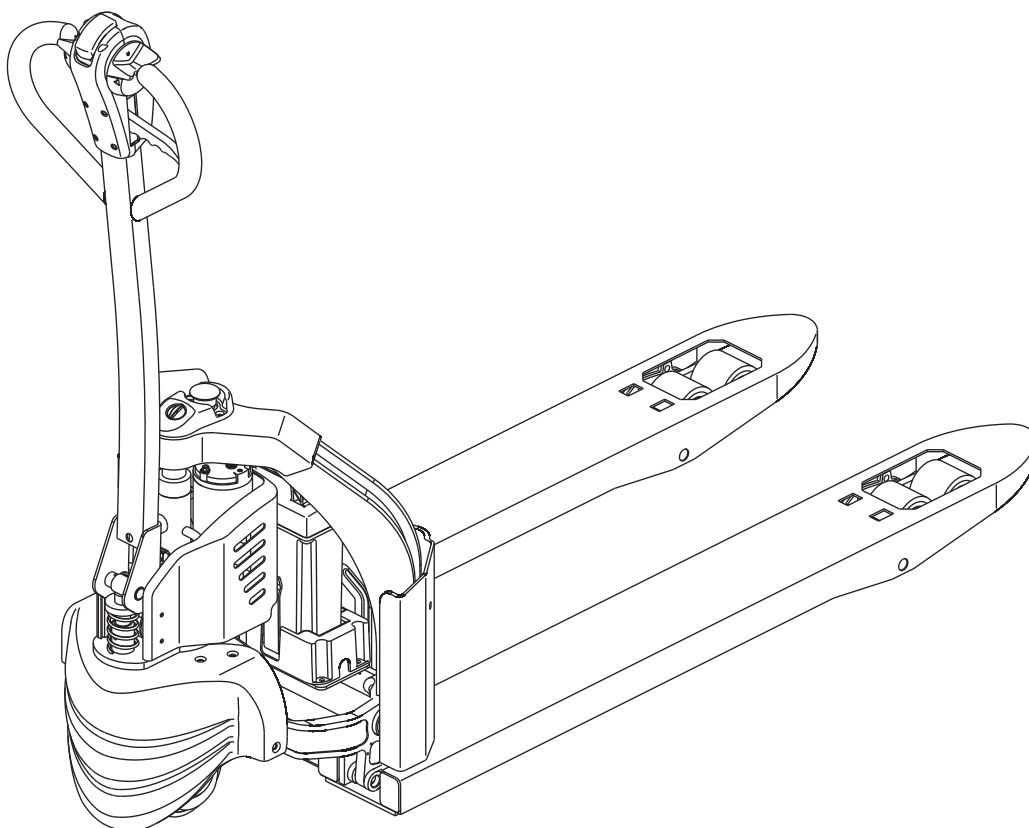




Service Manual

EPT12-EZ
Electric Pallet Truck



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SAFETY WARNING



For your own safety and that of others, please observe the following safety instructions:

Thorough and normative maintenance is one of the most important prerequisites to ensure stable and reliable operation of truck. Neglecting regular maintenance could easily lead to the truck malfunction and failure, and potential threats to staff and operational safety. Therefore, there must be adequate maintenance equipment, professional maintenance personnel and a comprehensive maintenance plan in place.

Please perform the maintenance and inspections according to the following provisions:

1. To strictly enforce the truck maintenance, lubrication and inspection plans.
2. Truck maintenance, lubrication and inspection personnel must be approved by accredited certification or evaluation agency.
3. The following operations shall be performed before you leave the truck:
 - No parking on slopes.
 - Fully lower the forks.
 - Cut off the power supply.
 - Turn the switch lock to “STOP” and remove the key.
4. Prior to truck maintenance:
 - Raise the drive wheel off the ground, or cut off the power supply connection.
 - Use wooden wedges or other effective fixtures.
 - When performing maintenance underneath the vehicle, make sure that the lifting device or jack leg is secure.
 - Park your vehicle in a safe and secure area.
5. Never use an open flame to check level of electrolyte, other oils or fluids for leaks.
6. Keep the parking lot clean, well-ventilated and dry.
7. Regular checks and maintenance should be conducted to braking, steering, control, warning and safety devices to keep them in good condition.
8. All nameplates and safety signs on the truck should be cleaned regularly to make them clearly visible.
9. Regular checks and maintenance should be conducted to all the devices of lifting system to ensure them to be safe for use.
10. The hydraulic system should be checked regularly based on usage. Hydraulic cylinders, hydraulic valves and other hydraulic components should be ensured to be without leakage.
11. Regular checks and maintenance should be conducted to batteries, motors, controllers, limit switches, protective devices, wires and connectors, and so on. Please pay particular attention to the electrical insulation.
12. Park the truck in a clean environment to minimize the risk of fire.
13. Without the permission of the manufacturer, users are not allowed to change or increase the capacity of the truck. After having been changed under permission, the nameplates and safety signs on the truck should also be changed accordingly.

NOTE:

NOTE:

CHASSIS SYSTEM

4.3.3 Removal and Installation

Removal

- Fully lower the forks and switch off the power supply;
- Tilt the vehicle to the left or right and support it with a block and other supporting stuff;

- Tap the coiled elastic cylinder (8) out from the chassis, and tap the long axis (7) out from the side to separate the lower connecting rod (10) with the chassis.
- Tap the coiled elastic cylinder (3) out, tap the long connecting rod pin shaft (4) out from the side, and remove the wheel frame assembly (5).

CAUTION

When replacing the long connecting rod, the connecting rod must be adjusted so that the fork surface height can reach the specified value.

Installation

- Install according to the reverse order of removal.

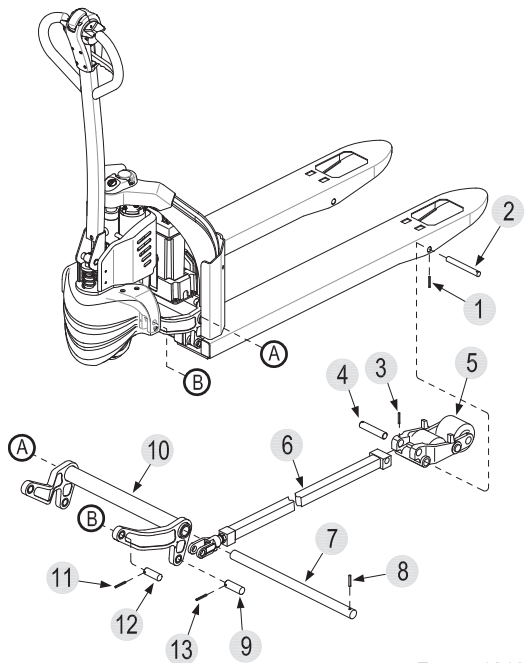


Figure 12107

CAUTION

Before going on with the next step, please fix the wheel bracket first. Be sure to avoid the falling of wheel bracket during removal, resulting in personal injury.

- Tap the coiled elastic cylinder (1) into the axle (2), and tap the axle (2) out from the side to separate the wheel frame from the front chassis;
- Remove the cover; (see Section 4.2)
- Tap the coiled elastic cylinder (11) out from the bearing bridge, and tap the short axis (12) out from the side to separate the lower connecting rod (10) with the bearing bridge;
- Tap the coiled elastic cylinder (13) out from the long connecting rod (6) , and tap the short axis (9) out from the side to separate the lower connecting rod (10) with the long connecting rod (6) ;

DRIVE SYSTEM

6	Fault	Excessive temperature rise
	Cause	a. Stator winding short circuit; b. Motor positive and negative electrodes with surface oxidation, resistance increases and results in heating; c. Bearing failure, resulting in severe heating.

5.4.3 Checking and Testing

Checking

- Check if the drive motor and appearance of cables are in good condition, and if the plug connection is secure;
- Check if the circuit is connected.

Testing

- Remove the cables on the drive motor;
- Carry out ON/OFF test to motor positive and negative electrodes with a multimeter:
 - If connected, the motor is normal;
 - If not connected:
 - 1) Broken circuits in rotor coils (replace the motor);
 - 2) Carbon brush wearing, move on to the next step.
- Replace the carbon brush .
(See Section 5.4.1)

CAUTION

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

Circuit of drive motor

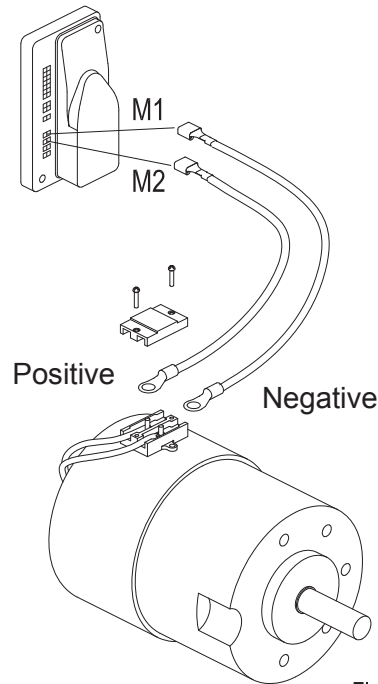


Figure 30211

5.5 Gearbox - A

5.5.1 Removal and Installation

See Section 5.4.1 .

CAUTION

Please add gear oil to the grease nipple on the gearbox cover (see Section 2.2.3 for specification and filling amount)

5.5.2 Faults and Causes

1	Fault	Gearbox Abnormal Noise
	Cause	a. Supporting bearing wear; b. Gear wear, the gap is too big; c. Foreign objects in gear oil.
2	Fault	Gearbox Oil Leaks
	Cause	Oil seal wear or aged
3	Fault	Gearbox Stuck
	Cause	a. Gear fastening screws or nuts loosening; b. Support bearing damage c. Foreign objects in gear oil.

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DRIVE SYSTEM

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NOTE:

HYDRAULIC SYSTEM

7.6 Reach Cylinder

7.6.1 Cylinder Removal Precautions

- Before removing the cylinder, be sure to relieve the hydraulic circuit first, which is to lower the lifting mast to the bottom. Otherwise, when removing the tubing connected with the cylinder, the pressured hydraulic oil within the circuit may be sprayed out at high speed along with the tubing, and there is risk of causing personal injury.

Turn off the power source, so that the entire hydraulic system will stop functioning, then the connecting tubing can be loosened; in order to avoid the residual pressure within the circuit, the tubing joint should be loosened slowly, loosen the joint by half and shake the tubing to see if there is overflow of pressured oil, and then go on with the removal;

- Cylinder is the powered actuator in hydraulic system. Therefore, before removing the cylinder from the equipment, the connection part must be supported with appropriate supporting to avoid personal injury or damage to the equipment;
- Cylinder is the powered actuator in hydraulic system. Therefore, before removing the cylinder from the equipment, the connection part must be supported with appropriate supporting to avoid personal injury or damage to the equipment;
- Upon disassembly of the cylinder, you should know the main structure of the cylinder to avoid sightless removal. Due to the different size, structure, purpose of use of the cylinders, the sequences and methods used for removal are also different;
- When removing each part, do not hammer forcefully, it such case cannot be avoided, please lay a copper rod to avoid damage to the parts; special tools must be used for the parts having such requirements, do not hammer forcefully or pry. Fine pitch threaded cylinder cap, after being shaken loose, loosen it with cylinder wrench with even force, copper rod can be used to hammer the part that cannot easily deform, do avoid violent shocks.

- Upon removal, the damage to cylinder threads, oil port threads, cylinder cap threads, piston rod surface and inner cylinder wall should be prevented.

In order to prevent piston rod from bending or deformation, support it wooden block when placing.

When removing seals, the use of sharp tools should be avoided, so as not to stab the seals. For the seals that are difficult to remove, soak them with boiled water, remove them when getting softened.

- Before removing, try to create conditions to prevent the cylinder parts from being contaminated by the surrounding dust and impurities. For example, try to disassemble the equipment in a clean environment; after the disassembly, all parts should be covered with plastic, do not cover with cotton cloth or other cloth used during operation;
- For the cylinder which is found with internal or external leakage during use, if the piston rod or cylinder tube is not scratched, such case may be due to wear or aged seals.

CAUTION

When the seals need to be replaced, replace with the complete set of seals in the cylinder repair kit.

- For the cylinder which is found with internal or external leakage during use, if the piston rod or cylinder tube is not scratched, such case may be due to wear or aged seals (when replacing seals, replace with the complete set of seals in the cylinder repair kit).

Pay special attention to the cylinder tube, piston rod and other moving parts for bumps and scratches. If only minor damage, sand the edge point around the damaged part with fine stone and then polish the part smooth with metallographic sandpaper.

ELECTRICAL SYSTEM

8.3 Emergency Stop Switch

Emergency switch is used for emergency cut-off of the power supply to all the control circuits.

8.3.1 Removal and Installation

Removal

- Remove the protective cover;(see Section 4.2)

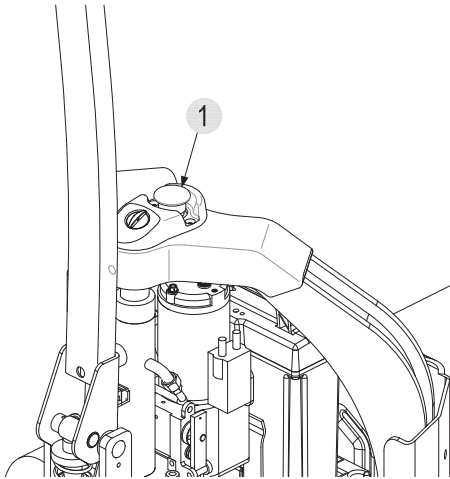


Figure 12507

- Disconnect the emergency stop switch connector from wiring harness;
- Unscrew the screws on the emergency stop switch (1) and remove switch.

Installation

- Install according to the reverse order of removal.

8.3.2 Faults and Causes

1	Fault	Emergency switch at pulled-out status, the vehicle not energized
	Cause	a. Emergency switch failure; b. Emergency switch circuit not conducted.
2	Fault	Emergency switch pressed, the vehicle still energized
	Cause	a. Emergency switch failure; b. Emergency switch shorted (short circuit)

8.3.3 Checking and Testing

Checking

- Check if the appearance of emergency switch its wiring harness are in good condition, and if the connectors are connected securely.

Testing

- Check if the emergency switch circuit is conducted;
- Carry out ON/OFF test to emergency switch with a multimeter:
Emergency switch in pulled-out status, circuit conducted;
press the emergency switch, the circuit is opened.

8.3.4 Control Circuit Troubleshooting

Emergency Switch Control Circuit (Figure 12506)

Check if the circuit is broken by using a multimeter:

- Set the multimeter to ON-OFF;
- Check if #0/#1/#3 circuit is conducted.

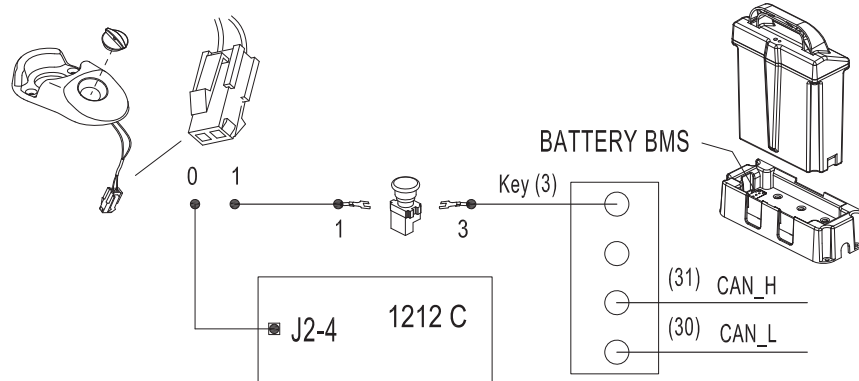


Figure 12506

ELECTRICAL SYSTEM

8.7.3 Monitor Menu

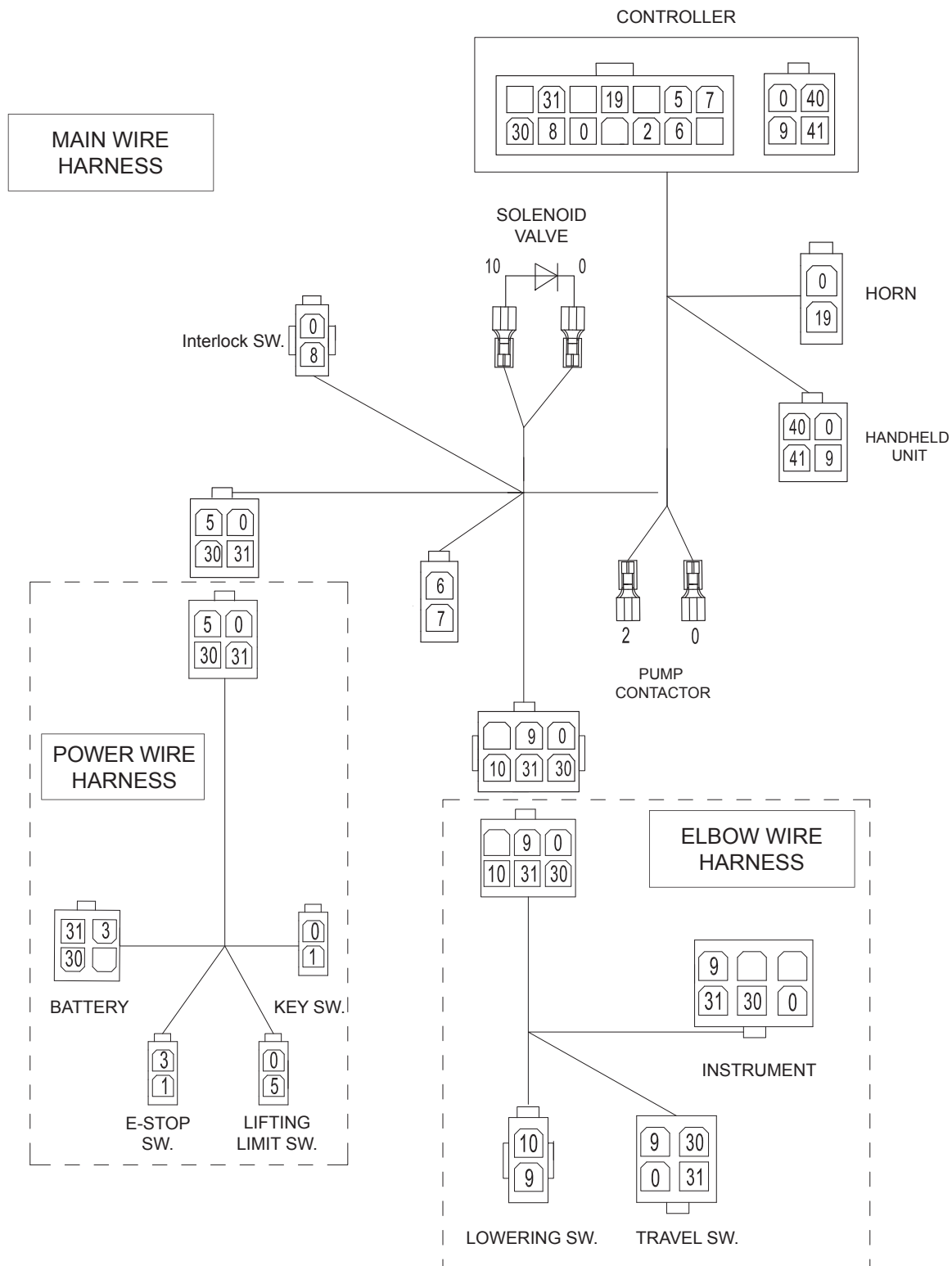
The parameters in Monitor Menu are real-time presentation of the running status of the equipment.

Traction Controller (1212C)

Name	Display Range	Description
KSI Voltage	0.0 ~ 38.2 V	KSI Voltage.
Battery Voltage	0.0 ~ 38.2 V	Battery Voltage.
Cap Voltage	0.0 ~ 38.2 V	Capacitor Voltage.
Motor Voltage	-27.4 ~ +27.4 V	Voltage drop between the motor terminals.
Pot Low Voltage	0.0 ~ 5.0 V	Pot low voltage.
Temp	-55 ~ +120 °C	Controller's internal temperature.
Motor Thermal Cutback	0 ~ 100 %	Current cutback during motor over temperature, as a percentage of max current. 100% = no cutback.
Armature Current	-90 ~ +90 A	Measured motor armature current.
Current Limit	-90 ~ +90 A	Ultimate current limit of the controller, taking into account boost mode, thermal protection, etc.
Resistance	0 ~ 854 mohm	Measured system resistance, when the motor is stalled.
Throttle	-100 ~ 100 %	A vailable throttle input.
BDI	0 ~ 100 %	Status of battery capacity in percentage.
Hourmeter	0 ~ 99999.9 hours	Hours of operation since the hourmeter was last reset.
Mode Switch	On / Off	Status of the mode switch (at J1-4).
Forward Switch	On / Off	Status of the forward switch .
Reverse Switch	On / Off	Status of the reverse switch.
Interlock Switch	On / Off	Status of the interlock input switch (at J1-6).
EMR Switch	On / Off	Status of the emergency reverse switch .
AUX Switch	On / Off	Status of the AUX input switch (at J1-9).

ELECTRICAL SYSTEM

Electrical Lowering



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