



Workshop literature

Electric trolleys and tow tractors

R07, R08



0736 0737 0809 0810

173709 EN - 06/2018

first in intralogistics

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

- Thank you very much for reading the preview of the manual.
- You can download the complete manual from: www.heydownloads.com by clicking the link below



- Please note: If there is no response to CLICKING the link, please download this PDF first and then click on it.

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

50 Controls

Accelerator	50-1
Accelerator pedal	50-1
Recuperating spring replacement	50-2
Preassembling the accelerator pedal	50-2

60 Electrics/electronics

Wiring	60-1
Maintenance guidelines for power cables	60-1
Power cables	60-2
Repair - Contact elements	60-3
Electrical control	60-5
EMC – Electromagnetic compatibility	60-5
AC Control - operating principle	60-6
LAC 24 (127-03)	60-8
Baseplate	60-9
Control unit for the fan housing and cooling system housing	60-10
LAC 24 wiring	60-11
Fuses	60-12
Fuses 127-03	60-13
Main contactor (127-03)	60-16
DC/DC converters	60-17
DC/DC converter, 80 V/13 V (127-03)	60-17
Lighting converters	60-18
Lighting relays	60-19
Lighting jumpers	60-20
Control module - A2	60-22
Plug connector X13	60-23
Switching on	60-26
Changed switch sequence	60-27
Charge resistor module - A11	60-27
Electrical control - traction	60-30
Traction power modules	60-30
Seat switch	60-33
Battery door lock switch	60-34
Direction switch	60-35
Parking brake	60-36
Accelerator	60-38

**NOTE**

To operate the USB CAN box, the appropriate driver must be installed on the diagnostic laptop. The driver can be obtained from the following sources:

- *Linde Extranet → After Sales / Service Fork Lifts → Software / Download of Service Software → Diag_Adapter → CANbox USB II 3903605141 / CANbox USB III 3903605114*
- *Service Software Stick **7917424003***

Application	Description	Nm	Comment
Swivel bearing cap	Special part	195	Tighten and release 2-3 times to ensure the swivel bearings are firmly seated before finally being tightened, and adjust to the nearest hole in the locking plate.
Shock absorber mounting nut	M12 Nyloc nut	64	
Drive wheel bolt		195	
Steering wheel bolt		195	
Master cylinder to booster		16	
Brake booster to chassis	M8 Hexagon head (grade 8.8)	23	Standard torque
Brake bundy pipes	Running nuts on brake pipes	10	
Brake banjo bolts to master cylinder	Banjo bolt with copper washer	16	
Banjo bolt (brake booster and return hose)	Banjo bolt	30	
Adaptor (brake accumulator block)	M16 (pump supply)	60	
Adaptor (brake accumulator block)	M18 (to steering)	75	
Adaptor (brake accumulator block)	M16 (brake booster)	60	
Adaptor (return block)	M18 (steering return, return to tank)	75	
Hose connections	M22	50	
Hose connections	M18	32	
Hose connections	M12	20	
Bundy pipe (M12)	Brake accumulator to return block	15	Both ends

Section 5 – Controls

Application	Description	Nm	Comment

Section 6 – Electric/electronics

Application	Description	Nm	Comment
Main fuses	Hexagonal nut M10	14	Brass

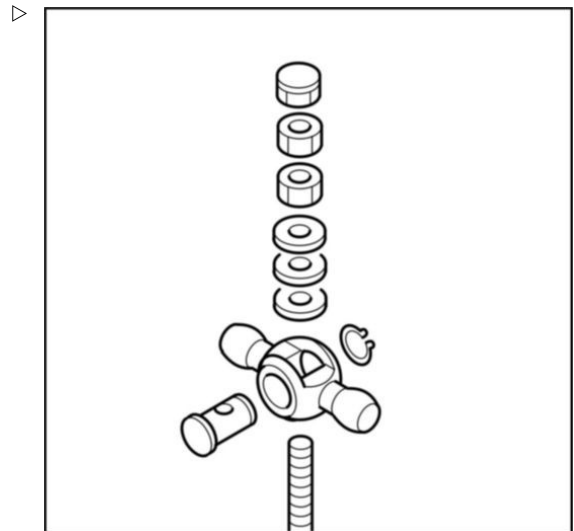
Section 7 – Hydraulic installation

Application	Description	Nm	Comment
Pump motor terminals	M6	7	Brass
Filter body mounting screws	M10 Hexagon head	17.5	Use spring washers supplied
Oil level switch	Brass fitting	45	
Tank plug	M10	18	

- Remove the nyloc nuts and washers with which the axle stub bolts are secured. Do **NOT** remove the pivot pins.



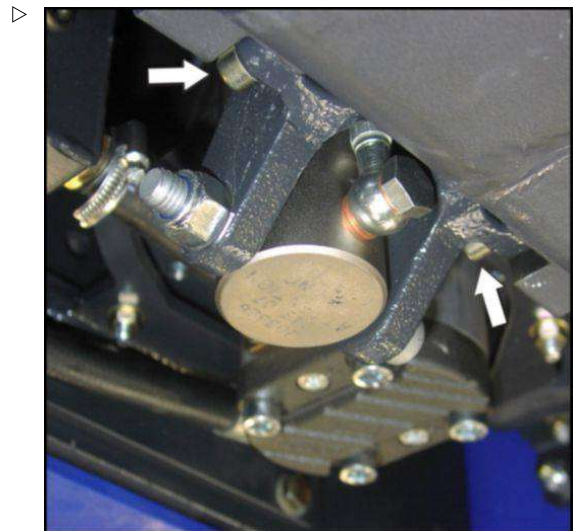
- Remove the parking brake adjusting nuts and pivot assembly.



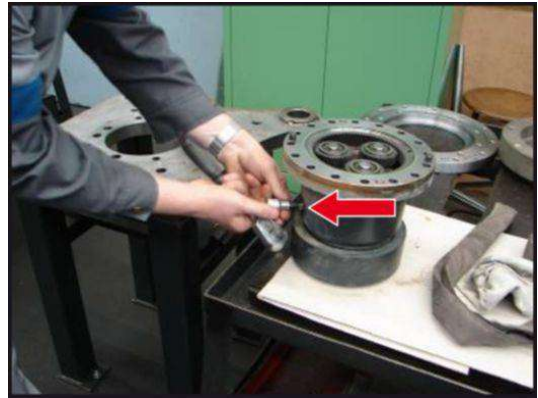
- Remove the four screws which secure the parking brake cylinder mounting bracket.

i NOTE

Do not disconnect the hydraulic connection.



- Close gearbox oil drain plug again.



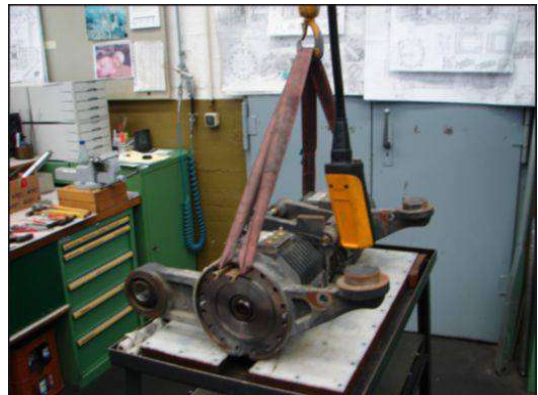
- Screw in two screws to reposition the axle.



- Cover gearbox so that no dirt can fall in.

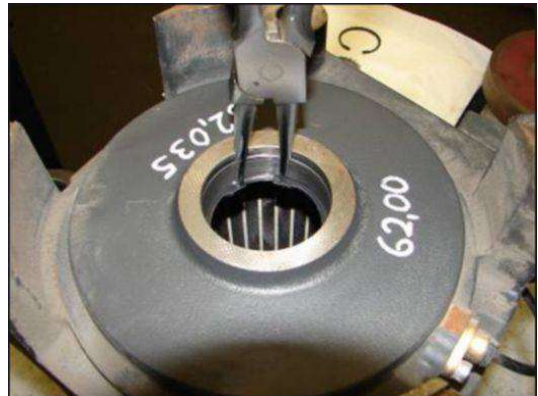


- Rest axle on an even surface using a rope.

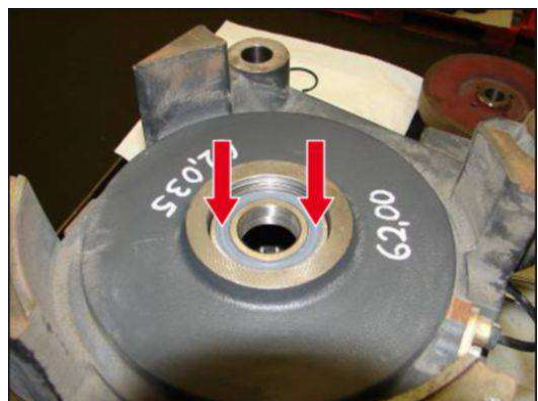


Engine assembly

- Fit lower retaining ring in C4 bearing seating. ▷



- Insert C4 bearing. ▷



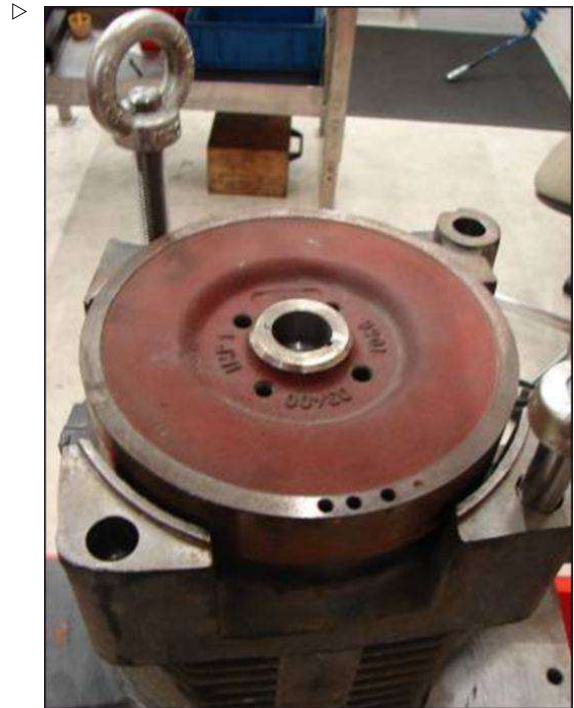
- Place upper retaining ring in C4 bearing. ▷



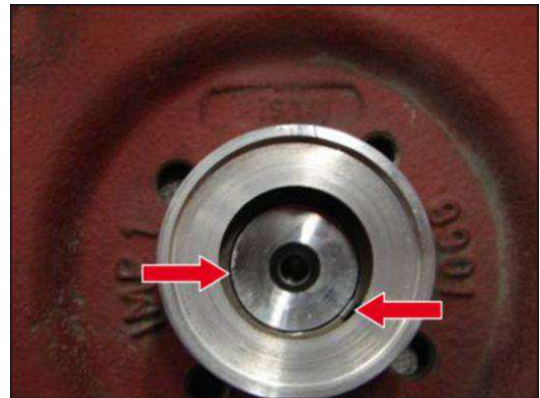
- Turn housing. ▷



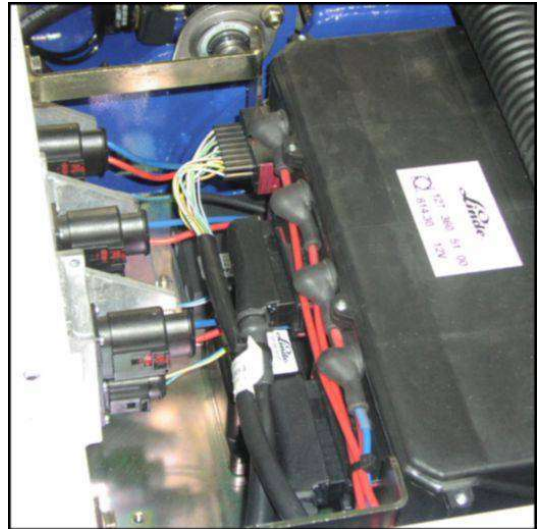
- Attach brake disc.
- Place mounting ring on brake disc.



- Ensure shaft and parallel key can move freely. ▷
- Carefully press down the brake disc.
- Remove engine from press and prepare for installing on axle.



- Disconnect the plug connectors located on the lighting fuse box. ▷



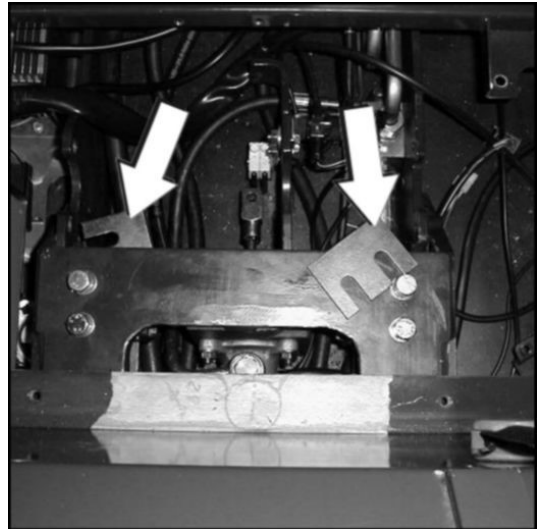
- Disconnect all hydraulic connections from the steering unit, noting their position for re-assembly. ▷



- Remove the two nuts located behind the seat which secure the rear of the cab. ▷



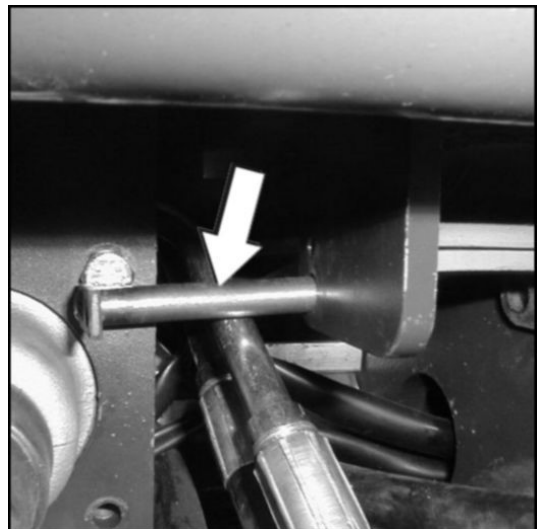
- ▷ – Remove the four screws which secure the leaf spring support brackets. Note the position and quantity of shims for re-assembly.



- ▷ – Extract both leaf spring locating pins on the support bracket.

**NOTE**

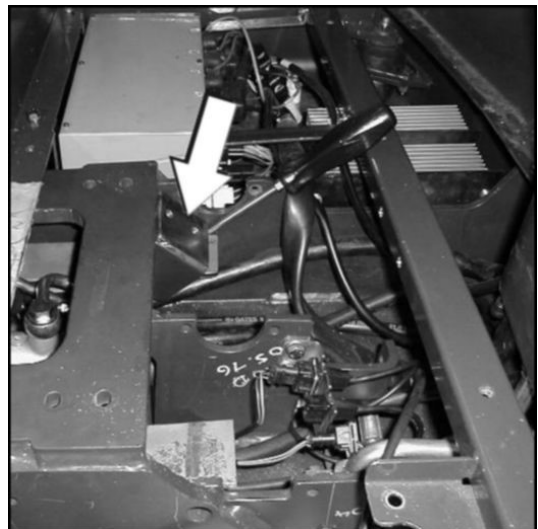
The bracket will need to be moved forwards to provide clearance for the bolt.



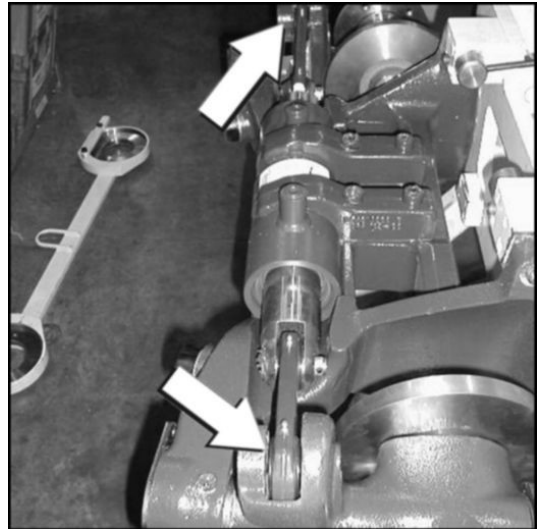
- ▷ – Remove both leaf spring support brackets.

**NOTE**

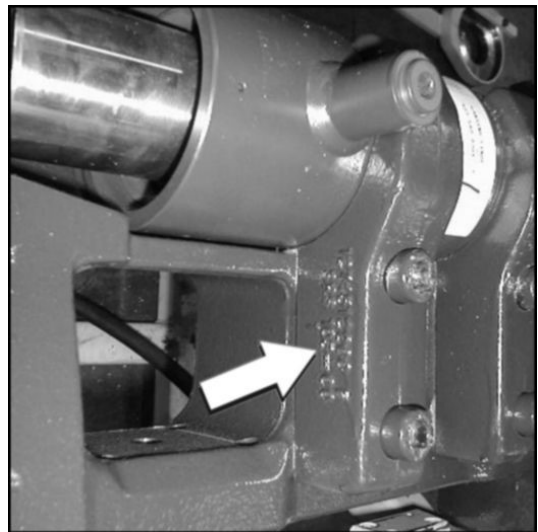
The leaf springs will need to be moved away from the chassis in order to provide clearance for the brackets.



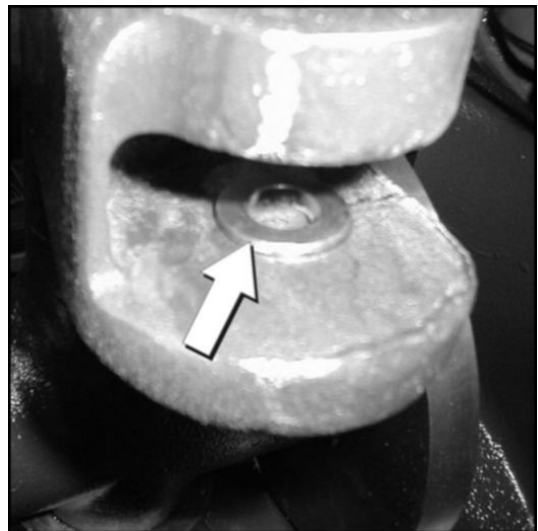
- Position and fix the intermediate steering shaft. ▷
Make sure it is in the centre of the axle frame and that the tie rods are seated centrally in the axle support lifting lugs.



- Ensure that the writing on the clamps is facing towards the outside of the axle frame. ▷
- Tighten steer axle clamp screws to 275 Nm.



- Insert the washers into the recess in the axle support. ▷
- Place the tie rods in position, ensuring the washers are in position.



CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

- Thank you very much for reading the preview of the manual.
- You can download the complete manual from: www.heydownloads.com by clicking the link below



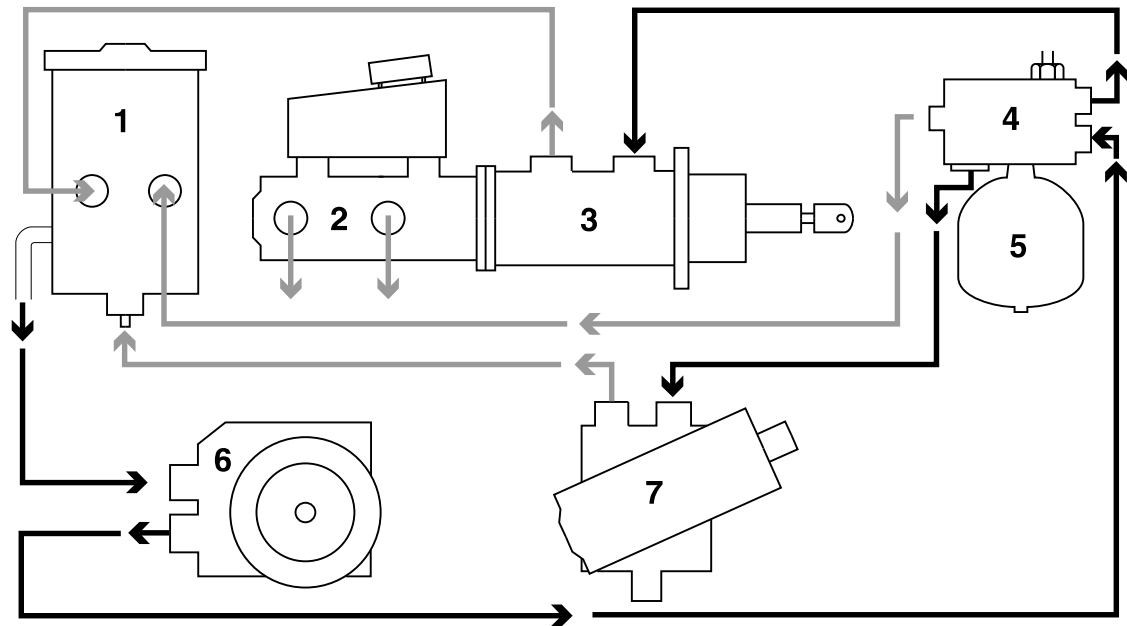
- Please note: If there is no response to CLICKING the link, please download this PDF first and then click on it.

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

Brake installation

Mechanical service brake

Overview



- | | | | |
|---|------------------------------------|---|-----------------------|
| 1 | Hydraulic tank | 5 | Hydraulic accumulator |
| 2 | Tandem master cylinder | 6 | Pump |
| 3 | Servo cylinder | 7 | Steering unit |
| 4 | Pressure controlled flow regulator | | |

⚠ WARNING

Before working on or disconnecting any part of the brake force booster system, the system must first be depressurised.

To release the pressure, apply the foot brake twenty times with the key switch turned **OFF**.

The braking system is a dual circuit with a servo cylinder, which is supplied with pressure from the power steering system via an accumulator.

The front wheel brakes are automotive-style disc brakes, with twin piston callipers.

The two rear brake discs are integrated in the drive axle.

Front brake disc and calliper

Removal

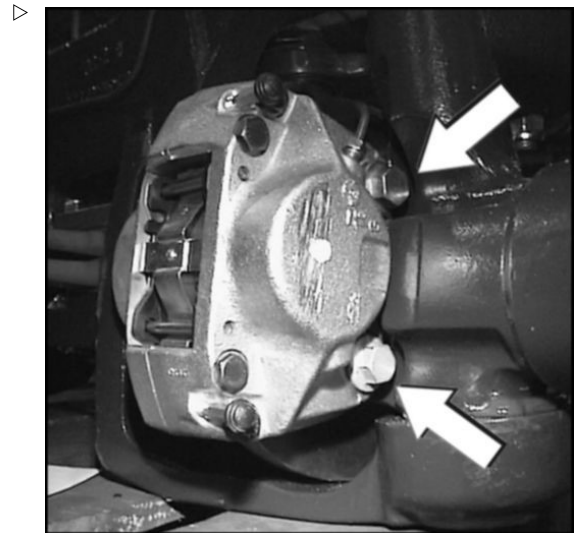
- Disconnect the hydraulic brake pipe from calliper assembly and allow the fluid to drain into a suitable container.
- Plug pipe to prevent contamination.
- Remove the two fixing screws.



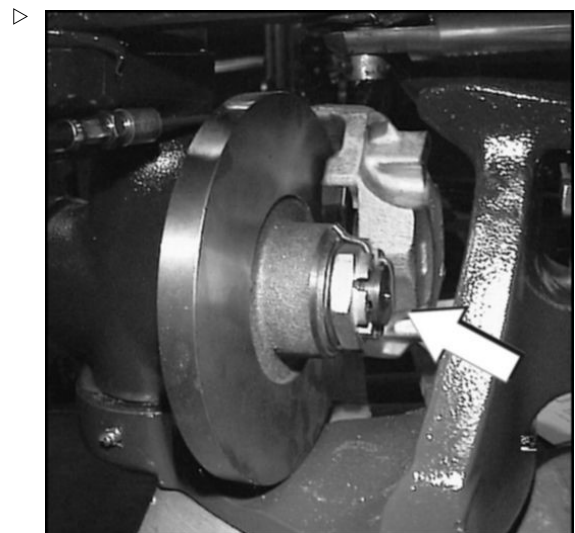
NOTE

The two screws are different sizes.

- Remove the calliper.



- Remove split pin from axle shaft nut.
- Remove nut and washer from the axle shaft.
- Remove the brake disc.
- Examine the discs, making sure they are not deformed or badly scoured. If so they should be replaced.

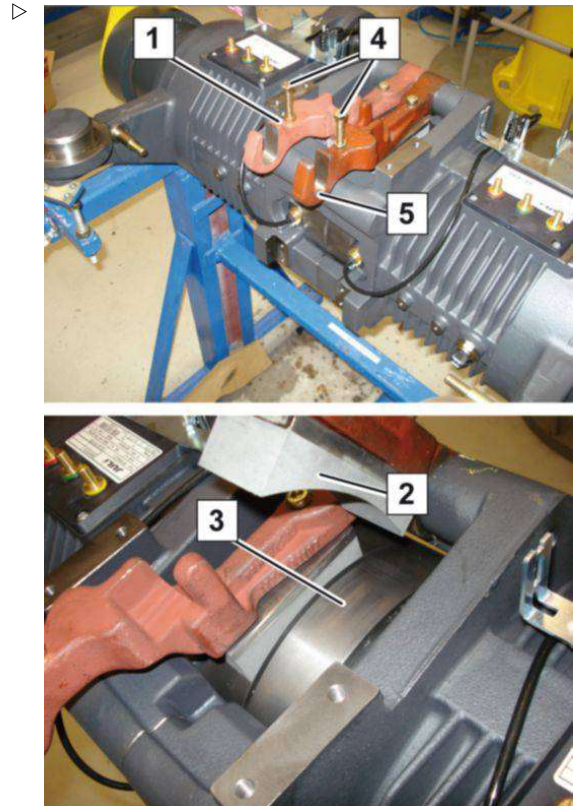


Installation

- Refit brake disc to axle shaft, washer and castellated nut. Torque the nut to 300 Nm, then slacken off to align the nearest castellation with the hole in axle shaft. Fit new split pin.
- Refit calliper assembly to axle support. Apply Loctite 222 to the upper M16 bolt and torque to 240 Nm.. Torque the lower M14 bolt to 195 Nm, do not use Loctite on the lower bolt.
- Refit brake pads. Refer to relevant procedure.
- Reconnect the brake pipe to calliper assembly.
- Bleed the brakes. Refer to relevant procedure.

Actuating element for the coach box brake

The drive axle comprises two traction motors. A brake disc (3) is pressed onto the armature shaft of each motor. The brake linings (2) can be pressed against the brake disc (3) using a lever (1). The lever has U-shaped tow-bar eyes (5) in which a tension rod connected to the parking brake cylinder is slotted. In an emergency, the brake can be released using the screws (4).



Wiring

Maintenance guidelines for power cables

1000-hour maintenance

- Check all cable connections on the power cables for damage. Check that the connections are securely attached, check the condition and check for corrosion
- Check the condition of conductor rails and bolts and check for corrosion
- Remove oxidation residue
- Replace brittle and defective cables
- Check the tightening torques

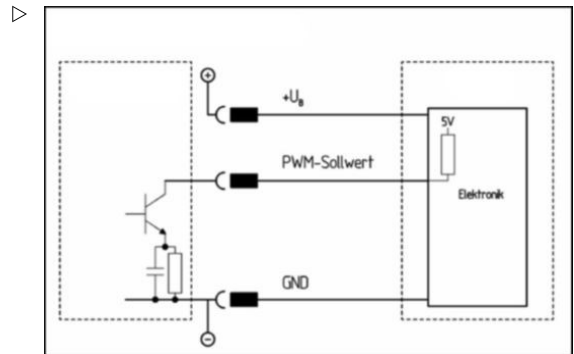
New

- 80-V supply voltage instead of 24 V
- Old and new fans are not interchangeable

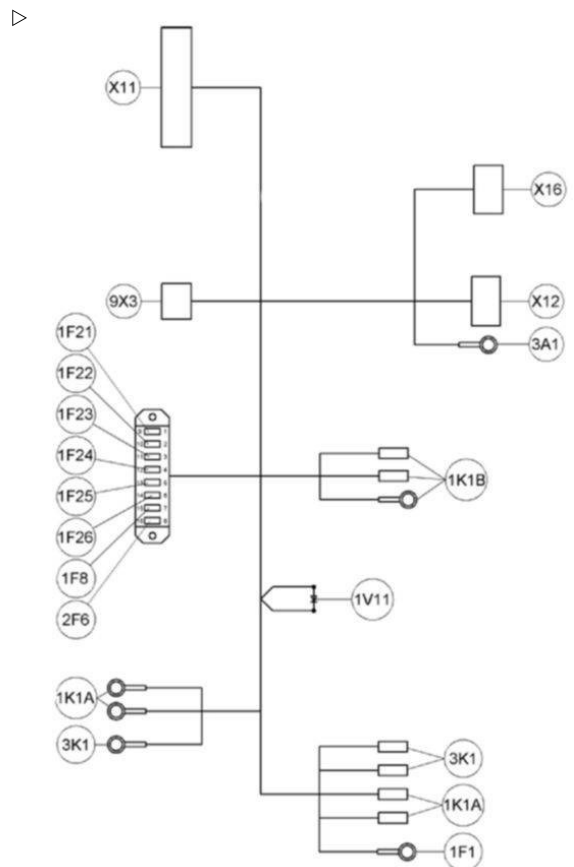
Identical to previous fan versions

- Same activation
- Same dimensions
- Same mounting

Setpoint signal for the input circuit

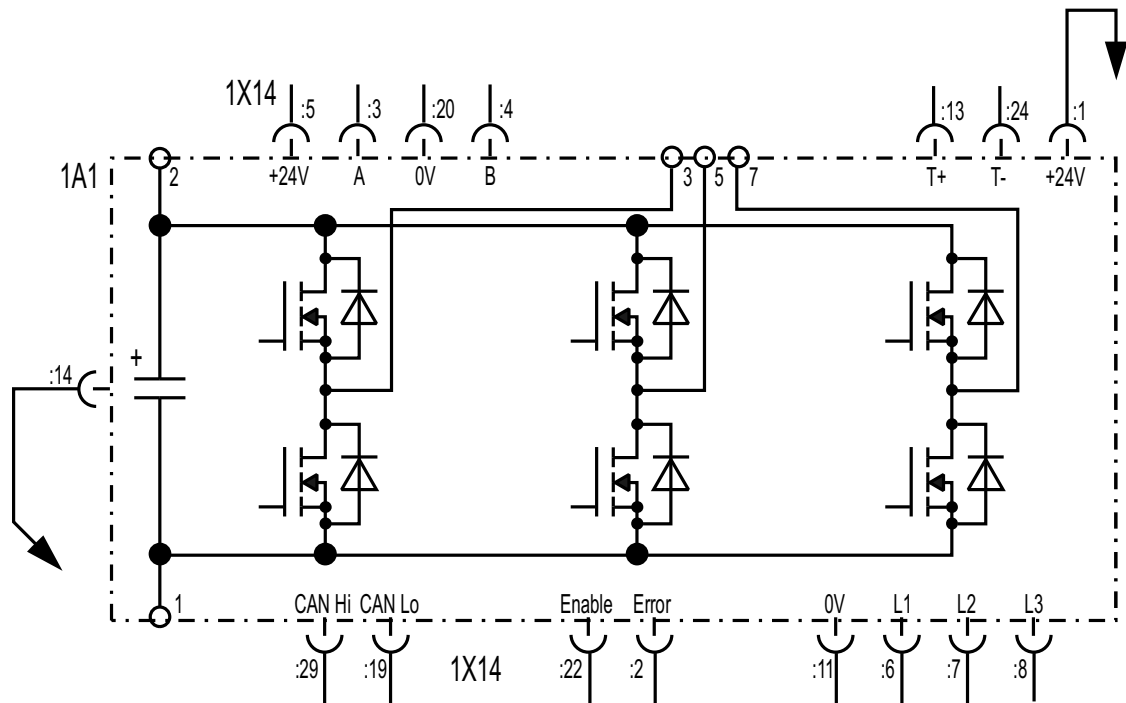


LAC 24 wiring



Link	Function	Road lighting left hand drive	High level lighting left hand drive	Road lighting right hand drive	High level lighting right hand drive
J7:14	Side lights from battery	■	■	■	■
J8:15	12/24V seat heater from terminal B				
J8:16	12V seat heater from terminal 30	■	■	■	■

Connector 1X14 and 1X15 pin designations



:1	24 volt supply	:16	Not connected
:2	Error signal	:17	Not connected
:3	Motor speed sensor signal A	:18	Not connected
:4	Motor speed sensor signal B	:19	CAN bus Lo connection
:5	24 volt supply to motor speed sensor	:20	Negative supply to motor speed sensor
:6	Phase voltage L1	:21	Not connected
:7	Phase voltage L2	:22	Enable signal
:8	Phase voltage L3	:23	Not connected
:9	Not connected	:24	Motor temperature T-
:10	Not connected	:25	Not connected
:11	Negative	:26	Not connected
:12	Not connected	:27	Not connected
:13	Motor temperature T+	:28	Not connected
:14	Coding pin for 1A1 (Not connected for 1A2)	:29	CAN bus Hi connection
:15	Coding pin for 1A2 (Not connected for 1A1)		

Error signal

The modules report their readiness for operation to the control unit A2 via the CAN bus 2. For safety reasons both the power modules are also connected to the control module via separate connections, 1X14:2 to X13:34 (1A1) and 1X15:2 to X13:15 (1A2). With the power module functioning correctly, a negative signal is present.

Enable signal

For traction to be available, an enable signal must be present at both the power modules 1A1 and 1A2. The signal is generated by the control module A2 and sent to the power modules via X13:9 and :10

In order to generate these enable signals, both hard-wired inputs and internally generated signals are monitored by the control module.

Speed signals

Each traction motor is fitted with a speed sensor which senses motor speed and direction of rotation. The speed sensor for motor 1M1 is connected to the power module via 1X14:3 (sensor A) and 1X14:4 (sensor B). The speed sensor for motor 1M2 is connected to the power module via 1X15:3 (sensor A) and 1X15:4 (sensor B). Speed and direction information is sent from the power modules to the control module via the CAN bus 2. For safety reasons speed and direction of rota-

Regenerative braking

During electrical braking the “slip” is reversed such that the motor frequency is slightly greater than that of the controller. Energy recovered is returned to the battery.

The tractor has four types of regenerative braking.

Foot off electrical braking

Electrical braking when the accelerator pedal is released.

Change of direction electrical braking

Electrical braking when the opposite direction of travel is selected.

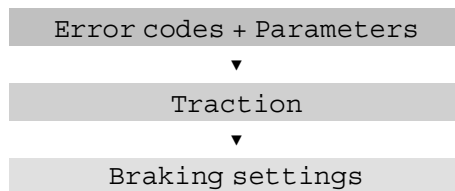
Footbrake electrical braking

Electrical braking when the footbrake is depressed.

Parking brake electrical braking

Electrical braking when the parking brake is applied

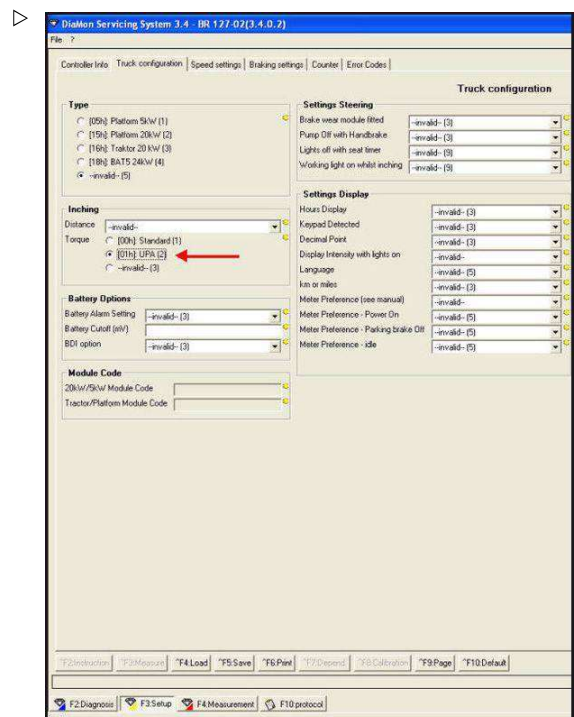
The level of electrical braking can be set using diagnostic software :



Improved reverse inching

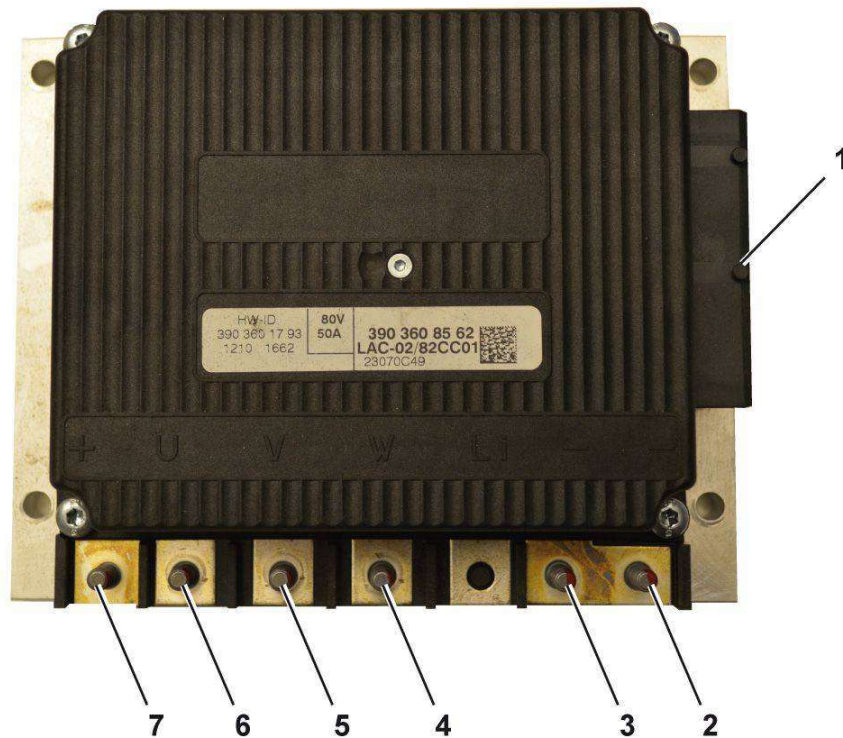
Since the introduction of series 0127-02, we have occasionally received complaints about inadequate drive performance when reverse inching over obstacles (roll-back monitoring has led to the drive switching off).

- A UPA characteristic curve is now available for reverse inching (reverse inching possible on gradients up to 6%).
- "Trainer" access rights are required to activate the UPA characteristic curve via diagnostics, i.e. technicians cannot see this option in diagnostics when logging in normally, nor can they read it out.



Electrical control - Steering

Steering power module LAC 02 (127-03)



- | | | | |
|---|-----------------------------|---|-----------------------------|
| 1 | Plug connector 3X7 | 5 | Motor connection V |
| 2 | Battery negative connection | 6 | Motor connection U |
| 3 | Battery negative connection | 7 | Positive battery connection |
| 4 | Motor connection W | | |

⚠ CAUTION

Risk of damage from electrostatic charge!

Do not touch the pins on the 42-pin plug. The modules are supplied with a protective cover that fits over the connectors. Always ensure this cover is in place when transporting a module.

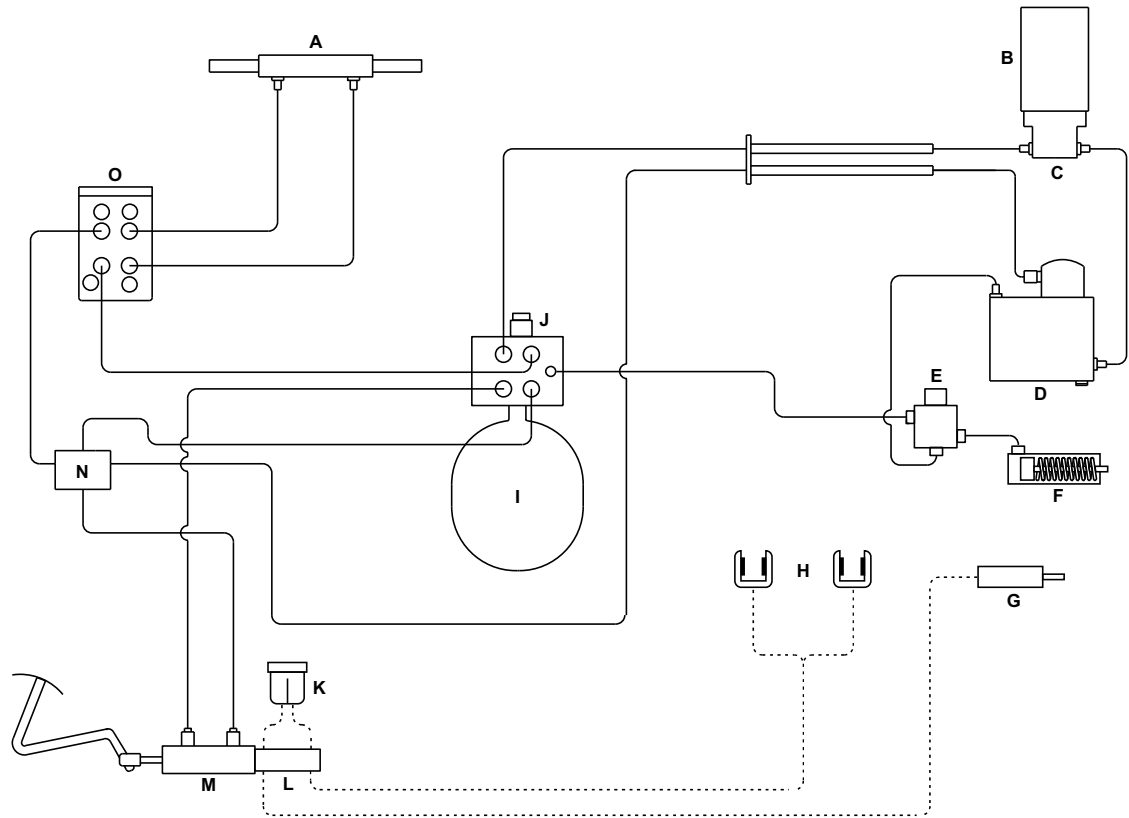
Do not attempt to open a power module as this will result in damage.

i NOTE

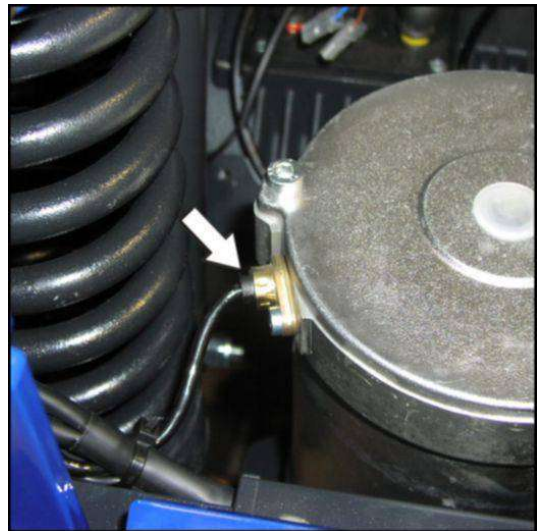
The power modules for the drive unit and pump activation are connected via a second local CAN bus to the truck control unit.

Basic hydraulics

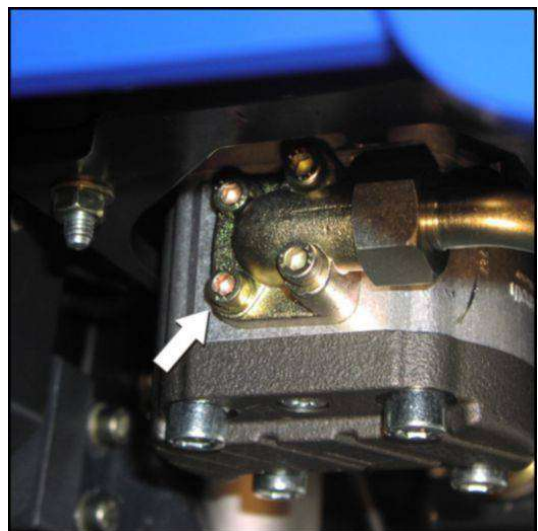
Hydraulic and braking system schematic



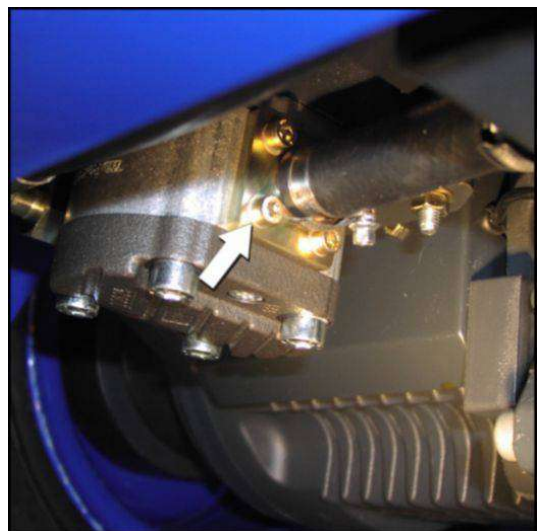
- Disconnect the motor speed sensor.



- Remove the four cylinder head bolts and washers that fasten the tank to the pump hose adapter, taking care to retrieve the O-ring seal.



- Remove the four cylinder head bolts and washers that fasten the pump hose adapter to the other side of the pump, taking care to retrieve the O-ring seal.



CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL

- Thank you very much for reading the preview of the manual.
- You can download the complete manual from: www.heydownloads.com by clicking the link below



- Please note: If there is no response to CLICKING the link, please download this PDF first and then click on it.

CLICK HERE TO **DOWNLOAD** THE COMPLETE MANUAL