Ein Bild, das Symbol, Grafiken, Logo, Kreis enthält.

Automatisch generierte BeschreibungEURABUS 3.0 - pure electric city bus

Maintenance Guide

8.5m city bus

Ein Bild, das Baum, draußen, Bus, Straße enthält.

Automatisch generierte Beschreibung

GTK6859BEVB1

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| Foreword Dear users, I sincerely thank you for choosing the pure electric bus by EURABUS.  The pure electric buses manufactured by our company have the advantages of zero emission and the features of good economy, high power performance, good safety, obvious effect of independent overhead air conditioning, elegant appearance, wide vision and comfortable riding. They are suitable for public transportation in various cities.  In order to keep the vehicle in good technical condition and prolong the service life of the vehicle, please carry out maintenance work according to the following regulations.  In this maintenance guide describes the rights and interests of maintaining your new vehicle warranty, as well as the instructions for regular maintenance of EURABUS. Please read this manual carefully to understand its contents and your rights and responsibilities.  In terms of the pictures in this manual, the delivered vehicle shall prevail as the configurations specified by different customers differ.  In case of any doubts or questions in the process of using the vehicle or reading this manual and other materials attached to the vehicle, please contact our after-sales service at any time.  Thank you for your support to EURABUS and we wish you a pleasant and safe drive!  Inhalt  [1.Foreword 2](#_Toc134457009)  [2.Contents 3](#_Toc134457010)  [3. Running-in period of new vehicles 4](#_Toc134457011)  [1.1. Breaking-in Period 4](#_Toc134457012)  [1.1. Work to Be Done after Break-in 5](#_Toc134457013)  [4. 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Routine maintenance 2. Breaking-in period 3. After breaking-in 4. Maintenance operations to be done in defined intervals 5. Special maintenance 6. Handling in case of faults 7. Treatment by software 8. Parts damaged 9. Warranty check 10. Spare parts order  Running-in period of new vehicles When a new bus is put into service, special attention should be paid to the breaking-in period of the new bus, which is very important for the service life of the bus, the safety of the operation and the efficiency of the bus. Breaking-in Period New vehicle with up to 3,500 km.  Pay attention to the working temperature of transmission, rear axle, wheel hub and brake drum. In case of serious heating, find out the cause and make adjustment or repair.  The wheel nuts should be tightened according to the specified torque after driving 50 km.  Always pay attention to the drive axle, wheel hub and brake drum. In case of any abnormality, the cause should be found out immediately and adjusted or repaired. Work to Be Done after Break-in To keep the vehicle in good technical conditions and extend the service life of the vehicles, please follow the provisions below to carry out the maintenance.   * Check all parts of the vehicle for oil, water and gas leaks, and replace the lubricating oil. * Fasten the fasteners of the suspension. * Fasten the nuts of the steering mechanism with cotter pins and the nuts of the drop arm. * Fasten the fastening bolts and nuts of the braking plate according to the specified torque. * Fasten the clamp nuts of the drive shaft universal joint fork and flange fork. Fasten the drive shaft bolts and nuts. * Perform lubrication maintenance according to the items of daily inspection.  Interval mileage and operation items for all levels of maintenance  |  |  | | --- | --- | | Daily routine maintenance | before daily operation | | First level maintenance | 3,500 km-4,000 km（For vehicles with short daily mileage and not able to determine the maintenance cycle by mileage, at most not more than one month, new vehicles breaking-in for the first class maintenance and first-level maintenance operations simultaneously. ) | | Second level maintenance | 18,000 km-20,000 km (For vehicles with short daily mileage and not able to determine the maintenance cycle by mileage, at most not more than five months) |   According to the maintenance execution cycle, confirm which maintenance section your vehicle is in, and require the maintenance process to be completed before the second maintenance process can be carried out to prevent missed maintenance and missed inspection.  Please carry out maintenance in time after the vehicle reaches the maintenance time point. Routine maintenance In order to ensure that the vehicle is in good condition, daily maintenance is performed before the bus starts operation. The main tasks are as follows:   * + Check the amount of oil in the power steering oil tank and add it if necessary.   + Check the oil level of the air compressor and add it if necessary.   + Check the oil, water and gas pipelines and other sealing devices for bending, folding and leakage.   + Check whether the steering and brake system parts are flexible and reliable.   + Check whether the battery wiring is firm and reliable. Inspect whether all kinds of instruments, lights, signals, wipers, etc. are working normally.   + Inspect whether the height of the air spring is normal and whether its control air pipeline is leaking; Inspect the air spring for wear, damage and improper bulging, etc., and inspect whether there is sufficient movement clearance around the air spring; Inspect and remove foreign matter such as gravel and glass slag adhering to the piston at the base of the air spring; Inspect all fastening couplings of the pneumatic suspension.   + After longer parking period check the balance of the bus (no tilting)   + Check the tires for damage and proper air pressure. (If TPMS is installed, check the drivers display)   + Drain the water in the wet storage tank if automatic drainage is not installed)   + Remove any faults from the day's operation. Vielleicht die Fehleranzeige im Display gemeint???   + Check whether the electrical wiring in the rear compartment for loose, frayed, and exposed copper terminals.   + Clean the electric steering pump motor, high pressure defroster and other parts. The surface should be free of water and dust.  First level maintenance Twice a month or every 3,500-4,000KM interval, customer-appointed or trained professional maintenance personnel will be responsible for execution. In addition to the daily maintenance, clean, tighten and lubricate as the central content, and check the safety parts such as braking and controlling. The breaking-in first maintenance of a new vehicle is the same as the first level maintenance.   * Check and add lubricating oil of transmission, rear axle, hydraulic oil of steering gear and steering power system. * Check and clean the air filter of the air compressor and the overall surface, especially the surface of the cooler, to prevent dust from blocking the cooling holes and causing high temperature. If the air filter element is too dirty, please replace it in time. * Check and tighten the drive shaft bolts, the bolts and nuts at each joint of the steering mechanism, all the fastening couplings of the front and rear pneumatic suspension, such as the traction bar coupling bolts, the front suspension air spring support and axle coupling bolts, the rear suspension U-bolts, the height valve control rod fastening nuts, etc., the engine support bolts and other parts of the bolts and nuts. * Check whether the tire pressure is within the specified range and inspect the condition of the tire surface. * Start the drive motor, steering pump motor and electric air compressor, listen to the operation for any noise, and cobserve whether there is leakage in each part. * Check the power battery installation structure screws for looseness and clean dust. * Check the oil level of the oil tank, whether the filter is blocked and whether the oil pipeline joints are loose. * Check the level of lubricating oil of the compressor \*See compressor manual\* * Check the amount of free rotation of the steering wheel and adjust it if necessary. * Check the drive shaft and universal joint bearings for looseness and inspect the tightness of each fork flange nut. * Check the fixed condition of the front and rear absorbers, and check all the fastening couplings of the pneumatic suspension, such as the traction bar coupling bolts, the front suspension air spring support and axle coupling bolts, and the tightening torque of the rear suspension U-bolts; Inspect whether the height of the air spring conforms to the design value, and the error is less than 6 mm; Inspect and maintain the height control valve and its adjusting arm, control rod tightening and installation. * Check whether there are cracks in the frame, and whether there are loose bolts and nuts and rivets. * Check whether the power battery wiring stubs and inserts are loose and not allowed to be exposed, and the wiring harness protection cover should be installed in place. * Lubricate as specified in the inspection and maintenance schedule.  Second level maintenance Five times a month or every 18,000-20,000KM interval, customer-appointed or trained professional maintenance personnel will be responsible for execution.  1. Complete all the items of the first level maintenance.  2. See special maintenance for drive motor and power battery maintenance.  3. Remove, inspect and adjust transmission, drive shaft, front axle, rear axle and steering mechanism, and replace lubricating oil.  4. Check air springs for wear, wrinkles and cracks, and replace if necessary; Inspect traction bar rubber bushings for wear and replace rubber bushings or traction bar assembly if necessary.  5. Check each instrument sensor and adjust if necessary.  6. Check whether the supports and suspension devices at each riveted joint of the frame are fixed and reliable, and repair, rust removal and paint patching if necessary.  8. The power steering hydraulic oil and the filter cartridge shall be replaced every 20,000 kilometers (See manual) and the oil tank and the pipeline system shall also be cleaned to discharge the dirt and sundries. When changing the oil, carefully clean the oil tank, the oil filter and the pipeline, and check the fixing screws.  9. The air filter cartridge of the air compressor shall be cleaned or replaced when necessary. See manual  10. The oil return valve, the oil filter cartridge and the temperature control valve of the air compressor shall be cleaned or replaced every 80,000 kilometers or 12 months of operation. See manual  11. Lubricate as specified in the inspection and maintenance schedule. | | |
| Other special maintenance Special maintenance in addition to the above maintenance, such as: Special maintenance of the large three electric (motor, electric control, battery); Maintenance of electric vehicles and vehicle body maintenance when they are out of use for a long time, etc. | | |
| Special maintenance of three major electric components Special Maintenance of Motors and Motor Controllers Preventive maintenance of the motor control system Before starting the vehicle, take care to inspect the condition of the coolant. Primary inspection:  1. Whether the coolant is leaking;  2. The presence of loose, damaged parts;  3. Whether there is any abnormal change in the motor during operation.  **Attention!**  l **Report to the maintenance department if the following conditions occur:**  1. Insufficient power  2. Any fault, fault signal appears  3. Unusual water temperature  4. Unusual motor rattling  5. Large amount of smoke appears  6. Leakage of oil, coolant | | |
| **8.3.1.2 Daily inspection of motors and motor controllers**  **1. Whether the low-voltage signal terminal is tightly plugged**  Inspect whether each low-voltage signal terminal is plugged in tightly, including:  a. 35pin AMP plug b. Motor aviation plug  **2. Whether the coolant is sufficient**  Inspect the sufficiency of the coolant balance in the sub-tank markings;  Inspect water pipes for broken, loose, or broken clamps. If necessary, replace them.  **3. Whether the cooling fan is working properly**  Inspect whether the cooling fan is leaking and whether the fan has been damaged or has accumulated a lot of dust;  **4. Whether the humidity of working environment is normal**  Inspect whether there is dripping and soaking water in the motor controller and motor working environment (especially in or after strong rainfall such as thunderstorm)  **5. Whether the voltage of 24V controller is normal**  Inspect whether the controller voltage is between 24V and 27V after the power is on;  **6. Whether the strong power voltage is within a reasonable range**  Inspect whether the controller voltage is between 450V and 700V after the power is on (whether the actual voltage is consistent with the voltage displayed by the meter)  **7. Whether there is any strange sound during the motor operation**  Listening carefully to the motor for strange noises when the vehicle is running;  Motor noise can be divided into two categories:  a. Motor mechanical noise: The cause of this noise may be caused by the mechanical structure. Mechanical noise sounds such as: "click.. .", "cluck.. .".  b. Motor electromagnetic noise: The cause of this noise may be caused by internal causes of the motor control system. The sound of electromagnetic noise such as: "zi zi.. .", "giggling.. .".  **8. Whether the rotational speed feedback is normal**  When the vehicle is running, observe whether the motor rotational speed is stable, and whether the display is "0" when it is stationary  **9. Whether the surface of the product is clean (whether the working environment is clean)**  Try to keep the environment of the controller clean for maintenance and overhaul. | | |
| **8.3.1.3 Minor maintenance of motor and motor controller**  **1. Inspect whether the signal harness of AMP connector is reliably installed**  **Attention!**  l **The clasp of the connector must be fastened to the end; The clasp will make a "click" sound when it is fastened to the end.**  **Warning!**  l **When plugging or unplugging the AMP connector, be sure to turn off the 24V control power first.**  l **Do not plug and unplug the AMP connector of the controller with electricity. Otherwise, it may cause damage to the motor controller.** | | Ein Bild, das Diagramm, Entwurf, technische Zeichnung, Plan enthält.  Automatisch generierte Beschreibung |
| **2. Inspect whether the motor and controller are well sealed**  Motor sealing mainly depends on the following aspects:  a. Whether the 3 AG terminals of the 3-phase AC terminal port are tightened (required to be screwed to the bottom of the thread);  b. Whether 7 M6×12 bolts on the junction box cover are tightened (required to be screwed to the bottom of the thread);  Controller sealing mainly depends on the following aspects:  a. Whether the 3 AG terminals of the 3-phase AC terminal port are tightened (required to be screwed to the bottom of the thread);  b. Whether the 2 AG terminals of the DC wiring port are tightened (required to the bottom of the thread);  c. Whether the 35pin connector of AMP is installed in place  d. Whether 10 M5×16 bolts on the junction box cover of the controller are tightened (required to be screwed to the bottom of the thread);  e. Do not loosen the bolts on the large cover plate of the controller. | | |
| **3. Inspect that the waterway is reliably connected**  **Attention!**  l **Whether the water pipe encases the entire spout;**  l **The locking screw of the throat pipe needs to be tightened;**  l **The installation position of the hose should be on the spout;**  l **Whether the water pipe is aged and needs to be replaced;** |  | |
| **Warning!**  l **Foreign matter entering the waterway will seriously affect the heat dissipation performance of the motor control system, which will lead to a decrease in the performance of the motor control system, reduce the service life of the motor control system, and even damage the parts within the motor control system. Therefore, please be careful when maintaining and strictly forbid foreign matter to enter the cooling waterway.**  **4. Whether the product is fixed reliably**  Push the controller by hand, the controller should be firm and reliable, not shaking. |  | |
| **5. Whether the product shell is well common ground with the vehicle body**  a. Adjust the working mode of the multimeter to resistance gear;  b. Put the black test meter pen of the multimeter in contact with the bolt on the controller box cover; Put the red test meter pen of the multimeter in contact with the beam of the whole vehicle chassis. With the controller reliably grounded, the resistance value is less than 0.1Ω.  **Attention!**  l **No oxidation layer on the surface of the bolt contacted by the multimeter test meter pen;**  l **The multimeter resistance test accuracy needs to reach 0.1Ω accuracy level;** |  | |
| **6. Whether the temperature feedback is normal**  a. After the vehicle is powered down for a period of time (usually 3 minutes), turn the key on the 24V control power, but not apply the strong power.  b. Observe that the motor temperature and motor controller temperature should be similar to the environment temperature;  c. Start the vehicle and after the vehicle starts to drive, the motor temperature and motor controller temperature rise, and the temperature rise for a short time is at 5℃;  d. When the vehicle begins to drive for a period of time, the motor temperature and motor controller temperature are generally below 80 ℃. | | |
| **7. Whether the voltage sampling is consistent with the battery feedback voltage**  a. After the vehicle is powered down for a period of time (usually 3 minutes), turn the key on the 24V control power, but not apply the strong power;  b. At this time, the "motor bus voltage" on the meter should be displayed as "0V" or so;  c. Turn the key on the strong power, then the "bus voltage" will gradually rise to the battery voltage amplitude, and the error range should not exceed 15V.  **8. Whether the communication with the whole vehicle controller is normal**  a. After the vehicle is powered down for a period of time (usually 3 minutes), turn the key on the 24V control power, apply the strong power, but do not start the motor; At this time, the motor rotational speed signal on the meter is jumping and changing.  b. When skidding or braking, the torque is negative, and the size of torque value will be different with the speed of the vehicle, battery voltage, temperature of motor control system, etc. | | |

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| **8.3.1.4 Major maintenance of the motor and motor controller**  **1. The arrangement of signal line**  Inspect whether the arrangement of signal line is reasonable;  Ensure that the signal wires themselves are safe and durable while not damaging other parts;  Tie the signal wires together without damaging them.  **2. The arrangement of power line**  Inspect whether the arrangement of power line is reasonable.  Ensure that the power lines themselves are safe and durable while not damaging other parts.  a. Note that the power lines are surrounded by sharp-edged burrs that may damage the cable insulation;  b. Power line fixing requirements: Power lines can not be suspended in the air, to be attached to the vehicle body of the vehicle, and without damaging the power lines, respectively, three-phase power lines, DC bus bundled together to prevent power lines involved in the drive shaft;  c. The bending radius of the power line needs to be greater than 5 times the radius of the power line, so as to facilitate the long-term use of the power line and improve the waterproof performance of the motor control system;  d. When the power line is arranged, it should go down along the interface, which is more conducive to improving the waterproof performance of the motor control system. |  |
| **3. The arrangement of waterway**  Inspect whether the arrangement of the waterway is reasonable to ensure that the waterway itself is safe and durable while not damaging other parts.  a. Note that the waterway is surrounded by sharp-edged burrs that may damage the waterway;  b. Waterway fixing requirements: The waterway coming out of the motor should be fixed to the vehicle body at the shortest distance, and the rest of the waterway should be attached to the vehicle body to prevent the power lines from getting caught in the drive shaft. | |
| **4. Maintenance precautions**  a. Disassembly and assembly of cooling system  When the "motor fault" appears on the instrument panel in front of the vehicle, do not remove the pressure cap of the water tank or the rubber hose of the waterway while the motor is in high temperature. Open the pressure cap or remove the rubber hose from the waterway only when the temperature of the coolant is less than 50 degrees. Highly heated coolant or steam may cause personal injury. Water can be drained by opening the water valve on the lower part of the water tank or the water inlet and outlet of the motor controller. A 19-liter water basin typically holds all the coolant.  b. Coolant addition  Do not add cold coolant directly into a hot motor, the motor's casting may be damaged. Let the temperature of the motor be less than 50 degrees before adding coolant. The motor control system can have good performance even in very cold conditions, but only if the coolant for the motor control system is mixed in different proportions according to the environment temperature.  **Warning!**  l **Never use only water as coolant. Using only water as coolant may cause corrosive damage to the cooling waterway of the motor controller. Long-term corrosive damage may cause leakage of coolant inside the motor control system.**  **5. Fault analysis and checking**  When the motor, power battery and other three electrical information failure, please pull over as soon as possible to take pictures of the meter fault information interface, and as soon as possible to contact the relevant professional maintenance personnel for fault diagnosis and maintenance, if you need to conduct high-voltage circuit checking, you should first disconnect the 24-volt low-voltage power switch, and then disconnect the high-voltage power service switch or service insurance, and then start the vehicle and run the vehicle after the trouble removal.  **Warning!**  l **Disassembly of high-voltage service switch must operate in accordance with the "Service of High-voltage Power off and High-voltage Power-on Process".**  l **If the fault cannot be removed on site and towing is required, please follow the "Towing Operation Method and Precautions".**  **8.3.2 Special Maintenance of Power Battery**  1. Inspect whether the information data sent by the BMS is displayed correctly in the meter, such as voltage, temperature, current, insulation resistance, etc.  2. Inspect the good degree of BMS communication function and charging equipment function.  3. Inspect whether the nodes such as conduction band and voltage collection terminal are loose, off, rusty or deformed, etc.  4. Inspect whether there are cracks, deformation, loose poles, bulging and other abnormal conditions in the battery shell.  5. Inspect whether the voltage differential of unit cell is normal, when the vehicle is dynamic, the pressure differential of unit cell should be within 150mv, after the vehicle is static for half an hour, the pressure differential of unit cell should be within 80mv. | |
| **8.4 Maintenance of electric vehicle which is out of service for a long time**  1. Clean the dust and inspect the exterior of the electric vehicle frequently for rust prevention and rust removal.  2. When stop driving for more than one month, the trolley should be erected and the front and rear suspensions and tires should be released from the load.  3. Recharge the battery once a month.  4. Inspect the operation of electrical meter, braking and steering mechanism once a month, inspect the air pressure of each tire, and supplement the air if found to be insufficient. | |
| **8.5 Maintenance of vehicle body**  **1. External cleaning**  a. External cleaning should be carried out in time after daily use, and mud should be removed in time after daily driving, and shall not be scraped with apparatus after drying, so as not to scratch the paint and cause rusting of the skinning skeleton.  b. Washing water is best to use soft water, hard water containing minerals will leave marks on the vehicle body. It is forbidden to use hot water, alkaline water, kerosene and other oil that is harmful to the paint to clean the painted part of the vehicle body.  c. When rinsing, the water pressure used should not be too high, add liquid soap and cleanser essence to the water when cleaning, and never wipe with a rag before the sand particles are rinsed off.  d. For oil stains on the vehicle body, you can also use vehicle beauty products to clean it.  e. Inspect the connection between the vehicle body and the frame frequently and repair any abnormality in time.  f. For the vehicle to be repaired,, the vehicle body chassis should be fully cleaned.  **2. Waxing**  a. Waxing can reduce the cracking and sticky dust of the vehicle body paint film, and can be applied once every six months.  b. When waxing, make sure the surface of the vehicle body has been cleaned and free of dust and sand.  c. After waxing, do not expose the vehicle body to the sun, but dry it until it is completely dry before polishing.  d. Polishing when the paint has rusted or lost its luster.  **3. Cleaning of window glass**  Normal cleaning with water and sponge only, use glass cleaner to remove grease. After cleaning the glass, wipe dry with a clean and dry soft cloth.  **4. Interior cleaning**  Regular use of vehicle-specific interior cleaners can clean the vehicle's interior facilities, keep the vehicle tidy and achieve the comfort of the ride.  **5. Vehicle lubrication**  Proper lubrication of the bus can greatly reduce the frictional resistance and wear of the parts of the vehicle. | |
| **8.6 Tightening torques of main fastening parts**   |  |  | | --- | --- | | **Fastening parts** | **Tightening torque, N. m** | | Front wheel nut | 540～600 | | Steering upper arm and steering knuckle joint stud | 216 | | Steering lower arm fastening nut | 274～343 | | Steering upper arm fastening nut | 274～343 | | Steering lower arm and ball pin connection nut | 250～280 | | Locking nut for drop arm and plumbing arm shaft | 630～770 | | Steering straight tie rod ball nut | 250～310 | | Steering straight tie rod clamp nut | 70～90 | | Bolt nuts for front air suspension traction bar | 380～460 | | Connection bolt for front air suspension airbag seat and front axle | 400～460 | | Drive shaft universal joint flange fork connection nut M16/M12 | 250～280/95～125 | | Main reducer driving gear flange fork locking nut | 392～539 | | Driven gear and differential housing fastening bolt | 588～686 | | Differential bearing cover fastening bolt | 441～490 | | Differential housing fastening bolt | 220～280 | | **Fastening parts** | **Tightening torque, N. m** | | Half shaft fastening bolt | 137～176 | | Rear braking plate fastening bolt | 200～250 | | Rear wheel fixing bolt fastening nut | 350～421 | | Rear wheel nut | 540～600 | | Steering machine fixing bolt nut | 470～570 | | Steering wheel lock nut | 98～114 | | Front braking plate fixing nut | 157～206 | | Absorber lower pin and support fixing nut | 80～100 | | Half shaft fastening bolt | 137～176 | | Rear brake chamber fixing nut | 167～186 | | Front traction bar and frame connection bolt | 上370～450下470～590  Upper 370-450 lower 470-590 | | Rear traction bar and frame connection bolt | 上245～325下380～460  Upper 245-325 lower 380-460 | | Rear air suspension traction bar and axle connection bolt | 400～480 | | |

**Common faults and cause analysis**

**8.7.1 Vehicle simple fault identification and removal**

When there is a fault indication in the operation data interface, the driver is asked to confirm the fault code first and then perform a fault reset. When resetting the fault, you must first use the manual brake to park, release the brake pedal and return the running state to neutral before pressing the fault reset button on the operation panel to reset the fault, and then switch from neutral to smooth or reverse position after the fault reset. If the same fault occurs again after resetting and restarting, it means that it is a serious fault that cannot be reset and needs to contact relevant personnel for service.

If the fault is not reset, the device cannot be put into idle operation.

**See Annex 1 for fault codes**

When the system is at fault, please ask the driver to find the possible causes of the fault against the fault code list, and do not touch the high-voltage parts such as battery and inverter if they are involved. Contact the relevant personnel for service in time.

If you encounter the fault state that you cannot drive by stepping on the foot pedal traction main command and there is no fault display, it may be a non-holding fault in the inverter, at this time, you can switch the electronic gear shift to P gear to reset. If you still can't drive, please pull over safely and contact relevant personnel for service in time.

When the battery detection system is faulty, please ask the driver to find the cause of the fault against the fault code list, and do not touch the high-voltage parts such as battery capacitors if they are involved. Contact the relevant personnel for service.

**Annex 1:**

Table 1-1 Whole Vehicle Fault Code Definitions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Failure Levels** | **Fault code range** | **Code meaning** | **Treatment measures** | **Remarks** |
| No fault | 0 | Normal mode | / | / |
| Level 1 | 10001-10070 | General fault | The vehicle can continue to drive to the bus station, and then reported to the professionals to deal with | Warning (meter warning) |
| Level 2 | 20001-20068 | More serious fault | Stop the vehicle and report to the professionals | Power limitation |
| Level 3 | 30001-30078 | Serious fault | Stop the vehicle immediately, lower the high voltage and disconnect the main positive relay | Vehicle cannot move |

Description: Fault codes are divided into three levels from low to high, with high level faults taking precedence over low level faults. The codes and corresponding faults are prepared by the manufacturer and sent to the system integrator and the whole vehicle factory for record.

1. When multiple levels of faults occur at the same time, only the code of the highest-level fault is reported (e. g. if level 1 and level 2 faults occur at the same time, then only the fault code of level 2 fault is reported).

2. The meter displays the fault code of the whole vehicle controller.

3. If multiple faults occur at the same time in the same fault level, then the fault code is sent in turn with a rotation period of 1 second (e. g. if the 24V low voltage power supply in the level 1 fault and the DCDC level I alarm occur at the same time, then the fault code 10039 and 10052 should be sent in turn, with 10039 sent in this second and 10052 sent in the next second).

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| **System level III fault** | | |
| **Code** | **Fault Description** | **VCU processing mode** |
| 30001 | BMS communication timeout | Stop and cut off high voltage |
| 30002 | MCU communication timeout | Stop and cut off high voltage |
| 30003 | High and low voltage oil pump controller communication timeout | Power limitation |
| 30004 | Gear controller communication timeout | Stop |
| 30005 | Relay control panel communication timeout | Stop |
|  | 30006-30015(Reserved) |  |
| 30016 | The whole vehicle controller requests to disconnect high voltage | Stop and cut off high voltage |
| 30017 | Inconsistent accelerator pedal signal | Stop |
| 30018 | Invalid brake pedal signal | Stop |
| 30019 | Motor controller high voltage pre-charge timeout | Stop and cut off high voltage |
|  | 30020-30029(Reserved) |  |
| 30030 | VCU internal fault | Stop and cut off high voltage |
| 30031 | Gear controller fault | Power limitation |
| 30032 | High voltage oil pump controller level III fault | Stop |
| 30033 | BMS Level 3 fault | Stop and cut off high voltage |
| 30034 | Low voltage emergency oil pump controller level III fault | Stop |
| 30035 | DCDC Level 3 fault | Stop |
| 30036 | Air pump controller level III fault | Stop |
| 30037 | Low air pressure in any air tank level III fault | Stop |
| 30041 | Relay sticking | Stop and cut off high voltage |
| 30042 | Insulation module communication timeout | Stop |
| 30043 | Insulation level III alarm | Stop and cut off high voltage |
| 30044 | Motor controller low voltage supply too low | Stop and cut off high voltage |
| 30045 | Motor controller low voltage supply too high | Stop and cut off high voltage |
| 30047 | DC high voltage input is too low (300V) | Stop and cut off high voltage |
| 30048 | DC high voltage input is too high (750V) | Stop and cut off high voltage |
| 30049 | Motor cable interlock | Stop and cut off high voltage |
| 30050 | DC high voltage cable interlock | Stop and cut off high voltage |
| 30051 | Position sensor fault | Stop and cut off high voltage |
| 30052 | Temperature sensor fault | Stop and cut off high voltage |
| 30053 | Phase current sensor fault | Stop and cut off high voltage |
| 30054 | Motor controller first phase current value reaches maximum value | \ |
| 30055 | Motor controller second phase current value reaches maximum value | \ |
| 30056 | Motor controller third phase current value reaches maximum value | \ |
| 30057 | The sum of the first, second and third phase current values of the motor controller exceeds the maximum limit | \ |
| 30058 | Motor controller fourth phase current value reaches maximum value | \ |
| 30059 | Motor controller fifth phase current value reaches maximum value | \ |
| 30060 | Motor controller sixth phase current value reaches maximum value | \ |
| 30061 | The sum of the fourth, fifth and sixth phase current values of the motor controller exceeds the maximum limit | \ |
| 30062 | Motor controller seventh phase current value reaches maximum value | \ |
| 30063 | Motor controller eighth phase current value reaches maximum value | \ |
| 30064 | Motor controller ninth phase current value reaches maximum value | \ |
| 30065 | The sum of the seventh, eighth and ninth phase current values of the motor controller exceeds the maximum limit | \ |
| 30066 | Torque feedback does not match the torque command | \ |
| 30067 | Allowable charge/discharge current value received from the BMS by the motor controller is out of range | \ |
| 30068 | Allowable charge/discharge voltage value received from the BMS by the motor controller is out of range | \ |
| 30069 | MCU whole vehicle controller communication timeout | Stop and cut off high voltage |
| 30070 | Motor IGBT fault | Stop and cut off high voltage |
| 30071 | Motor IGBT temperature is too high (fault) | Stop and cut off high voltage |
| 30072 | Motor phase current overload | Stop and cut off high voltage |
| 30073 | Motor three-phase insulation fault | Stop and cut off high voltage |
| 30074 | Motor other faults | Stop and cut off high voltage |
| 30075 | Motor IGBT temperature sensor abnormal | Stop and cut off high voltage |
| 30076 | Motor bus or three-phase line disconnection | Stop and cut off high voltage |
| 30077 | Motor initialization fault | Stop and cut off high voltage |
| 30078 | Motor body low voltage connector connection abnormal | Stop and cut off high voltage |
| **System level II fault** | | |
| **Code** | **Fault Description** | **VCU processing: Power reduction** |
| 20001 | BMS Communication Timeout | Power limitation |
| 20002 | Motor controller communication timeout | Power limitation |
| 20003 | Insulation module communication timeout |  |
| 20004 | DCDC Communication Timeout | Power limitation |
| 20005 | High voltage oil pump controller communication timeout | Power limitation |
| **Code** | **Fault Description** | **VCU processing: Power reduction** |
| 20006 | Air pump controller communication timeout | Power limitation |
| 20007 | Gear controller communication timeout | Power limitation |
| 20008 | Air pump fan fault | Power limitation |
| 20009 | Relay control panel communication timeout | Power limitation |
|  | 20010-20034(Reserved) |  |
| 20035 | Low air pressure value of any air reservoir level II fault | Power limitation |
| 20036 | Whole vehicle controller hardware output fault | Power limitation |
| 20037 | Whole vehicle controller hardware input fault | Power limitation |
|  | 20038-20048(Reserved) |  |
| 20049 | Insulation level II alarm | Power limitation |
| 20050 | DCDC level II fault | Power limitation |
| 20051 | High voltage oil pump controller level II fault | Power limitation |
| 20052 | Air pump motor temperature too high | Power limitation |
| 20053 | Air pump controller level II fault | Power limitation |
| 20054 | Low voltage emergency oil pump controller level II fault | Power limitation |
|  | 20055-20060(Reserved) |  |
| 20061 | Motor controller level II fault | Power limitation |
| 20062 | Motor temperature is too high | Power reduction |
| 20063 | Motor controller temperature is too high | Power reduction |
| 20064 | Motor over speed | Power reduction |
| 20065 | Energy return derating | Power reduction |
| 20066 | Drive derating | Power reduction |
| 20067 | Drive system energy derating | Power reduction |
| 20068 | BMS level II alarm | BMS self-processing, limited discharge current, feedback current, maximum allowable charging voltage, minimum allowable discharging voltage |
| **System level I fault** | | |
| **Code** | **Fault Description** | **VCU processing: Always report to the instrument, warning** |
| 10001 | Low voltage emergency oil pump controller is not online | Alarm |
| 10002 | DCDC is not online | Alarm |
| 10003 | High voltage oil pump controller DCAC is not online | Alarm |
| 10004 | Air pump DCAC is not online | Alarm |
| 10005 | Electric air conditioner is not online | Alarm |
| 10006 | Meter is not online | Alarm |
| 10007 | Gear controller is not online | Alarm |
|  | 10008-10018(Reserved) |  |
| 10019 | BMS communication timeout | Alarm |
| 10020 | Motor controller communication timeout | Alarm |
| 10021 | Low voltage emergency oil pump controller communication timeout | Alarm |
| 10022 | DCDC communication timeout | Alarm |
| 10023 | High voltage oil pump controller communication timeout | Alarm |
| 10024 | Air pump controller communication timeout | Alarm |
| 10025 | Electric air conditioner communication timeout | Alarm |
| 10026 | Meter communication timeout | Alarm |
| 10027 | Gear controller communication timeout | Alarm |
|  | 10028-10038(Reserved) |  |
| 10039 | 24V low voltage power supply is too low | Alarm |
| 10040 | 24V low voltage power supply is too high | Alarm |
|  | 10041-10050(Reserved) |  |
| 10051 | Insulation level I alarm | Alarm |
| 10052 | Level 1 alarm of DCDC | Alarm |
| 10053 | High voltage oil pump controller level I fault | Alarm |
| 10054 | Air pump motor temperature too high | Alarm |
| 10055 | Low voltage emergency oil pump controller level I fault | Alarm |
| 10056 | Dryer signal fault | Alarm |
| 10057 | Air pressure sensor fault | Alarm |
| 10058 | ABS fault | Alarm |
| 10059 | Relay control board level I fault | Alarm |
| 10060 | Motor controller level I fault | Alarm |
| 10065 | Motor controller low voltage supply too low | Alarm |
| 10066 | Motor controller low voltage supply too high | Alarm |
| 10067 | Level 1 alarm of BMS | BMS self-processing, limited discharge current, feedback current, maximum allowable charging voltage, minimum allowable discharging voltage |
| 10068 | ABS communication fault | Alarm |
| 10069 | Low air pressure value of any air reservoir level I fault | Alarm |
| 10070 | Air pump controller level I fault | Alarm |

Table 1-2 DCDC Fault Code Definitions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Fault Code | Fault description | Treatment for high-voltage controller fault | Failure Levels | Treatment for vehicle controller fault |
| 1 | DCDC output overcurrent | Shutdown | Level 3 | Stop |
| 2 | DCDC output overvoltage | Shutdown | Level 3 | Stop |
| 3 | DCDC output undervoltage | Shutdown | Level 3 | Stop |
| 4 | DCDC input overvoltage | Shutdown | Level 3 | Stop |
| 5 | DCDC input undervoltage | Shutdown | Level 3 | Stop |
| 6 | DCDC module level III over temperature | Shutdown | Level 3 | Stop |
| 7 | Controller low voltage supply undervoltage | Shutdown | Level 3 | Stop |
| 8 | CAN receive timeout fault | Continue to run | Level 2 | Power reduction |
| 9 | CAN initialization fault | Continue to run | Level 1 | Continue to run |

Table 1-3 High Voltage Oil Pump Fault Code Definitions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Fault Code** | **Fault description** | **Treatment for high-voltage controller fault** | **Failure Levels** | **Treatment for vehicle controller fault** |
| 1 | Controller overcurrent | Shutdown | Level 3 | Stop |
| 2 | Controller low voltage supply undervoltage | Shutdown | Level 3 | Stop |
| 3 | High voltage bus overvoltage | Shutdown | Level 3 | Stop |
| 4 | Output default phase | Shutdown | Level 3 | Stop |
| 5 | Driver overtemperature | Shutdown | Level 3 | Stop |
| 6 | Undervoltage of bus | Shutdown | Level 3 | Stop |
| 7 | Current detection fault | Shutdown | Level 3 | Stop |
| 8 | Motor overspeed | Shutdown | Level 3 | Stop |
| 9 | Excessive speed deviation | Shutdown | Level 3 | Stop |
| 10 | Motor overtemperature fault | Shutdown | Level 3 | Stop |
| 11 | Phase-to-phase short circuit | Shutdown | Level 3 | Stop |
| 12 | Bus rapid undervoltage | Shutdown | Level 3 | Stop |
| 13 | Rapid overvoltage |  |  |  |
| 14 | Fast overcurrent | Shutdown | Level 3 | Stop |
| 15 | EEPROM read-write fault | Shutdown | Level 3 | Stop |
| 16 | Fast current limit | Shutdown | Level 3 | Stop |
| 17 | CAN receive timeout fault | Continue to run | Level 2 | Power reduction |
| 18 | Frequency converter overload | Downrating | Level 2 | Power reduction |
| 19 | Motor overload | Downrating | Level 2 | Power reduction |
| 20 | CAN transmit timeout fault | Continue to run | Level 1 | Power reduction |
| 21 | Motor temperature sensor loses connection | Continue to run | Level 2 | Power reduction |
| 22 | CAN1 initialization fault | Continue to run | Level 1 | Continue to run |
| 23 | CAN2 initialization fault | Continue to run | Level 1 | Continue to run |
| 24 | Motor over-temperature early warning | Continue to run | Level 1 | Continue to run |

Table 1-4 Low Voltage Oil Pump Fault Code Definitions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Fault Code** | **Fault description** | **Low voltage controller fault handling method** | **Failure Levels** | **Treatment for vehicle controller fault** |
| 1 | Overcurrent fault | Immediate shutdown | Level 3 | Stop |
| 2 | Bus overvoltage fault | Immediate shutdown | Level 3 | Stop |
| 3 | Output default phase | Immediate shutdown | Level 3 | Stop |
| 4 | Drive Overheating | Immediate shutdown | Level 3 | Stop |
| 5 | Bus undervoltage fault | Immediate shutdown | Level 3 | Stop |
| 6 | Motor overtemperature fault | Immediate shutdown | Level 3 | Stop |
| 7 | Phase-to-phase short circuit fault | Immediate shutdown | Level 3 | Stop |
| 8 | Motor overload | Immediate shutdown | Level 3 | Stop |
| 9 | Motor temperature sensor loses connection | Power reduction | Level 2 | Stop |
| 10 | Frequency converter overload | Power reduction | Level 2 | Stop |
| 11 | CAN send fault | No shutdown required | Level 1 | Alarm |
| 12 | CAN receive fault | No shutdown required | Level 1 | Alarm |

Table 1-5 Air Pump Fault Code Definitions

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Fault Code** | **Fault description** | **Treatment for high-voltage controller fault** | **Failure Levels** | **Treatment for vehicle controller fault** |
| 1 | Air pump controller output overcurrent | Shutdown | Level 3 | Stop |
| 2 | Air pump low voltage power supply undervoltage | Shutdown | Level 3 | Stop |
| 3 | Bus overvoltage | Shutdown | Level 3 | Stop |
| 4 | Fast current limit | Shutdown | Level 3 | Stop |
| 5 | Output default phase | Shutdown | Level 3 | Stop |
| 6 | Drive Overheating | Shutdown | Level 3 | Stop |
| 7 | Undervoltage of bus | Shutdown | Level 3 | Stop |
| 8 | Current detection fault | Shutdown | Level 3 | Stop |
| 9 | Motor overspeed | Shutdown | Level 3 | Stop |
| 10 | Excessive speed deviation | Shutdown | Level 3 | Stop |
| 11 | Phase-to-phase short circuit | Shutdown | Level 3 | Stop |
| 12 | Rapid undervoltage | Shutdown | Level 3 | Stop |
| 13 | Level II rapid overvoltage | Shutdown | Level 3 | Stop |
| 14 | Level III rapid overvoltage | Shutdown | Level 3 | Stop |
| **Fault Code** | **Fault description** | **Treatment for high-voltage controller fault** | **Failure Levels** | **Treatment for vehicle controller fault** |
| 15 | EEPROM read-write fault | Shutdown | Level 3 | Stop |
| 16 | Motor overtemperature fault | Shutdown | Level 3 | Stop |
| 17 | Fast overcurrent | Shutdown | Level 3 | Stop |
| 18 | CAN initialization fault | Continue to run | Level 2 | Power limitation |
| 19 | CAN transmit timeout fault | Continue to run | Level 2 | Power limitation |
| 20 | CAN receive timeout fault | Continue to run, run for 4 minutes, stop for 1 minute, cycle work | Level 2 | Power limitation |
| 21 | Air pump operation timeout fault | Stop for 1min, then work in response to the command | Level 2 | Power limitation |
| 22 | Motor over-temperature early warning | Continue to run | Level 1 | Alarm |
| 23 | Motor overload | Downrating | Level 1 | Alarm |
| 24 | Frequency converter overload | Downrating | Level 1 | Alarm |
| 25 | Motor temperature sensor loses connection | Continue to run | Level 1 | Alarm |

**8.7.2 Common Faults of Power Supply System and Handling**

|  |  |  |  |
| --- | --- | --- | --- |
| **S/N** | **Fault Type** | **Fault Diagnosis** | **Treatment** |
| 1 | The voltage difference in the storage battery is too large | The combination meter will display a fault alarm, and the meter will display the highest and lowest unit cell voltage | (1) Use equalizer to equalize  (2) Charge the power of unit cell  (3) Replace the unit battery |
| 2 | Power module internal temperature difference is large | The combination meter will display a fault alarm and the meter will show the maximum and minimum temperatures | (1) Confirm the location of the temperature abnormal point and check if there is any abnormality |
| 3 | Large temperature differences between power supply modules | The combination meter will display a fault alarm and the meter will show the maximum and minimum temperatures | (1) Power modules avoid being close to heat sources, such as motors, engines and other heat sources |
| 4 | Unit cell battery overcharge phenomenon | The combination meter will display a fault alarm | (1) Find the cause of overcharging, or notify the company's engineers for cause analysis  (2) Replace the unit battery |
| 5 | Unit cell over-discharge phenomenon | The combination meter will display a fault alarm | (1) Find the cause of over-discharge, or notify the company’s engineer for cause analysis  (2) Replace the unit battery |
| 6 | Two neighboring unit cells are one high and one low | The combination meter will display a fault alarm | (1) Tighten the bolt fixing the copper nose of the sampling line to confirm whether it is loose or the sampling line is disconnected |
| 7 | Individual unit cell charging voltage rises quickly and voltage drops quickly when discharging | The combination meter will display a fault alarm | (1) Tighten the bolt of the unit cell to confirm whether the connection is loose  (2) If the connection is not loose, replace the unit cell |
| 8 | BMS system SOC is not stable, SOC does not change | The combination meter will display fault alarm, the current sensor is damaged or the connector is loose | (1) Replace the current sensor;  (2) Reconnect the loose connector |
| 9 | BMS system communication fault | The combination meter will display a fault alarm | (1) Replace the BMS system BMU;  (2) Replace the BMS system LECU; |
| 10 | BMS system static data is normal, but after the vehicle starts running, the data is abnormal | The combination meter will show fault alarm, BMS system is seriously disturbed | (1) Rearrange the power and signal lines of the vehicle |

**8.7.3 Common Faults of Electric Air Compressor and Handling**

|  |  |  |
| --- | --- | --- |
| **Fault** | **Reason** | **Solution** |
| Compressor is difficult to start | Electrical fault  Compressor is stuck inside | Electrical personnel overhaul  Contact with our company |
| Strange noise in operation | Loose connection  Damaged coupling pad  Reduced lubricating oil  Damaged motor bearing | Tighten connection points  Replace coupling pads  Add lubricating oil  Service or replace the motor |
| Pressure inside the machine increases  Safety valve open | Incorrect pressure setting | Adjust opening pressure |
| Low exhaust pressure | Clogged air filter  Oil sub-element clogged  Pipeline leakage  Inlet valve does not open  Compressed air demand is greater than the compressor's air production capacity | Blow clean or replace  Replace  Inspect to eliminate  Inspect service or replace  Contact supplier to solve |
| Oil consumption is too large | Oil return filter clogged  Damaged oil sub-element  Wrong lubricating oil specification | Clean or replace  Replace  Replace |
| High temperature shutdown | Cooler clogged  Oil filter clogged  Damaged temperature control valve spool  High environment temperature, obstructed ventilation  Oil level is too low  Oil sub-element clogged | Clean  Clean or replace  Replace the temperature control valve spool  Increase ventilation  Inspect the oil level and fill the lubricating oil  Replace |
| Shutdown and spray oil | Damaged inlet valve asbestos gasket  Damaged inlet valve sealing gasket | Replace  Replace |
| The motor is not normal damage | Under the control of inverter power supply, the inverter and the motor are not matched or the commissioning is not done according to the requirements of the inverter  Compressor is stuck inside  Electrical fault | Select the inverter that matches the motor and perform commissioning as required  Contact with our company  Electrical personnel overhaul and removal |

**Common Faults of Electric Power Steering Pump and Handling**

|  |  |  |
| --- | --- | --- |
| **Fault Type** | **Causes** | **Elimination method** |
| Pump does not absorb oil or does not absorb enough oil | Large oil viscosity | Use the recommended viscosity fluid |
| The fluid level in the tank is too low | Add oil to the specified oil level |
| Oil suction pipe is leaking | Identify and repair the air leak |
| Inhale air from the pump journal rotary seal | Disassemble the pump to inspect whether the pump rotary seal is damaged and be replaced |
| Motor reversal | Inspect wiring and correct steering |
| Pressure does not meet the requirements | Stable-flow valve stuck in the fully open state, the flow of internal leakage, resulting in insufficient pressure | Disassemble the valve, clean the spool and valve hole, and remove the spoil |
| The stable-flow valve is worn and the clearance is increased | Replace the corresponding worn parts |
| Pressure regulating valve leaks, resulting in insufficient pressure | Clean the pressure valve seat and valve element |
| Damping hole is blocked | Clean and remove debris |
| The flow bypass path is inflected and the pressure is not increased. | Check whether the oil circuit is inflected and whether the pressure oil flows out from the actuator bypass |
| Noise | The filter element is blocked and the oil is not sucked smoothly. | Check whether the filter element is blocked, if it is blocked, repair or replace the filter element |
| Gas enters the hydraulic oil inlet system | Check whether there is air leakage in the oil inlet connection part, and repair it if there is any. |
| Inlet and outlet oil pipes are too thin and too long, with too many elbows | Thicken and shorten the oil pipes, and reduce the elbows |
| Motor fan blade is loose or attached with foreign matter | Re-fix the fan blade or remove the foreign matter on the fan blade |
| Motor fan shield screws loose | Use a Phillips screwdriver to re-fix the screws |

**8.7.5 Common Faults and Treatment of Combination Meter**

|  |  |  |  |
| --- | --- | --- | --- |
| **Fault prompt** | **Systematic phenomenon** | **Possible causes** | **Inspection and handling opinions** |
| No responds from the system | No responds from the system | No power supply in the system; | Check whether the meter power supply earth terminal is normal; |
| Ignition signal is not connected to the meter | whether the meter has ON gear power supply when the key is turned ON gear; |
| Black screen | The preheat light is flashing. The vehicle speed warning light is flashing | No application in the system | Download application |
| The screen only shows blue strips | The system works normally, but the screen display is abnormal; | Video signal is not connected to the system | Confirm whether the video signal is normal; |
| If there is a transformer, whether the transformer is normal; |
| Information loss |  | Meter terminal resistance is damaged; | Open the meter plug and check whether the terminal resistance between the meter CANH and CANL is 120 Ω; |
| Communication error |  | Whether the external equipment is damaged when sending information; | Whether the tachographs or GPS is working properly; |
| Meter is not connected to the bus network; | Confirm whether the meter is connected to the bus network; |
| The bus terminal resistance is damaged; | 120 Ω resistance between non-connected meter CN1 and CAN H/L; |
| Vehicle speed sensor | The speedometer is working abnormal | The vehicle speed sensor is faulty; | Go to the diagnostic page to find the pin number of "vehicle speed sensor", and confirm that the wiring from the sensor to this pin number is normal; |
| Fault in connection between vehicle speed sensor and meter; | Replace the sensor; |
| High-speed wiper | When the high-speed wiper is not turned on, the dot in front of the "high-speed wiper" pin on the diagnostic page is a red exclamation mark. | Open circuit from load to pin | Go to the diagnostic page to find the pin number of the "vehicle speed sensor" and check the load or the connection to the pin; |
| When the high-speed wiper is turned on, the dot in front of the "high-speed wiper" pin on the diagnostic page is changed from a green dot to a red exclamation mark. | High-speed wiper is overloaded or short circuit from load to pin connection. | Check its load or connection to confirm whether there is a short circuit; |
| Sign light | When the sign light is not turned on, the dot in front of the "sign light" pin on the diagnostic page is a red exclamation mark. | Open circuit from load to pin | Go to the diagnostic page to find the pin number of the "sign light" and check the load or the connection to the pin. |
| When the sign light is turned on, the dot in front of the "sign light" pin on the diagnostic page is changed from a green dot to a red dot. | Sign light is overloaded or short circuit from load to pin connection. | Check the load or wiring to confirm whether there is an overload or short circuit phenomenon |
| Left low beam light | When the left low beam is not turned on, the dot in front of the "left low beam" pin on the diagnostic page is a red exclamation mark. | Open circuit from load to pin | Go to the diagnostic page to find the pin number of the "left low beam" and check the load or the connection to the pin. |
| When the left low beam is turned on, the dot in front of the "left low beam" pin on the diagnostic page is changed from a green dot to a red exclamation mark. | Left low beam is faulty or the connection is not normal. | Check the load or wiring to confirm whether there is an overload or short circuit phenomenon |
| Right low beam light | When the right low beam is not turned on, the dot in front of the "right low beam" pin on the diagnostic page is a red exclamation mark. | Open circuit from load to pin | Go to the diagnostic page to find the pin number of the "right low beam" and check the load or the connection to the pin. |
| When the right low beam is turned on, the dot in front of the "right low beam" pin on the diagnostic page is changed from a green dot to a red exclamation mark. | Right low beam is overloaded or short circuit from load to pin connection. | Check the load or wiring to confirm whether there is an overload or short circuit phenomenon |
| Front position lamp | When the front position light is not turned on, the dot in front of the "front position light" pin on the diagnostic page is a red exclamation mark. | Open circuit from load to pin | Go to the diagnostic page to find the pin number of the "front position light" and check the load or the connection to the pin. |
| Front position lamp | When the front position light is turned on, the dot in front of the "front position light" pin on the diagnostic page is changed from a green dot to a red exclamation mark. | Front position light is overloaded or short circuit from load to pin connection. | Check the load or wiring to confirm whether there is an overload or short circuit phenomenon |
| Electric horn | When the electric horn is not turned on, the dot in front of the "electric horn" pin on the diagnostic page is a red exclamation mark. | Open circuit from load to pin | Go to the diagnostic page to find the pin number of "electric horn" and check the load or the connection to the pin. |
| When the electric horn is turned on, the dot in front of the "electric horn" pin on the diagnostic page is changed from a green dot to a red exclamation mark. | Electric horn is overloaded or short circuit from load to pin connection. | Check the load or wiring to confirm whether there is an overload or short circuit phenomenon |
| Left front turn signal | When the left front turn signal is not turned on, the dot in front of the "left front turn signal" pin on the diagnostic page is a red exclamation mark. | Open circuit from load to pin | Go to the diagnostic page to find the pin number of "left front turn signal" and check the load or the connection to the pin. |
| When the left front turn signal is turned on, the dot in front of the "right front turn signal" pin on the diagnostic page is changed from a green dot to a red exclamation mark. | The left front turn signal is overloaded or short circuit from load to pin connection. | Check the load or wiring to confirm whether there is an overload or short circuit phenomenon |
| Right front turn signal | When the right front turn signal is not turned on, the dot in front of the "right front turn signal" pin on the diagnostic page is a red exclamation mark. | Open circuit from load to pin | Go to the diagnostic page to find the pin number of the "right front turn signal" and check the load or the connection to the pin. |
| When the right front turn signal is turned on, the dot in front of the "right front turn signal" pin on the diagnostic page is changed from a green dot to a red exclamation mark. | Right front turn signal is overloaded or short circuit from load to pin connection. | Check the load or wiring to confirm whether there is an overload or short circuit phenomenon |
| Front door courtesy light | When the front door is not open, the dot in front of the "front door courtesy light" pin on the diagnostic page is a red exclamation mark. | Open circuit from load to pin | Go to the diagnostic page to find the pin number of "front door courtesy light" and check the load or the connection to the pin. |
| When the front door is open, the dot in front of the "front door courtesy light" pin on the diagnostic page is changed from a green dot to a red exclamation mark. | Front door courtesy light is overloaded or short circuit from load to pin connection. | Check the load or wiring to confirm whether there is an overload or short circuit phenomenon |
| Scrubber | When the washer is not turned on, the dot in front of the "washer" pin on the diagnostic page is a red exclamation mark. | Open circuit from load to pin | Go to the diagnostic page to find the pin number of "washer" and check the load or the connection to the pin. |
| When the washer is turned on, the dot in front of the "washer" pin on the diagnostic page is changed from a green dot to a red exclamation mark. | Washer is overloaded or short circuit from load to pin connection. | Check the load or wiring to confirm whether there is an overload or short circuit phenomenon |
| Front fog lights | When the front fog light is not turned on, the dot in front of the "front fog light" pin on the diagnosis page is a red exclamation mark. | Open circuit from load to pin | Go to the diagnostic page to find the pin number of "front fog light" and check the load or the connection to the pin. |
| When the front fog light is turned on, the dot in front of the "front fog light" pin on the diagnostic page is changed from a green dot to a red exclamation mark. | Fog light is overloaded or short circuit from load to pin connection. | Check the load or wiring to confirm whether there is an overload or short circuit phenomenon |
| Low-speed wiper | When the low-speed wiper is not turned on, the dot in front of the "low-speed wiper" pin on the diagnostic page is a red exclamation mark. | Open circuit from load to pin | Go to the diagnostic page to find the pin number of "low-speed wiper" and check the load or the connection to the pin. |
| When the low-speed wiper is turned on, the dot in front of the "low-speed wiper" pin on the diagnostic page is changed from a green dot to a red exclamation mark. | Low-speed wiper is overloaded or short circuit from load to pin connection. | Check the load or wiring to confirm whether there is an overload or short circuit phenomenon |
| High beam | When the high beam is not turned on, the dot in front of the "high beam" pin on the diagnostic page is a red exclamation mark. | Open circuit from load to pin | Go to the diagnostic page to find the pin number of "high beam" and check the load or the connection to the pin. |
| When the high beam is turned on, the dot in front of the "high beam" pin on the diagnostic page is changed from a green dot to a red exclamation mark. | High beam is overloaded or short circuit from load to pin connection. | Check the load or wiring to confirm whether there is an overload or short circuit phenomenon |
| Rear fog lights | When the rear fog light is not turned on, the dot in front of the "rear fog light" pin on the diagnostic page is a red exclamation mark. | Open circuit from load to pin | Go to the diagnostic page to find the pin number of "rear fog light" and check the load or the connection to the pin. |
| When the rear fog light is turned on, the dot in front of the "rear fog light" pin on the diagnostic page is changed from a green dot to a red exclamation mark. | Rear fog light is overloaded or short circuit from load to pin connection. | Check the load or wiring to confirm whether there is an overload or short circuit phenomenon |
| Middle door courtesylamp | When the middle door is not open, the dot in front of the "middle door courtesy light" pin on the diagnosis page is a red exclamation mark. | Open circuit from load to pin | Go to the diagnostic page to find the pin number of "middle door courtesy light" and check the load or the connection to the pin. |
| Middle door courtesylamp | When the middle door is open, the dot in front of the "middle door courtesy light" pin on the diagnostic page is changed from a green dot to a red exclamation mark. | Middle door courtesy light is overloaded or short circuit from load to pin connection. | Check the load or wiring to confirm whether there is an overload or short circuit phenomenon |
| Brake light | When the brake is not applied, the dot in front of the "brake light" pin on the diagnostic page is a red exclamation mark. | Open circuit from load to pin | Go to the diagnostic page to find the pin number of the "brake light" and check the load or the connection to the pin. |
| When the brake is applied, the dot in front of the "brake light" pin on the diagnostic page is changed from a green dot to a red exclamation mark. | Brake light is overloaded or short circuit from load to pin connection. | Check the load or wiring to confirm whether there is an overload or short circuit phenomenon |
| Left rear turn signal | When the left turn switch is not turned on, the dot in front of the "left rear turn signal" pin on the diagnostic page is a red exclamation mark. | Open circuit from load to pin | Go to the diagnostic page to find the pin number of the "left rear turn signal" and check the load to pin connection. |
| When the left rear turn signal switch is turned on, the dot in front of the "left rear turn signal" pin on the diagnostic page is changed from a green dot to a red exclamation mark. | Left rear turn signal is overloaded or short circuit from load to pin connection. | Check the load or wiring to confirm whether there is an overload or short circuit phenomenon |
| Right rear turn signal | When the right turn signal switch is not turned on, the dot in front of the "right rear turn signal" pin on the diagnostic page is a red exclamation mark. | Open circuit from load to pin | Go to the diagnostic page to find the pin number of "right rear turn signal" and check the load to pin connection. |
| When the right rear turn signal switch is turned on, the dot in front of the "right rear turn signal" pin on the diagnostic page is changed from a green dot to a red exclamation mark. | Right rear turn signal is overloaded or short circuit from load to pin connection. | Check the load or wiring to confirm whether there is an overload or short circuit phenomenon |
| Rear position lamp | When the rear position light switch is not turned on, the dot in front of the "rear position light" pin on the diagnostic page is a red exclamation mark. | Open circuit from load to pin | Go to the diagnostic page to find the pin number of the "rear position light" and check the load or the connection to the pin. |
| When the rear position light switch is turned on, the dot in front of the "position light" pin on the diagnostic page is changed from a green dot to a red exclamation mark. | Rear position light is overloaded or short circuit from load to pin connection. | Check the load or wiring to confirm whether there is an overload or short circuit phenomenon |
| Reversing light | When the reverse gear is not engaged, the dot in front of the "reverse light" pin on the diagnostic page is a red exclamation mark. | Open circuit from load to pin | Go to the diagnostic page to find the pin number of "reverse light" and check the load or the connection to the pin. |
| Reversing light | When the reverse gear is engaged, the dot in front of the "reverse light" pin on the diagnostic page is changed from a green dot to a red exclamation mark. | Reverse light is overloaded or short circuit from load to pin connection. | Check the load or wiring to confirm whether there is an overload or short circuit phenomenon |

**Common Faults and Treatment of Electric Air Conditioner**

|  |  |  |  |
| --- | --- | --- | --- |
| **Fault contents** | **Fault causes** | **Fault analysis method** | **Processing** |
| Not cold | 1. Compressor motor does not turn  A Motor is broken and burnt.  B High pressure switch action  C Low pressure switch action  D Temperature switch action  E Wiring terminal fixing screw is loose. | Measure the coil resistance  Check whether the condensing fan is normal.  Check whether the refrigerant is leaking.  Check the connection  Check | Replace the compressor  Repair  Replace the refrigerant  Repair  Tighten |
| 2. Poor electrical control components  A Overvoltage and undervoltage relay action  B Contactor or intermediate relay coil is burned down or contact is faulty.  C Compressor is faulty.  D Thermal relay action of condensing fan motor | Check the electrical parts  Power supply voltage is too high or too low  Check the components  Check the compressor  Check the motor current | Replace the parts  Adjust the supply voltage  Repair or replace  Repair or replace  Repair or replace |
| 3. Compressor Operation  A Refrigerant leakage | Indoor inlet and discharge air temperature is the same, evaporator return pipe temperature is too high, compressor current is small. | Repair the refrigeration cycle system |
| 4. Scroll compressor reverses | Abnormal sound of compressor | Exchange the phase sequence |
| Insufficient cooling capacity | 1. Evaporator and condenser are full of dirt.  2. Evaporator icing  3. Set temperature is too high or temperature sensor wiring contact is poor.  4. Small amount of refrigerant is leaking.  5. Refrigerant charge is excessive.  6. Air cooling is insufficient.  7. Single cycle operation is not good | Check  Inspection (Visual)  Check  Measure the running current and make a decision  Excessive current  See "Low air volume" item  Measure the running current | Cleaning  Weathered ice  Adjustment or repair  Repair the refrigerant cycle system  Discharge a small amount of refrigerant  See "Low air volume" item  Repair bad circulation |
| No air output | 1. Wiring of centrifugal fan  A Broken wire at the connector  B Loose wiring screws | Check the circuit connection | Repair  Tighten |
| 2. Motor burned or broken | Measure whether the coil resistance is balanced and whether the wire is disconnected. | Replace the motor |
| 3. Control circuit and electrical fault | Check the circuit and electrical components | Repair or replace |
| Small air volume | 1. Fan motor reversal  2. Evaporator frosting or icing  3. Evaporator fins are dirty and plugged.  4. Leakage at the air duct  5. Air filter is plugged. | Check fan steering  Inspection (Visual)  Inspection (Visual)  Check  Check the filter | Change the phase line  Air is converted into ice and frost.  Clean  Repair  Clear the mesh blockage |
| Large vibration noise | 1. Abnormal fan motor ball bearing  2. unbalanced fan  3. Loose fastening parts  4. Scroll compressor reverses | Check the balance of the fan  Check each fastening part | Repair the fan  Tighten  Exchange the phase sequence |
| Low pressure is too low. | 1. Refrigerant leakage  2. Inlet air temperature is too low.  3. Insufficient air volume  4. Low pressure pipeline is plugged.  5. Evaporator fins are full of dust. | Small compressor current  Evaporator frost  See "Low air volume" item  Check  Check | Repair the refrigerant cycle system and flush the refrigerant  See "Low air volume" item  Exclude  Cleaning |
| High pressure is too high. | 1. Dirty condenser  2. Excessive refrigerant charge  3. Condensing fan reversing  4. Exhaust pipe section is plugged.  5. Condensing fan does not turn.  A Motor burned out  B Damage to motor ball bearing  6. Air or non-condensable gas mixed into the system. | Check the condenser  Excessive current  Check  Check  Measure the coil resistance  Check | Cleaning  Discharge a small amount of refrigerant  Adjust the phase sequence of the motor  Exclude  Replace the motor  Replace motor ball bearing  Exclude |
| Leakage of water | 1. Water leakage from the air return port  A Outfall is plugged.  B Poor installation leads to water seepage at the air outlet gasket.  C The top sealing tape of the unit is broken or the insulation material is broken. | Check  Check  Check | Cleaning  Perform correct installation  Replace wearing parts |
| 2. Water leakage from the air outlet | Drip tray is dirty and plugged. | Clean the evaporator and drip tray waterway, and drain the accumulated water. |
| 3. Condensation inside the car ducts form water droplets, blowing out from the air outlet. |  | Increase the set temperature appropriately |

**8.7.7 Common Faults and Treatment of the Drive Shaft**

|  |  |  |
| --- | --- | --- |
| **Fault performance** | **Cause Analysis** | **Elimination method** |
| Shaking of the drive shaft | 1. Bended and deformed transmission shaft  2 The relative position of the universal joint fork at both ends of the drive shaft is incorrect.  3. The universal-joint cross bearing and the transmission shaft spline are severely worn.  4 The dynamic balancing piece falls off | 1. Redynamic balancing after cold pressure correction  2 Reassemble  3. Replace  4 Rebalancing |
| Abnormal sound of drive shaft | 1 Loose nut at both ends  2. Bended and deformed transmission shaft  3. The needle bearing of the universal-joint cross trunnion is severely worn.  4 Loose spline of drive shaft | 1 Fasten the bolts and lock them tight  2. Redynamic balancing after cold pressure correction  3 Replace the universal joint  4 Timely lubrication or replacement |

**8.7.8 Common Faults and Treatment of Steering Gear**

|  |  |  |
| --- | --- | --- |
| **Fault performance** | **Cause Analysis** | **Elimination method** |
| Heavy steering | 1 Lack of oil in hydraulic system  2 There is air in the hydraulic system  3 Filter is plugged.  4 Insufficient pressure of oil pump  5 Steering drive shaft and steering gear connected to the universal joint movement does not work.  6 The rotary valve is stuck | 1 Check the oil level of the oil tank and add enough oil according to the regulations.  2 Exhaust and check the oil level and sealing of piping joints, etc.  3 Clean the filter and filter element and change the oil.  4 Check the safety valve and flow control valve of the oil pump, you can check with a hydraulic meter connected to the pipeline, and clean them if they are in poor operation.  6. Repair the steering gear |
|  |
| Turn the steering wheel quickly and feel heavy | 1 Insufficient oil supply to the oil pump  2 Too large bending of oil pipe causes poor oil circuit and action lag  3. Inhalation of air  4 improper adjustment of wheel positioning | 1 a oil tank is short of oil, so oil should be added.  b oil circuit is plugged or the filter is plugged, clear the blockage  2 Replace the oil pipe  3. Venting  4 Check and adjust the front wheel positioning |  |
| The free stroke of the steering wheel is too large. | 1 The ball pin and the ball pin seat at both ends of the steering rod have too much wear clearance.  2 The meshing clearance between the rack and the gear fan is large. | 1 Replace the ball pins and ball cups  2 Perform adjustment by adjusting screw |  |
| **Fault performance** | **Cause Analysis** | **Elimination method** |  |
| Noise | 1. Inhalation of air  2 Oil level is too low  3 Poor connection  4 Internal problem of oil pump | 1. Venting  2 Repair the oil leak and add oil  3 Tighten the connection parts  4 Repair or replace the oil pump |  |
| The steering wheel is heavy in one direction when steering | 1 Air in single cavity  2 Poor oil cleanliness pushes up the seal of the limit valve at one end, causing internal leakage at one end.  3 Insufficient system oil pressure  4 The steering gear leaks in only one direction.  5 Rotary valve is not in the middle position  6 Left or right fixed pressure cannot be built up  7. Excessively low tire pressure | 1. Venting  2 Clean and change the oil  3 Check the cause of insufficient pressure and eliminate it  4. Repair the steering gear  5. Repair the steering gear  6 Repair the steering gear and replace the seals  7 Inflate at specified air pressure |  |
| Excessive steering wheel clearance | 1 Loose steering gear  2 There is clearance for the universal joint  3 Steering screw and nut clearance is too large | 1. Tighten all bolt fasteners  2 Repair universal joint  3. Repair the steering gear |  |
| Steering drift | 1 Loose steering gear mounting bolts  2 Loose components in the system | 1 Tighten or replace  2. Tighten all bolt fasteners |  |
| Steering deviation | Incorrect front wheel alignment adjustment | Adjust front wheel positioning |  |
| Steering oscillation | 1 Loose steering housing bolt or steering column support  2 Steering gear clearance is large.  3. Worn front wheel bearing  4. Deformed steering knuckle  5 Loose front steel plate spring U-bolt | 1 Fasten the loose bolt  2 Adjust the clearance between the steering bolt and the nut  3 Adjust the front wheel bearing clearance or replace the bearing  4. Replace the knuckle  5. Fasten the leaf spring U-bolt |  |
| Steering wheel shaking | 1 The air is not completely discharged from the hydraulic system  2 Lack of oil in the oil tank causes the oil pump to suck in air  3 Poor sealing of oil circuit causes small amount of air to be sucked in. | 1. Venting   2 Add oil and exhaust air  3 Check the oil circuit and seal it well |  |

**8.7.9 Common Faults and Treatment of Front Axle**

|  |  |  |
| --- | --- | --- |
| **Fault performance** | **Cause Analysis** | **Elimination method** |
| Hub bearing not smooth | 1 The hub bearing preload is too large.  2 The bearing lacks grease or the grease used is not correct.  3. The bearing is dirty with dust | 1. Adjust the pretightening force  2. Enhance lubrication or replace the lubricating grease  3 Clean or enhance lubrication |
|  |
|  |
| Insufficient braking force of the brake | 1. Camshaft rotation is not smooth  2. The stroke of the brake chamber pushrod is not properly adjusted  3. Brake friction plate is overheated or deteriorated  4. Brake friction plate is not properly fit  5. Water ingress to the brake drum  6 Lubricating oil on the friction plates and brake drum | 1. Check the camshaft operation  2. Adjust the stroke  3. Replace the friction plate  4 Correct the friction plate fitting position  5 While driving, gently depress the pedal to drain the water.  6 Clean the oil stains or replace the friction plates. |  |
| Steering wheel oscillation | 1. Worn front wheel bearing  2 The main pins and bushings are worn too much  3. Deformed steering knuckle  4 Improper wheel positioning | 1 Replace the bearings  2 Correct or replace the faulty parts  3. Replace the knuckle  4 Check or adjust wheel positioning |  |
| Astringent wheels | 1. The camshaft is poorly lubricated or the adjustment arm does not return  2. The brake shoe or the air chamber return spring is broken or damaged due to fatigue | 1 Correct the faulty parts  2 Replace the faulty parts |  |
| There is abnormal sound when braking | 1. Bolts protrude due to wear of the brake plates  2 Surface hardening or deterioration of friction plates  3 Uneven wear on the inner surface of the brake drum or unstable installation  4. The brake shoe and the friction plate are not tightly contacted.  5. The brake shoe fixing pin is loose.  6. The hub bearing is worn  7. The brake drum is deformed | 1. Replace the friction plate  2. Replace the friction plate  3 Correct the brake drum or tighten the nut  4. Tighten the coupling bolts  5 Adjust the brake shoe clearance and tighten the retaining pin locking screw  6. Replace the hub bearing  7. Correct or replace the brake drum |  |
| The steering wheel is running to either side | 1. Incorrect front wheel alignment adjustment  2 The front axle is bent  3 Inflexible braking  4 Front wheel hub bearing nut is loose | 1 Check and adjust wheel positioning  2 Correct or replace front axle  3 Please read the brake program  4 Tighten at specified torque |  |
| Heavy steering wheel operation | 1 Improper wheel positioning adjustment (excessive rearward tilt)  2 Excessive clearance between main pin and bushing  3 Reverse installation of thrust bearing  4 Lack of lubrication of front axle parts  5 Ball joint connection is too tight or too loose.  6 Tire pressure is too low.  7 Excessive tire wear | 1 Check and adjust positioning  2 Check and adjust clearance  3 Correct assembly  4 Add grease to front axle  5 Check and lubricate ball pins  6 Replenish to specified pressure  7 Replace tires |  |
| Uneven or premature tire wear | 1 Incorrect front wheel positioning  2 Worn or broken wheel hub bearings, loose bearing nuts  3 Ball pins, main pins and bushings are too loose or too tight. | 1 Check and adjust front wheel positioning  2 Replace bearings or tighten nuts as required  3 Correct, and if necessary, replace faulty parts. |  |

**8.7.10 Common Faults and Treatments of Rear Axle**

|  |  |  |
| --- | --- | --- |
| **Fault performance** | **Cause Analysis** | **Elimination method** |
| Hub bearing not smooth | 1 The wheel hub bearing preload is too large  2 Lack of lubrication or incorrect grease used in the bearing  3. The bearing is dirty with dust | 1. Adjust the pretightening force  2. Enhance lubrication or replace the lubricating grease  3 Clean or enhance lubrication |
| Astringent wheels | 1. The camshaft is poorly lubricated or the adjustment arm does not return  2. The brake shoe or the air chamber return spring is broken or damaged due to fatigue | 1 Correct the faulty parts  2 Replace the faulty parts |
| lubricating oil leakage | 1 Oil seal is worn, loose or damaged  2 Reducer fastening bolts are loose or sealant is damaged  3 Bearing seat fastening bolt is loose  4 Loose oil drain plug or damaged liner  5 Deformation of the axle housing due to overload  6 Ventilation plug is plugged or damaged | 1 Replace the oil seal  2 Tighten the bolts according to the specified torque and reapply sealant  3 Tighten the bolts according to the specified torque  4 Tighten the screw plug according to the specified torque or replace the gasket  5 Correct or replace the axle housing  6 Clean or repair the ventilation plug |
| Insufficient braking force of the brake | 1. Camshaft rotation is not smooth  2. The stroke of the brake chamber pushrod is not properly adjusted  3. Brake friction plate is overheated or deteriorated  4 Insufficient brake air pressure or insufficient air volume  5. Brake friction plate is not properly fit  6 Lubricating oil on the friction plate or brake drum  7. Water ingress to the brake drum | 1. Check the camshaft operation  2. Adjust the stroke  3. Replace the friction plate  4 Check the pneumatic line and each air valve  5 Correct the friction plate fitting position or running-in  6 Clean the oil stains and replace the friction plates  7 Gently depress the pedal while driving to drain the water. |
| There is abnormal sound when braking | 1. Bolts protrude due to wear of the brake plates  2 Surface hardening or deterioration of friction plates  3. The brake shoe and the friction plate are not tightly contacted.  4 Uneven wear on the inner surface of the brake drum or loose mounting bolts  5. The brake shoe fixing pin is loose.  6. The hub bearing is worn  7. The brake drum is deformed | 1. Replace the friction plate  2. Replace the friction plate  3. Tighten the coupling bolts  4 Correct the brake drum or tighten the bolts  5 Tighten the retaining pin locking screw  6. Replace the hub bearing  7. Correct or replace the brake drum |
| Unstable braking | 1 Improperly installed brake shoes or damaged return springs  2 Brake friction plates have oil or deterioration  3 Braking plate damaged  4 Uneven tire pressure  5 Improper adjustment of left and right brakes  6 Damaged friction plates  7 Loose steel plate spring U-shaped bolt | 1 Tighten the retaining pin locking screw or replace the return spring  2 Clean or replace the friction plates  3 Replace the braking plate  4 Restore tire pressure as required  5 Adjust the brake  6. Replace the friction plate  7. Fasten the leaf spring U-bolt |
| Abnormal transmission sound | 1 Improper differential gear clearance  2 The clearance between the active and passive gears is too large.  3 The pretightening force of the driving gear bearing is too small  4 Axle shaft gear, planetary gear, universal joint thrust washers, etc. have wear or damage.  5 Oil level is too low | 1. Replace the gasket or the gear  2. Replace the gasket or the gear  3. Adjust the pretightening force  4 Correct or replace defective parts  5 Add enough lubricant |

**8.7.11 Common faults of brake system and treatment**

|  |  |  |
| --- | --- | --- |
| **Fault performance** | **Cause Analysis** | **Elimination method** |
| Poor braking performance of the vehicle | 1 The clearance between brake drum and brake shoe lining is too large  2 Excessive wear of brake lining  3 The 4 front and rear wheels do not brake at the same time  4 Oil contamination in the brake line | 1. Adjust the clearance   2 Replace the friction plate with new ones  3. Adjust the proper clearance  4 Clean |
|  |
| Brake drum is hot | 1 The clearance between brake drum and brake shoe lining is too small  2 Brake shoe return spring force is too weak  3 Excessive wear of lining  4 Brake cam bearing clip  5 Excessive out-of-roundness of the brake drum  6 Cracked brake shoe lining | 1. Adjust the proper clearance  2. Replace  3. Replace  4 Clean and lubricate  5 Boring and grinding  6. Replace |  |
| Braking deviation | 1 Improper adjustment of brake lining clearance  2 Oil contamination on the lining  3 Poor contact between lining and brake drum  4 Uneven tire pressure  5 The brake shoe shaft or camshaft is stuck in rotation | 1. Adjust the clearance  2 Scrub with gasoline and remove the surface dirt with gauze  3 Grinding  4 Inflate as required  5 Adjust and lubricate |  |
| Insufficient braking power (compressed air pressure drops quickly) | 1 Pneumatic elements or pipeline air leakage  2 Air compressor valve seat is loose, and valve is stuck or damaged  3 Brake valve air leakage | 1 Adjust and tighten or replace the pneumatic elements  2 Adjust and replace  3. Repair or replace |  |
| Insufficient braking power (no significant drop in air pressure during braking) | 1 Brake valve stroke is too short  2 The camshaft bushing lacks lubricating oil and does not rotate  3 Brake lining is too hot  4. Water ingress to the brake drum | 1 Adjust  2 Check the camshaft and lubricate as required  3 Check the friction plates and replace them if necessary  4 While driving, gently depress the pedal to drain the water |  |

**8.7.12 Common faults of pneumatic suspension and treatment**

|  |  |  |
| --- | --- | --- |
| **Fault performance** | **Cause Analysis** | **Elimination method** |
| Air spring is not inflated | 1 The air pressure in the air cylinder is too low, and the pressure protection valve cannot be opened  2 The pressure protection valve fails or its filter element is too dirty  3 The air line is leaking or blocked  4 The height control valve fails or its control rod is loose | 1 Continue to inflate  2 Service or replace  3 Repair  4 Replace or tighten |
| Air bag sides are worn or even worn out, appearing holes | 1 Damage to the rubber bushings of the traction bar causes suspension drift, resulting in friction between the air bag and the tire, etc.  2 Damage to the absorber or loose pipeline, etc. resulting in interference with the air bag | 1 Replace the air bag, traction bar or its rubber bushings  2 Replace the air bag, absorber or modify the pipeline fault, etc. |
| Air bag rolling over the piston area is worn, with wavy flap-like protrusions and even with holes | Foreign matter such as gravel and glass splinter stuck outside the piston of the air spring base | Remove the foreign matter and replace the air bag |
| Skewed air spring, eccentric contact of buffer block | The rubber bushing in the traction bar is damaged, resulting in the suspension drift | Replace the traction bar or its rubber bushings |
| Air bag crumpled and cracked | 1 Premature aging of the rubber caused by grease, solvent, etc. on the air bag  2 Normal aging of the rubber | 1 Replace the air bag and remove the root cause of oil, solvent, etc.  2 Replace the air bag |
| Air spring elasticity decreases and gets harder | The water vapor in the air cylinder is not released in time, and more and more water accumulate in the air spring | Clear the fault that water vapor in the air cylinder is not released in time, and clear the water in the air spring |
| Vehicle tilt | 1 Improper adjustment of the height control valve causes tilting of the vehicle in the front and rear or left and right directions  2 If a height control valve fails or the pipeline is inaccessible, resulting in its control air bag not to proceed or not to exhaust, the air bag is either low or high  3 A height valve control rod fastening nut is loose, disconnected from the height valve plunger arm, the height valve is not in the normal control state | 1 Adjust the height of the air bag according to the design height  2 Troubleshoot the height valve or pipeline  3 Link with the height valve plunger arm, tighten the tightening nut on the control rod |
| Height control valve response is slow | 1 Air supply pressure is too low  2 The height control valve is dirty or the air line is dirty or deformed  3 The water vapor in the air cylinder is not released in time, and the height control valve or pipeline freezes in cold weather due to water vapor in the air | 1 Continue to inflate to the specified air pressure value  2 Clean the height control valve or air line, repair the air line  3 Clear the freezing phenomenon, clear the fault of water vapor in the air cylinder is not discharged in time |

**Common faults of wheel and treatment**

|  |  |  |
| --- | --- | --- |
| **Fault performance** | **Cause Analysis** | **Elimination method** |
| Excessive tire wear | 1 Wrong wheel alignment  2. Excessively low tire pressure  3 Loose wheel hub bearing  4 Overload | 1 Adjust wheel alignment  2 Inflate to specified pressure  3 Adjust the bearing tightness  4 Pay attention not to overload as much as possible |

**8.7.14 Common faults of passenger doors and treatment**

|  |  |  |
| --- | --- | --- |
| **Fault performance** | **Cause Analysis** | **Elimination method** |
| The door cannot be opened and closed | 1 The iron core pull-in clearance is too large  2 Mechanical jamming of iron core | 1 Adjust the iron core center and adjust the screw  2 Adjust the fixed valve seat screw |
| Door opening valve seat air leakage | 1 The lower seal of the solenoid valve seat is out of order  2 Worn piston O-ring | 1 Repair or replace the seal packing  2 Replace the O-ring |
| Air leakage at the right end cap and piston | Worn O-ring at the right end cap | Replace the O-ring |

**8.7.15 Other common faults and treatment**

|  |  |  |
| --- | --- | --- |
| **Fault performance** | **Cause Analysis** | **Elimination method** |
| Vehicle vibration during driving | 1 Damage to the slip yoke of the drive shaft  2 Loose drive shaft | 1. Replace  2. Fastening |
| Noise in starting and driving | 1. The universal joint is worn  2 Needle bearing, slip yoke lack of lubricant | 1. Replace  2 Lubrication |
| Abnormal wear of rear tire | 1 Rear suspension clamping bolts are not tightened as required torque | 1 Tighten as required |
| The steel plate spring is broken along the center hole | 1 The vehicle is always in overload work  2 Steel plate spring U-bolts or clamping bolts are not tightened for a long time as required  3 The leaf spring is not maintained and lubricated according to the regulations | Replace, pay attention to regular maintenance and tightening, try not to overload |
| The whole vehicle vibration increased | Absorber fails | Repair or replace |
| Headlights do not light up | 1 Filament burnt out  2 Light switch is faulty  3 Dimmer switch is faulty  4. Blowout  5 The battery is discharged | 1 Replace the bulb  2 Repair or replace the light switch  3 Repair or replace dimmer switch  4. Replace the fuse  5 Battery charging |
| Turn signal light does not light up | 1. Blowout  2 The flasher is faulty or poor contact | 1. Replace the fuse  2 Repair the flasher |
| Left and right turn signal lights, one lights up and one doesn’t light up | Left and right turn signal lights, the wire lead is not connected properly | Connect the wire lead properly |
| Wiper does not operate | 1. Blowout  2 The wire is disconnected, poor contact  3 Wiper switch is faulty  4 Wiper arm fixing bolt is loose  5 Wiper motor is faulty | 1. Replace the fuse  2 Check and connect the wiring  3 Repair or replace the wiper switch  4. Fastening  5 Repair the wiper motor |
| No power | 1 The main power switch is faulty  2. Blowout  3 The control switch is faulty | 1 Repair the main power switch  2. Replace the fuse  3 Repair the control switch |

**Check and Maintenance Schedule**

**For reference, please refer to the actual usage.**

**A1 Inspection and maintenance period**

This schedule shows the inspection and maintenance items and period for the first year, and each year from the second year onward, except for the initial inspection items, it will be carried out according to the first-year items. The inspection and maintenance period is indicated by the number of mileage and months driven. The mileage driven are carried out according to the mileage driven when they come first, and the number of months is used when they come first.

A: Indicate total mileage (×1,000km)

Indicate inspection and maintenance items

B: Indicate the number of the month

Indicate breaking-in period maintenance check items

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Check and maintenance items** |  | **Check and maintenance period** | | | | | | | | | | | | | | | | | | | | | | | | | |
| **A** | **1** | | **4** | | **8** | | **12** | | **16** | | **20** | | **24** | | **28** | | **32** | | **36** | | **40** | | **44** | | **48** | |
| **B** | **－** | | **1** | | **2** | | **3** | | **4** | | **5** | | **6** | | **7** | | **8** | | **9** | | **10** | | **11** | | **12** | |
| Check acceleration and deceleration performance conditions | | ☆ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | |
| Check the oil level of the air compressor | | ☆ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | |
| Check and clean the air compressor air filter element | |  | |  | | ★ | |  | | ★ | |  | | ★ | |  | | ★ | |  | | ★ | |  | | ★ | |
| Replace the air compressor air filter element | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | | ★ | |
| Tighten all kinds of bolts (including suspension) | | ☆ | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | | ★ | |
| Check air compressor pressure | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | | ★ | |
| Check the cleanliness and remaining quantity of lubricating oil | |  | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | |
| Check the tightness of all kinds of bolts and nuts in the steering system | | ☆ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | |
| Check the steering wheel rotation for slack or vibration | |  | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | |
| Check the steering engine and hydraulic pipeline for oil leakage | | ☆ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | |
| Check the steering engine mounting for looseness | | ☆ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | |
| Check the steering engine bearings for looseness | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | | ★ | |
| Check the steering engine gear clearance | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | | ★ | |
| Check the internal leakage of the steering engine | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | | ★ | |
| Check the connecting part of steering engine for looseness, vibration and damage | | ☆ | |  | |  | | ★ | |  | |  | | ★ | |  | |  | | ★ | |  | |  | | ★ | |
| Check the connecting part between the tie-drag rod and knuckle arm for wear and damage | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | | ★ | |
| Check the connecting part between the steering knuckle arm and its steering knuckle for cracks | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | | ★ | |
| Check the connecting part of the steering knuckle for looseness | |  | |  | |  | |  | |  | |  | | ★ | |  | |  | |  | |  | |  | | ★ | |
| Check the clearance between the steering knuckle and the front axle | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | | ★ | |
| Check the steering knuckle for cracks | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | | ★ | |
| Check the positioning of the front wheels | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | | ★ | |
| Check the steering angle of the front wheels | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | | ★ | |
| Check the liquid level of the power steering hydraulic system | | ☆ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | |
| Replace the hydraulic oil and oil tank filter element of the power steering hydraulic system | | ☆ | |  | |  | |  | |  | |  | | ★ | |  | |  | |  | |  | |  | |  | |
| Check whether the hydraulic oil pump is working normally | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | | ★ | |
| Check the mounting and tightening of hydraulic system parts | | ☆ | |  | |  | | ★ | |  | |  | | ★ | |  | |  | | ★ | |  | |  | | ★ | |
| Check the free travel of brake pedal | | ☆ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | |
| Check the braking efficiency | | ☆ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | |
| Check the parking braking efficiency of the energy storage spring | | ☆ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | |
| Check the air pipeline for air leakage, damage and mounting fixation | | ☆ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | |
| Check the soft and hard brake fittings for damage and connection | | ☆ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | |
| Check the sealing efficiency of brake valves and other valves | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | | ★ | |
| Check whether the brake clearance automatic adjustment arm is working normally | | ☆ | |  | |  | |  | |  | |  | | ★ | |  | |  | |  | |  | |  | | ★ | |
| Check the brake drum (disc) and brake shoe lining wear and damage | | |  | |  | | ★ | |  | | ★ | |  | | ★ | |  | | ★ | |  | | ★ | |  | | ★ |
| Check whether the wheel brake air chamber is working normally and damaged | | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | | ★ |
| Check whether the air compressor is working normally | | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | | ★ |
| Check the connecting part of the drive shaft for looseness | | | ☆ | |  | |  | | ★ | |  | |  | | ★ | |  | |  | | ★ | |  | |  | | ★ |
| Check the drive shaft for offset | | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | | ★ |
| Check the drive shaft spline for looseness | | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | | ★ |
| Check the drive shaft universal joint bearing for looseness | | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | |  | | ★ |
| Check the battery electrolyte liquid level | | | ☆ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ |
| Check the specific gravity of the battery electrolyte | | | ☆ | |  | |  | | ★ | |  | |  | | ★ | |  | |  | | ★ | |  | |  | | ★ |
| Check the interconnecting piece of the electrical circuit for looseness or damage | | | ☆ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ | | ★ |

**A2 Grease filling mileage schedule**

The vehicle shall be filled with grease regularly to improve the lubrication conditions under normal use conditions. Before filling, wipe off the dirt on the lubricating nozzle or the part to be lubricated with the wiping rag, and then fill the grease. After adding grease, wipe off the excessive part of it. If there is a oil nozzle plate, be sure to cover it as it is. The grease used for lubrication and maintenance shall be No. 2 lithium grease, and it is not allowed to use other calcium, sodium-based grease instead, otherwise, it will not achieve the required effect. This table is used in the same way as the maintenance schedule.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Check and maintenance items** |  | **Check and maintenance period** | | | | | | | | | | | | |
| **A** | **1** | **4** | **8** | **12** | **16** | **20** | **24** | **28** | **32** | **36** | **40** | **44** | **48** |
| **B** | **－** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** |
| Steering column universal joint bearing and slip yoke | | ☆ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ |
| Steering tie-drag rod ball pin | | ☆ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ |
| Steering knuckle kingpin | | ☆ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ |
| Front and rear brake camshaft | | ☆ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ |
| Front and rear wheel hub bearing | |  |  |  |  |  |  | ★ |  |  |  |  |  | ★ |
| Front and rear brake shoe bearing pin | |  |  |  |  |  |  | ★ |  |  |  |  |  | ★ |
| Drive shaft slip yoke and universal joint | | ☆ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ |

**A3 Parts that are regularly replaced**

Regularly replaced parts are those parts whose usage performance is bound to deteriorate with time. They mainly include brake hoses, fuel hoses and other rubber and plastic parts. For these parts, it is difficult to predict the service life of these parts to ensure safe driving when they are inspected by the methods normally used for regular maintenance. Therefore, it is necessary to replace them with reliable parts, regardless of whether they appear to be serviceable or not.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Replace items**  **(Regular replacement is required only in the year specified)** |  | **Regular replacement period** | | | | | | | | | | | |
| **Year** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** | **12** |
| Power steering hydraulic system rubber hoses | |  | ★ |  | ★ |  | ★ |  | ★ |  | ★ |  | ★ |
| Brake valve type rubber parts | | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ |
| Brake hose | | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ |
| Wheel brake air chamber packing leather and seals | | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ | ★ |

**Chapter IX Warranty**

**9.1 Warranty Liabilities**

**9.1.1**

Vehicle Warranty Policy is a written statement of the Company's responsibility for service and replacement of faulty parts. It is the responsibility of the Company to properly and appropriately address the warranty issues of the consumers, so as to live up to the consumers' trust in the quality of the Company's products.

**9.1.2 Responsibility of special service station**

Each special service station is responsible for providing timely and effective warranty service services to vehicle customers as described in the authorization agreement. In addition, the special service station shall provide high quality service to vehicle customers by continuously developing, maintaining and operating a service store of the highest standard.

**9.1.3 Responsibility of customer**

In accordance with the matters described in the “Product Description”, the customer must perform the following in order to ensure maximum warranty rights and interests:

Please use, service and maintain your vehicle as described in the “Product Description”.

Please use the charging facility that matches the vehicle for charging.

Keep records of vehicle service and inspections for easy reference.

Please ensure that defects or faults in any component covered by the warranty are serviced immediately.

**9.1.4 Special service station/customer relations**

The special service station must provide warranty service for all vehicles sold. The customer may choose a special service station for warranty/service.

**9.2 Warranty scope**

**The relevant provisions of this manual apply to all vehicle products manufactured and sold by the Company.**

Parts of vehicles that fail due to defects in materials or workmanship may be serviced, replaced or adjusted at a special service station free of charge (service method chosen by the Company), subject to the following conditions:

l The part fault is not caused by the user's fault

l The owner shall carry out normal maintenance (please refer to the cycle stated in the “Maintenance Manual”) and use of the vehicle in accordance with the use methods, recommended ways and rated service parameters stipulated.

l The owner shall maintain the vehicle correctly, regularly and on time in accordance with the methods and recommended ways specified.

l After discovering the need for warranty service, the user should send the vehicle to . special service station for service as soon as possible, and the cost of sending the vehicle shall be borne by the user.

l If the user has not been checked on site after-sales department/after-sales service engineers/special repair station, and the fault is handled privately, in principle.. refuses to warranty and rejects all costs incurred by the user. In the case of after-sales service cannot be reached, the user communicates and negotiate with the after-sales department, the service time and material cost within the scope of negotiation shall be borne

l After the fault occurs, the user does not try to troubleshoot according to the operation routine, and continue to use, resulting in the aggravation of the fault or the expansion of the scope of the fault, will not be responsible for the warranty for the deteriorated and enlarged part.

l The gradual deterioration of the operating performance of the parts or the wear of the parts with the age of the vehicle, driving mileage and operating conditions are not included in the warranty.

l Unless the vehicle is modified under the direction of the Company, the vehicle will not be warranted for the fault of modified parts of the vehicle or for the fault of the vehicle due to modification or use of modified devices.

l will not bear the "warranty" responsibility for any fault or accident caused by the use of original parts not provided

l will not bear the "warranty" responsibility for any damage or loss caused by the use of the vehicle for illegal purposes beyond the scope of current national laws.

**Remarks: If the vehicle is resold to the next owner during the new vehicle warranty period, the new owner will be entitled to the warranty for the remaining warranty period of the new vehicle.**

**9.3 Warranty Period**

**9.3.1 The date of commencement of the warranty shall be the date of the purchase invoice.**

**9.3.2 The warranty period is divided into a time limit and a mileage limit, ending on the first to arrive.**

**9.3.3 Warranty schedule**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **S/N** | **Classification** | **Item** | **Warranty Period** | |
| **Time Limit (months)** | **Mileage Limit (km)** |
| 1 | Whole vehicle warranty | Vehicle | 24 | 200,000 km |
| 2 | New Energy Parts Warranty | Motor | 96 | 400,000 km |
| 3 | Motor controller | 96 | 400,000 km |
| 4 | Power battery | 96 | 400,000 km |
| 5 | Motor cooling system | 36 | 180,000 km |
| 6 | Electric steering pump | 36 | 100,000km |
| 7 | New Energy Parts Warranty | Electric air pump | 36 | 150,000 km |
| 8 | Electric air conditioner | 36 | 180,000 km |
| 9 | Charging port | 18 | 90,000 km |
| 10 | New Energy Parts Warranty | High voltage wiring for the whole vehicle | 18 | 90,000 km |
| 11 | Vehicle controller | 36 | 180,000 km |
| 12 | Electric defroster | 12 | 60,000 km |
| 13 | High voltage distribution box | 12 | 60,000 km |
| 14 | CAN bus | 36 | 180,000 km |
| 15 | Traditional Parts Warranty | Front and rear axles | 24 | 120,000 km |
| 16 | Rear axle housing, I-beam | 24 | 120,000 km |
| 17 | Basin angle bevel gear | 18 | 90,000 km |
| 18 | Main reducer housing | 24 | 120,000 km |
| 19 | Wheel hubs | 24 | 120,000 km |
| 20 | Steel ring | 18 | 90,000 km |
| 21 | Steering gear, transmission mechanism | 24 | 120,000 km |
| 22 | Steering angle driver | 24 | 120,000 km |
| 23 | New Energy Parts Warranty | Steering track rod | 24 | 120,000 km |
| 24 | Traditional Parts Warranty | Brake master pump, auxiliary pump | 12 | 60,000 km |
| 25 | Brake hose | 12 | 60,000 km |
| 26 | Brake | 2 | 10,000 km |
| 27 | Automatic adjustment arm | 12 | 60,000 km |
| 28 | Air cylinder | 24 | 120,000 km |
| 29 | Brake series valves | 12 | 60,000 km |
| 30 | ABS | 24 | 120,000 km |
| 31 | Transmission shaft | 24 | 120,000 km |
| 32 | Relays, sensors | 6 | 30,000 km |
| 33 | Ignition switch | 12 | 60,000 km |
| 34 | Combination switch | 12 | 60,000 km |
| 35 | Horn | 6 | 30,000 km |
| 36 | Traditional Parts Warranty | Generator | 18 | 90,000 km |
| 37 | Centralized lubrication device | 24 | 120,000 km |
| 38 | Wiper | 12 | 60,000 km |
| 39 | Audio-visual equipment | 12 | 60,000 km |
| 40 | Electronic clock | 12 | 60,000 km |
| 41 | Reversing monitor | 18 | 90,000 km |
| 42 | Battery | 12 | 60,000 km |
| 43 | Lamps and lanterns | 12 | 60,000 km |
| 44 | Power mirror (mechanical part) | 24 | 120,000 km |
| 45 | Power mirror (electrical part) | 18 | 90,000 km |
| 46 | Dashcam | 18 | 90,000 km |
| 47 | Fire extinguisher in the vehicle | 12 | 60,000 km |
| 48 | Central, switch control box | 12 | 60,000 km |
| 49 | Traditional Parts Warranty | Steel plate spring | 18 | 90,000 km |
| 50 | Air spring | 18 | 90,000 km |
| 51 | Front and rear lateral stabilizer bar | 24 | 120,000 km |
| 52 | Shock absorber | 6 | 30,000 km |
| 53 | Height valve | 12 | 60,000 km |
| 54 | Door pump | 18 | 90,000 km |
| 55 | Door lock | 18 | 90,000 km |
| 56 | Garage door | 24 | 120,000 km |
| 57 | Gas springs, hydraulic spring | 18 | 90,000 km |
| 58 | Seat | 18 | 90,000 km |
| 59 | Driver seat | 18 | 90,000 km |
| 60 | Abat vent | 24 | 120,000 km |
| 61 | Sunroof | 24 | 120,000 km |
| 62 | Traditional Parts Warranty | Sunroof motor | 18 | 90,000 km |
| 63 | Radiator, intercooler | 18 | 90,000 km |
| 64 | Accelerator pedal | 18 | 90,000 km |
| 65 | Automatic fire extinguisher | 18 | 90,000 km |
| 66 | Side windows and front and rear screens | 12 | 60,000 km |
| 67 | Floorboards | 36 | 180,000 km |
| 68 | Floor leather | 36 | 180,000 km |
| 69 | Guardrail | 36 | 180,000 km |
| 70 | Skeleton, exterior panel | 96 | 480,000 km |
| 71 | Body paint | Blistering, cracking, natural shedding | 12 | 60,000 km |

**9.3.4 Warranty date of accessories**

The original accessories purchased in special service station, the warranty is calculated from the date of purchase invoice. If the spare parts need to be repaired or replaced due to material defects or manufacturing process problems, the Company will bear the relevant costs. The warranty period for specific accessories is executed according to the table above.

**Such warranty is subject to the following conditions:**

l The customer shall retain and present the original repair order and invoice to the service station. The service order and invoice shall state the date of sale of the spare parts. If the original spare parts were installed by the service station, the service station shall indicate the mileage at the time of replacement on the service order;

l The accessory has not been subjected to any form of abuse, has not been damaged by negligence, accident or improper use or modification, and no damage has occurred as a result of the use of unapproved accessories, components or attachments;

l The accessory has been replaced, altered or modified in any way with the written consent of the Company;

l The accessory or the vehicle with such accessories have been maintained in accordance with the contents of our recommended maintenance section;

l The odometer reading of the vehicle has not been changed.

**The responsibility of the Company under the terms of this warranty shall be limited to the servicing or replacement of spare parts; For the avoidance of doubt, any incidental or consequential damages arising from the fault of a spare part shall not be covered by this warranty.**

**9.4 Warranty terms**

**1. Each new vehicle is given a first warranty, but must be serviced for the first time within 3,500-5,000 km or within 6 months at the special service station. please refer to contacting the special service station in this manual or inquiring about after-sales service). At the first warranty, please present this warranty manual and give the last set of "free first warranty" list to your service store for recycling, and you will receive a stamped voucher from our service station for the first warranty, and please keep it safe for later "warranty". If you do not have the first maintenance record, you will be deemed to have automatically waived your "warranty" rights.**

2. Tire warranty is provided by the tire supplier in accordance with the law or its agreement.

3. Vehicles sold at a discount, such as prototype vehicles, test vehicles, touring vehicles or overdue stock vehicles, etc., are not warranted in principle; In special cases, according to the specific agreement on the warranty period in the purchase agreement signed between the user and the company, no warranty will be made if there is no agreement.

4. There is no "warranty" for all kinds of wearing parts, such as gaskets, all kinds of bulbs, fuses, wiper strips, etc.

5. Normal consumable parts, such as coolant, lubricating oil (grease), air dryer, various filters, brake lining, etc. do not implement the "warranty"

6. Because maintenance costs and wear and tear items are not caused by defects in raw materials or workmanship, these items are not included in the new vehicle warranty policy.

7. Damage caused by improper use; Damage caused by improper maintenance; Claims will not be made if the vehicle is not maintained correctly, regularly and on time in accordance with the methods, recommended ways and rated service parameters

8. Use the vehicle beyond the rated parameters specified. Vehicle overloading, driving on unsuitable road surface (but not limited to this), etc. are improper use and driving, and parts failure due to these reasons will not be claimed according to New Vehicle Warranty Policy. No claim will be made for parts, assemblies, equipment or accessories related to modifications to the vehicle (unless the modifications were made or if the modifications affect the performance/handling of the parts.

9. Damage caused by vehicle accidents is not applicable to warranty claims.

10. Any damage caused by industrial, chemical or other airborne dust, as well as tree sap, beeswax, hail, windstorm, flood, weather, natural disaster, force majeure, etc., occurring after the user has taken possession of the vehicle is not warranted.

11. Proper care and maintenance are essential to the reliable and safe operation of the vehicle. Routine maintenance, adjustment or wear-and-tear items are not included by the warranty. Failures due to lack of maintenance or use of incorrect lubricating oil, fluids, etc. are not included by the warranty.

12. Calculation of "warranty" mileage: The odometer reading on the vehicle or the remote monitoring data of our company shall prevail. If the odometer of the vehicle is damaged, it shall be reported in time for repair, otherwise, the company will calculate the "warranty" mileage according to 300 km per day (the time point to start the calculation is based on the time when the mileage of the faulty vehicle is fixed by our remote monitoring).

13. Collateral damage

If a part included in the warranty may fail and damage another part that has a different time or mileage limit, to determine if such a repair needs to be compensated, check the warranty coverage of the part that caused the damage.

If the part that caused the failure is included in the warranty coverage, but damages another part that is out of warranty, the compensation of the entire repair project shall be subject to the terms of the warranty of the part that caused the damage.

If the part that caused the failure is out of warranty and the damaged part is under warranty, the entire repair shall not be compensated.

**9.5 Address book of Special Maintenance Stations**

To be defined

**9.6 Vehicle maintenance/repair record**

**First warranty record**

**Maintenance Records**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **To paste bills** | **Maintenance date** | **Description of maintenance / fault** | **Maintenance items** | **Seal of authorized maintenance station** |
|  |  |  |  |
|  |  |
| **Vehicle mileage** |  |  |
|  |  |  |
|  |  |

**9.7 Check list for the first maintenance**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | | | | | | |  |
| **License plate** | |  | **VIN code** |  | **Vehicle type** | |  |
| **Mileage** | |  | **Inspection technician** |  | **Inspection time** | |  |
| **Parts** | **S/N** | **Operation** | | **Results** | | **Treatment measures** | |
| Driving motor | 1 | Inspect the drive motor high-voltage wire fixation | |  | |  | |
| 2 | Inspect the drive motor high-voltage wire harness for damage, interference and abrasion | |  | |  | |
| 3 | Inspect the drive motor cooling system for coolant leakage, add if necessary | |  | |  | |
| 4 | Inspect and tighten the drive motor support fastening bolts | |  | |  | |
| 5 | Inspect the plugs and connectors of the gearshift mechanism | |  | |  | |
| 6 | Inspect the sealing condition of gearshift mechanism piping and joints | |  | |  | |
| Transmission shaft | 7 | Inspect and tighten the drive shaft connecting bolts | |  | |  | |
| 8 | Inspect and tighten the bolts and nuts of all front axle parts | |  | |  | |
| 9 | Inspect and tighten rear axle housing, differential and half-shaft bolts | |  | |  | |
| **Parts** | **S/N** | **Operation** | | **Results** | | **Treatment measures** | |
| Transmission shaft | 10 | Tighten wheel nuts | |  | |  | |
| 11 | Inspect the wear of universal joints | |  | |  | |
| Braking | 12 | Inspect and adjust the free travel of brake pedal | |  | |  | |
| 13 | Inspect whether all kinds of valves are working normally | |  | |  | |
| 14 | Inspect the working condition of the brake system of the whole vehicle | |  | |  | |
| 15 | Inspect whether the brake connection pipes and connection nuts are normal | |  | |  | |
| 16 | Inspect and tighten the nuts of the front and rear brake plates | |  | |  | |
| Steering | 17 | Inspect power steering oil level and filter element | |  | |  | |
| 18 | Inspect the working condition of steering system and power steering hydraulic system | |  | |  | |
| 19 | Inspect and tighten the steering mechanism joint bolts and grease the lubrication points. | |  | |  | |
| 20 | Inspect the electric steering pump high-voltage wire connection | |  | |  | |
| Chassis | 21 | Inspect and tighten the bolts and nuts connecting the body and chassis | |  | |  | |
| 22 | Inspect the oil and gas leaks of the whole vehicle | |  | |  | |
| Chassis | 23 | Inspect whether the shock absorber is loose or not | |  | |  | |
| 24 | Inspect the air bag and pipeline | |  | |  | |
| 25 | Inspect the tightness of the drive shaft cross shaft U-bolt, middle support universal joint U-bolt and other drive part bolts | |  | |  | |
| 26 | Inspect whether the blast pump is working normally | |  | |  | |
| 27 | Inspect the sealing condition of the blast pump pipeline and joints | |  | |  | |
| 28 | Inspect whether there is interference in the high-pressure line of the blast pump | |  | |  | |
| High-voltage part of electric appliance | 29 | Inspect the high-voltage control cabinet high-voltage harness, plug connections, insulation resistance value | |  | |  | |
| 30 | Inspect the harness, plug connection and insulation resistance value of the whole vehicle controller | |  | |  | |
| 31 | Inspect the motor controller harness, plug connections, insulation resistance value | |  | |  | |
| 32 | Inspect the blast pump harness, plug connection, insulation resistance value | |  | |  | |
| 33 | Inspect the DC/DC harness, plug connection, insulation resistance value | |  | |  | |
| 34 | Inspect the electric defroster harness, plug connection, insulation resistance value | |  | |  | |
| 35 | Inspect the power battery high-voltage plug connection, insulation resistance value | |  | |  | |
| High-voltage part of electric appliance | 36 | Motor three-phase wire bolt tightening, plug connection, insulation resistance value | |  | |  | |
| Electrical low-voltage part | 37 | Inspect whether the lights of the whole vehicle and each instrument work normally | |  | |  | |
| 38 | Check whether the horn and wiper work normally | |  | |  | |
| 39 | Clean the air conditioner evaporator filter and condenser | |  | |  | |
| 40 | Inspect and adjust the tension of vacuum belt | |  | |  | |
| 41 | Front door/middle door, whether the opening and closing speed is normal | |  | |  | |
| 42 | Front door/middle door, whether the door gap is normal | |  | |  | |
| 43 | All kinds of switches and control boxes/modules | |  | |  | |
| 44 | All kinds of sensors and solenoid valves | |  | |  | |
| 45 | Audio monitoring inspection | |  | |  | |
| 46 | 24V battery wiring terminal tightness inspection and battery test (if there is a test report, please paste it on the back of this checklist. ) | | Battery I voltage is V, electric quantity is, whether it is normal. | |  | |
| Battery II voltage is V, electric quantity is, whether it is normal. | |  | |
| Vehicle Interior Inspection | 47 | Are there any loose armrests, seats, luggage racks and air ducts in the vehicle? | |  | |  | |
| 48 | Whether the air conditioner is normal | |  | |  | |
| 49 | Whether the tools and accessories accompanying the vehicle are complete | |  | |  | |
| 50 | Whether the heat dissipation is normal? | |  | |  | |
| Cleaning | 51 | Dust the appearance of all battery compartments and electrical parts inside the compartment. (Blowing dust) | |  | |  | |

**Spare parts appendix**

| **S/N** | **Accessory name** | **Picture** | **Net weight (KG)** | **Specification** |
| --- | --- | --- | --- | --- |
| 1 | Driving motor | IMG_256 | 220 | Dana Electric Motor  Motor: TZ368XSPE251WH-E（MD100F） Rated power 145KW, peak power 200KW; Rated torque 1,100N. M, maximum torque 2,450N. M; Maximum speed 2,700r/min; |
| 2 | Water-cooled motor controller | Ein Bild, das Elektrische Leitungen, Maschine, Kabel, Elektronik enthält.  Automatisch generierte Beschreibung | 12 | Dana electric motor controller: KTZ60X40SP100F-E (C0150)  Used to control drive electric motor work/collect vehicle information for start and stop work/voltage on drive motor: 600V |
| 3 | Vehicle controller | IMG_256 | 1 | VMU200  Dana whole vehicle controller, responsible for communicating with electric motor controller, BMS and instrumentation, receiving signals and issuing relevant commands |
| 4 | High voltage box assembly (CATL) | Ein Bild, das Autoteile, Maschine, Elektrische Leitungen, Plastik enthält.  Automatisch generierte Beschreibung | 30 | 780153-00284  Interfaces include: Battery total positive and negative, charging positive and negative, the whole vehicle communication interface.  Contains: BMS main module, heating relay, total negative relay, charging relay, MSD, current sensor, HVB, RDB |
| 5 | 4-in-1 integrated controller | 1539659566(1) | 20 | WV6-H-4D5.5G-ZHGT(HW)  Contains high voltage control and each signal control of electric motor, air pump/oil pump, air conditioner, DC-DC, high voltage defroster, etc., |
| 6 | Oil-free vortex blast pump | IMG_256 | 53 | GTCLB4-12-Y  0.36m3/min, 3.3KW, Ingersoll Rand brand |
| 7 | Electric steering oil pump (with pressure relief valve) | 700616950422470956 | 23.5 | EHPS-0018R3/43AGTCL01  18L/min, 3kW, Quanxing machining dual source oil pump, permanent magnet brushless motor; Work pressure: 6MPa~17MPa, oil inlet size: M27\*1.5-6H, oil outlet size: M18\*1.5-6H, low noise, high efficiency; |
| 8 | 24V dual source controller | 240572830528186213 | 2.2 | Model: IEVII-1110202N-C。  24V dual source controller/used to convert 24V power to 38V AC power and provide electric steering pump work with the 38V AC power/working voltage 24V/Quanxing Machining brand / |
| 9 | Power battery | Ein Bild, das Text, Autoteile, draußen, Auto enthält.  Automatisch generierte Beschreibung | 216 | CATL lithium iron phosphate battery (including battery box and BMS), single 3.22V302AH; The whole vehicle is equipped with a total of 3 batteries and 192 multiple-series connections. The whole vehicle battery parameters 502.32V604Ah, total electric quantity 303.4kWh; The batteries are placed at the rear and top of the vehicle. |
| 10 | Battery box upper protection (CATL) | 393282835389401885 | 1.3 | 860000-00005  Prevent high voltage circuit short circuit or overload/used on high voltage box to protect high voltage circuit/automatic fuse when voltage abnormal/voltage: 618.24V |
| 11 | Brushless water pump | 150892835351763751 | 3.9 | CM100BL HF 27.2V D38  Domestic brand ATS, with imported pumps+SPEL fans |
| 12 | ATS electrical module | IMG_256 | 0.4 | 3616W11-020C0-ZD  ATS electrical module/used to control the cooling fan and water pump work/by collecting the cooling system temperature signal to control the fan work  Voltage: 27V |
| 13 | ATS water temperature sensor | 229507860892028077 | 0.1 | 3619A01-030A1  Used to detect the temperature of the radiator inlet and outlet pipes of the ATS cooling system/thermal sensor converts the temperature into a voltage signal and outputs it to the ATS electrical module |
| 14 | ECAS Controller | 239899952315678068 | 0.3 | 4461702270  Control the rise and fall of chassis airbag/realize the rise and fall of body by controlling the work of airbag solenoid valve  Voltage: 24v |
| 15 | EBS Controller | Ein Bild, das Text, Screenshot, Elektronik, Im Haus enthält.  Automatisch generierte Beschreibung | 0.5 | 4461352410  Electronic brake system, replacing the original mechanical system brake with electronic control system  Voltage: 24v |
| 16 | Brake master cylinder (EBS system) | 666493176858922077 | 3.1 | 4800021030  Applicable models: Pure electric bus |
| 17 | Air dryer assembly | 301413842117052335 | 3.5 | 4324102520  Used to remove the water in the compressed air and transmit the start and stop working signal to the air compressor |
| 18 | Voltage type air pressure sensor | 447601181940746655 | 0.05 | 36YX-0081  Function: To detect the air pressure value of the air storage tank  Uses: Used for instrument air gauge display  Working principle: Air pressure pushes the sensor switch and active resistance, the sensor output signal to the instrumentation system;  Detection object: Chassis air pressure of air storage tank. |
| 19 | Brake light switch | 704429139200340423 | 0.15 | 6100A2-3720100  Voltage: 24V |
| 20 | Handbrake light switch | 886819704578930217 | 0.1 | Voltage: 24V |
| 21 | Accelerator pedal | 90781465847570598 | 1 | Williams WM526  Applicable models: Pure electric bus |
| 22 | Airbag height valve | 184963397138441597 | 0.1 | WABCO 4410501200  Control normal rise and fall of the body |
| 23 | Gear switch | Ein Bild, das Fernbedienung enthält.  Automatisch generierte Beschreibung | 0.3 | KZ06-C2ER-AU-E  Voltage: 24V |
| 24 | Drive module | 468009457621484836 | 1 | HNS-QA202A  For low voltage circuit control/by collecting circuit signal and driving output/24V/Honorsun |
| 26 | MP5 transceiver | 869526734018207396 |  | Use local radio broadcast signal and audio and video contents of memory card/for audio and video playback in the vehicle/general electronic products/yes, connect to 24 V power supply of the whole vehicle. |
| 27 | Reverse buzzer | Ein Bild, das Gerät enthält.  Automatisch generierte Beschreibung | 0.15 | Mingtai  201003 |
| 28 | Combination switch assembly | 222491397877030848 | 0.5 | JK302K  Voltage: 24V |
| 29 |  |  |  |  |
| 30 | Intelligent drain valve | 506599136708344784 | 1.9 | ATR-EFS24R1/2-60GB01  Control the normal operation of the air conditioner/control the output signal of the control button via the air conditioner panel, control the start and stop of the air conditioner and work according to the set temperature. |
| 31 | Air conditioning control panel | Ein Bild, das Text, Auto, draußen enthält.  Automatisch generierte Beschreibung | 0.1 | 80115060A  Control the normal operation of the air conditioner/control the output signal of the control button via the air conditioner panel, control the start and stop of the air conditioner and work according to the set temperature. |
| 32 | Daytime running lights | 831497405465707778 | 0.2 | SK30-5  For vehicle daytime running lights/electrifying for light |
| 33 | Ignition button switch | 184214654611347101 | 0.05 | PBM-25Z22  Voltage: 24V |
| 34 | Door switch | 647138445928524034 | 0.05 | PBM-25Z22  Voltage: 24V |
| 35 | Parking brake switch | 87163764349933207 | 0.05 | PBM-25Z22  Voltage: 24V |
| 36 | Rotary switch outside the door | 505385573737835327 | 0.5 | KD-800A1(Rotary switch KD-800 right)  Voltage: 24V |
| 37 | Front door pump | 72346273594879121 | 5.2 | Nanjing Aiwei Electromechanical GTZ6129BEVG-6100000  General Buses |
| 38 | Middle door pump | 747059734934164554 | 5.2 | Nanjing Aiwei Electromechanical GTZ6129BEVG-6200000  General Buses |
| 39 | Door pump solenoid valve | 179002889684535017 | 0.4 | Nanjing Ivy Machinery GTZ6129BEVG-6100000  Control door pump normal switch |

Spare Part:

Workflow

Fault: replacement needed