Workshop manual

Primo 2008

STIGA®

1 General instructions

Contents in this chapter

General

This Workshop Manual is intended for Stiga Primo model 2008.

This Manual do not cover repair instructions for the motor. Regarding the motor, see the motor manual.
This Manual and its specifications are valid for machines in their original design. In case of modified or changed machine, i.e. the motor is replaced, the manual accordance is limited.

The manual is divided in the following chapters:
Chapter 1 is this chapter
Chapter 2 Chassis
Chapter 3 Steering
Chapter 4 Belts
Chapter 5 Electrical system
Chapter 5 Cutting deck

1.1 Introduction

1.1.1 Responsibility declaration

In spite of the great care we have taken there may be errors in this publication.
The author cannot be made liable for incorrect or missing information.
GGP SE reserves the right to regularly change product specifications without prior notice.
All the information in this book is based on the information available at the time of production. Illustrations and photographs may be arranged schematically, which implies that one picture may cover several models and therefore not correspond exactly with all models.

1.1.2 How this manual is used

To make this manual easy to understand we have divided the machine into its main systems and components. These parts are now the different chapters in the book.
Each chapter is divided up into sections.
There is a quick-guide on the cover of this book, which refers to the different chapters. In each chapter there is a detailed table of contents so that you can easily and quickly find what you are looking for.

1.2 Safety Precautions

This manual has been written primarily for trained mechanics working in a well-equipped workshop. Nevertheless, the manual contains such detailed information that it can also be of use to owners who wish to carry out simple service and repairs on their machine.
A basic knowledge of repairs, tools and repair instructions is, however, always a prerequisite for first-rate results.

A qualified mechanic should always be consulted if the owner does not have sufficient knowledge to carry out repairs.

During the warranty period all service must be carried out by an Authorised Workshop for the warranty to be valid.

The following basic points should be observed if the machine is to function perfectly:

- Follow the service schedule.
- Be on the alert for sudden vibrations or abnormal noise to avoid major breakdowns.
- Always use Genuine Spare Parts
- Follow the descriptions in this manual carefully. Do not take any short cuts.

1.2.1 Before service or maintenance

Before service or maintenance is carried out, the mesures below shall be performed:

- Prevent the machine from rolling by always applying the parking brake.
- Prevent unintentional starting of the engine by removing the ignition key.
- All service and all maintenance must be carried out on a stationary machine with the engine switched off.

1.2.2 Symbols and general warnings

Warning!

This symbol indicates a risk of personal injury or damage if the instructions are not followed.

Note!
This text indicates a risk of damage to the material or risk of unnecessarily complicated work if the instructions are not followed.

1.2.3 Warm parts

Please observe that engine and exhaust system picks up a lot of heat during use.

To avoid injuries, allow the machine to cool before any kind of repairs are made to or near parts of the engine or exhaust system.

1.2.4 Moving parts

The machines are all equipped with v-belt transmissions. Always stop the engine and remove the starter key before inspections or repairs are carried out.
Always use extreme caution when testing systems with moving parts to avoid injuries.

Always use Genuine Spare Parts during service work.

1.2.5 Lifting and blocking up

Before work under the machine, always make sure that lifting devices and jack-stands are approved for the weight.
Work safe!

1.2.6 Cleanliness

Clean the machine before starting repairs. Dirt that penetrates into sensitive components can seriously influence the service life of the machine.

1.2.7 Tightening torque

Unless otherwise stated the tightening torque in the tables in the section Technical specifications must be used for the different sizes of screws. This does not refer to self-tapping screws, which are mainly used for the assembly of body parts.

1.2.8 Sharp edges

Watch out for sharp edges, especially when working with the mower deck. The blades can be very sharp. Always wear gloves when working with the blades.

1.2.9 Replacement parts

Always use Genuine Spare Parts during service work.

1.2.10 Inspection

Each part dismantled in conjunction with service work must be inspected.
Examine for: wear, cracks, out of roundness, straightness, dents, discolouring, abnormal noise and jamming.

1.3 Guarantee

1.3.1 Guarantee period

For consumer use: two years from date of purchase.

1.3.2 Exeptions

The extended warranty does not cover damage due to the following:

- Neglect by users to acquaint themselves with accompanying documentation.
- Carelessness.
- Incorrect and non-permitted use or assembly.
- The use of non-genuine spare parts.
- The use of accessories not supplied or approved by the manufacturer.

Neither does the warranty cover:

- Wearing components such as blades, belts, wheels,battery and cables.
- Normal wear.
- Engine and transmission. These are covered by the respective manufacturer’s warranties, with separate terms and conditions.

The purchaser is covered by the national laws of each country. The rights to which the purchaser is entitled with the support of these laws are not restricted by this warranty.

1.3.3 Conditions for validity of the warranties

The fully completed warranty card must be sent to Stiga´s subsidiary or distributor.

1.4 Unpacking and assembly

Every Stiga machine has undergone an extensive control programme before delivery. The machines are delivered as completely assembled as possible.
Thanks to this the assembly on delivery is rapid and easy.
The correct and careful assembly of the machine on delivery is a simple way of ensuring satisfied customers!

! Note!
The machine shall remain placed on the pallet during the unpacking and assembly.

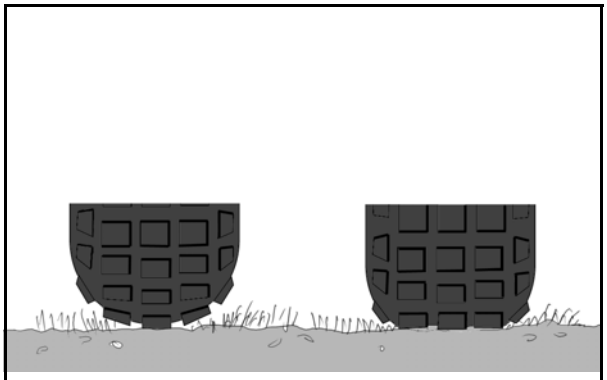
1.4.1 Unpacking

Open up the crate and release the part as follows:

1. Check the air pressure in the tyres. The pressure is designated on the floor mat. The air pressure in the tyres is of critical importance for the performance and handling of the machine. The correct air pressure for mowing is:
   Front: 1,2 bar (17 psi)
   Rear: 1,2 bar (17 psi)

   Too high pressure in the tyres leads to that the machine drives poor due to:
- A small surface in contact to the ground.
- Hard tyre = less flexibility = self cleaning characteristic deteriorate.

2. Remove the following parts from the package and put them on the floor.
- The steering wheel.
- The backrest.
- The plastic bag, containing owners manuals, and assembly screws.



Too high pressure Correct pressure

1.4.2 Battery

The battery is a valve regulated type.

Valve regulated battery

This battery needs limited maintenance. It has no electrolyte levels or plugs.

Warning!

Do not wear rings, metallic bracelet, chain round the neck or similar metal objects when working with the battery. It can cause short-circuit, burns and fire.

Warning!

The battery must be fully charged before being used for the first time. The battery must always be stored fully charged. If the battery is stored while discharged, serious damage will occur.

Charging with the engine

The battery can be charged using the engine's generator as follows:

1. Install the battery in the machine as shown below.
2. Place the machine outdoors or install an extraction device for the exhaust fumes.
3. Start the engine according to the instructions in the user guide.
4. Allow the engine to run continuously for 45 minutes.
5. Stop the engine. The battery is now fully charged.

Charging using battery charger

When charging using a battery charger, a battery charger with constant voltage must be used.

The battery can be damaged if a standard type battery charger is used.

Installation of battery

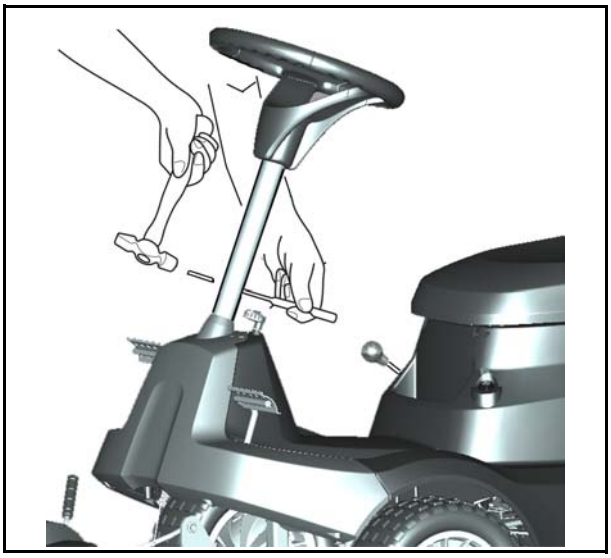
Connect first the red cable to plus (+) and then the black cable to minus (-).

If the cables are disconnected/ connected in the wrong order, there is a risk of a short-circuit and damage to the battery.

If the cables are interchanged, the generator and the battery will be damaged.

The engine must never be driven with the battery disconnected. There is a risk of serious damage to the generator and the electrical system.

1.4.3 Assembly



The assembly procedure shall take place in a clean, well illuminated and dry place.

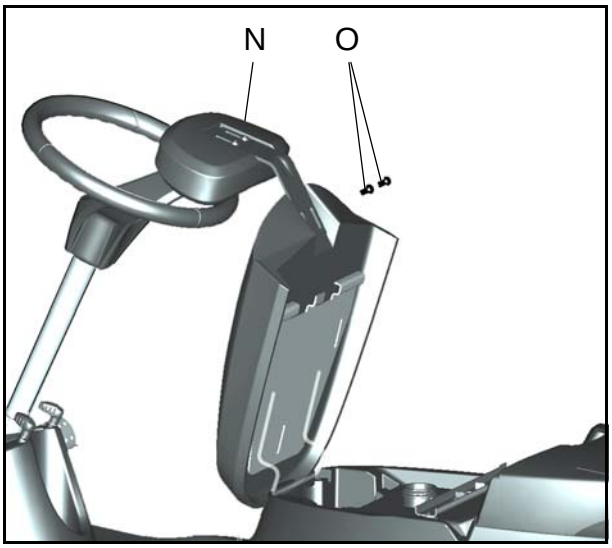
Assemble the machine as follows:

Steering wheel

Install the steering wheel as follows:

1. Install the steering column jacket on the steering column using a drift or similar so that the holes in the steering column jacket and steering column align with each other.
2. Tap in the supplied tension pin from the other side using a hammer.

Backrest

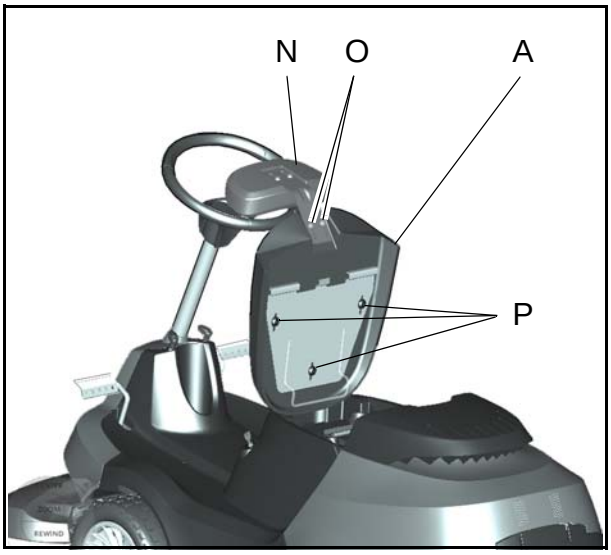


Install the backrest as follows:

1. Fold the seat up towards the steering wheel.
2. Install the backrest with the screws (O) without tightening.
3. Set the backrest to the desired position.
4. Tighten the screws. Tightening torque: 20-24 Nm.

If the screws are tightened more than 24 Nm, the seat will be damaged.

Seat



Adjust the seat backwards/forwards to a comfortable driving position.

The seat can be folded and adjusted front-rear. To adjust the seat, slacken off the three screws (P), set the seat to the desired position and tighten the screws.

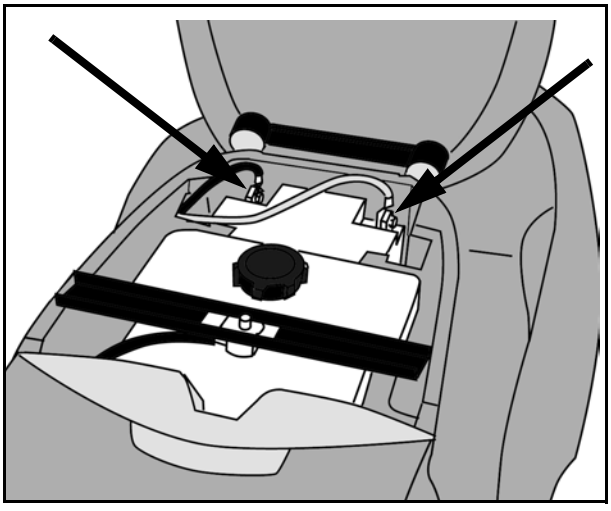
Tightening torque: 20-24 Nm.

If the screws are tightened more than 24 Nm, the seat will be damaged.

The seat is equipped with a safety switch that is connected to the machine's safety system. This means that certain dangerous activities are not possible when there is nobody sitting on the seat.

Backrest

The backrest can be adjusted laterally and vertically. To adjust the backrest, slacken off the screws (O), set the backrest to the desired position and tighten the screws. Tightening torque: 20-24 Nm.



If the screws are tightened more than 24 Nm, the seat will be damaged.

Battery

Fold the seat up and install the battery leads.

See also"1.4.2".

Engine oil

Check the oil level in the engine and top up if necessary.

1.4.4 Final checks

The final check consists of test driving and safety check as described below.

Test driving

Warning!

Do not drive without the mover deck attached. Risk for turning over.

Drive the machine for a few minutes. Test all the functions. Pay special attention to the safety functions. The mower deck must be fitted before test driving the machine.

Listen to abnormal noise or rattle during the test driving.

Safety check

Check the safety functions. It is often appropriate to do this check in conjunction with test driving. The following items shall be checked at all machines:

- No leakage on fuel lines and connections.
- No mechanical damages to the electrical cables. All insulation intact.
- The muffler shall be undamaged and its screws tightened. No exhaust leakage in connections.

The electrical check items are listed in the tables below.

Test	Status	Action	Result
1	PTO activated. No gear activated.	Turn the key and make a start attempt.	Motor shall not start.
2	PTO not activated. A gear is activated.	Turn the key and make a start attempt.	Motor shall not start.
3	Motor running. PTO activated.	Operator rises from the seat.	Motor shall stop.
4	Motor running. A gear activated.	Operator rises from the seat.	Motor shall stop.

1.4.5 General tightening torque

Unless otherwise stated, the following tightening torque are applicable for screws and nuts on the machine:

Tightening torques

Thread	Torque
M5	5 Nm
M6	9 Nm
M8	22 Nm
M10	45 Nm

1.5 Instructions for use

Some procedures, e.g. changing motor oil, motor filter etc., are refered to the instruction for use, delivered with the machine.

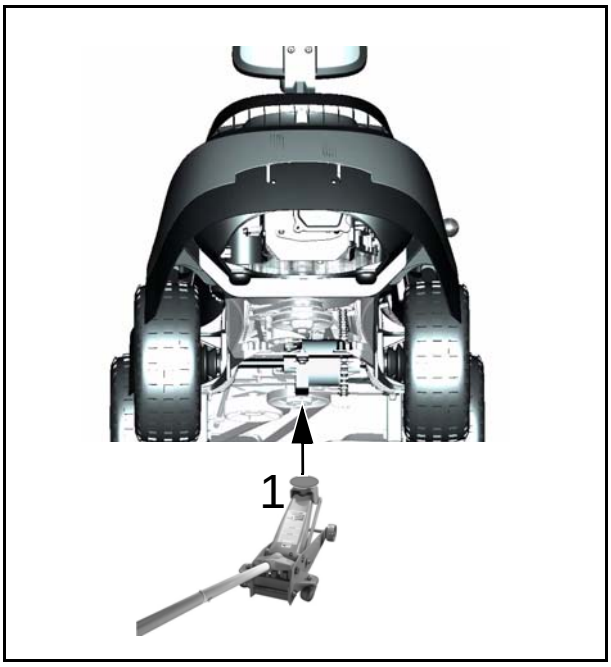
The instruction of use is written in 16 languages and divided in two parts. The first part always contains the languages SV, FI, DA, NO, DE, EN, FR and N.

1.6 Raising

Jacks must only be placed in the designated area. Placing the jack in other locations will damage the machine.

The machine must only be raised on hard, stable and horizontal surfaces. Otherwise there is a risk of the machine dropping.

The machine must never be loaded with further weight when it is raised. Nobody must sit on the machine when it is raised.



1.6.1 Raising back

For certain maintenance work, the rear part of the machine must be raised slightly so that the required rear wheel can be removed. Raise the machine as follows:

1. Position the machine on a hard, stable and horizontal surface.
2. Raise the machine using a jack, see the fig.

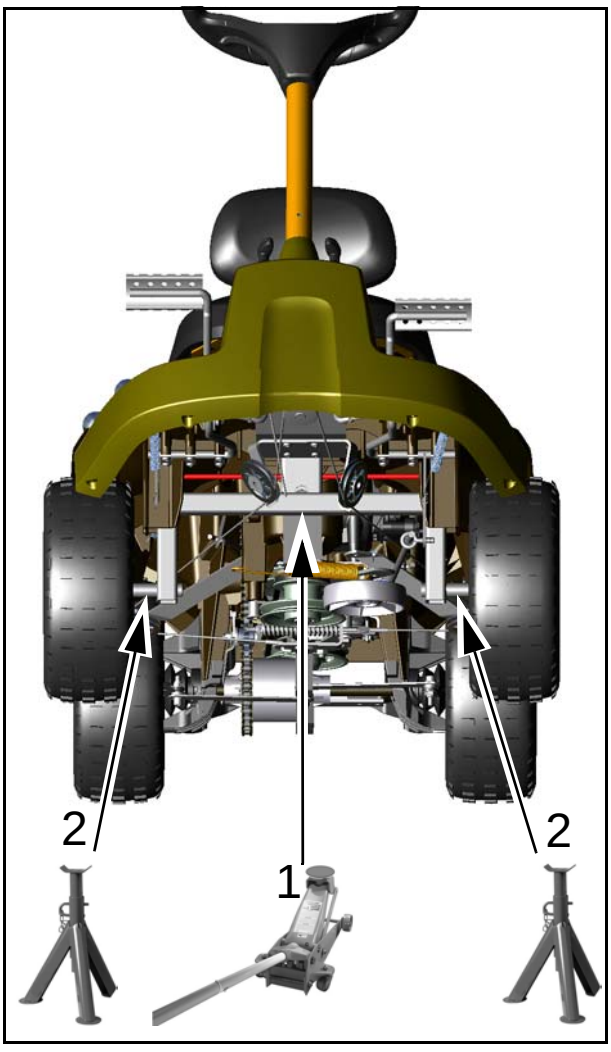
1.6.2 Raising front

Note!
To raise the machine at the front, the cutting deck must be removed.

Raise the machine at the front as follows:

1. Place the machine on a flat, solid and horisontal ground.
2. Disassemble the cutting deck. See chapter 6.
3. Raise the machine with help of a jack and apply the yokes according to the figure.

   For location of jack and yokes, see the figure.



1.7 Turning upsidedown

Some service measures are facilitated by turning the machine upsidedown on a work bench.

1.7.1 Preparing

Before the machine is turned, the following items must be disassembled:

- Cutting deck, see chapter 6
- Draining the petrol
- Seat with its plate
- Motor hood
- Motor oil
- Petrol tank

1.7.2 Draining the petrol

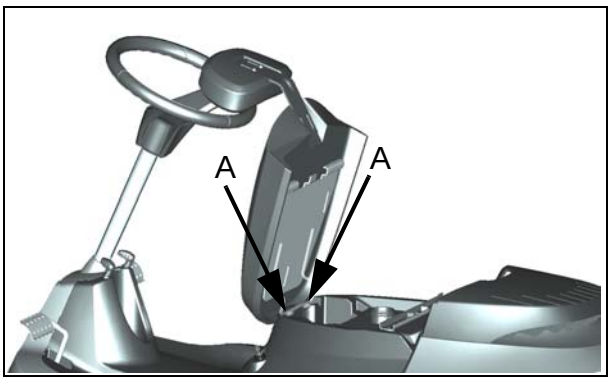
Petrol is highly inflammable. Always store fuel in containers that are made especially for this purpose.

Only handle petrol outdoors, and never smoke during petrol handling. Never handle petrol together with a warm or running engine.

1. Place the machine outdoors.
2. Drain the petrol tank by loosening the hose at the fuel cock. Close the hose and insert it in a suitable container until the tank is empty.
3. Start the engine and let it run until it the carburettor is empty and the engine stops.

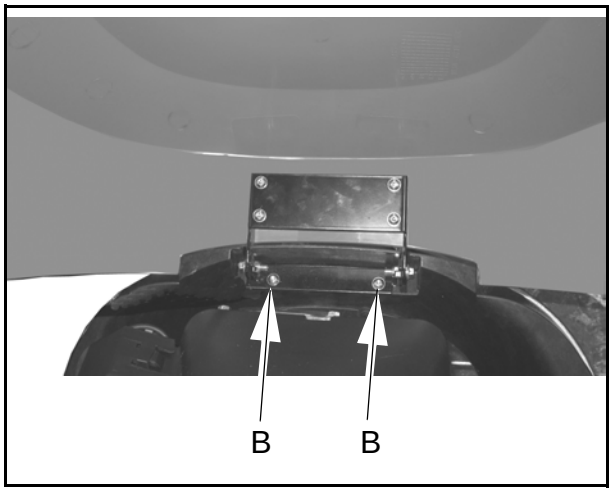
1.7.3 Seat with its plate

1. Fold up the seat and remove the screws (A).
2. Lift up and remove the seat with the seat plate.



1.7.4 Motor hood

1. Open the motor hood.
2. Person 1 holds the hood on one side and person 2 holds the other side and removes the screws (B).
3. Lift carefully up the hood and place it on a soft surface.



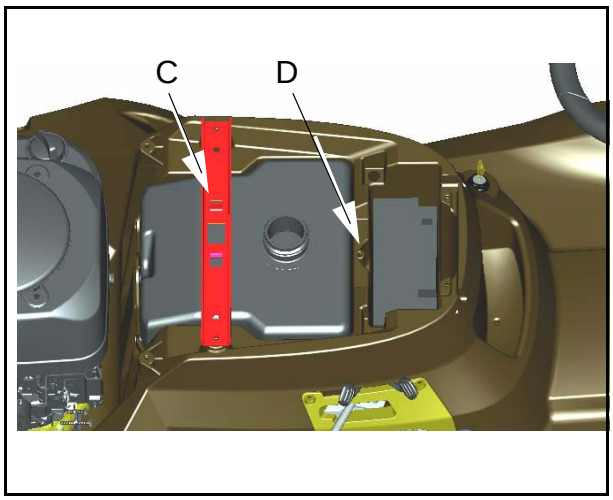
1.7.5 Motor oil

Drain the motor oil. See the owners manual.

1.7.6 Petrol tank

Loosen the screws holding the crossbar (C) and remove the crossbar.

Loosen the screw (D) holding the tank and battery cage and remove the tank and battery cage with battery.

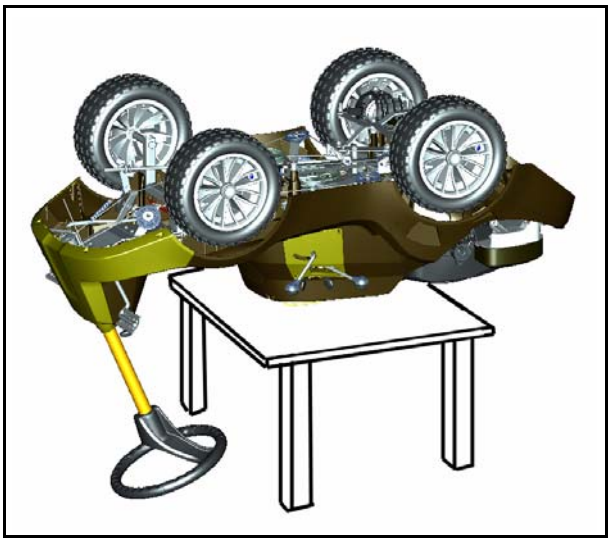


1.7.7 Turning

Prepare a work bench to place the machine on.

Two persons lift the machine, one person at the rear and one at the front.

Lift and turn the machine 180°. Place it carefully on the work bench.



1.7.8 Restoring the machine on its wheels

To restore the machine on its wheels, perform the instructions above in the opposite order.

2 Chassis and body

Contents in this chapter

General

To facilitate the driving, handling of work equipment and to make it comfortable for the driver, the machines are equipped with a various number of aid equipments.

This chapter gives a brief description of the equipments and describes their repair and replacements.

This chapter also contains information about how to repair the plastic chassis including material and threads.

2.1 Repair of the chassis

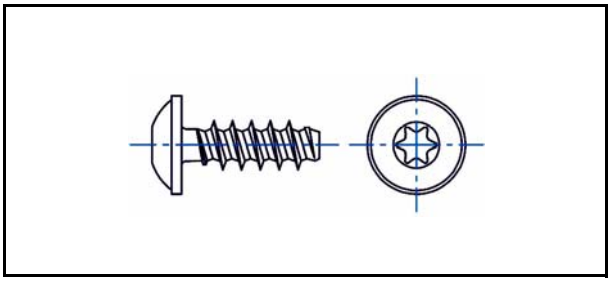
There are two types of chassis repair:
- Repair of cracks i.e. after interferences etc.
- Repair of threads.

2.1.1 Repair of cracks

Consult the dealer for detailed information.

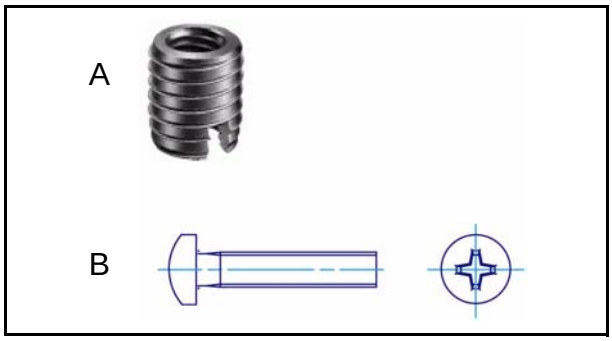
2.1.2 Repair of threads

A number of screws are threaded direct into the chassis. The screws used are shown in the figure to the right.

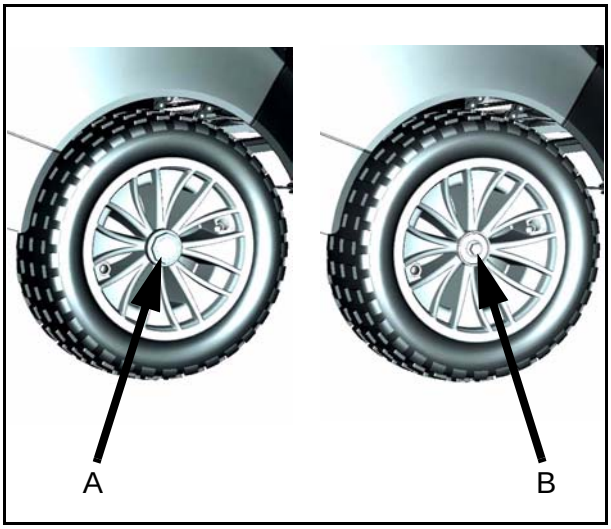


Threads for those screws can be repaired as follows:

1. Order a repair kit for threads. See the spare parts list.
2. Drill out the defect thread in the chassis with a 7 mm drill.
3. Screw the thread adapter (A) from the repair kit into the hole with the recess first. The recess is intendet to cut the thread in the plastic material.
   The thread adapter is screwed in with a screw in its internal thread.
4. Use a csrew M5x25 (B) from the repair kit and fit the actual item.



2.2 Wheel



For certain maintenance work, it is necessary to remove a rear wheel.

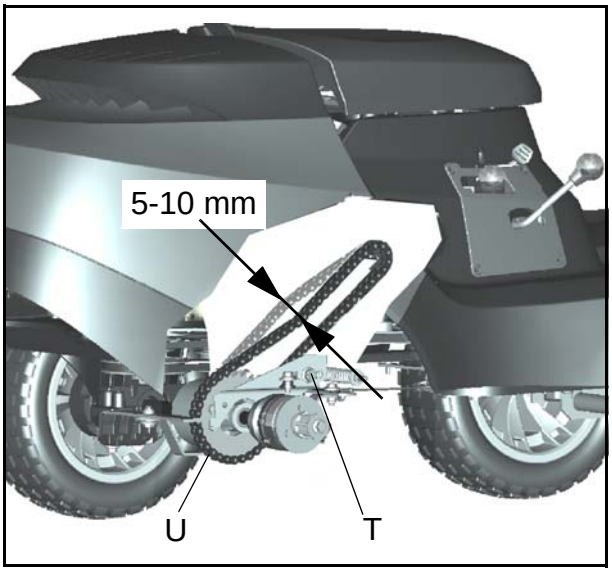
Dismantling:

1. Raise the machine according to chapter 1.
2. Remove the cover disc (A).
3. Use a 17 mm wrench and remove the screw (B) with disc.
4. Pull the wheel from the axle.

Assembly:

1. Slide the wheel onto the axle.
2. Install the screw (B) with disc.
3. Tighten the screw to **40-45 Nm.**

2.2.1 Adjusting the drive chain (U)



Check/adjust the belt tension each season as follows:

Check:

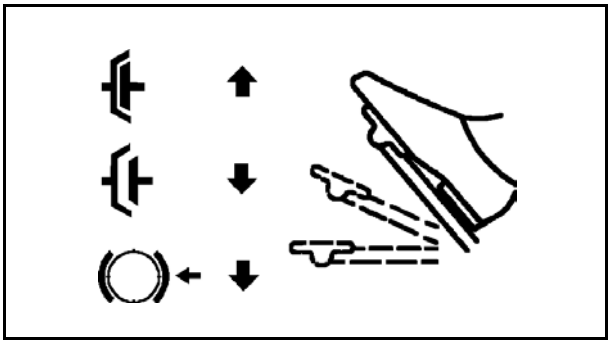
1. Raise the machine and remove the right-hand rear wheel. See 6.4.
2. The chain (15:U) must have 5-10 mm of play.
   Any required adjustment, see blow.

Adjustment:

Adjust the play by moving the tensioner wheel as follows:

1. Slacken off the nut (15:T) and set the tensioner wheel to the desired position.
2. Tighten the nut and check the play. Adjust again if required.
3. Tighten the nut to 40-45 Nm when adjustment has been completed.

2.3 Adjustments



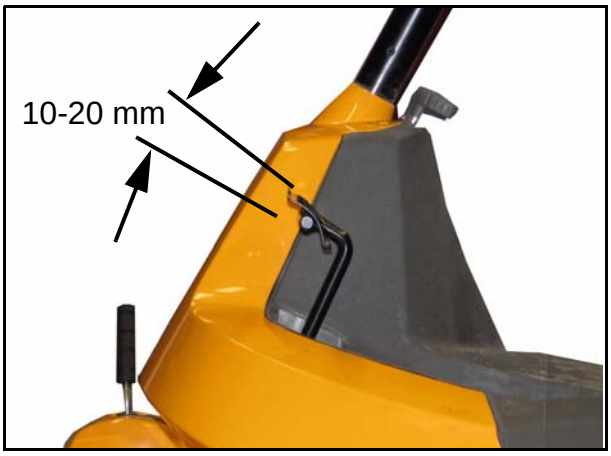
2.4 Brake - Clutch

General

Pedal has the following functions:
- Clutch
- Service brake
- Parking brake

The pedal has three positions:

1. Pedal released – forward drive engaged. The machine will move if a gear is engaged. Service brake not activated.
2. Pedal depressed halfway – forward drive disengaged, gear shifting can be performed. Service brake not activated.
3. Pedal fully depressed – forward drive disengaged. Service brake fully activated. Also see “Parking brake” below.
4. Pedal fully depressed and locked – Parking brake.



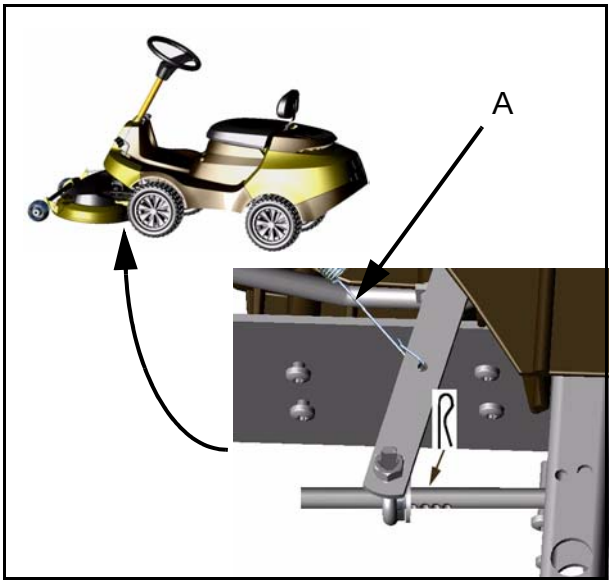
Adjustment

The adjustment is performed in 2 steps:

<u>Step 1</u>

The pedal shall have a play of 10-20 mm at the top.

Adjust this play by inserting the cotter pin in a suitable hole in the brake rod.



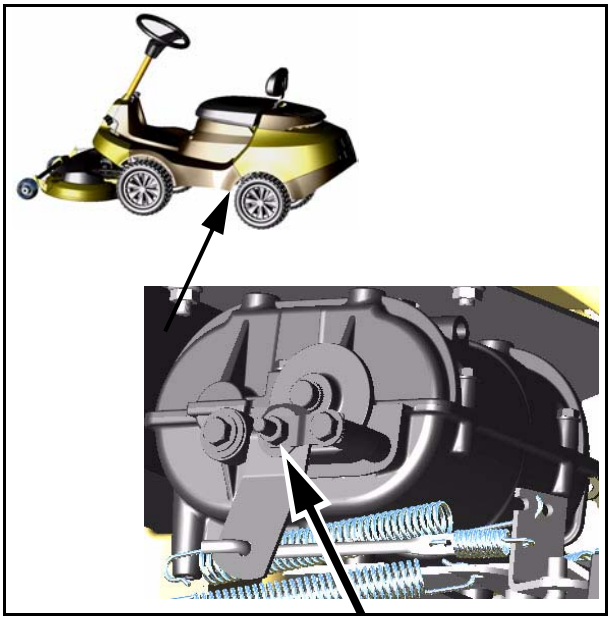
! Note!
Check that the pedal return spring (A) is in place. If not, the play cannot be felt.

Step 2

Adjust the brake to act according to the description under “General” at the previous page.

The adjustment is performed at the center nut at the gearbox brake lever.

- Turn the nut CW to increase the braking effect.
- Turn CCW to decrease the braking effect



2.5 Lubrication chassis

All lubrication points according to the table below must be lubricated after every 25 operating hours as well as after each clean.

Item	Chapter / Section
Drive chain	2.3.1
Steering cable	2.3.2
Tensioning arms and moving joints	2.3.3
Throttle cable	2.3.4

2.5.1 Drive chain

Lubricate the drive chain (U) using chain spray as follows. Use universal type chain spray.

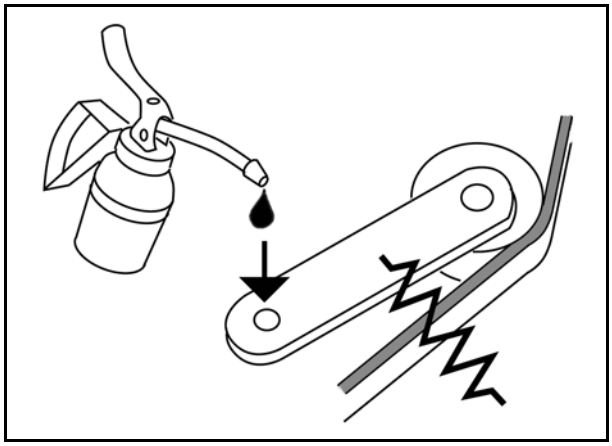
1. Trestle up the machine's right-hand rear wheel so that it can rotate freely.
2. Brush the chain clean using a wire brush.
3. Rotate the rear wheel by hand and at the same time spray the chain so that it is fully lubricated.
4. Lower the machine.

2.5.2 Steering cable

Lubricate the steering cable using chain spray as below. Use universal type chain spray.

1. Brush the chain clean using a wire brush.
2. Turn the steering wheel and at the same time spray the cable so that it is fully lubricated.

2.5.3 Tensioning arms, movable joints

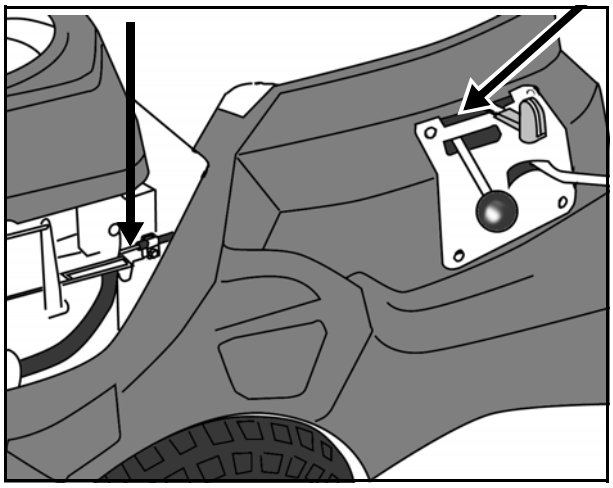


Lubricate the bearing points using an oil can at the same time as activating the respective control.

Preferably carried out by two people.

Activate the controls:
- Steering
- Clutch, brake
- Raise the cutting deck
- Engaging the cutting deck.
- Setting the cutting height

2.5.4 Throttle cable



Lubricate the cable ends using an oil can at the same time as activating the respective control.

2.5.5 Bearings

Shafts and attachments pivoted in the plastic chassie shall be lubricated with universal grease.

3 Steering

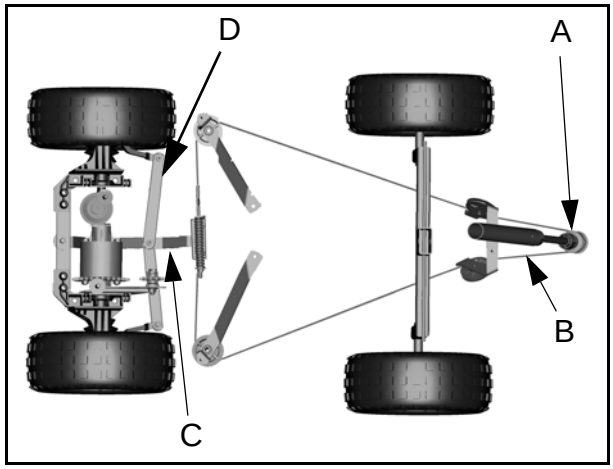
Contents in this chapter

General

The machine is equipped with a mechanical steering system, working with a wire.

This chapter contains a brief description of the function and describes repair, replacements and adjustments of stressed parts of the steering system.

3.1 Steering wire



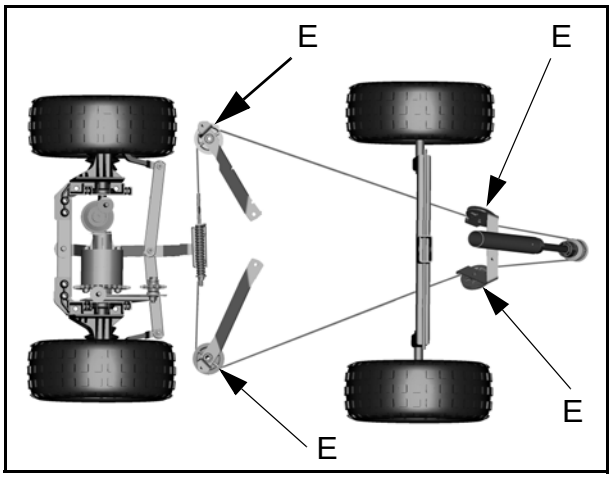
3.1.1 Description

The steering power from the steering wheel is transmitted to the rear wheels by a wire as follows:

- The roller (A) is turned by the steering wheel and mowes the wire (B).
- The wire is pulling the lever (C), which affects the wheels by the rods (D)

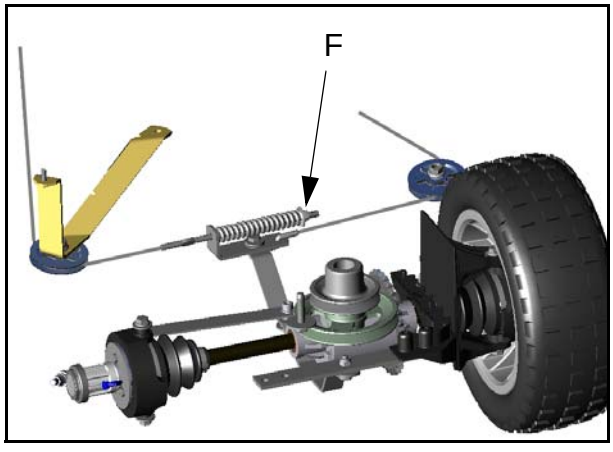
3.1.2 Dismantling

! Note!
Observe how the wire is located above/ under rods, arms etc. This observation is helpful at the installation of the new wire.



1. Remove the four steering pulleys (E). Use a 15 mm and a 17 mm wrench.

2. Remove the nut (F), holding the wire end. Use a 13 mm wrench and a pliers to hold the wire end.



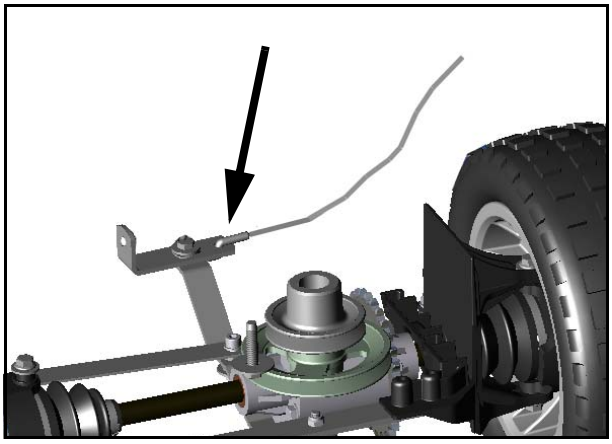
3. Remove the spring

4. Unwind the wire from the steering roller and unhook it from the rear attachment.

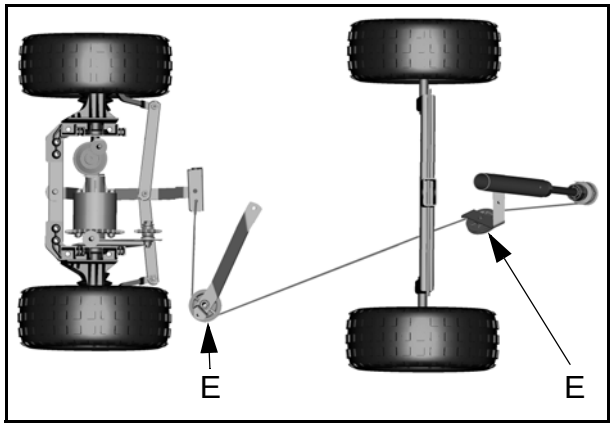
5. Remove the wire from the machine.

3.1.3 Assembly

1. Hook on the wire to the rear steering lever.



2. Mount the 2 pulleys (E) with the wire at the right side of the machine.



! Note!
Locate the wire as observed during the dismantling.

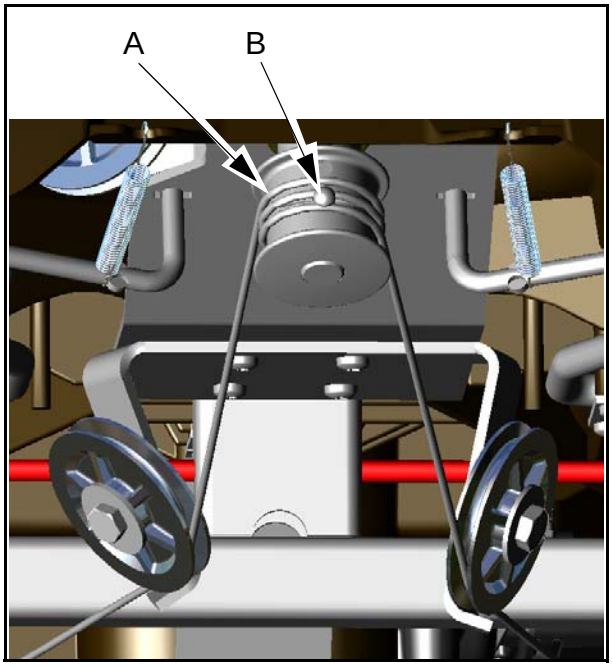
⚠ **Check that the wire not interface with frame parts, rods, levers etc.**

Lubricate the pulleys and mount them according to the figure.
See “3.1.4 Steering pulleys”.

3. Turn the steering wheel until the wire rivet hole in the steering roller is facing forwards.
4. Wind up the wire on the steering roller.

   Keep the right part of the wire stretched by blocking or holding the rear wheels.

   Start winding at position (A), wind 1,25 turns and push in the rivet (B) into the hole in the steering roller.
5. Continue to wind up the wire another 1,25 turns.

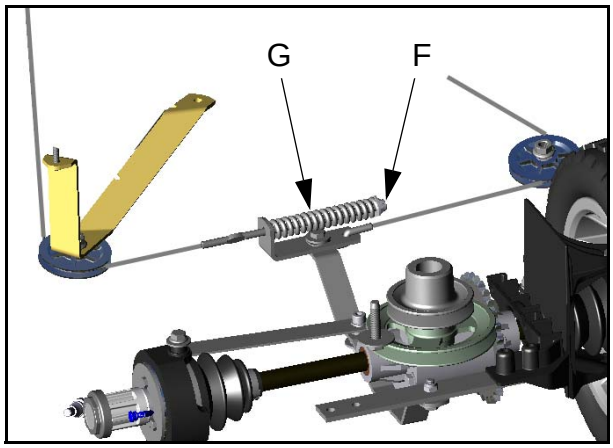


6. Fit the threaded wire to the rear steering lever.

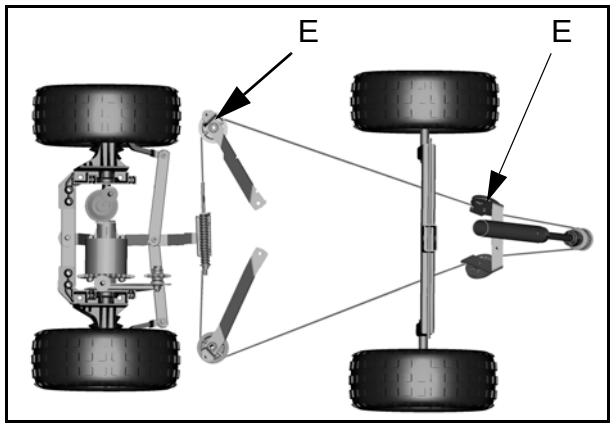
Note!
Locate the wire as observed during the dismantling.

Check that the wire not interface with frame parts, rods, levers etc.

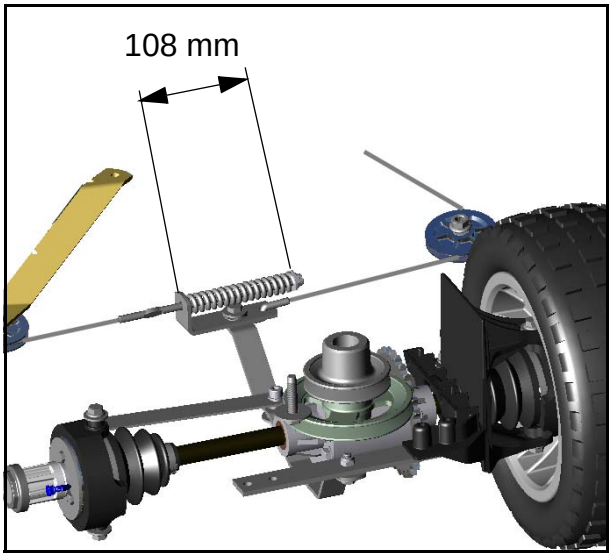
Mount the following parts:
- Spring (G)
- Nut (F). To facilitate the mounting of the remaining steering pulleys, screw on the nut a few turns only.



6. Mount the two pulleys at the left part of the machine together with the wire.
See “3.1.4 Steering pulleys”.



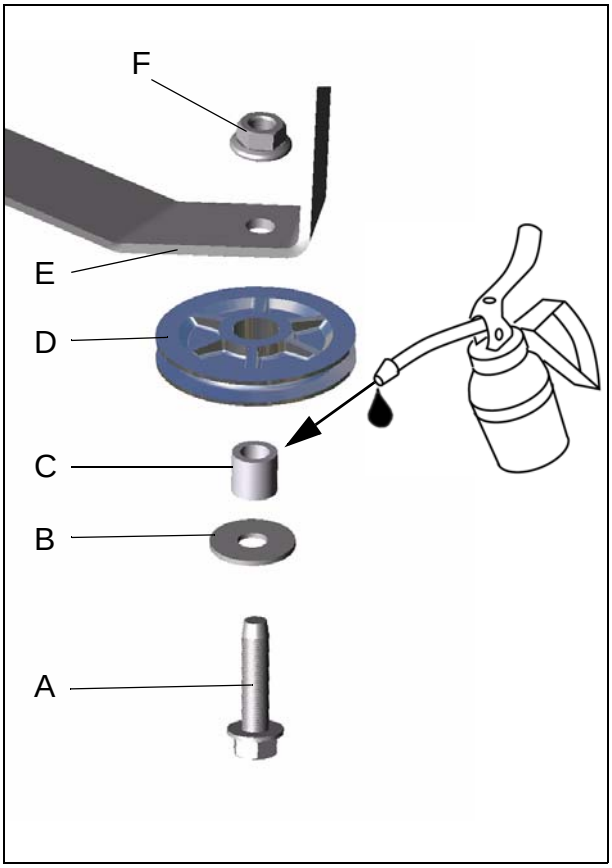
7. Tighten the nut (F) and compress the spring until its length is 108 mm. Hold the wire with a pliers.
8. Turn the wheels fully out in both directions. Check that there is no abnormal noise or abnormal resistance.



3.1.4 Steering pulleys

Every singel steering pulley consists of the following parts:

A.Screw
B.Washer
C.Bushing
D.Steering pulley
E.Part of the frame
F.Nut



Assembly instructions:

- Check the wear, specially of the steering pulley, and replace defective parts.
- Apply a thin layer of machine oil to the bushing (C).

4 Belts

Contents in this chapter

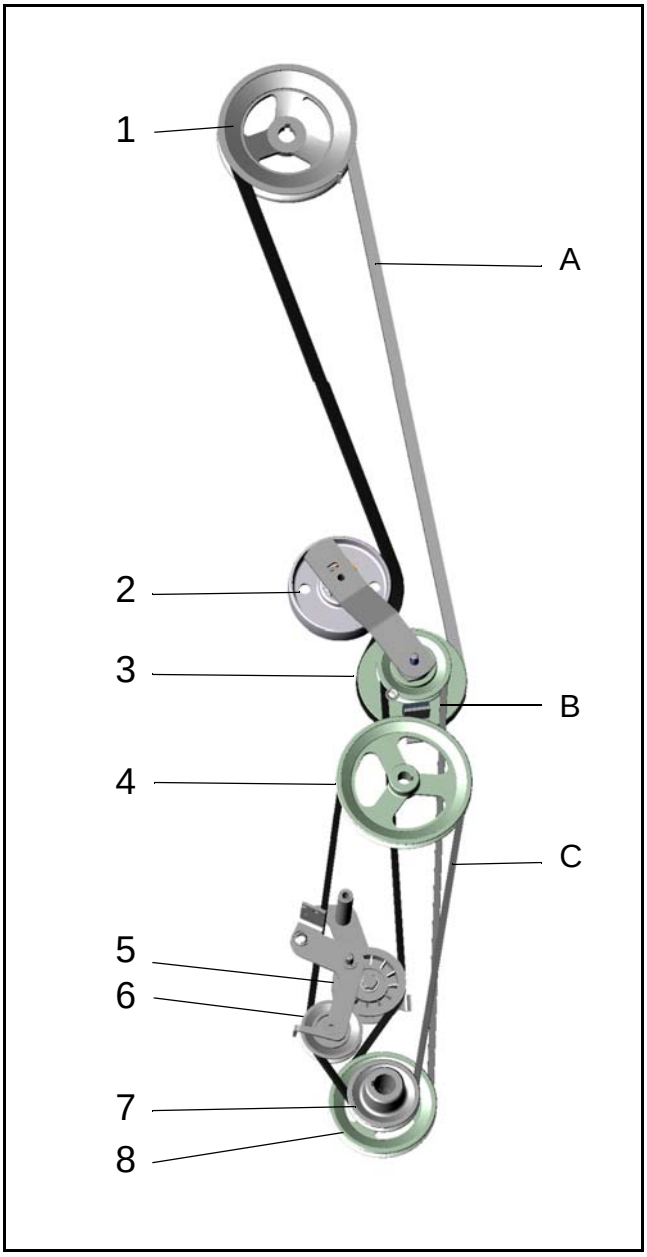
General

All mechanical power, delivered by the motor, is conducted to the different power consuments by a belt system. The maximum tension of each belt is regulated by a spring loaded belt tensioner.

This chapter gives a brief description of the belt system and describes replacements of belts and adjustments of their tensions.

This chapter is valid for the actual machines where the actual system occur.

4.1 Description



Belt A

Belt A belongs to the work equipment and is connected to the machine pulley (double) (3). The belt is tensioned by the tension pulley (2) which is mounted on a spring loaded lever.

Belt B

Belt B is intended to deliver the motor power to the pulley (double) (3), where it can be picked up by the work equipment.

Belt B also performs the mechanic PTO clutch function together with the pulley (5).

Engagement/disengagement of the mechanic PTO is performed by moving the pulley (5) to stretch/slacken the belt.

Belt C

Belt C is intended to transmitt the motor power to the transmission, where it is geared to a suitable ratio for the drive shaft. The belt is tensioned by the tension pulley (6) which together with the belt performs the clutch function.

The tensioning force is disengaged from the belt when the parking brake is activated.

Belts:

A. Work equipment belt (belongs to the work equipment).
B. Work equipment belt.
C. Transmission belt.

Pulleys:

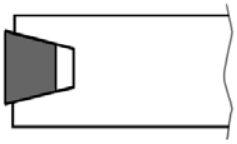
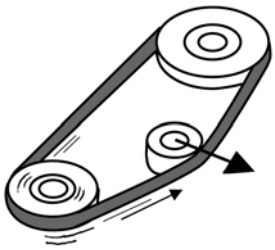
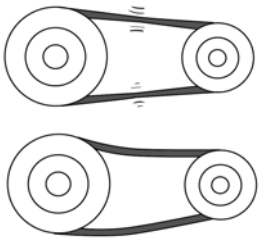
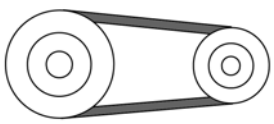
1. Pulley at the work equipment.
2. Tension pulley.
3. Pulley (double).
4. Pulley at the transmission.
5. Tension pulley with PTO clutch function.
6. Tension pulley with clutch function.
7. Drive pulley at the motor shaft.
8. Drive pulley at the motor shaft.

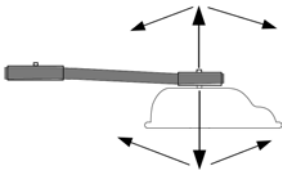
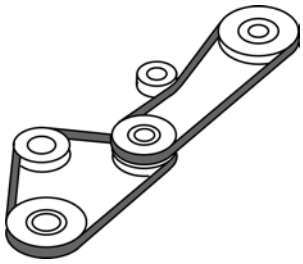
4.2 Belt theory

4.2.1 Why it is so important to use original belts from the retail dealer?

The table below shows the demands on normal commercial grade belts compared to demands on original spare parts belts from the retail dealer. The later are designed and manufactured in close connection between the subcontractor and the rider manufacturer.

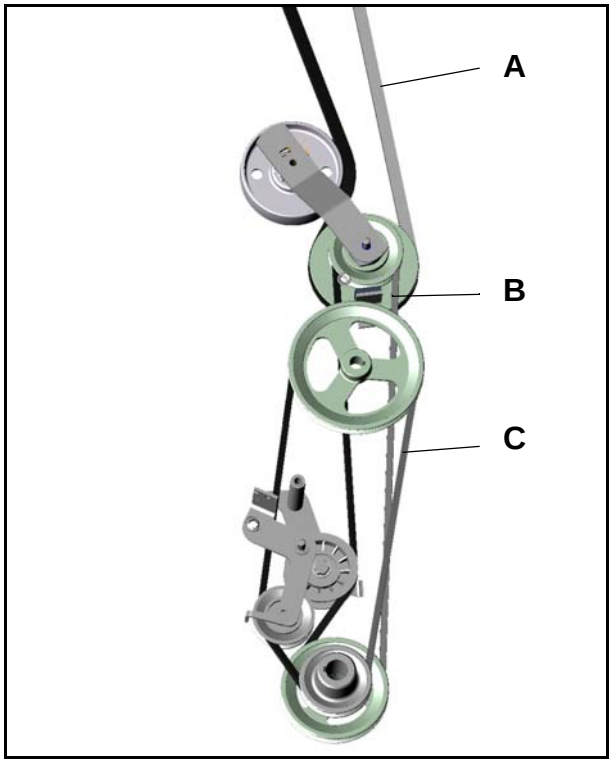
The table is intended to display the importance to use the original belts.

Case	**Commercial grade belts**	**Original spare parts belts**	**Remarks**
Fitness to pulleys. 	The belt shall rest with its angled sides against the pulleys. There must be a space between belt and pulley bottom.	The belt shall rest with its angled sides against the pulleys. There must be a space between belt and pulley bottom.	Same demands. Original belts guarantee that the belt fits against the pulleys.
Acceleration. . 	The belt follows the motor rpm in a continuous acceleration up to full speed.	Some belts shall engage to the pulleys with the motor running in full speed, which gives an excessive generation of heat.	Common belts are made of natural rubber, which can resist temperatures up to 70° only. Original belts are made of chloroprene rubber, which can resist temperatures up to 90°
Length	Manufactured in standard lengths in steps.. 	Manufactured in preedefined lengths to fit between the pulleys.. 	The distance between the pulleys is fix. The belt tensioner gives the original belt an optimal tension.

Case	**Commercial grade belts**	**Original spare parts belts**	**Remarks**
Floating pulley at the implement. 	Designed to transmit power between aligned, paralell and fixed pulleys.	The original PTO belt is designed to operate, even if the pulleys are moving up and down and are tilting at the same time	The implement follows the ground which involves that its pulley is constant moving. To resist the excessive operating conditions, the original belts are made of fibre reinforced rubber.
Bending in two directions 	Designed to bend around pulleys in one direction only	Most of the belts at the machine have tension rollers, actuating from the outside of the belt. This means the the belt has to bend both inwards and outwards during the operation.	All original belts which operate with tension rollers actuating from the outside have reinforcements. The reinforcement is special designed for the actual case.
Noise 	Manufactured without any special respect to the actual case.	The original belts are carefully selected to give the lowest noise increment to the machine during operation.	Depending on the function of the belt, any of the following belt types are itemised: • Wrapped • Non-friction • Raw-edge

4.3 Replacement of belts

This section describes the belt changing of belt C. For changing other belts, see actual parts of the belt C description.

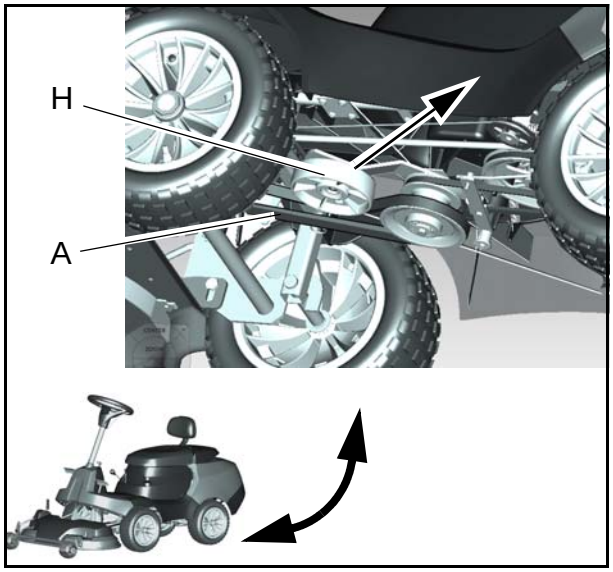


4.3.1 Disassembly of belt C

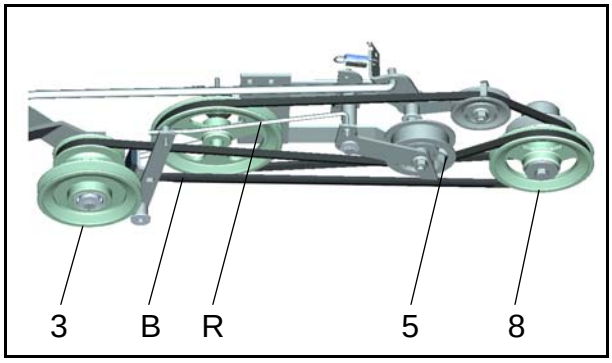
The belt **C** is the uppermost belt and is intended to conduct the engine power to the gearbox. The belt is controled by a lever for the clutch function.

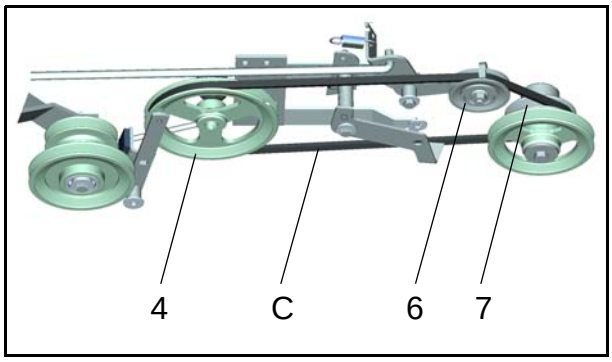
Dismantle the belt as follows:

1. Raise the machine by one of the alternatives below:
   - With a highjack and yokes. See section 1.
   - With a lifting table.
2. Set the cutting deck (if mounted) to max cutting heighth.
3. If the cutting deck is mounted; Pull out the pulley (H) and take down the belt to unload the belt tension.
4. If the cutting deck is mounted; Remove the belt A.



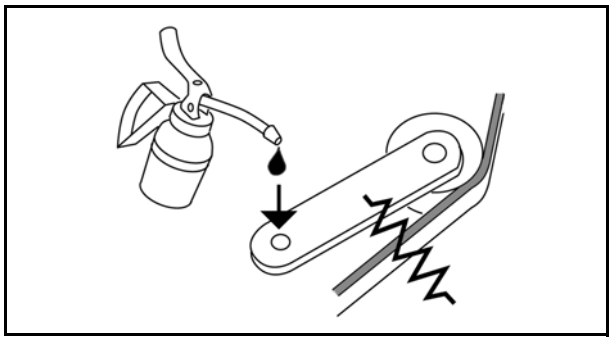
5. Unhook all springs and note where the respective spring is attached.
6. Remove the split pin and unhook the rod (R) at the front.
7. Remove the pulley (5). Use a 15 mm and a 17 mm wrench.
8. Take off the belt (B) first from pulley (8), then thread it around the pulley 3 and finally, remove it.
9. Remove the pulley (6). Use a 15 mm and a 17 mm wrench.
10. Remove the belt (C) from the pulleys (4) and (7).

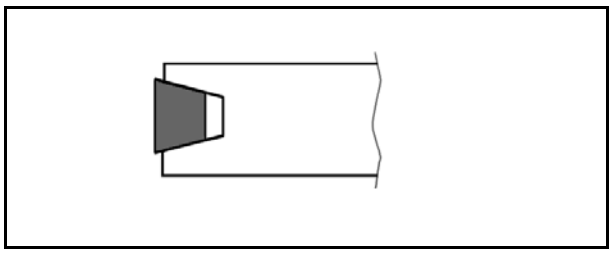




4.3.2 Inspection and measures

1. Check and lubricate all links.
   - The links shall move easily and not have any major play.
   - Lubricate all pivot linkages with machine oil.
2. Check the belts.
   - The belt shall rest with its angled sides against the pulleys. There must be a space between belt and pulley bottom.
   - The belt shall be intact. No loose parts or cracks.
3. Check all ball bearings with respect to the following:
   - No radial play.
   - The sealing shall be intact.
   - No abnormal noise when rotating. Shall rotate evenly without stop tendency.





Replace all defective parts with genuine spare parts.

4.3.3 Assembly of belt C

Assemble all part in the reverse order.

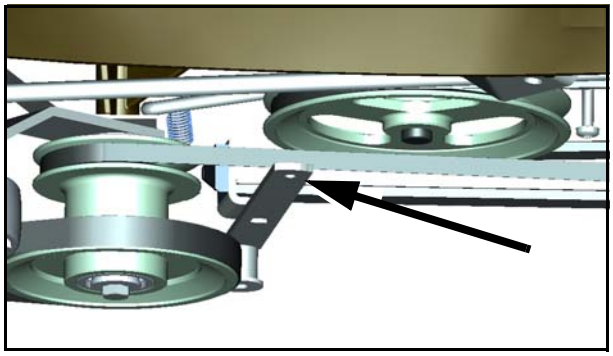
After the assembly, adjust the PTO brake. See below.

4.3.4 Adjustmen of PTO brake

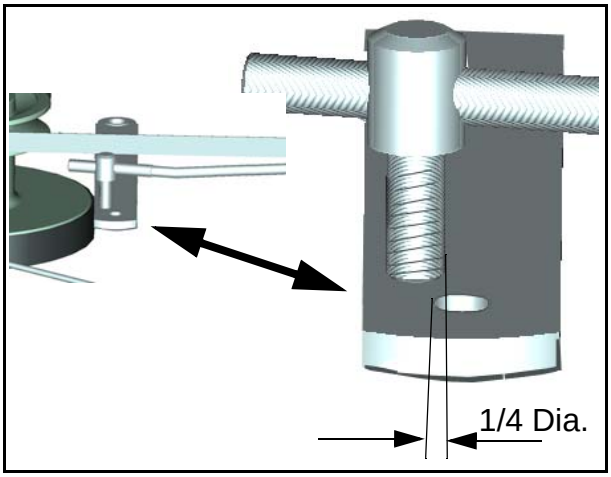
Warning!

It is important that the movement of the tensioning arm is always stopped by the brake pad, and not by the engagement rod. If the rod stops the movement, the braking capacity can be completely lost when the parts become worn.

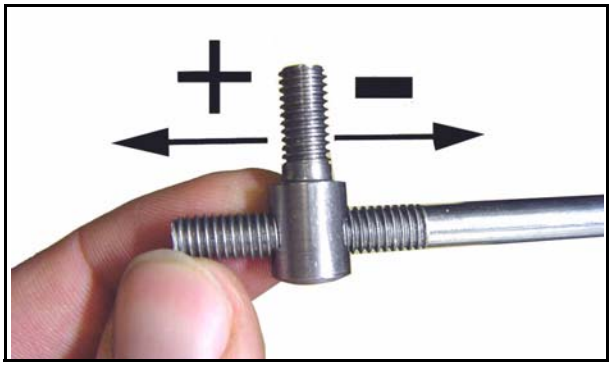
1. Remove the rod link and press the brake shoe hard against the pulley.



Hold the threaded stud above the lever close to the hole. In this position, 1/4 of the threaded stud diameter shall overlap the hole diameter.



2. Adjust the nipple towards **+** to increase the brake function.
   Adjust the nipple towards **-** to decrease the brake function.



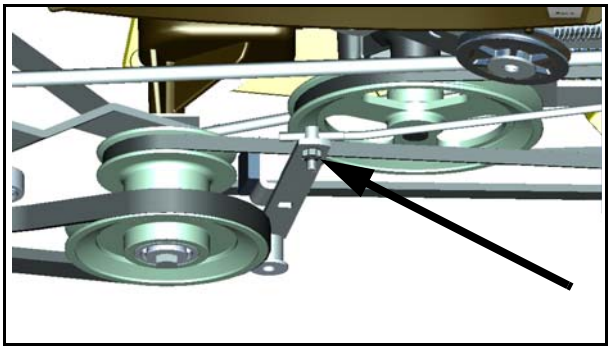
.

3. When 1/4 of the diameters overlap, fit the nipple in the hole and assemble the nut as follows:

   A. Screw on and tighten the nut moderately.

   B. Loosen the nut 1/2 turn.

The nipple shall be movable in the hole.



Warning!

If the nipple is tight in its hole, unnormal stress will occour to the mechanical parts.

4. When the adjustment is complete, the following items shall be fulfilled:
   - Engage the PTO and check that the brake pad no longer brakes the pulley. If the brake pad still brakes the belt pulley, adjust again.
   - Disengage the PTO and check that the brake works.
     If everything is correctly adjusted the brake should be applied just enough for the double PTO belt pulley to be turned round by hand only with extreme force.

5 Electrical System

Contents in this chapter

General

The electrical system has two main duties, to maintain the machine safety and to make the different functions easy to handle.

The main part of this chapter consists of trouble shooting of the electrical system to isolate faults and to give information about corrective measures. The electrical system is also described. There are also given instructions about general repair and replacement procedures.

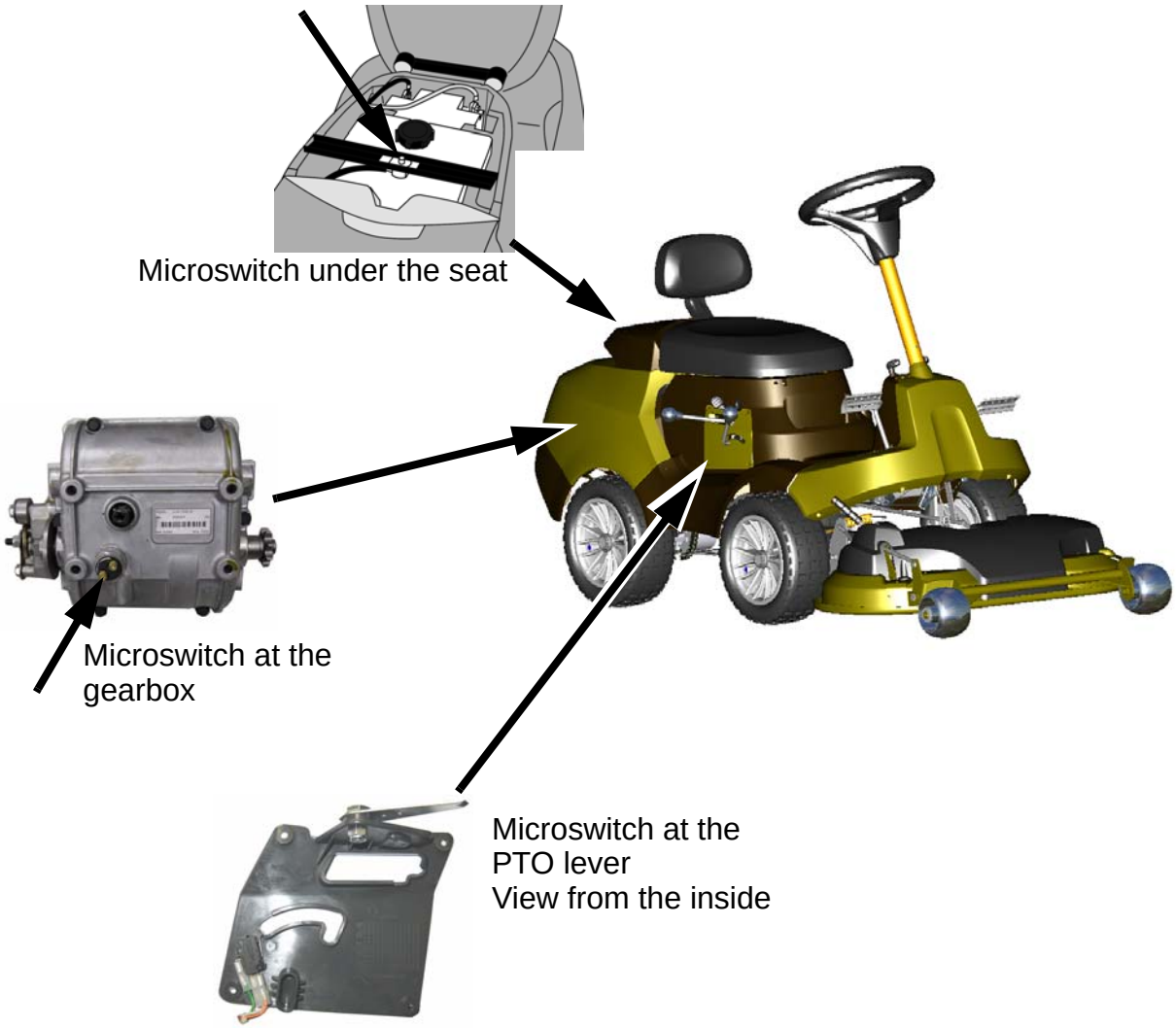
5.1 Description

The electrical components are connected with cables, integrated in a complete insulated harness. Thus the cables are protected against wear, contaminations and other stresses. The cables are connected to the actual components with tab or screw connectors and in some cases with multi-contact connectors.

The electrical system contains several safety circuits. Therefore actual levers and pedals are provided with micro switches. The micro switches are shown in the figure below. The signals from the micro switches are used to interlock the actual circuit in case of a forbidden manoeuvre attempt. Some manual switches and relays have also built in interlocks, related to the safety system.

To achieve a complete understanding of the electrical system, read also the actual wiring diagram.

All current consumption circuits except the start circuit are protected by a fuse.



5.2 Trouble Shooting

Warning!

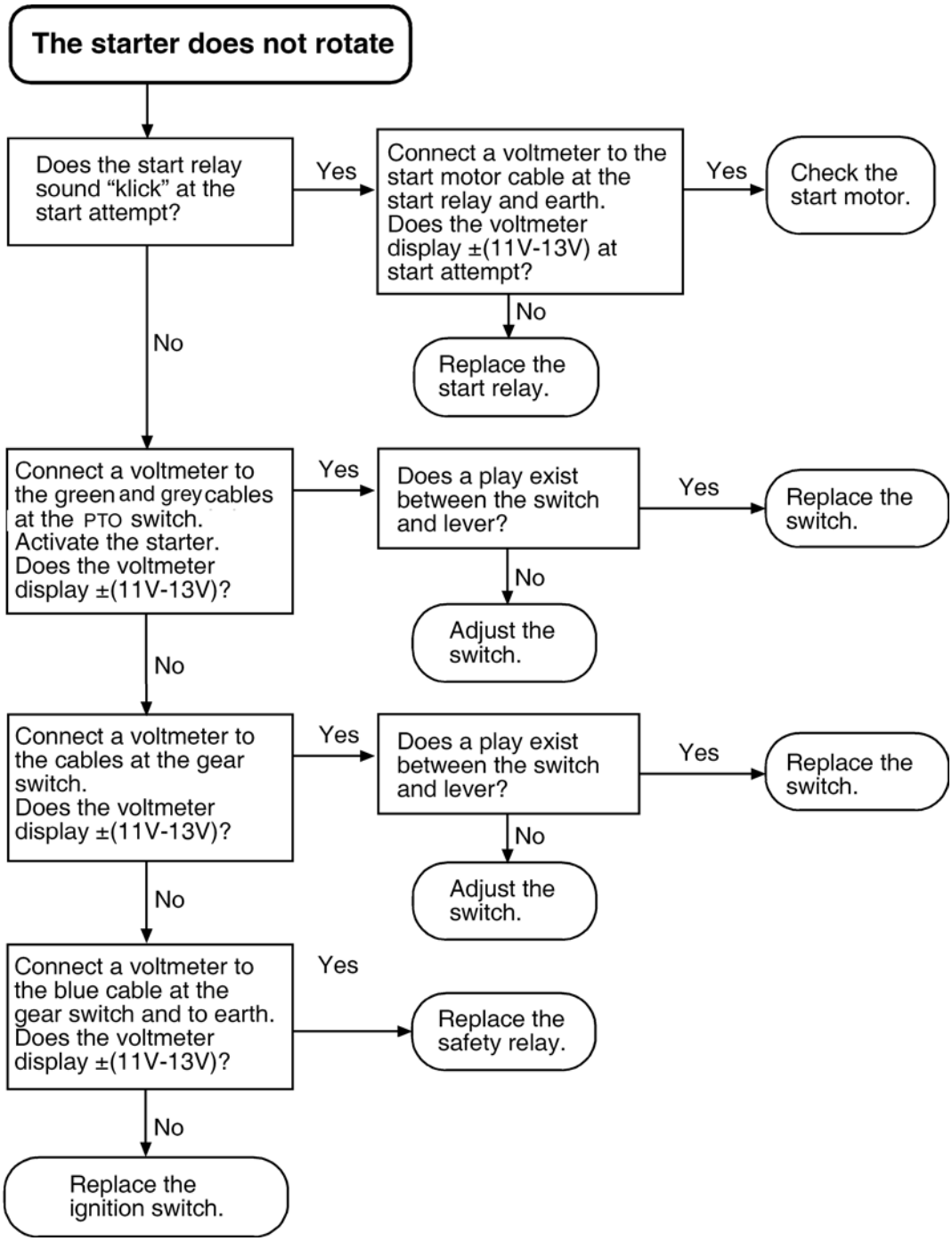
Do not wear rings, metallic bracelet, chain round the neck or similar metal objects when working with the electrical system. It can cause short-circuit, burns and fire.

This section describes the trouble shooting procedures in absence of an electrical function. It also describes the correction measures in each actual case. When following the trouble shooting schedules, it is provided that the following states are fulfilled:

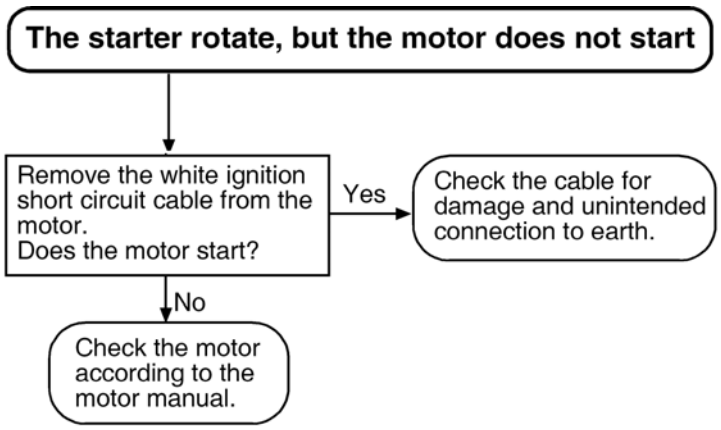
- All fuses are checked and, if necessary replaced.
- The battery shall be charged.
- The requirements for the actual measure shall be fulfilled. E.g. if it is advised to perform a start attempt, the gear shall be in neutral and the power take off shall be in disengaged position.

When following the trouble shooting shedules, it is in normal cases assumed that conductors and connectors to conductors are OK. However, in some cases, after a long period of use or in case of mechanical damages.

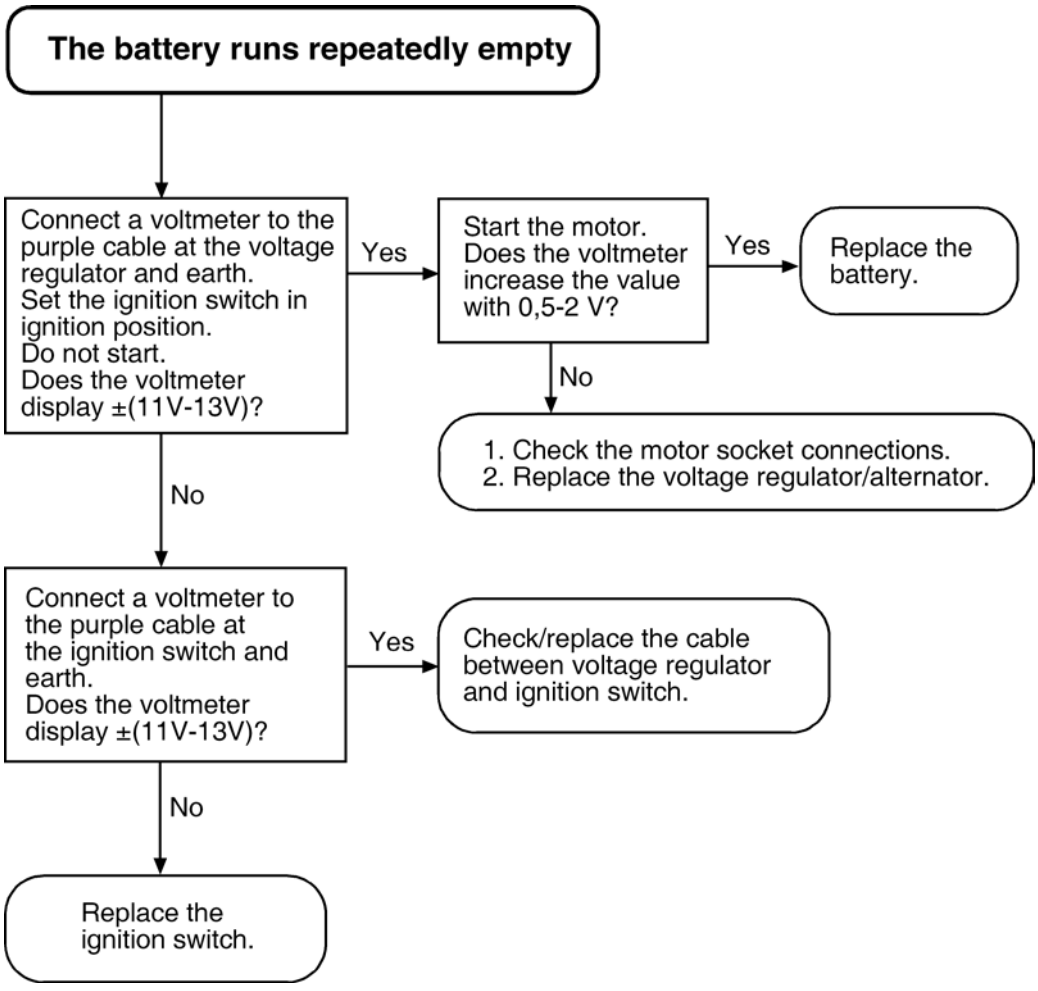
5.2.1 The starter does not rotate



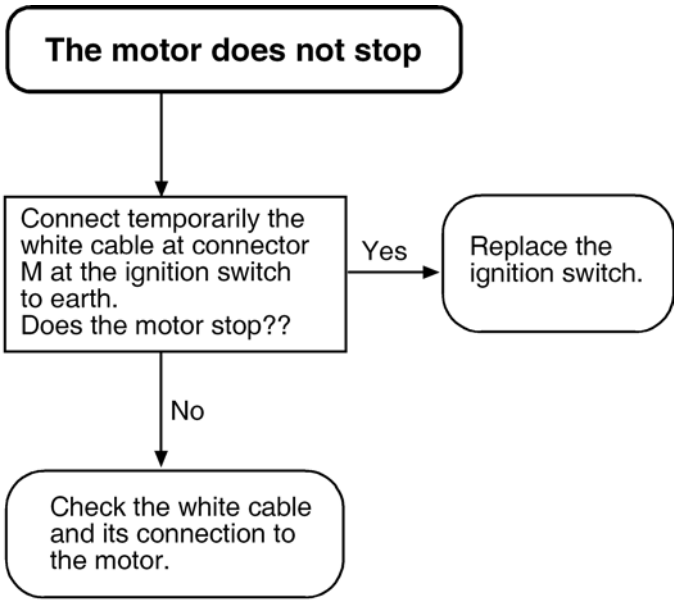
5.2.2 The starter rotate, but the motor does not start



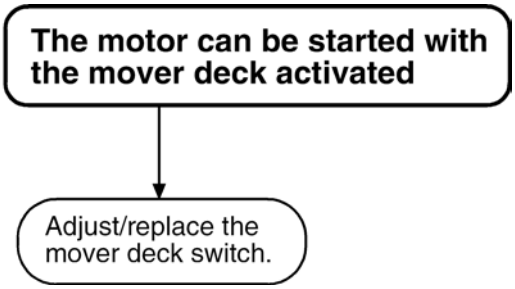
5.2.3 The battery runs repeatedly empty



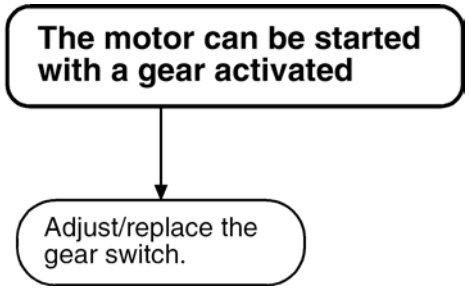
5.2.4 The motor does not stop



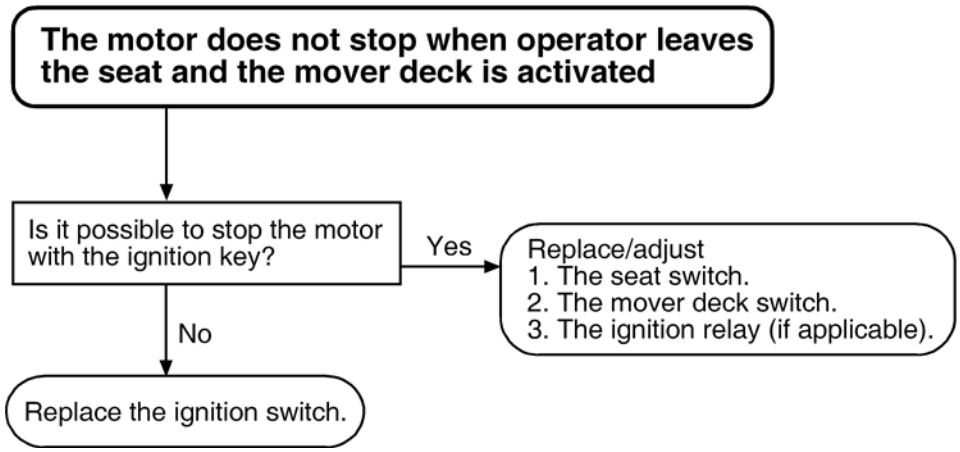
5.2.5 The motor can be started with the mover deck activated



5.2.6 The motor can be started with a gear activated



5.2.7 The motor does not stop when the operator leaves the seat and the mover deck is activated



5.3 Repair and replacements

Warning
Do not wear rings, metallic bracelet, chain round the neck or similar metal objects when working with the electrical system. It can cause short-circuit, burns and fire.

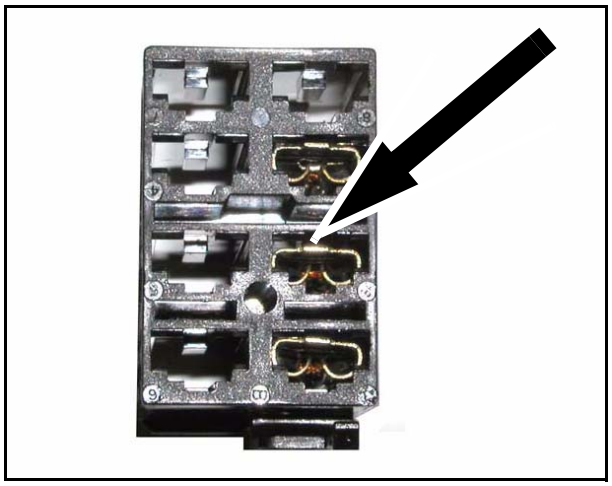
5.3.1 Connections

The machine is equipped with three kinds of connectors:
- Fixed connectors in plastic holders.
- Tab connectors
- Screw connectors

All connectors shall be kept free from contamination, corrosion and damp.

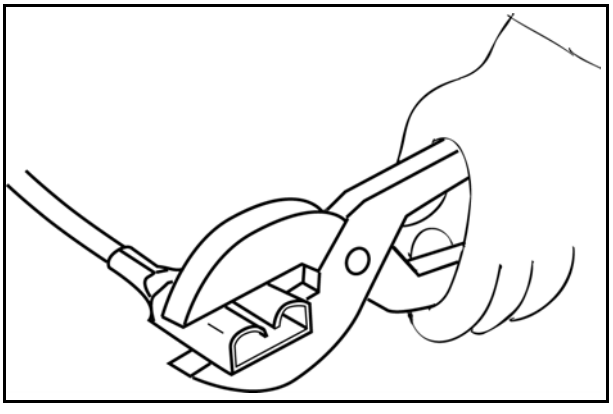
Fixed connectors in plastic holders

To remove the connectors from the plastic holder, put a small screwdriver behind the connector, hold the cable and pull out the connector.
See the figure.



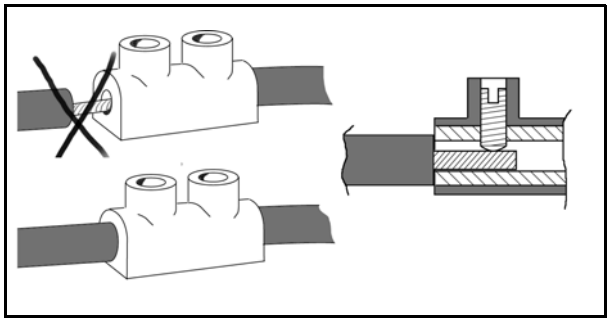
Tab connectors

To restore tab connectors if bad crimp forces occur, e.g. after a long time of use, the connector can be pinched by a pliers.
See the figure.



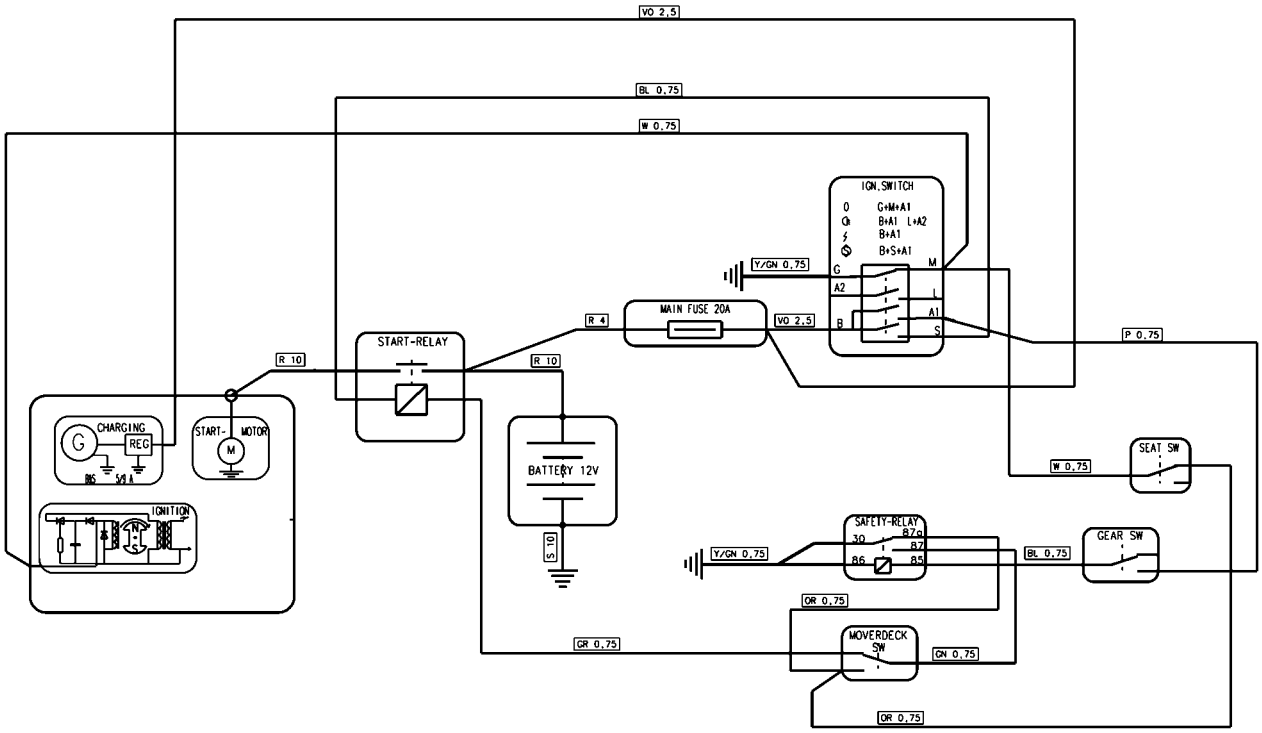
Screw connectors

When cables shall be connected into screw connectors, the cable shall be stripped off 5 mm only. No metallic conductor is allowed to be exposed outside the terminal.



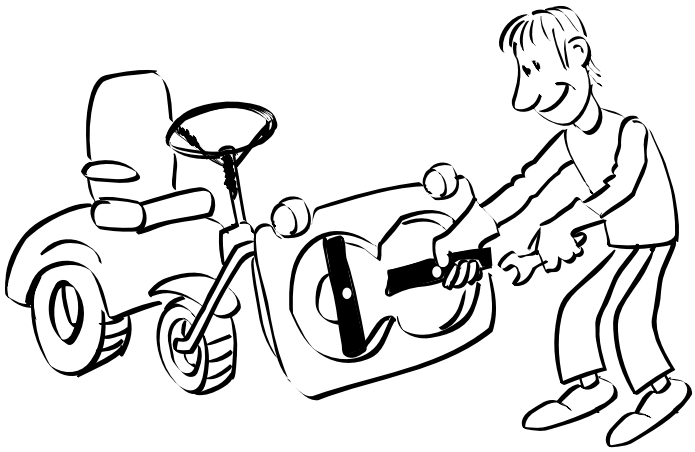
Warning!
Exposed conductors can cause short-circuit and fire.

5.3.2 Circuit diagram



6 Mower Deck

Contents in this chapter



6.1 General

The decks are equipped with two synchronised rotating blades. The tracks of adjacent blades are overlapping each other, which means that the synchronization is vital. All shafts/ pulleys are pivoted in sealed and permanent lubricated bearing boxes.

All decks are provided with a coupling to simplify the cleaning and inspection procedure. The decks are also provided with an manual adjusting device for the cutting height.

All decks are tested prior to delivery.

This chapter describes repair, replacements and adjustments of stressed parts of the mower decks.

6.1.1 General tightening torque

Unless otherwise stated, the following tightening torque are applicable for screws and nuts on the machine:

Tightening torques:

Thread	Torque
M5	5 Nm
M6	9 Nm
M8	22 Nm
M10	45 Nm

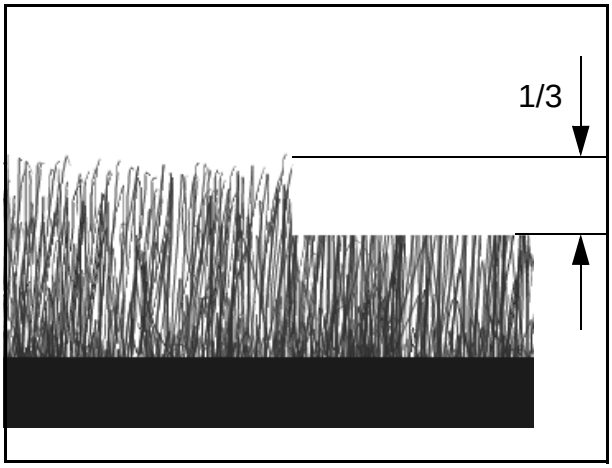
6.1 Cutting theory

6.1.1 Cutting height

The best cutting results are achieved when the when the top third of the grass is cut off.
I.e. 2/3 of the length of the grass remains.

If the grass is long and has to be cut significantly, cut twice using different cutting heights.

Do not use the lowest cutting heights if the lawn surface is uneven. This would entail a risk of the blades being damaged against the surface and the lawn's top layer of soil being removed.



6.2 Original blades

6.2.1 Why it is so important to use original blades and blade tips from the retail dealer?

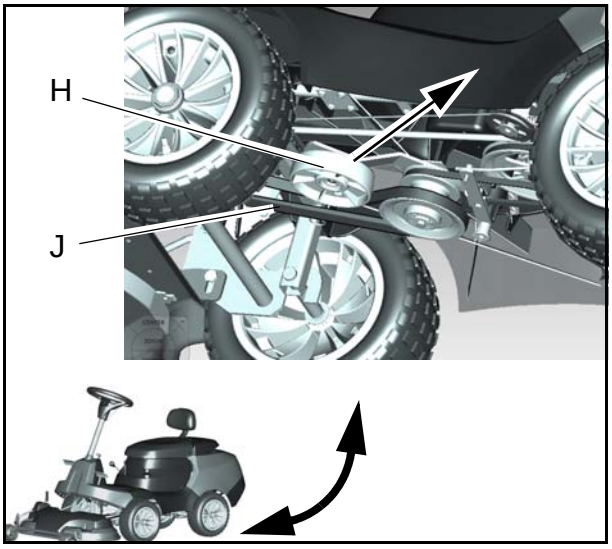
The table below shows the demands on original blades and blade tips, delivered from the retail dealer.

The table is intended to display the importance to use theoriginal blades and blade tips.

Demand	**Remarks**
No splitting of blade tips. 	Using steel balls, the manufacturer simulates what can happen if you drive over foreign objects on the lawn. The sharpening of the blades may be destroyed, but no parts are allowed to loosen or fly away.
No splitting of blades. . 	The impact test is the toughes durability test a lawn mower can be subject to. An iron pipe is placed right into the blades during operation. The blade can be deformed but it may not under any circumstances, come off or split. This test verifies that blades and other parts fulfil the high safety requirements.
Optimal balance. Minimum of noise. Minimum of vibrations. . 	Blades and blade tips from the retail dealer have exactly the same weight. Blades and blade tips from the retail dealer are optimal balanced. This guarantee a minimum of vibration and noise which gives a maximal durability of the machine. It also guarantee that the machine corresponds to the specification according to noise and vibrations.
Optimal cutting result.	Blades and blade tips from the retail dealer are optimized in the application. I.e. the blades are adapted to the shape och the cover and the number of revolutions to give the best cutting result.

6.3 Disassembly and assembly

Certain maintenance works are simplified if the cutting deck is removed from the machine.

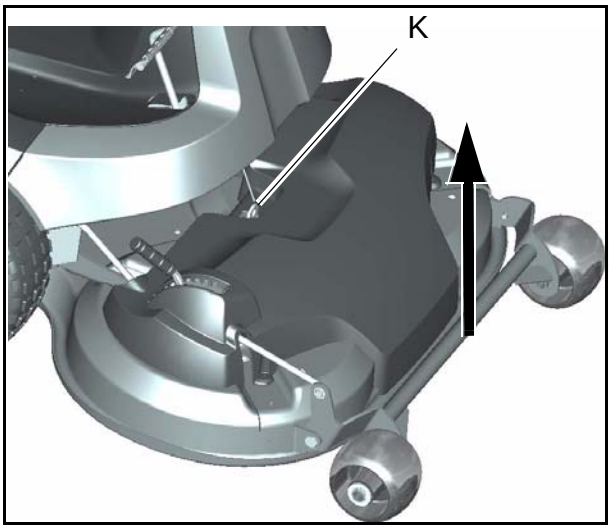


6.3.1 Disassembly

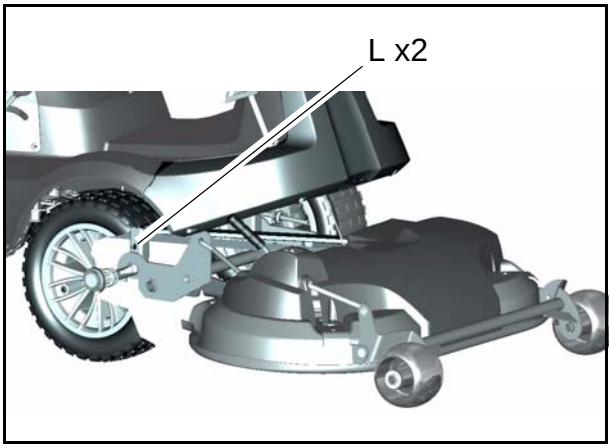
Disassemble the cutting deck as follows:

1. Set the highest cutting height.
2. Pull out the tensioning roller (H) and move the belt down (J) at the side of the tensioning roller to release the belt tension.
3. Work off the belt from the pulley.

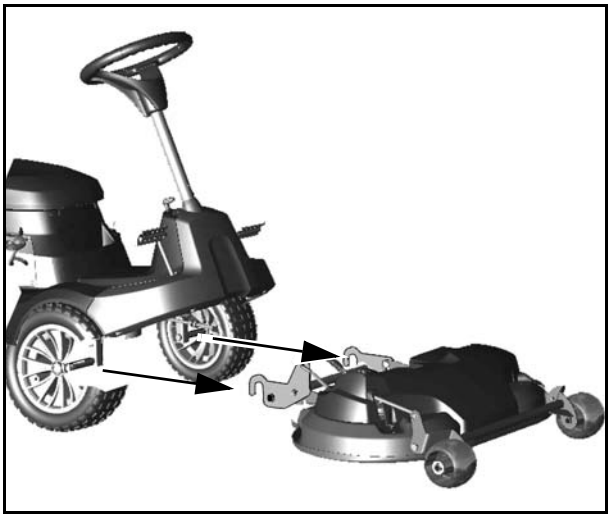
4. Lift the deck and hook off the lifting wire (K).



5. Disassemble the locking screws (L) at both sides.



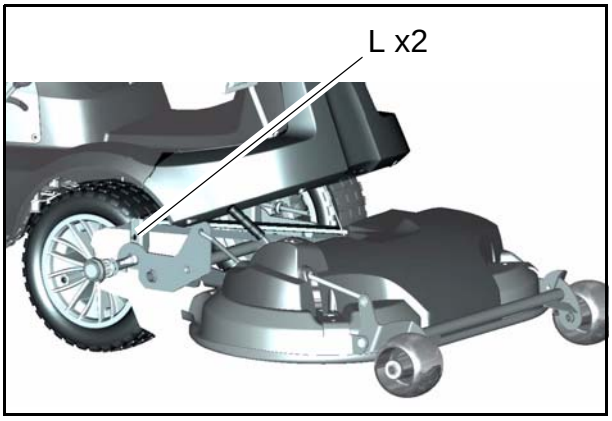
6. Hook off the deck from the front axes and take it out in the forward direction. See the figure.



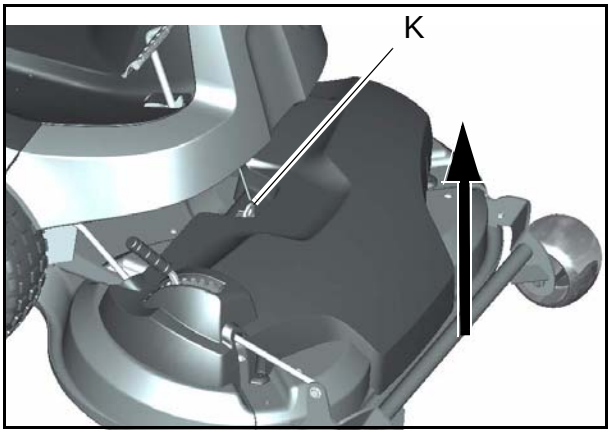
6.3.2 Assembly

Install the cutting deck as follows:

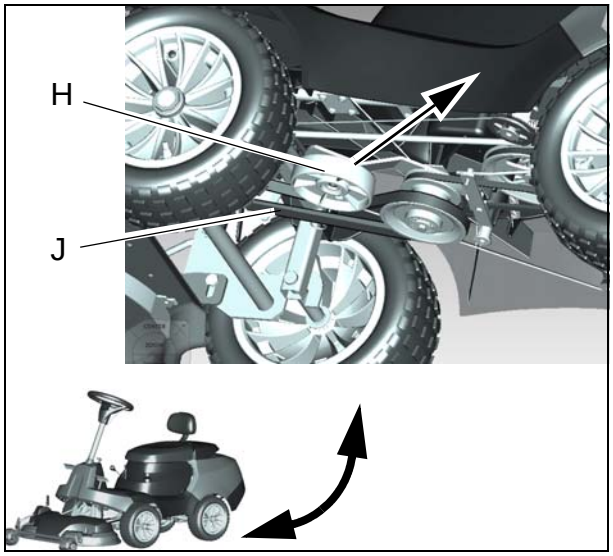
1. Hook the deck over the front axles.
2 Install the locking screws (L) on both sides.
3. Set the maximum cutting height.



4. Raise the deck and hook on the lift cable (K).



5. Install the belt (J) onto the pulley.
6. Pull out the belt idler (H) and place it on the outside of the belt so that the belt tensions.



6.3.3 Replacing blades

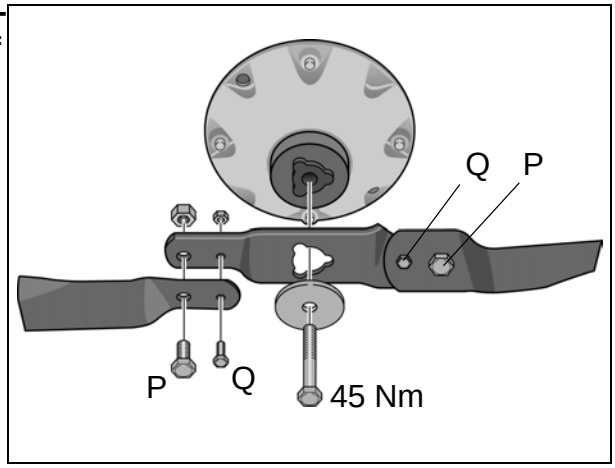
Warning!
The blades are sharp. Always wear gloves when working with the blades to avoid injury.

Warning!
When replacing, both blades on the same blade bar must be replaced to avoid imbalance.

Check that the blades are always sharp. This produces the best cutting results. The blades should be replaced once a year.

Always check the blades after a collision. If the blade system has been damaged, defective parts should be replaced.

Always use genuine spare parts. Non-genuine spare parts can entail a risk of injury, even if they fit the machine.



The blades are replaceable. When replacing, both blades on the same blade bar must be replaced to avoid imbalance.

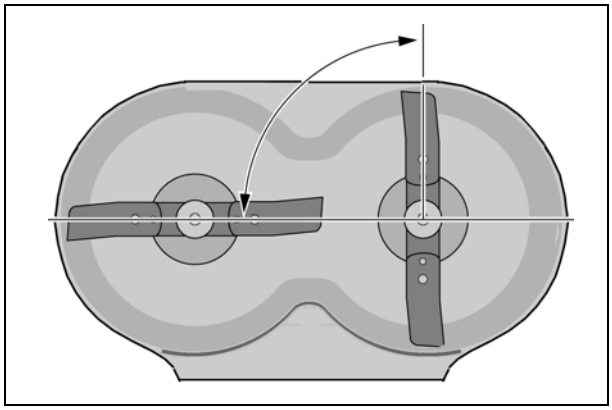
Attention!

Note the following when reassembling:
- The blades and blade bar must be installed as in the figure.
- The blades can be turned 1/3 of a turn in their mountings. Select positions so that the blades are offset 90° from each other. See below.

Tightening torque:
- Screws (P) - 45 Nm
- Shear bolts (Q) - 9.8 Nm

In the event of a collision, the shear bolts (Q) can break and the blades bend back. If this has happened, install genuine shear bolts and tighten as above.

6.3.4 Synchronising blades



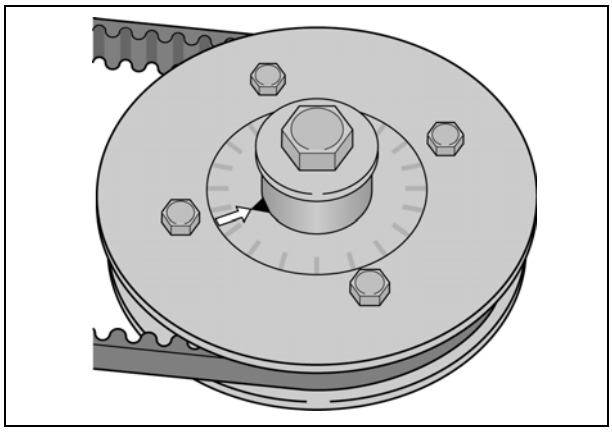
The deck has synchronised blades.

If one of the blades has struck a solid object (e.g. a stone), the synchronisation may be altered. This entails a risk of the blades colliding with each other.

Correctly synchronised blades must be offset 90° from each other. See the figure.

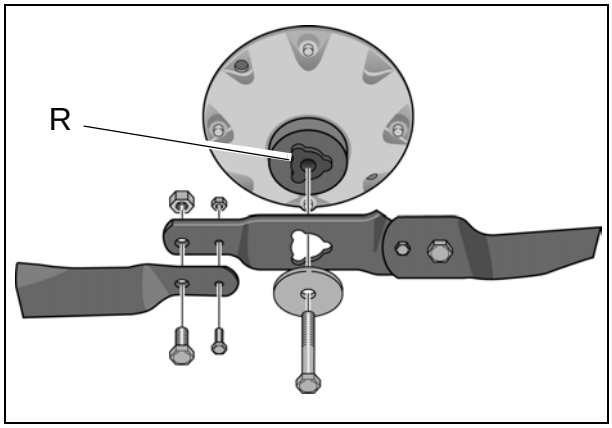
Always check synchronisation after a collision.

If the blades are not synchronised, one or more of the following faults may have occurred in the cutting deck:



The positive drive belt has slipped on the gear wheels.

Torque limiting between gear wheels and blade shaft has deployed. The arrows must be opposite each other for an intact deck. When torque limiting has deployed, the arrows are **not** opposite each other.



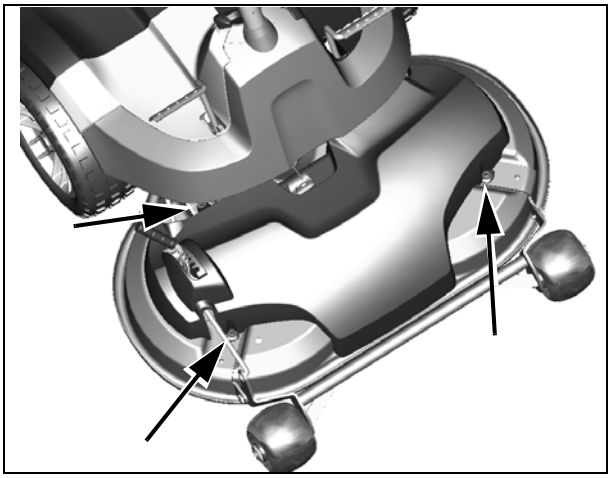
The blade member is incorrectly installed on the blade shaft. Can be installed in three different positions. See (R).

6.3.5 Safety

To reduce the risk of accidental injury in the event of a collision and to protect important parts in the cutting deck, a force limiter is integrated as follows.

- Shear bolts between blades and blade bar.
- Torque limiting between gear wheels and blade shaft.
- Possibility of positive drive belt slipping on the plastic gear wheels.

6.3.6 Replacing driving belt

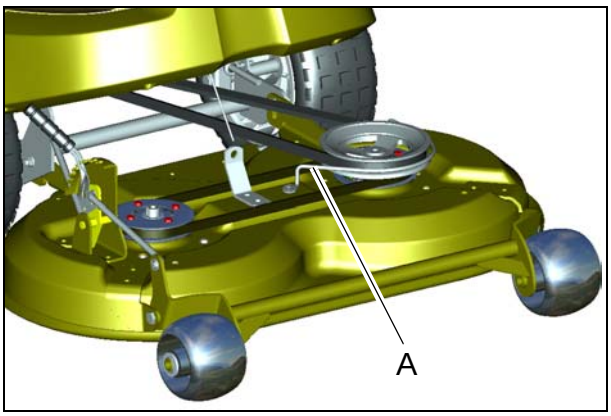


To replace the drive belt, it is not necessary to disassemble the deck from the machine.

Replace the driv belt as follows:

1. Remove the deck cover by unscrewing the 3 fastening screws. See the figure.

   The fourth screw shall not be removed.



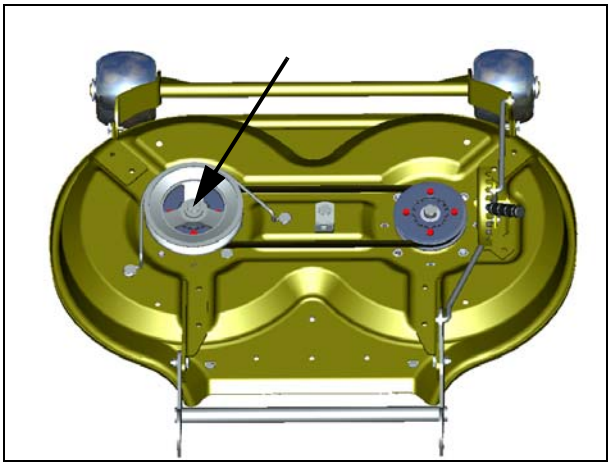
2. Remove the belt guide (A) by unscrewing its two screws.
3. Loosen the belt from the machine. See previous sections.
4. Fit the new belt and reassemble in the reverse order. See also previous sections.

6.3.7 Replacing timing belt

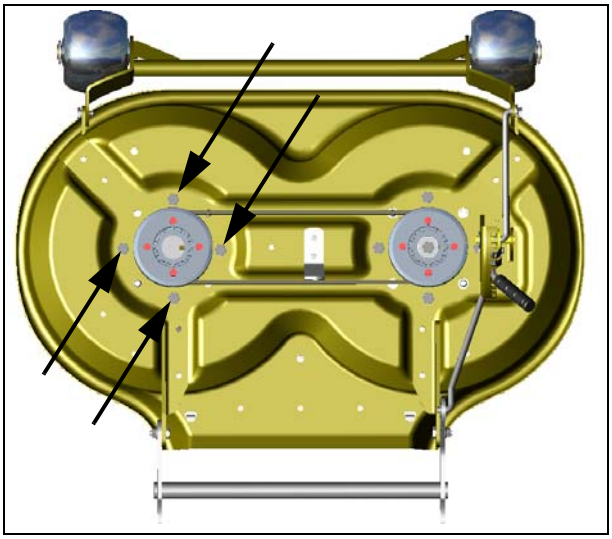
To replace the timing belt, disassemble the deck from the machine.

Replace the timing belt as follows:

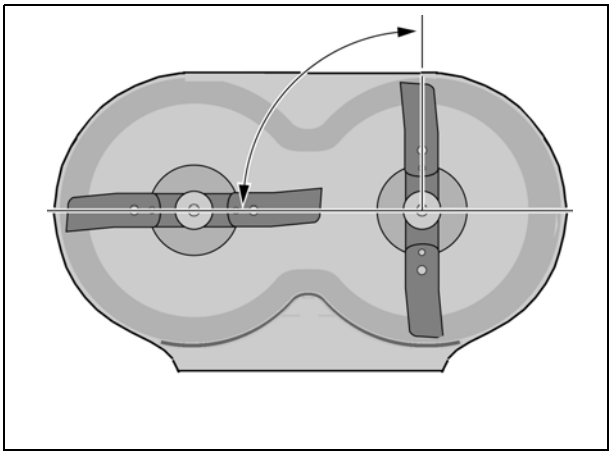
1. Disassemble the deck from the machine. See previous sections.
2. Remove the deck cover by unscrewing the 3 fastening screws. See the figure above.
3. Remove the belt guide (A) by unscrewing its two screws. See the figure above.
4. Remove the belt pulley from the left shaft by unscrewing its screw.



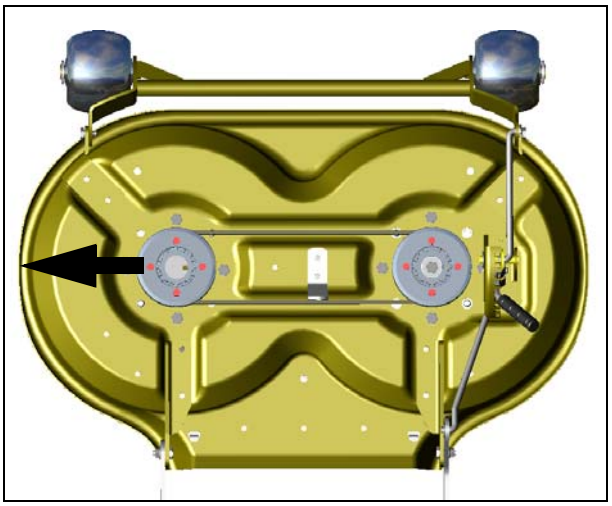
5. Slacken the belt by loosen the four bearing box screws a few turns.



6. Work off the timing belt from the pulleys and fit the new one.
   Observe the blades when fitting the new belt. Correctly synchronised blades must be offset 90° from each other. See the figure.



7. Pretension the timing belt by forcing the loose bearing box outwards and lock it in this position by tightening the four screws.

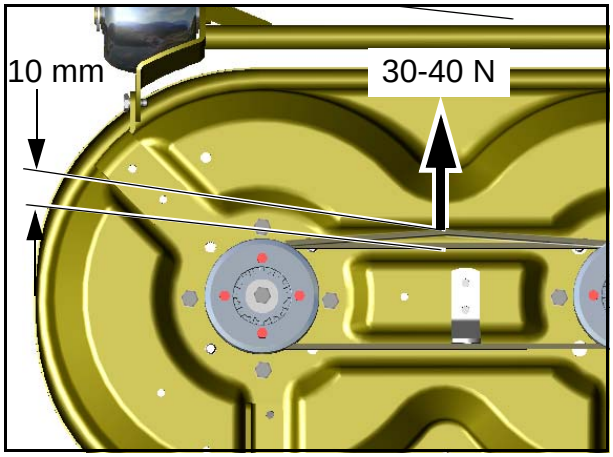


8. Check the belt tension.

   When pulling out the belt 10 mm, the force required shall be 30-40 N. See the figure.

9. Loosen the four screws and adjust again if necessary.

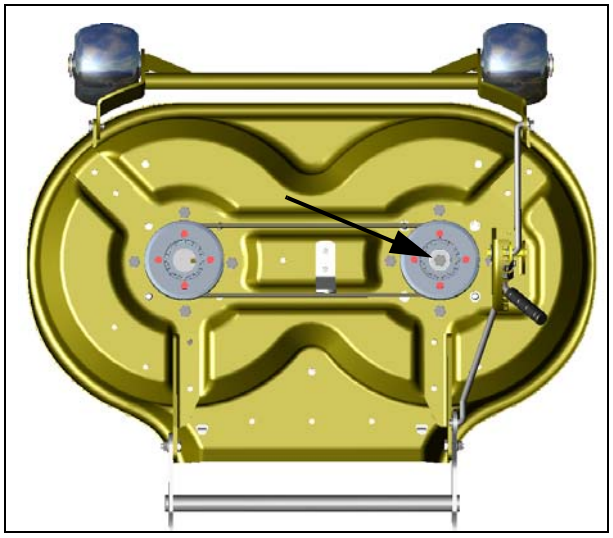
10. Assemble all parts in the reverse order.



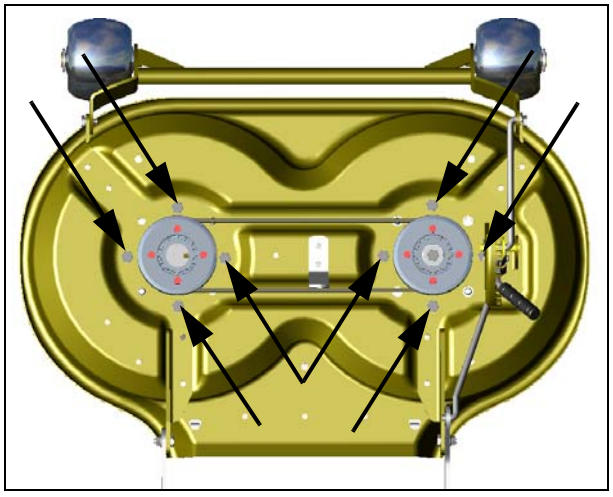
6.3.8 Replacements of pulleys and bearing boxes

Disassembly

1. Disassembly the drive belt and timing belt as described above.
2. Disassembly the blades as described above.
3. Unscrew the pulley screw at the left shaft and remove the spacer.
4. Pull up the plastic timing belt pulleys. Use an extractor if necessary.



5. Disassemble the eight screws and take out the bearing boxes.



Checks

When all parts are disassembled, check the following items.

All defective parts shall be replaced

Item	Check instruction
Bearing noise	Rotate the shafts in the bearing boxes and listen for abnormal noise and feel if any uneven resistance exists. If any abnormal noise is heard or if any uneven resistance exists shall the bearing box be replaced.
Bearing play	Force the shafts radially. No radial play shell exist
Bearing sealings	Check visually the bearing sealings. All sealings shall be intact.
Belts	Bend the belts in all directions. No cracks shall be visible.
Blades	The blades shall be sharp. No cracks are allowed.
Casing	The casings shall be intact and not show up errors any cracks.
Pulleys	Check that the arrows coincide at the timing belt pulleys. See previous in this chapter.
Painting	When the surfaces are completely dry and clean, touch up the paintwork. Use durable paint intended for metal outdoors.

Assembly

All parts shall be assembled in the reverse order.

- Note the following during the assembly:
- Lubricate all links.
- The blades shall be orrectly synchronised.

Fit the parts according to the figure.