Workshop literature

Pallet truck

ECU 14
ECU 14 Full Lead
ECU 16
ECU 18
ECU 20

0164 0165 0166 0167 0176

45588042311 EN - 4/2020

first in intralogistics

60 Electrical components

70 Hydraulic system

80 Load lift system

Electronic control diagnostics

Positioning the diagnostic connector ▷

The diagnostic connector on the electronics panel is marked with an arrow in the diagram.

Parameter Table:
electronic control for version with 1600 kg capacity

(from table of parameters, code 45588089010 -
Version 00 - 05/2012)

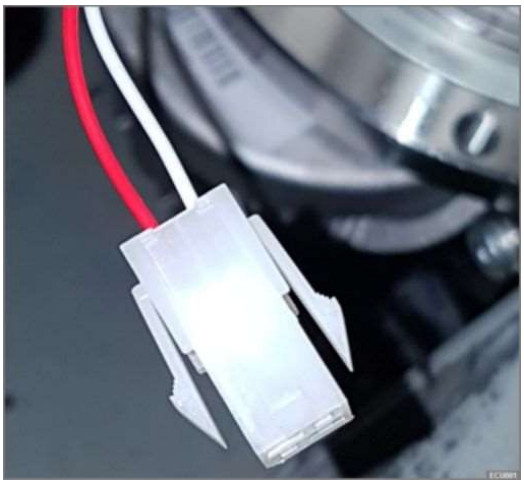
"Program" menu

		VALUE	RANGE		UNIT
			Min.	Max.	
Vehicle					
Rates	M1 Accel Rate	2.6	0.1	5.0	Seconds
	M2 Accel Rate	5.0	0.1	5.0	Seconds
	M1 Decel Rate	1.4	0.1	10.0	Seconds
	M2 Decel Rate	0.7	0.1	10.0	Seconds
	M1 Brake Rate	0.5	0.1	3.0	Seconds
	M2 Brake Rate	1.0	0.1	3.0	Seconds
	Fast Stop Rate	0.1	0.1	5.0	Seconds
	Accel Release Rate	0.0	0.0	1.0	Seconds
Speeds	M1 Min Speed	10.0	0.0	50.0	%
	M2 Min Speed	10.0	0.0	41.0	%
	M1 Max Speed	100.0	10.0	100.0	%
Multi Mode	Coast Decel Rate	2.0	0.1	20.0	Seconds
Throttle	Throttle Deadband	3.0	0.0	30.0	%
	Throttle Max	85.0	40.0	100.0	%
	Throttle Map	15.0	5.0	90.0	%
Brake	Brake Delay	0.2	0.0	2.0	Seconds
Emergency Reverse	Speed	17.0	0.0	25.0	%
	Time Limit	6.0	0.0	6.0	Seconds
System					
Battery	Empty Battery Voltage	1.73	0.90	3.00	Volts
Hourmeter	Enable Total Service Hours	0.0	0.0	1.0	
	Enable Drive Service Hours	0.0	0.0	1.0	
	Adjust Hours	0.0	0.0	999999.0	Hours
	Set Total Hours	0.0	0.0	1.0	
	Set Drive Hours	0.0	0.0	1.0	
	Total Service Hours	5000.0	100.0	5000.0	Hours
	Drive Service Hours	5000.0	100.0	5000.0	Hours
	Total Disable Hours	10.0	0.0	500.0	Hours
	Drive Disable Hours	10.0	0.0	500.0	Hours
	Drive Disable Speed	80.0	0.0	100.0	%
	Service Total Expired	0.0	0.0	1.0	
	Service Drive Expired	0.0	0.0	1.0	
Hydraulic	Pump Lockout Check Enable	0.0	0.0	1.0	
	Pump BDI Lockout	0.0	0.0	1.0	
	Max Pump Run Time	3.5	0.0	60.0	Seconds

Temperature sensor

NOTE

- *Following a technical product improvement, the **KTY84-130** temperature sensor has been replaced with a **PT1000** sensor.*



	Truck production date (**indicative**)	
	Until 2019 (up to serial numbers ... / G / H / V)	From 2019 (from serial numbers V / X / Y / ...)
	Example → F2 xxxx **G** 00001	Example → F2 xxxx **X** 00001
Sensor type	**KTY84-130**	**PT1000**
X7:1 cable colour	**Blue**	**White**
X7:2 cable colour	**Red**	**Red**
Resistance at 20°C	**580 Ω**	**1080 Ω**
Part number of the motor	**45583500602**	**45583500604**
Part number of the tiller head PCB	**45583608600**	**45583608601**

NOTE

- ***To determine the type of temperature sensor, you will need to measure its resistance as outlined below.***

Reducer gearbox group overhaul

– Position the reducer gearbox group on the floor or on a work bench.

– Use an Allen key to remove all the screws of the cover.

⚠ DANGER

During all the operations inside the motor compartment:

Disconnect the battery plug.

– Using a hammer and chisel, lift the cover from the rest of the reducer gearbox.

– The sealing agent keeps the cover attached to the body of the reducer gearbox.

⚠ CAUTION

Do not force the cover with the chisel.

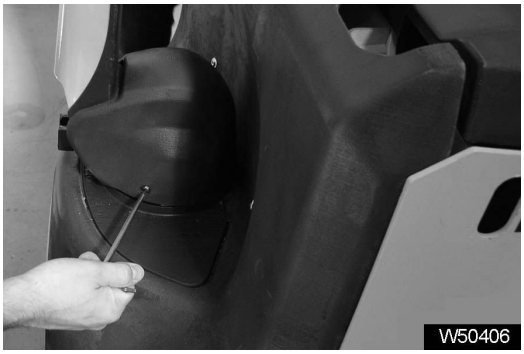
Avoid heavy scoring of the support surface of the cover severely.

– Heat the ring nut using a small gas torch, or preferably an electric air heater. This operation is performed in order to soften the thread locking.

– Using an appropriate hook spanner, completely unscrew the retaining ring nut of the crown. In order to block the rotation of the crown wheel and pinion, insert a soft metal wedge between the teeth of the gears, or block the wheel fixing flange in a vice.

Removing the motor compartment covers

– Loosen the two lateral Allen screws by 2 or 3 turns without removing them. ▷



– Turn the tiller as far as it will go and remove the cover. Remove it noting that there is a centring hole in the back part in which a dowel, found on the internal plastic mask, is inserted. ▷

– Using the screwdriver, remove the lower cover from its seating (the cover is fitted flush). ▷

– Now, the motor cover can be completely removed. ▷

Disassembling the non-adjustable pivoting wheel

– Completely unscrew the 4 nuts, holding the pivoting wheel from below the hood with the other hand. ▷

⚠ CAUTION

Danger of crushing feet.

– To reassemble the pivoting wheel, perform the disassembly operations in reverse order.

NOTE

The tightening torque of the four nuts is 30 Nm.

NOTE

Shimming discs are available if necessary to fit between the pivoting wheel and the chassis. For the order codes, consult the parts catalogue.

Disassembling the adjustable pivoting wheel

– Completely unscrew the 4 nuts, holding the pivoting wheel from below the hood with the other hand. ▷

⚠ CAUTION

Danger of crushing feet.

– To reassemble the pivoting wheel, perform the disassembly operations in reverse order.

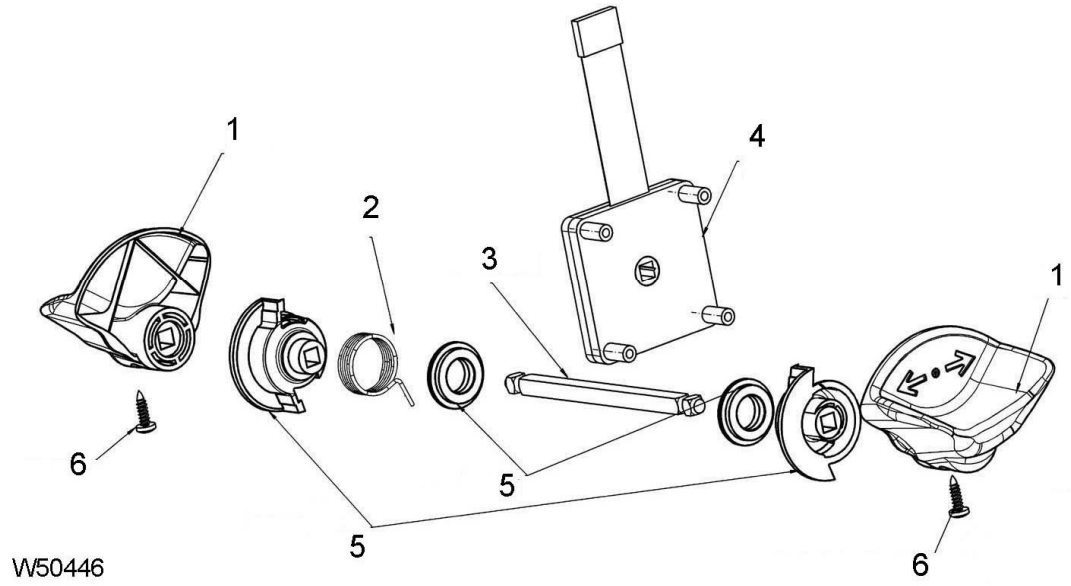
NOTE

The tightening torque of the four nuts is 30 Nm.

NOTE

Shimming discs are available if necessary to fit between the pivoting wheel and the chassis. For the order codes, consult the parts catalogue.

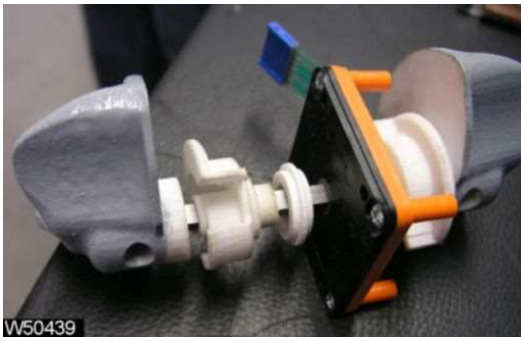
Disassembling traction potentiometer



1	Lever	4	Potentiometer
2	Flat spiral spring	5	Bush
3	Shaft	6	Screw

– Remove the connector to disconnect the potentiometer from the tiller card. ▷

– Once removed, the potentiometer remains attached to the drive operating levers as shown in the figure. ▷



Disassembling the numerical keypad ▷

Before disassembling the numerical keypad, remove both covers from the tiller head; see section "Removing tiller head covers".

– Disconnect the 3 cables attached to the keypad.

– Unscrew both screws shown in Figure 1 and remove them.

– To reassemble the numerical keypad, reverse the procedure.

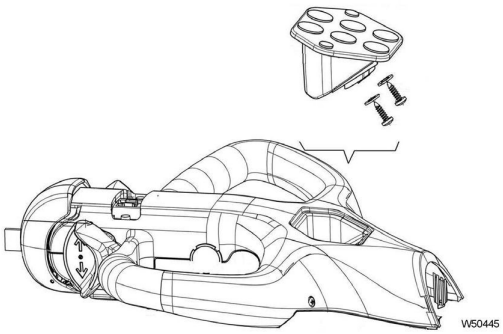
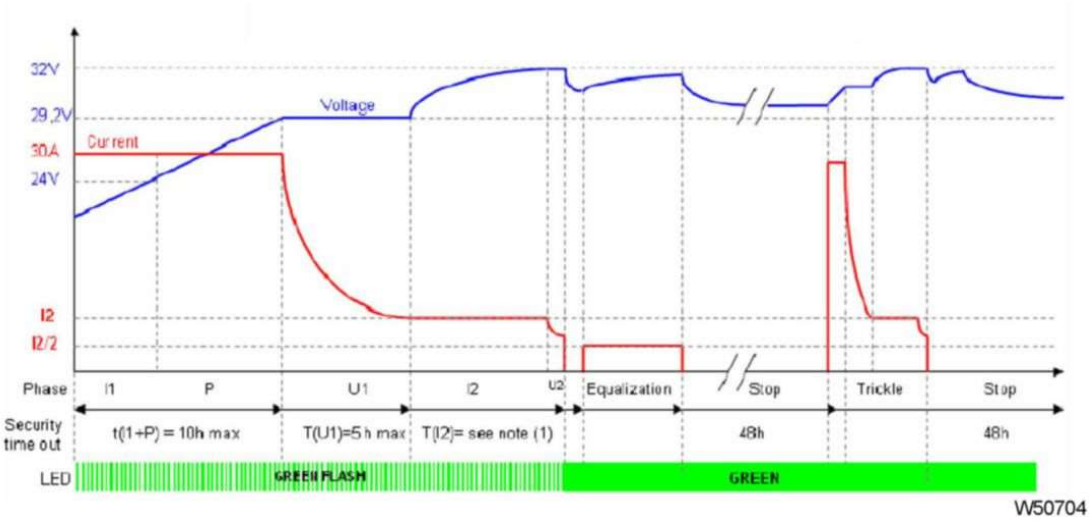


Figure 1

(2.67 V/cell). The current could therefore decrease in accordance with the U2 phase.

- **Phase 4 (Equalisation)** = this is carried out only every 7 full charging cycles (more than 4 hours). In this phase, the current is I2/2 for a maximum of 4 hours.
- **Phase 5 (Trickle charge)** = when the charger remains connected to the mains, even when charging is finished, a new cycle starts after 48 hours, to offset the battery self-discharge.

For Pb/lead batteries with a capacity of less than 250 Ah



Charging curve

Description

- **Phase 1 (I1, P)** = The maximum current of 30A is maintained until the voltage is lower than 29.2 V (2.43 V/cell). This stage is completed when the battery reaches this voltage level.
- **Phase 2 (U1)** = The voltage U1 is kept constant at 29.2 V with progressively decreasing current until the end of charging current I2 is reached.
- **Phase 3 (I2)** = The current I2 is kept constant until charging is completed. During this phase, the voltage is limited to 32 V max (2.67 V/cell). The current could therefore decrease in accordance with the U2 phase.
- **Phase 4 (Equalisation)** = this is carried out only every 7 full charging cycles (more than 4 hours). In this phase the current is I2/2.
- **Phase 5 (Trickle charge)** = when the charger remains connected to the mains, even when charging is finished, a new cycle starts after 48 hours, to offset the battery self-discharge.

Full Lead

Replacing "Full Lead" version batteries ▷

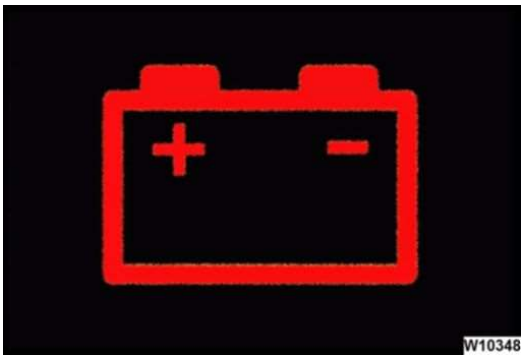
Preliminary operations

– Remove the hoods of the truck as described in "31 Chassis"

Necessary equipment

– Two 13-mm open-ended spanners
– 17-mm open-ended spanner
– Socket wrench with extension and 13-mm socket

Safety precautions for batteries ▷



– Protective gloves
– Protective goggles

⚠ DANGER

When replacing the battery, DO NOT generate short circuits. Short circuits can harm the batteries and the operator with sparks and even explosions.

To avoid short circuits when replacing batteries, DO NOT under any circumstances connect poles (+) and (-) of the battery. Pay particular attention when using open-ended spanners.

Removing "Full Lead" version batteries

– Fully lift the forks. ▷

– Disassembly of the coil body: Use a n.24 key. ▷

– Replacement of the maximum-pressure valve: Unscrew the maximum-pressure valve using a n.14 key, and replace it by proceeding in the reverse order. ▷

– Adjustment of the maximum-pressure valve: Using 2 spanners, loosen the lock nut at the head of the valve. ▷