Vehicle Maintenance

A Road Conditions

1. drive on rough, muddy or skiddy roads

2. drive on dusty roads

B. Driving Conditions

1. Repeat driving within 8km a few times, or when the outdoor temperature is below 0℃;

2. Idle the car drive at a low speed for a long time, such as police car, taxi, or door to door delivery vehicles;

3. Continuously drive the car at high speed for more than 2 hours (80% of the max speed or above).

Regular Inspection

1. Weekly Inspection

● inspect engine oil level and cleanness;

● inspect engine coolant level;

● inspect brake fluid level;

● inspect windshield washer fluid level;

2. Monthly Inspection

● inspect water pump belt;

● inspect tire air pressure and wear;

● inspect steering wheel;

● inspect brake;

● inspect acceleration pedal.

3. Inspection when driving (low speed)

● Check the speedometer and the water temperature gauge;

● check steering wheel power and if vehicle has deviation;

● check if the front wheels break away or wobble;

● inspect if brake works normally or if the vehicle has deviation when vehicle brakes.

4. Other Inspection Items

Eliminate problems immediately when there is anything abnormal.

Regular replacing parts table

Parts	No.	Regularly Replacing Parts	Interval
Braking System	1	Brake master cylinder cup valve and dust cover	Every 2 years(or as required)
	2	Brake master cylinder cup	Every 2 years(or as required)
	3	Brake hose	Every 2 years(or as required)
	4	Wheel-braking cylinder valve	Every 4 years(or as required)
	5	Brake booster rubber	Every 2 years(or as required)
	6	Brake booster vacuum hose	Every 2 years(or as required)
	7	Brake fluid	Yearly (or as required)

II. Removal of the Engine Assembly from the Vehicle

1. Avoid gasoline overflowing (Disconnect from the fuel tank and burn the fuel up).

2. Turn on the radiator drain plug and receive the coolant with a container.

3. Disconnect the engine inlet and outlet water pipes and discharge the coolant.

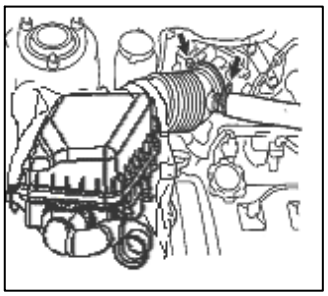


Fig. 1-3

4. Remove the air filter assembly with hose (see Figure 1-3 for MR479Q)

(1) Detach the vent pipe from the hose of air filter;

(2) Loose the clamp bolts on throttle body and disconnect the air filter hose;

(3) Remove 3 bolts and the air filter assemblies。

5 Remove the battery connectors and battery assembly.

6. Remove the battery support.

7. Remove fuel pipes

8. Disconnect A/C high pressure pipe and low pressure pipe from A/C compressor.

9. Disconnect the inlet and outlet water pipes from heater.

10. Unscrew the nut and remove the throttle control cable.

11. Remove left and right front wheels.

12. Detach the harness connectors connecting to the vehicle body.

13. Remove the front exhaust pipe assembly

14. Remove the nuts of front wheel hub(same method for other side).

15. Detach the front wheel speed sensor(with ABS).

16. Separate the steering tie rod ball end assembly

17. Separate the front suspension arm subassembly.

18. Separate the front drive shaft assembly (see Fig. 1-4).

19. Separate the front drive shaft from the hub using a plastic hammer

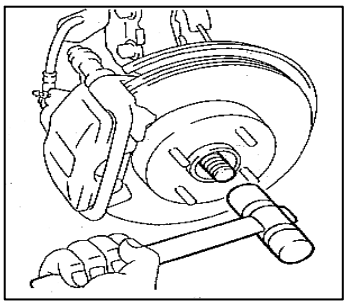


Fig. 1-4

20. Detach the transmission shift cable, transposition cable.

21. Detach the clutch cable

22. Loosen the engine rear mounting bolts connecting with subframe.

23. Remove the subframe assembly.

24. Remove the engine assembly together with the drive axle.

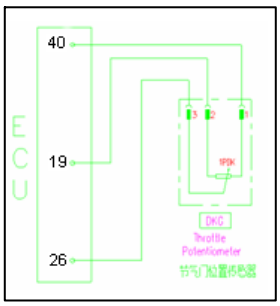
(1) Use a hoist to suspend the engine slightly;

(2) Remove 3 bolts from the right engine support (see Fig. 1-5); (2 bolts at top and 1 at bottom)

(3) Remove 3 bolts from the left engine support (see Fig. 1-6);

(4) Remove the engine together with the drive axle and lay them on the ground.

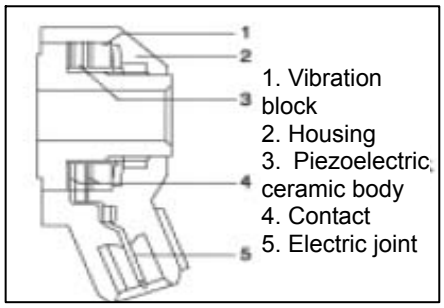
(2) Use an ohmmeter to measure the resistance between Pin 1 and Pin 2, resistance: 1.6～2.4kΩ.



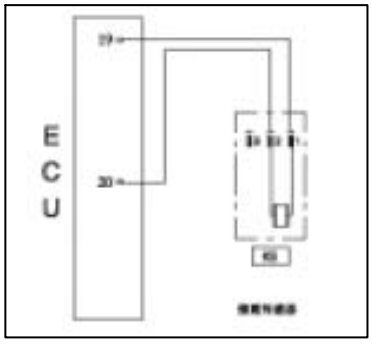
(3) Attach two ohmmeter probes to the sensor positive power pin and signal pin respectively, rotate the throttle and its resistance value should increase linearly and gradually without abrupt fluctuation, while this is contrary for Pin 2 and 3.

Note: Observe if the resistance value skips obviously when looking into the replace of resistance value.

4. Knock sensor



1. Vibration block
2. Housing
3. Piezoelectric ceramic body
4. Contact
5. Electric joint



Measurement: (remove the joint) set the digital multimeter to ohm gear and attach two probes to Pin 1 and 2 of the sensor respectively, and when at normal temperature its resistance value should be greater than 1 MΩ. Set the multimeter at mV gear, gently knock near the knock sensor using a small hammer and there should have the voltage signal output.

5. Water temperature sensor

Within this sensor is encompassed the NTC thermistor and its resistance value varies with ambient temperature, thus even minor change of outside temperature can be measured accurately and timely. The temperature of contact medium can be shown according to its output resistance. Where, Terminal A and C output the signal to ECU, Terminal B and earth terminal output the signal to the gauge.

Working Principle (see Fig. I):

Note: A, B and C represent three pins of the sensor; see the pin foot for their marks.

Test with a multimeter: temperature sensor resistance – temperature characteristic

Range of temperature(℃)	Resistance of Terminal A & C(KΩ)
-20±0.1	13.71—16.49
25±0.1	1.825—2.155
80±0.1	0.303—0.326
110±0.1	0.138—0.145
	Terminal B resistance(Ω)
50±0.2	176—280
80±0.2	63.4—81.4
110±0.2	24.6—30.6

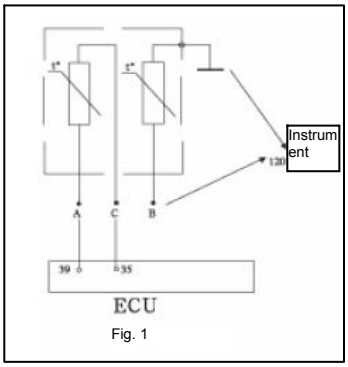


Fig. 1

6. Air intake temperature sensor

thoroughly.

2. Troubleshooting:

(1) Check whether the free stroke of clutch pedal is too large, and adjust it.

(2) Check whether releasing levers are of the same height or too low. Toggle the release fork under the vehicle to make the front end touching the inner end face of release lever lightly, then check it by rotating the clutch one turn, if the inner ends of release lever fails to touch the release levers simultaneously, it indicates that release levers are not of the same height, and they should be adjusted. If they are of the same height, but releasing is still not thorough, it is required to check lever height. Adjust release levers to the same height, if releasing is thorough, it indicates original adjustment is improper or wearing is too serious. After adjustment of release levers, free stroke of clutch pedal must be readjusted.

(3) If the releasing is still not thorough after adjustment above, it is necessary to remove the clutch to check whether driven disc is installed reversely, axial movement is hard, pressure plate and driven disc are warping, release lever screws are loose or floating pin has fallen off.

(4) For the clutch with newly-riveted frictional plate, check whether driven disc and the frictional plate are too thick. If so, add gasket between the clutch cover and the flywheel.

(5) For hydraulically-driven clutch, in addition to inspection above, it is also required to check whether brake fluid is insufficient or pipe is leaking and exhausts the air in hydraulic system.

(III) Clutch vibration when engaging

1. Symptom: when the clutch engages gently as normal operation, the vehicle starts intermittently instead of accelerating gradually and smoothly, and the vehicle even vibrates until the clutch engages completely.

2. Causes and troubleshooting:：

(1) Pressure between driving and driven discs is not distributed evenly. The elasticity of pressure spring on engaging clutch is not even, release levers are not adjusted consistently or releasing end of diaphragm spring is not flat, all above may cause compacting time inconsistent, uneven force applied on pressure plate, even cause pressure plate sway, resulting in poor contact between driving and driven discs, thus clutch vibration. In this case, clutch pressure spring should be replaced and release levers should be adjusted.

(2) Clutch torsion, elasticity reduction of damper spring and clutch pressure spring and cracks on diaphragm spring may all cause clutch vibration during engaging. In this case, springs should be replaced.

III Removal and installation of clutch

(I) Clutch removal

Clutch assembly contains clutch pressure plate assembly and clutch driven disc assembly, removal procedure is as follow;

1. Remove the transmission from the engine

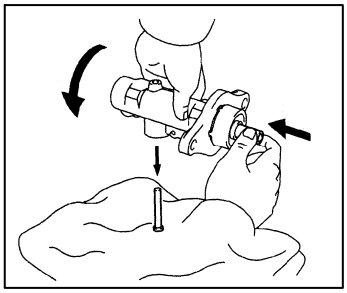
2. Insert special locating spindle into the spline of splined hub of clutch driven disc

3. Loose fixing bolts on clutch cover of the flywheel by 2-3 times diagonally

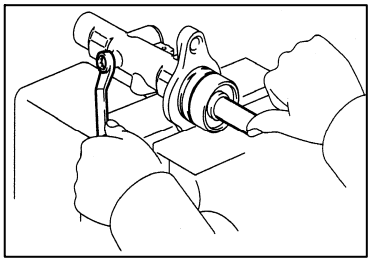
4. Since the clutch assembly rotates together with crank at high speed, excellent balance performance is required, before removing the pressure plate, it must be marked properly to facilitate precise positioning for reassembly.

5. Remove clutch pressure plate assembly and driven disc assembly

(4) Push the piston with hand, and turn the cylinder block to remove the straight pin. (with ABS)



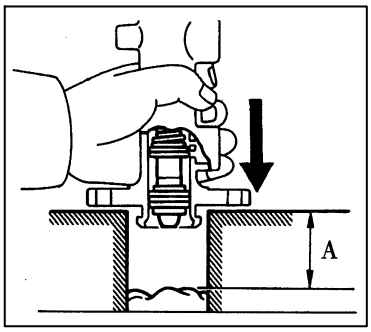
(5) Push the piston with hand, and remove the piston stopper bolt and washer. (without ABS)



(6) Pull out #1 piston, piston guide block, spring, cup and washer straightly.

Note: If angle appears in the pulling process, it may cause damage to the cylinder wall.

(7) Put two blocks and cloth on the work bench. Put the flange of the master cylinder against the block edge and knock it till #2 piston and spring get out of the cylinder.



Tips: Make sure the distance (A) between the working cloth and the block's top is at least 100mm.

Note: If angle appears in the pulling process, it may cause damage to the cylinder wall

5. Check the brake master cylinder.

(1) Check the cylinder wall whether there is any rust or scratch.

(2) Check the cylinder wall whether there is any abrasion or damage.

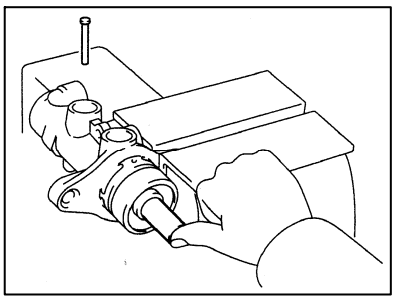
Note: If necessary, clean or replace the brake master cylinder.

Tips: Clean the assembled parts with compressed air.

6. Install the brake master cylinder.

(1) Fix the brake master cylinder on the plyer.

(2) Apply the lithium soap-base glycol lube on the rubber parts with arrow.



(3) Install # 2 and # 1 pistons, spring, piston guide block, cup and washer.

Note: If angle appears in the installation process, it may cause damage to the cylinder wall. Be careful not to damage the edge of the cup on the piston

(4) Push the piston, and install the straight pin on the cylinder body. (with ABS)

15 Install left parking brake cable assembly

Fix the left parking brake cable assembly on the bottom plate with bolts and smear some lubricating grease.

Torque: 6～10 N·m

16 Install right brake shoe assembly

17 Install the return spring of the brake shoe.

18 Install the automatic adjustment pull rod.

19 Install the left brake shoe assembly

20 Install the brake drum.

21 Check the installation of the brake drum.

22 Install the accessories of the brake drum.

23 Adjust brake shoe clearance

24 Install the rear wheel.

Torque : 100～105N·m

25.Fasten adjustment nut wire temporarily.

26 Fasten front floor heat insulating pad with two bolts. Torque: 6～10N·m

27 Install the front exhaust pipe component.

28. Install the front floor pull rod.

29. Check the stroke of the parking brake pull rod.

30. Adjust the stroke of the parking brake pull rod

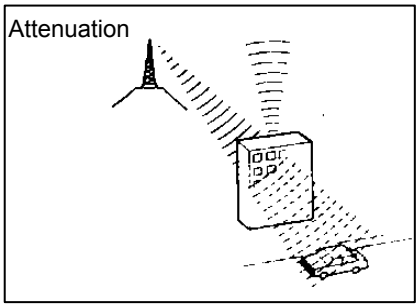
Tip: apply the same procedure to right parking brake cable assembly as the left.

Step	Operation	Yes	No
1	With DTC or not?	Motor trouble	Go to Step 2
2	1. Remove steering column hole cover 2. When ignition switch is OFF, disconnect motor and clutch connector 3. Check conduction among motor terminals 4. Is it conductive?	Go to Step 3	Motor trouble
3	1. Check resistance between motor and clutch and vehicle body grounding 2. Is it infinite?	1. “R” or “B1” circuit is disconnected 2. “R” or “B1” circuit is shorted to the ground 3. Connector contacts poorly 4. If items above are normal, replace a good control module and check again	Motor trouble

15. DTC51 clutch circuit (clutch circuit is open or shorted)

Step	Operation	Yes	No
1	1. Remove steering column hole cover 2. When ignition switch is OFF, disconnect motor and connector 3. Check conductivity among clutch connector terminals 4. Is it conductive?	Go to Step 2	Clutch trouble
2	1. Check resistance between motor & clutch connector terminal and power supply. 2. Is it infinite?	1. “B/B1” or “B/R” circuit is disconnected 2. “B/B1” or “B/R” circuit is shorted to ground 3. Poor contact of motor and clutch connector 4. Poor contact of terminal “A9” and “A10” 5. If items above are normal, replace a good control module and check again	Clutch trouble

(3) Attenuation



Since its frequency is higher than AM, FM wave is more easily reflected by high buildings or high mountains. Therefore, FM signal often disappears gradually, or when vehicle is blocked by barrier, it cannot receive any signal,such phenomenon is called "attenuation".

4. Noise problem

Detailed description of noise problem fed back by customers is of great importance for analyzing and eliminating noise interference, the table below may be used for diagnosis.

Radio wave	Noise condition	Cause
AM	Noise occurs in special position	Most probably external noise
	Noise occurs when receiving small signal	Broadcast from local station might broadcast the same program. If program is the same, one of them might be disturbed
FM	Noise only occurs at night	Most probably from remote interference
	Noise occurs in special position during driving	Most probably is multiplex interference due to FM frequency change

Notes: If noise occurred does not belong to any of the above-mentioned situations, please find out the cause according to "receiving problem

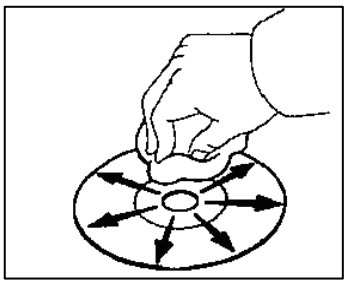
5. CD player

CD player (hereafter referred to as CD) uses laser beam to read digital signals recorded on CD, then revert to analog signal of music.

Tip: Don't attempt to break down or apply oil to any component of the player. Do not insert anything other than a CD into optical disk cartridge.

Notes: CD player with invisible laser beam, could generate harmful radialization, always operate player according to instructions.

6. Cleanness of CD player and disc



If CD is dirty, use soft cloth to wipe the surface from CD center radially outwards.

Notes: Don't use ordinary recorder detergent or antistatic protectant.

Step	Operations	Yes	No
4	Connections of LED and harness?	—	To Step 5
5	After repairs, switch on the power, and observe status of trouble lamp. And at this point, this lamp should go off after lighting for 4s (self-check).	To Step 6	To Step 1
6	Trouble eliminated already; eliminate the trouble with the diagnostic instrument. Update the latest maintenance date.	—	—

② System trouble lamp short circuit to power supply

Symptom: safety airbag system warning lamp is not lit, and trouble code as detected by the trouble diagnostic instrument is B0673.

Diagnostic program:

Step	Operations	Yes	No
1	When ECU trouble is checked with the diagnostic instrument, trouble code is B0673?	To Step 2	Others
2	With power off, check ECU harness is well connected? (short circuit?)	To Step 3	To Step 5
3	Check the connector of trouble lamp on the ECU harness? (short circuit?)	To Step 4	To Step 5
4	Connections of LED and harness?	—	To Step 5
5	After repairs, switch on the power, and observe status of trouble lamp. And at this point, this lamp should be go off after lighting for 4s (self-check).	To Step 6	To Step 1
6	Trouble eliminated already; eliminate the trouble with the diagnostic instrument. Update the latest maintenance date.	—	—

(6) Loop fault

① Driver air bag fault

- Driver air bag is open circuit

Fault symptom: warning lamp of air bag system always illuminates, detection trouble code on trouble diagnosis tester is B0026.

Step	Operation	Yes	No
1	When detecting ECU fault with diagnosis tester, trouble code is B0026 or not?	To Step 2	Other
2	Cut off power supply, and then check that ECU connector is plugged properly (harness is connected properly or not)	To Step 3	To Step 6
3	Disconnect battery cathode cable for 60s, check that driver bag module and clock spring are connected properly (harness is connected properly or not)	To Step 4	To Step 6
4	Resistance of driver bag module is normal or not?	To Step 5	To Step 6
5	Resistance of clock spring is normal or not?	—	To Step 6
6	Switch on power supply after repair and reserve the status of fault lamp. In this case, fault lamp should light for 4s and then go off.	To Step 7	To Step 1
7	Fault has been eliminated, clear fault with diagnosis tester and update recent repair date.	—	—

Diagnosis procedure:

X. Condenser Fan Motor and Condenser Assembly

On-board Inspection

1. Check condenser assembly

(1) If the radiator in the condenser is dirty, wash it with clean water and dry it with compressed air.

(2) If the radiator in the condenser is distorted, use the proper tool to correct it.

2. Check the condenser for coolant leakage.

(1) Use the leakage tester to check the connection area of the pipeline for leakage.

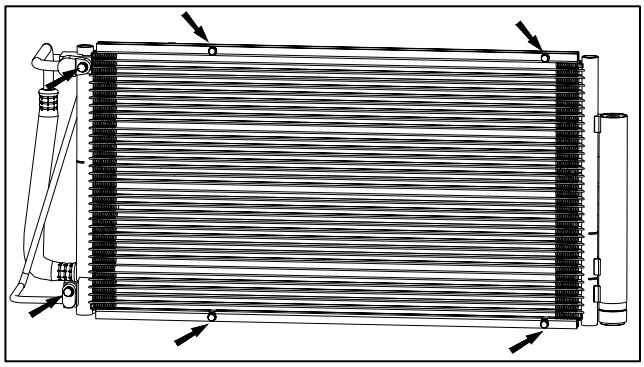
(2) If there is leakage, check the connector fixing bolt for tightening condition

Overhaul

1. Remove front bumper and left/right wind guide boards, and if necessary, remove front crash-proof beam.

2. Discharge the refrigerant (for details, see the refrigerant).

3. Remove fixing bolts of inlet/outlet pipeline of the condenser end, and take out O-ring from pipe connection, and replace it with a new one. The condenser assembly could be taken out by removing four bolts fixing the condenser and radiator.



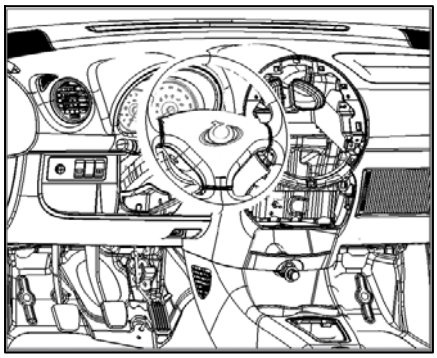
Note: Seal all joints of disconnecting parts with PVC tape to prevent entry of water and foreign substances.

4. For installation, ensure a new O-ring has been replaced. Carry out operations according to corresponding reverse process.

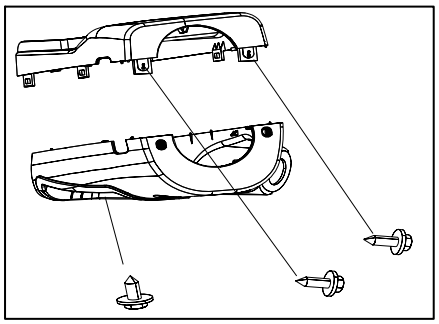
4. Remove the steering wheel, airbag, upper and lower housing of steering column.

a. Remove the steering wheel;

b. Remove the airbag;



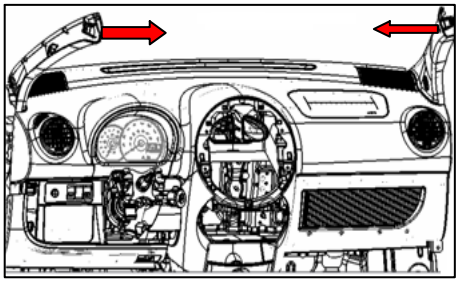
c. Release 3 tap screws and remove upper and lower cover of steering column.



5. Remove upper trim panels of left and right front pillars

a. Release 2 clips with a screwdriver and remove upper trim panels from left and right front pillars.

Tip: Before using a screwdriver, wrap its head with tapes.

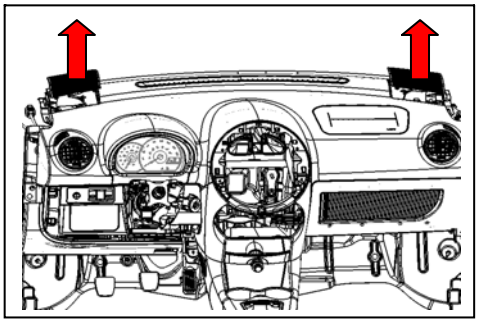


6. Remove the speaker after taking down the left and right trim covers of dashboard speaker

a. Release the clips with a screwdriver to remove left and right trim covers of dashboard speaker.

b. Release 2 tap screws with a screwdriver and remove the speaker.

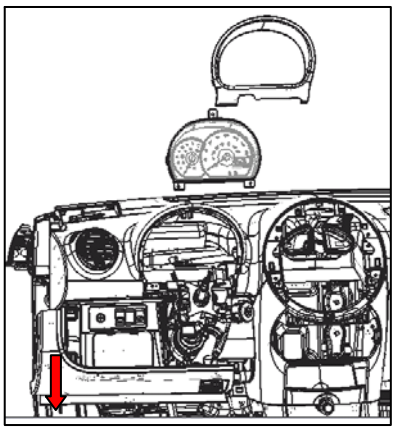
Tip: Before using a screwdriver, wrap its head with tapes.

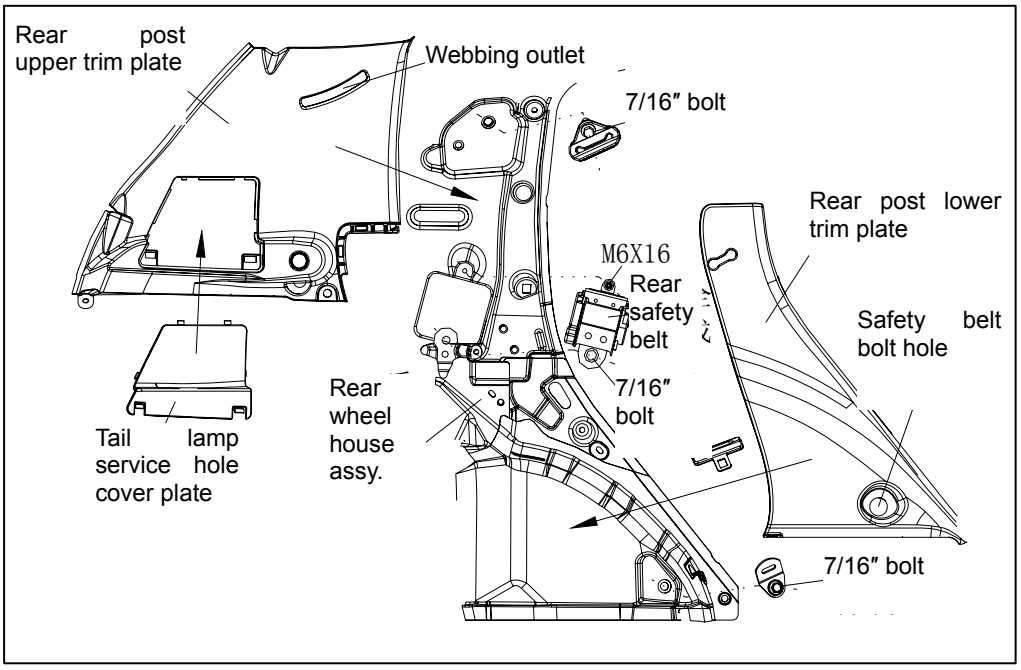


7. Remove the dashboard left lower guard and disassemble the combination instrument

a. Open the dashboard left lower guard manually;

b. Manually open the combination instrument cover and release 3 tap screws with a screwdriver, then take off the instrument.



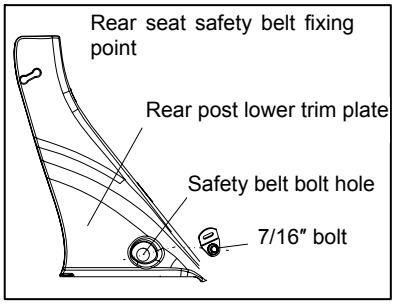


1. Remove the rear seat cushion assembly.

2. Remove the right rear seat backrest assembly

3. Remove the left rear seat backrest assembly

4. Remove the lower part fixing bolt of rear safety belt wheel house



5. Remove upper trim panel assy of right rear pillar

6. Remove lower trim panel assy. of right rear pillar

7. Remove upper trim panel assy. of left rear pillar

8. Remove lower trim panel assy. of left rear pillar

9. Remove the rear safety belt assembly

(a) Remove the fixing bolt at guide ring;

(b) Remove upper locating bolt and lower fixing bolt at the retractor;

(c) Remove the rear safety belt assembly;

(d) Remove the bolt, right rear safety belt buckle and intermediate lap belt assembly.

10. Remove right rear safety belt buckle and intermediate lap belt assembly.

11. Remove left rear safety belt buckle assembly

(a) Remove the bolt and left rear safety belt buckle assembly.

12. Remove left rear safety belt buckle assembly

(a) Mount left rear safety belt buckle assembly with the bolt.

Torque: 45 N·m

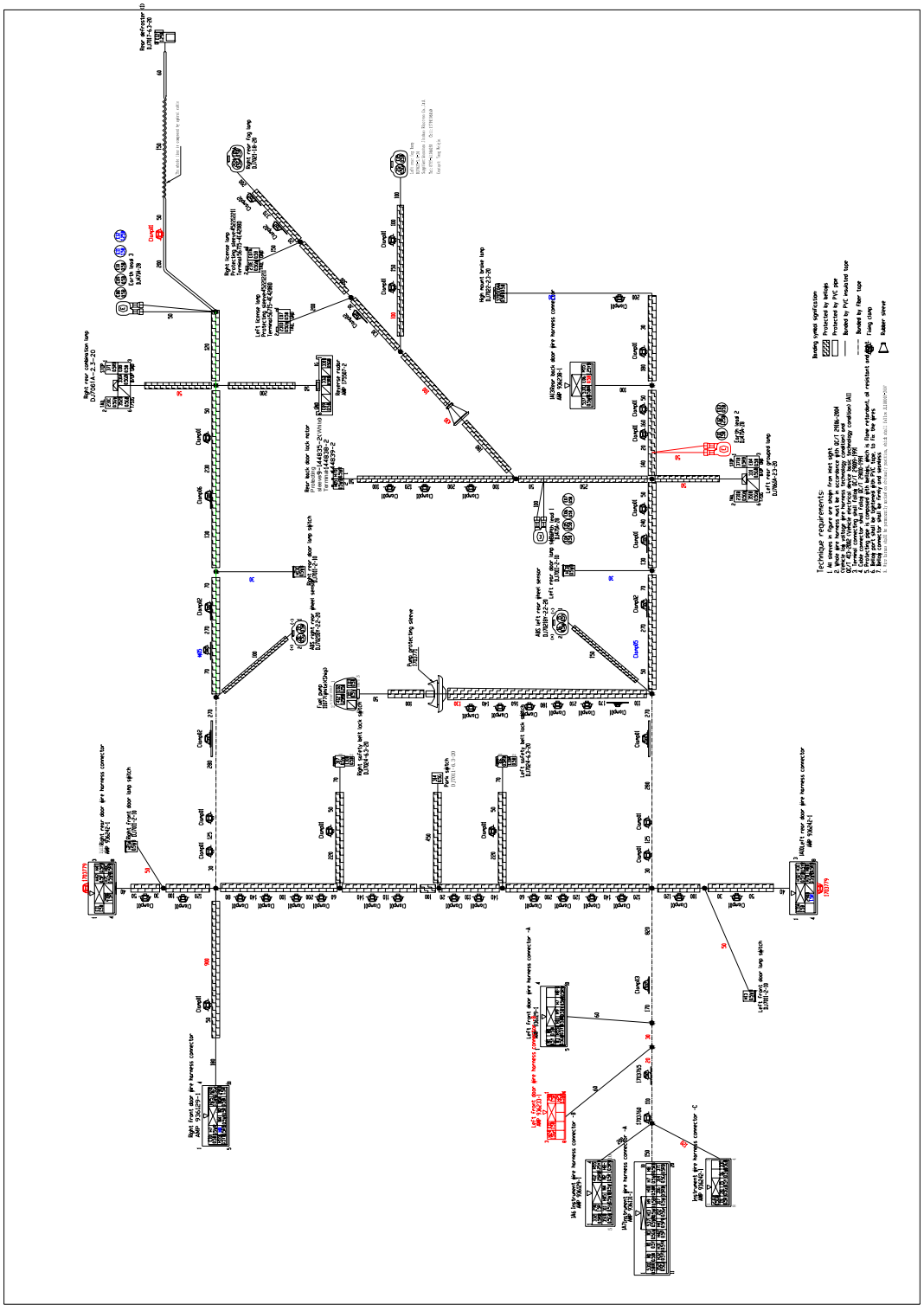
13. Mount right rear safety belt buckle and intermediate lap belt assembly

(a) Mount right rear safety belt buckle and intermediate lap belt assembly with the bolt.

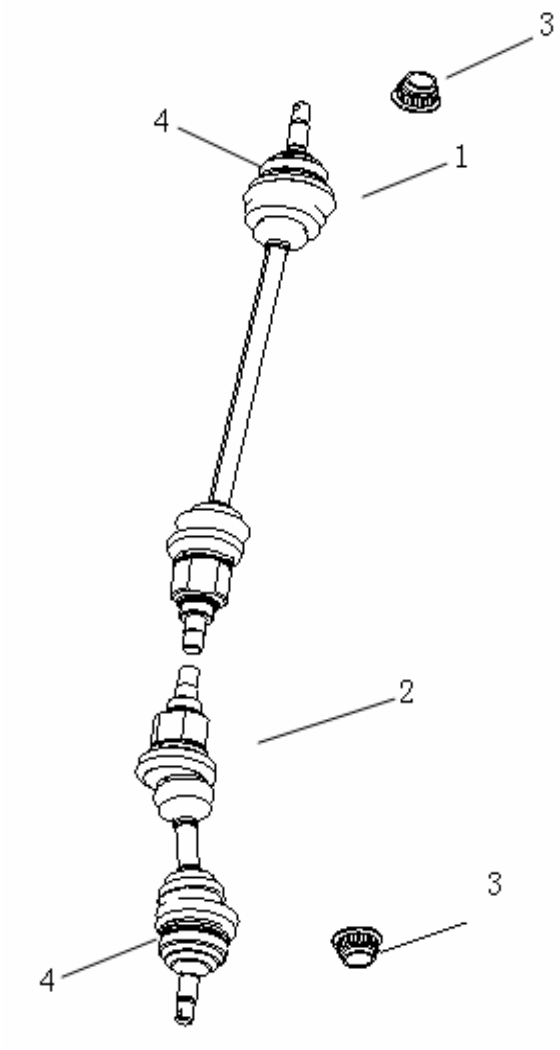
Torque: 45 N·m

Harness diagram of LC model electronics

Chassis harness assembly (deluxe)

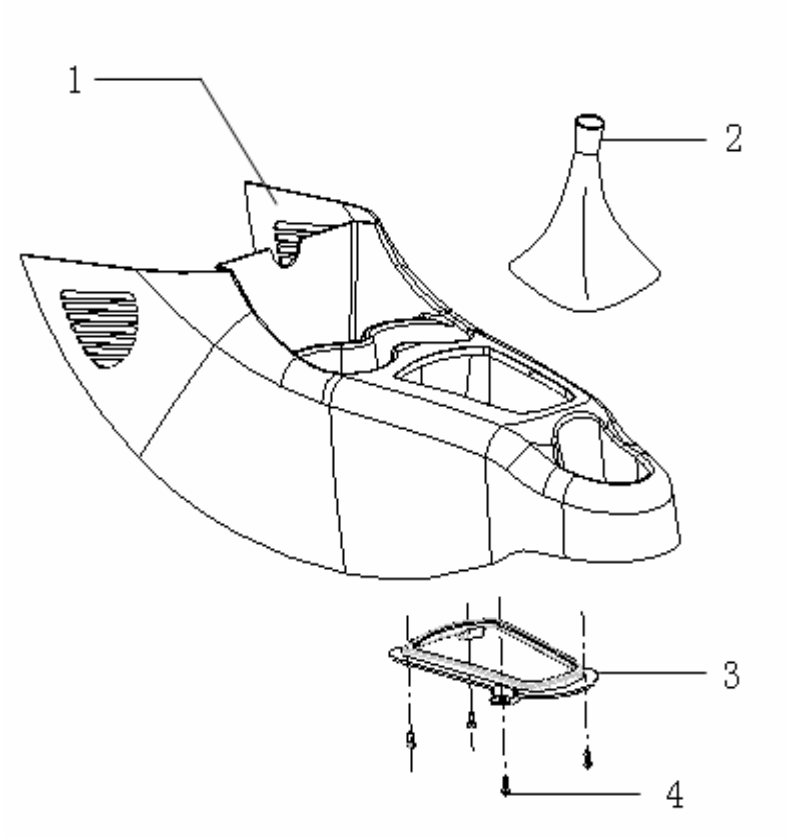


4150 CONSTANT VELOCITY DRIVE SHAFT



NO.	PART NO.	DES.	QTY	REMARK
1	1014015661	RIGHT CONSTANT VELOCITY DRIVE SHAFT	1	
2	1014015660	LEFT CONSTANT VELOCITY DRIVE SHAFT	1	
3	1014001757	FIXING NUT	2	
4		ABS GEAR RING	2	

8020 CONSOLE ASSY.



NO.	PART NO.	DES.	QTY	REMARK
	1018006962	CONSOLE ASSY.	1	
1		CONSOLE FRAME	1	
2		GEARSHIFT DUST BOOT	1	
3		GEARSHIFT DUST BOOT SEAT	1	
4		CROSS SLOTTED SCREW	4	
	1018007292	CONSOLE REAR COVER	1	