



Service Manual

Order picker

EOP68 / EOP70



WARNING

You must understand the operation instructions in this manual before using it.

Attention:

- Please check the last page of this document and all the current product type identification on the name plate.
- Keep it for future use

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1. Maintenance List

A. Overview of main components

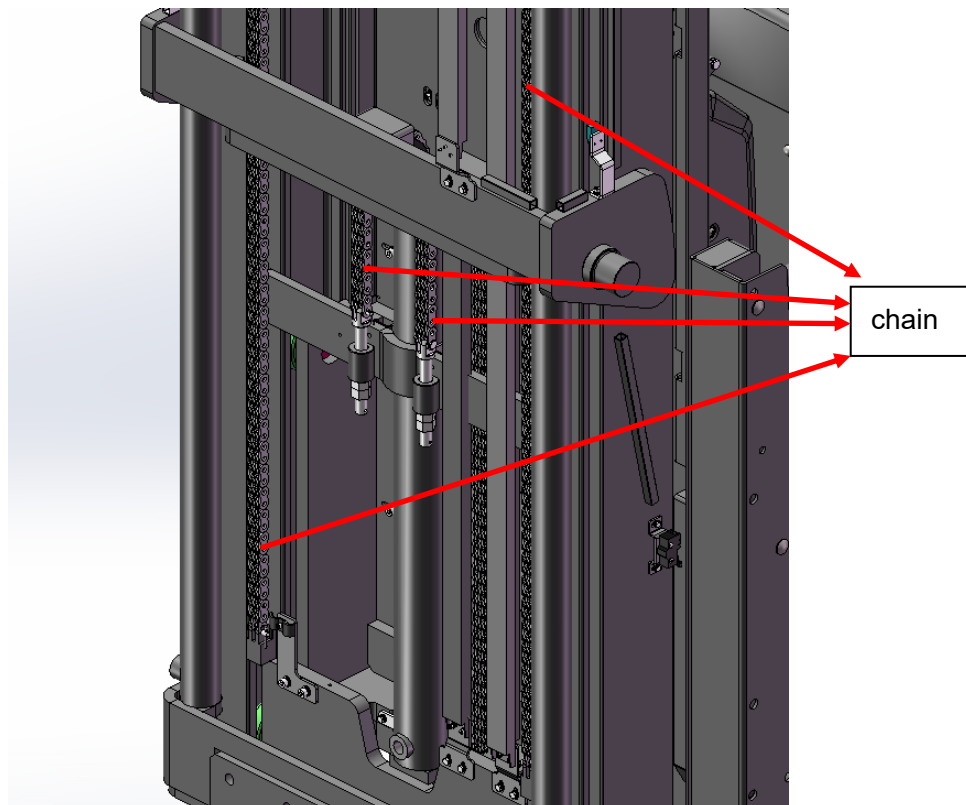
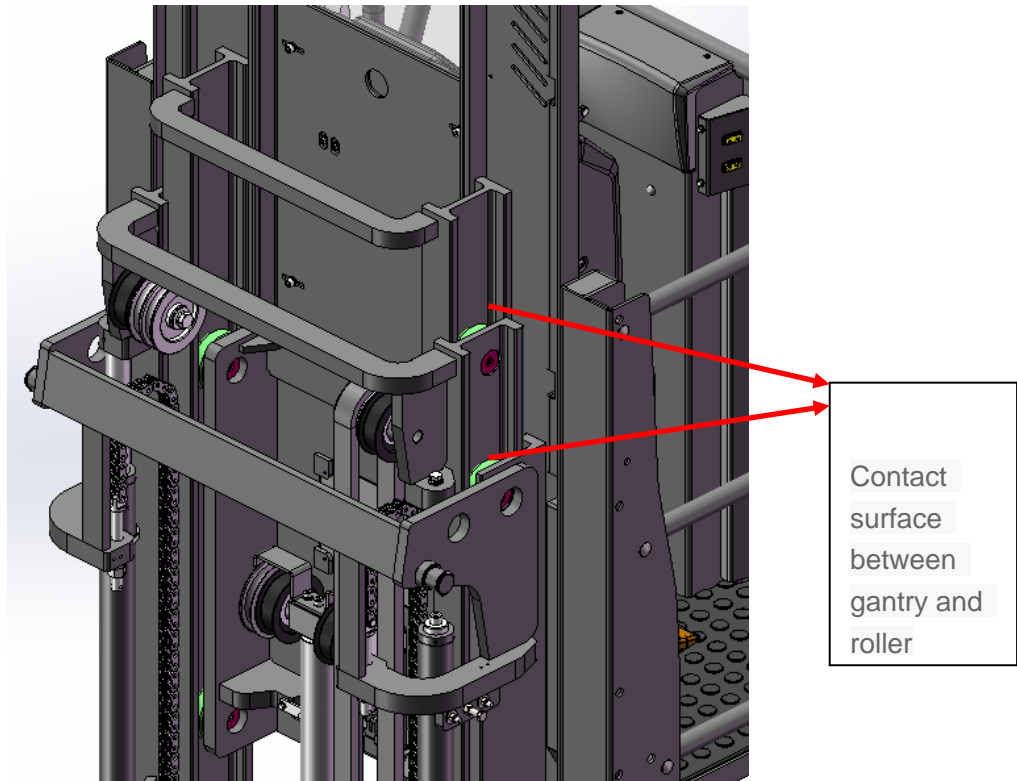
List 1: Maintenance List

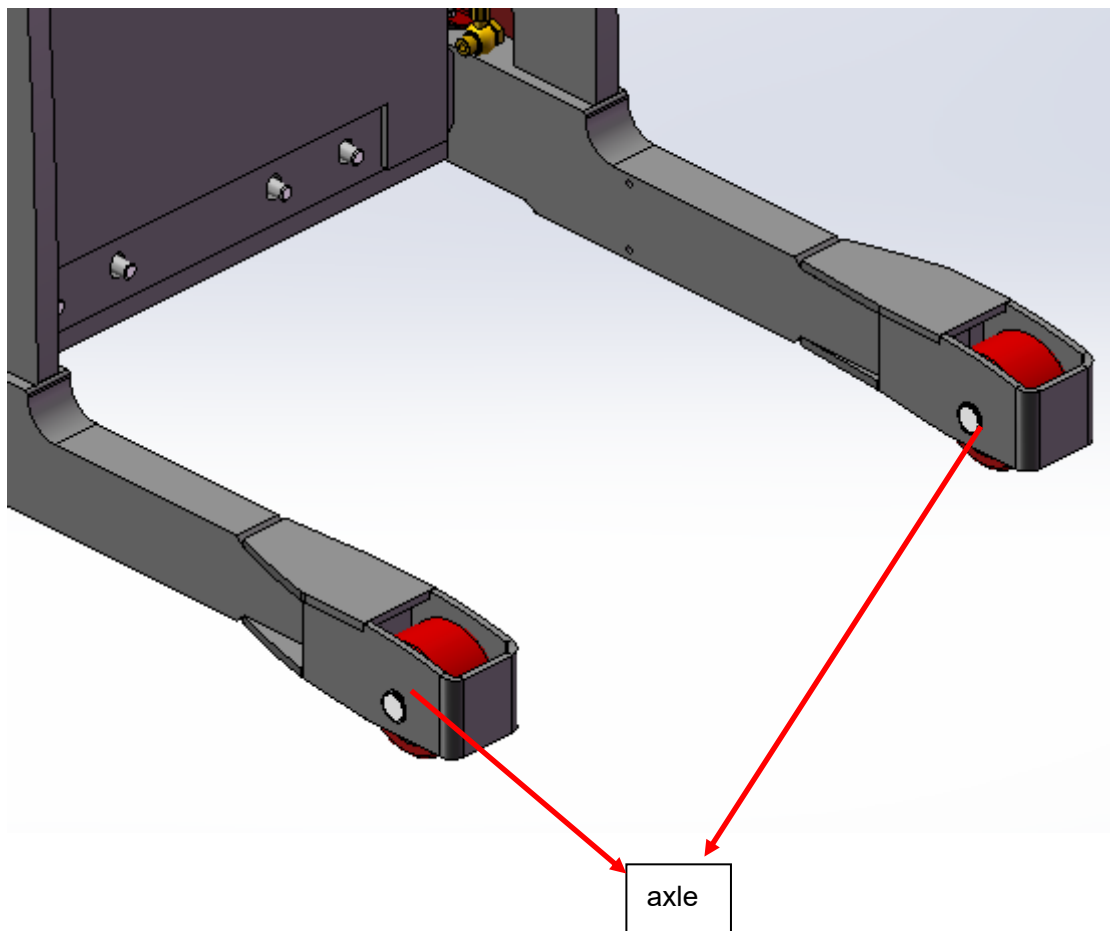
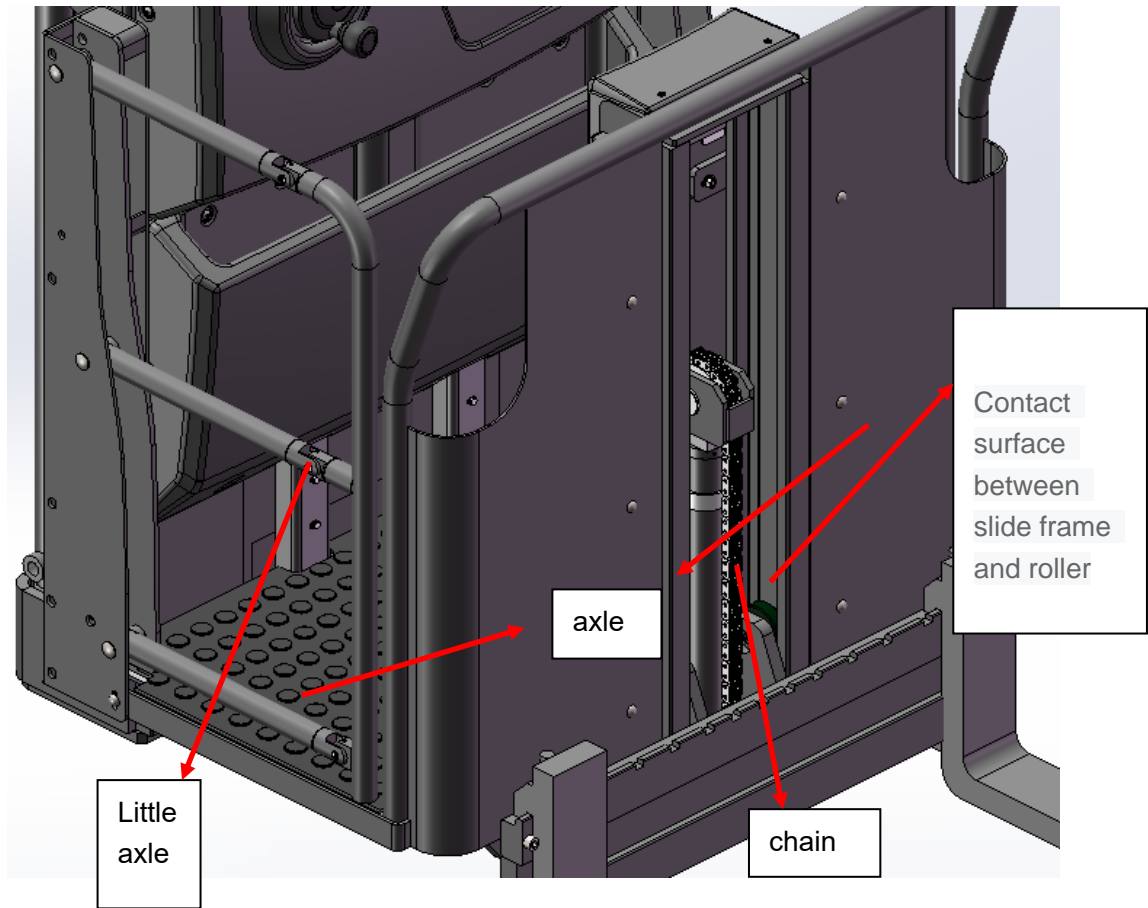
		Interval (month)			
		1	3	6	12
The hydraulic system					
1	Check the hydraulic cylinder, piston for damage noise and leakage		•		
2	Check hydraulic fittings and tubing for damage and leakage		•		
3	Check hydraulic oil level and refill if necessary		•		
4	Refill with hydraulic fluid (12 months or 1500 working hours)				•
5	Check and adjust the function of hydraulic valve (1500kg/2000kg +0/+10%)				•
Mechanical systems					
6	Check the fork for deformation and breakage		•		
7	Check chassis for deformation and cracking		•		
8	Check that all screws are in place		•		
9	Check push rod for deformation and damage		•		
10	Check gear box for noise and leakage		•		
11	Check wheel for deformation and damage		•		
12	Lubricated steering bearing				•
13	Check and lubricate the pivot points		•		
14	Lubricating grease nozzle	•			
Electric System					
15	Check whether electrical wiring is damaged		•		
16	Checking Electrical Connections		•		
17	Check emergency switch function		•		
18	Check electric drive system for noise and damage		•		
19	Detection meter		•		
20	Check that the correct fuse is used		•		
21	Detection warning signal		•		
22	Check the current contactor		•		
23	Check frame for leakage (insulation test)		•		
24	Check the function and wear of the drive controller		•		
25	Check the electrical system driving the motor		•		
Braking systems					
26	Check brake performance and replace brake discs or adjust air gaps if necessary		•		

Storage battery				
27	Checking the Battery voltage		•	
28	Clean and grease terminals and inspect for corrosion and damage		•	
29	Check whether the battery casing is damaged		•	
Charger				
30	Check whether the main power cable is damaged			•
31	Check the start up protection program during charging			•
Function				
32	Check horn function	•		
33	Check solenoid valve air gap	•		
34	Detect emergency brake	•		
35	Detect reverse braking and regenerative braking	•		
37	Check steering function	•		
38	Check lifting and descending functions	•		
Synthesize				
40	Check all labels for clarity and completeness	•		
41	Check load bearing pinion and adjust height, replace if worn		•	
42	Run a test run	•		

B. Lubrication points

Lubricate marked points according to maintenance list. Required grease specification: DIN 51825.





C. Check to refill hydraulic oil

Recommended hydraulic oil model according to temperature:

The environment temperature	-5°C~25°C	>25°C
Brand	HVLP 32, DIN 51524	HLP 46, DIN 51524
Viscosity	28.8-35.2	41.4 - 47
Oil	22 L	

Waste materials such as waste oil, waste batteries or other materials must be treated and recycled in accordance with national regulations and returned to the recycling company for recycling if necessary.

The oil level should not be lower than the minimum amount required to start the vehicle.

Fill up to refueling point if necessary

D. Check the electrical fuse

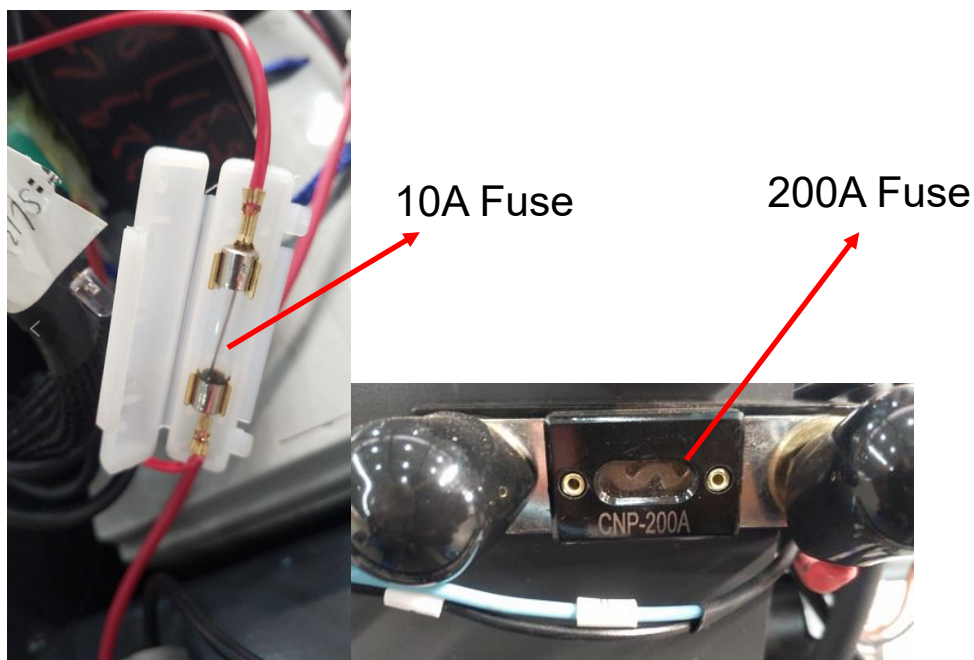


Table 2: Fuse specification

	Specification
FUSE1	10A
FUSE01	200A

2. Fault Analyses

If the vehicle continues to malfunction, follow the instructions of the manual.

A. Common fault analysis

Table 3: Fault analysis

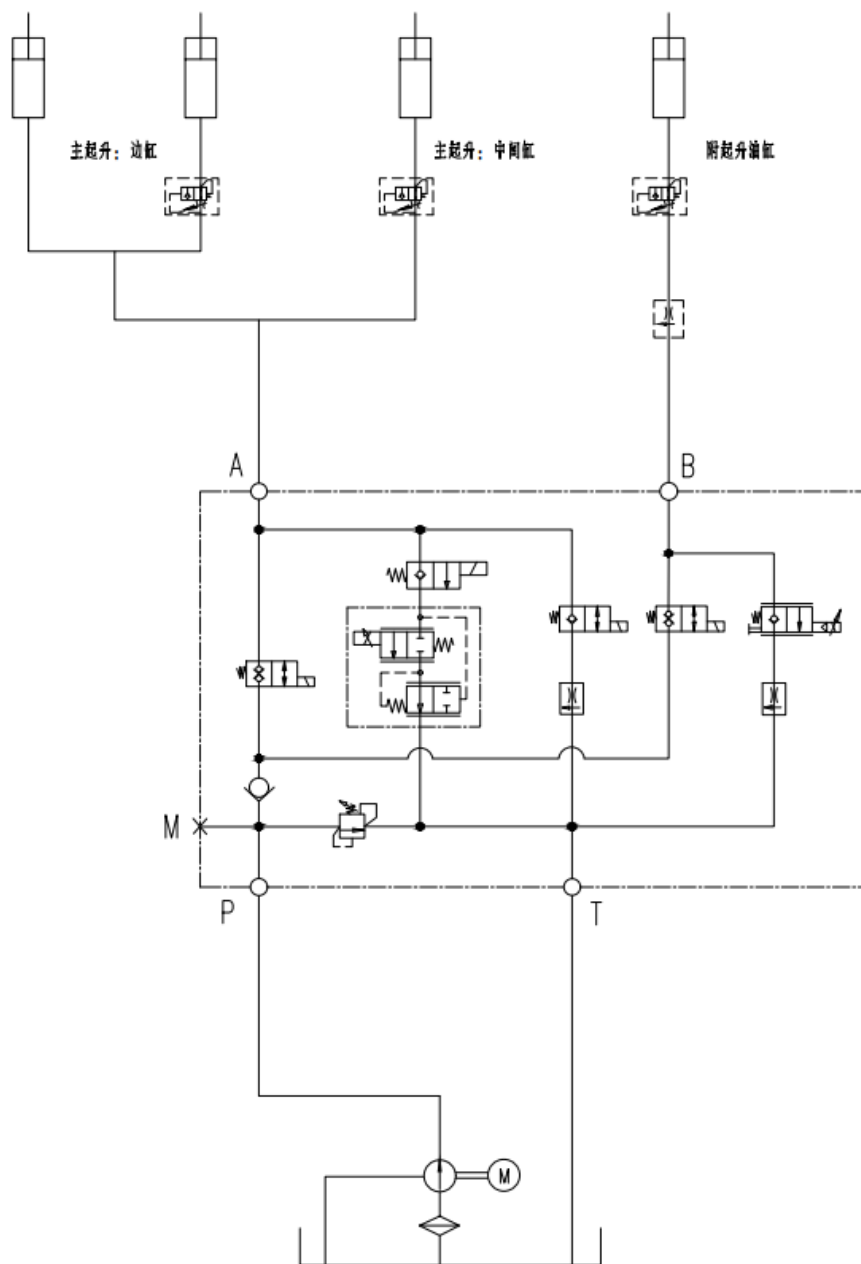
Fault	Cause	Maintenance
Cargo cannot be lifted	Excessive load weight	Increase only the maximum capacity shown on the nameplate
	Loss of battery	The battery
	The fuse is out of order	Check and replace the fuse
	The hydraulic oil level is too low	Check and refill hydraulic fluid
	The spill	Check the seal condition of oil cylinder
Suction oil leakage	Oil is too high	Reduce oily
Vehicle inoperable	The battery is charging	Fully charge the battery, then remove the main power plug from the power socket
	The battery is disconnected.	Connect batteries correctly
	Fuse failure	Check and replace the fuse
	Low battery	The battery
	The emergency switch is activated	Unplug the emergency switch
Traffic is going in one direction only	Accelerator and connector damage	Check accelerator and connector
The forklift is slow	Battery discharge	Check the battery condition on the discharge monitor
	The electromagnetic brake has been activated	Check electromagnetic brake
	The handle wiring harness is not connected or damaged	Check handle wiring harness and connectors
	At 400mm altitude, the speed decreases and the sensor fail	Check sensor
	Electrical system overheating	Discontinue use and cool the vehicle

	The thermal sensor is faulty	Check and replace the heat sensor if necessary
The forklift suddenly started	Controller damage	Replacing a Controller
	The accelerator has not moved back to the middle position	Repair or replace the accelerator

If the vehicle is malfunctioning and cannot be operated outside the work area, lift the vehicle up, place a load handling device under the vehicle and secure the vehicle, then remove the vehicle out of the channel.

B. Oil hydraulic circuit

Hydraulic principle diagram



Hydraulic oil inspection

Appearance	odor	condition	results
Clear and non-discoloration	good	good	You can use
Color transparent	good	Mix with other oils	Check viscosity, if qualified can continue to use
The color changes like milk	good	Mixed with air and water	Separate moisture or replace hydraulic oil
The color turns dark brown	bad	oxidation	Replacement of hydraulic fluid
The color is clear but there are small black spots	good	Mix it with other particles	Use after filtering

3. Disassembly of main parts

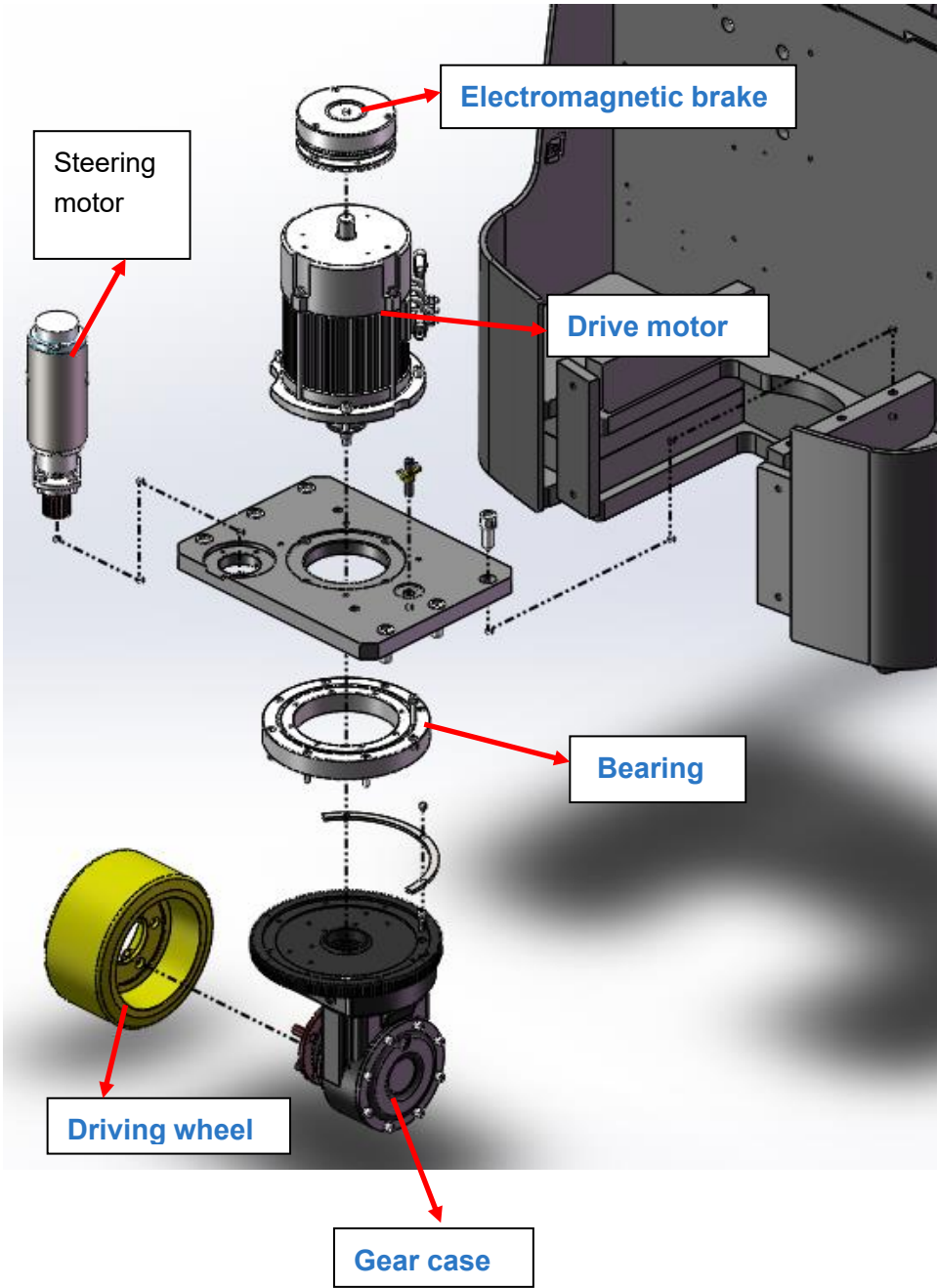
A. Electromagnetic brake adjustment

adjusting nut

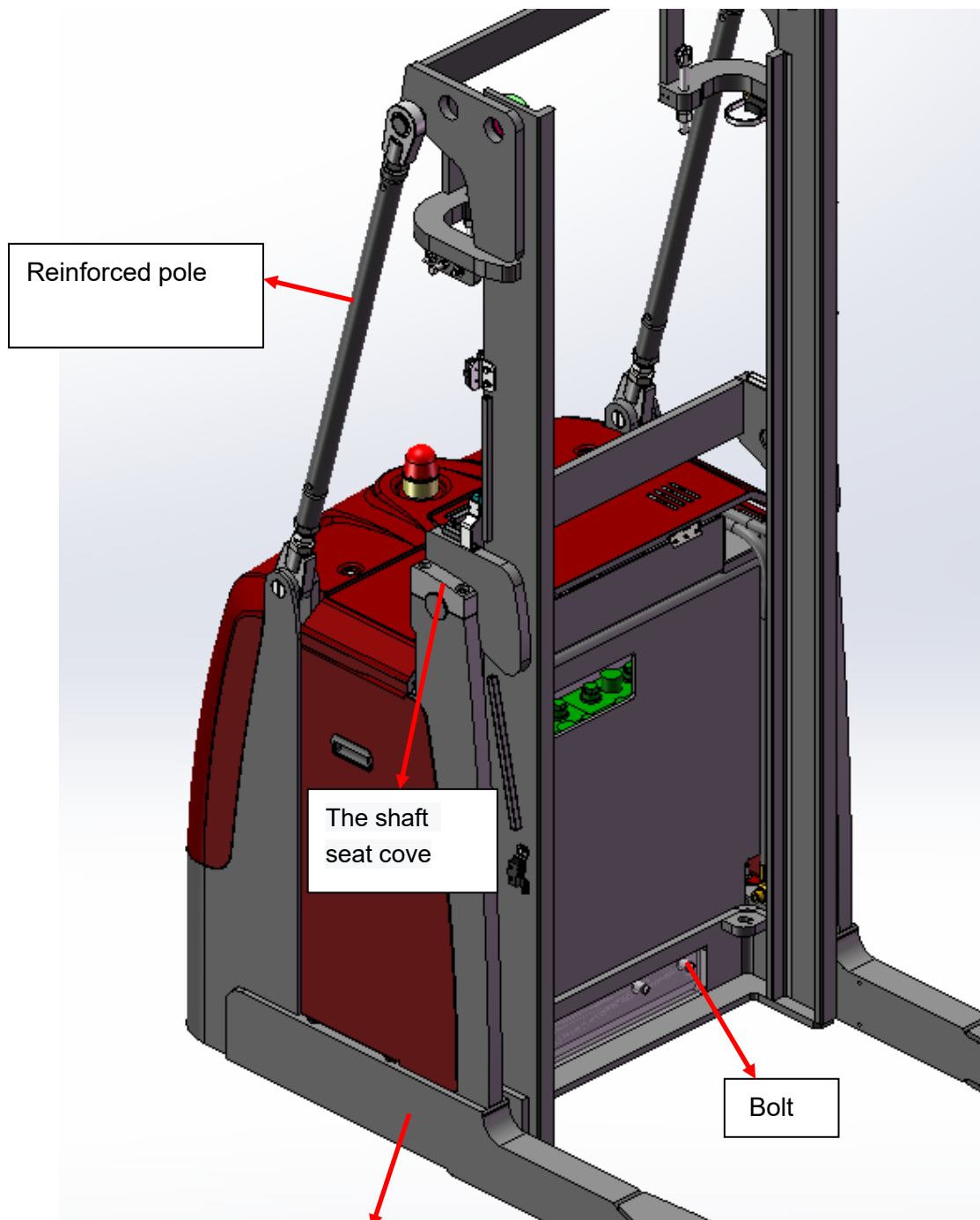
Note: electromagnetic brake can't pull properly when it is powered on in free state, it needs external force or installation to pull

Electromagnetic brake clearance is about 0.25-0.35mm, about the thickness of a piece of paper. Need to be adjusted carefully repeatedly, ensure that three adjustment surface clearances is consistent, electricity will give out a crisp sound.

B. Drive disassembly diagram

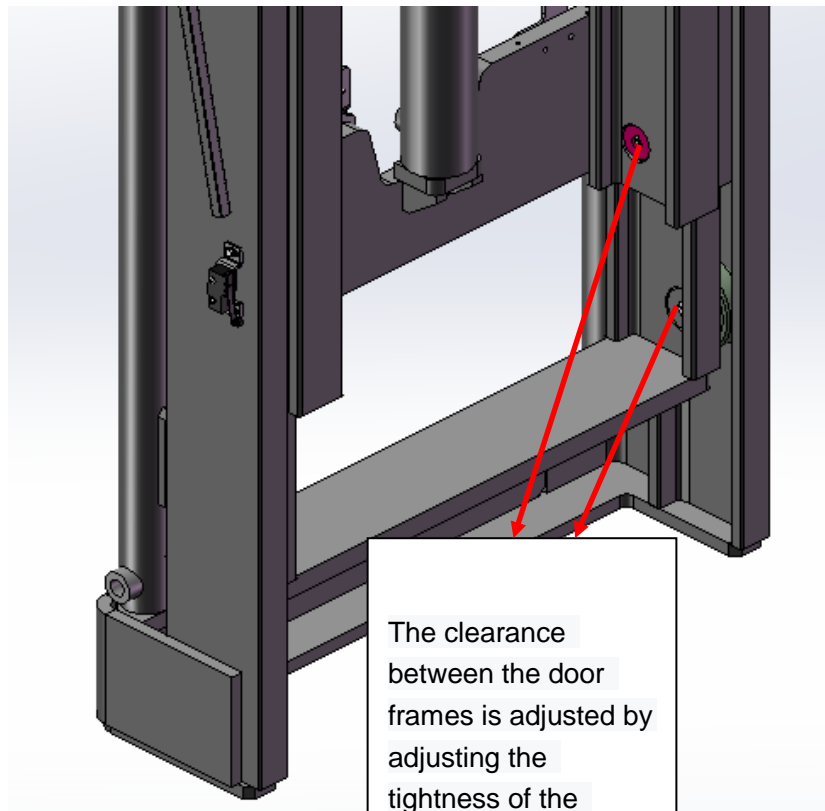


C. Dismantling of frame and door frame

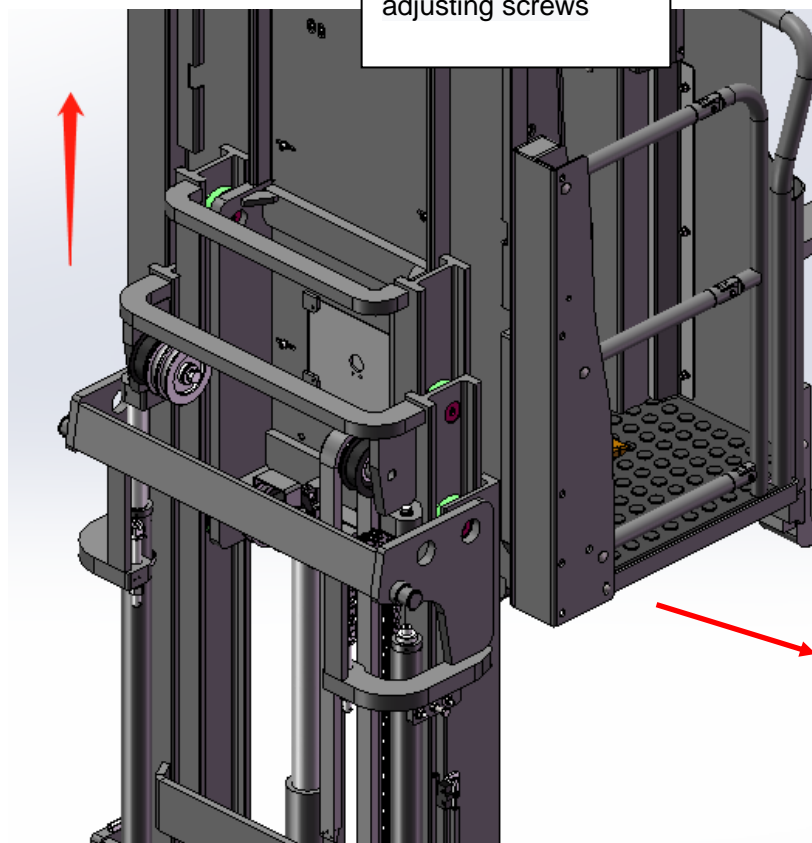


The door frame can be separated from the frame after the reinforcement rod, shaft seat cover and bolt are removed. Note: the body and door frame shall be fixed with external objects during disassembly to avoid safety accidents in the process of disassembly.

D. Mechanical part of door frame

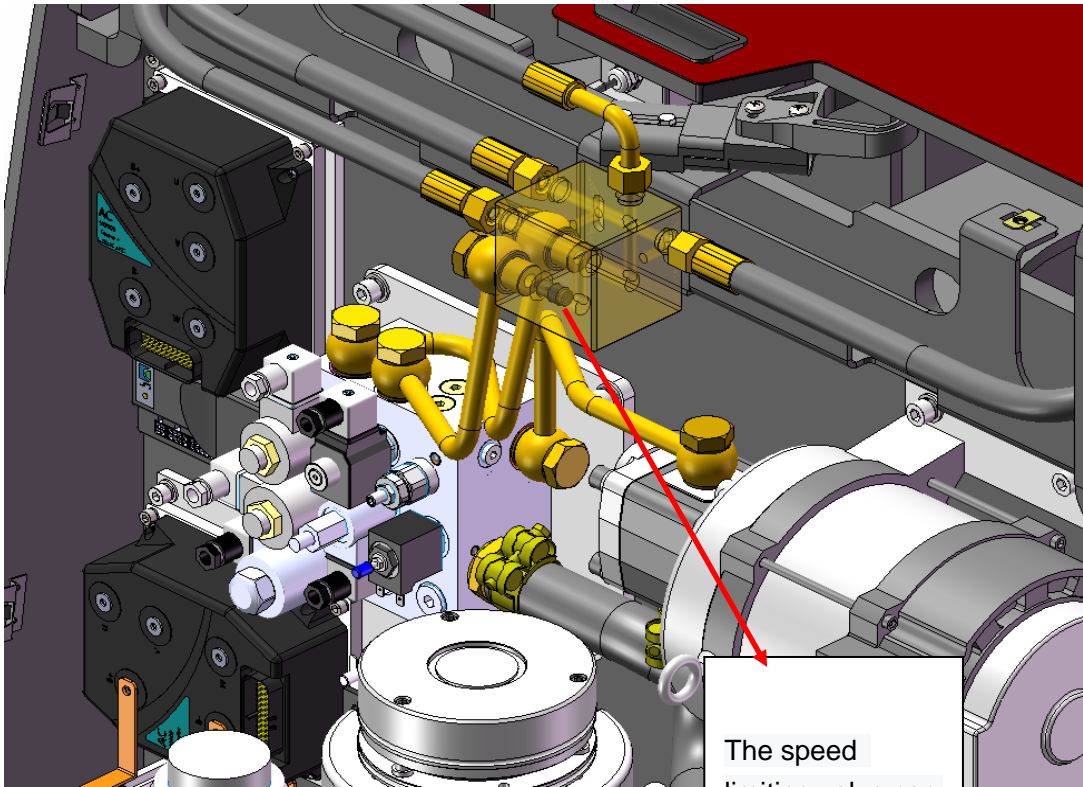


The clearance between the door frames is adjusted by adjusting the tightness of the adjusting screws



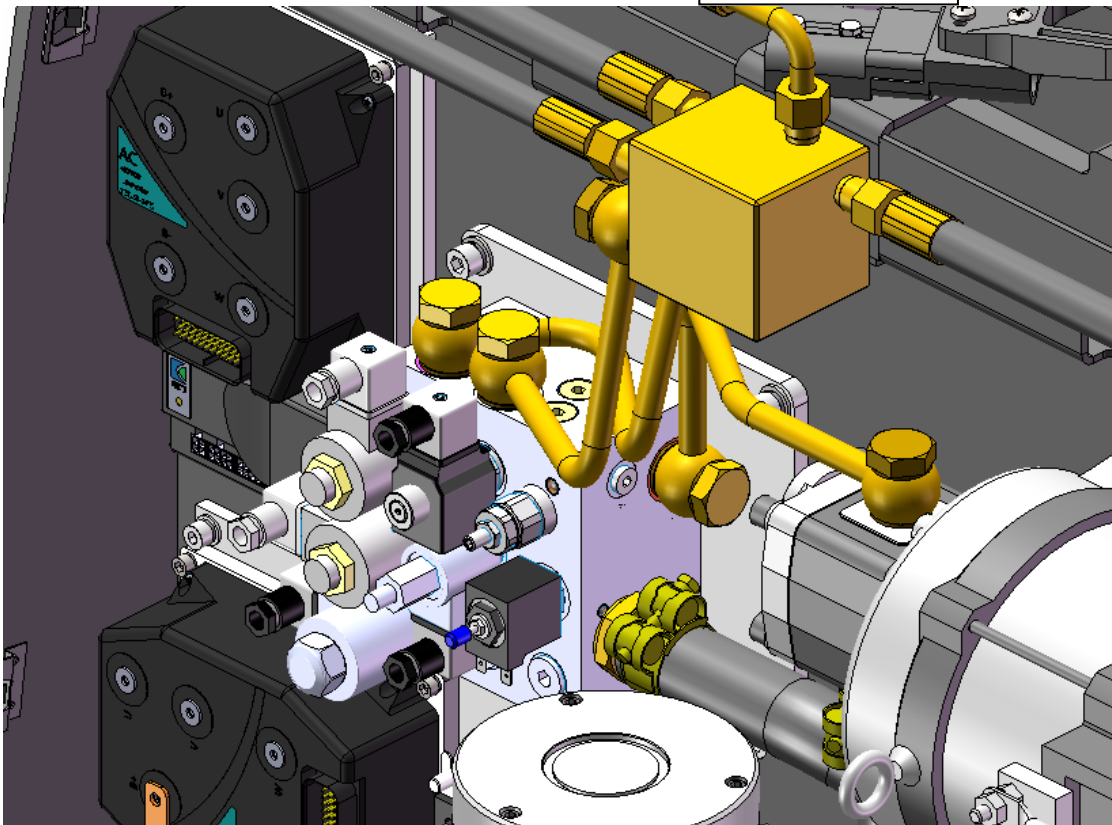
The door frame can be raised step by step by loosening the adjusting screw.

E. Frame mechanical part

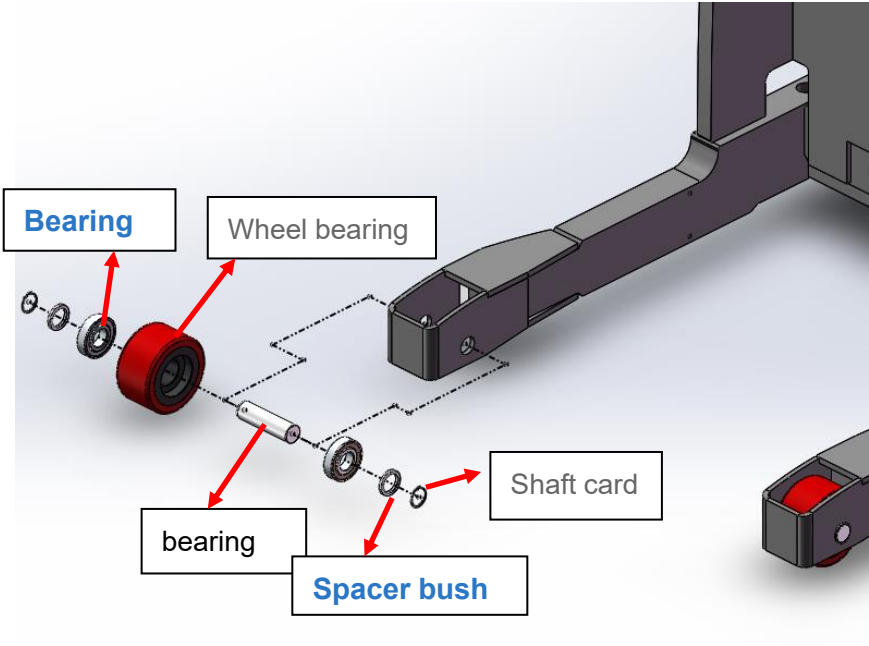


The speed limiting valve can adjust the speed of descent

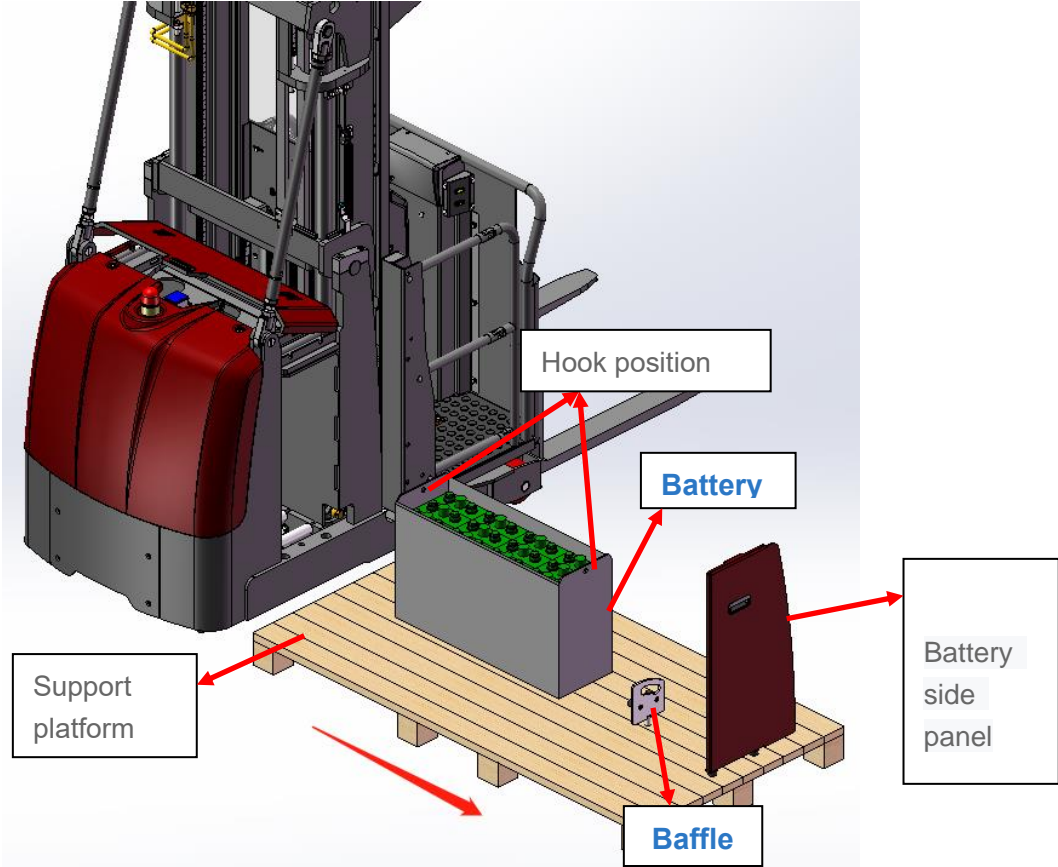
F. Pressure regulation



G. Disassembling diagram of bearing wheel



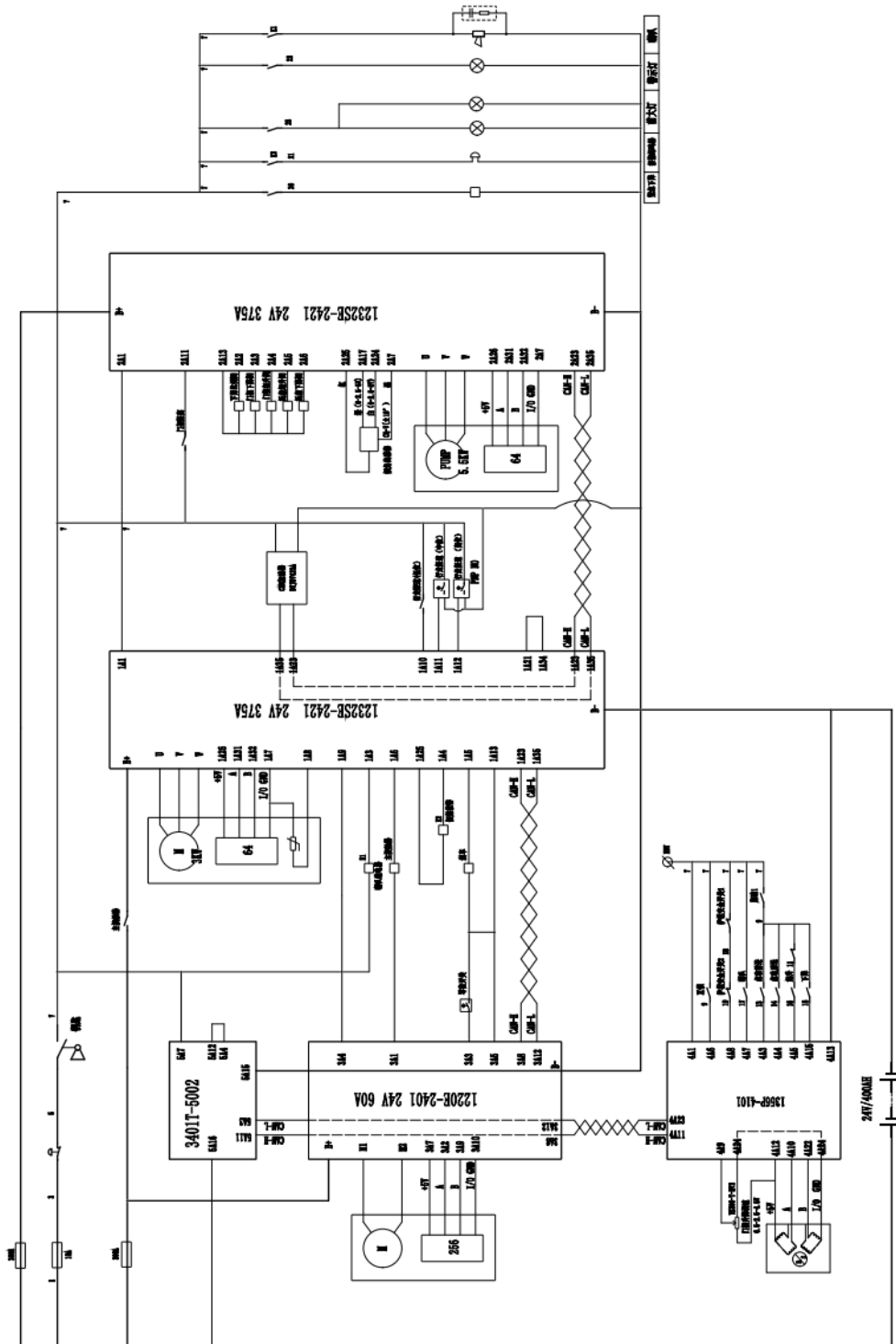
H. Battery removal diagram



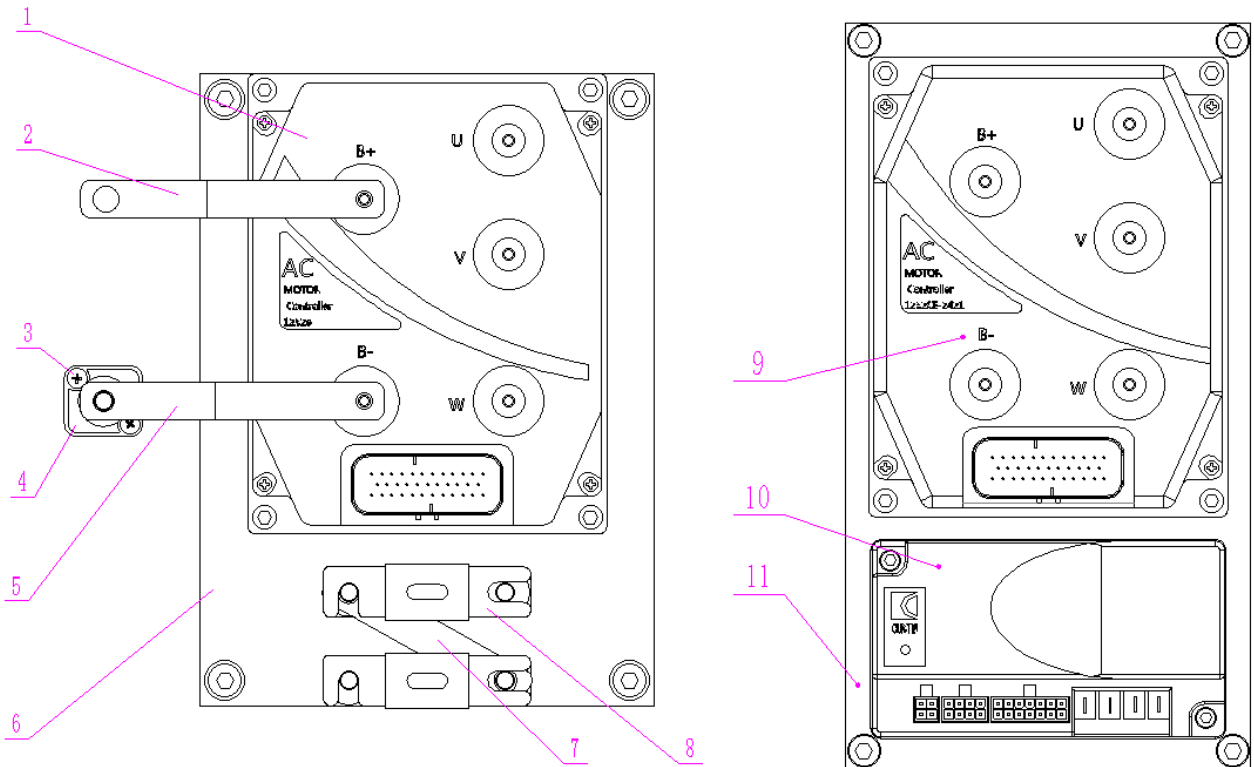
Before taking out the battery, prepare a support platform of appropriate height. First remove the battery side plate and baffle plate, then fix the battery side with the hook and slowly drag the battery to the support platform. After the battery is placed firmly on the support table, hook the hook position on both sides of the battery, and then place the battery in the appropriate position. The battery can be put into the car body in reverse order. Caution: Be careful during the operation, confirm the safety of the lifting device before lifting, do not place body parts (such as feet) under the lifting object, to avoid heavy objects accidentally falling off and being injured.

4. Electrical system

A. Electrical schematic diagram

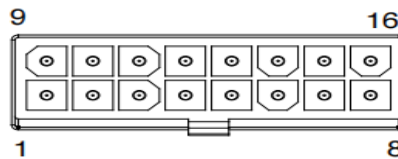


B. Electronic assembly



NO.	Code	Name	Specs.	Qty.	Remark
1	1232SE-2421	Ac controller	350A	1	
2	Q15GB-06.4.3	Copper connection bar B+		1	
3	GB/T 818-2000	Cross recessed pan head screws	M4*14	2	
4	16.0543	Negative terminal		1	
5	Q15GB-06.4.2	Copper connection bar B-		1	
6	Q15GB-06.4.1	Aluminum plate	250*180	1	
7		Safety connector		1	
8		The fuse	300A	2	
9	1232SE-2421	Ac controller	375A	1	
10	1220	Steering controller		1	
11	Q15GB-06.5.1	Aluminum plate	295*160	1	

C. Intelligent instrument



Pin	Function	Pin	Function
1	SCI Rx	9	SCI Tx
2	SCI GND	10	CAN_GND
3	CAN_L	11	CAN_H
4	CAN_L Termination	12	CAN_H Termination
5	Switch Input 1/ Analog Input 1/ Frequency Input 1*	13	Switch Input 2/Analog Input 2/ Frequency Input 2*
6	Switch Input 3/Analog Input 3/HYD Fault Code Input*	14	Switch Input 4/Analog Input 4/TRA Fault Code Input*
7	Keyswitch	15	B-
8	Switch Input 5/MOSFET Output*	16	B+

*Function of these pins may be configured in software.

MATING CONNECTOR

The mating connectors for the 3401T & 3301T are 16-pin Mini-Universal MATE-N-LOK housing from Tyco Connectivity. The Tyco part numbers to assemble a mating assembly are given in the table below.

Item	Part	Tyco P/N
1	Connector Housing	770583-1
2	Terminal (18-22 AWG)	770904-X

The ingress protection of the 3401T & 3301T connectors can be improved to IP54 (from IP40) by replacing the mating connector part numbers in the table at left with the following part numbers:

Item	Part	Tyco P/N
1	Connector Housing	794824-1
2	Terminal (18-22 AWG)	770904-X
3	Interface Seal	1-1586362-6
4	Single Wire Seal or Gang Seal	794758-1 or 1-1586359-6
5	Cavity Plug Seal (for unused terminal positions)	794995-1

D. Fault Diagnosis menu

- 1232SE programmer fault diagnosis menu and status display LED fault diagnosis table
- There are two luminous LED lights, red and yellow, on the controller shell. Different flashing conditions represent different fault conditions, as shown in the following table:

According to situation	On behalf of the meaning
Neither light is on	The controller has no power because the batteries are dead, or the wiring is faulty
The yellow lights flickered	Controller works normally
The yellow and red lights are always on	The controller is updating its software
The yellow and red lights were flashing	Controller is faulty.

Code	Fault display	probable cause
1, 2	Controller Overcurrent Friction main contactor electromagnetic current (motor does not work)	1. The U, V, or W phases of the motor are short-circuited 2. Motor parameters are incorrectly set Controller failure
1, 3	Current Sensor Fault (Main contractor, electromagnetic brake, motor not working)	1. Short circuit of U, V, W relative to car body (short circuit of motor stator) 2. The controller is faulty
1, 4	Pre-charge Failed (Main contractor, electromagnetic brake, motor not working)	1. An external load connected to the capacitor bank (terminal B+) prevents the capacitor from charging. View the capacitor voltage under the Monitor menu.
1, 5	Controller Severe Under temp The controller works under the low temperature protection temperature (main contractor, motor, electromagnetic brake, governor do not work; full brake input)	1. The controller works in the limit environment (below -40°C). View the controller temperature in the Monitoring menu.
1, 6	Controller Severe Over temp The controller works above the over-temperature protection temperature (main contractor, motor, electromagnetic brake, governor do not work, full brake input)	1. The controller works under the limit temperature condition (higher than 95°C). 2. Vehicle overload. 3. The controller is improperly installed.

1, 7	<p>Severe Undervoltage The battery voltage is seriously low (Drive torque decreases)</p>	<ol style="list-style-type: none"> 1. Battery voltage parameters are incorrectly set. 2. The battery runs out. 3. The battery internal resistance is too high. 4. The battery is not connected. 5. View the capacitor voltage in the monitoring menu. <p>B+ fuse is blown, or main contractor is not closed.</p>
1, 8	<p>Severe Overvoltage The battery voltage is too high (Main contractor, motor, electromagnetic brake, governor do not work; full brake input)</p>	<ol style="list-style-type: none"> 1. Battery voltage parameters are incorrectly set. 2. The battery resistance is too high when the regenerative braking current is generated. 3. The battery is not connected during regenerative braking. 4. View the capacitor voltage in the monitoring menu.
2, 1	<p>Controller Under temp Cutback Controller low temperature curtailment (driving and braking torque reduction) (controller does not start when VCL language execution fails)</p>	<ol style="list-style-type: none"> 1. The low-temperature reduction function of the controller takes effect. 2. The controller works in the limit condition. <p>View the controller temperature in the Monitoring menu.</p>
2, 2	<p>Controller Over temp Cutback Controller overheating curtailment (driving and braking torque reduction)</p>	<ol style="list-style-type: none"> 1. The controller overheat reduction function takes effect. 2. The controller works under extreme temperature conditions. 3. Vehicle overload. 4. The controller is improperly installed. <p>View the controller temperature in the Monitoring menu.</p>
2, 3	<p>Undervoltage Cutback Low pressure reduction (drive torque reduction)</p>	<ol style="list-style-type: none"> 1. Under normal operation, the battery needs to be charged, and the low-voltage limit function of the controller takes effect. 2. Battery voltage parameters are incorrectly set. 3. The battery runs out. 4. The battery internal resistance is too high. 5. The battery cable is disconnected. 6. View the capacitor voltage under the programmer Monitor menu. <p>B+ fuse is blown, or main contractor is not closed.</p>

2, 4	<p>Overvoltage Cutback Overvoltage reduction (driving torque reduction)</p>	<p>1. The system runs properly. In the regenerative braking process, the regenerative braking current causes the battery voltage to be too high, and the controller overvoltage limit parameter takes effect 2. Battery voltage parameters are incorrectly set. 3. The battery resistance is too high when the regenerative braking current is generated. 4. Open battery connection during regenerative braking. View the capacitor voltage under the programmer monitor menu.</p>
2, 5	<p>+5V Supply Failure The speed sensor +5V signal is interrupted (the controller does not start when the VCL language fails to execute)</p>	<p>1. External load resistance connected to +5V supply (pin26) is too low. View the 5V and Ext supply current under the Programmer monitor menu.</p>
2, 6	<p>Digital Out 6 Overcurrent Digital signal 6 output over current (digital output driver 6 does not operate)</p>	<p>1. External load resistance connected to digital output driver 6 (pin19) is too low.</p>
2, 7	<p>Digital Out 7 Overcurrent Digital signal 7 output over current (digital output driver 7 does not operate)</p>	<p>1. The external load resistance connected to the digital output driver 7 (pin20) is too low.</p>
2, 8	<p>Motor Temp Hot Cutback Reduced motor overheating (reduced drive torque)</p>	<p>1. The motor temperature exceeds the parameter setting, so the requested current is reduced. 2. The motor temperature control parameters are not adjusted correctly. 3. View motor temperature and Analog2 input under programmer monitoring menu. If the thermostat is not used, the temperature compensation and temperature cut-off should be set to OFF</p>
2, 9	<p>Motor Temp Sensor Fault Motor temperature sensor failure (limited operation <max speed reduction> and motor overheat</p>	<p>1. The motor temperature sensor is improperly connected. 2. If the thermostat is not used, temperature compensation and temperature cut-off should be set to OFF</p>

	reduction function failure)	3. The motor temperature exceeds the maximum temperature setting value.
3, 1	Coil1 Driver Open/Short The load connected to drive 1 is open/shorted (drive 1 has no output)	1. The connected load is open or short. 2. The connection terminal is contaminated. The cable harness is damaged or incorrectly connected.
	Main Open/Short Main contactor coil open/short circuit (drive 1, motor and electromagnetic brake not working)	1. The connected load is open or short. 2. The connection terminal is contaminated. The cable harness is damaged or incorrectly connected.
3, 2	Coil2 Driver Open/Short Open/shorted load connected to drive 2 (no output from drive 2)	1. The connected load is open or short. 2. The connection terminal is contaminated. The cable harness is damaged or incorrectly connected.
	EM Brake Open/Short Electromagnetic brake coil open/short circuit (drive 2 and governor not working, full braking)	1. The connected load is open or short. 2. The connection terminal is contaminated. The cable harness is damaged or incorrectly connected.
3, 3	Coil 3 Driver Open/Short Drive 3 connected coil open/shorted (drive 3 has no output)	1. The connected load is open or short. 2. The connection terminal is contaminated. The cable harness is damaged or incorrectly connected.
3, 4	Coil 4 Driver Open/Short Drive 4 connected coil open/shorted (drive 4 has no output)	1. The connected load is open or short. 2. The connection terminal is contaminated. The cable harness is damaged or incorrectly connected.
3, 5	PD Open/Short Proportional valve coil open or short circuit (Proportional valve does not work)	1. The connected load is open or short. 2. The connection terminal is contaminated. The cable harness is damaged or incorrectly connected.
3, 6	Encoder Fault Encoder failure (Restricted operation function takes effect)	1. Motor encoder is faulty. 2. The cable harness is damaged or improperly connected. 3. View motor monitoring menu: Motor RPM
3.7	Motor Open (Main contractor, motor and electromagnetic brake do not work)	1. Open circuit of motor U, V and W lines. 2. Cables are damaged or incorrectly connected.

3, 8	Main Contactor Welded (Main contractor, motor and electromagnetic brake do not work)	<ol style="list-style-type: none"> 1. Contact adhesion of main contractor. 2. Motor U connection line is in bad contact or open circuit. <p>An alternate voltage path (such as an external pre-charged resistor) provides a current to the capacitor bank (B+ terminal).</p>
3, 9	Main Contactor Did Not Close Main contractor not closed (main contractor, motor and electromagnetic brake do not work)	<ol style="list-style-type: none"> 1. The main contractor is not closed. 2. The contact of the main contractor is burned or not in good contact. 3. The external load in the capacitor bank (B+ end) prevents the capacitor bank from charging. B+ fuse is blown.
4, 1	Throttle Wiper High Accelerator wiper input is too high (The governor does not work)	<ol style="list-style-type: none"> 1. The sliding terminal voltage of the accelerator is too high. 2. View the monitoring menu accelerator input
4, 2	Throttle Wiper Low Accelerator wiper input too low (The governor does not work)	<ol style="list-style-type: none"> 1. The voltage at the sliding end of the accelerator is too low. 2. View the monitoring menu accelerator input.
4, 3	Brake Wiper High Brake potentiometer wiper input is too high (Full brake input)	<ol style="list-style-type: none"> 1. The sliding end voltage of brake potentiometer is too high. <p>View monitoring menu brake potentiometer input.</p>
4, 4	Brake Wiper Low Brake potentiometer input too low (full brake input)	<ol style="list-style-type: none"> 1. The sliding end voltage of brake potentiometer is too low. 2. Check the brake potentiometer input in the monitoring menu.
4, 5	Pot Low Over current Potentiometer low side over current (The governor does not work, full brake input)	<ol style="list-style-type: none"> 1. Potentiometer combination is connected to the low end of potentiometer to prevent it from being too low. <p>View monitoring menu potentiometer low end output.</p>
4, 6	EEPROM Failure Failed to write to EEPROM memory (Main contractor, motor, electromagnetic brake, governor, interlock, driven 1-4 and proportional valve do not work, full brake input)	<ol style="list-style-type: none"> 1. Failed to write to the EEPROM memory. EEPROM memory is written by VCL, by CAN bus, by adjusting 1311 parameters, or by loading new software to the controller, which may be the cause of the failure.

4, 7	HPD/Sequencing Fault HPD/Operation sequence error (The speed regulator does not work)	<ol style="list-style-type: none"> 1. Incorrect key switch, interlock, direction and accelerator input sequence. 2. Key switch, interlock, direction, and accelerator input connection is not good or switch failure. View the programmer monitor menu input.
	Emer Rev HPD HPD after emergency reverse operation (The governor and electromagnetic brake do not work)	<ol style="list-style-type: none"> 1. Emergency reverse operation aborted, but the accelerator, forward and backward inputs, interlock switch did not return to neutral.
4, 9	Parameter Change Fault Parameter change error (main contractor, motor, electromagnetic brake does not work)	This is a safety fault caused by a change in a parameter setting in 1311, which can be eliminated by opening the new switch. For example, if the user changes the accelerator type, this error can occur, and the vehicle can be controlled only after the switch is turned back on.
5, 1-6, 7	OEM Faults OEM Level Error	<ol style="list-style-type: none"> 1. These failures are OEM level failures that require a higher-level programmer to see.
6, 8	VCL Runtime Error VCL Operation error (main contractor, motor, electromagnetic brake, governor, interlock, 1-4 of the drive and proportional valve do not work, full brake input)	VCL code runtime error. <ol style="list-style-type: none"> 2. See 1311 Controller Monitoring menu: VCL Error Module and VCL Error. This failure can be likened to the runtime VCL module ID and error code defined in detail in the OS system information file.
6, 9	External Supply Out of Range External input out of range.	<ol style="list-style-type: none"> 1. Either external load connected to 5V and 12V generates too much or too little input current. 2. The external maximum and minimum parameters of the fault check menu are incorrectly adjusted. 3. See 1311 Input Test menu: External Input Current.
7, 1	OS General (Main contractor, motor, electromagnetic brake, governor, interlock, driven 1-4 and proportional valve do not work, full brake input)	<ol style="list-style-type: none"> 1. The internal controller is faulty.
7, 2	PDO Timeout CAN PDO (accept timeout)	<ol style="list-style-type: none"> 1. The receiving time of the CAN PDO exceeds the PDO timeout period. Procedure
7, 3	Stall Detect Encoder stops detecting	<ol style="list-style-type: none"> 1. Motor stops. 2. The motor encoder is faulty.

	(Control runs in restricted operating mode)	<p>3. The cable harness is damaged or improperly connected.</p> <p>4. The power supply of the encoder is faulty.</p> <p>5. See 1311 Motor Monitoring menu: Motor RPM.</p>
8, 7	<p>Motor Characterization Fault</p> <p>Incorrect motor characterization (main contractor, governor, electromagnetic brake, and motor do not work)</p>	<p>1. Motor description error in motor description step.</p>
8, 8	<p>Encoder Characterization Fault</p> <p>Encoder characterization error (main contractor, governor, electromagnetic brake, and motor do not work)</p>	<p>1. The description of the encoder is incorrect.</p> <p>2. Motor encoder pulse frequency is not a standard value (32,48,64,80 PPR)</p>
8, 9	<p>Motor Type Fault</p> <p>Incorrect motor model parameters (main contractor, governor, electromagnetic brake, and motor do not work)</p>	<p>The motor model parameter value is out of range.</p>
9, 2	<p>EM Brake Failed to Set</p> <p>The electromagnetic brake fails to brake (the brake is in)</p>	<p>1. After the brake signal was issued, the vehicle was still moving.</p> <p>2. The electromagnetic brake cannot hold the rotating motor tightly.</p>
9, 3	<p>Limited Operating Strategy (LOS) Limit Operation</p> <p>(Enter restricted operation mode)</p>	<p>1. Either an encoder failure (code 36) or a stall detection failure (code 73) results in the restricted operation control mode being activated.</p> <p>2. The motor encoder is faulty.</p> <p>3. The cable harness is damaged or improperly connected.</p> <p>4. Vehicle stalls.</p>
9, 4	<p>Emer Rev Timeout</p> <p>Emergency reverse timeout (governor and electromagnetic brake not working)</p>	<p>1. The emergency reverse is activated, but the emergency reverse has stopped working because the emergency reverse time has timed out.</p> <p>Emergency reverse signal adhesion</p>

5. CURTIS Handheld unit

Precautions for operation:

The attention function of the hand-held unit is to facilitate vehicle inspection and maintenance. It is not allowed to adjust the controller parameters without the approval of the vehicle manufacturer, to avoid vehicle and personal safety accidents.

The hand-held unit will automatically save the modification parameters, just need to close the key switch, restart.

The CURTIS handheld unit can be connected in the event of a controller power or power failure

Vehicle fault reading process:

1. After connecting the handheld unit with the controller, open the key switch
2. From the menu list of CURTIS handheld units, find: Faults...
3. When the vehicle is running and the hand-held cursor flashes, there will be English fault content, which can be interpreted by referring to the fault code table

Vehicle signal detection:

1. After connecting the handheld unit with the controller, open the key switch
- 2, According to the menu list of CURTIS handheld unit, find: Monitor.....
3. According to requirements, open the corresponding sub-item of the detection menu, run the vehicle, and observe the change of the hand-held value.

CURTIS Contents of handheld unit menu:

The Curtis 1313 handheld programmer is used to configure the Curtis electric control system. Through this programmer, you can adjust and save the set parameters, real-time monitoring of controller data and fault diagnosis



Warning: The control system can affect the vehicle's acceleration rate, deceleration rate, hydraulic system and braking. A dangerous situation can occur if the vehicle control system is not programmed correctly or exceeds safety. Only the vehicle manufacturer or an authorized service agent can program the control system

The programmer has two interfaces, one is used to communicate with the electric control, the other is used to communicate with the PC, the programmer has a battery box and a memory card slot



当编程器加载完控制器的信息后，编程器上会显示主菜单。

The programmer is powered on

The connection line of the handheld programmer can be connected to the controller by inserting the programming port of the controller. After connecting the controller, the handheld programmer will be powered on automatically and the control information will be displayed on the programmer.



The function keys:

Since the function of the three keys is determined by the specified content, the three keys are blank. At any given time, the function of the button is displayed on the LCD screen above.

Direction arrow key:

The displayed information can be selected up, down, or left by four directional buttons.

+ / - buttons

You can add and subtract parameters by using these two keys. In addition, "+" can mean "Yes" and "-" can mean "No". In some cases, it can also be used as a scrolling option.

Power key:

When the programmer inserts a controller that has been powered on, the programmer does not have to press the power button to use it. The programmer will

Collect keys:

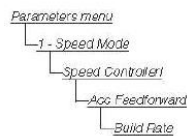
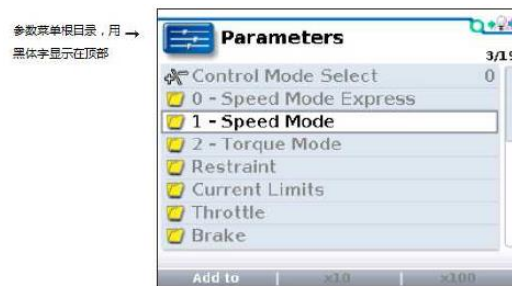
There are two ways to enter the Favorites menu. You can enter Favorites from the main menu or press this key

The menu structure

The main menu consists of nine sub-menus, and each sub-menu is displayed with a specific icon. Each item in the sub-menu is arranged by hierarchy.

Some menus contain only one item of information, but most menus contain more than one item of information and open each item folder to access the next level of sub menus. Expand the table through the grid option, enter a group of execution commands through the dialog box option, and return to the upper menu regardless of the interface by pressing the left direction button.

The names of all nine sub menus are shown in bold on the main menu and below the icon. When entering the stepped menu, the name of the sub menu or the path you are in is displayed at the top of the screen



Nine manuals

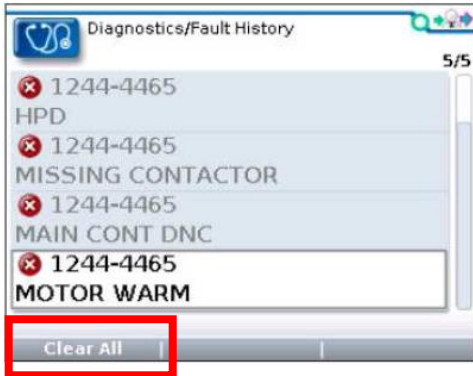


Fault Diagnosis menu

On the main menu, Select Diagnostics and press Select to access the Fault diagnosis menu. The Fault diagnosis menu contains Present Errors current faults and Fault History historical faults

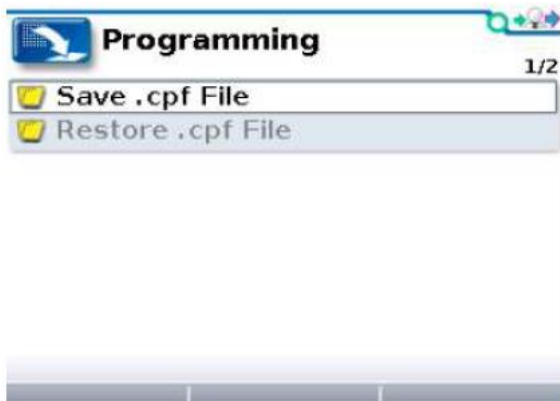
Note: Sometimes a fault caused by a temporary event captured in the circuit is not a system fault. You can determine whether the fault exists by restarting the system and observing whether the fault disappears automatically.

The historical faults folder lists all faults encountered after the last historical fault is cleared. By clearing the fault content in the entire folder, you can record the historical faults again.



Clear all is used to clear historical fault folders. A function key is highlighted only when there are historical failures in the historical failures folder and grayed out when there are no historical failures.

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Save.cpf File (Save.cpf File)

Use the save. CPF file function in the programming menu to back up the currently set parameters. You can save as many.cpf files as you want, and you need to name each.cpf file differently

Restore. CPF File (Restore.cpf File)

Restore. CPF File:

The. CPF File saved earlier can be used to replace the CPF File of the current controller. When the data recovery is