

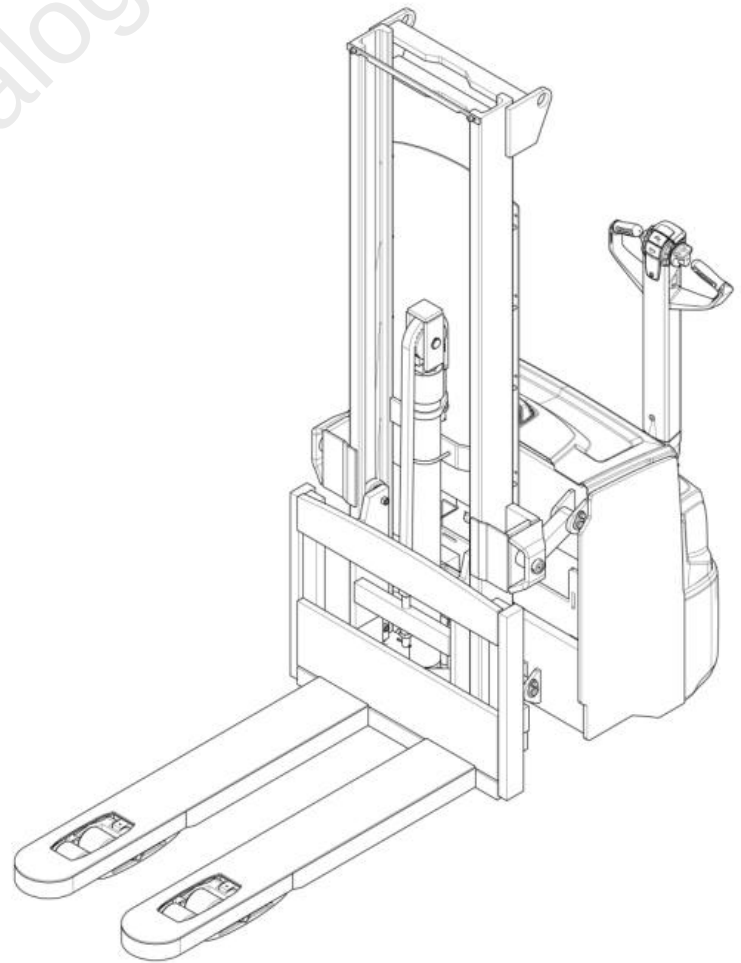
# SERVICE MANUAL

NSP

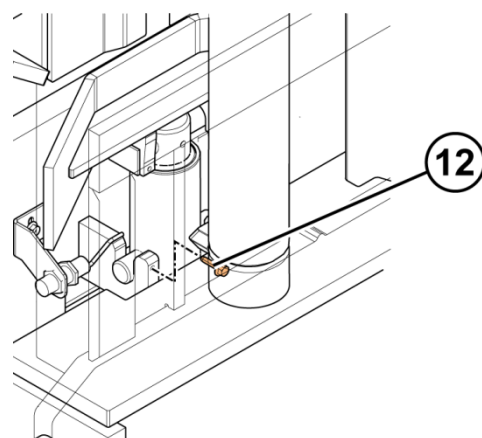
10N2/12N2/12N/14N2/

14N2I/16N2/16N2I/16N2S

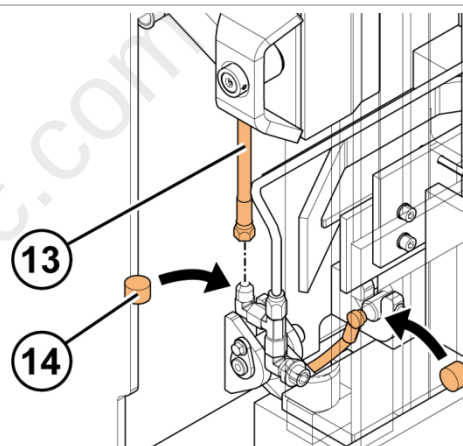
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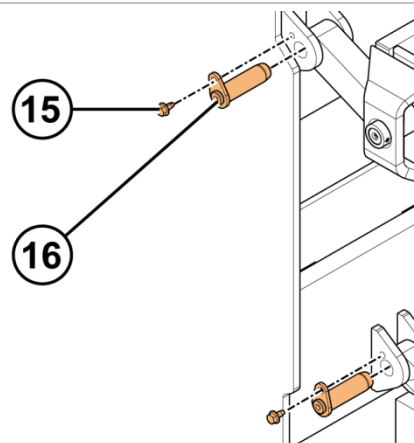
- 12.** Remove the screws of the initial lift cylinder.



- 13.** Disconnect the hydraulic hose.  
**14.** Plug the hydraulic connector on the mast unit side to prevent oil leakage.



- 15.** Remove the bolts attaching the top and bottom initial lift leverages to the truck frame.  
**16.** Remove the top and bottom initial leverage shafts.



### 8.2.4 Contactors and relays

|                   |                                                                                                              |
|-------------------|--------------------------------------------------------------------------------------------------------------|
| Type              | Main / drive contactor                                                                                       |
| Coil type         | 24 Vdc continuous duty coil                                                                                  |
| Electrical wiring | Coil: quick connect terminals 6.3 x 0.8 mm<br>Power contacts: M8 ring terminals                              |
| Contact rating    | Resistive load: 125/150 A @ 60 Vdc max<br>Overload: 205/225 A / UL 508<br>Inductive load: 100 A @ 96 Vdc max |
| Switching output  | NO                                                                                                           |
| Spare part        | RL490525                                                                                                     |

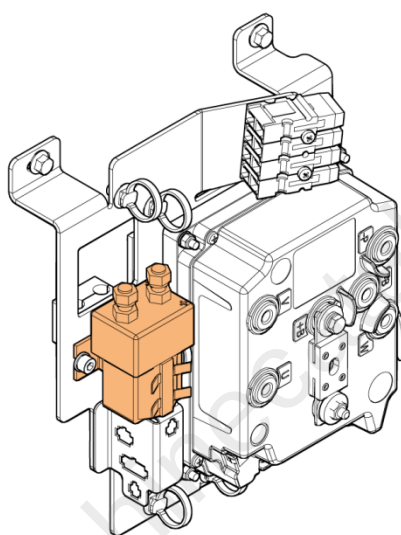
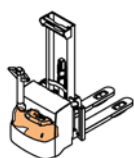


Figure 96. Contactor

A contactor is an electrically-controlled switch used for switching a power circuit, similar to a relay, except with higher current ratings. A contactor is controlled by a circuit, which has a much lower power level than the switched circuit.

#### Contactor functionality check:

1. Measure the resistance between the coil A1 – A2 terminals.  
The resistance value should be  $\sim 55 \Omega$ .  
If the resistance value is  $\sim 0 \Omega$  or  $\sim \infty \Omega$ , replace the contactor.
2. Measure the resistance between the main switching contacts 1-2.  
The resistance value should be  $\sim \infty \Omega$ .  
If the value does not match the above, replace the contactor.

| CODE       | TRUCKTOOL AND DISPLAY DESCRIPTION                                                                                                                                                                                                                                                                                                                                                     |           |        |
|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|--------|
| <b>189</b> | Battery lock not closed<br>BATTERY LOCK                                                                                                                                                                                                                                                                                                                                               | (Alarm)   |        |
|            | This alarm indicates that the battery lock is not closed.<br>In such a case, check the battery lock state from the tester menu. If the lock is stated to be open while the battery is mechanically locked, check the battery lock sensor operation and wiring.                                                                                                                        |           |        |
| <b>190</b> | Motor braking error<br>BRK TIMEOUT                                                                                                                                                                                                                                                                                                                                                    | (Alarm)   | Stored |
|            | One possible cause for this alarm is too steep braking ramp (parameter). Try to lower the braking ramps from the parameters. Also braking at a slope when the truck is loaded can cause this error.                                                                                                                                                                                   |           |        |
| <b>192</b> | Waiting for EPS<br>EPS RELAY OPEN                                                                                                                                                                                                                                                                                                                                                     | (Alarm)   | Stored |
|            | This alarm indicates that there is some problem in the steering and the steering has frozen.                                                                                                                                                                                                                                                                                          |           |        |
| <b>193</b> | Sideguard inputs illegal state<br>SIDEGUARD INPUTS                                                                                                                                                                                                                                                                                                                                    | (Alarm)   |        |
|            | This alarm is caused by an invalid combination of side guard inputs.<br>If both the side guards are in the correct position (both open or both closed), check from the tester menu if the logic inputs are the same. Check the correct positioning and operation of the side guard sensors. Also check the wiring of the sensors.                                                     |           |        |
| <b>194</b> | Platform inputs illegal state<br>PLATFORM INPUTS                                                                                                                                                                                                                                                                                                                                      | (Alarm)   | Stored |
|            | This alarm is caused by an invalid combination of operator's platform inputs.<br>When the operator's platform is either down with a driver standing on it or up, check from the tester menu that the logic inputs are correct. Check the correct positioning and operation of the platform sensors. Also check the sensor wiring.                                                     |           |        |
| <b>195</b> | Platform inputs inactive<br>WAITING DRIVER                                                                                                                                                                                                                                                                                                                                            | (Warning) |        |
|            | This is a general warning indicating only that the truck is waiting for an operator.                                                                                                                                                                                                                                                                                                  |           |        |
| <b>196</b> | Invalid motor resistance<br>MISMATCHED RM                                                                                                                                                                                                                                                                                                                                             | (Alarm)   | Stored |
|            | This alarm occurs if the motor resistance is different than the value of the parameter MOTOR RESIST.<br>In such a case, teach the new motor resistance value by setting the parameter MOTOR RESIST to 0 and saving the value while holding the tiller arm in the drive position. Restart the truck after the main contactor is opened. The new settings are active after the restart. |           |        |

| IDENTIFIER | DESCRIPTION                                                  |
|------------|--------------------------------------------------------------|
| M#         | Motor                                                        |
| V#         | Diode                                                        |
| A#         | Controllers and displays                                     |
| K#         | Contactors and relays                                        |
| X#         | Connector. Contact numbers are marked on individual wires.   |
| XX#        | Splice. Multiple wires are connected together at this point. |

Figure 81 shows the reference to which Figure 80 referred.

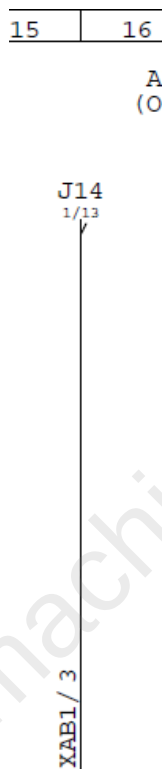


Figure 81. Page 8, zone 16, wiring reference J14

Once again, note the numbers below the wiring reference J14. These numbers (1/13) direct you back to the page (and zone) shown in Figure 80.

|                  |        |       |
|------------------|--------|-------|
| INPUTS & OUTPUTS | 4 / 9  | REV H |
|                  | 3-7109 |       |

Figure 82. Page numbers (4/9), circuit diagram number (3-7109) and revision letter (H)

## 11 TruckTool Diagnostics

Software maintenance can be performed with a diagnostics application called TruckTool. This program runs on a laptop PC and connects to the truck's data bus (CAN) via a special adapter and wire harness.

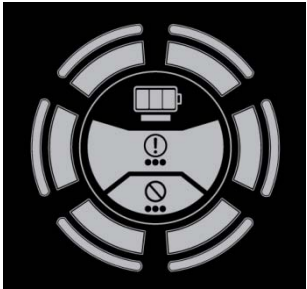
TruckTool can be used to receive, display and modify settings, update (flash) controller firmware, reset settings to hardware defaults, review and clear alarms, perform calibrations, execute a quick truck setup and monitor digital and analogue inputs and outputs.

The TruckTool program's usage instructions are available in the application itself. Additional training is required to use the program.



Figure 124. TruckTool Diagnostics

Table 2. Level of battery charge indications

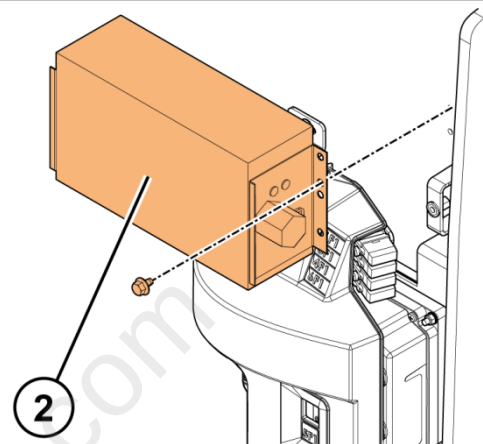
| LED DISPLAY                                                                         | DESCRIPTION                                                                                                                          |
|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
|    | Green light in all six dial segments = Battery charge level at 70 - 100%                                                             |
|    | Yellow light in the bottom four dial segments = Battery charge level at 40 - 70%                                                     |
|  | Red light in the bottom two dial segments = Battery charge level at 20 - 40%                                                         |
|  | Slowly flashing red light in the bottom two dial segments = Battery charge level at 0 - 20% (battery is empty, recharge immediately) |

In case of a warning or error, press and hold down the brake release button to read the warning or error code. The LED display uses a flashing light sequence to indicate the error code as explained in Table 3.

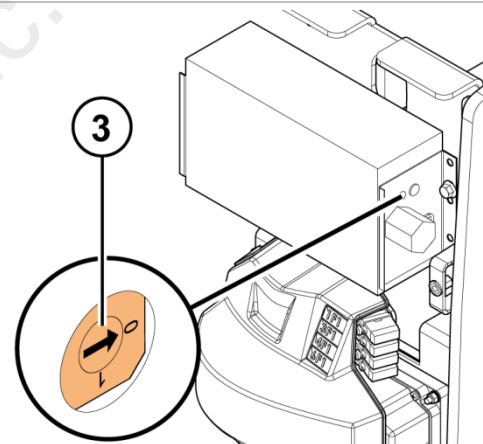
### 15.6.1 Installation of the internal charger and the internal charger connector

1. Open the control panel. For instructions, see section 5.4.2.

2. Screw the internal charger onto the truck frame.

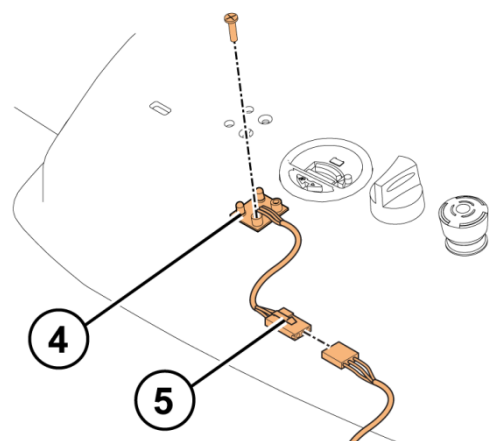


3. Check that the charging curve's selection disk is in the correct position (the arrow points to 0).



4. Screw the internal charger's LED indicator into the control panel, covering the screw ends with stickers.

5. Connect the LED indicator wire connector.



6. Connect the wires according to the truck model specific schematic diagram (see Figure 134).

## Full Version Available

### Caterpillar NSP12N2 Stacker Service and Operator Manual (616838)

Caterpillar NSP12N2 Stacker service manual, covers hydraulics, drive unit, wiring, brakes, and diagnostics. Searchable PDF download.

**[VIEW THE FULL MANUAL](https://machinecatalogic.com/caterpillar-nsp12n2-stacker-service-and-operator-manual-616838/)**

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