

Grillo

AGRIGARDEN MACHINES



FD 500 Hydrostatic Lawnmower



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OPERATOR'S MANUAL **EN**

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Translation of the original manual.

All information, illustrations and technical specifications in this manual are based on the latest information available at the time of publication.

Subject to change without prior notice.

1 INTRODUCTION

Dear Customer,
we thank you for the trust you have placed in our Grillo FD 500 and we are confident that the use of your new machine will fully meet your requirements. To use and maintain the mower over time, please read and carefully observe the instructions herewith contained; this will enable you to get the best results out of your purchase.
Please ensure this manual is kept with the machine.
Reading the operator's manual is very important.

2 DESCRIPTION AND INTENDED USE

The Grillo FD 500 is a ride-on lawnmower designed the cutting of grass and for the collection of both grass and leaves.
Any other use is considered to be non-intended.
Before operating the mower, ensure people are familiar with its controls and specific features, safety rules and everything related to accident prevention.

Any improper use of the machine will invalidate the warranty and relieve the manufacturer of any liability. Any risk arising from improper use will be borne by the user.

Maintenance and repair of the machine must be carried out by qualified people only, following the procedures specified by the manufacturer; any alteration or tampering invalidates the warranty and relieves the manufacturer from any liability in case of damage or accident.

HIGHLIGHTS IN THE MANUAL

This manual contains bold messages highlighted using the symbols below:



This symbol and the following text contain information pointing out potential very serious risks to the safety of the operator and of anyone else working on the mower if they do not observe the written information and procedures.



This heading informs the operator of actions or conditions that could damage the mower.

Read these messages carefully to avoid injury or damage to the machine.

The retailer is responsible for inspecting the machine before delivery and for completing the inspection sheet. "PER-DELIVERY INSPECTION".

On this occasion the dealer will provide the customer with all the information necessary to use the machine.

The customer will receive the machine in optimum condition.

FD 500 Hydrostatic Lawnmower

3 WARNING DECALS

RIGHT AND LEFT SIDE refer to the sides of the machine with the operator sitting on the driver's seat.

RIGHT SIDE



Decal - Danger of moving parts.



LEFT SIDE



Decal - Danger of moving parts.



Decal - Danger of sharp blades and Danger of objects thrown by the rotation of blades

Decal - Dangers and warnings

Danger consult the manual		Risk of explosion	
Danger of burns		Fire hazard	
Danger transmission parts		Risk gas inhalation	
		Danger of rollover	

MAX 18° - 32%



Decal - Danger cardan joint

Decal - Danger transmission organs



Decal - Danger of sharp blades and Danger of objects thrown by the rotation of blades

4 GENERAL SAFETY RULES

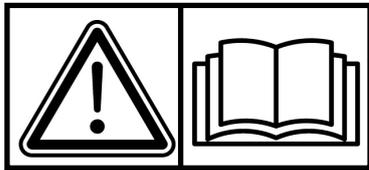
SAFETY RULES

On the machine and in this manual there are warnings and indications along with this symbol:



it indicates the presence of a potential hazard, so particular attention should be paid for operator safety and the safety of others who may be within the operating range of the machine.

This machine is manufactured in compliance with European standards and is CE marked.



All accident prevention regulations in this manual are important and must be observed. Always keep the manual at hand and read it carefully to learn how to use the machine safely. Do not allow anyone to use the machine without having received full instructions.

EXPLANATION OF WARNING DECALS

DANGER of accidents caused by sharp blades and objects thrown by the rotation of the blades



Do not put your hands or feet under or into the mower when the engine is running. Do not work with the mower on gravel or foreign bodies which can be sucked up and thrown away by the blades, making them very dangerous.

Keep people at least 15 m away when the machine is running.

DANGER of moving parts



The grass-catcher can be raised and tilted. Keep a safe distance from the operating machine.

DANGER of accidents by rotation of the cardan joint



Do not touch the cardan shaft while it is rotating, this can cause serious personal injury. Do not carry out maintenance while the engine is running.

DANGER of accidents caused by transmission parts



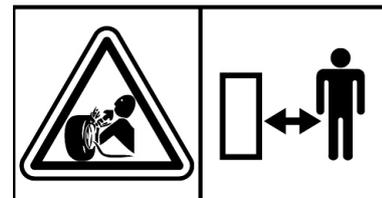
When the engine is running, never touch pulleys or belts, do not carry out maintenance and keep hands away from the designated area.

DANGER of machine rollover



Do not use the mower on slippery or sloping ground greater than 18° (32%).

RISK of explosion.



A burst which separates the tyre from the rim parts can cause serious injury or death. Make sure to maintain tyre pressures at the levels recommended in this manual, excessive pressure may cause the tyre to explode. If a tyre is damaged or cut, do not use it as it may explode; refer to an expert mechanic for replacement or repair.

DANGER of burns



Take particular care not to come into contact with hot engine parts.

RISK of gas inhalation



Exhaust fumes may cause serious damage to health or death. If you need to start the engine in a closed area, use an extension to the exhaust pipe to blow out the smoke. If it is necessary to operate the engine in a closed area use an extension piece to the exhaust pipe to blow out the smoke. Work in a well ventilated area.

FIRE HAZARD



Handle fuel with care, it is highly flammable; do not refuel while smoking, near open flames or sparks, when the engine is running.

RISK of explosion.



Keep the battery away from flames or sparks. The gases that may exhale are highly explosive.

DANGER of acid burn



Sulfuric acid in battery electrolyte is poisonous. It is strong enough to burn skin, eat holes in clothing and cause blindness if it gets in contact with the eyes

Safety devices



Before using the machine, it is mandatory to put on the individual safety devices: body protection, protection gloves, safety footwear, ear protection, goggles.

SAFETY LOCKINGS



CAUTION: When servicing the engine with the GRASS-CATCHER raised, engage the two red-painted safety lockings on the two hydraulic cylinders that support it. Do not access the engine compartment without having engaged before the safety lockings. Do not leave the machine parked with the GRASS-CATCHER raised without having inserted the two red safety lockings.

ROLL-BAR



CAUTION: the roll-bar must be always raised as shown in the picture and properly fixed using appropriate screws. In addition, always wear seat belts.

5 GENERAL WARNINGS



ATTENTION: read carefully before operating the machine.

Caution is the main safeguard in preventing accidents. We recommend that you to read the warnings before starting the machine. Incorrect use of the mower and its equipment may cause damage. To minimise risks the precautions outlined must be followed:

- Read this manual completely before starting and running the mower.
- Before handing over the machine to other people, they must be made aware of the safety regulations and how to use the machine.
- Pay particular attention to the safety decals on the mower.
- Before starting work, always wear appropriate work clothes, long trousers, gloves, boots, goggles.
- Wear acoustic protection systems during continuous use of the machine. Use ear plugs and ear muffs that comply with current regulations.

HOW TO WORK SAFELY

- Before switching on the machine, check that there are no animals or people in the area around it, especially children, the minimum distance is 15 m;
- Before engaging reverse gear, make sure that there are no people or obstacles behind the machine.
- Check the ground before mowing to ensure there are no stones, sticks or foreign bodies that become a danger when projected.
- Be very careful when working with the mower on areas with sandy grounds or gravel. Sand and gravel can be sucked up and thrown away by the blade, making it very dangerous.
- Be careful when working near a road.
- Do not operate the mower near ditches or verges which may collapse under the weight of the machine, especially if the surface is uneven or wet.

HOW TO DRIVE AND BEHAVE SAFELY

- If you have children, hide the ignition key after using the machine.
- Do not allow passengers to ride on the machine.
- Children under 16 years of age must not use the machine.
- Do not use the machine when fatigued or after drinking alcohol.
- Be careful while driving and avoid abrupt steering, especially at high speed.
- Drive at low speed on uneven ground.
- On slopes and descents, slow down and always steer slowly.
- Work only in sunlight or good artificial light.
- Lift and empty the grass-catcher only when the machine is stationary and on even ground.
- Do not leave the machine on a slope.
- Before getting off the mower, switch off the PTO, lower the mower deck if raised, switch off the engine, engage the parking brake and remove the ignition key.

FURTHER SAFETY ADVICE

- When the machine hits a foreign body, disengage the blade, stop the engine, remove the starter key and inspect the cutting device for damage. If it is damaged, have it repaired before operating the mower again.
- If the machine begins to vibrate abnormally after a collision, immediately carry out a general check to identify the reason for the abnormality. If necessary, request the assistance of an authorised Grillo workshop.
- Rotation of the mower blade is very dangerous, never put your hands or feet under the mower deck.
- Always engage the red safety hooks on the hydraulic cylinder jacks before servicing the machine with the cylinder raised.
- Before checking, adjusting, repairing or simply cleaning the mower, disengage the deck drive and switch off the engine:
- Do not place any weights on the seat, this may disable the starter safety device.
- Do not lift the grass-catcher while the machine is moving.
- Do not tamper with or disable the safety devices.
- Do not change the engine settings, especially the maximum revolutions.
- Do not let anyone check the machine while you are sitting on the driver's seat with the engine running.
- Do not move the machine without the mower deck, the machine may become unbalanced and driving may be dangerous.

FUEL AND FIRE HAZARD

- Only refuel outdoors, always switch off the engine, stay away from sparks or flames, do not smoke! Securely replace tank and fuel container caps.
- Avoid fuel spills. After filling the tank clean up any spillage on the machine before starting the engine.
- Store fuel in containers specifically designed for this purpose.
- If you have to empty the fuel tank, do this outdoors or in a ventilated area.
- Caution! To reduce the risk of fire, always keep the engine compartment, muffler, exhaust manifold, battery, fuel tank area and fuel line clean and free from grass, leaves and dust.
- Do not store the machine in buildings where fuel gases could lead to flames and sparks.
- Let the engine cool down before storing the machine in closed rooms.

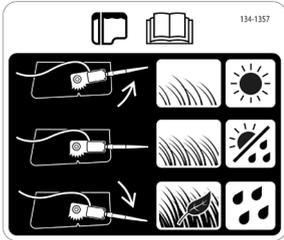
HOW TO REPLACE COMPONENTS SAFELY

- Deformed or damaged blades must always be replaced, never repaired.
- Replace the muffler if worn or damaged.
- The drive belts are specifically designed for this mower, do not replace them with compatible ones, use original belts.
- Always use original Grillo spare parts and accessories.

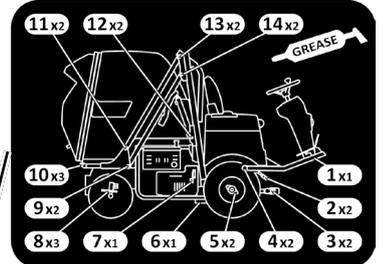
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6 IDENTIFICATION OF USAGE DECALS

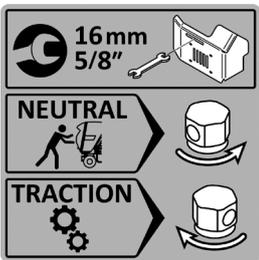
RIGHT SIDE refers to the side of the machine with the operator sitting on the driver's seat.



Decal - Adjustments
grass-catcher-full microswitch



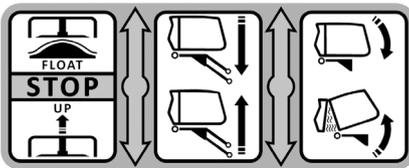
Decal - Lubrication points scheme



Decal - By-pass
hydrostatic pump



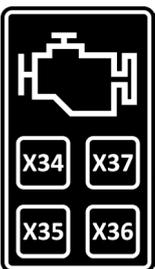
Decal - Forward
and reverse gear



Decal - Operating levers



Decal - Serial number



Decal - Engine relays



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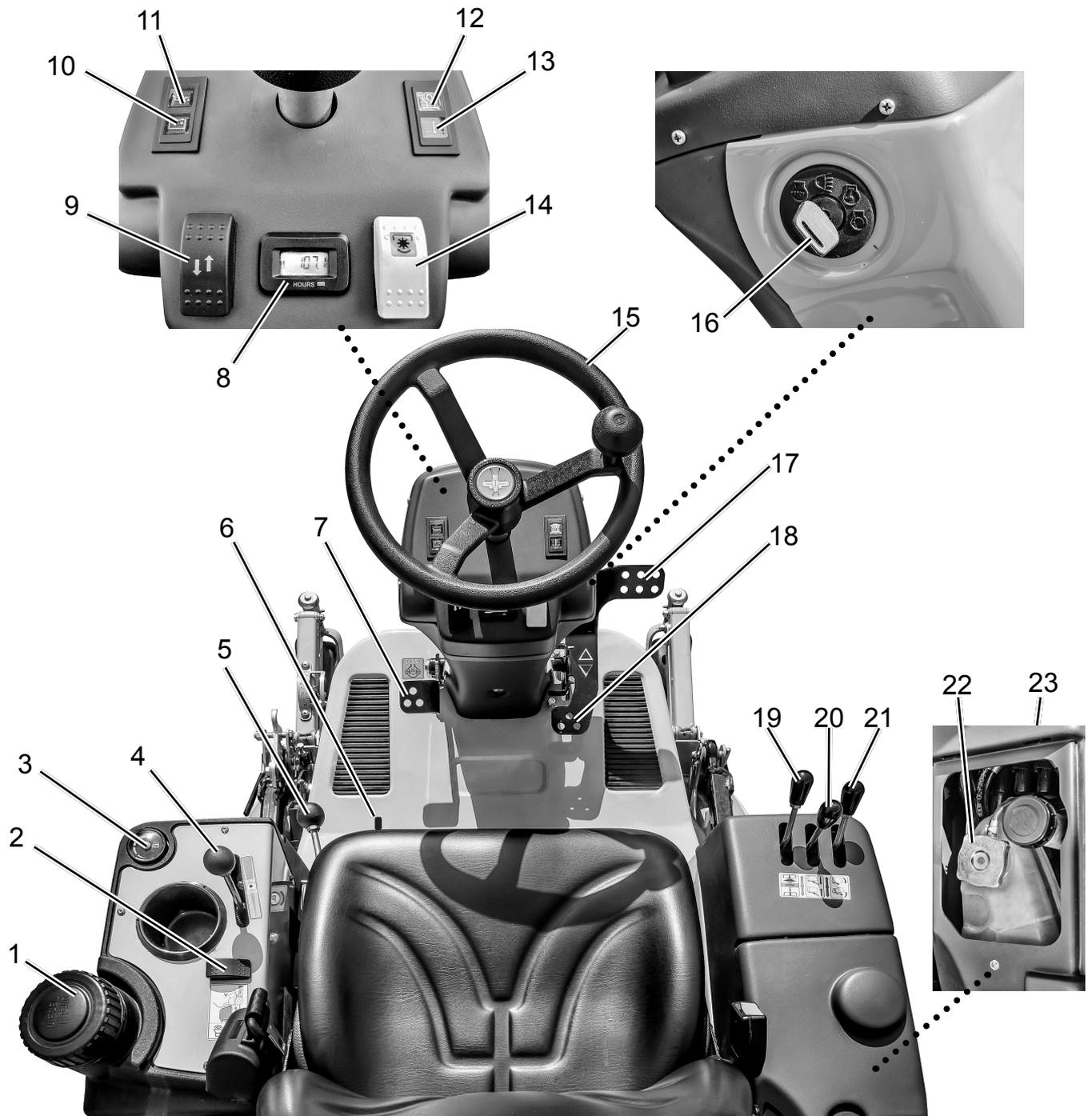
6 IDENTIFICATION OF USAGE DECALS

LEFT SIDE refers to the side of the machine for the operator sitting on the driver's seat.



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7 IDENTIFICATION OF MACHINE CONTROLS AND FUNCTIONS

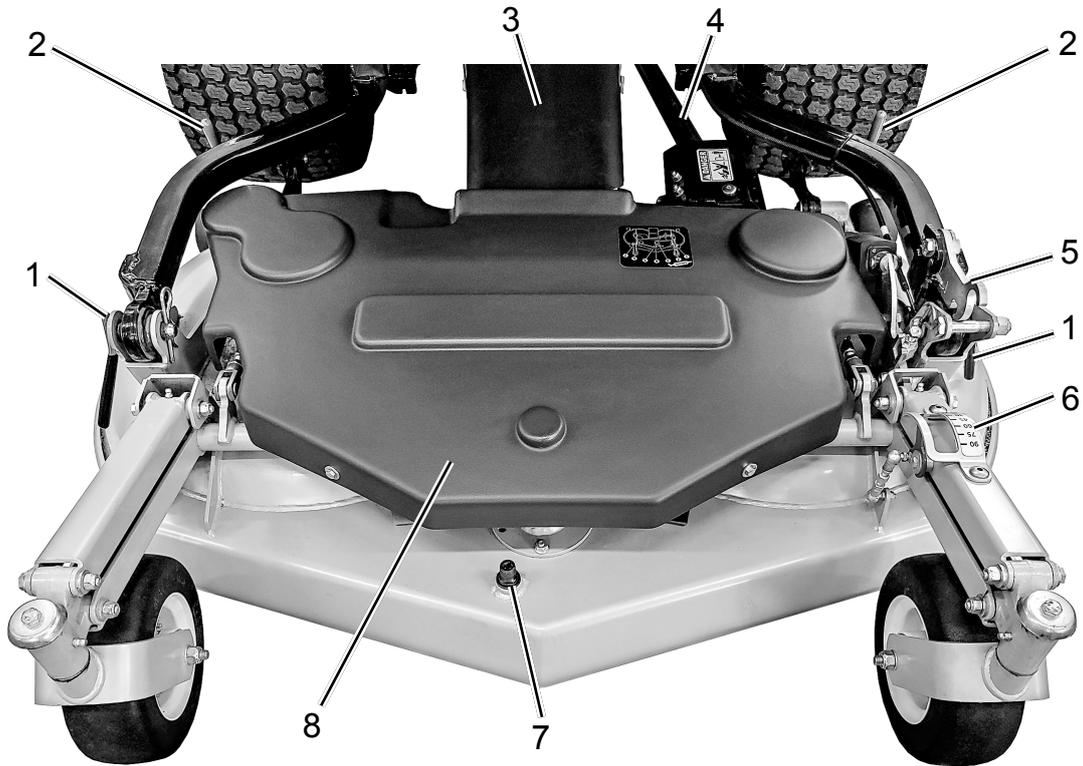


1. FUEL TANK CAP
2. FULL GRASS-CATCHER WARNING BUZZER BUTTON
3. FUEL LEVEL INDICATOR
4. THROTTLE LEVER
5. PARKING BRAKE LEVER
6. SEAT ADJUSTMENT LEVER
7. DIFFERENTIAL LOCK PEDAL
8. HOUR METRE
9. CUTTING HEIGHT ADJUSTMENT BUTTON
10. RECHARGE BATTERY WARNING LIGHT
11. ENGINE OIL WARNING LIGHT
12. ENGINE HEAT WARNING LIGHT
13. ENGINE TEMPERATURE WARNING LIGHT

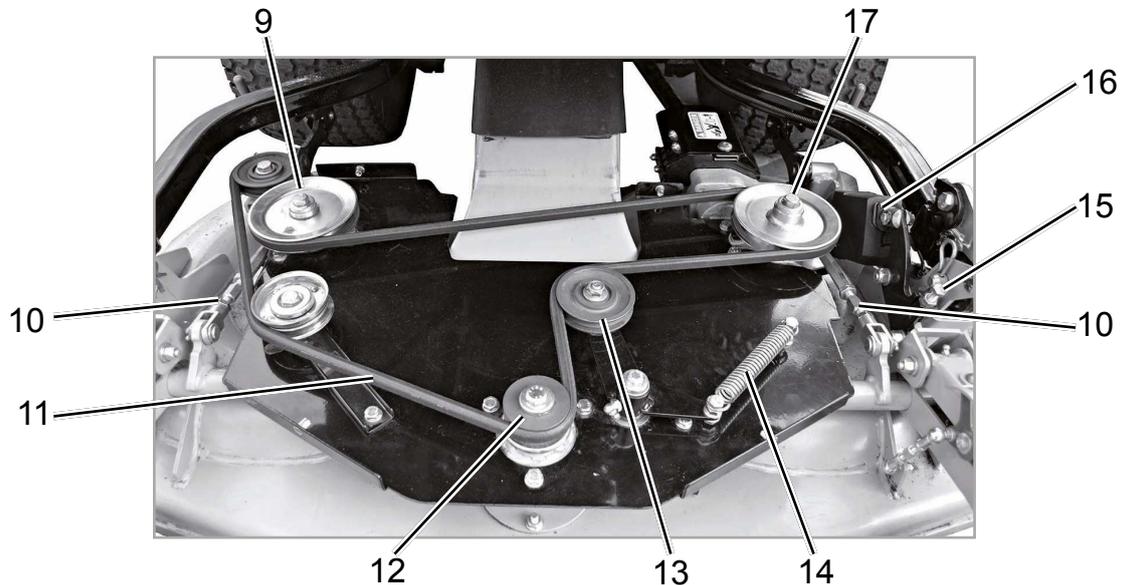
14. PTO BUTTON
15. STEERING WHEEL
16. IGNITION KEY
17. FORWARD PEDAL
18. REVERSE GEAR PEDAL
19. MOWER DECK LIFTING LEVER
20. GRASS-CATCHER LIFTING LEVER
21. GRASS-CATCHER TIPPING LEVER
22. COOLING LIQUID TANK CAP
23. HYDRAULIC OIL TANK CAP

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8 MOWER DECK COMPONENTS



TRANSMISSION INNER COMPONENTS



- | | |
|---|---|
| 1. PIN WITH COTTER PIN - FRONT MOWER DECK CONNECTION | 12. FRONT BLADE PULLEY |
| 2. PIVOT WITH PIN - REAR CONNECTION OF THE MOWER DECK | 13. BELT TENSIONER PULLEY |
| 3. LOAD CHUTE | 14. BELT TENSIONER SPRING |
| 4. CARDAN SHAFT | 15. FRONT PLATE HEIGHT ADJUSTMENT SCREW |
| 5. LOCKING HOOK FOR FULL LIFT | 16. ELECTRIC CUTTING HEIGHT DAMPER |
| 6. CUTTING HEIGHT INDICATOR | 17. LEFT BLADE PULLEY |
| 7. WASHING HOSE CONNECTION NOZZLE | |
| 8. TRANSMISSION PROTECTION COVER | |
| 9. RIGHT-HAND BLADE PULLEY | |
| 10. REAR DECK HEIGHT ADJUSTMENT ROD | |
| 11. BELT | |

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9 GRASS - CATCHER COMPONENTS

REAR VIEW WITH OPEN GRASS-CATCHER



1. GRASS-CATCHER DOOR
2. FIXED GRID
3. LIFTING ROD
4. REMOVABLE GRID
5. DEFLECTOR
6. FULL GRASS-CATCHER MICROSWITCH
7. LOAD CHUTE
8. LOCK HOOK
9. ELECTRIC MOTOR
10. SHOCK ABSORBER



10 TECHNICAL SPECIFICATIONS

ENGINE: KUBOTA D722-E4B-EU-Y2, Diesel EPA /CARB Tier 4, EU Stage V, ECE R 120, 722 cc, 13,2 kW (17,7HP) at 3200 rpm, 3 cylinders, liquid cooled, with electric fan and automatic radiator cleaning device.

FUEL TANK CAPACITY: 22 litres.

HYDRAULIC OIL CIRCUIT CAPACITY: 6.7 litres.

STARTER: electric 12 V

DRIVE: Hydrostatic 2-wheel drive with cascade reduction gear, parking brake and differential.

DIFFERENTIAL LOCK: mechanical with foot control.

DRIVE SYSTEM: steering wheel with hydraulic drive, with pedal-operated forward and reverse gears.

PTO: electromagnetic, with integrated blade brake.

SPEED: 0 -13 km/h with continuously variable.

WHEELS: front 20 x 10.50-8 GARDEN; rear 16 x 6.50-8 GARDEN.

SEAT: sprung and adjustable, seat belt included.

STEERING WHEEL: mounted on steering column, with knob.

TURNING RADIUS: 32 cm

AUTOMATIC FEATURES: blade disengagement when the grass catcher is full, radiator cleaning, electric grass distribution inside the grass catcher, grass catcher door opening.

BRAKE: parking brake, disc brake on gearbox.

GRASS CATCHER: 700 litre capacity, with motorised deflector that ensures complete and uniform filling of the basket. Hydraulic basket lifting and unloading system with automatic opening.

DISCHARGE HEIGHT: 190 cm

TIPPING HEIGHT: 15 cm

MOWER DECK: 3 blades, with central collection.

CUTTING HEIGHT: from 2.5 to 9 cm continuously variable and electric adjustment from the driver's seat.

CUTTING WIDTH: 113 cm.

HOURLY MOWING CAPACITY: 7500 m²/h.

ATTACHMENTS: cutting deck with collection 113 cm, mulching kit.

SIZE (with deck): Length: 271 cm - Width: 119 cm - Height: 151 cm (roll-bar lowered) - 193 cm (roll-bar raised)

GROUND CLEARANCE: 12 cm

WHEELBASE: 110 cm

WEIGHT (without mower deck): 530 kg

WEIGHT (with mower deck): 630 kg

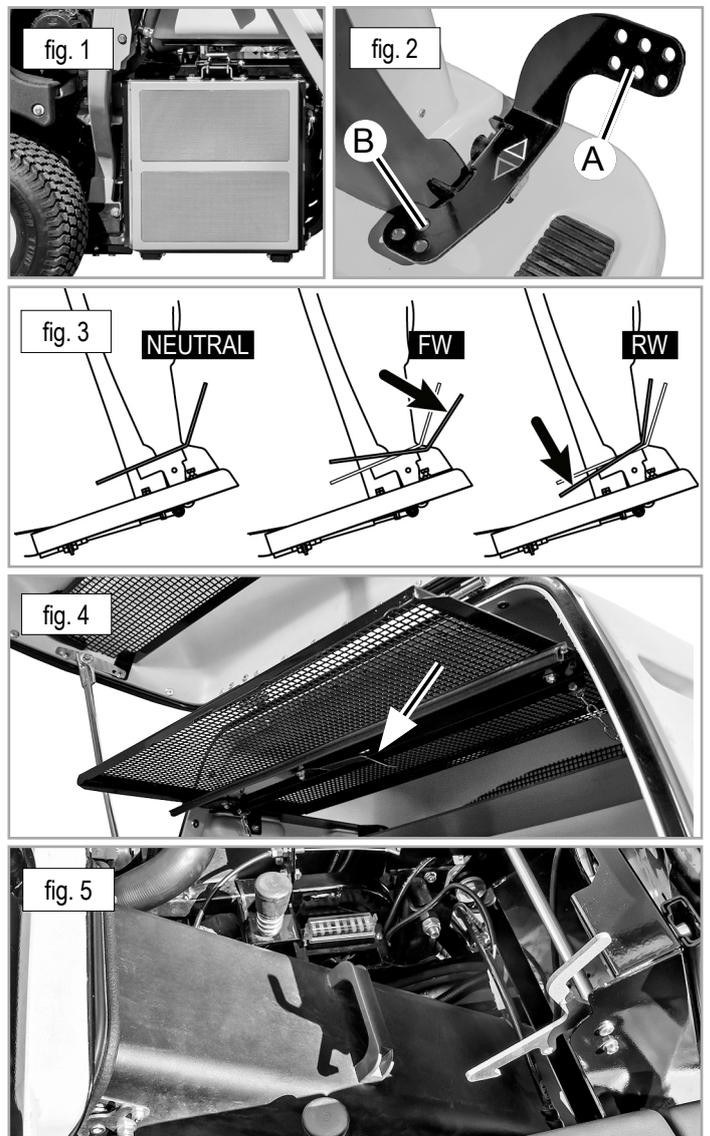
11 INSTRUCTIONS FOR USE

11.1 Checks to do before starting the engine

Check that;

- the radiator fluid up to level;
- The radiator intake fin is clean (Fig. 1).
- that the engine oil is up to the level;
- that the hydraulic oil is up to the level;
- that the forward/reverse pedal (fig. 2) is in NEUTRAL position (fig. 3).
- that the air filter is clean;
- that the grid inside the basket is clean (fig. 4); to remove it, pull the grid and push on the lock lever;
- that the mower deck and the load chute are clean and correctly fitted (Fig. 5).
- that there is sufficient fuel inside the tank.

For detailed level controls, please refer to chapter ORDINARY MAINTENANCE and LUBRICATION.



11.2 Starting the engine

1. Insert the key into the ignition block (Fig. 6).
2. Turning the key by one position supplies the electrical circuit with power: the electronic control unit performs a safety and function check, the engine glow plugs are preheated and the worklight is switched on.

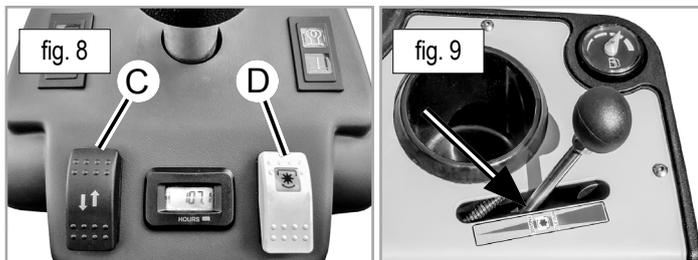
3. Turning the key one further position supplies power to the machine, but switches off the worklight.
4. Turning the key to the last position turns the engine on.
5. Release the key after starting.

 **IMPORTANT:** Always preheat the engine before attempting to start it and wait for the engine warning light to go out. (fig. 7)



11.3 Starting work

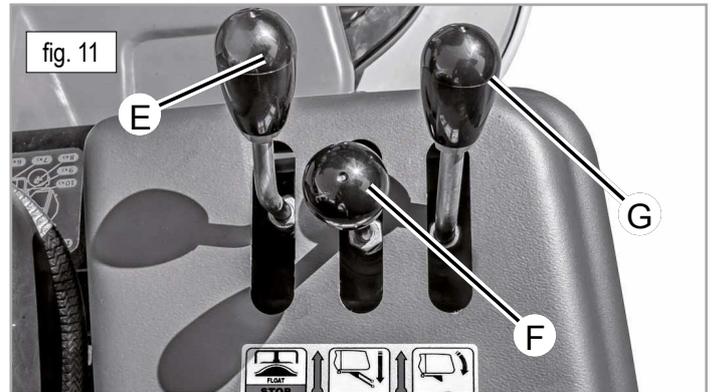
1. Adjust the seat and carry out the above described necessary checks.
2. Start the engine.
3. Release the parking brake by removing the lever from the housing (Fig. 12) and by bringing it to the lowest position.
4. Adjust the cutting height by pushing button (Fig. 8/C).
5. Move the throttle to the half-way position (Fig. 9).
6. Push the PTO button (Fig. 8/D).
7. Always check the running of the PTO safety devices before you start working,
 - the PTO is automatically disengaged by getting up from the seat;
 - blades stop in less than 5 seconds
8. Press the pedal (Fig. 2/A, Fig. 3/FW) smoothly and start working. Use the lower part of the pedal (fig. 2/B, fig. 3/RW) for reverse gear engagement.
9. To stop, simply release the forward pedal which will return to the neutral position (fig. 3/NEUTRAL).
10. When the grass-catcher is full, a sensor automatically disengages blade rotation, thus preventing the clogging of the load chute; alternatively, there is a full grass-catcher warning buzzer button on the left-hand side of the driver's seat (fig.10). By holding it down and re-engaging the PTO, you can keep the blades on when the grass catcher is full and continue mowing, if small areas are missing to finish the job.
11. To discharge the grass: raise the grass catcher by operating the central lever on the hydraulic distributor (Fig. 11/F) and tilt the grass catcher by using lever Fig. 11/G.



 **IMPORTANT:** do not engage the blades with the engine at full r.p.m., but bring the the throttle to the half-way position and then engage the PTO (Fig. 8/D).

 **IMPORTANT:** during cutting, the mower deck lift lever must be kept in the FLOAT floating position (Fig. 11/E).

 **IMPORTANT:** Always engage the blades a few metres outside entering the area to be cut. This cleans the mower deck and the load chute and does not strain the clutch.



11.4 Finishing work

Once mowing has been completed, disengage the blades and empty the grass-catcher . Then proceed as follows

1. Release the forward pedal to stop,
2. Set the throttle lever to minimum speed
3. if the mower deck was raised, lower it to the ground,
4. switch the engine off by turning the key to the STOP position and engage the parking brake (fig. 12)
5. finish by cleaning the machine.



11.5 Ordinary machine cleaning

 **CAUTION:** always wear appropriate clothing and goggles before starting any cleaning work.

 **CAUTION:** if you clean the machine with the grass-catcher raised, you must insert the two red safety hooks on the hydraulic pistons (fig.13).



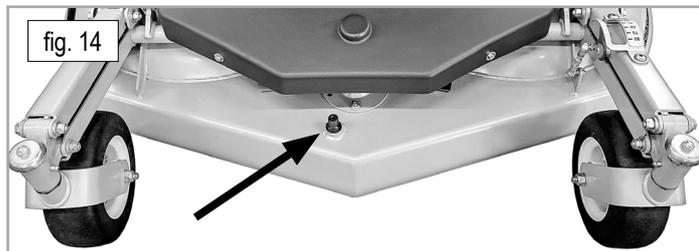
At the end of each job, proper cleaning ensures a long service life for the machine and prevents most common mishaps. The best way to clean the machine is with compressed air or a blower/vacuum cleaner.

IMPORTANT: keep the engine compartment and muffler area clean of dust and dried grass residues.

If necessary, use water for the body parts for the mower deck, the load chute and the grass-catcher; avoid wetting the electrical sensor inside the basket directly (fig. 18)

To clean the inner mower deck, place the machine on a solid floor, lower the cutting height to the minimum, connect the water connection nozzle (Fig. 14) to the water pipe and let the water run for a few minutes, with

- the operator sitting in the driver's seat
- engine running
- the advance pedal in NEUTRAL position
- the blades engaged.



Once the work is completed, also clean the grass-catcher grid. After using water, run the gearboxes for a few minutes, including those of the mower deck to ensure that all components dry.

CAUTION: To reduce the risk of fire, it is very important to keep the engine compartment, exhaust manifold, battery, fuel tank area and fuel line clean and free from grass, leaves and dust at all times.

IMPORTANT: Do not use a high-pressure cleaner in the engine compartment and wherever there are electrical components.

11.6 Useful rules for proper use

The machine can work even under severe conditions without clogging issues. A few preventive measures must be taken and all devices must be correctly adjusted.

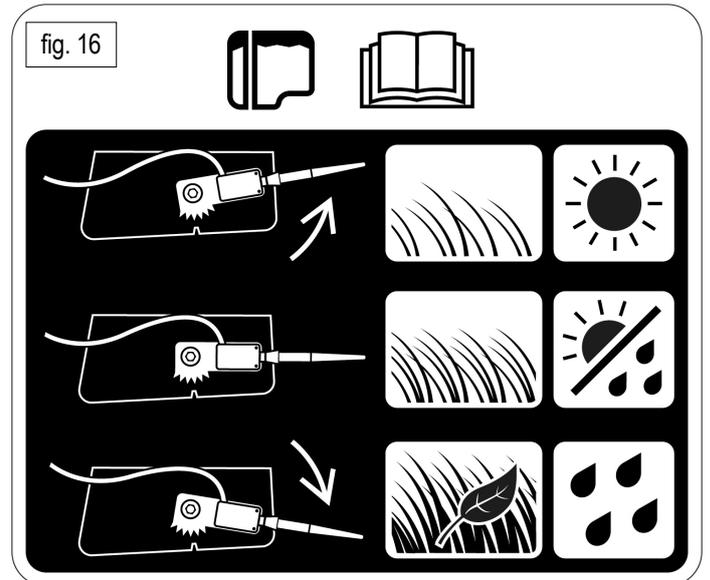
- Before starting work, check that the mower deck and the load chute are perfectly clean and free of grass and dirt.
- Check that the load chute is correctly positioned and hooked up with the two clips (fig.15).



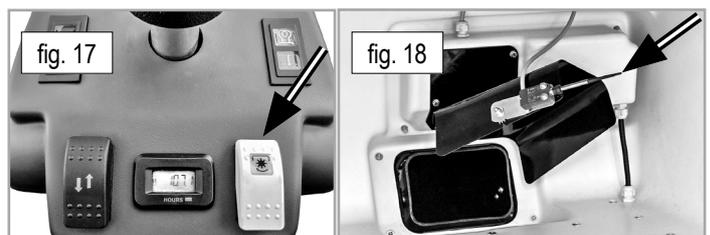
- Check the ground before mowing: no stones, twigs, roots or foreign bodies.
- When mowing, keep the engine at full speed and adjust the forward speed according to the grass height. Be careful and slow down when coming across tall or dense grass.
- Check that the blades are not worn, the cutting edge is sharp and the blade is not damaged. Sharpen the mower blades frequently; the cut will be better and the engine will run at lower consumption (ref.16.4 SHARPENING THE BLADES).

IMPORTANT: The blades must be mounted properly. Do not reverse the position of the blades.

- Keep the grid in front of the radiator clean (Fig. 1).
- To remove it, open the grass-catcher door and release the locking lever (Fig. 4).
- If the grass is wet or very high, do not cut with the mower deck in the lowest position, but set it to an intermediate position.
- Check the PTO driving belt tension
- Under normal cutting conditions, the microswitch of the full grass-catcher should be adjusted to the horizontal position. For optimum filling of the grass-catcher and to prevent clogging the load chute, we recommend adjusting it at a downward angle when the grass is wet or very tall, and at an upward angle when the grass is short or dry. (Fig. 16)



- Check the function of the distributor in the grass-catcher: pressing the PTO button (Fig. 17) automatically activates the distributor inside the grass-catcher (Fig. 18).
- Check that the blades disengage automatically when the grass-catcher is full or that the warning buzzer is activated. (ref. 11.3 MACHINE STARTING, point 10)



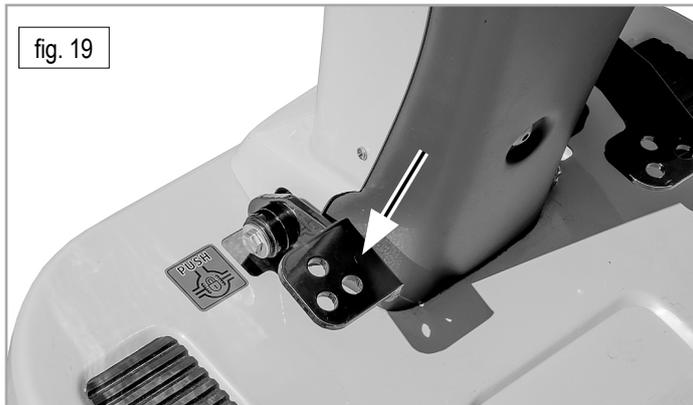
CAUTION: only use the hydraulic lift of the mower deck to cover short distances, to overcome obstacles, to step on kerbs.

11.7 Slopes and differential lock

Steep terrain should be driven in uphill/downhill direction by paying attention when changing direction and ensuring that the wheels uphill do not encounter any obstacles (stones, branches, roots, etc.) which could cause the machine to lose control. If the drive wheels tend to slip, use the hydraulic control to raise the mower deck slightly in order to put more weight on the drive wheels and thus gain more drive. Evaluate the various situations and be careful on damp ground and wet grass as the machine may slip. When travelling downhill, start at low speed and avoid driving over dry or cut grass as the wheels may lose grip.

The **differential lock** can be engaged by pushing the pedal on the left hand side of the steering column (Fig. 19) in the condition of wheel slip, or to load the mower on vehicles with ramps. Only engage the differential lock if necessary.

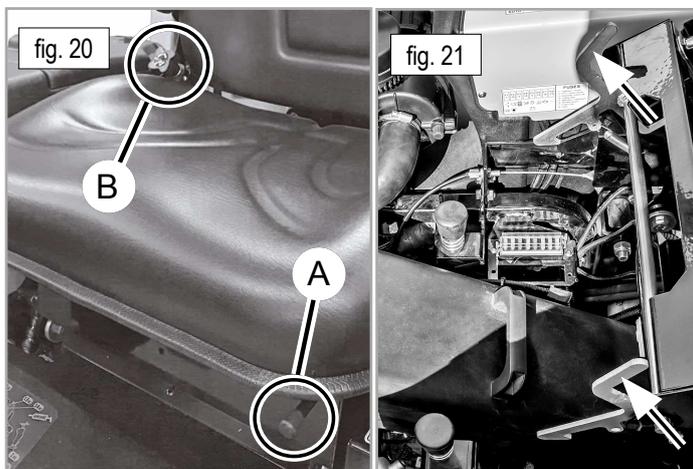
⚠ CAUTION: avoid slopes that are too steep; respect the safety limits set out in the manual (max. 18°- 32%).



12 ORDINARY ADJUSTMENTS

12.1 Seat adjustment

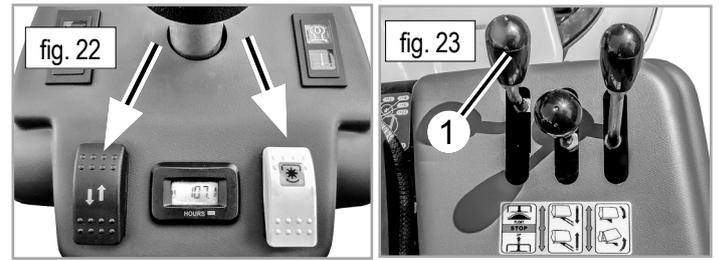
Before starting to work, we recommended to adjust the seat where you are most comfortable and have the most manageability over the machine. To adjust the seat forwards or backwards, move the lever on the left-hand side of the seat to the side (Fig. 20/A), then move the seat. To adjust the inclination of the backrest, turn the knob on the right-hand side at the base of the seat (Fig. 20/B). To fold the seat up, pull the levers on the back of the backrest (Fig. 21).



12.2 Cutting height adjustment

To adjust the cutting height, push the button (Fig. 22), pressing upwards to raise and downwards to lower.

⚠ IMPORTANT: During cutting, the mower deck lifting lever must be kept in the floating "FLOAT" position, by shifting it forward (Fig. 23/1).



When working on uneven ground, gutters or bumps, we recommend working with the cutter deck in the highest cutting position in order to avoid impact from the blades. There are two anti-scalp wheels at the rear of the mower deck (fig. 24); their height can be adjusted into three positions using the drillings in the deck.

For a proper use, set the height of the wheels at the closest position but not in contact with the ground.



13 SAFETY DEVICES

13.1 Electronic safeties

On the FD 500, an electronic control unit receives inputs from the microswitches located on the seat, forward pedal, parking brake and grass-catcher. Based on these inputs, the control unit produces logical blocks for the safety of the machine and the operator.

In particular, always remember that:

THE ENGINE

- turns off if the operator gets up from the seat with the parking brake off.
- will not start if the driver is not seated in the driving seat, unless the parking brake has been engaged first.
- will not start if the drive pedal is not in the NEUTRAL position.

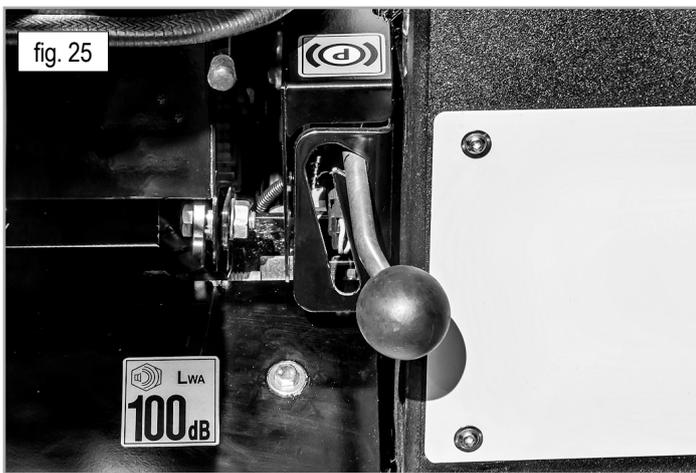
THE PTO

- does not activate if the parking brake is engaged
- does not activate if the basket is open or full, unless the warning buzzer switch has been pressed.
- does not activate if the engine is overheated.

13.2 Parking brake

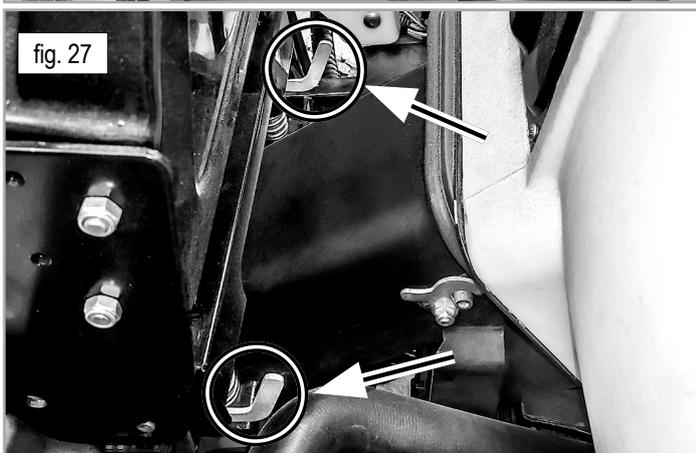
The FD 500 is equipped with a hydraulic feed system. Simply release the foot pedal to brake. To engage the parking brake, pull the lever with knob (Fig. 25) and position it in the housing. To release the parking brake, simply remove the lever from the housing and move it to a lower position. If the parking brake is engaged and the travel pedal is pressed, the warning buzzer will sound to warn the operator to release the brake. The blades cannot be engaged in this condition.

With the parking brake engaged, you can leave the driver's seat with the engine running.



13.3 Roll-Bar

⚠ CAUTION: In order to avoid serious injuries due to the machine tipping over, keep the roll-bar raised (fig. 26) and use the safety belt. In addition, make sure that the seat is securely fastened using the hooks behind the backrest (Fig. 27).



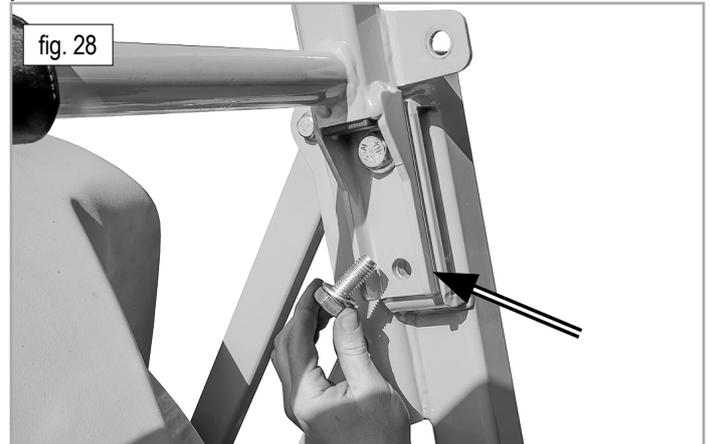
- Roll-over protection is not ensured if the roll-bar is in the lowered position.
- Do not operate the machine on uneven ground or on slopes with the roll-bar in the lowered position.
- Only lower the roll-bar when absolutely necessary.
- Do not wear a seat belt when the roll-bar is lowered.
- Drive slowly and carefully.
- Raise the roll-bar as soon as clearance permits.

- Take care when working under the tree crowns. Check that there are no low branches or other obstacles that could get in the way of the roll-bar.

To lower the roll-bar, proceed as follows:

1. Park the machine on a level surface.
2. Switch off the PTO, lower the cutting deck and engage the parking brake.
3. Switch off the engine and fold down the seat, using the levers at the rear (Fig. 27).
4. Undo the lower screws of the roll cage (Fig. 28).
5. Lower the roll bar behind the seat (Fig. 29) and tighten the screws in the new position (Fig. 30).

⚠ CAUTION: lower the roll-bar only when absolutely necessary, for short periods and raise it immediately as soon as clearance permits



To raise the roll-bar, proceed as follows:

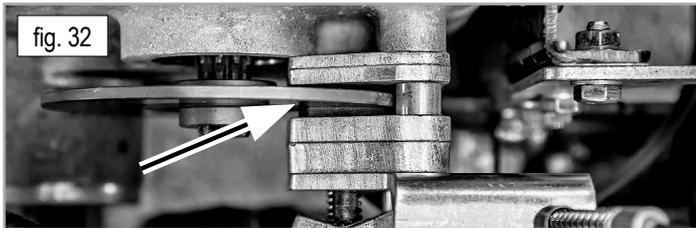
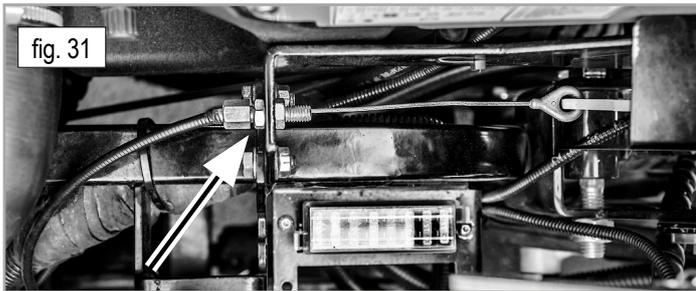
1. Park the machine on even surface.
2. Switch off the PTO, lower the mower deck and engage the parking brake.
3. Switch off the engine and fold down the seat, by using the levers at the rear (Fig. 27).
4. Unscrew the lower screws on the roll bar (Fig. 30).
5. Raise the roll bar (Fig. 26) and secure it by tightening the screws in the new position (Fig. 28).

14 EXTRAORDINARY ADJUSTMENTS

⚠ CAUTION: The adjustment procedures described below require technical skills and expertise. We recommend that you contact an authorised Grillo centre to carry out these procedures.

14.1 Adjusting the parking brake

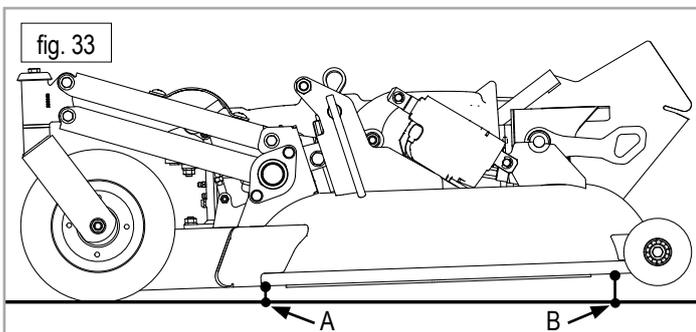
If the parking brake is ineffective, it is possible to adjust it using the adjusting screw and nut located under the seat (fig. 31): by loosening the lock nut and unscrewing or screwing the adjusting screw and nut, it is possible to modify the tension of the wire connected to the lever. The effectiveness of the brake is due to the block between the two pads of the disc placed at the exit of the reducer (fig. 32). When the brake is not activated, it is important to have a clearance between the pad and the disc (0.4 ± 0.6 mm) and that the wire is not tensed.



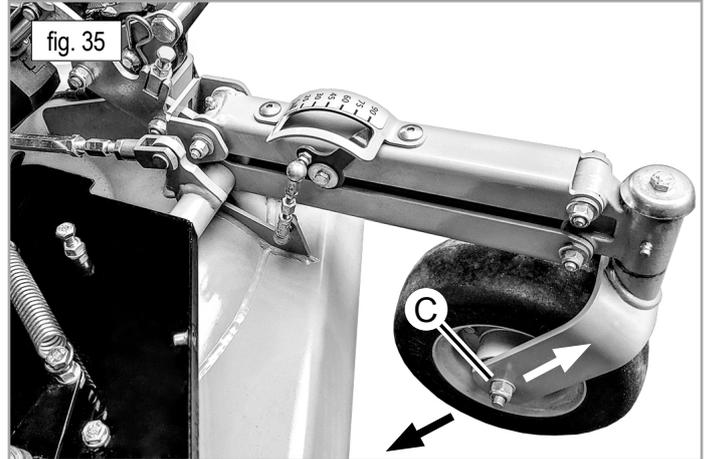
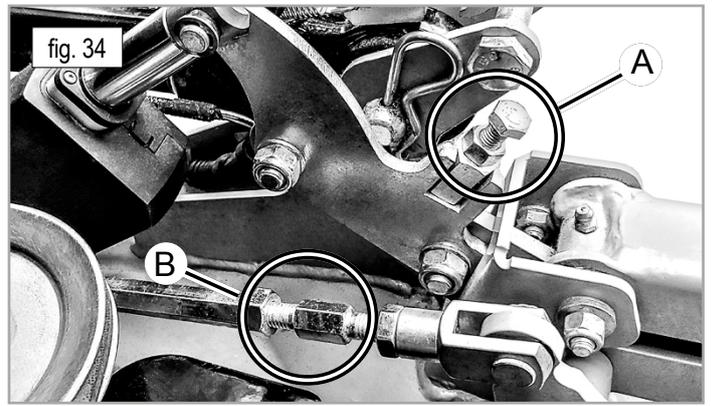
14.2 Adjustment of the mower deck

An optimal alignment of the deck is essential to achieve an evenly mowed lawn. Place the mower on a smooth, even surface, ensure the distributor lever is floating and lower the cutting height to the minimum. Then:

1. check the correct tyre pressure (1.5 bar) check the distance of the edge of the pan from the ground at the points indicated (fig. 33).



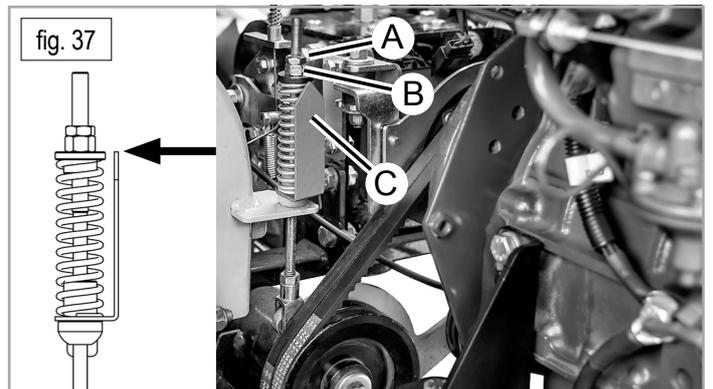
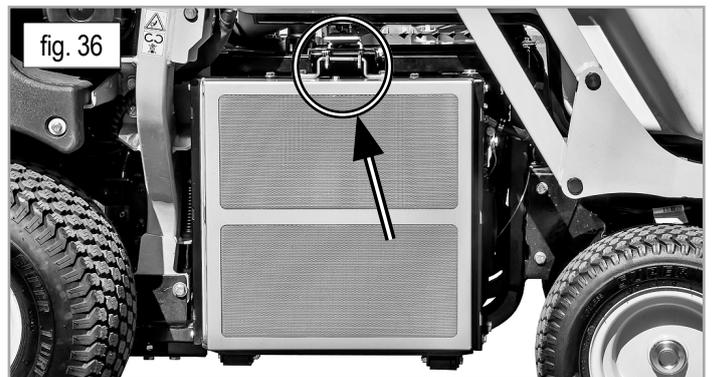
2. in A the measurement must be 15/20 mm, in B it must be about 5/10 mm greater than A.
3. if necessary, proceed as follows:
 - on the adjustment screw (fig. 34/A) to adjust the height of the front part;
 - on the two tie rods (fig. 34/B), one on the right and one on the left, to adjust the height of the rear part;
 - on the front wheel eyelets (fig. 35/C) to adjust the difference in height between the left and right-hand sides.



14.3 Adjustment of PTO belts

To adjust the tension of the PTO belts:

1. Release the radiator, using the lever to access the clutch (Fig. 36).
2. Loosen the lock nut (fig. 37/A).
3. Screw/unscrew the nut (fig. 37/B) so that the tip of the red tension indicator (fig. 37/C) is aligned with the end of the spring terminal.

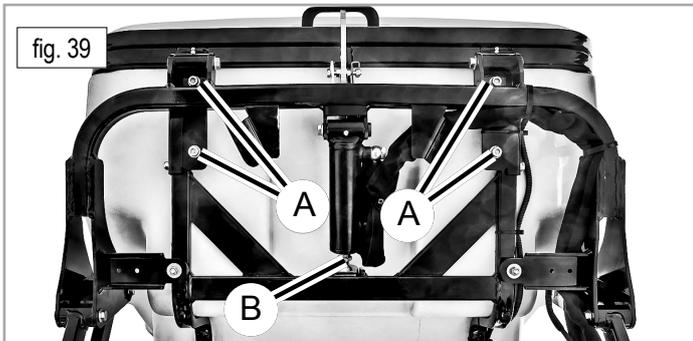


14.4 Adjusting the grass-catcher alignment

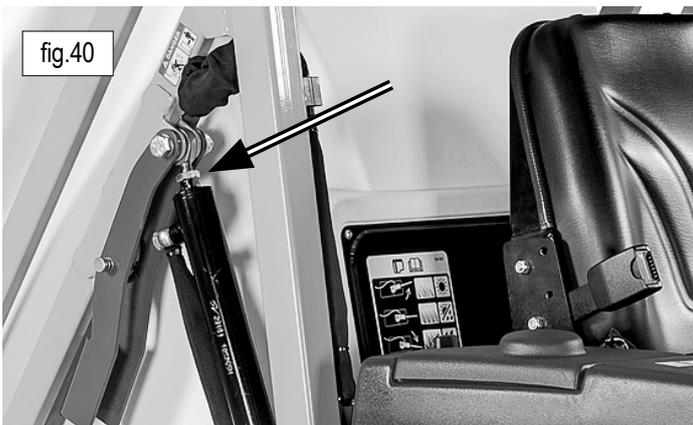
A perfect fit between the grass-catcher and the load chute in the closed position is very important to obtain a good result (fig. 38).

For this reason proceed as follows:

1. Put the grass-catcher in completely closed position and check the alignment with the load chute.
2. If the seal does not seal well or is too compressed, loosen the screws that secure the basket to the rear part (fig. 39/A).
3. Loosen the safety nut at the top of the central hydraulic cylinder rod. Screw or unscrew the cylinder rod (fig. 39/B.) to obtain the desired movement of the basket, so that the seal is slightly compressed and the grass catcher is aligned with the load chute.



4. If necessary, the position can also be adjusted by acting on the lifting pistons (fig. 40): lengthening the piston rod moves the grass-catcher away from and upwards from the chute, shortening the piston rod moves the grass catcher closer to and downwards from the chute.

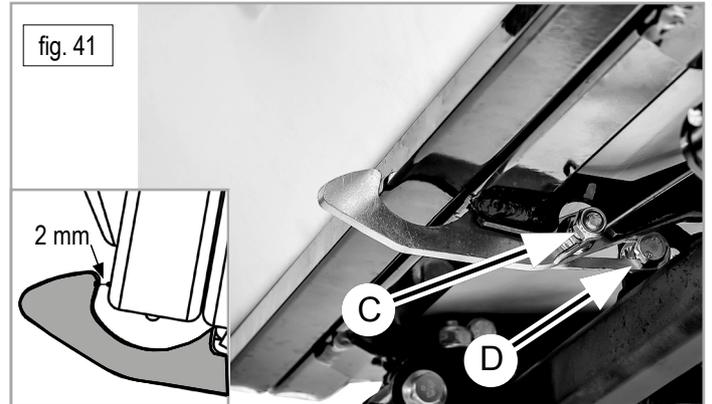


 **IMPORTANT:** for correct operation of the hydraulic grass-catcher raise, both pistons must be adjusted equally

14.5 Adjusting the grass-catcher lock hook

The grass-catcher lock hook is adjusted using the dedicated screw (Fig. 41/C).

It is necessary to leave approximately 2 mm clearance between the hook and the frame in order to facilitate hooking during closing. By acting on (fig. 41/D) it is possible to adjust the automatic opening angle of the tailgate.



15 ADJUSTING THE GRASS-CATCHER LOCK HOOK

 **CAUTION:** Always use suitable tools, such as supports or safety catches, if the machine or part of it has to be raised.

- Always wear suitable clothing and work gloves before starting any cleaning, maintenance or repair work.
- Do not leave the machine during maintenance without safety devices or lifted up, in places accessible to inexperienced people, especially children and animals.
- Never dispose of used oil, diesel or any other pollutant in the environment!
- Regular maintenance and correct lubrication help to keep the machine in perfect working order.

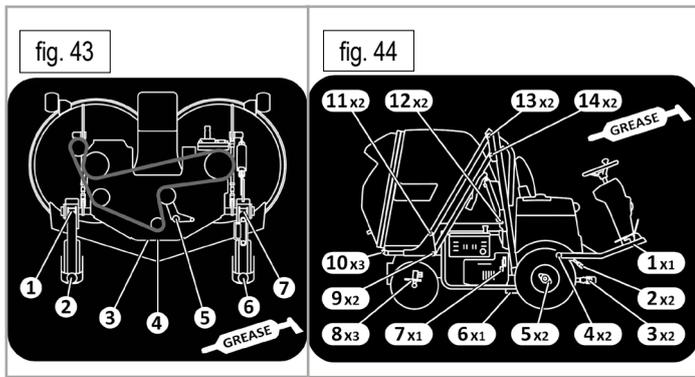
 **CAUTION:** when inspecting the machine with the grass-catcher raised, insert the two red safety locks on the hydraulic pistons (fig.42).



15.1 Lubrification

GREASE LUBRICATION POINTS

Consult the location of the lubrication points according to the schemes on the machine.



Mower deck scheme (fig.43) showing the components to lubricate where there (1 to 7), is a single grease nipple. The components are following:

1. right-hand deck arm
2. right swivel wheel
3. right-hand blade hub
4. front blade hub
5. platter drive sleeve
6. left caster wheel
7. left-hand deck arm

The scheme (fig.44) displays the components to be lubricated on the machine body (1 to 13), followed by the number of existent grease nipples. The components are as follows:

1. forward/reverse gear, grease nipple under the footboard
2. mower deck lifting pistons, left/right hand
3. cardan joint: both spiders
4. footplate: left/right coupling
5. front wheel hub bearings, left/right hand
6. PTO gearbox
7. hydraulic pump transmission pulley
8. rear axle: centre pin and spindles right/left hand
9. lower lift arms: bottom pins, right/left hand
10. grass-catcher: left/right hinges and centre tilt piston
11. upper lift arm: lower right/left-hand hand pins
12. grass-catcher lifting pistons, right/left hand
13. upper lift arm: upper pins, right/left hand
14. lower lift arm: upper pins, right/left hand

 **IMPORTANT:** Lubricate all points indicated in the schemes with grease every 40 hours.

15.2 Engine maintenance

 **IMPORTANT:** check the engine periodically, and keep the air filter clean and the engine oil level.

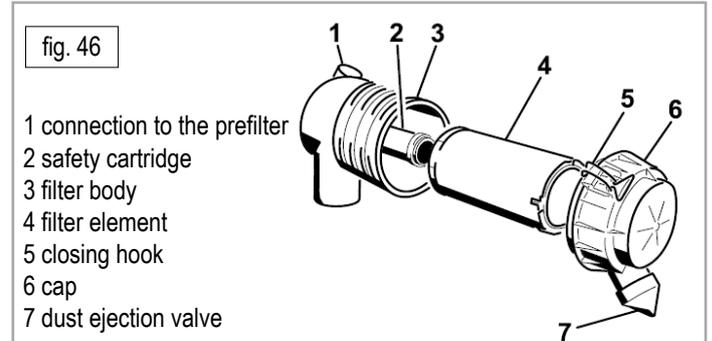
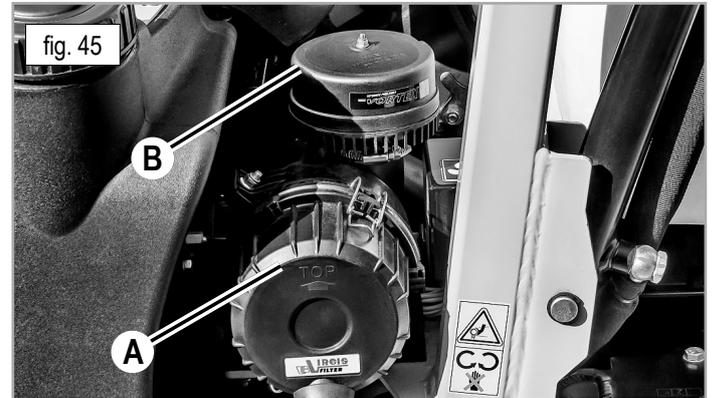
HOW TO MANUALLY ACCESS THE ENGINE COMPARTMENT

To access the engine if the machine breaks down, engage the parking brake, switch off the engine, hold down the grass-catcher folding lever and simultaneously push the grass-catcher towards the rear of the machine.

The grass-catcher will rotate allowing you to access the engine compartment.

AIR FILTER

Check and clean the air filter (Fig. 45/A) and the prefilter (Fig. 45/B) every 8 hours. For maintenance intervals and procedures refer to the rules contained in this manual (CHAPTER 18 MAINTENANCE SUMMARY TABLE); for further details consult the engine manual. If you work in a very dusty environment, it is recommended to clean the air filter every 4 hours or when necessary. There is also a safety cartridge inside the filter (Fig. 46/2) to prevent debris from entering the intake pipe when cleaning the filter. If the filter element (Fig. 46/4) is damaged, replace it. Only replace the safety cartridge if it is damaged or worn.



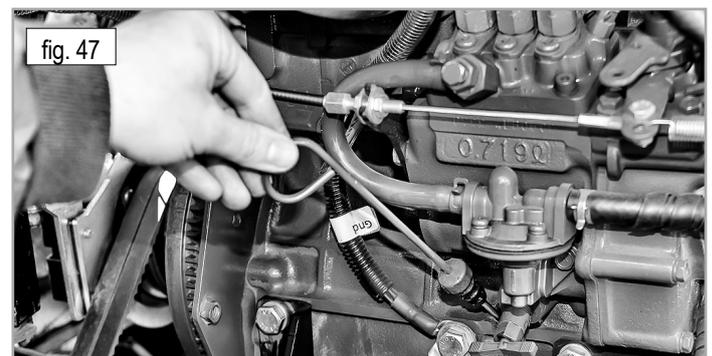
ENGINE OIL

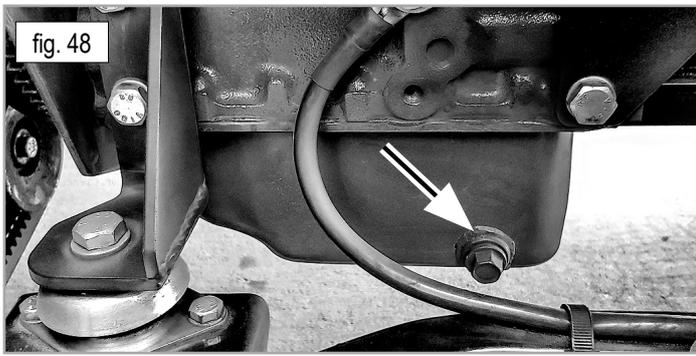
For lubrication intervals and lubrication methods follow the rules contained in this manual (CHAPTER 18 MAINTENANCE SUMMARY TABLE); for further details refer to the engine manual.

 **IMPORTANT:** it is essential to change the oil and oil filter after the first 50 hours of operation.

Then change the oil every 75 hours. For the engine, use SAE 15W40 oil in a quantity of 3.2 litres (including the quantity in the filter).

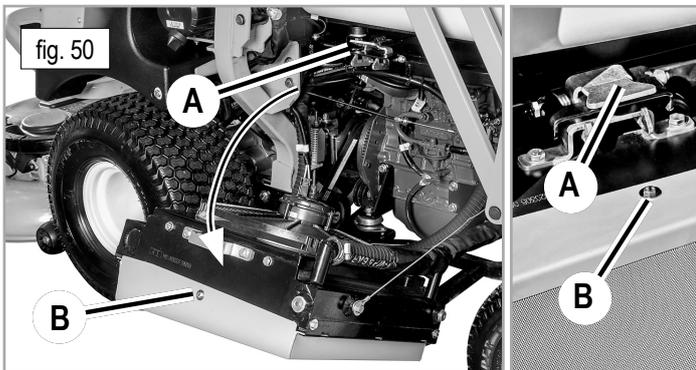
To check the oil level, use the oil dipstick (fig. 47) when the engine is cold. To remove all the oil from the engine, unscrew the screw located under the engine sump (fig. 48). To add oil or top up, use the plug located in the upper part of the engine (fig. 49).





ENGINE COOLING SYSTEM

In order to prevent clogging of the air passage, ensure that the protective fins on the radiator are always clean. The radiator fan is operated by an electric motor; if the fins become clogged and the temperature of the coolant rises above 95°C, the fan will automatically reverse direction for a few seconds to clean the fins. To inspect and clean the fan, press the lever located above the radiator (fig. 50/A). To remove the grid and get access to the radiator, unscrew the screw at the top (Fig. 50/B).



15.3 Maintenance of the battery

The battery does not require any special maintenance. It is sufficient to check that the voltage is not lower than 12.5 Volts and recharge if necessary. To access the battery (fig. 51), lift the grass-catcher and unscrew the cover located above the battery.

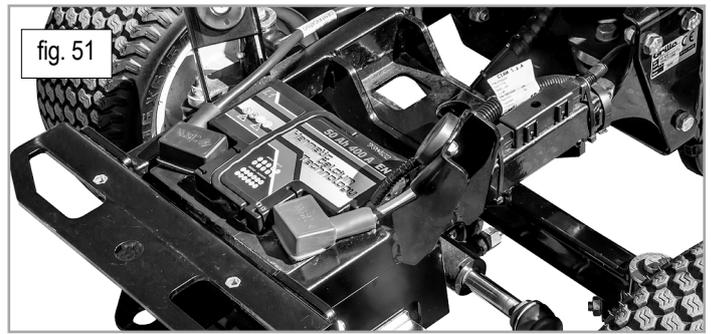
To recharge the battery it is necessary to disconnect the wires **and remove the battery from the machine.** (See PARAGRAPH 16.7 Changing the battery).

⚠ CAUTION: charging should be carried out in a dry and ventilated place, free from sparks and heat sources.

⚠ CAUTION: do not reverse the polarity of the battery, and be careful not to cause a short circuit.

⚠ CAUTION: the gases released by the battery are explosive, keep it away from flames or sparks.

🔧 IMPORTANT: do not attempt to start the machine if the battery is not correctly secured and connected: the alternator and the control unit could be damaged.



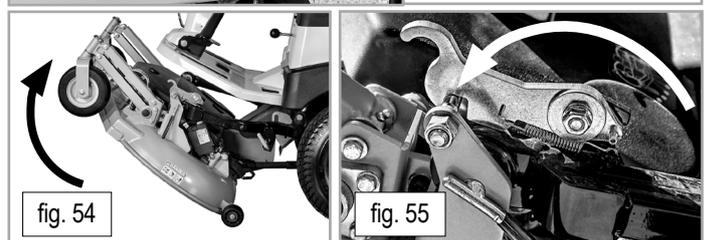
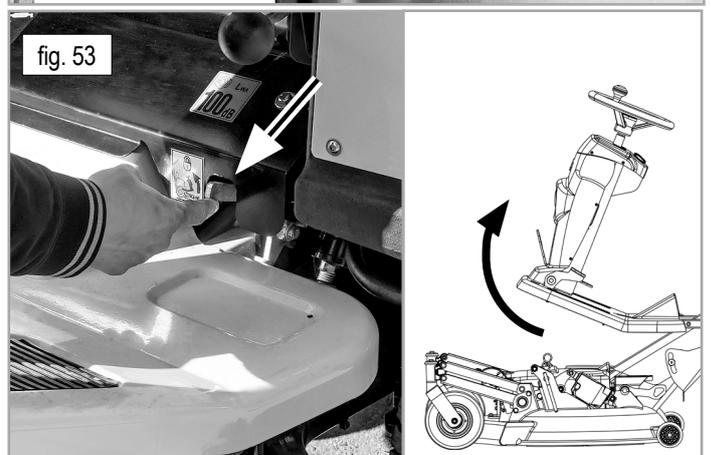
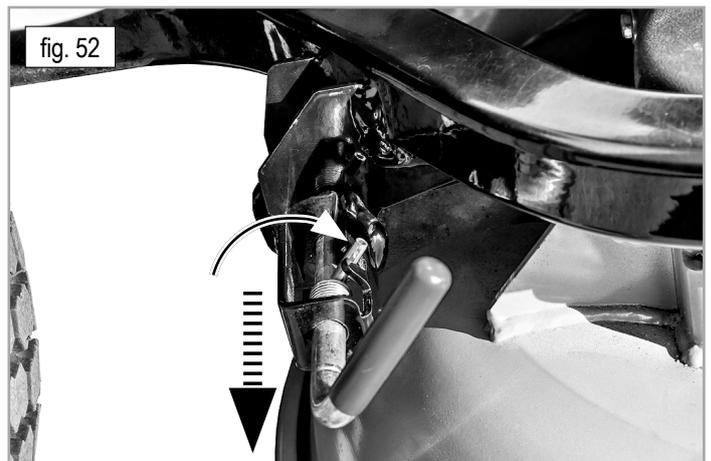
15.4 Maintenance of the cutting deck

HOW TO COMPLETELY RAISE THE MOWER DECK

Before carrying out the following operation lift the deck via the distributor lever (fig. 59/1) and then switch off the engine and engage the parking brake.

⚠ CAUTION: carry out the operation only when the engine is switched off and the brake is engaged.

1. Release the side arm pins by pulling them towards the outside of the machine and turning them to lock the pin in place (fig. 52).
2. Raise the footplate manually and secure it with the footplate lever (Fig. 53).
3. Raise the deck by hand (fig. 54) until it is locked in position with the safety hook (fig. 55); it engages automatically. It is not necessary to release the cardan shaft or remove the load chute.



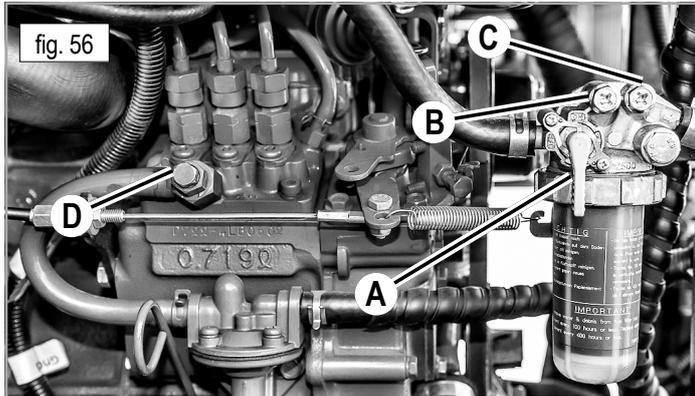
16 EXTRAORDINARY MAINTENANCE

⚠ CAUTION: The operations contained in this chapter require technical skills and special equipment. It is advisable to contact an authorised Grillo centre.

16.1 Maintenance of the fuel system

FUEL FILTER AND FUEL CIRCUIT

The fuel filter cartridge is located on the left-hand side of the machine, near the engine (fig. 56). For maintenance intervals and methods follow the rules contained in this manual (CHAPTER 18 MAINTENANCE SUMMARY TABLE); for further details consult the engine manual.



Total exhaustion of the fuel in the tank can cause the engine to shut down and be difficult to restart. In this case it is necessary to carry out the procedure of purging the air from the fuel circuit.

HOW TO REMOVE AIR FROM THE FUEL CIRCUIT

Proceed as follows:

1. Fill the tank to at least half full.
2. Keep the filter tap in the open position (Fig. 56/A).
3. Loosen the first bleed screw (Fig. 56/B), allow any air to vent and wait for fuel to bleed. When fuel starts bleeding from the screw, tighten it.
4. Loosen the second bleed screw (fig. 56/C) and check that fuel enters the filter, filling it completely, letting air vent from the screw. When fuel starts bleeding from the screw, tighten it.
5. Loosen the bleeder screw (fig. 56/D) on the engine. Allow any air to vent. When fuel starts bleeding from the screw, tighten it.
6. Try to start the machine; it may be necessary to make more than one attempt. Always wait for the pre-glow warning indicator light to go out before starting the engine.

16.2 Maintenance of the cooling system

HOW TO REPLACE THE COOLANT

With the engine switched off and cold, unscrew the reservoir cap (Fig. 57/E) and the screws at the top (Fig. 58/G) and bottom (Fig. 58/H) of the radiator to remove the old fluid completely. Retighten the lower screw (Fig. 58/H) and pour the new fluid into the reservoir until the radiator is completely filled. At this point the fluid will begin bleeding from the screw at the top of the radiator (Fig. 58/G), which must then be tightened.

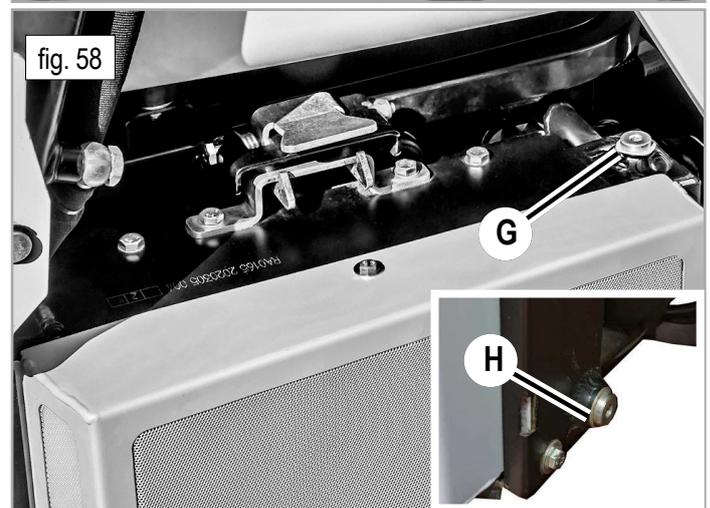
Continue to fill and bleed the radiator as follows.

HOW TO REMOVE AIR FROM THE COOLING CIRCUIT

To make cooling of the engine easier there must be no air in the cooling system. Therefore, ensure that the clamps on the water hoses are tight and that no air enters the circuit. Carry out the bleeding procedure as indicated below.

⚠ CAUTION: danger of hot liquid running out under pressure, always wear suitable work gloves for this operation. Do not perform the following operation when the engine is hot.

1. With the engine switched off, add coolant into the reservoir from the reservoir cap (Fig. 57/E) until the reservoir is completely filled.
2. Leaving the reservoir cap open, loosen the bleeder screw (Fig. 58/G) again. The level in the tank will drop, as air will vent from the bleeder screw. When fluid starts bleeding of the screw, tighten it.
3. If no fluid comes out of the screw and the reservoir is empty, tighten the bleeder screw, refill the reservoir and repeat step 2. Top up the fluid in the reservoir to the correct level, equal to the raised edge of the reservoir (Fig. 57/F).
4. Start the engine and move the throttle to the half-way position. Wait approximately 15 minutes to reach operating temperature. Recheck the level in the coolant tank and top up if necessary.
5. After one hour of using the machine, check the level again.



16.3 Maintenance of the hydraulic system

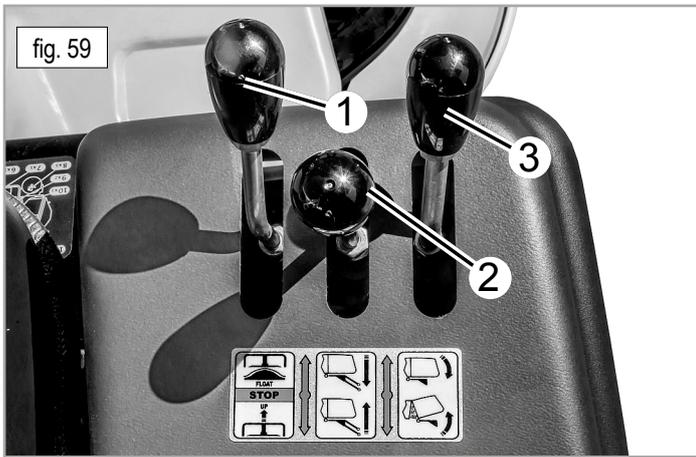
HYDRAULIC SERVICES DISTRIBUTOR

The hydraulic lever valve (Fig. 59) operates at a maximum operating pressure of approximately 140 bar.

Lever 1 makes the cutting deck float or can raise it.

Lever 2 raises / lowers the basket.

Lever 3 tilts down the grass-catcher for unloading.

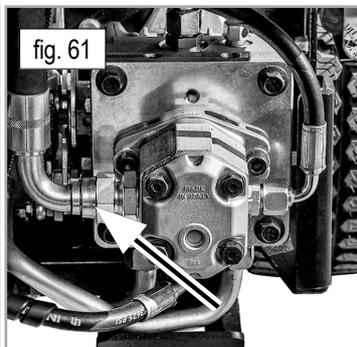


Check the level in the hydraulic oil tank periodically, when the oil is cold. To check or top up the oil level, unscrew the oil level plug (fig. 60). Check the level by means of the dipstick on the oil filler cap: the level must lie between the two notches at the end of the dipstick. Check the level by screwing the cap on and off completely each time. To remove the oil, unscrew the hydraulic hose on the gear pump (fig. 61). Change the hydraulic oil and oil filter (Fig. 62) the first time after 100 hours, then every 400 hours. It is not necessary to bleed the hydraulic system. Pay attention to the degree of filtration of the filter (10 µm). The oil must be changed before 100 hours if:

- the oil is dark in colour;
- the oil is whitish in colour (oil is contaminated with water);
- there are black residues (partial deterioration of the oil).

Use hydraulic oil 5W50 in a quantity of 6.7 litres including filling the circuit and the filter.

 **IMPORTANT:** take particular care with any impurities that may end up in the circuit and cause serious damage to the machine.



HYDRAULIC PRESSURES	
Closed circuit transmission: variable displacement pump and hydraulic motor	200 bar
Power steering	140 bar
Lever distributor	140 bar
Hydraulic pump loading pressure	5 bar

16.4 Maintenance and complete disassembly of the mower deck

 **CAUTION:** carry out this operation with the engine switched off and the brake applied.

Proceed as follows to remove the mower deck:

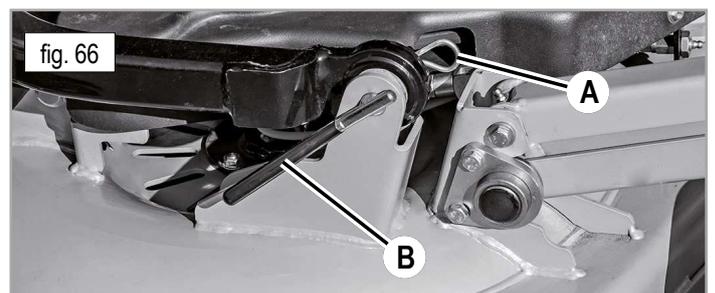
1. Lower the cutting deck by moving the distributor lever to the FLOAT position (fig.59/1).
2. Unscrew the cardan shaft guard screw (fig.63) and release the cardan shaft by pressing the locking button (fig.64).



3. Release the rear arm pins by pulling them outwards and turning them to lock the pin in the slot (Fig. 65).



4. Remove the split pins (fig. 66/A) from the pins of the plate lift arms and slide out the pins (fig. 66/B).

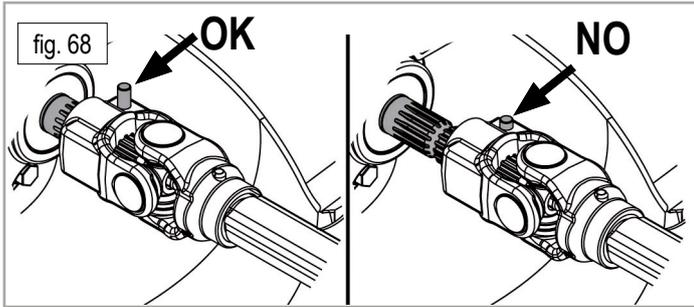


5. Disconnect the electrical wire of the motor that controls the cutting height of the cutting deck (Fig. 67).



6. Pull the mower deck forward to release it from the machine.
To reassemble mower deck, follow the procedure in reverse order.

⚠ CAUTION: When refitting the mower deck, check that the cardan shaft (fig. 68) and the load chute correctly connected.

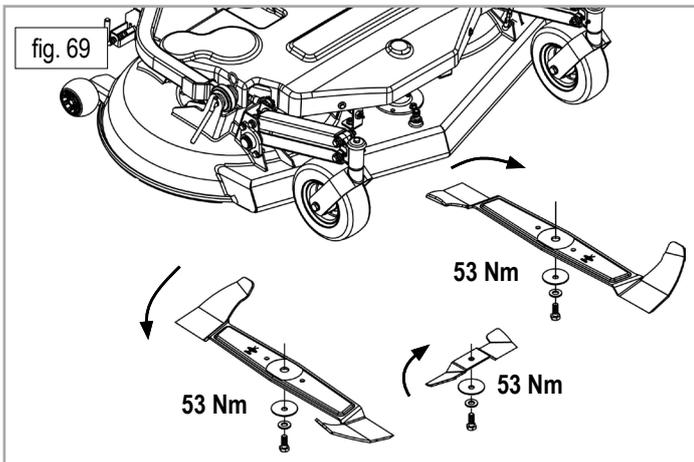


SHARPENING OF BLADES

An unsharpened blade tears up the grass, giving the lawn an unsightly appearance. It is necessary that sharpening is always carried out on the cutting edges of all blades evenly. Also, if the blades do not cut properly, they tend to become unbalanced, causing the mower to vibrate;

⚠ CAUTION: Never attempt to repair damaged blades. Damaged blades must be replaced.

Pay attention to the direction of rotation and correct assembly of the blades (Fig. 69).



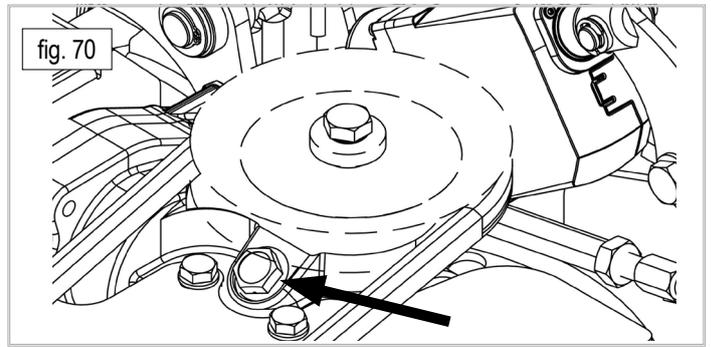
⚠ IMPORTANT: The central screw of the right-hand blade (looking from the driver's seat) has a left-hand thread. The tightening torque of the central blade fixing screw is 53 Nm.

⚠ CAUTION: Before starting the machine, however, ensure that the cardan shaft is securely connected and the stop button protruding (fig. 68).

MOWER DECK GEARBOX

Use LSX 75W90 synthetic oil in a quantity of 0.25 litres.
 Change the oil every 300 hours.

The oil level plug is located on the side of the gearbox (fig. 70). To change the oil from the gearbox, remove the plastic cover of the plate, remove the pulley, unscrew the inspection plug and suck out the oil.



If you notice any oil leaks, we recommend that you contact your authorised Grillo service centre.

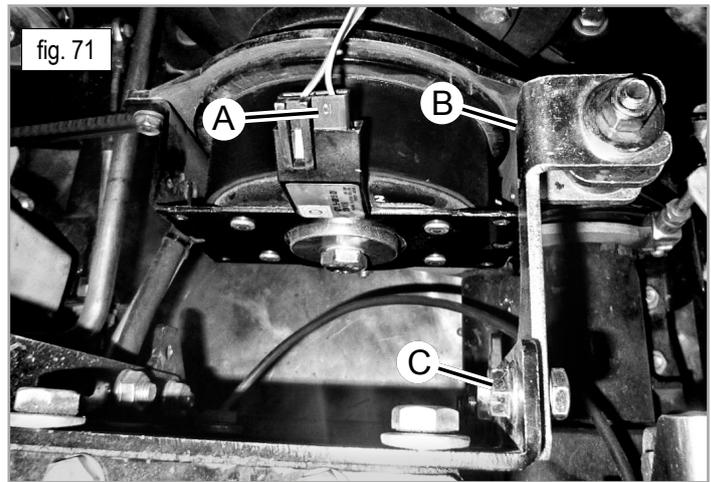
16.5 Maintenance of belts

HOW TO CHANGE THE PTO BELTS

⚠ IMPORTANT: use only original belts

For their replacement proceed as follows:

1. Fold down the seat and remove the load chute.
2. Release the radiator by means of the lever above to gain access to the clutch.
3. Disconnect the electrical wire of the electromagnetic clutch (fig. 71/A).
4. Remove the arm (fig. 71/B) fixed to the gearbox by means of the two screws (fig. 71/C).
5. Loosen the spring that adjusts the idler by unscrewing the nuts (ref. 14.3 PTO BELT ADJUSTMENTS).
6. The belts can now be replaced.



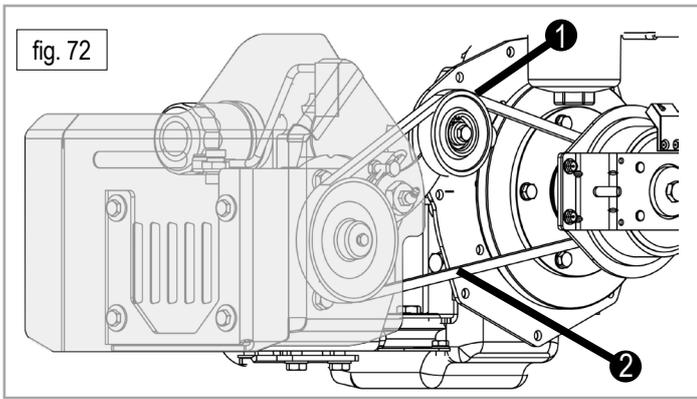
Once the change was completed proceed as follows:

1. Reposition the arm in its initial position and connect the electrical cable to the clutch.
2. Tension the belts by bringing the pulley of the idler to the correct compression, so that the tip of the red tension indicator is aligned with the end of the spring (ref. 14.3 PTO BELT ADJUSTMENTS).
3. Re-attach the radiator, re-insert the load chute.

HOW TO CHANGE THE HYDRAULIC PUMP DRIVE BELT

To replace the pump drive belt proceed as follows:

1. Remove the two PTO belts as described above.
2. Lower the pulley by hand (fig 72/1).
3. Remove the belt (fig 72/2).
4. Refit the PTO belts.



ENGINE TEMPERATURE SENSOR

A sensor that detects the temperature of the coolant is located on the engine head. When the temperature of the coolant exceeds 95°C, the sensor sends a signal to the ECU located under the dashboard (fig. 76) that triggers the automatic cleaning cycle of the radiator, reversing the direction of rotation of the fan for a few seconds, cleaning the fins. If the coolant exceeds 105°C, an acoustic alarm is activated and at the same time the warning light on the dashboard turns on (fig. 77). The blades are automatically disengaged.

If the coolant exceeds 110°C, the engine is switched off.

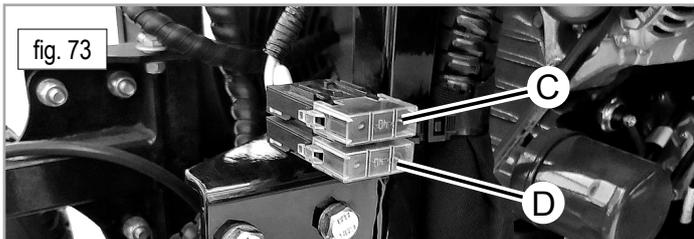
If the sensor is faulty or absent, it will not be possible to start the engine and the control unit will signal the sensor failure by activating a continuous acoustic alarm.

16.6 Maintenance of electrical installation

FUSES

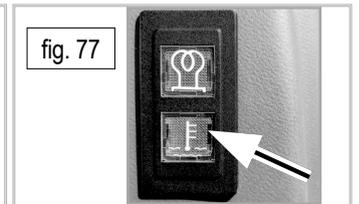
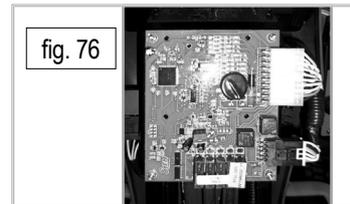
The electrical system is protected by fuses which, if interrupted, will cause the entire electrical system to fail. There are two main 40 A fuses: one protects the entire electrical system (fig.73/C) and the other protects the radiator fan (fig.73/D). Under the seat, to the left of the operator, other fuses are installed to protect the components of the electrical system (fig.74). If electrical problems persist after the fuses have been replaced, contact the authorised service centre. Never attempt to carry out major repairs without having the necessary means and technical expertise.

IMPORTANT: you must not replace fuses with fuses of a different rating than that indicated in the manual and on the relevant decal.



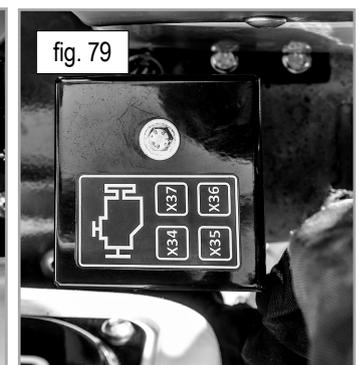
MICROSWITCH FOR GRASS-CATCHER POSITION

- A safety microswitch detects whether the basket is in the working position (Fig. 75). Otherwise the PTO will not engage. The microswitch is located next to the load chute, to the left of the operator.



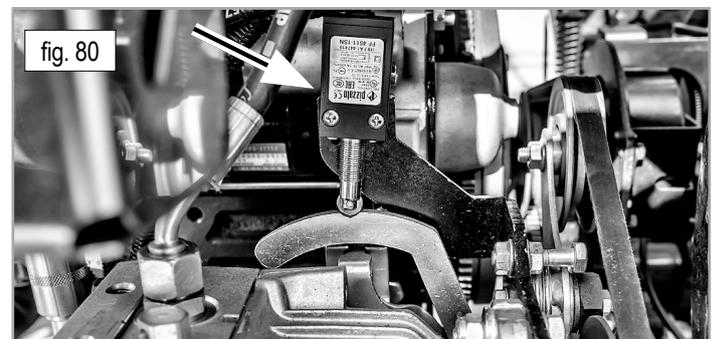
RELAY

- There are four radiator fan control relays (fig. 78) located on the side of the radiator to the left of the operator.
- There are four engine supply relays (key, glow plugs, starter motor, diesel pump) (Fig. 79), located on the opposite side to the right of the operator.



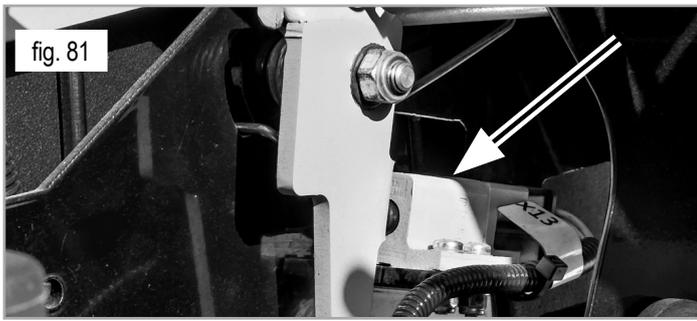
NEUTRAL POSITION MICROSWITCH

The travel pedal is connected to a microswitch located behind the hydraulic pump (fig. 80) which signals the clutch's neutral position.



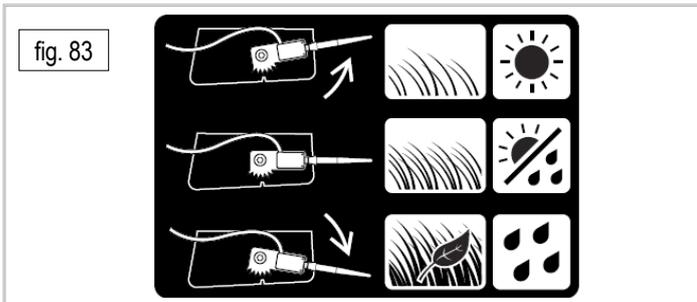
PARKING BRAKE MICROSWITCH

The parking brake lever activates a microswitch (fig. 81) that signals that the brake is engaged and allows the engine to remain running even if the operator leaves the driver's seat.



GRASS-CATCHER-FULL MICROSWITCH

- The grass catcher-full microswitch is mounted on the moving deflector inside the grass-catcher and sends a signal to automatically disengage the blades when the grass catcher is full (fig. 82). Alternatively, by pressing the switch on the left-hand side of the operator, the blades can be kept on. In this way it is possible to continue cutting, if small areas are missing to finish the job; a buzzer warns the operator that the grass-catcher is full. It is important to adjust the position of the microswitch according to
- the type of grass to be cut, to ensure that the grass catcher box is completely filled. Under normal cutting conditions, the full grass-catcher microswitch should be adjusted to the central position. We recommend setting it at a downward angle for wet or very tall grass, and upward for short or dry grass (Fig. 83).



- The engine compartment of the electric distributor is accessible by unscrewing the four screws of the grass catcher cover located behind the housing (Fig. 84).



COUNTER

The hour counter is located on the dashboard and shows the number of hours the machine has been working. By pressing the button below the screen once, it is possible to see how many hours remain until the next engine oil change (OIL will flash, followed by the number of hours remaining). Pressing the button again will display how many hours remain until the next lubrication at the greasing points (LUBE flashing, followed by the number of hours remaining). Pressing the button again will return you to the working hours screen. When 10 hours for oil / 5 hours for grease guns are missing, the OIL / LUBE signs will start flashing. They will continue counting the missing hours, until the OIL NOW / LUBE NOW writing is shown: at this point it is advisable to carry out maintenance in a short time. Once the maintenance has been carried out, to reset the hours count go to the screen to be reset (for example OIL) and keep the button pressed until a series of zeros (000000) appears. The count is automatically reset.

OPERATOR PRESENCE MICROSWITCH

The operator presence microswitch is located under the seat and detects the presence of the operator when seated in the driver's seat.

16.7 Replacing the battery

To access the battery and replace it if the car breaks down, the ignition key must be in the off position and the parking brake must be applied, after which unscrew the cover located above the battery and the bumper with the tow hook (fig. 85), then disconnect the cables (first the negative BLACK and then the positive RED) and after loosening the fixing screws, remove the discharged battery.



Insert the new battery, connecting the wires (first the positive RED wire and then the negative BLACK wire), tighten the fixing screws and refit the bumper and top cover.

If the replacement battery has been supplied "dry" with separate acid, choose a suitable dry, well-ventilated location free from sparks and heat sources for installation and then proceed with the following steps:

1. - insert the acid and wait 2 hours;
2. - charge the battery with a battery charger set to 12 Volt on slow charge for 2 hours.

⚠ CAUTION: Failure to do so may lead to battery deterioration and acid leakage during work.

- Check the fluid level periodically and keep the clamps lubricated with Vaseline grease.

⚠ CAUTION: the gases released by the battery are explosive, keep it away from flames or sparks.

⚠ CAUTION:

- Do not reverse the polarity of the battery.
- Do not operate the mower without battery.
- Make sure not to cause a short circuit.

17 TROUBLE - SHOOTING IDENTIFICATION

FD 500 - TROUBLE-SHOOTING GUIDE		
PROBLEM	CAUSE	SOLUTION
The instrument panel remains off, with the key in a position other than STOP.	The battery is not supplying any current	<ul style="list-style-type: none"> - Check the connection wires - Check the electrolyte level in the battery - Recharge the battery - Check the integrity of the fuses - Check the earth wire connections on the engine
The instrument panel is on, the key is not in the STOP position, but the starter motor does not turn. does not turn	The battery does not supply sufficient current	<ul style="list-style-type: none"> - Charge the battery - Battery has no earth wire connection - Check the integrity of the fuses
	No consent to start-up	<ul style="list-style-type: none"> - Forward/reverse pedal is not in neutral position - Operator seated to activate the microswitch, or engage the parking brake - High engine temperature - Check for a defective microswitch - Faulty key lock
Difficult starting or irregular running of the engine	Combustion problems	<ul style="list-style-type: none"> - Clean or replace the air filter - Check that there is no air intake in the fuel circuit - Bleed the air from the fuel circuit
	Deposits or impurities in the fuel	<ul style="list-style-type: none"> - Check and, if necessary, replace the fuel filter - Consult the engine manual
	Injection problems	<ul style="list-style-type: none"> - Consult the engine manual
The starter motor turns but the engine does not start	Lack of fuel flow	<ul style="list-style-type: none"> - Check the fuel level in the tank - Check (and replace if necessary) the fuel filter - Bleed the air from the fuel system
	Pre-glow plugs not warmed up enough when the engine is cold	<ul style="list-style-type: none"> - Wait until the preheating warning light has gone out - Check that the glow plugs are working properly
	Stopping solenoid	<ul style="list-style-type: none"> - Manually check the sliding of the stop lever
	Timer relay	<ul style="list-style-type: none"> - Replace the timer - Check electrical connection
Drop in engine performance during cutting	Speed too high for the grass height	<ul style="list-style-type: none"> - Slow down - Put the mower deck in a higher cutting position
	mower deck transmission	<ul style="list-style-type: none"> - Check the integrity of the mower deck bearings and guides. - Lubricate the cutter deck using the grease nipples indicated. - Check the cleanliness of the load chute and cutter deck.
When engaging the blades, the engine stops.	<ul style="list-style-type: none"> - Blades - Pulleys - mower deck gearbox 	<ul style="list-style-type: none"> - Check the integrity of the cutter deck bearings and pulleys. - Check the mower deck transmission - Check blades and transmission for clogging.

FD 500 - TROUBLESHOOTING GUIDE

PROBLEM	CAUSE	SOLUTION
Irregular cutting and insufficient collection	Incorrect tilting of the cutting deck	- Check tyre pressure - Restore correct inclination of the mower deck..
	Poor blade performance	- Check that the blades are fitted correctly - Sharpen or replace blades - Adjust the tension of the PTO belts
	High forward speed in relation to cutting height or lawn conditions	- Slow down - put the mower deck in a higher cutting position
	Load chute blocked	- Remove the mower deck and empty the load chute - Check engine speed - Clean the basket net - Adjust the full grass-catcher microswitch
Vibrations during operation	Unbalanced blades	- Balance or replace blades if damaged - Check the integrity of bearings and idlers
	Accidental bumps, on kerbs, walls, etc	- Check the blade, frame and motor fixing screws and tighten any loose screws, and tighten any loose screws
Engine oil warning light comes on	Insufficient engine oil pressure	- Check and refill engine oil level - Change engine oil filter
Blades do not engage	- Parking brake engaged - Faulty switch - Clutch defective - Faulty full grass catcher microswitch - Faulty closed grass catcher microswitch - Full or opened grass catcher - High engine temperature	- Check the PTO button - Check the function and integrity of the clutch - Check the fuses - Check the operation and adjustment of the microswitches - Check the microswitch connectors - Check engine temperature warning light

⚠ CAUTION: If problems persist after carrying out the operations described in this manual, contact an authorised service centre. Never attempt to carry out major repairs without having the necessary means and technical expertise.

IF YOU HIT A STONE OR ANOTHER FOREIGN BODY

1. Disengage the blades
2. Raise the cutting deck.
3. Switch off the engine and engage the parking brake.
4. Check the screws securing the blades and the integrity of the cutting deck.
5. Check that no foreign body has entered the load chute or is stuck.

18 MAINTENANCE SUMMARY TABLE

Maintenance Summary table									
Procedure		every 8 hours	after 20 hours	every 40 hours	every 50 hours	every 75 hours	every 100 hours	every 150 hours	over
Engine oil	check the level	●							
	change				● (first change)	●			
Engine oil filter	replace				● (first change)			●	
Air filter	check	●							
	replace						*		
hydraulic oil and filter	check		●		●				
	replace						●		● (Every 400 hours)
front axle oil	replace								● (first change 500 ore then every 1000 hours)
check the cleanliness of the radiator intake grid		●							
check that blades are well-sharpened and well tightened			●			●			
lubricate with grease				●					
diesel filter	check						●		
	replace								● (every 400 hours)
Mower deck gearbox oil	replace								● (every 300 hours)

● recommended procedure

* procedure to be carried out if necessary

19 SUMMARY TABLE OF LIQUIDS AND QUANTITIES

LIQUIDS TO BE REPLACED AND QUANTITY			
engine oil	15W40	3,2 L	Replace after the first 50 hours of operation and every 75 hours thereafter.
cooling liquid	50% water 50% antifreeze	6,4 L	Empty and flush the reservoir then add fluid every 1000 hours or once a year
front axle oil	ISO VG220	1,5 L	Replace after the first 500 hours of operation and every 1000 hours thereafter.
mower deck gearbox oil	75W90	0,25 L	Replace every 300 hours.
hydraulic oil	5W50	6,7 L	Replace after the first 100 hours of operation and every 400 hours thereafter.

Correct tyre pressure (1,5 bar)

20 LONG-TERM STORAGE

Store the machine in a dry environment, sheltered from bad weather conditions. Clean the machine from soil and grass residues and, when the engine is cold, cover it with a cloth if possible. If the machine is not to be used for a long period of time (more than 1 month), you have to:

- disconnect the positive (red) battery cable and follow the instructions in the engine instruction booklet;
- Also lubricate all the joints following the points indicated.

21 TOWING THE MACHINE WITH THE ENGINE OFF

Caution! To tow the machine with the engine switched off, loosen the screw on the hydrostatic pump (Fig. 86); use a 16 mm - 5/8" wrench. Loosen the screw by a maximum of two turns.



CAUTION: this cancels the effectiveness of the braking device.

IMPORTANT: hitch the machine at very low speed and for short distances, 100 m maximum, to avoid damaging the hydraulic pump or the motor. To restore correct operation of the machine, remember to tighten the screw again, with a maximum torque of 14 Nm.

22 TECHNICAL ASSISTANCE SERVICE

22.1 Assistance

This manual provides instructions for the use of the mower and for its ordinary and extraordinary maintenance.

For extraordinary maintenance, for all work requiring technical skills and expertise, please contact your authorised Grillo dealer.

22.2 Identification data

If it is necessary to contact an authorised service centre, always provide them with maintenance information:

Model

Serial number

The machine's serial number plate is located at the rear of the frame, above the right-hand wheel (fig.87).



We advise the customer to make a note of this additional information in the spaces below, as it may be useful for the service department.

PURCHASE DATE

GRILLO DEALER.....

22.3 Spare parts

It is recommended to use only original spare parts, which are the only ones that offer safety and interchangeability.

22.4 Warranty

The warranty is provided in the manner and within the limits specified by applicable law. The dealer must give the warranty certificate of the machine to the end customer, printing a copy of the registration from the Grillo web site. As far as the engine is concerned, the conditions provided by the respective Manufacturers apply.

22.5 How to order spare parts

Contact our authorized dealer.

(Indicate the machine's serial number and the code of the component to be replaced). The spare parts catalogues are available on line at the Grillo website. You can consult them by entering the serial number.

23 TRANSPORT WARNINGS

TOW HITCH

The tow hitch is located at the rear of the machine. It can tow compactors, trailers up to a maximum weight of 200 kg on flat grounds.

LIFTING AND TRANSPORT

If the machine is to be transported on a lorry or trailer, lower the cutting deck, apply the parking brake and secure it properly to the means of transport using ropes, cables or chains. When lifting, the ropes can be hooked at the point indicated by the arrow (fig.88). Check that the crane, hoists and ropes have sufficient capacity. The total weight of the machine is 630 kg.



24 DISPOSAL

Never dispose of used oil, petrol or any other type of pollutant in the environment! Proper maintenance and correct lubrication help to keep the machine fully efficient. Contact a recycling centre or your dealer for information on proper disposal.

EC DECLARATION OF CONFORMITY

(2006/42/CE, II A)

The undersigned, Ing. Andrea Pinza, authorised officer of:

GRILLO SPA – Via Cervese, 1701 – 47521 CESENA (FC) – ITALY

Hereby certifies that the underwritten machinery

Model	Function	Engine	Nominal power (kW)	Serial number
FD500	Lawnmower	Kubota D722-E4B	13,2 @ 3200U.p.M.	709503 and further

Is in compliance with the relevant provisions of the Directive:

2006/42/CE (Machinery Directive)
2000/14/CE - 2005/88/CE - D. Lgs 262/02 (Noise)
EN ISO 5395:2013 (Garden equipment – Safety requirements)

Sound power level

Model	Cutting width (cm)	Measured sound power level (dBA)	Guaranteed sound power level (dBA)	Uncertainty (dBA)	Engine revolutions (rpm)
FD500	113	99	100	1	3100

Values determined according to EN ISO 5395-1:2013 and to Annex VI PROC.1 of directive 2000/14/CE
Uncertainty determined according to UNI EN ISO 3744:2010 for Instruments Class I

Measure sound pressure at the operator's ear

Model	Sound pressure (dBA)	Uncertainty (dBA)
FD500	91	1

Values determined according to EN ISO 5395-1:2013
Uncertainty determined according to UNI EN ISO 11200:2020 for Instruments Class I

Vibrations

Model	Unladen mass (kg)	Total body (m/s ²)	Uncertainty (m/s ²)	Hand/Arm (m/s ²)	Uncertainty (m/s ²)
FD500	630	0,72	0,5	1,42	0,5

Values determined according to EN ISO 5395-1:2013
Uncertainty determined according to UNI EN 12096:1999 for Instruments Class I

Notified Body:
ECO Certificazioni S.p.A. – Via Mengolina, 33 – 48018 Faenza (RA) – ITALY

Authorized person to compile the relevant technical documentation:
Rubaconti Ilario, Technical Director
Grillo S.p.A. – Via Cervese, 1701 – 47521 Cesena (FC) – ITALY

Authorised person to draw up a declaration on behalf of the manufacturer:
Eng. Pinza Andrea, Managing Director
Grillo S.p.A. – Via Cervese, 1701 – 47521 Cesena (FC) – ITALY




CESENA, July 15th, 2021

The spare parts catalogues are available on line at http://www.grilloagrigarden.co.uk/spare_parts_lists
Le tavole ricambi sono disponibili online all'indirizzo http://www.grillospa.it/tavole_ricambi
Les vues éclatées son disponibles en ligne sur http://www.grillofrance.fr/vues_eclatees
Die Ersatzteillisten sind online verfügbar unter: <http://www.grillodeutschland.de/ersatzteillisten>
Los despieces son disponibles on line en <http://es.grillospa.it/despieces>

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Grillo
AGRIGARDEN MACHINES