Workshop literature

STILL
ELECTRONIC
DOCUMENTATION
SYSTEM

Power Pallet with Supplementary Lift

EXU-H
(AC)

CE

0203

Ident no. 4492099 - EN

Technical data

Characteristics			
Manufacturer			STILL
Manufacturer's model designation			**EXU H**
Platform			-
Power source: Electric, Diesel, petrol, LPG, electric mains			Battery
Operator type: Hand, pedestrian, stand-on, seated, order picker			Pedestrian
Lifting capacity / load		Q (kg)	2000
Load centre distance		c (mm)	600
Load distance		x (mm)	972
Wheelbase		y (mm)	1468
Weights			
Truck weight	With battery	kg	670
Axle loading with load	Driver's end/load end	kg	984/1685
Axle loading without load	Driver's end/load end	kg	493/177
Wheels, Chassis			
Tyres: Superelastic (SE), air (L), Vulkollan (V)			V
Wheel size	Driver's end	mm	∅230 x 75
Wheel size	Load end	mm	2 x ∅85 x 80
Stabiliser dimensions	Driver's end	mm	2 x ∅125 x 40
Wheels, number (x = drive wheels)	Driver's end/load end		1x -2/4
Distance between centreline of tyres, front		b 10 (mm)	469
Distance between centreline of tyres, rear		b 11 (mm)	388
Dimensions			
Lift		h 3 (mm)	560
Initial lift		h 5 (mm)	130
Height of driver's platform		h 7 (mm)	-
Height of tiller in driving position	Min/max	h 14 (mm)	740/1230
Fork height		h 13 (mm)	91
Overall length		l 1 (mm)	1840
Length of powerhead		l 2 (mm)	646
Overall width		b 1 (mm)	720
Fork thickness		s (mm)	55
Fork width		e (mm)	184
Fork length		l (mm)	1190
Width across forks		b 5 (mm)	564
Ground clearance		m 2 (mm)	20
Working aisle width with 800 x 1200 pallets		Ast (mm)	2089
Turning radius		Wa (mm)	1661

Using the table

This table applies only for joining two metal parts.

If washers are used, the torque must be multiplied with the factor stated in the table.

⚠ CAUTION

When installing in aluminium parts it must be observed that the torque must be multiplied with the factor stated in the table.

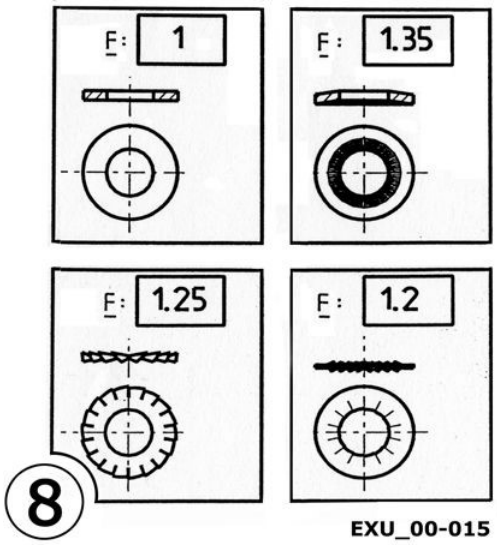
If this information is not applicable for a certain application, please request further information.

Tolerances

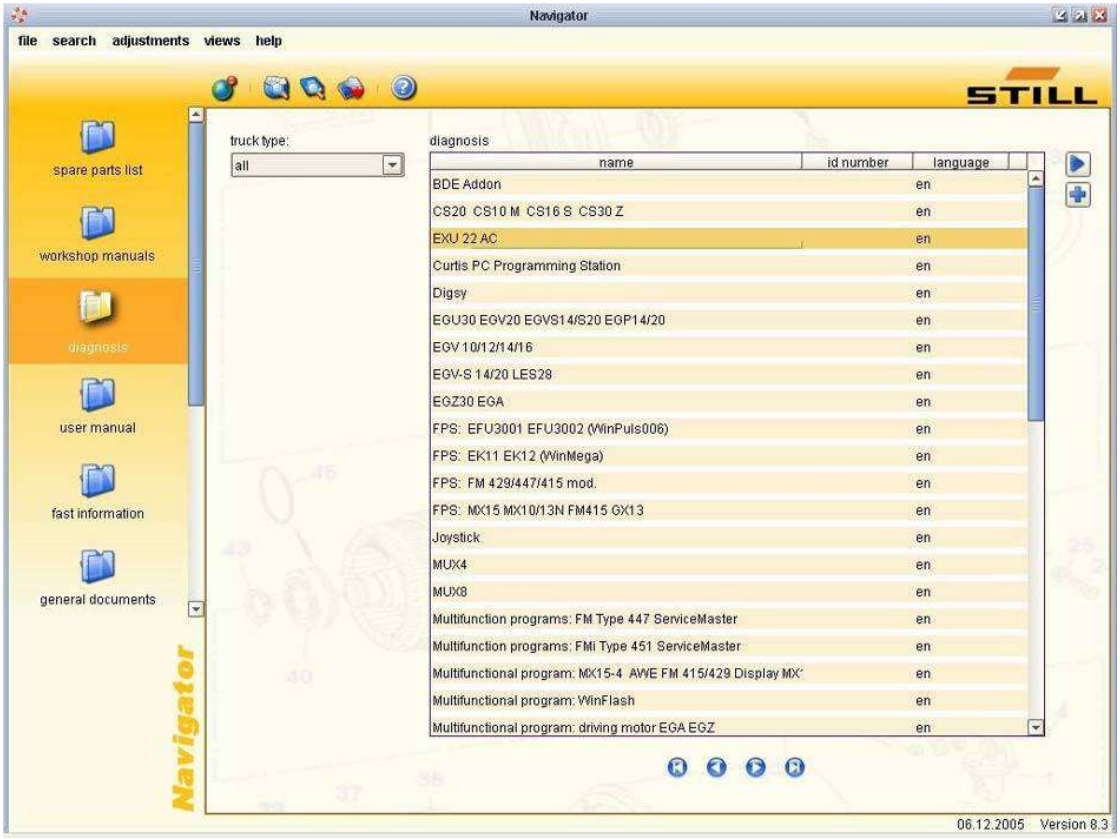
Tightening safety-related parts

Wheel fasteners, motors, reduction gearboxes and hydraulic cylinders, mast-to-frame fasteners, mast rollers, steering stop, brake fasteners, support roller fasteners, pump unit, turntable: ±10%

Other parts (bonnet, accessories, etc...): ±20%



Starting the software



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Before the software can be started, the Notebook must be connected to the truck with the afore-mentioned cables.

– Start "STEDS".
– Click on the "Diagnosis" symbol.
– Select the truck type and click twice (automatic start of the fault diagnosis).

The following window will appear:

– Enter your code ("22113"). ▷

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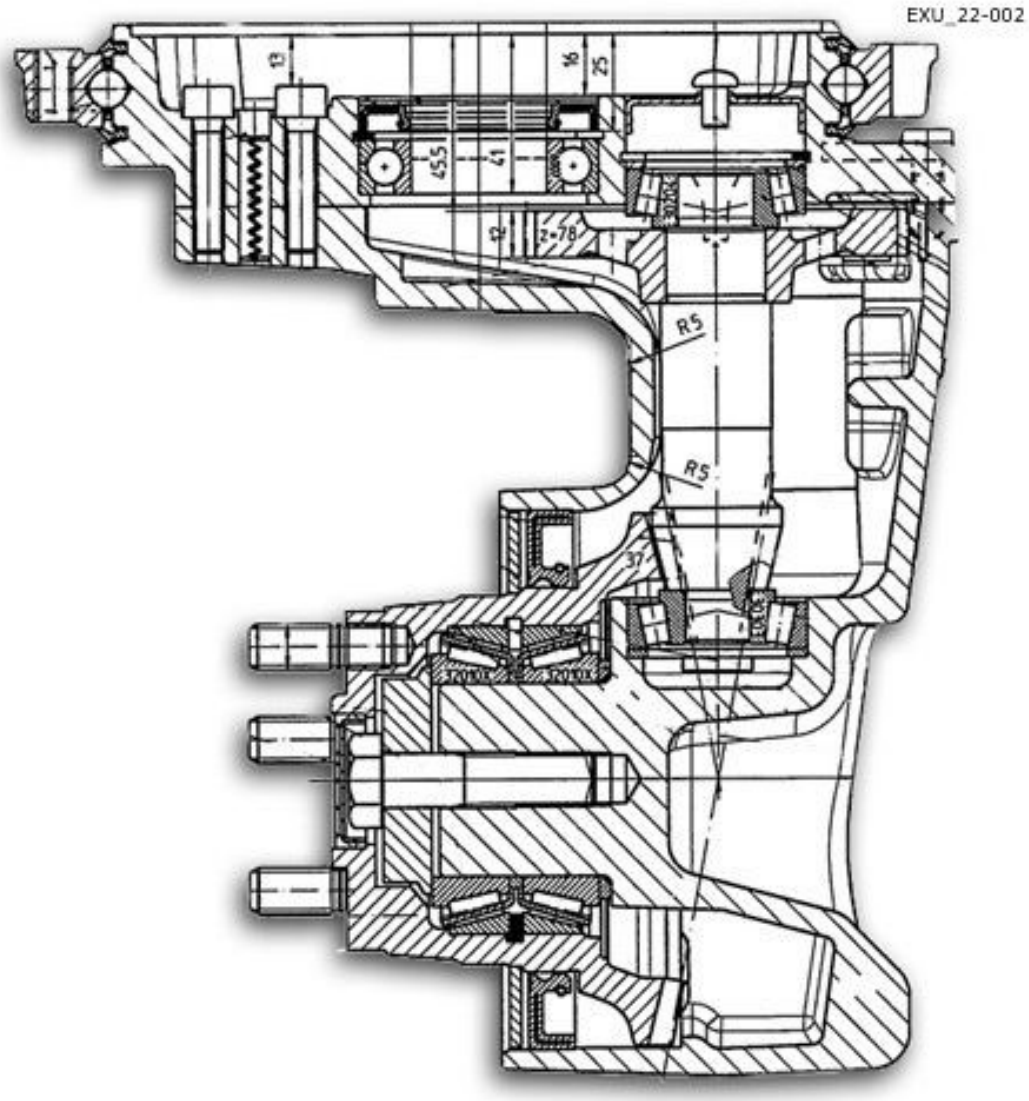
Navigation - introduction

The software allows you to perform the following operations:

- To show the fault list
- To change the parameterisation
- To display various values
- To load, save and print the configuration

Mechanical traction drive

Technical data



⚠ CAUTION

Attention: The gearbox is delivered without oil.

Filling capacity (litres)	1
Max load (N)	10000
Max static torque (Nm)	900
Max dynamic torque (Nm)	600
Max permanent torque (Nm)	150
Gear reduction ratio	30.204

Installation of main cover

Installation is the reverse of removal.

– Tilt the tiller.

– First place the cover in the cut-outs at the bottom in the frame (6).

– Press the top part of the cover into the clips with a short, solid blow in the area of the document holder (7).

– Put the right part of the cover into the frame again and fasten it with the socket head screw (8).

– Insert the right part of the brake cover in the cable holder. Turn the tiller to the right to fasten the left part of the brake cover with two socket head screws (9).

Installation

The installation is carried out in the reverse order of removal:

– First insert the lower part of the cylinder and lock it.

– Insert the upper part of the cylinder and lock it.

Removal of the tiller

The tiller cable must always be removed first.

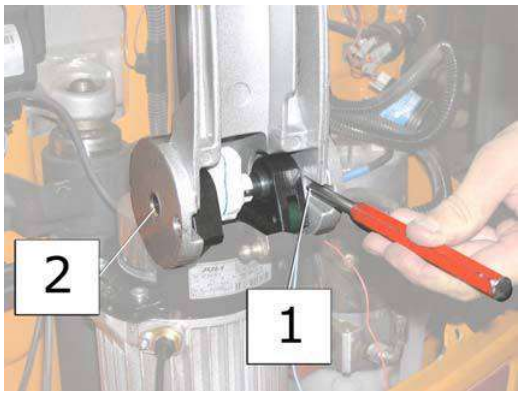
– The tiller head must be removed so that the cable loom can be disconnected from the p. c. board in the tiller⇒ Chapter "Removal of the tiller head", P. 4-3.

– Open the tiller and take the top part of the gas-filled spring out of its mounting⇒ Chapter "Gas-filled spring", P. 4-7.

– Continue to drive out the pin (1) until pin (2) can be extracted from the tiller base.

– Pull the pin out of the tiller base (2).

– Remove the tiller.



General

Method of operation of the electric brake

The following drawing shows the brake inoperative, ie in the braking position.

The compression springs (1) press the brake plate (2) axially against the brake lining (3) and this in turn presses against the flange mounted on the motor.

If the tiller is moved from the home position to the driving position, the microswitch in the tiller base is operated by a cam.

The microswitch sends a signal to the controller, which then excites the winding of the electromagnetic brake (5).

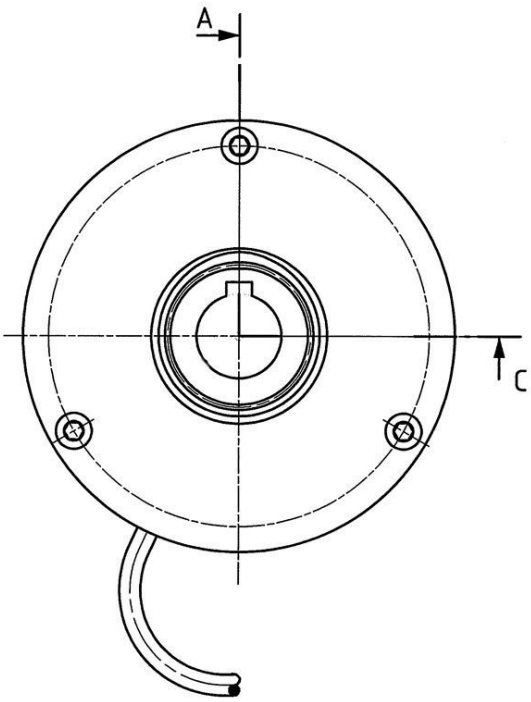
As soon as the field winding of the electromagnetic brake is excited with DC current, the magnetic circuit between the brake plate (2) and the magnetised part (5) closes.

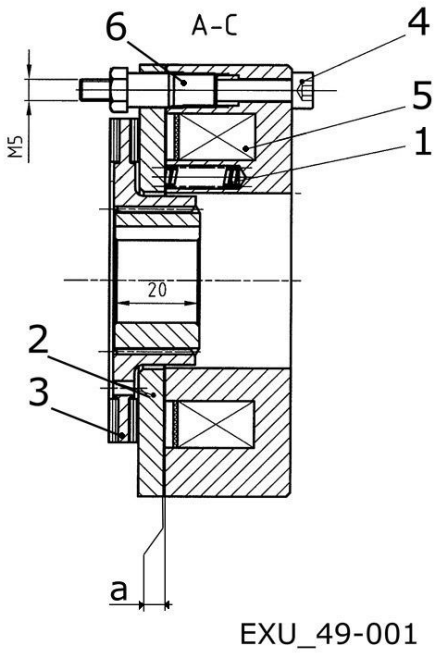
The brake plate (2) moves axially on the permanently fixed magnetised part, whereby the air gap "a" is reduced to "zero", thus releasing the brake lining (3).

NOTE

The air gap of this brake is adjustable.
⇒ Chapter "Adjustment and check of brake air gap", P. 4-21.

Description





1	Compression spring
2	Brake plate
3	Brake lining
4	Adjustment screw
5	Coil
6	Threaded part

Indicators

Battery discharge indicator and hour meter

General

The battery discharge indicator functions according to the principle of permanent comparison of the battery voltage with a series of internally defined reference voltages.

The reference voltage divided into 36 levels corresponds to the curve of the controlled battery discharge.

If the average battery voltage less than the related reference voltage for 46 seconds, the battery discharge indicator (BDI) automatically makes a comparison with the next lower reference voltage level. This procedure is repeated with each voltage level.

As the voltage levels drop, the LED indicator (1) goes from the right to the left. When the cut-off threshold is reached (voltage at the discharge state), the two red LEDs on the left blink.

At the back of the device it is possible to adjust the discharge characteristic to the existing conditions of use(see page 09-04).

The storage of the discharge state of the battery is buffered by a lithium battery (10 years), whereas the levels of the battery discharge indicator are stored in an EEPROM.

Method of operation of the battery discharge indicator

The battery discharge indicator runs as soon as the battery connector is connected. The monitoring of the discharge process protects the battery from deep discharges. When a residual capacity of 20% is reached, the lifting function is cut out. If the battery is fully charged, only the extreme right diode of the 10 LEDs (1) is illuminated. As the battery capacity decreases, the indicator moves to the left. When the battery discharge is 70%, the next to last red diode blinks to indicate that the battery must be charged. When the discharge is 80%, the next to last and last red LEDs flash alternately. The lifting function is cut out and which battery must be charged.

Hour meter

The hour meter (2) counts to 99,999.9 hours. As soon as the tiller is in work position, the hour meter begins to run.

Battery change with a hoist

For the change, the battery can be lifted out with a hoist.

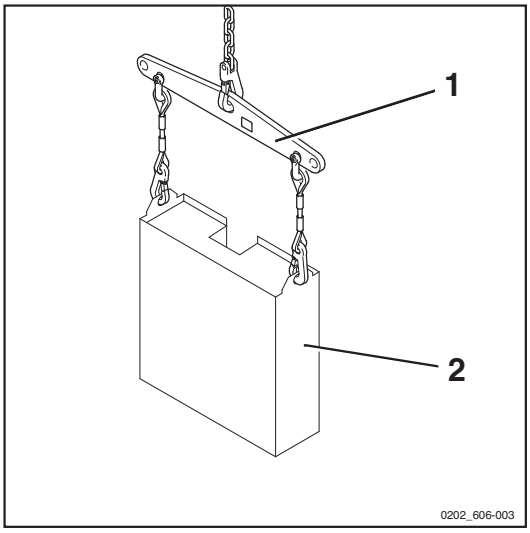
To prevent shorts, it is recommended to protect batteries with unprotected terminal clamps or connections with a rubber mat.

- Attach the hoist (1) as specified to the battery (2) and then lift it out of the truck.
- The hoist must exercise a vertical pull to prevent damage to the tray. The hooks must be installed so that they can not fall on the battery cells when the lifting gear becomes slack.

⚠ DANGER

No persons are allowed to stand under the raised load. Danger!

- Carefully lift the battery out of the truck.



Battery weight and dimensions

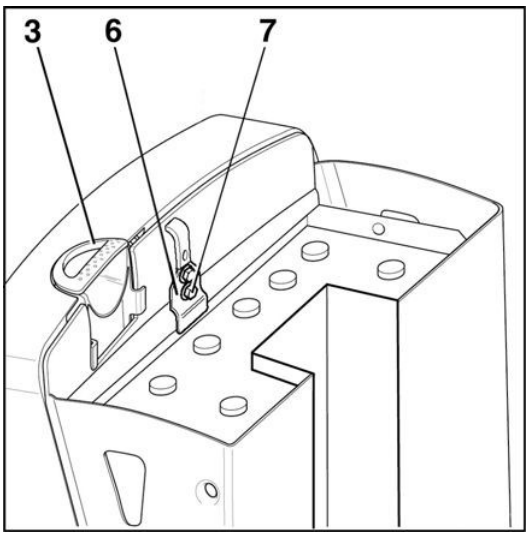
NOTE

- *The weight and dimensions of the battery affect truck stability. The installed battery must have the same weight. Do not remove any added weights or change their location.*
- *Observe the information on the battery⇒ Chapter "Battery specifications", P. 0-10.*
- *Observe the information on charging the battery⇒ Chapter "Battery PzS (open-lead)", P. 6-4.*
- *The installation a charged battery is carried out in the reverse order of removal. Be sure to refit all covers correctly.*

Damage to cables

⚠ CAUTION

Do not damage the cables when changing the battery.



The battery charger also cuts out when the micro-controller has detected a fault in the temperature sensing.

Electrical safety

Galvanic isolation: 1500 Vrms (effective mean value)

False-polarity protection of battery: Two 25A automotive fuses in the output.

Normal operation

The green LED (3) indicates mains power is applied.

The yellow LED (2) indicates the current state of charging:

- It is illuminated in phases **I1** and **P**.
- In phase **U** it flashes fast.
- It flashes slowly during the final overvoltage phase.
- It flashes with the on periods much shorter than the off periods starting from the end of the overvoltage until the end of the equalising charge phase.
- It goes off when charging is completed.

Fault indication

The green LED flashes if a charging time fault occurs (abnormal duration of phases **I1 + P**).

3. Maintenance and remedial action

a. Care

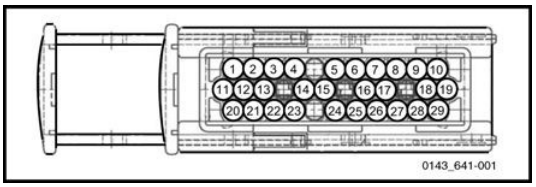
The battery charger does not need any special maintenance. Depending on the duty conditions, however, it is recommended to inspect the mechanical and electric fasteners regularly for security to achieve a high availability and durability of the charger.

Although the battery charger is suited for rapid charges, it is nevertheless recommended to charge the battery completely at least once a week.

b. Troubleshooting

In order to determine if the battery charger is defective, carry out the following checks:

Traction controller input and output signals

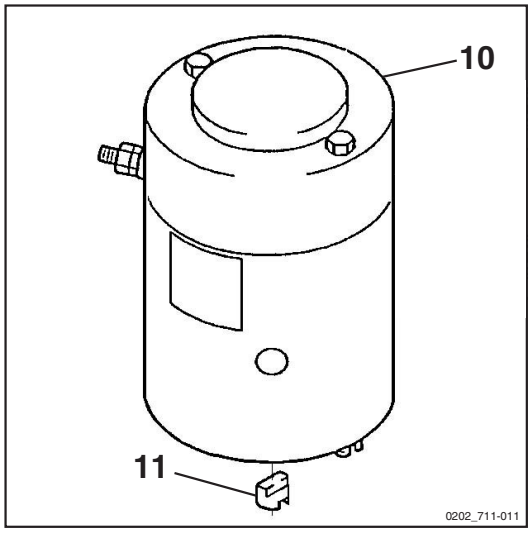


The input and output signals are arranged on the 29-pin connector X1, which is connected directly to the controller.

Inputs:	
Pin 4	24 V power supply for controller via the key switch.
Pin 27	Speed reduction input (0 V)
Pin 17	Speed reduction and lift cut-out input (0 V)
Pin 26	Mode selection (tortoise) input (+24 V)
Pin 16	Lift forks input (0 V)
Pin 25	Lower forks input (0 V)
Pin 24	Initial lift raising input (0 V)
Pin 23	Initial lift lowering input (0 V)
Pin 14	Belly button on tiller head (N/O) input
Pin 15	Belly button on tiller head (N/C) input If Pin 14 = 0 V and Pin 15 = circuit open, the traction motor receives a pulse to change the direction of travel in the direction of the load end if the truck drove in the direction of the driver's end.
Pin 3	Desired value for acceleration (rises with forward travel)
Pin 13	Desired value for acceleration (rises with reverse travel)
Pin 2	Desired value for tiller inclination (rises when tiller is raised)
Pin 21	Desired value for tiller inclination (rises when tiller is lowered)
Pin 11 and Pin 20	Input for traction motor speed transmitter
Pin 1	Input for traction motor temperature sensor
Pin 5 and Pin 6	CAN bus for communication with diagnosis
Outputs:	
Pin 10	Negative of main contactor controlled
Pin 9	Negative of electromagnetic brake energised
Pin 19	Negative of pump contactor energised
Pin 29	Negative of lower forks solenoid valve energised
Pin 18	Negative of lower mast solenoid valve energised
Pin 28	Negative of initial lift down solenoid valve energised
Pin 8	Positive (+24 V) of main contactor and electromagnetic brake
Pin 7	Positive (+24 V) of pump contactor and solenoid valves
Pin 22	Power supply (10 V) for traction, tilting the tiller and traction motor speed transmitter potentiometers
Pin 12	Power supply (0 V) for traction, tilting the tiller and traction motor speed transmitter potentiometers

– Pull the stator (9) out upwards. ▷

– Take the rotor off and pull the two bearings out of the rotor. ▷



Installation is the reverse of removal. Do not forget to replenish the oil to the correct level.

NOTE

Do not damage the commutator cables when reinstalling the commutator cover.

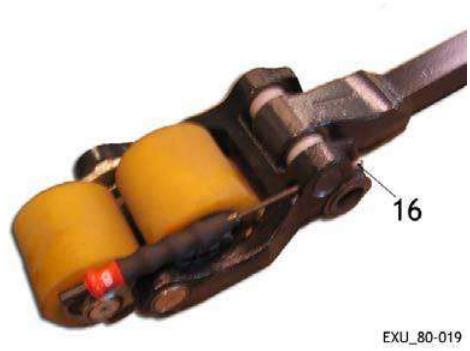
NOTE

Make sure the brushes fully contact the armature surface.

NOTE

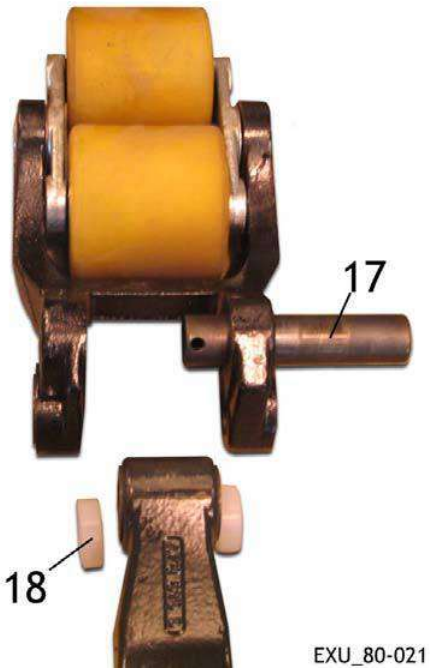
When reinstalling the unit, be sure the rotor of the pump motor (10) sits correctly in the dog (11).

– Drive out the two straight pins (16) at the end of the pull rod. ▷

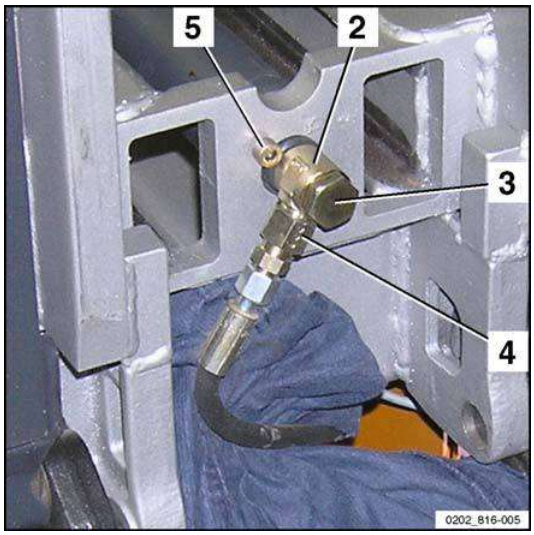


– Drive out the pin (17). ▷

– Take care not to lose the white spacers. ▷



– Place a cloth underneath the hydraulic hose (4)and screw it off at the fitting (2).
– Loosen the socket head screw (5).
– Remove the screw (3) and put it to the side along with the fitting (2).
– Remove the socket head screw (5) and remove the lift cylinder.



Installation

Installation is the reverse of removal.

To bleed the lift cylinder extend and retract it several times.

NOTE

Install the screw (5) with Loctite 243. Tighten the screws (1 and 5) to a torque of 25 Nm.