Workshop literature

Electric pallet truck

ECU-15C

CE

0138

1133 801 21 01 EN - 06/2017

first in intralogistics

Description of the safety devices and warning labels

The truck has an emergency switch (3) which stops all lifting-, lowering-, driving- functions and engages the fail safe electromagnetic brake when it is pushed.

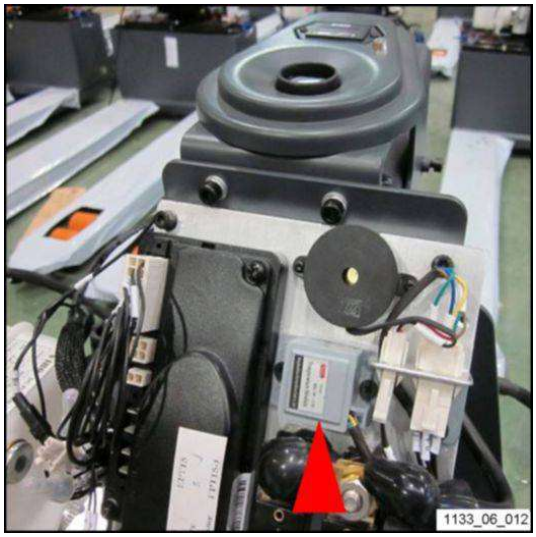
By turning the pushed button 90° anti-clockwise, the push- button can be removed and then prevent against unauthorized access. Remove this button, if you not operate the truck.

The truck is equipped with a safety (belly) button (12) which switches the driving function away from the operator, if the truck travels towards the operator and the tiller is activated in the tillers operating zone.

Follow also the instructions given on the decals. Replace the decals if they are damaged or missing.

A	Sticker to read and follow this instruction
B	'No passengers' decal
C	LOGO sticker (both side)
D	Identification plate
(3)	Emergency switch
(12)	Safety (belly) button

– Dismantle the protect module and replace it. ▷



Replace the carbon brush of the pump motor

Spare parts:

- 2 x bolts (M6X40), 9008311140
- 4 x washers (A6.4), 9292003014
- 2 x nuts (M6), 9210281090

– Remove the pump motor assembly from the truck. ▷

– Remove the rear cover of the motor. ▷

NOTE

The direction of the polar should be observed. The red line means positive polar, the blue line means negative polar.

Electric Principle

Curits Controller 1212

Specifications

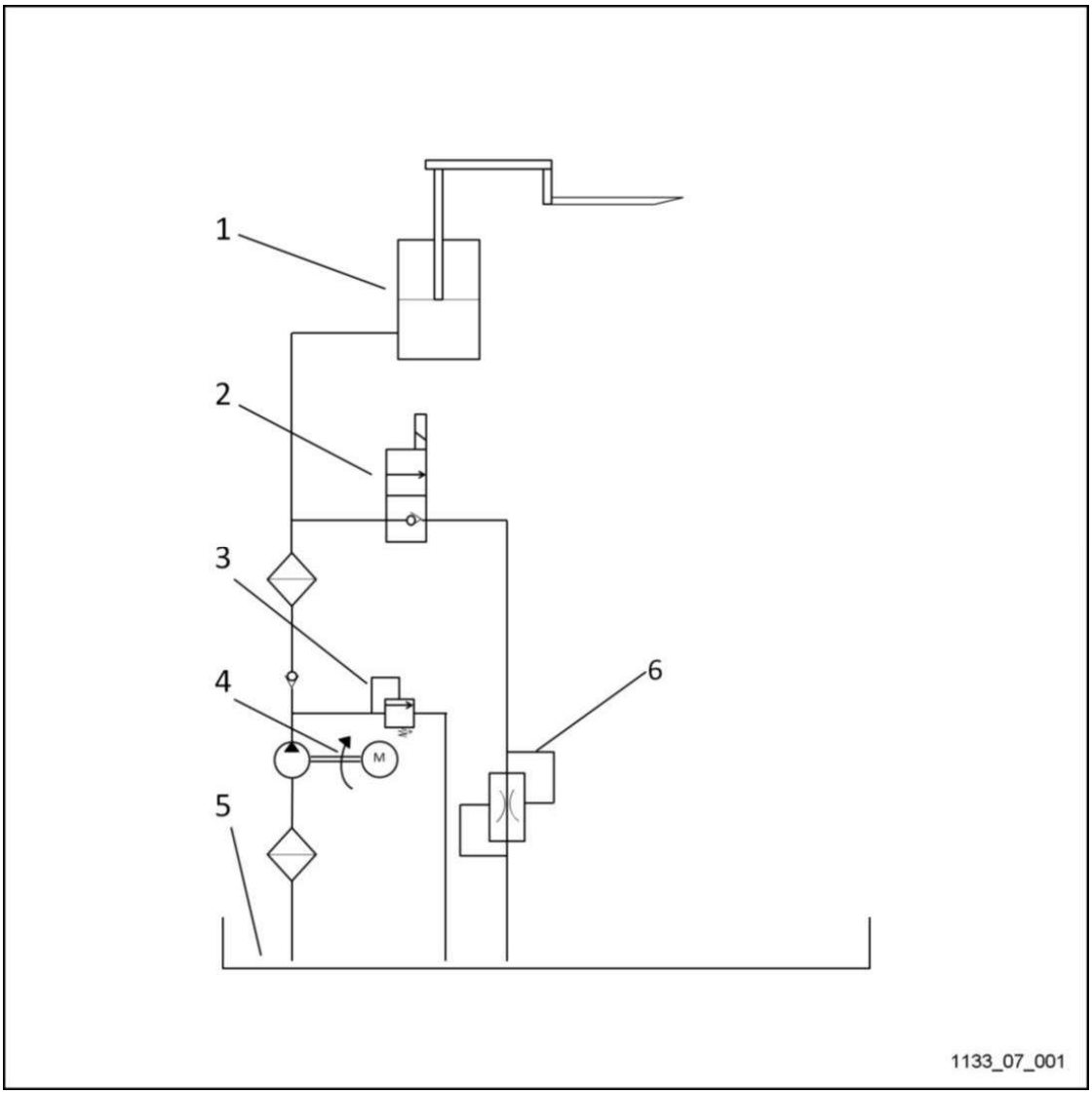
Nominal input voltage	24 V
PWM operating frequency	15.6 kHz
Electrical isolation to heatsink (min.)	500 V
Minimum motor resistance	160 mΩ (45 amp models); 120 mΩ (70 amp models)
B+, B- logic pin current (max.)	9 A (pins 7 and 13 on 14-pin connector)
KSI input current (typical)	80 mA
Logic input current (typical)	1 mA
Horn output current (max.)	15 mA
BDI output voltage, resistance (max.)	0–5 V, 10 kΩ
LED output current (max.)	15 mA
Electromagnetic brake coil resistance (min.)	32 Ω
Undervoltage cutoff	14 V
Overvoltage cutoff	34 V
BDI: Battery Discharge Indicator KSI: Key switch input	

PARAMETER	ALLOW-ABLE RANGE	DESCRIPTION
Throttle Map	20–80 %	The throttle map parameter adjusts the static throttle map. The parameter setting corresponds to the throttle command at half throttle. A setting of 50% provides linear response. Values below 50% reduce the throttle command at low throttle positions, providing enhanced slow speed maneuverability. Values above 50% give the vehicle a faster, more responsive feel at low throttle positions.
Tremor Suppression	0–100 %	This parameter can be used to limit the controller's response to sharp throttle movements, such as movements resulting from hand tremors. Larger values will provide a steadier ride, but they also result in more sluggish response to throttle request. There is thus a trade-off between crispness of response (low Tremor Suppression settings) and steady speed in the presence of tremors (high settings).
Calibration	On/Off	Wigwag and unipolar throttle pots should be centered. Setting this parameter to On inhibits driving and puts the controller into throttle autocalibration mode; see procedure below. Setting the parameter Off returns the controller to normal operation.
THROTTLE MENU		
Type	0–9	The 1212 controller can accept inputs from both 5kΩ, 3-wire pot throttles and voltage throttles. Set the throttle type parameter to match the throttle used in your application. 5kΩ, 3-wire pot throttles 0 = wigwag 1 = inverted wigwag 2 = single-ended; neutral when wiper at PotLow 3 = inverted single-ended; neutral when wiper at PotHigh 4 = unipolar. Voltage throttles 5 = wigwag 6 = inverted wigwag 7 = single-ended; neutral when wiper ≤ PotLow 8 = inverted single-ended voltage; neutral when wiper ≥ PotHigh 9 = unipolar
PotHigh	3–5 V	Sets the maximum voltage for voltage throttles (Types 5–9). (For 5kΩ, 3-wire pot throttles, PotHigh is determined by the throttle itself.)
PotLow	0–2 V	Sets the minimum voltage for voltage throttles (Types 5–9). (For 5kΩ, 3-wire pot throttles, PotLow is determined by the throttle itself.)
Neutral Deadband	5–30 %	Sets the throttle range the controller interprets as neutral. Increasing the parameter setting increases the neutral range. This parameter allows the neutral deadband to be defined wide enough to ensure the controller goes into neutral when the throttle is released.

The IR Comp parameter is used to set the percentage of the maximum motor resistance that will be applied, i.e., (IR Comp) × (System Resistance), to compensate for increased load caused by uneven terrain.
The trade-off in setting this parameter is that as ability to overcome load disturbances increases, operating smoothness decreases. A high IR Comp value will allow the vehicle to continue creeping at a low speed, even though it has just contacted a bump in the threshold of a doorway. But if IR Comp is set too high, it may make the vehicle "jumpy" during normal driving. Small throttle movements in this case may no longer provide gentle linear acceleration, but instead initiate accelerations with a sharp jerk. Therefore, the tuning goal is a balance between adequate load disturbance response and normal acceleration/ deceleration response.
The normal range for IR Comp is approximately 50–80%. Larger numbers provide stiffer, stronger response. If the value needs to be much larger or smaller than this range to achieve acceptable performance, the System Resistance has probably not been set up correctly and should be checked. Note: Largely different settings for IR Comp will affect the maximum speeds that were set in Step 5. Therefore, if you make large changes to IR Comp, you should repeat Step 5.
Just before stopping, when the throttle is in neutral, IR Comp is replaced by Anti-Rollback Comp. Typically Anti-Rollback Comp is set about 20% higher than IR Comp.
Assuming that System Resistance is set correctly (within 10–20%), some general rules of thumb apply:
7-a. If the vehicle is extremely "jumpy" (i.e., responds abruptly to small throttle changes, IR Comp could be set too high.
7-b. If the vehicle speed varies dramatically when cresting a hill, IR Comp is most likely set too low.
7-c. If the vehicle rolls the other direction near the end of a stop on flat ground, Anti-Rollback Comp is set too high.
7-d. If the vehicle is still moving on a modest ramp when the brake gets set, Anti-Rollback Comp is set too low.
7-e. If the vehicle seems to decelerate to a stop in a nonlinear fashion, Anti-Rollback Comp could be set too high.

Hydraulic system

Hydraulic System



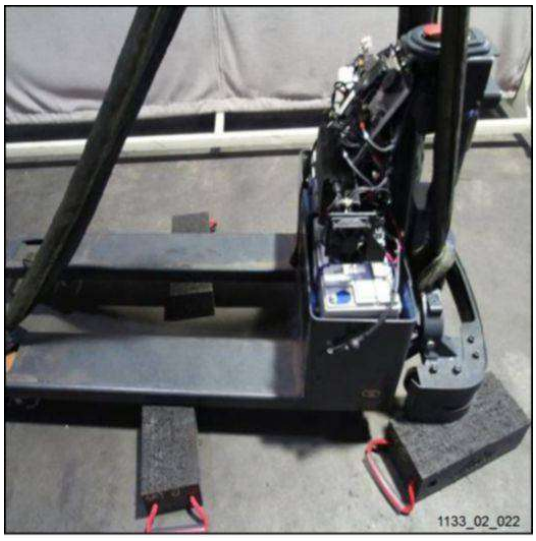
1	Lift cylinder	4	Motor and pump
2	Lowering valve	5	Oil tank
3	Pressure valve	6	Throttle valve

Hydraulic Troubleshooting

External appearance	Smell	Condition	Measurement
Clear and no discoloration	Fine	Fine	Possible to use
Clear but the color becames brighte	Fine	Mixed with other oil	Inspect the viscosity and if fine it can be continuously used
Color changed like milk.	Fine	Mixed with air and water	Separate water or replace oil.

– Disconnect the plug (electromagnetic brake). ▷

– Prepare the plates and lift the truck, then use the plates to support the truck. ▷



– Remove the plate. ▷

NOTE

Use a new locking plate when reinstall the drive unit.

– Remove the key.

– Unscrew two tie rods connecting the end cap with the gearbox.

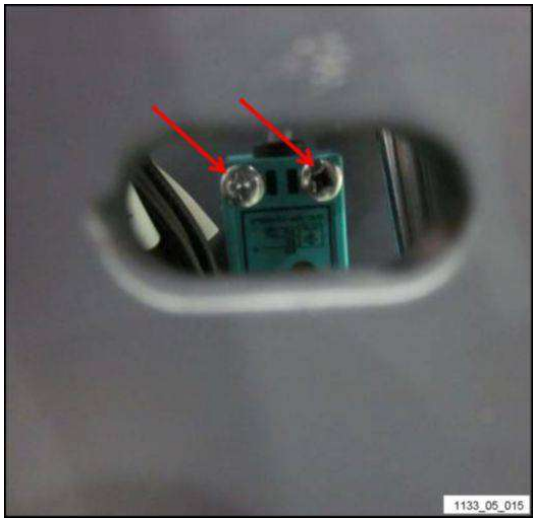
NOTE

Tightening torque 5.5Nm

– Remove the end cap.

– Dismantle the plug of the tiller. ▷

– Dismantle 2 screws of the switch and replace it. ▷



– Remove elastic collar then dismantle the shaft of the tiller bar. ▷