Workshop Manual EFU 3001

1/0360

First issued: 04/01 Last update:		Workshop Manual	**EFU 3001** with Highpulse	Id. No. W8 054 232

Signs on the vehicle

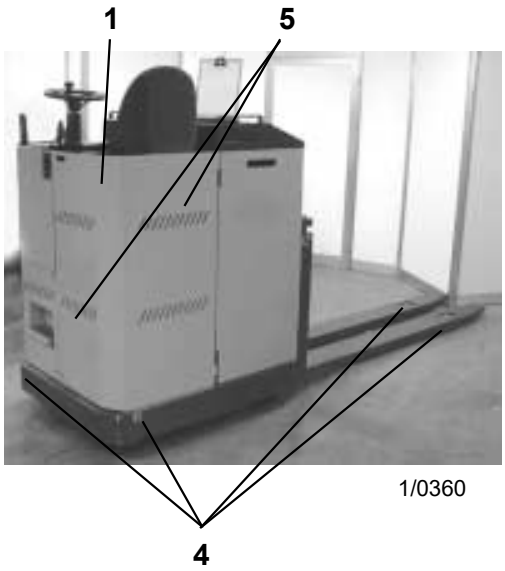
1 Factory nameplate (next to the driver's seat)

2 UVV test plaque

3 Maximum pressure for hydraulics

4 Towing points

5 Vehicle no. on chassis (behind the driver's seat and on drive motor support)



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Vehicle data

• Load bearing capacity	3000kg
• Drive motor	5.2kW
• Maximum speed	12km/h
• Dimensions L/W/H	3700/990/1930
• Unloaded weight	2340kg
• Battery type	PzS
Volts/amps	48/560
Weight min/max	886 - 933kg

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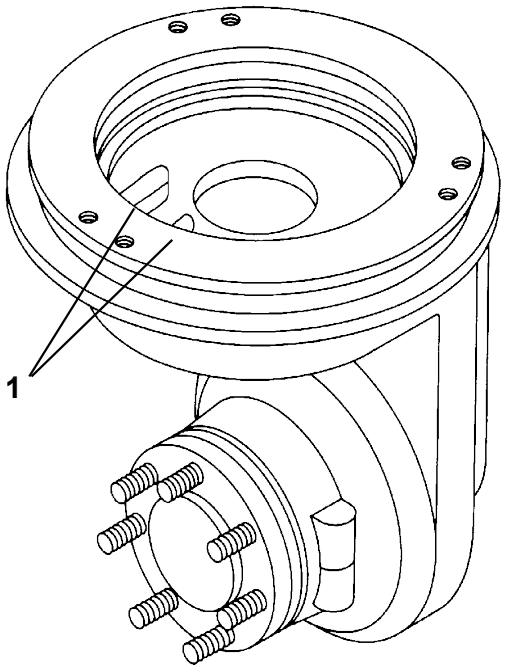
Drive motor maintenance

Visual inspection, replacing damaged parts

- Straighten or replace dented sealing tapes.
- Check fan impellers for damage. Damaged fans (imbalance, reduced output) must be replaced.
- Clean the gear ventilation channels (1). To do so, remove the drive motor and clean the channels with a vacuum cleaner (do not blow them out with compressed air). Soiling impairs the air circulation, which leads to increased temperatures in the motor and possibly to irreparable damage.
- Check field and armature coils for signs of over-loading (overheating): dark coloration, brittle or burned insulation, unsoldered commutators. Motors with this kind of damage must be replaced without delay.
- If you discover oil or grease in the motor (usually a paste made up of oil, oil vapour mixed with dust and carbon abrasions), investigate the cause immediately and remedy it.
  The motor must be cleaned extremely thoroughly.



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Remark: Rapid carbon brush or commutator wear is generally due to the effect of oil.
The oil/grease burns in the brush sparks, leaving behind a sharp-edged oil ash which has an abrasive effect.
This can lead to inadmissibly high levels of carbon brush wear before the scheduled maintenance date is reached.

Steering controller WLR 48/30

Id. no. W8 409 943

General

The steering controller is used in combination with a split field motor in electrically assisted steering systems.

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The setpoint request made with the steering wheel is measured by differential magneto-resistive sensors and evaluated, as a result of which the integrated MOSFET power amplifier is driven.

In combination with the non-linear current/ torque characteristic curve, this gives a steering performance that guarantees both high stability during fast travel and easy steering at a standstill.

Internal monitoring functions guarantee a safe function.

Installing/removing the drive motor brake

Note: Once the brake has been removed, the vehicle is no longer braked. For this reason:
- Pull out the battery plug.
- Jack up the vehicle and secure it to prevent it from rolling away.

Removal:

- Remove the brake hose (1) from the brake cylinder, making sure that no oil runs out over the brake and motor.
- Remove the brake housing (2) by releasing the 4 hexagon socket screws (3).
- The brake can now be removed from the drive motor.
- For easy removal of the cable pull, relieve the tension on it at the adjusting device of the hand-brake lever.
- Separate the baseplate (4) from the housing by releasing the 7 hexagon socket screws (4) M8 x 16.

Installation:

- Attach the baseplate to the housing.
- Secure the cable pull for the handbrake.
- Set the brake on the motor and screw the housing to the motor flange.
- Attach the brake hose.
- Bleed the brake and reset the handbrake.
- Check that the brake functions correctly.
  - Brake pedal function check
  - Handbrake function check.

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Protective devices

- **Reverse voltage protection**
  The wiring must be exactly as shown in the circuit diagram, so that the power section is not damaged.
  The main contactor protects the power section from reverse voltage.
  The logic itself is protected internally against reverse voltage.

- **Wiring errors**
  All the inputs are protected against wiring errors.
  All the outputs for selecting the contactors may only be loaded with a maximum of 3A, although they are protected against overloading and short-circuiting.

- **Overheating**
  If the housing temperature (heat sink temperature) rises above 80°C, the maximum current is reduced in proportion to the rise in temperature.
  The temperature must not rise above 85°C. If it does, the system switches off.

- **Battery flat**
  If the battery is flat (remaining capacity <10%), the maximum current is reduced to 50%. This function can be switched on and off with the notebook. In this vehicle, the function is switched off.

- **External influences**
  The control unit is built into a closed housing and is therefore protected against dust and splashing water (IP 54).

- **Uncontrolled driving away**
  In order to put the vehicle into gear, a certain switching-on sequence must be followed. If this is not carried out correctly, the vehicle does not start up.
  Switching sequence:
  Key switch ON, door switch actuated, then travel direction signal.

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Configuration

Remark: Values in **<bold print>** apply for this vehicle.

BYPASS CONTACTOR (not used)

BATTERY CHECK

- OFF **(0)** = The charging level of the battery is not monitored;
- ON (1) = The charging level of the battery is monitored. If the remaining capacity is less than 10%, the maximum current is reduced by half and the error LED flashes continuously.

ANTIROLLBACK (ARB)

- Free (0) = No "Anti-rollback"
- Check **(1)** = "Anti-rollback" is active, i.e. if the vehicle rolls backwards on starting up, the logic reacts. The motor is controlled with a steeper current curve to prevent rollback as far as possible.

RELEASE BRAKING

- Free (0) = No generator braking when the travel transducer is moved to zero position (travel transducer switch opens).
- Braking **(1)** = Generator braking when the travel transducer is moved to zero position. The braking current can also be increased with the brake pedal (optional brake pedal switch).

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Error diagnosis

Flashing code on the diagnosis LED

The number of flashing impulses represents the error number. There is a pause of 2 seconds between each code. Only the last error to have occurred is displayed.

Error

1 Error in the electronics (EEPROM DATA KO, EEPROM PAR. KO, EEPROM OFF LINE, CHOPPER NO CONF, WATCH-DOG)

2 When the system is switched on, a travel direction is selected or the start sequence is not maintained (INCORRECT START)

3 VMN not in order (VMN, NO FULL COND)

4 Error in potentiometer signal (VACC NOT OK / VACC >1V)

5 Current flow in main current circuit is not in order (STBY I HIGH, I = 0 EVER)

6 Error at the contactor drivers (DRIVER SHORTED, COIL SHORTED)

7 Temperature > 80°C (TH PROTECTION)

8 The contactors do not close or VMN high is idle position (BRAKE CONT. OPEN, DIR. CONT. OPEN, VMN HIGH)

9 Contactors do not open (BRAKE CONT.CLOSED, DIR.CONT.CLOSED)

Continuous flashing light Battery discharged; remaining capacity < 10%.

Continuous light Both travel directions selected at the same time.

WinPulsE

Opening a file
(File Open)

Option 2:

Alternatively, the file can be opened from the "Parameter Change" window (1).

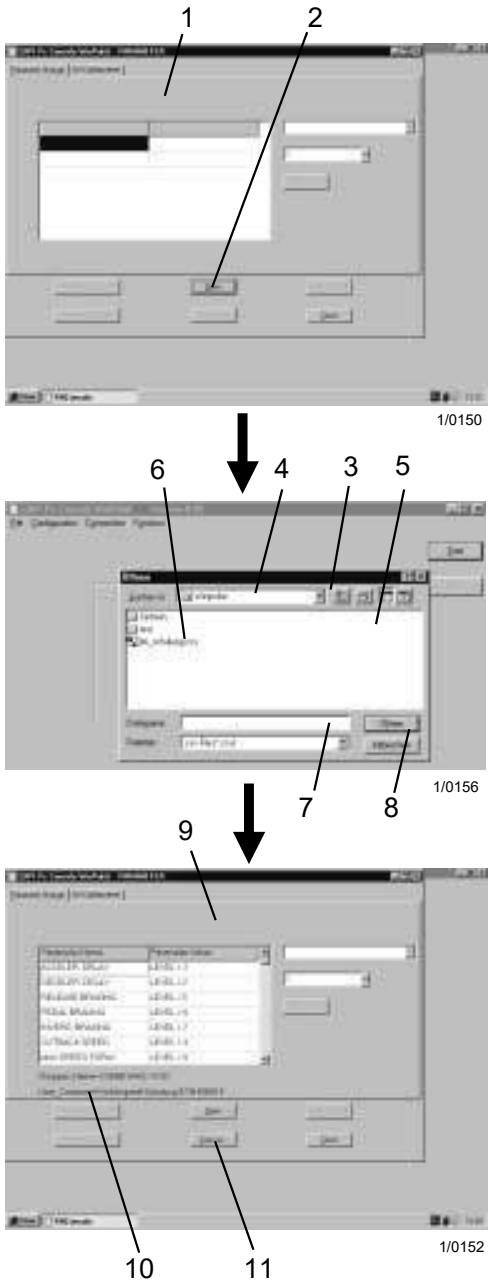
- Select the Open button (2). The "Open" window (3) appears.
- In the "Search in" input field (4), select the directory in which a vehicle file has been stored, e.g. the customer directory. All the saved files are listed in the selection window (5).

Remark: The standard setting is the WinPulsE directory.

- Select the file you want (6). This should appear in the "File name" window (7).
- The file can be read in with the Open button (8). The "Parameter change" window (9) opens and the parameters are displayed.
- There is a User_Comment (10) under the selection window that was entered when the file was saved.

Remark: A file that is opened in this way can be modified and then saved under the same name or a different name!
Before the data can be sent to the control unit, the connection must be made.

- The current window can be quit by selecting the Close button (11).



WinPulsE

Test function (Tester)

Remark: Display function for various control unit signals.
No settings can be made in this function.

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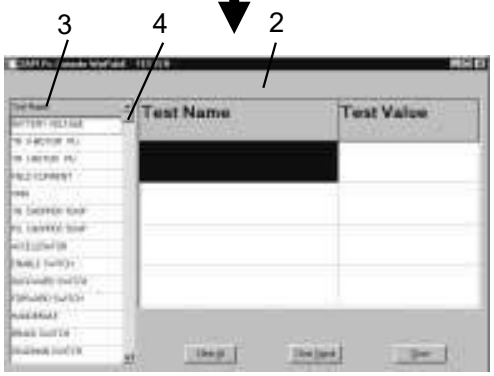
- In the menu bar, click on "Function" and then "Tester" (1).
- The - Tester - window (2) opens.
  The data for the tester is read automatically out of the control unit.
- In the selection window (3), use the scroll bar (4) to find the function you require and click on it with the mouse. The function is automatically displayed in the "Test name" display window (5) with the corresponding "Test value" (6).



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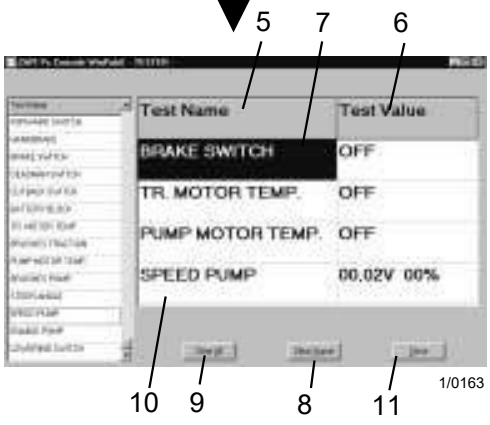
Remark: A maximum of 4 functions can be displayed at one time. If you wish to display different functions, one or all the functions must first be deleted.

- Click on the function you want to delete with the mouse. The background to the function turns blue, e.g. "Brake switch" (7).
- Use the Clear Signal button (8) to delete the selected function.
- The Clear all button (9) deletes all the selected test points from the display window (10).
- Use the Close button (3) to quit the active window.



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Pump assembly

General

The pump assembly is made up of the following components:

Item.	Component
1	Pump motor (compound)
2	Hydraulic pump
3	Hydraulic suction filter
4	Lowering valve (pilot controlled non-return valve
5	Tank (1.5 litres)
6	Air filter
7	Carbon brushes
8	Pressure relief valve
9	Lowering brake valve
10	Non-return valve (load holding valve)