Workshop literature

Electric Pallet Stacker

ECV10C-10
ECV10iC-10
ECV10-10

CE

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first in intralogistics

50028012000 EN - 02/2018

Troubleshooting Solutions of Common Faults

Fault	Fault Symptom	Troubleshooting Order *	Troubleshooting Measures
Power supply failure	1. Whole vehicle power outrage	a. Power supply failure b. Fuse failure c. Emergency stop switch or circuit failure d. Key switch or circuit failure	1) Check the voltage of storage battery 2) Check the fuses 3) Check key switch and its circuit 4) Check emergency stop switch and its circuit
Travel Fault	1. Forward and reverse moving failures of the vehicle, but other functions are normal	a. Interlock switch or its circuit connection failure b. Electromagnetic brake locked (Non-mechanical failure, the instrument will display fault code) c. Travel switch or its circuit connection failure d. Drive motor or its circuit connection failure e. Drive motor carbon brush failure f. Controller failure	Controller failure error, carry out troubleshooting according to the fault code information on the instrument. 1) Check if the interlock switch or the connection of its circuit is normal; 2) Electromagnetic brake and its connecting circuit; 3) Check the travel switch and its connection circuit; 4) Check the drive motor and its connection circuit; 5) Replace the controller.
	2. The vehicle can travel at low speed, but cannot travel at high speed	Failures due to external factors: a. Electromagnetic brake locked (Non-mechanical failure, the instrument will display fault code) b. Motor bearing blocked c. Gearbox bearing blocked Failures due to internal factors: a. Battery voltage deficiency b. Speed mode switch failure c. Controller failure	Controller failure error, carry out troubleshooting according to the fault code information on the instrument. 1) Check the voltage of storage battery; 2) Check if the motor rotation is normal; 3) Check the electromagnetic brake or its connection circuit; 4) Check speed mode switch and its connection circuit; 5) Remove the gearbox, check if the gear rotation is smooth and if there is blocking; 6) Replace the controller;

Carbon Brush

– Unscrew the three screws(1) and remove motor end cover(2);

– Unscrew the two screws(5) and remove the carbon brush(7) on the holder(6).

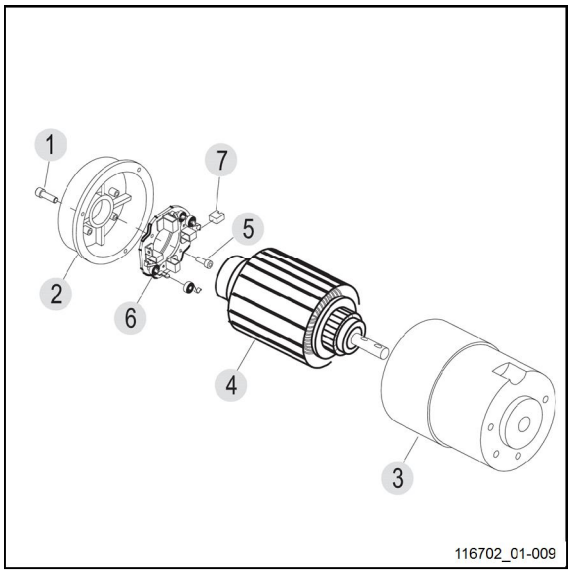
– Install according to the reverse order of removal.

⚠ CAUTION

When replacing the carbon brush, replace the complete set of carbon brushes.

⚠ CAUTION

Due to magnetic force, the rotor and the stator may pull each other, therefore, when dismantling motor rotor, do not hold your hand between the rotor and the stator to avoid pinch hazard!



Adjustment

– After replacing the motor or carbon brush, conduction test must be carried out to the motor.

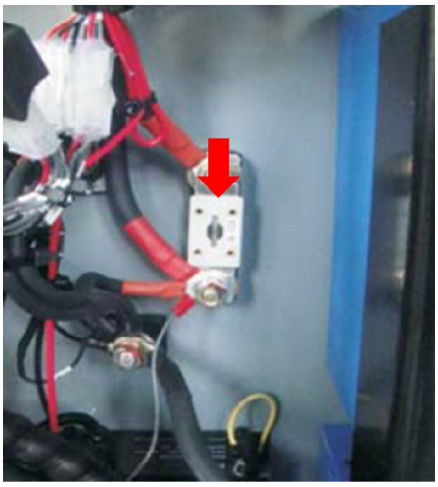
– After replacing carbon brush, running operation must be carried out to the carbon brush: By running the motor with repeated lifting, letting the carbon brush to be fully running, making its surface smooth to fit the rotor.

Faults and Causes

1	Fault	Motor does not rotate
	Cause	a. Negative electrode cable broken; b. Motor positive and negative electrode with loose terminals; c. Armature winding with broken circuits; d. Motor bearing damaged and blocked; e. Serious wearing of carbon brush.
2	Fault	Motor speed is turning slow.
	Cause	a. Insufficient voltage of battery; b. Carbon brush worn or carbon brush spring pressure decreases; c. Bearing wear or lack of lubricating oil; d. Armature winding has short circuit elements; e. Carbon brush winding grounded.

Fuse

- Location: right side of the controller;
- Function: overcurrent protection;
- Description: fusing current is 150A;
- Note: Unserviceable.



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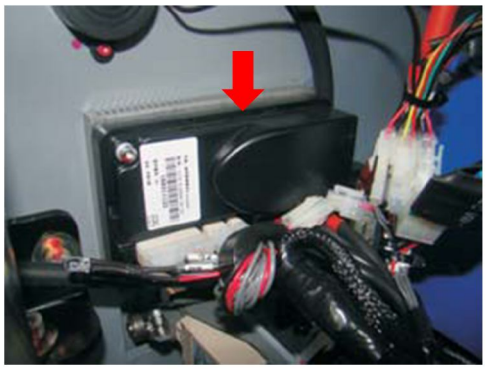
Controller

- Location: on vertical plate of chassis;
- Function: to control the truck through the signal input ;
- Description: 24V operating voltage, to control the circuit;
- Note: Unserviceable.



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Tiller

Control Lever

Control lever is used to control the travel, lifting, lowering, horn and emergency reverse of the vehicle.

Removal

Control lever is mounted on control arm.

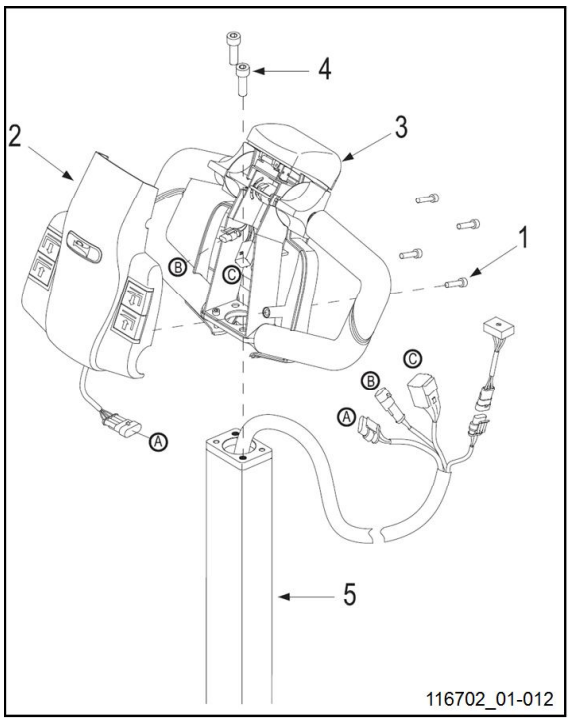
- Remove four screws(1) , lift up cap assembly(2);
- Disconnect control lever wiring harness from wiring harness;
- Unscrew two screws(4), remove the control lever(3).

Installation

- Install according to the reverse order of removal.

⚠ CAUTION

When removing or installing, please pay attention to protect the cables from being damaged.



Button Switch

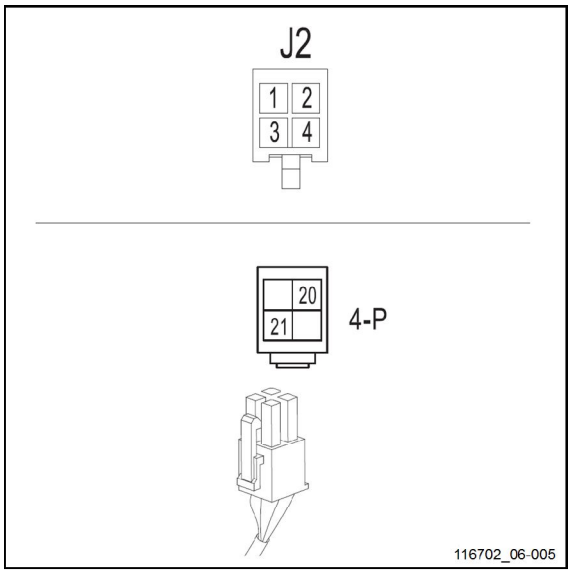
Push button switch is the switch that makes the dynamic and static contacts ON or OFF to achieve the switching of circuits through pushbutton drive mechanism. In the electrical control circuits of this truck, the push button switch is used for manual emitting of control signals to control the vehicle lifting, lowering, horn and emergency reverse.

By function:

- Lifting Button Switch
- Lowering Button Switch
- Horn Button Switch
- Emergency Reverse Switch

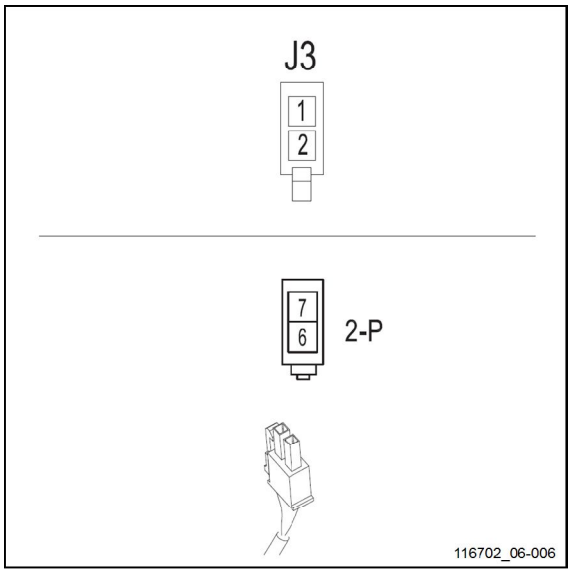
J2 Interface (Handheld unit communication interface)

J2 Interface	
Pin No.	Description
J2#1	Rx
J2#2	B
BJ2# 3	Tx / Charge inhibit
J2#4	Mode switch (open=M1,closed=M2)



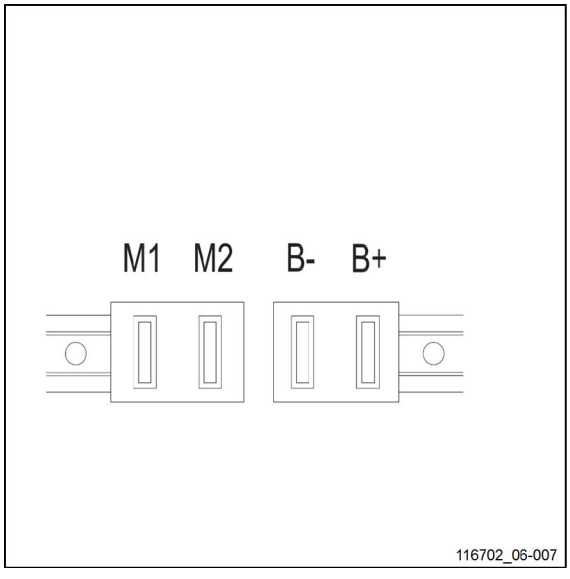
J3 Interface

J3 Interface	
Pin No.	Description
J3#1	Positive of electromechanical brake coil.
J3#2	Negative of electromechanical brake coil.



Terminal stud

Terminal stud	
Pin No.	Description
M1	Negative of the motor.
M2	Positive of the motor.
B-	- Batt.
B+	+Batt.



2	Fault	Lifting mechanism does not stop after the being lifted to the top, and continues impacting the mechanical limiter
	Cause	Lifting limit switch is not reset and always in a closed state.

Speed Reduction Switch

1	Fault	When speed reduction switch is activated, the speed is not reduce
	Cause	Speed reduction switch is not reset and in OFF state.

Checking and Testing

Checking

– Check the limit switch for damage and check the roller for deformation;

– Check if the handwheel is working smoothly and if there is foreign body blockage.

Testing

– Enter Monitor Menu to check if each limit switch is working properly;

– Turn the key switch to "OFF", remove key; pull out the battery plug and switch off the power supply.。

– Check the ON/OFF normally-opened (NO) terminal with a multimeter:

- with handwheel at natural position, Terminal (3) and (4) not conducted
- toggle the handwheel, Terminal (3) and (4) conducted.

– Check the ON/OFF normally closed (NC) terminal with a multimeter:

- with handwheel at natural position, Terminal (1) and (2) conducted;
- toggle the handwheel, Terminal (1) and (2) not conducted.

Maintenance Free Battery

Maintenance-free Battery - Safety and Warnings

NOTE

- *The battery should be away from heat source and the place that is easy to produce sparks, the safety distance should be greater than 0.5m.*
- *The battery should avoid direct sunlight, and cannot be placed in the environment with large amount of radioactivity, infrared radiation, ultraviolet radiation, organic solvent gas and corrosive gases.*
- *Due to the high voltage of battery components, there is risk of electrical shock; therefore, insulated tools should be used when installing or removing the conductive straps, wear insulated gloves, aprons and protective goggles when installing or handling batteries. During installation or handling of the batteries, only non-metallic sling can be used, wire ropes cannot be used.*
- *Dirty strap or loose connection may cause battery ignition, or even damage the battery group, so double-check and remove the dirt on the strap when installing, and tighten the strap.*
- *DO NOT clean the battery case with organic solvent, DO NOT use carbon dioxide fire extinguisher to extinguish electrical fires, carbon tetrachloride fire extinguisher is available.*
- *When the battery is connected to the charger or the load, circuit switch should be at "OFF" position, and make sure the connection is correct: positive electrode of the battery is connected to the positive electrode of the charger, and negative electrodes are connected with each other.*
- *During the use of battery, be sure to tighten the bolts of the terminals, so as to avoid sparks and poor contact.*

⚠ CAUTION

As for failure to comply with instructions for use, maintenance without using original parts, user corruption, or violation of provisions when adding electrolyte and other circumstances, the quality assurance will automatically void.

Use of Battery

Pre-use Checks

– Check if the fixing bolts on the bracket for the battery are tightened, insecure installation may cause damage to the case due to the shock during the travel of the vehicle. Metal objects should not be placed on the battery to prevent short circuits;

– Check if the poles and wiring connections are reliable from time to time. In order to prevent oxidation of terminals, you can apply Vaseline or other protective agents;

– DO NOT check the capacity of battery through direct ignition (short circuit test), such method may damage the battery;

– There will often be yellow white paste around the battery poles and cover, which is caused by the corrosion of sulfuric acid to the poles, wire clips and holders, etc. These substances are of very large resistance and must be removed in a timely manner;

– When you need to use two batteries in series, the capacities of the two batteries are preferably to be equal. Otherwise it will affect the service life of the battery.

Discharging

– When connecting or disconnecting the battery connector (such as, plug), the power supply must be disconnected first;

– In order to meet or exceed the rated battery service life, the battery should avoid excessive discharge during runtime (the remaining capacity is less than 20% of the rated capacity);

– Re-charge the battery immediately after discharging without delay;

– The normal load voltage of battery is 20.8V ~24.4V, if the voltage is lower than this range, it indicates that the battery already has capacity loss, the circumstance of long time under load voltage may reduce the service life of the battery.

Charging

– When charging, only DC can be used. Connect the battery with proper charger for specifi-

Checking and Testing

Checking

– Check if the pump contactor and appearance of cables are in good condition, and if the plug connection is secure;

Testing

– Switch off the power supply of the vehicle;

– Carry out ON/OFF test to contacts of pump contactor with a multimeter:

- If connected, but with contactor adhesion, replace the contactor;
- If not connected, move on to the next step;

– Measure the resistance between pump contactor coil end point A and B to identify if the coil is normal;

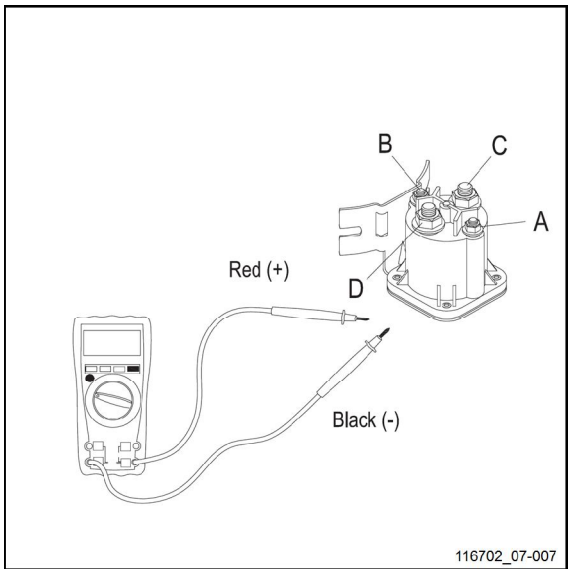
As shown in the following table:

Resistance Measurement	Judgment
Approx. 22 Ω	Normal
0 Ω	Coil shorting (replace the contactor)
∞ Ω	Coil breaking (replace the contactor)

If the coil is normal, move on to the next step.

– Energize the contactor coil between end point A and B (24V):

- If the contact is not absorbed (without the sound of absorption), the contactor is having mechanical failure with its contact, replace the contactor;
- If the contact is absorbed (with the sound of absorption), and contact C and D are conducted, then the contactor is working properly.

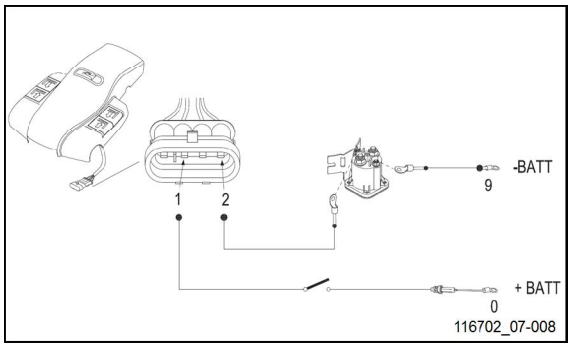


Control Circuit Troubleshooting

Check if the circuit is broken by using a multimeter:

– Set the multimeter to ON-OFF;

– Check if #2/#9 circuit is conducted.



Two-stage Mast

Lifting Chains

Chain Adjustment

- Lower the fork frame to the bottom;
- Press the emergency stop switch and disconnect the key switch;

⚠ CAUTION

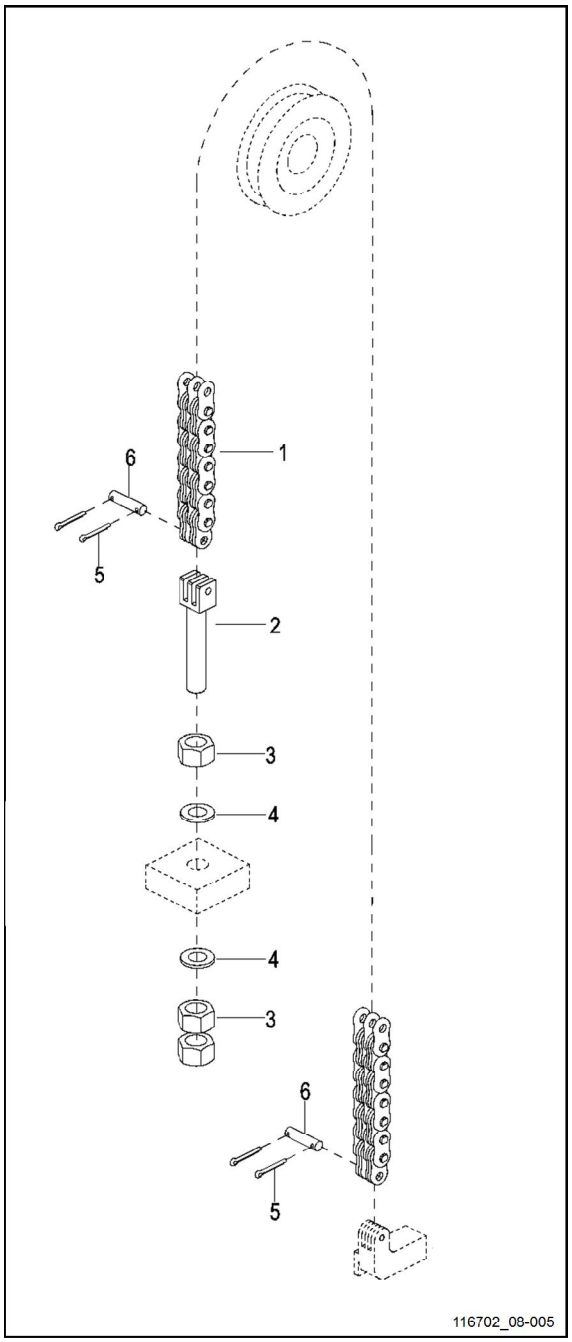
Switch off the power supply before any adjustments or operations!

- Loosen the upper and lower jam nuts (3) on chain bolt;
- Through screwing upward the jam nut (3) in the middle, the chain will slowly tension;
- When the chain is adjusted to be tensioned with no obvious loosening, fasten the upper and lower lock nuts;

⚠ CAUTION

When the adjustment is completed, there should be an adjustable distance of at least three pitches over the chain bolts.

- Pull out emergency stop switch and turn on the key switch;
- Through repeatedly lifting/lowering the mast to test if the chain is tensioned. If the chain is still loose, repeat the steps above.



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Stacker