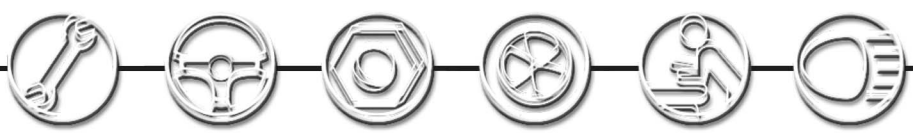
GREAT WALL

SERVICE MANUAL



GREAT WALL MOTOR

HOVER

Basic parameter

The basic parameters of the complete vehicle of CC6460K and CC6460KY estate car should be in accordance with the regulation in Table 1.

Basic parameters of the complete vehicle of CC6460K and CC6460KY

Item	CC6460K	CC6460KY
Dimension parameter(no-load)(mm)		
L	4620	
W	1800	
H	1710(car body)/1755(with tail fin and luggage carrier)	1700(car body)/1765(with tail fin and luggage carrier)
Axle tread	2700	
Wheel tread: front/rear	1515/1520	
Front suspension	850	
Rear suspension	1070	
weight parameter:		
Loading weight(kg)	5 person × 65kg/person ＋ 150kg	
Complete weight(kg)	1720	1830
Max. total weight(kg)	2195	2305
No-load axial load distribution: front/rear(kg)	890/830	980/850
full-load axial load distribution: front/rear(kg)	980/1215	1070/1235
Traffic ability parameter		
Min. turning diameter(m)	≤13	
Min. ground clearance (mm)	≥180	≥175
Approach angle(°)	≥28(no-load)	
departure angle(°)	≥27.5(no-load)	
Dynamic parameter:		
Min. stable speed of direct step(km/h)	≤25	
30km/h～100km/h acceleration time of direct step(s)	≤32	
acceleration time from 1 step starting to 100km/h(s)	≤20	
Max. speed(km/h)	≥160	
Max. Climbing capability(%)	≥35	
Economical character:		
Slipping distance in initial speed of 50km/h(m)	≥500	
Traveling fuel consumption in 90km/h constant speed (L/100km)	≤10.19	
Traveling fuel consumption in 120km/h constant speed (L/100km)	≤13.24	
Under simulated urban and suburb comprehensive operating condition(L/100km)	≤11.9	≤12.5
Braking characteristics:		
Traveling braking distance in 50km/h braking initial speed (m)	≤19(no-load), ≤20(full-load)	
Emergency braking distance in 50km/h braking initial speed(m)	≤38	
Slope stop braking(%)	≥20(no-load), ≥18(full-load)	

Air-conditioning system

The structure and parameter of the air-conditioning system is shown in table 8.

Table 8 The structure and parameter of the air-conditioning system

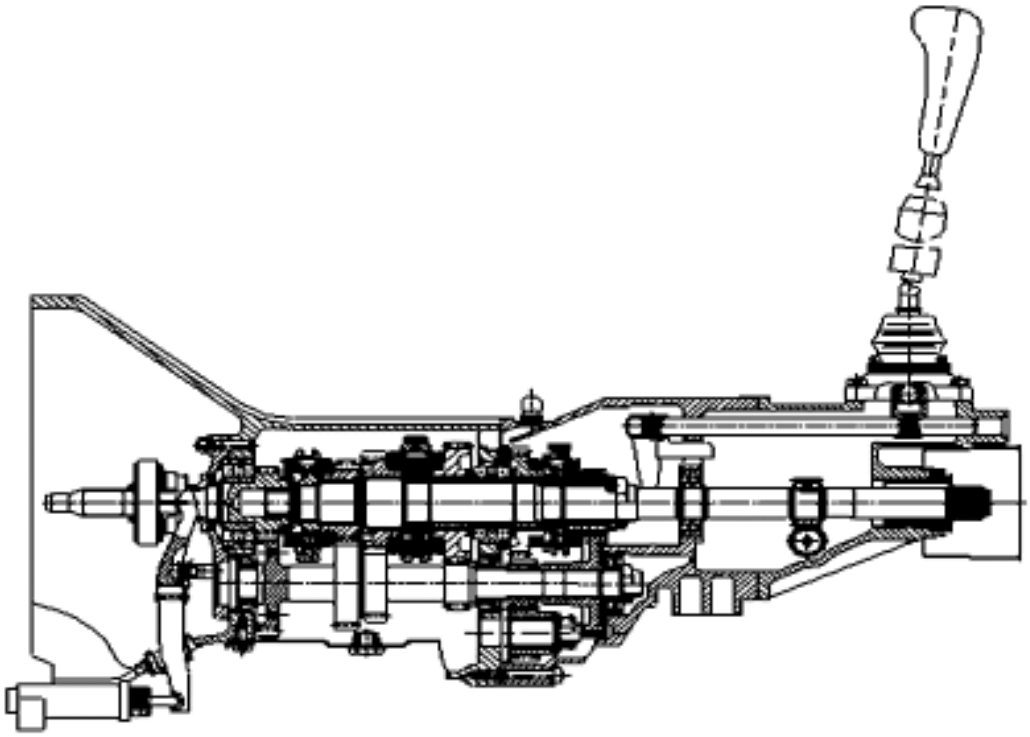
Serial No.	Item	Structure and Parameter
1	Structure and shape	Front and rear heating and cooling air conditioner, vapor compression type cooling, hot-water heating
2	Performance and parameters	Refrigerating capacity 3.5kW, heat exchange capacity 3.5kW, fan capacity 350m^3/h
3	Operation	Control board button type operation, temperature auto control, air door micro motor drive, the temperature in the car can be controlled automatically, the fanning position mode, heating/cooling mode, air intern/external cycling mode and wind speed and temperature can be selected and adjusted
4	Refrigerant	R134a
5	Compressor	SD7V16 variable capacity compressor, with a maximum capacity of 160ml
6	Condenser	Parallel stream mode structure, flat pipe thickness of 26mm
7	Evaporator	Two boxes structure, cascading evaporator, F expansion valve, centrifugal blower
8	Drying fluid collector	External diameter Φ60.5mm
9	Refrigerating pipe and warm water pipe	Refrigerating pipe: complex structure of rubber refrigeration soft tube and aluminum tube. The warm water pipe: rubber molding pipe
10	Transducer	Outdoor temperature sensor, indoor temperature sensor, evaporator temperature sensor
11	pressure switch	Three-state pressure switch

Chapter 3

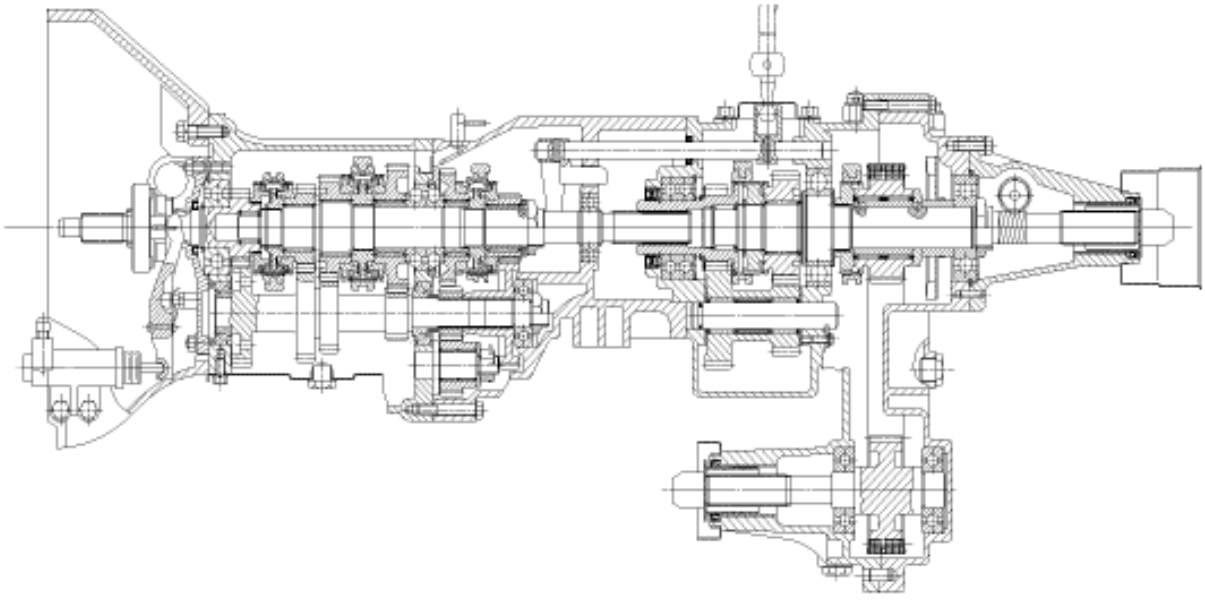
Clutch

Specification of transmission

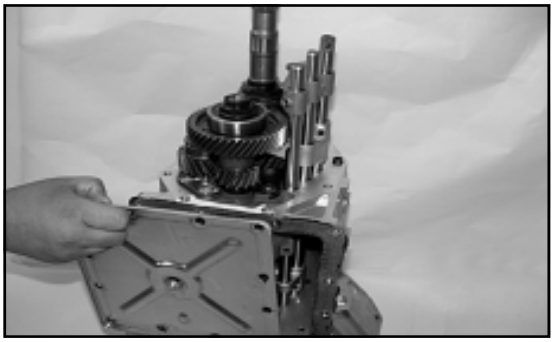
Structure diagram of SC5M2D-C and SC5M4D-C transmission: shown in figure



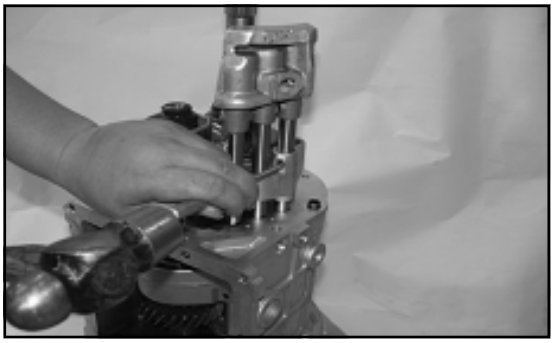
Structure diagram of SC5M2D-C transmission



Structure diagram of SC5M4D-C transmission

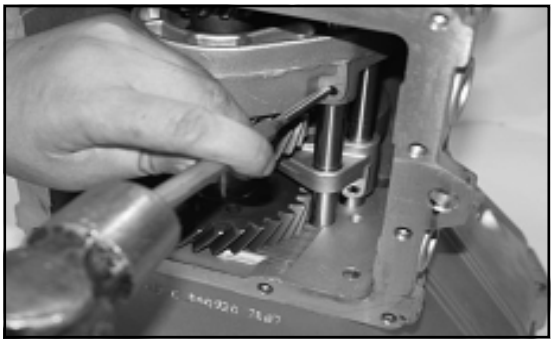


b. Remove the lower cover plate assembly

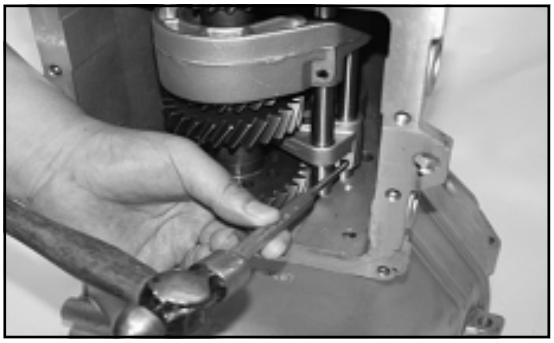


17. Remove the declutch shift shaft assembly

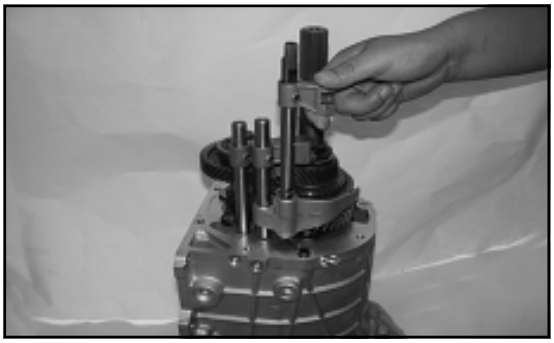
a. Use the punch to remove the reverse gear 5 shift fork elastic cylindrical pin



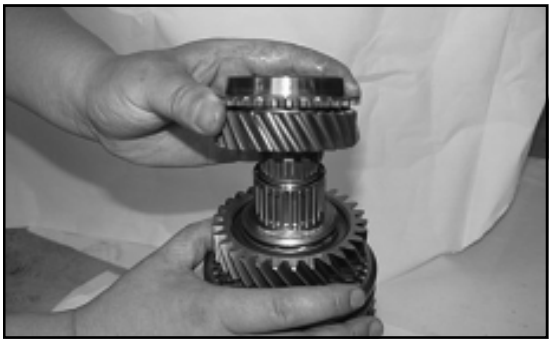
b. Use the punch to remove the Gear 1/2 shift fork elastic cylindrical pin



c. Use the punch to remove the Gear 3/4 shift fork cylinder pin.

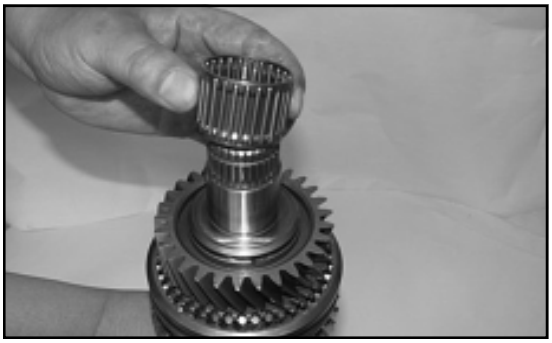


d. Remove the reverse gear 5 declutch shift shaft assembly

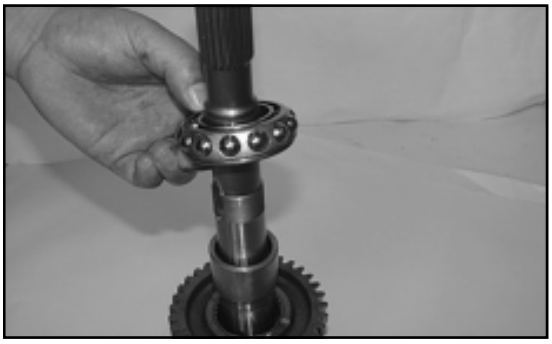


d. Remove the 3rd-Gear driven gear assembly

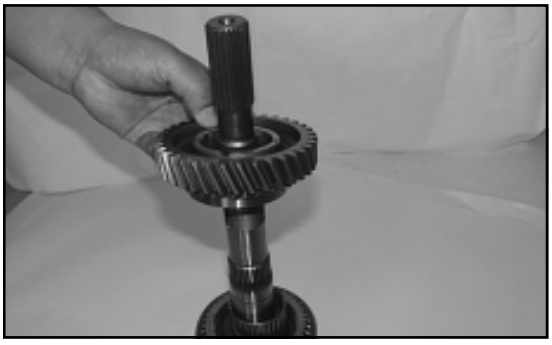
Caution: When install the 3rd-Gear driven gear assembly, it should use the plug gage to measure the 3rd-Gear driven gear assembly axial clearance to ensure it is within 0.17-0.284mm



e. Remove the 3rd-Gear driven gear needle bearing



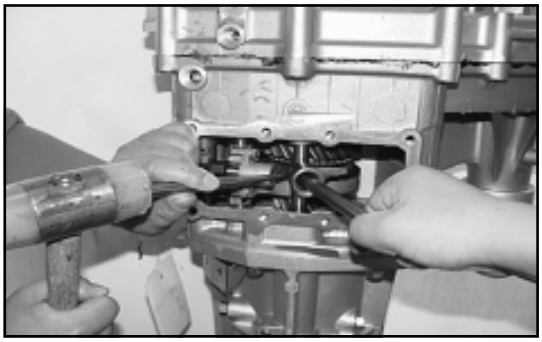
f. Use the special tools to press the second shaft to remove the inner race of double inner-race ball bearing.



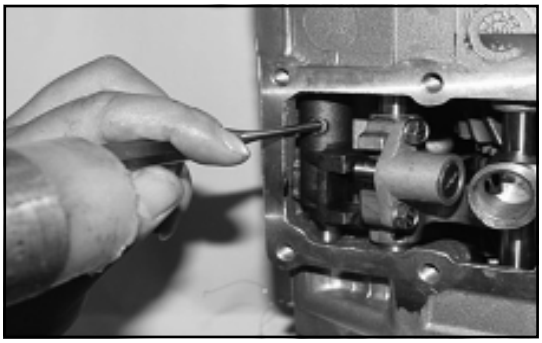
g. Remove the 1st-Gear driven gear

Caution: When install the 1st-Gear driven gear, it should use the plug gage to measure the 1st-Gear driven gear axial clearance to ensure it is within 0.17-0.284mm.

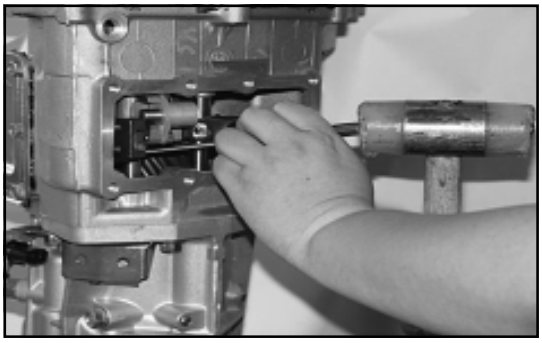
h. Remove the 1st-Gear driven gear needle bearing



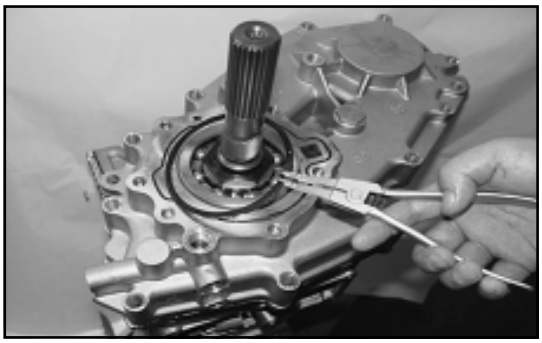
b. Remove the select & shift seating elastic cylindrical pin



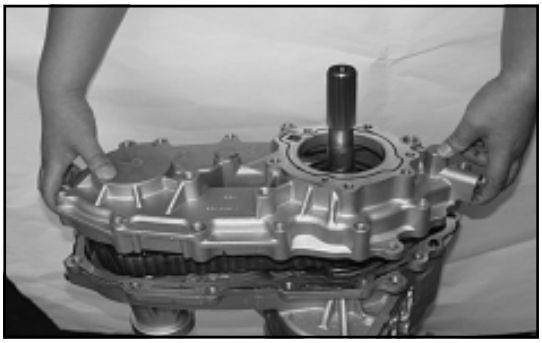
c. Remove the high/low drive declutch shift shaft elastic cylindrical pin



d. Remove the 2nd/4th declutch shift shaft elastic cylindrical pin



e. Use the circlip pliers to remove the bearing snap ring



f. Use the rubber hammer to knock out the transfer case cover assembly slightly and remove the transfer case cover assembly.

Table 2.1 Gear selection and its function

Gear selection	function
1st-Gear (manual 1st-Gear)	The first gear is using for climbing and braking. It is a function which limits the speed of the car. The speed limitation by engine is realized by reduce the opening degree of throttle position.
2nd-Gear (automatic, manual 2nd-Gear)	In economic mode, it can process the 1st and 2nd shifting operation when engage the 2nd –Gear. The limitation of vehicle speed by engine is realized through reducing the opening of throttle position. in 4WD 4 high, , the transmission will maintain 2nd-Gear position The manual mode and winter-Mode will only maintain 2nd-Gear 。
3rd-Gear (automatic, manual 3rd-Gea)	In economic mode and dynamic mode, it can process the shifting operation of 1st, 2nd and 3rd-Gear when engage the 3rd-Gear, and can reaches the very high vehicle speed. At this time the locking clutch can process the locking action, refer to vehicle user manual. The limitation of vehicle speed by engine is realized by reduce the opening of throttle position. In 4WD 4 low, the transmission should be maintained in 3rd –Gear position. Under manual mode, the transmission will be kept in 3rd-Gear.
D-gear (drive)	It can process the 1st, 2nd, 3rd and 4th –Gear position operation and gear-shifting operation of (1-2), (1-3), (2-3), (2-4), (3-4), (4-3), (4-2), (3-1) and (2-1). This shifting operation is processed by taking the vehicle speed, throttle position, throttle position switching frequency (or forced Gear-decreasing) as the parameter. The locking clutch can process the locking action in 3rd –Gear, 4th-Gear according to the type of vehicle. Refer to user manual of vehicle.
N-Gear (neutral gear)	Only the rear brake belt is engaged at this time. It determines whether the function can be realized according to the vehicle speed, engine speed and throttle position. But the gear-position sensor allows the starting of engine. Allow the slide of N-Gear.
R-Gear (reverse gear)	Set the anti-misoperation in forward function according to the vehicle speed, engine speed and throttle position opening to realize the reverse operation. The gear-position sensor can start the reverse lamp.
P-gear (parking gear)	Only the rear brake belt is engaged at this time. The function can be determined according to the vehicle speed, engine speed and throttle position. The output shaft of transmission is locked. The gear-position sensor can start the engine.

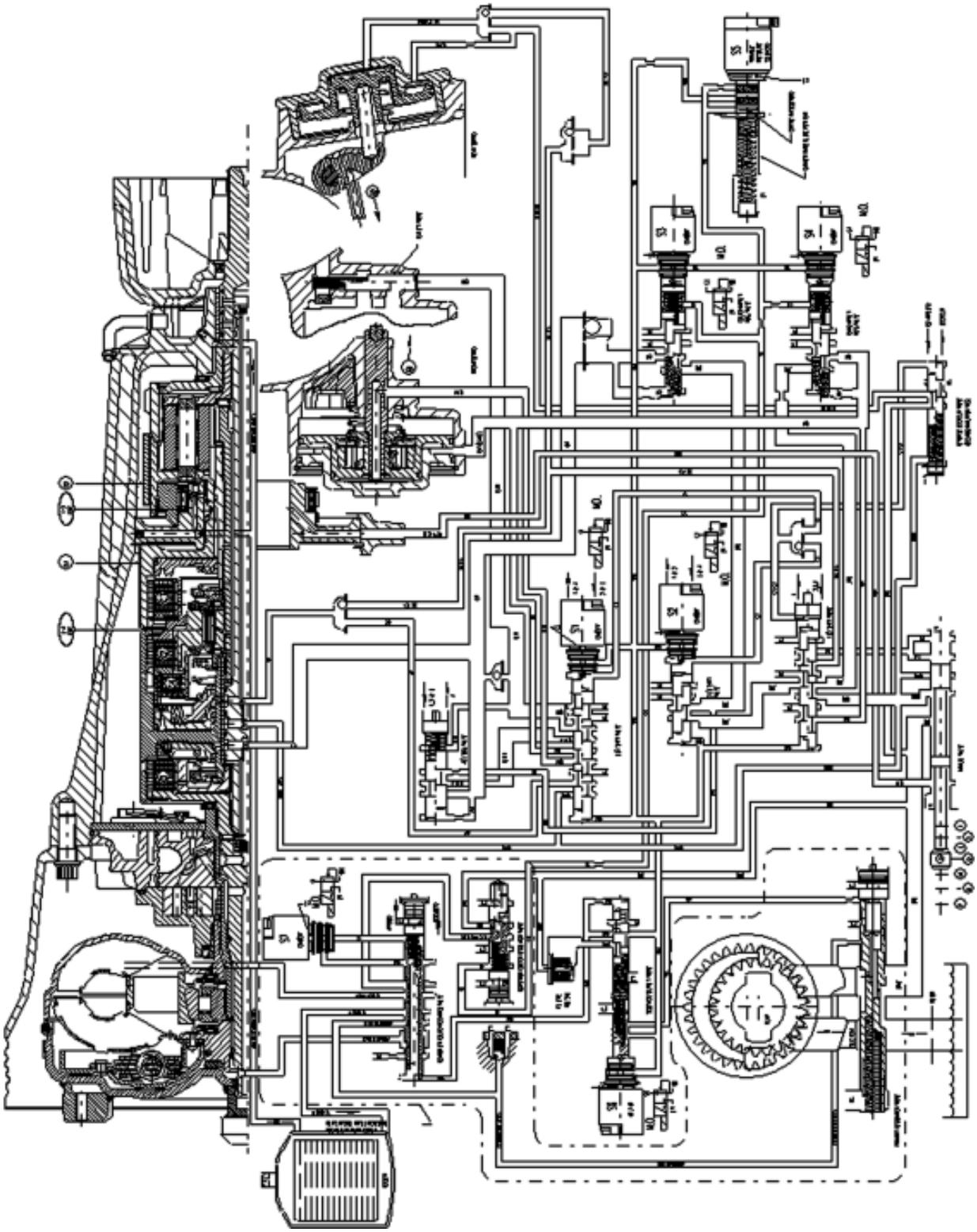


Figure 3.6 — Hydraulic control circulation flow

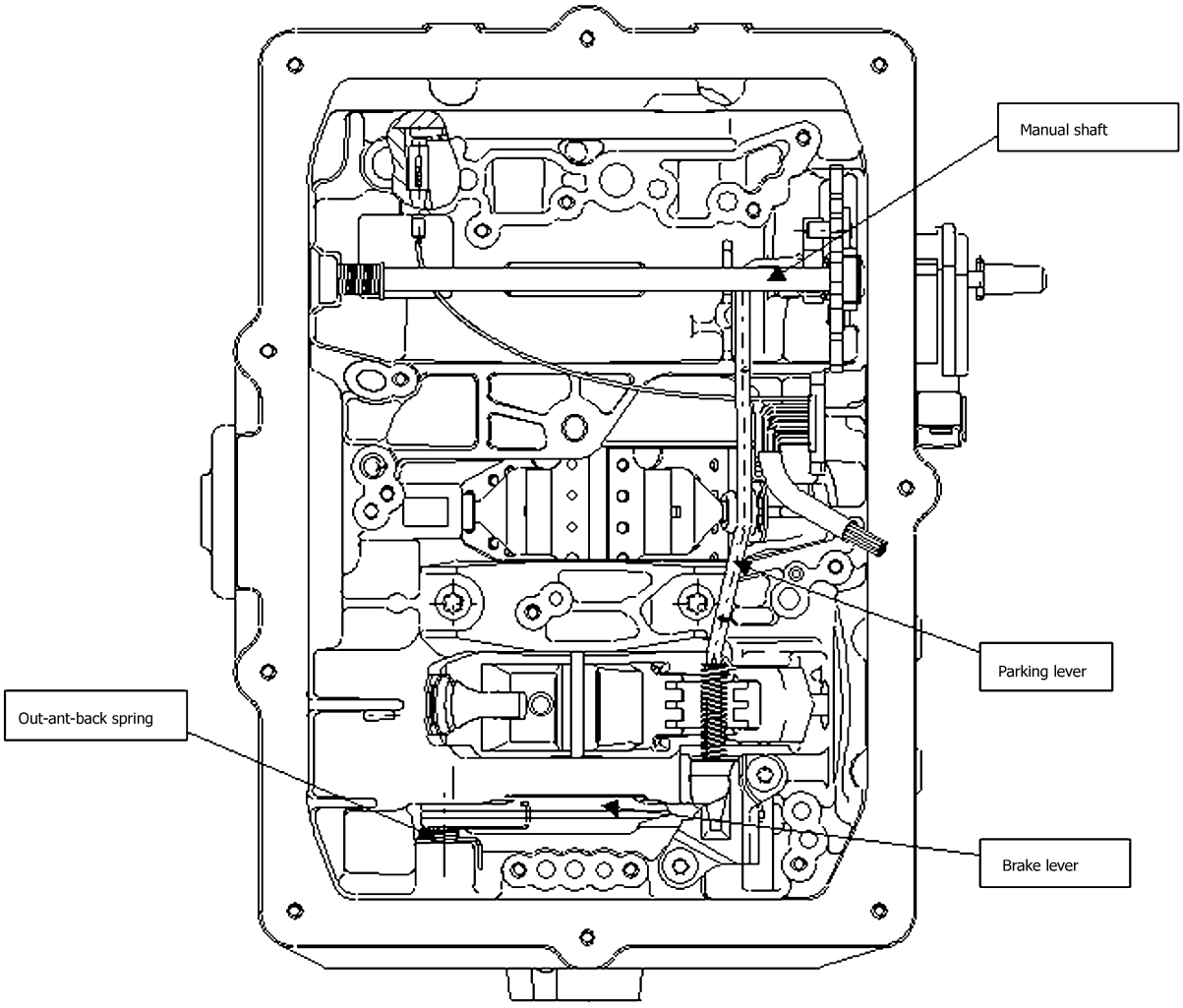


Figure 4.5 Parking mechanism

Power transmission －automatic 2nd-Gear and manual 2

In automatic 1st and manual 2nd-Gear, the drive of transmission reaches the front clutch cylinder through the input shaft. In this condition, the operating principle of each functional unit of transmission is shown as follows:

- The engagement of clutch C2 drives the forward central gear.
- The forward central gear drives the short planetary gear to rotate in anticlockwise.
- The short planetary gear drives the long planetary gear to rotate clockwise.
- The engagement of brake belt B1 makes the stop of reverse central gear to make the long planetary gear rotates around the reverse central gear, then make the internal gear and output shaft rotates in clockwise to make the vehicle moves forwardly.
- The clutch C4 is engaged through the 3-4 one-way clutch (OWC) and provides the brake force of engine during overspeed.

Control:

In stable status, the status action of solenoid valve and valve is shown as follows:

- The solenoid valve S1 is powered off ; The solenoid valve S2 is powered on.
- The drive oil (line pressure) from the manual-operated valve makes the engagement of clutch C2.
- When the solenoid valve S1 is powered off, the S1 oil pressure form line pressure 500 pushes the 3-4 Gear shifting valve moves to left. At the same time, the S1 oil flows into the 1-2 Gear shifting valve to push the 1-2 Gear shifting valve to the 2nd –Gear.
- The line pressure oil from the 1-2 Gear shifting valve flows into the brake belt combination regulating valve, and 2-3 Gar shifting valve.
- The brake belt engagement regulator valve provides the 2nd-Gear oil (controlled by product of line pressure and valve rate) to brake belt feed loop (BAF).
- The brake belt engagement feed loop directly provides the oil to:
- External engagement part of front servo piston.
- 1-2 Gear shifting valve can provide a oil drainage port when the transmission is shifted to 1st-Gear.
  Use the 3-4 Gear shifting valve when the transmission is in 4th-Gear position.
- The drive force (line pressure) is sent to the clutch C4 through the 3-4 Gear shifting valve to realize the engagement of clutch C4.

Refer to Figure 5.5 and table 5.6

Table 5.6 －－ The participating condition of each unit in automatic 2nd-Gear and manual 2nd-Gear

	Name of participation unit								
Gear position	C1	C2	C3	C4	B1	B2	1–2 OWC	3–4 OWC	LU Clutch
Automatic 2nd-Gear and manual 2nd-Gear	—	X	—	X	X	—	—	X	—

Diagnosis and test

Test system

1. Recommended test equipment and program

The test equipment and control unit for design will be used for the test of all vehicles. The parts for transmission test includes:

- Tester for service after sales
- Special vehicle for test

2. Tester for service after sales

After the special programming, the tester equipped with special car test software can be used to test the specified system and unit. The program allows the normal communication between the transmission control units (TCUs) .

The computer needs the required information from the customer and select the necessary data through the manual. For example: view the code, clear the error code and make the real-time operation. For detailed operating instruction refer to user's manual.

The equipment can be used by the trained specialized persons, such as technician, machinist to test the electronic and loop problem related to transmission. The testable information includes: the engine speed, rode (shaft speed), transmission fluid temperature, position of throttle position, status of solenoid valve and gear and position of operating lever. Additionally, it can be used to detect the current and stored problem.

3. Description of TCU pin

The description of TCU pin code had been listed in Table 6.1.1

For description of wire bunch refer to Figure 6.1.1

Pin No.	Function	Type	2WD	description
A14	Public grounding	GND	●	Negative pole of TCU supply, connected to negative pole of battery.
A13	Nonuse	－－	○	－－－－－
A12	Mode indicator lamp Snowland mode	OP	●	Indicate that select the "Snowland Mode" operating method.
A11	Parking-Gear indicator lamp	OP	●	The drive instrument panel indicator lamp indicates that is in the "Parking Gear"
A10	Reverse-Gear indicator lamp	OP	●	The drive instrument panel indicator lamp indicates that is in "Reverse Gear"
A9	N-Gear indicator lamp	OP	●	The drive instrument panel indicator lamp indicates that is in "Idle N Gear"
A8	Nonuse	－－	○	－－－－－
A7	Nonuse	－－	○	－－－－－
A6	Mode indicator lamp dynamic mode	OP	●	Indicate that select the "dynamic mode" operating method.
A5	Nonuse	——	○	－－－——
A4	Nonuse	——	○	－－－－－
A3	Nonuse	——	○	－－－－－
A2	Mode switch	IP	●	The switch is used to select the "economic mode", "dynamic mode" and "snowland mode". The voltage is variable in range of 0 V－2V .
A1	Nonuse	——	○	－－－－－
A30	Power supply	PWR	●	Power supply for TCU; is the main power source of drive unit and solenoid valve.
A29	Nonuse	——	○	－－－－－
A28	1^{st}-Gear indicator lamp /1^{st}-Gear position *	OP	●	Drive the instrument panel indicator lamp indication, indicate that the gear-position is in "1^{st}-Gear"
A27	2nd-Gear indicator lamp /2nd-Gear position	OP	●	Drive the instrument panel indicator lamp indication, indicate that the gear-position is in "2^{nd}-Gear"
A26	3^{rd}-Gear indicator lamp /3^{rd}-Gear position *	OP	●	Drive the instrument panel indicator lamp indication, indicate that the gear-position is in "3^{rd}-Gear"
A25	Automatic gear indicator lamp /4^{th} –Gear position	OP	●	Drive the instrument panel indicator lamp indication, indicate that the gear-position is in "automatic-Gear"

Disassembly /assembly

Cautions for assembly

It should notice the following items before reassemble the transmission system:

1. **Ensure the cooler pipeline is washed and all chip is removed when replace the transmission. It can be realized by using the compressed air to enter into the rear cooler pipeline to remove the oil and all foreign material in the front cooler.**
2. **It should check the cooler after the transmission is installed. Ensure the front and rear cooler pipeline is connected to the proper container. Rotate the vehicle in P-Gear in idle-speed, measure the flow rate within 15s.**
3. **The flow within 15s should be more than 1L.**
4. **It should avoid any water entering into the transmission. This will cause the transmission fluid to generate the foam or make the transmission fluid flows out form the respirator.**
5. **Ensure that two grounding wires in vehicle (one end to battery, one end to vehicle) are connected before the installation of the anode of battery.**
6. **If the power control module and transmission control unit is exchanged, then calibrate the program refer to related throttle position in Part**

Removal

1. Transmission

Caution:

It should remove the gear-position sensor before wash the transmission in solvent or hot abluent.

When need to remove the transmission from the vehicle, it should drainage the transmission fluid,

and use the special removal tools.

The removal of the transmission should be processed in module method, the details of removal of each module is described in following section in detail. Refer to details of special tools listed in table 9.10 and 9.6 when remove it.

The technician needs a set of quality tools when inspect the transmission, especially for dual hexagon spanner of model 30, 40, 50 and 8mm, 10mm, 12mm.

It should abide by the following procedure when disassemble the transmission:

a. Remove the shell of torque converter and torque converter.
b. Place the transmission on the saddle platform.
c. Remove the oil pan and oil pan sealing.
d. Remove the filter retainer of each valve and remove the filter.
e. Remove the wire on solenoid valve, place it in side.
f. Remove the protection screw in the valve and remove the valve from the main housing (remove the model Z connecting bar).
g. Remove the front servo circlip, cover and piston.

Caution:

The plastic servo block on used for piston return spring.

h. Remove the flange shaft fork, then remove the transmission housing (2WD and Chairman).
Use the 8mm hexagon wrench to move the pump to the housing bolt.

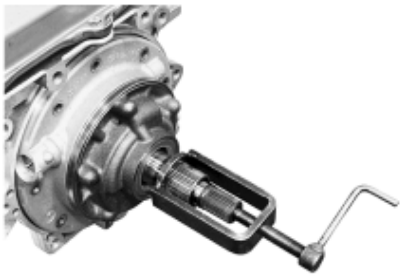


Figure 8.1 Removal of typical pump

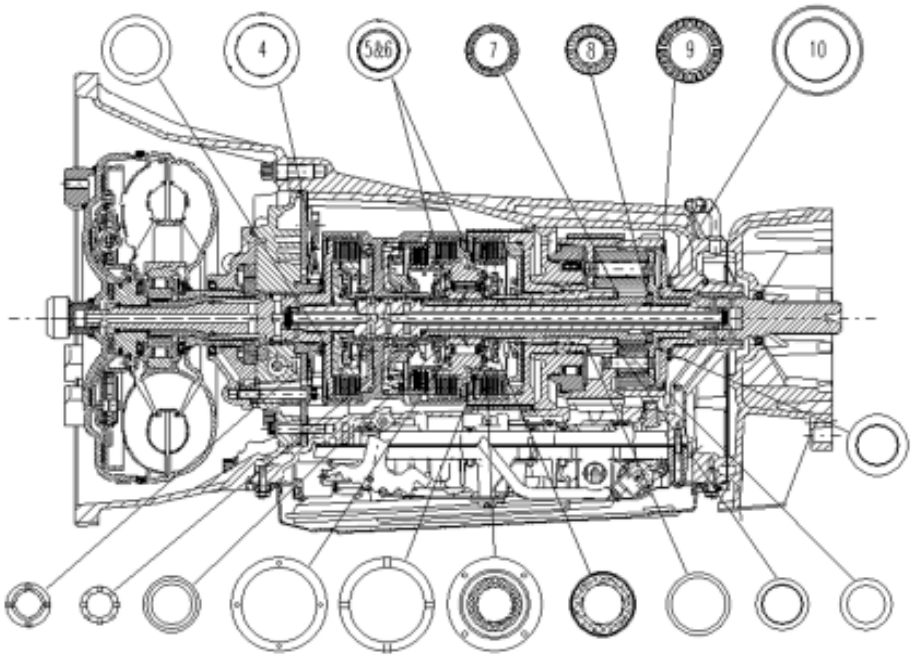


Figure 8.19 Position of thrust bearing and sealing pad

4. Rear servo assembly

Install the rear servo assembly (Refer to Figure 8.18), the procedure is shown as follows:

a. Check the servo piston O-ring and washer for damage.

b. Use the transmission fluid to lubricate the servo piston O-ring and install the O-ring on the piston groove.

c. Install the piston on the housing; ensure the O-ring is compressed to position, but do not excess.

d. Adjust the spring and piston sleeve; then install the rear servo brake bar on the sleeve.

Caution:

Do not coat the washer with the Vaseline.

e. Install the housing installed with washer on the case.

f. Provide the bolt with the Loctite567 sealant and install it; ensure the bolt is tightened according to the specification.

5. Planet carrier assembly and central support

The installation process of planet carrier assembly and central support is shown as follows:

a. Check the bracket and planet assembly for damage or abnormal and ensure all pinion rotates freely and the pinion axle end floats in the allowable range; described as 9.2.

b. Install the one-way clutch fixing plate on the planet carrier and ensure the internal edge points to the downwardly. Check the one-way clutch and brake accessory for damage; replace it according to the requirement.

c. Install the external race on the drum. Press sown the ring race to bottom of drum and install the fixing ring spring. Ensure the ring spring is installed in the groove stably. Refer to Figure 8.20.

d. Install the one-way brake on the external race with the lip upwardly. Use the automatic transmission liquid to lubricate the brake accessories. Refer to Figure 8.20.

e. If need to install the new friction disk, please remove the clutch assembly and immerse the friction assembly into the transmission fluid for 5 minutes at least before the installation.
f. Check whether the clutch C1 wheel axle is matched with the overspeed shaft. It should replace the wheel axle and wheel axle assembly if loose.
g. Coat the small nylon thrust insulation plate with the Vaseline and installs it on the overspeed shaft. Refer to Figure 8.19.
h. It should be carefully when install the overspeed shaft on the C1 cylinder to avoid the damage of sealing ring.
i. Use the Vaseline to install the small copper C1 wheel axle thrust washer, shown as Figure 8.19.
j. Check the input shaft for problem. Install the input shaft on the cylinder and use the ring spring to install the wire safety of input shaft and cylinder. Ensure the coil is in groove completely.
k. Use the petroleum jelly to install the gasket and place it on the input shaft.
l. Assemble the C1/C2/C4 clutch, clutch C3 and sun gear, shown as figure 8.24, 8.32
m. Install the assembly in the transmission case.

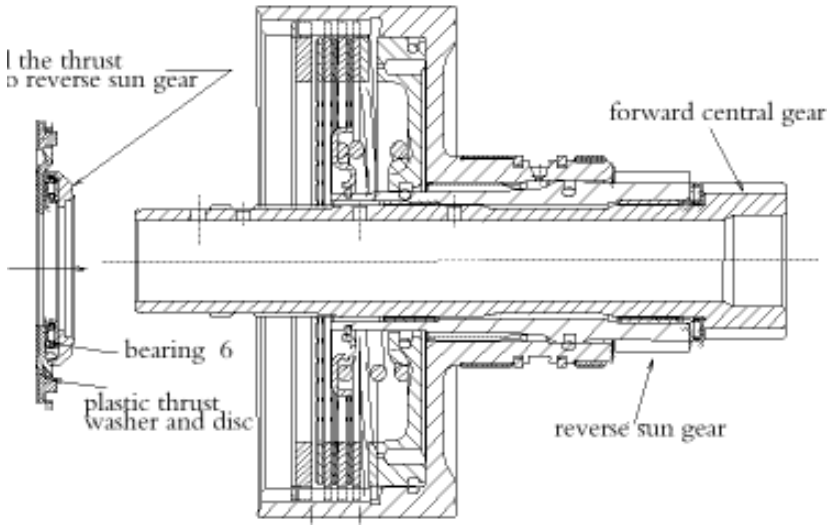


Figure 8.32 and 8.33 assembly number: 6 bearing and pressure disc to clutch C3 assembly

13. Pump housing and torque support

Caution:

a. Do not clean the solenoid valve by solvent.
b. Ensure the O-ring is installed in the correct position.
c. Do not blow off the first drop and mix it with the ball spring blowed off by the torque converter. (only for the condition of installing the transmission to STD pump housing)
d. Do not damage the line bearing on the assembly; avoid any impact for bearing during the loading.
e. Check the end floating of transmission; it is help for the lose and incorrect assembly of any assembly.

Caution: Figure 8.35 The orientation of crossing part is shown in Figure 8.36 to 8.42.

The assembly procedure of pump housing and torque converter is as follows:

a. Check the pump for damage, chip and abnormity; check whether the sleeve of drive gear is fixed.
b. Wash the pump and pump gear carefully; remove all redundant oil and dirt.
c. Install the pump gear and pump. Use the micrometer to measure the depth from the surface of pump to gear surface. The measured value is the side clearance of pump. The side clearance should be in the range of 0.020-0.040mm.
d. Remove the pump gear from the pump.
e. If had been removed, please replace the pump sealing. Ensure the cleanness of pump sealing.
f. Use the transmission liquid to lubricate the pump gear, pump, washer and sealing and install the pump gear on the pump.

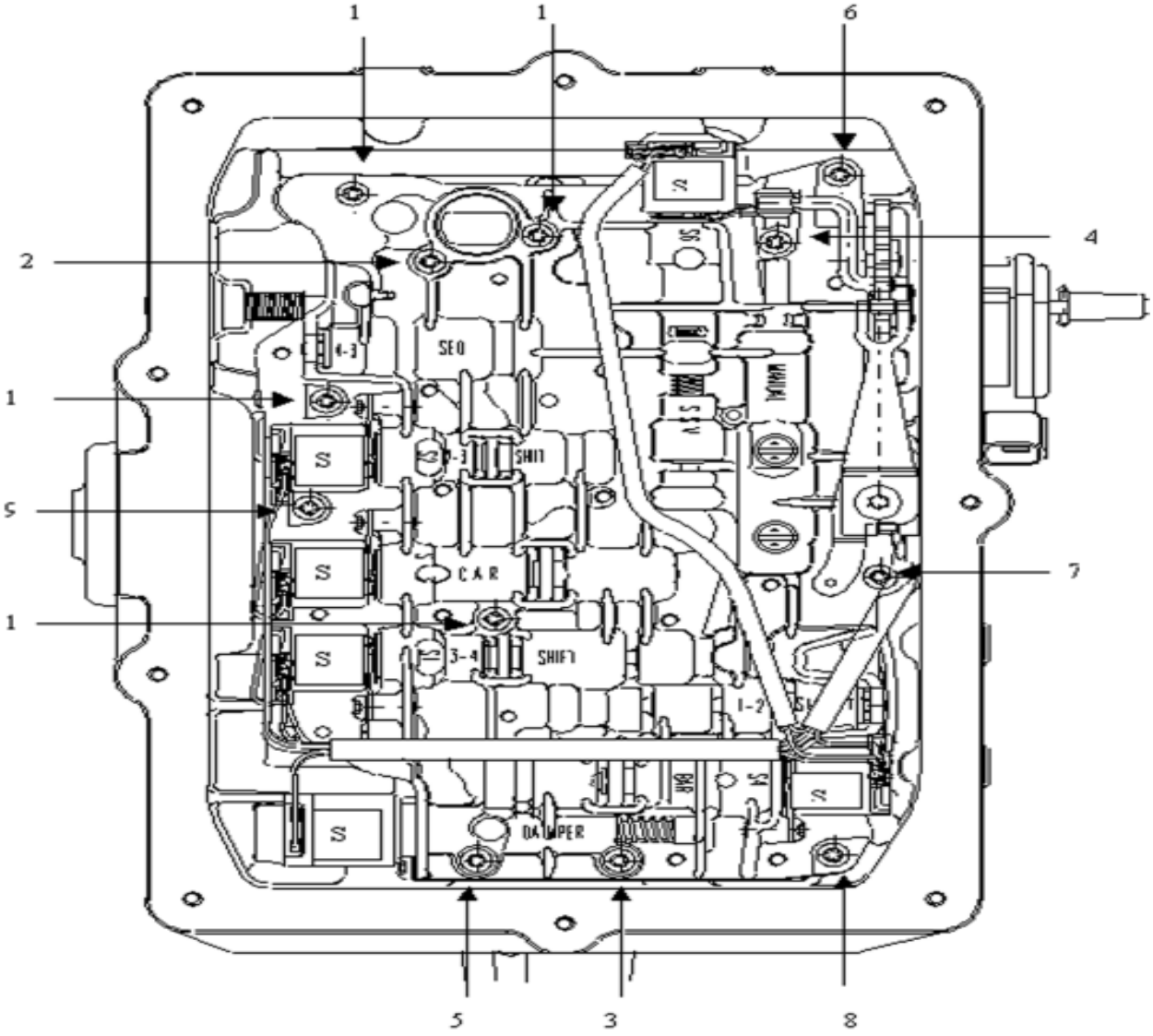


Figure 8.58 Tighten sequence of bolt form valve to box

15. Installation of oil filter and oil bottom shell

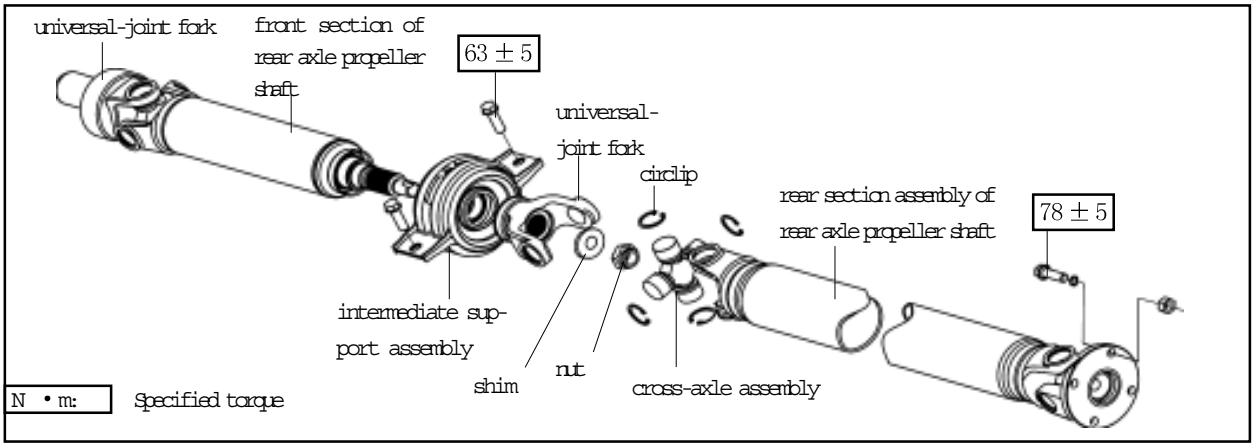
Caution:

a. It should replace the filter when a important mechanical component is damaged and assemble a transmission.

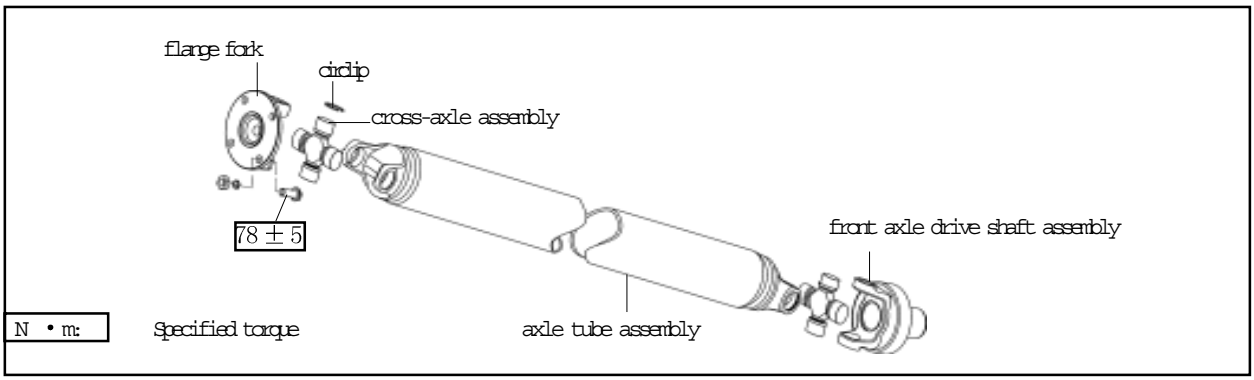
b. To assist the assembly of sealing gasket groove, please coat the surface of oil pan and washer with thin Vaseline to ensure the sealing gasket is in the groove. Do not rotate the washer, otherwise it will cause the distort or incline of groove.

c. Ensure the line pressure in the plug is proper in the valve.

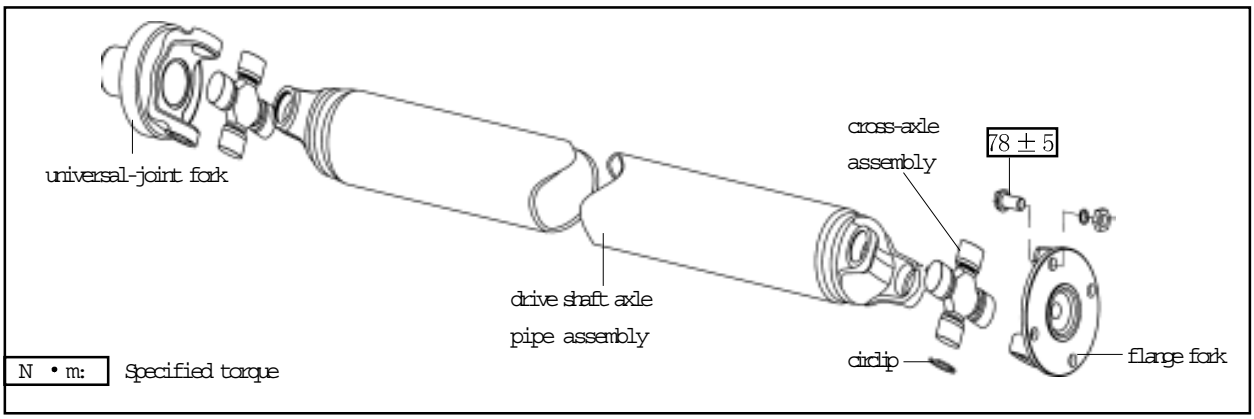
propeller shaft assembly(2WD)

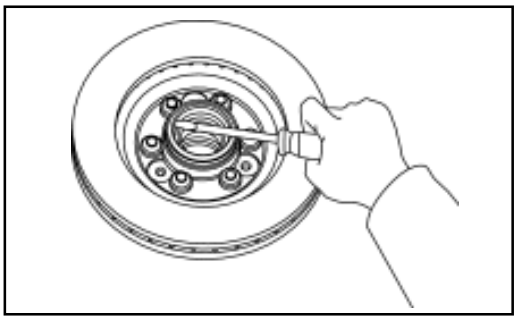


Front axle propeller shaft (4WD) assembly



Rear axle propeller shaft (4WD) assembly

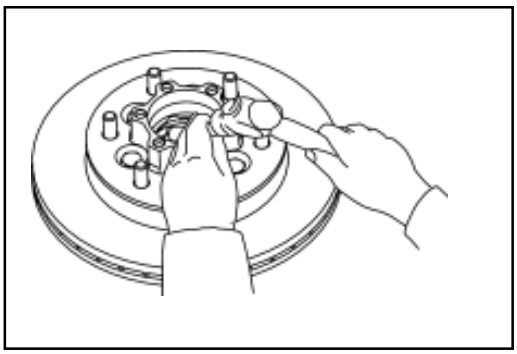




4. Remove the oil seal and inner bearing

a. Use the screwdriver to pry out the oil seal.

b .Remove the inner race of inner bearing from the hub.



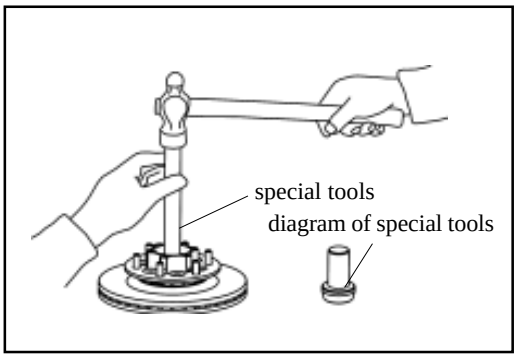
Check and repair of front hub

1. Check each bearing

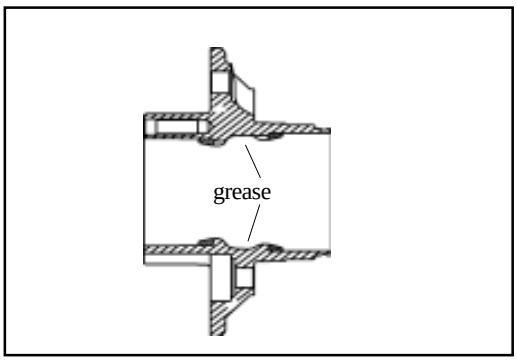
Wash the inner and outer race of each bearing and check them for damage or wear.

2. Replace the bearing outer race

a. Use the brass bar and hand hammer to knock out the bearing outer race.



b. Use the special tools to knock in the new bearing outer race.

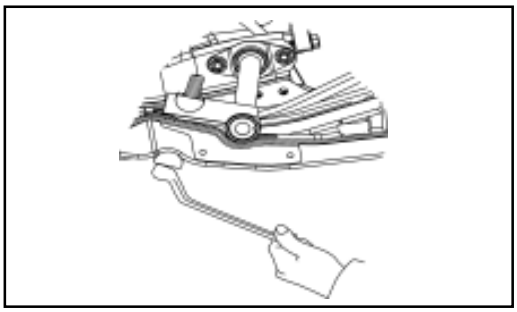


Assembly of front hub

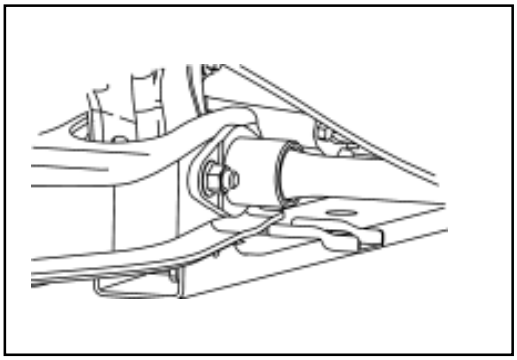
1. Coat the inner surface of hub and bearing outer race with the grease.

The grease is the Jin HP-R grease or the grease met the requirement in following table.

Item	Typical data
Dropping point, C	289
Leakage amount (104。C, 6h), g	0.48
EP performance OK value , N	178



d. Tighten the adjusting bolt to make the extension length of the bolt equal to the length before remove.



2. For new torsion bar spring

a. Remove the wheel.

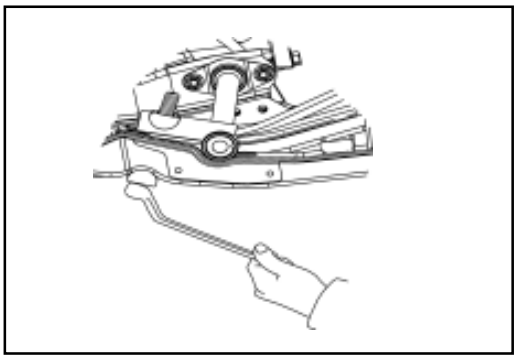
b. Coat thin grease on the spline of the torsion bar spring.

c. Install the torsion bar spring on the torsion bar base.

d. Lower the lower arm to the lower limitation position; install the adjusting arm in the torsion bar spring with the angle that the adjusting bolt just can be screwed on the upper adjusting block.

e. Tighten the adjusting bolt to the specified torque.

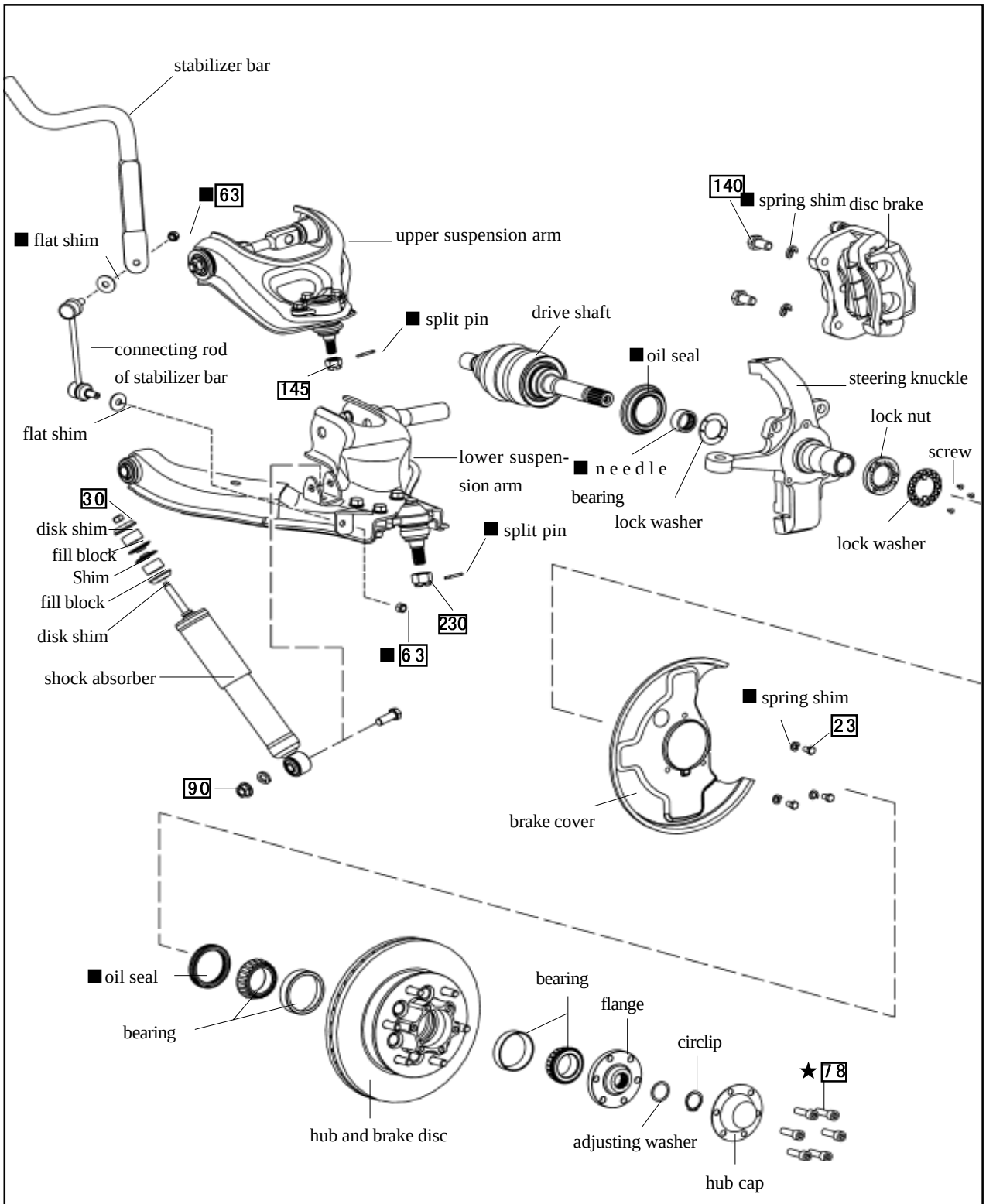
Nut tightening limitation: A is about 30-35mm; if A> 35mm, then it is adjusted through height of adjusting arm.



f. Install the wheel; remove the bracket; bounce the vehicle for several times to make the suspension enters into the stable status.

g. Rotate the adjusting bolt and adjust the ground clearance of chassis (Refer to 4-Wheel Alignment).

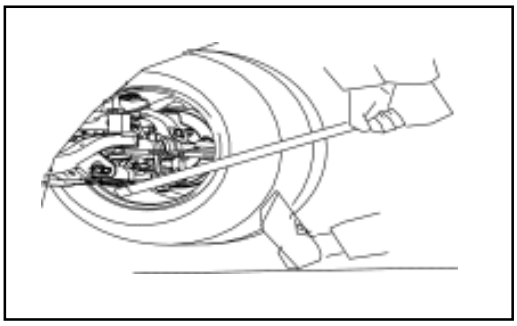
Front hub and steering knuckle (4WD)



N • m: specified torque

■ Used component which can not be used any more.

★ precoated component

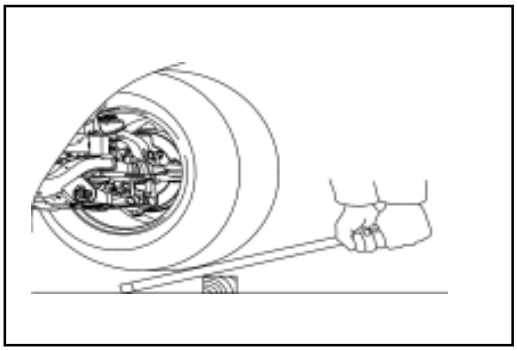


Ball pin

Check of ball pin

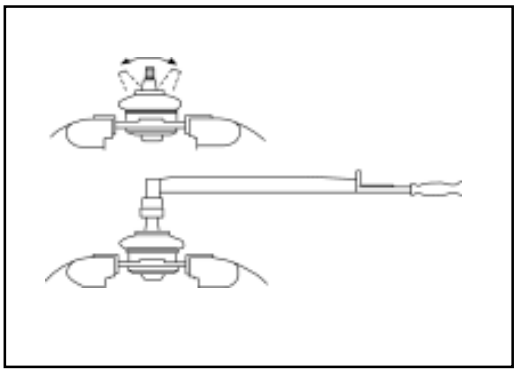
1. Check the lower ball pin for loose

a. Raise the front of the car by jack and support it by the frame.
b. Ensure the front wheel is in straight advancing position and step down the brake pedal.
c. Move the arm upwardly and downwardly; check the clearance of lower ball pin.
Max. vertical clearance: 0mm



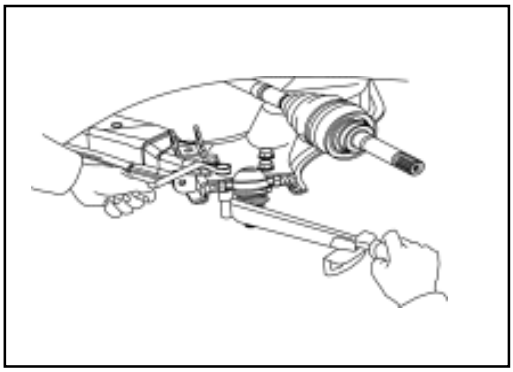
2. Check the upper ball pin for loose move the wheel upwardly and downwardly and check the gap of upper ball pin.

Max. vertical clearance: 0mm



3. Check the rotation of ball pin

a. Remove the ball pin.
b. Shown as figure, shake the ball pin stud forwardly and backwardly for several times before install the nut
c. Rotate the nut continuously by torsion meter and 2-4s for a cycle; record the readout of torsion meter in the fifth cycle.
Tightening torque (for rotary):
Lower ball pin 0.1 － 4N • m
Upper ball pin 0.1 － 4N • m

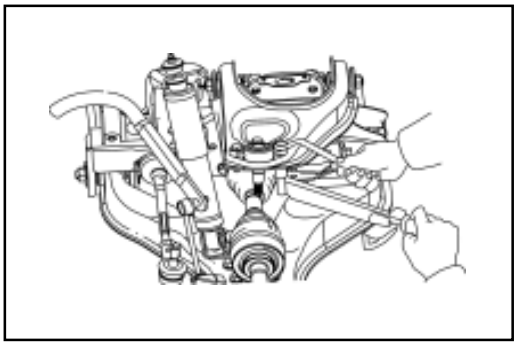


Disassembly of ball pin

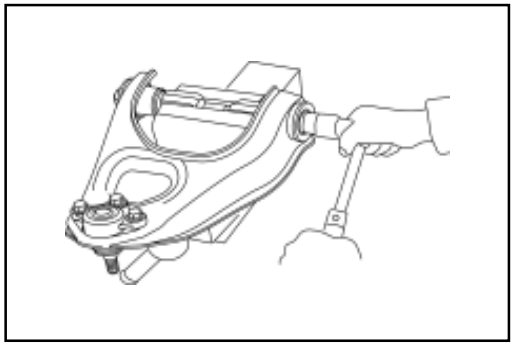
1. Remove the steering knuckle and front hub assembly

(Refer to section “Front Hub and Steering Knuckle”)

2. Remove the lower ball pin form the lower arm

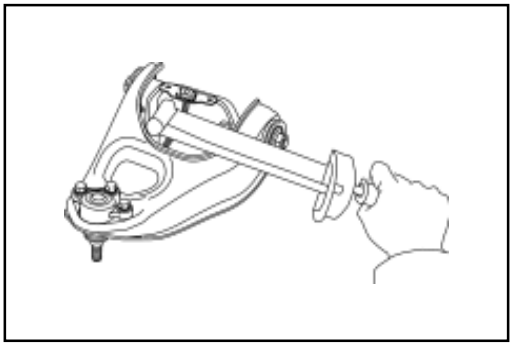


3. Remove the upper ball pin from the upper arm



b. Tighten the upper arm shaft nut to specified torque.

Tightening force: 210 ± 10N • m



Installation of upper suspension arm

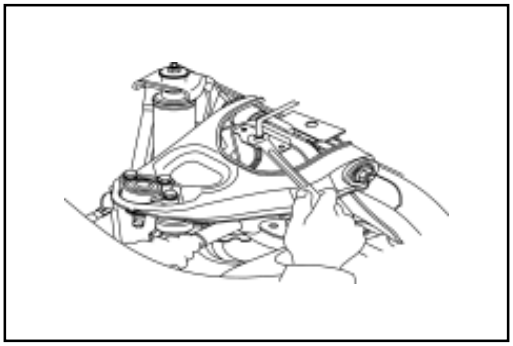
1. Install the upper suspension arm on the carriage

a. Install the upper suspension arm and camber adjusting shim.

b. Tighten all bolts to the specified torque.

Tightening force: 200 ± 10N • m

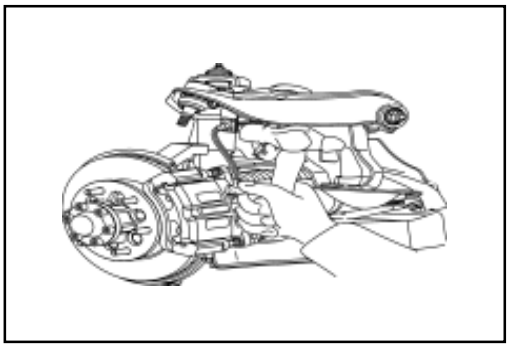
Remarks: Install the shim with same quantity and thickness to the original position.



2. Connect the brake oil pipe of upper arm shaft Tighten the oil pipe compression nut to specified torque.

Tightening force: 15-17N • m

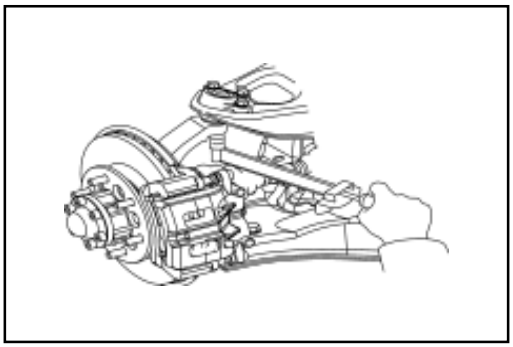
Remarks: It should tighten four connectors of two two-way valves to the specified torque if disassemble the right upper arm.



3. Connect the brake hose to the upper arm oil pipe bracket

a. Thread the brake hose through the hole on upper arm oil pipe bracket.

b. Insert the sheet steel spring clip by the hammer to fix the brake hose.



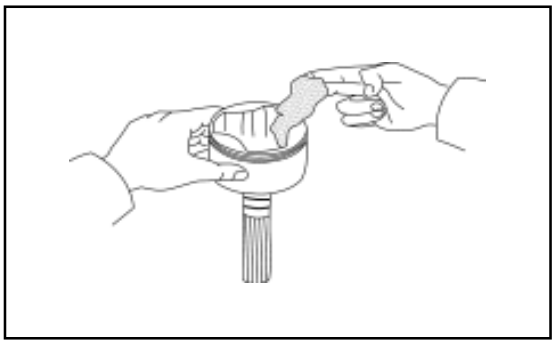
4. Connect the upper ball pin to the steering knuckle.

a. Tighten the slotted nut according to the specified torque.

Tightening force: 145 ± 15N • m

b. Install the new split pin.

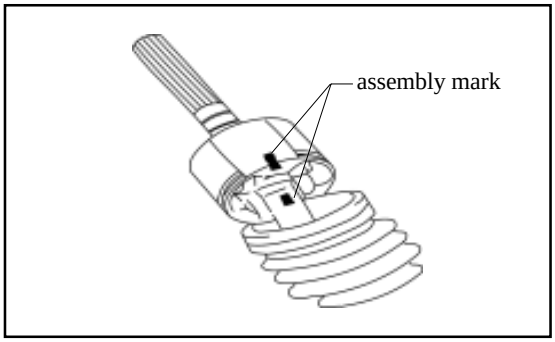
Remarks: It should align the notch of nut with the pinhole when install the split pin; the nut can be tightened but not loosed during the alignment.



6. Install the inner trumpet connector on the front drive shaft

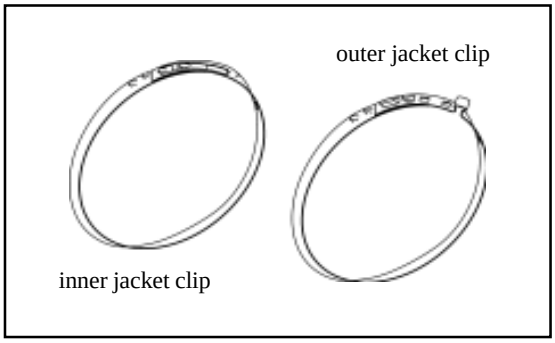
a. Fill the inner trumpet connector and inner jacket with the grease supplied with the jacket

(Recommend used grease is CAPLEX or KY1). Amount About140g

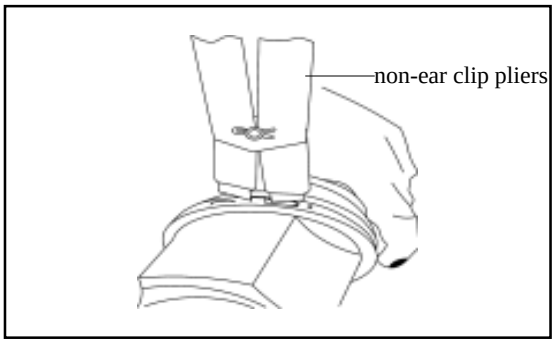


b. Align the assembly mark made during disassembly; covered with inner trumpet connector.

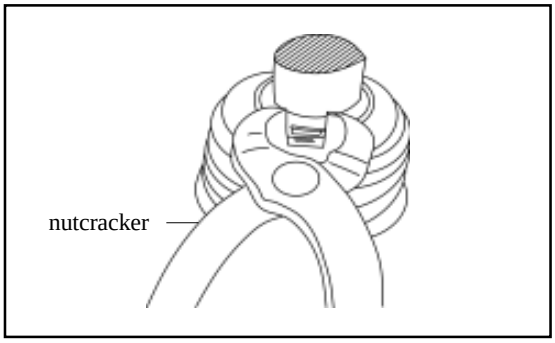
c. Cover the inner jacket on the inner trumpet connector.



7. Use the inner and outer jacket clip pliers to clamp the inner and outer jacket.

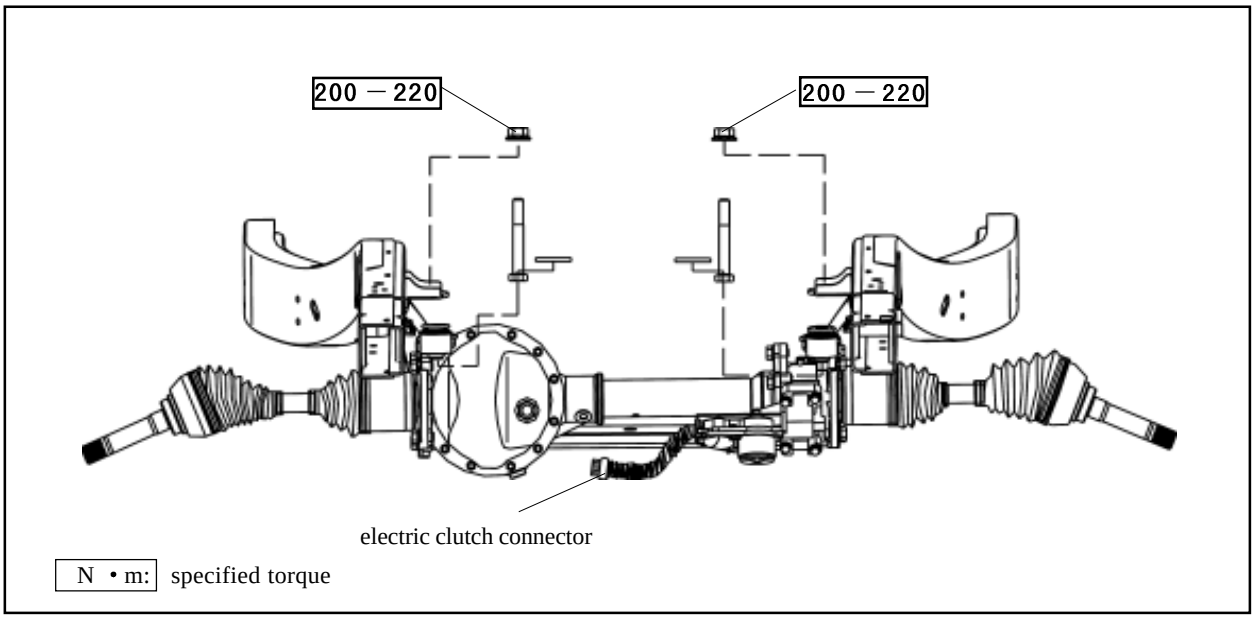


a. Use the special non-ear clip pliers to lock the large clip of inner jacket.

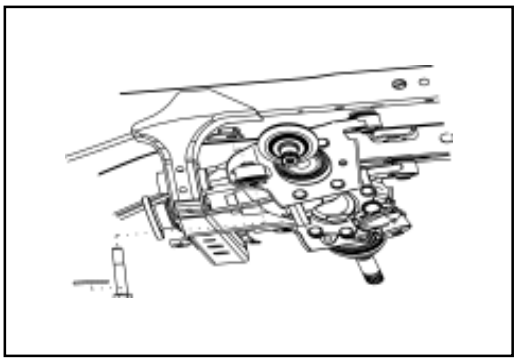


b. Use the nutcracker to lock the small clip of inner jacket.

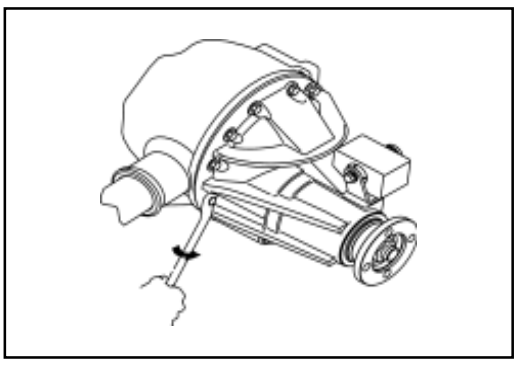
Caution: Ensure the large and small connecting place of jacket is in the corresponding groove of trumpet connector and shaft.



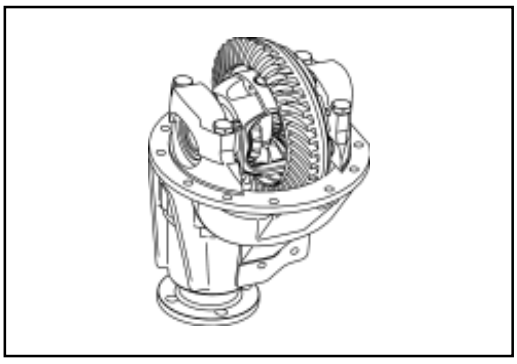
N • m: specified torque



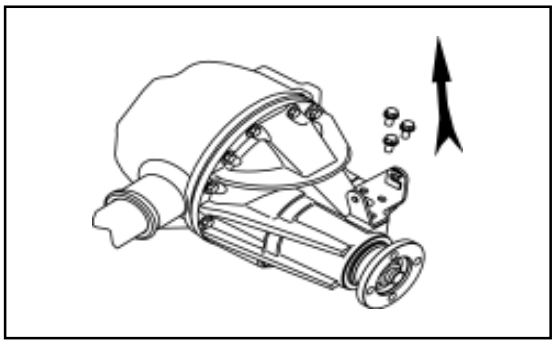
8. Use the jack to support the front reducer assembly
9. Remove the lifting bolt of front drive axle hanger plank and carriage.
10. Remove the front drive axle assembly
Caution: Do not damage the drive shaft and front drive shaft jacket
11. Remove the front drive shaft assembly of both sides from the front drive axle assembly.



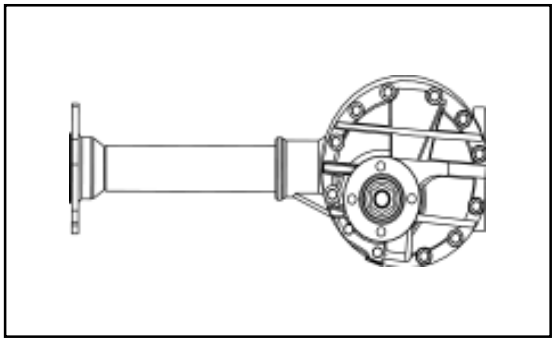
12. Use the wrench to remove the bolt and nut which is used to fix the front reducer housing.



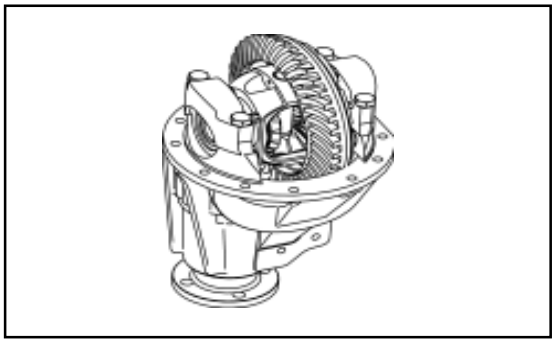
13. Remove the clump weight assembly and clump weight bracket welded assembly
(Refer to “Disassembly of Front Reducer Assembly”)



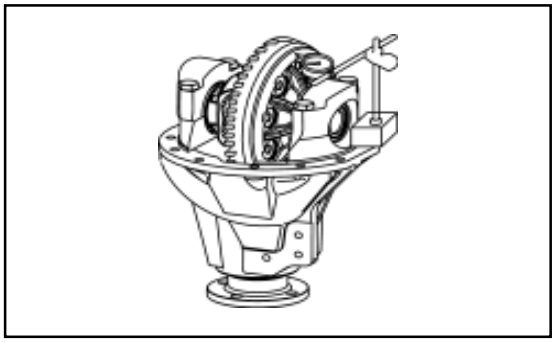
15. Use the wrench to remove the bolt fixed the clump weight bracket welded assembly.



16. Use the wrench to remove the bolt and nut used to fix the front reducer assembly and front axle housing.



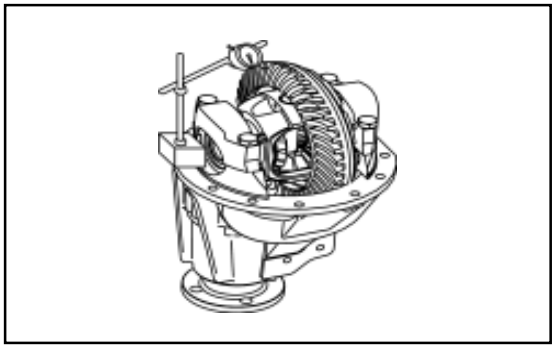
17. Use the brass rod or hand hammer to knock the front reducer housing to separate it from the front drive axle housing.



18. Check the run-out of driven bevel gear.
Rotate the flange; use the dial indicator to measure the run-out of driven bel gear.

Max. Runout: 0.07mm

It should replace the drive and driven bevel gear totally if the run-out is more than 0.07mm.



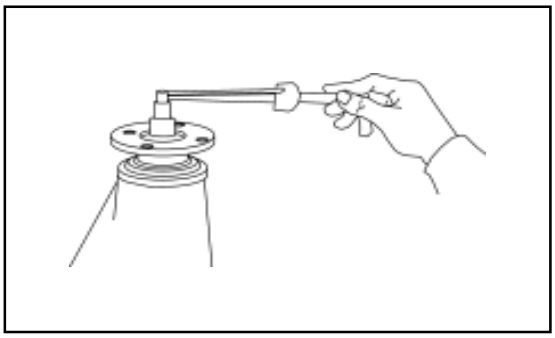
19. Check the running clearance of drive and driven bevel gear.

a. Install the dial indicator and ensure the side axis is vertical to contact tooth surface.

b. Hold the drive gear flange and rotate the driven bevel gear in clockwise and anticlockwise to measure the clearance.

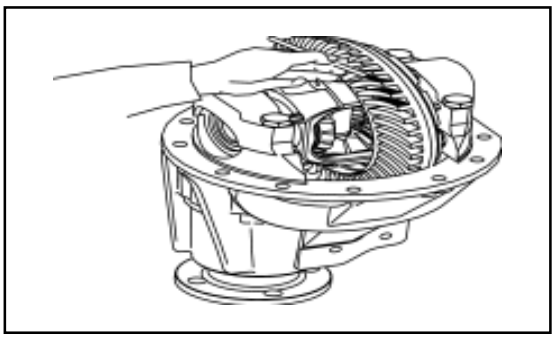
Specified range of clearance: 0.15-0.25mm

Remarks: Check three average points on circumference of driven bevel gear at least.



19. Use the torque measuring meter to measure the total pre-applied load of front reducer.

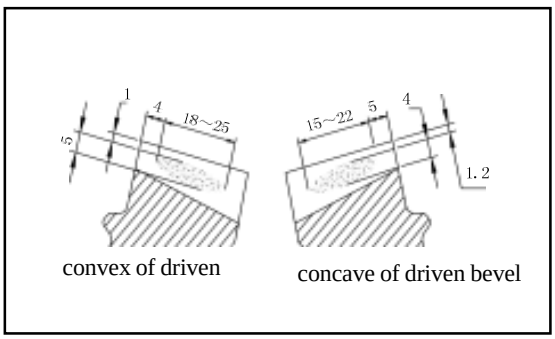
specified torque : 1.8-2.4N • m



20. Check the meshing mark of drive and driven bevel gear.

a. Paint 3-4 teeth with the red lead in three different positions of driven bevel gear.

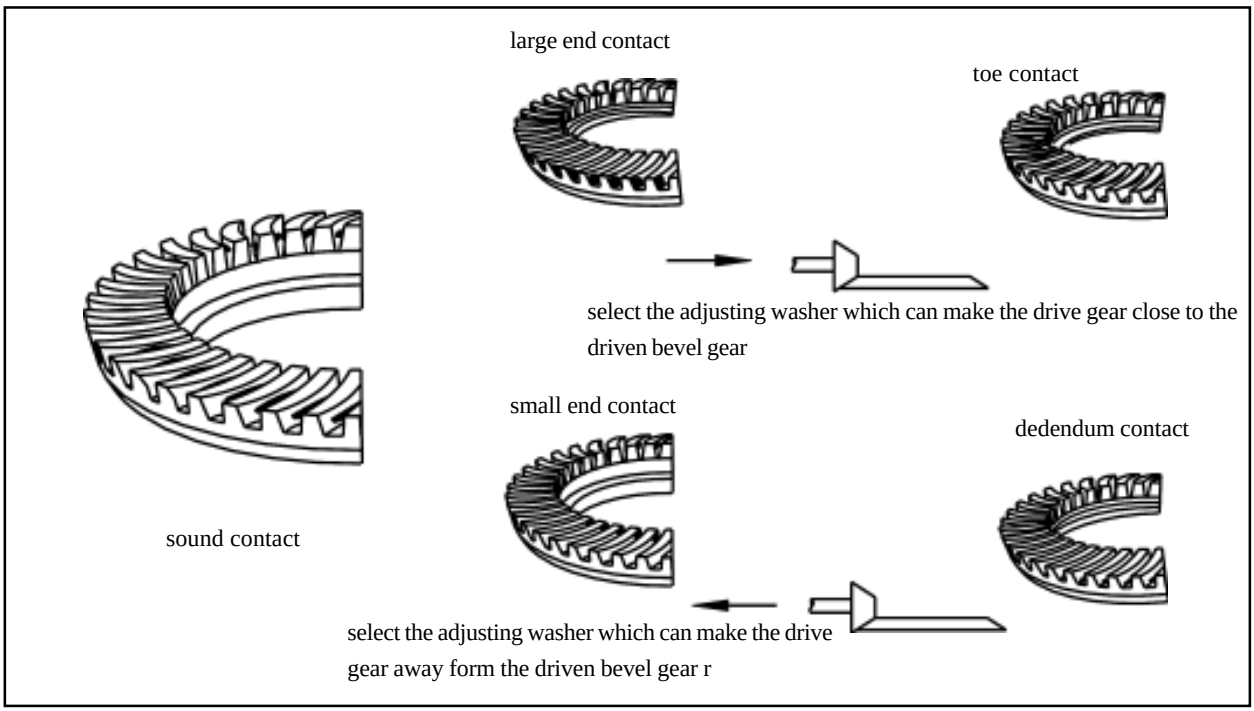
b. Hold the flange of drive gear; rotate the driven bevel gear in clockwise and anticlockwise.



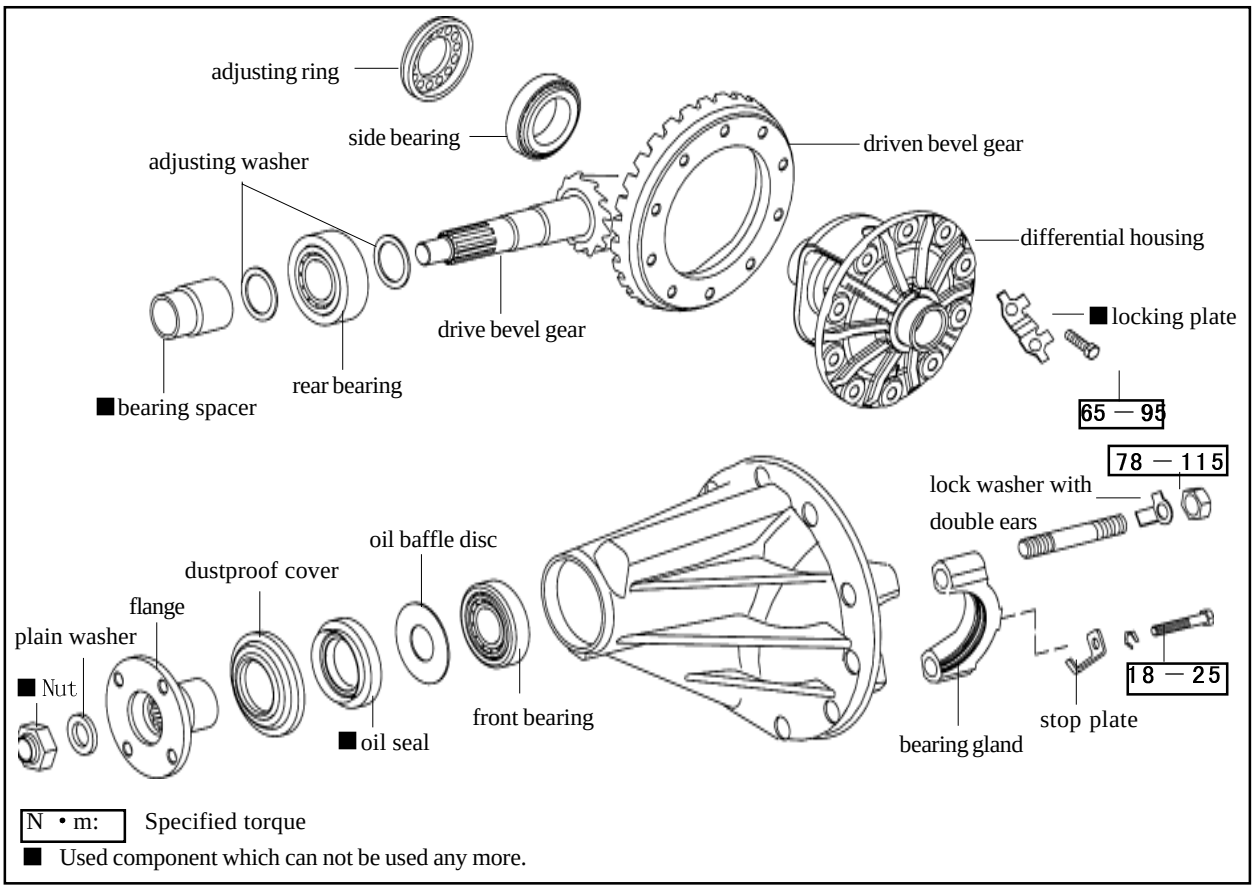
convex of driven

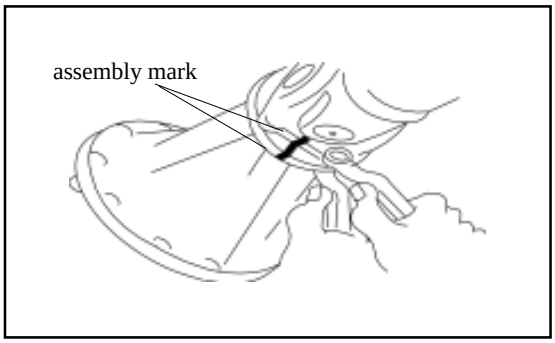
concave of driven bevel

c. Check the contacting condition of gear tooth.If the meshing mark of drive and driven bevel gear does not consist with thatshown in figure, it should select the proper adjusting washer for modification according to the detailed form of meshing mark.



Reducer



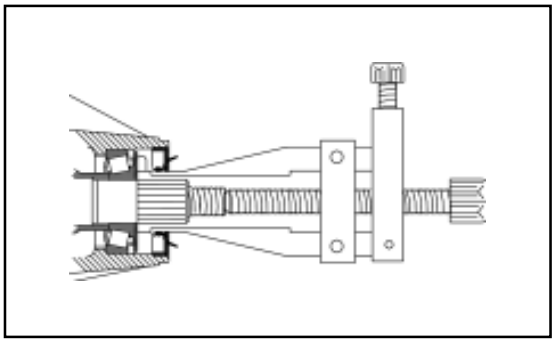


Replace the oil seal on the car

1. Disconnect the reducer from the drive shaft.

a. Make the assembly mark on two flanges.

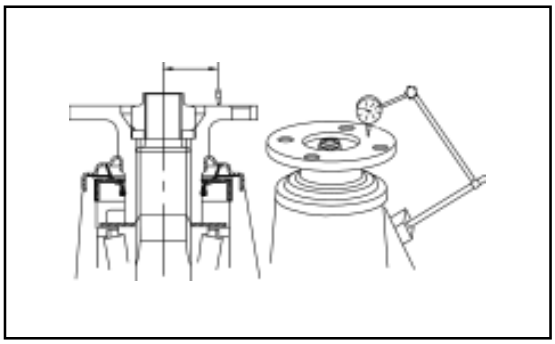
b. Remove four bolts and nuts.



2. Remove the flange and dustproof cover assembly

3. Remove the oil seal

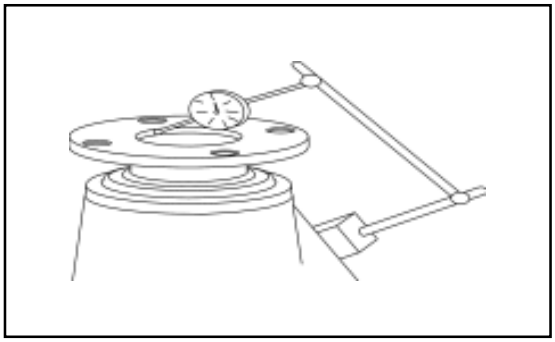
Use the special tools to remove the oil seal.



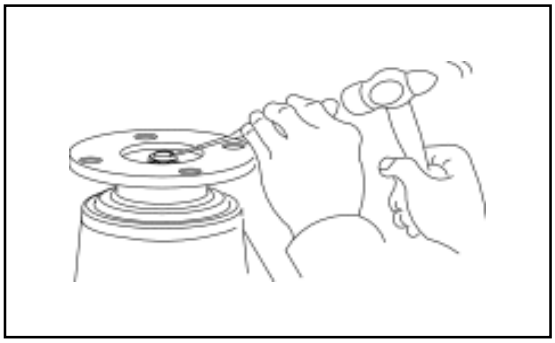
17. Check and adjust the run-out of flange.

a.Adhere the dial indicator base on the reducer housing; make the probe of dial indicator contact with the end surface of flange; rotate the flange and watch the rotation range of the dial.

Full run-out tolerance of end surface: 0.10mm



b.Adhere the dial indicator base on the reducer housing; make the probe of the dial indicator contact with the inner diameter of flange; rotate the flange by hand , and watch the rotation range of the dial.Radial full run-out tolerance: 0.10mm



18. Rivet the nut of drive bevel gear

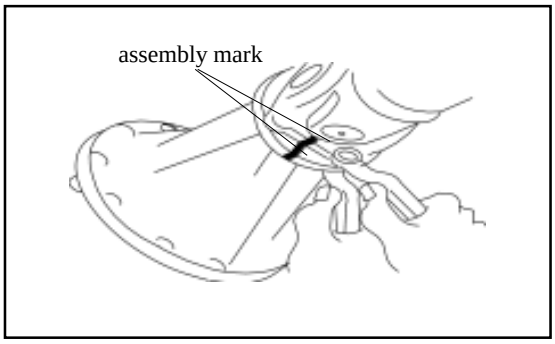
Installation of reducer and differential assembly

1.Install the new stiffening ring

2.Install the reducer and differential assembly

Install the reducer and differential assembly in the rear axle housing; place the washer and nut. Tighten the nut to the specified torque.

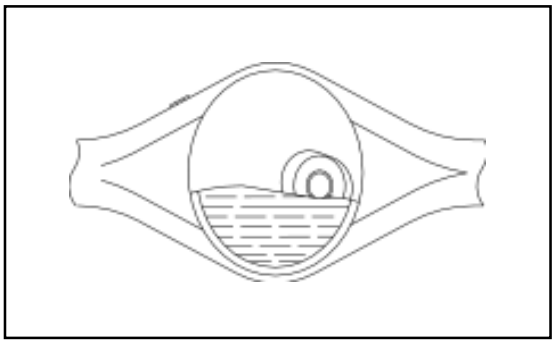
Tightening force: 18-25N • m



3.Install the reducer and differential assembly flange on the drive shaft flange and align the assembly mark; use four bolts and nuts to connect them.

Tighten the bolt and nut to the specified torque.

Tightening force: 78 ± 5N • m



4.Install the oil drain plug; fill the differential with the gear oil

oil number : GL-5 hyperbolic gear oil

Viscosity: SAE80W/90

Amount: Filled with oil until the oil flow out from the oil filling port.

Tighten the oil filling plug.

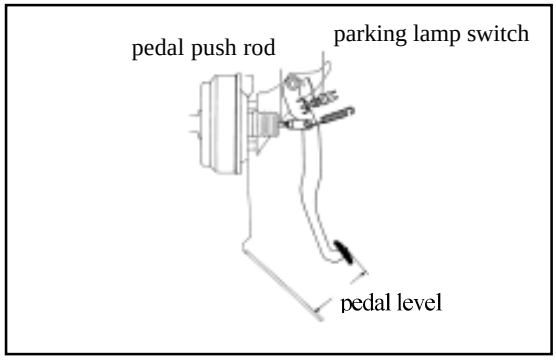
Tightening force: 140-150N • m

Check and adjustment

Check and adjustment of brake pedal

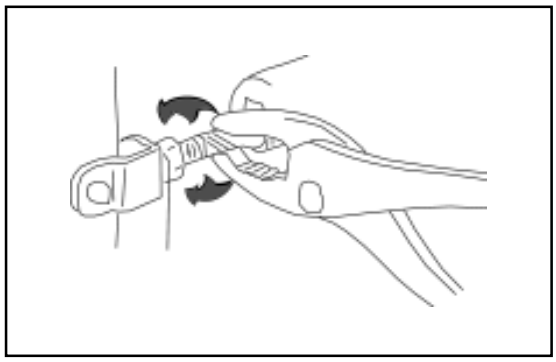
1. Check the correctness of height of pedal

Distance from pedal to lower front apron: 152mm, Operating stroke of pedal push bar is 1mm.

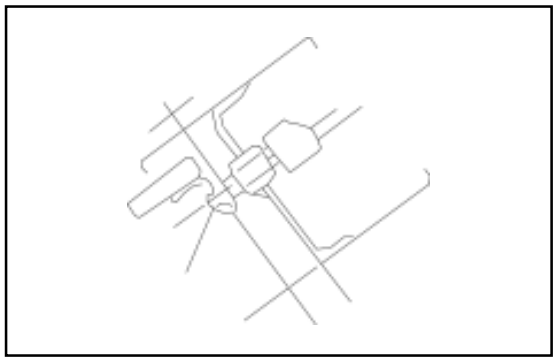


2. Adjust the pedal height if necessary

a. Disconnect the brake lamp switch wire connector; loose the tightened nut; rotate the brake switch to the position not contacted to limit block of brake pedal



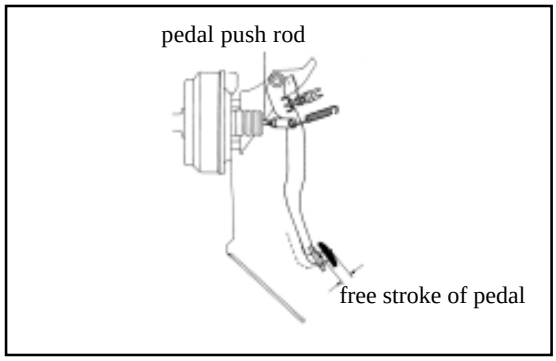
b. Loose the lock nut of operating connecting rod; use the thinnose pliers to rotate the operating connecting rod to adjust the height of brake pedal to the standard value; lock the block nut tightenedly when reach the standard value.



c. Rotate the brake lamp switch to contact with the limit block of brake pedal; then rotate 1/2～1 round continuously; tighten the block nut;

d. Connect the wire connector of brake lamp switch;

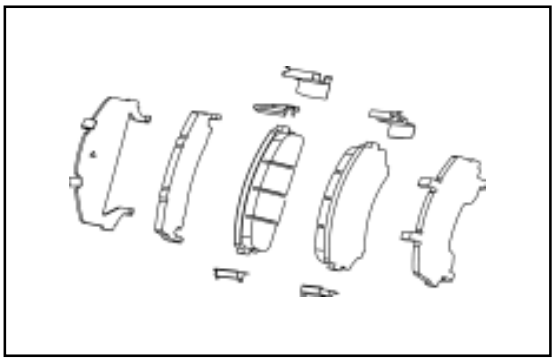
e. The brake lamp should not be light when the brake pedal is released.



3. Check the free stroke of pedal

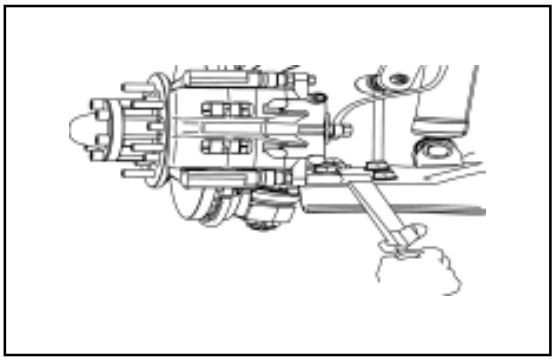
Free stroke of pedal: 4－6mm

In the status of engine is stop, step on the brake pedal for 2～3 times after eliminate effect of the brake assist, push down the brake pedal by hand to just with the resistance, then measure its displacement (free stroke). It should be in accordance with the standard value.



Installation of brake caliper

1. Install the brake block

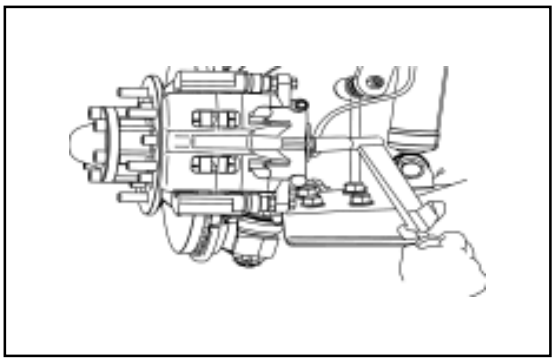


2. Install the brake pump

a. Install the brake pump.

b. Install and tighten the hexagon flange bolt.

Tightening force: 25～35N • m



3. Connect the brake pipeline

Connect the brake oil pipe to the tong body.

Tightening force: 50 ± 5N • m

4. Fill up the brake liquid reservoir with the brake fluid and dis charge the air in brake system.

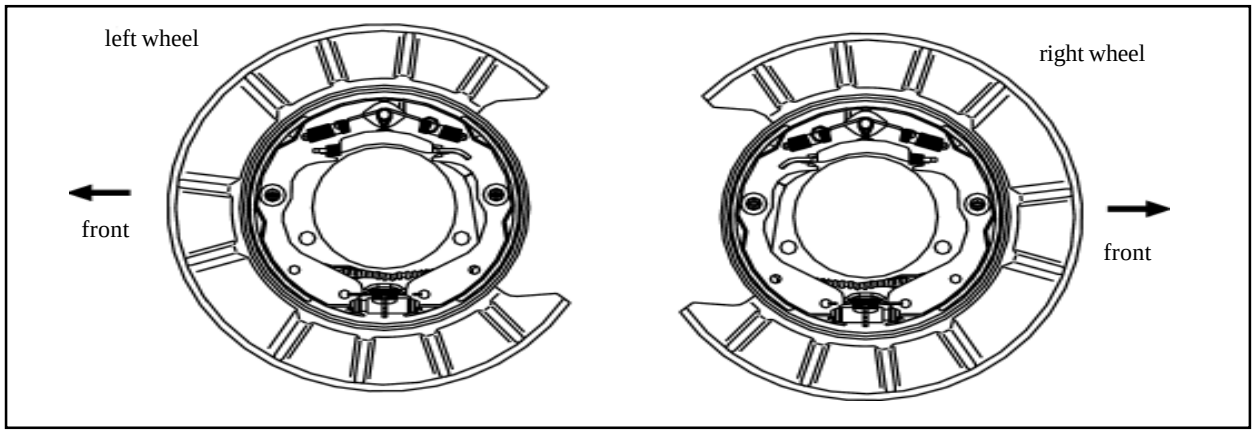
5. Check for the leakage of brake fluid.

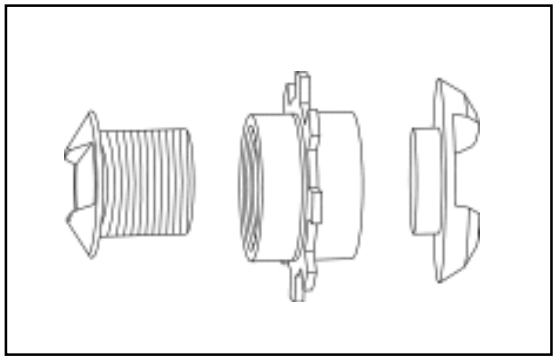
Caution: Discharge the air after the completion of replacement.

Assembly of rear parking brake

Remarks: Assemble the component according to the direction shown in figure;

It is prohibited strictly that the working surface of brake drum and abrasion disk is polluted by the paint and grease. It should be removed by the fine abrasive paper if the abrasion disk has little dirty. The brake shoe should be replaced when the polluted area is large, otherwise it will cause the serious effect of insufficient brake force.



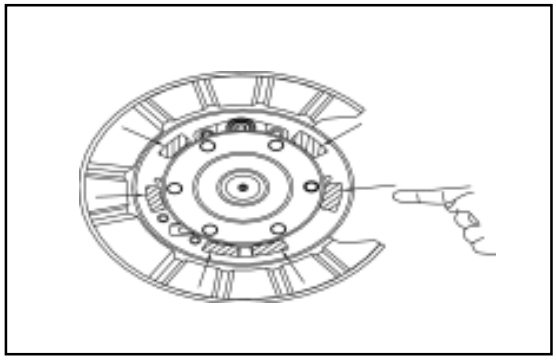


1. Install the clearance-adjusting device assembly

Insert the clearance-adjusting shaft head into the clearance-adjusting wheel; screw the clearance-adjusting screw rod into the clearance adjusting wheel.

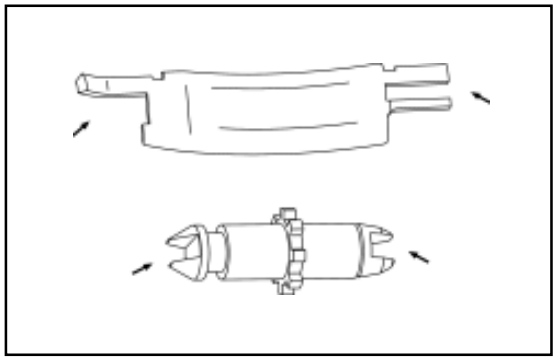
Remarks: The screw direction of left clearance-adjusting screw rod is the left hand.

The screw direction of right clearance-adjusting screw rod is the right hand.



2. Coat the following components with the proper anti-high tem perature grease :

a. Contact position of brake soleplate and brake shoe.



b. Contacting surface of push plate and shoe plate; contacting surface of clearance-adjusting device assembly and shoe plate.

Precautions:

When replacing the parts, please carry out replacement carefully and correctly, any minor error may influence the performance of the steering system and result in the accidents and danger at the time of driving.

Trouble and Troubleshooting

Poor Returnability

Causes of the trouble	Troubleshooting
1. Insufficient air pressure of the tire 2. Alternation of front wheel alignment 3. Jamming of the steering valve 4. Performance of steering valve's torsion-bar lowered down 5. Steering revolute pairs too tight	1. Inflate the tire 2. Re-measure and adjust the parameters of front wheel alignment 3. Examine components of the steering gear and replace them if necessary 4. Replace the steering gear 5. Replace the revolute pairs

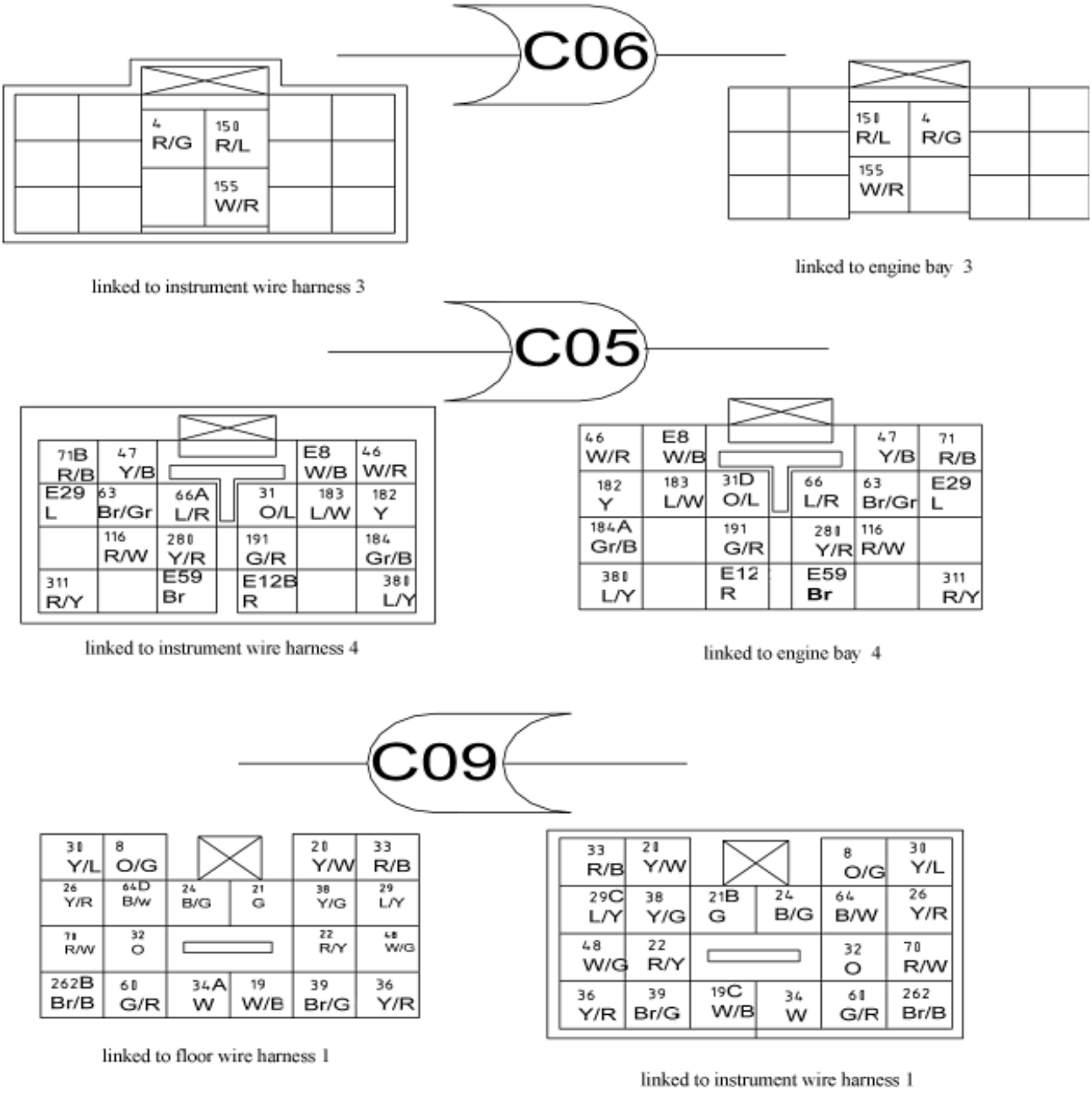
Steering too heavy

Causes of the trouble	Troubleshooting
1. Lower air pressure of the tire 2. Steering knuckle too tight 3. Steering gear too tight 4. Inaccurate front wheel alignment 5. Hydraulic system lacking of oil 6. Air in the hydraulic system 7. Insufficient oil supply of the steering pump 8. Steering revolute pairs too tigh	1. Inflate the tire with the standard pressure 2. Check the adjusting gap between steering knuckles and lubricate these knuckles 3. Examine and adjust the clearance between the gear and the gear rack 4. Adjust the front wheel alignment 5. Check the liquid level of oil reservoir and fill in the steering fluid as specified 6. Examine the sealing ability of all joints of oil pipes, exhaust the gas and check the liquid level 7. If the wear of oil pump and interior leakage is serious, replace the steering fluid with qualified one 8. Examine and adjust the gear backlash Add the lubricant

One-way Steering too heavy

Causes of the trouble	Troubleshooting
1. Insufficient air pressure of the side tire 2. Valve of the steering gear not in the center 3. Left or right fixing pressure not formed	1. Inflate the tire 2. Repair or replace the steering gear 3. Replace the seals

wire harness middle link number pin function diagram 3



linked to instrument wire harness 3

linked to engine bay 3

linked to instrument wire harness 4

linked to engine bay 4

linked to floor wire harness 1

linked to instrument wire harness 1

Figure VIII 2.2-3

Front illumination lamp system

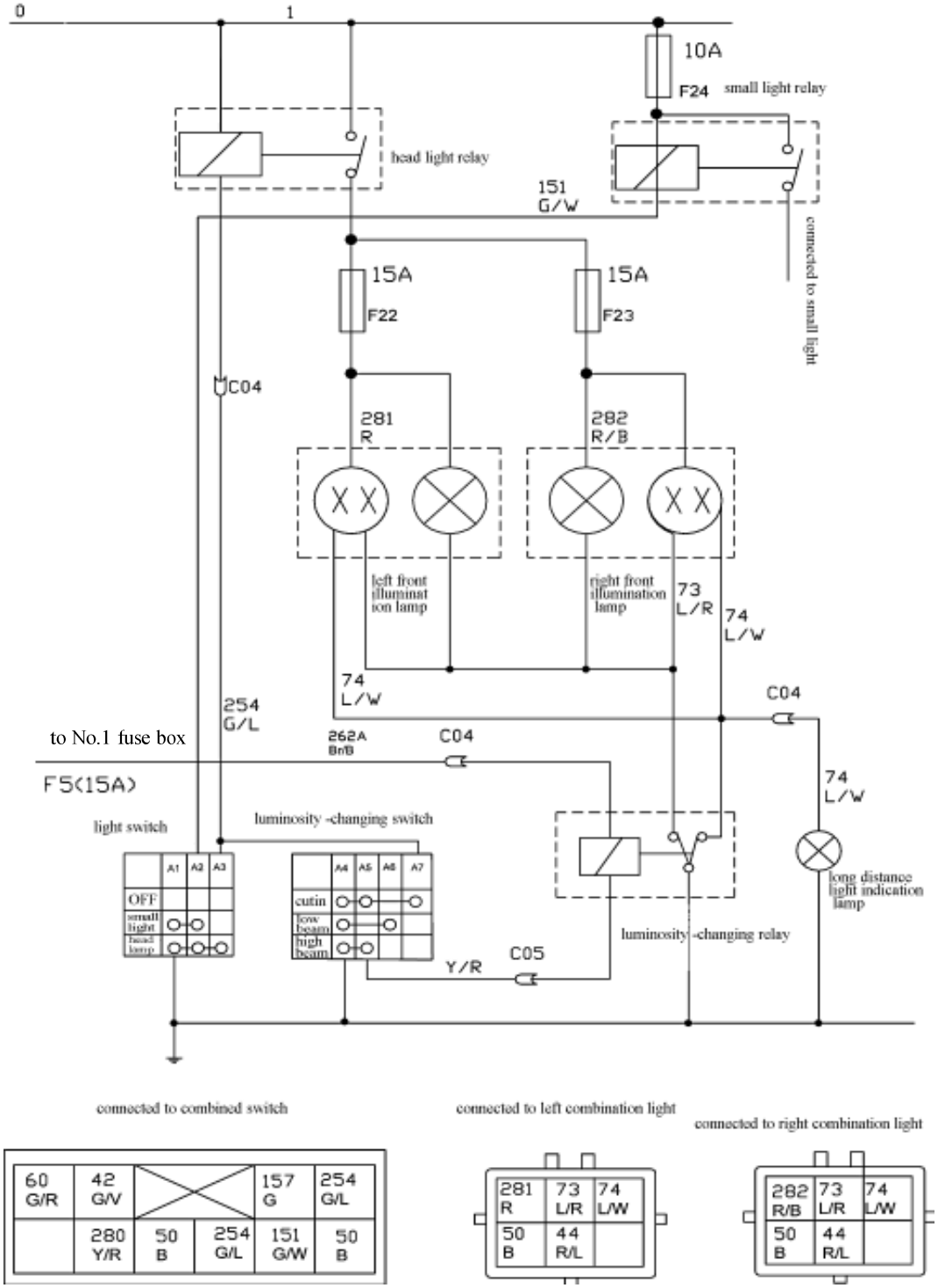


Figure VIII 4.3

Controller of the Central Door Lock

1. Positive pole of the power supply (12V) is connected to the positive pole of car's battery through a 15A fuse; when the engine is started, the voltage is not less than 10V.

2. Output of the central door lock. The unlock cable connected to the executor of the central door lock is usually grounded through the normally-closed contact of the internal relay; when the door is unlocked by the remote controller or unlocked manually, the public contact of the relay will get through with the normally-open contact, realizing an output of 12V voltage.

3. Output of the central door lock. The lock cable connected to the executor of the central door lock is usually grounded through the normally-closed contact of the internal relay; when the door is locked by the remote controller or locked manually, the public contact of the relay will get through the normally-open contact, realizing an output of 12V voltage.

4. Key detection cable. This cable is connected to the ignition lock of the car and will get through with the grounding wire when the key is inserted into. (negative input)

5. Right direction indicator. The cable is connected to the positive pole of the right direction indicator of the car; an output of 12V voltage will be available when this cable is at work.

6. Left direction indicator. The cable is connected to the positive pole of the right direction indicator of the car; an output of 12V voltage will be available when this cable is at work.

7. Negative input of door switch, which is connected to the door switch of the car; this cable will be earthed when the door is opened. (Interior lights will be on)

a. Open the door and then close it, the reading light will be on for 10 seconds; if during this period, it is detected that the key has been inserted into the ignition lock or the door closed, then the reading light will turn off.

b. When the key is pulled out of the ignition lock, then reading light will turn on, during this period, if the key is reinserted into the ignition lock or the door lock, the reading light will be off; if there is not any action when the door is closed within 1 minute, the reading light will automatically turn off.

8. ON power supply detection cable. A conductive wire connected to the ON gear of the ignition lock. (When the key is turned to the ON position, a 12V output will be available)

9. Car speedometer detection cable, which is connected to the detection cable of car's speedometer. (When the car is accelerated to the speed of 15km/h, the instruments unit will output a 500mS rectangular positive pulse to the central door lock controller, which will control the locking of the central door lock when this 500mS rectangular positive pulse signal is detected by the controller.)

10. Output of window closing signal. When the door is locked by the remote controller, this line will be available with an output of 12V positive current for one second and then be off. (No output)

11. Locking signal. The locking signal line connected to the central door lock of car's left front door is connected through with the grounding line when at work. (Earthing)

12. Unlocking signal. The unlocking signal line connected to the central door lock of car's left front door is connected through with the grounding line when at work. (Earthing)

13. Negative pole of the power supply, which is connected to the car body, (earthing) line shall be as short as possible, over-length will produce the interference.

Function of controller of the central door lock

1. Locking. When all the car doors are closed, press LOCK button of the remote controller once, at this time, the direction indicator will flash once and the central door lock is closed.

2. Unlocking. At the locking state, press UNLOCK button of the remote controller once, at this time, the direction indicator will flash two times and the central door lock is opened.

3. Car-finding function. At the locking state, press LOCK bottom of the remote controller once, and at this time, the direction indicator will flash ten times quickly. Press UNLOCK button of the remote controller to quit the car-finding function.

4. Automatic prevention function. At the locking state, press UNLOCK button of the remote controller to open the lock; if the

Step 6: Display “06”(set the temperature zone)

Display the detection code of mode/ temperature damper executor

Code number	Code Meaning
0x0	Temperature damper executor works normally
0x1	Detection for temperature damper executor is in progress.
0x2	Temperature damper executor failure
00x	Mode damper executor works normally
01x	Detection for mode damper executor is in progress.
02x	Mode damper executor failure

Press down “Temp+” switch

Note: X is a digital number without specific meaning; the code number is displayed in the outside temperature display zone.

Step 7: display “07”(set the temperature zone)

Action of the executor mechanism:
Mode damper: wind to the person
Circulation damper: internal circulation
Temperature damper: cold end
Wind amount: the maximum
Compressor: enabled

Press down “Temp+” switch

display “08”

C

Chapter 12

Safety airbag

Procedure	Test	Operation	
3	Test the wiring harness connection between ECU unit and instrument cluster. • Place the ignition switch in LOCK position。 • shut off accumulator negative line • shut off the instrument cluster plug • test the connection between alarm lamp circuit and its relative circuits	Yes	Next procedure.
		No	Replace the wiring harness and get into step 5

2. Normal-light of safety airbag system indicator lamp

2	Normal-light of safety airbag system alarm lamp
Test status	Normal-light of safety airbag system alarm lamp
Possible causes	Insufficient battery voltage ECU internal failure Combined instrument safety airbag alarm lamp failure ECU plug misconnects Combined instrument plug bad-contact ECU power-supply fuse shutoff or bad contact Misconnection of ECU plug terminal Bad contact between ECU plug terminal and grounding wiring harness. Driver's or passengers' side safety airbag circuit failure.

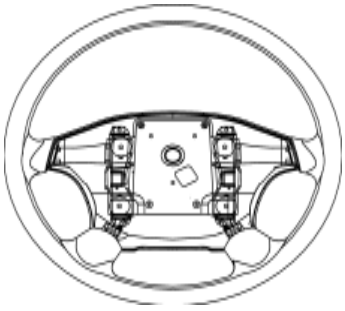


Figure 6－1

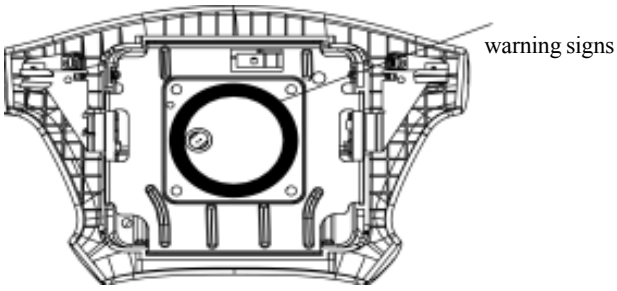


Figure 6－2

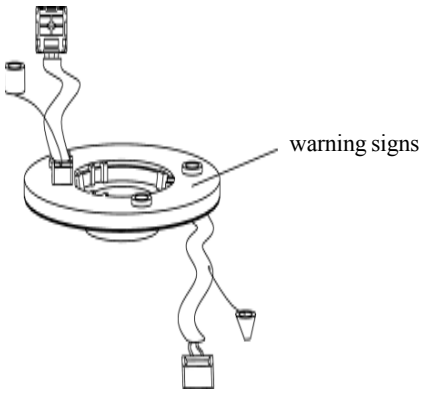


Figure 6－3

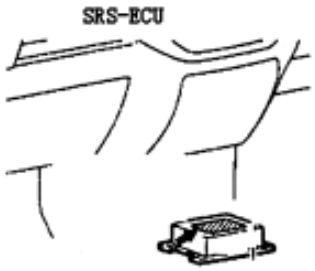


Figure 6－4

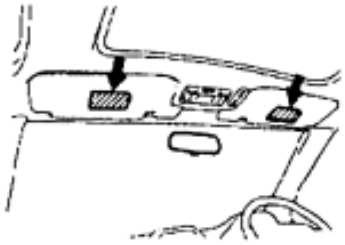


Figure 6－5

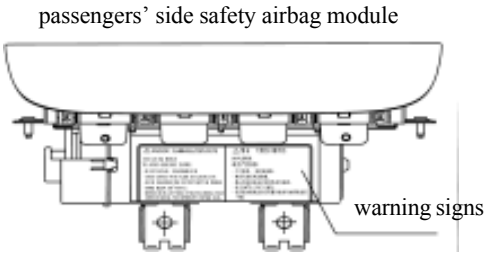


Figure 6－6

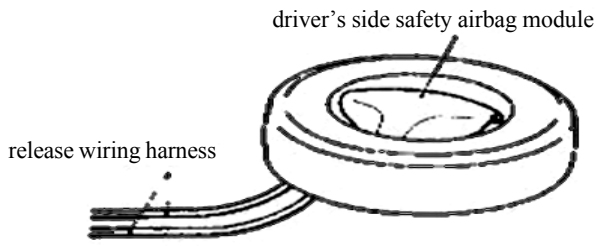
Removal methods for all the parts

Safety airbag electronic-control unit (SRS-ECU)

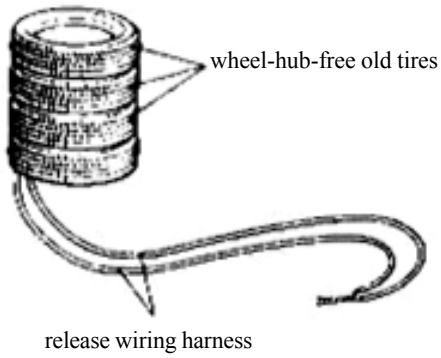
Caution

1. **Continue the operation 60 seconds after the removal of accumulator negative. Wrap the removed negative with insulating tape for insulation.**
2. **The SRS-ECU must not be separated nor repaired replace the failed SRS-ECU with a new one.**
3. **Prevent the SRS-ECU from shock and vibration, replace the SRS-ECU with depression, crack or deformation with a new one.**
4. **Do replace the SRS-ECU with a new one after the safety airbag is released.**
5. **Do not damage the SRS-ECU when removing or maintaining the parts next to it.**

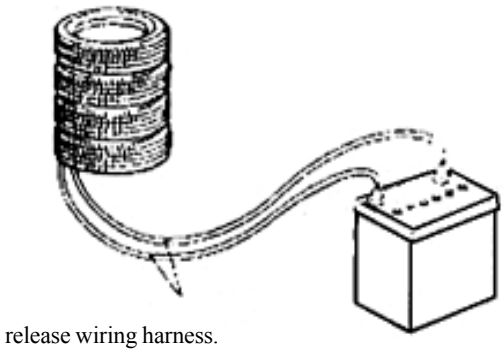
- Installed the stand-by bolts on the driver's side safety airbag module's inside bolt and fasten a thick wire to the wheel rim to fix it.
- Connect the release wiring harness connecting with the driver's side safety airbag module with the low part of an old tire loading the wheel rim. (refer to figure 9-6)



Lay three wheel-hub-free old tires on the tire fixing the driver's side safety airbag module (Figure 9-7).



Shut off the joint of driver's side safety airbag release wiring harness somewhere far from the vehicle, and connect the joint with the accumulator and make the safety airbag release (Figure9-8).



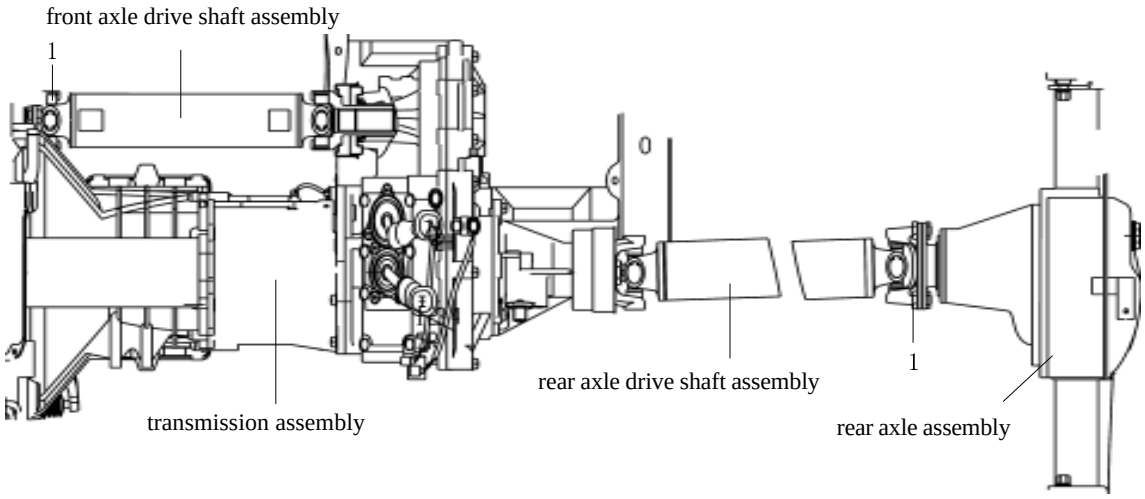
Caution

Release the driver's side safety airbag module after the confirmation of nobody close to it.

Its gas generator is quite hot after the driver's side safety airbag's release, it can be used after its cooling down for more than 30 minutes.

- Contact with the local service station of the Great Wall Auto Stock Corporation if the driver's side safety

Control item	Request	Control mean
drive shaft bolt	the fixed torque of bolt 1 in the Figure is 78 ± 5N • m	torque wrentch



Control item	Request	Control mean
petrol lien joint Tightening torque	petrol line joint tightening torque is 16 ± 2 N	torque wrench