Figure 1 Maintenance Sequence Diagram

整车操作流程——维修保养操作	Vehicle Operation Procedure——Maintenance
对任何高压设备拆卸	Apply wiring harness to dismantle any high-voltage apparatus
断低压	Off-low-voltage
拔钥匙	Pull out the key
断高压	Off-high-voltage
拔 MSD	Pull out MSD
拆低压	Dismantle low-voltage parts
拆除低压线束	Dismantle the low-voltage wiring harness
拆高压	Dismantle high-voltage parts
拆除高压线束	Dismantle high-voltage wiring harness
拆螺栓	Unbolt
连接螺栓	Connecting bolt
严禁强拆！！	Forced dismantlement is strictly forbidden!!
装螺栓	Install bolts
接螺栓	Connect bolts
接高压	Connect with high-voltage parts
连接高压线束	Connect with high-voltage wiring harness
接低压	Connect with low-voltage parts
连接低压线束	Connect with low-voltage wiring harness
通高压开关	Connect with high-voltage switch
安装 MSD	Install MSD
接钥匙	Insert the key
钥匙驾驶	Rotate the key for power-up driving

1) Pull out the key, which shall be kept properly to avoid misoperation;

2) Disconnect with low-voltage main power;

Item	EH300
Voltage range (V)	435-560.28-635.1
Gross energy (KWh) 23±2℃,1/3C	127.74
Battery pack capacity (Ah) 23±2℃,1/3C	228
Operating temperature range	Battery charge: 0～60℃ Battery discharge: -30～60℃
Environment relative humidity	15%～90%
Storage temperature	-30~55℃ (recommendation: 0～35℃)
Continuous charging current	≤200A(0.88C)
Maximum charging current	≤350A(60s)
Maximum discharging current	≤350A(60sv
Continuous discharging current	≤228A（1C)
Charge retention (put aside for 28 days in normal temperature, 25 ℃, and SOC ≥ 85%)	≥96.5%
Ex-factory value of insulation resistance (Ω)	≥8MΩ(@DC 1000V)
Water dust protection standard	IP67

1.4 Motor Parameters

Item	EH300
Motor model	TZ366XS014A
Working system	S9
Rated power	60kw
Continuous torque	510Nm
Phase number	Three phase
Rated speed	1125rpm
Type of cooling	Liquid cooling
Level of protection	IP67
Motor number	Refer to steel seal on motor body
Rated voltage	560VDC
Maximum power	110kw
Continuous power	60kw
Peak torque	1200Nm
Maximum working speed	3800rpm

components include high-voltage wiring harness, signal lines and cooling system. It shall be noticed that motor controller of the product is integrated in high-voltage integrated controller.

1. Permanent magnet synchronous motor installed with AMT

The product applies PMSM as its motor and its advantages are high efficiency, small size, light weight and high reliability.

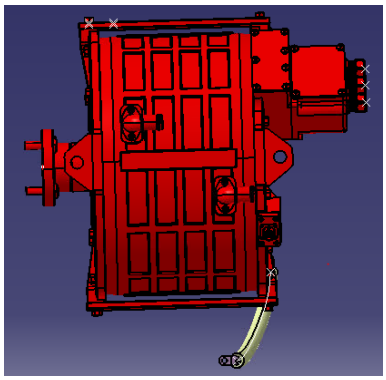
PMSM is an important executing agency of the system. It is the component transforming electric energy to mechanical energy, and sending information of running status of the motor to motor controller.

Motor applies certain sensors to provide its working information.

The aforementioned sensors include:

Speed sensor: It is applied to detect actual rotate speed when motor is operating;

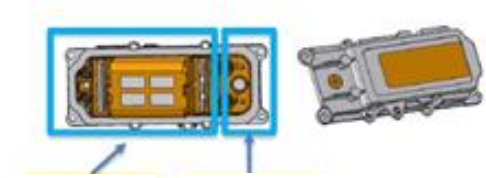
Temperature sensor: It is applied to detect operating temperature of the motor.



EH300 Motor Assembly

There are two models of MSD on the electricity box, MSD with fuse and MSD without fuse. Refer to the following figure for detailed information.

MSD component A (with fuse): Shell color is gray



MSD handle

Main upper cover on forward direction

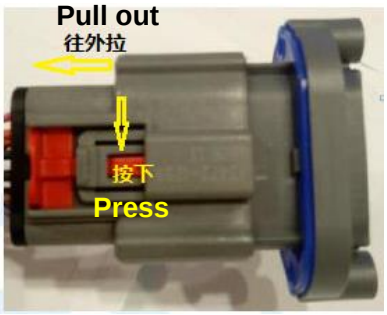
MSD component B (with copper bar): Shell color is orange

MSD handle

Main upper cover on forward direction

5) Disconnect the low-voltage wiring harness

Before disconnecting the low-voltage wiring harness, please pull out the snap joint of the secondary lock as shown in the left figure, then press and pull out the connector as with your thumb as shown in the right figure.

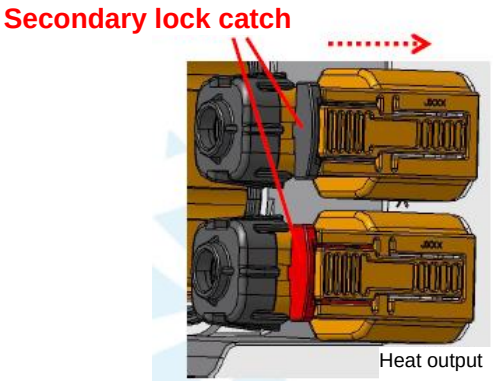


Check if the low-voltage connector is clean or has any oil contamination. Make sure that there is no metal powder falling in the connector.

6) Disconnect the heater wiring harness

1. Quit the secondary lock catch as shown in Figure 1;

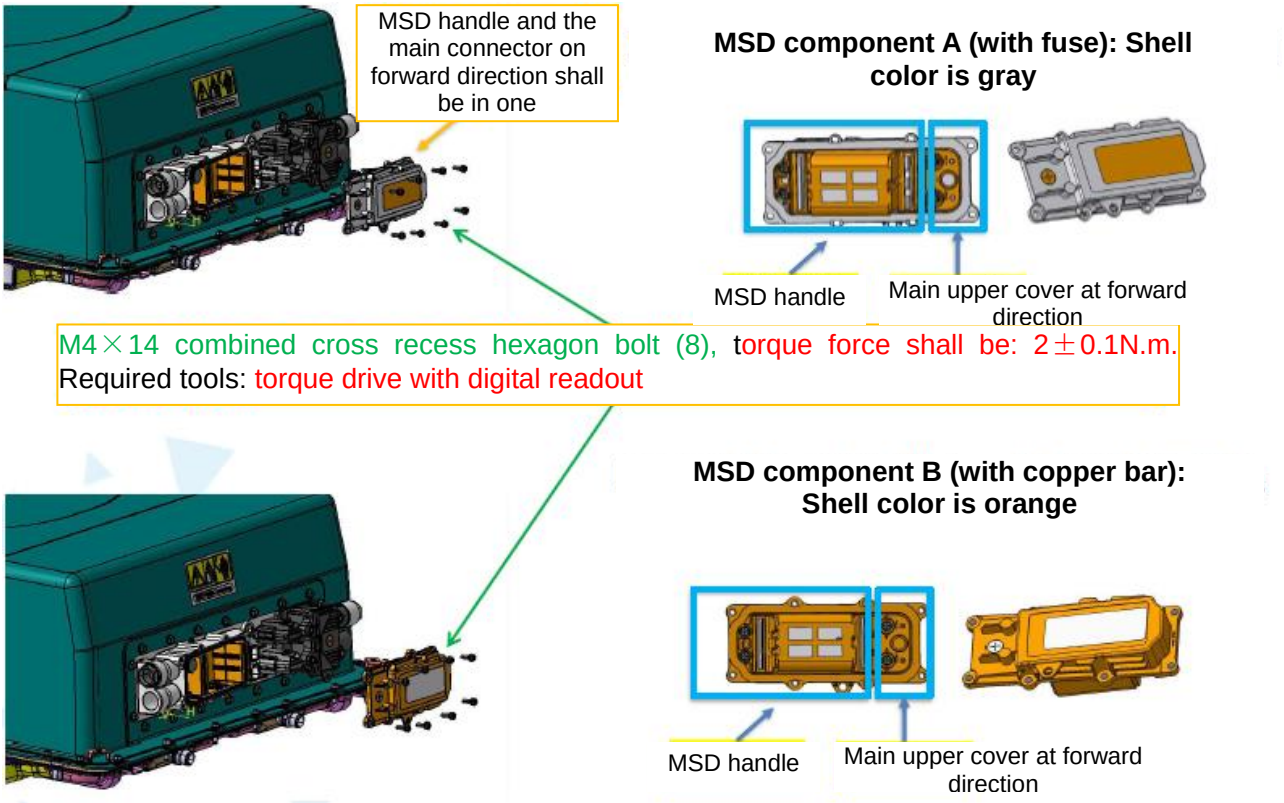
2. Press the secondary lock catch, draw the plug alongside the direction as shown in Figure at the



6. Inspection: Pull back the plug externally (do not pull out the wiring harness) with the force not higher than 20N. Make sure that it is completely inserted, then vertically and inwardly insert the plug for the second time to avoid poor contact.

1) MSD installation

1. Refer to the following picture for installation procedure of battery box MSD.



2. MSD installation on high voltage box.

Step 1: As shown in Figure 1, hold the handle on upper cover of the service switch with the right hand and form up an included angle of 90° between the handle and service switch, then slightly insert into the base in the direction of arrow A.

Step 2: As shown in Figure 2, slowly push forward the handle of the service switch with the left and right

B000113	Sensor output 2 of accelerator pedal position has short-circuit current	
B000114	Accelerator pedal position rationality detection fault	
B000115	Braking vacuum degree is excessively low/ braking fault	Check the vacuum pump, blast pump and braking lines
B000116	Fault of gear position	Check the wiring harness
B000117	Cruise switch is failed	Check the wiring harness
U010187	VCU and BMS communication is lost	Check BMS low-voltage power supply and CAN lines
U010287	VCU and MCU communication is lost	Check low-voltage power supply of the motor controller and CAN lines
U010487	VCU and DCDC communication is lost	Check DCDC low-voltage power supply and CAN lines
U010687	VCU and ABS communication is lost	Check ABS low-voltage power supply and CAN lines
U010887	VCU and EHPS communication is lost	Check low-voltage power supply of the steering controller and CAN lines
U010787	VCU and APS communication is lost	Check low-voltage power supply of the blast pump and CAN lines
U010A87	VCU and PDCU communication is lost	Check low-voltage power supply of the high-voltage distribution box and CAN lines
U010B87	VCU and gateway communication is lost	Check the gateway wiring harness
U010987	VCU and ACP communication is lost	Check AC wiring harness
U007388	PTCAN bus off	Check low-voltage wiring harness power CAN
U007488	BDCAN bus off	Check low-voltage wiring harness bodywork CAN
P100116	Interlocking of BMS, PDCU and MSD	Check if all high-voltage connectors are inserted
P100118	Low-voltage charging fault	Check DCDEC working condition
P100119	Cooling system fault	Check pipeline of the fan water pump cooling system
P100120	BMS MCU low-voltage self-inspection overtime	
P100121	Total negative closing overtime	
P100122	Motor shutting down overtime	
P100123	Accessory shutting down overtime	
P100124	Motor accessory power off overtime	
P100134	Pipe opening of the motor overtime	
B000123	Rapid power off overtime	
B000210	Electrification fault	
P100132	AC fault	Check status of the electronic heater and high-voltage distribution box AC heater relay
B000206	Upper relay fault	Check the distribution box

Clean grinded and polished (finish machining) parts:

a. Use cleaning agent to clean the precision-machined parts and surface. Use kerosene or diesel instead of gasoline.

b. If needed, use the tools with plain blade to eliminate sealing material from the parts. Be careful and do not damage the surface of precision-machined parts.

c. Do not use water or steam to clean the surface of precision-machined parts. Do not immerse the precision-machined parts into high-temperature vessels or use alkaline solution to clean the precision-machined parts, or the smooth and slippy sealing surface will be damaged.

Clean unfinished parts:

a. Cleaning method of unfinished parts is the same as that of precision-machined parts.

b. Unfinished parts can be cleaned with alkalescent solution or dilute aqueous alkali in high-temperature vessels.

c. Parts can only be taken out after being heated and thoroughly washed.

d. Use water to clean the alkali liquor on the parts.

Dry the parts after cleaning:

a. Parts shall be dried immediately after cleaning.

b. Use soft and clean paper or cloth to dry the parts.

c. Except for the bearing, other parts can be dried with compressed air.

Prevent cleaned parts from corrosion:

a. Apply axle lubricant on the dry parts after cleaning.

b. For easy storage, apply dedicated antirust agent on surfaces of all parts and then wrap up with damp-proof and antirust paper.

2) Inspection of parts

All parts shall be inspected before assembly and the worn or damaged parts shall be replaced.

Inspection of conical roller bearing:

Check the inner ring, outer ring, roller and holder of the bearing. In case of the following problems, replace the bearing:

a. Center of the large end of the pin roller has been worn to the same level as the outside surface or lower than the outside surface.

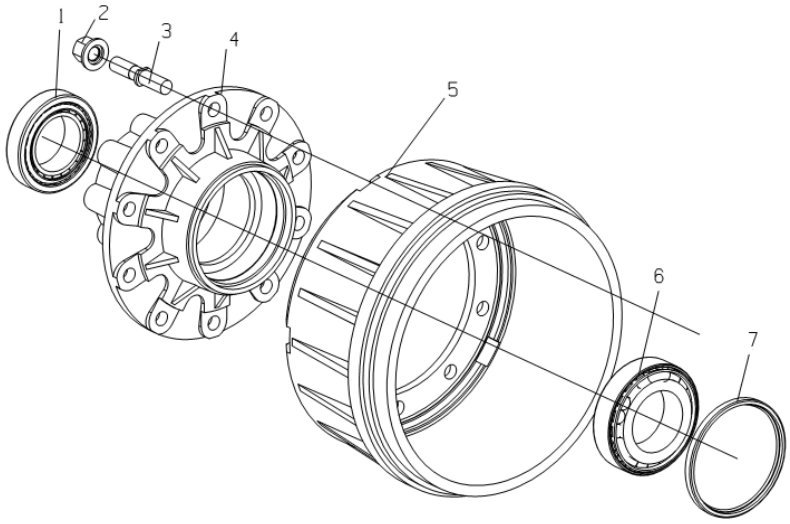


Figure 4 Structural Map of Rear Hub Assembly

No.	Name	Usage for single vehicle	Remarks
1	Bearing	2	
2	Wheel nut assembly	20	
3	Wheel bolt	20	
4	Rear hub	2	
5	Rear drum brake	2	
6	Bearing	2	
7	Oil seal	2	

7.2.2.2.4 Structure of main reducer assembly

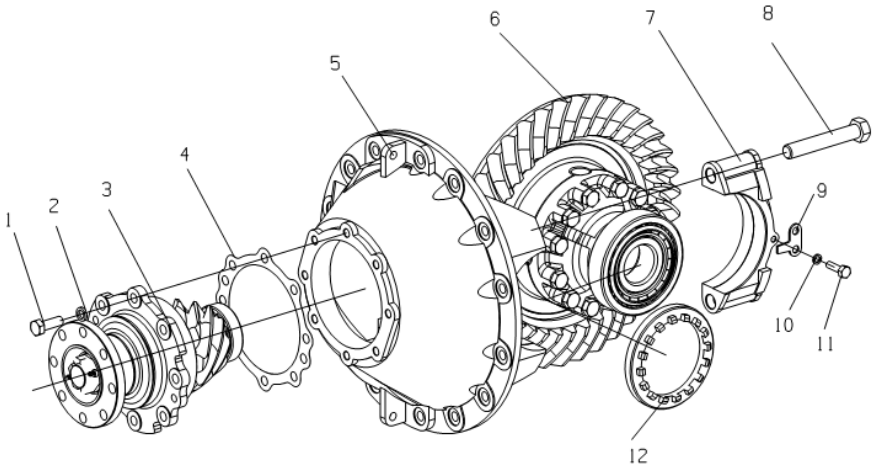


Figure 5 Structural Map of Main Reducer Assembly

No.	Name	Usage for single vehicle	Remarks
1	Bolt	8	

the bearing running pulley with internal and external rings of the hub bearing hole in manual manner, then assemble the bearing retainer ring and bolt, use tightening tools to slowly screw it in, have it tightened to 100Nm with tightening wrench after the bearing is in place, reverse the nuts by 1/4-1/3 and assemble the lock-pin for fixation.

7.3.1.7 Regular Lubrication and Maintenance of the Front Axle

Perform one time of periodic maintenance while driving mileage reaches specified kilometers. Disassembly, examination and maintenance of the front axle mean to clean bearings, fill lubricating grease and re-adjust bearing clearance.

7.3.2 Front Axle

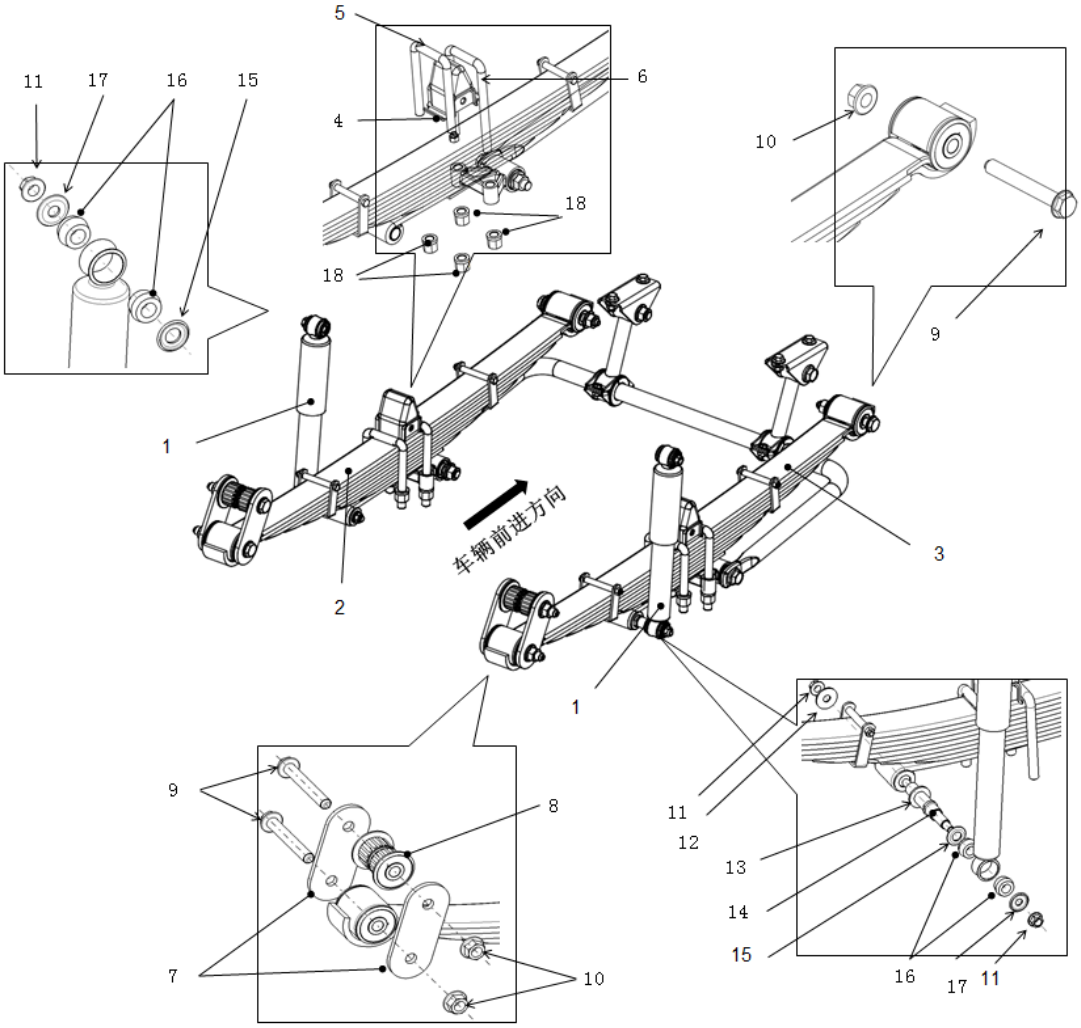
7.3.2.1 Front Axle Technical Parameters

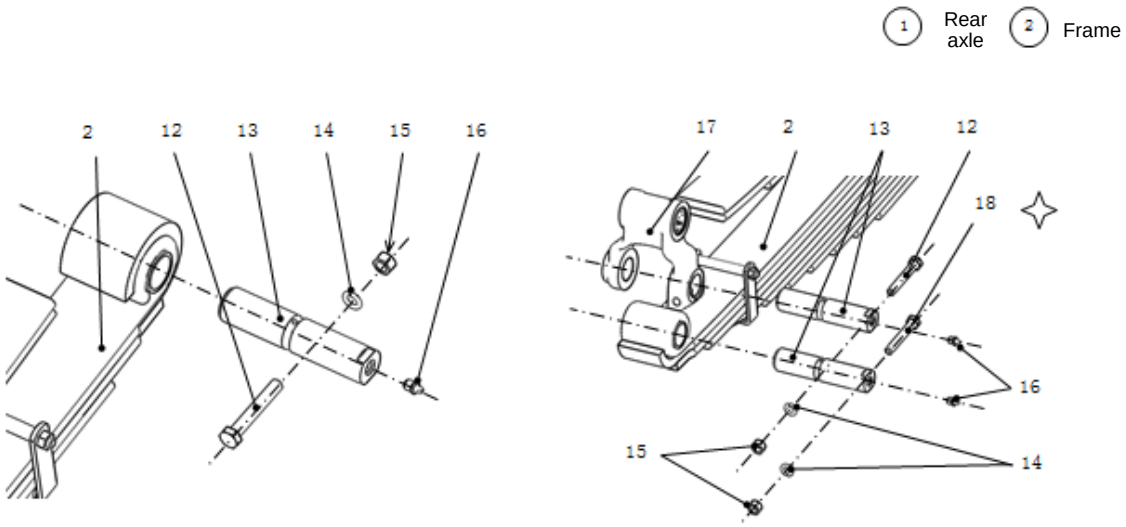
No.	Item		Data
1	Form		Non-breakaway steering knuckle
2	Front axle assembly		Forging I beam
3	Cross-section dimension of the middle I beam (height X width) (mm)		70X65X14
4	Wheel tread (mm)		1624
5	Center distance of the plate spring seat (mm)		770
6	Center distance of the master pin (mm)		1410
7	Wheel alignment	Front-wheel camber	1°
		kingpin inclination angle	8°
		Kingpin caster angle	0°
		Toe in (mm)	1.5-3mm
8	Maximum steering angle of the front angle	External wheel	42°
		Internal wheel	42°
9	Rated axle laden mass (kg)		2400
10	Kingpin diameter (mm)		Φ30
11	Hub bearing		32306-1/-2, C00134703/ C00134705
12	Vehicle reference circle / seam allowance		Φ190/Φ140
13	Master pin	Normal size of external diameter of master pin	Φ30（0, -0.025）
14		Wear limit of external diameter of master pin	Φ46.884
15		Maintenance standard of difference value of inner and outer diameters of the master pin	Wearing capacity of the master pin is greater or equals to 0.1mm
16		Maintenance standard for clearance between master pin and mater kin hole	Greater or equal to 0.16mm
17	Tripping force of the steering knuckle		20-60 N

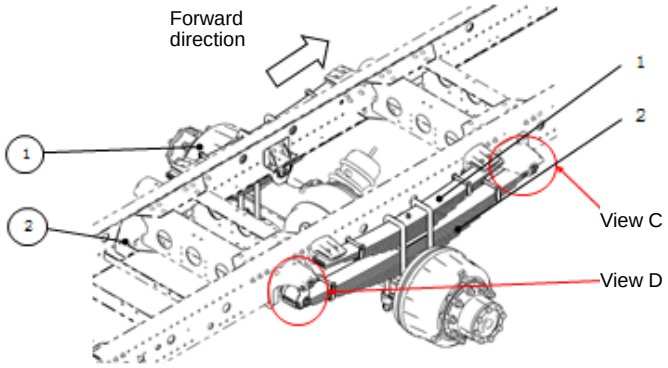
The two-way cylinder hydraulic absorber may rapidly weaken vibration of the wheels and bring about excellent driving comfort.

Anti-roll bar is for maintaining parallel of the front axle, rear axle and car frame, which may greatly reduce the imbalance resulted from uneven load and maintain excellent stability under transport condition.

7.4.2 Technical Parameters







No.	Part name	Quantity	Tightening torque
1	Rear auxiliary plate spring assembly	2	
2	Rear plate spring assembly	2	
3	U-bolt	4	
4	Upper pressing plate of rear plate spring	2	
5	Rear plate spring cushion block	2	
6	Lower bracket assembly of rear plate spring	6	
7	Heavy-duty spring washer	8	
8	Hex nut	8	558-682 N.m
9	Hexagon nut with flange	4	42-51 N.m
10	Rear plate spring buffer stopper	2	
11	Hexagon bolt with large flange	4	
12	Hexagon bolt	4	
13	Pin roll	6	

(3) In case of installing the steering pump, pay special attention that conducting cannot be established between any two of the following components, pump head, motor and mounting bracket, or the steering pump may not realize the double insulation effect.

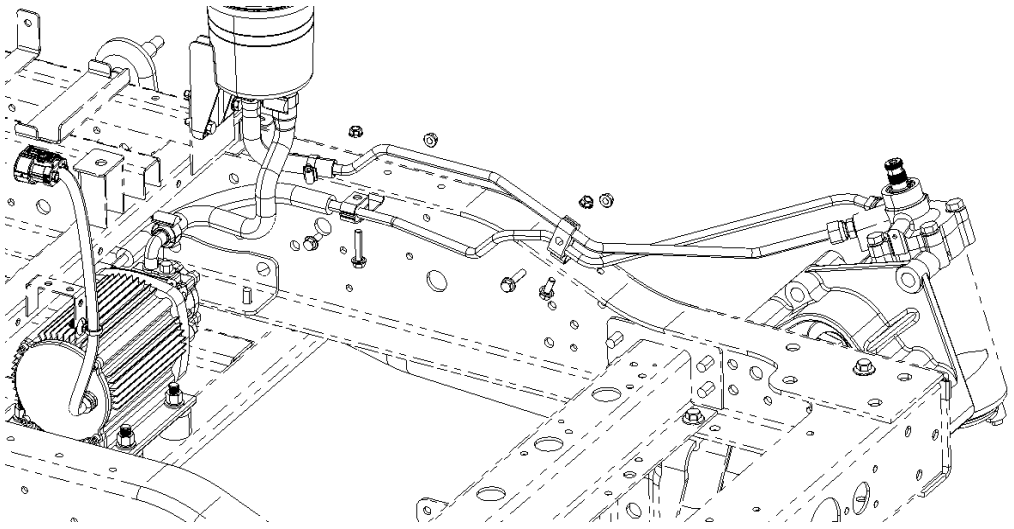
(4) If there are bubbles in the oil tank, shake it from side to side to shorten the time for discharging bubbles.

(5) After driving mileage reaches the specified value, hydraulic oil shall be replaced and pipeline system shall be cleaned.

(6) Pay attention that the steering wheel shall not stay on its limiting position for more than 10 seconds, or the temperature of steering pump will be dramatically increased which will damage the pump.

(7) In case of abnormal noises of the electronic steering pump, check if the oil level in the oil tank is excessively low, filter screen is blocked or oil connection is loose.

7.6.5 Disassembly and Assembly of Steering Pump



1. Fix the steering pump on the low-tension control box support with bolts and the tightening torque of the set bolts shall be 30-40 N.m, Use a steel-ribbon strap to connect one end of the steering oil tube (connect the steering pump) with the oil inlet of the power steering pump, then use the hollow bolts to fix the high-pressure tube assembly on the oil outlet of the power steering pump and the tightening torque shall be 3-3.5 N.m. Fix another end of the high-tension oil tube assembly on the steering pump with bolts and the tightening torque shall be 3-3.5 N.m without exceeding stipulated values, or it will lead to deformed and invalid pipe clamps.

2. Respectively fix the cutting sleeve and cutting sleeve nut come with the high tension tube assembly 2 and steel oil return tube 1 on the oil outlet of the steering gear. Fix the support 4 on the car frame with bolts, fix the high-tension tube assembly 2 and steel oil return tube 1 on the support 4 with pipe clamp 3, fix the high-tension tube assemble 2 on support 4 with pipe clamp 8 and the tightening

Prevent muddy water from splashing on the air compressor.

1.2.2 It is suggested to use low-temperature oil in case of applying the air compressor in Alpine regions.

Vehicle model	Applicable environment temperature	Suggested territory of use
Normal-temperature vehicle model	-25-60°C	Tibet, Xinjiang, Qinghai, Gansu, Ningxia, Inner Mongolia, Liaoning, Jilin and the south of Heilongjiang
Low-temperature vehicle model	-40-60°C	Tibet, Xinjiang, Qinghai, Gansu, Ningxia, Inner Mongolia, Liaoning, Jilin and the north of Heilongjiang

1.3 Safety Instructions

1.3.1 Operating Requirements

a. Installation, starting up, control and operation of the air compressor must be performed in strict accordance with the safety instruction.

b. Operation, operation and maintenance must be performed by qualified personnel with sufficient trainings;

c. Owner of the air compressor shall perform sufficient maintenance on the air compressor, which is very important for safety operation. All old, wrong, damaged safety-related parts shall be replaced immediately.

1.3.2 Transportation and Handling

a. In case of handling, lifting and transporting the air compressor, it shall be handled with care according to the direction of arrow. Inclination and inversion are forbidden to prevent lubricating oil from discharging from the air inlet and cause damages;

b. In case of carrying and lifting the air compressor, collision and shock shall be avoided to maintain stability of center of gravity of the air compressor. Center of gravity of the air compressor is around the coupling between the compressor and motor. All sides of the air compressor must be firmly fixed in transportation;

c. In case lf hoisting the air compressor, pay special attention now to damage the bearing structure and shell.

d. In transportation, storage and installation process of the air compressor, it is forbidden to place the nose upside down to avoid immersion oil of the oil separation system.

1.3.3 Identifications

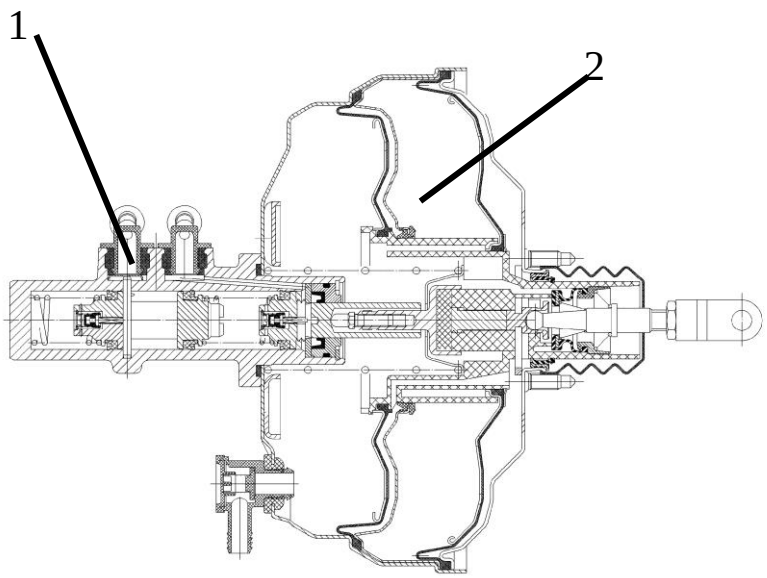


Figure 3-10-4 Vacuum Booster with Brake Master Cylinder Assembly

1. Brake master cylinder; 2.Vacuum booster

7.8.9 Parking Brake System

Parking brake system is air brake controlled type and consists of hand control valve assembly, nylon tube assembly, support, quick release valve (combination valve) and etc.

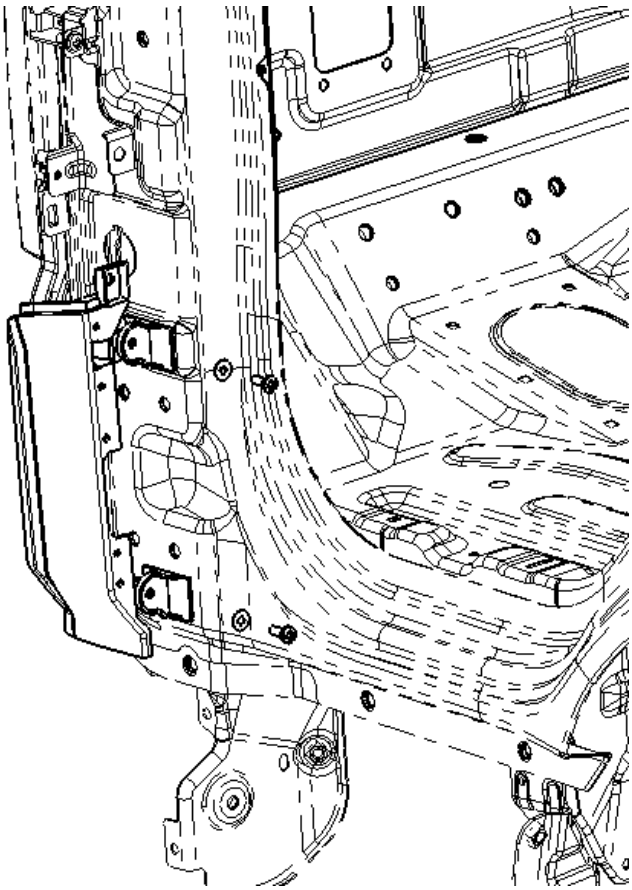
1) Overview

Compression spring will push the air chamber push rod so as to rotate the camshaft, and parking brake system may realize the braking function via contacting the brake shoe with drum brake. Pull the parking control handle forwardly and backwardly to enter the stopping position, so as to realize parking function. Lift the handle upwardly push the front stop from backward to forward to realize the driving function.

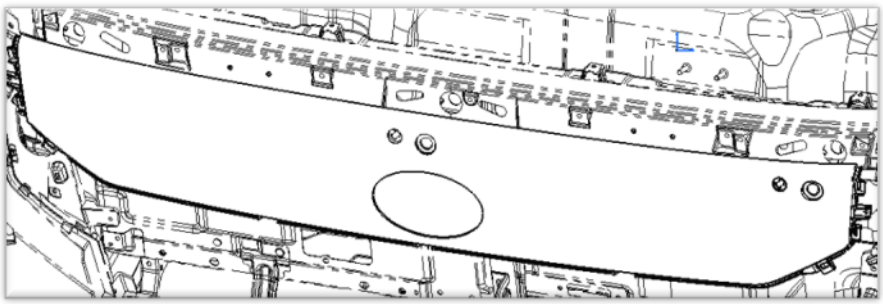
2) Inspection of parking brake system

1. If the parking brake indicator lamp is still on, please firstly confirm that if the braking system pressure has reached the stipulated minimum driving pressure (0.6MPa). If system pressure has already reached stipulated pressure value and the brake cannot be relieved, unscrew the screw on spring stored energy chamber to relieve the parking brake, then move the vehicle to maintainable area for maintenance.
2. In case of invalid parking brake, it is forbidden to unscrew the screw on spring stored energy chamber.

7.8.10 Braking Fault Diagnosis



2. Use two cross recess pan head screws and two flat washers to fix the decorative sheet of the headlamp on the two bodywork installation snap joints, and the decorative sheet of the headlamp and the decorative sheet (2) of the headlamp are eudipleural parts. Adopt the same installation method to install the bodywork installation snap joints and decorative sheet of the headlamp.



3. Clamp the seven plastic nut seats in the bodywork mounting hole, clamp upper decorative sheet of the front wall with the car body along the direction of the locating pin, use seven cross recess pan heads tapping screws to fasten the upper decorative sheet of the front wall.