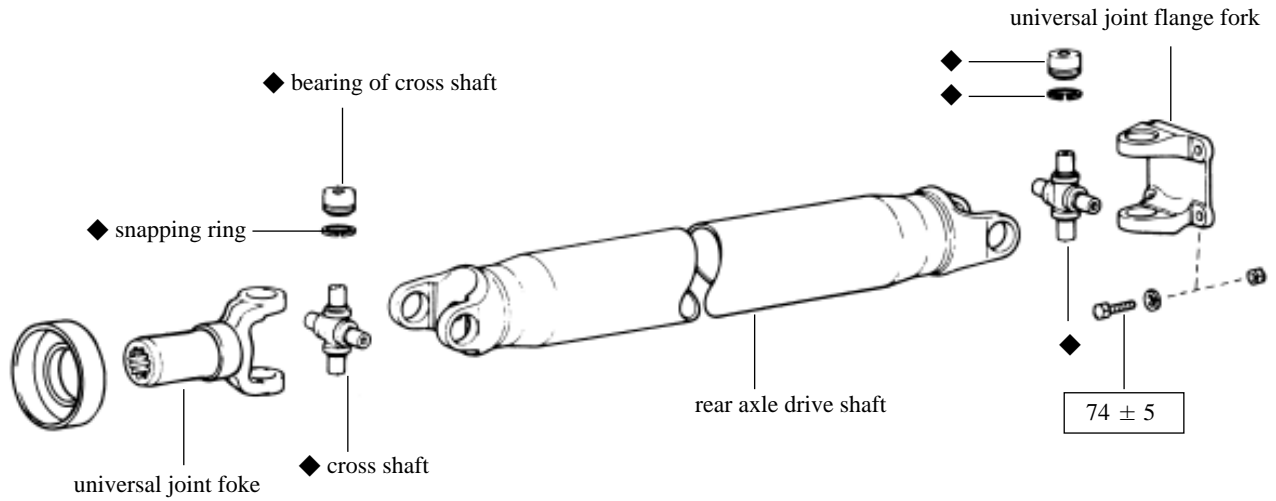


## Drive Shaft

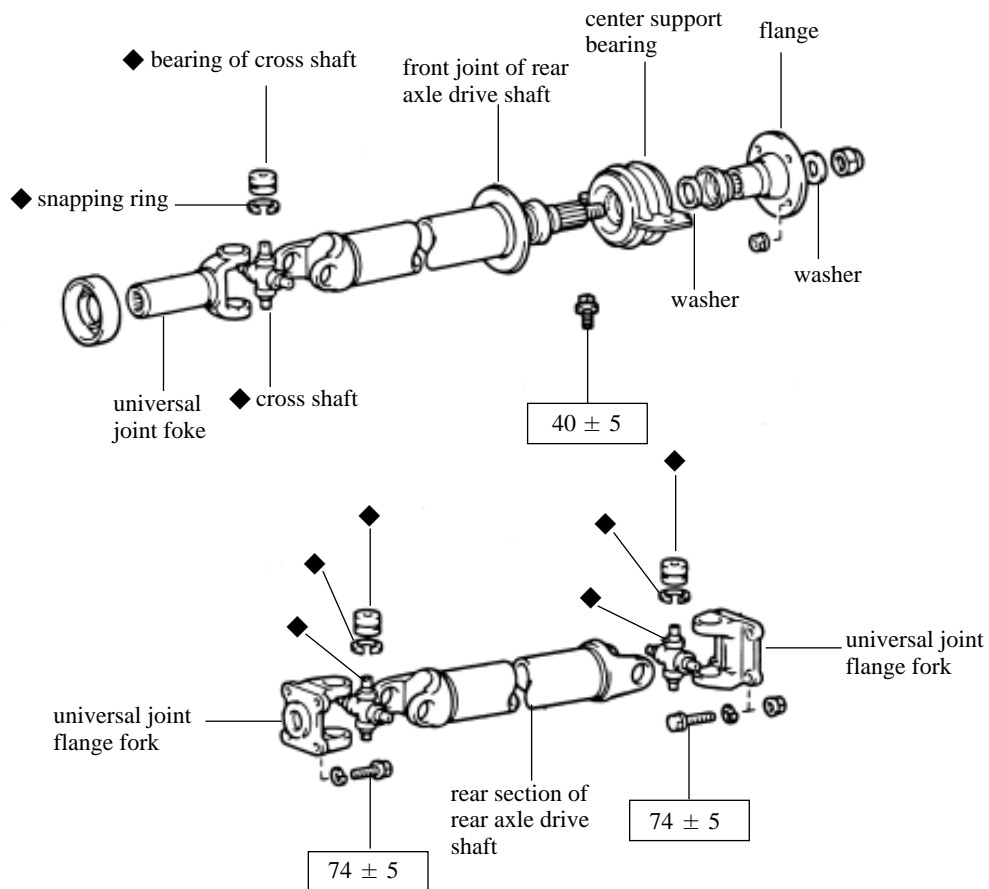
### Element Drawing

2WD

two-joint type



three-joint type



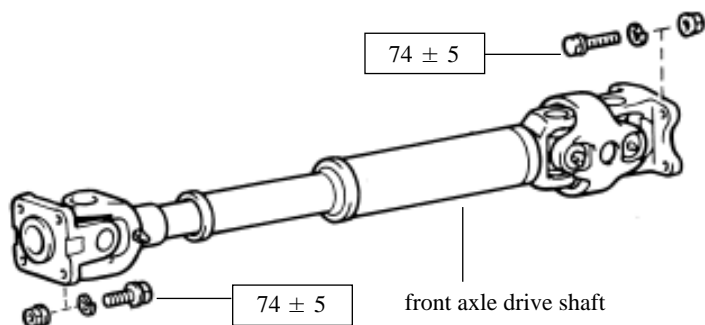
**N\*m** : specified torque

◆ Parts that cannot be reused after being used

## Element Drawing(continued)

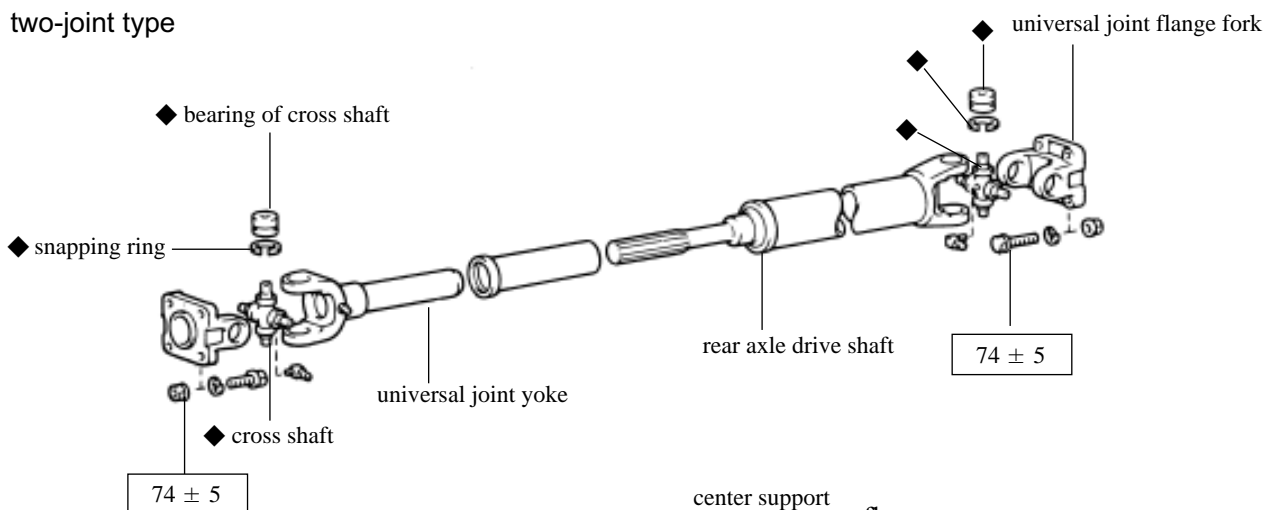
4WD

front axle drive shaft

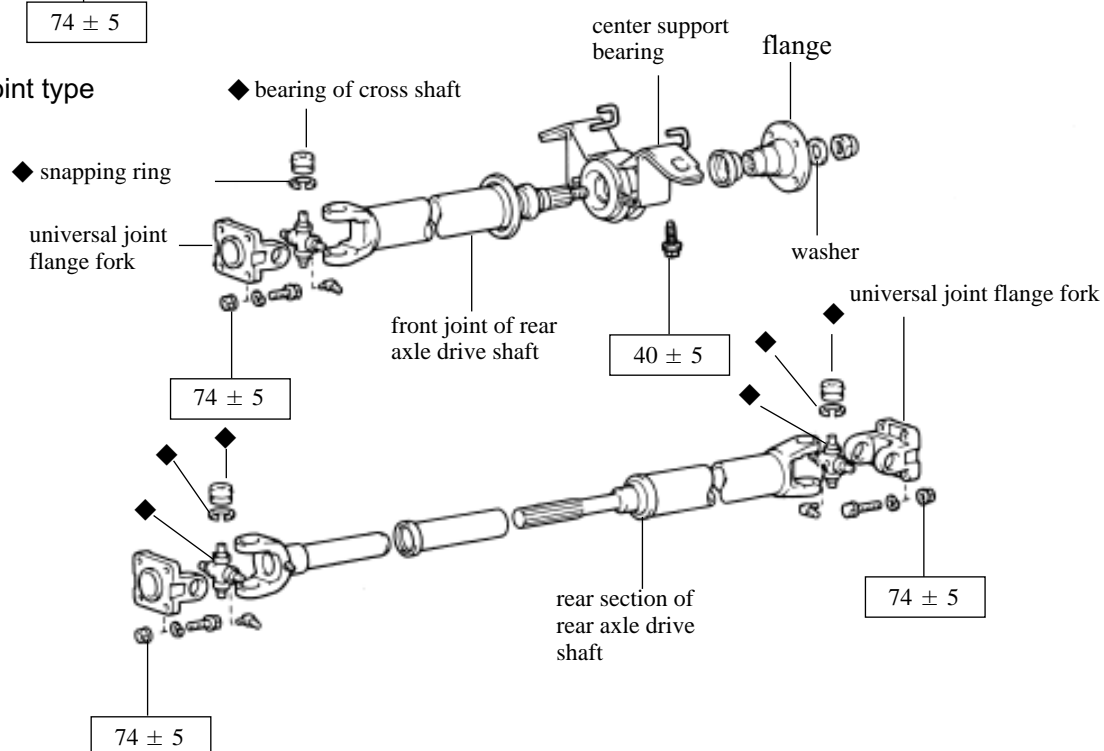


rear axle drive shaft

two-joint type

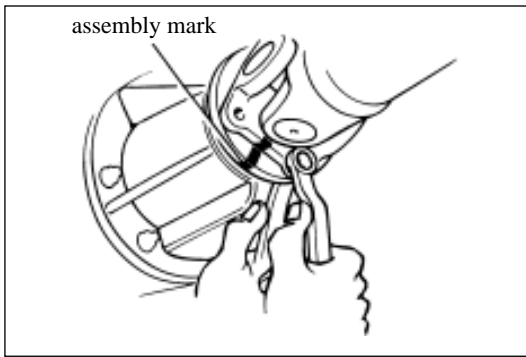


three-joint type



N\*m : specified torque

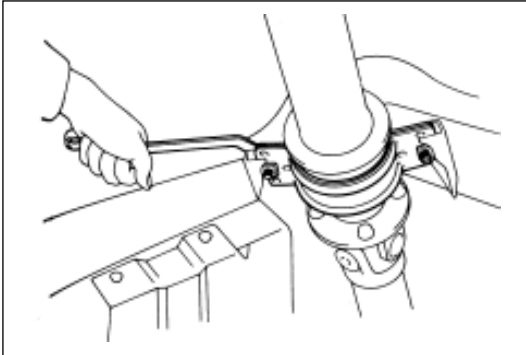
◆ Parts that cannot be reused after being used



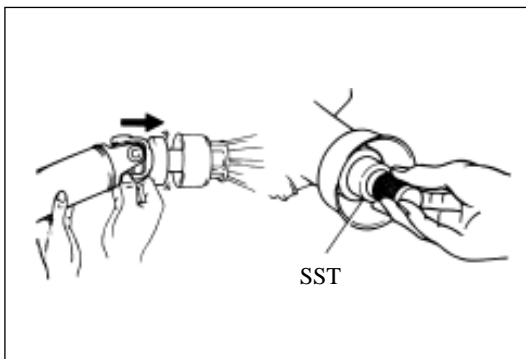
## Disassembly of Drive Shaft

(2WD)

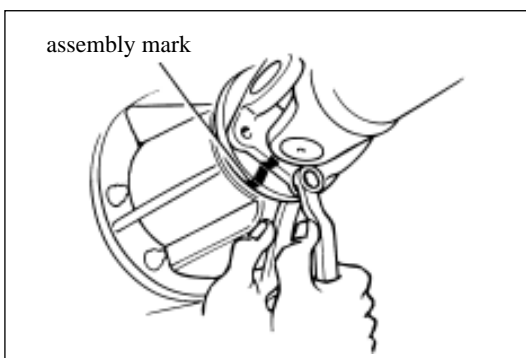
1. Take apart the universal joint flange fork of the drive shaft from the differential flange.
  - (a) Label the two flanges with assembly remarks.
  - (b) Take apart the four sets of bolt and nut.



2. Take apart the center support bearing from the frame beam (for the three-joint type)



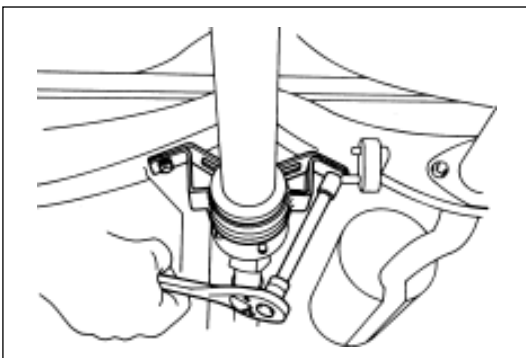
3. Take apart the drive shaft from the gearbox
  - (a) Pull out the universal joint yoke from the gearbox.
  - (b) Insert the SST in gearbox for oil leakage prevention.



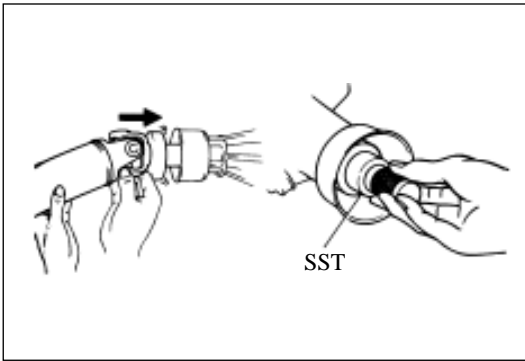
(4WD)

Rear axle drive shaft

1. Take apart the universal joint flange fork of rear axle drive shaft from the differential flange.
  - (a) Label the two flanges with assembly marks.
  - (b) Take apart the four sets of bolt and nut.

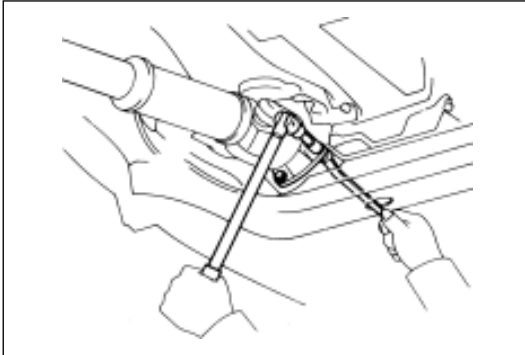


2. Take apart the center support bearing from the frame beam (three-joint type)

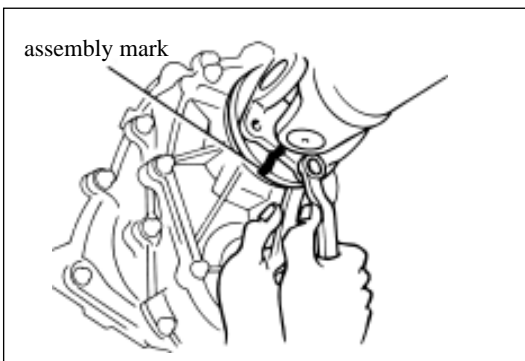


3. Take apart the drive shaft from the gearbox.
  - (a) Pull out the universal joint yoke from the gearbox.
  - (b) Insert the SST in gearbox to prevent the oil leakage

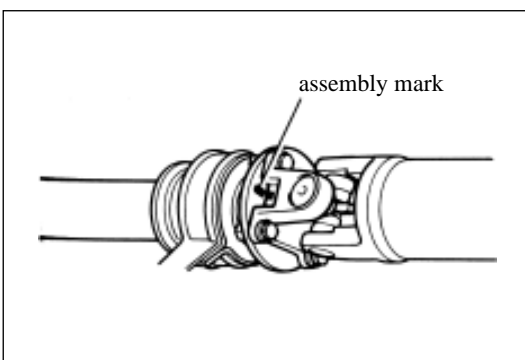
Front axle drive shaft



4. Tear down the front universal joint flange fork of the front drive shaft.
  - (a) Hang the front end of the front axle drive shaft.
  - (b) Label the assembly mark on the flange
  - (c) Take apart the four sets of bolt and nut.

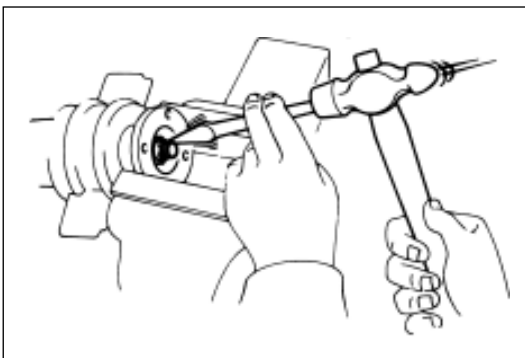


5. Disconnect the rear universal joint flange fork from the front axle drive shaft along the transmission path.
  - (a) Label the assembly marks on each flange.
  - (b) Take apart the four sets of bolt and nut.

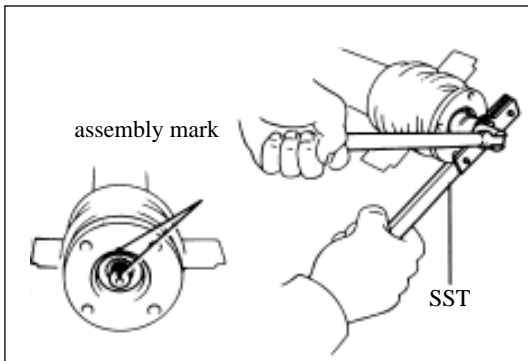


#### Drive shaft disassembly

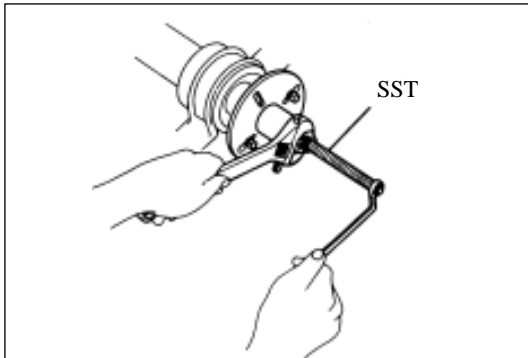
1. Separation of the rear joint of the rear axle drive shaft from the front joint of rear axle drive shaft
  - (a) Label the assembly marks on each flange.
  - (b) Take apart the four sets of bolt and nut.



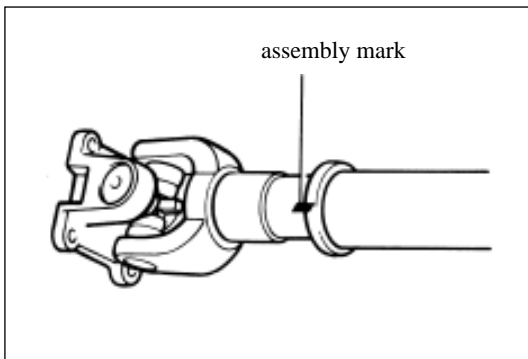
2. Take apart the center support bearing from the front joint of the rear axle drive shaft.
  - (a) Loosen the riveted nut by chiseling with a chisel and hammer.



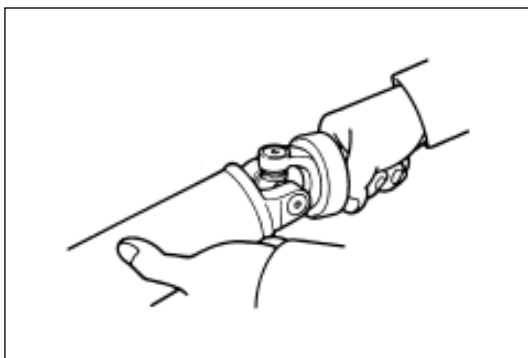
- (b) Lock the flange with SST tools to tear down the nuts.
- (c) Label the assembly marks on flange and shaft.



- (d) Tear down the flange from the front joint of rear axle drive shaft with SST tools.



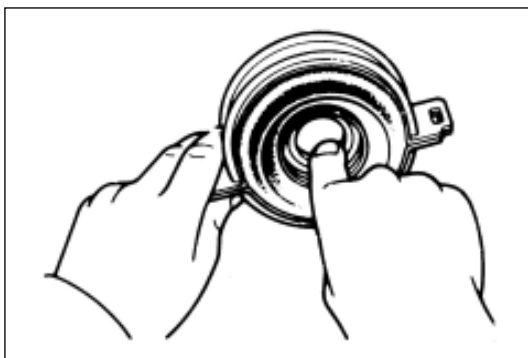
3. Take apart the universal joint yoke from the rear joint of rear axle drive shaft.
  - (a) Label the universal joint yoke and the shaft with assembly marks.
  - (b) Pull out the universal joint yoke from the shaft.



## Inspection on Drive Shaft Parts

### 1. Cross shaft bearing inspection

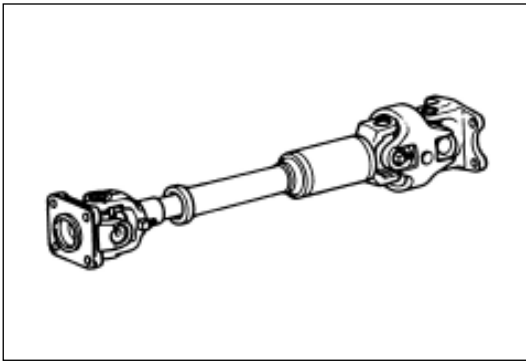
Check the wear or damage situation of the cross shaft bearing and change the weary or damaged bearing where necessary.



### 2. Check the wear and damage situation of the central bearing.

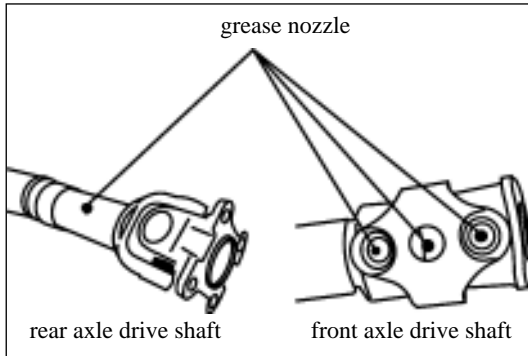
Check the bearing to see whether it can run freely.

In case that the bearing is damaged or wearied or cannot run freely, change it in time.



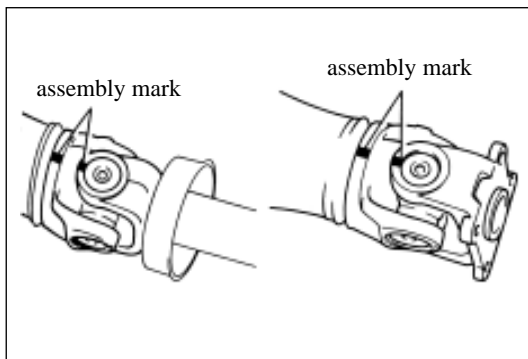
### 3. Inspection for the front axle drive shaft

- (a) Check the wear or damage situation of the shaft.
- (b) Check the wear or damage situation of the two universal joints



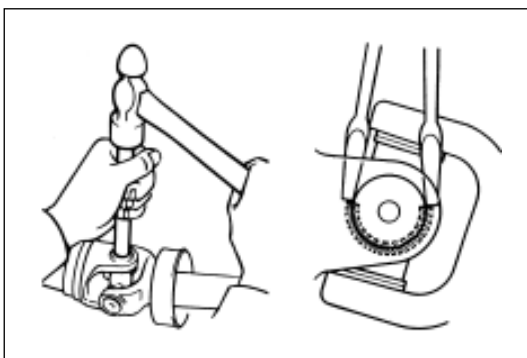
### 4. Inspection for the drive shaft lubrication

If the drive shaft is not lubricated completely, add the Lithium base lubricant grease with SST.



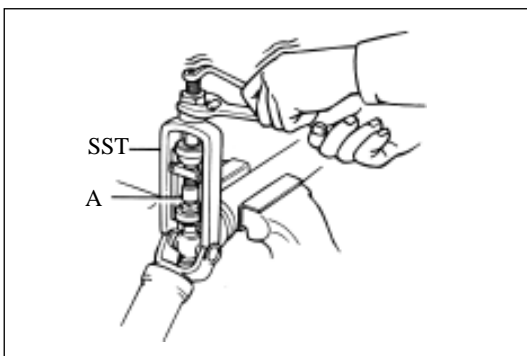
## Cross bearing change

1. Label the shaft and universal joint yoke with assembly marks.



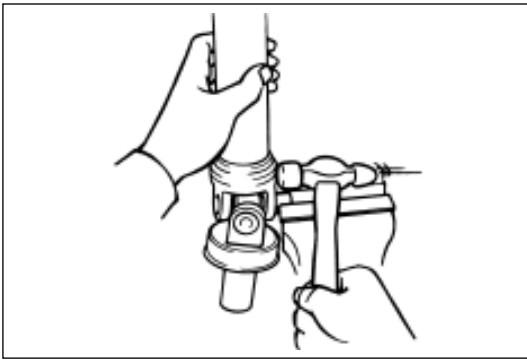
2. Take apart the snapping ring.

- (a) Tap in the outer bearing race lightly.
- (b) Take apart the four snapping rings in the grooves with two screwdrivers.



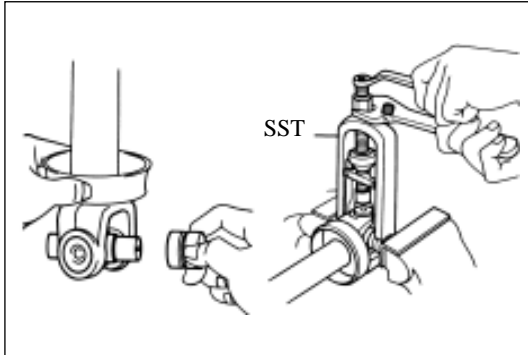
3. Take apart the cross shaft bearing

- (a) Pull out the bearing from the drive shaft with SST tools.  
Remarks: Pull up the part A in the drawing to a enough height so that it cannot contact the bearing.



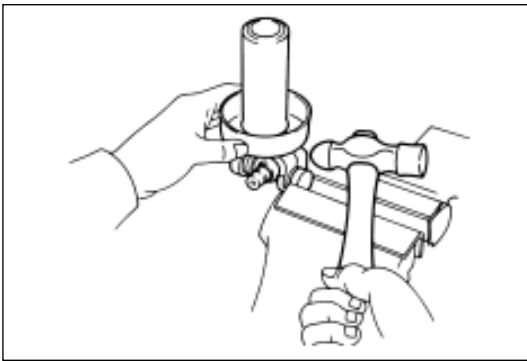
- (b) Grip the outer bearing race with a vice to tap out the drive shaft lightly with a hammer.

Remarks: Take apart another bearing with the same approach.



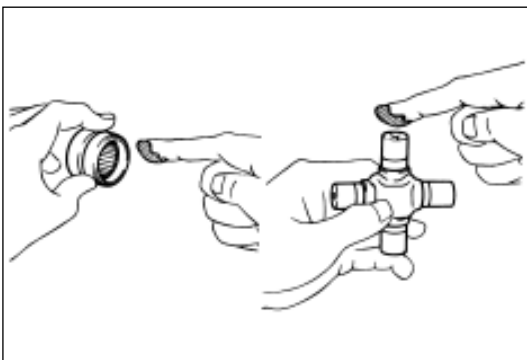
- (c) Mount the two outer bearing races that are taken apart on the cross shaft.

- (d) Pull out the bearing on the universal joint yoke with SST tool, and



- (e) Grip the outer bearing race in the vice and tap lightly out the universal joint yoke with a hammer.

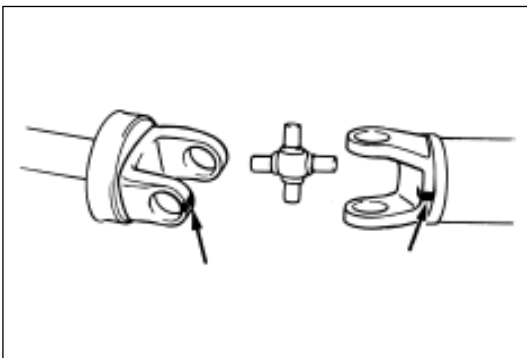
Remarks: the bearing at the other end may be taken apart with the same approach.



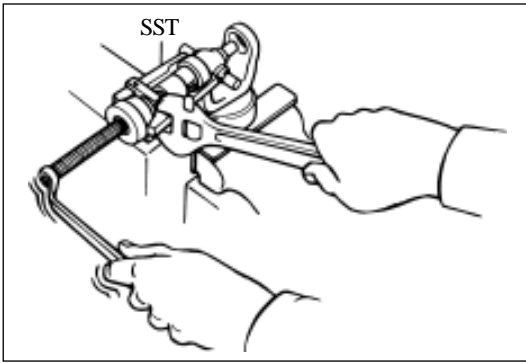
#### 4. Cross shaft bearing mount

- (a) Coat the lithium base grease on the cross shaft and the bearing.

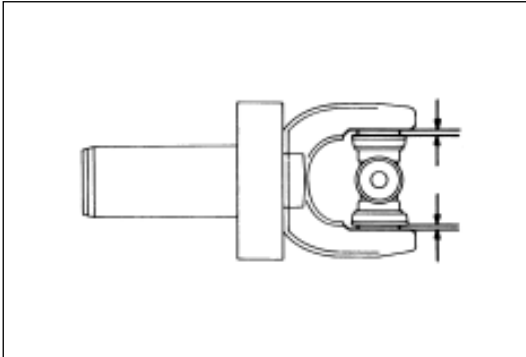
Remarks: do not over coat the lubricant.



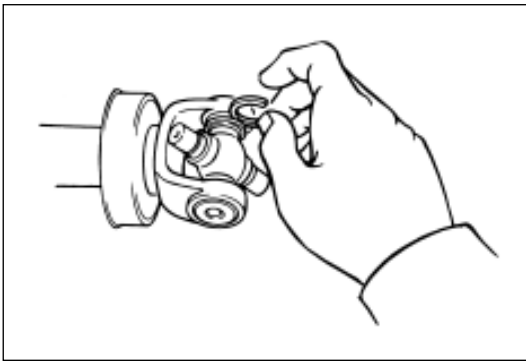
- (b) Align the assembly marks on the universal yoke and on the shaft.



- (c) Encase the new cross shaft in the universal joint yoke.
- (d) Mount the new bearing on the cross shaft with SST tool, and



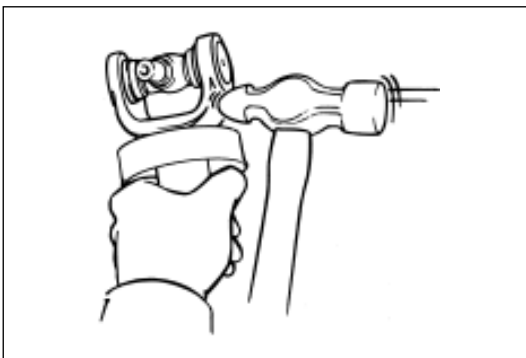
- (e) Adjust the two bearings with SST tool so that the widths of two snapping ring grooves are equal and maximum.



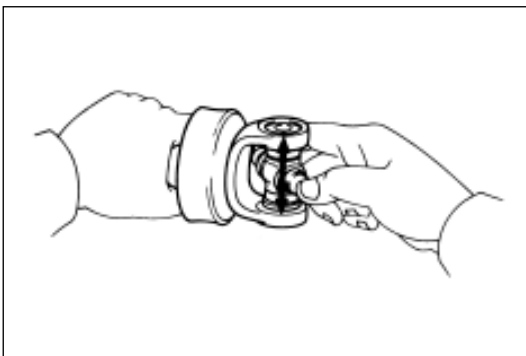
#### 5. Snapping ring mount

- (a) Mount two snapping rings with the same thickness.

Remarks: Do not use the used snapping ring.



- (b) Tap the universal joint yoke lightly with a hammer until there is no clearance between the outer bearing race and the snapping ring.

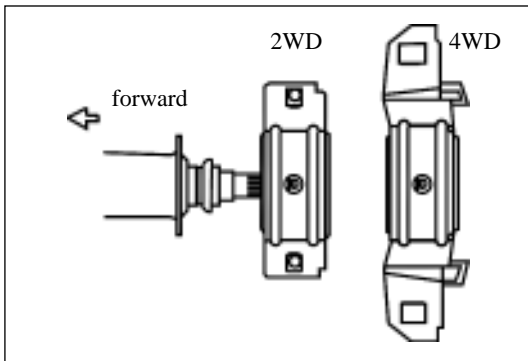


#### 6. Cross shaft bearing inspection

Check the cross shaft bearing to see whether it can run freely

Remarks: the approach for mounting the cross shaft bearing at the bearing end is the same.

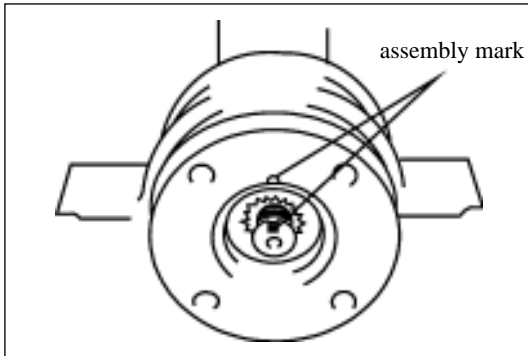




## Drive shaft assembly

1. Mount the center support bearing on the front joint of rear axle drive shaft.

Remarks: The notch of the center support bearing shall face backward when mounting it.

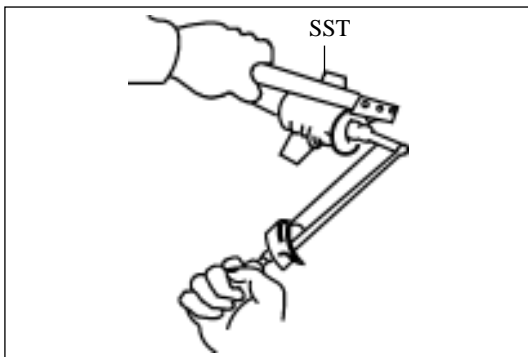


2. Mount the flange joint on the front joint of rear axle drive shaft.

(a) Coat the spline of front joint of rear axle drive shaft with lithium base grease.

(b) Mount flange joint on the shaft and align the assembly marks.

Remarks: if the central flange joint or the front joint of the rear axle drive shaft is required to change, the front and back universal joint yokes of the rear axle drive shaft shall face in the same direction when re-assembling.

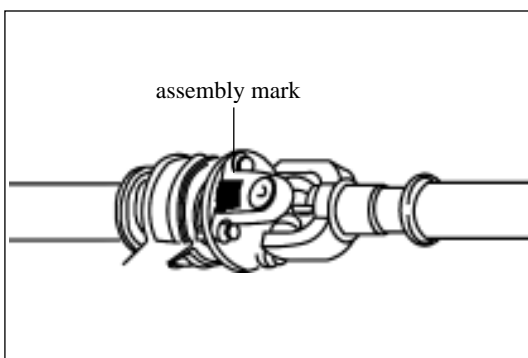


(c) Lock the flange joint with SST and screw up the newly-changed nut to press the bearing in place.

(d) Loosen the nuts.

(e) Tighten the nuts again, and

(f) Rivet the nuts with hammer and punch.



3. Drive shaft mount

(a) Align the assembly marks on flanges, and connect the two flanges with four sets of bolt and nut.

Remarks: if the central flange or the front joint of the rear axle drive shaft is required to be changed, the front and back universal joint yokes of the front joint of rear axle drive shaft shall face in the same direction when reassembling them.

(b) Screw up the sets of bolt and nut according to the specified torque.

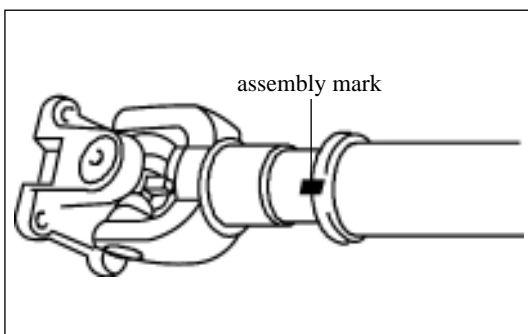
Fastening torque:  $(74 \pm 5) \text{ N} \cdot \text{m}$

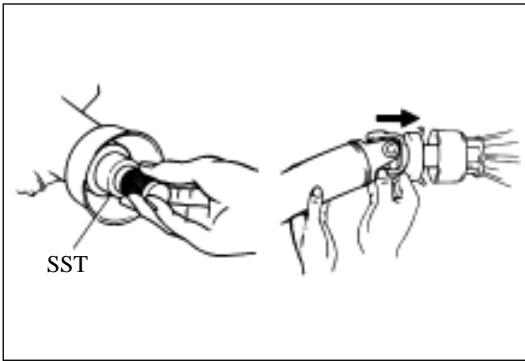
4. Insert the universal joint yoke in the universal joint yoke (4WD).

(a) Coat the lithium base grease on the sliding surfaces of the drive shaft spline and the universal joint yoke.

(b) Align the assembly marks on universal joint yoke and drive shaft.

(c) Insert the universal joint yoke in drive shaft.

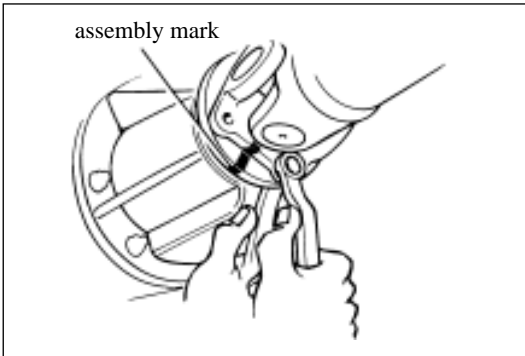




## Mount of Drive Shaft

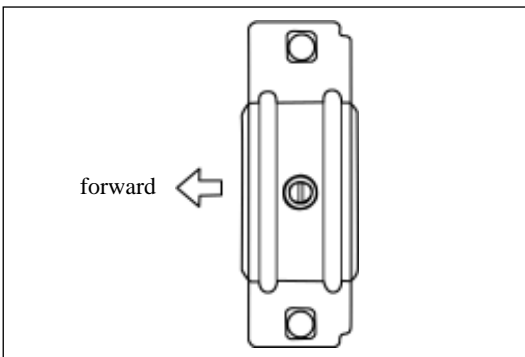
(2WD)

1. Insert the universal joint yoke in the gearbox.
  - (a) Tear down the SST tools.
  - (b) Push the universal joint yoke into the gearbox.



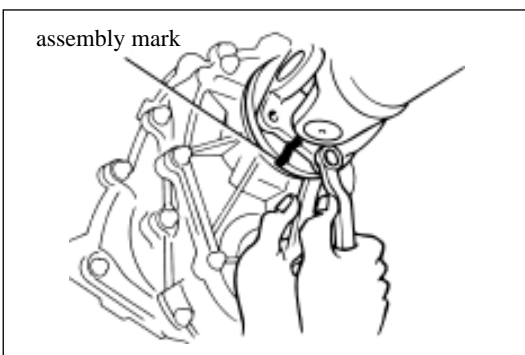
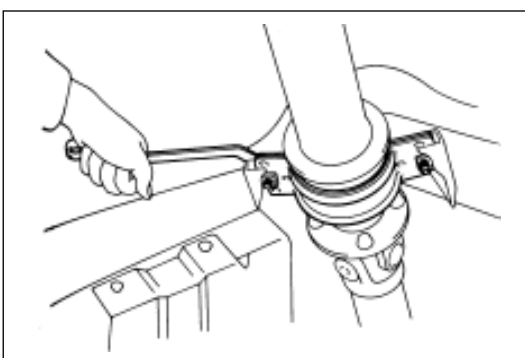
2. Connect the universal joint flange of the rear joint of rear axle drive shaft and the relative the differential flange.
  - (a) Align the assembly marks on the two flanges and connect the flanges with four sets of bolt and nut.
  - (b) Screw up the sets of bolt and nut according to the specified torque.

Fastening torque:  $(74 \pm 5) \text{N} \cdot \text{m}$



3. Mount the center support bearing on the frame beam (three-joint type)
  - (a) Use two bolts to mount the center support bearing on the frame beam and tighten them manually.
  - (b) Check the bearing seat, which shall be vertical with the drive shaft, and change it where necessary.
  - (c) Check the central line of the central bearing and ensure that the central lines of the central bearing and the bearing seat shall be the same when the vehicle is in the non-loaded stage. And adjust the bearing seat only it is necessary.
  - (d) Screw up the mounting bolts according to the specified torque.

Fastening torque:  $(40 \pm 5) \text{N} \cdot \text{m}$

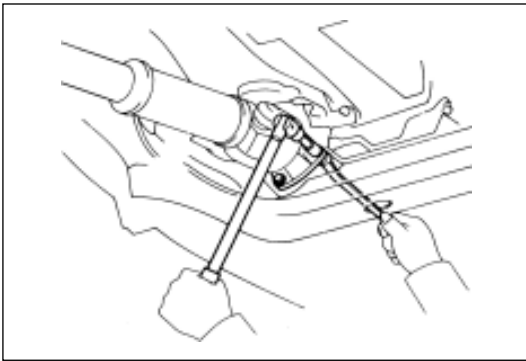


(4WD)

1. Connect the universal joint flange fork of the front axle drive shaft with the flange that matches with the transfer box.

Align the assembly marks and use four sets of bolt and nut to connect the flange fork with the flange, screw up the sets of bolt and nut according to the specified torque.

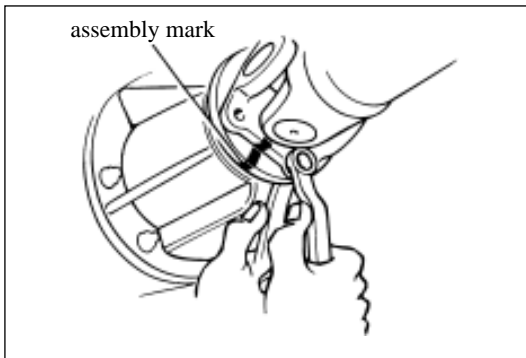
Fastening torque:  $(74 \pm 5) \text{N} \cdot \text{m}$



2. Mount on the front axle drive shaft.

Mount on it and screw up the four bolts according to the specified torque.

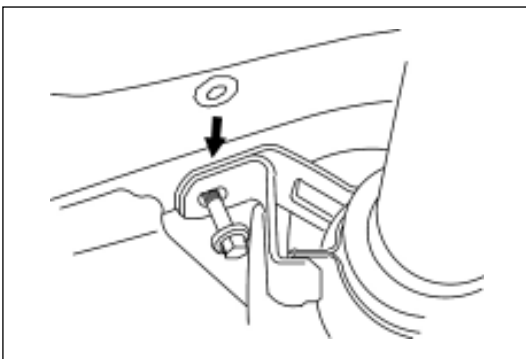
Fastening torque:  $(74 \pm 5) \text{N} \cdot \text{m}$



3. Connect the universal joint flange fork of the rear axle drive shaft on the relative differential flange.

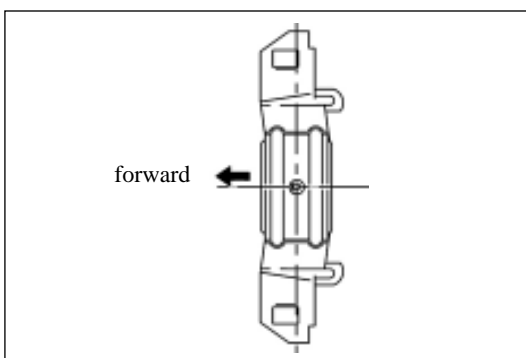
- (a) Align the assembly marks on flanges and connect the flanges with four sets of bolt and nut, and
- (b) Tighten the sets of bolt and nut according to the specified torque.

Fastening torque:  $(74 \pm 5) \text{N} \cdot \text{m}$

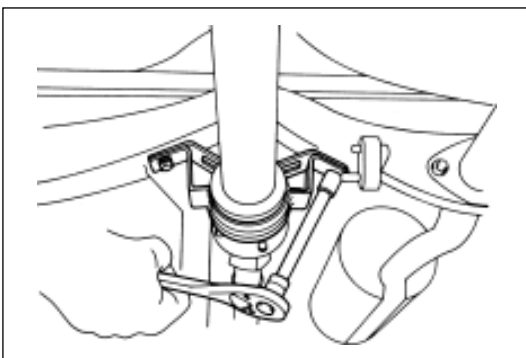


4. Mount the center support bearing on the frame beam (three joint type)

- (a) Use two mounting bolts to mount the center support bearing on the frame beam and screw up them manually.



- (b) Check the bearing seat, which shall be vertical with the drive shaft, and adjust the bearing seat when necessary.
- (c) Check the central line of the central bearing. The central line of the central bearing shall be the same with that of the bearing seat when vehicle is in the non-loaded stage.
- (d) Adjust the bearing seat if necessary, and



- (e) Screw up the mounting bolts according to the specified torque.

Fastening torque:  $(40 \pm 5) \text{N} \cdot \text{m}$

# Suspension System and Automobile Axle

	Page
Troubleshooting .....	SA-2
Alignment of Front Wheel .....	SA-3
(Dr/2WD)	
Front Wheel Hub and Steering Knuckle .....	SA-10
Front Wheel Hub .....	SA-11
Steering Knuckle .....	SA-14
Front Suspension .....	SA-16
Ball Stud .....	SA-17
Torsion bar .....	SA-19
Lower Arm and Vibration Damper .....	SA-21
Upper Arm .....	SA-24
Guide Level .....	SA-26
Lateral Stabilizer .....	SA-27
(SF/2WD)	
Front Wheel Hub and Steering Knuckle .....	SA-28
Front Wheel Hub .....	SA-29
Steering Knuckle .....	SA-32
Front Suspension .....	SA-36
Ball Stud .....	SA-37
Torsion bar .....	SA-38
Lower Arm and Vibration Damper .....	SA-39
Upper Arm .....	SA-42
Guide Level .....	SA-43
Lateral Stabilizer .....	SA-43
(SF/4WD)	
Front Wheel Hub and Steering Knuckle .....	SA-44
Front Wheel Hub .....	SA-45
Steering Knuckle .....	SA-49
Constant Speed Drive Shaft .....	SA-54
Front Speed Reducer .....	SA-57
Change of Oil Seal of Driving Bevel Gear Of	
Front Speed Reducer .....	SA-57
Dismantle of Front Speed Reducer .....	SA-61
Change of Axle Shaft Oil Seal .....	SA-63
Disassembly and Assembly of Front Speed Reducer ....	SA-65
Assembly of Front Speed Reducer .....	SA-74
(Back)	
Rear Axle Shaft .....	SA-79
Rear Speed Reducer .....	SA-83
On-vehicle Change of Oil Seal of Main Teeth .....	SA-84
Dismantle of Rear Speed Reducer .....	SA-85
Disassembly of Rear Speed Reducer .....	SA-85
Assembly of Rear Speed Reducer .....	SA-89
Mount of Rear Speed Reducer and	
Differential Assembly .....	SA-94
Rear Differential .....	SA-95
Rear Suspension .....	SA-97

## Troubleshooting

Trouble	Causes	Inspection items
Body wandering/body dragging	Tire wear or improper air inflation Incorrect alignment of front wheel Over-tightened wheel bearing Part looseness or damage of front/rear suspension Wear or looseness of steering rod system Poor connection or damage of steering device	Inflate the tire to the proper pressure or change the tire. Check the situation of alignment of front wheel Adjust the wheel bearing Tighten or change the suspension element Tighten or change the steering rod system Adjust or repair the steering device
Body sink	Overloaded vehicle Wear of vibration damper Poor spring performance	Check the loading mass Change vibration damper Change spring
Left-right vibration/up-down bouncing	Improper air inflation Bending or damaged lateral stabilizer Vibration damper wear	Inflate the tire to suitable pressure Change stabilizer Change vibration damper
Front wheel vibration	Tire wear or improper air inflation Imbalance of wheels Vibration damper wear) Improper Alignment of Front Wheel Wheel bearing wear or improper adjustment Ball joint or liner wear Steering linkage looseness or wear Poor adjustment or damage of steering mechanism	Change the tire or inflate to the proper pressure Balance the wheels Change vibration damper Check Alignment of Front Wheel Change or adjust the wheel bearing Check ball joint) or liner Tighten or change steering linkage Adjust or repair the steering device
Abnormal tire wear	Improper air inflation Vibration damper wear Poor Alignment of Front Wheel Suspension system wear	Inflate the tire to the proper pressure Change vibration damper Check the Alignment of Front Wheel Change suspension element
Speed reducer leakage	Over-high oil level or improper oil quality Oil seal wear or damage Flange looseness or damage	Discharge the oil for change Change oil seal Tighten or change the flange
Noise inside the axle Noise inside the axle	Over-low oil level or inferior oil quality Over-large wandering clearance between driving bevel gear and driven bevel gear Wear and disintegration of driving bevel gear and driven bevel gear Bearing wear of driving bevel gear Bearing wear of rear axle shaft Bearing looseness or wear of speed reducer	Discharge the oil and change with new one Check the wandering clearance Check the gears Change the bearing Change the bearing Tighten or change the bearing

## Alignment of Front Wheel

(Dr SL SK SY SJ)

1. Inspection should be conducted for the following items to remove the trouble

(a) Check the tire abrasion and air inflation situation

Tire inflation pressure:

Front (220 0)kPa

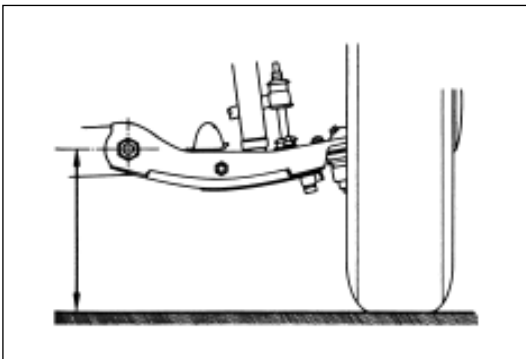
Back (240 0)kPa

(b) Check the front wheel bearing to see whether it is loose.

(c) Check the front suspension to see whether it is loose.

(d) Check the steering driving device to see whether it is loose, and

(e) Check the front vibration damper work to see whether it is loose.



2. Measure the ground clearance of the chassis.

Chassis ground clearance:

Dr:  $295_0^{+5}$ mm

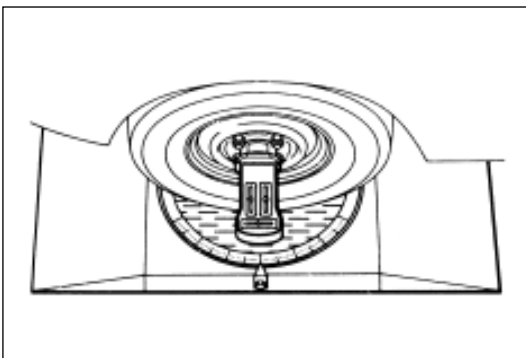
SL SK:  $(255 \pm 2)$ mm

SY:  $(310 \pm 2)$ mm

SJ:  $(295 \pm 1)$ mm

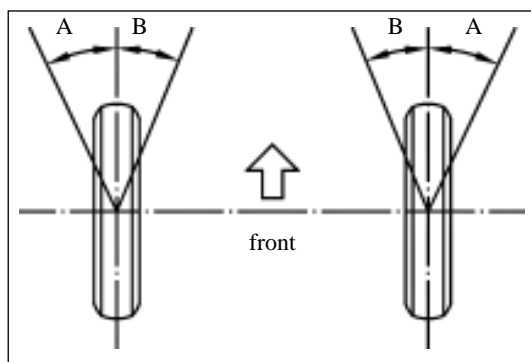
If the chassis ground clearance of the vehicle is sub-standard, push down the body or raise it for a trial adjustment, if fails, check the spring or suspension element to see whether they are normal.

Remarks: adjust the chassis ground clearance to a specified value before checking the Alignment of Front Wheel parameters.



3. Mount on the four-wheel locating device.

The mount should be conducted according to the manufacturer's instructions.



#### 4. Adjust the wheel angle

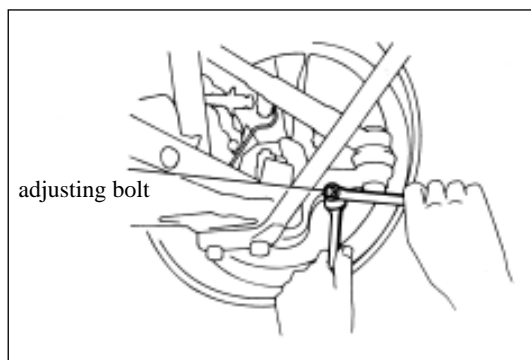
Take apart the limit bolts of the steering knuckle to check the steering angle A of inner wheel.

Inner wheel steering angle

Dr SL SK SY: (  $36^{\circ}$  –  $40^{\circ}$  )

SJ: (  $32^{\circ}$  –  $34^{\circ}$  )

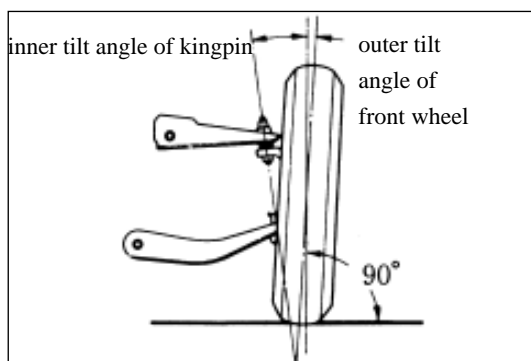
Remark: The wheel should not contact the body or brake hose when the steering wheel reaches the limit position.



In case the steering angle of inner wheel doesn't conform to the standard value, adjust the wheel angle through adjusting the limit bolts of the steering knuckle.

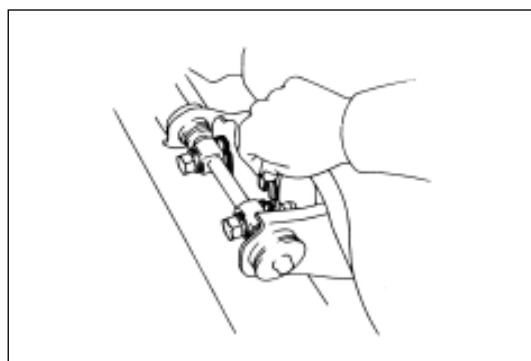
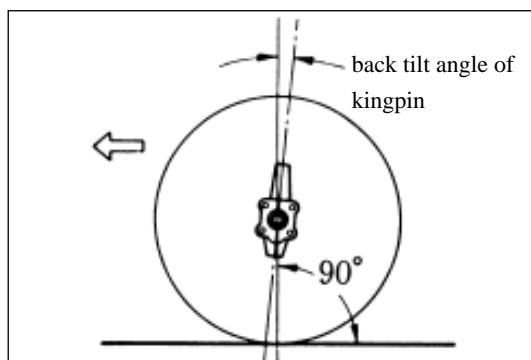
Fastening torque: (90 0)N · m(SJ)

If the wheel angle fails to be adjusted within the standard value, change the weary or damaged parts of steering system.



#### 5. Adjustment for inner tilt angle of kingpin, outer tilt angle of front wheel and back tilt angle of kingpin

Item	Applicable vehicle type		Location parameter
Inner tilt angle of kingpin	Dr SL SK SY		$9^{\circ} 30' \pm 45'$
	SJ		$14^{\circ} 52'$
Outer tilt angle of front wheel	Mechanic steering	Dr SL SK SY	$0^{\circ} 30' \pm 20'$
		Dr	$0^{\circ} 10' \pm 10'$
	Power steering	SL SK SY	$0^{\circ} 20' \pm 10'$
		SJ	$0^{\circ} 30' \pm 15'$
Back tilt angle of kingpin	Mechanic steering	Dr SL SK SY	$1^{\circ} 50' \begin{smallmatrix} +30' \\ -20' \end{smallmatrix}$
		Dr SL SK SY	$2^{\circ} 45' \pm 15'$
	Power steering	SJ	$3^{\circ} \pm 15'$

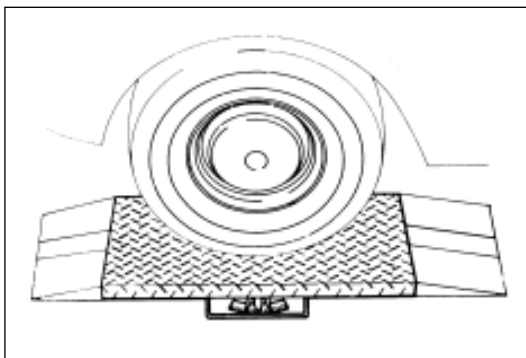
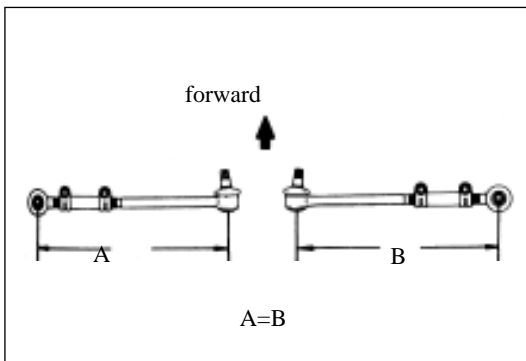
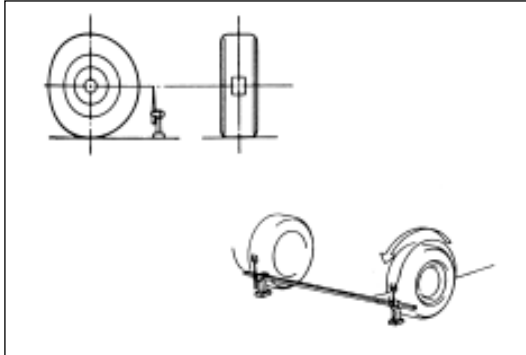
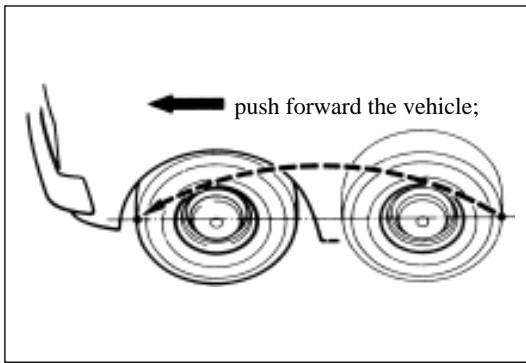


If the tilt angle fails to fall within the specified values, make an adjustment through adding or reducing the gaskets on the location of upper arm.

Gasket thickness: 3.0, 2.0 and 1.0mm

Once the gasket thickness increases by 1mm, the outer tilt angle of wheel will change by 7', while the back tilt angle of kingpin will change 20'.

After the wheel outer tilt angle and the back tilt angle of kingpin are adjusted, if the inner tilt angle of kingpin still fails to the specified value, check the steering knuckle or front wheel to see whether they are bending or loose.



## 6. Wheel toe-in adjustment

- Verify that each wheel has been located forward in a line.
- Mark the tire center at the bearing height on the tread of left and right tire, and measure the distance between the marks on left and right treads.
- Push forward the vehicle until the mark on the back tread of tire moves to the front.
- Measure the distance between the two marks on the front of two treads.

Remark: the toe-in measurement should be conducted from the same spot at the same height.

Toe-in value: (0-2)mm

- Loosen the clamping bolts of connecting pipe.
- Adjust the toe-in angle through the approach according to which rotate the left and right drag rod tube by a same angle.

Remark: check the lengths of the two drag rods to see whether the two rods are same in length.

Length error of the left and right drag rod should not be larger than 2.0mm.

- Tighten the clamping bolts.
- Fastening torque: (20 牒) N · m
- Locate the split pin well.

## 7. Check the sliding measuring situation.

Check the sliding situation with the sliding measuring tester.

Sliding measuring value: ?5m/km



## Alignment of Front Wheel

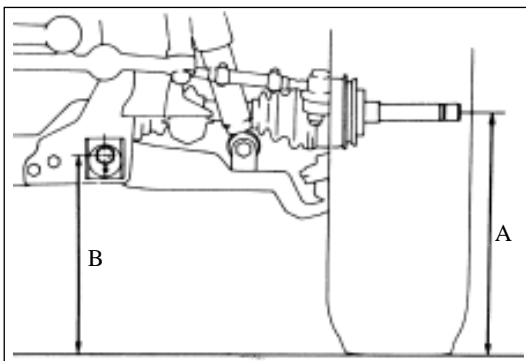
(SF)

1. The following items should be checked to remove the troubles.

(a) Check the tire abrasion and the air inflation to see it is suitable or not.

Tire inflation pressure: (250 0)kPa

- (b) Check the front wheel bearing to see whether it is loose.  
 (c) Check the front suspension to see whether it is loose.  
 (d) Check the steering driving device to see whether it is loose, and  
 (e) Check the front vibration through elastic force test to see whether it is normal in performance.



2. Height adjustment of vehicle

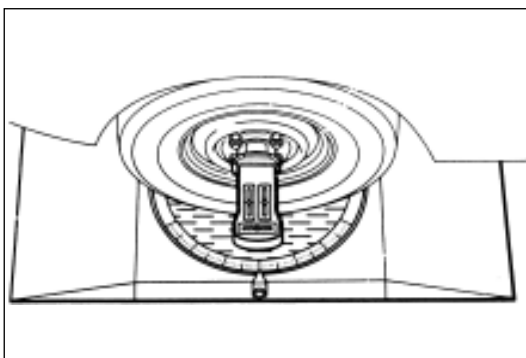
Adjust the vehicle height to the standard value so as to make the Alignment of Front Wheel inspection.

A-B-58 5mm

A: The height of steering knuckle shaft center.

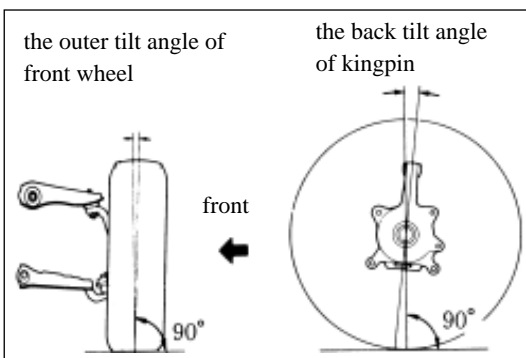
B: The center height of the adjusting cam bolt at front end

The standard value for the unloaded height is: the difference of the center height of drive shaft climax and the front adjusting cam bolt is 58.5mm.



3. Mount on the four wheel locating device

This approach should be conducted according to the detailed instruction of the equipment manufacturer.

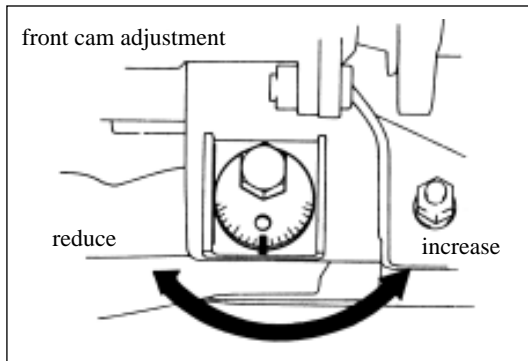


4. Adjust the outer tilt angle of front wheel and the back tilt angle of kingpin

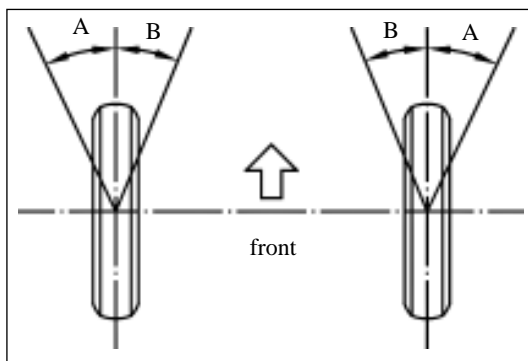
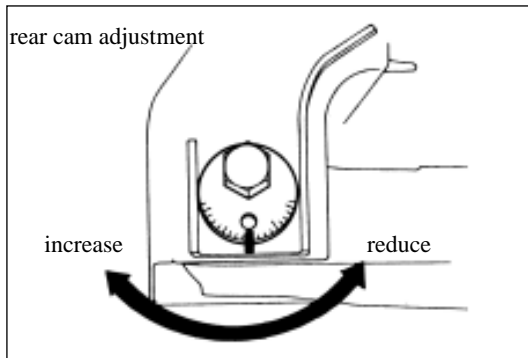
The outer tilt angle of front wheel:  $0^{\circ} 5' \pm 0'$

The back tilt angle of kingpin:  $2^{\circ} 0' \pm 0'$

Outer inclination of front wheel:



In case the outer tilt angle of front wheel or the back tilt angle of kingpin fails to conform to the specified value, adjust the cam forward or backward may amend them.

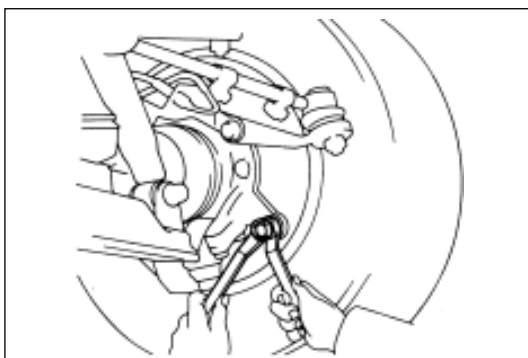


#### 5. Wheel angel adjustment

Take apart the limit bolt cap of the steering knuckle to check the inner wheel steering angle A.

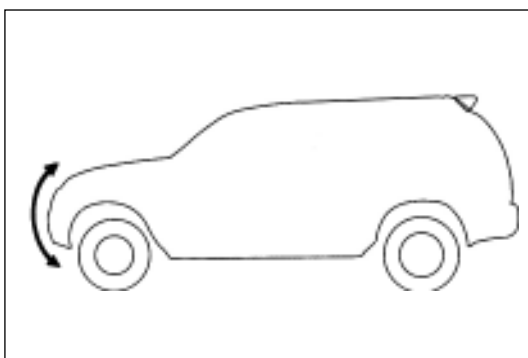
The inner wheel steering angle:  $\approx 32^\circ$

Notice: The wheel should not touch the body brake hose when the steering wheel is rotated to the bottom.



In case the max steering angle is not in the conformity with the standard value, adjust the wheel angle through the limit bolts of steering knuckle.

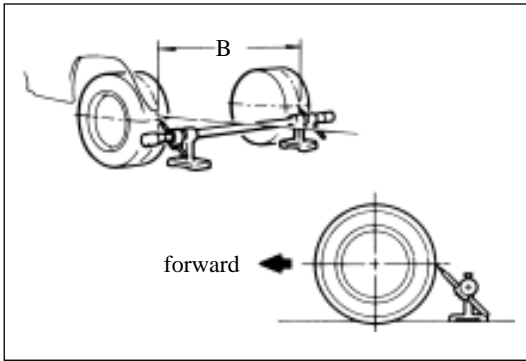
In case the wheel angle still fails to fall within the standard range, make a inspection and change the weary and damaged steering mechanism parts.



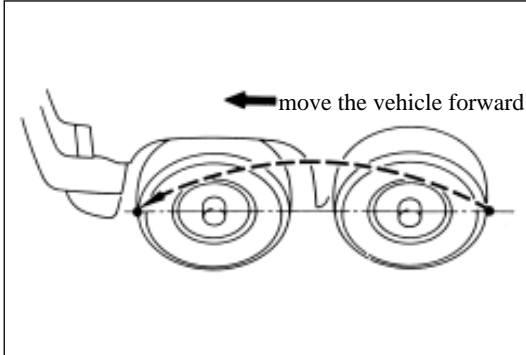
#### 6. Wheel toe-in adjustment

Adjust the wheel toe-in according to the following approach

- Raise or reduce the vehicle until the suspension stands in balance.
- Push the vehicle on the ground 5 meters forward under the condition that the front wheels locate forward in a line.

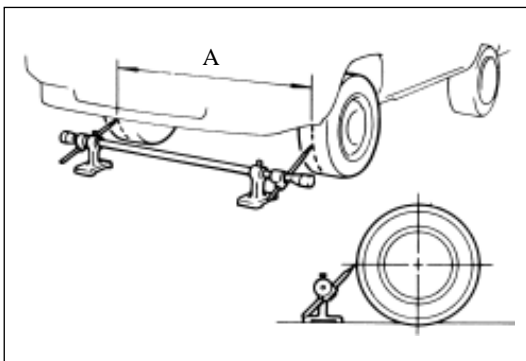


- (c) Mark the center of the back of front wheel, and measure the distance  $\hat{B}$  between the remarks on the left and right tires.



- (d) Push the vehicle forward so that the mark on the back of tire moves to the measuring height of the instrument.

Remark: if the tire moves too far, repeat the approach (b).



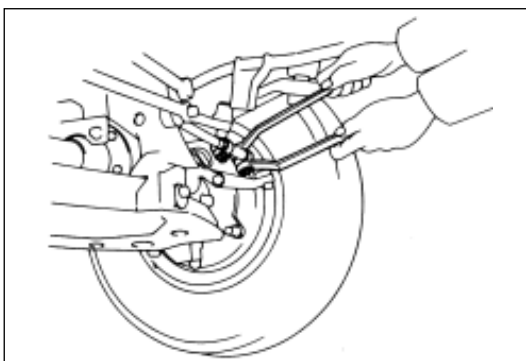
- (e) Measure the distance  $\hat{A}$  between the marks on the front of tire.

- (f) Measure the wheel toe-in.

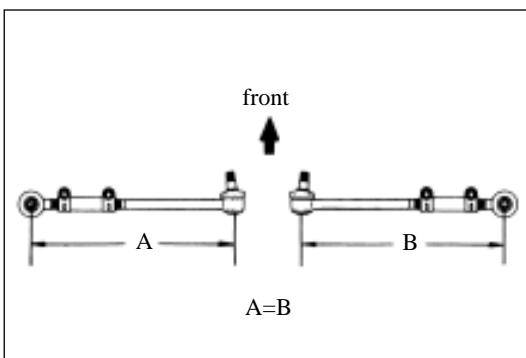
$$\text{Toe-in} = B - A$$

Inspection standard: (0-2)mm

In case the toe-in fails to conform to the specified value, it can be amended through adjusting the left and right drag rods.

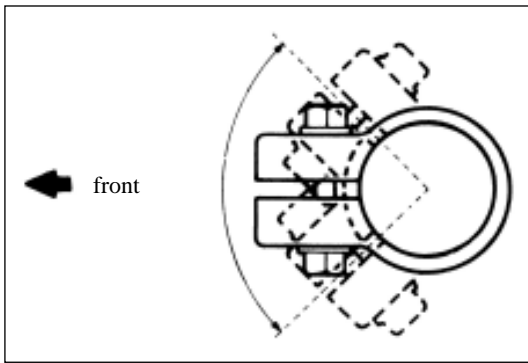


- (g) Loosen the clamping bolt and nut.

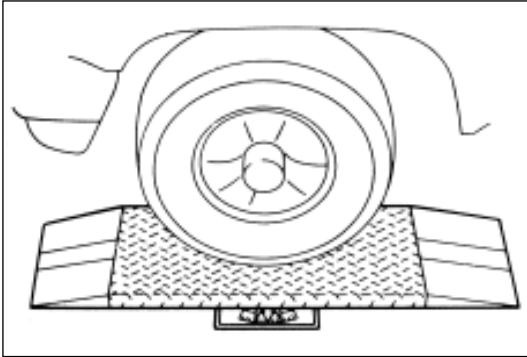


- (h) Adjust the toe-in situation by the approach of rotating the left and right drag rod by a same angle.

- (i) Ensure the left and the right drag rods are same in length.



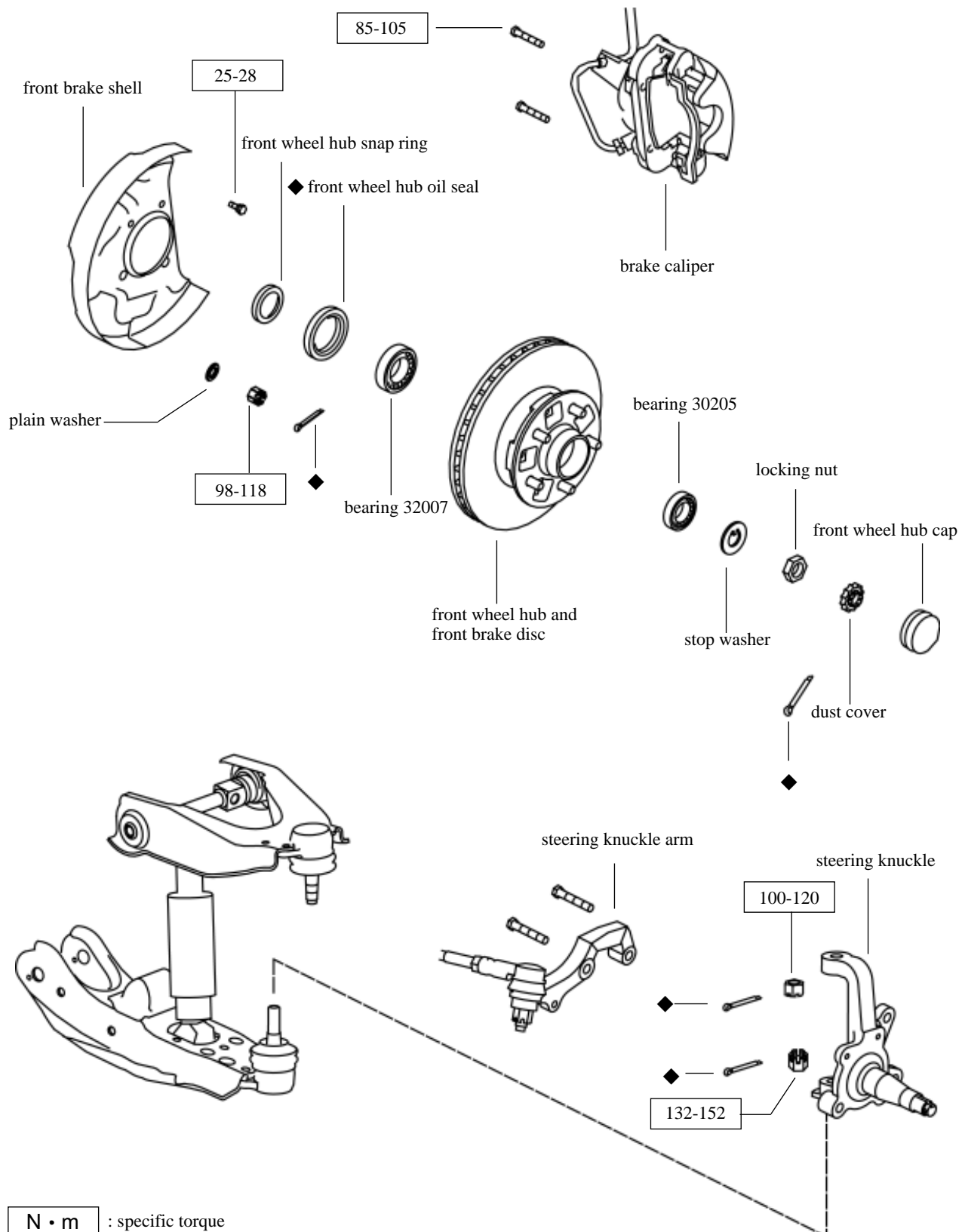
- (j) Tighten the clamping bolts and lock them with split pin.  
Remark: the clamping bolt should face the front of the vehicle.



- (k) Side-slip inspection  
Sideslip:  $\approx 5\text{m/km}$

## Front wheel hub and steering knuckle Element Drawing

Dr



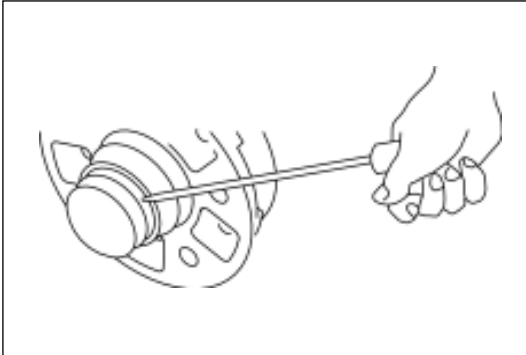
## Front Wheel Hub

### Disassembly of Front Wheel Hub

1. Take apart the brake caliper.

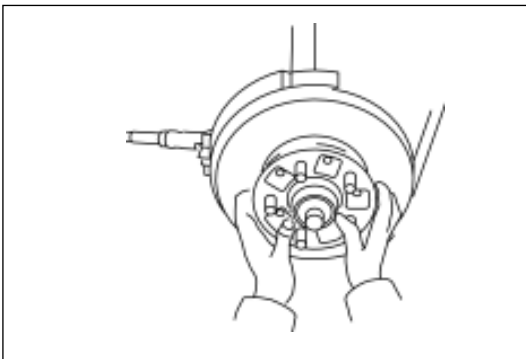
Disassembly the wheel hub and suspend it with tightwire.

Remark: Don't dismantle the brake hose and brake metal pipe



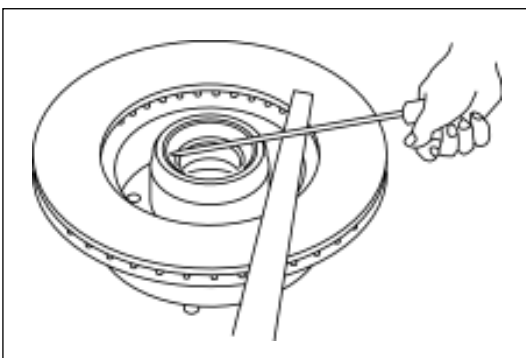
2. Take apart the front wheel hub cap.

Take apart the front wheel hub cap from the gap between the front wheel hub cap and the front wheel hub.



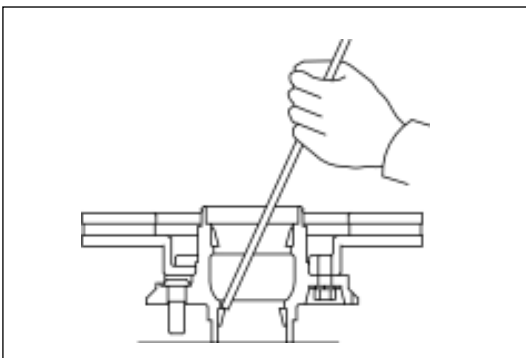
3. Take apart the front wheel hub and front brake disc:

- (a) Take apart the split pin to take down the lock cover.
- (b) Screw off the lock nuts of the hub bearing with spanner and take down the stop washer.
- (c) Take apart the front wheel hub and front brake disc with the bearing 30205 together.



4. Take apart the front wheel hub oil seal, the inner race and roller assembly of bearing 32007.

- (a) Pry out the oil seal.
- (b) Take out the bearing inner race and roller assembly.



5. Bearing outer race inspection and tear-down

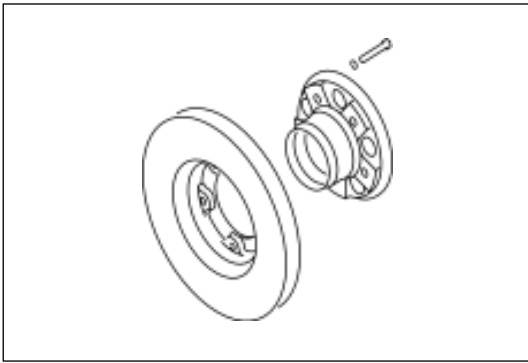
- (a) Inspect the bearings

Clean each bearing and check them to see whether there is wear or damage.

- (b) Take apart the bearing outer race

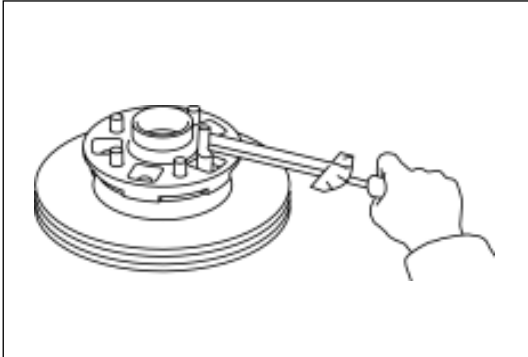
Tap out the bearing outer race with copper bar and hammer.

Notice: bind the disassembled inner and outer bearing race together to avoid of mixing.



## 6. Inspection and replacement for front brake disc

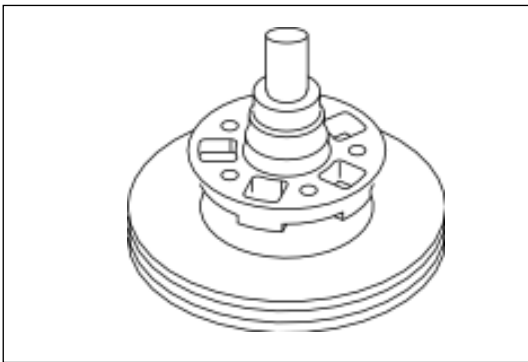
- (a) Check the wear situation of the front brake disc. (see Dr the brake caliper).
- (b) Use the spanner to tear down the bolts that connect the front wheel hub and the front brake disc.



- (c) Connect the front wheel hub and the front brake disc with bolt and spring washer, and screw up the bolts with a moment spanner to the specified torque in the diagonal order.

Fastening torque:  $(60-79)\text{N} \cdot \text{m}$

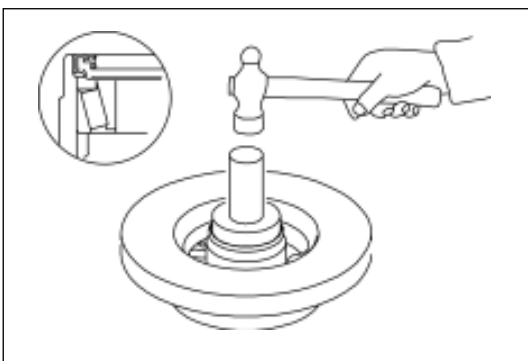
- (d) Conduct the equilibrium test on the dynamic balancer, the amplitude value displayed should not be larger than 13.5g under the condition that the measuring rotating velocity is 796 r/m and the locking rotating velocity is 786 r/m, when the amplitude value is larger than 13.5 g, encase the counter balanced clip, which is 4 g each, at the corresponding phase, the number of the clip encased should not be more than four.



## 7. Bearing outer race change

Press in the new bearing outer space with the special service tools.

Notice: the bearing inner and outer races should be changed at one time.



## Assembly of Front Wheel Hub

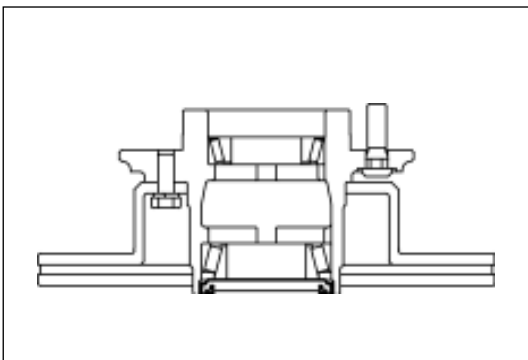
1. Mount on the Bearing 32007 inner race and roller assembly as well as the front wheel hub oil seal.

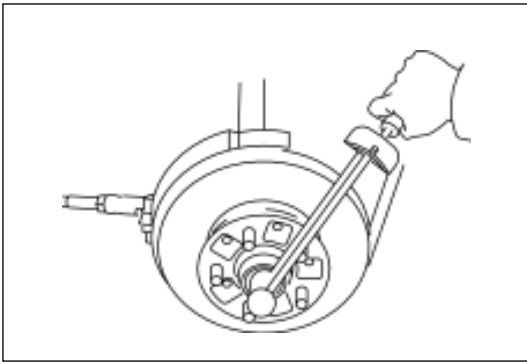
Coat the lithium base grease of (4-5)mm on the inner surfaces of bearing outer race and the front wheel hub, encase the Bearing 32007 inner race and roller assembly, plaster the lubricant again. Coat a little lubricant on the lips of front wheel hub oil seal and then tap it in place.

Notice: do not make the lubricant contact the front brake disc face.

2. Mount on the Bearing 32007 inner race.

After coating the bearing outer race with the lithium base grease of 4-5 mm, encase the inner race and roller assembly of Bearing 30205, and plaster the lubricant again.





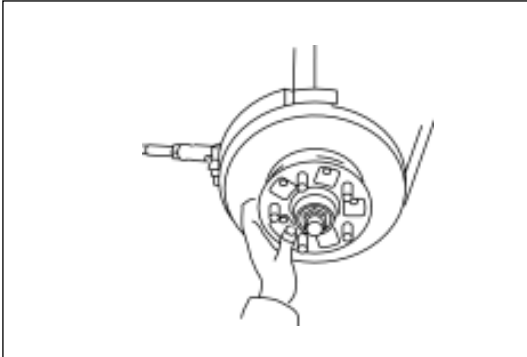
3. Mount the front wheel hub on the steering knuckle.

Coat a little lubricant at the position of the steering knuckle where the oil seal locates, mount the front wheel hub and front brake disc on the steering knuckle, and then mount on the stop washer.

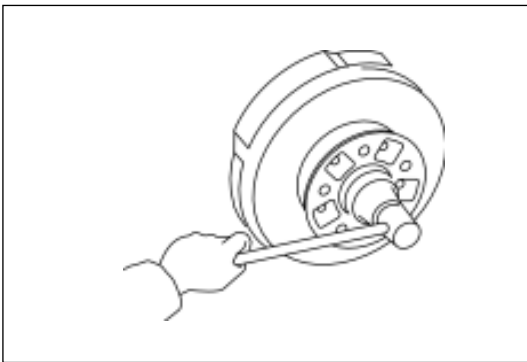
4. Preload adjustment

- (a) Mount on the lock nut and screw up according to the specified torque.

Fastening torque:  $(130-150)\text{N} \cdot \text{m}$

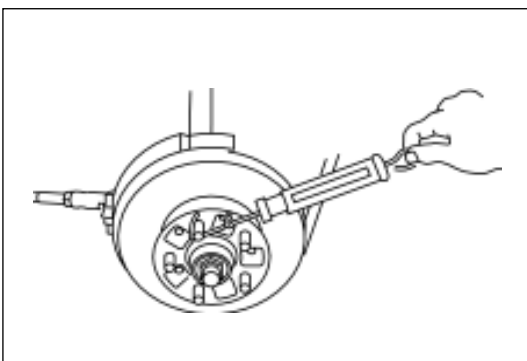


- (b) Run the front wheel hub about  $1/4-1/3$  of circle, and combine it with the bearing seat.



- (c) Loosen the locking nut to ensure the front brake disc run freely, and then screw up the nuts to the specified torque.

Fastening torque:  $(25-35)\text{N} \cdot \text{m}$



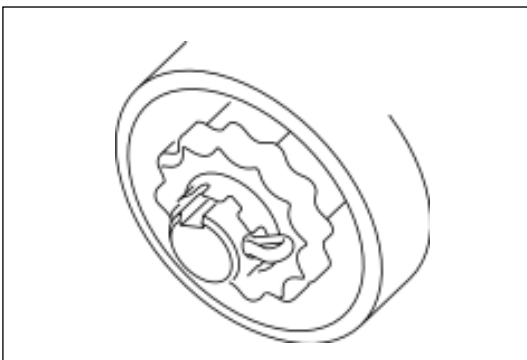
- (d) Hook the front wheel hub with the spring-tension meter and pull the spring-tension meter slowly in the tangential direction of this spot.

The reasonable range of tension force:  $(16-33)\text{N}$ .

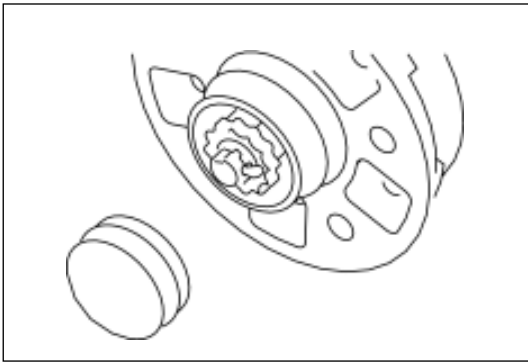
Remark: if the tension force is larger or smaller of the reasonable range, screw up the nuts again until the tension force falls within the reasonable range.

- (e) Measure the bouncing value of the front brake disc, which should not be larger than  $0.11\text{mm}$ .

5. Mount on the lock cover and the split pin







6. Tap in the front wheel hub with a rubber hammer

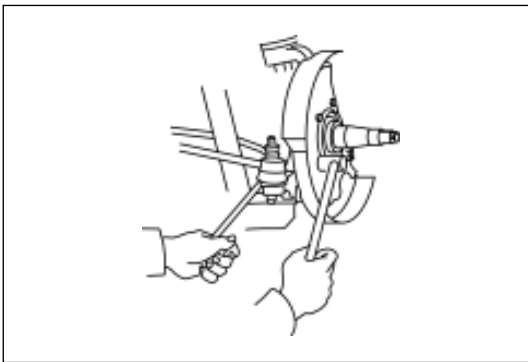
7. Mount the brake caliper on the steering knuckle.  
Fastening torque: (85-105)N • m



## Steering Knuckle

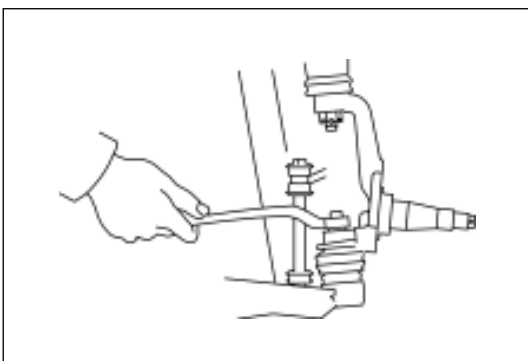
### Disassembly of Steering Knuckle

1. Take apart the brake caliper, the front wheel hub and the front brake disc.



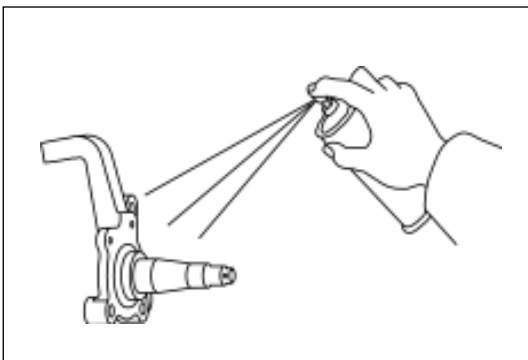
2. Take apart the front brake shell:

- (a) Tear down the two bolts (M8X16).
- (b) Tear down the two split pins, grooved nuts, washer and bolts that connect the steering knuckle arm.



3. Tear down the steering knuckle

- (a) Support the lower arm with jack;
- (b) Tear down the two split pins and the grooved nuts
- (c) Disconnect the steering knuckle from the upper and lower ball studs and take apart it.

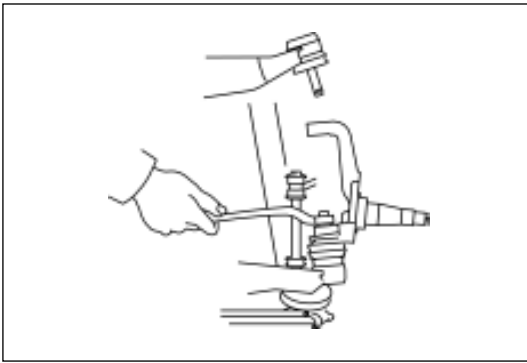


## Inspection on Steering Knuckle

### Check the steering knuckle

Check the steering knuckle with the dye penetration agent to see whether the steering knuckle has a crack or not.

If the crack is found, the steering knuckle is required to be changed.



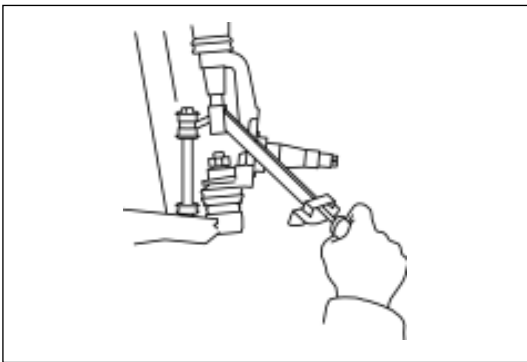
## Mount the steering knuckle

### 1. Mount the steering knuckle

- (a) Support the lower arm of the steering knuckle with a jack.
- (b) Mount the steering knuckle on the lower ball stud and screw on the nuts.



- (c) Press the upper arm to mount on the steering knuckle and screw on the nuts.



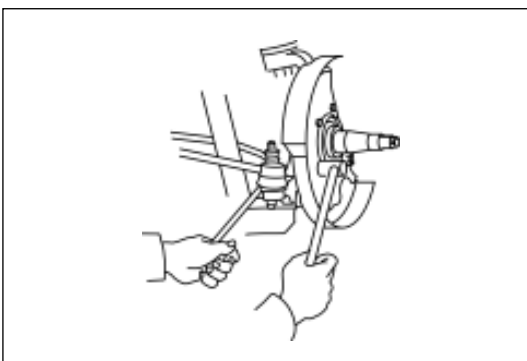
- (d) Screw up the nuts of the upper ball stud according to the specified torque.

Fastening torque:  $(100-120)\text{N} \cdot \text{m}$

- (e) Screw up the nuts of the lower ball stud according to the specified torque.

Fastening torque:  $(98-118)\text{N} \cdot \text{m}$

- (f) Mount on the split pin between the upper and lower ball studs.



### 2. Mount the steering knuckle arm and the front brake shell;

- (a) Screw up the two bolts of M8X16.

Fastening torque:  $(25-28)\text{N} \cdot \text{m}$

- (b) Screw up the two bolts and groove nuts (M12X67) to the specified torque.

Fastening torque:  $(98-118)\text{N} \cdot \text{m}$

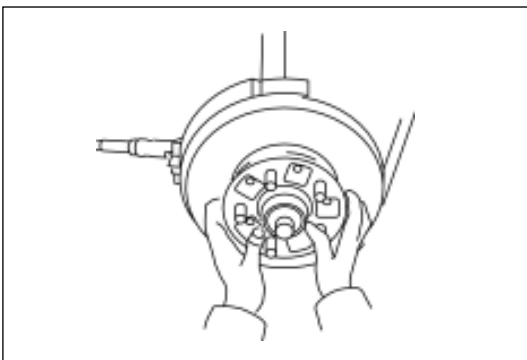
- (c) Mount on the two split pins.

In case the pin hole in the ball stud are not in alignment with the groove nut, adjust the fastening torque and the rotating angle under the condition that satisfying the minimum torque, so as to ensure the torque falls within the specified range, if cannot, mount the split pin with the minimum torque beyond the range

### 3. Mount the front wheel hub and the front brake disc.

### 4. Check the Alignment of Front Wheel.

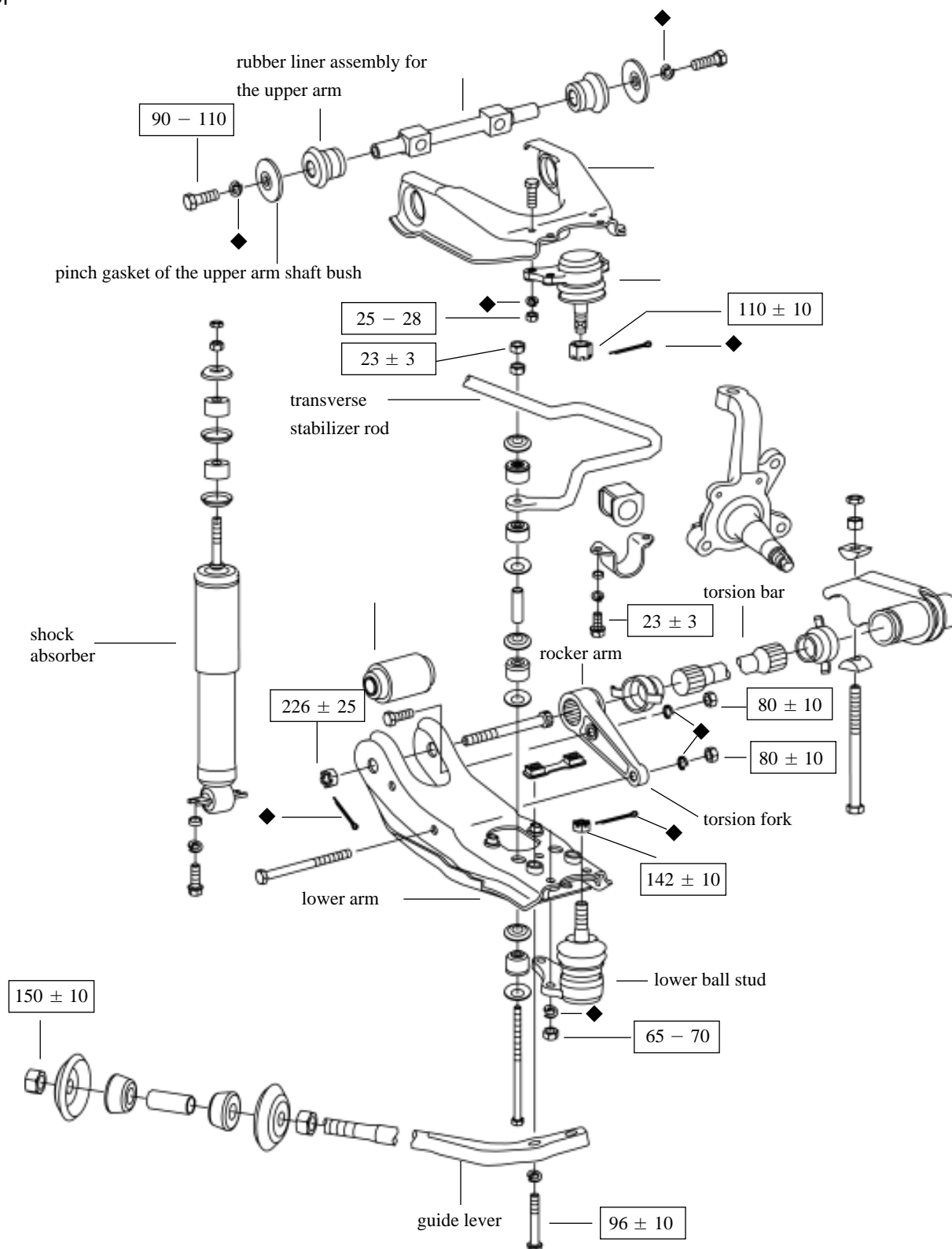
(See SA-3)



## Front suspension

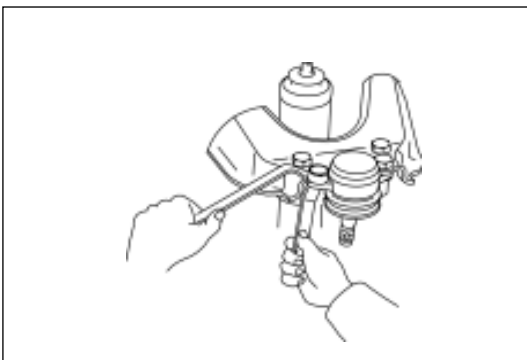
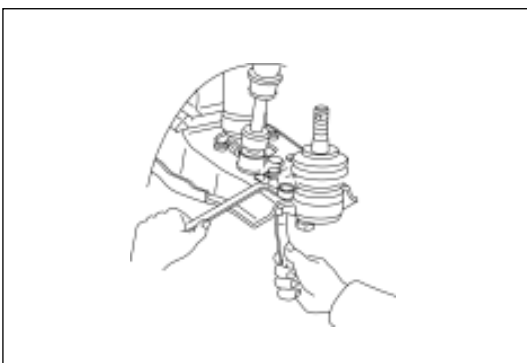
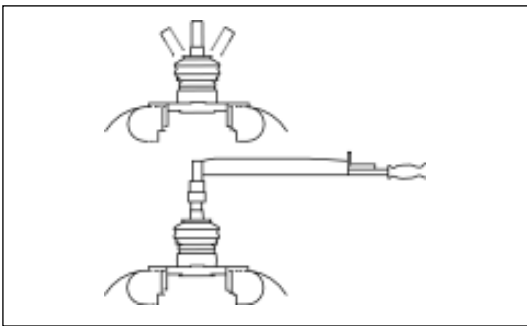
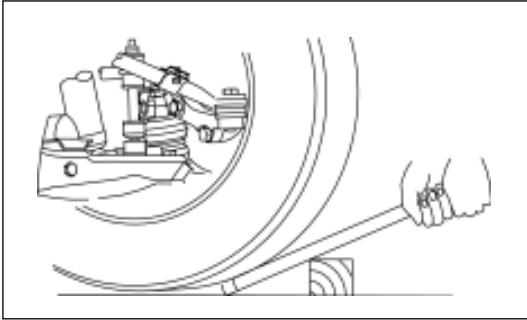
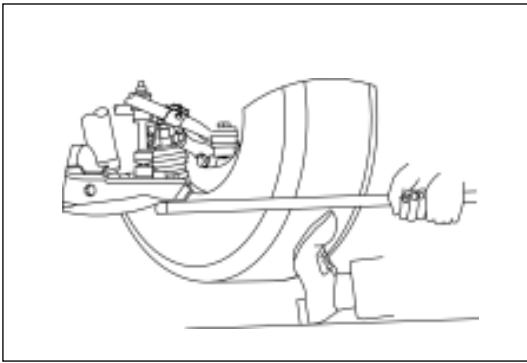
## Element figure

Dr



**N • m** : specified torque

◆ Parts that cannot be reused after being used



## Ball stud

### Inspection on Ball Stud

1. Check the lower ball stud to see whether it is excessively loose or not.
  - (a) Prop up the front of the vehicle with jack and then support it with the bracket.
  - (b) Tread down the brake pedal after verifying that the front wheel are in straight line.
  - (c) Move the arm vertically to check the lower ball stud to see whether the clearance is overlarge.

Max vertical clearance : 0.5mm

2. Check the upper ball stud to see whether it is over-loose. Move the wheel vertically to check whether the clearance of the ball stud is over large.

3. Check the rotating performance of ball stud

- (a) Take apart the ball stud.
- (b) Shake the ball stud several times forward and backward before mounting on the nut, as shown in the drawing.
- (c) Rotate the nut continuously with a torsion meter, which rotates the nut round per 2 to 4 seconds, and read the reading of the torsion meter after the fifth round.

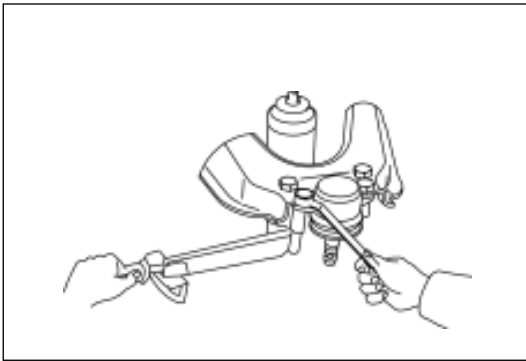
Fastening torque (running)

Lower ball stud:  $(0.1-4)N \cdot m$

Upper ball stud:  $(0.1-4)N \cdot m$

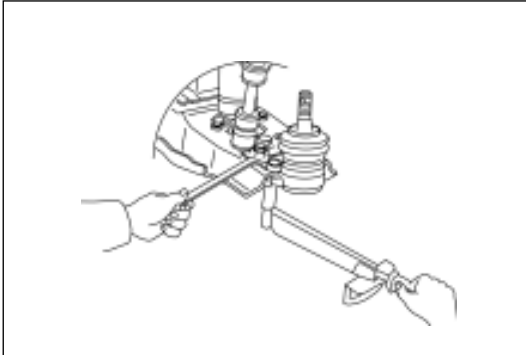
### Disassembly of Ball Stud

1. Tear down the steering knuckle.  
(see the SA-14).
2. Take apart the lower ball stud from the lower arm; and
3. Take apart the upper ball stud from the upper arm.

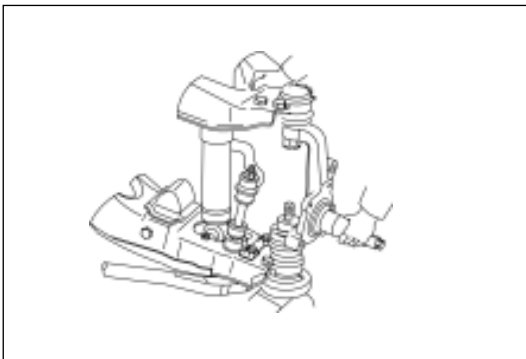


## Mount of Ball Stud

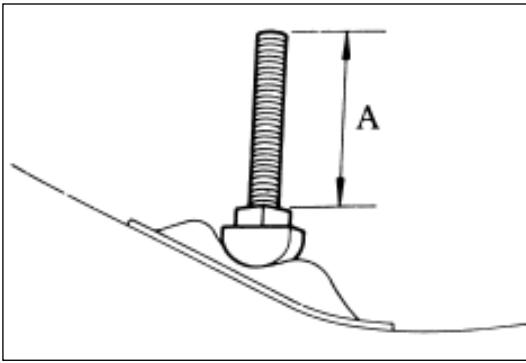
1. Mount the upper ball stud on the upper arm;  
Fastening torque:  $26\text{N} \cdot \text{m}$



2. Mount the lower ball stud on the lower arm;  
Fastening torque:  $65\text{N} \cdot \text{m}$



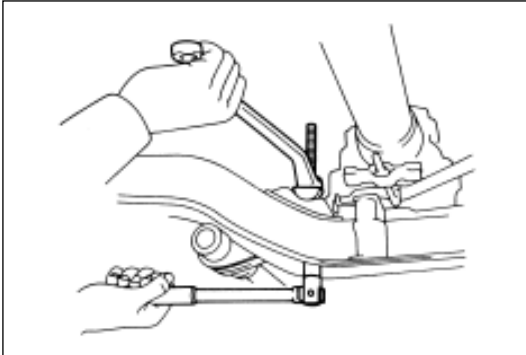
3. Mount on the steering knuckle  
(see page SA-15)



## Torsion Rod Spring

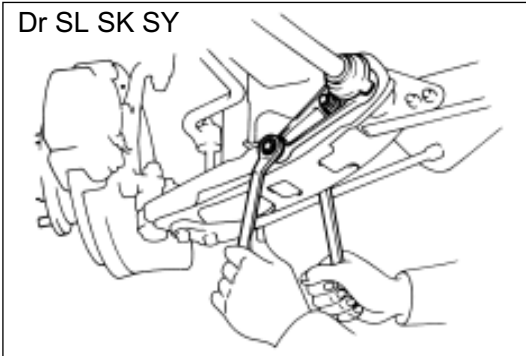
### Dismantle of Torsion Rod Spring

1. Use the jack to raise up the frame and support it with the bracket.
2. Take apart the locking nuts to measure the length of the projecting end of the bolts, as shown in the drawing.  
Remark: This measuring value can be referred when adjusting the chassis ground clearance.



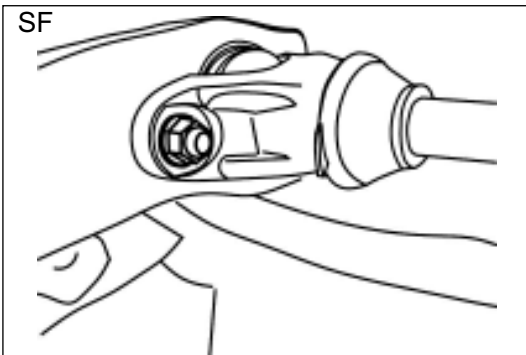
3. Take apart the dust cover.
4. Loosen the regulating nut until there is no tension on the torsion rod spring.

Dr SL SK SY

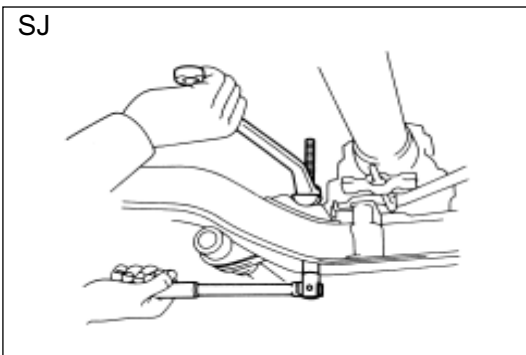


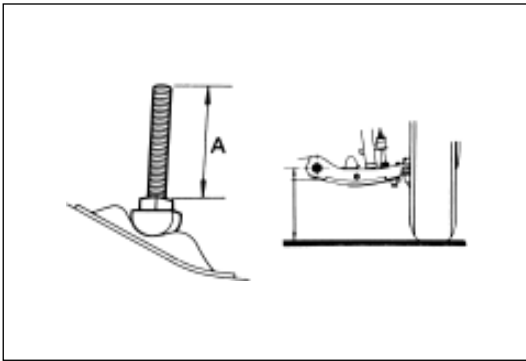
5. Take apart the torsion arm, torsion rod spring and the torsion regulating arm.
  - (a) Tear down the mounting nuts of the torsion rod arm.
  - (b) Take apart the torsion regulating arm from the adjusting bolt, the torsion regulating arm should be taken apart with the torsion rod spring and the torsion rod arm together.

SF



SJ



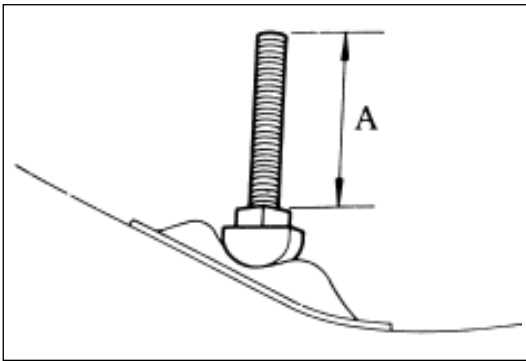
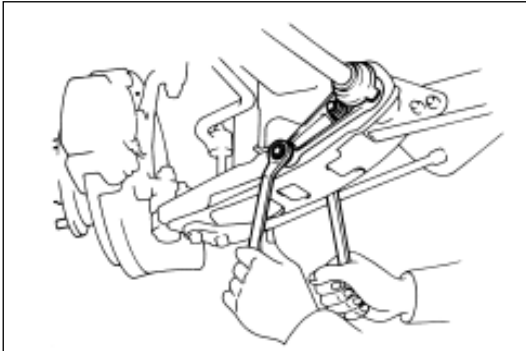


## Mount of Torsion rod Spring

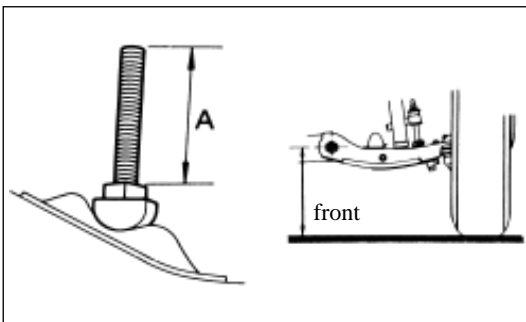
Notice: the torsion rod spring marked with “L”(left) or “R” (right), do not mount the springs at the incorrect location.

1. Mount the torsion rod spring, pedestal arm and torsion arm;
  - (a) Coat the lithium base grease on the spline of torsion rod spring.
  - (b) Align the wide-teeth parts and then mount the pedestal arm on the torsion rod spring.
  - (c) Align the wide-teeth parts and then mount the torsion arm on the torsion rod spring.
  - (d) Mount the torsion rod spring on the side of torsion arm and mount on the pedestal arm on the adjusting bolts.
  - (e) Screw up the torsion arm nuts according to the specified torque.

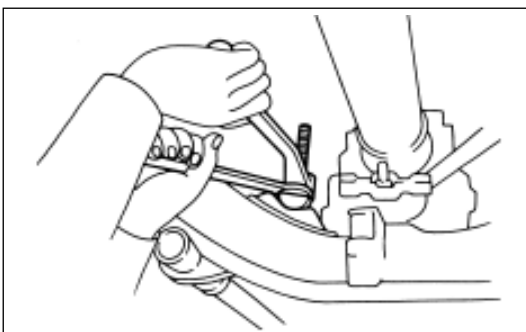
Fastening torque:  $(83 \pm 5) \text{ N} \cdot \text{m}$



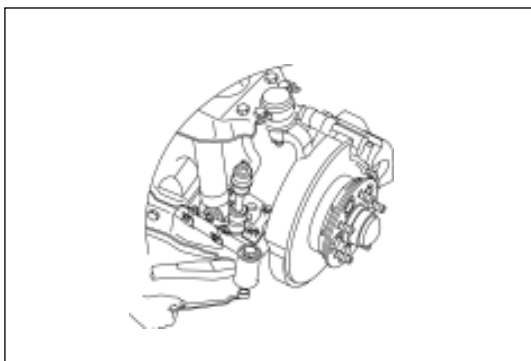
- (f) Screw up the adjustable nuts so that the protruding length of the bolt is equal to that before tearing down.



- (g) Mount on the wheel and dismantle the bracket, bounce the vehicle several times so as to make the suspension in place.
- (h) Screw up the adjustable nut to regulate the ground clearance.



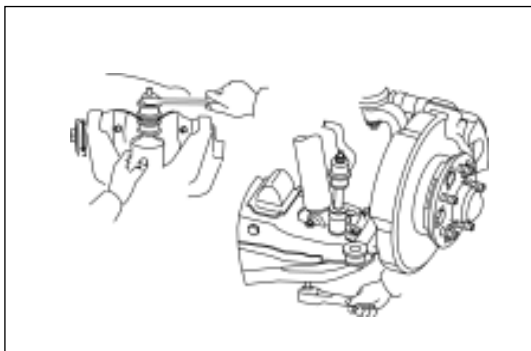
2. Tighten the locking nuts according to the specified torque.  
Tighten torque :  $(83 \pm 5) \text{ N} \cdot \text{m}$
3. Mount on the dust cover.



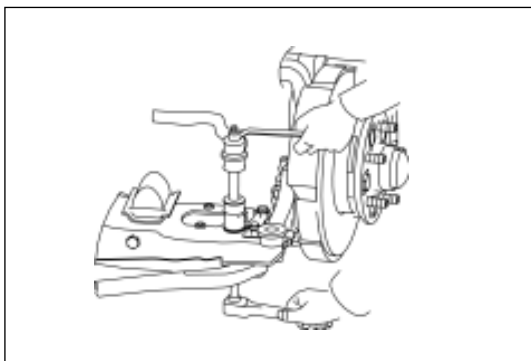
## Lower Arm and Vibration Damper

### Disassembly of Lower Arm And Vibration Damper

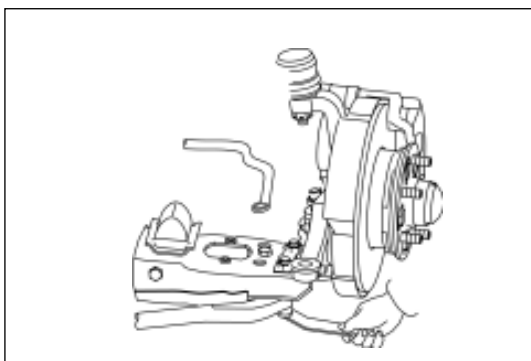
1. Take apart the torsion rod spring.  
(see page SA-19)
2. Take apart the ending part of the torsion rod
  - (a) Take apart the split pin and nuts.
  - (b) Take apart the ending part of drag rod.
3. Take apart the vibration damper



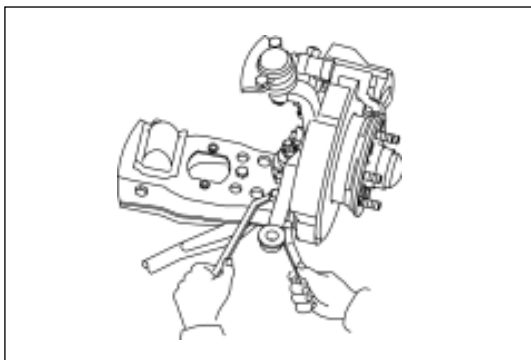
4. Take apart the transverse stabilizer rod from the lower arm.



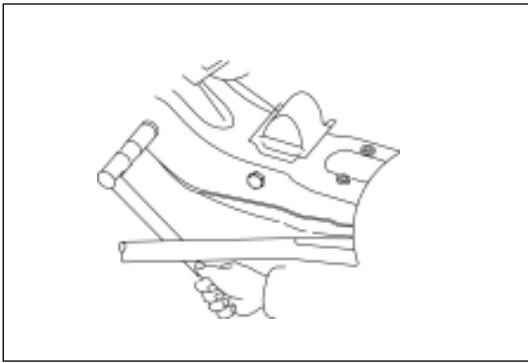
5. Take apart the guide lever from the lower arm;



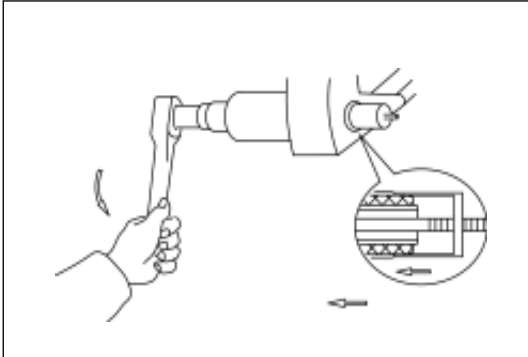
6. Take apart the lower ball stud.





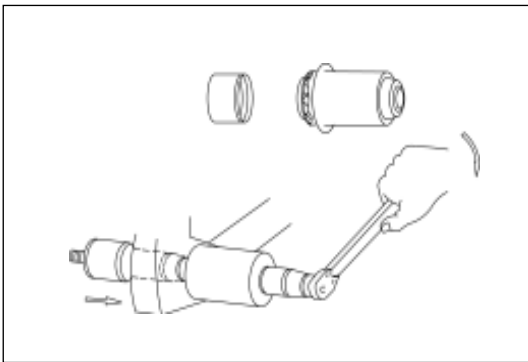


7. Take apart the lower arm  
Tear down the nuts and lower arm.

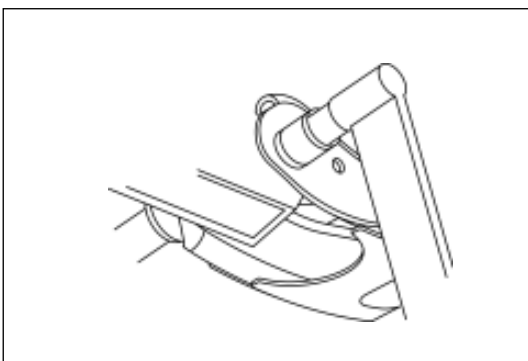


## Change of Lower Arm Shaft Bush

1. Take down the shaft bush.
  - (a) Shear off the rubber on shaft bush, as shown in drawing.
  - (b) Take apart the shaft bush.

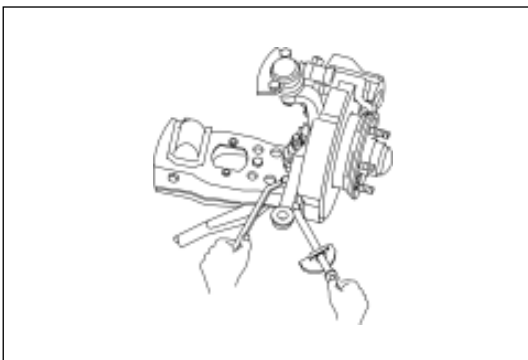


2. Mount the shaft bush.  
Mount on the new shaft bush.

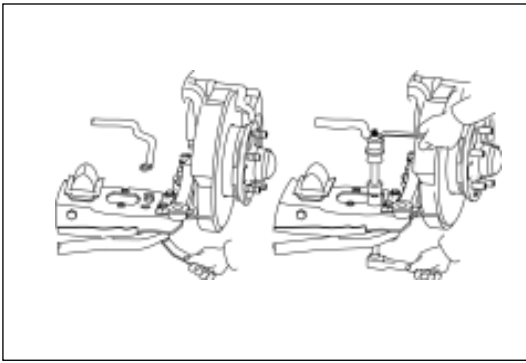


## Mount of Lower Arm And Vibration Damper

1. Mount on the lower arm.  
Adjust the lower arm in the unloaded stage when screw up the axial bolts of the lower arm.  
Fastening torque:  $(226 \pm 5) \text{ N} \cdot \text{m}$



2. Lower ball stud and lower arm connection  
Assemble the lower ball stud and lower arm with three bolts.  
Fastening torque:  $65 \text{ N} \cdot \text{m}$

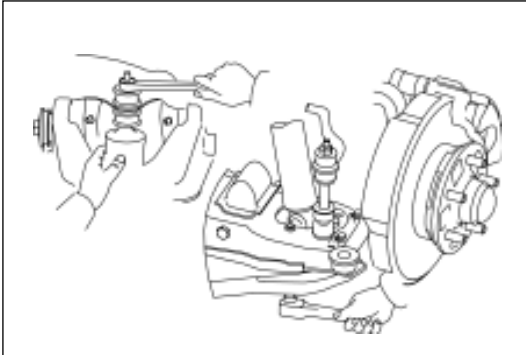


3. Mount the guide lever on the lower arm

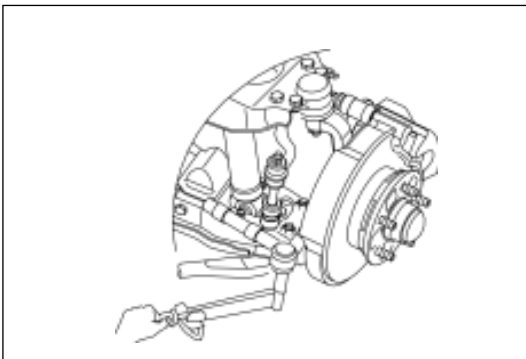
Fastening torque:  $(96 \pm 0) \text{ N} \cdot \text{m}$

4. Link the transverse stabilizer rod with the lower arm.

Fastening torque:  $(23 \pm 3) \text{ N} \cdot \text{m}$



5. Mount the vibration damper.



6. Mount the ending part of the drag rod:

- (a) Link the drag rod end to the steering knuckle arm, mount and screw up the nuts according to the specified torque.

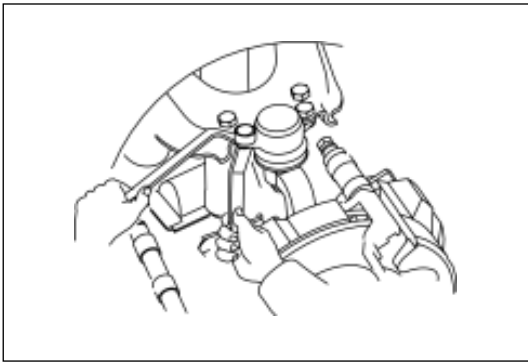
Fastening torque:  $(91 \pm 0) \text{ N} \cdot \text{m}$

- (b) Lock the nut with the new split pin.

7. Mount the torsion rod spring.

8. Check the Alignment of Front Wheel.

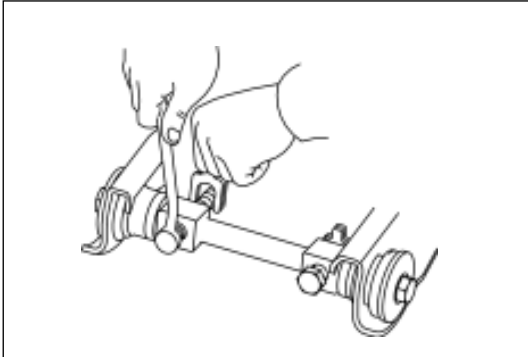
(See the page SA-3)



## Upper Arm

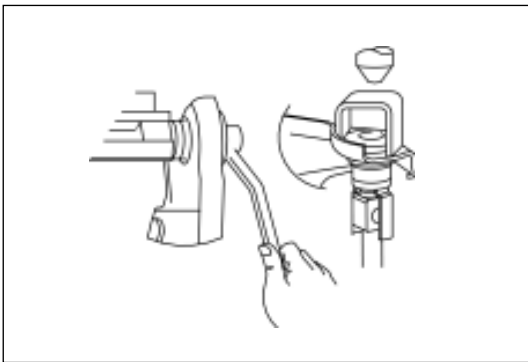
### Dismantle of Upper Arm

1. Take apart the ball stud from the upper arm:
  - (a) Support the upper arm with a jack.
  - (b) Take apart the four sets of bolt and nut.



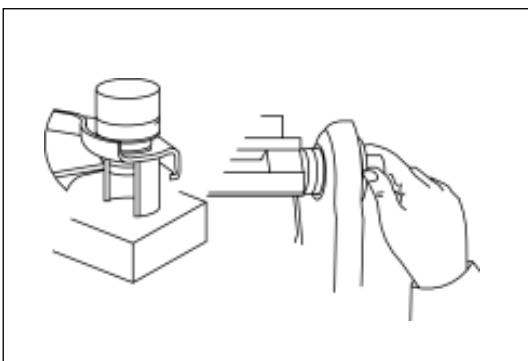
2. Take apart the upper arm
  - (a) Tear down the bolts and adjusting gasket.
  - (b) Take apart the upper arm.

Remark: Do not lose the adjusting gasket. Write down the gasket thickness so that it can be mounted on the original place.



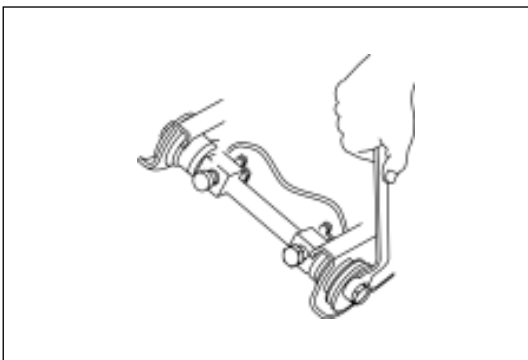
### Change of the rubber liner of Upper arm shaft

1. Tear down the rubber liner of the upper arm.
  - (a) Tear down the bolts and the pinch-off gasket of the upper arm shaft bush.
  - (b) Push out the rubber liner of upper arm with tools.



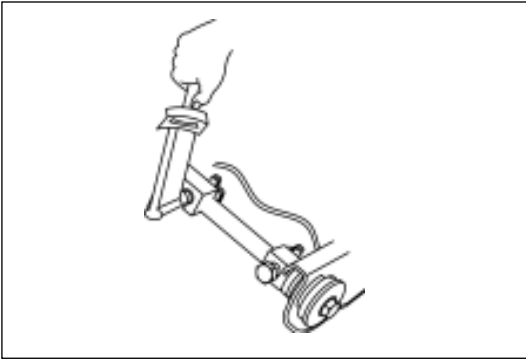
2. Mount the upper arm rubber liner.
  - (a) Push in the rubber liner of the upper arm with tools.
  - (b) Mount on the pinch-off gasket of the upper arm shaft bush and tighten the bolts manually.

Remark: it is not required to screw up the bolts according to the specified torque.



### Mount of Upper Arm

1. Screw up the axle bolts of the upper arm according to the specified torque,  
Fastening torque: (100    0)N • m

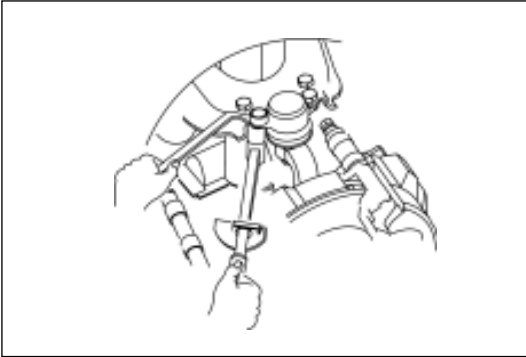


2. Mount the upper arm

- (a) Mount on the upper arm and the regulating gasket.
- (b) Screw up the bolts according to the specified torque.

Fastening torque:  $(96 \pm 0) \text{ N} \cdot \text{m}$

Remark: Mount back the gaskets of the same thickness in the same number on the original locations.

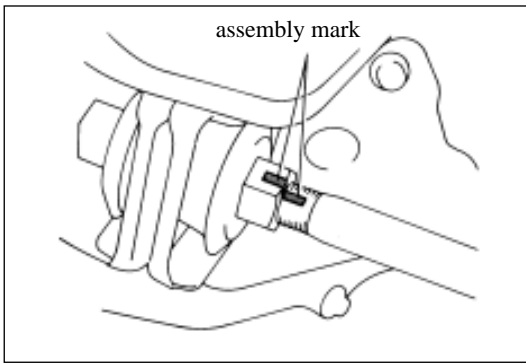


3. Connect the upper ball stud and upper arm together.

Fastening torque:  $26 \text{ N} \cdot \text{m}$

4. Check the Alignment of Front Wheel

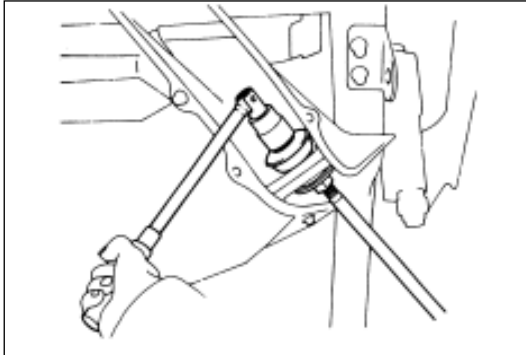
(See page SA-3)



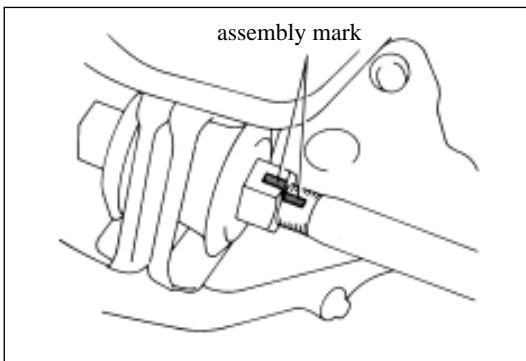
## Guide Lever

### Disassembly of Guide Lever

1. Mark the assembly mark on the guide lever.



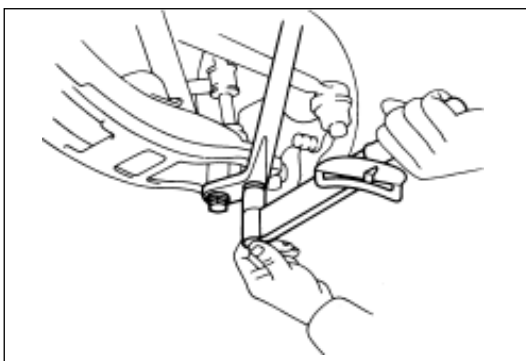
2. Tear down the front fixing nuts from the guide lever.
3. Tear down the guide lever from the lower arm.  
Tear down the nuts that fix the guide lever on the lower swimming arm, and then tear down the guide lever.



### Mount of Guide Lever

1. Mount on the front fixing nuts

Mount on the front fixing nuts and meanwhile align the assembly marks on the guide lever.

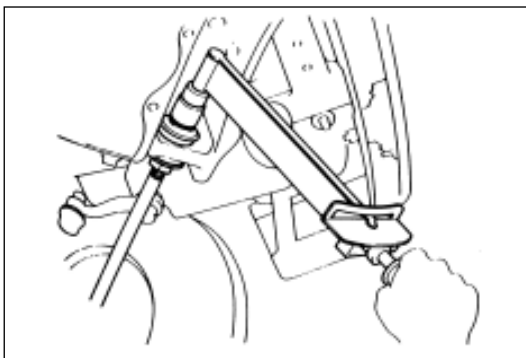


2. Mount the guide lever on the bracket
  - (a) Mount the washer and liner on the guide lever, and then mount the guide lever on bracket.
  - (b) Mount the sleeve ring, the liner and the washer on the guide lever.
  - (c) Screw up the fixing nuts with finger.

3. Mount the guide lever on the lower swing arm.

Screw up the fixing nuts according to the specified torque.

Fastening torque: (96 )N • m

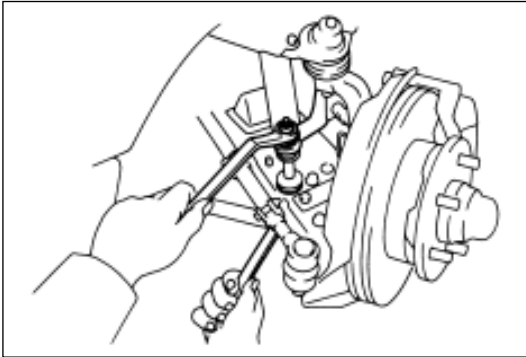


4. Screw up the fixing nuts according to the specified torque,
  - (a) Dismantle the bracket so that make the vehicle bounce sever times to put the suspension in balance.
  - (b) Screw up the front fixing nut.
5. Check the Alignment of Front Wheel  
(See Page SA-3)

## Transverse stabilizer rod

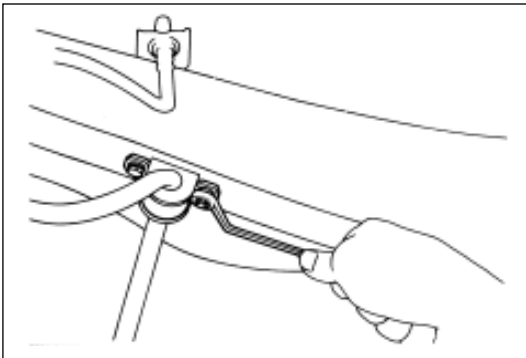
### Dismantle of Transverse Stabilizer Rod

1. Tear down the torsion rod spring

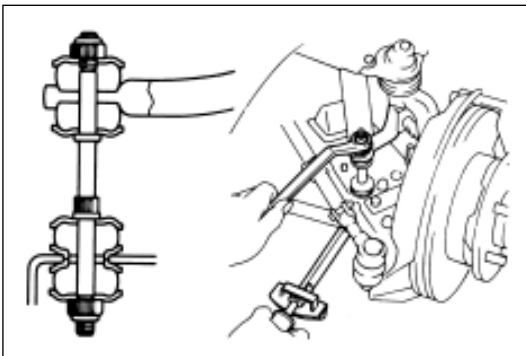


2. Tear down the transverse stabilizer rod from the lower swing arm,

- (a) Tear down the nuts and cushion blocks that support the two sides of the stabilizer rod from the lower swing arm so as to disconnect the stabilizer rod.



- (b) Tear down the liner and bracket of the stabilizer rod and then tear down the stabilizer rod.



### Mount of Transverse Stabilizer Rod

1. Put the transverse stabilizer rod on the frame,  
Lay the stabilizer rod in place, and mount the stabilizer rod liner on the bracket, then mount the bracket on frame, finally screw up the bolts with fingers.

2. Connect the transverse stabilizer rod to the lower swing arm.  
Connect the two ends of stabilizer to two lower swing arm with bolts, cushion blocks and new nuts.

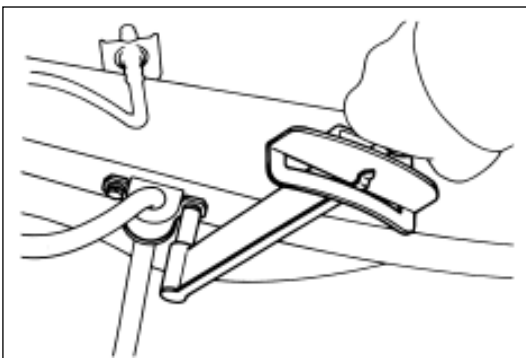
As shown in the drawing, tighten the nuts according to the specified torque.

Fastening torque: (29 )N • m

3. Screw up the locating bolts according to the specified torque,

Fastening torque: (29 )N • m

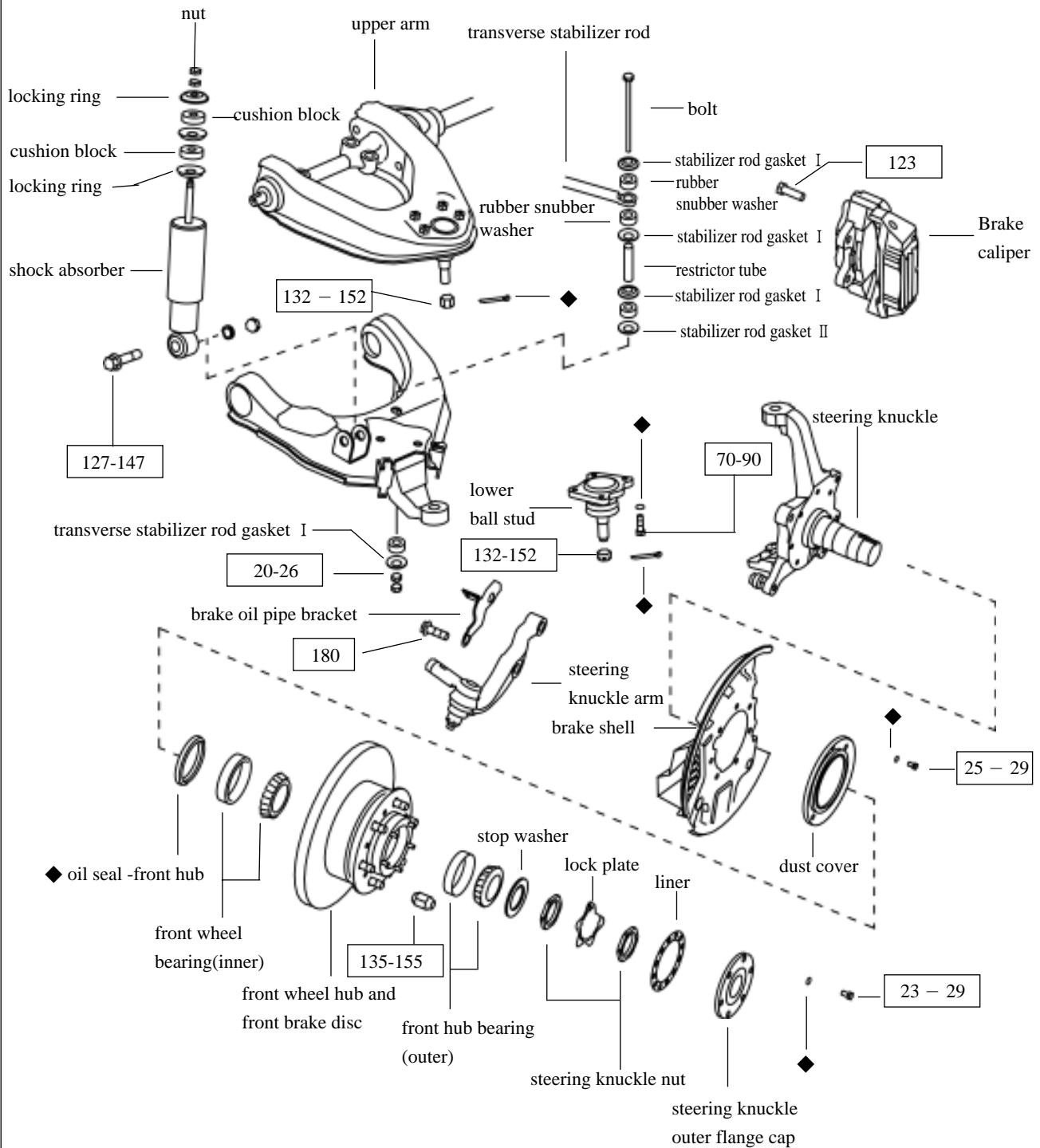
4. Mount on the torsion rod spring.



## Front wheel hub and steering knuckle

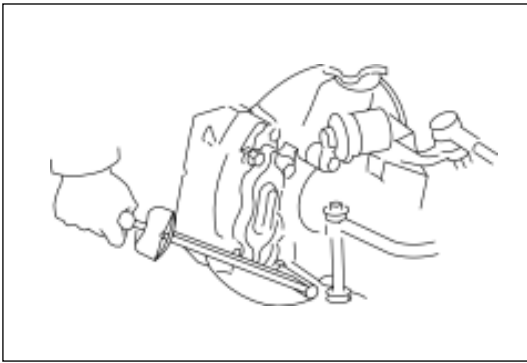
## Element figures

SF2WD



$N \cdot m$  :specified torque

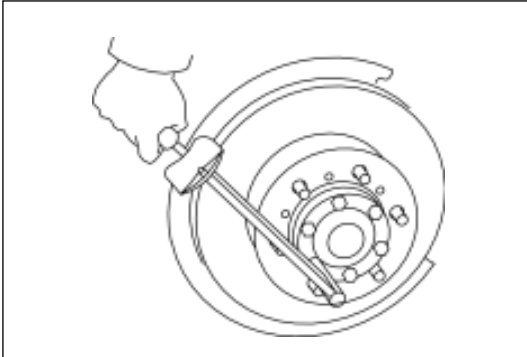
◆ Parts that cannot be reused after being used



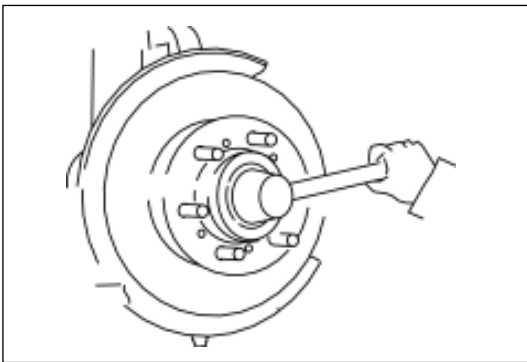
## Front Wheel Hub

### Disassembly of Front Wheel Hub

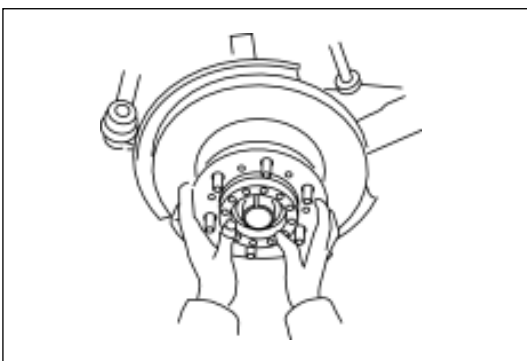
1. Tear down the brake caliper.
  - (a) Tear down the brake Bundy tube from the brake caliper, and block the Bundy tube line with a cork.
  - (b) Tear down the brake caliper from the steering knuckle.



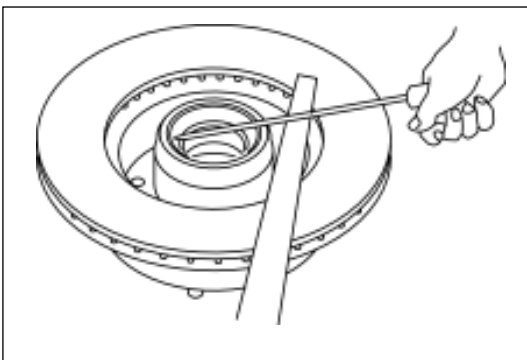
2. Tear down the steering knuckle outer flange cap.



3. Tear down the front wheel hub and brake disc.
  - (a) Open the lock plate with a screwdriver.
  - (b) Tear down the steering knuckle nut with the SST tools to take out the lock plate
  - (c) Tear down the other steering knuckle nut with SST tools to take out the stop washer and the steering knuckle outer bearing.



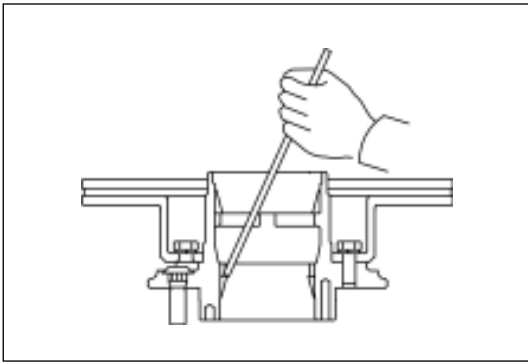
- (d) Tear down the front wheel hub and the brake disc assembly.



4. Tear down the front hub, oil seal, front hub bearing (inner) inner race and roller assembly.
  - (a) Pry out the oil seal.

Notice: the deformed oil seal should not be reused.
  - (b) Take out the front hub bearing (inner) inner race and roller assembly.





## 5. Front hub bearing outer race inspection and change

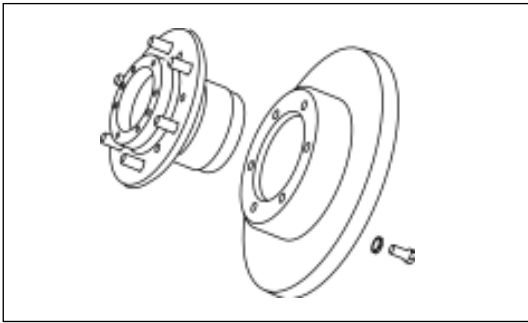
### (a) Check each bearing

Wash the inner and outer races of each bearing, and check them whether they are wearied or damaged.

### (b) Tear down the outer race of each bearing.

Tap out the bearing outer race with copper bar and hammer.

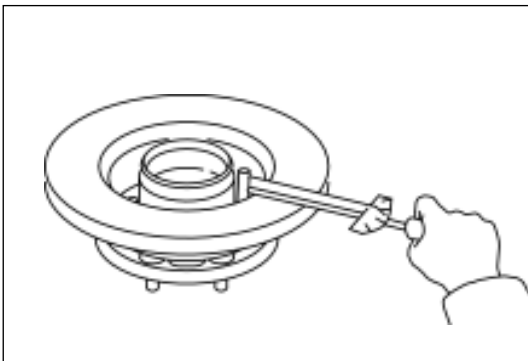
Notice: bind the dismantled inner and outer races of bearing together to prevent from mixing.



## 6. Front brake disc inspection and change

### (a) Check the wear situation of front brake disc.

### (b) Tear down the bolts that connect the front wheel hub and front brake disc.



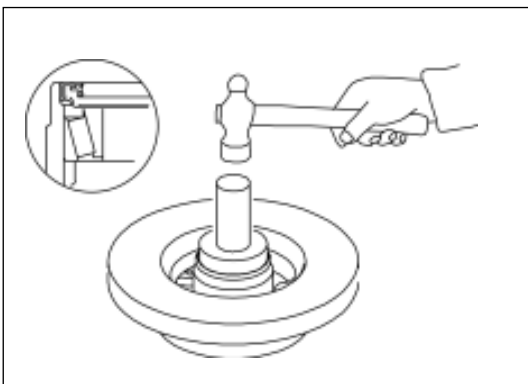
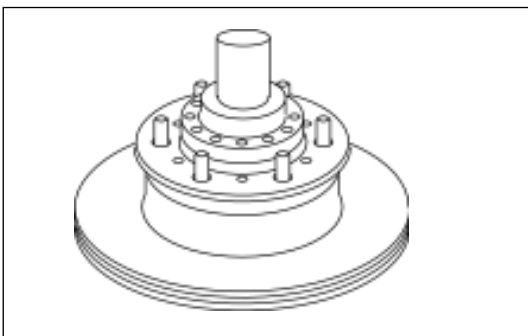
### (c) Connect the front wheel hub and front brake disc and screw up the bolts with moment spanner to the specified torque diagonally

Fastening torque:  $(70-80)\text{N} \cdot \text{m}$

### (d) Conduct the dynamic balance test on the dynamic balancer, the amplitude value displayed should not be above 13.5g under the condition that the measuring rotating velocity is 796 r/m and the locking rotating velocity 786 r/m, otherwise, tap in the counter balanced clip, which is 4g each, at the corresponding location, the number of the clip should not be more than 4.

### (e) Tap in the new bearing outer race with the special service tool.

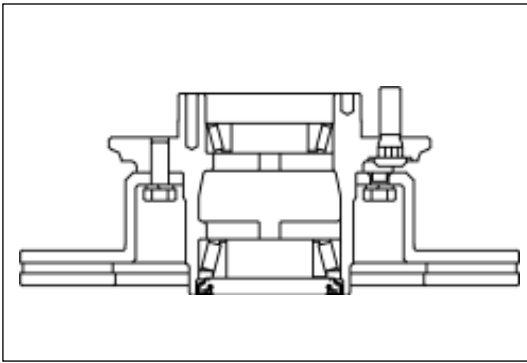
Notice: the inner and outer races of bearing should be changed in set.



## Assembly of Front Wheel Hub

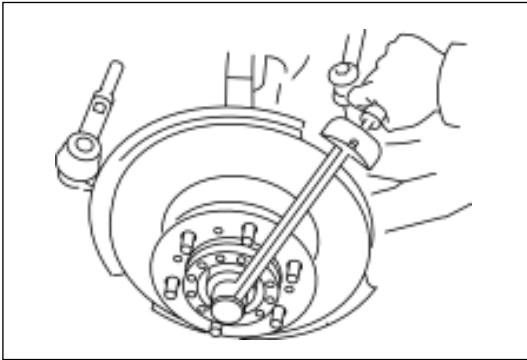
### 1. Mount on the inner race and roller assembly of front hub bearing (inner) as well as the front hub oil seal.

Coat the lithium base grease of 4 to 5 mm on the inside surface of the bearing outer race and front wheel hub, and plaster the lubricant in the front hub bearing (inner) and the roller assembly. Coat a little lubricant on the lips of oil seal of front wheel hub, and then tap the oil seal of front hub in place with special service tool. Notice: do not coat the lubricant on the front brake disc face.



2. Mount on the inner race and roller assembly of front hub bearing (outer).

After coating 4 to 5 mm lithium base grease on the outer race of bearing, put in the inner race and roller assembly of front hub bearing (outer), and then plaster the lubricant.



3. Mount the front wheel hub and front brake disc on the steering knuckle.

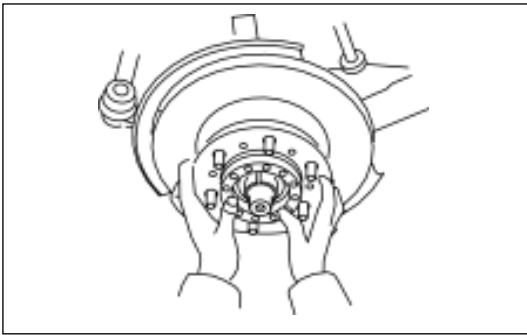
Coat a little lubricant on the steering knuckle where the oil seal locates, and mount the front wheel hub and front brake disc on the steering knuckle, then mount on the stop washer.

4. Adjust the preload

- (a) Mount on the steering knuckle nut and screw up them according to the specified torque.

Tighten torque:  $(100-120)\text{N} \cdot \text{m}$

- (b) Run the front wheel hub about  $1/4-1/3$  round, and seat the bearing.

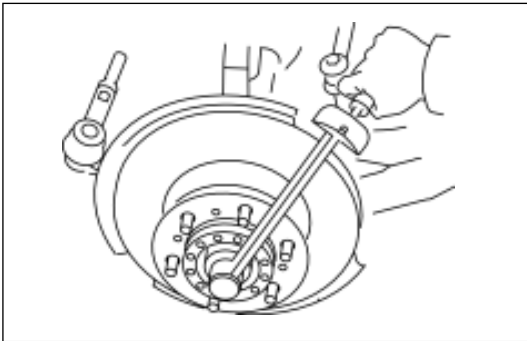


- (c) Loosen the steering knuckle nut to ensure the front brake disc can run freely. Screw up the steering knuckle nut again according to the specified torque.

Fastening torque:  $25\text{N} \cdot \text{m}$

- (d) Mount on the lock plate and another steering knuckle nut.

Tighten torque:  $60\text{N} \cdot \text{m}$



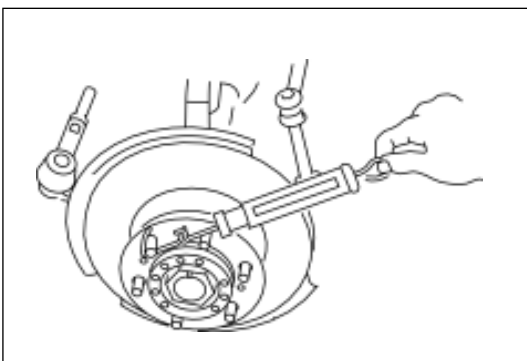
- (e) Hold the front wheel hub bolts with a spring-tension meter and drag the meter slowly in the direction of the tangent line of this spot.

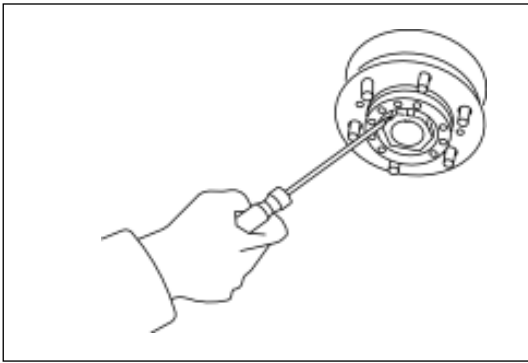
Suitable tension range:  $(29-54)\text{N}$

The nuts should be retightened until falls within the suitable range if the tension force is overlarge or over small.

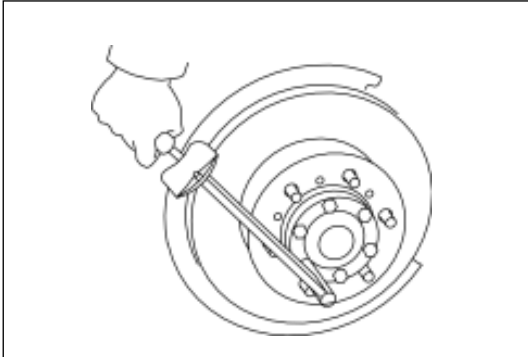
- (f) Check the bearing and ensure that the clearance, which is not larger than  $0.05\text{ mm}$ , is not excessive.

- (g) Measure the bouncing value of the front brake disc face. Bouncing value should not be above  $0.11\text{mm}$ .



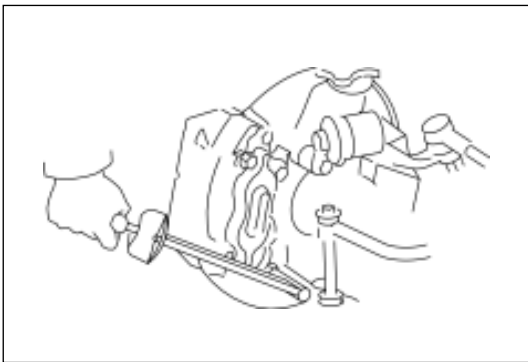


- (h) Bend one tooth of the lock plate inside and other teeth outside to lock the steering knuckle nut.



5. Mount on the liner and the steering knuckle outer flange cap.

Fastening torque:  $(23-29)\text{N} \cdot \text{m}$



6. Mount the brake caliper

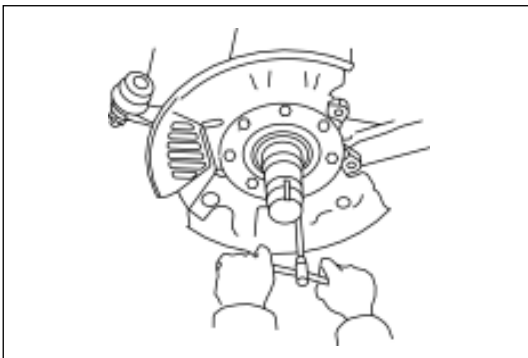
- (a) Mount the brake caliper on the steering knuckle and screw up the bolts according to the specified torque.

Fastening torque:  $123\text{N} \cdot \text{m}$

- (b) Connect the Bundy tube.

Fastening torque:  $(20-22)\text{N} \cdot \text{m}$

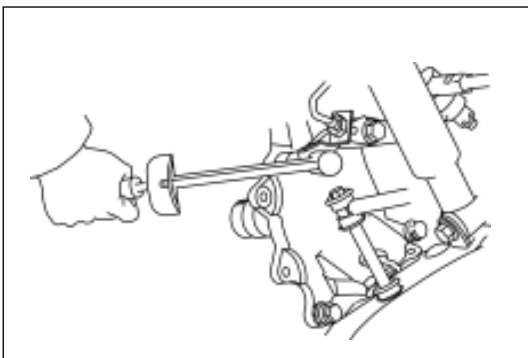
7. Check the height of the brake liquid level and add the brake liquid as requirement, exhaust the gas in the braking system.



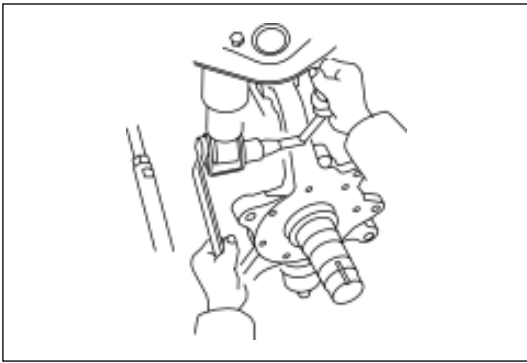
## Steering knuckle

### Dismantle of Steering Knuckle

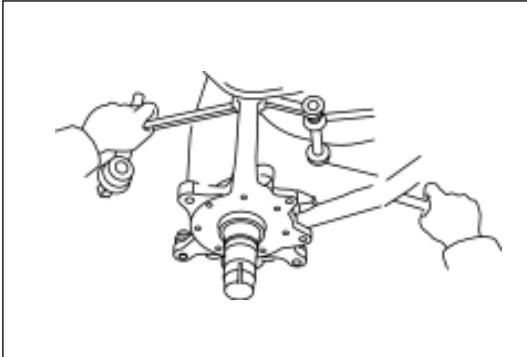
1. Tear down the brake caliper, front wheel and the front brake disc.
2. Tear down the dust cover, and the brake shell.



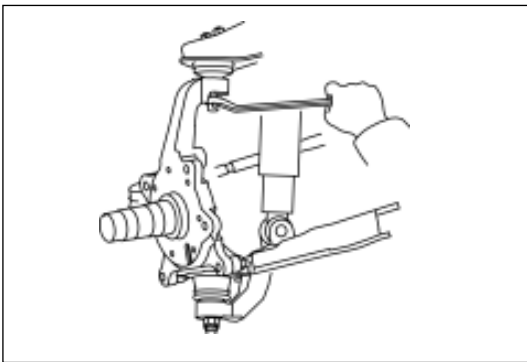
3. Tear down the steering knuckle arm from the steering knuckle.



4. Tear down the vibration damper from the lower arm.

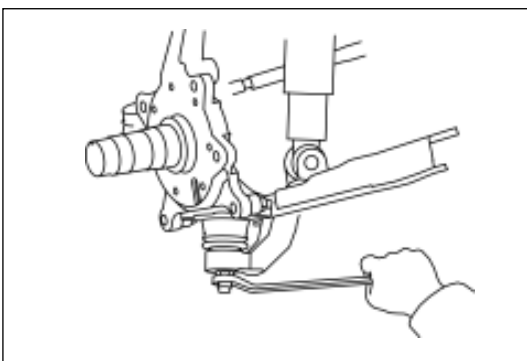


5. Tear down the transverse stabilizer rod from the lower arm.

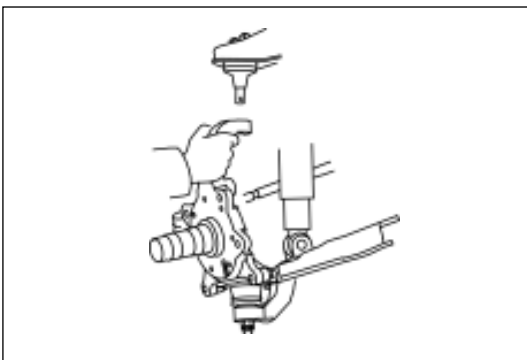


6. Tear down the steering knuckle;

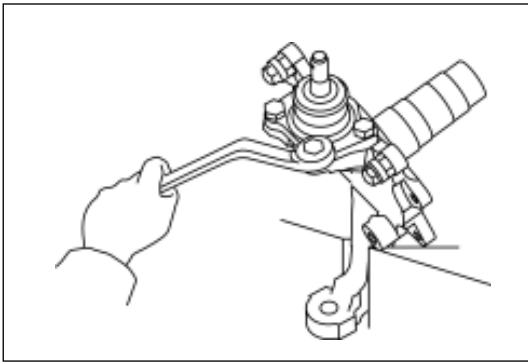
- (a) Tear down the split pin and groove nut of upper ball stud.
- (b) Take apart the steering knuckle from the upper ball stud with special service tool.



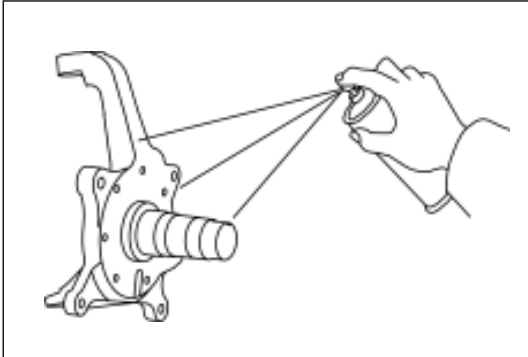
- (c) Tear down the split pin and groove of the lower ball stud.
- (d) Take apart the steering knuckle from the lower ball stud with special service tool.



- (e) Press down the lower arm to tear down the steering knuckle.

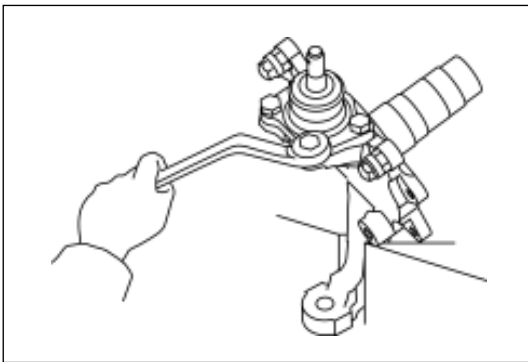


7. Tear down the lower ball stud assembly from the steering knuckle.



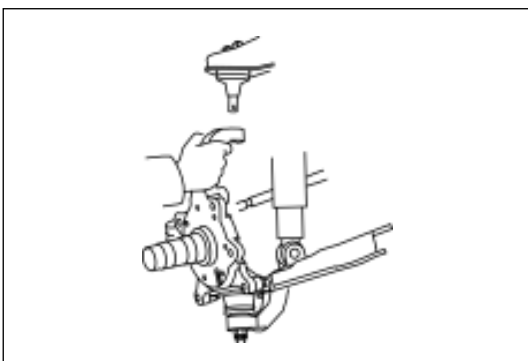
## Inspection on and Change of Steering Knuckle

1. Check the steering knuckle.  
Check the steering knuckle with the dye penetration agent to see whether there is crack or not.  
If crack is found, the steering knuckle is required to be changed.

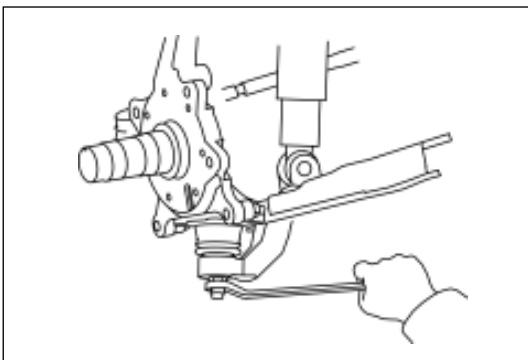


## Mount of Steering Knuckle

1. Mount the lower ball stud on the steering knuckle.  
Connect the lower ball stud and steering knuckle with bolts, which are tightened according to the specified torque.  
Fastening torque: (70-90)N • m

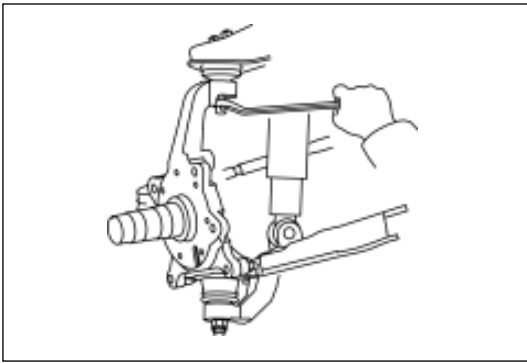


2. Mount on the steering knuckle
  - (a) Press down the lower arm to mount on the steering knuckle.



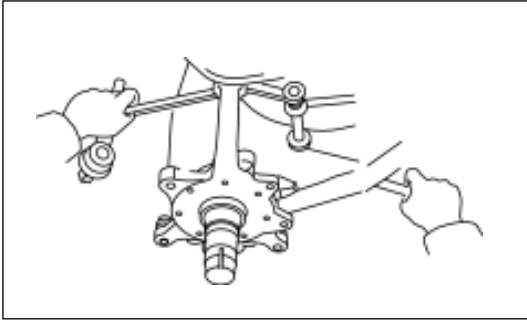
- (b) Mount on the lower ball stud, groove nut and screw up the nuts according to the specified torque and then mount on the split pin.

Fastening torque: (132-152)N • m



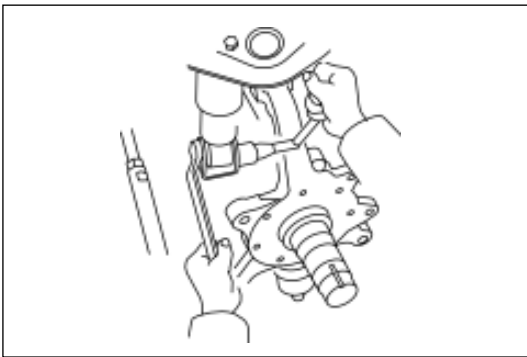
- (c) Mount on the upper ball stud and the groove nut that are screwed up according to the specified torque, and then split pin.

Fastening torque:  $(132-152)\text{N} \cdot \text{m}$



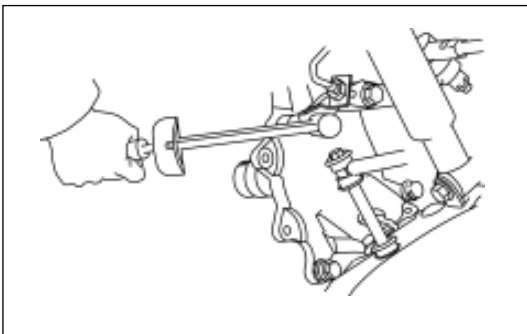
3. Mount the stabilizer rod on the lower arm.

Fastening torque:  $(20-26)\text{N} \cdot \text{m}$



4. Mount the vibration damper on the lower arm.

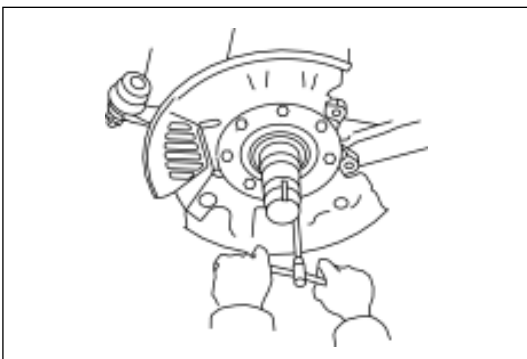
Fastening torque:  $(127-147)\text{N} \cdot \text{m}$



5. Mount the steering knuckle arm and the brake oil pipe bracket on the steering knuckle.

Coat the sealing agent 1271 on the bolt thread.

Fastening torque:  $180\text{N} \cdot \text{m}$



6. Mount the dust cover and brake shell, and align the locating hole of the dust cover with the groove of the steering knuckle to ensure that the dust cover is concentric with the steering knuckle.

Fastening torque:  $(25-29)\text{N} \cdot \text{m}$

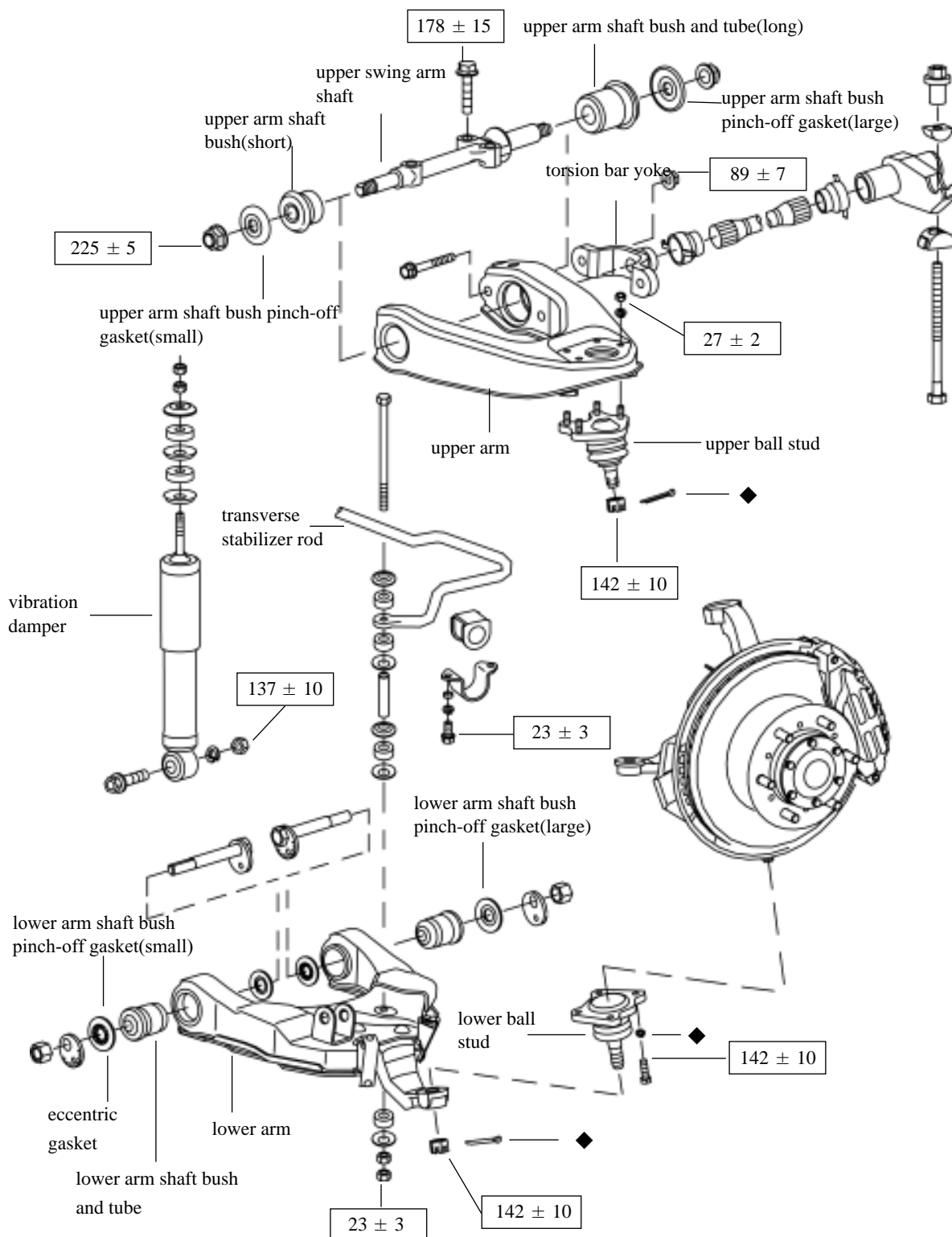
7. Mount the front wheel hub and the front brake disc as well as the brake caliper.

8. Check the height of brake liquid level and add the brake liquid as requirement, then exhaust the gas in the braking system.

## Front Suspension

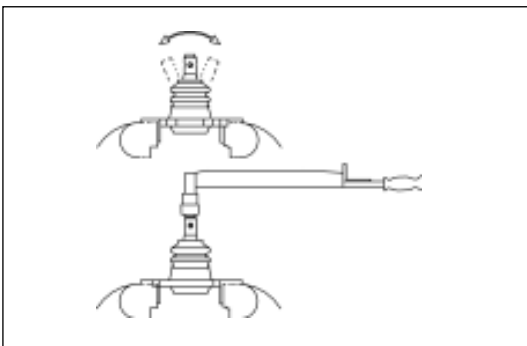
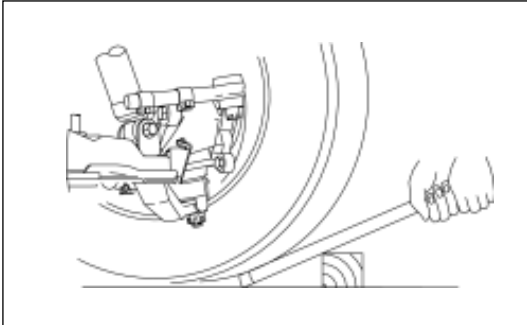
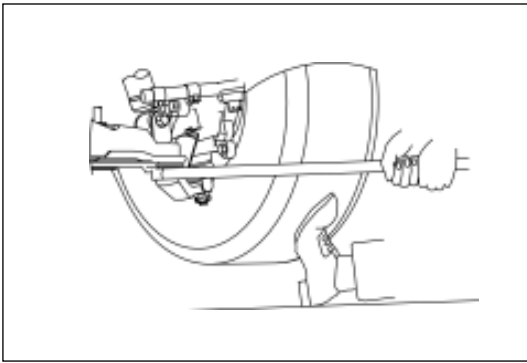
## Elements figures

SF



**N • M** : specified torque

◆ Parts that cannot be reused after being used



## Ball Stud

### Inspection on Ball Stud

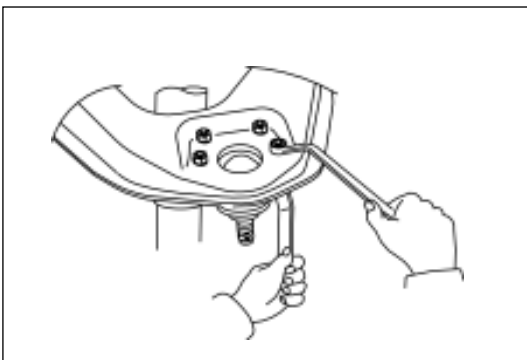
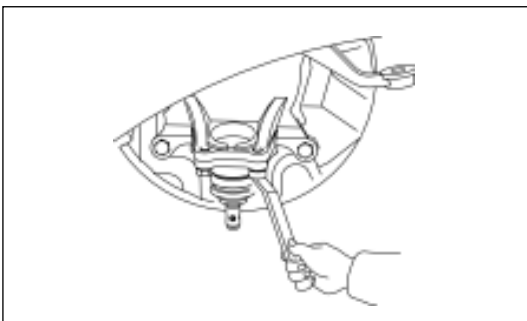
1. Check the lower ball stud to see whether it is excessively loose:
  - (a) Raise the vehicle with a jack and then support it with the bracket.
  - (b) Press down the brake pedal after verifying that the front wheel is straightly forward.
  - (c) Move the arm vertically to check whether the clearance of lower ball stud is over large.  
(Max vertical clearance): 0.5 mm
2. Check whether the upper ball stud is loose excessively; Move the wheel vertically to check whether the clearance of the ball stud is over large.  
(Max vertical clearance): 0.5 mm

3. Check the rotating performance of the ball stud:
  - (a) Tear down the ball stud;
  - (b) Shake the ball stud column several times before mounting on the nut, as shown in the drawing.
  - (c) Rotate the nut continuously with the torsion meter at the speed of one round each 2 to 4 seconds, read the meter reading at the fifth round.

Fastening torque(running):

lower ball stud: (0.1-4)N · m

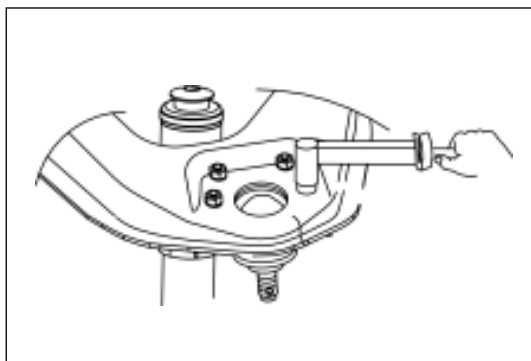
Upper ball stud: (0.1-4)N · m



### Disassembly of Ball Stud

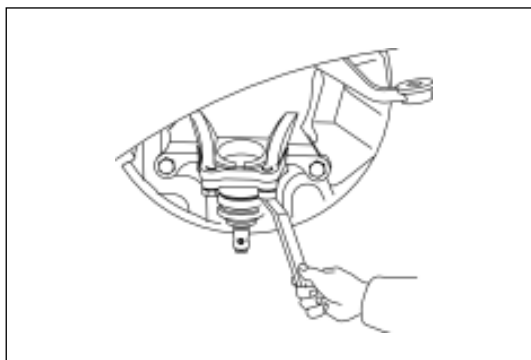
1. Tear down the steering knuckle, steering knuckle arm and the lower ball stud assembly.
2. Tear down the ball stud from the steering knuckle;
3. Tear down the ball stud from the upper ball stud.



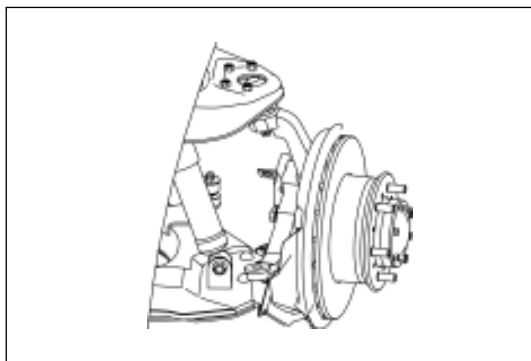


## Mount of Ball Stud

1. Mount the upper ball stud on the upper arm;  
Fastening torque: (27 ~ 30)N · m



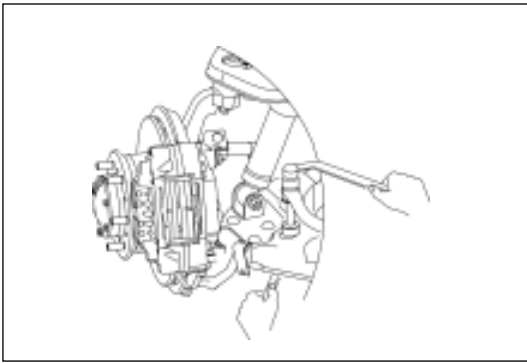
2. Mount the lower ball stud on the steering knuckle;  
Fastening torque: (80 ~ 100)N · m



3. Mount on the steering knuckle and hub brake disc assembly  
(See Page SA-34)

## Torsion Rod Spring

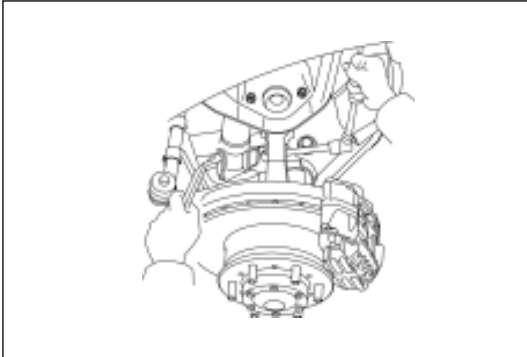
(see Page SA-19)



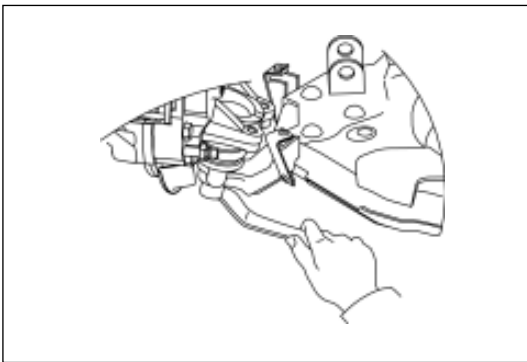
## Lower arm and Vibration Damper

### Disassembly of Lower Arm

1. Tear down the transverse stabilizer rod;

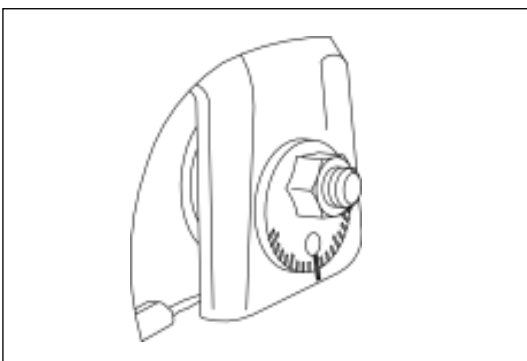


2. Tear down the vibration damper;



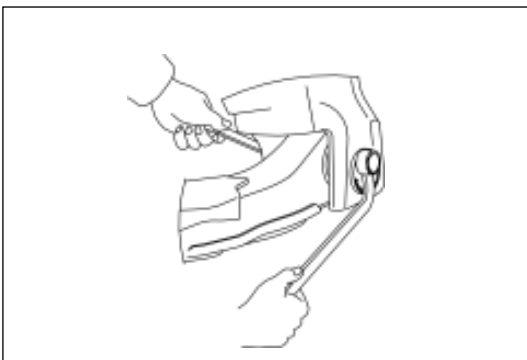
3. Disconnect the lower arm ball stud seat and the lower ball stud;

Remove the cotter pin and the groove nut.

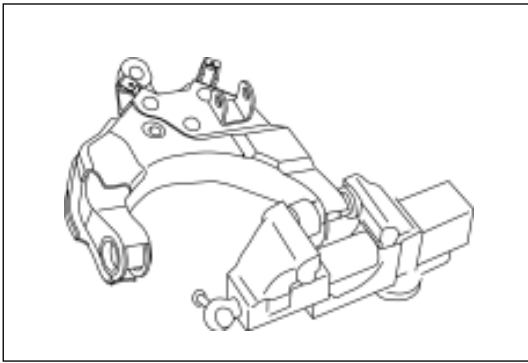


4. Tear down the lower arm

- (a) Make a mark on the mounting position of the eccentric gasket.

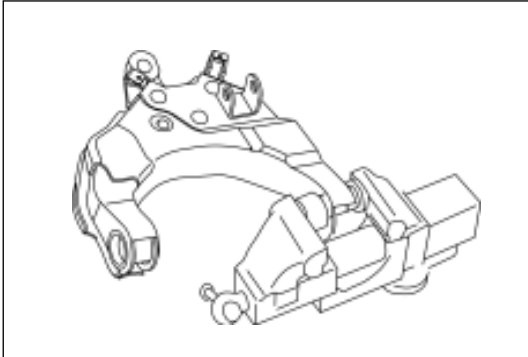


- (b) Tear down the lower arm.

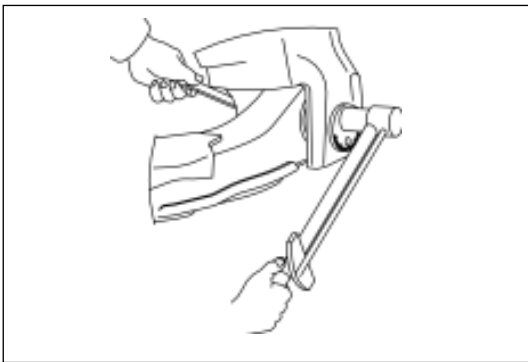


## Change of Lower Arm Shaft Bush and Tube

1. Tear down the lower arm shaft bush and shaft tube:
  - (a) Tear down the large and small pinch-off gaskets of the lower arm shaft bush first.
  - (b) Tear down the lower arm shaft bush and tube.

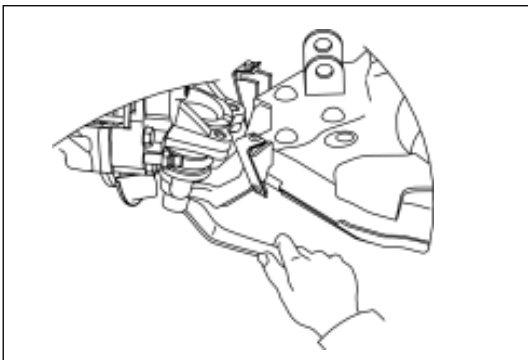


2. Mount the lower arm shaft bush and tube.
  - (a) Press down the lower arm shaft bush and tube.
  - (b) Press down the large and small pinch-off gaskets of the lower arm shaft bush.

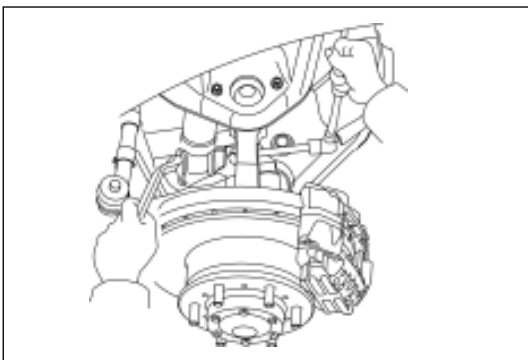


## Mount of Lower Arm

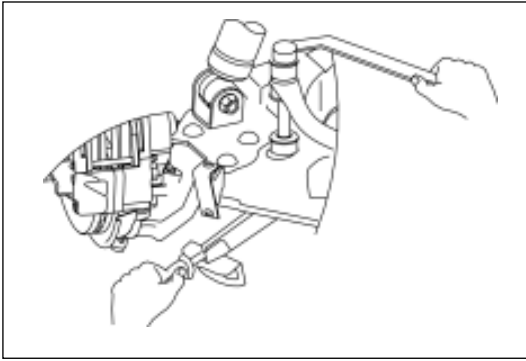
1. Mount on the lower arm  
Align the marks on the eccentric gasket and on the frame, and then screw up the lower arm bolt.



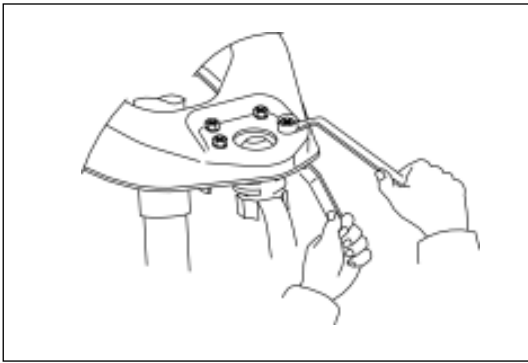
2. Connection for lower ball stud and lower arm:  
Mount the lower ball stud and the lower arm ball stud seat together.  
Fastening torque: (142 0)N • m



3. Vibration damper mount  
Mount the vibration damper on the lower arm bracket;  
Fastening torque: (137 0)N • m



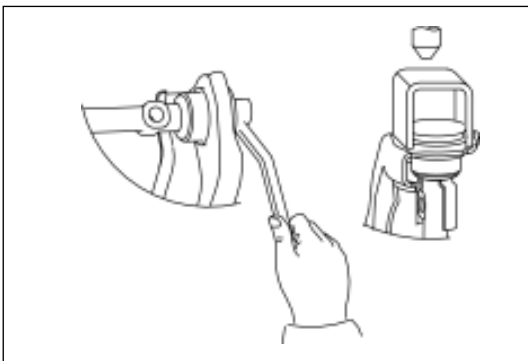
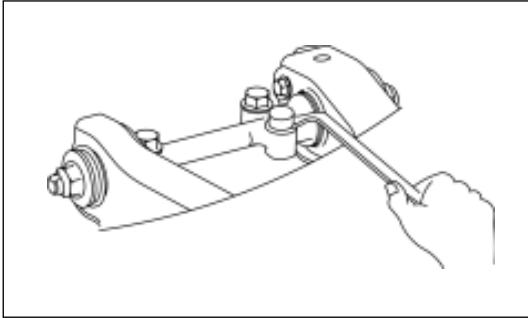
4. Mount the transverse stabilizer rod on the lower arm;  
Fastening torque: (23 牒)N • m
5. Check the Alignment of Front Wheel;  
(See Page SA-6)



## Upper Arm

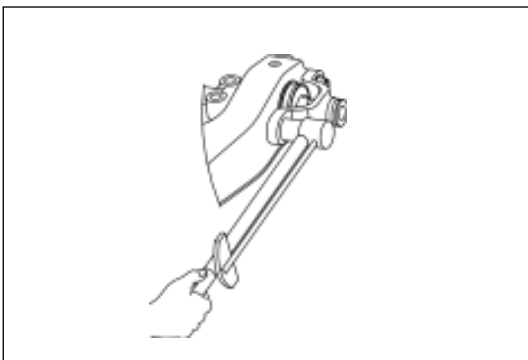
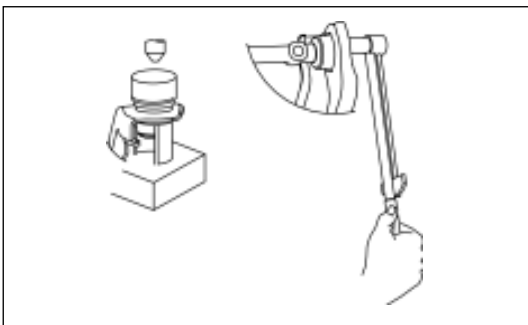
### Dismantle of Upper Arm

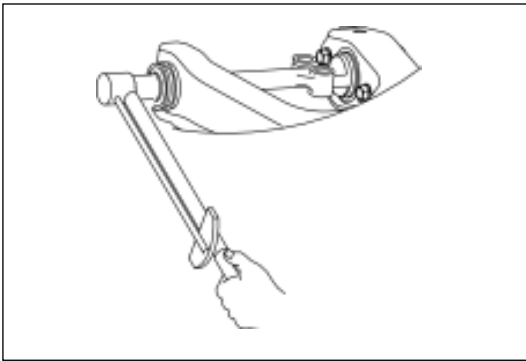
1. Tear down the torsion rod spring:  
(See page SA-19)
2. Tear down the upper ball stud:
  - (a) Support the upper arm with a jack.
  - (b) Tear down the four sets of bolt and nut.
3. Upper arm dismantle  
Tear down the bolts to take down the upper arm.



### Change of the Upper Arm Shaft Bush (Short) and the Upper Arm Shaft Bush and Tube

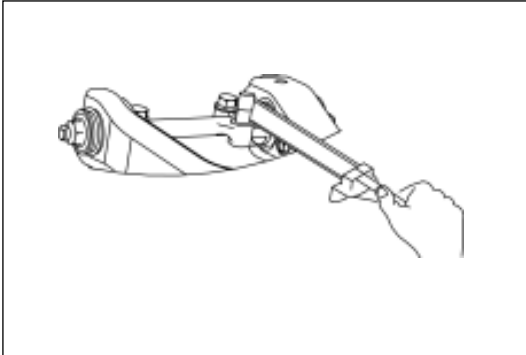
1. Tear down the upper arm shaft bush (short) and the upper arm shaft bush and tube (long)
  - (a) Tear down the torsion bar yoke, the nuts as well as the large and small pinch-off gaskets of the upper arm shaft bush.
  - (b) Push out the upper arm shaft bush (short) and upper arm shaft bush and tube.
2. Mount on the upper arm shaft bush (short) and the upper arm shaft bush and tube (long):
  - (a) Press the upper arm shaft bush and tube (long) in the upper arm, and encase the upper swing arm shaft, and then encase the upper arm shaft bush (short).
  - (b) Mount on the large and small pinch-off gaskets of upper arm shaft bush and screw up the nuts.  
Fastening torque: (225 )N • m
  - (c) Mount on the torsion bar yoke.  
Notice: the notch of torsion bar yoke should face downward;  
Fastening torque: (89 旌)N • m



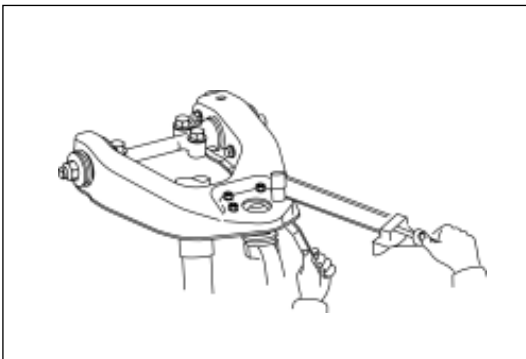


## Mount of Upper Arm

1. Screw up the axle nut of upper arm according to the specified torque;  
Fastening torque: (225    )N • m



2. Mount on the upper arm;  
Screw up the three bolts of the upper swing arm shaft according to the specified torque;  
Fastening torque: (178    5)N • m



3. Connect the upper arm ball stud with the upper arm;  
Use four sets of bolt and nut to connect the upper arm ball stud and the upper arm.  
Fastening torque: (27    ?)N • m

4. Mount the torsion rod spring;

5. Check the Alignment of Front Wheel:  
(See Page SA-6)

## Guide Lever

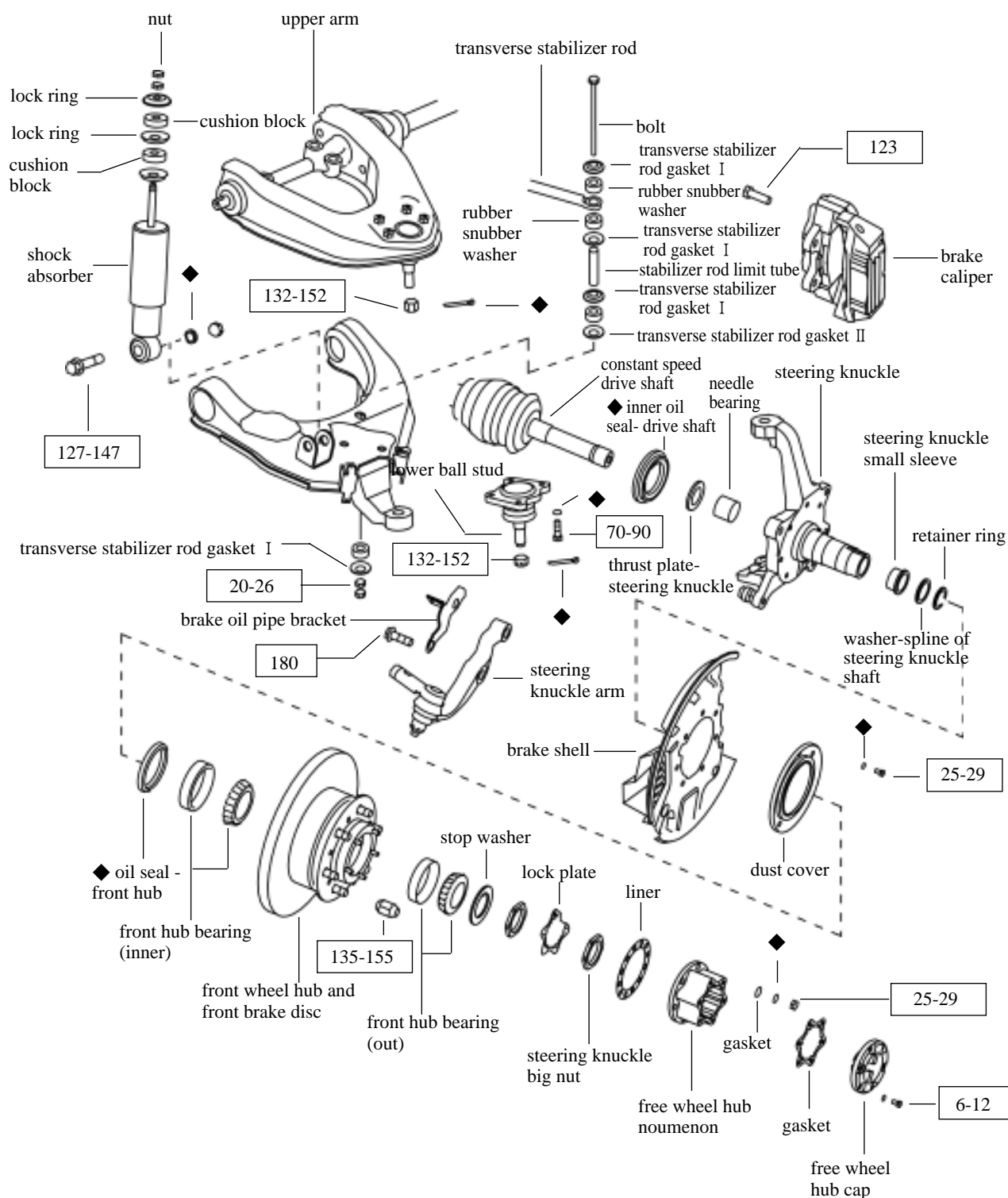
(See page SA-26)

## Transverse Stabilizer rod

(See page SA-27)

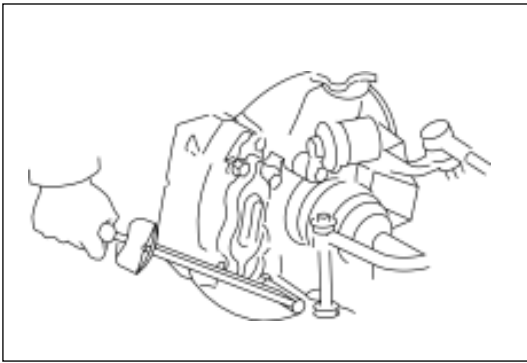
# Front Wheel Hub and Steering Knuckle Element Figure

SF 4WD



**N • m** : specified torque

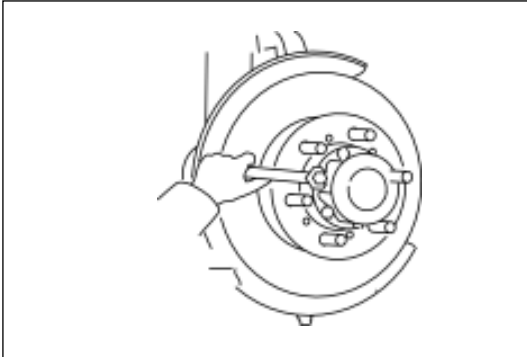
◆ Parts that cannot be reused after being used



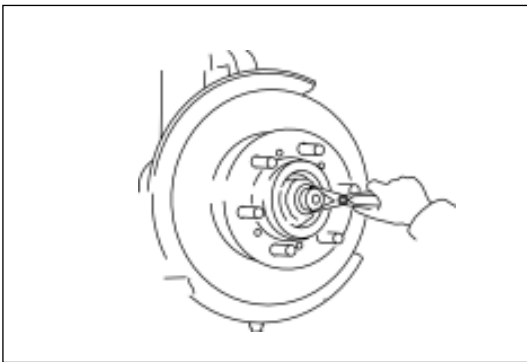
## Front Wheel Hub

### Disassembly of Front Wheel Hub

1. Tear down the brake caliper:
  - (a) Tear down the Bundy tube from the brake caliper and block the pipeline of Bundy tube with cork.
  - (b) Tear down the brake caliper from the steering knuckle.

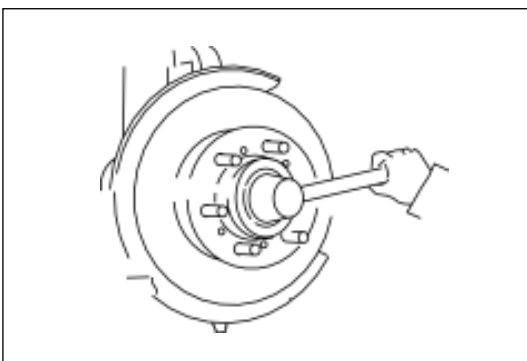


2. Tear down the free hub.

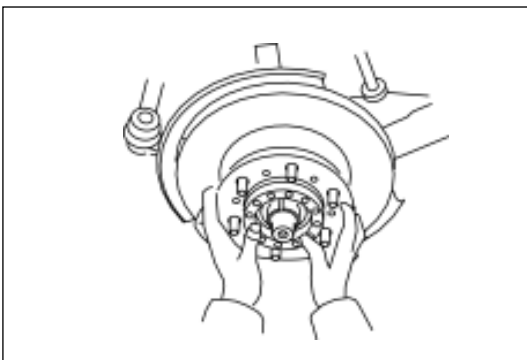


3. Tear down the retainer ring and the axle spline of washer-steering knuckle:

Tear down the retainer ring with the pliers for retainer ring, and take down the axle spline of washer-steering knuckle by hand.

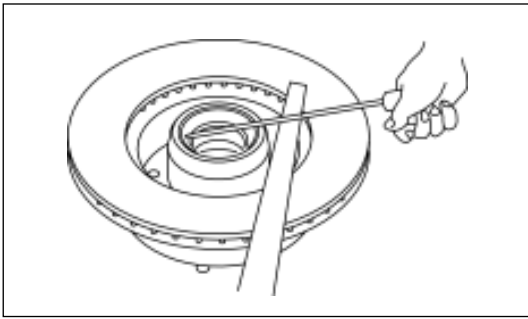


4. Tear down the front wheel hub and front brake disc:
  - (a) Prize up the lock plate with screwdriver.
  - (b) Tear down the steering knuckle nut with special service tool to take out the lock plate.
  - (c) Tear down another steering knuckle nut with special service tool to take out the stop washer.



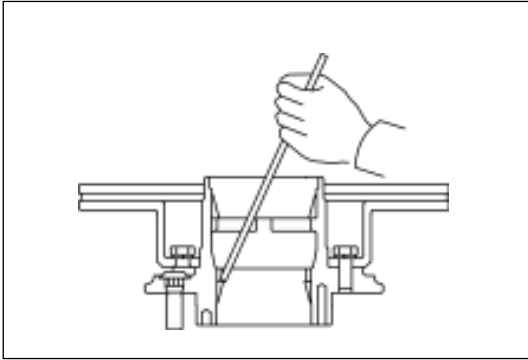
- (d) Tear down the front wheel hub and the front brake disc.





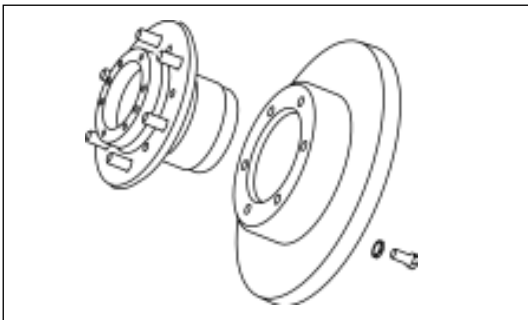
5. Tear down the front hub, the oil seal and the inner race of front hub bearing (inner)

- (a) Pry out the oil seal.
- (b) Take out the inner race of front hub bearing (inner).



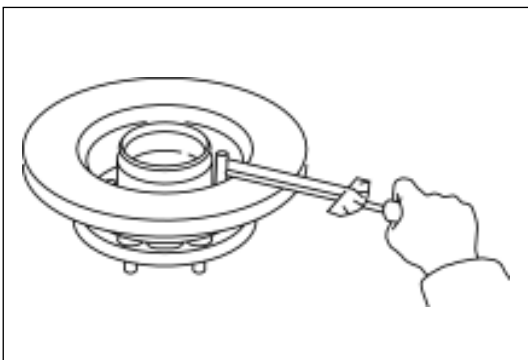
6. Inspection on and change of the outer race of front hub bearing

- (a) Check each bearing:  
Wash the inner and outer races of each bearing to check their wear or damage situation.
- (b) Tear down the outer race of each bearing:  
Tap out the outer bearing race with copper bar and hammer.  
Notice: bind the inner and outer races of the same bearing together to prevent from mixing.



7. Inspection and change for front brake disc

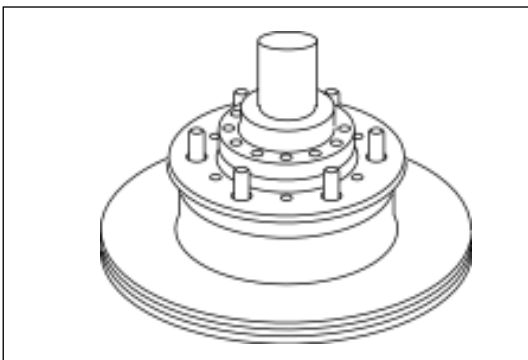
- (a) Check the wear situation of the front brake disc.
- (b) Tear down the bolts that connect the front wheel hub and the front brake disc.



- (c) Connect the front wheel hub and the front brake disc with bolts, which are tightened diagonally with moment spanner according to the specified torque.

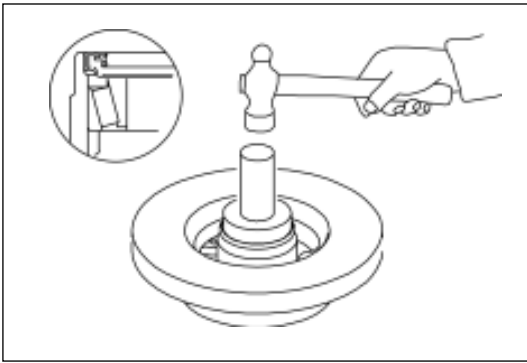
Fastening torque:  $(70-80)\text{N} \cdot \text{m}$

- (d) Make the dynamic balance test on the dynamic balancer, and the amplitude value displayed should not be smaller than 13.5g under the condition that the measuring rotating velocity is 796 r/m and the locking rotating velocity of 786 r/m, otherwise, tap the counter balanced clip, which is 4g each, in the corresponding position, the clip number should not be more than 4.



- (e) Tap in the new bearing outer race carefully with the special service tool.

Notice: the inner and outer races of the same bearing should be changed in one time.

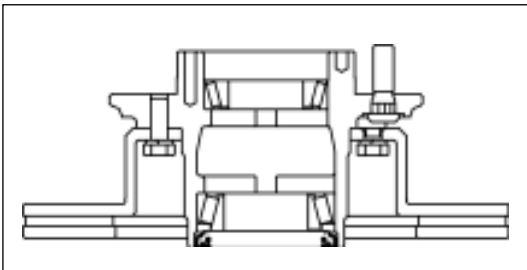


## Assembly of Front Wheel Hub

1. Mount on the inner race and roller assembly of front hub bearing as well as the oil seal of front hub.

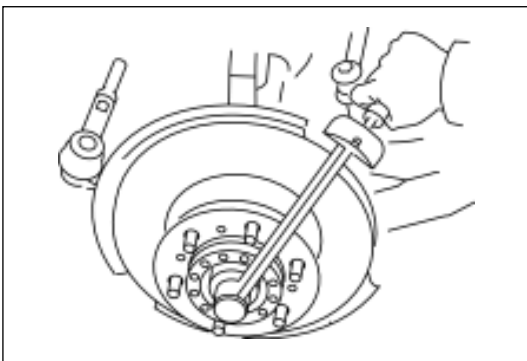
Coat the lithium base grease of (4-5)mm on the inside surfaces of the bearing outer race and the front wheel hub, put in the inner race and roller assembly of front hub bearing (inner), then plaster the lubricant. Plaster a little lubricant on the lips of front wheel hub oil seal, and finally tap the front hub in place with special service tool.

Notice: Do not plaster the lubricant on the face of front brake disc.



2. Mount the inner race of front hub bearing (outer) and roller assembly

Coat 4 – 5 mm of lithium base grease on the outer race of bearing, and then put the inner race of front hub bearing (outer) and roller assembly in it, finally plaster with lubricant.



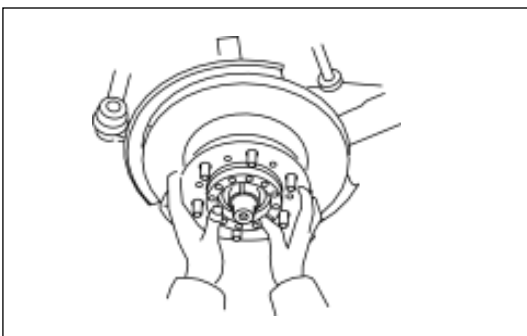
3. Mount the front wheel hub on the steering knuckle

Coat a little lubricant on the oil seal of steering knuckle, and then mount the front wheel hub and front brake disc on the steering knuckle, finally mount on the stop washer.

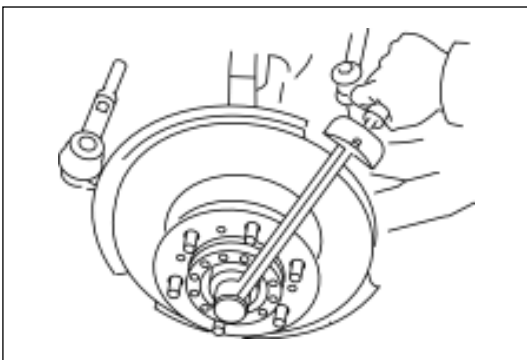
4. Adjust preload:

- (a) Mount on the steering knuckle nut and screw it up according to the specified torque.

Fastening torque: (100-120)N • m



- (b) Run the front wheel hub by 1/4-1/3 round so as to seat the bearings.

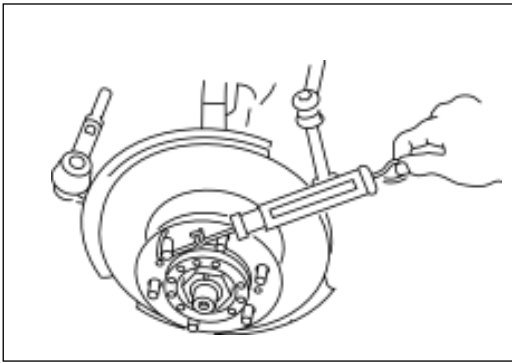


- (c) Loosen the steering knuckle nut to ensure the front brake disc can run freely. Screw up the steering knuckle nut again to the specified torque.

Fastening torque: 25N • m

- (d) Mount on the lock plate and mount on another steering knuckle nut.

Fastening torque: 60N • m

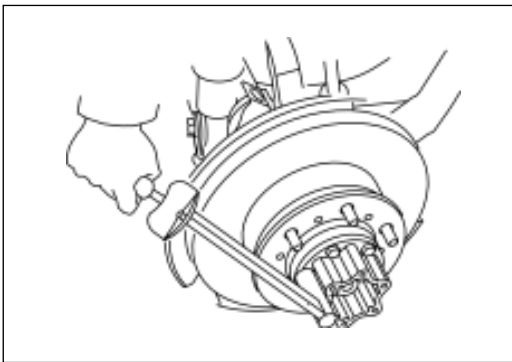
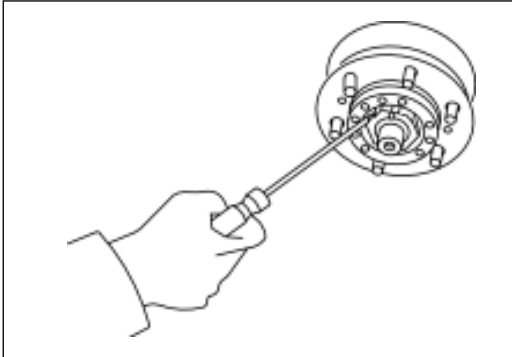


- (e) Hold the bolt of front wheel hub with the spring-tension meter and drag slowly in the direction of the spot tangent line.

Suitable tension range: (29-54)N

The nut should be screwed up again within the suitable range if the tension value is overlarge or over small.

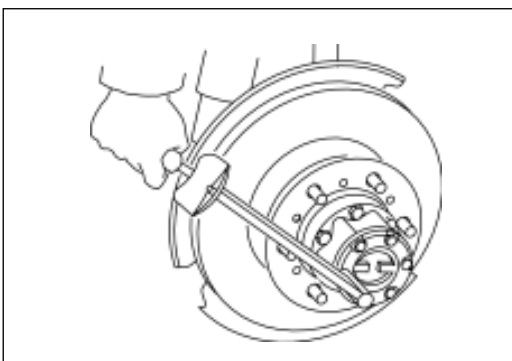
- (f) Check the bearing to ensure it cannot leap excessively (the axial clearance should not be more than 0.05mm).
- (g) Measure the bouncing value of the front brake disc, which should not be more than 0.11mm, and
- (h) Bend one tooth of lock plate inside and other teeth outside so as to lock the steering knuckle nut.



5. Mount the liner and the free hub:

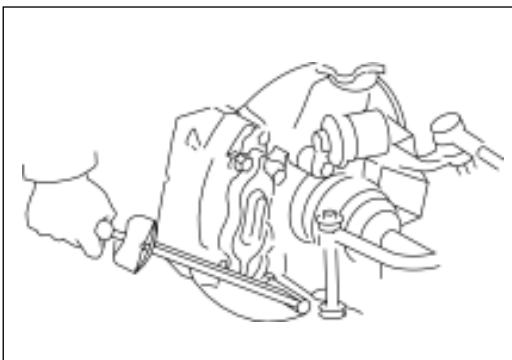
- (a) Tear down the free wheel hub cap firstly.
- (b) Mount the liner and the free hub on the front wheel hub.

Fastening torque: (25-29)N · m



- (c) Mount on the free wheel hub cap.

Fastening torque: (6-12)N · m



6. Mount the brake caliper:

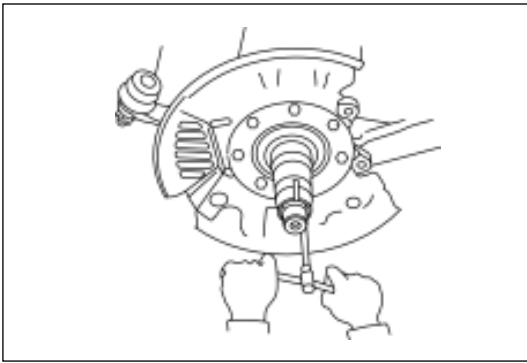
- (a) Mount the brake caliper on the steering knuckle and screw up the bolts according to the specified torque.

Fastening torque: 123N · m

- (b) Connect the Bundy tube.

Fastening torque: 20-22N · m

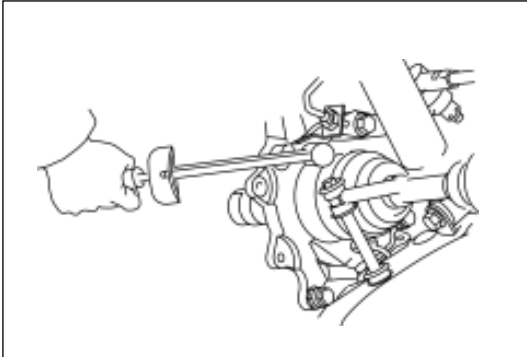
7. Check the height of brake liquid level and, if required, add the brake liquid, exhaust the gas from the brake system.



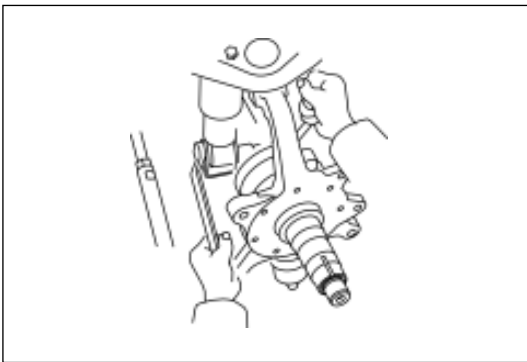
## Steering Knuckle

### Dismantle of Steering Knuckle

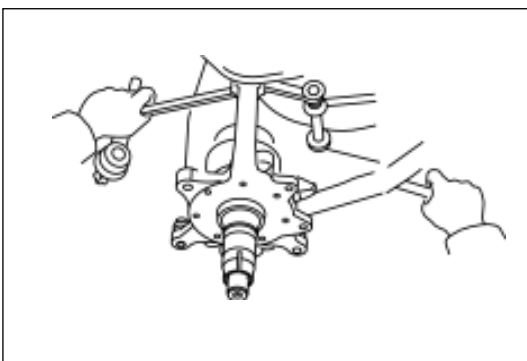
1. Tear down the brake caliper, the front wheel and the front brake disc.
2. Tear down the dust cover and the brake shell;



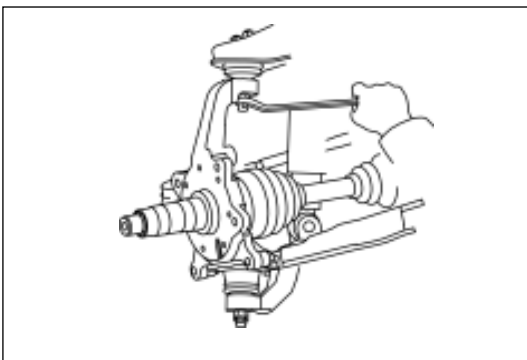
3. Tear down the steering knuckle arm from the steering knuckle;



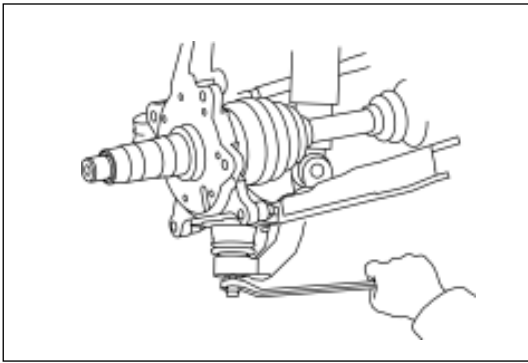
4. Tear down the vibration damper from the lower arm;



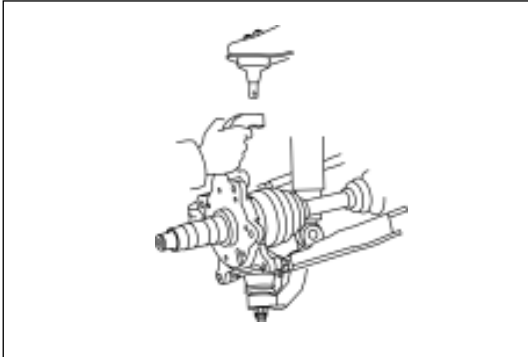
5. Tear down the transverse stabilizer rod from the lower arm;



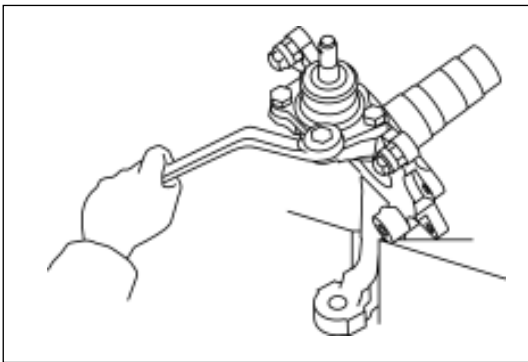
6. Tear down the steering knuckle:
  - (a) Tear down the split pin and groove nut from the position where the ball stud locates.
  - (b) Tear down the steering knuckle from the position where the ball stud locates with the special service tool.



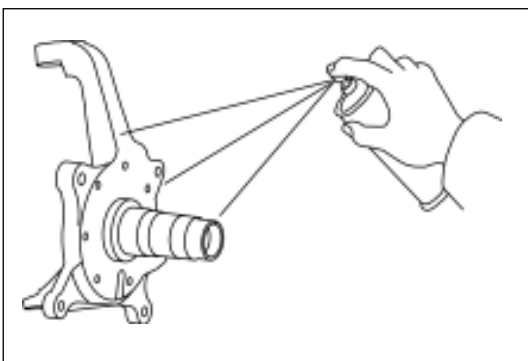
- (c) Tear down the split pin and groove nut from the position where the lower ball stud.
- (d) Tear down the steering knuckle from the position where the lower ball stud with the special service tool, and



- (e) Press down the lower arm to tear down the steering knuckle.

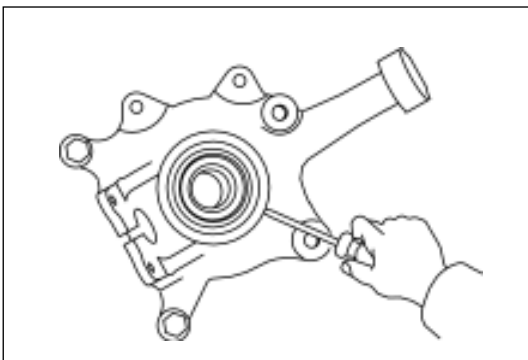


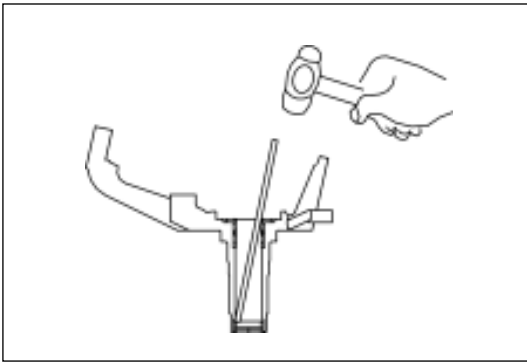
7. Tear down the Lower ball stud assembly from the position where the steering knuckle locates.  
Steering knuckle inspection and change



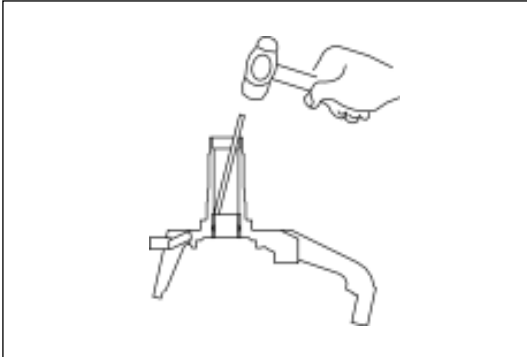
## Inspection on and Change of Steering knuckle

1. Check the steering knuckle  
Check the steering knuckle with the dye penetration agent to see whether has crack, if any crack is found, change the steering knuckle.
2. Tear down the inner oil seal – drive shaft and the thrust plate – steering knuckle.  
Prize out the inner oil seal – drive shaft from the steering knuckle with the screwdriver to take out the thrust plate – steering knuckle.

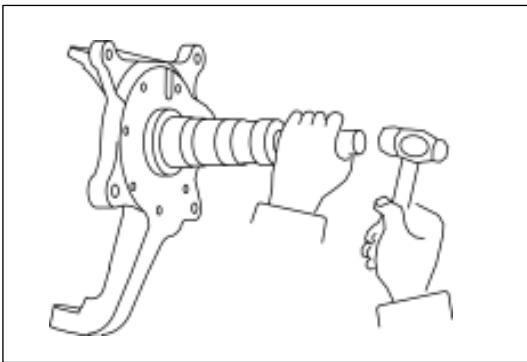




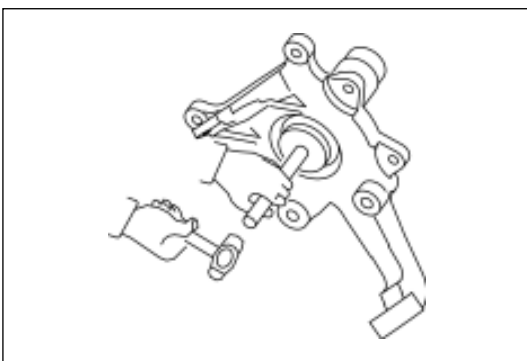
3. Tear down the needle bearing;  
Tap out the steering knuckle small sleeve with hammer and copper.



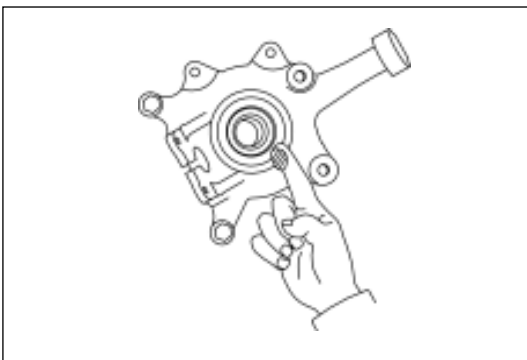
4. Tear down the needle bearing.  
Tap out the needle bearing with the hammer and copper bar.



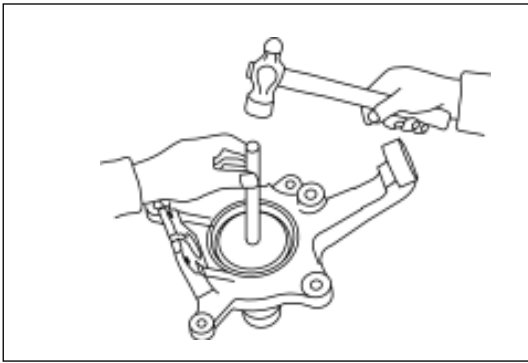
5. Mount the steering knuckle small sleeve;  
Tap in the steering knuckle small sleeve with the special service tool.



6. Mount on the needle bearing;  
Tap in the needle bearing with the special service tool.

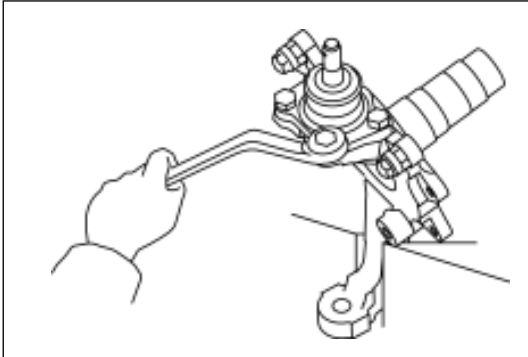


7. Mount on the thrust plate- steering knuckle;  
Coat the needle roller of the needle bearing with the lithium base grease, and plaster the lubricant on the both sides of the thrust plate ñsteering knuckle.



8. Mount the inner oil seal on the steering knuckle.

Check the oil seal visually, if any deformation or glue lack is found, change the oil seal

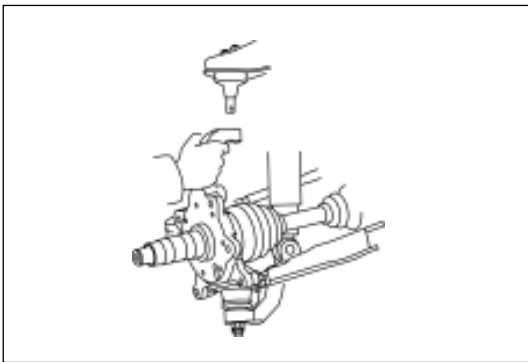


## Mount of Steering Knuckle

1. Mount the lower ball stud on the steering knuckle;

Connect the lower ball stud and the steering knuckle with bolts, and screw up the bolts according to the specified torque.

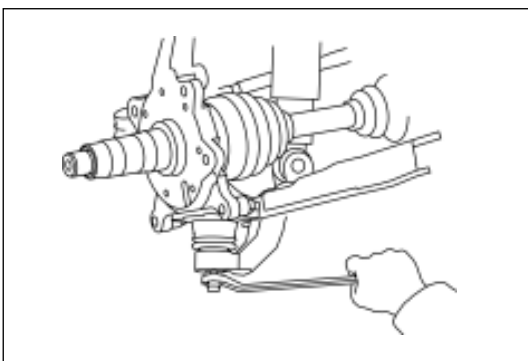
Fastening torque: (70-90)N · m



2. Mount on the steering knuckle

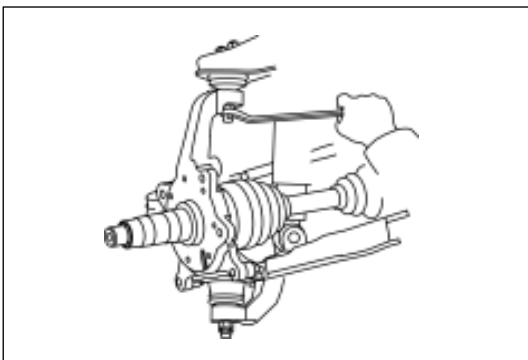
(a) Coat the lubricant HP-R on the drive shaft.

(b) Press down the lower arm to mount on the steering knuckle.



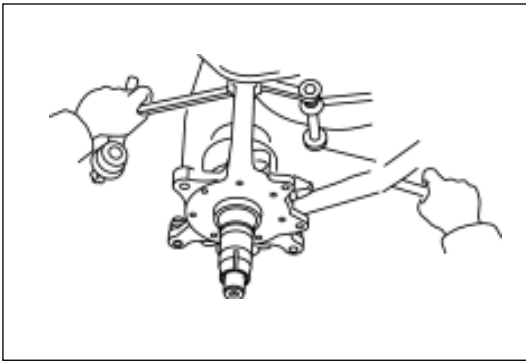
(c) Mount on the groove nut of lower ball stud and screw up the nut according to the specified torque, and then mount on the split pin.

Fastening torque: (132-152)N · m



(d) Mount on the groove nut of upper ball stud and screw up the nut according to the specified torque, and then mount on the split pin.

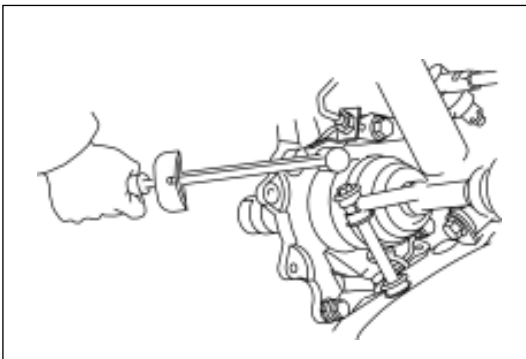
Fastening torque: (132-152)N · m



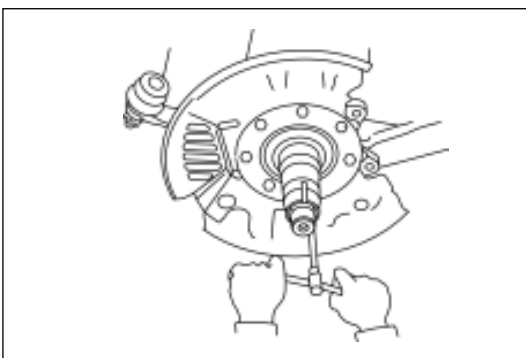
3. Mount the stabilizer rod on the lower arm.  
Fastening torque: (20-26)N • m



4. Mount the vibration damper on the lower arm.  
Fastening torque: (127-147)N • m



5. Mount the steering knuckle arm and the brake oil pipe bracket on the steering knuckle, and coat the sealing agent 1271 on the bolt thread.  
Fastening torque: 180N • m



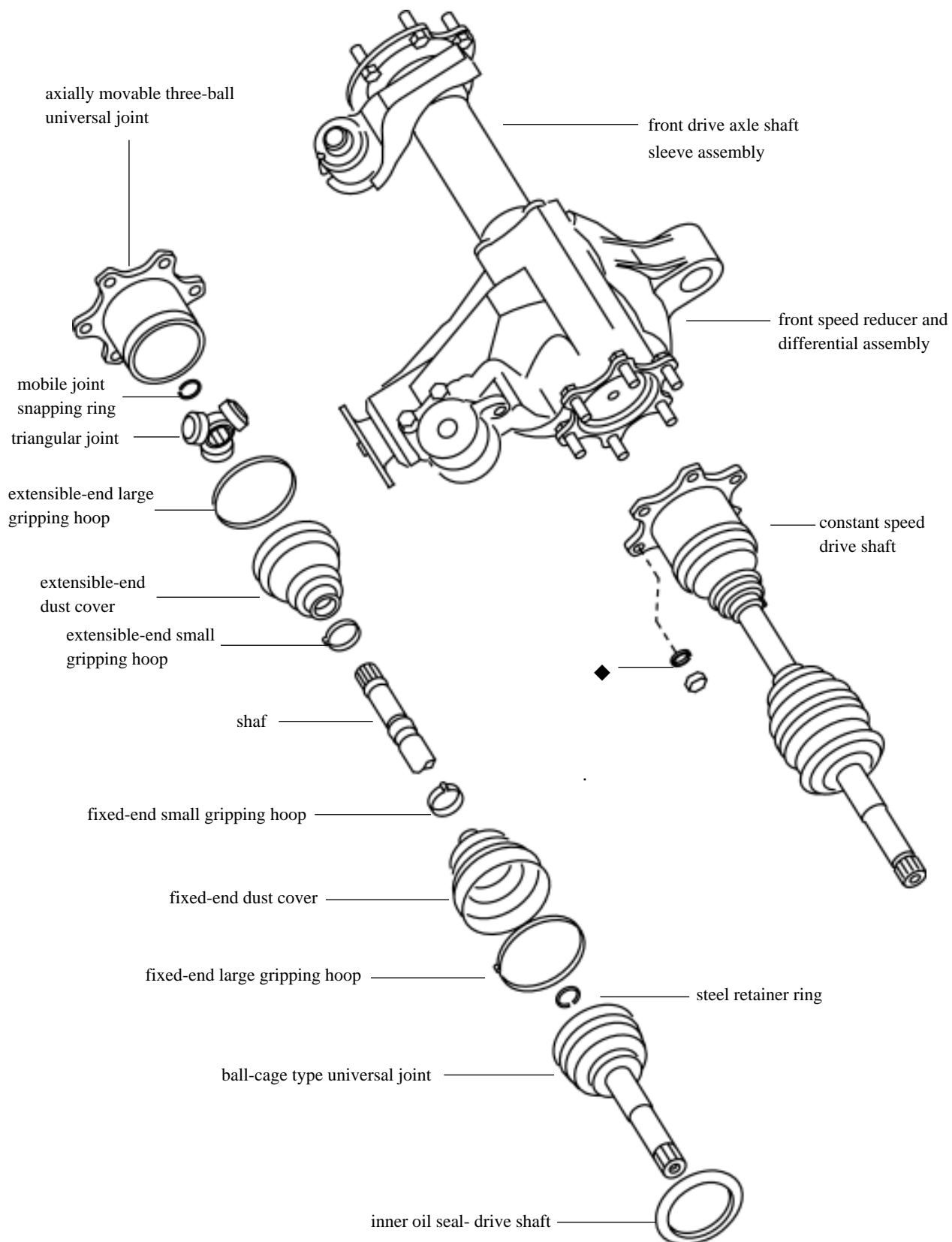
6. Mount on the dust cover and the brake shell.  
Align the locating hole of dust cover and the groove of the steering knuckle so as to guarantee the dust cover and the steering knuckle are concentric.  
Fastening torque: (25-29)N • m
7. Mount the front wheel hub and the front brake disc as well as the brake caliper.
8. Check the height of the brake liquid level and, if required, add the brake liquid, exhaust the gas of the braking system.



# Constant Speed Drive Shaft

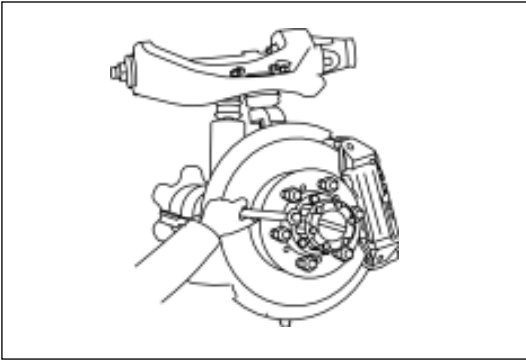
## Element figure

SF4WD



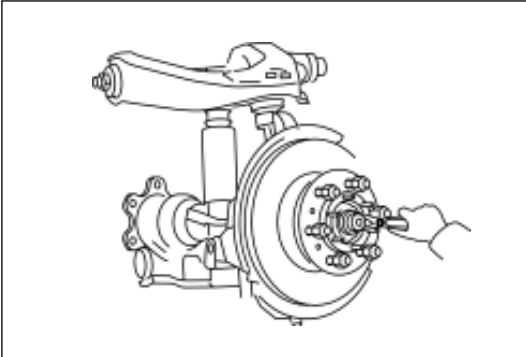
**N • M** : specified torque

◆ Parts that cannot be reused after being used

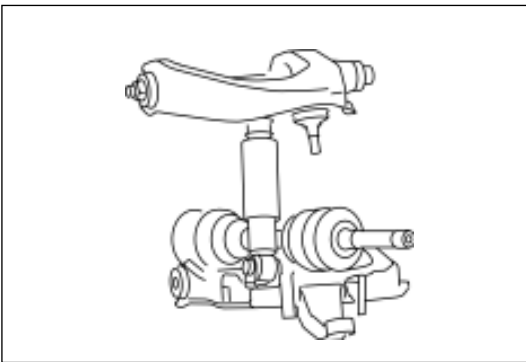


## Disassembly of Constant Speed Driving Shaft

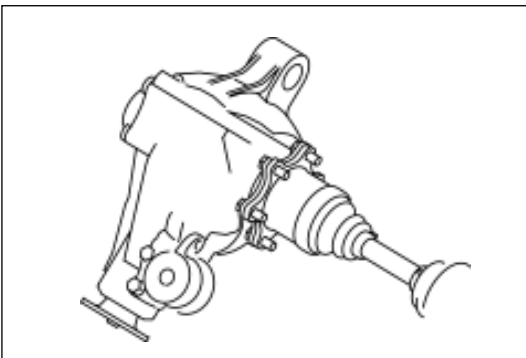
1. Tear down the brake caliper.
2. Tear down the free hub



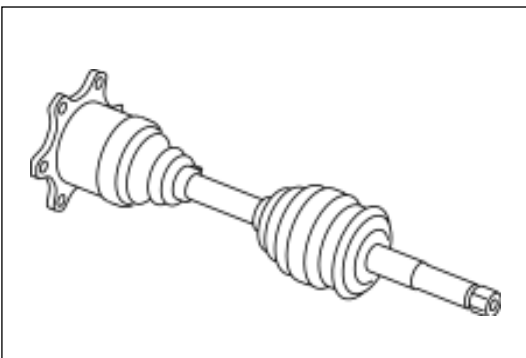
3. Tear down the retainer ring from the drive shaft with the calipers, and take down the washer-steering knuckle shaft spline.



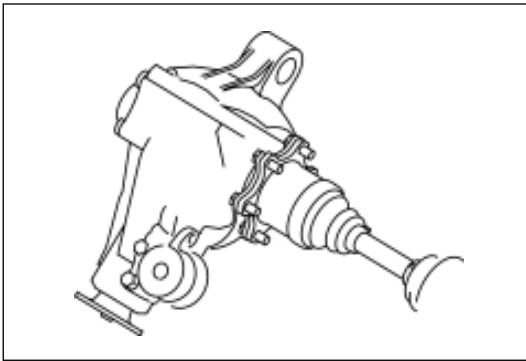
4. Tear down the front wheel hub and the steering knuckle together.



5. Screw off the nuts that connect the constant speed drive shaft to take down the constant speed drive shaft.

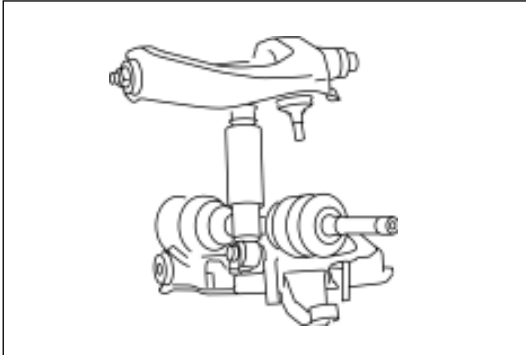


6. Check and repair the constant speed drive shaft  
Inject the molybdenum disulphide lithium grease of 100-110 g in the end of ball-cage type universal joint and the end of axially movable tripod universal joint.  
The ball-cage type universal joint and the axially movable tripod universal joint should swing freely, and no clipping stagnant is allowed. The dust cover should be prevented from deformation and every gripping loop shall be clamping tightly.

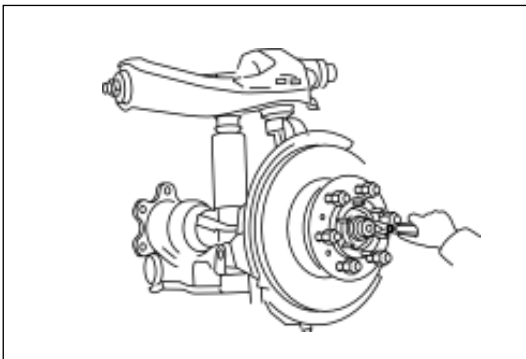


## Mount of Constant Speed Drive Shaft

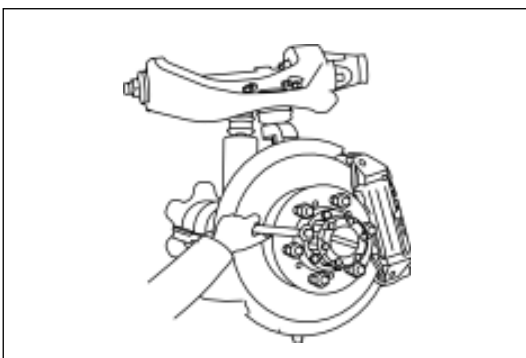
1. Mount the constant speed drive shaft on the flanges of the long and short axle shafts.



2. Mount on the front wheel hub and the steering knuckle.



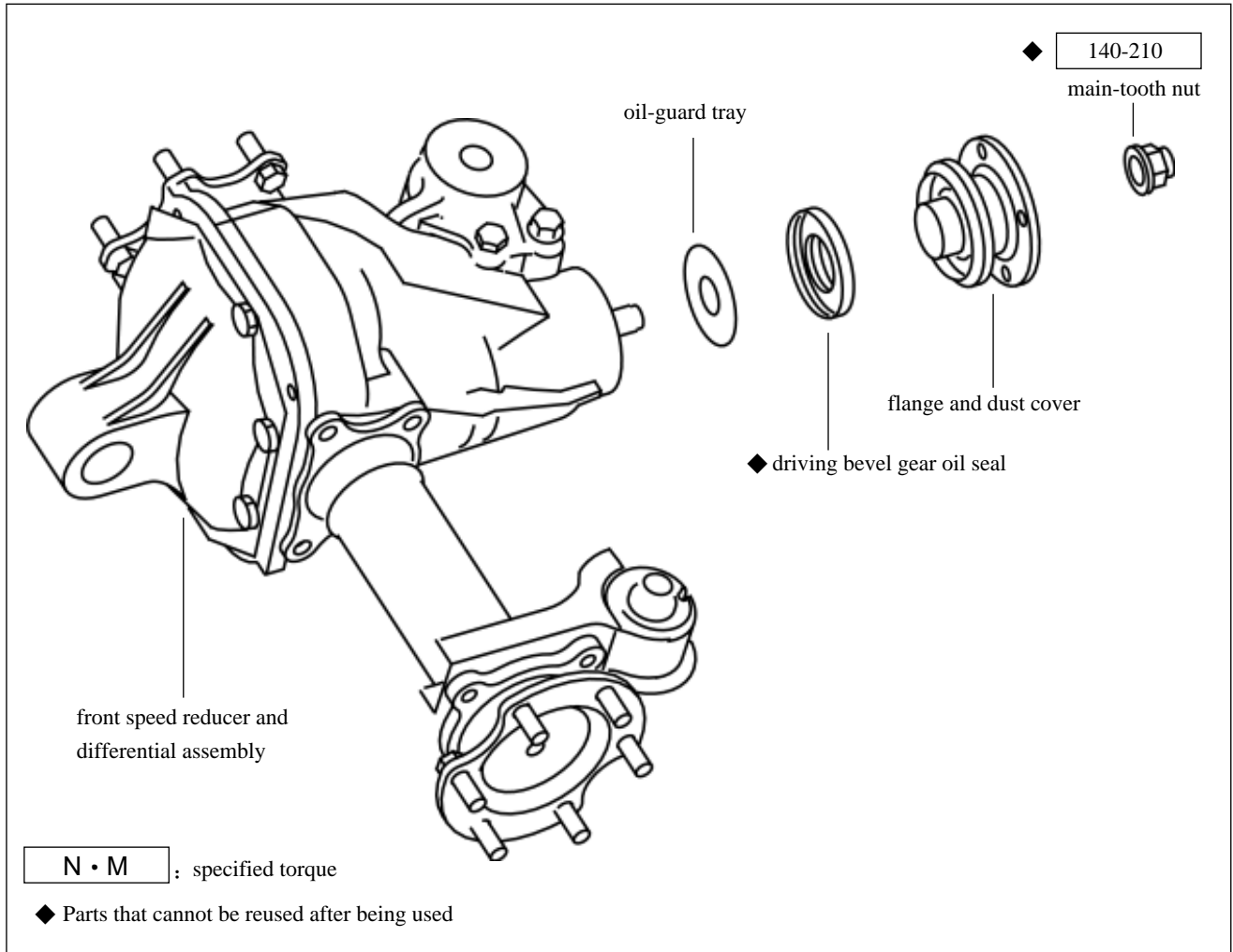
3. Mount on the washer-steering knuckle shaft spline, and then use the caliper to mount on the retainer ring.



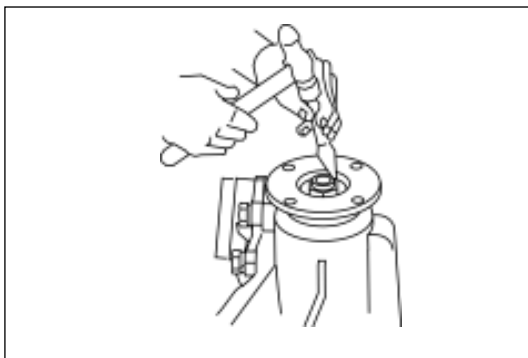
4. Mount on the free hub.
5. Mount on the brake caliper.

## Front Speed Reducer

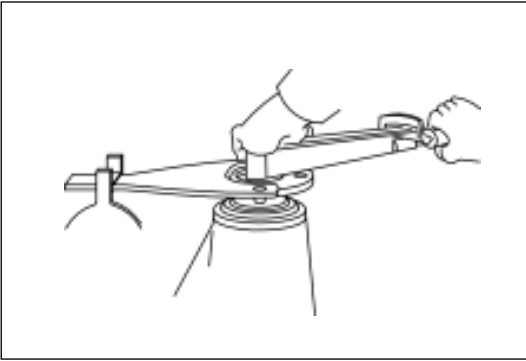
### Change of driving bevel gear oil seal of front speed reducer



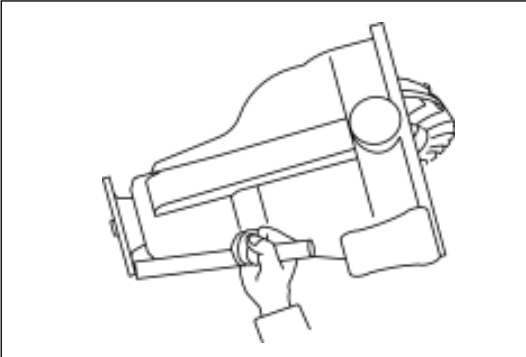
1. Support up the front of vehicle to tear down the front wheel and the steering knuckle.
2. Drain off lubricant in the front speed reducer.
3. Disconnect the front speed reducer flange and the drive shaft.  
Notice: Mark the assembly marks on the speed reducer and the drive shaft before disconnecting them.
4. Tear down the front speed reducer.



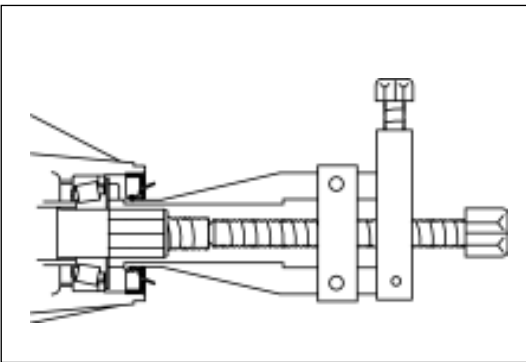
5. Tear down the flange and dust cover:
  - (a) Loosen the riveted position on main-tooth nut with the hammer and chisel.



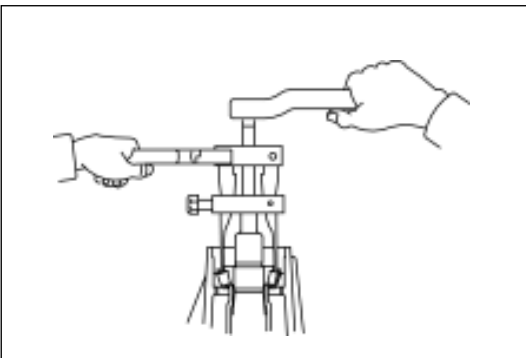
- (b) Lock the flange with special service tool to tear down the main-tooth nut.



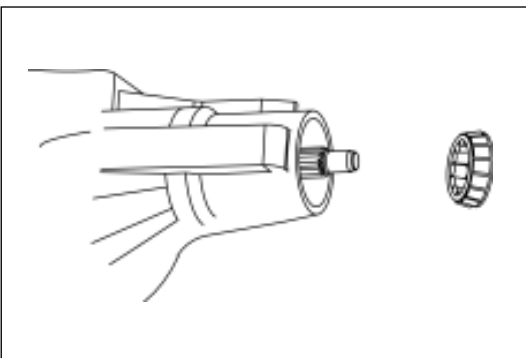
- (c) Tap down the flange and dust cover with copper bar.



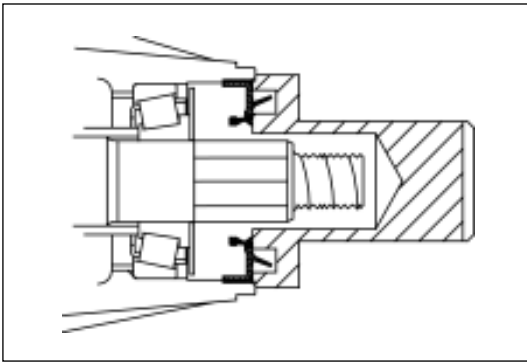
6. Tear down the driving bevel gear oil seal and oil-guard tray:
- (a) Tear down the driving bevel gear oil seal with special service tool.
- (b) Tear down the oil-guard tray.



7. Tear down the inner race of conical roller bearing;  
If the bearing is damaged, change a new bearing.



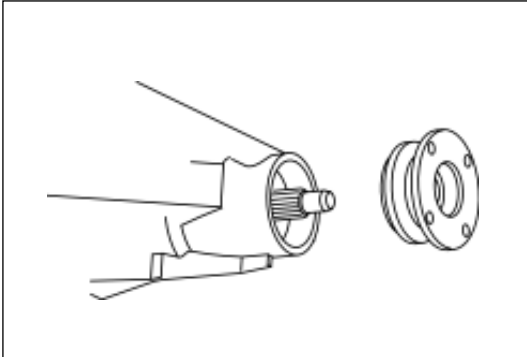
8. Mount the new bearing.



9. Mount the new driving bevel gear oil seal:

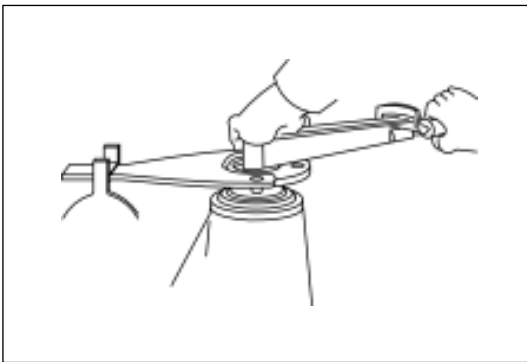
- (a) Encase the oil-guard tray.
- (b) Press the new oil seal in the speed reducer shell with the special service tool; the mounted oil seal should be 1.5 mm away from the end face of the housing.

Notice: Coat the lithium base grease evenly on the lips of oil seal.



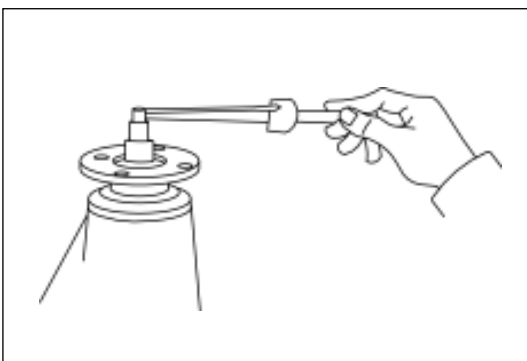
10. Mount the flange and dust cover:

- (a) Encase the flange and dust cover in the front speed reducer shell through the clinch of oil seal.



- (b) Lock the flange with the special service tool and screw up the nuts according to the specified torque.

Fastening torque:  $(140-210)\text{N} \cdot \text{m}$



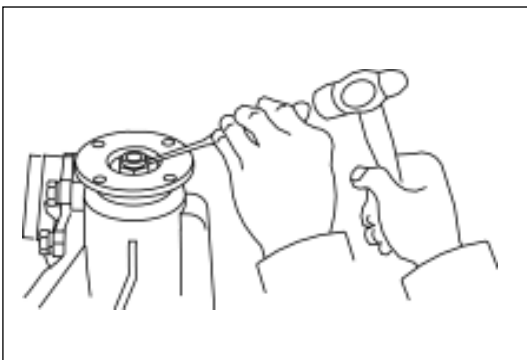
11. Adjust the preload of driving bevel gear bearing

Measure the play preload between the driving bevel gear and the driven bevel gear with the torque tester.

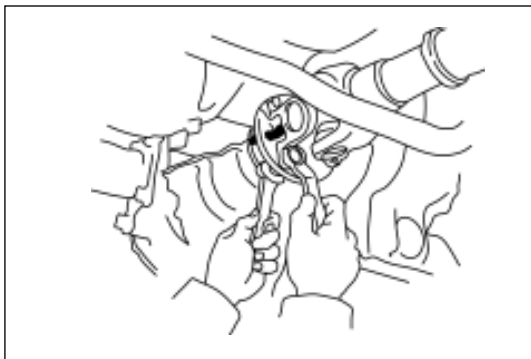
Preload:  $(1.8-2.4)\text{N} \cdot \text{m}$

Remark: if the requirement is not satisfied, change the adjusting washer between the adjusting washer jackets and bearing 32307, see the disassembly and assembly for front speed reducer, until the requirement is satisfied.

- (a) If the preload is larger than the specified value, change with a thicker adjusting washer;
- (b) If the preload is smaller than the specified value, change with a thinner adjusting washer.



12. Rivet the main-tooth nut.

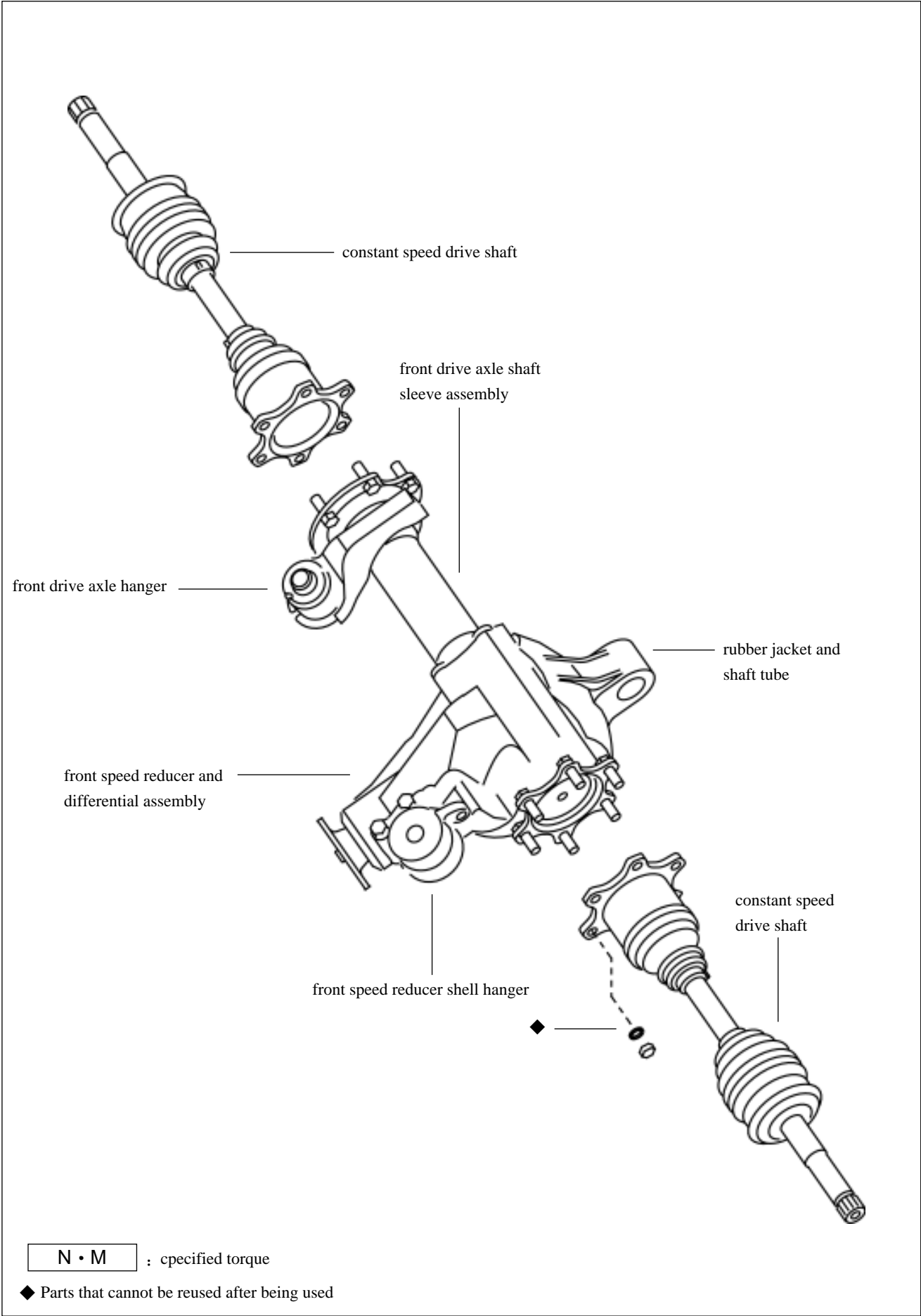


13. Mount the front speed reducer assembly on the frame.

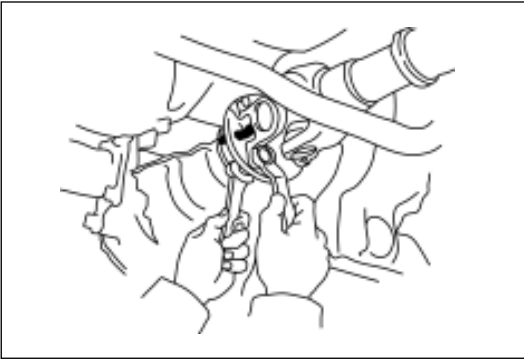
14. Connect the drive shaft to the flange:

- (a) Align the assembly mark and then connect the drive shaft and the front drive axle flange with four sets of bolt and nut.
  - (b) Screw up the nuts according to the specified torque.
- Specified torque: (69-79)N • m

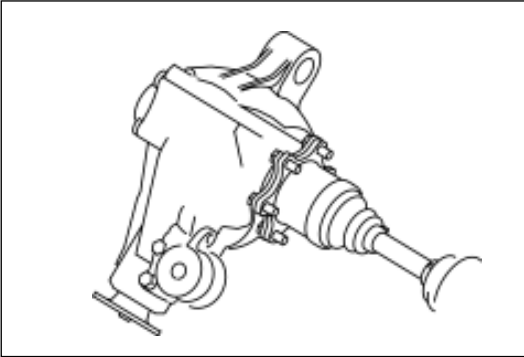
# Dismantle of Front Speed Reducer



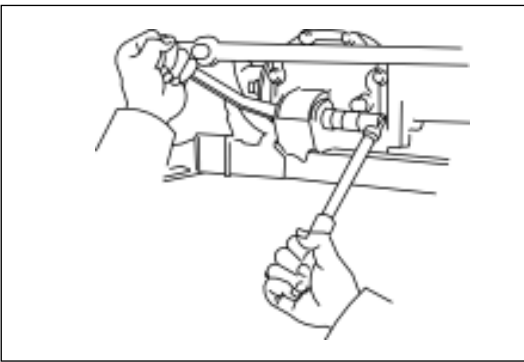




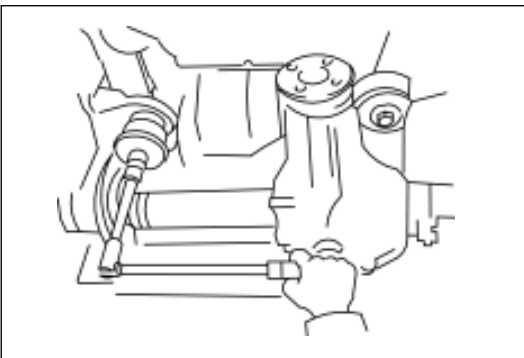
1. Disconnect the front speed reducer flange and the drive shaft.



2. Screw off the nuts that connect the constant speed drive shaft.

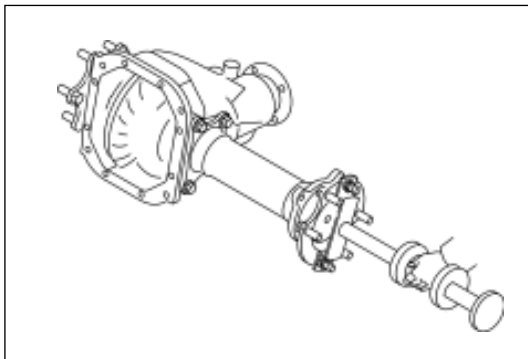
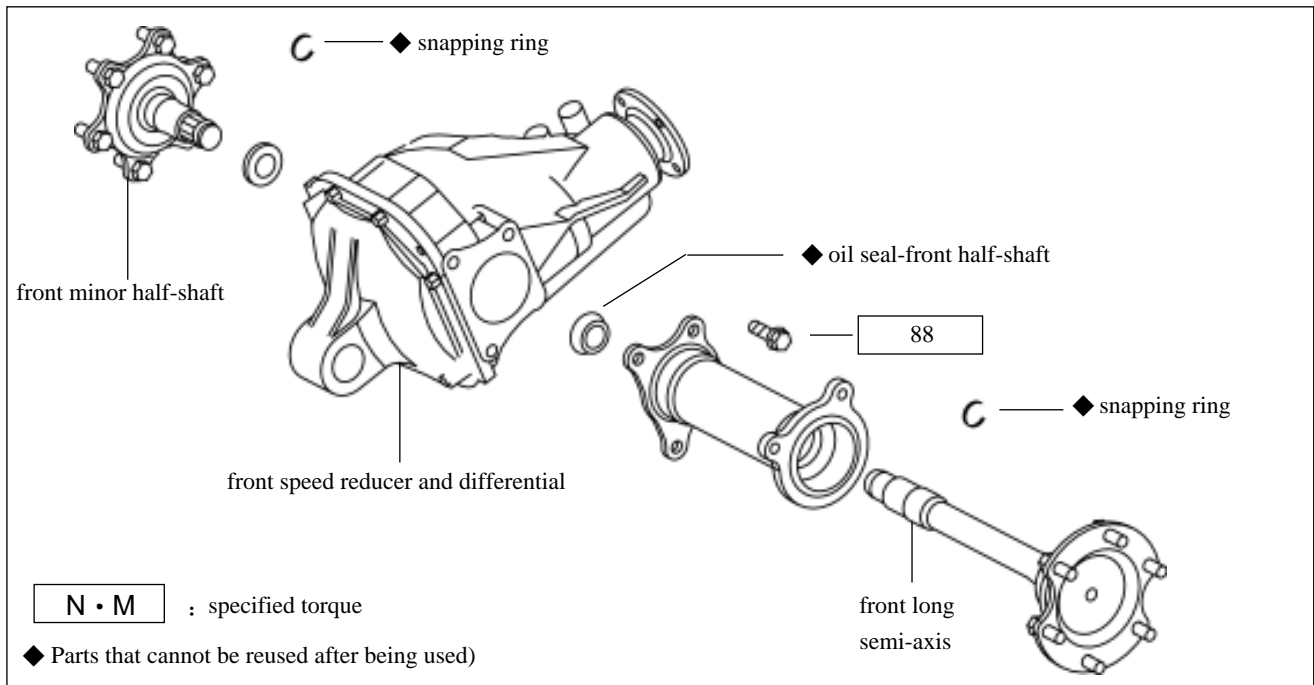


3. Screw off the bolts connecting the rubber jacket and shaft tube of the front speed reducer cover and the frame.



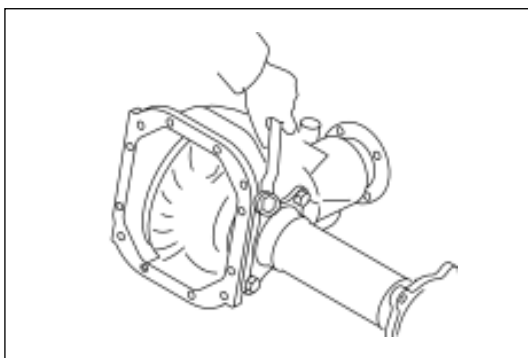
4. Screw off the bolts connecting the front drive axle hanger assembly and the front speed reducer shell hanger, and tear down the front speed reducer.

## Change of Axle Shaft Oil Seal

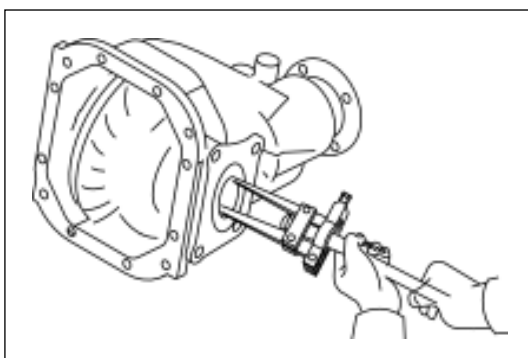


1. Tear down the front long semi-axis and the front minor half-shaft

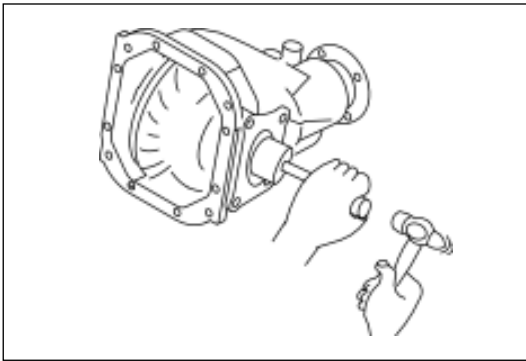
Pull out the front long and minor semi-axis from the front speed reducer with tool.



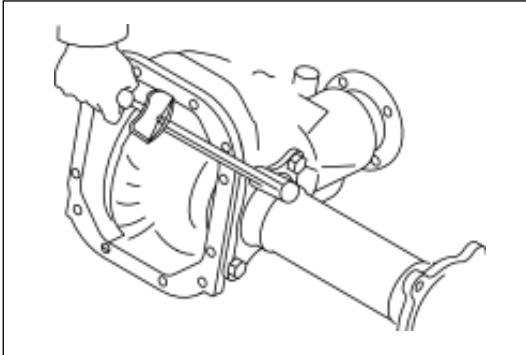
2. Tear down the front drive axle shaft sleeve and screw off the bolts connecting the half-shaft sleeve.



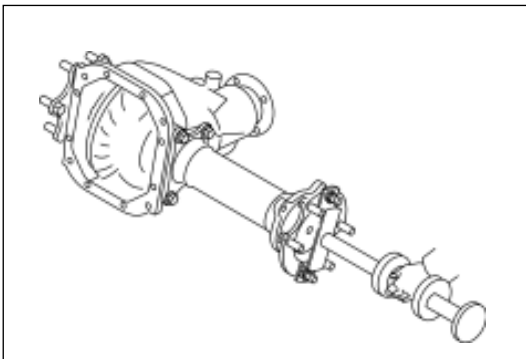
3. Tear down the oil seal - front half-shaft:  
Tear down the oil seal-front half-shaft with the special service tool.



4. Mount on the new oil seal-front half-shaft:  
Press in the new oil seal with the special service tool until it flush with the outer ending of the oil seal, coat moderate lubricant on the lips of the oil seal.



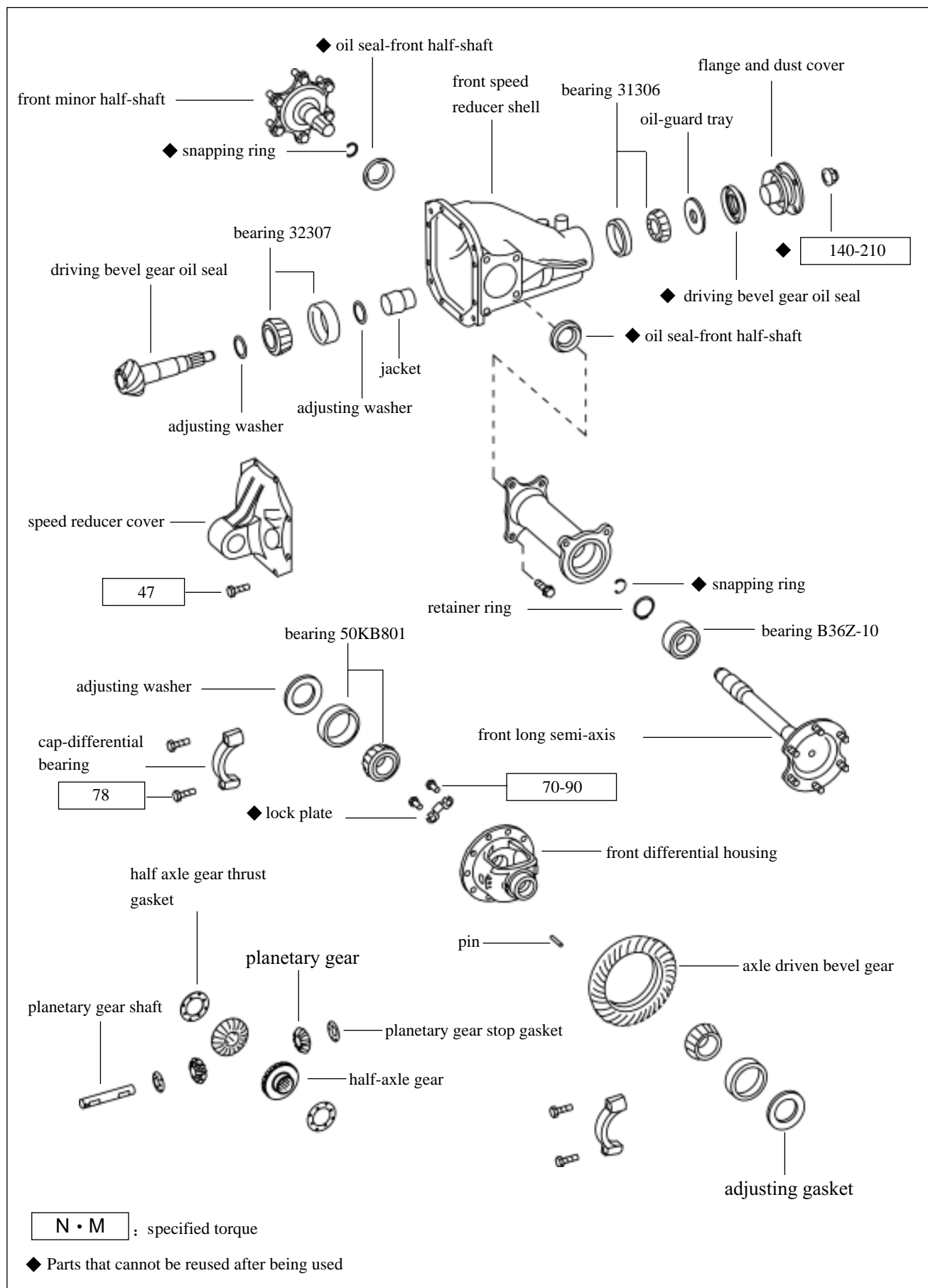
5. Mount on the upper front drive axle shaft sleeve,  
Coat the bolt thread with thread locking agent.  
Fastening torque: 88N • m

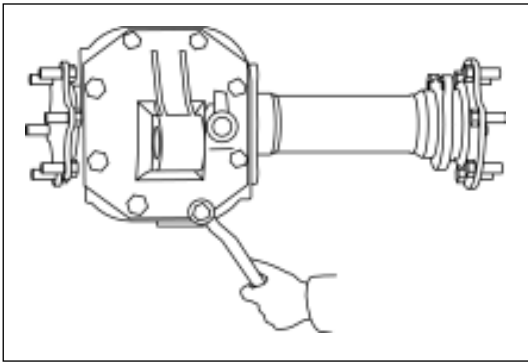


6. Mount on the front long semi-axis and the front minor half-shaft.  
(a) Mount the new snapping ring on the half-shaft.  
(b) Mount on the long semi-axis and the minor half-shaft with the special service tool.

## Disassembly and Assembly of Front Speed Reducer

### Element figure

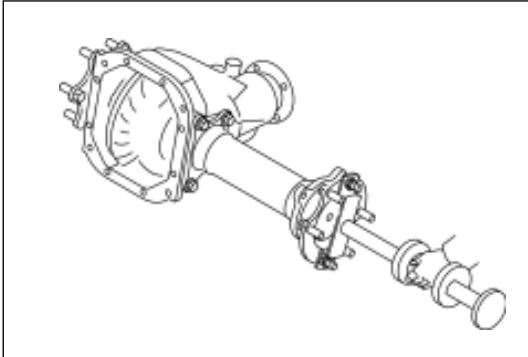




## Disassembly of Front Speed Reducer

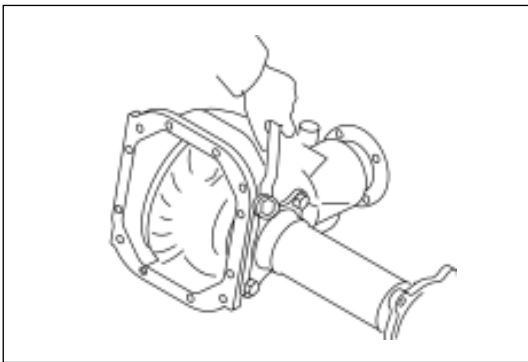
1. Tear down the speed reducer cover:

Screw off the eight bolts connecting the speed reducer cover.



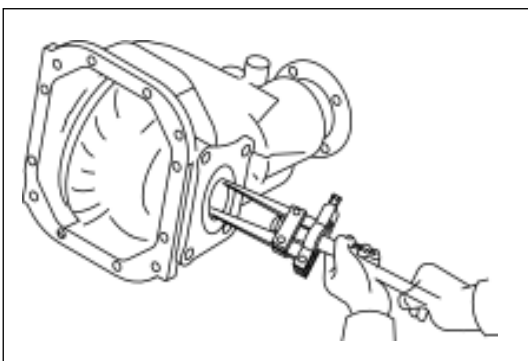
2. Tear down the front long semi-axis and the front minor half-shaft:

Tear down the front long semi-axis and the front minor half-shaft from the speed reducer assembly with the special service tool.



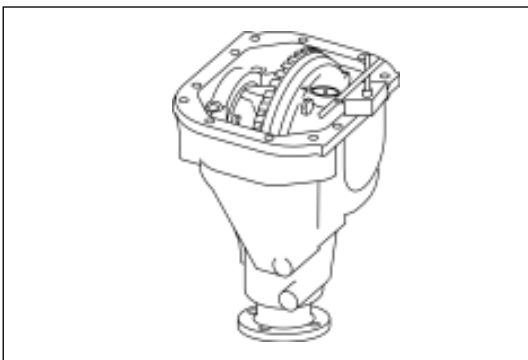
3. Tear down the front drive axle shaft sleeve

Screw off the four bolts connecting the front drive axle shaft sleeve.



4. Tear down the oil seal of front half-shaft;

Tear down the oil seal of front half shaft with the special service tool.

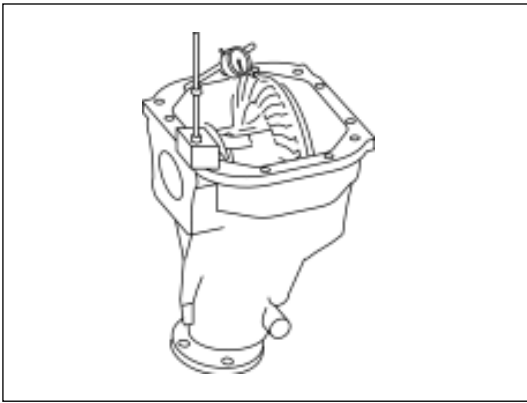


5. Check the swing difference of the axle driven bevel gear;  
Run the flange to measure the axle driven bevel gear with the dial-indicating lamp.

Swing difference: 0.07mm

Max swing difference: 0.07 mm

In case the swing difference is more than 0.07 mm, change the complete package of driven bevel gear.

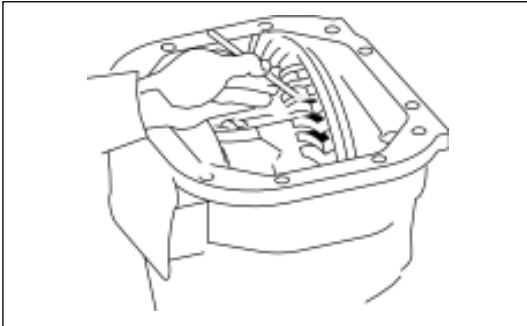


6. Check the teeth-clearance of the driving bevel gear and the axle driven bevel gear:

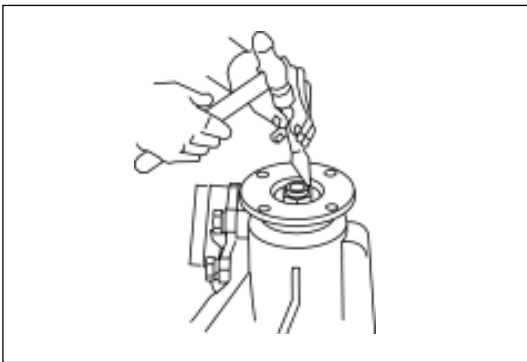
- (a) Install the dial-indicating lamp and ensure the axial line of measuring head is vertical with the contact teeth face.
- (b) Run the flanges, and record the clearance values of driving bevel gear and the axle driven bevel gear.

Specified clearance range: (0.15-0.25)mm

Remark: the inspection should be conducted at no less than three equally divided spots on the circumference of the axle driven bevel gear.

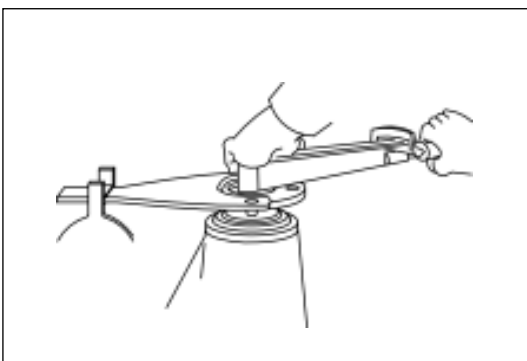


7. Check the engagement trace of the axle driven bevel gear.  
(See page SA-76)

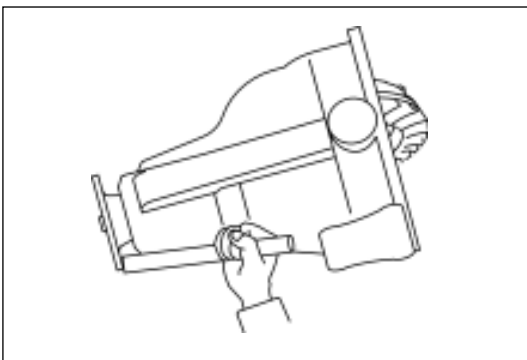


8. Tear down the flange and dust cover:

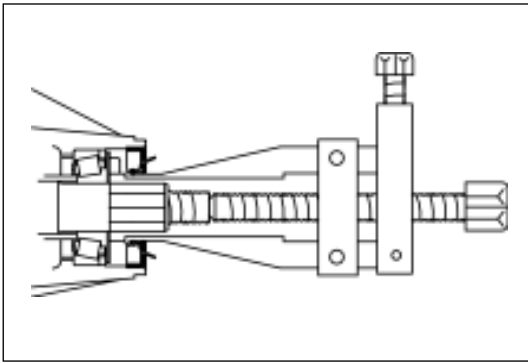
- (a) Loosen the riveted position of main-tooth nut with the hammer and chisel.



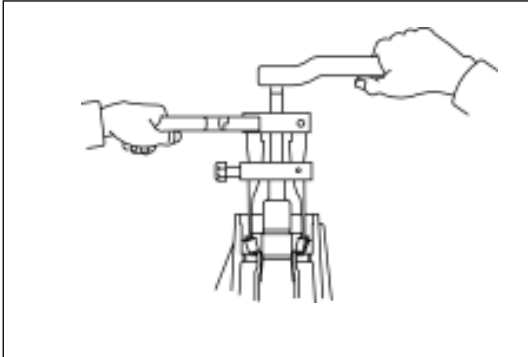
- (b) Lock the main-tooth flange with SST to tear down the main-tooth nut.



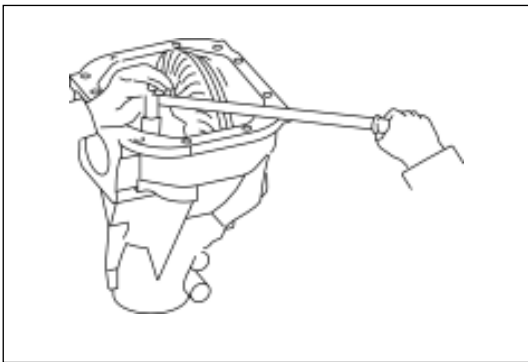
- (c) Tap down the driving bevel gear flange and dust cover with copper bar.



9. Tear down the driving bevel gear oil seal and the oil-guard tray:
  - (a) Tear down the oil seal from the driving bevel gear with SST.
  - (b) Take out the oil-guard tray.

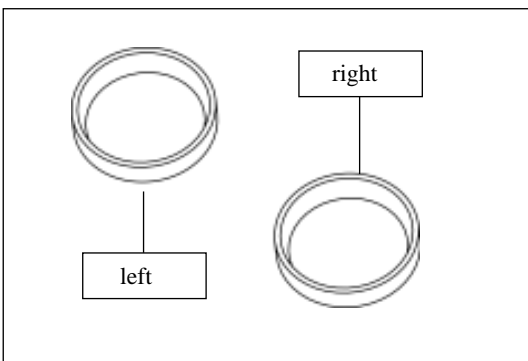


10. Tear down the inner race of bearing 31306 with SST;  
If the bearing is damaged, change with a new bearing.

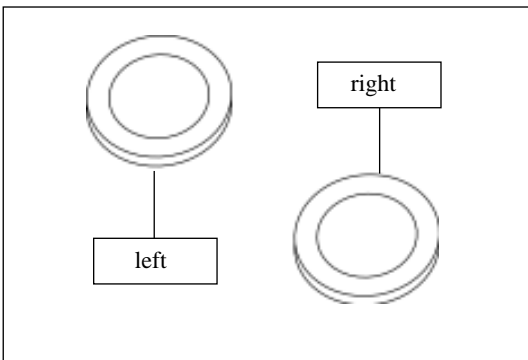


11. Tear down the cap-differential bearing.

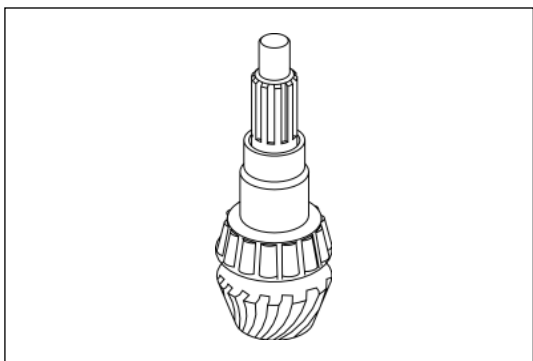
12. Take out the differential.



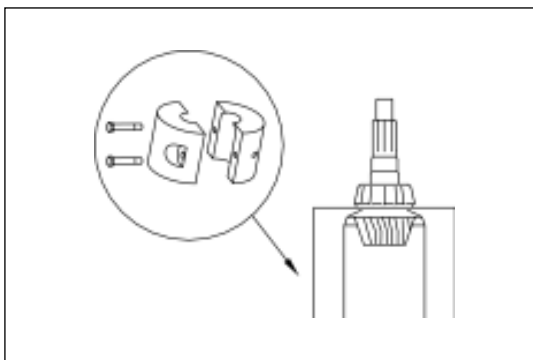
13. Take down the outer race of bearing 50KB801 and mark clearly the left and right parts to avoid of confusion during reassembling.



14. Tear down the adjusting gaskets and clearly mark the left and right to avoid of confusion during re-assembling.



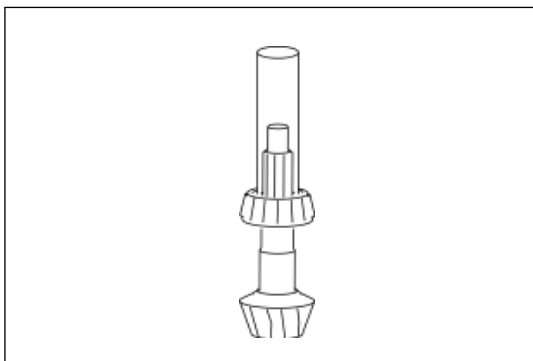
15. Tear down the driving bevel gear.



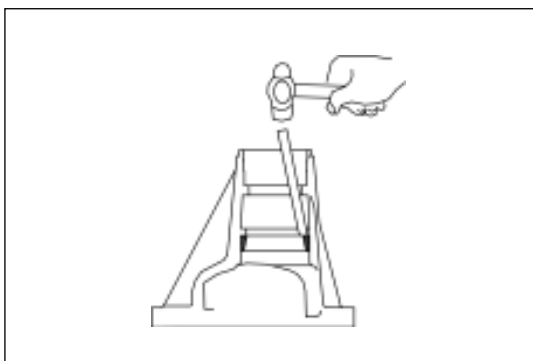
## Inspection on and Change of Front Speed Reducer

1. Change the bearing 32307 on driving bevel gear

- (a) Press out the inner race and roller assembly of bearing 32307 with the special service tool.

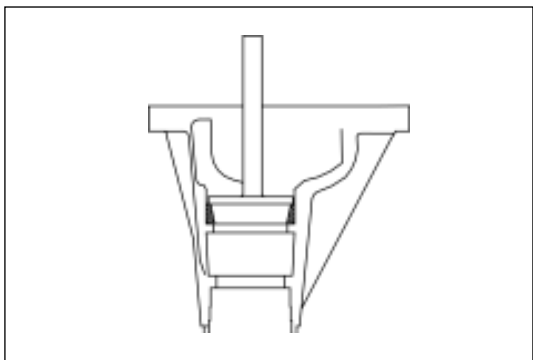


- (b) Press in the new inner race and roller assembly of bearing 32307 with SST.



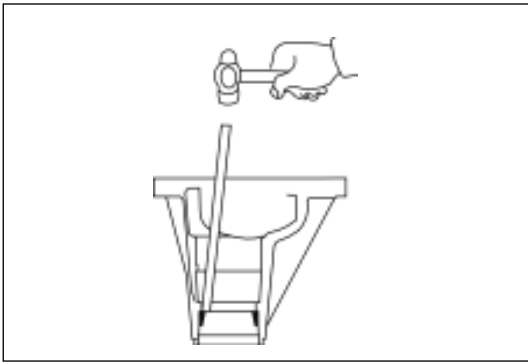
2. Change the outer race of bearing 32307:

- (a) Tap down the outer race of bearing 32307 with the copper bar and hammer.



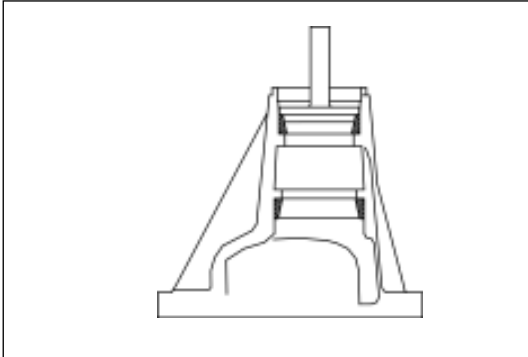
- (b) Press in the new outer race of bearing 32307 with the SST.



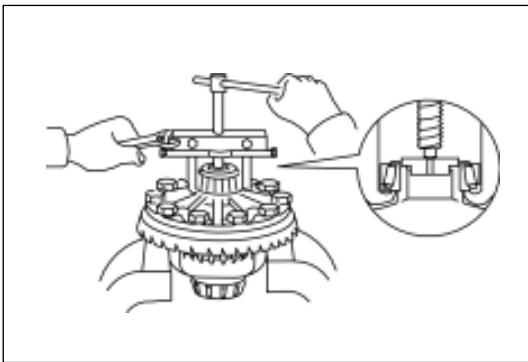


3. Change the outer race of bearing 31306:

- (a) Tap down the outer race of bearing 31306 with copper bar and hammer.

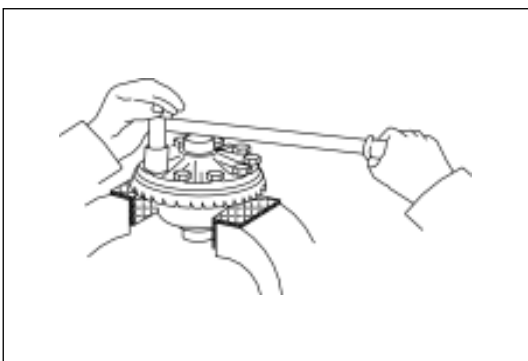


- (b) Press in the new outer race of bearing 31306 with SST.  
Remark: the inner race of the bearing should be changed with the outer race together.



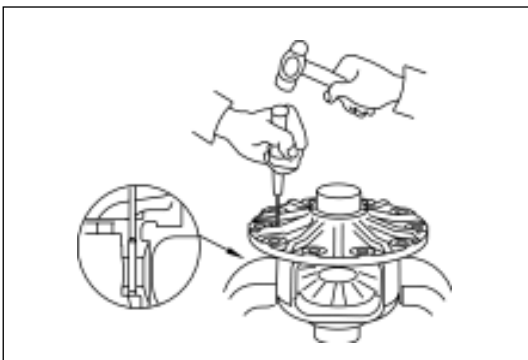
4. Tear down the inner race and roller assembly of the two bearings 50KB801 from the differential housing.

Tear down the inner race and roller assembly of bearing 50KB801 with SST.



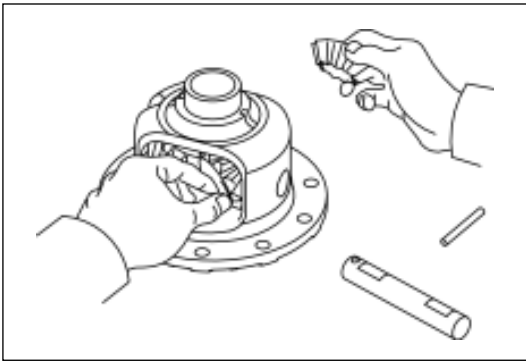
5. Tear down the axle driven bevel gear:

Tear down the bolts and lock plate by tapping lightly the axle driven bevel gear with the copper until tear them down.

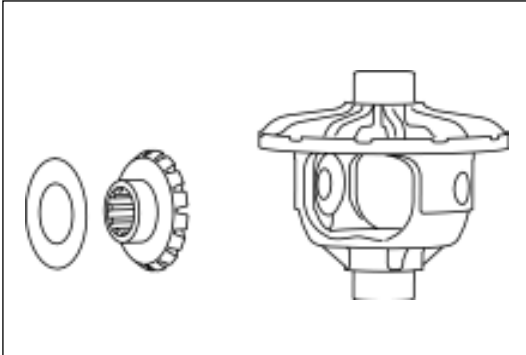


6. Differential disassembly

- (a) Tap out the pin with SST.

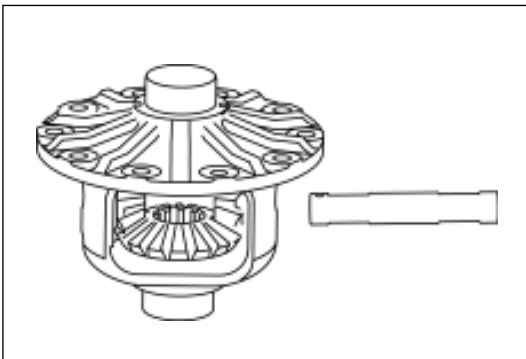


- (b) Tear down the planetary gear shaft to take out the planetary gear, planetary gear stop gasket, half-axle gear and the half axle gear thrust gasket



## 7. Differential assembly mount

- (a) Clean the differential housing.  
(b) Encase the half-axle thrust gasket in the differential housing after covering on the half-shaft gear.



- (c) Run the half-axle gear to encase the planetary gear and planetary gear stop gasket, and put on the planetary gear shaft.

Remark: The half-axle gear and the planetary gear should run freely without stagnant.

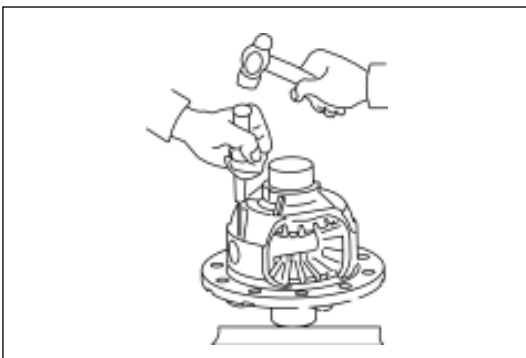
- (d) Measure the clearance between the half axle gear thrust gasket and differential housing.

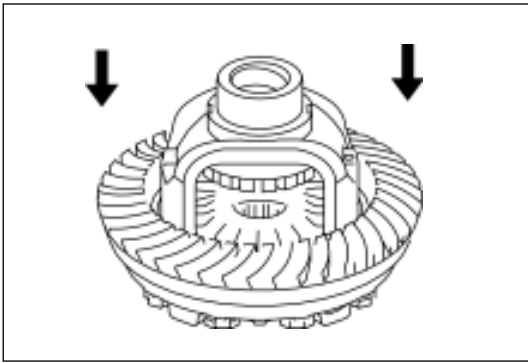
Push the planetary gear to the inside and then measure the clearance between half-axle gear thrust gasket and the differential housing with the dial-indicating lamp.

Suitable clearance range: (0.4-0.75)mm

Remark: If the clearance fails to fall within the above-mentioned range, change the half-axle gear thrust gasket, and ensure that the thrust gaskets on the both sides are same thick.

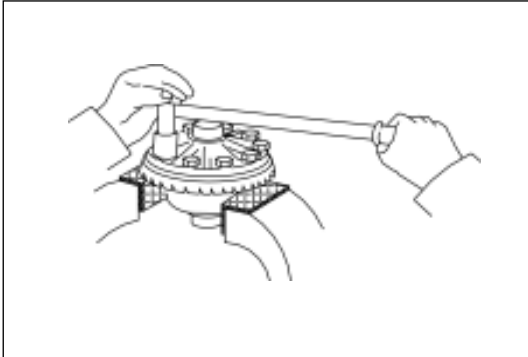
- (e) Tap the pin in the pinhole of differential housing and the planetary gear shaft with SST, and rivet the hole port so as to prevent the pin from missing.





- (f) Clean the differential housing surface, mount the axle driven bevel gear on the differential housing with copper bar.

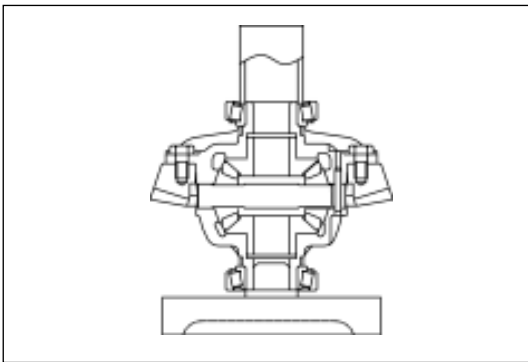
Notice: align the assembly marks made when disassembling when mounting the axle driven bevel gear, and tap in the driven bevel gear evenly alongside the direction of circumference.



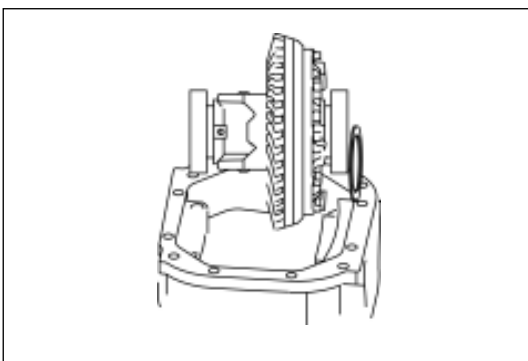
- (g) Mount on the lock plate and screw on the bolts, then lock the lock plate with the drift pinch and hammer.

Fastening torque:  $(70-90)\text{N} \cdot \text{m}$

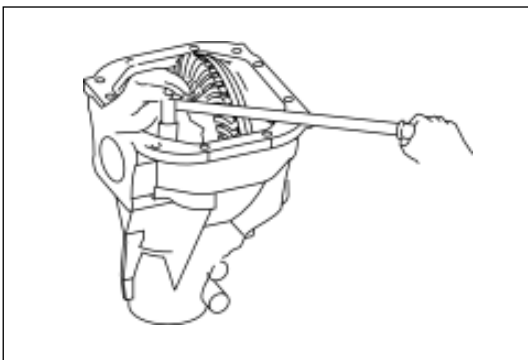
Notice: the bolts should be screwed up in the diagonal order in such manner that tighten a little at first, and then screw up evenly to the specified torque, the lock plate claw should contact closely the side face of bolt head.



- (h) Press the inner race and roller assembly of bearing 50KB801 in the bearing position at the both sides of differential housing.

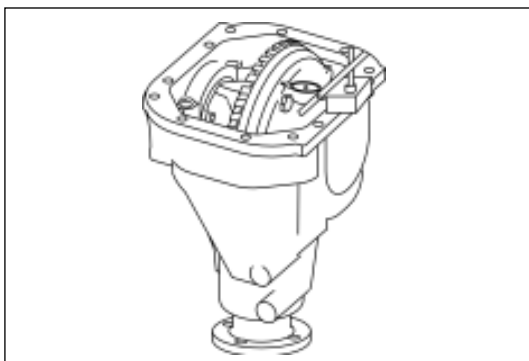


- (i) Put the adjusting gasket in the outer position of the side bearing of front speed reducer shell.
- (j) Encase another adjusting gasket with the outer race of bearing 50KB801 in the front speed reducer shell together with the differential.



- (k) Mount on the right and left cap-differential bearing, and screw up the bolts with spanner according to the specified torque.

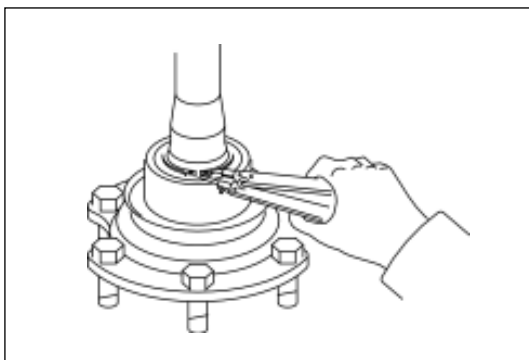
Fastening torque:  $78\text{N} \cdot \text{m}$



- (1) Run the flange to check the swing difference of axle driven bevel gear.

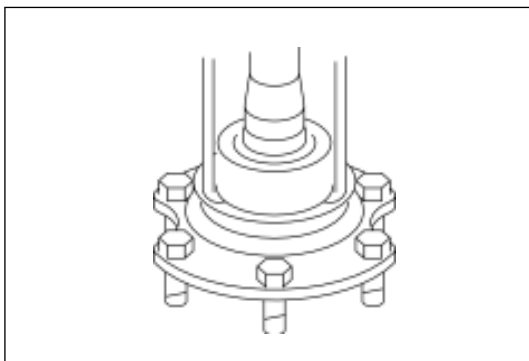
Max swing difference: 0.07mm

Remark: if the requirement is not satisfied, tear down the axle driven bevel gear from the differential, and then screw up the bolts again.

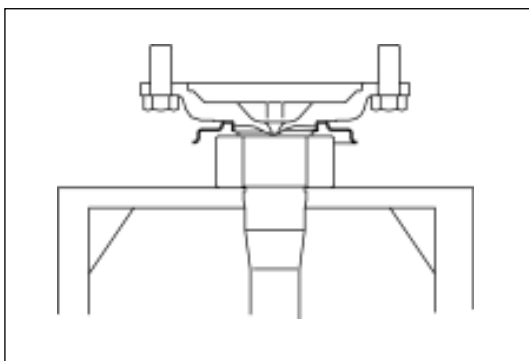


8. Change the bearing of the long semi-axis:

- (a) Take down the retainer ring with the calipers.

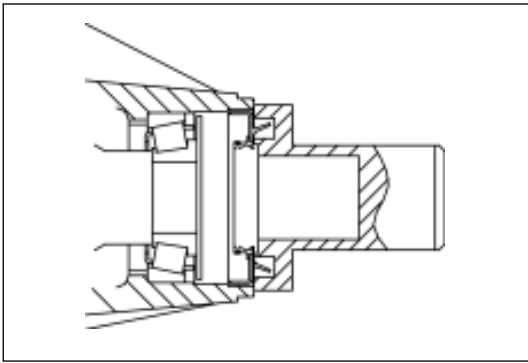


- (b) Tear down the grooved ball bearing from the long semi-axis.



- (c) Mount on the new grooved ball bearing on the long semi-axis

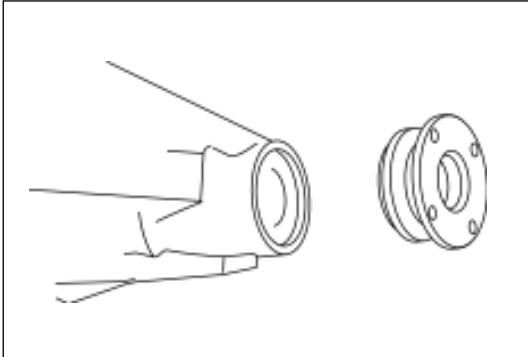
- (d) Mount on the retainer ring with calipers.



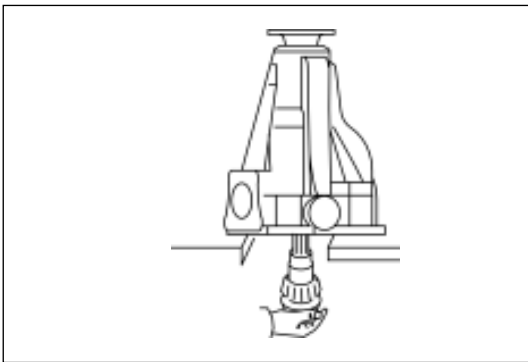
## Assembly of Front Speed Reducer

1. Clean the front speed reducer shell; press the outer races of bearing 31306 and bearing 32307 to mount them in the speed reducer shell.
2. Mount the inner race and roller assembly of bearing 31306 as well as the oil-guard tray in the front speed reducer shell, then press on the driving bevel gear oil seal with SST.

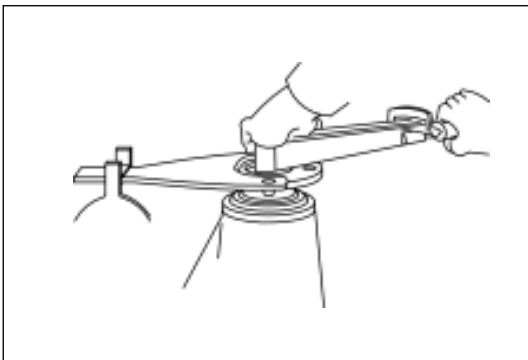
Notice: coat a little lubricant on the lip open of the oil seal before encasing it, and the oil seal that is encased in the front speed reducer shell should be 1.5 mm away from housing faces.



3. Encase the flange and dust cover in the front speed reducer through the lip open of oil seal and press it by hand.

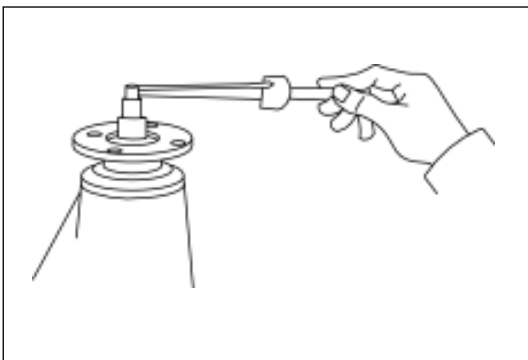


4. Select the adjusting washer for driving bevel gear according to the experience, and cover it on the driving bevel gear; and mount the inner race and roller assembly of bearing 32307 on the driving bevel gear by pressing.
5. Mount the adjusting washer and sleeve on the driving bevel gear, and encase it in the front speed reducer cell through the flange along with the spline, and screw on the nuts.



6. Screw up the main-tooth nuts to the specified torque with the SST.

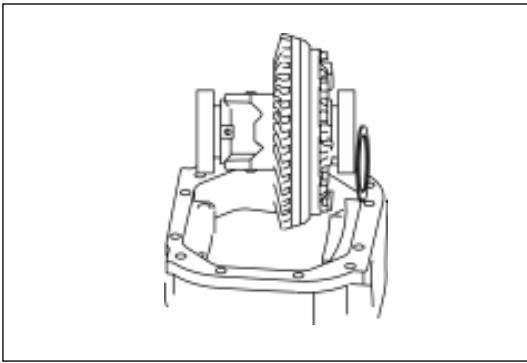
Fastening torque:  $(175 \pm 35) \text{ N} \cdot \text{m}$



7. Measure the preload on the driving bevel gear bearing with torque tester :

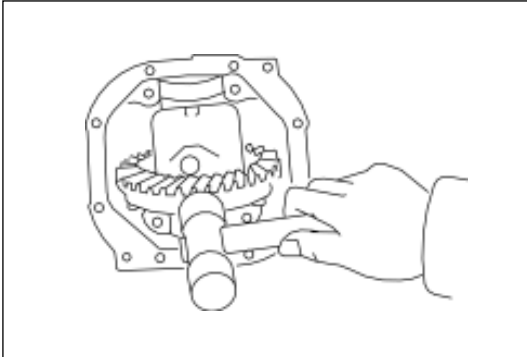
New bearing:  $(1.2-1.7) \text{ N} \cdot \text{m}$

Old bearing:  $(0.9-1.3) \text{ N} \cdot \text{m}$

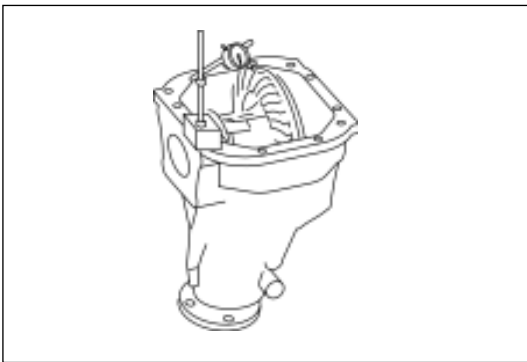


8. Encase in the differential:

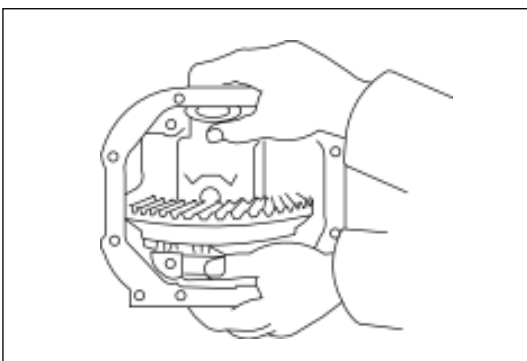
- (a) Put the adjusting gasket in the outer position of bearing at the side of the front speed reducer shell, and then Encase the differential in the front speed reducer shell, be sure there is a play between the driving gear and the driven gear.



- (b) Tap the axle driven bevel gear with the rubber hammer, so that the bearing 50KB801 on the differential, together with the adjusting gasket, contact the mounting part of the side face of speed reducer closely.

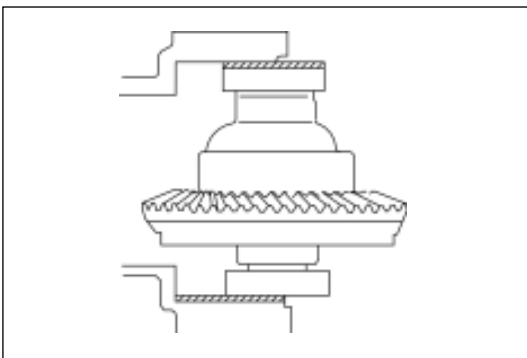


9. Measure the clearance between the axle driven bevel gear and the driving bevel gear with the dial indicator to select the adjusting gasket that satisfy the reasonable play of (0.15-0.25)mm.

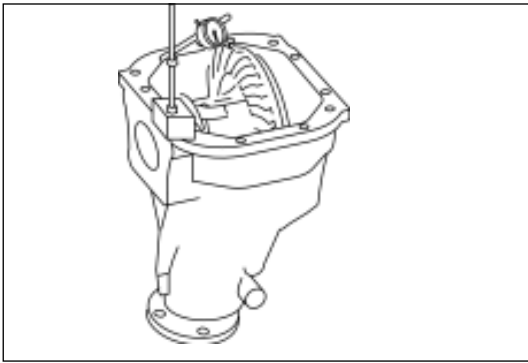


10. Select the adjusting washer for the other side:

The thickness of adjusting gasket should eliminate the clearance between the bearing 50KB801 and the front speed reducer shell, on the other side, the adjusting gasket should not be over thick because the over-thick gasket will lead in too large pre-tightening force on the bearing 50KB801 of differential.

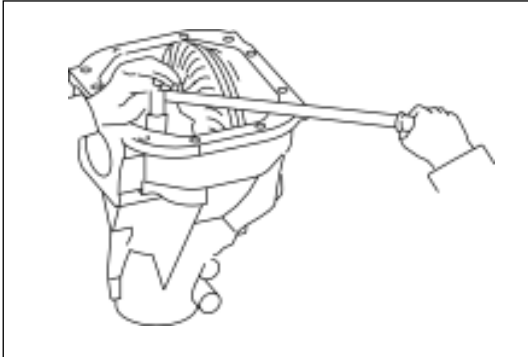


11. Tear down the adjusting gasket and differential, and encase the new adjusting gasket in the front speed reducer shell, and another adjusting gasket, together with the differential housing, should be encased in the front speed reducer shell correctly.

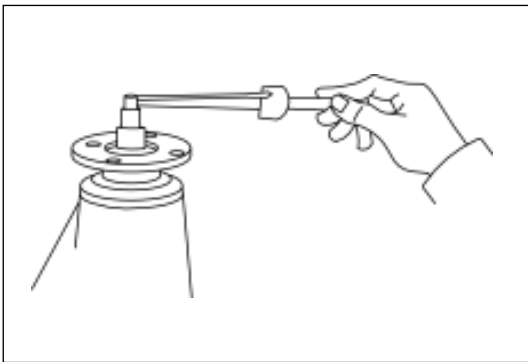


12. Measure the clearance between the axle driven bevel gear and the driving bevel gear with dial indicating lamp.  
Clearance: 0.15-0.25mm

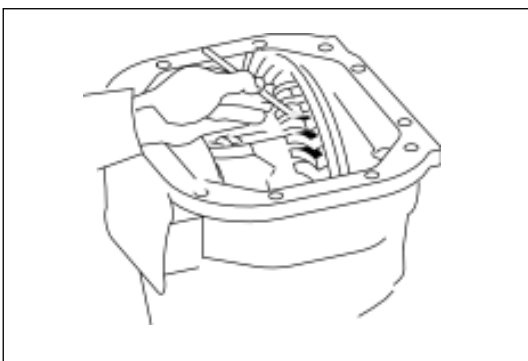
Remark: if the play fails to fall within the specified range, change with the adjusting gasket of other thickness to satisfy the requirement under the precondition there is no clearance between the adjusting gasket and the differential.



13. Mount on the left and the right cap-differential bearing:  
Screw up the bolts with spanner to the specified torque;  
Fastening torque: 78N • m

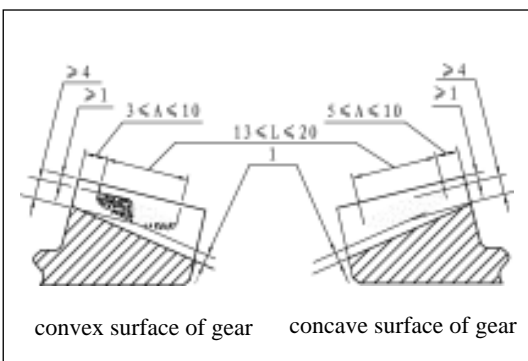


14. Measure the total preload of the front speed reducer with torque tester;  
Fastening torque: (1.8-2.4)N • m



15. Check the teeth engagement between the axle driven bevel gears:

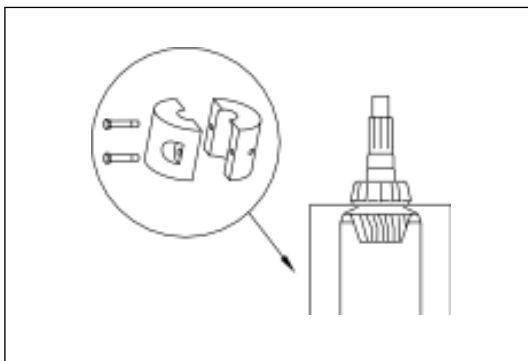
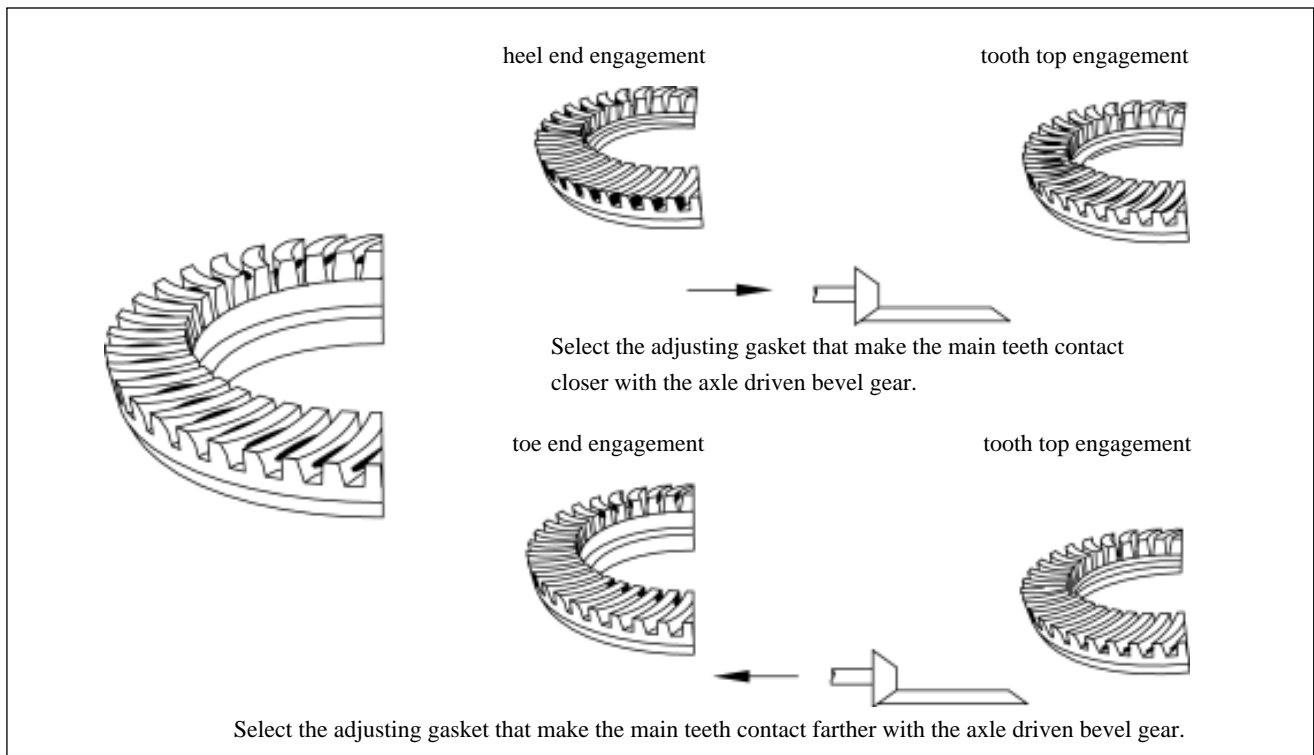
- Coat three or four teeth at three different positions of the axle driven bevel gear in red
- Hold the flange tightly while rotating the axle driven bevel gear.



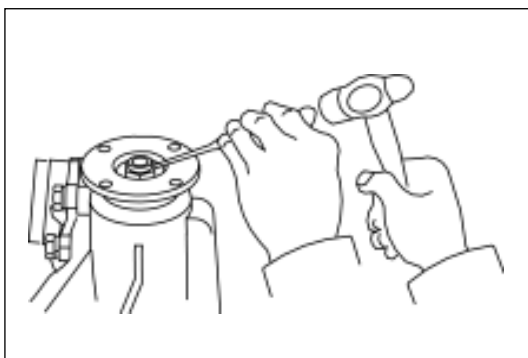
- Check the teeth engagement situation.

Remark: the trace of the teeth of axle driven bevel gear should satisfy this requirement. Otherwise, select the suitable adjusting washer for correcting according to the situation of poor teeth engagement;

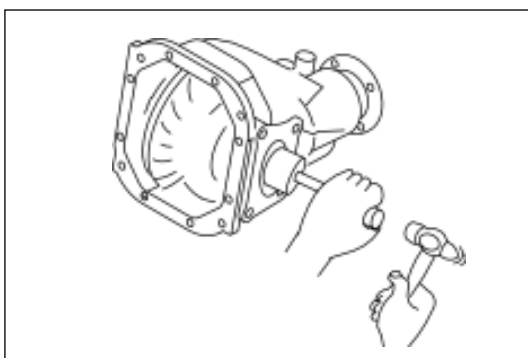
Select the adjusting gasket that makes the main teeth apart from the axle driven bevel gear.



- (d) Tear down the bearing 32307 from the driving bevel gear and change the adjusting washer.
- (e) Re-measure the total preload of the front speed reducer and the situation of teeth engagement until they satisfy the requirement.

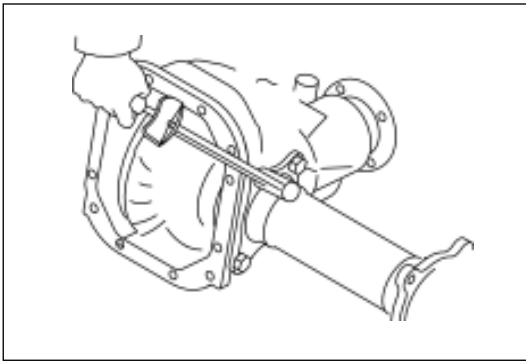


16. Rivet the main-tooth nut;

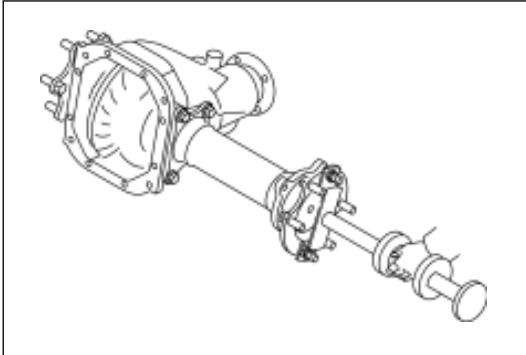


- 17. Mount on the new oil seal ó front half-shaft;  
Press in the new oil seal with the SST until it flush with the outer face of the oil seal, coat the moderate lubricant on the position of oil seal and on the lip open of oil seal.

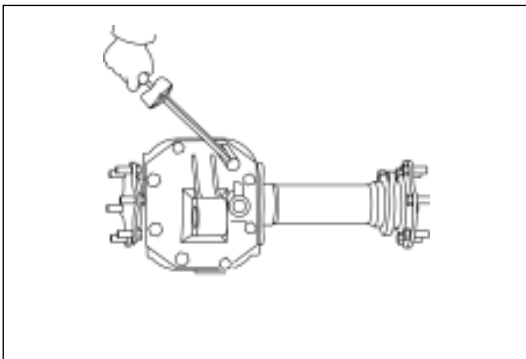




18. Mount on the front drive axle shaft sleeve;  
Notice: Thread locking agent should be coated on the bolt thread.  
Fastening torque:  $88\text{N} \cdot \text{m}$



19. Mount on the front long semi-axis and the front minor half-shaft.  
(a) Mount the new snapping ring on half-shaft.  
(b) Mont on the front semi-axis and the front minor half-shaft.

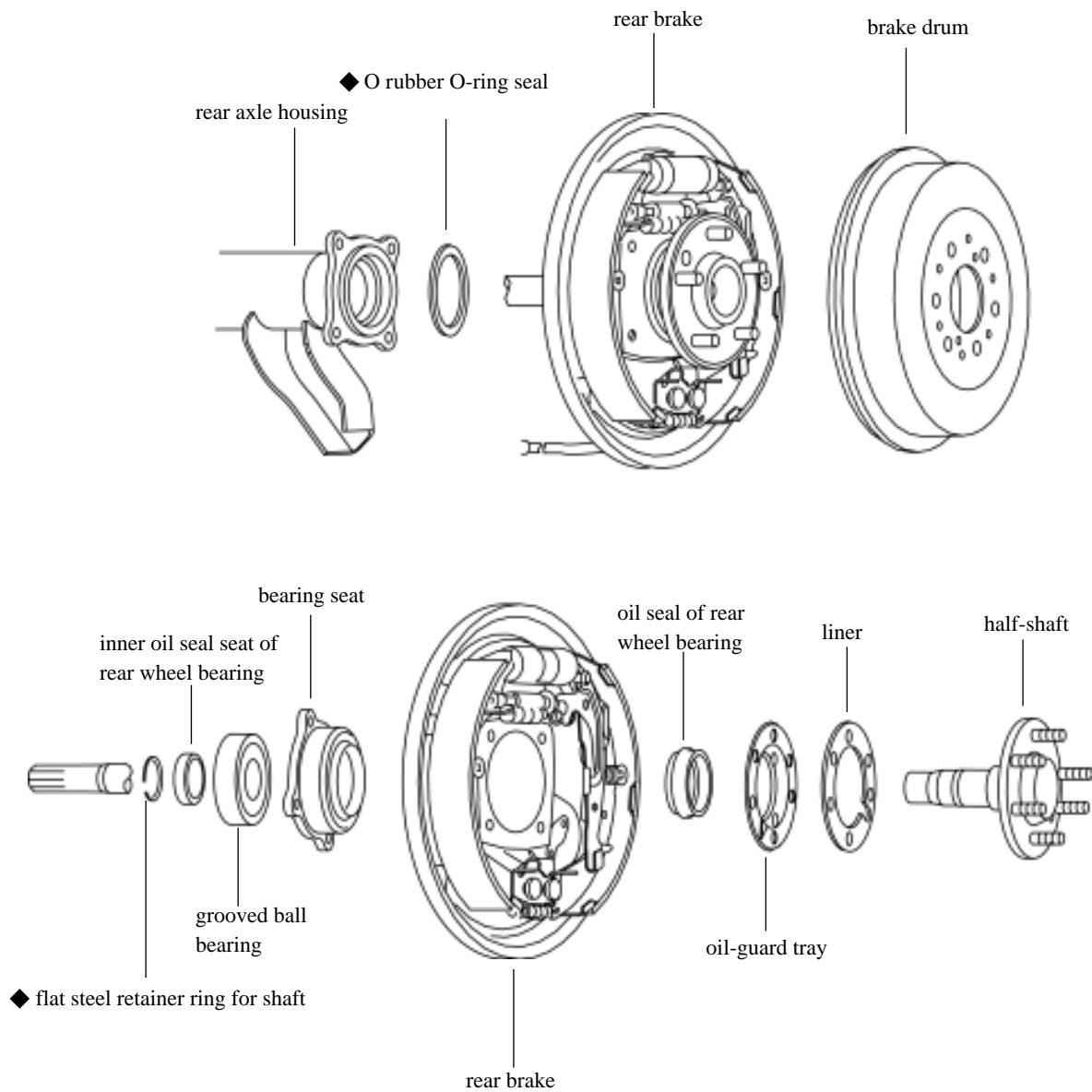


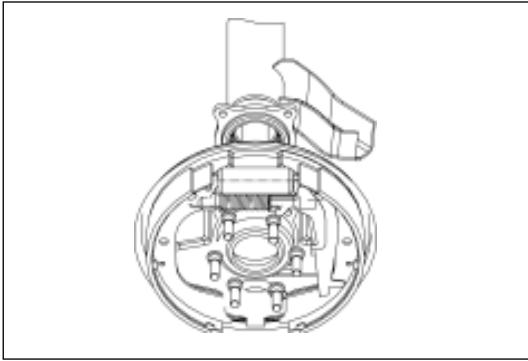
20. Mount the front speed reducer shell assembly:  
(a) Clear the front speed reducer shell and the contact face of front speed reducer shell;  
(b) Coat the glue line with diameter of 2-3 mm, and the glue line should be even and without fracture.  
Remark: The front speed reducer shell should be mounted ready within 15 min after coating the glue.  
(c) The bolts, before screwed up, should be coated with thread locking sealing agent and screwed up to the specified torque.

Fastening torque:  $47\text{N} \cdot \text{m}$

## Rear Axle Shaft

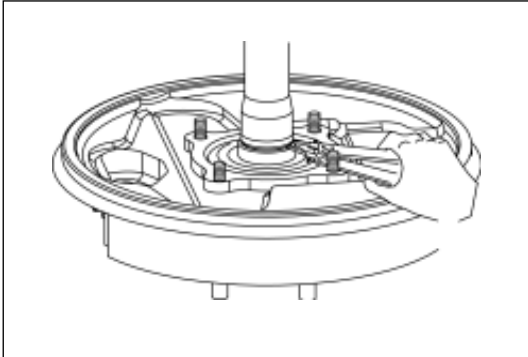
### Element figure



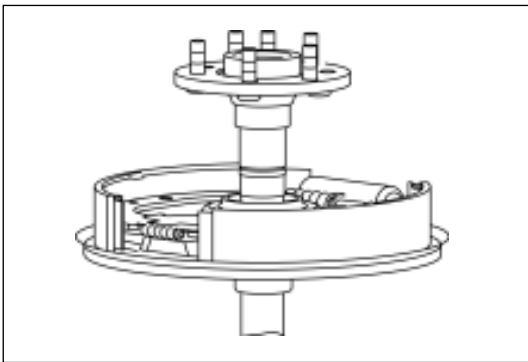


## Dismantle of Rear half Axle Shaft

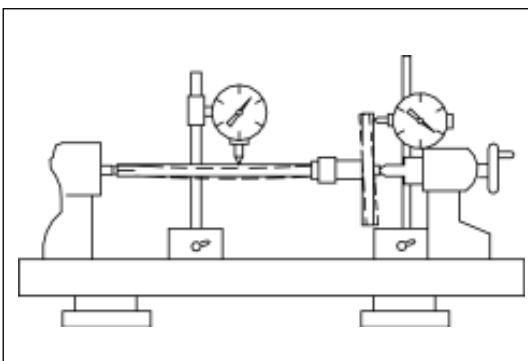
1. Tear down the wheels.
2. Tear down the rear brake drum.
3. Tear down the grab end of the bracing wire of hand brake from the rear brake.
4. Tear down the half-shaft and the rear brake assembly from the rear axle housing.



5. Tear down the flat steel retainer ring for shaft from the half-shaft;  
Tear down the flat steel retainer ring for shaft with the ring calipers.



6. Tear down the half-shaft:  
Put down a wooden plate on the flat ground, and thrust the end of spline of half-shaft and rear brake assembly toward the wooden plate to separate the shaft and the rear brake assembly.



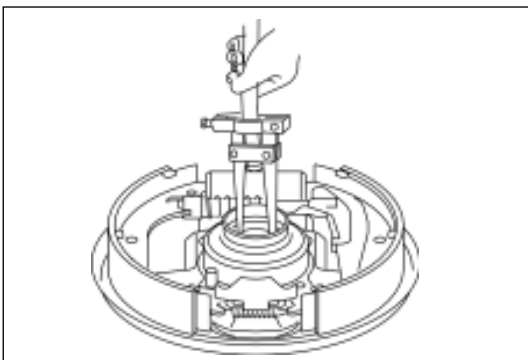
## Inspection on and repairing of half-shaft parts

1. Check the wear, damage and swing difference half-shaft and the flange.

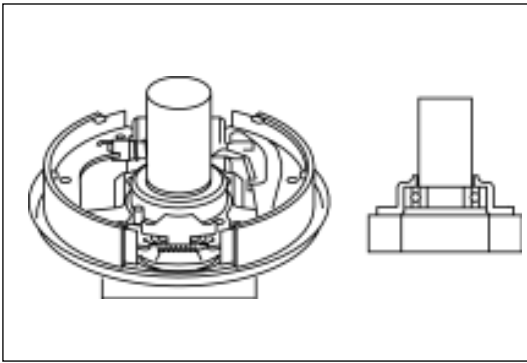
Max shaft run-out: 2 mm

Max flange run-out: 0.2 mm

In case the half-shaft is damaged, or wearied or the measuring value of the swing difference is excessive, change the half-shaft.



2. Check the oil seal of rear wheel bearing:  
Check to see whether there is wear or damage, and change the oil seal if necessary.
3. The disassembly of the outer oil seal of rear wheel bearing;  
Tear down the outer oil seal of rear wheel bearing with SST.

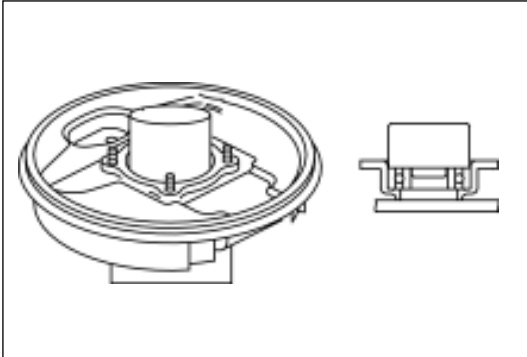


4. Check the grooved ball bearing

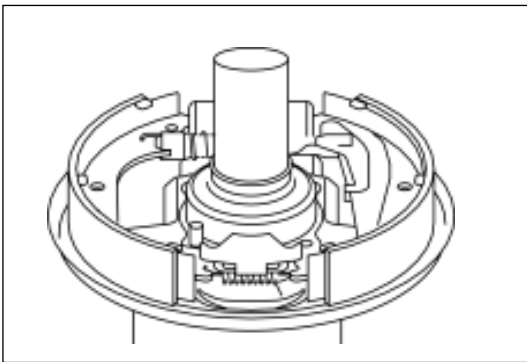
Check the grooved bearing to see whether there is damage or wear.

5. Change the bearing where necessary:

(a) Press out the grooved ball bearing with SST.



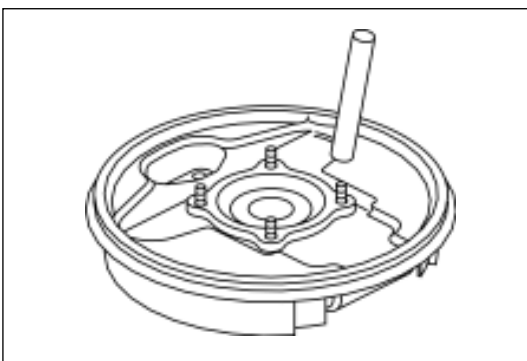
(b) Press in the new grooved ball bearing with SST.



6. Mount the new oil seal of rear wheel bearing.

Press in the new oil seal of rear wheel bearing with SST

Coat moderate lithium base grease on the lip open of oil seal.



7. Check the bearing seat.

Check the wear or damage situation.

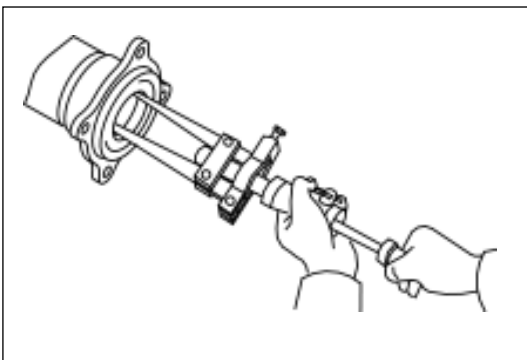
8. Change the bearing seat where necessary:

(a) Tear down the oil seal of rear wheel bearing and the grooved ball bearing with SST.

(b) Tap the bolts with copper bar to tear down the bearing seat.

(c) Mount the new grooved ball bearing and the oil seal of rear wheel bearing on the bearing seat

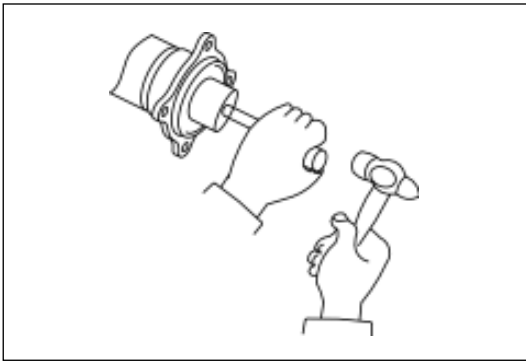
(d) Press the rear brake, which is put on with bolts, in the bearing seat.



9. Check the wear or damage of the inner oil seal of the rear wheel bearing.

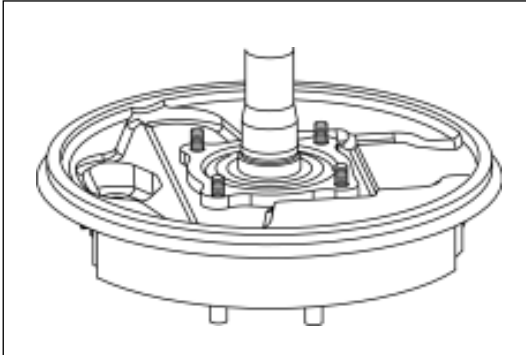
10. Change the rear wheel bearing where necessary:

(a) Tear down the oil seal of rear wheel bearing with SST.



#### 11. Mount the new inner oil seal of rear wheel bearing.

Coat the hyperbolic gear oil on the axle housing where matches with the oil seal; and plaster the moderate lithium base grease on the lip open of the oil seal, then put them on the pressure head and press them in.



### Mount of Rear Axle Shaft

1. Press the rear brake and the bearing seat assembly on the half shaft.
2. Press the heated inner oil seal seat of rear wheel bearing on the half shaft;

Notice: the face at the chamfering end of inner oil seal of rear bearing should contact the oil seal closely, do not mount it at the incorrect position.

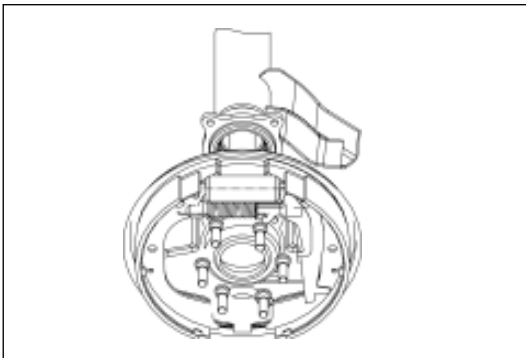
Requirement for heat mount: heat the inner oil seal seat into the 22# oil (GB443-1989) to 100℃, after the part is heated completely, take it out for mount.

3. Mount on the flat steel retaining ring with the ring calipers.
4. Encase the half-shaft rear brake in the axle housing, screw on the self-locking nut.

Tightening moment:  $(63-79)\text{N} \cdot \text{m}$

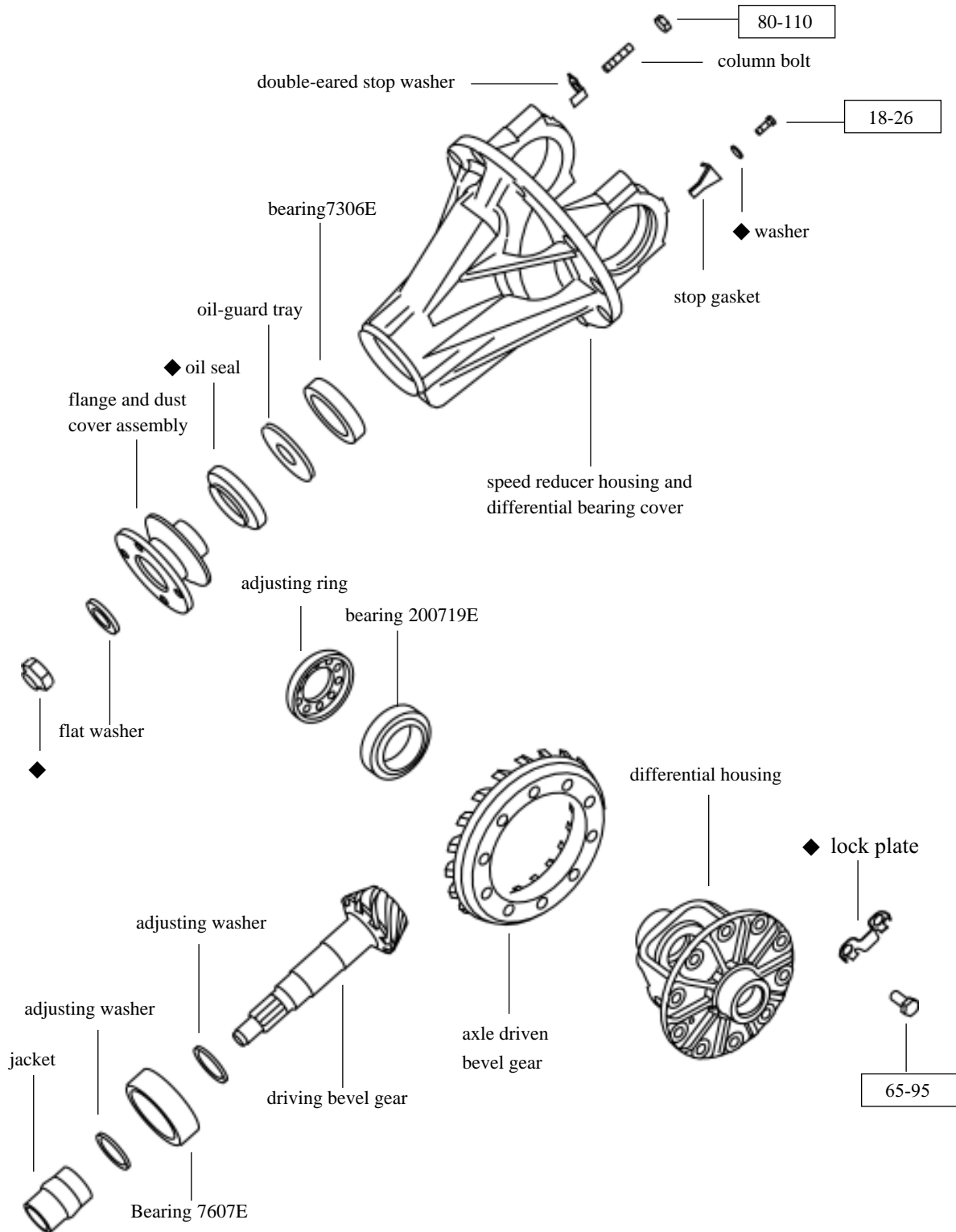
Notice: protect the oil seal lip open, bracing wire assembly and the oil-guard sleeve.

5. Mount on the hand brake wire and the brake pipe.
6. Mount on the liner and rear brake drum;
7. Make a trial gas exhaust on the braking system, and
8. Mount on the rear wheels.



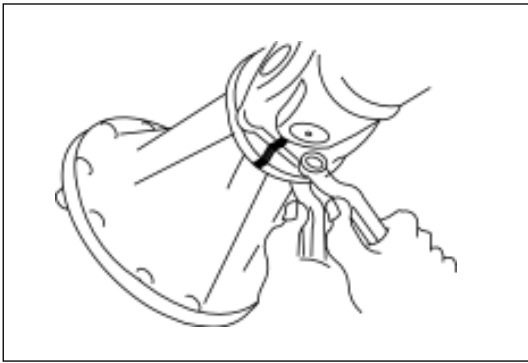
## Rear speed reducer

### Element figure



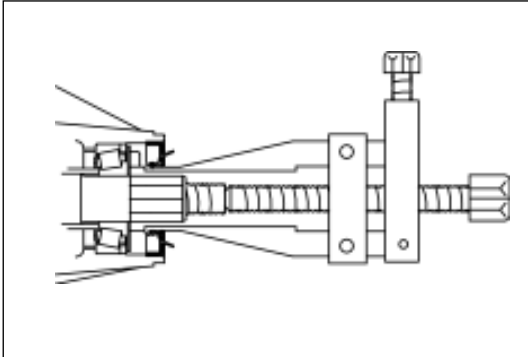
N • M :specified torque

◆ Parts that cannot be reused after being used



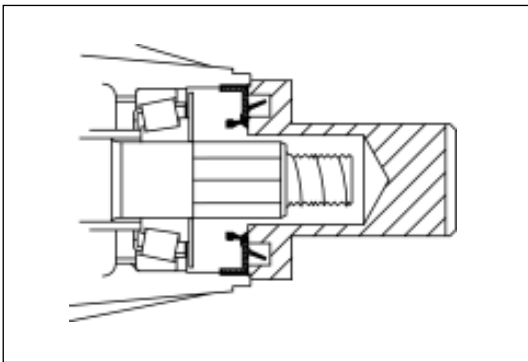
## On-vehicle Change of main-teeth oil seal

1. Disconnect the drive shaft from the speed reducer:
  - (a) Mark the assembly mark on the two flanges;
  - (b) Tear down the four sets of bolt and nut.



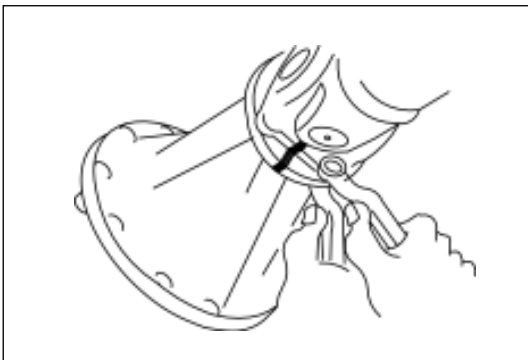
2. Tear down the flange and dust cover assembly.

3. Tear down the oil seal.  
Tear down the oil seal with SST.

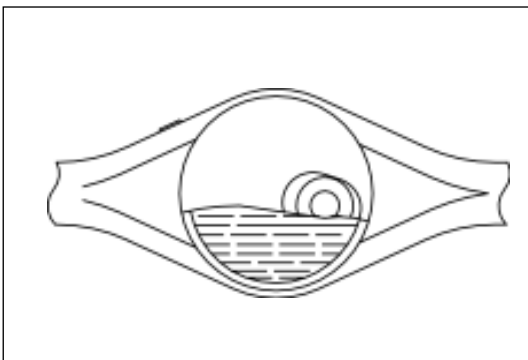


4. Mount on the new oil seal:
  - (a) Coat the lithium base grease on the lips of oil seal;
  - (b) Tap in the new oil seal with SST.
 Remark: tap the new oil seal until it is in place.

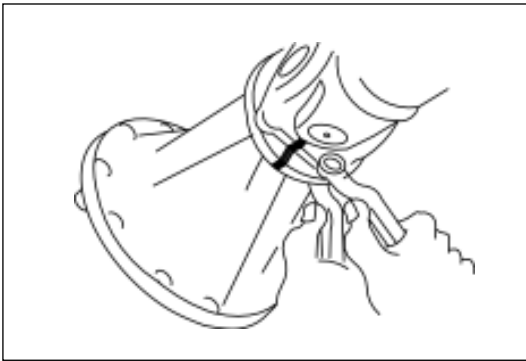
5. Mount the flange and dust cover assembly.
6. Screw up the nut to the specified torque.  
Specified torque: (140-160)N • m
7. Rivet the nut.



8. Connect the drive shaft flange with the speed reducer flange:  
Align the assembly mark and connect the flanges with bolts.  
Tightening moment: (69-79)N • m

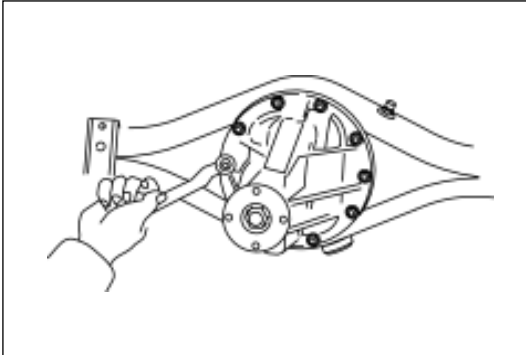


9. Check the oil level of the speed reducer.  
Change the gear oil where necessary.  
Oil brand: heavy-duty oil of grade : GL-5  
Oil volume: add the oil until it overflows from the oil filler outlet.  
Viscosity: SAE 85W/90



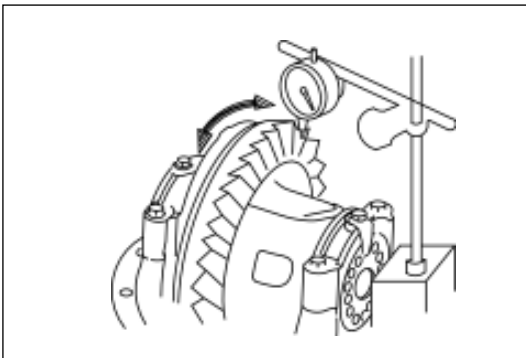
## Dismantle of Rear Speed Reducer

1. Take out the oil drain plug to drain the oil in the speed reducer up.
2. Tear down the rear axle shaft.
3. Disconnect the drive shaft from the speed reducer.
4. Tear down the nuts on the bolts that connect the rear axle housing and the speed reducer.
5. Tear down the rear speed reducer.



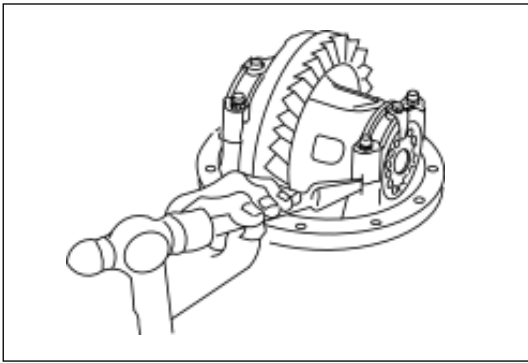
## Disassembly of Rear Speed Reducer

Remark: in case the noise is over loud, the following item should be checked before taking apart it to find out the causes. If the speed reducer has serious drawback, take it apart for repairing where necessary.



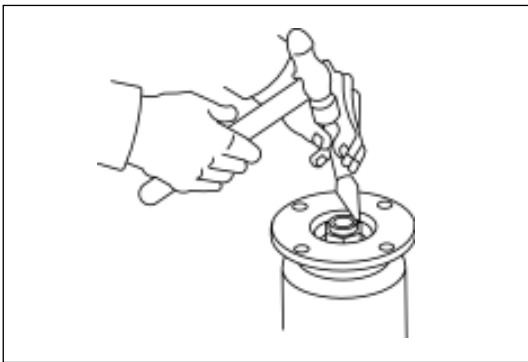
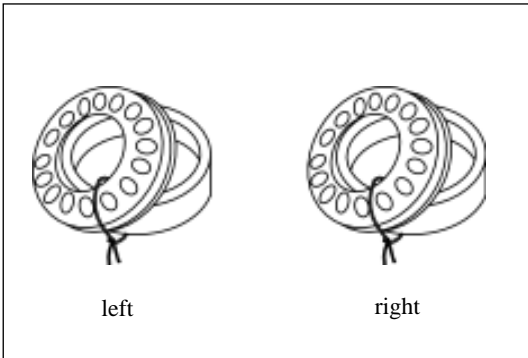
1. Check the play between the axle driven bevel gear;  
In case the play value fails to be within the specified range, adjust the preload of bearing 200719E or repair it where necessary.  
(see page SA-91)  
Standard play: (0.13-0.25)mm
2. Check the teeth engagement of the driving bevel gear with the axle driven bevel gear.  
(See Page SA-92)  
Record the teeth engagement positions.
3. Check the clearance between the half-shaft gear thrust gasket and the differential housing.  
Check the clearance between the half-shaft gear thrust gasket and the differential housing with the feeler.  
Standard clearance: (0.45-0.75)mm  
Remark: in case the clearance value fails to fall within the above range, change the half-shaft gear stop gasket, and ensure the half-shaft gear stop gaskets on the left and right sides are same in thickness.  
(See Page SA-95)



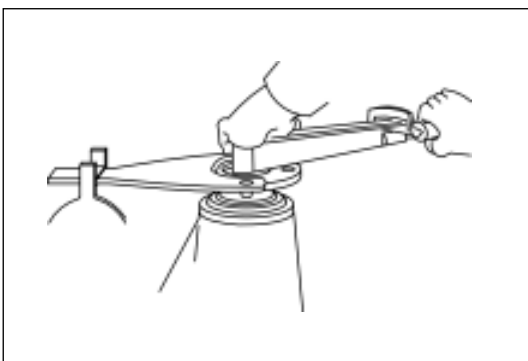


4. Tear down the differential and the axle driven bevel gear:
  - (a) Mark the assembly marks on the differential bearing cover and the speed reducer housing.
  - (b) Tear down the stop gasket and take down the adjusting ring.
  - (c) Loosen the double-stop washer and screw off the nut to take down the differential bearing cover.
  - (d) Tear down the differential and axle driven bevel gear from the rear speed reducer.
  - (e) Tear down the outer race of bearing 200719E.

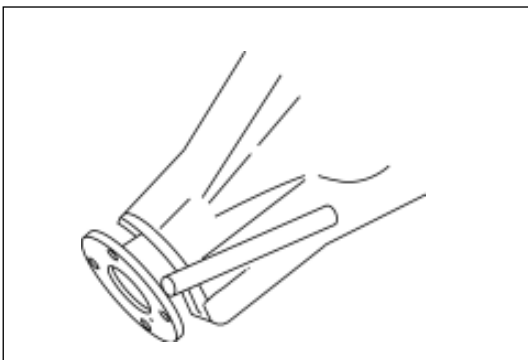
Remark: mark the label on the parts to clarify the position for re-assembling



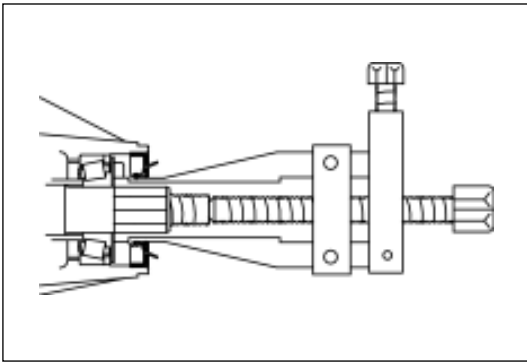
5. Tear down the flange and dust cover assembly:
  - (a) Loosen the riveted part of the nut with hammer and chisel;



- (b) Lock the flange with SST to tear down the nuts.  
Notice: those nuts should not be reuse.

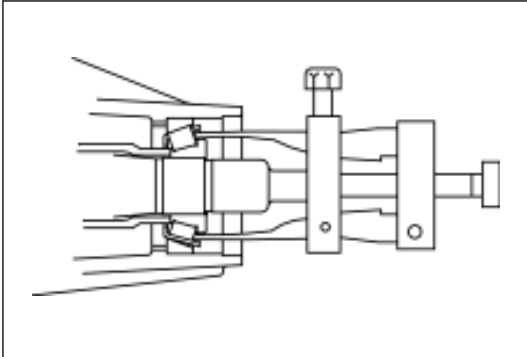


- (c) Tear down the flange and dust cover assembly with copper bar.



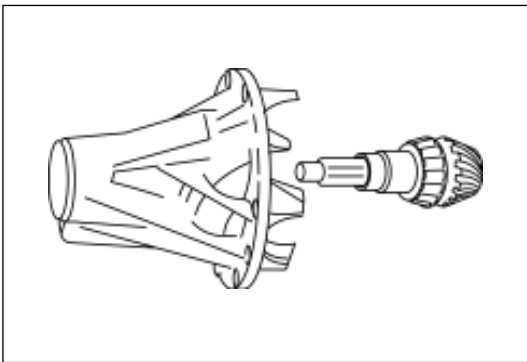
6. Tear down the oil seal and oil-guard tray:

- (a) Support the face at the teeth end of the driving bevel gear to tear down the oil seal with SST.
- (b) Take out the oil-guard tray.



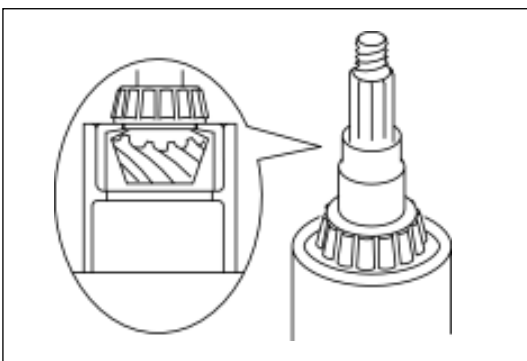
7. Tear down the inner race and roller assembly of bearing 7306E;

Tear down the inner race and roller assembly of bearing 7306E with SST.



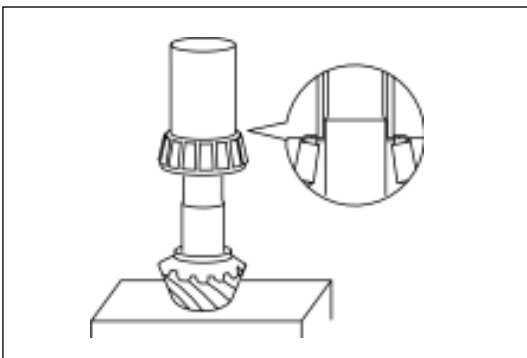
8. Tear down the driving bevel gear;

Tear down the driving bevel gear, which is mounted with adjusting washer and inner race of bearing 7306E, together with another adjusting washer and jacket

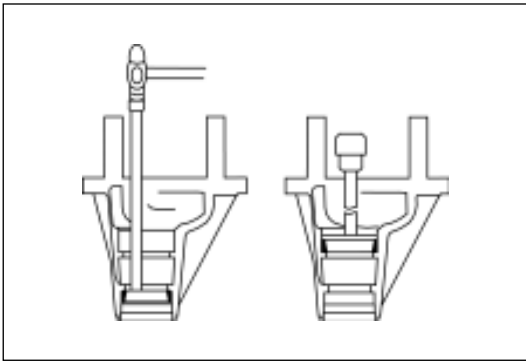


9. Change the bearing 7306E:

- (a) Press out the bearing from the driving bevel gear with pressure machine and SST.

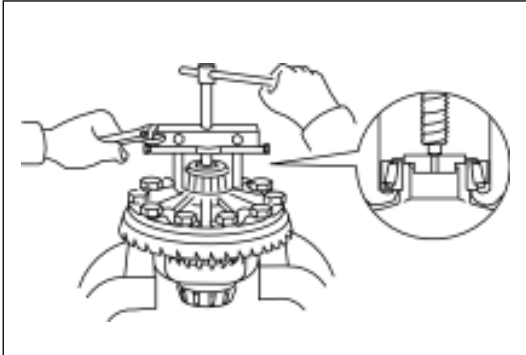


- (b) Mount the new inner race and roller assembly of bearing 7306E on the driving bevel gear with pressure machine and SST.



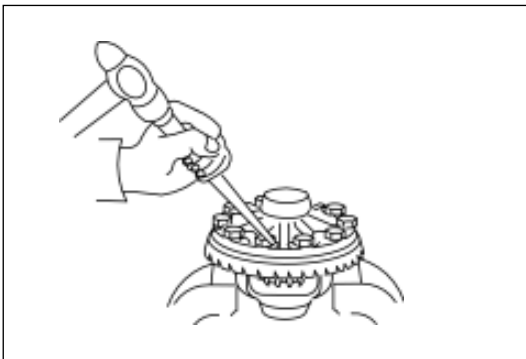
10. Change for the bearing 7306E and the outer race of bearing 7607E:

- (a) Tap out the bearing outer race with hammer and copper bar.
- (b) Press in the new bearing outer race with pressure machine and SST.



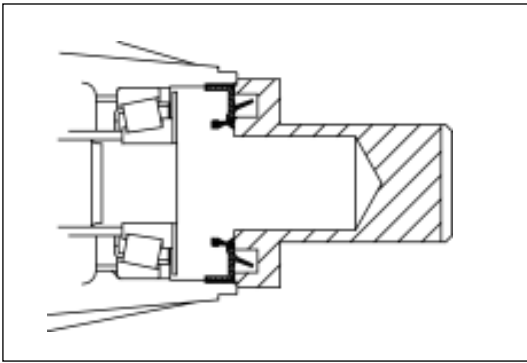
11. Tear down the inner race and roller assembly of bearing 200719E from differential.

Pull out the inner race and roller assembly of bearing 200719E from the differential housing with SST.



12. Tear down the axle driven bevel gear.

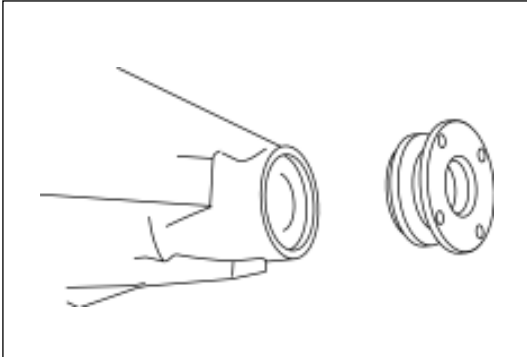
- (a) Tear down the lock plate and bolts on the axle driven bevel gear.
- (b) Mark the assembly marks on the axle driven bevel gear and the differential housing.
- (c) Tap down the axle driven bevel gear with rubber hammer and copper bar.



## Assembly of Rear Speed Reducer

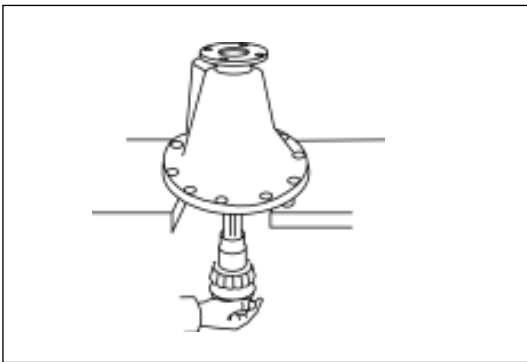
1. Mount the inner race and roller assembly of bearing 7306E, oil-guard tray and oil seal.

- (a) Put the inner race and roller assembly of bearing 7306E in the speed reducer housing, and put the oil-guard tray on it.
- (b) Coat the lithium base grease on the position of speed reducer where oil seal locates and on the lips of oil seal, align the oil seal and press it to mount.



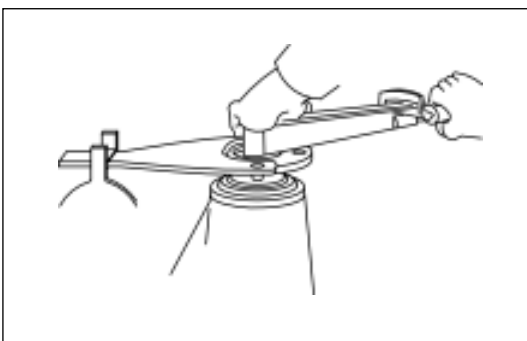
2. Mount the flange and dust cover assembly

Encase the flange and dust cover assembly in the speed reducer housing, then flat it by hand.



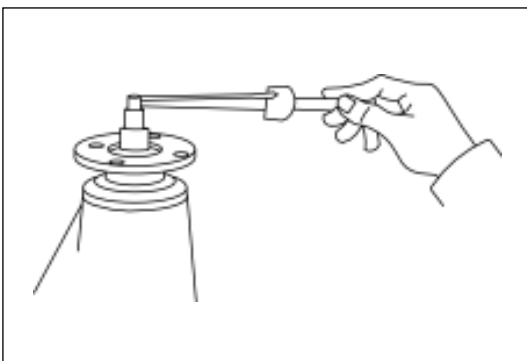
3. Mount the driving bevel gear:

- (a) Put the adjusting washer, jacket on the driving bevel gear, which is mounted with adjusting washer and inner race and roller assembly of bearing 7607E, then encase the driving bevel gear in the speed reducer housing.



- (b) Screw up the nuts to tighten the flange, flat washer and the driving bevel gear with SST, and the thread locking agent is required to be coated when screwing.

Tightening moment:  $(140 \sim 160)\text{N} \cdot \text{m}$



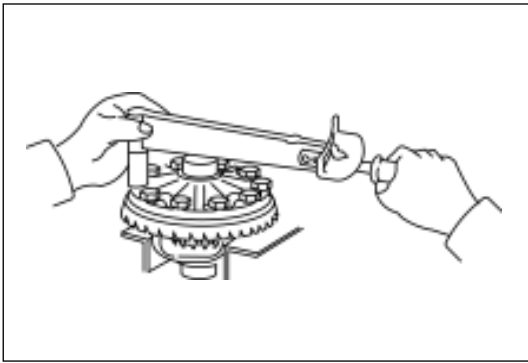
4. Measure the pre-tightening torque of the bearing:

New bearing:  $(1.2-1.7)\text{N} \cdot \text{m}$

The reused bearing:  $(0.9-1.3)\text{N} \cdot \text{m}$

Remark: if the requirement is not satisfied, change the adjusting washer under jacket until the requirement is satisfied.

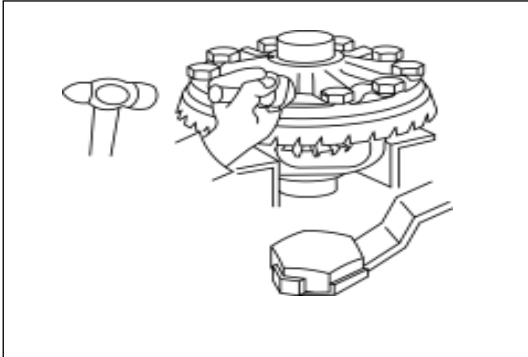
- (a) If the measure value is smaller than the standard one, reduce the thickness of adjusting washer;
- (b) If the measure value is larger than the standard one, increase the thickness of adjusting washer.



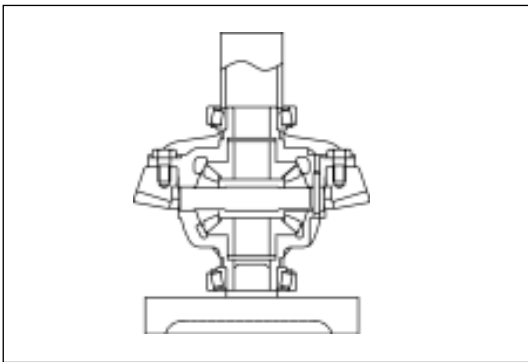
5. Mount the axle driven bevel gear on the differential housing:
- (a) Mount on the lock plate and screw up the bolts to the specified torque.

Tightening moment:  $(65-95)\text{N} \cdot \text{m}$

Notice: screw up the bolts diagonally.

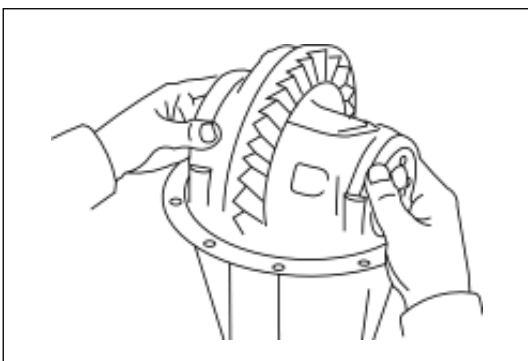


- (b) Tighten the lock plate with hand hammer and flat head pinch.



6. Mount the inner race and roller assembly of bearing 200719E;

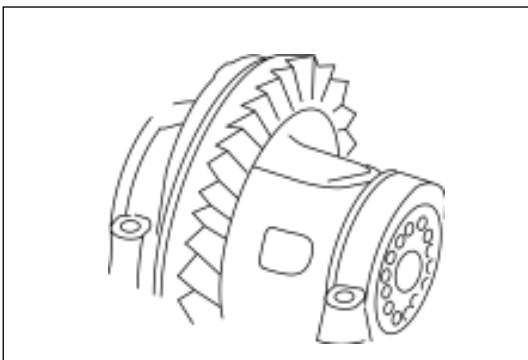
Mount the bearing inner race and roller assembly in differential housing with the pressure machine and SST.



7. Mount the differential assembly;

Mount the differential in the speed reducer housing.

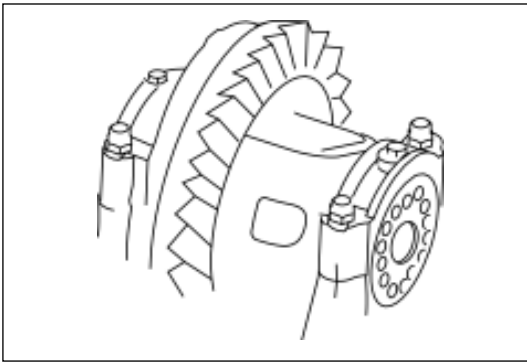
When mounting the differential that hasn't changed the inner race and roller assembly of bearing 200719E, ensure the outer race of the left and the right bearings that has disassembled should match with their inner racers respectively.



8. Mount the adjusting ring;

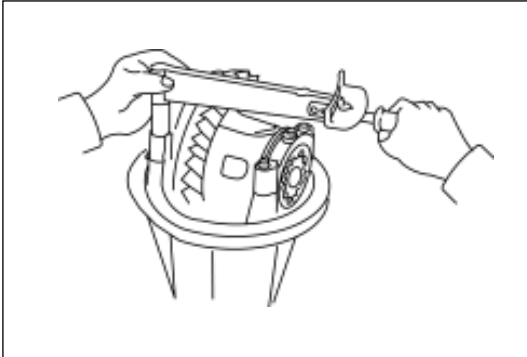
Adjust the clearance between the driving bevel gear and the axle driven bevel gear to the moderate size. And press the bearing outer race to flatten it with adjusting ring, and then screw up moderately.

Notice: the two adjusting rings should be adjusted synchronically in the movement of same direction.



9. Mount on the differential bearing cover:

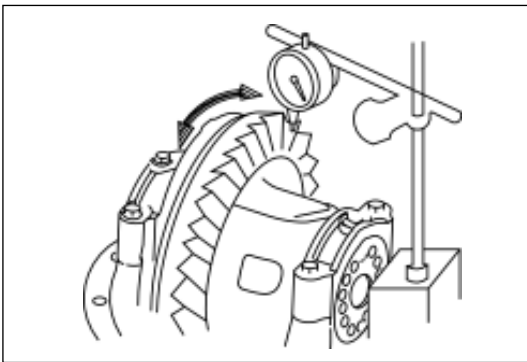
- (a) Align the assembly marks on differential bearing cover and the speed reducer housing, and press down the differential bearing by hand.
- (b) Mount on the double-eared stop washer and the hex nut.



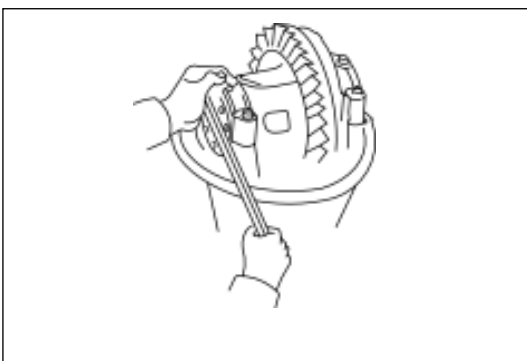
10. Adjust the clearance between the driving bevel gear and the axle driven bevel gear

- (a) Screw up the hex nuts connecting the differential bearing cover to the specified torque.

Tightening moment:  $(80-110)\text{N} \cdot \text{m}$

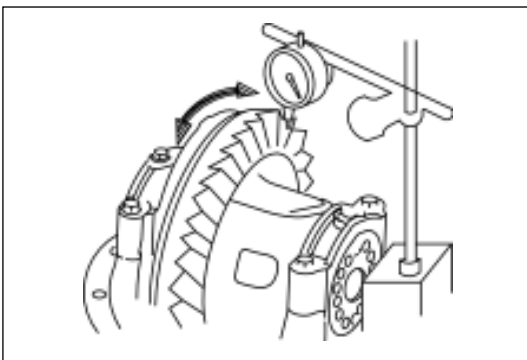


- (b) Attach the measuring meter seat on the face of speed reducer housing with the measuring head touching the teeth face, run the axle driven bevel gear with hand to measure the teeth engagement clearance, and then compare it with the clearance value in step (d) to decide the order of the adjusting ring tightening according to the values.



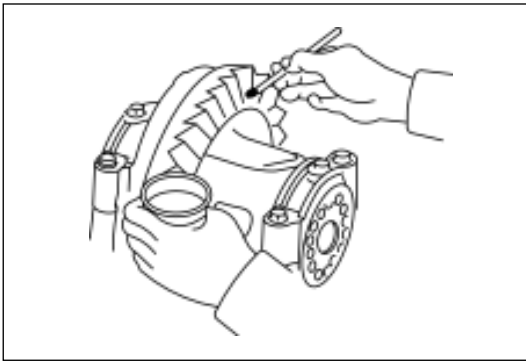
- (c) Adjust and screw up the adjusting rings with SST.

Tightening moment:  $(115-135)\text{N} \cdot \text{m}$



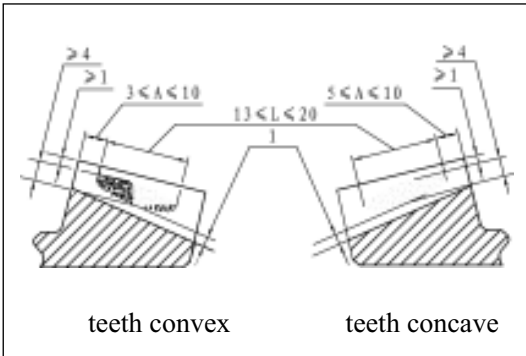
- (d) Check the engagement clearance again until the clearance value of the three spots evenly locates on the circumference of axle driven bevel gear. Otherwise, adjusting ring adjustment is suggested.

Engagement clearance:  $(0.13-0.25)\text{mm}$



11. Check the engagement situation of the axle driven bevel gear and the driving bevel gear:

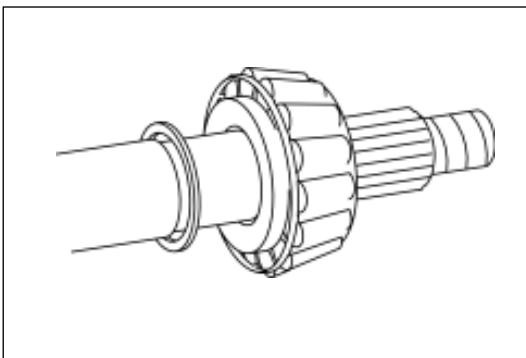
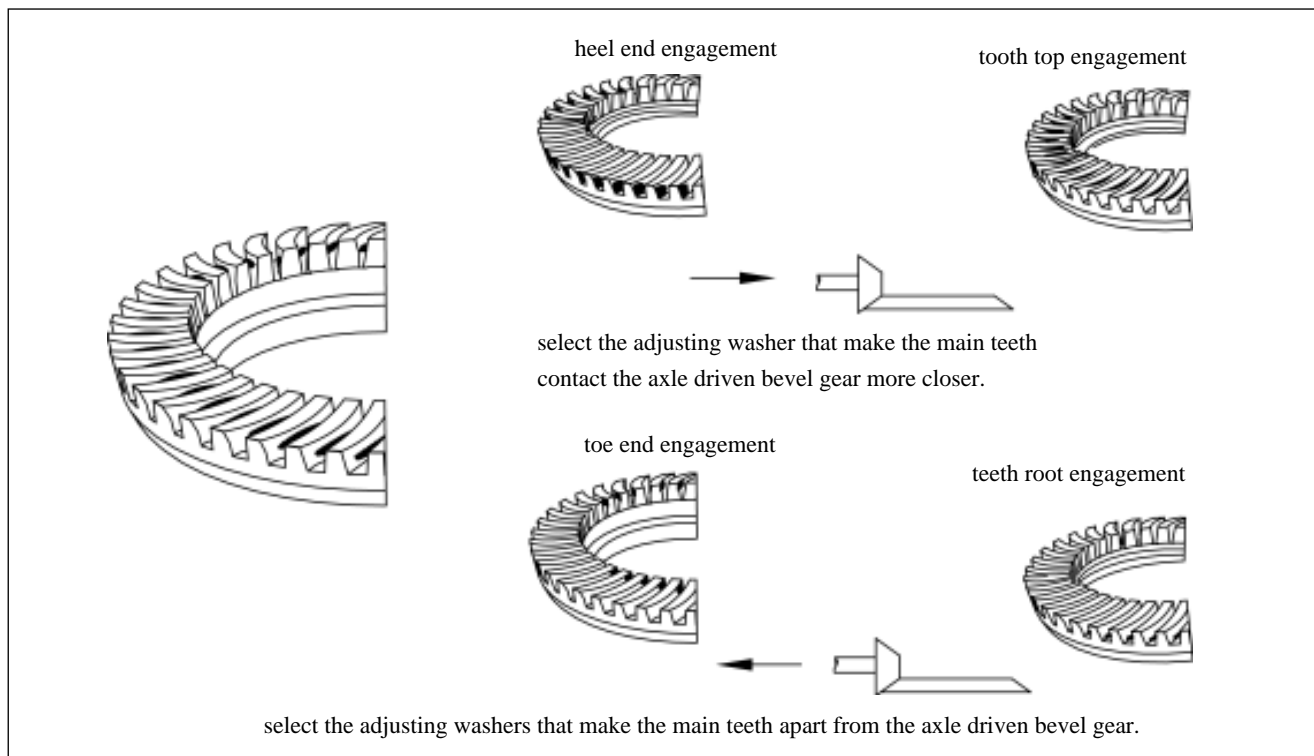
- Coat four teeth locating on different spots of axle driven bevel gear with red powder.
- Rotate the axle driven bevel gear in different directions.



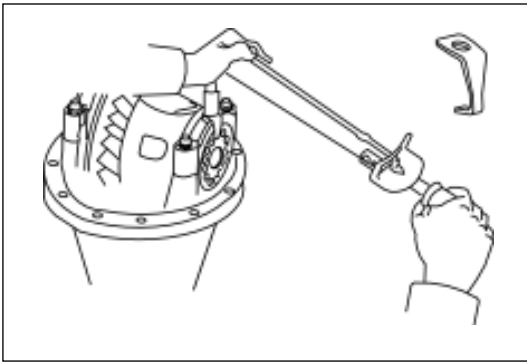
(c) Check the teeth engagement situation.

The teeth trace of axle driven bevel gear should satisfy this requirement. If not, select the suitable adjusting washer to correct according to the poor teeth engagement situation.

Washer thickness (unit: mm) see the following table:



Group NO.	Washer thickness	Group NO.	Washer thickness
1	1.60	7	1.90
2	1.65	8	1.95
3	1.70	9	2.00
4	1.75	10	2.05
5	1.80	11	2.10
6	1.85	12	2.15

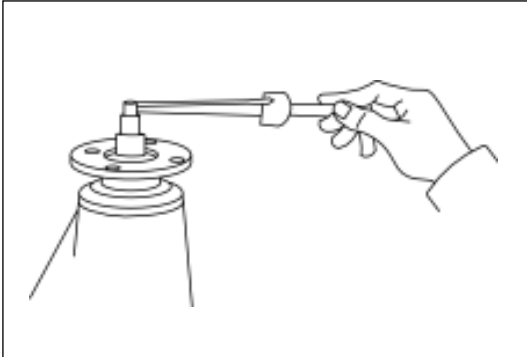


12. Lock the double-eared stop washer to mount the stop gasket and bolts:

- If the engagement trace satisfies the requirement, lock tightly the double-eared stop washer with hand hammer and pinch.
- Mount on the stop gasket, spring gasket and bolts, and then screw up the bolts.

Tightening moment:  $(18-26)\text{N} \cdot \text{m}$

- Tap in the adjusting ring with the pinch and hammer.



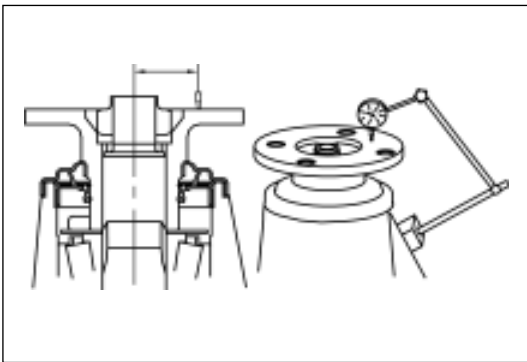
13. Measure the total preload:

Preload:  $(1.8-2.4)\text{N} \cdot \text{m}$

If the preload is beyond the specified range, change the gaskets between the jacket and bearing 7607E, until they meet the requirement.

- If the preload is larger than the specified value, change the adjusting washer.
- If the preload is smaller than the specified value, screw up the nuts again slowly but not exceed  $160\text{N.m}$ .

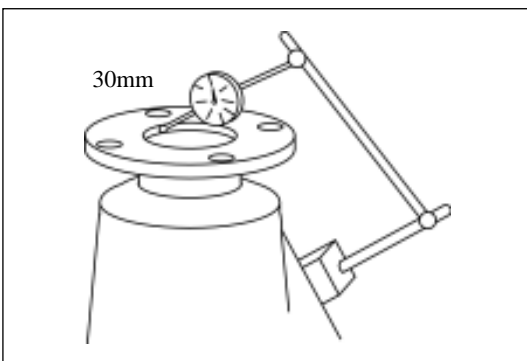
Notice: if the screwing torque exceeds the max torque, change the adjusting washer and repeat the preload process. Do not screw back the main-tooth nut to reduce the preload.



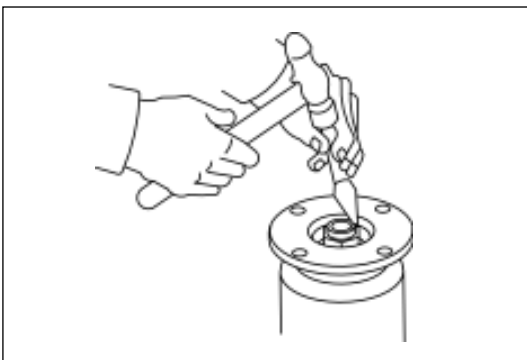
14. Check and adjust the flange bouncing

- Attach the dial indicating lamp seat on the speed reducer housing with the measuring head contact the flange face, run the flange to observe the swing out range of the dial indicating lamp hand.

Radial full bouncing tolerance:  $0.10\text{mm}$

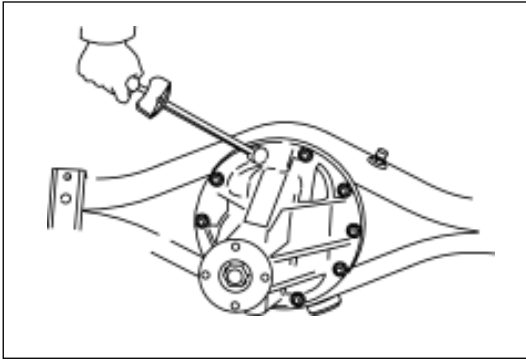


Remark: the two bouncing values should be controlled within  $0.10\text{mm}$ , as for the parts of bounce exceeding the tolerance, loosen the nut-driving bevel gear to assembly them in another angle, measure the bounce value again. Observe carefully the swing direction of the hands, which can be referred when changing the locations of flange and the driving bevel gear. If the requirement cannot be satisfied after several trials, change the new flanges until the requirement is met.



15. Rivet the driving bevel gear nuts.



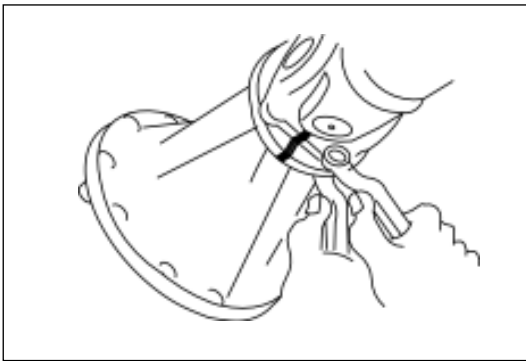


## Mount of Rear Speed Reducer and Differential Assembly

1. Mount the speed reducer and differential assembly on the rear axle housing.

Tightening moment:  $(18-26)\text{N} \cdot \text{m}$

Remark: in case the sealing gasket is mounted, it should be checked to see whether it is damaged before mounting, if damaged, change with the new sealing gasket, and the damaged sealing gasket should be clear away; if no sealing gasket is mounted, no mount is required to mount. Clean the contact face of the mounted axle housing and coat it with silicon-rubber plain sealing agent.

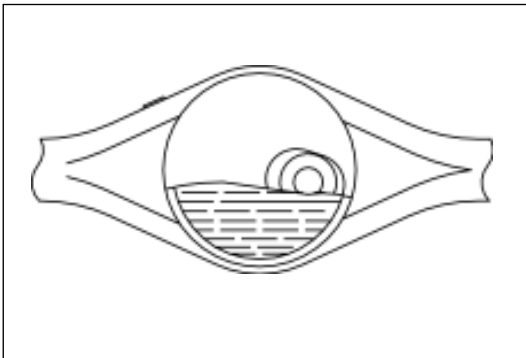


2. Connect the drive shaft and flange well and be careful to align the assembly marks marked when disassembling.

Tightening moment:  $(69-79)\text{N} \cdot \text{m}$

Screw up the oil drain plug with the Tightening moment of  $(140-150)\text{N} \cdot \text{m}$

Mount on the half-shaft and the brake assembly to adjust the brake oil path so that the wheel brake pump is filled with brake liquid.



3. Inject in the heavy-duty oil.

Oil brand: heavy-duty oil graded GL-5;

Viscosity: SAE 85W/90

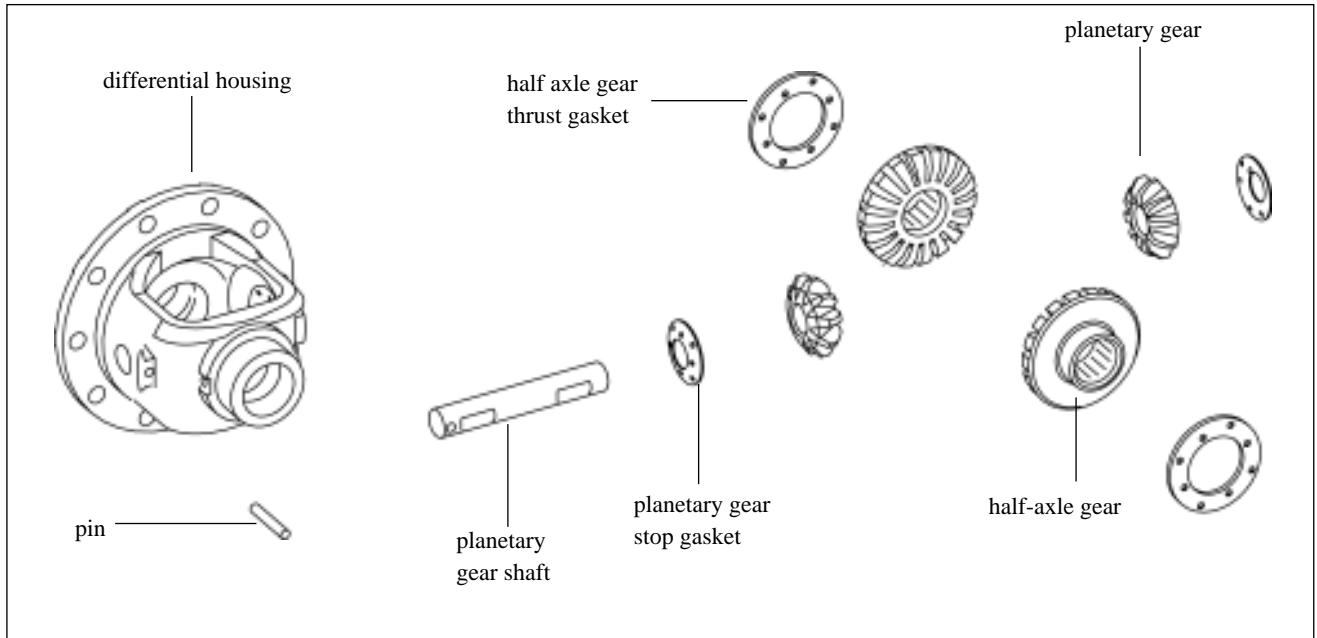
Oil volume: add the oil until it overflows from the oil filler outlets.

Screw up the oil-filling plug.

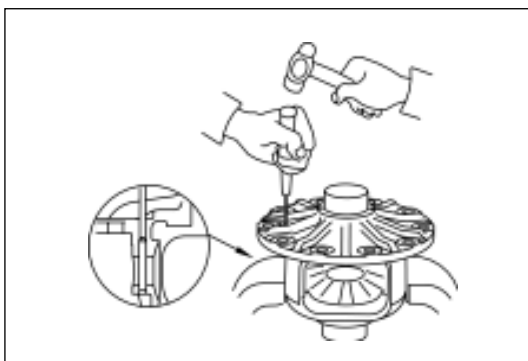
Tightening moment:  $(140-150)\text{N} \cdot \text{m}$

## Rear Differential

### Element Figure



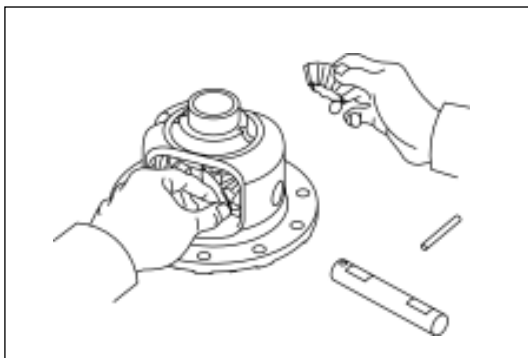
1. Tear down the speed reducer and the differential assembly.
2. Tear down the differential from the speed reducer and differential assembly.



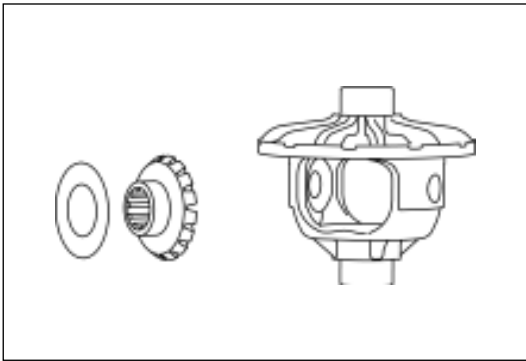
### Change of Differential Parts

#### 1. Disassembly of Differential

- (a) Tap out the pin with hammer and pinch.

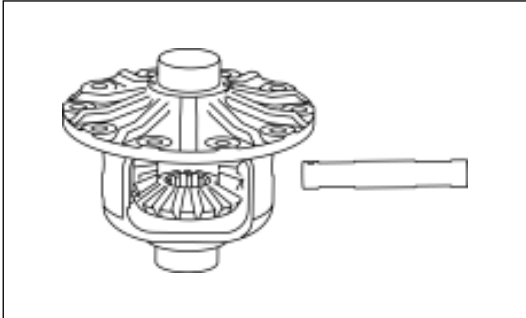


- (b) Tear down the planetary gear shaft, the planetary gear, planetary gear stop gasket, half-shaft gear and half axle gear thrust gasket.



## 2. Assembly of Differential

- (a) Put the half-axle gear thrust gasket on the half-axle gear and then encase them in the differential housing.



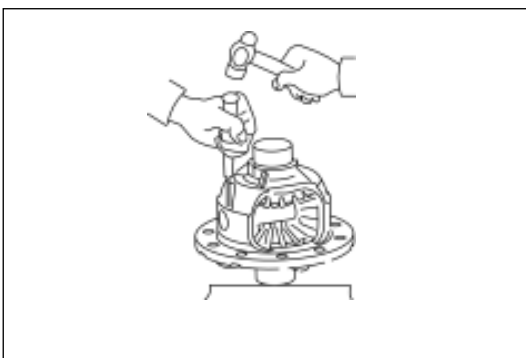
- (b) Encase the planetary gear stop gasket, planetary gear and encase the planetary gear shaft.

- (c) Check the clearance between the half-axle gear thrust gasket and the differential housing.

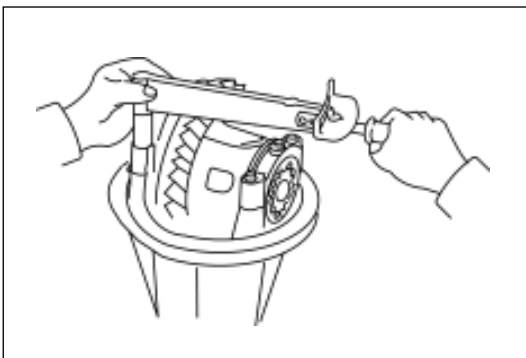
Remark: the half-axle gear and the planetary gear should run freely without stagnant, push the planetary gear inside, then measure the clearance between the half-axle gear thrust gasket and the differential housing with dial indicating lamp.

Reasonable clearance range: (0.45-0.75)mm.

Remark: if the clearance value fails to fall within the above range, change the half axle gear thrust gasket, at the same time, ensure the left and right half axle gear thrust gasket are same in thickness.



- (d) Tap the pin in the pinhole, and rivet the end of the pinhole so as to prevent from the pin missing.

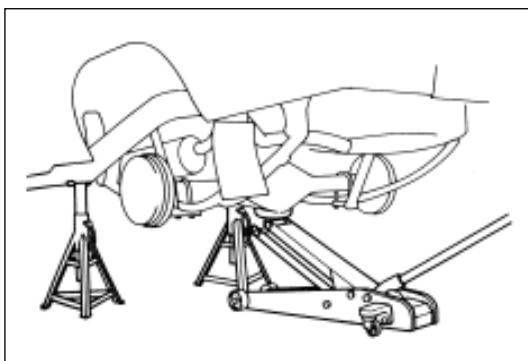
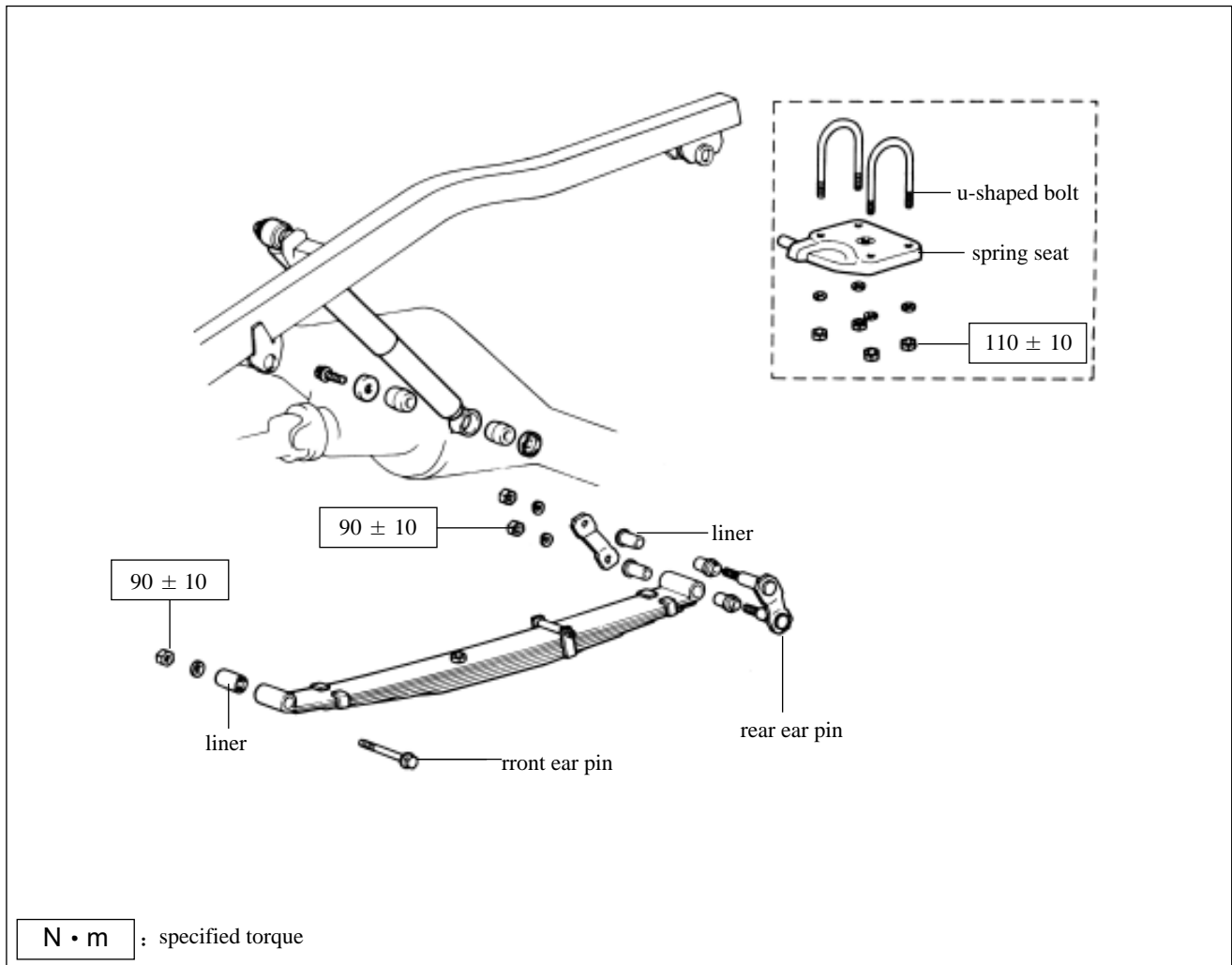


## Mount of Differential

1. Encase the differential assembly in the speed reducer housing.
2. Mount the speed reducer and differential.

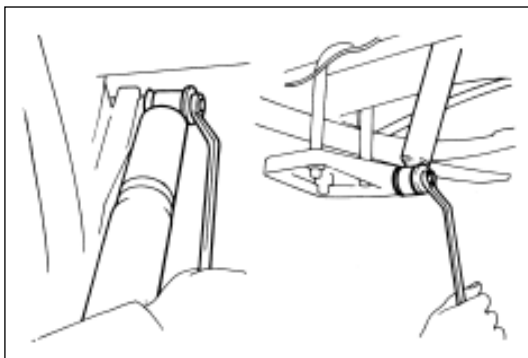
## Rear suspension(leaf spring)

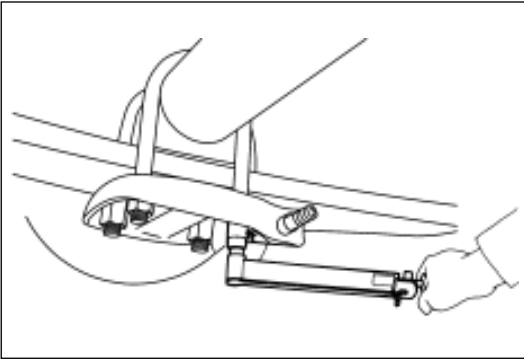
### Leaf spring and shock absorber



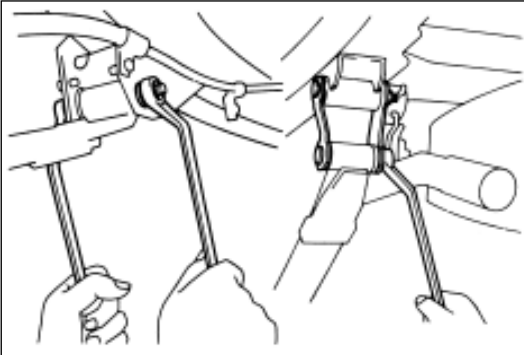
### Dismantle of leaf spring and vibration damper

1. Raise the vehicle body with a jack and support it with a bracket;
  - (a) Raise the vehicle body with a jack and support it with a bracket;
  - (b) Lower the axle housing until the leaf spring is loosened to the degree there is no tension existing. Keep the leaf spring in such status.
2. Tear down the vibration damper.

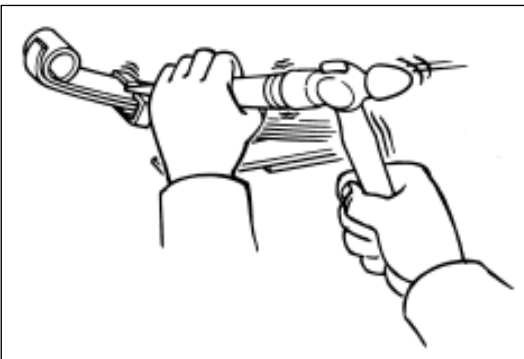




3. Tear down the U-shaped bolt;
  - (a) Tear down the mounting nuts of U-shaped bolts.
  - (b) Tear down the spring seat;
  - (c) Tear down the U-shaped bolts.



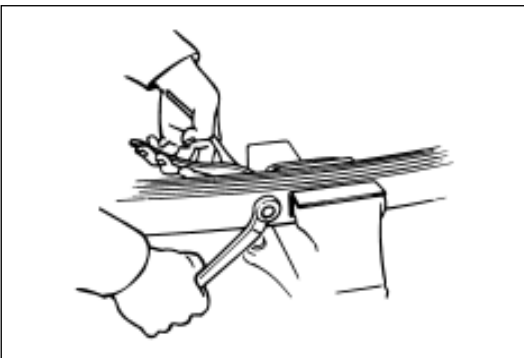
4. Tear down the leaf spring;
  - (a) Tear down the mounting nuts of front ear pin;
  - (b) Tear down the front ear pin;
  - (c) Disconnect the leaf spring from the bracket;
  - (d) Tear down the rear ear pin and the leaf, and then take apart the leaf spring.



### Change of leaf spring

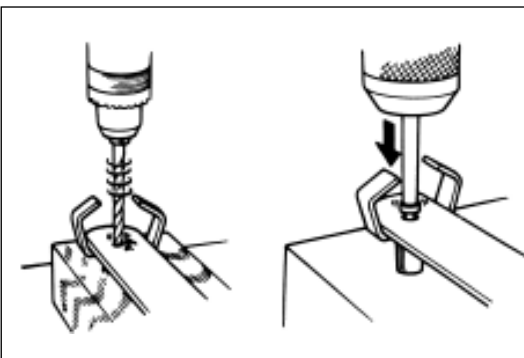
1. Loosen the spring clip;
 

Loosen the spring clip with a chisel.

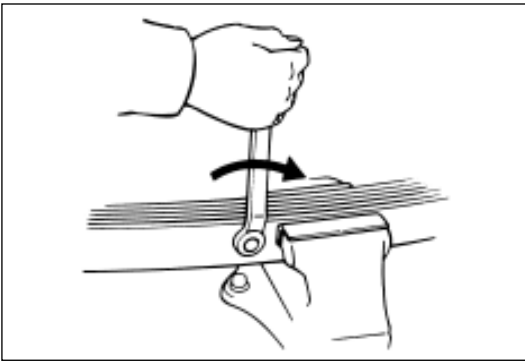


2. Tear down the central bolt;
 

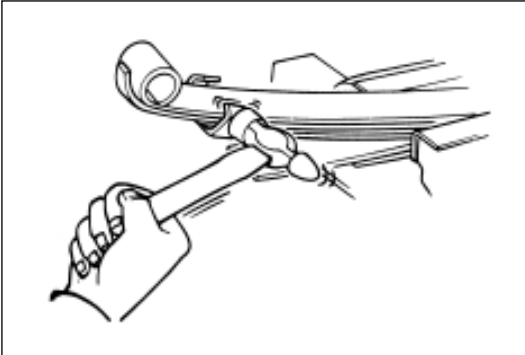
Clamp the spring with a table vice at the position near to the central bolt to take apart the central bolt.



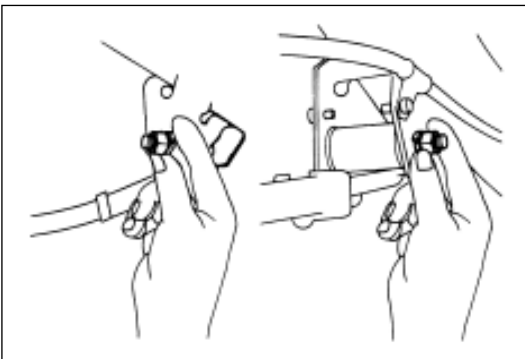
3. Change the spring clip if necessary;
  - (a) Cut the rivet-head with a drill-head and tap the rivet out.
  - (b) Tap a new rivet in the hole of leaf spring and spring clip and rivet it with pressure machine.



4. Mount the central bolt of leaf spring;
  - (a) Align the bolt with the spring hole after clamping the steel spring with a table vice.
  - (b) Mount on and tighten the spring central bolt.
 Tighten torque:  $(50 \pm 5) \text{N} \cdot \text{m}$

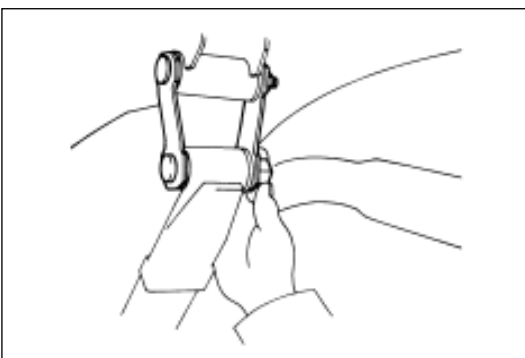


5. Bend the spring clip to a correct angle.  
Bend the spring clip to the correct position with a hammer.

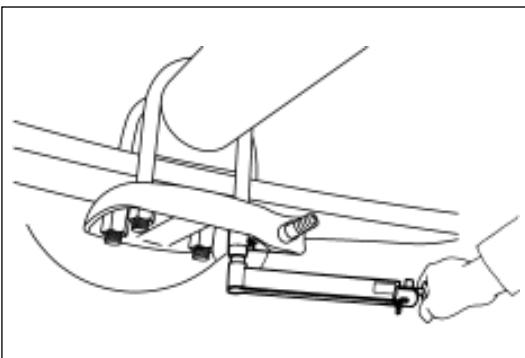


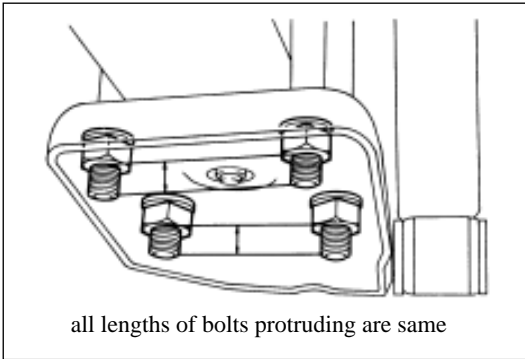
## Mount of leaf spring

1. Mount the steel spring;
  - (a) Encase the front end of leaf spring into the front bracket;
  - (b) Mount on the bolt of front ear pin.
  - (c) Screw on the nut of front ear pin with fingers;
  - (d) Encase the rear end of leaf spring into the rear bracket and mount on the rear ear pin.
  - (e) Mount on the leaf and tighten the nuts with fingers.

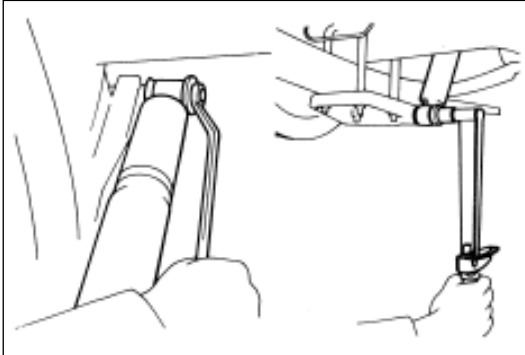


2. Mount the U-shaped bolt;
  - (a) Mount the U-shaped bolt on the axle housing.
  - (b) Mount the spring seat and nut under the steel spring.
  - (c) Tighten the mounting nut of U-shaped bolt.
 Tightening moment:  $(110 \pm 0) \text{N} \cdot \text{m}$





Remark: Tightening U-shaped bolt to the degree that the protruding lengths of all U-shaped bolts under the spring seat are the same.



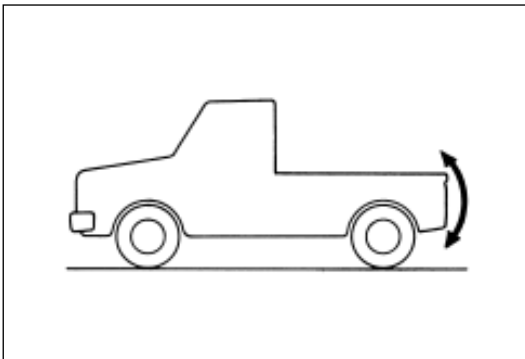
3. Mount the rear vibration damper

- (a) Connect the vibration damper to the vehicle frame with bolts and then tighten the bolts.

Tightening moment: (25 )N • m

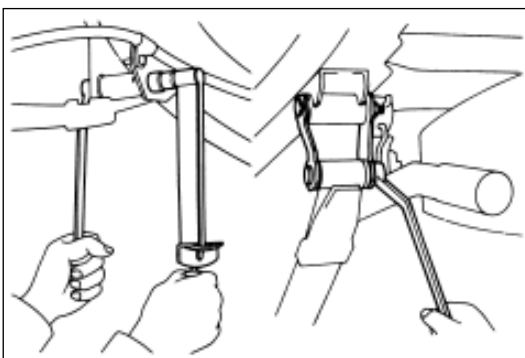
- (b) Connect the vibration damper to the spring seat with bolts and tighten these bolts.

Tightening moment: (25 )N • m



4. Keep the suspension frame in stable status;

- (a) Mount on the wheel;
- (b) Remove the bracket, and make the vehicle bounce vertically for several times so as to conduct it in stable status.



5. Tighten the front ear pin and rear ear pin;

Tighten the nuts of front ear pin;

Tightening moment: (90 0)N • m

Tighten the nuts of rear ear pin;

Tightening moment: (90 0)N • m

# Braking System

	Page
Notice .....	BR-2
Troubleshooting .....	BR-2
Inspection and Adjustment .....	BR-5
Master Cylinder .....	BR-8
Vacuum Booster .....	BR-10
Front Brake .....	BR-13
Dr .....	BR-13
SF .....	BR-20
Rear Brake .....	BR-26
Dr .....	BR-26
SF .....	BR-34
Load sensing proportion valve .....	BR-42



## Notice:

1. Carefully change each part where necessary because any mistake will affect the brake system properties, and will lead accidents during driving. And the parts to be changed must be the same in part number or equal in quality.
2. Keep the parts and each position clean when repairing the braking system.

## Troubleshooting

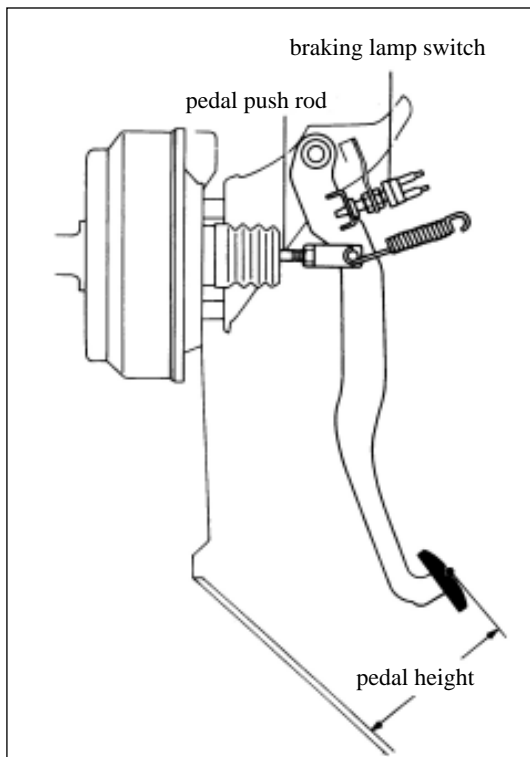
Trouble	Causes	Inspection items
Lower or soft pedal	Abrasion of brake shoe Abrasion of brake pad Oil leakage of braking system Master cylinder failure Air in braking system Wheel-brake cylinder failure Failure in the automatic regulator of rear brake.	Change the brake shoe; Change the brake pad; Repair the oil leakage; Change the master cylinder; Drain out the air from braking system; Change the wheel-brake cylinder; Repair or change the regulator
Brake stagnant	Poor adjustment of parking brake; The bracing wire of parking brake is seized; Poor adjustment of vacuum booster pushrod) Failure of the drag spring or the return spring Pipe line blockage Brake shoe breakage or deformation Brake pad breakage or deformation Seizing of the wheel-brake cylinder or the brake caliper piston Automatic regulator breakage Master cylinder failure	Adjust the parking brake; Make repairing according to real situation; Adjust the drag rod; Change the drag spring or the return spring Make repairing according to real situation; Change the brake shoe Change the brake pad Make repairing according to real situation; Change the regulator Change the master cylinder
Over large braking distance	Unsuitable tire inflation There is oil stain or lubricant on the brake shoe or brake pad; Brake shoe deforms, the brake liner is worn or polished; Brake pad deforms or is worn or polished; Brake drum or brake disc deforms Drag spring or return spring has trouble The wheel-brake cylinder has trouble The inner piston of wheel-brake cylinder is seized; The brake pad is seized;	Inflate the air to suitable pressure; Change the brake shoe or the brake pad; Change the brake shoe; Change brake pad Change the brake drum or the brake disc; Change the spring; Change the wheel-brake cylinder; Change the wheel-brake cylinder Change the brake pad
The brake pedal is hard but doesn't work;	There is oil stain or lubricant on the brake shoe or brake pad; The brake shoe deforms, brake liner is worn or polished, or the brake wheel is worn; The brake pad deforms, or is worn or polished; The piston of wheel brake pump is seized; The vacuum booster has trouble The vacuum degree is unsuitable The brake pipe line is blocked	Change the brake shoe brake pad; Change the brake shoe Change the brake pad; Change the wheel-brake cylinder; Change the vacuum booster; Make repairing according to real situation; Make repairing according to real situation;

## Troubleshooting (continued)

Trouble	Causes	Inspection items
There is clatter noise when using the brake	(Drum-type brake) The brake shoe is seized on the flange of rear baffle; The flange of rear baffle is worn; The pressure spring of brake shoe is loose or missing; The fixed bolts of brake bottom plate is loose; (disc type brake) The brake pad support plate is loose or missing The mounting bolts are loose;	Add lubricant Change the lubricating flange Change Tightening it  Change Tightening it
There is hoarse noise or quack-quack when using the brake	The brake shoe or brake pad is worn;  The brake caliper, the wheel or the rotator interferes each other.  There is friction between the dust cover and brake disc, the brake bottom plate and the brake drum; The other braking part has trouble There is friction between the tire and body	Change the part, and re-process precisely the brake drum or rotator if the abrasion is serious; Make change according to real situation; repair or change Make repairing according to real situation; Change Check or maintain the part
There is such noise as continuous screaming, quack-quack, oscillating sound, etc. Notice: the braking materials may generate the natural noise and heat during friction, and thus emit the energy. Therefore, it is normal to have the screaming noise. These phenomena will be more serious under the condition of frigidity, torridity, and over humidity, snowing and mud. the screaming noise occurring occasionally will not lead the fatal brake trouble nor reduce the effective properties of the brake.	The brake drum, brake liner, liner or brake pad is worn or scraped The brake liner or brake pad is dirty or with oil stain or polished. The brake liner or brake pad is improperly used. The brake pedal or vacuum booster drag rod is unsuitably adjusted. (disc type brake) The brake pad silent pad is loss or damaged; The brake pad is worn to the degree that the abrasion-indicating lamp of brake pad has friction with the rotator. There is burr or rust on the brake caliper. (Drum type brake) The pressure spring of brake shoe is soft in rigidity, or is damaged or unsuitable. The pressure spring pin or spring of brake shoe is loose or damaged; There is crack on the brake bottom plate flange	Check, repair or change  Clean or change  Check or change Check for adjustment  Change Change  Clean or polish the burr  Check, repair or change  Check, repair or change  Check, repair or change

## Troubleshooting (continued)

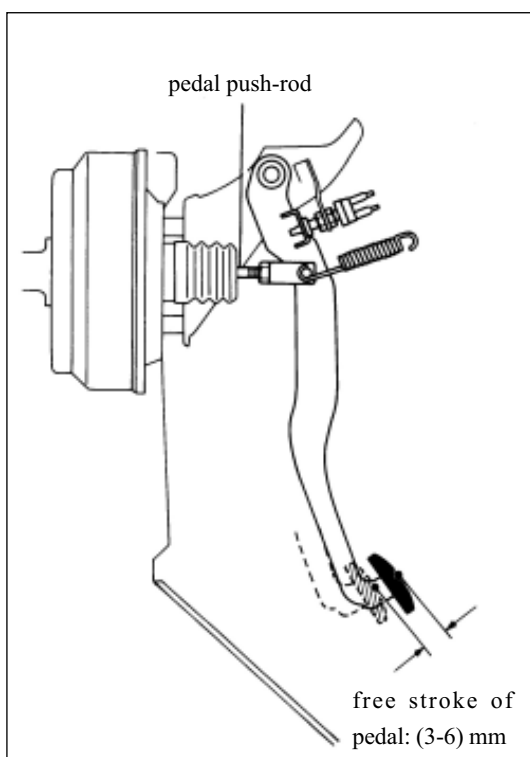
Trouble	Causes	Inspection items
There are quack-quack noises without using the brake.	<p>Alien materials such as stone is reeled inside the wheel shell</p> <p>Nuts on hub is loose;</p> <p>The brake pedal or vacuum booster pushrod is adjusted improperly;</p> <p>The wheel bearing is worn or damaged or lubricated insufficiently; (disc type brake)</p> <p>The outer end edge of brake pad support plate or brake pad is dog-eared;</p> <p>The silent pad is poor in properties;</p> <p>The sliding liner is worn;</p> <p>The mounting bolt is loose</p> <p>The piston returns incompletely (drum type brake)</p> <p>There is loose or redundant part.</p>	<p>Clear away the alien materials</p> <p>Tighten the nut to the specified torque; and change it in case the bolt hole is enlarged;</p> <p>Check and adjust</p> <p>Check, lubricate or change</p> <p>Check repair or change</p> <p>Check and make change according to real situation</p> <p>Check and make change according to real situation</p> <p>Check and tighten according to the necessity.</p> <p>Check, repair or change</p> <p>Check, take out or repair.</p>
There is continuous screaming noise without using brake	<p>The brake pedal or vacuum booster pushrod is adjusted improperly</p> <p>The vacuum booster, master cylinder or wheel-brake cylinder returns incompletely. (Disc type brake)</p> <p>The piston is rusted or seized;</p> <p>The brake pad in brake caliper locates improperly;</p> <p>There is friction between the brake disc and brake caliper shell;</p> <p>The brake pad support plate is mounted improperly;</p> <p>There is interference between the abrasion indicating lamp of brake pad and the brake disc due to the brake pad abrasion; (Drum type brake)</p> <p>The pressure spring of brake shoe is soft rigidity, damaged or unsuitable;</p> <p>There is crack on the brake bottom plate flange;</p> <p>There is interference of brake bottom plate with the brake drum after it is bending or warping.</p> <p>The brake drum interferes with the brake bottom plate or with brake shoe due to it is processed improperly;</p> <p>Other brake parts;</p> <p>There is loose or redundant part in braking system;</p> <p>The brake liner is polished due to it is adjusted over-tightly;</p> <p>The wheel bearing is worn, damaged or lubricated insufficiently.</p>	<p>Check and adjust</p> <p>Check, repair or change</p> <p>Check and add the lubricant according to the necessity;</p> <p>Repair or change</p> <p>Repair or change</p> <p>Repair or change</p> <p>Change</p> <p>Repair or change</p> <p>Repair or change</p> <p>Change the brake drum</p> <p>Check, maintain and change according to the necessity;</p> <p>Check, maintain and change according to the necessity;</p> <p>Check, maintain and change according to the necessity;</p>



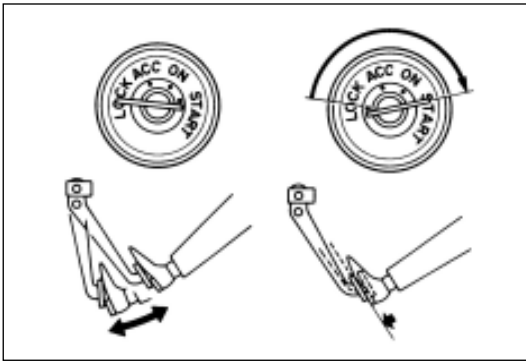
## Inspection and adjustment

### Inspection on and adjustment of brake pedal

1. Check the pedal height as shown in the drawing to whether it is correct,  
 The height from the pedal to the front floor:  
 Dr SF : 160mm  
 SL SK SY SJ : (190-200)mm
2. Adjust the pedal height if necessary:
  - (a) Loosen the locking nuts of braking lamp switch;
  - (b) Loosen the braking lamp switch to the most degree.
  - (c) Loosen the locking nuts of drag rod;
  - (d) Adjust the pedal height through rotating the pedal drag rod;
  - (e) Rotate the stop light switch reversibly until it contact with the stop baffle of pedal.
  - (f) Screw up the two locking nuts.
  - (g) Check the braking lamp is lightened or not when tread down the brake pedal.
  - (h) Check and adjust the pedal free stroke after adjusting the pedal height



3. Inspection on Pedal Free Stroke:
  - (a) Stop the engine working and tread down the brake pedal several times until the vacuum booster is not in the stage of vacuum.
  - (b) Tread down the pedal until the resistance occurs, and measure the distance shown in the drawing.  
 Pedal free stroke: (3-6)mm
4. Adjust the free stroke of pedal if necessary:
  - (a) Loosen the locking nuts of the pedal drag rod and rotate the pedal drag rod to adjust the pedal free stroke.
  - (b) Start the engine to confirm the free stroke.
  - (c) Check the pedal height after adjusting the pedal free stroke.



## Operation test of vacuum booster

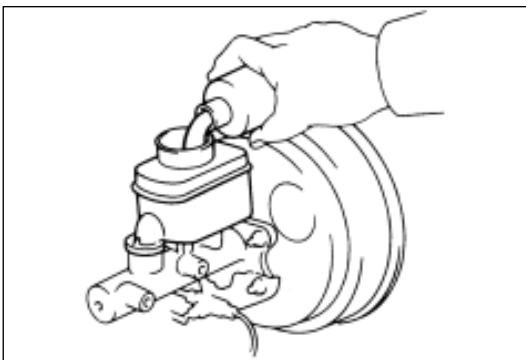
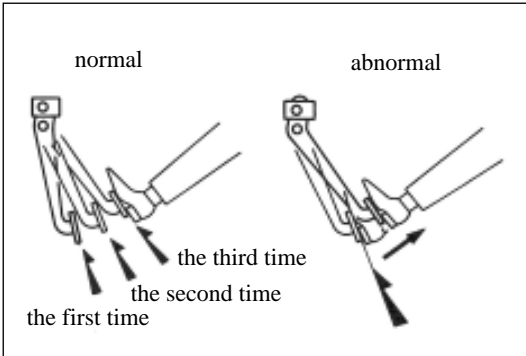
Remark: check the operation of vacuum booster with the vacuum booster tester if workable.

### 1. Operation inspection

- (a) Before starting the engine, tread down the brake pedal several times, and check the pedal reservation distance to ensure there is no change occurs.
- (b) Tread down the brake pedal and start the engine. If the treaded pedals continue to move downward, which means the operation is normal.

### 1. Inspection on Air-tight

- (a) Start the engine for 1-2 min and then turn it off. Then tread down the brake pedal slowly for several times, if the pedal move downward continuously in the first, but return gradually in the second or third time, which means the vacuum booster has a good air-tight.
- (b) Tread down the brake pedal when the engine is working, then stop the engine, but tread the pedal down. If the reservation distance doesn't change within the 30 seconds, which shows the air tight of vacuum booster is good.



## Air-bleeding of braking system

Remark: air-bleeding is required if any operation for braking system is conducted or the pipe line is doubted to have air.

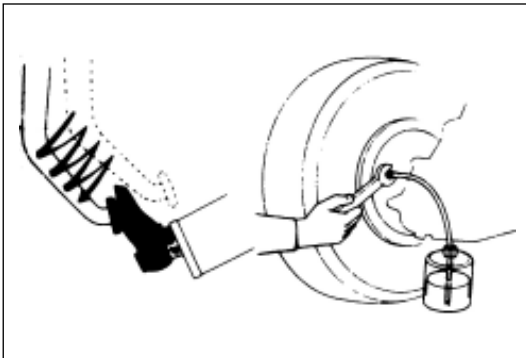
### 1. Fill the oil cup with the brake liquid

Check the liquid level of oil cup after the air in each wheel brake pump is exhausted. If necessary, add the brake liquid.

### 2. Connect the vinyl resin pipe with the vent screws.

Insert the other end of pipe into the container with half brake liquid.

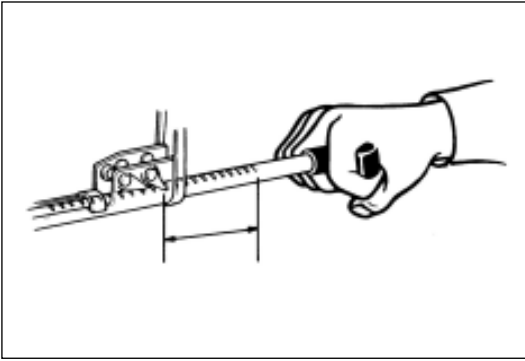
Remark: the air-bleeding shall begin from the longest pipe line when the wheel-brake cylinder is exhausting the air.



### 3. Air exhaust of the pipe line in braking system

- (a) Tread down brake pedal slowly several times.
- (b) Loosen the vent screws until the brake liquid flows out while letting the assistant tread down the pedal. Then screw up the vent screws.
- (c) Repeat this approach until there is no air in the liquid.

### 4. Repeat the approach for the wheel-brake cylinder.



## Check and adjust the parking brake

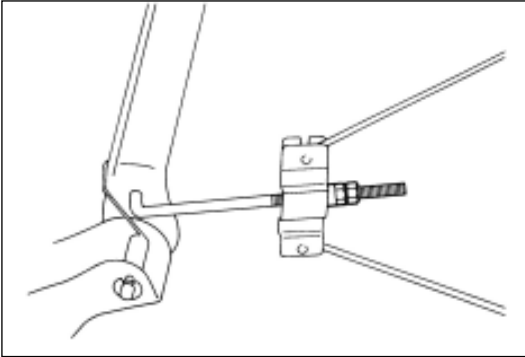
1. Check the stroke of operating lever of the parking brake to see whether it is correct.

Drag the brake operating lever to the max stroke and count the grooves it passes.

Stroke of operating lever of parking brake:

Dr: (9-10) Teeth

SL SK SY: (7-9) Teeth



2. Adjust the parking brake lever where necessary:

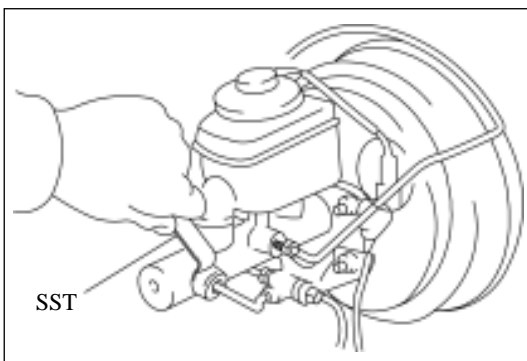
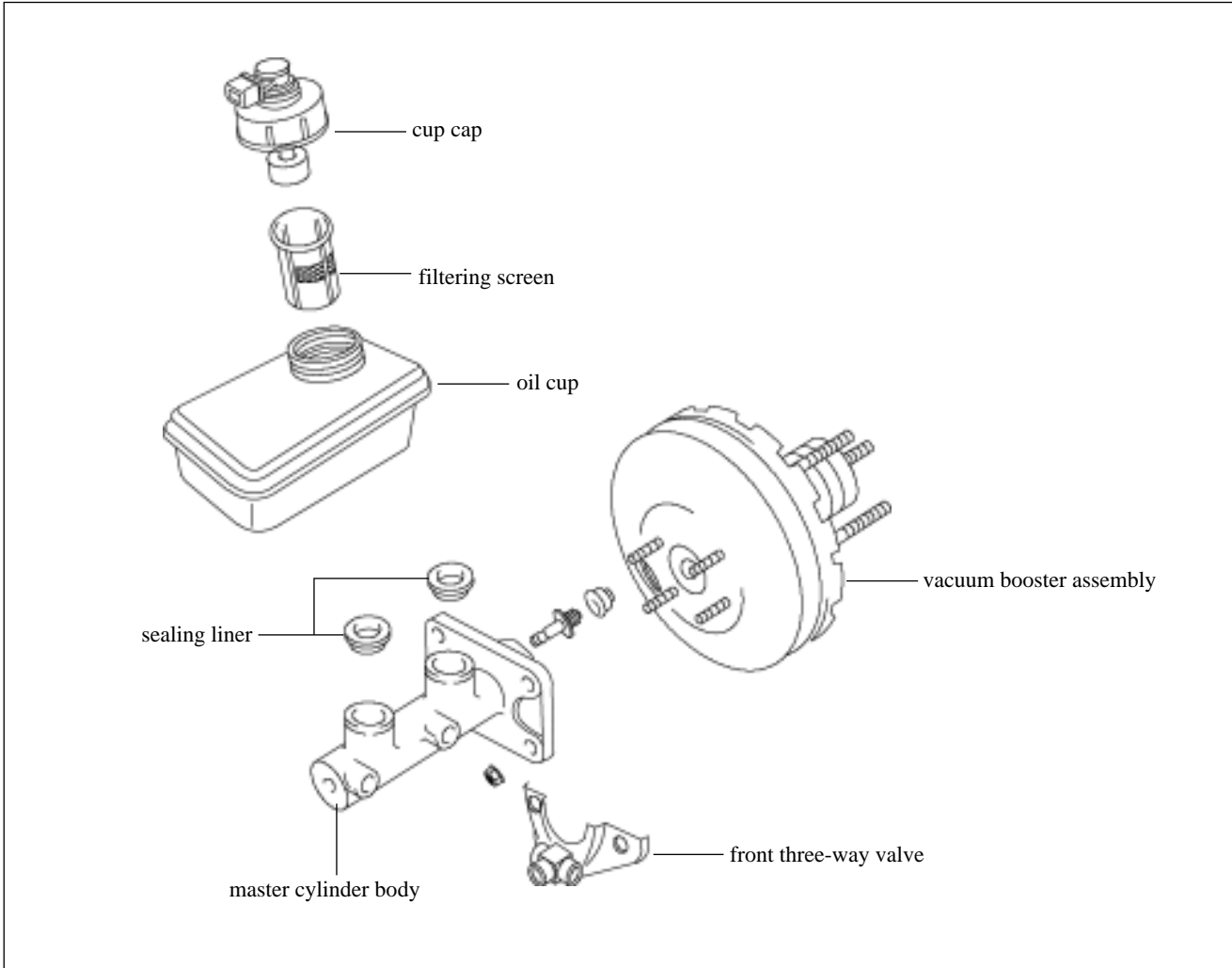
Remark: Adjust the rear brake shoe clearance before the adjustment.

Brake shoe clearance: 0.6mm

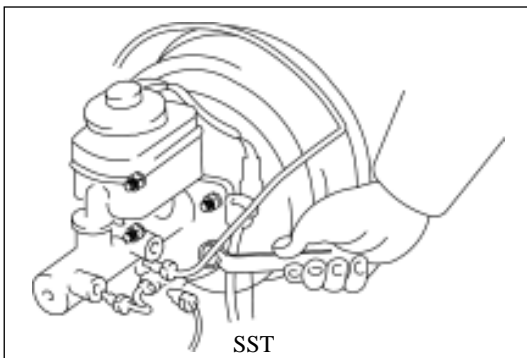
- (a) Loosen the locking nut and then rotate the adjustable nut until the stroke is correct, then screw up the nuts.
- (b) The brake shoe shall not be stagnant after the adjustment.

## Master Cylinder

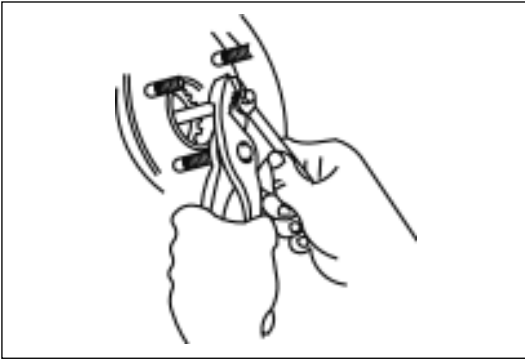
### Disassembly of Master Cylinder



1. Tear down the alarm joint for liquid level;
2. Exhaust the brake liquid with the injector:  
Notice: brake liquid must not be left on the paint surface, if any, clear it away.
3. Tear down the pipeline of braking system;  
Tear down the pipeline of braking system from the master cylinder with SST.

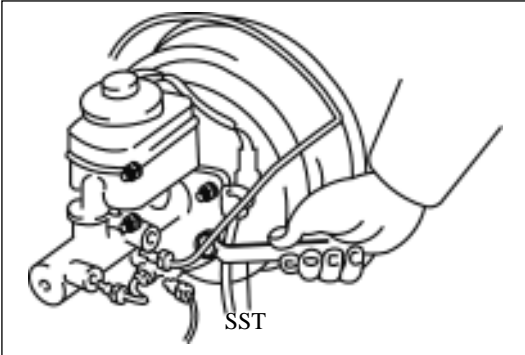


4. Take apart the master cylinder:
  - (a) Tear down the four nuts and the three-way joint.
  - (b) Tear down the master cylinder and sealing washer from the vacuum booster

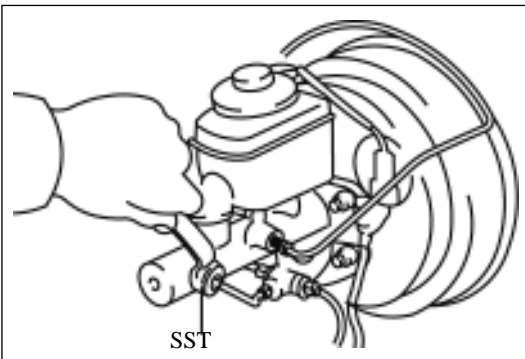


## Mount of Master Cylinder

1. Adjust the length of vacuum booster pushrod before mounting the master cylinder;



2. Mount the master cylinder:  
Mount the master and sealing washer on the vacuum booster with four nuts.



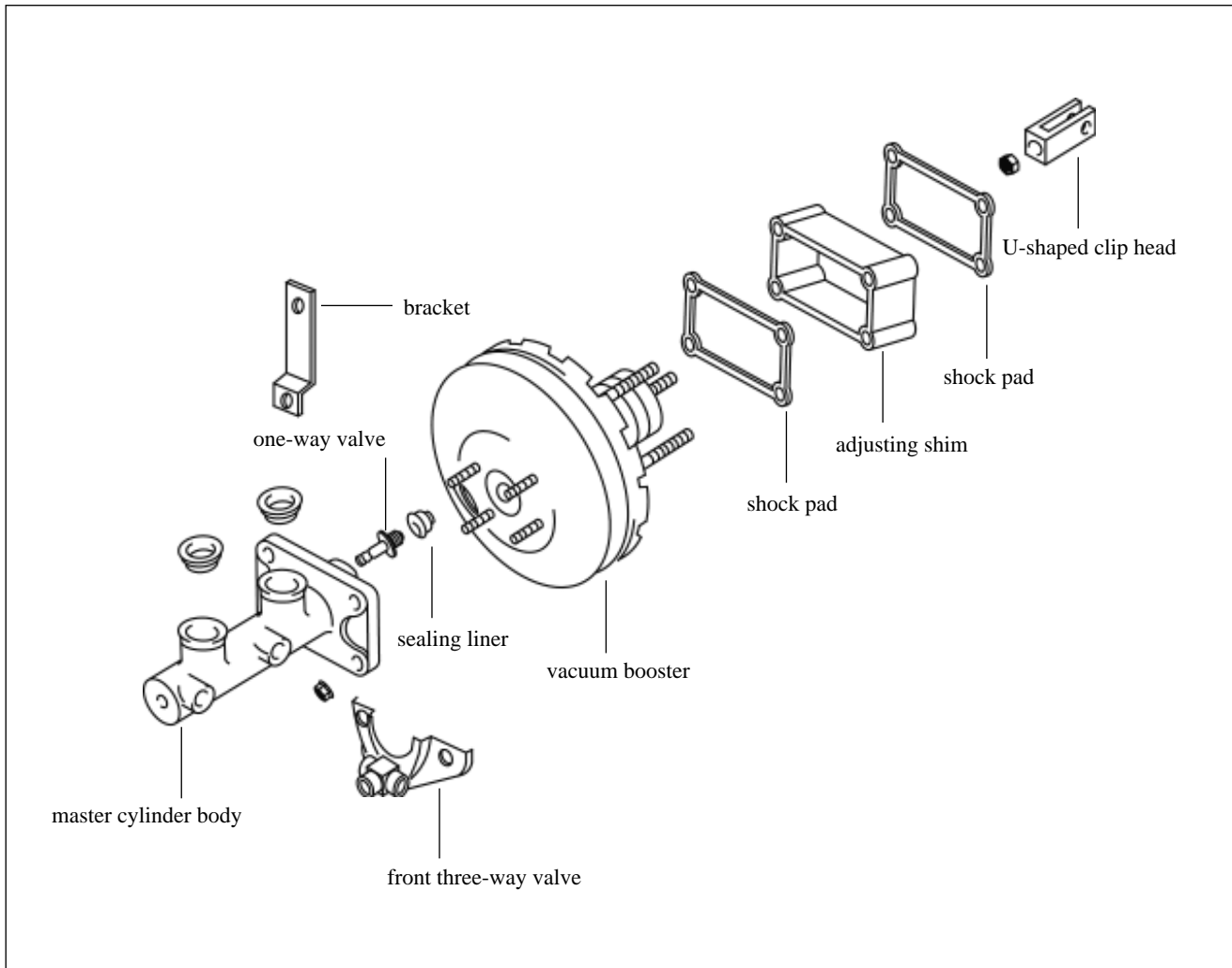
3. Connect the two pipelines of braking system;  
Mount the brake pipeline on the master cylinder with SST and screw up the nuts.  
Fastening torque:  
Dr SF:  $(18 \pm 2) \text{N} \cdot \text{m}$   
SL SK SY SJ:  $(19 \pm 1) \text{N} \cdot \text{m}$

4. Connect the alarm switch joint for liquid level;
5. Fill the oil cup with brake liquid and exhaust the air in the brake pipeline;
6. Check to see whether there is brake liquid leakage;
7. Check and adjust the brake pedal.



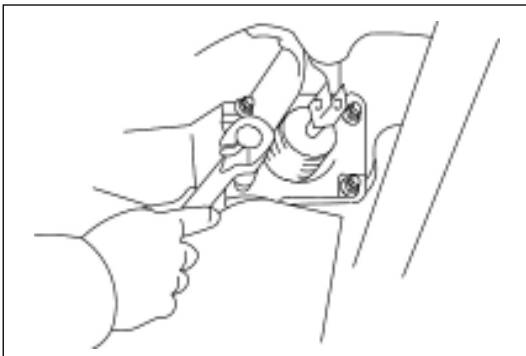
## Vacuum booster

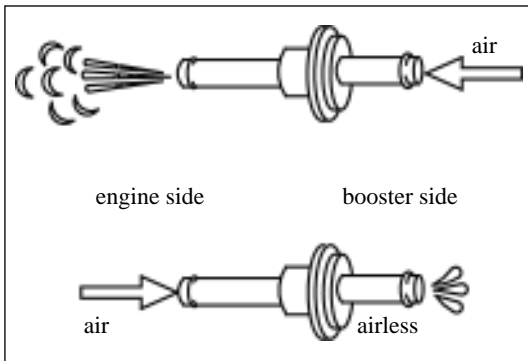
### Disassembly of Vacuum Booster



### Disassembly of Vacuum Booster

1. Take apart the master cylinder
2. Tear down the vacuum hose from the vacuum booster
3. Tear down the return spring
4. Tear down the clamping pin and U-shaped clamping pin
5. Tear down the vacuum booster, sealing washer and U-shaped clamping head





## Inspection on Vacuum booster parts

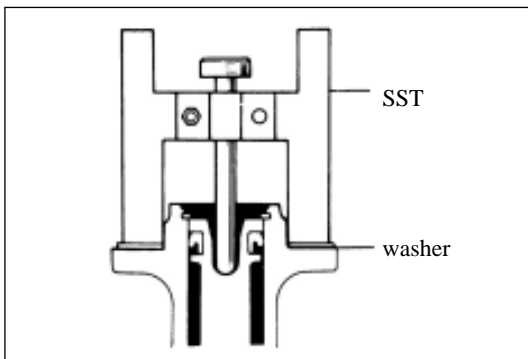
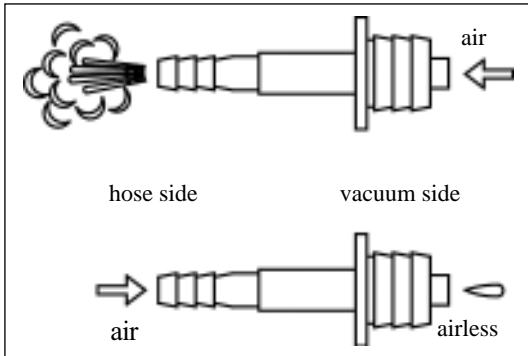
### Operation for one-way valve inspection

#### (Gasoline engine)

- Tear down the one-way valve;
- Check the air to see whether it flows from the vacuum booster side toward the engine side.
- Check the air, change the one-way valve if the air flows from the side of engine toward the vacuum booster.
- Mount the one-way valve in the right place.

#### (Diesel engine)

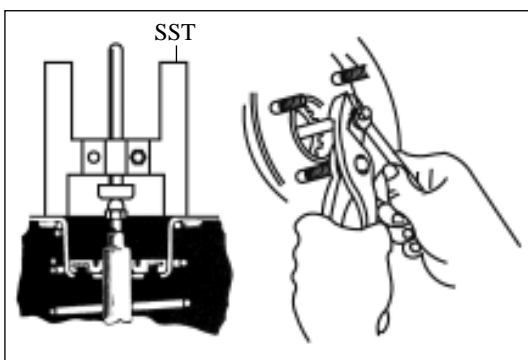
- Tear down the one-way valve from the vacuum pipe.
- Check the air to see whether it flows from the side of vacuum room to the hose.
- Check the air, and change the one-way valve if the air flows to the hose to the vacuum room.



## Mount of Vacuum Booster

### 1. Adjust the length of vacuum booster pushrod:

- Mount the sealing washer on the master cylinder;
- Put SST on the sealing washer and descend the pin rod until it contact lightly the piston with its top;
- Put top of SST downward ,and mount it on the vacuum booster.
- Check the clearance between the vacuum booster pushrod and the head of pin on SST.
- Adjust the length of vacuum booster pushrod until the pushrod touches the pinhead.

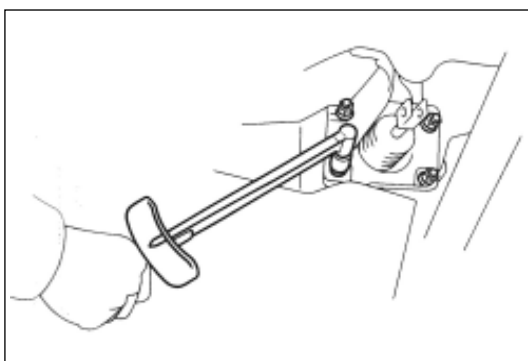


### 2. Mount the vacuum booster, sealing washer and Ushaped clip head.

- Mount the vacuum booster and sealing washer.
- Mount the U-shaped clip head.
- Mount and tighten the assembling nuts of vacuum booster.

### 3. Connect the U-shaped clip head and the brake pedal:

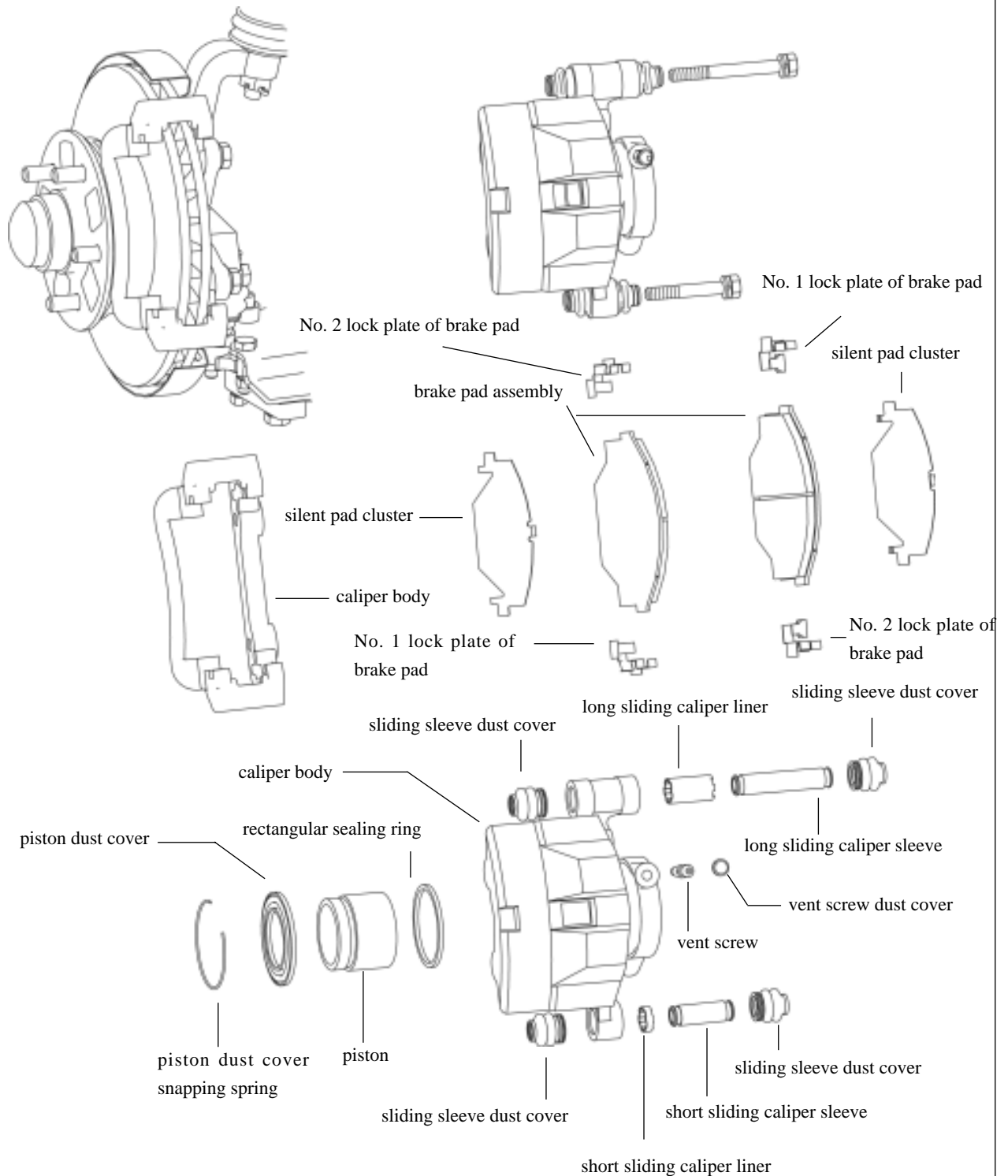
Encase the U-shaped clamping pin in the hole of U-shaped clip head and the brake pedal, and then mount the spring pin on the U-shaped clamping pin.

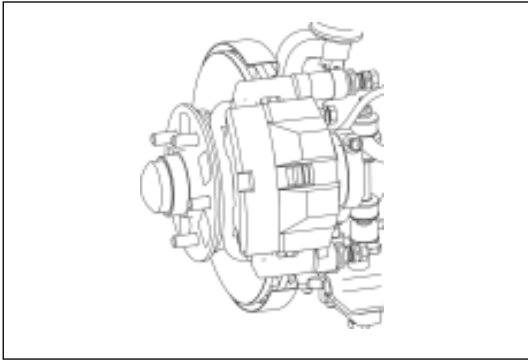


4. Mount the pedal return spring.
5. Mount the brake master cylinder  
(see Page BR-8)
6. Connect the hose and the vacuum booster.
7. Fill the oil cup with brake liquid and exhaust the air in  
braking system.  
(see page BR-6)
8. Check the liquid leakage;
9. Check and adjust the brake pedal  
(See page BR-5)
10. Check the operation  
(See Page BR-6)

## Front Brake Element figure

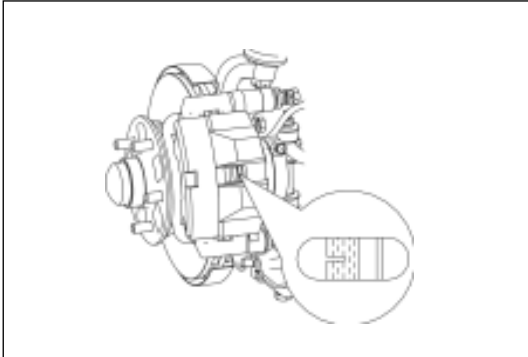
Dr





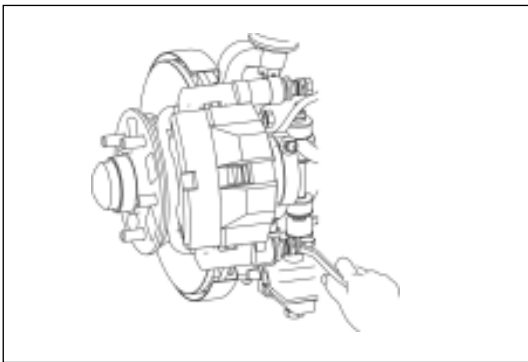
## Brake pad change

Remark: Check the thickness of the friction material of brake pad through the observation hole on caliper body after the vehicle covers thirty thousand; if the thickness fails to fall within the specified range, change is required. (If the brake is used often, the thickness of friction materials of brake pad is required to check whether it is within the specified range after the vehicle covers more than ten thousand, if not, change it.

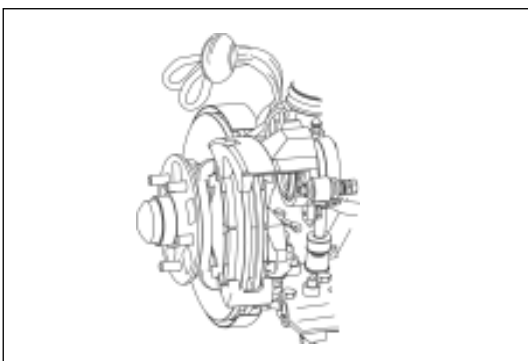


1. Tear down the front wheel;
2. Check the thickness of friction material of brake pad:  
Check the thickness of friction material of brake pad through the observation hole on caliper body, if it fails to be within the specified range, change it.

Min thickness: 2.0mm

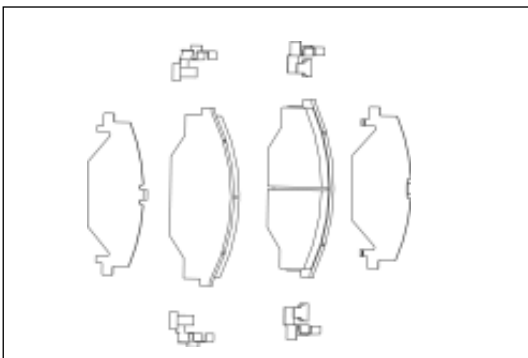


3. Raise the wheel-brake cylinder:
  - (a) Tear down the short bolts of sliding sleeve;



- (b) Uplift the wheel brake pump and hang it with rope to protect the brake oil pipe.

Remark: Do not loosen the brake oil pipe and the bleeding plug.



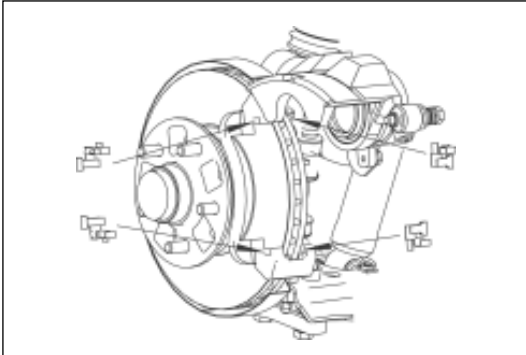
4. Tear down the following parts:
  - (a) Two braking pads;
  - (b) Two silent pad clusters;
  - (c) Four braking pad lock plates.

## 5. Brake disc measurement

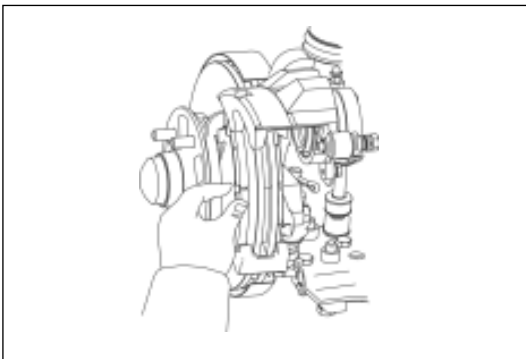
(See page BR-17)

## 6. Measure the radial run-out of the brake disc;

(See BR-18)



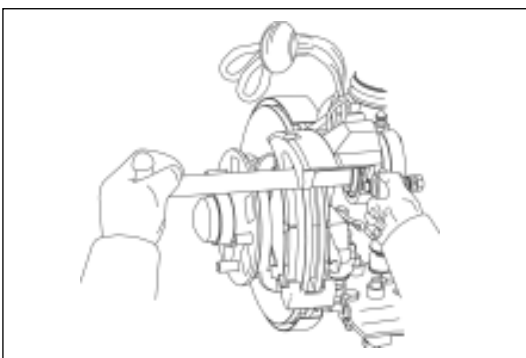
## 7. Mount the lock plate of brake pad.



## 8. Mount the new brake pad.

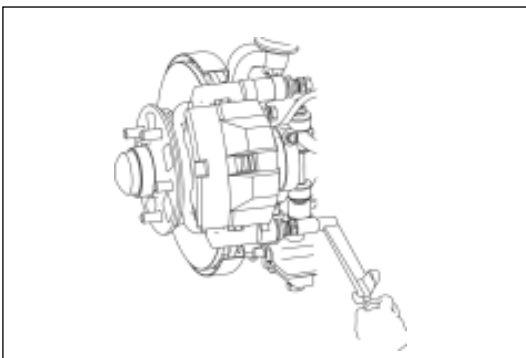
- (a) Mount the silent pad cluster on brake pads of both the inner and outer sides;

Remark: Pollution of oil stain or coat is not allowed on the work faces of brake pad or brake disc.



- (b) Draw out a little brake liquid from the liquid container to prevent the brake liquid overflowing from the liquid container;

- (c) Press in the piston with the hammer lever or similar tool.



## 9. Mount the wheel-brake cylinder;

Mount and screw up the hex bolts (the hex bolts shall be coated with the thread locking sealing agents.

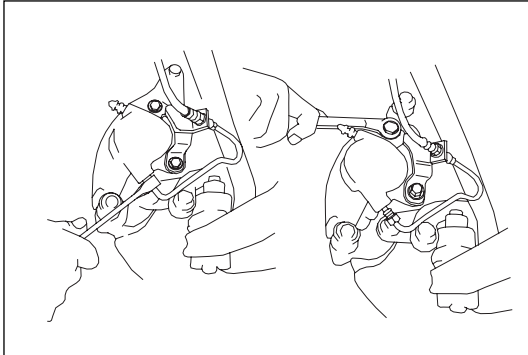
Fastening torque: (38-50)N • m

Remark: only one brake pad can be changed in one time so as to prevent the piston of other wheel being shot out.

## 10. Mount the front wheel;

Screw up the fixing nut of wheel.

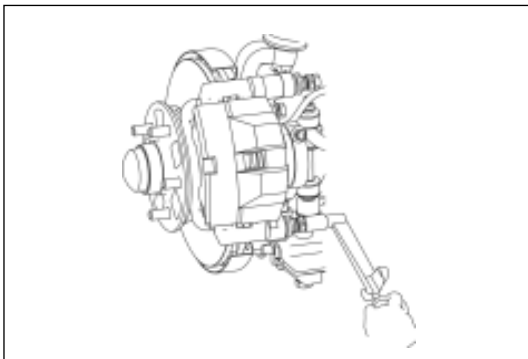
Fastening torque: (135 ~ 150)N · m



## Disassembly of Wheel-brake Cylinder

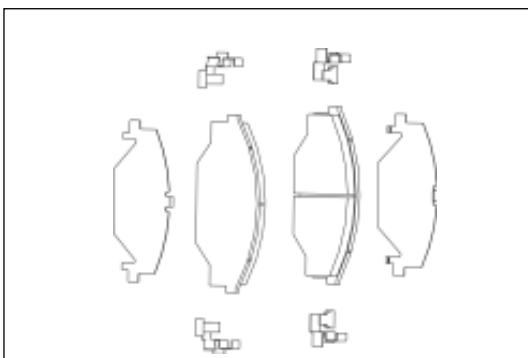
## 1. Take apart the brake pipeline.

- (a) Tear down the brake pipeline. And block the outlet with a clean cork.
- (b) Tear down the brake oil pipe bracket from the wheel-brake cylinder.



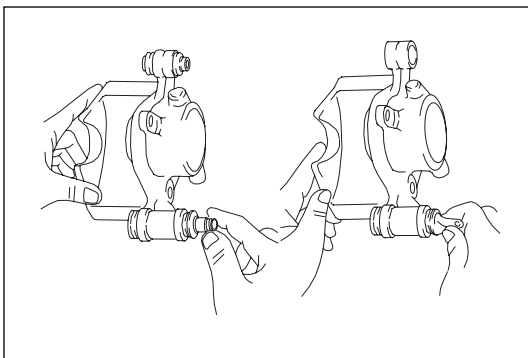
## 2. Tear down the wheel-brake cylinder from the caliper bracket.

Tear down the two hex bolts and the wheel-brake cylinder.



## 3. Tear down the brake pad:

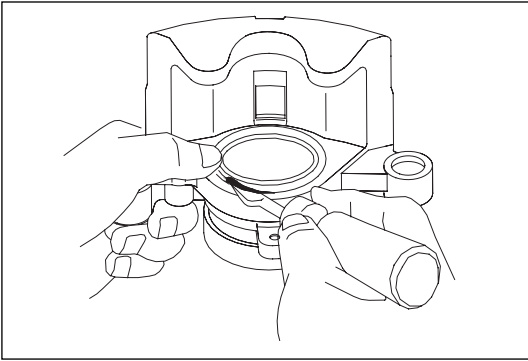
- (a) Two brake pad;
- (b) Two silent pad cluster;
- (c) Four brake pad lock plate.



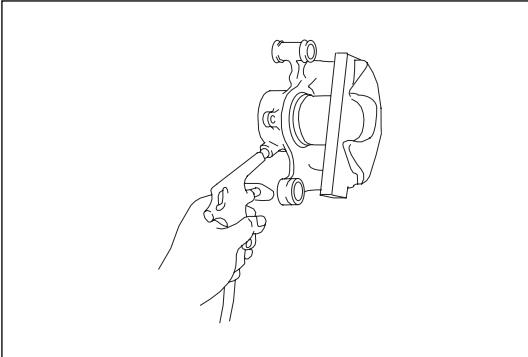
## Pump Disassembly of Wheel brake

## 1. Take apart the following parts:

- (a) Two sliding sleeve;
- (b) Four sliding sleeve dust cover;
- (c) Two sliding liner.

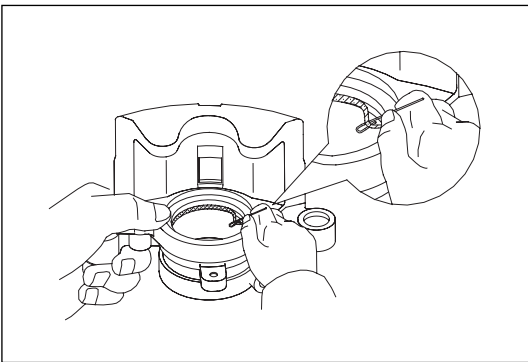


2. Tear down the piston dust cover snapping ring and the piston dust cover;  
Tear down the piston dust cover snapping ring and the piston dust cover with screwdriver.

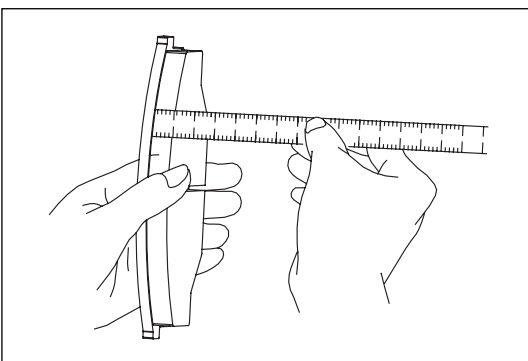


3. Tear down the piston from the wheel-brake cylinder:
  - (a) Put a wooden plate between the piston and the caliper body.
  - (b) Tear down the piston from wheel-brake cylinder with the compressed air.

Warning: Do not put your finger in front of the piston when using the compressed air.

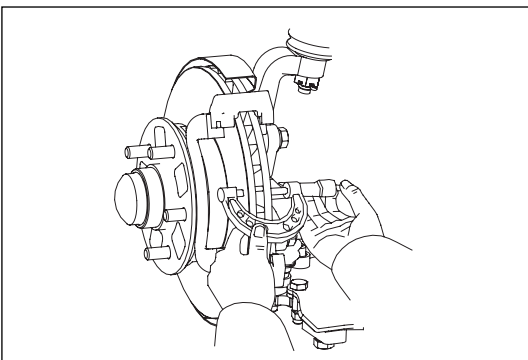


4. Tear down the piston sealing ring from the caliper body.  
Tear down the piston sealing ring with bent needle.  
Notice: the tools used shall not be sharp so as not to scrape the piston sealing ring.



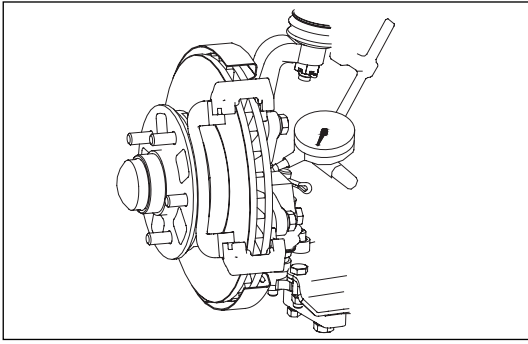
### Check the front brake parts

1. Measure the thickness of brake pad liner;  
Standard thickness: 10.0mm  
Min thickness: 2.0mm  
If the thickness is less than the min thickness or is unevenly worn; change the brake pad.

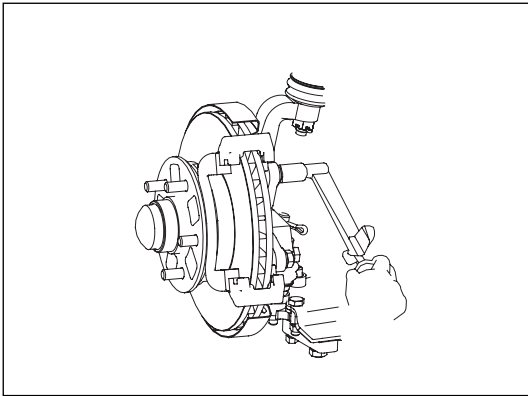


2. Measure thickness of brake disc  
Standard thickness: 25.0mm  
Min thickness: 23.0mm  
If the brake disc is scraped, repair it, if the brake is serious worn to the degree that its thickness is less than the min thickness, brake disc requires to be changed

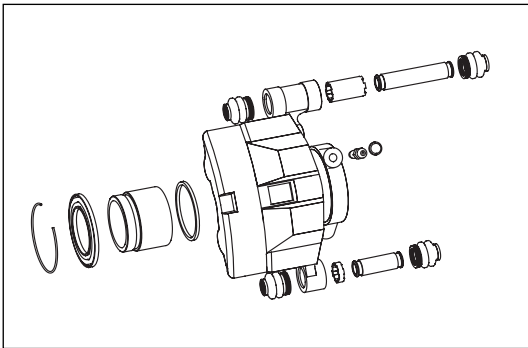




3. Measure the bouncing value of the brake disc face;  
 Remark: verify the bearing is aligned correctly before measuring.  
 The bouncing value of max face: 0.11mm



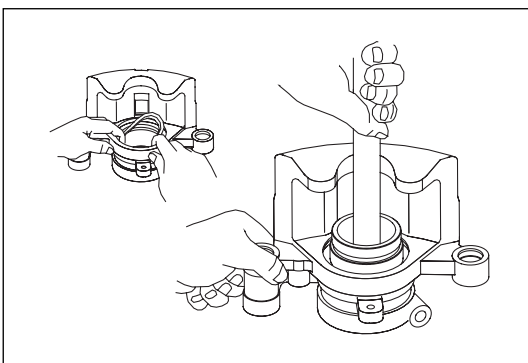
4. Change the brake disc according to the requirements
  - (a) Tear down the calipers body from the steering knuckle.
  - (b) Tear down the hub and the brake disc (See Page SA-11).
  - (c) Mount the new brake disc and screw up the connecting bolts according to the specified torque.  
 Fastening torque : (60 ~ 79)N.m
  - (d) Mount the hub and brake disc assembly (see page SA-12);
  - (e) Mount the caliper bracket on the steering knuckle and screw up the bolts according to the specified torque.  
 Fastening torque : (85 ~ 105)N.m



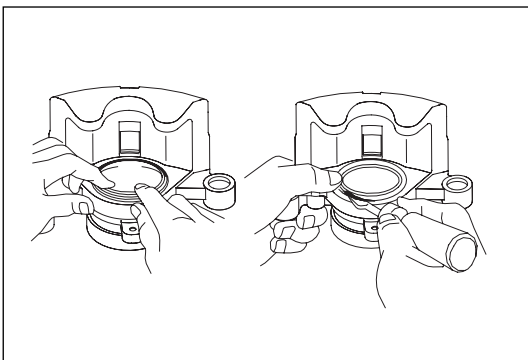
## Cylinder Assembly of Wheel-brake

### 1. Preparation

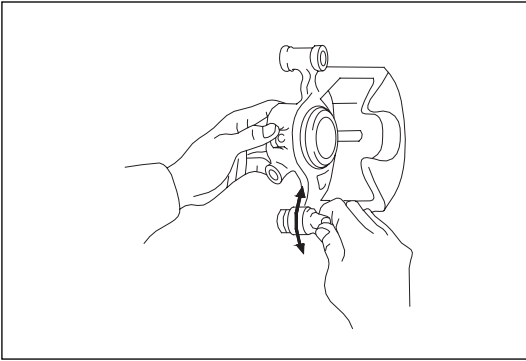
All parts shall be washed, dried and cleared away the alien materials before the assembly. And coat moderate vacuum silicon base grease on the work faces of sliding sleeve dust cover, sliding sleeve and the sliding liner; and plaster the moderate rubber lubricant on the work faces of piston, piston dust cover and the rectangular sealing ring.



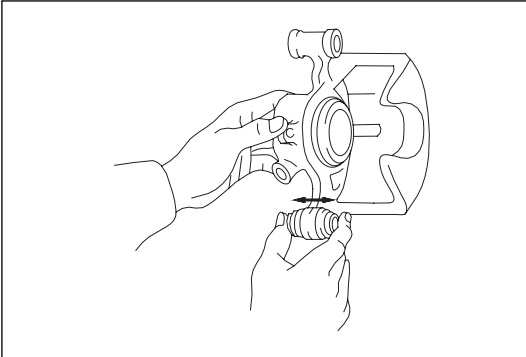
2. Encase the piston sealing ring and piston in the caliper body;
  - (a) Screw the vent screw in the vent hole of calipers.  
 Fastening torque : (8 ~ 13)N.m
  - (b) Coat moderate rubber lubricant on the work face rectangular sealing ring and encase the caliper body in groove.
  - (c) Encase the piston in the caliper body.



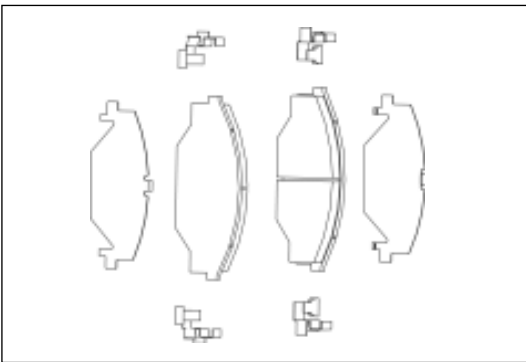
3. Encase the piston dust cover and the dust cover snapping in the wheel-brake cylinder.



4. Mount the sliding liner, sliding sleeve dust cover and sliding sleeve.
  - (a) Encase the sliding liner and sliding sleeve dust cover in the wheel-brake cylinder.
  - (b) Ensure the sliding sleeve dust cover in the ring groove of wheel-brake cylinder hard.

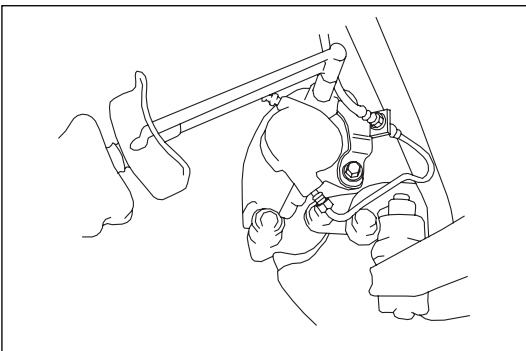


- (c) Encase the sliding sleeve in the sliding sleeve dust cover.
  - (d) Ensure the sliding sleeve dust cover in the ring groove of sliding sleeve.



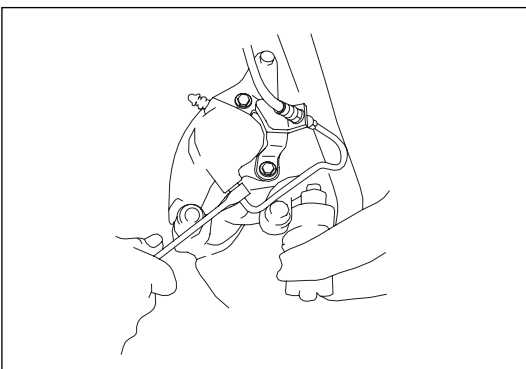
## Mount of Brake Calipers

1. Mount the brake pad;



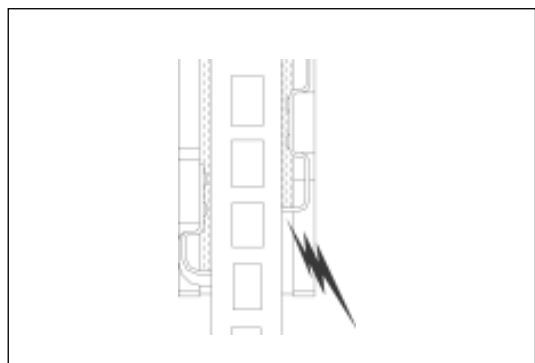
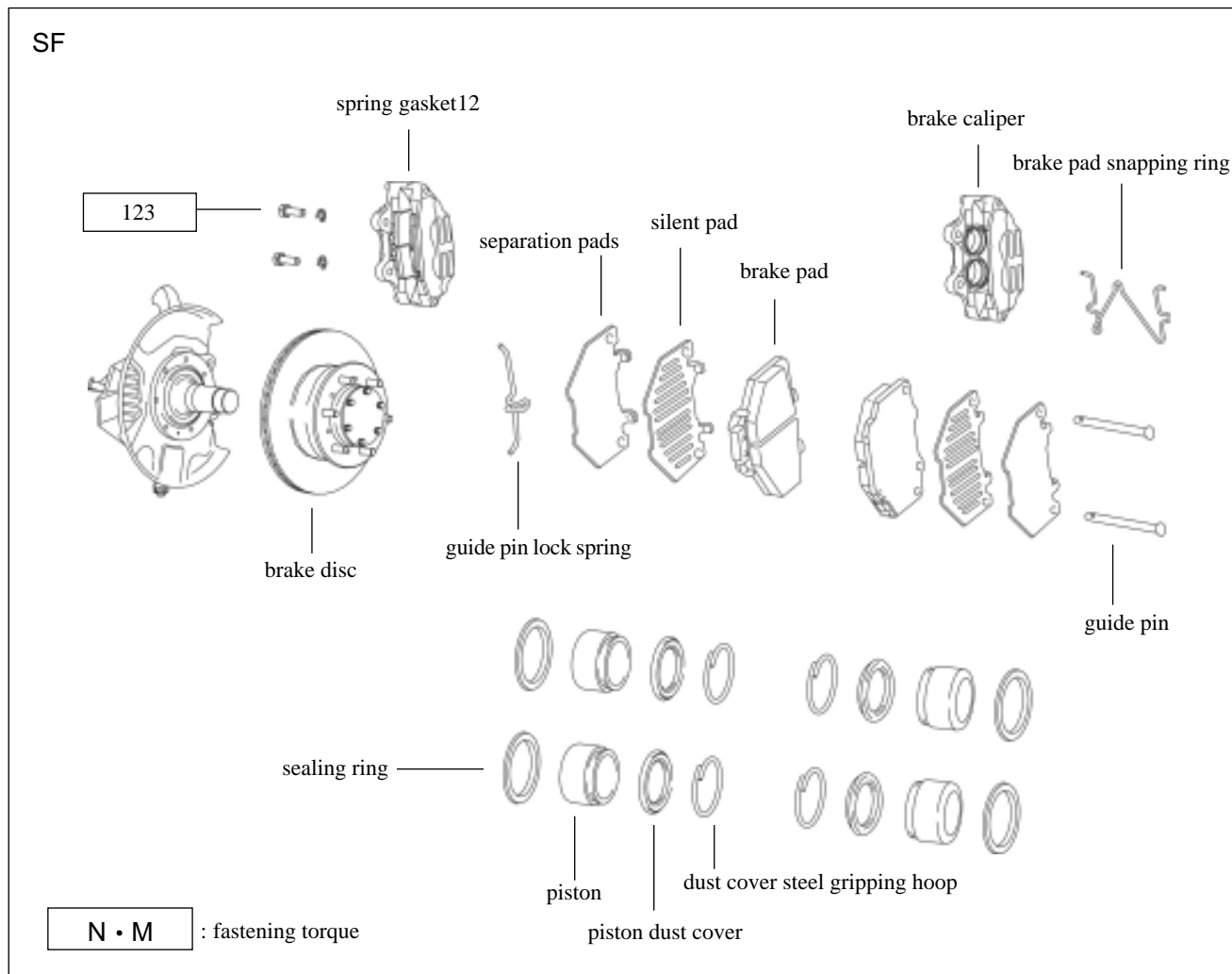
2. Mount the wheel-brake cylinder:
  - (a) Mount the wheel-brake cylinder;
  - (b) Mount and tighten the two assembling bolts (the bolts shall be coated with the thread locking sealing agent).

Fastening torque: (38 ~ 50)N.m



3. Connect the brake pipeline.  
Connect the brake pipeline with the calipers.  
Fastening torque: (21 ± 2)N.m
4. Observe the height of brake liquid level and, if necessary, add in the brake liquid and exhaust the air in braking system.  
Notice: prevent the brake liquid from spraying on the brake disc when exhausting air.
5. Check to see whether there is leakage of brake liquid.

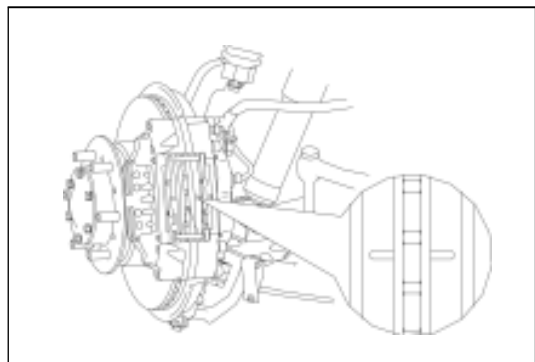
## Front Brake Element figure

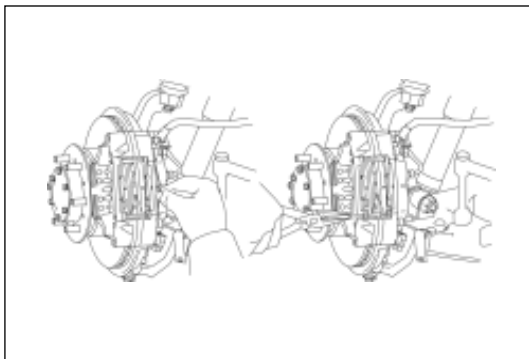


### Change of Brake pad

Remark: In case there is a continuous screaming from the front wheel when braking the vehicle during driving, check the alarm pad for friction limit for brake pad. If there is friction trace on the alarm pad with the brake disc, change the brake pad

1. Disassemble the front wheel;
2. Check the thickness of friction material of brake pad.  
Check the thickness of friction material of brake pad, if it fails to be within the specified range, change the brake pad.  
Min thickness: 2.0mm





3. Disassemble the following parts:

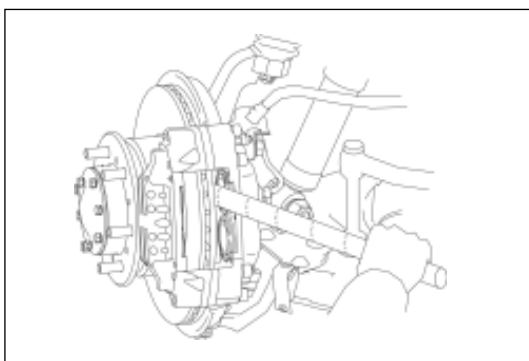
- (a) Guide pin snapping spring;
- (b) Two guide pins;
- (c) Brake pad snapping ring
- (d) Two brake pads;
- (e) Two silent pads; and
- (f) Two separation pads

4. Measure the thickness of brake disc.

(See BR-24)

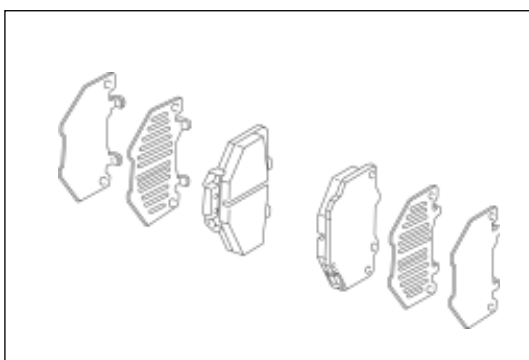
5. Measure the radial swinging of the brake disc.

(see page BR-24)



6. Mount on the new brake pad;

- (a) Draw out a little brake liquid from the liquid container.
  - (b) Press in the piston with the hammer lever and similar tool.
- Remark: Only one brake pad of the same wheel can be changed in one time so as to prevent the piston on the other face ejecting out.

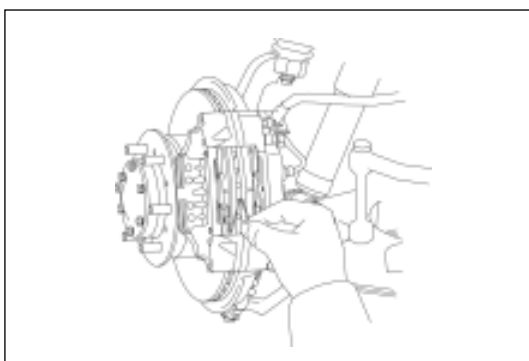


- (c) Mount two silent pads and two separation pads on the new brake pad.

Remark: coat the brake oil for disc on the inner silent pads.

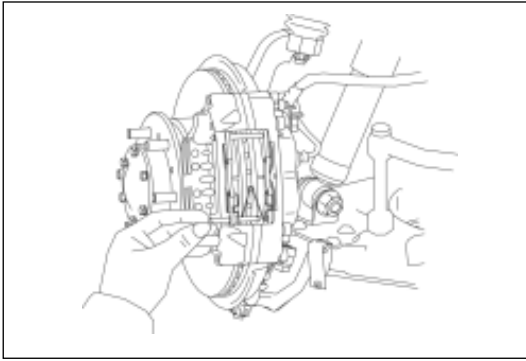
- (d) Mount the brake pad with the worn limit alarm pad on the inner side, while the other brake pad on the outer side.

Note: Pollution of oil stain or coat is not allowed on the work faces of brake pad or brake disc.

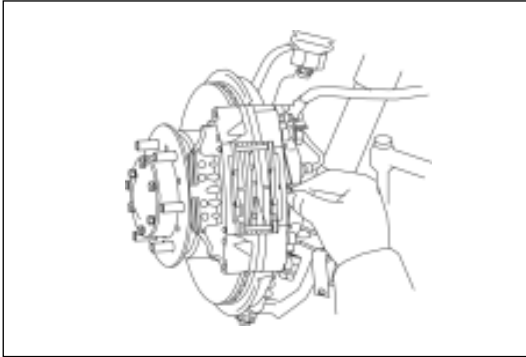


7. Mount the brake pad snapping spring;

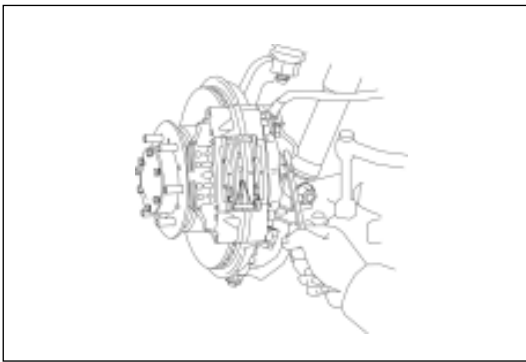
Brake pad snapping spring shall be mounted at the lower position;



8. Mount the two guide pins;

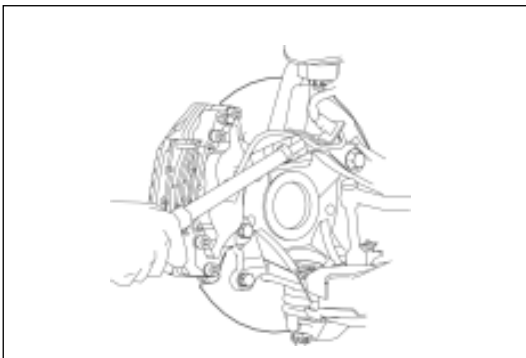


9. Mount the guide pin snapping spring

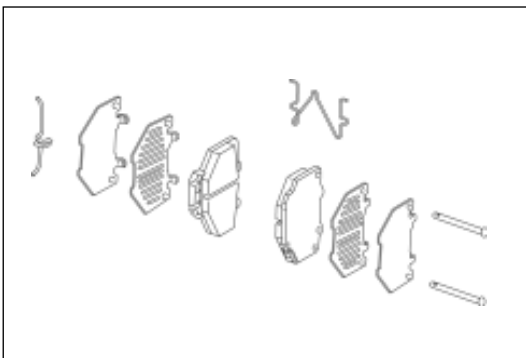


### Disassembly of Wheel brake Pump

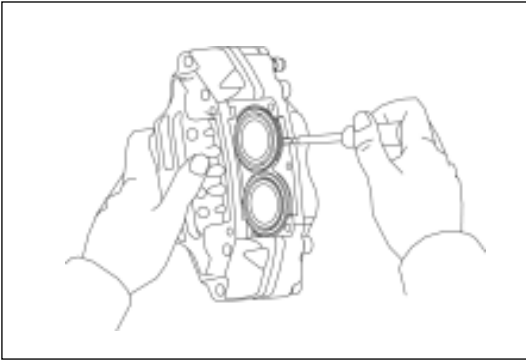
1. Disassemble the front wheel;í
2. Disassemble the brake pipeline;  
Tear down the brake pipeline with a container containing the brake liquid.



3. Disassemble the wheel-brake cylinder.  
Tear down the two hex bolts and the wheel-brake cylinder.



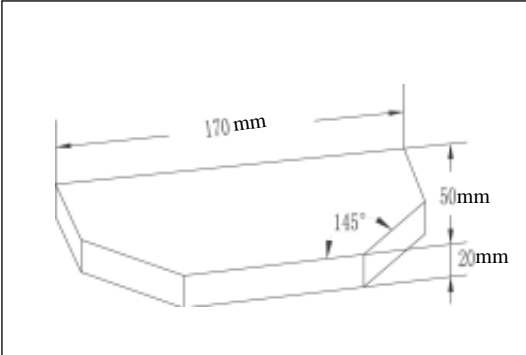
4. Disassemble the following parts:
  - (a) Guide pin snapping spring;
  - (b) Two guide pins;í
  - (c) Brake pad snapping spring;
  - (d) Two brake pads;
  - (e) Two silent pads and
  - (f) Two separation pads.



### Wheel-brake cylinder disassembly:

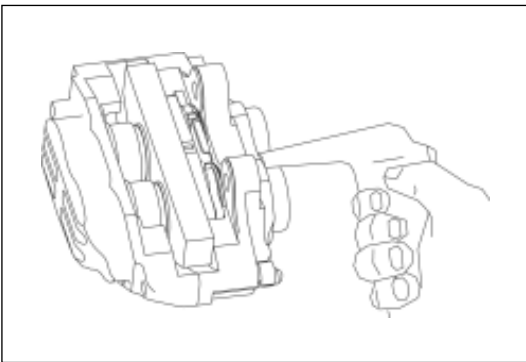
1. Tear down the dust cover steel gripping hoop and the dust cover.

Tear down the dust cover steel gripping hoops and piston dust covers of the four wheel-brake cylinders with the screwdriver.



2. Tear down the piston from the wheel-brake cylinder:

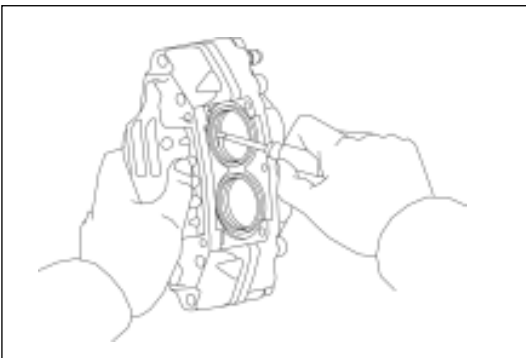
- (a) Prepare a wooden block with the dimensions as shown in the drawing (which is used to support the piston)



- (b) Put the wooden block between the pistons and insert one brake pad on one side of the wooden block.

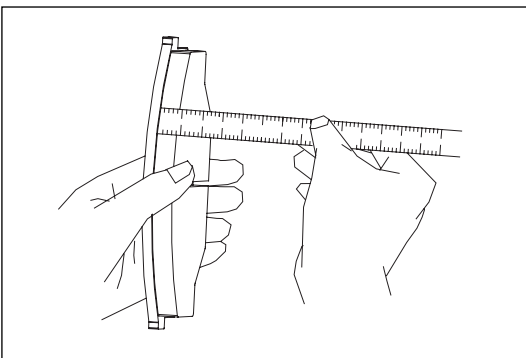
- (c) Tear down the four pistons from the wheel-brake cylinder by using the compressed air.

**Warning:** do not put your fingers in front of the piston when using the compressed air.



3. Tear down the piston sealing ring.

Tear down the four piston sealing ring from the wheel-brake cylinder with the screwdriver.



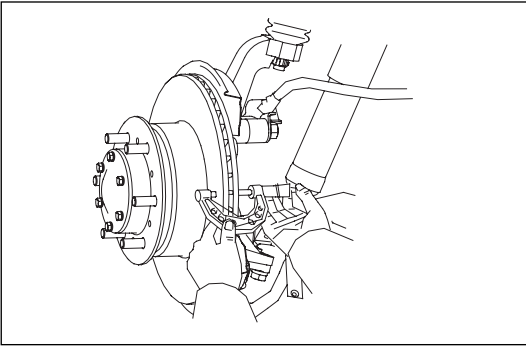
### Check the front brake parts

1. Measure the thickness of brake pad liner;

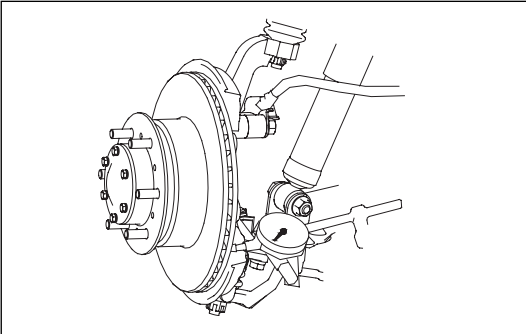
Standard thickness: 9.0mm

Min thickness: 2.0mm

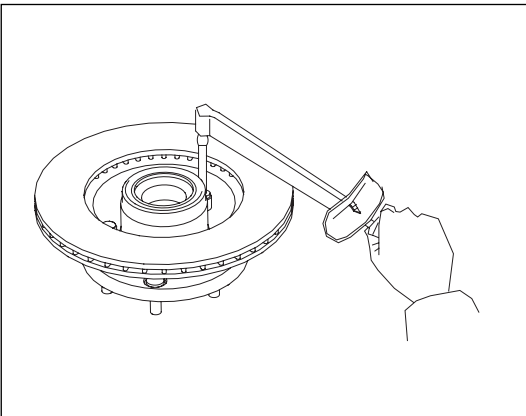
In case the liner is less than the min thickness or the liner is worn unevenly, change the brake pad.



2. Measure the thickness of brake disc;  
 Standard thickness: 20.0mm  
 Min thickness: 18.0mm  
 If the brake pad is scraped, repair it; where the abrasion is serious and its thickness is smaller than the min thickness, change the brake disc.



3. Measure the bounding value of the brake disc face;  
 Remark: the bearing is required to be verified in the suitable adjustment before measuring.  
 Max face bouncing value: 0.11mm;

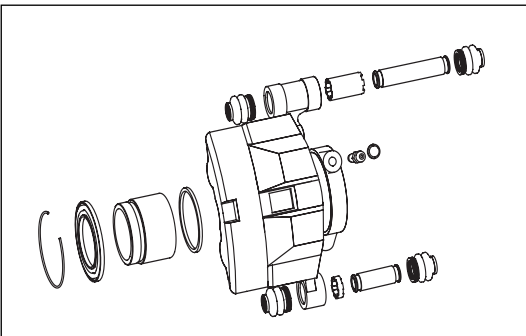


4. Change the brake disc according to the requirement:
  - (a) Tear down the hub and the brake disc. (see the paragraph of front wheel hub)
  - (b) Mount the new brake disc and screw up the connecting bolts as the specified torque.
  - (c) Mount the hub and brake disc assembly. (see the paragraph of front wheel hub).

Fastening torque:  $(75 \pm 5) \text{N} \cdot \text{m}$

- (d) Mount the caliper bracket on the steering knuckle and screw up the bolts according to the specified torque.

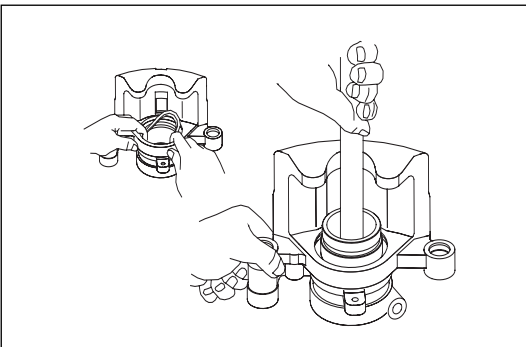
Fastening torque:  $123 \text{N} \cdot \text{m}$ .



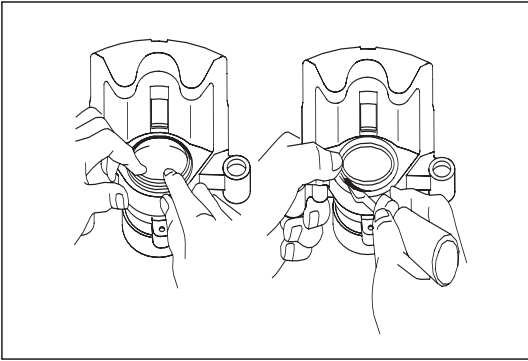
### Assembly of Brake-wheel pump

#### 1. Preparation

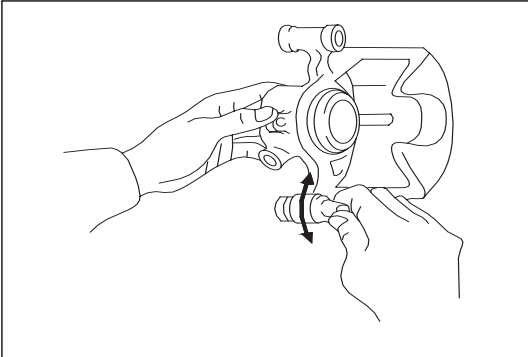
All parts shall be washed, dried and cleared away the alien materials, and coat moderate rubber lubricant on the work faces of piston, piston dust cover and rectangular sealing ring.



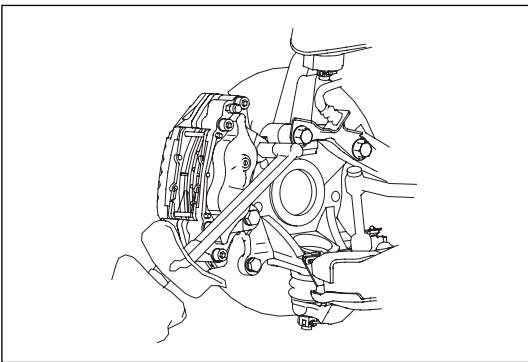
2. Encase the piston sealing ring in the caliper body



3. Encase the piston in the caliper body.



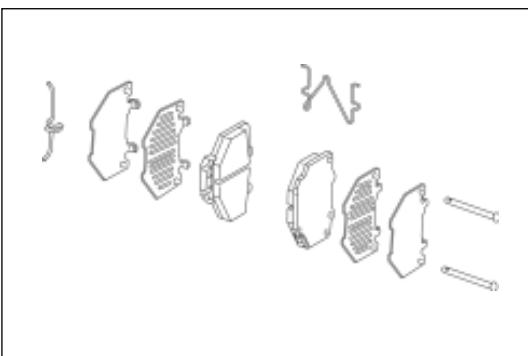
4. Encase the piston dust cover, dust cover steel-gripping hoop in the caliper body.



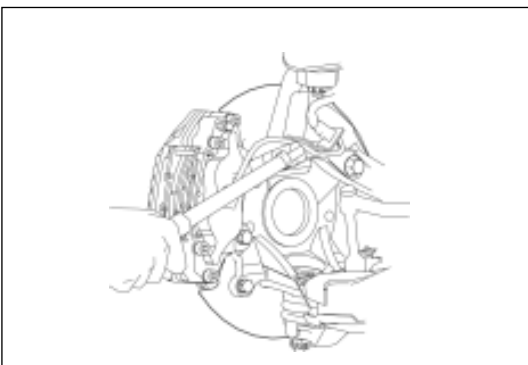
### Mount of Brake Calipers

1. Mount the brake caliper and screw up the two mounting bolts.

Fastening torque: 123N • m



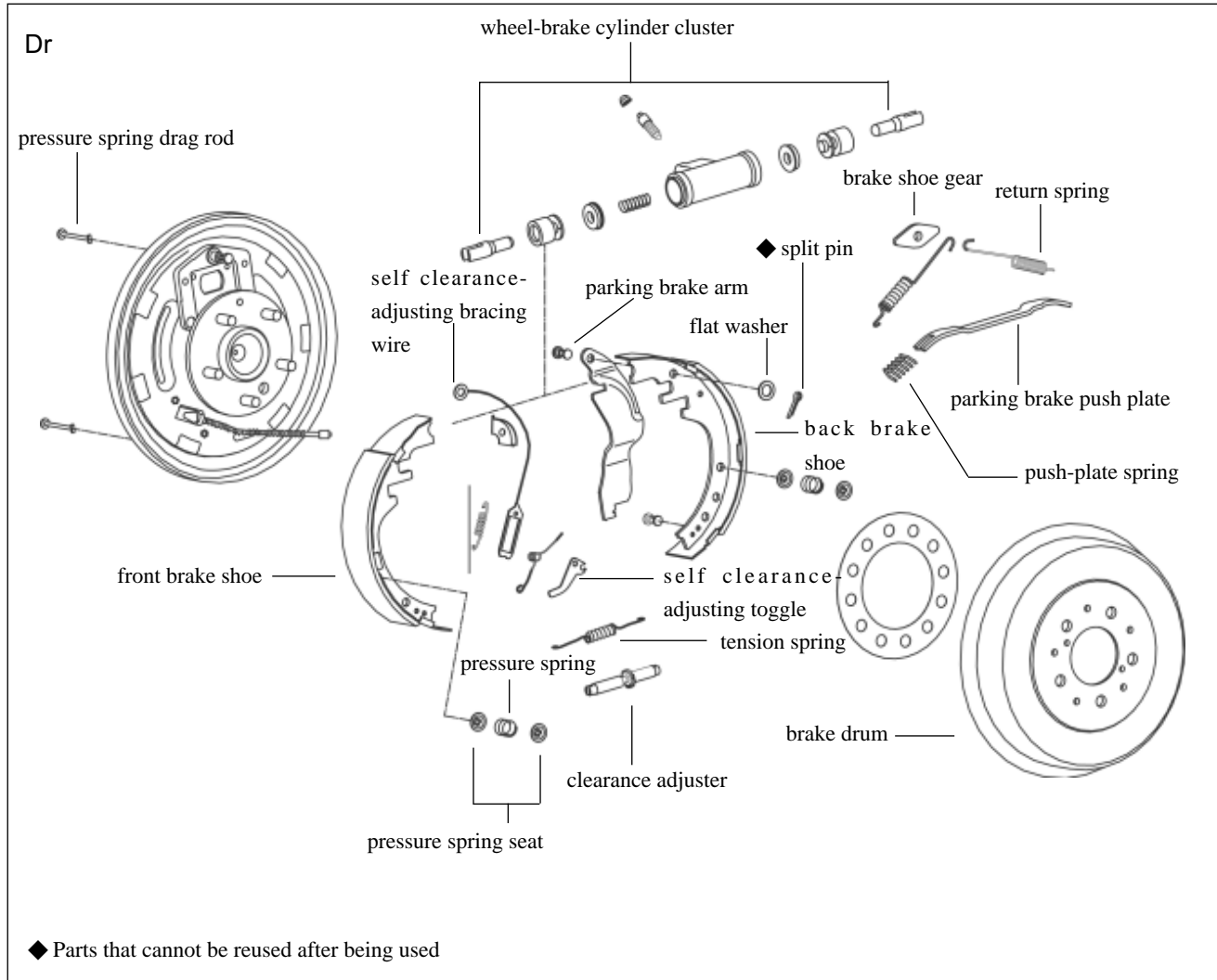
2. Mount the brake pads;



3. Connecting the brake pipeline;  
Use the open spanner to connect the pipeline.  
Fastening torque:  $(21 \pm 1)\text{N} \cdot \text{m}$
4. Observe the height of brake liquid level and, if necessary, add in the brake liquid and exhaust the air in braking system.  
Notice: avoid the brake liquid of spraying on the brake disc when exhausting the air.
5. Check to see whether there is leakage of brake liquid.



## Rear brake Element figure



### Disassembly of Rear drum-type Brake

Remark: if the braking torque of manual brake cannot satisfies the braking requirement, it is suggested to check the thickness of brake shoe liner, where the thickness is less than the min thickness, change the brake shoe.

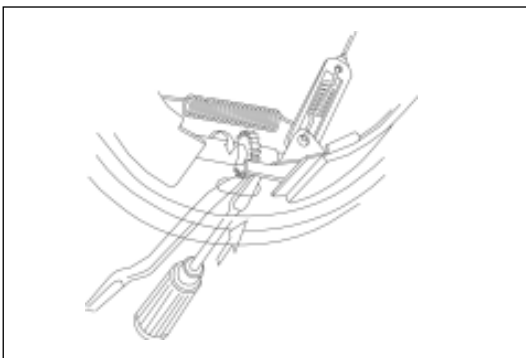
Min thickness: 1.0mm

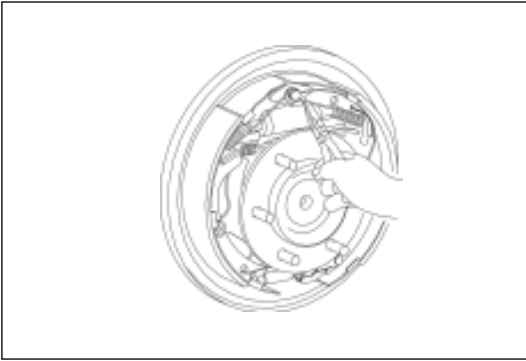
1. Tear down the rear wheel;

2. Tear down the brake drum;

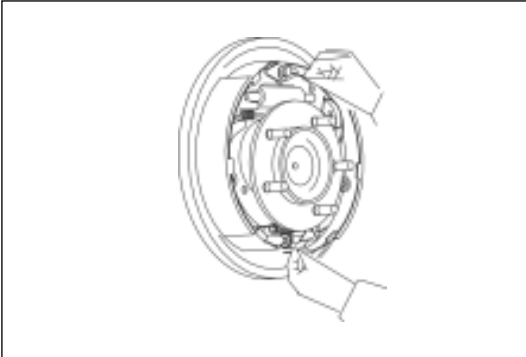
Remark: in case the brake drum is not easy to tear down, the following steps shall be adapted:

- Tear down the clearance-adjusting hole; insert a screw-driver in the brake bottom plate hole to prize up the adjusting bolt inner tilt angle with the self-adjusting fork.
- Use another screwdriver to adjust the adjusting bolt inner tilt angle to loosen the clearance adjuster of brake shoe.

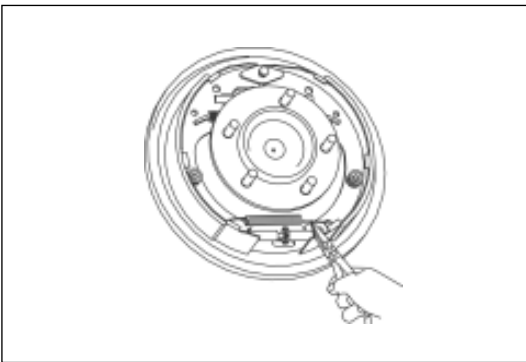




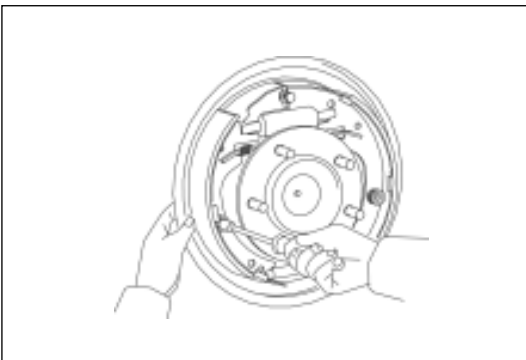
3. Tear down the return springs of the two brake shoes.



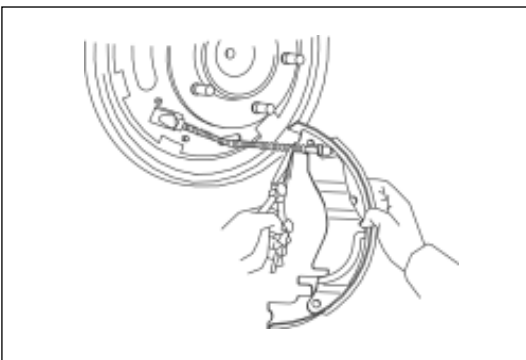
4. Tear down the self-adjusting bracing wire, brake shoe retainer ring, bracing wire guide seat and the self-clearance adjusting toggle plate.
  - (a) Press and push the self clearance-adjusting toggle plate to teardown the bracing wire of self clearance-adjuster, brake shoe retainer ring and bracing wire guide seat.
  - (b) Take out the spring from the self clearance-adjusting toggle plate to tear down the clearance-adjusting toggle plate and the spring.



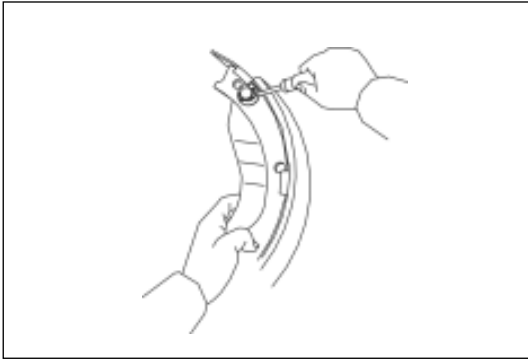
5. Tear down the tension spring;  
Tear down the tension spring with the pliers.



6. Tear down the brake shoe, clearance adjuster and parking brake push plate.
  - (a) Tear down the pressure spring seat, pressure spring and pressure spring drag rod.
  - (b) Tear down the brake shoe, clearance adjuster and parking brake push plate.

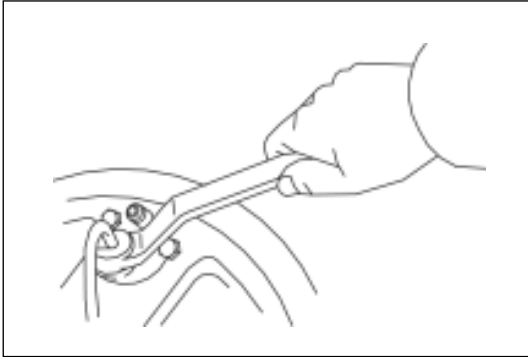


- (c) Tear down the bracing wire from the parking brake.



7. Tear down the parking brake arm;

Tear down the split pin with pliers to take apart the parking brake arm.

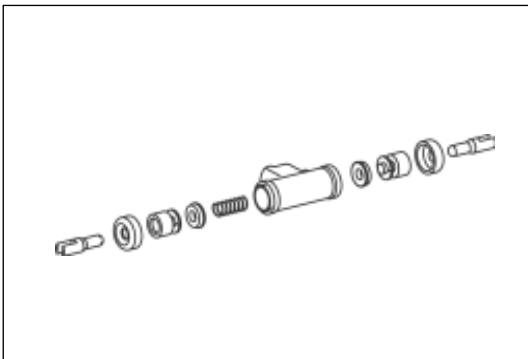


8. Take apart the brake pipeline from the wheel pump;

Tear down the brake pipeline and block the oil pipe with a clean cork.

9. Tear down the wheel brake pump;

Tear down the two bolts and the wheel-brake cylinder.



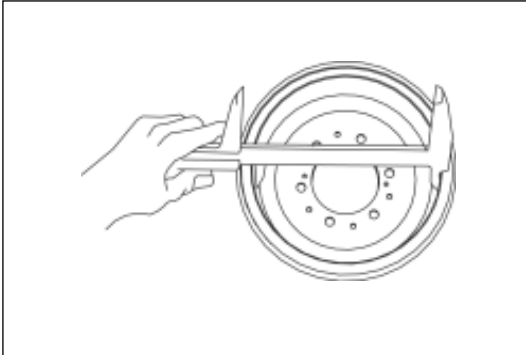
10. Tear down the following bolts and wheel-brake cylinder parts:

- (a) Two piston rod;
- (b) Two dust cover
- (c) Two pistons
- (d) Two piston rubber bows
- (e) Spring.

## Check and Repair the Rear Brake Parts

### 1. Check and test the disassembled parts;

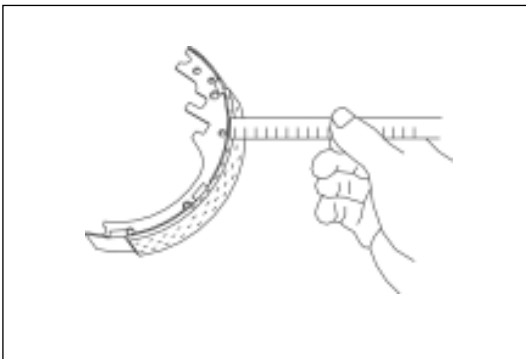
Check the disassembled parts to see whether there is abrasion, rust or damage.



### 2. Measure the inner diameter of brake drum;

Standard inner diameter: 254.0mm

Mix inner diameter: 256.0mm



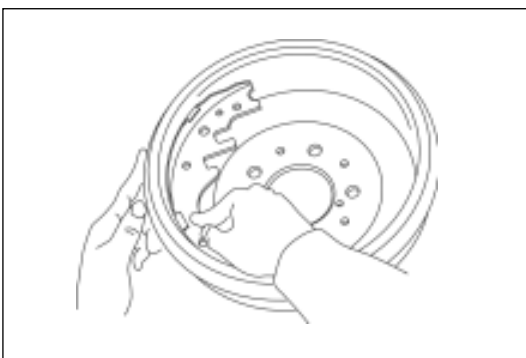
### 3. Measure the thickness of brake shoe liner;

Standard thickness: 5.0mm

Min thickness: 1.0mm

In case the thickness of brake shoe liner is less than the min thickness or there is uneven abrasion, change the liner.

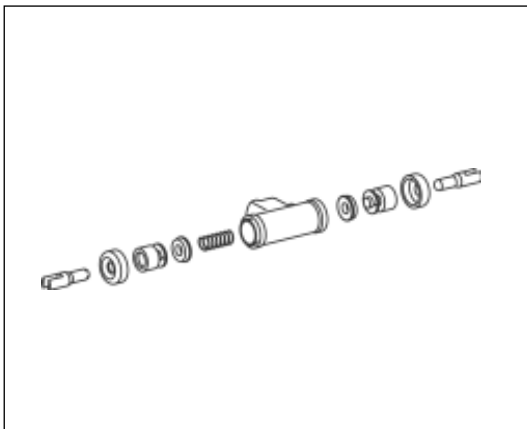
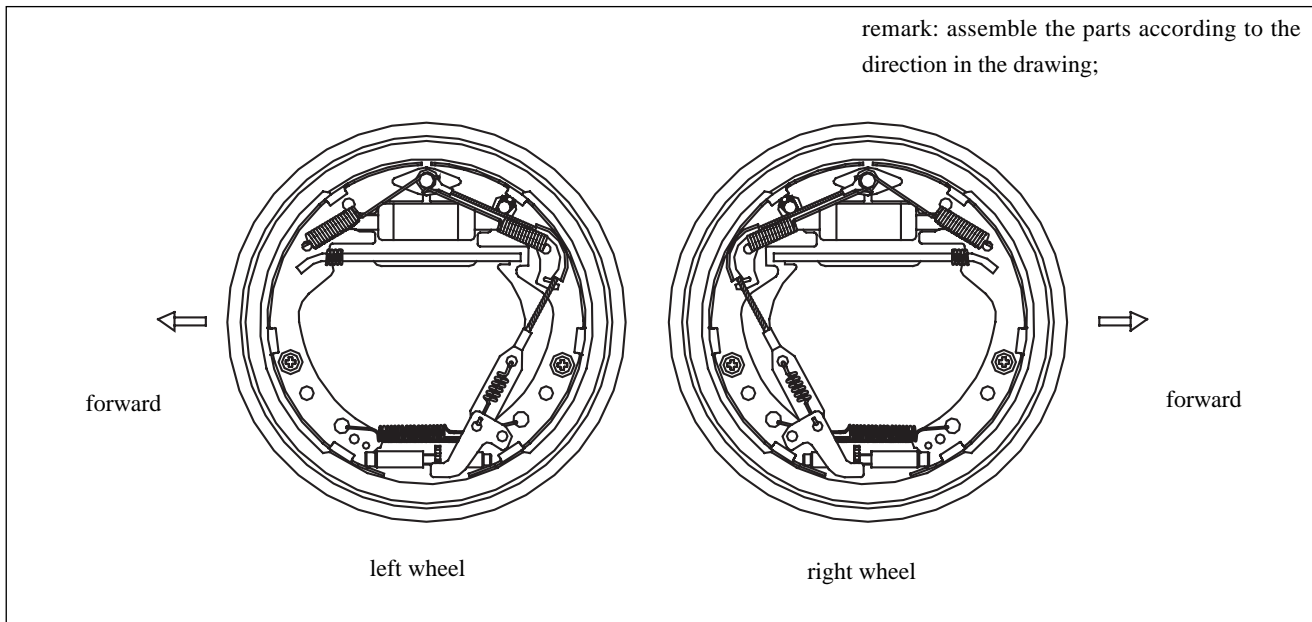
Remark: if one of the brake shoes is needed to change, all of the brake shoes are required to change so that the even braking performance is maintained.



### 4. Measure the brake liner and the brake drum to see whether they contact closely;

If there is poor contact between the brake liner and the brake drum, repair the brake shoe with the grinding devices, or change the brake shoe cluster.

## Assembly of Rear Brake

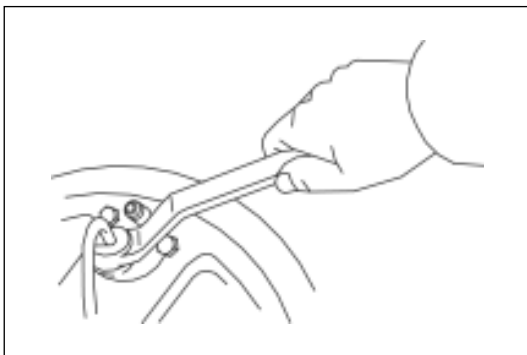


### Assembly of Rear Brake

#### 1. Assemble the wheel-brake cylinder:

- (a) Coat moderate lithium soap base glycol grease on the piston cup;
- (b) Assemble the wheel-brake cylinder:
  - Mount the two piston cups on two piston;
  - Encase the spring and two pistons in the wheel cylinder body and
  - Mount the two dust covers

Remark: Assembly shall be conducted correctly according to the direction shown in the drawing.



#### 2. Mount the wheel-brake cylinder:

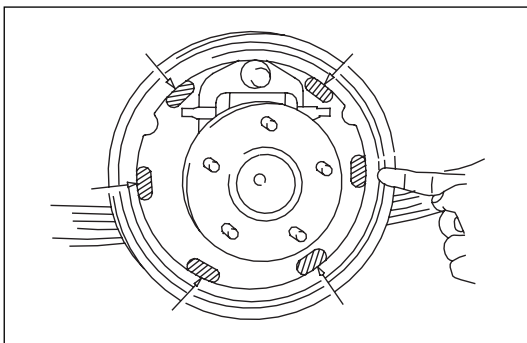
- (a) Use two bolts to fix the wheel-brake cylinder on the rear bottom plate.

Coat moderate sealing glue (Glue 704) on the position where the wheel-brake cylinder connects with the bottom plate.

Fastening torque: (16 ~ 20)N • m

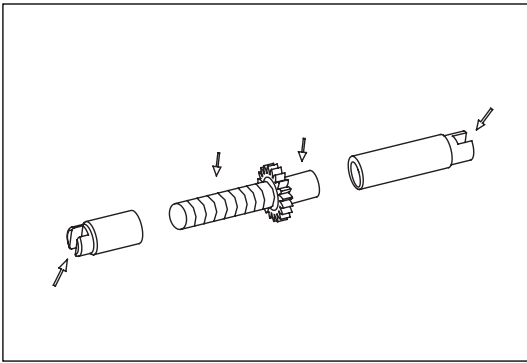
- (c) Connect the brake pipeline on the wheel-brake cylinder.

Fastening torque: 18N • m

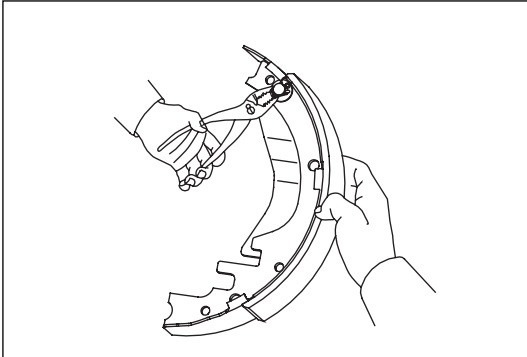


#### 3. Coat the following parts with moderate lubricant that resistant high temperature (do not pollute the friction plates);

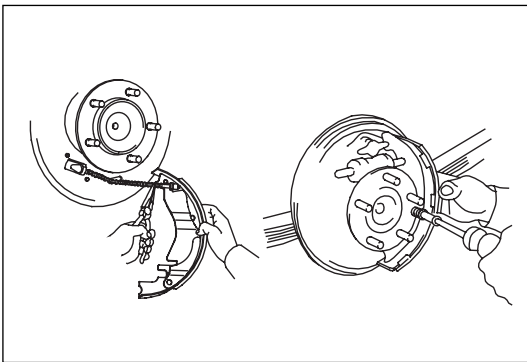
- (a) The upper plain of the hex convex platform where the bottom plate connects the brake shoe;
- (b) Contact face of the brake shoe and the top lever of wheel cylinder;
- (c) Contact face of the brake shoe with the support pin.



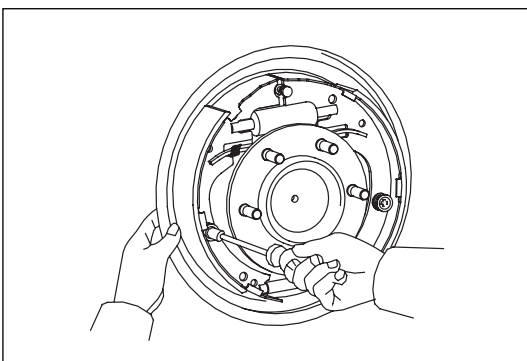
- (d) Adjusting bolts
- (e) Contact position where the clearance adjuster and the brake shoe.



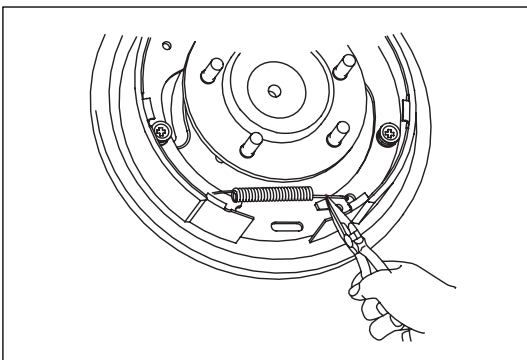
4. Mount the parking brake drag arm;  
Mount the new split pin with pliers to mount the parking brake drag arm.



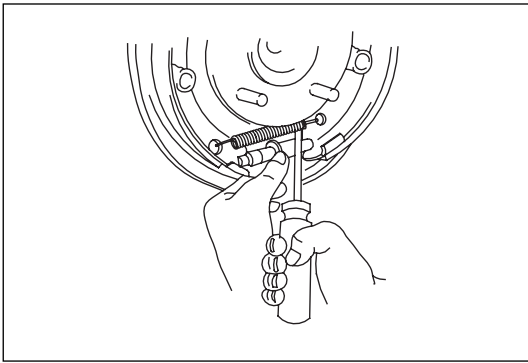
5. Mount the rear brake shoe:
  - (a) Mount the parking brake bracing wire on the parking brake drag arm.
  - (b) Mount the rear brake shoe in such way that its end is inserted into the cylinder rod. Encase the pressure spring drag rod in the brake bottom plate and the brake shoe assembly in turn and then insert it in the pressure seat , pressure spring, pressure spring seat, finally rotate the pressure spring in place with the pressure spring fork.



6. Mount the parking brake pull plate and the front brake shoe:
  - (a) Mount the pull plate and the spring.
  - (b) Mount the front brake shoe, of which, the end is inserted in the piston rod, and mount the pull plate. Insert the pressure spring drag rod in the brake bottom plate and brake shoe assembly in turn, then encase it in the pressure spring seat, pressure spring and pressure spring, finally rotate the pressure spring in place with the pressure spring.

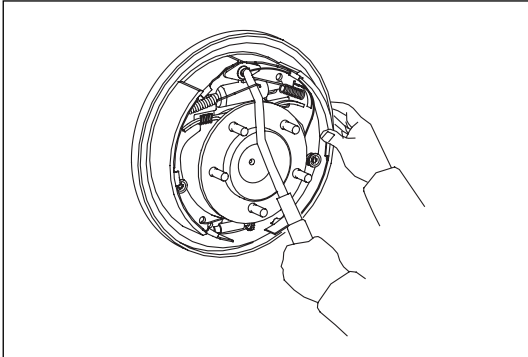


7. Mount the tension spring;  
Mount the tension spring with pliers.



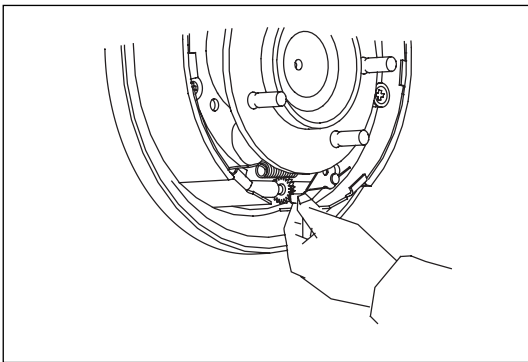
8. Mount on the adjuster;

Poke the brake shoes with the screwdriver and then mount the adjuster.



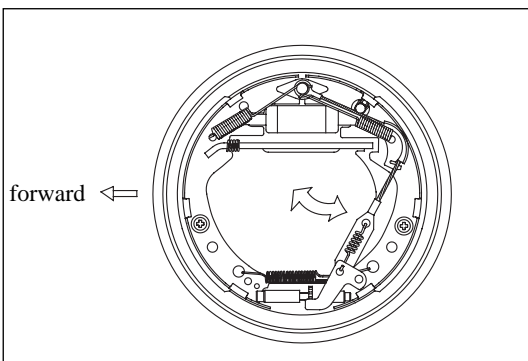
9. Mount the brake shoe retainer ring, bracing wire of guide seat, self clearance-adjusting bracing wire and the return spring.

- (a) Mount the brake shoe retainer ring, then the front return spring.
- (b) Mount the return spring, and then mount the forward return spring.



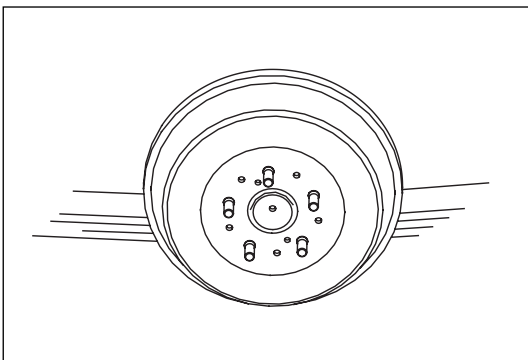
10. Mount the self-clearance toggle plate:

- (a) Mount the toggle plate bracing wire torsion spring on the rear brake shoe.
- (b) Mount the clearance self-adjusting toggle plate and hook it with the clearance-adjusting bracing wire.
- (c) Hook the self clearance-adjusting toggle plate with the bracing wire torsion spring

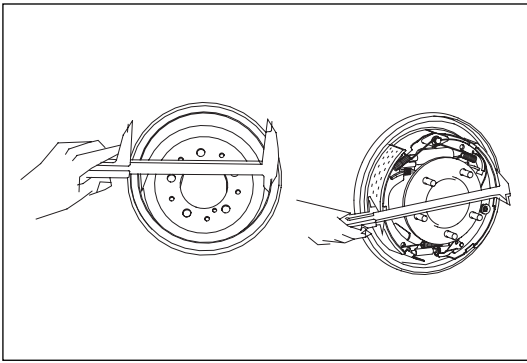


11. Check the operation of self-adjusting mechanism.

- (a) Drag the clearance-adjusting bracing wire backward as shown in the drawing, then release it. Check the clearance-adjusting bolts to see whether it is rotating. If not, check the rear brake to verify which part has problem.



- (b) Adjust the clearance adjuster to shorten its length as possible as can.
- (c) Mount the brake drum



12. Check the clearance between the brake shoe and the brake drum:
  - (a) Tear down the brake drum;
  - (b) Measure the inner diameter of the brake drum and the outer diameter of brake shoe to check whether the difference of the two diameters falls within the standard clearance range.

Shoe clearance: 0.6mm

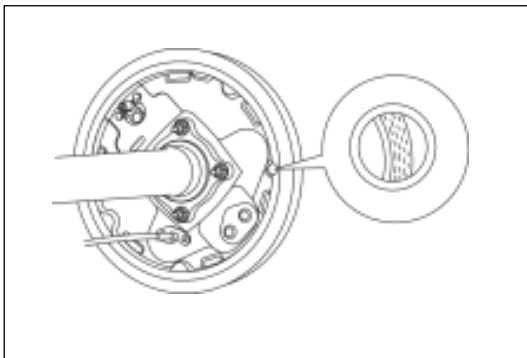
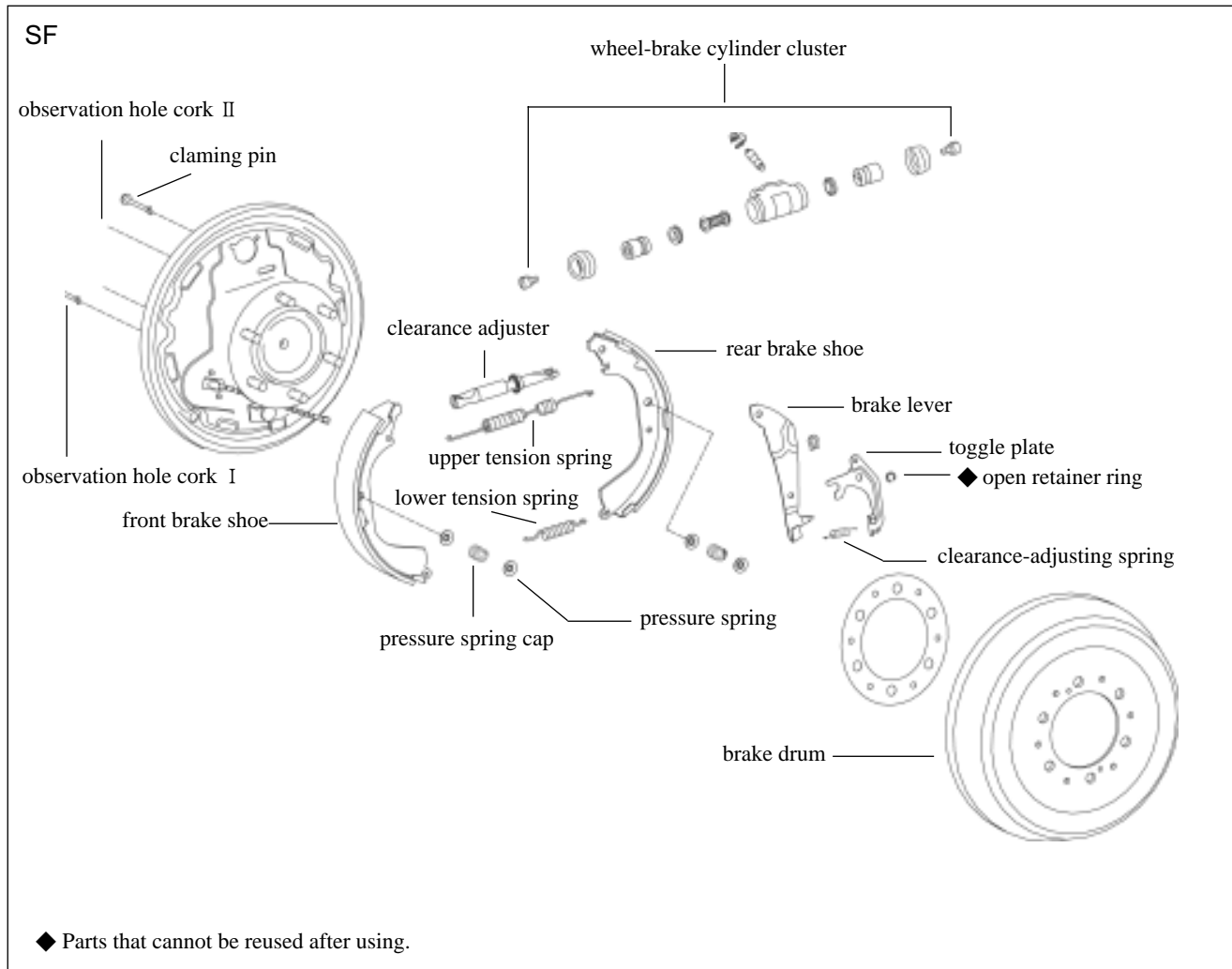
If it is not correct, check the parking brake system.

13. Mount the brake drum and the rear wheel; screw up the nuts of rear wheel hub.  
Fastening torque:  $(145 \pm 10)\text{N} \cdot \text{m}$
14. Fill the liquid container with brake liquid and exhaust the air in braking system.
15. Check to see whether there is leakage of brake liquid.



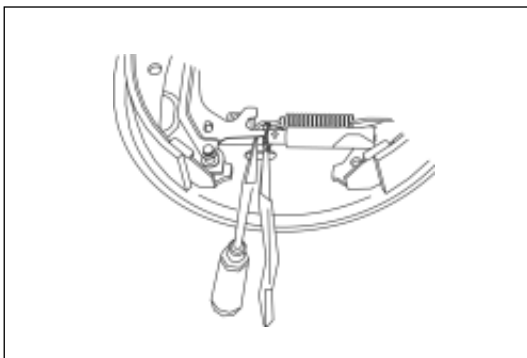
## Rear brake

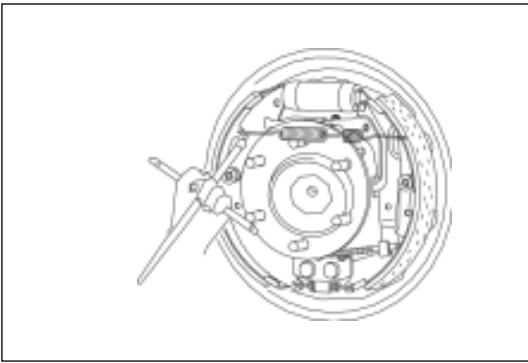
### Element figure



### Disassembly of Rear Brake

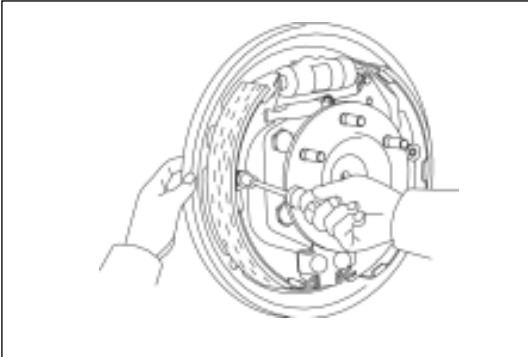
1. Check the thickness of the brake shoe liner:  
Tear down the observation hole cork I and measure the thickness of brake shoe liner through the observation hole. If the thickness is less than the min thickness, change the brake shoe.  
Min thickness: 1.0mm
2. Tear down the rear wheel.
3. Tear down the brake drum;  
Remark: if the brake cannot be tear down easily, the following steps shall be adapted:
  - (a) Tear down the observation hole cork II by inserting the screwdriver in the hole of brake bottom plate, and poke the toggle plate from the self-adjusting screw arbor.
  - (b) Loosen the brake shoe clearance adjuster with another screwdriver by screwing the self-adjusting screw arbor.





4. Tear down the front brake shoe:

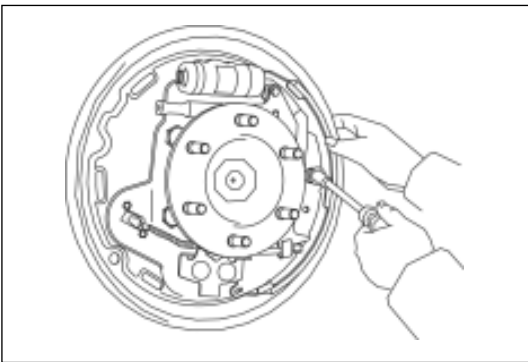
- (a) Tear down the tension spring from the front brake shoe;



- (b) Tear down the pressure spring cap of brake shoe, the pressure spring and claming pin.

- (c) Tear down the lower tension spring from the front shoe and the shoe pads.

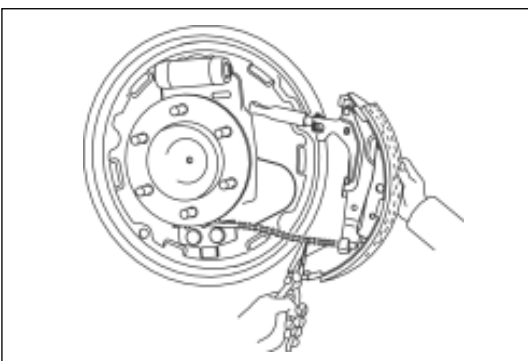
- (d) Tear down the lower tension spring from the rear shoe.



5. Tear down the rear brake shoe:

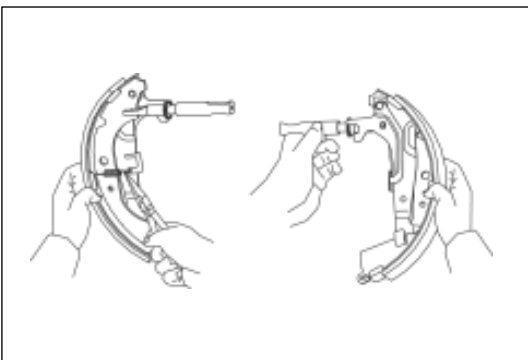
- (a) Tear down the shoe pressure spring cap, pressure spring and claming pin.

- (b) Tear down the upper tension spring from the shoe pad.



- (c) Tear down the rear brake shoe and the clearance adjuster.

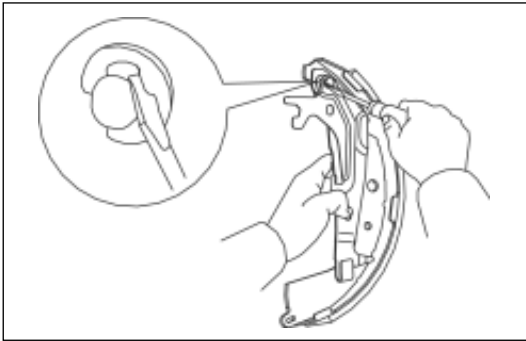
- (d) Tear down the parking brake bracing wire from the brake shoe.



6. Tear down the clearance adjuster from the rear brake shoe:

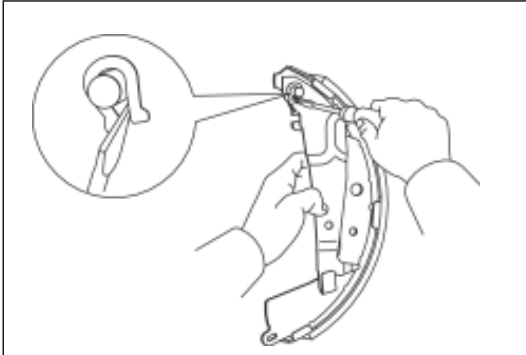
- (a) Tear down the clearance-adjusting spring.

- (b) Tear down the clearance adjuster.

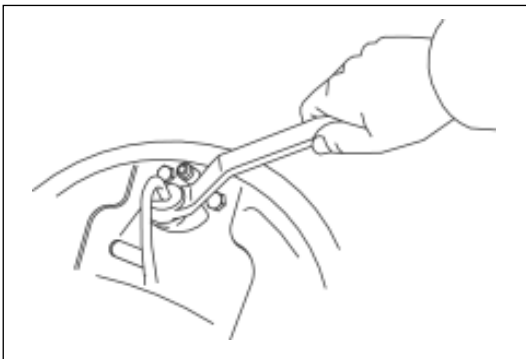


7. Tear down the toggle plate and the brake lever:

- (a) Tear down the open retainer ring;
- (b) Tear down the toggle plate;

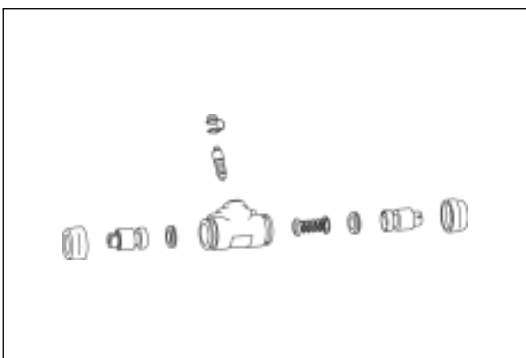


- (c) Tear down the pin clip;
- (d) Tear down the brake lever.



8. Tear down the wheel-brake cylinder:

- (a) Tear down the brake pipeline. And block the pipeline with a clean cork.
- (b) Tear down the two bolts to take apart the wheel-brake cylinder.



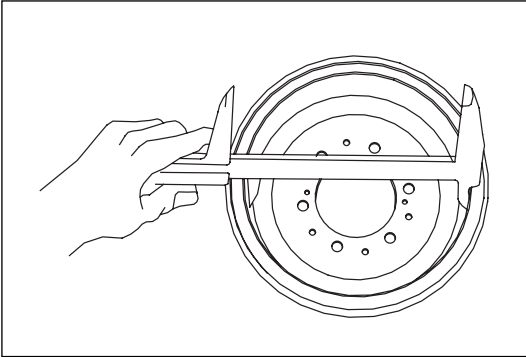
9. Tear down the following parts:

- (a) Two dust covers;
- (b) Two pistons;
- (c) Two piston cups
- (d) Spring.

## Check and Repair the Brake Parts

1. Check the disassembled parts;

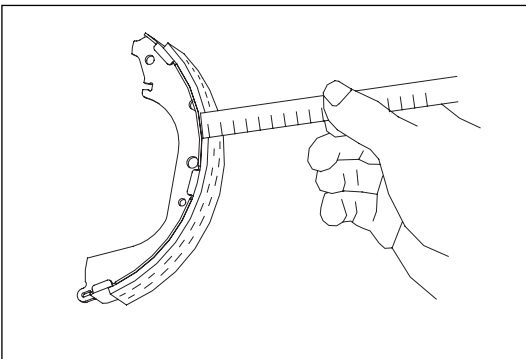
Check the disassembled parts to see whether there is abrasion, rust or damage.



2. Measure the inner diameter of the brake drum;

Inner diameter: 295.0mm

Max diameter: 297.0mm



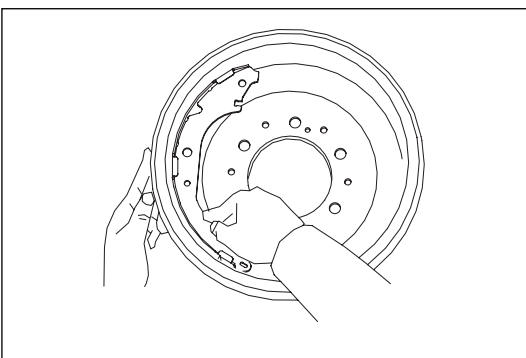
3. Measure the thickness of brake shoe liner;

Standard thickness: 6.5mm

Min thickness: 1.5mm

In case the thickness of brake shoe liner is less than the min thickness or there is uneven abrasion, change the brake shoe.

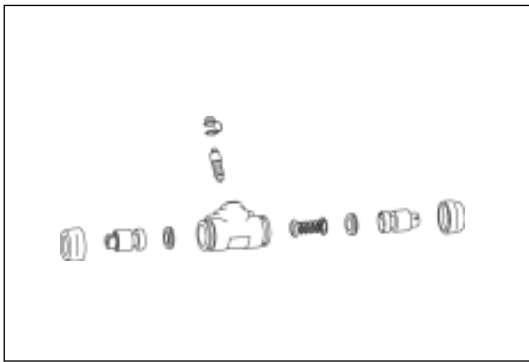
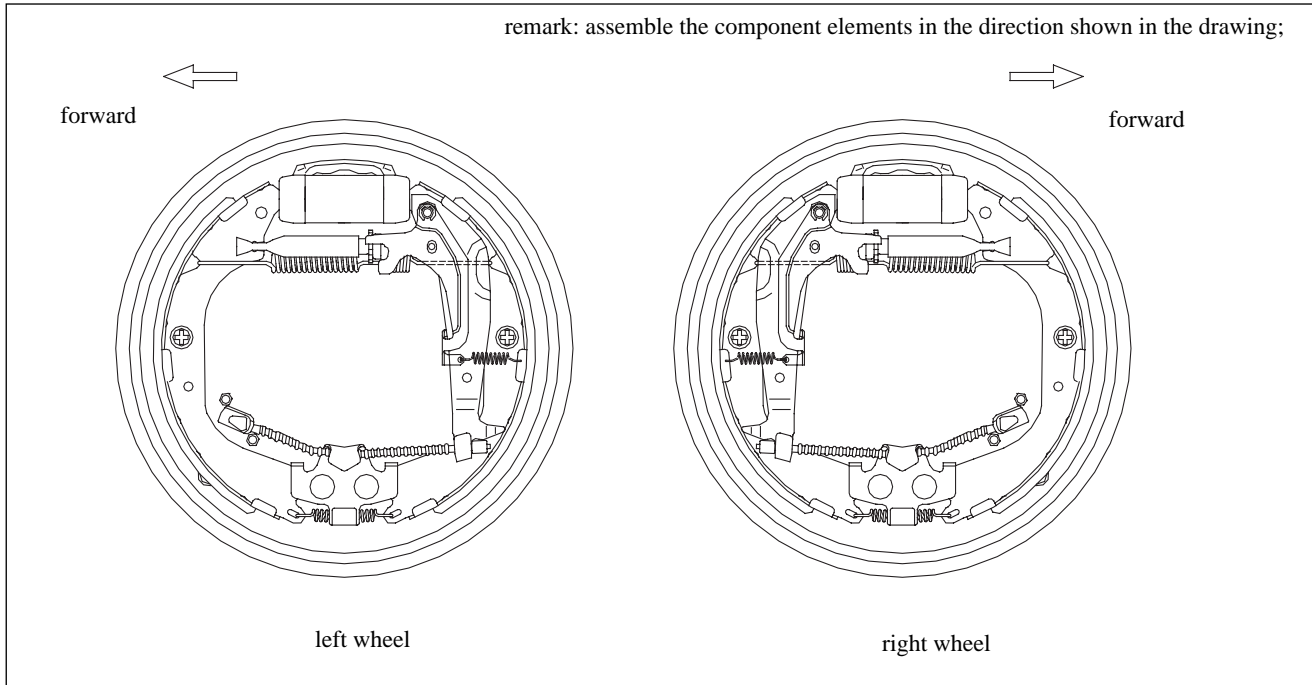
Remark: if either brake shoe is required to change, all rear brake shoes shall be changed to maintain the even braking properties.



4. Check the brake shoe liner and the brake drum to see whether there is close contact;

If there is poor contact between the brake shoe liner or brake drum, repair or change the brake shoe cluster with the grinding devices.

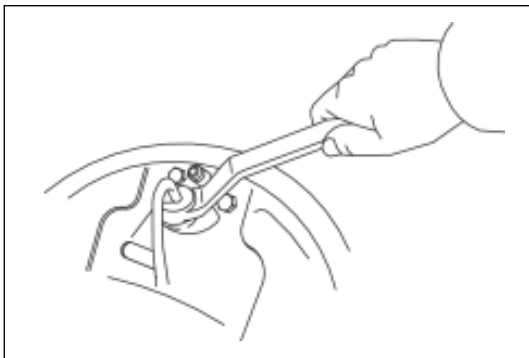
## Assembly of Rear Brake



### 1. Assemble the wheel-brake cylinder:

- Coat moderate lithium soap base glycol grease on the piston cup.
- Assembly the wheel-brake cylinder
  - Mount the two piston cups on two pistons
  - Mount the two dust cover on two pistons.
  - Encase the spring and the two pistons in the wheel cylinder body.

Remark: assembly correctly according to the direction shown in the drawing.



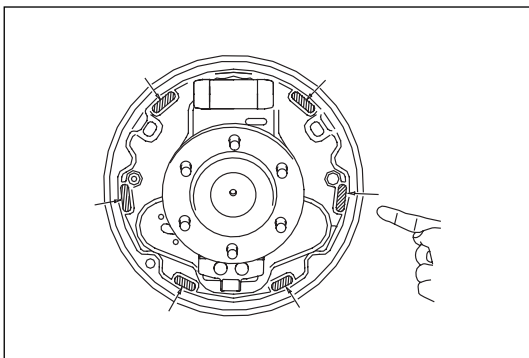
### 2. Mount the wheel-brake cylinder:

- Mount the wheel-brake cylinder on the rear bottom plate with two bolts.

Fastening torque :  $(6.5 \sim 10) \text{N} \cdot \text{m}$

- Connect the brake pipeline on the wheel-brake cylinder.

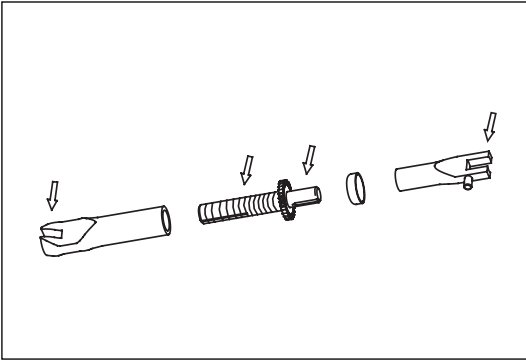
Fastening torque :  $(18+2) \text{N} \cdot \text{m}$



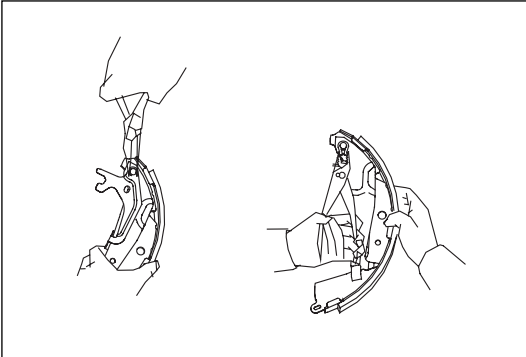
### 3. Coat the lithium base grease on the following parts:

- Hex convex platform where the bottom plate contacts with the brake shoe.
- Two ends of support brocks
- Contact position where the piston and the shoe rib.

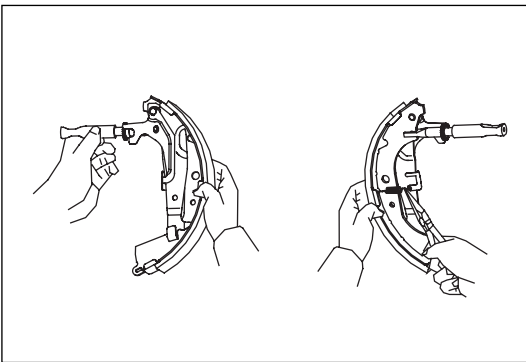
Remark: Do not pollute the friction pads.



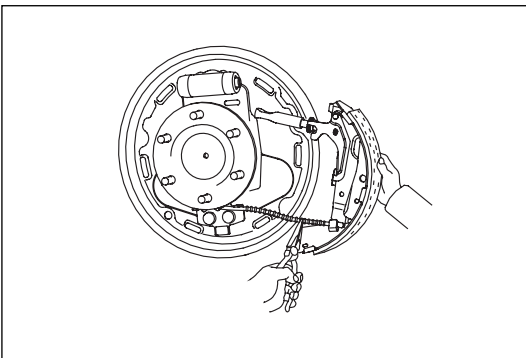
- (c) Self adjusting screw arbor thread;
- (d) Contact position where the self-adjusting screw sleeve and the brake shoe.



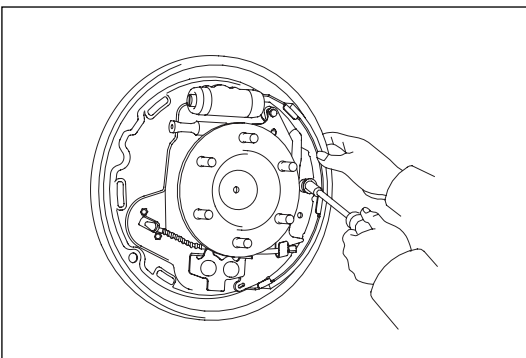
4. Mount the parking brake lever and the toggle plate
  - (a) Mount the parking brake lever and lock it with a new pin.
  - (b) Mount the toggle plate and a new open retainer ring.



5. Mount the adjuster on the rear brake shoe:
  - (a) Mount the adjuster;
  - (b) Mount the clearance-adjusting spring;

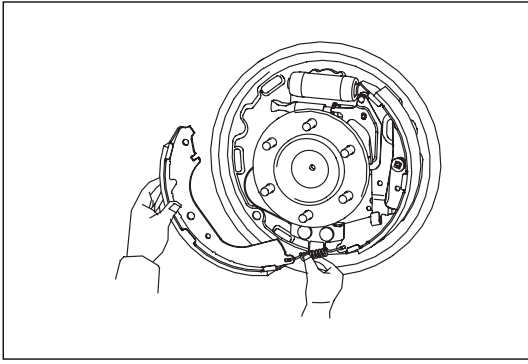


6. Mount the rear brake shoe:
  - (a) Mount the brake bracing wire on the parking brake lever;
  - (b) Mount the tension spring on the rear brake shoe;



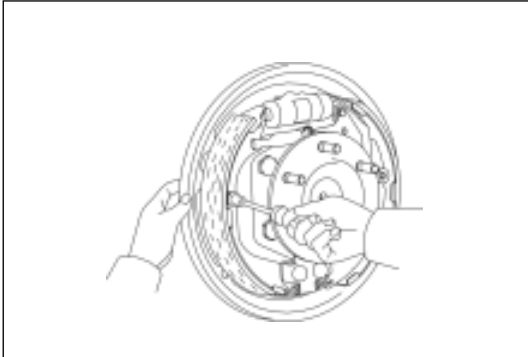
- (c) Encase the rear brake shoe in such way that the end shoe is inserted in the wheel-brake cylinder.
- (d) Mount the brake shoe pressure spring, pressure spring cap and the clamping pin.

Notice: Do not let the oil or lubricant touch the brake shoe.



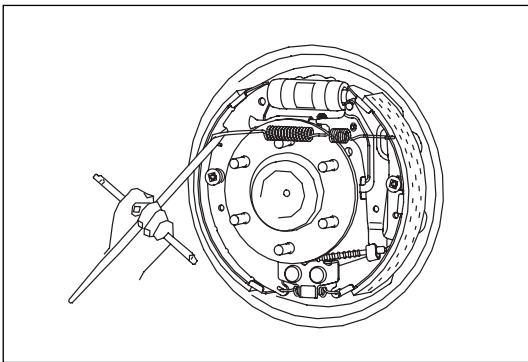
### 7. Mount the front brake shoe:

- (a) Mount the lower tension spring between the front shoe and the back shoe.
- (b) Mount the front brake shoe in such manner that the end shoe is inserted in the wheel-brake cylinder, and mount correctly the adjuster.

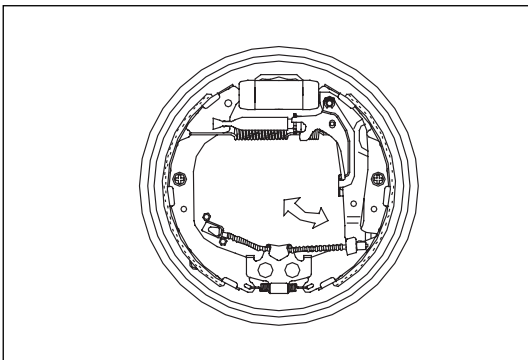


- (c) Mount the pressure spring, pressure spring cap and claming pin.

Notice: Do not let the oil or lubricant touch the brake shoe.

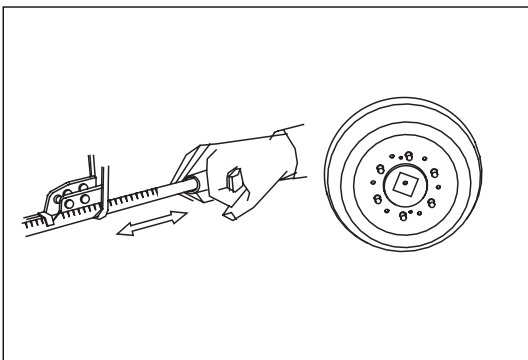


- (d) Mount the upper tension spring.

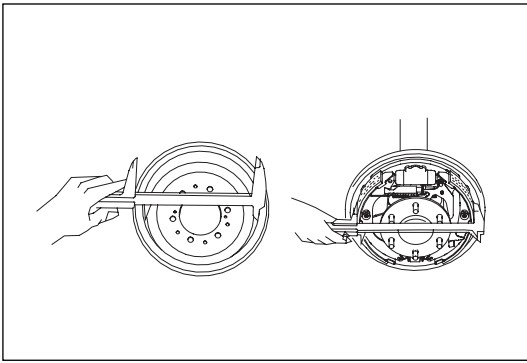


### 8. Check the operation of self-adjusting mechanism.

- (a) Move the parking brake lever of rear brake shoe forward and backward as shown in the drawing, check the self-adjusting screw arbor to see whether it can rotate or not, if not, check the rear brake to see which part has problem.



- (b) Adjust the adjuster length and shorten it as can as possible.
- (c) Mount the brake drum.
- (d) Drag the parking brake lever to the max distance until no quack-quack is heard.



9. Check the clearance between the brake shoe and the brake drum:
  - (a) Tear down the brake drum.
  - (b) Measure the inner diameter of brake drum and the outer diameter of brake shoe, then Check the difference of the two diameters to see whether it falls within the standard clearance range.

Shoe clearance: 0.6mm

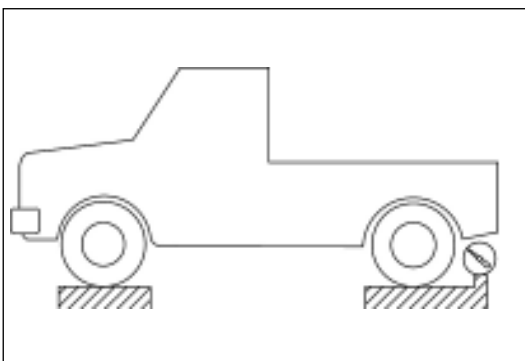
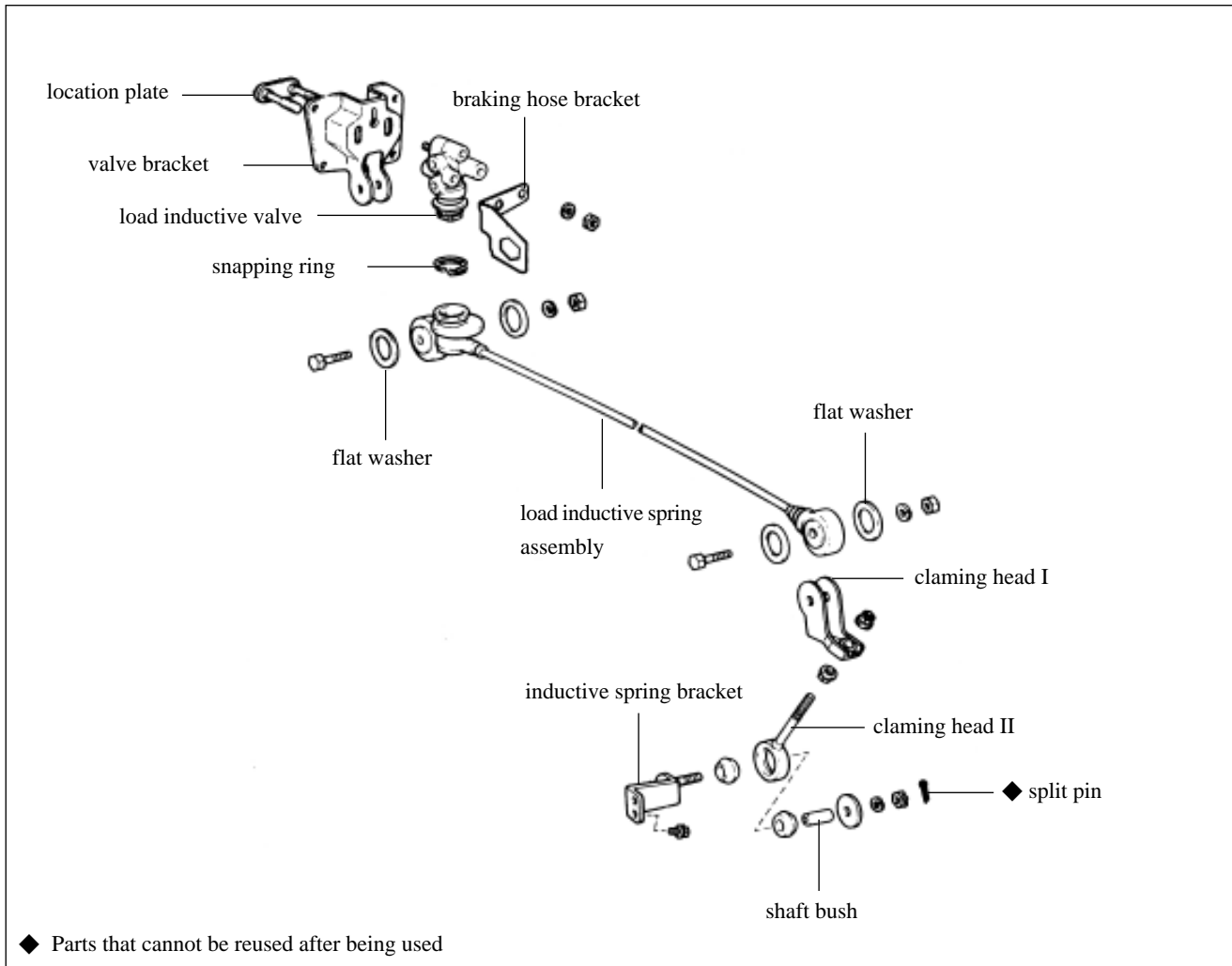
If it is not correct, check the parking braking system.

10. Mount the brake drum and rear wheel;  
Fastening torque:  $(145 \pm 10)\text{mm}$
11. Fill the liquid container with brake liquid and exhaust air in the braking system.
12. Check to see whether there is leakage of brake liquid



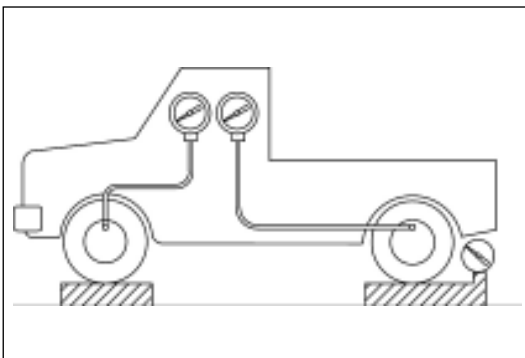
## Load Sensing Proportion Valve

### Element figure

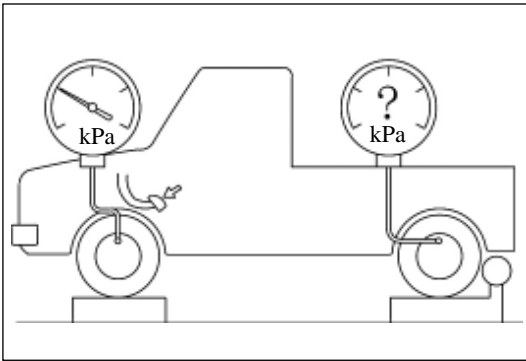


### Inspection on and Adjustment of hydraulic pressure

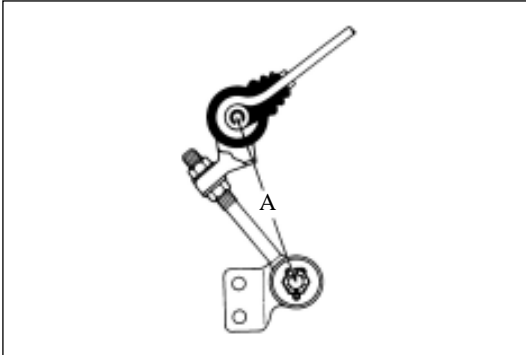
1. Adjust the load on rear shaft  
Load on rear shaft (including the vehicle weight): 800kg



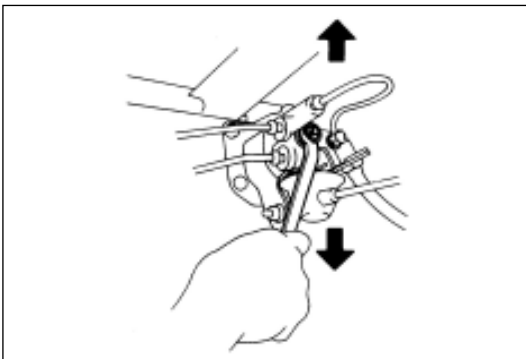
2. Mount the load sensing proportion valve instruments (SST) and exhaust the air.



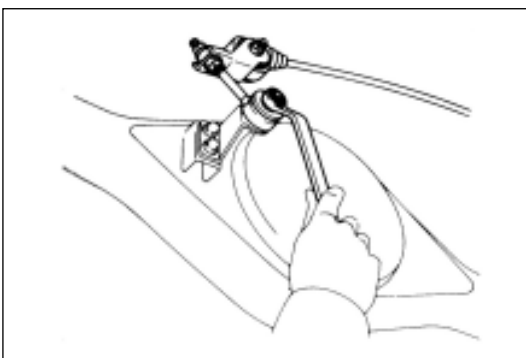
3. Check the rear brake pressure on the condition that the front brake pressure increases to 7,845kPa  
Rear brake pressure:  $(4,315 \pm 490)\text{kPa}$   
If the brake pressure is incorrect, adjust the hydraulic pressure.



4. Adjust the hydraulic pressure if necessary:
  - (a) Adjust the length of clamping head II.  
When lengthen the A distance, the rear brake pressure; if A distance is shortened, the rear brake pressure reduces.  
Initial adjustment: 78mm  
Adjust range: (72-84)mm

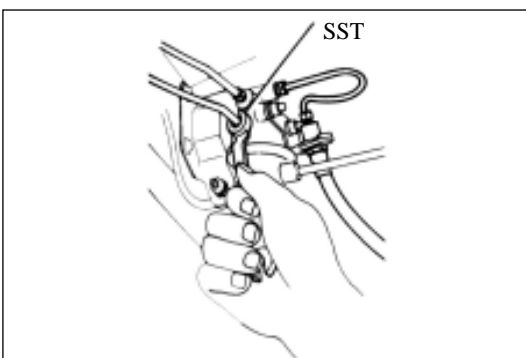


- (b) In case no even brake pressure is obtained after adjusting the clamping head, raise the valve or move it downward.  
If the valve moves forward, the rear brake pressure will reduce; if the valve moves downward, rear brake pressure will increase.
- (c) Screw up the nuts.
- (d) Adjust the length of clamping head II again.  
If it is unsuitable after re-adjustment, change the valve.

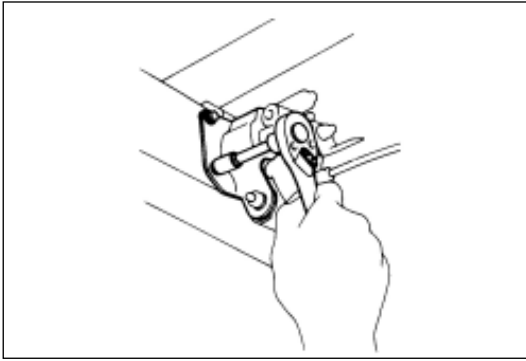


## Disassembly of load sensing proportion valve

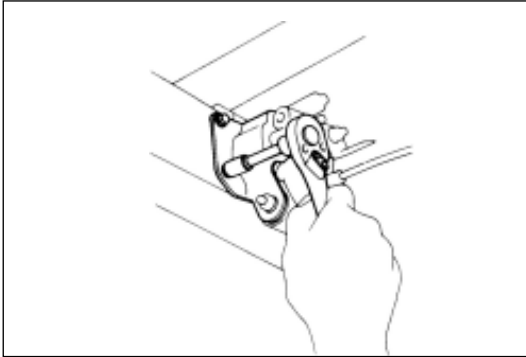
1. Tear down the clamping head II from the bracket;



2. Tear down the load sensing proportion valve cluster:
  - (a) Tear down the brake pipeline from the valve with SST.

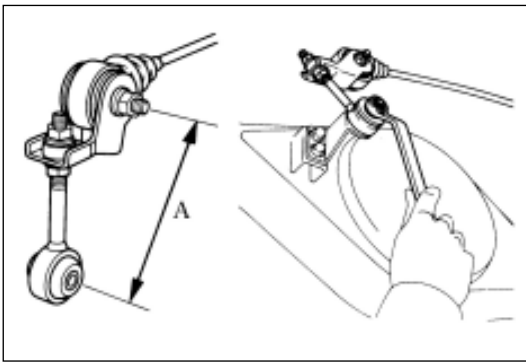


- (b) Tear down the mounting bolts of valve bracket, and load sensing proportion valve cluster.

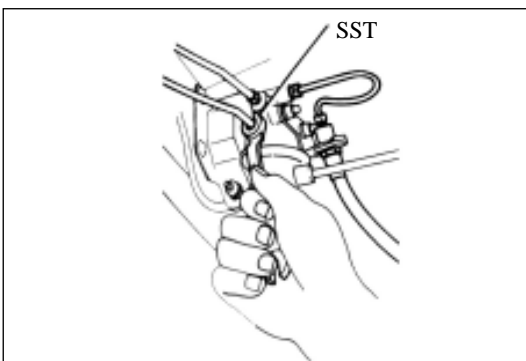


## Mount of Load Sensing Proportion Valve

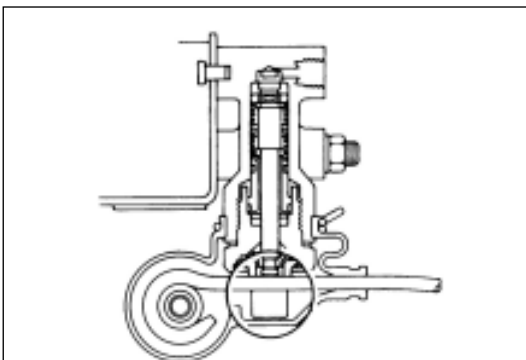
1. Mount the load sensing proportion valve cluster on the frame.



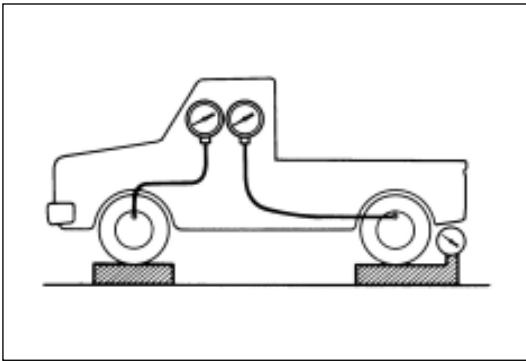
2. Connect the claming head II with the bracket:
  - (a) Mount the claming head on the load inductive spring;
  - (b) Adjust the spacing A.  
Initial adjustment: 78 mm;
  - (c) Mount the claming head II on the claming head bracket



3. Connect the brake pipeline;  
Connect the brake pipeline with SST.  
Fastening torque:  
Dr SF:  $(18 \pm 2) \text{N} \cdot \text{m}$   
SL SK SY SJ:  $(19 \pm 1) \text{N} \cdot \text{m}$



4. Adjust the rear shaft load
5. Adjust the valve:
  - (a) When drag downward the load inductive spring, the valve piston shall move downward smoothly.
  - (b) When mount the valve body, the valve piston shall touch the load inductive sensing spring lightly.
  - (c) Screw up the mounting nuts of valve body.



6. Exhaust the air in braking system
7. Check and adjust the hydraulic pressure of load sensing proportion valve.

---

# Steering System

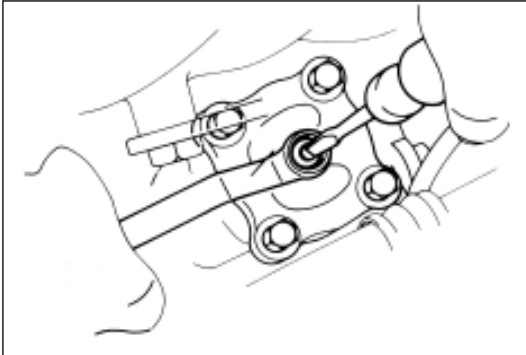
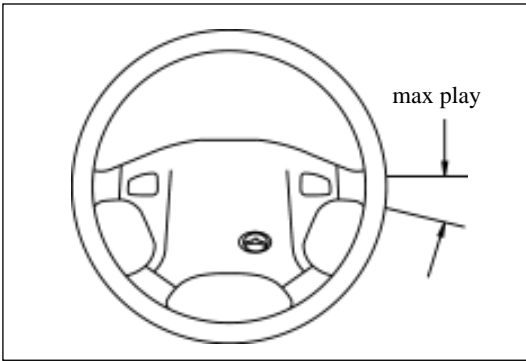
	Page
Notice .....	SR-2
Troubleshooting .....	SR-2
Inspection on Vehicle .....	SR-3
Steering Column .....	SR-4
Manual Steering Gear .....	SR-9
Power Steering .....	SR-11
General Introduction .....	SR-11
Inspection on vehicle .....	SR-13
Power Steering Oil Pump .....	SR-16
Power Steering Gear .....	SR-18
Steering linkage .....	SR-20

## Notice

The parts change should be conducted correctly because any error will affect the properties of steering system, or lead to accidental or damage when driving.

## Troubleshooting

Trouble	Causes	Inspection items
Difficulty in steering	Unsuitable tire inflation Insufficient lubricant Over-large inclination Steering gear joint wear Lower swing arm ball head wear  Steering column seize-up Steering gear unsuitable adjustment or damage Power steering conveyer looseness Over-low liquid level in oil cup of steering pump Failure in power steering mechanism	Inflate the tire to specified pressure Lubricating the hanging devices Check the Alignment of Front Wheel Change the Steering gear joint Change the lower swing arm ball head;  Check the steering column Adjust or repair the gear. Adjust the conveyor. Check the steering pump oil cup Check the power steering devices
Poor returning	Unsuitable tire inflation Insufficient lubricant Incorrect wheel alignment  Steering column seize-up Steering gear unsuitable adjustment or damage	Inflate the tire to specified pressure Lubricating the hanging devices. Check the Alignment of Front Wheel  Check the steering column Change the steering gear.
Over-large play	Front wheel bearing wear Steering drive shaft yoke wear Lower swing arm ball head wear Steering gear joint wear Steering gear unsuitable adjustment or damage	Change the front bearing Change the steering drive shaft Change the swing arm ball head Change the steering gear joint Change the steering joint
Abnormal noise	Steering drive lever looseness Steering gear joint wear Steering gear unsuitable adjustment or damage Oil lack or poor sealing of steering machine.	Tighten the steering drive lever Change the steering gear joint Change the steering gear Add the oil or change the sealing washer Steering system inspection on vehicle.



## On-vehicle Inspection

### Steering wheel play

1. SR-18 Check to see whether the steering wheel play is correct;

Park the vehicle stably and align the tires in correct direction, press the steering wheel with finger and swing it in left and right direction. The play should not exceed the max play.

(Max play) :  $6^{\circ}$  (Dr SF)

If the play is not correct, adjust or repair the steering wheel as requirement.

2. Adjust the steering wheel play:

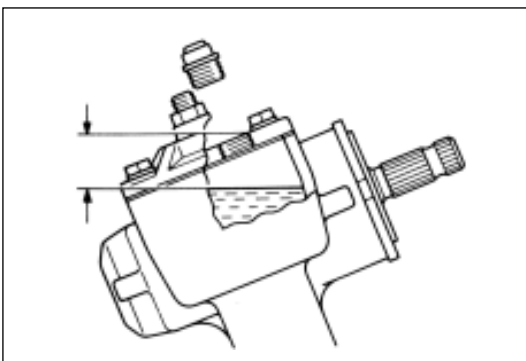
- (a) Align the wheel forward precisely;
- (b) Loosen the locking nuts of steering gear;
- (c) Rotate the adjusting screws of steering gear clockwise to reduce the steering wheel play, while contrarotate the adjusting screws to increase the steering wheel play.

Remark: screw the adjusting screws and enlarge the play a little each time to check the adjusted play.

3. Check to see whether there is steering inconvenience

Rotate the steering wheel by half round in right and left direction to check whether the play is correct, and whether the wheel runs smoothly or any seize-up in its running.

4. Fix the adjusting screws and fasten the adjustable nut.



### Oil level height

Check the oil level height in the steering gear housing.

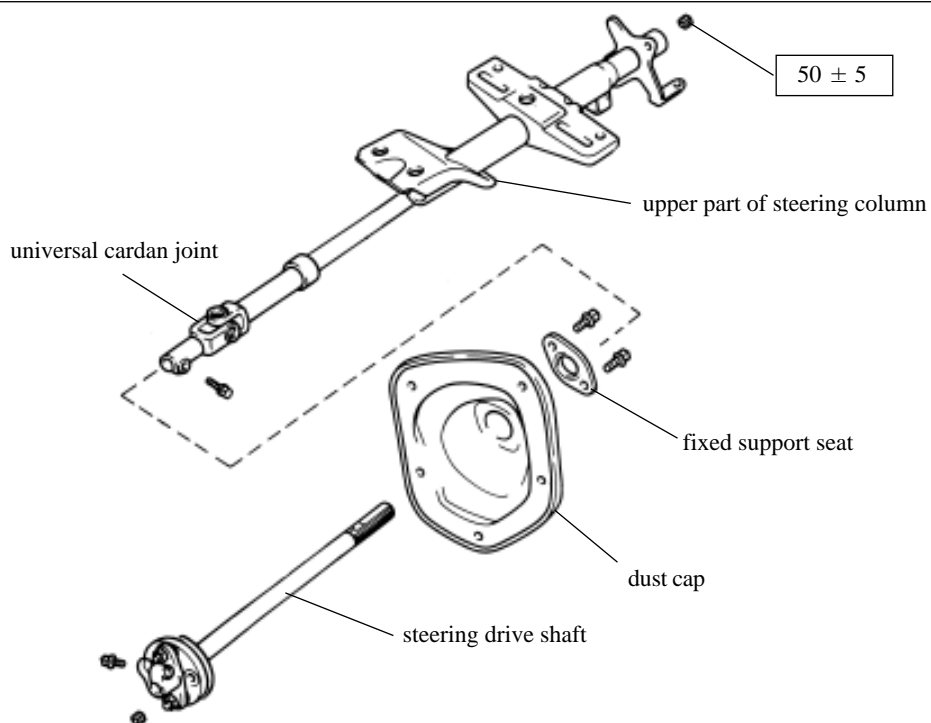
Oil level height: flush with the filler opening.

If there oil is insufficient, add the gear oil and check to see whether there is oil leakage.

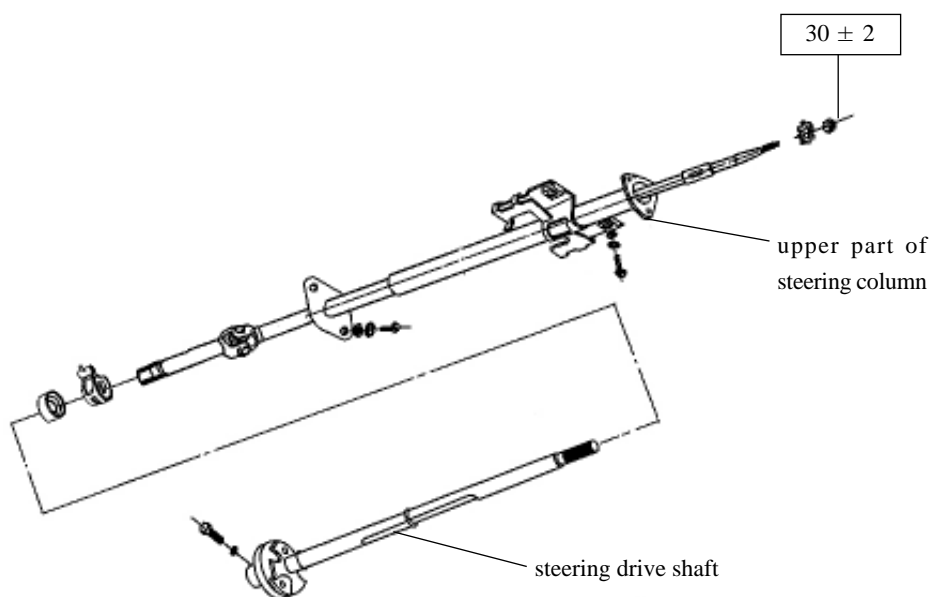
## Steering Column

### Element figure of non-adjustable steering column

Dr



SL SK SY



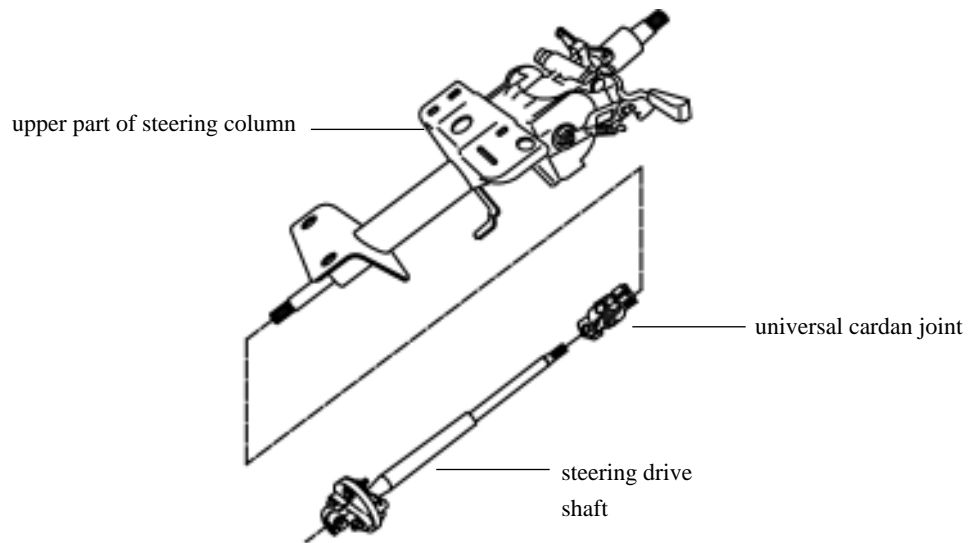
**N • m** : specified torque



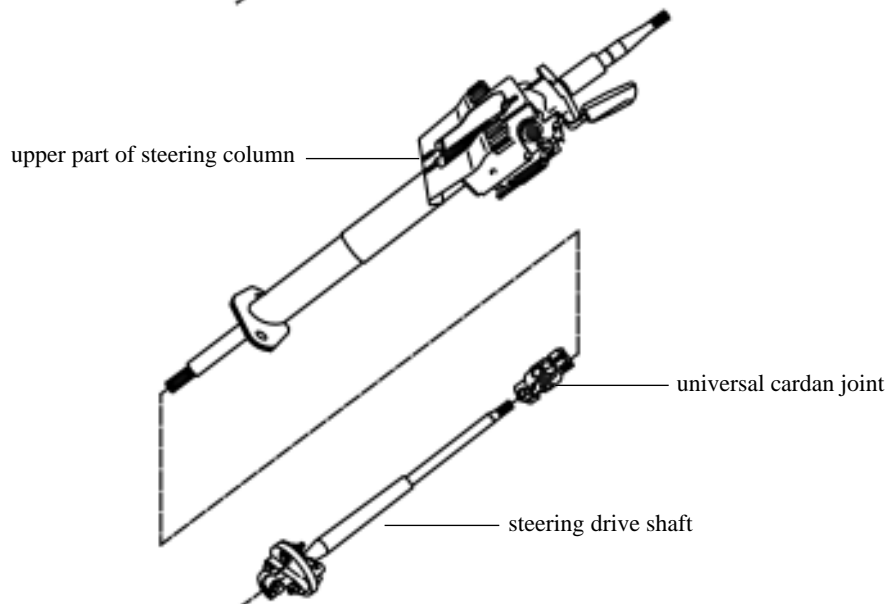
## Steering Column

### Element figure of adjustable steering column

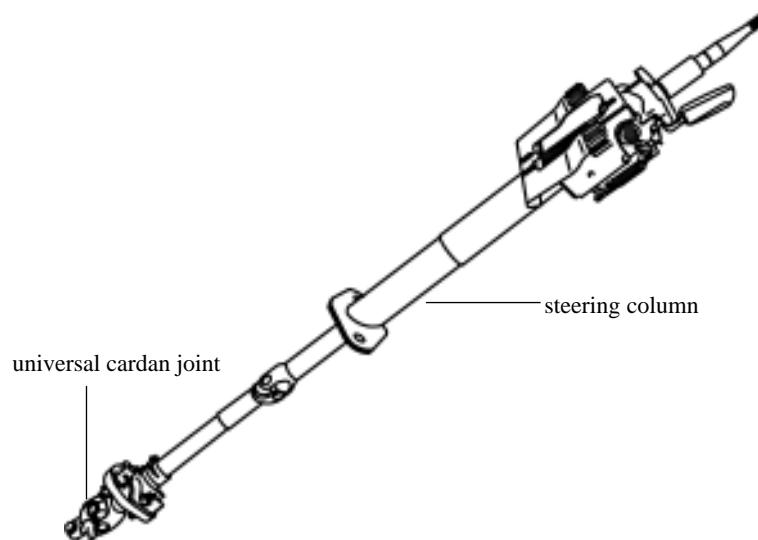
Dr SF

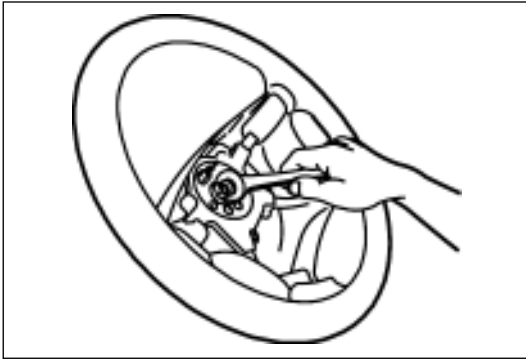


SL SK SY



SJ



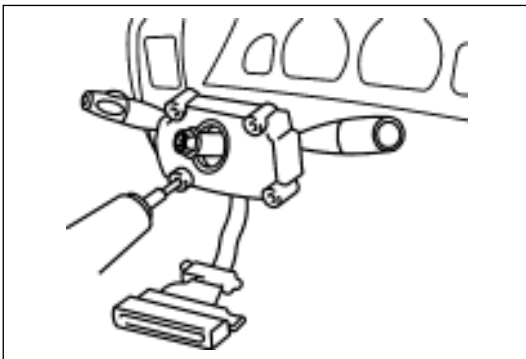


## Dismantle of the steering wheel

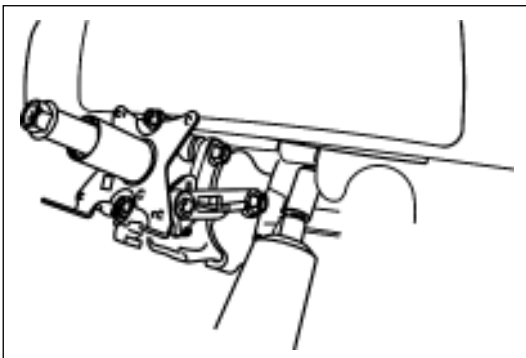
1. Dismantle of the steering wheel;
  - (a) Take down the bugle cap;
  - (b) Pull down the bugle wire.
  - (c) Tear down the fixing nut of steering wheel.



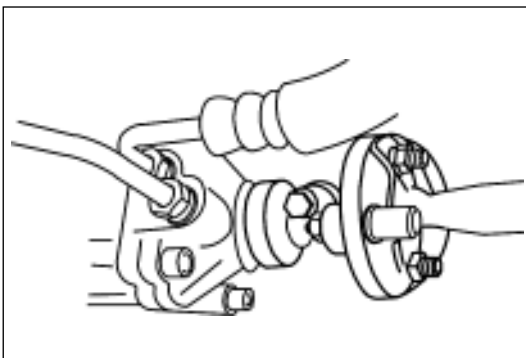
2. Tear down the combined switch cover;
3. Tear down the cover at left bottom part.
4. Tear down the fixing bracket for the left-bottom cover.
5. Tear down the air passage;



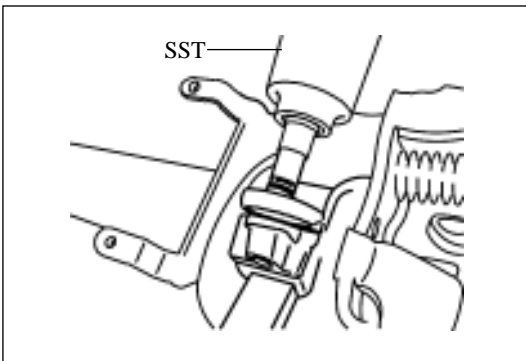
6. Tear down the combined switch;
7. Tear down the fixed support seat bolts on front-wall panel;



8. Tear down the fixing bolts at upper part of steering column, and

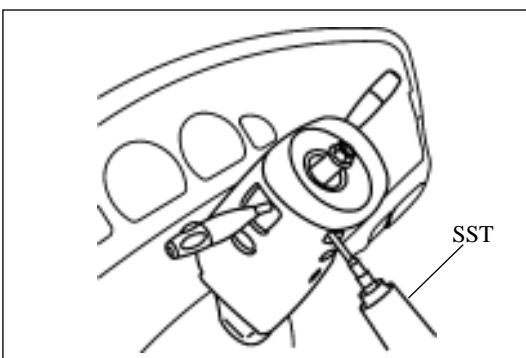
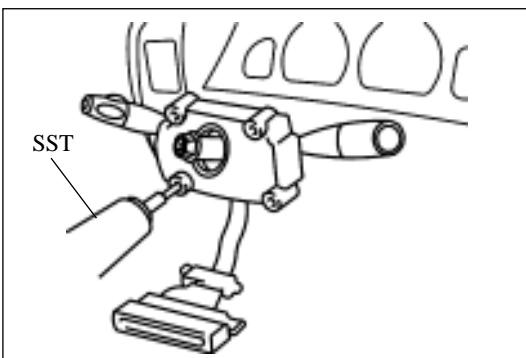
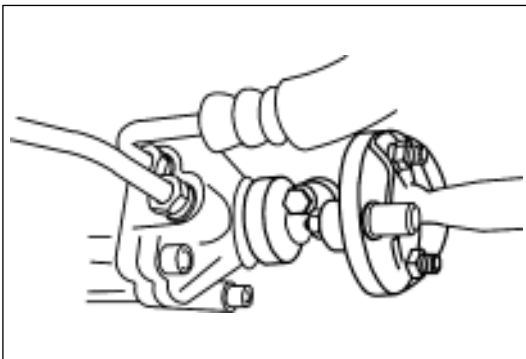
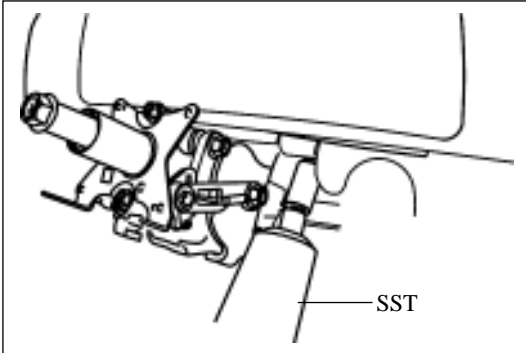


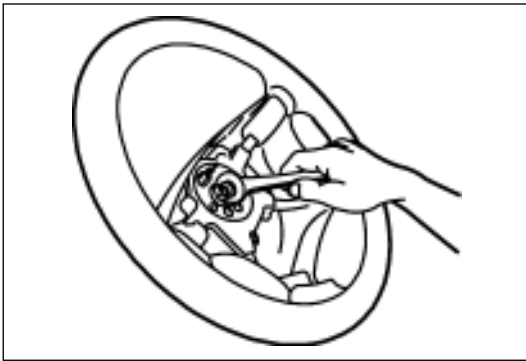
9. Tear down the connecting bolts of steering column drive shaft.
10. Pull out the steering column.



## Mount of Steering Column

1. Mount the ignition switch assembly  
Fix the ignition switch on the steering column with SST.
2. Mount the dust cap and fixed support seat of steering column on the front-wall panel.
3. Mount the upper part of steering column;  
Mount the upper part of steering column on the fixed bracket with SST.
4. Connect the upper part of steering column and the steering drive shaft with the universal cardan joint;
5. Connect the steering drive shaft and the steering gear;
6. Mount the combined switch.  
Fix the combined switch with SST.
7. Mount the combined switch cover;  
Fix the combined switch cover with SST.





8. Mount the steering wheel:

- (a) Screw up the fixing nuts of steering wheel according to the specified torque.

Specified torque

Dr SF:  $(50 \pm 5)\text{N}\cdot\text{m}$

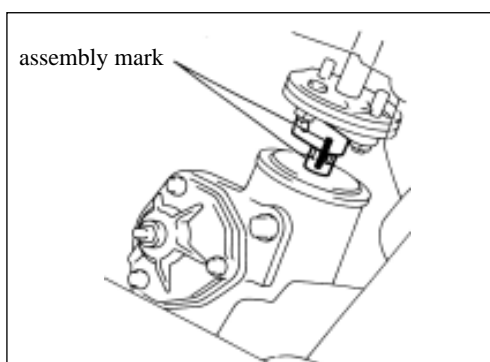
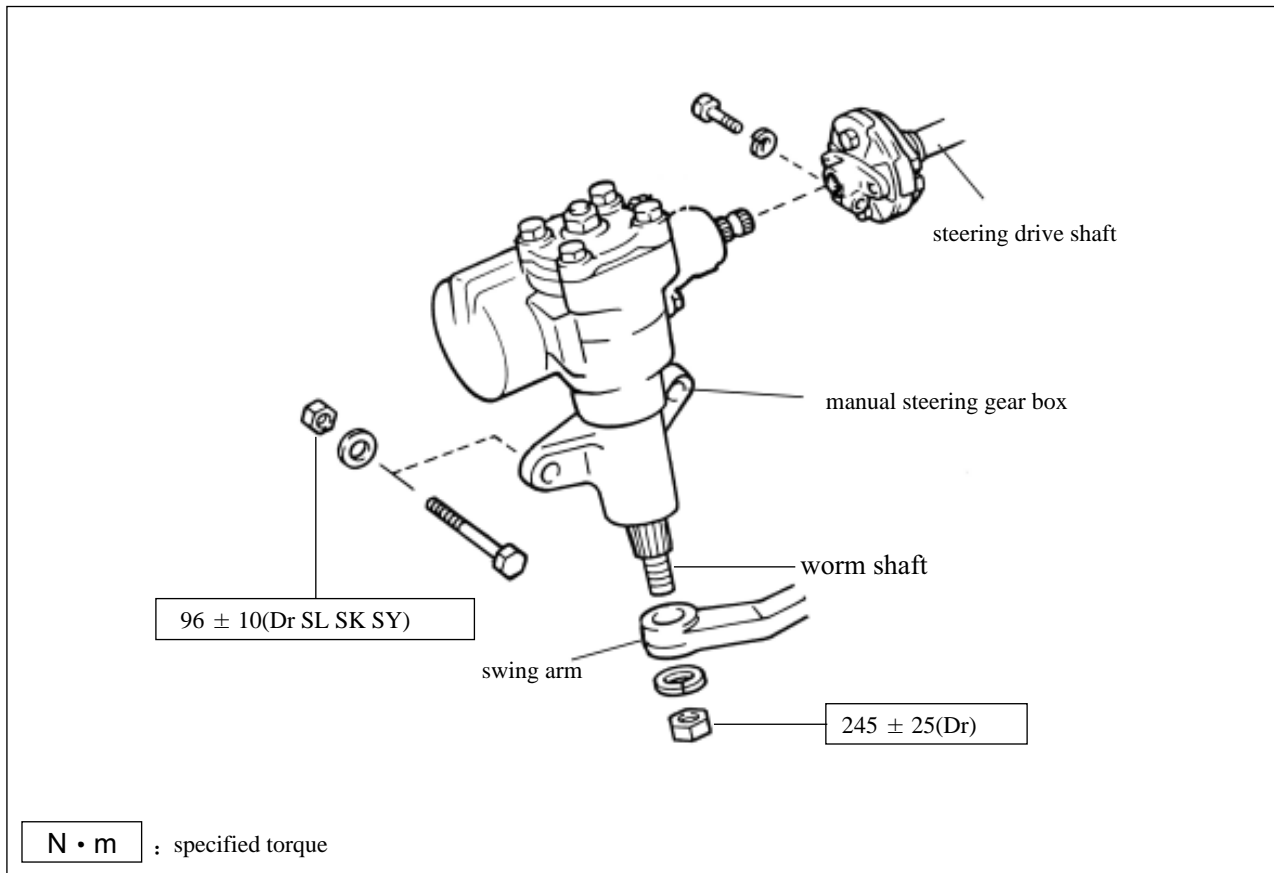
SL SK SY SJ:  $(30 \pm 2)\text{N}\cdot\text{m}$

- (b) Connect the bugle wire;

- (c) Mount the bugle cap.

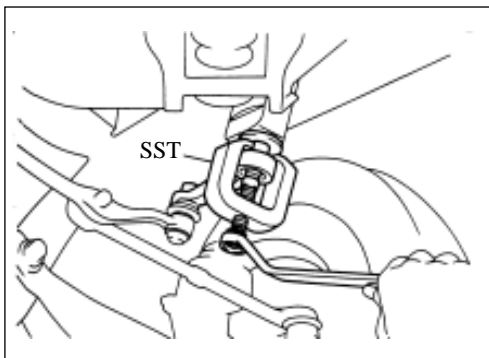
## Manual steering gear

### Disassembly and mount of manual steering gear



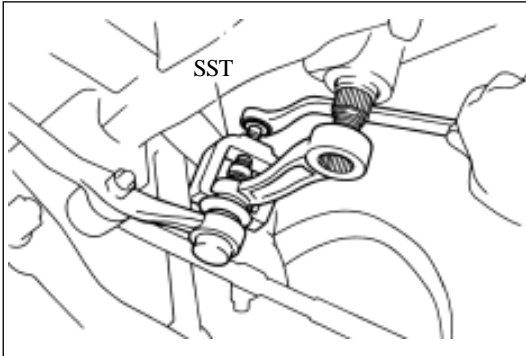
### Points on disassembly and mount

1. Disassemble the steering drive shaft:
  - (a) Loosen the fixing bolts at upper part of steering column;
  - (b) Tear down the connecting bolts of steering drive shaft;
  - (c) Mark the assembly marks on the steering drive shaft and worm shaft;
  - (d) Slide the shaft backward to tear it down from the worm shaft.
2. Tear down the swing arm from the steering gear:
  - (a) Loosen the fixing nuts of swing arm;
  - (b) Tear down the swing arm from the steering gear with SST.



3. Connect the swing arm to the steering gear:
  - (a) Mount the swing arm on the segmental gear shaft, and mount the spring washer and steering arm.
  - (b) Screw up the swing arm nuts.

Fastening torque:  $(245 \pm 25)\text{N} \cdot \text{m}(\text{Dr})$



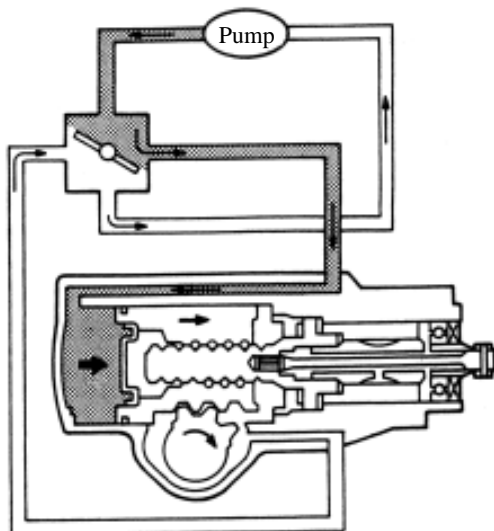
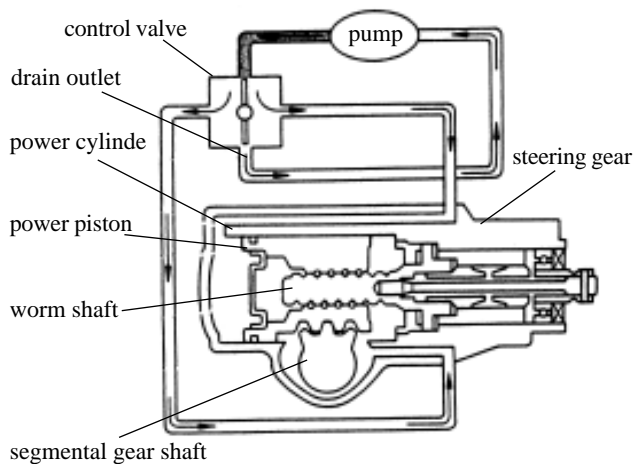
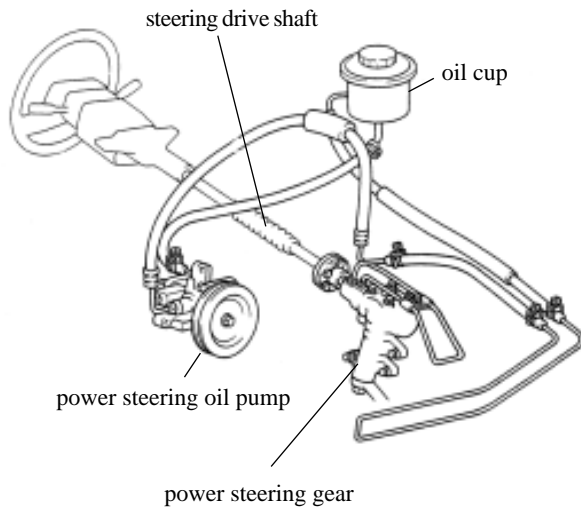
4. Tear down the swing arm from the central transverse drag rod;  
Tear down the swing arm from the central transverse drag rod with SST.

## Power steering

### Introduction

#### Principal of Power Steering

The power steering is a kind of hydraulic device that use the engine power to steer. The engine drive the power steering oil pump to generate the hydraulic pressure, which actuates the piston in steering gear, so that the worm shaft can provide to the piston with a supplementary force, which has relation with the pressure actuated on the piston. Therefore, pressure increase is required if larger steering force is needed, and the pressure variation is accomplished through the control valve.

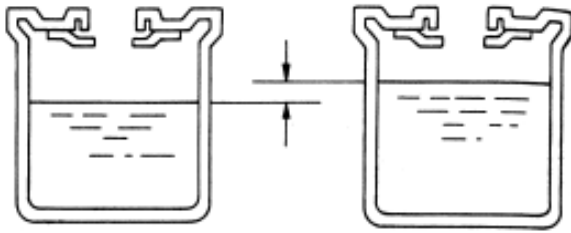


#### Intermediate position (forward straightly)

The liquid from the power steering oil pump is sent to the control valve, which, if located at the intermediate, will allow the liquid to pass and enter into the drain outlet, finally return the pump. At this time, it is difficult to increase the pressure; meanwhile, due to the equal pressures at the both sides of the power piston, it cannot move toward either side.

#### Steering time

When the steering drive shaft move toward either side, the control valve will move together with it, in case one oil passage is shut off, meanwhile open the other larger, the liquid flow variation will increase the pressure, as result, the unequal pressure at both sides of piston will make the piston move toward the side of smaller pressure, therefore, the liquid is pressed in the pump through the control valve.



### Suggestion on maintenance

The failure of power steering system usually relates to the steering difficulty due to lack of supplementary force. In such case, it is the first to verify the problem is produced by the pump or steering gear when repairing. In doing so, the problem can be checked on vehicle with the pressure meter.

### On-vehicle Inspection

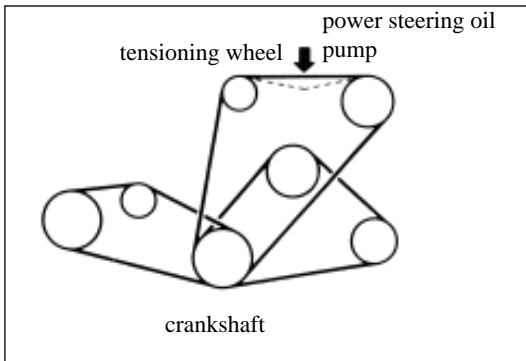
As the power steering is a hydraulic pressure device, its trouble usually caused by the lack of specified hydraulic pressure or the abnormal work of control valve. As a result, it cannot acquire the moderate hydraulic pressure.

In case the problem is caused by the pump, the steering wheel will deflect toward right or left. On the other side, if the problem is caused by control valve, when the steering wheel rotates to left or right, the steering will become more difficult due to the unequal supplementary force. However, when there is wear on the piston sealing ring of power cylinder, it also cause the hydraulic pressure loss that may lead into steering difficulty toward right or left.

Before making inspection on vehicle, verify the power steering system firstly to see whether there is air. If any, the air volume will increase with the variation of hydraulic pressure, which will cause the hydraulic pressure fluctuation that makes the power steering work abnormally. In order to verify whether there is any air in the system, check whether the liquid level varies or not when the steering wheel rotates completely toward the right or left. For instance, if there is air in the system, the air will be compressed, which will reduce the liquid level remarkably, when the steering wheel rotating. If there is no air in system, the liquid level variation is very small even though the hydraulic pressure increases. This is because the liquid volume will not varies when being compressed. And the small liquid level variation is caused by the expansion of hose between the pump and steering gear when the hydraulic pressure increasing.

Meanwhile, the air in system sometimes will cause the pump or steering gear produce noise when the steering wheel rotating completely toward a certain direction. After checking or exchanging the pump or steering gear, the on-vehicle inspection should be often conducted to guarantee the normal work of power steering system.





## On-vehicle inspection

### Inspection on tension of drive conveyor

Measure the tension of drive conveyor.

Drive conveyor tension: under the condition of 98 N.

New conveyor: (5-7)mm

Old conveyor: (7-9)mm

Remark:

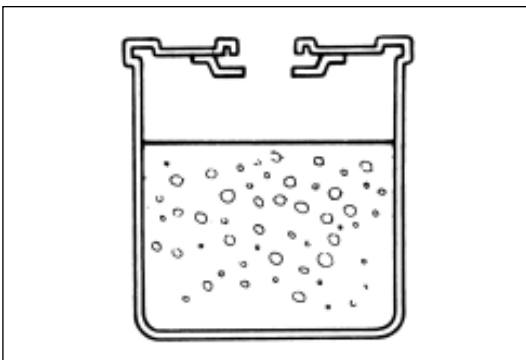
“new conveyor” means the conveyor that is used on the machine less than five minutes;

“old conveyor” means the conveyor that is used on machine more than five minutes

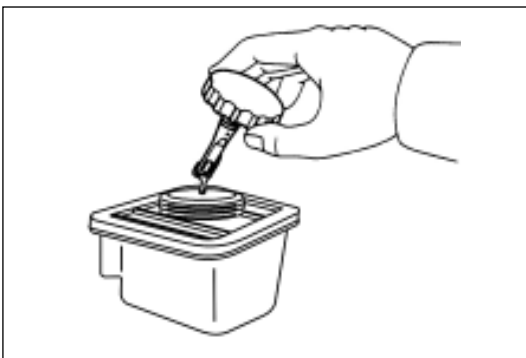
### Check for height of liquid level

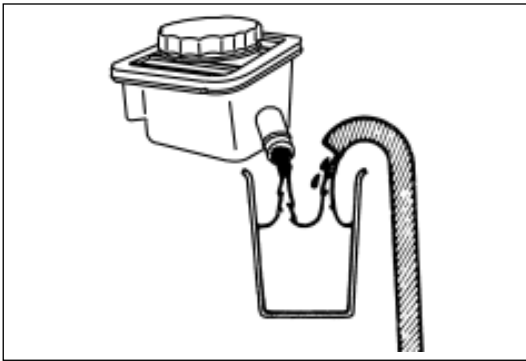
1. Keep the body in horizontal status
2. Increase the liquid temperature

When the engine runs idly by 1000 r/m or less, rotate the steering wheel several times from the locking position to the reverse locking position to increase the liquid temperature.



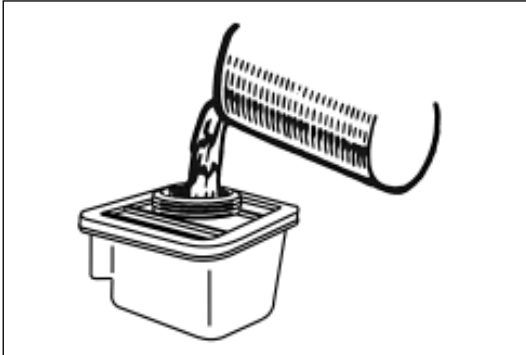
3. Check to see whether there is foam or emulsification;  
Remark: the foam or emulsification shows there is air in the system or the liquid level is over-low.
4. Check the liquid level height in oil cup;  
Check the liquid level height and, if needed, add the oil.





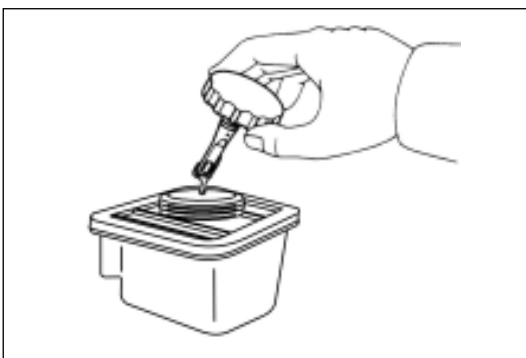
### Change of power steering liquid

1. Tear down the oil-returning hose from the oil cup to drain the liquid into the container;
2. Run the engine in the idle status, and rotate the steering wheel toward the max rotating angle for several times in right or left direction while draining the liquid, until the oil in steering liquid is drained up.
3. Turn off the engine.



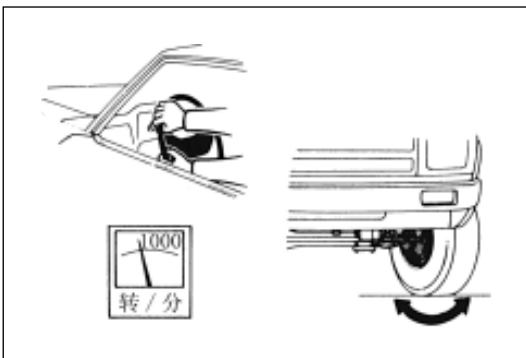
4. Connect the oil-returning pipe and inject the new power steering liquid in the liquid tank;  
Hydraulic oil type: No.8 Liquid drive oil (Q/SH003.01.012-88)

5. Start the engine, and make it running in the idle status.  
Rotate the steering wheel to the max rotating angle repeatedly several times, meanwhile, supplement new power steering liquid in the liquid tank until there is no foam or turbidities in the liquid tank, and the oil indicating lamp reaches the marked range when the engine is turned off.
6. Tighten the liquid tank cover
7. Exhaust the air in the power steering system;

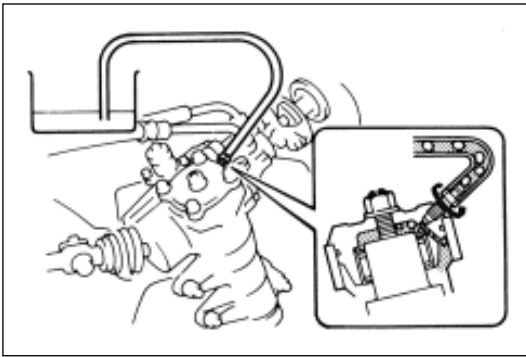


### Air bleeding in power steering system

1. Check the liquid level height in the liquid tank  
Check the liquid level and, if needed, supplement the liquid.



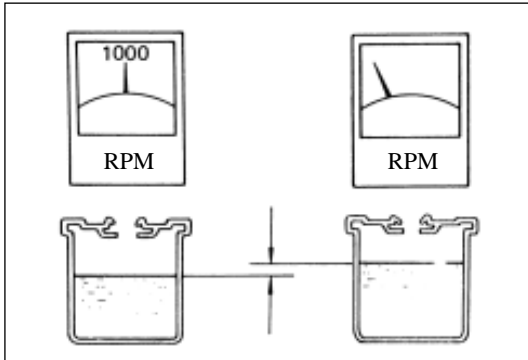
2. Start the engine in the idle status and rotate the steering wheel repeatedly to the max rotating angle several times.
3. Turn off the engine and connect the ethane pipe and bleeding plug.
4. Start the engine and rotate the steering wheel repeatedly to the max rotating angle several times.
5. Locate the steering wheel at the intermediate position.



6. Exhaust the air in steering system:

- (a) Loosen the bleeding plug;
- (b) Screw up the bleeding plug when there is no air bubble exhausted from the pipeline.

Notice: take care not let the ethane pipe slide from the bleeding plug, because the liquid is high in temperature and pressure.



7. Check to see whether there is air bubble or turbidities in the oil cup, and ensure the liquid level will not exceed the max value when the engine stops,

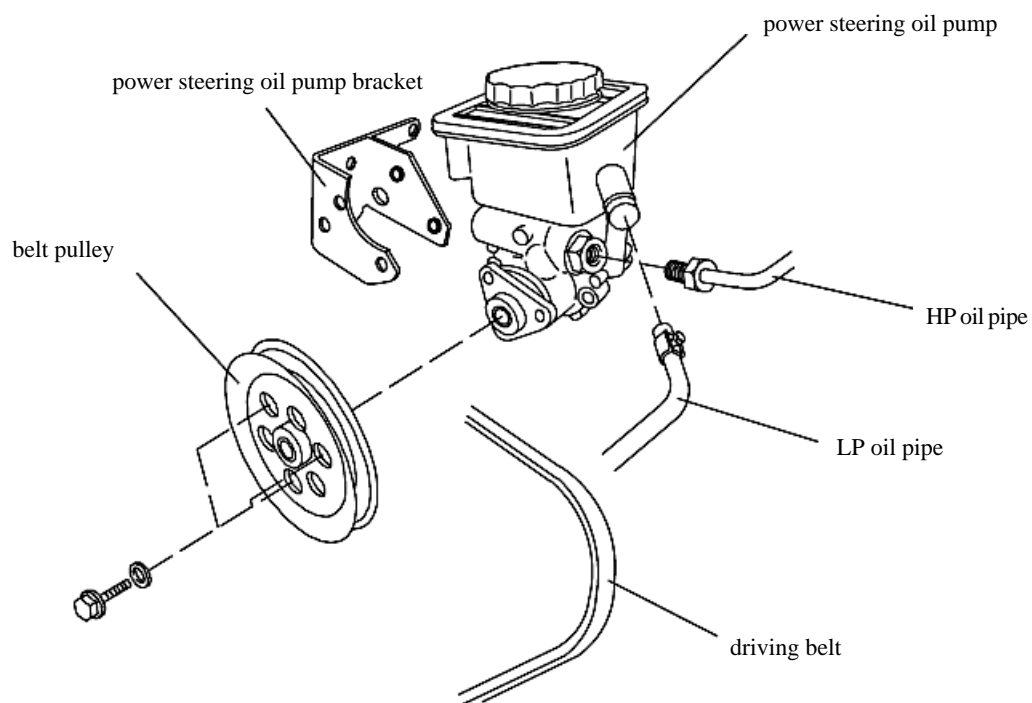
Measure the liquid height under the condition of engine running, then turn off the engine and measure the liquid height again.

In case any problem is found, repeat the approaches of (5) and (6) in *Power Steering Liquid Change*. If the problem still exists, repair the power steering oil pump.

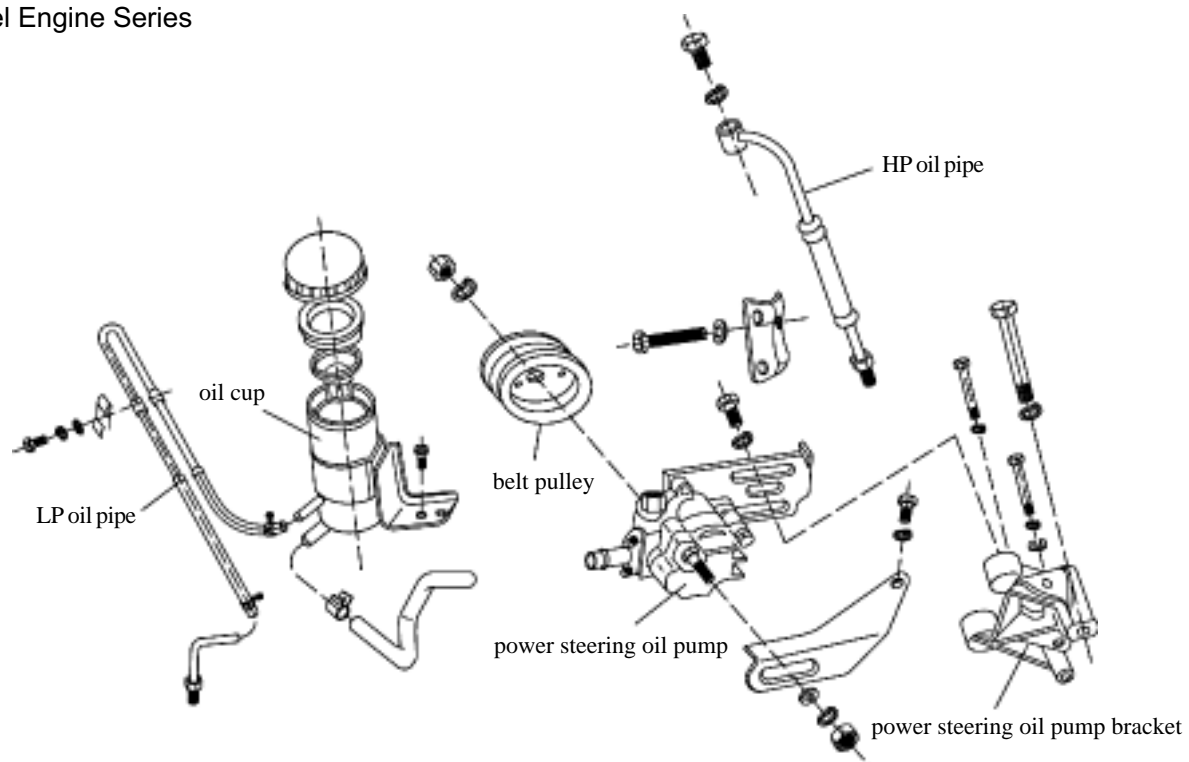
## Oil Pump of Power Steering

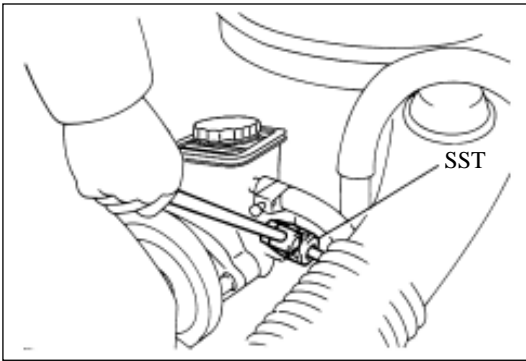
### Dismantle and Mount of Oil Pump of Power Steering

#### Gasoline Engine Series



#### Diesel Engine Series





### Points on disassembly and mount

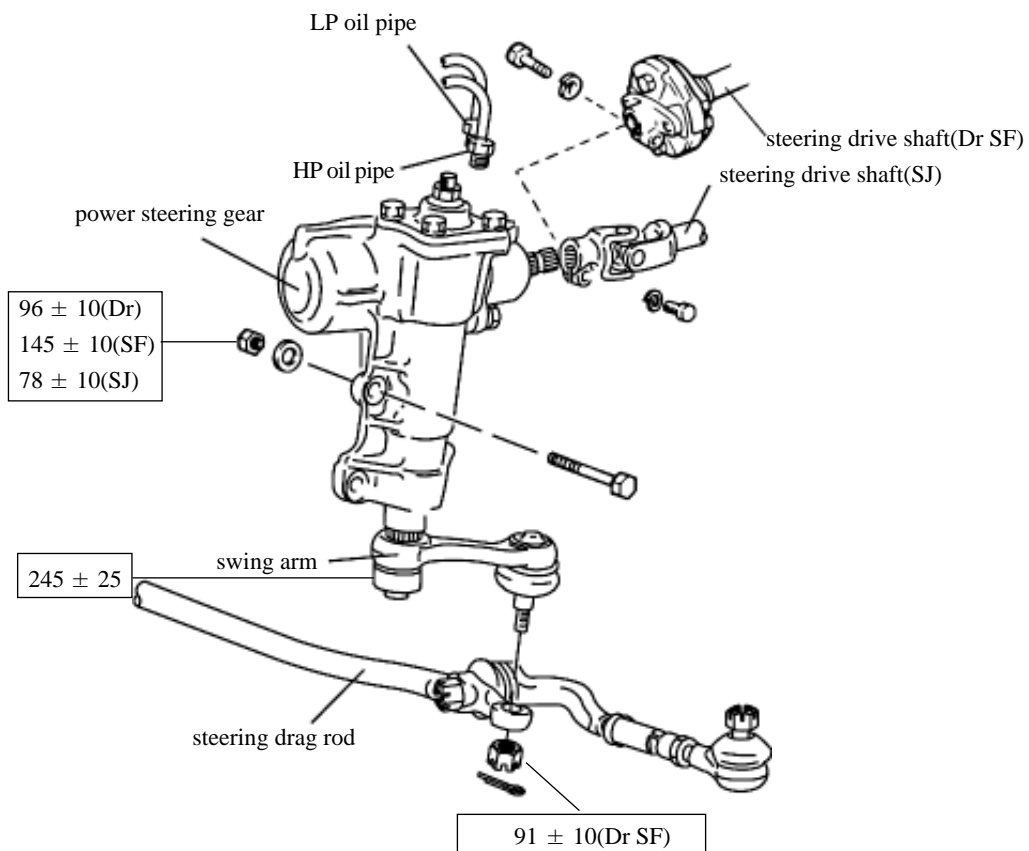
1. Disassemble and connect the pressure pipe;  
Tear down and mount the pressure pipeline on the power steering oil pump with SST.
2. Loosen the belt pulley nuts;  
Press the driving belt by hand to fix the belt pulley to immobilize and loosen the belt pulley nut.
3. Adjust the driving belt tension after mounting the power steering oil pump;  
(See page SR-13)



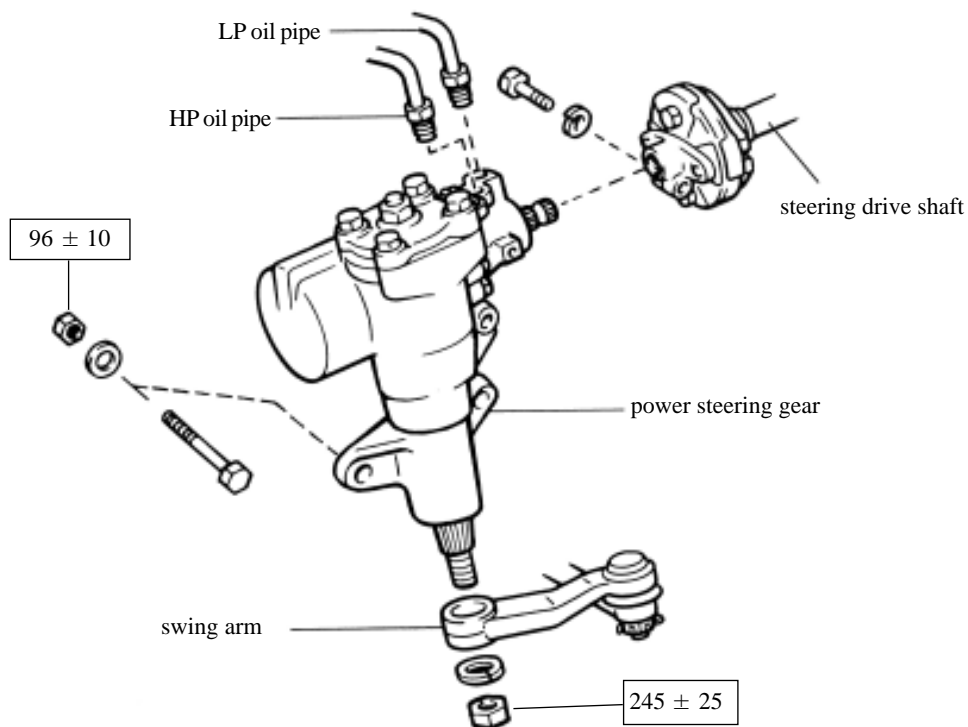
## Power steering gear

### Disassembly and mount of power steering gear

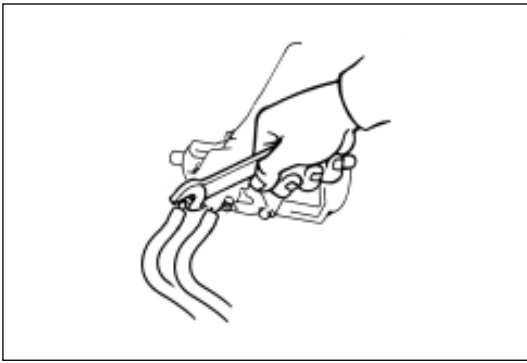
Dr SF SJ



SL SK SY



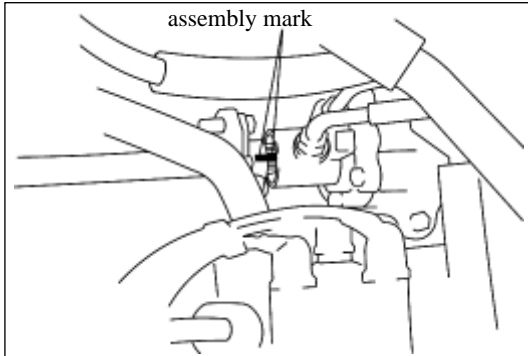
N • m : specified torque



### Points on disassembly and mount

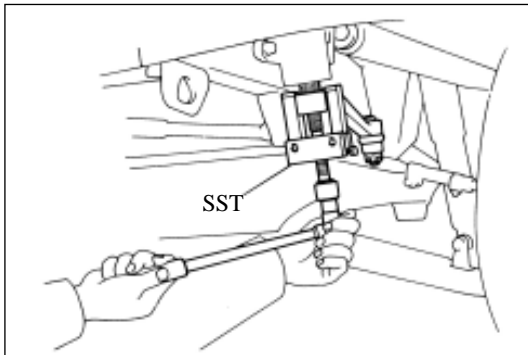
1. Tear down the HP oil pipe and LP oil pipe from the steering gear;

Tear down the HP oil pipe and LP oil pipe from the steering gear.



2. Tear down the steering power shaft

- (a) Make assembly marks on the steering drive shaft and the worm shaft.
- (b) Tear down the connecting bolts of drive shaft
- (c) Dismantle the steering drive shaft from the worm shaft.



3. Tear down and connect the swing arm:

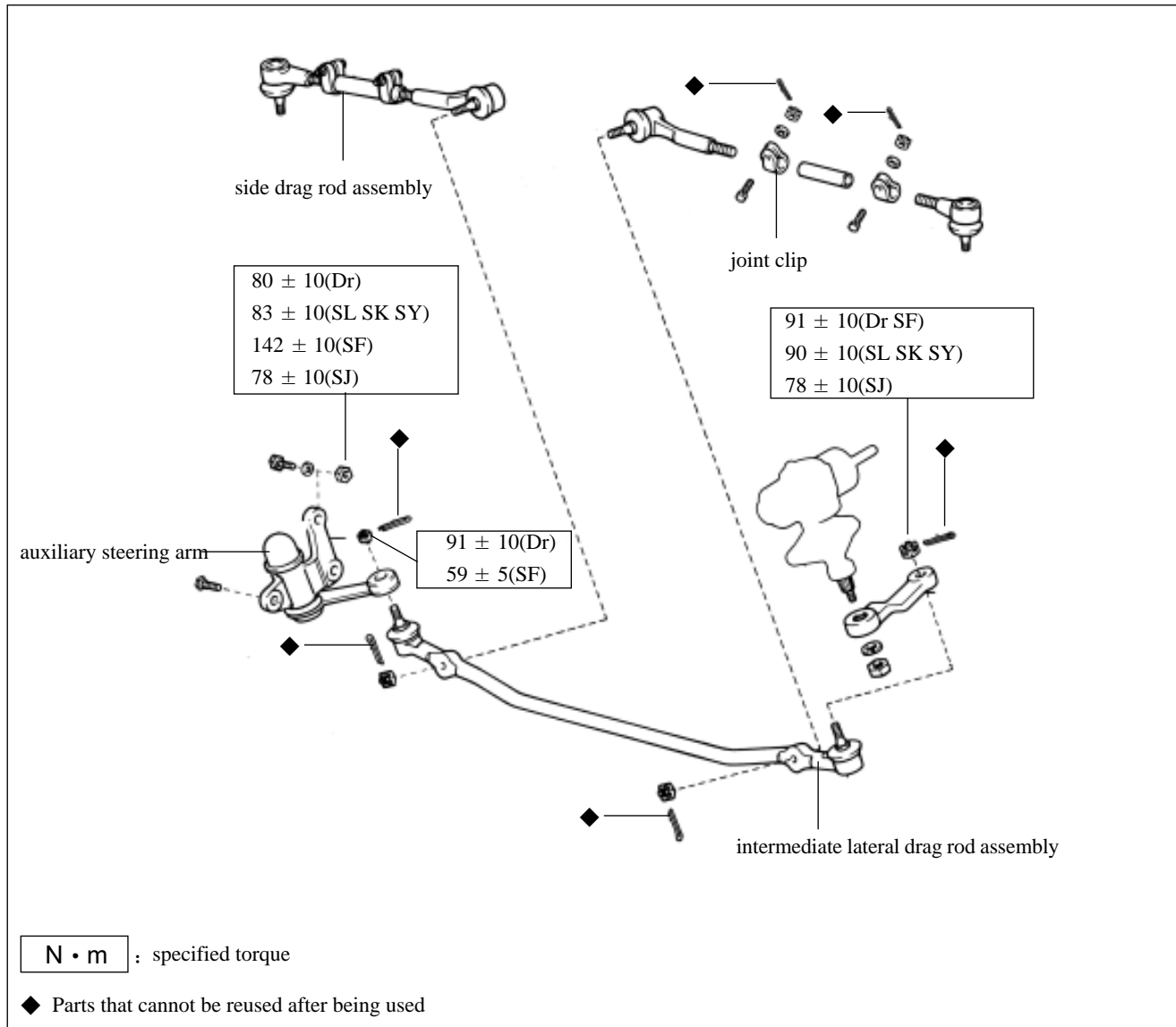
- (a) Tear down the swing arm fixing bolts;
- (b) Tear down the swing arm from the steering gear with SST.

4. Tear down the fixing bolts of steering gear;

Tear down the fixing bolts from the steering gear and then the steering gear can be disassembled.

## Steering Linkage

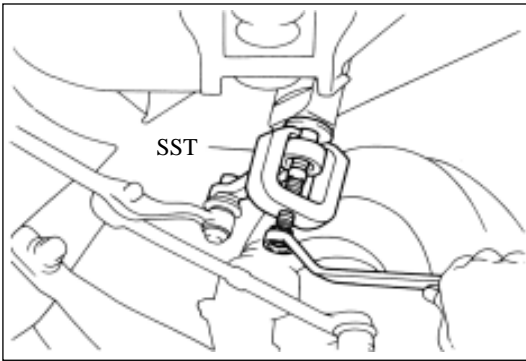
### Dismantle and mount of steering linkage



#### Remark

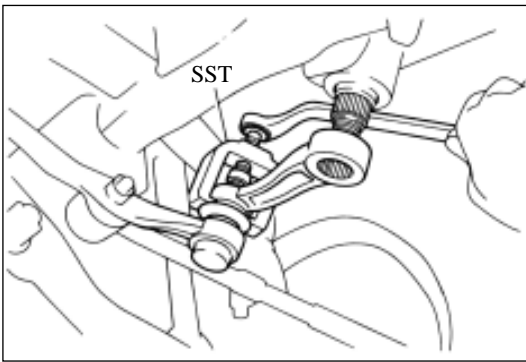
- Where the bolts of recirculating ball are connected with the arm or lever, the lubricant on its surface should be cleaned.
- Screw up the bolts and nuts of re-circulating ball to the specified torque, and then screw the nut forward to the degree that the split pin can be encased in.
- Check the Alignment of Front Wheel and side slip after any part of steering linkage is mounted.



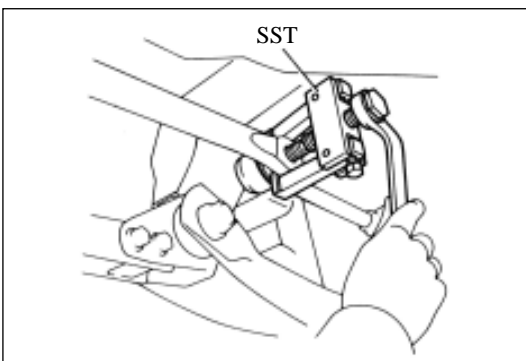


## Points on Dismantle and Mount

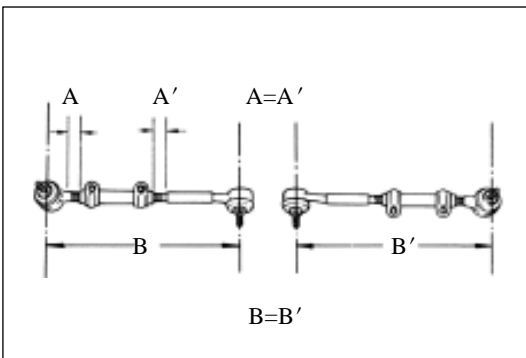
1. Tear down and connect the swing arm on segmental gear shaft:
  - (a) Loosen the swing arm nuts;
  - (b) Tear down the swing arm from the segmental gear shaft with SST;
  - (c) Mount the swing arm on the segmental gear shaft and mount the spring washer and nut when connecting.



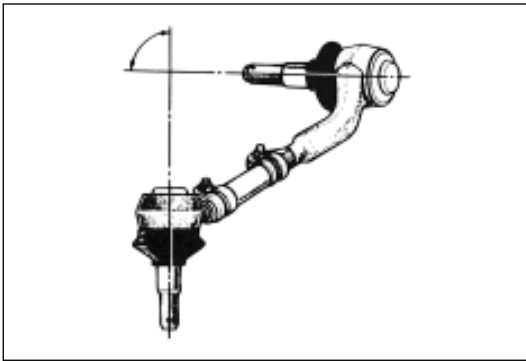
2. Tear down the swing arm from the intermediate lateral drag rod;  
Tear down the swing arm from the intermediate lateral drag rod with SST.



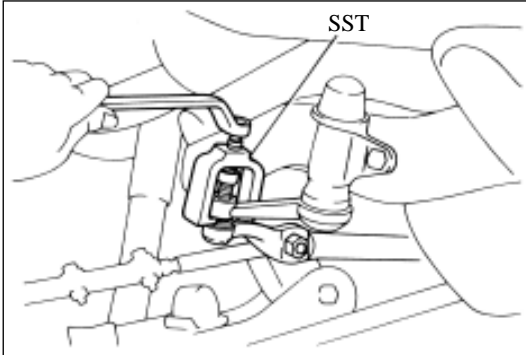
3. Tear down the side drag rod assembly from the intermediate lateral drag rod;  
Use the SST to tear down the side drag rod assembly from the intermediate lateral drag rod;



4. Connect the side drag rod assembly:
  - (a) Screw the two ends in the side drag rod.
 Remark: the thread length at the two ends that cannot screw in the side drag rod should be equal.



- (b) Rotate the two ends of side drag rod to make them intercross at 90° angle, and connect the side drag rod.



5. Tear down the auxiliary steering arm from the intermediate lateral drag rod.  
Tear down the auxiliary steering arm from the intermediate lateral drag rod with SST.

# Body Electric System

	Page
Protective box Location and content .....	BE-6
Power Supply System .....	BE-16
Starting System .....	BE-17
Lighting System .....	BE-19
Combination Instrument .....	BE-32
Backup Radar System .....	BE-39
Wiping and Washing System .....	BE-40
Central control lock and Power regulator System .....	BE-50
Acoustical Equipment System .....	BE-61
Wire Harness Arrangement.....	BE-68

## Brief Introduction

### 1. Power supply system

The power supply system includes accumulator, generator and its adjustor. Generator is the main power supply; the accumulator is the auxiliary power supply. The generator, parallel with the accumulator, is equipped with the adjustor, which is used to maintain the voltage of generator stable when the rotating velocity and the load varies.

### 2. Starting System

Which includes the direct current motor, drive mechanism and control device, etc. its performance is to start the engine.

### 3. Lighting system

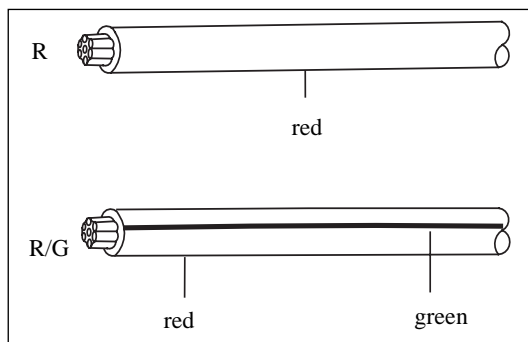
Which includes various lighting lamps inside and outside of the body and their control device; they are used mainly to guarantee safety driving in night.

### 4. Alarming System

Which includes the electric horn, flasher and various service signal indicating lamps, etc. they are mainly used to guarantee the physical and driving safe when driving.

### 5. Auxiliary Electric Appliance System

It includes the electric wiper, air-conditioner, recorder and cigarette lighter, etc.



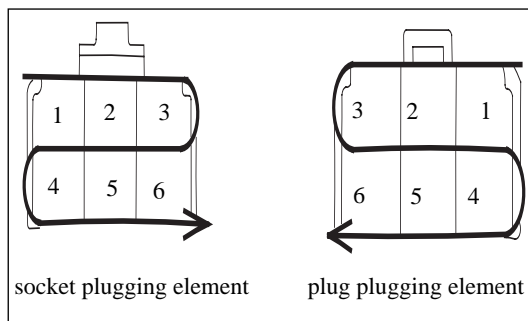
#### English letters for wiring colors code:

B =black Bl =blue R =red Br =brown

Lg =reseda V =purple G =green O =orange

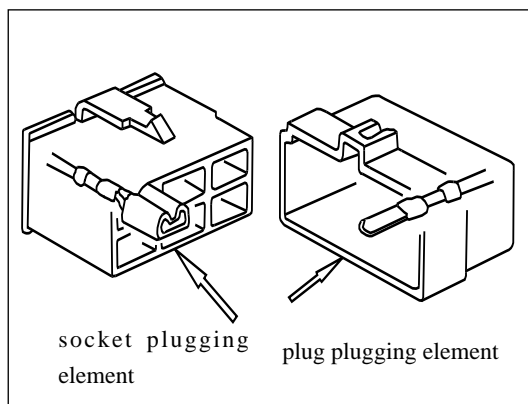
W =white Gr =gray P =pink Y =yellow

First letter stands for the basic color, while the second for the stripe color.



1. The codes of sockets of socket plugging element are complied from left to right.
2. The codes of sockets of socket plugging element are complied from right to left.

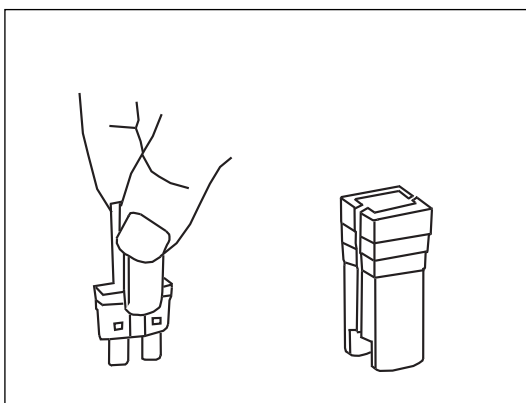
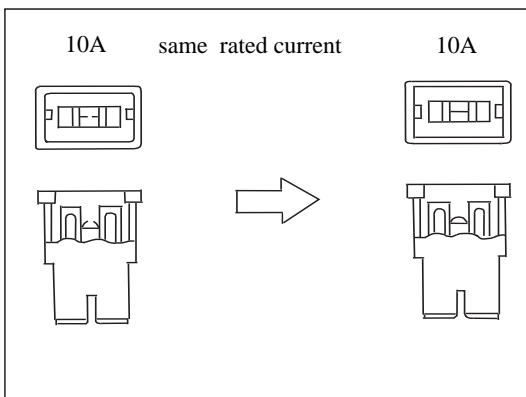
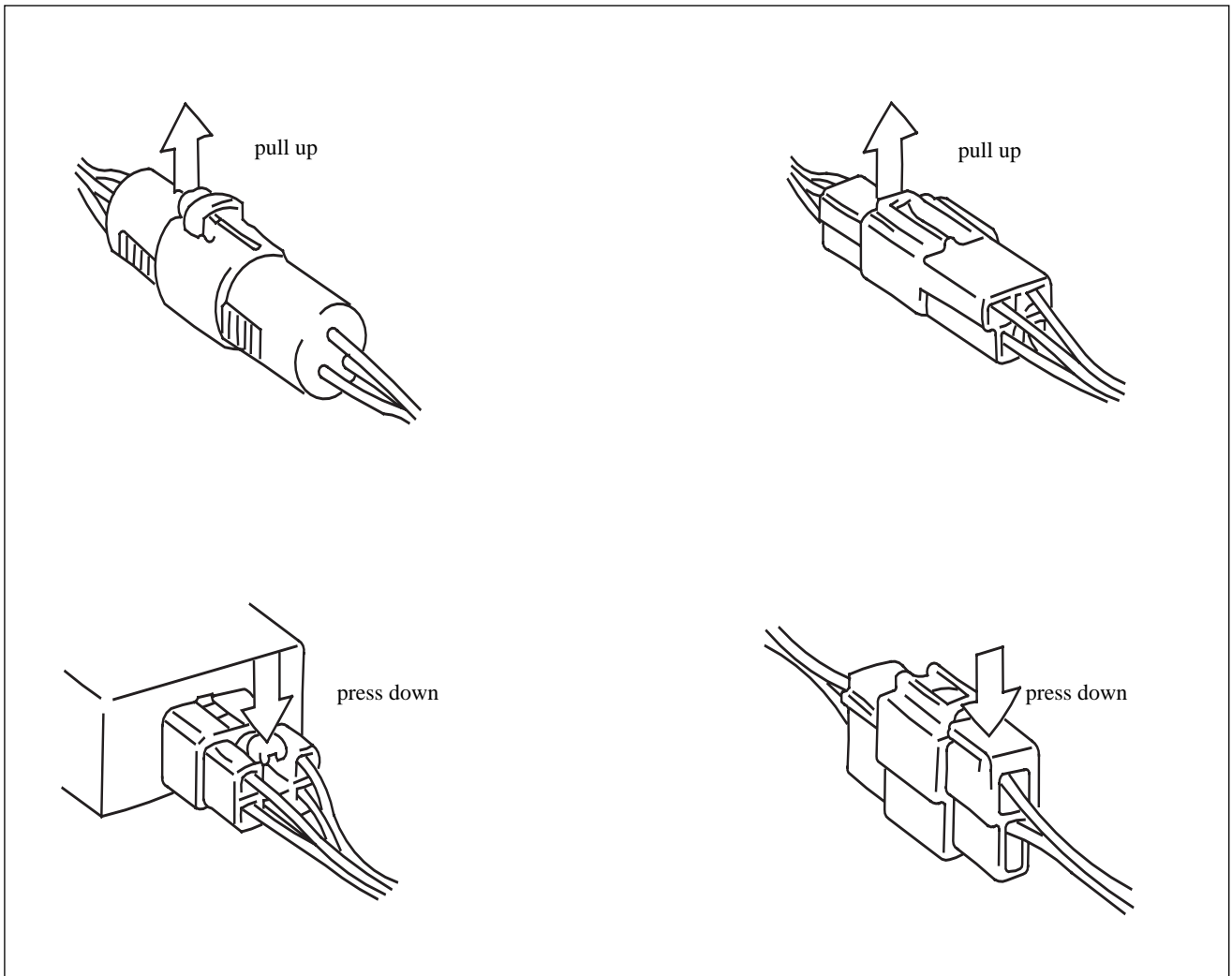
Remark: all of plugging elements are watched from the in-wiring direction.



3. Comparison between plug and socket plugging elements  
The plug and socket plugging elements are classified according to their in-built socket shape.

- (a) All of plugging element are marked according to the opening end and are locked at their tops.
- (b) When pulling the plugging element, pull the plugging element itself instead of wire.

Remark: before pulling the plugging element, check the plugging element that you want to disconnect first to verify their classifications.



## Change of fuse and maxi-fuse

Remark: in case of exchanging the fuse or maxi-fuse, the fuse or maxi-fuse with same rated current should be used.

### Notice:

1. Before exchanging the fuse or maxi-fuse, all electric appliances and ignition switches should be turned off firstly. And the rated current of fuse or maxi-fuse should not be exceeded.
2. When disassembling or assembling the fuse, the disassembly and assembly tools must be used. And they must be pulled out or plugged in vertically. No bend is allowed because the bend will make the connecting terminals depart away, and thus poor connection will occur. In case the fuse or maxi-fuse is burned, it shows there is short circuit. In such situation, the systematic inspection should be conducted by the qualified technician.

Remark: the disassembly and assembly tools are put on the protective box cover.

## How to make systematic inspection

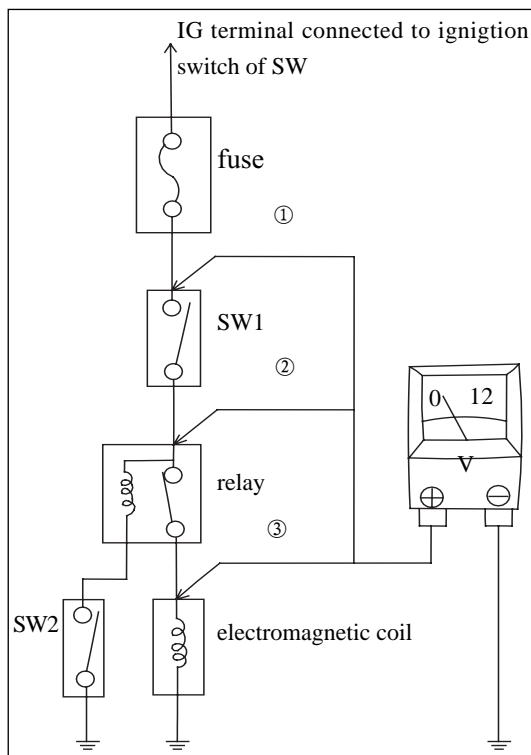
The inspection order is a simple troubleshooting approach, which is used to check and diagnose the failure on vehicle when there is part (wiring and plugging elements excluded) failure in the systematic operation or presupposed system.

Following items should be considered firstly when checking the failure.

- wiring failure
- open circuit or short circuit of electric wiring
- failure in plugging element connection or terminal connection
- failure of fuse or maxi-fuse

Notice:

1. The inspection is conducted on vehicle when the system is in operation, therefore, security should be taken into account when checking.
2. Care should be paid not to make short circuit in the system under the condition that the accumulator is directly connected, and the applicable voltage should be selected correctly.

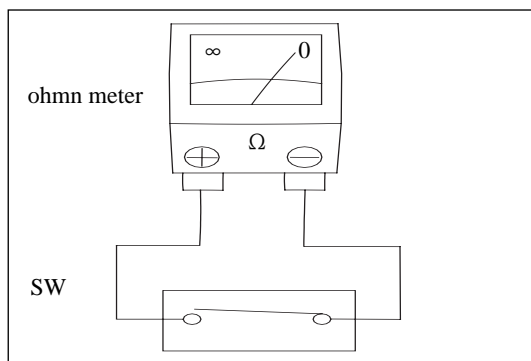


## Voltage inspection

- (a) Verify the voltage situation at the inspection spots.

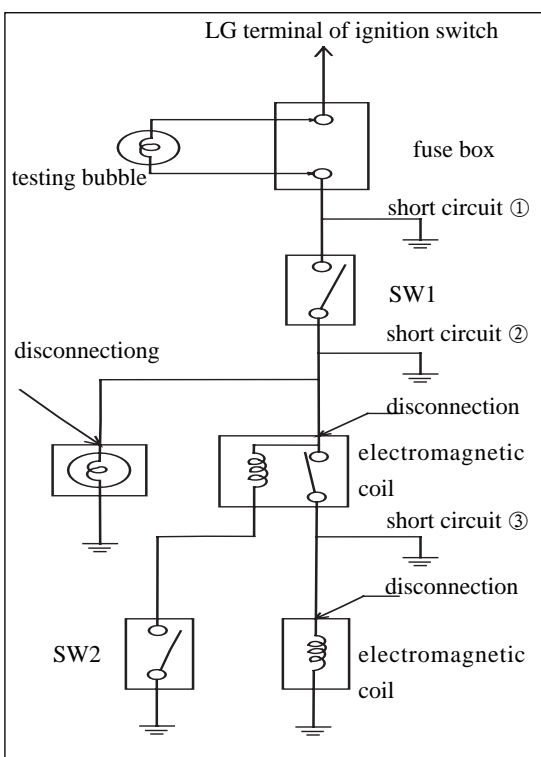
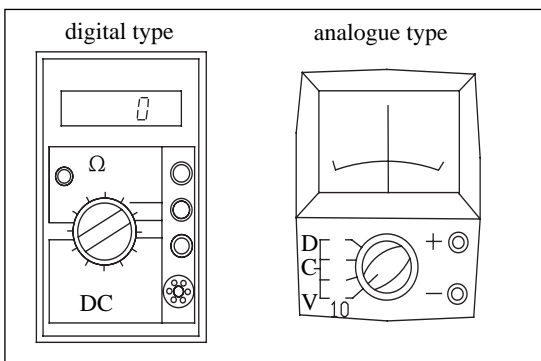
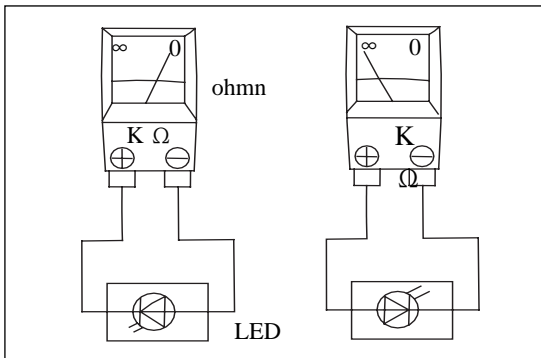
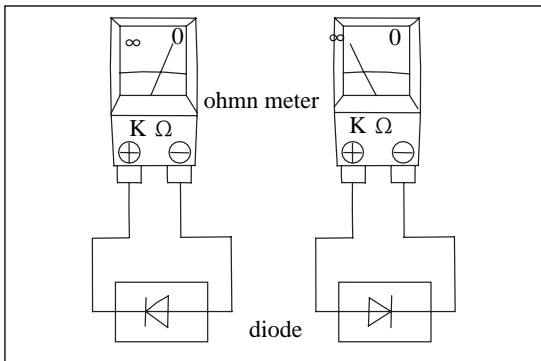
For example:

- ① Put the ignition switch at “ON” position
  - ② Put the ignition switch and SW1 at “ON” position;
  - ③ Put the ignition switch of SW, SW1 and the relay at “ON” position (SW2 at “OFF” position)
- (b) Connect the cathode lead (-) to the normal grounding place or the cathode terminal of accumulator with the voltmeter; while connecting the positive lead (+) to the plugging element or part terminal. Such inspection can be conducted with the test bubble instead of voltmeter.



## Inspection on Conductance and Resistance

- (a) Disconnect the terminal or wire of accumulator to guarantee there is no voltage between the inspection spots.
- (b) Connect the two measuring leads of ohmn meter with the inspection spots.



If there is diode in the circuit, connect the two leads in reverse polar and make another inspection. When the cathode lead (-) is connected with the positive (+) side of diode, and the positive (+) lead should be connected with the cathode (-) lead of diode, the diode should conduct, while the two leads connected to the reverse polar, the diode should not contact. Remark: the specification may be not same due to different testing meter types; therefore, the application instruction for testing meter should be referred before the inspection.

Check the light emitting diode (LED) according to the same approach for diode inspection.

Remark:

The testing meter should be used the one with 3V voltage or the one has larger resistance than that in circuit.

If no suitable testing meter is applied, the voltage of accumulator may be added to check the LED to see whether it is lighted.

- (c) Use the voltage or ohmn meter with high-impedance (min voltage of 10 KV) to diagnose the failure in electric circuit.

## Check to see whether there is short circuit

- (a) Tear down the burned fuse and remove all loads from the fuse.
- (b) Connect the testing bubble at the fuse position;
- (c) Verify the situation of testing bubble position:

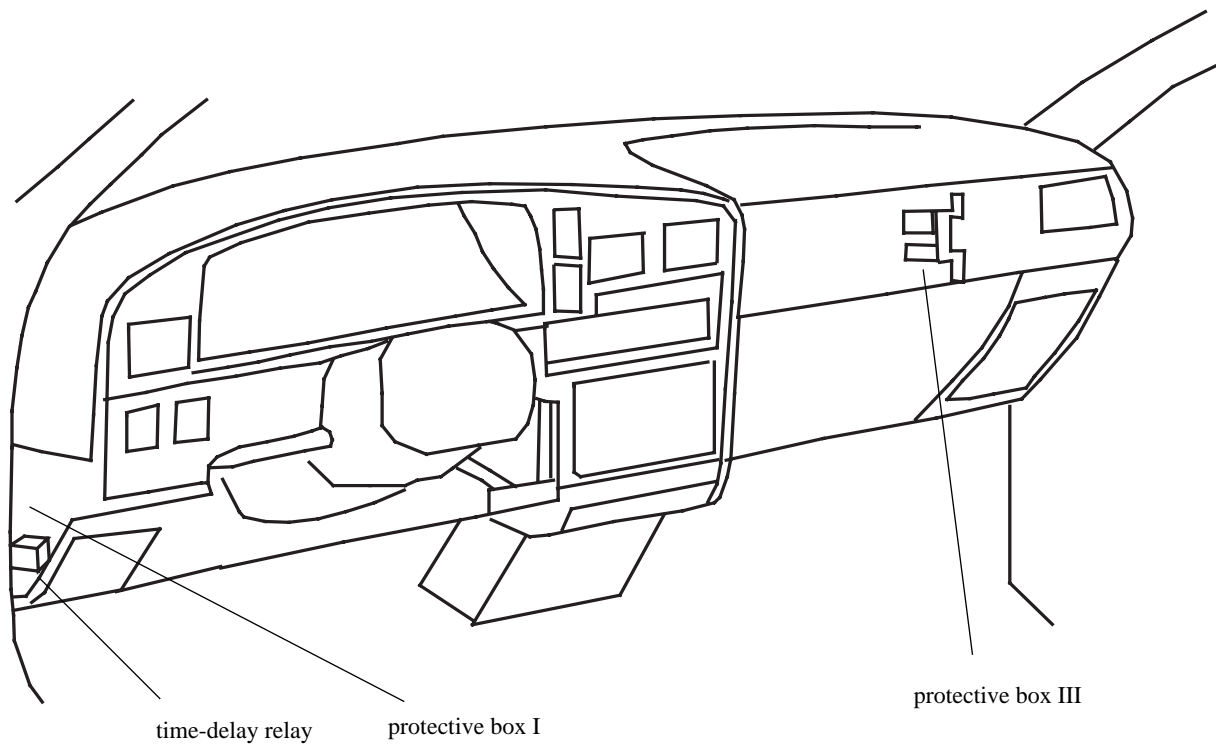
For example:

- ① Put the ignition switch of SW at “ON” position;
- ② Put the ignition switch of SW and SW1 at “ON” position;
- ③ Put the ignition switch of SW, SW1 and Relay at “ON” position (which connects with the relay), and put SW2 at “OFF” position (or disconnect the SW2).
- (d) Disconnect or re-connect the plugging elements when observing the testing bubble. In case the testing bubble keeps lighting, which shows there is short circuit between the plugging elements; if the testing bubble extinguishes, there is short circuit between the plugging elements.
- (e) Shake the trouble wire alongside the body to locate the

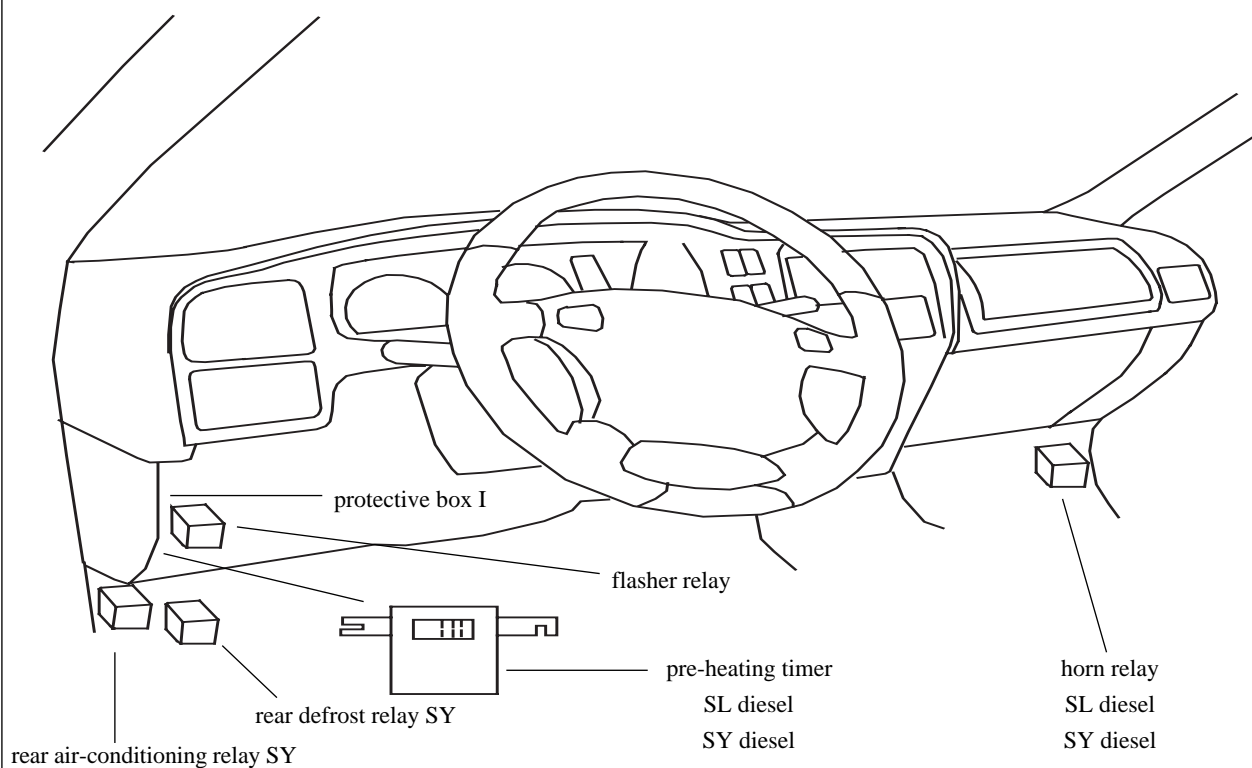
## Position and content of protective box

### Parts mounting Position

Dr SF

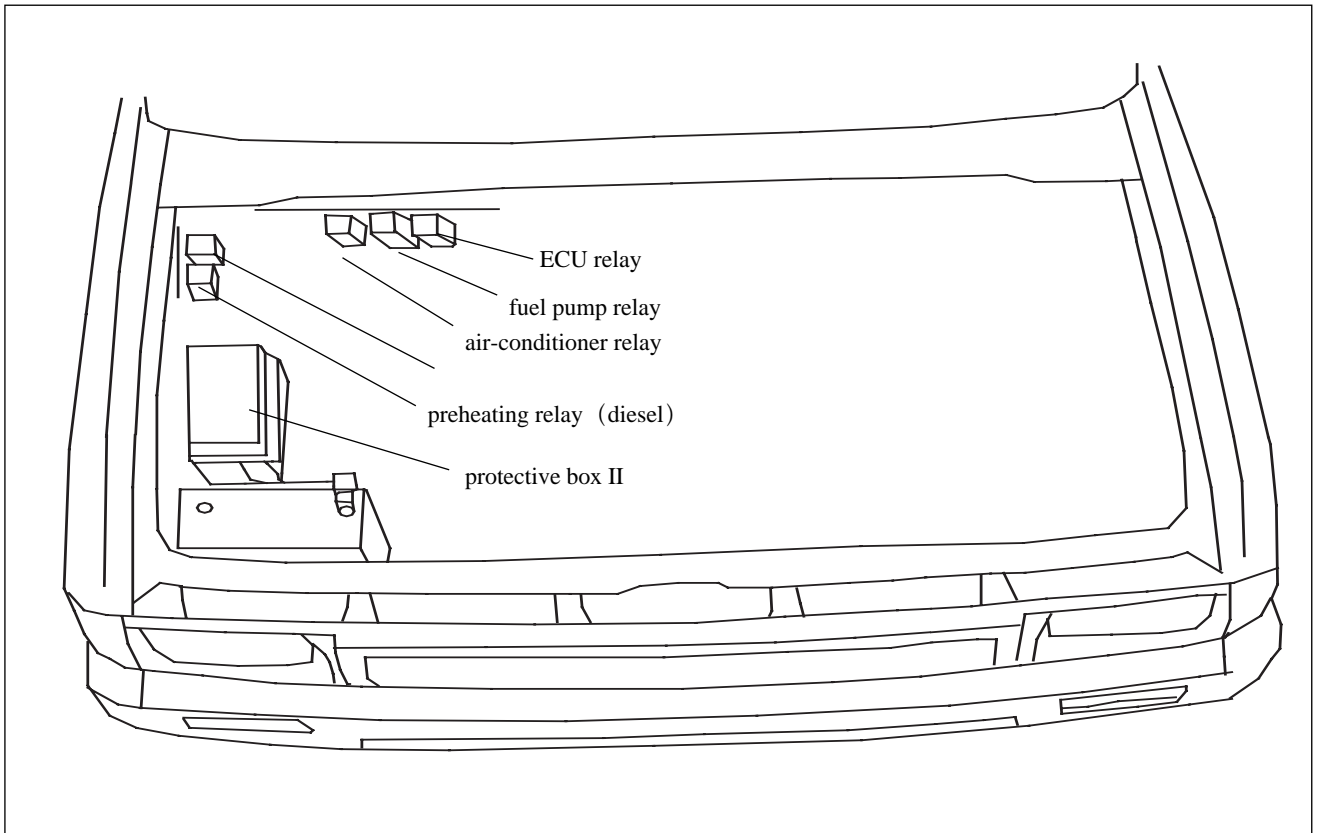


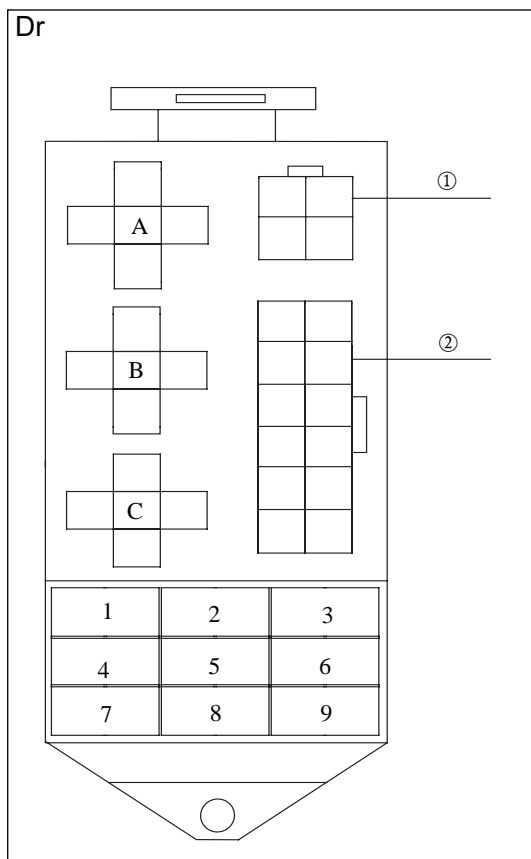
SL SK SY SJ





## Parts Mounting Position (Continued)



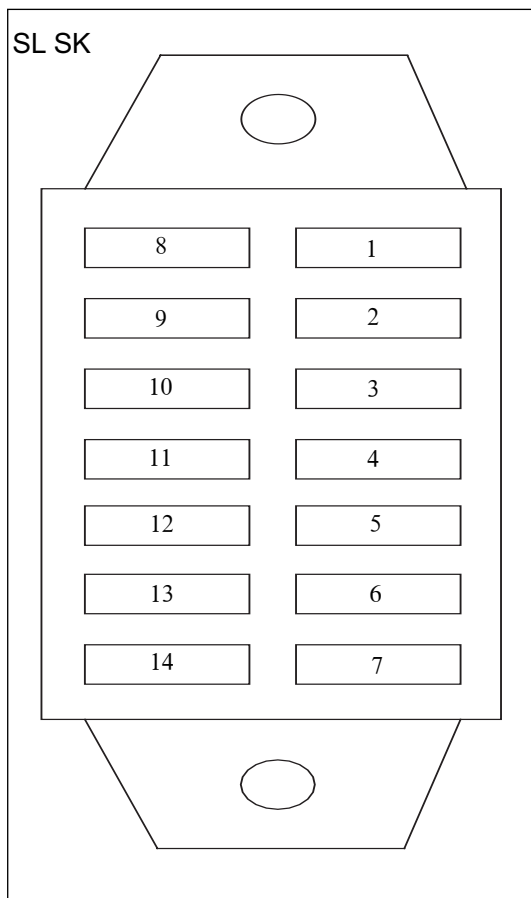


## Content of Protective Box

### 1 protective box I

fuse		relay
1.Small lamp	10A	A electric window relay
2.Rain brus	20A	B. small lamp relay
3.Ceiling lamp	10A	C.(flasher)
4.(Cigarette lighter)	15A	①(plugging elements of ceiling
5.Back -u	15A	lamp wire harness)
6.Brake	10A	②(plugging elements of wire
7.electric window	30A	harness in engine room)
8.Instrument	10A	
fuel delivery/break electromagnetic valve		10A(diesel)
9.Central control lock	15A	

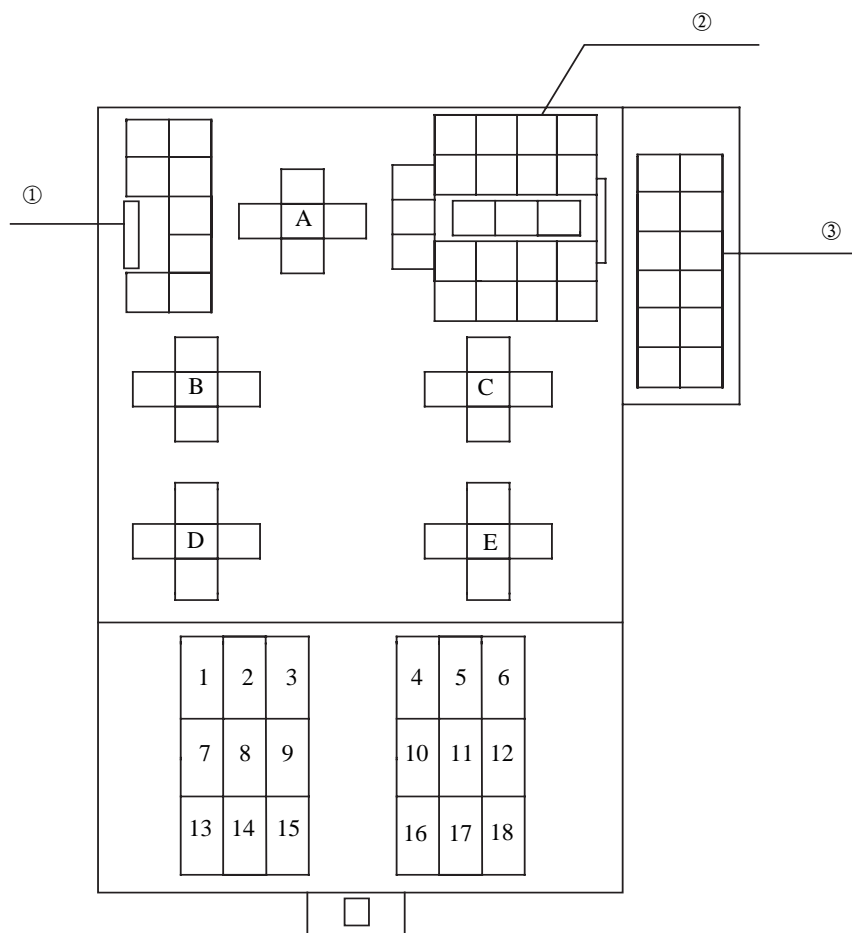
SL SK



### FUSE

1. Protection	10A
2. Unload	
3. Charging	10A
4. Back-up	10A
5. ECU	10A
6. Unload	
7. Rain wiper	10A
8. Stop lamp	10A
9. Ceiling lamp	10A
10. Central control lock	15A
11. Dual flasher	10A
12. EC	10A
13. Fuel pump	10A
14. Cigarette lighter	15A

## SF

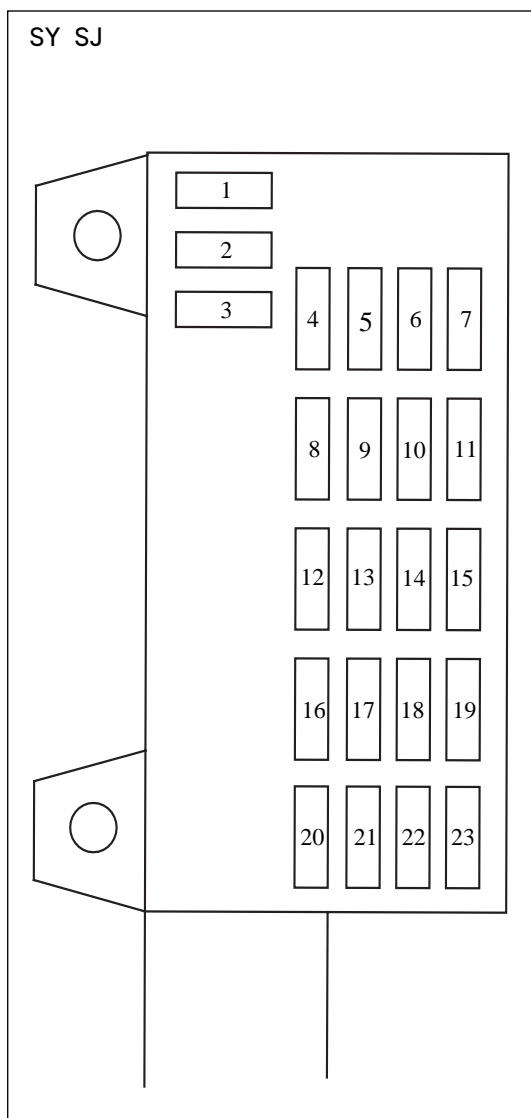


fuse	
1. Small lamp	10A
2. Brake	5A
3. Ceiling lamp	5A
4. Central control lock	15A
5. Electric rocker gear	30A
6. Dual flasher	10A
7. Cigarette lighter	15A
8. Rear vision mirror	5A
9. Unload	
10. Acoustic device	15A
11. Rear window	20A
12. Electromagnetic fan	10A
13. Instrument	5A
14. Back-up lamp	5A
15. Rain brush	10A
16. Steering	5A
17. Unload	
18. Unload	

relay

- A. electromagnetic fan relay
- B. lasher
- C. electromagnetic fan relay
- D. small lamp relay
- E. electric window relay

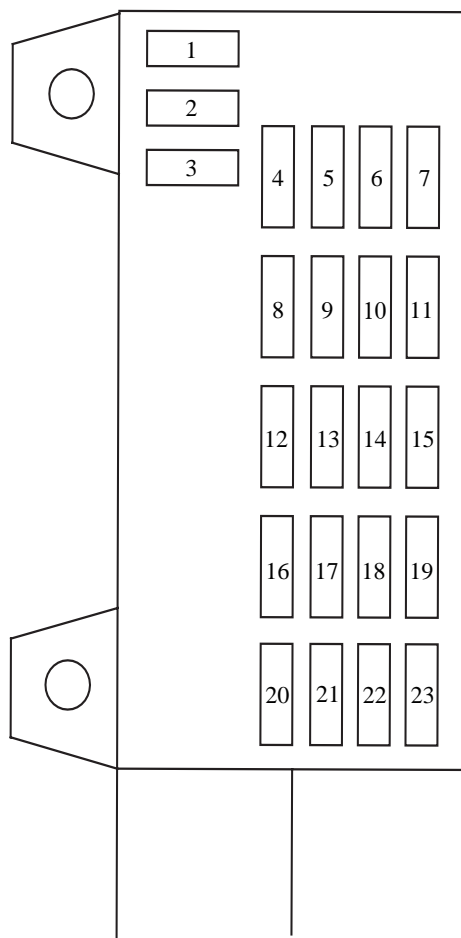
- (1) plugging elements of ceiling lamp wire harness
- (2) plugging elements of wire harness at front left door
- (3) plugging elements of wire harness in engine room



## 1 Protective box I (continued)

Fuse		Vehicle
Model		
1. Standby		30A
Standby		20A SJ
2. Standby		15A SY
Standby		10A SJ
3. Standby		10A SY SJ
4. Unload		SY
Bass bubble	10A	SJ
Power amplification	10 A	top SY
5. Unload		SY SJ
6. Unload		SY SJ
7. Unload		SY SJ
8. Air-conditioner	10A	SY SJ
9. Charging	10A	SY
Instrument	10A	SJ
10. ECU	10A	SY SJ
11. Back-up lamp	10A	SY SJ
12. Cigarette lighter	30A	SY SJ
receiver		
13. Unload		SY
Refrigerant	10A	SJ top SY
14. Unload		SY SJ
15. Steering electric window	10A	SY
Humid display of steering	10A	SJ
sindicating lamp		
16. Stop lamp	10A	SY SJ
17. Power aerial of inside lamp	10A	SY SJ
18. Central control lock	20A	SY SJ
19. Dual flasher	10A	SY SJ
20. Front rain brush	10A	SY SJ
21. Rear air-conditioner	15A	SY
Unload		SJ
22. Rear defroster	15A	SY
Unload		SJ
23. Rear rain brush	10A	SY
Unload		SJ

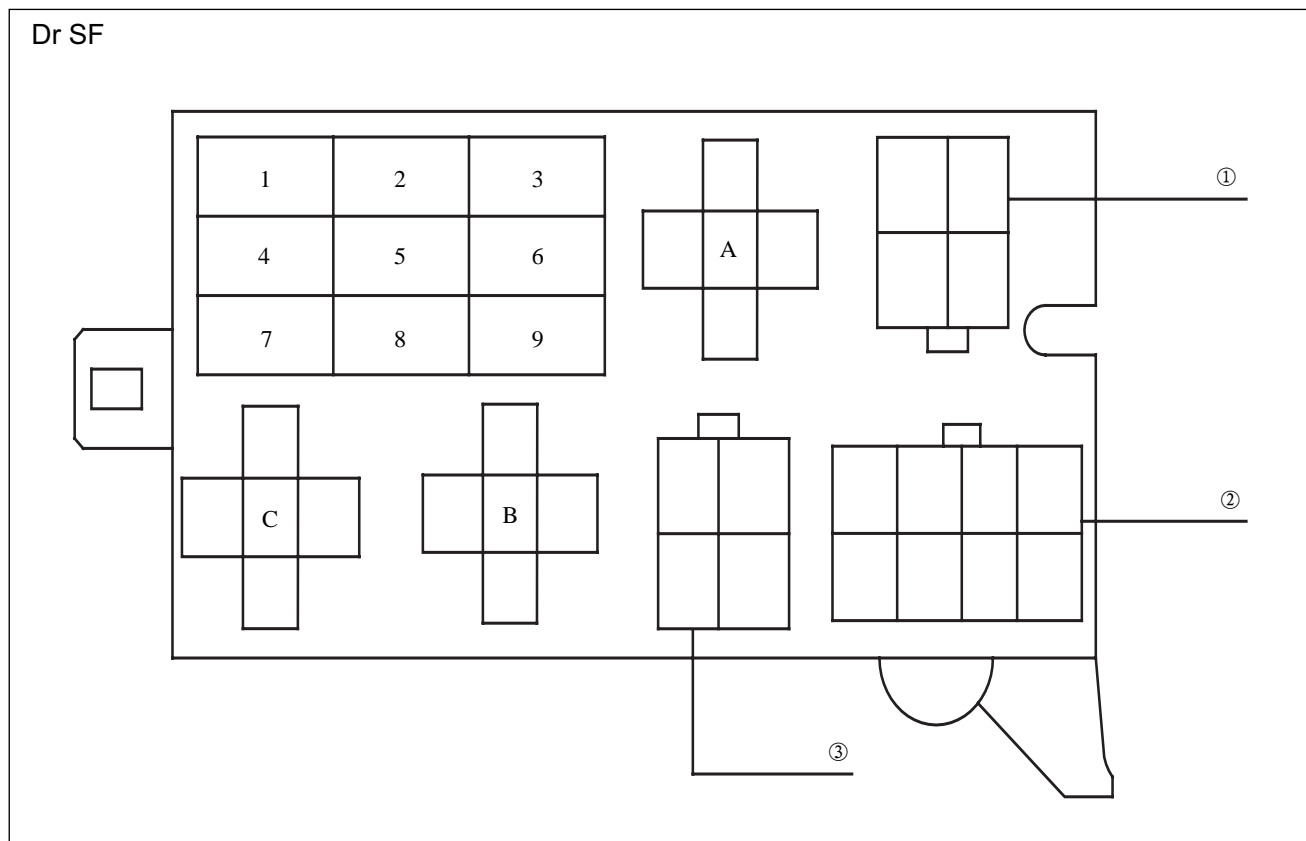
SLDiesel SYDiesel



## 1.Protective box I (continued)

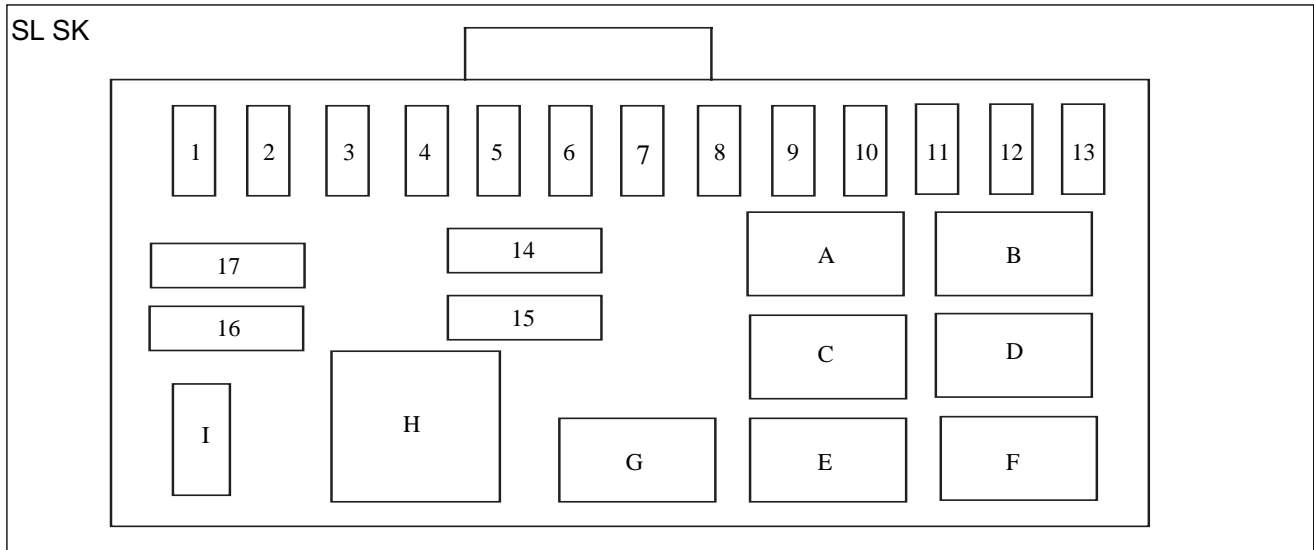
Fuse		Vehicle model
1. Standby	10A	(SL diesel)(SY diesel)
2. Standby	15A	(SL diesel) (SY diesel)
3. Standby	30A	(SL diesel) (SY diesel)
4. Unload		(SL diesel) (SY diesel)
5. Unload		(SL diesel) (SY diesel)
6. Unload		(SL diesel) (SY diesel)
7. Unload		(SL diesel) (SY diesel)
8. Start	10A	(SL diesel) (SY diesel)
9. Rear defroster	15A	(SY diesel)
Unload		(SL diesel)
10.Cigarette lighter and receiver	30A	(SY diesel)
Cigarette lighter	15A	(SL diesel)
11.Rear rain brush	10A	(SY diesel)
Unload		(SL diesel)
12.Front rain brush	15A	(SY diesel)
Rain brush	5A	(SL diesel)
13.Steering	10A	(SY diesel)
Dual flasher	10A	(SL diesel)
14.Preheating	15A	(SL diesel)(SY diesel)
15.Electric window	30A	(SL diesel)(SY diesel)
16.Small lamp	10A	(SL diesel)(SY diesel)
17.Stop lamp	10A	(SL diesel)(SY diesel)
18.Inside lamp and electric aerial	15A	(SY diesel)
eilng lamp	10A	(SL diesel)
19.Central control lock	20A	(SY diesel)
Central control lock	15A	(SL diesel)
20.Rear air-conditioner	15A	(SY diesel)
Unload		(SL diesel)
21.Unload		(SL diesel)(SY diesel)
Refrigerant	10A	(top SY diesel)
22.Unload		(SL diesel )(SY diesel)
Power amplification	10A	(top SY diesel)
23.Unload		(SL diesel)(SY diesel)

## Protective box II



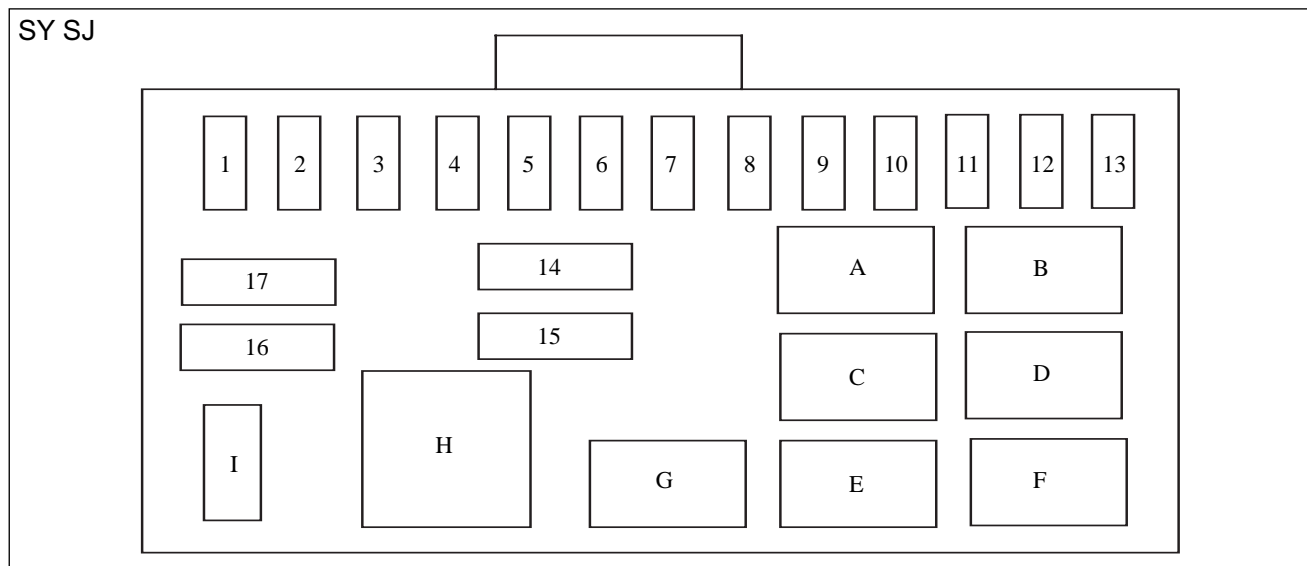
Fuse	Vehicle		Relay	vehicle
1. Front fog lamp	15A	Dr	A. electromagnetic fan relay	Dr
Unload		SF	charging relay	Dr diesel
2. Electromagnetic fan	15A	Dr	electric horn relay	SF
ECU1	10A	SF	B. large lamp	Dr SF
3. Large lamp	10A	Dr	C. frost relay	Dr SF
Horn	15A	SF		
4. Horn	15A	Dr		
Lower beam	10A	SF		
5. ECU1	10A	Dr	(1) plugging elements of wire harness in engine room	Dr
Charging	10A	Dr diesel	none	SF
Rear frost	5A	SF	(2) plugging elements of wire harness in engine room	Dr SF
6. Large lamp	10A	Dr	(3) plugging elements of wire harness in engine room	Dr SF
ECU2	10A	SF		
7. Rear frost	10A	Dr		
Upper beam	10A	SF		
8. ECU2	10A	Dr		
Preheating	10A	Dr diesel		
Front fog lamp	10A	SF		
9. Fuel pump	10A	Dr SF		
Unload		Dr diesel		

## Protective box II (continued)



Fuse		Vehicle	Relay	Vehicle
1. Standby	10A	SL SK	A.electromagnetic fan relay	SL SK
2. Standby	10A	SL SK	small lamp relay	(SL diesel)
3. Standby	30A	SL SK	B.electric window relay	SL SK
	20A	(SL diesel)	cold start relay	(SL diesel)
4. Rear fog lamp	10A	SL SK	C.frost relay	SL SKLeft
large lamp	10A	(SL diesel)	charging relay)	(SL diesel)
5. Front fog lamp	10A	SL SK	D.blower relay)	SL SK
Right large lamp	10A	(SL diesel)	thermostatic relay	(SL diesel)
6. Small lamp	10A	SL SK	E.small lamp relay	SL SK
Air-conditioner	10A	(SL diesel)	heating relay	(SL diesel)
7. Electric horn	10A	SL SK	F.large lamp relay	SL SK
Warm air	20A	(SL diesel)	G.air-conditioner relay	SL SK
8. Electric window	30A	SL SK	frost relay	(SL diesel)
Unloa		(SL diesel)	H.rain-brusher intermissive relay	SL SK
9. A/C	10A	SL SK	I.diod	SL SK
Charging	10A	(SL diesel)		
10.Air blower	30A	SL SK		
Electric horn	10A	(SL diesel)		
11.Electronic fan	10A	SL SK		
Dual flasher	10A	(SL diesel)		
12.Right large lamp	10A	SL SK		
Unload		(SL diesel)		
13.Left large lamp	10A	SL SK		
Fog lamp	10A	(SL diesel)		
14.60A fuse		SL SK		
15.60A fuse		SL SK		
16.30A fuse		SL SK		
17.30A fuse		SL SK		
Unload		SL diesel		

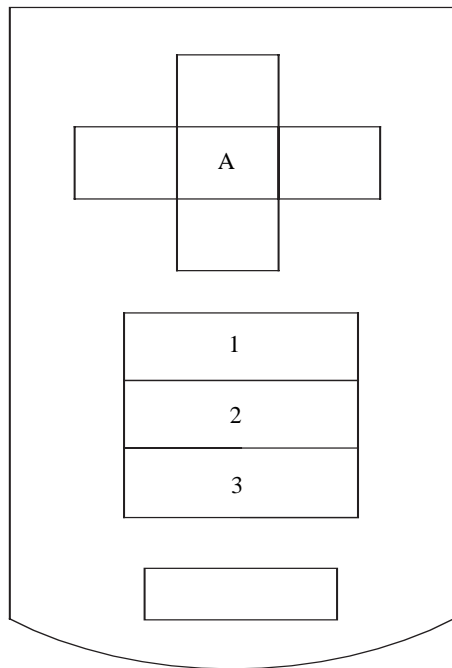
## Protective box II (continued)



Fuse	Vehicle	Relay	Vehicle
1. Standby	10A SY SJ	A. electromagnetic fan relay	SY SJ
2. Standby	10A SY SJ	small lamp relay	(SY diesel)
3. Standby	30A SY SJ	B. electric window relay	SY SJ
4. Rear fog lamp	10A SY SJ	cold start relay	(SY diesel)
Left large lamp	10A (SY diesel)	air-conditioner relay	SJ
5. Front fog lamp	10A SY SJ	C. frost relay	SY SJ
Right large lamp	10A (SY diesel)	charging relay	(SY diesel)
6. Small lamp	10A SY SJ	D. blower relay	SY SJ
Air-conditioner	10A (SY diesel)	thermostatic relay	(SY diesel)
7. Electric horn	10A SY SJ	E. small lamp relay	SY SJ
Warm air	20A (SY diesel)	heating relay	(SY diesel)
8. ECM	10A SY SJ	rear defrost relay	SJ
Unload	(SY diesel)	F. large lamp	SY SJ
9. Fuel pump	10A SY SJ	H. rain-brusher intermissive relay	SY SJ
Charging	10A (SY DIESEL)	I. diode	SY SJ
10. Air blower	30A SY SJ		
Electric horn	10A (SY diesel)		
11. Electronic fan	10A SY SJ		
Dual flasher	10A (SY diesel)		
12. Right large lamp	10A SY SJ		
Rear fog lamp	10A (SY diesel)		
13. Left large lamp	10A SY SJ		
Front fog lamp	10A (SY diesel)		
14. 60A fuse	SY SJ		
15. 60A fuse	SY SJ		
16. 30A fuse	SY SJ		
17. 30A fuse	SY SJ		
Unload	(SY diesel)		



Dr SF



### Protective box III

#### Fuse

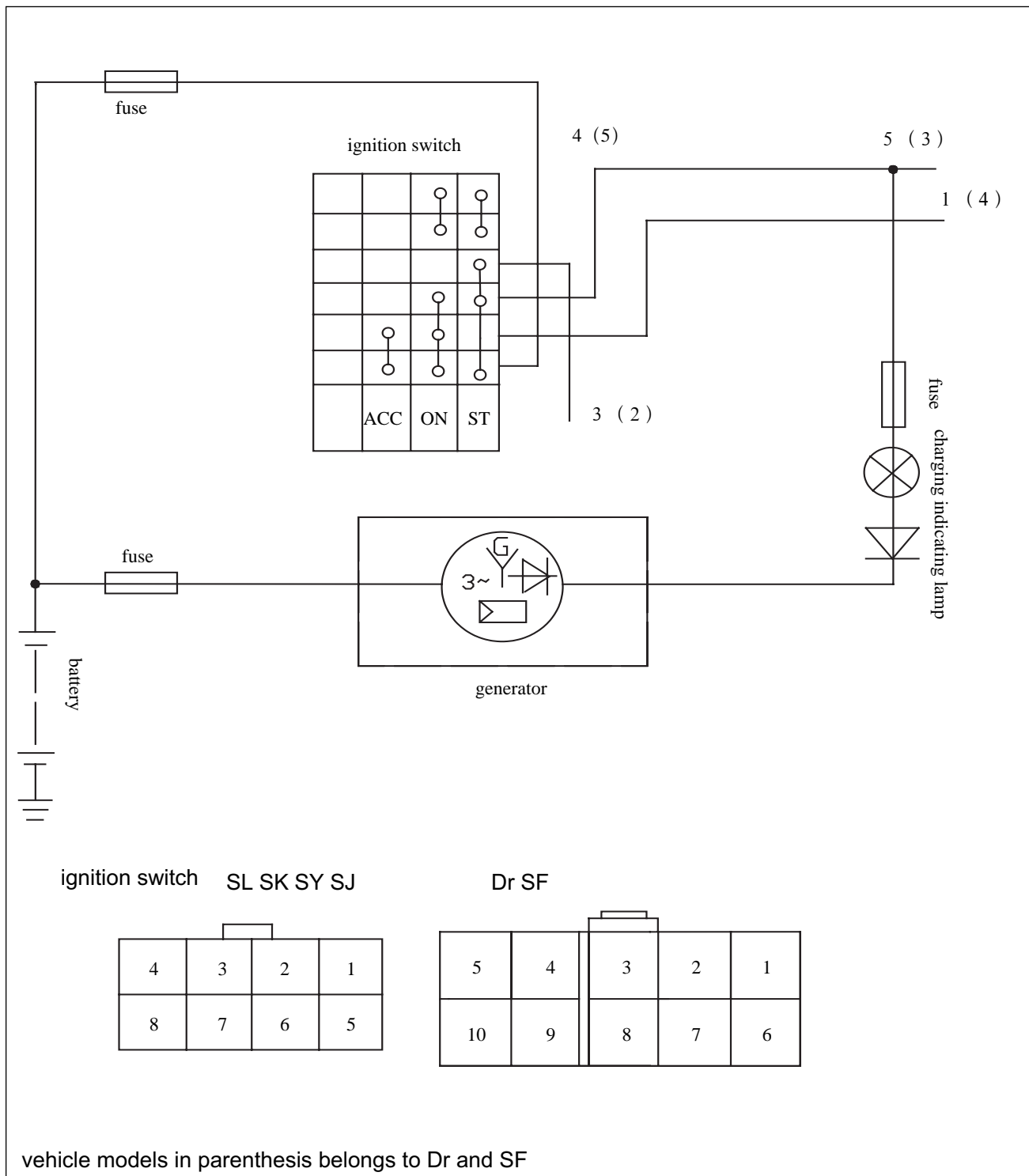
- |               |     |
|---------------|-----|
| 1. Compressor | 10A |
| 2. Unload     |     |
| A/C           |     |
| 3. Warm air   | 30A |

#### Vehicle model

Dr SF
SF
10A Dr
Dr SF

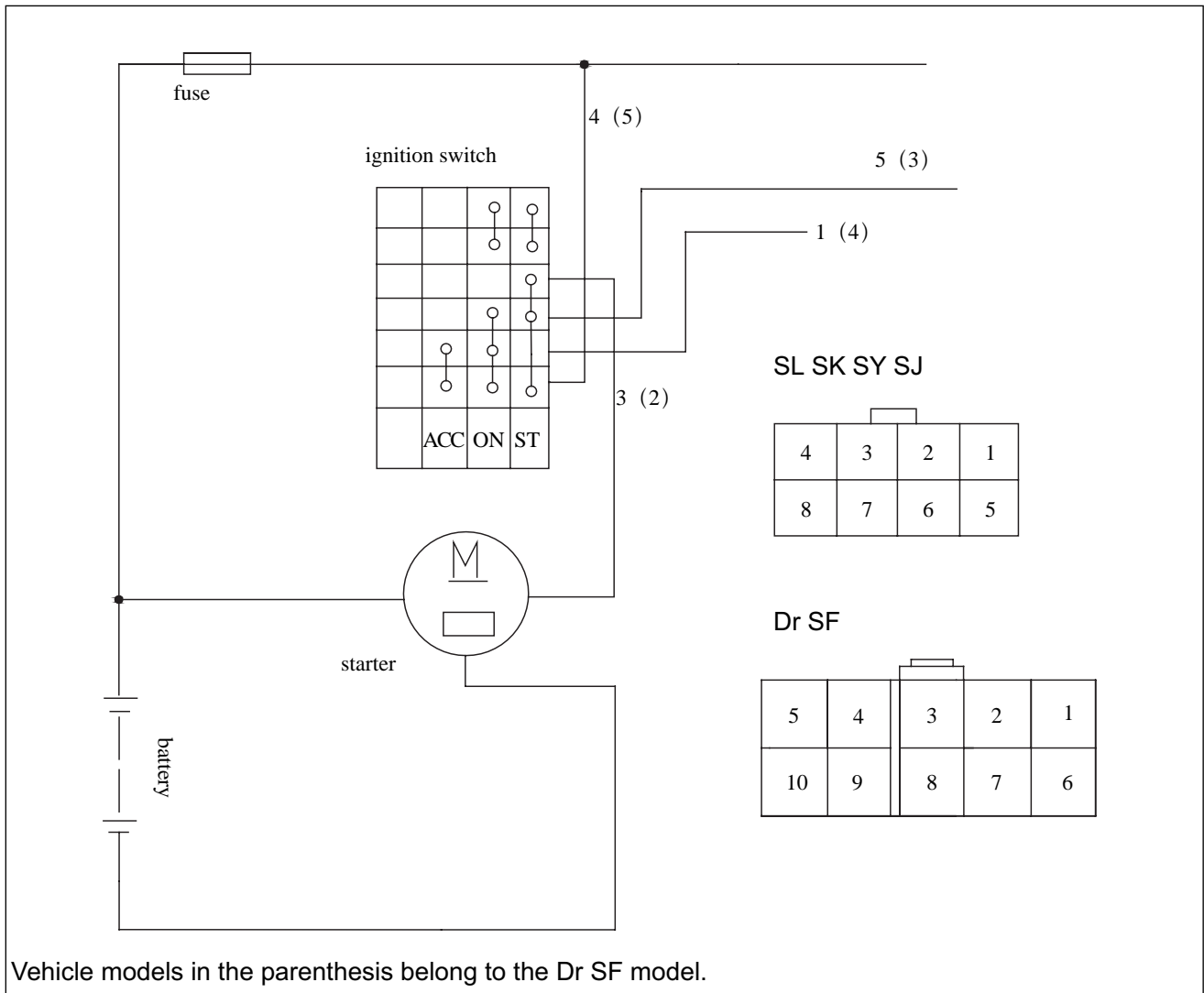
## Power supply system

The power supply system includes the accumulator and the generator, the latter is the main power supply while the accumulator is the auxiliary power supply. The two power supplies are in paralleling connection.



## Starting system

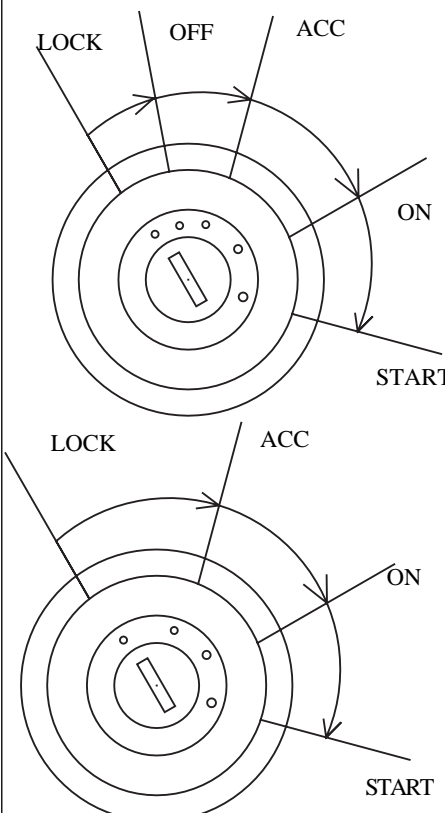
The starter, powered by the accumulator, is driven by the direct current motor and is in normal operation through the drive device and control mechanism.



## Parts inspection

### Ignition switch

Check the conductance situation of the switch



LOCK OFF ACC ON START

LOCK ACC ON START

**SLdiesel SYdiesel**

4	3	2	1
8	7	6	5

**SL SK SY SJ**

4	3	2	1
8	7	6	5

**Dr SF**

5	4	3	2	1
10	9	8	7	

terminal switch position	4 B	1 Bl	5 B/Y	3 W/Bl		
LOCK						
ACC	○—○					
ON	○—○	○—○				
START	○—○	○—○	○—○			

terminal switch position	4 R	1 G	5 W	3 R/W		
LOCK						
ACC	○—○					
ON	○—○	○—○	○—○			
START	○—○	○—○	○—○	○—○		

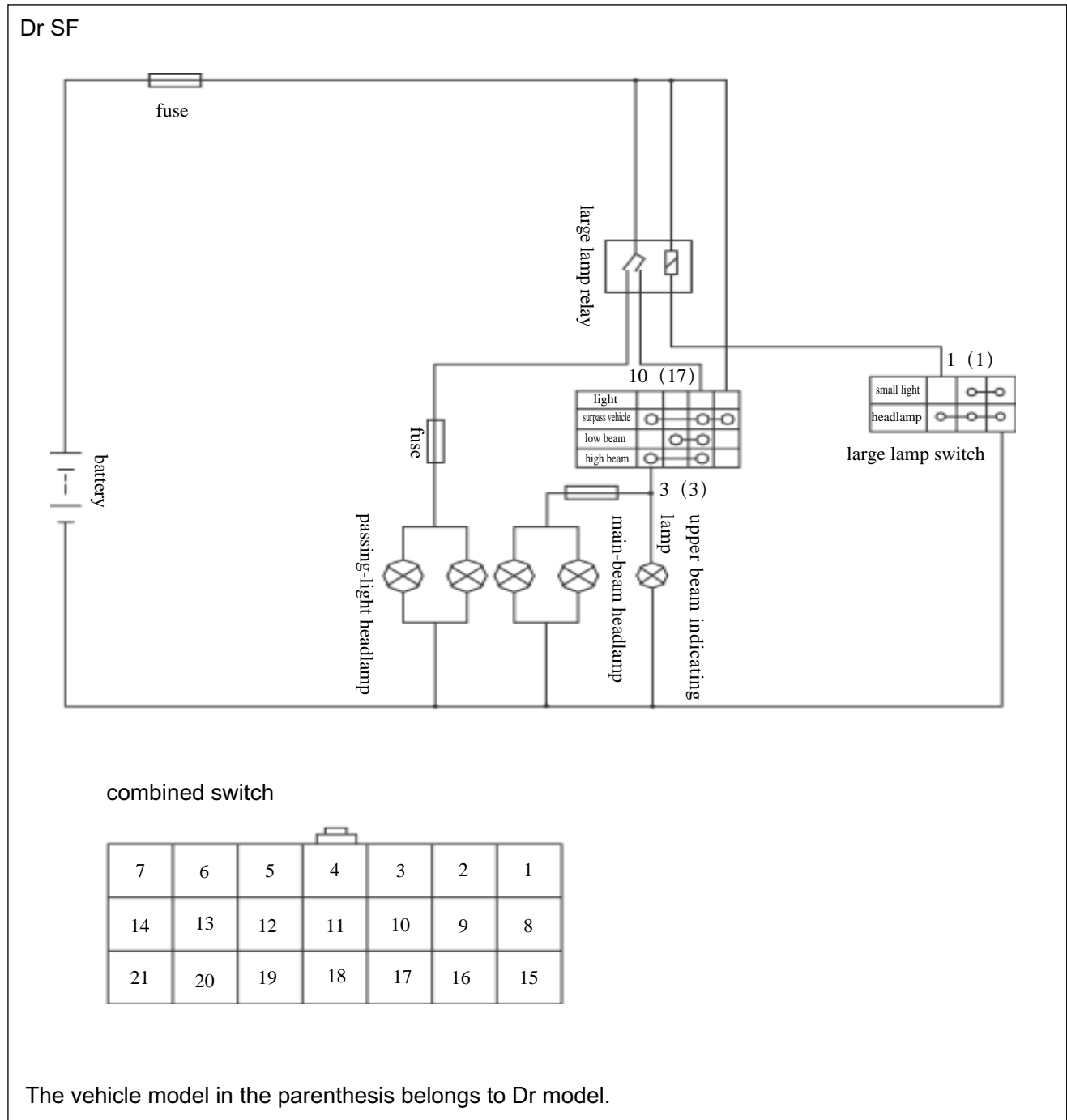
terminal switch position	5/10 R	4 G	3 W	2 R/W	9 Y	
LOCK						
ACC	○—○					
ON	○—○	○—○	○—○			
START	○—○	○—○	○—○	○—○		

Remark: in case the conductance fails to satisfy the specified requirement, change the switch.

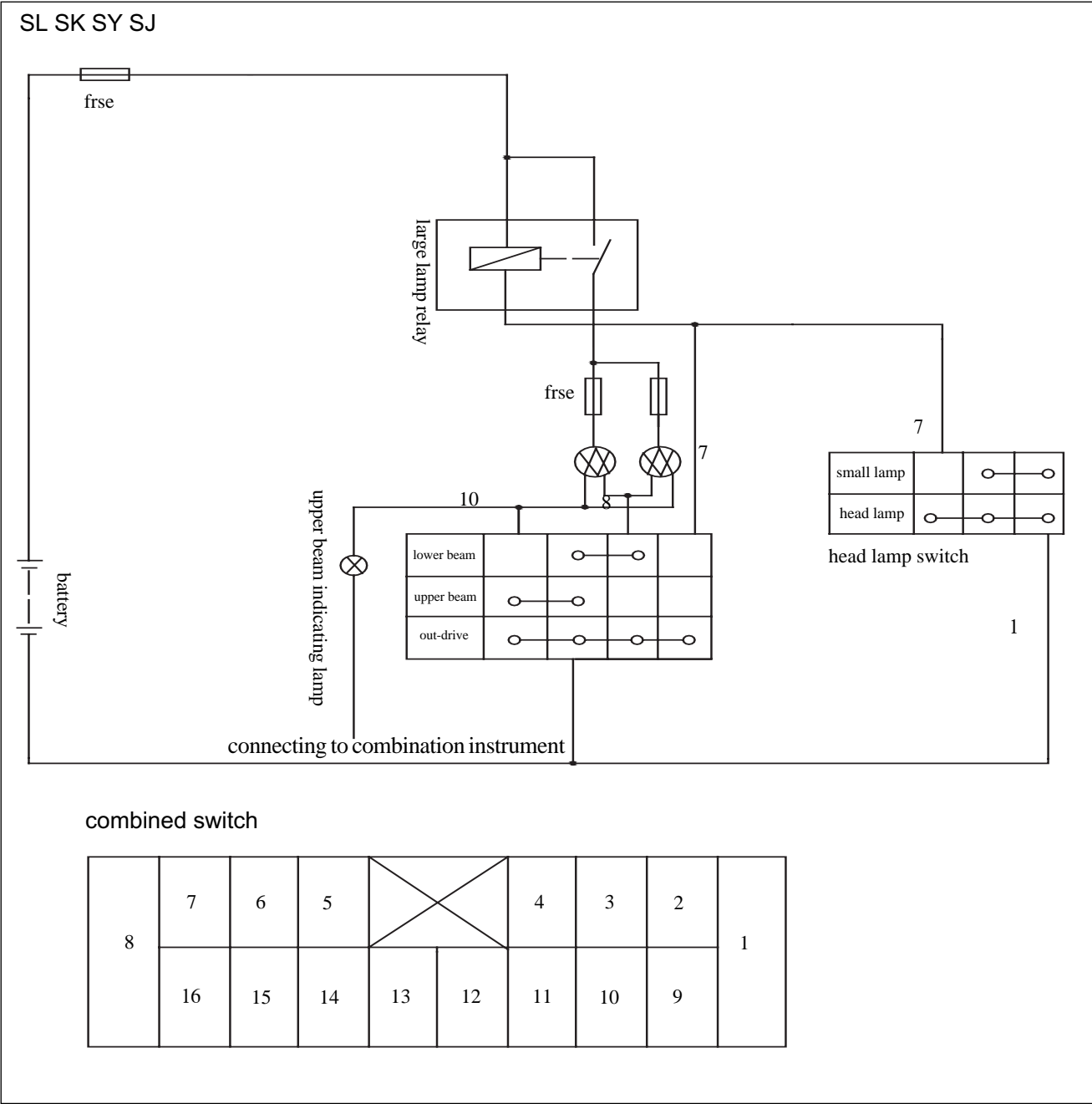
## Lighting system

The lighting system includes the front combination lamp, rear combination lamp, fog lamp, inside lamp, instrument lighting lamp, air-conditioner panel lighting lamp and various signal indicating lamps. The small lamps shown in the small lamp system drawing include the instrument lighting lamp, air-conditioner panel lighting lamp, fog lamp, license lamp and ashtray lighting lamp.

### Upper/lower beam lighting system

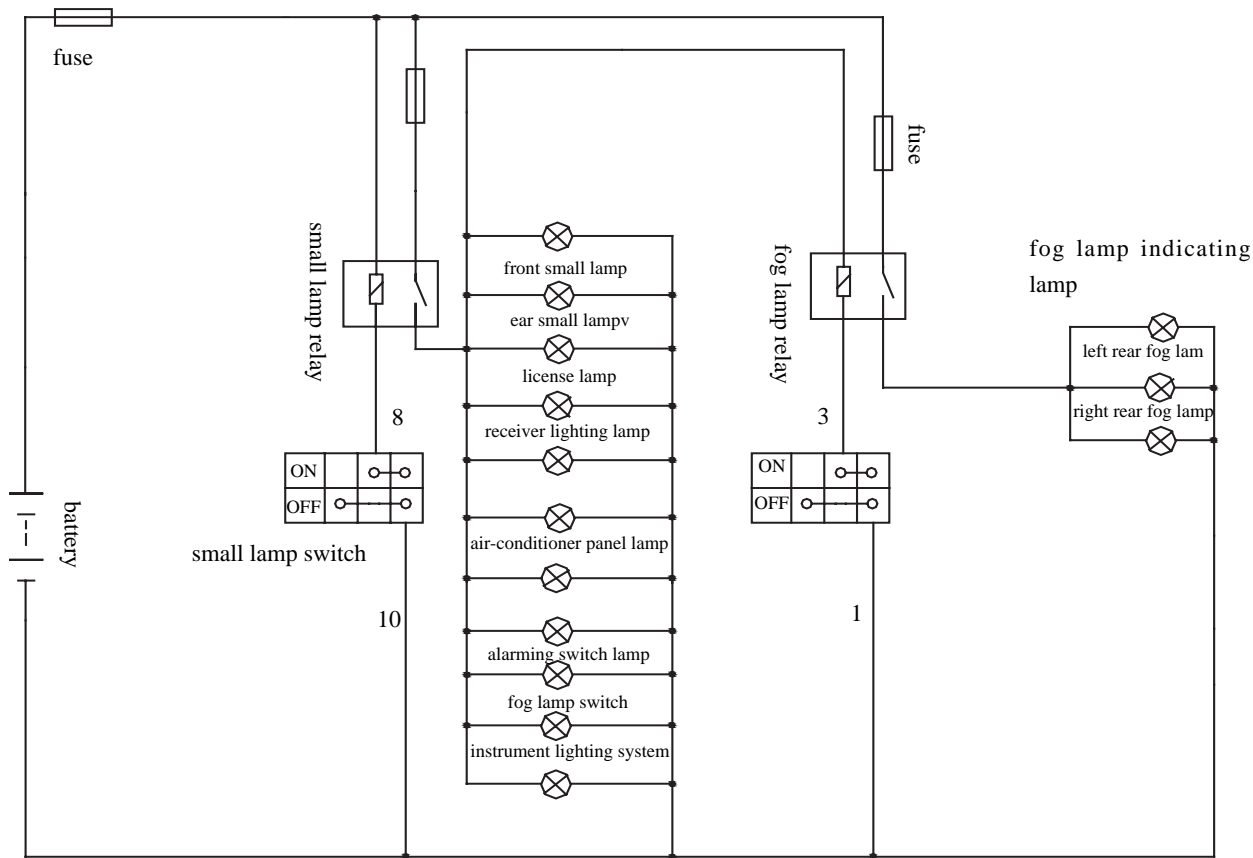


Upper/lower beam lighting system (continued)



Small lamp, steering and alarming system  
Small lamp system

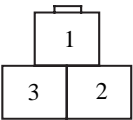
Dr



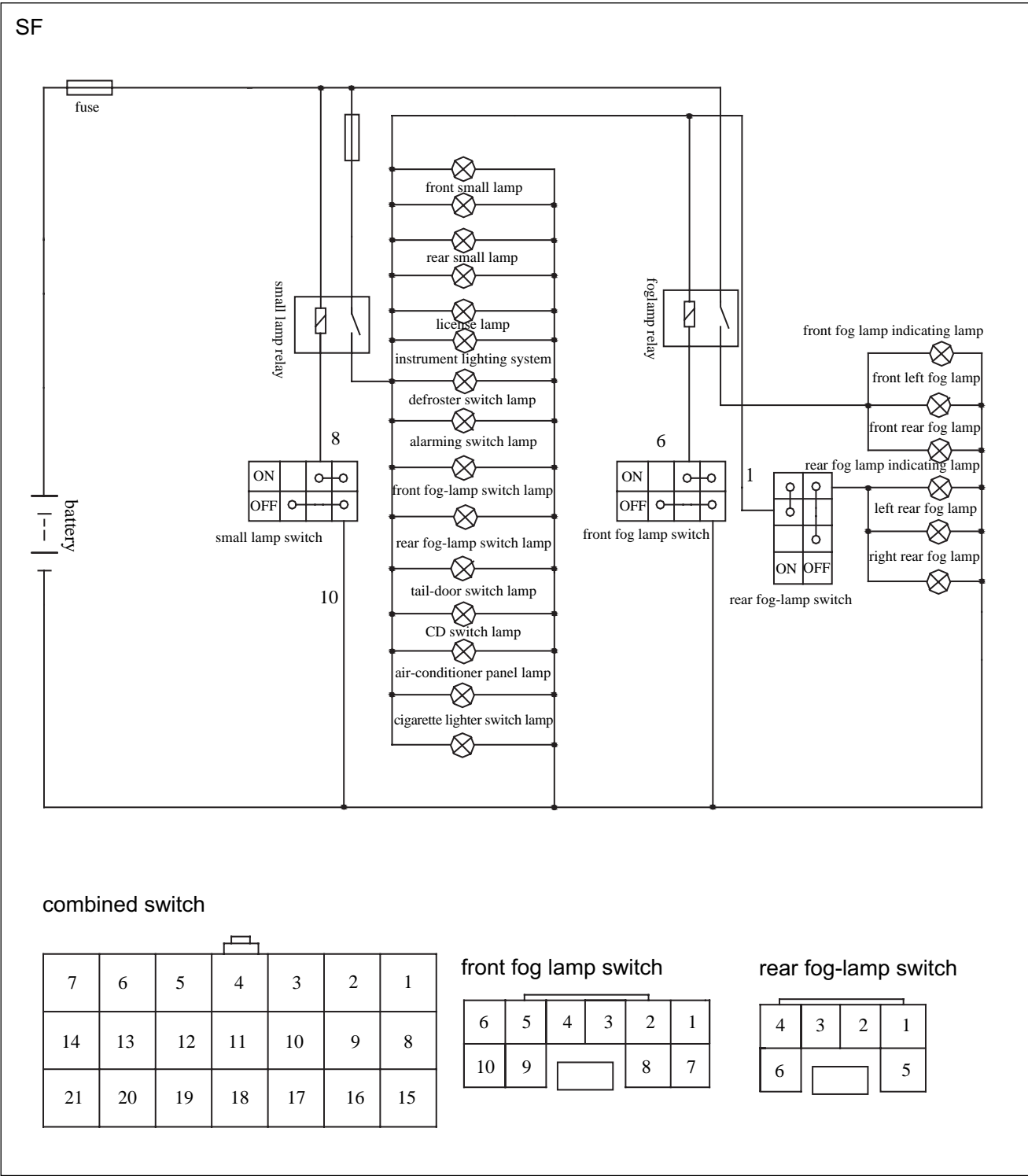
combined switch

7	6	5	4	3	2	1
14	13	12	11	10	9	8
21	20	19	18	17	16	15

fog-lamp switch lamp



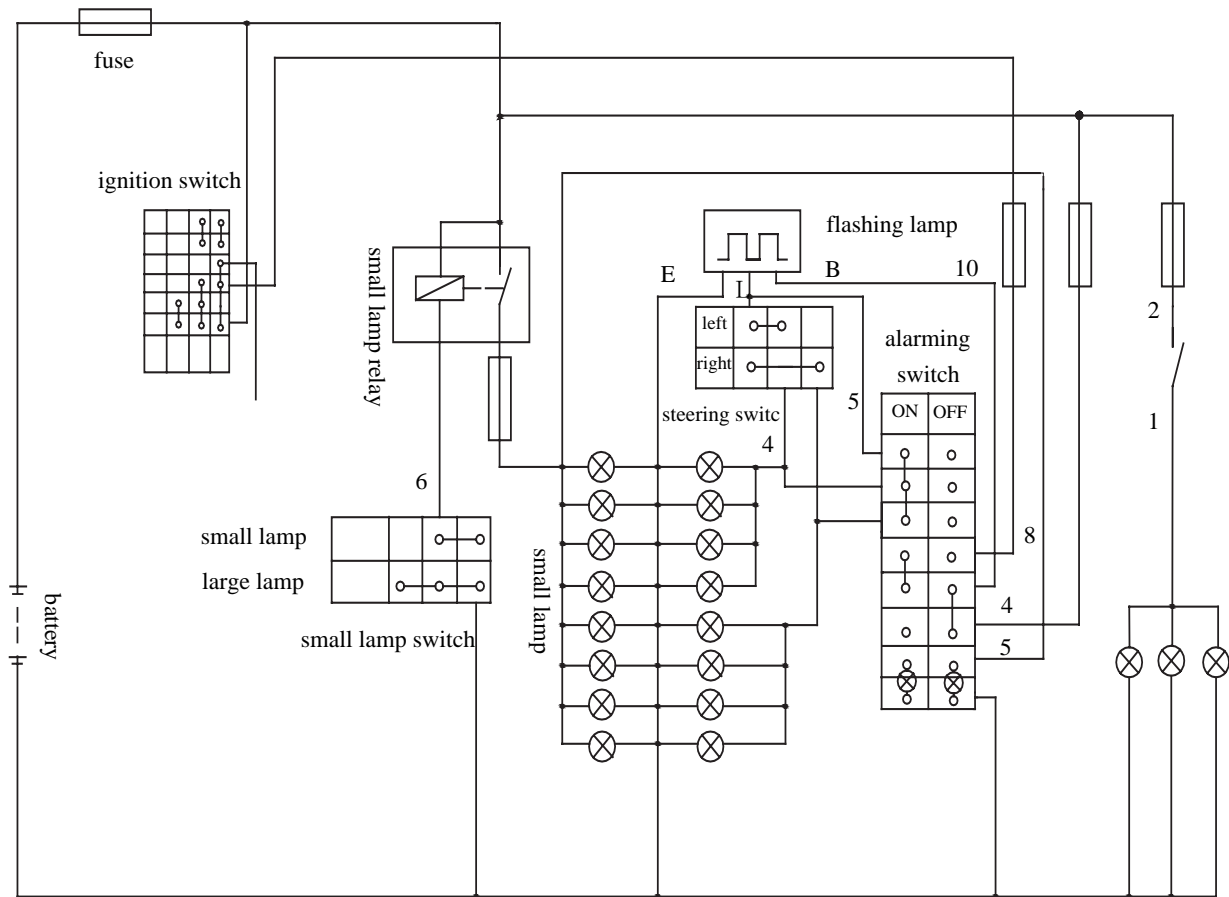
Small lamp system



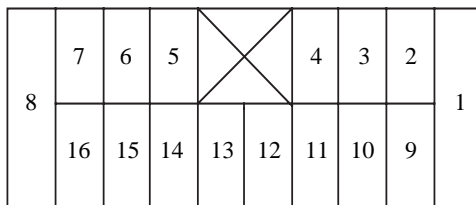


## Small lamp steering system

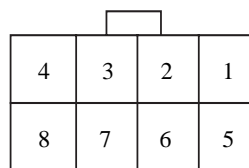
SL SK SY SJ



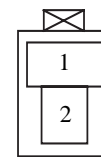
combined switch



alarming switch lamp

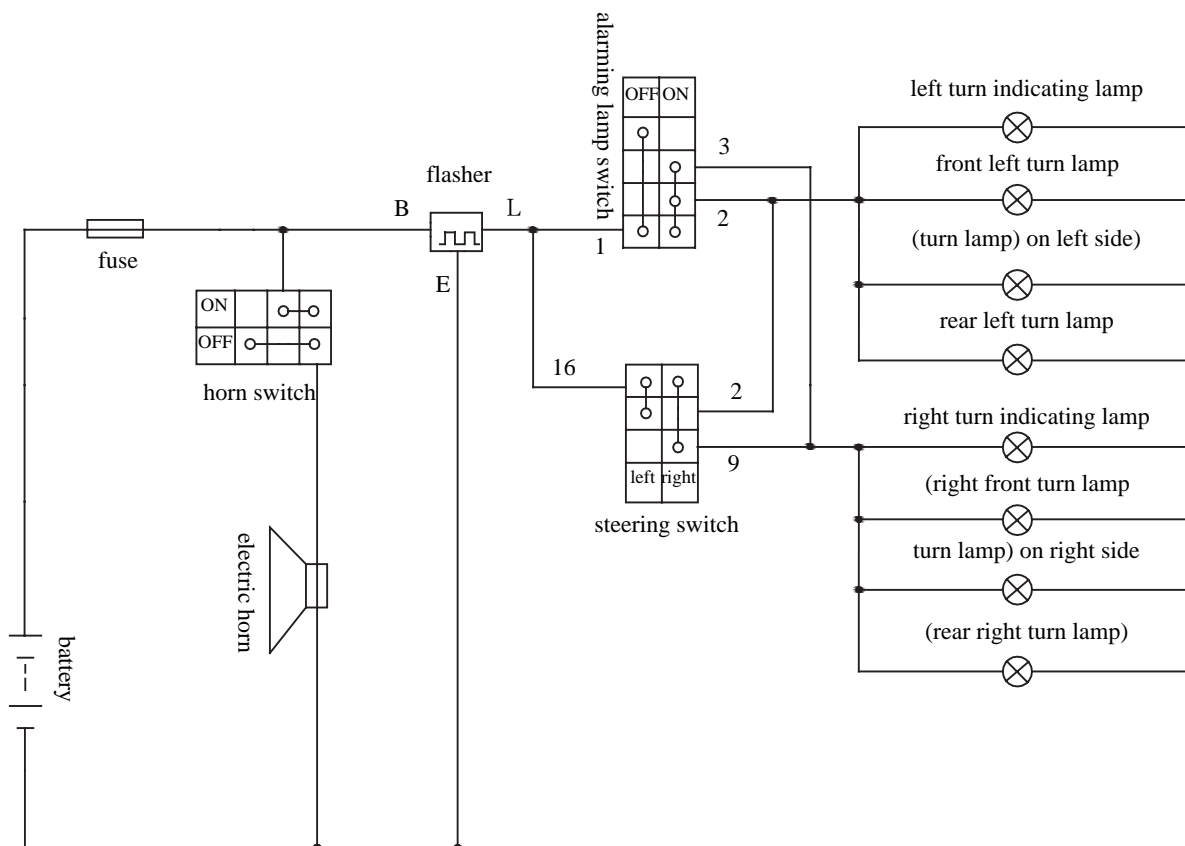


stop lamp switch



## Steering and Alarming System

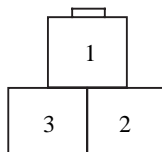
Dr



combination switch lamp)

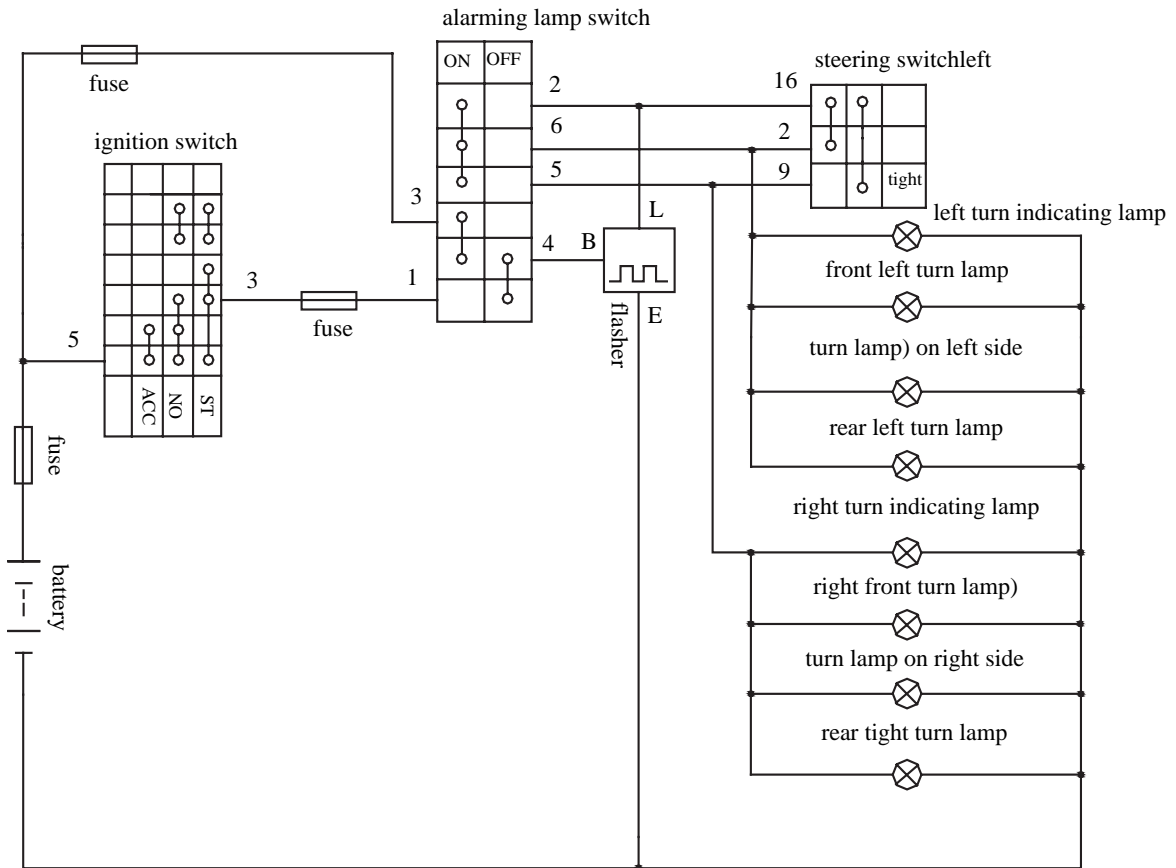
7	6	5	4	3	2	1
14	13	12	11	10	9	8
21	20	19	18	17	16	15

alarming switch



## Steering and Alarming System (continued)

SF



combined switch

7	6	5	4	3	2	1
14	13	12	11	10	9	8
21	20	19	18	17	16	15

alarming switch

6	5	4	3	2	1
10	9			8	7

ignition switch

5	4	3	2	1
10	9	8	7	6

### Inspection on Common Failure

FailurePossible	Causes	Repairing approaches	Remark
Only one lamp doesn' t work	Burn off bubble Grounding failure of socket or wiring	Change the bubble Make reparation as required.	
The front combination	Burn off fuse Failure of large lamp relay Failure of combinationswitch Wiring or grounding failureMake	Change the fuselamp don' t work Check the relay Check the switch Make reparation as required	
Upper beam lamp doesn' t work	Failure of combination switch Wiring or grounding failure	Check the switch Make reparation as required	
The rear combined tail lampand license lamp don' t work	Burn off fuse in tail lamp  Burn off maxi-fuse Failure of combined switch Wiring or grounding failure	Change the fuse and check whether there is short circuit Change the maxi-fuse; Check the switch; Make reparation as required.	
Alarming lamp doesn' t workBurn off horn fuse	Change the fuse and check to see  Failure of steering signal flasher Failure of steering signal/alarming switch Wiring or grounding failure	Change the fuse and check whether there is short circuit Check the flasher Check the switch Make reparation as required.	Dr SF
One side of the steering signal doesn't flash	Failure of steering signal switch Wiring or grounding failure	Check the switch Make reparation as required.	
Abnormal steering signal	Burn off horn fuse  Failure of steering signal flasher Failure of steering signal/alarming switch Wiring or ground ing failure	Change the fuse and check to see whether there is short circuit Check the flasher Check the switch Make reparation as required.	Dr SF

## Parts inspection

### Combined switch conductance

Dr

7	6	5	4	3	2	1
14	13	12	11	10	9	8
21	20	19	18	17	16	15

Terminal function		1 Bl/W	8 Bl/Br	10 B	17 B/Y	3 B/W	7 B	2 G/Y	9 G/R		
Lamp switch	OFF										
	small lamp		○	○							
	Large lamp	○		○							
Dimmer switch	Lower beam				○		○				
	upper beam					○	○				
steering switch	Left turn			○				○			
	right turn			○					○		
	central										
overtake						○	○				

SF

7	6	5	4	3	2	1
14	13	12	11	10	9	8
21	20	19	18	17	16	15

Termina function		1 Bl/W	8 Bl/Br	7 B	10 B/Y	3 B/W	15 B	2 G/Y	9 G/R		
Lamp switch	OFF										
	small lamp		○	○							
	large lamp	○		○							
dimmer switch	lower beam				○		○				
	upper beam					○	○				
steering switch	left turn			○				○			
	right turn			○					○		
	central										
over drive						○	○				

SL SK SY SJ

8	7	6	5		4	3	2	1
	16	15	14	13	12	11	10	9

terminal function		16 Bl/Br	7 Bl/W	15 B	10 B/W	8 B/Y	9 Bl/W	1 B	4 G/Y	3 G/R	5 Br
lamps switch	OFF										
	small lamp	○		○							
	large lamp	○	○	○							
dimmer switch	lower beam				○			○			
	upper beam					○		○			
steering switch	right turn								○		○
	left turn									○	○
	central										
over drive					○	○	○	○			

Combined Switch conductance (continued)

SLDiesel SYDiesel

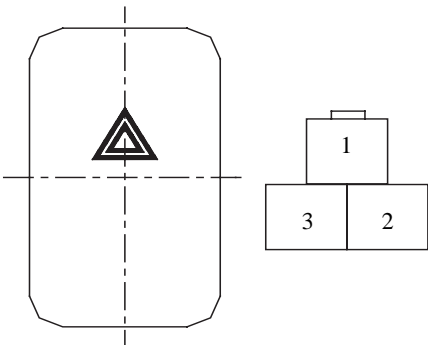
8	7	6	5		4	3	2	1
16	15	14	13	12	11	10	9	

Terminal	16	7	15	10	8	9	1	4	3	5
function	R	R/Bl	B	R/Y	R/B	R/Bl	B	G/B	G/W	Br
Lamp switch	OFF									
	Small lamp	○	—	○						
	Small lamp	○	○	○						
Dimmer switch	Lower beam			○	—	—	○			
	Left steering				○	—	○			
steering switch	upper beam							○	—	○
	Right to								○	○
	central									
overdrive				○	○	○	○			

In case the conductance situation fails to satisfy the specified requirement, change the switch.

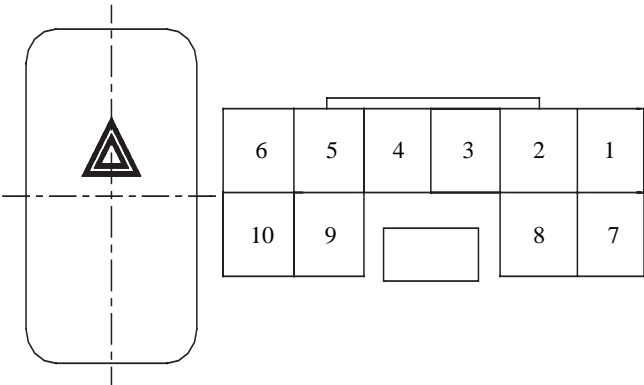
Conductance of Alarming Switch

Dr




Terminal	1	2	3
switch position	G/B	G/Y	G/R
OFF	○	○	○
ON	○	○	○

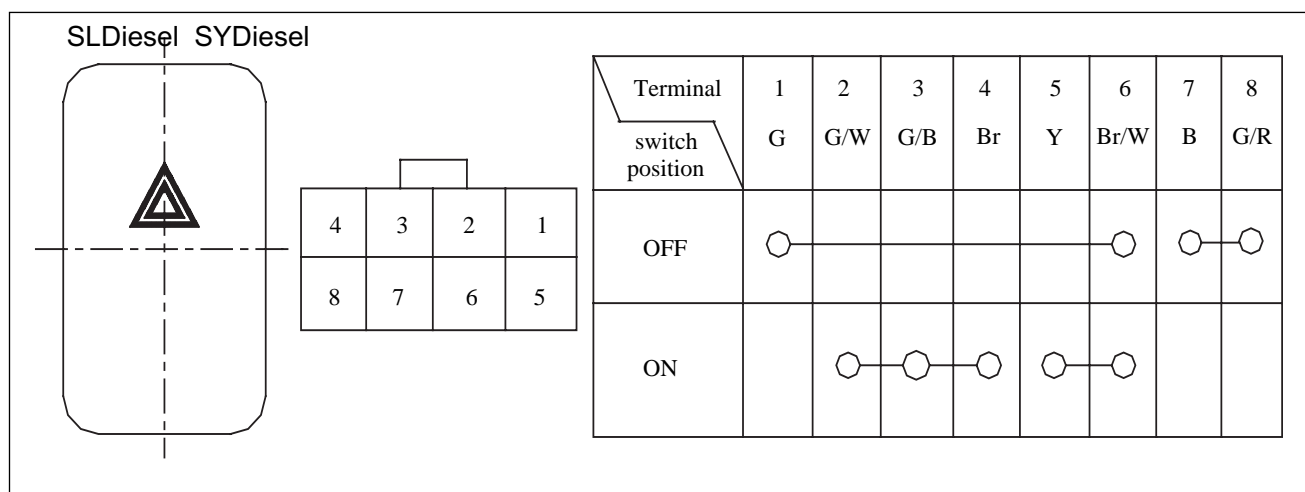
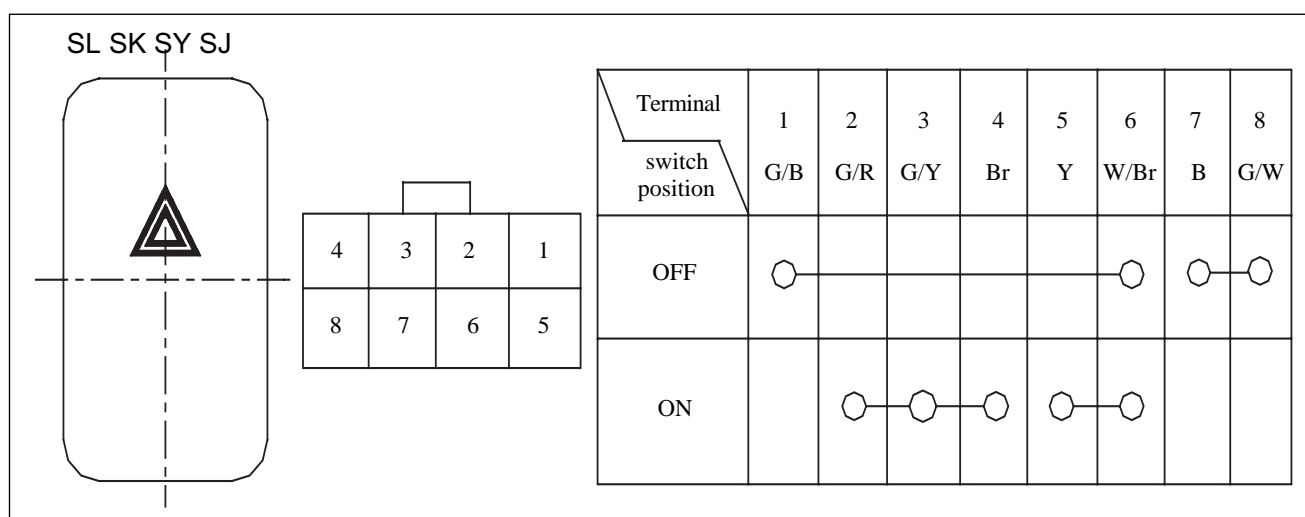
SF



Terminal	8	9	1	2	3	4	5	6
switch position	B	G/W	P/G	G/B	P/B	Br/Bl	G/R	G/Y
OFF			○	—	—	○		
ON	○	○		○	○	○	○	○

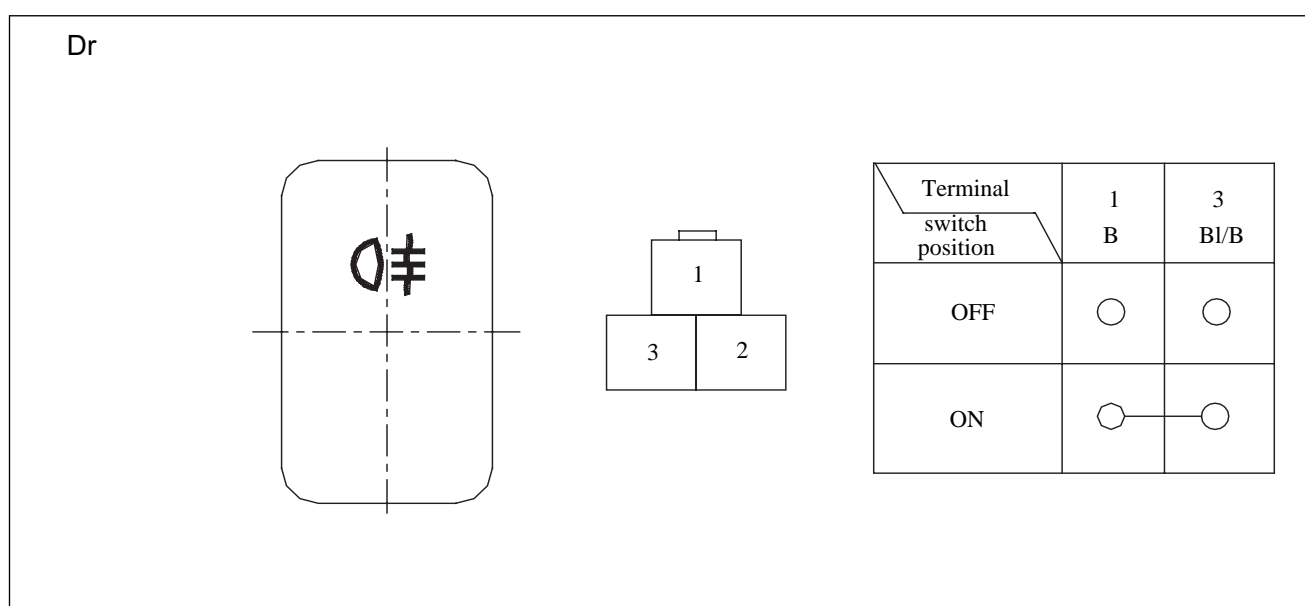


## Conductance of Alarming Switch (continued)

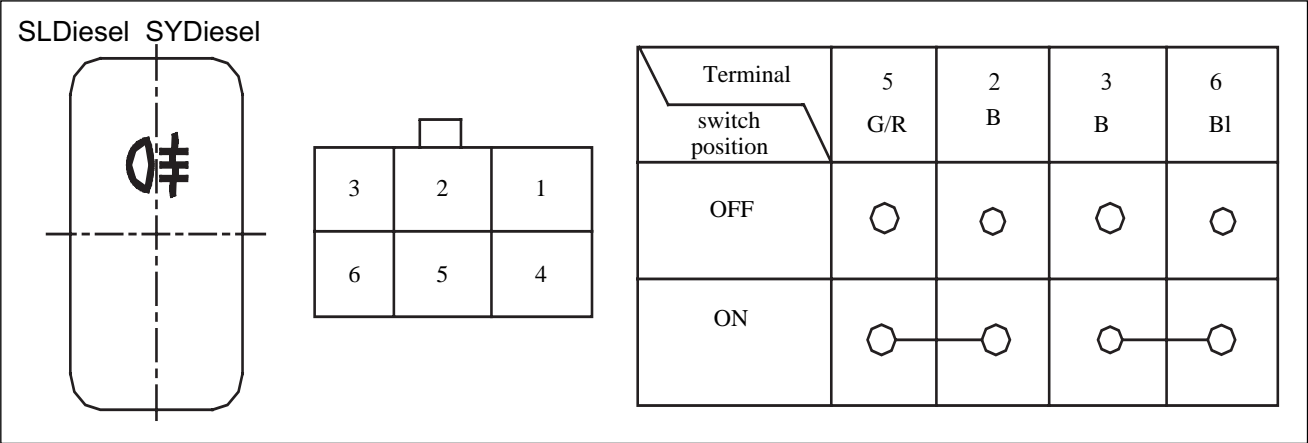
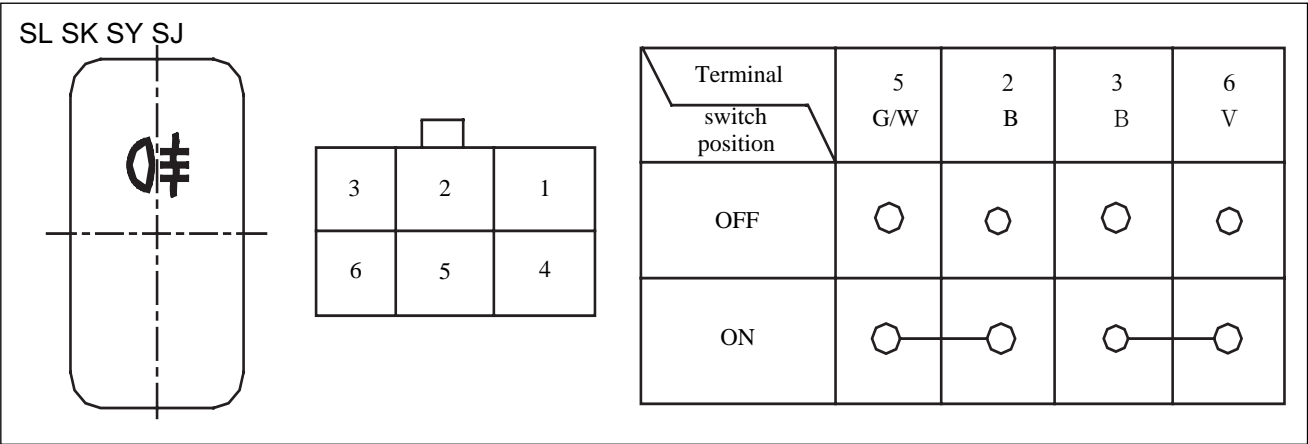
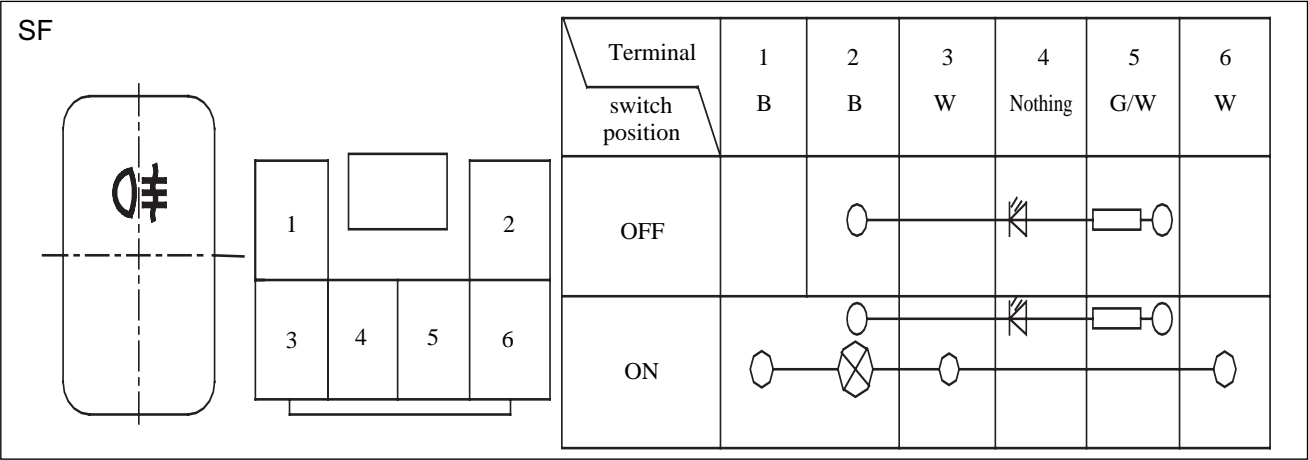
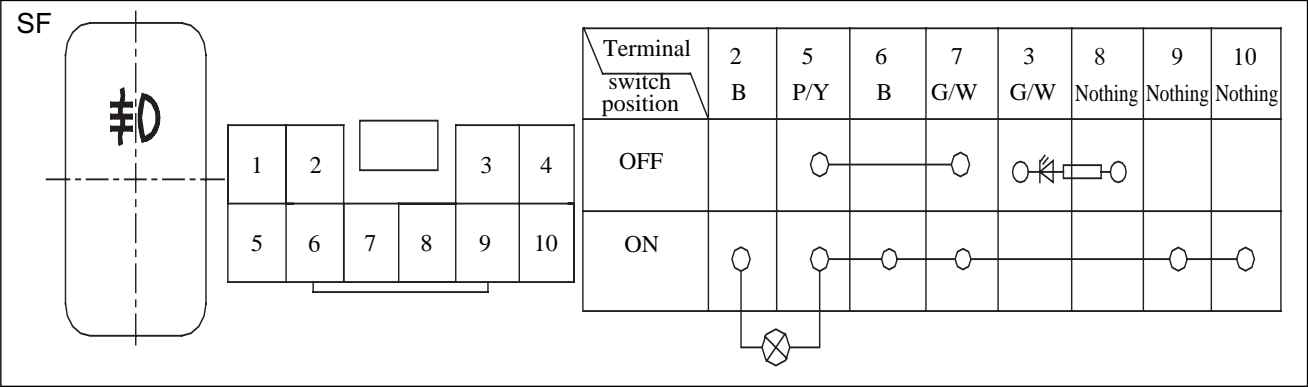


In case the conductance fails to satisfy the specified requirement, change the switch.

## Conductance of Fog-lamp Switch

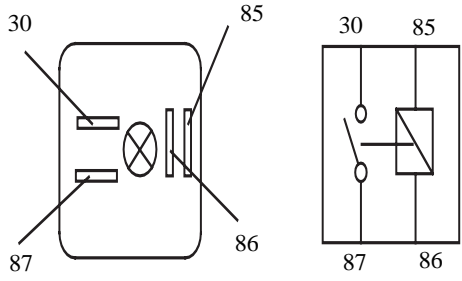


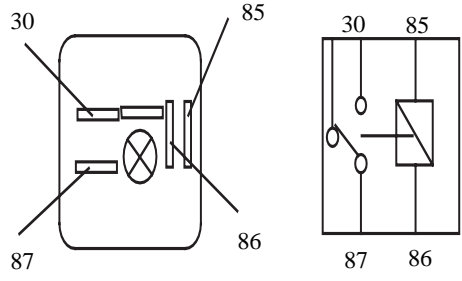
Conductance of Fog-lamp Switch





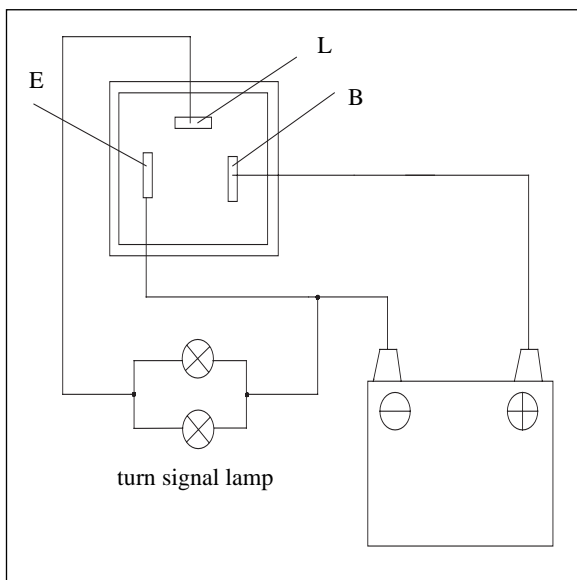
### Conductance of Large Lamp Relay

<b>Dr SF</b> 	Terminal status	85	86	87	30
	Fixed				
	Load accumulator voltage on the terminal 85,86.				

<b>SL SK SY SJ</b> 	Terminal status	85	86	87	30
	Fixed				
	Load accumulator voltage on the terminal 85,86.				

In case the conductance of above-mentioned switch fails to satisfy the specified requirement, change the switch.

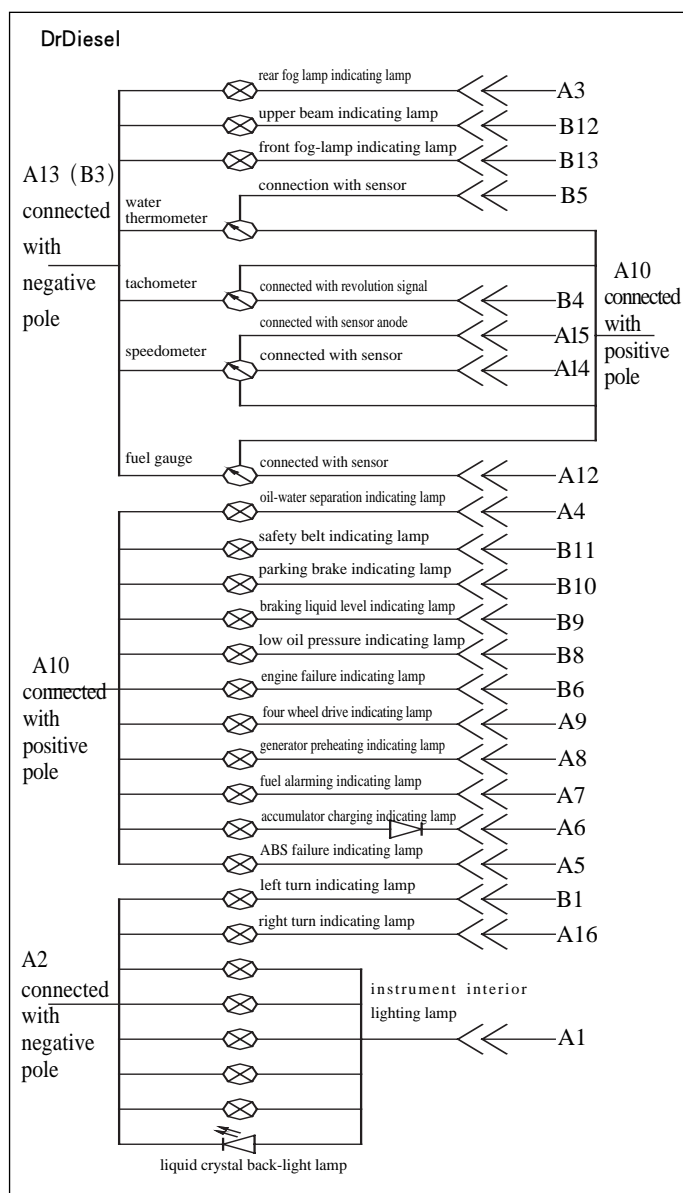
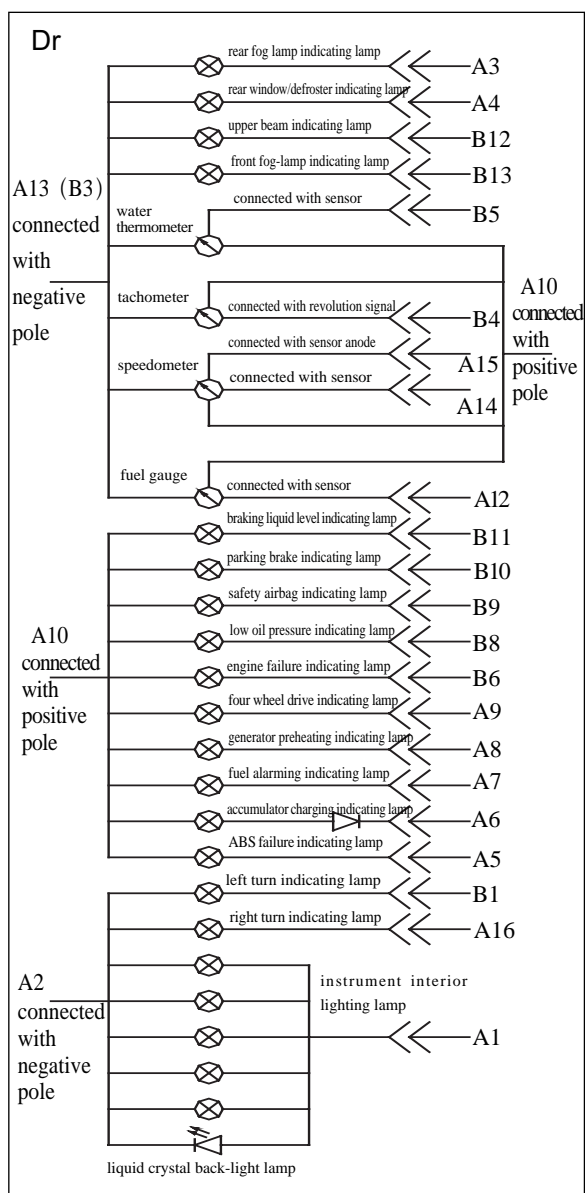
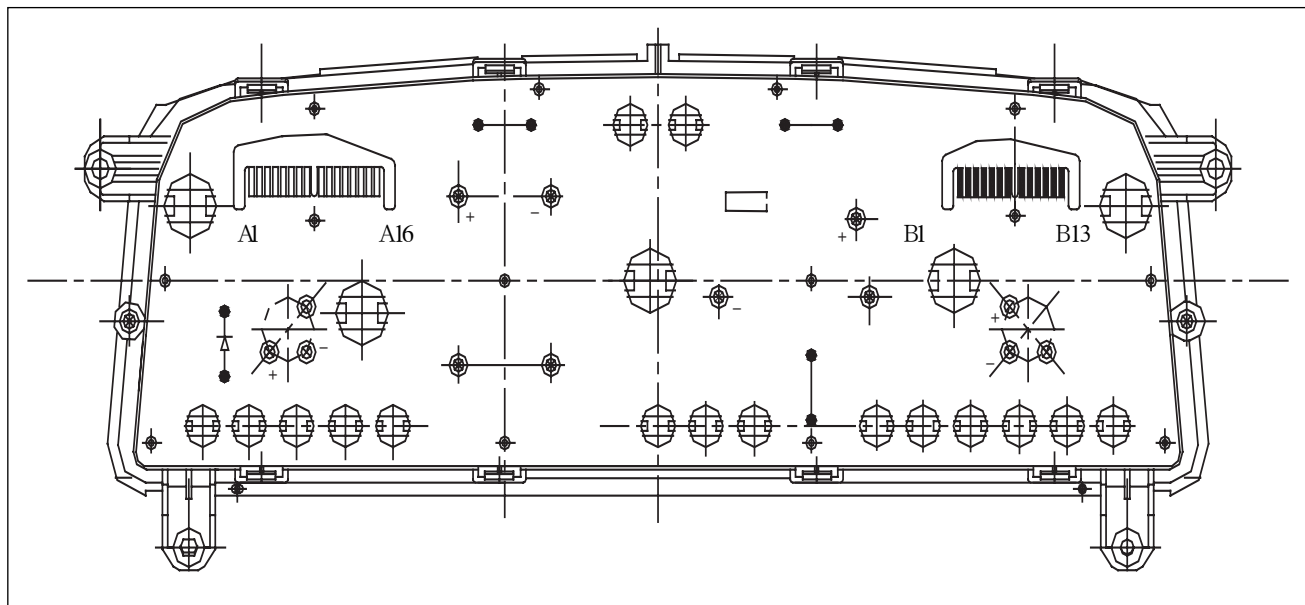
### Conductance of Flasher Relay



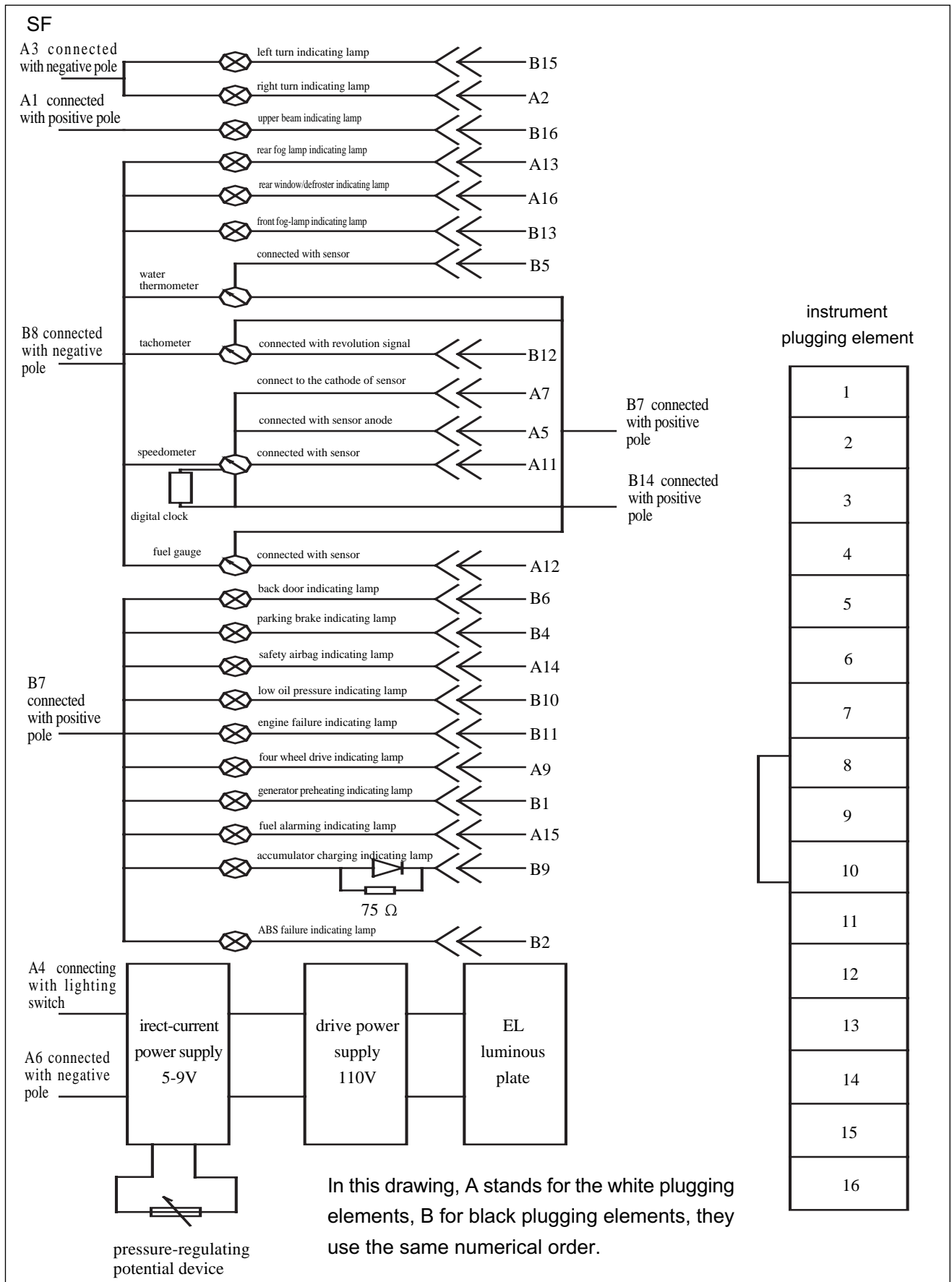
1. Connect the positive lead from the accumulator to the terminal B, and the cathode lead to terminal E.
2. Connect two turn signal lamps to the terminal L and E and check the flashing situation of the two bubbles.  
The turn signal lamp should flash  $85 \pm 10$  per minute, in case the flashing frequency fails to satisfy the specified requirement, change the flasher relay.

## Combination instrument

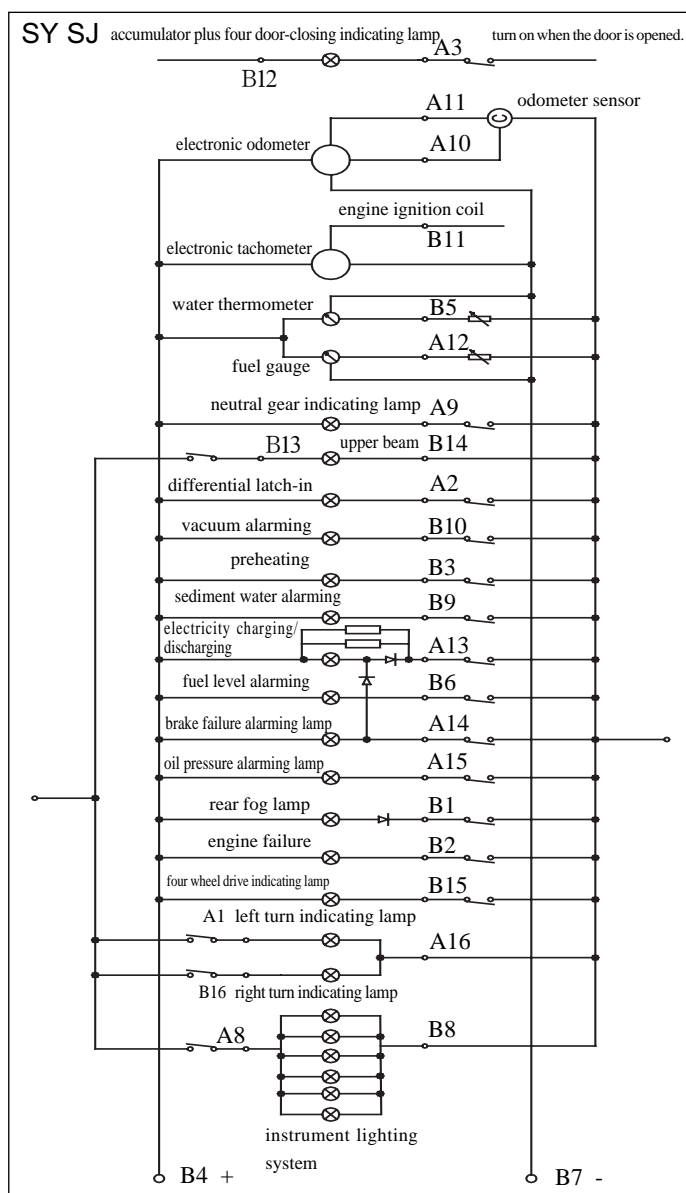
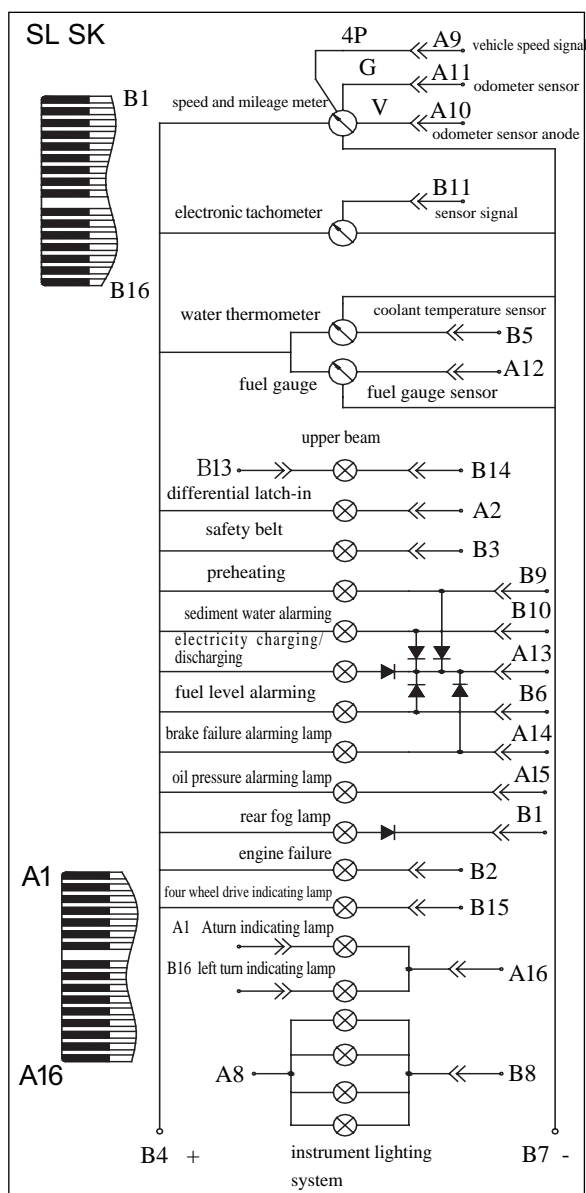
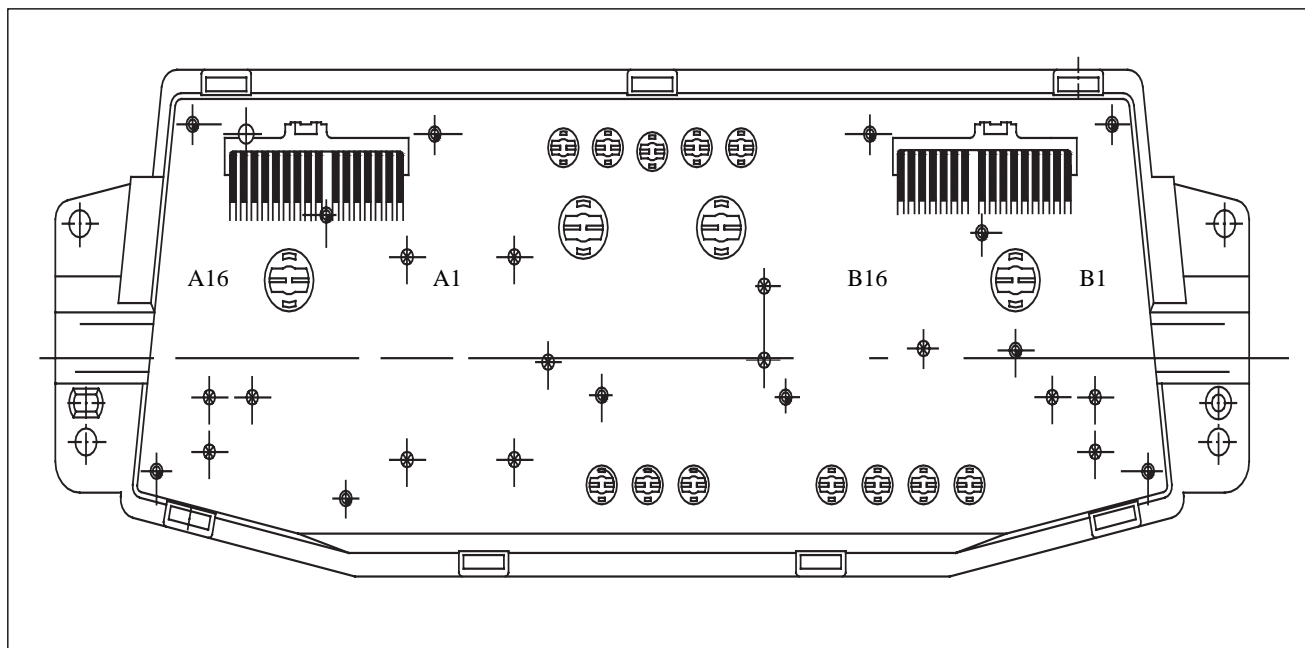
### Electric circuit diagram



## Electric circuit diagram (continued)

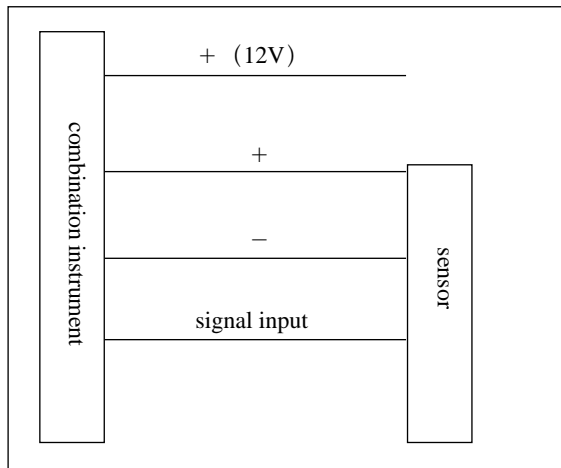


## Electric circuit diagram (continued)

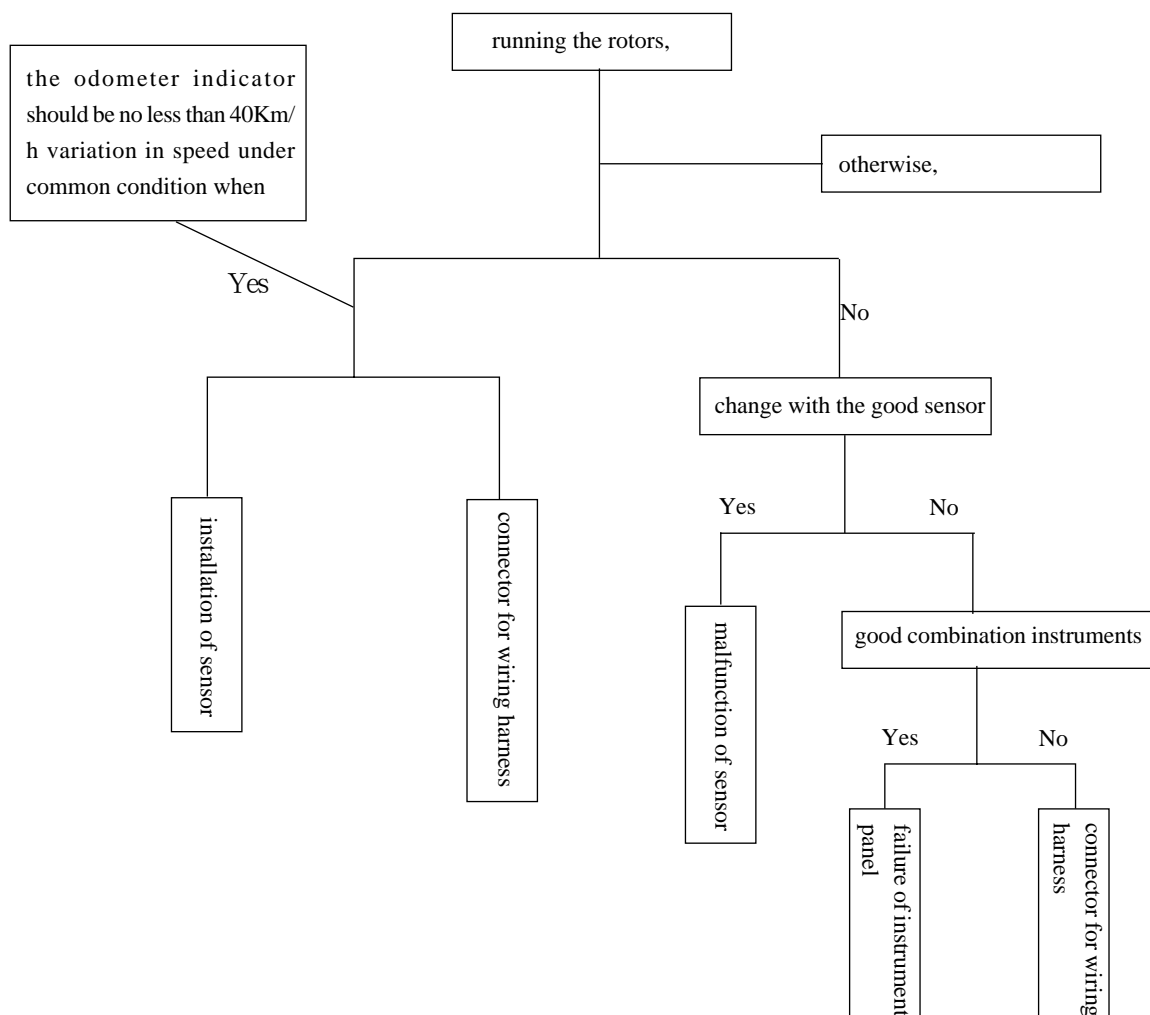


## Common Troubleshooting

- Such failures as inaccuracy indication, out-operation of indicator, on the fly of large and small summation meters (mechanical wheel drive excluded) or incomplete liquid crystal display are caused by the interior failures of the instrument, therefore, these failures, once occur, should be judged according to the instrument interior failures, and change the combination instrument directly.
- In case both the large and small summation meter and the indicator of electronic odometer are on the fly, such failures can be removed by disassembling the speed sensor from the whole vehicle first, then connecting the sensor and combination instruments as shown in the drawing.



Then, open the power supply and run the rotors quickly to observe the indicator variation of odometer.



- c. The inaccuracy display of tachometer is usually caused by the interior failures of tachometer, in such situation, change the combination directly. As for the good-bad shift or out-operation of tachometer, the failures can be judged according to the following approaches:
- 1) Start the vehicle, then check the voltage of signal input of tachometer (wire harness with multi-meter, the voltage should be 6 V or so.
  - 2) In case there is no signal voltage, check the power supply system of the whole vehicle to remove the failures in circuit.
  - 3) The plugs of wire harness is only allowed to be inserted in the combination instruments under the condition that the signal voltage is normal, and the instrument is in normal operation.
  - 4) Where the instrument is in abnormal operation, such trouble is caused by the failure of combination instruments, in such case, change the combination instrument directly.
- d. Troubles of fuel gauge and water thermometer
- 1) In case the instrument indicator points to the large number after it is powered, disconnect the sensor from the plugging elements of wire harness before judging such kinds of troubles, if the indicator is still at large number, it can be make a judgment that the trouble is caused by the interior failure of instrument, in such case, change the combination instrument directly; if the indicator returns to the small number, according to which it can be judged that the trouble is caused by the sensor failure, therefore, change the sensor directly.
  - 2) where the instrument indicator stands still, such trouble may be caused by three causes probably, interior failure of sensor, plugging elements of wire harness or interior failure of instrument; the inspection may be conducted according to the following approaches: disconnect the plugging elements of wire harness from that of sensor, grounding the wire at the sensor end; in such condition, the indicator should move upwardly to the largest number; if such phenomena occurs, it can show the trouble is caused by the interior failure of sensor, in such case, change the sensor directly; if the instrument indicator is still immobilized after it is powered, it can be judged that the trouble is caused by the interior failure of instrument under the condition that the wire harness and plugging elements are normal, in such case, change the combination instrument directly.

### Normal indicating range of combination instrument indicator

#### Speedometer

Real speed Km/h	20	40	60	80	100	120	140	160
Displayed speedKm/h	$20 \pm 3$	$40_0^5$	$60_0^5$	$80_0^5$	$100_0^5$	$120_0^6$	$140_0^7$	$160_0^8$

#### Tachometer Dr SL SK SF

Real rotating speedr/min	1000	2000	3000	4000	5000	6000	7000
Displayed rotating speedr/min	$1000 \pm 100$	$2000 \pm 200$	$3000 \pm 150$	$4000 \pm 200$	$5000 \pm 250$	$6000 \pm 300$	$7000 \pm 350$

#### Tachometer SY SL

Real rotating speedr/min	750	1000	2000	3000	4000	5000	6000
Displayed rotating speedr/min	$750_{-10}^{+20}$	$1000_{-10}^{+50}$	$2000 \pm 120$	$3000 \pm 150$	$4000 \pm 200$	$5000 \pm 250$	$6000 \pm 300$

#### Fuel gauge Dr SF SY

Displayed oil volume	E	1/2	F
Reference resistance $\Omega$	110	38	7
Permitted error $\Omega$	$\pm 5$	$\pm 4$	$\pm 3$

#### Fuel gauge SJ

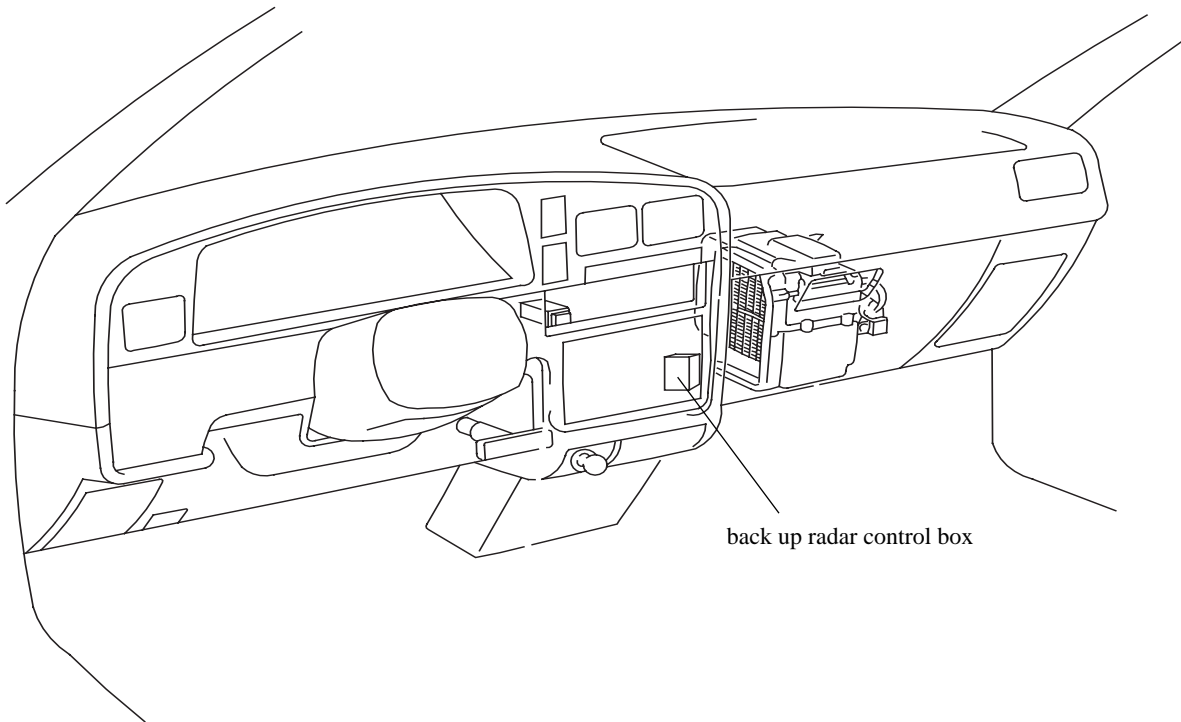
Displayed oil volume	E	1/2	F
Reference resistance $\Omega$	110	38	7
Permitted error $\Omega$	$\pm 12$	$\pm 4$	$\pm 2$

#### Fuel gauge SL SK

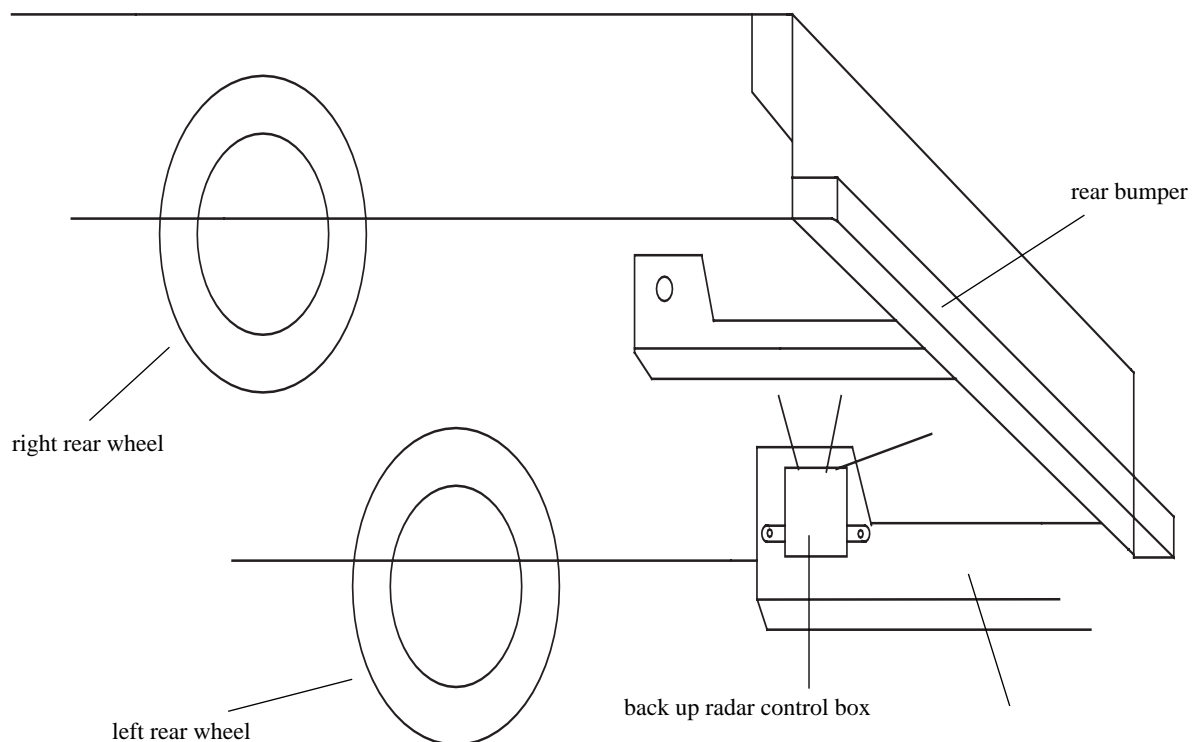
Displayed oil volume	E	1/2	F
Reference resistance $\Omega$	120	45	17
Permitted error $\Omega$	$\pm 10$	$\pm 10$	$\pm 10$

## Backup Radar System Part Mounting Position

Dr SF



SL SK



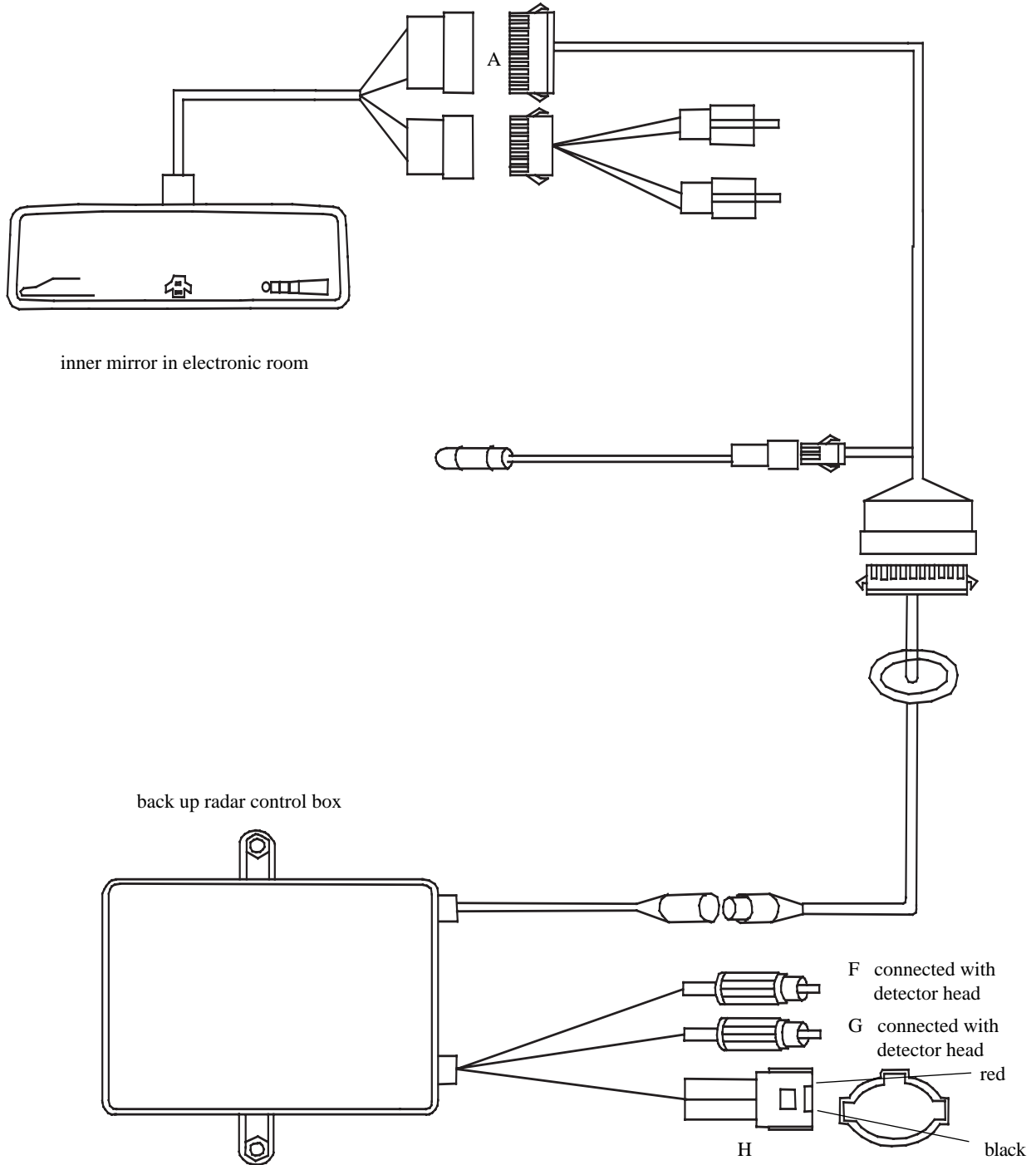
## Inspection on Common Trouble

Trouble description	Failure Judgment Methods	Repairing and treatment approaches
Vehicle model	SL SK	
No backup radar display (no system start notification when the reverse gear is engaged)	Check whether the plugging elements of power supply of back up radar control box are in well connection as shown in drawing H in next page.(when the reverse gear is engaged, touch the detector, if there is vibration, which shows the detector is powered.	
	Check whether the wire harness of inner mirror in electric room and that on the top of body are in well connection as shown in the drawing A in next page	
	Check whether the wire harness of back up radar control box is well connected with that of chassis and that on the top of body.	
	Rotate the vehicle key to the ACC position and engage the reverse gear, then measure to see whether the back up power supply reaches to 12 V with the multi-meter of 50 V of voltage, refer to the “red and black” positions shown in the drawing in next page.	
		If the voltage fails to reach 12 v, check the power supply system of original vehicle’s large wires to restore the voltage to 12 V.
		If the voltage reaches 12 V, change the backup radar control box in trial firstly, then the inner mirror in electric room, finally change the roof wire harness and the chassis.
No backup radar display (but there is start notification when the reverse gear is engaged) remark: such trouble occur under the blocking condition.	Check whether the power supply of back up radar is well located, see the red and position in the drawing of next page.	Poor properties of ultrasonic wave
	Check and align the plugging element.	Change the ultrasonic detector heads.
Continuous back up radar red lamp alarming (remark: there is no obstacle within 0.5 m away from the detector head)	Check whether the detectors in the two circuit of back up radar control box is well plugged, see the marked positions F, G in the drawing of next page.	Check and well connect those plugging elements
	Check and well connect those plugging elements Poor connection of the left/right ultrasonic detector head	Change the ultrasonic detector head
	Poor performance of back up radar control box.	Change the back up radar control box.
Vehicle model	SF	
Alarming by mistake	The rear standby tire is removed	Conduct the inspection operation for the rear standby tire at the spacious place
fail to detect the obstacle	The detector head doesn’ t work	Change the detector head
fail to detect the obstacle	There is dirt on detector head	Clean the detector head
Rear standby tire inspection	1. engage the reverse gear for five times repeatedly within ten seconds at the spacious place so that the red lamp on the screen flash three times, the system will automatically remember the standby tire status. 2. When the body height varies or the stand by tire is opened, make a new inspection for the rear stand by tire to ensure the backup radar in normal operation.	
Seven section of lamp display	Column I: 1.49m-1.3m      Column II: 1.29m-1.1m Column III: 1.09m-0.9m      Column IV: 0.89m-0.75m Column V: 0.74m-0.6m      column VI: 0.59m-0.45m Column VII: < 0.45m Remark: the right and left LED display the direction and distance of obstacle respectively for driver reference.	



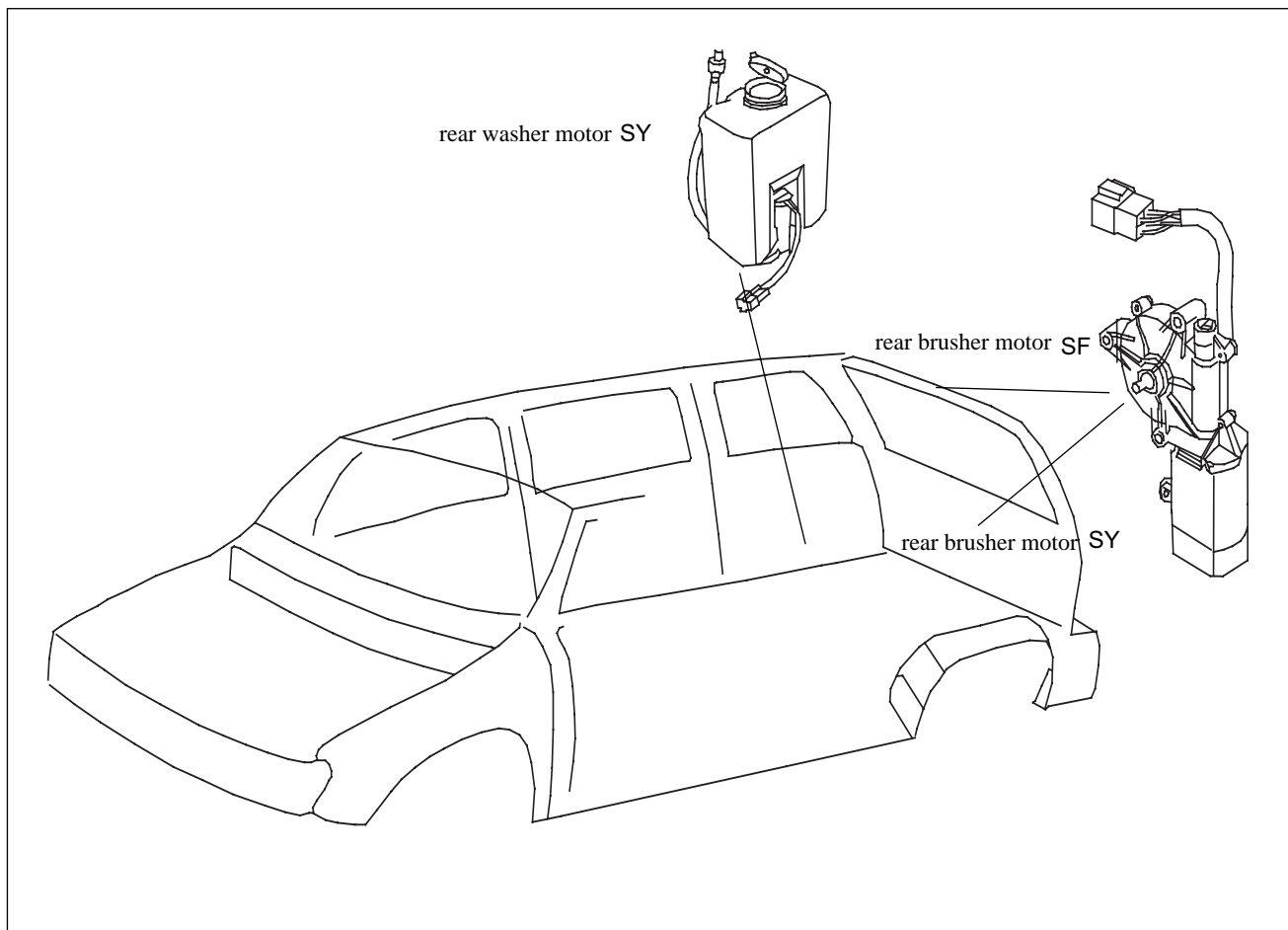
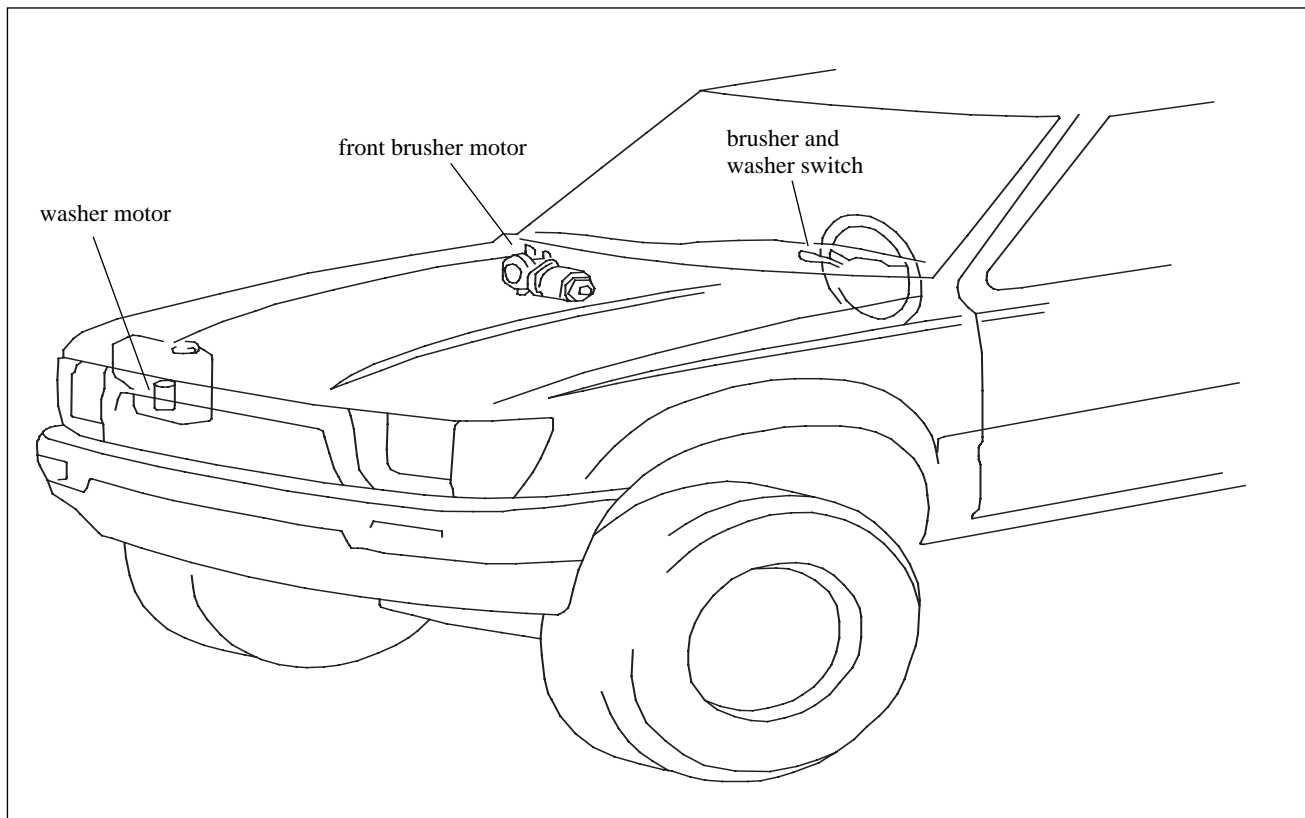
## Distribution Drawing of Wire Harness

SL SK



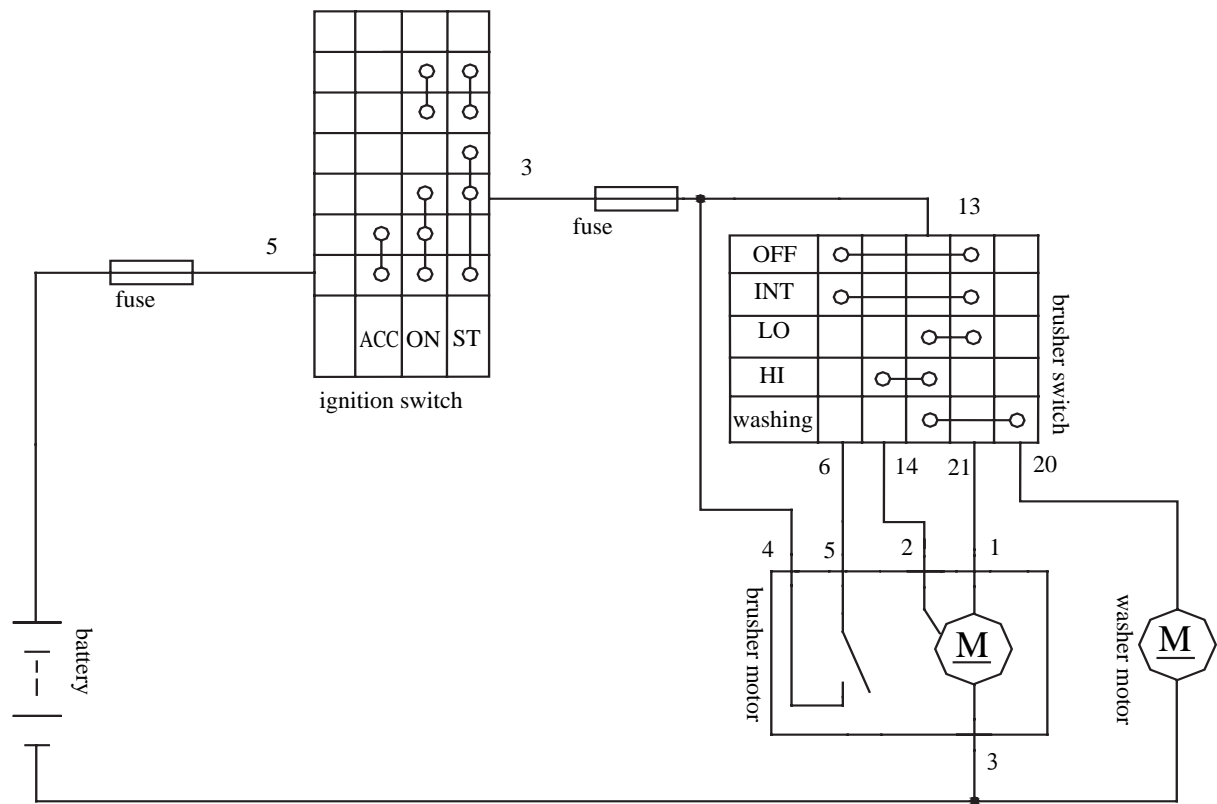
## Wiping and Washing System

### Part Mounting position

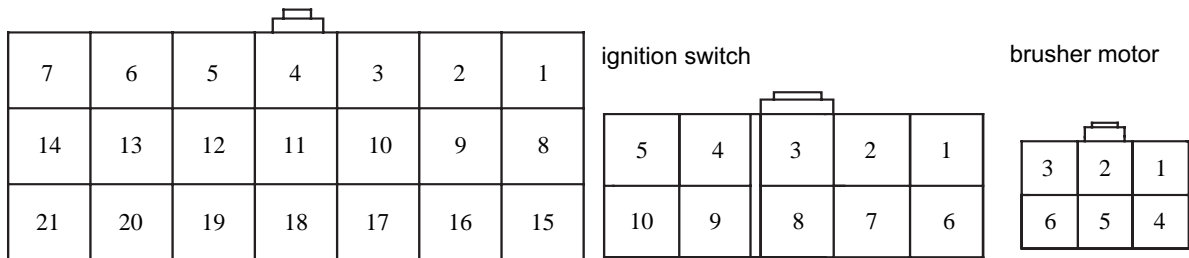


Electric circuit diagram of wiping and washing system

Dr SF

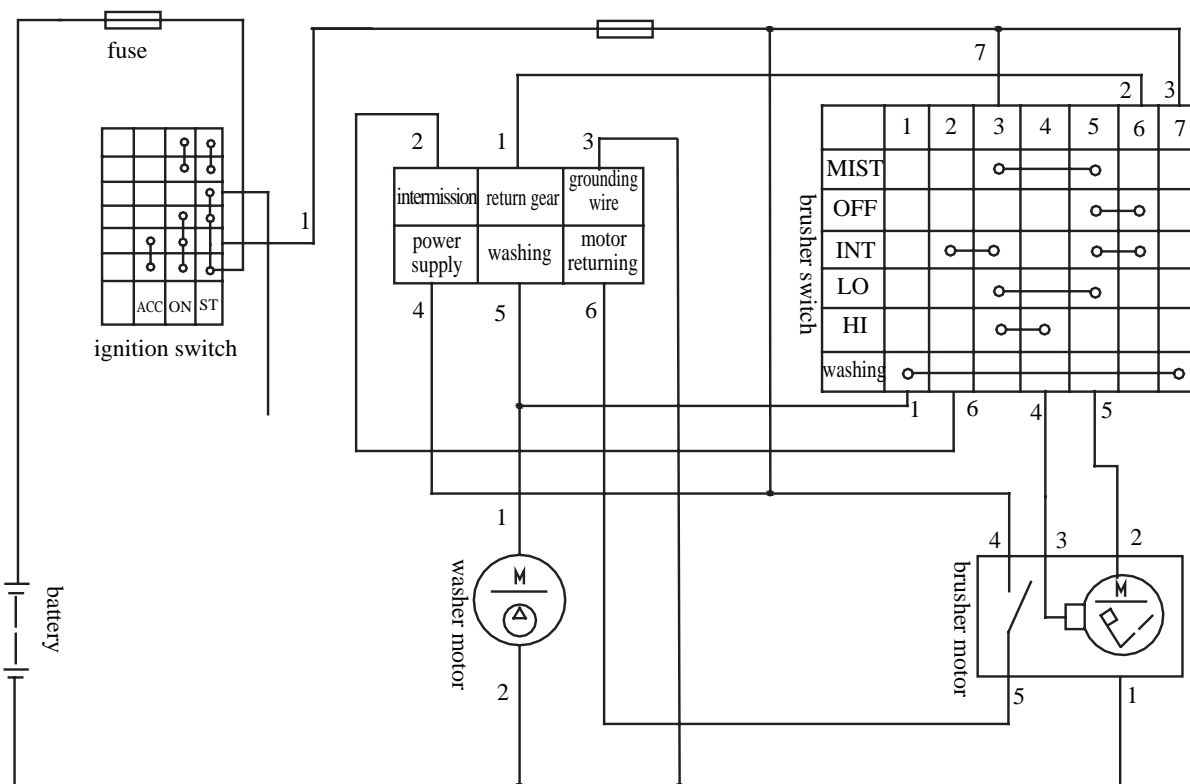


combined switch

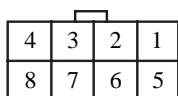


## Electric circuit diagram of wiping and washing system (continued)

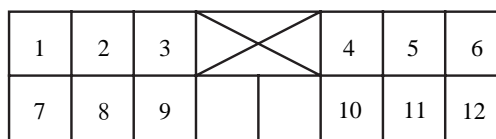
SL SK



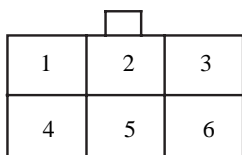
ignition switch



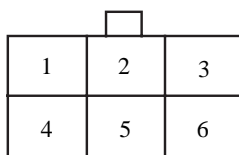
combined switch



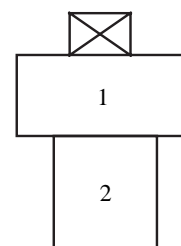
rain-brusher intermissive relay



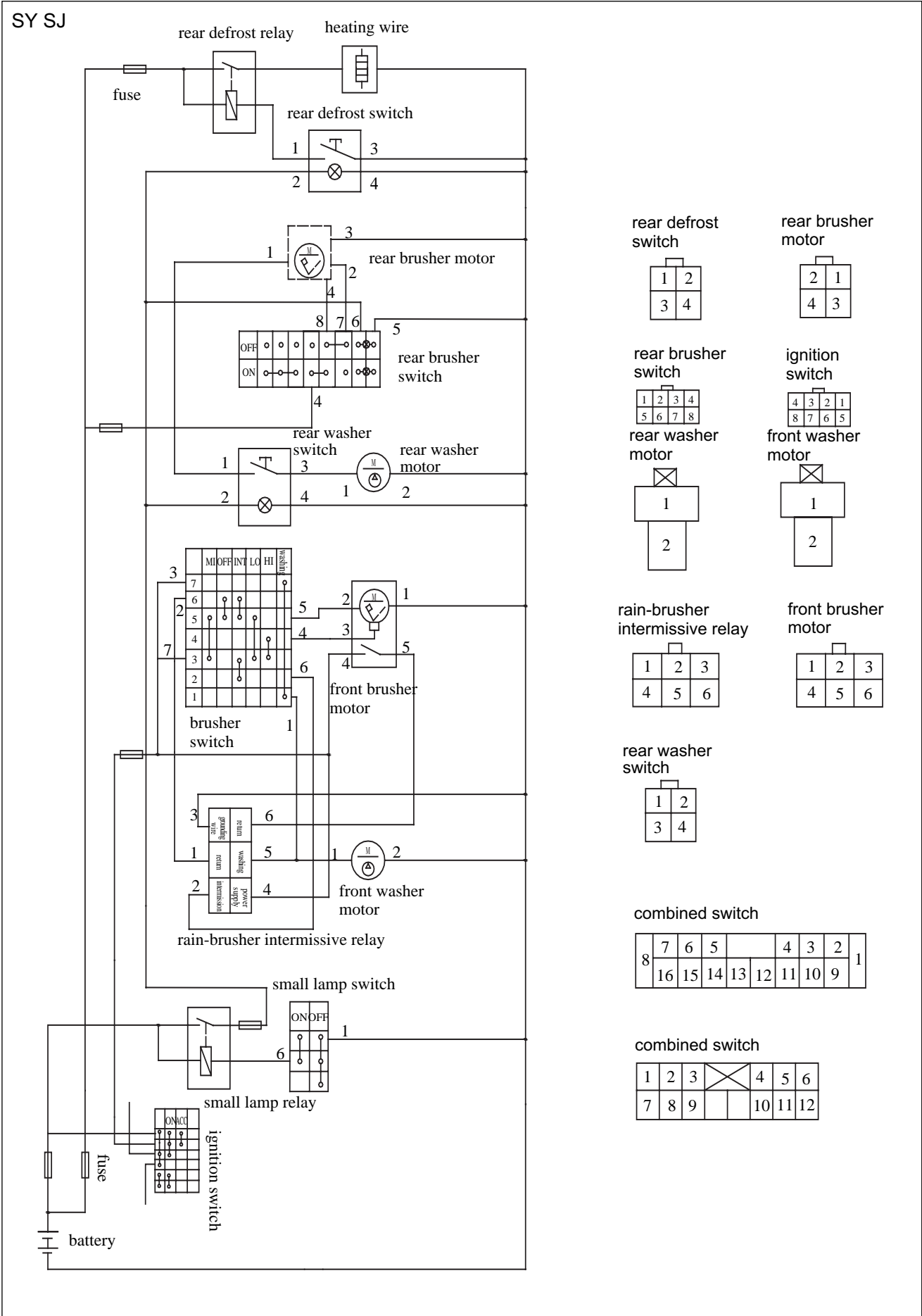
brusher motor



washer motor

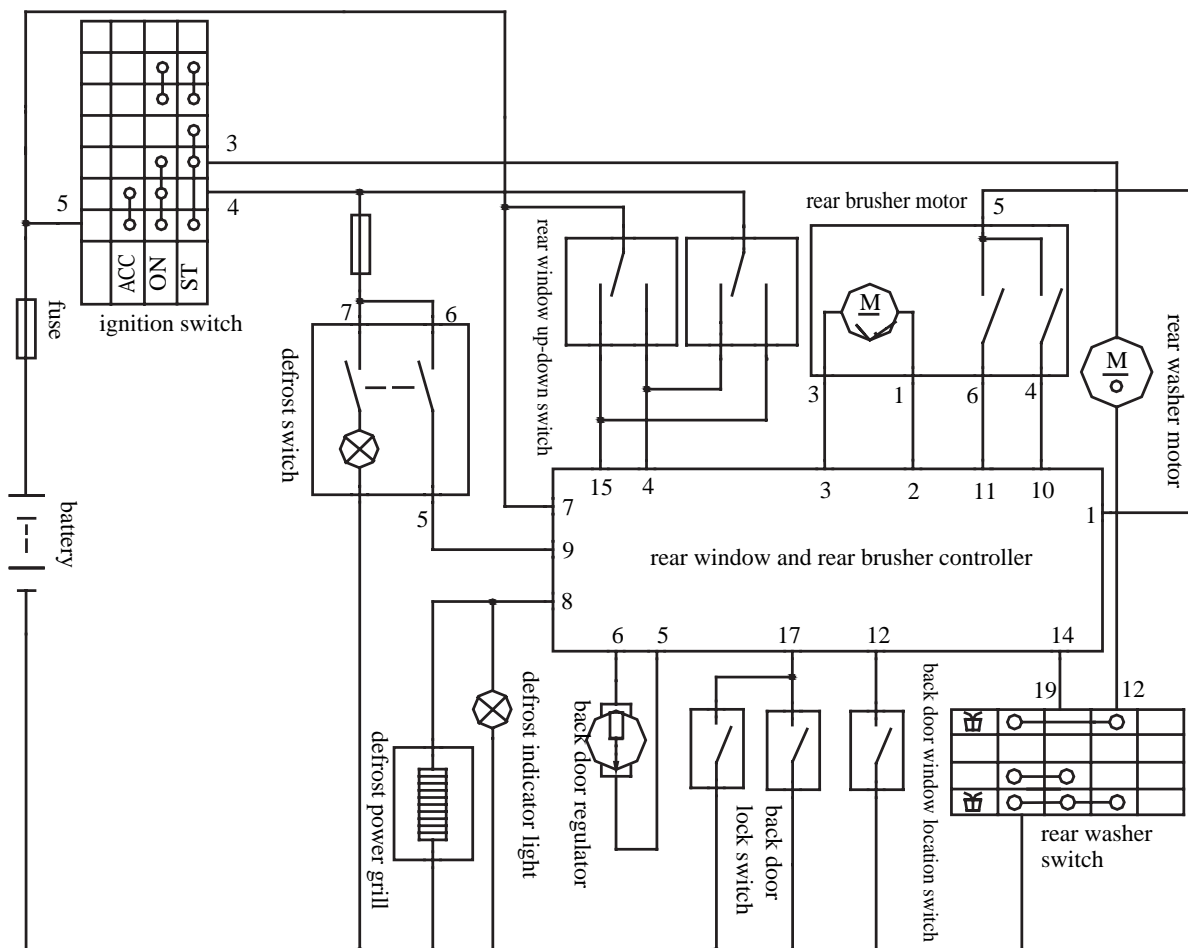


Electric circuit diagram of front and rear brusher and washing system

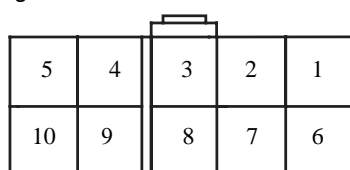


## Electric circuit diagram of rear window, rear brusher and washing system

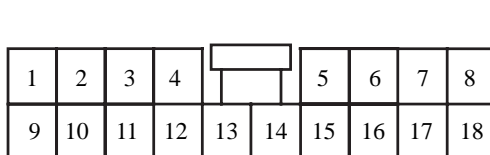
SF



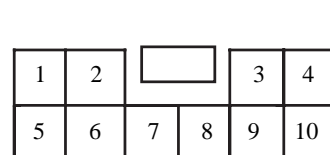
ignition switch



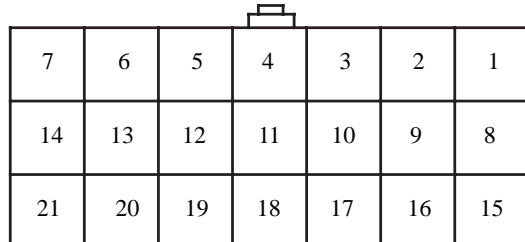
rear window and rear brusher controller



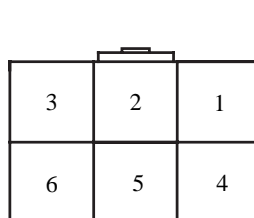
defrost switch



combined switch



rear brusher motor



### Inspection on Common Trouble

Trouble	Possible causes	Repairing approaches
Brusher cannot move or cannot return to the stop position	Burn out of brusher fuse; Failure of brusher switch; Change the fuse and check whether there is short circuit; Check the brusher switch.	Failure of brusher motor; Brusher or grounding failure; Check the brusher motor;  Make reparation as required.
Brusher has no action at the intermissive gear	Failure of brusher switch; Wiper or grounding failure; Check the wiping motor.	Failure of motor switch; Check the brusher switch; Make reparation as required.
Washer has no action	The washer hose or nozzle is blocked; Failure of washer motor; Failure of washer switch; Wiring failure.	Make reparation as required; Check the washer motor; Check the brusher switch; Make reparation as required.

## Parts inspection

### Brusher switch conductance situation

Dr

7	6	5	4	3	2	1
14	13	12	11	10	9	8
21	20	19	18	17	16	15

Terminal switch position	6 Gr	14 Gr/G	13 Gr/Br	21 Gr/Bl	20 Gr/B
OFF					
INT					
LO					
HI					
Washing					

SF

7	6	5	4	3	2	1
14	13	12	11	10	9	8
21	20	19	18	17	16	15

Terminal switch position	6 Gr/R	14 Gr/G	13 Gr/Br	21 Gr/Bl	20 Gr/B
OFF					
INT					
LO					
HI					
Washing					

SL SK SY SJ

1	2	3		4	5	6
7	8	9		10	11	12

Terminal switch position	1 W/B	2 Gr/R	3 Gr/Br	4 Gr/Bl	5 Gr/G	6 Gr	7 Gr/Br
MIST							
OFF							
INT							
LO							
HI							
Washing							



Brusher switch conductance situation (continued)

SLDiesel SYDiesel

1	2	3		4	5	6
7	8	9		10	11	12

Terminal switch position	1 Bl/B	2 Lg/R	3 Lg/W	4 Bl/Y	5 Bl	6 Bl/O	7 Lg/W
MIST							
OFF							
INT							
LO							
HI							
Washing							

In case the conductance situation fails to satisfy the requirements in the above-mentioned drawing, change the switch.

Conductance Situation of Rear Brusher

SY SJ

4	3	2	1
8	7	6	5

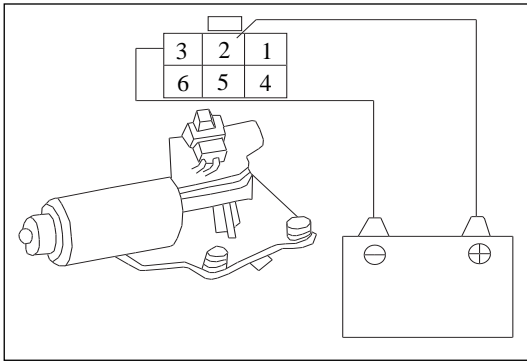
Terminal switch position	1 R/Y	8 B	7 G/W	6 Bl/Y	5 B/Y
OFF					
ON					

SYDiesel

4	3	2	1
8	7	6	5

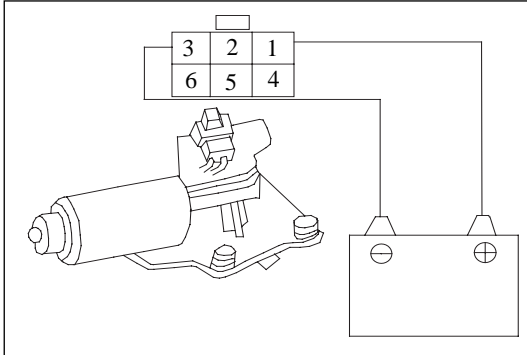
Terminal switch position	1 R/Y	8 B	7 G/R	6 Bl/Y	5 B/Y
OFF					
ON					

Where the conductance fails to satisfy the requirements in the above-mentioned drawing, change the switch.

**In low-speed operation**

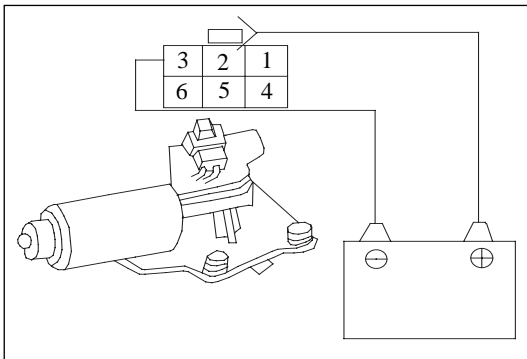
Check the front brusher motor

Connect the anode lead to the terminal 2 (1) from accumulator, and the cathode lead to terminal 3, at this time, the front wiper motor should be in low-speed operation, otherwise change the front brusher motor.

**In high-speed operation**

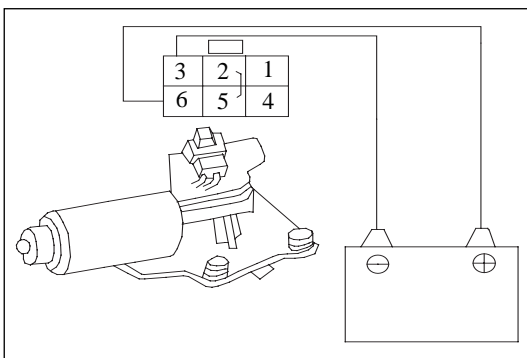
Connect the anode lead to the terminal 1(2) from the accumulator, and cathode lead to terminal 3, in such condition, the front wiper motor should be in high-speed operation.

In case the operation fails to meet the requirement, change the front wiper motor.



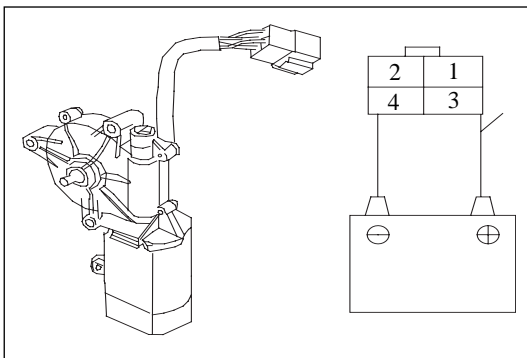
in operation , stop running at the stop position

- a. Run the front wiper motor at low speed and stop it at any positions excluding the stop position by disconnect the anode lead from the terminal 2 (1).

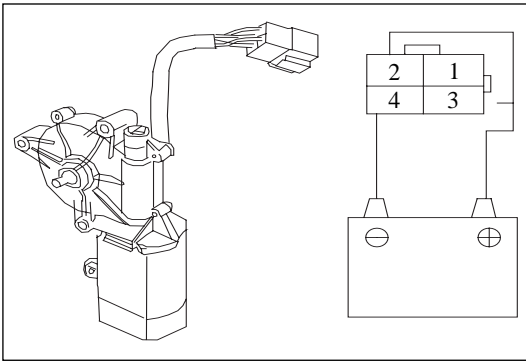


- b. Connect the terminals 2 and 5.
- c. Connect the anode lead to the terminal 6 (4) from the accumulator, and the cathode lead to terminal 3, check whether the wiper motor parks at the stop position after it running for another time, if the requirement is not satisfied, change the front brusher motor.

Remark: items in parenthesis is for Dr and SF.

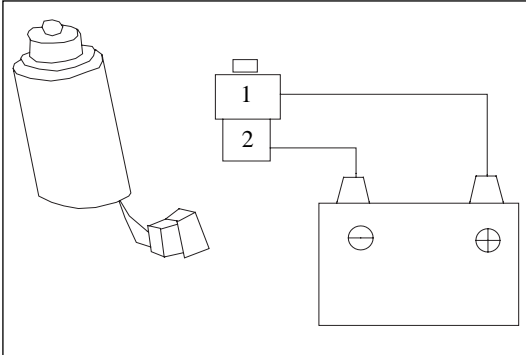
**Rear brusher motor inspection**

Connect the anode lead to the terminal 3 from the accumulator, and the cathode lead to terminal 4, at this time, the wiper motor will be in normal operation, disconnect the terminal 3, the rear wiper motor should stop running at any position excluding the stop position.



Connect the anode lead to terminal 3 from the accumulator, and cathode lead with terminal 4, at this time, the wiper motor should be in normal operation, under such condition, disconnect the terminal 3, which is connected with terminal 1, and the anode lead is connected to the terminal 2, in such case, the rear wiper motor should stop running at the stop position.

In case the operation fails to satisfy the specified requirement, change the rear wiper motor.



#### Inspection on Washer Motor

Connect the anode lead to the terminal 1 from the accumulator, and the cathode lead to the terminal 2, at this time the washer motor should be in normal operation.

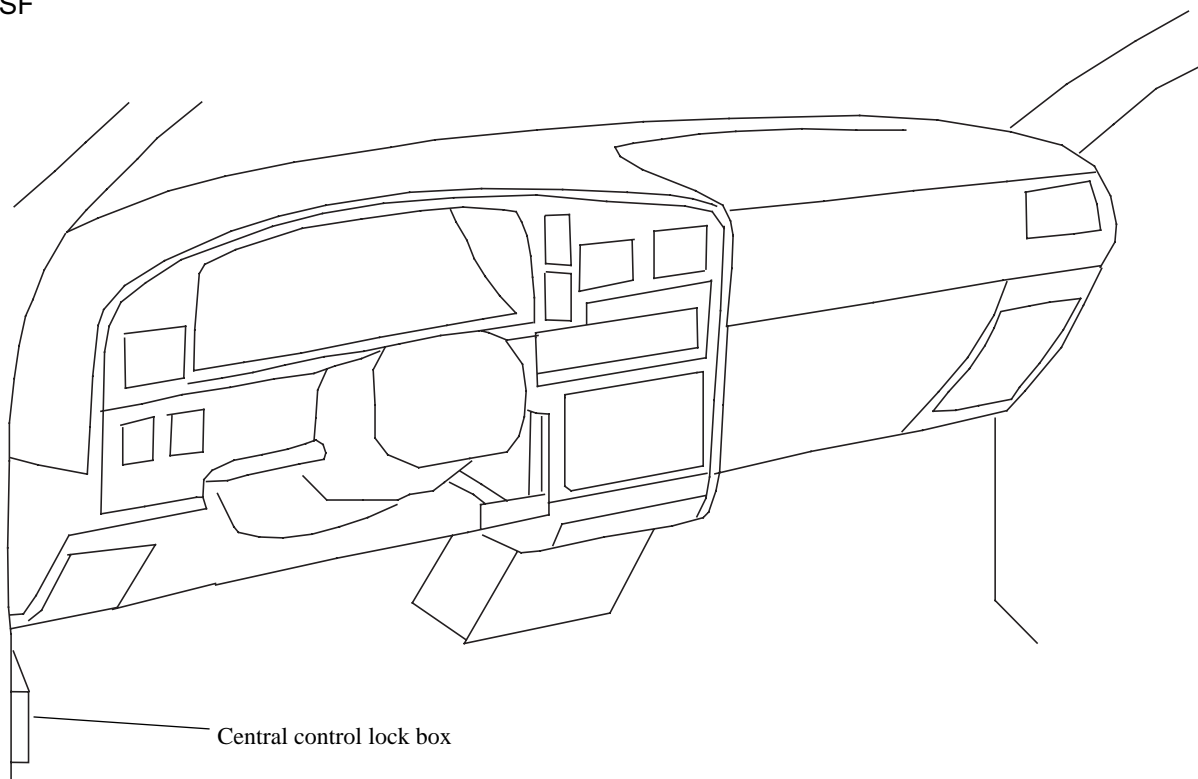
**Notice:** this test should be finished rapidly (within 20 seconds).

In case the operation fails to meet the specified requirement, change the washer motor.

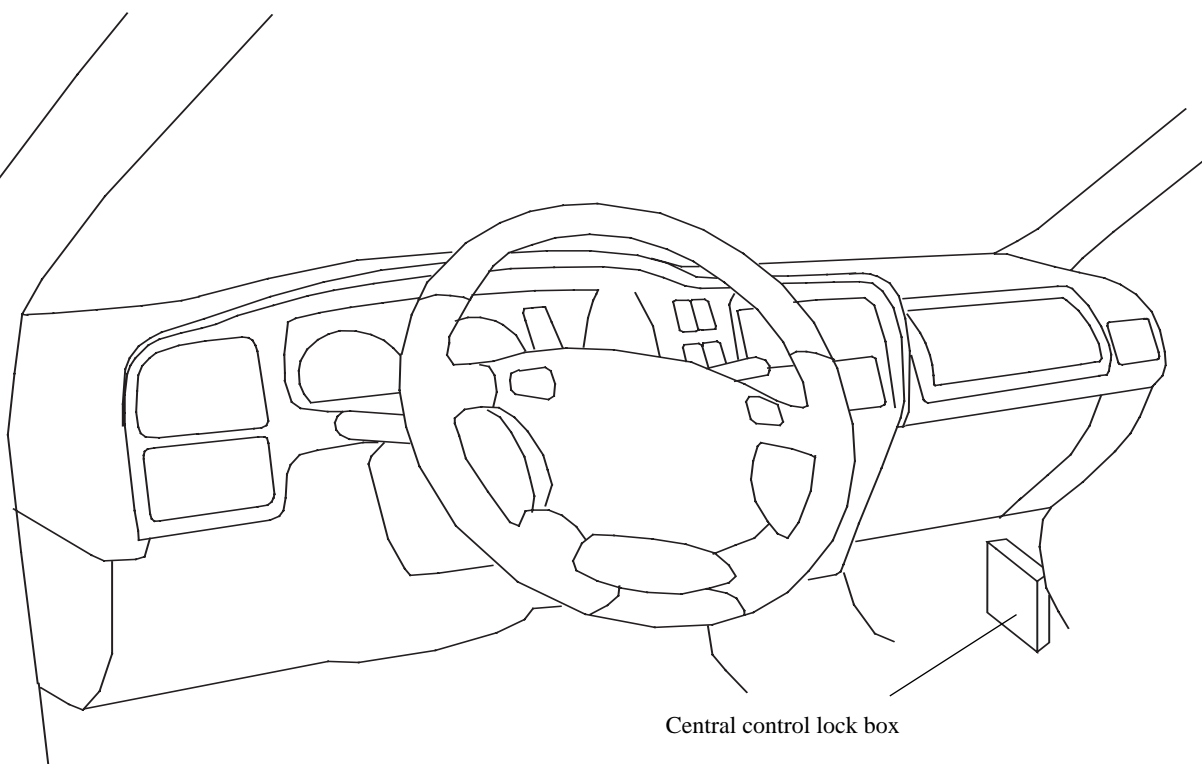
## Central control lock and electric rocker gear system

### Part Mounting position

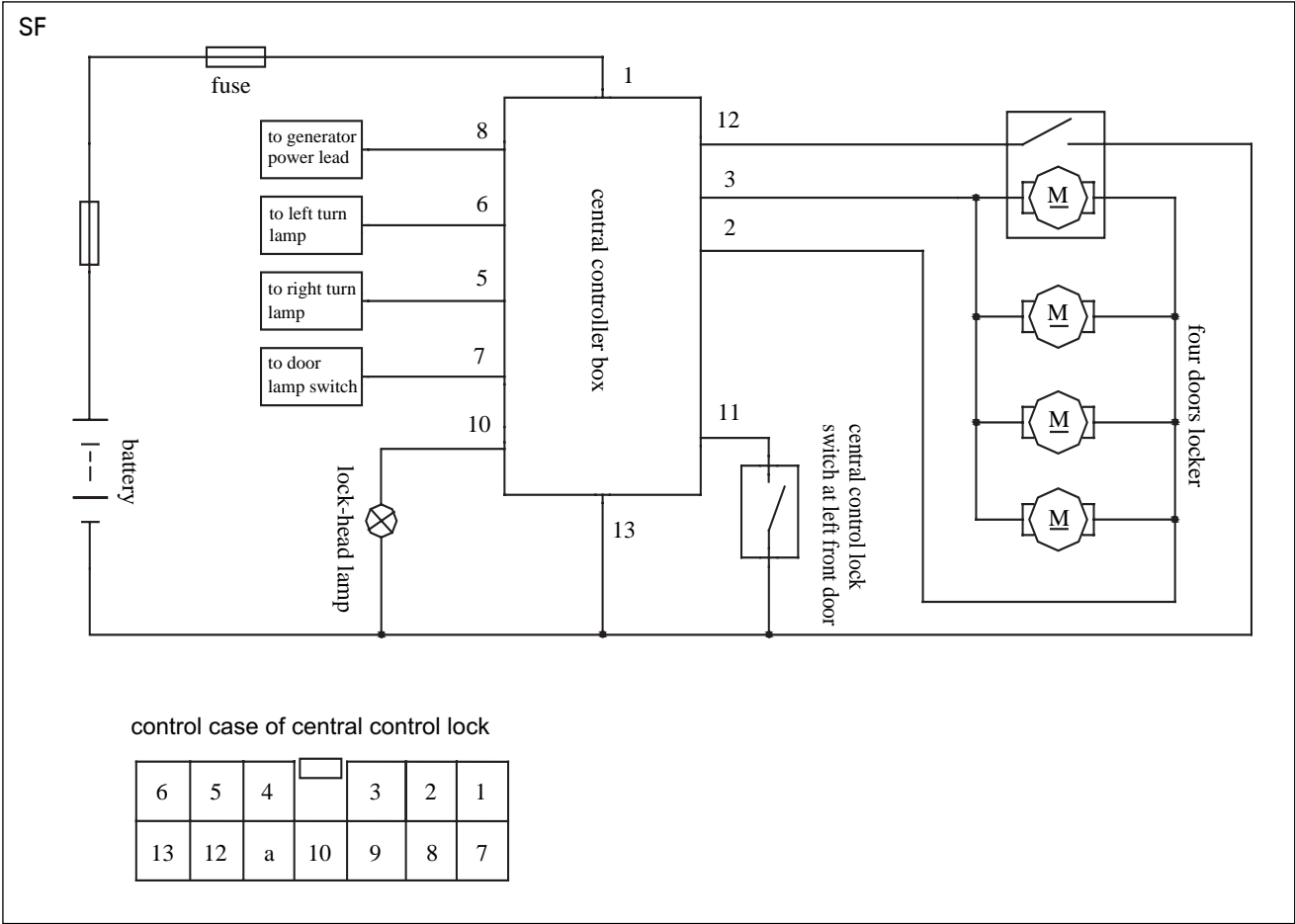
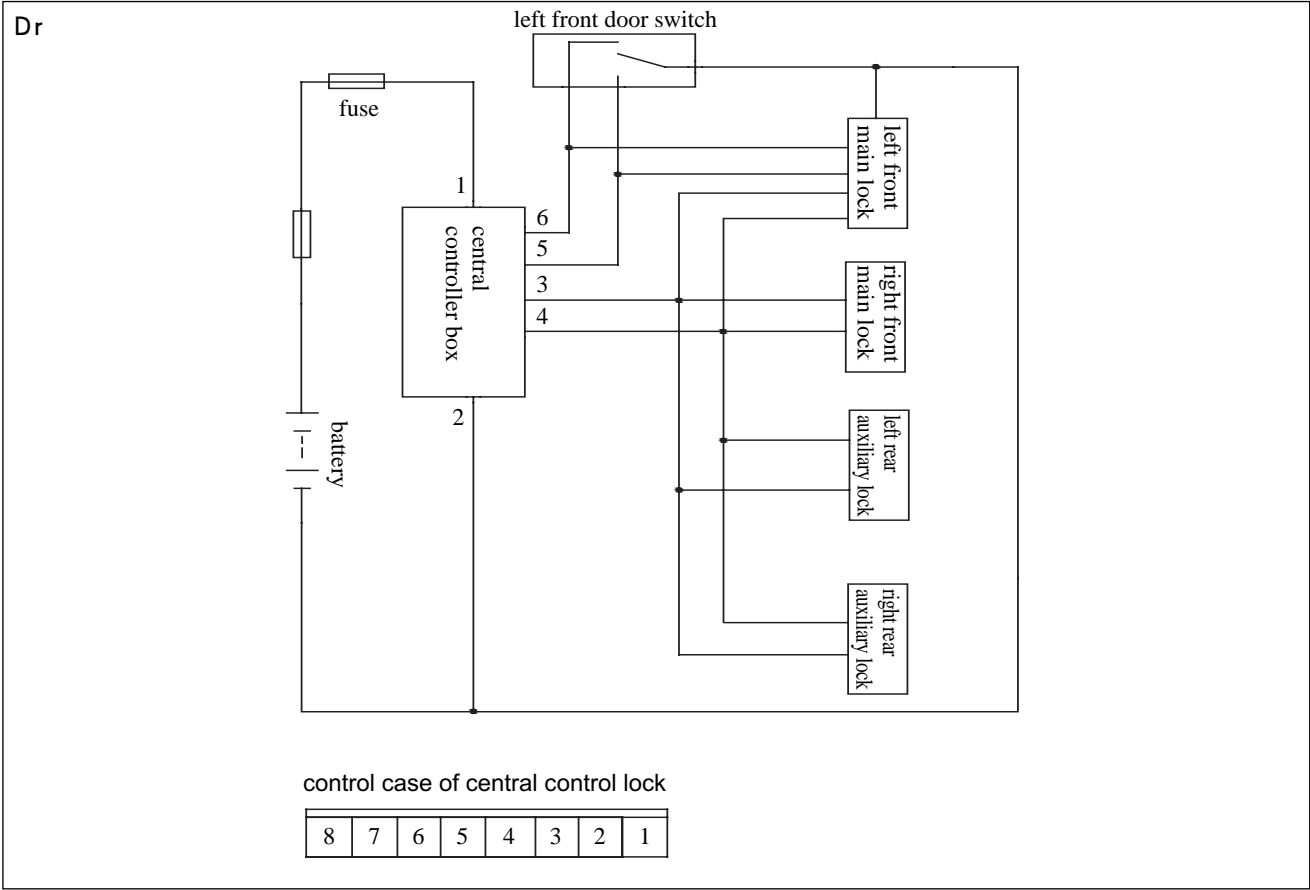
Dr SF



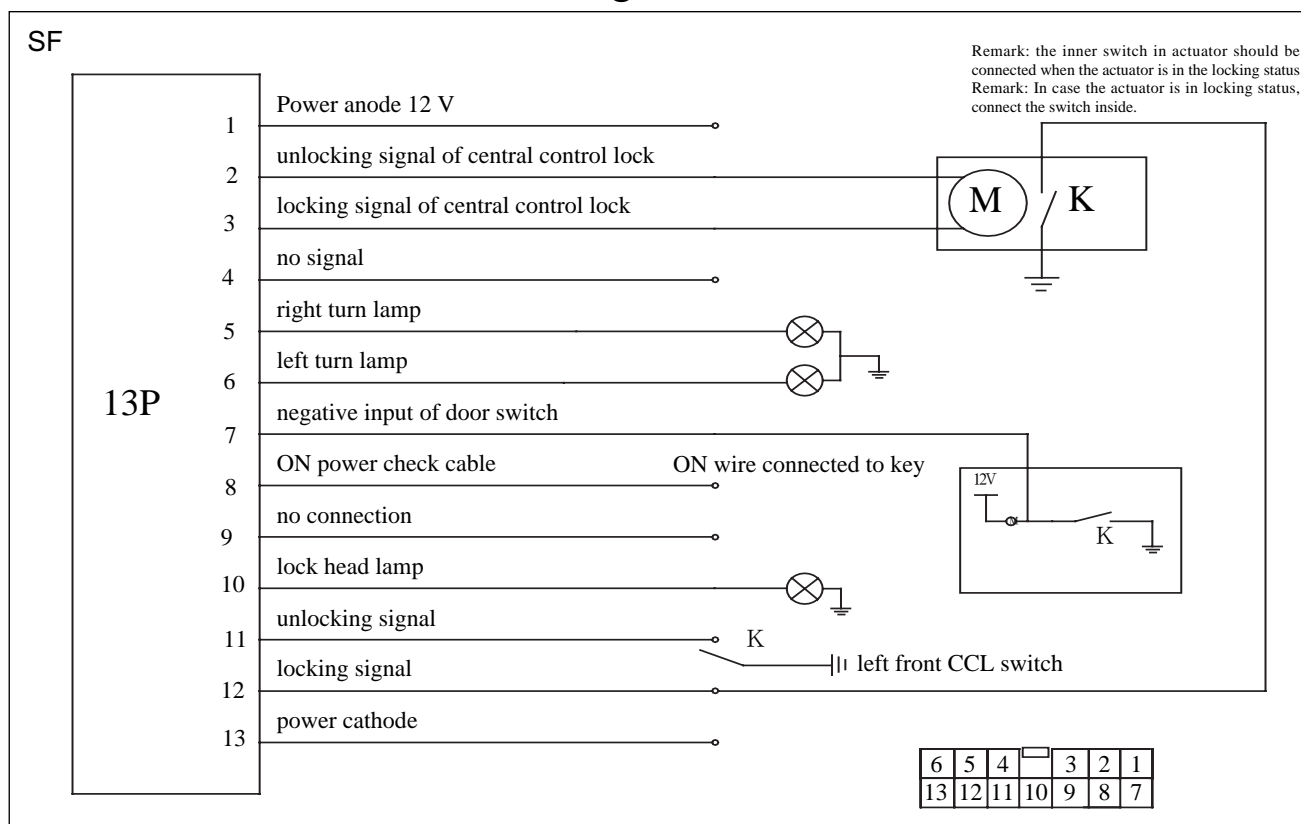
SL SK SY SJ



Electric circuit diagram of central control lock



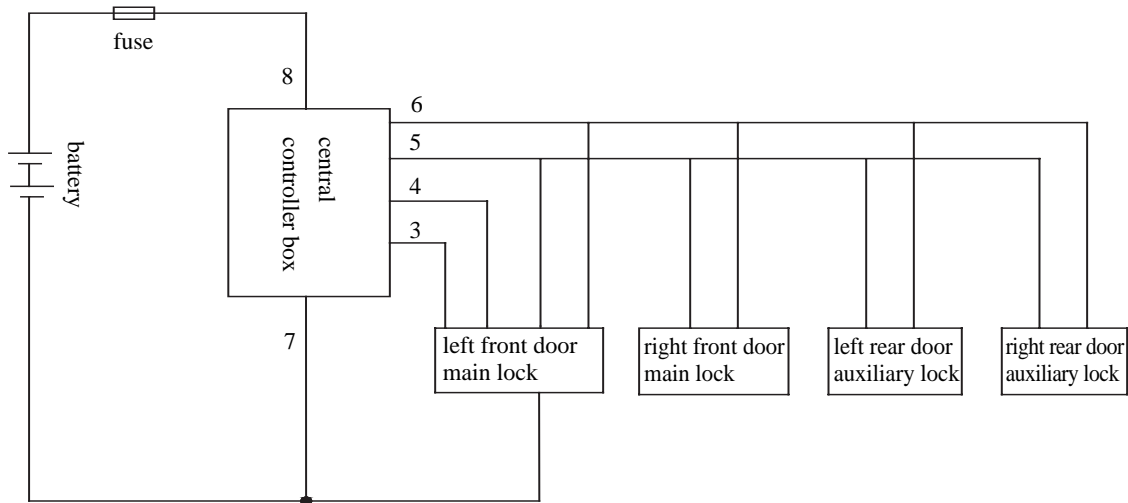
## Definition for connecting wire of central control lock



1. Y/V Connect the power anode of 12V
2. B1 Unlocking output of central control lock: to the cell anode on vehicle, in front of which a fuse of 15 A should be set, and when the motor is started, the voltage should not less than 10V
3. LG locking signal of central control lock the locking wire of the CCL actuator, and the grounding wire at the normally closed contact inside the relay will contact with the normally opening contact at the common spots inside relay when unlocking with REMOTE CONTROLLER or manually, the wire will output 12 V voltage.  
The CCL locking signal is connected to the unlocking wire of actuator of CCL, and the normally closed contact in the interior relay is grounding wire, which will output 12 V voltage when unlocking with REMOTE CONTROLLER or manually and the common spots of relay contacting the normally opening contact.
4. non-connection There is no wire connected at present
5. G/R Right turn lamp Connected to the anode wire of the right turn lamp on the vehicle, and it will output 12 V voltage in operation.
6. G/Y Left turn lamp Connected to the anode wire of left turn lamp on the vehicle, and it will output 12 V voltage when in operation
7. Br Negative input of door switch Which is connected to the door switch and it is grounding when the door is opened (the indoor lamp will light)
8. GD ON power check cable Connected to the ON wire of the locking door( there will be 12 v voltage when rotating the key at "ON" position.
9. Non-connection This wire is not connected temporarily
10. GD/B Lock head lamp output There will be 12 V voltage outputted in this wire when opening the door, and will be powered off (no output) ten seconds later after the door is closed
12. Y/B Locking signal Connected to the locking signal wire of CCL at the left front door, and connect to the grounding wire when in operation.
13. B Power cathode Connect to the body (grounding wire) it should be as short as possible, because the overlong wire will produce the interference source.

## Electric circuit diagram of central control lock (continued)

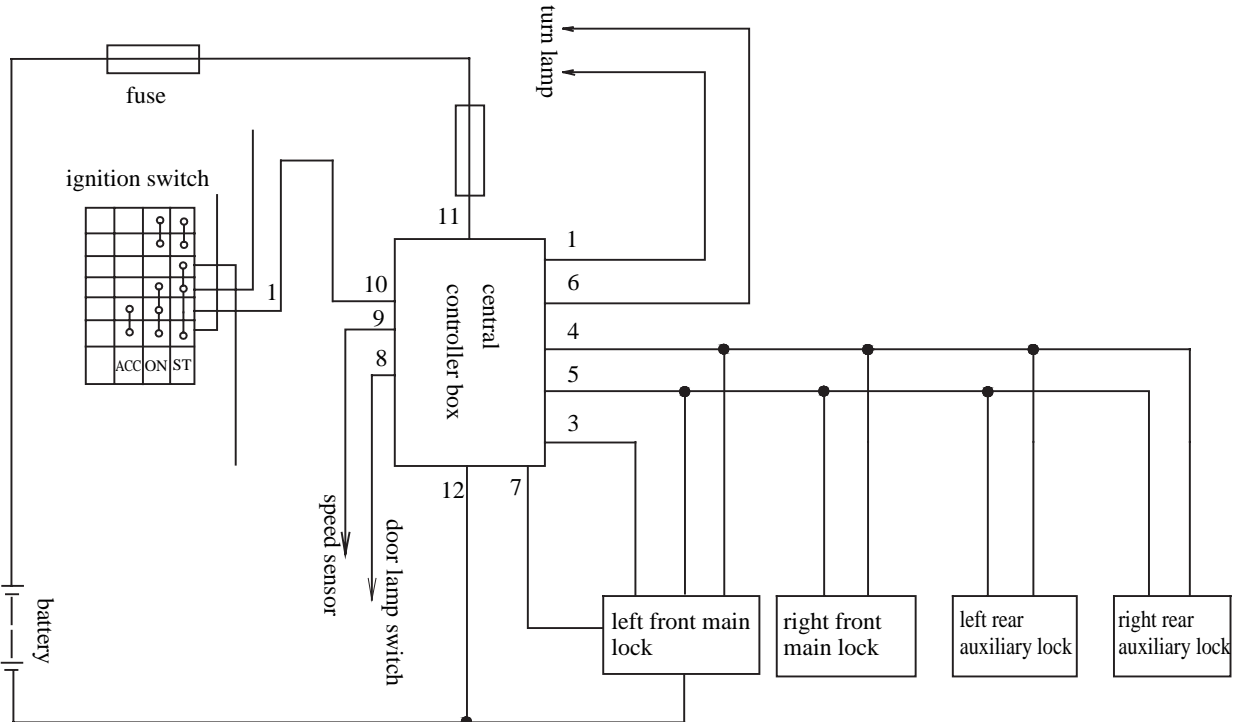
SL SK



control case of central control lock

1	2	3	4	5	6	7	8
---	---	---	---	---	---	---	---

SY



control case of central control lock

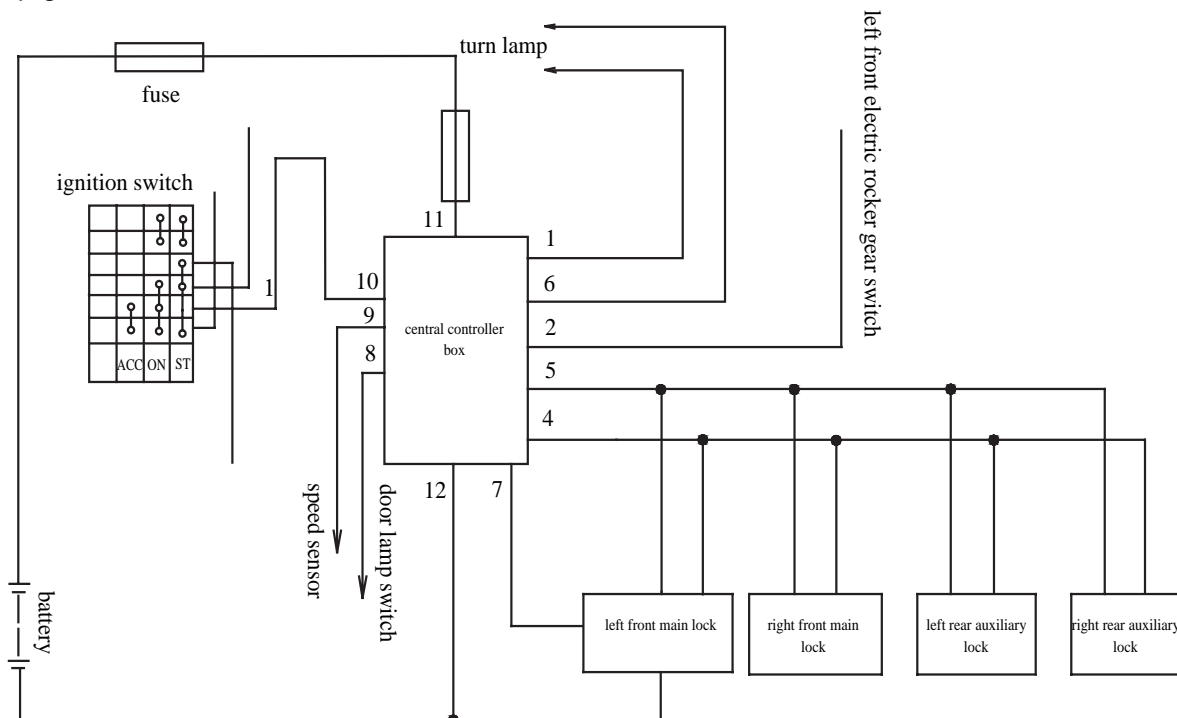
ignition switch

4	3	2	1
8	7	6	5

1	2	3		4	5
6	7	8	9	10	11
12					

## Electric circuit diagram of CCL

SJ Top-grade SY



central controller box

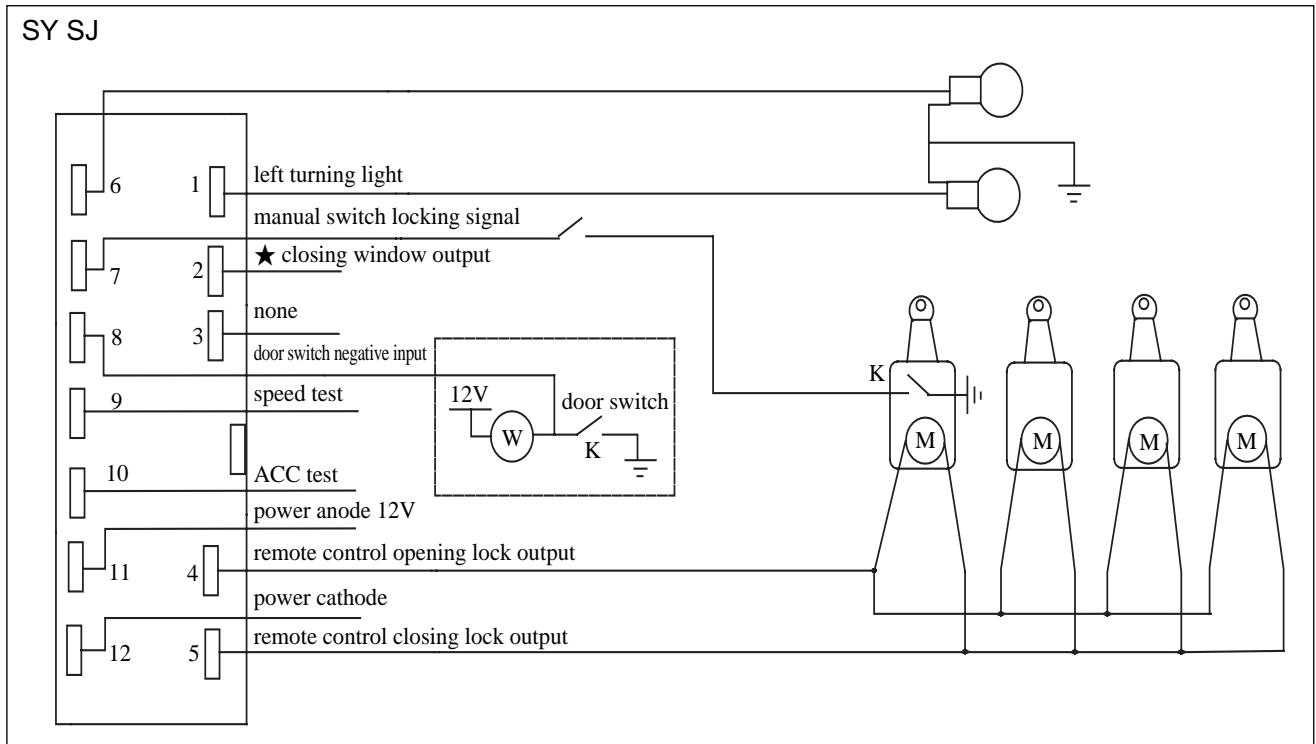
ignition switch

4	3	2	1
8	7	6	5

1	2	3	X		4	5
6	7	8			11	12



## Definition of the connecting wire of CCL

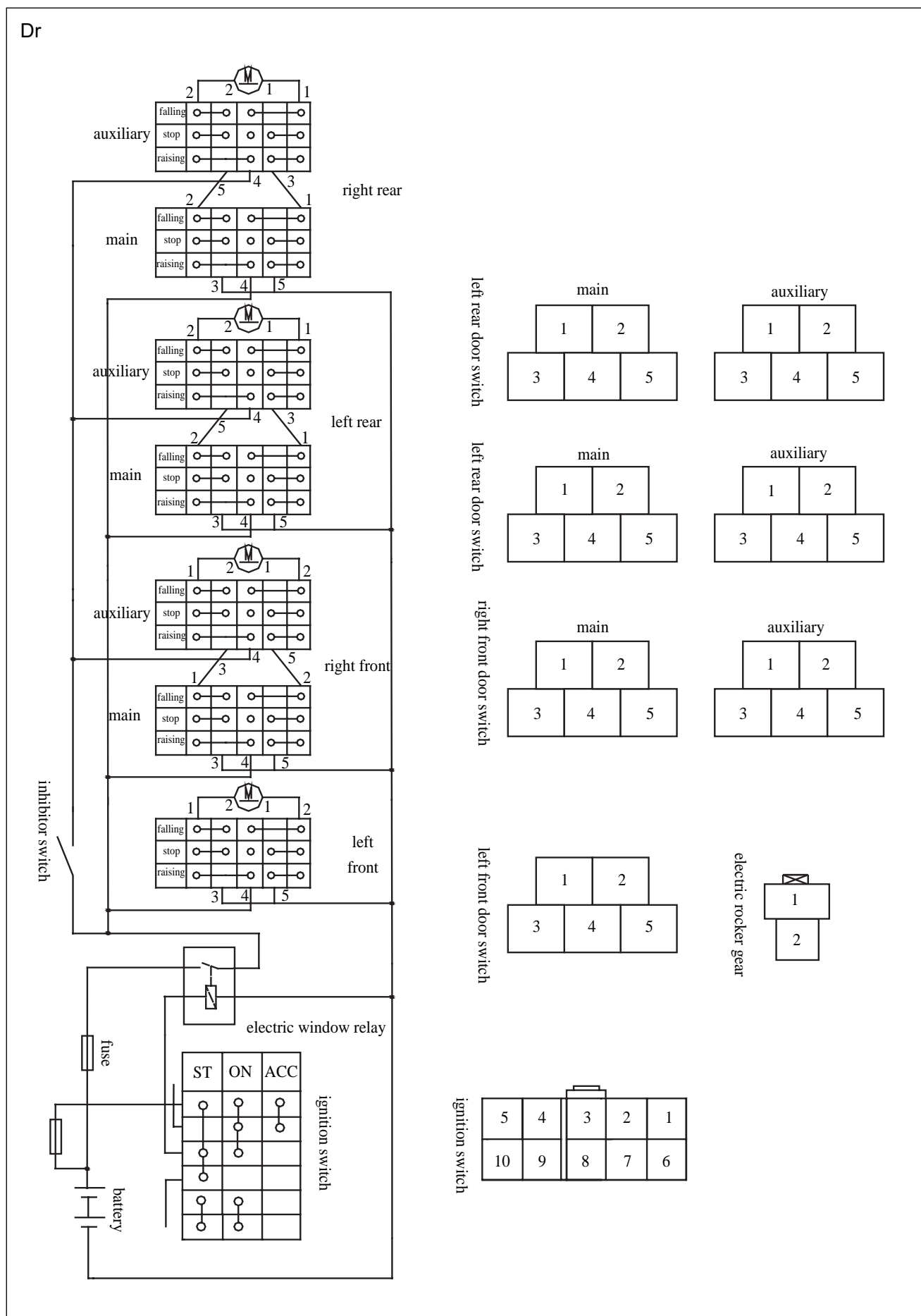


- |  |   |
|--|---|
| 1. G/R(G/W) Turn lamp                        | Connected to the anode wire of the turn lamp (right ) on vehicle, it will output 12 V voltage when it is in operation   |
| 2. O(w/b1) Window-shutting signal output     | This wire has one second of voltage output of 12V when the car door is locking. (top SY SJ)   |
| 3. No connection                             |   |
| 4. G (Y) Unlocking output of CCL             | Connected to the locking wire of actuator of CCL, and the normally closed contact in the internal relay is the grounding wire. It will output 12 v voltage when locking with REMOTE CONTROLLER or manually because the common spot of relay will contact the normally opening contact.          |
| 5. Bl(G) Locking output of CCL               | Connected to the locking wire of actuator of CCL, and the normally closed contact inside the internal relay is the grounding wire. It will output 12 V voltage when locking with REMOTE CONTROLLER or manually because the common sots of relay will contact with the normally opening contact. |
| 6. Gr(G/B) Turn lamp                         | Connected to the anode wire of left turn lamp of vehicle, it will output 12 v Voltage when in operation.  |
| 7. W(W) Manually controlled unlocking signal | The door lock control the locking process through the manual unlocking switch at left front door, that is, under the locking condition, press the switch, the lock will be opened (the switch will return to the connection situation automatically after pressing).                            |
| 8. Br(R/B) Negative output of door switch    | Connected to the car door lamp switch, it is connected to the grounding wire (the indoor lamp will light when opening the door).  |
| 9. R/G(G/B) Rotating speed test              | The car door will lock automatically when the vehicle reaches a certain speed.  |
| 10. W(R) ACC test                            | Connect to the ACC wire, which will have 12 V voltage when the key is rotated to the ACC position.  |
| 11. R (R) Power anode (12V)                  | Connect to the anode of accumulator on vehicle, in front of which should be set the fuse so that the voltage will be no less than 10V when the starter is in operation.   |
| 12. B(B) Power cathode                       | Connect to the body (grounding wire), it should be short as possible as can because the overlong wire will produce the interference source.   |

Items in the parenthesis is for SY diesel model

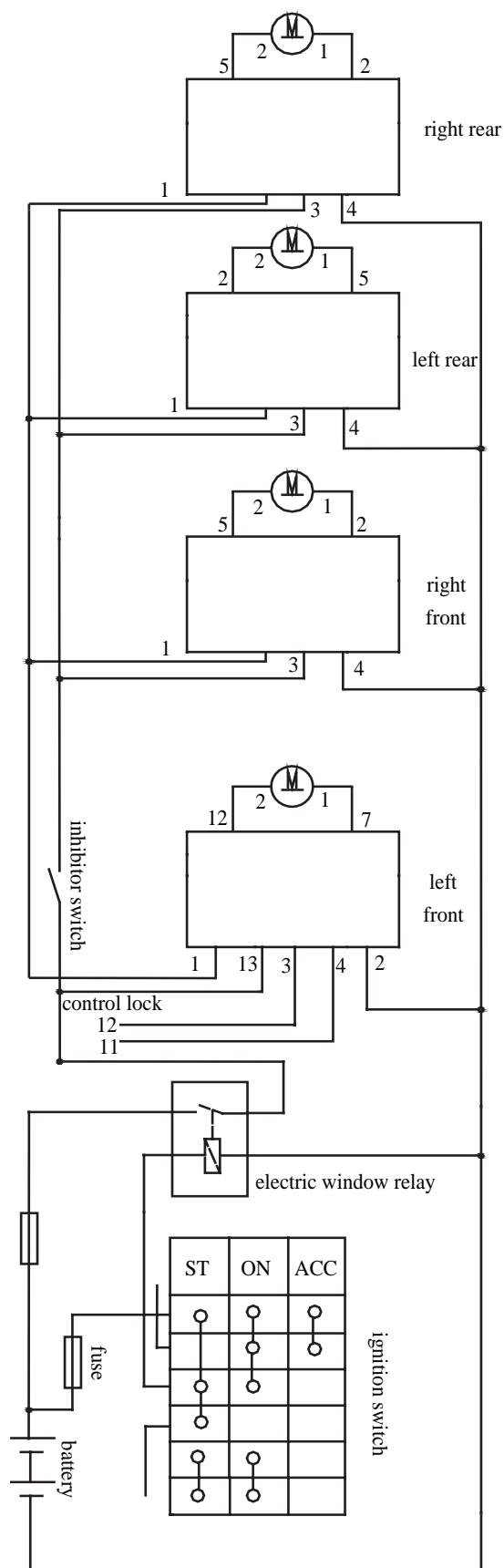
Items with ★ are configuration for SJ and top SY

Diagram of electric rocker gear




### Diagram of electric rocker gear


SF




right rear door switch

1		2
3	4	5


left rear door switch

1		2
3	4	5

right front door switch

1		2
3	4	5

left front door switch

1	2	3		4	5	6
7	8	9	10	11	12	13

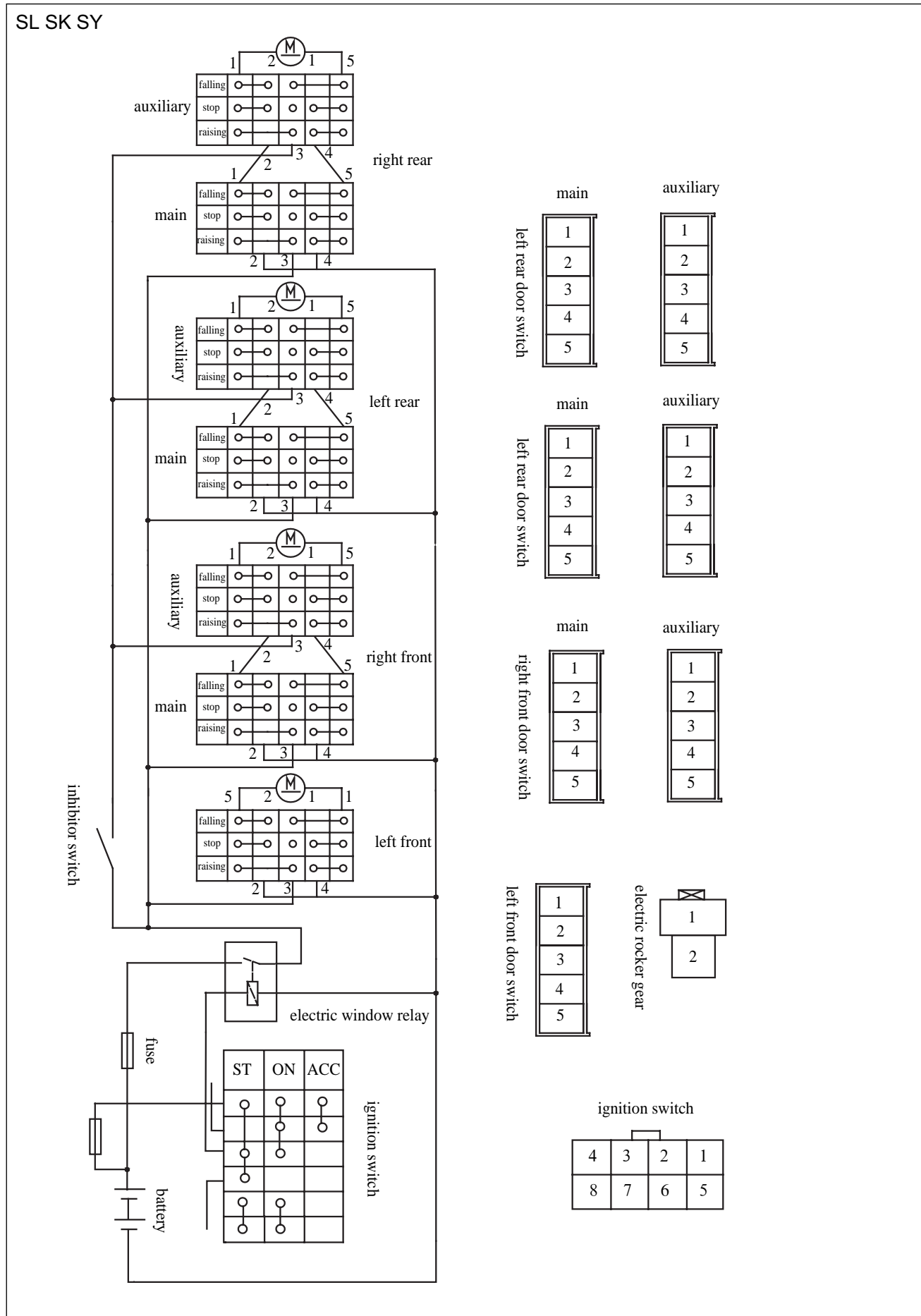
ignition switch

5	4	3	2	1
10	9	8	7	6

electric rocker gear

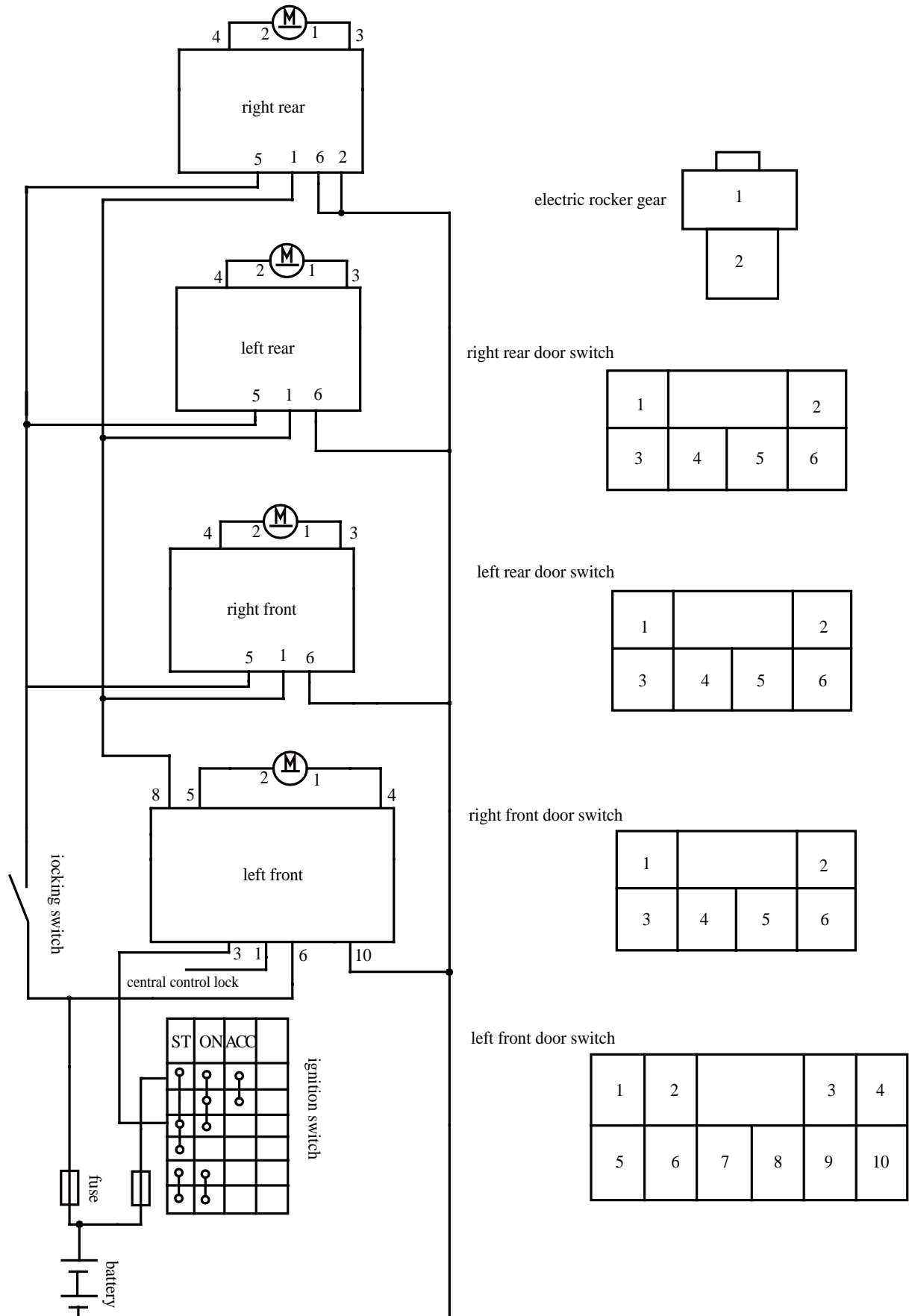
Diagram of a two-story building with a cross-section showing a wide top floor (1) and a narrower bottom floor (2).

Diagram of electric rocker gear



## Diagram of electric rocker gear

SJ Top-grade SY



### Inspection on Common Trouble

Trouble	Possible causes	Repairing approaches
Electric rocker gears at four doors don' t work	Burned out fuse	Change and check whether there is short circuit
The CCL at four doors don' t work	Burned out fuse	Change and check whether there is short circuit
The electric rocker gear or CCL at one door doesn' t work	Wiring failure Seize-up of electric rocker gear or mechanical lock Failure of brush-rocker or lock out device	Make reparation as required. Make reparation as required. Change
The indicating lamp of electric rocker gear switch doesn' t work	Wiring failure Failure of indicating lamp locates interior side of switch	Make reparation as required. Change
One remote controller cannot control the CCL	There is no electricity in the remote controller	Change the cell
Both remote controller cannot control the CCL	Controller box damage	Change
Glass cannot raise automatically after the car door is locked (top SY SJ)	Wiring failure Failure of Control case of CCL Brush-rocker switch failure	Make reparation as required. Change Change

## Acoustical equipment system

The devices in this series is the vehicle-equipped acoustical receiver and recorder whose function is realized through the electronic tuner and CD recorder, therefore, it can receive the amplitude modulation, frequency modulation and stereo broadcast and can record the CD disc, what??s more, it is with the advanced electric anti-quaking, strong capability of error correction, fashionable blue LCD liquid crystal digital display, and four-way power output. The device in this series also has the characteristics such as low distortion, large output power and good performance of anti-interference, broad frequency range and sweet sound, etc.

Diagram of Acoustical equipment system

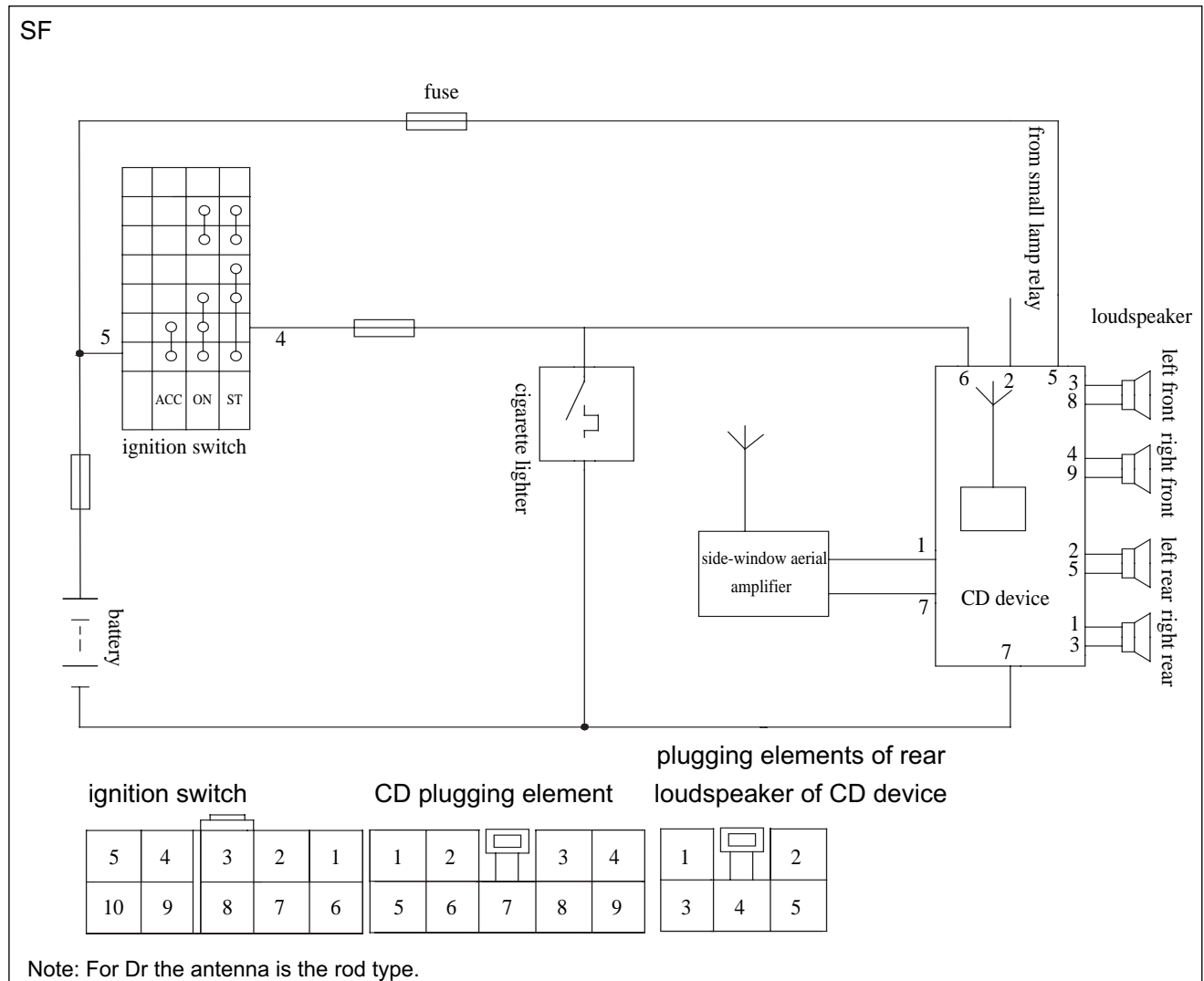
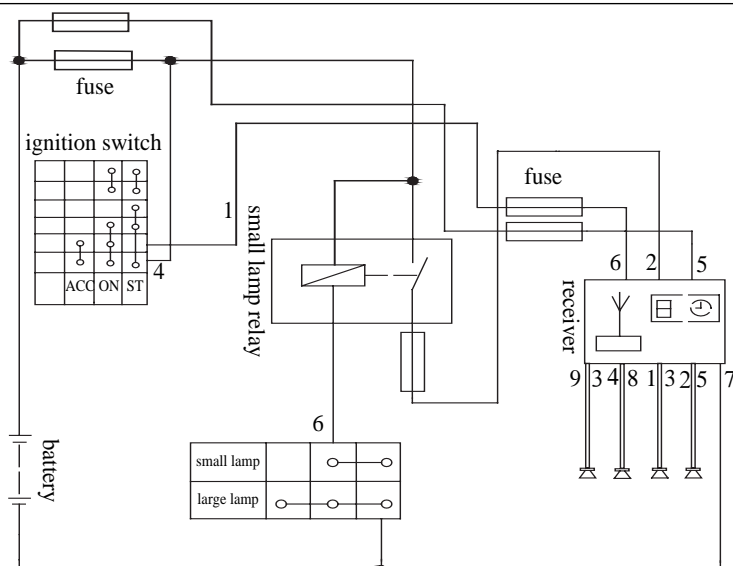


Diagram of acoustical equipment system (continued)

SL SK



receiver

1	2	3	4
5	6	7	8
9			

receiver

1	2
3	4
5	

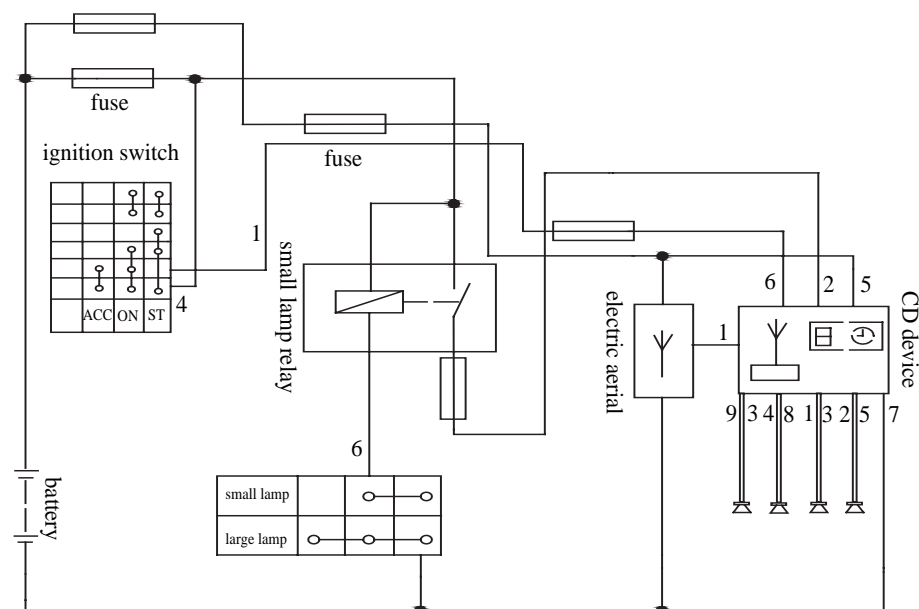
ignition switch

4	3	2	1
8	7	6	5

combined switch

8	7	6	5		4	3	2	1
	16	15	14	13	12	11	10	9

SY SJ



CD device

1	2	3	4
5	6	7	8
9			

CD device

1	2
3	4
5	

ignition switch

4	3	2	1
8	7	6	5

combined switch

8	7	6	5		4	3	2	1
	16	15	14	13	12	11	10	9

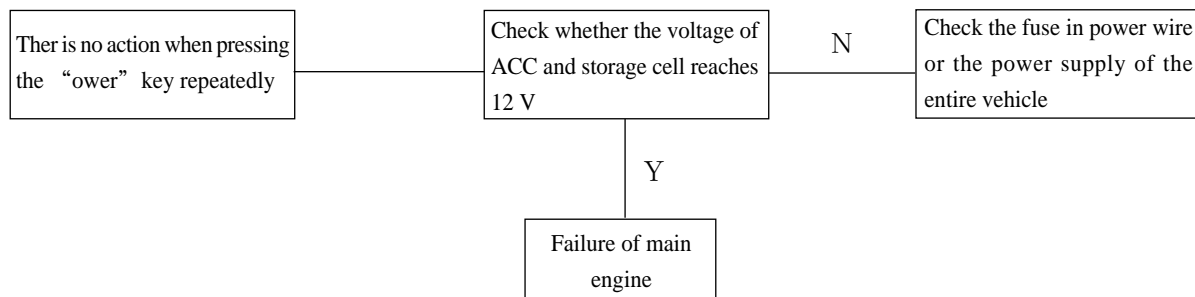


## Inspection on Common Trouble

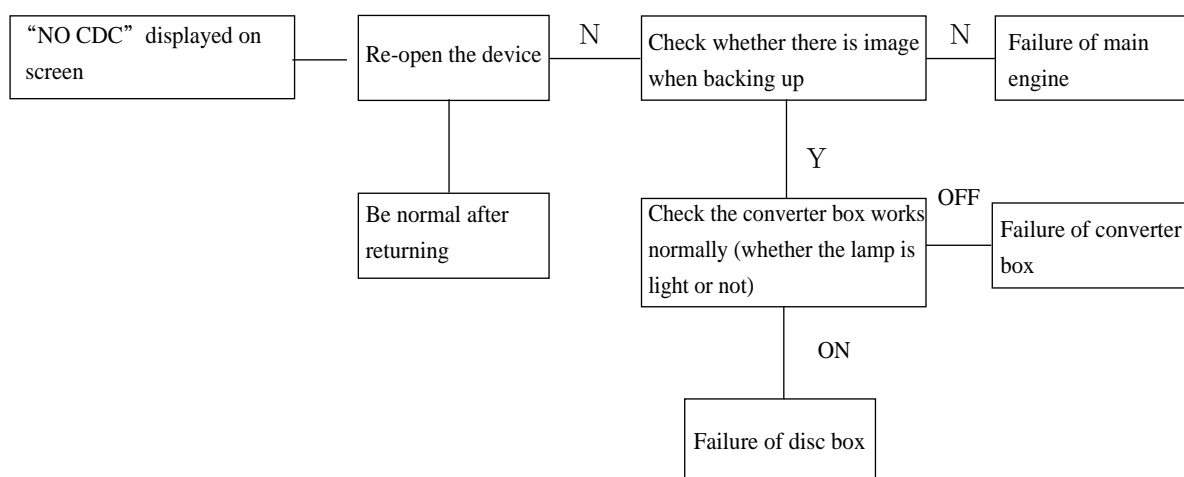
	Trouble	Possible causes	Repairing approaches	Page
Receiver CD recorder	Lack of power supply	Burned out fuse Wiring failure	Change the fuse and check whether there is short circuit; Make reparation as required	
	Loudspeaker doesn't work	Failure of loudspeaker Wiring failure	Change the loudspeaker; Make reparation as required.	
	Do not read the tape or disc	Receiver failure or CD recorder failure	Change the receiver or CD recorder	
	AM or FM doesn't work	Receiver or CD recorder failure	Change the receiver or CD recorder	
VCD	Non-opening of devices	Aerial failure Wiring failure Main machine failure	Change or repair it as required; Make reparation as required. Change the main device	BE-64
	Neither image nor sound is broadcasted	Failure of main device; converter box failure plus disc box failure	Make inspection as required and change the parts with failure	BE-64
	No image when backing up	Wiring failure Failure of video camera	Conduct an inspection as required and change the parts with failure	BE-64
	FM/TV failure	Failure of aerial amplifier Weak signal from TV station	Make an inspection as required and change the parts with failure	BE-65
	Screen cannot be turned over	Unsuitable main device adjustment Failure of main device	Adjust according to the application instruction; change the main device	BE-65
	Disc box cannot be pushed outside	Failure of disc box	Make an inspection as required	
	Bass speaker doesn't work	Wiring failure Failure of bass speaker	Make reparation as required. Change the bass speaker.	
Electric aerial	Non-raising when receiver is opened	Wiring failure Failure of electric aerial	Make reparation as required. Change the electric aerial	
	Falling seize-up	Wiring failure Failure of electric aerial.	Make an inspection as required and change the parts with failure.	

## Inspection on Common Trouble

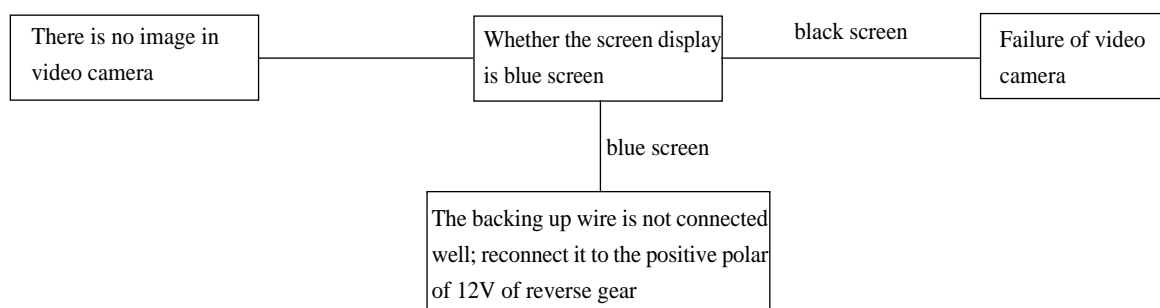
### (a) Main engine cannot be opened



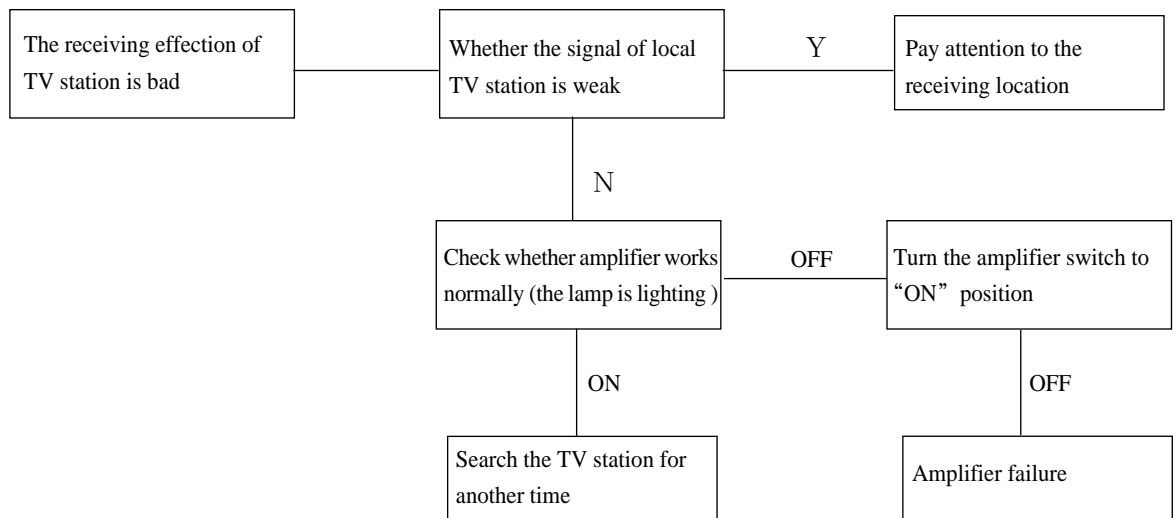
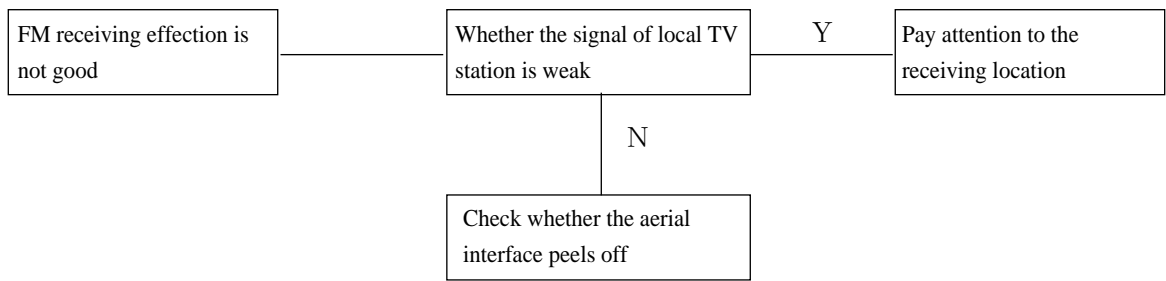
### (b) No voice or image when broadcasting



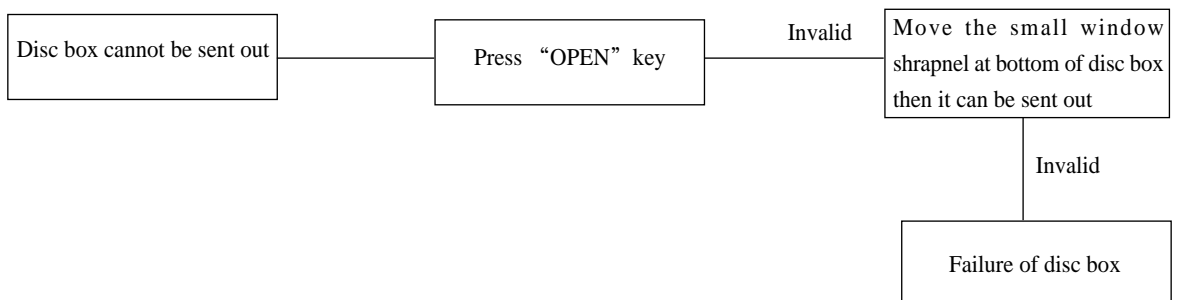
### (c) There is no image when backing up



## (d) FM/TV failures



## (e) disc box cannot be sent out



**Mount of bass speaker and VCD****(a) bass speaker**

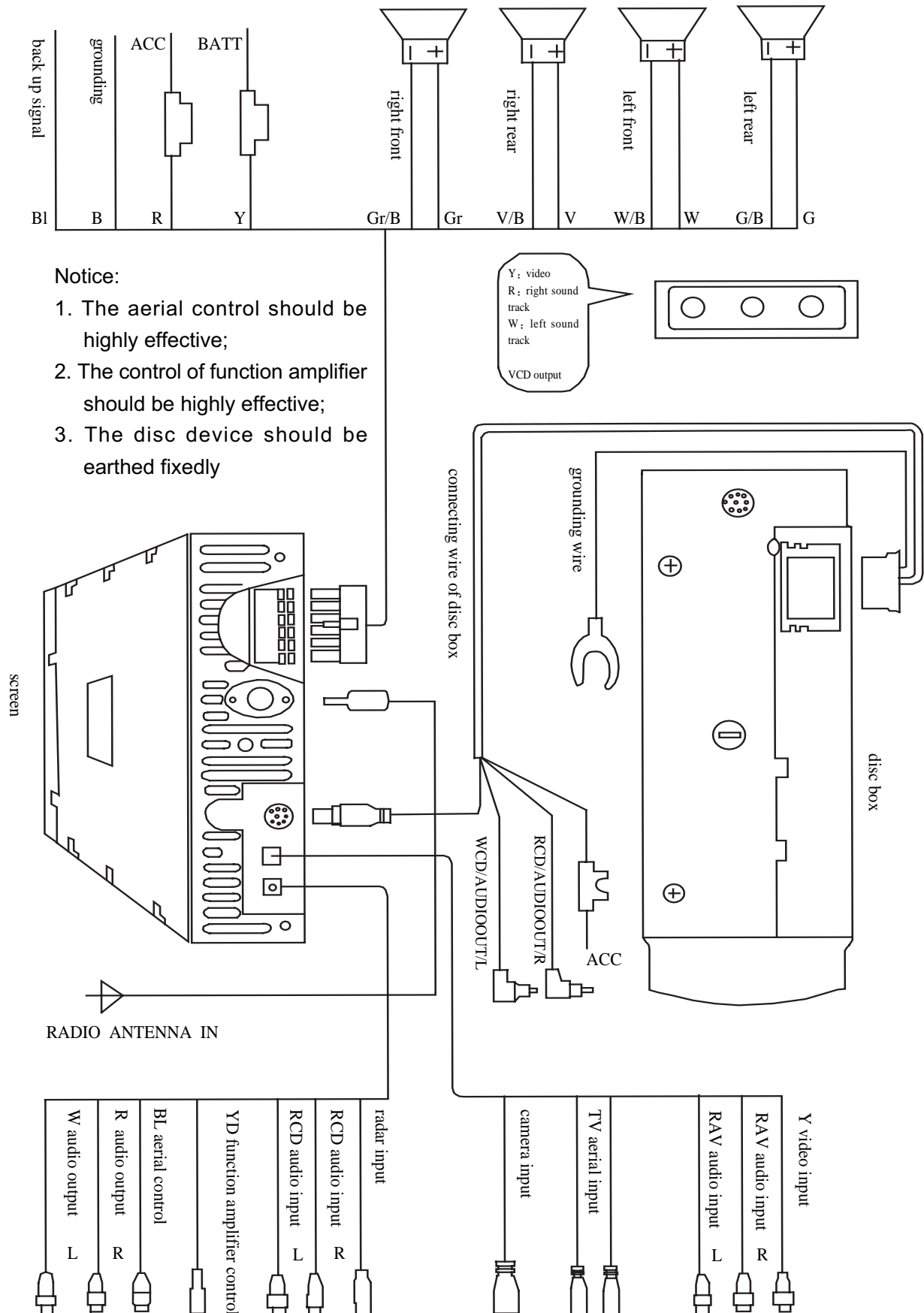
Connect the audio output wires of bass speaker with the sockets in bass speaker correspondingly according to the wire color (red plugging element should be plugged in red socket, yellow plugging element in white socket, the grounding wire (black), power wire (yellow) and signal wire (blue) should be fixed at the corresponding positions (GND、12V、REM) on bass speaker tightly.

**(b) multi-disc VCD**

The feed cables of VCD main device should be connected as marked, when connecting the plugging element of wire harness of video camera (CAM) with the plugs on main device (CAM), notice should be taken on the two arrow marks so as to prevent the plugging element damage; The audio output wire plugging elements (red and yellow plugs) of bass speaker should be connected with the red and white sockets of mainframe (AV OUT); the plugging elements of TV receiving input wire of amplifier should be connected with either of the plugging elements (AV AN) of the mainframe; the plugging element (black and white ACC) of anode wire of power supply should be connected with the red socket (ACC) of mainframe wire harness; grounding wire plugging element (black GND) should connect with the black socket of mainframe wire harness; the plugs of audio input wire of disc data converter should be connected with the red and white socket on mainframe according to the plugs color (the plugs (red, white CD OUT) of audio input wire of eight-disc box should be connected with the red, white socket (CD IN) on mainframe according to the plug color, the yellow power wire plugging element (BATT) should be connected with the yellow power wire socket (BATT) on mainframe, the electric aerial, plugging elements of control wire of function amplifier should be connected with the electric aerial (CTL), socket of control line of function amplifier on mainframe. After completing the connection of plugging elements, wrap the connecting position with adhesive strap in order to prevent those plugging elements from peeling off, the plugging element of feed cable of TV receiving aerial can connect with any two of the four holes on amplifier, meanwhile, turn on the switch (with a red indicating lamp) of amplifier when watching the TV play. When mounting the VCD mainframe, push the wire harness innermost as can as possible so that there is spacious room for mainframe, then push in the mainframe, notice should be taken not to damage the wire harness. Fasten the mainframe to the degree that it cannot be pull out by hand after assembling, if it cannot be clamped tightly, prize out the two clips on the inner sleeve, then fasten the mainframe, and mount on the external decoration frame finally. When disassembling the mainframe, tear down the external decoration frame first, then insert the special key into the open grooves at two sides to pull out the mainframe.

## Connecting Sketch of VCD System

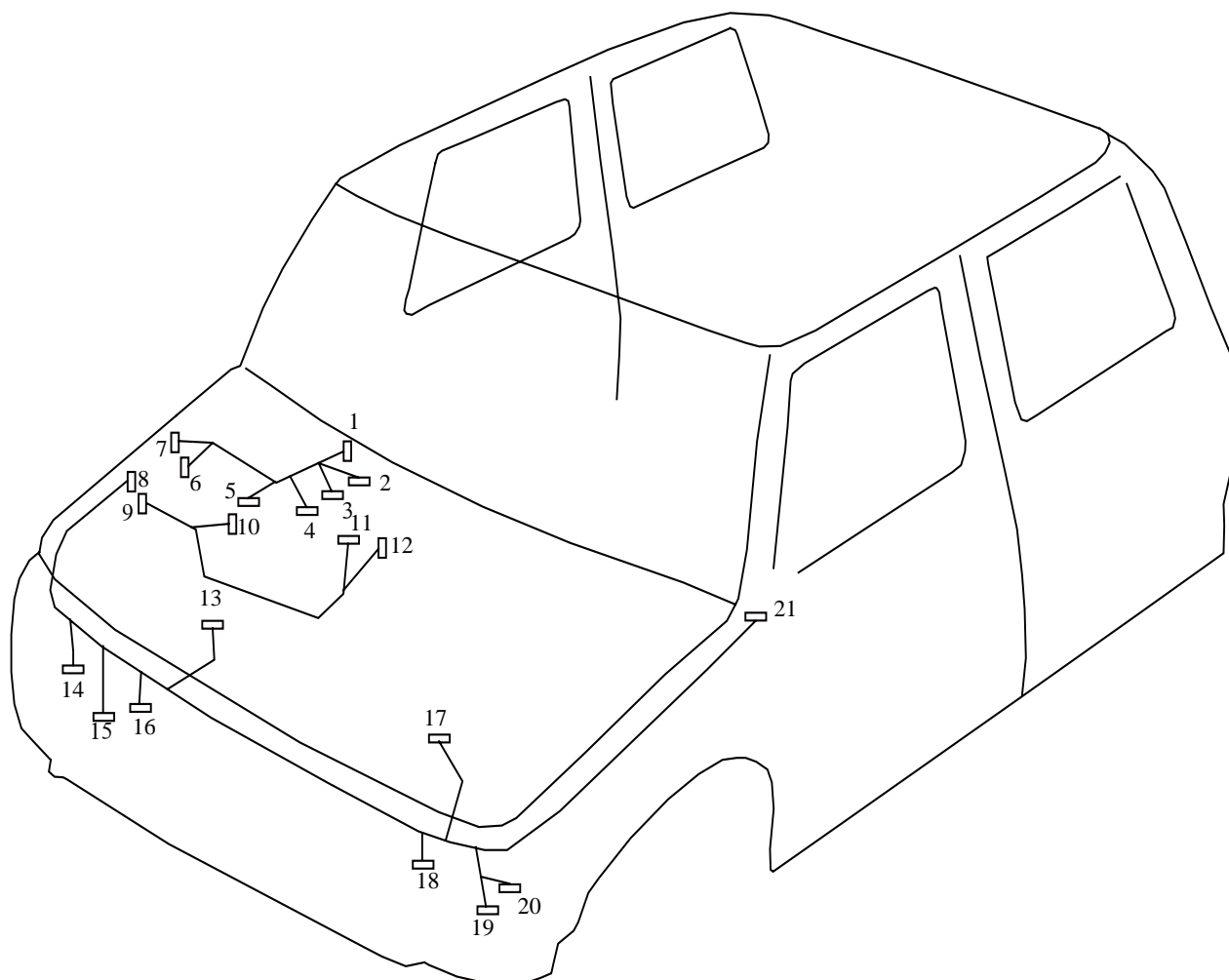
SY SJ



## Wire harness distribution

## Housing wire harness

Dr

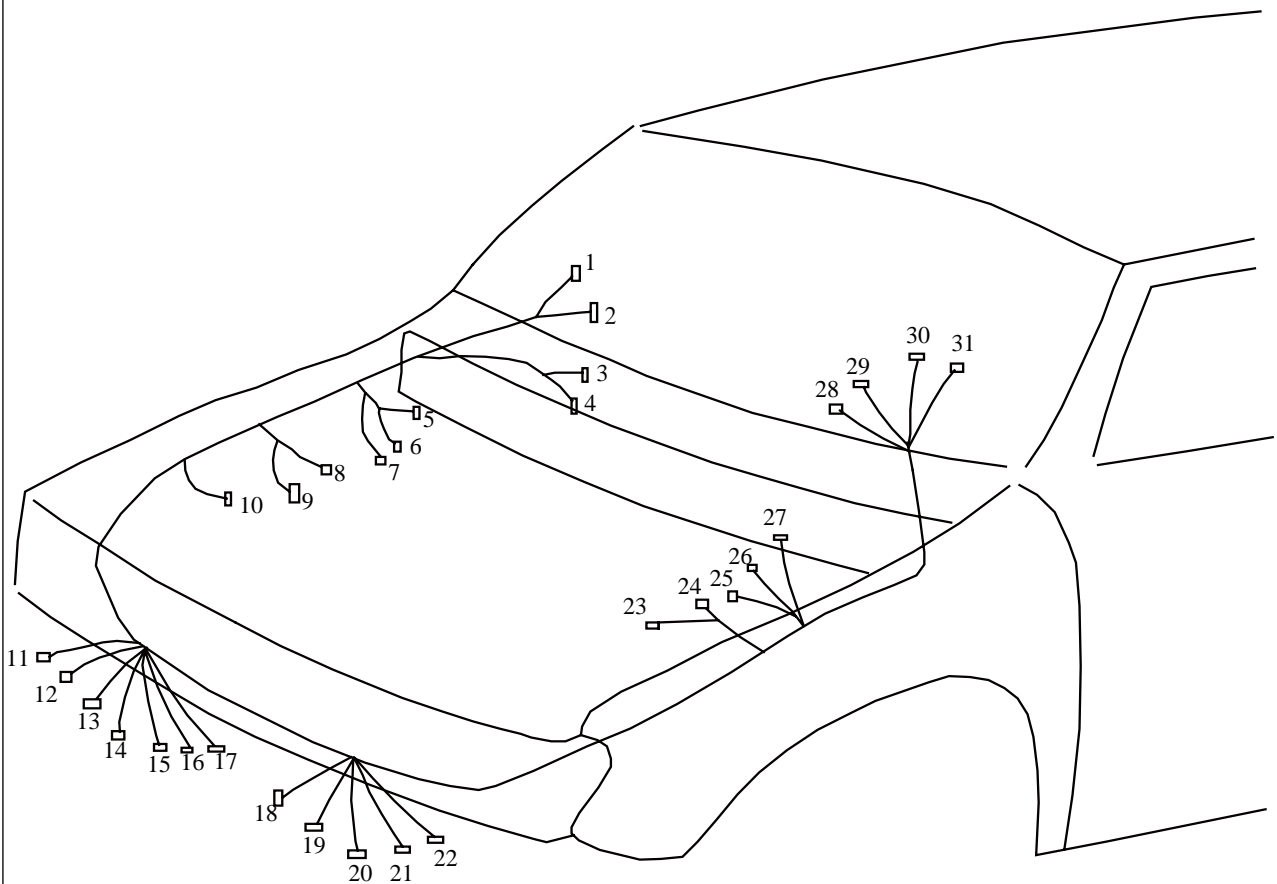


- 1 back-up lamp switch
- 2 starter
- 3 starter
- 4 oil pressure sensor
- 5 grounding wire
- 6 grounding wire
- 7 connected to protective box II
- 8 protective box II
- 9 connected to protective box II
- 10 starter

- 11 air-conditioner compressor
- 12 water temperature sensor
- 13 washer motor
- 14 right headlamp
- 15 right lever-shaped lamp
- 16 electric horn
- 17 generator
- 18 left headlamp
- 19 left lever-shaped lamp
- 20 front turn lamp of left side
- 21 connected to protective box I

## Housing wire harness (continued)

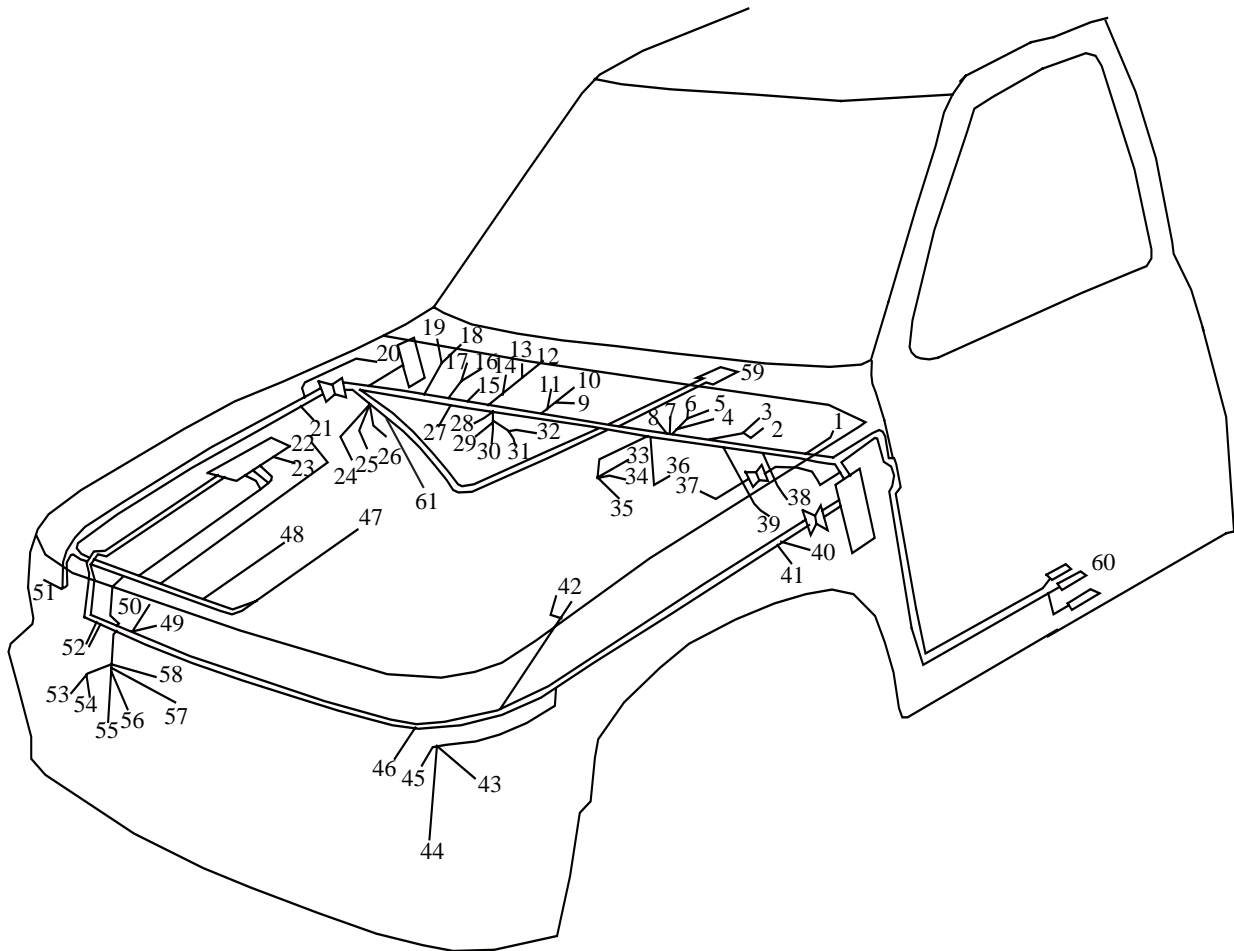
SL SK SY SJ



- |   |                                       |
|---|---------------------------------------|
| 1 connected to cab wire harness           | 17 horn electric horn                 |
| 2 connected to cab wire harness           | 18 left turn lamp                     |
| 3 odometer sensor                         | 19 left small lamp                    |
| 4 back-up lamp switch                     | 20 left headlamp                      |
| 5 turn lamp on right side                 | 21 left fog lamp                      |
| 6 grounding wire                          | 22 pressure switch of air-conditioner |
| 7 brush motor                             | 23 generator                          |
| 8 protective box II                       | 24 generator                          |
| 9 wire connecting with accumulator anode  | 25 grounding wire                     |
| 10 wire connecting with accumulator anode | 26 turn lamp on left side             |
| 11 electromagnetic fan                    | 27 brake liquid level sensor          |
| 12 washer motor                           | 28 connected to cab wire harness      |
| 13 right fog lamp                         | 29 connected to cab wire harness      |
| 14 right turn lamp                        | 30 connected to cab wire harness      |
| 15 right headlamp                         | 31 flasher relay                      |
| 16 right small lamp                       |                                       |

## Housing wire harness (continued)

SF

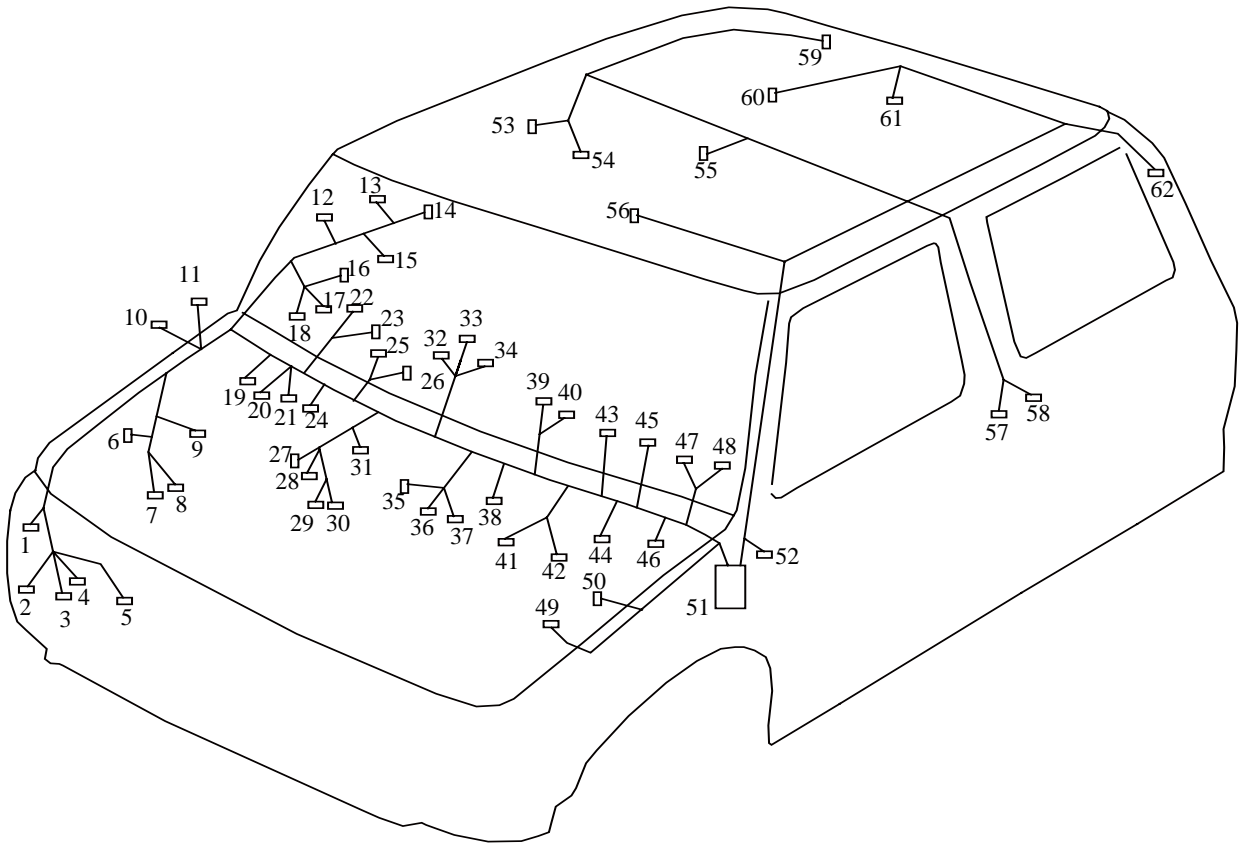


- |  |  |  |
|--|--|--|
| 1 left door lamp switch                | 22 electric fan relay                        | 43 left front conner lamp  |
| 2 defrost switch at tail door          | 23 maxi-fuse                                 | 44 left front lever-shaped lamp                                      |
| 3 window regulator at tail door        | 24 joint of wire harness at right front door | 45 front fog lamp  |
| 4 parking brake switch                 | 25 right front door lamp switch              | 46 left headlamp   |
| 5 ignition lock                        | 26 right electric back-up mirror             | 47 temperature control switch  |
| 6 combined switch                      | 27 grounding wire                            | 48 connected to wire of 220  |
| 7 instrument                           | 28 rear sound box wire                       | 49 spraying motor A  |
| 8 combined switch shell                | 29 ashtray lamp                              | 50 spraying motor B  |
| 9 grounding wire                       | 30 CD Device wire                            | 51 right front conner lamp   |
| 10 amplifying plate of air-conditioner | 31 cigarette lighter A                       | 52 right headlamp  |
| 11 heat-sensitive resistance           | 32 cigarette lighter B                       | 53 horn A  |
| 12 control panel of air-conditioner    | 33 dual flasher switch                       | 54 horn B  |
| 13 A/C Switch                          | 34 fog lamp switch                           | 55 right front lever-shaped lamp                                     |
| 14 glove-box lamp switch               | 35 temperature indicator                     | 56 right front fog lamp  |
| 15 glove-box lamp                      | 36 stop lamp switch                          | 57 electric fan  |
| 16 speed-adjusting resistance          | 37 brake liquid level sensor                 | 58 outdoor temperature sensor  |
| 17 blower                              | 38 control case of central control lock      | 59 connected to chassis wire harness<br>anright central wire harness |
| 18 indoor temperature sensor           | 39 left front loudspeaker                    | 60 connected to left central wire harness                            |
| 19 right front loudspeaker             | 40 automatic aerial                          | 61 connected to engine wire harness                                  |
| 20 brush motor                         | 41 turn lamp on left side                    |  |
| 21 turn lamp on right side             | 42 generator                                 |  |



## Cab wire harness

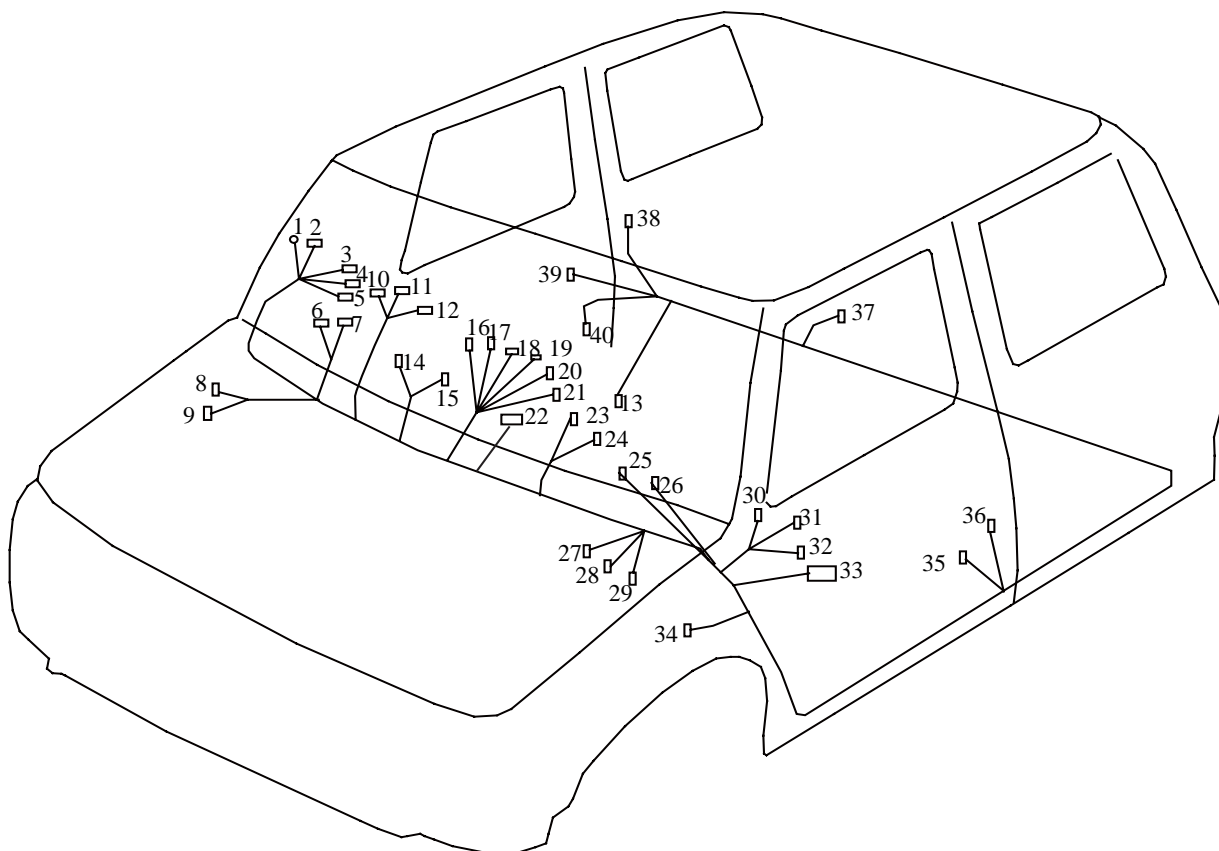
Dr



- |   |  |   |
|---|--|---|
| 1 right front turn lamp                       | 22 speed-adjusting resistance          | 43 parking brake switch                   |
| 2 outdoor temperature sensor                  | 23 air blower                          | 44 brake switch                           |
| 3 right lever-shaped lamp                     | 24 grounding wire                      | 45 left loudspeaker                       |
| 4 front fog lamp                              | 25 A/C switch                          | 46 control case of central control lock   |
| 5 horn  | 26 controlling element                 | 47 grounding wire                         |
| 6 accumulator wire of 220V                    | 27 ashtray lamp                        | 48 grounding wire                         |
| 7 electromagnetic fan                         | 28 receiver wire                       | 49 voltage regulator                      |
| 8 temperature control switch                  | 29 cigarette lighter                   | 50 brake liquid level alarming device     |
| 9 protective box II                           | 30 cigarette lighter                   | 51 protective box I                       |
| 10 turn signal lamp on right side             | 31 rear sound box wire                 | 52 plug of wire harness at left rear door |
| 11 brush motor                                | 32 amplifying plate of air-conditioner | 53 door lamp                              |
| 12 plug of engine wire harness                | 33 grounding wire                      | 54 door lamp switch                       |
| 13 wire harness at right rear door            | 34 heat-sensitive resistance           | 55 ceiling lamp                           |
| 14 plug of frame wire harness                 | 35 dual flasher switch                 | 56 lamp for reading                       |
| 15 door lamp switch                           | 36 fog lamp switch                     | 57 door lamp                              |
| 16 wire harness at right front door           | 37 temperature indicator               | 58 door lamp switch                       |
| 17 door lamp                                  | 38 combined switch shell lamp          | 59 backup radar screen                    |
| 18 right external electric rear vision mirror | 39 combined switch                     | 60 right rear loudspeaker                 |
| 19 protective box III                         | 40 ignition switch                     | 61 highly-mounted stop lamp               |
| 20 indoor temperature sensor                  | 41 combination instrument A            | 62 left rear loudspeaker                  |
| 21 right loudspeaker                          | 42 combination instrument B            |   |

## Cab Wire harness (continued)

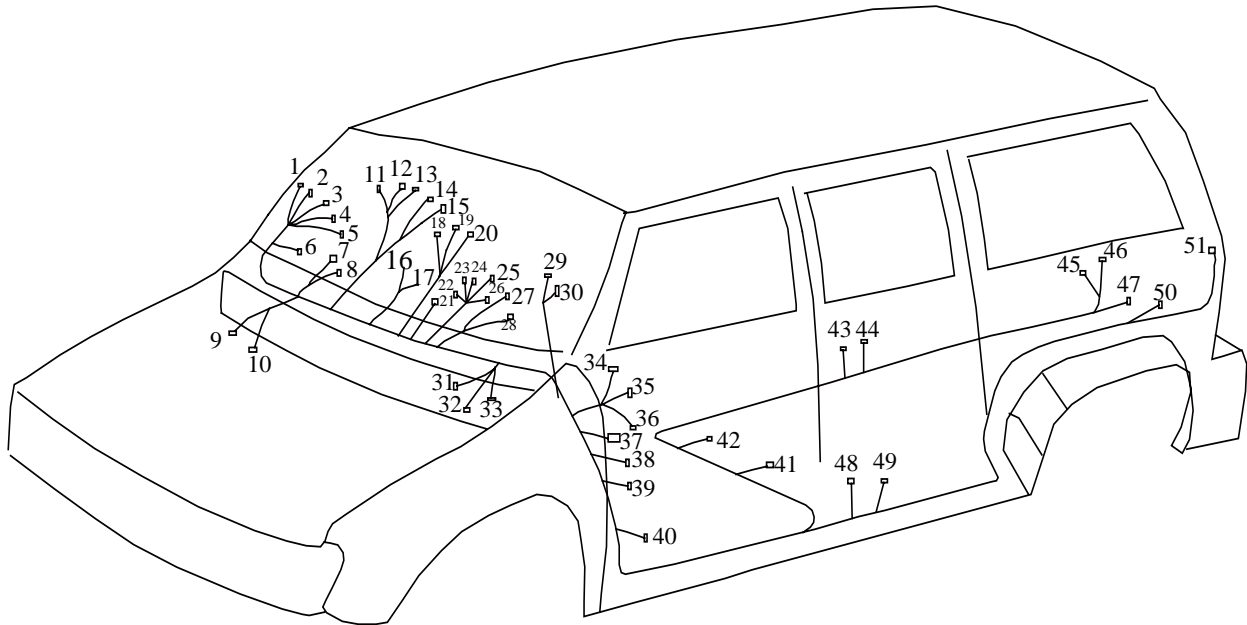
SL SK



- |  |   |
|--|---|
| 1 grounding wire                       | 21 luminous lamp on air-conditioner panel       |
| 2 wire harness at right front door     | 22 combined switch                              |
| 3 warm air motor                       | 23 instrument                                   |
| 4 wire harness at right front door     | 24 instrument                                   |
| 5 control case of central control lock | 25 stop lamp switch                             |
| 6 heat-sensitive resistance            | 26 connected to roof wire harness               |
| 7 speed-adjusting resistance           | 27 connected to housing wire harness            |
| 8 connected to housing wire harness    | 28 connected to housing wire harness            |
| 9 connected to housing wire harness    | 29 connected to housing wire harness            |
| 10 A/C switch                          | 30 connected to wire harness at left front door |
| 11 air-volume switch                   | 31 connected to wire harness at left front door |
| 12 ashtray luminous lamp               | 32 connected to wire harness at left front door |
| 13 ECU                                 | 33 protective box I                             |
| 14 receiver                            | 34 grounding wire                               |
| 15 rear loudspeaker                    | 35 wire harness at left front door              |
| 16 cigarette lighter                   | 36 connected to wire harness at left rear door  |
| 17 cigarette lighter grounding wire    | 37 parking brake switch                         |
| 18 cigarette lighter luminous lamp     | 38 connected to wire harness at right rear door |
| 19 fog lamp switch                     | 39 right front door lamp switch                 |
| 20 dual flasher switch                 | 40 connected to chassis wire harness            |

## Cab wire harness (continued)

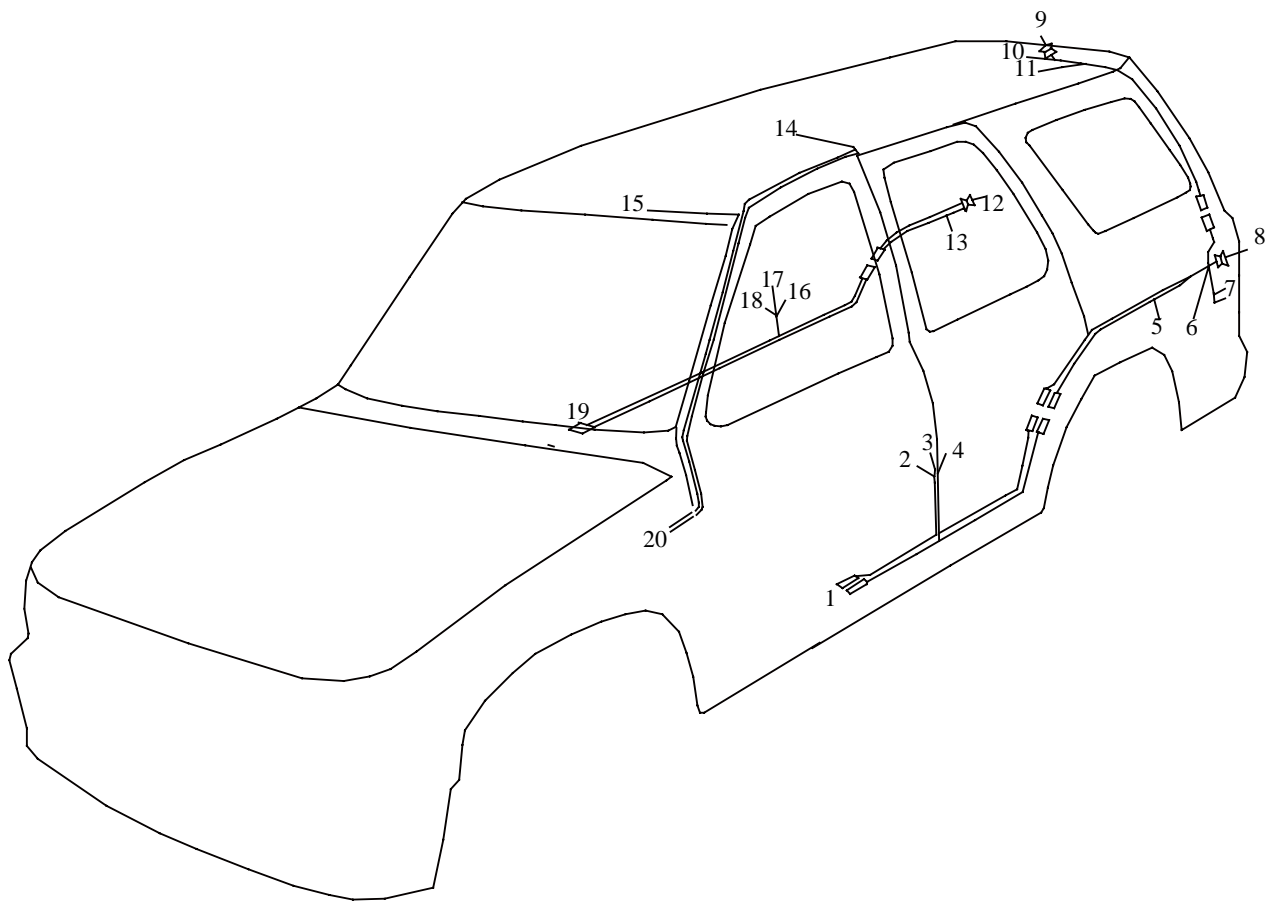
SY SJ



- |   |  |
|---|--|
| 1 grounding wire                                | 27 combination instrument                            |
| 2 wire harness at right front door              | 28 combination instrument                            |
| 3 warm air motor                                | 29 stop lamp switch                                  |
| 4 connected to wire harness at right front door | 30 roof wire harness                                 |
| 5 control case of central control lock          | 31 connected to housing wire harness                 |
| 6 electric aerial                               | 32 connected to housing wire harness                 |
| 7 heat-sensitive resistance                     | 33 connected to housing wire harness                 |
| 8 speed-adjusting resistance                    | 34 connected to wire harness at left front door      |
| 9 connected to housing wire harness             | 35 connected to wire harness at left front door      |
| 10 connected to housing wire harness            | 36 connected to wire harness at left front door      |
| 11 A/C switch                                   | 37 protective box                                    |
| 12 air-volume switch                            | 38 rear defrost relay                                |
| 13 ashtray luminous lamp                        | 39 connected to wire harness of rear air-conditioner |
| 14 grounding wire                               | 40 grounding wire                                    |
| 15 ECU  | 41 parking brake switch                              |
| 16 CD device                                    | 42 connected to chassis wire harness                 |
| 17 CD device                                    | 43 wire harness at right rear door                   |
| 18 cigarette lighter                            | 44 right front door lamp switch                      |
| 19 cigarette lighter grounding wire             | 45 right rear loudspeaker                            |
| 20 cigarette lighter luminous lamp              | 46 rear washer motor                                 |
| 21 combined switch                              | 47 connected to wire harness at tail door            |
| 22 fog lamp switch                              | 48 left front door lamp switch                       |
| 23 dual flasher switch                          | 49 wire harness at left rear door                    |
| 24 rear defroster switch                        | 50 left rear loudspeaker                             |
| 25 rear brush switch                            | 51 standby power seat                                |
| 26 rear washer switch                           |  |

## Cab Wire harness (continued)

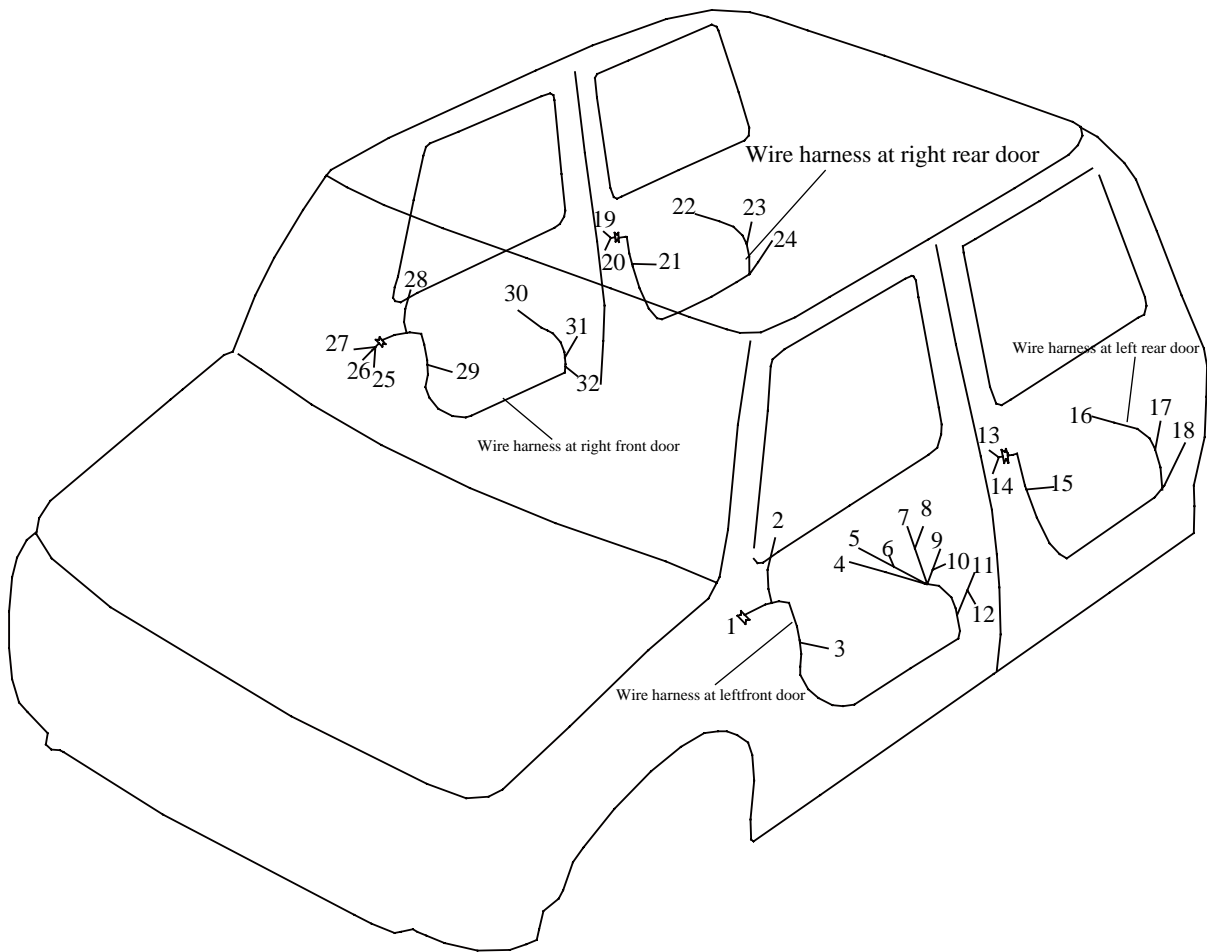
SF



- |   |   |
|---|---|
| 1 connected to cab wire harness                         | 11 rear brusher motor                                     |
| 2 left rear door lamp switch                            | 12 right rear combination lamp                            |
| 3 door lamp at left rear door                           | 13 right rear sound box                                   |
| 4 electric rocker and lock-out device at left rear door | 14 front ceiling lamp                                     |
| 5 left rear sound box                                   | 15 lamp for reading                                       |
| 6 controller for brush, door and window at rear door    | 16 electric rocker and lock-out device at right rear door |
| 7 connected to wire harness at tail door                | 17 right rear door lamp                                   |
| 8 left rear combination lamp                            | 18 right rear door lamp switch                            |
| 9 highly-mounted stop lamp                              | 19 connected to cab wire harness                          |
| 10 rear ceiling lamp                                    | 20 connected to protective box I                          |

## Wire harness at four door

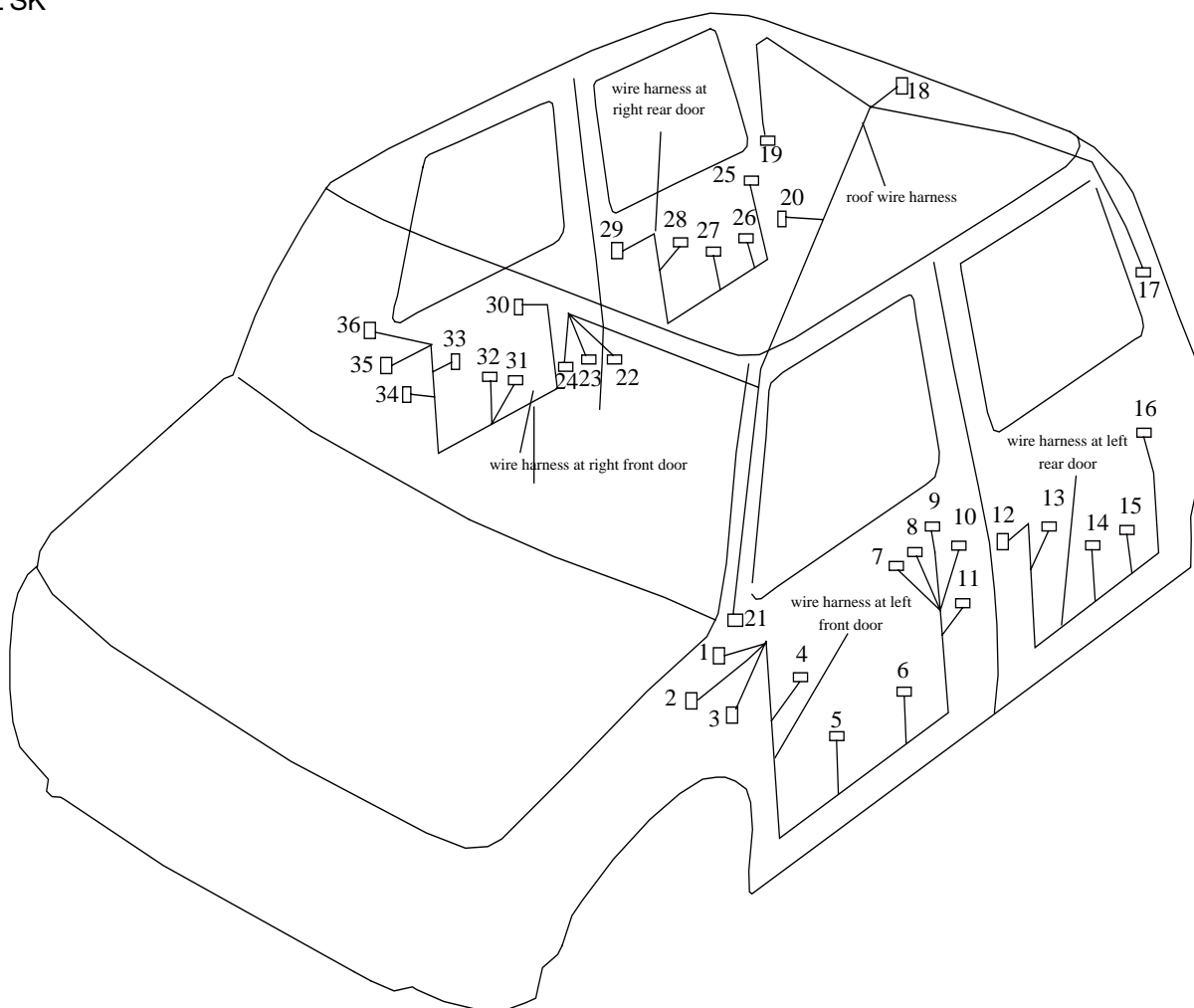
Dr



- |   |   |
|---|---|
| 1 connected to cab wire harness               | 18 lock-out device at left rear door            |
| 2 left external electric rear vision mirror   | 19 right rear door lamp                         |
| 3 electric rocker                             | 20 connected to wire harness at right rear door |
| 4 rear vision mirror switch                   | 21 right rear door lamp switch                  |
| 5 power switch                                | 22 right rear door switch                       |
| 6 remote control lock switch                  | 23 electric rocker                              |
| 7 rocker switch                               | 24 lock-out device at right rear door           |
| 8 rocker switch                               | 25 right front door lamp switch                 |
| 9 rocker switch                               | 26 connected to cab wire harness                |
| 10 rocker switch                              | 27 connected to cab wire harness                |
| 11 lock-out device at left front door         | 28 right external electric rear vision mirror   |
| 12 left front door lamp                       | 29 electric rocker                              |
| 13 left rear door lamp                        | 30 rocker switch                                |
| 14 connected to wire harness a left rear door | 31 lock-out device at right front door          |
| 15 left rear door lamp switch                 | 32 right front door lamp                        |
| 16 left rear door switch                      |   |
| 17 electric rocker                            |   |

## Wire harness at four doors and body roof

SL SK

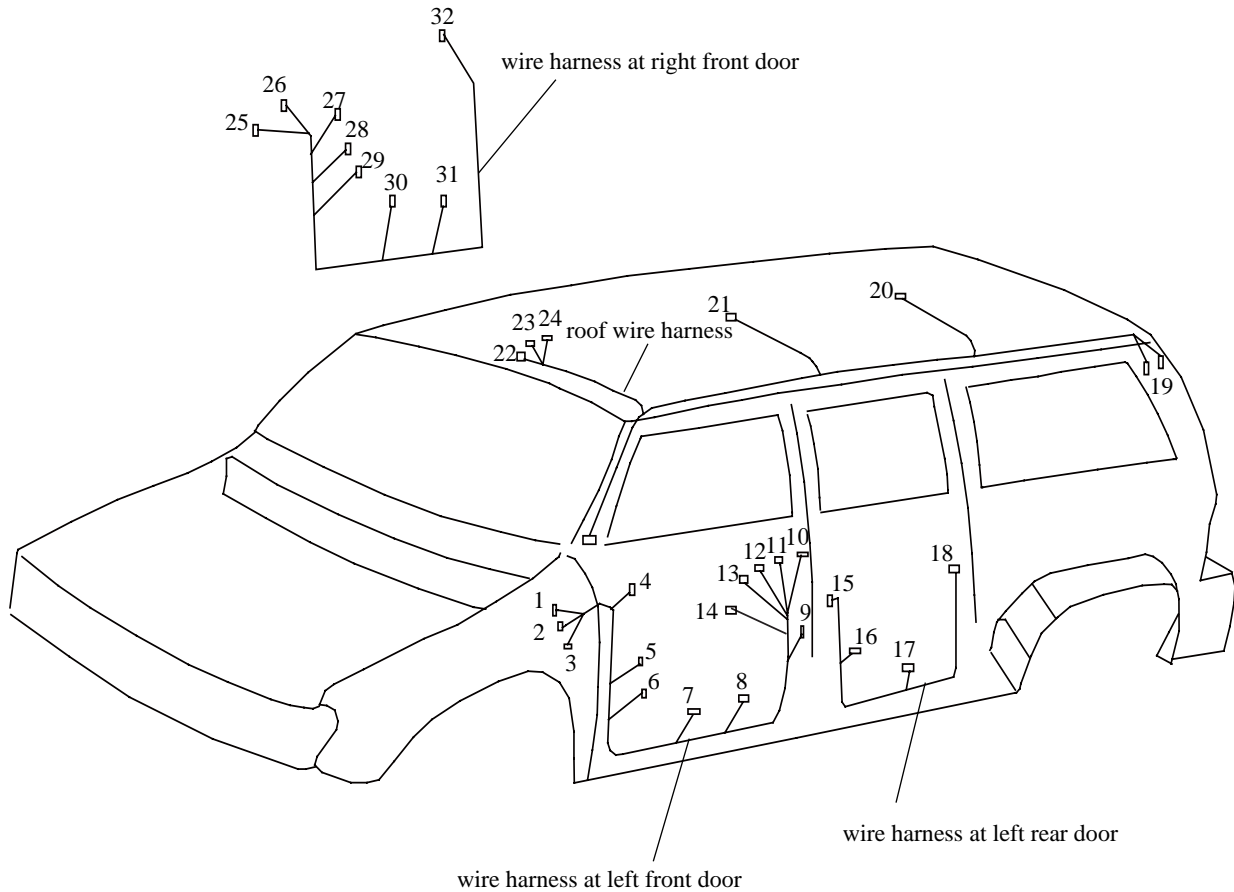


- 1 connected to cab wire harness
- 2 connected to cab wire harness
- 3 connected to cab wire harness
- 4 left front loudspeaker
- 5 left door lamp
- 6 electric rocker
- 7 rocker switch
- 8 rocker switch
- 9 rocker switch
- 10 rocker switch
- 11 left front lock-out device
- 12 connected to cab wire harness
- 13 left rear loudspeaker
- 14 electric rocker
- 15 left rear lock-out device
- 16 rocker switch
- 17 left rear door lamp switch
- 18 highly-mounted stop lamp

- 19 right rear door lamp switch
- 20 ceiling lamp
- 21 connected to cab wire harness
- 22 lamp for reading
- 23 car door display
- 24 temperature display
- 25 rocker switch
- 26 right rear lock-out device
- 27 electric rocker
- 28 right rear loudspeaker
- 29 connected to cab wire harness
- 30 rocker switch
- 31 right front lock-out device
- 32 electric rocker
- 33 right front loudspeaker
- 34 right door lamp
- 35 connected to cab wire harness
- 36 connected to cab wire harness

## Wire harness at four doors and body roof (continued)

SY

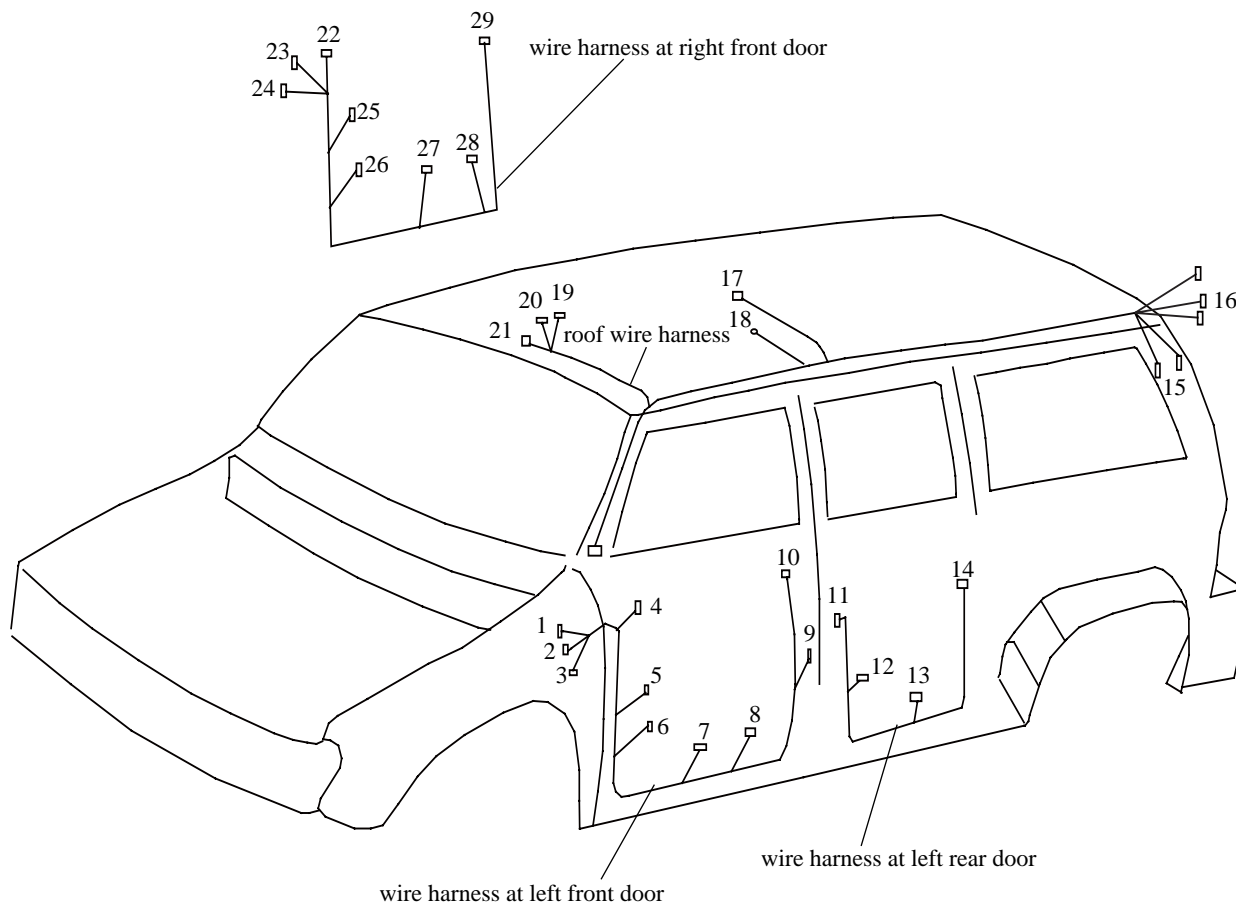


Wire harness at right rear door is distributed in the same way as that at left front rear door.

- |   |   |
|---|---|
| 1 connected to cab wire harness             | 17 left rear lock-out device                  |
| 2 connected to cab wire harness             | 18 rocker switch                              |
| 3 connected to cab wire harness             | 19 highly-mounted stop lamp                   |
| 4 left external electric rear vision mirror | 20 rear ceiling lamp                          |
| 5 left front loudspeaker                    | 21 front ceiling lamp                         |
| 6 left door lamp                            | 22 lamp for reading                           |
| 7 electric rocker                           | 23 car door display                           |
| 8 left front lock-out device                | 24 temperature display                        |
| 9 rear vision mirror switch                 | 25 connected to cab wire harness              |
| 10 rocker switch                            | 26 connected to cab wire harness              |
| 11 rocker switch                            | 27 right external electric rear vision mirror |
| 12 rocker switch                            | 28 right front loudspeaker                    |
| 13 rocker switch                            | 29 right door lamp                            |
| 14 inhibitor switch                         | 30 electric rocker                            |
| 15 connected to cab wire harness            | 31 right front lock-out device                |
| 16 electric rocker                          | 32 rocker switch                              |

## Wire harness at four doors and body roof (continued)

Top style SY SJ



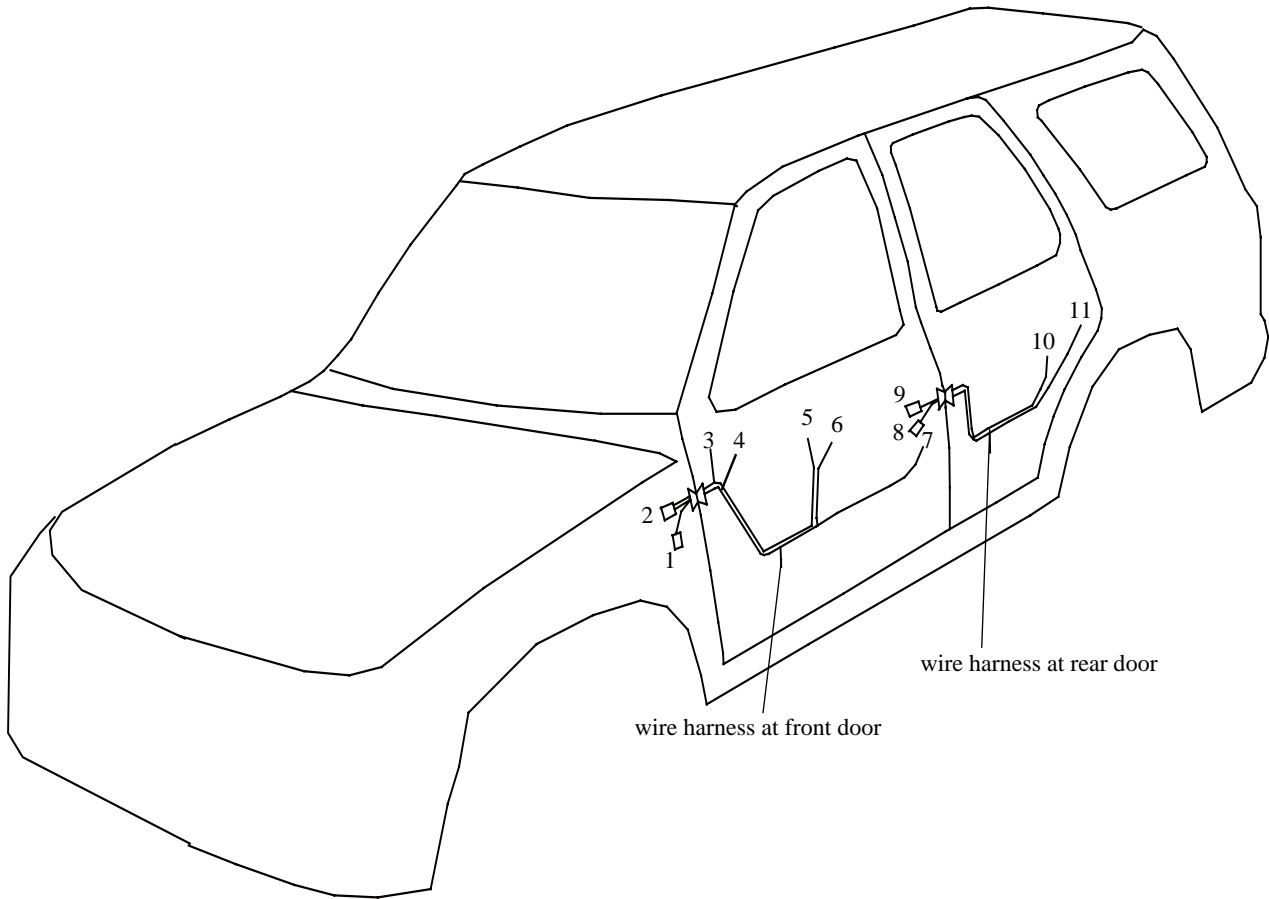
Wire harness at right rear door is distributed in the same way as that at left rear door.

- |   |   |
|---|---|
| 1 connected to cab wire harness             | 16 bass speaker(top SY)                       |
| 2 connected to cab wire harness             | 17 ceiling lamp                               |
| 3 connected to cab wire harness             | 18 grounding wire(top SY)                     |
| 4 left external electric rear vision mirror | 19 lamp for reading                           |
| 5 left front loudspeaker                    | 20 car door display                           |
| 6 left door lamp                            | 21 temperature display                        |
| 7 electric rocker                           | 22 connected to cab wire harness              |
| 8 left front lock-out device                | 23 connected to cab wire harness              |
| 9 rear vision mirror switch                 | 24 right external electric rear vision mirror |
| 10 rocker switch                            | 25 right front loudspeaker                    |
| 11 connect to cab wire harness              | 26 right door lamp                            |
| 12 electric rocker                          | 27 electric rocker                            |
| 13 left rear lock-out device                | 28 right front lock-out device                |
| 14 rocker switch                            | 29 rocker switch                              |
| 15 highly-mounted stop lamp                 |   |



## Wire harness of four doors(continued)

SF

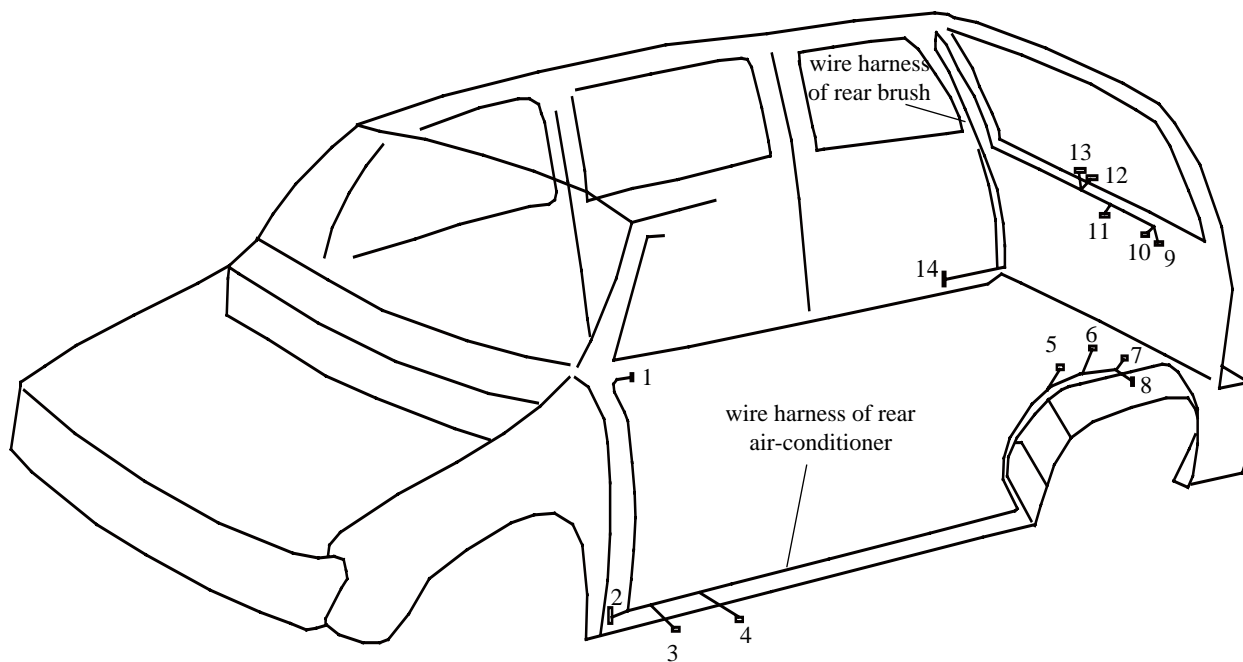


Wire harness distribution at front left door, front right door, rear left door and rear right door are same with each other.

- |                                 |                                 |
|---------------------------------|---------------------------------|
| 1 connected to protective box I | 7 lock-out device at front door |
| 2 connected to protective box I | 8 wire harness at central part  |
| 3 rear vision mirror            | 9 wire harness at central part  |
| 4 front door-lamp switch        | 10 rocker at rear door          |
| 5 rocker switch                 | 11 rocker switch                |
| 6 rocker at front door          |                                 |

## Wire harness at tail door and of rear air-conditioner

SY SJ

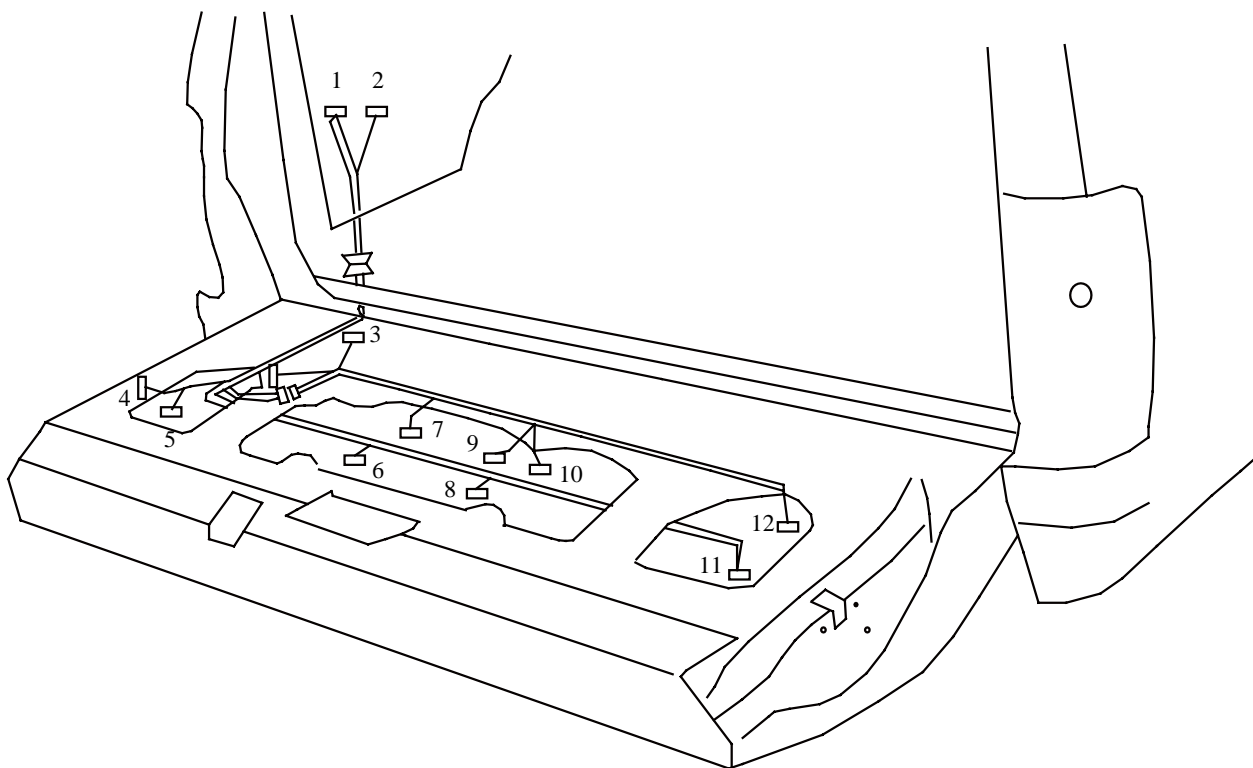


Only the vehicle with SY model has the wire harness of rear air-conditioner shown in above-mentioned wire harness.

- |                                 |                                  |
|---------------------------------|----------------------------------|
| 1 rear A/C switch               | 8 speed-adjusting resistance     |
| 2 connected to cab wire harness | 9 license lamp                   |
| 3 rear air-conditioning relay   | 10 license lamp                  |
| 4 grounding wire                | 11 rear brusher motor            |
| 5 temperature control switch    | 12 defroster                     |
| 6 electromagnetic valve         | 13 defroster                     |
| 7 temperature controller        | 14 connected to cab wire harness |

## Wire harness at tail door (continued)

SF

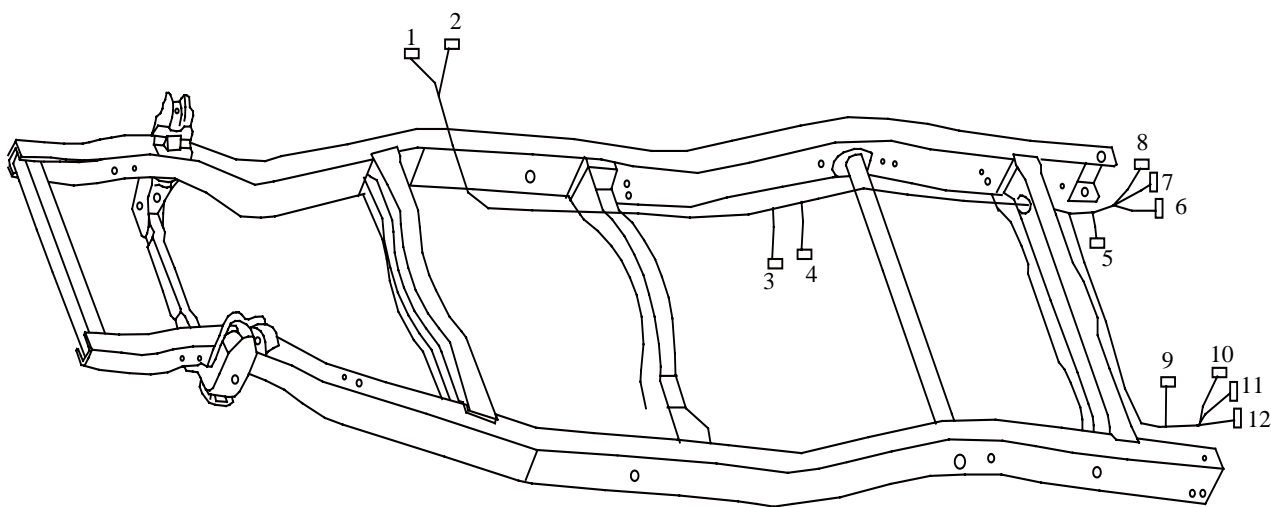


- 1 connected to left rear wire harness
- 2 connected to left rear wire harness
- 3 lock switch at left tail door
- 4 electro-heating gate at tail door
- 5 electro-heating gate at tail door
- 6 left license lamp

- 7 electric rocker at tail door
- 8 right license lamp
- 9 lower limit switch at tail door
- 10 alarming switch at tail door
- 11 lock barrel at tail door
- 12 lock switch at right tail door

## Chassis Wire Harness

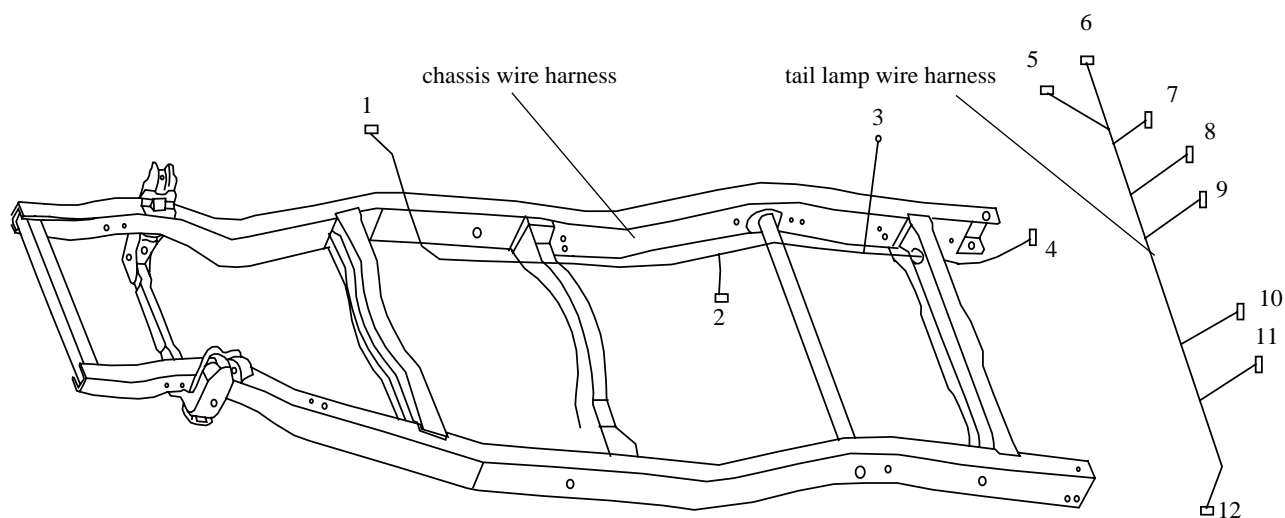
Dr



- |                                 |                                |
|---------------------------------|--------------------------------|
| 1 connected to cab wire harness | 7 left license lamp            |
| 2 back up radar                 | 8 left rear combination lamp   |
| 3 fuel pump                     | 9 right backup radar probe     |
| 4 fuel sensor                   | 10 right rear fog lamp         |
| 5 left backup radar probe       | 11 right license lamp          |
| 6 left rear fog lamp            | 12 right rear combination lamp |

## Chassis wire harness (continued)

SL SK



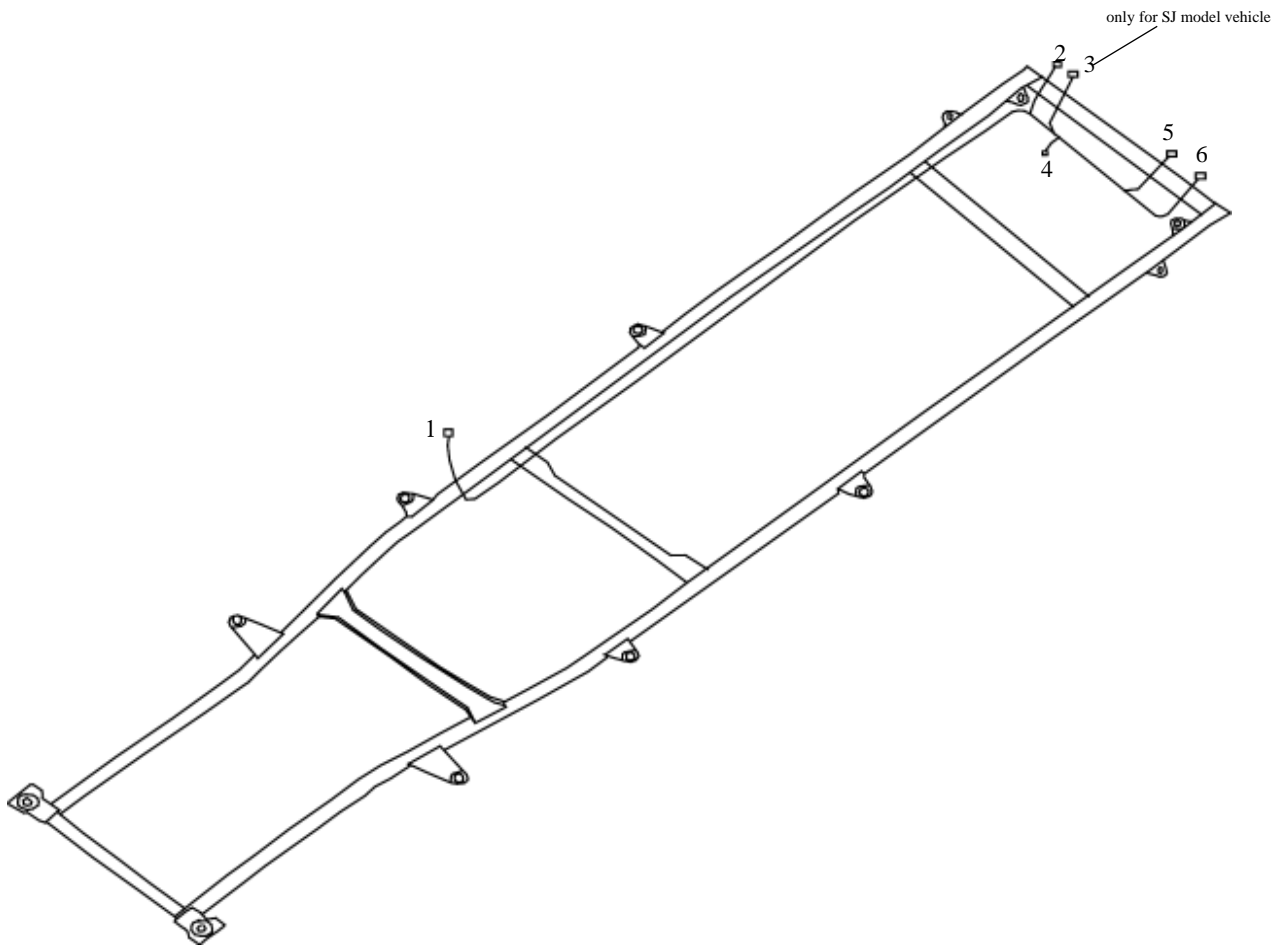
Tail lamp wire harness should be fixed at the inner side of the rear baffle of load-compartment.

- 1 connected to cab wire harness
- 2 fuel pump
- 3 grounding wire
- 4 connected to wire harness
- 5 connected to chassis wire harness
- 6 right rear combination lamp

- 7 right rear fog lamp
- 8 back up radar control box
- 9 right license lamp
- 10 left license lamp
- 11 left rear fog lamp
- 12 left rear combination lamp

## Chassis Wire Harness (continued)

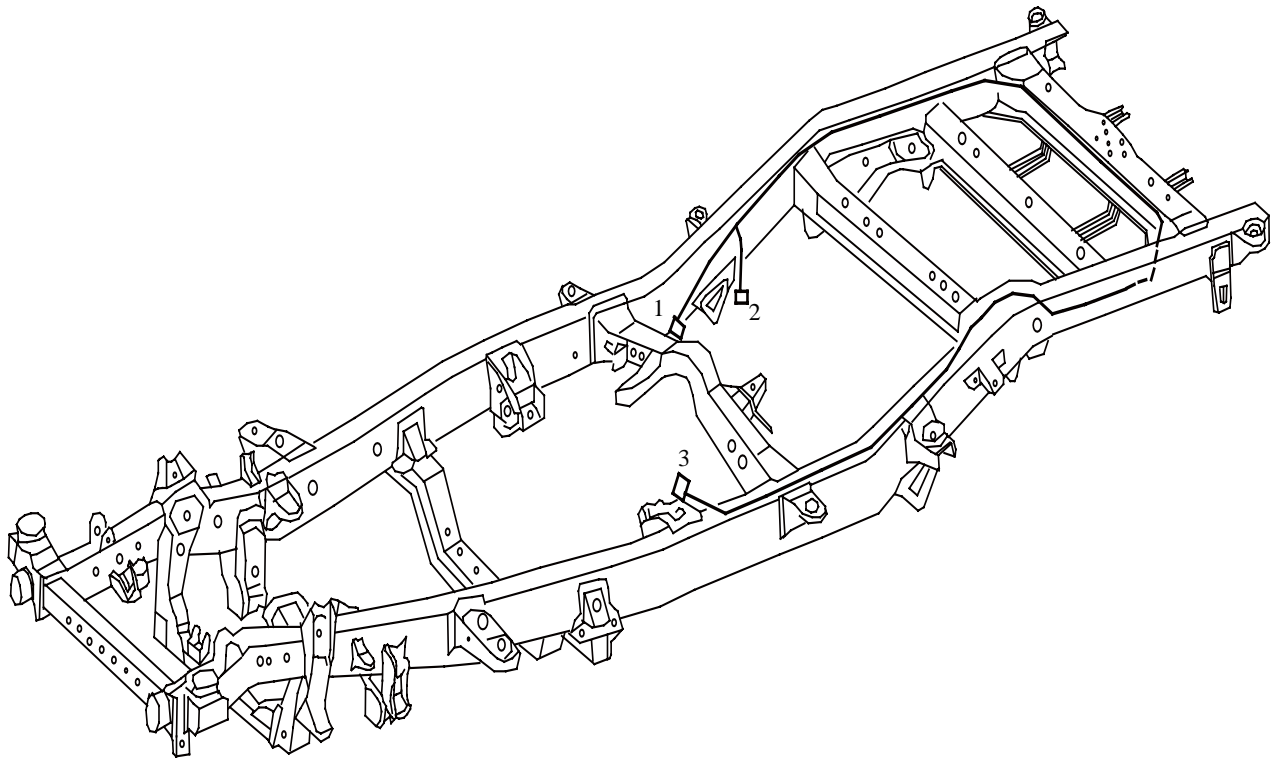
SY SJ



- 1 connected to cab wire harness
- 2 right rear combination lamp
- 3 right rear fog lamp
- 4 electric fuel pump
- 5 left rear fog lamp
- 6 left rear combination

## Chassis Wire Harness (continued)

SF

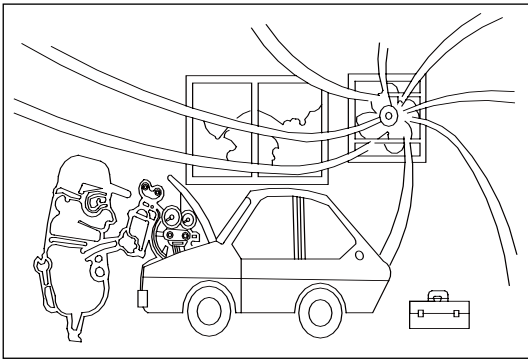


- 1 fuel level sensor
- 2 electric fuel pump
- 3 connected to cab wire harness

# Air-conditioning System

	Page
Introduction .....	AC-2
Electric circuit diagram of air-conditioning system .....	AC-4
System constitutes .....	AC-8
General introduction .....	AC-9
Troubleshooting .....	AC-10
Inspection for refrigerant quantity .....	AC-11
Compressor .....	AC-12
Liquid container .....	AC-14
Condenser .....	AC-15
Cooling device .....	AC-16
Refrigerant pipeline .....	AC-20

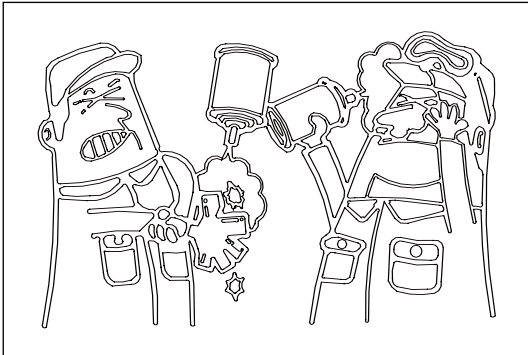




## General Introduction

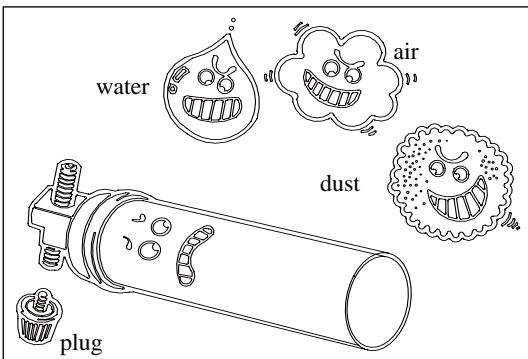
### 1. Take notice when handling refrigerant General Introduction

- (a) Do not handling with refrigerant in the closed room or near to open fire.
- (b) Safety goggles shall be worn when handling
- (c) Be careful to avoid the liquid refrigerant from entering into your eye or touching you skin.



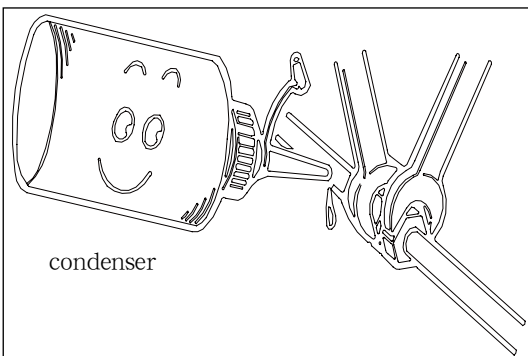
In case the liquid refrigerant enters into the eye or touches the skin, the following measures shall be taken:

- Wash the part where is touched by the refrigerant with a great deal of water.
- Coat the skin with the clean Vaseline.
- See the doctor or go to the hospital for treatment; and
- Do not try to cure it yourself.



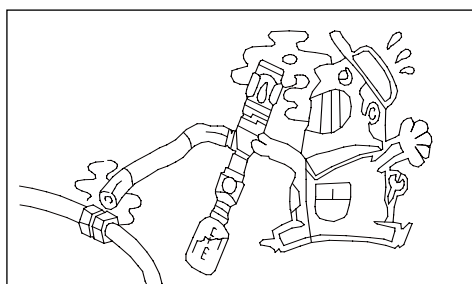
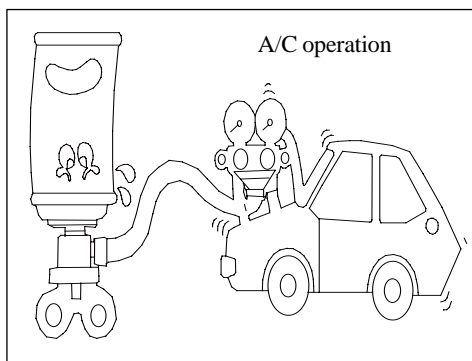
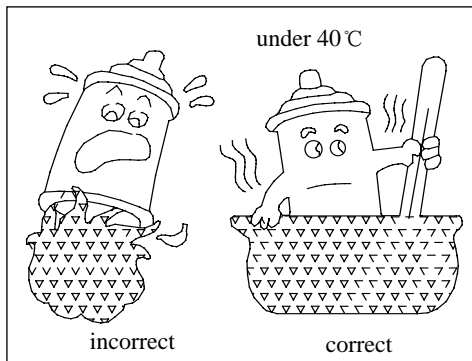
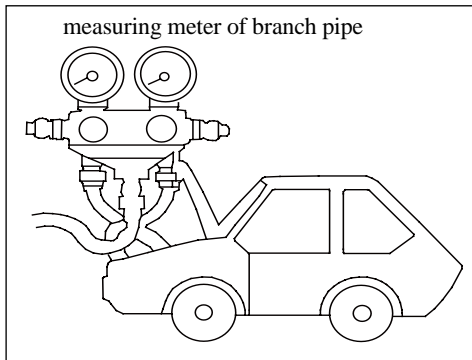
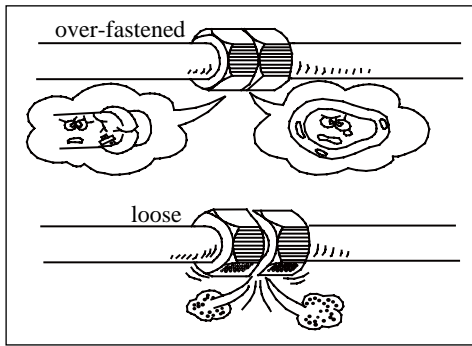
### 2. Take notice when changing the parts of refrigerant pipes:

- (a) The refrigerant shall be exhausted gradually before changing.
- (b) The dismantled parts shall be covered with plug right away so as to prevent the water or dust from entering into the system.
- (c) Do not store the condenser or liquid tank under the condition that the plug has been uncovered. and
- (d) Refrigerant shall be exhausted before installing the new condenser, because the refrigerant, if not exhausted, will eject out in gaseous form with the lubricant oil when the plug is moved away.



### 3. Take notice when fastening the connection parts:

- (a) Spread a little lubricant oil at the matching position of the O-type ring to fasten the connection and avoid of gaseous refrigerant leakage.
- (b) Fasten the nut with two spanners so as to avoid of the pipe deformation.

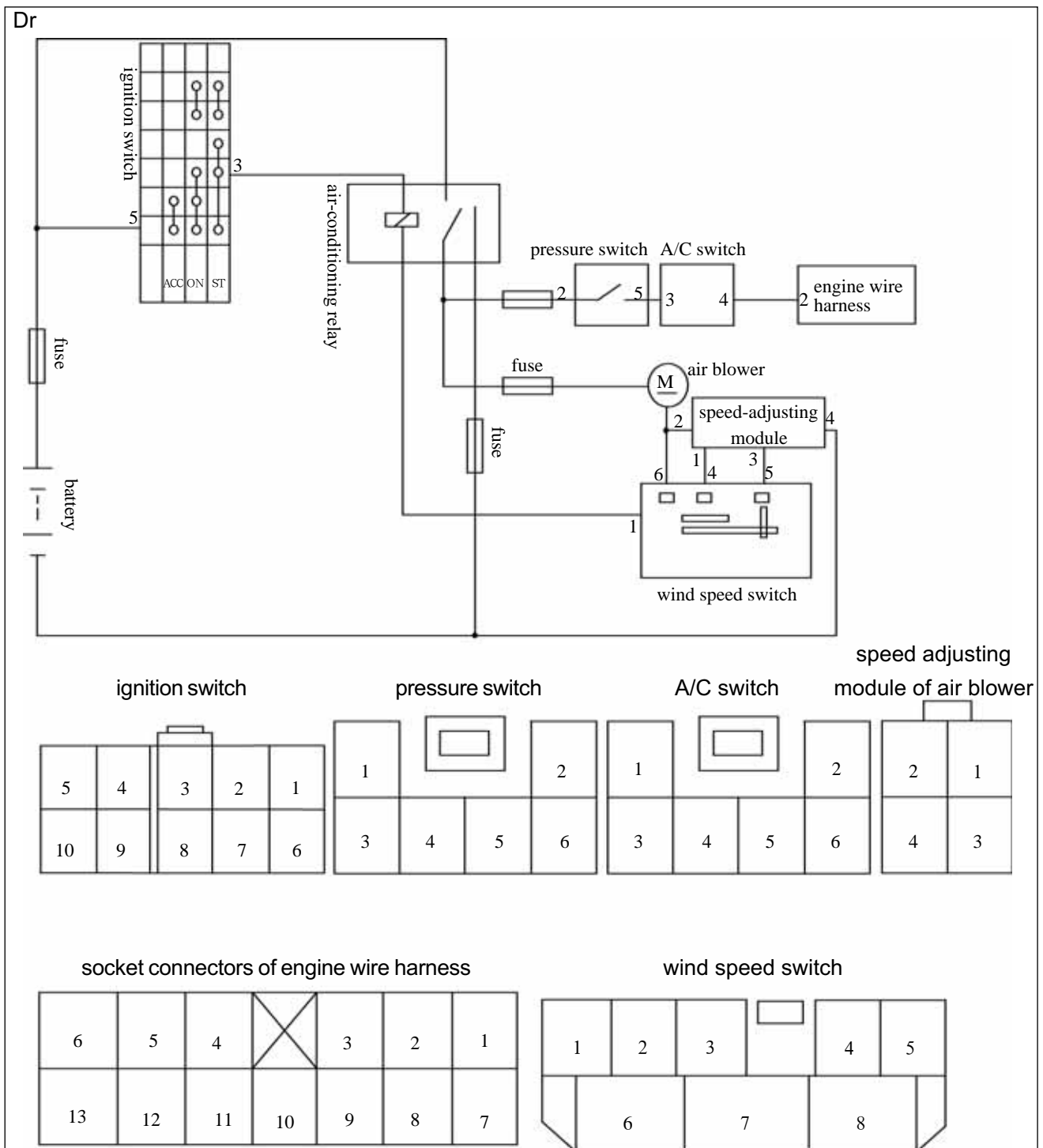


- (c) Tighten the O-ring matching position or the threaded position to the specified moment.
4. Take notice when connecting measuring meter at branch pipes:
  - (a) Connect the end of filling hose with high speed joint to the filling valve of compressor.
  - (b) Letter "D" marked on the compressor near the auxiliary valve represents the side of high voltage while "S" means the side of low voltage, which shall be looked out when connecting the hose.
  - (c) Fasten the bolts by hand, and
  - (d) In order to prevent the hose from loosening, lubricant oil shall not be spread at the connection position.

Remarks: after connecting the measuring meter on branch pipes to the refrigerant container (repairing tank), the air in the hose shall be exhausted up.
5. Take notice when vacuumizing:
 

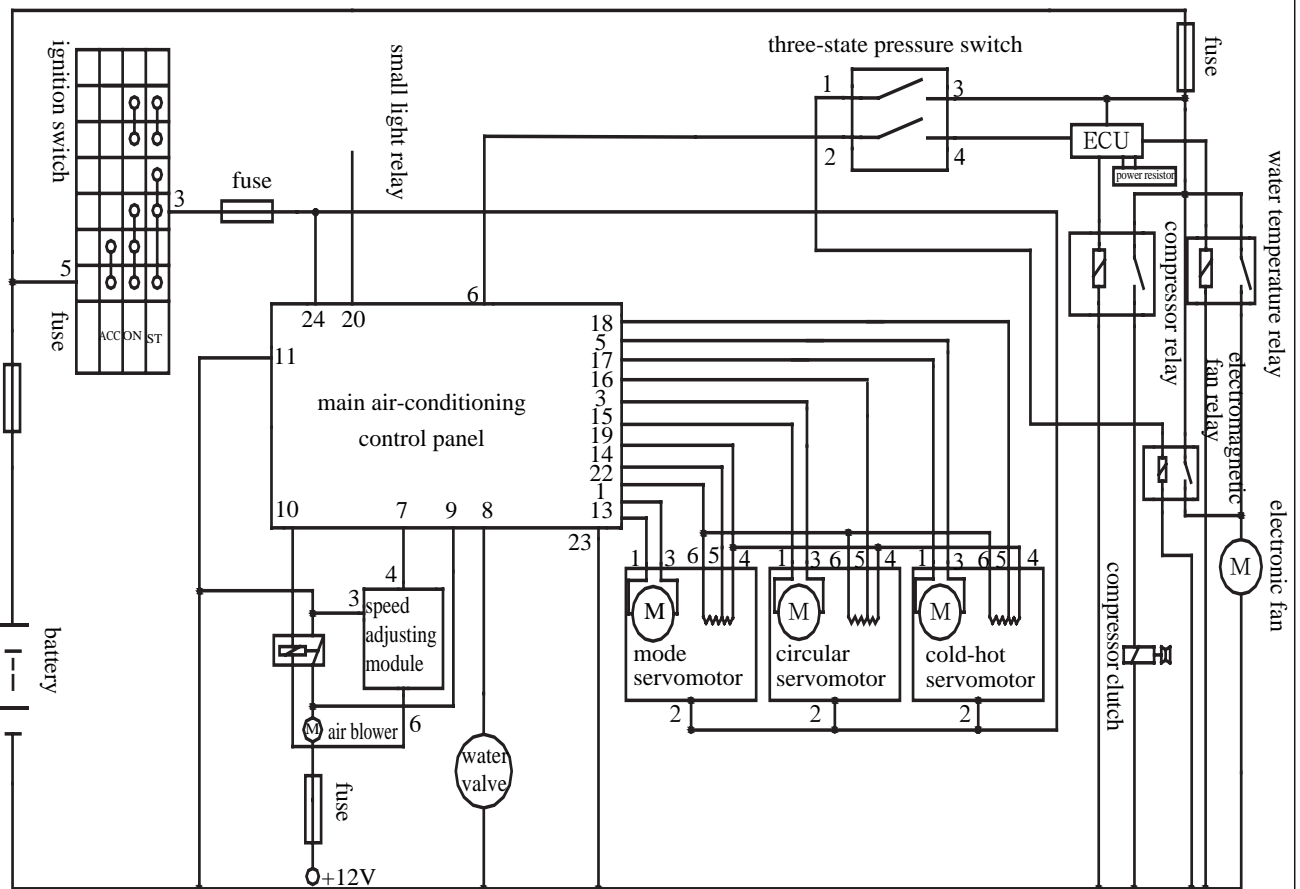
After vacuumizing for 20 min, maintain the container at certain pressure to ensure that all air in it is exhausted up, and another inspection shall be made to see whether there is leakage.
6. Take notice when handling with the refrigerant container (repairing tank):
  - (a) Do not heat it.
  - (b) Store the container at the place where temperature is under 40°C
  - (c) In case of heating the repairing tank with hot water, care shall be paid to the valves at the top of tank, do not dip them into the water, or the water will penetrate into the cooling system.
  - (d) The empty repairing tank is forbidden to reuse.
7. Take notice in the A/C operation or when adding the liquid refrigerant:
  - (a) In case the gaseous refrigerant in the cooling system is insufficient, which can lead to the compressor burns out, and such accidents shall be avoided.
  - (b) If the valve on the side of high pressure is uncovered, the refrigerant will flow in the reverse direction, which may lead to the break of the repairing tank, therefore, only valves on the side of low pressure are allowed to open or closed.
  - (c) If the repair tank is laid in reverse direction, and the refrigerant is added in liquid status, the liquid refrigerant will be compressed, which may lead to failure of the compressor, therefore, refrigerant shall be inflated in the gaseous status.
  - (d) Be careful not over-inflate the gaseous refrigerant, otherwise, such failures as insufficient cooling, increase of oil consuming or over heat of engine will be followed.
8. Take notice when using the high-pressure air cylinder type inspecting device:
  - (a) In case the open fire is used, it is the first to ensure before using there is no flammable material around.
  - (b) Be careful because toxic gas will be produced when the gaseous refrigerant meets with the open fire.

### Electric circuit diagram of air-conditioning system (continued)

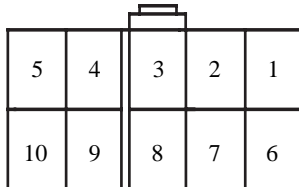


## Electric circuit diagram of air-conditioning system (continued)

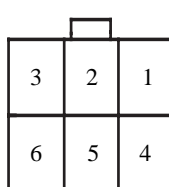
SF



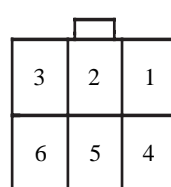
ignition switch



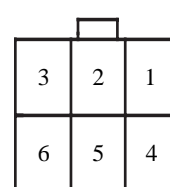
modular air-door motor



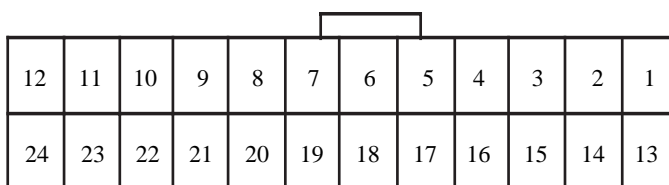
cold-hot air-door motor



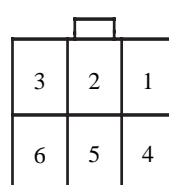
air-in motor



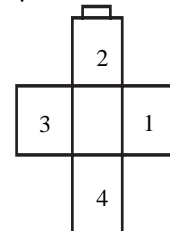
air conditioning



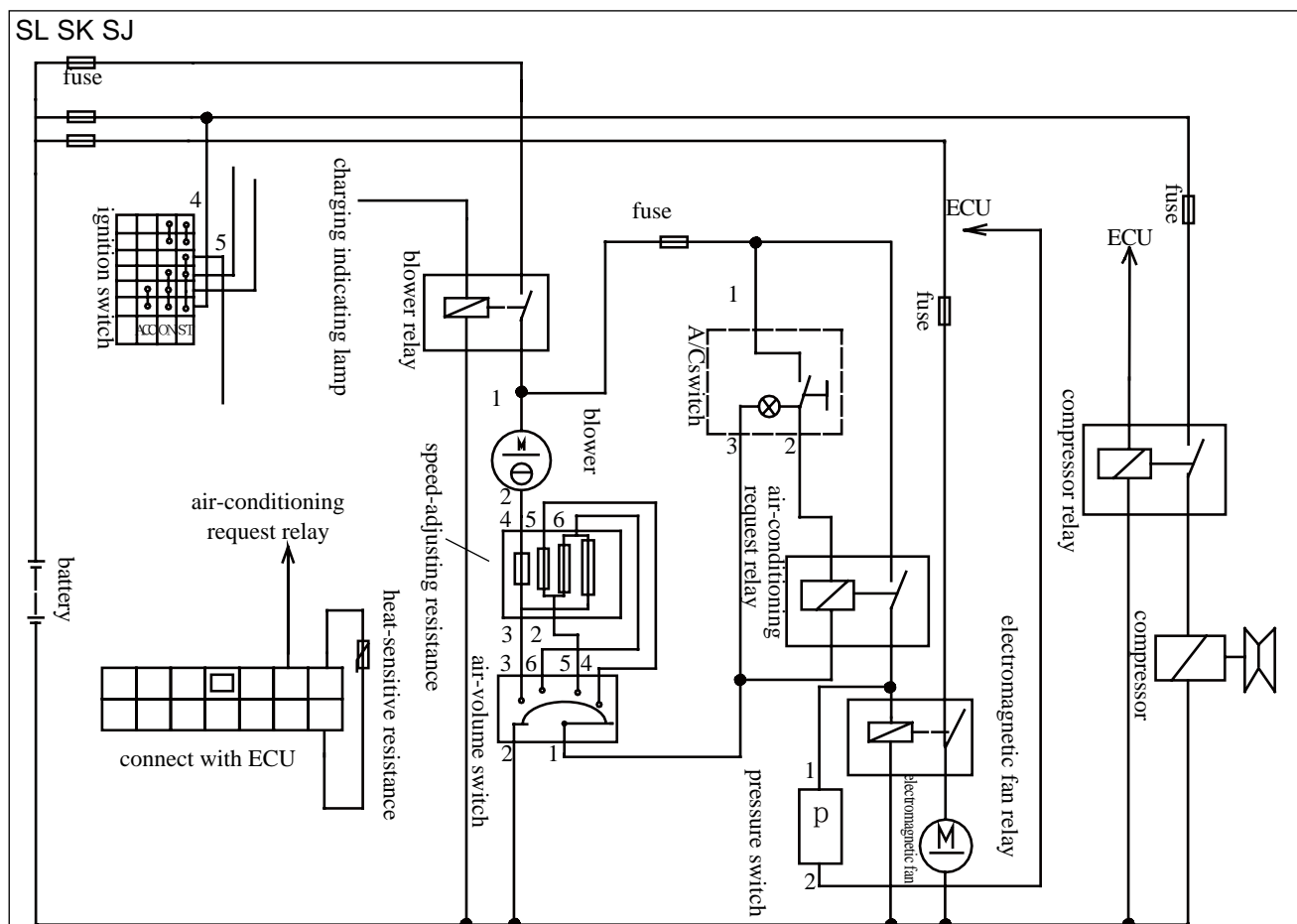
speed adjusting modul



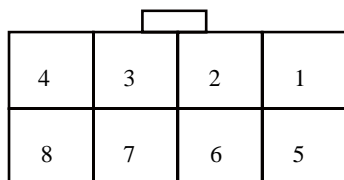
three-stage pressure switch



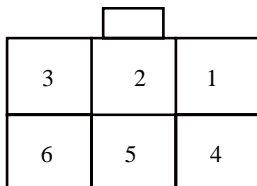
Electric circuit diagram of air-conditioning system (continued)



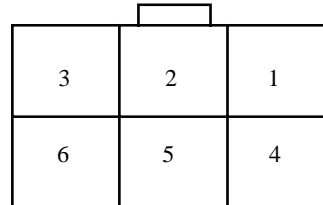
ignition switch



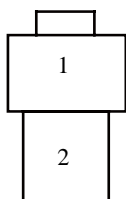
speed adjusting module



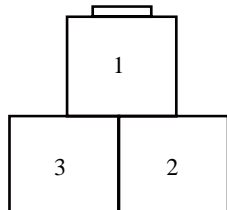
air-volume switch



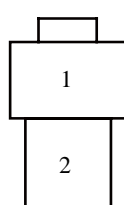
air blower



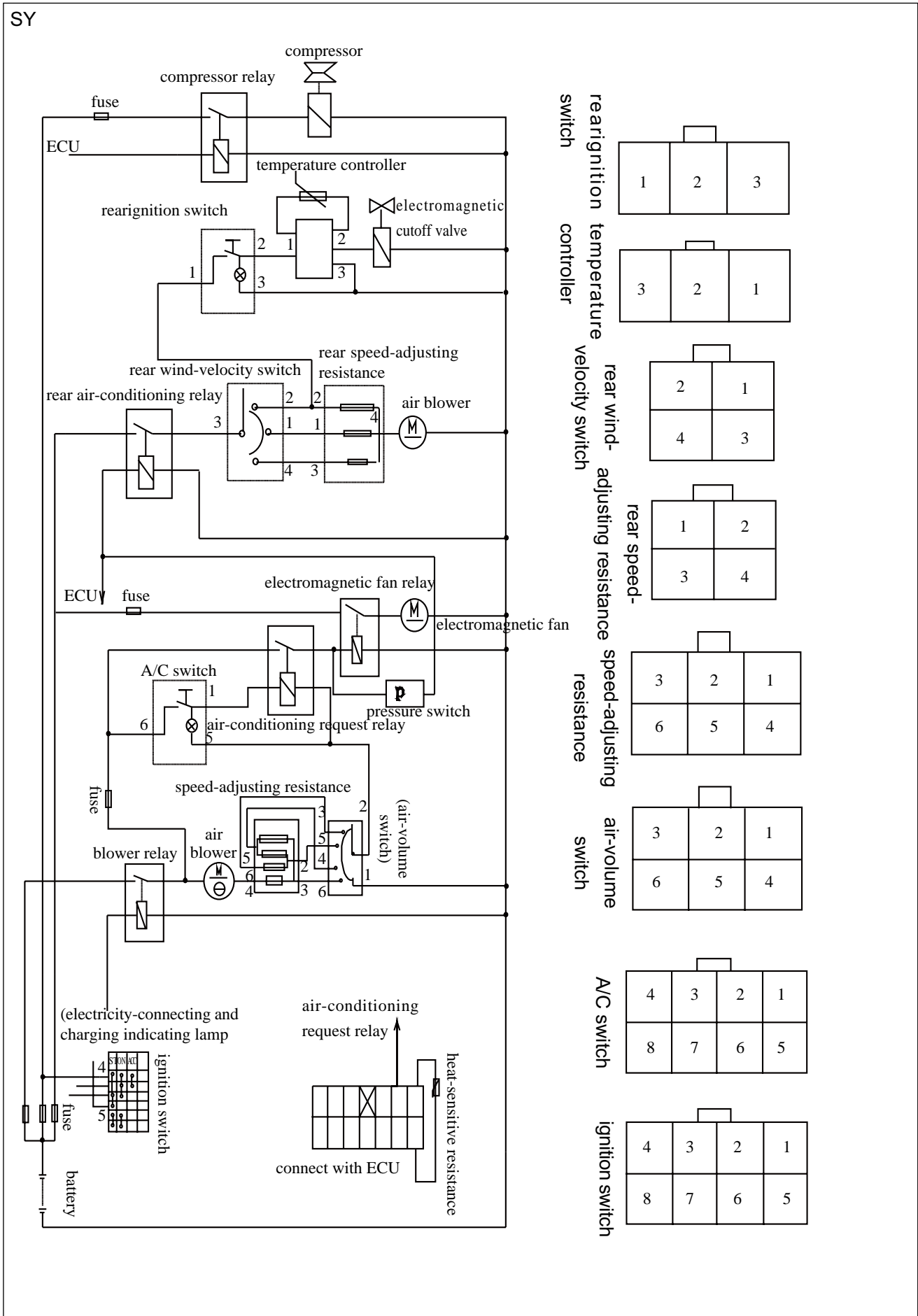
A/C SWITCH



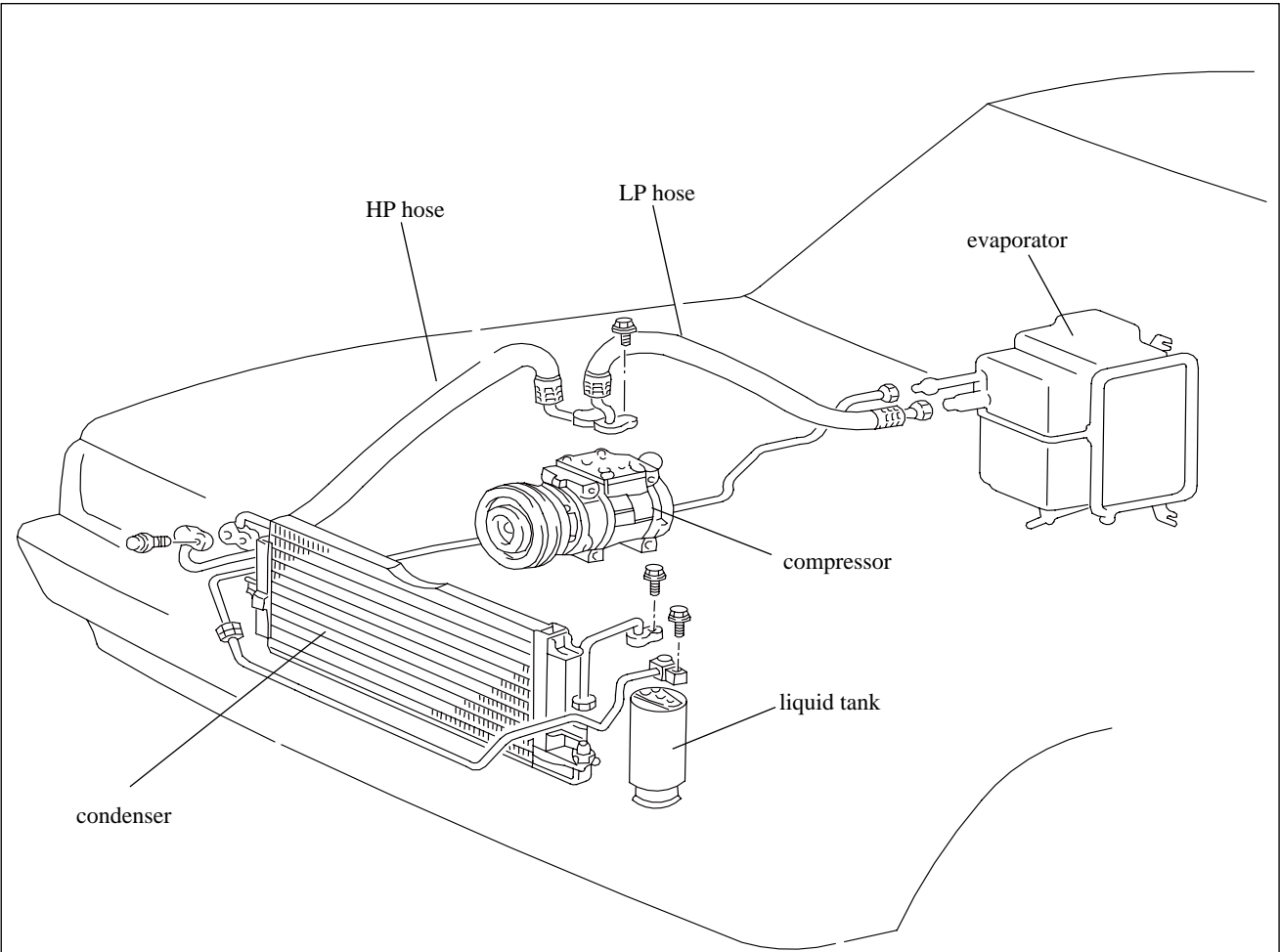
pressure switch



Electric circuit diagram of air-conditioning system (continued)



system component



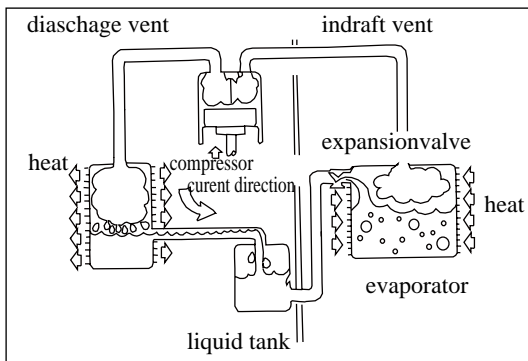
Tightening moment for air-conditioning pipeline :

SL SK SY SJ

Threaded joint	Open-wrench spanner (mm)	Tightening moment(N · m)
	14、 17	15 ± 3
	17、 19	15 ± 3
	19、 19	15 ± 3
	22、 24	25~30
	24、 27	30~35
	27、 27	30~35
Pressing plate bolt	Threaded head (mm)	Tightening moment(N · m)
	10	8~12
	14	21~25
Threaded joint of compressor	Open-wrench spanner (mm)	Tightening moment(N · m)
	24	25~30
	14	30~35

Dr SF

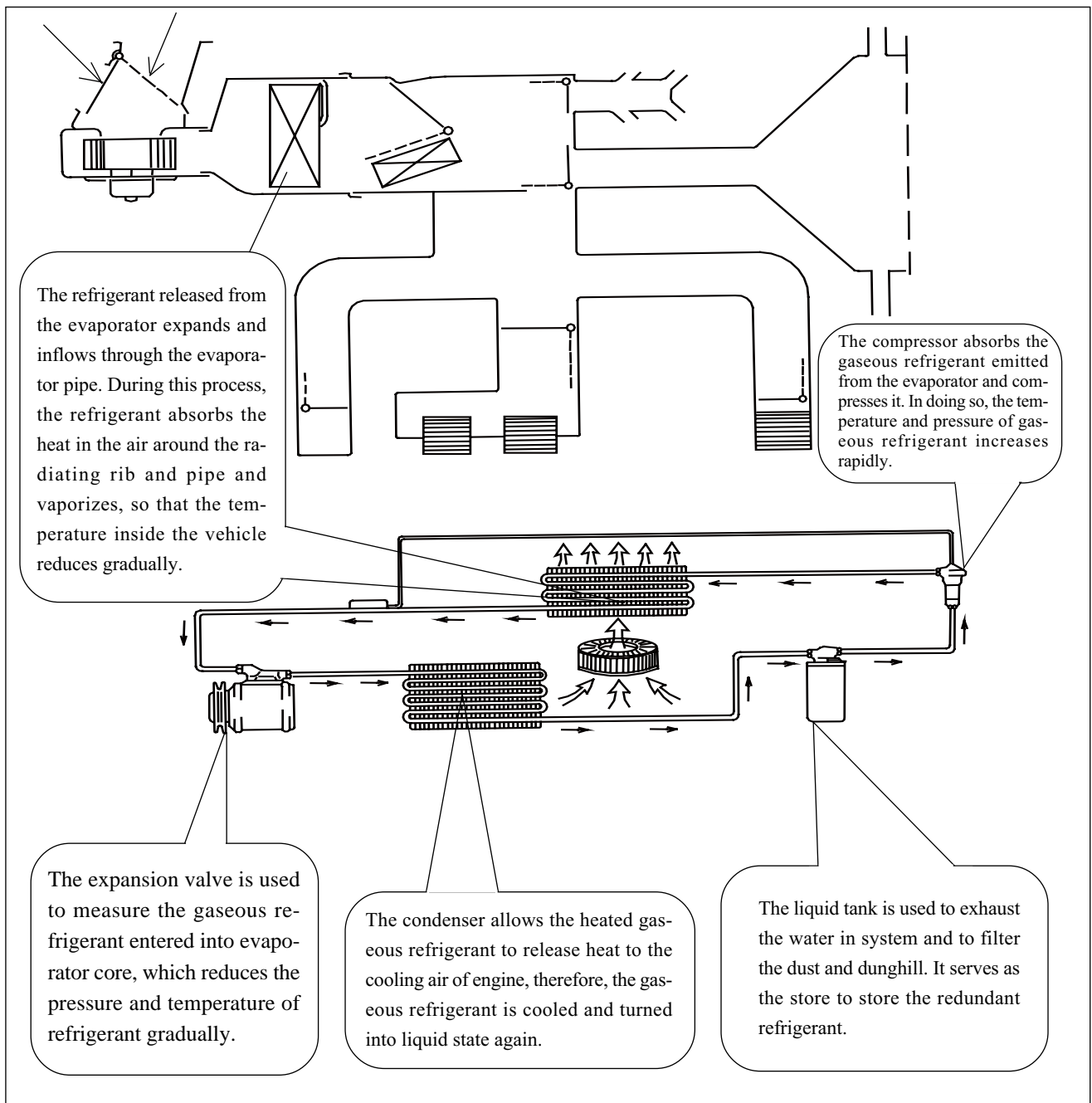
Air-conditioning pipe-line	Tightening moment(N · m)
LP hose interface	35 ± 3
HP hose interface	25 ± 2
HP hose interface	18 ± 1.5



## General introduction

### Refrigeration cycle

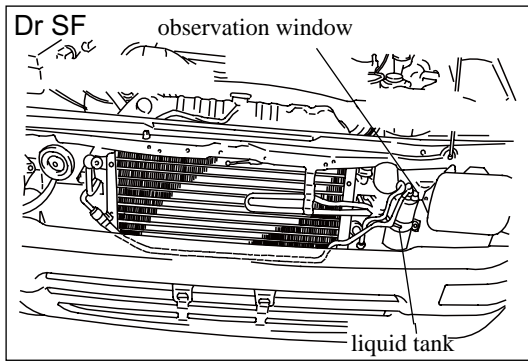
1. The refrigerant at the lower pressure side is condensed by the compressor into the HT and HP gaseous refrigerant.
2. These gaseous refrigerant flows into the condenser, where it is turned into liquid refrigerant.
3. Those liquid refrigerant flows into the liquid tank, where the liquid refrigerant is stored and filtered so as to satisfy the requirement of evaporator.
4. The liquid refrigerant is throttled by the expansion valve to reduce the pressure, so that the liquid refrigerant is turned into the LT and LP mixture of liquid and gaseous refrigerant.
5. The cold and fog-like refrigerant flows into the evaporator, where it is vaporized with the given heat, which is absorbed from the hot air flow by the evaporator core. All liquid refrigerants are turned into the gaseous refrigerant in the evaporator, and only the heated gaseous refrigerant is absorbed into the compressor. Then repeat the above-mentioned cycling approach.





## Troubleshooting

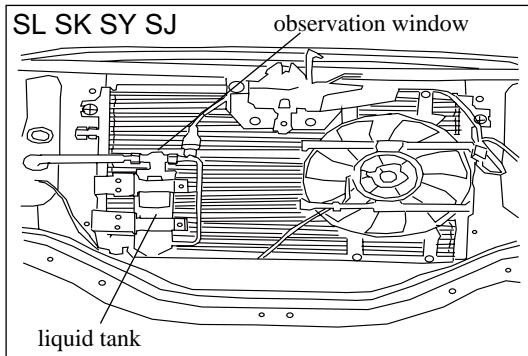
Trouble	Possible causes	Reparation approaches	Page
Lack of cold air	Non-pull-in performance of electromagnetic clutch: (a) Break of ignition switch and fuse; (b) Trouble of electromagnetic clutch; (c) Trouble of A/C switch; (d) Wiring or grounding trouble; (e) Lack of refrigerant; and (f) Trouble of pressure switch. Abnormal operation of compressor: (a) Looseness or break of driving belt; (b) Compressor trouble; Expansion valve trouble; Systematic leakage; Liquid tank fusible plug melting or filtering screen blocking; Non-work of air blower: (a) Failure of A/C switch; (b) Failure of air blower motor, and (c) Wiring failure.	Change the fuse and check to see whether there is short circuit; Check the electromagnetic clutch; Check the A/C switch; Repair it as requirement; Check the refrigerant pressure; Check the pressure switch; Adjust or change the driving belt; Check the compressor; Check the expansion valve; Conduct lubricating test for the system; Check the liquid tank; Check the A/C switch; Check the air blower motor; Conduct reparation as requirement.	Page AC-4 to 7 Page AC-12 Page AC-4 to 7 Page AC-11 Page AC-13 Page AC-12 Page AC-16 Page AC-14 Page AC-4 to 7
Inconsecutive cold air	Electromagnetic valve slip Failure of expansion valve; Wiring or connecting failure; Over water content in system	Check the electromagnetic clutch; Check the expansion valve; Make reparation as requirement. Reclaim the water first, then exhaust the system to vacuum and inflate in the refrigerant.	Page AC-12 Page AC-16 Page AC-4 to 7
Cold air occurs in high-speed condition	Blocking of radiating face of condenser; Driving belt slip; Compressor failure; Insufficient or redundant refrigerant; Air existing in system	Check and wash the condenser Check and change the driving belt; Check the compressor; Check the refrigerant quantity; Vacuumize the system and inflate the refrigerant;	Page AC-15 Page AC-13 Page AC-12 Page AC-11
Insufficient cold air	Condenser blocking; Driving belt slip; Electromagnetic clutch failure; Compressor failure; Expansion valve failure; Insufficient or redundant refrigerant; Air existing in system; Redundant compressor lubricant; Liquid tank block	Check the condenser; Check and change the driving belt; Check the electromagnetic clutch; Check the compressor; Check the expansion valve; Check the refrigerant quantity; Reclaim the air, then vacuumize the system and inflate the refrigerant; Check the compressor lubricant quantity; Check the liquid tank	Page AC-15 Page AC-12 Page AC-12 Page AC-12 Page AC-16 Page AC-11 Page AC-14
Under-speed cold air	Evaporator blocking or frosting Air leakage in cooling device or air pipeline; Air inlet blocking; Air blower motor failure;	Clean the evaporator radiating rib or filter; Make reparation as requirement Make reparation as requirement Change the air blower motor.	Page AC-18 Page AC-20



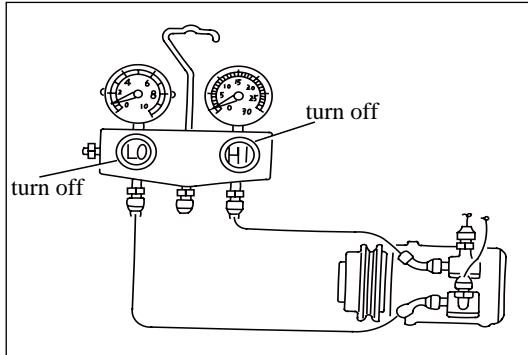
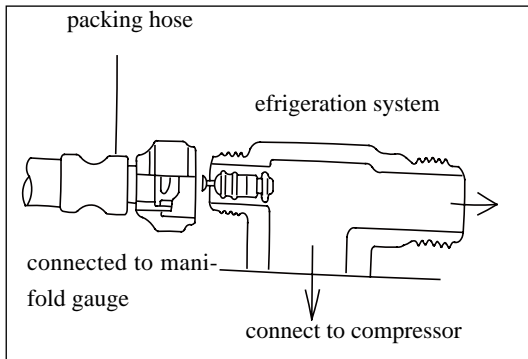
## Inspection on Refrigerant Quantity

1. Run the engine at the speed of 1500 r/m or so (the atmospheric temperature should be above 35°C);
2. Start the air-conditioner in the max cold air status for several minutes;
3. Check the refrigerant quantity.

Watch the observation window on liquid tank.



No.	Symptoms	Refrigerant quantity	Repairing approaches
1	Air bubble occurs in the observation window	Insufficient	Check to see whether there is leakage with the gas leakage detector
2	No air bubble in observation window	No, normal or redundant	Refers 3 and 4.
3	No temperature difference between the inlet and outlet of compressor	No, or almost no	Vacuumize the system and inflate the refrigerant, then check to see whether there is leakage with the gas leakage detector.
4	Obvious temperature difference between the inlet and outlet of compressor.	Normal or redundant	Refer 5 and 6
5	Observation window is in clear status once the air-conditioner is turned off	Redundant	Exhaust the redundant refrigerant until the specified quantity is satisfied.
6	There is refrigerant foam on observation window after the air-conditioner is turned off, then the observation window becomes clear.	Normal	_____



## Compressor Installation of manifold gauge

Remark: Connect the manifold gauge to the auxiliary valve of compressor.

1. Turn off the manual valve of manifold gauge.
2. Mount the packing hose of manifold gauge on the packing valve.

Mount the LP hose to the LP packing valve and the HP hose to HP packing valve. Then screw up the nuts for hose joint by hand.

Remark: Do not coat the compressor lubricant on the connection positions.

## On vehicle inspection

1. Mount the manifold gauge;  
(see manifold gauge mount)
2. Run the engine at the speed of 1500 r/m or so;
3. Check the compressor according to the following items:
  - (a) The HP gauge readings under the normal system should satisfy the specified value of (1.4-1.7)MPa , that of LP gauge should meet the specified value of (0.15-0.2)MPa .
  - (b) Whether there is abnormal sound;
  - (c) Whether there is leakage at the shaft oil seal.

If any problem is found, repair or change the compressor.
4. Check the electromagnetic clutch:
  - (a) Check to see whether there is lubricant trace on the pressing plate and rotor;
  - (b) Check to see whether there is noise or lubricant leakage at the clutch bearing;
  - (c) Measure the resistance between the stator coils that is set between the clutch lead and the grounding lead with the ohmmeter.

Standard resistance:

SL SK SJ: (3.2 ± 0.2)Ω

Dr SF SY: (3.5 ± 0.2)Ω

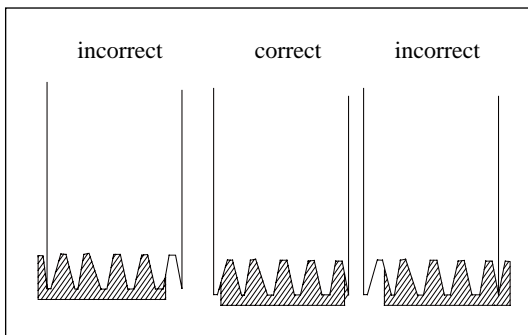
In case the requirement is not satisfied, change the compressor.

## Disassemble of compressor

1. Run the engine in the idle status for ten minutes under the air-conditioning situation;
2. Turn off the engine;
3. Disconnect the cathode lead from the storage cell;
4. Disconnect the electromagnetic clutch lead from the matching wire;
5. Exhaust the refrigerant from the refrigeration system;
6. Disconnect the two hoses from the auxiliary valve of compressor;

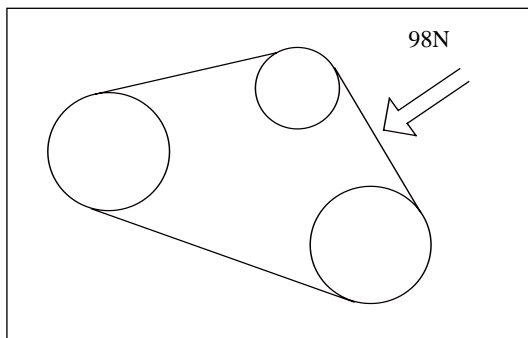
Cover the opening joint with cork right away to prevent the wet gas entering in to the system.

7. Tear down the compressor:
  - (a) Tear down the fan cover;
  - (b) Loosen the driving belt;
  - (c) Tear down the fixing bolts of compressor bracket and the compressor.



## Mount of compressor

1. Mount the compressor with fixing bolts;  
Tightening moment:  $(25-30)\text{N} \cdot \text{m}$
2. Mount the driving belt correctly;



Requirement for belt tension: the tension belt is allowed to reduce  $(9-13)\text{mm}$  under  $98\text{N}$  after the compressor runs for five minutes;

3. Connect the two hoses to the auxiliary valve of compressor;  
Tightening moment: (see page AC-8)
4. Connect the clutch lead to the matching wire;
5. Connect the cathode lead of storage cell to the storage cell, and
6. Vacuumize the system and inflate the refrigerant:

Vacuum time:

Dr SL SK SF SJ: Vacuumize for 20min and maintain the pressure for 30min;

SY: Vacuumize for 30min and maintain for 30min

Inflated refrigerant quantity:

Dr:  $(600-650)\text{g}$

SL:  $700 \pm 0\text{g}$

SK SJ:  $560 \pm 0\text{g}$

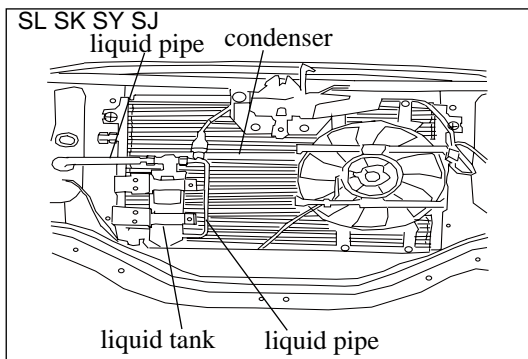
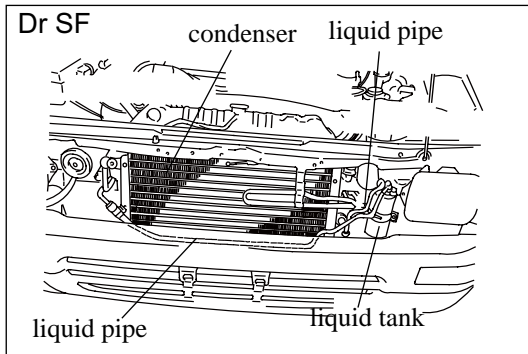
SF:  $(700-720)\text{g}$

SY:  $850 \pm 0\text{g}$

## Liquid Tank

Check to see whether there is leakage in observation window, fusible plug and joints;

Conduct the inspection with the gas leakage detector and, if necessary, repair or change the liquid tank.



## Dismantle of Liquid Tank

1. Exhaust the refrigerant;
2. Tear down the two liquid pipes from the liquid tank;  
Remark: the opened joint should be plugged with cork so as to prevent the humid air from entering into the system.
3. Tear down the liquid tank from the tank bracket.

## Mount of Liquid Tank

1. Mount the liquid tank on the liquid tank bracket;  
Remark: the cover of joint should not be take down before connecting the pipe;
2. Connect the two liquid pipes to the liquid tank;  
Tightening moment: (See page AC-8)
3. Vacuumize the system and inflate the refrigerant in;  
Vacuumizing time:

Dr SL SK SF SJ: Vacuumize for 20 min and maintain the pressure for 30min;

SY: Vacuumize for 30 min and maintain the pressure for 30min.

4.

Dr: (600-650)g

SL: 700 ? 0g

SK SJ: 560 ? 0g

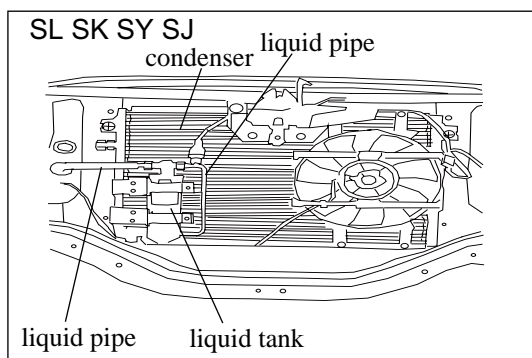
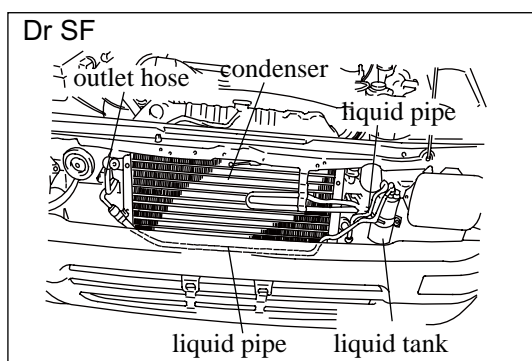
SF: (700-720)g

SY: 850 ? 0g

## Condenser

### Condenser dismantle

1. Check the radiating ribs of condenser to see whether there is blocking or damage;  
if the radiating rib is blocked, wash it with water and dry it with compressed air.  
Notice: be careful not to damage the radiating rib;
2. Check the condenser joint to see whether there is leakage;  
Make reparation as requirement;



### Condenser disassembly

1. Exhaust the refrigerant;
2. Tear down the median mesh and the bonnet lock bracket;
3. Disconnect the outlet hose from the entrance joint of condenser;
4. Tear down the liquid pipe from the outlet of liquid tank;  
Remark: the opened joint should be plugged with cork so as to prevent the humid air from entering into the system.
5. Tear down the condenser:  
Tear down the two bolts.

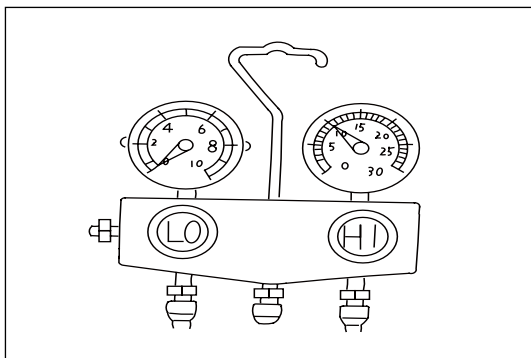
### Condenser mount

1. Mount the condenser  
Screw on the two bolts so that the rubber washer contacts the mounting flanges correctly.
2. Connect the liquid pipe to the liquid tank and the outlet hose to the condenser.  
Tightening moment: (See page AC-8)
3. Mount the median mesh and the bonnet lock bracket;
4. vacuumize the air-conditioning system;  
Vacuumizing time:  
Dr SL SK SF SJ: vaccumize for 20min and maintain the pressure for 30min;  
SY: vaccumize for 30min and maintain the pressure for another 30min.
5. Inflate the refrigerant in the air-conditioning system and check to see whether there is air leakage:  
Dr: (600-650)g  
SL: 700 ? 0g  
SK SJ: 560 ? 0g  
SF: (700-720)g  
SY: 850 ? 0g

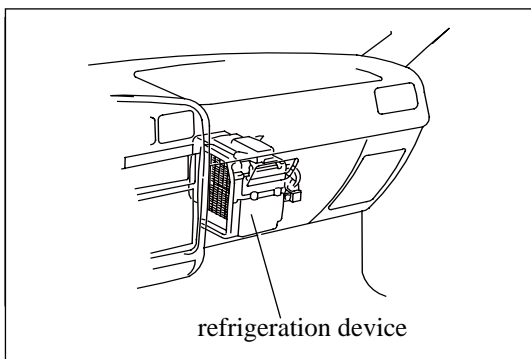
## Refrigeration device

### On-vehicle inspection on expansion valve

1. Check the gaseous refrigerant quantity in the refrigeration cycle;
2. Mount the manifold gauge;  
(see Page AC-12)



3. Run the engine;  
Run the engine at a speed of 2000 r/m for five minutes.
4. Check the expansion valve;  
If the expansion valve is blocked, the LP readings will reduce to 0 kPa, otherwise, the valve is normal.



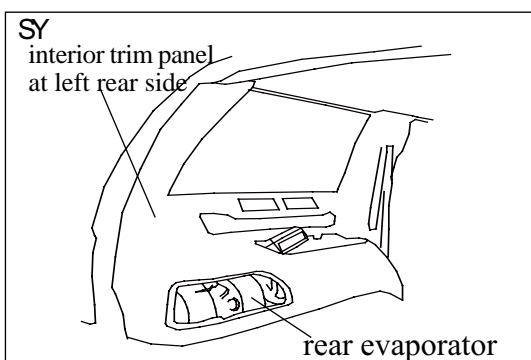
### Disassembly of Refrigeration Device

1. Disconnect the cathode lead from the storage cell;
2. Exhaust the refrigerant;
3. Tear down the suction pipe from the entrance joint of refrigeration device;
4. Tear down the outlet pipe from the entrance joint of refrigeration device;

Remark: the opened joint should be sealed with the cork to prevent the humid air from entering into the system.

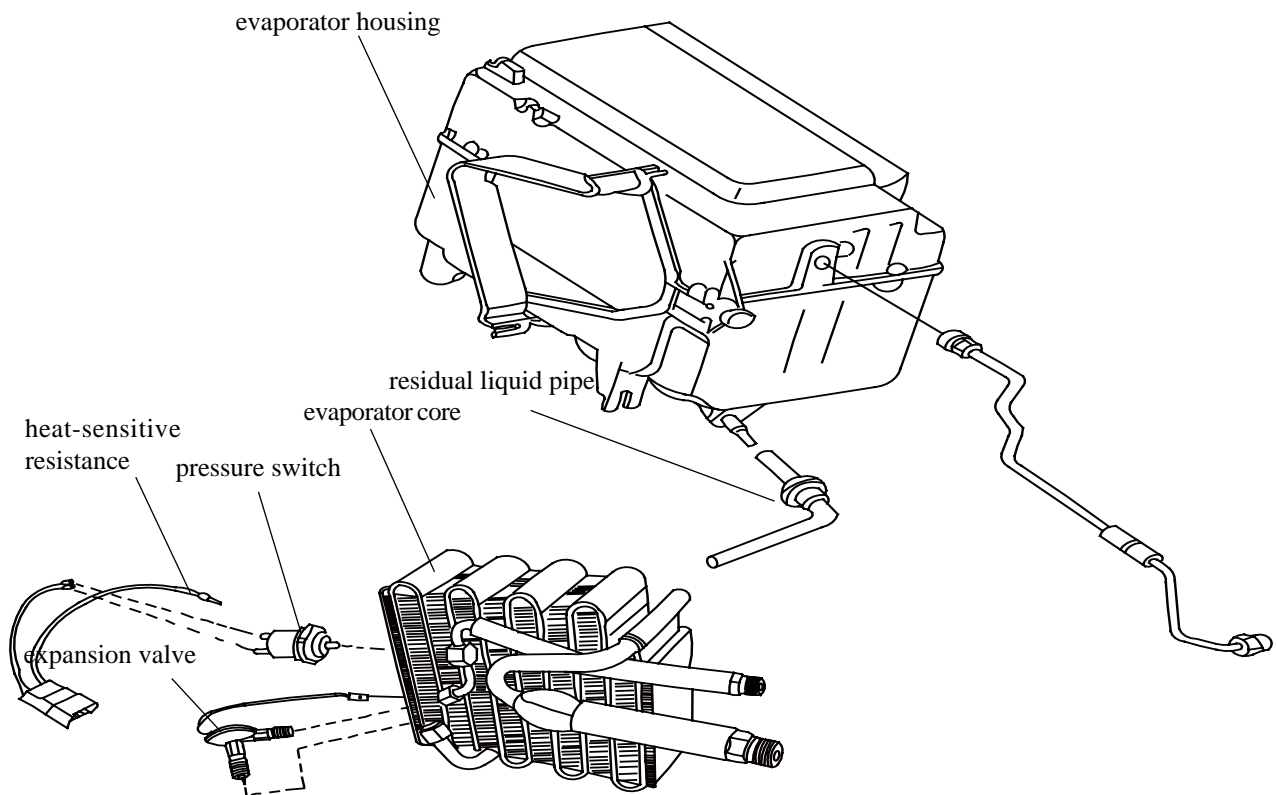
5. Tear down the insulation rings from the inlet and outlet joints.
6. Tear down the right glove box (SY rear air-conditioner: tear down the interior trim panel at left rear side).
7. Disconnect the plugging element;
8. Tear down the refrigeration device;

Tear down the three nuts.

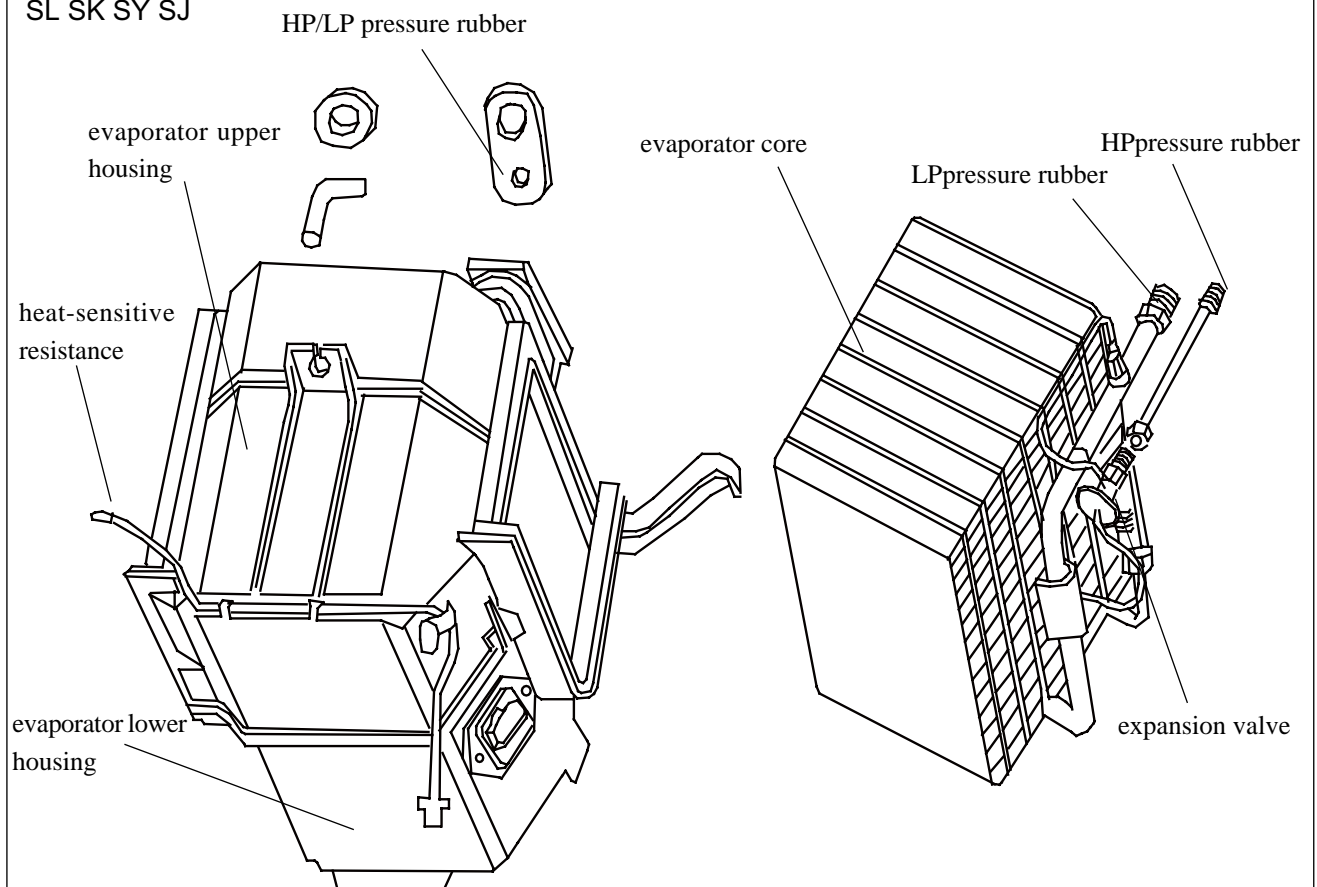


## evaporator housing

Dr SF

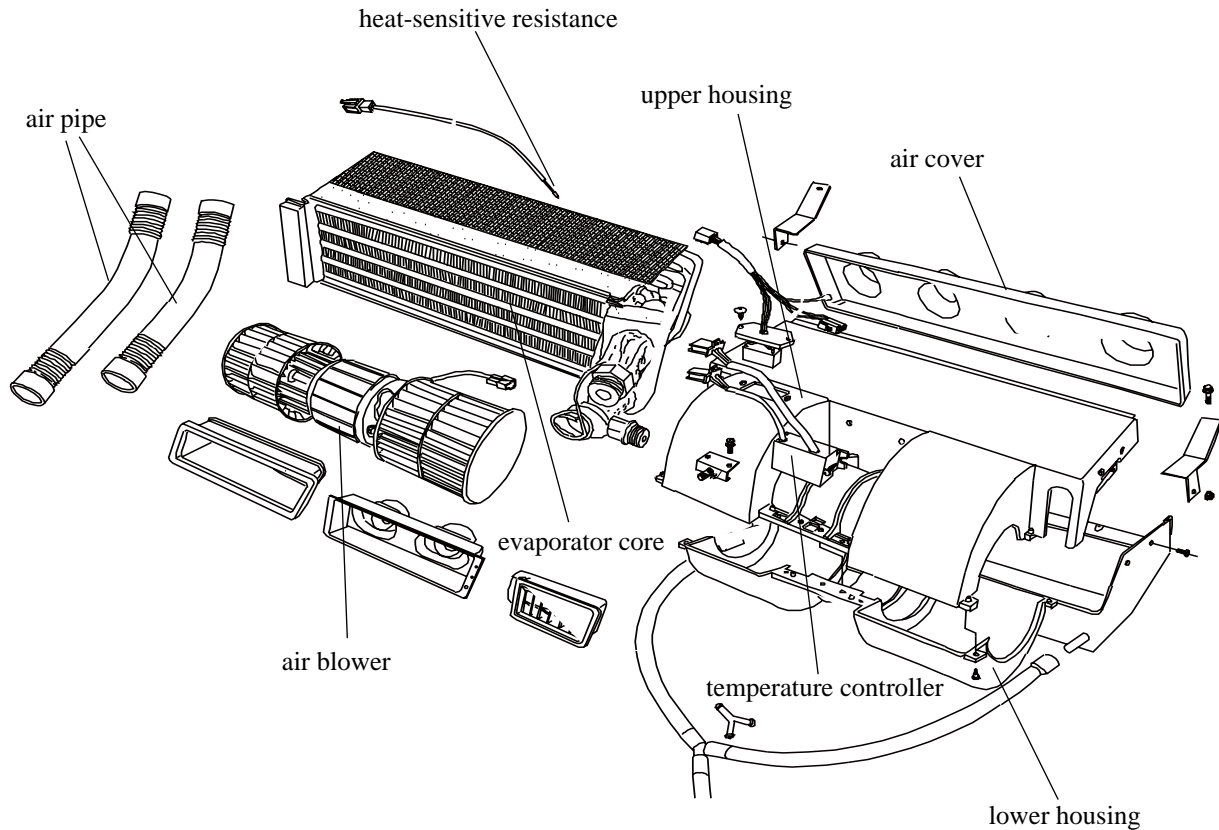


SL SK SY SJ

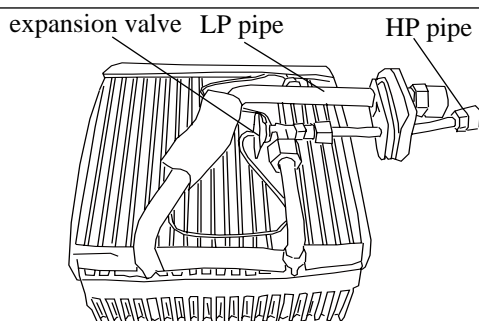




## SYrear evaporator

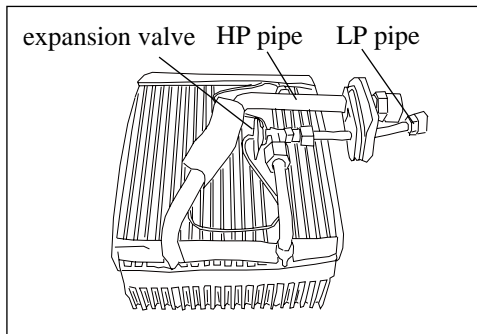


1. Tear down the evaporator housing:
  - (a) Disconnect the plugging element;
  - (b) Tear down the two clips;
  - (c) Tear down the four screws;
  - (d) Tear down the upper cluster housing;
  - (e) Tear down the HP/LP pressure pipe rubber washers; and
  - (f) Tear down the lower cluster housing.
2. Tear down the expansion valve:
  - (a) Tear down the liquid pipe from the entrance joint of expansion valve;
  - (b) Tear down the sealing washer and thermal bulb from the suction pipe of evaporator;
  - (c) Tear down the expansion valve.



## inspection of evaporator

1. Check the radiating ribs of evaporator to see whether there is block.  
If the radiating rib is blocked, clean it with the compressed air.  
Notice: do not wash the evaporator with water.
2. Check the joint to see whether there is crack or scrape.  
Make reparation as requirement.



### Mount the evaporator parts:

- (a) Connect the expansion valve to the entrance joint of evaporator and screw up the nuts.  
Remark: Carefulness should be put on the O-ring seal.
- (b) Mount the bracket on the suction pipe with thermal sensor;
- (c) Connect the liquid pipe to the entrance joint of expansion valve and screw up nuts.
- (d) Mount the lower cluster housing on evaporator.
- (e) Mount the upper cluster housing;
- (f) Mount the four screws;
- (g) Mount the two clips;
- (h) Mount the HP/LP pressure rubber washer; and
- (i) Connect the plugging elements;

1. Mount the refrigeration device.  
Mount the refrigeration device with three nuts.
2. Connect the plugging elements;
3. Mount the right glove box (SY rear air-conditioner: mount the interior trim panel at left rear side).
4. Mount the insulation ring on the inlet and outlet joints;
5. Connect the liquid pipe to the outlet joint of refrigeration device;  
Tightening moment: (see page AC-8)
6. Connect the suction pipe to the outlet joint of refrigeration pipe;  
Tightening moment: (see page AC-8)
7. Connect the cathode lead to the storage cell.
8. Vacuumize the air-conditioning system:

#### Vacuumizing time:

Dr SL SK SF SJ: vacuumize for 20min and maintain the pressure for 30min

SY: vacuumize for 30min and maintain the pressure for another 30min.

9. Inflate the refrigerant in the air-conditioning system and check to see whether there is air leakage;

#### Refrigerant quantity:

Dr: (600-650)g

SL: 700 ? 0g

SK SJ: 560 ? 0g

SF: (700-720)g

SY: 850 ? 0g

## Refrigerant pipe

### On-vehicle inspection

1. Check the pipelines of each part to see whether there is leakage:

Make the inspection with the gas leakage detector and, if necessary, change them.

2. Check the clamping parts of the pipelines to see whether there is looseness;

Make a new fastening or change as requirement.

### Change of refrigerant pipeline

1. Exhaust the refrigerant;
2. Change the damaged pipe or hose  
Remark: the opened joint should be sealed right away with cork so as to prevent the humid from entering into the system.
3. Screw up the O-ring seal joint and threaded joint according to the Tightening moment;

4. Vacuumize the air-conditioning system:

Vacuumizing time:

Dr SL SK SF SJ: Vacuumize for 20min and maintain the pressure for 30min;

SY: Vacuumize for 30min and maintain the pressure for another 30min.

5. Inflate the refrigerant in the air-conditioning system and check the system to see whether there is air leakage;

Refrigerant quantity:

Dr: (600-650)g

SL: 700 ± 0g

SK/SJ: 560 ± 0g

SF: (700-720)g

SY: 850 ± 0g

# Vehicle Body

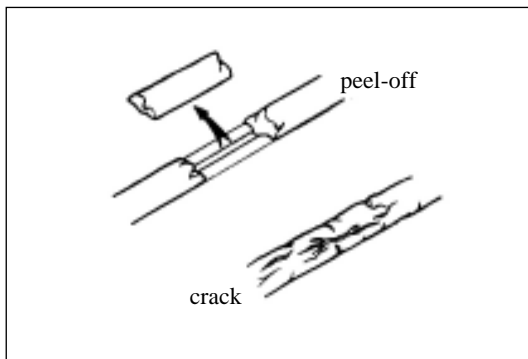
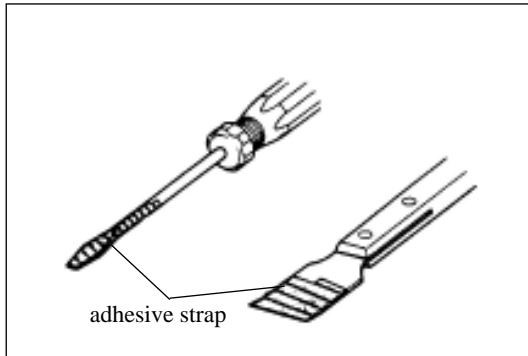
	Page
Introduction .....	BO-2
Engine cover .....	BO-3
Front door .....	BO-4
Rear car Door .....	BO-10
Body collision avoidance adhesive strip .....	BO-20
Wheel-trims .....	BO-24
Wheel-trims wrapping angle and exterior trim panel ...	BO-26
Front Windshield .....	BO-32
Side-window glass .....	BO-37
Rear-door glass .....	BO-40
Rear windshield .....	BO-41
Load-compartment baffle .....	BO-43
Tail door .....	BO-45
Instrument panel .....	BO-50
Safety belt .....	BO-57
Seat .....	BO-60
Spoiler .....	BO-63
Luggage rack .....	BO-65
Reserve tire bracket .....	BO-66
Body dimension .....	BO-68
Frame dimension .....	BO-78

## General Introduction

In case there is damage to body and/or part, protection measures should be taken first to prevent the vehicle from damaging before repairing them.

Example:

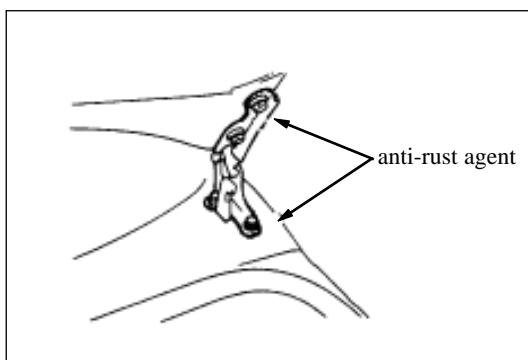
1. Protection adhesive strap should be contacted on the relative part of body when conduct the disassembling and mounting operation.
2. When prizing the body parts with screwdriver or scraper, those body parts head or the edge of screwdriver or scraper should be wrapped with adhesive strap to prevent paint layer and the body from damaging.

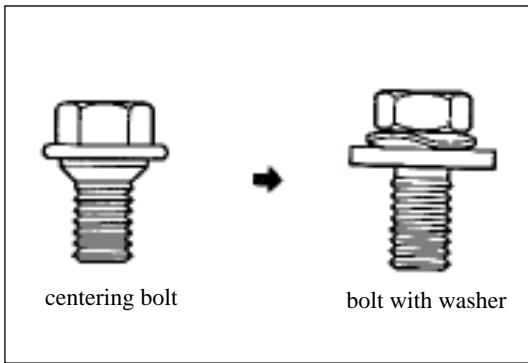


If the antirust is damaged when repairing other parts, it should be recoated in time.

Example:

1. In case the sealing agent, paint layer or priming coat on the body is damaged due to peel-off or crack, etc. the corresponding antirust shall be used for reparation.
2. If the hinge or plate is loosened or torn down, the antirust should be re-coated after repairing them.

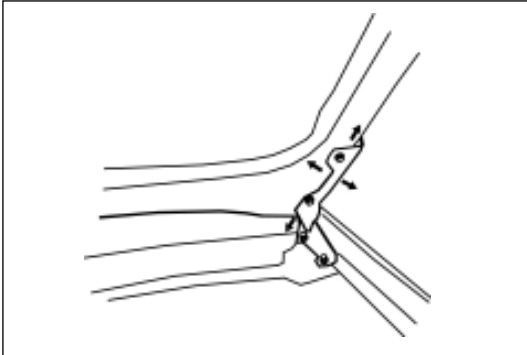




## Engine cover

### Adjustment of engine cover

Remark: as the centering bolt are used as the fixing bolt to fix the hinge of engine cover, the engine cover cannot be adjusted when mounting, in such case, the bolt with a washer should be used to substitute the centering bolt.

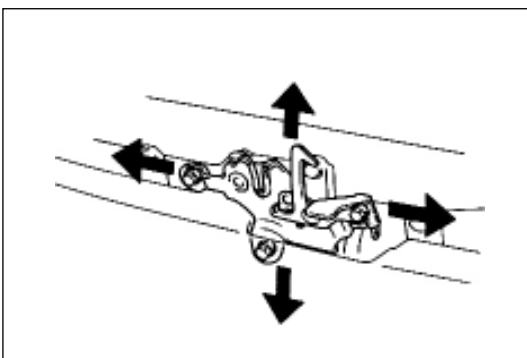


1. Adjust the engine cover in front-back and right-left direction.

Loosen the hinge bolts on engine cover to adjust the engine cover.



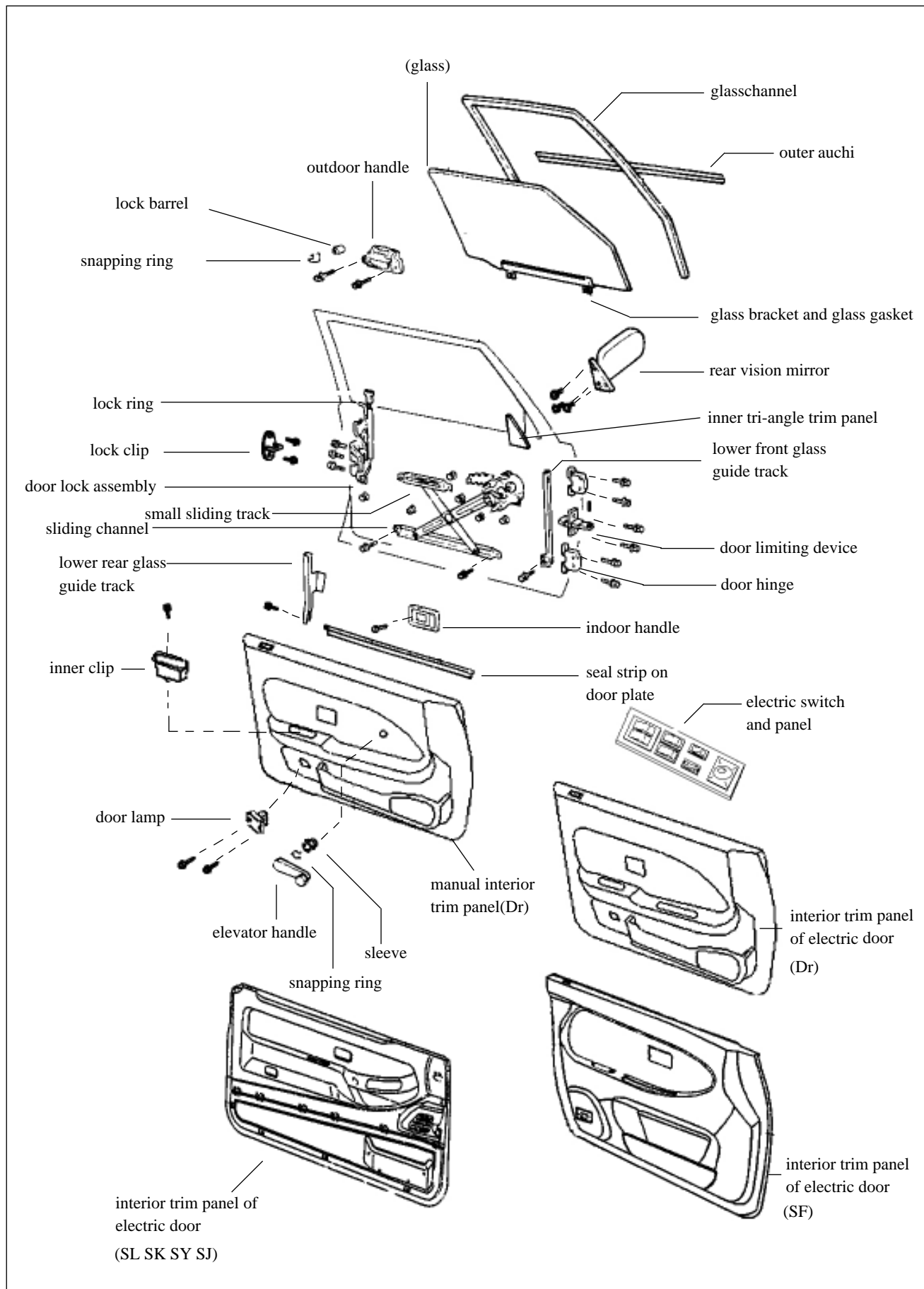
2. Adjust the engine cover leading edge vertically;  
Rotate the buffer block to adjust the engine cover.

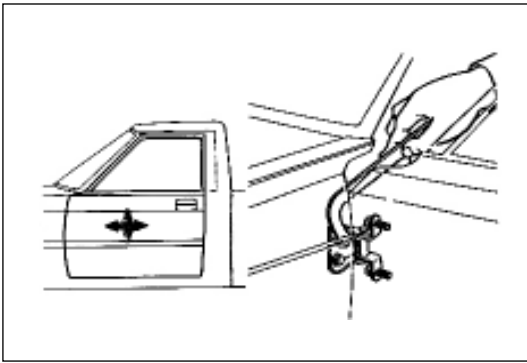


3. Adjust the lock clips on engine cover Loosen the bolt to adjust the lock clip.

## Front door

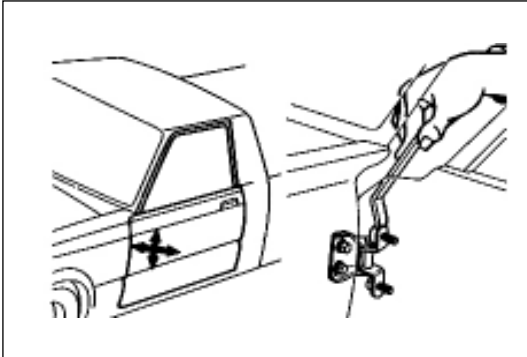
### Element figure



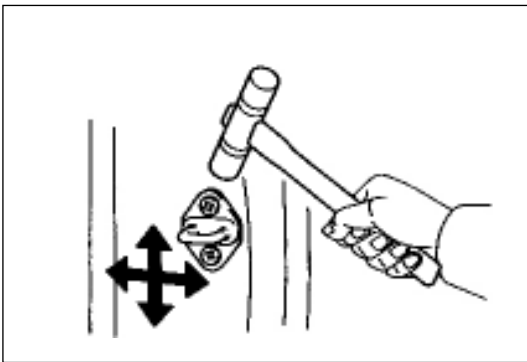


## Adjustment of front door

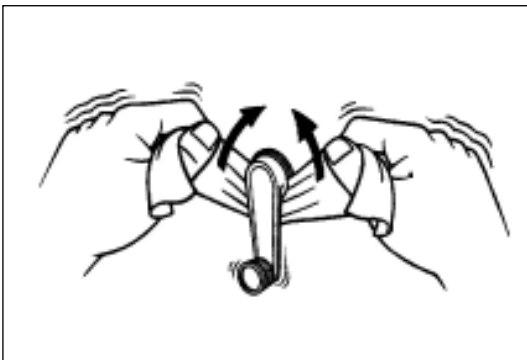
1. Adjust the car door in the front-back and vertical direction;  
Adjust the car door under the condition that the bolts of body side hinge are loosened.



2. Adjust the car door in left-right and vertical direction  
Adjustment should be made after the bolts of side hinge of body are loosened.

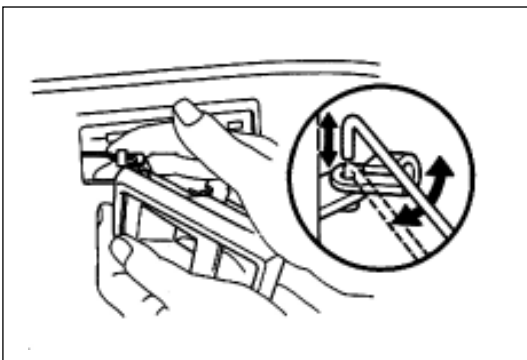


3. Adjust the clip of door lock:
  - (a) Check whether the car door assembly and the match of door lock are adjusted correctly.
  - (b) Loosen the lock clip lightly to mount the screws and tap the lock clip with hammer to adjust their positions.
  - (c) Screw off the fixing screws of lock clip.



## Disassembly of front door

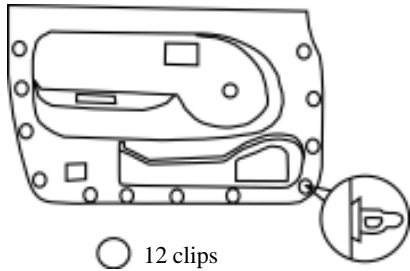
1. Tear down the elevator handle (Dr)  
Pull out the snapping ring of spring with dishcloth and tear down the elevator handle and the sleeve.



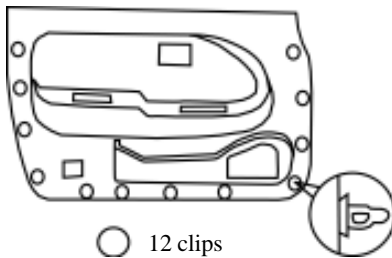
2. Tear down the indoor handle
3. Tear down the inner triangle trim panel;  
Loosen the clip open with a screwdriver to tear down the inner triangle trim panel.  
Notice: before using the screwdriver, wrapping the screwdriver head with adhesive strap.
4. Tear down the rear vision mirror;  
Tear down the three screws and rear vision mirror.



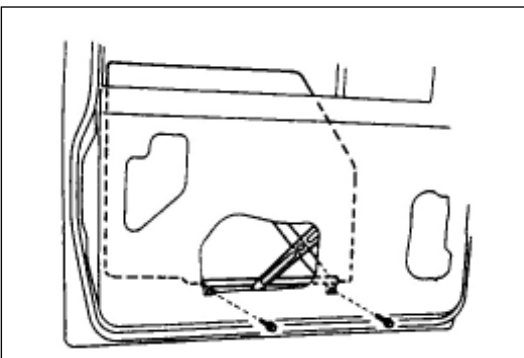
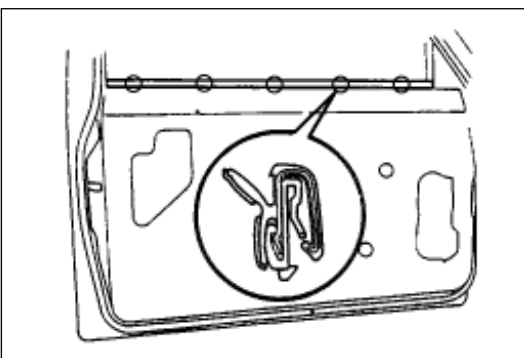
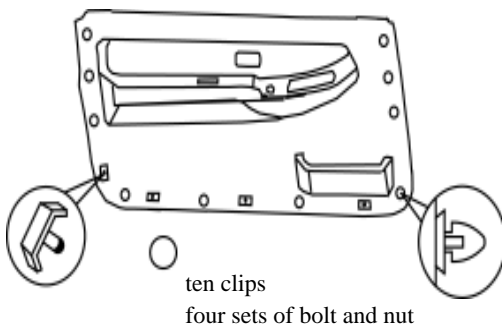
manually operated indoor plate



inner plate of electric door (type A)



inner plate of electric door (type B)



## 5. Tear down the interior trim panel of car door:

- (a) Tear down the inner clip bolts and the inner clip.
- (b) Tear down the door lamp bolts and the door lamp;
- (c) Insert the screwdriver into seam between fixing clip and interior trim panel of car door to loosen the interior trim panel.

Notice: before using the screwdriver, wrap its head with adhesive strap.

- (d) Tear down the interior trim panel of car door.

(Dr SF)

- (a) Tear down the inner clip bolts and the inner clip;
- (b) Tear down the door lamp bolts and the door lamp;
- (c) Tear down the electric switch and panel.
- (d) Insert the screwdriver into the seam between fixing clip and the interior trim panel of car door to loosen the interior trim panel.

Remark: use the adhesive strap to wrap the screwdriver head before using.

- (e) Tear down the interior trim panel of car door.

(SL SK SY SJ)

- (a) Tear down the door lamp bolts and the door lamp;
- (b) Tear down the electric switch and the panel;
- (c) Tear down the screw covers and screws on the indoor trim panel
- (d) Insert the screwdriver into the seam between the fixing clip and the interior trim panel of car door to loosen it.

Notice: use the adhesive strap to wrap the screwdriver head before using.

- (f) Tear down the interior trim panel of car door.

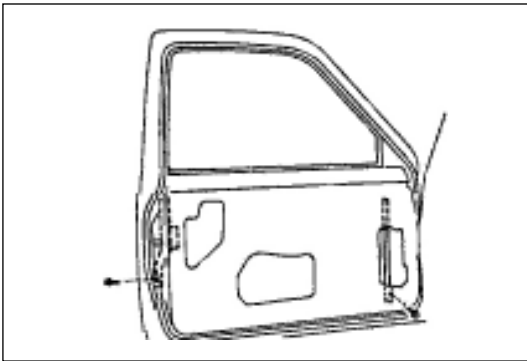
## 6. Tear down the outer auchi

Loosen the clip along the edge of paneling to tear down the outer

## 7. Tear down the door and window glass;

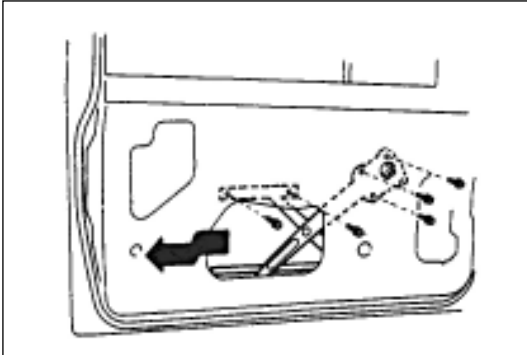
- (a) Tear down the fixing bolts in the two glass sliding-grooves.
- (b) Pull up the glass to take it down.

## 8. Tear down the glass groove on car door.

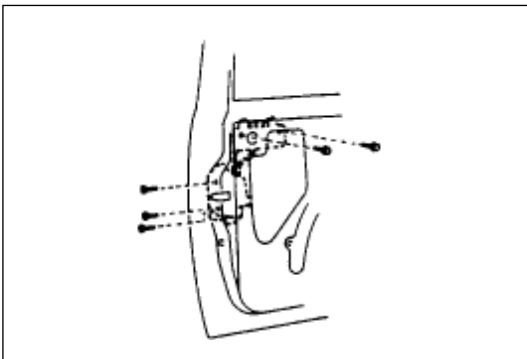


9. Tear down the lower rear glass guide track:  
Tear down the bolts and guide track.

10. Tear down the lower front glass guide track;  
Tear down the bolts and guide track.



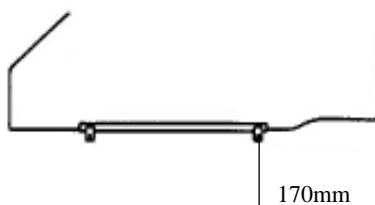
11. Tear down the glass elevator:
  - (a) Tear down the two fixing bolts of small sliding track;
  - (b) Tear down the fixing bolts of three elevators (manually operated)  
Tear down the fixing bolts of four elevators. (electric)
  - (c) Tear down the elevator through the auxiliary hole.



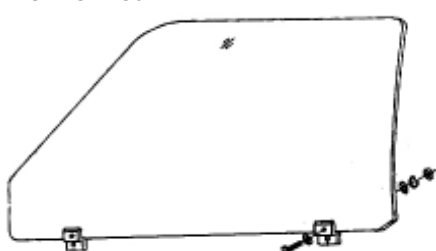
12. Tear down the lock ring inside the vehicle;  
Disconnect the control lever to tear down the lock ring inside the vehicle.

13. Tear down the door lock and outdoor handle with lock barrel;
  - (a) Disconnect the control lever from the outdoor handle with lock barrel.
  - (b) Tear down the 3 bolts and door lock.
  - (c) Tear down the two bolts and outdoor handle with lock barrel.
  - (d) Tear down the spring snapping ring and lock barrel.

Dr. SF



SL. SK. SY. SJ



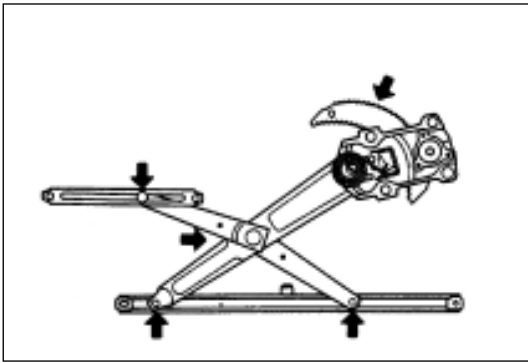
## Change of Glass

(Dr SF)

1. Tear down the glass bracket with screwdriver or similar tool;
2. Coat the black glue on the inside of glass bracket liner;
3. Tap the glass bracket with rubber hammer to encase it in.

(SL SK SY SJ)

1. Tear down the bolts on gear plate with pliers or similar tool;
2. Tear down the bolts of glass bracket of car door to take out the glass.

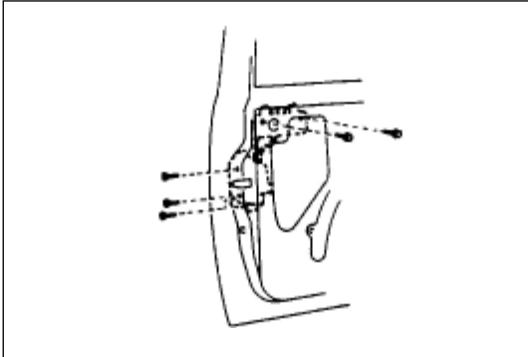


## Assembly of Front Door

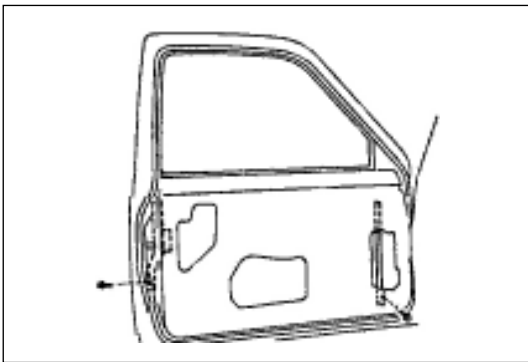
1. Coat the MP lubricant on the parts before mounting.
  - (a) Coat the MP lubricant on the sliding face and the gear of glass elevator.

Notice: Do not plaster the MP lubricant on the spring of glass elevator.

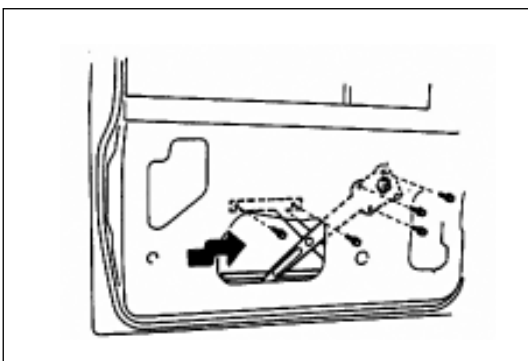
- (b) Plaster the MP lubricant on the sliding face of door lock.



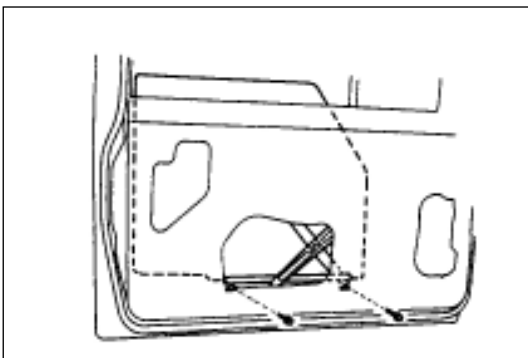
2. Mount the outdoor handle with lock barrel and the door lock;
  - (a) Mount the lock barrel on the outdoor handle with spring snapping ring;
  - (b) Use two bolts to mount the outdoor handle and the lock barrel;
  - (c) Mount the door lock with three screws;
  - (d) Connect the outdoor handle to the control lever.



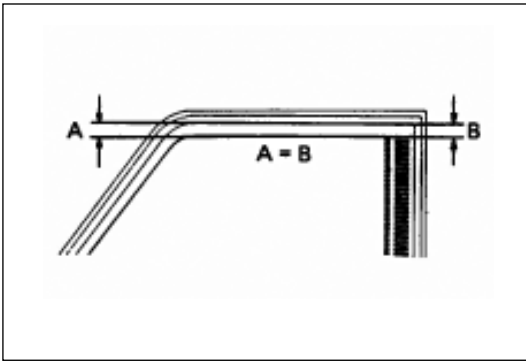
3. Mount the lock ring inside vehicle  
Mount the lock ring inside of vehicle and connect the control lever.
4. Mount the lower rear glass guide track;
5. Mount the lower front glass guide track;



6. Mount the glass elevator:
  - (a) Put in the elevator through the auxiliary hole;
  - (b) Mount on the three fixing bolts of elevator. (manually operated)  
Mount on the four fixing bolts of elevator (electric)
  - (c) Mount the small sliding track, and screw up the bolts of small sliding track temporarily.
7. Mount the glass groove on car door;



8. Mount the car door and window glass;  
Put the glass in the car door cavity, and then use two bolts to fix the glass on the elevator.



9. Adjust the car door and window glass;

Adjust the balance arm upwardly or downwardly until the dimensions of A and B shown in drawing are equal, and then fix the balance arm.

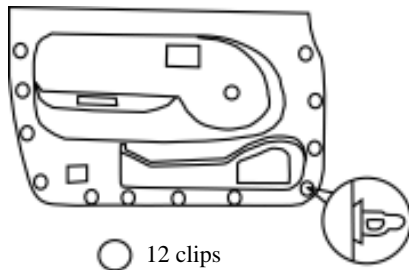
10. Mount the outer

Encase the claw of clip into the paneling seam and press the outer on the paneling.

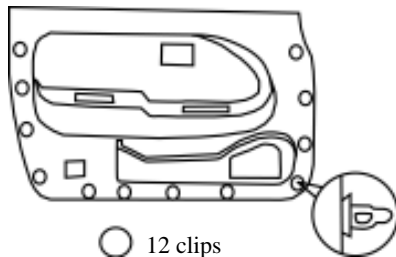
11. Mount the rear vision mirror

12. Mount the interior trim panel of car door:

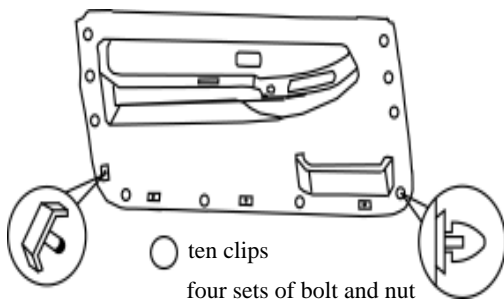
manual indoor plate



Electric indoor plate (Type A)



inner panel of electric door (type B)



(Dr)

- Connect the handle to the control lever first, then pull it out from the indoor handle hole.
- Fix the clip by tapping to encase the interior trim plate of car door in the corresponding hole of car door interior panel.
- Use one screw to mount the inner clip.

(Dr SF)

- Connect the handle to the control lever first, and then pull it out from the indoor handle hole.
- Fix the clip by tapping to encase the interior trim panel in the corresponding hole of car door interior panel
- Mount the inner clip with one screw; and
- Mount the electric switch and panel.

(SL SK SY SJ)

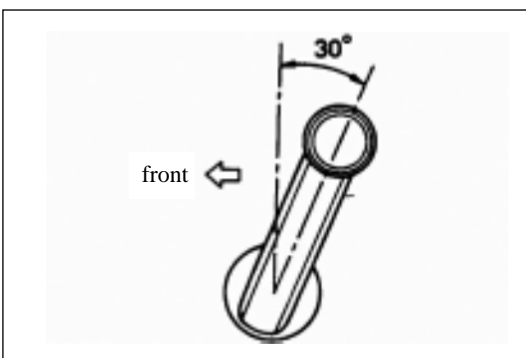
- Connect the handle with the control lever first, then pull out it from the indoor panel handle.
- Connect the plugging elements.
- Fix the clip by light tapping to encase the interior trim panel of car door in the corresponding holes on indoor panel.
- Mount the inner clip with two bolts;
- Mount the four screws to fasten the interior trim panel of car door, and cover the nuts.
- Mount the electric elevator switch.

13. Mount the indoor handle:

- Push the indoor handle into the car door paneling and make it slide backward.
- Screw on the screws;

14. Mount the elevator handle (Dr)

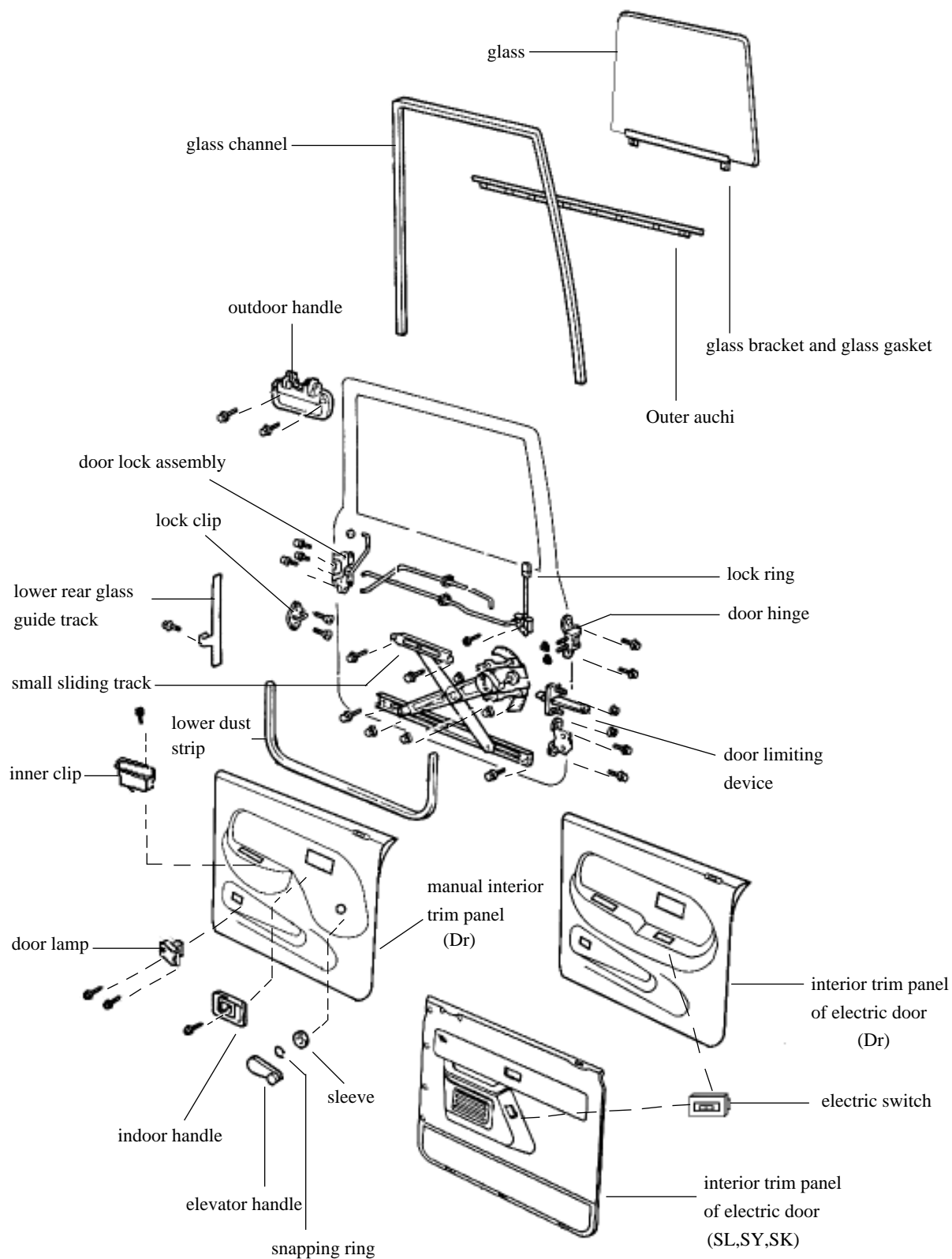
Mount the paneling and elevator handle with spring snapping ring under the condition the car doors and windows are closed completely as shown in drawing.



## Rear Door ( I )

### Element Figure

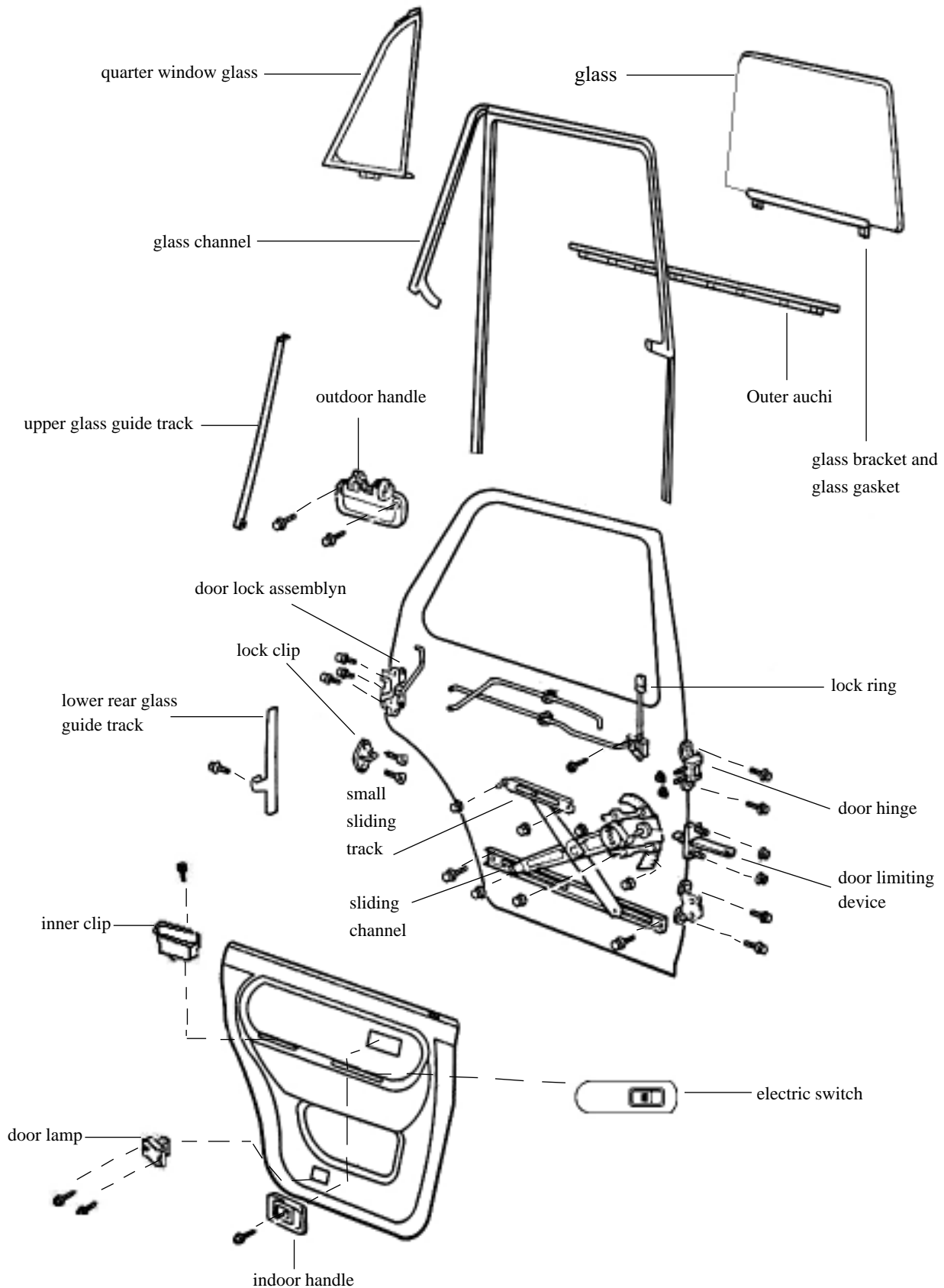
Dr SL SK SY



## Rear Door ( II )

### Element Figure

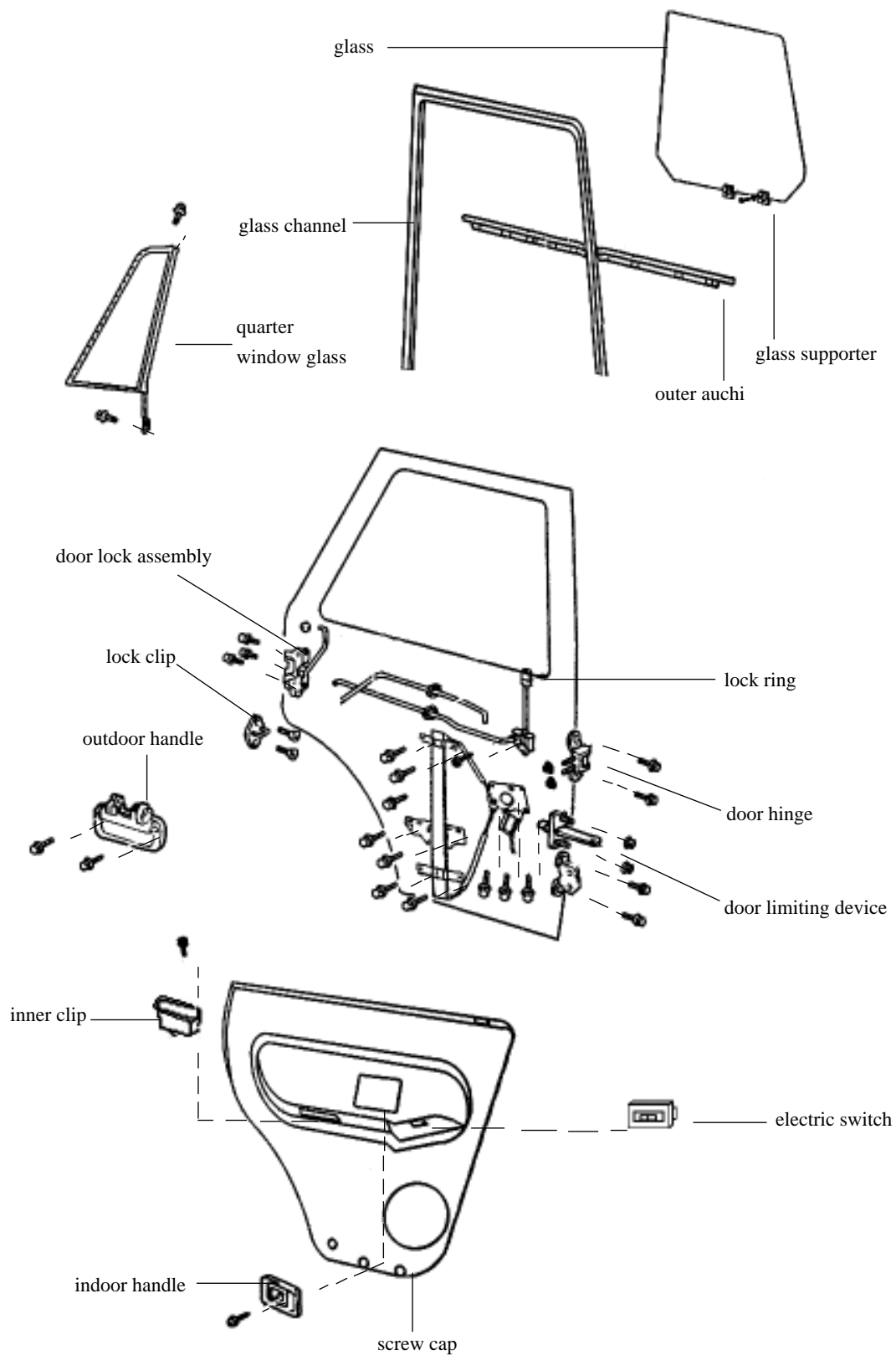
SF

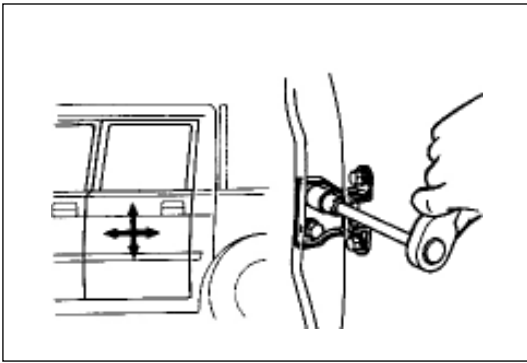


## Rear door(III)

### Element figure

SJ

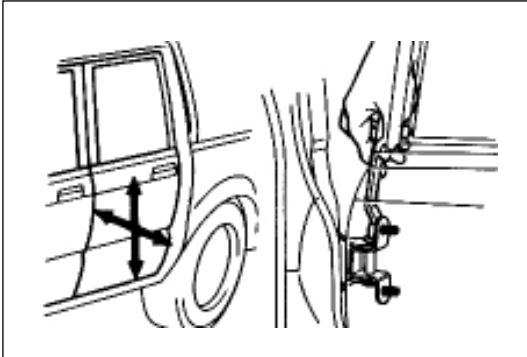




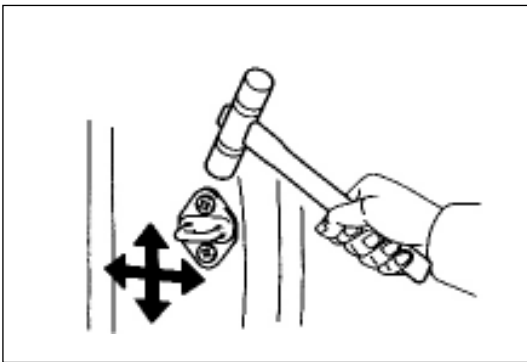
## Adjustment of Rear Door

(Dr SL SK SF SY SJ)

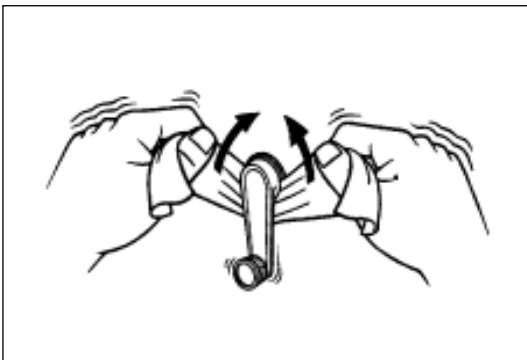
1. Adjust the door along the front-back and vertical direction;  
(upper side)  
Screw off the hinge nuts on the body side for the adjustment.  
(lower side)  
Screw off the hinge nuts on the side body for the adjustment.



2. Adjust the door along the left-right and vertical direction.

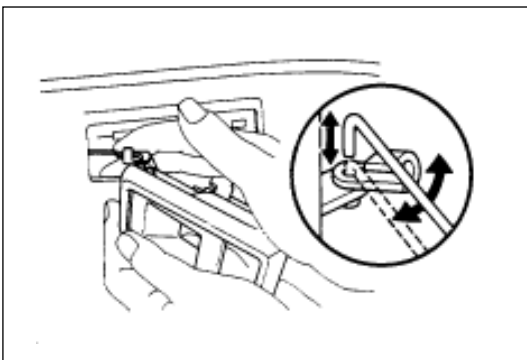


3. adjust the door lock clip
  - (a) Screw off the mounting bolts of lock clip and tap the lock clip with hammer to adjust its position.
  - (b) Screw on the fixing nuts of lock clip.



## Disassembly of Rear Door

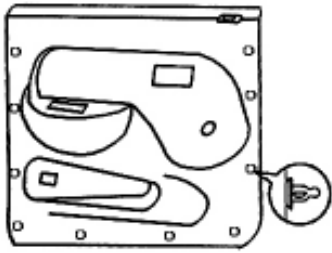
1. Tear down the elevator handle (Dr)  
Pull out the spring snapping ring with dishcloth and tear down the elevator handle and sleeve.



2. Tear down the indoor handle;
  - (a) Take apart the screw and slide the handle forwardly.
  - (b) Take down the handle from the controlrod

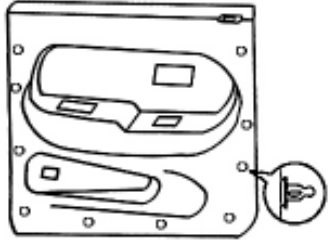


manually operated indoor plate (Dr)



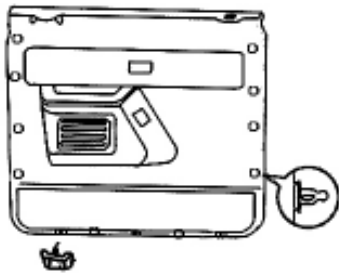
○ ten clips

electric indoor plate (Dr)



○ ten clips

electric indoor plate(SL. SK. SL)



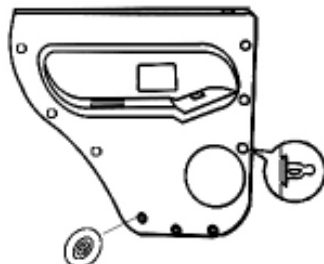
○ eight clips

electric indoor plate(SF)



○ seven clips

electric indoor plate(SJ)



○ six clips

### 3. Tear down the door interior trim panel

(Dr manually operated)

- Tear down the inner clip bolts and inner clip;
- Tear down the door lamp bolts and the door lamp;
- Insert the screwdriver into the seams between fixed clips and the door interior trim panel.

Notice: before using the screwdriver, its head must be wrapped with adhesive strap,

- Tear down the door interior trim panel.

(Dr electric)

- Tear down the inner clip bolts and inner clip;
- Tear down the door lamp bolts and the door lamp;
- Tear down the electric switch and its panel; and
- Insert the screwdriver into the seam between the fixed clip and the door interior trim panel to loose the interior trim panel.

- Tear down the door interior trim panel.

(SL SK SY)

- Tear down the inner clip bolts and inner clip;
- Tear down the electric switch and its panel;
- Tear down the screw cap and screw of door interior trim panel;
- Insert the screwdriver into the seam between the fixed clips and door interior trim panel to loose the panel.

Notice: the head of screwdriver must be wrapped with adhesive strap when using the screwdriver.

- Tear down the door interior trim panel.

(SF)

- Tear down the inner clip bolts and the inner clip;
- Tear down the door lamp bolts and the door lamp;
- Tear down the electric switch and panel;
- Insert the screwdriver into the seam between the fixed clips and door interior trim panel to loose the panel;
- Tear down the door interior trim panel

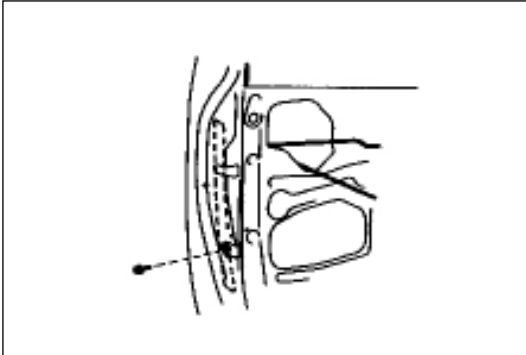
(SJ)

- Tear down the inner clip bolts and the inner clip;
- Tear down the electric switch and panel;
- Tear down the screw caps and screws of door interior trim panel;
- Insert the screwdriver into seam between fixed clips and door interior trim panel to loosen the panel.

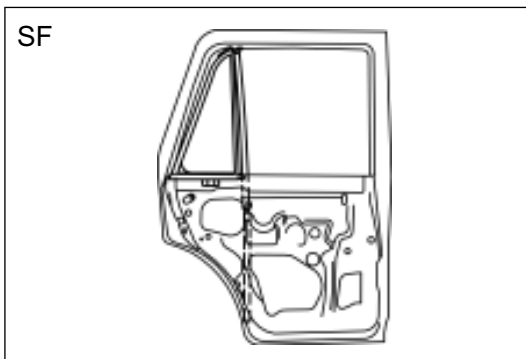
Notice: the screwdriver head must be wrapped with adhesive strap before using the screwdriver.

- Tear down the door interior trim panel.

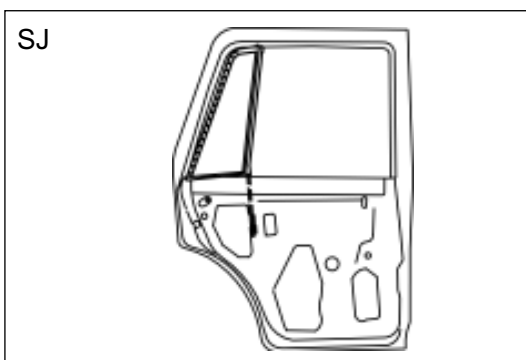
4. Tear down the outer auchi  
Prize the clips alongside the edge of paneling to tear down the outer
5. Tear down the door window glass;(Dr SF SL SK SY SJ)  
Tear down the fixing bolts of two glass channels  
 (a) Pull the glass up to take it down.  
 (b) Pull the glass downwardly to take it down after disassembling the tail door lower baffle and lower dust strip (Dr)



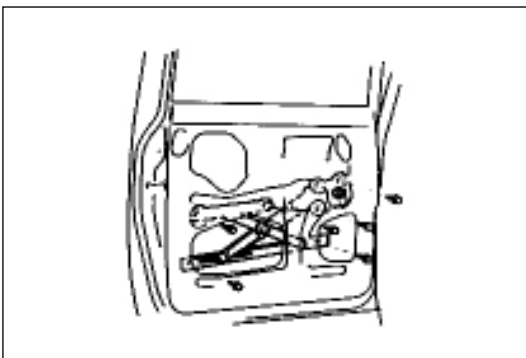
6. Tear down the upper glass guide track (SF)  
Tear down the bolts and guide track.
7. Tear down the lower rear glass guide track (Dr SF);  
Tear down the bolts and guide track.



8. Tear down the quarter window glass (SF SJ)



9. Tear down the door glass channel



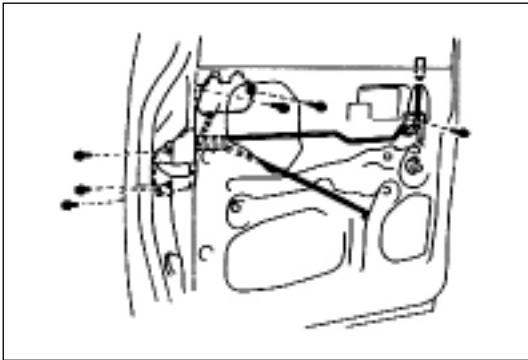
10. Tear down the glass elevator(Dr SF SL SK SY)
  - (a) Tear down the two fixing bolts of small sliding track.
  - (b) Tear down the fixing bolts of three elevators (manually operated)
  - (c) Disassemble the elevator through auxiliary hole.

SJ



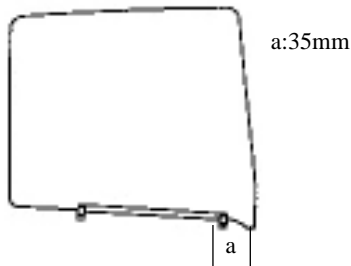
(SJ)

- (a) Tear down the four fixing bolts of elevator bracket;
- (b) Tear down fixing bolts of three elevators;
- (c) Disassemble the elevator through the auxiliary hole.



11. Tear down the lock ring inside the vehicle;  
Disconnect the connecting bar to tear down the lock ring inside vehicle body.
12. Tear down door lock and the outdoor handle with lock barrel:
  - (a) Disconnect the outdoor with lock barrel from the connecting bar.
  - (b) Tear down three screws and door lock.
  - (c) Tear down the two bolts and the outdoor handle with lock barrel.
  - (d) Tear down the spring snapping ring and lock barrel.

Dr

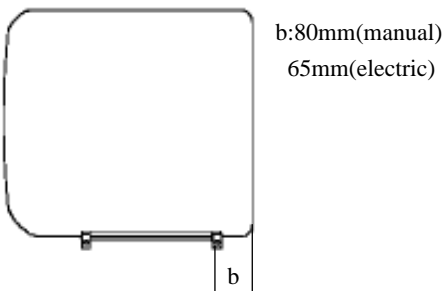


## Change of Glass

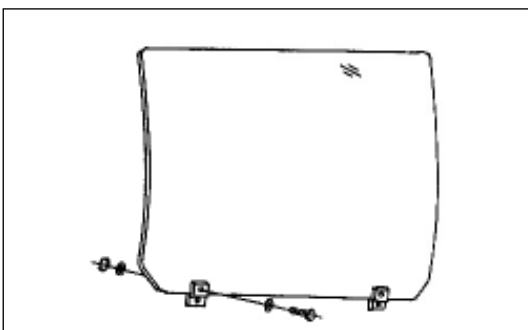
(Dr SF)

1. Tear down the glass bracket with screwdriver or similar tool.
2. Coat the black glue on the inner side of glass bracket liner.
3. Tap the glass bracket with rubber hammer to encase it.

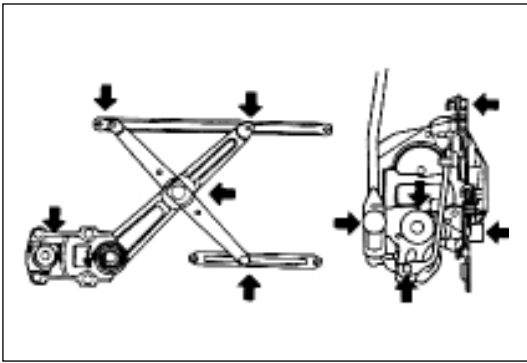
SF



Tear down the bolts on gear panel with the pliers or similar tool.



4. Tear down the bolts of door window glass bracket to take the glass out.

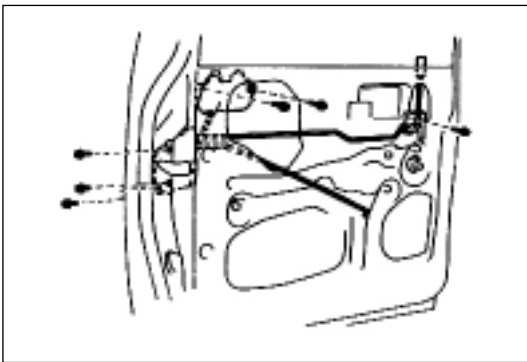
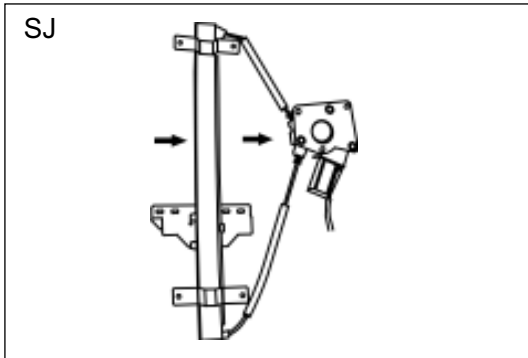


## Assembly of rear door

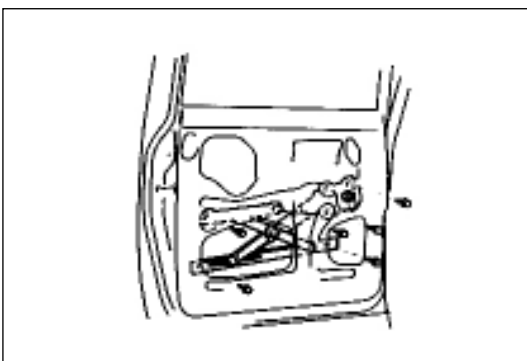
1. Coat the MP lubricant on the parts before mounting
  - (a) Coat the MP lubricant on the sliding face and gear of glass elevator;

Notice: Do not coat the MP lubricant on the spring of glass elevator.

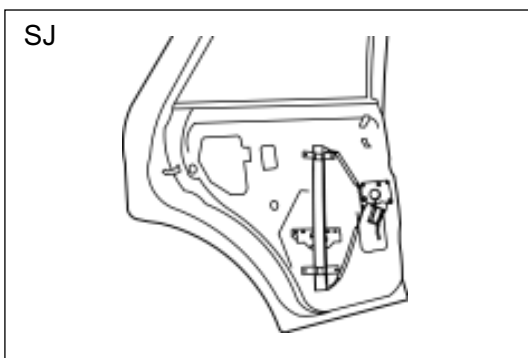
  - (b) Coat the MP lubricant on the sliding face of door lock.



2. Mount the outdoor handle with lock barrel and door lock:
  - (a) Mount the lock barrel on the outdoor handle with spring snapping ring.
  - (b) Mount the outdoor handle and the lock barrel with two bolts;
  - (c) Mount the lock door with three screws; and
  - (d) Connect the connecting bar to the outdoor handle.
3. Mount the inside lock ring  
Mount the inside lock ring and connect the connecting bar.



4. Mount the glass elevator:
  - (a) Put in the elevator through the auxiliary hole;
  - (b) Mount three fixing bolts of elevator (for manually-operated elevator);  
Mount four fixing bolts of elevator (for electric elevator)
  - (c) Mount the small sliding track and tighten the fixing bolts temporarily;



(SJ)

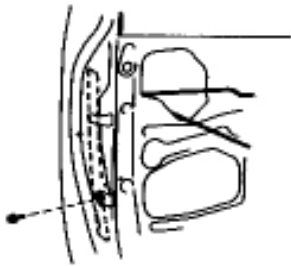
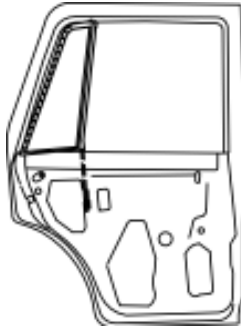
- (a) Put in the elevator through the auxiliary hole;
- (b) Mount three fixing bolts of elevator;
- (c) Mount four fixing bolts of elevator bracket.

SF

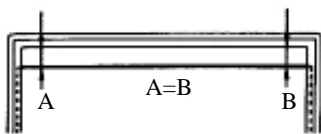


5. Mount the door glass channel;
6. Mount on the quarter window glass (SF SJ)
7. Mount the upper glass guide track (SF)  
Mount the bolts and guide track.

SJ

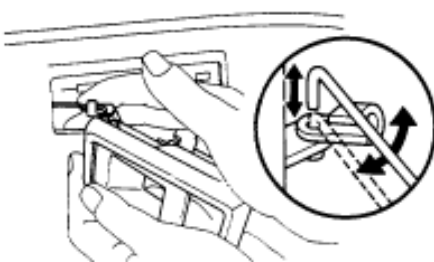


8. Mount lower rear glass guide track (Dr SF)  
Mount the bolts and guide track.
9. Mount the door window glass;  
(Dr SF SL SK SY SJ)  
Put the glass in the door cavity and then fix the glass on the glass elevator with two bolts.  
Mount on the tailgate baffle and lower dust strip (Dr)

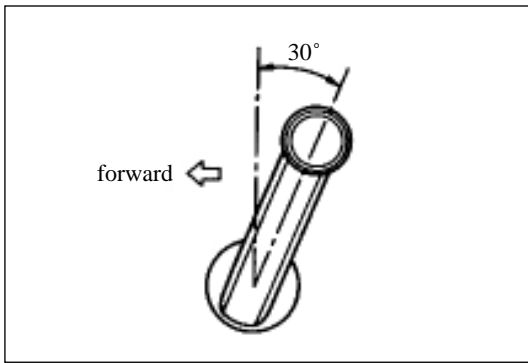


10. Adjust the door window glass  
Adjust the balance arm upwardly or downwardly until the dimensions A and B shown in the drawing are equal, and then fix the balance arm.

11. Mount the outerauchi



12. Mount the door interior trim panel;
13. Mount the indoor handle:
  - (a) Push the indoor handle in the door paneling and slide it backwardly.
  - (b) Tighten the screws.



#### 14. Mount the elevator handle (Dr)

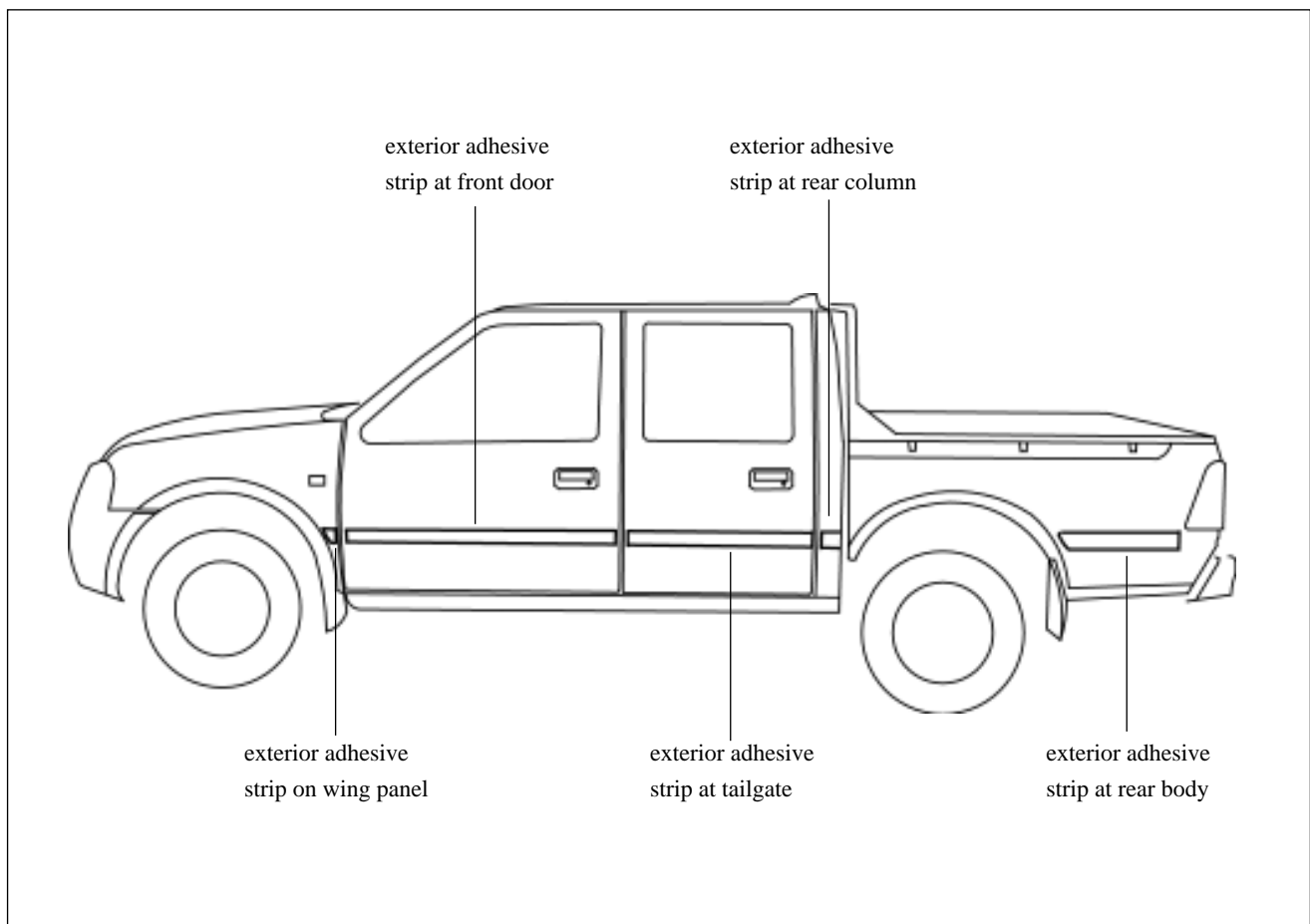
Mount the paneling and elevator handle with spring snapping ring as shown in the drawing under the condition that the all of doors and windows of vehicle are closed.

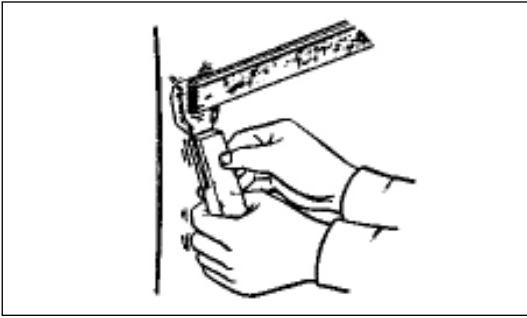
## Adhesive strip of body collision avoidance

Notices on storing the adhesive strip of body collision avoidance:

1. The adhesive strip should be stored in the cool shadow place where can avoid the direct lighting of sun, the high temperature and the dust.
2. As the adhesive strip is the PVC product, do not make it touch the paint thinner, other solvents and the boiling water.
3. The limit storage period of adhesive strip is 9 months.

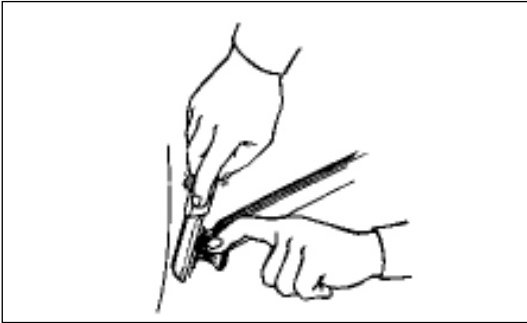
Element figure





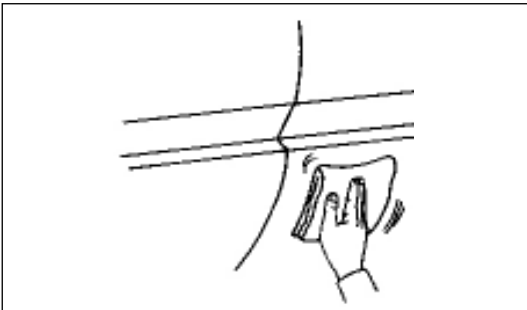
## Disassembly of adhesive strip of body collision avoidance

1. Tear down the ends of adhesive strip;  
Loosen the ends of adhesive strip for 31 mm with the scraper.



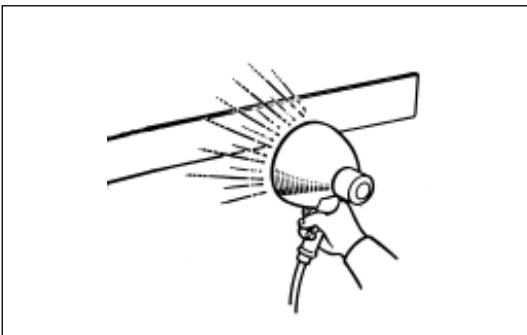
2. Tear down the adhesive strip and clear away the adhesive agent;
  - (a) Cut down the adhesive agent with knife and pull down the adhesive strip;
  - (b) Clear away the adhesive agent with knife or abrasive paper.

Remark: Do not reuse the adhesive strip that is disassembled.



## Mount of adhesive strip of body collision avoidance

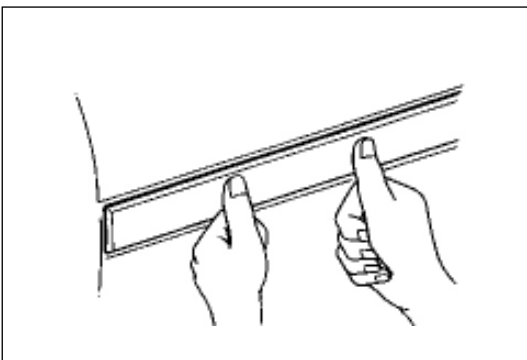
1. Clean the mounting face of adhesive strip;  
Scrape the feculence with cleaning materials.



2. Heat the adhesive strip;  
Heat the new adhesive strip with heating lamp to the 30°C – 60°C .  
Notice: do not overheat the adhesive strip and the temperature should not higher than 80°C .

3. Pull out the separation paper from the adhesive strip surface;

Remark: notice should be taken not to let the feculence and dust enter into when separating the separation paper.



4. Mount the adhesive strip along with the body pinching line.  
Mount the adhesive strip along with the body pinching line as shown in the drawing.

Remark: the convex and concave line of the adhesive strip should be in consistent with the body pinching line.

Notice:

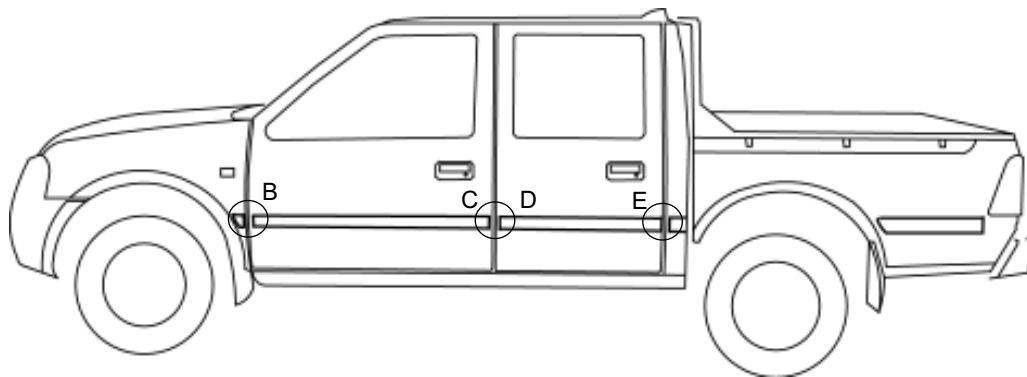
1. Heat the body and adhesive strip to the moderate temperature;
2. Press the adhesive strip with thumb and exert moderate pressure so as to ensure the mount is fastening.
3. Do not wash the vehicle within 24 hours once the mount is finished.



## Adhesive strip of body collision avoidance ( I )

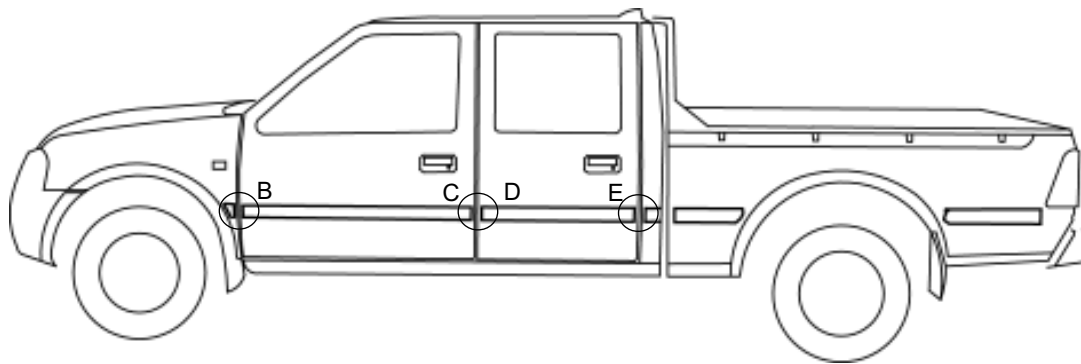
## Element mounting position

SL small double-row model



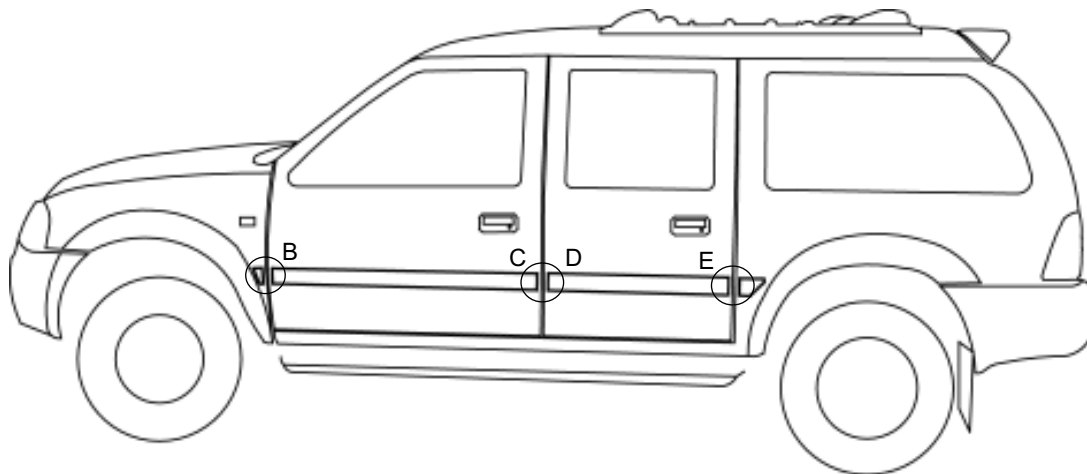
B: 7 mm  
C: 3 mm  
D: 10 mm  
E: 4 mm

SLbig double-row model



B: 7 mm  
C: 3 mm  
D: 10 mm  
E: 4 mm

SY

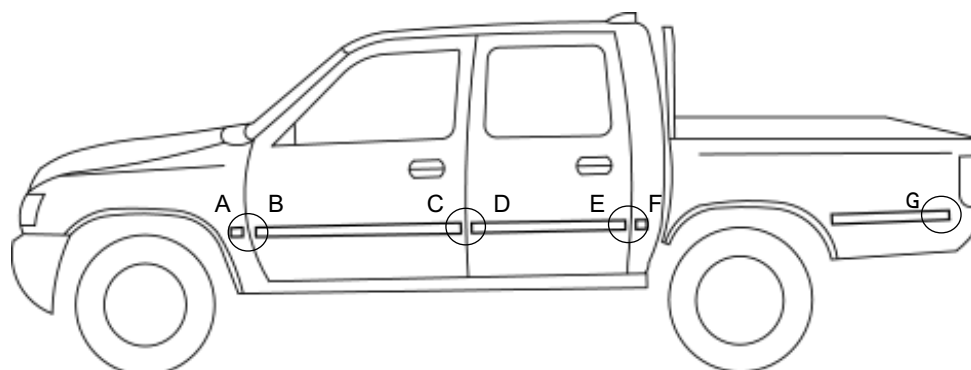


B: 7 mm  
C: 3 mm  
D: 10 mm  
E: 4 mm

## Adhesive strip of body collision avoidance ( II )

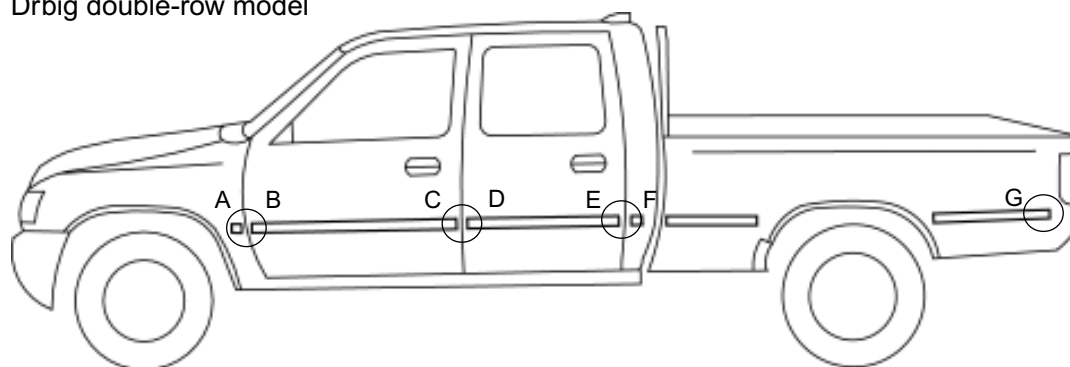
## Element mounting position

Drsmall double-row model

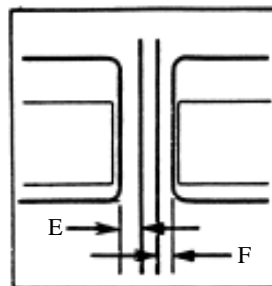
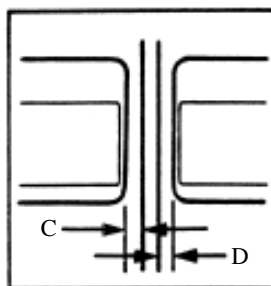
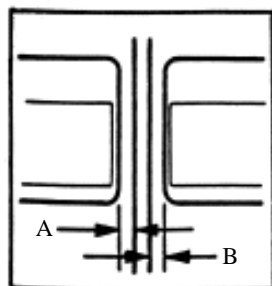


- A: 2 mm
- B: 3 mm
- C: 3 mm
- D: 3 mm
- E: 6 mm
- F: 2 mm
- G: 18 mm

Drbig double-row model



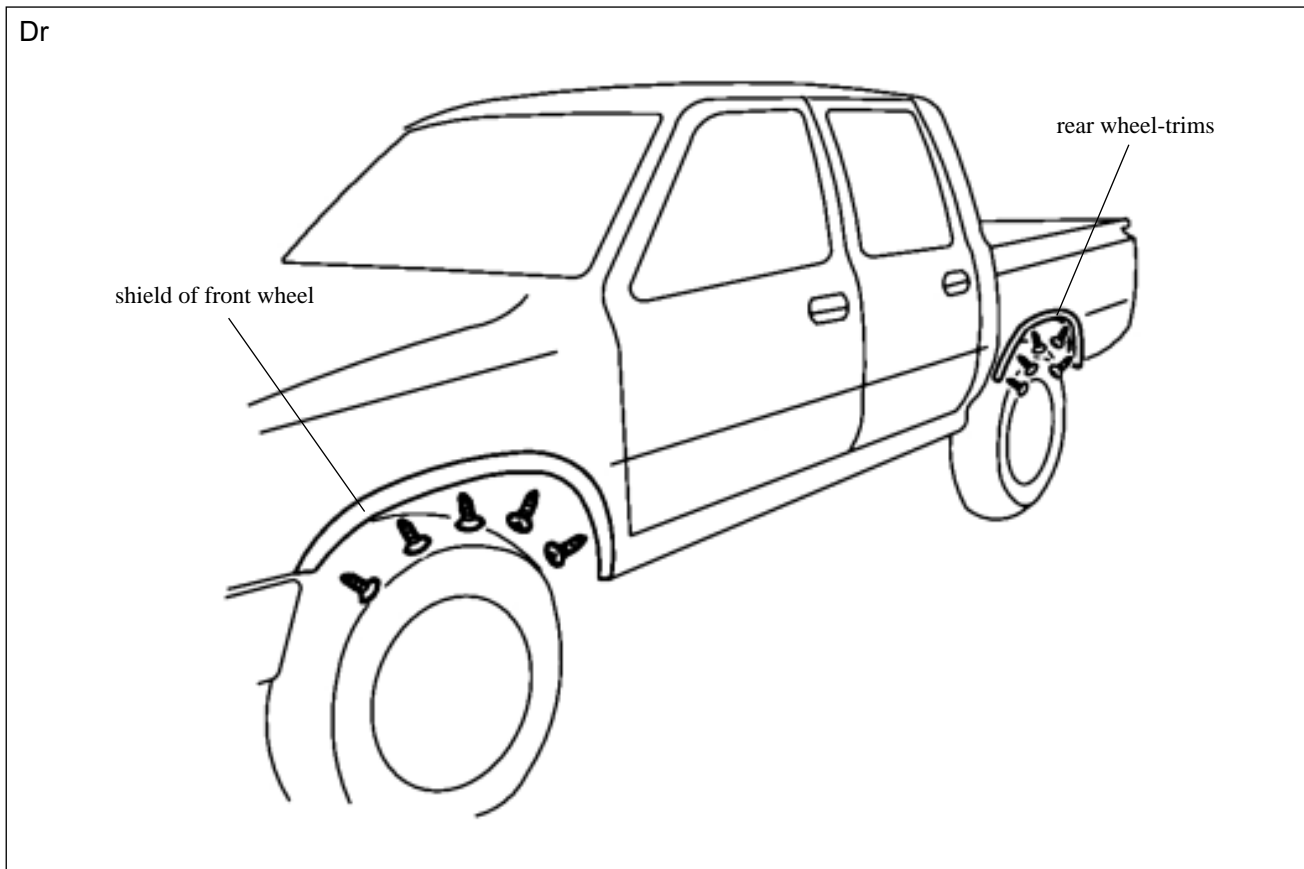
- A: 2 mm
- B: 3 mm
- C: 3 mm
- D: 3 mm
- E: 6 mm
- F: 2 mm
- G: 18 mm



## Wheel-trims

Wheel-trims of stainless steel

Element mounting position



### Change of shield of front wheel

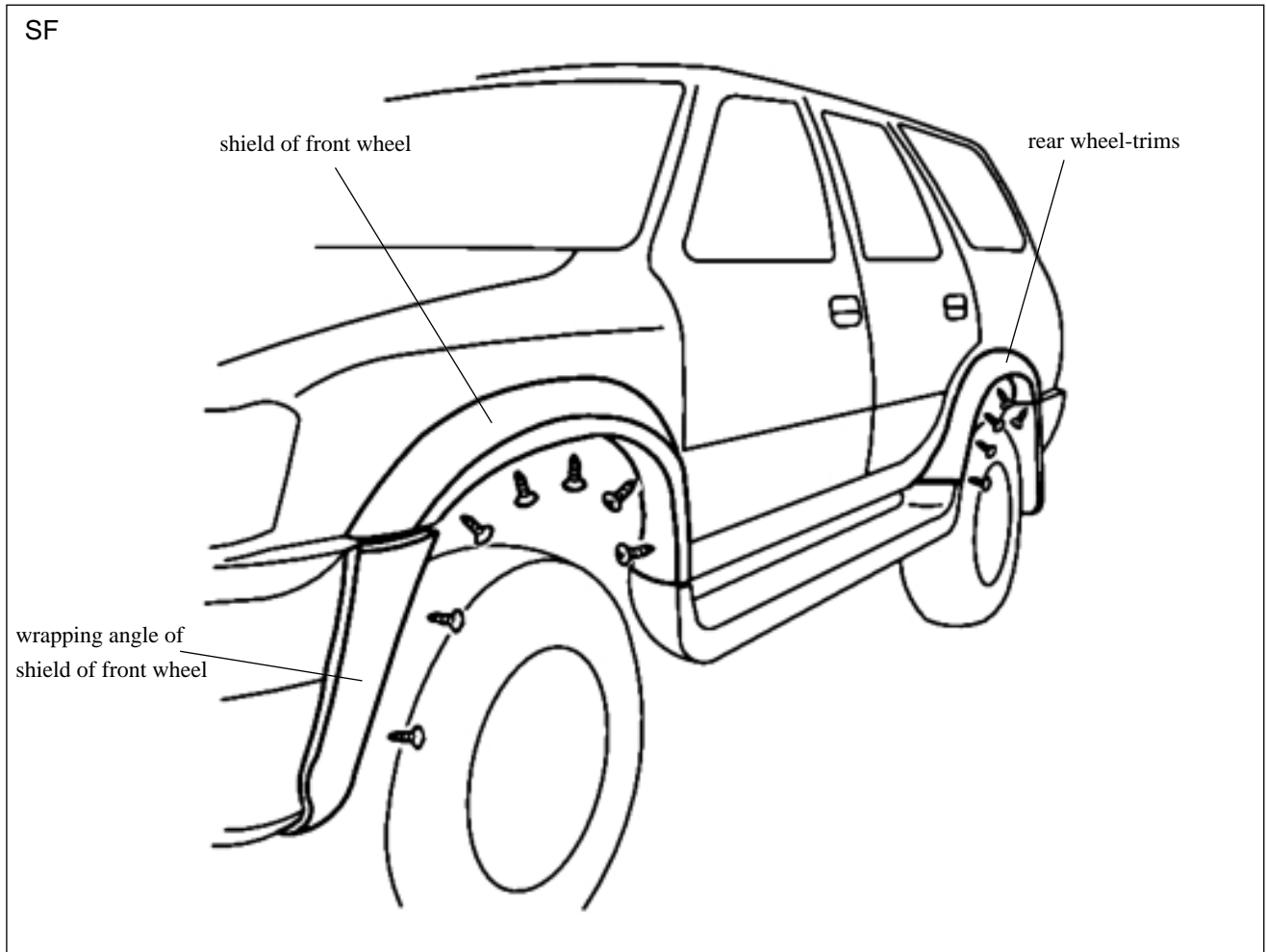
1. Tear down the shield of front wheel;  
Tear down the five screws to take down the Wheel-trims;
2. Mount the shield of front wheel
  - (a) Tap the front shield manually to ensure it contact the body closely.
  - (b) Mount the five screws.

### Change of rear Wheel-trims

1. Tear down the rear Wheel-trims.  
Tear down the five screws and take down the Wheel-trims.  
Prize up the snapping plate of Wheel-trims with screwdriver to take down the Wheel-trims (SF)
2. Mount the rear Wheel-trims:
  - (a) Tap the rear Wheel-trims manually to ensure it contacts the body closely.
  - (b) Mount the five screws.  
Clamp the Wheel-trims with snapping plate. (SF)

## large wheel trims

### Element mounting position



### Change of shield of front wheel and wrapping angle

1. Tear down the shield of front wheel and wrapping angle;  
Tear down the seven screws and take down the Wheel-trims.
2. Mount the shield of front wheel:
  - (a) Mount the adhesive strip of Wheel-trims first, ensure the adhesive strip contact the Wheel-trims closely;
  - (b) Mount the five screws.
3. Mount the wrapping angle of the front Wheel-trims.  
Mount the wrapping angle on the front bar first, and then fix it with two screws.

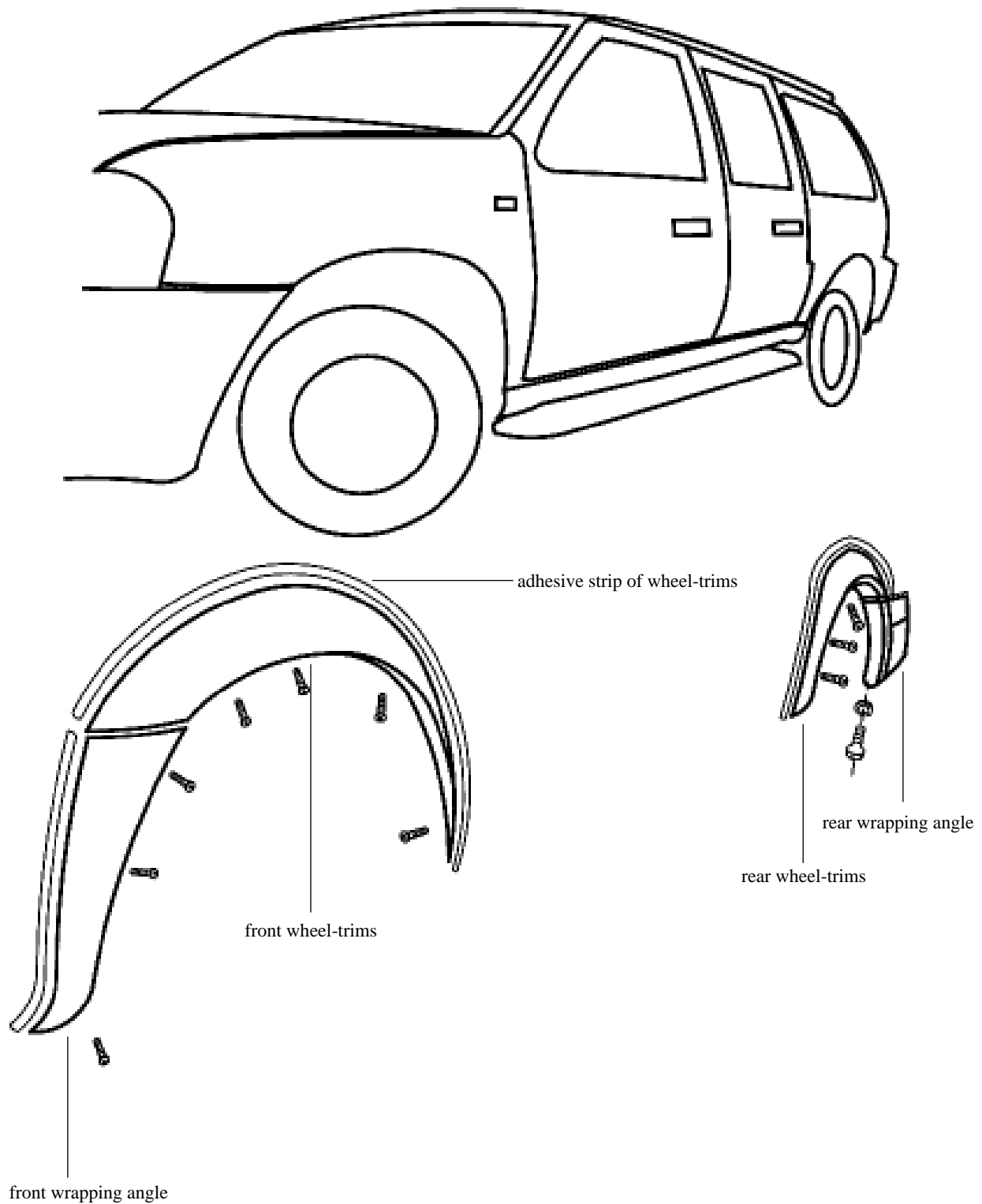
### Change of rear wheel-trims

1. Tear down the rear Wheel-trims  
Tear down the five screws and take down the Wheel-trims;
2. Mount the rear Wheel-trims
  - (a) Mount the adhesive strip of Wheel-trims first, ensure the adhesive strip contact the Wheel-trims closely;
  - (b) Mount the five screws

## Wheel-trims wrapping angle and exterior trim panel ( I )

### Element mounting position

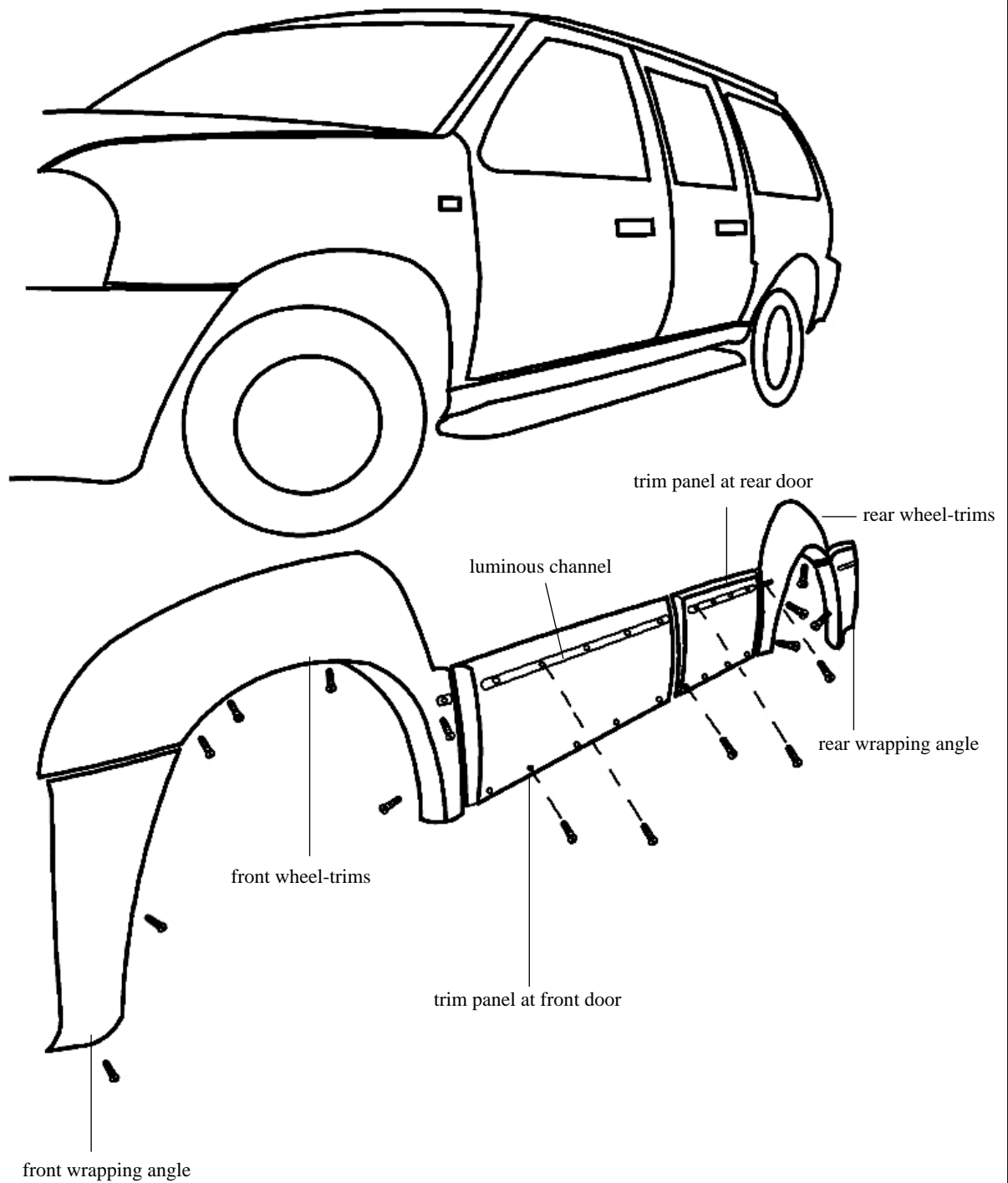
SY



## Wheel-trims wrapping angle and exterior trim panel ( II )

## Element mounting position

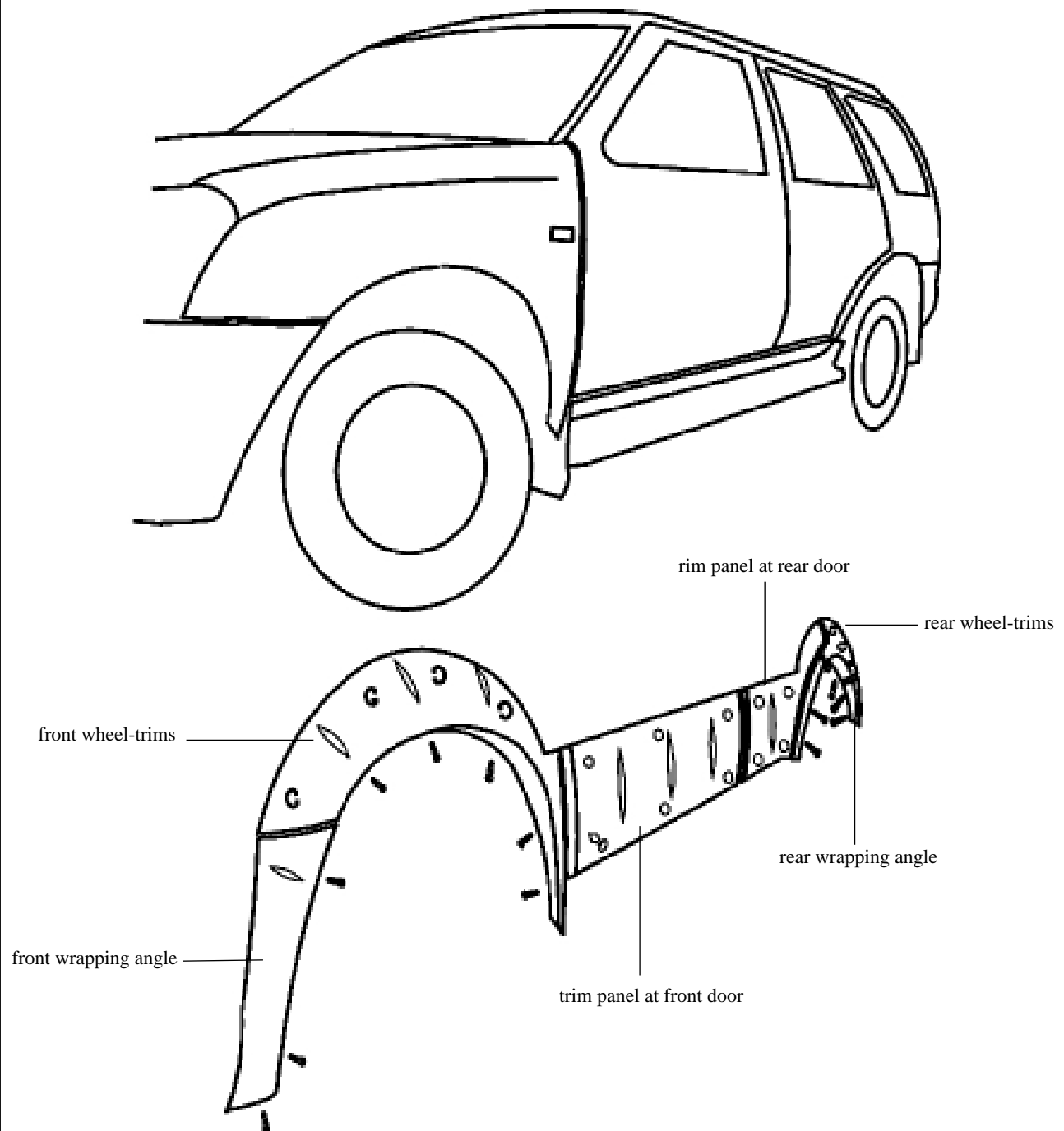
Top-grade SY



## Wheel-trims wrapping angle and exterior trim panel (III)

### Element mounting position

SJ



SJ



## Change of front wrapping angle

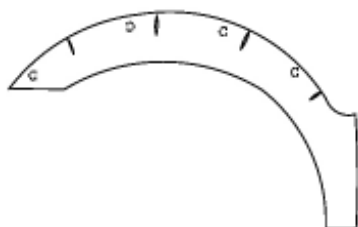
### 1. Tear down the front wrapping angle;

Tear down the three screws and take down the front wrapping angle and adhesive strip of wrapping angle lightly (there is two screws in top-grade SY vehicle)

### 2. Mount the front wrapping angle

- Mount on the three screws (mount two screws for top-grade SY vehicle)
- Contact the front wrapping angle with the front bar closely, and the seam between the front wrapping angle and the front Wheel-trims should be even with a smooth transmission (by the way, the adhesive strip of wrapping angle should be pressed tightly and evenly)

SJ



## Change of front Wheel-trims

### 1. Tear down the front Wheel-trims

Tear down the four screws and the pressing plate of mudguard, and take down the front Wheel-trims and adhesive strip of Wheel-trims tightly (SY)

Tear down the five screws and the pressing plate of mudguard, and take down the front Wheel-trims and adhesive strip of Wheel-trims tightly (SJ)

Tear down the four screws and uncover the lighting channel of the front Wheel-trims, take down the front Wheel-trims after tearing down one screw (top-grade SY).

### 2. Mount the front Wheel-trims

- Flush the front end of front Wheel-trims with the lower edge of wing panel; the adhesive strip of wheel-trims should be pressed tightly and evenly. (SY)

Flush the front end of front Wheel-trims with the lower edge of wing panel, the rear end of front Wheel-trims with rear edge of wing panel. (top-grade SY SJ)

- Mount the four screws (five screws for SJ model) and the pressing plate of mud guard and stick the lighting strip. (top-grade SY)

SJ



## Change of trim panel at front door

### 1. Tear down the trim panel at front door;

Prize up the clip of trim panel at front door and take down the trim panel at front door. (SJ)

Uncover the luminous strip to tear down the five screws, then open the front door and take down the trim panel at front door after tearing down the five screws. (top-grade SY)



Top-grade SY

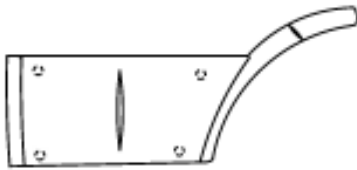


## 2. Mount the trim panel at front door;

- Flush the arc lines of the front and rear ends of trim panel at front door in consistent with the door waist line, and the rear end should flush with the rear end of front door, but the front end should not interfere with the wing panel.
- Tap the positions of six clips of trim panel at front door manually to mount it on.(SJ)

Mount the five screws at upper part after aligning the holes, and mount the five screws at lower part from the inside, then stick the luminous strip. (top-grade SY)

SJ



## Change of trim panel at rear door

### 1. Tear down the trim panel at rear door

Take down the trim panel at rear door after tearing down one screw and four clips. (SJ)

Uncover the luminous strip to tear down the four screws, and then open the rear door to tear down the four screws inside so as to take down the trim panel at rear door. (top-grade SY)

Top-grade SY

Top-grade SY



## 2. Mount the trim panel at rear door

Tap the positions of four clips of trim panel at rear door manually to mount it on, meanwhile mount the one screw at upper part of rear edge. (SJ)

Mount the four screws at upper part after aligning the holes, and mount the four screws at lower part from the inside, then stick the luminous strip. (top-grade SY)

SJ



## Change of rear Wheel-trims

### 1. Tear down the rear Wheel-trims;

Tear down the three screws and take down the rear Wheel-trims and the adhesive strip of Wheel-trims. (SY)

Take down the rear Wheel-trims after tearing down the three screws. (SJ)

Tear down the three screws and uncover the luminous strip on rear Wheel-trims, take down the rear Wheel-trims after tearing down the two screws. (top-grade SY)

## 2. Mount the front Wheel-trims

- Flush the front end of rear Wheel-trims with the edge line of rear door, the rear end of the Wheel-trims with the rear wrapping angle, the seam should be smooth with even transmission. (top-grade SY SJ)
- Mount the three screws (and mount two screws at the position where the luminous strip is stickled).

Top-grade SY



## Change of rear wrapping angle

### 1. Tear down the rear wrapping angle;

Tear down the three nuts, one screw and one self-drilling screw, and then take down the rear wrapping angle, the rear mudguard and the adhesive strip. (SY)

Tear down the four screws and then take down the rear small Wheel-trims. (SJ)

Tear down one screw and three bolts to take down the rear wrapping angle (top-grade SY)

### 2. Mount the rear wrapping angle

(a) Parallel the rear wrapping angle with the body waist line, and contact the body with rear bar closely. (the adhesive strip of wheel trims of SY model vehicle should be pressed tightly and evenly)

(b) Mount two bolts through the body bracket, wrapping angle and mudguard, and another bolts should be mounted to connect the rear bar bracket and the wrapping angle. Then mount on one screw and one self-drilling screw. (SY)

Flush the rear small Wheel-trims and the rear Wheel-trims, then mount on the four screws (SJ)

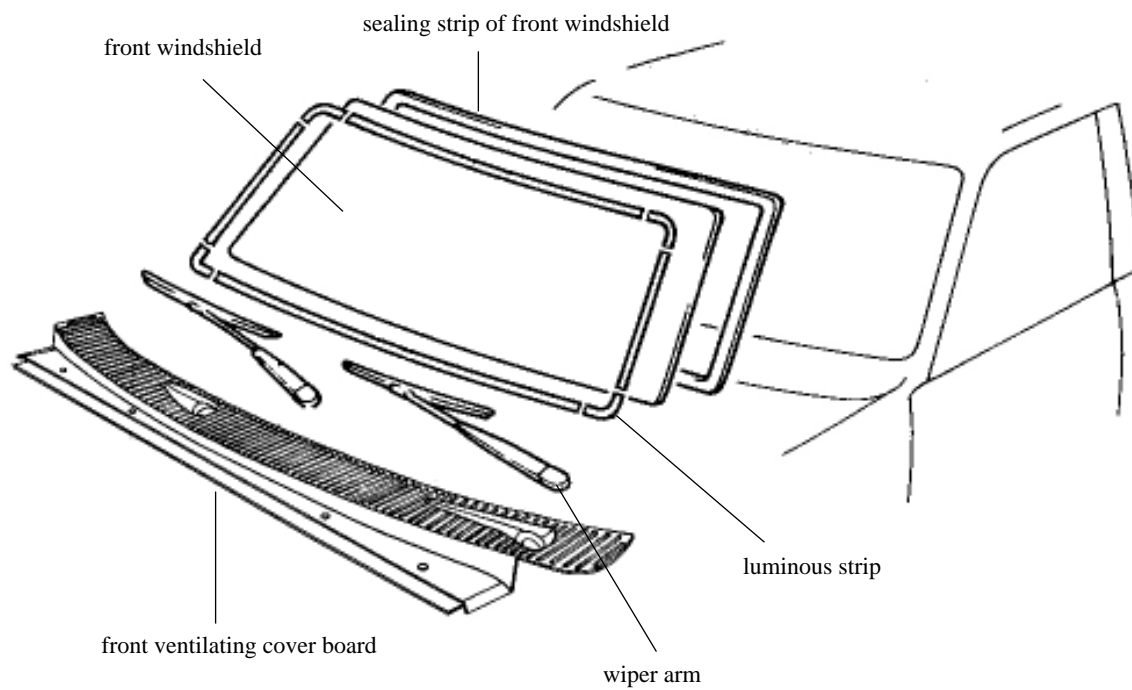
Mount on one screw and the other three bolts through the body bracket, rear bar and wrapping angle. (top-grade SY)

Notice: the parts mentioned above should be carefully disassemble or assemble to avoid of paint face scrape

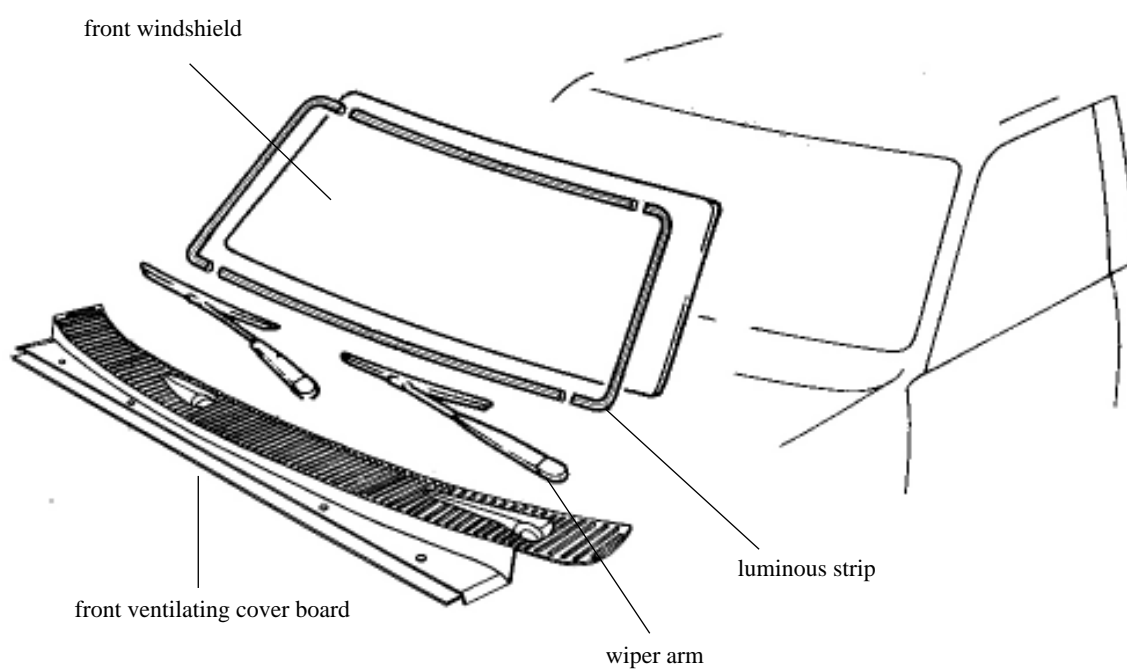
## Front Windshield ( 1 )

### Element mounting position

Dr

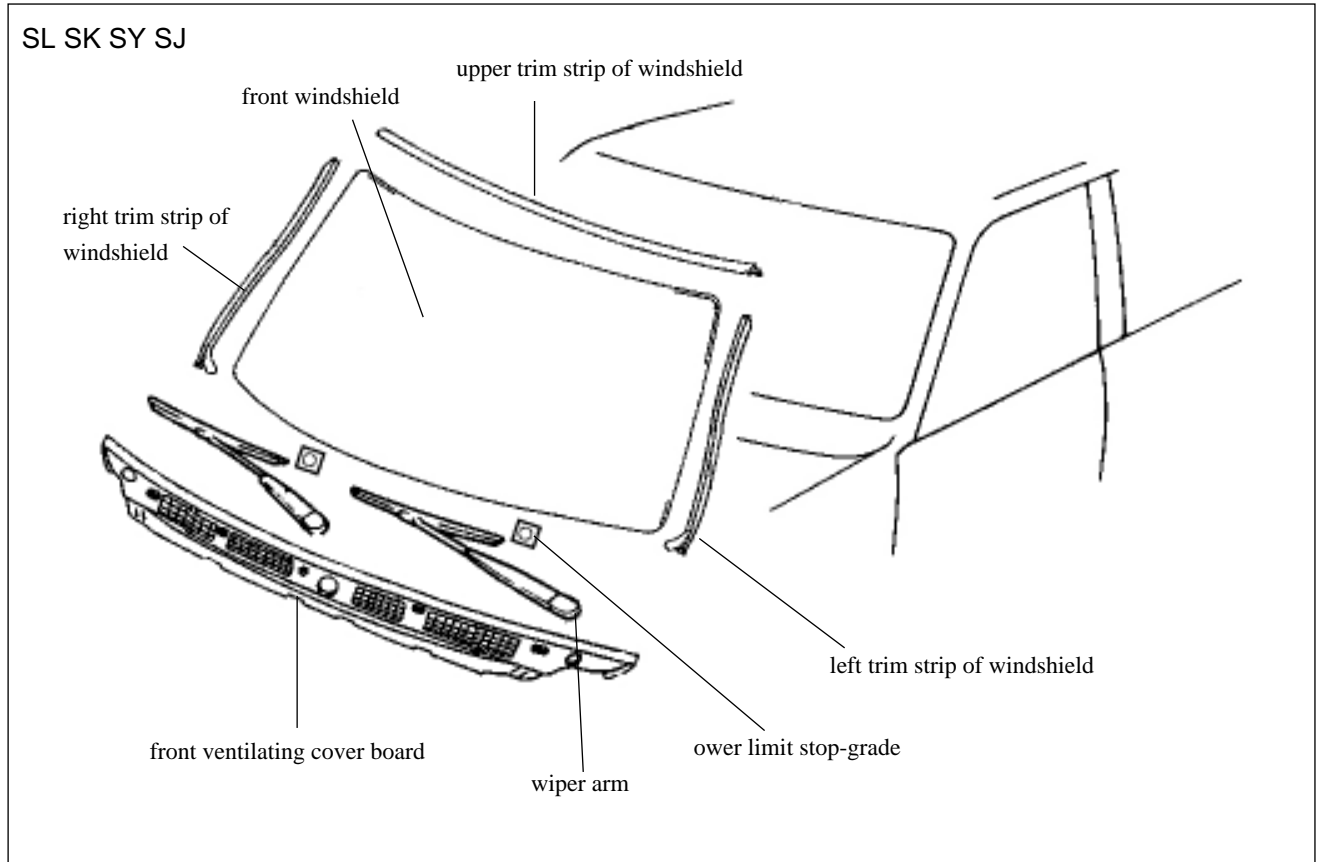


SF



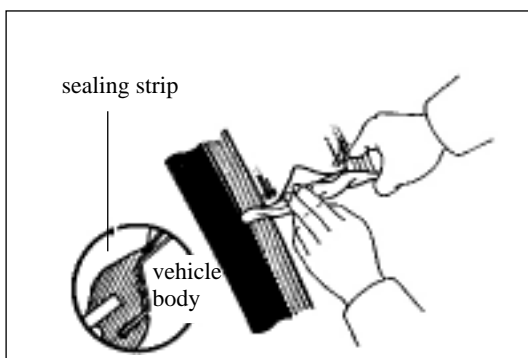
## Front windshield ( II )

### Element mounting position



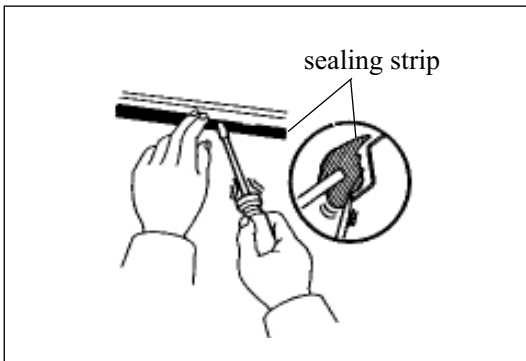
### Dismantle of front windshield

1. Tear down the following parts:
  - (a) The wiper arm;
  - (b) The front ventilating cover board;



2. Tear down the front windshield;
  - (a) Use the screwdriver to prize the sealing element from the body.

Notice: be careful not to damage the paint on body.



- (a) Prize the lips of sealing strip from the inside of body flange outwardly;
- (b) Pull out the glass to take it down together with the sealing strip.
- (c) Take out the glass from the sealing strip.



In case new sealing strip is used:

- (a) Prize the lips of the sealing strip from the inside of body flange outwardly;
- (b) Pull out the glass to take it down;
- (c) Tear down the old sealing strip.

Notice: be careful not to damage the body and glass.

Cut a small open in the sealing agent between the glass and the vehicle body, then insert a steel wire in the open to pull is to and fro slowly until the sealing agent is separated completely, then pull out the glass to take it down.

Notice: be careful not to damage the body and glass.

## Mount of front windshield

1. Clean the body frame and the glass.

Clear away the sealing agent on the body surface completely, then clean the contacting face of body and glass with cleaning materials.

2. Clean the sealing strip;

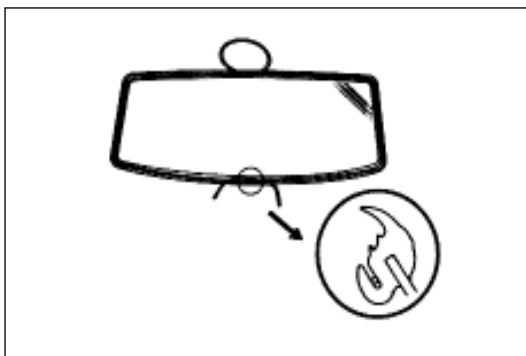
Clean the sealing strip surface with cleaning materials.

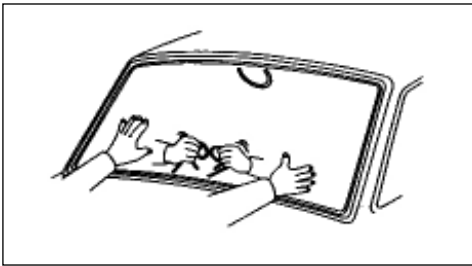
3. Encase the front windshield in the sealing strip (Dr)

- (a) Coat the silicon oil around the glass, and mount the adhesive strip on the glass according to the glass shape.

Notice: if the adhesive is stiffening or deforming, it may result the water leakage, therefore, change with the new one where possibly.

- (b) Mount a rope alongside the sealing strip groove as shown in the drawing for operation, (fasten the rope inside of the adhesive strip, rope diameter:  $\varnothing = 4\text{mm}$ )



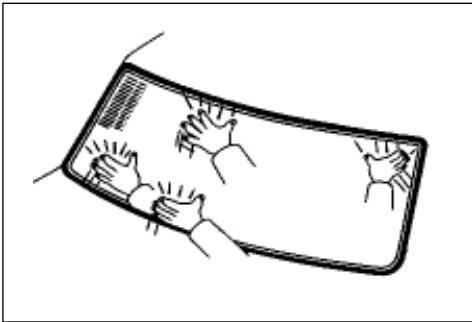


## 4. Mount of front windshield.

Dr

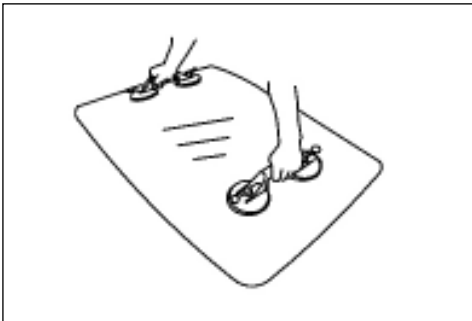
- Lay the ready glass against the corresponding position of front windshield opens.
- Pull the rope from the inside of body to encase the roof, the front column and the door frame within the adhesive strip, meanwhile push the outside of the glass by hand.
- Tap the four edges of the adhesive strip to ensure that the adhesive strip contact closely with the body windshield opened.
- Coat the glue from left to right at the upper part of windshield (location between the adhesive strip and the body windshield open) and the lower part of windshield (location between the adhesive strip and glass), and the remaining glue should be cleared away with abrasive paper, and the location should be cleaned with cloth.

Notice: there should no breakage at the sealing glue seam when coating the glue.



SL SK SF SY SJ

- Suck the front windshield with two sucking discs and put the glass on the worktable in reverse direction.
- Seize the upper trim strip of front windshield at the position of upper glass edge.
- Coat the cleaning active agent on the inside edges around the front windshield (the black glass edges), airing for 3~5 min, then coat the priming paint on the layer of cleaning active agent, and airing for 5 to 30 min, finally coat the sealing agent.



Notice: no breakage should be allowable at the sealing glue seam when coating.

Recommended sealing agent for use:

(SF)

Glass glue TS-100 PVC windshield glue

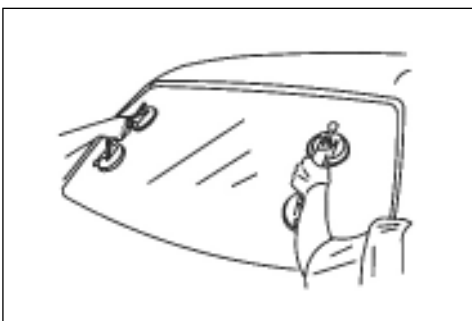
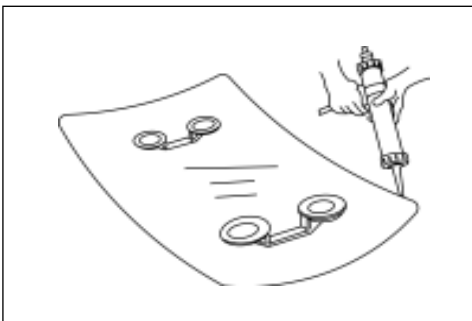
Priming paint TS-5028

Cleaning active agent TS-7016

(SL SK SY SJ)

Glass glue TEROSTAT-8590 windshield glue

Priming paint TEROSTAT-8511



- Clean the body windshield open completely with cotton cloth to coat the priming glue, airing for 5 min or so, and then stick the front windshield to the windshield open.
- Fix the left/right trim strip of front windshield at the edges of windshield open.
- Fix the lower trip strip of front windshield with screw at the cliques of lower glass edge. (SF)
- Stick the upper edge of front windshield to the body with transparent adhesive strip so as to prevent the glass from lowering.

Notice:

- (a) Clear away the redundant glue from the body completely.
- (b) The vehicle should not be driven after 4 hours in summer and 8 hours in winter under common circumstances.

5. Mount the following parts:

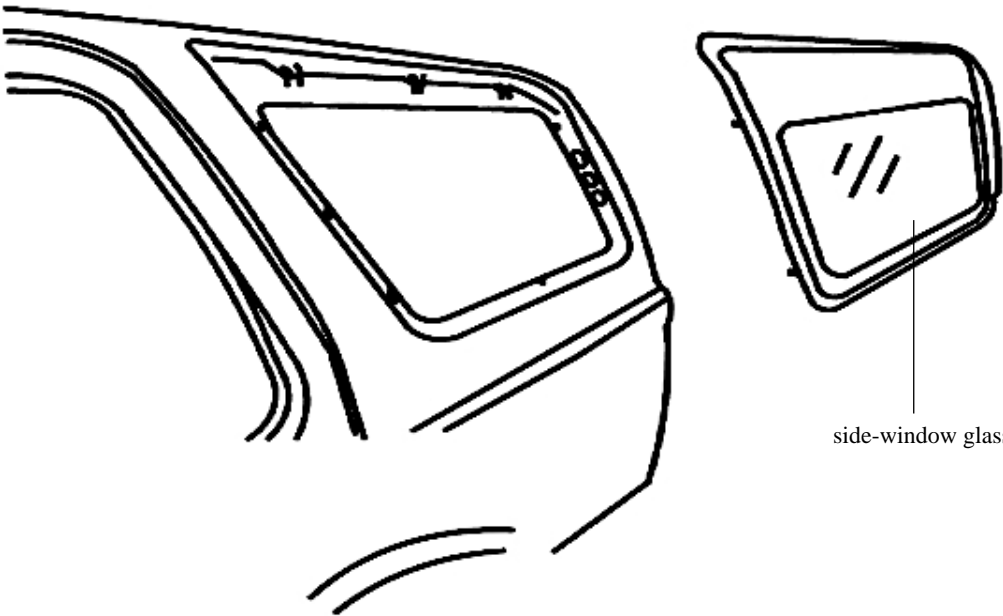
- (a) Front ventilating cover board;
- (b) Wiper arm.

6. Check whether there is leakage and the leakage reparation

- (a) Conduct the leakage test.
- (b) Seal the leaking parts with vehicle glass glue.

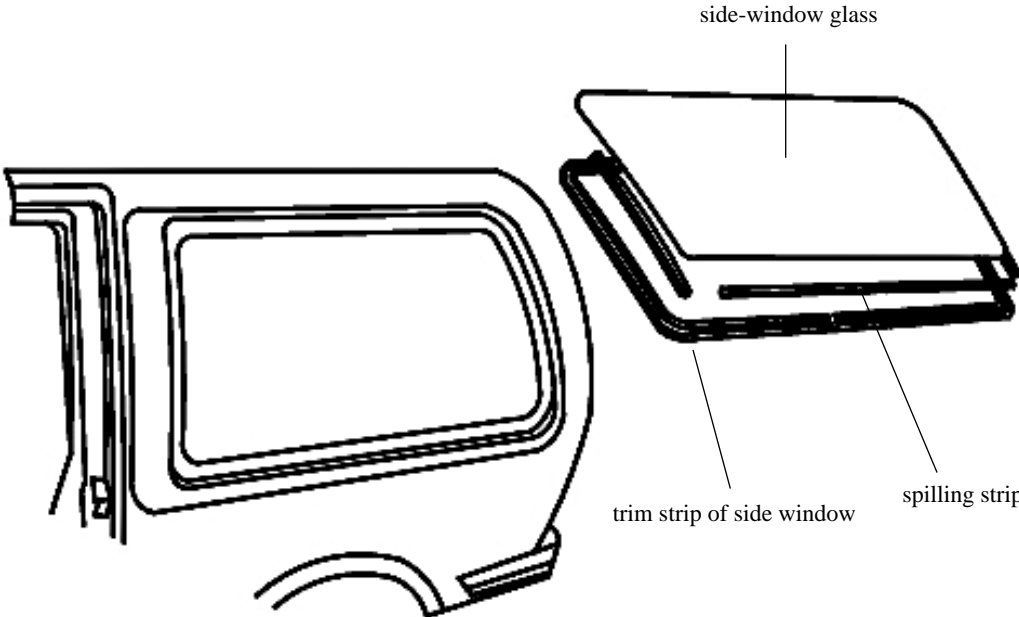
Side-window glass ( I )  
Element mounting position

SF



side-window glass

SY



side-window glass

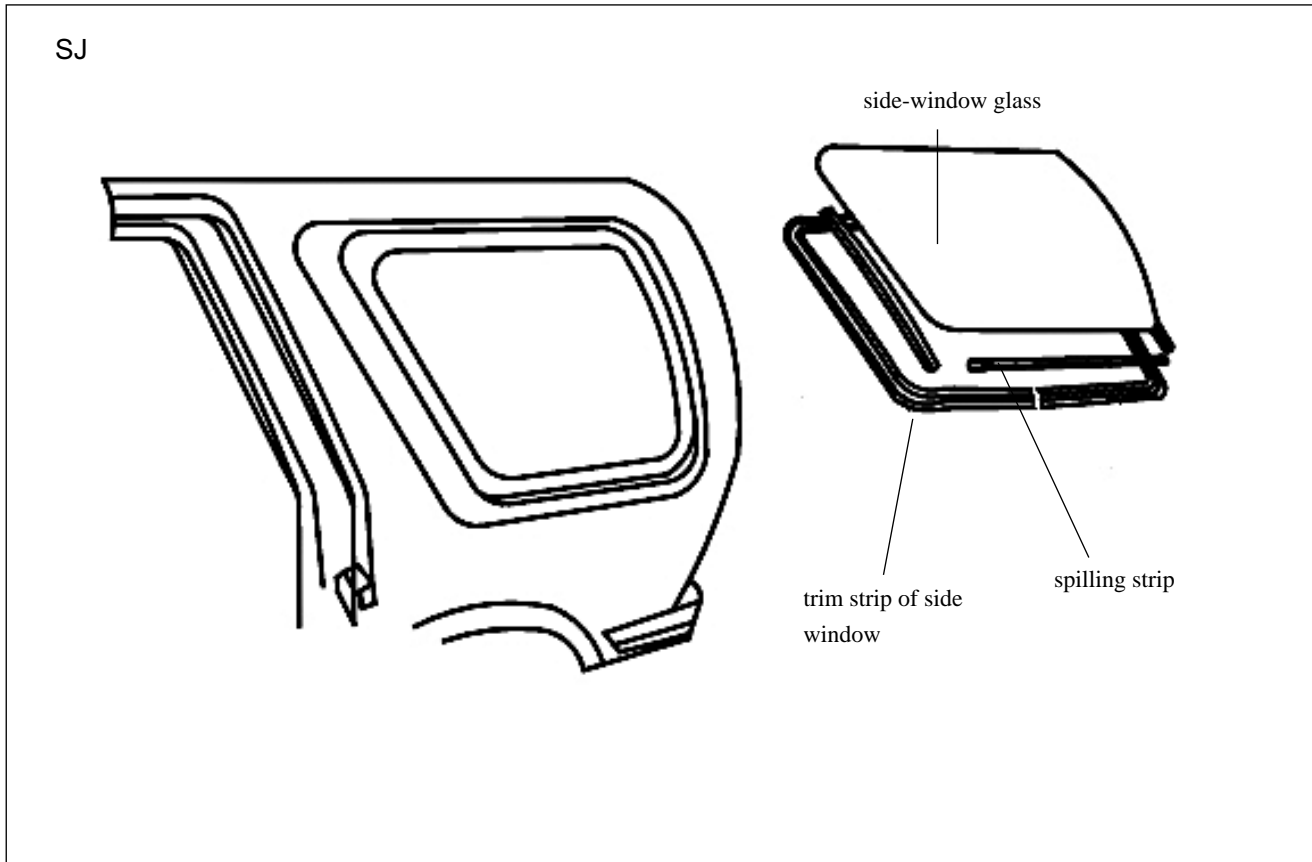
trim strip of side window

spilling strip



## Side window glass ( II )

### Element mounting position



### Dismantle of side window glass

1. Tear down the following parts:
  - (a) Lower trim panel of rear column;
  - (b) Rear side-panel trim
  - (c) Roof
2. Tear down the side window glass
  - (a) Tear down the three hex nuts and eight nuts on flange (SF)
  - (b) Cut a small open in the sealing glue between the glass and body with knife, then insert the steel wire into the small open and pull it fro and to slowly until the sealing glue between the glass and body separate completely, and pull the glass out to take it down.

Notice: be careful not damage the body and glass.

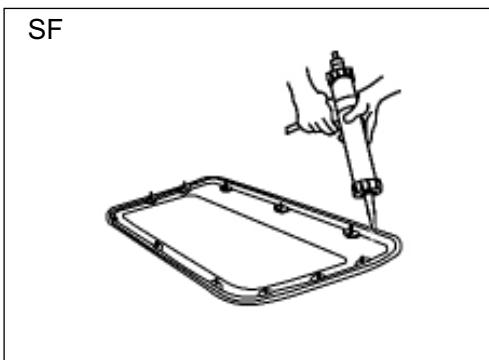
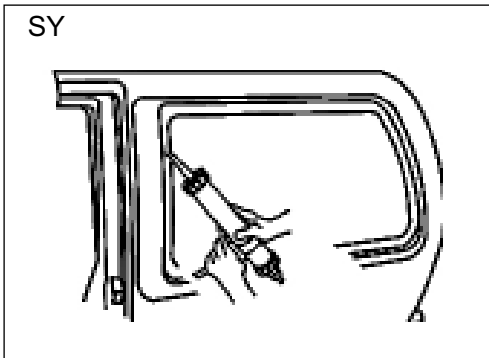
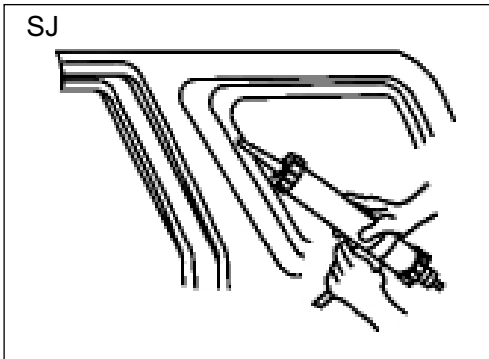
### Mount of side window glass

1. Clean the body and glass;
 

Clean the contacting face of body and glass completely with cleaning materials.
2. Cleaning the sealing strip;
 

Clean the sealing strip surface with cleaning materials.

3. Mount the trim strip and spilling strip of side window (SY SJ)
  - (a) Assemble the trip strip of side window on the left upper conner of inner edge of the left side window at 60 mm under the conner, and encase the roof in the trim strip.
  - (b) Stick the spilling strip (4 × 6) to the center of lower edge of side window and to the circumference of the glass frame.



#### 4. Mounting of side glass

Coat the cleaning active agent around the inner edge along the circumference of side window glass (the black glass edge).

Airing for 3 to 5 min, coat the priming agent on the layer of cleaning active agent and airing for 5 to 30 min.

(SY、SJ)

- (a) Plaster the glass glue with the glue container on the layer of priming paint of window frame with the initiative location 200 mm under the left upper conner of left side window.
- (b) Stick the glass quickly to the window frame and adjust the upper, lower, left and right clearance, and fill them with gasket.
- (c) Exert the pressure of certain degree on the glass circumference after adjusting so that the glass contact

Recommended sealing glue for use

Glass glue U-201 windshield glue

Priming paint 130

Cleaning active agent C020

(SF)

- (a) Plaster the glass glue alongside the complete circumference of adhesive strip of side window glass, and the glue section should be similar to tri-angle after coating.
- (b) Put the side window glass assembly at the corresponding location on body, fix the upper edge of side window glass with three hex nuts and others should be fixed with flange nuts.

Recommended sealing glue for use

Glass glue TS-100 PVC windshield glue

Priming paint TS-5028

Cleaning active agent TS-7016

Notice:

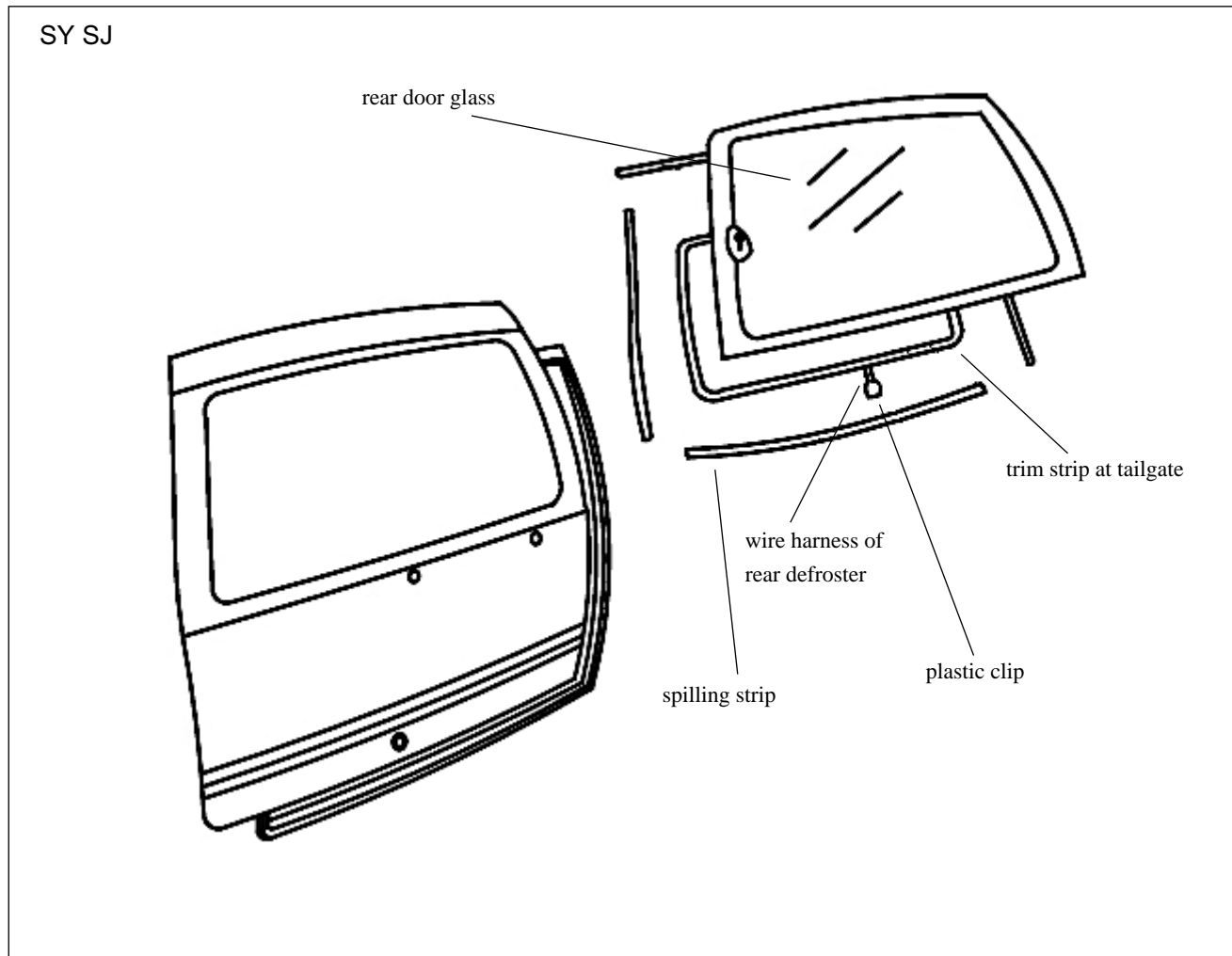
- (a) When plastering glue, the glue should be plastered continuously and no breakage is allowable at the sealing glue seam.
- (b) Clean the redundant glue on the body;
- (c) The vehicle is not allowed to drive within 4 hours in summer and 8 hours in winder under common circumstances.

#### 5. Check whether there is leakage and the leakage reparation;

- (a) Conduct the leakage test;
- (b) Seal the leaking parts with glass glue.

## Rear door glass

### Element mounting position



#### Dismantle of rear door glass

Disconnect the connecting wire of the defroster first, cut a small open in the sealing agent between the glass and body with knife, then insert the steel wire into the open and pull the steel wire to and fro until the sealing glue between the glass and body separates completely, finally pull the glass outwardly to take it down.

Notice: be careful not to damage the body and glass.

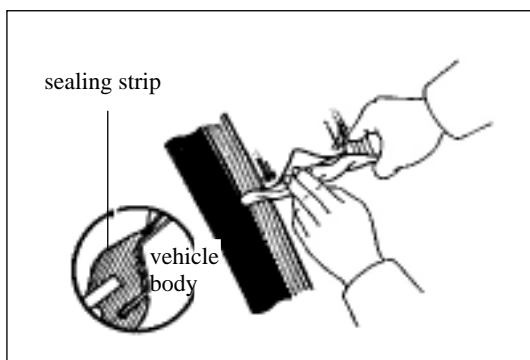
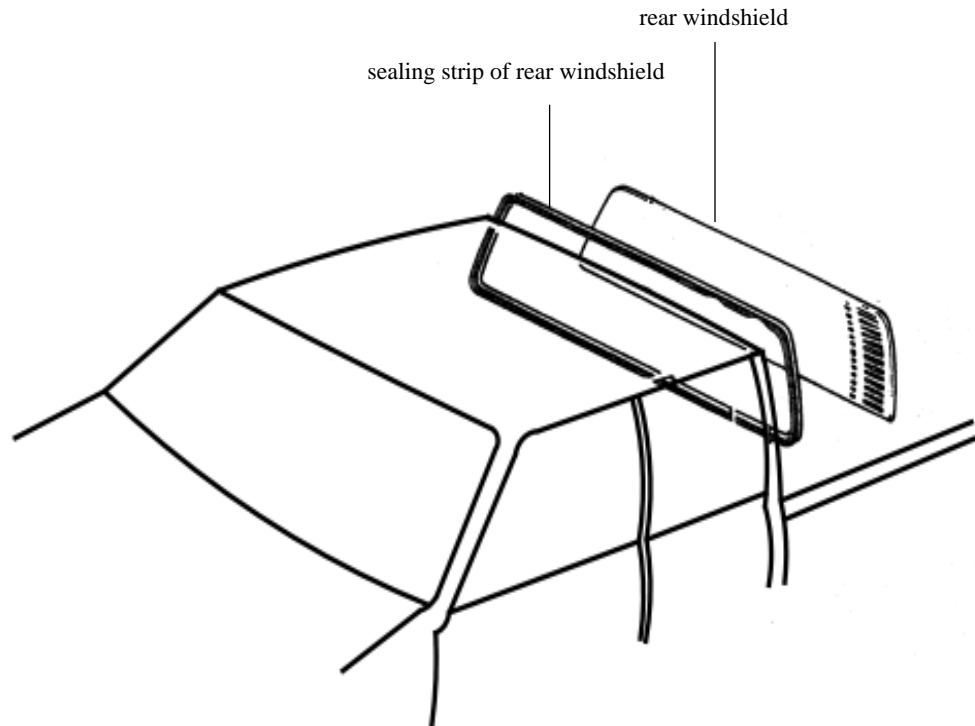
#### Mount of rear door glass

Seize the wire harness of rear defroster in the plastic clips and encase the clips into the mounting open, then seize the wire harness of rear defroster in the trim strip at tailgate.

As this mount is the same with that of side window glass, see the mounting approaches for side window glass.

## Rear windshield Element mounting position

Dr SL SK

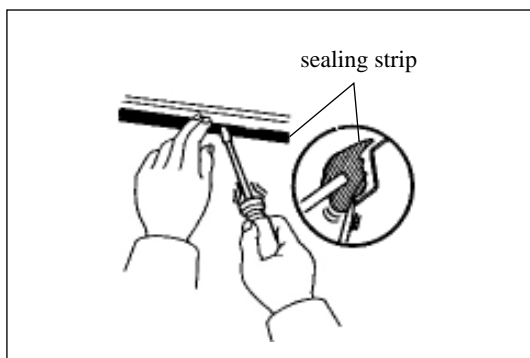


### Dismantle of rear windshield

#### 1. Tear down the rear windshield:

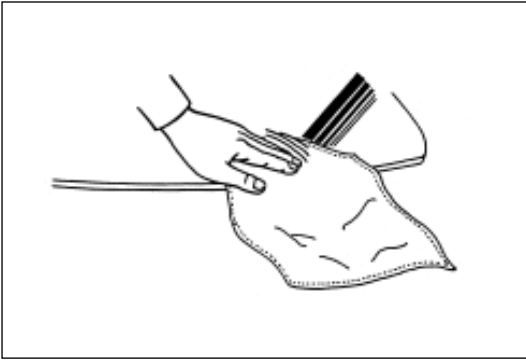
- (a) Prize up the sealing strip front the body with screwdriver.

Notice: be careful not to damage the paint on body.



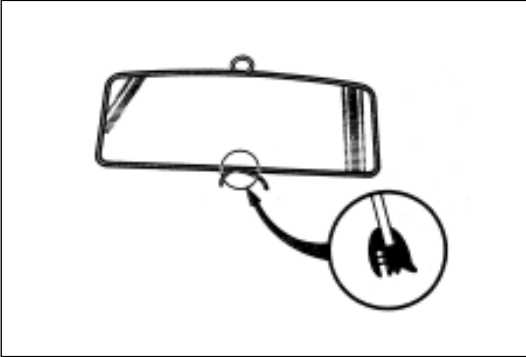
- (b) Prize the lips of sealing strip outwardly from the inside of the body flange.

- (c) Pull the glass outwardly to tear it down together with the sealing strip.



## Mount of rear windshield

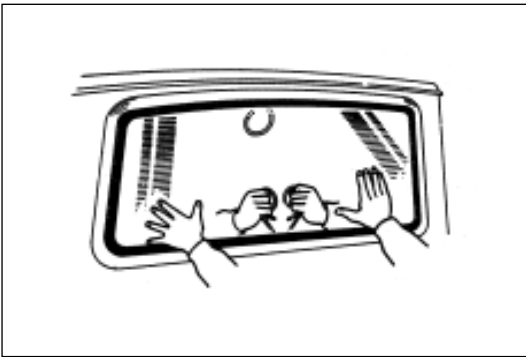
1. Clean the body and glass;  
Clean the contacting face of body and glass with the cleaning materials.
2. Clean the sealing strip  
Clean the sealing strip with cleaning materials;



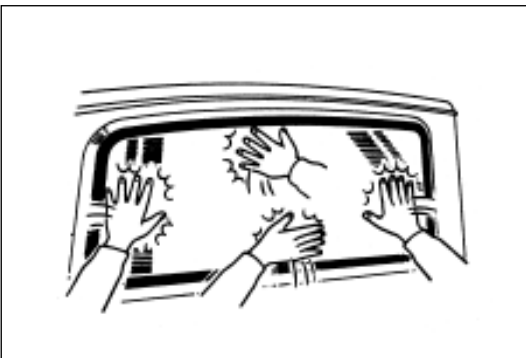
3. Mount the rear windshield in the sealing strip
  - (a) Coat a layer of silicon oil around the glass circumference and mount the adhesive strip on the glass according to the glass shape.

Notice: if the adhesive strip becomes stiffening or deforming that will lead to water leakage, change with the new one where possibly.

- (b) Mount a rope alongside the sealing strip channel as shown in the drawing (fix the rope in the adhesive strip).



4. Mount the rear windshield
  - (a) Lay the ready glass against the corresponding position of rear windshield opens.
  - (b) Pull the rope from the inside of body to encase the roof, the rear column and the door frame within the adhesive strip, meanwhile push the outside of the glass by hand.



- (c) Tap the four edges of the adhesive strip to ensure that the adhesive strip contact closely with the body windshield opened.
  - (d) Coat the glue from left to right at the upper part of windshield (location between the adhesive strip and the body windshield open) and the lower part of windshield (location between the adhesive strip and glass), and the remaining glue should be cleared away with abrasive paper, and the location should be cleaned with cloth.

Notice: there should no breakage at the sealing glue seam when coating the glue.

Recommended sealing agent for use

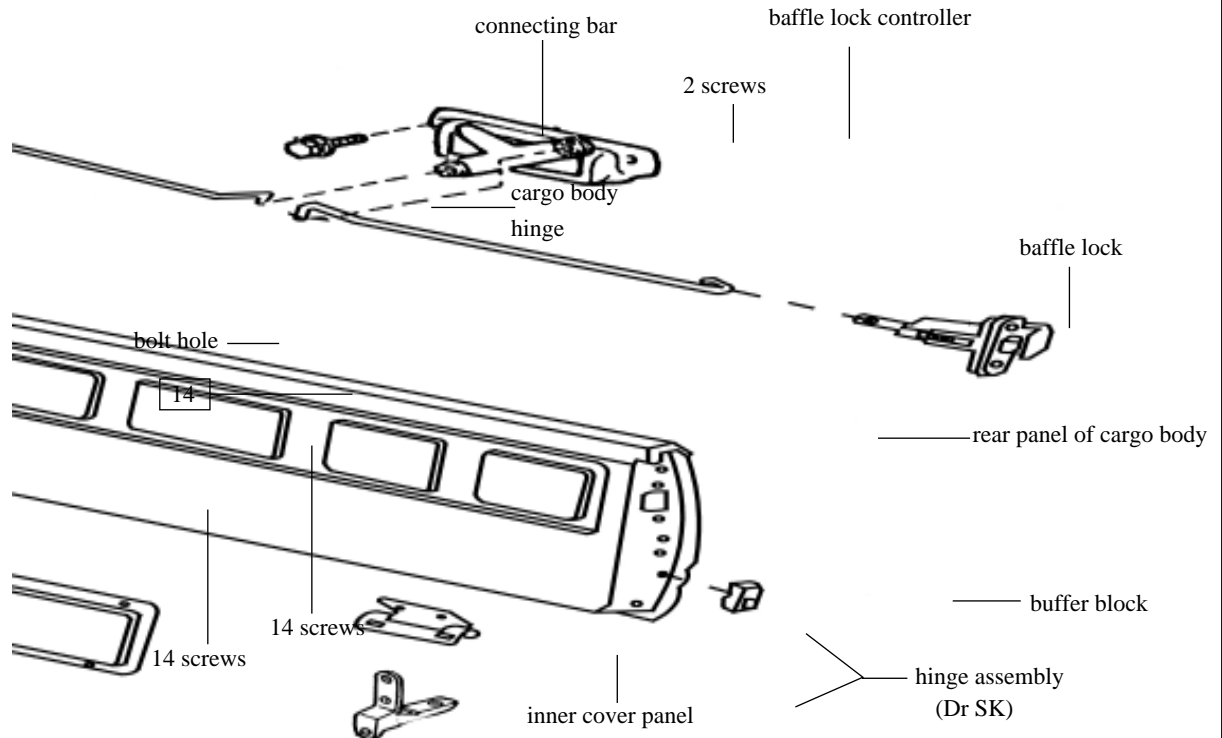
Glass glue                      XL-1211 acid silicone glass glue

5. Check whether there is leakage and the leakage reparation;
  - (a) Conduct the leakage test;
  - (b) Seal the leaking parts with glass glue.

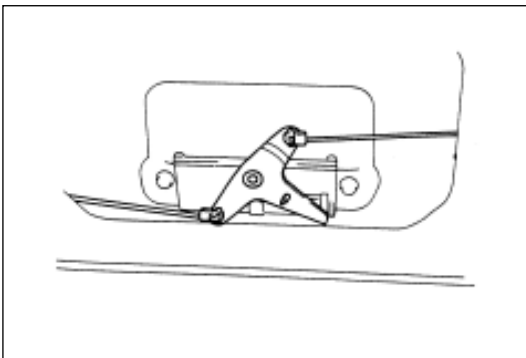
## Cargo body baffle

### Element mounting position

Dr SL SK

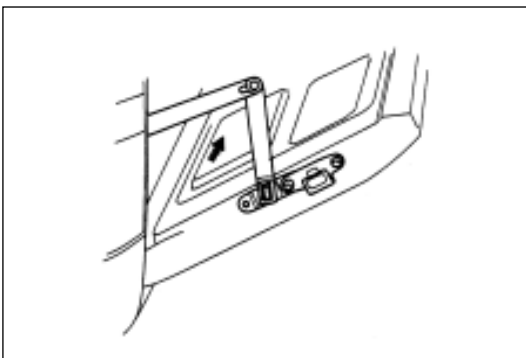


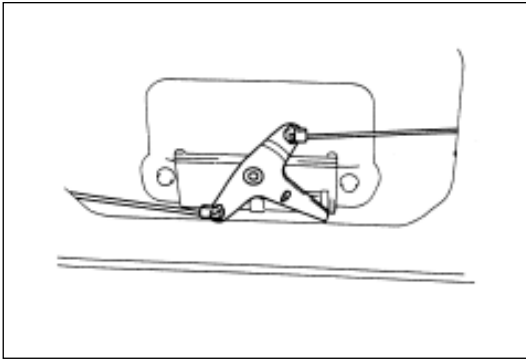
**N • m** : specified torque



### Dismantle of baffle lock

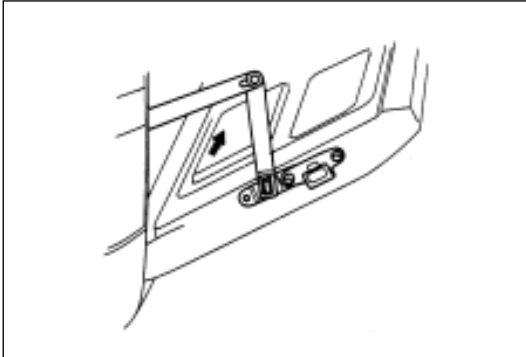
1. Tear down the inner cover panel.  
(SL)  
Tear down the 14 screws and the inner cover panel.  
(Dr SK)  
Tear down the 12 screws and the inner cover panel.
2. Disconnect the connecting bar of baffle lock from the baffle lock controller.
3. Tear down the baffle slide fastener
  - (a) Tear down the baffle lock from the baffle.
  - (b) Tear down the two screws and the baffle lock.
4. Teardown the baffle from the baffle  
Teardown the 12 screws and the baffle lock





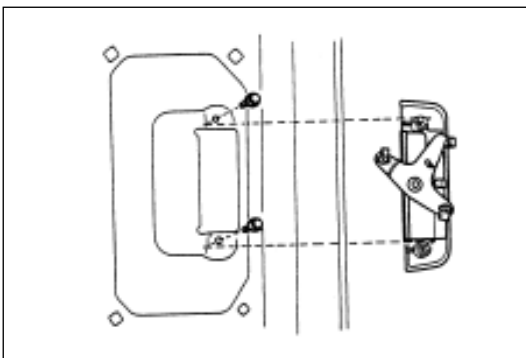
## Mount of Baffle

1. Mount the baffle lock on the baffle;  
 Mount the baffle lock with two screws (Dr SK)  
 Mount the baffle lock with two nuts (SL)
2. Connect the connecting bar with the baffle lock controller.



3. Mount the baffle slide fastener;  
 (a) Mount the baffle slide fastener and bolts.  
 Fastening torque: 14N • m  
 (b) Connect the baffle slide fastener with the baffle.
4. Mount the baffle hinge on the baffle

5. Mount the inner coverpannel  
 (SL)  
 Mount the inner cover panel with 14 screws;  
 (Dr SK)  
 Mount the inner cover panel with 12 screws.



## Dismantle of baffle lock controller:

1. Tear down the inner cover panel;
2. Disconnect the two baffle connecting bar;
3. Tear down the baffle lock controller  
 Tear down the two screws and the baffle lock controller; (Dr SK)  
 Tear down the two nuts and the baffle lock controller. (SL)

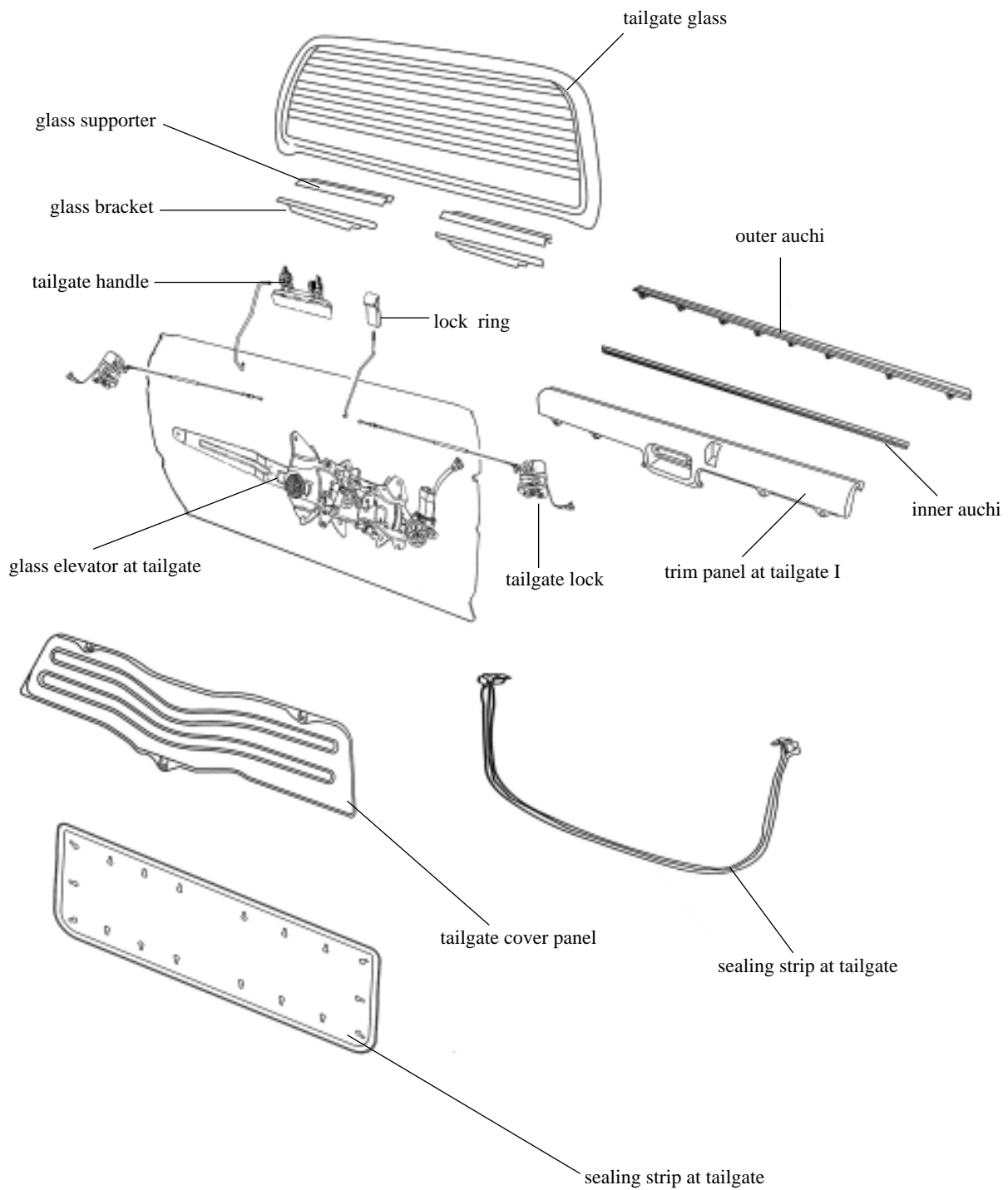
## Mount of baffle lock controller

Mount the baffle lock controller in the reverse order for disassembly.

## Tailgate ( I )

### Element figure

SF





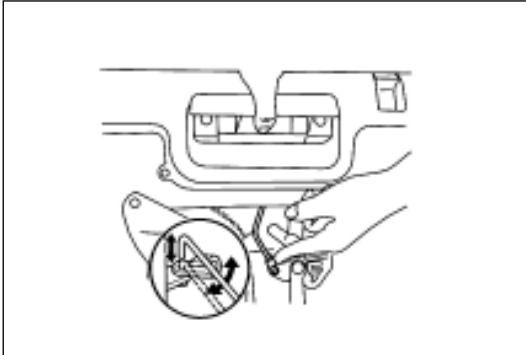
## Dismantle of tailgate

1. Tear down the trim panel of the tailgate:
  - (a) Insert the screwdriver between the fixing clips and the trim panel at the tailgate to loose the trim panel.

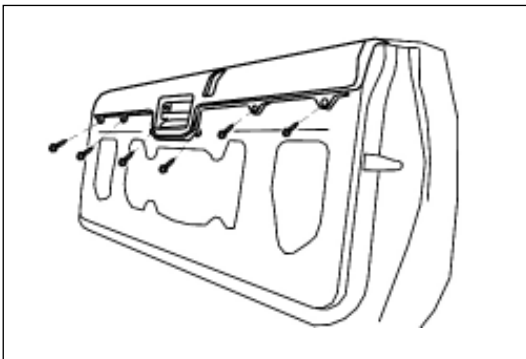
Notice: the screwdriver should be wrapped at its head with adhesive strap before using

- (b) Tear down the trim panel at tailgate.
2. Tear down the tailgate cover panel;
 

Tear down the three bolts and the tailgate cover panel.



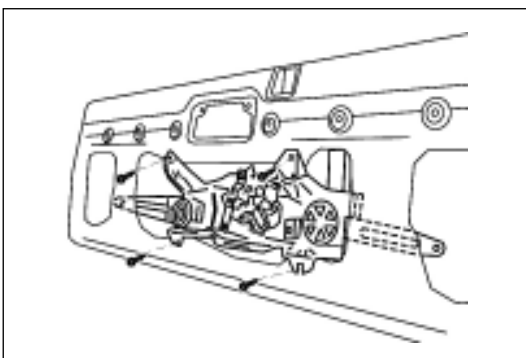
3. Tear down the tailgate handle and the lock ring:
  - (a) Tear down the two bolts on handle.
  - (b) Disconnect the controlling bar from the glass elevator and tear down the tailgate handle.
  - (c) Disconnect the controlling bar from the glass elevator to take down the lock ring.



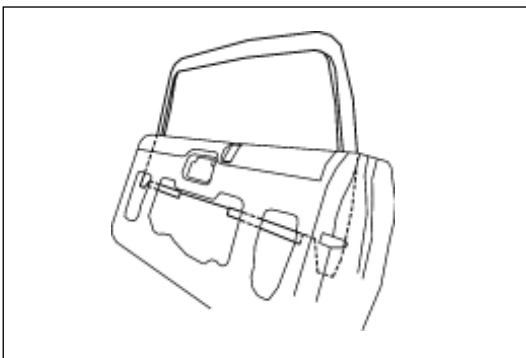
4. Tear down the trim panel of tailgate I;
 

Tear down the six bolts and trim panel of tailgate I;
5. Tear down the sealing strip at tailgate;
 

Tear down the two threaded ends and the sealing strip;
6. Tear down the outer auchi

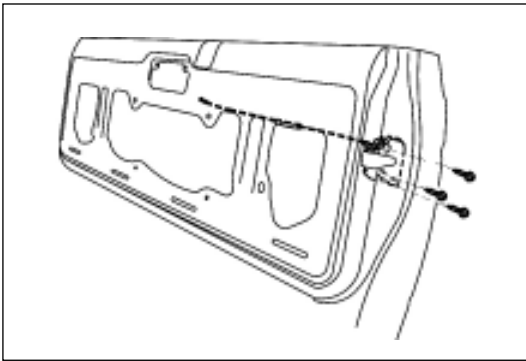


7. Tear down the glass elevator at tailgate;
  - (a) Tear down the tailgate glass;
  - (b) Pull the glass outwardly to take it down.



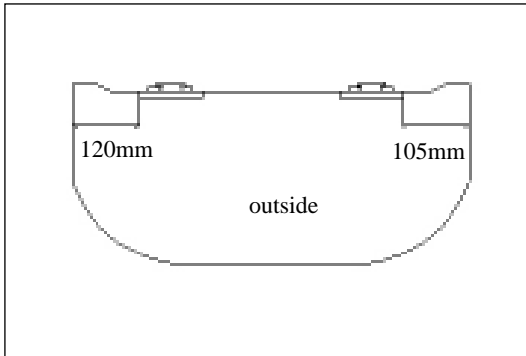
8. Tear down the tailgate lock;
 

Tear down the three bolts and the tailgate lock.



#### 9. Tear down the tailgate lock

Tear down the three screws from the tailgate to tear down the lock



#### Change of Glass

1. Tear down the glass bracket with screwdriver or with similar tool.
2. Coat the polyurethane glue, seize the gasket on the glass and coat the glass glue at outside of the gasket.
3. Encase the glass bracket by tapping it with rubber hammer.

#### Tailgate Assembly of

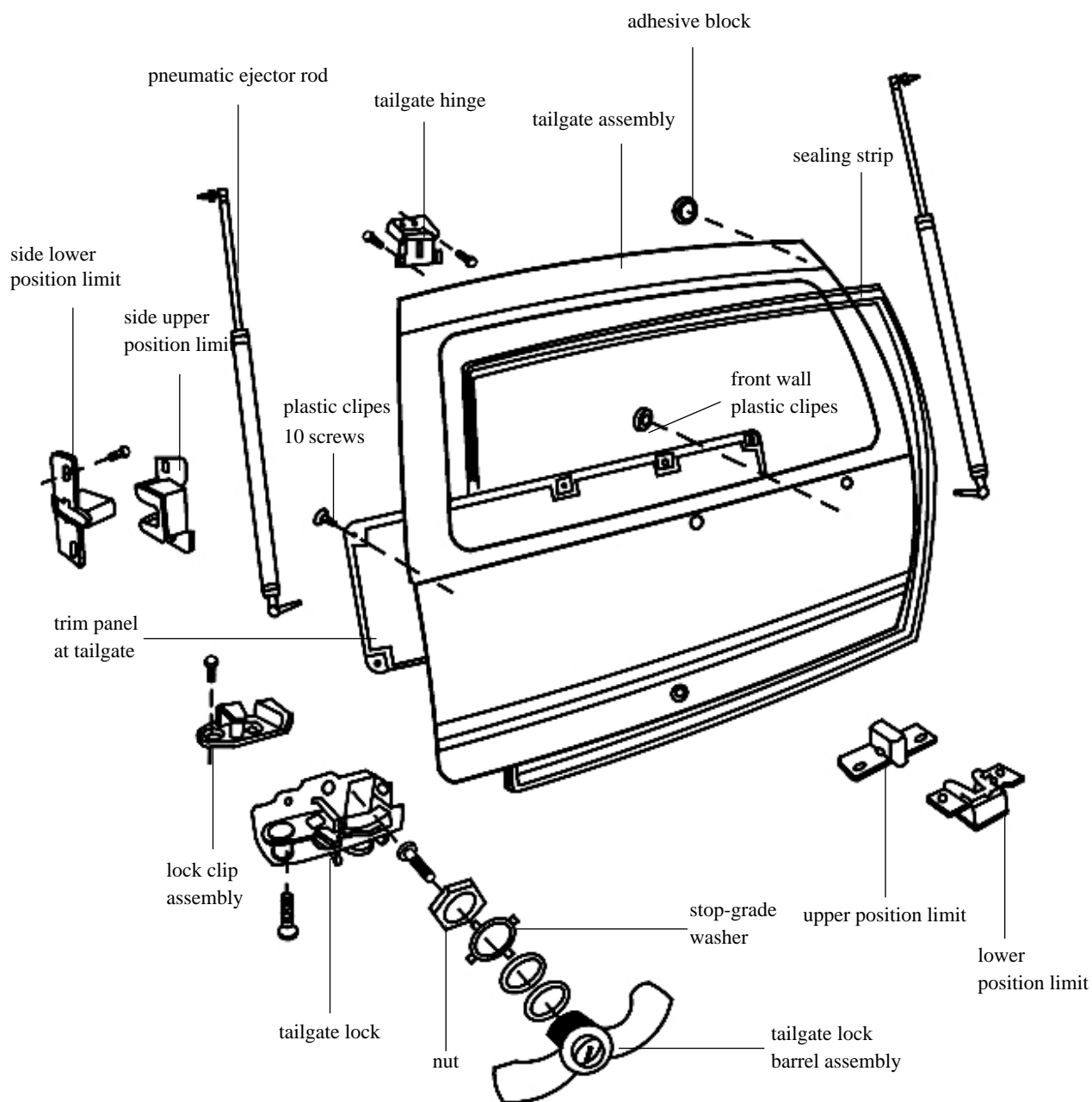
Assembly the tailgate in the reverse order of the disassembly approaches.

Notice: coat the lubricant on the sliding face, elevator gear and door lock before mounting the parts.

## Tailgate ( II )

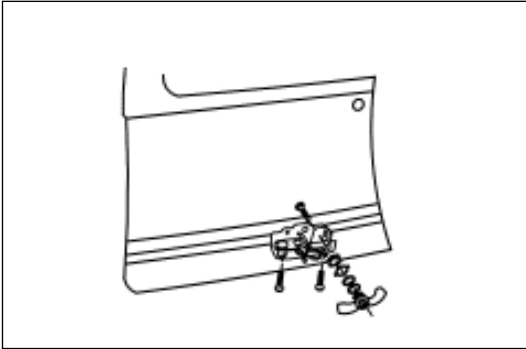
## Element figure

SY SJ

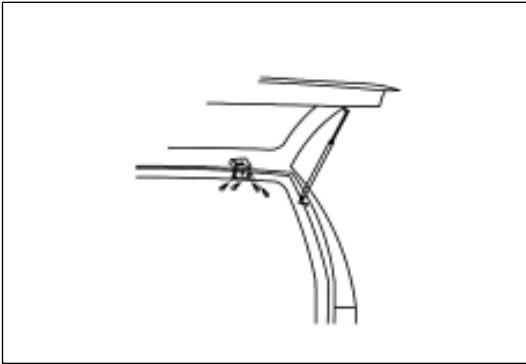


## Dismantle of Tailgate

1. Tear down the trim panel at tailgate;  
Tear down the ten plastic clips and take down the trim panel at tailgate.



2. Tear down the tailgate lock barrel and lock from tailgate:
  - (a) Screw off the nuts of lock barrel from the inside of tailgate cavity and take down the lock barrel from the outside.
  - (b) Tear down the three screws to take down the tailgate lock.
3. Tear down the tailgate lock clip  
Take down the tailgate lock clip from the lower beam flange after tearing down the two screws.



## Dismantle of Tailgate

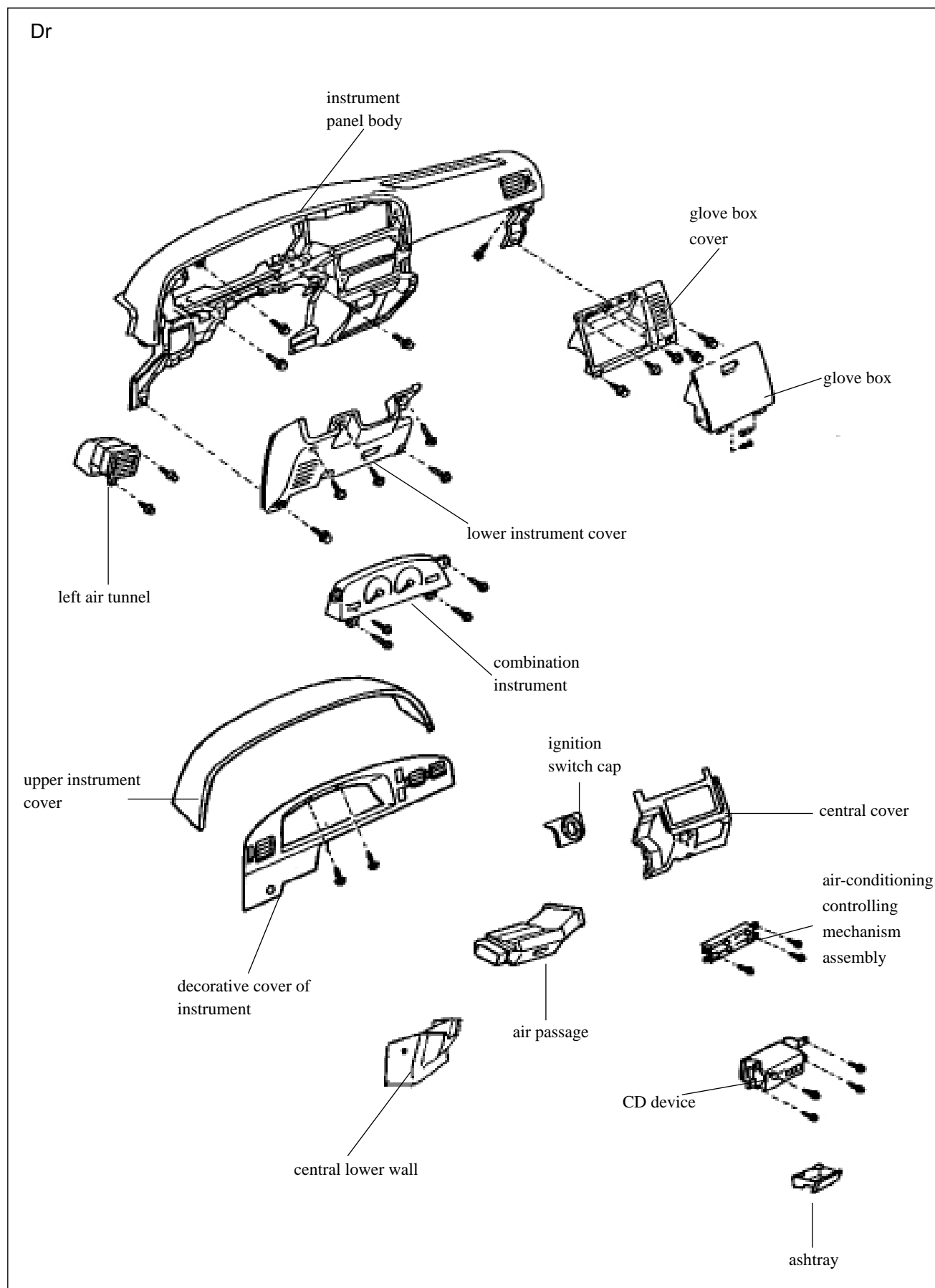
1. Tear down the pneumatic ejector rod;  
Tear down the screws and take down the two pneumatic ejector rod from the tailgate and the body.
2. Tear down the tailgate hinge and the tailgate;
  - (a) Tear down the eight bolts to take down the right and left tailgate hinge from the tailgate and the body;
  - (b) Pull out the plugging element of wire harness to tear down the tailgate from the body.
3. Tear down the position limit  
After tearing down the two bolts, take down the left and right side upper/lower position limits and the upper/lower position limit from the tailgate and the body.  
Tear down the position limit

## Mount of tailgate lock and the tailgate

Mount the tailgate lock and the tailgate in the reverse order

## Instrument panel ( I )

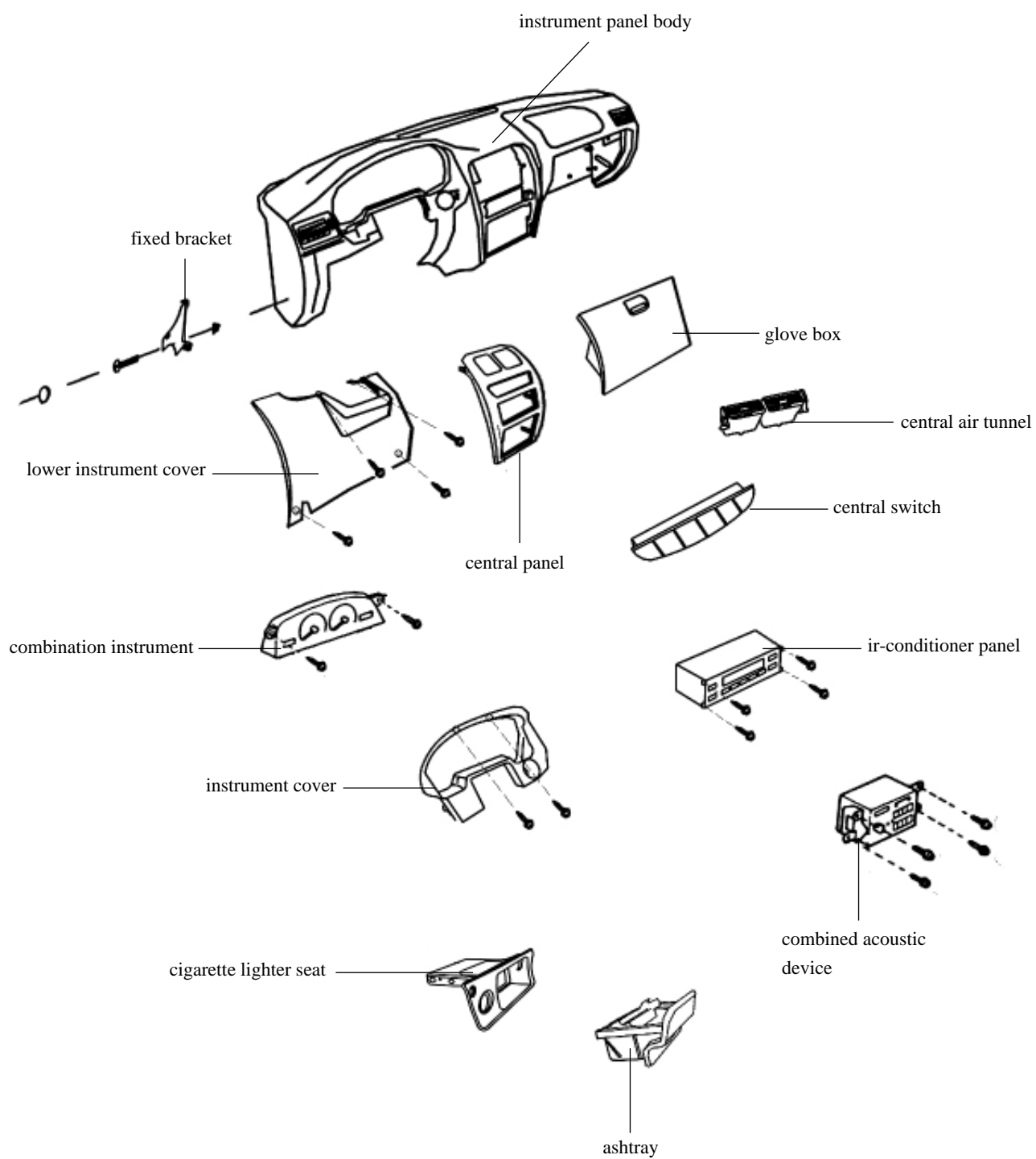
## Element figure



## Instrument Panel ( II )

## Element figure

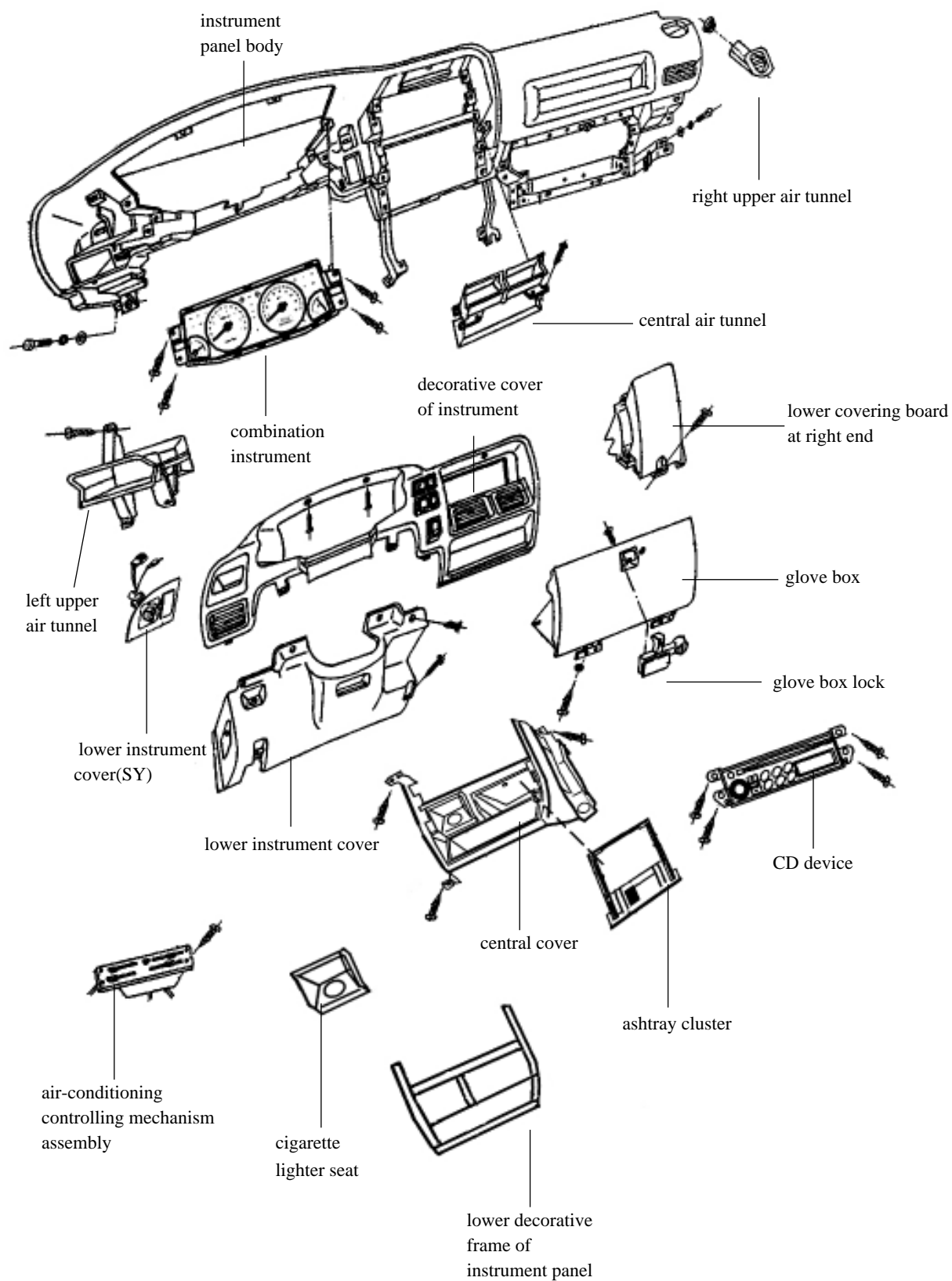
SF

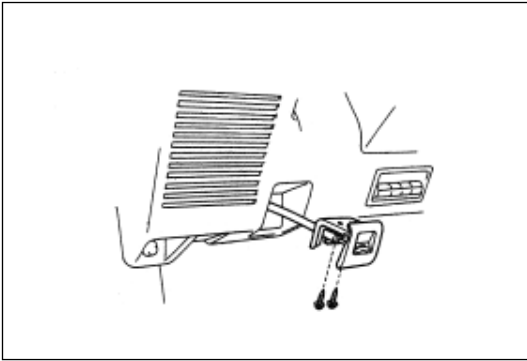


## Instrument panel (III)

## Element figure

SL SK SY SJ

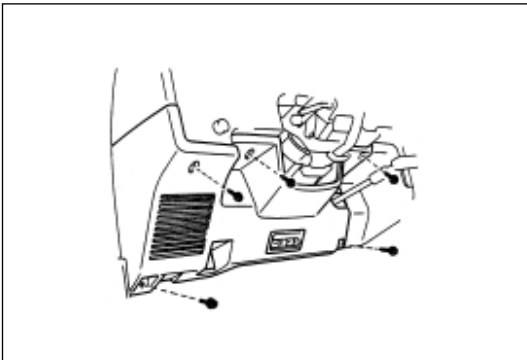
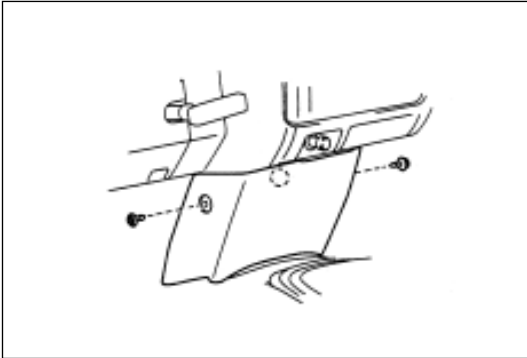




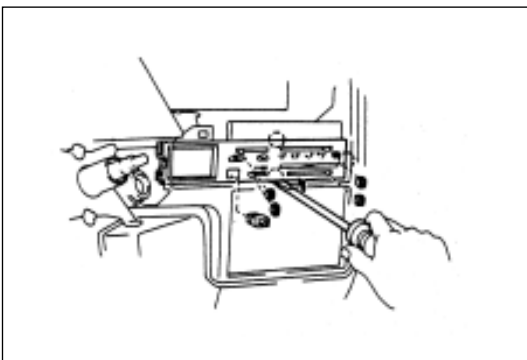
## Dismantle of instrument panel

(Dr SF)

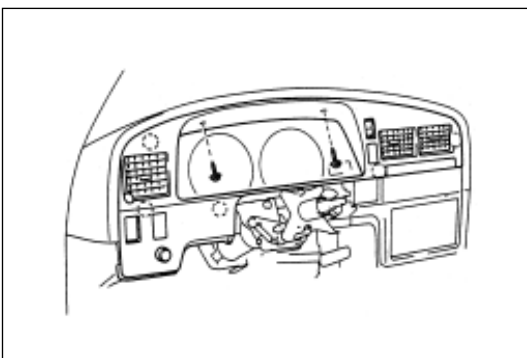
1. Disconnect the cable of accumulator from the negative polar;
2. Tear down the steering wheel;
3. Tear down the combined switch shell cluster;
4. Tear down the bonnet lock switch;  
Tear down the two screws and the sliding fastener of bonnet lock.
5. Tear down the central bottom-wall (Dr)  
Tear down the decorative cover of gearbox (SF)
6. Tear down the instrument cover (SF).  
Tear down the two screws and the cover.



7. Tear down the lower instrument cover;
  - (a) Tear down the ignition lock;
  - (b) Tear down the five screws and the cover;  
Tear down the four screws and the cover;
  - (c) Disconnect the plugging elements.

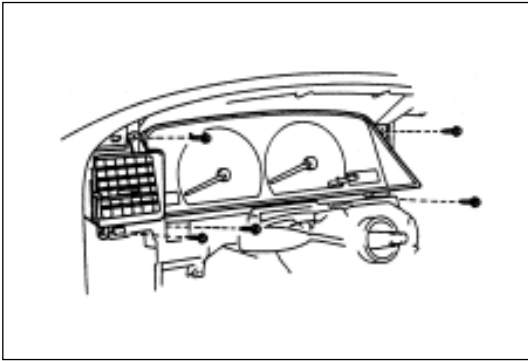


8. Tear down the air-conditioner controlling panel;
  - (a) Pull out the air-conditioner controlling button;
  - (b) Prize out the A/C switch;
  - (c) Prize out the air-conditioner panel as shown in the drawing with screwdriver and take it down.  
Notice: the screwdriver should be wrapped with adhesive strap at its head before using.
  - (d) Disconnect the plugging elements.



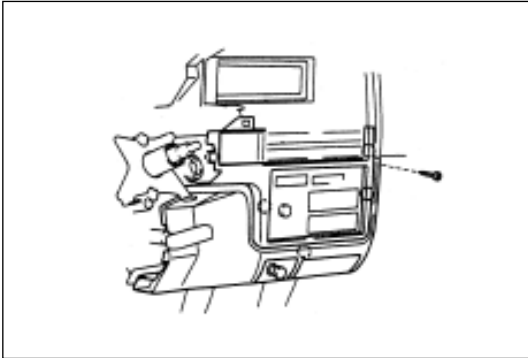
9. Tear down the decorative cover of instrument (Dr)
  - (a) Tear down the two screws to pull out the decorative cover of instrument;
  - (b) Disconnect the plugging elements.



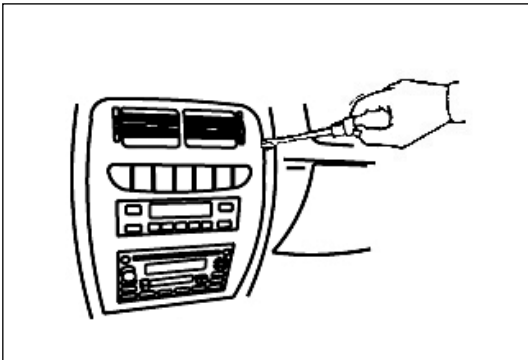


10. Tear down the combination instrument;
  - (a) Tear down the four screws;  
Tear down the two screws;
  - (b) Disconnect the plugging elements;
  - (c) Tear down the combination instrument.

11. Tear down the ashtray cluster;



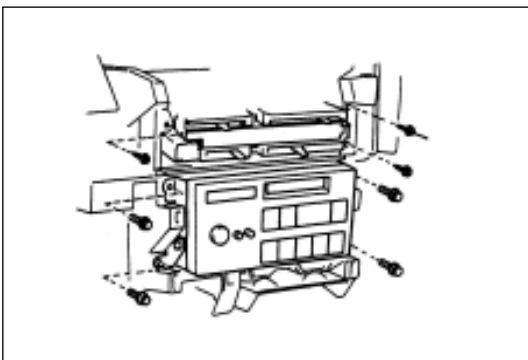
12. Tear down the central cover;
  - (a) Tear down the decorative frame;
  - (b) Tear down the three screws to pull out the central cover;
  - (c) Disconnect the plugging elements.



13. Tear down the central panel;
  - (a) Prize out the central panel as shown in the drawing with screwdriver to take it down.  
Notice: the screwdriver must be wrapped with adhesive strap at its head before using.
  - (b) Disconnect the plugging elements.

14. Tear down the air-conditioning controlling mechanism assembly;

Tear down the two screws, which will let the air-conditioning controlling mechanism in suspension.



15. Tear down the air-controlling panel;
  - (a) Tear down the four screws to pull out the air-conditioning panel;
  - (b) Disconnect the plugging element;
16. Tear down the CD device or the combined acoustic device;
  - (a) Tear down the four screws.
  - (b) Disconnect the aerial cable and the plugging elements.
  - (c) Tear down the CD device or the combined acoustic device.

17. Tear down the glove box;

Tear down the two screws and the glove box.

SF

Seize the flanges at two ends of glove box into the sliding channel of the glove box.

18. Tear down the central air tunnel;

Tear down the four screws and the central air tunnel.

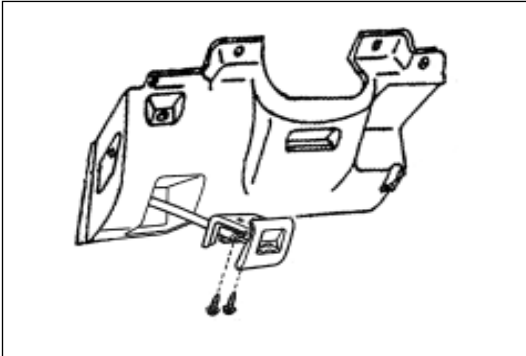


## 19. Tear down the instrument panel body;

- (a) Tear down the three screws and the instrument panel.
- (b) Disconnect the plugging elements.

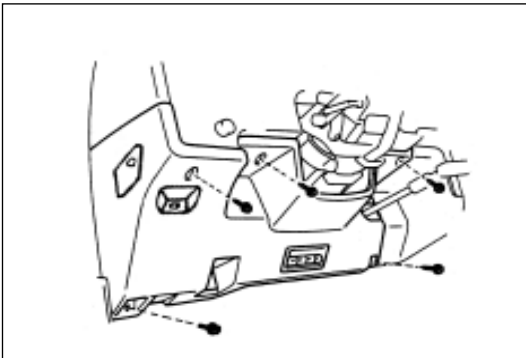
SF:

- (a) Tear down the fixing bolts at the ends of instrument panel body to pull out the fixed clips at the front end.
- (b) Disconnect the plugging elements.



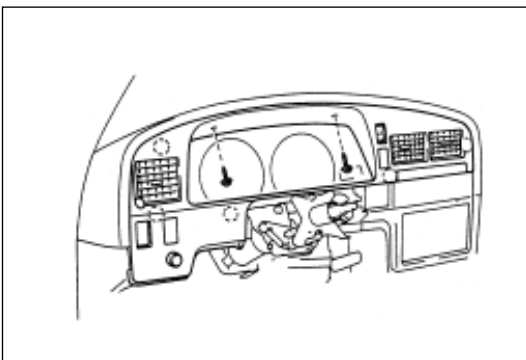
SL SK SJ SY

- 1. Disconnect the cable of accumulator from the negative polar (-):
- 2. Tear down the steering wheel;
- 3. Tear down the combined switch shell cluster;
- 4. Tear down the bonnet lock switch;  
Tear down the two screws and the sliding fastener of bonnet lock.



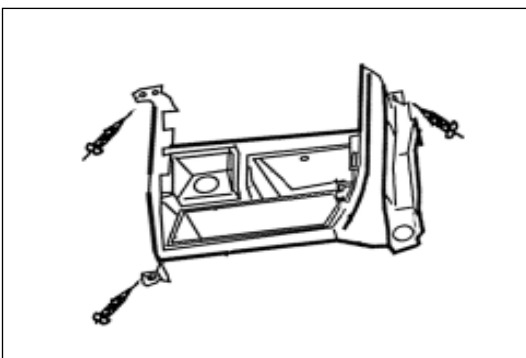
## 5. Tear down the lower instrument cover;

- 6. Tear down the lower decorative frame of the instrument panel;  
Prize out the decorative frame of instrument with screwdriver and take it down.  
Notice: the screwdriver must be wrapped with adhesive strap at its head before using.

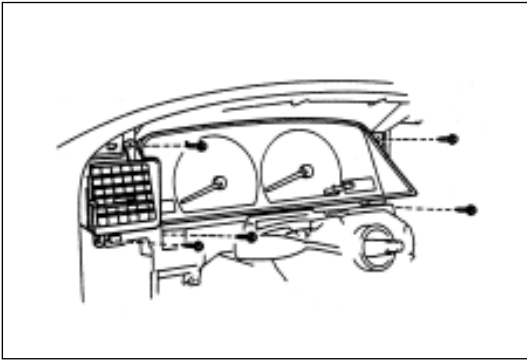


- 7. Tear down the decorative cover of instrument;
  - (a) Tear down the three screws to pull out the decorative cover of instrument.
  - (b) Disconnect the plugging elements.

## 8. Tear down the ashtray cluster;



- 9. Tear down the central cover;
  - (a) Tear down the three screws to pull out the central cover;
  - (b) Disconnect the plugging elements

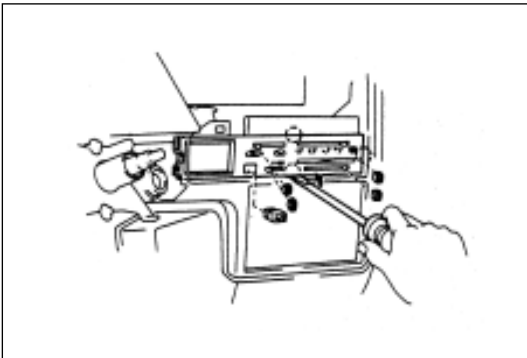


10. Tear down the combination instrument;
  - (a) Tear down the four screws;
  - (b) Disconnect the plugging elements.
  - (c) Tear down the combination instrument.

11. Tear down the CD or combined acoustic device;
  - (a) Tear down the four screws;
  - (b) Disconnect the aerial cable and the plugging elements;
  - (c) Tear down the CD or the combined acoustic device.

12. Tear down the central air tunnel;
 

Tear down the four screws to take out the central air tunnel.



13. Tear down the air-conditioner controlling panel;
  - (a) Pull out the air-conditioner controlling button;
  - (b) Prize out the A/C switch;
  - (c) Prize out the air-conditioner controlling panel as shown in the drawing with screwdriver and take it down.  
Notice: the screwdriver should be wrapped with adhesive strap at its head before using.
  - (d) Disconnect the plugging elements.

14. Tear down the air-conditioning controlling mechanism assembly;
 

Tear down the two screws and let the air-conditioner controlling mechanism in suspension.

15. Tear down the lower covering board at right end;
 

Tear down the four screws and take out the lower covering board at right end.

16. Tear down the glove box;
 

Tear down the two screws and the glove box

17. Tear down the instrument body;
  - (a) Tear down the three bolts and the instrument panel;
  - (b) Disconnect the plugging elements.



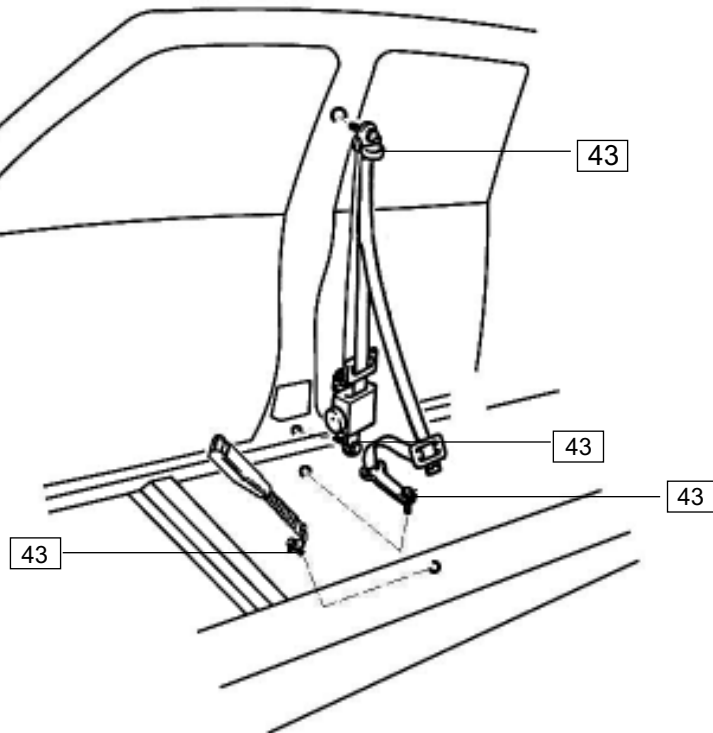
## Mount of instrument panel

Mount the parts of instrument panel in the reverse approach.

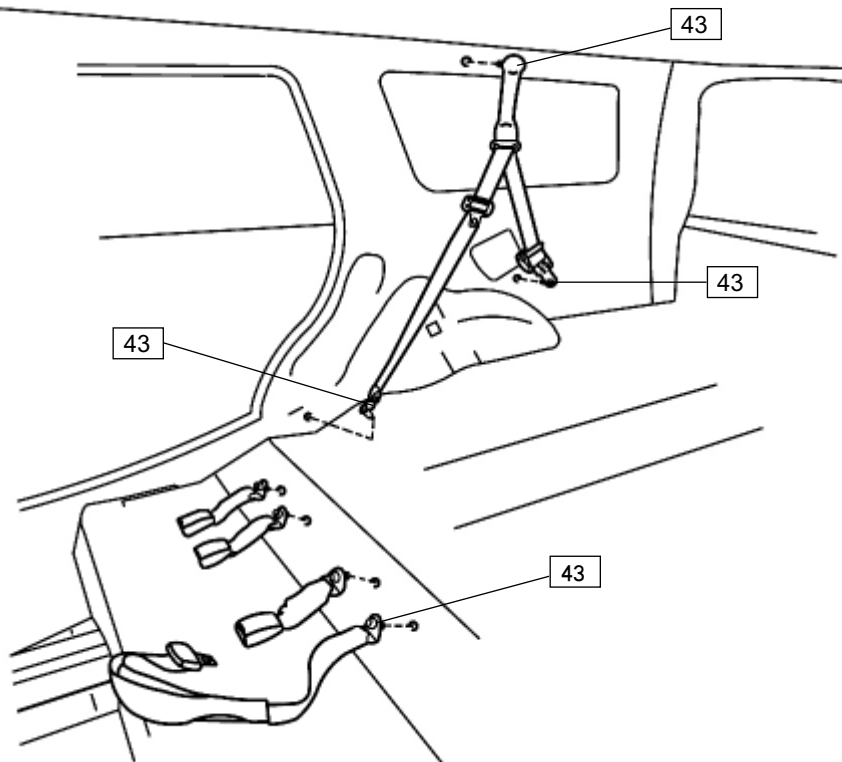
## Safety belt ( I )

### Element figure

Dr SL SK SF SY SJ front safety belt



SF rear safety belt

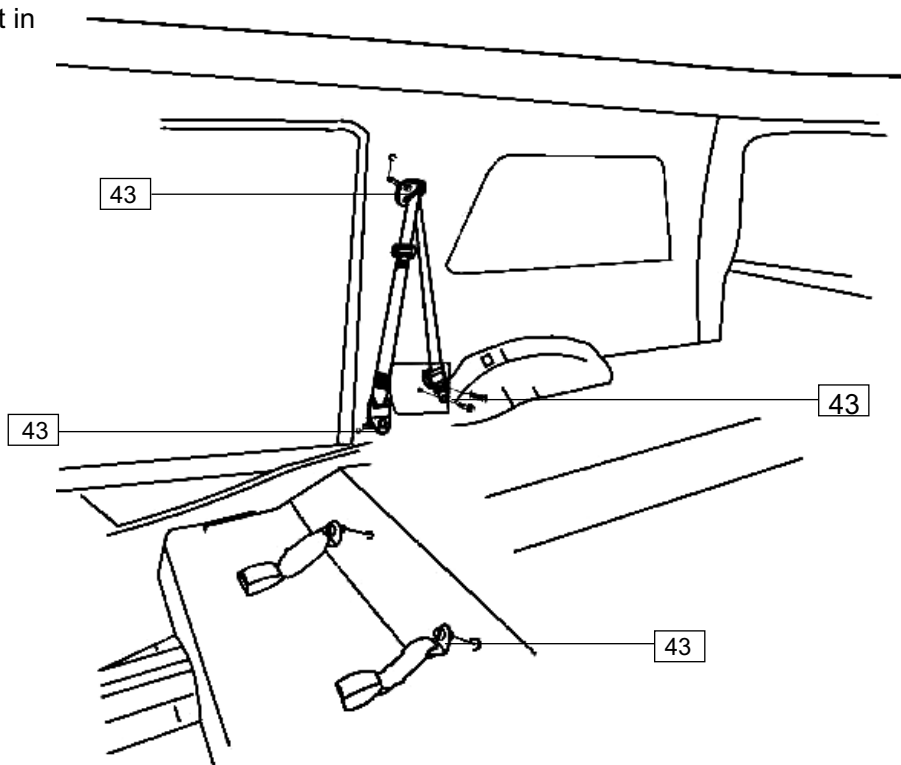


$\boxed{\text{N} \cdot \text{m}}$  : specified torque

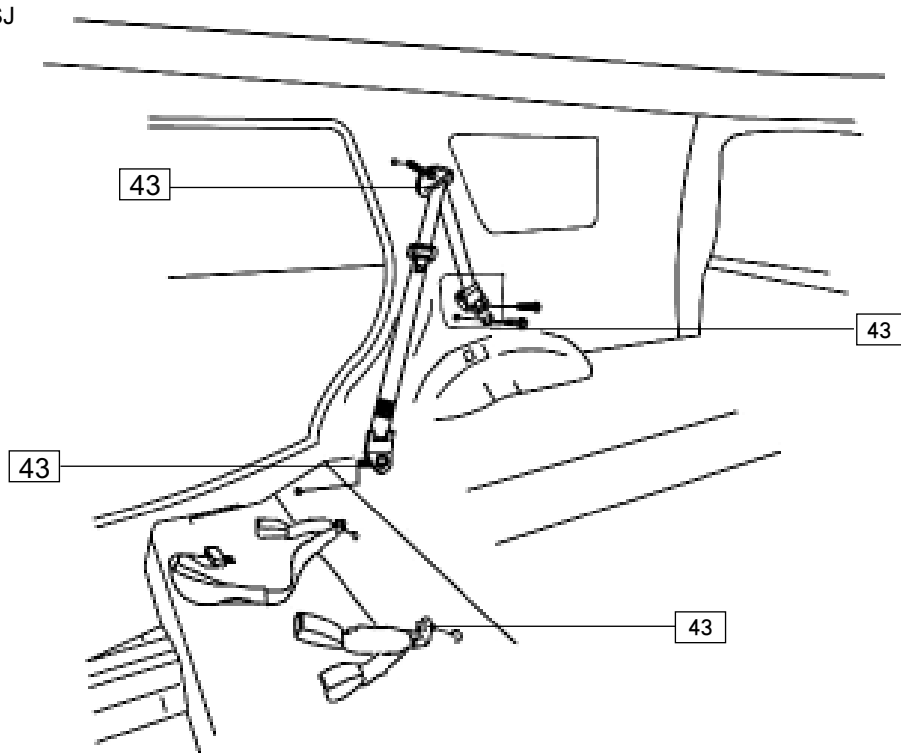
## Safety belt ( II )

## Element figure

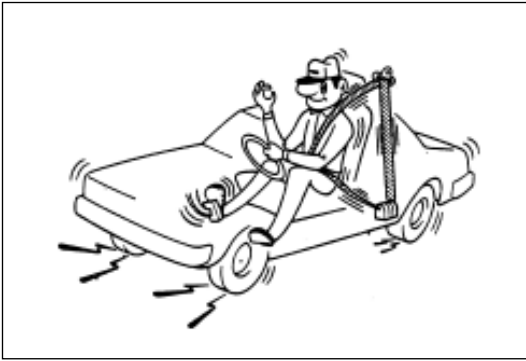
safety belt in  
SY model  
vehicle



safety belt in SJ  
model vehicle



N • m : specified torque

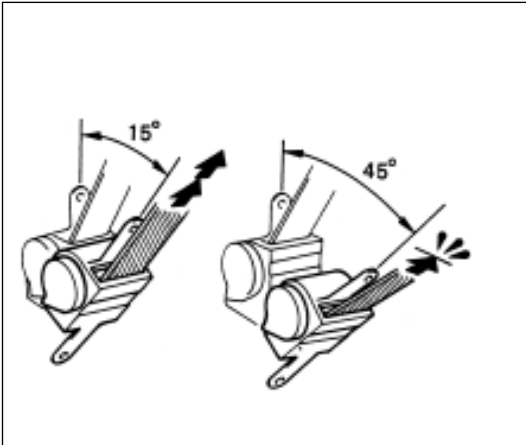


## Safety belt

### 1. Driving test (in the security place);

- (a) Fix the safety belt of the front seat.
- (b) Drive the vehicle at the speed of 16 km/h and brake it suddenly;
- (c) Check the safety belt, which should be lock tightly without expansion.

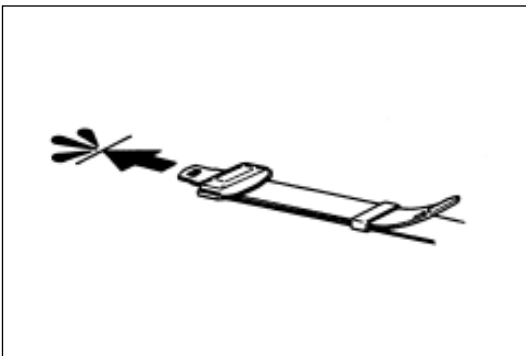
Remark: it is required to tear down the mechanism fittings of the safety belt to make the following static load test at the security place, in addition, moderate inspection for the new safety belt should be conducted before mounting no matter when the new safety belt fittings is needed to mount.



### 2. Static test

- (a) Tear down the lock-type expansion fittings;
- (b) Tilt the expansion fittings slowly;
- (c) Check the expansion of safety belt, which should be pulled out when the tilt angle is no more than 15 but not be pulled out when the tilt angle is more than 45°.

If the requirement is not met, change the safety belt fittings.



## Two-point safety belt

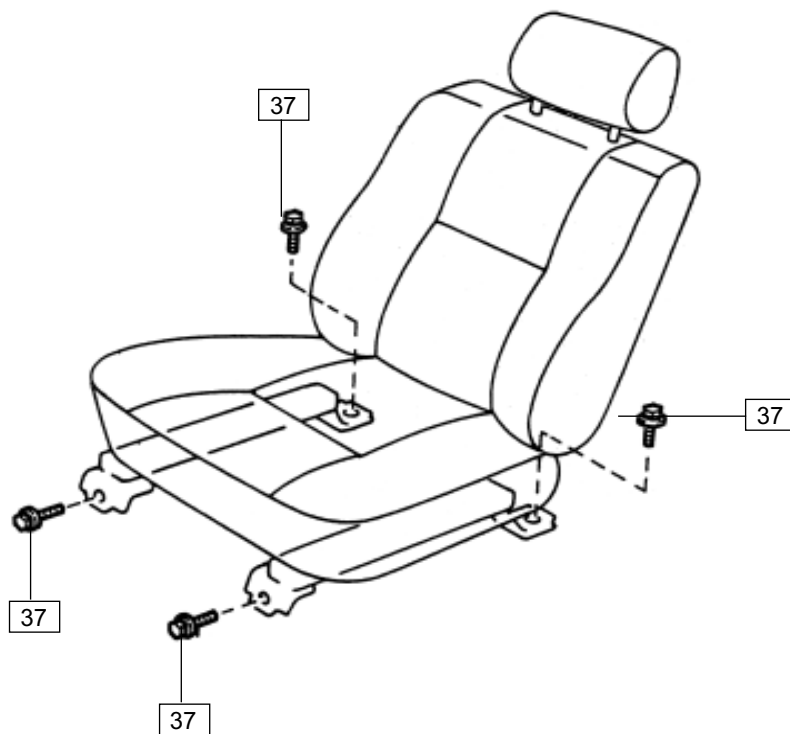
(manually operated)

- (a) Adjust the safety belt to the moderate length;
- (b) Exert the stable load on the belt;
- (c) Check whether the safety belt is elongated or not, in such case, the belt should not be elongated.

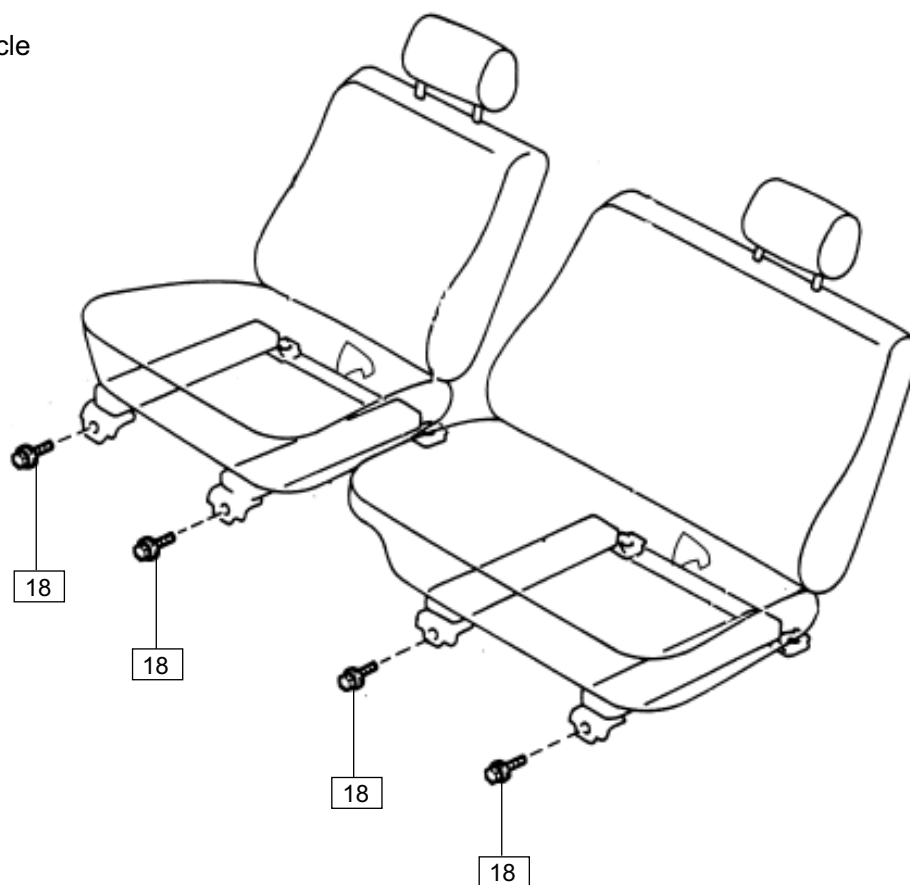
## Seat ( I )

### Element figure

Dr SL SK SF SY SJ  
front seat



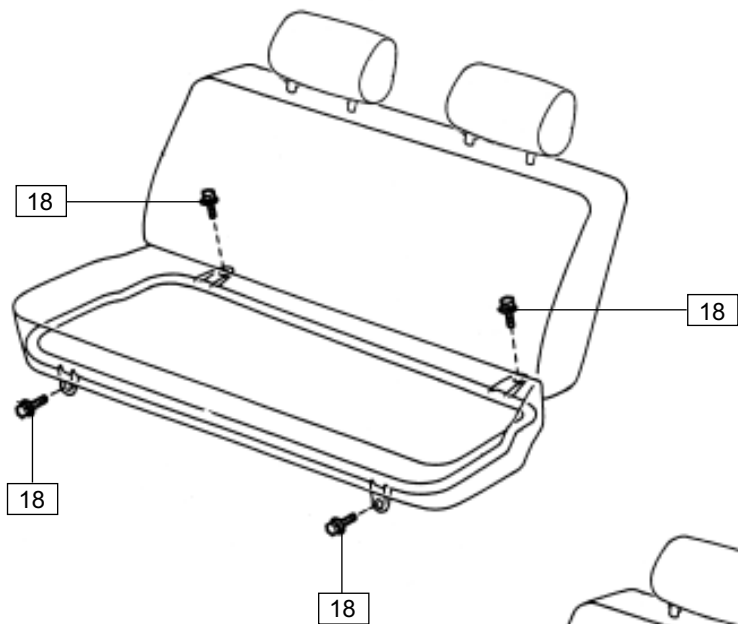
seat in SY  
model vehicle



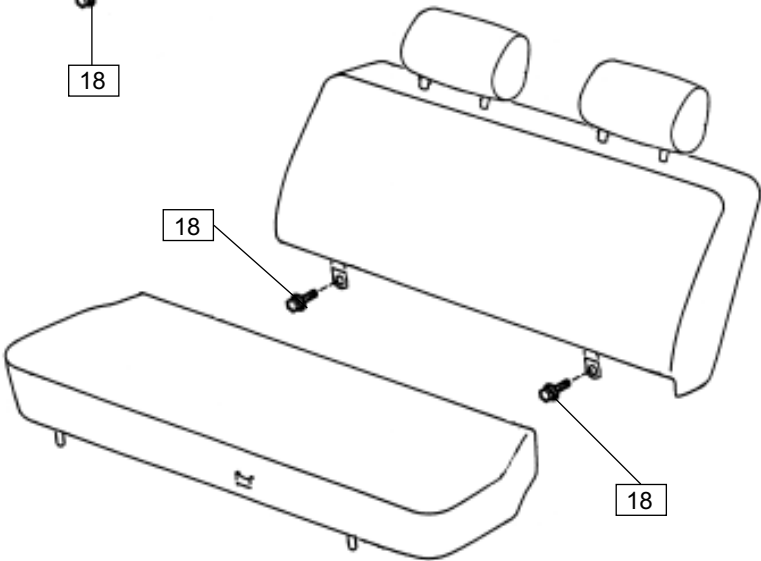
**N • m** : specified torque

Safety belt ( II )  
Element figure

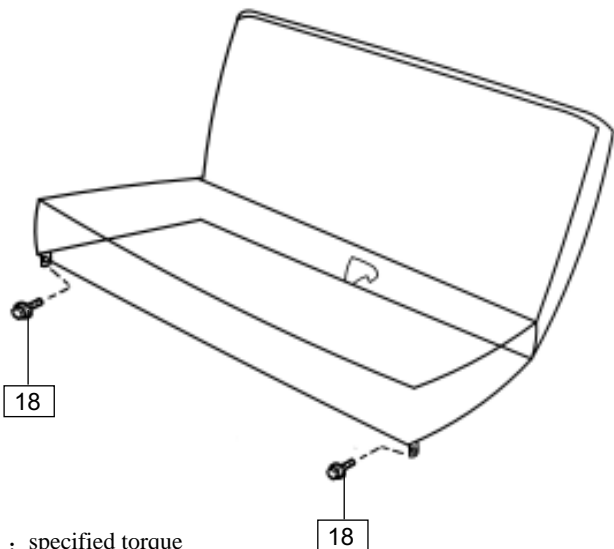
Dr rear seat



SL rear seat



SY small seat



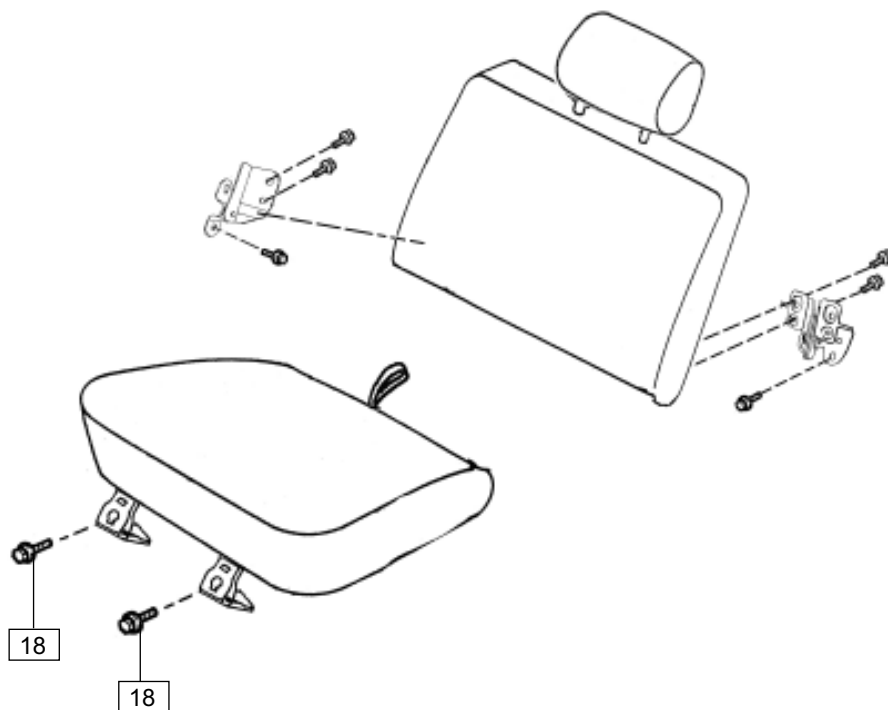
N • m : specified torque



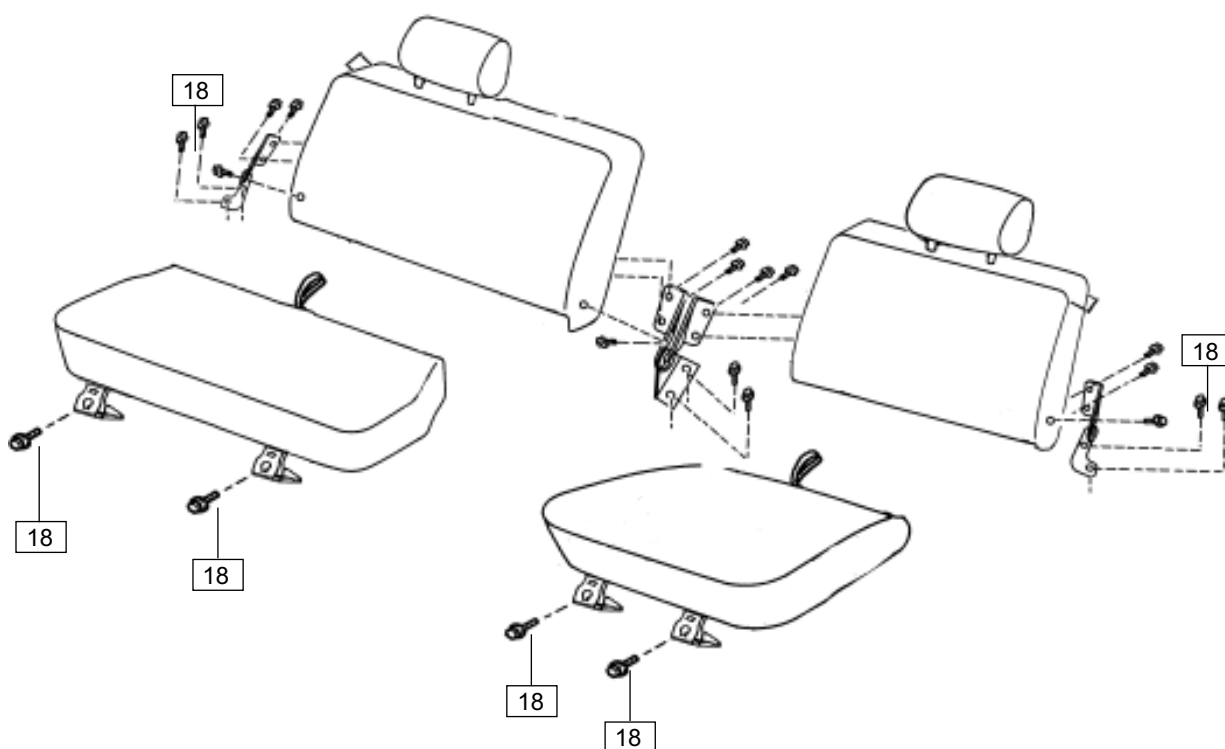
## Seat (III)

### Element figure

SF rear seat



SJ rear seat

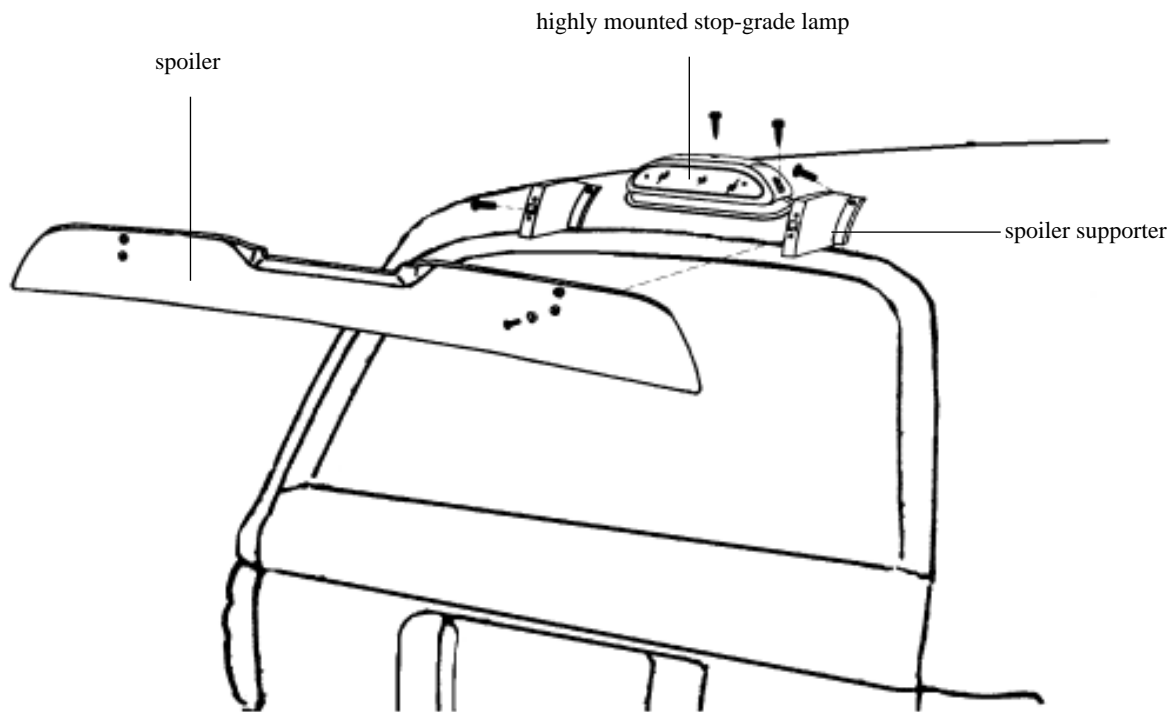


$\boxed{\text{N} \cdot \text{m}}$  : specified torque

## Spoiler ( I )

### Element figure

SF



### Dismantle of Spoiler

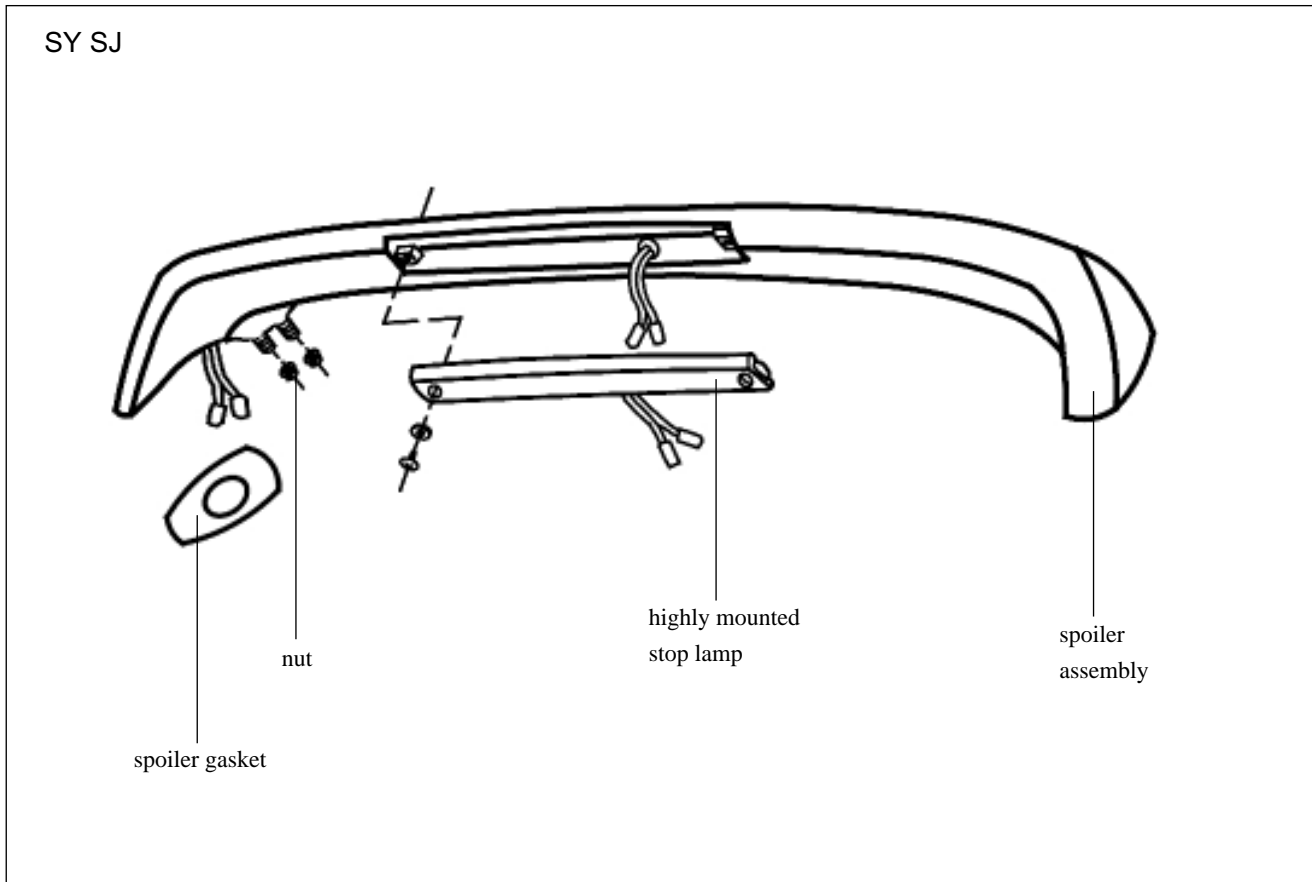
1. Tear down the spoiler assembly;
  - (a) Tear down the four bolts and the spoiler;
  - (b) Tear down the three bolts and the spoiler supporter.
2. Tear down the wire harness of highly-mounted stop-grade lamp and take it down;

### Mount of spoiler

Mount the spoiler in the reverse approach.

## Spoiler ( II )

### Element figure



### Spoiler disassembly

1. Tear down the highly-mounted stop-grade lamp;
  - (a) Tear down the two screws and disconnect the wire harness from lamp.
  - (b) Tear down the highly-mounted stop lamp from the spoiler.
2. Tear down the spoiler assembly
  - (a) Tear down the rear beam trim panel from the inside of body.
  - (b) Tear down the four nuts and disconnect the wire harness from the spoiler;
  - (c) Tear down the spoiler assembly and spoiler gasket from the outside.

### SJ

- (a) Open the two covers of round hole at the top-grade of spoiler;
- (b) Tear down the two bolts and disconnect the wire harness from the spoiler.
- (c) Tear down the spoiler assembly and spoiler gasket from the outside.

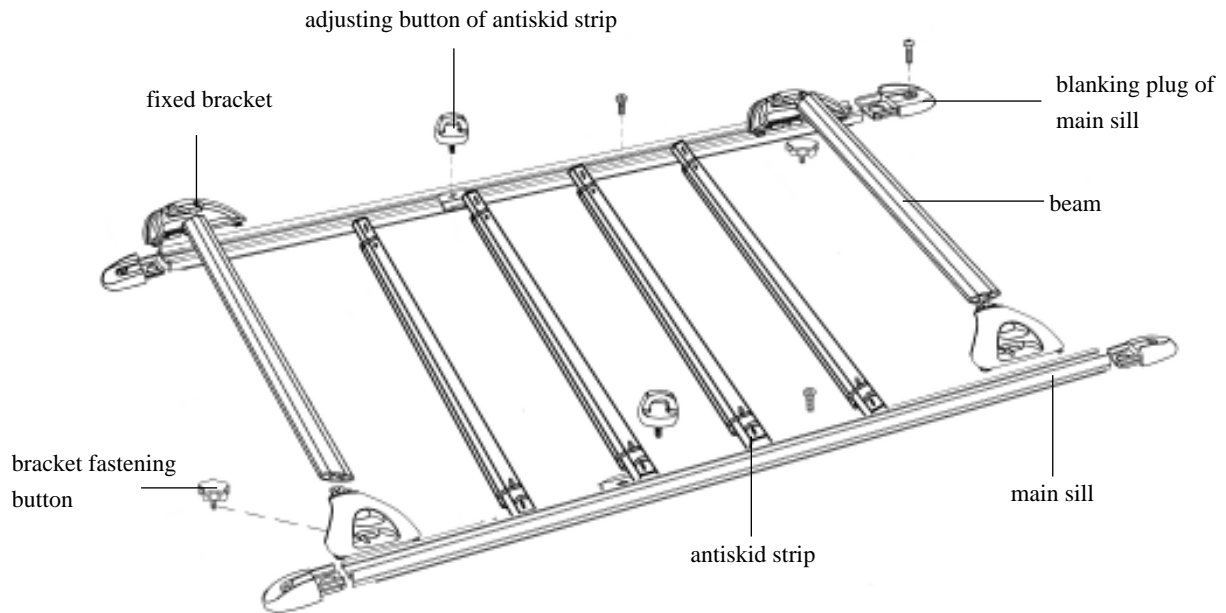
### Mount of Spoiler

Mount the spoiler in the reverse approach.

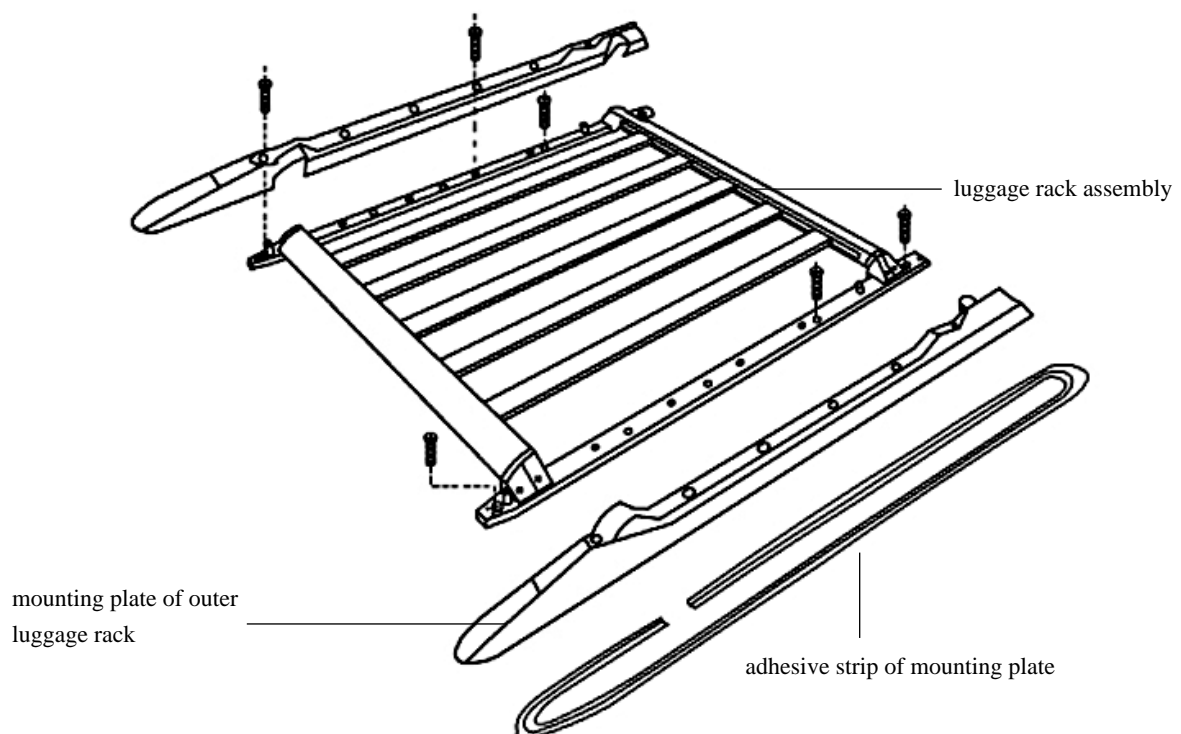
## Luggage rack

### Element figure

SF SY



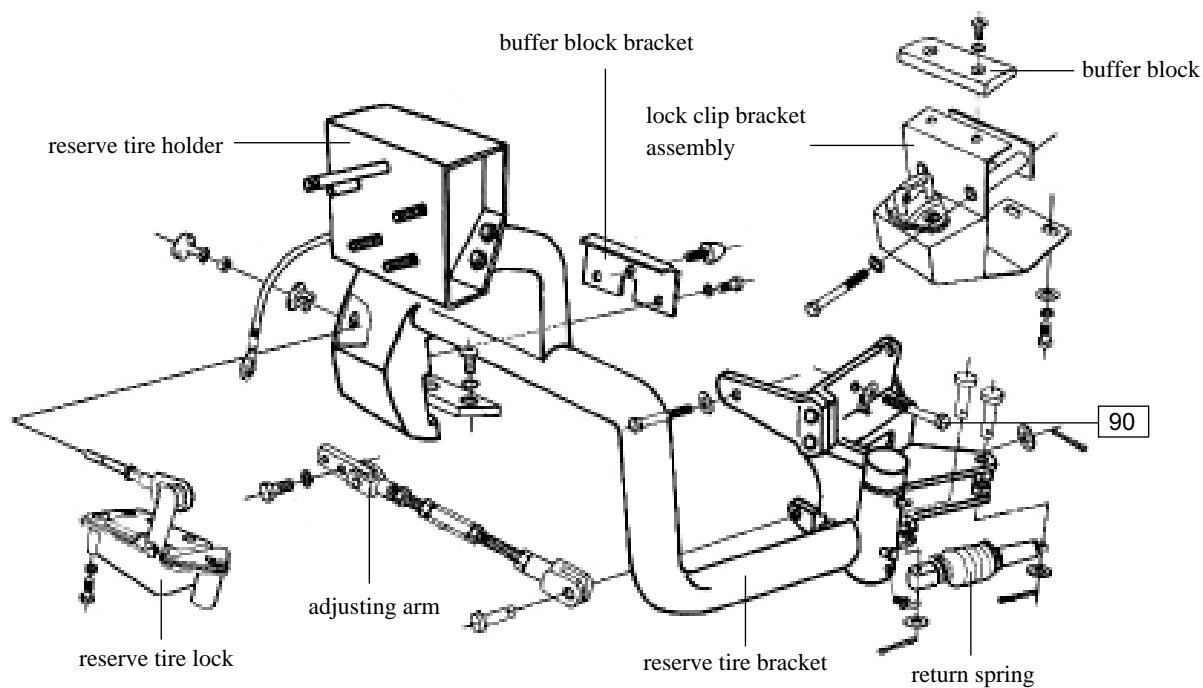
SJ



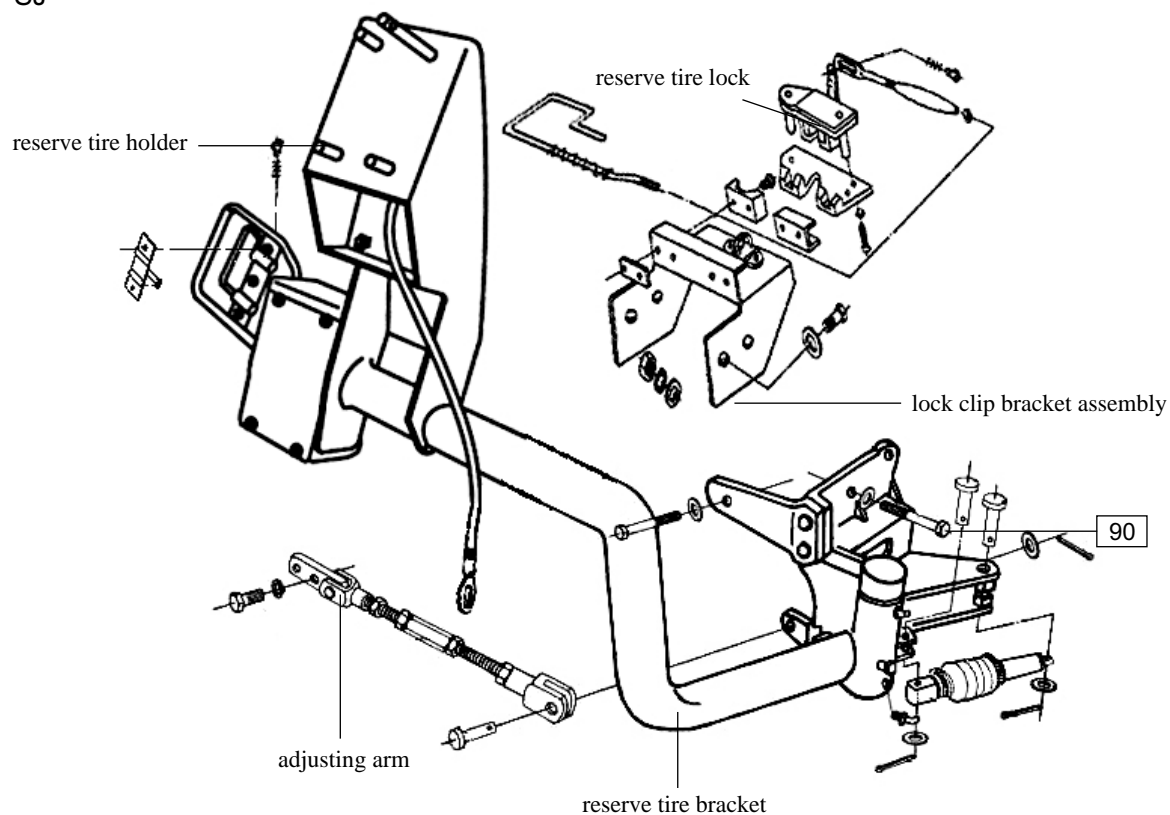
## Reserve tire bracket ( I )

## Element figure

SY



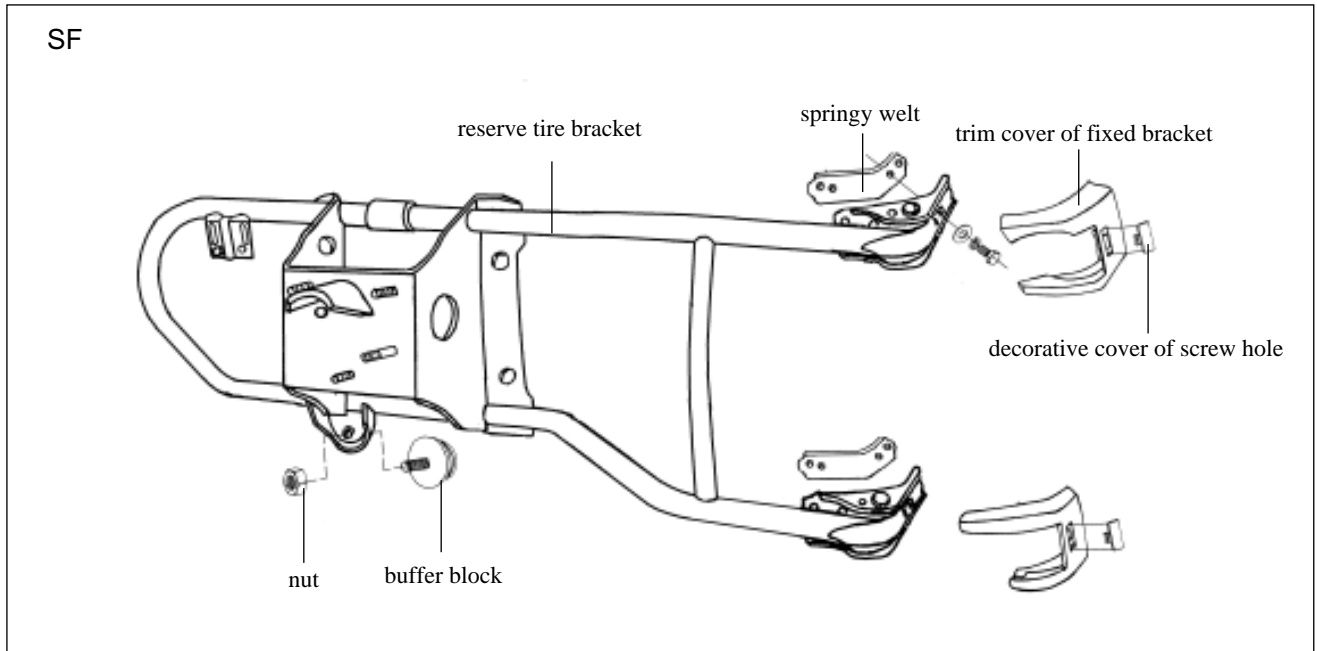
SJ



$\boxed{N \cdot m}$  : specified torque

## Reserve tire bracket ( II )

### Element figure



### Dismantle of reserve tire bracket

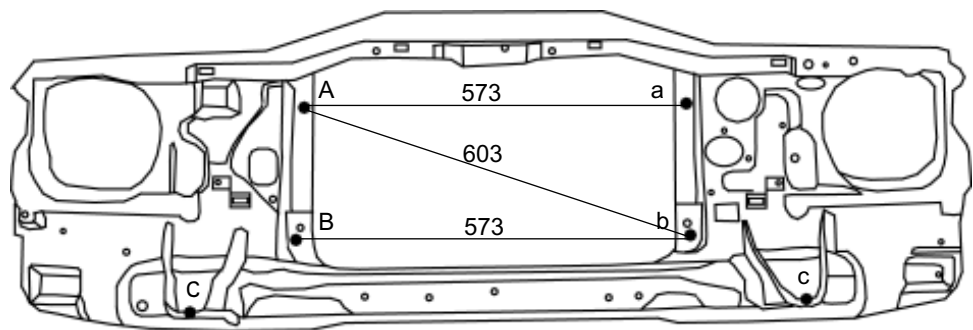
1. Tear down the trim cover of fixed bracket;  
Tear down the decorative cover of screw hole, and then tear down the trim cover of fixed bracket.  
Tear down the adjusting arm (SY SJ)  
Tear down the two bolts to take down the adjusting arm;
2. Tear down the reserve tire bracket;  
Tear down the three bolts and take down the reserve tire bracket. (SF)  
Tear down the three bolts and take down the reserve tire bracket. (SY SJ)

### Mount of reserve tire bracket

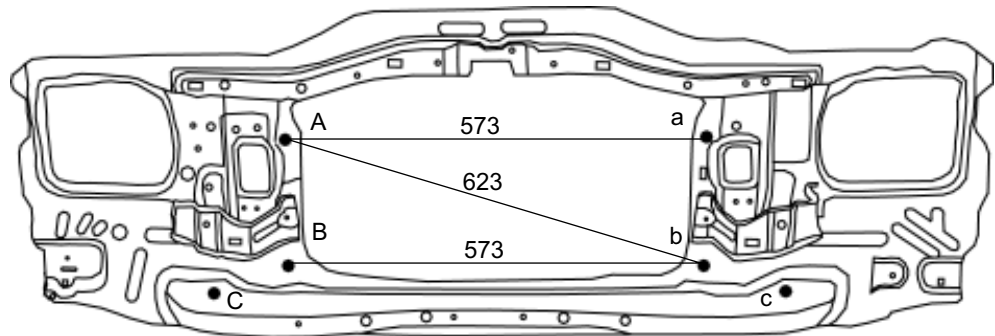
1. Mount the reserve tire bracket;
  - (a) Stick the springy welt on the corresponding face where the reserve tire bracket contact with the body; (SF)
  - (b) Fix the reserve tire bracket on the body with eight bolts (SF).  
Fix the reserve tire bracket with three bolts on the right mail sill and tail beam of the body.
2. Mount the trim cover of fixed bracket;  
Mount the trim cover of fixed bracket and the decorative cover of screw hole.  
Mount the adjusting arm (SY SJ)  
Fix the adjusting arm on the tail beam bracket of the body by screwing the two bolts in the fixing hole.  
Notice: the paint layer should be well protected during disassembling and assembling.

Body Dimension  
Large lamp seat ( I )

Dr  
(point Size in 3D)



SF  
(point Size in 3D)

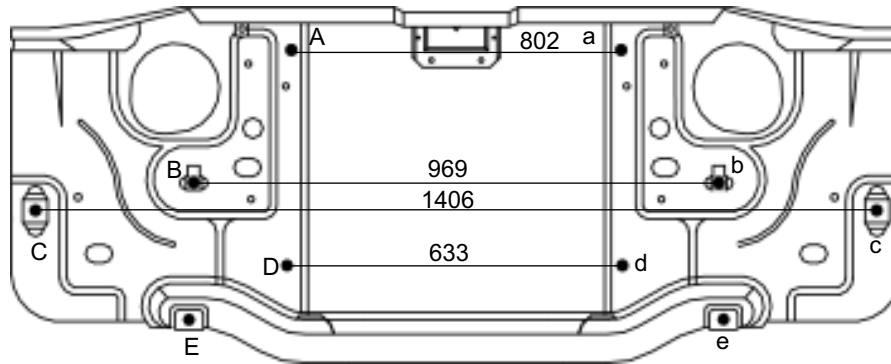


Mark	Name	Bore diameter	Mark	Name	Bore diameter
A,a	Radiator mounting hole	M8			
B,b	Radiator mounting hole	M8			
C,c	Cab mounting hole	φ 10 φ 20			

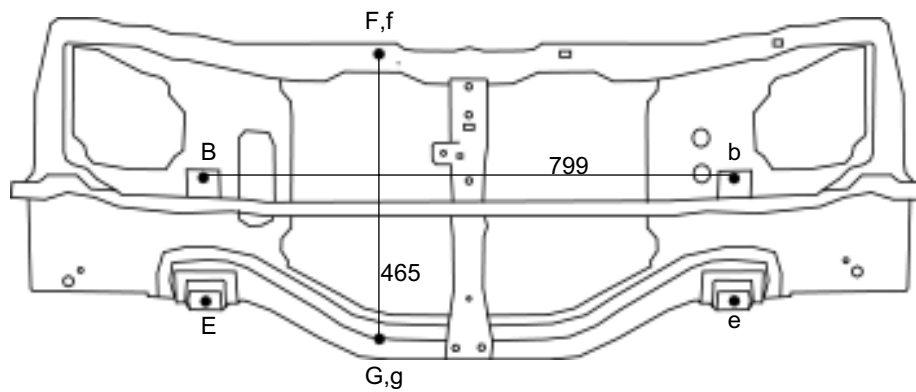
## Body Dimension

### Large lamp seat ( I )

SL SY  
(point Size in 3D)



SK SJ  
(point Size in 3D)



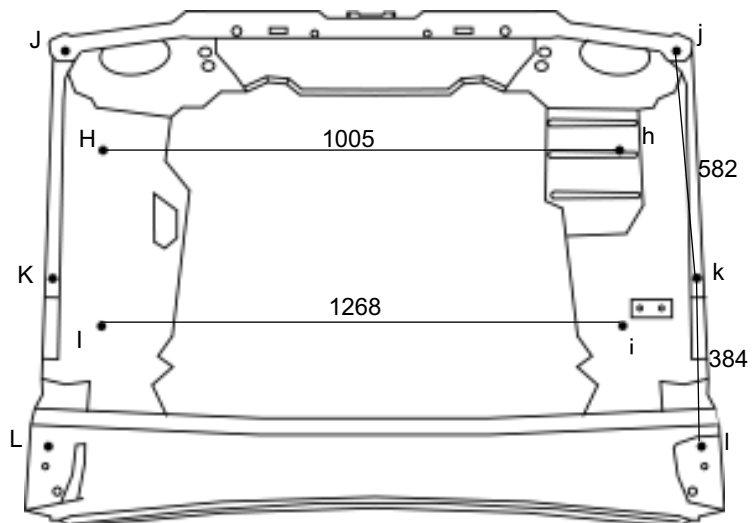
Mark	Name	Bore diameter	Mark	Name	Bore diameter
A,a	Radiator mounting hole	—	F,f	Mounting hole of median mesh	—
B,b	Fixing bolts of front bar	—	G,g	Vertical projection spot of lower beam of radiator	—
C,c	Fixing bolts of front bar	—			
D,d	Radiator mounting hole	—			
E,e	Cab mounting hole	—			



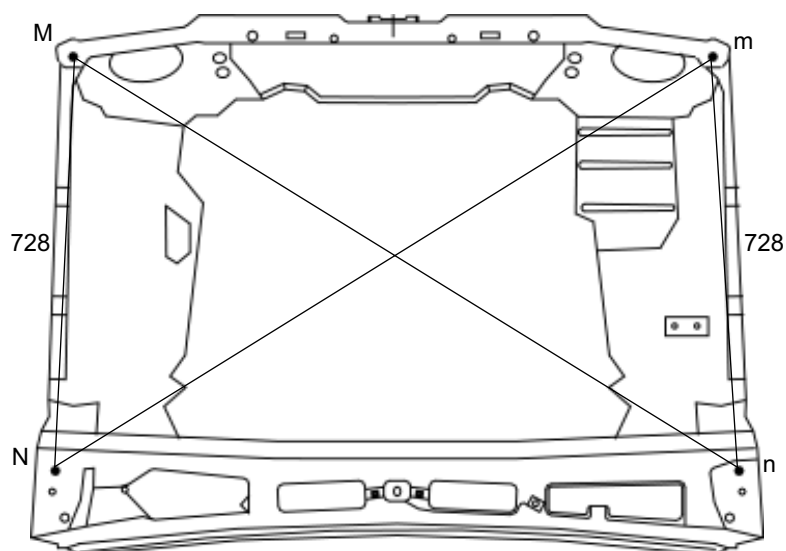
# Body Dimension

## Engine Room ( I )

Dr SF  
(point size in 3D)



SL SY  
(point size in 3D)



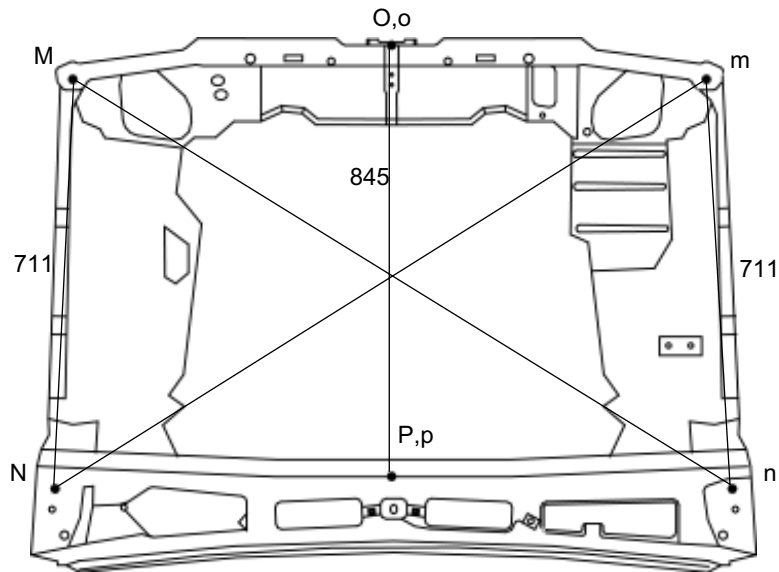
Remark: the deviation in length of diagonal line of engine room should not be more than 4 mm.

Mark	Name	Bore diameter	Mark	Name	Bore diameter
H,h	Front locating hole of mudguard	M8	M,m	Locating hole of upper part of front wall	φ7
I,i	Hole of fixing nut of large lamp	M8	N,n	First mounting hole of wing panel	—
J,j	Front locating hole of mudguard	M6			
K,k	First mounting hole of engine cover	M6			
L,l	First mounting hole of wing panel	φ 10			

## Body Dimension

### Engine Room ( II )

SK SJ  
(point size in 3D)



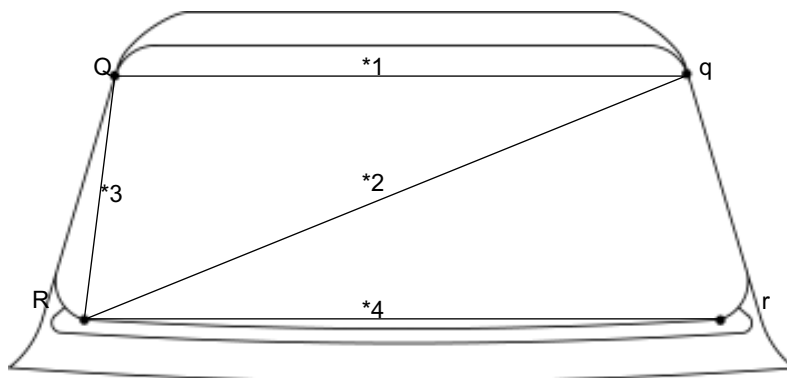
Remark: the deviation in length of diagonal line of engine room should not be more than 4 mm.

Mark	Name	Bore diameter	Mark	Name	Bore diameter
M,m	Hole of fixing nut of large lamp	$\phi 7$			
N,n	First mounting hole of engine cover	—			
O,o	Vertical face of median mesh	—			
P,p	Projection line of vertical face of median mesh	—			

# Body Dimension

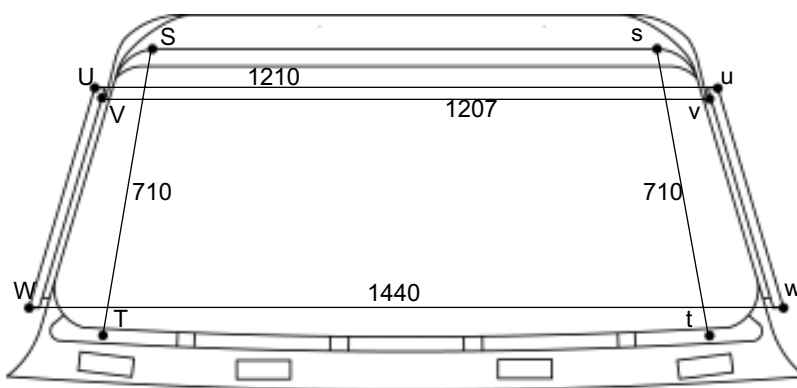
## Wind tunnel

Dr SF  
(point size in 3D)



\*1: Dr 1159  
SF 1155  
\*2: Dr 1370  
SF 1373  
\*3: Dr 589  
SF 692  
\*4: Dr 1327  
SF 1333

SL SK SY  
(point size in 3D)

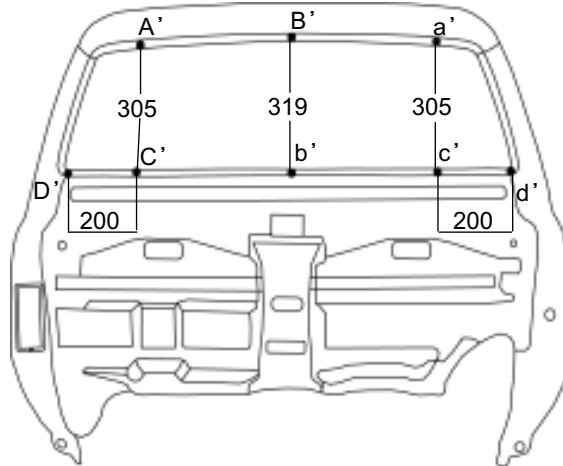


Mark	Name	Bore diameter	Mark	Name	Bore diameter
Q,q	Connecting part of top-grade cover and exterior plate of front pillar	—	V,v	Conner spots along outer edge of top-grade cover	—
R,r	Connecting part of upper front wall and exterior plate of front pillar	—	W,w	Outer spots of top-grade water channel	—
S,s	Conner spots along outer edge of top-grade cover	—			
T,t	Mounting hole on cover plate of front windscreen	—			
U,u	Outer spots of top-grade water channel	—			

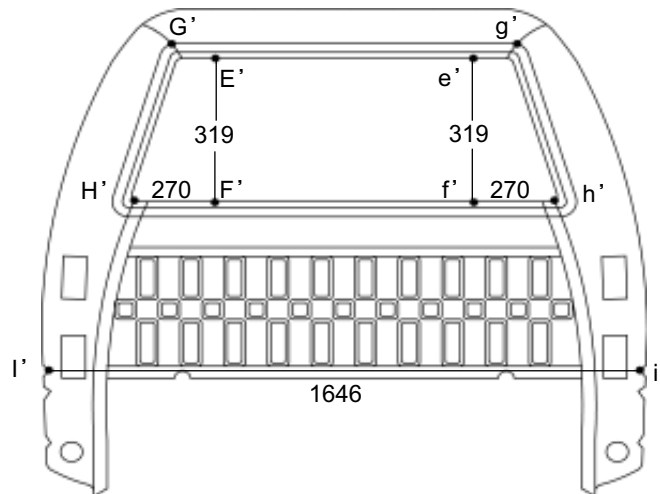
## Body Dimension

## Rear Wall ( I )

Dr  
(point size in 3D)



SL SK  
(point size in 3D)

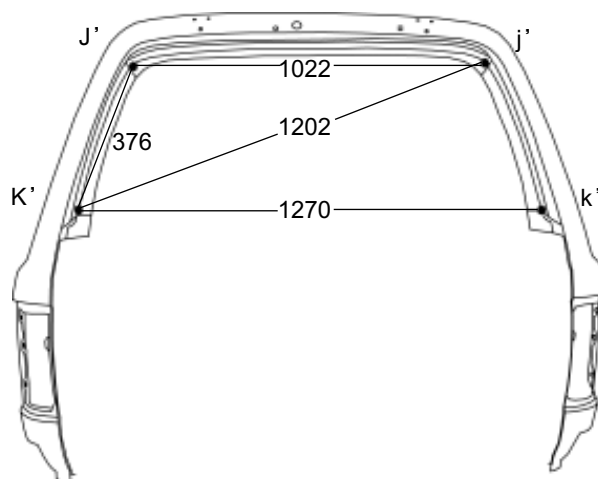


Mark	Name	Bore diameter	Mark	Name	Bore diameter
A',a'	0spots on cover	—	F',f'	Connecting spot on outer panel of rear pillar	—
B',b'	Technique notch on top-grade cover	—	G',g'	Corresponding spots of upper edge of rear wind channel	—
C',c'	Corresponding spots on rear wall panel	—	H',h'	Corresponding spot of waist line of outer panel of rear pillar	—
D',d'	Connecting spot on outer plate of rear pillar	—	I',i'	Corresponding spots of lower edge of rear wind channel	—
E',e'	Outer edge of rear wall panel	—			

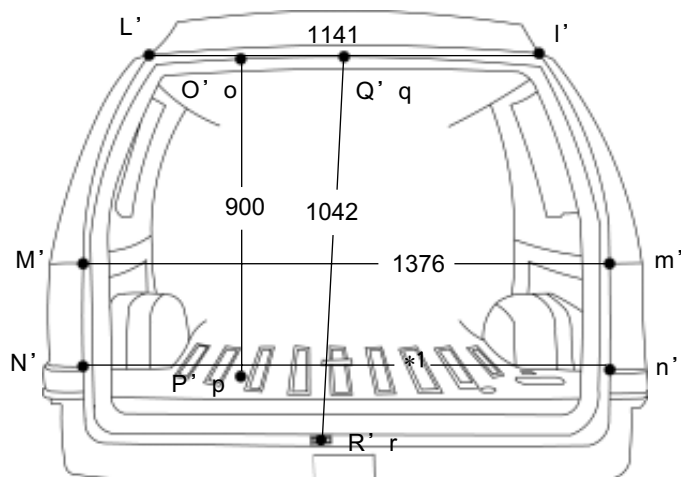
## Body Dimension

### Rear Wall ( II )

SF  
(point size in 3D)



SY SJ  
(point size in 3D)



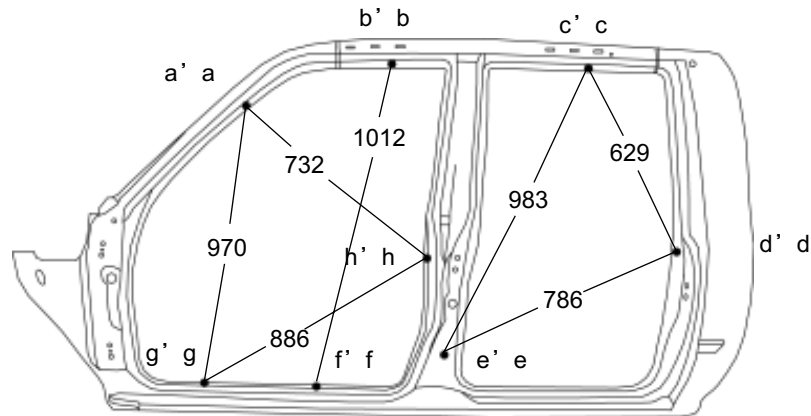
\*1: SY 1376  
SJ 1385

Mark	Name	Bore diameter	Mark	Name	Bore diameter
J', j'	Connecting part of outer panel of rear wall with roof	—	O', o'	Corresponding spots of upper edge	—
K', k'	Lower edge of outer panel of rear wall	—	P', p'	Vertical corresponding spot of floor	—
L', l'	Lines and angle of rear side wall	—	Q', q'		—
M', m'	Upper angle of rear lamp cavity	—	R', r'	Outer edge of lock box at tailgate	—
N', n'	Lower angle of rear lamp cavity	—			

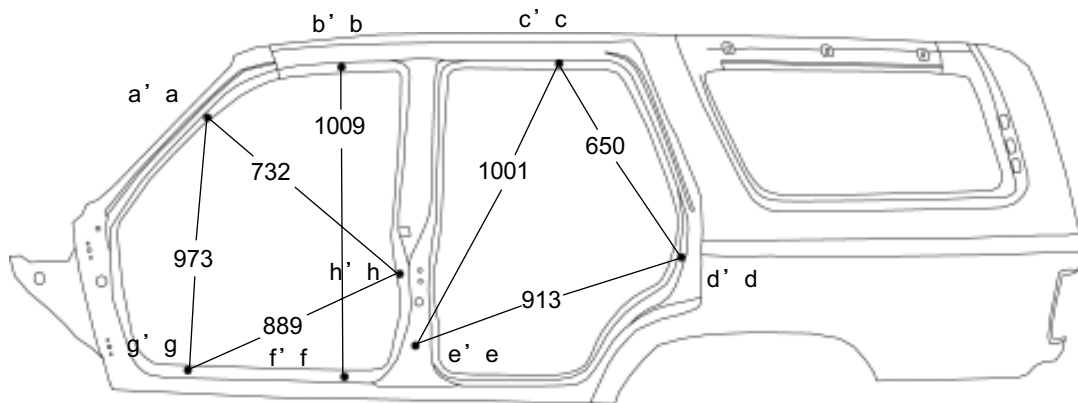
# Body Dimension

## Side wall ( I )

Dr  
(point size in 3D)



SF  
(point size in 3D)

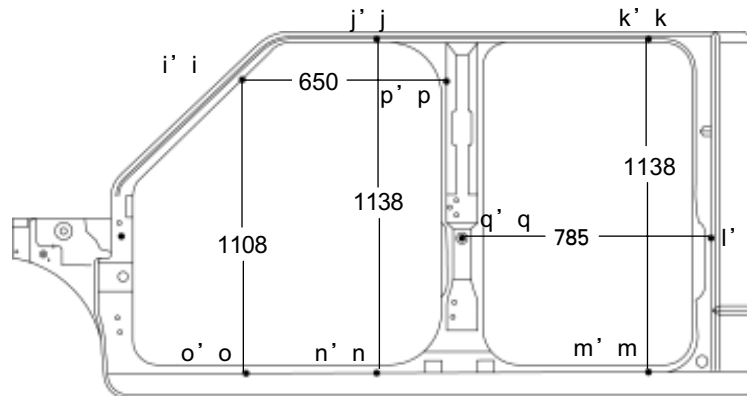


Mark	Name	Bore diameter	Mark	Name	Bore diameter
a',a	Technical notch on outer panel of front pillar	—	f',f	Technical notch on outer panel of lower side beam	—
b',b	Technical notch on outer panel of upper side beam	—	g',g	Technical notch on of lower beam of outer panel	—
c',c	Technical notch on outer panel of upper side beam	—	h',h	Technical notch of outer panel of middle pillar	—
d',d	Locating hole/technical notch on outer panel of rear wall	φ 10			
e',e	Central mounting hole of rear door hinge	φ 8			

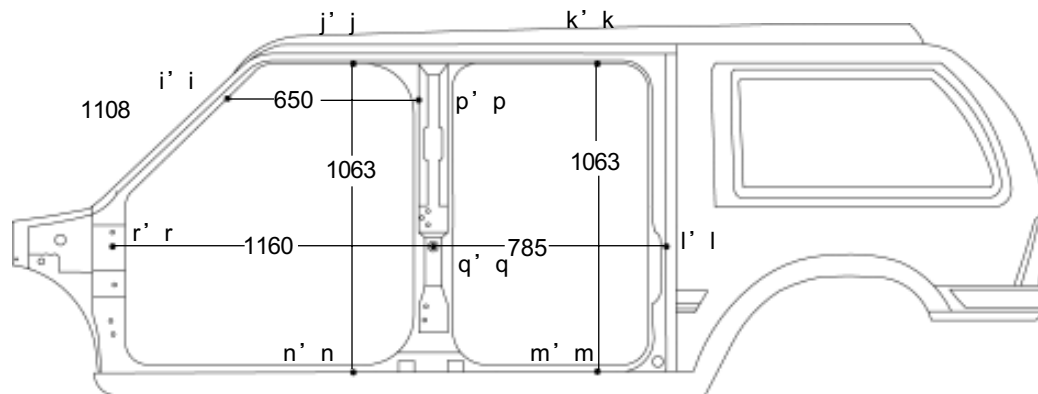
## Body Dimension

### Side wall ( II )

SL SK  
(point size in 3D)



SY  
(point size in 3D)

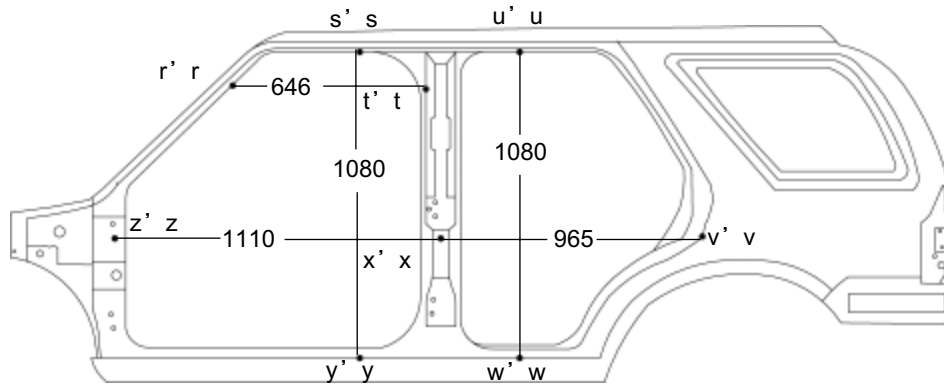


Mark	Name	Bore diameter	Mark	Name	Bore diameter
i',i	Technical notch on outer panel of front pillar	—	n',n	Technical notch on outer panel of lower side beam	—
j',j	Technical notch on outer panel of upper side beam	—	o',o	Technical notch on outer panel of lower side beam	—
k',k	Technical notch on outer panel of upper side beam	—	p',p	Corresponding spot of outer panel of middle pillar	—
l',l	Corresponding spot of outer panel of rear pillar	—	q',q	Wiring hole of outer panel of middle pillar	—
m',m	Technical notch on outer panel of lower side beam	—	r',r	Technical hole on outer panel of front pillar	—

# Body Dimension

## Side wall(III)

SJ  
(point size in 3D)

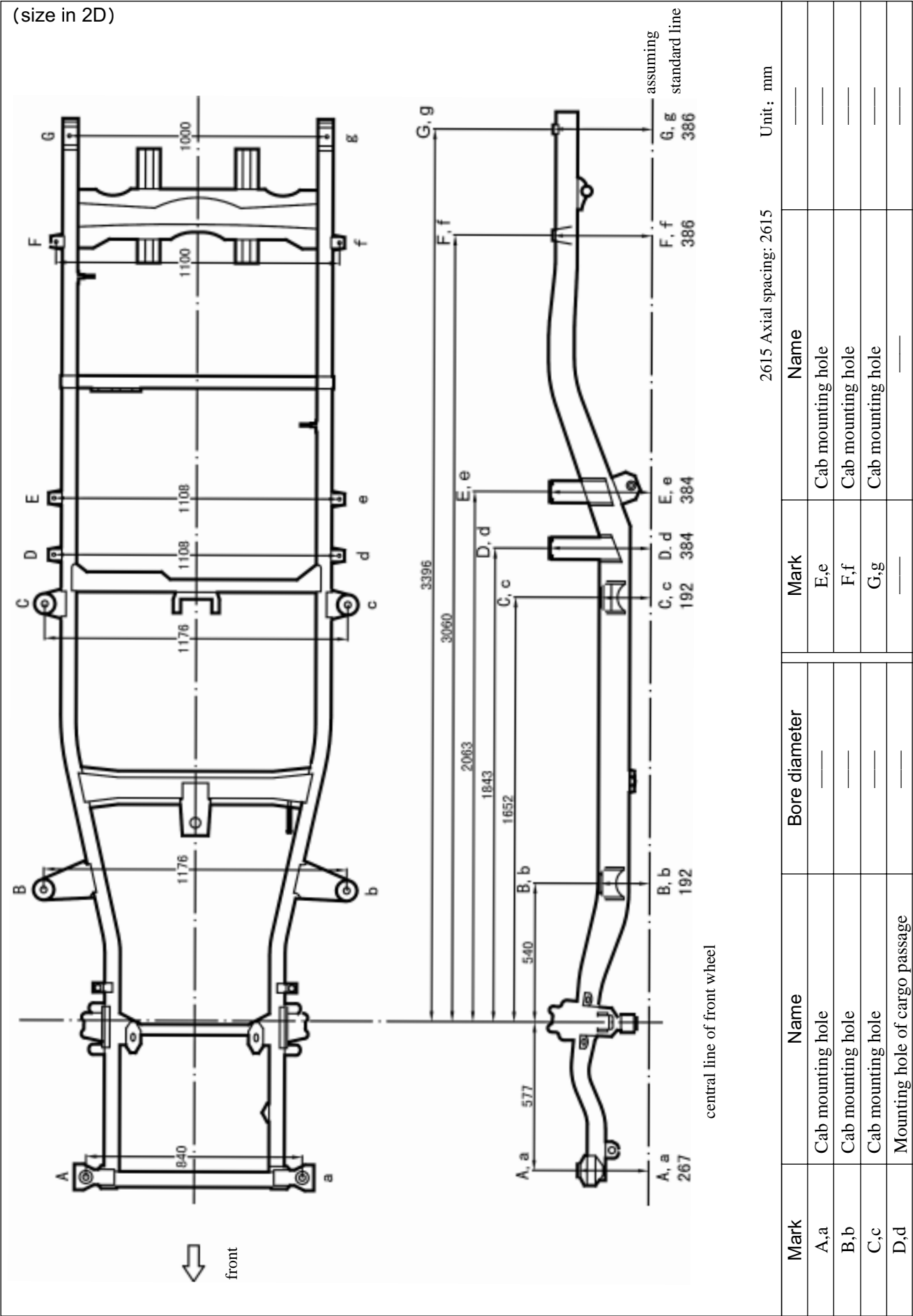


Mark	Name	Bore diameter	Mark	Name	Bore diameter
r',r	Technical notch on outer panel of front pillar	—	w',w	Corresponding spot of outer panel of lower side beam	—
s',s	Technical notch on outer panel of upper side beam	—	x',x	Corresponding hole of outer panel of middle pillar	—
t',t	Corresponding spot of outer panel of middle pillar	—	y',y	Corresponding spot of outer panel of lower side beam	—
u',u	Corresponding spot on outer panel of upper side beam	—	z',z	Technical hole on outer panel of front pillar	—
v',v	Corresponding spot of outer panel of rear pillar	—			



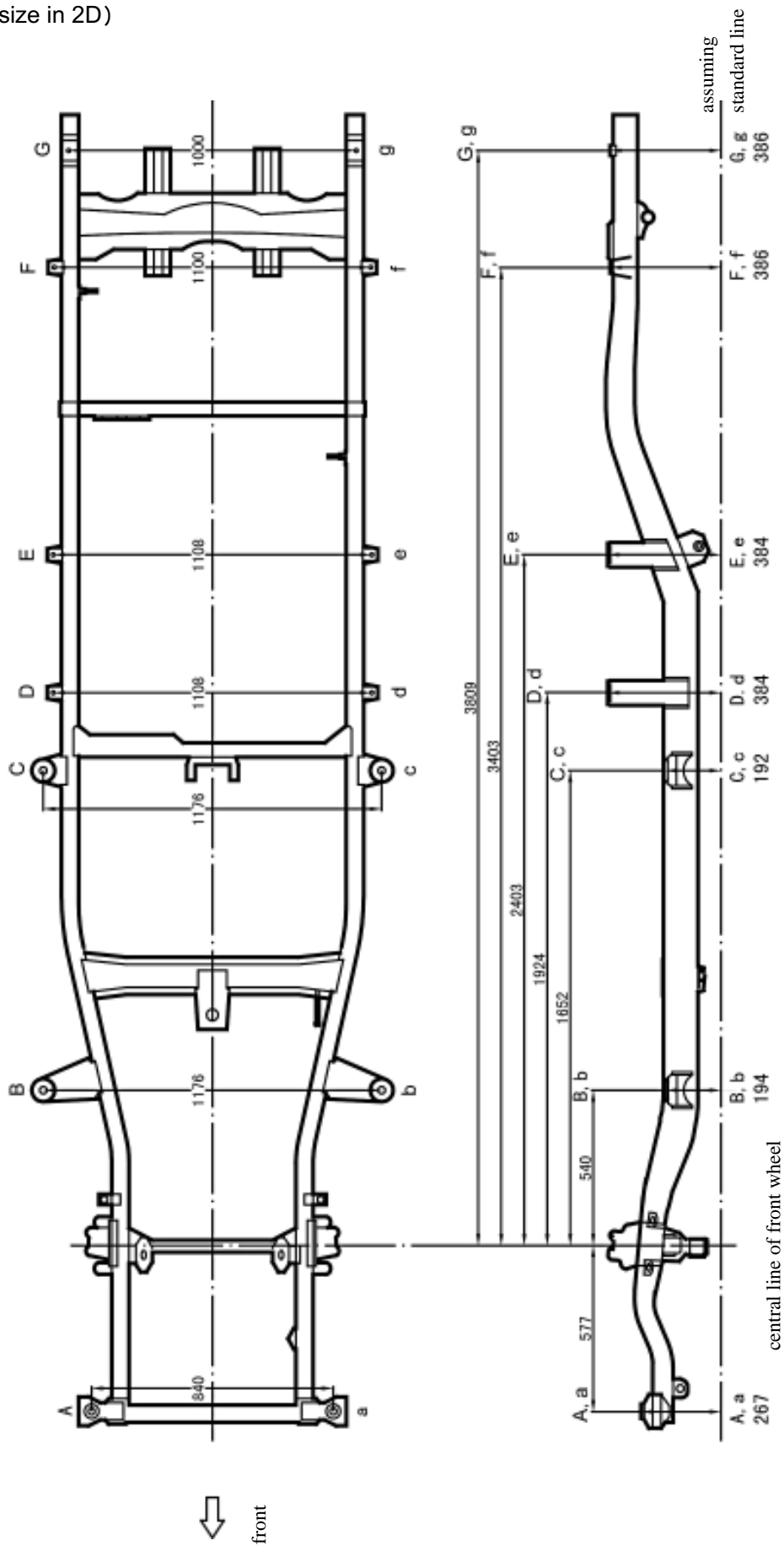
Small single-row Deer

(size in 2D)



big single-row Deer

(size in 2D)



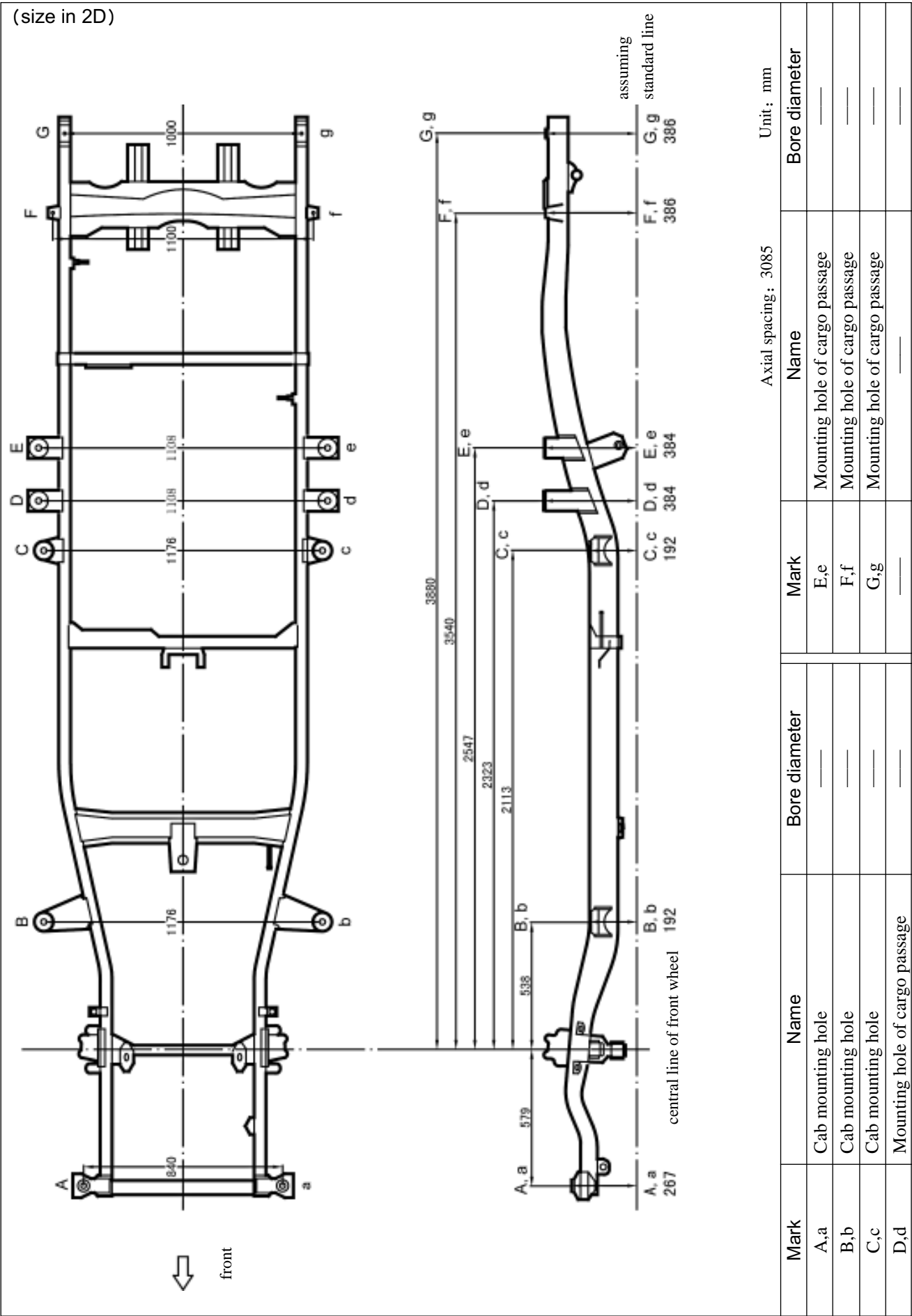
Unit: mm

Axial spacing: 2960

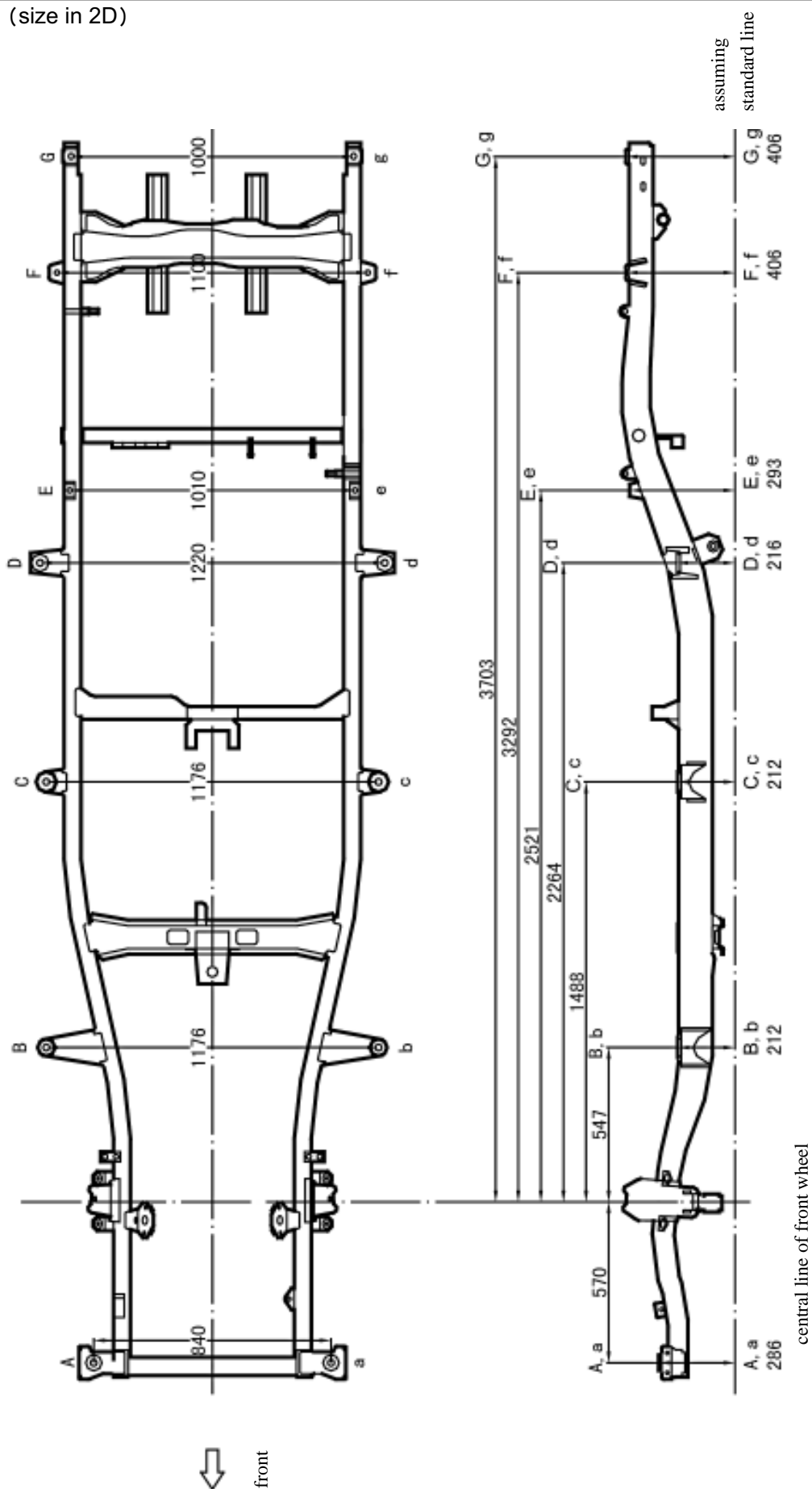
Mark	Name	Bore diameter	Mark	Name	Bore diameter
A,a	Cab mounting hole	—	E,e	Mounting hole of cargo passage	—
B,b	Cab mounting hole	—	F,f	Mounting hole of cargo passage	—
C,c	Cab mounting hole	—	G,g	Mounting hole of cargo passage	—
D,d	Mounting hole of cargo passage	—	—	—	—

One and half row deer

(size in 2D)



(size in 2D)

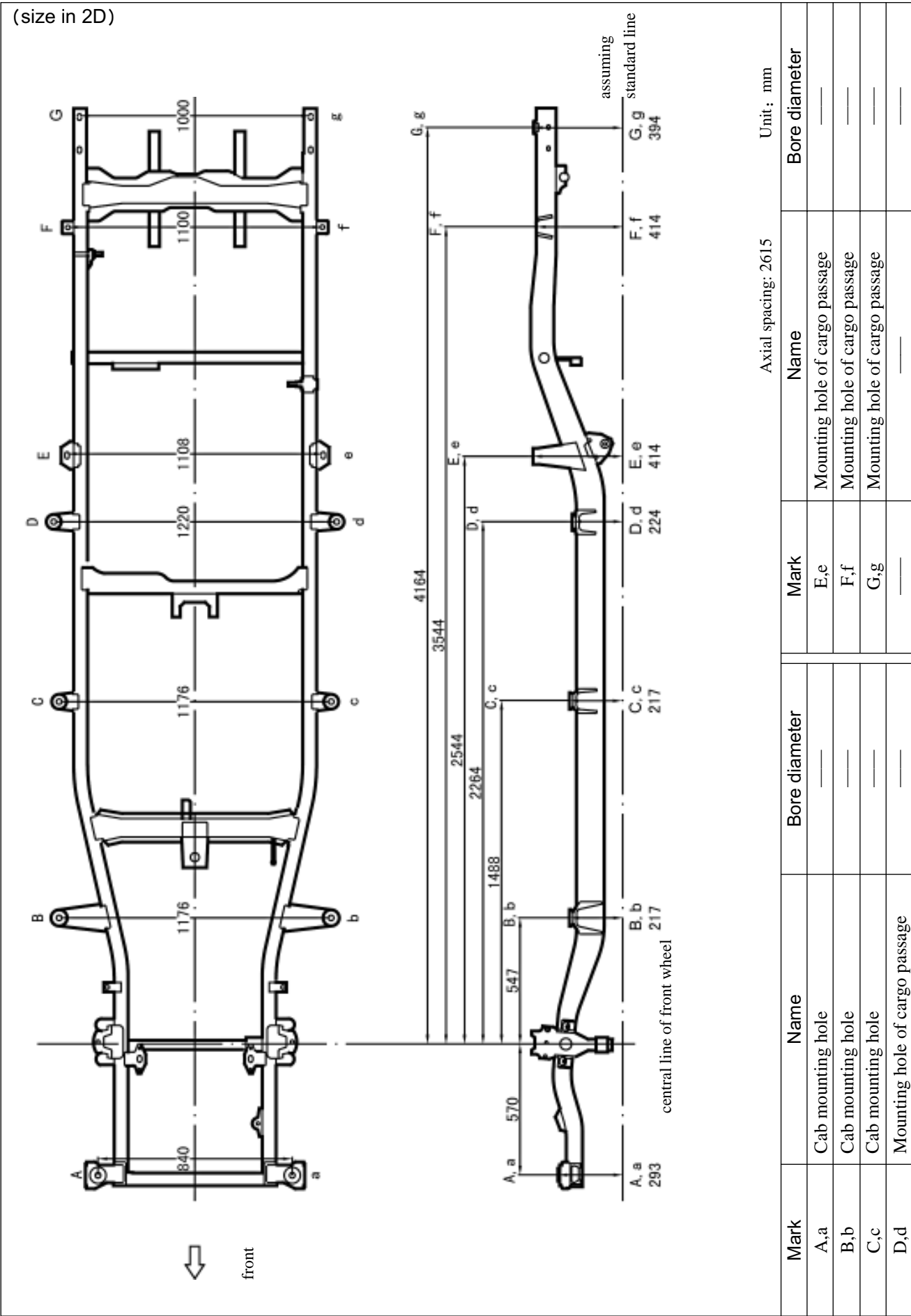


Unit: mm

Axial spacing: 2615

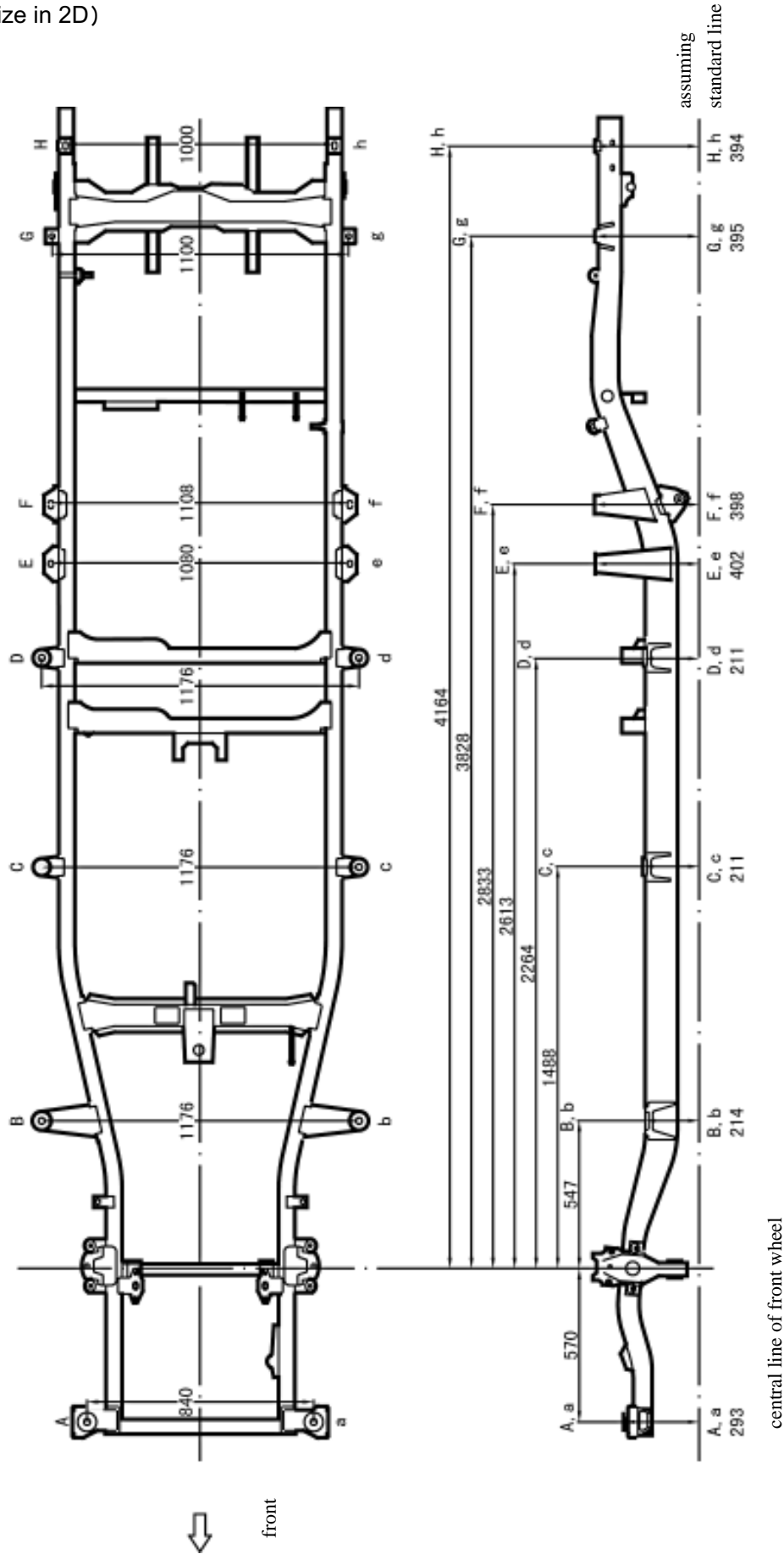
Mark	Name	Bore diameter	Mark	Name	Bore diameter
A,a	Cab mounting hole	—	E,e	Mounting hole of cargo passage	—
B,b	Cab mounting hole	—	F,f	Mounting hole of cargo passage	—
C,c	Cab mounting hole	—	G,g	Mounting hole of cargo passage	—
D,d	Mounting hole of cargo passage	—	—	—	—

Middle double-row Deer



Big double-row Deer

(size in 2D)

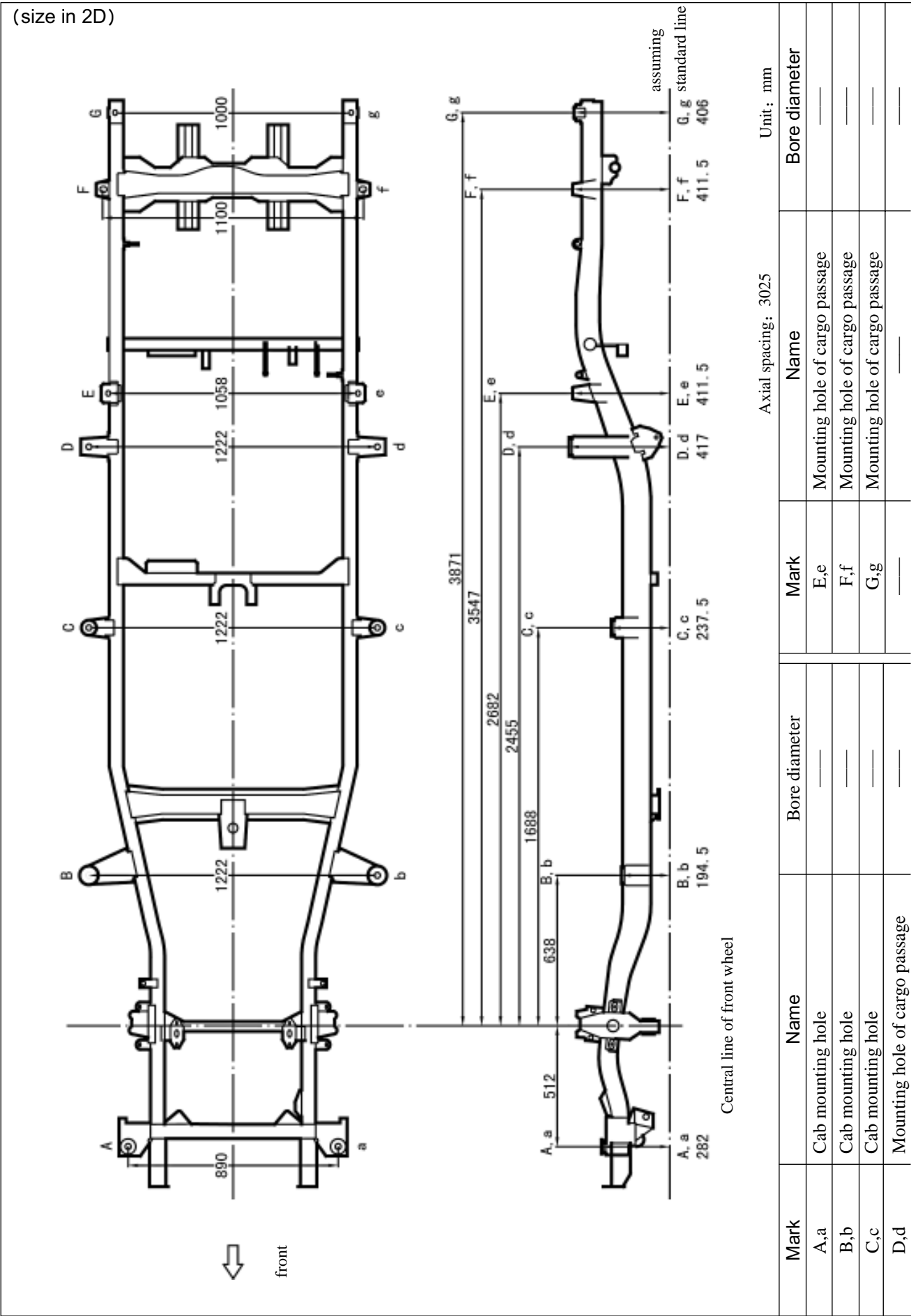


Unit: mm

Axial spacing: : 3380

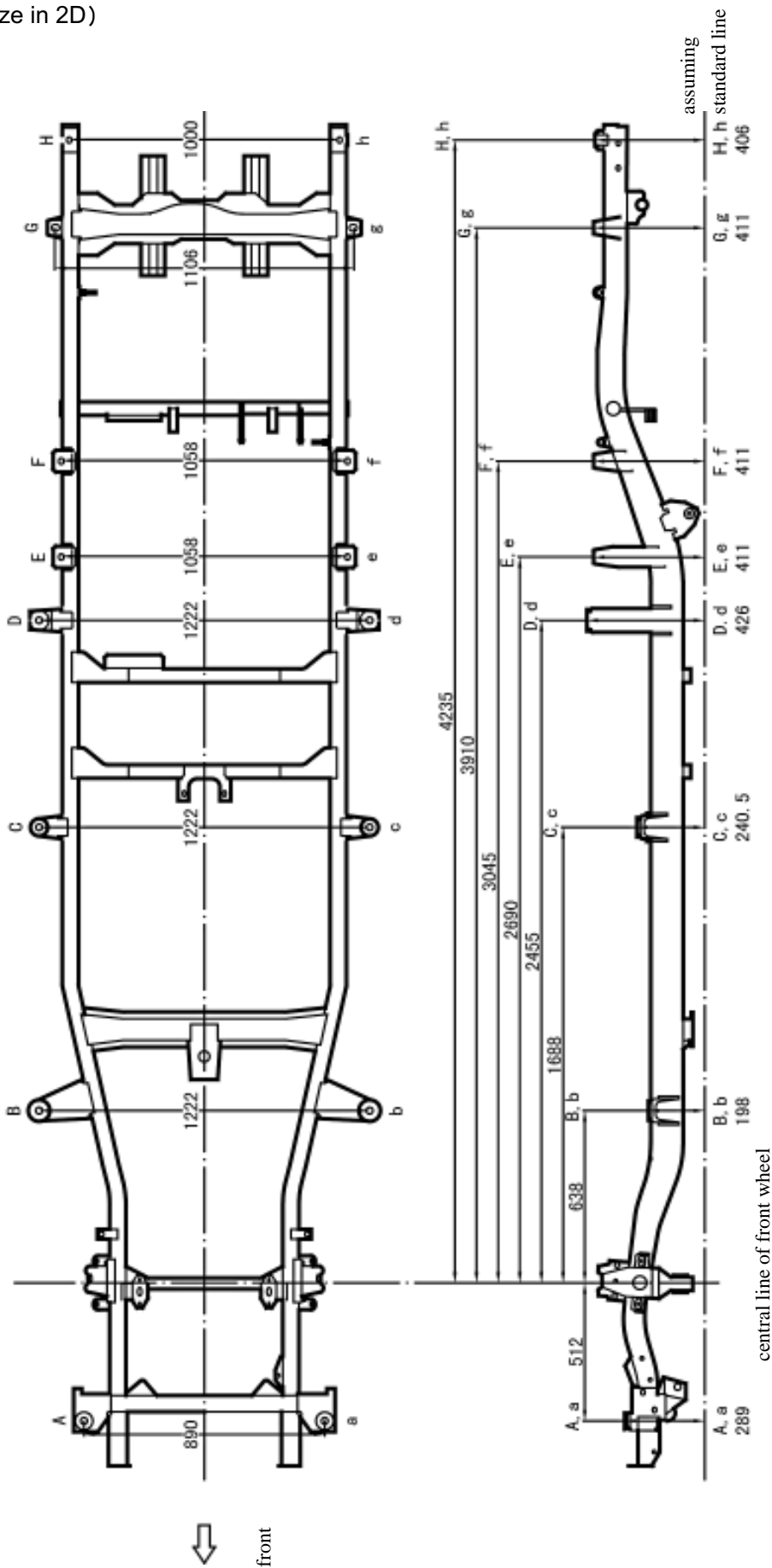
Mark	Name	Bore diameter	Mark	Name	Bore diameter
A,a	Cab mounting hole	—	E,e	Mounting hole of cargo passage	—
B,b	Cab mounting hole	—	F,f	Mounting hole of cargo passage	—
C,c	Cab mounting hole	—	G,g	Mounting hole of cargo passage	—
D,d	Mounting hole of cargo passage	—	H,h	Mounting hole of cargo passage	—

Small double-row Sailor



big double-row Sailor

(size in 2D)



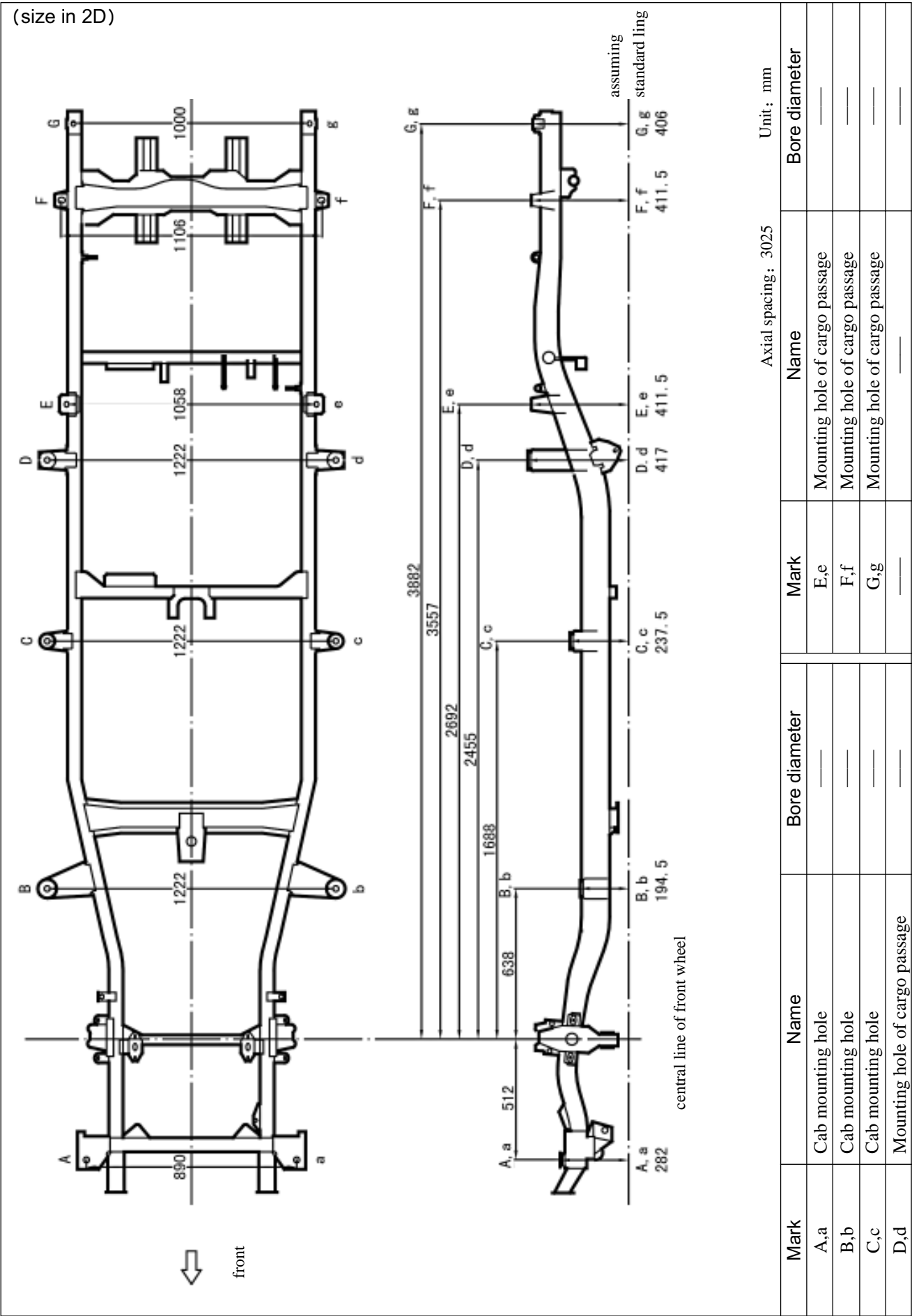
Unit: mm

Axial spacing: 3380

Mark	Name	Bore diameter	Mark	Name	Bore diameter
A,a	Cab mounting hole	—	E,e	Cab mounting hole	—
B,b	Cab mounting hole	—	F,f	Cab mounting hole	—
C,c	Cab mounting hole	—	G,g	Cab mounting hole	—
D,d	Cab mounting hole	—	H,h	Cab mounting hole	—

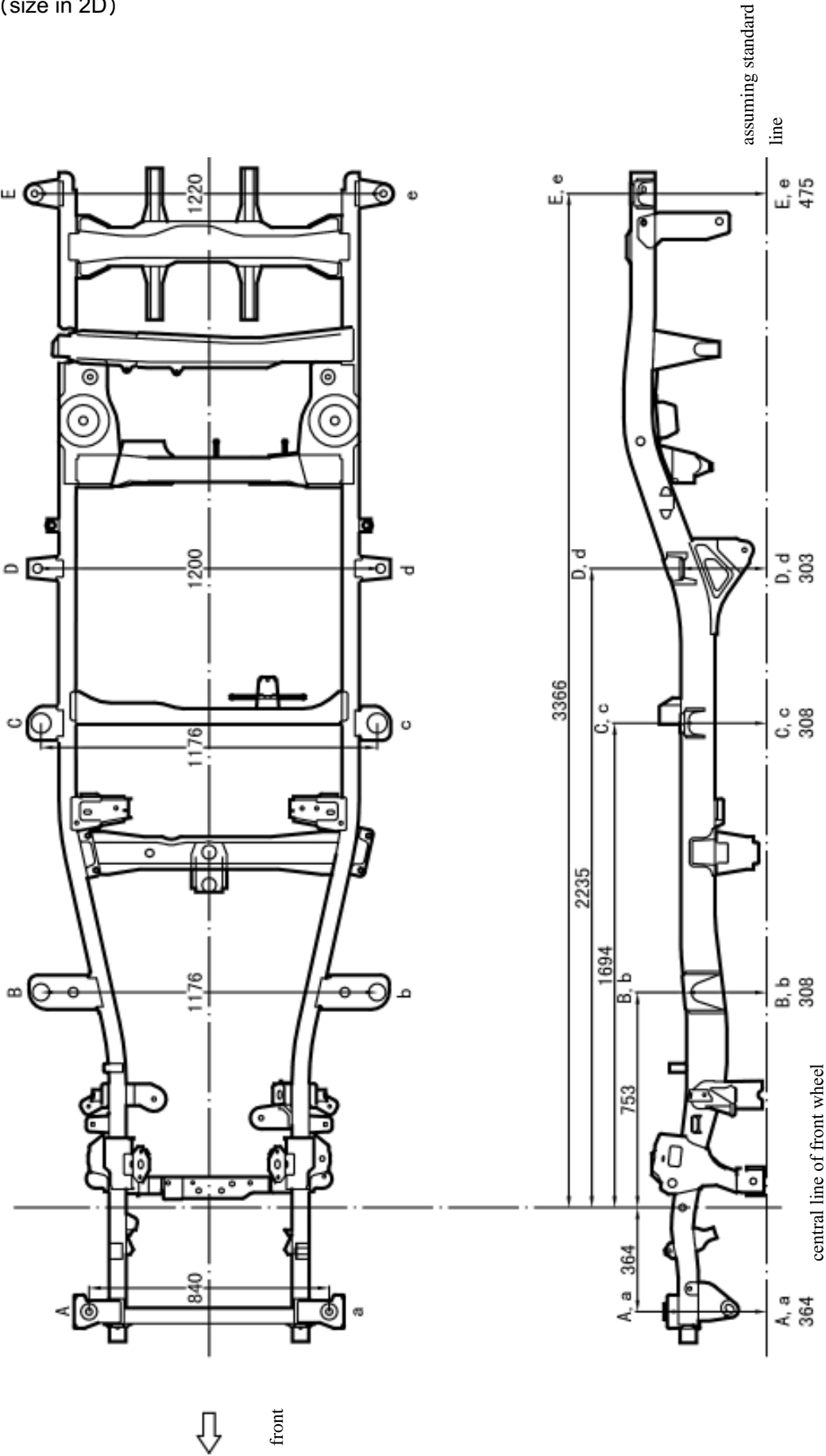


So Cool



Safe

(size in 2D)

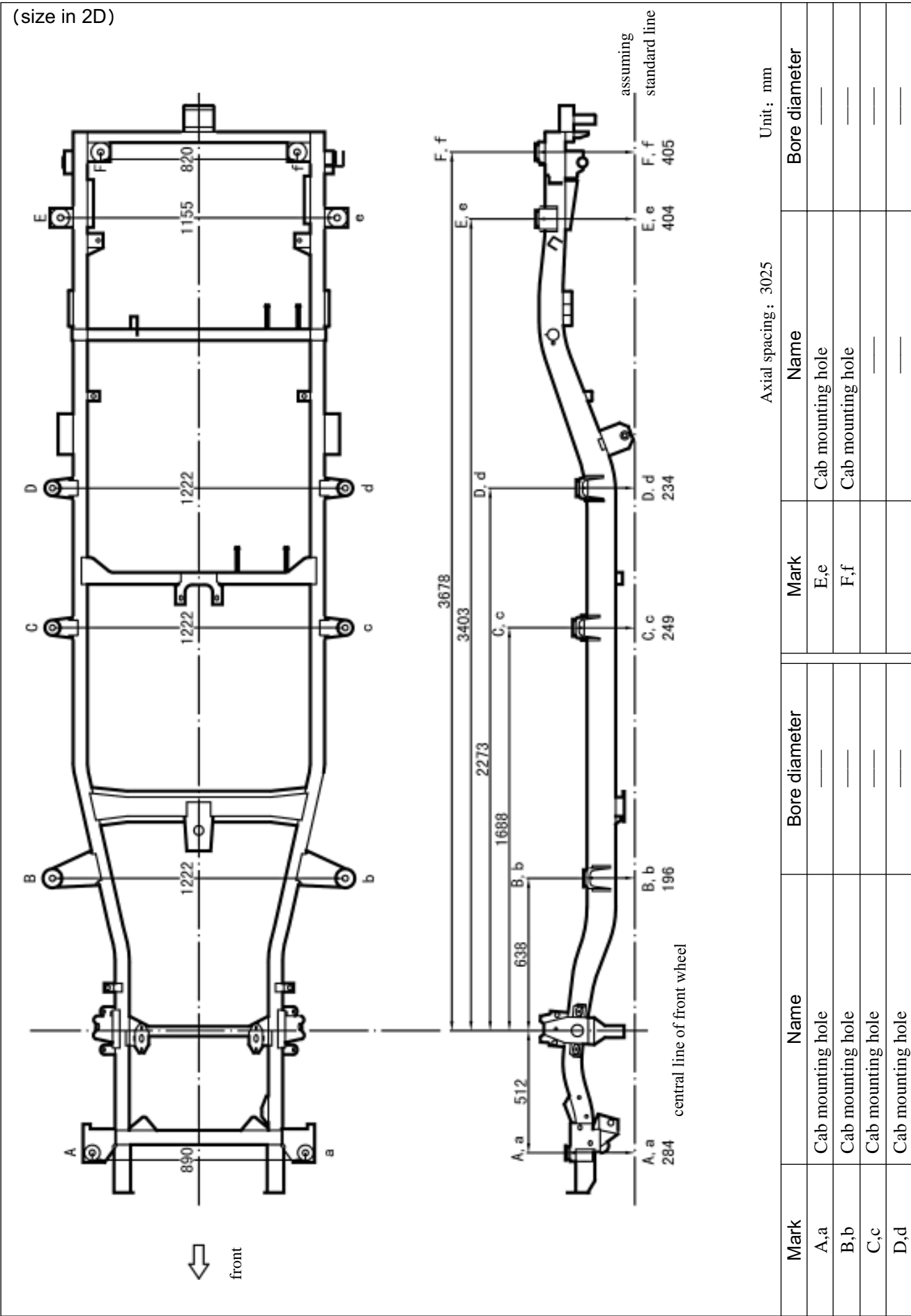


Unit: mm

Axial spacing: 2630

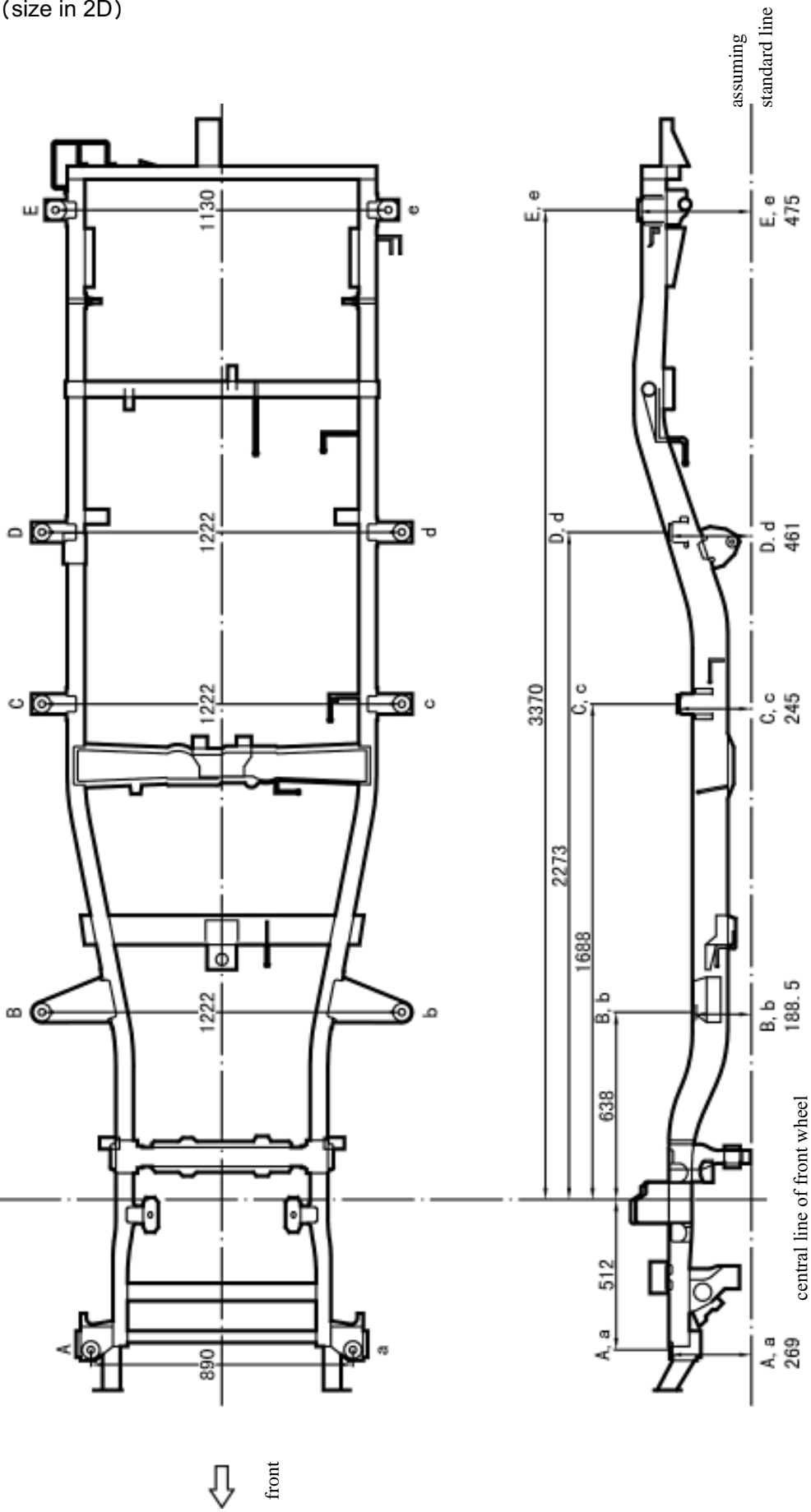
Mark	Name	Bore diameter	Mark	Name	Bore diameter
A,a	Cab mounting hole	—	E,e	Cab mounting hole	—
B,b	Cab mounting hole	—	—	—	—
C,c	Cab mounting hole	—	—	—	—
D,d	Cab mounting hole	—	—	—	—

Sing



Pegasus

(size in 2D)



Unit: mm

Axial spacing: 2760

Mark	Name	Bore diameter	Mark	Name	Bore diameter
A,a	Cab mounting hole	—	E,e	Cab mounting hole	—
B,b	Cab mounting hole	—			—
C,c	Cab mounting hole	—			—
D,d	Cab mounting hole	—			—

# Specifications of Maintenance and Up-keeping

	page
Clutch .....	A-2
Gear box .....	A-2
Transfer box .....	A-3
Drive shaft .....	A-4
Suspension system and automobile axle .....	A-4
Braking system .....	A-5
Steering system .....	A-6

## Clutch

### Specification

Unit: mm

Item	Applicable vehicle model	Specification
Pedal height (calculated from front wall)	Dr SF SL SK SY SJ	160 190-200
Pedal free stroke	Dr SF SL SK SY SJ	5-15
Min depth of clutch-facing rivet	Dr SF SL SK SY SJ	0.3
Max radial swing difference of clutch rib	Dr SF SL SK SY SJ	0.8
Max radial swing difference of flywheel	Dr SF SL SK SY SJ	0.2
Max width of wear of diaphragm spring	Dr SF SL SK SY SJ	0.6
Max width of wear of diaphragm spring	Dr SF SL SK SY SJ	5
Alignment degree of diaphragm spring end	Dr SF SL SK SY SJ	Max misplacement: 0.5

### Torsion moment

Fastening location	Applicable Vehicle model	(N*m)
Fastening torque for clutch tube on master cylinder	Dr SF SL SK SY SJ	15-17
Fastening torque for clutch tube on wheel-brake cylinder	Dr SF SL SK SY SJ	15-17
Fastening torque for clutch pressure plate	Dr SF SL SK SY SJ	30

## Gearbox

### Three-grade maintenance for gearbox

#### 1. Grade I maintenance for gear box

Grade I maintenance: Check the lubricant level to see whether the lubricant level is in alignment with the lower edge of oil filler; if the lubricant is lower than the oil filler lower edge, add the lubricant; or the insufficient lubricant will lead to the poor lubrication or burn-out of bearing and teeth; while the over-high lubricant will cause the overheating and oil leakage.

#### 2. Grade II maintenance for gear box

Grade II maintenance: The gear box of a new vehicle should be maintained by exchanging the lubricant during the first grade II maintenance and should be washed with kerosene; and the lubricant quality should be checked in the grade II maintenance in later time, if the lubricant is diluted, gumming or over-dirty, it should be changed.

#### 3. Grade III maintenance

The gearbox should be disassembled for inspection, washing and oil change.

Notice: As the new vehicle is in the running-in status, the gearbox should be maintained by exchanging lubricant after the vehicle covers 1500 km, Lubricant Type: GL-5 SAE80W/90

### Torsion moment of relative connecting elements

Tung Teeth: Tang tooth(5DYA4TWD、5DYA8FWD)

Fastening location	N*m
Locating screw of fork axle at first and second gear	13 – 17
Locating screw of yoke block	15 – 20
Screw on baffle of rear bearing of output shaft	17 – 22
Screw of reverse idler shaft	17 – 20
Bolt of gearshift cover	15 – 20
Bolt of front cover	15 – 20
Bolt of rear body	30 – 45
Bolt of clutch shell	30 – 45
Bolt of locating spring	17 – 22

Fastening location	N*m
Oil filling/draining plug	30 – 50
Location mechanism cluster	30 – 50
Pillar of clutch toggle fork	30 – 50
Bolt on odometer pressure plate	10 – 15
Reverse gear switch assembly	30 – 50

## Upper tooth(JK72TWD)

Fastening location	N*m
Toggle fork at first, second and fifth gears and the screw of toggle fork	15 – 20
Bolt on odometer pressure plate	10 – 15
Screw on baffle of rear bearing of output shaft	12 – 17
Screw on baffle of reverse idler shaft	15 – 20
Locating screw of gearshift yoke block	15 – 20
Bolt of front cover	15 – 20
Bolt of gearshift cover	15 – 20
Pillar of clutch toggle fork	30 – 40
Bolt of clutch cover	60 – 70
Bolt of rear body (M10X1.25X130)	30 – 40
Bolt of rear body (M10X1.25X80)	30 – 40
Plug of locating spring	17 – 22
Oil filling/draining plug	30 – 50
Reverse gear switch assembly	20 – 40
Location mechanism cluster	30 – 40
Locking nut at rear end of countershaft	90 – 125

## Maintenance and Up-keeping of Transfer Box

1. The oil level of transfer box should be checked when exchanging the engine lubricant or the vehicle covers more than 8000 km, and add the lubricant where necessary.
2. Change with the appointed lubricant each year or after the vehicle covers more than 48000 km.  
Notice: lubricant brand: 85W/90 GL-5.

## Fastening torque of relative connecting elements

Fastening location	N*m
Flange nut	203 – 244
Oil drain plug	19 – 30
Bolt of motor clip	8 – 11
Fixing bolt of motor	8 – 11
Clutch coil nut	8 – 11
Housing bolt	27 – 46
Oil pump bolt	4.0 – 8.5
Venting valve	8 – 19
Bolt of front connecting body	27 – 46

## Drive Shaft

### Torsion moment

Fastening location	Applicable vehicle model	N*m
Connecting bolt	Dr SF SL SK SY SJ	74 ± 5
Fixing bolt of central supporter	Dr SL SK SY SJ	40 ± 5

## Suspension System and Automobile Axle

### Specification

Item	Applicable vehicle model	Specification
Inflation pressure of tire	Dr SL SK SY SJ	Front:220 0kPa Back:240 0kPa
	SF	Front:250 0kPa Back:250 0kPa
Ground clearance of chassis	Dr	295mm
	SL SK	255 ? mm
	SF	58.5mm(difference in height between shaft center of lower arm and wheel center)
	SY	310 ? mm
	SJ	295 mm
Steering angle of inner wheel	Dr SL SK SY	36° – 40°
	SF	≥ 32°
	SJ	32° – 34°
Kingpin inner inclination	Dr SL SK SY	9° 30' 柏 5'
	SJ	14° 52'
Outer inclination of front wheel		
Mechanical steering	Dr SL SK SY	0° 30' ? 0'
Power steering	Dr	0° 10' 0'
	SL SK SY	0° 20' 0'
	SJ	0° 20' 5'
Kingpin rear inclination (inclination)		
Mechanical steering	Dr SL SK SY	1° 50' <sup>+30'</sup> <sub>-20'</sub>
Power steering	Dr SL SK SY	2° 5' 5'
	SJ	2° 0' 牒 0'
Toe-in	Dr SL SK SF SY SJ	0-2mm
Error in length between left and right drag rod	Dr SL SK SF SY SJ	=2mm
Side slip value	Dr SF	=5m/km
	SL SK SY SJ	? .5m/km



## Torsion moment

Fastening location	Applicable vehicle model	N*m
Limit bolt of steering knuckle	SJ	90 ± 10
U-type fixing bolt	Dr SL SK SY SJ	110 ± 10
Bolt of spring pin of rear plate and shackle	Dr SL SK SY SJ	90 ± 10
Central bolt of rear steel plate spring	SL SK SY SJ	50 ± 5
Connecting bolt of rear vibration damper and rear axle	SF	64 ± 5
	SL SK SY SJ	25 ± 5
Connecting bolt of front vibration damper and lower swing arm	SL SK SY SJ	25 ± 5
Connecting bolt of rear vibration damper and frame	SF	137 ± 10
Connecting bolt of rear vibration damper and lower swing arm	SL SK SY SJ	83 ± 5
Fixing bolt of pedestal arm of torsion rod spring	SL SK SY SJ	83 ± 5
Locking nut of torsion rod spring	Dr	23 ± 3
	SL SK SY SJ	29 ± 5
Fixing bolt at two ends of transverse stabilizer rod	Dr SF	23 ± 3
	SL SK SY SJ	25 ± 5
Fixing bolt of transverse stabilizer rod bracket	Dr SF SL SK SY	96 ± 10
Connection bolt of guide lever and lower arm	Dr	150 ± 10
Fixing nut at front end of guide lever	Dr SL SK SY SJ	96 ± 10
	SF	178 ± 15
Axial fixing nut of front suspension and lower arm	Dr	226 ± 25
	SF	196 ± 10
Axial fixing nut of lower arm of front suspension	SL SK SY	226 <sub>0</sub> <sup>25</sup>
	SJ	210 <sub>0</sub> <sup>25</sup>
Connecting nut of steering knuckle and upper ball stud	Dr SL SK SY SJ	110 ± 10
	SF	142 ± 10
Connecting bolt of steering knuckle and lower ball stud	Dr SF SL SK SY SJ	142 ± 10

## Braking system

### specification

Item	Applicable vehicle model	specification
Pedal height	Dr SF	160mm
	SL SK SY SJ	190-200mm
Free stroke of pedal	Dr SL SK SF SY SJ	3-6mm
Stroke of operating lever of parking brake	Dr	9-10 牙
	SL SK SY	7-9 牙

### torsion moment

Fastening location	Applicable vehicle model	N*m
Brake oil pipe	Dr SF	18 ± 2
	SL SK SY SJ	19 ± 1

## Steering system

### Specification

Item	Applicable vehicle model	Specification
Max play of steering wheel	Dr SF	6°
Tension degree of driving belt:		
When f=98N                      New belt	Dr SL SK SF SY SJ	5-7mm
Old belt	Dr SL SK SF SY SJ	7-9mm

### Torsion moment


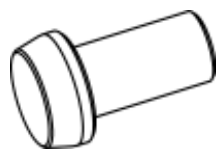
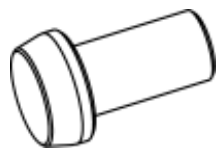
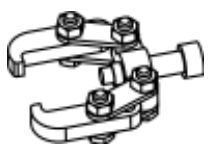
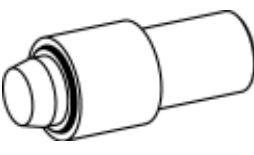

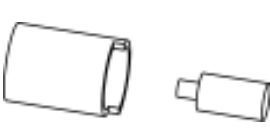
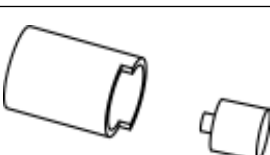
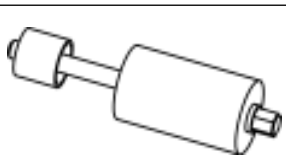
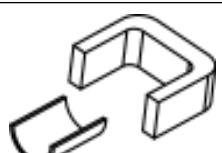
Fastening location	Applicable vehicle model	N*m
Fixing nut of steering wheel	Dr SF	50 ± 5
	SL SK SY SJ	30 ± 2
Connecting nut of steering ger and swing arm	Dr SF	245 ± 25
Fixing bolt of steering driven arm	Dr	80 ± 10
	SF	142 ± 10
	SL SK SY	83 ± 10
	SJ	78 ± 10
Fixing bolt of steering gear	Dr	96 ± 10
	SF	145 ± 10
	SL SK SY	96 ± 10
	SJ	78 ± 10
Connecting nut of steering drag rod and swing arm of steering gear	Dr SF	91 ± 10
Connecting nut of steering drag rod and steering driven arm	Dr	91 ± 10
	SF	59 ± 5
Connecting nut of steering drag rod and front brake	Dr SF	91 ± 10
Steering limit bolt	SJ	90 ± 10

# SST Special tool




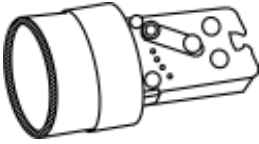
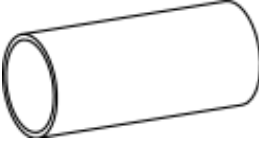

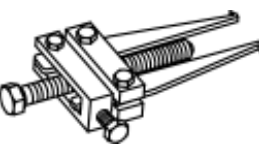


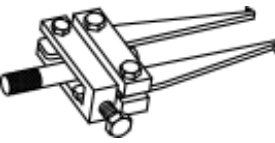
page

Special tool ..... B-2

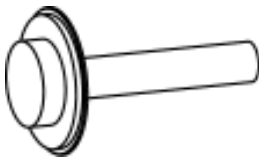

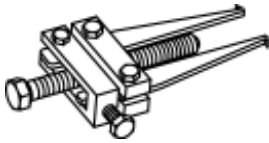


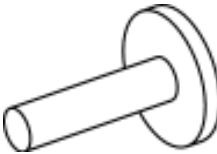
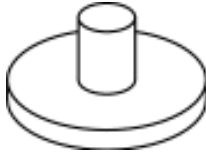


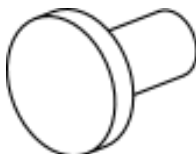
## SST Special Service tool

Diagram	Tool name	tool number	Application position			Remark
			Front axle		Rear axle	
			2WD	4WD		
	Disassembling and assembling tools for locking nut of steering knuckle	3916001	●	●		
	Press fitting tool for inner bearing of front wheel hub	3916002	●	●		
	Press fitting tool for outer bearing of front wheel hub	3916003	●	●		
	Disassembling tool of ball stud	3916004	●	●		
	Fixing tool of main teeth flange of needle bearing	3916005		●		
	Press fitting tool for steering knuckle oil seal	3916006		●		
	Disassembling tool of shorter liner of lower arm	3916007	●	●		
	Mounting tool of shorter liner of lower arm	3916008	●	●		
	Mounting and disassembling tool of long liner of lower arm	3916009	●	●		
	Disassembling tool of upper arm liner	3916010	●	●		


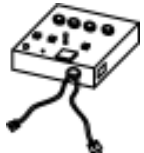

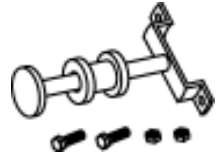
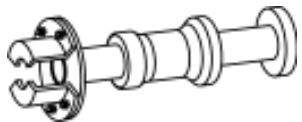




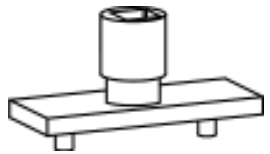
## SST Special tool

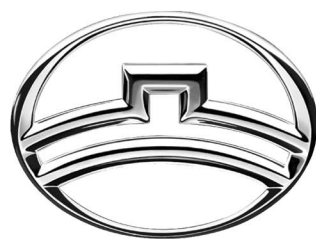
Diagram	Tool Name	tool number	Application position			Remark
			Front axle		Rear axle	
			2WD	4WD		
	Press fitting tool of upper arm liner	3916011	●	●		
	Disassembling and assembling tools of wheel brake cylinder of front brake caliper	3916012		●		
	Disassembling tool of front drive shaft bearing	3916013		●		
	Pneumatic caliper of outer sleeve of front drive shaft	3916014		●		
	Press fitting casing of front drive shaft bearing	3916015		●		
	Disassembling tool of main teeth oil seal	3916016		●	●	
	Press fitting tool of main teeth oil seal	3916017		●	●	
	Disassembling tool of long semi-axis	3916018		●		
	Electric clutch tester	3916019		●		
	Disassembling tool of oil seal and needle bearing	3916020		●	●	Oil seal of long semi-axis of front axle Inner oil seal of rear axle shaft Needle bearing of long semi-axis

## SSTSpecial Service tool

Diagram	Tool name	tool number	Application position			Remark
			Front axle		Rear axle	
			2WD	4WD		
	Press fitting tool of oil seal of long semi-axis	3916021		●		
	Disassembling bracket of long semi-axis bearing	3916022		●		
	Disassembling tool of inner race of small bearing of main teeth	3916023		●		
	Disassembling bracket of inner race of large bearing of main teeth	3916024		●	●	
	Press fitting casing of inner race of large bearing of main teeth	3916025		●	●	
	Press fitting casing of outer race of large bearing of main teeth	3916026		●	●	
	Press fitting casing of outer race of small bearing of main teeth	3916027		●	●	
	Disassembling tool of differential side bearing	3916028		●	●	
	Press fitting tool of differential side bearing	3916029		●		
	Mounting tool of needle bearing of long semi-axis	3916030		●		

## SSTSpecial Service tool

Diagram	Tool name	tool number	Application position			Remark
			Front axle		Rear axle	
			2WD	4WD		
	Press fitting tool of long semi-axis bearing	3916031		●		
	Electric clutch tester	3916032		●		
	Disassembling tool of half-shaft bearing	3916033			●	
	Press fitting casing of half-shaft bearing and oil seal	3916034			●	
	Mounting tool of rear axle oil seal	3916035			●	
	Mounting tool of main teeth oil seal	3916036			●	
	Change oil seal of rear axle main teeth on vehicle	3916037			●	
	Mounting tool of main teeth oil seal	3916038			●	Change oil seal of rear axle main teeth on vehicle
	Mounting tool of main teeth oil seal	3916039			●	Use with torsion spanner together
	Spanners of adjusting ring of side bearing of differential	3916040			●	



improving little by little everyday

## Great Wall Motor Company Limited

---

Add: 2266 Chaoyang South Avenue, Baoding City, Hebei Pro, P.R.China.  
PostCode: 071000  
Sales direct line: 0086-312-2197688 Fax: 0086-312-2197680  
Service direct line: 0086-312-2197682  
<http://www.gwm.com.cn>

Version number: 06-06-01/01