WORKSHOP MANUAL

01/2021 EN

AS-MOTOR Sherpa

AS 940 4WD RC

Important note:
Use in conjunction with
Workshop Manual AS Sherpa.

Service Information

Adjustment, maintenance and repair instructions

Workshop Manual AS 940 Sherpa 4WD RC:

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Navigate quickly and easily in the document.

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Note:
contents, red: see workshop manual AS Sherpa.

Workshop Manual AS 940 Sherpa 4WD RC:

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Important safety notice for this RC device:

Work on control elements, sensors and the control system requires special knowledge and may only be carried out by skilled personnel who were trained by AS-Motor.

Warning!
Risk of injury caused by unintended movement of the device.
When mechanical, electrical or electronic components of the control elements, sensors or the control system are replaced or changed, an unintended movement of the device during commissioning can result.
Observe the following instructions; otherwise, accidents with severe injuries may result and the device can be damaged.

1. After work on the control elements, sensors and/or the control system, re-calibrate the device as described in the manual of the device.
2. After calibration, make sure that the drive is in neutral position before you start the engine.
3. After calibration, make sure that during the initial startup of the engine no persons or material assets are in the danger area.
4. Check the safety functions as described in the operating manual of the RC device.
5. Carry out a test run as described in the manual of the device.

Introduction

Deviating device versions and safety instructions

Deviating device versions (first series/current series)

Since the market launch of the AS 940 Sherpa 4WD RC in November 2015, technical changes of the device have been made on a constant basis.

The changes made in general affect only minor details and software. There have been no major, extensive, design changes. For you this means that this manual can be used and is helpful for all currently existing devices.

Deviating parts are available for the executing mechanic in the parts lists and drawings on our online service portal. “www.parts-and-more.org" (PAM).
(See section: "parts&more")

In this case the designation of an assembly is: "From serial number 0274... ".

For future device versions this Workshop Manual will be revised annually. Please ascertain for yourself whether newer versions of the manual are available.

If for some activities there are different alternative possibilities then you will be alerted to this situation through our symbol  "Tip/note".

Safety instructions 

Only authorised AS-MOTOR Workshops are allowed to execute the activities cited in this manual.

Comply with the following instructions and the warnings in the respective sections, otherwise accidents with severe injuries can occur and/or the device can be damaged.

Prior to starting work:

- **See important safety notice for RC devices on page 3 and 49** ! 
- Place the device on a level and non-slip substrate.
- Only use ramps and hoists that are suitable for the device.
- Safeguard the device against rolling off and falling over.
- Let the device cool for at least 20 minutes.
- Close the fuel tap and the tank ventilation.
- Never place the device with petrol in the tank, inside a building where petrol fumes can come into contact with open fire or sparks.
- Do not inhale fuel fumes, they are harmful.
- Use gloves, particularly for tasks on cutting tools.
- Avoid skin contact with fuel and operating fluids.
- Caution when handling batteries: Battery acid is corrosive. Protect your hands and eyes from escaping fluid.
- Disconnect the battery via the negative terminal.
- This  symbol signals a warning. Failure to comply with the warning can result in accidents, injuries and damage!

Introduction

Notice – original spare parts and technical data

Important note:

ATTENTION **WELDING TASKS**

Prior to performing welding tasks on the device unplug the plug connector from the control device (receiver). Always attach the welding device earth very close to the welding point. Otherwise there is danger of irreparably damaging the control device.

Original spare parts

Important note:

Only original AS-MOTOR spare parts ensure safety, keep the guarantee intact and protect against damage. Consequently only use original AS-MOTOR spare parts; do not use any imitation or counterfeit parts.

Installation of non-original parts invalidates the guarantee claim and the operating authorisation. Accidents with severe or fatal injuries can be the result.

All original wear parts, all original blades and many original spare parts bear the stamped AS-MOTOR logo, as well as the EXXXXX and/or G XXXXXXXX part number.

Technical data – AS 940 Sherpa 4WD RC:

Type	**AS 940 Sherpa 4WD RC**
Range of application (temperature)	0 - 30 °C For temperatures below 5 °C, observe the engine manufacturer's information regarding the engine oil.
Engine, type Manufacturer Type Cylinder capacity Performance Engine speed	Two cylinder four stroke OHV engine Briggs & Stratton 44 Professional Series 8, V-Twin 724 cm^3 16,5 kW (22,4 PS) 3300 min^{-1}
Starting device	Electric start
Battery **Device** **Transmitter**	 12 V, approx. 30 Ah 2xAA 1.5V or 2xAA Mignon 1.2V NiMH batteries (not included in scope of delivery)
Traction drive Rear Front Speed forward Speed reverse	Permanent all-wheel drive Rear axle with differential lock Pendular portal axle, with two hydraulic engines and upright shafts 0 - 6,7 km/h 0 - 6,5 km/h
Maximum area coverage	ca. 6000 m^2/h
Turning circle	approx. 1,2 m
Seat	Movable, spring mounted, adjustable to the driver's weight.
Cutting device, type Cutting width Continuous cutting height Transport position Drive of cutting tool Clutch of cutting tool Growth height	Cutter bar with screwed-on reversing blades and mulching blades 90 cm 80-135 mm, electrical 160 mm, electrical V-belt Belt clutch, electrical up to approx. 150 cm
Measures and weights Weight Transport size with packaging L/W/H max. tyre dimensions L/W/H Height when rollbar is folded down max. towing load max. drawbar load	 325 kg 195/111/112 cm 191/106/156 cm approx. 103 cm 100 kg 25 kg
Capacities Fuel tank Engine oil Transmission oil (hydrostat)	 15 litres with reserve (regular fuel lead-free) approx. 1,9 litres 5 W50 fully synthetic engine oil (see Checking the oil level) approx. 6,8 litres 5 W50 fully synthetic engine oil
Tyre pressure Front Rear	 1,6 bar 0,8 bar
Tyre designation Front Rear	Big wheels 4.80/4.00-8 20x10.00-8
Range of transmitter	up to approx. 300 m

Introduction

Technical data (continued) and accessories

Technical data – AS 940 Sherpa 4WD RC:

Operating mode	MC	RC
Sound level according to DIN EN 12733 Measured sound level L_{WA} Sound level L_{pA} at working place Sound level L_{pA} For distance of 15 metres Measurement uncertainty k	 100,3 dB 90,0 dB - 3,0 dB (A)	 100,3 dB - 81,0 dB 3,0 dB (A)
Vibration emission value according to DIN EN 12733 Hand-arm-vibrations $a_{h,w}$ Measurement uncertainty U Whole body vibration $a_{h,w}$ Measurement uncertainty U	 1,2 m/s² 2,0 m/s² 0,24 m/s² 0,2 m/s²	 0,0 m/s² 0,0 m/s² 0,0 m/s² 0,0 m/s²
Stability	21° (according to the standard measuring method)	33°
Angle at which the device flips over	35°	39°

Accessories – AS 940 Sherpa 4WD RC:

- Trailer (max. 100 kg)
- Trailer hitch
- Snow blade
- Adapter for snow blade
- Lawn/mulch accessories (mulch kit, for grass heights up to max. 40 cm)
- Tilt meter
- Steering wheel knob (not recommended)
- Tyre sealant “Platfuss-Stop”
- Blade spacer (replaces upper mulching blade)
- Standard tyres (front and rear) AS 940 4WD XL, AS 940 4WD RC
- Spray paint 400 ml, colour orange, RAL 2000

Accessory is not available as spare part in "parts&more.org" (PAM).

Order is the same as for machines.

Online service portal "parts-and-more.org" (PAM)

For all tasks shown in the Workshop Manual the online service portal ""parts-and-more.org" is your most important companion. It offers you the following functions for every single AS-MOTOR device:

- Exploded drawings of each assembly
- Spare parts lists for each assembly
- Modification information for parts
- Current availability (online stock) of spare parts
- Spare part ordering function
- Management of current shopping carts and older orders
- FAQ and general technical information
- Guarantee claims

Access to the online portal "parts-and-more.org":

Every official AS-Motor dealer has access to the online service portal via his customer number.

Login access to the system occurs via the website:

www.parts-and-more.org

Access data is issued within one to two days after "Dealer first login" using the AS-Motor customer number.

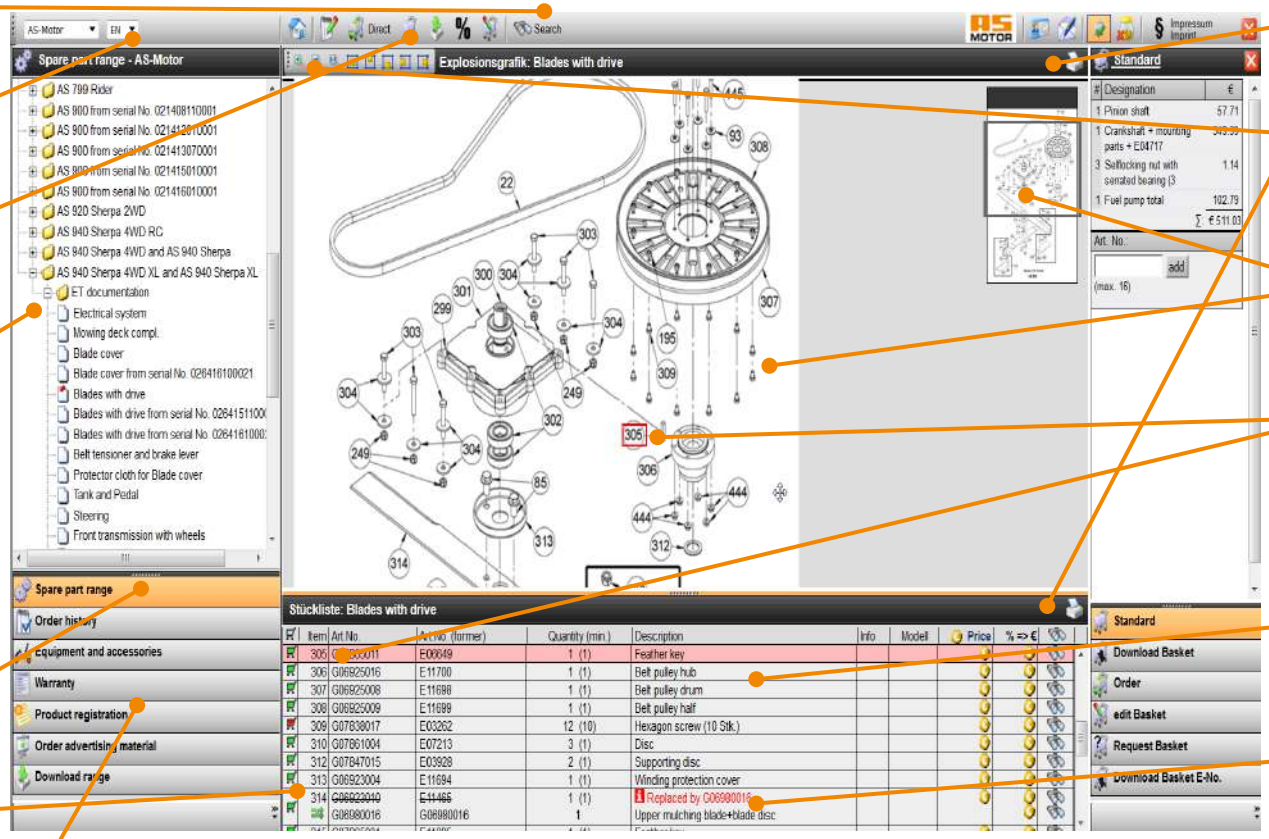
After receipt of the access data (parts ID and password) you can log in via "Immediate login" and use all functions immediately.

For questions concerning "parts-and-more.org" please contact:

- info@as-motor.de or
- service@parts-and-more.info
- AS-Motor Germany +49 7973 9123-0

Introduction

Online Service Portal "parts-and-more.org" (PAM) 2/2



Maintenance and cleaning (general information)

To ensure the full functionality, the safety and a long service life of the machine, regular maintenance and cleaning of the machine is essential.

All necessary activities and their intervals are listed on the following pages.

Prior to maintenance

Danger! ⚠ Danger of injury if maintenance and cleaning tasks are performed when the engine is running. Only execute maintenance tasks when the engine is running if this is explicitly required.

Prior to all maintenance and cleaning tasks when the engine is at a standstill:

- Let the device cool for at least 20 minutes.
- Close the fuel tap and the tank ventilation.
- Disconnect the negative terminal of the battery.

Warning! ⚠ The device can tip or fall over and cause severe injuries.

The device can be lifted or tilted to execute maintenance, repair or cleaning tasks on the underside of the device.

- Only lift the device on a level substrate.
- Only use hoists and ramps that are suitable.
- Only attach hoists on the main frame, only the main frame can bear the weight.
- Safeguard the device against tipping over or falling.
- Stay out of the tipping area.
- Do not tilt the device more than 23 degrees (AS 940 XL), 18 degrees (AS 920) and 21 degrees (AS 940). Otherwise the device can fall over, it can be damaged and contamination can occur due to escaping fluids.

Clean the device:

- Thoroughly clean the device after each use. Particularly the underside and the blade enclosure.
- Clean the air grille, engine cooling unit and engine.
- Clean the transmission housing and transmission fan.
- Danger of fire! ⚠ Particularly ensure clean parts on the exhaust system.
- For cleaning use brooms, brushes, damp cloths and wood or plastic spatulas.
- Do not clean with a high-pressure cleaner!
- Do not use any aggressive cleaning agents.

Thorough visual inspection:

Check the following for safe operation of the machine:

- Nuts, bolts, screws, fuel lines, air filter for firm seat
- Ignition cable and ignition connector for damage
- Covers, protective cloths, muffler
- Tank, fuel tap, carburettor, engine, transmission, battery, hydraulic system for leaks

Check safety functions

Check magnetic contact switch on the transmitter holder:

1. Select operating mode MC.
2. Sit on the driver seat.
3. Switch on the transmitter and receiver.
4. Start the engine.
5. Set the drive lever to the zero position.
6. Take the transmitter out of the transmitter holder.
7. Set the drive lever to the slow speed forward.
8. Result: The engine must switch off.

Seat contact switch:

1. Select operating mode MC.
2. Insert the transmitter into the transmitter holder.
3. Sit on the driver seat.
4. Switch on the transmitter and receiver.
5. Start the engine.
6. Set the drive lever to the slow speed forward.
7. Carefully exit the driver seat.
8. Result: The engine must switch off.

Check magnetic contact switch on the transmitter holder and seat contact switch:

1. Select operating mode MC.
2. Insert the transmitter into the transmitter holder.
3. Sit on the driver seat.
4. Switch on the transmitter and receiver.
5. Start the engine.
6. Set the drive lever to the slow speed forward.
7. Result: Engine must not switch off.

Check emergency stop switch:

1. Select operating mode MC.
2. Sit on the driver seat.
3. Switch on the transmitter and receiver.
4. Start the engine.
5. Drive on a substrate where the blade can freely rotate, and touches neither objects nor the ground.
6. Ensure that no one is in the danger zone of the device.
7. Engage the blade clutch.
8. Press the emergency stop switch on the device.
9. Result: It must: The engine must switch off and the status light on the device must be continuously illuminated.

Check Start/Stop switch:

1. Select operating mode RC.
2. Switch on the transmitter and receiver.
3. Start the engine.
4. Drive onto a large, free and level area.
5. Ensure that no one is in the danger zone of the device.
6. Drive slowly forward.
7. Press the Start/Stop switch.
8. Result: Result: It must: The drive lever in zero position, the engine must switch off and the status light must be continuously illuminated.

Check parking brake:

Danger: If the parking brake is not set properly the device can roll off. Ensure that the parking brake always functions faultlessly.

1. Place the device on a non-slip substrate.
2. Switch off the engine.
3. Let the device cool.
4. Select operating mode MC.
5. Unlock traction drive. (Lever on the hydrostatic transmission)
6. Activate the parking brake. (Drive lever in position "P")

Check parking brake: (Continued)

7. Attempt to push the device.
8. Result: If the rear wheels block, the parking brake is correctly adjusted. If the device can be pushed, the parking brake must be readjusted. (See section "Operating elements", Parking brake)

Check foot brake:

Check whether the drive lever returns to the aperture of the zero position, when the brake pedal is activated.

Check blade: (See section: "Mow unit bonnet", Blade maintenance)

Danger! There is a considerable danger of injury if the blade is improperly mounted and maintained.

Check the blades and all fastening parts for wear, damage and cracks.

Immediately replace blade parts and fastenings if there is:

- Damage or cracks (e.g. wear of the blade bolts and nuts)
- Wear that extends beyond the wear indicators of the blades (granularity marks on the blades)
- At least once a year or every 50 operating hours, depending on whether wear is present. Material is subject to fatigue; hairline cracks can develop. (Example: blade bars)

Vibration:

Vibration indicates imbalance in the rotating system. Causes can be:

- One-sided wear of the blade
- Missing blade, parts, or chipping
- Damage of the engine, blade, or enclosure fastening
- Dull or poorly sharpened blades increase vibration and can cause cracks and breaks.

Check blade clutch:

1. Select operating mode MC.
2. Sit on the driver seat.
3. Switch on the transmitter and receiver.
4. Start the engine.
5. Drive on a substrate where the blade can freely rotate, and touches neither objects nor the ground.
6. Ensure that no one is in the danger zone of the device.
7. Engage the blade clutch.
8. Disengage the blade clutch.
9. Result: At full speed the blade must come to a complete standstill in less than 5 seconds. The status lights on the device must go out.

Check blade transport position

1. Select operating mode MC.
2. Sit on the driver seat.
3. Switch on the transmitter and receiver.
4. Start the engine.
5. Drive on a substrate where the blade can freely rotate.
6. Ensure that there is no one in the danger zone.
7. Bring the mower deck into transport position.
8. Engage the blade clutch.
9. The blade clutch must not engage.

Check engine

See section "ENGINE".

Checking the battery

See section "Electrical system".

Check hydrostatic transmission

See section "Drive system".

General information

Cleaning and maintenance intervals

Component	Action	Maintenance interval	
		A	B
Device	Check for safe working condition (basic inspection).	■	▲
	Clean.	■	
	Customer service.		▲
Fuel	Check fuel level.	■	
	Is the tank cap closed?	■	
Tank, fuel valve, and fuel line	Check parts for leaks and check for good condition.	■	▲
Ventilation grid	Clean.	■	▲
Engine cooling	Clean.		▲
Spark plug	Check/replace.		▲
Air filter	Maintain.	■	■▲
Blade and fastening components	Check for wear and damage. See chapter Checking the blade.	■	▲
	Change.		▲
	Clean the screw-on point of the knife blade.	■	
Blade brake	Does the blade function safely and does the blade come to a standstill within 5 seconds?	□	▲
Drive lever	Does the device stop when the lever is in neutral position (parking brake)?	□	▲
	If the lever moves to neutral position when the foot brake is actuated?	■	▲
V-belt	Are the belts tensioned correctly, without fissures, and in good condition?		▲
Bowden cables	Check for proper function and ease of movement.	■	▲
Acceleration lever	Check for proper function.	□	▲
Chassis and impact protection	Check for rust and fissures and check the welding seams.	■	▲
	Are all protective devices and covers in place, fastened correctly and properly functioning?	■	▲
Label	Condition of the labels.	■	▲
Engine	For reliable information, see the operating manual of the engine manufacturer.	■	▲
	Check oil level (see operating instructions of the engine manufacturer).	■	▲
	Oil change.		▲
	Oil filter change.		▲
Parking brake	Check.	■	▲
Check the foot brake	Check the foot brake.	■	▲
Flammable material	Remove easily flammable debris buildup from the engine and the device.	■	▲
Steering	Check the clearance.	■	▲
Tyres	Check tyres and, if necessary, the tyre pressure.	■	▲
Safety functions	Check.	□	▲
Emergency stop switch	Check.	□	▲
Start-stop switch with key	Check.	□	▲
Selection lever operating mode	Check.		▲
Hydrostatic transmission	Check oil level.	■	▲
	Repair leaks.		▲
	Oil change after 50 h and every 200 h thereafter.		▲
Battery of the device	Check the charging conditions.		▲

A Before and after each use
B Yearly or every 50 operating hours

■ By the user when the engine is at a standstill
□ By the user when the engine is running
▲ Through the authorised workshop

General information

Tyre sizes, wheel dimensions, tyre pressures 1/2

Tyre pressures

A uniform and correct tyre pressure is essential for the following characteristics:

- Traction uphill
- Braking force downhill
- Suspension comfort
- Safety ⚠ : The tyre does not come off of the rim!
- Uniform mowing pattern

Rules: ⚠

- Check the air pressure on a regular basis.
- Examine tyres and tyre flanks regularly for damage.
- Replace damaged tyres.
- Only use original AS-MOTOR tyres.
- Do not change tyre diameters or tyre sizes. This can damage the 4WD.

Tips / notes: 👍

- Inflate the tyres with our recommended tyre pressures. In our opinion, these pressures offer an optimum of suspension comfort and traction.
- High tyre pressures have a negative influence on suspension comfort and traction.
- Do not underrange the recommended tyre pressures. Tyres can come off of the rims. ⚠
- Do not exceed the maximum tyre pressures.
- AS-Motor mowers come from the factory with a tyre pressure that is higher than the recommended pressure.
- Tyre sealant can prevent flat tyres. Particularly in tubeless tyres.
- Anti-puncture insert strips can prevent flat tyres.
- For the AS 940 Sherpa 4WD XL airless front wheels (foamed with PUR) are available at PAM. The suspension comfort suffers greatly in this case. Steering and ball joints are subjected to greater load and wear more quickly. Additional weight of 7 kg per front wheel.
- Pay attention to the running direction of the tyres, left / right for optimal traction.
- Slow pressure loss of a tyre indicates that there is a thorn in the tyre.
- Tubed tyres cannot be easily used without a tube.
- Next page: Overview TABLE "Wheels"

General information

Tyre sizes, wheel dimensions, tyre pressures 2/2

Model:	Front wheel (F) / rear wheel (R):	Tyre size:	Recommended air pressure:	Maximum air pressure:	Tread:	Tubed Tyres (TT) / Tubeless (TL):	Standard equipment / optional:
AS 940 Sherpa 4WD RC (XL)	F:	4.80 x 4.00-8	**23 psi / 1.60 bar**	40 psi / 2.80 bar	Agriculture	TT	Series
	R:	20 x 10.00-8	**12 psi / 0.80 bar**	22 psi / 1.50 bar	Agriculture	TL	Series
	F:	15 x 5.00-6	**17 psi / 1.20 bar**	18 psi / 1.24 bar	Terrain	TL	Optional
	R:	18 x 9.50-6	**15 psi / 1.00 bar**	24 psi / 1.65 bar	Terrain	TL	Optional

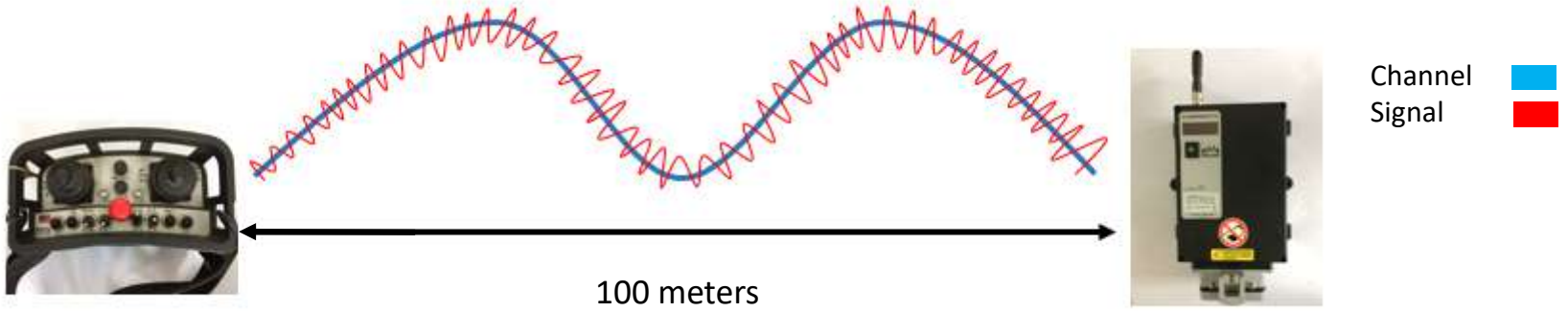
Tightening torque wheel bolts:

- Rear wheels: M12 100 Nm
- Front wheels: M8 40 Nm

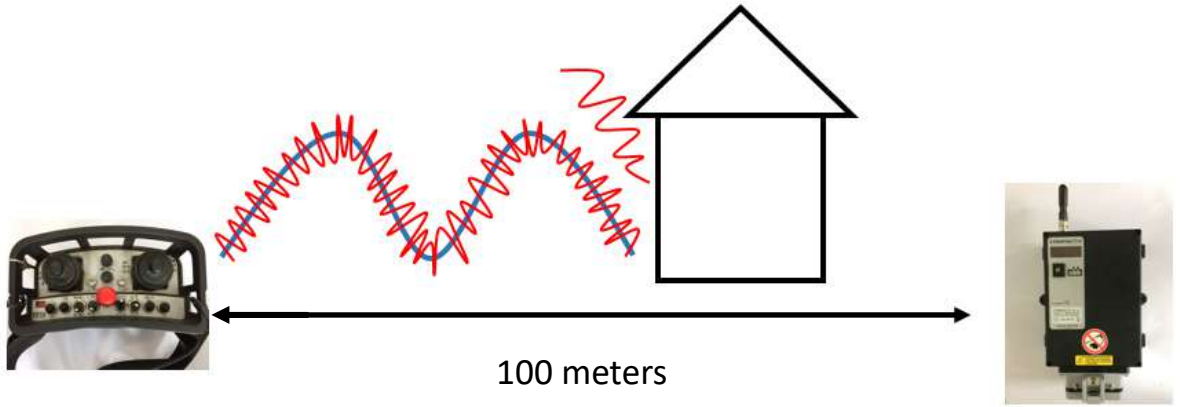
General information

NBB radio remote control 1/2

The specified range of 100 meters is only achieved if there are no obstructions (trees, houses) or weather conditions (fog) that interfere with the radio connection.



Obstructions (houses, trees, etc.) interfere with the radio signal and reduce the range of the radio remote control.

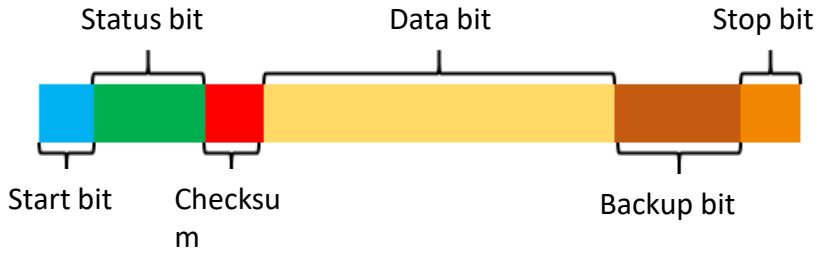


General information

NBB radio remote control 2/2

The signal is exchanged between transmitter and receiver every 0.25 seconds and checked every 0.5 seconds. If in this period a wrong signal or an interference signal arrives at the transmitter / receiver, after 1 second the machine will switch off and the error message "OL" will be displayed on the remote control unit.

The signal that is transmitted consists of a data protocol (bit-sequence). This protocol is structured as follows:



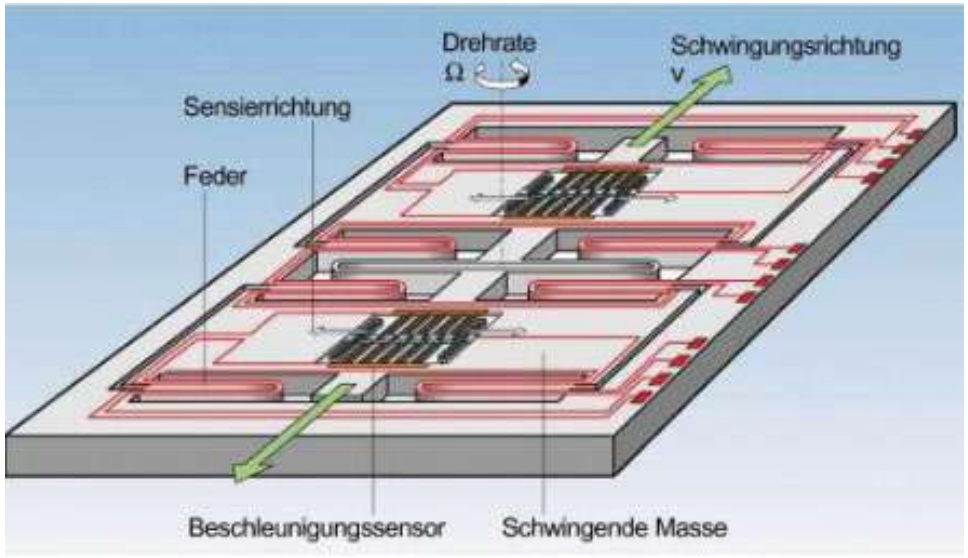
In Europe the freely receivable frequency band of 433.1 – 434.75 MHz is used. In the USA the frequency band of 915 MHz is used.

Interference can occur if there are other wireless connections in the work area of the machine. All radio remote operations, such as garage door openers, automobile keys, etc., and construction site cranes, as well as remote-controlled, toys work with the frequency band of 433.1 - 434.75 MHz. Interferences can also come from the engine.

The built - in gyroscope in the NBB receiver gives a warning from the following inclinations:

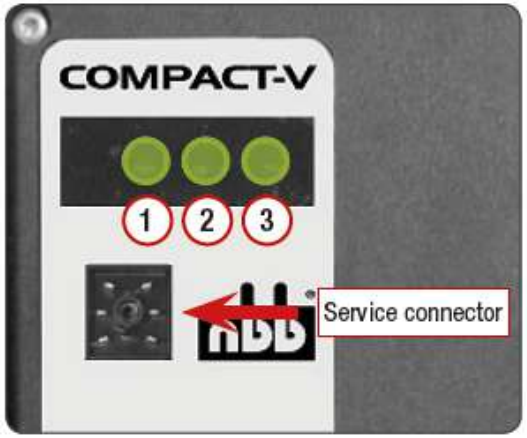
1. 33 degrees at deep slopes
2. 45 degrees up and down the hill
3. >60 degrees emergency stop, blade off at a roll over

Attention: Transmitter and receiver can not be exchanged individually. The transmitter and receiver are a unit paired with the serial number.



General information

Meaning of the LED display of the NBB control box



	LED 1*	LED 2	LED 3
No supply	Off	Off	Off
Supply OK and ready to receive	Lights up green	Weakly flashes green	Lights up green
Radio signal is received (not mandatory for associated transmitter)	Lights up green	Flashes yellow for signal reception	Lights up green
Connection to the associated transmitter correctly established	Lights up green	Flashes yellow	Flashes green
Fault in RF channel (for existing radio connection)	Lights up green	Flashes yellow	Flashes red
Error when checking the emergency relay	Lights up green	Flashes yellow	Slowly flashes red
Other error sources	Off	(Undefined)	Lights up or flashes red

* LED 1: Shows communication between both microcontrollers (only information for NBB Service).

Service connector: Only for NBB service team.

If problems occur: a. Check whether the transmitter is switched on.
b. Check the power supply of the receiver.
c. (Optional) Check or change the current frequency channel.

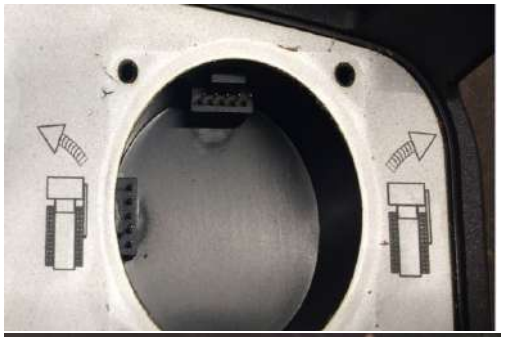
JE Error by AS 940 RC

Installation, Calibration

-Switch Off Transmitter

-Battery take off

pn:
AS940 RC
LH G75050055
RH G75050056



-Remove the 4 Torx10 Screws

-Pull out the operator lever.

- Install the operation lever (Attention Guide)

-Tighten the screws

- Install the batteries

Afterwards Calibrate(Teachen)

Press and Hold the Button „Frequency Switch“ and switch an the transmitter till „Jt“ will display.

Frequency Swith now releae

Steer the operator lever fully in one direction and back to center position.Repeat this point for all directions.

A new activation of the calibration mode (teaching) is not necessary

Press the horn button

This ends the calibration mode.

Attention! The transmitter is now in working mode

Recommendation: For JE Fault,perform this calibration before replacing the operation levers

Procedure by AS 750 RC, AS 751 RC and AS 940 RC similar

General information

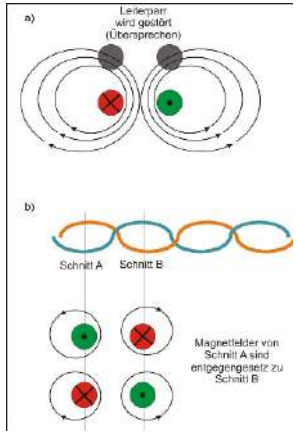
Software

Since April 2017 a new software is installed at the NBB receiver. The software has following updates:

- Drive lever expansion of operational field (F2)
- Activation of the emergency driving program
- Oil shortage will no longer produce an Emergency Stop
- Thermal overload protection of the control box
- Additional error codes:
  1. F9 : Micro switch maximum cutting height no function
  2. C1 : Micro switch transport position no function
  3. C2 : Blade off (US - model)
  4. FU : Radio disruption between receiver and transmitter

In addition, the harness was changed to the servomotors and sensors. The cables are now twisted in the harness. Harness with connection of a faraday cage to the engine hood.

Twisted - Cables



Attention as of 05/2016, the test resistor was integrated into the RC system

Systems before 05/2016 need a resistance cable between the horn and the wiring harness as soon as the horn or receiver is before 05/2016

Fault	Possible fault	Remedy
No connection between transmitter and receiver.	Transmitter battery is empty.	Replace battery.
	Battery on the device is depleted.	Charge battery. (see Checking the battery)
	Radio range exceeded.	Decrease the distance between transmitter and receiver.
	Radio interference due to other transmitters. (Radios, garage door openers, vehicle keys, construction cranes, transmission masts)	▪ Switch off transmitter and receiver, after 10 seconds switch them on again. (Automatic channel selection) ▪ Manually change the radio channel. ▪ Increase the distance to the interference source. Remove interference source.
	"Emergency stop switch" on the device is activated.	Unlock emergency stop switch.
	Antenna loose, damaged, or no longer present.	Fasten or replace antenna.
Starter does not turn.	MC mode: Safety switches are not activated.	▪ Bring drive lever into zero position. ▪ Load seat contact switch through the weight of the driver. ▪ Insert transmitter in the transmitter holder. (Installed magnetic switch in the remote control)
	Emergency situation is present.	Rectify the emergency stop situation.
	Fuse is defective.	Replace. (See section "Electrical system")
	Battery on the device is depleted.	Charge battery. (See section "Electrical system")
	Battery on the device is empty.	Replace battery.

Fault	Possible cause	Remedy
Engine does not start.	Petrol tap is closed.	Open petrol tap.
	Tank ventilation screw is closed.	Open tank ventilation screw.
	No petrol in the tank.	Top-up fuel. (Switch to reserve, if necessary)
	Choke (starter flap) not activated.	Place throttle lever in the "Choke on" position.
	Device has been tipped over – air filter is oily.	Replace air filter, unscrew spark plugs and start several times with the petrol tap closed. Dry spark plug and screw it back in.
	Engine flooded due to multiple start attempts.	Replace air filter, unscrew spark plugs and start several times with the petrol tap closed. Dry spark plug and screw it back in.
	Spark plug connector unplugged.	Comply with safety instructions! Fit on plug connector.
	Air filter contaminated.	Service air filter. (See section "Engine")
	Sparkplug sooted, damaged or wrong electrode gap.	Clean spark plug and check electrode gap. (See section "Engine") Replace as needed.
	No oil pressure – insufficient engine oil.	Check engine oil level, top-up.
	No oil pressure – excessive inclination.	Bring device into a level position.
	Poor, contaminated, or old fuel.	Clean fuel system. Refuel with fresh fuel.

Fault	Possible cause	Remedy
Engine starts poorly or runs irregularly.	Choke (starter flap) activated.	Bring starter lever out of the "Choke on" position and into the "Full-throttle" position.
	Air filter contaminated.	Service air filter. (See section "Engine")
	Poor, contaminated, or old fuel.	Always use fresh fuel.
	Sparkplug sooted, damaged or wrong electrode gap.	Clean spark plug and check electrode gap. (See section "Engine") Replace as needed.
Engine switches off when mowing.	No oil pressure – insufficient engine oil.	Check engine oil level, top-up.
	No oil pressure – excessive inclination.	Bring device into a level position.
Device does not move.	RC mode: Rotary knob drive speed limitation is at "0".	Increase drive speed limitation. (Turn in the "Rabbit" direction)
	Traction drive is unlocked.	Lock traction drive. (Lever on the hydrostatic transmission)
	Hydrostatic drive overheated.	Let cool.
Blade clutch does not engage.	Engine does not run.	Start engine.
	Blade in transport position.	Bring blade to any cutting height.
	No oil pressure – insufficient engine oil.	Check engine oil level, top-up.
	No oil pressure – excessive inclination.	Bring device into a level position.
	MC mode: Safety switches are not activated.	▪ Bring drive lever into zero position. ▪ Load seat contact switch through the weight of the driver. ▪ Insert transmitter in the transmitter holder. (Magnetic switch)

Fault	Possible cause	Remedy
Blade clutch disengages when mowing.	No oil pressure – insufficient engine oil.	Check engine oil level, top-up.
	No oil pressure – excessive inclination.	Bring device into a level position.
Blade does not rotate.	V-belt is not sufficiently tensioned or is defective.	Check belt and replace if necessary. (See section "Mower deck")
	Bowden cable of the blade clutch is defective.	Replace Bowden cable. (See section "Mower deck")
Strong vibration in operation.	Blade imbalance due to incorrect re-sharpening or chipping on the blade.	Service blade correctly. (See section: "Mower deck") Replace damaged blades immediately!
	Blade drive shaft bent due to collision with foreign objects.	Check blade shaft and mow unit bonnet and repair if necessary. (See section "Mower deck")
	Engine fastening is loose.	Check engine fastening.
	Blade fastening is loose.	Check blade system and mow unit bonnet. (See section "Mower deck")
Abnormal noises.	Loose fastening elements.	Find and fasten loose parts.
	Muffler or manifold is loose.	Fasten parts, repair if necessary.
	Hydrostatic drive overheated.	Let cool. Service and clean. (See section "General information", Maintenance tasks)
Interval horn signal in spite of compliance with the permitted slope incline.	Warning of excessive device load to ground unevenness.	Reduce drive speed. (Acceleration sensor)
Smoke coming from engine.	Air filter contaminated or soaked with oil.	Service or replace air filter.
	Oil level too high.	Reduce oil level to the "max" mark.

General information

Frequent faults and rectification (troubleshooting) 5/7

Fault	Possible cause	Remedy
Engine gets hot.	Fan grille contaminated.	Clean fan grille.
	Insufficient oil level in the engine.	Check oil level and top up if necessary.
	Cooling fins of the engine are contaminated.	Clean cooling fins.
Cut is not clean, lawn / meadow is unsightly.	Blade dull or worn.	Sharpen / turn and balance blade. Replace damaged blades immediately.
	Drive speed is too high for the grass height or grass density.	Reduce drive speed and/or adjust the cutting height.
	Mower deck of the device is heavily contaminated.	Clean.
	Different tyre pressure.	Check tyre pressure.
	Mower deck of the mower is not parallel to the ground.	Adjust the parallelity of the mower deck.
	Mow without full-throttle. Blade rotates too slowly.	Accelerate full-throttle.
	Use of the mulch kit in high grass.	Mow high grass without mulch kit.
	Mulch blade (top blade) installed the wrong way around.	Install mulch blade (top blade) correctly.
Mulching result is unsatisfactory in high growth.	Drive speed too high.	Reduce drive speed.
Mulching result is not satisfactory on short growth / lawn.	Growth is discharged too quickly.	Install optional mulch kit. (Maximum grass height for mulch kit 40 cm)
The device does not stop when the brake is activated.	Brake is incorrectly adjusted, worn or defective.	Adjust brake correctly or repair it.

Fault	Possible cause	Remedy
Mow unit bonnet is clogged.	Mowing grass that is too tall or too wet.	Adapt cutting height and mowing speed.
	Blade worn.	Service or replace blade system.
	Insufficient engine speed, in spite of full throttle.	Check the engine.
Engine does not switch off.	Switch-off system defective.	Close petrol tap. Repair.
Tyres go flat or lose air.	Thorns or sharp objects damage the tyres.	Tyre / tube repair, tyre sealant, airless front tyres available as accessories.
Differential lock cannot be activated.	MC mode.	Only manual activation via left foot pedal possible.
	RC mode: Emergency stop situation is present.	Eliminated emergency stop situation.
Cutting height cannot be adjusted.	MC mode: Safety switches are not activated.	▪ Load seat contact switch through the weight of the driver. ▪ Insert transmitter in the transmitter holder.
Emergency stop when changing the operating mode. (From RC to MC)	Mode selector lever not completely thrown over.	Throw over mode selector lever to the stop.
	Blade clutch engaged.	Disengage blade clutch before changing the operating mode.
Emergency stop when changing the operating mode. (From MC to RC)	Mode selector lever not completely thrown over.	Throw over mode selector lever to the stop.
	Transmitter in the transmitter holder.	Take transmitter out of the transmitter holder.
	Seat contact switch activated.	Exit the driver seat.
Device does not drive straight ahead.	RC mode: Trim of the steering incorrectly adjusted.	Adapt the trim with the rotary knob on the transmitter.

Fault	Possible cause	Remedy
Control unit cannot be counter-confirmed, error code A8 and F2	Steering angle sensor incorrectly set, wire break	Check steering angle sensor and wiring harness
Machine cannot be started in MC mode	Steering microswitch loose or incorrectly adjusted	Adjust the microswitch
Blade clutch switches off after 3 seconds, error message F8	Microswitch of the blade clutch is contaminated, incorrectly adjusted.	Clean, adjust the microswitch
Mower deck cannot be switched on or off, height adjustment element has no function	Plug connections not properly locked, wire break	Check plug connections and wiring harness
Steering does not automatically return to middle position	Axle geometry, axle suspension, holder of the steering angle sensor	Check axle geometry, axle suspension and holder of the steering angle sensor for damage
Machine does not function in MC mode, error message A1	Seat contact switch	Check seat contact switch, check plug connection of the seat contact switch for firm seat of the pins
Mower deck switches off after 5 seconds, error message C2	Safety-related switch-off of the mower deck because remote control unit is not operated	

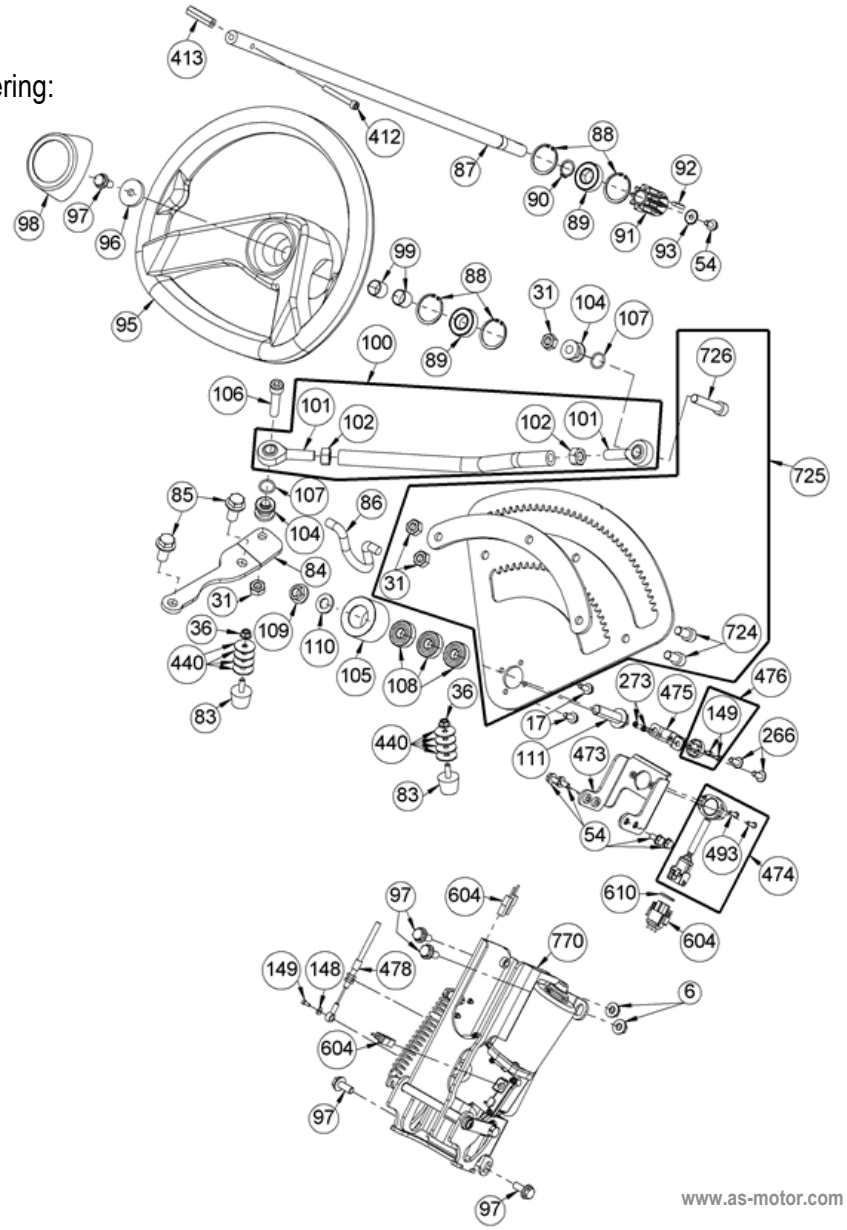
The special RC components

Overview 1/4

The AS 940 Sherpa 4WD RC differs from a normal AS 940 Sherpa 4WD in the following components and assemblies:

1. **Steering**: Steering actuator with gear motor and mechanical clutch.
2. **Drive lever**: Drive lever (drive lever activation) with gear motor and clutch.
3. **Blade clutch**: Blade actuator with gear motor and end position detection.
4. **Cutting height adjustment**: Linear actuator (spindle drive) for **cutting height adjustment** with cutting height detection (max. and transport position).
5. **Limited slip differential**: Linear actuator (spindle drive).
6. **Changeover lever** operating modes MC/RC: for 4 Bowden cables.
7. **Control unit and electrical system.**

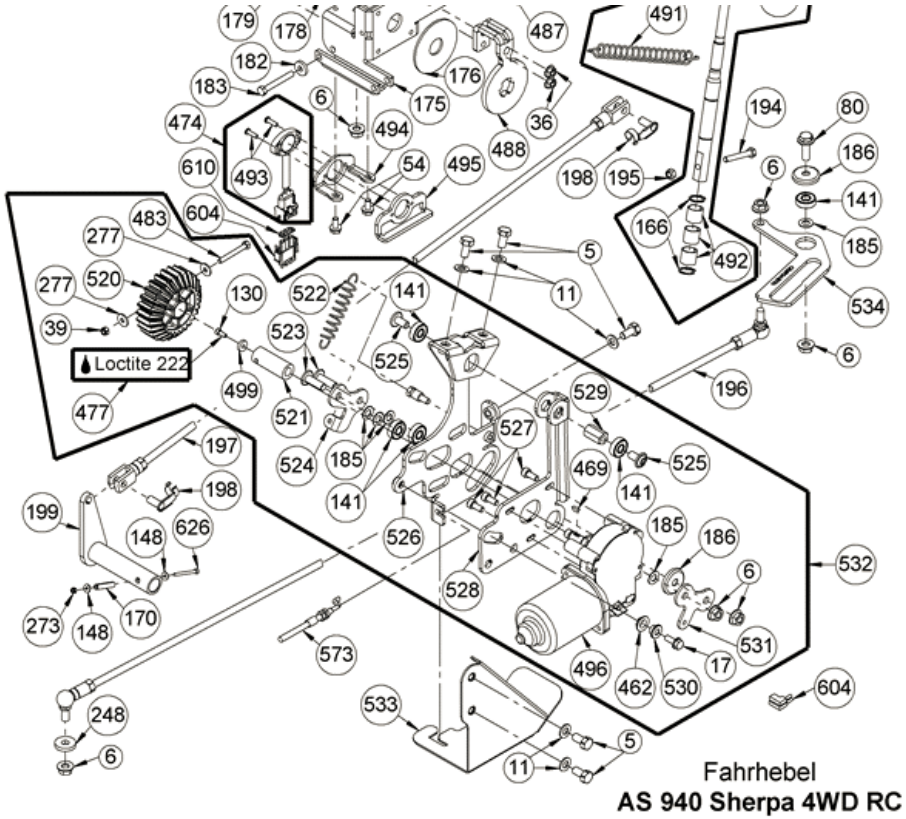
1. Steering:



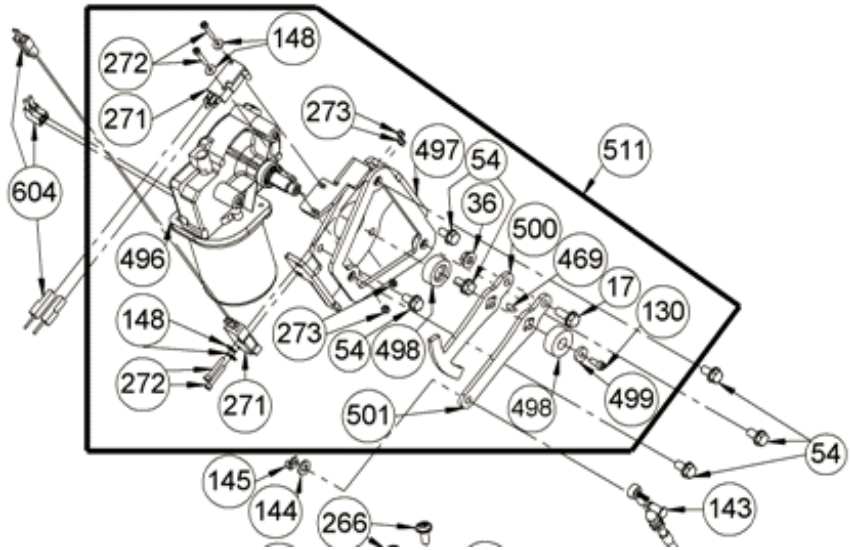
The special RC components

Overview 2/4

2. Drive lever:



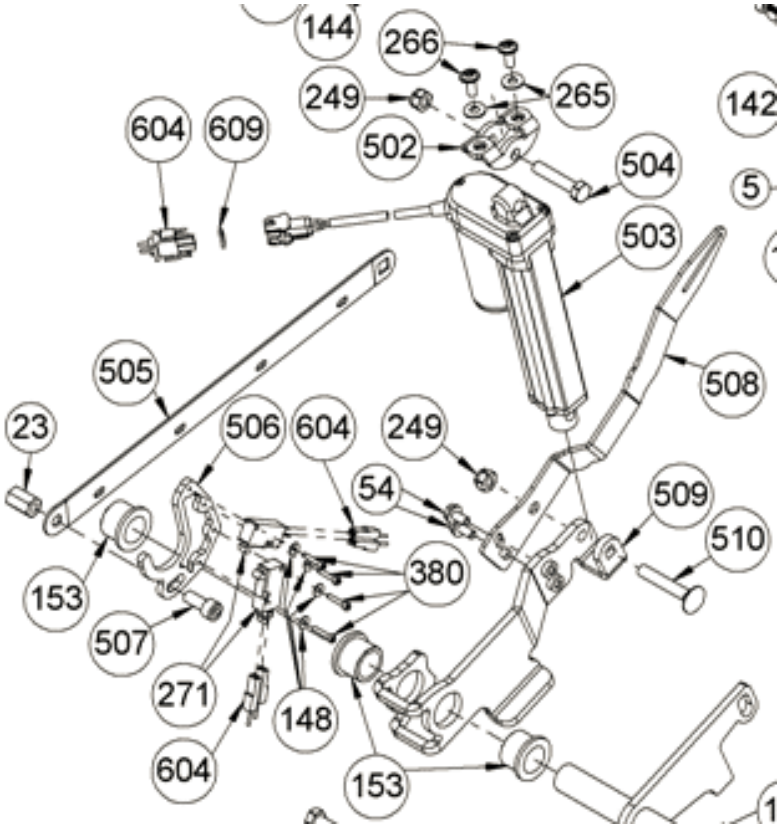
3. Blade clutch:



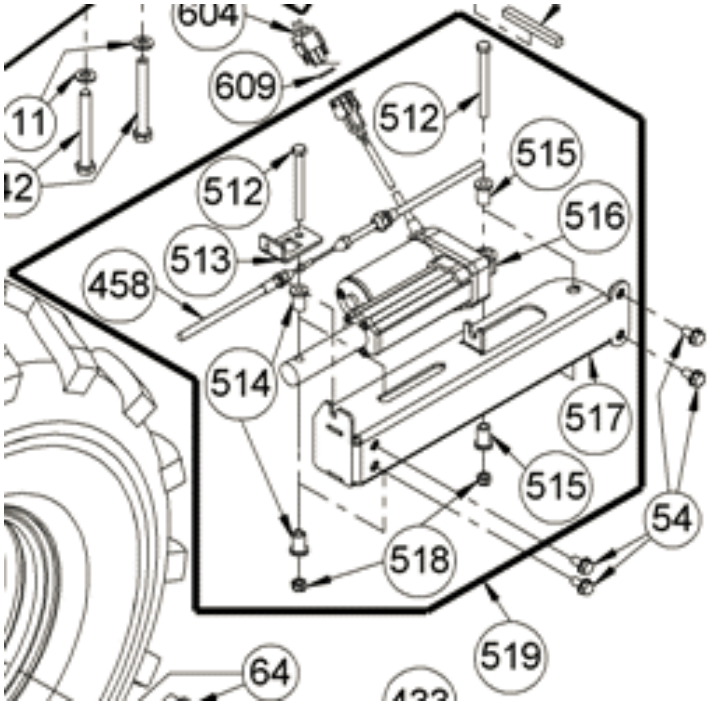
The special RC components

Overview 3/4

4. Cutting height adjustment:



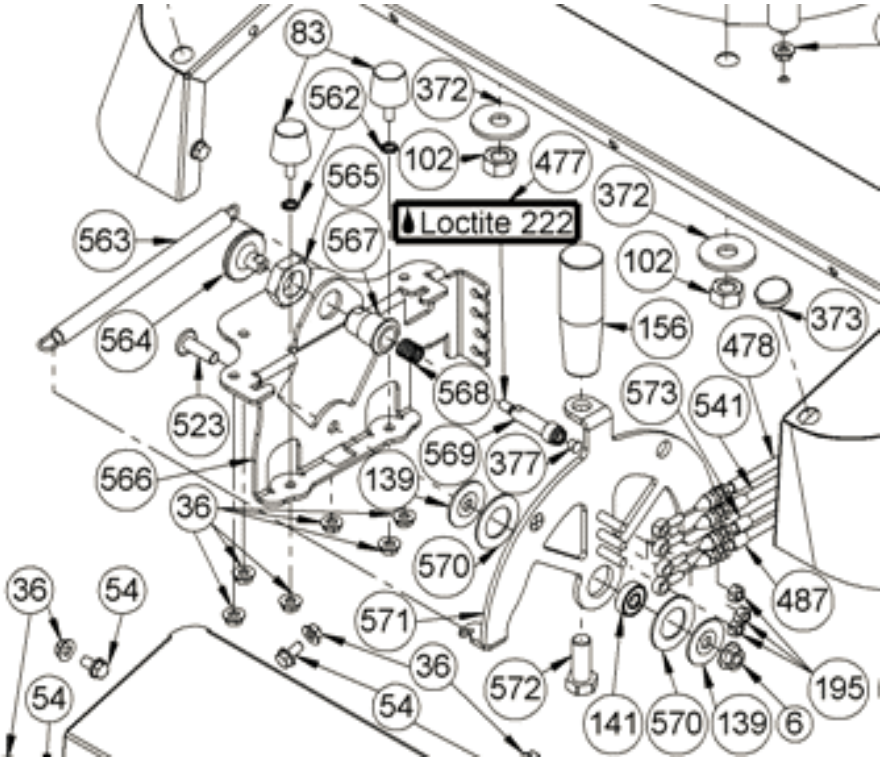
5. Limited-slip differential:



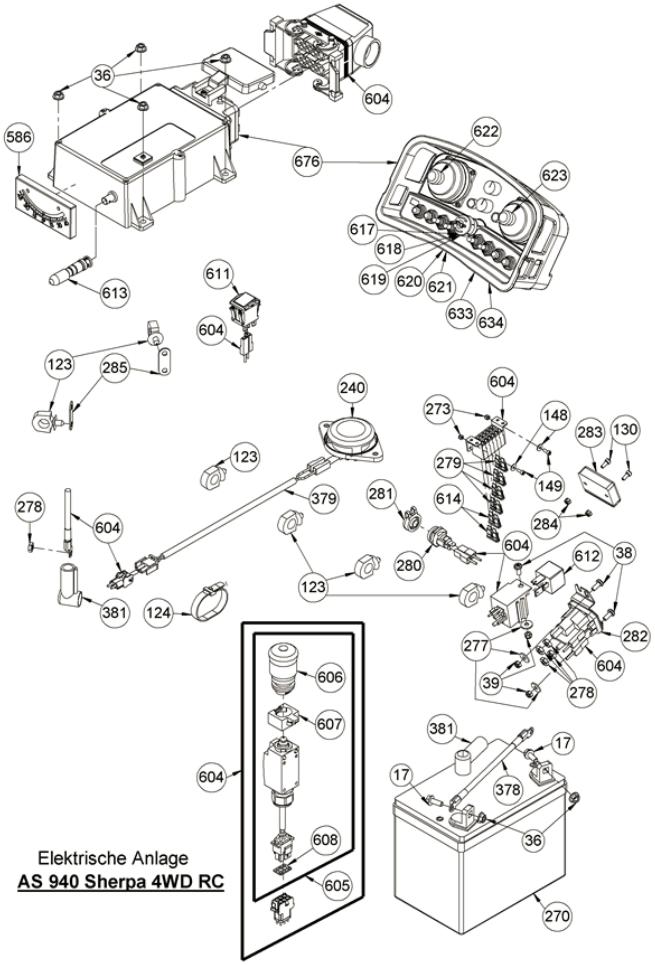
The special RC components

Overview 4/4

6. Changeover lever:



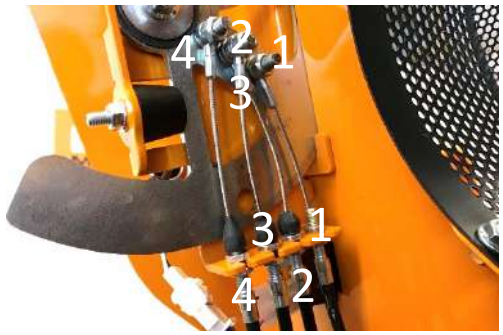
7. Control unit and electrical system:



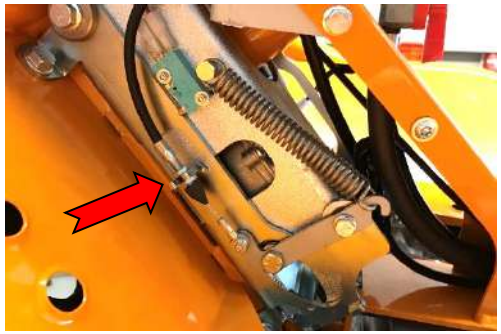
The special RC components

1. Changeover lever till introduction of the new seat spring 1/3

The changeover lever of the operating modes MC/RC. (manual control/remote control)

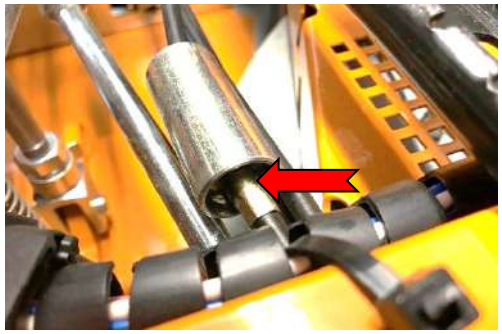


Cables of the changeover lever:
1. Steering clutch
2. Drive lever clutch
3. Drive lever gate
4. Activation – drive lever

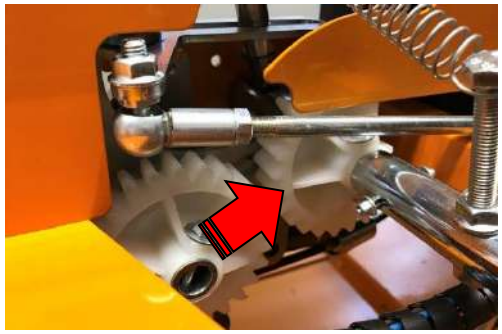


Cable 1: Steering clutch

Activates mechanism of the steering clutch. Can be adjusted on both cable stops.



Tension spring pack of the steering cable tensions approx. 1 cm at activation of the lever to RC mode.



Cable 2: Drive lever clutch

Engages gears of the drive lever actuator in RC mode. Can be adjusted on both cable stops.

Drive lever clutch on MC mode.

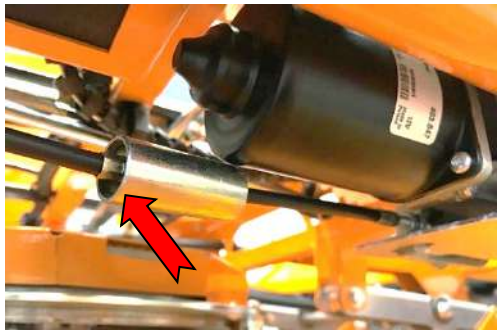
The special RC components

1. Changeover lever till introduction of the new seat spring 2/3

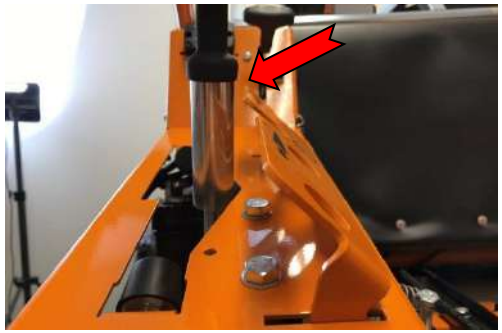
Drive lever clutch on RC mode.

Illustration:

Changeover lever is on RC mode.



Tension spring pack tensions approx. 1 cm at activation of the lever to RC mode. (Ensures constant spring force and tension force)



Shifting gate must completely lift in order not to touch the drive lever.
In MC mode it must fold in completely.

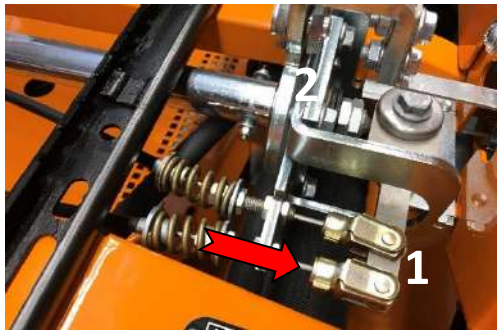
Cable 3: Drive lever gate

When switching to RC mode the shift gate of the drive lever lifts.

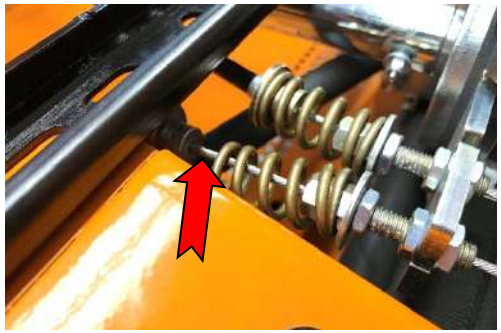
Adjustment only on one cable stop possible. Only on the changeover lever. Other cable stop is fixed. (Illustration)

The special RC components

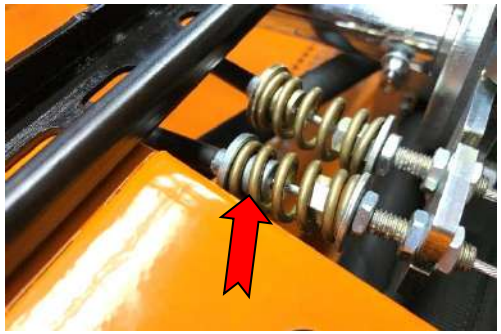
1. Changeover lever till introduction of the new seat spring 3/3



Cable 4: Drive lever activation
In RC mode the cable activates the friction clutch of the drive lever (2) via a lever (1).



In MC mode the cable is very loose. Even the aluminium bushing is not in the spring.



In RC mode the cable pulls on the lever of the activation.

The aluminium bushing moves into the spring and the spring is compressed.

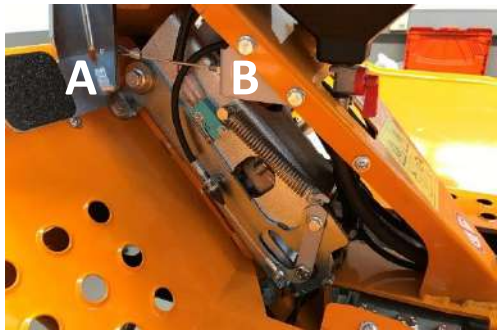
Tip/note:

Test of drive lever activation.

Place the changeover lever on RC mode. Detach cable 2 and 3 on the changeover lever. If the drive lever activation is functioning the drive lever must be very easy to move by hand.

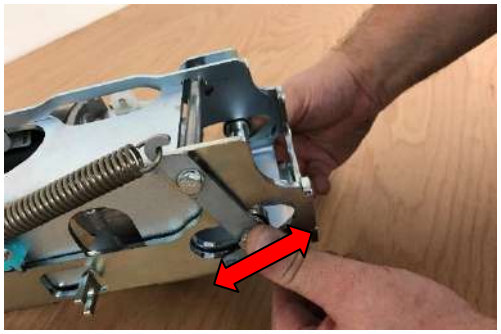
The special RC components

2. Steering – the steering activation element

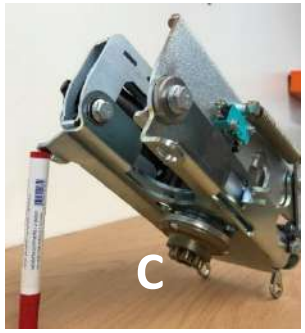


Install situation:

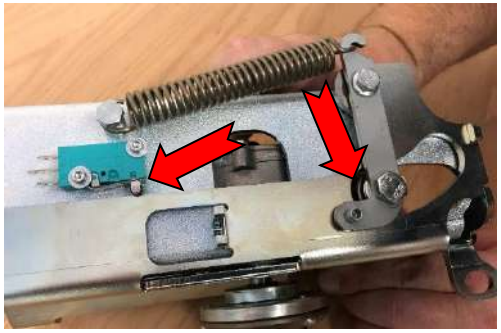
For installation and removal unscrew both pedals (A) and both counter holders (B).



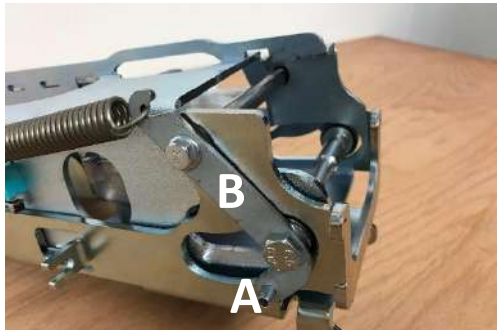
The ratchet lever and locking bolt must move easily. If tilted when mounted the mechanism can jam. (Grease lightly)



Entire steering activation element with steering pinion (C) and steering angle sensor (D).



In RC mode the ratchet lever is switched on the stop and the microswitch. Appropriately fasten microswitch.



Function:
Steering clutch cable of the changeover lever pulls on point (A) and moves the ratchet lever (B).

In RC mode the steering pinion engages in the sheet metal gear element. If it by chance is on tooth-to-tooth, it engages briefly after changeover.

The steering pinion has a protective function for the gear motor. If excessive force is exerted on the steering it can and should break.

Sheet metal gear element of the steering is now loose.

To replace the steering pinion, first take off the front panel and then unscrew the holding bracket of the steering sensor.

Unscrew the lock-toothed screw of the steering gear of the manual steering.

Unscrew the position encoder of the steering sensor and sheet metal gear element.

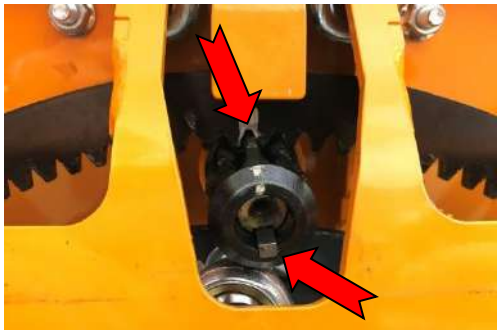
To do this, counter by holding the steering wheel. When the steering gear is loose, then pull out the steering wheel slightly and take out the gear with feather key and detent edge washer.

Sheet metal gear element is now moveable and can be moved to the side. It only still fastened on the steering bar. The steering pinion is now free.

Place the steering wheel in the straight-ahead position.

Now replace the steering pinion. To do this unscrew the three Torx screws.

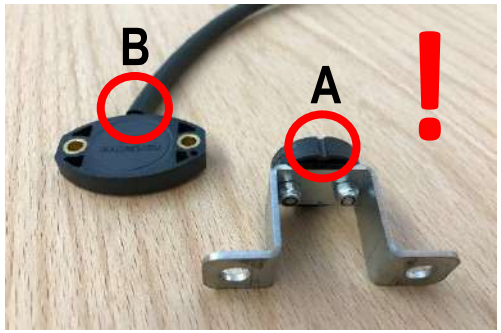
Thereafter place the changeover lever on MC mode.



Thread-in the gear of the manual steering in the centre of the sheet metal gear element (at tooth no. 16). Feather key on the opposite side!

Now put together in the reverse sequence.

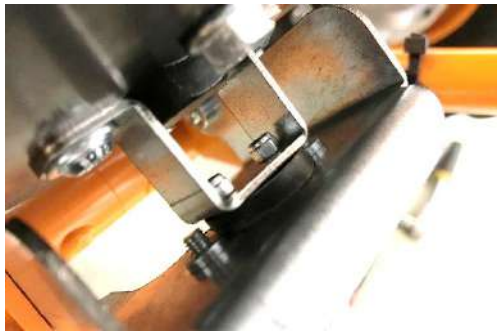
Tighten gear. To do this, counter by holding the steering wheel.



Now refasten the position encoder (A) of the angle sensor (B) back on the sheet metal gear element. **Attention:** Notch must point towards the sensor cable!!!

Now fasten the holding bracket with steering sensor.

Sensor cable points downward and so does the notch of the position encoder!!!
(Rating plate of the steering sensor is visible.)



The position encoder is centred in the aperture of the holding bracket. It lightly touches the steering sensor.

When steering with the steering wheel, the position encoder moves easily in the holding bracket of the steering sensor.

TEST:

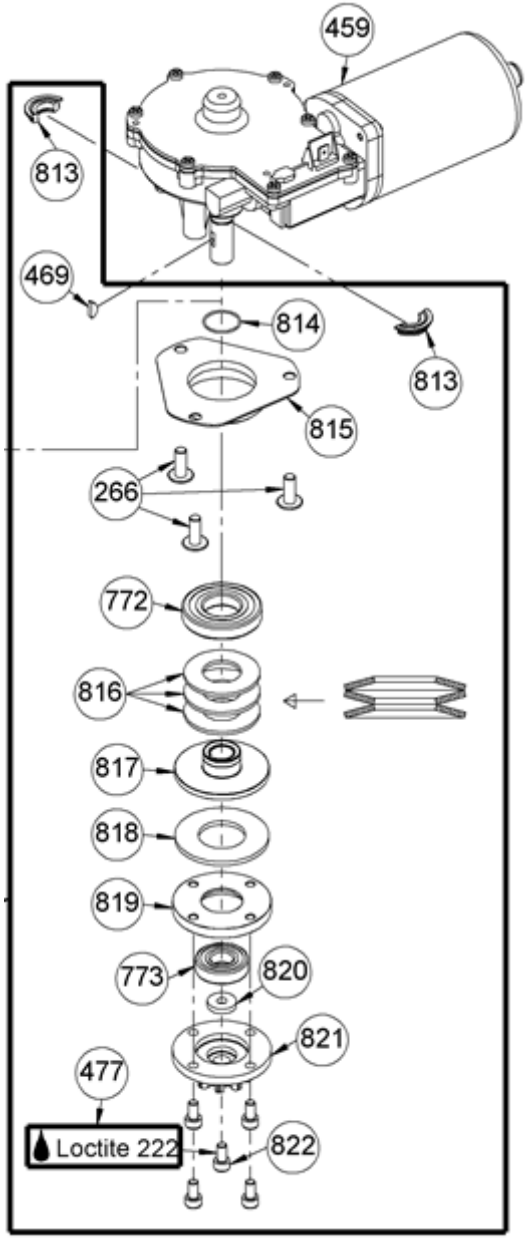
Drive the machine in RC mode. If it runs normally straight-ahead, everything is OK. If not then please "reteach" the steering (teaching).

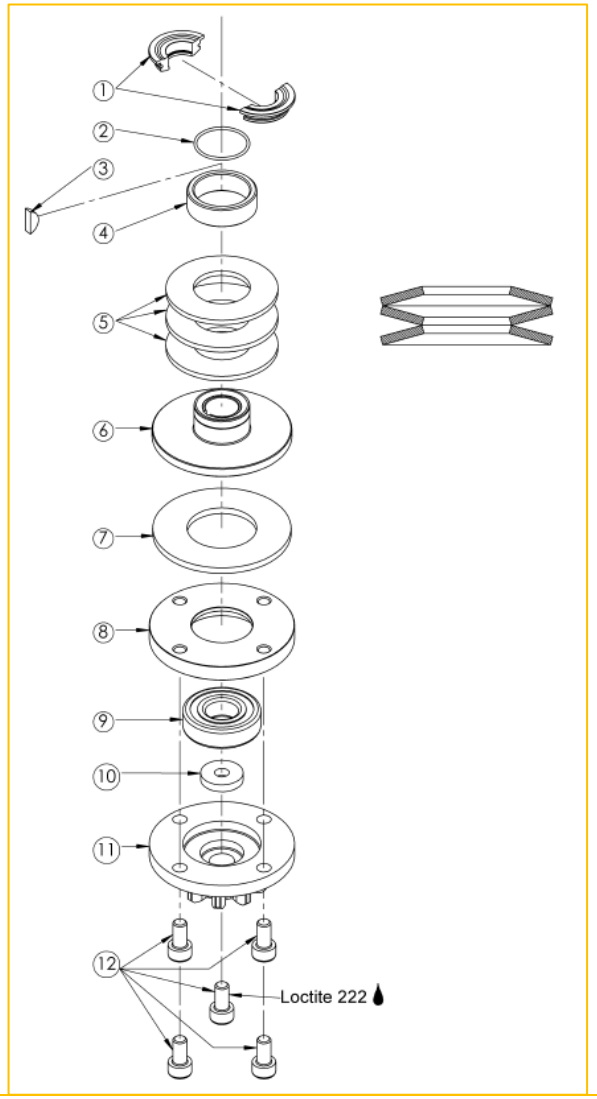
TEST:

See section: "Teaching". If the steering is deflected in one direction then it may be that the position encoder is installed incorrectly. Quickly switch off the machine.

The special RC components

2.2. Assembly slipper clutch from SN 027419060001 1/5

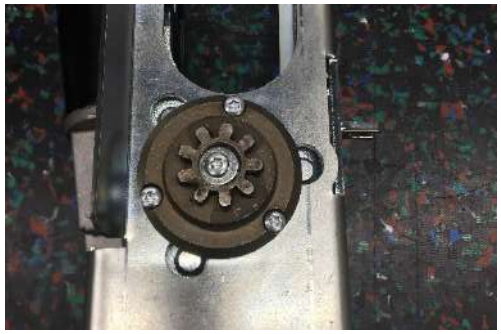




modification kit for machines up to SN 02741906001

The special RC components

2.2. Assembly slipper clutch from SN 027419060001 2/5



Remove steering activation element

Remove bolts of the engine hub

Remove engine hub and steering pinion

Remove locking ring

Remove locking switch

The special RC components

2.2. Assembly slipper clutch from SN 027419060001 3/5

Remove bearings of the bearing block

Remove the bearing block

Remove 3x bolts of the engine

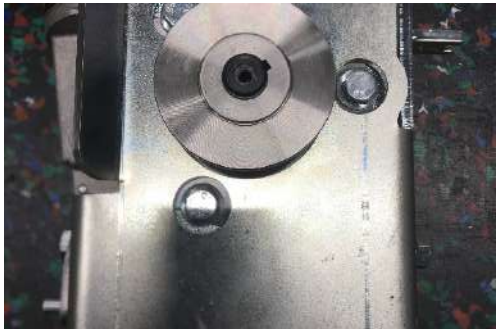
Fix the brackets with the mounting ring

Push the brackets onto the engine hub until they snap in

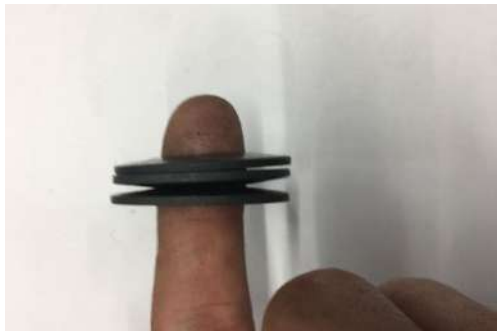
Mount the bearing shell with 3 bolts

Mount the bearing and tighten the 3 bolts

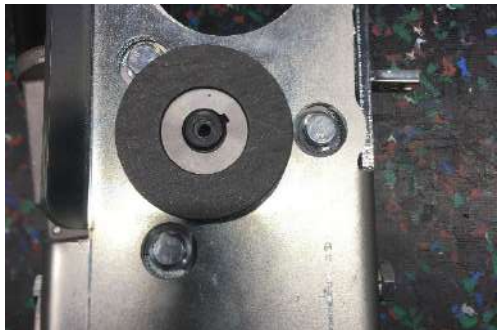
Assemble the bearing block



Mount the pressure plate on the engine



Mount 3 feather keys on the engine hub



Mount the sliding disk

The special RC components

2.2. Assembly slipper clutch from SN 027419060001 5/5

Right to left:

- Steering pinion
- Spacer
- Bearing
- Pressure plate

Mount the spacer in the sterring pinion

Mount the bearing and the pressure plate on the steering pinion

Obere Druckplatte auf Lenkritzel setzen

Tighten the bolts steering pinion on the pressure plate

8Nm + Loctite 222

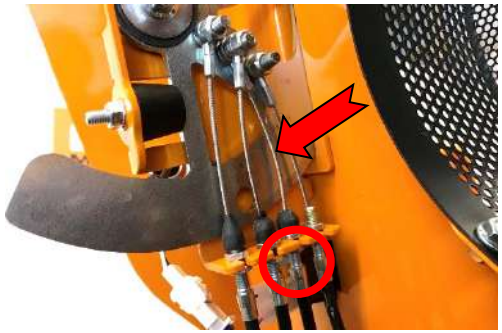
Mount the sterring pinion on the steering activation element

8Nm + Loctite 222

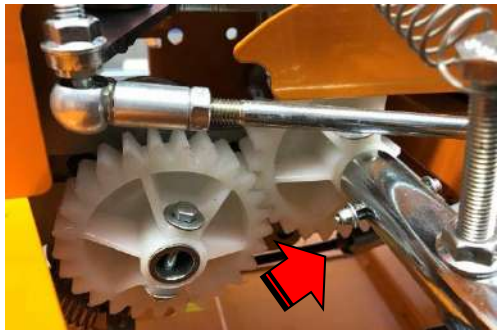
The special RC components

3. Drive lever – traction drive activation

Entire drive activation element.

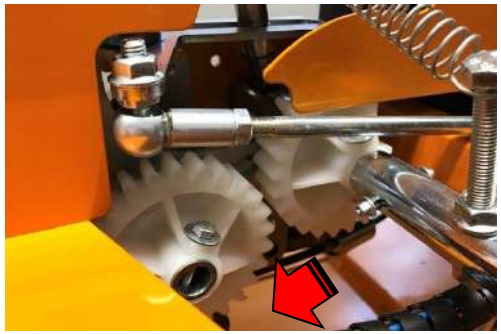


This cable moves the drive activation element in.

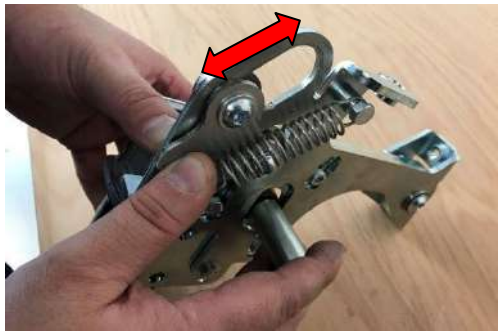


At RC mode the drive activation element moves the gear in.

Adjustment of the cable is possible on both cable stops. Spring pack (A) must be slightly tensioned in RC mode.



In MC mode, the gears are separated.



Mechanism must move easily.

The special RC components

3.1 Drive lever – removing the drive lever activation element 1/2

Place the changeover lever on MC mode.

Unscrews screws of the cover (branch deflector).

Take off cover.

Unscrew screws.

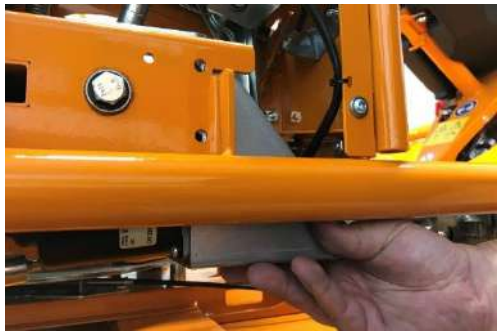
Unscrew screw.

Take out drive lever activation in this position.

Removed drive lever activation element with drive activation cable.

Z ➡ A

Installation in the reverse sequence.

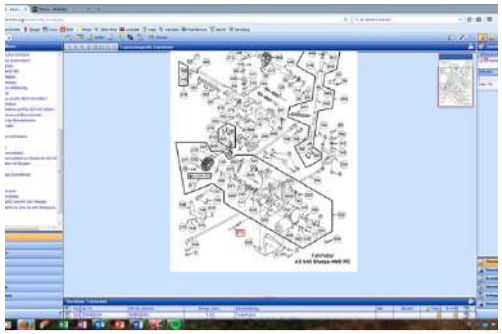


Tip/note:

First fit on all screws loosely, and only tighten them thereafter.

The cover plate fits with its aperture directly on the drive lever activation element.

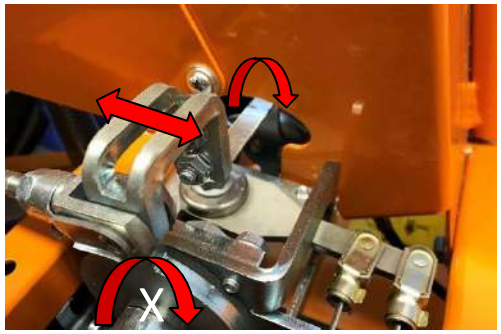
Finished installation.



Tip/note:

PAM shows you all parts and the install sequence in the exploded drawings. (See section "Introduction")

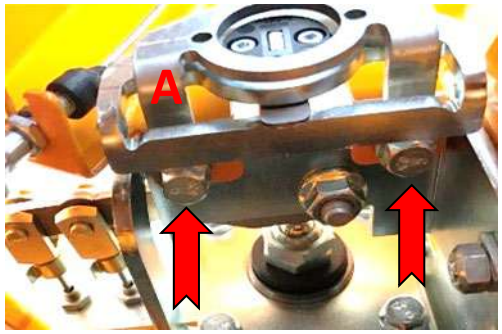
The angle sensor of the drive lever activation element sits under the left side cover. Cable downward! Rating plate is visible.



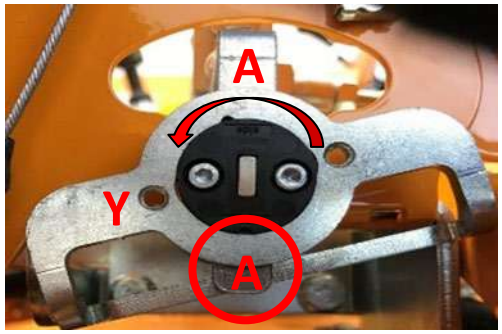
It detects the position of the drive lever via the position of the drive lever tube (X), (Zero position, max. forward, and max. reverse).

Angle sensor unscrewed. Sensor cable pointed downward!

See illustration above.



Unscrew the holder of the angle sensor (A) and take it off.

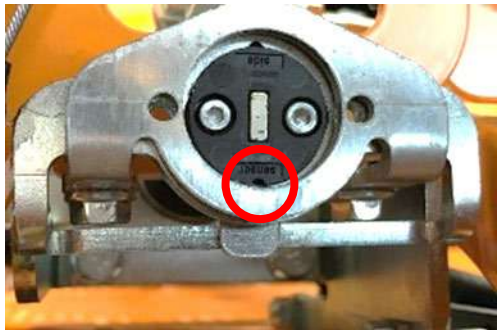


Turn the guide of the position encoder (Y) 90 degrees to the left, in order to take it from the link (V) of the position encoder.

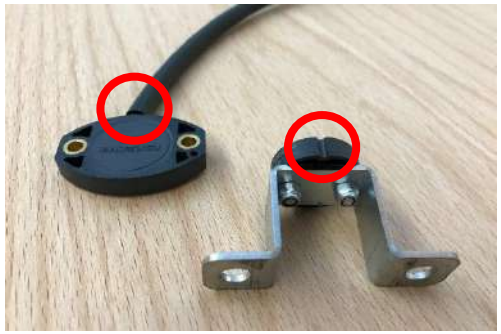
In this 90 degree position the guide of the position encoder (Y) can be taken off.

Z ➡ A

Installation in the reverse sequence.



Important: The aperture in the position encoder must be in the direction of the cable of the angle sensor (both pointing downward)!



Important:

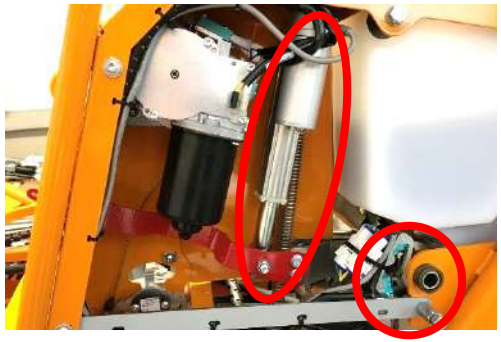
Always install the aperture of the position encoder in the direction of the cable of the angle sensor.

Finished installation. Cable downward.

After installation, the drive lever and its positions must be "re-taught" (see section "Teaching"). Rating plate is visible.

The special RC components

4. Cutting height adjustment – spindle drive with limit switches 1/4



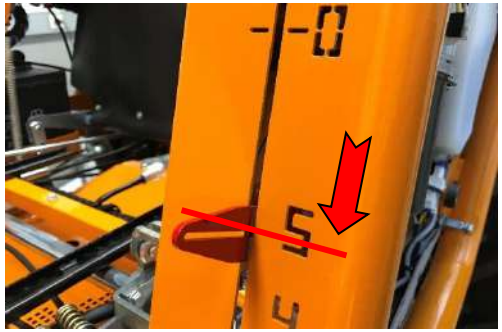
Install situation: Cutting height adjustment (spindle drive) and cutting height detection (max. and transport position)

Linear actuator 100 mm with plug connector.

Setting the zero position of the pointer:

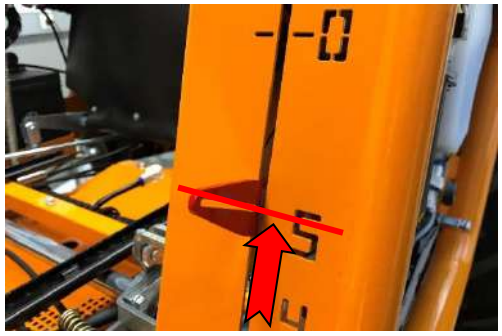
Mower deck in highest level = transport position ("0").

Unscrew screws of the pointer, set the pointer in the exact zero position.



Adjustment of the limit switches:

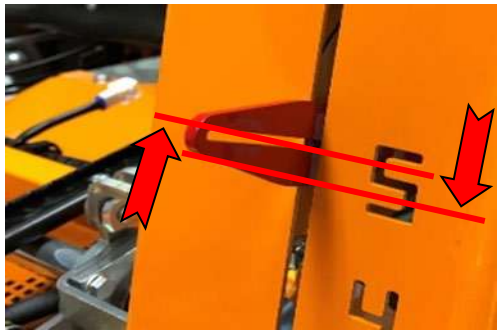
From the transport position, the pointer should move to this position "highest cutting height".



Coming from the lowest cutting position, the pointer should move to this position "highest cutting height" position.

The special RC components

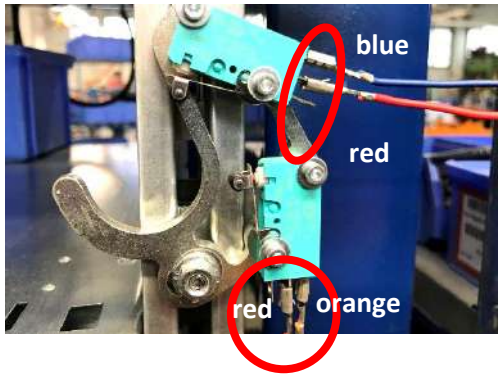
4. Cutting height adjustment – spindle drive with limit switches 2/4



The two end settings of the highest cutting height are set through adjustment of the microswitch holder. (Target position as in the illustration)

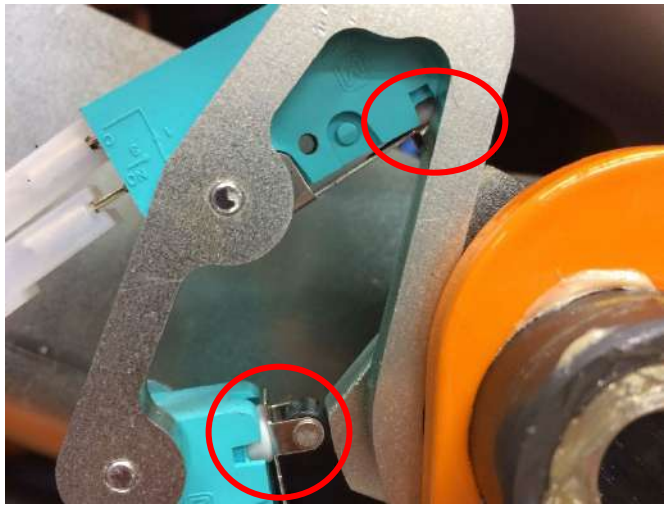
By unscrewing the connection nut, the microswitch holder can be adjusted.

The retighten the nut and try out the end positions.
Rule: "Holder upward, end position upward".



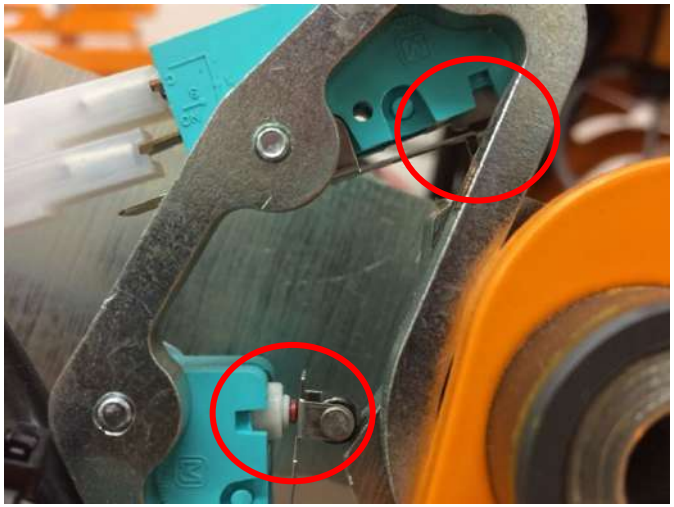
Please pay attention to the plug pin assignment of the connection pins. In each case one pin is not assigned!

Attention :New switch See page 73

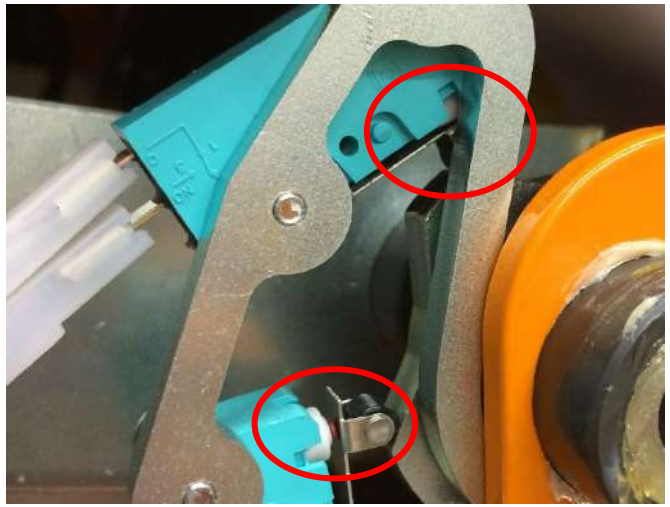


If the mower deck is in transport position both switches are switched. In this position the mower deck cannot be switched. Both switches are normally open contacts.

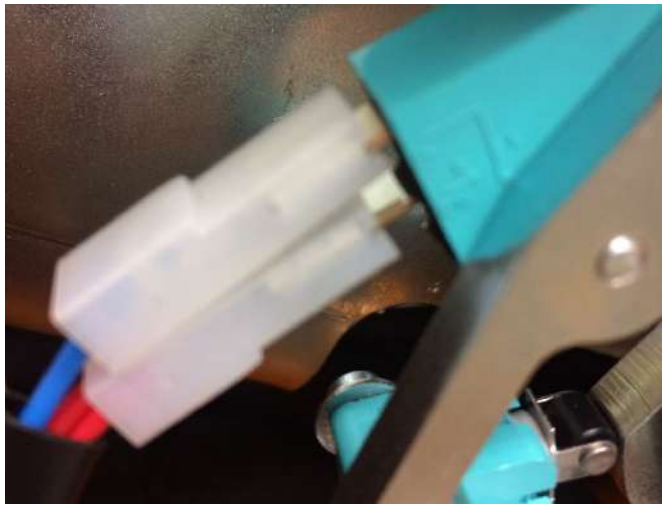
Please pay attention to the plug pin assignment of the switches. For each switch one pin is not assigned.



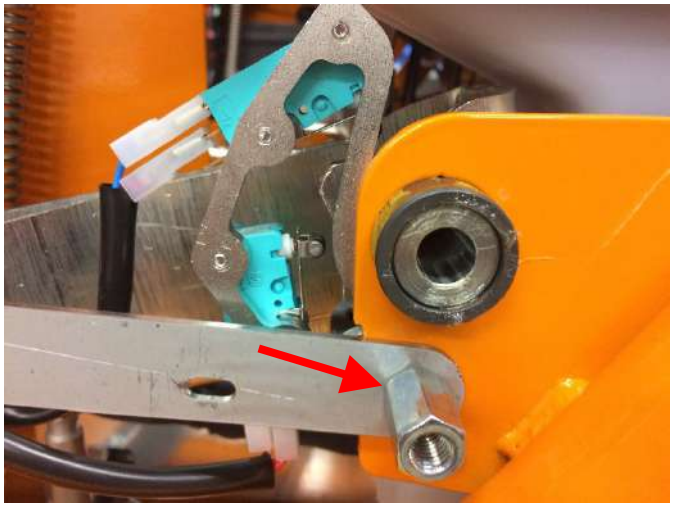
If you move the mower deck out of transport position and into position "5“ then both switches are opened. In position "1" both switches are also opened.



If you move from position "1" into position "5" the upper switch is switched and the lower switch is opened.

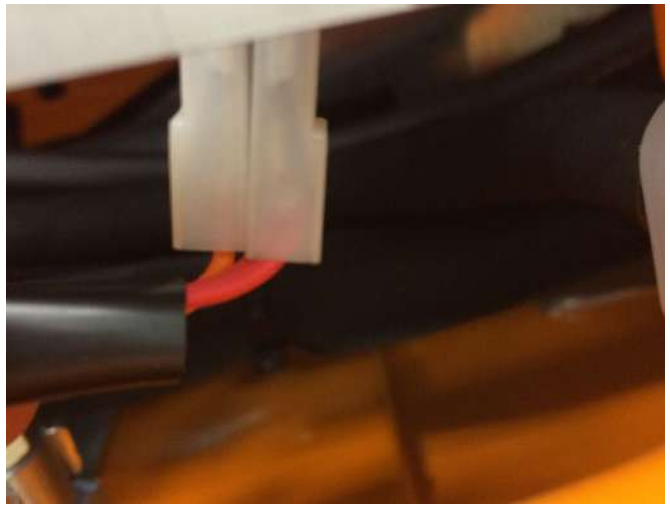


Pay attention to the plug pin assignment:
Red cable in the middle, blue cable on top



To set the zero position, the nut is removed and the curved path is moved upward or downward.

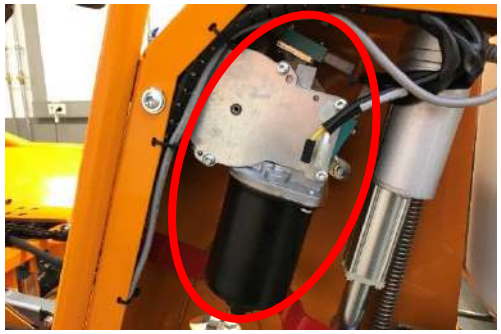
Important: Holder upward, end position downward



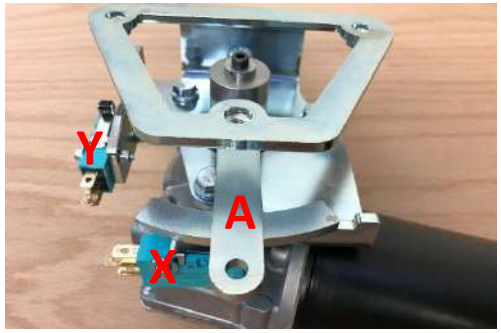
Pay attention to the plug pin assignment:
Red cable in the middle, orange cable left

The special RC components

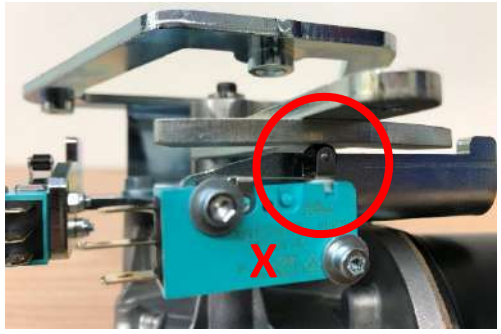
5. Blade clutch activation – gear motor with end position detection



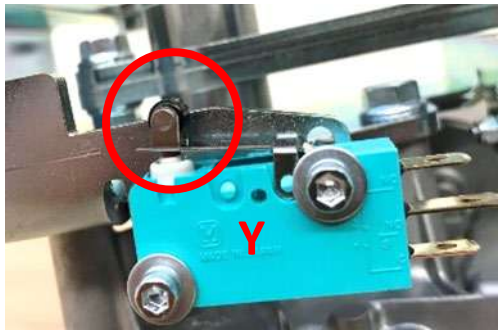
Install situation of the gear motor of the blade activation element.



Blade clutch lever (A) in position "Off". Limit switch (X) pressed. Limit switch (Y) in the "On" position.

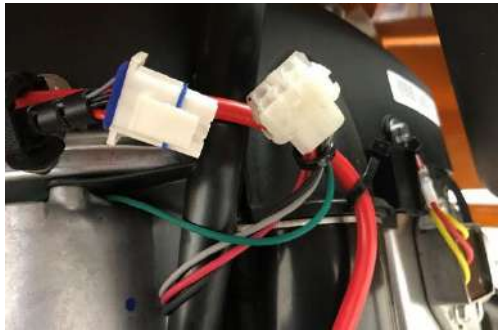


Correct adjustment of the limit switch (X) "Off". Can be adjusted via the slotted holes.



Correct installation of the limit switch (Y) position "On". Is switched by the lever (A) at position "On". For information concerning the cabling, see section "Electrical system".

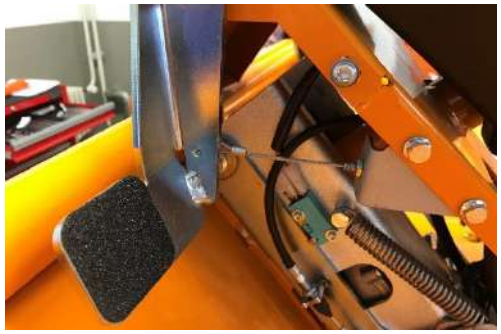
Important: Fastening bolt of the blade drive cable must **point towards the driver seat (inside)**. Securing spring visible from the outside.



Tip/note:
By pulling off the engine plug connector, the blade clutch can be tested without the engine running. (Switch on, pair, and briefly press and test the Start button)

The special RC components

6. Limited slip differential – spindle drive 1/2



In MC mode the limited slip differential lock is operated with the left foot as needed. Adjustment of the cable stop near the pedal.

Spindle drive (linear actuator 50 mm) of the limited-slip differential.

Install situation, (viewed from the rear).

The limited slip differential is only electrically switchable in RC mode. In MC mode an activated lock is deactivated automatically

Lever of the limited slip differential.

Test: Without limited slip differential drive diagonally into a pit. Bring two wheels to spin (no contact). When switching on the lock the rear axle will be blocked.

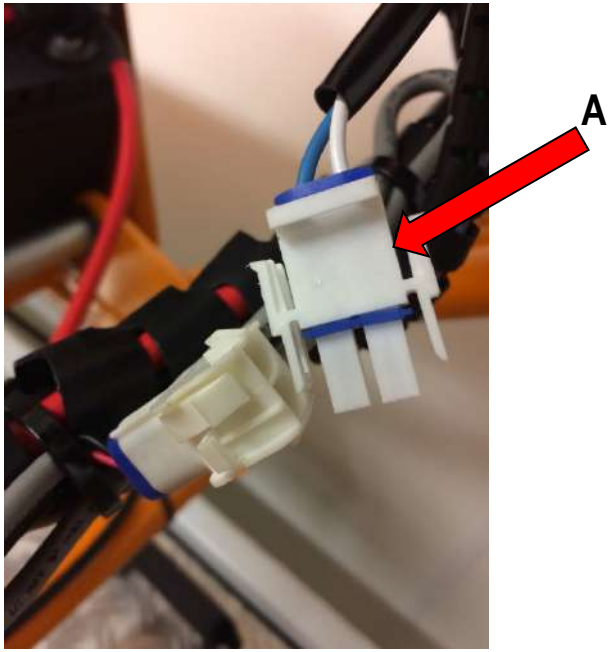
6. Limited slip differential – spindle drive 2/2

The servomotor of the limited slip differential is activated by the NBB control box in RC mode. To test the servomotor, the plug connection (A) in the engine compartment is disconnected.

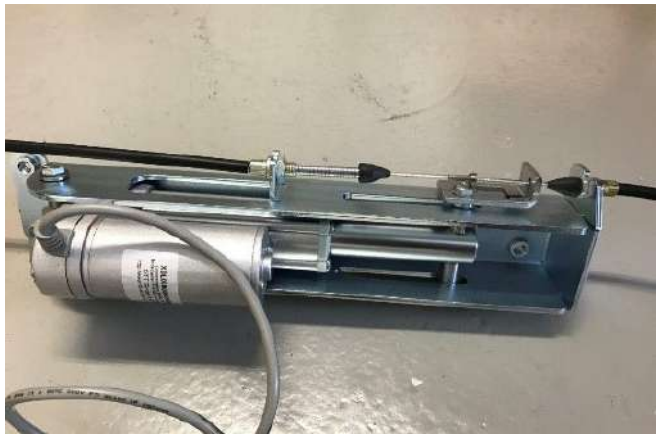
Limited-slip differential on 12.5 V

Limited-slip differential off -12.5 V

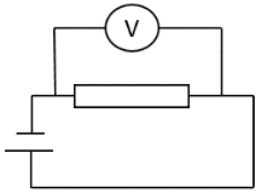
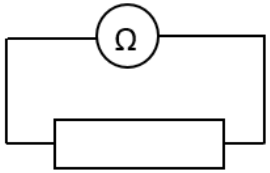
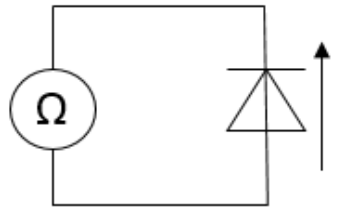
The NBB control box takes the current from the connection 5 seconds after reaching the "Off" position.



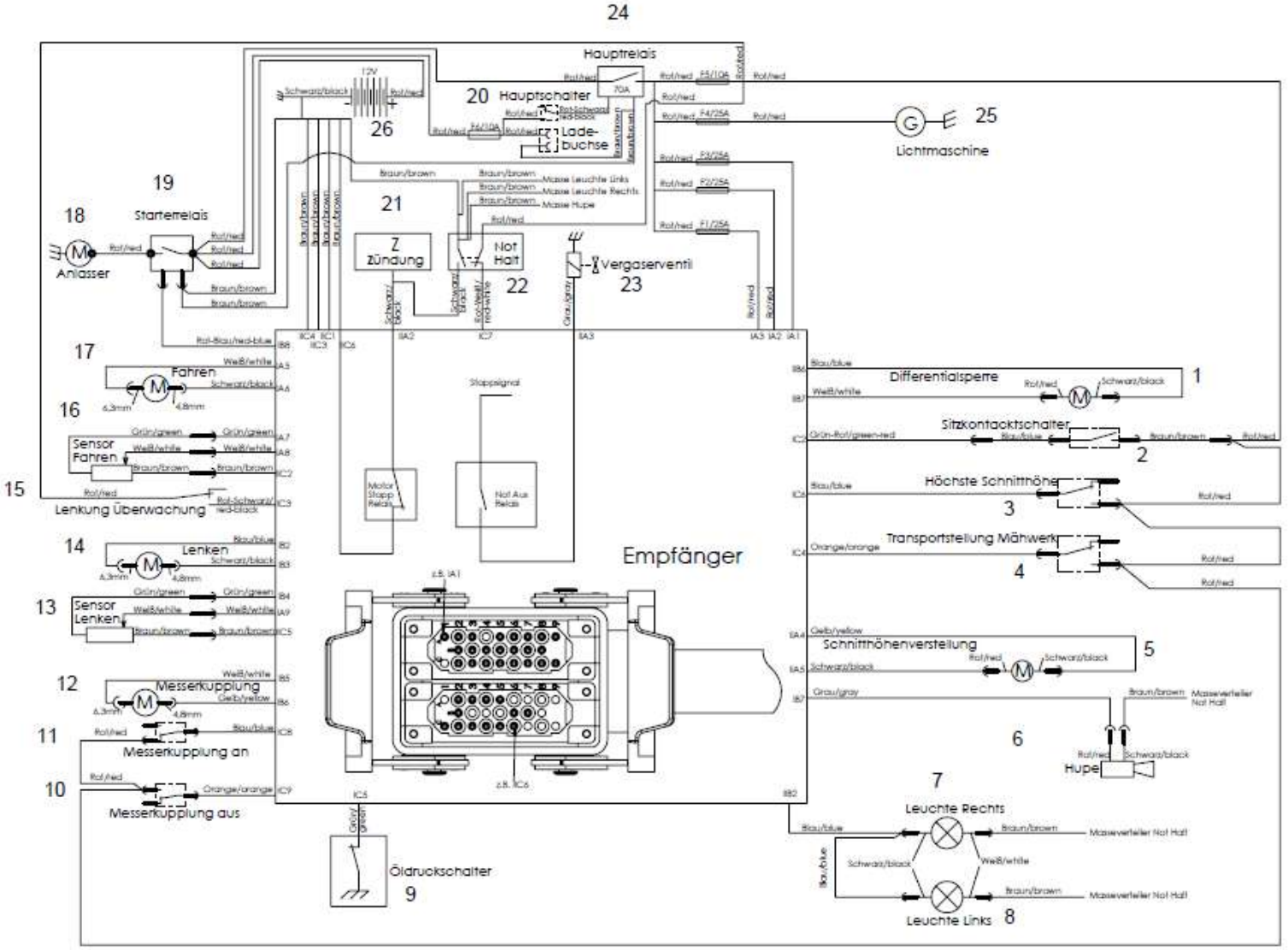
View from the rear



View in removed status

Measurement	Unit	Execution	Circuit diagram
Voltage	Volt	Select voltage type (AC/DC) set the measuring range, connect measuring leads & measure	
Current	Ampere	Select voltage type (AC/DC), set measuring range, switch multimeter in series to the energised components	
Resistance	Ohm	Component de-energised, select measuring range, connect measuring leads & measure	
Resistance diode	Ohm	Select measuring range, connect measuring leads, in the flow direction a low resistance value is shown, in the blocking direction a resistance value in the MΩ range is shown	

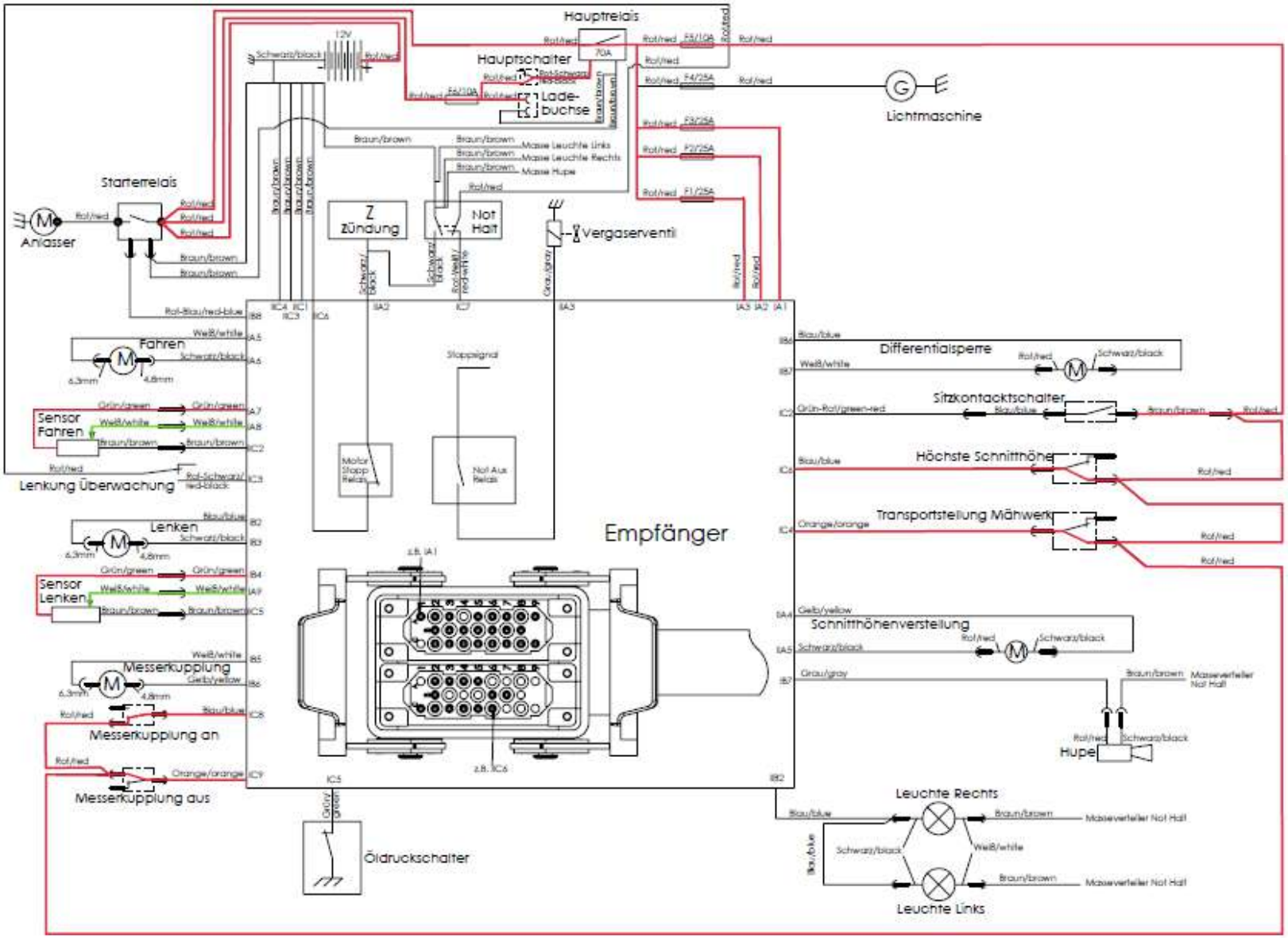
Circuit diagram AS Sherpa 940 RC / 940 RC US 1/2



1. Differential lock
2. Seat contact switch
3. Cutting height adjustment position 5
4. Cutting height adjustment transport position
5. Motor cutting high adjustment
6. Horn
7. Right lamp
8. Left lamp
9. Oil pressure switch
10. Blade clutch switch “ON”
11. Blade clutch switch “OFF”
12. Motor blade clutch
13. Steering sensor
14. Steering motor
15. Steering switch
16. Sensor drive lever
17. Motor drive lever
18. Starter
19. Start relay
20. Main switch
21. Ignition
22. Emergency stop
23. Carburetor valve
24. Main relay
25. Generator
26. Battery

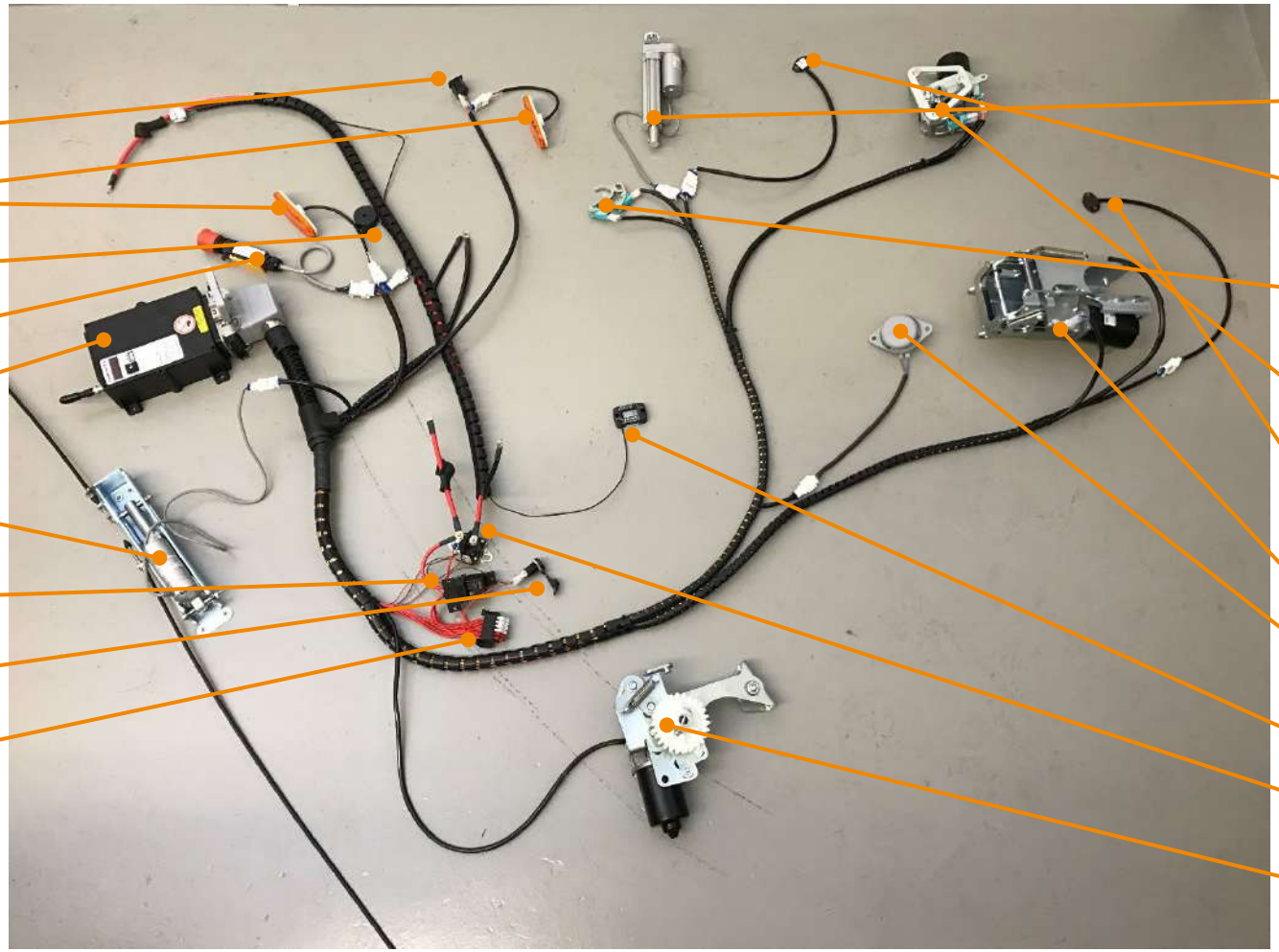
Electrical system

Circuit diagram – AS Sherpa 940 RC / 940 RC US 2/2



Electrical system

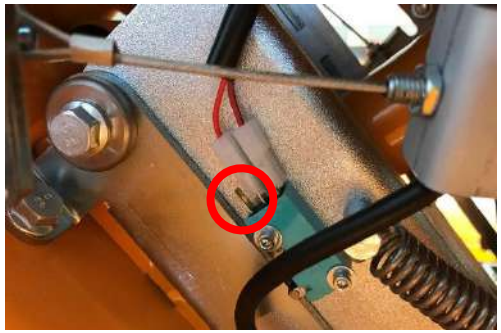
Electrical components – overview



Electrical system

Cabling – steering activation, seat contact switch 1/3

Steering activation element, angle sensor of the steering activation element and seat contact switch.

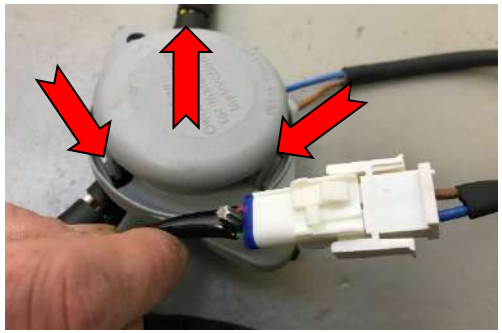


Microswitch on the steering activation element. Pay attention to the unassigned pin! Red cable in the middle.

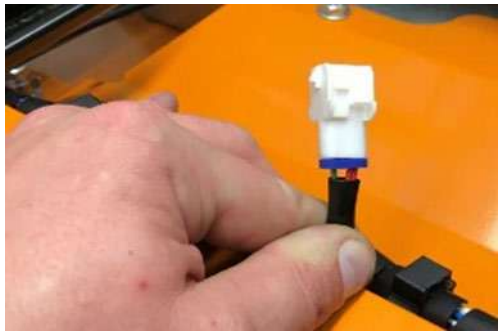
Power supply of the gear motor.

Angle sensor of the steering.

Important: Notch of the position encoder in the direction of the cable. Rating plate visible.



Seat contact switch: Ensure that the switch is firmly screwed into the seat, and that the cover is engaged in the three openings.



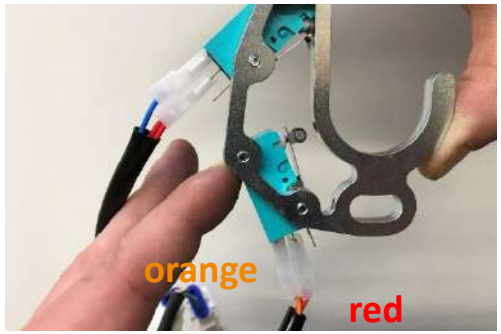
Plug connection of the seat contact switch.

Electrical system

Cabling – cutting height actuator, blade clutch activator 2/3

Cutting height actuator with cutting height detection and blade clutch activation.

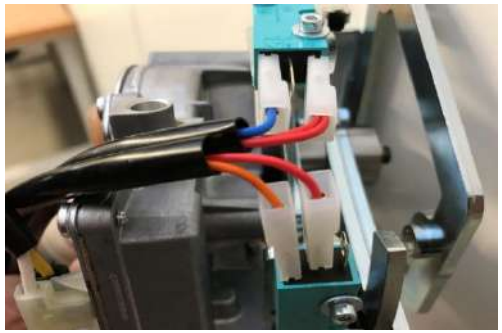
Power connection – cutting height actuator.



Cabling – cutting height adjustment element.

Important: Pay attention to the pin assignment. In each case one pin remains free.

Blade clutch activation.



Cabling – blade clutch activation.

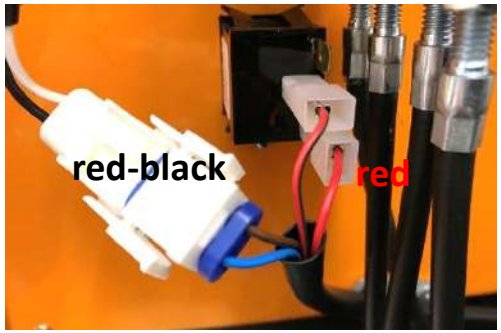
Important: Pay attention to the pin assignment. In each case one pin remains free.

Cable fastening: Ensure that cable is not torn off of the cutting height indicator or the blade clutch activation element!

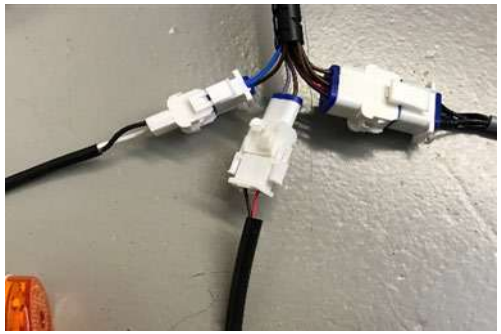
Electrical system

Cabling – rock switches, status lights, horn, emergency stop, solenoid starter 3/3

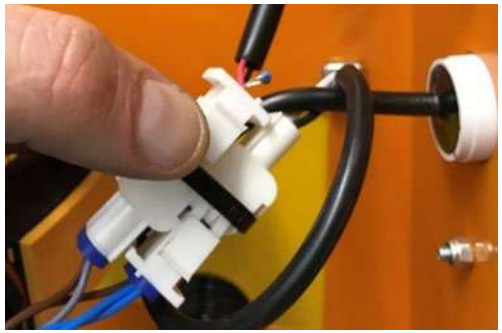
Status light left and rocker switch "On/Off".



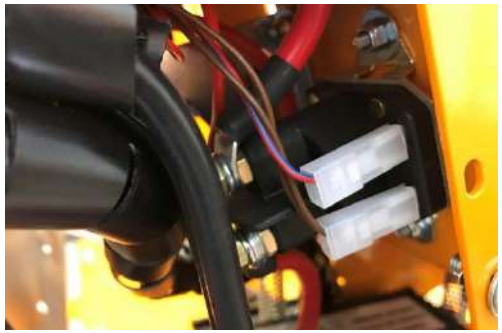
Status light left and rocker switch "On/Off".



Status light right, horn and emergency stop switch.



Horn and status light right.

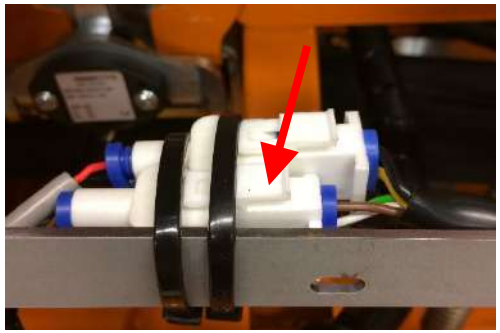


Solenoid starter switch

Testing the sensor – drive lever position and steering 1/2

Sensor – drive lever position

Unscrew cover on the left side of the vehicle



Disconnect 3-pin plug connection and install measuring adapter. With the controller move towards the stops of the drive lever

Sensor – steering

Remove left cover on the centre console

Disconnect 3-pin plug connection of the steering angle sensor and install measuring adapter. With the controller move towards the stops of the steering

Testing the sensor – drive lever position and steering 2/2

Drive lever sensor

Supply voltage:	4.6 V
Middle position:	2.3 V
Forward:	1.4 V
Reverse:	3.1 V

Current draw – drive lever motor 10 A

Steering angle sensor

Supply voltage:	4.6 V
Middle position:	2.3 V
Right:	3.5 V
Left:	1.4 V

Current draw – steering motor 20 A

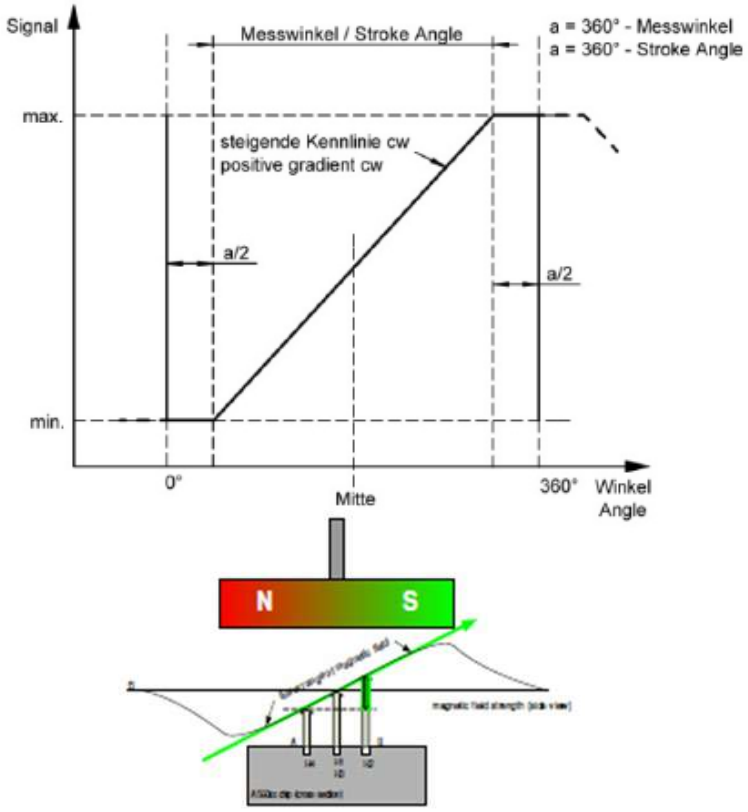
A 24 volt gear motor is installed on the steering, due to its torque curve and its power curve in 12 volt operation.

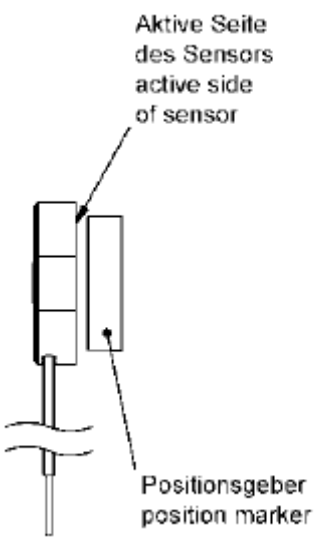
Measuring adapter

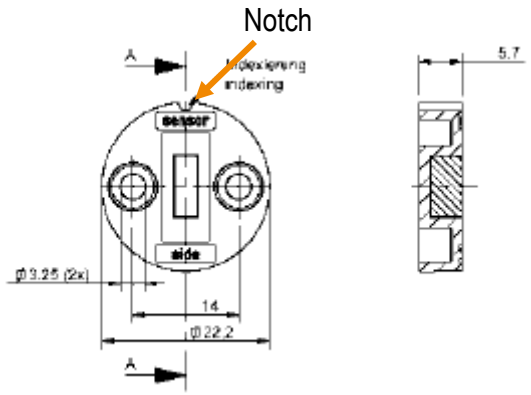
Electrical system

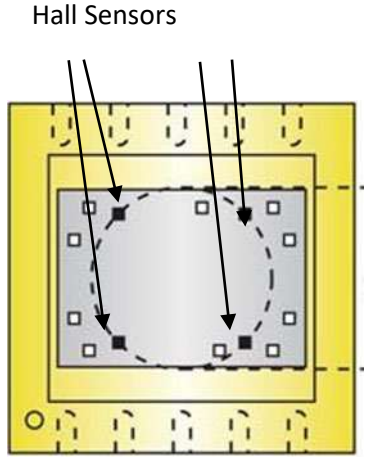
Mode of operation of the angle sensors

The angle sensor that is installed on the steering and on the drive lever has a measuring angle of 100 degrees. The sensor has an active side on which it measures the angle change that the position encoder supplies. The position encoder has a notch in the housing that serves as calibration. This notch must always point in the direction of the cable of the angle sensor. If this is not the case the angle sensor outputs a wrong signal.

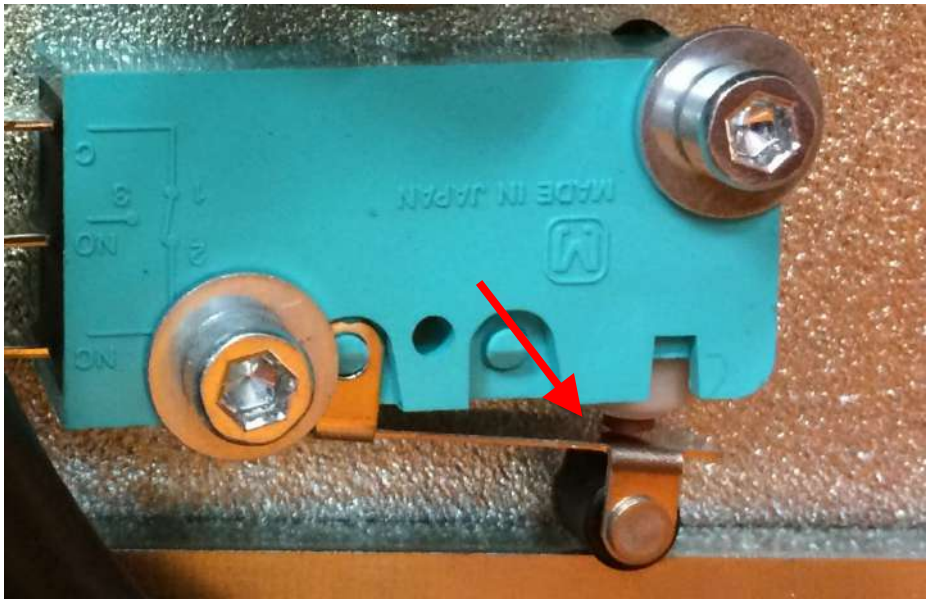








Check the switches for contamination and function. The switches must be free of grass residues and cuttings. There must be no material between switch tongue and switch, this can cause a failure of the functionality.



Electrical system

Voltage supply NBB control box

Battery charging current

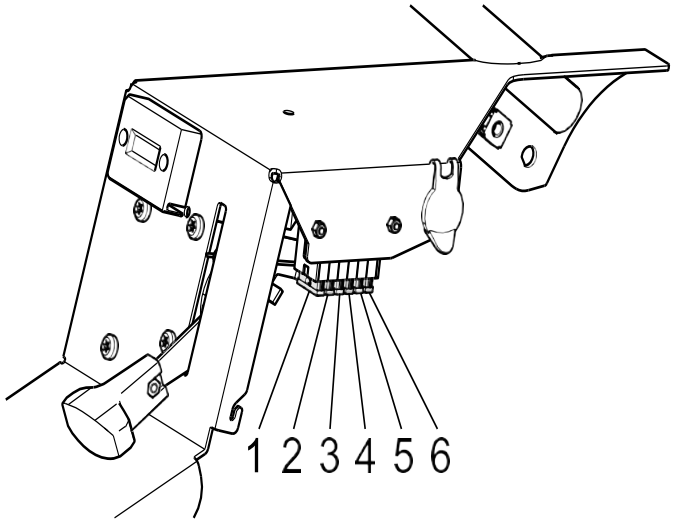
The voltage supply of the NBB control box occurs via pins IA1, IA2 and IA3. The control box is fused via fuses 1 – 3, each with a 25 ampere fuse. The voltage supply is measured with the main switch switched on and with the plug of the control box unplugged.

Pin	Pin	Measured value
IA1	Ground	12.5 V
IA2	Ground	12.5 V
IA3	Ground	12.5 V

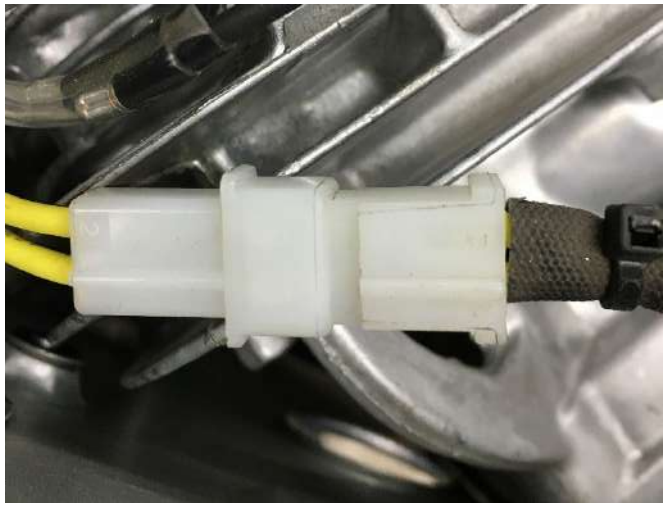
The charging current of the generator is measured on the battery at idle and at full throttle.

Idle: approx. 13 V

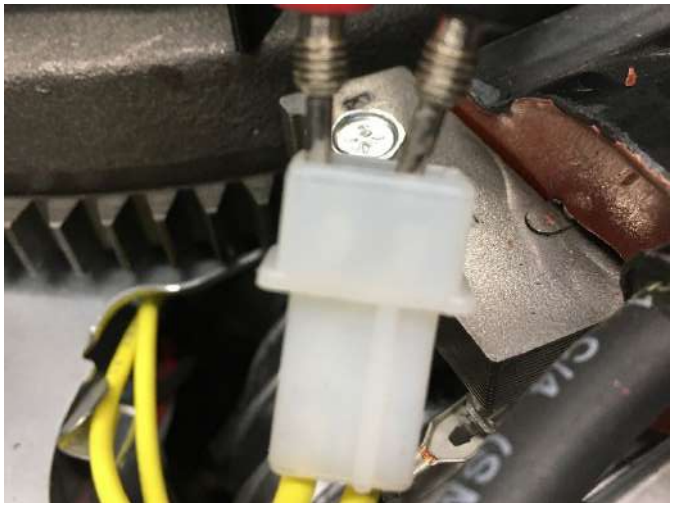
Full throttle: approx. 13.9 V



Pos	Strength	Designation	Supplied
1	25 A	Main fuse 1	Receiver
2	25 A	Main fuse 2	Receiver
3	25 A	Main fuse 3	Receiver
4	25 A	Regulator alternator	Alternator
5	10 A	Safety switch	Emergency stop switch, seat contact switch, blade clutch monitor, cutting height monitor
6	10 A	Main switch	Main switch, on-board power socket



Disconnect plug between charge controller and power coil



To test the output voltage of the power coil, the two yelllow cables are measured against each other.

Measured value: approx. 30 V

Resistance: approx. 1.3 ohms

Caution: AC voltage

The charging current of the generator is measuerd on the battery at idle and at full throttle.

Idle: approx. 13.0 V

Full throttle: approx. 14.0 V

Electrical system

Microswitch overview

The pin assignments and the switch states of the microswitches are provided in the table below.

Switch	type	pin assigmen	Switch state						
			MC mode	RC mode	Transport position	Transport position into position "5"	Position "1" into position "5"	Blade "ON"	Blade "OFF"
Steering	Closer contact	1 - 3	open	closed	-	-	-	-	-
High adjustment position "5"	Closer contact	1 - 3	-	-	closed	open	closed	-	-
High adjustment transport position	Closer contact	1 - 3	-	-	closed	open	open	-	-
Blade "ON"	Open contact	1 - 2	-	-	-	-	-	closed	open
Messerkupplung "Aus"	Closer contact	1 - 3	-	-	-	-	-	open	closed

Installation instructions – Faraday cage

Because the control box is installed on the engine bonnet of the Sherpa 940 RC, interference signals from the ignition of the engine can occur. If these interferences occur you can install a "Faraday cage". This consists of a galvanised sheet metal element (partnumber G06927412) that is installed under the NBB control box. In addition, from the battery a ground cable is laid out to the sheet metal element.

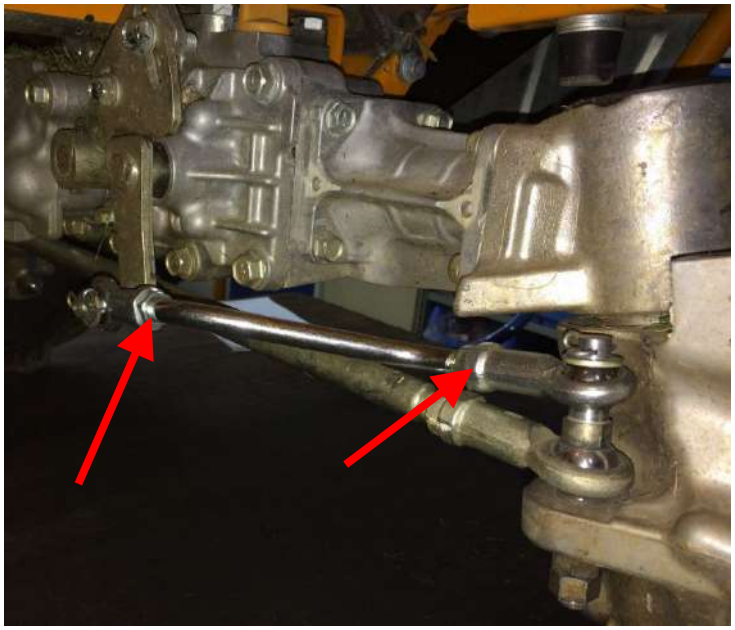
The interference radiation of the ignition is intercepted by the sheet metal element under the NBB control box and is fed into the battery via a ground cable.

Hydraulic system

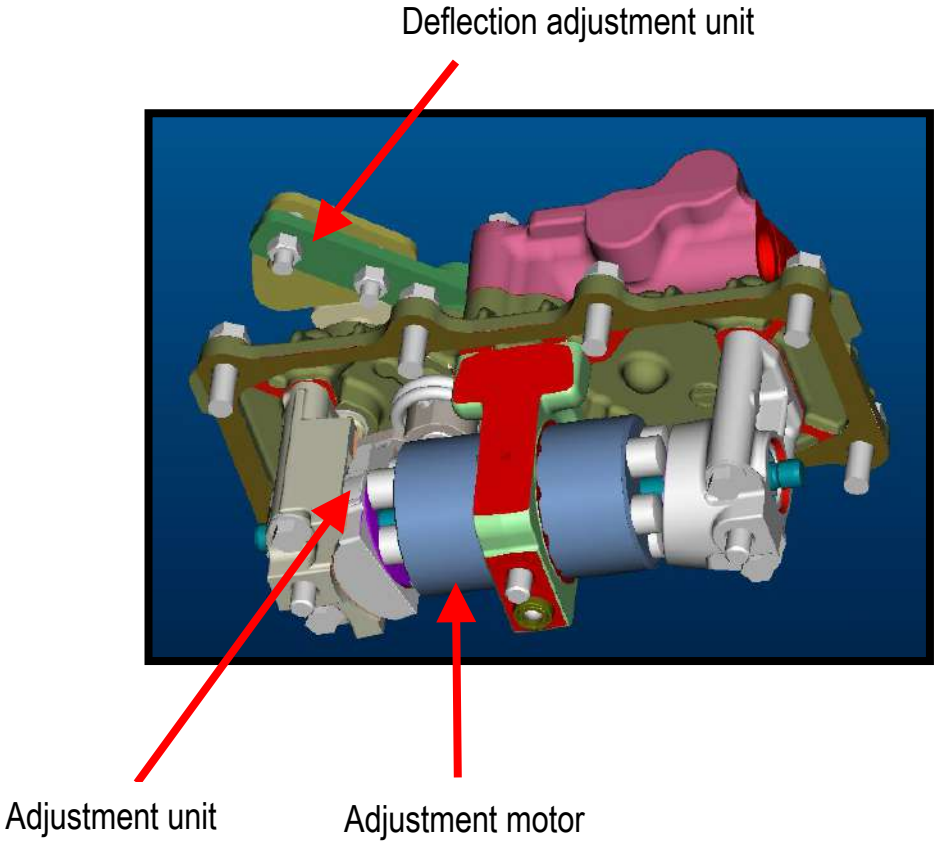
Axle drive front 1/2

The axle drive is powered with the return oil of the rear axle. This means that in normal operation a variable all-wheel drive is present. As soon as one wheel of the rear axle spins, the front axle gets pressure from the rear axle and thus absolute all-wheel drive.

In addition, the front axle has a compensation for cornering, to prevent deformation of the front axle. The right front wheel is driven by a servomotor. When cornering this motor runs faster or slower. The servomotor is activated via a linkage. It must be ensured that the linkage is not bent. This can cause a blocking of the front angle.



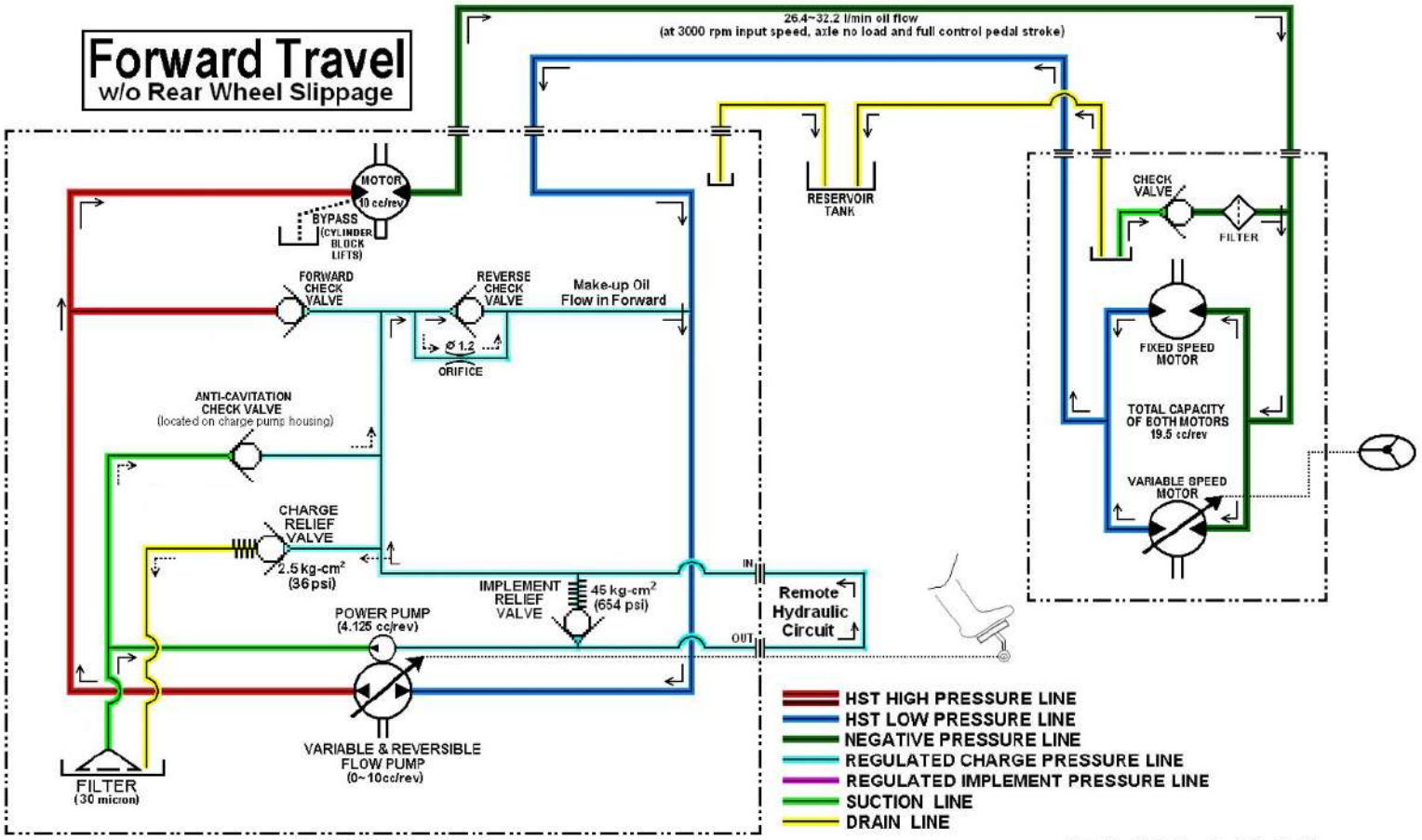
Double – engine unit of the front axle



Hydraulic system

Axle drive front 2/2

Hydraulic system diagram



K664E
(Rear Drive Unit)
Rear axle

KXH10N
(Front Steering Unit)
Front axle

With s/n from February 2019 we will have a Limp Home function in the software

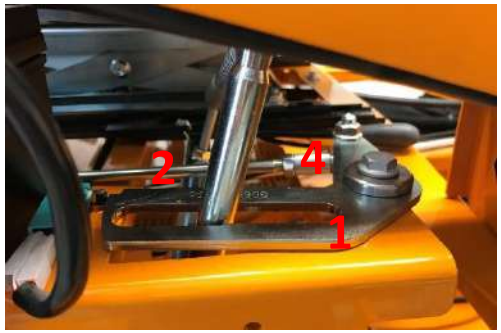
So it can be activate and it works for approx. 3 Minutes. After this it has to be activate new.

Attention: during this time the blade function is deactivate. Please take a look at page 102/103.

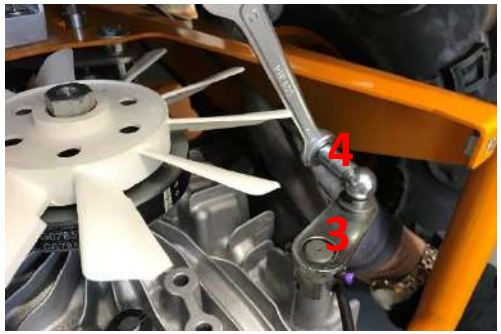
Operating elements

Parking brake 1/2

In MC mode and RC mode the parking brake is activated in the middle position of the drive lever. The drivel lever must not touch the orange sheet metal. Distance approx 4 mm.



Brake bracket (1) activates the brake arm (3) via the brake rod (2). Adjusting the parking brake via the length of the brake rod.

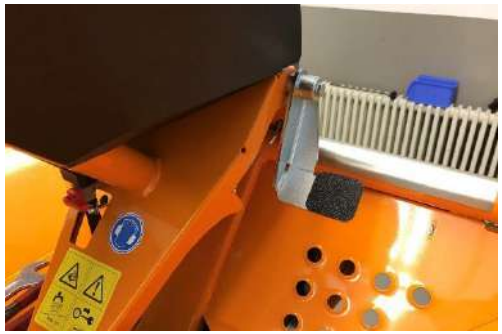


For adjustment of the brake rod, open the threaded fittings (4), adjust the rod by turning it, and relock it.

Parking brake "disengaged" if the drive lever is not in the "P" position. Brake arm (3) positioned at 90° relative to the hydrostatic transmission. Distance approx 0 to 1 mm.

Parking brake "engaged" with drive lever in the "P" position. Brake arm (3) is positioned slightly in the direction of travel.

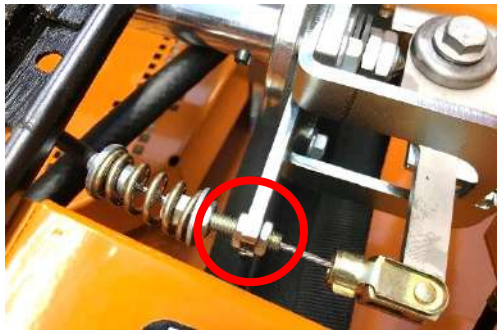
Gap ≥ 3 mm.



Brake pedal (right) brings the drive level into position "P" via a Bowden cable.

Operating elements

Parking brake 2/2



Brake pedal cable pulls on the trigger lever at activation. Adjustment "play-free" on the cable fastening, without the lever being activated.

Test: Activation of the brake pedal brings the drive lever into position "P" before it touches the frame.

Seat spring package

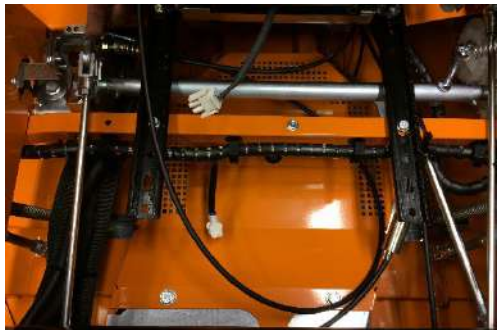
G06980045

From the following serein numbers, a new seat spring package in the Sherpa series is installed:

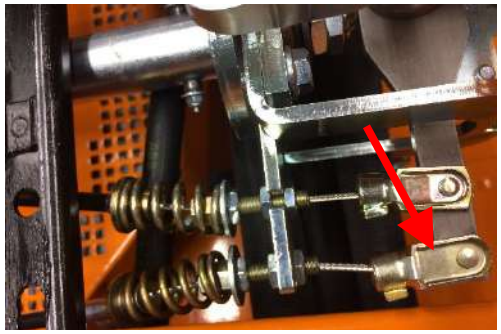
AS 940 Sherpa 4WD RC	**from 027417080036**
AS 940 Sherpa 4WD	**from 021917080011**
AS 940 Sherpa 4WD XL	**from 026417080011**
AS 920 2WD	**from 027617080001**
AS 940 Sherpa 4WD XL US	**from 028017080001**

Seat spring package

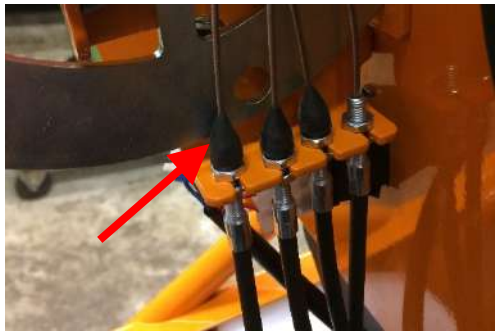
Installation instructions



Dismount seat

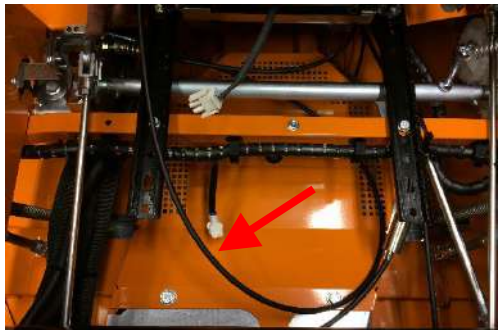


Detach the Bowden cable on the drive lever activation element

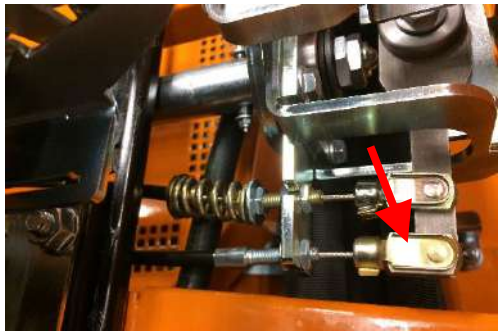


Detach Bowden cable on the MC – RC changeover and remove cable

The new spring package has a Bowden cable that moves the drive lever into middle position when no one is sitting in the seat.



Mount the seat and lay out the Bowden cable in a loop to the left side of the vehicle

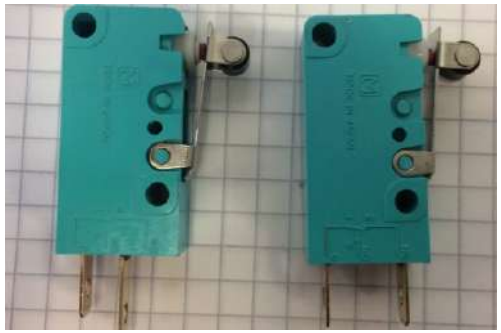


Install Bowden cable on the drive lever activation element

News from February 2019

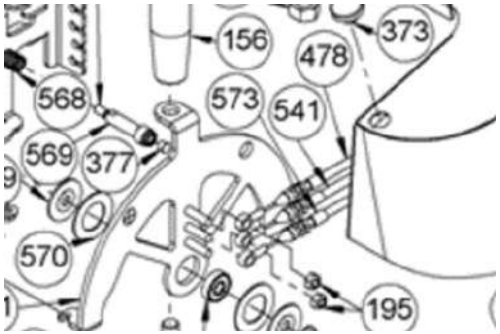
Switch lever blade

s/n from February 2019



Micro switch with 2 Pins

s/n from February 2019



Seat cable (US Version)

s/n from February 2019

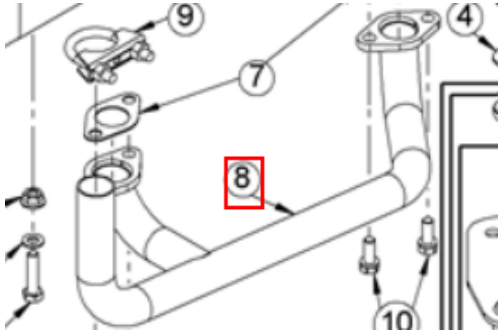
AS 920 Sherpa 2 WD	27617080001
AS 940 Sherpa 4 WD	21917080011
AS 940 Sherpa 4 WD XL	26417080011
AS 940 Sherpa 4 WD XL, US	28017080001
AS 940 Sherpa 4 WD RC	27417080036

Steering quadrant reinfored

s/n from February 2019

Steering Sensor bracket reinforced

s/n from February 2019



Exhaust pipe no longer Nickel plated due to hydrogen embrittlement

since Juni 2018

Engines

New emission standard

From s/n the new B+S engine installed by Sherpa - Series:

- Changed carburettor (plastic)

AS 915 Sherpa 2WD	
AS 920 Sherpa 2WD	#027617110003
AS 940 Sherpa 4WD	#021917110001
AS 940 Sherpa 4WD XL	#026417110022
AS 940 Sherpa 4WD RC	#027417110001

Calibration "Teaching"

Which functions will be taught? How do I proceed?

Important safety notice for this RC device:

Work on control elements, sensors and the control system requires special knowledge and may only be carried out by skilled personnel who were trained by AS-Motor.

Warning!
Risk of injury caused by unintended movement of the device.
When mechanical, electrical or electronic components of the control elements, sensors or the control system are replaced or changed, an unintended movement of the device during commissioning can result.
Observe the following instructions; otherwise, accidents with severe injuries may result and the device can be damaged.

1. After work on the control elements, sensors and/or the control system, re-calibrate the device as described in the manual of the device.
2. After calibration, make sure that the drive is in neutral position before you start the engine.
3. After calibration, make sure that during the initial startup of the engine no persons or material assets are in the danger area.
4. Check the safety functions as described in the operating manual of the RC device.
5. Carry out a test run as described in the manual of the device.

"Teaching" – what's that?

Teaching means to teach the control of the machine to the mechanical systems and sensor systems.

Tolerances of the mechanical systems and sensors systems are tuned to each other, i.e. corrected.

When is teaching required?

1. Whenever sensor systems and control system have been changed. After replacement of the control system or of individual sensors the device must be retaught.
2. When a change in the mechanical systems has changed the teach values, and the machine no longer functions faultlessly.
3. When the teach values are no longer right due to other influences.

Which functions will be taught? ("taught)

Drive lever:

1. Middle position (zero position) of the drive lever.
2. Maximum drive lever position forward and backward.

Steering activation:

1. Middle position (zero position) of the steering pinion.
2. Maximum steering deflection left and right.

How do I proceed?

Three instruction sets are provided below for teaching. Select the respective instruction set as needed.

- After control system / receiver replacement or sensor conversion / sensor replacement:
  - Instruction set: Teaching – overall (steering and drive lever)
- Steering activation does not function faultlessly.
  - Teaching – middle position, steering
  - Teaching – maximum steering deflection (left/right)
- Drive lever activation does not function faultlessly.
  - Teaching – middle position of the drive lever
  - Teaching – maximum drive lever settings (forward/reverse)

Teaching

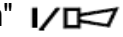
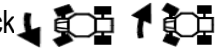
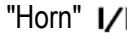
Teaching – overall (steering and drive lever) 1/3

Tip/note: Position yourself at the left side of the machine for the best view of the drive lever.

Step:	Action:
1.	Bring the steering and drive lever into middle position by hand (in MC mode). Turn the rotary knob of the steering trim into middle position.
2.	Change the operating mode on the changeover lever to RC.
3.	Switch on machine and transmitter.
4.	Wait for the horn signal of the machine and do not confirm.
5.	Activate the pushbutton "Engine start" , "Transport position" and the rocker switch "Cutting height adjustment downward" until the machine honks twice (after approx. 4 seconds). You are now in "Teach mode“.
6.	Confirm "Teach mode" with the "Horn" button. Machine emits a horn tone.
7.	Deflect joystick "Drive" once completely forward. Drive lever does not move.
8.	Turn rotary knob Drive speed to the turtle. (Selection middle position)
9.	Place rocker switch "Steering reversal" to normal position (forward).
10.	Check the middle position of the drive lever. If necessary, use the joystick “Drive" to correct the middle position. **(See illustration #1 below)**
11.	Store position by activating the "Horn" button. (Machine emits a horn tone)
12.	Turn rotary button of the drive speed to the rabbit. (Selection maximum position)
13.	Use the joystick to move the drive lever "Drive forward" to "Max." forward speed and hold it there. Store position by activating the "Horn" button. (Machine emits a horn tone)
p.t.o.	Continued next page.

Teaching

Teaching – overall (steering and drive lever) 2/3

Step:	Action:
14.	Place rocker switch "Steering reversal" on the reversal position  (to the rear).
15.	Use the joystick to move the drive lever "Drive reverse"  to "Max." reverse speed and hold it there. Store position by activating the "Horn"  button. (Machine emits a horn tone)
16.	Activate the "Channel change"  button. Drive lever moves approximately into middle position.
17.	Deflect joystick "Steering"  once completely to the right. (Steering does not move)
18.	Turn rotary knob Drive speed to the  turtle. (Selection middle position)
19.	Place rocker switch "Steering reversal"  at normal position (forward).
20.	Check middle position of the steering (front wheel parallel to the frame). If necessary, use the joystick  to correct the middle position.
21.	Store position by activating the "Horn" button. (Machine emits a horn tone)
22.	Turn rotary knob Drive speed to  rabbit. (Selection maximum position)
23.	Use the joystick to move the steering "Steering right"  to "Max." steering deflection right and hold it there. Store position by activating the "Horn"  button (machine emits a horn tone). After releasing the joystick the steering can move toward the middle position.
24.	Place rocker switch "Steering reversal" on the reversal position (to the rear)  .
25.	Use the joystick to move the steering "Steering left"  to "Max." steering deflection left and hold it there. Store position by activating the "Horn"  button (machine emits a horn tone). After releasing the joystick the steering can move toward the middle position.
26.	Activate the "Channel change"  button. Steering does not move.
p.t.o.	Continued next page.

Step:	Action:
27.	Place rocker switch "Steering reversal" at normal position (forward).
28.	Switch off transmitter (not the machine) and wait until the machine transitions to interval honking. (Settings will be saved in the receiver).
29.	Switch on transmitter again.
30.	Wait until the status lights on the machine go out and the interval honking stops. Ignore any "F4" error display.
31.	Confirm with the "Horn" button. Machine acknowledges with horn tone.
32.	Use the joystick to test the steering function. (Middle position and "Max." steering deflection) (Note: End stops are intentionally not reached)
33.	Use the joystick “Drive" to test the drive function. (Middle position and "Max." drive lever positions) (Note: End stops are intentionally not reached)
34.	Switch off transmitter and machine.

(Illustration #1 for step 10.)

Tip/note:

Test straight-ahead movement with equal tyre pressure in RC mode on flat and level terrain.

If necessary repeat teaching of the steering. (See instruction set "Teaching steering" p. 57-60).

Teaching

Teaching – middle position of the drive lever 1/2

Tip/note: Position yourself at the left side of the machine for the best view of the drive lever.

Step:	Action:
1.	Bring the steering and drive lever into middle position by hand (in MC mode). Turn the rotary knob of the steering trim into middle position.
2.	Change the operating mode on the changeover lever to RC.
3.	Switch on machine and transmitter.
4.	Wait for the horn signal of the machine and do not confirm.
5.	Activate the pushbutton "Engine start" , "Transport position" and the rocker switch "Cutting height adjustment downward" until the machine honks twice (after approx. 4 seconds). You are now in "Teach mode“.
6.	Confirm "Teach-Modus" with the "Horn" button. Machine emits a horn tone
7.	Deflect joystick "Drive" once completely forward. Drive lever does not move.
8.	Turn rotary knob Drive speed to the turtle. (Selection middle position)
9.	Place rocker switch "Steering reversal" at normal position (forward).
10.	Check the middle position of the drive lever. If necessary, use the joystick "drive" to correct the middle position. **(See illustration #1 below)**
11.	Store position by activating the "Horn" button. (Machine emits a horn tone)
12.	Turn rotary button of the drive speed to the rabbit. (Selection maximum position)
28.	Switch off transmitter (not the machine) and wait until the machine transitions to interval honking. (Settings will be saved in the receiver)
p.t.o.	Continued next page.

Step:	Action:
29.	Switch on transmitter again.
30.	Wait until the status lights on the machine go out and the interval honking stops. Ignore any "F4" error display.
31.	Confirm with the "Horn" button. Machine acknowledges with horn tone.
33.	Use the joystick “Drive” to test the drive function. (Middle position and "Max." drive lever positions) (Note: End stops are intentionally not reached)
34.	Switch off transmitter and machine.

(Illustration #1 for step 10.)

Tip/note:

Test straight-ahead movement with equal tyre pressure in RC mode on flat and level terrain.

If necessary repeat teaching of the steering. (See instruction set "Teaching steering" p. 57-60).

Teaching

Teaching – maximum drive lever settings 1/2

Tip/note: Position yourself at the left side of the machine for the best view of the drive lever.

Step:	Action:
1.	Bring the steering and drive lever into middle position by hand (in MC mode). Turn the rotary knob of the steering trim into middle position.
2.	Change the operating mode on the changeover lever to RC.
3.	Switch on machine and transmitter.
4.	Wait for the horn signal of the machine and do not confirm.
5.	Activate the pushbutton "Engine start" , "Transport position" and the rocker switch "Cutting height adjustment downward" until the machine honks twice (after approx. 4 seconds). You are now in "Teach mode“.
6.	Confirm "Teach mode" with the "Horn" button. Machine emits a horn tone.
12.	Turn rotary button of the drive speed to the rabbit. (Selection maximum position)
13.	Use the joystick to move the drive lever "Drive forward" to "Max." forward speed and hold it there. Store position by activating the "Horn" button. (Machine emits a horn tone)
14.	Place rocker switch "Steering reversal" on the reversal position (to the rear).
15.	Use the joystick to move the drive lever "Drive reverse" to "Max." reverse speed and hold it there. Store position by activating the "Horn" button. (Machine emits a horn tone)
16.	Activate the "Channel change" button. Drive lever moves approximately into middle position.
19.	Place rocker switch "Steering reversal" at normal position (forward).
28.	Switch off transmitter (not the machine) and wait until the machine transitions to interval honking. (Settings will be saved in the receiver).
p.t.o.	Continued next page.

Teaching

Teaching – maximum drive lever settings 2/2

Step:	Action:
28.	Switch off transmitter (not the machine) and wait until the machine transitions to interval honking. (Settings will be saved in the receiver).
29.	Switch on transmitter again.
30.	Wait until the status lights on the machine go out and the interval honking stops. Ignore any "F4" error display.
31.	Confirm with the "Horn"  button. Machine acknowledges with horn tone.
33.	Use the joystick “Drive"  to test the drive function. (Middle position and "Max." drive lever positions) (Note: End stops are intentionally not reached)
34.	Switch off transmitter and machine.

Teaching

Teaching – middle position, steering 1/2

Step:	Action:
1.	Bring the steering and drive lever into middle position by hand (in MC mode). Turn the rotary knob of the steering trim into middle position.
2.	Change the operating mode on the changeover lever to RC.
3.	Switch on machine and transmitter.
4.	Wait for the horn signal of the machine and do not confirm.
5.	Activate the pushbutton "Engine start" , "Transport position" and the rocker switch "Cutting height adjustment downward" until the machine honks twice (after approx. 4 seconds). You are now in "Teach mode“.
6.	Confirm "Teach mode" with the "Horn" button. Machine emits a horn tone.
17.	Deflect joystick "Steering" once completely to the right. (Steering does not move)
18.	Turn rotary knob Drive speed to the turtle. (Selection middle position)
19.	Place rocker switch "Steering reversal" at normal position (forward).
20.	Check middle position of the steering (front wheel parallel to the frame). If necessary, use the joystick to correct the middle position.
21.	Store position by activating the "Horn" button. (Machine emits a horn tone)
22.	Turn rotary button drive speed to the rabbit. (Selection maximum position)
26.	Activate the "Channel change" button. Steering does not move.
p.t.o.	Continued next page.

Teaching

Teaching – middle position, steering 2/2

Step:	Action:
28.	Switch off transmitter (not the machine) and wait until the machine transitions to interval honking. (Settings will be saved in the receiver).
29.	Switch on transmitter again.
30.	Wait until the status lights on the machine go out and the interval honking stops. Ignore any "F4" error display.
31.	Confirm with the "Horn"  button. Machine acknowledges with horn tone.
32.	Use the joystick  to test the steering function. (Middle position and "Max." steering deflection) (Note: End stops are intentionally not reached)
34.	Switch off transmitter and machine.

Teaching

Teaching – maximum steering deflection 1/2

Step:	Action:
1.	Bring the steering and drive lever into middle position by hand (in MC mode). Turn the rotary knob of the steering trim into middle position.
2.	Change the operating mode on the changeover lever to RC.
3.	Switch on machine and transmitter.
4.	Wait for the horn signal of the machine and do not confirm.
5.	Activate the pushbutton "Engine start" , "Transport position" and the rocker switch "Cutting height adjustment downward" until the machine honks twice (after approx. 4 seconds). You are now in "Teach mode“.
6.	Confirm "Teach mode" with the "Horn" button. Machine emits a horn tone.
17.	Deflect joystick "Steering" once completely to the right. (Steering does not move)
19.	Place rocker switch "Steering reversal" at normal position (forward).
22.	Turn rotary button drive speed to the rabbit. (Selection maximum position)
23.	Use the joystick to move the steering "Steering right" to "Max." steering deflection right and hold it there. Store position by activating the "Horn" button (machine emits a horn tone). After releasing the joystick the steering can move toward the middle position.
24.	Place rocker switch "Steering reversal" on the reversal position (to the rear) .
25.	Use the joystick to move the steering "Steering left" to "Max." steering deflection left and hold it there. Store position by activating the "Horn" button (machine emits a horn tone). After releasing the joystick the steering can move toward the middle position.
27.	Place rocker switch "Steering reversal" at normal position (forward).
p.t.o.	Continued next page.

Teaching

Teaching – maximum steering deflection 2/2

Step:	Action:
28.	Switch off transmitter (not the machine) and wait until the machine transitions to interval honking. (Settings will be saved in the receiver).
29.	Switch on transmitter again.
30.	Wait until the status lights on the machine go out and the interval honking stops. Ignore any "F4" error display.
31.	Confirm with the "Horn"  button. Machine acknowledges with horn tone.
32.	Use the joystick  to test the steering function. (Middle position and "Max." steering deflection) (Note: End stops are intentionally not reached)
34.	Switch off transmitter and machine.

Troubleshooting and general test of the machine

Procedures 1/1

Fundamentally always "Restart":

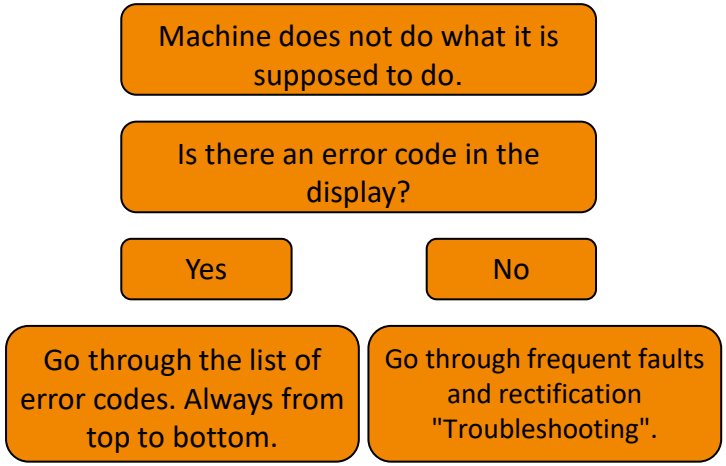
At every fault switch off the transmitter via the Start/Stop and **switch off** the device on the main switch. **Wait** 10 seconds and only after 10 seconds **switch on** the device, and then switch on the transmitter.

The frequency number appears briefly in the display of the transmitter. The status lights on the device and on the transmitter go out. If the machine is operational it "beeps" briefly. Please first wait for this beep and only after the beep, activate the "Horn" button (first button from the left on the remote control) switch the device operational on the transmitter.

At this "Restart" of the transmitter and receiver the error memory will be deleted. It may be necessary to repeat the procedure several times.

A **manual frequency change, if there is interference,** to another channel may be helpful. (See the operating manual)

Procedure for troubleshooting:



Procedure for a general test:

During a test do not change the operating mode. Always proceed in sequence.

1. **Function test:**
   - Start in RC mode. Place the changeover lever on RC mode.
   - Switch on the device, switch on the transmitter, after the honk tone, activate the "Horn" button (first button from the left on the remote control) to switch the device operational on the transmitter.
   - Do not start the engine of the device!
   - Now start the steering.
   - Test the drive lever.
   - Test the cutting height adjustment.
   - After this has been done, now start the engine.
   - Now test steering and driving.
   - Test the cutting height adjustment.
   - Test the limited-slip differential.
   - Test the blade clutch. (comply with safety instructions)
   - Now repeat the test in MC mode.
2. **Safety test:**
   - See the procedure in the section "General information", Safety test.

Error codes – display in the remote control

Overview 1/9

Display	Designation	Action	Causes	Remedy
A1	Seat contact closed in RC mode	Emergency stop	Seat contact activated by driver in RC mode	Transporting other persons is not permitted in RC mode
			Seat contact activated by a third person in RC mode	Transporting other persons is not permitted in RC mode
			Seat contact activated by objects in RC mode	Remove objects from the seat
			Mode selector lever not completely thrown over to MC	Completely throw over selector lever
			Steering activation does not completely disengage (microswitch activated)	Make steering activation clutch moveable, i.e. readjust it
			Seat contact is defective	Replace
			Short circuit between supply line and seat contact control line	Repair
			Steering microswitch loose or incorrectly adjusted	Readjust and tighten
			Steering microswitch is defective	Replace
			Short circuit between supply line and seat steering control line microswitch	Repair
A2	Transmitter in the transmitter holder in RC mode	Emergency stop	Transmitter in the transmitter holder in RC mode	Take transmitter out of the transmitter holder
			Magnetic switch activated through a magnet on the underside of the transmitter	Remove magnet
			Mode selector lever not completely thrown over to MC	Completely throw over selector lever
			Steering activation does not completely disengage (microswitch activated)	Make steering activation clutch moveable, i.e. readjust it
			Seat contact is defective	Replace
			Short circuit between supply line and seat contact control line	Repair
			Steering microswitch loose or incorrectly adjusted	Readjust and tighten
			Steering microswitch is defective	Replace
			Short circuit between supply line and seat steering control line microswitch	Repair

Error codes – display in the remote control

Overview 2/9

A3	Emergency stop switch on the machine activated	Emergency stop	Emergency stop switch activated	Unlock emergency stop switch by turning it counter-clockwise
			Fuse no. 5 (10 A) blown	Eliminate the cause that tripped the fuse and replace fuse
			Poor contact in the plug connector of the emergency stop switch	Ensure good contact, e.g. with contact spray
			Emergency stop switch is defective	Replace emergency stop switch
			Cable break in the supply line or emergency stop control line	Repair
A4	Blade clutch engaged when changing the operating mode (RC -> MC)	Emergency stop	Blade clutch was engaged when selector lever was thrown over from RC to MC	Disengage blade clutch beforehand
			Steering microswitch loose or incorrectly adjusted	Readjust and tighten
			Steering microswitch is defective	Replace
			Cable break in the supply line or steering microswitch control line	Repair
A5	Transmitter not in the transmitter holder and drive lever not in middle position (MC)	Engine stop	Transmitter not in the transmitter holder	Insert transmitter in the transmitter holder
			Transmitter not in the transmitter holder	Properly insert transmitter in the transmitter holder. See Operating Manual
			Teach values are incorrect	Re-teach drive lever
			Magnet on the transmitter holder not correctly adjusted	Adjust magnet (if necessary place underlay underneath it to reach a better position)
			Magnetic switch in the transmitter is defective	Test through magnet on the transmitter right front bottom Repair is only possible through NBB
			Middle position of the drive lever not adjusted correctly	Re-teach middle position see NBB operating manual
			Steering microswitch loose or incorrectly adjusted	Readjust and tighten
			Steering microswitch is defective	Replace

Error codes – display in the remote control

Overview 3/9

A7	Transmitter not in the transmitter holder and blade clutch engaged	Emergency stop	Transmitter not in the transmitter holder	Insert transmitter in the transmitter holder
			Transmitter not in the transmitter holder	Properly insert transmitter in the transmitter holder. See Operating Manual
			Magnet on the transmitter holder not correctly adjusted	Adjust magnet (if necessary place underlay underneath it to reach a better position)
			Magnetic switch in the transmitter is defective	Test through magnet on the transmitter right front bottom Repair is only possible through NBB
			Steering microswitch loose or incorrectly adjusted	Readjust and tighten
			Steering microswitch is defective	Replace
A8	Seat contact not closed and drive lever not in middle position (MC)	Engine stop	Driver is not sitting on the driver seat in MC mode	Have driver sit in the seat
			Driver is not sitting properly on the driver seat in MC mode	Have driver sit in the seat
			Driver is too light to activate the seat contact	Select a suitable driver
			Teach values are incorrect	Re-teach drive lever
			Seat contact is defective	Replace
			Cable break in the supply line or seat contact switch control line	Repair
			Poor contact in the plug connector of the seat contact switch	Ensure good contact, e.g. with contact spray
			Fuse no. 5 (10 A) blown	Eliminate the cause that tripped the fuse and replace fuse
			Middle position of the drive lever not adjusted correctly	Re-teach middle position (see p. 50 ff.)
			Steering microswitch loose or incorrectly adjusted	Readjust and tighten
			Steering microswitch is defective	Replace
A9	Emergency stop due to steep slope	Emergency stop	Emergency stop steep slope (devices has tipped over)	Recover the device
			Emergency stop due to strong vibration and impact	Drive slower on uneven terrain If necessary lower tyre pressure
				Check blade for imbalance
				Check engine fastening
			Engine bonnet loose or open	Close / fasten engine hood

Error codes – display in the remote control

Overview 4/9

C1	Microswitch transport position does not switch	None	Fuse no. 5 (10 A) blown	Eliminate the cause that tripped the fuse and replace fuse
			Fuses no. 1-3 (10 A) blown	Eliminate the cause that tripped the fuse and replace fuse
			Cutting height adjustment blocked	Eliminate the blockage
			Microswitch holder loose or incorrectly adjusted	Readjust and tighten
			Cable break in the supply line or transport position control line	Repair
			Poor contact in the plug connector of the microswitch	Ensure good contact, e.g. with contact spray
			Transport position microswitch is defective	Replace
			Cable break in the supply line of the cutting height adjustment (linear actuator)	Repair
			Poor contact in the plug connector of the cutting height adjustment element	Ensure good contact, e.g. with contact spray
			Cutting height adjustment element (linear actuator defective)	Replace
C2	The blades switches off after 2 minutes	None	No activation of a control function in the RC mode	Engage the blade
F1	Drive lever activation does not function (RC)	Emergency stop	Drive lever / linkage blocked	Eliminate the blockage
			Mode selector switch not completely thrown over to RC	Completely throw over selector lever
			Drive lever activation clutch not properly engaged	Readjust / repair drive lever activation element
			Drive lever activation element does not drive lever axle	Check gearing, Woodruff keys, dowel pins and fastening screws, and replace if necessary
			Drive lever axle does not move freely	Check activation – drive lever
			Teach values are incorrect	Re-teach drive lever
			Motor for drive level activation is defective	Replace motor
			Poor contact in the plug connectors of the motor	Ensure good contact, e.g. with contact spray
			Cable break in the drive lever activation element supply lines	Repair
			Fuses no. 1-3 (10 A) blown	Eliminate the cause that tripped the fuse and replace fuse
			Cable break in the supply lines or the earth lines of the control system	Repair

Error codes – display in the remote control

Overview 5/9

F1	Drive lever activation does not function (RC	Emergency stop	Drive lever angle sensor loose, holder bent	Fasten, properly replace
F2	Drive lever activation element does not go into middle position (RC)	Emergency stop	Drive lever / linkage blocked	Eliminate the blockage
			Drive lever activation clutch not properly engaged	Readjust / repair drive lever activation element
			Drive lever activation element does not drive lever axle	Check gearing, Woodruff keys, dowel pins and fastening screws, and replace if necessary
			Drive lever axle does not move freely	Check activation – drive lever
			Teach values are incorrect	Re-teach drive lever
			Motor for drive level activation is defective	Replace motor
			Poor contact in the plug connectors of the motor	Ensure good contact, e.g. with contact spray
			Cable break in the drive lever activation element supply lines	Repair
			Fuses no. 1-3 (10 A) blown	Eliminate the cause that tripped the fuse and replace fuse
			Cable break in the supply lines or the earth lines of the control system	Repair
			Drive lever angle sensor loose, holder bent	Fasten, properly replace
F3	Angle sensor – drive	Emergency stop	Poor contact in the plug connector of the angle sensor	Ensure good contact, e.g. with contact spray
			Cable break in the supply lines or angle sensor – drive control line	Repair
			Angle sensor is defective	Replace
			Teach values are incorrect	Re-teach drive lever
			Fuses no. 1-3 (10 A) blown	Eliminate the cause that tripped the fuse and replace fuse
			Cable break in the supply lines or the earth lines of the control system	Repair

Error codes – display in the remote control

Overview 6/9

F4	Drive lever activation element does not function (RC)	None	Steering is blocked through substrate	Only steer as the substrate permits
			Steering / linkage blocked	Eliminate the blockage
			Steering activation clutch not properly engaged	Readjust / repair steering activation element
			Steering activation element does not drive sheet metal gear element	Check gearing, Woodruff keys, dowel pins and fastening screws, and replace if necessary
			Teach values are incorrect	Re-teach steering
			Motor for steering activation element is defective	Replace motor
			Poor contact in the plug connectors of the motor	Ensure good contact, e.g. with contact spray
			Cable break in the supply lines – steering activation element	Repair
			Fuses no. 1-3 (10 A) blown	Eliminate the cause that tripped the fuse and replace fuse
			Cable break in the supply lines or the earth lines of the control system	Repair
F5	Steering angle sensor is defective	Emergency stop	Poor contact in the plug connector of the angle sensor	Ensure good contact, e.g. with contact spray
			Cable break in the supply lines or steering angle sensor control line	Repair
			Angle sensor is defective	Replace
			Teach values are incorrect	Re-teach steering
			Fuses no. 1-3 (10 A) blown	Eliminate the cause that tripped the fuse and replace fuse
			Cable break in the supply lines or the earth lines of the control system	Repair

Error codes – display in the remote control

Overview 7/9

F6	Blade clutch not correctly engaged or disengaged	Emergency stop	Blade clutch activation is blocked	Eliminate the blockage
			Blade clutch does not move freely or is blocked	Service blade clutch, replace parts that do not move freely..., remove blockages
			Blade clutch activation microswitch loose or incorrectly adjusted	Readjust and tighten
			Poor contact in plug connectors of the microswitches	Ensure good contact, e.g. with contact spray
			Poor contact in the plug connectors of the motor	Ensure good contact, e.g. with contact spray
			Microswitch is defective	Replace
			Cable break in the supply lines of the blade clutch motor	Repair
			Cable break in the supply lines or the earth lines of the blade clutch microswitch	Repair
			Cable break in the supply lines or the earth lines of the control system	Repair
			Fuse no. 5 (10 A) blown	Eliminate the cause that tripped the fuse and replace fuse
			Fuses no. 1-3 (10 A) blown	Eliminate the cause that tripped the fuse and replace fuse
			Blade clutch motor is defective	Replace motor
			Blade clutch activation element worn	Replace worn parts
F7	Blade status is unclear	Emergency stop	Blade clutch activation microswitch loose or incorrectly adjusted	Readjust and tighten
			Microswitch is defective	Replace
			Poor contact in plug connectors of the microswitches	Ensure good contact, e.g. with contact spray
			Cable break in the supply lines of the blade clutch motor	Repair
			Cable break in the supply lines or the earth lines of the blade clutch microswitch	Repair
			Cable break in the supply lines or the earth lines of the control system	Repair
			Fuse no. 5 (10 A) blown	Eliminate the cause that tripped the fuse and replace fuse
			Fuses no. 1-3 (10 A) blown	Eliminate the cause that tripped the fuse and replace fuse

Error codes – display in the remote control

Overview 8/9

F8	Motor status is unclear	Emergency stop	Poor contact in the plug connectors of the oil pressure switch	Ensure good contact, e.g. with contact spray
			Oil pressure switch does not switch	Replace oil pressure switch
			Cable break in the oil pressure signal lines	Repair
			Shut-down relay in the controller is defective	Repair only at NBB
F9	Microswitch highest cutting height does not switch	None	Fuse no. 5 (10 A) blown	Eliminate the cause that tripped the fuse and replace fuse
			Fuses no. 1-3 (10 A) blown	Eliminate the cause that tripped the fuse and replace fuse
			Cutting height adjustment blocked	Eliminate the blockage
			Microswitch holder loose or incorrectly adjusted	Readjust and tighten
			Cable break in the supply line or highest cutting height microswitch	Repair
			Poor contact in the plug connector of the microswitch	Ensure good contact, e.g. with contact spray
			Microswitch highest cutting height is defective	Replace
			Cable break in the supply line of the cutting height adjustment (linear actuator)	Repair
			Poor contact in the plug connector of the cutting height adjustment element	Ensure good contact, e.g. with contact spray
			Cutting height adjustment element (linear actuator defective)	Replace

Error codes – display in the remote control

Overview 9/9

FU	Radio interruption	Emergency stop	Transmitter battery is empty.	Replace battery.
			Battery on the device is depleted.	Charge battery (see Checking the battery) or authorised workshop.
			Radio range exceeded.	Decrease the distance between transmitter and receiver.
			Radio interference due to other transmitters (radios, garage door openers, vehicle keys).	Switch off transmitter and receiver, after 10 seconds switch them on again.
				Change the radio channel.
				Increase the distance to the interference source. Remove interference source.
			Antenna loose, damaged, or no longer present.	Fasten or replace antenna.
OL	Engine shut-down due to lack of oil	Blade stop (3 s) and engine stop (13 s)	Lack of oil pressure due to slope	Reduce the angle of inclination
				Check oil lever, top-up if necessary
			Lack of oil pressure due to lack of oil	Check oil lever, top-up if necessary
L	Warning – low battery capacity		Battery on the sender has low charge.	Replace transmitter battery.
.2, .5	Internal error of the NBB control box	None	Short-term overheating of the NBB control box by a stiff electric motor	Replace controller
E1, E2, E3, E4, E5, E6, E7, E8	Internal error of the NBB control box	None		Replace controller
JE	Internal error of the NBB control box	None		Replace controller

Important: The error code display on the remote control unit occurs according to a prioritisation of the occurring errors. The error with the highest priority is displayed first. For this reason pay close attention to the sequence in which the errors are displayed.

Emergency driving programme

Important requirements

Integrated since 2019

⚠ Warning

Risk of injuries in the emergency driving programme due to overridden safety functions. The device can tilt or drive off when starting. The cutting height cannot be adjusted and the differential lock cannot be deactivated. The blade can rotate.

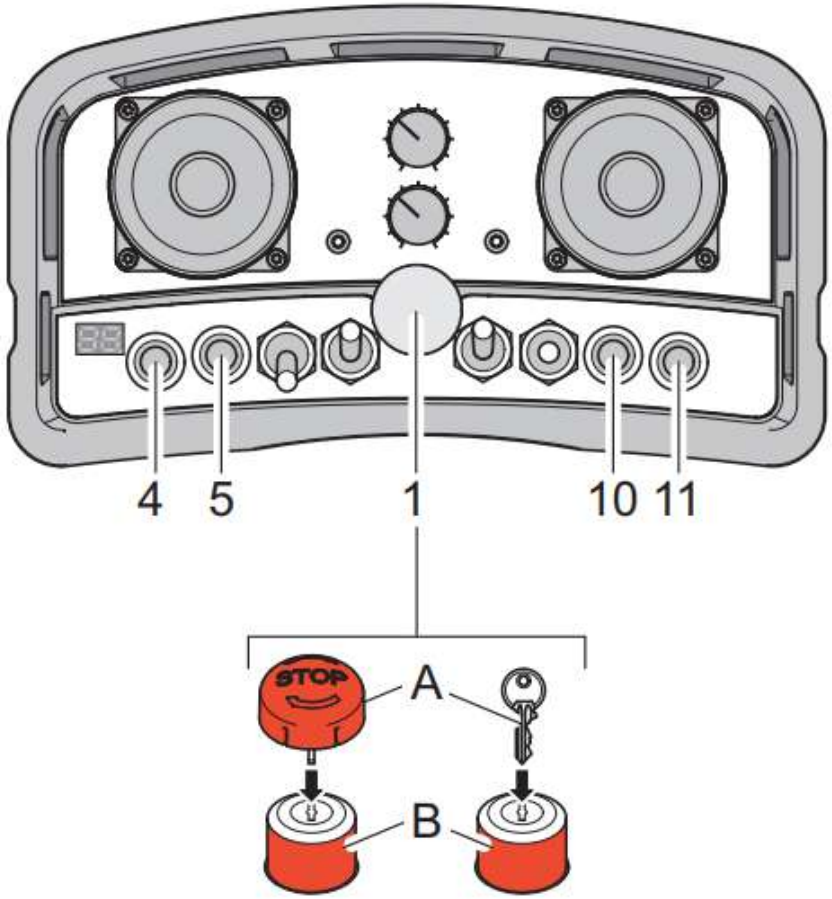
- ► Make sure that no people, children, animals or objects are in front of or behind your device and that your path is clear of obstacles.
- ► Please observe the following notices.

Requirements

- The device cannot be rescued in the operating modes MC or RC.
- Slope flatter than 21°. Please observe the safety instructions regarding being careful when driving on slopes
- You have experience in the safe handling of the device
- The rotating blade is not a hazard
- Restricted cornering does not lead to hazards

Emergency driving programme

Activating and finishing



Activating the emergency driving programme

1. Select the operating mode MC
2. Insert the transmitter into the transmitter holder
3. Sit down in the driver's seat
4. Switch on the main switch on the device
   - ➢ When the control has booted, the status indicators on the device light up
5. Place the key (A) on the start-stop switch (B)
6. 6.Turn the key (A) clockwise to switch on the transmitter
   - ➢ Wait 5 seconds
7. Press the button "Engine start" (5), "Transport position blade" (10) and "Display frequency" (11) simultaneously for more than 2 seconds
   - ➢ The engine starts automatically
   - ➢ You can drive for 3 minutes

The engine does not start

1. Press the button "Horn/Acknowledge" (4) and "Engine start" (5) simultaneously
   - ➢ The engine starts automatically, it is possible that the blade is turning
   - ➢ You can drive for 3 minutes

Notice: If the engine does not start, rescue with the emergency driving programme is not possible

Finishing the emergency driving programme:
Press the start-stop switch (1) to finish the emergency driving programme.

Personal notes

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