

STIGA



WORKSHOP MANUAL



IMPORTANT NOTICE

The information contained herein is intended for Service Operations and professionals only, able to competently perform the operations described herein, using the appropriate equipment in order to safeguard security and performance of the machine.

The manufacturer is not liable for damages or injuries arising from operations performed by individuals or inadequate facilities.

- The Manufacture reserves the right to make any improvements to the product of a technical or commercial nature that may be necessary. There maybe, therefore, differences between the various series of machines and that described here, though the basic features and various repair methods will remain the same.
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GENERAL INFORMATIONS

The purpose of this manual is to assist Service Centres service, disassemble and repair machines.

The manual has left out the simplest and quickest operations that can be handled by a good mechanic, while concentrating more on specific aspects with tips and advice on the best servicing procedures.

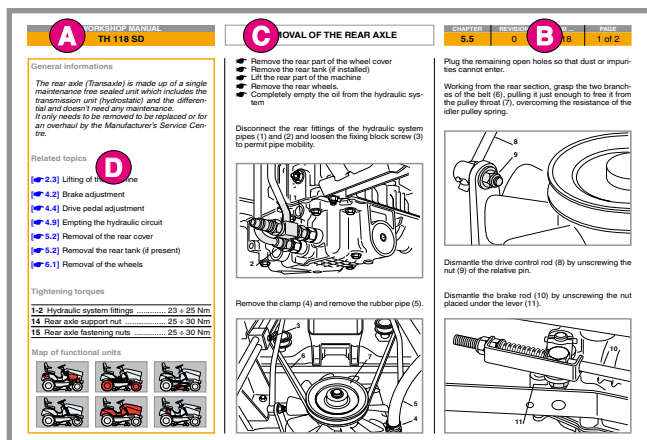
Please take time to read through this manual to acquire a basic understanding of the machine, which is necessary for working rationally without making errors or wasting time.

All problems related to the use of the machine are fully covered in the User manual.

STRUCTURE OF THE MANUAL

The manual is divided into sections and chapters. Each page of this manual states the following information:

A) Machines or series of machines to which the contents of the chapter are applicable.



HOW TO USE THE MANUAL

- B) Identification and number of the page based on the following criteria:
- the first field indicates the section and chapter;
 - the second field indicates the revision index;
 - the third field indicates the chapter validity start date, i.e. the year of manufacture of the machine;
 - the fourth field indicates the page number and total number of pages dedicated to the subject.
- C) Chapter title.
- D) General information, references to other chapters in the manual, technical information related to the topic, and buttons with links to the machine operating units map can be found in the left column on each initial page.

SECTIONS OF THE MANUAL

The content of the manual is divided into sections which correspond to the various subjects and the different types of servicing.

1. Rules and procedures for Service Centres

This chapter covers all the main aspects of the relationship between the manufacturer and the service centres.

A close collaboration between the manufacturer and the service centres is conclusive for solving problems in the most effective way as well as maintaining an image of efficiency and reliability.

Compliance with these brief and simple guidelines will facilitate this task and prevent general misunderstandings and time-wasting for both the manufacturer and the service centre.

2. General regulations

This chapter covers the main aspects of a servicing procedure and the general rules for guaranteeing a successful service which protects the environment and respects the safety of both the serviceman and the user of the apparatus.

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3. Maintenance

This chapter covers the main aspects of a servicing procedure.

A specific chapter is dedicated to a quick troubleshooting guide on the most frequent questions and the chapter references providing information on the interventions required to resolve the same.

4. Adjustments and tuning

This chapter deals with the adjustments to be made to remedy the more frequent performance failures and are usually resolved by quick checks and tunings.

5. Removal of external parts and main assemblies

For doing more difficult jobs, greater accessibility may be required. This can be done by taking the unit concerned off and working at the bench, or by removing the cover or other external parts.

Whether or not this will be useful is at the discretion of the mechanic's experience.

6. Repairs

This chapter deals with all the more complex work connected with the replacement or repair of malfunctioning or worn parts.

The descriptions must follow a logical sequence and can include operations not specifically connected to a particular type of repair.

In this case, careful reading of the entire procedure can help you omit all those operations not connected with the case in hand without, however, overlooking anything that may be necessary.

7. Electrical system

This chapter deals with the problems and checks connected with the electrical system.

All work can be done using a tester without having to use special equipment.

The electrical diagrams can be useful to you for

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understanding how the system functions and to facilitate the pinpointing of any problems.

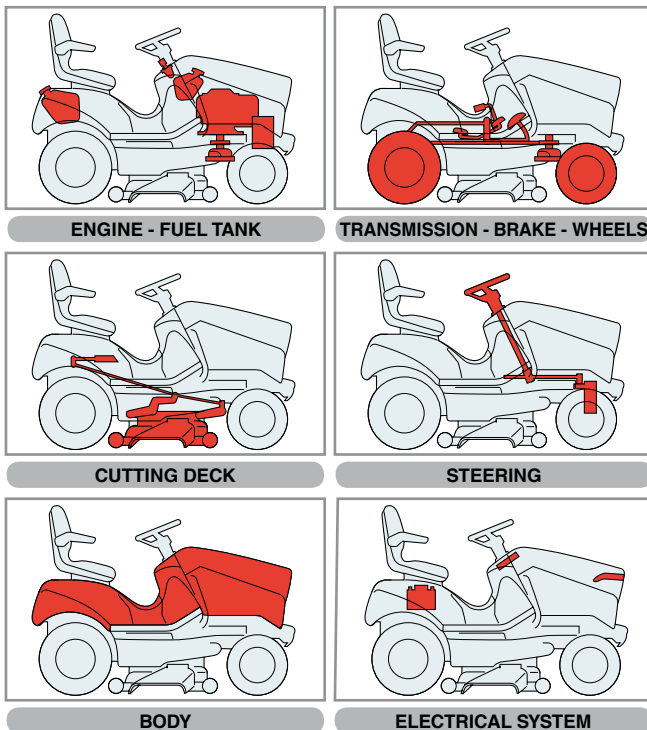
8. Hydraulic system

It allows a better understanding of the hydraulic system and its components and provides instructions on faults that could occur.

9. Technical specifications

This chapter summarises all the main information regarding the machine.

FUNCTIONAL UNITS MAP



The map is a search tool that provides instant access to all information concerning machine operational unit or element. Identification is simplified by the use of icons resembling the various units, each of which is linked to a table of contents that lists all related topics.

SYMBOLS

In the manual some symbols are present. They are used to draw the attention of the operator, reminding him to perform the interventions with the necessary attention and caution.

- Indicates operations that should be carried out with utmost care to avoid impairing the functionality and safety of the machine.
- Indicates operations that should be carried out with utmost care to avoid injury to operators.
- Highlights all those operations that require different working methods depending on the type of machine, subsequent modifications and the accessories fitted.
- Indicates cross-reference to other parts of the manual, followed by the number of the relevant chapter, paragraph or sub-paragraph.

TERMINOLOGY AND ABBREVIATIONS

Some paragraphs are preceded by a definition that highlights their importance:

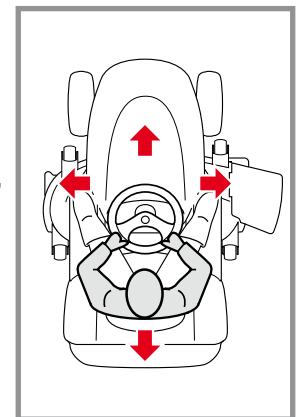
NOTE General reference for the correct maintenance execution and methods..

IMPORTANT Specific procedures or information necessary to avoid damage to the machine or equipment.

WARNING! Non-observance will result in the risk of injury to oneself or others.

DANGER! Non-observance will result in the risk of serious injury or death to oneself or others.

Whenever reference is made to a position on the machine "front", "back", "left" or "right" side, this refers to the positions of the seated operator.



- The following abbreviations are used in this manual
- Dx / Sx = Right / LeftV
 - Min / Max = Minimum / Maximum
 - Chap. = Chapter
 - PTO = Power Take Off
 - HST = Hydrostatic Transmission

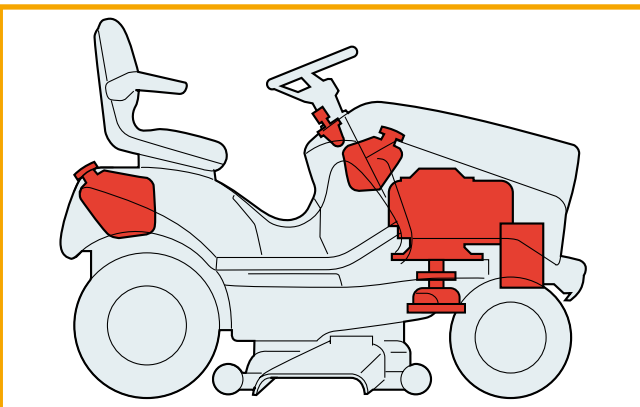
General informations

Different fittings are foreseen for this machine which can imply the use of different engines within the same.

This manual only describes the operations relating to the application of the machine engine; reference to the engine's Manufacturer's Manual is recommended for information regarding servicing, disassembly and replacement of components.

Related topics

[👉 1.1] Identification of components



RELATED TOPICS:

Adjustments and tuning

Removal of external parts and main assemblies

- Removal of front hood [👉 5.1]
- Removal of the engine [👉 5.4]
- Removal the rear tank [👉 5.8]

Repairs

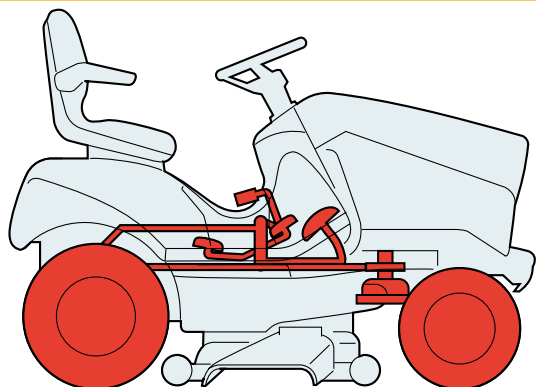
- Replacement of the accelerator and adjustment of the carburettor .. [👉 6.8]

General informations

The use of outsourced third-party hydrostatic drive units is foreseen on this machine.
This manual only describes the operations relating to the application of the machine units; reference to the drive unit's Manufacturer's Manual is recommended for information regarding servicing, disassembly and replacement of components.

Related topics

[👉 1.1] Identification of components



RELATED TOPICS:

Adjustments and tuning

Brake adjustment	[👉 4.2]
Drive belt adjustment	[👉 4.3]
Drive pedal adjustment	[👉 4.4]
Changing oil in the hydraulic circuit	[👉 4.9]

Removal of external parts and main assemblies

Removal of the rear axle	[👉 5.5]
Removal of the front axle	[👉 5.6]

Repairs

Replacement of tyres and wheels	[👉 6.1]
Replacement of front wheel bearings	[👉 6.2]
Replacement of the drive belt	[👉 6.4]
Replacement of the small wheels for the drive belt	[👉 6.5]
Replacement of the pipes of the hydraulic system	[👉 6.9]

Info

Guide to understanding the hydraulic system	[👉 8.1]
Checking the hydraulic system	[👉 8.2]

General informations

The terms "Cutting deck" or "Equipment" refer to the cutting-means assembly, connected to the machine PTO by means of a belt.

Related topics

RELATED TOPICS:

Adjustments and tuning

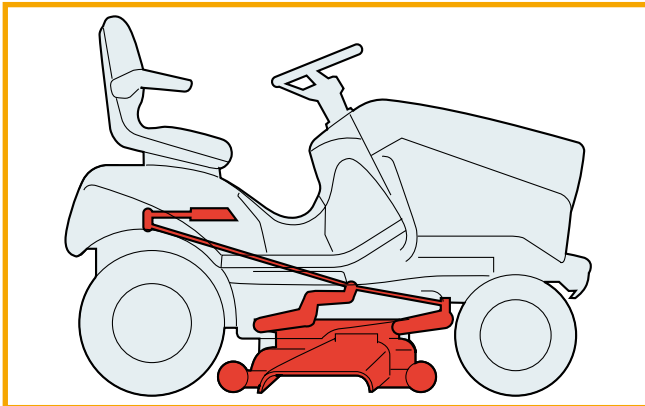
- Adjusting the engagement and checking the blade brake [👉 4.1]
- Aligning the cutting deck [👉 4.5]
- Checking blades alignment [👉 4.7]
- Removing, sharpening and balancing the blades [👉 4.8]

Removal of external parts and main assemblies

- Removal of the cutting deck [👉 5.7]

Repairs

- Replacement of the blades control belt [👉 6.6]
- Replacement of the supports and shafts of the blades [👉 6.7]



General informations

Related topics

RELATED TOPICS:

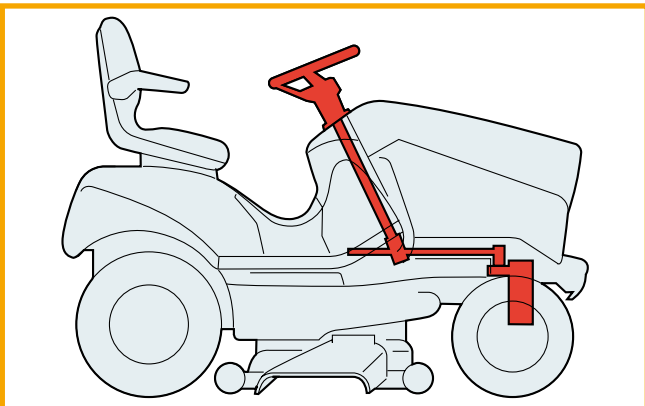
Adjustments and tuning

Steering allowance adjustment [👉 4.6]

Removal of external parts and main assemblies

Repairs

Dismantling of the steering components [👉 6.3]



General informations

Different outfittings are foreseen for this machine which can imply the use of different bodywork designs.

The operations described herein are applicable to all versions, except for instructions provided for each specific outfitting, recognisable according to the type of dashboard installed on the machine.

Related topics

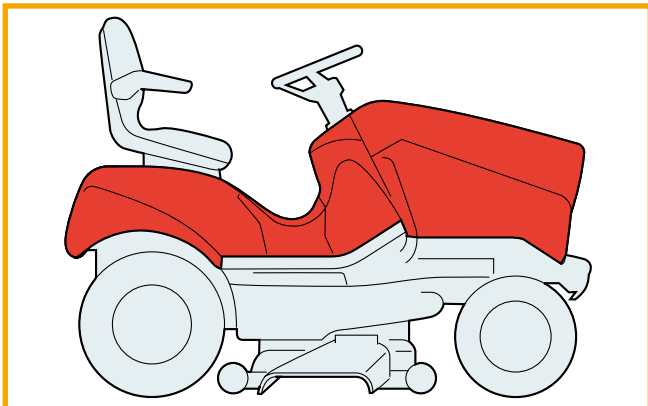
RELATED TOPICS:

Adjustments and tuning

Removal of external parts and main assemblies

- Removal of front hood [👉 5.1]
- Removal of the wheel cover [👉 5.2]
- Removal of the dashboard and front cover [👉 5.3]

Repairs



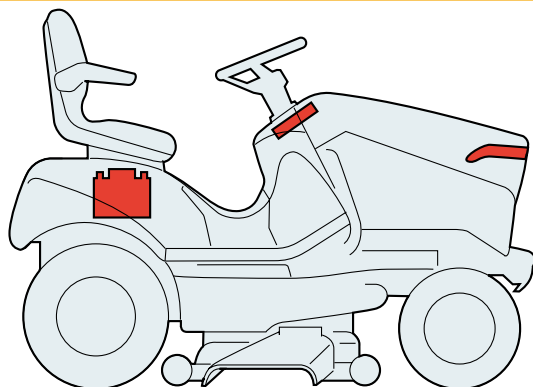
General informations

Related topics

RELATED TOPICS:

Information and Verifications

Troubleshooting of the electrical system [👉 7.1]
 Cutting in of the safety devices [👉 7.2]
 Safety microswitches operation check [👉 7.3]
 Terminal board supply check [👉 7.4]
 Carburettor solenoid valve operation check [👉 7.5]
 Starter relay operation check [👉 7.6]
 Electromagnetic clutch operation check [👉 7.7]
 Recharge circuit check [👉 7.8]
 Maintenance of the sealed battery [👉 7.9]
 Fitting safety microswitches [👉 7.10]
 Electrical diagrams [👉 7.11]



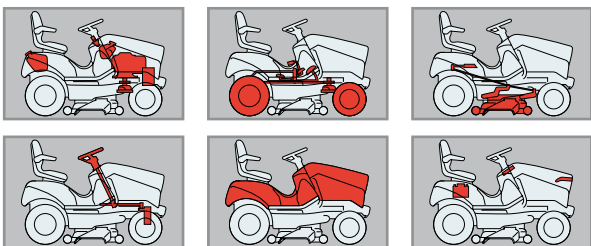
General informations

This chapter covers all the main aspects of the relationship between the Manufacturer and the Service Centres.

A close collaboration between the Manufacturer and the Service Centres is conclusive for solving problems in the most effective way as well as maintaining an image of efficiency and reliability. Compliance with these brief and simple guidelines will facilitate this task and prevent general misunderstandings and time-wasting for both the manufacturer and the service centre.

Related topics

Map of functional units

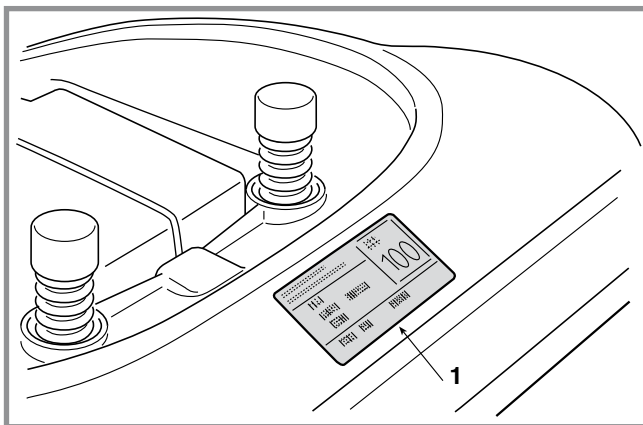


A) Identification

1) Machine

Each machine has a label attached (1) under the driver's seat which shows the technical specifications, the model and the serial number..

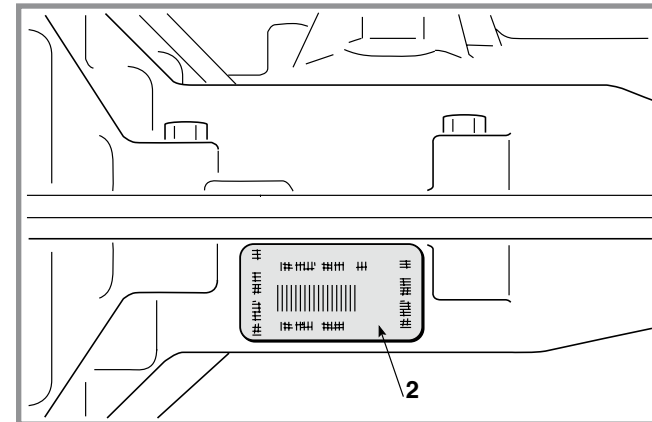
The model and serial number must be shown on each repair sheet when requests are made under guarantee, and are indispensable for spare part orders.



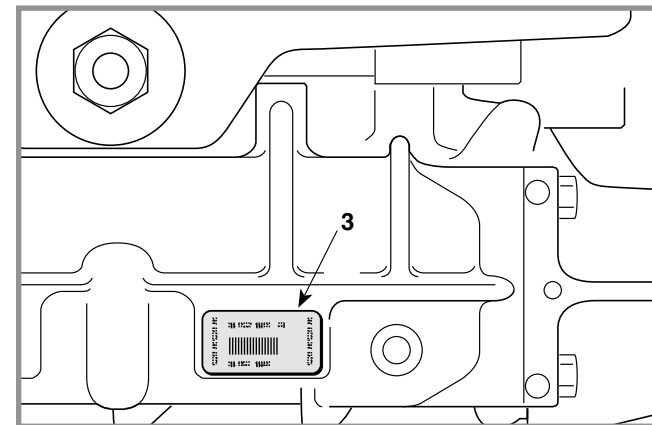
2) Transmission

The machine is fitted with two hydrostatic engine block transmission units, the front is equipped with a hydraulic distributor, and a rear one which includes the differential and rear axle.

These units are made by another manufacturer according to precise technical specifications which differentiate them from similar items by this same Manufacturer.



The serial number on the label (2 – rear unit) or (3 – front unit) clearly identifies the product and its specifications. This number must always be quoted when requesting spare parts or any information from the Manufacturer.



3) Engine

The engine is made to precise technical specifications which differentiate it from similar items by this same Manufacturer.

The serial number on the label clearly identifies the product and its specifications. This number must always be quoted when requesting spare parts or any information from the Manufacturer.

B) Guarantee validity

The guarantee is supplied under the terms and the limits of the contractual relations in being. As far as the engine and the transmission unit are concerned, the conditions given by their respective manufacturers apply.

C) Service repairs after guarantee period

The Service Centre has to make out a report containing the machine's serial number, a summary of the problem, the repairs carried out and any spare parts used for each repair done on the machine.

A copy of this report must be retained to be made available to the Manufacturer together with the parts in case of any subsequent disputes with Customers.

D) Fault notification

The Manufacturer welcomes any notifications of faults that recur with particular frequency. It gives the opportunity for a careful inspection of the problem and the implementation of corrective action at production level.

Similarly, the Manufacturer will notify of any faults discovered on the machines produced, with recommendations for the most suitable procedures for their remedy.

E) Spare parts request


When requesting spare parts, the code number must be given, referring to the exploded charts for the year of manufacture, shown on the identification label.

General informations

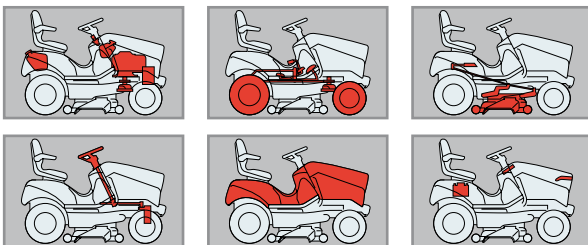
This chapter covers the main aspects of a servicing procedure and the general rules for guaranteeing a successful service which respects the safety of the machine.

Related topics

 **2.2** Tools

 **7.3** Safety microswitches operation check

Map of functional units



SAFETY REGULATIONS

A) Qualification of operators

All maintenance, disassembly and repairs must be carried out by expert mechanics who are familiar with all the accident prevention and safety regulations after reading through the procedures in this manual.

B) Safety measures

All the machines are manufactured in accordance with the strict European safety regulations in force.

To maintain these levels of safety in the longer term, the Service Centres should work to this end by making appropriate checks every time there is the chance to do so.

Particularly, every time there is work done on the machine the Service Centre should:

1) check:

- that safety microswitches are working correctly;
- that the casings and protection covers have not been removed;
- that the labels with instructions or provisions have not been removed or have become illegible (these form an integral part of the safety system).

2) they should also:

- restore to proper working order any safety devices which have been manipulated or removed;
- reattach inefficient, damaged or missing casings and protection covers;
- replace illegible labels;

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- not endorse any repair or modification on the machine or the engine which results in a change in performance or use that is incorrect or different from the purpose for which it was designed and approved;
- warn the Customer that the failure to comply with the above points results in the automatic annulment of the Guarantee and the Manufacturer declines all responsibility, as also shown in the Instruction Booklet.

C) Precautions during servicing

The operations described in this manual do not entail particularly hazardous situations besides the normal hazard related to mechanical operations and that can be avoided by taking the necessary care and attention normally required for this type of work.

As well as following the usual accident prevention regulations that apply to most repair shops, we recommend you:

- taking out the ignition key before beginning any repair work.
- protect hands with suitable working gloves, especially when working near the cutting unit;
- check that you do not cause accidental petrol leaks or other losses;
- do not smoke when working on the tank or when handling petrol;
- do not inhale oil or petrol fumes;
- clean up all traces of spilt petrol immediately;
- test the engine in a well-ventilated environment or where there are adequate exhaust fume extraction systems;
- do not pollute the environment with oil, petrol or other waste and dispose of all waste in accordance with the laws in force;

- ensure that other persons cannot accidentally carry out actions that may physically endanger those working on the machine.

D) Necessary equipment

All the operations can be carried out with the tools normally used in a good garage.

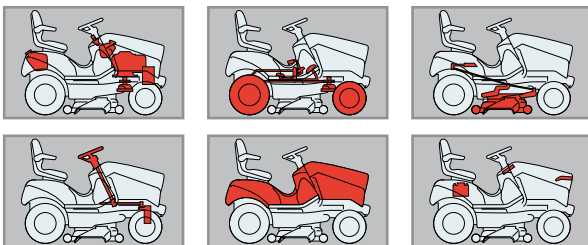
Some operations require special equipment and tools.

General informations

This chapter covers the main aspects of a servicing procedure and the general rules for guaranteeing a successful service which respects the safety of the machine.

Related topics

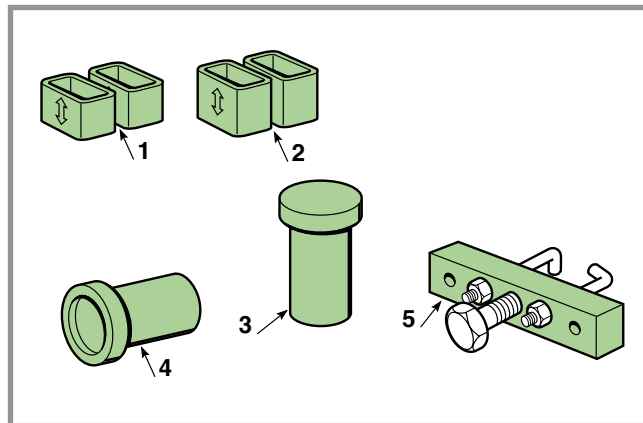
Map of functional units



All work can be carried out using the tools normally available from a good workshop. However, it is advisable to have a set of special tools (1 ÷ 8).

These tools (1 ÷ 8) are to be used whenever is given in the text.

1. Blocks H = 26 mm for adjusting the cutting deck
2. Blocks H = 32 mm for adjusting the cutting deck
3. Bush for assembly of blades bearings
4. Stopper for assembly of wheel bearings
5. Pulley extractor



LIFTING AND STABILISING

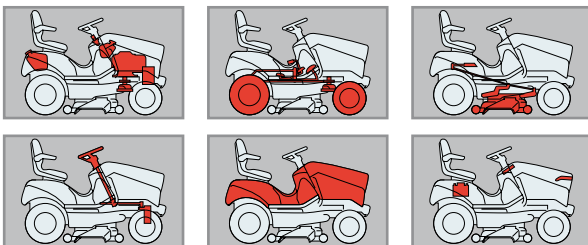
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General informations

This chapter covers the main aspects of a servicing procedure and the general rules for guaranteeing a successful service which respects the safety of the machine.

Related topics

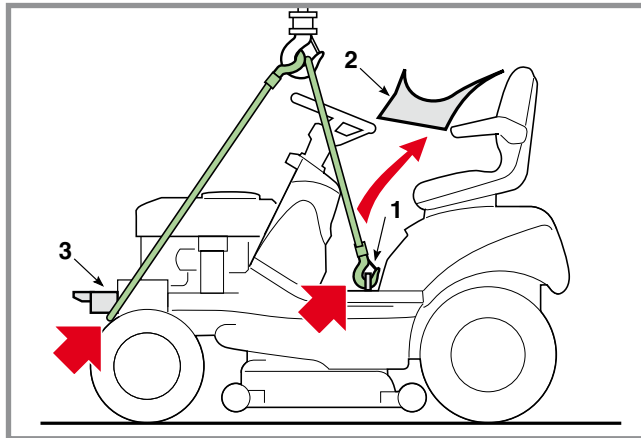
Map of functional units



A) Lifting

There are four points on the machine that are to be used when lifting it:

- 2 central eyelets (1) accessible from the inspection hatch (2), to support the weight of the machine;
- 2 front extensions (3) on the frame beams, to balance the machine during lifting.

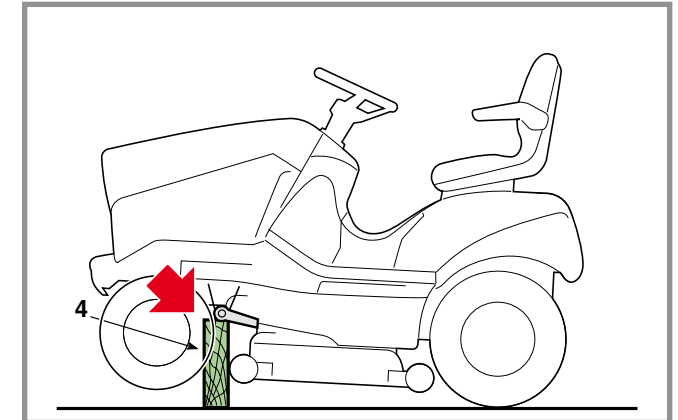


! DANGER! *Lifting of the machine should be carried out using a hoist and adequately strong cables equipped with safety hooks and only hooked onto the previously mentioned four points.*

! DANGER! *To balance the weight of the machine, the two front cables should be about 30% longer than those attached to the central eyelets.*

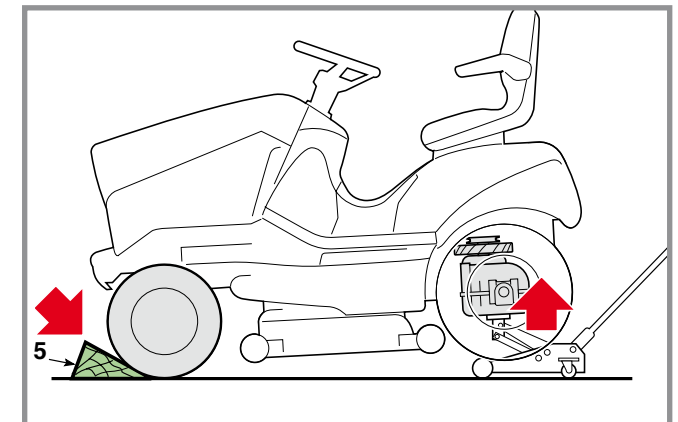
B) Stabilising the front part

With the parking brake is engaged, the front part of the machine can be lifted using a wooden block of about 100 x 270 x 550 mm (4) placed under the front axle of the cutting deck lifting levers.

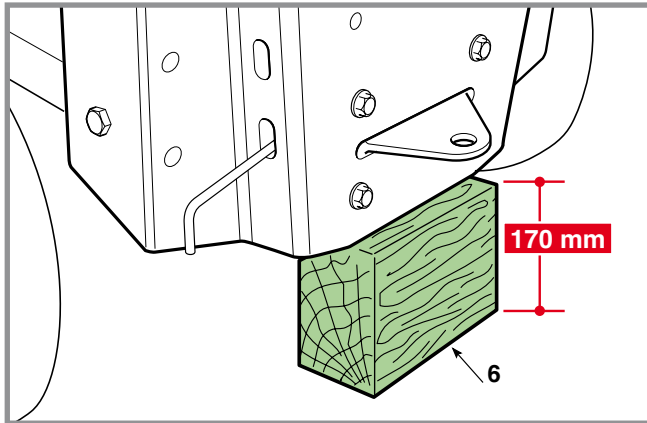
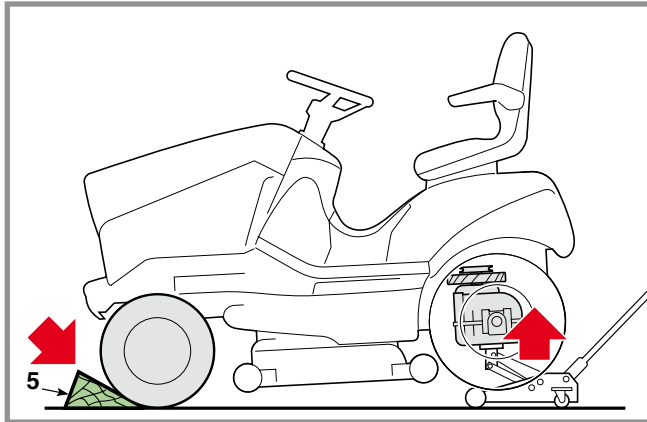


C) Stabilising the rear part

Position two suitably sized wedges (5) in front of the front wheels to prevent all uncontrolled movement of the machine.



Position a jack under the transmission unit and lift it enough to insert a 170 mm high block (6) under the lower section of the chassis, then release the jack.



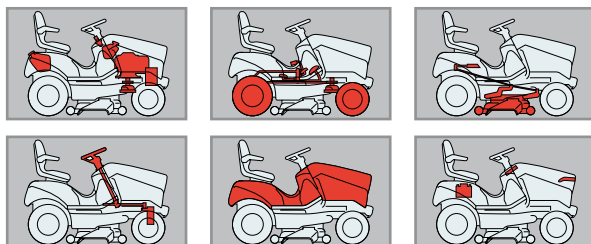
! **DANGER!** Always ensure that the machine is stable before starting work in its lifted position.

General informations

This chapter covers the main aspects of a servicing procedure and the general rules for guaranteeing a successful service which respects the safety of the machine.

Related topics

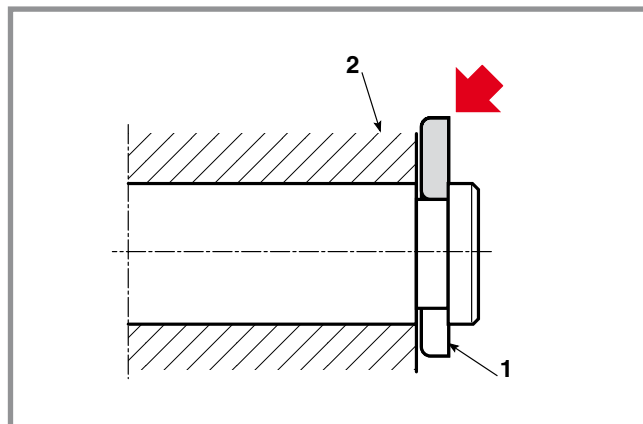
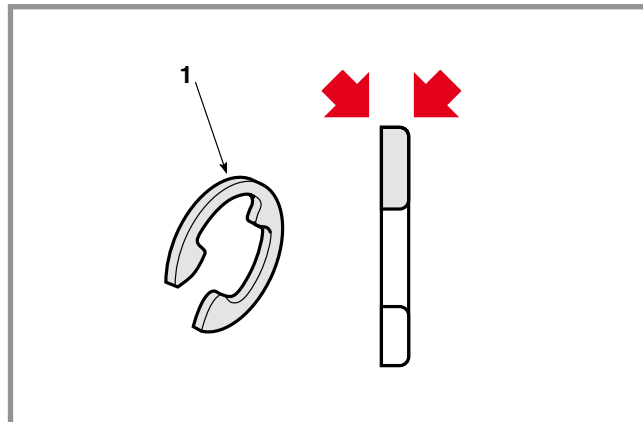
Map of functional units



A) Fitting snap rings

One side of the “Benzing” snap rings (1) has a rounded edge and the other a sharp edge.

For maximum grip the rounded part needs to be facing towards the element to be held (2), with the sharp edges on the outside.

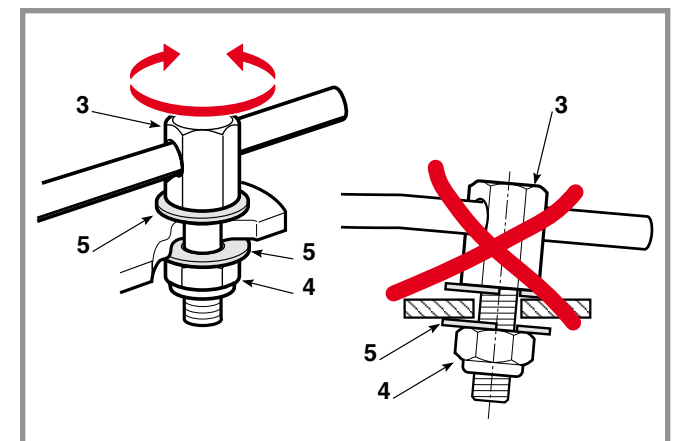
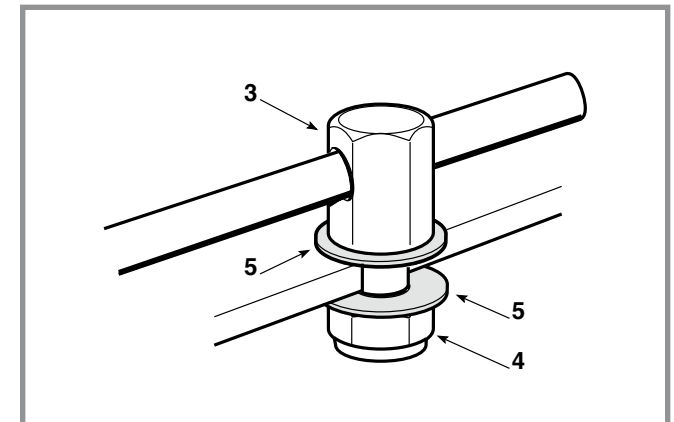


B) Joint pivot pins

There are a large number of pivot pins, usually connected to rods, that need to be able to move in various directions.

A typical situation has the pin (3) fixed by a self-locking nut (4) with two anti-friction washers (5) in between the pin (3) and the support element, and between this and the nut (4).

Since these are joints, the nut must never be tightened completely but only so much that it can ensure the free rotational movement of the pin on its axis without, however, creating excessive free play which could result in the parts concerned becoming misaligned and failing to work correctly.

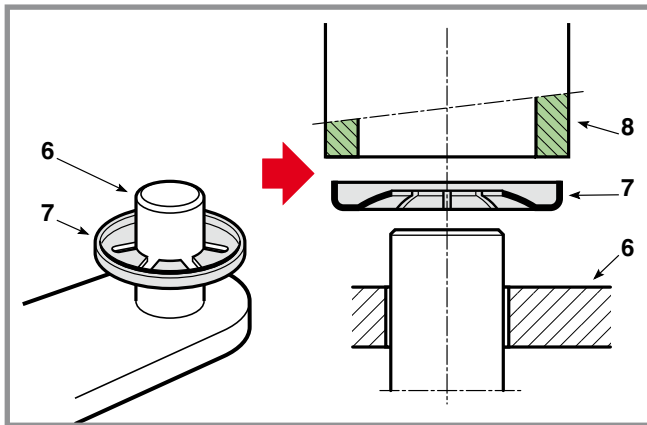


C) Crown fasteners

Some pin ends (6) are secured by crown fasteners (7). During dismantling, these fasteners are always damaged and lose their hold, so they should never be reused.

On assembly, make sure it is inserted in the right direction and push the fastener (7) onto the pin using a pipe or socket spanner (8) with the right diameter, so that it can be fitted without deforming the fastener "crown".

IMPORTANT A deformed fastener should always be replaced.

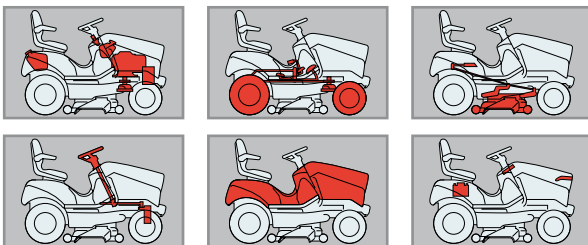


General informations

In questo capitolo vengono trattati i criteri di intervento per la manutenzione ordinaria.

Related topics

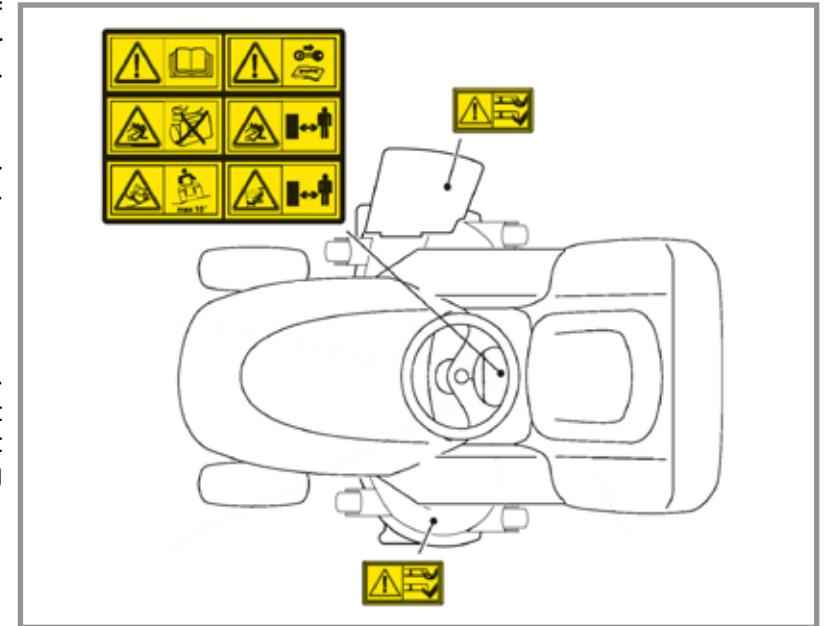
Map of functional units



The Instruction Handbook has a number of operations to be carried out by the Customer for a minimum of basic maintenance, and other operations not always within his capacity.

For this reason the Service Centre should undertake to keep the machine in perfect working order in two ways:

- Tuning the machine whenever possible.
- Proposing a regular maintenance programme to the Customer to be carried out at prearranged intervals (for example, at the end of the summer or prior to a long period of inactivity).



A) Occasional tuning

- Check working order of safety devices and renew illegible or missing labels, following the layout below
- Check tyre pressures
- Clean air filter
- Check engine oil level
- Check for fuel leaks
- Aligning the cutting deck
- Sharpen and balance the blades and check the condition of the hubs
- Check for wear in the belts
- Check the blade brake engagement
- Grease front wheels lever joint pins and bushes
- Check tightness of engine screws
- Check all those items indicated in the engine manual
- Check the oil level of the transmission
- Check for leaks in the hydraulic system

B) Routine maintenance

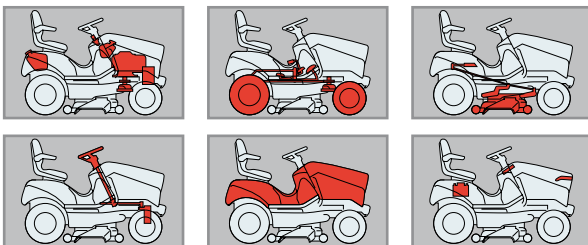
- All work carried out in section a), plus:
- Check battery charge
- Check tension of belts
- Adjust brake
- Adjust blade engagement
- Adjust blades brake
- Check steering allowance
- General lubrication
- Check and/or replace the transmission oil
- Clean away grass cuttings and wash exterior
- Clean and wash inside cutting deck
- Touching up of any damaged paint

General informations


This chapter helps achieve a rapid identification and solution to the most recurrent problems, classified according to the operating unit in question.

Related topics

Map of functional units



1. Engine and Tank

Problem	Probable cause	Solution	
Starter motor does not run	Low battery	Recharge	[7.9]
	No starter relay contact	Check	[7.6]
	Faulty connector and/or starter motor failure	Check and/or replace	[*]
The starter motor runs but the engine does not start	Blown spark plug electrode	Replace the spark plugs	[*]
	Uncertain connections	Check the connectors	-
	Coil failure	Check and/or replace	[*]
	The carburettor solenoid valve does not open	Check	[7.5]
The engine runs irregularly and/or lacks power	No fuel is pumped to the carburettor	Check the filter, fuel pump (if applicable) and the carburettor	[*]
	Faulty ignition	Check the spark plugs and ignition system	[*]
Dense and/or blue exhaust fumes	Low fuel level in the tank	Top up	-
	Dirty or old fuel	Empty the fuel tank and add fresh fuel	-
	Clogged carburettor filter	Check and clean	[*]
Black exhaust fumes	Excessively oily carburetion	Check the starter and command cable	[*]
Engine overheating	Spark plugs with inadequate heat rating	Check	[*]
	Carburetion problems	Check the carburettor	[*]
	Insufficient oil level	Check and top up	[*]
	Clogged suction system	Check and clean the air filter and the suction pipe	[*]
	Dirty cooling flaps	Clean	[*]
Engine idling speed is too high or too low.	Broken cooling fan	Replace	[*]
	Incorrect cable adjustment	Adjust	[6.8]
Abnormal noise and vibrations	Loose bolts and screws	Check and tighten to the prescribed values	[5.4]

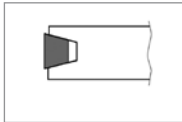
[*] Check the engine Manufacturer's Manual

Important informations

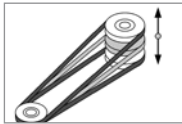
Characteristics of the original belts

The standard belts on the market have different characteristics compared to the requirements of the original spare belts, supplied by the authorised dealer. The latter are designed and manufactured in close cooperation with the belt supplier and the machine manufacturer.

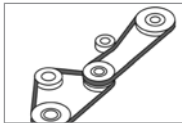
Here are the reasons why it is important to choose an original belt, useful when making such decisions..



a) Adhesion on the pulley. The belt rests with the sides inclined against the walls of the pulley. There must be a gap between the belt and the bottom of the groove.




b) Floating pulley on cutting equipment. The original Power Take Off (PTO) belt is designed to work even if the pulleys move up and down and tilt at the same time.



c) Curvature in two directions. All the original belts, which work with tensioning arms acting on the external side, are equipped with reinforcements. The reinforcement is designed specifically for these specific cases..

2. Transmission - Brakes - Wheels

Problem	Probable cause	Solution	
The machine moves slowly, loses power or doesn't move at all	Slack belt	Adjust	[4.3]
	Worn or oily belt	Replace	[6.4]
	Broken pulleys	Replace	[5.4] [*]
	The brake is not adjusted correctly	Check and adjust	[4.2]
	Hydrostatic unit failure	Check the Manufacturer's Instruction Manual.	[*]
The machine will not move in either direction	Pulley splines broken	Replace	[*]
	Hydrostatic unit failure	Check the Manufacturer's Instruction Manual.	[*]
The machine does not reach the foreseen speed in forward drive	Incorrect pedal adjustment	Adjust	[4.4]
Uncertain or ineffective braking	The brake is not adjusted correctly	Check and adjust	[4.2]
Hydrostatic unit overheating	Insufficient oil level	Top up	[*]
	Clogged oil filter	Clean and/or replace	[*]
Abnormal noise and vibrations	Slack or worn belt	Check and/or replace	[6.4]
	Irregular fan rotation	Check the condition of the fan, that it is securely fastened in place and that nothing interferes with the rotation movement	[*]
	Incorrect positioning of the by-pass valve	Check and adjust	[*]
	Loose bolts and screws	Check and tighten to the prescribed values	[5.5] [5.6]
The machine moves in neutral gear	Incorrect micro-switch adjustment	Adjust	[4.4]
	Slack or worn linkage system	Check and/or replace	[4.4]
Pushing the machine by hand is difficult	By-pass partially enabled	Check	[*]
The parking brake does not stop the machine on a 30% slope	Incorrect brake adjustment	Adjust	[4.2]
Excessive clearance on the front wheels	Worn bearings	Replace	[6.2]

[*] Check the transmission unit Manufacturer's Instruction Manual.

Important informations

Characteristics of the original blades

The original blades have design, material and processing characteristics optimised for use on the equipment for which they were designed; these characteristics are not present in so-called “compatible” spare parts.

Here are the reasons why it is important to choose an original blade, useful when making such decisions.



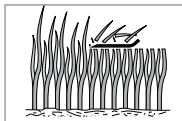
a) No breakage of the blade ends. Using steel balls, the manufacturer simulates what can happen when mowing over any foreign

bodies on the lawn. This can ruin the blade edge, but no component can come loose, fall off or be hurled away.



b) No breakage of the blades. The impact test is the most severe durability test that any lawnmower can be subjected to. An iron tube is


placed exactly inside the blades when the mower is running. The blade may deform but it will never, under any circumstances, fall off or break. This test verifies that blades and other components meet the high safety requirements.




c) Excellent cutting result. The blades and blade ends supplied by the authorised dealer are optimised for the application for which

they are intended. In short, this means that the blades are suitable for the shape of the casing and to the number of revolutions to provide the best possible cutting result.

3. Cutting deck

Problem	Probable cause	Solution	
The blades do not engage or do not stop promptly within 5 seconds when they are disengaged	Slack belt	Adjust the engagement	[4.1]
	Incorrect adjustment of the engagement spring	Adjust the engagement	[4.1]
	Electromagnetic engagement problems	Check and/or replace	[7.7]
Uneven mowing	Cutting deck not parallel to the ground	Check the tyre pressures Align the cutting deck with the ground	[6.1] [4.5]
	Blades cutting badly	Check their condition and that they are well sharpened	[4.8]
	Misaligned blades	Check the blade shafts and flanges	[4.7]
Abnormal noise or vibrations	Loose joint bolts and screws	Check and adjust	[5.7]
	Pulleys or guide pulleys are worn and do not rotate correctly	Check and/or replace	-

4. Steering

Problem	Probable cause	Solution	
Excessive clearance on the steering wheel	Worn pinion and crown teeth	Adjust and/or replace	[4.6] [6.3]
The machine does not maintain a straight line when the steering wheel is straight	Incorrect tie-rod adjustment	Adjust	[4.6]

General informations


The blades are driven by the engine by means of a "V" belt and are engaged by an electromagnetic clutch.

After a certain amount of use the belt can become longer which can result in malfunctioning, i.e.:

- belt slipping = belt stretched
- difficulty in disengaging, with the blades continuing to run = belt shortened

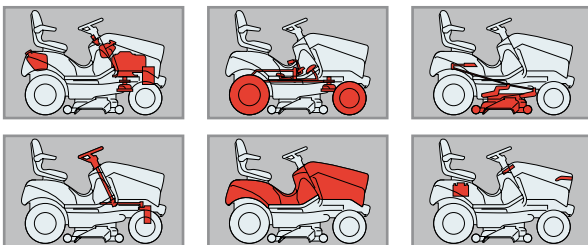
In both cases the stretcher needs to be adjusted. Disengaging the blades causes the cutting in of a brake, incorporated in the electromagnetic clutch, whose task is to stop the blades from rotating within five seconds.

Related topics

 **6.6** Replacement of the blades control belt

 **7.7** Electromagnetic clutch check

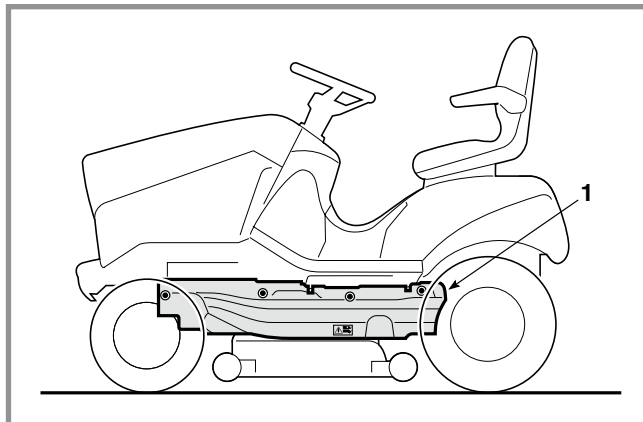
Map of functional units



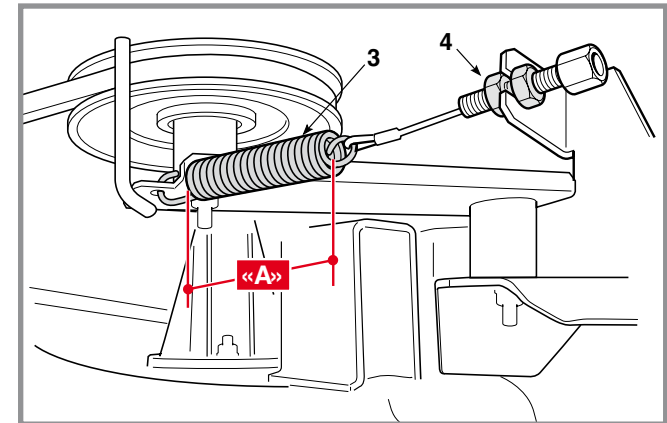
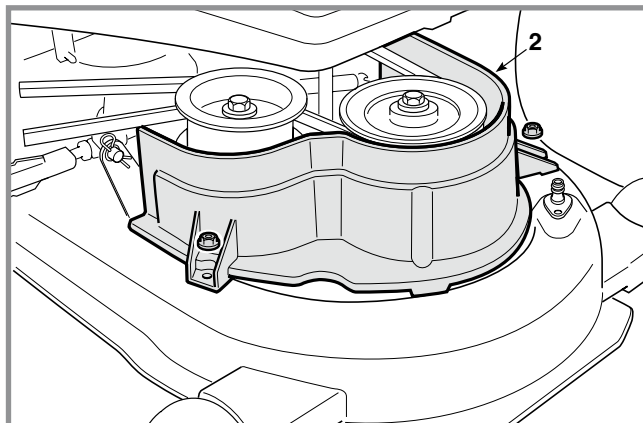
A) Adjusting blade engagement

Lower the cutting deck completely.

Identify the fastening screws and remove the left external safety guard (1).



Also remove the left internal safety guard (2) to obtain easier access.



Measure the length "A" of the spring (3) and adjust the nuts (4) until you obtain the measurements:

$$A = 82-84 \text{ mm}$$

measured on the outside of the coils.

On completing the adjustments, fully tighten the nuts.

Always reassemble the internal (2) and external (1) side safety guards.

B) Checking the blade brake



WARNING! Correct operation of the brake, which must ensure that the blades stop within 5 seconds from disengagement; longer stopping times do not comply with the safety standards.


If the blades do not stop within 5 seconds from disengagement, appropriate checks must be made to the electrical system and the clutch must be replaced if no result is achieved.

BRAKE ADJUSTMENT

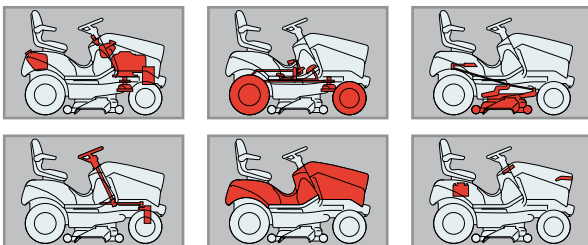
General informations

Reduced braking power is corrected by adjusting the spring on the brake rod, which is accessible by removing the rear right wheel.

Related topics

 5.5] Removal of the rear axle

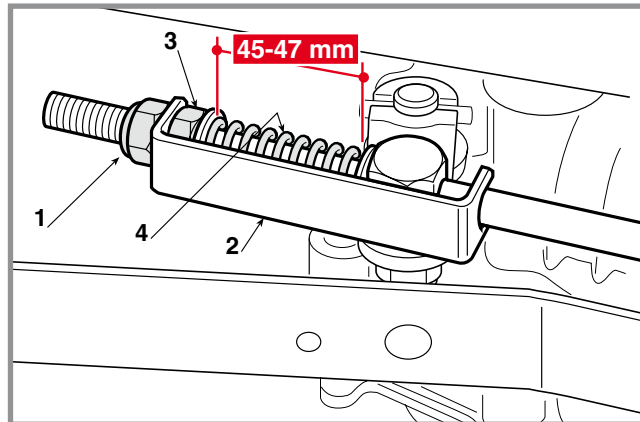
Map of functional units




The adjustment is to be made with the parking brake engaged and consists of altering the length of the spring (4) to the best measurement. The braking capacity is increased by screwing the nut (3) down on the rod (and thus shortening the length of the spring).

Loosen the nut (1) which holds on the bracket (2) and turn the nut (3) until the length of the spring (4) is 45 ÷ 47 mm, measured from the inside of the washers.

When the adjustment has been made, tighten the nut (1).

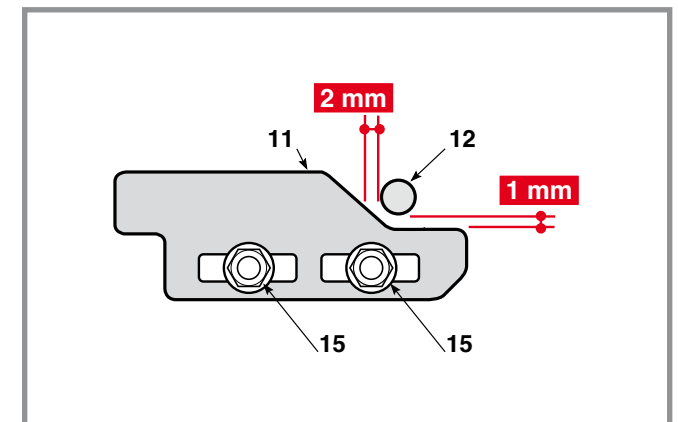
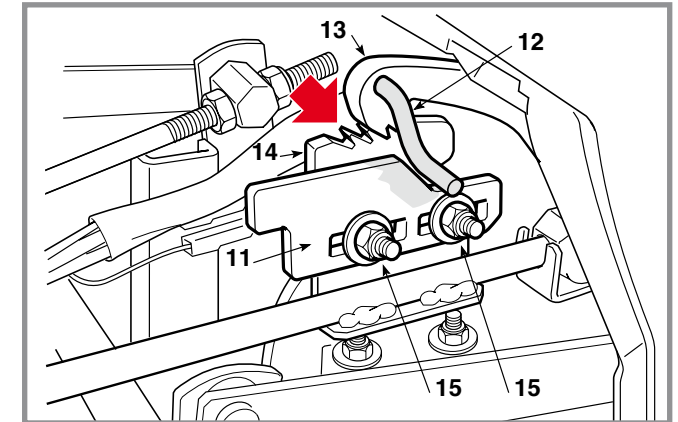


NOTE Never go under these amounts to avoid overloading the brake unit.

 **WARNING!** When the adjustments have been made, the parking brake should prevent the machine from moving on a slope of 30% (16°) with the driver in position.

If braking is still poor or unsteady even after making the adjustment, you cannot make any further adjustments from the outside. Therefore you need to dismantle the whole rear axle of the machine and contact one of the manufacturer's Service Centres.

To adjust the release cam (11) position to the pin (12), position the pawl (13) on any tooth on the rack (14), loosen the nuts (15) and adjust the cam (11) to achieve the condition indicated in the illustration.



General informations

If it seems that the forward drive is not working properly after a long period of use or after replacing the belt, this may be caused by a change in the length of the belt.

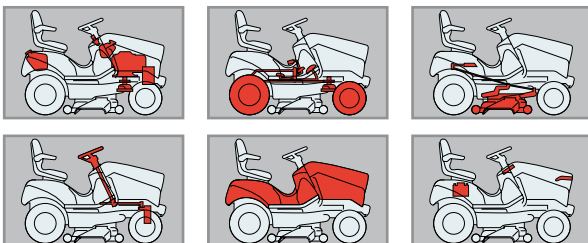
- *A loose belt reduces output from the drive and limits forward movement power;*
- *a belt which is too tight increases noise and results in jerky movements or tipping up when engaging the drive.*

In both cases the stretcher needs to be adjusted.

Related topics

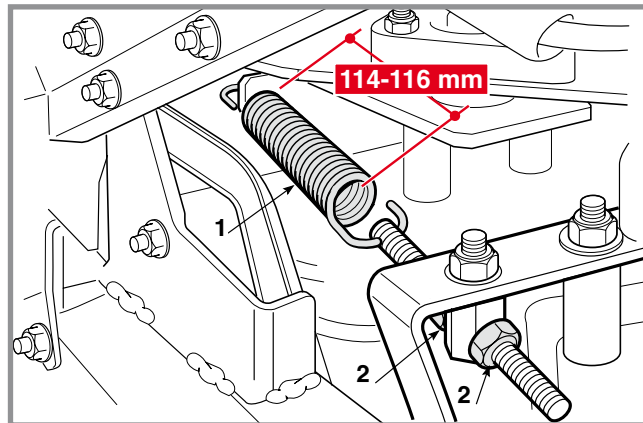
[\[🔧 6.4\]](#) Replacement of the drive belt

Map of functional units



The tensioner is to the right of the steering unit and accessible from the front hood, turning the wheels fully to the right.

Adjust the tension of the spring (1) by suitable working on the nuts (2) until a measure of 114 ÷ 116 mm is obtained, measured on the outside of the turns with a gauge, with the transmission controls in neutral.



When the adjustment has been made, tighten the nuts (2).

DRIVE PEDAL ADJUSTMENT

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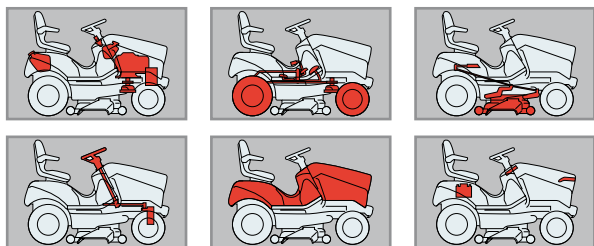
General informations

This operation should be carried out every time the rear axle, pedal or control rod is removed, in order to get the correct travel for the pedal and to reach the envisaged speeds both forwards and in reverse.

Related topics

 **7.10** Fitting safety microswitches

Map of functional units

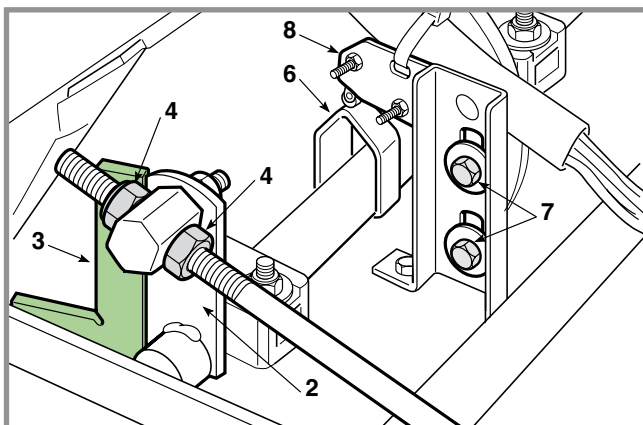
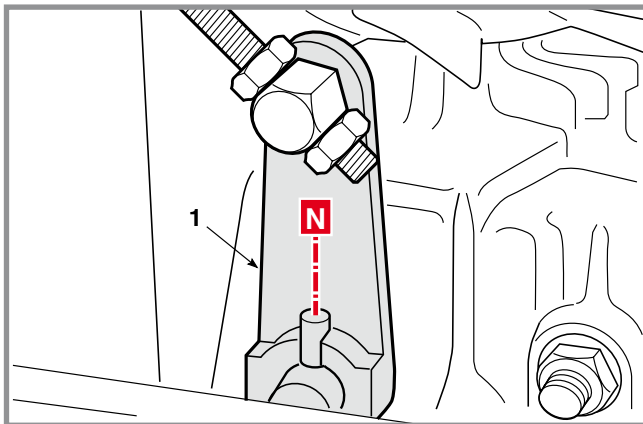


A) Adjusting the pedal in the “neutral” position

Adjustment of the pedal position must be carried out with the hydraulic unit lever in the “neutral” position (1); this position «N» can be easily recognised as it is forced to stay there by a fastening sphere.


Open the inspection hatch which is placed at the base of the seat; the drive control pedal is in its ideal position when the lever (1) of the hydrostatic unit is in “neutral”, and the internal lever (2) on the pedal axle is perfectly vertical.

This is obtained using a bracket (3), by working on



the nuts (4) until reaching the desired situation. Taking care not to accidentally change the position of the lever (1) during the adjustment.

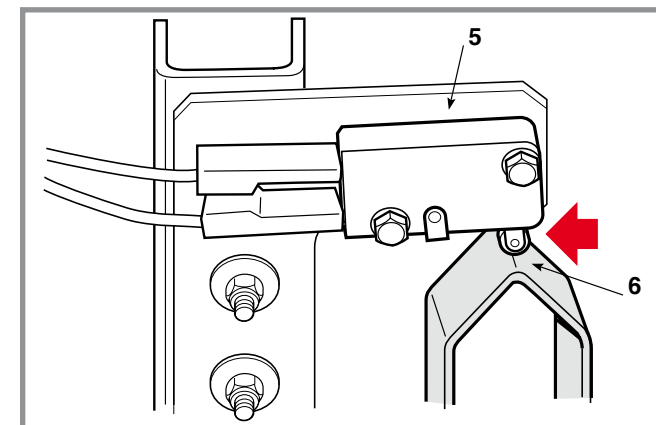
B) Adjusting the “neutral” position of the microswitch

 **IMPORTANT** *This is a very important adjustment for the correct operation of the safety devices for starting and stopping of the machine during work.*

The neutral position «N» is signalled by the micro-switch (5) of the cam (6), accessible from the inspection hatch which is placed at the base of the seat.

After checking that the adjustment “A” has been correctly made, make sure that the pedal is released and in neutral “N” then loosen the screws (7) that fasten the microswitch support (8), until the roller is in line with the tip of the cam, so that the microswitch remains activated.

By moving the pedal to the forward gear and neutral position, you should hear the click of the button at each gear change before the wheels start moving.



ALIGNING THE CUTTING DECK

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General informations

Lowering of the cutting deck is controlled by a linkage activated by the lever and is moved by two connecting rods at the front; the descent is limited by a cam that returns the deck to the preset height.

In order to get a good cut it is essential that the cutting deck is parallel with the ground crosswise, and slightly lower at the front.

There are three types of possible adjustments:

- a) synchronization of the control lever to the height setting cam;
- b) a combined adjustment to the parallel and the minimum front and back height, to be carried out if the cutting is irregular;
- c) adjustment of the longitudinal deck position, is only necessary when, during cutting deck replacement operations, the original position has been lost and the correct distance to the engine pulley must be restored.

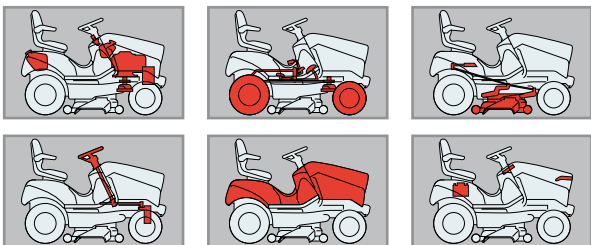
Related topics

[🔧 2.2] Tools

Tightening torques

Front	1,0 Bar
Rear	1,4 Bar

Map of functional units

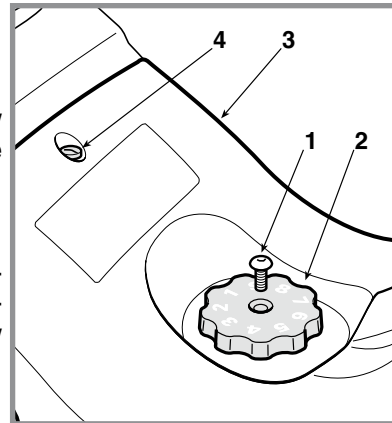


Check the tyre pressures. If one or more tyres have been replaced or you find differences in diameter, do **not attempt to compensate these differences by giving different tyre pressures**, but make the adjustments as in point “B”.

A) Synchronization of the control lever with the cam

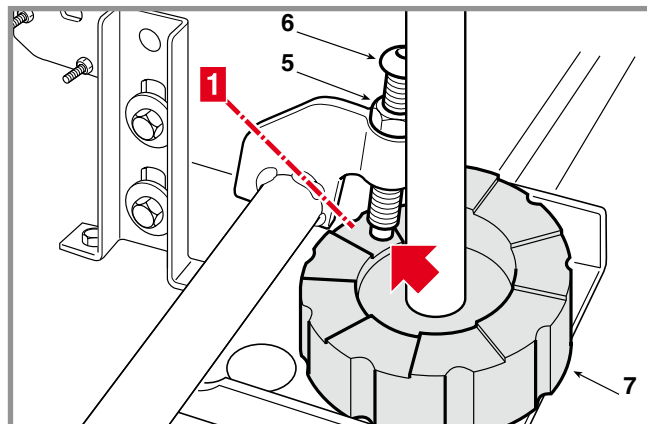
This adjustment is fundamental to allow use of all nine positions of cutting height.

Loosen the screw (1) and remove the handle (2).



Remove the inspection hatch (3) secured by the screw (4).

Loosen the locknut (5) and the screw (6) and move the cam (7) into position “1” by using the control lever in its completely lowered position.

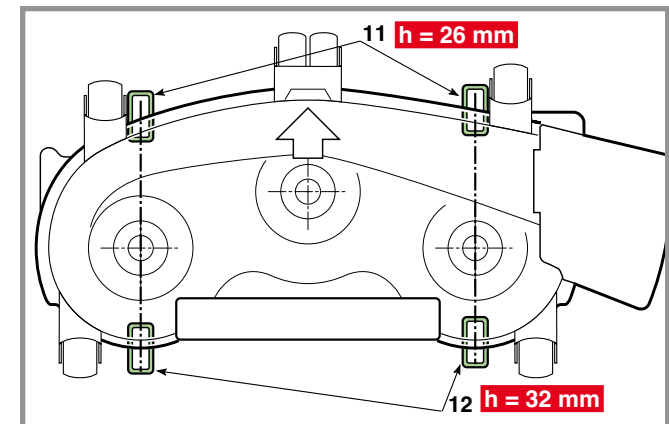


Turn the screw (6) until the tip can be placed on the cam step (7) corresponding with position “1”, then tighten the screw by half a turn and fasten the nut (5).

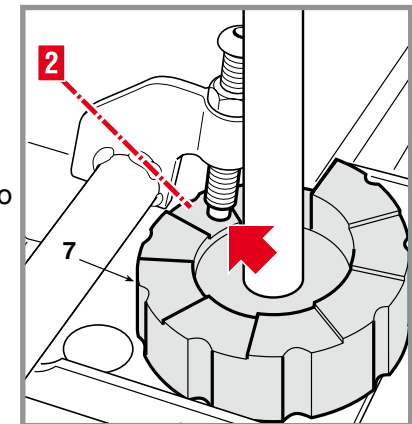
B) Combined adjustment to the parallel and the minimum front and rear height

Put the machine onto a flat and stable surface (such as a work bench) and put blocks beneath the cutting deck in line with the centre lines of the blades:

- at the front 26 mm (1)
- at the rear 32 mm (2)



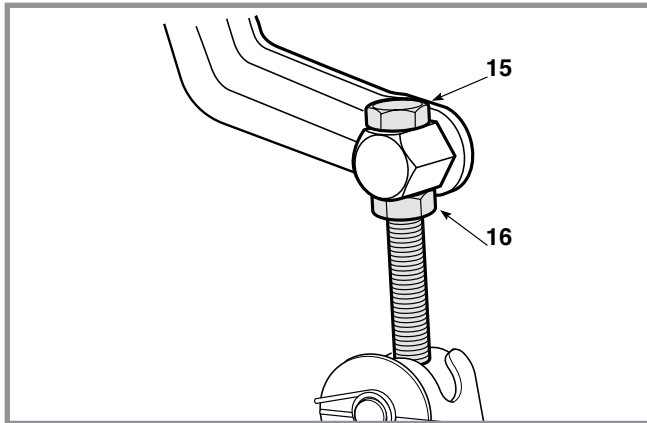
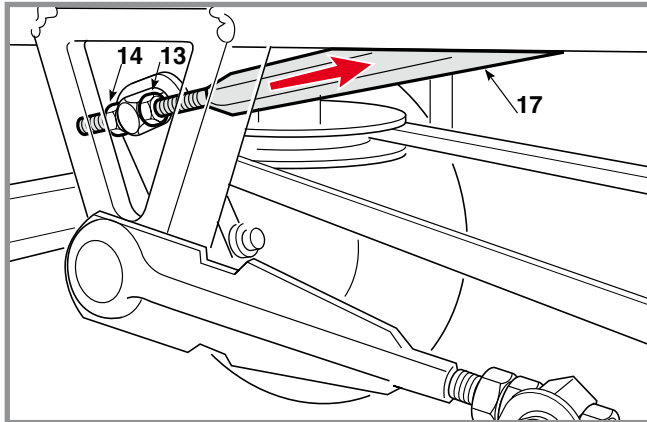
Move the cam (7) to position “2”



ALIGNING THE CUTTING DECK

CHAPTER	REVISION	FROM ...	PAGE
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Loosen the nuts (13), the screws (15) and the lock-nuts (14-16) on the right and left-hand side, so that the deck is resting firmly on the blocks.



Turn both the rear screws (15) until both the left and right side of the rear part of the deck begin to rise and then tighten the locknuts (16).

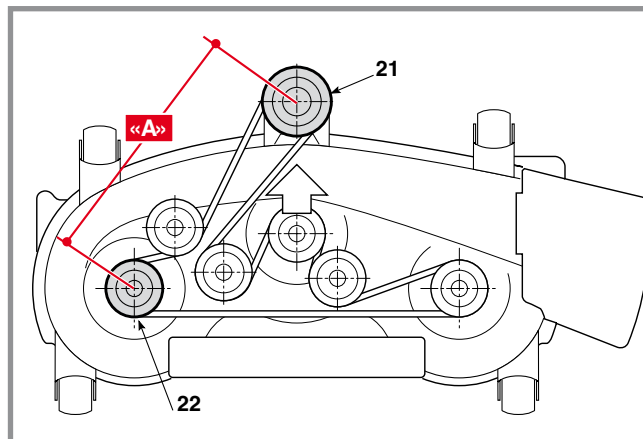
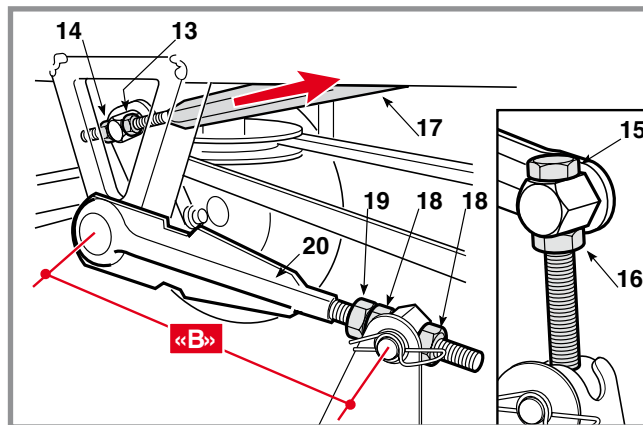
Push the two connecting rods backwards (17) and tighten the nuts to the respective rods (13) until both the left and right side of the front part of the deck begin to rise and then tighten the locknuts (14).

C) Adjustment of the longitudinal position

NOTE These adjustments are not performed to align the cutting deck, but simply to determine the distance of the deck from the motor pulley, so as to achieve correct functioning of the belt.

Put the machine onto a flat and stable surface (such as a work bench) and put blocks beneath the cutting deck in line with the centre lines of the blades:

- at the front 26 mm (11)
- at the rear 32 mm (12)



Set the lifting lever to position «1»-

Slacken off the nuts (13), screws (15) and locknuts (14 - 16) on both the right and left hand sides, so that the deck rests firmly on the blocks.

Slacken off the nuts (18) and locknut (19) of the two front connecting rods (20) and adjust nuts (18) of the front left connecting rod to set the exact distance «A» of 474 mm between the centre of the engine pulley hub and the centre of the left blade shaft.

Measure height «B» obtained on the left connecting rod after the adjusting and adjust the front tight connecting rod nuts until it is the same measurement.

Fully tighten the nuts (18) and lock nuts (19) on both the front connecting rods.

NOTE It is very important that distance «B» is the same on both the left and right hand sides, to prevent the belt from rubbing against the collector channel.

Turn both the rear screws (15) until both the left and right side of the rear part of the deck begin to rise and then tighten the relative locknuts (16).

Push the two connection rods backwards (17) and tighten the nuts to the respective rods (13) until both the left and right side of the front part of the deck begin to rise and then tighten the locknuts (14).

General informations

The correct geometry of the steering is given by the clearance between the centres of the joints of the two right and left tie-rods connected to the steering wheel. Any anomalies caused by knocks or accidents result in reduced driving precision and increased wear on the tyres.

If the machine does not maintain a straight line when the steering wheel is straight, it is necessary to adjust the tie-rods.

Moreover, the steering allowance should never be excessive if driving is not to be impaired.

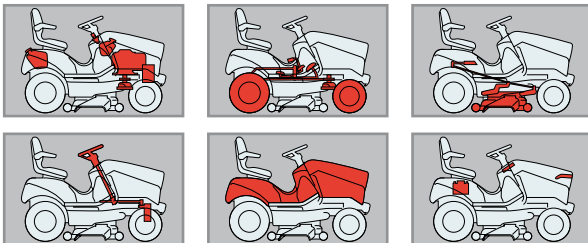
Related topics

Tightening torques

7-8 Nuts and locknuts of the tie-rod joint 125÷135 Nm

11 Nut for sector bearing fastening.... 45 ÷ 50 Nm

Map of functional units

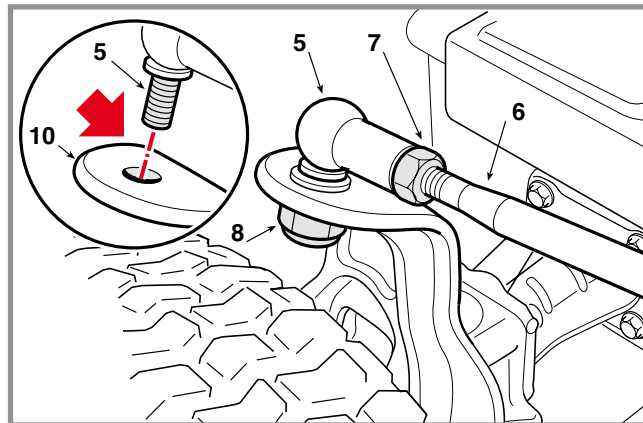


NOTE Before any other action, check that the joint fastenings have not worked loose and align the front wheels.

A) Adjustment of the steering wheel

If the steering wheel is not straight:

- unscrew the nuts (8) and remove both joints (5);
- align the front wheels and steering wheel;
- screw the joints (5) in or out of the tie rods (6) enough to align the joint pins (5) with the rod holes (10).



IMPORTANT NOTE The adjustment must always be performed on both tie-rods.

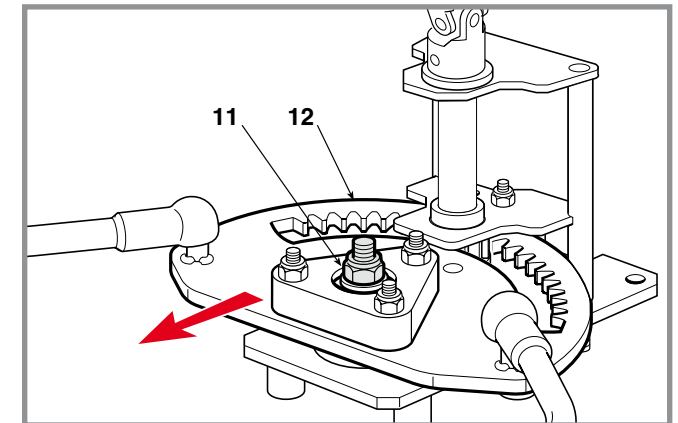
On assembly, fully tighten the locknuts (7) and the fastening nuts (8).

B) Steering allowance adjustment

Check that the movement is not caused by loose linkage nuts and tighten all the nuts of the tie-rods and ball joints.

If allowance is due to coupling between the pinion and toothed sector, adjust the reciprocal positions between the two parts.

Loosen the nut (11) and move the toothed sector (12) longitudinally until allowance is reduced to a minimum between sector teeth and the pinion; then tighten the nut (11) and grease concerned parts.



General informations

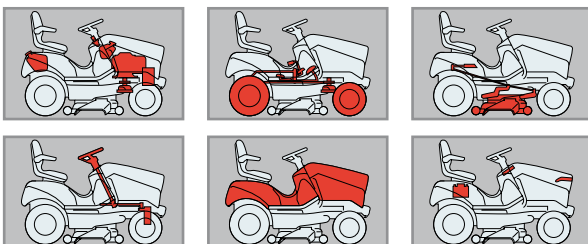
Excessive vibration when cutting and an uneven cut can be due to misalignment of the blades owing to deformation of the flanges or the shafts as a result of accidental knocks.

Related topics

[🔧 5.7] Removal of the cutting deck

[🔧 6.7] Replacement of the supports and shafts of the blades

Map of functional units

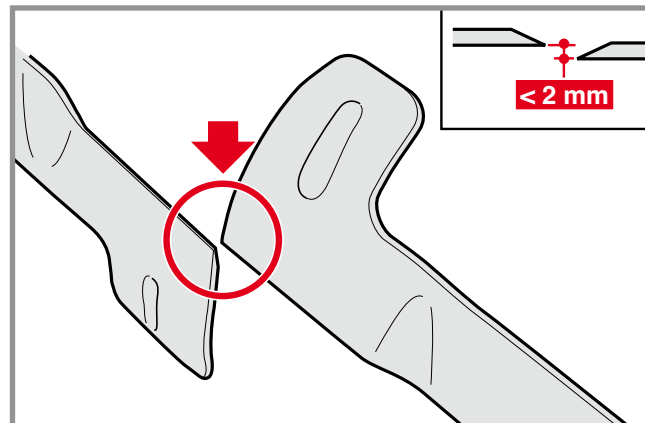


🔧 Remove the cutting deck.

⚠️ WARNING! Always wear strong gloves when handling the blades.

⚠️ WARNING! The blades are connected to each other, the rotation of each blade engages the rotation of the other.

Grasp two blades firmly together and rotate them so as to bring the cutting edges closer, then check that the gap between the ends does not exceed 2 mm.



Repeat the operation rotating the blades in the various different combinations.

If higher amounts are found, check that the blades are not distorted. If this is not the case, check the supports or the shafts for the blades, replacing if necessary, and check the condition of the point where the flanges rest on the cutting deck.

⚠️ IMPORTANT Always replace damaged blades and do not attempt to repair or straighten them. Always use manufacturer's genuine spare parts!

General informations

A badly sharpened blade causes grass to become yellow and reduces grass collection capability. If not balanced, excessive vibration can be caused during use.

Fins on broken, bent or damaged blades reduce the grass expulsion force and can cause damage and injuries.

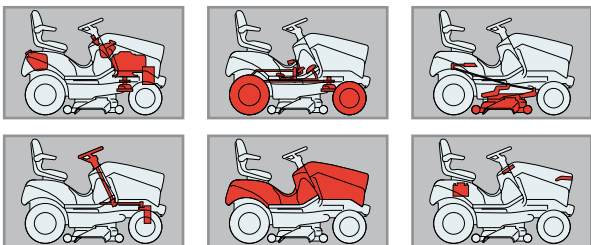
Related topics

[🔧 5.7] Removal of the cutting deck

Tightening torques

1 Screw for blade45 ÷ 50 Nm

Map of functional units



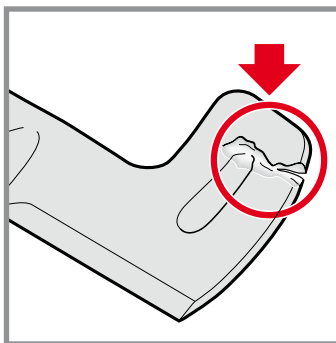
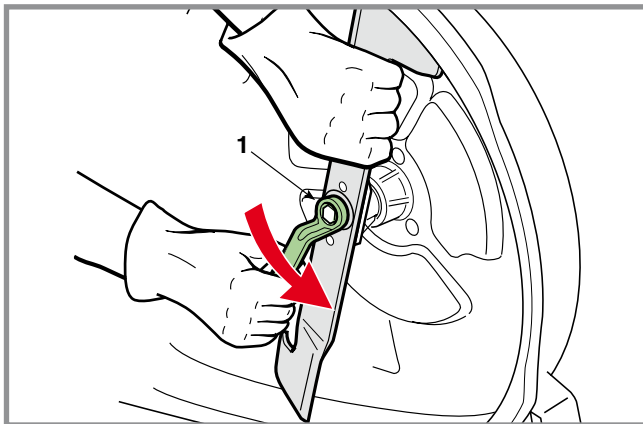
🔧 Remove the cutting deck

⚠️ WARNING! Always wear protective gloves when handling the blades and protect eyes when sharpening.

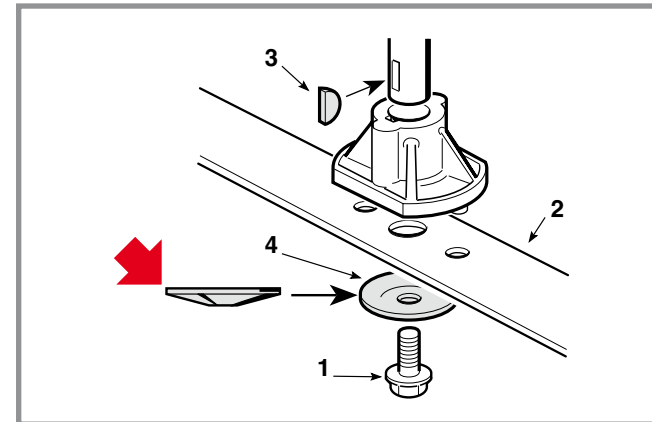
⚠️ WARNING! The blades are connected to each other, the rotation of each blade engages the rotation of the other.

A) Removing and reassembling

For removing a blade it must be firmly held and the central screw (1) undone.

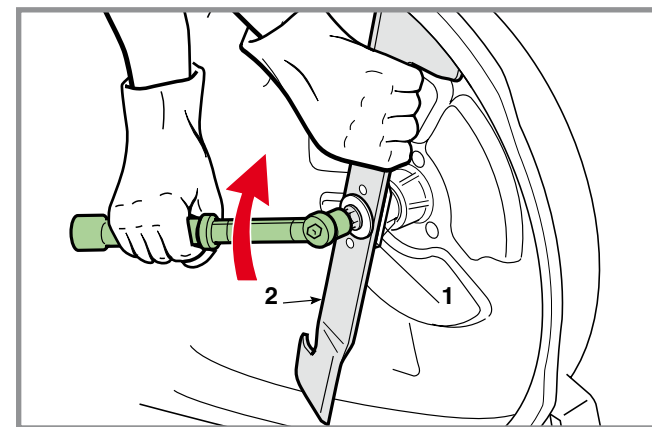


⚠️ Always check that the fins are intact with cracks or breaks. Always replace damaged blades.



⚠️ On assembly, be careful to:

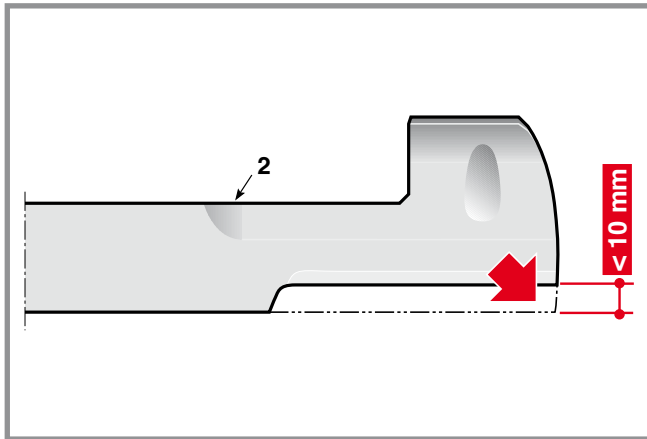
- correctly position the keys (3) on the shafts;
- correctly locate the blades, with the fins facing towards the inside of the cutting deck;
- fit the flexible disc (4) so that the concave part is pressing against the knife;
- tighten the screws (1) with a torque wrench set to 45-50 Nm.



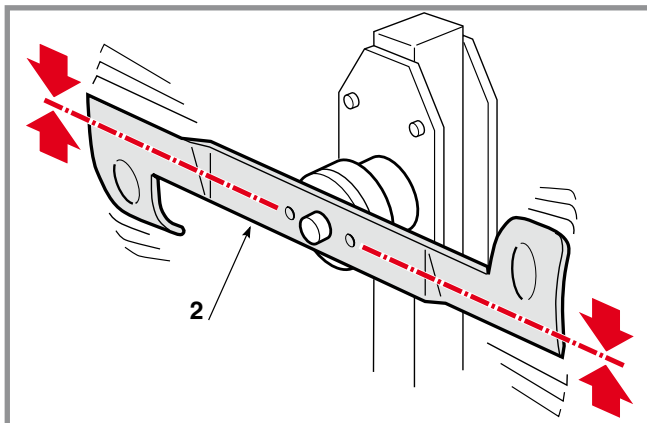
B) Sharpening and balancing

Always sharpen both cutting edges of the blade (2) using a medium grade grinder. Sharpening must only be done from the rounded side, removing as little material as possible.

The blade is to be replaced when the cutting edge has worn down to 10 mm.



Using the appropriate equipment, check the balance to make sure that there is a maximum difference of 2 grams between one side and the other.



General informations:

Oil in the hydraulic circuit is subject to high pressures and temperatures and is thus susceptible to deteriorating in time. For this reason, oil must be changed after the first 50 hours of operation and, subsequently, every 200 hours.

Related topics:

[🔧 8.1] Guide to understanding the hydraulic system

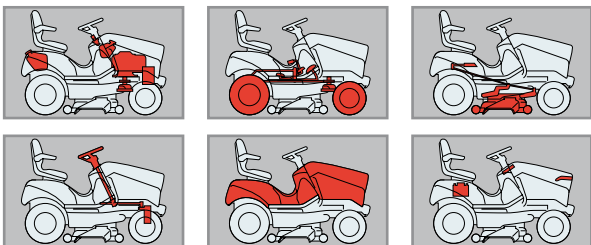
Tightening torques

6 Front drain caps	13 ÷ 16 Nm
8 Front breather cap	13 ÷ 16 Nm
9 Rear inspection cap	20 Nm
11 Rear quick coupling	25 Nm

Technical informations

- SAE 10W30 oil ~ 4 litres

Map of functional units



A) Draining oil from the transmission units and hydraulic circuit

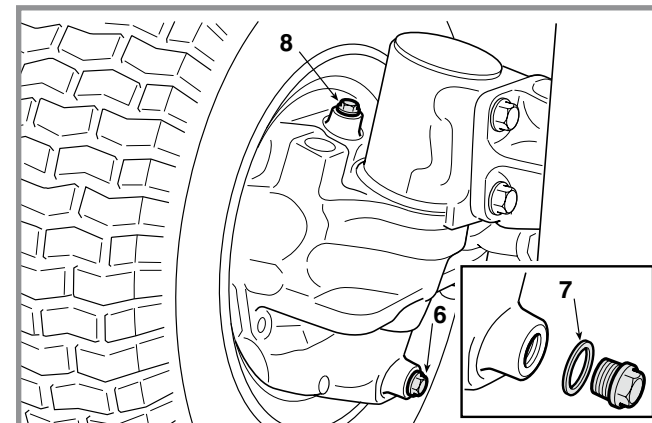
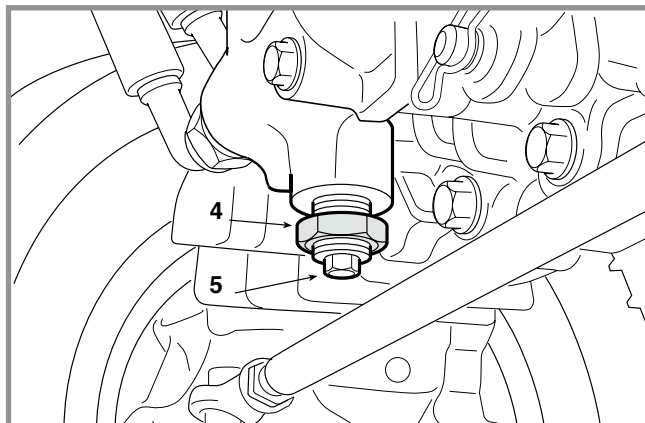
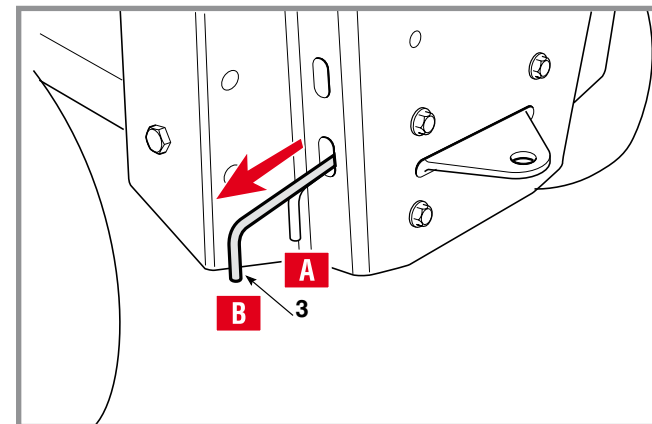
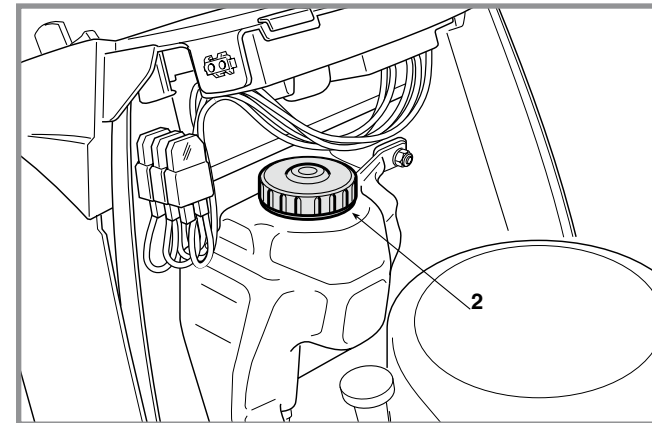
NOTE Oil is easily drained when hot, after unscrewing the tank cap (2).

Both transmission by-pass valves must be open to drain oil from the transmission units and hydraulic circuit. This is achieved:

- at rear transmission, moving the rod (3) to the release position «B»;
- at front transmission, loosening the locknut (4) and unscrewing the screw (5) about 3 turns, avoiding to undo completely the screw.

Place a container to collect oil near each front wheel and unscrew the two drain caps (6) being careful not to lose the sealing washers (7).

When oil flow starts to slow, unscrew the breather cap (8) near the right wheel.



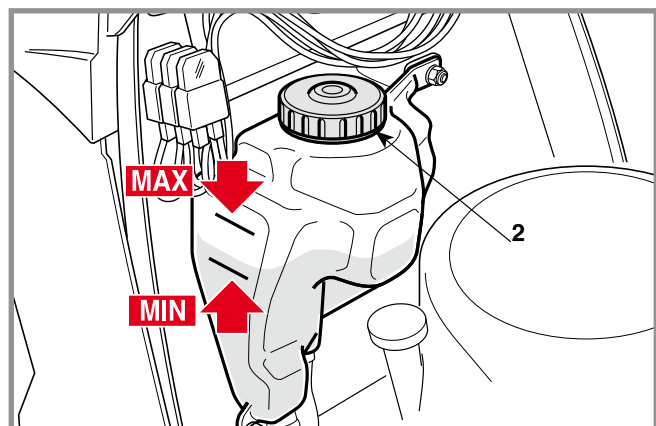
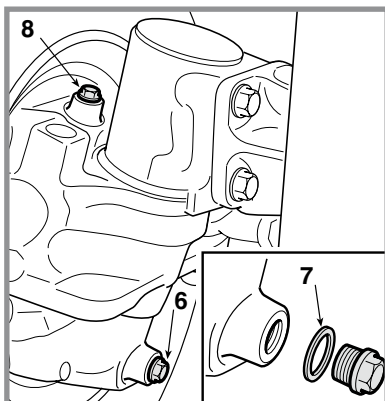
Place a container to collect oil near the rear transmission.

Using a 3/8" spanner, unscrew the inspection cap (9) being careful of the gasket underneath (10) and unscrew the quick coupling (11) to facilitate oil flow.

NOTE Draining the circuit may take several minutes.

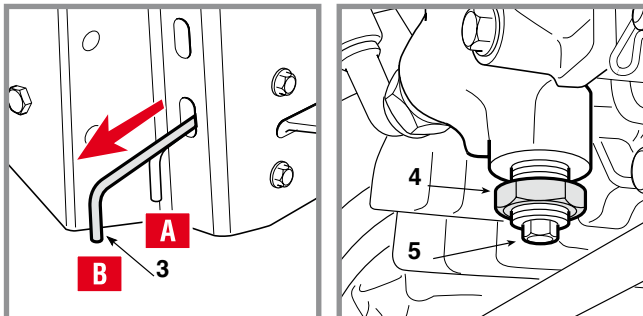
When oil no longer drips from the drain holes,

- tightly screw-in the two front caps (6) with their gaskets (7);
- fully screw-in the inspection cap (9) being careful to correctly reposition the sealing ring (10);
- screw-in the quick coupling (11) without tightening it in order to trap air in the rear unit and facilitate front unit filling.



B) Filling the transmission units and hydraulic circuit

NOTE Filling must be performed from the tank, with by-pass devices (3) and (5) open, after making sure that the breather valve (8) is also open.



● **Front transmission unit**

Fully fill the oil tank and keep the breather hole under control (8); as soon as oil starts to spill, replace the screw (8) fully tightening it and fill the tank again.

● **Rear transmission unit**

Unscrew the quick coupling (11) so that it acts as a breather to eliminate air and place a container under it to collect oil when all air is drained.

Constantly check the oil level in the tank and top up to compensate rear transmission filling.

NOTE The tank must never be emptied to prevent emitting air in the circuit.

When oil starts to flow out continuously, screw-in and fully tighten the quick coupling (11). At this point filling is complete.

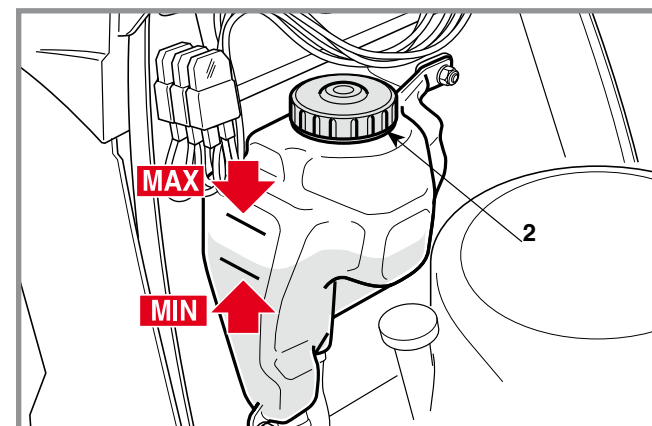
● **Final operations**

IMPORTANT NOTE In the first hours of use, after emptying and topping up with hydraulic oil, the oil level in the tank could decrease quite noticeably and the transmission may be rather unstable.

This is absolutely normal since due to small amounts of air in the transmission units.

To prevent the user from having to question himself on whether the work is being performed correctly or not, it is recommended to perform an additional "dynamic" bleed operation following the procedure below.

- Remove the fuel tank cap (2) and close the filler with a cloth, or something similar, which prevents any dirt or dust from entering but still allows the air to filter.
- With the engine running at minimum speed,
 - push the forward run pedal to around 3/4 of its stroke, and keep the machine running for about 1 minute, without pushing the pedal down all the way.



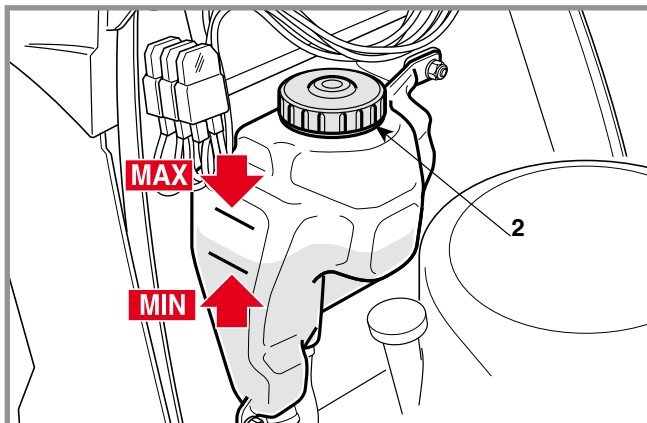
- push the reverse run pedal to around 3/4 of its stroke, and keep the machine running for about 2 minutes, without pushing the pedal down all the way.

- With the engine running at maximum speed,
 - push the forward run pedal to around 3/4 of its stroke, and keep the machine running for about 1 minute, without pushing the pedal down all the way.
 - push the reverse run pedal to around 3/4 of its stroke, and keep the machine running for about 2 minutes, without pushing the pedal down all the way.

- With the engine running at maximum speed,
 - push the forward run pedal all the way down, and keep the machine running for about 1 minute.
 - push the reverse run pedal all the way down, and keep the machine running for about 1 minute.

Switch the engine off, check the oil level in the tank and top-up so that it is between the two «MIN» and «MAX» marks.

Check for leaks in the pipes and fittings, then replace the tank cap (2) and replace the protection arch (1).



REMOVAL OF FRONT HOOD

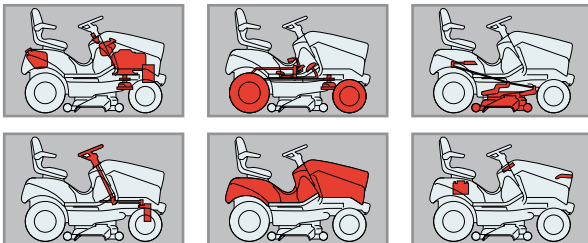
General informations

The removal of the front hood gives greater accessibility to:

- the engine and its accessories
- the silencer and protection devices

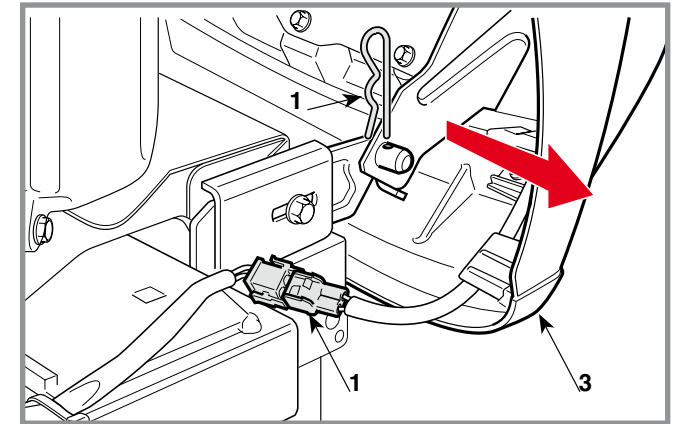
Related topics

Map of functional units



To remove the hood, disconnect the headlight connector (1).

Take out the split pin (2) from the right-hand side and remove the hood (3) by moving it to the right.



REMOVAL OF THE WHEEL COVER

CHAPTER	REVISION	FROM ...	PAGE
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General informations

Removing the wheel cover gives access to:

- the mount for the lever to raise the deck;
- the supports of the footboards.

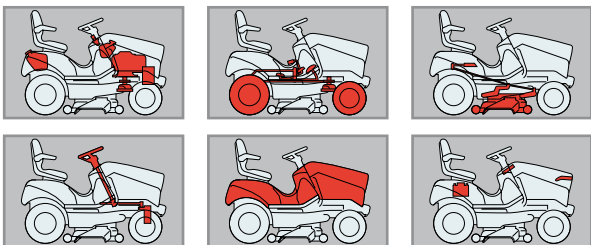
Removing the rear section of the wheel cover makes it possible to access the rear tank and necessary in order to access the transmission belt..

Related topics

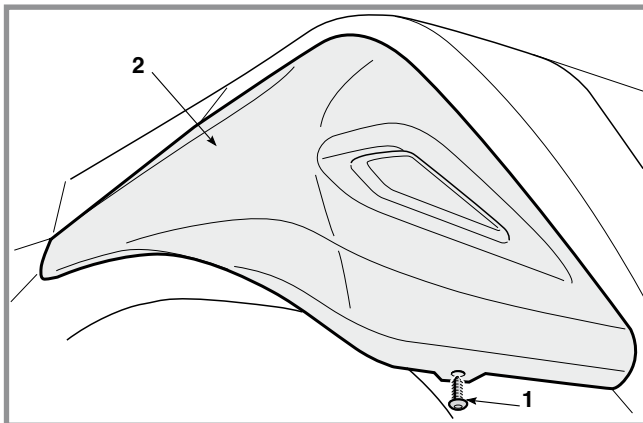
Tightening torques

20 Lower cover fixing screw4,0 ÷ 4,5 Nm

Map of functional units

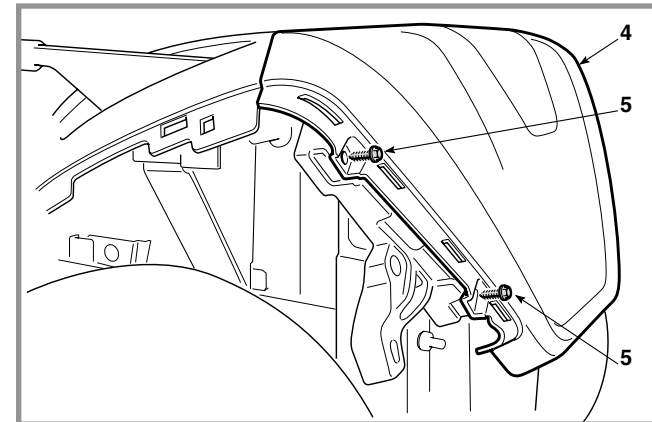
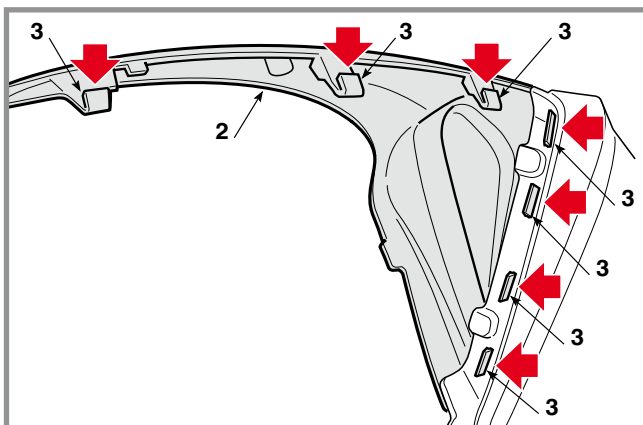


A) Removing the rear of the wheel cover only



Loosen the two screws (1) and disassemble the two side sections (2), unhooking the 7 fastener tabs (3) positioned inside each of them.

Remove the rear cover (4) fixed with four screws (5).



B) Removing the whole wheel cover

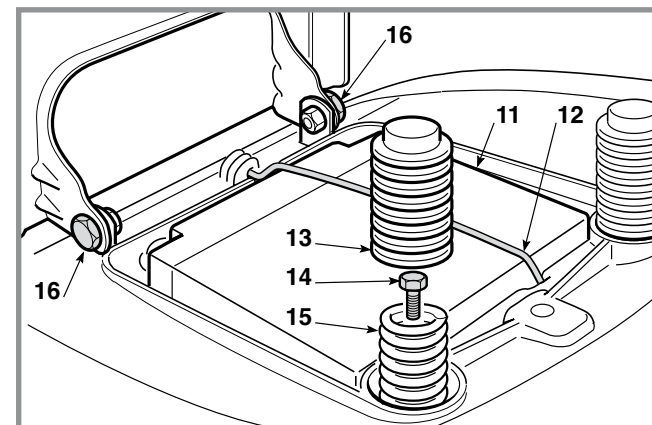
● Remove the rear cover as shown in point A).

FIRST disconnect the black cables (mass) and ONLY THEN the red cable (positive) on the battery (11).

Disassemble the spring (12) and remove the battery (11).

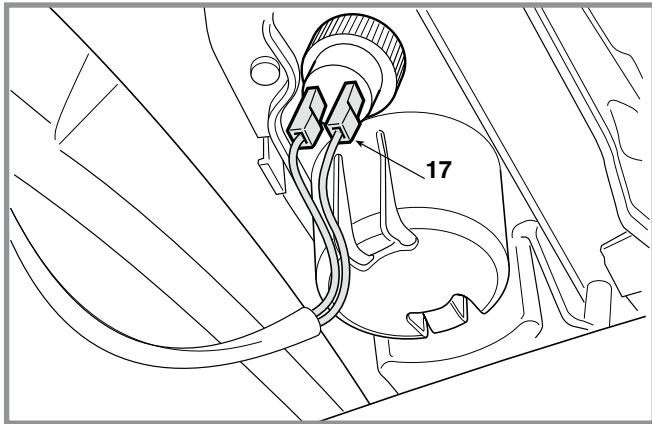
Remove the caps (13), loosen the internal screws (14) and remove the springs (15).

Disassemble the two pins (16) and remove the seat.



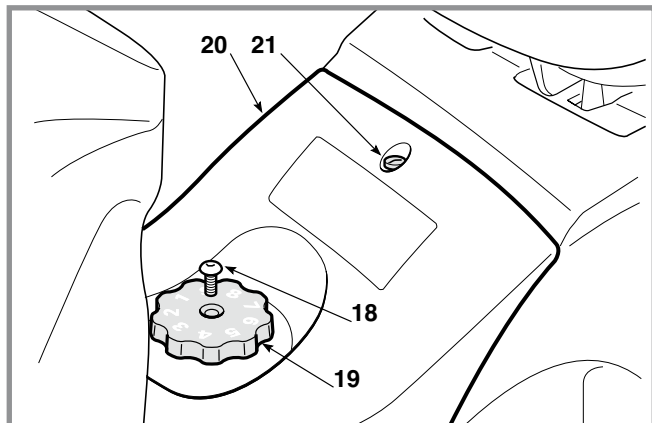
REMOVAL OF THE WHEEL COVER

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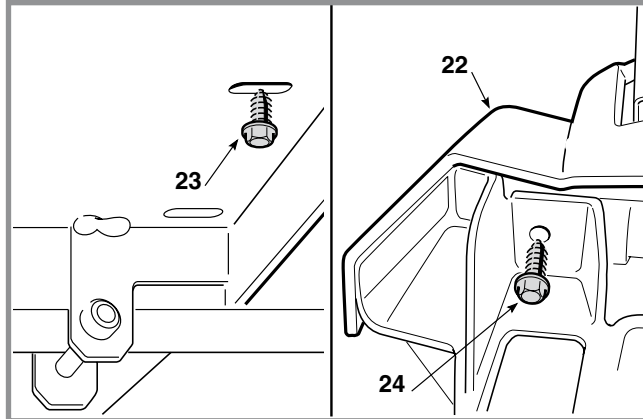
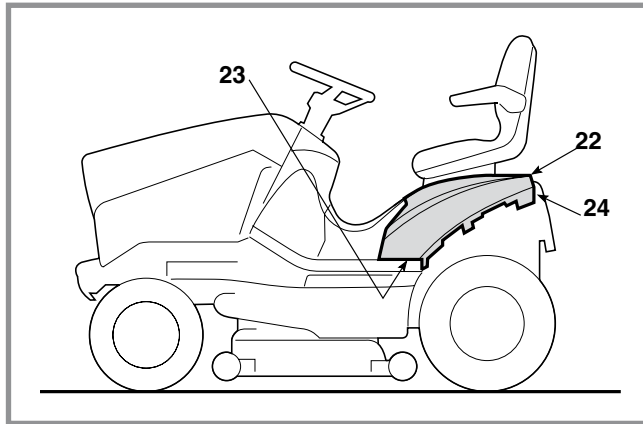


Disconnect the auxiliary power socket cables (17), marking them clearly to prevent inverting their positions during reassembly.

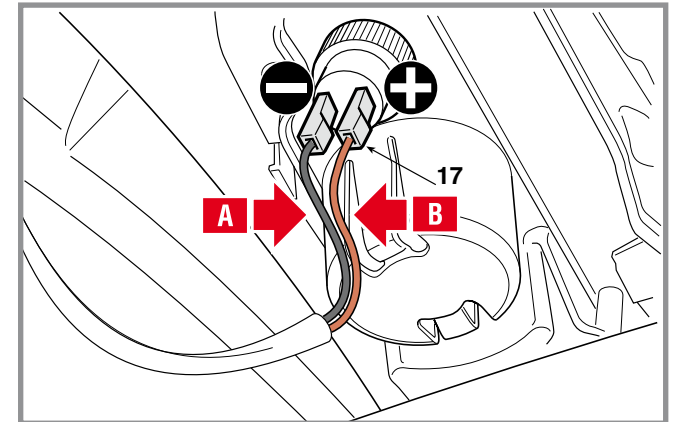
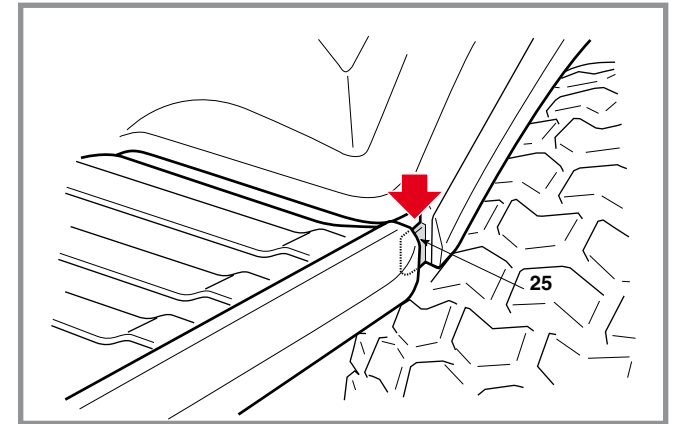
Undo the screw (18) and remove the knob (19), then remove the central safety guard (20) fastened in place by the screw (21).



The wheel cover (22) is fixed by two screws (23) located under the side footboards and two rear screws (24).



For assembly, follow the procedure described above in reverse, taking care to correctly insert the two side tongues (25) of the cover in the housings in the footboards.



When connecting the cables (17) make sure to replace them in the right position:

- A = Black = Terminal « - »
- B = Brown = Terminal « + »

REMOVING THE DASHBOARD
AND FRONT COVER

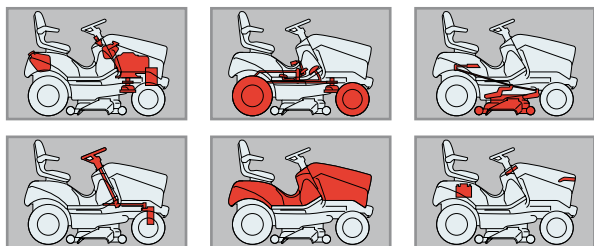
General informations

Removing the dashboard gives better access to:

- the accelerator
- the ignition block,
- various electrical components.

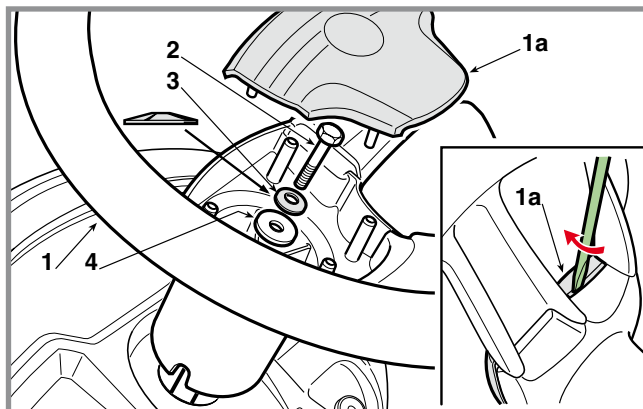
Related topics

Map of functional units



A) Removing the dashboard

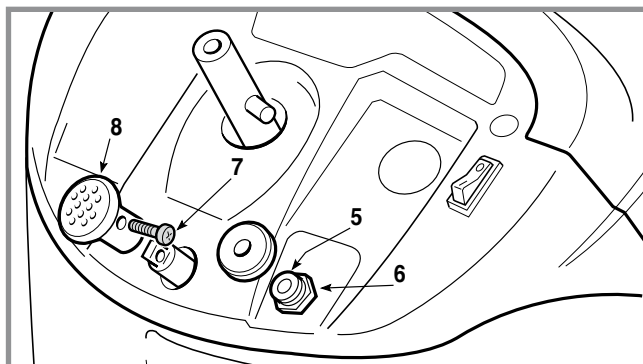
Use a screwdriver to remove the central cover (1a) of the steering wheel (1), being careful not to damage it.



Unscrew the screw (2), remove the Belleville washer (3) and washer (4) and remove the steering wheel (1).

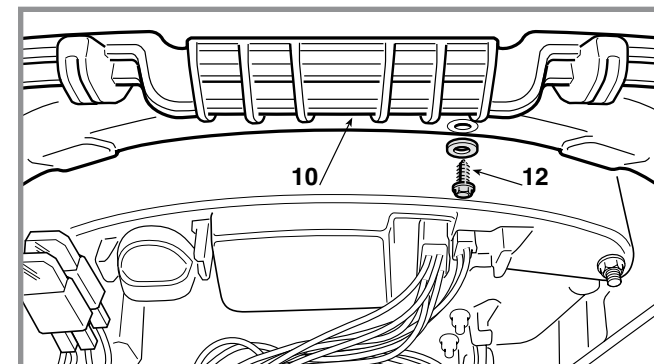
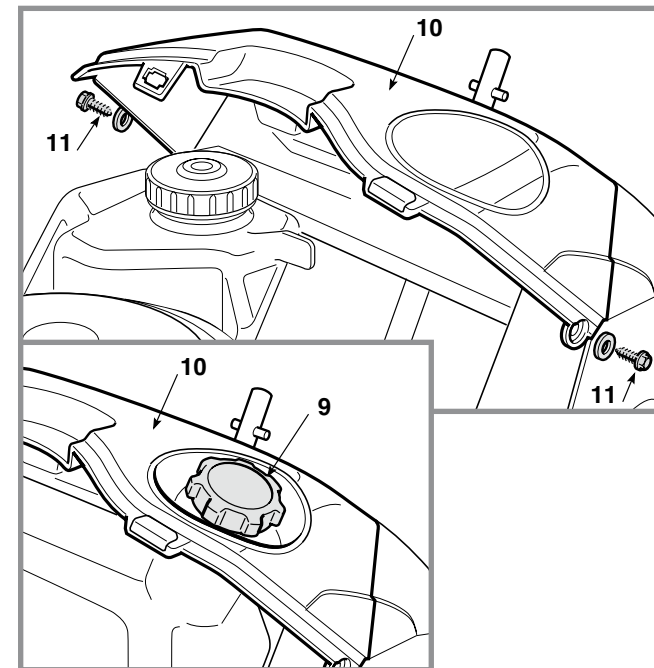
Unscrew nut (5) and dismantle the ignition key block (6) without disconnecting the electric cables, to prevent reassembly errors.

- **Models with cruise control:**
- Loosen the screw (7) and remove the control knob (8).



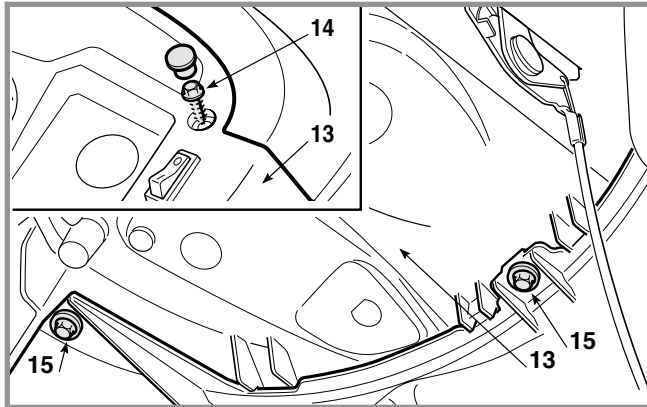
- **Models with front tank:**
- Remove the tank cap (9) and protect the nozzle to prevent foreign bodies from falling into the tank.

- **Models with dashboard extension:**
- Remove the dashboard extension (10), secured by screws (11) and (12).

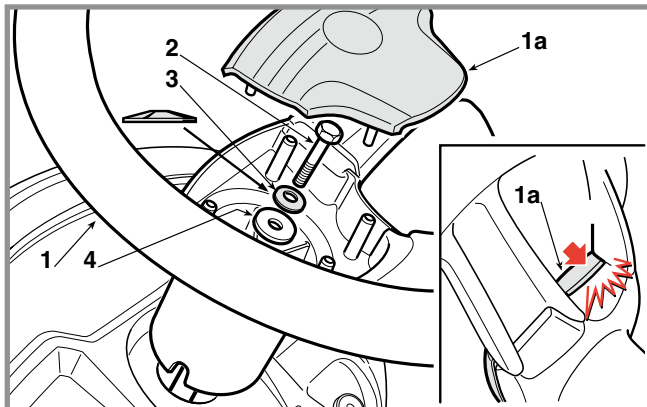


Disconnect the accelerator cable terminal from the engine and disconnect all remaining electrical connections and the starter cable (where present).

The dashboard (13) can be removed at this point; it is fixed to the chassis by two upper screws (14), covered by plastic caps, and three lower screws (15).



On assembly, follow the steps described in reverse, being careful to restore wheel alignment with the steering wheel, install the Belleville washer (3) with the concave part facing down and fully tighten the screw (2).

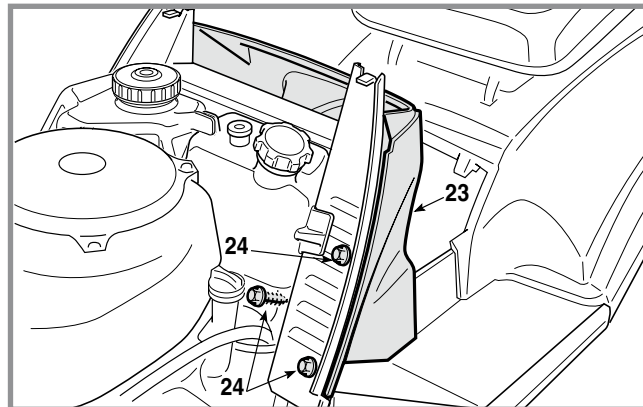
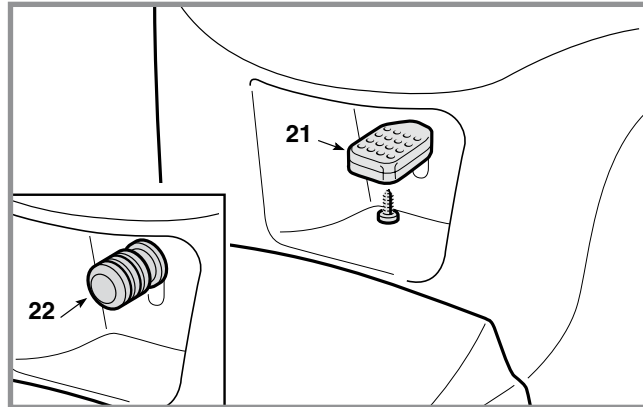


REMOVING THE DASHBOARD AND FRONT COVER

B) Removing the front cover

☛ Remove the dashboard [see point "A"].

Remove the parking brake lever knob (21) or (22) and dismantle the front guard (23) fixed to the chassis by six screws (24).







REMOVAL OF THE ENGINE

CHAPTER	REVISION	FROM ...	PAGE
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General informations

Since there are different types of drive, the stages described here refer to those shared or similar in all types of engine.

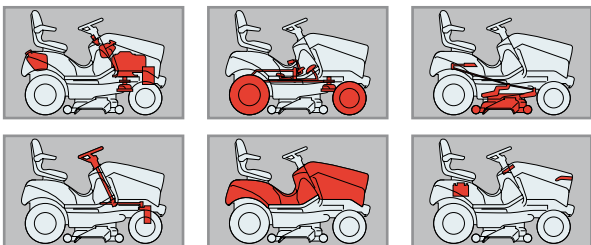
Related topics


-  **4.1** Adjusting the engagement and checking the blade brake
-  **4.3** Drive belt adjustment
-  **5.1** Removal of front hood
-  **6.8** Replacement of the accelerator and adjustment of the carburettor

Tightening torques

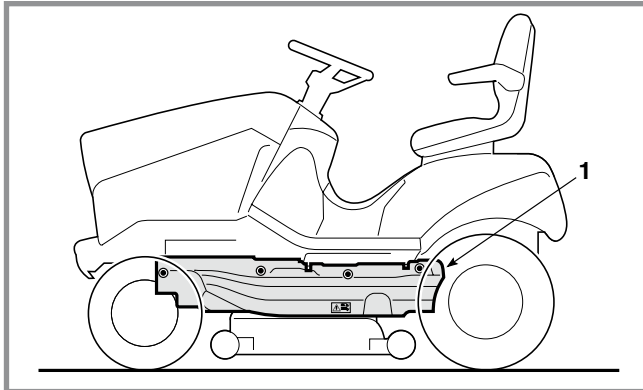
8 Screw for pulley	45 ÷ 50 Nm
- Screws for engine fastening	25 ÷ 30 Nm

Map of functional units

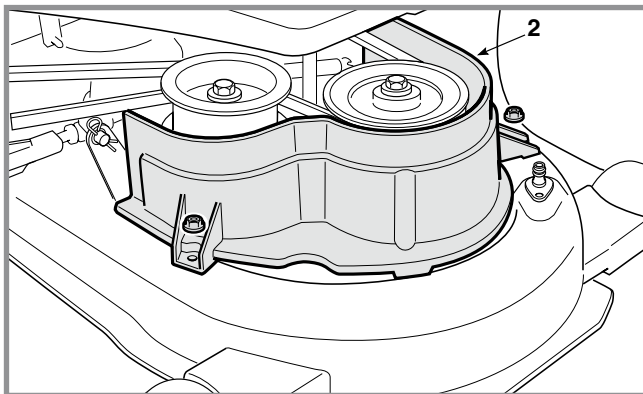


 Remove the front hood.

Lower the cutting deck completely.



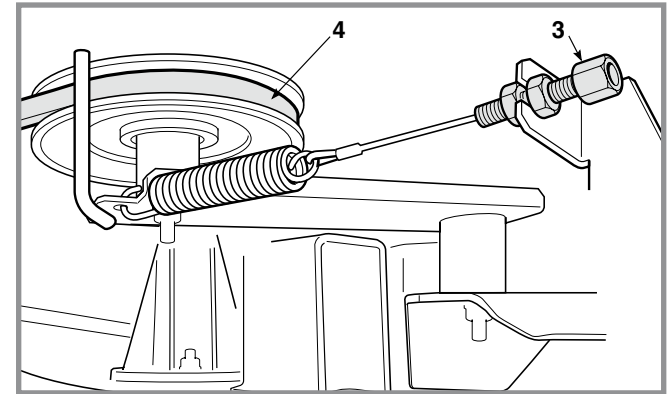
Identify the fastening screws and remove the left external safety guard (1).



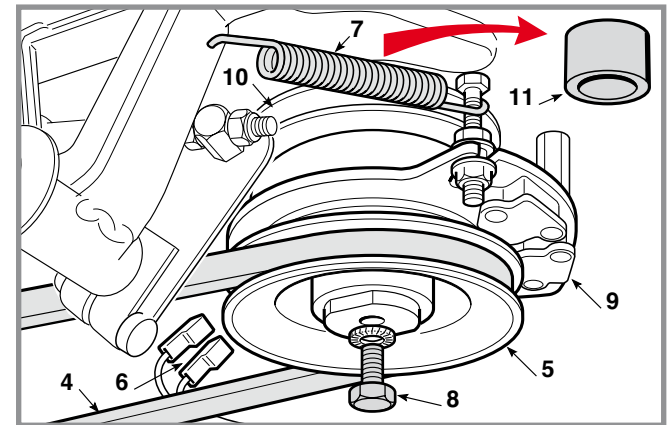
Also remove the left internal safety guard (2) to obtain easier access.

Loosen and release the screw adjuster (3) to loosen the blade control belt (4) and free it from the pulley (5).

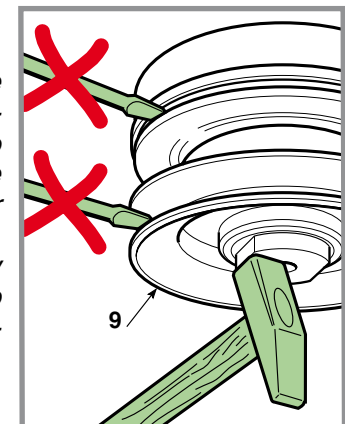
Disconnect the connector (6), unhook the check spring (7) from the clutch side and undo the central screw (8); remove the clutch (9) from the shaft, to-

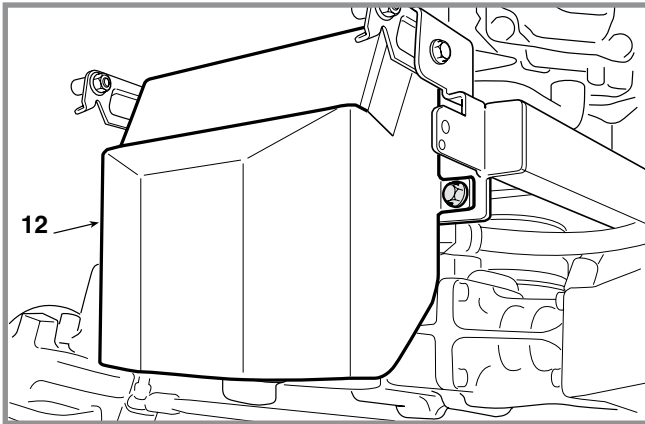


gether with the transmission control pulley (10) and spacer (11).





IMPORTANT To remove the clutch (9) from the engine shaft, absolutely do not use a lever to force the pulleys or the outer cover. In case of difficulty, apply an unlocking spray and gently tap on the hub with a hammer, to facilitate extraction.

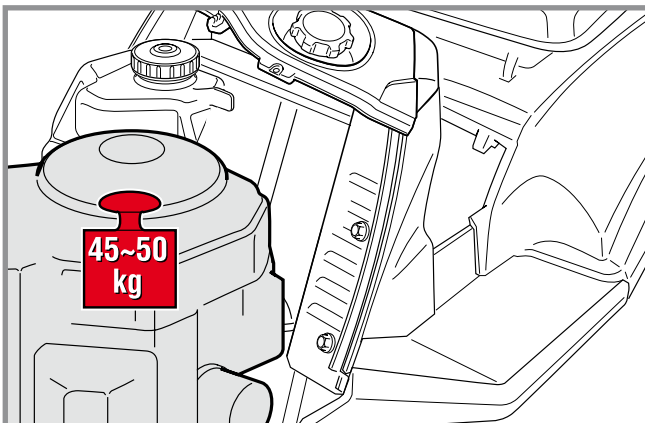




Remove the protection from the exhaust (12) and disconnect the cable control from the accelerator and all the electrical wires.

 Detach the fuel line pipe, taking care not to spill fuel.

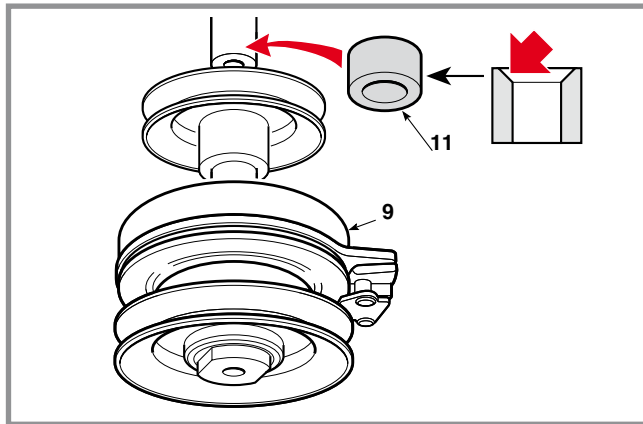
 Identify and undo all the screws that fasten the engine to the chassis, then carefully lift and remove the engine using equipment suitable for the weight of the engine (about 45-50 kg) and the designated lifting points to guarantee safe working conditions.



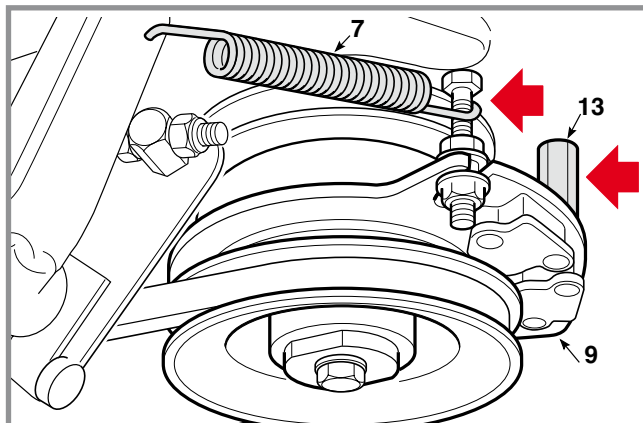
REMOVAL OF THE ENGINE

NOTE Some engines are held with screws of different length and in different positions, so it is best to label them so that no errors are made on reassembly.


On reassembly, fully tighten the screws for the engine and the pulley to the amounts shown.



Reassemble the spacer (11), with the countersink facing the engine. Ensure that the pin (13) is inserted into the clutch spline (9) and remember to refit the spring (7).







CHAPTER	REVISION	FROM ...	PAGE
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 Remember to fit the clamps back on the fuel pipe and check that it does not leak.

Refit the protection (12) and restore accurately the mass and all the electrical contacts, taking care to secure them in such a way that they do not interfere with the movement of the two steering tie rods.

Reattach the accelerator cable and ...

-  Adjust the «MINIMUM» position.
-  Refit the front hood.
-  Reset the adjuster (3) and check the spring tension.
-  Reset the tension of the stretcher spring if it has been loosened.

REMOVAL OF THE REAR AXLE

CHAPTER	REVISION	FROM ...	PAGE
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General informations

The rear axle (Transaxle) is made up of a single maintenance free sealed unit which includes the transmission unit (hydrostatic) and the differential and doesn't need any maintenance.

It only needs to be removed to be replaced or for an overhaul by the Manufacturer's Service Centre.

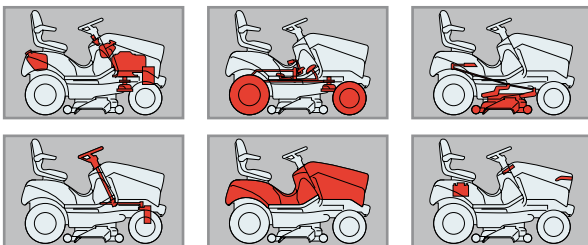
Related topics

- [🔧 2.3] Lifting of the machine
- [🔧 4.2] Brake adjustment
- [🔧 4.4] Drive pedal adjustment
- [🔧 4.9] Emptying the hydraulic circuit
- [🔧 5.2] Removal of the rear cover
- [🔧 5.8] Removal the rear tank (if present)
- [🔧 6.1] Removal of the wheels

Tightening torques

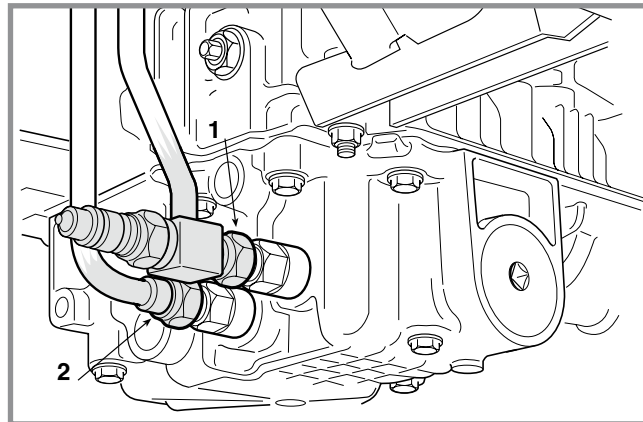
1-2	Hydraulic system fittings	23 ÷ 25 Nm
14	Rear axle support nut	25 ÷ 30 Nm
15	Rear axle fastening nuts	25 ÷ 30 Nm

Map of functional units

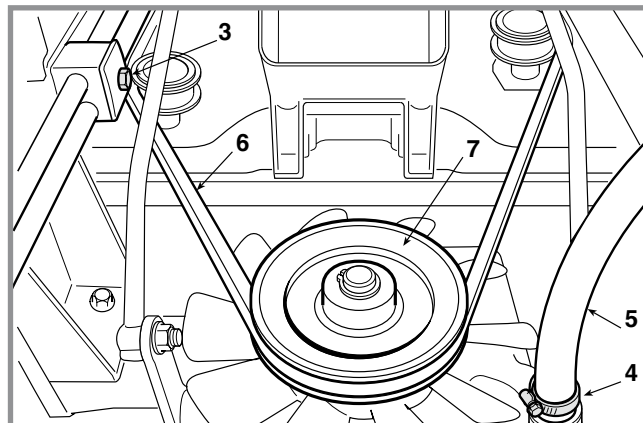


- 🔧 Remove the rear part of the wheel cover
- 🔧 Remove the rear tank (if installed)
- 🔧 Lift the rear part of the machine
- 🔧 Remove the rear wheels.
- 🔧 Completely empty the oil from the hydraulic system

Disconnect the rear fittings of the hydraulic system pipes (1) and (2) and loosen the fixing block screw (3) to permit pipe mobility.

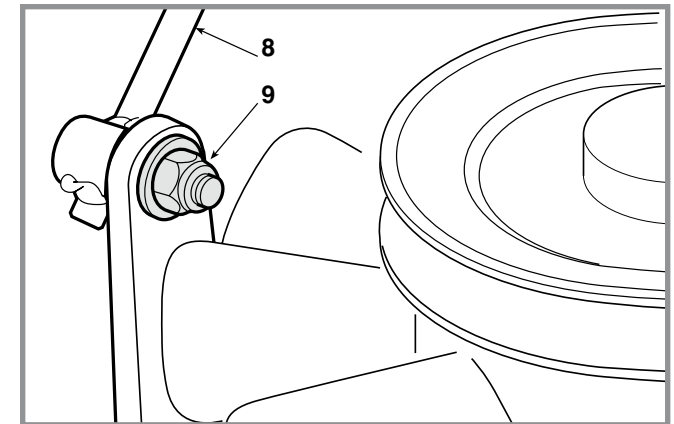


Remove the clamp (4) and remove the rubber pipe (5).



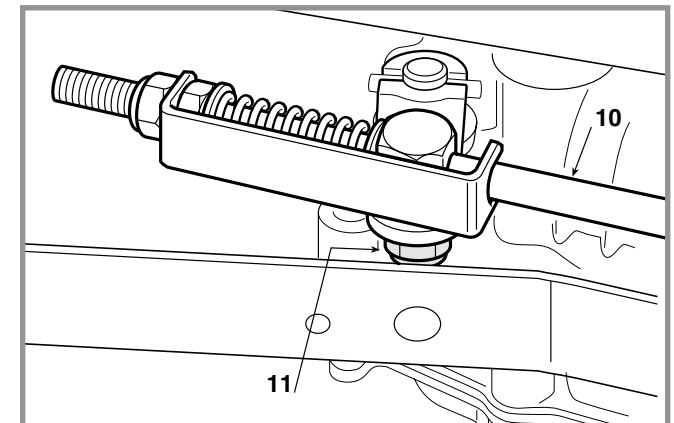
Plug the remaining open holes so that dust or impurities cannot enter.

Working from the rear section, grasp the two branches of the belt (6), pulling it just enough to free it from the pulley throat (7), overcoming the resistance of the idler pulley spring.



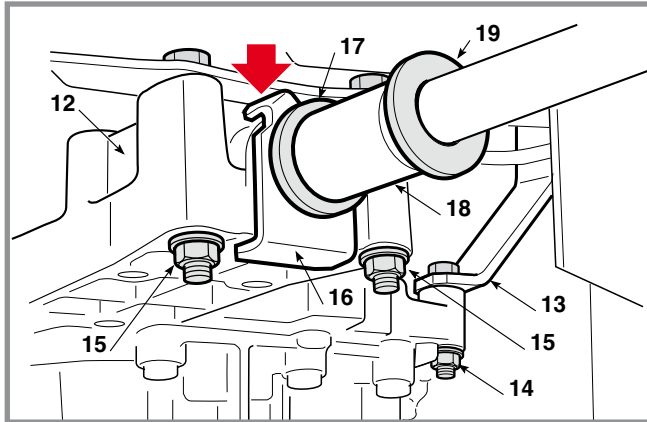
Dismantle the drive control rod (8) by unscrewing the nut (9) of the relative pin.

Dismantle the brake rod (10) by unscrewing the nut placed under the lever (11).



REMOVAL OF THE REAR AXLE

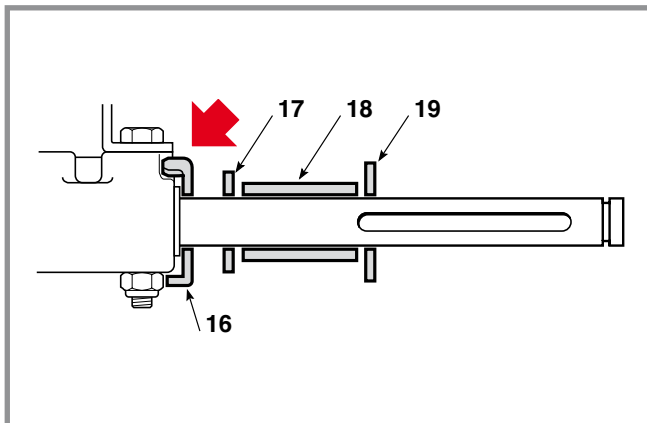
The transmission unit (12) is supported by a holder (13) fixed by a screw with nut (14) and is fixed to the chassis by four screws with relative nuts (15).



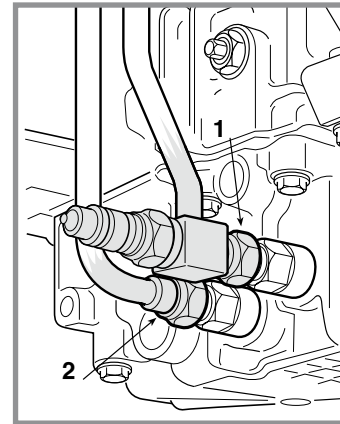
Undo the nut (14) and then carefully undo the four lower nuts (15), holding up the unit so that it does not fall.

Repeat the above operations in reverse for reassembly.

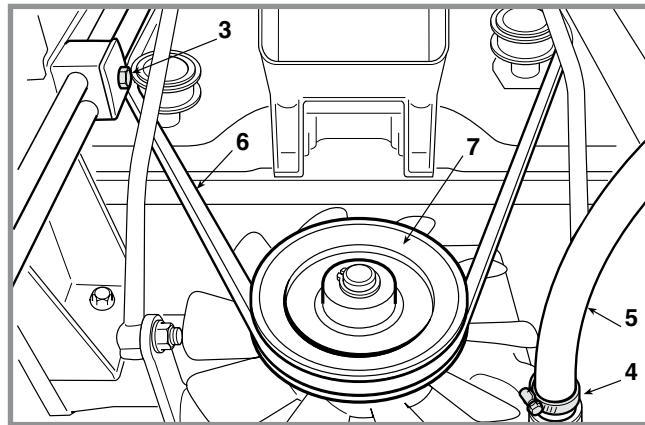
Check that the spacers (16 - 17 - 18 - 19) are correctly fitted to the shafts, in the sequence given.



Reconnect the rear fittings of the hydraulic system pipes (1) and (2), tightening them to the prescribed value and reassemble the rubber pipe (5) with the clamp (4).



Tighten the screw (3) to return the pipes in position.



Reattach all the connections, and then ...

- ☛ Check the brake.
- ☛ Refit the rear wheels.
- ☛ Refit the rear tank (if installed)
- ☛ Refit the rear part of the wheel cover
- ☛ Completely fill the hydraulic system

If the the drive control rod has been replaced or completely pulled down:

- ☛ Adjust the travel and the position of “neutral” for the pedal

REMOVAL OF THE FRONT AXLE

General informations:

The front axle is made up of a sealed single block which includes the hydrostatic transmission unit and a torque transfer box and doesn't require maintenance.

It only needs to be removed to be replaced or for an overhaul by the Manufacturer's Service Centre.

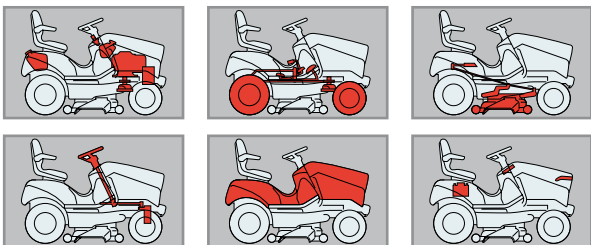
Related topics

- [🔧 2.3] Lifting of the machine
- [🔧 4.2] Brake adjustment
- [🔧 4.4] Drive pedal adjustment
- [🔧 4.6] Steering geometry adjustment
- [🔧 4.9] Emptying the hydraulic circuit
- [🔧 6.1] Removal of the wheels

Tightening torques

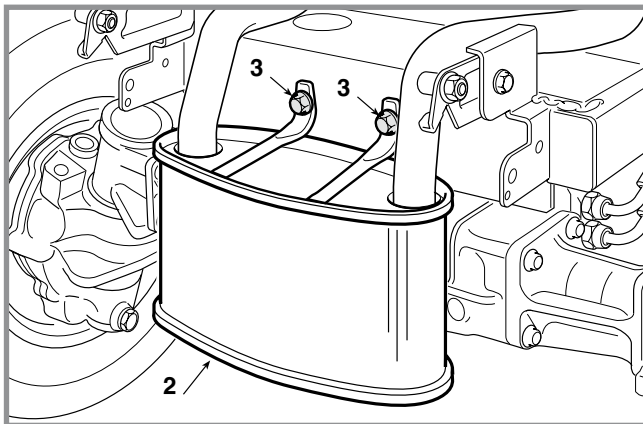
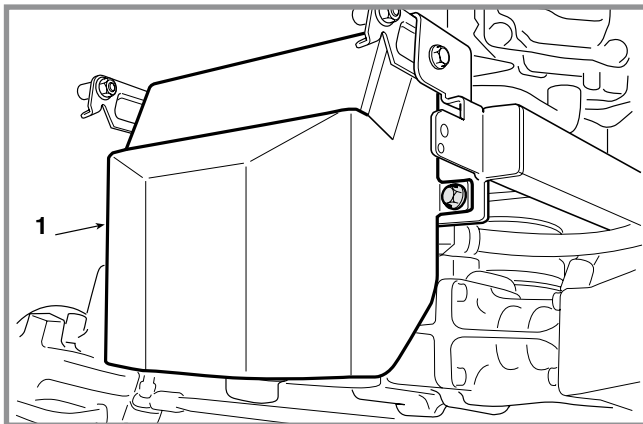
4-5 Hydraulic system fittings	25 ÷ 30 Nm
8 Steering tie-rod joint nut	125 ÷ 135 Nm
11 Front axle fastening nut	280 Nm
15-17 Screws for bracket fastening	45 ÷ 55 Nm

Map of functional units

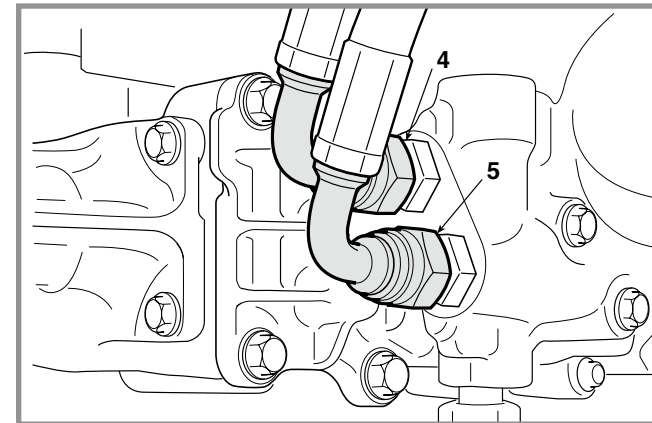


- 🔧 Lift the front part of the machine.
- 🔧 Remove the front wheels.
- 🔧 Completely empty the oil from the hydraulic system.

Remove the silencer guard (1) and the silencer (2) fixed by the screws (3)

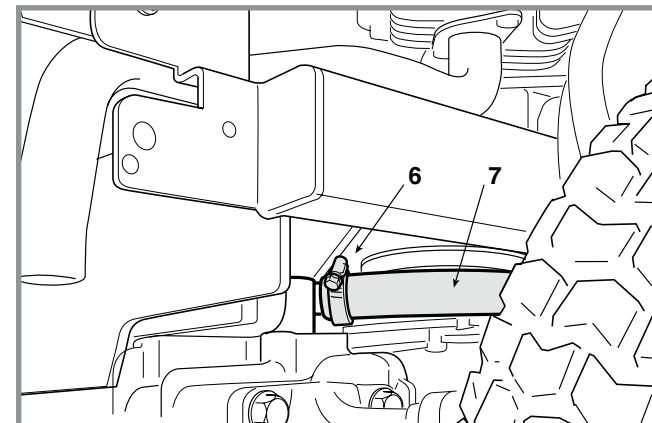


Disconnect the front fittings of the hydraulic system pipes (4) and (5), marking them so that they can be correctly repositioned.



Remove the clamp (6) and slide out the rubber pipe (7).

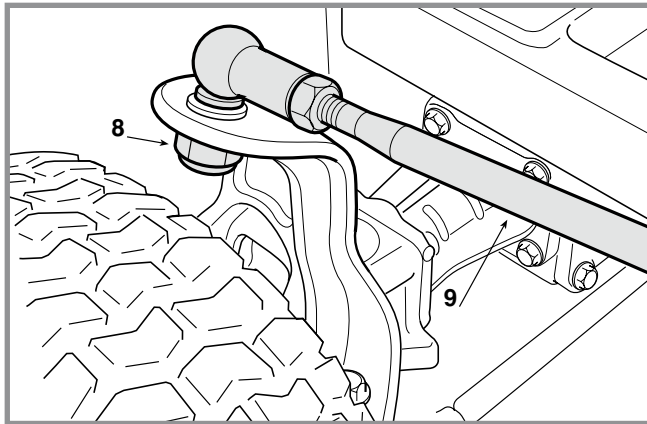
Plug the open holes so that dust or impurities cannot enter.



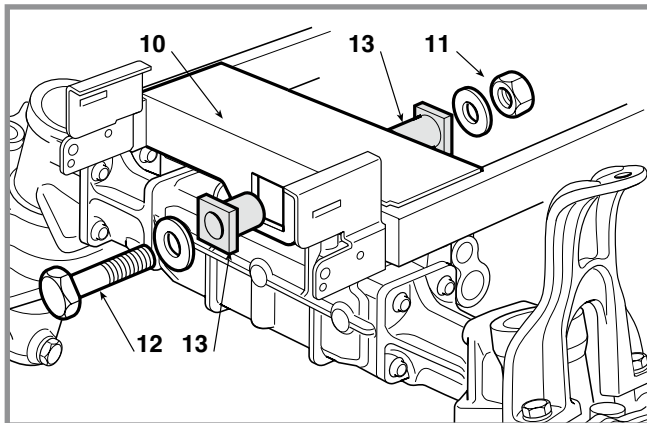
REMOVAL OF THE FRONT AXLE

CHAPTER	REVISION	FROM ...	PAGE
5.6	0	2018	2 of 2

Unscrew the nuts (8) and remove both steering tie-rods (9).



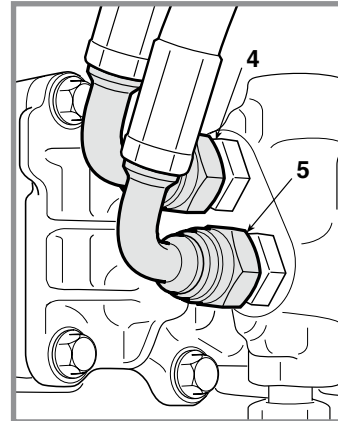
The unit is supported by a support (10) to which it is fixed by a screw (11) with a nut (12).



Unscrew the nut (11) and then carefully undo the screw (12) and the bush square (13), holding up the unit so that it does not fall.

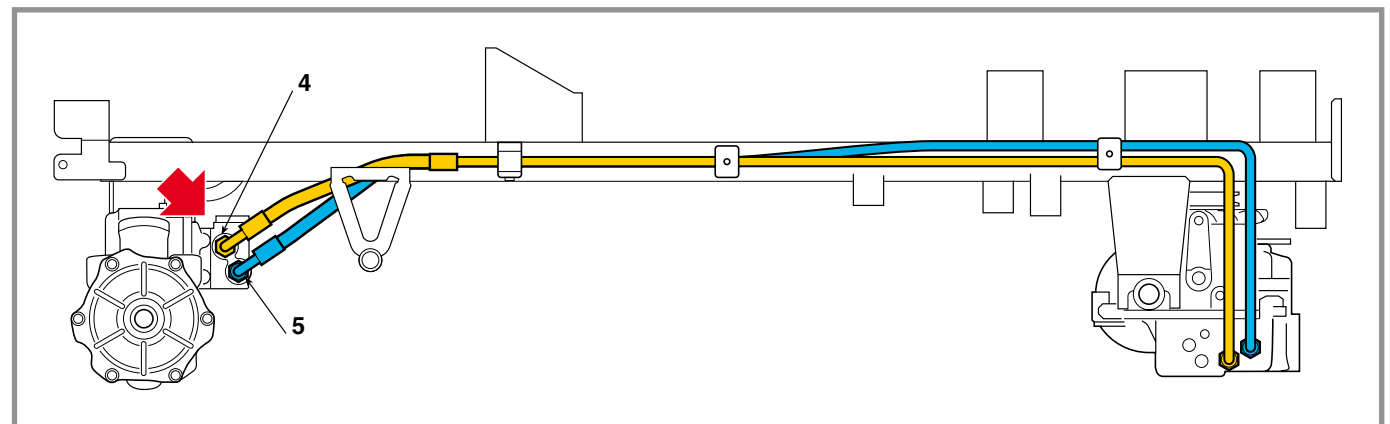
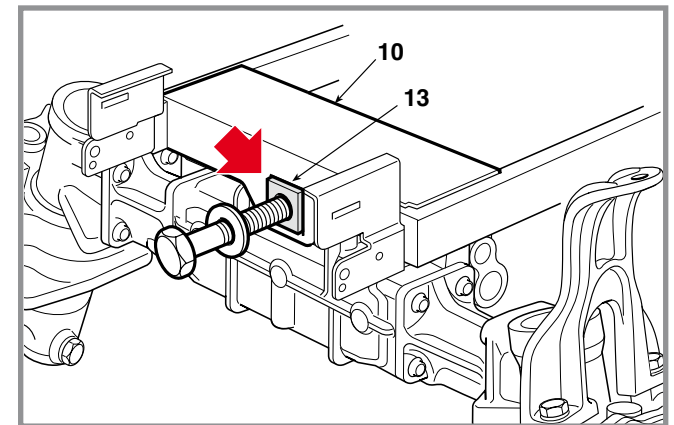
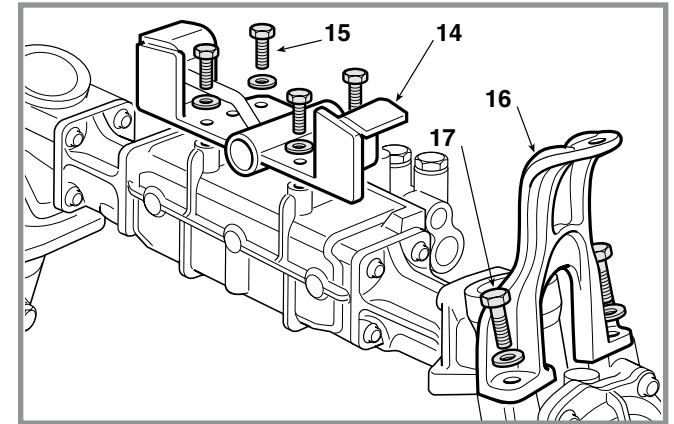
If the unit needs to be replaced, the supporting bracket should be removed (14), which is fixed by the screws (15) and the tie-rod bracket of the steering (16) is fixed by the screws (17).

On assembly follow the above indicated steps in reverse order, taking care to correctly reposition the bush square (13) into their respective housings in the support (10).



When reassembling the fittings (4) and (5) take care to respect the positions indicated on the connection diagram.


- ➡ Reassemble the front wheels.
- ➡ Check front wheel and steering wheel alignment.
- ➡ Completely fill the hydraulic system.



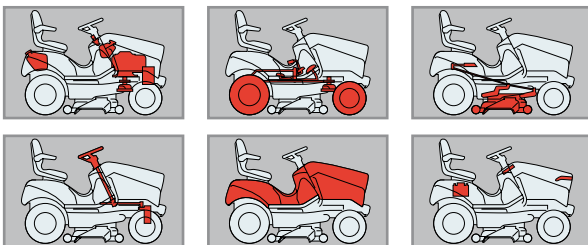
General informations

Removing the cutting deck facilitates all operations involving the blade connecting toothed belt and the overhaul and replacement of the hubs, bearings or blade shafts.
 With some practice and experience it is possible to do this work with the deck still in position.

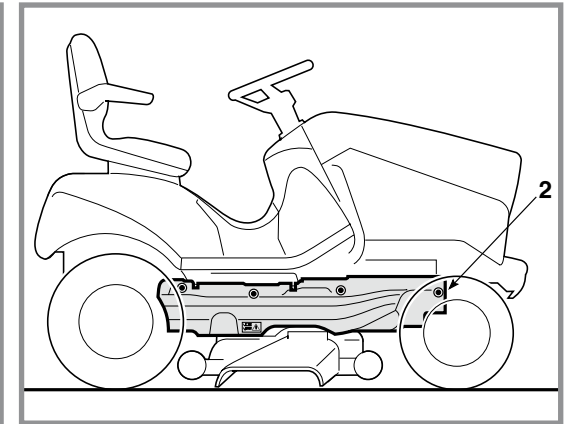
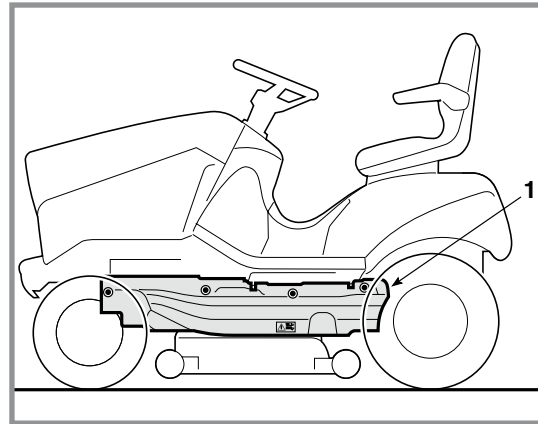
Related topics

 **4.5** Aligning the cutting deck

Map of functional units

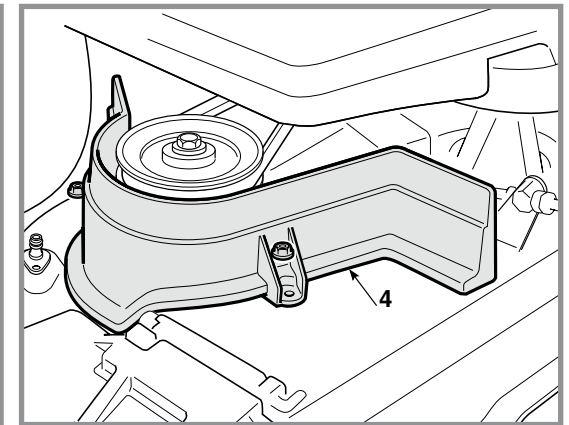
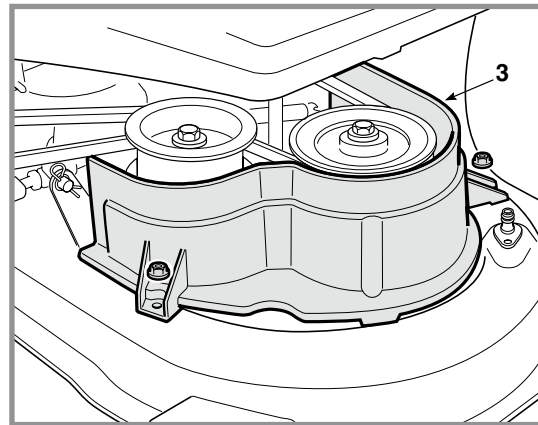


Lower the cutting deck completely.

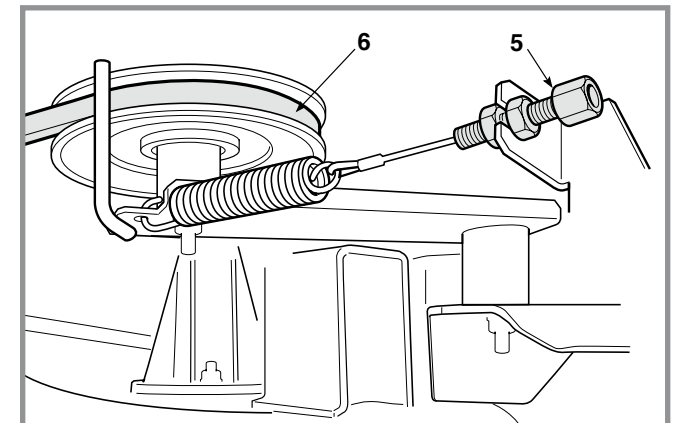


Identify the fastening screws and remove the left (1) and right (2) external safety guard.

Remove the left (3) and right (4) internal safety guards.



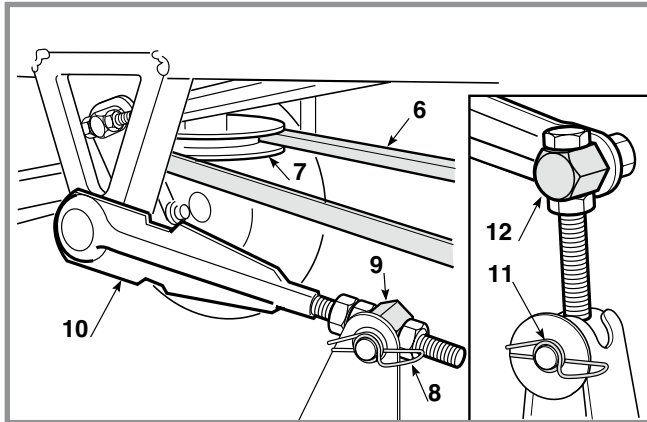
Loosen and release the screw adjuster (5) to loosen the blade control belt (6) and free it from the pulley of the clutch (7).



REMOVAL OF THE CUTTING DECK

CHAPTER	REVISION	FROM ...	PAGE
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Remove the two split-pins (8) of the two pins (9) of the front connecting rods (10).



Remove the two split-pins (10) of the rear pins and then, having checked that there are no obstructions, the deck can be removed by extracting it in such a way that all the pins leave their housings.

Repeat the above operations in reverse for reassembly.


! Always reassemble the internal (3-4) and external (1-2) side safety guards.

REMOVING THE REAR TANK

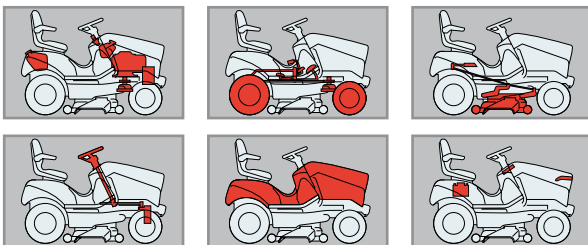
General informations:

It is necessary to remove the rear tank to access the hydrostatic transmission control belt and replace the transmission unit.

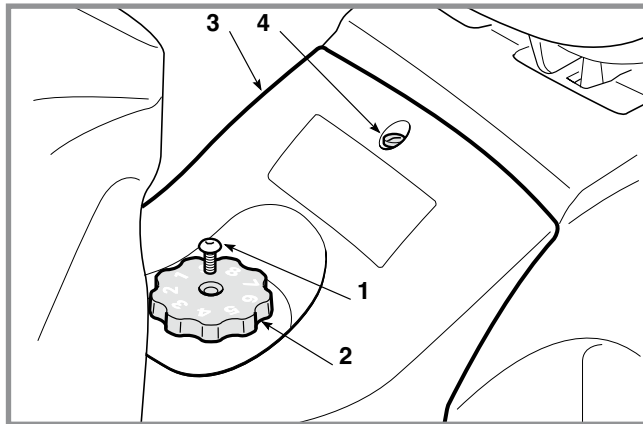
Related topics:

 [5.2](#) Removal of the wheel cover

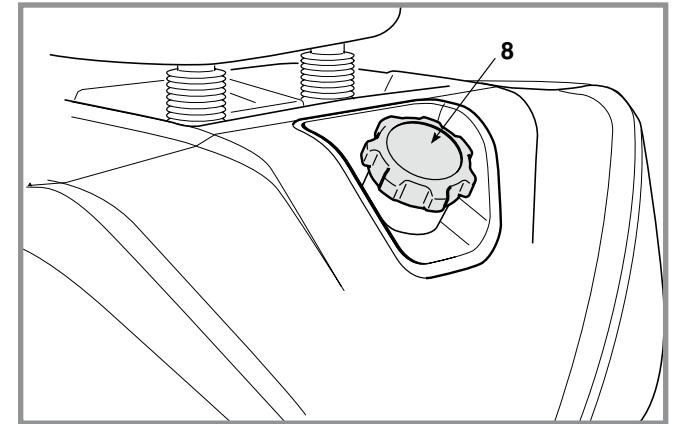
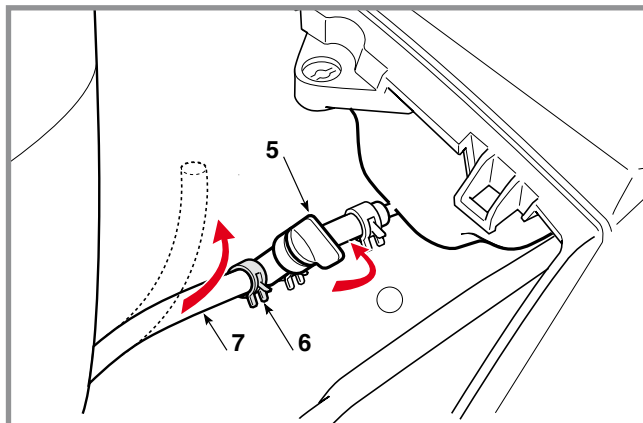
Map of functional units




Undo the screw (1) and remove the knob (2), then remove the central safety guard (3) fastened in place by the screw (4).



Close the tap (5), remove the clamp (6) and disconnect the output tube (7) holding it up to prevent spillage of any fuel left inside it, **making sure not to disperse it in the work area.**

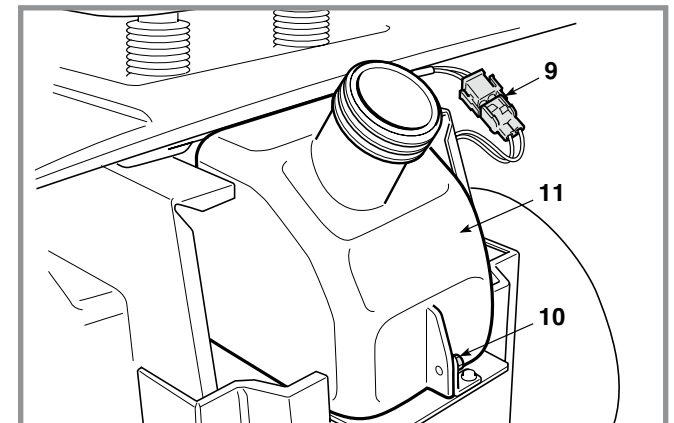


Remove the tank cap (8) and protect the nozzle to prevent foreign bodies from falling into the tank.

 Remove the rear part of the wheel cover

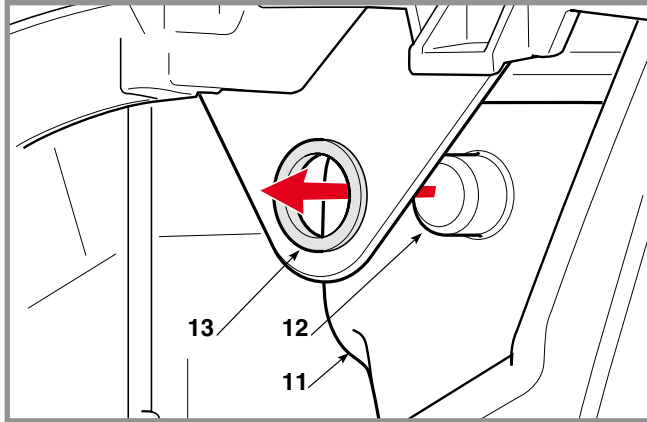
Disconnect the level indicator connector (9).

Loosen the screw (10) and remove the tank (11).



REMOVING THE REAR TANK

During reassembly, make sure the protuberance (12) of the tank is correctly positioned in its seat (13) on the chassis.



Complete the assembly process, follow the steps described above in the reverse order, making sure to:



Pay close attention to:

- reposition the spring clips;
- check there are no fuel leaks.

REPLACEMENT OF TYRES AND WHEELS

CHAPTER	REVISION	FROM ...	PAGE
6.1	0	2018	1 of 1

General informations

The tyres used are of the "Tubeless" type and so every repair of a hole in the tyre must be done by a tyre specialist according to the methods used for this type of tyre.

Related topics

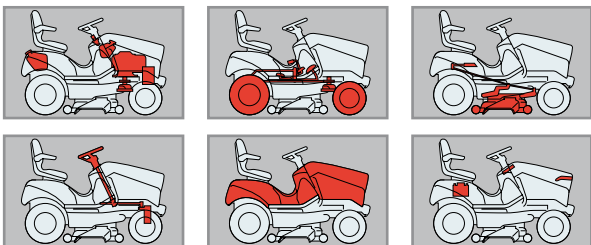
[🔧 2.3] Lifting of the machine

[🔧 4.5] Aligning the cutting deck

Tyre pressures

Front	1,0 Bar
Rear	1,4 Bar

Map of functional units



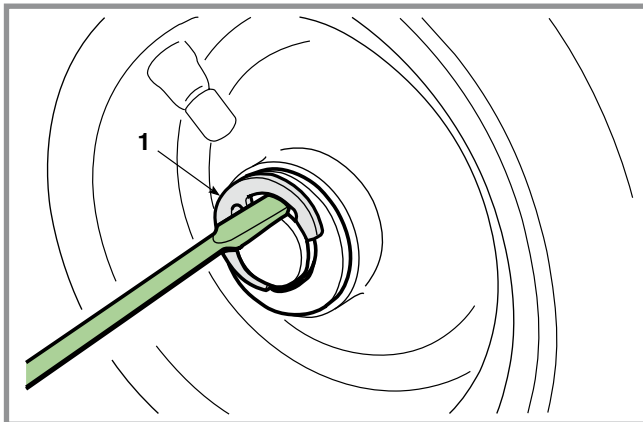
A) Tyres

After replacing one or more tyres or the wheels, it is always necessary to check the pressure and to check the alignment of the cutting deck.

⚠ ATTENZIONE Replace distorted wheel rims as they could impair the tyre's hold.

B) Wheels

The wheels are held by a snap ring (1) which can be removed with the help of a screwdriver.

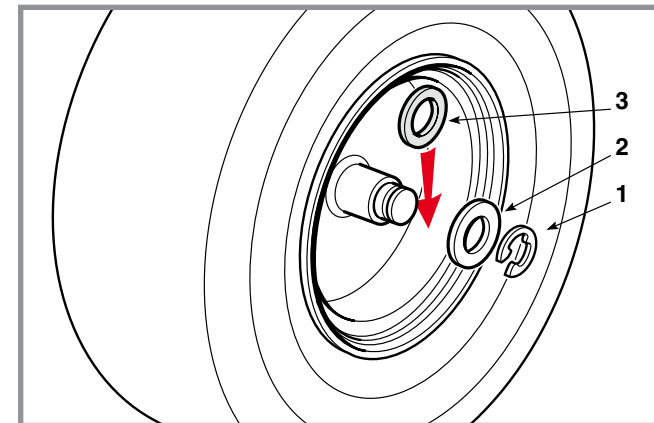


NOTE If a wheel is jammed onto the shaft, use a releasing spray, directing it around the splining hole.

On assembly it is advisable to spread grease on the shaft to facilitate the next wheel removal.

● **For the front wheels:** replace the shoulder washer (2) and the flexible ring (1) with the bevel facing inwards.

● **For the rear wheels:** replace the shoulder washer (2) and the flexible ring (1) with the bevel facing inwards and check the axial gap of the wheel on the shaft; if it is greater than 3 mm, a spacer (3) must be fitted between the wheel hub and the shoulder washer (2).



General informations

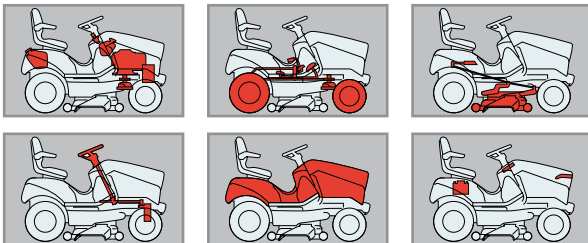
Related topics

[🔧 2.2] Tools

[🔧 2.3] Lifting of the machine

[🔧 6.1] Replacement of tyres and wheels

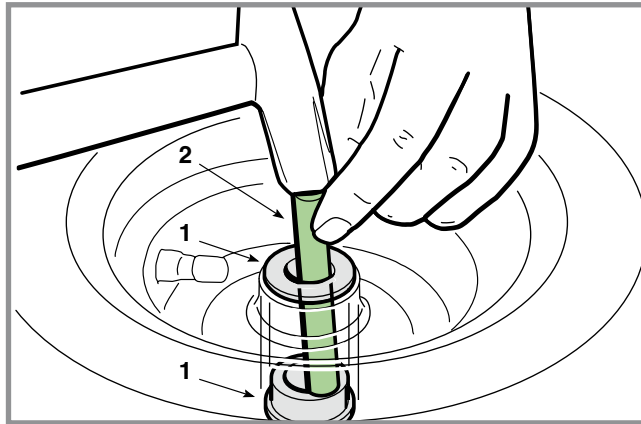
Map of functional units



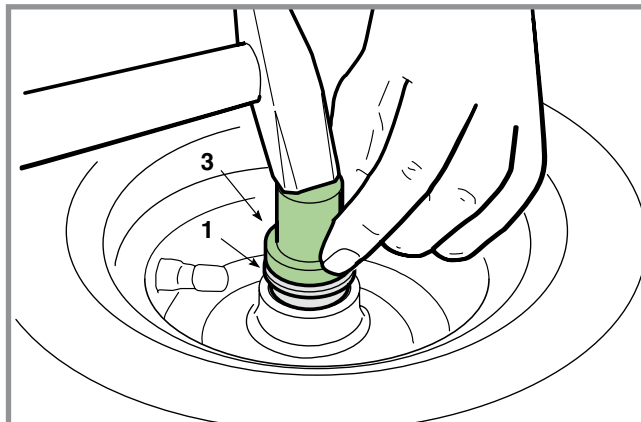
🔧 Dismantle the front wheel.

The front wheel bearings (1) are force splined into the front wheel hub.

A 10 - 12 mm diameter round bar (2) must be used to extract a bearing, inserted from the opposite side and struck with a hammer around various points of the inner circumference of the bearing.




The new bearing must be fitted with the help of a plastic mallet or of a bronze pad (3) that only acts on the bearing's outer ring.



General informations

Related topics

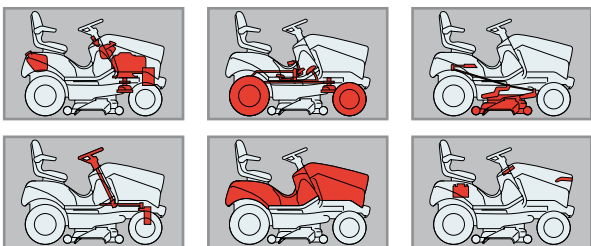
 **4,3** Adjusting the drive engagement

 **4,6** Steering geometry adjustment

Tightening torques

19 Nut for pulley fastening	25 ÷ 30 Nm
21 Screws for steering unit fastening	50 ÷ 55 Nm
24 Nuts for support fastening.....	35 ÷ 40 Nm
31 Nuts for bearing support fastening.	25 ÷ 30 Nm
34 Nut for sector bearing fastening	55 ÷ 60 Nm

Map of functional units

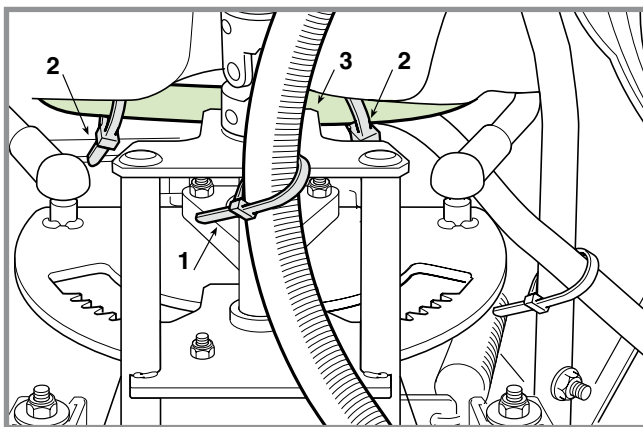


NOTE Removing steering parts requires removing the entire unit from the vehicle.

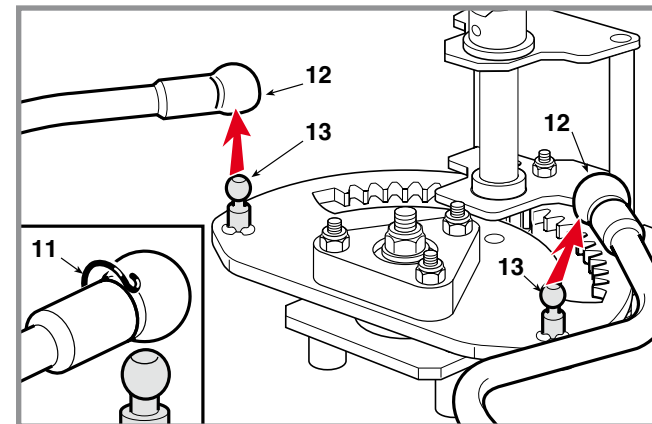
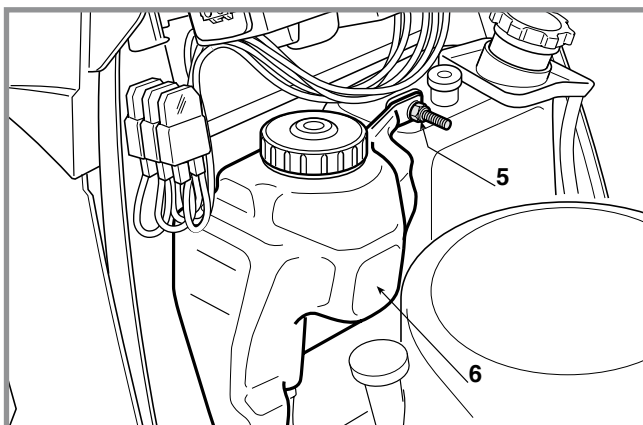
A) Removing the steering unit from the vehicle

Remove the wire clamp (1), accessible through the inspection hatch in front of the seat.

Remove the two clamps (2) to free the hydraulic system pipe (3).

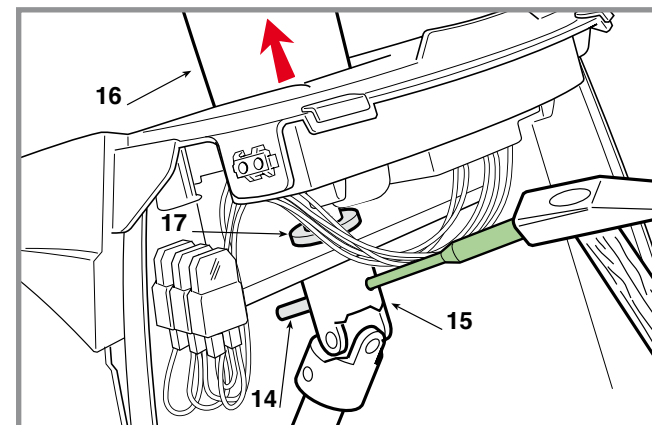


Unscrew the two nuts (5) and laterally move the oil tank (6), being careful not to spill oil.

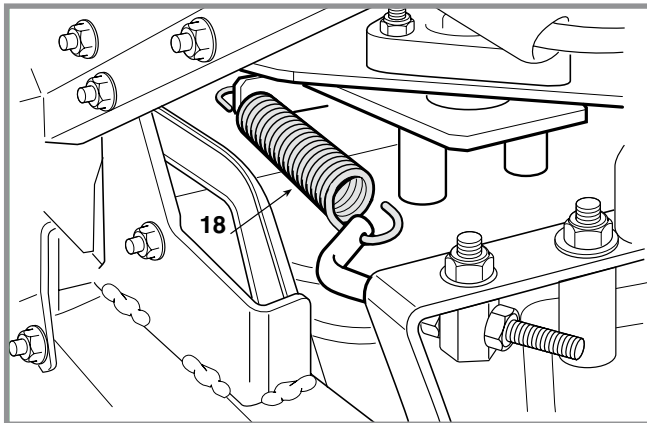


Extract the retention spring (11) and disconnect each articulated head (12) from their relevant pins (13).

Using a drift of suitable diameter, extract the pin (14) from the upper cardan joint (15) and extract the steering wheel (16) with relevant column, being careful not to remove the bushing (17).

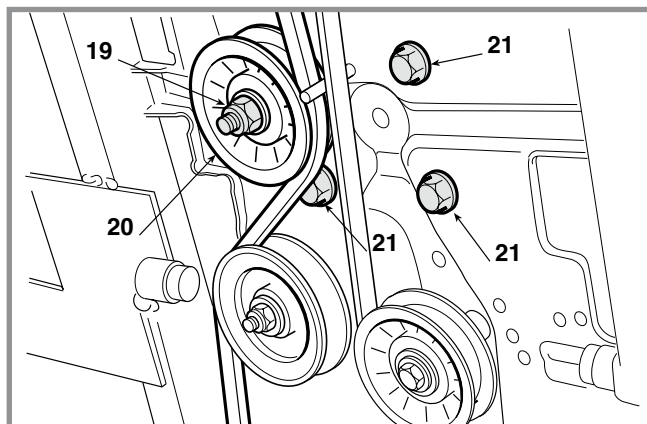


Unhook the spring (18) from the drive belt tensioner.



Working from the lower part of the vehicle, unscrew the nut (19) and remove the pulley (20) to access the steering unit fastening screws.

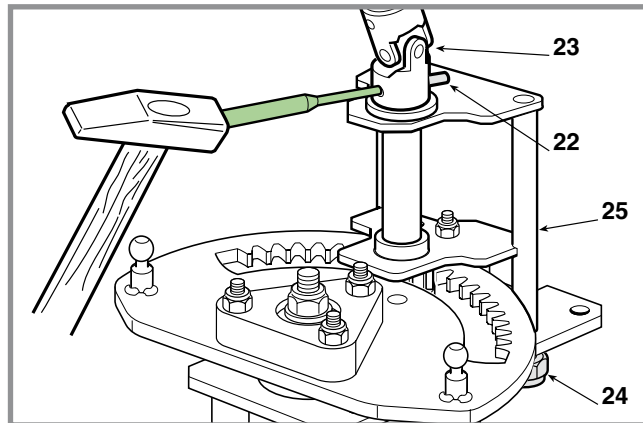
Unscrew the 4 screws (21) and remove the unit.



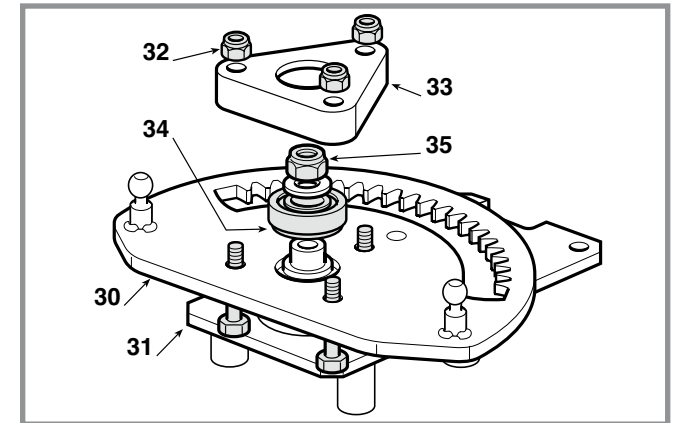
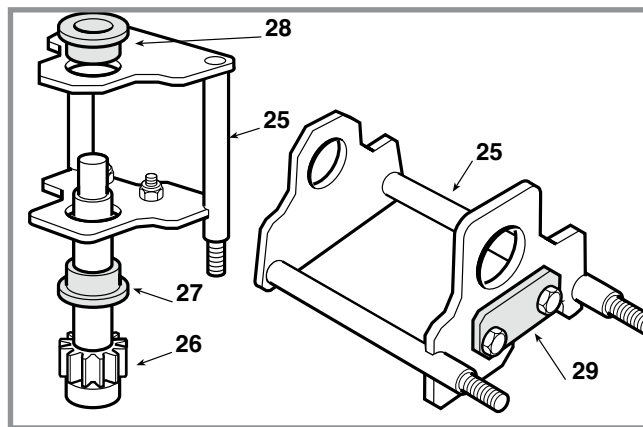
B) Part removal

Extract the pin (22) and remove the lower cardan joint (23).

Unscrew the two nuts (24) and remove the support (25).



Slide out the shaft with the pinion (26) and lower bushing (27).



Remove the upper bushing (28).

Check sliding plate wear (29) and replace if necessary.

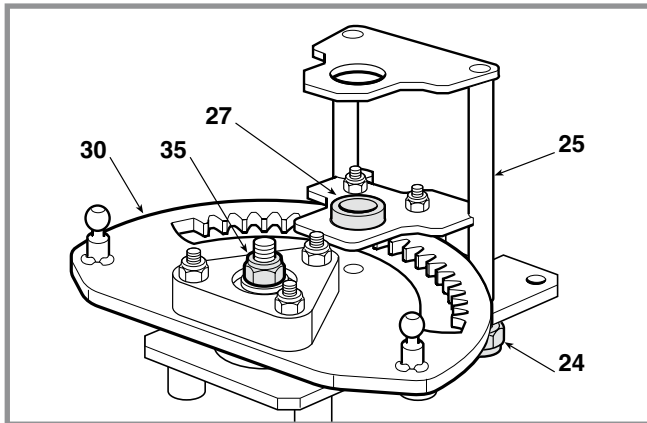
Check toothed sector allowance (30) compared to the support (31); if excessive, replace the bearing.

Unscrew the three nuts (32), remove the support (33) and slide out the bearing (34), secured by the nut (35) to replace..

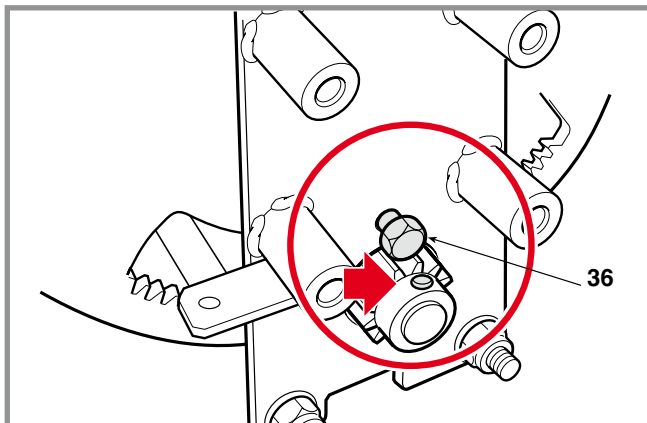
C) Part reassembly and allowance adjustments

Reassemble the lower bushing (27) and support (25) fully tightening the two nuts (24).

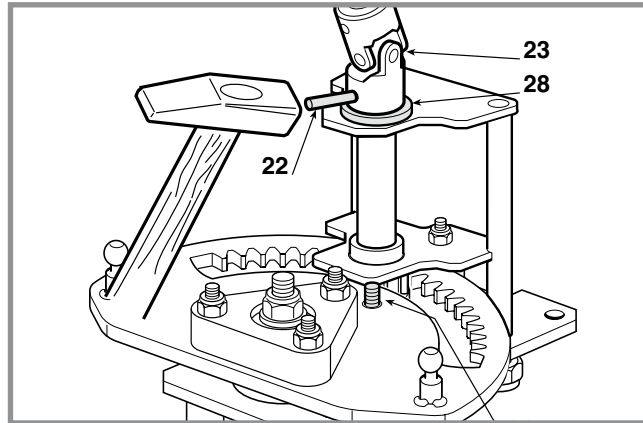
Loosen the nut (35) to let the toothed sector (30) move.



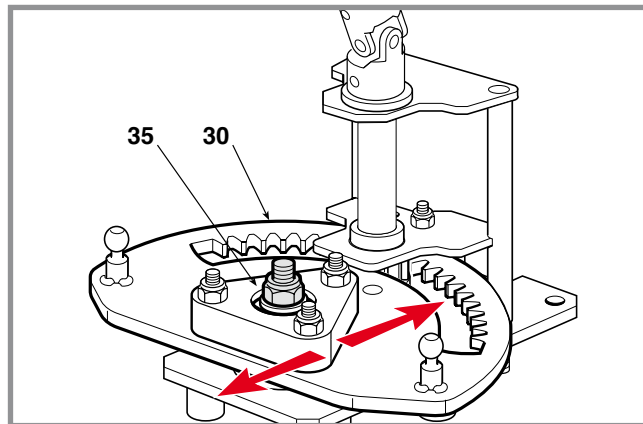
Place an M8 screw (36) in the toothed sector hole and reassemble the shaft with pinion (30) so that the pin and tooth face the screw head (36).



Reassemble the upper bushing (28) and cardan joint (23) with relevant pin (22) then remove the screw (36).



Move the toothed sector (30) longitudinally until allowance is reduced to a minimum between sector teeth and the pinion. Then tighten the nut (35) and grease concerned parts.

**D) Steering unit reassembly on the vehicle**

Follow the steps in point "A" in reverse order.

When assembly is completed:

- ☛ Check front wheel and steering wheel alignment.
- ☛ Adjust the drive belt.

REPLACEMENT OF THE DRIVE BELT

CHAPTER	REVISION	FROM ...	PAGE
6.4	0	2018	1 of 1

General informations

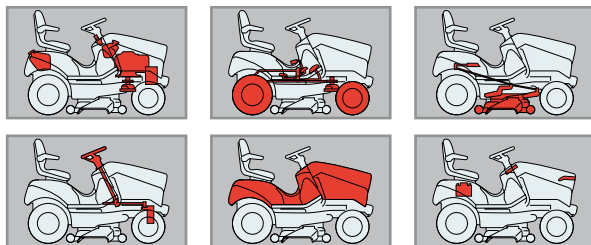
Related topics

- [🔧 4.3] Drive belt adjustment
- [🔧 5.2] Removal of the wheel cover
- [🔧 5.4] Removal of the engine
- [🔧 5.8] Removal the rear tank
- [🔧 9.2] Belts assembly

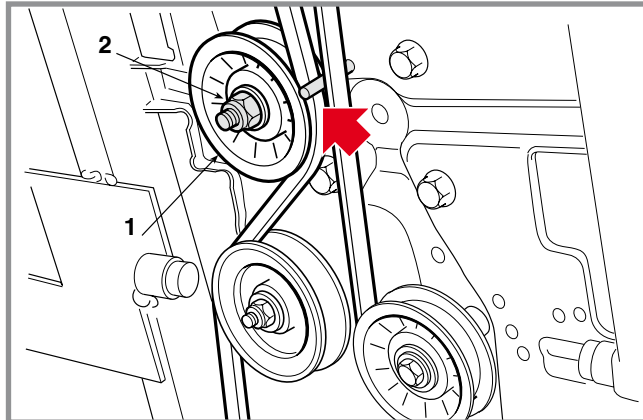
Tightening torques

2 Nut for pulley.....	25 ÷ 30 Nm
3 Nuts for small wheels	25 ÷ 30 Nm

Map of functional units

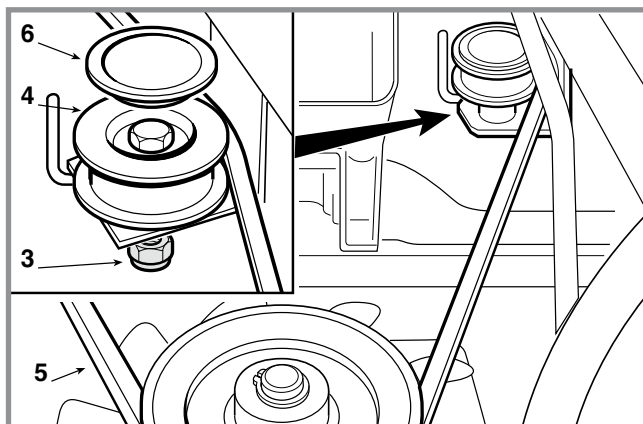


- 🔧 Dismount the engine pulley and the clutch.
- 🔧 Remove the rear part of the wheel cover
- 🔧 Remove the rear tank (if installed)



Dismantle the stretcher pulley (1) which is fixed by the nut (2).

Loosen the nut (3) of the right rear wheel (4) just enough to allow passage of the belt (5) and to remove the belt.



During reassembly operations, make sure the belt (5) is positioned accurately in relation to the pulleys and the containment guides.

Always reassemble the dust cover (6).

When assembly is completed,

- 🔧 Replace the engine pulley and the clutch.
- 🔧 Adjust the drive belt.
- 🔧 Replace the rear tank (if installed)
- 🔧 Replace the rear part of the wheel cover.

REPLACEMENT OF THE SMALL WHEELS FOR THE DRIVE BELT

CHAPTER	REVISION	FROM ...	PAGE
6.5	1	2018	1 of 1

General informations

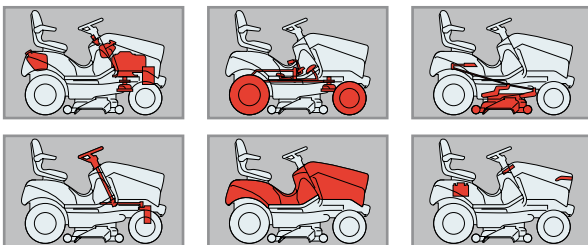
Related topics

- [🔧 4.3] Drive belt adjustment
- [🔧 5.2] Removal of the wheel cover
- [🔧 5.8] Removal the rear tank
- [🔧 9.2] Belts assembly

Tightening torques

2 Nuts for small wheels 25 ÷ 30 Nm

Map of functional units



🔧 Remove the collector channel.

It is advisable to slacken the transmission belt to work on the parts involved more easily. This is done by slackening the stretcher.

The two small side wheels are fixed to the chassis with a nut (2).

- The small wheels differ in:
- sizes (1a - Ø 63 mm) or (1b - Ø 50 mm);
 - spacer length (3a - 21,5 mm), (3b - 30,6 mm).

On assembly it is important to follow both specifications, as shown on the diagram, taking into account

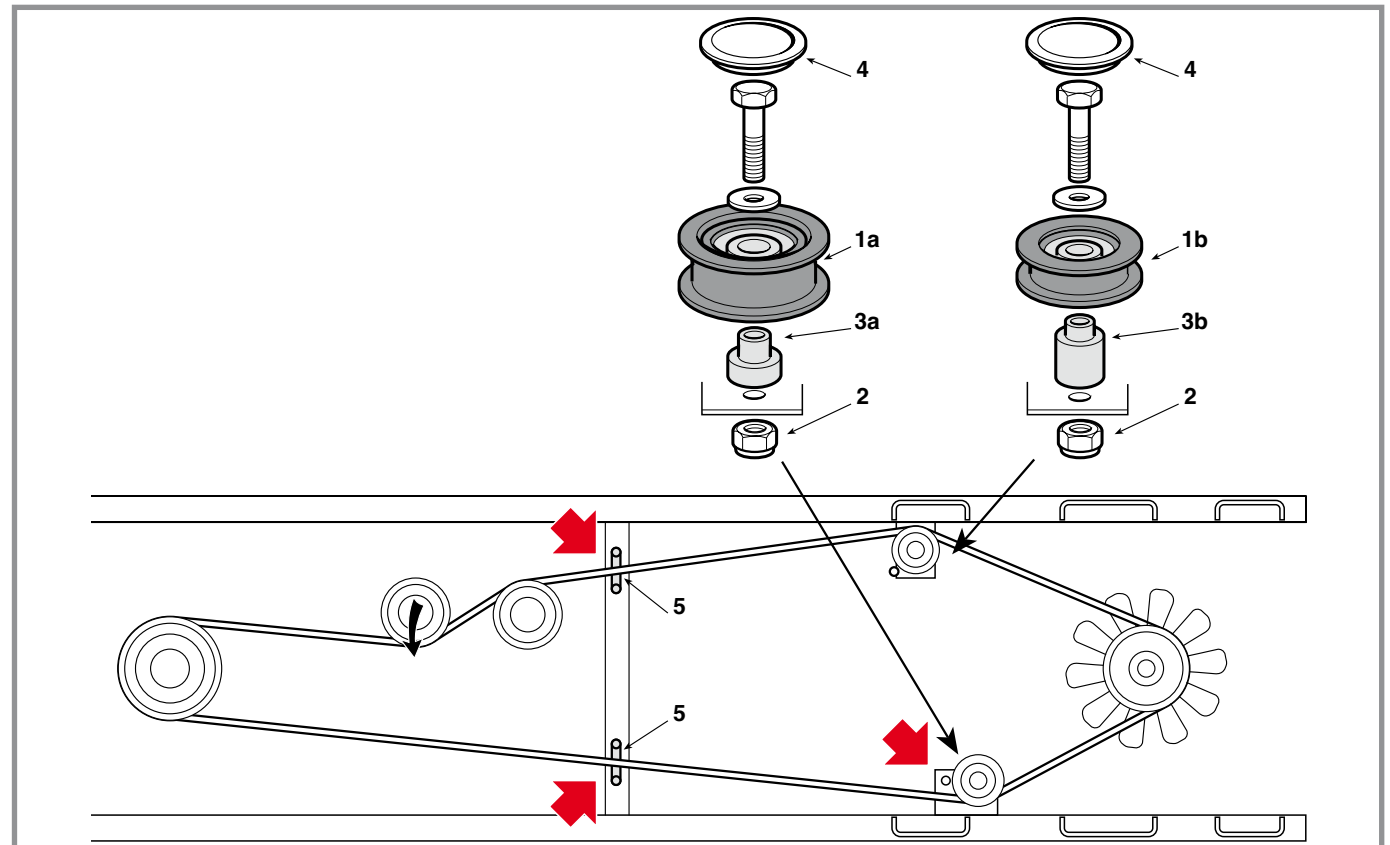
that the left rear small wheel should be placed in the rear hole of the chassis plate.

Make sure it is fed through the two forks (5).

Always reassemble the dust covers (4).


Once assembly is completed ...

- 🔧 Adjust the drive engagement.
- 🔧 Refit the collector channel.
- 🔧 Tighten the spring of the stretcher.



General informations

Related topics

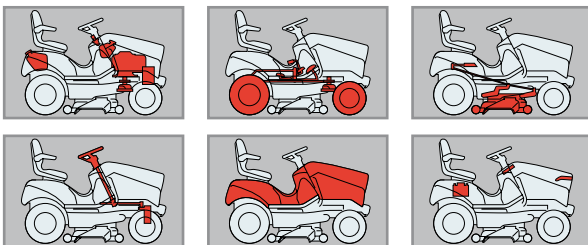
 **4.1** Adjusting the engagement and checking the blade brake

 **9.2** Belts assembly

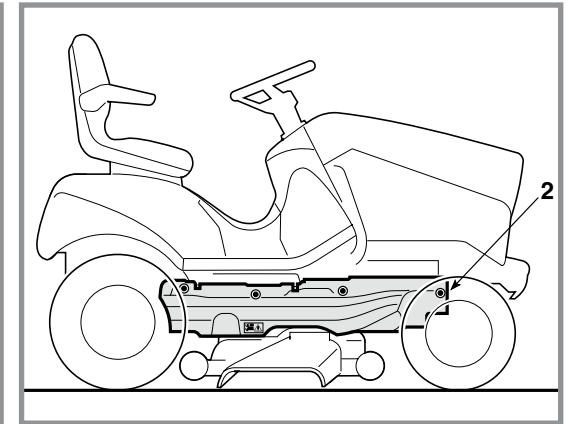
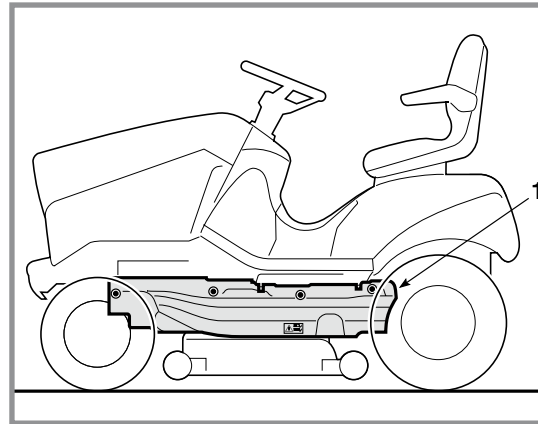
Tightening torques

8-9 Screws for pulleys 20 ÷ 25 Nm

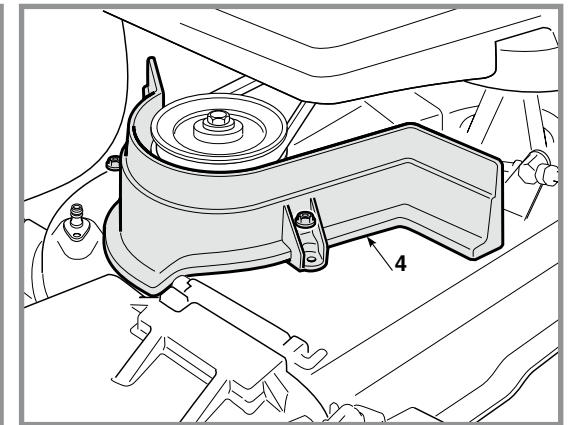
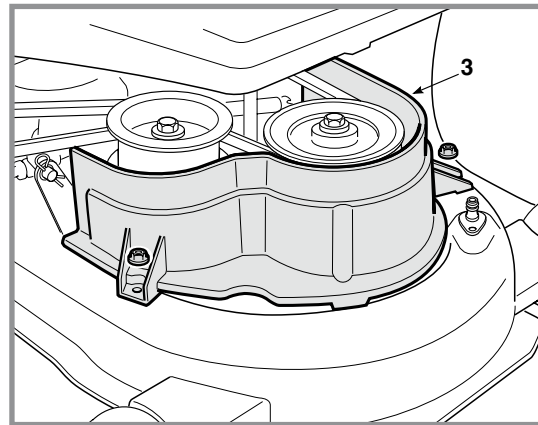
Map of functional units



Lower the cutting deck completely.

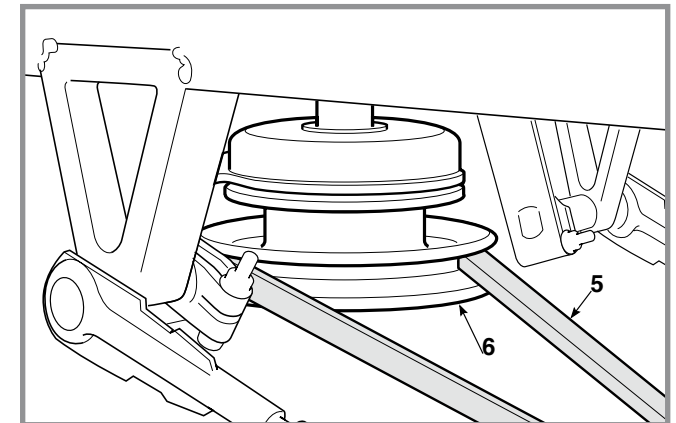


Identify the fastening screws and remove the left (1) and right (2) external safety guard.



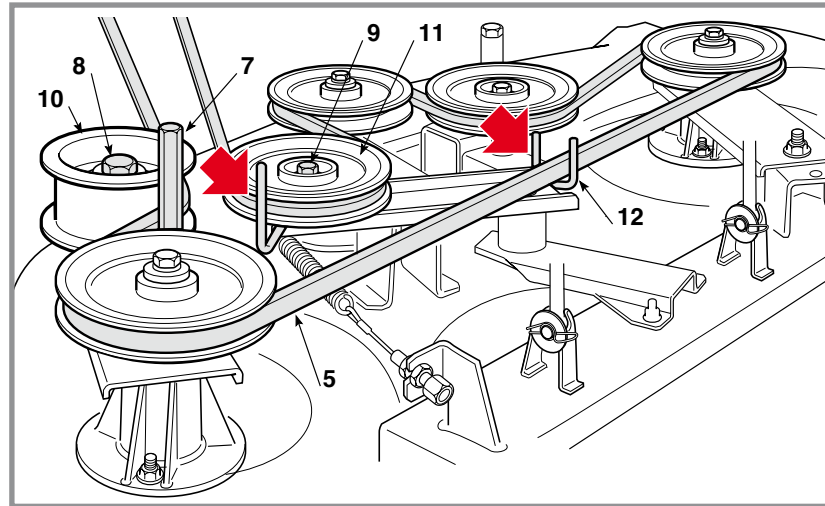
Remove the left (3) and right (4) internal safety guards.

Pull one branch of the belt (5) to release it from the clutch pulley (6).



Loosen the guide pulley pin (7) and the screws (8-9) almost completely, without removing the idler pulley (10) and the pulley (11) in order to be able to extract the belt (5).

At this point the belt (5) is completely free and can be extracted.



During reassembly operations, make sure the belt is positioned accurately in relation to the containment pins and its passage through the fork (12).

On completing the reassembly, it is necessary to ...

☞ Adjust the blade engagement.

! Always reassemble the internal (3-4) and external (1-2) side safety guards.

REPLACEMENT OF THE SUPPORTS AND SHAFTS OF THE BLADES

CHAPTER	REVISION	FROM ...	PAGE
6.7	0	2018	1 of 2

General informations

Related topics

[🔧 2.2] Special tools

[🔧 4.8] Removing, sharpening and balancing the blades

[🔧 5.7] Removal of the cutting deck

[🔧 6.6] Replacement of the blades control belt

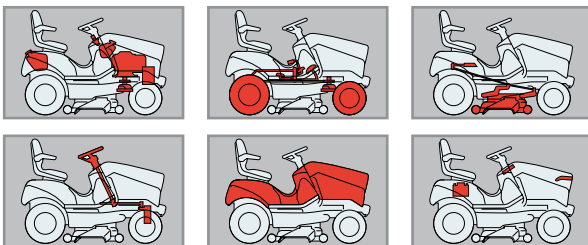
Tightening torques

6-7 Nuts for pulleys 20 ÷ 25 Nm

10 Plates fixing nuts 20 ÷ 25 Nm

22 Flanged support fixing nuts..... 25 ÷ 30 Nm

Map of functional units



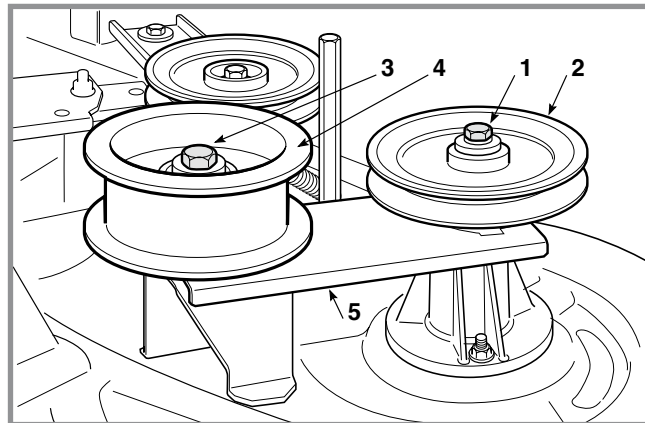
🔧 Remove the cutting deck.

NOTE *This operation is not strictly necessary since, with a little practice and experience, it is possible to dismantle the deck supports without removing the cutting deck.*

🔧 Remove the blade control belt.

🔧 Remove the blades and take off the hubs.

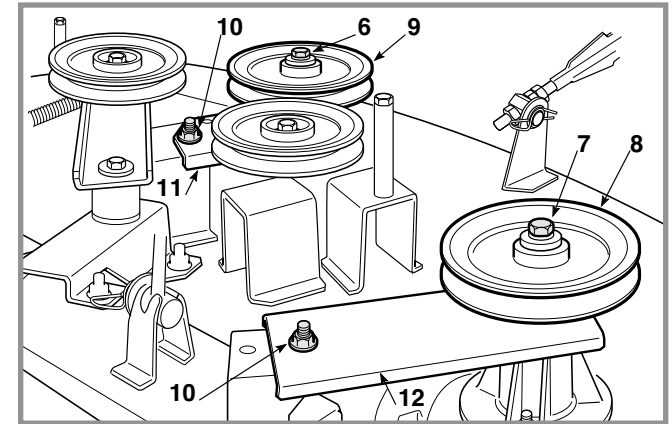
Undo the central screw (1) and extract the left pulley (2).



Unscrew the screw (3) and remove the drive pulley (4) and the connection plate (5).

Undo the central screws (6-7) and extract the right pulley (8) and the central pulley (9).

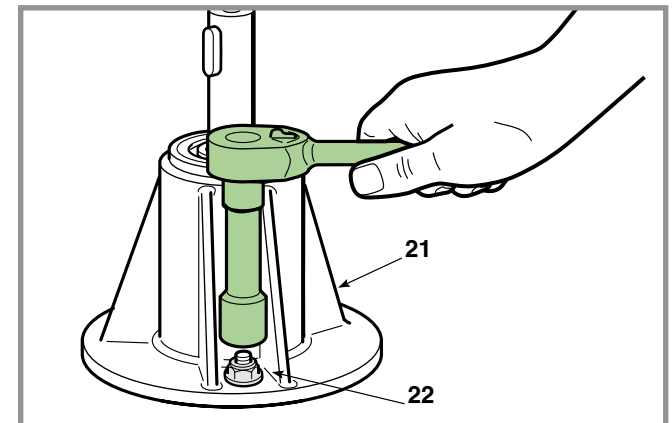
Unscrew the two nuts (10) and remove the two connection plates (11-12).



A) Replacement of the supports of the blades

Dismantle the flanged support (21) by unscrewing the three fixing screws (22).

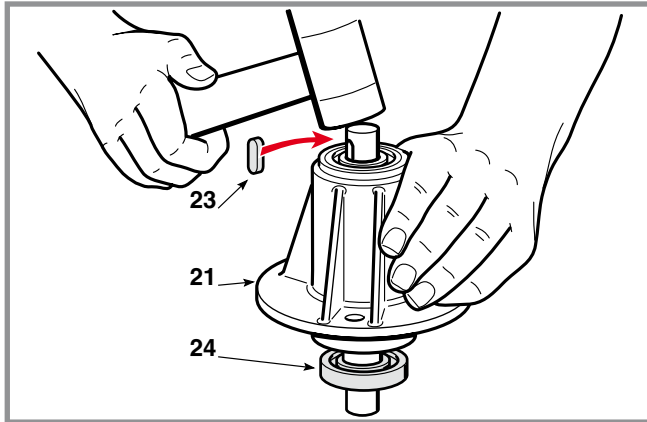
NOTE - *The entire support (21), including shafts and bearings, is a spare part available as a single assembly unit.*



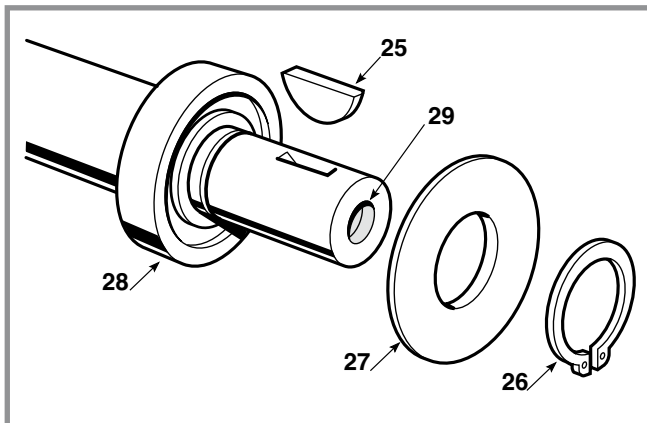
REPLACEMENT OF THE SUPPORTS AND SHAFTS OF THE BLADES

B) Replacement of the bearings and the shafts of the blades

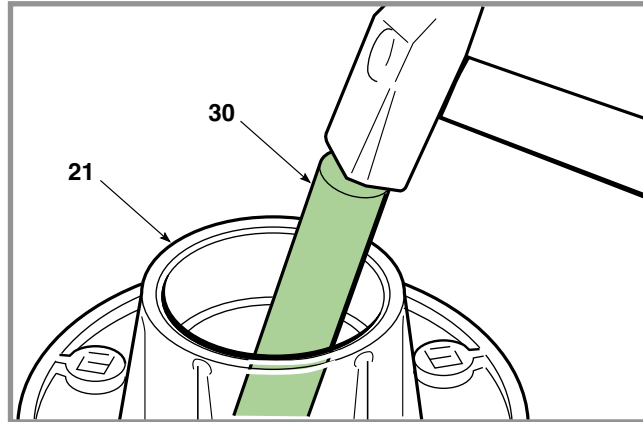
Remove the key (23) and hit the shaft on the pulley side with a plastic mallet to extract the shaft together with the lower bearing (24).



After having removed the key (25), the snap ring (26) and the dust cover (27), the bearing (28) splined onto the shaft can be removed using a normal extractor, being careful to close the threaded hole (29) with a suitable screw to prevent the tip of the extractor from damaging the thread.

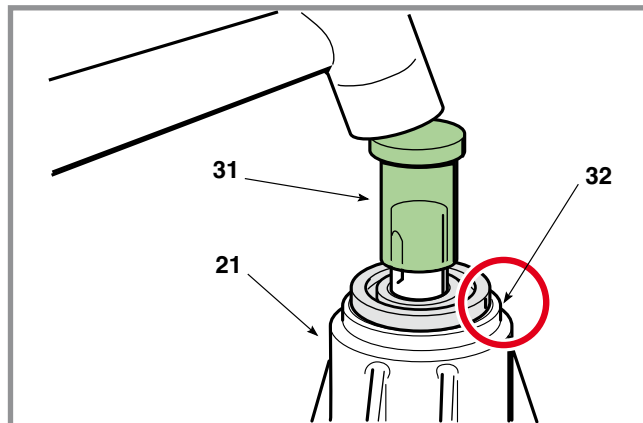


The second bearing still in place must be removed by hitting it from the inside of the flange using a 12 ÷ 15 mm diameter round bar (30).



On reassembly, having first inserted the shaft in the lower bearing hole and inserted everything into the support, fit the upper bearing using the specific stopper (31) that acts on the inner ring, hitting it squarely with a mallet until the bearing is fully driven home.

Refit the flanged supports onto the deck, fully tightening the nuts (22).



IMPORTANT When refitting the plates (5-12), the holes corresponding to the support axes must meet perfectly in the centring step (32) cut into the upper part of each support.

☛ Reassemble the blades.


☛ Reassemble the blade control belt.


REPLACEMENT OF THE ACCELERATOR AND ADJUSTMENT OF THE CARBURETTOR

CHAPTER	REVISION	FROM ...	PAGE
6.8	0	2018	1 of 1

General informations

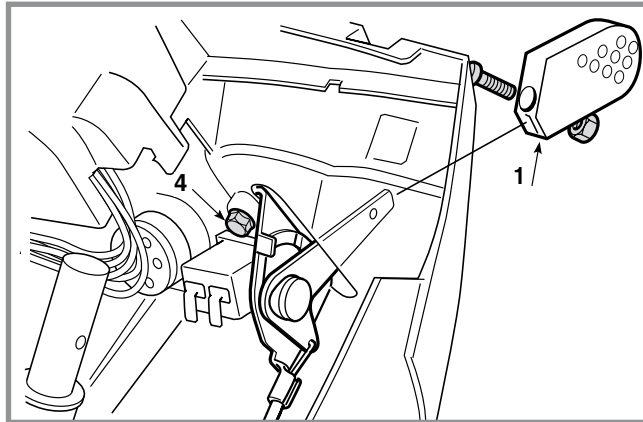
Related topics

 **5.3** Removal of the dashboard

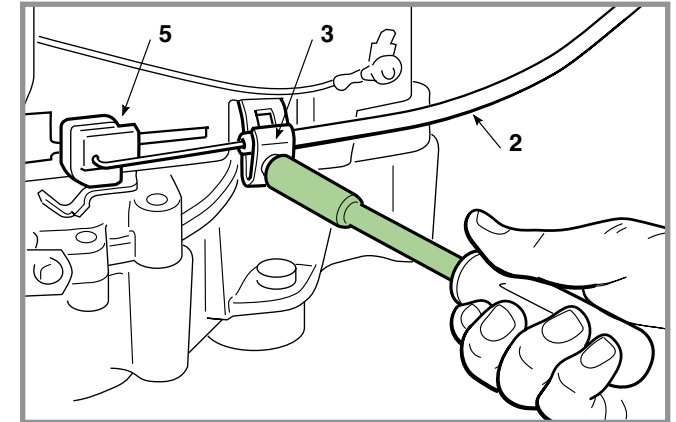
 Remove the dashboard.

Take off the knob (1) and disconnect the cable (2) from the connection terminal (3) on the engine.


Undo the two fixing screws (4) and take out the accelerator together with the wire.



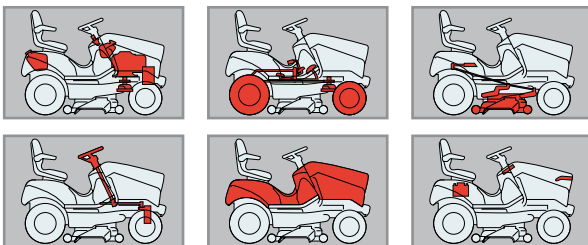
On reassembling, put the accelerator lever in the «MINIMUM» position, connect the end of the cable (2) to the terminal (3) on the engine after having moved the cursor (5) in the same «MINIMUM» position specific to each type of engine and shown in the instruction booklet.



When assembly is completed ...

 Refit the dashboard.

Map of functional units



General informations:

The hydraulic circuit has two different types of pipes:

- rigid pipes with flexible ends, and screwed on fittings for the delivery and return of high pressure oil to and from the two transmission units;
- flexible hoses to connect the transmission units to the tank, at low pressure (atmospheric pressure).

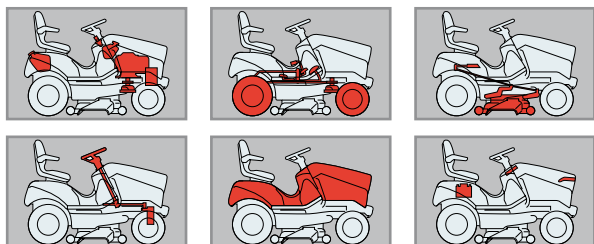
Related topics:

- [🔧 2.3] Lifting of the machine
- [🔧 4.9] Emptying the hydraulic circuit
- [🔧 5.2] Removal of the wheel cover
- [🔧 6.1] Removal of the wheels

Tightening torques

1-2 Hydraulic system fittings	35 ÷ 40 Nm
3-4 Hydraulic system fittings	25 ÷ 30 Nm

Map of functional units



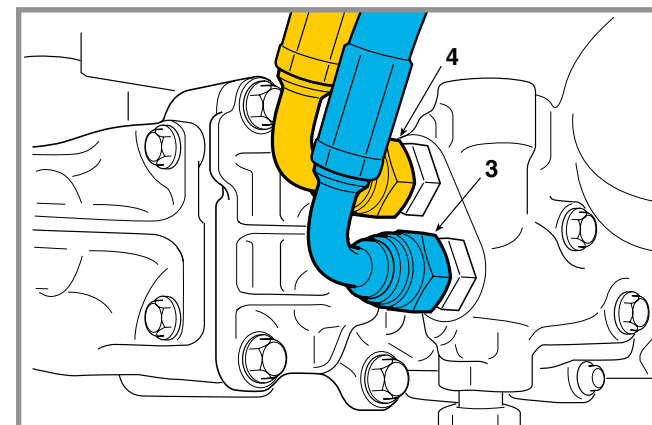
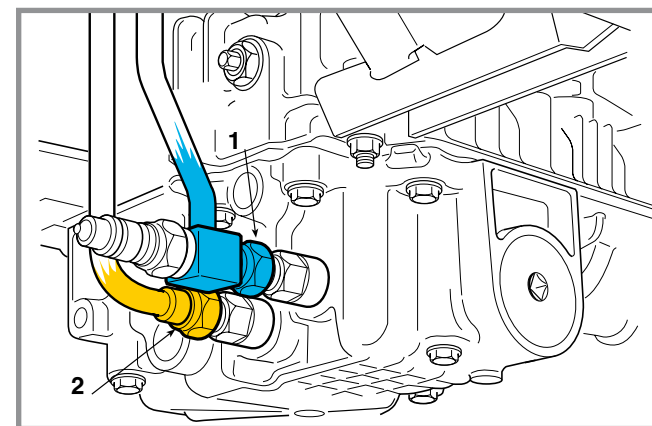
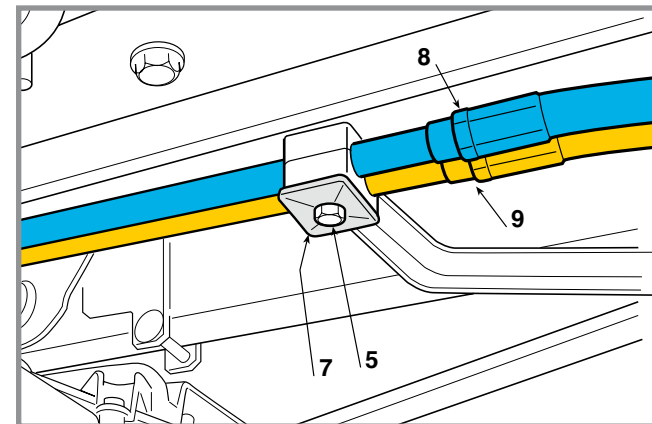
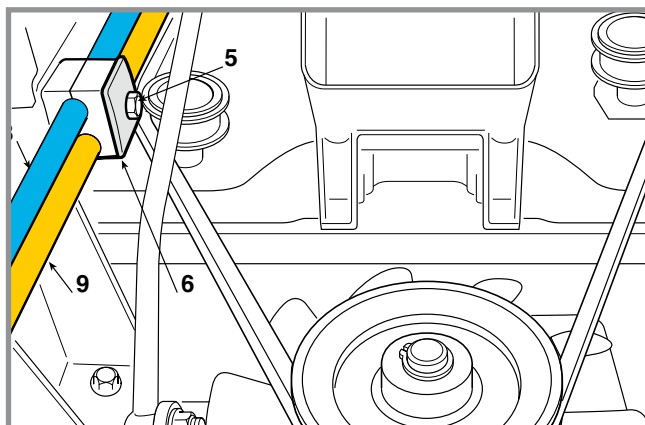
- 🔧 Lift the front part of the machine.
- 🔧 Dismantle the front left wheel.
- 🔧 Remove the rear part of the wheel cover.
- 🔧 Completely empty the oil from the hydraulic system

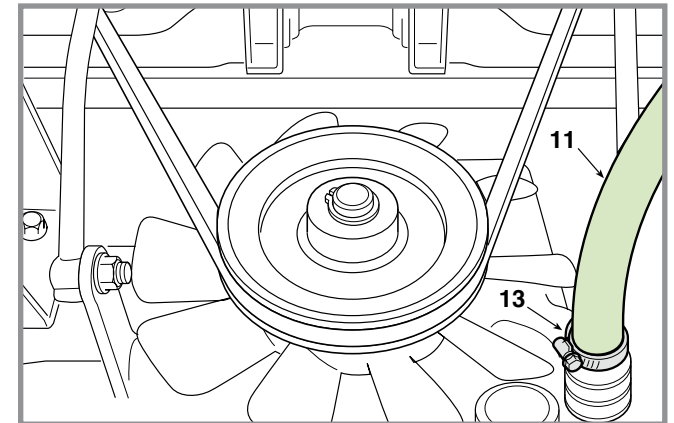
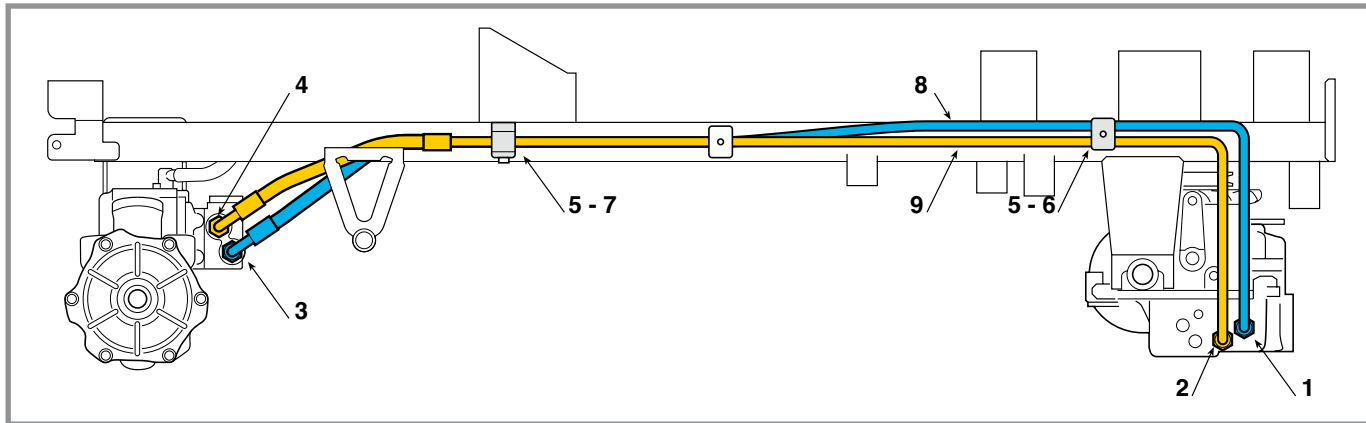
A) High pressure pipes

NOTE The high pressure pipes are those that connect the rear transmission to the front transmission and that run along the left beam of the chassis.

Unscrew the screws (5), remove the plate (6) and (7) from the fixing blocks.

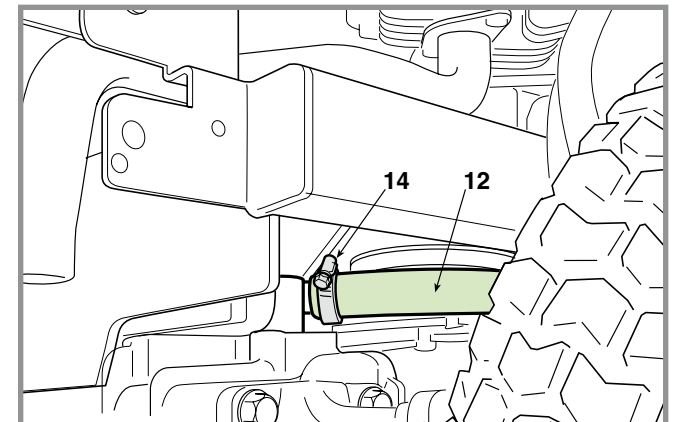
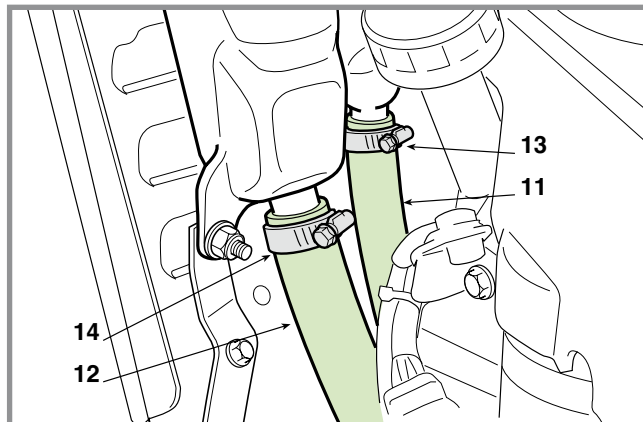
Disconnect the rear fittings (1) and (2) and the front fittings (3) and (4) from the pipes of the hydraulic system and remove the pipes (8) and (9).





The pipes differ, so on assembly take care not to invert their position (8) and (9), and to correctly fit the front and rear fittings into their attachments on the transmission.

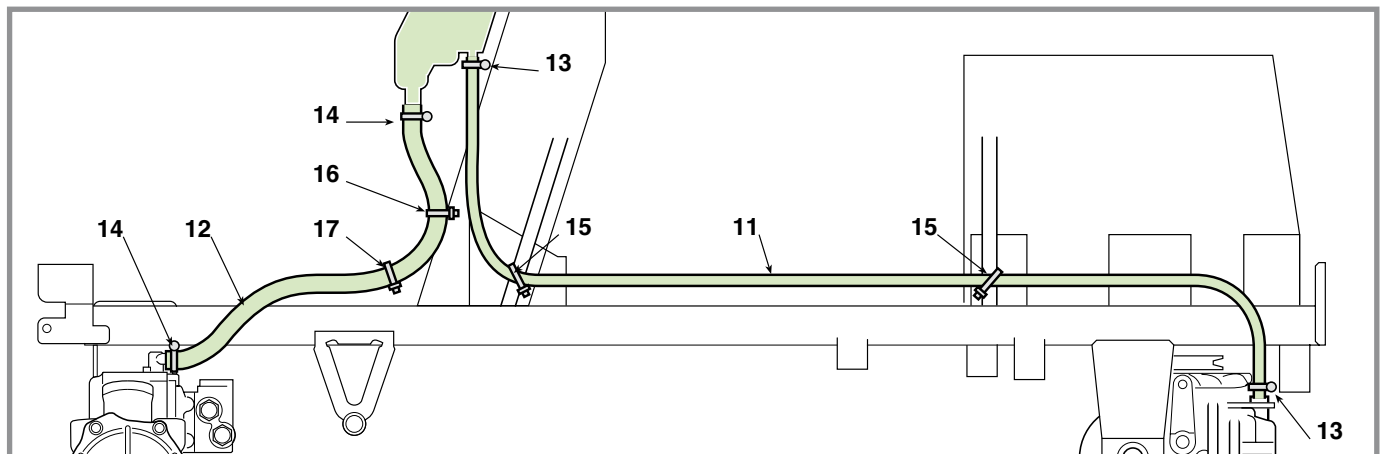
After connecting the two front fittings (3) and (4), check that the swing of the front transmission doesn't cause the flexible tubes to scrape against the chassis.



B) Low pressure pipes

The low pressure pipes connect the oil tank to the two transmission units.

The two pipes (11) and (12) are fixed to the attachments on the fuel tank and to the transmission unit fittings by the pipe clamps (13) and (14).

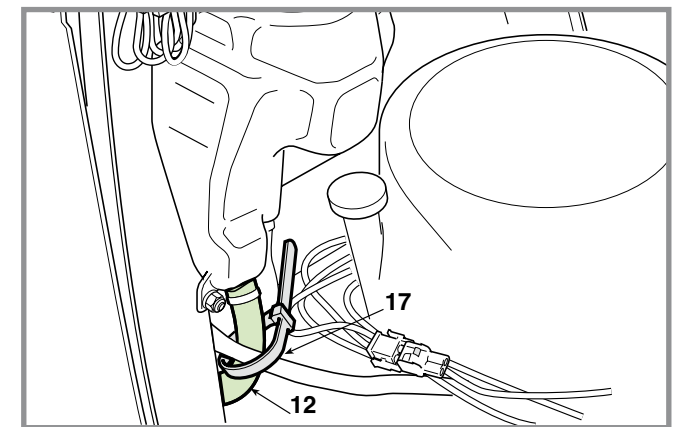
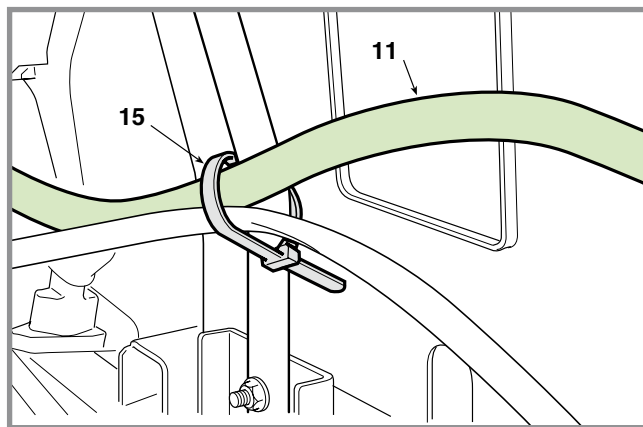
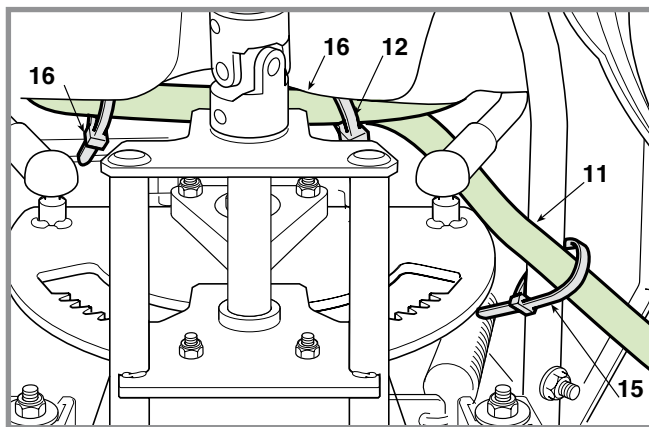
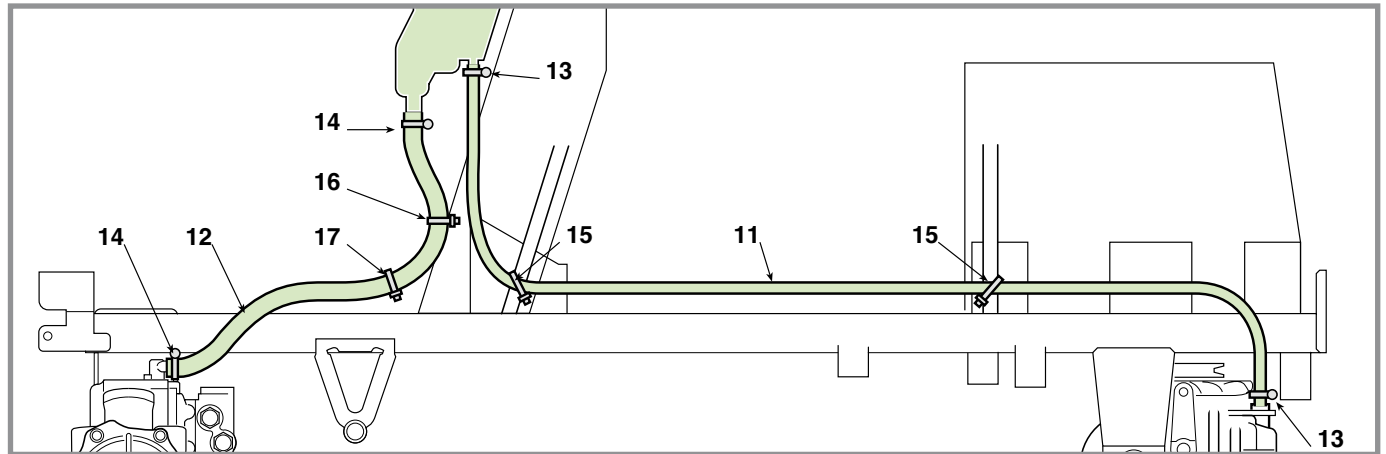


On assembly take care to restore the correct pipe positions, fixing them to the chassis at the points indicated on the diagram, using:

- 2 clamps (15) on the right side for the rear pipe (11);
- 2 central clamps (16) and 1 clamp (17) for the front pipe (12), checking that the pipe does not come into contact with the steering tie-rod or other moving parts.

☛ Fill the hydraulic system.

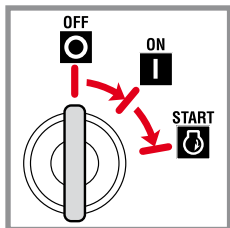
☛ Reassemble the rear part of the wheel cover.



General informations

In the following some of the problems connected to the malfunctioning of the electrical system are shown, with their probable cause and the remedial action to be taken.

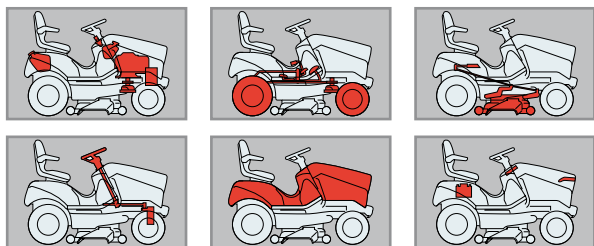
Should the problem continue after the appropriate checks, seek assistance from your local Service Centre.



Related topics

- [7.2](#) Table for the cutting in of the safety devices
- [7.3](#) Safety microswitches operation check
- [7.6](#) Starter relay operation check
- [7.8](#) Recharge circuit check
- [7.9](#) Maintenance of the sealed battery

Map of functional units



PROBLEM	CAUSE	REMEDY
1. Activation of the self-resetting protection 1)		
a) ... on inserting the key in position «ON»	Battery terminal crossed	Check the battery connections
	Short circuit to earth	Check the connectors and wiring of the microswitches
b) ... in position «START» or after a few seconds use, following an attempt at starting with outside means:	Sulphated battery (it no longer accepts recharging)	Replace the battery
	Faulty or wet electronic card	Check and dry with low pressure tepid air (hair-dryer)
	Disconnected or missing battery	Reconnect the battery. It must always be connected
	Battery terminals corroded or with poor contact	Check and clean the connections
c) ... after several minutes' use:	Poor or missing earth contact on the charge regulator	Check the earth connections and the screws fastening the regulator
	Overvoltage from a malfunction in the regulator	Check the recharge circuit
	Battery disconnected or faulty during use	Check the battery or wiring
2. The dashboard remains off with the key in position «ON»	The battery is not supplying the card	Check the connection cables Check the battery's condition
	Battery or card not earthed to frame	Check and put right
	10 A fuse blown	Replace fuse (10 A)
	Battery terminal crossed	Check connections

! WARNING! The self-setting guard reaches very high temperatures (around 180 °C) which are to be considered normal. Similarly, there might be some smoke inside the box which is due to the overheating of the powder inside. **Do not touch this component of the circuit board until it has cooled down.**

1) The cutting in of the self-resetting protection of the electronic card is signalled by a beep, except in cases where the battery is missing, flat or with the terminal crossed. The signal stops when the key is returned to position «OFF»; then wait a few seconds before returning to position «ON».

IMPORTANT Faulty electronic cards must always be replaced without trying to repair them or replace single components.

PROBLEM	CAUSE	REMEDY
3. The dashboard switches on but, with the key in position «START», the starter does not turn or lacks power (poor starting)	The battery is not supplying sufficient current	Recharge the battery
	Badly earthed battery, or the starter relay or engine not earthed	Check and put right
	Starting not permitted	After checking that the conditions are met, check all the microswitches and the relative wiring
	Malfunction in the electronic card	Try replacing the card with one that is known to work
	Starter relay is faulty	Check that the starter relay is activated
4. The starter turns but the engine does not start	No fuel flow	Check the leads for the carburettor solenoid valve opening control (if provided) or check the fuel stopcock and filter
	Impaired starter system	Check that the spark plug cap is positioned correctly Check that the spark plug electrodes are clean and have the correct gap
5. The starter continues to turn after engine has started, and does not stop when the key is removed	Mechanical difficulties with the contact breakers of the starter relay	Replace the starter relay
	Starter works erratically for mechanical or electrical reasons taking excessive current and causing binding of relay contacts	Check the starter
6. The starter operates as soon as the key is in the «ON» position, and can be turned off only by removing the key	Fault in the card	Replace the panel/board group (NOTE: it is possible to complete the work in any case, but the panel/board group must be replaced as soon as possible)
	Starter block operating faults	Replace the block
7. The battery warning light does not come on with the key in position «ON» but the machine operates	Fault in the electronic circuit or in the signalling LED	Replace the panel/board group (NOTE: it is possible to complete the work in any case, but the panel/board group must be replaced as soon as possible)
8. The battery warning light remains on	Insufficient charge	Check that the charging cable has not detached
		Check that there are no current leakages caused by cables with damaged insulation
		Check the recharge circuit
	Charger fuse blown	Replace fuse (25 A) and check the recharge circuit

IMPORTANT Faulty electronic cards must always be replaced without trying to repair them or replace single components.

PROBLEM	CAUSE	REMEDY
9. The battery light is blinking	Recharge overvoltage	Check the recharge circuit
	Battery insufficiently charged at startup	Recharge the battery
10. Abnormal, uncontrolled lighting up of the LEDs or irregular card operation	Faulty or wet electronic card	Check and dry with low pressure tepid air (hair-dryer)
	Bad earthing of the electronic card	Check and put right
11. The 10 A fuse cuts in	The safety devices have cut in or are faulty	Check the operation of the microswitch operation and the relevant wiring
	Accidental detaching of an electrical wire	Check all wiring
	Starting of engine not permitted	After checking that the conditions are met, check all the microswitches and the relative wiring.
12. The 10 A fuse cuts in	Short circuit or overload on the power side of the card (ignition block, starter relay, headlamps and recharger connector)	Find and replace the defective user
	Short circuit or damage to the electronic card protection (power side)	Replace the panel/circuit board group with one that is known to work; if the problem does not reoccur replace the faulty group definitively
13. The 25 A fuse cuts in	Faults in the battery charging circuit	Replace fuse (25 A) and check the recharge circuit

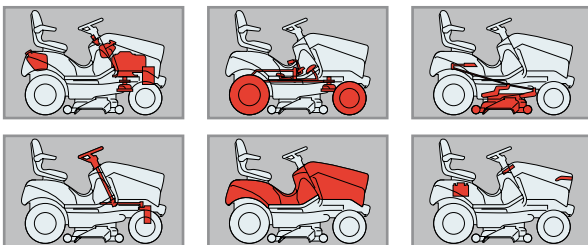
IMPORTANT *Faulty electronic cards must always be replaced without trying to repair them or replace single components.*

General informations

Related topics

[7.3](#) Safety microswitches operation check

Map of functional units



This table shows the various situations in which the safety devices intervene.

A) STARTING («START» position)

The engine DOES NOT start, when:

Operator	-/-	-/-	Absent
Blades	-/-	Engaged	-/-
Drive	Engaged	-/-	-/-
Parking	-/-	-/-	-/-
Indication on the Dashboard			

B) WHILE CUTTING

The engine STOPS start, when:

Operator	Absent	Absent	-/-	-/-	Absent	Seated
Blades	-/-	Engaged	Engaged	Engaged	-/-	Engaged
Drive	Engaged	-/-	-/-	-/-	-/-	Reverse
Consent Button	-/-	-/-	-/-	-/-	-/-	Released
Parking	-/-	-/-	-/-	Engaged	-/-	-/-
Indication on the Dashboard						

-/- Irrelevant condition for the triggering of safety devices

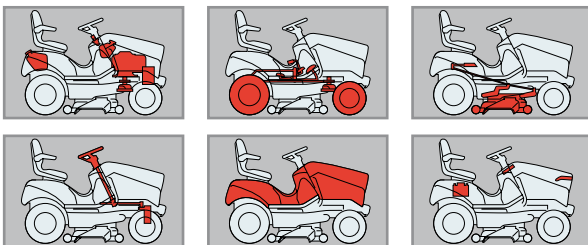
= Pilot lamp on = Pilot lamp off = Pilot lamp uninfluential

SAFETY MICROSWITCHES OPERATION CHECK

General informations

Related topics

Map of functional units



This check is done by disconnecting connector CN1 and using the tester in Ohmmeter mode. This operation must be performed without the operator aboard, making contact with the ferrules on the contacts of the wiring connector (1) and must give these results:

No. of Contacts	Tester reading and condition		
OPERATOR PRESENCE			
1 - 14	∞ (absent)	O (seated)	
PARKING MICROSWITCH			
1 - 17	O (free)	∞ (engaged)	
BLADES SWITCH			
1 - 16	∞ (engaged)	O (disengaged)	
"IN NEUTRAL" SIGNAL			
1 - 7	O (drive)	∞ (neutral)	
FUEL LEVEL GAUGE (if present)			
1 - 5	O (reserve)	∞ (from 1/2 to full)	
1 - 8	O (full)	∞ (from reserve to 1/2)	
OIL WARNING LIGHT (if present)			
1 - 15	O (always)		
IGNITION KEY			
+ Battery - 11	∞ (OFF)	O (ON)	O (START)
+ Battery - 12	∞ (OFF)	∞ (ON)	O (START)

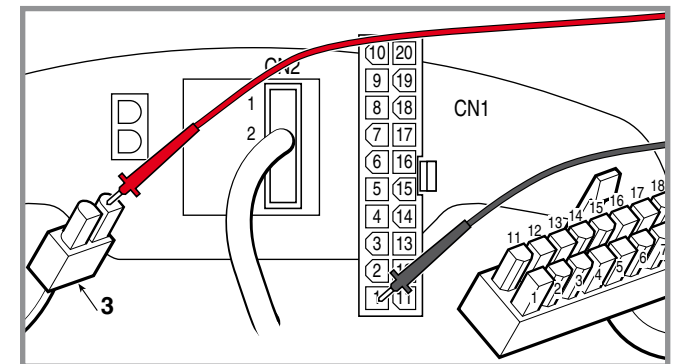
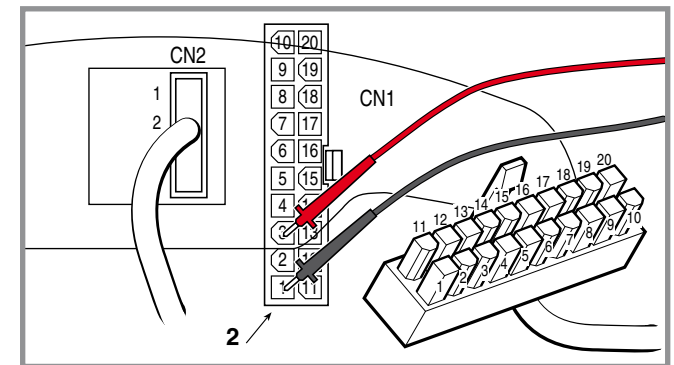
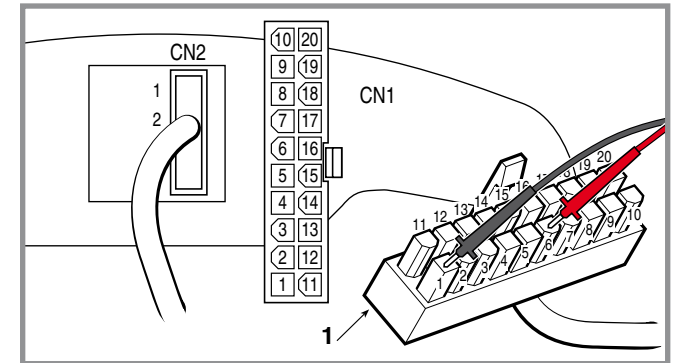
Engine Stop

This operation must be done making contact with the ferrules on the contacts of connector CN1 of the card, keeping all other connectors connected, and must give this result:

No. of Contacts	Tester reading and condition		
1 - 3	O (Always)		

Reverse Consent

This check is made by detaching all the connector (3). The following results must be achieved using the Ohm-meter function tester with the probes in contact with the contacts of circuit board connector (3) and the contact «1-CN1» of the card:



No. of Contacts	Tester reading and condition		
REVERSE CONSENT BUTTON			
1 (CN1) - 3 violet	∞ (released)	O (pressed)	
REVERSE GEAR MICROSWITCH			
1 (CN1) - 3 bleu	O (free)	∞ (pressed)	

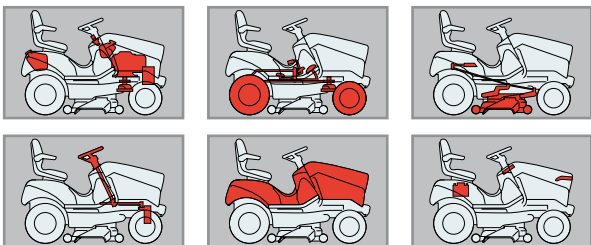
TERMINAL BOARD SUPPLY CHECK

CHAPTER	REVISION	FROM ...	PAGE
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General informations

Related topics

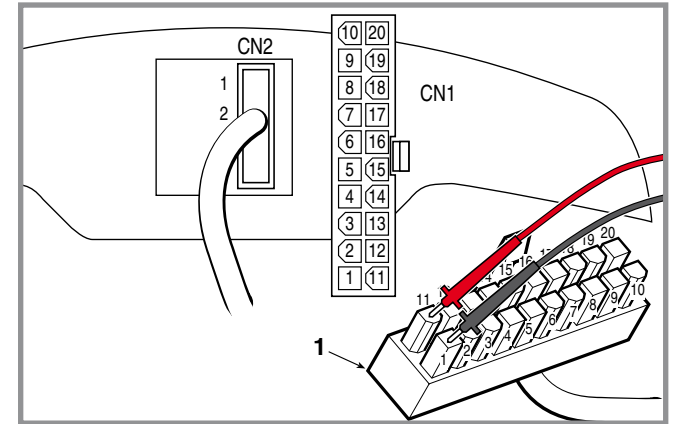
Map of functional units



This check is made with the tester operating as a Voltmeter (Volts DC 0 ÷ 20), with the black ferrule on terminal 1 and the red one on terminal 11 of the connector (1) of the wiring.

- The key in the «ON» position

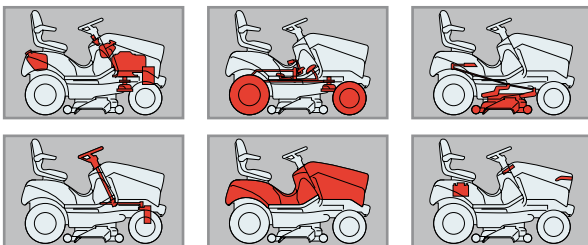
The reading shows the battery voltage, which should never go below 11 Volts.



General informations

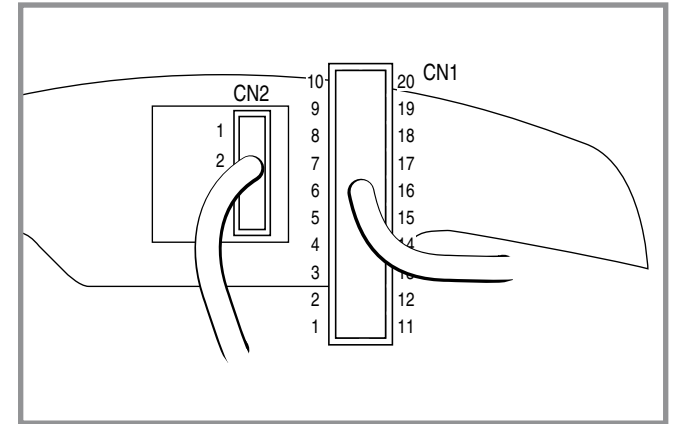
Related topics

Map of functional units



Connector CN1 must be connected to make this check.

When the key is set to «ON», a click must be heard from the carburettor solenoid valve coil.



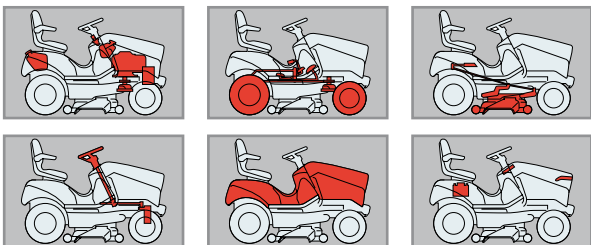
STARTER RELAY OPERATION CHECK

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General informations

Related topics

Map of functional units



⚠ WARNING! Remove the cap of the sparking plug (or plugs), since the safety systems that normally prevent accidental starting of the engine are cut out when the checking procedure is carried out.

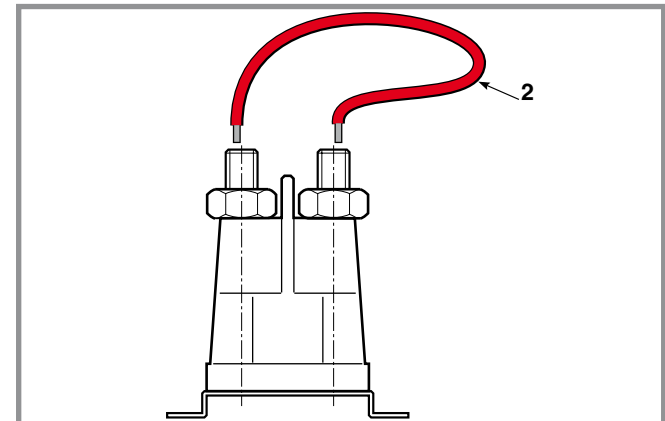
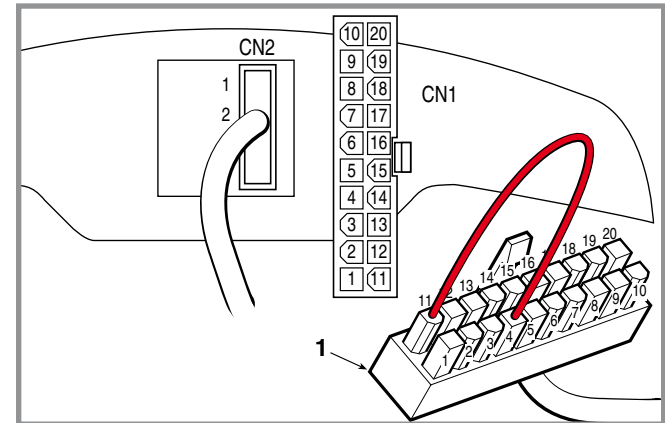
To do this requires:

- operator seated;
- blades disengaged;
- the key in the «ON» position.

Detach connector CN1 and then, when a bridge is made between terminals 11 and 4 of connector CN1 of the wiring (1), the relay bobbin must be heard to click and the starter must start.

-
- **except Honda engines:**
 - If the bobbin clicks but the starter does not start,
 - make a bridge (2) with a large section cable (5 mm²) between the power contacts of the relay.
-

If the starter comes into operation, look for the fault within the relay or replace it. Otherwise, check the starter together with its wiring.

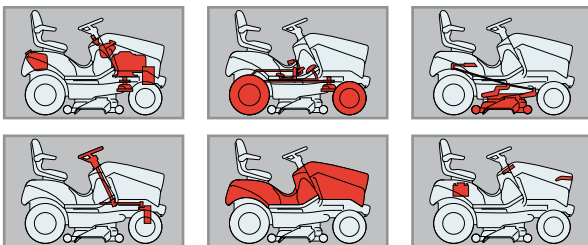


General informations

Related topics

[7.3](#) Safety microswitches operation check

Map of functional units



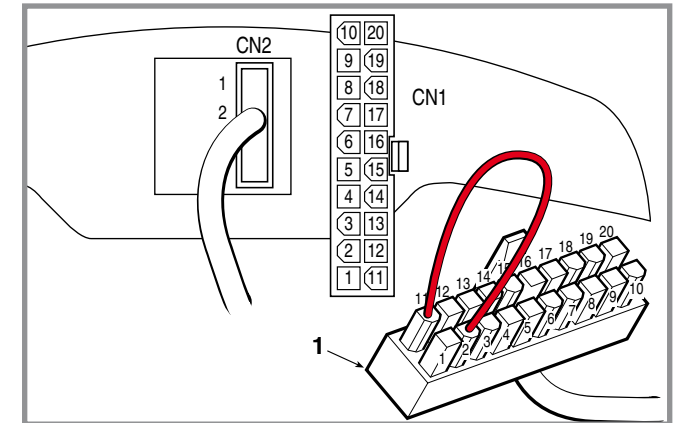
WARNING! *This check must be made with the engine off.*

Disconnect connector CN1 and bridge terminals 2 and 11 of cabling connector CN1 (1).

With the key set to «ON», when the switch is operated a click must be heard from the moving part of the clutch, due to excitation of the electric wiring.

If this is not so, check the operation of the cabling and control switch.

The clutch must be replaced if engagement does not take place after these checks.



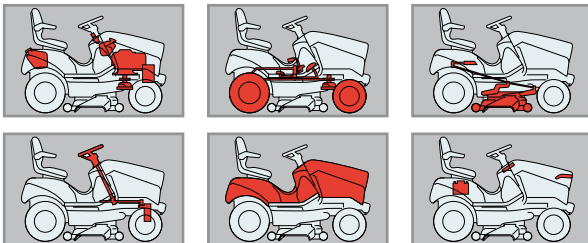
RECHARGE CIRCUIT CHECK

CHAPTER	REVISION	FROM ...	PAGE
7.8	0	2018	1 of 1

General informations

Related topics

Map of functional units



The job of the voltage regulator is to supply a flow of current to the battery at a constant voltage of about 14 -15 Volts, cutting in every time that the output voltage from the generator exceeds this threshold.

A faulty regulator may recharge the battery insufficiently (therefore needing frequent recharging) or, otherwise, may supply overloading that causes the self-resetting protection to cut in.

Before checking the recharge circuit, make sure that:

- all connections are correct;
- the earth connections are firmly connected, especially the earth connection to the regulator;
- the battery is charged and not sulphated;
- the charger fuse is not blown.

A) Checking the lower charging limit

Start the engine and keep running at minimum with the headlights on.

With the voltmeter tester, measure the voltage at the battery terminals. If the value does not rise but tends to fall, even slowly, it means that the regulator is not charging sufficiently and must be replaced.

If the voltmeter shows no value it means that the charger fuse is blown.

B) Checking the upper charging limit

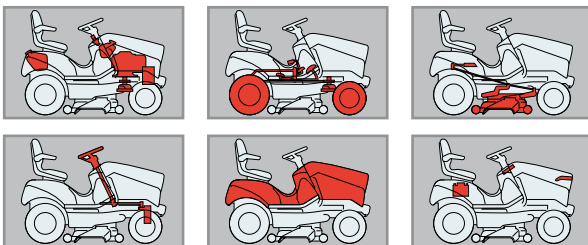
Start the engine and take it to maximum speed. With the tester in the voltmeter function, measure the voltage at the battery terminals. The amount should slowly rise and settle at 14-15 Volts after about 10-15 minutes.

If this value is exceeded to the extent that the engine stops due to the self-resetting protection cutting in (at approximately 16 Volts) it means that the regulator is charging too much and must be replaced.

General informations

Related topics

Map of functional units



A) General information

In a sealed “dual” battery, the electrolyte for each element is carefully measured out during manufacture and sealed at source, in order to ensure maximum performance during the battery’s entire life.

With a battery of this type, it is not necessary to add water or acid, and the cover must never be opened or removed.

B) Recommendations for correct use

To keep the battery performing at optimum levels and to increase its life, various precautions should be taken:

- always keep the battery fully charged;
- always recharge a flat battery within 1 month, otherwise the elements could be damaged and no longer able to take the charge (sulphated);
- always recharge the battery before and after periods of prolonged inactivity or storage.

IMPORTANT! *Only recharge with a constant voltage battery charger. Use of other types of battery charger could damage the battery.*

C) Rules for recharging the battery

La ricarica è una operazione particolarmente IMPOR-
Recharging is a particularly important operation for the life of the battery and must be carried out according to these instructions:

- do not recharge the battery when its case is broken or damaged;
- carefully read the instructions for using the battery charger and the battery;
- use a suitable battery charger;
- recharge at a room temperature of between +10 and +30 °C;
- check that the battery does not heat to beyond 50 °C while recharging. If it should do so, stop recharging immediately and dispose of the battery since it will be unusable.

With the battery disconnected (and at rest for at least 12 hours) and the tester in voltmeter function, measure the voltage between the terminals. The amount given (open circuit voltage) gives an indication of the operations to be carried out, as per the following table:

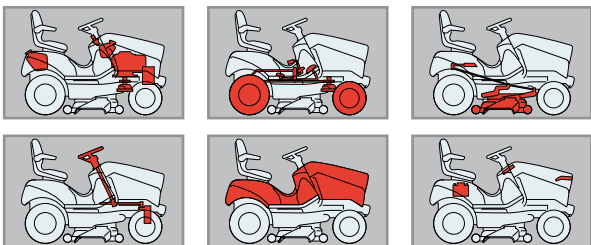
Battery voltage with open circuit	Battery state	Operation to be carried out
> 12.6 Volt	Fully charged	None
< 12,4 Volt	Flat	Recharge

Check the battery voltage at least 12-24 hours after recharging.

General informations

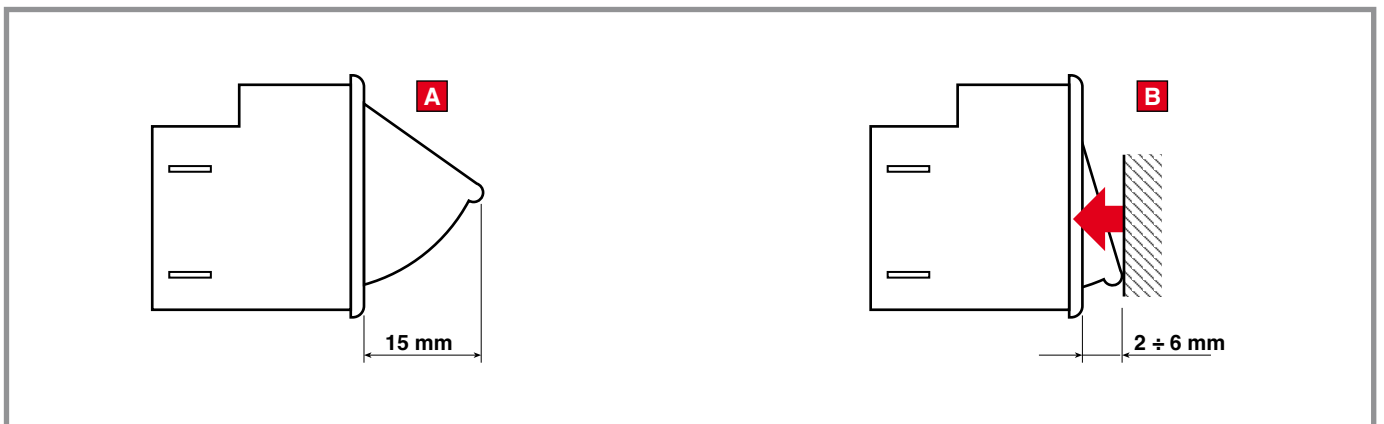
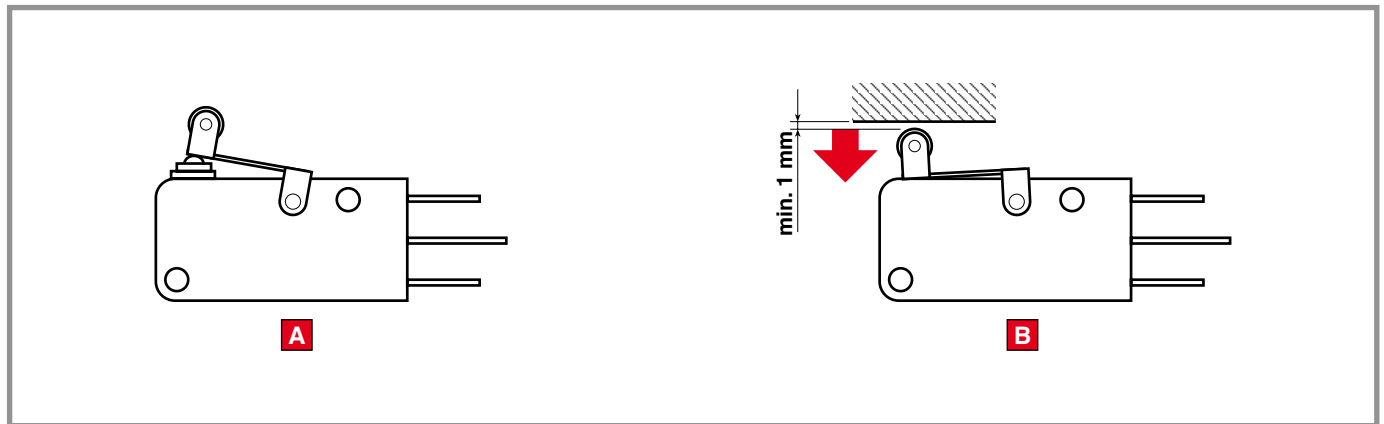
Related topics

Map of functional units



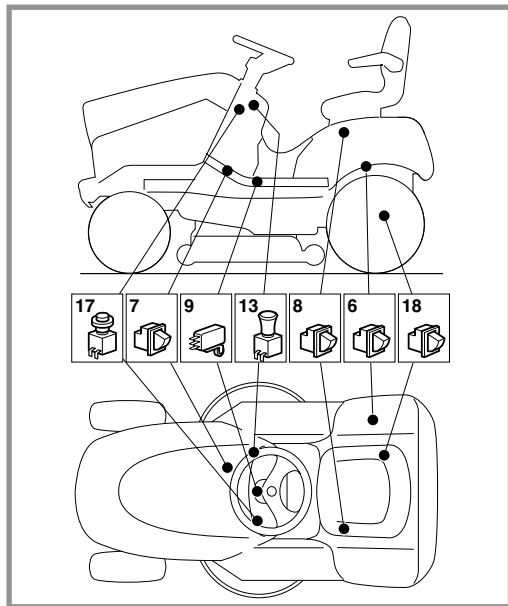
! **IMPORTANT!** *If the microswitches are to function correctly, it is important to follow the exact assembly positions by referring to the drawings that indicate the various usages of each type.*

A = Free
B = Activated

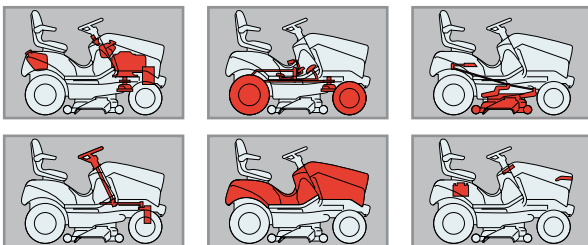


General informations

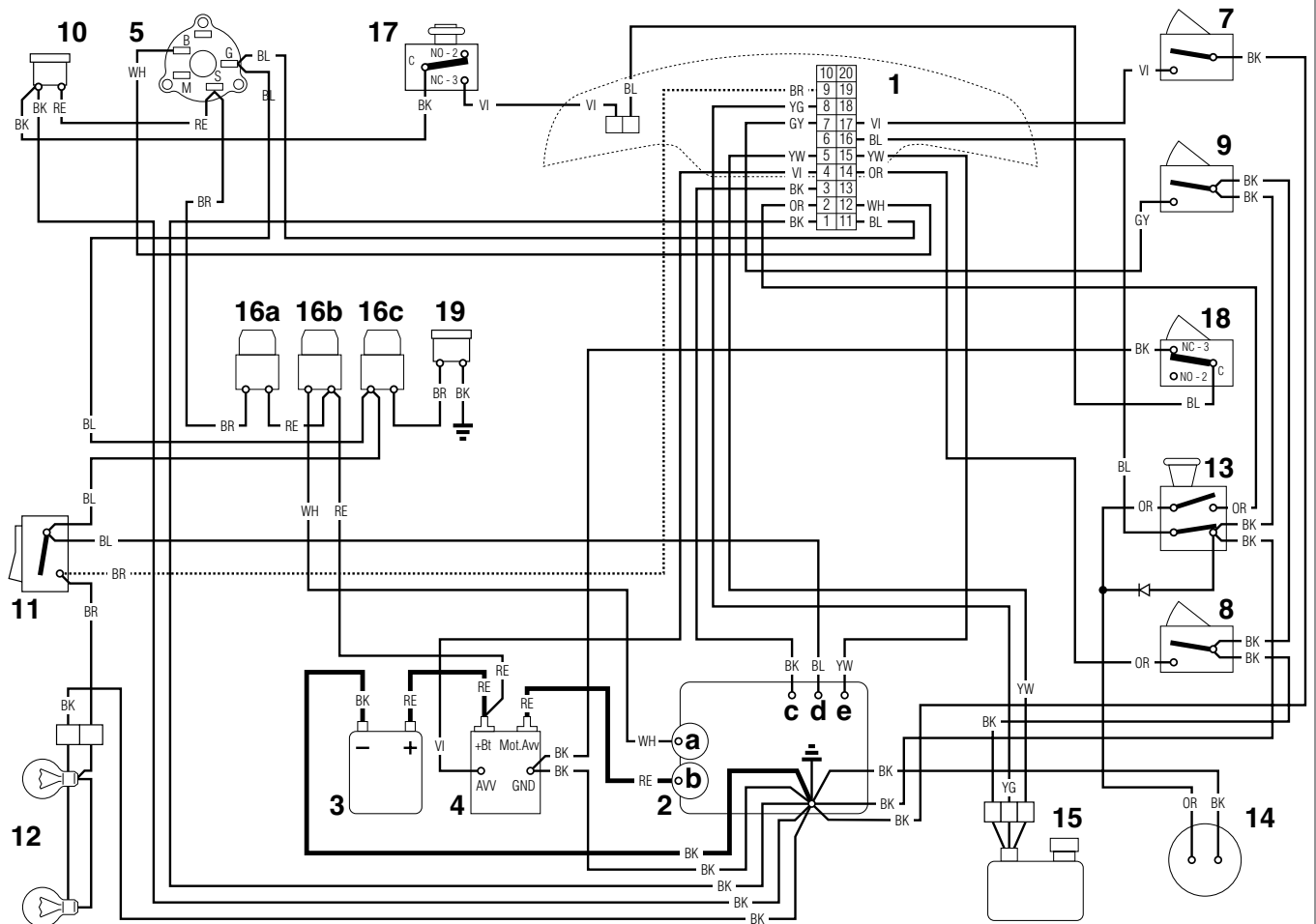
Related topics



Map of functional units



Engines: B&S - Stiga - Kawasaki



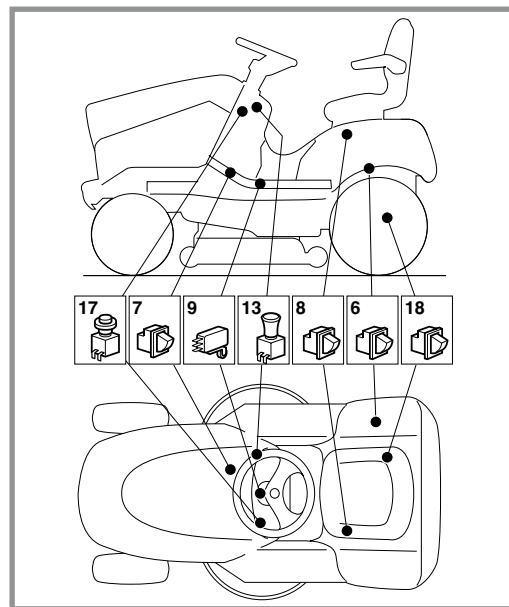
- 1 Circuit board
- 2 Engine
- 2a Generator
- 2b Starter motor
- 2c Engine stop
- 2d Carburettor
- 2e Oil
- 3 Battery
- 4 Starter relay
- 5 Key ignition switch
- 6 Relay
- 7 Brake microswitch
- 8 Microswitch operator present
- 9 Neutral microswitch
- 10 Recharge connector
- 11 Lights switch
- 12 Light
- 13 Clutch switch
- 14 Clutch
- 15 Fuel tank
- 16a 10 A Fuse
- 16b 25 A Fuse
- 16c 5 A Fuse
- 17 Reverse consent button
- 18 Reverse gear microswitch
- 19 Auxiliary power socket

CABLE COLOURS

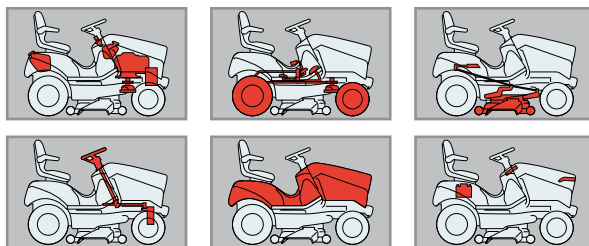
- BK Black
- BL Blue
- BR Brown
- GY Grey
- OR Orange
- RE Red
- VI Violet
- YW Yellow
- WH White

General informations

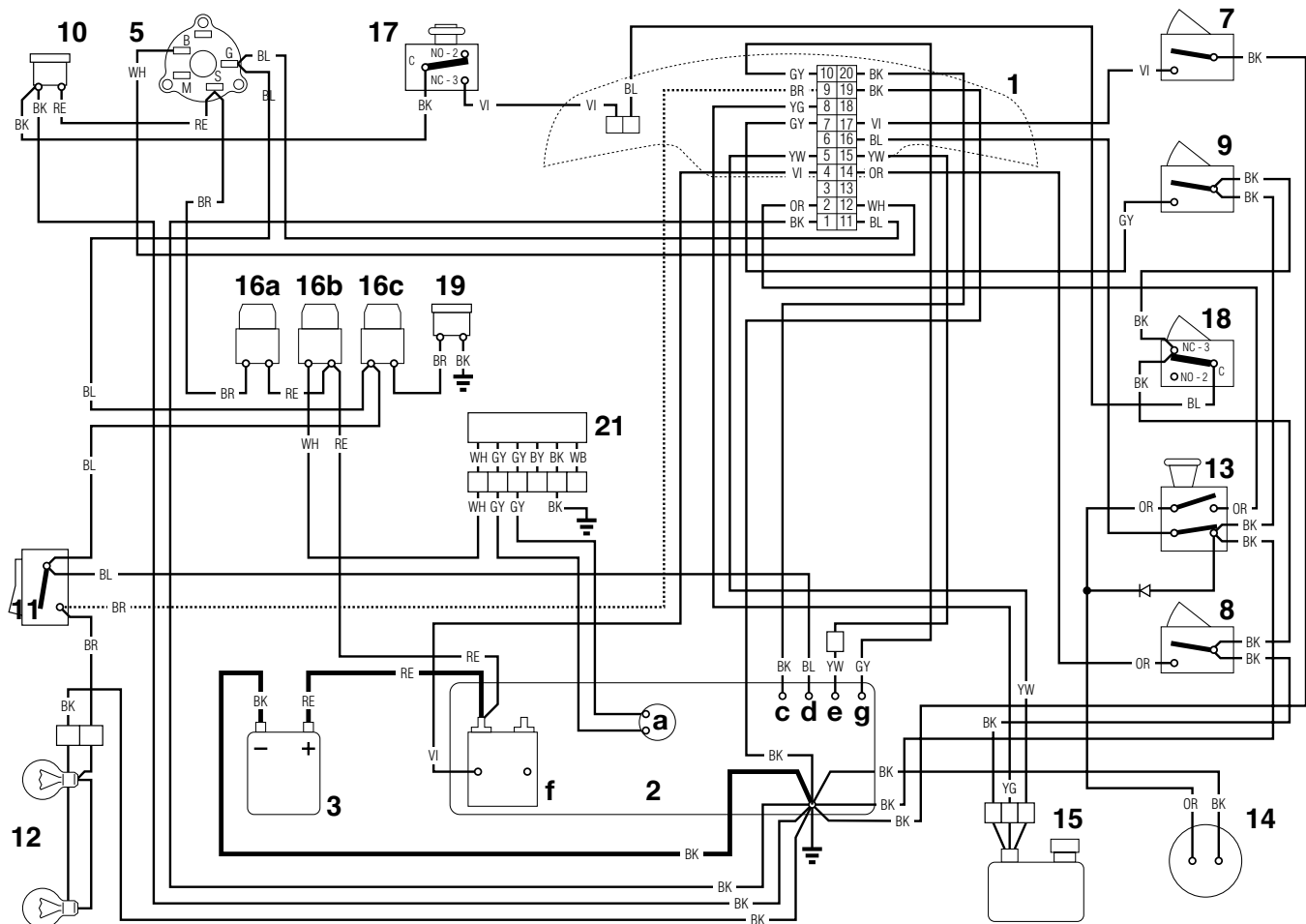
Related topics



Map of functional units



Engines: Honda



- | | | | | | |
|----|------------------------------|-----|--------------------------|----|------------------|
| 1 | Circuit board | 9 | Neutral microswitch | 21 | Charge regulator |
| 2 | Engine | 10 | Recharge connector | | |
| 2a | Generator | 11 | Lights switch | | |
| 2c | Engine stop | 12 | Light | | |
| 2d | Carburettor | 13 | Clutch switch | | |
| 2e | Oil | 14 | Clutch | | |
| 2f | Starter relay | 15 | Fuel tank | | |
| 2g | RPM signal | 16a | 10 A Fuse | | |
| 3 | Battery | 16b | 25 A Fuse | | |
| 5 | Key ignition switch | 16c | 5 A Fuse | | |
| 6 | Relay | 17 | Reverse consent button | | |
| 7 | Brake microswitch | 18 | Reverse gear microswitch | | |
| 8 | Microswitch operator present | 19 | Auxiliary power socket | | |

CABLE COLOURS

- BK Black
- BL Blue
- BR Brown
- GY Grey
- OR Orange
- RE Red
- VI Violet
- YW Yellow
- WB White/Blue
- WH White

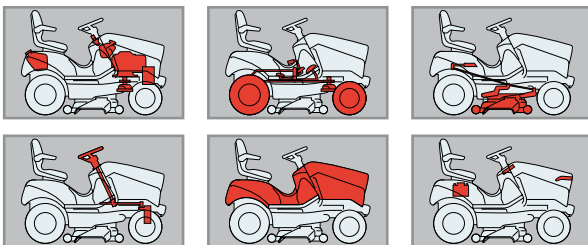
General informations:

The information provided forms a basic understanding of the working principles of the hydraulic system when using the machine.

Related topics:

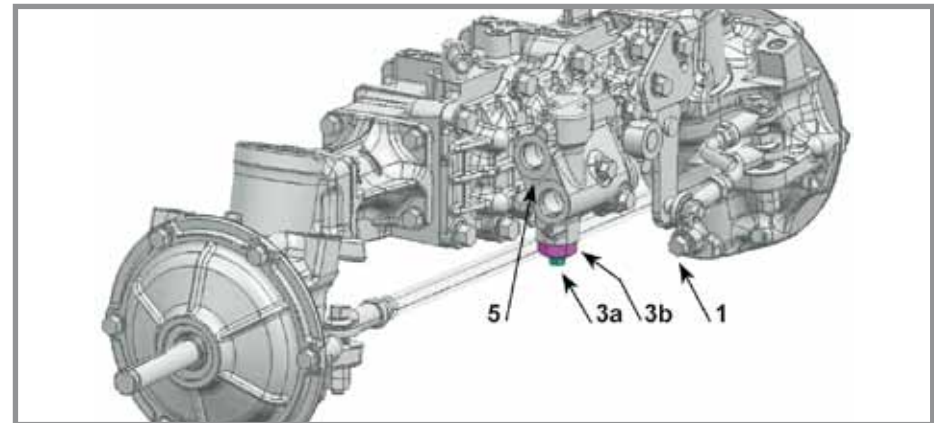
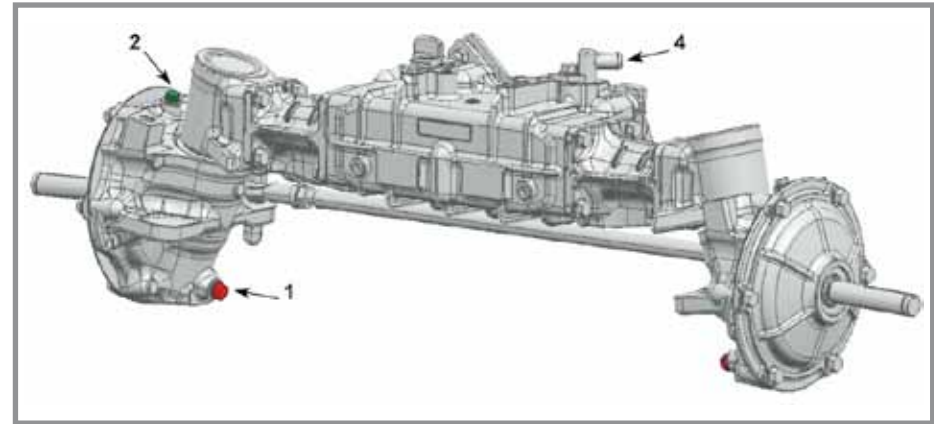
[8.2](#) Checking the hydraulic system

Map of functional units



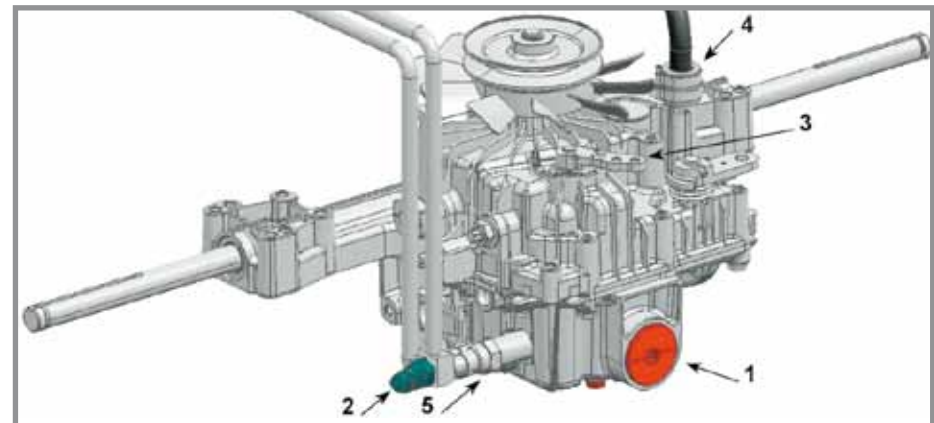
A) Front axle components

1. Oil drain cap
2. Breather cap
- 3a. Transmission release screw (by-pass)
- 3b. Nut
4. Fittings for entrance of low pressure oil
5. Fitting for high pressure pipes



B) Rear axle components

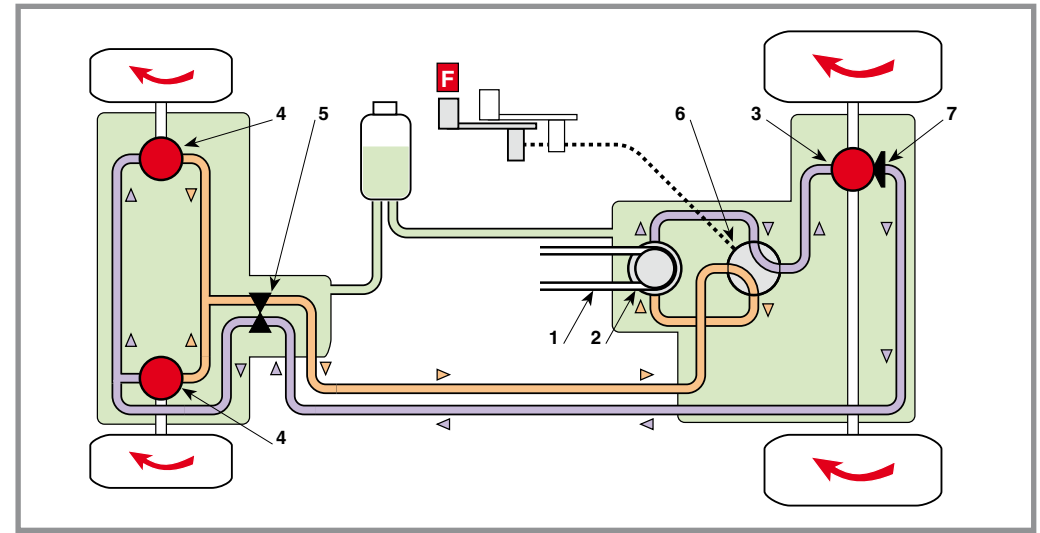
1. Oil drain cap
2. Quick coupling and breather
3. Transmission release lever (by-pass)
4. Fitting for entrance of low pressure oil
5. Fitting for high pressure pipes



C) Working principles

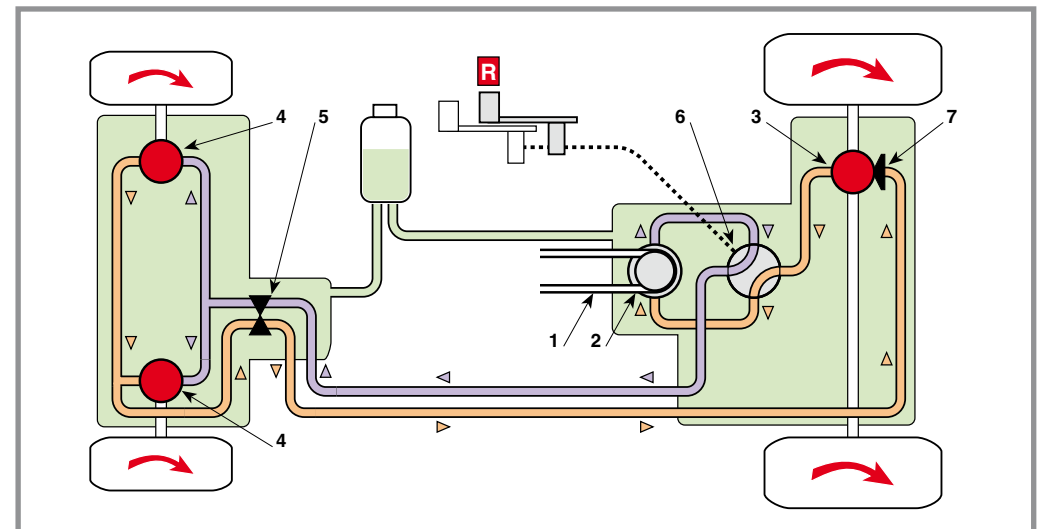
1. In forward gear

- The pump (2), is activated by the transmission belt (1), which keeps the oil under pressure; by pressing the pedal for forward gear, the lever (6) sends oil to the hydraulic engine (3) in the rear unit.
- With the rear by-pass valve closed (7), the hydraulic engine moves the rear wheels and sends the oil under pressure to the front transmission.
- With the front by-pass valve closed (5), the oil is divided between the two front hydraulic engines (4), moving the front wheels and then going back to the pump.



2. In reverse gear

- The pump (2), is activated by the transmission belt (1), which keeps the oil under pressure; by pressing the pedal into reverse gear, the lever (6) sends oil to the front transmission.
- With the front by-pass valve closed (5), the oil is divided between the two front hydraulic engines (4), moving the front wheels and then going back to the rear transmission.
- With the rear by-pass valve closed (7), the oil under pressure activates the hydraulic engine (3) of the rear wheels and goes back to the pump.

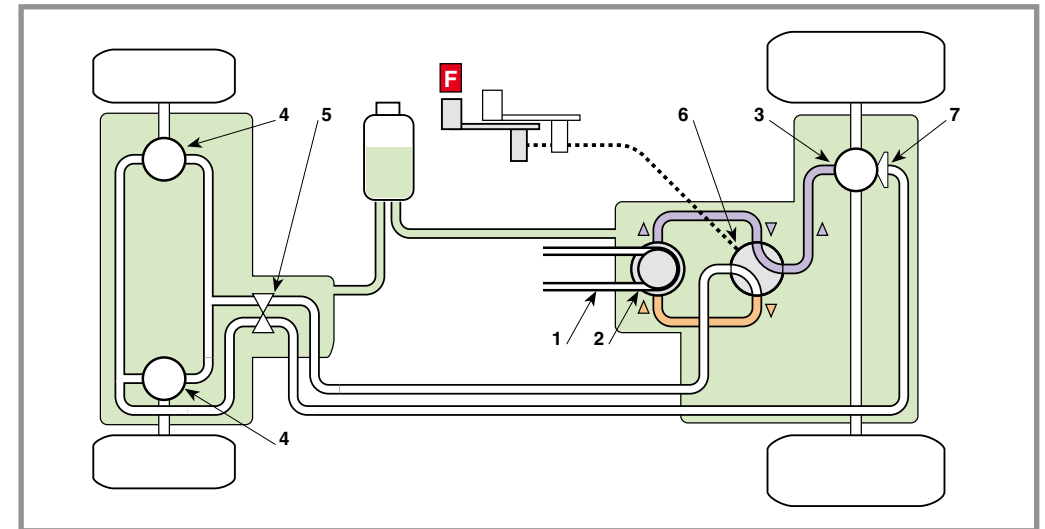


3. Both by-passes open

The pump (2), activated by the transmission belt (1), keeps the oil under pressure.

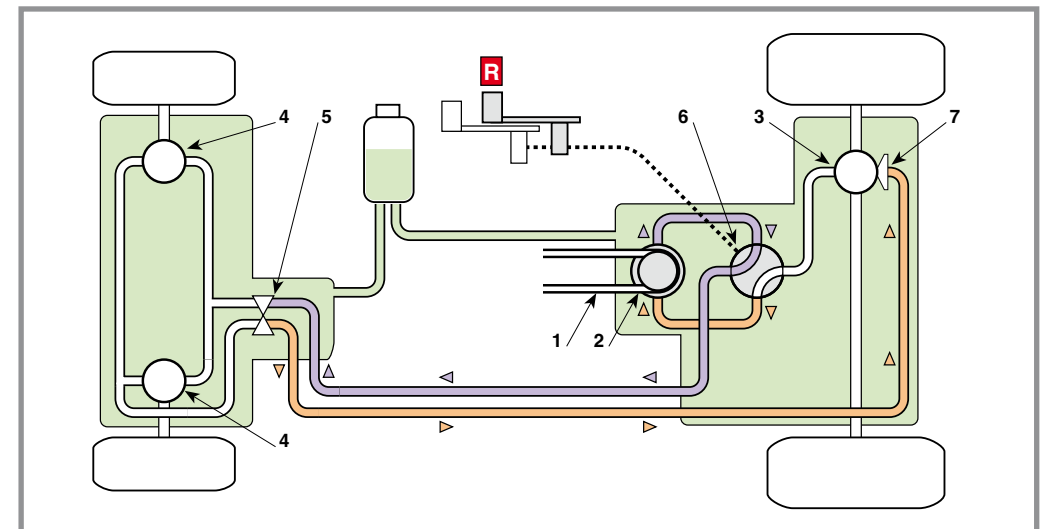
a) In forward gear

- By operating the pedal in forward gear, the by-pass opens causing a fall in pressure and therefore the hydraulic engine (3) is not activated and the oil does not reach the front transmission.



b) In reverse gear

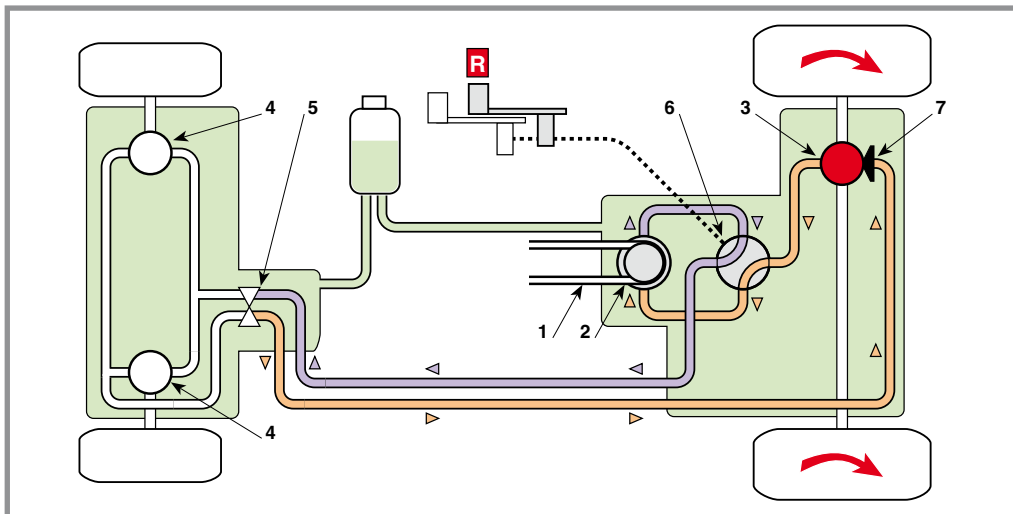
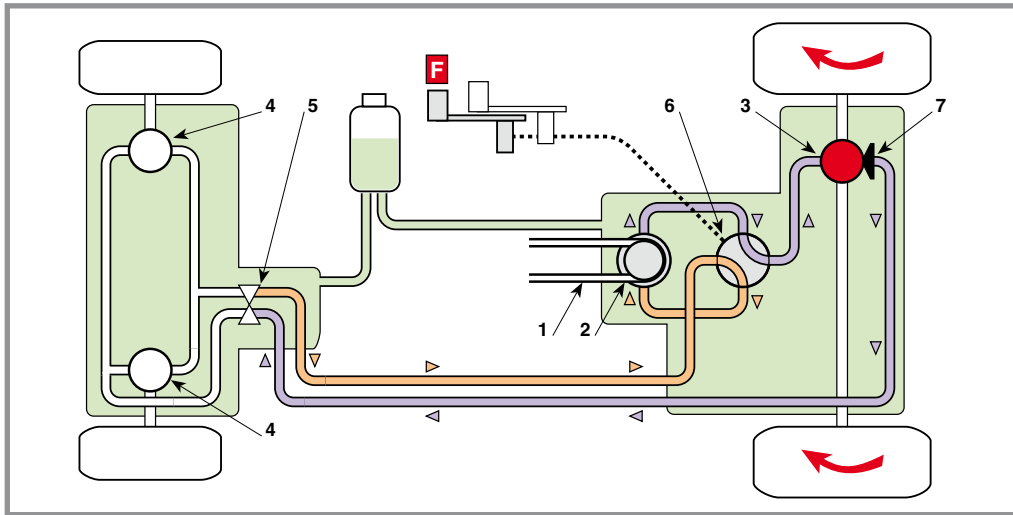
- By operating the pedal in reverse gear, oil reaches the front transmission but on finding the by-pass open (5) does not activate the hydraulic engines (4) and so goes back to the pump.
- In this case, the machine can be moved manually without difficulty both forwards and backwards.



4. Rear by-pass closed and the front by-pass open

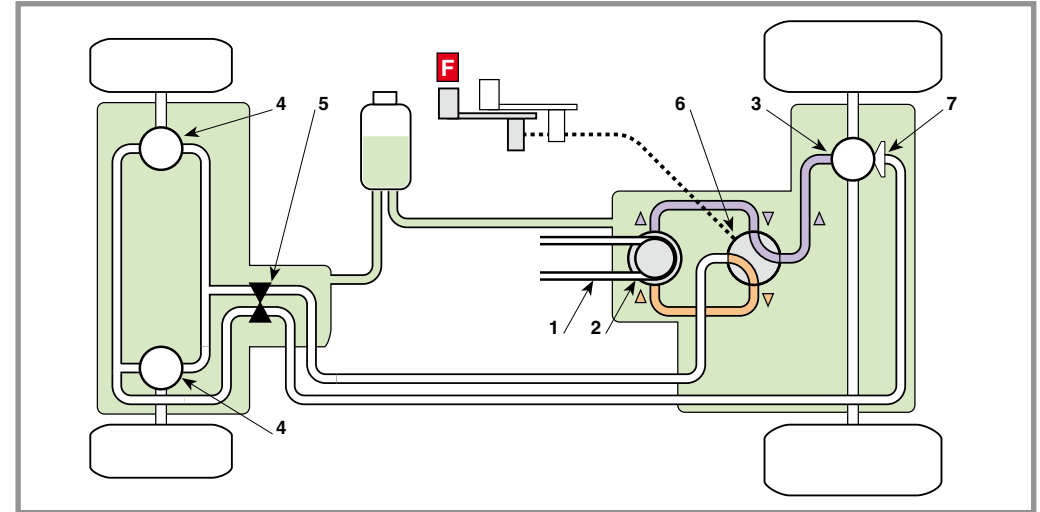
In forward and reverse gears, the same situations indicated in points 1 and 2 occur, with the difference that the front by-pass open (5) impedes the two front hydraulic engines from being activated (4).

In this case, the machine only works with the rear wheel drive.

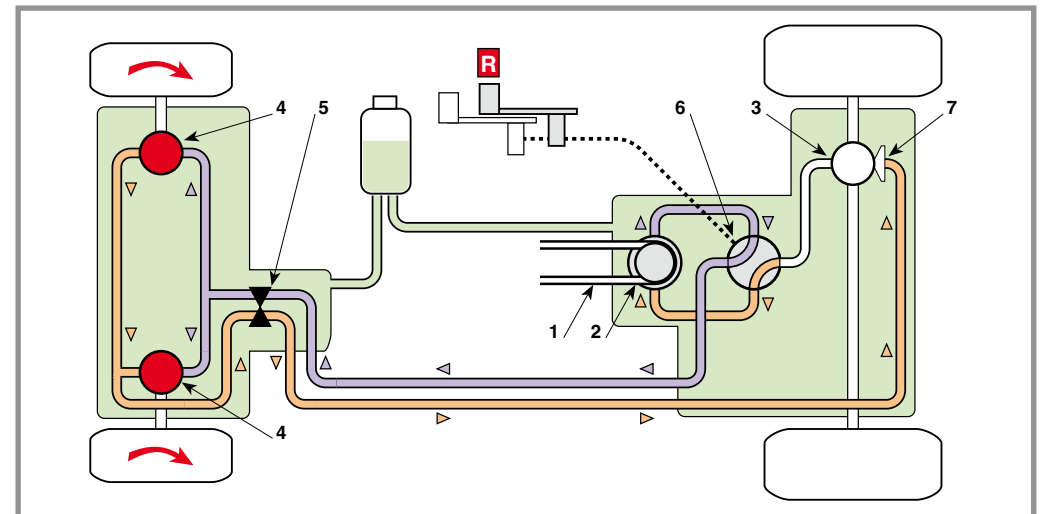


5. Rear by-pass open and the front by-pass closed

a) In forward gear, the by-pass opens (7) preventing the oil under pressure to activate the rear hydraulic engine (3) and from reaching the front transmission; in this case, the machine remains without front and rear wheel drive.



b) In reverse gear, the oil under pressure reaches the front transmission and can be divided between the two hydraulic engines (4), but the opening of the bypass (7) stops the hydraulic engine from being activated (3); in this case, the machine will only work in reverse, with front wheel drive only.

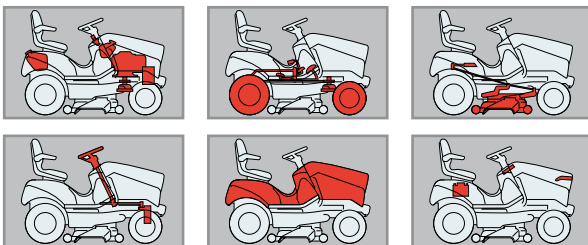


General informations:

If any transmission problems should arise (insufficient power or general malfunction) it is recommended to carry out a series of preliminary tests to exclude the possibility that the malfunction has been generated upstream of the transmissions; if the tests listed below do not help in identifying and resolving the problem, it will be necessary to remove the unit in question so that the necessary repair work can be done.

Related topics:

[🔍 8.1] Guide to understanding the hydraulic system

Map of functional units**A) Engine tests**

- Check that the engine reaches the maximum foreseen rpm.

A) Machine tests


- Check that the belt is not worn, dirty or soaked in oil and check that the tension regulator is adjusted properly.
- Check that the pedals and levers are all intact and regulated properly.
- Check that the wheel hubs are intact and that the front wheels have keys which are part of the hub.

C) Transmission unit and hydraulic system tests


- Check that the rear transmission fan is intact.
- Check that the rear by-pass is closed and that the control tie-rod is able to complete its travel stroke to achieve complete opening and closing.
- Check that the front by-pass is closed and the lock-nut is firmly tightened.
- Check that the connection pipes have not been inverted.
- Check that there are no leaks in the hydraulic system and, where necessary, bleed the circuit to eliminate any residual air from the system.

General informations

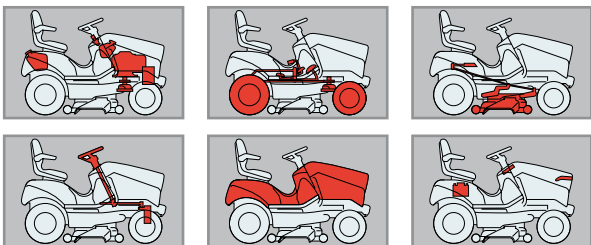
Related topics

 **4.1** Adjusting the engagement and checking the blade brake

 **4.2** Brake adjustment

 **4.3** Drive belt adjustment

Map of functional units

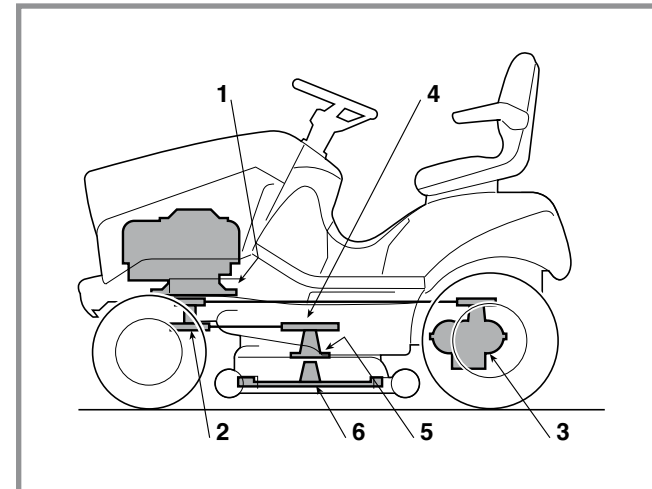


A) Tightening torques

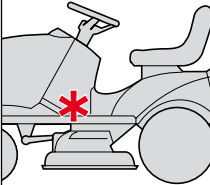
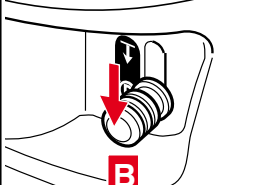
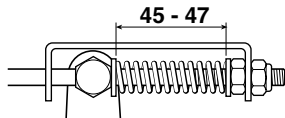
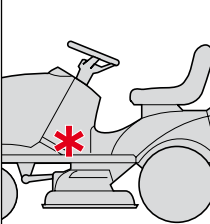
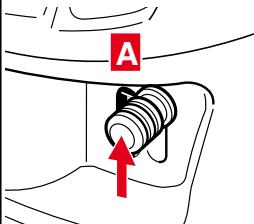
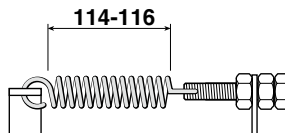
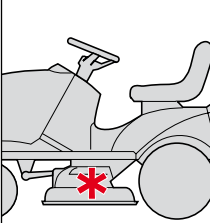
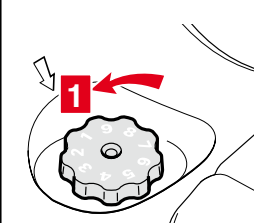
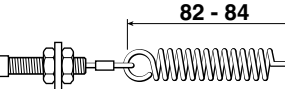
Below are the specified tightening torques for the fixing bolts on the main parts.

- 1 Screws for engine fastening 25 ÷ 30 Nm
- 2 Screw for engine pulley 45 ÷ 50 Nm
- 3 Screws for rear axle fastening 25 ÷ 30 Nm
- 4 Blade pulley screws 25 ÷ 30 Nm
- 5 Flanged support fixing nuts 25 ÷ 30 Nm
- 6 Screw for blade 45 ÷ 50 Nm

Every section in this manual gives values for all the components involved in each operation.



B) Adjustments

Operation	Position	Position of controls	Adjustment
a) Brake adjustment			
b) Drive belt adjustment			
c) Blades engagement adjustment			

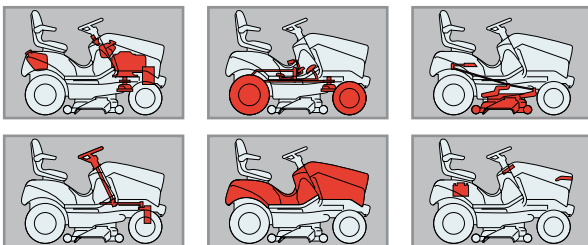
General informations:

Related topics

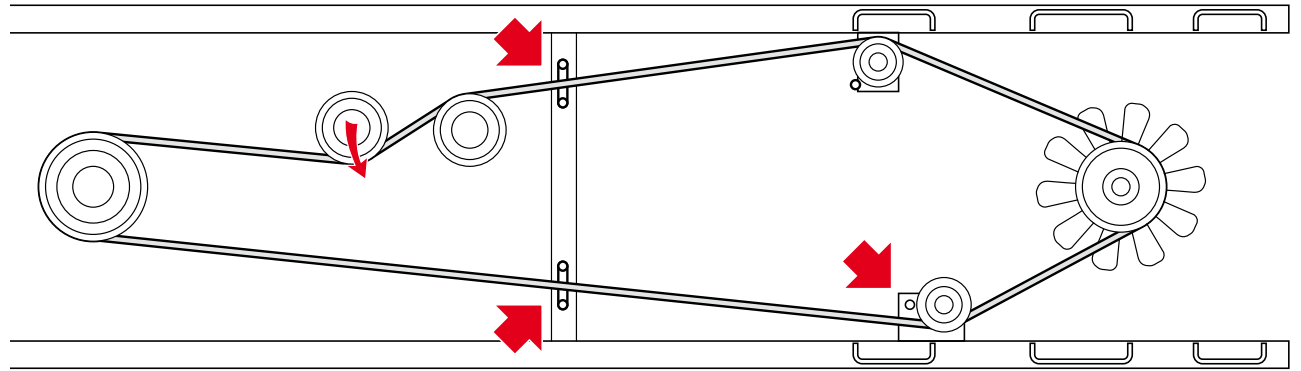
[🔗 6.4] Replacement of the drive belt

[🔗 6.6] Replacement of the blades control belt

Map of functional units



1



1 Drive belt development

2 Blades control belt development

2

