

Service Training
Electric Truck

Linde Material Handling

Series 346

E18, E20

Edition 07/2008

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Pin	Signal	Function	Displayed
116	In	Battery voltage for lift safety relay	Battery voltage
117	In	Negative lead control, proportional valves	L-
118	Out	Supply valve coils 2Y1, 2Y2, 2Y3, 2Y4, 2Y9	Battery voltage
119	Out	Accumulator charging valve 2Y10	L- pulsed
120	Out	Safety valve 2Y9	L-
121	Out	Supply valve coils 2Y5, 2Y6, 2Y7, 2Y8	Battery voltage

Power supply

The control module is supplied with power via various connections .

- X13:24 – 13 V from voltage converter U1
- X13:2, X13:114, X13:117 – negative supply
- X13:4 – battery positive, supply for contact safety relay Traction
- X13:115 und X13:116 – battery positive, supply for contact safety relay Lift

Inputs + Outputs
▼
Traction
▼
Voltages
▼
X13:4 Battery voltage

Charging circuit

The intermediate circuit capacitors in the power modules must be charged before switching on the main contactor to prevent an arc forming when the main contactor contacts are closed, causing the contacts to be burnt away. Charging and discharging of the intermediate circuit capacitors is performed by the charging circuit A1.

The charging circuit A1 is attached to the side of the contactor carrier and connected to the electrical system by the 6-way connector X12.

The following components are incorporated in the charging circuit:

- Charging relay K2
- Discharging relay K3
- Charging resistor 1R2
- Charging resistor 2R1
- Discharging resistor R2

When key switch S1 is switched on, the charging relay K2 is activated by means of the connection X13:72. At the same time the discharging relay K3 is activated since this is supplied directly from the voltage converter U1. The intermediate circuit capacitors are now charged through fuses (2F1, F7), relay contact (K2), charging resistors (1R1, 2R1) and fuses (F8, 1F6). The capacitor voltage is communicated to the control module by contacts X13:79 and X13:21 and is monitored by the control module. After the capacitors have been charged, the relay K2 drops out again, and the main contactor is activated by X13:2 on the negative lead.

As soon as the key switch S1 is switched off, the relay K3 drops out. The intermediate circuit capacitors can now discharge via the fuses (F8, 1F6), charging resistors (1R1, 2R1), relay contact K2, discharging resistor R2 and relay contact K3 to battery negative.

The capacitor voltages can be tested using the diagnostic program.

Inputs + outputs
▼
Traction
▼
Voltages
▼
X13:79 Capacitor voltage 1A1
X13:21 Capacitor voltage 2A1

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Internal hour meter

The indicator unit has several hour meters.:

Operating hours of indicator unit

- Value not shown by indicator unit.
- Value is unchangeable.
- Value is counted as soon as key switch is switched on.
- Value can only be read out via diagnostic program.

Error codes + Parameters
▼
Display
▼
General
▼
Operating hours (h)

Operating hours indicated

- In new indicator units, this value is 99997 hours.
- Operating hours are counted as soon as the driver's seat is occupied (factory setting - hourglass symbol flashes).
- Value can be changed via the diagnostic program down to a meter reading below 00010 as required.

Error codes + Parameters
▼
Display
▼
Parameters
▼
Operating hours
Displayed operating hours (h)

Operating hours until next service

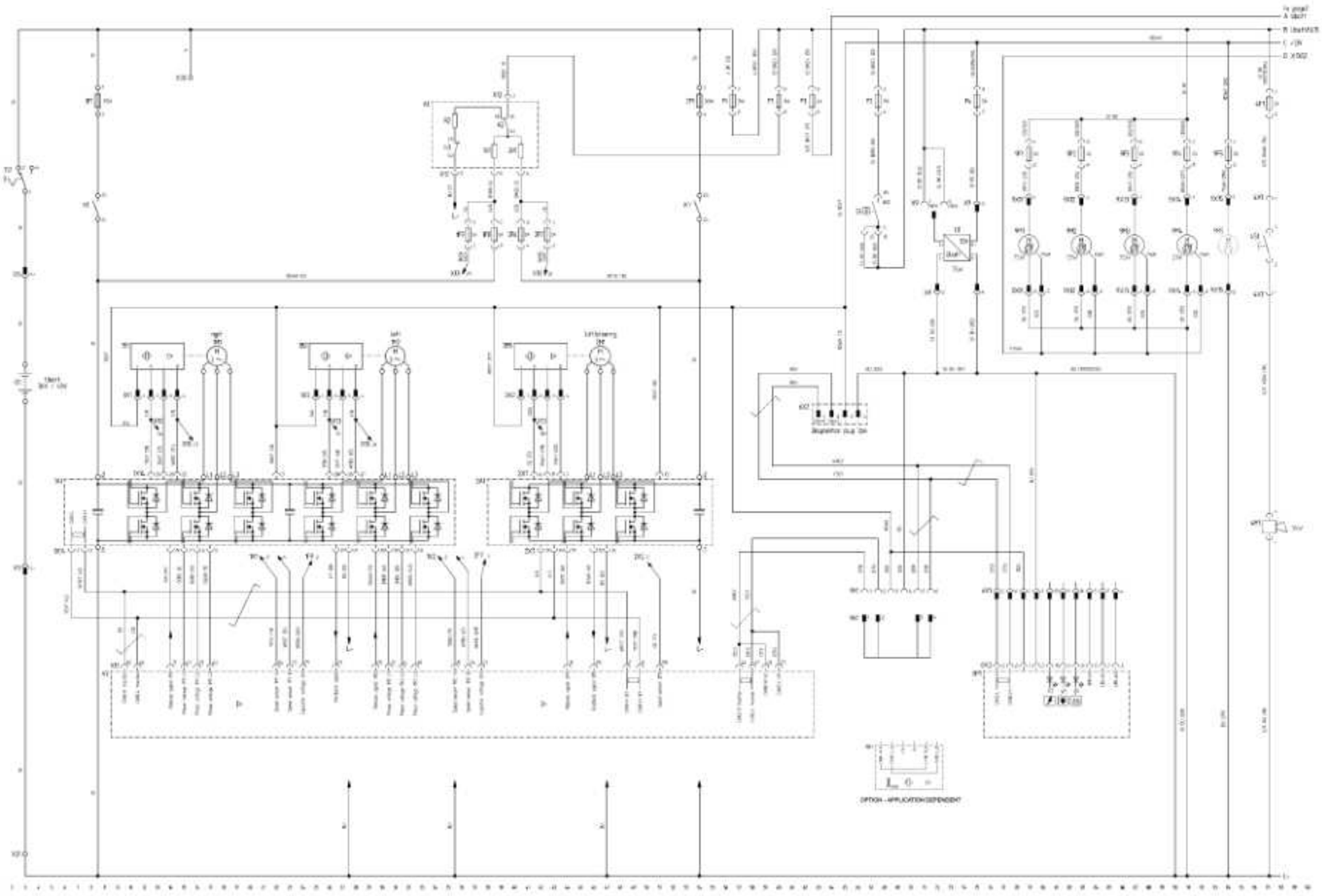
- Value is shown for 5 sec after switch-on.
- In new indicator units, this value is 1003 hours.
- Value is counted down synchronously with operating hours.
- Value can be changed via the diagnostic program (0 to 5000 hours).
- Operating hours occurring after service interval has been exceeded are shown as a negative value, e. g. -15.
- If the operating hours shown are changed, the operating hours value until service is automatically set to 0, i. e. the service interval indicator must be reset via the diagnostic program.

Error codes + Parameters
▼
Display
▼
Parameter
▼
Operating hours
Time to next service (h)

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Wiring diagrams

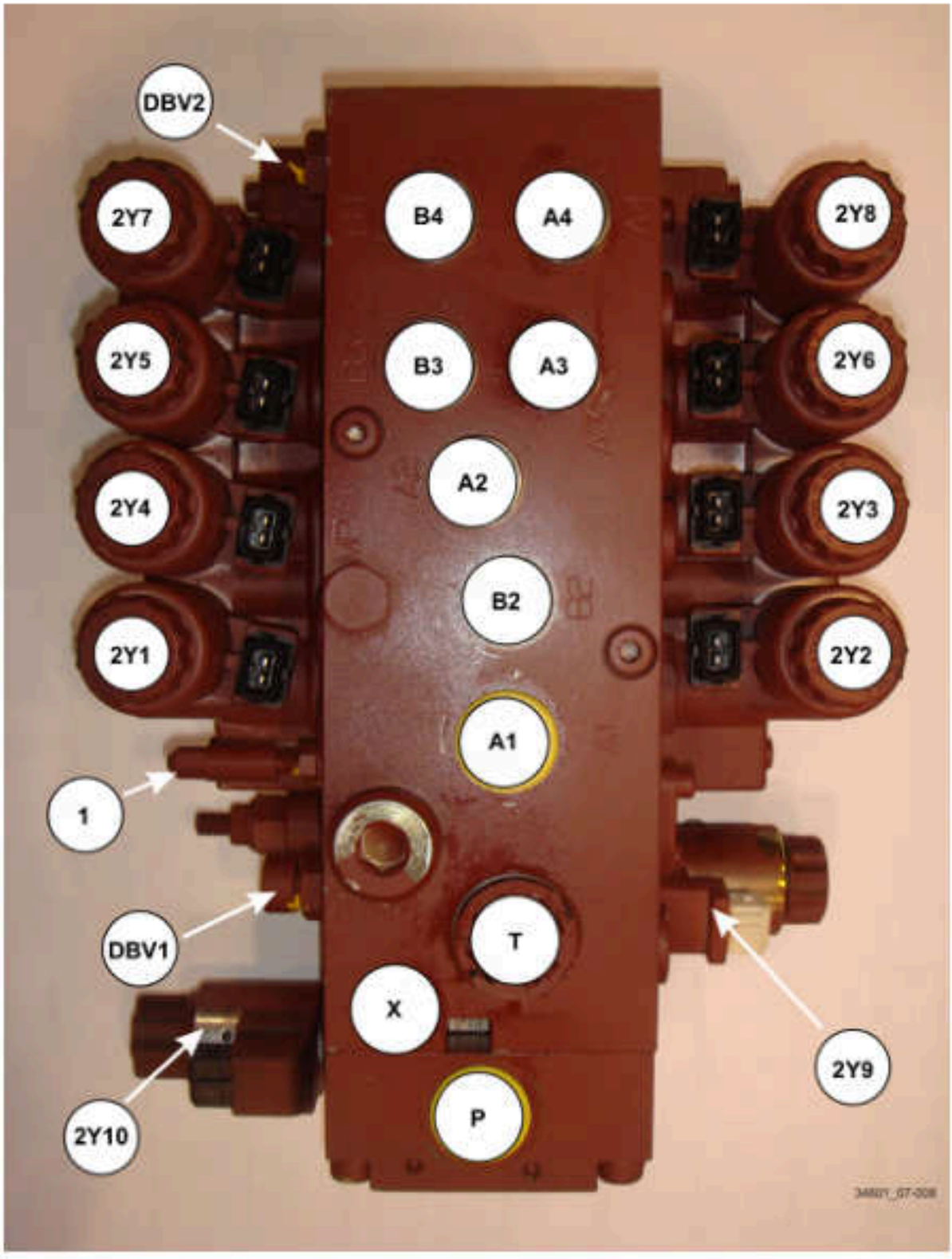
Basic equipment sheet 1



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Control valve

Overview



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Hexagon head screw M12x100

Quantity	2
Use	Fastening extractor strip



Threaded rod (WM11)

Quantity	1
Use	Pressing out wheel shaft



Intermediate ring (WM454)

Quantity	1
Use	Fitting / removing slotted nut

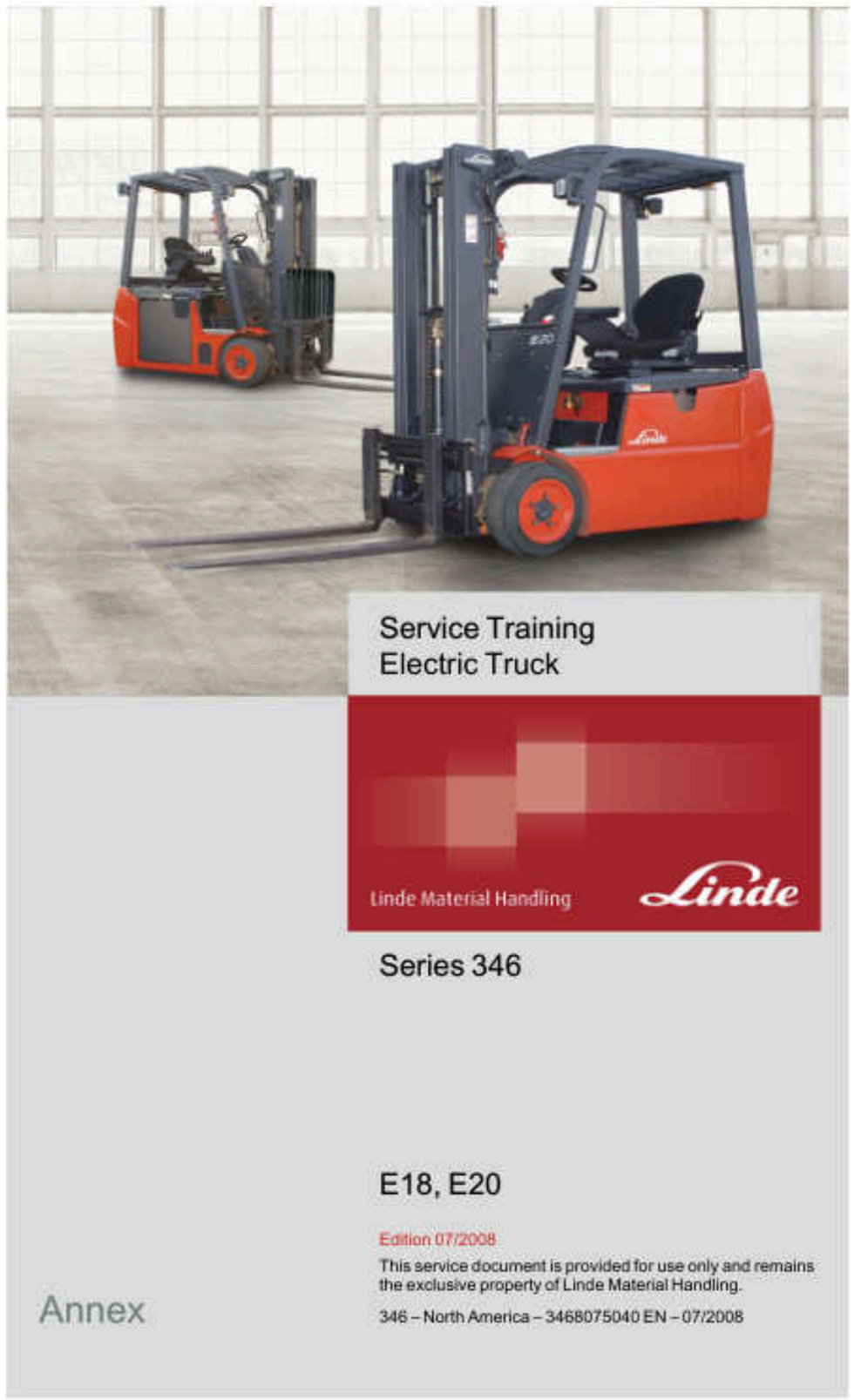


Ejector rod (WM109)

Quantity	1
Use	Removing the shaft seal ring



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Annex

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