

Preface

Dear user:

Thank you for choosing the pure electric city bus manufactured by CHTC KINWIN Automobile Co., Ltd.

The HTK6780YBEV is a pure electric city bus designed and developed by our company, featuring energy efficiency, environmental protection, zero-emission operation, low noise, and cost effective performance. It is specifically designed for urban public transportation routes.

This manual provides essential guidance on emergency procedures, maintenance protocols, and key technical specifications for the vehicle's equipment systems. Please strictly follow the instructions to ensure safe operation, extended service life, and improved economic efficiency.

The CHTC KINWIN AUTO HTK6780YBEV bus is a fully electric vehicle powered by lithium iron phosphate batteries. The high-voltage and low-voltage wiring systems are highly complex. We strongly advise against unauthorized disassembly of these critical components or installation of external devices such as anti-theft systems or audio equipment, as any resulting malfunctions will not be covered under our manufacturer's warranty (3w).

With continuous technological advancements, our all-electric city bus series will undergo ongoing upgrades and refinements. We will update and adjust this manual as needed based on the actual operational conditions of our vehicles. Should you encounter any issues or have questions, please contact us promptly for assistance and improvements. Service hotline: 025-56225815.

Thank you for your support and love for CHTC KINWIN AUTO. We wish you a pleasant ride!



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No part of this manual may be reproduced or copied without prior written permission from CHTC KINWIN AUTO.
Capacity. Copying will be prosecuted.

All sections of this manual marked with "Danger", "warning" and "caution" must be strictly followed. The representation and usage of warning types are described as follows:

Remind
Prevent any actions that may endanger the safety of vehicles or individuals.

 Danger
Matters that pose a serious threat to human life and safety

 Warn
Matters concerning the warning of personnel injuries and vehicle equipment damage

 Pay attention to
Knowledge and operation reminders to ensure vehicle normal operation

Vehicle orientation in the illustration

Unless otherwise specified, all vehicle orientation references (front, rear, left, right) in this manual are based on the vehicle's driving direction.

About symbols

In this manual, all places marked with "Danger", "Warning" and "Caution" must be strictly followed.

The representation and usage of tip types are described as follows:

 Warn
Inform you of mandatory actions or prohibited activities to mitigate risks of severe injury or death to you and others. Failure to comply with this warning may result in personal injury or life-threatening consequences for you or others.

 Pay attention to
Inform you of what you must do or strictly prohibit to avoid or reduce the risk of vehicle damage. Failure to follow these precautions may cause vehicle damage.

 Point out
The prompt contains helpful information that may assist you.

The pictures in the book are for reference only.

CHTC KINWIN Automobile Co., Ltd. reserves the right to modify the technical specifications and content of this manual without prior notice or any obligation.

Thank you for choosing CHTC KINWIN AUTO HTK6780YBEV minibus. We welcome your valuable feedback and suggestions.



Danger

precautions for the use of pure Electric Buses

In addition to the 24-volt system, vehicles are also equipped with high-voltage direct current (HVDC) and high-voltage alternating current (HVAC) systems. Both HVDC and HVAC are highly hazardous, capable of causing death or severe injury, including critical burns and electric shock.

- ① To avoid personal injury, do not touch high-voltage cables (orange) or their connectors.
- ② Please follow the warning labels attached to high-voltage electrical components.
- ③ Do not disassemble or replace high-voltage electrical components, such as the motor controller and high-voltage distribution box located in the rear engine compartment.
- ④ In case of emergency, disconnect the maintenance switch located at the upper right rear compartment and securely store the plug. Never touch the socket with bare hands or any non-insulated object.



Danger

In the event of an accident

Disconnect the right upper maintenance switch in the rear compartment and tow the vehicle off the road.

- ① To prevent personal injury, do not touch any high-voltage wiring, its connectors, or high-voltage components.
- ② Never touch exposed wires.
- ③ If the battery compartment of the vehicle is damaged, with liquid leakage or entering certain components of the vehicle, do not touch these liquids, as they may be electrolyte from the battery compartment. If the liquid enters the skin or eyes, immediately rinse with large amounts of clean water and seek medical attention promptly.
- ④ In case of vehicle fire, use a dedicated electric fire extinguisher.



Warn

During operation, electric vehicles may potentially affect electronic medical devices, such as implantable cardiac pacemakers or implantable cardioverter-defibrillators (ICDs). If you wear such electronic medical devices and are engaged in long-term work related to electric vehicles, including charging operations, vehicle maintenance, driving, ticketing, and cashier duties, please verify with the electronic device manufacturer whether there is any impact on these devices.

Additionally, if you carry such electronic medical devices while the vehicle is charging:

- ① Please do not stay in the car;
- ② Do not open or approach any electrical compartment door of the vehicle.



Warn

To protect your legal rights and interests, please strictly follow the following precautions. Otherwise, our quality guarantee will be void.

- ① Strictly follow the usage and maintenance guidelines specified in CHTC KINWIN AUTO HTK6780YBEV product manual and maintenance manual.
- ② Unauthorized modification or adjustment of data in ECU (Electronic Control Unit) for drive motors, ABS, etc. is strictly prohibited.
- ③ Users are prohibited from disassembling ECU components such as ABS and drive motors, as well as other precision parts.
- ④ It is strictly prohibited to modify vehicles without authorization.

Preface	1	
About Symbol	2	
Overview	5	
Technical Parameters	6	
Type and dosage of fuel for the entire vehicle....	8	
Vehicle Identification Information.....	9	
Regular maintenance	10	
Vehicle Operating Conditions	11	
Self-care Precautions	12	
Maintenance Plan for HTK6780YBEV Bus.....	12	
Electrical Appliance Maintenance	24	
Check the battery condition	24	
Low-voltage circuit inspection	25	
Wiper maintenance	26	
Air conditioner maintenance	31	
Maintenance and Installation Instructions for Power Batteries	36	
Chassis maintenance	38	
Cooling system	38	
Front axle maintenance	40	
Rear Drive Axle Maintenance	42	
Suspension System Maintenance....	65	
Maintenance Instructions for Drive Motor and Control...	71	
Check the free travel of the brake pedal	73	
Turn Check	74	
Maintenance of Air Compressors	78	
Change the tires and wheels	86	
keyTorqueTableofBusvehicle...	89	
The other	90	

Summary

A pure electric vehicle (PEV) consists of an electric drive system, chassis, body, and electrical equipment. Unlike conventional cars, its key distinction lies in the drive system, which comprises an electric motor, speed control devices, and power supply. The motor is powered by batteries, and the system may also feature regenerative braking to recover energy when needed.

Due to the different driving system, other systems of the vehicle also change.

vehicle control software

The electric bus is managed and controlled by the vehicle management system, which consists of two parts: the vehicle controller and the vehicle control software. The vehicle control software is divided into six parts: initialization module, power-on logic control module, motor drive and brake control module, auxiliary system management module, network communication module, and fault diagnosis module.

War"



To protect your legal rights and interests, please strictly follow the following guidelines. Otherwise, our quality assurance commitment will be void.

use and maintain the HTCKINWIN AUTO

HTK6780YBEV product strictly in accordance with the relevant provisions of its user manual and maintenance manual.

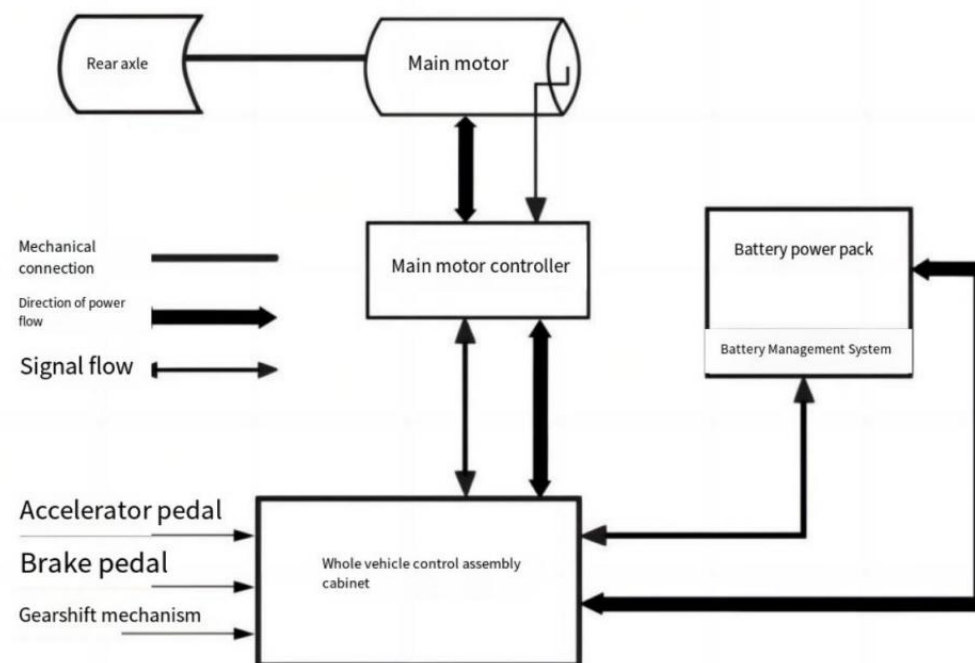
Unauthorized modification or adjustment of data in ECU systems (e.g., drivemotors, ABS) is strictly prohibited.

Users are prohibited from disassembling components such as ABS, drivemotors, ECU, and other precision parts.

Do not modify vehicles without permission.

Operational principle

In the architecture of pure electric vehicles, the drive control system serves as the core component. The motor, a critical element of this system, converts electrical energy into mechanical energy, enabling direct vehicle propulsion and enhancing driving efficiency. The powertrain assembly structure of a pure electric passenger vehicle is illustrated in the diagram. The energy flow between the main drive motor and the battery is regulated by a controller, while the motor is mechanically connected to the transmission, rear axle, and other components through transmission device.



Technical parameter

Vehicle outline



Note: The body width and length exclude the exterior rearview mirrors.

Vehicle base parameters		
Full vehicle model		HTK6780YBEV
external dimensions	Long mm (millimeters)	7850
	Width (mm)	2350
	High mm (millimeters)	3050(withA/c)
wheel base	Long mm (millimeters)	4350
tread	mm (millimeters)	1925
	mm (millimeters)	1790
front overhang	mm (millimetre)	1100
rear overhang	mm (millimetre)	2400
approach angle	° (linear measure)	15
departure angle	° (linear measure)	9.8
minimum turning diameter	m (Mi)	≤16
Minimum ground clearance (no load)	mm (millimetre)	160
maximum gradability	%	16%
maximum speed	km/h (kilometers per hour)	100
maximum autohrozed total mass	kg (kilogram)	11000
front axle load	kg	3500
rear axle load	kg	6500
passenger seat	Seat	27+1
rated crew	human being	27+1

Chassis parameters		
drive motor	parameter	105/188kw,335/600N. m, 11000rpm
	type	permanent magnet synchronous motor
	position	rear drive
	cooling-down method	liqkd cooling
	insulation grade	H
power battery	model	176.04 kWh, 268 Ah/656.9 V, liquid-cooled
	form	lithium iron phosphate battery
	Auxiliary power supply voltage, V/ type	24/Lead-acid battery
	working temperature , °C	Charging: 0~60, Discharging: -35~60
propons		4T, disc brakes, independent suspension
rear axle		7T, disc brakes, drive axle
frame		truss structure
suspension system		Front independent suspension, air suspension, equipped with ECAS. Front 2 rear 4 air suspension
steering system		ElectricHydraulicpowersteering withDualsourcepowerpump
brake assembly	braking of vehicle	Pneumatic dual circuit, front and rear disc brakes
	parking braking	electronicparkingbrake
	auxiliary braking	energy recovery braking
tyre		235/75R17.5,6+1,onespare tire

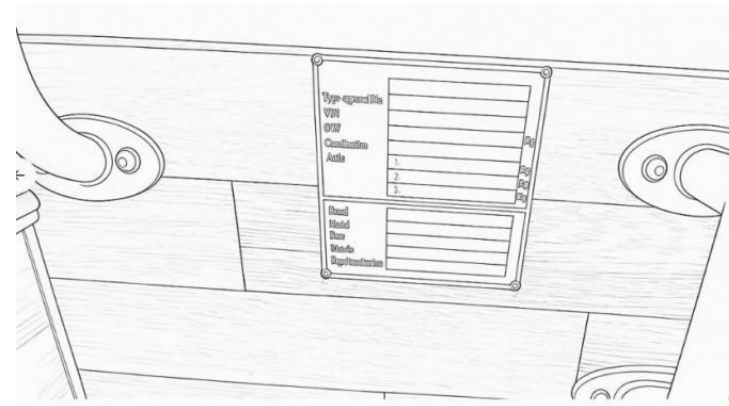
Type and dosage of fuel for vehicle refueling

Order number	Name	Specifications	Unit	Quantity	Remarks
1	Steering hydraulic oil	The 8th	rise	6.5	Add to the fuel tank until it reaches the maximum capacity.
2	Main reducer oil	GL-5,85W/90 Heavy-duty Vehicle Gear Oil	rise	13	rear axle main reducer
3	Longpan antifreeze	-25°C	rise	50	
4	grease	No.2 Extreme Pressure Lithium-based Grease 15kg/bucket	Kg	0.3	Grease the drive shaft and other parts

Vehicle identification information

Image of the vehicle identification number (VIN) and manufacturer's nameplate

Image of the vehicle identification number (VIN) and manufacturer's nameplate



The Vehicle Identification Number (VIN) is engraved on the lower front crossbeam of the vehicle's right front wheel.

The manufacturer's nameplate is riveted to the side wall of the passenger door step inside the carriage. The nameplate is engraved with the complete vehicle model, chassis model, motor model, motor rated power, maximum designed total mass, number of occupants, factory serial number, manufacturing date, and vehicle identification code. (VIN), manufacturer, etc.

Periodic maintenance

Regular maintenance is necessary

CHTC KINWIN AUTO strongly recommends following the maintenance plan outlined in this manual for KINWIN vehicles.

Maintenance for the CHTC KINWIN AUTOHTK6780GBEV electric bus: Regular maintenance helps achieve:

- > Energy savings
- > Extended service life
- > Enhanced driving pleasure
- > Improved safety
- > Stable operation
- > Warranty compliance
- > Government regulations compliance.

The CHTC KINWIN AUTO HTK6780GBEV electric bus is designed for economical operation and maintenance, unlike conventional fuel-powered buses, it significantly reduces maintenance requirements. To maintain optimal vehicle performance,

●Where can I get maintenance?

It is ideal to be maintained by CHTC KINWIN AUTO after-sales service station.

CHTC KINWIN AUTO After-sales Service Center is equipped with specialized tools and maintenance equipment for CHTC KINWIN AUTO vehicles, facilitating efficient vehicle maintenance. The maintenance department at CHTC KINWIN AUTO After-sales Service Center performs all necessary maintenance tasks for vehicles in a reliable and cost-effective manner.

1. Vehicle cleaning

Clean all wheel covers, fenders, and wheel components thoroughly with water to remove oil stains and dirt, ensuring all surfaces are clean.

2. Use compressed air to remove debris adhering to the radiator surface. Hold the compressed air nozzle in your hand and direct it against the airflow direction of the radiator fins. Move the nozzle horizontally up and down at a distance of approximately 6 mm from the fins, gently blowing until all debris is thoroughly removed. The nozzle pressure should be maintained below 2.05 bar.

3. Rear compartment cleaning. The rear compartment of the vehicle houses most high-voltage controllers, and washing with water is prohibited.

clean with compressed air by holding the nozzle and blowing slowly until debris is removed.

In addition to cleanliness, the nozzle pressure should be below 2.05 bar.

4. Clean the rear axle housing and all four suspension arms thoroughly to ensure a spotless finish.



Driving a faulty vehicle that has not been repaired is prohibited, as it may cause serious personal injury and vehicle damage.



Do not use water to wash floors!



Do not wash high-voltage electrical equipment with water!

Does the vehicle need repairs?

● Monitor vehicle performance, sound changes, and visible indicators of maintenance needs. Key warning signs include

- > Abnormal motor startup noise
- > Persistent coolant temperature, coolant stagnation, or leakage
- > Motor stalling or abnormal noises
- > Excessive vibration during operation
- > Motor failure to rotate
- > Powertrain odors
- > Significant power reduction
- > Underbody leaks (air conditioning drip is normal)
- > Tire blowouts
- > Excessive tire noise during turns
- > Uneven tire wear
- > Sideways drift on flat roads
- > Suspension-related noises
- > Brake loss
- > Sponge-like brake pedal response
- > Sideways drift during braking
- > Marked range reduction
- > Battery overheating with thermal protection activated
- > Power loss



If you notice any of the above issues, contact CHTC KINWIN AUTO's sales and service team immediately, as your vehicle may require adjustments or repairs.

● Vehicle operating conditions

Vehicle operating conditions:

When driving, avoid driving through water. If the water depth exceeds 300mm, it is recommended to avoid such areas.

When driving through water, maintain a slow speed of ≤ 15 km/h and monitor the instrument panel for any audible or visual warning signals. In the event of a power battery alarm during water crossing, the driver should immediately move the vehicle away from the flooded area to a safe location, engage the parking brake lever, stop the vehicle to cut off power, evacuate passengers, and disconnect the maintenance switch. During vehicle cleaning, avoid direct water flushing of high-voltage components, batteries, and the radiator grille.



- In case of high temperature, smoke, or severe fire, immediately move away from the vehicle and evacuate surrounding personnel. Promptly call the local fire department for assistance. If there are casualties, contact the local emergency services.



Point out

- For optimal performance, schedule a battery maintenance visit to the local CHT KINWIN AUTO After-sales service center every six months.

Battery operating conditions

Do not start the vehicle in temperatures above 55°C.

Stop charging the vehicle when the ambient temperature drops below -20°C.

> Avoid exposing your battery to water;

> Non-professionals are prohibited from touching, moving, or disassembling batteries and their associated high-voltage cables, or any other components bearing high-voltage warning signs;

For long-term battery storage (over 6 months), complete power disconnection is required. Manufacturers recommend storing at a SOC (State of Charge) of 50% with humidity not exceeding 95%. Refer to the table below for details.

If the vehicle is hit hard during driving, stop in a safe area and check for damage to the chassis, body, and front/rear battery areas.

If an electrolyte leak is detected, do not touch it. In case of accidental contact, immediately rinse with plenty of water. If the eyes are affected, wash with a large amount of boric acid solution and seek medical attention immediately. In the event of a fire involving the vehicle or battery, quickly move to a safe distance and use a dry powder fire extinguisher. Using water or an incorrect extinguisher may cause electric shock.

Storage ambient temperature	Storage environment phase Humidity	Storage time	Charge state
0-35°C (recommended)	5%-70%	Within 1 year	$30\% \leq SOC \leq 40\%$
Below -30°C	/	not allow	/
-30-40 °C	5%-90%	Within 6 months	$20\% \leq SOC \leq 40\%$
40-50 °C	5%-90%	Cannot exceed 7 days	$30\% \leq SOC \leq 40\%$
50-55 °C	5%-90%	Cannot exceed 24 hours	$30\% \leq SOC \leq 40\%$
Above 55°C	/	not allow	/

Precautions for Self-Maintenance

If you perform maintenance yourself, follow the correct procedure outlined in this chapter. Note that improper or incomplete maintenance may damage the vehicle.

This chapter focuses on explaining the easier maintenance tasks you can perform yourself.

However, certain projects still require maintenance by qualified technicians using specialized tools. During operation, precautions must be taken to prevent accidents. The following preventive measures requiring special attention must be observed:

> After the vehicle is powered on, keep your hands, clothes, and tools away from the running fan.

The rear compartment components of the vehicle are still hot after driving. Do not touch them.

> Before working near the electronic fan or radiator, ensure the power is on. When powered on, the coolant temperature will rise to a certain level, and the electronic fan will automatically start rotating.

Do not smoke near the battery to prevent sparks or open flames, as open flames can easily cause fires.

Handle batteries with extreme caution, as they contain toxic and corrosive sulfuric acid solution.

When working on or under vehicles, safety goggles must be worn to protect against falling objects or splashing liquids.

Used lubricating oils contain potential contaminants that may cause dermatological conditions such as skin inflammation. Cleanse with soap and water, and seek medical attention if necessary.

Used lubricating oil must be poured into the designated recycling bin and must not be dumped into household waste, sewers, or the ground.

Maintenance Plan of CHTC KINWIN AUTO HTK6780YBEV Bus

The maintenance plan for CHTC KINWIN AUTO HTK6780GBEV buses is designed to ensure stable operation, minimize breakdowns, and promote safe and cost-effective driving.

The maintenance interval can be determined by referring to the schedule, based on the odometer reading or time interval, whichever comes first.

For maintenance items not performed as planned, follow-up maintenance should be conducted at the original scheduled intervals or mileage intervals.

The maintenance interval of each project is recorded in the maintenance plan.

Rubber hoses (for air conditioning and heating systems) should be inspected by certified technicians in accordance with the CHTC KINWIN AUTO HTK6780GBEV bus maintenance plan.

These are particularly critical maintenance items. Any deterioration or damage to the hose must be replaced.

Note that rubber hoses will age over time, leading to expansion, wear, or rupture.

The CHTC KINWIN AUTO HTK6780YBEV bus must be maintained according to the standard maintenance schedule (for specific maintenance items, refer to the 'Maintenance Schedule'). The maintenance schedule below specifies the inspection, replacement, and refilling items for the first year, along with their intervals. For subsequent years, all maintenance tasks—except the initial run-in check—should follow the items listed in the first-year schedule.

Running-inperiod

Maintenance PROJECTS		Running in
Drive motor	Check whether the three-phase wires of the drive motor are damaged, and ensure that the low-voltage connection plug is securely fastened without any looseness.	I
	Check whether the drive motor operates normally, with no looseness or abnormal noises, and verify its acceleration and deceleration performance.	I
	Check that the fasteners on the inlet and outlet ports of the drive motor are securely fastened, and that the coolant lines are free from bending or damage with sufficient coolant level.	I
	Check the tightening torque of bolts and nuts on the drive motor and transmission shaft	I
Brake assembly	Check the free travel of the brake pedal	I
	Check the brake and parking brake performance	I
	Inspect the air piping and valves for leaks.	I
	Check the thickness of the brake disc, hub, and friction pads, as well as the clearance between them.	I
	Check if the brake caliper guide pin bushing is damaged	I
	Check the air dryer's operation	I
	Check for damage to the rubber bushing	I
	Check the connection status of the brake caliper mounting bolts	I
	Check the drain hole on the brake chamber	I
	Check the clearance between the rubber bushing and the guide pin	I
	Check the movement of the brake caliper along the guide pin	I
	Inspection and maintenance of valve assemblies	I
	Cleaning condenser screw plug	C
	Cleaning condenser filter screen	C
	Clean the condenser valve core	C

Running-in period

Maintenance PROJECTS		Running in
Air compressor	Check and clean the intake filter	I
	Check and clean the radiator	I
Steering system	Check the steering tank level	I
	Check the steering wheel for looseness or vibration.	I
	Check for leaks or looseness in the steering oil line	I
	Check and adjust the steering gear	I
	Check the fastening condition of the steering knuckle and drop arm	I
	Check the fastening condition of all bolts and nuts in the steering system	I
	Check for oil leakage or shortage in the steering gear	I
	Inspect the connections and fastening of all components	I
	Check the tightness of the ball joints in the steering tie rod and cross tie rod.	I
	Check the grease of sliding fork and cross shaft bearing of transmission shaft	I
	Check the free travel and operation of the steering wheel	I
	Check the fastening of the steering mechanism and bracket.	I
	Check if the electric steering oil pump is functioning properly	I
Front and rear axles	Check the fastening condition of the front and rear stabilizer bar connections and whether the rubber is worn.	I
	Check and adjust the front wheel track	I
	Check the front wheel alignment	I
	Check the fastening of the upper and lower suspension bolts	I
	Check for any damage to the suspension system	I

Running-in period

Maintenance PROJECTS		Running in
Front and rear axles	Inspect the shock absorber and airbag for damage, leaks, or looseness.	I
	Check the oil level in the rear axle.	I
	Check whether all lubrication points of the vehicle are fully lubricated.	I
	Check the grease (oil) level in the front axle hub before inspection	I
	Torque for tightening the left and right swing arm bolts and nuts before inspection	I
	Torque for tightening the bolts and nuts on the upper and lower arms of the front axle before inspection	I
	Check the fastening of the thrust rod	I
	Clean the front axle and wheel assembly	I
	Check the tire pressure and the tightening torque of the wheel bolts and nuts	I
	Check for abnormal tire wear	I
	Check the tire assembly for damage or deformation	I
	Check for foreign objects penetrating the tire tread	I
Coolant passage	Check if the coolant is sufficient	I
	Check for wear on the cooling water pipes	I
	Check if the electronic fan and electric water pump are functioning properly.	I
Electrical system	Battery status indicator	I
	Check whether the inlet and outlet cooling water pipe connections of the controller are reliable and leak-free.	I
	Check whether the low-voltage connector of the controller is securely engaged	I
	Check whether the high-voltage connector of the controller is securely engaged	I
	Check whether the bolts of the fixed bracket are securely tightened	I

First class maintenance

Interval item	Lubricating oil interval (X1000km)	5	10	15	20	25	30	35	40	45	50	55	60
		1	2	3	4	5	6	7	8	9	10	11	12
Power assembly	B Replacement cycle (months)	1	2	3	4	5	6	7	8	9	10	11	12
	Check whether the three-phase wires of the drive motor are damaged, and ensure that the low-voltage connection plug is securely fastened without any looseness.	I	I	I	I	I	I	I	I	I	I	I	I
	Check the motor's operation is normal, with no looseness or abnormal noises, and verify its speed reduction and increase performance.	I	I	I	I	I	I	I	I	I	I	I	I
	Check that the fasteners at the engine inlet and outlet are securely tightened, the coolant pipes are free from bending or damage, and the coolant level is adequate.	I	I	I	I	I	I	I	I	I	I	I	I
Brake assembly	Check the tightening torque of bolts and nuts on the drive motor and transmission shaft	I	I	I	I	I	I	I	I	I	I	I	I
	Check the brake performance	I	I	I	I	I	I	I	I	I	I	I	I
	Check the free travel of the brake pedal	I	I	I	I	I	I	I	I	I	I	I	I
	Check the efficiency of driving and parking brakes	I	I	I	I	I	I	I	I	I	I	I	I
	Check the air piping and valves for leaks.	I	I	I	I	I	I	I	I	I	I	I	I
	Inspection of the gap between the brake disc and the friction plate	I	I	I	I	I	I	I	I	I	I	I	I
	Check the thickness of the friction pads	I	I	I	I	I	I	I	I	I	I	I	I
	Check if the brake caliper guide pin bushing is damaged	I	I	I	I	I	I	I	I	I	I	I	I
	Check for damage to the rubber bushing	I	I	I	I	I	I	I	I	I	I	I	I
	Check the connection status of the brake caliper mounting bolts	I	I	I	I	I	I	I	I	I	I	I	I
	Check the drain hole on the brake chamber	I	I	I	I	I	I	I	I	I	I	I	I
	Check the clearance between the rubber bushing and the guide pin	I	I	I	I	I	I	I	I	I	I	I	I
	Check the movement of the brake caliper along the guide pin	I	I	I	I	I	I	I	I	I	I	I	I
	Check and maintain all valve assemblies	I	I	I	I	I	I	I	I	I	I	I	I
	Inspection of the Air Dryer	I	I	I	I	I	I	I	I	I	I	I	I
	Check the shock absorber pad of the air compressor	I、R	I、R	I、R	I、R	I、R	I、R	I、R	IR	I、R	I、R	I、R	I、R
Steering system	Check the steering tank level		I		I		I		I		I		I

First class maintenance

Interval item	Lubricating oil interval (X1000km)	5	10	15	20	25	30	35	40	45	50	55	60
	B Replacement cycle (months)	1	2	3	4	5	6	7	8	9	10	11	12
Steering system	Check the steering wheel for looseness or vibration.	I	I	I	I	I	I	I	I	I	I	I	I
	Check the fastening condition of all bolts and nuts in the steering system	I	I	I	I	I	I	I	I	I	I	I	I
	Check for leaks and looseness in the steering oil pipe	I	I	I	I	I	I	I	I	I	I	I	I
	Check for oil leakage or shortage in the steering gear	I	I	I	I	I	I	I	I	I	I	I	I
	Check and adjust the steering gear	I	I	I	I	I	I	I	I	I	I	I	I
	Inspect the connections and fastening of all components	I	I	I	I	I	I	I	I	I	I	I	I
	Check the fastening condition of the ball joint of the steering tie rod and the cross tie rod	I	I	I	I	I	I	I	I	I	I	I	I
	Check the lubrication of the sliding fork and cross shaft bearings on the transfer drive shaft.	I	I	I	I	I	I	I	I	I	I	I	I
	Check the free travel and operation of the steering wheel	I	I	I	I	I	I	I	I	I	I	I	I
	Check the tightness of the steering mechanism and bracket.	I	I	I	I	I	I	I	I	I	I	I	I
Front and rear axles	Check the fastening condition of the steering knuckle arm and the vertical arm	I	I	I	I	I	I	I	I	I	I	I	I
	Check if the electric steering oil pump is functioning properly	I	I	I	I	I	I	I	I	I	I	I	I
	Check the fastening condition of the tie rod and the stabilizer bar connection after the check, and inspect for rubber wear.	I	I	I	I	I	I	I	I	I	I	I	I
	Check and adjust the front wheel track	I	I	I	I	I	I	I	I	I	I	I	I
	Check the front wheel alignment	I	I	I	I	I	I	I	I	I	I	I	I
	Check the fastening of front and rear suspension bolts	I	I	I	I	I	I	I	I	I	I	I	I
	Check for any damage to the suspension system	I	I	I	I	I	I	I	I	I	I	I	I



First class maintenance

Margin project	Lubricating oil interval (X1000km)	5	10	15	20	25	30	35	40	45	50	55	60
	B Replacement cycle (months)	1	2	3	4	5	6	7	8	9	10	11	12
Front and rear axles	Check the tire pressure and the tightening torque of the wheel bolts and nuts	I	I	I	I	I	I	I	I	I	I	I	I
	Check the fastening condition and torque of the thrust rod	I	I	I	I	I	I	I	I	I	I	I	I
	Inspection of Damaged and Loose Condition of Shock Absorber	I	I	I	I	I	I	I	I	I	I	I	I
	Inspection of airbag performance	I	I	I	I	I	I	I	I	I	I	I	I
	Check whether all lubrication points of the vehicle are fully lubricated.	I	I	I	I	I	I	I	I	I	I	I	I
	Clean the front and rear axles and wheel assemblies	C	C	C	C	C	C	C	C	C	C	C	C
	Check the wheel nut tightness	I	I	I	I	I	I	I	I	I	I	I	I
	Check the tire pressure	I	I	I	I	I	I	I	I	I	I	I	I
	Check for abnormal tire wear	I	I	I	I	I	I	I	I	I	I	I	I
	Check for foreign objects penetrating the tire tread	I	I	I	I	I	I	I	I	I	I	I	I
	Check the tire assembly for damage or deformation	I	I	I	I	I	I	I	I	I	I	I	I
Coolant passage	Check if the coolant is sufficient	I	I	I	I	I	I	I	I	I	I	I	I
	Check for wear on the cooling water pipes	I	I	I	I	I	I	I	I	I	I	I	I
	Check whether the electric fan and water pump are functioning properly.	I	I	I	I	I	I	I	I	I	I	I	I
Storage battery	Check the tightness of all battery connections	I	I	I	I	I	I	I	I	I	I	I	I
	Check the battery status indicator light	I	I	I	I	I	I	I	I	I	I	I	I
	Check the battery cell voltage	I	I	I	I	I	I	I	I	I	I	I	I
The light of a lamp	Check the vehicle's lighting condition	I	I	I	I	I	I	I	I	I	I	I	I
Auxiliary control system	Check whether the low-voltage connector of the controller is securely engaged	I	I	I	I	I	I	I	I	I	I	I	I
	Check whether the high-voltage connector of the controller is securely engaged	I	I	I	I	I	I	I	I	I	I	I	I
	Check whether the fixed bracket bolts are securely tightened	I	I	I	I	I	I	I	I	I	I	I	I
Actuator Controller	Check the reliability and leak-proof condition of the controller's cooling water inlet and outlet pipe connections.	I	I	I	I	I	I	I	I	I	I	I	I
	Check whether the fixed bracket bolts are securely tightened	I	I	I	I	I	I	I	I	I	I	I	I



First class maintenance

Margin Project	Lubricating oil interval (X1000km)	5	10	15	20	25	30	35	40	45	50	55	60
	B Replacement cycle (months)	1	2	3	4	5	6	7	8	9	10	11	12
Actuator controller	Check whether the low-voltage connector of the controller is securely engaged	I	I	I	I	I	I	I	I	I	I	I	I
	Check whether the high-voltage connector of the controller is securely engaged	I	I	I	I	I	I	I	I	I	I	I	I
Air conditioning system	Check if the return air filter is clean	I、C	I、C	I、C	I、C	I、C	I、C	I、C	I、C	I、C	I、C	I、C	I、C
	Check if the fresh air filter is clean	I、C	I、C	I、C	I、C	I、C	I、C	I、C	I、C	I、C	I、C	I、C	I、C
Body of car	Check the air spring of the hatch door	I	I	I	I	I	I	I	I	I	I	I	I
	Check whether the locking screws of the guide wheel support rod and the connecting screws between the support plate and the door plate are loose.	I	I	I	I	I	I	I	I	I	I	I	I
	Check the fastening screws of the up/down arm and the connection between the door bracket and the door panel for looseness.	I	I	I	I	I	I	I	I	I	I	I	I
	Check whether the guide rod bearing fastening screws are loose	I	I	I	I	I	I	I	I	I	I	I	I
	Check if the fixing screws on the drive mechanism assembly are loose	I	I	I	I	I	I	I	I	I	I	I	I
	Check whether the solenoid valve operates promptly and accurately, and whether there are any misoperations or air leaks.	I	I	I	I	I	I	I	I	I	I	I	I
	Check whether the air filter is damaged, and whether its filtering function is impaired or weakened.	I	I	I	I	I	I	I	I	I	I	I	I
	Check if the anti-clogging function is working properly	I	I	I	I	I	I	I	I	I	I	I	I
	Check for air leaks in the barometer	I	I	I	I	I	I	I	I	I	I	I	I
	Check for air leaks or gas crossover in the cylinder	I	I	I	I	I	I	I	I	I	I	I	I
	Check for air leaks at all tracheal connector sites	I	I	I	I	I	I	I	I	I	I	I	I
	Check if the door opens or closes too quickly or too slowly.	I	I	I	I	I	I	I	I	I	I	I	I
	Check if the door and window sealing strips are intact	I	I	I	I	I	I	I	I	I	I	I	I



Secondary maintenance

Internal item	Lubricating oil interval (X10000km)	1.5	3	4.5	6	7.5	9	10.5	12
	B Replacement cycle (months)	3	6	9	12	15	18	21	24
Power assembly	Check and maintain the high and low voltage harness of the drive motor	I	I	I	I	I	I	I	I
Brake assembly	Check if the brake chamber is functioning properly	I	I	I	I	I	I	I	I
	Check the wear condition of the brake disc and hub	I	I	I	I	I	I	I	I
	Inspect or replace the friction pads, with a minimum thickness of 3mm.	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R
	Check the brake system air pressure	I	I	I	I	I	I	I	I
Air compressor	Check and clean the intake filter	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R
	Check and replace the metal bellows	I	R	I	R	I	R	I	R
	Replace the air filter core	I	R	I	R	I	R	I	R
	Change the lubricating oil	R	R	R	R	R	R	R	R
	Replace the oil filter element	R	R	R	R	R	R	R	R
	Replace the return oil valve	I	I	R	I	I	R	I	I
	Replace the oil core	I	I	R	I	I	R	I	I
Steering system	Inspection of Steering Pull Rod Assembly and Joint Assembly Wear	I	I	I	I	I	I	I	I
	Check the clearance between the steering knuckle and the front axle	I	I	I	I	I	I	I	I
	Check the steering angle of the front wheels	I	I	I	I	I	I	I	I
	Check the steering gear bearing	I	I	I	I	I	I	I	I
	Change the steering fluid	I	R	I	R	I	R	I	R
	Replace the oil tank filter element	I	R	I	R	I	R	I	R
Front and rear axles	Inspect the front axle, tie rod, and rocker arm.	I	I	I	I	I	I	I	I
	Check the front wheel hub assembly	I	I	I	I	I	I	I	I
	Check the alignment of the front wheels	I	I	I	I	I	I	I	I



Secondary maintenance

Interval item	Lubricating oil interval (X10000km)	1.5	3	4.5	6	7.5	9	10.5	12
	B Replacement cycle (months)	3	6	9	12	15	18	21	24
Front and rear axles	Check and adjust the front wheel track	I	I	I	I	I	I	I	I
	Check central lubrication (optional)	I	I	I	I	I	I	I	I
	Tire rotation	R	R	R	R	R	R	R	R
	Check the drive axle	I	I	I	I	I	I	I	I
	Check or replace the drive axle gear oil	I	R	I	R	I	R	I	R
Body of car	Inspect the welds and components of the vehicle frame and body for cracks, and check whether the connecting bolts and rivets are loose.	I	I	I	I	I	I	I	I
	Check the wear of the rotating arm and guide rail on the car door, and maintain the grease.	I	I	I	I	I	I	I	I
	Check and maintain the piston rod, cylinder swivel and tailstock grease of the car door	I	I	I	I	I	I	I	I
	Check and adjust the door opening and closing speed	I	I	I	I	I	I	I	I
Storage battery	Check if the positive and negative terminals of the battery are burned out	I	I	I	I	I	I	I	I
	Check the battery itself	I	I	I	I	I	I	I	R
Distribution box	Check whether all connecting bolts are properly tightened.	I	I	I	I	I	I	I	I
Low-voltage wiring harness	Check whether the low-voltage wiring harness is worn and securely fastened.	I	I	I	I	I	I	I	I
Power battery inspection	Check BMS fault codes		I		I		I		I
	Check the temperature of the power battery		I		I		I		I
	Check the battery voltage		I		I		I		I
High-voltage cable harness	Check whether the high-voltage cable harness is worn and securely fastened.	I	I	I	I	I	I	I	I
Battery capacity test	Contact CHTC KINWIN AUTO sales service for assistance		I		I		I		I
Whole vehicle leakage detection	Contact CHTC KINWIN AUTO sales service for assistance		I		I		I		I
High-tension distribution box	Check if the connectors in the high-voltage distribution box are loose	I	I	I	I	I	I	I	I
Air conditioning system	Check if the heat exchanger is clean	I, C	I, C	I, C	I, C	I, C	I, C	I, C	I, C

Level 3 maintenance

Interval item		6	12	18	24	30	36	42	48	54	60
	Lubricating oil interval (X10000km)	6	12	18	24	30	36	42	48	54	60
	B Replacement cycle (years)	1	2	3	4	5	6	7	8	9	10
Drive motor	Check the oil seal	I	I	I	I	I	I	I	I	I	I
	Check the clutch actuator	I	I	I	I	I	I	I	I	I	I
	Check the bearing separation	I	I	I	I	I	I	I	I	I	I
	Check the clutch plate	I	I	I	I	I	I	I	I	I	I
	Check the motor bearing	I	I	I	I	I	I	I	I	I	I
	Check torsion damper	I	I	I	I	I	I	I	I	I	I
	Check the electromagnetic clutch	I	I	I	I	I	I	I	I	I	I
Steering system	Check the gear clearance of the steering gear	I	I	I	I	I	I	I	I	I	I
	Check or replace the steering tie rod assembly and joint assembly.	I	I	R	I	I	R	I	I	R	I
	Change the steering fluid	I	I	R	I	I	R	I	I	R	I
	Check or replace the steering system hose	I	I	R	I	I	R	I	I	R	I
	Check the hydraulic oil pump	I	I	I	I	I	I	I	I	I	I
	Check the steering motor shock absorber pad	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R
Brake assembly	Inspect the air dryer and replace the desiccant	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R
	Check the parking and driving brakes	I	I	I	I	I	I	I	I	I	I
Air compressor	Cleaning condenser screw plug	C	C	C	C	C	C	C	C	C	C
	Cleaning condenser filter screen	C	C	C	C	C	C	C	C	C	C
	Clean the condenser valve core	C	C	C	C	C	C	C	C	C	C
	Replace the metal bellows	R	R	R	R	R	R	R	R	R	R
	Check and clean the dorsal fin of the static and dynamic vortices	I	I	I	I	I	I	I	I	I	I
	Check and clean the radiator	I	I	I	I	I	I	I	I	I	I
	Check and add bearing grease	I	R	I	R	I	R	I	R	I	R
	Replace the sealing strip	I	R	I	R	I	R	I	R	I	R

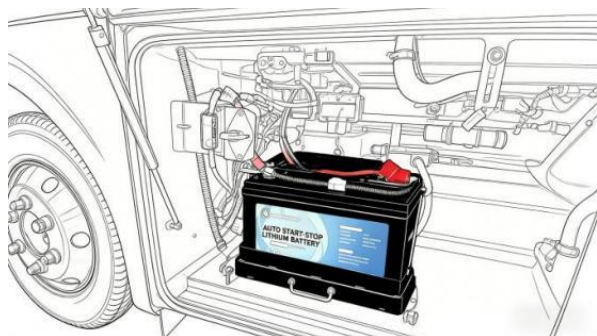
Level 3 maintenance

Interval item	Lubricating oil interval (X10000km)	6	12	18	24	30	36	42	48	54	60
	B Replacement cycle (years)	1	2	3	4	5	6	7	8	9	10
Front and rear axes	Check or replace the suspension rubber parts	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R
	Inspect the shock absorber and airbag	I	I	I	I	I	I	I	I	I	I
	Check the front wheel hub assembly	I	I	I	I	I	I	I	I	I	I
Coolant passage	Change the coolant	I	R	I	R	I	R	I	R	I	R
	Check or replace the rubber hose in the cooling system	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R
Storage battery	Replace the battery	I	R	I	R	I	R	I	R	I	R
Air conditioning system	Inspection of air conditioning system piping	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R
	Inspection of air conditioning condenser fan	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R
	Check the evaporator fan.	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R
	Change the dryer	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R	I、 R

Pour :
 Symbol meanings in tables
 A: Lubricating oil interval (×1000km/×10000km); B: Replacement cycle (monthly/annual); I=inspection; maintenance; R=replacement; C=cleaning.

Electrical appliance maintenance

1. Check the battery condition



Danger

- Batteries may produce hydrogen gas which is flammable and explosive.
- Do not let the battery spark when using the tool.
- Do not smoke or light a fire near the battery.
- The battery contains toxic and corrosive sulfuric acid.
- Avoid electrolyte splashes to eyes, skin, or clothing.
- Do not drink electrolytes.
- Wear protective goggles when working near batteries.
- Keep children away from batteries.

Safe

1. The battery contains phosphoric acid liquid, which is highly corrosive. Keep it away from children. Users should wear protective goggles and rubber gloves when handling the battery. In case of splashing into eyes, skin, or clothing, immediately rinse with large amounts of water. Seek medical attention for severe cases.
2. During charging, batteries release hydrogen and oxygen gases. Exposure to open flames or blocked exhaust ports may cause explosions. Therefore, batteries should be kept away from open flames and protected against short circuits.
3. The battery casing is made of polypropylene injection-molded, a flammable material that should be kept away from open flames.
4. Users must strictly follow the warning instructions on the battery label for proper operation and maintenance.

Memory

1. This product series is a charged liquid lead-acid battery, which should be stored in a dry, clean and well-ventilated environment at 5-25°C, away from direct sunlight and at least 2m away from heat source.
2. The storage period of this battery at room temperature is 6 months, during which the battery generally does not require recharging and can be used. Batteries stored for more than 6 months can still be used after recharging.

Charge

This series of batteries can be charged using either constant voltage or constant current methods, but the constant voltage method is recommended, and the constant current method should be avoided whenever possible.

Battery recharge

1. The constant-current charging method involves charging the battery at a current of one-twentieth of its rated capacity (A) for 20 hours until the terminal voltage reaches 14.4V, followed by an additional 2-3 hours of charging.
2. The constant-voltage charging method applies 16.0V to the battery (with a maximum current of 25A) until the charging current approaches zero, remaining stable for 2-3 hours.
3. When charging the battery, connect the charger's positive terminal to the battery's positive terminal and the charger's negative terminal to the battery's negative terminal. Reverse charging is strictly prohibited.
4. During charging, if the battery electrolyte temperature exceeds 45°C, reduce the charging voltage or current as needed to prevent electrolyte splashing caused by overheating.



Pay attention to

- Ensure the vehicle is de-energized before maintenance.
- When inspecting the battery, first disconnect the grounding cable from the negative terminal (marked with a "-" sign), then reconnect it.
- Note: Do not cause battery short circuits when using the tool.
- When cleaning the battery, ensure no liquid enters the battery compartment.
- Charging the battery while the cable remains connected may cause severe damage to the vehicle's electronic control unit and electrical systems. Therefore, disconnect the battery cable before connecting it to the charger.

Install

1. Before battery installation, ensure the terminal post surface is clean and the wiring is secure and reliable. Striking the terminal post is strictly prohibited to prevent loosening that may cause battery acid leakage.

2. When installing the battery, first connect the battery's positive terminal to the car's D+ positive terminal, then connect the battery's negative terminal to the vehicle's negative terminal.

Take good care of one's health

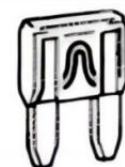
1. For batteries that have been discharged due to various reasons during use, they should be charged promptly.

2. Avoid overcharging the battery during use and charging.

3. Gas may form during battery charging. Regularly check the vent holes to ensure they remain unobstructed and prevent battery explosion.

4. For batteries already installed and in use, if they remain unused for an extended period (typically over 15 days), remove them from the vehicle and store them in a dry, well-ventilated location. Recharge the batteries every 3-6 months.

2. Low-voltage circuit breaker inspection



良好



烧毁



良好



烧毁



良好



烧毁



Danger

Never use a fuse with a higher rated current or any other conductor as a substitute for a fuse, as this may cause serious damage or even a fire.

3. Replace the lamp

If any lights fail to illuminate, contact the KINWIN AUTO's after-sales service center immediately for repair or replacement.

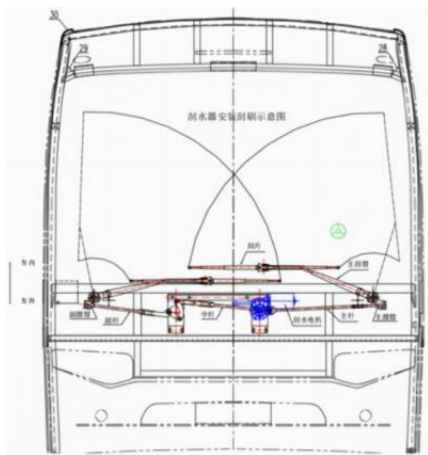
4. Low-voltage wiring harness inspection

1. Inspect the low-voltage wiring harness connectors of the vehicle controller, auxiliary controller, BCM, DCM, gateway, battery manager, drive motor controller, high-voltage distribution box, power steering motor, and air compressor or integrated controller for damage and ensure reliable connections.

2. Inspect the electrical harnesses in the vehicle compartment, under the dashboard, chassis, and rear cabin to ensure they are bundled, neatly arranged, securely fastened, and properly connected. Check for any damage or exposed harnesses, friction interference with moving parts, or bundling with oil pipes. Ensure they are at least 100mm away from heat sources; otherwise, install effective thermal insulation.

Wiper maintenance and care

As a key electrical component of the front windshield, the wiper serves to clear the windshield surface. The windshield is protected from rain, fog, and foreign objects to ensure clear visibility for the driver. Regular maintenance and repair of wiper components are necessary during use to extend the service life of the wipers.



Schematic diagram of wiper blade installation

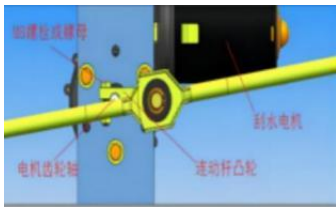
Wind deflector working principle:	The linkage rod is driven by a permanent magnet DC motor to perform reciprocating motion. This drives the movement of the scraper arm and scraper blade. Its main structure includes: a motor, a linkage rod (or including a connecting rod bracket, two scraper arms, two scraper blades, and a set of scrubbers).
Wiper control mode:	The rotary switch on the combination switch controls the intermittent, low-speed, high-speed, and spray functions of the windshield wipers through the module (or relay control box).
Daily maintenance requirements:	1. Pre-use instructions: (1) Spray water first, then scrape; dry scraping with a windshield wiper is strictly prohibited. (2) Promptly remove foreign objects from glass and rubber strips. 2. Parking wiper protection: (1) Avoid prolonged exposure to direct sunlight and parking. If necessary, remove the scraping blade or hold the scraping arm upright. Prevent the rubber strip from sticking to the glass and causing deformation, which may result in incomplete cleaning of the glass or produce rattling and abnormal noises. (2) When snow or ice is present, manually clear the snow or ice before using the windshield wipers. to prevent motor overload and rubber strip damage caused by rain. 3. Glass water selection: The combination of tap water and dish soap is strictly prohibited as it accelerates the corrosion of rubber gaskets. Neutral glass water must be selected.

Regular maintenance and replacement cycle for windshield wipers and wear-prone components:

Order number	Project	Frequency	Operation declaration
1	Cleaning of Bus Glass and Scraper Strip	weekly / When washing the car	Wipe with soft cloth and clean water
2	Glass degreasing film	monthly	Special oil film remover for glass cleaning
3	Check for any abnormal noise or vibration during the operation of the scraping device.	monthly	Adjust the scraper arm angle if abnormal noise or vibration is detected
4	Check if the bolts and nuts securing the motor, connecting rod, and scraper arm are loose.	every 3 months	Use tools to retighten the fasteners
5	Check the flexibility of the scraper arm joint and scraper rotation, and apply lubricating oil on both sides of the scraper arm joint.	every 3 months	Manually rotate the scraper arm to inspect for any abnormalities.
6	Lubricating Oil Injection for Connecting Rod Movement Bearing	every 6 months	Lubricate all bearing sections of the connecting rod with 5W/40 engine oil.
7	Replace windshield wipers	every 6 months	Remove the bolt and nut that hold the scraper in place, then replace it with a new one.

Common windshield wiper malfunctions and repair methods:

Common faults	Diagnose	Repair method	Graphic
Scraper fails to remove windshield	Check for foreign bodies on the scraping strip	Clean the strip surface with a glass cleaner.	/
	Fogging and oil stains on the windshield surface	Clean the glass surface with glass oil stain cleaner	/
	The scraping tool cannot move freely.	Loosen the scraper bolt and nut	/
	Scraper joint rivet Clutch jammed, no pressure at the front end of the scraper arm	Apply lubricating oil to both sides of the scraper joint and rotate it back and forth several times.	/
	Seal strip aging or severe deformation	Replace windshield wipers	/
The scraper is running jitter and noise during the procedure	Doctor-bar block gine Use one period of time posterior Its blade oral deformity	Scratch and shake dynamic and heterogeneous	Rotate the swab 180 degrees or adjust as specified below 
		Scratch and shake dynamic and heterogeneous	Rotate the swab 180 degrees or adjust as specified below 
	Up-and-down bidirectional shaking	1. Clean the glass and sealing strip surfaces; 2. Replace the windshield wiper blades.	/

Rain wipers without intermittent operation	Check if the motor has a low-speed gear	Includes low-speed gear and return function	Change the control module or intermittent relay
		No low-speed gear, no return	1. Check if the relevant wiring harness connectors are securely connected, and reconnect them if needed. 2. Replace the control module or wiper motor.
		No low gear	1. Check if the relevant wiring harness connectors are securely connected, and reconnect them if needed. 2. Replace the wiper motor.
Wiper not returning to its original position	The return line (yellow wire) in the connector has come loose, and the control module cannot detect the return signal.	Check for loose pins in all connector lines and reconnect the connectors	
	Internal return piece failure in the motor	Replace the motor cover or the motor itself.	
After returning to its original position The scraping tool is not Horizontal or At startup (recoil Run downward Start (Reset))	Module control windshield wiper After a while The connecting rod cam is not horizontal.	Remove the scraper arm and the connecting rod cam. After the motor resets, reinstall the cam in a horizontal position.	
	Loose movement in the connecting rod and scraper arm	Replace the linkage rod and scraper arm	
Connecting rod motion disordered row	Lubrication deficiency in the connecting rod bearing	Lubricating oil is added to the connecting rod bearing	/
	The connecting rod lock nut is loose	Tighten the corresponding nut	/
	There is a gap between the connecting rod copper bearing and the retaining ring.	Remove the retaining ring and install a thin washer	/
	The clearance between the connecting rod copper bearing and the shaft is excessive, or the clearance between the reversing bearing and the reversing shaft is excessive.	Replace the connecting rod	/

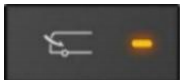
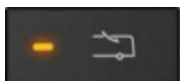


The windshield wiper blade is angled too wide.	After prolonged use of the wiper, the clearance between the joints of the linkage and the wiper arm joint increases, resulting in a larger angle of the wiper blade.	Replace the scraper arm and connecting rod	/
	The connecting rod lock nut is loose	Tighten the corresponding nut	/
The windshield wipers are not working.	The connector has come loose.	Replug the plug-in	/
	Insurance circuit breaker	Get a new insurance policy	/
	Connecting rod jam	Adjust the connecting rod and tighten the corresponding nuts	/
	Motor failure	Replace the motor	/
	The control module is damaged.	Change the control module	/
The washer does not spray water.	Air is present in the washing machine.	Disconnect the two-way valve of the hose at the washing machine outlet to purge air from both the washing machine and the water pipe.	/
	Scraper nozzle blockage	Replace the nozzle.	/
	The washing machine is broken.	Replace the washing motor	/

Air-conditioning

1. Control Panel



Automatic mode 	Auto mode: Selects automatic air conditioning speed. Press this button to turn on the auto mode.
Previous fresh air button 	The fresh air damper that turns on the air conditioner before it starts. Press this button to turn on the indicator light and open the front air conditioning fresh air damper. Press it again to turn off the indicator light and close the damper. (Not applicable to this item)
Post fresh air button 	The fresh air damper for the air conditioner when it is on. Press this button to turn on the indicator light and open the fresh air damper. Press it again to turn off the light and close the damper.
Radiator button 	To select a radiator fan, press to choose the radiator 1 fan, then press Selecting the fan for radiator 2, then for radiator 3, and holding down the 'Disperse' button. Press the heater button for 3 seconds to turn off all radiator fans. (This option is not applicable)
Air Purification Button 	Press this key to turn on the air purifier and light up the indicator. Press this key again to turn off the air purifier and turn off the indicator. (Not applicable to this item)

2. Description of Combination Key Functions

- (1) To enable forced cooling, hold the cooling mode button for more than 3 seconds. Press and hold the cooling mode button for more than 3 seconds. The temperature display will show "88", and the system will enter forced cooling mode. In forced cooling mode, press the AUTO or cooling mode button to cancel the forced cooling and switch to the corresponding mode.
- (2) Forced heating function: Hold the cooling mode button for more than 3 seconds to activate forced heating. Press and hold the heating mode button for more than 3 seconds. The temperature display will show "99", activating forced heating mode. To cancel the forced heating, press the control button again within 5 minutes.
- (3) Forced battery self-cycling mode

Press and hold the air conditioning fresh air button "  " for more than 3 seconds. The display will return to its original state after 3 seconds. Repeat pressing the air conditioning fresh air button to display in a loop.

- (4) Forced cooling for battery
press the fresh air button  of the defroster for 3 seconds. The panel will emit three audible alerts and automatically return to the original state after 3 seconds. Press the fresh air button of the defroster for 3 seconds. The panel will emit three audible alerts and automatically return to the original state after 3 seconds. Display status; automatically exits forced battery cooling after 15 minutes of operation. In debug mode, the water-cooled unit can be forced to start when the ambient temperature is greater than or equal to -5°C under normal operating conditions, the water-cooled unit can operate normally for refrigeration when the ambient temperature is above 5°C. Both the water pump and compressor should be able to start at temperatures above -5°C; if the ambient temperature drops below -5°C, the water pump must be operational.

3. Fault Display and Query Processing

Fault indicator: When a fault occurs, the word 'ER' appears in the upper left corner of the panel.

Troubleshooting: when a fault occurs , long press to display the fault code. Query the fault from the

corresponding fault code list.

ER-01: Indoor sensor failure
when the indoor temperature sensor short-circuits or opens, a fault occurs (indicated by a '---' in the temperature display area). Check the sensor circuit and verify if the sensor is functioning properly. After troubleshooting, the controller automatically returns to normal operation.

ER-02: outdoor temperature sensor malfunction
when the outdoor temperature sensor short-circuits or opens, the indoor temperature sensor malfunctions (displaying '---' in the outdoor temperature zone). If this occurs, check the sensor circuit and verify if the sensor is faulty. After troubleshooting, the controller automatically returns to normal operation.

ER-06: TMS communication failure
The air conditioning and vehicle communication are abnormal. Check whether the air conditioning communication connector is securely installed and inspect the air conditioning control board.

ER-08: water pump failure
when a water pump malfunction occurs, it may exhibit issues such as dry running, blockage, overcurrent, overvoltage, overheating, undervoltage, or overvoltage. Inspect whether the feed water pump is receiving normal power supply, check for liquid deficiency, and replace the pump if necessary.

ER-12: water tank low level fault
when the water tank is reported as low, check for liquid deficiency. Inspect the sensor for malfunctions and verify wiring integrity.

ER-17: DCD power supply failure
when the DCD power failure is reported, check if high voltage is supplied to the air conditioner, inspect the DCD power supply for damage, and verify the DCD power fuse is intact.

ER-18: lo board communication failure
when the lo board communication fault is reported, check whether the connector between the display panel and the air conditioner is securely connected and inspect the wiring for any issues.

ER-21: internal heat exchanger temperature sensor fault
The evaporator sensor is faulty. Check the sensor and wiring.

ER-22: Fault of External Thermal Exchange Temperature Sensor

The condenser sensor is malfunctioning. Check the sensor and wiring.

ER-23: Exhaust temperature sensor fault

The compressor exhaust sensor is faulty. Check the sensor and wiring.

ER-33: System High Voltage Fault

The power supply detection system monitors the status of the high-voltage protection switch. If three compressor high-voltage protection failures occur within 30 minutes, the compressor will be locked and disabled. The system also checks for condenser fan damage and pressure switch malfunctions.

ER-34: System low-voltage fault.

The power supply detection system monitors the low-voltage protection switch status. If three low-voltage protection failures occur within 30 minutes, the compressor will be locked and disabled. The system also checks for condenser fan damage and pressure switch malfunctions. ER-37: Compressor inverter board communication failure. Inspect the inverter board and wiring for issues.

ER-40: Electric heating failure

Check if the PTC electric heating is overheating and verify the temperature control switch is functioning properly.

ER-A4: Over/Under-voltage Fault of Compressor

Check if the air conditioner has high voltage and if the fuse is normal.

4. Maintenance and Care

4.1 Condenser Cleaning

When the condenser fins accumulate dust or foreign particles, it will impair heat dissipation efficiency and cause the refrigeration system pressure to rise. Therefore, regular cleaning should be performed.

4.2 Evaporator Cleaning

When the evaporator fins are covered with dust, the system ventilation will decrease, resulting in insufficient cooling/heating. In severe cases, condensation on the evaporator surface may be blown into the air duct and then into the cabin through the air outlet. Therefore, regular cleaning should be performed based on the dust accumulation level.

4.3 Drainage Outlet Cleaning

The evaporator drain channel is primarily responsible for discharging condensate water from the unit. If drainage is obstructed, excessive water accumulation inside the unit may occur, leading to water ingress at the supply air outlet and leakage at the return air outlet. To ensure smooth drainage, the entire drain channel and its bottom drainage holes should be thoroughly cleaned.

The condenser drain hole is mainly used to drain rainwater and sand. If the drain hole of the condenser base plate is blocked, it will cause water and sand accumulation inside the room. Therefore, when cleaning, debris and sediment on the base plates should be swept away, and the drain holes should be cleaned thoroughly.

4.4 Fan Ball Bearings

The motor ball bearings of evaporator fans and condenser fans should be regularly lubricated.

4.5 Dust buildup on the evaporator return air filter reduces air flow capacity, requiring regular inspection and cleaning.

5. Other precautions

When the air conditioner unit fails to operate or exhibits abnormal performance, you must first contact KINWIN AUTO After-sales service station for on-site repair by our factory's maintenance personnel.

Alternatively, with the approval and guidance of the factory's maintenance team, follow the procedures outlined below for inspection and repair.

When the air conditioner is powered on, the power indicator on the display control panel lights up. Check the fault query page to see if it displays a fault (FXX).

If the display control panel does not light up, check whether the power supply to the display control panel is properly connected or whether the power supply to the air conditioning unit is functioning normally.

If the display control board malfunctions, refer to the troubleshooting table below to identify the corresponding issue. The system will only function properly after the issue is resolved.

Annex 1: Fault Inquiry Form

Mainboard failure			
Hitch code	Failure cause	Hitch code	Failure cause
F01	Short Circuit Fault of Indoor Ambient Temperature Sensor	F02	Short Circuit Fault of Outdoor Ambient Temperature Sensor
F03	Obligate	F04	Humidity sensor malfunction
F05	The four-way heating valve is malfunctioning and fails to reverse direction.	F06	CAN communication failure
F07	Obligate	F08	Water tank malfunction
F09	Obligate	F10	AC undervoltage
F11	Obligate	F12	The water level in the tank is too low.
F13	EEROM fault	F14	EEROM failure
F15	Obligate	F16	Defrost
F17	DC power failure	F18	Controller and panel communication failure
F19	Air conditioner fresh air valve feedback fault	F20	Obligate

A system failure			
Hitch code	Failure cause	Hitch code	Failure cause
F21	Short Circuit Fault of Indoor Heat Exchange A Sensor	F22	Short Circuit Fault of Outdoor Thermal Sensor A
F23	Short circuit fault in the exhaust A sensor	F24	A System Refrigeration Ice
F25	System A is unloaded (lacking fluorine).	F26	A System press, internal fan phase current overcurrent
F27	The A-system press and internal fan circuit are unloaded.	F28	A system bus voltage over/under-voltage
F29	A system overload protection (heating, cooling)	F30	A System compressor IPM abnormal (IPM/DC vector speed/Start failure)
F31	System A condenser fan IPM malfunction (IPM/DC vector speed/starting failure)		

A System condenser fan failure (non-inverter)			
Hitch code	Failure cause	Hitch code	Failure cause
F32	Fan IPM malfunction in System A (IPM/DC speed/Start failure)	F33	A high-voltage fault in the system
F34	A low-voltage fault in the system	F35	The fan frequency converter board in System A encountered an EEPROM read error.
F36	A System Overheat Protection(Exhaust Temperature, Protection Switch)	F37	Host fails to receive A system variable frequency compressor communication
F38	The host fails to receive communication from the A-system variable-frequency external fan.	F39	Host fails to receive A system frequency conversion internal fan communication
F40	Electrical heating A failure		

B system failure			
Hitch code	Failure cause	Hitch code	Failure cause
F41	Short Circuit Fault of Indoor Heat Exchange B Sensor	F42	Short Circuit Fault of Outdoor Thermal Sensor B
F60	Electrical heating B failure		

Instructions for Use, Installation and Maintenance of Power Battery

Check of battery system

- 1) Check for any visible abnormalities in the battery system's appearance.
 - 2) Ensure the battery system's high-voltage output connector is functioning properly.
 - 3) Once the battery system is confirmed to be operational, proceed with connecting/disconnecting the power lines.
- safe operation**
- 1) Determine whether the working environment is safe, such as combustion vibration, thunderstorm weather, live-line work, confined spaces, etc. Targeted detection equipment and protective gear may be required.
 - 2) When working in a safe environment, use tools, materials, and personal protective equipment (PPE) for installation, debugging, or troubleshooting, ensuring all tools are safe and reliable.
 - 3) Provide protective gear designed to safeguard health and safety, including but not limited to: insulated gloves, heat-resistant gloves, insulated shoes, noise-canceling earphones, safety goggles, dust masks, and insulated rescue hooks. These safety items must be properly stored, used correctly, and worn consistently.
 - 4) Thoroughly review the project's product specifications and electrical schematics, identify high-voltage safety components in the vehicle or battery pack, and verify their operability before commencing the test.
 - 5) When testing or disassembling high-voltage components of battery systems, especially in confined spaces, wear insulated gloves and wrap non-operational tool parts with insulating tape for protection; otherwise, short-circuit accidents may occur.
 - 6) Insulate with tape to prevent accidental contact with short-circuit points during operation. For example: When measuring connector pins with a multimeter, an uninsulated probe may accidentally touch adjacent test points, causing a short circuit. Similarly, during battery module assembly/disassembly, an uninsulated handle could contact adjacent cell terminals, leading to a short circuit.
 - 7) For water ingress and fire detection battery pack troubleshooting, the safety of the working environment must be thoroughly evaluated. LOW-voltage monitoring should be prioritized, followed by wearing insulated gloves for relevant tests and high-voltage component disassembly/assembly of the battery system. For water-affected batteries, insulation resistance must first be measured to ensure it remains within safe limits. Special attention should be paid to fire detection batteries, as testing procedures may potentially cause secondary failures.
 - 8) When installing, debugging, or troubleshooting battery systems or related cables, always disconnect the low-voltage power supply or maintenance switch first. For insulation faults, sequentially disconnect the high-voltage components' cables for insulation testing when necessary. Always wear insulated gloves during battery or high-voltage component testing and disassembly.
 - 9) High-voltage cable installation and removal must be performed with low-voltage power disconnected and maintenance switches off.
 - 10) For insulation fault diagnosis, wear insulating gloves before pinpointing the fault location, then sequentially inspect the battery management system, high-voltage cables, and high-voltage components.

Disassembly and inspection of battery system

Connect the battery system correctly according to its high/low voltage and communication interface specifications. When disassembling the battery system, note the following points:

- 1) During disassembly and inspection, proper insulation protection must be implemented. Disassembly tools should be insulated using protective measures such as insulating tape or heat shrink tubing.
- 2) High-voltage and low-voltage line connections must be performed with the high-voltage circuit disconnected.
- 3) First, remove the MSD protection switch. To do so, disconnect the high-voltage busbar from the high-voltage box.
- 4) The vehicle's 24V power supply must be turned off, and the key should be set to the OFF position.
- 5) Low-voltage control harnesses and high-voltage power lines must be routed separately and must not be twisted together.
- 6) High-voltage power lines must not be secured with binding straps; they should be fastened with wire clamps as required.
- 7) For battery cabinet bottom cover, remove bolts using sleeves and electric wrenches. For external connectors like the low-voltage interfaces of the battery box's main positive/negative power cables, use a crosshead screwdriver. Ensure proper torque during removal.
- 8) The disassembly environment must be dry and dust-free.
- 9) For hardware components in the pool system, wrap a section of copper busbar with insulating tape to prevent sparking.
- 10) After disassembly, verify that all bolts securing the box have been removed.
- 11) The high-voltage switch can only be activated after confirming all interfaces are correct.
- 12) This battery system requires IP67 tightness (dust proof and short-term immersion resistant). During disassembly, avoid damaging the sealing strip, and retest the seal when reinstalling the cover.
- 13) production full-bag sealing test: positive pressure test at 5kpa, maintained for 60 seconds. (Test equipment details are provided in Appendix 1 at the end of the document)
- 14) prior to battery installation, the battery must undergo insulation and voltage withstand testing, with the housing heating resistance measured. The specific methods and standards are as follows:
 - (1) secure the black probe to the tester's housing and the red probe to the positive terminal. Initiate the test. when 'pass' is displayed, record the data (test specifications: withstand 1800V Dc for 30 seconds, with a 4-second rise and 3-second fall, and leakage current $\leq 1\text{mA}$).
 - (2) set the insulation meter to "1000V", connect the black probe to the external screw of the housing, and the red probe to the positive and negative screws respectively, then record the test data. The test duration is 5 seconds, with an insulation value $\geq 100\text{M}\Omega$.
 - (3) set the multimeter to Ω , connect one probe to the heating input and the other to the heating output, then measure the resistance value of the test box (specific values depend on the model).

Maintenance Scheme of Battery Packaging Vehicle

1) During the warranty period, the battery manufacturer provides premium after-sales services. When a vehicle is reported for repair by a customer, CHTCKINWINAUTO's after-sales team or its authorized service centers will conduct preliminary fault diagnosis using professional equipment or experienced technicians. If the issue is confirmed to stem from quality defects in the power battery system, the case is referred to the manufacturer's designated service specialist with diagnostic documentation. The manufacturer then conducts further evaluation. Should the issue be identified as a power battery system defect, technicians are dispatched immediately to the specified location for diagnosis and repair.

2) In exceptional circumstances (e.g., when the manufacturer's service specialist is geographically distant from the reported vehicle, unable to arrive promptly, or when the service station lacks capacity to resolve minor issues), CHTCKINWINAUTO or its authorized service centers may, with the battery manufacturer's written approval, assume responsibility for after-sales maintenance and servicing of the manufacturer's power battery system products. The manufacturer's after-sales services for these power battery systems will be integrated into Hualing's service network, forming a "one-stop" service model with CHTCKINWINAUTO.

Precautions during installation and debugging

1) Remove the maintenance switch and disconnect the equipment's high and low voltage.

2) The product number must be used with its corresponding battery compartment. Mixing batteries with different numbers is strictly prohibited.

3) During battery pack installation, proceed slowly and ensure precise alignment to prevent deformation of the battery case.

4) To prevent high-voltage electric shock, installation personnel must not touch the battery's high- and low-voltage connectors with bare hands.

5) During rainy or snowy weather, install and test the system indoors to prevent rainwater from entering the battery system.

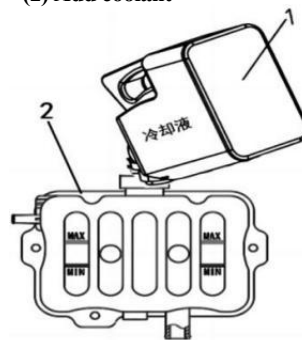
Chassis maintenance

1. Cooling system

(1) Check the coolant level

check the coolant level in the expansion tank. If the coolant level is between the MAX and MIN marks, it meets the requirement. If the level is below the MIN mark, add coolant.

(2) Add coolant



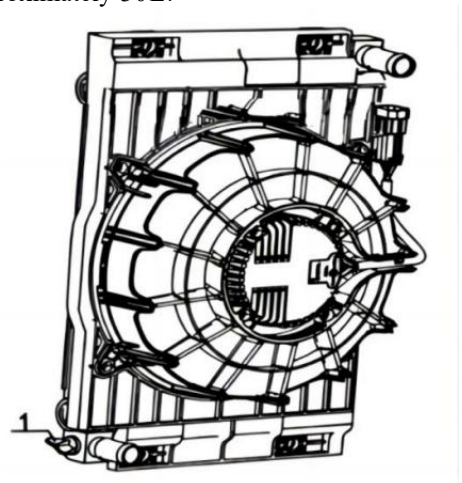
1. Coolant 2. Expansion tank

Add coolant operation method:

1. Run the water pump for about 5 minutes, then power it off and repeat 2-3 times. Ensure the motor and radiator are properly cooled.
2. Open the expansion tank cover, add the specified coolant, and tighten the end cap. The circulating cooling system requires a coolant capacity of 30L.
3. Power the pump for approximately 5 minutes, then disconnect the power. Check the coolant level.
4. If the coolant level is low, repeat the above steps until the coolant reaches slightly above the MAX-MIN range in the expansion tank.
5. cover the expansion tank and tighten the lid firmly.

(3) Change the coolant

Replace the coolant as per the maintenance schedule, with a cooling system capacity of approximately 30L.



Schematic diagram of radiator components 1. Drain valve

Coolant replacement procedure:

1. Run the water pump for about 5 minutes, then turn off the power and repeat 2-3 times. Ensure the motor and radiator are fully cooled.
 2. Open the radiator maintenance port and unscrew the drain valve. Transfer the drained coolant to a suitable container.
 3. After the coolant has been completely drained, re-tighten the drain valve.
 4. Open the radiator tank end cover, fill the designated coolant to the port, then tighten the end cover.
 5. Turn on the power and run the water pump for about 5 minutes, then turn it off.
 6. Repeat steps 4 and 5 until the coolant level in the radiator stabilizes.
 7. open the expansion tank cover. Add coolant to the level slightly above the MAX-MIN mark on the expansion tank, then tighten the end cap.
 8. power the pump for approximately 5 minutes, then disconnect the power. check the coolant level.
 9. If the coolant level drops, repeat steps 7 and 8 until the coolant reaches the upper portion of the expansion tank's MAX-MIN range.
 10. cover the expansion tank and tighten the lid firmly.
- If the coolant level drops rapidly after refilling, it may indicate a system leak. Inspect the radiator, hoses, radiator cap, drain plug, and water pump visually for leaks.
- If no leakage is detected, visit the CHTC KINWIN AUTO After-sales service center to test the cap seal and inspect the cooling system for leaks.

Pay attention to

To prevent burns, do not remove the radiator cap while the drive motor is still hot.

Select coolant type

The recommended coolant is the one designated by CHTC KINWIN AUTO Bus. Select the appropriate coolant model based on ambient temperature and fill it into the cooling system. Using an unsuitable coolant may damage the motor cooling system. Refer to the chassis system oil (liquid) specification table for coolant specifications.

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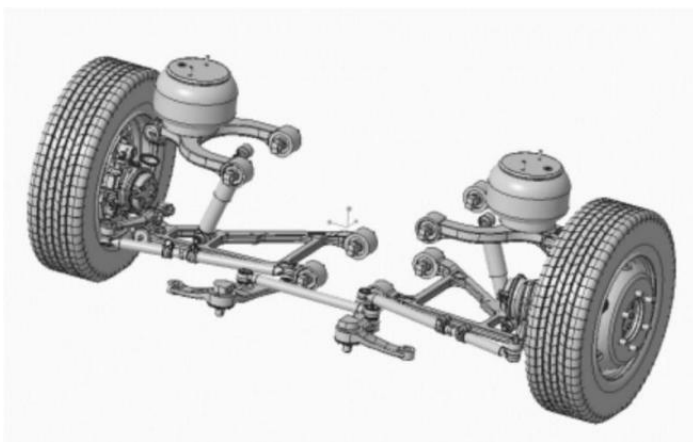
v

If any of the aforementioned components are severely dirty or their condition is unclear, please contact CHTC KINWIN AUTO After-sales Service Center.

Warn

Do not operate the device yourself to prevent radiator damage.
To avoid burns, do not touch the radiator immediately after power is disconnected.

F'ront axle maintenance



1. Before using the new axle: Apply sufficient lithium-based grease to all grease nozzles.

2. After installing the new axle: After the vehicle has been driven for 1500Km to 2500Km, inspect all fasteners for looseness, check if the brake calipers return smoothly, and verify if the brake clearance is normal.

3. Daily maintenance of the axle

(1) Add lithium-based grease to all grease nozzles every 5000km.

(2) Inspect the clearance between brake pad and brake disc every 5000km. If the brake pad wear exceeds the limit groove (e.g., the wear sensor light illuminates, the brake pad must be replaced within 5000km).

(3) Inspect the brake caliper assembly, left and right crossbar arms, and straight rod arms for tightness every 10,000km.

(4) For new vehicles, replace the wheel hub grease or lubricant when the mileage reaches 5,000km or 15,000km for standard and maintenance-free oil. For standard wheels, replace the hub grease every 30,000km thereafter.

The maintenance-free oil-lubricated wheel edge requires only the replacement of hub lubricant every 100,000 kilometers. For the maintenance-free grease-lubricated wheel edge, routine inspections of brake discs, calipers, and brakes are sufficient, with no need for maintenance or replacement of components.

Recommended lubricants: shell Nengdeli LX-2 or LX-3 / Mobilx HP222



Pay attention to

In addition to the prescribed maintenance intervals, the hub bearings must be inspected and lubricating oil replaced under the following conditions:

1. Remove the hub from the steering knuckle during maintenance;
2. When replacing the shaft seal (hub seal ring);
3. Replace the brake disc every time;
4. The brake components are overheating.

For maintenance-free hubs, simply check if the lubricating oil level in the hub cover is above the normal line and if the oil is contaminated. Under normal conditions, the lubricating oil should be dark in color. If it appears white or milky, it indicates contamination and requires replacement.

Replace the front wheel hub bearing grease

1. Remove the wheel hub and thoroughly clean the hub, bearings, and steering knuckle.
2. Inspect the hub bearings for wear; replace them immediately if worn.
3. Replace the sealing components (shaft seal or O-ring) as a rule.
4. Lubricating grease should be fully applied to the hub bearings on both sides.
5. Then reattach the wheel hub.

The amount of grease for the hub is about 200g.



Pay attention to

The roller, inner and outer rings, and front face of the hub bearing are coated with grease. The remaining grease is added to the center cavity of the hub (the midpoint between the two bearing holes).

Adjustment of the front wheel hub bearing

1. Tighten the hub bearing nut with a torque of 300 N·m, then rotate the hub 2-3 times to ensure full bearing engagement.
2. Tighten the hub bearing nut with a torque of 300N·m, then rotate it 1/6 to 1/4 turn to position the bearing correctly. The hub should rotate smoothly without any resistance.
3. Tighten the locking bolt of the hub bearing nut with a torque of 35 N·m.

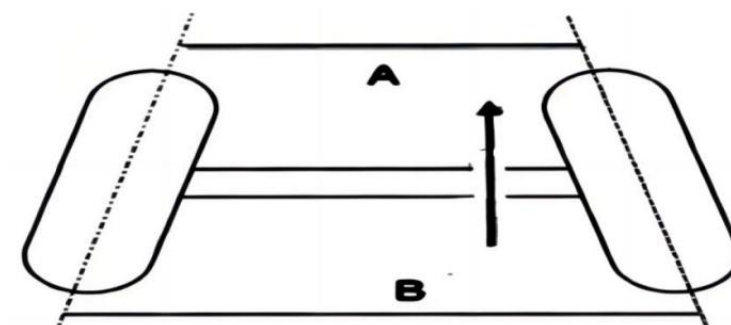
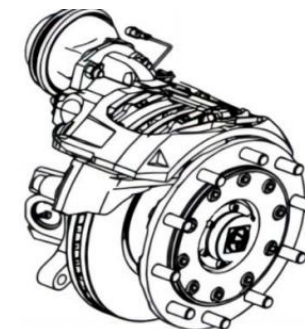
Inspection of the front wheel track

The front wheel track should be checked during every 15,000 km maintenance. The recommended track range for this vehicle is 0-2 mm. Improper track will accelerate front tire wear.

Adjust the front wheel track

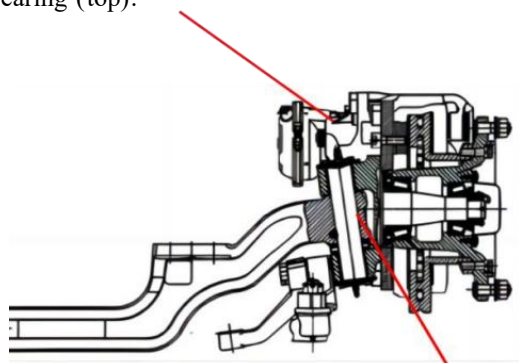
The vehicle is parked on a flat ground, the wheels are in a straight line, the clamp bolt on the crossbar is loosened, and the crossbar is rotated with a pipe wrench to adjust the required front wheel track value.

When adjusting, mark the center of the tread pattern on both tires. Measure the A value directly in front of the front axle, then move the vehicle to rotate the mark to the rear and measure the B value. The front track is the difference between A and B (B-A). After adjustment, tighten the clamp bolts.



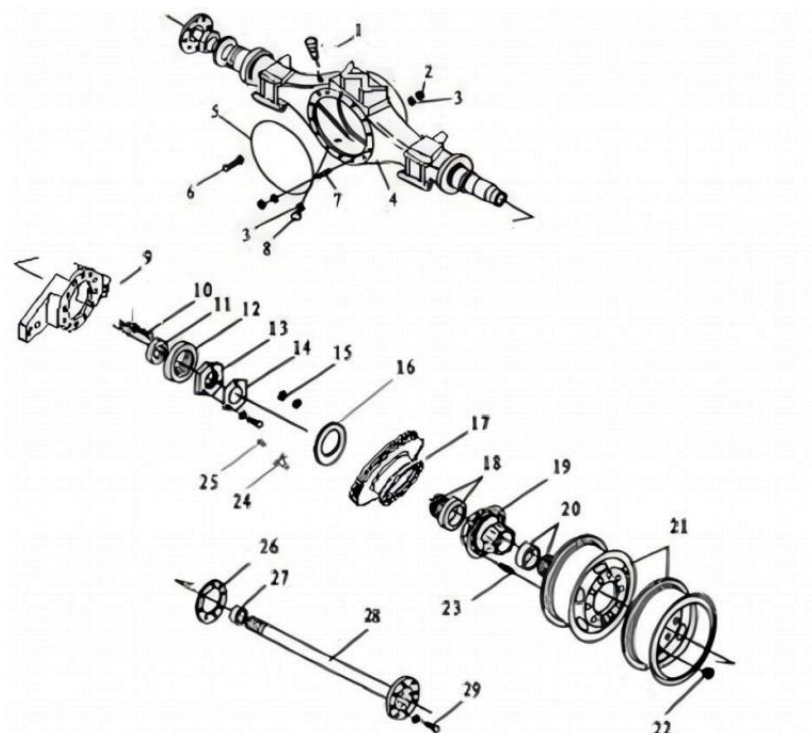
If conditions permit, the lateral runout of tires should be inspected. Adjust the front wheel track to ensure the tire lateral runout meets the specified requirements: Qualified $\leq 5\text{m/km}$, Good $\leq 3\text{m/km}$.

The lubricant injection points are shown in the figure below: the steering knuckle joint bearing (top).



Wing joint bearing (bottom)

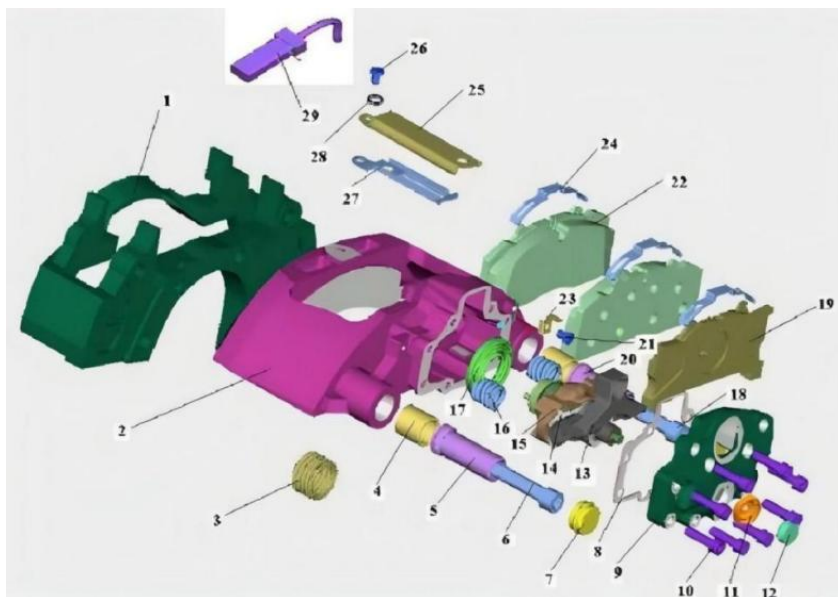
Maintenance of rear drive axle



Schematic diagram of disc-type bridge shell and hub structure

Grade	Repair parts line item	Grade	Repair parts line item
1	ventilation plug assembly	16	rear gear ring of ABS
2	oil injection plug	17	rear brake disc
3	packing washer	18	inner bearing assembly of rear wheel hub
4	rear axle housing assembly	19	rear hub
5	Sealant application diagram	20	outer bearing assembly of rear wheel hub
6	main reducer fastening bolt	21	wheel rim
7	heavy spring washer	22	rear wheel nut
8	drain hole plug assembly	23	tire bolt
9	brake caliper mounting plate assembly	24	ABS sensor bracket
10	bolt	25	ABS sensor
11	oil seal seat ring	26	rear axle half shaft bushing
12	oil seal for rear wheel hub	27	half shaft oil seal assembly
13	rear hub adjusting nut	28	half shaft
14	lock washer	29	half shaft bolt of rear axle
15	nut bolt		

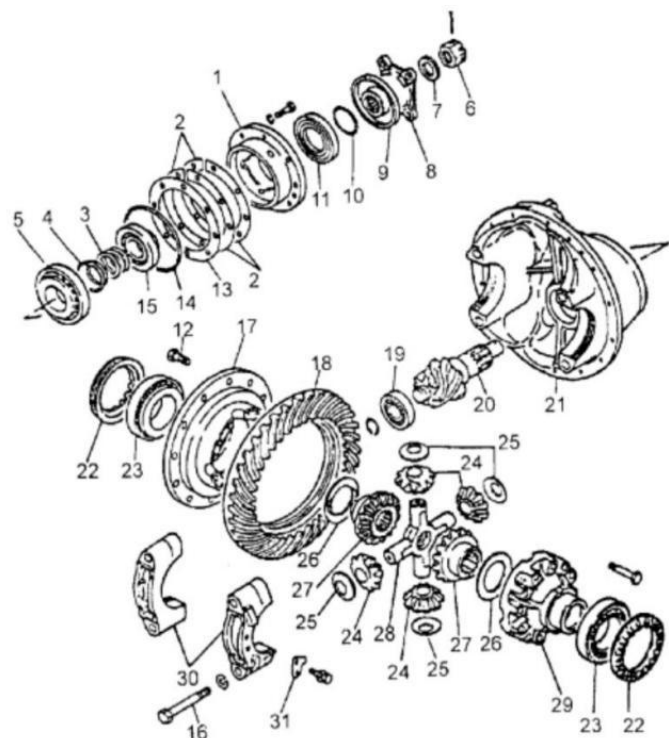
Disc brake structure



Schematic diagram of disc brake structure

Grade	Repair parts line item	Grade	Repair parts line item
1	stent-left	16	support spring
2	caliper body-left	17	screw dust cover
3	guide bush dust cover	18	inside hexagonal bolt
4	bush	19	push plate-left
5	long guide sleeve	20	short guide sleeve
6	inside hexagonal bolt	21	hexagon headed bolt
7	nut cap	22	friction block assembly
8	gland	23	alarm line terminal block
9	loam cake	24	pul-out piece spring
10	inside hexagonal bolt	25	platen
11	dust guard	26	hexagon headed bolt
12	blanking cap	27	bearing frame
13	pressure arm assembly	28	lock washer
14	roller rolling assembly		
15	shaft assembly		

Main reducer structure



Grade	Repair parts line item	Grade	Repair parts line item
1	bearing block	16	bolt
2	split adjustment washer	17	left housing of bevel gear differential
3	adjusting washer	18	rear axle driven bevel gear
4	cuff	19	main cone rear bearing assembly
5	pre-internal bearing assembly	20	driven bevel gear
6	hexagonal groove nut	21	differential case
7	flat washer	22	differential bearing adjusting nut
8	lug	23	differential bearing assembly
9	dust guard	24	epicyclic gear
10	o-ring	25	supporting bead
11	main cone oil seal assembly	26	supporting bead
12	bolt	27	axle shaft gear
13	adjusting shim	28	universal joint pin
14	o-ring	29	right housing of bevel gear differential
15	pre-outer bearing assembly	30	differential bearing cover
		31	stop plate

Usage and Maintenance

New bridge bridge

Before using the new vehicle bridge, fill the main reducer with sulfur-phosphorus type 90# heavy-duty gear oil (GL-5) through the oil hole until it reaches the oil level. The oil type and quantity for each bridge type are listed in the table below.

Region and conditions	Oil type	Oil type
Southern regions with temperatures above 10°C All-year universal	Gear oil for heavy-duty vehicles (GL-5)	90or85W/90
In southern regions under heavy load and hot summer conditions		140or85W/140
Northwestern cold zone- regions above 20°C are generally applicable throughout the year		80W/90
Winter and spring seasons in cold regions		75W

Main Gearbox Gear Oil Selection Table

Before using the new vehicle bridge, apply sufficient No.2 lithium-based grease to all grease nozzles.

After the vehicle is equipped with the new axle, it must complete 1500 km of road testing, with brake clearance readjusted and all fasteners (except adhesive bolts) rechecked before being officially put into service.

Reference and Replacement Period of Oil Injection for Each Bridge Type

Bridge type	Oil consumption	First oil change mileage	Conventional oil change cycle
3.5t~5t rear axle	Align the fuel level with the bottom of the fuel inlet hole (about 4L)	5000 kilometres	20,000 to 30,000 kilometers
5.5~6-ton rear axle	Align the fuel level with the bottom of the fuel inlet hole (about 5L)		
7-ton rear axle	Align the fuel level with the bottom of the fuel inlet hole (about 8~9 liters)		
8-ton rear axle	Align the fuel level with the bottom of the fuel inlet hole (about 8~9 liters)		
9.5-ton rear axle	Align the fuel level with the bottom of the fuel inlet hole (about 9~10 liters)		
11-ton rear axle	Align the fuel level with the bottom of the fuel inlet hole (about 11~12L)		
13-ton rear axle	Align the fuel level with the bottom of the fuel inlet hole (about 12~13 liters)		
11~3 tons of new energy for the rear axle	Align the fuel level with the bottom of the fuel inlet hole (about 13~14L)		

car axle maintenance

1. Clean the dirt and dust from the rear axle housing vent plug regularly;
 2. Regularly inspect the fuel filler cap and drain plug. If leakage is detected, promptly tighten these seals or replace the gaskets.
 3. After every 2000 km of operation, apply NO. 2 lithium-based grease to all grease nozzles and clean the vent plugs; inspect the fastening condition of the half-shaft bolts; check the gear oil level in the bridge housing (by loosening the oil level bolts).
 4. After every 8,000-10,000 km of operation, perform the following inspections:
 - (a) Check the brake caliper tightness;
 - (b) Verify brake clearances specifications (drum rear axle: 0.5-0.8 mm; disc rear axle: 0.7-1.2 mm);
 - (c) Inspect hub bearing looseness;
 - (d) Examine brake pad wear - replace if wear exceeds the wear limit;
 - (e) Assess gear oil quality in the axle housing for signs of degradation. If the gear oil becomes thin or shows other signs of degradation, it should be replaced promptly.
 5. At every 20,000 km, rotate the hex head of the head adjusting arm worm in a counterclockwise direction to check if the torque exceeds 18 Nm. Repeat the measurement three times. If the measured torque is less than 18 N·m, it indicates that the head adjusting arm assembly is damaged and must be replaced promptly.
 6. For axles with hubs lubricated by standard grease, replace the hub bearing grease every 25,000 to 30,000 kilometers.
 7. For axles equipped with Cummins maintenance-free hubs, replace the hub bearing lubricant every 120,000 kilometers.
- Failure to perform routine maintenance on the axle as required will be deemed as a waiver of the warranty service rights.

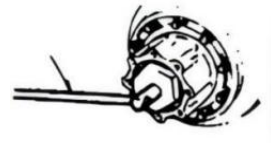
Prohibited items for vehicle axle use:

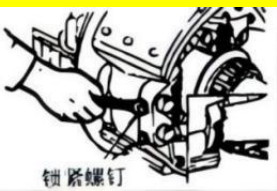
1. It is prohibited to use the vehicle under load exceeding its designed load capacity.
 2. The use of defective axle bridges is prohibited.
 3. Unauthorized disassembly or repair of the axle is strictly prohibited during malfunction.
 4. It is forbidden to modify the original technical parameters or structure of the vehicle axle.
- Note: Failure to perform routine maintenance on the axle as required will be considered as a waiver of the warranty service rights for the axle.**

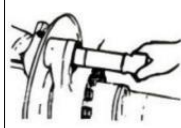
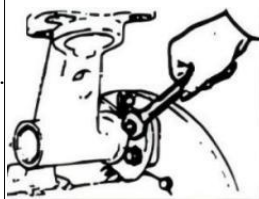
Dismantle

The rear axle system consists of three parts: the axle housing assembly, the main reducer assembly and the brake assembly.

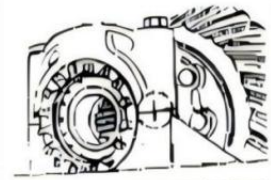
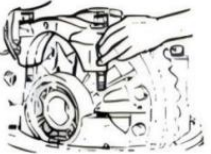
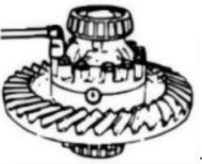
1. Remove the wheels;	
2. Use triangular wooden wedges to secure both the front and rear wheels;	
3. Use a wrench to loosen the tire nut (Note: Car tire nuts come in two types- single right-hand and left-hand).	
4. Place the jack under the rear axle spring seat to lift the rear axle;	
5. Remove the outer wheel nut and the outer wheel;	
6. Lower the rear axle, loosen the inner wheel nuts, and lift the rear axle;	
7. Drain the rear axle gear oil and remove the inner wheel screw and wheel;	
8. Drain the rear axle gear oil; remove the drain plug at the bottom of the rear axle housing to completely empty the gear oil inside.	
9. Disconnecting the rear axle from the drive shaft;	
10. Remove the half shaft;	
11. Secure the rear axle assembly firmly.	
12. Remove the lower axle bolt using a specialized tool or wrench;	
13. Use the disassembly bolt on the half shaft to push out the half shaft, gently withdraw it, and on its spline. When partially passing through the oil seal, slowly rotate the half shaft to avoid damaging the oil seal. If the half shaft is difficult to pull, gently tap the center of the half shaft tail with a copper hammer until the half shaft becomes loose, as shown in the figure.	

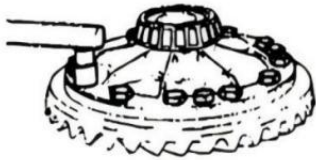
14. Disconnect the hose and pipe connections of the brake air chamber;	
15. Disassemble the hub brake drum assembly or hub brake disc assembly;	
16. Remove the wheel hub brake drum assembly;	
17. Use a pneumatic screwdriver to remove the screw and then take off the adjustment nut lock plate.	
18. Remove the adjusting nut using a dedicated sleeve. The grinding surface of the adjusting nut should contact the inner ring of the bearing, or the chamfered surface should face outward. If no clear distinction can be made, mark it clearly to prevent misassembly, as shown in the figure.	
19. Gently rotate the hub brake drum and pull it outward with a puller, while tapping the drum to loosen the outer bearing inner ring. Once the inner ring is loose, remove the hub brake drum, taking care not to damage the outer bearing inner ring. During disassembly, note that the hub brake drum assembly is heavy and should not be dropped or struck to avoid injury.	
20. Remove the ABS sensor;	
21. Use a pneumatic screwdriver to remove the screws and disassemble the ABS sensor and bracket assembly.	
22. Remove the elastic sleeve and bellows from the sensor and bracket assembly, taking care to protect the sensor probe from damage.	
23. Remove the brake assembly;	
24. Use the dedicated tool for the return spring to remove it, as shown in the figure.	 同位弹簧安装工具
Note: Before removing the return spring, secure the brake shoe with a ring or wire.	

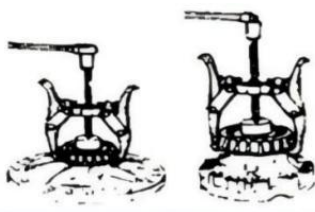
25. Remove the wire lock and fastening screw as shown in the figure.	
26. Remove the brake shoe plate shaft and brake shoe, as shown in the figure.	
27. Remove the retaining ring, roller shaft, and roller as shown in the figure.	
28. Remove the sturdy nut from the air chamber and detach the brake air chamber from its bracket.	
29. Remove the brake adjustment arm;	
30. Release the brake, remove the opening pin on the fork connected to the air chamber push rod, and pull out the flat-head pin;	
31. Remove the connecting bolts of the adjustment arm bracket;	

32. Remove the cotter pin and outer retaining plate from the camshaft end;	
33. Turn the hex head of the adjusting arm worm in counterclockwise direction with a wrench to disengage the arm (note: high torque is required during rotation, producing a clicking sound).	
34. Remove the camshaft as shown in the figure.	
Note: Mark the left and right camshafts to prevent incorrect installation.	
35. Remove the brake air chamber bracket as shown in the figure.	
36. Remove the brake base plate and dust cover as shown in the figure.	
37. Remove the wheel hub and brake disc assembly;	
38. Remove the brake caliper assembly;	

39.Remove the brake air chamber assembly;	
40.Remove the bolt connecting the brake caliper assembly to the brake plate;	
41. Remove the hub brake disc assembly;	
42.Remove the locking washer and screws;	
43.Remove the adjustment nut;	
44.Remove the inner ring of the outer bearing on the wheel hub;	
45: Remove the hub and brake disc assembly, along with the bearing inside the hub;	
46: Disassemble the hub and disc assembly;	
47.Loosen the flange bolts connecting the hub and brake disc to separate them.	
48.Remove the hub oil seal assembly;	
Note: Typically, removed oil seals cannot be reused and must be replaced with new ones.	
49: Locate the two notches on the hub oil reservoir, then remove the bearing outer ring;	
50.ABS gear ring with separation	
51.Remove the main reducer assembly; loosen the main reducer housing fastening bolts, then extract the main reducer and differential assembly from the axle housing;	

52.Disassemble the main reducer assembly;	
53. Before disassembly, measure and record the tooth clearance of both the driving and driven gears.	
54. Remove the stopper plate;	
55.Mark the assembly points on the bearing cover and housing as shown in the figure.	
56. Loosen the bearing cover's fixing bolts, then remove the adjustment nut using a differential wrench, as shown in the figure.	
57.Remove the bearing cover and bolts as shown in the figure.	
58.Remove the differential assembly;	
59.Remove the active bevel gear and bearing housing assembly using a disassembler, along with the O-ring and adjustment shim;	
60. Disassemble the differential assembly	
61. Remove the right housing of the differential as shown in the figure.	 

62. Remove the half-shaft gear washer and half-shaft gear, as shown in the figure.	
63. Measure and record the tooth-side clearance of planetary gears, as shown in Figure.	
Note: When measuring the tooth clearance, press down the planetary gear cross shaft.	
63. Remove the planetary gear and cross shaft assembly, then disassemble the planetary gear and washer from the cross shaft, as shown in the figure.	 
64. Remove the driven gear from the left housing of the differential;	

65. Remove the inner rings of the left and right housing bearings of the differential, as shown in the figure.	
66. Remove the active bevel gear and bearing housing assembly;	/
67. Remove the cotter pin, slotted nut, and washer;	
68. Demolish the flange;	
69. Remove the guide bearing;	
70. Remove the driving gear from the bearing housing;	
71. Remove the bearing cover and adjust the gasket;	
72. Remove the oil seal and outer ring of the bearing from the bearing housing;	
73. Remove the inner ring of the bearing from the driving gear;	

Cleaning and inspection

wash

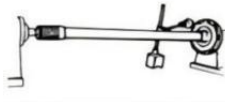
After disassembly, the parts may be contaminated with oil or sludge, making cleaning an essential step.

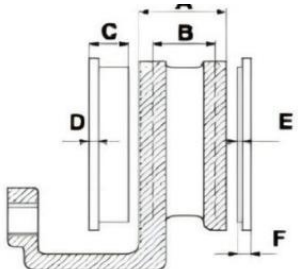
Common cleaning methods include steam cleaning, gasoline cleaning, acidic or alkaline solution cleaning, neutral agent cleaning, trichloroethylene cleaning, and magnetic cleaning. During the cleaning process, some parts may be found to be damaged. Therefore, it is essential to conduct a thorough inspection during the cleaning procedure.

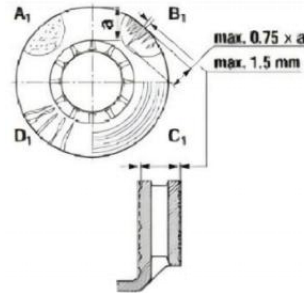
Part material	Cleaning method	Remarks	Maintenance method
Metalwork	Gasoline cleaning	Unlike other methods, gasoline has almost no permeability to sludge or dissolution capacity, unless the part surface has been precision machined. Use a wire brush or other tool to remove the sludge and scrub twice.	Anti-corrosion: After cleaning all residual oil and grease from the part surfaces, apply a clean oil layer to prevent corrosion.
	Alkaline treatment	Alkaline treatment is highly effective for cleaning steel and cast iron components. However, alkaline treatment is not recommended for parts made of alloys.	
Rubber parts	Alcohol cleaning	Mineral oil is not recommended. Alcohol can be used to clean the surface, or simply wipe it with a clean cloth.	

Check up

1. After disassembly, all rubber components including O-rings, oil seals, and gaskets shall be scrapped, and new parts must be replaced during reassembly.
2. After disassembly, the components must be inspected using specialized measuring instruments or tools. Their usability should be assessed against specified maintenance standards, with damaged parts requiring repair or replacement as required. If one component in a pair is worn beyond the specified clearance requirements, both the affected part and its mating component must be replaced in accordance with relevant standards.
3. From the perspective of preventive maintenance, certain parts that are at the repair or wear limit should be replaced before they exceed the limit.
4. All components shall be inspected by visual examination or infrared flaw detection. Any abnormal conditions such as uneven wear, scratches, eccentric wear, cracks, deformation, failure or weakened performance (e.g., springs), bending, looseness, abnormal noise (e.g., bearings), sticking, or corrosion shall be repaired or replaced as required.

Name	Maintenance standard	Repair limit	Graphic	Remarks
Half shaft	No more than 1 mm	1.5mm		Measure the bending of the rear axle half-shaft (on the outer circumference of the middle part of the half-shaft rod)
Tooth side clearance of driving and driven bevel gears	0.20-0.35mm	0.60mm		Note: When replacing the driving and driven bevel gears, they must be replaced in pairs.
Gear tooth side clearance of differential	0.25-0.45mm	0.50mm		If the clearance measured before disassembly exceeds the repair limit, inspect the gear contact marks and bearing wear.
The Fit Clearance Between the Planetary Gear of Differential and the Cross Shaft	0.10-0.14mm	0.3mm		Measure the inner diameter of planetary gears and the outer diameter of the journal of planetary cross shaft.
The clearance between the half shaft gear sleeve and the differential housing;	0.21-0.31mm	0.6mm		The outer diameter of the spline drum of the half shaft gear and the inner diameter of the differential housing are measured, and the fit clearance between them is calculated.
Note: Apply gear lubricant to the gear surface and other friction pairs before assembling the gear and accessories.				

Inspection of brake disc and friction pad thickness	
1. A=Brake disc thickness (as-is), 45mm;	
2. B=Brake disc thickness (after wear); replacement is required if ≤ 37 mm.	
3. c=Brake pad thickness, equal to 30mm;	
4. D=Back panel thickness, equal to 6mm;	
5. E=wear limit of the friction plate, equal to 2mm;	
6. F=limit of wear of brake block=back plate thickness+minimum lining thickness=11mm.	
pay attention to: 1. when the brake disc thickness is ≤ 39 mm, replacement should be considered, with 37mm being the minimum acceptable thickness. 2. Burnt, polished, or oil-contaminated brake pads must be replaced immediately. 3. Brake pads on the same side must be replaced together; individual replacement is not allowed.	

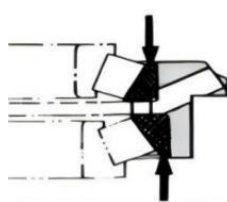
Inspection of the surface wear of brake disc	
1. A=Frictions surface	
2. A1: small cracks are acceptable;	
3. B1: Radial cracks with a depth or width less than 1.5mm are permitted.	
4. c1: A unevenness of less than 1.5mm is acceptable;	
5. D1: Radial cracks (penetrating the friction surface) are not permitted.	
6. Hub	
7. check for wear on internal and external bearings;	
8. Bearing housing wear;	
9. check whether the sliding of the brake caliper is normal. push the brake caliper with manual force (without tools). If it can slide freely along the guide pin with a stroke exceeding 30mm, the brake caliper is functioning properly. If not, replace the long and short pin, copper bushing, or sleeve assembly.	
10. check the clearance between brake pads and brake discs; push the brake caliper assembly inward along the guide pin, then use the appropriate tool to separate the inner brake pad from the sleeve push plate. check the clearance between the inner brake pad back plate and the sleeve push plate with a feeler gauge; the total clearance should be between 0.7-1.2mm.	

Installation and adjustment

The assembly process of rear axle assembly is the reverse of disassembly, but in the assembly process, we should pay attention to the tightening torque of bolt connection, the pre-tightening force of bearing, and the adjustment of main reducer, differential, brake, etc.

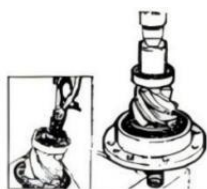
Installation of the double-acting bevel gear assembly

1. Pressing the outer ring of the front bearing of the bevel gear into the bearing housing

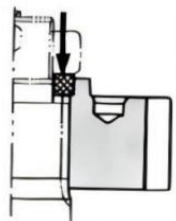


2. Select and adjust the gasket, then tighten the bearing cover.

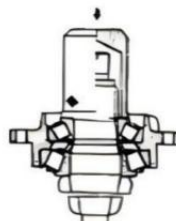
3. Press the cylindrical roller bearing onto the small end of the driving bevel gear, then install the shaft with an elastic retaining ring.



4. Press the inner ring of the front bearing of the driving bevel gear onto the driving bevel gear



5. Mount the bevel gear onto the bearing housing, then press-fit the inner ring of the bearing.



Installation of the double-acting bevel gear assembly

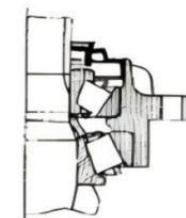
6. Measure and adjust the preload of the active bevel gear bearing, install the flange and washer, then tighten the slot nut.

Note: Tightening torque: Refer to Appendix 1. Pre-tightening force: Refer to Appendix 3.

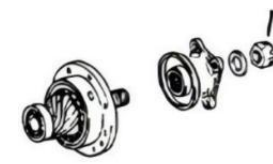
7. Secure the bearing housing by hooking one end of the spring scale onto the threaded hole of the connecting flange, then measure the preload.

8. If the measured preload is outside the standard range, adjust the gasket thickness accordingly and recheck the preload.

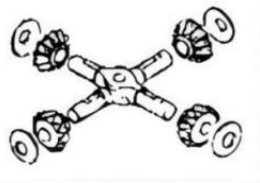
9. After adjusting the preload, remove the slotted nut, washer, and flange, then install the oil seal assembly onto the bearing housing.

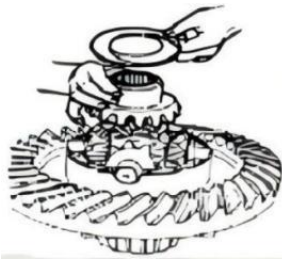
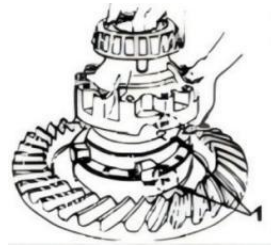


10. Install the flange and washer, then tighten the slotted nut and secure it with a cotter pin.



Note: If the pin hole of the opening pin does not align with the nut slot, slowly tighten the nut until alignment is achieved.

Install differential assembly	
1. Install the bearing back onto the left and right differential housings	
2. Mount the driven bevel gear on the left differential housing. Note: Tightening torque: Refer to Appendix 1	
Note: Apply thread-locking adhesive to the threaded portion of the driven bevel gear connecting bolt.	
3. Install the thrust washer and half-shaft gear back into the differential housing	
4. Reinstalling the planetary gear and thrust washer on the cross shaft	
5. Mounting the planetary gear train on the differential housing	
6. Measurement of the Tooth Side Clearance of the Planetary Gear of Differential	
Note: When measuring the tooth-side clearance, press the cross shaft and differential housing.	

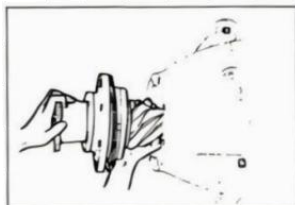
Install differential assembly	
7. Mount the half-shaft gear onto the planetary gear, then install the half-shaft gear washer.	
8. Align the markings on the left and right differential housings with the assembly, and ensure the bolt tightening torque meets the specified requirements. Note: Tightening torque: Refer to Appendix 1	
Note: Apply thread-locking adhesive to the threaded sections of the left and right differential housing fastening bolts.	

Assembly of Main Housing and Active Bevel Gear

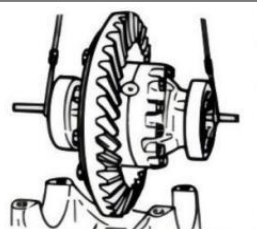
1. Apply sealant to the outer ring of the threaded hole at the main reduction shell interface, and select an appropriate adjusting washer.

2. Apply sealant on the adjusting washer and reassemble the active bevel gear assembly.

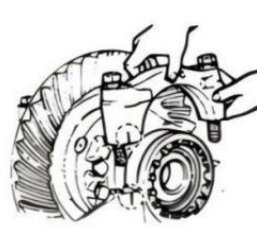
Tightening torque: Refer to Appendix 1



3. Install the differential assembly onto the main reducer housing

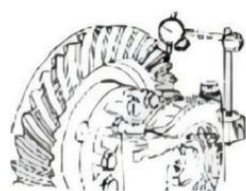


4. Install the adjustment nut, then reposition it to align with the assembly marks made before disassembly, and reinstall the bearing cover, securing it with bolts.



5. Adjusting the tooth clearance of gears

Tightening torque: Refer to Appendix 3

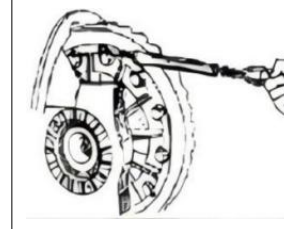


Note: Before adjusting the meshing clearance, the differential bearing preload must be properly set. The adjustment nut on one side must be turned in by the corresponding amount on the other side to maintain the pre-tightened force. Since the driving and driven bevel gears are machined as a pair during production, they must be replaced simultaneously with the same mating gear number for the driving gear. If the driven bevel gear is not properly maintained, it will cause excessive noise and premature wear.

Assembly of Main Housing and Active Bevel Gear

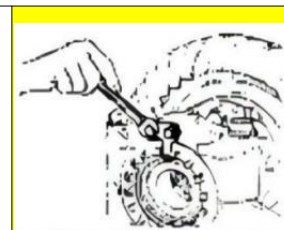
6. After adjusting the interdental clearance, evenly tighten the left and right adjustment nuts to set the preload until it meets the maintenance standard requirements.

Tightening torque: Refer to Appendix 1



Note: Apply red paint to the meshing surfaces at two or three points on the driven bevel gear, then inspect the gear's meshing contact. If the meshing marks are unsuitable, Adjust the spacer between the active bevel gear bearing housing and the reducer housing by increasing or decreasing it until the imprint is properly aligned. When inspecting the meshing imprint, manual inspection may be performed. The driven bevel gear rotates in both directions.

7. Reinstall the lock block



8. Mount the fully assembled main reducer unit onto the rear axle housing, then apply sealant evenly to both the reducer-housing interface and the fastening bolts.

Pay attention to :

1. Before installing the main reducer assembly into the bridge housing, the interface between the bridge housing and the main reducer assembly must be cleaned to ensure there are no protrusions or burrs on the installation surface.
2. The inner cavity of the bridge shell is free of debris, the shaft tube threads are intact, and the oil seal position is clean.

Install the hub brake drum assembly/hub brake disc assembly

1. Install the brake base plate and dust cover with the brake assembly, then tighten the fastening bolts of the brake base plate.

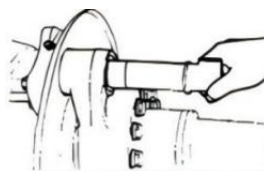
Tightening torque: Refer to Appendix 2



2. Install the ABS sensor and bracket assembly

3. When installing the ABS sensor into the bracket, ensure the sensor protrudes as much as possible beyond the bracket's outer edge. After installation, apply anti-wear coating to the sensor head.

4. Mounting the camshaft and air chamber bracket



5. Apply grease to the camshaft and install the adjusting arm on it. Ensure the adjustment is correct.

The shoulder of the arm housing is aligned with the braking direction of the brake chamber push rod. Turn the hex head of the adjusting arm worm clockwise to guide the arm into the U-shaped fork of the brake chamber push rod. Continue until the U-shaped fork hole naturally aligns with the positioning hole on the adjusting arm. Apply grease to the cylindrical pin hole, insert it smoothly into the fork hole, and secure the opening pin.

6. Assembly and Adjustment of the Arm Assembly and Fixing Bracket



7. Return spring



Install the hub brake drum assembly/hub brake disc assembly

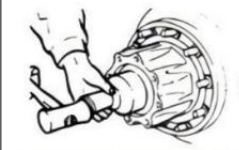
8. Apply grease to all grease nozzles

9. Hub oil seal seat ring and inner bearing ring



10. Seal the hub oil seal and fill the hub cavity with grease

11. Install the wheel hub brake drum assembly with the outer bearing inner ring



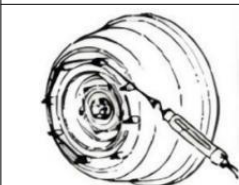
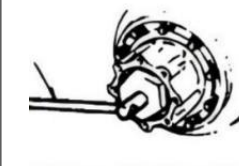
12. Install the adjusting nut and set the starting torque for the hub bearing. The procedure for single-locking nut adjustment is as follows:

① While rotating the hub or wheel, tighten the adjustment nut with a special wrench to the specified torque, then reverse the adjustment nut 1 turn and rotate the brake drum 2-3 turns;

② Repeat step 1

③ Finally, use a special wrench to tighten the adjusting nut to the specified torque, positioning the bearing. Then, reverse the adjusting nut by 1/6 to 1/4 turn, and rotate the brake drum 2 to 3 turns.

④ Install the lock plate, tighten the lock plate fastening screw, and test the hub bearing starting torque.





Install the hub brake drum assembly/hub brake disc assembly

13. The adjustment method for the double-locking nut is as follows: ① While rotating the wheel hub or wheel, tighten the adjusting nut inside the hub bearing to 136N using a torque wrench. .m (values may vary by product), then turn the nut one full turn back; ② Then, while rotating the hub or wheel, tighten the adjustment nut inside the hub bearing to 68N (the required torque may vary by product). ③ Turn the adjusting nut back by about 1/4 to 1/3 turn, install the housing, sealing ring, and locking washer, then tighten the outer locking nut of the hub bearing, and test the starting torque of the hub bearing; ④ Tighten the outer lock nut of the hub bearing to the specified torque (380–420 N·m, varying by product).
14. Check the ABS sensor signal
15. Measure the sensor's resistance using a multimeter. Set the multimeter to DC mode, rotate the hub at 30 rpm for 3 full turns, and the displayed voltage should be greater than 0.2 volts.
16. Half shaft oil seal
17. Install the half-shaft bushing and half-shaft, then tighten the half-shaft bolts (for 8.5-ton rear axles, use double-ended studs and nuts)
Tightening torque: Refer to Appendix 2
18. Install the brake air chamber assembly and connect the adjustment arm to the brake air chamber;
19. Adjust the brake clearance;
20. Turn the hex head of the adjusting arm worm clockwise with a wrench until it stops rotating. At this point, the brake friction plate will contact the brake drum. Then, rotate the hex head counterclockwise by 270 degrees (high torque will produce a clicking sound) to ensure the gap between the brake drum and the friction plate is maintained at 0.5-0.8mm.
21. After applying the brakes several times, the brake gap will automatically adjust to the normal range. This adjustment can be observed by rotating the hex nut clockwise just before the braking process ends.
22. Leak test for bridge assembly;
23. Mount the rear axle onto the vehicle frame and connect the drive shaft.

Install wheel assembly

1. Mount the wheel onto the positioning surface at the outer end of the hub and the wheel bolt.
2. Install the wheel nuts and tighten them evenly in a diagonal pattern.
3. Tighten the oil drain bolt; tightening torque: refer to Appendix 2
4. Add rear axle gear oil and tighten the oil level hole plug; tightening torque: refer to Appendix 2

Note: Gear oil must be used in the specified grade and quantity as required.

Appendix 1 Tightening torque for main reduction assembly bolt assembly

Order number	Operation content	Product model							
		3.5t	5.5t	8.5t	8.5t (new energy)	9.5t	9.5t (new energy)	153	452
2	Torque for tightening the flange nut (N·m)	220~300	350~450	850~1000	850~1000	950~1000	950~1000	500~700	550~700
5	Torque for tightening the left and right shell connection bolts (N·m)	55~75	95~145	110~150	110~150	180~240	180~240	220~280	160~220
6	Torque for tightening the driven gear connecting bolt (N·m)	120~145	185~230	240~320	240~320	490~580	490~580	530~570	580~650
8	Torque for tightening the bearing cover bolt (N·m)	120~150	300~350	430~480	430~480	520~560	520~560	680~720	680~720
12	Torque for tightening the stopper bolt (N·m)	20~30	16~30	40~70	40~70	40~70	40~70	40~70	40~70

(Note: For other bus bridges, refer to the relevant national standards based on bolt specifications.)

Appendix 2 Torque for Assembly of Bridge Assembly Bolts

Order number	Operation content	Product model					
		3.5t~5t	7t/8.5t	9t	9.5t	11 t	13 t
1	Tightening torque for main double-headed bolt (N·m)	65~80	50~70	50~70	50~70	50~70	50~70
2	Tightening torque of main connecting bolts (N·m)	65~80	100~120	130~150	Flange anti-loosening bolt: 175~225 mm; Belt washer bolt: 130~150 mm		200~240
4	Torque for tightening brake plate bolts (N·m)	180~220	Flange anti-loosening bolt 225~275 Bolt with gasket: 160~200	160~200	Flange anti-loosening bolt: 288~360 Bolt with gasket: 230~270 Cast iron bridge M14 with gasket bolt: 160~200		
5	Cavity bracket bolt tightening torque (N·m)	120~130	Flange anti-loosening bolt 175~225 Bolt with gasket: 120~130	140~180	Flange-bolting bolts: 175~225 Bolt Bolt with gasket: 120~130		120~130
9	Torque for tightening the hub adjustment nut (N·m)	200~250	300~350	400~450	400~450	400~450	400~450
12	Adjust the nut, lock plate, and screw (N·m)	---	---	10~20	10~20	10~20	10~20
14	Tightening torque for half-shaft bolt (nut) (N·m)	75~95	90~110	140~180	140~180	140~180	140~180
15	Tightening torque for half-shaft double-ended screw (N·m)	75~95	70~90	---	---	---	---
16	Cavity fastening torque (N·m)	115~140	167~186	167~186	167~186	167~186	167~186
18	Tightening torque for oiling hole plug (N·m)	70~80 N·m (with composite gasket structure) / 35~45 N·m (conical plug)					
19	Torque for tightening the drain plug (N·m)	70~80					
20	Tire bolt nut tightening torque (N·m)	M22 : 550~600 ; M20: 480~550 ; M18 : 380~420					

Schedule 3 Other Maintenance Reference Standards

Order number	Project	Maintenance standard	Repair limit	Wear limit
1	Gap between differential planetary gears and cross shaft (mm)	0.10-0.14		0.30
2	Gap between half-shaft gear boss and differential housing (mm)	0.21~0.31		0.60
3	Tooth side clearance of the driving and driven gears (mm)	0.20~0.35	0.60	
4	Gear clearance between half-shaft gear and planetary gear (mm)	0.25~0.35	0.50	
5	Interaxle differential planetary gear clearance (mm)	0.15~0.25	0.45	
6	Radial runout of brake drum (disc) (mm)	0~0.1	0.2	
7	Drum friction plate thickness (mm)		12~13	8.5
8	Camshaft and bushing clearance (mm)	0.40~0.46		0.70
9	Horse hoof axle and degree (mm)	0.16~0.26		0.56
10	Main spindle bearing preload (Kg)	0.8~1.5		
11	Differential bearing preload (Kg)	16~22		
12	Drum brake clearance (mm)	0.5~0.8		
13	Disc brake clearance (mm)	0.7~1.2		
14	ABS signal value (V)	>0.2		



Common Fault Analysis

Fault performance	Analysis of causes	Processing method
Transmission noise	1. Improper gear clearance in the differential	Replace the thrust washer or gear
	2. Excessive clearance between the driving and driven gears	Replace the thrust washer or gear
	3. Insufficient preload of the sun gear bearing	Adjust preload
	4. Wear or damage of half-shaft gears, planetary gears, cross-shaft thrust washers, etc.	Correct or replace the faulty parts
	5. Low oil level	Add more lubricating oil
Lubricating oil leakage	1. Wear, loosening, or damage of the oil seal	Replace the oil seal
	2. The reducer's fastening bolts are loose.	tighten according to the specified torque
	3. Sealant damage	reapply sealant
	4. Loose bearing housing fastening bolts	tighten according to the specified torque
	5. Loose oil drain plug or damaged gasket	Tighten the plug or replace the gasket according to the specified torque.
	6. Overload causes deformation of the bridge shell	Calibrate or replace the bridge housing
	7. The ventilation plug is blocked or damaged	Clean or replace the ventilation plug
Hub bearing lag	1. Excessive preload on the hub bearing	Adjust preload
	2. Bearing lacks lubrication or incorrect grease application	Add or replace the grease
	3. The bearing is covered with dust.	Clean and lubricate
	4. Water ingress caused by a faulty sealing ring	Replace the sealing ring

Common Fault Analysis

Insufficient braking force	1. Camshaft rotation is not smooth	Check the camshaft's operational condition and replace it if necessary. Inspect the bushing for lubricant deficiency.
	2. Improper adjustment of the brake chamber push rod stroke	Adjust the schedule
	3. Overheating or degradation of brake friction pads	Replace the friction pads
	4. Improper contact of brake friction pads	Correct the friction pad alignment
	5. Brake drum water ingress	During the journey, gently press the pedal to drain the water.
	6. The friction pads and brake drums are lubricated with grease.	Remove grease or replace the friction pad
	7. Insufficient brake air pressure and inadequate air supply	Check the pneumatic piping and all valves.
	8. Adjustment arm failure	Re-adjust or replace the adjustment arm
Braking noise	1. Friction plate wear causes bolt protrusion	Replace the friction pads
	2. Surface hardening or degradation of the friction plate	Replace the friction pads
	3. Uneven wear of the brake drum or poor installation	Calibrate the brake drum or tighten the bolts
	4. Loose contact angle between brake shoe and friction plate	Tighten the connecting bolts
	5. Loose brake shoe fixing pin	Tighten the locking screw of the fixing pin
	6. Hub bearing wear	Replace hub bearing
	7. Brake drum deformation	Calibrate or replace the brake drum
Unstable braking	1. Improper installation of brake shoes	Tighten the locking screw of the fixing pin
	2. Damage to the return spring	Replace the return spring
	3. The friction plate shows oil stains or deterioration	Clean or replace the friction pads
	4. Brake pad damage	Change the brake plate
Wheel stinging	1. Poor camshaft lubrication or failure of the adjusting arm to return to its position	Calibrate faulty components
	2. Fracture or fatigue of the brake shoe or air chamber return spring	Replace the faulty component

List of vulnerable parts

Oorder number	Figure number	Name	Quantity
1	Refer to the relevant spare parts catalog for specific part numbers	oil seal assembly-half shaft	2
2		pad half shaft	2
3		oil seal assembly-rear hub	2
4		brake friction plate (disc type)	4
5		drum brake friction plate	8
6		rear brake disc	2
7		rear brake drum	2
10		oil seal assembly-main cone	1
11		rear tire bolt	20
12		outer bearing-active bevel gear	1
13		internal bearing-active bevel gear	1
14		positioning bearing-active bevel gear	1
15		bearing-differential	2
16		inner bearing-rear hub	2
17		outer bearing-rear hub	2
18		Sealing washer-plug	2

Maintenance Instructions for Air Suspension System

Requirements for vehicle maintenance

During vehicle maintenance, the "safety operating procedures" must be strictly adhered to. The vehicle should be unloaded and parked on a clean, flat surface, preferably on a repair ditch, with the parking brake engaged and wheels secured. According to the repair requirements, determine whether to use appropriate jacks or supports to elevate the frame to the required height and ascertain whether tire removal is necessary.

Inspection of Air Spring

check that the suspension height or air spring height is correct, with an allowable error of no more than 5mm. If necessary, refer to the 'Adjustment of Height control valve' section in the 'Maintenance Manual' to adjust the suspension height or air spring height to the correct value.

when the supply pressure exceeds 6.1 bar, inspect the air spring inflation for normality, verify the consistency of firmness between both sides of the same axle, and check for wear, damage, or abnormal bulging. The air spring should maintain a 25mm clearance around its periphery.

If the air spring fails to maintain its height for an extended period after parking or even collapses, the air supply system's piping should be inspected with soapy water, paying special attention to pipe joints to identify and eliminate any leaks.

推力杆
Thrust Rod / Torque Rod

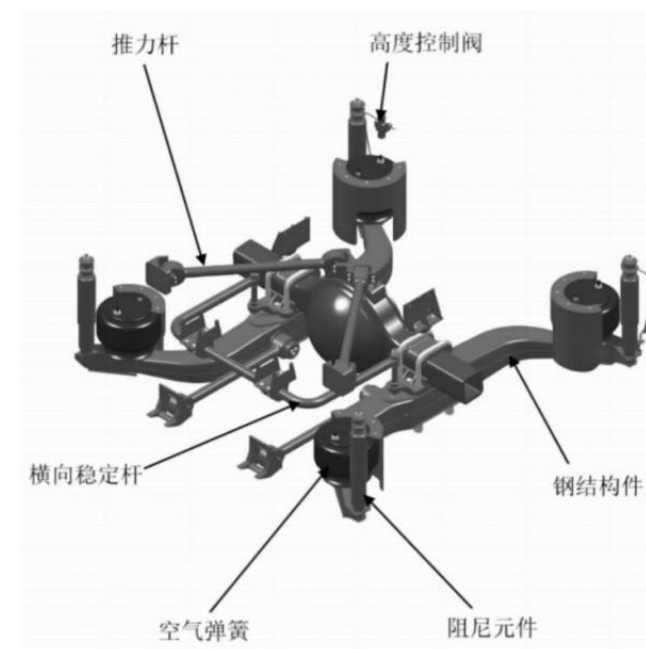
高度控制阀
Height Control Valve

横向稳定杆
Stabilizer Bar / Anti-roll Bar

钢结构件
Steel Structural Component

空气弹簧
Air Spring

阻尼元件
Damping Element

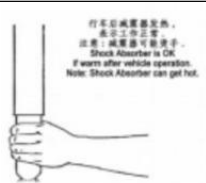


Replacement of Air Spring	1) Use a jack or support to elevate the vehicle frame slightly above the standard suspension height. 2) Air spring deflation 3) Disassemble the connector at the lower end of the flexible linkage of the height control valve (do not loosen the hose connector to maintain the same length of the flexible linkage during reassembly). Rotate the control arm of the height control valve downward to release the air from the air spring. 4) Disconnect the air intake pipe from the air spring. 5) Remove the damaged air spring. 6) Install new air springs (split-type air springs; bladder replacement details are listed in the table below). The air spring cover plate must fit snugly against the chassis beam or mounting plate, and fasteners should be tightened to the specified torque (refer to the torque tables for each suspension model). Ensure the correct type of air spring is installed. 7) Connect the air spring supply pipe to the flexible linkage's lower end joint and the height control valve. 8) Remove the jack or support. 9) Start the engine to reach the system pressure required to shut down the air compressor. Inspect the system for leaks using soapy water and verify proper inflation of the air spring. Check that the clearance around the air spring within 25mm and the suspension height or air spring height are correct.	
	10) Install a new sac membrane without tools, as follows:	
	a) Clean the edges of the air spring cover and base, and apply soapy water to the cover and base at the pouch pick-up opening. b) Forcefully press the new sac to the height of one hand while simultaneously pushing the middle sac inward.	
	c) Place the folded sac membrane between the base and the air spring cover, with the narrow end of the conical sac membrane secured to the base.	

Replacement of Air Spring	d) Install the lower edge of the bag skin onto the base, and attach the upper edge to the air spring cover.	
	e) Inflating the air spring is intended to press the bladder edge against the air spring cover and base, after which a click sound will be heard, indicating the bladder has been pressed in.	
	f) Lower the vehicle height to allow the airbag to automatically deploy into the base, completing the installation of the split-type airbag system.	

Inspection of shock absorber

When the suspension height or air spring height is correct, measure the shock absorber length to verify its normality. Inspect the shock absorber for scratches, wear, or oil drips to ensure proper functioning. After the vehicle has traveled a certain distance, the shock absorber should warm up. A simple method to check its normal operation is shown in the figure.



Determination of Oil Leakage Fault of Shock Absorber



Replacement of shock absorber

- 1) Remove the upper and lower mounting bolts or nuts from the shock absorber, then disassemble the shock absorber.
- 2) Replace with new shock absorbers and tighten the fastening nuts to the specified torque.
- 3) Inspect the clearance around the shock absorber to ensure no interference with other components during operation. After inflating the air spring to normal pressure, verify the shock absorber length is correct. If abnormal, identify and resolve the issue.
- 4) After the vehicle has traveled a certain distance, check whether the shock absorber is functioning properly (it should be warm).

Note: Shock absorbers and air springs must be matched according to the suspension model. Ensure proper installation.

The correct type of shock absorber must be used, otherwise the performance and service life of the air suspension system will be reduced, and the air spring and shock absorber will be damaged quickly.

Maintenance and Inspection of Pressure Protection Valve

1) Maintenance of pressure relief valves: Periodically drain water vapor from the gas storage tank. Approximately every 3 months

(For harsh environments, the length should be shorter.) Remove the filter element and O-ring from the bottom of the pressure relief valve, clean and inspect the filter element for damage. Replace if necessary. When installing the O-ring and filter element, tighten them manually only.

2) Inspection of Pressure Protection Valve

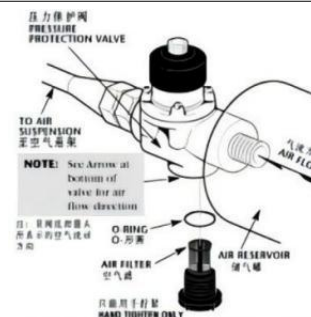
a) During each brake system inspection, verify that the pressure relief valve is functioning properly.

b) The pressure relief valve is set to open at 6.1 bar and close at a minimum of 5.2 bar. During inspection, disconnect any joint on the air suspension line connected to the valve's outlet. When the air tank pressure exceeds 6.1 bar, the valve opens and air flows out. The valve should automatically close before the pressure drops below 5.2 bar, preventing air leakage.

If these functions fail to operate and no other fault causes can be identified, the pressure relief valve should be replaced.

Replacement of Pressure Protection Valve

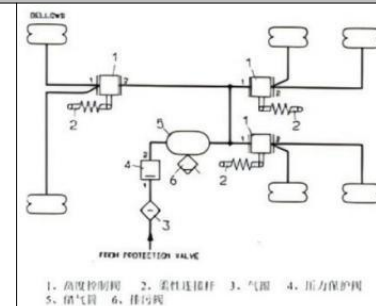
Remove the old pressure protection valve and install the new one in the airflow direction indicated by the arrow at the valve's base. Check that the valve operates normally as described above, then connect the valve outlet fitting. When the supply pressure reaches the system's maximum allowable pressure of 6.9 bar, verify the system is leak-proof.



1) Perform periodic visual inspection to ensure sufficient clearance around the valve. Within the dynamic travel limit range of the axle, neither the valve control arm nor the connecting rod should exhibit any interference. Inspect the horizontal control rod of the valve for damage (refer to the attached diagram).

3) Perform regular maintenance of the gas supply system to remove contaminants and foreign particles from the air pipelines, preventing interference with valve operation. Do not use grease-lubricated valves. Regularly release water vapor from the gas storage tank. Under cold climate conditions, it is recommended to use a desiccant and/or alcohol evaporator to prevent valve freezing or damage to the height control valve.

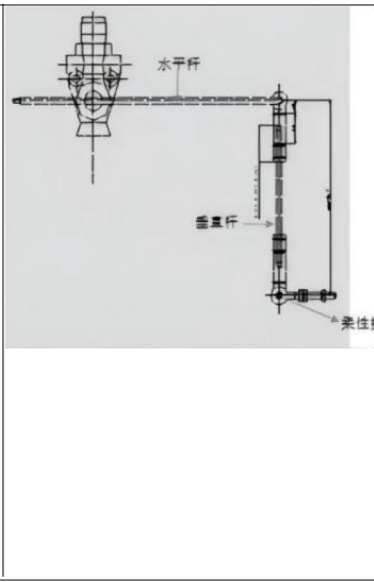
- 1) Install a pressure relief valve in front of the dedicated air reservoir for air suspension. Note: Install it according to the arrow direction marked on the valve body.
- 2) Assembly of air inlet and outlet pipe joints. Note that all pipe joints must be coated with sealant (sealant should be applied to all joints in the entire air system, including the braking system).



1) The high-control valve can be installed in either vertical (with the control arm extending leftward or rightward) or horizontal (with the control arm extending leftward or rightward) configurations. For vertical installation, the control arm must be inserted through the hole marked with a ">" symbol. For horizontal installation, the positional relationship between the control arm and the hole marked with a ">" symbol is illustrated in the diagram.

3) The installation position of the high-control valve must be carefully considered to ensure proper positioning:

- a) Facilitates inspection, maintenance, and servicing of the height control valve;
- b) When the chassis (whole vehicle) is at normal suspension height, the height control valve lever must be kept horizontally.
- c) Sufficient clearance must be maintained around the horizontal and vertical linkage rods of the high-control valve, ensuring no interference occurs during the axle's dynamic stroke (90 mm up and down).
- d) The horizontal rod of the height control valve must be no less than 160mm from the rotation center of the valve to the center of the flexible joint, and it must be ensured that the horizontal rod and the vertical rod do not overlap or form a straight line when the axle reaches its maximum stroke.



Air Suspension System Debugging and Testing

Use a gas pump or start the engine to inflate the air suspension supply line. When the pressure reaches the pump's automatic shutdown threshold, perform the following checks:

1. When the pipeline pressure reaches 6.1 bar, the pressure relief valve opens, initiating air spring inflation. The suspension height gradually increases until the height control valve's horizontal rod returns to its neutral position, at which point the air spring inflation stops.
2. Check whether the air spring height meets the design specifications.
3. If the air spring height deviates from the design specifications, adjust it according to the "Height Control Valve Adjustment Method and Steps".
4. When the air spring is designed with sufficient air volume, there should be 25 mm (radial) clearance around the air spring, and the bladder skin on the same bridge must maintain consistent firmness. Note:
 - 1) Under chassis conditions, the air springs in the front suspension may exhibit insufficient inflation or even sag due to low axle load, where the frame can be supported to its designed height with minimal air pressure—a normal phenomenon that resolves upon loading.
 - 2) Test the pipeline system for leaks using soapy water.
 - 3) After releasing air from any pipe joint downstream of the pressure relief valve outlet, when the pipeline system pressure drops to 5.2 bar, the pressure relief valve shall automatically close. No air shall continue to escape from the loosened joint, ensuring sufficient brake system pressure remains.

Adjustment of high level control valve

- 1) Park the vehicle on a level surface and verify the height control valve's correct installation. The arrow's direction must comply with the requirements of "Height Control Valve Installation (1)". Start the engine or use an air source to maintain a pressure range of 6-8 bar, at which point the air spring will begin inflating.
- 2) Remove the rear air spring height adjustment rod and inflate only the two front suspension air springs. Check if the front suspension air spring height meets $H \pm 5\text{mm}$. If not, adjust the vertical tie rod length to correct it.
- 3) Install the rear air suspension height adjustment rod as specified for height control valve installation. Verify that the average height of the single-side air spring meets the $H \pm 5\text{mm}$ tolerance. Similarly, adjust the vertical tie rod length to ensure the air spring height conforms to the design specifications. Repeat this process to adjust the front and rear air springs on the opposite side until they also meet the design requirements. Note that after adjusting the other side, the height of the original side air spring may change, requiring recalibration.
- 4) When the height difference between the front and rear air springs on one side exceeds 5mm, adjust the length of the lower longitudinal thrust rod. If the rear air spring is taller than the front one, shorten the length of the corresponding side's lower thrust rod. Similarly, if the rear air spring is taller than the front one, shorten the length of the push rod on the same side should be extended until the air spring height meets the design requirements.

Detection and adjustment of rear axle positioning

When the air spring is fully inflated to meet the design specifications, perform the following adjustments and inspections:

- 1) Positioning requirements for the rear axle and frame:

- a) Centerline deviation of the rear axle (top view): $\leq 5/1000$ mm;
b) Offset between the rear axle centerline and the frame centerline (left-right direction): ≤ 5 mm.

2) Adjustment Method

2) **Adjustment Method**
The positioning of the axle can be adjusted by adding or removing adjustment shims between the thrust rod and its support in the rear air suspension system. For an axle centerline deviation, install additional shims on the forward-leaning side (or remove shims on the reverse side). Similarly, for lateral displacement between the axle center and the frame center, install shims on the offset side (or remove shims on the opposite side).

3) Detection Methods

Take 1 point in the front and 1 point in the back of the center of the axle, and measure the vertical distance from each point to the longitudinal beam of the frame. The maximum difference of the 4 distances should not be more than 5mm.

Detection and adjustment of front axle positioning

When the air spring is fully inflated to meet the design specifications, perform the following adjustments and inspections:

- 1) Positioning requirements for the front axle and frame

- a) Centerline deviation of the front axle (top view): $\leq 5/1000$ mm;
b) Offset between the front axle center and the frame centerline (left-right direction): ≤ 5 mm.

2. Adjustment Method

The rear tilt angle of the main pin of the front suspension system and the positioning dimension of the axle and the frame can be adjusted by adding or removing the washer between the thrust rod and the bracket.

3. Detection Methods

The two center holes of the axle plate and the two symmetric holes on the left and right longitudinal beams of the frame are taken as the reference, and the diagonal error between the two center holes of the axle plate and the two symmetric holes on the left and right longitudinal beams of the frame is measured.

The diagonal error must not exceed 5mm per 1000mm length.

Parameter checkout

- 1) Axle distance diagonal error: $\leq 10\text{mm}$. Inspection method:

- The vehicle is parked on a hard, flat surface with the steering wheels facing forward.
- At the hub centers of both front and rear axles, hang vertical lines from the ground and mark them;
- After removing the vehicle, the diagonal error between the two marked points should not exceed 10mm.

- 2) Air spring installation height: $H \pm 5\text{mm}$ (front and rear shock absorbers installation height: $H \pm 5\text{mm}$)

- a) Adjustment method: Adjust the front and rear height control valves of the suspension system

- b) Measurement method: With the bottom surface of the air spring base as the reference, measure the distance H from the base bottom surface to the upper plane of the air spring to ensure compliance with the required height. The allowable error should not exceed $\pm 5\text{mm}$.

- 3) Height difference between the upper surfaces of the frame (left and right): ≤ 10 mm for the front axle and ≤ 10 mm for the rear axle.

Maintenance Notice of Drive Motor and Controller

Safety Precautions

1. After installing the motor, do not touch its high-voltage terminals!
2. The motor housing must be grounded using a dedicated grounding wire, with the cross-sectional area of the cable being at least 0.5 times that of a UVW three-phase high-voltage line, ensuring reliable grounding.
3. As a high-voltage electrical component, the motor requires power-off operation during maintenance!
4. After power-off, if residual voltage remains in the drive unit, do not touch internal circuits or components immediately. Wait for 5 minutes. Before disconnecting or connecting high-voltage connectors, always use a multimeter to check for residual voltage at the high-voltage terminals.
5. The metal casing of the motor may become hot after use. Do not touch it directly after shutdown to avoid burns!
6. During motor disassembly and assembly, ensure three-phase wires and low-voltage signal lines are not scratched. If you need to disconnect the low-voltage wiring, first remove the mechanical protective cover from the connector. Never forcibly pull the low-voltage signal wire from one end of the motor.
7. The internal electronic components of the drive are sensitive to static electricity. Do not insert foreign objects or touch the circuit board!

Maintenance requirement

1. Personnel requirements: Before performing maintenance on the motor system, maintenance personnel must undergo training to ensure they are aware of safety precautions, familiar with the measurement equipment and tools used, and understand the operational requirements.
2. Maintenance Site and Environmental Requirements: Open-air maintenance operations must be avoided under conditions with sandstorms, rain, or snow. If such conditions are unavoidable, appropriate protective measures must be taken to prevent sand, water, or other contaminants from entering the motor system. Maintenance Scope: The scope is limited to external interface components. Opening the motor's end cover or housing for internal maintenance is strictly prohibited. Improper opening may cause permanent motor damage, serious personal injuries, or significant property loss. The company shall not be liable for any consequences arising from such actions. For internal motor system malfunctions, please contact CHTC KINWIN AUTO Bus after-sales service personnel.
3. Upon receiving a fault alarm, follow the alarm instructions and consult this manual for preliminary troubleshooting. If no obvious insulation damage or circuit faults are detected, restart the power supply and conduct another test. Resume operation once the alarm ceases, and technicians must document the fault for future reference. Should the alarm persist, notify maintenance personnel for repairs. Non-technical personnel must not open the casing or enclosure to avoid unnecessary damage.

Product environment and cooling requirements

Electric drive products have specific environmental and cooling requirements, as detailed in the table below:

Project	Ask	Remarks
Coolant temperature at work	-40°C to 85°C	Not exceeding 65°C under full performance conditions
Working environment temperature	-40°C to 85°C	Not exceeding 75°C under full performance conditions
Storage temperature	-40°C to 85°C	
Coolant specification	40% deionized water, 60% ethylene glycol	

Coolant Usage Instructions

To ensure the service life and optimal performance of the electric drive system, special attention should be paid to the use of coolant, as follows:

1. The coolant composition must contain 40% deionized water and 60% ethylene glycol, in compliance with the NB/SH/T 0521-2010 standard.
2. When replenishing coolant, it is prohibited to add tap water, mineral water, or distilled water, and the mixing of different brands or specifications of coolant is strictly forbidden.
3. The coolants should be replaced every 2 years or 50,000 km (whichever comes first), with the replacement interval potentially shortened under harsh operating conditions.
4. Before replacing the coolant, thoroughly clean the cooling system with deionized water.
5. If coolant is frequently low, first check for leaks in the cooling system, then repair and replenish the coolant.
6. The motor controller housing features a coolant warning label on its surface.

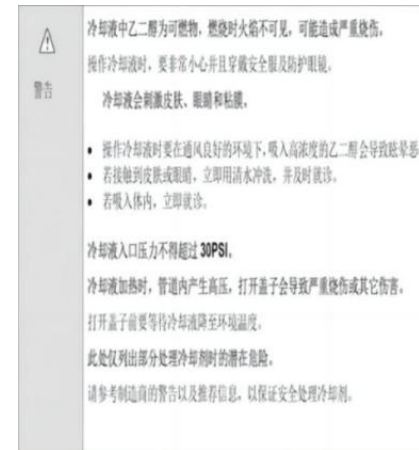


Note: Before filling, flush the cooling circuit with deionized water (to remove impurities). Ethylene glycol must contain a specific type of active corrosion inhibitor. Ethylene glycol must comply with the standards corresponding to its application (light ASTM D3306 Type III or heavy ASTM D6210 Type III).

The coolant composition is 60% ethylene glycol and 40% deionized water (minimum 50% ethylene glycol and 50% deionized water to ensure adequate corrosion resistance). Mixing two or more different types of coolants is not recommended.

To ensure the proper operation of the electric drive system, the cooling system must meet the specified requirements and maintain the required flow rate.

If the temperature of the system is too high due to the failure of the cooling system, the electric drive system will enter the derating state, and the temperature will exceed the limit, and the system will automatically protect and stop.



Note: If you need to remove the cooling water pipe during maintenance, ensure the cooling system temperature has cooled to room temperature before proceeding.

During operation, note that disassembling the tubing may cause coolant leakage. Use an appropriate container to collect the coolant and avoid direct skin contact with the coolant.

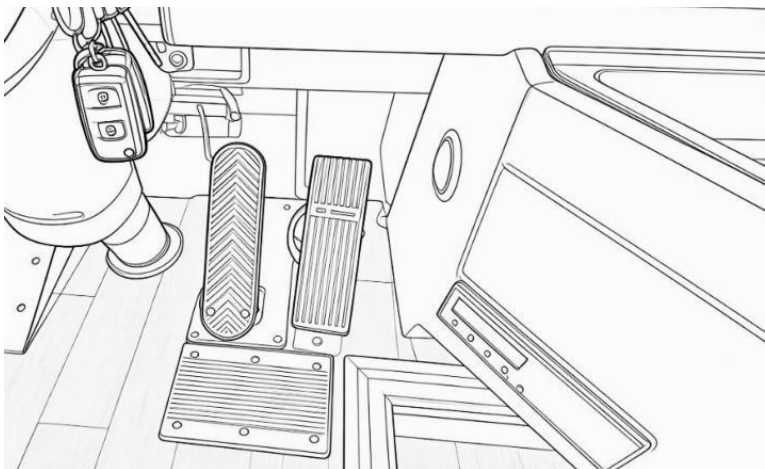
Other key security matters

It is forbidden to plug and unplug the vehicle controller, motor and motor controller plug-in, which will cause the hardware damage of the electronic control system. When performing wiring tasks, protective measures must be taken for the vehicle controller, motor, and low-voltage connector of the motor controller to prevent burn injuries from nearby wiring harnesses.

Direct high-voltage power supply to the motor controller without pre-charging circuit is prohibited, as it may cause capacitor damage.

Unauthorized opening of the entire housing, replacement of components, modification of parts, alteration of peripheral electrical circuits in the electric drive system, or use of non-original spare parts are strictly prohibited.

Check of free travel of brake pedal



1. Lightly press the brake pedal to check its free travel, with a normal range of 10- 15mm
2. The brake pedal should not feel stiff when fully depressed.
3. The exhaust sound should be heard when the brake pedal is released.

Turn check

A. Check the steering fluid

Before driving each day, visually inspect the steering reservoir, oil pipe joints, and steering gear for any leaks. If leakage is detected, repair it promptly. Contact CHTC KINWIN AUTO's after-sales service team if necessary.

The requirement is met if the liquid level in the oil tank is between the 'MAX' and 'MIN' mark lines.

If the fluid level is at or below the 'MIN' mark, add steering fluid to position it slightly above the 'MAX' and 'MIN' markings. After refilling, if the fluid level drops rapidly, visually inspect the parking area for hydraulic oil leaks.

If steering fluid leakage is detected, immediate repair is required. Contact CHTC KINWIN AUTO's after-sales service team if necessary.

B. Add steering fluid

Inspect the steering oil tank every 3 months or 15,000 kilometers, and add the specified oil as per the CHTC KINWIN AUTO vehicle Maintenance Manual when necessary. Refer to the chassis system oil (Fluid) List in this manual. Using the types of power steering fluid or automatic transmission oil may damage the steering system. Procedure for adding steering fluid:

- 1) After powering on the vehicle, turn the steering wheel two to three times in place, then disconnect the power after five minutes.
- 2) Open the front hood and the steering tank end cap, fill the steering fluid to the "MAX" level, then tighten the end cap.
- 3) Repeat step 1.
- 4) If the oil tank level has not reached the "MIN" line, repeat the above steps.
- 5) Tighten the steering oil tank end cover.

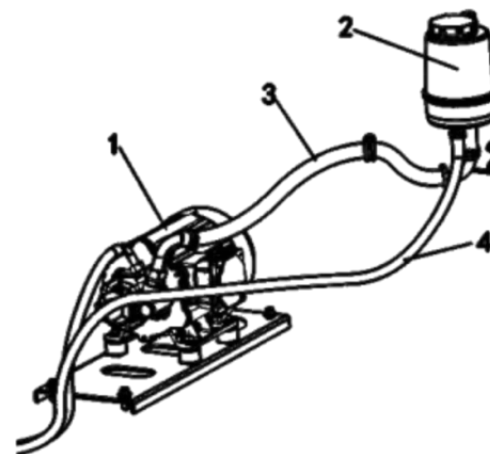


Diagram of position of all parts of steering system

1. Electric steering oil pump
2. Steering oil tank
3. Steering oil inlet pipe
4. Steering oil return pipe

C. Replace the steering fluid

(1) The oil should be replaced promptly after every 20,000 km, along with the replacement of the filter element in the oil tank. The filtration precision of the filter element shall not be less than 30 μm . During use, regularly check whether the oil level in the tank is insufficient, whether the oil has deteriorated, or whether there are excessive impurities. If any adverse conditions are detected, the oil should be replenished or replaced immediately.

(2) Fuel change procedure:

a. Lift the front axle, or disconnect the tie rod from the vertical arm.
 b. Open the fuel tank cover and either loosen the steering gear drain bolt or release the steering gear outlet. Rotate the steering wheel to its extreme positions repeatedly to drain residual oil from the pump and tank. If necessary, idling the engine and making several full turns to the extreme positions until no oil flows from the outlet.

c. Tighten the steering gear oil drain bolt or connect the steering gear oil outlet.

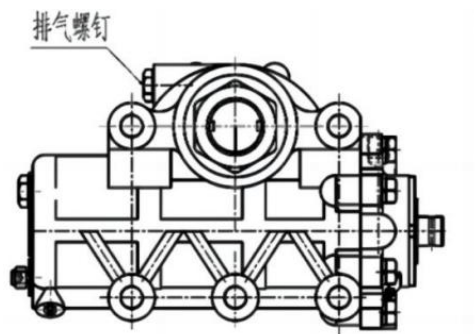
d. Remove the filter cartridge from the oil tank, clean it thoroughly, and reinstall it. Then fill the tank with clean hydraulic oil.

operate the oil pump motor and turn the steering wheel to the extreme positions several times, while simultaneously injecting oil into the steering tank until the oil level in the tank stops dropping and no bubbles are produced. If the steering gear adopts a horizontal arrangement, the exhaust screw of the steering gear must be manually unscrewed.

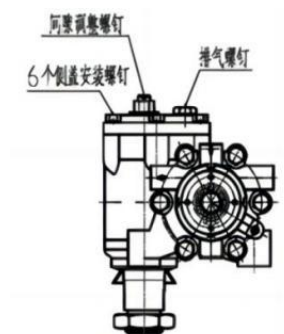
e. Drive two rounds before performing exhaust. After completing the exhaust, tighten the exhaust screw to a torque of $(80-100)\text{N}\cdot\text{m}$.

(1) When the steering gear assembly is installed with its belly facing upward, the exhaust screw should be positioned as shown in Figure A below:

(2) When the steering gear assembly is installed with its side cover facing upward, the exhaust screw is positioned as shown in Figure B above:



graph A



graph B

f. Add oil to the tank until the oil level reaches the marked mark.

g. Tighten the lid of the oil tank.

h. Power steering oil: It is recommended to use No.8 hydraulic transmission oil from Shanghai Refinery and Lanzhou Refinery.

The oil must be clean.

i. Selection of steering oil pump: Choose the appropriate steering oil pump based on the vehicle's performance requirements and the basic parameters of the power steering system.

j. When installing the steering tie rod, align the wheel properly and ensure it is aligned with the mark line on the steering arm shaft.

k. The steering gear should have no external leakage.

D. Steering wheel inspection: During maintenance every 15,000 km, the steering wheel's free rotation range should be checked. The value at the neutral position should be:

1) Check if the clearance of the front wheel hub bearing is excessive; if so, adjust it.

2) Inspect the steering tie rod and direct pull rod joints for looseness; replace them if found loose.

3) Check the fit of the ball pin of the steering tie rod with the taper hole of the upper and lower arm.

4) Check for looseness in the spline connection between the steering vertical arm and the steering knuckle shaft, as well as the securing bolts.

E. Adjustment of the Steering Mechanism

1) If the steering gear or tie rod needs to be disassembled, the steering mechanism must be readjusted.

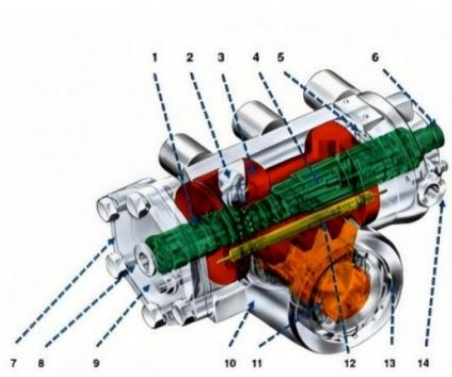
2) When replacing the steering gear, the installation surface must be free of paint and grease.

3) When assembling the steering mechanism, the front wheel should be oriented straight ahead. Align the dust cover on the input end of the angle transmission with the mark on the housing, the input end of the steering gear with the mark on the housing, and the sector shaft of the steering gear with the mark on the steering vertical arm.

4) When installing the steering tie rod, ensure its swing angle does not exceed the initial setting angle of the limit bolt to prevent the steering limit bolt from failing when tightening the locking nut. Avoid striking the tie rod during installation.

i Pay attention to

When changing the steering fluid, collect the used fluid carefully and avoid dripping it onto the vehicle body or components. If any spills occur, wipe them off immediately.



Internal structure of steering gear

Order number	Name
1	worm
2	steel ball
3	plunger
4	torsion lever
5	pressure limiting valve
6	input axis
7	cylinder head cover
8	steering gear return oil port
9	adjusting bolt
10	monoblock
11	sector shaft
12	steer limit valve
13	shell cap
14	steering gear inlet

The steering wheel feels heavy and stiff.

1. The tire pressure is abnormal.

2. The oil level is too low;

3. Pipeline deformation (as shown in the figure);



4. Failure of booster pump;

5. Check for interference clearance in the steering linkage components (e.g., tie rods, tie bars, etc.);

6. Check for interference clearance in the steering knuckle assembly (e.g., main shaft, bearings, etc.);

7. Overload: Is the load on the steering axle within the design limits? (Note: This issue becomes more pronounced during downhill driving or when using a trailer.)

8. Steering oil temperature affects premature unloading

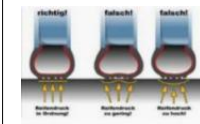
9. The steering system failed due to contamination. Remove the filter element to check its cleanliness (Note: The steering system cannot function without a filter element).

10. Abnormal inner diameter of the oil tube hole

11. Steering heaviness or lock-up caused by non-genuine steering gear or power steering pump



Note: A slightly heavier steering feel under heavy load compared to an empty vehicle is normal. Check if the steering axle load exceeds the design capacity.



Common Faults and Troubleshooting Methods of Steering System

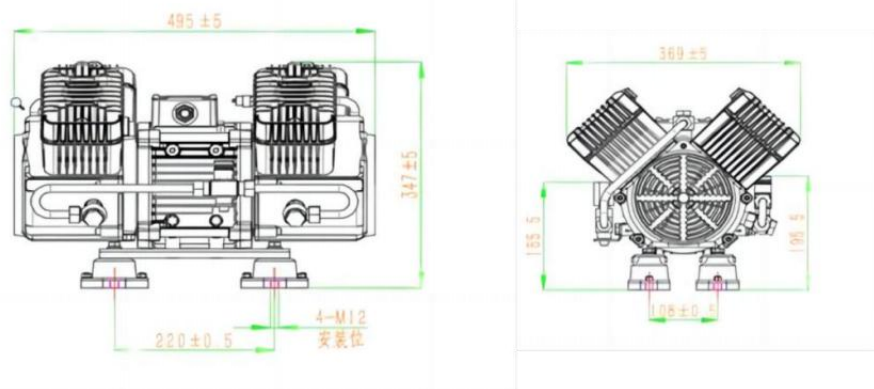
Steering gear oil leakage	
The oil leakage location in the steering gear is shown in the figure. This is not the described position, and it is not an oil leakage in the steering gear.	
Method of judgment: 1. Turn off the engine and clean the oil leak. 2. Start the engine and manually rotate the steering wheel in both directions for 5 minutes. 3. Check for oil leakage at the leak point; (Note: If the leak cannot be confirmed during on-site testing, wipe the leak point clean and let the vehicle run for a while before retesting)	
Rx →As shown in the diagram, oil leaks at positions 2, 5, and 7. We can retighten the limit bolts (P.2) to 12+3Nm according to the specified torque. P.5 Oil drain plug (50 Nm) P.7 Pressure relief valve (30+10 Nm) Oil leakage at positions 1, 3, 4, and 6 as shown in the diagram. Replace with a new unit.	

Eyeballing		
Oil level inspection	During engine operation, ensure the oil level is between the upper and lower marks on the fuel tank gauge.	
	Check the oil level and oil mark when the engine is off. If the oil level is too low, it may cause steering system failure.	
Oil inspection	Normal oil should be clear or exhibit a glossy appearance.	
	If the fruit oil turns black or develops an unpleasant odor, replace the oil.	
Eyeballing	Check the lubrication of the steering system mechanical connectors	
	Check the oil level and steering oil in the steering oil tank, and ensure the filter element is clean and functional.	
	Check for damage or deformation of the steering tie rod and pressure bearing	
	Start the engine and gently turn the steering wheel to check for excessive clearance or gaps in the mechanical connections.	
	Support the steering axle to shake up and down, then check the steering knuckle for any gaps.	
	Start the engine and inspect the steering hydraulic system for any oil leaks.	

Maintenance of Air Compressor

Install

The exterior design and installation dimensions of the vehicle-mounted oil-free piston air compressor are shown in the figure below.



Note: The air compressor must be properly grounded to ensure safe operation.

1. Air ducts must be installed by certified professionals. The duct dimensions should match the air compressor's exhaust capacity and pressure. The exhaust pipe should be positioned below the exhaust port height to facilitate condensate drainage, prevent ice buildup from freezing the duct, and ensure easy replacement. A flexible hose is recommended for the exhaust port to avoid damage from vibration-induced rigid connections. For vehicles sold in cold regions, the exhaust duct should be insulated with thermal materials or equipped with heating insulation devices.

2. The air compressor must be installed horizontally with secure connections, leaving a clearance of at least 100mm on all sides for maintenance. The installation area must have good ventilation, and the fan must be protected from below.

3. During installation and transportation, avoid moving or pulling the air inlet/outlet pipes, as this may cause deformation or breakage, which could impair the machine's performance.



Operate

1. Before startup, inspect the unit and remove any foreign objects to ensure there are no obstructions.
2. Before startup, ensure electrical and piping connections are correct.
3. After startup, inspect the pipeline connections for any leakage. If leakage is detected, immediately discharge the pressure after shutdown. Never disassemble machine components while the air compressor is in operation or when internal pressure exists to avoid injury.
4. The operating pressure of the air compressor must not exceed the rated pressure specified on the nameplate.
5. In case of any abnormality during operation, immediately shutdown the machine and disconnect the power supply. The inspection and repair shall be performed by trained personnel or the company's maintenance staff.

Inspection of the working condition of the air compressor

1. Open the drain valve to discharge the condensate water during shutdown.
2. Clean the motor, air filter cartridge, and cooler surface of dust using compressed air (air gun).
3. Connect the vehicle to power, start the air compressor, and check for any abnormal noises during operation.
4. After the air compressor starts, once it reaches the working pressure, compressed air begins to discharge from the air dryer. The system will emit a 'puff' sound and the compressor will shut down, indicating a normal startup.
5. Inspect all valve bodies and pipe joints for leaks.
6. Check the connection status of all fasteners.

Maintenance and Care

Relief valve

The safety valve is preset according to the air compressor pressure. Do not modify or replace it without authorization.

Inspection and maintenance schedule of vulnerable parts

Note: The warranty is valid only when using original parts from the manufacturer and following the maintenance procedures specified in the table below.

o: Indicates wear parts requiring inspection or cleaning. Replace them if any abnormalities are detected during inspection.

o: Indicates a maintenance part. Replace it on schedule.

-: No action required.

For the following maintenance cycles, mileage and time are subject to whichever comes first. In harsh operating conditions, shorten the air filter replacement interval to maintain internal cleanliness of the air compressor. During each maintenance, inspect the relevant seals. If any abnormalities are detected, contact a qualified technician immediately for repair.

Maintenance and Service Life Table of 4KW						
Order number	Maintenance items	Maintenance content	Quantity	Monthly maintenance	Minor maintenance	Major maintenance
				Monthly and/or 5,000 km per trip	6 months or 30,000 km	2 years/once or 100,000 km/time
1	Clean and replace the air filter element	Primary filter element	1	o	●	●
		Secondary filter element	1	o	●	●
2	Clean the cylinder cooling air duct	Remove dust and debris		o	o	o
3	Check the fan	Is there any unusual noise during operation?	2	o	o	o
		Clean the dust				
4	Plunger	Check and replace	4	-	-	o
5	Piston pin assembly	Renewal	4			●
6	Connecting rod assembly	Renewal	4	-	-	●
7	O molding ring	Check and replace	4			●
8	Relief valve	Renewal	1			●
9	Bearing	Renewal	4			●
10	Shock absorber	Check for aging	4			o
11	Pencil	Is there any looseness?				
		Is the seal normal?		o	o	o
12	Air intake hose	Check if the intake pipe is ruptured	-	o	o	o
13	Escape-pipe	Check if the exhaust connector is become less crowded		o	o	o
14	Fan housing	Remove the attachments.			o	o

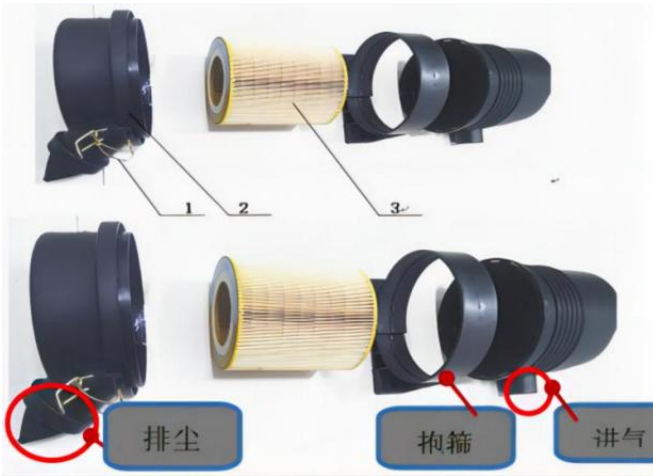


2.2/3KW Maintenance and Service Life Table of Wear Parts						
Order number	Maintenance items	Maintenance content	Quantity	Monthly maintenance	Minor maintenance	Major maintenance
				Monthly and/or 5,000 km per trip	Every 6 months or every 30,000 kilometers	2 years/once or 100,000 km/time
1	Clean and replace the air filter element	Primary filter element	1	○	●	●
		Secondary filter element	1	○	●	●
2	Clean the cylinder cooling air duct	Remove dust and debris		○	○	○
3	Check the fan	Is there any unusual noise during operation?	2	○	○	○
		Clean the dust				
4	Plunger	Check and replace	4	-	-	○
5	Piston pin assembly	Renewal	4	-	-	●
6	Connecting rod assembly	Renewal	4	-	-	●
7	O molding ring	Check and replace	4	-	-	●
8	Relief valve	Renewal	1			●
9	Bearing	Renewal	4			●
10	Shock absorber	Check for aging	4	-	-	○
11	Encil	Is there any looseness?	-	○	○	○
		Is the seal normal?				
12	Air intake hose	Check if the intake pipe is ruptured	-	○	○	○
13	E'scape-pipe	check if the exhaust connector is become less crowded	-	○	○	○
14	Fan housing	Remove the attachments.	-	○	○	○

Before cleaning the air filter cartridge and housing, remove the hose from the air filter outlet to prevent accidental dust ingress into the hose and subsequent inhalation into the air compressor. Disassemble the air filter cartridge from the assembly. When cleaning the filter cartridge, use dry, clean compressed air at approximately 0.4 Mpa to blow from the inside out. Never use liquids such as water, gasoline, or cleaning agents for cleaning. Replace the filter cartridge promptly if it becomes excessively dirty. For the housing, use dry, clean compressed air at approximately 0.4 Mpa to thoroughly clean both the exterior and interior surfaces.

Maintenance Instructions

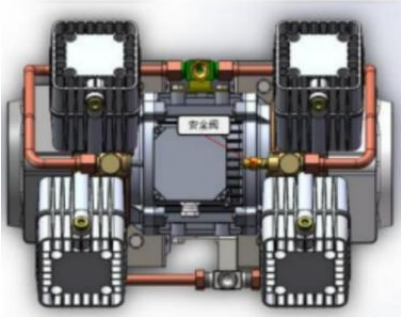
Filter maintenance

Operating steps	Operational process	Tool	Characteristic	Graphic
1	Remove the external air filter cartridge: ① Split the clamp (1) at two points; ② Remove the upper shell (2); ③ Remove the air filter cartridge (3).	\	\	
2	External air filter cleaning: ① External air filter cleaning: use 0. Dry, clean compressed air at approximately 4 MPa should be blown from the inside out. The use of liquid such as water, gasoline, or cleaning agents for cleaning is strictly prohibited. ② Air filter housing cleaning: use dry, clean compressed air at approximately 0.4 MPa to thoroughly remove dust from both the exterior and interior surfaces of the housing.	Airgun	▲ Ashless dust	
3	Replacement of external air filter cartridge: ① Remove the clamp and insert the empty filter cartridge, which is oriented with the "NALI" label facing the dust discharge port. ② Adjust the center line orientation of the intake and dust exhaust ports as shown in the diagram, then secure the clamp. ③ Press the black button on the maintenance indicator (2-3) to reset. ④ Ensure the dust discharge hole faces downward.	\	\	

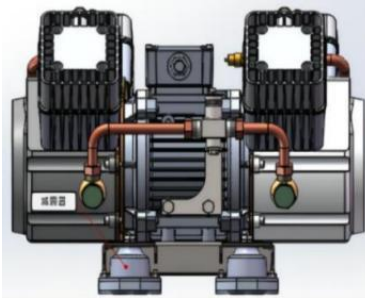
Clean the cylinder cooling air duct

Step	Operational process	Tool	Characteristic	Graphic	
01	Use compressed air to clean the ventilation ducts of the air compressor's four compression cylinders, ensuring they remain unobstructed and free from mud or debris.	\	\	Whack	Clean up
					

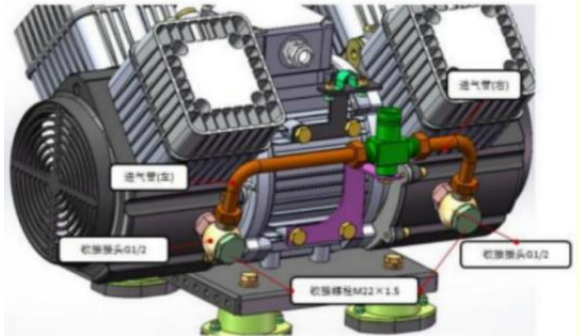
Replace the safety valve

Step	Operational process	Tool	Characteristic	Graphic
01	Remove the safety valve: Remove the safety valve from the hinge joint and clean the residual seal. The glue is located as shown in the figure.	Openinwrench Hand	\	
02	Install a new safety valve: Install the safety valve onto the hinged joint 1/4 and apply Loctite. 577, fastening torque 25N · m.		Mail ▲	

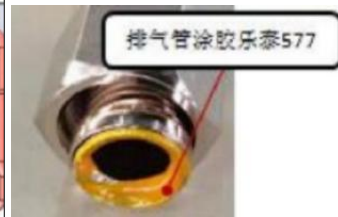
Check and replace shock absorbers

St ep	Operational process	To ol	Characteristic	Graphic	
01	1 Check the shock absorber bolts for looseness and inspect the rubber surface for cracks or fractures. Replace the shock absorber if any issues are found. 2. Remove the shock absorber assembly from the base, then detach the shock absorber from the assembly. 3. Secure the new shock absorber to the base plate with M6×20 hex bolts and M6 anti-loosening nuts, marking the anti-loosening lines; 4. Secure the base and shock absorber assembly with M10×30 bolt assemblies, applying a test torque of 45 N·m, and mark the anti-loosening line. After tightening, the shock absorber should be nearly parallel to the base.	\	\		

Check the intake pipe replacement

Step	Operational process	Tool	Characteristic	Graphic	
01	1. Inspect the intake manifold connection for looseness or detachment, and if found, retighten the manifold. Check the surface of the intake manifold for cracks or damage. If any are present, replace the intake manifold. 2. Remove the intake pipe; 3. Connect the intake pipe with a sealing gasket and a hinged joint. Install the intake pipe (if installation is difficult, first remove the hinge bolts, and tighten to a torque of 30N·m during installation). 4. Tighten the intake pipe with a torque of 17N·m, and mark the anti-loosening line.	\	\		

Check and replace the exhaust pipe

Step	Operational process	Tool	Characteristic	Graphic	
01	1. Inspect the exhaust pipe connection for looseness or detachment, and if found, retighten the pipe. Check the surface of the exhaust pipe for cracks or damage. If any are present, replace the exhaust pipe. 2. Remove the exhaust pipe and clean the hinge bolt joint; 3. Apply Toluene 577 to the new exhaust pipe and the M22×1.5 hinge joint. Connect the components and install the exhaust pipe (if installation is difficult, first remove the hinge bolts; apply a tightening torque of 50N·m during installation). 4. After adjusting the angle of the hinge joint, tighten the exhaust pipe with a torque of 30N·m.	\	\		

Any power-generating or power-driven machine

If the air compressor is not used for an extended period or operates in an extremely humid environment, the insulation resistance of the windings must be checked, with the resistance value not falling below 20MΩ. The motor and the entire air compressor must be properly grounded.

Lay in

Air compressors shall be equipped with protective measures to prevent rusting and damage during transportation and short-term storage (3 months). For long-term storage, please contact our company.

In humid climates, electrical and mechanical components should be stored in dry environments.

Breakdown maintenance

Hitch	Cause	Resolvent
The air compressor is difficult to start.	Phase loss or wiring error	Maintenance of electrical personnel
	Electrical, wiring, or motor failure	Check each component one by one, including fuses, switches, terminals, and motors.
	The pressure in the gas storage tank is between the automatic shutdown and startup pressure (the air compressor does not need to be started).	Empty the pressure from the gas storage tank
	The voltage is either too low or too high.	Check the reason
	Loose electrical terminal	Check and resolve
The motor overheats and may even burn out.	The exhaust pressure exceeds the maximum allowable pressure, causing the motor to overload.	Use for pressure reduction to operate the machine within normal pressure range (contact the maintenance team if necessary) Car manufacturer after-sales service)
	The ambient temperature is too high.	Keep the area well-ventilated.
Abnormal sound	Loose connection	Fastening connection point
	Motor bearings and connecting rod bearings lack oil or are damaged	Repair, lubricate, or replace (contact our after-sales team)
Insufficient pressure in the gas storage tank or inflation time elongate	Leakage in the pipeline or joint	Check and resolve
	The inhalation filter is clogged.	Clean or replace the filter element
	The exhaust valve plate is damaged, or the piston ring and cylinder are worn out.	Maintenance and replacement
	The motor speed slows down due to low voltage.	Maintenance and replacement
	Dry gas without exhaust	Check and contact the vehicle manufacturer's after-sales service for handling
Motor failure	Inverter and Motor Not Matching Under the Control of Frequency Conversion Power Supply	Selection of Frequency Converter Matching with Motor
	Failure to perform debugging as required by the inverter	Debug as required
	The air compressor is jammed inside.	Contact us
	Electrical fault	Electrical personnel maintenance and troubleshooting

Note: 1. The owner of the air compressor is responsible for its maintenance. All worn, defective, or damaged parts must be replaced immediately.

2. Inspection operations and maintenance shall be performed by trained personnel.

3. When troubleshooting, always disconnect the power supply first and ensure complete pressure relief before proceeding.

4. If users are unable to analyze or troubleshoot the issue, please contact our company.

5. Important Notice: Always use original factory parts when maintaining air compressors. If non-original parts are found, the company will consider this as the customer's automatic waiver of warranty rights, and the warranty service for the equipment will be terminated.

Change the tires and wheels

check the tire pressure



Pay attention to

Refer to the tire's surface pressure marking. When checking the inflated tire pressure, use the 860 kPa reading as the reference, but apply 900 kPa for actual inflation.



Danger

Maintain proper tire pressure. Otherwise, the following may occur and lead to serious accidents.

Low tire pressure (underinflation):

v excessive wear

v abnormal wear

v uncontrollability

v The tire overheated, causing a leak.

v The sealing performance of the tire bead is weakened

v Wheel deformation

or tire separation

High

tire pressure

(overinflated):

v uncontrollability

v Central overwear of the wheel tread

Keep the tire pressure at the correct level.

The tire specifications are specified in the chassis parameters.

Check your tires every two weeks or at least monthly. Don't forget to check the pressure in your spare tire.

Incorrect tire pressure can lead to energy consumption, reduced driving comfort, shortened tire life, and decreased driving safety. If tires require frequent inflation, they should be inspected at the CHTC KINWIN AUTO After-sales Service Station.

When checking tire pressure, follow these instructions.

The tire pressure should be checked only when the tires are cold. The correct cold tire pressure reading can only be obtained after the vehicle has been parked for at least three hours or driven a distance of no more than 1.5 km.

Always use a tire pressure gauge. Relying on experience to estimate tire pressure may lead to inaccuracies, which can compromise comfort and driving performance.

Do not deflate or reduce tire pressure after driving. It is normal for tires to retain higher pressure post-drive.

Ensure the tire valve cap is properly installed. The valve cap effectively prevents dust or moisture from entering the valve core, thus avoiding air leakage. If the valve cap is lost, replace it with a new one immediately.

Inspection tire

If you find any severe damages such as cuts, fractures, exposed inner liner layers, deep cracks or bulges in the tire, it indicates that there is damage inside the tire and it needs to be replaced.

If the tire frequently leaks or is unsuitable for repair due to the size and location of cuts or other damages, it should be replaced. If the condition cannot be determined, contact KINWIN AUTO BUS Maintenance station.

If the vehicle leaks air while driving, do not continue driving.

Even if tires are unused or infrequently used, they can still degrade due to aging.

The above applies to spare and stored tires as well.

Change the tires

When changing tires, always use tires that match the specified type and exact size. Using any other tires will seriously affect driving comfort, speedometer/odometer readings, and vehicle performance.

The distance from the ground and the distance between the body and the tires or anti-slip chains.

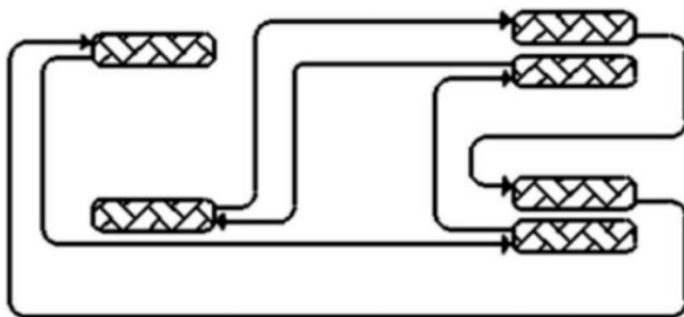


Danger

- v Do not mix radial tires with diagonal ply tires on the same vehicle, as this may cause typical handling hazards and lead to loss of control.
- v Do not use tires that exceed the manufacturer's recommended size. This may cause typical handling hazards and result in loss of vehicle control.
- v Do not use old tires.
- v Do not use tires of unknown origin.
- v The front wheels are steering wheels, and refurbished tires are not permitted.

Tire rotation

To ensure uniform tire wear and prolong service life, perform tire rotation as shown in the diagram below every 15,000 km.



Principle of tire replacement

When dual tires are installed on rear wheels, tires with an outer diameter difference exceeding 12mm must not be used. If two tires are installed with an outer diameter difference below 12mm, the smaller outer diameter tire must be positioned on the inner side. During installation, the valve cores of both inner and outer tires should be separated to facilitate compressed air replenishment. The front wheels should be fitted with balanced, wear-resistant tires that minimize abrasion. After the position change, the tires must rotate in the opposite direction to their original orientation. Only tires of the same size and specification can be installed on the same axle. It is prohibited to install tires of different sizes on the same axle, as this may cause brake misalignment, body sway, or loss of steering control. New tires must be used in pairs and initially installed on the front wheels. Inspect the threads of the hubbolts and wheel nuts for scratches. For safety, replace any damaged threads in pairs, as the other side may also be damaged. Check the contact surface of the tire for deformation or damage. If the contact surface or mounting hole is deformed or damaged, the tire must be replaced.

selection and Installation of Tire Anti-skid chain

Use the correct size of tire chains. The rules for using anti-slip chains vary depending on the location or type of road, so check local regulations before installing them. After driving 0.5~1.0km with the anti-slip chain installed as tight as possible on the drive wheel tire, tighten the anti-slip chain again. When installing a tire chain, follow the manufacturer's instructions. Remove the wheel cover before installation to avoid scratches from the chain.



Danger

- v The driving speed must not exceed 50 km/h or the lower of the two limits specified by the anti-slip chain manufacturer.
- v Drive carefully, paying attention to bumps, potholes, and sharp turns, which can cause your vehicle to bounce.
- When using anti-slip chains, avoid sharp turns or wheel lock-up braking, as these actions may adversely affect vehicle handling.
- v When driving a vehicle with anti-slip chains, you must be cautious and slow down before turning to avoid losing control and causing an accident.

Inspection and replacement of wheels

If the wheel is damaged by bending, cracking or severe corrosion, replace it immediately. If the damaged wheel is not replaced, the tire may detach from the wheel or cause the vehicle to lose control.

When changing wheels, use wheels that match the required type and size specifications. The size of the wheels used.

The different size or type of wheel will bring adverse effects on the cooling of brake, the calibration of speedometer, braking performance, the aiming of headlights, the height of bumper, the height of vehicle off the ground, and the distance between the tire or anti-slip chain and the body and the chassis.

precautions for Aluminum Alloy wheel Rim (optional)

We recommend using aluminum alloy rims with the correct specifications. For detailed parameters, please refer to the chassis specifications.

For vehicles with aluminum alloy rims, inspect the wheel nuts for tightness between 1000 and 5000 kilometers of mileage.

If the tires are rotated, repaired, or replaced, check the wheel nuts for tightness when the mileage reaches 1000-5000 km.

When using wheel anti-slip chains, ensure that the aluminum alloy rims are not damaged.

Only wheel nuts and wrenches specifically designed for aluminum wheels should be used. Regular inspection of aluminum alloy rims for damage is required. If damage is detected, immediate replacement is necessary.



Pay attention to

The tightening torque of aluminum alloy wheel rim nut is 650 ± 30 N·m

HYK6780GBEV Bus Key Torque Gauge

Tightening torque table for main fasteners of chassis

Position	Tightening torque (N.m)
Front wheel nut	570 ~ 600
Double-ended bolt connecting the upper steering knuckle to the steering knuckle	216
Turn to the lower arm fastening nut	274 ~ 343
Turn to fasten the nut on the upper connecting arm	274 ~ 343
Turn to the nut connecting the lower arm to the ball joint pin	245 ~ 340
Locking nut for the vertical arm and its shaft	407 ~ 434
Turning ball nut for tie rod	200 ~ 240
Turning tie rod clamp nut	70 ~ 100
Cross shaft flange fork connecting nut	211 ~ 240
Back brake plate fastening bolt	200 ~ 250
Nut for securing the rear wheel bolt	350 ~ 421
Rear wheel nut	570 ~ 600
Rear suspension bracket fixing bolt	250 ~ 300
Steering gear fixing bolt nut	360 ~ 420
Steering wheel lock nut	70 ~ 80
Front brake plate fixing nut	157 ~ 206
The fixing nut of the damper pin and bracket	134 ~ 167
Back brake chamber fixing nut	167 ~ 186
Bolt and nut of the thrust rod of the rear air suspension	96 ~ 112/345 ~ 380
U-bolt and nut connecting the C-shaped bracket of rear suspension to rear axle	750 ~ 800

Tightening torque table of main fasteners of front and rear axle

Class	Position	Tightening torque (N.m)
Propons	turning the tie rod nut	350 ~ 450
	Left and right steering arm nuts	350 ~ 450
	connection plate fastening bolt	160 ~ 220
	brake caliper mounting bolt	280 ~ 330
	limiter bolt locking nut	120 ~ 150
	ball joint nut	350 ~ 400
	crossbar clamp nut	120 ~ 150
	front hub bearing adjusting nut	400
	thrust rod seat connecting bolt	400
	half shaft mounting bolt	200 ~ 220
Rear axle	brake mounting bolt	180 ~ 200
	brake disc mounting bolt	150 ~ 160
	brake caliper mounting bolt	300
	Cavity bracket mounting bolt	160
	cavity mounting nut	160
	main reducer installation bolt	220 ~ 250
	differential bearing cover connecting bolt	450 ~ 500
	stop differential adjusting nut	18
	tooth mounting bolt	450 ~ 500
	main gear flange locking nut	500 ~ 550
	bearing seat connecting bolt	170 ~ 200
	upper thrust rod seat mounting bolt	300
	fuel plug	35
	drain plug	35

Other

- 1) If no specific torque value is provided, always use the torque values listed in the table below.
- 2) Do not use this torque value to replace those specified in other chapters of this manual.

Thread diameter (mm)	Pitch (mm)		Tightening torque (Nm)		Thread diameter (mm)	Pitch (mm)		Tightening torque (Nm)	
			Minimum--Standard--Maximum					Minimum--Standard--Maximum	
			Mechanical properties grade 8.8	Mechanical properties grade 10.9				Mechanical properties grade 8.8	Mechanical properties grade 10.9
6	coarse thread	1	6-9-12	-	18	coarse thread	2.5	229-268-298	380-437-467
8	coarse thread	1.25	16--23-26	-		closely-pitched	1.5	287-316-346	397-467-507
	closely-pitched	1	17-25-28	-	20	coarse thread	2.5	389-430-470	450-528-568
10	coarse thread	1.5	37-59-75	52-74-90		closely-pitched	1.5	396-440-480	475-558-598
	closely-pitched	1.25	45-63-79	63-78-93	22	coarse thread	2.5	500-607-705	675-853-989
	closely-pitched	1	46-64-80	65-80-95		closely-pitched	1.5	503-666-755	697-900-1095
12	coarse thread	1.75	73-95-111	105-140-156	24	coarse thread	3	620-769-928	857-1081-1283
	closely-pitched	1.5	75-97-113	106-142-158		closely-pitched	2	664-795-918	918-1147-1376
	closely-pitched	1.25	78-99-115	108-145-161	27	coarse thread	3	900-1127-1330	1249-1585-1845
14	coarse thread	2	122-160-185	141-175-200		closely-pitched	2	968-1216-1452	1335-1670-2003
	closely-pitched	1.5	146-180-205	178-210-235	30	coarse thread	3.5	1230-1528-1810	1740-2149-2503
16	coarse thread	2	182-215-245	200-280-310		closely-pitched	2	1344-1680-2016	1853-2316-2779
	closely-pitched	1.5	199-240-270	240-305-335	-	-	-	-	-

3.1.4 Fault Code Diagnosis and Operation

3.1.4.1 DTC List

Level- 1 Faults

Fault Code	Fault Description	Possible Causes	Solutions
8	Cell Over- Voltage Alarm	1. Power battery pack over- charge 2. Single cell failure 3. Power battery pack failure 4. Three- branch high- voltage cabinet failure	Refer to DTC: 1, 51, 101
7	Cell Under- Voltage Alarm (No high- voltage shutdown request under charging mode)	1. Insufficient SOC of power battery pack 2. Single cell under- voltage 3. Excessive discharge of single cell 4. Single cell failure	Refer to DTC: 2, 7, 52, 57, 102, 107
1	Total Voltage Over- Voltage Alarm	1. Power battery pack over- charge 2. Power battery pack failure 3. Three- branch high- voltage cabinet failure	Refer to DTC: 1, 51, 101
2	Total Voltage Under- Voltage Alarm (No high- voltage shutdown request under charging mode)	1. Insufficient SOC of power battery pack 2. Excessive discharge of power battery pack 3. Power battery pack failure 4. Three- branch high- voltage cabinet failure	Refer to DTC: 2, 52, 102

Fault Code	Fault Description	Possible Causes	Solutions
3	Battery Cell Over- Temperature Alarm	1. Excessively high ambient vehicle temperature 2. Abnormal heat source near vehicle 3. Power battery pack cooling system failure (insufficient coolant, blocked pipeline, damaged water pump, etc.) 4. Air- conditioning refrigeration failure leading to failed heat exchange 5. Temperature acquisition error, abnormal connection of temperature sampling circuit causing local overheating 6. High internal resistance of single cell resulting in cell overheating	Refer to DTC: 3, 53, 103
6	Excessive Temperature- Difference Alarm	1. Poor heat dissipation of power battery pack 2. Power battery pack cooling system failure (insufficient coolant, blocked pipeline, damaged water pump, etc.) 3. Heating function failure of power battery pack 4. Acquisition error, abnormal connection of temperature sampling circuit 5. Three- branch high- voltage cabinet failure	Refer to DTC: 6
10	Pulse Discharge Current Over- Limit Alarm	1. Excessive high- voltage load 2. High- voltage circuit failure 3. High- voltage electrical component failure 4. Internal current- sensor failure of three- branch high- voltage cabinet	Refer to DTC: 10, 60, 110

Fault Code	Fault Description	Possible Causes	Solutions
9	Pulse Regenerative- Charging Current Over- Limit Alarm	5. Current- sampling circuit failure of three- branch high- voltage cabinet 6. Power battery pack failure 7. Three- branch high- voltage cabinet failure	Refer to DTC: 9, 59, 109
		1. High- voltage circuit failure 2. Drive motor failure 3. Motor controller failure 4. Four- in- one unit failure 5. Internal current- sensor failure of three- branch high- voltage cabinet 6. Current- sampling circuit failure of three- branch high- voltage cabinet 7. Power battery pack failure 8. Three- branch high- voltage cabinet failure	
12	Low Battery SOC Alarm	1. Insufficient SOC of power battery pack 2. Poor or failed balancing function 3. High self- discharge rate of battery cells 4. Low cell capacity with fast voltage drop during discharge 5. Battery cell aging	Refer to DTC: 12, 62, 112
14	On- Board Insulation Low Alarm	1. High- voltage harness insulation failure 2. Insulation failure of high- voltage electrical components 3. Power battery pack insulation failure	Refer to DTC: 14, 64, 114

Fault Code	Fault Description	Possible Causes	Solutions
23	Charging Socket Over- Temperature Alarm	4. Insulation sampling circuit failure 5. Three- branch high- voltage cabinet failure 1. Wear, ablation or other defects of DC charging socket / charging gun 2. Poor contact or loose connection between DC charging socket and charging gun 3. Short- circuit or open- circuit of temperature- sensor circuit for DC charging socket 4. Temperature- sensor failure of DC charging socket 5. Three- branch high- voltage cabinet failure	Refer to DTC: 23, 73
96	Continuous Discharge Over- Current	1. Excessive high- voltage load 2. High- voltage circuit failure 3. High- voltage electrical component failure 4. Internal current- sensor failure of three- branch high- voltage cabinet 5. Current- sampling circuit failure of three- branch high- voltage cabinet 6. Power battery pack failure 7. Three- branch high- voltage cabinet failure	Refer to DTC: 96

Level- 2 Faults

Fault Code	Fault Description	Possible Causes	Solutions
58	Cell Over- Voltage Alarm	1. Power battery pack over- charge	Refer to DTC: 1, 51, 101

Fault Code	Fault Description	Possible Causes	Solutions
57	Cell Under- Voltage Alarm (No high- voltage shutdown request under charging mode)	2. Single cell failure 3. Power battery pack failure 4. Three- branch high- voltage cabinet failure	Refer to DTC: 2, 7, 52, 57, 102, 107
		1. Insufficient SOC of power battery pack 2. Single cell under- voltage 3. Excessive discharge of single cell 4. Single cell failure	
51	Total Voltage Over- Voltage Alarm	1. Power battery pack over- charge 2. Power battery pack failure 3. Three- branch high- voltage cabinet failure	Refer to DTC: 1, 51, 101
52	Total Voltage Under- Voltage Alarm (No high- voltage shutdown request under charging mode)	1. Insufficient SOC of power battery pack 2. Excessive discharge of power battery pack 3. Power battery pack failure 4. Three- branch high- voltage cabinet failure	Refer to DTC: 2, 52, 102
53	Battery Cell Over- Temperature Alarm	1. Excessively high ambient vehicle temperature 2. Abnormal heat source near vehicle 3. Power battery pack cooling system failure (insufficient coolant, blocked pipeline, damaged water pump, etc.) 4. Air- conditioning refrigeration failure leading to failed heat exchange	Refer to DTC: 3, 53, 103



Fault Code	Fault Description	Possible Causes	Solutions
6	Excessive Temperature- Difference Alarm	5. Temperature acquisition error, abnormal connection of temperature sampling circuit causing local overheating	Refer to DTC: 6
		6. High internal resistance of single cell resulting in cell overheating	
60	Pulse Discharge Current Over- Limit Alarm	1. Poor heat dissipation of power battery pack	Refer to DTC: 10, 60, 110
		2. Power battery pack cooling system failure (insufficient coolant, blocked pipeline, damaged water pump, etc.)	
59	Pulse Regenerative- Charging Current Over- Limit Alarm	3. Heating function failure of power battery pack	Refer to DTC: 9, 59, 109
		4. Acquisition error, abnormal connection of temperature sampling circuit	
		5. Three- branch high- voltage cabinet failure	
		1. Excessive high- voltage load	
		2. High- voltage circuit failure	
		3. High- voltage electrical component failure	
		4. Internal current- sensor failure of three- branch high- voltage cabinet	
		5. Current- sampling circuit failure of three- branch high- voltage cabinet	
		6. Power battery pack failure	
		7. Three- branch high- voltage cabinet failure	
		1. High- voltage circuit failure	
		2. Drive motor failure	
		3. Motor controller failure	



Fault Code	Fault Description	Possible Causes	Solutions
		4. Four- in- one unit failure 5. Internal current- sensor failure of three- branch high- voltage cabinet 6. Current- sampling circuit failure of three- branch high- voltage cabinet 7. Power battery pack failure 8. Three- branch high- voltage cabinet failure	
62	Low Battery SOC Alarm	1. Insufficient SOC of power battery pack 2. Poor or failed balancing function 3. High self- discharge rate of battery cells 4. Low cell capacity with fast voltage drop during discharge 5. Battery cell aging	Refer to DTC: 12, 62, 112
64	On- Board Insulation Low Alarm	1. High- voltage harness insulation failure 2. Insulation failure of high- voltage electrical components 3. Power battery pack insulation failure 4. Insulation sampling circuit failure 5. Three- branch high- voltage cabinet failure	Refer to DTC: 14, 64, 114
73	Charging Socket Over- Temperature Alarm	1. Wear, ablation or other defects of DC charging socket / charging gun 2. Poor contact or loose connection between DC charging socket and charging gun 3. Short- circuit or open- circuit of temperature- sensor circuit for DC charging socket	Refer to DTC: 23, 73

Fault Code	Fault Description	Possible Causes	Solutions
96	Continuous Discharge Over- Current	4. Temperature- sensor failure of DC charging socket	Refer to DTC: 96
		5. Three- branch high- voltage cabinet failure	
		1. Excessive high- voltage load	
		2. High- voltage circuit failure	
		3. High- voltage electrical component failure	
		4. Internal current- sensor failure of three- branch high- voltage cabinet	
		5. Current- sampling circuit failure of three- branch high- voltage cabinet	
		6. Power battery pack failure	
		7. Three- branch high- voltage cabinet failure	

Level- 3 Faults

Fault Code	Fault Description	Possible Causes	Solutions
108	Cell Over- Voltage Alarm	1. Power battery pack over- charge 2. Single cell failure 3. Power battery pack failure 4. Three- branch high- voltage cabinet failure	Refer to DTC: 1, 51, 101
107	Cell Under- Voltage Alarm (No high- voltage shutdown request under charging mode)	1. Insufficient SOC of power battery pack 2. Single cell under- voltage 3. Excessive discharge of single cell	Refer to DTC: 2, 7, 52, 57, 102, 107

Fault Code	Fault Description	Possible Causes	Solutions
101	Total Voltage Over- Voltage Alarm	4. Single cell failure 1. Power battery pack over- charge 2. Power battery pack failure 3. Three- branch high- voltage cabinet failure	Refer to DTC: 1, 51, 101
102	Total Voltage Under- Voltage Alarm (No high- voltage shutdown request under charging mode)	1. Insufficient SOC of power battery pack 2. Excessive discharge of power battery pack 3. Power battery pack failure 4. Three- branch high- voltage cabinet failure	Refer to DTC: 2, 52, 102
103	Battery Cell Over- Temperature Alarm	1. Excessively high ambient vehicle temperature 2. Abnormal heat source near vehicle 3. Power battery pack cooling system failure (insufficient coolant, blocked pipeline, damaged water pump, etc.) 4. Air- conditioning refrigeration failure leading to failed heat exchange 5. Temperature acquisition error, abnormal connection of temperature sampling circuit causing local overheating 6. High internal resistance of single cell resulting in cell overheating	Refer to DTC: 3, 53, 103
6	Excessive Temperature- Difference Alarm	1. Poor heat dissipation of power battery pack 2. Power battery pack cooling system failure (insufficient coolant, blocked pipeline, damaged	Refer to DTC: 6



Fault Code	Fault Description	Possible Causes	Solutions
		water pump, etc.)	
		3. Heating function failure of power battery pack	
		4. Acquisition error, abnormal connection of temperature sampling circuit	
		5. Three- branch high- voltage cabinet failure	
110	Pulse Discharge Current Over- Limit Alarm	1. Excessive high- voltage load 2. High- voltage circuit failure 3. High- voltage electrical component failure 4. Internal current- sensor failure of three- branch high- voltage cabinet 5. Current- sampling circuit failure of three- branch high- voltage cabinet 6. Power battery pack failure 7. Three- branch high- voltage cabinet failure	Refer to DTC: 10, 60, 110
109	Pulse Regenerative- Charging Current Over- Limit Alarm	1. High- voltage circuit failure 2. Drive motor failure 3. Motor controller failure 4. Four- in- one unit failure 5. Internal current- sensor failure of three- branch high- voltage cabinet 6. Current- sampling circuit failure of three- branch high- voltage cabinet 7. Power battery pack failure 8. Three- branch high- voltage cabinet failure	Refer to DTC: 9, 59, 109
112	Low Battery SOC Alarm	1. Insufficient SOC of power battery pack	Refer to DTC: 12,

Fault Code	Fault Description	Possible Causes	Solutions
			62, 112
		2. Poor or failed balancing function 3. High self- discharge rate of battery cells 4. Low cell capacity with fast voltage drop during discharge 5. Battery cell aging	
114	On- Board Insulation Low Alarm	1. High- voltage harness insulation failure 2. Insulation failure of high- voltage electrical components 3. Power battery pack insulation failure 4. Insulation sampling circuit failure 5. Three- branch high- voltage cabinet failure	Refer to DTC: 14, 64, 114
96	Continuous Discharge Over- Current	1. Excessive high- voltage load 2. High- voltage circuit failure 3. High- voltage electrical component failure 4. Internal current- sensor failure of three- branch high- voltage cabinet 5. Current- sampling circuit failure of three- branch high- voltage cabinet 6. Power battery pack failure 7. Three- branch high- voltage cabinet failure	Refer to DTC: 96

General Faults

Fault Code	Fault Description	Possible Causes	Solutions
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Fault Code	Fault Description	Possible Causes	Solutions
4	Battery Cell Low- Temperature Alarm	1. Excessively low ambient vehicle temperature 2. Heating function failure of power battery pack 3. Acquisition error, abnormal connection of temperature sampling circuit 4. Three- branch high- voltage cabinet failure	Refer to DTC: 4
90	Current- Sensor Failure	1. Refer to relevant fault- diagnosis manual 2. Contact technical support	Refer to relevant fault- diagnosis manual
134	BMS Low- Voltage Power- Supply Abnormality Alarm	1. Abnormal storage- battery voltage 2. DCDC failure 3. Three- branch high- voltage cabinet failure	Refer to DTC: 134
40	Excessive SOC Deviation Alarm	1. Refer to relevant fault- diagnosis manual 2. Contact technical support	Refer to relevant fault- diagnosis manual
41	SOC Jump Fault Alarm	1. Refer to relevant fault- diagnosis manual 2. Contact technical support	Refer to relevant fault- diagnosis manual
91	Thermal- Management Unit Failure	1. Short- circuit or open- circuit of thermal- management communication circuit 2. Thermal- management module failure 3. Three- branch high- voltage cabinet failure	Refer to DTC: 91
92	Heating- Film Heating- Loop Failure	1. Refer to relevant fault- diagnosis manual 2. Contact technical support	Refer to relevant fault- diagnosis manual
143	Low Insulation Resistance during	1. Refer to relevant fault- diagnosis manual	Refer to relevant

Fault Code	Fault Description	Possible Causes	Solutions
	Charging		fault- diagnosis manual
122	ACAN Communication Fault	2. Contact technical support 1. Short- circuit or open- circuit of CAN communication circuit 2. Failure of other modules on CAN communication bus 3. Three- branch high- voltage cabinet failure	Refer to DTC: 122
93	BMS Internal Communication Fault	1. Low- voltage communication- circuit fault between power battery packs 2. Low- voltage communication- circuit fault between power battery pack and three- branch high- voltage cabinet 3. Power battery pack failure 4. Three- branch high- voltage cabinet failure	Refer to DTC: 93
81	Branch Circuit Open- Circuit Alarm	1. Refer to relevant fault- diagnosis manual 2. Contact technical support	Refer to relevant fault- diagnosis manual
135	High- Voltage Interlock Fault Alarm	1. Poor contact or loose connection of high- voltage harness connectors 2. Short- circuit or open- circuit of high- voltage interlock circuit 3. Three- branch high- voltage cabinet failure	Refer to DTC: 135
42	Heating- Film / TMS Contactor Cannot Close Alarm	1. Refer to relevant fault- diagnosis manual 2. Contact technical support	Refer to relevant fault- diagnosis manual
42	Heating- Film / TMS Contactor Cannot Open Alarm	1. Refer to relevant fault- diagnosis manual 2. Contact technical support	Refer to relevant fault- diagnosis manual

Fault Code	Fault Description	Possible Causes	Solutions
66	Main- Negative Contactor Cannot Close Fault Alarm	1. Open- circuit of main- negative contactor control circuit 2. Main- negative contactor failure 3. Three- branch high- voltage cabinet failure	Refer to DTC: 66
66	Main- Negative Contactor Cannot Open Fault Alarm	1. Short- circuit of main- negative contactor control circuit 2. Ablation or adhesion of main- negative contactor 3. Three- branch high- voltage cabinet failure	Refer to DTC: 66
67	DC- Charging A- Positive Contactor Cannot Close Fault Alarm	1. Open- circuit of DC- charging A- positive contactor control circuit 2. DC- charging A- positive contactor failure 3. Three- branch high- voltage cabinet failure	Refer to DTC: 67
67	DC- Charging A- Positive Contactor Cannot Open Fault Alarm	1. Short- circuit of DC- charging A- positive contactor control circuit 2. Ablation or adhesion of DC- charging A- positive contactor 3. Three- branch high- voltage cabinet failure	Refer to DTC: 67
67	DC- Charging A- Negative Contactor Cannot Close Fault Alarm	1. Refer to relevant fault- diagnosis manual 2. Contact technical support	Refer to relevant fault- diagnosis manual
67	DC- Charging A- Negative Contactor Cannot Open Fault Alarm	1. Refer to relevant fault- diagnosis manual 2. Contact technical support	Refer to relevant fault- diagnosis manual
78	DC- Charging B- Positive Contactor Cannot Close Fault	1. Refer to relevant fault- diagnosis manual	Refer to relevant fault- diagnosis manual

Fault Code	Fault Description	Possible Causes	Solutions
	Alarm		
78	DC- Charging B- Positive Contactor Cannot Open Fault Alarm	2. Contact technical support 1. Refer to relevant fault- diagnosis manual 2. Contact technical support	Refer to relevant fault- diagnosis manual
78	DC- Charging B- Negative Contactor Cannot Close Fault Alarm	1. Refer to relevant fault- diagnosis manual 2. Contact technical support	Refer to relevant fault- diagnosis manual
78	DC- Charging B- Negative Contactor Cannot Open Fault Alarm	1. Refer to relevant fault- diagnosis manual 2. Contact technical support	Refer to relevant fault- diagnosis manual
88	Plug- In Connection Signal Abnormality	1. Poor contact or loose connection between Euro- standard DC charging socket and charging gun 2. Loose or poor- contact low- voltage harness connector of Euro- standard DC charging socket 3. Wear, fracture or other damage of low- voltage harness for Euro- standard DC charging socket 4. Charging- protocol conversion module failure 5. Three- branch high- voltage cabinet failure	Refer to DTC: 88
13	Rechargeable Energy- Storage System Mismatch Fault Alarm	1. Refer to relevant fault- diagnosis manual 2. Contact technical support	Refer to relevant fault- diagnosis manual
94	Excessive Discharge Current during Charging	1. Refer to relevant fault- diagnosis manual 2. Contact technical support	Refer to relevant fault- diagnosis manual
95	Charging- Current Over- Limit	1. Mismatched or faulty charging pile	Refer to DTC: 95

Fault Code	Fault Description	Possible Causes	Solutions
Alarm			
86	Charging- Socket NTC Fault	2. Internal current- sensor failure of three- branch high- voltage cabinet	Refer to DTC: 86
		3. Current- sampling circuit failure of three- branch high- voltage cabinet	
		4. Charging- protocol conversion module failure	
		5. Power battery pack failure	
		6. Three- branch high- voltage cabinet failure	
		1. Open- circuit of temperature- sensor circuit for DC charging socket	
5	Poor Battery- Cell Consistency	2. Temperature- sensor failure of DC charging socket	Refer to DTC: 5
		3. Three- branch high- voltage cabinet failure	
		1. Abnormal connection of cell- voltage sampling harness	
		2. High self- discharge rate of battery cells	
		3. Aging or damage of individual battery cells	
		4. Poor or failed balancing function	
61	Excessive SOC Fault	5. Internal slave- board failure of power battery pack	Refer to relevant fault- diagnosis manual
		6. Three- branch high- voltage cabinet failure	
		1. Refer to relevant fault- diagnosis manual	
		2. Contact technical support	

Limit Faults

Fault Code	Fault Description	Possible Causes	Solutions
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Fault Code	Fault Description	Possible Causes	Solutions
156	Cell Over- Discharge Fault	1. Insufficient SOC of power battery pack 2. Single cell under- voltage 3. Excessive discharge of single cell 4. Single cell failure 5. Internal protection- circuit fault of power battery pack 6. Power battery pack failure 7. Three- branch high- voltage cabinet failure	Refer to DTC: 2, 7, 52, 57, 102, 107, 156
152	Battery- Pack Fire Alarm	1. Short- circuit of high- voltage harness between power battery packs 2. Overheating of power battery pack 3. Over- charge of power battery pack 4. Collision of power battery pack 5. Three- branch high- voltage cabinet failure	Refer to DTC: 152
151	Battery- Pack Self- Protection Fault	1. Refer to relevant fault- diagnosis manual 2. Contact technical support	Refer to relevant fault- diagnosis manual

3.1.4.2 DTC: 8, 58, 108

Fault Code Description

Fault Code	Fault Level	Fault Description	Possible Causes
8	Level- 1	Cell Over- Voltage Alarm	1. Power battery pack over- charge 2. Single cell failure 3. Power battery pack failure 4. Three- branch high- voltage cabinet failure

Fault Code	Fault Level	Fault Description	Possible Causes
58	Level- 2	Cell Over- Voltage Alarm	1. Power battery pack over- charge 2. Single cell failure 3. Power battery pack failure 4. Three- branch high- voltage cabinet failure
108	Level- 3	Cell Over- Voltage Alarm	1. Power battery pack over- charge 2. Single cell failure 3. Power battery pack failure 4. Three- branch high- voltage cabinet failure

Diagnostic Procedures

a. Switch off the whole-vehicle power supply. b. Perform vehicle high-voltage power-on again. c. Check whether the status returns to normal. → If YES: Fault cleared.

a. Check whether other fault codes exist for the power battery pack. → If YES: Clear associated faults following corresponding diagnostic procedures.

a. Acquire power-battery-pack data. b. Check whether the data is normal. → If NO: Repair the faulty power battery pack.

a. Verify whether power-battery-pack voltage falls within rated range. b. Check whether the voltage is normal. → If NO: Discharge the power battery pack.

a. Switch off the whole-vehicle power supply. b. Switch off the low-voltage hand-brake switch. c. Disconnect the MSD of power battery pack. d. Disconnect MSD1 and MSD2 on the three-branch high-voltage cabinet. e. Install a new three-branch high-voltage cabinet and restore vehicle conditions. f. Conduct road test and verify fault clearance. → If YES: Fault cleared. → If NO: Locate root cause from other potential faults.

Notes: • After replacing the three- branch high- voltage cabinet, re- calibrate it with diagnostic instrument.

3.1.4.3 DTC: 7, 57, 107

Fault Code Description

Fault Code	Fault Level	Fault Description	Possible Causes
7	Level- 1	Cell Under- Voltage Alarm (No high- voltage shutdown request under charging mode)	1. Insufficient SOC of power battery pack 2. Single cell under- voltage 3. Excessive discharge of single cell 4. Single cell failure
57	Level- 2	Cell Under- Voltage Alarm (No high- voltage shutdown request under charging mode)	1. Insufficient SOC of power battery pack 2. Single cell under- voltage 3. Excessive discharge of single cell 4. Single cell failure
107	Level- 3	Cell Under- Voltage Alarm (No high- voltage shutdown request under charging mode)	1. Insufficient SOC of power battery pack 2. Single cell under- voltage 3. Excessive discharge of single cell 4. Single cell failure

Diagnostic Procedures

a. Switch off the whole-vehicle power supply. b. Perform vehicle high-voltage power-on again. c. Check whether the status returns to normal. → If YES: Fault cleared.

a. Charge the vehicle. b. Check whether the status returns to normal. → If YES: Fault cleared.

a. Acquire power-battery-pack data. b. Check whether the data is normal. → If NO: Repair the faulty power battery pack.

a. Switch off the whole-vehicle power supply. b. Switch off the low-voltage hand-brake switch. c. Disconnect the MSD of power battery pack. d. Disconnect MSD1 and MSD2 on the three-branch high-voltage cabinet. e. Install a new three-branch high-voltage cabinet and

restore vehicle conditions. f. Conduct road test and verify fault clearance. → If YES: Fault cleared. → If NO: Locate root cause from other potential faults.

Notes: • After replacing the three-branch high-voltage cabinet, re-calibrate it with diagnostic instrument.

3.1.4.4 DTC: 156

Fault Code Description

Fault Code	Fault Level	Fault Description	Possible Causes
156	Limit Fault	Cell Over-Discharge Fault	1. Insufficient SOC of power battery pack 2. Single cell under-voltage 3. Excessive discharge of single cell 4. Single cell failure 5. Internal protection-circuit fault of power battery pack 6. Power battery pack failure 7. Three-branch high-voltage cabinet failure

Diagnostic Procedures

a. Switch off the whole-vehicle power supply. b. Perform vehicle high-voltage power-on again. c. Check whether the status returns to normal. → If YES: Fault cleared.

a. Charge the vehicle. b. Check whether the status returns to normal. → If YES: Fault cleared.

a. Acquire power-battery-pack data. b. Check whether the data is normal. → If NO: Repair the faulty power battery pack.

a. Switch off the whole-vehicle power supply. b. Switch off the low-voltage hand-brake switch. c. Disconnect the MSD of power battery pack. d. Disconnect MSD1 and MSD2 on the three-branch high-voltage cabinet. e. Install a new three-branch high-voltage cabinet and restore vehicle conditions. f. Conduct road test and verify fault clearance. → If YES: Fault cleared. → If NO: Locate root cause from other potential faults.

Notes: • After replacing the three-branch high-voltage cabinet, re-calibrate it with diagnostic instrument.

3.1.4.5 DTC: 1, 51, 101

Fault Code Description

Fault Code	Fault Level	Fault Description	Possible Causes
1	Level- 1	Total Voltage Over- Voltage Alarm	1. Power battery pack over- charge 2. Power battery pack failure 3. Three- branch high- voltage cabinet failure
51	Level- 2	Total Voltage Over- Voltage Alarm	1. Power battery pack over- charge 2. Power battery pack failure 3. Three- branch high- voltage cabinet failure
101	Level- 3	Total Voltage Over- Voltage Alarm	1. Power battery pack over- charge 2. Power battery pack failure 3. Three- branch high- voltage cabinet failure

Diagnostic Procedures

a. Switch off the whole-vehicle power supply. b. Perform vehicle high-voltage power-on again. c. Check whether the status returns to normal. → If YES: Fault cleared.

a. Acquire power-battery-pack data. b. Check whether the data is normal. → If NO: Repair the faulty power battery pack.

a. Switch off the whole-vehicle power supply. b. Switch off the low-voltage hand-brake switch. c. Disconnect the MSD of power battery pack. d. Disconnect MSD1 and MSD2 on the three-branch high-voltage cabinet. e. Install a new three-branch high-voltage cabinet and restore vehicle conditions. f. Conduct road test and verify fault clearance. → If YES: Fault cleared. → If NO: Locate root cause from other potential faults.

Notes: • After replacing the three- branch high- voltage cabinet, re- calibrate it with diagnostic instrument.

3.1.4.6 DTC: 2, 52, 102

Fault Code Description

Fault Code	Fault Level	Fault Description	Possible Causes
2	Level- 1	Total Voltage Under- Voltage Alarm (No high- voltage shutdown request under charging mode)	1. Insufficient SOC of power battery pack 2. Excessive discharge of power battery pack 3. Power battery pack failure 4. Three- branch high- voltage cabinet failure
52	Level- 2	Total Voltage Under- Voltage Alarm (No high- voltage shutdown request under charging mode)	1. Insufficient SOC of power battery pack 2. Excessive discharge of power battery pack 3. Power battery pack failure 4. Three- branch high- voltage cabinet failure
102	Level- 3	Total Voltage Under- Voltage Alarm (No high- voltage shutdown request under charging mode)	1. Insufficient SOC of power battery pack 2. Excessive discharge of power battery pack 3. Power battery pack failure 4. Three- branch high- voltage cabinet failure

Diagnostic Procedures

a. Switch off the whole-vehicle power supply. b. Perform vehicle high-voltage power-on again. c. Check whether the status returns to normal. → If YES: Fault cleared.

a. Charge the vehicle. b. Check whether the status returns to normal. → If YES: Fault cleared.

a. Acquire power-battery-pack data. b. Check whether the data is normal. → If NO: Repair the faulty power battery pack.

a. Switch off the whole-vehicle power supply. b. Switch off the low-voltage hand-brake switch. c. Disconnect the MSD of power battery pack. d. Disconnect MSD1 and MSD2 on the three-branch high-voltage cabinet. e. Install a new three-branch high-voltage cabinet and restore vehicle conditions. f. Conduct road test and verify fault clearance. → If YES: Fault cleared. → If NO: Locate root cause from other potential faults.

Notes: • After replacing the three-branch high-voltage cabinet, re-calibrate it with diagnostic instrument.

3.1.4.7 DTC: 3, 53, 103

Fault Code Description

Fault Code	Fault Level	Fault Description	Possible Causes
3	Level- 1	Battery Cell Over- Temperature Alarm	1. Excessively high ambient vehicle temperature 2. Abnormal heat source near vehicle 3. Power battery pack cooling system failure (insufficient coolant, blocked pipeline, damaged water pump, etc.) 4. Air- conditioning refrigeration failure leading to failed heat exchange 5. Temperature acquisition error, abnormal connection of temperature sampling circuit causing local overheating 6. High internal resistance of single cell resulting in cell overheating
53	Level- 2	Battery Cell Over- Temperature Alarm	1. Excessively high ambient vehicle temperature 2. Abnormal heat source near vehicle 3. Power battery pack cooling system failure (insufficient coolant, blocked pipeline, damaged water pump, etc.) 4. Air- conditioning refrigeration failure leading to failed heat exchange 5. Temperature acquisition error, abnormal connection of temperature sampling circuit causing local overheating 6. High internal resistance of single cell resulting in cell overheating
103	Level- 3	Battery Cell Over- Temperature Alarm	1. Excessively high ambient vehicle temperature 2. Abnormal heat source near vehicle 3. Power battery pack cooling system failure (insufficient coolant, blocked pipeline, damaged water pump, etc.)

Fault Code	Fault Level	Fault Description	Possible Causes
			4. Air- conditioning refrigeration failure leading to failed heat exchange 5. Temperature acquisition error, abnormal connection of temperature sampling circuit causing local overheating 6. High internal resistance of single cell resulting in cell overheating

Diagnostic Procedures

- a. Switch off the whole-vehicle power supply. b. Perform vehicle high-voltage power-on again. c. Check whether the status returns to normal. → If YES: Fault cleared.
- a. Check whether power-battery compartment is dirty or poorly ventilated. → If NO: Clean power-battery compartment.
- a. Check ambient vehicle temperature and heat sources nearby. b. Check for nearby abnormal heat sources. → If YES: Park vehicle in suitable environment or keep away from heat sources.
- a. Check whether fault codes exist for air-conditioning system. → If YES: Clear air-conditioning faults according to fault codes.
- a. Verify coolant condition. → If NO: Add coolant complying with specifications.
- a. Inspect cooling pipelines of power battery pack for damage or disconnection. → If NO: Repair or replace faulty cooling pipelines.
- a. Inspect cooling water pump of power battery pack and its control circuit. → If NO: Repair or replace faulty components.
- a. Inspect power-battery-pack cooler for blockage or damage. → If NO: Repair or replace power-battery-pack cooler.
- a. Acquire power-battery-pack data. b. Check whether the data is normal. → If NO: Repair the faulty power battery pack.
- a. Switch off the whole-vehicle power supply. b. Switch off the low-voltage hand-brake switch. c. Disconnect the MSD of power battery pack. d. Disconnect MSD1 and MSD2 on the three-branch high-voltage cabinet. e. Install a new three-branch high-voltage cabinet and restore vehicle conditions. f. Conduct road test and verify fault clearance. → If YES: Fault cleared. → If NO: Locate root cause from other potential faults.

Notes: • After replacing the three-branch high-voltage cabinet, re-calibrate it with diagnostic instrument.

3.1.4.8 DTC: 4

Fault Code Description

Fault Code	Fault Level	Fault Description	Possible Causes
4	General Fault	Battery Cell Low- Temperature Alarm	1. Excessively low ambient vehicle temperature 2. Heating function failure of power battery pack 3. Acquisition error, abnormal connection of temperature sampling circuit 4. Three- branch high- voltage cabinet failure

Diagnostic Procedures

a. Switch off the whole-vehicle power supply. b. Perform vehicle high-voltage power-on again. c. Check whether the status returns to normal. → If YES: Fault cleared.

a. Check whether ambient vehicle temperature is excessively low. → If YES: Park vehicle in suitable environment.

a. Verify whether heating function of power battery pack works normally. → If NO: Repair heating system of power battery pack.

a. Acquire power-battery-pack data. b. Check whether the data is normal. → If NO: Repair the faulty power battery pack.

a. Switch off the whole-vehicle power supply. b. Switch off the low-voltage hand-brake switch. c. Disconnect the MSD of power battery pack. d. Disconnect MSD1 and MSD2 on the three-branch high-voltage cabinet. e. Install a new three-branch high-voltage cabinet and restore vehicle conditions. f. Conduct road test and verify fault clearance. → If YES: Fault cleared. → If NO: Locate root cause from other potential faults.

Notes: • After replacing the three- branch high- voltage cabinet, re- calibrate it with diagnostic instrument.

3.1.4.9 DTC: 6

Fault Code Description

Fault Code	Fault Level	Fault Description	Possible Causes
6	Level- 1	Excessive Temperature- Difference Alarm	1. Poor heat dissipation of power battery pack 2. Power battery pack cooling system failure (insufficient coolant, blocked pipeline, damaged water pump, etc.) 3. Heating function failure of power battery pack 4. Acquisition error, abnormal connection of temperature sampling circuit 5. Three- branch high- voltage cabinet failure
6	Level- 2	Excessive Temperature- Difference Alarm	1. Poor heat dissipation of power battery pack 2. Power battery pack cooling system failure (insufficient coolant, blocked pipeline, damaged water pump, etc.) 3. Heating function failure of power battery pack 4. Acquisition error, abnormal connection of temperature sampling circuit 5. Three- branch high- voltage cabinet failure
6	Level- 3	Excessive Temperature- Difference Alarm	1. Poor heat dissipation of power battery pack 2. Power battery pack cooling system failure (insufficient coolant, blocked pipeline, damaged water pump, etc.) 3. Heating function failure of power battery pack 4. Acquisition error, abnormal connection of temperature sampling circuit 5. Three- branch high- voltage cabinet failure

Diagnostic Procedures

a. Switch off the whole-vehicle power supply. b. Perform vehicle high-voltage power-on again. c. Check whether the status returns to normal. → If YES: Fault cleared.

a. Check whether power-battery compartment is dirty or poorly ventilated. → If NO: Clean power-battery compartment.

a. Verify coolant condition. → If NO: Add coolant complying with specifications.

a. Inspect cooling pipelines of power battery pack for damage or disconnection. → If NO: Repair or replace faulty cooling pipelines.

a. Acquire power- battery- pack data. b. Check whether the data is normal. → If NO: Repair the faulty power battery pack.

a. Switch off the whole- vehicle power supply. b. Switch off the low- voltage hand- brake switch. c. Disconnect the MSD of power battery pack. d. Disconnect MSD1 and MSD2 on the three- branch high- voltage cabinet. e. Install a new three- branch high- voltage cabinet and restore vehicle conditions. f. Conduct road test and verify fault clearance. → If YES: Fault cleared. → If NO: Locate root cause from other potential faults.

Notes: • After replacing the three- branch high- voltage cabinet, re- calibrate it with diagnostic instrument.

3. 1. 4. 10 DTC: 152

Fault Code Description

Fault Code	Fault Level	Fault Description	Possible Causes
152	Limit Fault	Battery- Pack Fire Alarm	1. Short- circuit of high- voltage harness between power battery packs 2. Overheating of power battery pack 3. Over- charge of power battery pack 4. Collision of power battery pack 5. Three- branch high- voltage cabinet failure

Diagnostic Procedures

a. Stop vehicle immediately and switch off whole- vehicle power supply. b. Evacuate personnel and guarantee site safety. c. Check whether smoke or fire occurs on power battery pack. → If YES: Call fire- alarm number immediately and perform initial fire- extinguishing with fire extinguisher.

a. Check whether power battery pack has suffered collision. → If YES: Request professional rescue support.

a. Acquire power- battery- pack data. b. Check whether the data is normal. → If NO: Repair the faulty power battery pack.

a. Switch off the whole- vehicle power supply. b. Switch off the low- voltage hand- brake switch. c. Disconnect the MSD of power battery pack. d. Disconnect MSD1 and MSD2 on the three- branch high- voltage cabinet. e. Install a new three- branch high- voltage cabinet and

restore vehicle conditions. f. Conduct road test and verify fault clearance. → If YES: Fault cleared. → If NO: Locate root cause from other potential faults.

Notes: • After replacing the three-branch high-voltage cabinet, re-calibrate it with diagnostic instrument.

3.1.4.11 DTC: 10, 60, 110

Fault Code Description

Fault Code	Fault Level	Fault Description	Possible Causes
10	Level- 1	Pulse Discharge Current Over- Limit Alarm	1. Excessive high- voltage load 2. High- voltage circuit failure 3. High- voltage electrical component failure 4. Internal current- sensor failure of three- branch high- voltage cabinet 5. Current- sampling circuit failure of three- branch high- voltage cabinet 6. Power battery pack failure 7. Three- branch high- voltage cabinet failure
60	Level- 2	Pulse Discharge Current Over- Limit Alarm	1. Excessive high- voltage load 2. High- voltage circuit failure 3. High- voltage electrical component failure 4. Internal current- sensor failure of three- branch high- voltage cabinet 5. Current- sampling circuit failure of three- branch high- voltage cabinet 6. Power battery pack failure 7. Three- branch high- voltage cabinet failure
110	Level- 3	Pulse Discharge Current Over- Limit Alarm	1. Excessive high- voltage load 2. High- voltage circuit failure 3. High- voltage electrical component failure

Fault Code	Fault Level	Fault Description	Possible Causes
			4. Internal current- sensor failure of three- branch high- voltage cabinet 5. Current- sampling circuit failure of three- branch high- voltage cabinet 6. Power battery pack failure 7. Three- branch high- voltage cabinet failure

Diagnostic Procedures

a. Switch off the whole-vehicle power supply. b. Perform vehicle high- voltage power-on again. c. Check whether the status returns to normal. → If YES: Fault cleared.

a. Check operating status and insulation resistance of high- voltage electrical components. b. Check whether insulation resistance is normal. → If NO: Repair or replace faulty high- voltage electrical components.

a. Inspect high- voltage harness for wear or corrosion; test its insulation resistance. b. Check whether conditions are normal. → If NO: Replace faulty high- voltage harness.

a. Acquire power- battery- pack data. b. Check whether the data is normal. → If NO: Repair the faulty power battery pack.

a. Switch off the whole-vehicle power supply. b. Switch off the low- voltage hand- brake switch. c. Disconnect the MSD of power battery pack. d. Disconnect MSD1 and MSD2 on the three- branch high- voltage cabinet. e. Install a new three- branch high- voltage cabinet and restore vehicle conditions. f. Conduct road test and verify fault clearance. → If YES: Fault cleared. → If NO: Locate root cause from other potential faults.

Notes: • After replacing the three- branch high- voltage cabinet, re- calibrate it with diagnostic instrument.

3.1.4.12 DTC: 9, 59, 109

Fault Code Description

Fault Code	Fault Level	Fault Description	Possible Causes
9	Level- 1	Pulse Regenerative- Charging Current Over- Limit Alarm	1. High- voltage circuit failure 2. Drive motor failure 3. Motor controller failure 4. Four- in- one unit failure 5. Internal current- sensor failure of three- branch high- voltage cabinet 6. Current- sampling circuit failure of three- branch high- voltage cabinet 7. Power battery pack failure 8. Three- branch high- voltage cabinet failure
59	Level- 2	Pulse Regenerative- Charging Current Over- Limit Alarm	1. High- voltage circuit failure 2. Drive motor failure 3. Motor controller failure 4. Four- in- one unit failure 5. Internal current- sensor failure of three- branch high- voltage cabinet 6. Current- sampling circuit failure of three- branch high- voltage cabinet 7. Power battery pack failure 8. Three- branch high- voltage cabinet failure
109	Level- 3	Pulse Regenerative- Charging Current Over- Limit Alarm	1. High- voltage circuit failure 2. Drive motor failure 3. Motor controller failure 4. Four- in- one unit failure 5. Internal current- sensor failure of three- branch high- voltage cabinet 6. Current- sampling circuit failure of three- branch high- voltage cabinet 7. Power battery pack failure 8. Three- branch high- voltage cabinet failure

Diagnostic Procedures

- a. Switch off the whole-vehicle power supply. b. Perform vehicle high-voltage power-on again. c. Check whether the status returns to normal. → If YES: Fault cleared.
- a. Verify operating status of drive motor. → If NO: Troubleshoot drive-motor faults.
- a. Verify operating status of motor controller. → If NO: Troubleshoot motor-controller faults.
- a. Verify operating status of four-in-one unit. → If NO: Troubleshoot four-in-one unit faults.
- a. Acquire power-battery-pack data. b. Check whether the data is normal. → If NO: Repair the faulty power battery pack.
- a. Inspect high-voltage harness for wear or corrosion; test its insulation resistance. b. Check whether conditions are normal. → If NO: Replace faulty high-voltage harness.
- a. Switch off the whole-vehicle power supply. b. Switch off the low-voltage hand-brake switch. c. Disconnect the MSD of power battery pack. d. Disconnect MSD1 and MSD2 on the three-branch high-voltage cabinet. e. Install a new three-branch high-voltage cabinet and restore vehicle conditions. f. Conduct road test and verify fault clearance. → If YES: Fault cleared. → If NO: Locate root cause from other potential faults.

Notes: • After replacing the three-branch high-voltage cabinet, re-calibrate it with diagnostic instrument.

3.1.4.13 DTC: 90

Fault Code Description

Fault Code	Fault Level	Fault Description	Possible Causes
90	General Fault	Current-Sensor Failure	1. Refer to relevant fault-diagnosis manual 2. Contact technical support

Diagnostic Procedures

- a. Switch off the whole-vehicle power supply. b. Perform vehicle high-voltage power-on again. c. Check whether the status returns to normal. → If YES: Fault cleared.

a. Acquire power-battery-pack data. b. Check whether the data is normal. → If NO: Repair the faulty power battery pack.

a. Switch off the whole-vehicle power supply. b. Switch off the low-voltage hand-brake switch. c. Disconnect the MSD of power battery pack. d. Disconnect MSD1 and MSD2 on the three-branch high-voltage cabinet. e. Install a new three-branch high-voltage cabinet and restore vehicle conditions. f. Conduct road test and verify fault clearance. → If YES: Fault cleared. → If NO: Locate root cause from other potential faults.

Notes: • After replacing the three-branch high-voltage cabinet, re-calibrate it with diagnostic instrument.

3.1.4.14 DTC: 134

Fault Code Description

Fault Code	Fault Level	Fault Description	Possible Causes
134	General Fault	BMS Low-Voltage Power-Supply Abnormality Alarm	1. Abnormal storage-battery voltage 2. DCDC failure 3. Three-branch high-voltage cabinet failure

Diagnostic Procedures

a. Switch off the whole-vehicle power supply. b. Perform vehicle high-voltage power-on again. c. Check whether the status returns to normal. → If YES: Fault cleared.

a. Switch off whole-vehicle power supply. b. Inspect low-voltage harness of three-branch high-voltage cabinet for damage, fracture or poor contact. c. Inspect low-voltage harness connectors for poor contact or damage. d. Check whether conditions are normal. → If NO: Repair or replace faulty harness / connectors.

a. Switch off whole-vehicle power supply. b. Switch off low-voltage hand-brake switch. c. Measure low-voltage storage-battery voltage. d. Check whether voltage is normal. → If NO: Charge low-voltage storage battery; replace it if necessary.

a. Power on vehicle high-voltage system. b. Verify whether DCDC output voltage is within rated range. → If NO: Troubleshoot four-in-one unit.

a. Measure low-voltage supply voltage of three-branch high-voltage cabinet. b. Check whether voltage is normal. → If NO: Troubleshoot low-voltage supply circuit of three-branch high-voltage cabinet.

a. Inspect low-voltage earthing circuit of three-branch high-voltage cabinet. b. Check whether circuit is normal. → If NO: Repair or replace low-voltage earthing harness of three-branch high-voltage cabinet.

a. Switch off the whole-vehicle power supply. b. Switch off the low-voltage hand-brake switch. c. Disconnect the MSD of power battery pack. d. Disconnect MSD1 and MSD2 on the three-branch high-voltage cabinet. e. Install a new three-branch high-voltage cabinet and restore vehicle conditions. f. Conduct road test and verify fault clearance. → If YES: Fault cleared. → If NO: Locate root cause from other potential faults.

Notes: • After replacing the three-branch high-voltage cabinet, re-calibrate it with diagnostic instrument.

3.1.4.15 DTC: 40

Fault Code Description

Fault Code	Fault Level	Fault Description	Possible Causes
40	General Fault	Excessive SOC Deviation Alarm	1. Refer to relevant fault-diagnosis manual 2. Contact technical support

Diagnostic Procedures

a. Switch off the whole-vehicle power supply. b. Perform vehicle high-voltage power-on again. c. Check whether the status returns to normal. → If YES: Fault cleared.

a. Acquire power-battery-pack data. b. Check whether the data is normal. → If NO: Repair the faulty power battery pack.

a. Switch off the whole-vehicle power supply. b. Switch off the low-voltage hand-brake switch. c. Disconnect the MSD of power battery pack. d. Disconnect MSD1 and MSD2 on the three-branch high-voltage cabinet. e. Install a new three-branch high-voltage cabinet and restore vehicle conditions. f. Conduct road test and verify fault clearance. → If YES: Fault cleared. → If NO: Locate root cause from other potential faults.

Notes: • After replacing the three-branch high-voltage cabinet, re-calibrate it with diagnostic instrument.

3.1.4.16 DTC: 41

Fault Code Description

Fault Code	Fault Level	Fault Description	Possible Causes
41	General Fault	SOC Jump Fault Alarm	1. Refer to relevant fault- diagnosis manual 2. Contact technical support

Diagnostic Procedures

a. Switch off the whole-vehicle power supply. b. Perform vehicle high-voltage power-on again. c. Check whether the status returns to normal. → If YES: Fault cleared.

a. Acquire power-battery-pack data. b. Check whether the data is normal. → If NO: Repair the faulty power battery pack.

a. Switch off the whole-vehicle power supply. b. Switch off the low-voltage hand-brake switch. c. Disconnect the MSD of power battery pack. d. Disconnect MSD1 and MSD2 on the three-branch high-voltage cabinet. e. Install a new three-branch high-voltage cabinet and restore vehicle conditions. f. Conduct road test and verify fault clearance. → If YES: Fault cleared. → If NO: Locate root cause from other potential faults.

Notes: • After replacing the three-branch high-voltage cabinet, re-calibrate it with diagnostic instrument.

3.1.4.17 DTC: 12, 62, 112

Fault Code Description

Fault Code	Fault Level	Fault Description	Possible Causes
12	Level- 1	Low Battery SOC Alarm	1. Insufficient SOC of power battery pack 2. Poor or failed balancing function 3. High self- discharge rate of battery cells 4. Low cell capacity with fast voltage drop during discharge 5. Battery cell aging
62	Level- 2	Low Battery SOC Alarm	1. Insufficient SOC of power battery pack 2. Poor or failed balancing function 3. High self- discharge rate of battery cells 4. Low cell capacity with fast voltage drop during discharge 5. Battery cell aging

Fault Code	Fault Level	Fault Description	Possible Causes
112	Level- 3	Low Battery SOC Alarm	1. Insufficient SOC of power battery pack 2. Poor or failed balancing function 3. High self- discharge rate of battery cells 4. Low cell capacity with fast voltage drop during discharge 5. Battery cell aging

Diagnostic Procedures

a. Switch off the whole-vehicle power supply. b. Perform vehicle high-voltage power-on again. c. Check whether the status returns to normal. → If YES: Fault cleared.

a. Charge the vehicle. b. Check whether the status returns to normal. → If YES: Fault cleared.

a. Acquire power-battery-pack data. b. Check whether the data is normal. → If NO: Repair the faulty power battery pack.

a. Switch off the whole-vehicle power supply. b. Switch off the low-voltage hand-brake switch. c. Disconnect the MSD of power battery pack. d. Disconnect MSD1 and MSD2 on the three-branch high-voltage cabinet. e. Install a new three-branch high-voltage cabinet and restore vehicle conditions. f. Conduct road test and verify fault clearance. → If YES: Fault cleared. → If NO: Locate root cause from other potential faults.

Notes: • After replacing the three- branch high- voltage cabinet, re- calibrate it with diagnostic instrument.

3.1.4.18 DTC: 91

Fault Code Description

Fault Code	Fault Level	Fault Description	Possible Causes
91	General Fault	Thermal- Management Unit Failure	1. Short- circuit or open- circuit of thermal- management communication circuit 2. Thermal- management module failure 3. Three- branch high- voltage cabinet failure

Diagnostic Procedures

a. Switch off the whole-vehicle power supply. b. Perform vehicle high-voltage power-on again. c. Check whether the status returns to normal. → If YES: Fault cleared.

a. Switch off whole-vehicle power supply. b. Switch off low-voltage hand-brake switch. c. Install new thermal-management module and restore vehicle conditions. d. Conduct road test and verify fault clearance. → If YES: Fault cleared.

a. Switch off the whole-vehicle power supply. b. Switch off the low-voltage hand-brake switch. c. Disconnect the MSD of power battery pack. d. Disconnect MSD1 and MSD2 on the three-branch high-voltage cabinet. e. Install a new three-branch high-voltage cabinet and restore vehicle conditions. f. Conduct road test and verify fault clearance. → If YES: Fault cleared. → If NO: Locate root cause from other potential faults.

Notes: • After replacing the three-branch high-voltage cabinet, re-calibrate it with diagnostic instrument.

3.1.4.19 DTC: 92

Fault Code Description

Fault Code	Fault Level	Fault Description	Possible Causes
92	General Fault	Heating- Film Heating- Loop Failure	1. Refer to relevant fault- diagnosis manual 2. Contact technical support

Diagnostic Procedures

a. Switch off the whole-vehicle power supply. b. Perform vehicle high-voltage power-on again. c. Check whether the status returns to normal. → If YES: Fault cleared.

a. Acquire power-battery-pack data. b. Check whether the data is normal. → If NO: Repair the faulty power battery pack.

a. Switch off the whole-vehicle power supply. b. Switch off the low-voltage hand-brake switch. c. Disconnect the MSD of power battery pack. d. Disconnect MSD1 and MSD2 on the three-branch high-voltage cabinet. e. Install a new three-branch high-voltage cabinet and restore vehicle conditions. f. Conduct road test and verify fault clearance. → If YES: Fault cleared. → If NO: Locate root cause from other potential faults.

Notes: • After replacing the three-branch high-voltage cabinet, re-calibrate it with diagnostic instrument.

3.1.4.20 DTC: 151

Fault Code Description

Fault Code	Fault Level	Fault Description	Possible Causes
151	Limit Fault	Battery-Pack Self-Protection Fault	1. Refer to relevant fault-diagnosis manual 2. Contact technical support

Diagnostic Procedures

a. Switch off the whole-vehicle power supply. b. Perform vehicle high-voltage power-on again. c. Check whether the status returns to normal. → If YES: Fault cleared.

a. Acquire power-battery-pack data. b. Check whether the data is normal. → If NO: Repair the faulty power battery pack.

a. Switch off the whole-vehicle power supply. b. Switch off the low-voltage hand-brake switch. c. Disconnect the MSD of power battery pack. d. Disconnect MSD1 and MSD2 on the three-branch high-voltage cabinet. e. Install a new three-branch high-voltage cabinet and restore vehicle conditions. f. Conduct road test and verify fault clearance. → If YES: Fault cleared. → If NO: Locate root cause from other potential faults.

Notes: • After replacing the three-branch high-voltage cabinet, re-calibrate it with diagnostic instrument.

3.1.4.21 DTC: 14, 64, 114

Fault Code Description

Fault Code	Fault Level	Fault Description	Possible Causes
14	Level-1	On-Board Insulation Low Alarm	1. High-voltage harness insulation failure 2. Insulation failure of high-voltage electrical components 3. Power battery pack insulation failure 4. Insulation sampling circuit failure

Fault Code	Fault Level	Fault Description	Possible Causes
64	Level- 2	On- Board Insulation Low Alarm	5. Three- branch high- voltage cabinet failure
			1. High- voltage harness insulation failure
			2. Insulation failure of high- voltage electrical components
			3. Power battery pack insulation failure
			4. Insulation sampling circuit failure
114	Level- 3	On- Board Insulation Low Alarm	5. Three- branch high- voltage cabinet failure
			1. High- voltage harness insulation failure
			2. Insulation failure of high- voltage electrical components
			3. Power battery pack insulation failure
			4. Insulation sampling circuit failure
			5. Three- branch high- voltage cabinet failure

Diagnostic Procedures

- a. Switch off the whole-vehicle power supply. b. Perform vehicle high-voltage power-on again. c. Check whether the status returns to normal. → If YES: Fault cleared.
- a. Inspect high-voltage harness for wear or rupture. → If NO: Replace faulty high-voltage harness.
- a. Measure insulation resistance of high-voltage harness. → If NO: Replace faulty high-voltage harness.
- a. Measure insulation resistance of high-voltage electrical components. → If NO: Replace faulty high-voltage electrical components.
- a. Measure insulation resistance of power battery pack. → If NO: Replace faulty power battery pack.
- a. Acquire power-battery-pack data. b. Check whether the data is normal. → If NO: Repair the faulty power battery pack.
- a. Switch off the whole-vehicle power supply. b. Switch off the low-voltage hand-brake switch. c. Disconnect the MSD of power battery pack. d. Disconnect MSD1 and MSD2 on the three-branch high-voltage cabinet. e. Install a new three-branch high-voltage cabinet and restore vehicle conditions. f. Conduct road test and verify fault clearance. → If YES: Fault cleared. → If NO: Locate root cause from other potential faults.

Notes: • After replacing the three- branch high- voltage cabinet, re- calibrate it with diagnostic instrument.

3.1.4.22 DTC: 143

Fault Code Description

Fault Code	Fault Level	Fault Description	Possible Causes
143	General Fault	Low Insulation Resistance during Charging	1. Refer to relevant fault- diagnosis manual 2. Contact technical support

Diagnostic Procedures

a. Switch off the whole-vehicle power supply. b. Perform vehicle high-voltage power-on again. c. Check whether the status returns to normal. → If YES: Fault cleared.

a. Acquire power-battery-pack data. b. Check whether the data is normal. → If NO: Repair the faulty power battery pack.

a. Switch off the whole-vehicle power supply. b. Switch off the low-voltage hand-brake switch. c. Disconnect the MSD of power battery pack. d. Disconnect MSD1 and MSD2 on the three-branch high-voltage cabinet. e. Install a new three-branch high-voltage cabinet and restore vehicle conditions. f. Conduct road test and verify fault clearance. → If YES: Fault cleared. → If NO: Locate root cause from other potential faults.

Notes: • After replacing the three-branch high-voltage cabinet, re-calibrate it with diagnostic instrument.

3.1.4.23 DTC: 122

Fault Code Description

Fault Code	Fault Level	Fault Description	Possible Causes
122	General Fault	ACAN Communication Fault	1. Short-circuit or open-circuit of CAN communication circuit 2. Failure of other modules on CAN communication bus 3. Three-branch high-voltage cabinet failure

Diagnostic Procedures

a. Switch off whole-vehicle power supply. b. Connect oscilloscope. c. Power on vehicle high-voltage system. d. Measure CAN-H and CAN-L waveforms by oscilloscope. e. Check whether waveforms are normal. → If NO: Repair CAN communication harness; if normal, proceed to next step.

a. Verify operating status of other controllers on CAN bus. b. Check whether controllers work normally. → If NO: Repair faulty controllers.

a. Switch off the whole-vehicle power supply. b. Switch off the low-voltage hand-brake switch. c. Disconnect the MSD of power battery pack. d. Disconnect MSD1 and MSD2 on the three-branch high-voltage cabinet. e. Install a new three-branch high-voltage cabinet and restore vehicle conditions. f. Conduct road test and verify fault clearance. → If YES: Fault cleared. → If NO: Locate root cause from other potential faults.

Notes: • After replacing the three-branch high-voltage cabinet, re-calibrate it with diagnostic instrument.

3.1.4.24 DTC: 93

Fault Code Description

Fault Code	Fault Level	Fault Description	Possible Causes
93	General Fault	BMS Internal Communication Fault	1. Low-voltage communication-circuit fault between power battery packs 2. Low-voltage communication-circuit fault between power battery pack and three-branch high-voltage cabinet 3. Power battery pack failure 4. Three-branch high-voltage cabinet failure

Diagnostic Procedures

a. Switch off the whole-vehicle power supply. b. Perform vehicle high-voltage power-on again. c. Check whether the status returns to normal. → If YES: Fault cleared.

a. Inspect connection integrity and harness condition of low-voltage circuits between power battery packs for damage or fracture. b. Check whether harnesses are normal. → If NO: Repair or replace faulty harnesses.

a. Inspect connection integrity and harness condition of low-voltage circuits between power battery pack and three-branch high-voltage cabinet for damage or fracture. b. Check whether harnesses are normal. → If NO: Repair or replace faulty harnesses.

a. Acquire power-battery-pack data. b. Check whether the data is normal. → If NO: Repair the faulty power battery pack.

a. Switch off the whole-vehicle power supply. b. Switch off the low-voltage hand-brake switch. c. Disconnect the MSD of power battery pack. d. Disconnect MSD1 and MSD2 on the three-branch high-voltage cabinet. e. Install a new three-branch high-voltage cabinet and

3.3.4 Fault Code Diagnosis and Operation

3.3.4.1 DTC List

Level- 1 Faults (1- 50)

When a fault occurs: fault code displayed in yellow font with fault code/icon text; alarm sound lasts for 2 seconds, repeating every 5 minutes.

Fault Code	Fault Description	Possible Causes	Solutions
1	Motor Controller Bus Over- Voltage Warning	1. Power battery pack over- charge 2. Power battery pack failure 3. Motor controller failure 4. Four- in- one unit failure	Refer to DTC: 1
2	Motor Stall Warning	1. Excessive motor load 2. Motor bearing failure 3. Motor controller failure 4. Drivetrain failure	Refer to DTC: 2
3	Motor Controller Over- Temperature Warning	1. Long- duration vehicle operation 2. Excessively high ambient temperature 3. Insufficient coolant 4. ATS radiator blocked 5. Cooling pipeline blocked or leaking 6. Water pump failure 7. ATS fan failure	Refer to DTC: 3



Fault Code	Fault Description	Possible Causes	Solutions
4	Motor Controller Bus Under- Voltage Warning	8. Motor controller failure 1. Insufficient power- battery- pack SOC 2. Power battery pack failure 3. Motor controller failure 4. High- voltage circuit failure	Refer to DTC: 4
5	Traction Motor Over- Temperature Warning	1. Long- duration vehicle operation 2. Excessively high ambient temperature 3. Insufficient coolant 4. Cooling- system failure 5. Motor over- load operation 6. Traction motor failure	Refer to DTC: 5
6	Traction Motor Over- Speed Warning	1. Excessive downhill vehicle speed 2. Motor controller failure 3. Resolver sensor failure 4. Drivetrain failure	Refer to DTC: 6
7	Defrost Contactor Failure	1. Defrost- contactor control- circuit failure 2. Defrost contactor failure 3. Motor controller failure	Refer to DTC: 7
8	Air- Conditioning Contactor Failure	1. Air- conditioning- contactor control- circuit failure 2. Air- conditioning contactor failure 3. Motor controller failure	Refer to DTC: 8



Fault Code	Fault Description	Possible Causes	Solutions
9	Air- Conditioning Communication Fault	1. Short- circuit or open- circuit of air- conditioning communication line 2. Air- conditioning controller failure 3. Motor controller failure	Refer to DTC: 9
10	Air- Conditioning System Fault	1. Air- conditioning compressor failure 2. Abnormal air- conditioning- system pressure 3. Air- conditioning controller failure 4. Air- conditioning communication fault	Refer to DTC: 10
11	Low Battery Voltage	1. Low- voltage battery under- charge 2. Low- voltage battery aging 3. DCDC failure 4. Low- voltage circuit electric leakage	Refer to DTC: 11
12	Oil- Pump Temperature- Sensor Fault	1. Short- circuit or open- circuit of oil- pump temperature- sensor line 2. Oil- pump temperature- sensor failure 3. Motor controller failure	Refer to DTC: 12
13	Air- Pump Temperature- Sensor Fault	1. Short- circuit or open- circuit of air- pump temperature- sensor line 2. Air- pump temperature- sensor failure 3. Motor controller failure	Refer to DTC: 13
14	Driving Hand- Brake Interlock Fault	1. Hand- brake switch failure 2. Hand- brake circuit failure 3. Motor controller failure	Refer to DTC: 14



Fault Code	Fault Description	Possible Causes	Solutions
16	Battery Cooling- System Fault	1. Cooling water- pump failure 2. Cooling fan failure 3. Insufficient coolant 4. Cooling pipeline blocked or leaking 5. Battery- cooling- system controller failure	Refer to DTC: 16
17	DCDC Input Under- Voltage	1. Insufficient power- battery- pack SOC 2. Power battery pack failure 3. DCDC failure 4. High- voltage input- circuit failure	Refer to DTC: 17
18	DCDC Input Over- Voltage	1. Power battery pack over- charge 2. Power battery pack failure 3. DCDC failure 4. Four- in- one unit failure	Refer to DTC: 18
19	DCDC Output Over- Current	1. Excessive low- voltage load 2. Low- voltage circuit short- circuit 3. DCDC failure 4. Low- voltage electrical- component failure	Refer to DTC: 19
20	DCDC Module Over- Temperature	1. Excessively high ambient temperature 2. Excessive DCDC load 3. Poor heat dissipation 4. DCDC failure	Refer to DTC: 20



Fault Code	Fault Description	Possible Causes	Solutions
21	DCDC Output Open- Circuit	1. Open- circuit in DCDC output line 2. Blown low- voltage fuse 3. DCDC failure 4. Low- voltage main- switch failure	Refer to DTC: 21
22	DCDC Communication Fault	1. Short- circuit or open- circuit of DCDC communication line 2. DCDC failure 3. Motor controller failure	Refer to DTC: 22
25	DCDC Hardware Fault	1. Internal DCDC hardware failure 2. Abnormal DCDC power supply 3. Four- in- one unit failure	Refer to DTC: 25
28	Accelerator- Brake Interlock	1. Accelerator- pedal failure 2. Brake- pedal failure 3. Pedal- circuit failure 4. Motor controller failure	Refer to DTC: 28
33	Pull- Up Hand- Brake for Charging	1. Hand- brake not engaged 2. Hand- brake switch failure 3. Charging- controller failure 4. Motor controller failure	Refer to DTC: 33
34	Exhaust- System Fault	1. Dryer exhaust- valve failure 2. Dryer ground- circuit failure	Refer to DTC: 34



Fault Code	Fault Description	Possible Causes	Solutions
35	Air- Pump Continuous- Operation Fault	3. Dryer assembly failure	Refer to DTC: 35
		4. Pneumatic- system fault	
		1. Pneumatic- system air leakage	
		2. Air- pump failure	
37	OBC Communication Fault	3. Pressure- sensor failure	Refer to DTC: 37
		4. Motor controller failure	
		1. Short- circuit or open- circuit of OBC communication line	
		2. OBC failure	
		3. Motor controller failure	

Level- 2 Faults (51- 150)

When a fault occurs: fault code displayed in yellow font with fault code/icon text; power limited to 40% of rated power; alarm sound lasts for 5seconds, repeating every 1minute.

Fault Code	Fault Description	Possible Causes	Solutions
70	Oil- Pump Communication Fault	1. Short- circuit or open- circuit of oil- pump communication line	Refer to DTC: 70
		2. Oil- pump controller failure	
		3. Motor controller failure	
71	Air- Pump Communication Fault	1. Short- circuit or open- circuit of air- pump communication line	Refer to DTC: 71
		2. Air- pump controller failure	
		3. Motor controller failure	



Fault Code	Fault Description	Possible Causes	Solutions
72	Instrument- Panel Communication Fault	1. Short- circuit or open- circuit of instrument- panel communication line 2. Instrument- panel failure 3. Motor controller failure	Refer to DTC: 72
73	Air- Pump Phase- Loss Fault	1. Air- pump motor phase loss 2. Air- pump controller failure 3. Air- pump circuit failure 4. Motor controller failure	Refer to DTC: 73
74	Oil- Pump Phase- Loss Fault	1. Oil- pump motor phase loss 2. Oil- pump controller failure 3. Oil- pump circuit failure 4. Motor controller failure	Refer to DTC: 74
75	Oil- Pump Temperature- Sensor Fault	1. Short- circuit or open- circuit of oil- pump temperature- sensor line 2. Oil- pump temperature- sensor failure 3. Motor controller failure	Refer to DTC: 12
77	ABS Communication Fault	1. Short- circuit or open- circuit of ABS communication line 2. ABS controller failure 3. Motor controller failure	Refer to DTC: 77
80	Oil- Pump Over- Temperature	1. Excessive oil- pump load 2. Poor oil- pump heat dissipation 3. Oil- pump failure	Refer to DTC: 80



Fault Code	Fault Description	Possible Causes	Solutions
81	Air- Pump Over- Temperature	4. Oil- pump controller failure	Refer to DTC: 81
		1. Excessive air- pump load	
		2. Poor air- pump heat dissipation	
		3. Air- pump failure	
82	Oil- Pump Inverter Fault	4. Air- pump controller failure	Refer to DTC: 82
		1. Oil- pump inverter hardware failure	
		2. Abnormal oil- pump- inverter power supply	
		3. Oil- pump motor failure	
83	Air- Pump Inverter Fault	4. Motor controller failure	Refer to DTC: 83
		1. Air- pump inverter hardware failure	
		2. Abnormal air- pump- inverter power supply	
		3. Air- pump motor failure	
84	Air- Pump Inverter Over- Voltage	4. Motor controller failure	Refer to DTC: 84
		1. Excessive input voltage	
		2. Air- pump inverter failure	
		3. Air- pump motor failure	
85	Air- Pump Inverter Under- Voltage	4. Motor controller failure	Refer to DTC: 85
		1. Insufficient input voltage	
		2. Air- pump inverter failure	
		3. Power- supply- circuit failure	



Fault Code	Fault Description	Possible Causes	Solutions
86	Air- Pump Inverter Over- Current	1. Air- pump motor short- circuit 2. Excessive air- pump load 3. Air- pump inverter failure 4. Motor controller failure	Refer to DTC: 86
87	Air- Pump Controller Over- Temperature	1. Excessively high ambient temperature 2. Excessive air- pump- controller load 3. Poor heat dissipation 4. Air- pump controller failure	Refer to DTC: 87
88	Air- Pump Temperature- Sensor Fault	1. Short- circuit or open- circuit of air- pump temperature- sensor line 2. Air- pump temperature- sensor failure 3. Motor controller failure	Refer to DTC: 13
89	Oil- Pump Inverter Over- Voltage	1. Excessive input voltage 2. Oil- pump inverter failure 3. Oil- pump motor failure 4. Motor controller failure	Refer to DTC: 89
90	Oil- Pump Inverter Under- Voltage	1. Insufficient input voltage 2. Oil- pump inverter failure 3. Power- supply- circuit failure 4. Motor controller failure	Refer to DTC: 90
91	Oil- Pump Inverter Over- Current	1. Oil- pump motor short- circuit	Refer to DTC: 91



Fault Code	Fault Description	Possible Causes	Solutions
		2. Excessive oil- pump load 3. Oil- pump inverter failure 4. Motor controller failure	
92	Oil- Pump Controller Over- Temperature	1. Excessively high ambient temperature 2. Excessive oil- pump- controller load 3. Poor heat dissipation 4. Oil- pump controller failure	Refer to DTC: 92
93	Accessory- Shutdown Timeout Fault	1. Accessory- contactor adhesion 2. Accessory- control- circuit failure 3. Motor controller failure 4. Accessory fault	Refer to DTC: 93
98	Single- Channel Accelerator- Pedal Signal Abnormality	1. Accelerator- pedal sensor failure 2. Accelerator- pedal circuit failure 3. Abnormal accelerator- pedal power supply 4. Motor controller failure	Refer to DTC: 98
99	Brake- Pedal Signal Abnormality	1. Brake- pedal sensor failure 2. Brake- pedal circuit failure 3. Abnormal brake- pedal power supply 4. Motor controller failure	Refer to DTC: 99
101	Accessory- Contactor- Close Failure Fault	1. Accessory- contactor control- circuit failure 2. Accessory contactor failure	Refer to DTC: 101



Fault Code	Fault Description	Possible Causes	Solutions
		3. Excessive accessory load 4. Motor controller failure	

Level- 3 Faults (151- 250)

When a fault occurs: fault code displayed in red font with fault code/icon text; immediate power- down; alarm sound lasts for 10 seconds, repeating every 30 seconds.

Fault Code	Fault Description	Possible Causes	Solutions
151	MCU Self- Test Fault	1. Internal motor- controller hardware failure 2. Abnormal motor- controller power supply 3. Motor- controller software fault	Refer to DTC: 151
152	Motor Controller Bus Over- Voltage	1. Power battery pack over- charge 2. Power battery pack failure 3. Motor controller failure 4. Four- in- one unit failure	Refer to DTC: 152
153	Motor Controller Phase Over- Current	1. Motor phase- to- phase short- circuit 2. Motor controller failure 3. Current- sensor failure 4. Traction motor failure	Refer to DTC: 153
154	Motor Controller Over- Temperature	1. Long- duration vehicle operation 2. Excessively high ambient temperature	Refer to DTC: 154



Fault Code	Fault Description	Possible Causes	Solutions
		3. Insufficient coolant 4. ATS radiator blocked 5. Cooling pipeline blocked or leaking 6. Water pump failure 7. ATS fan failure 8. Motor controller failure	
155	Motor Controller Bus Under- Voltage	1. Insufficient power- battery- pack SOC 2. Power battery pack failure 3. Motor controller failure 4. High- voltage circuit failure	Refer to DTC: 155
156	Traction Motor Over- Temperature	1. Long- duration vehicle operation 2. Excessively high ambient temperature 3. Insufficient coolant 4. Cooling- system failure 5. Motor over- load operation 6. Traction motor failure	Refer to DTC: 156
157	Resolver Fault	1. Short- circuit or open- circuit of resolver- sensor line 2. Resolver- sensor failure 3. Motor controller failure 4. Traction motor failure	Refer to DTC: 157
158	Motor Temperature- Sensor Fault	1. Short- circuit or open- circuit of motor temperature- sensor line 2. Motor temperature- sensor failure	Refer to DTC: 158



Fault Code	Fault Description	Possible Causes	Solutions
160	MCU Shutdown Failure (Active- Discharge Fault)	3. Motor controller failure 4. Traction motor failure 1. Active- discharge- circuit failure 2. Motor controller failure 3. High- voltage capacitor failure 4. Discharge- resistor failure	Refer to DTC: 160
161	Traction Motor Excessive Rotational- Speed	1. Excessive downhill vehicle speed 2. Motor controller failure 3. Resolver- sensor failure 4. Drivetrain failure	Refer to DTC: 161
162	Insulation Fault	1. High- voltage harness insulation failure 2. Insulation failure of high- voltage electrical components 3. Traction- motor insulation failure 4. Motor- controller insulation failure 5. Insulation- detection- circuit failure	Refer to DTC: 162
163	Load- Removal Failure Fault	1. Motor controller failure 2. Traction motor failure 3. Load cannot be removed 4. Drivetrain failure	Refer to DTC: 163
164	Main- Negative Disconnect- Timeout Fault	1. Main- negative contactor adhesion	Refer to DTC: 164



Fault Code	Fault Description	Possible Causes	Solutions
		2. Main- negative- contactor control- circuit failure 3. Motor controller failure 4. Abnormal high- voltage load	
165	Motor Stall	1. Excessive motor load 2. Motor bearing failure 3. Motor controller failure 4. Drivetrain failure	Refer to DTC: 165
166	Motor- Controller IGBT Hardware Fault	1. Damaged IGBT module 2. Drive- circuit failure 3. Motor- controller over- current 4. Motor- controller over- temperature 5. Motor controller failure	Refer to DTC: 166
167	MCU Communication Fault	1. Short- circuit or open- circuit of MCU communication line 2. Motor controller failure 3. VCU failure	Refer to DTC: 167
168	Motor- Controller Output Phase- Loss	1. Open- circuit of motor phase wire 2. Motor- controller IGBT failure 3. Traction motor failure 4. High- voltage circuit failure	Refer to DTC: 168
169	Motor- Controller Phase- Short- Circuit Fault	1. Motor phase- to- phase short- circuit 2. Motor- controller IGBT short- circuit	Refer to DTC: 169



Fault Code	Fault Description	Possible Causes	Solutions
170	Motor Controller Bus Over- Current	3. Traction motor failure 4. High- voltage circuit short- circuit	Refer to DTC: 170
		1. High- voltage- side short- circuit 2. Motor controller failure 3. Traction motor failure 4. Power battery pack failure	
171	Motor- Controller Current- Rise Fault	1. Current- sensor failure 2. Motor controller failure 3. Traction motor failure 4. Abnormal load	Refer to DTC: 171
172	Motor- Controller Current- Filter Fault	1. Current- sensor failure 2. Filter- circuit failure 3. Motor controller failure 4. Electromagnetic interference	Refer to DTC: 172
173	Motor- Controller Mid- Point- Voltage Fault	1. Voltage- sensor failure 2. Motor controller failure 3. Traction motor failure 4. Bus- capacitor failure	Refer to DTC: 173
174	Motor- Controller Voltage- Rise Fault	1. Voltage- sensor failure 2. Motor controller failure 3. Power battery pack failure	Refer to DTC: 174



Fault Code	Fault Description	Possible Causes	Solutions
175	Motor- Contactor Adhesion Fault	4. High- voltage circuit failure 1. Short- circuit of motor- contactor control- circuit 2. Ablation / adhesion of motor contactor 3. Motor controller failure 4. Abnormal high- voltage load	Refer to DTC: 175
176	VCU Hardware Fault	1. Internal VCU hardware failure 2. Abnormal VCU power supply 3. VCU software fault	Refer to DTC: 176
177	VCU 24V Power- Supply Abnormality	1. 24V power- supply failure 2. Power- supply- circuit failure 3. Blown fuse 4. VCU failure	Refer to DTC: 177
178	BMS Main- Negative- Close Timeout Fault	1. BMS main- negative- contactor control- circuit failure 2. BMS main- negative contactor failure 3. BMS failure 4. Power battery pack failure	Refer to DTC: 178
179	Pre- Charge- Contactor Adhesion Fault	1. Short- circuit of pre- charge- contactor control- circuit 2. Ablation / adhesion of pre- charge contactor 3. Motor controller failure 4. Pre- charge- resistor failure	Refer to DTC: 179
180	Gear- Shift- Panel Fault	1. Gear- shift- panel communication fault	Refer to



Fault Code	Fault Description	Possible Causes	Solutions
			DTC: 180
		2. Gear- shift- panel key failure 3. Abnormal gear- shift- panel power supply 4. Motor controller failure	
181	Pre- Charge Contactor Fault	1. Pre- charge- contactor control- circuit failure 2. Pre- charge contactor failure 3. Pre- charge- resistor failure 4. Motor controller failure	Refer to DTC: 181
183	Transmission Fault	1. Internal transmission mechanical failure 2. Transmission- sensor failure 3. Transmission- controller failure 4. Abnormal transmission- fluid condition	Refer to DTC: 183
185	Main- Contactor Disconnect- Timeout Fault	1. Main- contactor adhesion 2. Main- contactor control- circuit failure 3. Motor controller failure 4. Abnormal high- voltage load	Refer to DTC: 185
186	BMS Communication Fault	1. Short- circuit or open- circuit of BMS communication line 2. BMS failure 3. Motor controller failure 4. Power battery pack failure	Refer to DTC: 186
187	Controller Current- Sensor Fault	1. Short- circuit or open- circuit of current- sensor line	Refer to DTC: 187



Fault Code	Fault Description	Possible Causes	Solutions
188	Controller Temperature- Sensor Fault	2. Current- sensor failure 3. Motor controller failure 4. Abnormal power supply 1. Short- circuit or open- circuit of temperature- sensor line 2. Temperature- sensor failure 3. Motor controller failure 4. Abnormal power supply	Refer to DTC: 188
191	Pre- Charge Fault	1. Pre- charge contactor failure 2. Pre- charge- resistor failure 3. High- voltage- side short- circuit 4. Motor controller failure 5. Power battery pack failure	Refer to DTC: 191
192	Motor Contactor Fault	1. Motor- contactor control- circuit failure 2. Motor contactor failure 3. Motor controller failure 4. Abnormal high- voltage load	Refer to DTC: 192
193	Main- Positive Contactor Fault	1. Main- positive- contactor control- circuit failure 2. Main- positive contactor failure 3. Motor controller failure 4. Abnormal high- voltage load	Refer to DTC: 193
194	Main- Negative Contactor Fault	1. Main- negative- contactor control- circuit failure	Refer to DTC: 194



Fault Code	Fault Description	Possible Causes	Solutions
195	General Hardware- Drive Fault	2. Main- negative contactor failure 3. Motor controller failure 4. Abnormal high- voltage load	Refer to DTC: 195
		1. Drive- circuit failure 2. IGBT failure 3. Motor controller failure 4. Abnormal power supply	
196	Motor- Controller Current- Detection Fault	1. Current- sensor failure 2. Current- detection- circuit failure 3. Motor controller failure 4. Abnormal power supply	Refer to DTC: 196
197	Hardware Over- Current Fault	1. High- voltage- side short- circuit 2. Motor phase- to- phase short- circuit 3. IGBT short- circuit 4. Motor controller failure 5. Traction motor failure	Refer to DTC: 197
198	Dual- Channel Accelerator- Pedal Signal Abnormality	1. Accelerator- pedal sensor failure 2. Accelerator- pedal circuit failure 3. Abnormal accelerator- pedal power supply 4. Motor controller failure	Refer to DTC: 198
199	Active- Discharge Failure Fault	1. Active- discharge- circuit failure	Refer to DTC: 199



Fault Code	Fault Description	Possible Causes	Solutions
200	Low- Insulation- Resistance Fault	2. Discharge- resistor failure	Refer to DTC: 200
		3. High- voltage capacitor failure	
		4. Motor controller failure	
		1. High- voltage harness insulation failure	
		2. Insulation failure of high- voltage electrical components	
202	BMS Level- 3 Fault	3. Traction- motor insulation failure	Refer to DTC: 202
		4. Motor- controller insulation failure	
		5. Insulation- detection- circuit failure	
		1. Severe power- battery- pack fault	
		2. Severe BMS fault	
204	General Hardware- Drive Fault	3. Severe high- voltage- system fault	Refer to DTC: 195
		4. Battery- pack thermal runaway	
		1. Drive- circuit failure	
		2. IGBT failure	
		3. Motor controller failure	
205	Hardware V- Phase IGBT Fault	4. Abnormal power supply	Refer to DTC: 205
		1. Damaged V- phase IGBT module	
		2. V- phase drive- circuit failure	
		3. Motor- controller over- current	
		4. Motor- controller over- temperature	
		5. Motor controller failure	



Fault Code	Fault Description	Possible Causes	Solutions
206	Hardware W- Phase IGBT Fault	1. Damaged W- phase IGBT module 2. W- phase drive- circuit failure 3. Motor- controller over- current 4. Motor- controller over- temperature 5. Motor controller failure	Refer to DTC: 206
207	Hardware U- Phase IGBT Fault	1. Damaged U- phase IGBT module 2. U- phase drive- circuit failure 3. Motor- controller over- current 4. Motor- controller over- temperature 5. Motor controller failure	Refer to DTC: 207
208	Hardware V- Phase Drive Under- Voltage Fault	1. V- phase drive- power- supply failure 2. V- phase drive- circuit failure 3. Abnormal motor- controller power supply 4. Motor controller failure	Refer to DTC: 208
209	Hardware W- Phase Drive Under- Voltage Fault	1. W- phase drive- power- supply failure 2. W- phase drive- circuit failure 3. Abnormal motor- controller power supply 4. Motor controller failure	Refer to DTC: 209
210	Hardware U- Phase Drive Under- Voltage Fault	1. U- phase drive- power- supply failure 2. U- phase drive- circuit failure 3. Abnormal motor- controller power supply	Refer to DTC: 210



Fault Code	Fault Description	Possible Causes	Solutions
211	General Hardware Over- Current Fault	4. Motor controller failure	Refer to DTC: 211
		1. High- voltage- side short- circuit	
		2. Motor phase- to- phase short- circuit	
		3. IGBT short- circuit	
		4. Motor controller failure	
212	Hardware Over- Current Fault	5. Traction motor failure	Refer to DTC: 197
		1. High- voltage- side short- circuit	
		2. Motor phase- to- phase short- circuit	
		3. IGBT short- circuit	
		4. Motor controller failure	
		5. Traction motor failure	

3.3.4.2 DTC: 1

Fault Code Description

Fault Code	Fault Description	Possible Causes
1	Motor Controller Bus Over- Voltage Warning	1. Power battery pack over- charge
		2. Power battery pack failure
		3. Motor controller failure
		4. Four- in- one unit failure

Diagnostic Procedure

Step1 General inspection

Step2 Review DTC list of power- battery system; eliminate power- battery- system faults

Step 1 General inspection

Step 3 Inspect the motor controller

Step 4 Inspect the four- in- one unit

3. 3. 4. 3 DTC: 2

Fault Code Description

Fault Code	Fault Description	Possible Causes
2	Motor Stall Warning	1. Excessive motor load 2. Motor bearing failure 3. Motor controller failure 4. Drivetrain failure

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect motor load

Step 3 Inspect motor bearings

Step 4 Inspect the motor controller

Step 5 Inspect the drivetrain

3. 3. 4. 4 DTC: 3

Fault Code Description

Fault Code	Fault Description	Possible Causes
3	Motor Controller Over- Temperature Warning	1. Long- duration vehicle operation 2. Excessively high ambient temperature 3. Insufficient coolant 4. ATS radiator blocked

Fault Code	Fault Description	Possible Causes
		5. Cooling pipeline blocked or leaking
		6. Water pump failure
		7. ATS fan failure
		8. Motor controller failure

Diagnostic Procedure

Step 1 General inspection

Step 2 Check surrounding environment

Step 3 Inspect coolant

Step 4 Inspect ATS radiator

Step 5 Inspect cooling pipelines

Step 6 Inspect water pump

Step 7 Inspect ATS fan

Step 8 Inspect the motor controller

3.3.4.5 DTC: 4

Fault Code Description

Fault Code	Fault Description	Possible Causes
4	Motor Controller Bus Under- Voltage Warning	1. Insufficient power- battery- pack SOC 2. Power battery pack failure 3. Motor controller failure 4. High- voltage circuit failure

Diagnostic Procedure

Step 1 General inspection

Step 1 General inspection

Step 2 Review DTC list of power- battery system; eliminate power- battery- system faults

Step 3 Inspect high- voltage circuits

Step 4 Inspect the motor controller

3. 3. 4. 6 DTC: 5

Fault Code Description

Fault Code	Fault Description	Possible Causes
5	Traction Motor Over- Temperature Warning	1. Long- duration vehicle operation 2. Excessively high ambient temperature 3. Insufficient coolant 4. Cooling- system failure 5. Motor over- load operation 6. Traction motor failure

Diagnostic Procedure

Step 1 General inspection

Step 2 Check surrounding environment

Step 3 Inspect coolant

Step 4 Inspect cooling system

Step 5 Inspect motor load

Step 6 Inspect the traction motor

3. 3. 4. 7 DTC: 6

Fault Code Description

Fault Code	Fault Description	Possible Causes
6	Traction Motor Over- Speed Warning	1. Excessive downhill vehicle speed 2. Motor controller failure 3. Resolver- sensor failure 4. Drivetrain failure

Diagnostic Procedure

Step1 General inspection

Step2 Check vehicle driving condition

Step3 Inspect resolver sensor

Step4 Inspect the motor controller

Step5 Inspect the drivetrain

3.3.4.8 DTC: 7

Fault Code Description

Fault Code	Fault Description	Possible Causes
7	Defrost Contactor Failure	1. Defrost- contactor control- circuit failure 2. Defrost contactor failure 3. Motor controller failure

Diagnostic Procedure

Step1 General inspection

Step2 Inspect defrost- contactor control circuit

Step3 Inspect defrost contactor

Step4 Inspect the motor controller

3.3.4.9 DTC: 8

Fault Code Description

Fault Code	Fault Description	Possible Causes
8	Air- Conditioning Contactor Failure	1. Air- conditioning- contactor control- circuit failure 2. Air- conditioning contactor failure 3. Motor controller failure

Diagnostic Procedure

- Step 1** **General inspection**
- Step 2 Inspect air- conditioning- contactor control circuit
- Step 3 Inspect air- conditioning contactor
- Step 4 Inspect the motor controller

3.3.4.10 DTC: 9

Fault Code Description

Fault Code	Fault Description	Possible Causes
9	Air- Conditioning Communication Fault	1. Short- circuit or open- circuit of air- conditioning communication line 2. Air- conditioning controller failure 3. Motor controller failure

Diagnostic Procedure

- Step 1** **General inspection**
- Step 2 Inspect air- conditioning communication lines
- Step 3 Inspect air- conditioning controller
- Step 4 Inspect the motor controller

3.3.4.11 DTC: 10

Fault Code Description

Fault Code	Fault Description	Possible Causes
10	Air- Conditioning System Fault	1. Air- conditioning compressor failure 2. Abnormal air- conditioning- system pressure 3. Air- conditioning controller failure 4. Air- conditioning communication fault

Diagnostic Procedure

Step1 General inspection

Step2 Inspect air- conditioning compressor

Step3 Inspect air- conditioning- system pressure

Step4 Inspect air- conditioning controller

Step5 Inspect air- conditioning communication

3.3.4.12 DTC: 11

Fault Code Description

Fault Code	Fault Description	Possible Causes
11	Low Battery Voltage	1. Low- voltage battery under- charge 2. Low- voltage battery aging 3. DCDC failure 4. Low- voltage circuit electric leakage

Diagnostic Procedure

Step1 General inspection

Step 1 General inspection

Step 2 Measure low- voltage- battery voltage

Step 3 Inspect DCDC output

Step 4 Inspect low- voltage circuits

3. 3. 4. 13 DTC: 12

Fault Code Description

Fault Code	Fault Description	Possible Causes
12	Oil- Pump Temperature- Sensor Fault	1. Short- circuit or open- circuit of oil- pump temperature- sensor line 2. Oil- pump temperature- sensor failure 3. Motor controller failure

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect oil- pump temperature- sensor lines

Step 3 Inspect oil- pump temperature sensor

Step 4 Inspect the motor controller

3. 3. 4. 14 DTC: 13

Fault Code Description

Fault Code	Fault Description	Possible Causes
13	Air- Pump Temperature- Sensor Fault	1. Short- circuit or open- circuit of air- pump temperature- sensor line 2. Air- pump temperature- sensor failure 3. Motor controller failure

Diagnostic Procedure



Step 1 General inspection

Step 2 Inspect air- pump temperature- sensor lines

Step 3 Inspect air- pump temperature sensor

Step 4 Inspect the motor controller

3. 3. 4. 15 DTC: 14

Fault Code Description

Fault Code	Fault Description	Possible Causes
14	Driving Hand- Brake Interlock Fault	1. Hand- brake switch failure 2. Hand- brake circuit failure 3. Motor controller failure

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect hand- brake switch

Step 3 Inspect hand- brake circuits

Step 4 Inspect the motor controller

3. 3. 4. 16 DTC: 16

Fault Code Description

Fault Code	Fault Description	Possible Causes
16	Battery Cooling- System Fault	1. Cooling water- pump failure 2. Cooling fan failure 3. Insufficient coolant 4. Cooling pipeline blocked or leaking 5. Battery- cooling- system controller failure

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect coolant

Step 3 Inspect cooling water- pump

Step 4 Inspect cooling fan

Step 5 Inspect cooling pipelines

Step 6 Inspect battery- cooling- system controller

3. 3. 4. 17 DTC: 17

Fault Code Description

Fault Code	Fault Description	Possible Causes
17	DCDC Input Under- Voltage	1. Insufficient power- battery- pack SOC 2. Power battery pack failure 3. DCDC failure 4. High- voltage input- circuit failure

Diagnostic Procedure

Step 1 General inspection

Step 2 Review DTC list of power- battery system; eliminate power- battery- system faults

Step 3 Inspect high- voltage input circuits

Step 4 Inspect DCDC

3. 3. 4. 18 DTC: 18

Fault Code Description

Fault Code	Fault Description	Possible Causes
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Fault Code	Fault Description	Possible Causes
18	DCDC Input Over- Voltage	1. Power battery pack over- charge 2. Power battery pack failure 3. DCDC failure 4. Four- in- one unit failure

Diagnostic Procedure

Step 1 General inspection

Step 2 Review DTC list of power- battery system; eliminate power- battery- system faults

Step 3 Inspect DCDC

Step 4 Inspect four- in- one unit

3. 3. 4. 19 DTC: 19

Fault Code Description

Fault Code	Fault Description	Possible Causes
19	DCDC Output Over- Current	1. Excessive low- voltage load 2. Low- voltage circuit short- circuit 3. DCDC failure 4. Low- voltage electrical- component failure

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect low- voltage load

Step 3 Inspect low- voltage circuits

Step 4 Inspect DCDC

Step 5 Inspect low- voltage electrical components

3.3.4.20 DTC: 20

Fault Code Description

Fault Code	Fault Description	Possible Causes
20	DCDC Module Over- Temperature	1. Excessively high ambient temperature 2. Excessive DCDC load 3. Poor heat dissipation 4. DCDC failure

Diagnostic Procedure

Step1 General inspection

Step2 Check ambient temperature

Step3 Inspect DCDC load

Step4 Inspect heat- dissipation system

Step5 Inspect DCDC

3.3.4.21 DTC: 21

Fault Code Description

Fault Code	Fault Description	Possible Causes
21	DCDC Output Open- Circuit	1. Open- circuit in DCDC output line 2. Blown low- voltage fuse 3. DCDC failure 4. Low- voltage main- switch failure

Diagnostic Procedure

Step1 General inspection

Step 1 General inspection

Step 2 Inspect low- voltage fuses

Step 3 Inspect DCDC output lines

Step 4 Inspect low- voltage main- switch

Step 5 Inspect DCDC

3. 3. 4. 22 DTC: 22

Fault Code Description

Fault Code	Fault Description	Possible Causes
22	DCDC Communication Fault	1. Short- circuit or open- circuit of DCDC communication line 2. DCDC failure 3. Motor controller failure

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect DCDC communication lines

Step 3 Inspect DCDC

Step 4 Inspect the motor controller

3. 3. 4. 23 DTC: 25

Fault Code Description

Fault Code	Fault Description	Possible Causes
25	DCDC Hardware Fault	1. Internal DCDC hardware failure 2. Abnormal DCDC power supply 3. Four- in- one unit failure

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect DCDC power supply

Step 3 Inspect DCDC

Step 4 Inspect four- in- one unit

3. 3. 4. 24 DTC: 28

Fault Code Description

Fault Code	Fault Description	Possible Causes
28	Accelerator- Brake Interlock	1. Accelerator- pedal failure 2. Brake- pedal failure 3. Pedal- circuit failure 4. Motor controller failure

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect accelerator pedal

Step 3 Inspect brake pedal

Step 4 Inspect pedal circuits

Step 5 Inspect the motor controller

3. 3. 4. 25 DTC: 33

Fault Code Description

Fault Code	Fault Description	Possible Causes
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Fault Code	Fault Description	Possible Causes
33	Pull- Up Hand- Brake for Charging	1. Hand- brake not engaged 2. Hand- brake switch failure 3. Charging- controller failure 4. Motor controller failure

Diagnostic Procedure

Step1 General inspection

Step2 Check hand- brake status

Step3 Inspect hand- brake switch

Step4 Inspect charging controller

Step5 Inspect the motor controller

3. 3. 4. 26 DTC: 34

Fault Code Description

Fault Code	Fault Description	Possible Causes
34	Exhaust- System Fault	1. Dryer exhaust- valve failure 2. Dryer ground- circuit failure 3. Dryer assembly failure 4. Pneumatic- system fault

Diagnostic Procedure

Step1 General inspection

Step2 Inspect dryer exhaust valve

Step3 Inspect dryer ground circuit

Step4 Inspect dryer assembly

Step 1 General inspection

Step 5 Inspect pneumatic system

3.3.4.27 DTC: 35

Fault Code Description

Fault Code	Fault Description	Possible Causes
35	Air- Pump Continuous- Operation Fault	1. Pneumatic- system air leakage 2. Air- pump failure 3. Pressure- sensor failure 4. Motor controller failure

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect pneumatic system for leakage

Step 3 Inspect air pump

Step 4 Inspect pressure sensor

Step 5 Inspect the motor controller

3.3.4.28 DTC: 37

Fault Code Description

Fault Code	Fault Description	Possible Causes
37	OBC Communication Fault	1. Short- circuit or open- circuit of OBC communication line 2. OBC failure 3. Motor controller failure

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect OBC communication lines

Step 3 Inspect OBC

Step 4 Inspect the motor controller

3.3.4.29 DTC: 70

Fault Code Description

Fault Code	Fault Description	Possible Causes
70	Oil- Pump Communication Fault	1. Short- circuit or open- circuit of oil- pump communication line 2. Oil- pump controller failure 3. Motor controller failure

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect oil- pump communication lines

Step 3 Inspect oil- pump controller

Step 4 Inspect the motor controller

3.3.4.30 DTC: 71

Fault Code Description

Fault Code	Fault Description	Possible Causes
71	Air- Pump Communication Fault	1. Short- circuit or open- circuit of air- pump communication line 2. Air- pump controller failure 3. Motor controller failure

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect air- pump communication lines

Step 3 Inspect air- pump controller

Step 4 Inspect the motor controller

3. 3. 4. 31 DTC: 72

Fault Code Description

Fault Code	Fault Description	Possible Causes
72	Instrument- Panel Communication Fault	1. Short- circuit or open- circuit of instrument- panel communication line 2. Instrument- panel failure 3. Motor controller failure

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect instrument- panel communication lines

Step 3 Inspect instrument panel

Step 4 Inspect the motor controller

3. 3. 4. 32 DTC: 73

Fault Code Description

Fault Code	Fault Description	Possible Causes
73	Air- Pump Phase- Loss Fault	1. Air- pump motor phase loss 2. Air- pump controller failure 3. Air- pump circuit failure 4. Motor controller failure

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect air- pump circuits

Step 3 Inspect air- pump motor

Step 4 Inspect air- pump controller

Step 5 Inspect the motor controller

3. 3. 4. 33 DTC: 74

Fault Code Description

Fault Code	Fault Description	Possible Causes
74	Oil- Pump Phase- Loss Fault	1. Oil- pump motor phase loss 2. Oil- pump controller failure 3. Oil- pump circuit failure 4. Motor controller failure

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect oil- pump circuits

Step 3 Inspect oil- pump motor

Step 4 Inspect oil- pump controller

Step 5 Inspect the motor controller

3. 3. 4. 34 DTC: 77

Fault Code Description

Fault Code	Fault Description	Possible Causes
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Fault Code	Fault Description	Possible Causes
77	ABS Communication Fault	1. Short- circuit or open- circuit of ABS communication line 2. ABS controller failure 3. Motor controller failure

Diagnostic Procedure

Step1 General inspection

Step2 Inspect ABS communication lines

Step3 Inspect ABS controller

Step4 Inspect the motor controller

3.3.4.35 DTC: 80

Fault Code Description

Fault Code	Fault Description	Possible Causes
80	Oil- Pump Over- Temperature	1. Excessive oil- pump load 2. Poor oil- pump heat dissipation 3. Oil- pump failure 4. Oil- pump controller failure

Diagnostic Procedure

Step1 General inspection

Step2 Inspect oil- pump load

Step3 Inspect oil- pump heat- dissipation

Step4 Inspect oil pump

Step5 Inspect oil- pump controller

3.3.4.36 DTC: 81

Fault Code Description

Fault Code	Fault Description	Possible Causes
81	Air- Pump Over- Temperature	1. Excessive air- pump load 2. Poor air- pump heat dissipation 3. Air- pump failure 4. Air- pump controller failure

Diagnostic Procedure

Step1 General inspection

Step2 Inspect air- pump load

Step3 Inspect air- pump heat- dissipation

Step4 Inspect air pump

Step5 Inspect air- pump controller

3.3.4.37 DTC: 82

Fault Code Description

Fault Code	Fault Description	Possible Causes
82	Oil- Pump Inverter Fault	1. Oil- pump inverter hardware failure 2. Abnormal oil- pump- inverter power supply 3. Oil- pump motor failure 4. Motor controller failure

Diagnostic Procedure

Step1 General inspection

Step 1 General inspection

Step 2 Inspect oil- pump- inverter power supply

Step 3 Inspect oil- pump motor

Step 4 Inspect oil- pump inverter

Step 5 Inspect the motor controller

3. 3. 4. 38 DTC: 83

Fault Code Description

Fault Code	Fault Description	Possible Causes
83	Air- Pump Inverter Fault	1. Air- pump inverter hardware failure 2. Abnormal air- pump- inverter power supply 3. Air- pump motor failure 4. Motor controller failure

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect air- pump- inverter power supply

Step 3 Inspect air- pump motor

Step 4 Inspect air- pump inverter

Step 5 Inspect the motor controller

3. 3. 4. 39 DTC: 84

Fault Code Description

Fault Code	Fault Description	Possible Causes
84	Air- Pump Inverter Over- Voltage	1. Excessive input voltage



Fault Code	Fault Description	Possible Causes
		2. Air- pump inverter failure
		3. Air- pump motor failure
		4. Motor controller failure

Diagnostic Procedure

Step1 General inspection

Step2 Measure input voltage

Step3 Inspect air- pump motor

Step4 Inspect air- pump inverter

Step5 Inspect the motor controller

3.3.4.40 DTC: 85

Fault Code Description

Fault Code	Fault Description	Possible Causes
85	Air- Pump Inverter Under- Voltage	1. Insufficient input voltage
		2. Air- pump inverter failure
		3. Power- supply- circuit failure
		4. Motor controller failure

Diagnostic Procedure

Step1 General inspection

Step2 Measure input voltage

Step3 Inspect power- supply circuits

Step4 Inspect air- pump inverter

Step5 Inspect the motor controller

3.3.4.41 DTC: 86

Fault Code Description

Fault Code	Fault Description	Possible Causes
86	Air- Pump Inverter Over- Current	1. Air- pump motor short- circuit 2. Excessive air- pump load 3. Air- pump inverter failure 4. Motor controller failure

Diagnostic Procedure

Step1 General inspection

Step2 Inspect air- pump motor

Step3 Inspect air- pump load

Step4 Inspect air- pump inverter

Step5 Inspect the motor controller

3.3.4.42 DTC: 87

Fault Code Description

Fault Code	Fault Description	Possible Causes
87	Air- Pump Controller Over- Temperature	1. Excessively high ambient temperature 2. Excessive air- pump- controller load 3. Poor heat dissipation 4. Air- pump controller failure

Diagnostic Procedure

Step1 General inspection

Step 1 General inspection

Step 2 Check ambient temperature

Step 3 Inspect air- pump- controller load

Step 4 Inspect heat- dissipation system

Step 5 Inspect air- pump controller

3. 3. 4. 43 DTC: 89

Fault Code Description

Fault Code	Fault Description	Possible Causes
89	Oil- Pump Inverter Over- Voltage	1. Excessive input voltage 2. Oil- pump inverter failure 3. Oil- pump motor failure 4. Motor controller failure

Diagnostic Procedure

Step 1 General inspection

Step 2 Measure input voltage

Step 3 Inspect oil- pump motor

Step 4 Inspect oil- pump inverter

Step 5 Inspect the motor controller

3. 3. 4. 44 DTC: 90

Fault Code Description

Fault Code	Fault Description	Possible Causes
90	Oil- Pump Inverter Under- Voltage	1. Insufficient input voltage



Fault Code	Fault Description	Possible Causes
		2. Oil- pump inverter failure
		3. Power- supply- circuit failure
		4. Motor controller failure

Diagnostic Procedure

Step1 General inspection

Step2 Measure input voltage

Step3 Inspect power- supply circuits

Step4 Inspect oil- pump inverter

Step5 Inspect the motor controller

3.3.4.45 DTC: 91

Fault Code Description

Fault Code	Fault Description	Possible Causes
91	Oil- Pump Inverter Over- Current	1. Oil- pump motor short- circuit
		2. Excessive oil- pump load
		3. Oil- pump inverter failure
		4. Motor controller failure

Diagnostic Procedure

Step1 General inspection

Step2 Inspect oil- pump motor

Step3 Inspect oil- pump load

Step4 Inspect oil- pump inverter

Step5 Inspect the motor controller

3.3.4.46 DTC: 92

Fault Code Description

Fault Code	Fault Description	Possible Causes
92	Oil- Pump Controller Over- Temperature	1. Excessively high ambient temperature 2. Excessive oil- pump- controller load 3. Poor heat dissipation 4. Oil- pump controller failure

Diagnostic Procedure

Step 1 General inspection

Step 2 Check ambient temperature

Step 3 Inspect oil- pump- controller load

Step 4 Inspect heat- dissipation system

Step 5 Inspect oil- pump controller

3.3.4.47 DTC: 93

Fault Code Description

Fault Code	Fault Description	Possible Causes
93	Accessory- Shutdown Timeout Fault	1. Accessory- contactor adhesion 2. Accessory- control- circuit failure 3. Motor controller failure 4. Accessory fault

Diagnostic Procedure

Step 1 General inspection

Step 1 General inspection

Step 2 Inspect accessory contactor

Step 3 Inspect accessory- control circuit

Step 4 Inspect accessories

Step 5 Inspect the motor controller

3. 3. 4. 48 DTC: 98

Fault Code Description

Fault Code	Fault Description	Possible Causes
98	Single- Channel Accelerator- Pedal Signal Abnormality	1. Accelerator- pedal sensor failure 2. Accelerator- pedal circuit failure 3. Abnormal accelerator- pedal power supply 4. Motor controller failure

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect accelerator- pedal power supply

Step 3 Inspect accelerator- pedal circuits

Step 4 Inspect accelerator- pedal sensor

Step 5 Inspect the motor controller

3. 3. 4. 49 DTC: 99

Fault Code Description

Fault Code	Fault Description	Possible Causes
99	Brake- Pedal Signal Abnormality	1. Brake- pedal sensor failure

Fault Code	Fault Description	Possible Causes
		2. Brake- pedal circuit failure
		3. Abnormal brake- pedal power supply
		4. Motor controller failure

Diagnostic Procedure

Step1 General inspection

Step2 Inspect brake- pedal power supply

Step3 Inspect brake- pedal circuits

Step4 Inspect brake- pedal sensor

Step5 Inspect the motor controller

3.3.4.50 DTC: 101

Fault Code Description

Fault Code	Fault Description	Possible Causes
101	Accessory- Contactor- Close Failure Fault	1. Accessory- contactor control- circuit failure
		2. Accessory contactor failure
		3. Excessive accessory load
		4. Motor controller failure

Diagnostic Procedure

Step1 General inspection

Step2 Inspect accessory- contactor control circuit

Step3 Inspect accessory contactor

Step4 Inspect accessory load

Step5 Inspect the motor controller

3.3.4.51 DTC: 151

Fault Code Description

Fault Code	Fault Description	Possible Causes
151	MCU Self- Test Fault	1. Internal motor- controller hardware failure 2. Abnormal motor- controller power supply 3. Motor- controller software fault

Diagnostic Procedure

- Step 1** **General inspection**
- Step 2 Inspect motor- controller power supply
- Step 3 Inspect motor- controller hardware
- Step 4 Re- flash motor- controller software

3.3.4.52 DTC: 152

Fault Code Description

Fault Code	Fault Description	Possible Causes
152	Motor Controller Bus Over- Voltage	1. Power battery pack over- charge 2. Power battery pack failure 3. Motor controller failure 4. Four- in- one unit failure

Diagnostic Procedure

- Step 1** **General inspection**
- Step 2 Review DTC list of power- battery system; eliminate power- battery- system faults
- Step 3 Inspect the motor controller

Step 1 General inspection

Step 4 Inspect four- in- one unit

3. 3. 4. 53 DTC: 153

Fault Code Description

Fault Code	Fault Description	Possible Causes
153	Motor Controller Phase Over- Current	1. Motor phase- to- phase short- circuit 2. Motor controller failure 3. Current- sensor failure 4. Traction motor failure

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect traction motor

Step 3 Inspect current sensor

Step 4 Inspect the motor controller

3. 3. 4. 54 DTC: 154

Fault Code Description

Fault Code	Fault Description	Possible Causes
154	Motor Controller Over- Temperature	1. Long- duration vehicle operation 2. Excessively high ambient temperature 3. Insufficient coolant 4. ATS radiator blocked 5. Cooling pipeline blocked or leaking 6. Water pump failure

Fault Code	Fault Description	Possible Causes
		7. ATS fan failure
		8. Motor controller failure

Diagnostic Procedure

Step 1 General inspection

Step 2 Check surrounding environment

Step 3 Inspect coolant

Step 4 Inspect ATS radiator

Step 5 Inspect cooling pipelines

Step 6 Inspect water pump

Step 7 Inspect ATS fan

Step 8 Inspect the motor controller

3.3.4.55 DTC: 155

Fault Code Description

Fault Code	Fault Description	Possible Causes
155	Motor Controller Bus Under- Voltage	1. Insufficient power- battery- pack SOC 2. Power battery pack failure 3. Motor controller failure 4. High- voltage circuit failure

Diagnostic Procedure

Step 1 General inspection

Step 2 Review DTC list of power- battery system; eliminate power- battery- system faults

Step 3 Inspect high- voltage circuits

Step 1 General inspection

Step 4 Inspect the motor controller

3. 3. 4. 56 DTC: 156

Fault Code Description

Fault Code	Fault Description	Possible Causes
156	Traction Motor Over- Temperature	1. Long- duration vehicle operation 2. Excessively high ambient temperature 3. Insufficient coolant 4. Cooling- system failure 5. Motor over- load operation 6. Traction motor failure

Diagnostic Procedure

Step 1 General inspection

Step 2 Check surrounding environment

Step 3 Inspect coolant

Step 4 Inspect cooling system

Step 5 Inspect motor load

Step 6 Inspect the traction motor

3. 3. 4. 57 DTC: 157

Fault Code Description

Fault Code	Fault Description	Possible Causes
157	Resolver Fault	1. Short- circuit or open- circuit of resolver- sensor line 2. Resolver- sensor failure

Fault Code	Fault Description	Possible Causes
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- | | |
|--|-----------------------------|
| | 3. Motor controller failure |
| | 4. Traction motor failure |

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect resolver- sensor lines

Step 3 Inspect resolver sensor

Step 4 Inspect traction motor

Step 5 Inspect the motor controller

3. 3. 4. 58 DTC: 158

Fault Code Description

Fault Code	Fault Description	Possible Causes
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- | | | |
|-----|---------------------------------|--|
| | | 1. Short- circuit or open- circuit of motor temperature- sensor line |
| 158 | Motor Temperature- Sensor Fault | 2. Motor temperature- sensor failure |
| | | 3. Motor controller failure |
| | | 4. Traction motor failure |

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect motor temperature- sensor lines

Step 3 Inspect motor temperature sensor

Step 4 Inspect traction motor

Step 5 Inspect the motor controller

3.3.4.59 DTC: 160

Fault Code Description

Fault Code	Fault Description	Possible Causes
160	MCU Shutdown Failure (Active- Discharge Fault)	1. Active- discharge- circuit failure 2. Motor controller failure 3. High- voltage capacitor failure 4. Discharge- resistor failure

Diagnostic Procedure

Step1 General inspection

Step2 Inspect active- discharge circuit

Step3 Inspect high- voltage capacitor

Step4 Inspect discharge resistor

Step5 Inspect the motor controller

3.3.4.60 DTC: 161

Fault Code Description

Fault Code	Fault Description	Possible Causes
161	Traction Motor Excessive Rotational- Speed	1. Excessive downhill vehicle speed 2. Motor controller failure 3. Resolver- sensor failure 4. Drivetrain failure

Diagnostic Procedure

Step1 General inspection

Step 1 General inspection

Step 2 Check vehicle driving condition

Step 3 Inspect resolver sensor

Step 4 Inspect the motor controller

Step 5 Inspect the drivetrain

3.3.4.61 DTC: 162

Fault Code Description

Fault Code Fault Description

Possible Causes

162	Insulation Fault	1. High- voltage harness insulation failure
		2. Insulation failure of high- voltage electrical components
		3. Traction- motor insulation failure
		4. Motor- controller insulation failure
		5. Insulation- detection- circuit failure

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect insulation of high- voltage harness

Step 3 Inspect insulation of high- voltage electrical components

Step 4 Inspect traction- motor insulation

Step 5 Inspect motor- controller insulation

Step 6 Inspect insulation- detection circuit

3.3.4.62 DTC: 163

Fault Code Description



Fault Code	Fault Description	Possible Causes
163	Load- Removal Failure Fault	1. Motor controller failure 2. Traction motor failure 3. Load cannot be removed 4. Drivetrain failure

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect traction motor

Step 3 Inspect the drivetrain

Step 4 Inspect the motor controller

3. 3. 4. 63 DTC: 164

Fault Code Description

Fault Code	Fault Description	Possible Causes
164	Main- Negative Disconnect- Timeout Fault	1. Main- negative contactor adhesion 2. Main- negative- contactor control- circuit failure 3. Motor controller failure 4. Abnormal high- voltage load

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect main- negative contactor

Step 3 Inspect main- negative- contactor control circuit

Step 4 Inspect high- voltage load

Step 5 Inspect the motor controller

3.3.4.64 DTC: 165

Fault Code Description

Fault Code	Fault Description	Possible Causes
165	Motor Stall	1. Excessive motor load 2. Motor bearing failure 3. Motor controller failure 4. Drivetrain failure

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect motor load

Step 3 Inspect motor bearings

Step 4 Inspect the motor controller

Step 5 Inspect the drivetrain

3.3.4.65 DTC: 166

Fault Code Description

Fault Code	Fault Description	Possible Causes
166	Motor- Controller IGBT Hardware Fault	1. Damaged IGBT module 2. Drive- circuit failure 3. Motor- controller over- current 4. Motor- controller over- temperature 5. Motor controller failure

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect IGBT module

Step 3 Inspect drive circuit

Step 4 Inspect the motor controller

3.3.4.66 DTC: 167

Fault Code Description

Fault Code	Fault Description	Possible Causes
167	MCU Communication Fault	1. Short- circuit or open- circuit of MCU communication line 2. Motor controller failure 3. VCU failure

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect MCU communication lines

Step 3 Inspect the motor controller

Step 4 Inspect VCU

3.3.4.67 DTC: 168

Fault Code Description

Fault Code	Fault Description	Possible Causes
168	Motor- Controller Output Phase- Loss	1. Open- circuit of motor phase wire 2. Motor- controller IGBT failure 3. Traction motor failure 4. High- voltage circuit failure

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect motor phase wires

Step 3 Inspect traction motor

Step 4 Inspect motor- controller IGBT

Step 5 Inspect the motor controller

3. 3. 4. 68 DTC: 169

Fault Code Description

Fault Code	Fault Description	Possible Causes
169	Motor- Controller Phase- Short- Circuit Fault	1. Motor phase- to- phase short- circuit 2. Motor- controller IGBT short- circuit 3. Traction motor failure 4. High- voltage circuit short- circuit

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect high- voltage circuits

Step 3 Inspect traction motor

Step 4 Inspect motor- controller IGBT

Step 5 Inspect the motor controller

3. 3. 4. 69 DTC: 170

Fault Code Description

Fault Code	Fault Description	Possible Causes
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Fault Code	Fault Description	Possible Causes
170	Motor Controller Bus Over- Current	1. High- voltage- side short- circuit 2. Motor controller failure 3. Traction motor failure 4. Power battery pack failure

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect high- voltage side

Step 3 Inspect traction motor

Step 4 Review DTC list of power- battery system; eliminate power- battery- system faults

Step 5 Inspect the motor controller

3. 3. 4. 70 DTC: 171

Fault Code Description

Fault Code	Fault Description	Possible Causes
171	Motor- Controller Current- Rise Fault	1. Current- sensor failure 2. Motor controller failure 3. Traction motor failure 4. Abnormal load

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect current sensor

Step 3 Inspect traction motor

Step 4 Inspect load condition

Step 1 General inspection

Step 5 Inspect the motor controller

3.3.4.71 DTC: 172

Fault Code Description

Fault Code	Fault Description	Possible Causes
172	Motor- Controller Current- Filter Fault	1. Current- sensor failure 2. Filter- circuit failure 3. Motor controller failure 4. Electromagnetic interference

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect current sensor

Step 3 Inspect filter circuit

Step 4 Check for electromagnetic interference sources

Step 5 Inspect the motor controller

3.3.4.72 DTC: 173

Fault Code Description

Fault Code	Fault Description	Possible Causes
173	Motor- Controller Mid- Point- Voltage Fault	1. Voltage- sensor failure 2. Motor controller failure 3. Traction motor failure 4. Bus- capacitor failure

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect voltage sensor

Step 3 Inspect bus capacitor

Step 4 Inspect traction motor

Step 5 Inspect the motor controller

3. 3. 4. 73 DTC: 174

Fault Code Description

Fault Code	Fault Description	Possible Causes
174	Motor- Controller Voltage- Rise Fault	1. Voltage- sensor failure 2. Motor controller failure 3. Power battery pack failure 4. High- voltage circuit failure

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect voltage sensor

Step 3 Review DTC list of power- battery system; eliminate power- battery- system faults

Step 4 Inspect high- voltage circuits

Step 5 Inspect the motor controller

3. 3. 4. 74 DTC: 175

Fault Code Description

Fault Code	Fault Description	Possible Causes
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Fault Code	Fault Description	Possible Causes
175	Motor- Contactor Adhesion Fault	1. Short- circuit of motor- contactor control- circuit 2. Ablation / adhesion of motor contactor 3. Motor controller failure 4. Abnormal high- voltage load

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect motor- contactor control circuit

Step 3 Inspect motor contactor

Step 4 Inspect high- voltage load

Step 5 Inspect the motor controller

3. 3. 4. 75 DTC: 176

Fault Code Description

Fault Code	Fault Description	Possible Causes
176	VCU Hardware Fault	1. Internal VCU hardware failure 2. Abnormal VCU power supply 3. VCU software fault

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect VCU power supply

Step 3 Inspect VCU hardware

Step 4 Re- flash VCU software

3.3.4.76 DTC: 177

Fault Code Description

Fault Code	Fault Description	Possible Causes
177	VCU 24V Power- Supply Abnormality	1. 24V power- supply failure 2. Power- supply- circuit failure 3. Blown fuse 4. VCU failure

Diagnostic Procedure

Step1 General inspection

Step2 Inspect 24V power supply

Step3 Inspect fuses

Step4 Inspect power- supply circuits

Step5 Inspect VCU

3.3.4.77 DTC: 178

Fault Code Description

Fault Code	Fault Description	Possible Causes
178	BMS Main- Negative- Close Timeout Fault	1. BMS main- negative- contactor control- circuit failure 2. BMS main- negative contactor failure 3. BMS failure 4. Power battery pack failure

Diagnostic Procedure

Step1 General inspection

Step 1 General inspection

Step 2 Review DTC list of power- battery system; eliminate power- battery- system faults

Step 3 Inspect BMS main- negative- contactor control circuit

Step 4 Inspect BMS main- negative contactor

Step 5 Inspect BMS

3. 3. 4. 78 DTC: 179

Fault Code Description

Fault Code	Fault Description	Possible Causes
179	Pre- Charge- Contactor Adhesion Fault	1. Short- circuit of pre- charge- contactor control- circuit 2. Ablation / adhesion of pre- charge contactor 3. Motor controller failure 4. Pre- charge- resistor failure

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect pre- charge- contactor control circuit

Step 3 Inspect pre- charge contactor

Step 4 Inspect pre- charge resistor

Step 5 Inspect the motor controller

3. 3. 4. 79 DTC: 180

Fault Code Description

Fault Code	Fault Description	Possible Causes
180	Gear- Shift- Panel Fault	1. Gear- shift- panel communication fault

Fault Code	Fault Description	Possible Causes
		2. Gear- shift- panel key failure
		3. Abnormal gear- shift- panel power supply
		4. Motor controller failure

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect gear- shift- panel power supply

Step 3 Inspect gear- shift- panel keys

Step 4 Inspect gear- shift- panel communication

Step 5 Inspect the motor controller

3. 3. 4. 80 DTC: 181

Fault Code Description

Fault Code	Fault Description	Possible Causes
181	Pre- Charge Contactor Fault	1. Pre- charge- contactor control- circuit failure 2. Pre- charge contactor failure 3. Pre- charge- resistor failure 4. Motor controller failure

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect pre- charge- contactor control circuit

Step 3 Inspect pre- charge contactor

Step 4 Inspect pre- charge resistor

Step 5 Inspect the motor controller

3.3.4.81 DTC: 183

Fault Code Description

Fault Code	Fault Description	Possible Causes
183	Transmission Fault	1. Internal transmission mechanical failure 2. Transmission- sensor failure 3. Transmission- controller failure 4. Abnormal transmission- fluid condition

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect transmission fluid

Step 3 Inspect transmission sensor

Step 4 Inspect transmission controller

Step 5 Inspect internal mechanical parts of transmission

3.3.4.82 DTC: 185

Fault Code Description

Fault Code	Fault Description	Possible Causes
185	Main- Contactor Disconnect- Timeout Fault	1. Main- contactor adhesion 2. Main- contactor control- circuit failure 3. Motor controller failure 4. Abnormal high- voltage load

Diagnostic Procedure

Step 1 General inspection

Step 1 General inspection

Step 2 Inspect main contactor

Step 3 Inspect main- contactor control circuit

Step 4 Inspect high- voltage load

Step 5 Inspect the motor controller

3. 3. 4. 83 DTC: 186

Fault Code Description

Fault Code	Fault Description	Possible Causes
186	BMS Communication Fault	1. Short- circuit or open- circuit of BMS communication line 2. BMS failure 3. Motor controller failure 4. Power battery pack failure

Diagnostic Procedure

Step 1 General inspection

Step 2 Review DTC list of power- battery system; eliminate power- battery- system faults

Step 3 Inspect BMS communication lines

Step 4 Inspect BMS

Step 5 Inspect the motor controller

3. 3. 4. 84 DTC: 187

Fault Code Description

Fault Code	Fault Description	Possible Causes
187	Controller Current- Sensor Fault	1. Short- circuit or open- circuit of current- sensor line

Fault Code	Fault Description	Possible Causes
		2. Current- sensor failure
		3. Motor controller failure
		4. Abnormal power supply

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect current- sensor power supply

Step 3 Inspect current- sensor lines

Step 4 Inspect current sensor

Step 5 Inspect the motor controller

3. 3. 4. 85 DTC: 188

Fault Code Description

Fault Code	Fault Description	Possible Causes
188	Controller Temperature- Sensor Fault	1. Short- circuit or open- circuit of temperature- sensor line
		2. Temperature- sensor failure
		3. Motor controller failure
		4. Abnormal power supply

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect temperature- sensor power supply

Step 3 Inspect temperature- sensor lines

Step 4 Inspect temperature sensor

Step 5 Inspect the motor controller

3.3.4.86 DTC: 191

Fault Code Description

Fault Code	Fault Description	Possible Causes
191	Pre- Charge Fault	1. Pre- charge contactor failure 2. Pre- charge resistor failure 3. High- voltage- side short- circuit 4. Motor controller failure 5. Power battery pack failure

Diagnostic Procedure

- Step 1** General inspection
- Step 2 Review DTC list of power- battery system; eliminate power- battery- system faults
- Step 3 Inspect pre- charge contactor
- Step 4 Inspect pre- charge resistor
- Step 5 Inspect high- voltage side
- Step 6 Inspect the motor controller

3.3.4.87 DTC: 192

Fault Code Description

Fault Code	Fault Description	Possible Causes
192	Motor Contactor Fault	1. Motor- contactor control- circuit failure 2. Motor contactor failure 3. Motor controller failure 4. Abnormal high- voltage load

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect motor- contactor control circuit

Step 3 Inspect motor contactor

Step 4 Inspect high- voltage load

Step 5 Inspect the motor controller

3. 3. 4. 88 DTC: 193

Fault Code Description

Fault Code	Fault Description	Possible Causes
193	Main- Positive Contactor Fault	1. Main- positive- contactor control- circuit failure 2. Main- positive contactor failure 3. Motor controller failure 4. Abnormal high- voltage load

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect main- positive- contactor control circuit

Step 3 Inspect main- positive contactor

Step 4 Inspect high- voltage load

Step 5 Inspect the motor controller

3. 3. 4. 89 DTC: 194

Fault Code Description

Fault Code	Fault Description	Possible Causes
194	Main- Negative Contactor Fault	1. Main- negative- contactor control- circuit failure

Fault Code	Fault Description	Possible Causes
		2. Main- negative contactor failure
		3. Motor controller failure
		4. Abnormal high- voltage load

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect main- negative- contactor control circuit

Step 3 Inspect main- negative contactor

Step 4 Inspect high- voltage load

Step 5 Inspect the motor controller

3. 3. 4. 90 DTC: 195

Fault Code Description

Fault Code	Fault Description	Possible Causes
195	General Hardware- Drive Fault	1. Drive- circuit failure
		2. IGBT failure
		3. Motor controller failure
		4. Abnormal power supply

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect power supply

Step 3 Inspect drive circuit

Step 4 Inspect IGBT

Step 5 Inspect the motor controller

3.3.4.91 DTC: 196

Fault Code Description

Fault Code	Fault Description	Possible Causes
196	Motor- Controller Current- Detection Fault	1. Current- sensor failure 2. Current- detection- circuit failure 3. Motor controller failure 4. Abnormal power supply

Diagnostic Procedure

Step1 General inspection

Step2 Inspect power supply

Step3 Inspect current sensor

Step4 Inspect current- detection circuit

Step5 Inspect the motor controller

3.3.4.92 DTC: 197

Fault Code Description

Fault Code	Fault Description	Possible Causes
197	Hardware Over- Current Fault	1. High- voltage- side short- circuit 2. Motor phase- to- phase short- circuit 3. IGBT short- circuit 4. Motor controller failure 5. Traction motor failure

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect high- voltage side

Step 3 Inspect traction motor

Step 4 Inspect IGBT

Step 5 Inspect the motor controller

3. 3. 4. 93 DTC: 198

Fault Code Description

Fault Code	Fault Description	Possible Causes
198	Dual- Channel Accelerator- Pedal Signal Abnormality	1. Accelerator- pedal sensor failure 2. Accelerator- pedal circuit failure 3. Abnormal accelerator- pedal power supply 4. Motor controller failure

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect accelerator- pedal power supply

Step 3 Inspect accelerator- pedal circuits

Step 4 Inspect accelerator- pedal sensor

Step 5 Inspect the motor controller

3. 3. 4. 94 DTC: 199

Fault Code Description

Fault Code	Fault Description	Possible Causes
199	Active- Discharge Failure	1. Active- discharge- circuit failure



Fault Code	Fault Description	Possible Causes
		2. Discharge- resistor failure
		3. High- voltage capacitor failure
		4. Motor controller failure

Diagnostic Procedure

Step1 General inspection

Step2 Inspect active- discharge circuit

Step3 Inspect discharge resistor

Step4 Inspect high- voltage capacitor

Step5 Inspect the motor controller

3.3.4.95 DTC: 200

Fault Code Description

Fault Code	Fault Description	Possible Causes
		1. High- voltage harness insulation failure
		2. Insulation failure of high- voltage electrical components
200	Low- Insulation- Resistance Fault	3. Traction- motor insulation failure
		4. Motor- controller insulation failure
		5. Insulation- detection- circuit failure

Diagnostic Procedure

Step1 General inspection

Step2 Inspect insulation of high- voltage harness

Step3 Inspect insulation of high- voltage electrical components

Step4 Inspect traction- motor insulation

Step 1 General inspection

Step 5 Inspect motor- controller insulation

Step 6 Inspect insulation- detection circuit

3.3.4.96 DTC: 202

Fault Code Description

Fault Code	Fault Description	Possible Causes
202	BMS Level- 3 Fault	1. Severe power- battery- pack fault 2. Severe BMS fault 3. Severe high- voltage- system fault 4. Battery- pack thermal runaway

Diagnostic Procedure

Step 1 Stop vehicle immediately and cut off high- voltage power

Step 2 Review DTC list of power- battery system; eliminate power- battery- system faults

Step 3 Inspect BMS

Step 4 Inspect high- voltage system

Step 5 Contact professional personnel for handling

3.3.4.97 DTC: 205

Fault Code Description

Fault Code	Fault Description	Possible Causes
205	Hardware V- Phase IGBT Fault	1. Damaged V- phase IGBT module 2. V- phase drive- circuit failure 3. Motor- controller over- current 4. Motor- controller over- temperature

Fault Code	Fault Description	Possible Causes
		5. Motor controller failure

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect V- phase IGBT module

Step 3 Inspect V- phase drive circuit

Step 4 Inspect the motor controller

3. 3. 4. 98 DTC: 206

Fault Code Description

Fault Code	Fault Description	Possible Causes
206	Hardware W- Phase IGBT Fault	1. Damaged W- phase IGBT module 2. W- phase drive- circuit failure 3. Motor- controller over- current 4. Motor- controller over- temperature 5. Motor controller failure

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect W- phase IGBT module

Step 3 Inspect W- phase drive circuit

Step 4 Inspect the motor controller

3. 3. 4. 99 DTC: 207

Fault Code Description



Fault Code	Fault Description	Possible Causes
207	Hardware U- Phase IGBT Fault	1. Damaged U- phase IGBT module 2. U- phase drive- circuit failure 3. Motor- controller over- current 4. Motor- controller over- temperature 5. Motor controller failure

Diagnostic Procedure

Step1 General inspection

Step2 Inspect U- phase IGBT module

Step3 Inspect U- phase drive circuit

Step4 Inspect the motor controller

3.3.4. 100 DTC: 208

Fault Code Description

Fault Code	Fault Description	Possible Causes
208	Hardware V- Phase Drive Under- Voltage Fault	1. V- phase drive- power- supply failure 2. V- phase drive- circuit failure 3. Abnormal motor- controller power supply 4. Motor controller failure

Diagnostic Procedure

Step1 General inspection

Step2 Inspect V- phase drive power supply

Step3 Inspect V- phase drive circuit

Step4 Inspect the motor controller

3.3.4.101 DTC: 209

Fault Code Description

Fault Code	Fault Description	Possible Causes
209	Hardware W- Phase Drive Under- Voltage Fault	1. W- phase drive- power- supply failure 2. W- phase drive- circuit failure 3. Abnormal motor- controller power supply 4. Motor controller failure

Diagnostic Procedure

Step1 General inspection

Step2 Inspect W- phase drive power supply

Step3 Inspect W- phase drive circuit

Step4 Inspect the motor controller

3.3.4.102 DTC: 210

Fault Code Description

Fault Code	Fault Description	Possible Causes
210	Hardware U- Phase Drive Under- Voltage Fault	1. U- phase drive- power- supply failure 2. U- phase drive- circuit failure 3. Abnormal motor- controller power supply 4. Motor controller failure

Diagnostic Procedure

Step1 General inspection

Step2 Inspect U- phase drive power supply

Step 1 General inspection

Step 3 Inspect U- phase drive circuit

Step 4 Inspect the motor controller

3. 3. 4. 103 DTC: 211

Fault Code Description

Fault Code	Fault Description	Possible Causes
211	General Hardware Over- Current Fault	1. High- voltage- side short- circuit 2. Motor phase- to- phase short- circuit 3. IGBT short- circuit 4. Motor controller failure 5. Traction motor failure

Diagnostic Procedure

Step 1 General inspection

Step 2 Inspect high- voltage side

Step 3 Inspect traction motor

Step 4 Inspect IGBT

Step 5 Inspect the motor controller