



Service manual

Electric Pallet Truck

EP15JLI/EP18JLI/EP20JLI



Warning

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

Note:

Please check the last page of this document and nameplate for all current product type identification.

Keep it for future use

Directory

1. Regular maintenance.....	1
1.1. Maintenance list.....	1
1.2. Lubrication points	3
1.3. Check and refill hydraulic oil.....	4
1.4. Check the electrical fuse	5
2. fault analysis	6
2.1. Common fault analysis	6
2.2. Display of fault code	7
3. Circuit/circuit diagram	9
3.1. Electrical schematic diagram.....	9
3.2. hydraulic principle diagram.....	11
4. Dis assembly of main parts.....	12
a、 Electromagnetic brake adjustment	12
b、 Drive the dis assembly diagram.....	13
c、 hand assembly Operating handle assembly.....	14
5. CURTIS Handheld unit	15

1. Regular maintenance

Only qualified and trained personnel should perform maintenance work on this vehicle. Before maintenance, remove the cargo from the fork and lower the fork to the lowest position.

If you need to lift the vehicle, use the specified lashing or jacking equipment. Before operation, place safety devices (such as designated jacks, wedges or wood blocks) under the vehicle to prevent accidental drop, movement or sliding.

Use the original parts approved and released by your dealer.

Please consider that hydraulic fluid leakage may lead to machine failure and accidents. Pressure valve adjustment is only allowed by trained service technician.

If you need to replace wheels, casters must be round and free of abnormal wear.

Check the items on the maintenance list.

1.1. Maintenance list

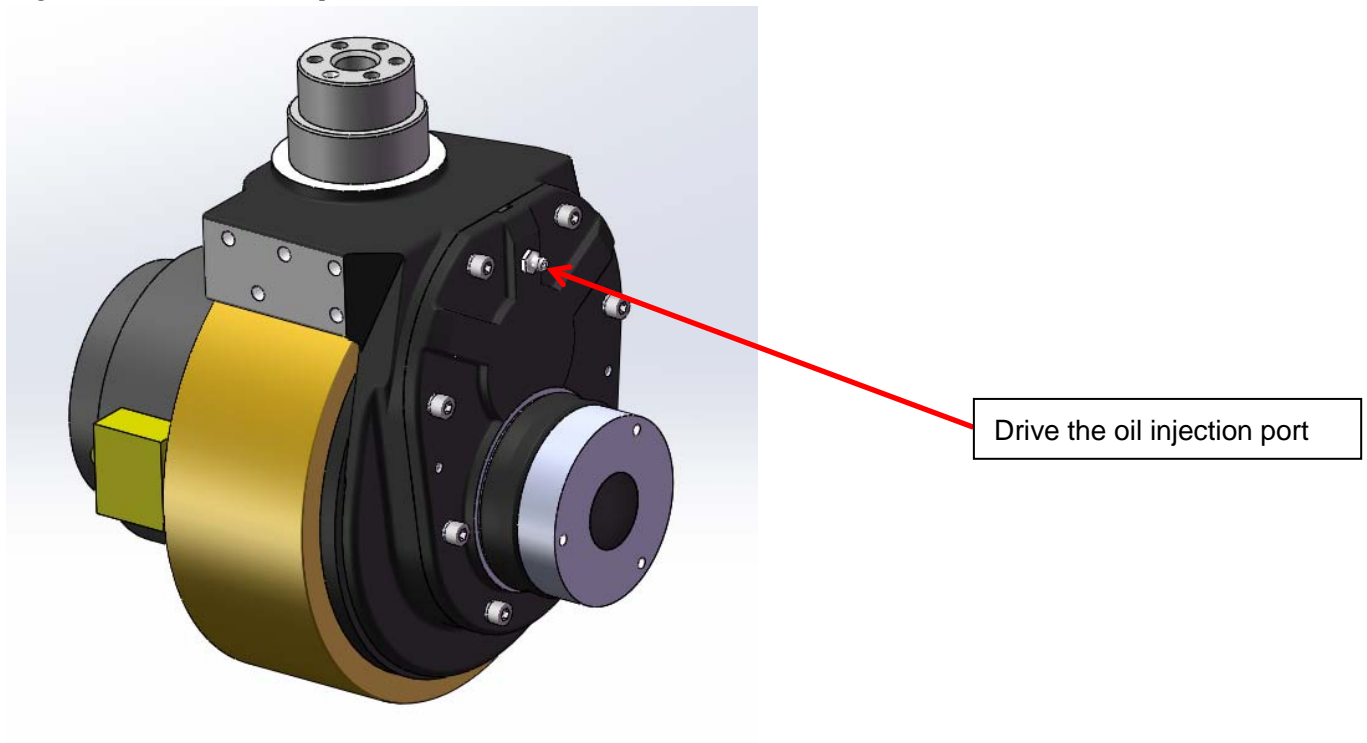
		间隔 (月)			
		1	3	6	12
hydraulic system					
1.1	Check the function of hydraulic system		•		
1.2	Check hoses, piping and joints for tightness, sealing and damage		•		
1.3	Inspect cylinder block and piston for damage, sealing and fixation			•	
1.4	Visually inspect the door stand roller and inspect the roller surface for wear			•	
1.5	Inspect forks and loading parts for wear and loss			•	
1.6	Check load chain Settings and re-tensioning if necessary			•	
1.7	Check oil level in fuel tank			•	
1.8	Replacement hydraulic fluid				•
mechanical system					
2.1	Check the fork for deformation and breakage		•		
2.2	Check chassis for deformation and cracking		•		
2.3	Check that all screws are in place		•		
2.4	Check gear box for noise and leakage		•		
2.5	Check wheel for deformation and damage		•		
2.6	Lubricated steering bearing				•
2.7	Check and lubricate the pivot points		•		
2.8	Lubricating grease nozzle	•			
Electric System					
3.1	Check whether electrical wiring is damaged		•		
3.2	Checking Electrical Connections		•		
3.3	Check emergency switch function		•		
3.4	Check electric drive system for noise and damage		•		
3.5	Detection meter		•		
3.6	Check that the correct fuse is used		•		

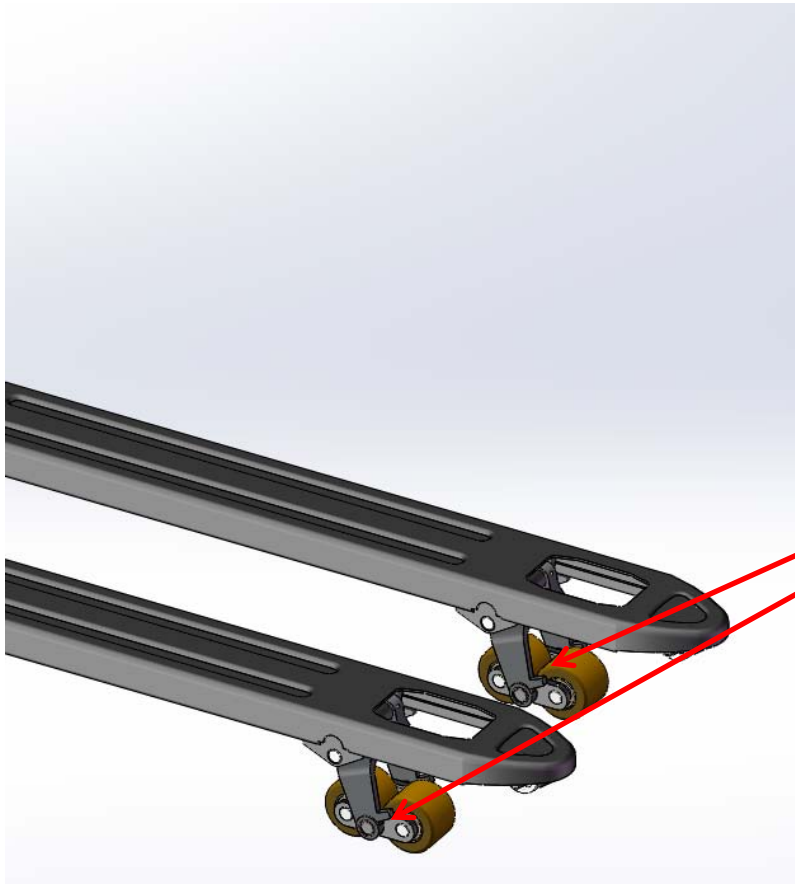
3.7	Check alarm system and safety devices		•		
3.8	Check the current contactor		•		
3.9	Check frame for leakage (insulation test)		•		
3.10	Check the function and wear of the drive controller		•		
3.11	Check the electrical system driving the motor		•		
traveling system					
4.1	Check the gearbox for abnormal sound			•	
4.2	Check the driving mechanism and grease it		•		
4.3	Inspect driving and steering wheels for wear and damage			•	
4.4	Check wheel bearing and fastening condition			•	
4.5	Check the air gap of the electromagnetic brake			•	
4.6	Check the lifting, forward and backward tilt and left and right movement of the door frame		•		
4.7	Check and adjust braking effect		•		
energy supply					
5.1	Check the voltage of the battery		•		
5.2	Check that battery cables are securely connected and grease the electrodes if necessary		•		
5.3	Check whether the battery cover is damaged		•		
5.4	Check the main cable for damage			•	
5.5	Check the startup protection program during charging			•	
monolithic component					
6.1	Check all labels for clarity and completeness	•			
6.2	Check the frame for damage		•		
6.3	Check the fixing condition of lifting door frame			•	
6.4	Run a test run	•			

1. 2. Lubrication points

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

Figure 1: Lubrication points





Bogie bearing

1. 3. Check and refill hydraulic oil

Recommended hydraulic oil model according to temperature:

Ambient temperature	- 5°C~25°C	>25°C
mark	HVLP 32, DIN 51524	HLP 46, DIN 51524
Viscosity	28.8-35.2	41.4 - 47
Oil	1L	

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.

1. 4. Check the electrical fuse



10A Fuse



200A Fuse

List 2:Fuse specification

	specification
Fuse 1	10A
Fuse 01	200A

2. Fault analysis

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

2.1. Common fault analysis

Fault	Cause	Processing method
Vehicles cannot move	The battery connector is not connected	Check the battery connector and connect it if necessary
	The electric lock switch is in "OFF" position	The electric lock switch is placed in the "0" position
	The emergency stop switch is not on	Turn on the emergency stop switch
	Battery running out	Check the charging status of the battery and recharge it if necessary
	The forklift is charging	Interrupt charging process
	Fuse damage	Check fuse
Cargo cannot be lifted	The vehicle is not running	Follow the procedure listed in the "Vehicle cannot Move" fault
	There's too little hydraulic fluid	Check hydraulic oil
	Fuse damage	Check fuse
	Load overweight	Note rated load
	The lift micro switch is in bad contact or damaged	Check fuse
Goods cannot be lowered	Dirty oil clogs the control valve	Check the hydraulic oil and clean the control valve and replace the hydraulic oil if necessary
	The descent solenoid valve is not open or damaged	Check the drop solenoid or replace it
can't stop when go up	The lifting micro switch is damaged	Cut off the power supply and replace the lifting micro switch
Moving in one direction	Contact between micro switch and connecting cable is not good	Check the micro switch and connecting cable in the control handle
Traffic moves slowly	The battery power is low or the corresponding cable is in poor contact	Check the battery indicator and corresponding cables

The vehicle started suddenly	Controller damage	Replacing a Controller
	Control forward and backward handle is not reset	To restore or replace

2.2. Display of fault code

Table 4:1212P fault codes

Programmer display	Code	The fault phenomenon	fault diagnosis
BATTERY DISCONNECT FAULT	4.5	Battery don't answer	1) The battery is not connected 2) Poor contact of battery end
BRAKE OFF FAULT	3.4	Brake closing fault	1) Electromagnetic brake coil short circuit 2) Electromagnetic brake drive open circuit
BRAKE ON FAULT	3.2	Brake opening failure	1) Electromagnetic brake coil open 2) Electromagnetic brake drive short circuit
CURRENTSENSE FAULT	4.1	Current detection fault	1) Short circuit of motor or motor wiring 2) The controller is faulty
EEPROM CHECKSUM FAULT	4.3	EEPROM failure	1) EEPROM is faulty or invalid
HARDWARE FAILSAFE	4.2	Motor voltage is out of range	1) Motor voltage cannot match accelerator input 2) Short circuit of motor or motor matching ring 3) The controller is faulty
HPD FAULT	3.5	HPD Fault	1) Accelerator, key switch, promotion or prohibition Input several actions out of order 2) Wrong adjustment of accelerator
MAIN FAULT	2.3	The main contactor is faulty	1) Main contactor adhesion or open 2) Main contactor coil drive error
MAIN OFF FAULT	2.1	Main contactor coil drive 'off' failure	1) Wrong opening of main contactor coil
MAIN ON FAULT	2.4	Main contactor coil drive 'on' failure	1) The main contactor coil is closed incorrectly
OVERVOLTAGE FAULT	1.5	Battery voltage is too high	1) Battery voltage >31V 2) The charger is still connected when the vehicle is running 3) Poor battery contact

PRECHARGE FAULT	3.3	Pre charge failure	1) The controller is faulty 2) Low battery voltage
SPEED POT FAULT	1.3	The speed limiting potentiometer is faulty	1) Open or short circuit connection of speed limiting potentiometer 2) Open speed limiting potentiometer
THERMAL FAULT	1.1	Over/under temperature cut-off	1) Temperature >80°C or <-10°C 2) Vehicle overload 3) Operate in extremely harsh environment 4) The electromagnetic brake is not released normally
THROTTLE FAULT	1.2	Potentiometer slip end or low	1) Accelerator input is open or short 2) Accelerator potentiometer failure 3) Wrong selection of accelerator type
UNDERVOLTAGE FAULT	1.4	The terminal voltage is out of range	1) Battery voltage <17V 2) The battery or controller is not connected properly

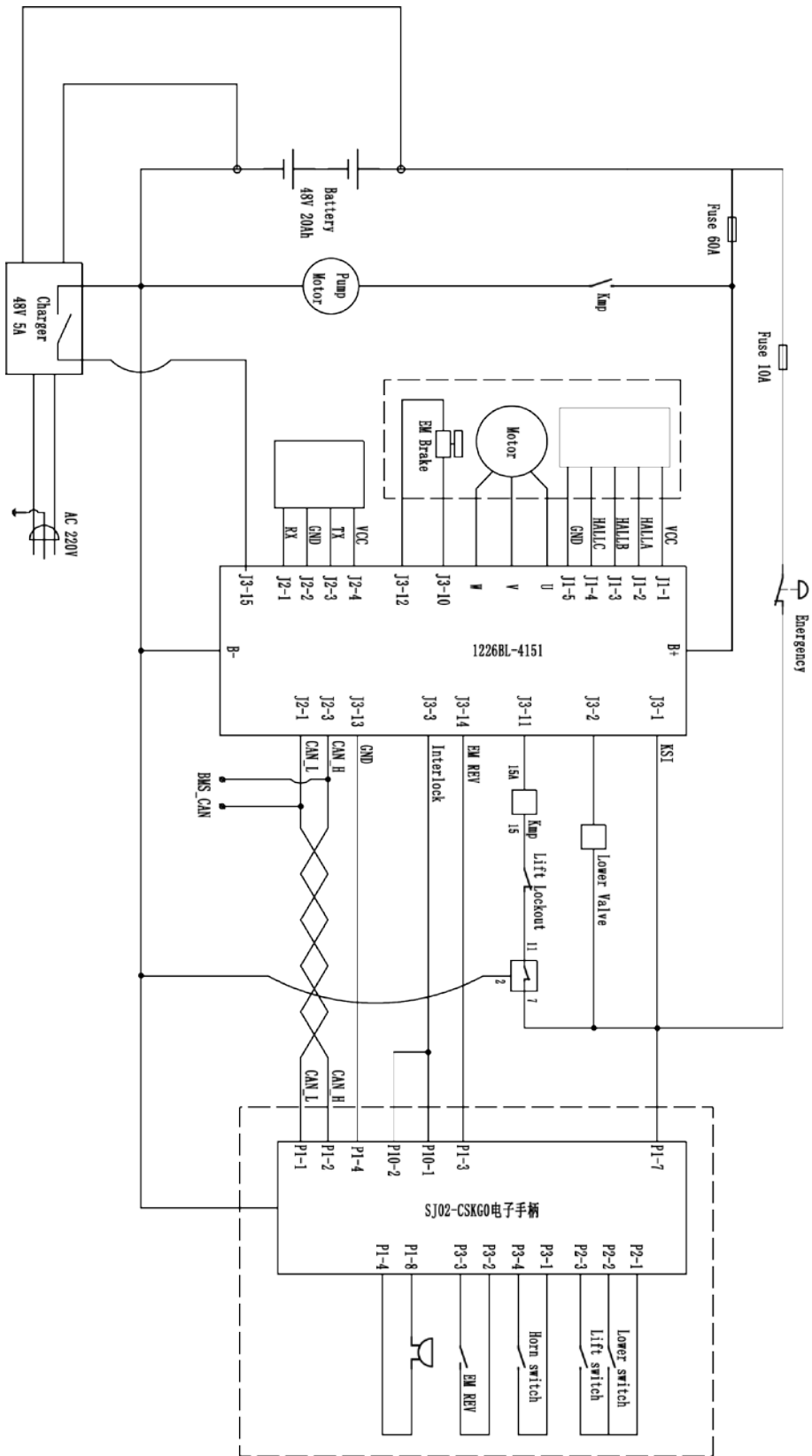
Methods for troubleshooting common faults

Code 4.5 The battery is not connected

1、 Check whether the fastening of cable terminals of the car body is loose, as shown below:

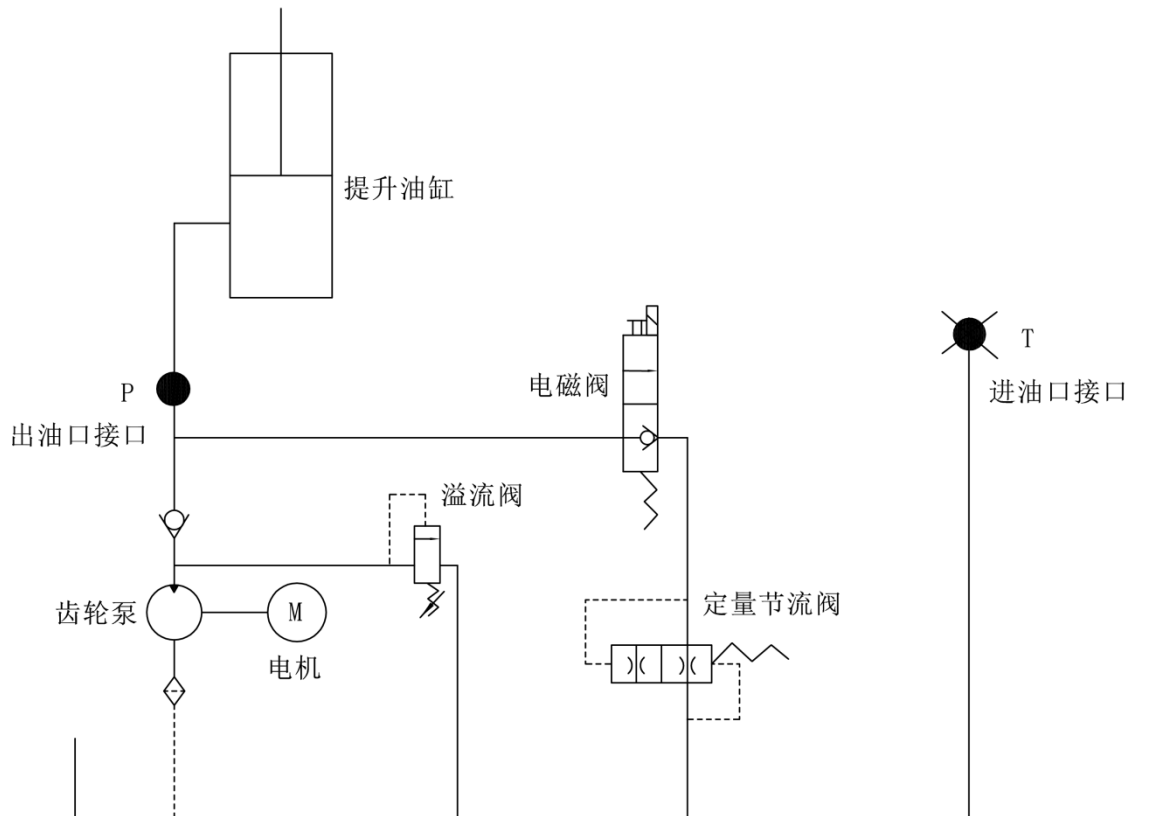


Check whether the cable connection (including other secured parts) is loose



(48V)

3. 2. hydraulic principle diagram



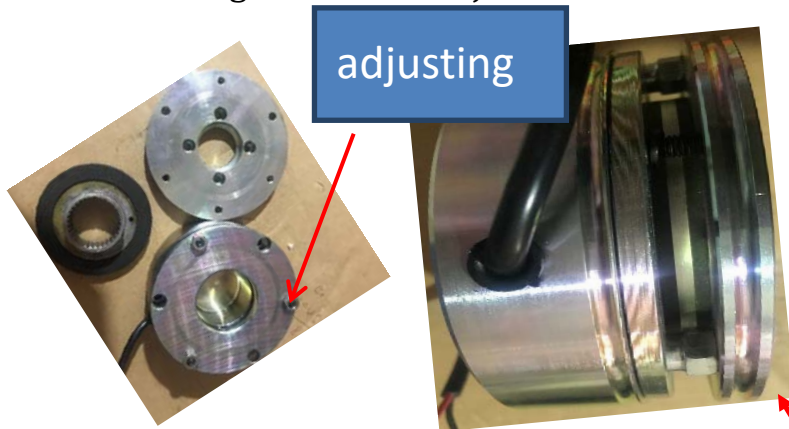
Hydraulic oil inspection

appearance	smell	situation	The results of
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

4. Disassembly of main parts

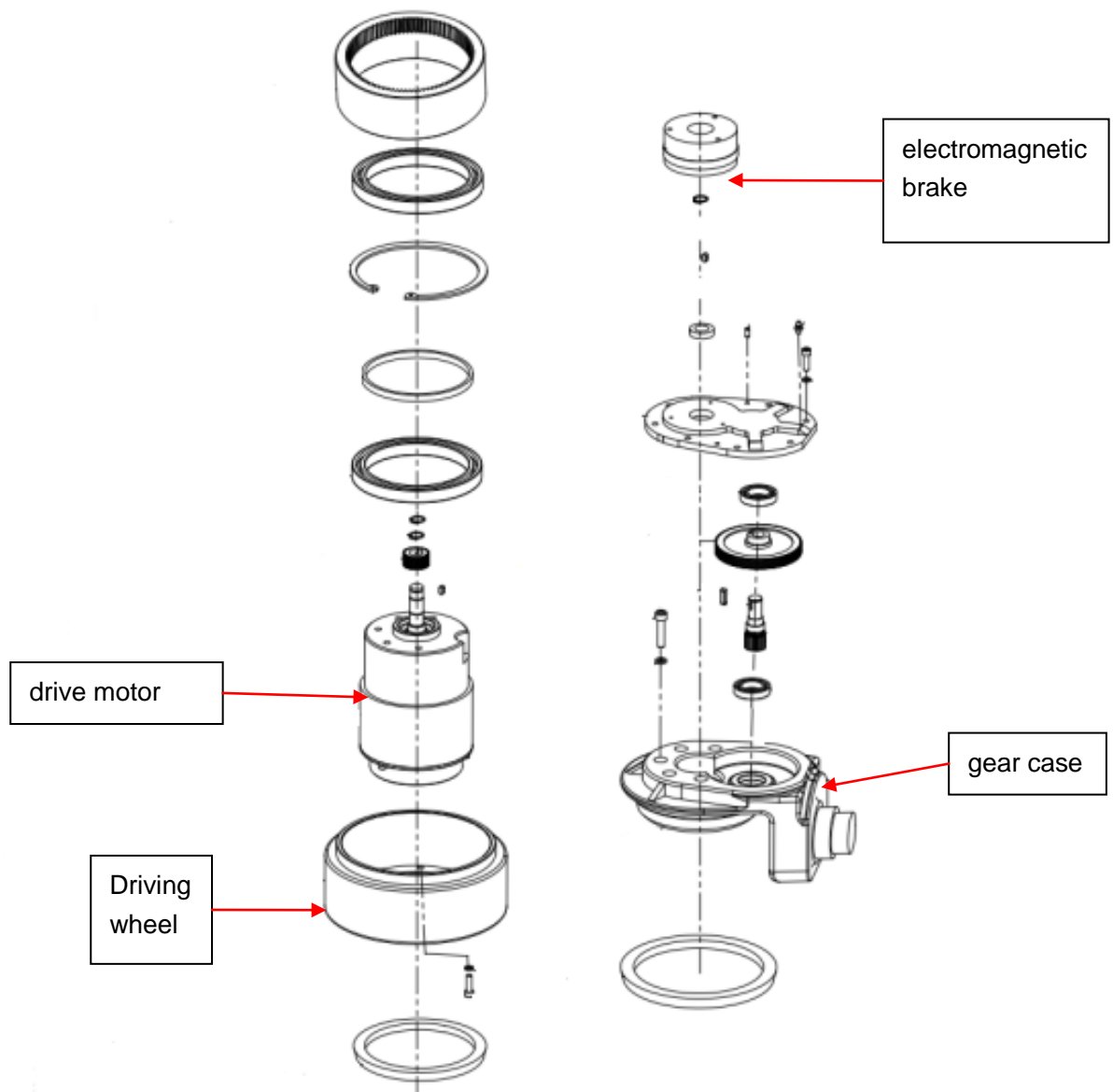
A、 Electromagnetic brake adjustment



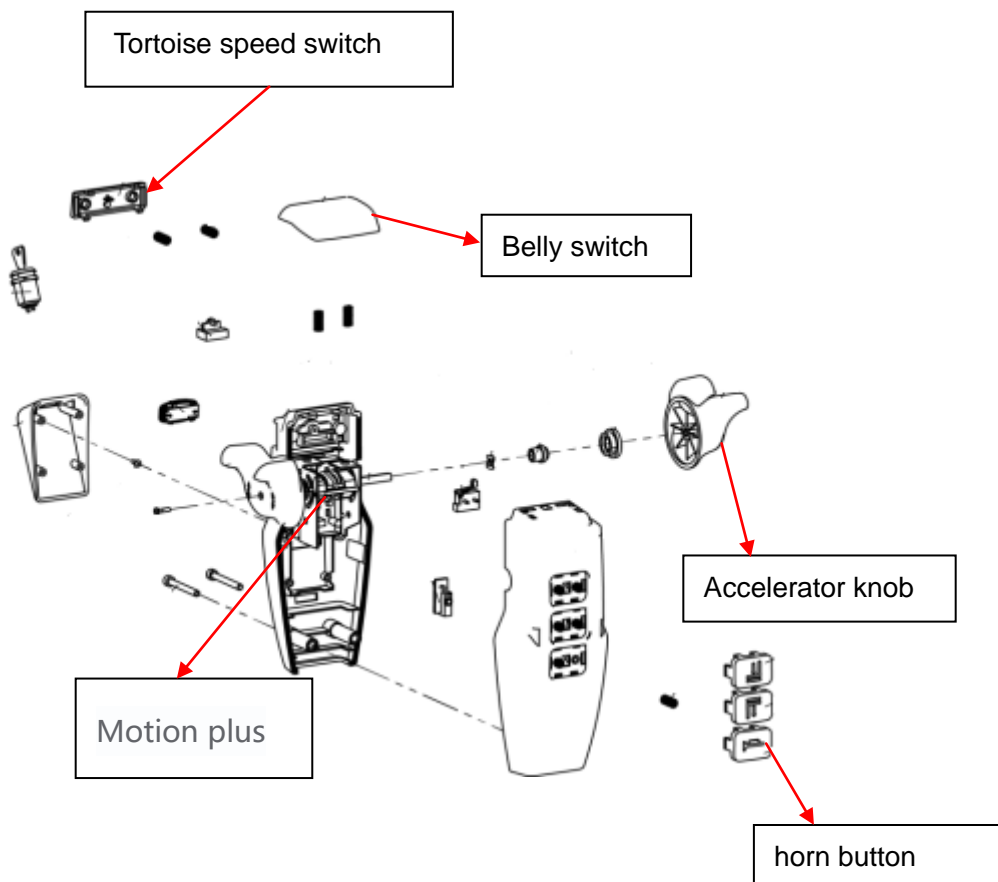
Note: electromagnetic brake can't pull properly when it is powered on in free state, it needs external force or installation to pull

Electromagnetic brake clearance is about 25-35 wire, about one hundred thickness. Need to be adjusted carefully repeatedly, ensure that three adjustment surface clearance is consistent, electricity will give out a crisp sound.

B、 Drive the disassembly diagram



C、 hand assembly Operating handle assembly



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, so as 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 Handheld Unit Menu contents:

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



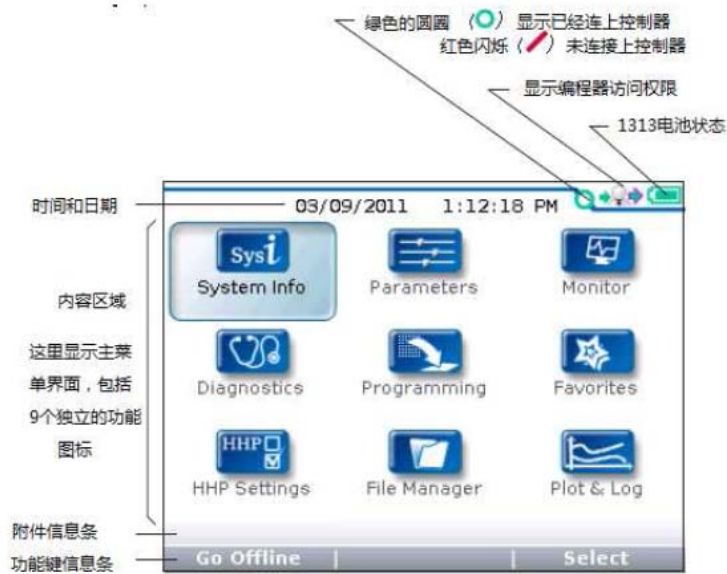
Warning: The control system can affect the vehicle's acceleration rate, deceleration rate, hydraulic system and braking. A dangerous situation can occur if the vehicle control system is not programmed correctly or exceeds safety. Only the vehicle manufacturer or an authorized service agent can program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



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 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 submenus. 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 submenus are shown in bold on the main menu and below the icon. When entering the stepped menu, the name of the submenu or the path you are in is displayed at the top of the screen.

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.

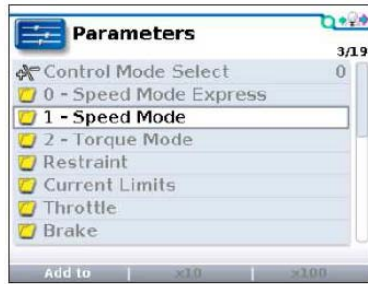
Power key

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 start up automatically. When you hold it down for a few seconds, the programmer will prompt you whether to turn it off. You can decide whether to turn it off by selecting the "Yes" and "No" represented by the function key. After closing the programmer, press for a few seconds and the programmer will restart.

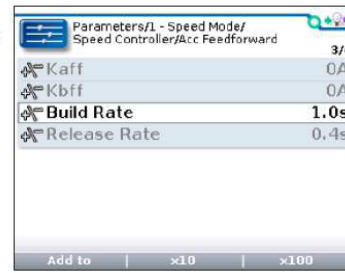
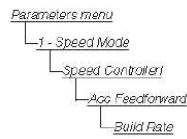
Collection keys

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

参数菜单根目录，用 →
黑体字显示在顶部



运行文字显示的是参数菜单中具体参数的路径信息 →



Nine menu

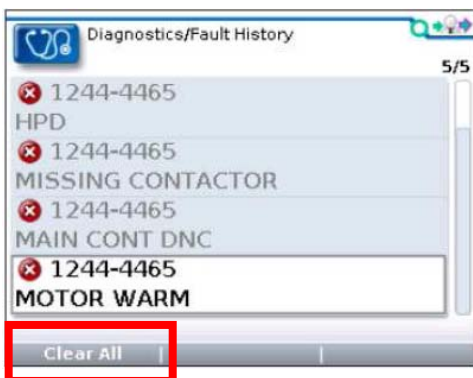


Fault Diagnosis menu

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.

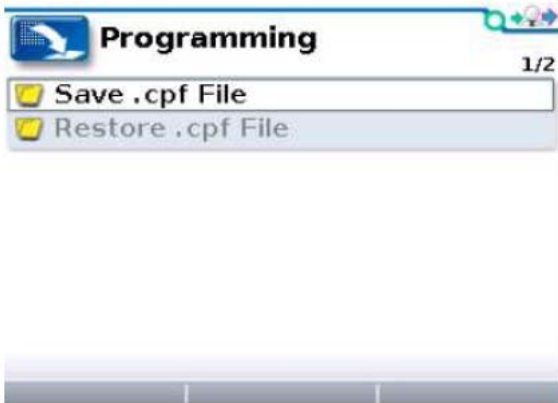
The historical faults folder lists all faults encountered after the last historical fault is cleared. By clearing the fault content in the entire folder, you can record the historical faults again.



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.

Programming menu

On the main menu, Select The Programming icon and press Select to access the menu. Save and restore parameter Settings files (.cpf files) through programming menus



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 complete, a dialog box is displayed asking you to restart the system.