Workshop Manual

KRONE

Self-propelled Forage Harvester

BiG X 600
BiG X 700
BiG X 850
BiG X 1100
BiG X 700 -1
BiG X 850 -1
BiG X 1100-1

(from serial no.: 795 000)

Order no.: 27 016 665 0 en

05.02.2015

Notes concerning towing

- Release parking brake
- Switch on the ignition so that the direction indicators (hazard lights) and the brake lights are working
- Switch the “Road/field” release switch into road travel position
- Increased steering and braking forces must be applied when the engine is switched off

Transporting on a low loader

Note
The forage harvester must be properly secured in place to be transported on a low loader.

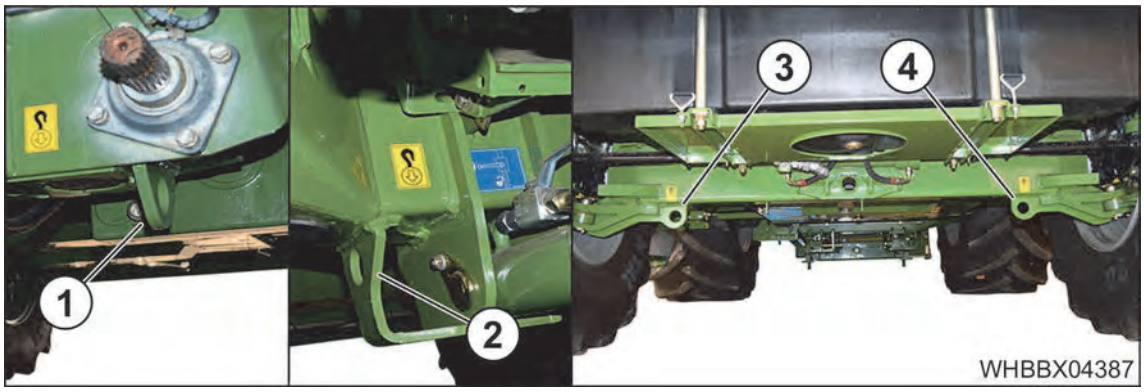


Fig. 5
1 Lashing point left front
2 Lashing point right front
3 Lashing point left rear
4 Lashing point right rear

A damaged compressor unit may lead to health problems

Damaged compressed air hoses of compressor unit may cause hoses to tear down. Hoses that move uncontrollably may hurt persons seriously.

- Replace damaged hoses properly.

Toxic exhaust gases

Exhaust gases may seriously damage your health or be fatal.

- While the engine is running, provide adequate ventilation to prevent prolonged exposure to exhaust gases.
- Do not leave the engine running in a closed room unless there is a suitable exhaust gas extraction system.

Hot surfaces

The following parts could become hot during operation:

– Engine
– Exhaust system
– Cooling system
– Hydraulic system
– Mechanical drives, gearbox and couplings
– Electronic components

Danger of burns!

- Keep sufficient distance from hot surfaces.
- Allow machine parts to cool down and wear protective gloves.

2.5.21 Dangers associated with certain activities: Climbing up and down

Safe climbing and descending

Persons behaving carelessly when getting on and off the machine may fall down from the ladder. Persons getting on the machine without using the ladders intended for that purpose may slip or fall or they may get hurt seriously.
Dirt as well as operating fluids and lubricants may impair surefootedness and stability.

- Always keep ladder steps and platforms clean and in proper condition so that you can step and stay safely.
- Do not get on and off while the machine is moving.
- Always get on and off with the face towards the machine.
- When getting on and off, ensure three-point contact with steps and handrails (both hands and one foot are in contact with the machine or both foots and one hand).
- When getting on and off the machine, never use control elements as a handle. Functions may be activated unintentionally when operating elements are actuated accidentally. These functions hold a danger.
- When getting off the machine, never jump.
- Only get on and off the machine by using ladder steps and platforms, refer to operating instructions chapter “Machine Description” → “Ladders”.

Venting the hydraulic oil tank

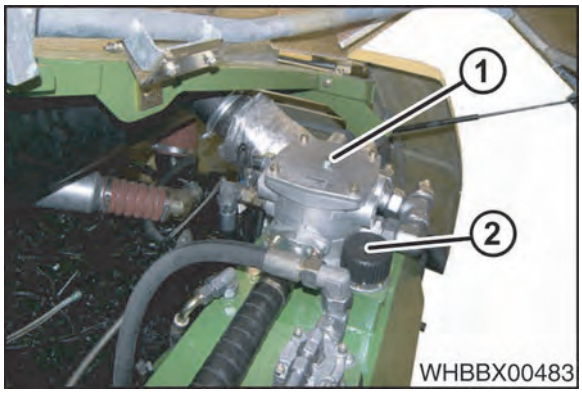


Fig. 35

- Unscrew the venting screw (1) of the return suction filter so that air can influx
- Open the hydraulic oil tank cover (2)

Note
The hydraulic oil from the upper hoses and filters flows back into the tank.

Folding down the hydraulic oil tank

Fig. 36

- Remove the clamp (2)
- Remove the plug from the level switch (4)
- Remove the plug from the pressure switch (3)
- Loosen the screws (1) of the lock

3.3.4.2 Adjusting the transfer gearbox

Compensating axial play

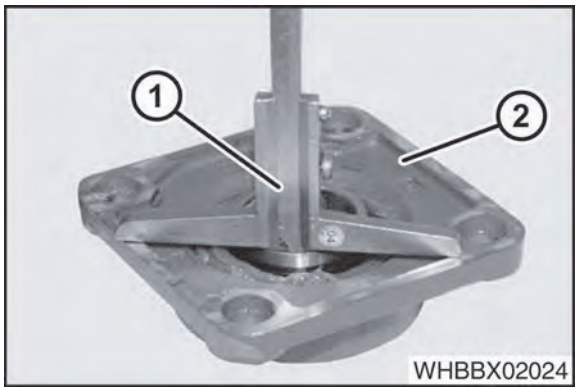


Fig. 80

Note
The axial play setting must be set equally on both flange-mounted bearings.

- Using a depth gauge (1), measure to the inner ring of the bearing in the flange-mounted bearing (2) and make a note of the dimension

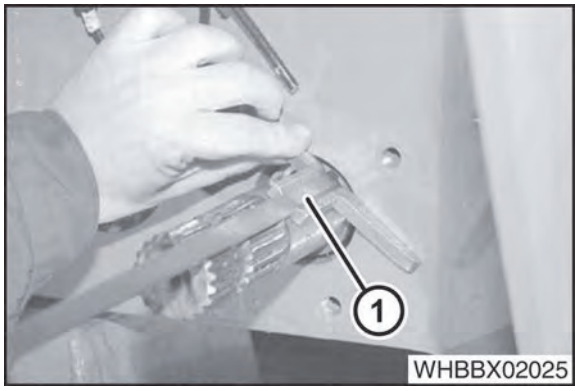


Fig. 81

- Using a depth gauge (1), measure against the seating shoulder on the drive shaft. Add the dimension to the other dimension previously noted

The result is the dimension that must be compensated with the compensation discs.

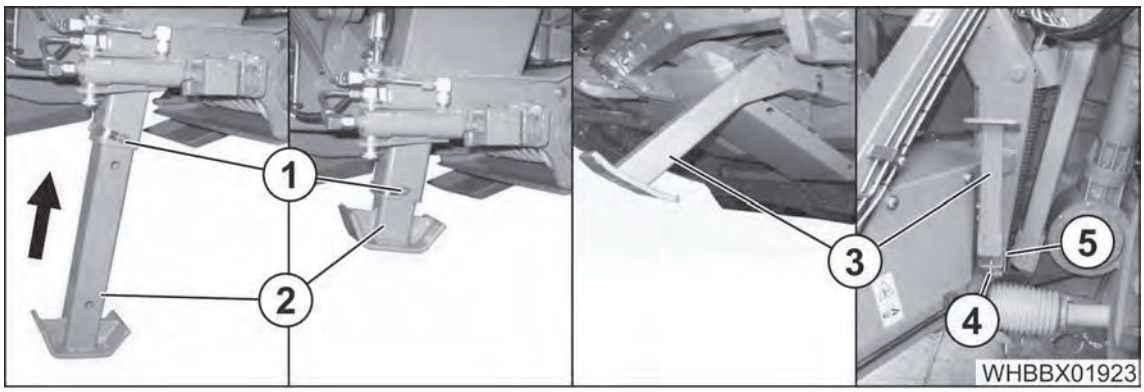


Fig. 115

- Dismount spring locking pin (1).
- Insert parking supports rear (2) and secure with spring locking pin.
- Remove front parking support (3) and insert it in the insert pocket (4) on the pendulum frame.
- Secure parking support with spring locking pin (5).

WARNING! – Risk of injury when working on the lifting unit!

When working on the lifting unit or when opening/closing the stop cocks on the lifting cylinders, the lifting unit and the installed components may move unexpectedly. As a result, people may be injured.

- To secure the lifting unit from unintentionally lowering, close the stop cocks.
- To reach the stop cocks safely, swivel open the tool box, go under the machine and actuate the stop cocks.

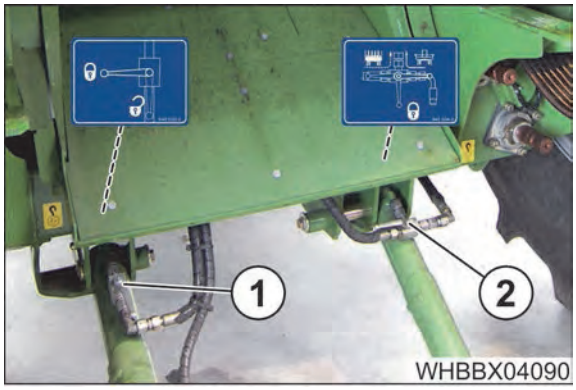


Fig. 116

- Open two-way stopcock (1) and three-way stopcock (2), refer to information label.

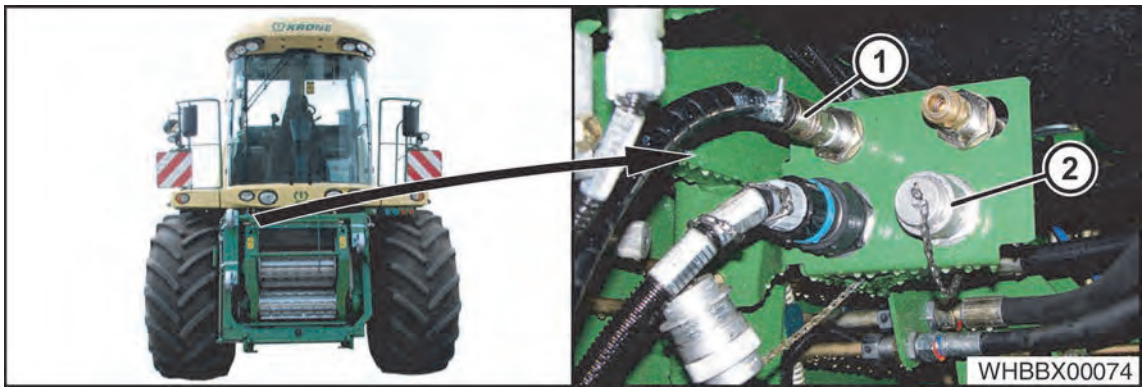


Fig. 162

- Connect the compressed air cleaning hose (1)
- Connect plug of the RockProtect and CropControl (2) options

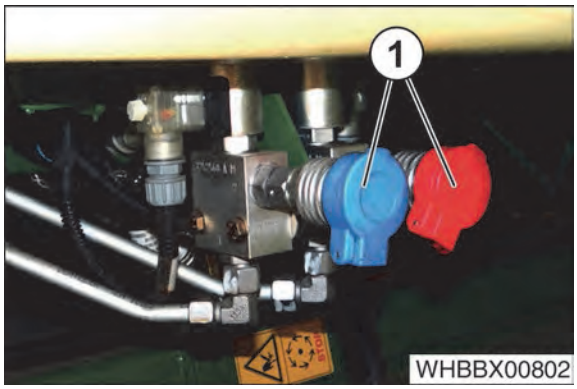


Fig. 163

- Connect lines (1) of the pendulum frame (if installed)

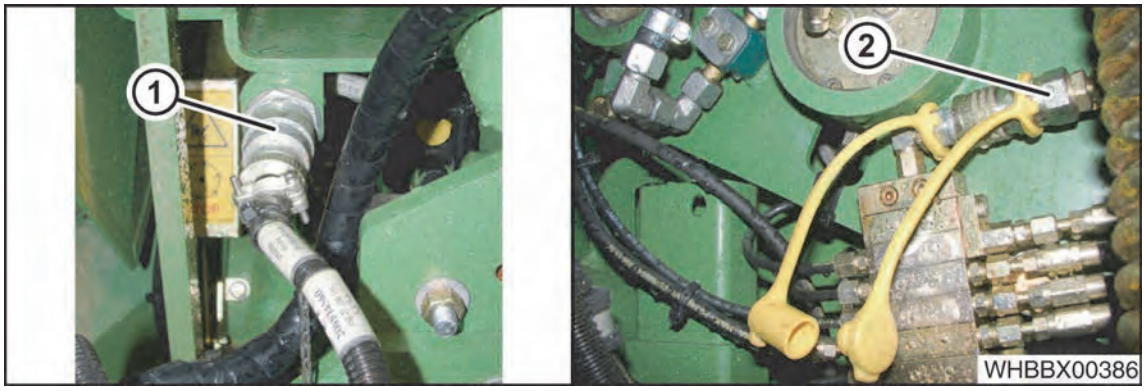


Fig. 164

- Remove the connection cable plug (1) for the metal detection sensor and pendulum frame
- Connect the connection line (2) to the central lubrication, ensuring that the line is installed and attached correctly
- Start the engine
- Move lifting unit all the way up using the side pushbuttons
- Switch off the engine

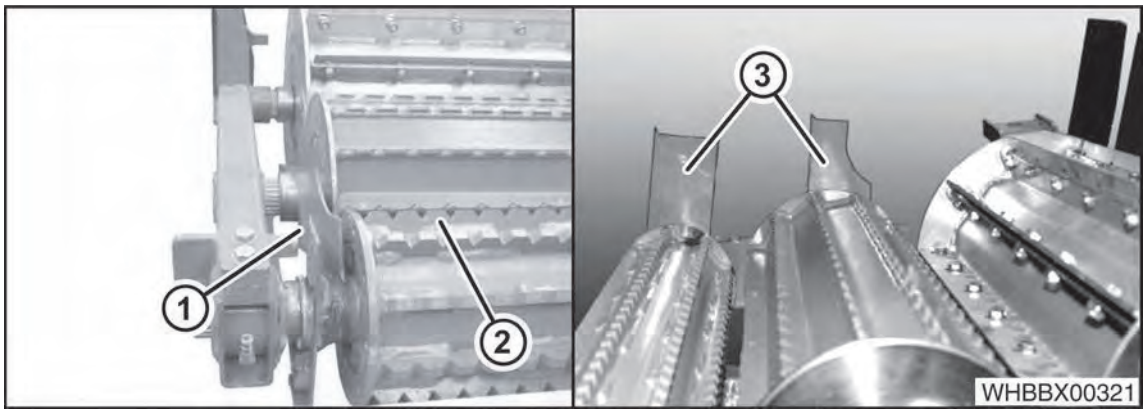


Fig. 200

- Install the rear baling roller (2) in the sleeve (1)

Note

Make certain the slides (3) are installed as shown in the illustration.
Once again observe the marks made during removal.

4.2.8.4 Removing flat roller

The removal of the flat roller is identical to the removal of the "lower intermediate roller" as far as the work sequence is concerned, however shape and appearance differ. Therefore only the removal of the "lower intermediate roller" is described here as an example. See paragraph "Removing lower intermediate roller".

4.2.8.5 Removing flat roller

- Removing flat roller

Note
Note direction of rotation of the flat roller!

Note
Screws of the bearing journals and drive journals are inserted with thread lock.

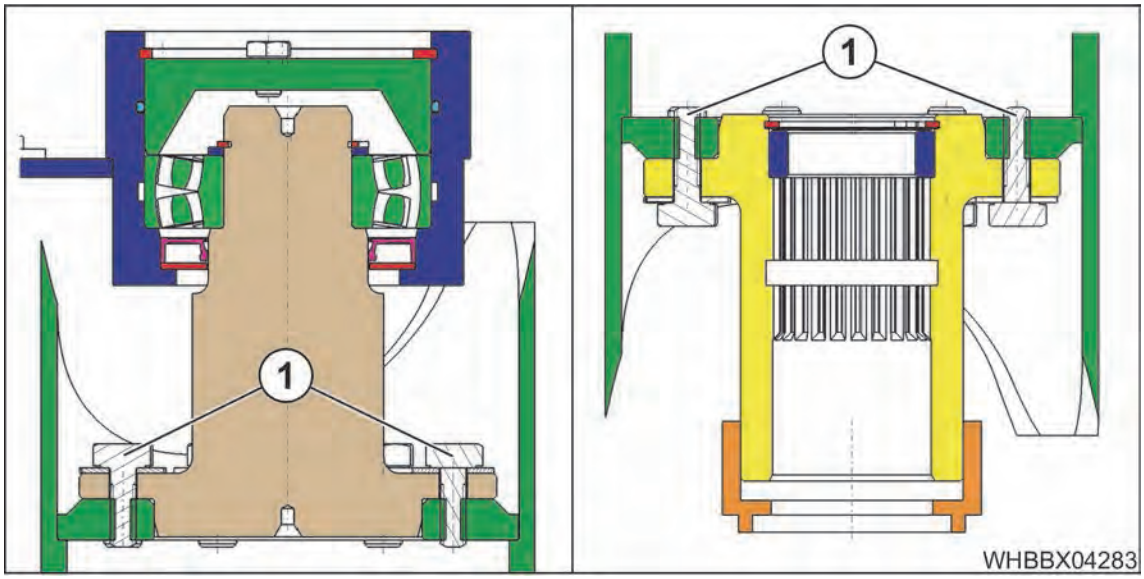


Fig. 241

Bearing journal | Drive journal

The flat roller weighs approx. 35 kg

- Remove screws (1) from bearing journals and drive journals
- Screw hexagonal head screws (M12) into bearing journals and drive journals and press off from the flat roller

4.2.8.6 Removing "lower intermediate roller"

The "lower intermediate roller" weighs approx. 30 kg

- Removing "lower intermediate roller"

Note
Note direction of rotation of "lower intermediate roller"!

The removal of the "lower intermediate roller" is identical to the removal of the flat roller as far as the work sequence is concerned. However shape and appearance differ. Therefore only the removal of the flat roller is described here as an example. See paragraph "Removing flat roller" →"Removing lower intermediate roller".

see page 192
see page 193

4.2.10.2 Removing "upper roller gearbox"

WARNING! – Risk of injury due to suspended load!
There is a danger for persons due to falling load.
- Pay attention to sufficient carrying load of the hoist.
- Do not stay under the suspended load.

WARNING!
Risk to people and the environment from escaping fluid!
Consumables, such as diesel fuel, hydraulic oil, anti-freeze, refrigerants and lubricants, may be harmful to health and the environment.
- Make sure the system has been depressurised prior to carrying out tasks.
- Avoid all contact with fluids.
- Always wear suitable protective clothing, e.g. safety gloves and protective goggles.

Do not rub your eyes if fluid comes into contact with them. Rinse your eyes and any other affected parts with cold water for a few minutes and seek medical assistance immediately.
- Keep working areas well ventilated.
- Catch fluids in suitable collectors and dispose of them in the proper manner.

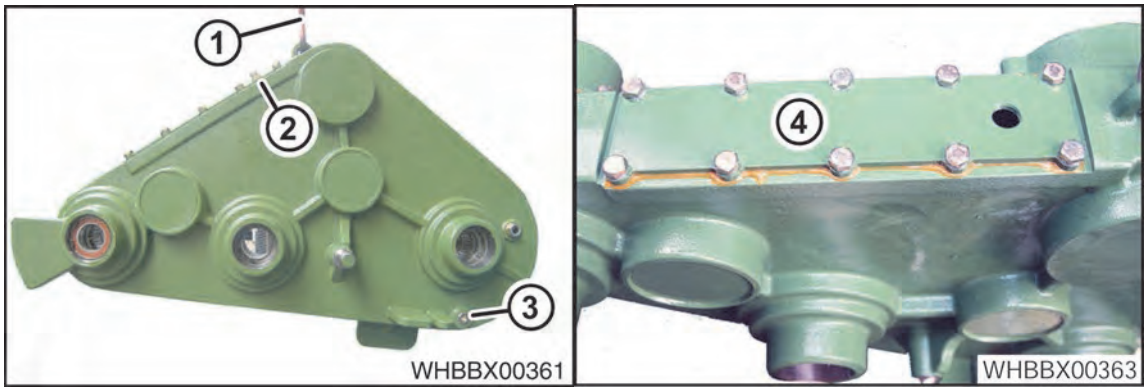


Fig. 275

The "upper roller gearbox" weighs approx. 100 kg
- Remove the "upper roller gearbox", see page 150
- Hook "upper roller gearbox" into the hoist (1)
- Drain gear oil; to do this, remove screw plug (3) and ventilation filter (2)
- Install screw plug (3)
- Remove the cover (4)

Installing the spur wheel shaft "c" (baling roller drive)

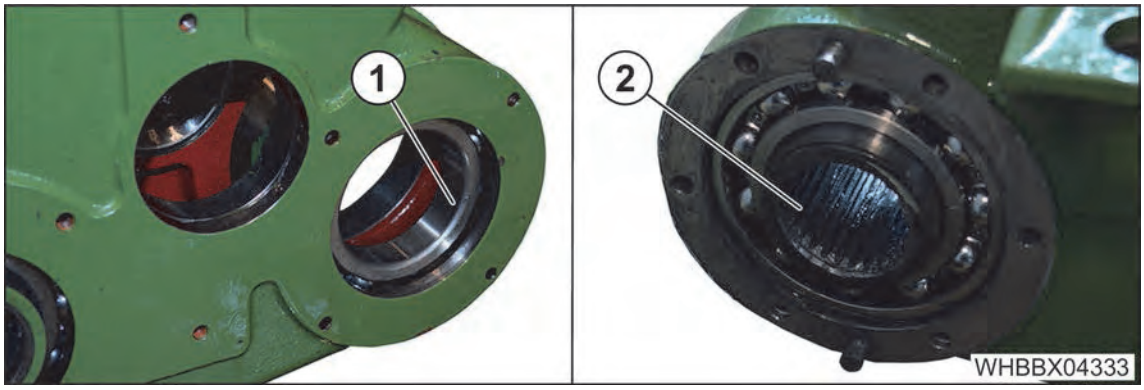


Fig. 320

- Mount the grooved ball bearing (1) in the housing.
- Mount the pre-assembled spur wheel shaft (2) in the housing.
  Note: Pay attention to the correct installation position. The internal gear of the spur wheel shaft (2) faces outwards, away from the intake unit.

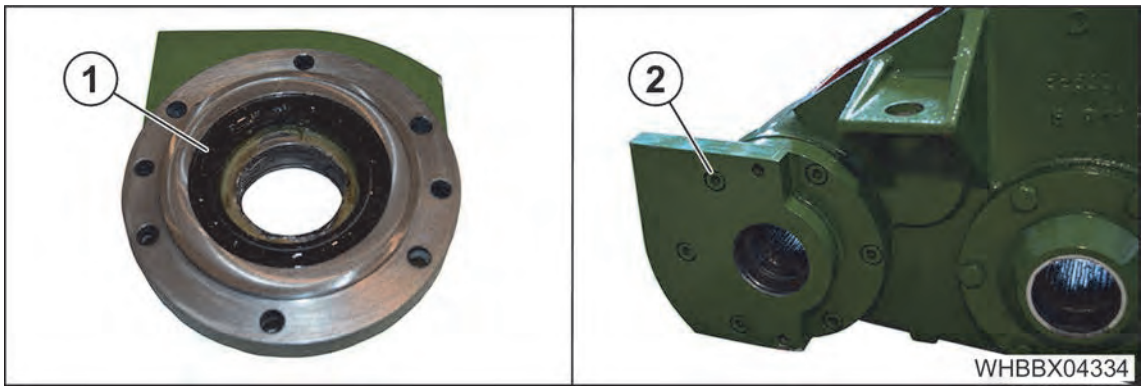


Fig. 321

- Mount the shaft sealing ring (1) in the stop.
  Note: Pay attention to the correct installation position. The sealing lip must face the gearbox housing.
- Coat the flange surface of the stop with flat sealing.
- Push the stop onto the roll pins and insert it, mount all the screws (2).

4.2.14 Angular Gearbox from Machine No. 880 000

4.2.14.1 Overview angular gearbox

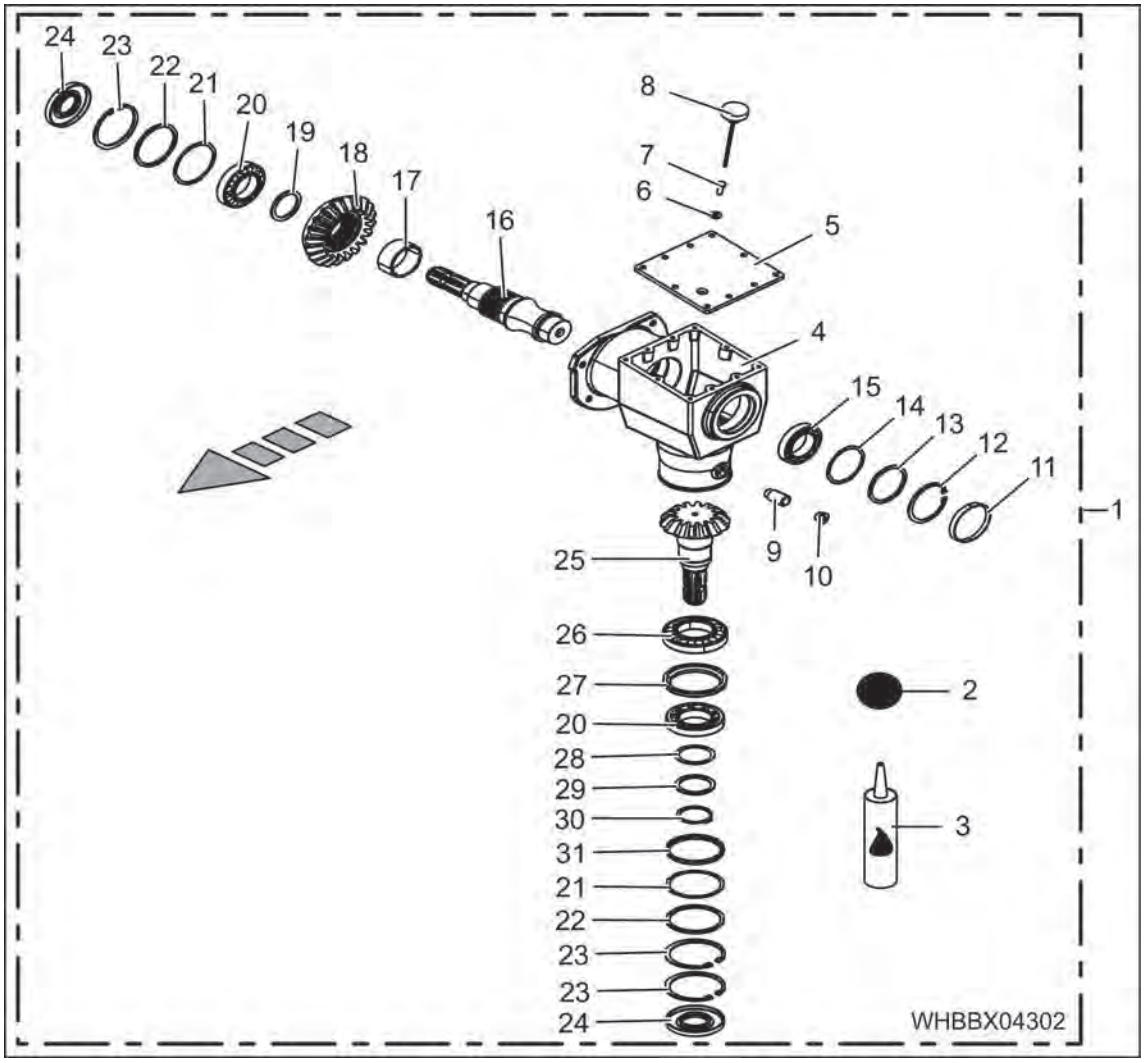


Fig. 362

1 Installed angular gearbox
2 Gearbox oil
3 Universal sealant - silicone-free
4 Gearbox housing
5 Cover
6 Detent edged washer
7 Hexagonal head screw
8 Oil dip stick with fan
9 Thread extension
10 Locking screw
11 Cover
12 Retaining ring
13 Support washer
14 Shim ring
15 Taper roller bearing
16 Bevel gear shaft
17 Spacer sleeve
18 Bevel gear
19 Support washer
20 Taper roller bearing
21 Shim ring
22 Support washer
23 Retaining ring
24 Radial shaft seal
25 Pinion shaft
26 Taper roller bearing
27 Support sleeve
28 Shim ring
29 Support washer
30 Retaining ring
31 Support sleeve for retaining ring

4.3.9 Counterblade

Note
A new counterblade adjustment is fitted for machine no. 874836 and higher. Different images may therefore be presented in the following descriptions. However the work steps are identical.

Note
The counterblade should not be turned or replaced until the satisfactory chop quality can no longer be achieved even with the cutting gap correctly adjusted and with the blades intact.

Note
Install the counterblade on a cleaned holding surface only. The surface area must be flat and free of rust and dirt, replace if necesssary.
When turning the counterblade, remember to clean the underside of the counterblade.
Check the counterblade for wear.

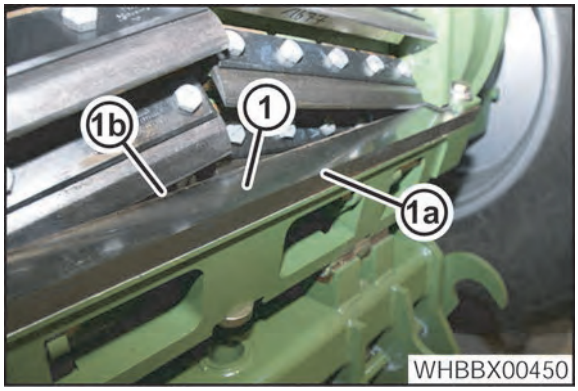


Fig. 395
Both sides of the counterblade (1) can be used.
If one or both sides (1a, 1b) of the counterblade (1) are worn, the counterblade must be turned or replaced.

Different counterblades

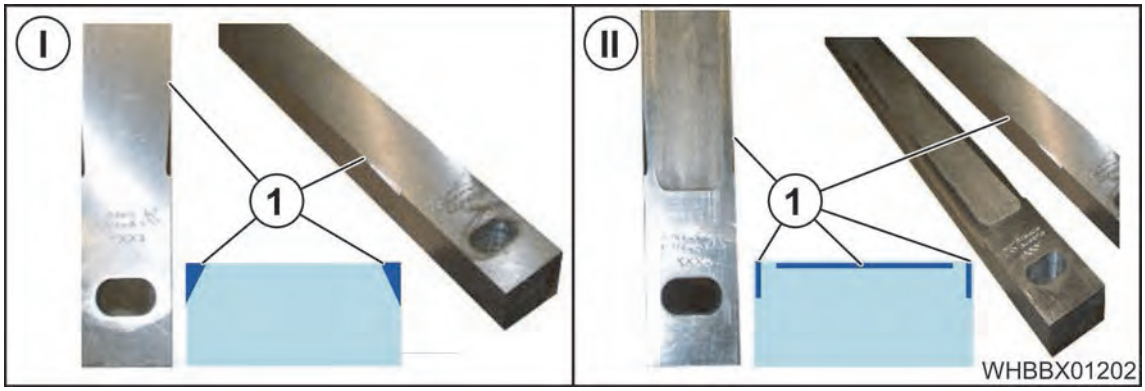


Fig. 396
I "Standard" counterblade
II "Special" counterblade

The counterblade is worn out when the hardened edge (1) has been worn down.

4.3.13 Installing Cutting Drum

4.3.13.1 Installing Cutting Drum into Cutting Drum Housing

WARNING! – Risk of injury due to suspended load!
There is a danger for persons due to falling load.
- Pay attention to sufficient carrying load of the hoist.
- Do not stay under the suspended load.

Note
Make sure that shafts and bearing housings are clean and that they are not damaged.
Clean shaft ends left and right and check them for damage.

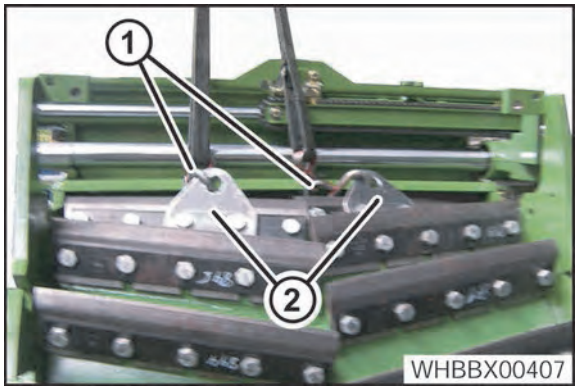


Fig. 442

Depending on the design, the weight of the blade drum is approx. 450 – 550 kg.
- Unscrew the screws on the blade carrier and mount special tool no. 22 (2).
- Hang cutting drum into a hoist (1) and raise it slightly.

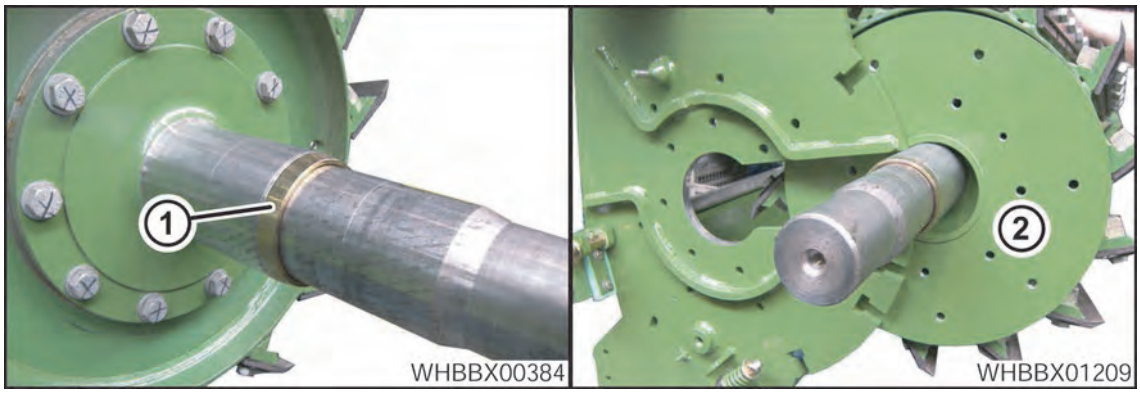


Fig. 443
- Push the thrust ring (1) onto the shaft on the left-hand side.
- Mount threaded rings (2). In doing so, mind the installation position.

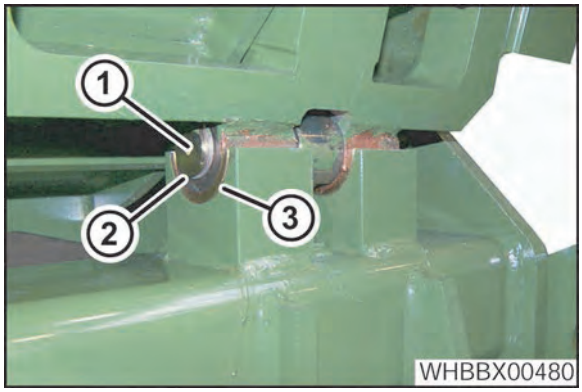


Fig. 480

- Remove the retaining ring (2) and pull out the bolts (1).
- Remove the counterblade support from the holder upwards.

Note
Check the slide bush (3) for damage, replace it if necessary.

4.3.16.2 Installing Counterblade Support

Installation is in reverse order to removal.

- Tighten the spring assemblies of the tension anchors (tightening torque 65 … 75 Nm) and fix the crown nuts with a splint.

Spring assembly installation position

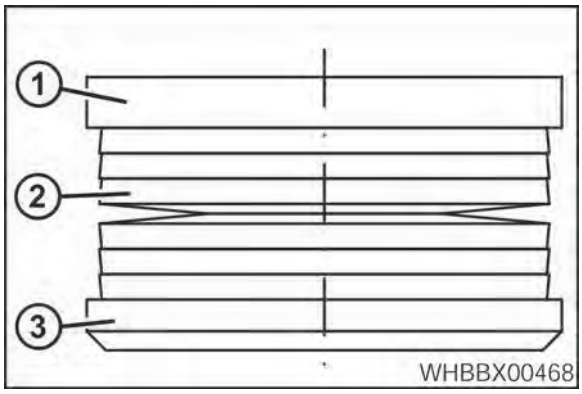


Fig. 481

1 Guide
2 Spring discs (disc springs)
3 Disc

Note
Adjust the counterblade, see page 292.
Adjust the drum base, see page 304.

Removing Front Corn Conditioner Roller Shell

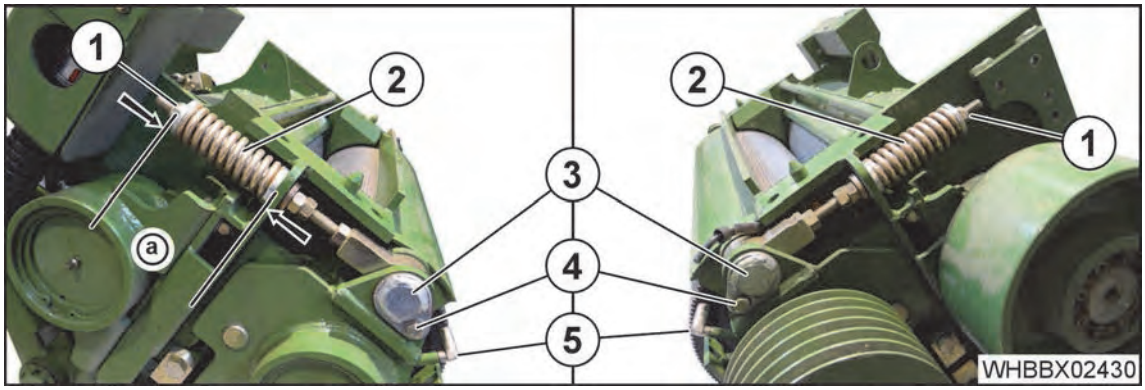


Fig. 515

- Dismount the lines of central lubrication system (5) on both sides.
- Unscrew the nuts (1) on both sides and remove springs (2).
- Unscrew the screws (4) of bolts (3) on both sides.

WARNING! – Risk of injury due to suspended load!
There is a danger for persons due to falling load.
- Pay attention to sufficient carrying load of the hoist.
- Do not stay under the suspended load.

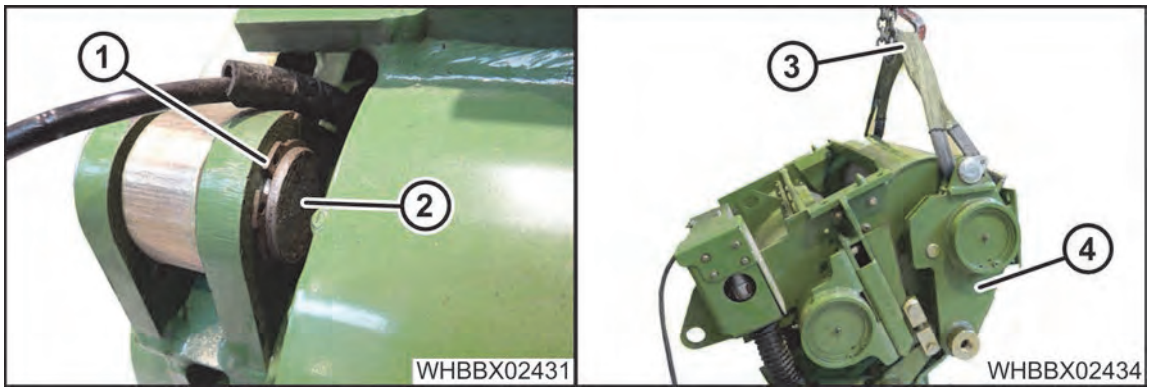


Fig. 516

The weight of the front roller unit is approx. 150 kg.

- Dismount the retaining ring (1) of the bolt on both sides.
- Pull out bolts (2). To do this, remove pulley, if necessary.
- Remove the eye with the spindle on both sides.
- Hang the front roller unit (4) into lifting tool (3).

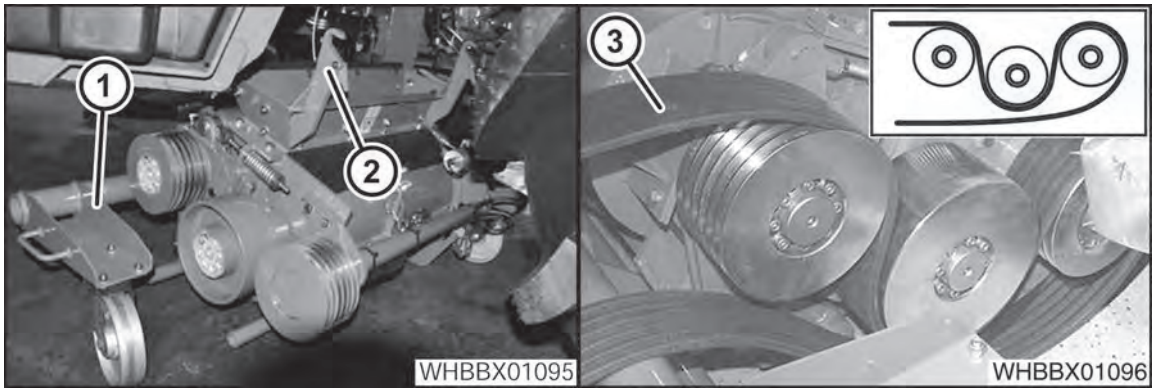


Fig. 561

- Put kraftband (3) in place as shown in the diagram.
- Push corn conditioner with transportation trailer (1) and fitted kraftband (3) under the forage harvester and align it so that the receiving hooks of the corn conditioner (2) are in front of the holders of forage harvester suspension.

WARNING! – Risk of injury due to suspended load!

There is a danger for persons due to falling load.

- Pay attention to sufficient carrying load of the hoist.
- Do not stay under the suspended load.

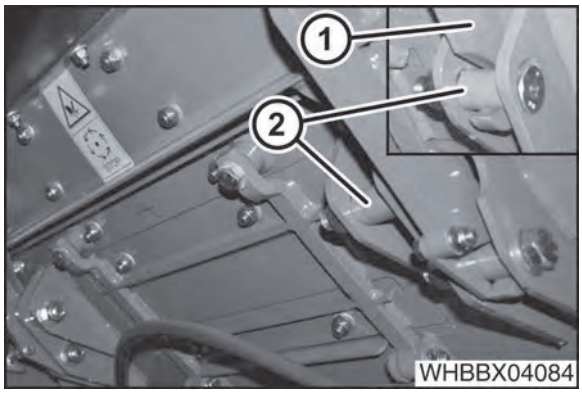


Fig. 562

Depending on the design, the weight of the corn conditioner is approx. 450 kg.

- Pull corn conditioner up by using the cable winch until the receiving hooks (1) on the corn conditioner are located further up than the holders (2) on the transfer shaft of the forage harvester.
- Push corn conditioner to the front until the receiving hooks (1) on the corn conditioner are located directly above the holders (2) on the transfer shaft of the forage harvester.

Setting the spring force of the rear wall

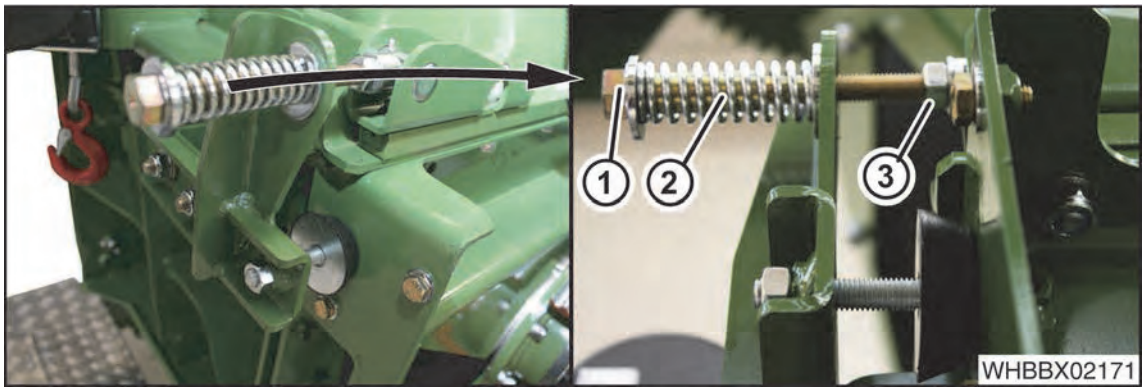


Fig. 600

- Loosen nut (3)
- In order to reduce the spring force, slightly screw out the hexagon head screws (1) on the rear wall - the spring (2) is released
- To reinforce spring force, slightly screw in the hexagon head screws (1) on the rear wall - the spring (2) is tensioned
- Tighten nut (3)

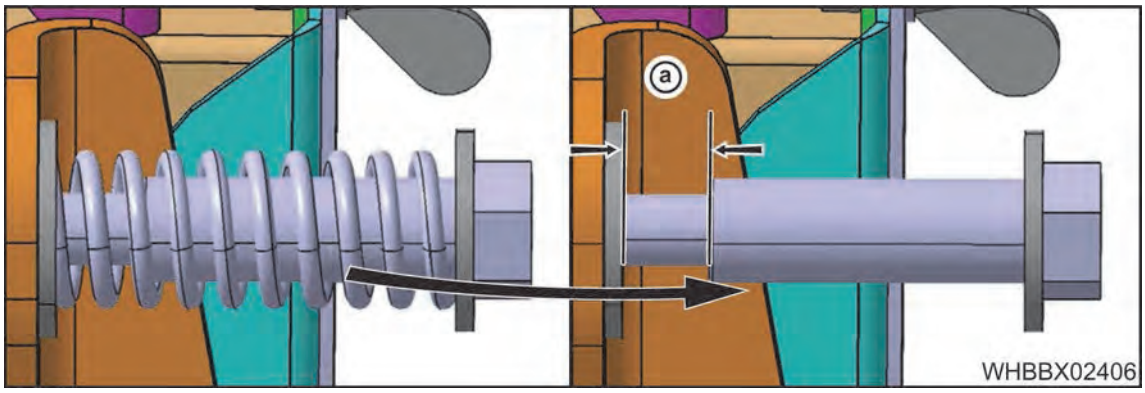


Fig. 601

- Select the pretension so that a spring path (a) of min. 10 mm and max. 12 mm.
- After the adjustment has been carried out completely, it is essential to check whether a collecting edge arises towards the channel support when the rear wall is entirely sprung back. The position of the rear wall must be corrected again via rubber buffers, if necessary. Readjust the preload length of the spring and check the distance between throw shovels and wear sheet of rear wall.

4.7.15.7 Removing the right-hand belt pulley

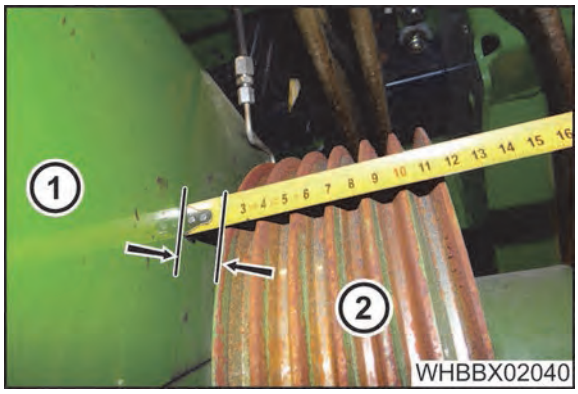


Fig. 636

- Measure the distance between the discharge accelerator housing (1) and the belt pulley (2) and make a note of the dimension

Note
The dimension is required for installation.

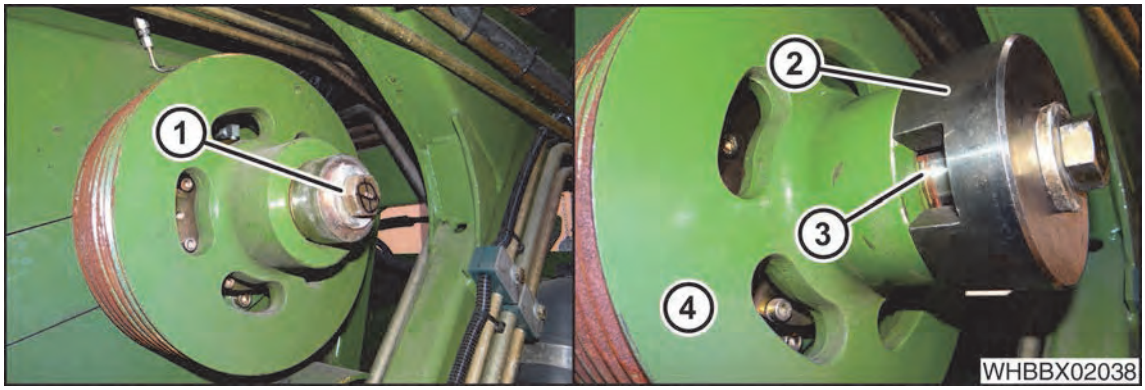


Fig. 637

Note
By screwing in the special tool no. 33 (2), the clamping of the clamping ring (3) is released, if necessary counter (block) the rotor shaft.

Note
The screw (1) has a left-hand thread.

- Unscrew the screw (1), remove the disc and cap
- Install the special tool no. 33 (2) on the belt pulley (4), ensuring the open side of the clamping ring is located in the recess of the tool
- Screw in and tighten the screw (1)
- Use a suitable tool to lever out the clamping ring (3)
- Remove the special tool no. 33 (2)
- Remove the clamping ring (3)
- Remove the belt pulley (4)

4.7.18 Installing the discharge accelerator with housing

WARNING! – Risk of injury due to suspended load!
There is a danger for persons due to falling load.
- Pay attention to sufficient carrying load of the hoist.
- Do not stay under the suspended load.

Note
To install discharge accelerator into housing, see page 437

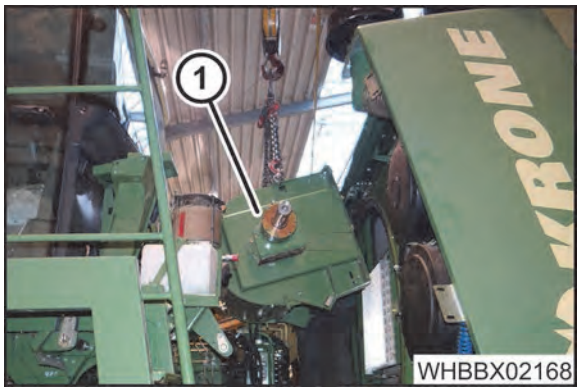


Fig. 677

The weight of the entire discharge accelerator is approx. 450 kg
- Hook discharge accelerator housing (1) into hoist and lift it into the machine

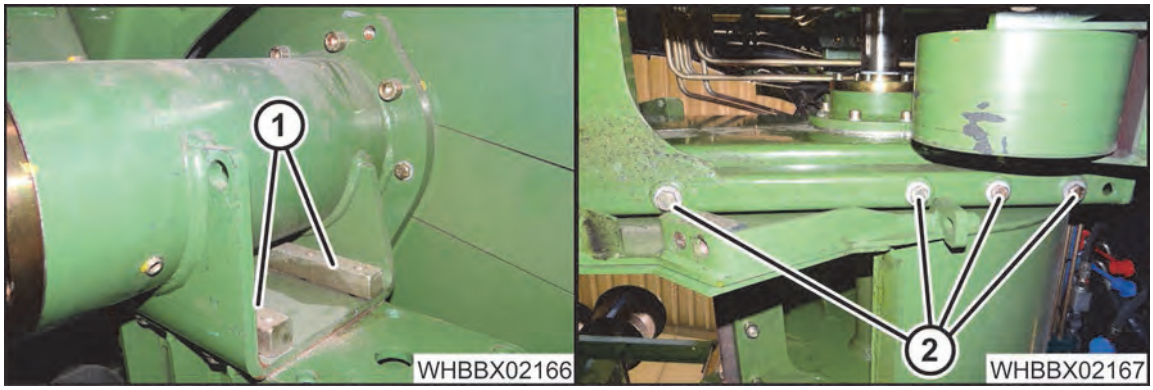


Fig. 678
- Mount left bearing housing with threaded blocks (4) on the frame
- Screw in the four screws (2) on the right bottom side of the discharge accelerator housing

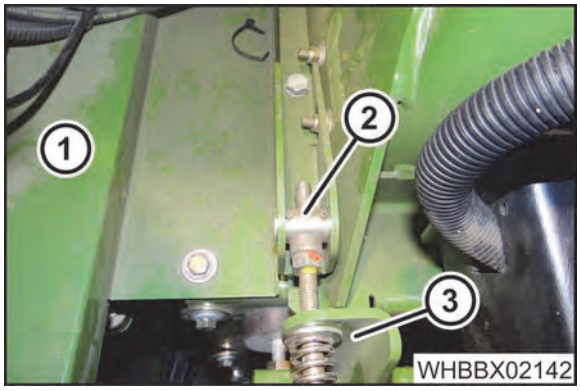


Fig. 717

- Mount joint bolt (2) on both sides
- Mount spring guide (3) of discharge accelerator rear wall on both sides
- Loosen spring lock of discharge accelerator rear wall
- Mount cover sheet (1)

Fig. 718

- Mount clamp (1) and lubrication line (2)
- Place plug 27X1b (3) of cable winch power supply voltage, located behind the cab.
- If the cable winch has been dismounted, mount cable winch, see page 1204

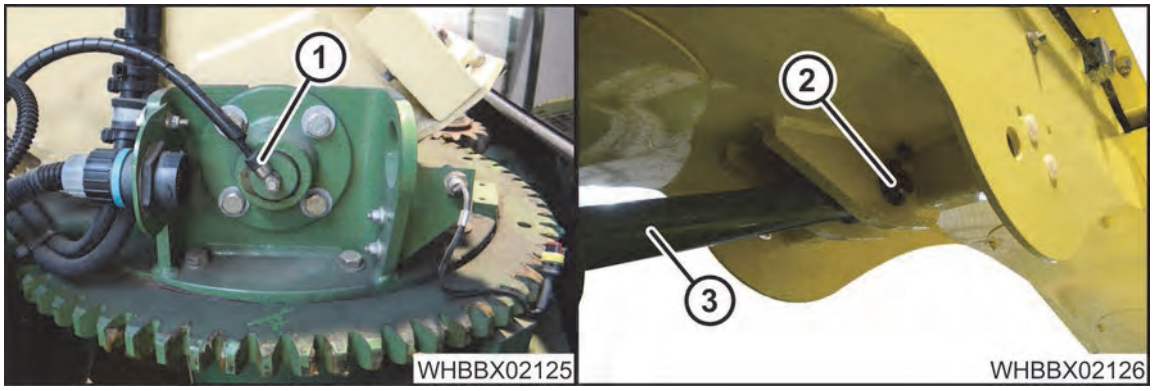


Fig. 757

- Remove the lubrication line (1) on both sides of the bearing flange
- Remove the dowel pin from the bolt (2) of the hydraulic cylinder (3) and extract the bolt
- Put down the hydraulic cylinder (3)

WARNING! – Risk of injury due to suspended load!
There is a danger for persons due to falling load.
- Pay attention to sufficient carrying load of the hoist.
- Do not stay under the suspended load.

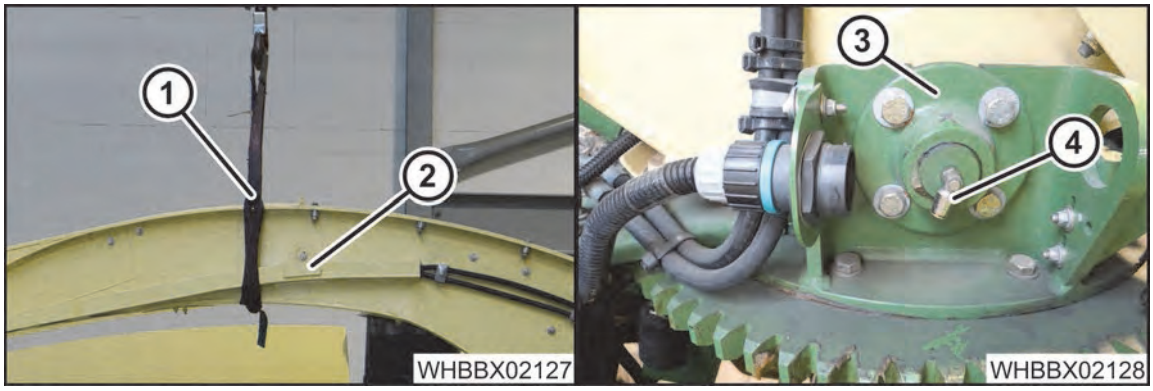


Fig. 758

Note
Equilibrate the discharge chute. The centre of gravity differs depending on the design and the intended holders (2) may not fit!

The complete discharge chute weighs approx. 380 kg (basic version without an extension) or approx. 540 kg (with a 14-row extension)

- Hook the discharge chute into the lifting gear (1) and lift slightly
- Unscrew the grease nipple (4) on both sides of the bearing flange
- Unscrew the screws of the bearing flange (3) on both sides of the discharge chute and remove the bearing flange
- Slowly lift and equilibrate the discharge chute, then lift it out of the machine and put it down in a safe place

WARNING!

Risk of burning by hot oil or machine parts!

When changing the oil, hot oil or machine parts may cause burns.

- Wear protective clothing.

ATTENTION!

Damage to hydraulic system or gearbox

If non-approved hydraulic gear oils or a mixture of different oils are used, the hydraulic system or the gearbox may be damaged.

- Never mix different types of oil.
- Never use engine oil.
- Only use the hydraulic gear oil specified under "Consumables".

CAUTION!

Damage to the machine by the contamination of the hydraulic system or fuel system!

Serious damage may be caused when foreign bodies or liquids get into the hydraulic system or fuel system.

- Clean connections and components prior to removal.
- Lock the open connections by using protective caps.
- Make sure that no foreign bodies or liquids get into the hydraulic system or fuel system.

CAUTION!

If work has been performed by a specialist workshop that is not qualified, the machine may be damaged!

A qualified specialist workshop has the necessary expertise, qualification and tools for a correct execution of the required works.

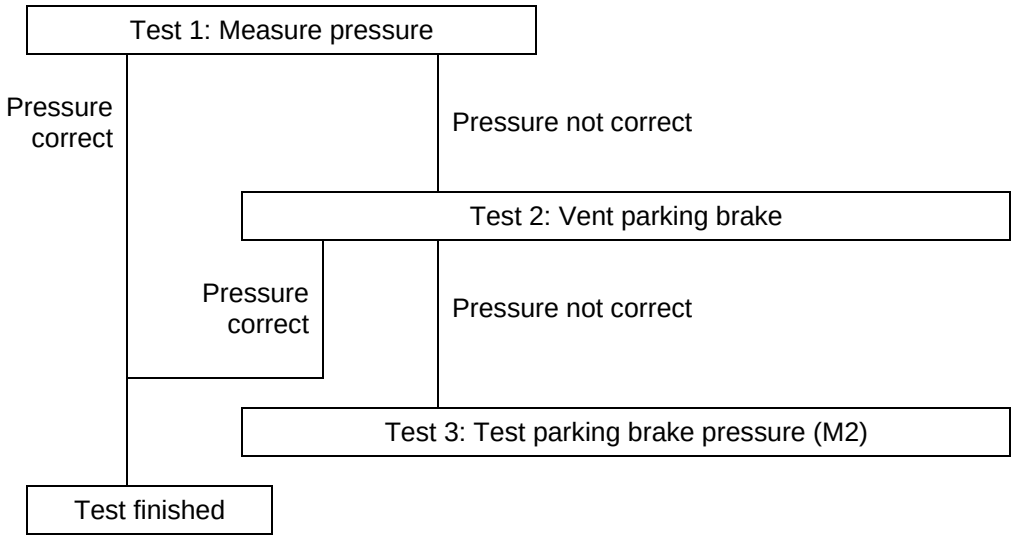
- Always perform work by a qualified specialist workshop.

Note

For information on filling quantities and specifications of liquids, see page 18.

Overview test sequence

Overview of test steps concerning M3, M5:



Test 1:

Measuring pressure

- The pressure is 30 bar when the parking brake is released
- With engaged parking brake, the pressure drops to 0 bar

Test 2:

Venting parking brake

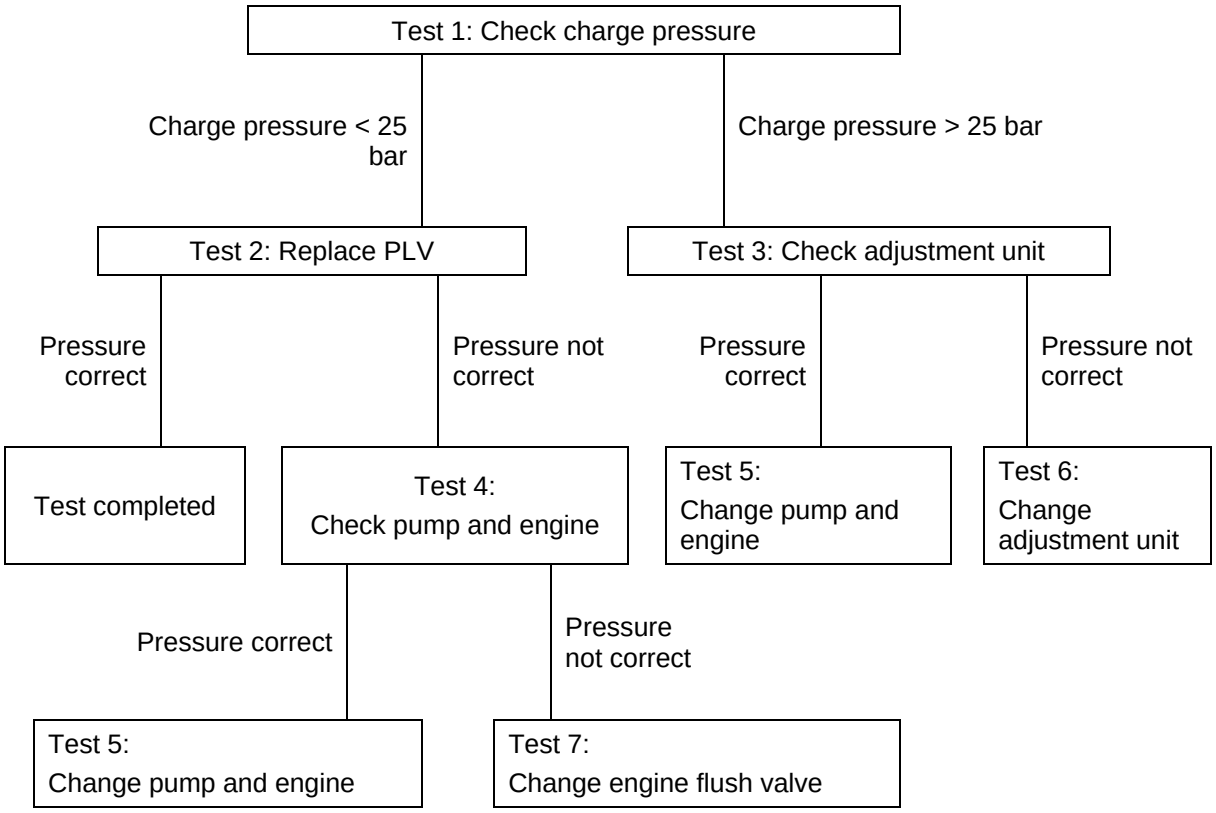
- Vent parking brake, see page 793

Test 3:

Test parking brake pressure at measurepoint minimess connection M2

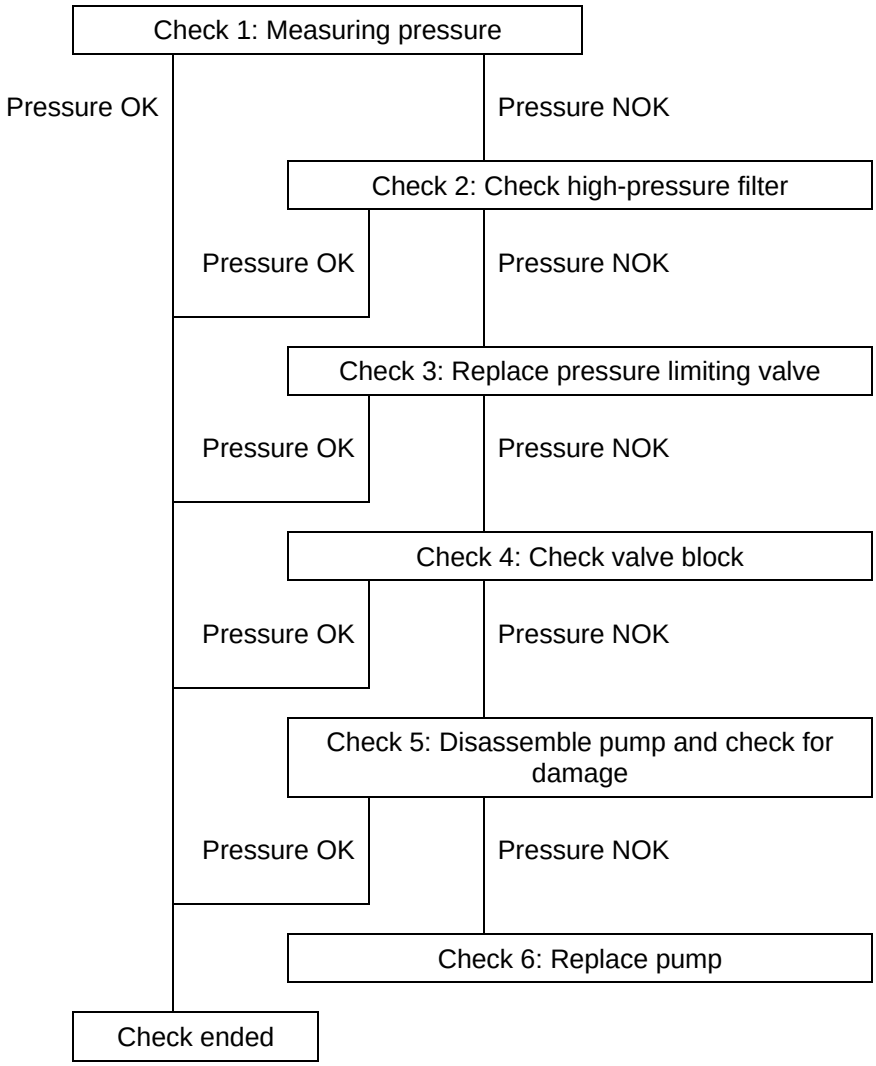
- Check the pressure of the parking brake at measurepoint minimess connection M2, see page 543

Overview of test steps concerning M15/M16:



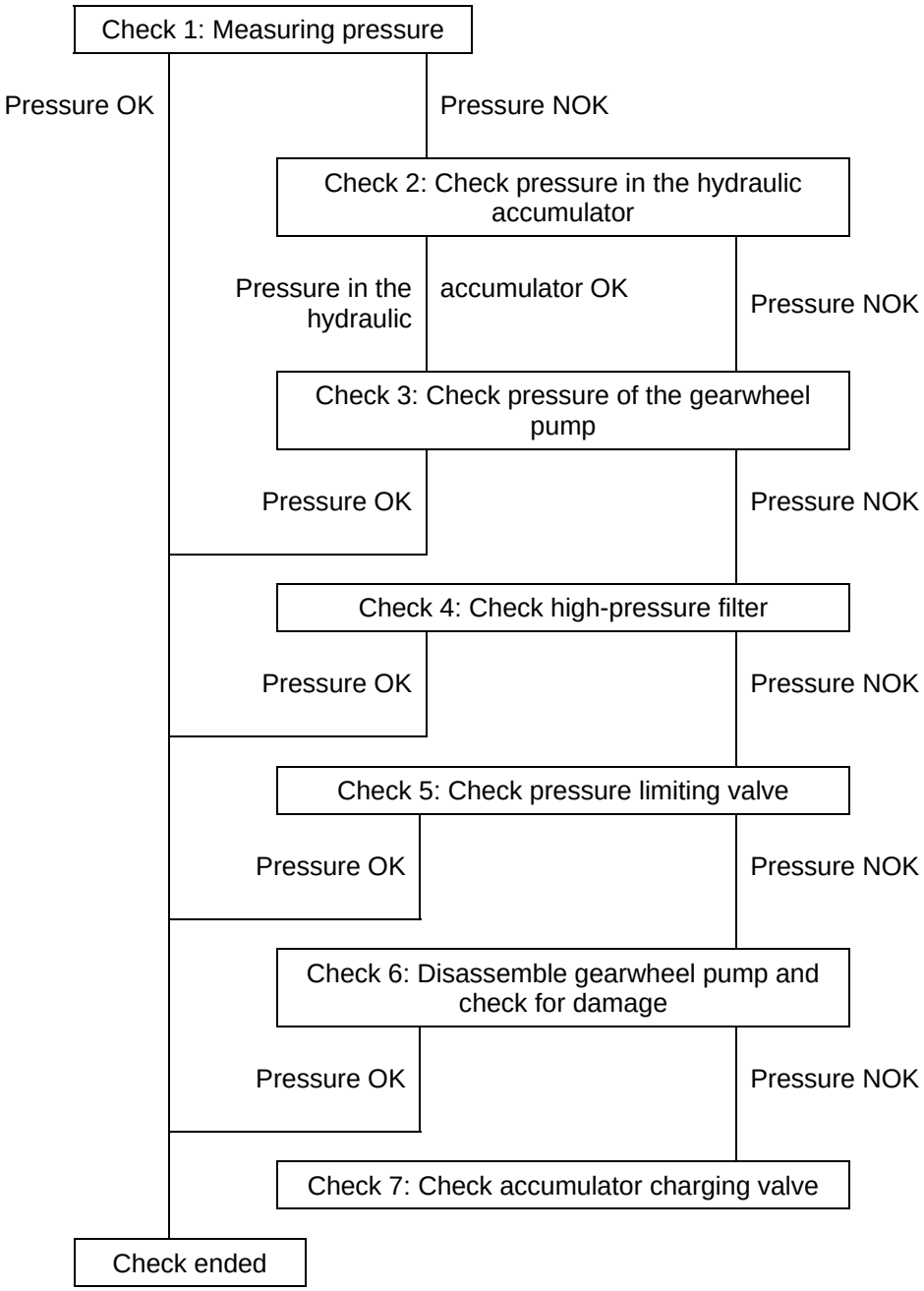
Note
If a part has been replaced, check charge pressure again (test 1)

Overview of test steps for M21:



Overview test sequence

Overview of test steps for M1:



Test 3:

Checking feed pump

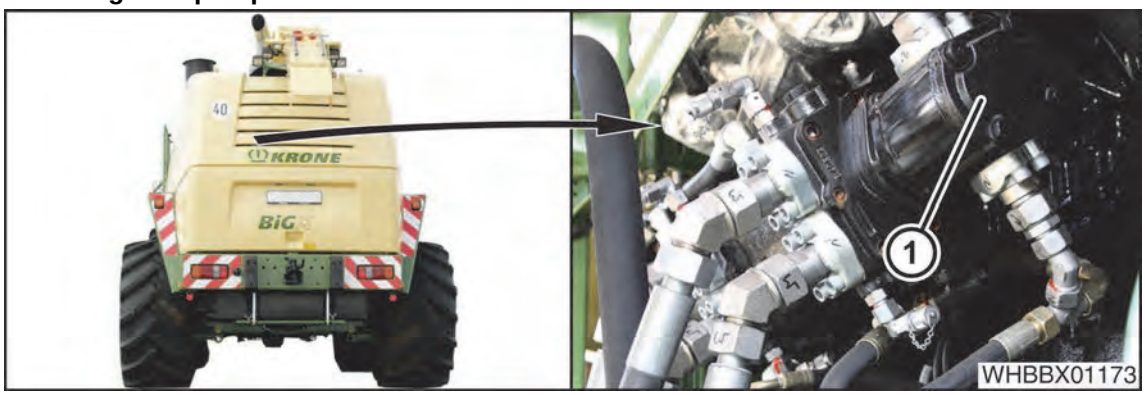


Fig. 908

Test:

Decompose feed pump (1) and check it for damage, see page 759

Test 4:

Replacing pressure limiting valves

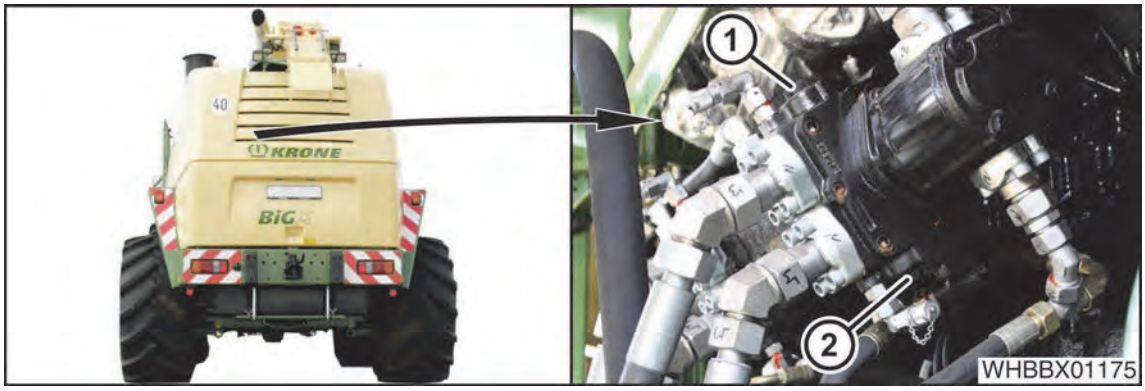


Fig. 909

Test:

- To check the charge pressure limiting valves (1, 2), see page 757
- To check the high pressure limiting valves, see page 758

Note

Always check both pressure limiting valves:

(1) = Intake

(2) = Header

5.4.33 Miniature measurement connection M18: Steering pressure

The pressure between the pump for the steering hydraulics and the steering valve can be measured on the connection M18. This may be required if there are problems with the steering.

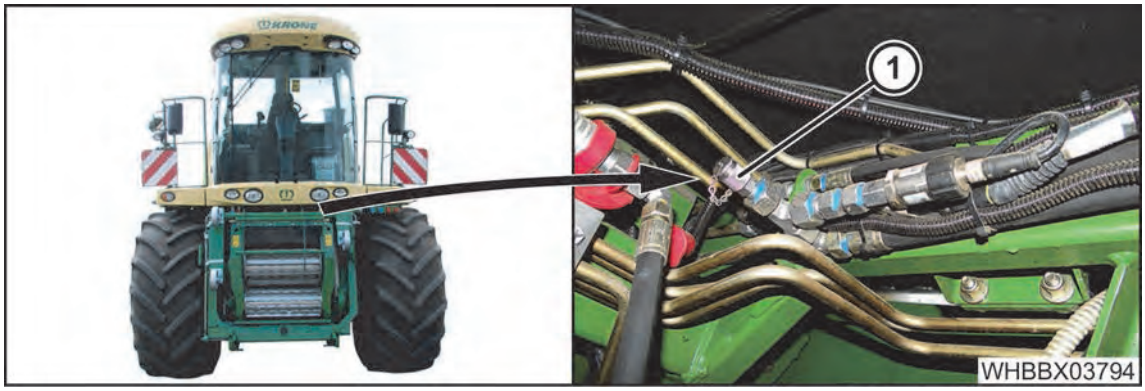
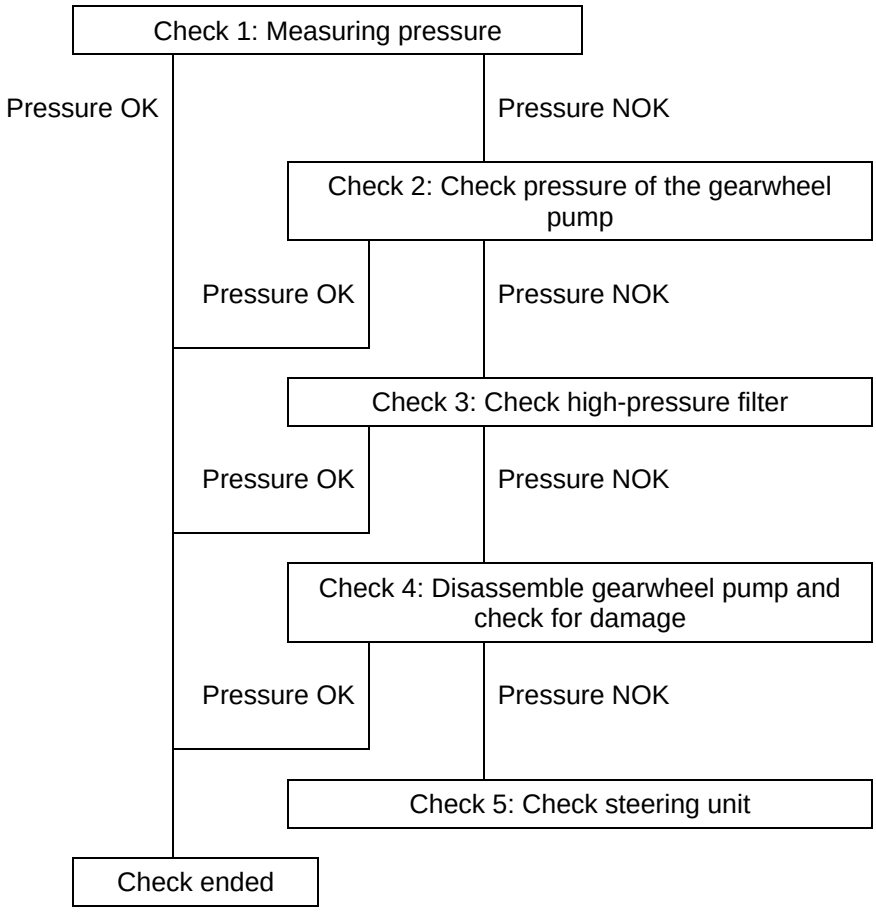


Fig. 936

Installation location:
The miniature measurement connection M18 (1) is located under the cabin.

Overview of test steps for M18:



Check 5:

Replace valve block

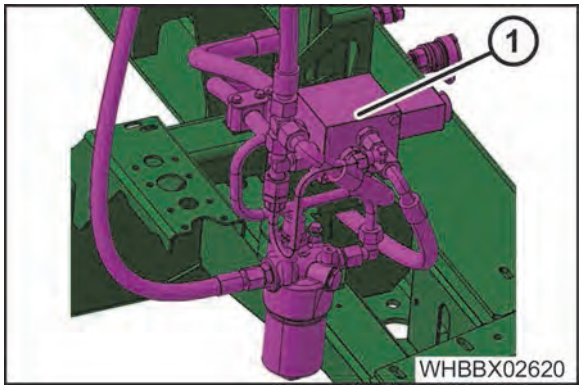


Fig. 960

- Replace valve block (1)

Test 6:

Replacing molasses gearwheel pump

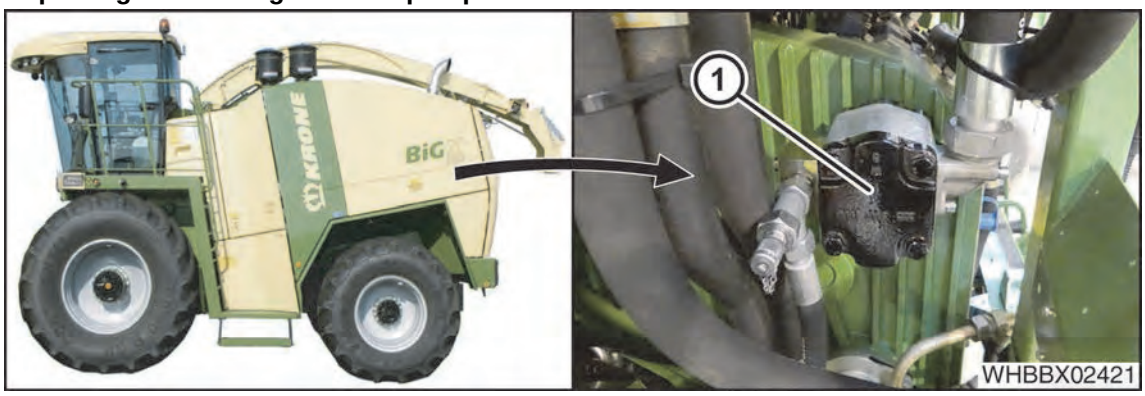


Fig. 961

- Replace gearwheel pump (1)

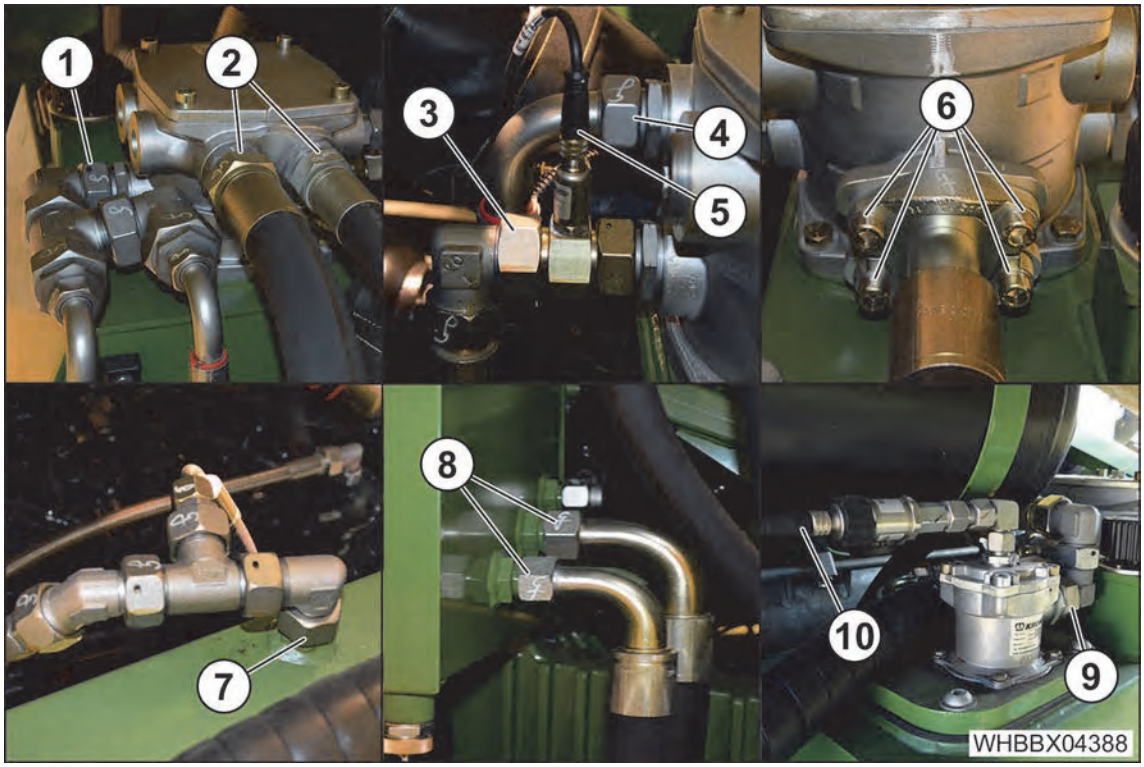


Fig. 987

Steckverbindungen trennen

- Disconnect plug connection of sensor B20 „Return suction filter”.
- Disconnect plug connection of sensor B43 „Filling level oil tank”.
- Disconnect plug connection of sensor B85 “Temperature hydraulic oil” (5).
- Disconnect plug connection of sensor B91 “Pressure sensor leakage oil filter” (10) (only available on machines with Poclain traction drive).

Hydraulikschläuche demontieren

Note
Seal all openings against dirt.

- Dismount housing lines of intake/header pump at return connection R3 (1).
- Dismount suction lines of drive pump and intake/header pump at suction connections S7 and S6 (2).
- Dismount return line of steering and working hydraulics at return connection R2 (3).
- Dismount suction line of “fan wheel” pump at suction connection S5 (4).
- Dismount return line of oil cooler at return connection R1 (6).
- Dismount leakage oil line (7) at hydraulic tank.
- Dismount suction line (8) of gearwheel pump at hydraulic tank.
- Dismount leakage oil line (9) of wheel motors (only Poclain traction drive) at tank return filter.

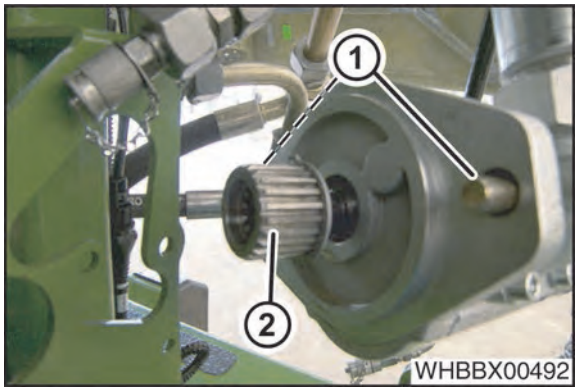


Fig. 1018

- Unscrew the screws (1) and remove gearwheel pump
- Remove adapter (2)

5.12.16 Replacing the Pilot Valve

5.12.16.1 Removing the pilot valve

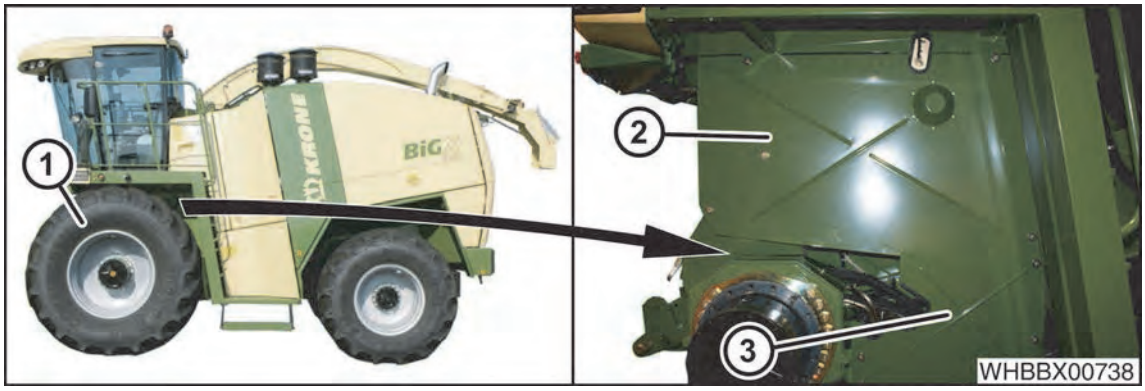


Fig. 1059

- Remove the left front wheel (1) and set the vehicle down securely on a suitable support
- Remove covering panel (2)
- Remove lower covering panel (3)
- Connect vacuum pump, see page 1217

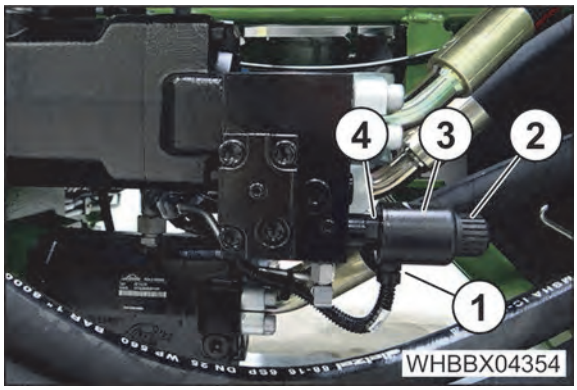


Fig. 1060

- Remove plug (1) from the pilot valve
- Unscrew knurled nut (2) and remove solenoid coil (3)
- Unscrew valve (4)

5.12.16.2 Installing the pilot valve

Installation is in reverse order to removal.

Note
Tighten valve (4) to 25 Nm.

5.16.11 Venting the parking brake

Note
2 people are required to vent the service brake.

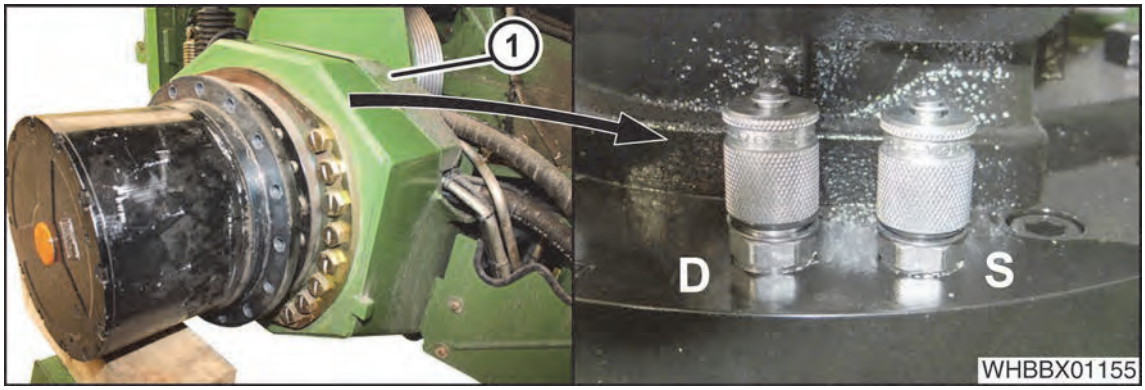


Fig. 1092

- Set the forage harvester securely down on a suitable support and remove the right and left front wheels
- Unscrew the screws of the covering panel (1) and remove the covering panel
- Turn miniature measurement hose onto connection (S) (mark on the wheel hub gearbox)
- Start diesel engine
- Release parking brake:
  Fully depress service brake pedal
  Press "parking brake" pushbutton once
  Release brake pedal
- When oil flows out without bubbles, unscrew miniature measurement hose
- Release service brake pedal, press parking brake pushbutton. The parking brake is now inserted
- Repeat the process on the second wheel hub gearbox
- Check: see page 543
  Pressures should also be checked on the "D" connections

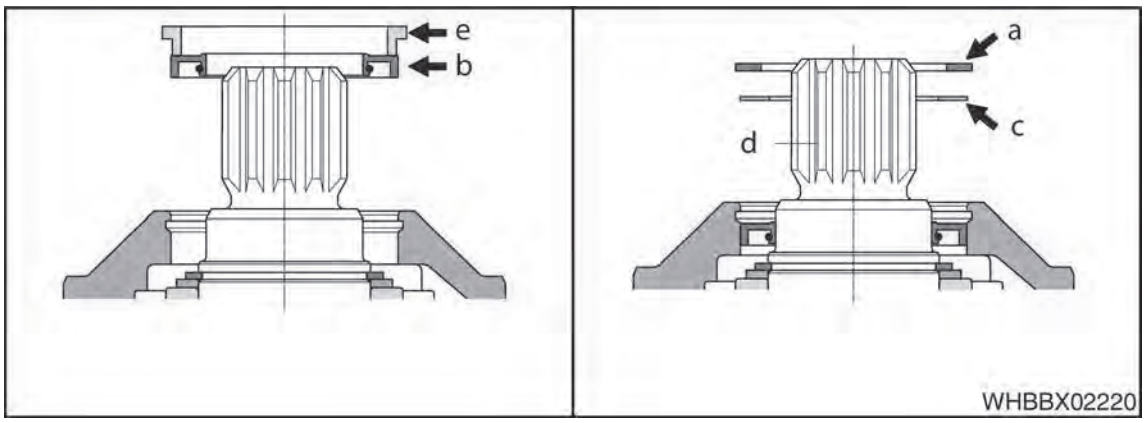


Fig. 1126

- Lightly grease shaft sealing ring between sealing lip and dust lip to prevent dry running
- Press in shaft sealing ring (b) with assembly sleeve (e) all the way
- Insert (c) disc
- Insert retaining ring (a) until it engages in the groove
- Remove masking from the drive shaft (d)

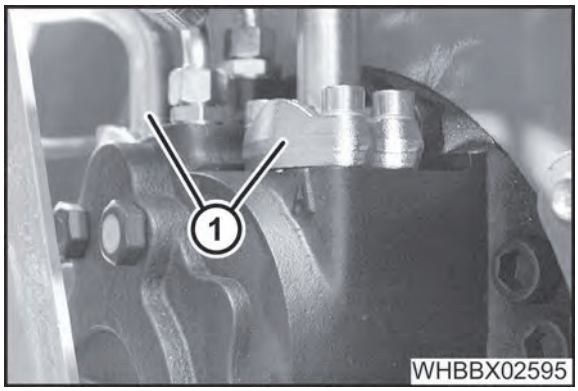


Fig. 1159

Note
Secure the hexagonal socket head screws (1) with medium-strength thread lock.

- After replacing a wheel motor, vent the hydraulic system.

Venting rear wheel motor

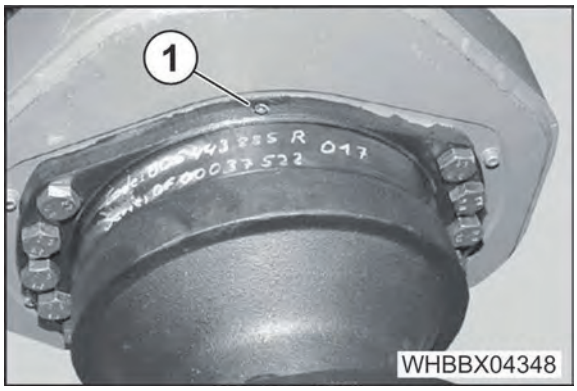


Fig. 1160

- Undo venting screw (1) and wait until hydraulic oil runs out bubble-free.
- Retighten venting screw (1).

Note
The static pressure in the system is adequate to allow all the air to escape. It is not necessary to start the diesel engine.

5.20.6 Replacing high-pressure sensor (Poclain)

To replace the sensor, see page 1866.

Removing valve block all-wheel

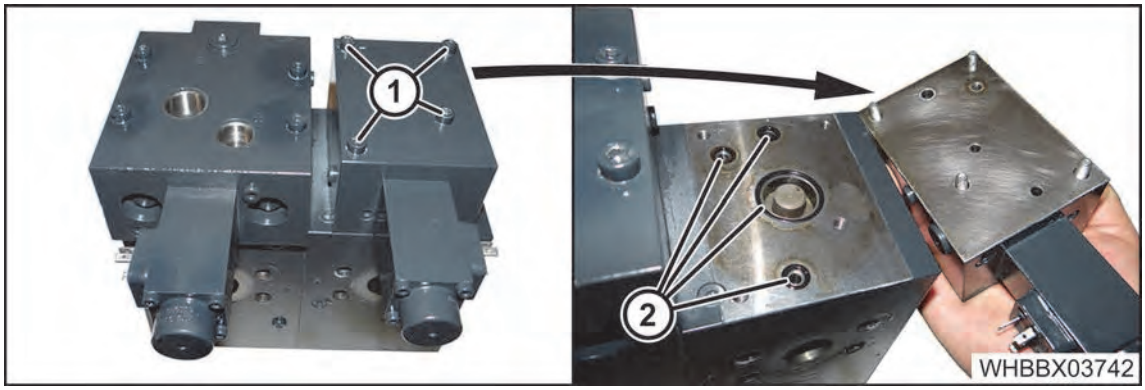


Fig. 1207

Note
Seal the holes thereby created with dummy plugs.
Collect escaping hydraulic oil in a suitable container.

- Unscrew hexagonal socket head screws (1) and remove valve block
- Before installing, check all O-ring seals (2) for damage, replace if required

Installing valve block all-wheel
Installation is in reverse order to the removal procedure.

- Tighten hexagonal socket head screws (1) crosswise

Replacing valves
The replacement is shown below as an example on valve Y13 "All-wheel".

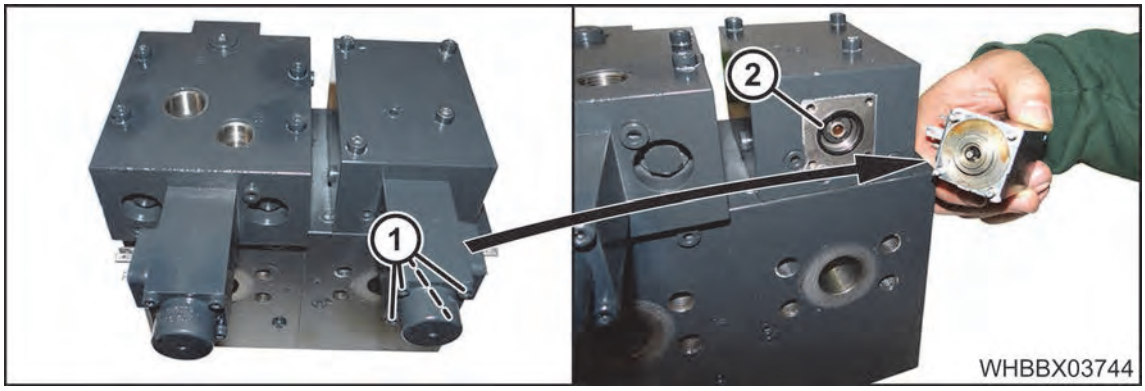


Fig. 1208

Note
Seal the holes thereby created with dummy plugs.
Collect escaping hydraulic oil in a suitable container.

- Unscrew hexagonal socket head screws (1) and remove valve block
- Before installing, check O-ring seal (2) for damage, replace if required
- Tighten hexagonal socket head screws (1) crosswise

6.6.3 Draining Engine Oil

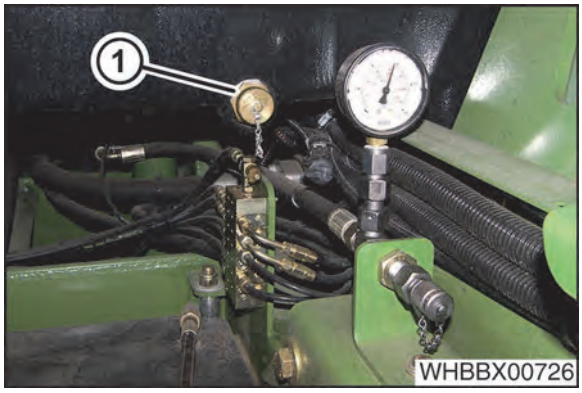


Fig. 1234

- Provide a collecting vessel (approx. 60 litres).
- Dismount the protective cap from the drain valve (1) on the engine oil pan.
- Lay one end of the hose (from the tool box of the machine) into the collecting vessel. Mount the other end of the hose on the drain valve (1). As a result, the valve is opened automatically.

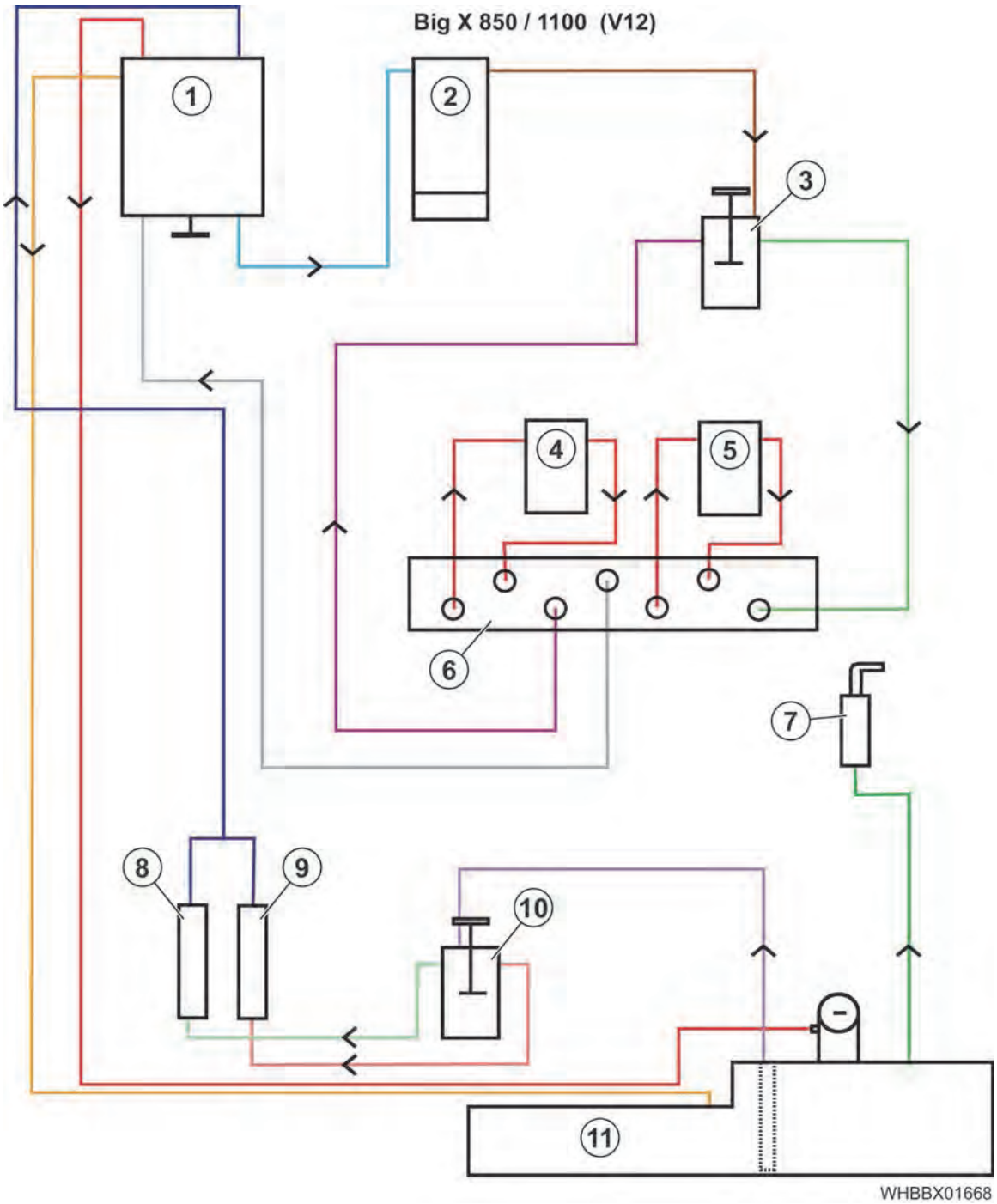


Fig. 1279

1	Intermediate tank	5	Filter	9	E-pump
2	Water separator	6	Distributor block	10	Hand pump
3	Hand pump	7	Tank vent system	11	Tank
4	Filter	8	E-pump		

Fan door

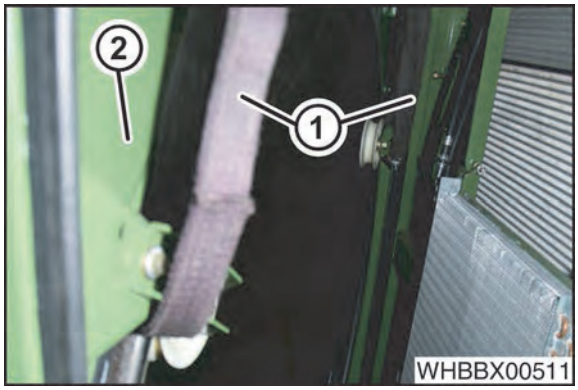


Fig. 1317

- Open the fan door by loosening the lockings top and bottom.
- Mount a lifting tool (1) on the inside of the fan door (2).
- Remove the cotter pins of the bolts and pull out the bolts.
- Raise fan door out of the machine and secure it against falling over.

Air conditioner capacitor

Note
Removal and installation of charge air cooler, oil cooler and coolant cooler is the same.

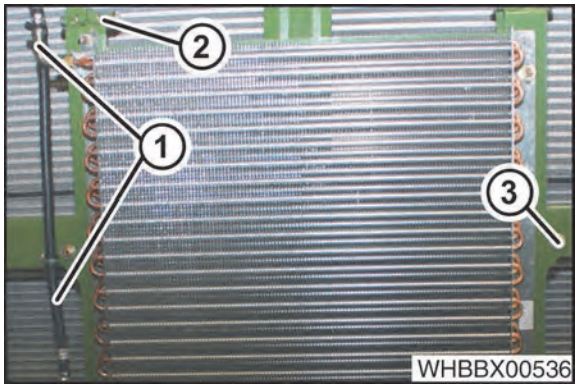


Fig. 1318

- Dismount the screw connections of the coolant lines (1) and close the openings.
- Dismount the screws (3) on the left and right.
- Remove the split pins (2) of the bolts on the left and right and remove the bolts.
- Remove the air conditioning condenser.

7.2.2 General View Cooler Unit

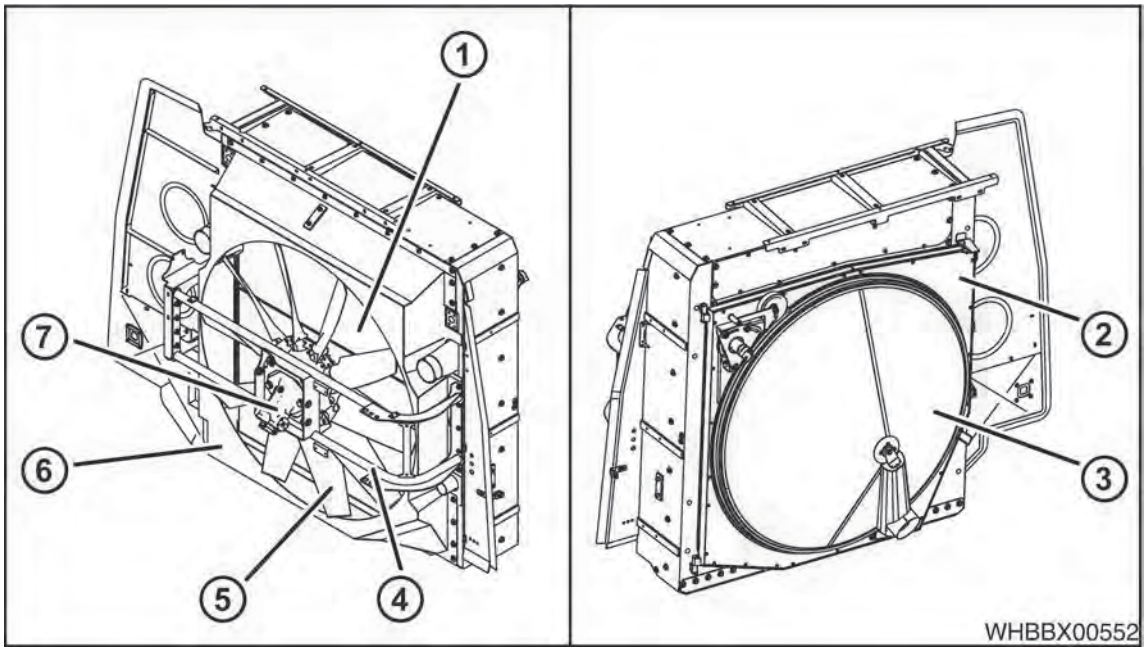


Fig. 1358

1 Cooler unit
2 Fan door
3 Rotary sieve
4 Support-fan
5 Fan wheel
6 Wind header
7 Engine-fan wheel

Fixing the radiator segments

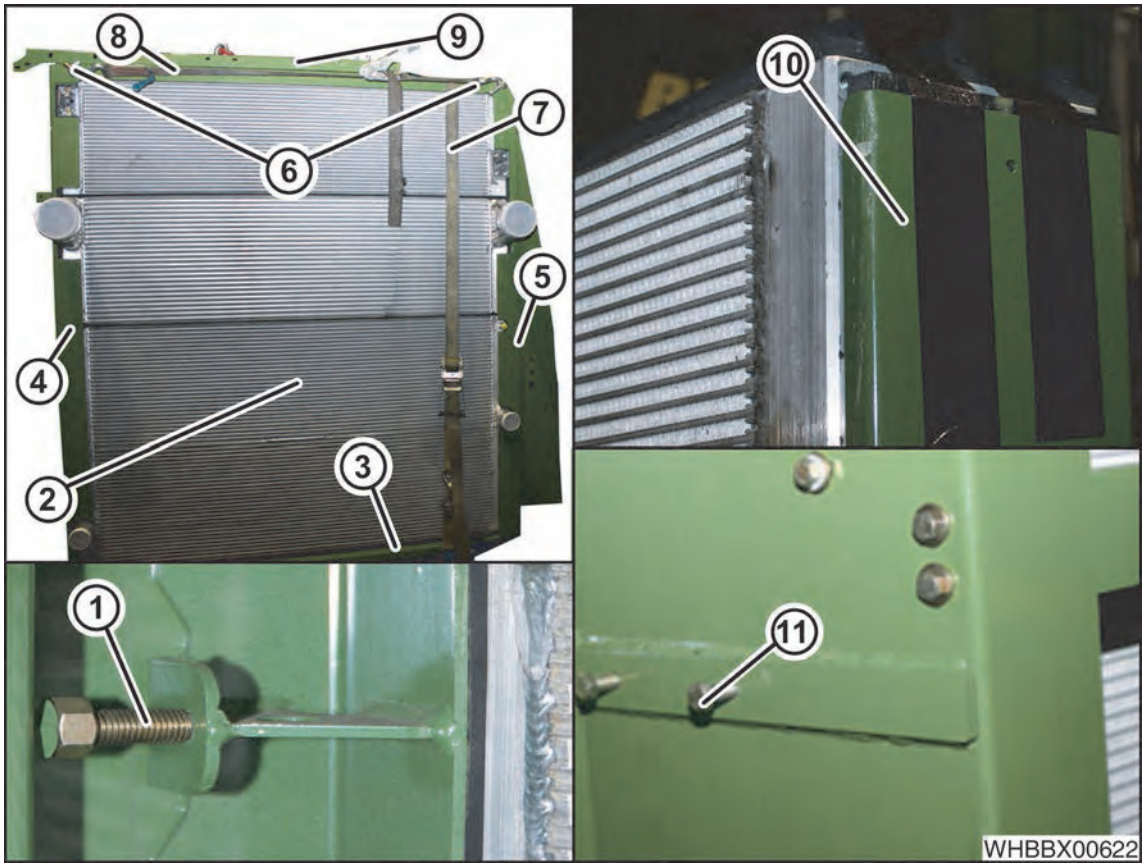


Fig. 1404

Ensure that the radiator segments are not damaged.

- Install the right pressing plate (10) and secure against falling over.
- Install the side part (5). Fix the bottom and then the top screws loosely into position.
- Mount the ring lugs (6) in the side parts (4, 5).
- Attach a lashing strap (8) to the ring lugs (6) and pull the two side parts together by tightening the lashing strap.
- Tighten the screws of the side parts (4, 5).
- Remove the lashing strap (8) and dismount the ring lugs (6).
- Install the cover (9) and mount the screws loosely.

Note

If the screws cannot be inserted, place a lashing strap (7) around the radiator segments (2) and pull the cover (9) and the bottom plate (3) together.

- Tighten the screws of the cover (9).
- Remove the lashing strap (7).
- Use the pressing screws (11) of the pressing plate to push the radiator segments as far to the left as possible.
- Loosen the pressing screws.
- Use the pressing angle (1) to push the radiator segments on both sides as far as possible to the rear and mount the screws of the pressing angle.
- Mount the pressing screws of the pressing plate.

7.4 Passive Rotor

General view

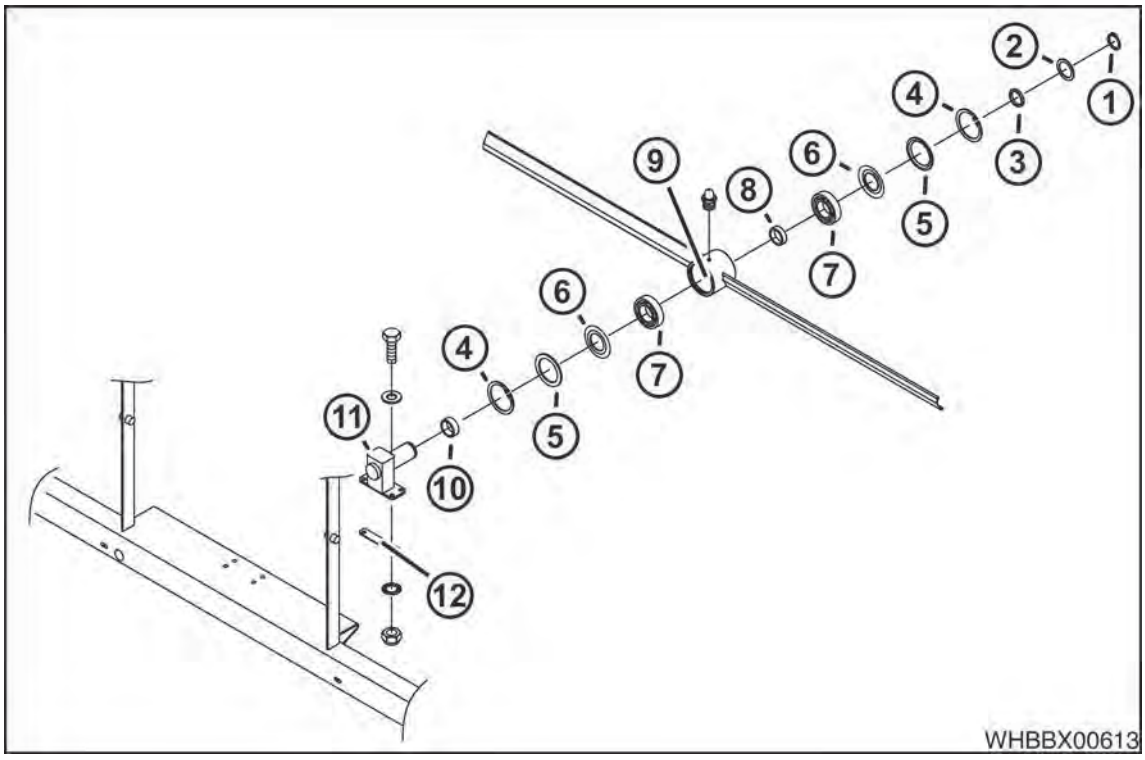


Fig. 1448

1 Retaining ring
2 Shim ring
3 Spacer ring
4 Retaining ring
5 Nilos spacer ring
6 Nilos ring
7 Grooved ball bearing
8 Spacer bushing
9 Passive rotor
10 Spacer sleeve
11 Rotor block
12 Compensation plate

8.3 Maintenance fuel system (engine)

WARNING!

Risk to people and the environment from escaping fluid!

Consumables, such as diesel fuel, hydraulic oil, anti-freeze, refrigerants and lubricants, may be harmful to health and the environment.

- Make sure the system has been depressurised prior to carrying out tasks.
- Avoid all contact with fluids.
- Always wear suitable protective clothing, e.g. safety gloves and protective goggles.

Do not rub your eyes if fluid comes into contact with them. Rinse your eyes and any other affected parts with cold water for a few minutes and seek medical assistance immediately.

- Keep working areas well ventilated.
- Catch fluids in suitable collectors and dispose of them in the proper manner.

WARNING!

Take care when working on the fuel system!

Fuel may escape when working on the fuel system. The escaping fuel may

cause skin irritation and breathing problems, or may ignite.

- Carry out work only with the engine off and cold.
- When working on the fuel system avoid creating sparks, and do not smoke.
- Wear protective clothing, and do not inhale escaping vapours.

WARNING!

Risk of scalding by escaping engine coolant!

The engine coolant must be drained before working on the engine cooling system. The engine coolant may be hot. People may be scalded as a result.

- Drain engine coolant only with the engine off and cold.
- Never open the coolant reservoir cover or the drain cock when the engine is hot.

WARNING!

If the basic safety instructions are not followed, people may be seriously injured or killed.

- To avoid accidents, the basic safety instructions in the chapter Safety must have been read and followed, see chapter Safety "Basic safety instructions".

8.6.3 Maintenance of transfer gearbox

Oil level check

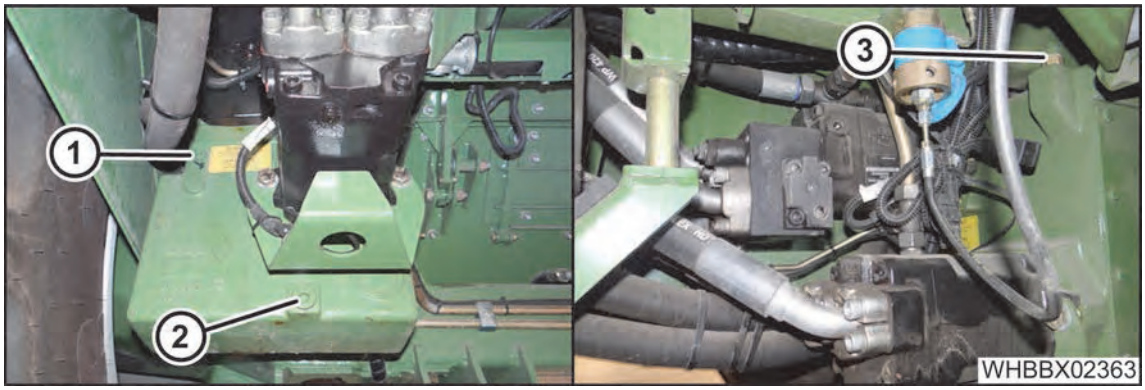


Fig. 1489

- Thoroughly clean the area around the oil level inspection screw (1).
- Dismount the oil level inspection screw (1) at the transfer gearbox.
- Oil level must reach the inspection bore, if necessary, top up oil (see Oil change).
- Mount the oil level inspection screw (1).

Oil change

- Provide a collector (approx. 10 litres).
- Thoroughly clean the area around the oil drain plug (2) and the screw plug with ventilation filter (3).
- Dismount the oil drain plug (2) and drain the oil.
- Dismount the screw plug with ventilation filter (3).
- Mount the oil drain plug (2).

ATTENTION! Damage to the gearbox! If a mixture of different oils is used, the gearbox may be damaged.

• Fill oil.

Through year of manufacture 2012:
Type of oil: Gear oil PGLP DIN 51502, ISO viscosity class 220
Filling quantity: approx. 9.0 litres

From year of manufacture 2013:
Type of oil: Gear oil Mobil SHC 630, ISO viscosity class 220
Filling quantity: approx. 9.0 litres

- Mount the screw plug with ventilation filter (3).

Filling cylinder

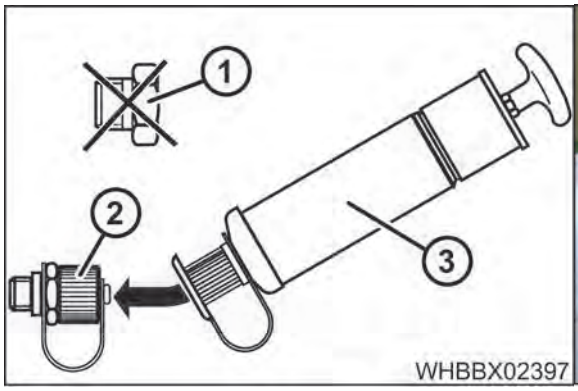
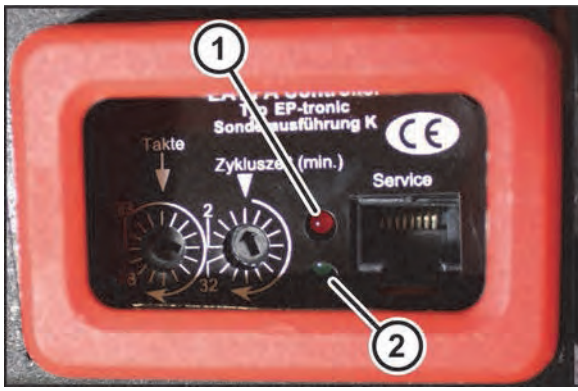


Fig. 1514

The lubricant is filled via a filling cylinder.

- Dismount the screw plug M20 x 1.5 (1) and mount the filling socket 940 392 0 (2)
- For filling, remove the protective caps on the socket (2) and the filling cylinder 940 393 0 (3)

Operational sequence



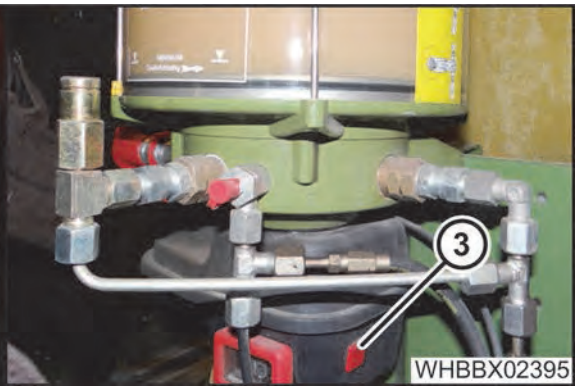


Fig. 1515

- Switch on the ignition.
  - ➔ The green (2) and red (1) LEDs light up for approx. 1.5 s (independently of the set programme) and indicate that the control of the lubrication system is operational.
- Subsequently, both LEDs extinguish again.

The central lubrication works independently. The machine only supplies the voltage and displays a general fault message.

The lubrication intervals are set at the control unit of the lubrication system.

The actual error is displayed via various signal statuses of both LEDs, see page 1192.

Note

If the ignition is interrupted during a lubrication sequence or in the course of the cycle time, the time will be stopped and stored in the data memory. When the ignition is turned on again, the remaining lubrication or cycle time stored in the memory will be re-activated and the sequence of operations will be continued at that point where it was interrupted before.

The frequency and the duration of the grinding process depend on the application conditions. In principle, short grinding intervals with a short grinding duration and corresponding counterblade adjustment are recommended.

– To ensure that the cutting blades for the maize operation achieve a very good self-sharpening effect, they must not be "fully ground", i.e. the blade should not be ground down to the cutting edge. This will cause the base material to wear more quickly than the coating and an aggressive cutting edge will be formed, the so-called "mouse tooth". Before grinding the cutting blades, check the automatic re-adjustment of the grinding stone and clean the grinding channel.
– On account of the application conditions, the self-sharpening effect of the cutting blades for grass operation is difficult to achieve, as is the case with the cutting blades for maize operation. The blades must therefore be "fully ground", i.e. the blade should be ground down to the cutting edge. Before grinding the cutting blades, check the automatic re-adjustment of the grinding stone and clean the grinding channel.

Checking the cutting blades

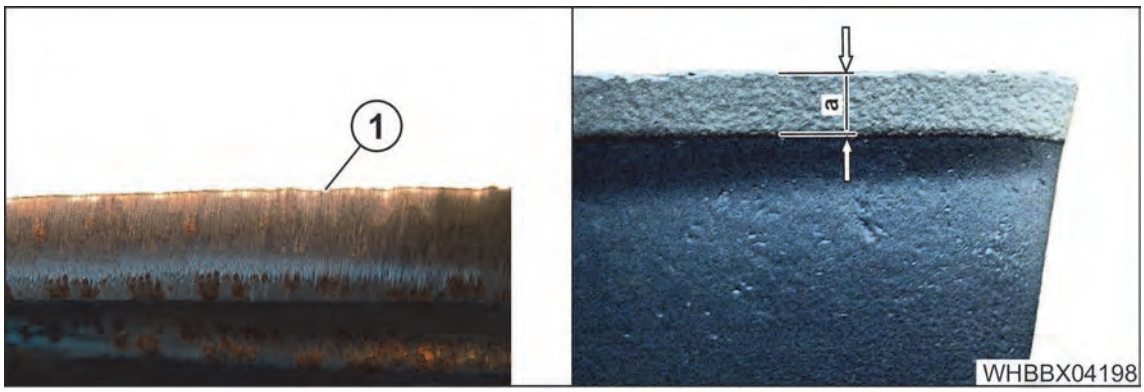


Fig. 1534

Worn cutting blades may result in an unsatisfactory chop quality. To keep wear as low as possible, the cutting blades must be ground correctly and regularly and the distance between the counterblade and the cutting blades (cutting gap) must be adjusted correctly and regularly.

To ensure that the cutting blades for the maize operation achieve a very good self-sharpening effect, they must not be "fully ground", i.e. the blade should not be ground down to the cutting edge. This will cause the base material to wear more quickly than the coating and an aggressive cutting edge will be formed, the so-called "mouse tooth".

On account of the application conditions, the self-sharpening effect of the cutting blades for grass operation is difficult to achieve, as is the case with the cutting blades for maize operation. The blades must therefore be "fully ground", i.e. the blade should be ground down to the cutting edge. Before grinding the cutting blades, check the automatic re-adjustment of the grinding stone and clean the grinding channel.

The cutting blades must be replaced if they can no longer be re-adjusted and the coating (a) under the cutting blade is worn. In the original state the coating "a" = 19 mm. The cutting drum operates particularly efficiently if the maximum cutting radius and conveying space can be used. Therefore the cutting blades should be re-adjusted if dimension "a" = 10-12 mm.

Replacing the cutting blades, see page 286.

9.4.7 Installing the track rod

Installation is in reverse order to removal.

- Adjust the track rod to the dimensions determined prior to removal.

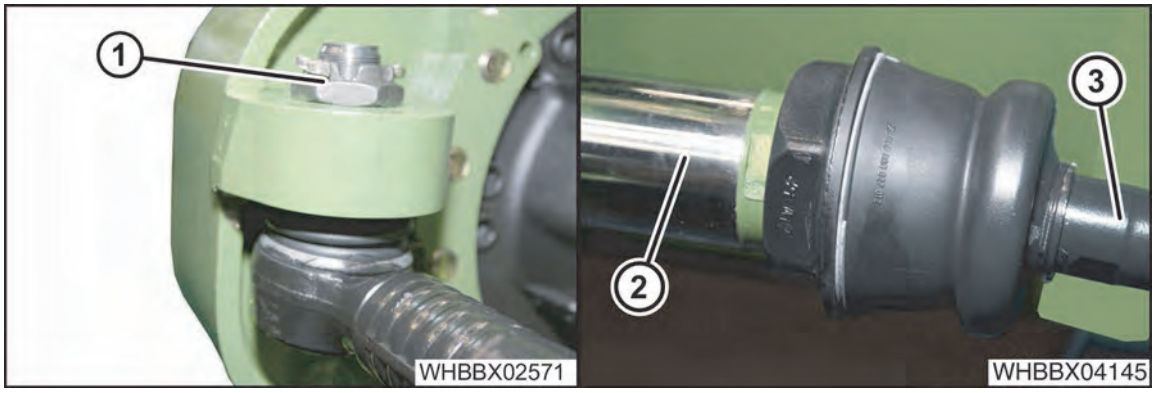


Fig. 1557

- Tighten the crown nut (1) (tightening torque = 450 +50 Nm) and fix with a splint
- Screw in the axial ball joint (3) with "high strength thread lock" (tightening torque = 350 Nm), countering the plunger rod (2)

Note

After installation, check the track and, if necessary, adjust it, see page 1141.

Calibrate sensor B64 "Inclination registration, steering axle" (with Bosch and Poclain), see page 2035.

Calibrate sensor B107 "steer angle" (only Bosch), see page 1823.

9.8.3 Replacing driver's seat

Removing driver's seat

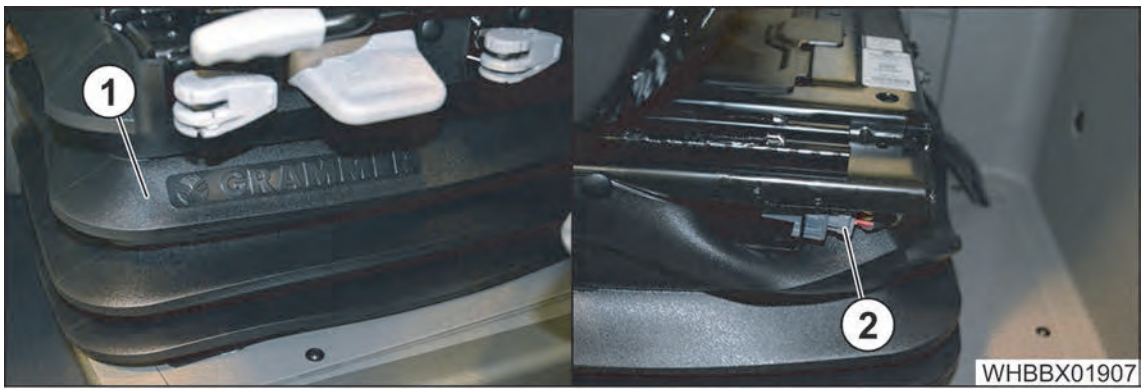


Fig. 1589

- Remove the bellows (1) from the left, right and back.
- Loosen the plug connection (2) and remove all cable ties from the cable.
- Note the installation route of the cable up to the opening in the cabin floor and withdraw the cable.

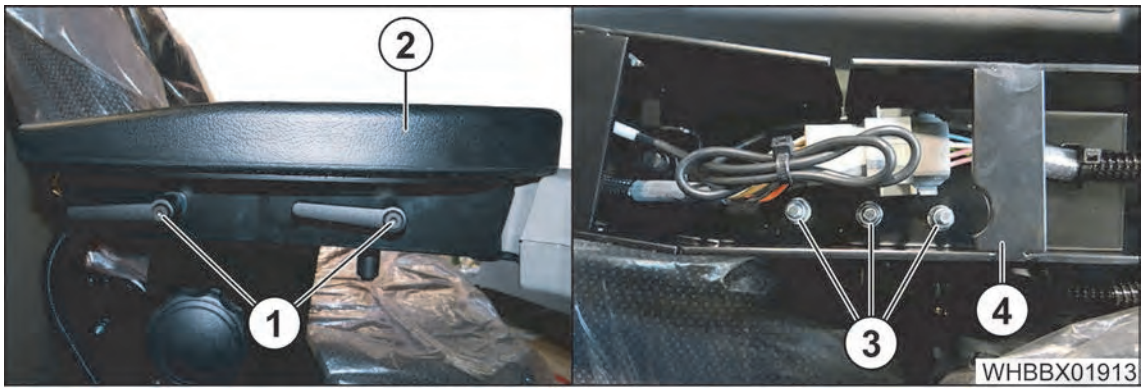


Fig. 1590

- Detach and remove the clamping levers (1).
- Remove the holding surface (2).
- Dismount the nuts (3).
- Remove the armrest (4) together with the control lever and put them to one side.

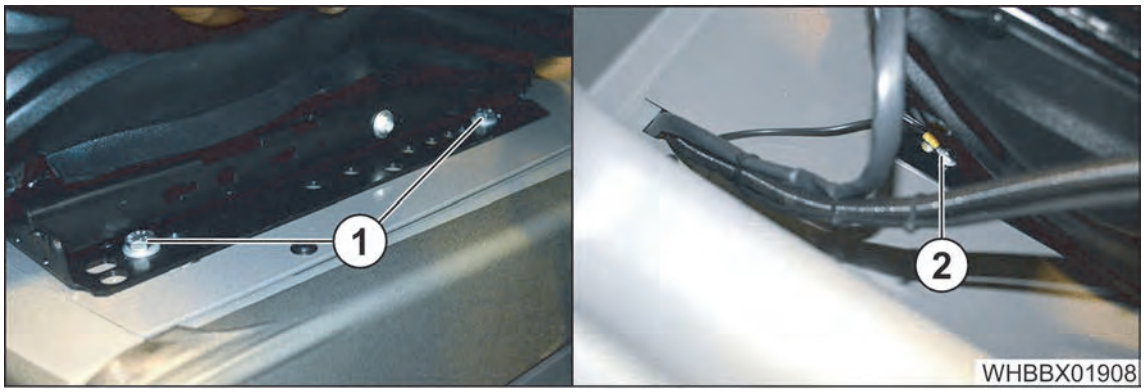


Fig. 1591

- Remove the screws (1) on both sides and remove the ground cable (2).
- Remove the driver's seat.

9.9.5 Removing the ascending pipe

WARNING!
Take care when working on the fuel system!
Fuel may escape when working on the fuel system. The escaping fuel may cause skin irritation and breathing problems, or may ignite.
- Carry out work only with the engine off and cold.
- When working on the fuel system avoid creating sparks, and do not smoke.
- Wear protective clothing, and do not inhale escaping vapours.

Note
Pay attention to cleanliness!

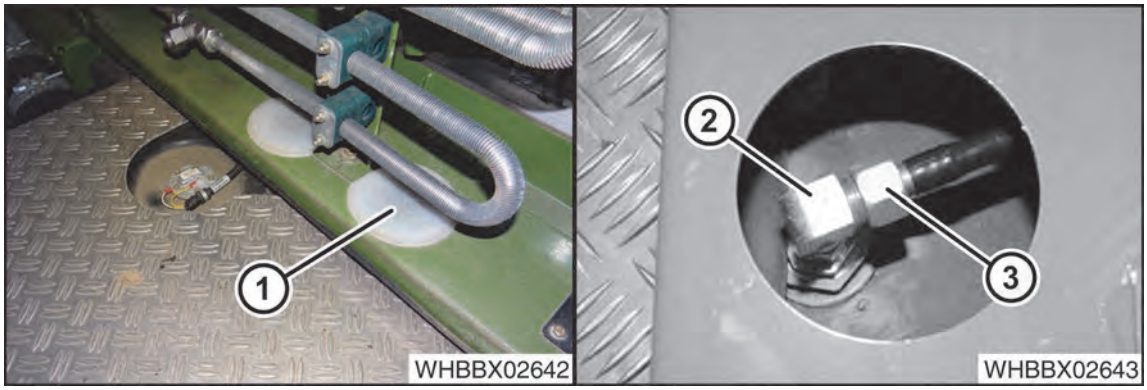


Fig. 1638

- Remove the right-hand plastic cap (1)

Note
Seal the holes thereby created with dummy plugs.
Collect escaping fuel in a suitable container.

- Unscrew the union nut (3), counter the angle bracket and remove the fuel line
- Dismount the elbow union (2)

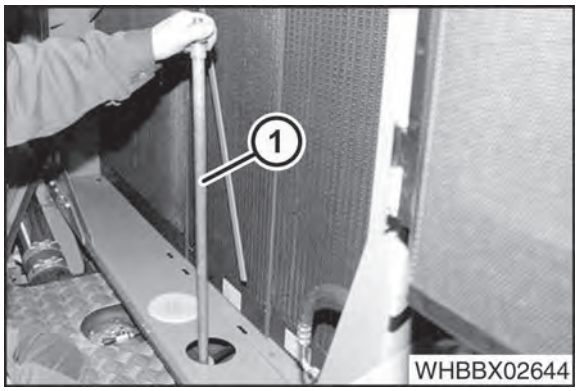


Fig. 1639

- Unscrew the ascending pipe (1) from the fuel tank and remove it

9.12.6 Setting the parameters

Fig. 1665

- Remove the red frame (1) using a flat screw driver.
- Dismount the four screws (4) and remove the transparent protective cover.
- Use a flat screwdriver to set the lubrication duration (2) or the cycle time (3).
- Install the transparent protective cover and mount the four screws (4).
- Securely attach the red frame (1) again.

Note
If the cover is not properly closed, water can penetrate the control system, which then may be destroyed. In this case, the warranty will be void.

Note
It is not recommended to reduce the amount of grease, as this may lead to serious damage at the machine. In this case, the warranty will be void.

Clock pulses
33 to 48 clock pulses (16 notches at 1 cycle each)

Factory settings

Cycle time:	8 min
Lubrication duration:	34 cycles

Before making any changes to settings, note the following instructions:

- To increase the amount of grease, increase the number of clock pulses per lubrication cycle
- To reduce the amount of grease, reduce the number of clock pulses per lubrication cycle

Note
The change in the amount of grease is about 3% for each cycle more or less.
The amount of grease should not be set via the cycle time.

Example

- With a setting of 33 clock pulses, lubricating grease consumption is reduced by 3%
- With a setting of 48 clock pulses, lubricating grease consumption is increased by 42%

10.6.1 Technical data

CAUTION!

Damage may occur due to freezing of heat exchanger!

On machines that feature a heating and air conditioning system, the heating medium must contain water/glycol antifreeze protection at a ratio of 50 to 50%.

- Observe mixture ratio

Technical data of air conditioning and heating system

Type			**KL2/4 Split / VD 2109**
Refrigerant			R 134a
Operating voltage		Volt DC	12
Refrigerating capacity evaporator VD2109/4		Watt	6000
Heating capacity VD2109/4		Watt/Q100	12000
Air volume evaporator VD2109/4 (up to year of manufacture 2012)		m^3/h	1.130 (free blowing)
Air volume evaporator VD2109/4 (from year of manufacture 2013)		m^3/h	910 (free blowing)
Power consumption evaporator VD2109/4		A	12 V / 34.5 A
Pressure switch (B11-AA1-351)			
Low pressure switch	kg/cm^3	2.0 ± 0.3 OFF	2.1 ± 0.3 ON
Low pressure switch	kg/cm^3	26.0 ±2.0 OFF	20,0 ± 2,0 ON
Filling quantities			
Total filling quantity (refrigerant)		g	1500
Amount of PAG oil in the system (after initial filling)		cm^3	265

Table 88: Technical data of air conditioning system

Refrigerant data sheet R 134a, excerpt

Refrigerant R 134a	
Chemical designation	1,1,1,2-tetrafluorethane
Chemical formula	$CH_2F\ CF_3$
Molecular weight:	102.0 g/mol
Boiling point (at 1013 mbar)	-26.1°C
Freezing point	-101.0 °C
Critical temperature	-101.1 °C
Critical pressure	40.60 bar
Density (liquid at 25 °C)	1206 kg/m_3
Flammability limit in air	not inflammable
Environmental data FC 134a	
ODP - Ozone depletion potential	0
CLP - Chlorine load potential	0
HGWP - Greenhouse effect	0.26
PCR - Photochemical reactivity	0.5

Table 89: Refrigerant data sheet

Installing the compressor

When installing a new compressor, note the following points:

The amount of refrigerant oil drained from the old compressor must also be drained from the new compressor.

Note

Even if it was not possible to drain any oil from the removed compressor in order to determine the oil quantity, do not drain more than 50 cm^3 from the new compressor.

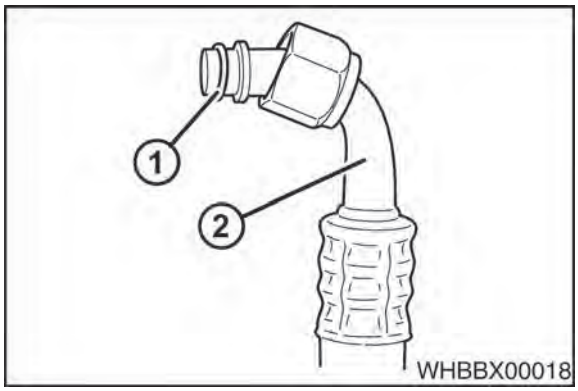
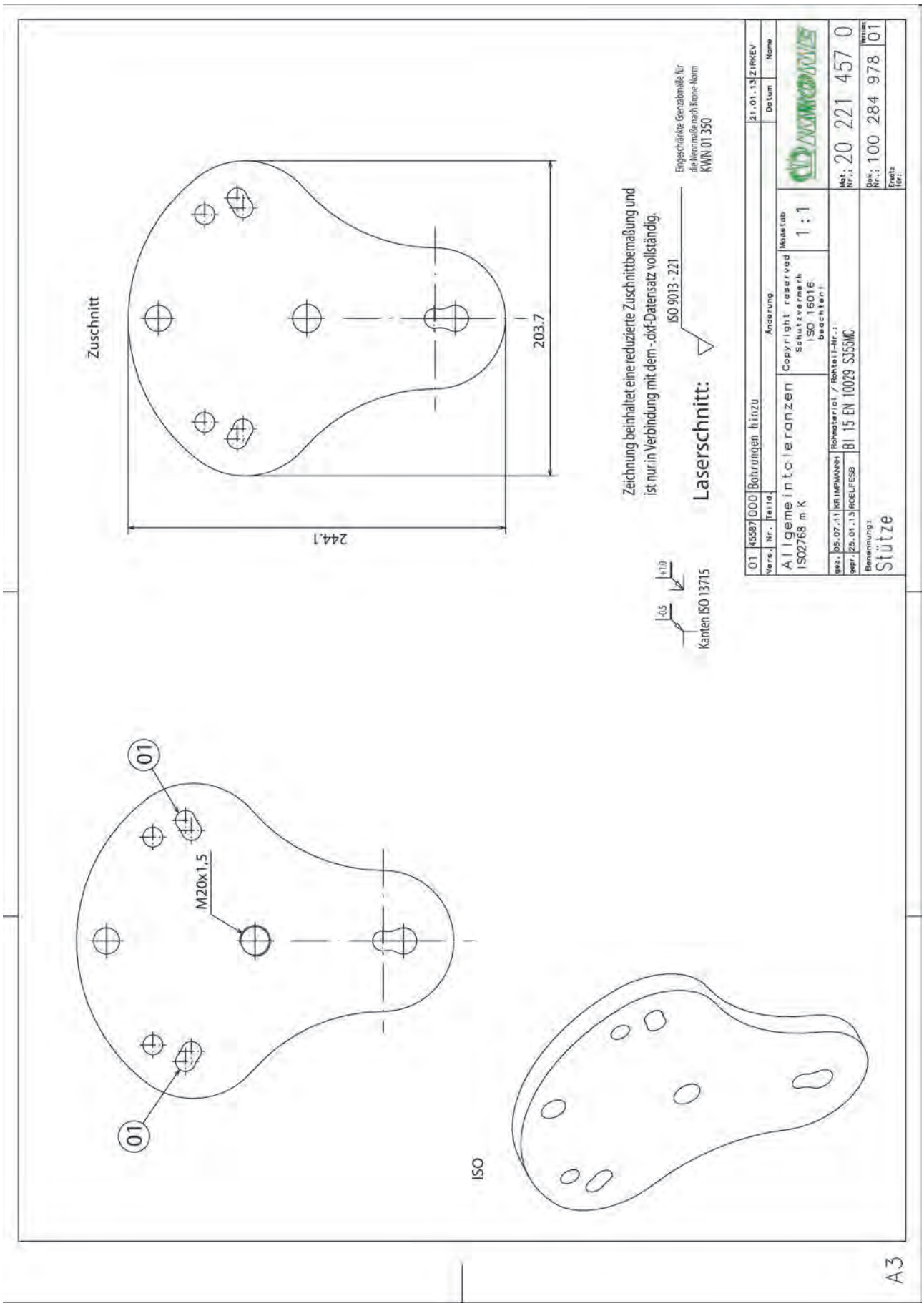


Fig. 1720

- Replace the sealing ring (1) of the pressure and suction line (2) and oil with refrigerant oil
- The remainder of the installation is in reverse order to removal
- Only then evacuate the air conditioning system and fill with refrigerant



Special tool no. 31 "pulling tool bearing discharge accelerator"

D

The description, the declaration and the order numbers of the safety labels are listed in the following.

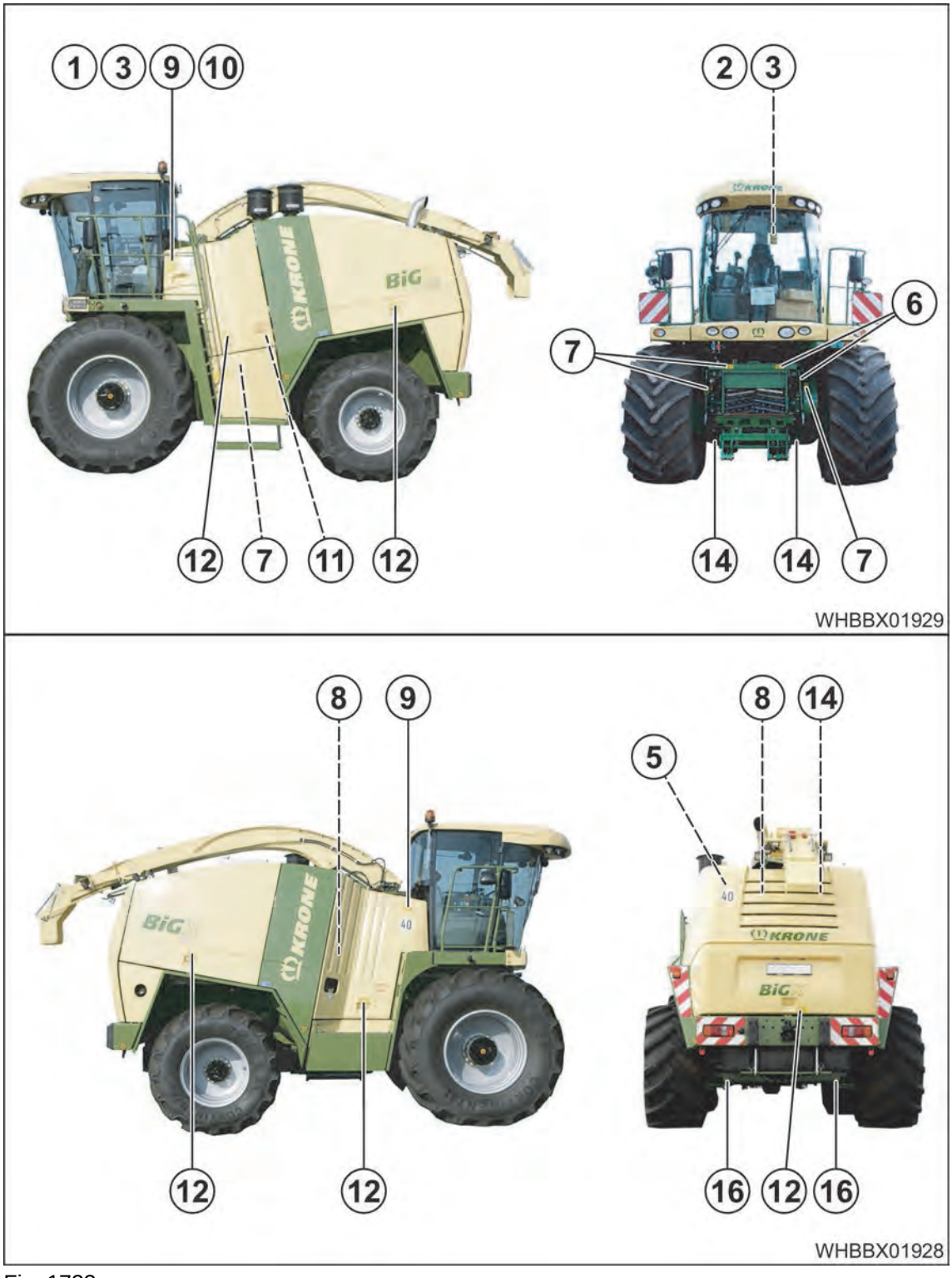


Fig. 1733

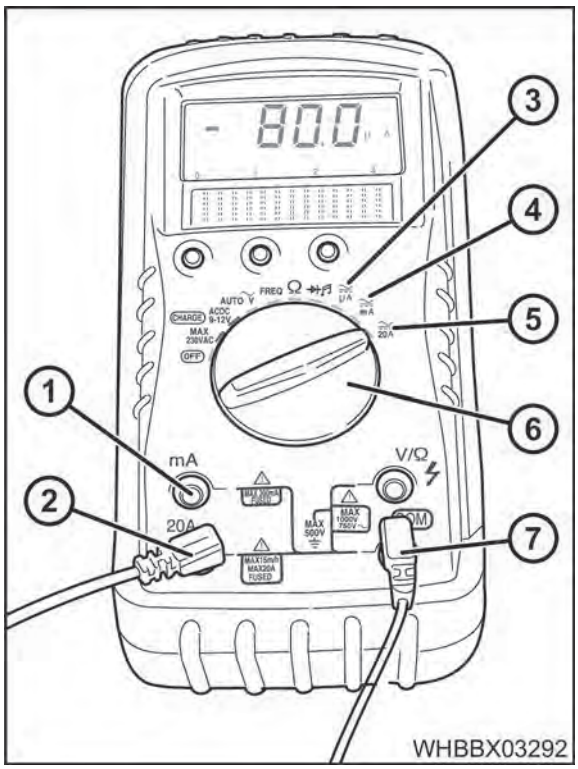


Fig. 1738

To measure the current within the ampere range, proceed as follows:

- Connect the measuring lead (black) to the COM connection (7) of the multimeter.
- Connect the measuring lead (red) to the 20 A connection (2) of the multimeter.
- Set the function selector switch (6) to position 20 A (5).
- Connect the measuring leads to the measurement point.
- Read off the value on the display.

Note

If no value or a too low value is indicated on the display (current in the milli or microampere range), the function selector switch (6) must be reset and the measuring lead (red) plugged into a different socket.

To measure the current within the micro or milliampere range, proceed as follows:

- Connect the measuring lead (black) to the COM connection (7) of the multimeter.
- Connect the measuring lead (red) to the mA connection (1) of the multimeter.
- Set the function selector switch (6) within the milliampere range to position mA (4) or within the microampere range to position µA (3).
- Connect the measuring leads to the measurement point.
- Read off the measured value on the display.

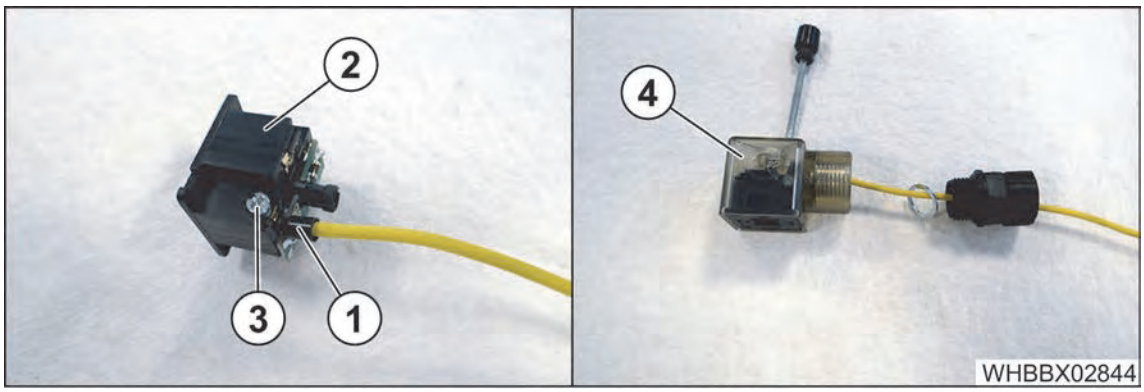


Fig. 1784

- Insert the single wire with crimped wire end ferrule (1) into the contact holder (2) and tighten the screw (3).
- Insert the contact holder into the plug housing, carefully pulling the single wires out of the opening for the corrugated pipe transition.

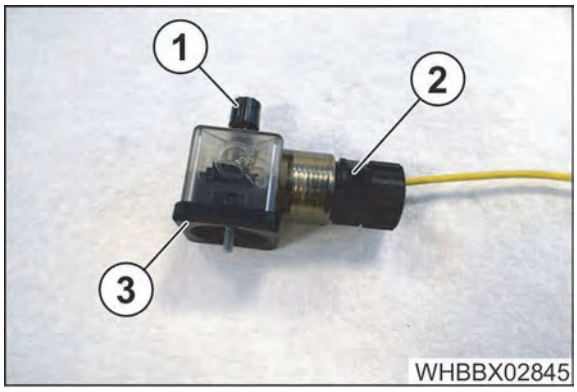


Fig. 1785

- Screw the screw (1) into the back of the solenoid valve plug.
- Attach the corrugated pipe transition (2) and the seal (3).

Removing battery change-over relay

- Disconnect the batteries, see page 1392.

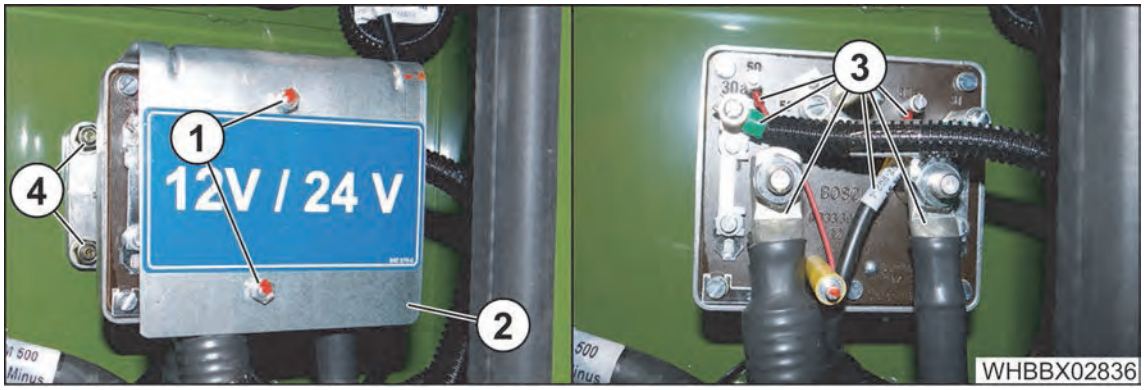


Fig. 1827

- Remove the nuts (1) and remove the cover (2).
- Mark and disconnect all cables (3) from the battery change-over relay.
- Remove all nuts (4) and remove the battery change-over relay.

Installing battery change-over relay

- Install the battery change-over relay and attach the nuts (4).
- Connect all cables (3) to the battery change-over relay according to markings.
- Attach the cover (2) using the nuts (1).
- Connect the batteries, see page 1392.

Fuses, LEDs and switches of the "Cab relay board"

Ref.	Value	LED	Description
4F1	20 A		Allround lights
4F2	10 A		Cutting drum lighting
4F3	15 A		Seat compressor
4F4	15 A		Side window wiper
4F5	15 A		Windscreen wiper/washer system
4F6	10 A		Indicator
4F7	5 A		Horn, headlamp flasher
4F8	5 A		Mirror adjustment
4F9	30 A		Continuous voltage, PWM module
4F10	15 A		+12 V socket (cool box)
4F11	5 A		Control unit K6
4F12	5 A		GPS antenna
4F13	5 A		Compressor
4F14	15 A		Radio/CB radio
4F15	7.5 A		Radio/CB radio
4F16	15 A		Hazard warning lights
4F17	15 A		Comfort seat/reserve
4F18		4LD18	Fuse tester test current 0.5 A
4F19	5 A		Interior lighting, reading lamp
4F20	10 A	4LD20	Dipped beam headlight right
4F21	10 A		Dipped beam headlight left
4F22	10 A		Full beam left
4F23	10 A		Full beam right
4F24	30 A	4LD24A	Cab roof floodlight left inner
		4LD24B	Cab roof floodlight right inner
4F25	30 A	4LD25A	Cab roof floodlight left centre/outer
		4LD25B	Cab roof floodlight right centre/outer
4F26	30 A	4LD26A	Working floodlight discharge chute
		4LD26B	Rear floodlights
4F27	30 A	4LD27A	Cab platform floodlight
		4LD27B	Rear wheel lighting working floodlight
4F28	15 A	4LD28	Front guard floodlight
4F29	10 A	4LD29	Reversing horn, reversing lights
4F30	10 A	4LD30	Brake light
4F31	10 A	4LD31	Side/rear lights, left side perimeter light
4F32	10 A	4LD32	Side/rear lights, right side perimeter light
4F33	10 A	4LD33	Locator lighting
4F34	7.5 A		Dipped beam headlight control relay

Table 101

Replacing the back-up battery in the 6" terminal

Note
The power to the machine must not be switched off when replacing the back-up battery, otherwise data will be lost.

- Ignition key = ignition stage II.

For replacing the terminal, see page 1435.

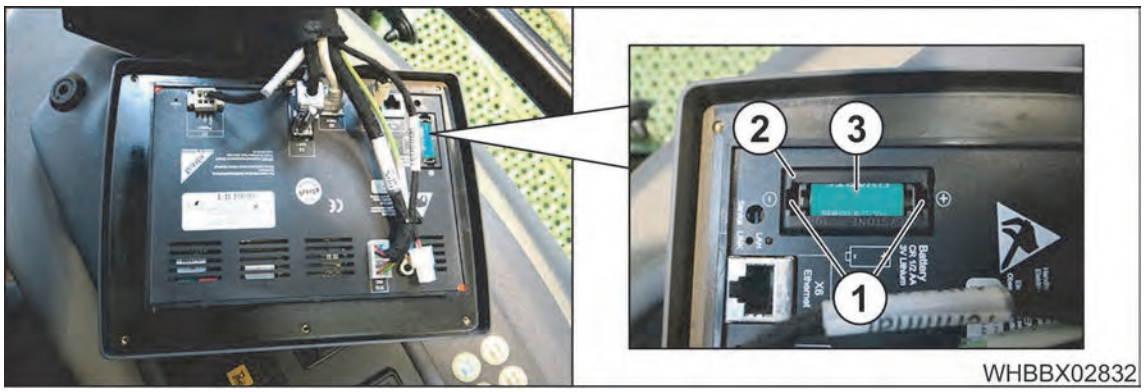


Fig. 1883

- Using a screwdriver, carefully release the lock catches in the recesses (1) of the plastic surround (2) and detach the surround.
- Carefully prise the battery (3) out of its holder using a screwdriver.

Note
Do not damage the battery compartment and do not cause any short circuits.
If a short circuit is caused, the control unit may be destroyed.

Note
So as not to shorten the life expectancy of the new battery, grasp it only by its sides and not by the terminals!

- Insert the new battery (3), paying attention to the correct polarity, and refit the plastic surround.
- Switch the ignition off and on again.
- Check the functioning of the control unit.

For installing the terminal, see page 1435.

14.3.26 Replacing control unit A37 "NIR sensor moisture meter"

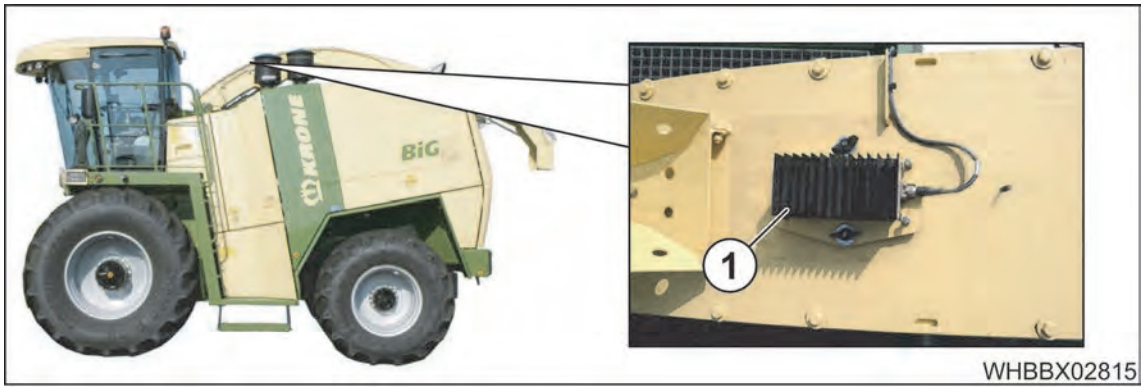


Fig. 1911

Installation location

Control unit A37 (1) is located on the rear panel of the base discharge chute.

Removing the control unit

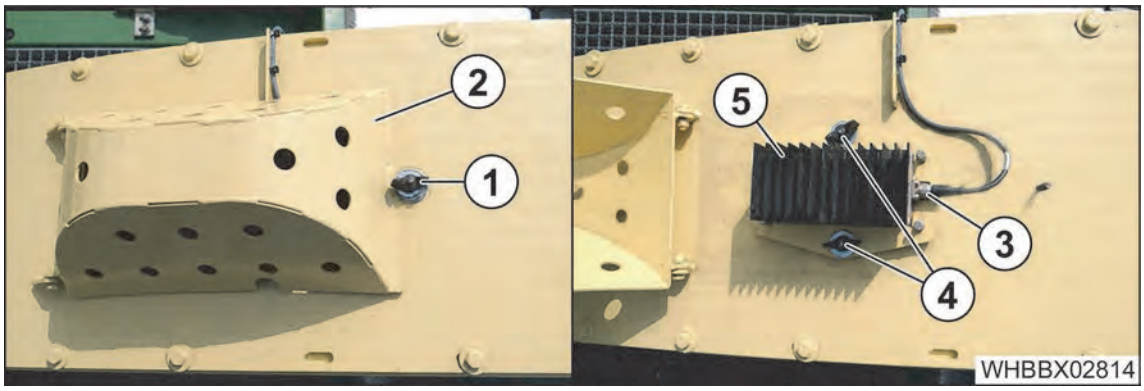


Fig. 1912

Note

Read out the parameters before replacing the control unit.

- The values of the following parameters must be read, recorded and re-entered after installing the new control unit.

Parameter	Parameter group	Description
30043	Moisture meter	Maize offset
30114		Grass offset
30116		Offset for self-defined crop

Table 109

- Remove the wing nut (1) and lift off the cover (2).
- Detach the plug connection (3).
- Remove the wing nuts (4).
- Take out the control unit (5).

14.7 Radio and CB radio

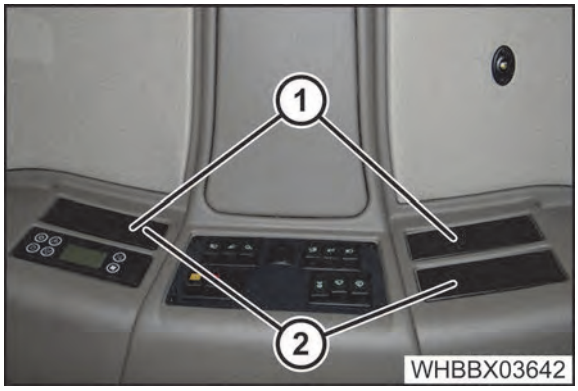


Fig. 1955

Depending on the year of manufacture, the connections for the radio are located in the left (up to year of manufacture 2011) or right (since year of manufacture 2012), upper installation slot (1) in the roof panel. For a CB radio, connections are available in the installation slots (2) on both sides.

Note

The following pictures show the installation for machines since year of manufacture 2012. The process is the same for all machines.

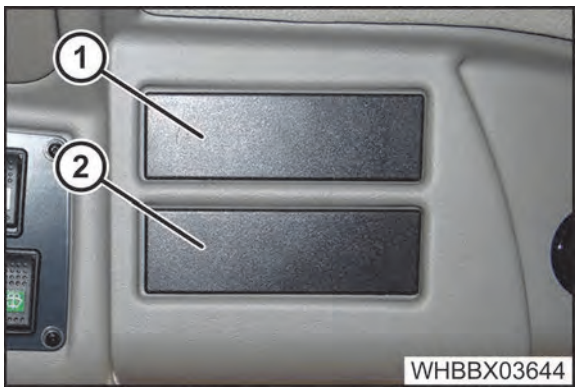


Fig. 1956

- Prise the dummy cover out of the installation slot (1).

Note

To facilitate installation, also prise the dummy cover out of the lower installation slot (2).

The connector cables are attached to the backs of the dummy covers with cable ties.

- Detach the cable ties and remove the dummy covers.

Note

Keep the dummy covers for potential reuse.

14.9.1.8 Replacing licence plate lamps

Plug XH51b/XH52b

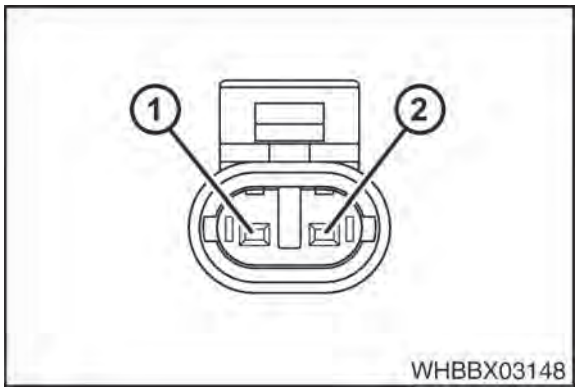


Fig. 2009

Pin 1: Supply voltage 12 V
Pin 2: Earth

Removing the lamp

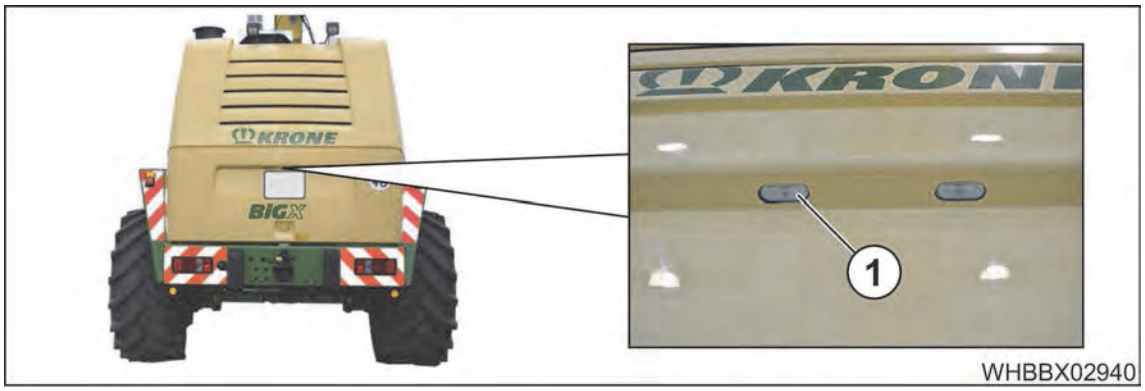


Fig. 2010

The removal procedure is the same for both licence plate lamps. The following section describes how to remove lamp H51 "Left licence plate lamp" (1) as an example.

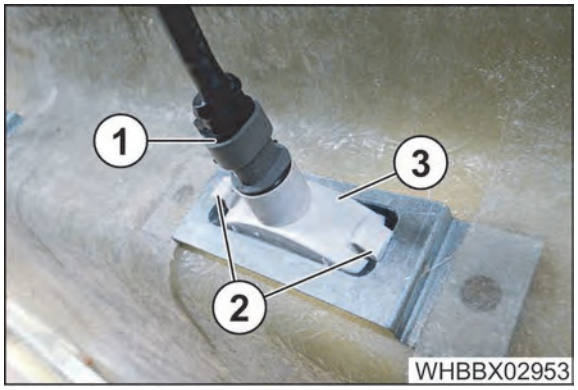


Fig. 2011

- Loosen the plug connection (1).
- Press in the locks (2) and remove the lamp (3).

Removing the lamp

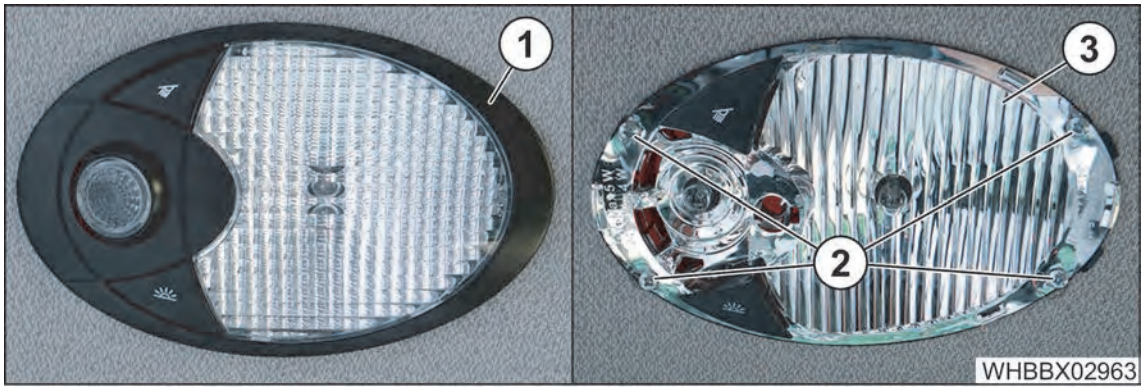


Fig. 2067

- Remove the cover (1).
- Dismount the screws (2) and remove the lamp (3).
- Loosen the plug connections "XH21/1" and "XH21/2".

Installing the lamp

- Attach the plug connections "XH21/1" and "XH21/2".
- Insert the lamp (3) and mount the screws (2).
- Mount the cover (1).

Removing the lamps

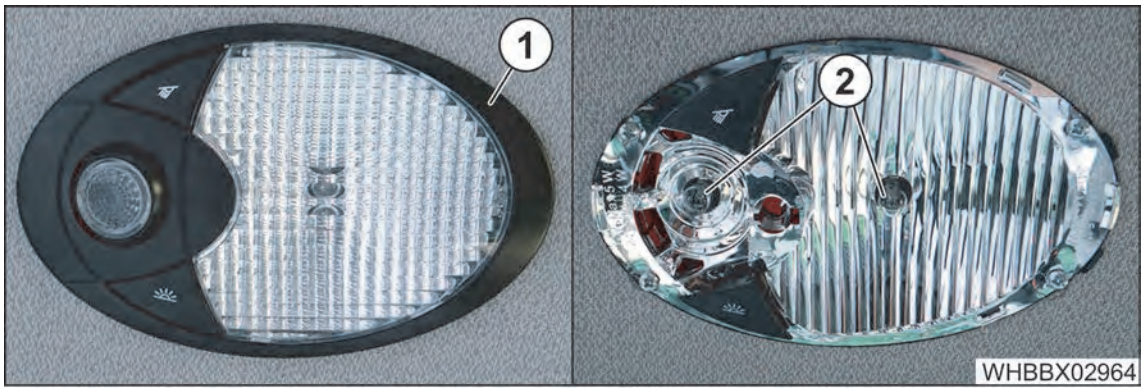


Fig. 2068

- Remove the cover (1) and remove the corresponding lamp (2).

Installing the lamps

- Insert the relevant lamp (2) and mount the cover (1).

Installing the relay

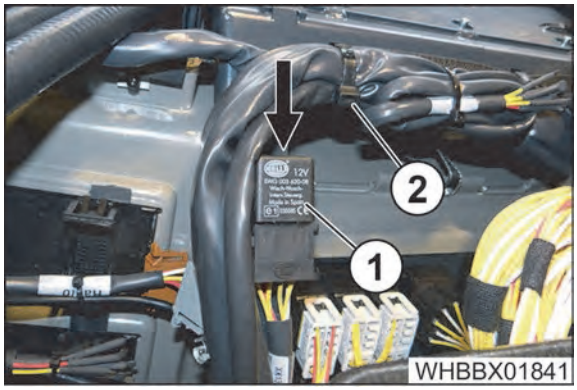


Fig. 2111

- Insert the relay (1) in the direction of the arrow.
- Attach the cable tie (2).
- Attach the service cover in the cabin roof, see page 1164.

14.16.1.11 Running diagnostics

The following steps can be performed in order to run diagnostics on the vehicle.

- Input the displayed error number in the KRONE Solution Manager.
- Use the BMK of the defective part in table 1-table 4 (see pages 3-10) to select the corresponding diagnostics chapter.
- Go to the particular diagnostics chapter and run the diagnostics according to the description. For a description of the general structure of a diagnostics chapter, see page 1590.
- After replacing components, always check which calibrations must be run and which parameters must be adjusted. For this purpose, each diagnostics chapter includes a relevant section.
- Finally a function test must be run. For this purpose, each diagnostics chapter includes a relevant section.

Running the diagnostics on the CAN bus is described in the chapter "Diagnostics CAN bus", see page 1653.

If the supply and enable voltages of control units are defective, use the chapter "Diagnostics electronics" as an aid, see page 2055.

Valve Y5 “Intake forward” and valve Y6 “Intake backward”

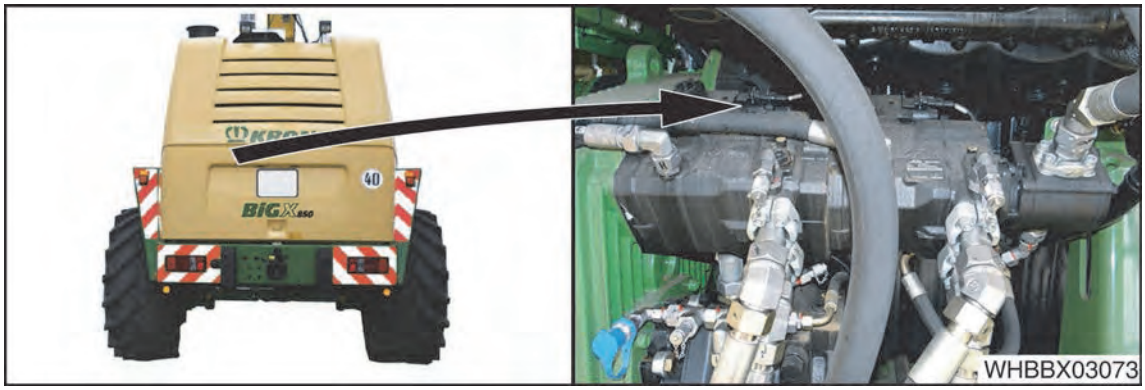


Fig. 2153

Installation location

The valves are located in the rear of the machine on the left upper pump on the side facing the engine.

Task

The functions “Intake forward/backward” are executed via valves Y5/Y6.

Evaluation

	Operating equipment designation			**Description**	**Value range**
	Y5			**Intake forward**	
	Y6			**Intake backward**	
Valve type				Proportional valve	≈ 8 Ω
Identical valve coil concerning constructio n	Y5, Y6			Valve coils Y5 and Y6 can be interchanged.	
Control unit	KMC2	Y5	LD5	LD5 not lit (valve inactive) LD5 lit (valve active)	ON/OFF
			HBPWM_3	Plug 2X2_6 (+ PWM)	
		Y6	LD6	LD6 not lit (valve inactive) LD6 lit (valve active)	ON/OFF
			HBPWM_4	Plug 2X1_8 (+PWM)	
		Y5 Y6	HBPWM_4	Plug 2X1_25 (-PWM)	
Measureme nt point				Plug XY5b Plug XY6b See fig. 2154	
Measurem ent values	**Refer to menu 4-1-1 “Intake”**				**0 … 1500 mA**

Table 141

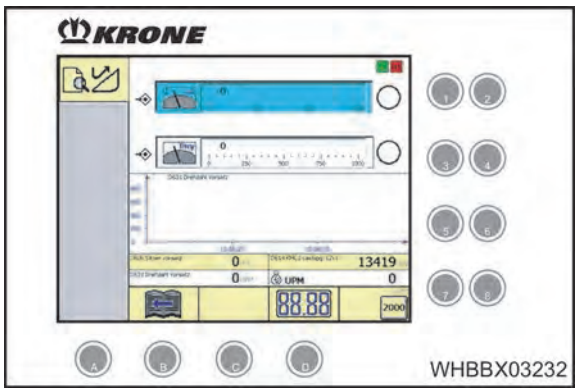
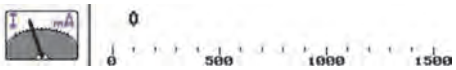
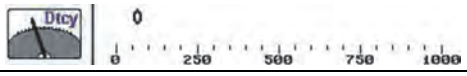


Fig. 2164

In display 3 “Actuator test”, the function of the actuators which belong to the front attachment can be tested. In case there may appear impermissible values so that an error recovery is necessary, refer to the subchapters “Sensors Front Attachment” and “Actuators Front Attachment” for further information.

Mask description display 3 “Actuator test”

Operating equipment designation	Mask description/symbols/description
	
Y7	Front attachment forward The current intensity of the actuator to be diagnosed can be adjusted via the incremental encoder.

	
Y7	Front attachment forward The pulse-pause ratio of the actuator to be diagnosed can be adjusted via the incremental encoder.

	
	Graphical display of front attachment speed via time.

Table 170

Checking the power supply voltage of the control units

If there is no power supply voltage, the control units are not active on the CAN bus and an error message is displayed.

The power supply must be checked.

Active counters

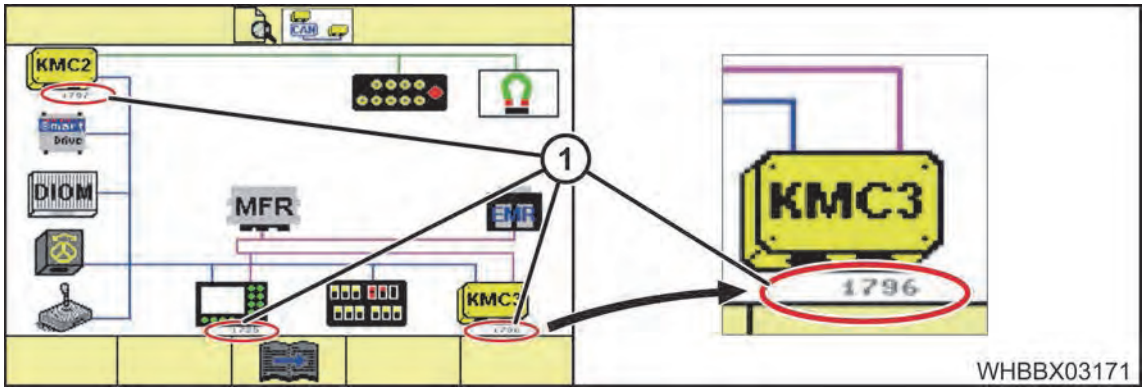


Fig. 2178

The red marked control units are equipped with an internal operating hours counter (1) in seconds that is reset to zero each time the control unit is restarted.

If the counter reading of a control unit deviates significantly from the counter readings of the other control units or if errors messages such as “Communication restored” or “Restart hardware” are displayed, this points to an internal problem or a problem with the power supply voltage of the control unit.

For troubleshooting, please refer to “CAN Bus” diagnostics menu 4-1-3.

14.16.5.2 Switching Conditions for “Discharge Chute” Diagnostics

The following switching conditions must be fulfilled so that the discharge chute can be operated manually.

KMC3

Operating equipment designation	Switching conditions	Target state	Diagnostics possibility
S1	Release switch “Road/field” = field mode	ON	Diagnostics 4-1-17 “Operation Unit Console”
S5	“Maintenance” release switch	OFF	
S90	“Quick stop console” switch is not activated	OFF	
S91	“Quick stop manual operation” switch is not activated	OFF	
A2	KMC2: There must be no error message from CAN bus	✓	Diagnostics 4-1-3 “CAN Bus”
A15	Control lever: There must be no error message from CAN bus	✓	
A16	CUC: There must be no error message from CAN bus	✓	

Table 198

KMC2

Operating equipment designation	Switching conditions	Target state	Diagnostics possibility
A15	The actuator test MUST NOT be called in the diagnostics menu 4-1-16	✓	Diagnostics 4-1-16 “Control Lever”
A15	Control lever: No errors on the control lever keys	✓	Diagnostics 4-1-3 “CAN Bus”

Table 199

Valve Y24 “Raise discharge chute” and valve Y25 “Lower discharge chute”

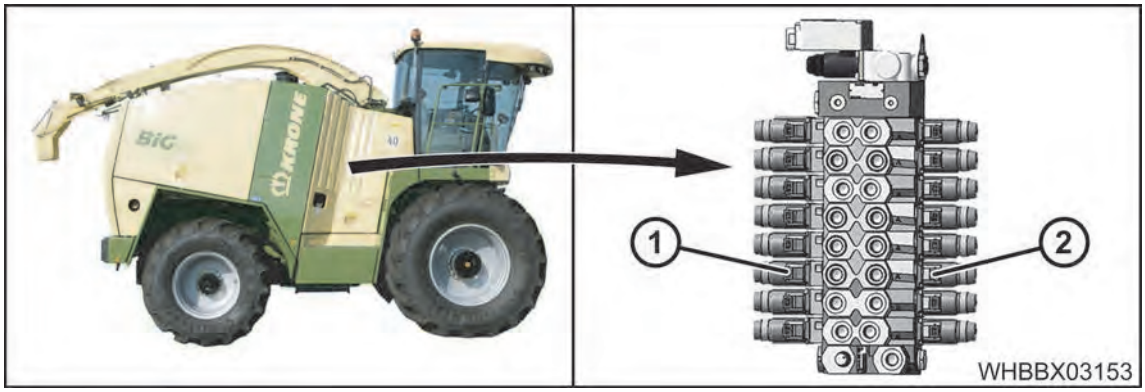


Fig.2227

Installation location

Valves Y24 (2) and Y25 (1) are located on the right-hand side of the machine in the third valve disc (from below) of “work hydraulics” valve block.

Task

The functions “Raise/lower discharge chute” are executed via valves Y24/Y25.

Evaluation

	Operating equipment designation			**Description**	**Value range**
	Y24			**Raise discharge chute**	12 volts
	Y25			**Lower discharge chute**	
Identical valve coil concerning construction	Y24 Y25			Valve coils Y24 and Y25 can be interchanged.	
Valve type				Directional valve black/white	3 - 4 Ω
Control unit	KM C2	Y24	LD1	LD1 not lit (valve inactive) LD1 lit (valve active)	ON/OFF
			PWM_LA_7	Plug 2X2_30	
		Y25	LD9	LD9 not lit (valve inactive) LD9 lit (valve active)	ON/OFF
			PWM_LA_7	Plug 2X2_26	
Measurement point				Plug XY24b Plug XY25b See Fig. 2228	
Measurement values	**Refer to menu 4-1-4 “Discharge Chute”**				**none**

Table 219

Display 3 “Actuator test”

WARNING!

Danger of injury by moving machine/machine parts!

In case of actuator tests via the terminal or directly on the actuator, there is the risk of unexpected movements of the machine or machine parts.

- Make sure that work on the machine is only performed by qualified personnel.
- Secure the machine against the possibility of rolling back.
- Secure controlled machine parts against unintentional movements.
- Ensure that there are no persons, animals or objects in the danger zone.
- The actuator test must only be performed from a safe position outside the range of the machine parts that are moved by actuators.

Note

To be able to perform an actuator test, all hydraulically moveable parts must be in their basic position/initial position.

The following switching-on conditions must be satisfied before the actuator test can be run.

BMK	Switching-on conditions	Setpoint condition	Diagnostics option
	Diesel engine = idling speed	✓	Diagnostics 4-1-8 "Diesel engine"
S1	Release switch Road/field = field mode	ON	Diagnostics 4-1-17 "Control unit console"
S90	"Quick stop console" switch	not actuated	
S91	"Quick stop manual operation" switch	not actuated	
A3	KMC3: There must be no error message from the CAN bus	✓	Diagnostics 4-1-3 "CAN bus"
A9	LUC: There must be no error message from the CAN bus	✓	
A15	Control lever: There must be no error message from the CAN bus	✓	
A17	Control unit console: There must be no error message from the CAN bus	✓	

Table 250

CAUTION!

Damage to the machine by the contamination of the hydraulic system or fuel system!

Serious damage may be caused when foreign bodies or liquids get into the hydraulic system or fuel system.

- Clean connections and components prior to removal.
- Lock the open connections by using protective caps.
- Make sure that no foreign bodies or liquids get into the hydraulic system or fuel system.

CAUTION!

Damage to property due to incorrect assembly!

An incorrect assembly of components may damage the machine.

- Therefore it is absolutely necessary to follow the instructions given regarding assembly.

It is obligatory to use the related circuit diagram when working with the electrical device. The document “Circuit Diagram” belongs to the delivery of the machine.
Depending on the type of machine, the electrical connections depicted in the workshop manual may contain deviations.

Various measuring adapters can be used to gather electrical data: see page 1348.

Symbols/Connections	Description
	Drive hydraulics (drive pump)
	Sensors/actuators
	Diesel engine
	CAN bus 1 (blue)
	CAN bus 2 (green)
	CAN bus 3 (violet)
	CAN bus motor (red)
	Mechanical connection
	Electrical connection
----------	Hydraulic connection

Table 300

Sensor B107 "Steering angle at rear left"

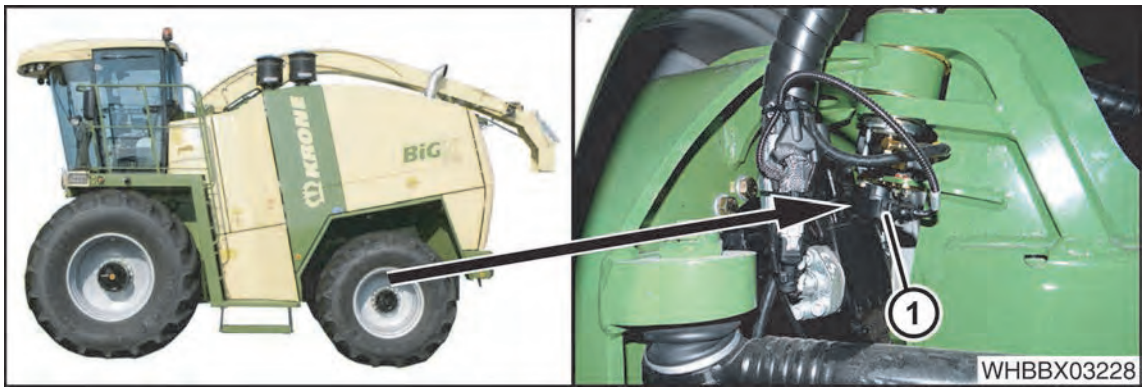


Fig. 2303

Installation location

The sensor B107 (1) is located on the left side of the machine on the holder (pivot point) of the steering knuckle.

Task

The sensor B107 records the steering angle of the steering axle so that the anti-blocking system and traction control system can function.

Evaluation

	BMK		**Description**		**Value range**
	B107		**Steering angle at rear left**		10 V
Sensor type			Hall angle sensor Bosch 110°		
Control unit	DRC	IN_35	Plug 1X2_31		
Measurement point			Plug XB107b See Fig. 2304	on left (-35 – 0°)	2.5 – 5 V
				straight ahead (0°)	5 V
				on right (0 – 35°)	5 – 7.5 V
Measured values	**See menu 4-1-6 "Travelling gear"**				

Table 321

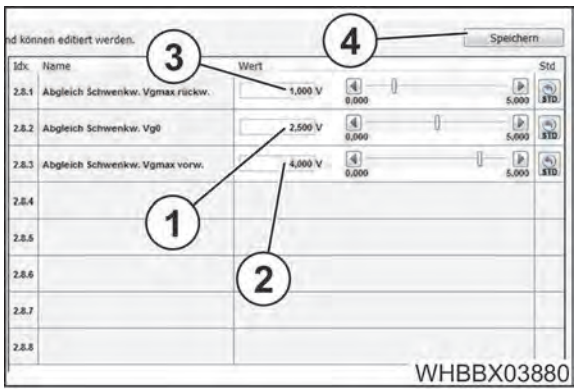


Fig. 2331

- Enter the indicated value in "BODAS" for Parameter 2.8.2 "Calibrating pivoting angle Vg0" (1).
- To save all parameters and to transfer them to the control unit, click the "Save" (4) pushbutton.

Determining the maximum pivoting angle of the drive pump when travelling forwards

Note
A second person is required for this calibration!

- Release switch "Road/field" = field mode.
- Diesel engine = nominal speed.
- Accelerate the machine forwards to ≥12 km/h.

Note
If the speed is increased, the value of the pivoting angle sensor should no longer be changed, as the maximum pivoting angle of the drive pump has already been reached.

- On the terminal read off the voltage value of the pivoting angle sensor B108 in mV.
- Stop the machine.
- Enter the indicated value in "BODAS" for Parameter 2.8.3 "Calibrating pivoting angle Vgmax forw." (2).
- To save all parameters and to transfer them to the control unit, click the "Save" (4) pushbutton.

Symbols/Connections	Description
	Sensors/actuators
	Diesel engine
	CAN bus 1 (blue)
	CAN bus 2 (green)
	CAN bus 3 (violet)
	CAN bus motor (red)
	Mechanical connection
	Electrical connection
----------	Hydraulic connection

Table 373

14.16.8.2 Switching-on conditions for "travelling gear (Poclain)" diagnostics

To ensure that the travelling gear is in running order, the following switching-on conditions must be satisfied.

SmartDrive

BMK	Switching-on condition	Setpoint condition	Diagnostics option
	Diesel engine = idling speed	✓	Diagnostics 4-1-8 "Diesel engine"
S3	"Travelling gear" release switch	ON	
S69	Seat switch actuated (driver is seated!)	✓	
S9	"Parking brake" switch	OFF	
A3	KMC3: There must be no error message from the CAN bus	✓	Diagnostics 4-1-3 "CAN bus"
A16	Control unit console: There must be no error message from the CAN bus	✓	
A15	Control lever: There must be no error message from the CAN bus	✓	
A15	The control lever must be in neutral position while the diesel engine is starting	✓	Diagnostics 4-1-16 "Control lever"

Table 374

KMC3

BMK	Switching-on condition	Setpoint condition	Diagnostics option
S3	"Travelling gear" release switch	ON	Diagnostics 4-1-17 "Control unit console"
S69	Seat switch actuated (driver is seated!)	✓	

Table 375

Sensor B16 “Pressure service brake”

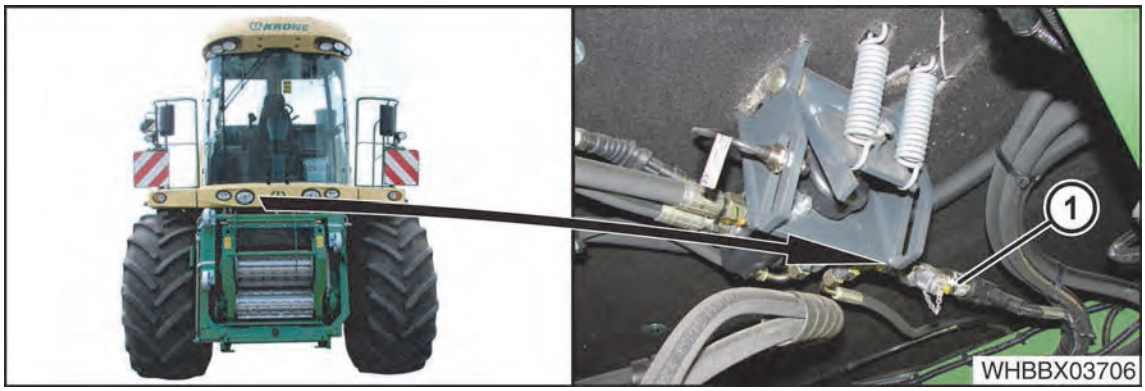


Fig. 2359

Installation location

Sensor (1) is located below the driver's cabin on the brake valve.

Task

Sensor B16 records the brake pressure in the service brake.

Evaluation

	BMK		Description	Value range
	B16		**Service brake pressure**	12 V
Sensor type			Pressure sensor Hydac 0 … 130 bar	
Control unit	SmartDrive	ANA_IN_8	Plug X1_45	
Measurement point			Plug XB16b See Fig. 2360	1 … 5 V
Measurement values	**Refer to menu 4-1-6 “Traction Drive”**			**0 … 120 bar**

Table 398

Plug XB16b

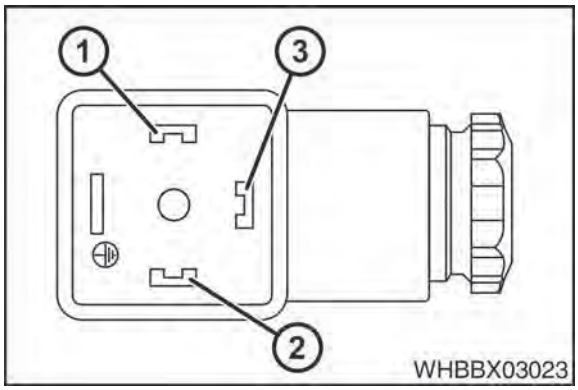


Fig. 2360

Pin 1: Power supply voltage 12 V
Pin 2: Ground
Pin 3: Signal voltage 1 … 5 V

Valve Y11 "1/2 intake volume rear axle"

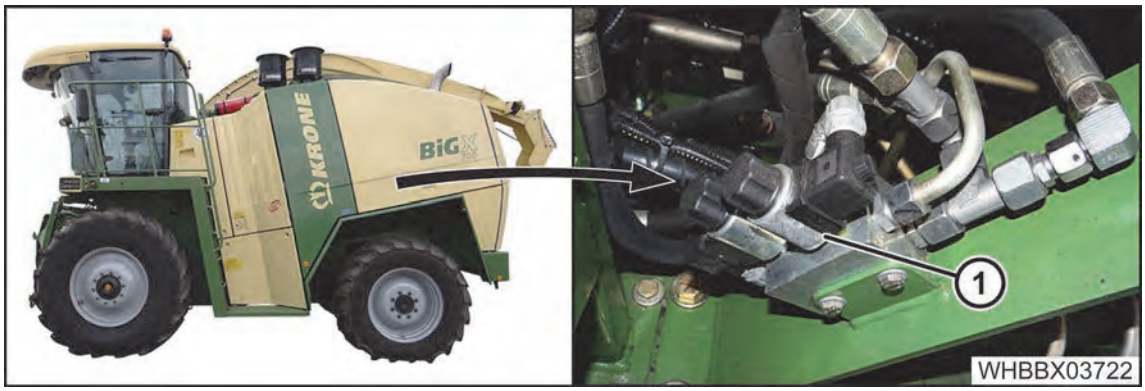


Fig. 2389

Installation location

The valve Y11 (1) is located on the left side of the machine at the front of the engine support.

Task

The "intake volume switchover rear axle" function is implemented via valve Y11.
The valve is switched in all-wheel drive only.

Evaluation

	BMK		Description	Value range
	Y11		**1/2 absorption volume rear axle**	
Identical valve coil	Y108		Tensioning roller main belt	
Valve type			Proportional valve	8 Ω
Control unit	SmartDrive	22LD26	22LD26 is not lit (valve inactive) 22LD26 is lit (valve active)	ON/OFF
		DIG _ OUT_3	Plug X1_12	
Measurement point			Plug XY11b See Fig. 2390	0 / 12 V
Possible via the "Phases" diagnostics programme only.				

Table 409

The LED 22LD26 is located on the relay PCB A22.
Switching logic of the valves, see page 1913.

– **Check in field mode (when travelling forwards)**

• Move the control lever as follows.

Check	Setpoint value
With rocker forwards	Machine starts up
Without rocker forwards	Machine accelerates as long as the control lever is actuated
Check the final speed when travelling forwards and at nominal speed	Maximum final speed (field mode) is reached.
With rocker to right	Current speed is saved and speed control system is activated
Without rocker to right	Machine starts up at the speed last saved if it is not equal to zero
With rocker to left	Fast reversing, the machine decelerates to a standstill and accelerates backwards to 60 % of the previous forward speed.
Without rocker to left	Machine decelerates to a standstill
With rocker backwards	Machine decelerates to a standstill as long as the control lever is actuated and accelerates backwards
Without rocker backwards	Machine decelerates to a standstill as long as the control lever is actuated
Press the brake pedal slightly	Machine decelerates, from a certain brake pressure the drive pump is swivelled back
Press the brake pedal fully	Machine decelerates to a standstill

Table 447

Display 2 "Sensor test"

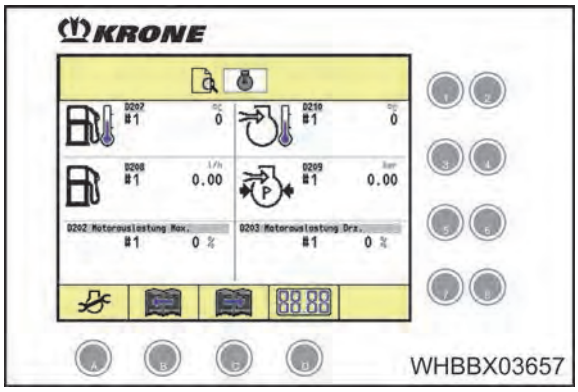


Fig. 2414

Display 2 "Sensor test" shows the latest measurement results for the diesel engine. If impermissible values occur which require error correction, further information can be found in the "Diesel engine sensors" and "Diesel engine actuators" subsections.

Screen description - display 2 "Sensor test"

Ref.	Screen display/symbols/description
	Max. engine duty #1 . . . %
D202	Current engine duty referred to maximum engine power.

	Engine duty rpm #1 . . . %
D203	Current engine duty referred to maximum engine power at current engine speed.

	D207 #1	°C . . .
D207	Current fuel temperature in °C.	

	D208 #1	l/h . . .
D208	Current fuel consumption in litres per hour.	

	D209 #1	bar . . .
D209	Current charge pressure in bar	

	D210 #1	°C . . .
D210	Current charge air temperature in °C	

Table 489

Sensor B403 "Charge air/charge pressure temperature"

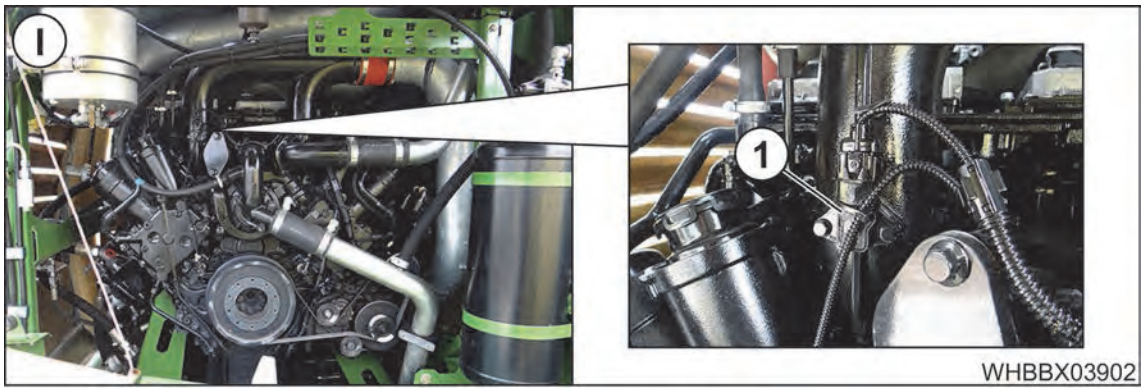


Fig. 2442

Up to build year 2011: I V8 / V12 engine

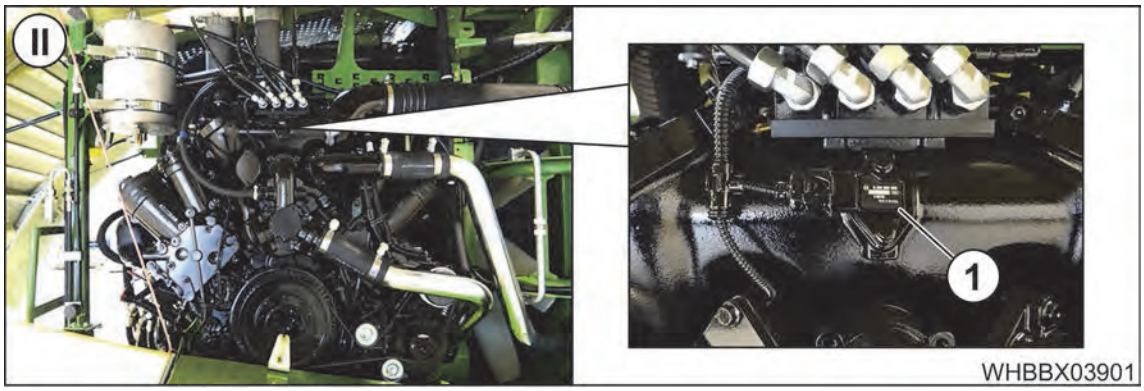


Fig. 2443

From build year 2012: IIV8 / V12 engine (facelift)

Installation location

Sensor B403 (1) is located on the right-hand side of the machine on the intake tract's charge air manifold. The installation location varies slightly according to build year
(see Fig. 2442 - Fig. 2443).

Function

Sensor B403 records the temperature and pressure of the charge air.

Removing the dynamo

- Disconnect the leads on the batteries, see page 1392.

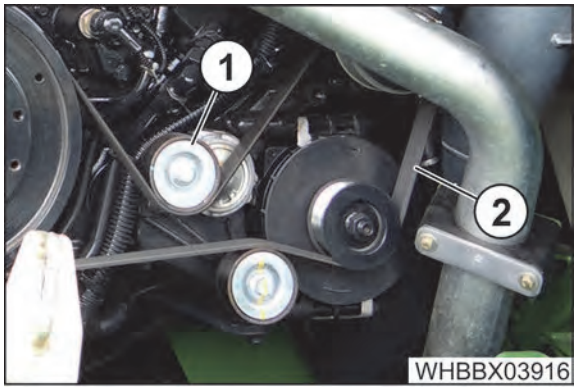


Fig. 2473

- To relieve the tension on the ribbed V-belt (2), turn the ribbed V-belt tensioner (1) fully clockwise and hold it there.
- Dismount the ribbed V-belt (2).
- Carefully relieve the load on the ribbed V-belt tensioner (1).

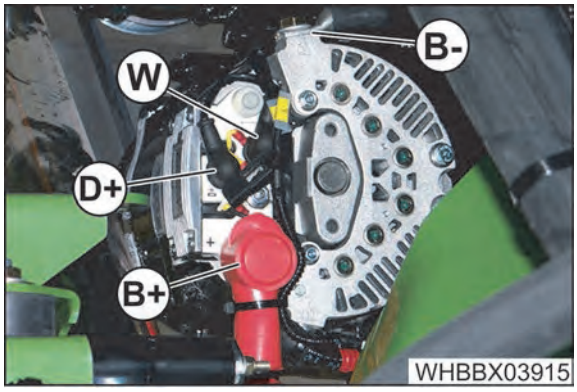


Fig. 2474

- Disconnect terminals B+, B-, D+ and W.

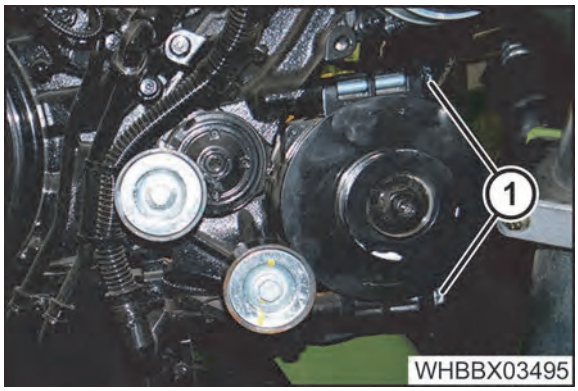


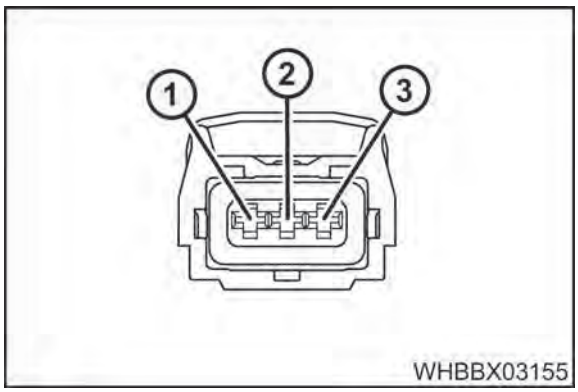
Fig. 2475

- Label and remove the four screws (1).
- Remove the dynamo.

BMK	Display value in digits	Description
B61	540 – 640	Row tracer in zero position
	220 – 340	Row tracer fully actuated
B65	215 – 315	Row tracer in zero position
	515 – 635	Row tracer fully actuated

Table 532

Plug XB61b/XB65b



200803090:
Pin 1: Earth
Pin 2: Signal voltage 2.1 V … 6.4 V
Pin 3: Power supply voltage 8.5 V

200818760:
Pin 1: Earth
Pin 2: Signal voltage 2.5 – 7.5 V
Pin 3: Power supply voltage 10 V

Fig. 2500

Removing sensor

Replacement of the sensors is identical for both sensors and for all EasyCollect types. The replacement of sensor B65 is shown below (central tip).

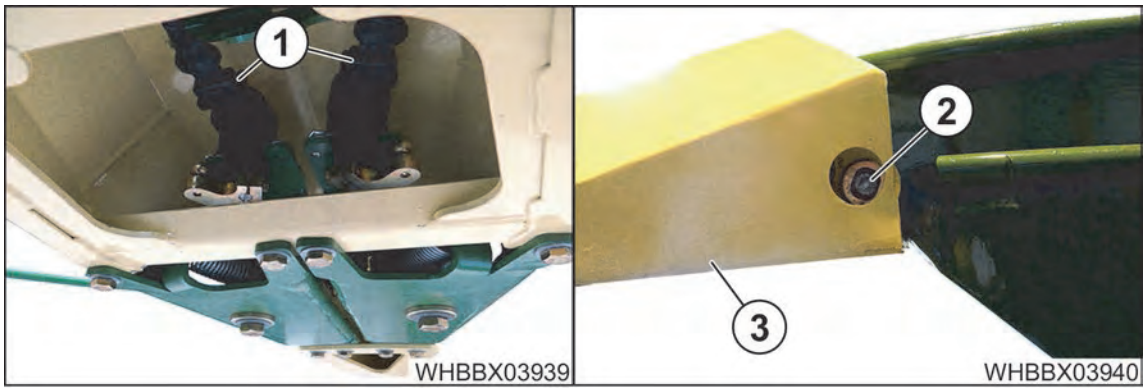


Fig. 2501

- Loosen the plug connections (1).
- Remove the screws (2) on both sides and remove the central tip (3).

Sensors B66 "row registration, right and left"

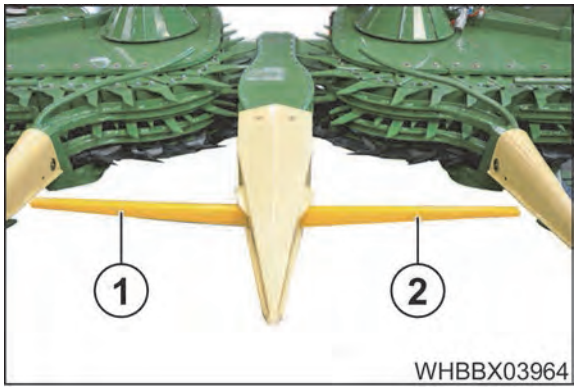


Fig. 2531

- Check the sensor value according to the following table.

BMK	Display value in digits	Description
B66	40 – 60	Row tracer in zero position (new condition)
	40 – 120	Row tracer in zero position (used condition)

Table 546

- Select the input field for row tracer, left (1) by pressing the incremental encoder.
- Press the incremental encoder again and save the current sensor values as the zero position.
- Select the input field for row tracer, right (2) by pressing the incremental encoder.
- Press the incremental encoder again and save the current sensor values as the zero position.

Note

If the values are not reached, the sensor must be replaced, see page 2014.

The power supply voltage „+12V3 KMC3“ can be released by three different cases.

Power supply voltage +12V3 KMC3					
Case	**Switch S90 “Quick stop console” LED: 16LD14**	**Switch S91 “Quick stop manual operation” LED: 16LD15**	**Release switch S1 “Road/field” = field mode LED: 22LD113**	**Release switch S5 “Maintenance” LED: 22LD109**	**Diagnostics possibility**
1	not actuated	not actuated	ON	OFF	Diagnostics 4-1-17 “Control Unit Console”
2	not actuated	not actuated	OFF	ON	
3	not actuated	not actuated	ON	ON	

Outputs which are supplied with voltage +12V3 KMC3				
Plug	**Description**	**LED**	**Operating equipment designation**	**Description**
2X1_22	PWM_LA_5	LD35	Y12	Main coupling
2X1_23	PWM_LA_6	LD34	Y55	Pendulum frame free 2
2X1_26	PWM_LA_7	LD30	Y30	Grinding stone to the right
2X1_30	PWM_LA_8	LD31	Y31	Grinding stone to the left

Table 588

Status displays

Actuator status active	Actuator status inactive	Actuator status released	Actuator status Error	Description
				Intake/front attachment forwards
				Intake/front attachment backwards
				Intake/front attachment

Table 615

Status extended	Status retracted	Description
		Position of tensioning cylinder main belt

Table 616

Status ON	Status OFF	Description
		Main coupling

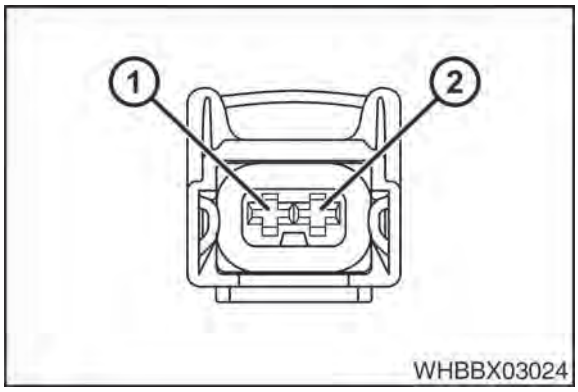
Table 617

Evaluation

	BMK			Description	Range of values
	Y26			**Fold in front attachment, raise holding-down device**	12 V
	Y27			**Unfold front attachment, lower holding-down device**	
Identical valve coil	Y26, Y27			The valve coils Y26 and Y27 are interchangeable.	
Valve type				Black/white directional valve	3 - 4 Ω
Control unit	KMC3	Y26	LD8	LD8 is not lit (valve inactive) LD8 is lit (valve active)	ON/OFF
			PWM_LA_2	Plug 3X2_24 (+PWM)	
		Y27	LD1	LD1 is not lit (valve inactive) LD1 is lit (valve active)	ON/OFF
			PWM_LA_3	Plug 3X2_30 (+PWM)	
Measurement point				Plug XY26b Plug XY27b See Fig. 2582	0 /12 V
Measured values	**See menu 4-1-9 "Work"**				**None**

Table 629

Plug XY26b/XY27b



Pin 1: Control signal 12 V (voltage controlled)

Pin 2: Earth

Fig. 2582

Replacing the valve

To replace the valve, see page 733.

– Auxiliary hydraulics "1DW"/"2DW" (optional)

• Press the green key  on the membrane keyboard.

Check	Setpoint value
Check the pressure on the pressure gauge	200 – 210 bar
Check the magnetic field at the valve coil using a magnetic field tester	present
With the "2DW" option only: Visually check whether the LED at the angled plug for the valve is lit	✓

Table 651

• Press the green key  on the membrane keyboard.

Check	Setpoint value
Check the pressure on the pressure gauge	200 – 210 bar
Check the magnetic field at the valve coil using a magnetic field tester	present
With the "2DW" option only: Visually check whether the LED at the angled plug for the valve is lit	✓

Table 652

– Auxiliary hydraulics "2DW" (optional)

• Press the black key  on the membrane keyboard.

Check	Setpoint value
Check the pressure on the pressure gauge	200 – 210 bar
Check the magnetic field at the valve coil using a magnetic field tester	present
Visually check whether the LED at the angled plug for the valve is lit	✓

Table 653

• Press the black key  on the membrane keyboard.

Check	Setpoint value
Check the pressure on the pressure gauge	200 – 210 bar
Check the magnetic field at the valve coil using a magnetic field tester	present
Visually check whether the LED at the angled plug for the valve is lit	✓

Table 654

14.16.16 Counterblade diagnostics

14.16.16.1 System description of counterblade

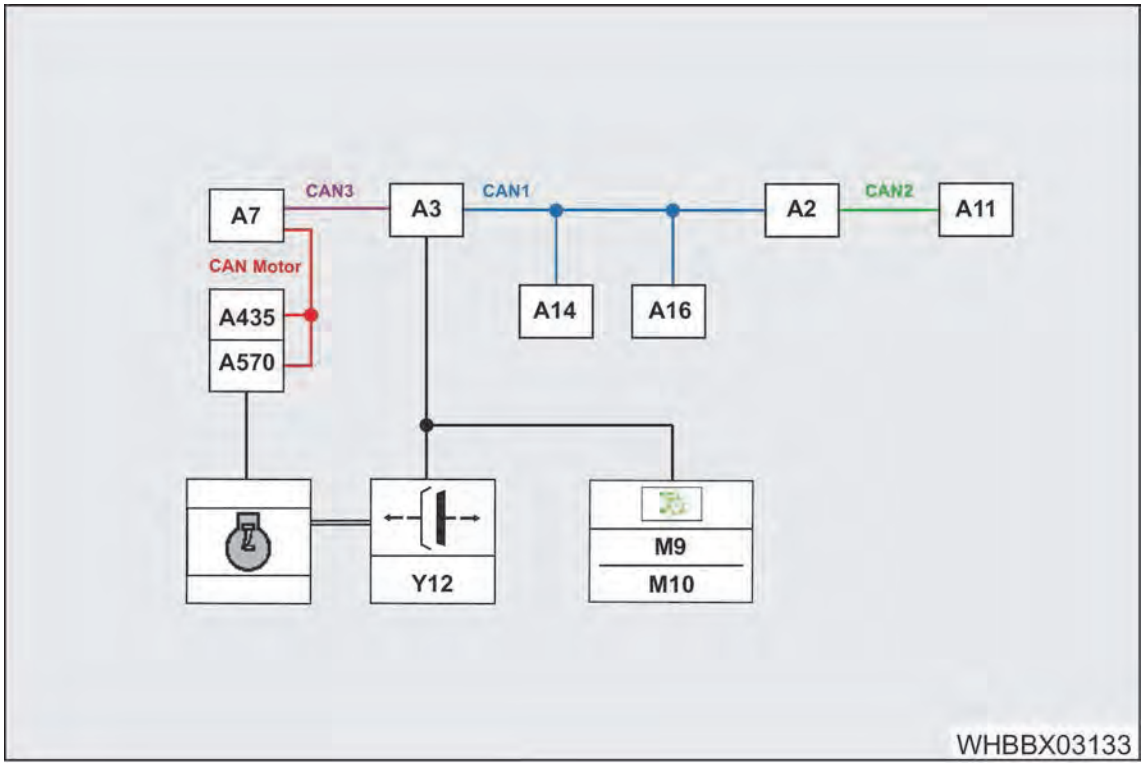


Fig. 2616

BMK	Description	BMK	Description
A2	KMC2	A570	EDC slave
A3	KMC3		
A7	MFR	M9	Counterblade on left
A11	Manual operation	M10	Counterblade on right
A14	Terminal		
A16	Control unit console	Y12	Main clutch
A435	EDC master		

Table 686

Procedure

WARNING!

Danger of injury resulting from unintentional movement of machine parts!

While performing machine functions, the machine may perform uncontrolled movements. As a result, persons in the operating area of the machine parts may get seriously hurt.

- Secure the machine against the possibility of rolling back.
- Make sure there are no persons or animals in the operating zone of the machine parts.
- Parameter settings may only be performed by qualified expert personnel.

- All switching conditions must be fulfilled, see page 2176.
- Select menu 3-6 “Calibration Corn Conditioner”.

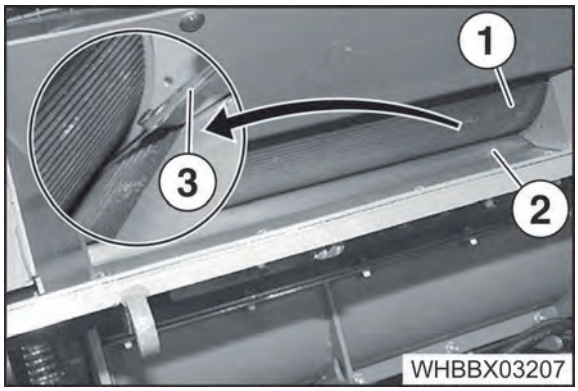


Fig.2634

- For an exact calibration, it is necessary to measure the distance between the rollers (1, 2) precisely by using a feeler gauge (3).
- Lower the corn conditioner to the ground, see page 351.
- Reduce/increase the roller distance by pressing the keys 3 / 4 until a dimension of 3 mm is set.
- Select the input field for the roller distance by using the incremental encoder and set the measured distance by turning the incremental encoder.
- Save the value by pressing the incremental encoder and leave the input field.
- Perform function test, see page 2186.
- Install corn conditioner, see page 384.

14.16.19.9 Function test control unit

- All switching-on conditions must be met, see page 2194.
- Ignition key = ignition stage 2.
- Release switch "Travelling gear" = OFF
- Release switch "maintenance" = OFF.
- Release switch "Road/field" = field mode.

- On the terminal select the menu 4-1-17 "Control unit diagnostics".

Check	Setpoint value
Check all keys on the membrane keyboard.	The respective symbol is highlighted in green.
Check all release switches.	

Table 724

To run the functions of the main coupling or the auxiliary hydraulics, see page 2073.
To run the functions of the pendulum frame, see page 1720.

- Actuate "Quick stop panel" switch.

Check	Setpoint value
Visually check whether the "actuated" status is displayed.	

Table 725

- Release "Quick stop panel" switch.
- Actuate "Manual control unit quick stop" switch.

Check	Setpoint value
Visually check whether the "actuated" status is displayed.	

Table 726

- Release "Manual control unit quick stop" switch.
- Open the cabin door.

Check	Setpoint value
Visually check whether the "unactuated" status is displayed.	

Table 727

Removing sensor

There are two versions of the acceleration sensor support depending on the type of intake. Removal of the sensor is the same for both versions.

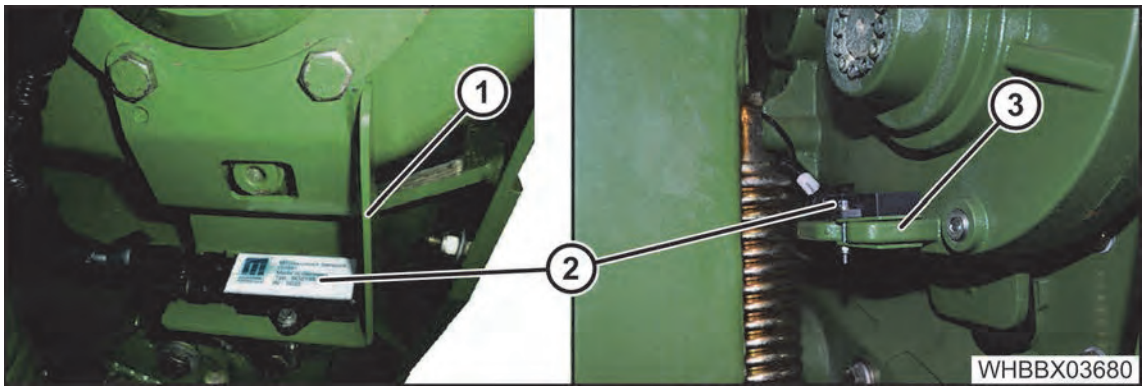


Fig. 2686

1 Version 1: Separate, threaded support.
2 The acceleration sensor (identical for both versions).
3 Version 2: The support is cast integrally with the gearbox housing.

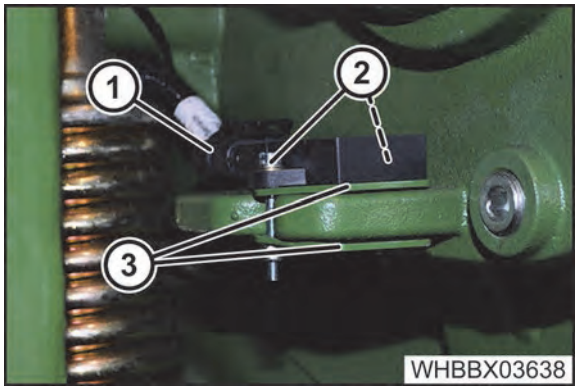


Fig. 2687

- Loosen the plug connection (1) on the sensor.
- Dismount the screw connections (2).
- Remove the sensor and the shims (3, only for version 2).

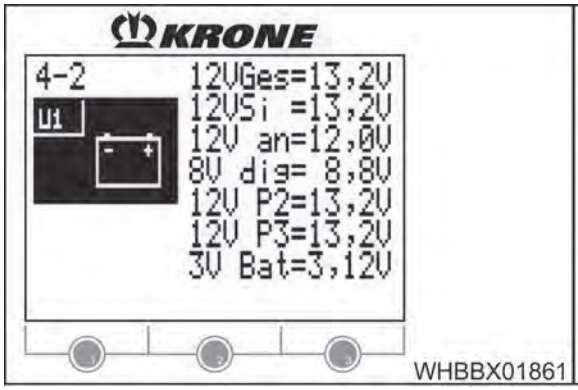
Installing sensor

Note

The screws (3, version 2) must not be tightened so tightly that the sensor or shims bend.

- Insert the sensor with shims (3, only for version 2) and attach with the screw connections (2).
- Attach the plug connection (1).

Display 4 "Supply voltages diagnostics"



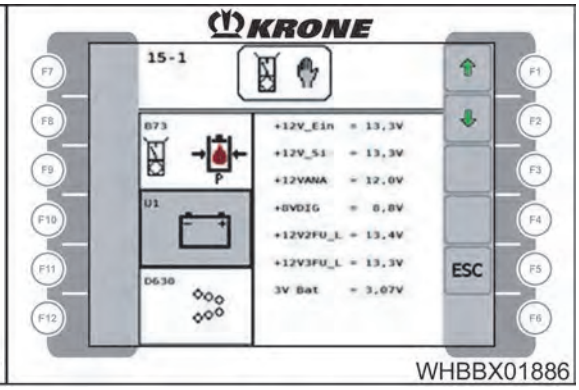


Fig. 2704

I Beta terminal II ISOBUS terminal

The current supply voltages of the control unit A35 "KMC4 "RockProtect/CropControl" are indicated on display 4 "Supply voltages diagnostics".

Mask description display 4 "Supply voltages diagnostics"

BMK	Mask display/symbols/description
	 
	Currently selected display.

Table 775

Setpoint voltages

Beta terminal	ISOBUS terminal	Values	Description
12VGes	+12V_ON	12 – 14.5 V	Supply voltage control unit 12 V
12VSi	+12V_Si	12 – 14.5 V	Supply voltage terminal 12 V
12V an	+12VANA	12 – 13 V	Supply voltage analogue sensors 12 V
8V dig	+8VDIG	8.5 – 9.1 V	Supply voltage digital sensors 12 V
12V P2	+12V2FU_L	12 – 14.5 V	Supply voltage 12 V
12V P3	+12V3FU_L	12 – 14.5 V	Supply voltage 12 V
3V Bat	3V Bat	>2.5 V	Voltage back-up battery

Table 776

USB-RS232 Converter Cable (illustration may differ)

Fig. 2736

Note
The USB-RS232 Converter Cable is only required if the PC/laptop does not have a COM interface

14.17.3 Installing KRONE DownloadCenter

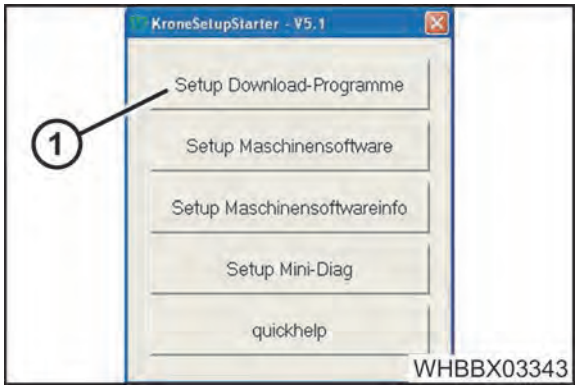


Fig. 2737

- Insert the KRONE DownloadCenter CD into the laptop/PC, the Setup menu appears.

Note
If the Autostart function for CDs was switched off on the laptop/PC, Setup must be manually started.

- Select the "Setup Download Programme" (1) button. The Windows Setup Assistant is started.
- Follow the instructions for the Setup Assistant.

Further setups do not have to be installed.

- After setup, download the current machine software from the Internet and install it, see page 2282.

14.18.6 Parameter set update BODAS

A new set of parameters must be imported if
– the wheels are changed to a different size,
– if a new set of parameters is released,
– a software update is run

Procedure

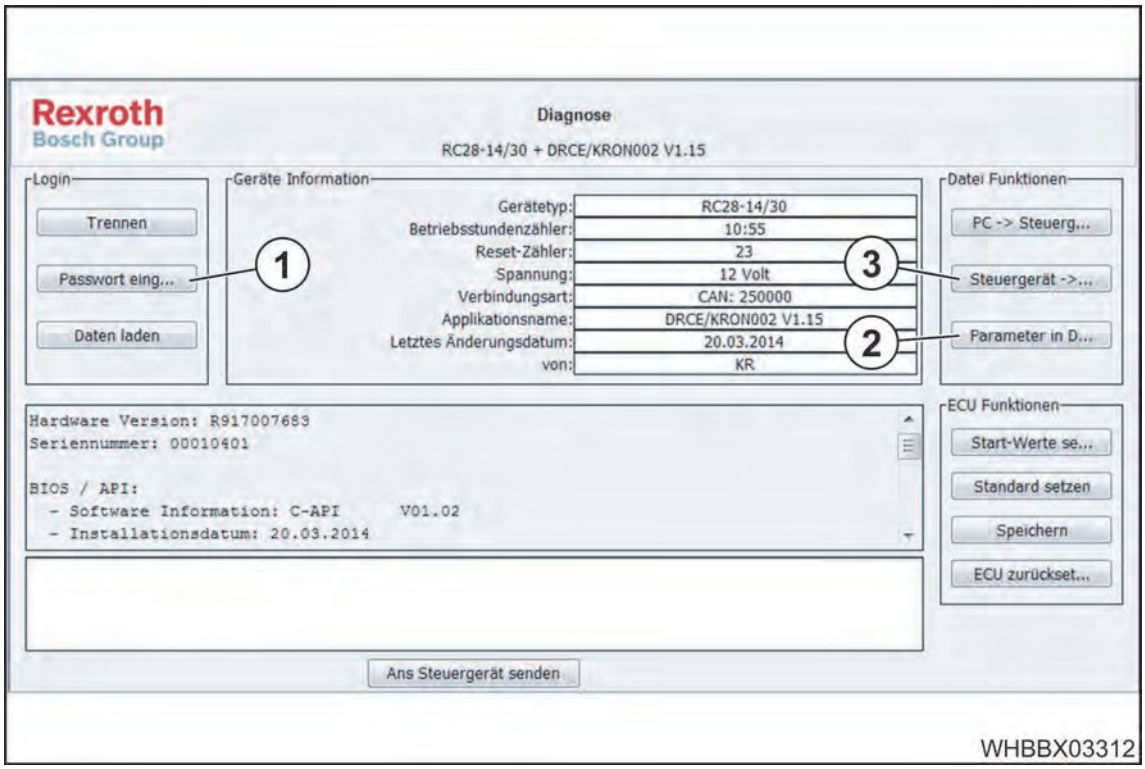


Fig. 2780

- Select the "Input password" field (1) and input the service password.

Note
If there is no password, ask KRONE customer service.

- Select the "Parameters in file" field (2).

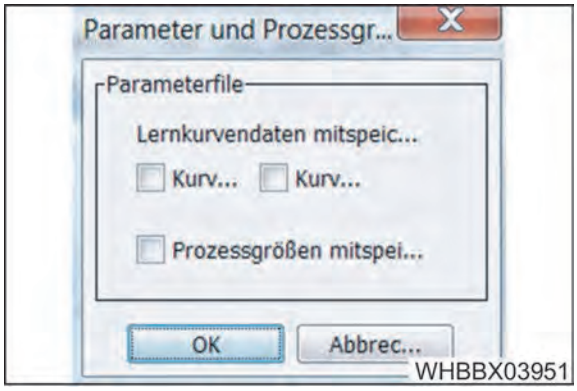


Fig. 2781

- Confirm the window with "OK".

14.19.6 Setting the PHASES communications interface

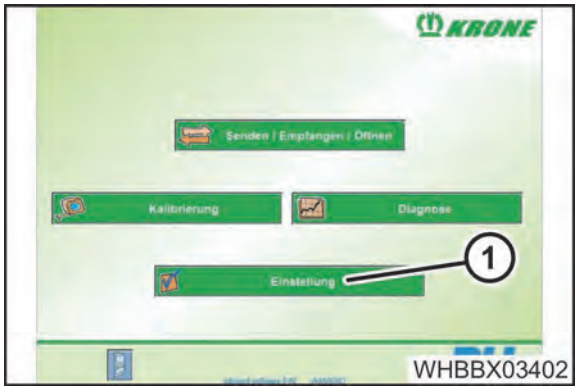


Fig. 2820

- In the main menu select the "Settings" field (1).

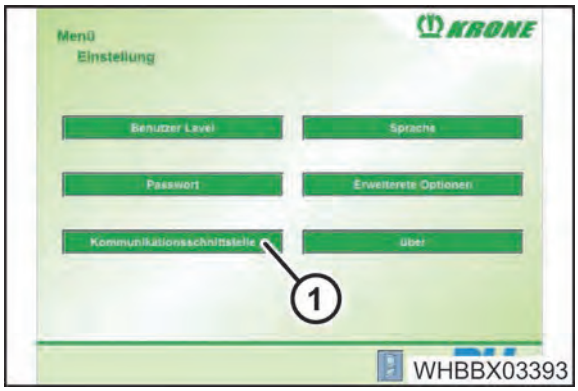


Fig. 2821

- Select the "Communications interface" field (1).

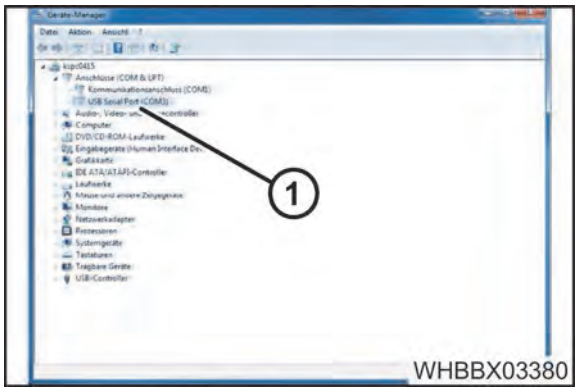


Fig. 2822

- Open the "Windows device manager" on the PC.
- Determine the connector cable interface assigned by the PC in the tree structure under "Connections (COM & LPT)".

No.	Parameter name	Rights	Min.	Max.	Default	Unit	Lowering	Raising	Description
33699 service	Constant Power acceleration Min. Torque	rw	1	100	150	(km/h)/s	Acceleration by the load limit controller decreases	Acceleration by the load limit controller increases	Acceleration in (km/h)/s if acceleration is to be from the load limit controller when the engine has a small torque (< 50%). (Acceleration depends on the control deviation). Parameter is only important if the ConstantPower control type "Torque control" has been set by the driver.
33700 service	Constant Power deceleration Max. Torque	rw	1	100	5	(km/h)/s	Deceleration by the load limit controller decreases	Deceleration by the load limit controller increases	Deceleration in (km/h)/s if deceleration is to be from the load limit controller when the engine has its permitted max.-torque (see parameter) for the load limit control, (deceleration depends on the control deviation). Parameter is only important if the ConstantPower control type "Torque control" has been set by the driver.
33741 service	Drive: 0= Poclain, 1= Bosch	rw	0	1	0				Setting denoting which travelling gear is installed.
34002 service	Brake-valve control pressure minimal	rw	1	120	5	bar	The control pressure is decreased.	The control pressure is increased.	The brake pressure that must be present as a minimum for longer than the set time, before the alarm message appears.
34003 service	Time Control Brake-Valve	rw	1	1000	180	s	The control time is decreased	The control time is increased	The time that the minimum brake pressure must be present before the alarm message appears.
34017 service	Additional axis available	rw	0	1	0				Setting as to whether an additional axle is available: 0 = Additional axle not available, 1 = Additional axle available

No.	Parameter name	Rights	Min.	Max.	Default	Unit	Lowering	Raising	Description
34085 service	Lifting gear pressure mode offset	rw	20	250	50		The position first controlled by the lifting gear if pressure mode is activated is decreased (less distance to the ground)	The position first controlled by the lifting gear if pressure mode is activated is increased (greater distance to the ground)	Position (offset + calibrated value "Lifting gear on ground") which is controlled in pressure mode first based on position. The following values can be set: 50 ==> 1 * default offset 25 ==> 0.5 * default offset 100 == 2 * default offset If the value < 20 or > 100, the default value is used.
34089 service	Maximum lift height if front attachment ON	rw	1	100	55	%			Max. permitted height of the lifting gear when the EasyFlow is ON in grass mode. Above this height the attachment cannot be connected.
34090 service	Position control gain down	rw	1	250	50				Amplification (P-factor) position controller EMR when lowering the lifting gear in grass mode 1 = 1/50 amplification 50 = 1x amplification 250 = 5x amplification
34091 service	Ramp for pressure control of position control	rw	0	15	15				Increase in the ramp for controlling the pressure after the automatic position control switches to pressure control in grass mode. Values > 15 means Default 0,-> max. ramp duration = 5.0 sec. (= Default) 1,-> max. ramp duration = 3.5 sec. 2,-> max. ramp duration = 2.7 sec. 3,-> max. ramp duration = 2.2 sec. 4,-> max. ramp duration = 1.8 sec. ? 6,-> max. ramp duration = 1.3 sec. ? 10,-> max. ramp duration = 1.0 sec. .. 15,-> max. ramp duration = 0.6 sec.