

MASCAR



Use and maintenance manual



Roundbaler

DIAVEL 630

DIAVEL 630 CUT



*Prima di iniziare ad
operare con la
macchina, leggere le
istruzioni per l'uso*

CE

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Details mentioned in the identification plate

Machine model

Serial number

Year of production

Machine weight

Authorized **MASCAR** repair center to contact for service in

The identification plate is located at the front right side of the machine, near to the drawbar hooking.

In this manual there are symbols and notes used to highlight requirements of particular interest for the machine and / or operator, their meaning is indicated here below.

DANGERS CAN BE OF 3 LEVELS:



DANGER

The writing «DANGER» indicates the maximum danger and warns that if the described operations are not properly carried out, this can cause serious injury, death or long-term health risks.



WARNING

The signal «WARNING» warns that if the described operations are not properly carried out, this can cause serious injury, death or long-term health risks.



CAUTION

This signal advises that if the described operations are not properly carried out, they can cause damages to the machine and/or to the person.

1 DESCRIPTION AND MAIN FEATURES

1.1 PRESENTATION

This manual contains information and instructions and what deemed necessary for the knowledge, the proper use and the regular maintenance of the baler «DIAVEL 630, DIAVEL 630 CUT», hereinafter also referred to as the machine, is manufactured by MASCAR of Grumolo delle Abbadesse (Vicenza) Italy, hereinafter referred to more simply as the Manufacturer.

The contents of this manual does not constitute a detailed account of the various components and how they work, the user, however, will find what is normally useful for the safe use and proper preservation of the machine. From the observance and fulfillment of what described in this manual, together with a careful and cautious maintenance, depends the smooth operation, durability and operating economy of the machine.

Failure to comply with the instructions given herein, negligent operation, incorrect use of the machine and the performance of unauthorized modifications may cause the loss of any rights of warranty provided by the Manufacturer.



WARNING

Consequently, the Manufacturer declines all responsibility for damages resulting from negligence or failure to observe the instructions herein.

When in need of repairs or overhauling involving complex operations, you must contact the authorized Service Centres having their own skilled personnel, or get in touch with the Manufacturer directly. Remember that the Manufacturer is available to ensure a prompt and precise technical service and any other element required to get the maximum efficiency from the machine



DANGER

This manual is an integral part of the machine and must be kept with it at all times, even when it is moved to a new location or sold.

It must be kept in a safe place known to the authorized personnel. It is up to said personnel to make sure it is kept safe and intact for consultation for the entire duration of the

machine's service life. Should it be damaged or lost, apply immediately to the Manufacturer for a new copy.

1.1.1 Intended users of the manuals

This manual represents the fundamental instrument for the personnel authorized to perform various operations concerning the machine, i.e:

- Personnel in charge of the transportation and handling of the machine;
- Personnel in charge to operate with the machine;
- Maintenance personnel;
- Personnel in charge of the demolition

1.2 WARRANTY

The Manufacturer warrants its brand new products for a period of 12 (twelve) months from the date of the purchase.

Check at the delivery that the machine has not been damaged during transport and that the accessories are integral and complete.

Any complaints must be made in writing within 8 (eight) days from the receipt of the machine. The warranty shall consist in the free of charge repair or replacement of any parts proving to be defective after a careful examination carried out by the Manufacturer's Engineering Department (and does not include the electrical parts or any eventual implement).

Under no circumstances the repair or replacement of parts covered by the warranty shall extend the warranty period.

The purchaser may only enforce its rights concerning the warranty only as far as the warranty service is concerned, also featured in the supply contract.

1.2.1 Exclusions from warranty

Warranty becomes void (in addition to those situations featured in the supply contract):

- In the event of an incorrect operations attributable to the operator.
- In the event the damage can be attributable to poor maintenance.
- In the event the machine is altered, following repairs carried out by the user without the Manufacturer's permission or subsequent to the fitting of non-original spare parts, and the damage is the result of said alterations.

- In the event the instructions featured in this manual have not been followed.
- Neither shall the warranty cover any damage resulting from negligence, carelessness, bad operation or improper use of the machine.



WARNING

The removal of the safety devices supplied with the machine shall automatically cause the warranty to become void and relieve the Manufacturer of any responsibility.

In addition, the warranty shall become void in the event non-original spare parts are used.

The machine, or parts of it, must be returned carriage free, even when under warranty.

1.3 MARKINGS

Each machine features an identification plate, featuring the following datas:

- «CE» marking
- Manufacturer Name and Address;
- Machine Model;
- Serial Number;
- Year of manufacture;
- MODEL YEAR: Year of the model
- Net weight in kg
- Maximum loading capacity in kg.

	
Via Roma, 82 - 36040 Grumolo delle Abbadesse (VI) ITALY	
MODEL	SERIAL NUMBER
CONSTRUCTION YEAR	MODEL YEAR
NET WEIGHT (kg)	MAXIMUM PAY LOAD (Kg)
 Round - balers ENI BLASIA 220 Bale - Wrappers ENI MULTITECH 15W/40 Seed Drills ENI MULTITECH 15W/40	
	

Data showed on the machine identification plate have to be quoted at page 4 of this manual and they have to be always mentioned for eventual requests for spare parts or need of assistance.

The machine is standards equipped with:

- Machine use and maintenance manual
- Declaration of «CE» conformity

1.4 DESCRIPTION AND USE OF THE MACHINE

The round baler «MONSTER 770, MONSTER-CUT 770» manufactured by MASCAR, is a machine marked «CE» in conformity with the rules indicated by the 2006/42/CE directive, as described in the conformity declaration each machine is provided with.

The machine is substantially made by a bearing metal structure, which bears the various machinery suitable to the collection of agricultural products and their pressing in bales of cylindrical shape. These mechanisms are contained by a series of steel panels and plastic materials. All this is supported by an axis with rubber wheels for transport and equipped by an height-adjustable drawbar for mounting and towing to the tractor.

The mechanism forecasted for product collection is called collector or pick-up.

The mechanism to direct the product into the bale chamber is called rotor.

The area under the rotor can move to avoid choke is called lowerable drawer

Rotor and lowerable drawer can be made and equipped with knives to cut the entering products (version cut).

The set of rollers within the chamber ensures the creation of the round bale

By the system of twine or net binding, the bale maintains its own shape once unloaded from the machine.

The unload of the bale is made through the rear door of the machine.

The connection to the electrical system of the baler is made by:

- A 3-ways power outlet (12V, 30A) which powers the control unit
- A 7-ways power outlet which powers the light system.

The oleo dynamic system of the baler is driven by two hydraulic distributors at double effect installed on the tractor, connected to the machine by four quick joints and four flexible tubes. By operating just on the hydraulic distributors of the tractor, it's possible to operate the following functions of the round baler:

- Lift or lower the pick-up
- Open and close the rear door

- The machine is equipped with a control system made by a control unit on board of the machine and a terminal to be placed inside the cabin of the tractor.

By the monitor it's possible to:

- Select the pressure level.
- Start the net or twine binding.
- Select the type of binding.
- Select and clear the counters of partial bales.
- By the combined action of the terminal and the hydraulic distributor it's possible to:
  - Open and close the loading tray.
  - Start or stop the cutting knives (cut version).

The round baler is a machine intended to be used only for agricultural works, and for loading and wrapping of pressed bales of cylindrical shape of hay, straw, corn stalks and green forage.

One single operator located on the driving position can manage the different operations of collection and load of the product laid in the swaths.

1.5 NOT FORECASTED USE OF THE MACHINE



DANGER

The operator should use the machine as indicated in this manual, keeping in mind the rules of accident, use conditions and technical characteristics of the machine.

ANY OTHER NOT FORECASTED USE OF THE MACHINE EXCLUDES THE MANUFACTURER FROM EVERY KIND OF RESPONSIBILITY TO PERSONS, ANIMALS AND THINGS.

1.6 SOUND LEVEL

The Directive 2003/10/EC concerning noise in workplaces, instructs companies and workers to evaluate the level of noise and take appropriate precautions.

The noise level during the work in the field is subjected to variations depending on the noise produced by the tractor and by the conditions of use of the round baler.

The sound level generated by the round baler DIAVEL 630 and DIAVEL 630 CUT during normal use, measured at the level of the operator's head

inside the tractor cabin with open windows, remains under the 70 dB (A).

The combination of the noise coming from the tractor and the round baler mainly depends on the noise level produced by the tractor (That is the main source of noise).



ATTENZIONE

It's better to use the machines with the tractor's windows closed.

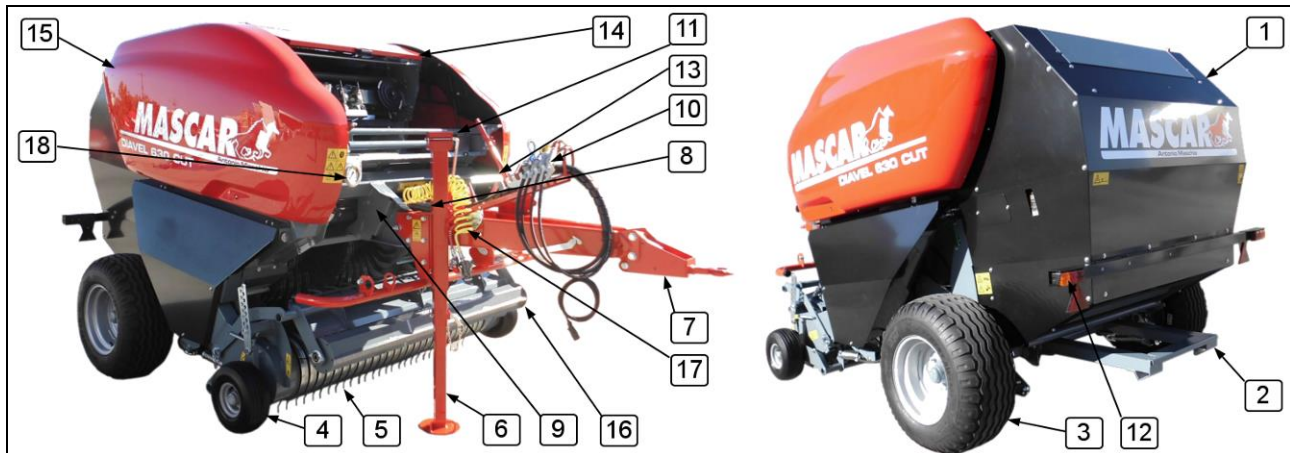


Fig. 1 – General view of the machine with the main groups.

1) REAR DOOR	10) ELECTRICAL AND HYDRAULIC CONNECTIONS TO THE TRACTOR
2) BALE EJECTOR (OPTIONAL)	11) NET ROLL CASE
3) WHEELS	12) REAR LIGHTS
4) PICK-UP WHEELS	13) LADDER
5) PICK-UP	14) UPPER CARTER
6) STANDING FOOT	15) SIDE CARTERS
7) ADJUSTABLE DRAW BAR	16) CROP GUARD
8) CARDAN JOINT INPUT WITH CONNECTION SHIELD	17) BRAKES CONNECTIONS (OPTIONAL)
9) IDENTIFICATION PLATE	18) CHAMBER PRESSURE GAUGE

1.7 TECHNICAL DATA

MODEL	DIAVEL 630	DIAVEL 630 CUT
Type of chamber	Fix	
Bale width (cm)	120	
Bale diameter (cm)	130	
Bale rotation	18 Rollers	
Nr cutting knives	/	(0 – 15)
Cutting lenght (cm)	/	7
Minimum Power required kW (CV)	59 (80)	74 (100)
Pick-up collection width DIN 11220 (cm)	195.5	
Tines rows/Tines for pick-up row	4/28	
Regulation of bale density	Electrohydraulic	
Electrical system	12 V, 30A	
Tractor hydraulic system required	2 distributors double action	
Tyres (optional)	15.0/55-17 (500/50-17)	
Nr RPM at the PTO (rpm/min)	540	
PTO shaft	80° CV with automatic torque limiter (1900 Nm)	
Towing eye height (D) min – max (cm)	37 - 110	
Weight on towing eye (kg)	Max 540	
Dimensions free towing eye* (mm)	Ø 35 – Ø 100	
Empty weight (full optional) (kg)	2850 (3140)	2980 (3270)
Dimensions (AxBxC) (cm)	238** x 434 x 230***	
Wheel distance (E) (cm)	200	
Minimum height from ground (F) (cm)	23	

(*) Available with towing eye Ø40 – Ø100 fix and with towing eye Ø45 – Ø105 (homologated France).

(**) With wheels 500/50-17 A = 260; with pick-up wheels in work position 0A = 259.

(**)With wheels 500/50-17 C = 235;

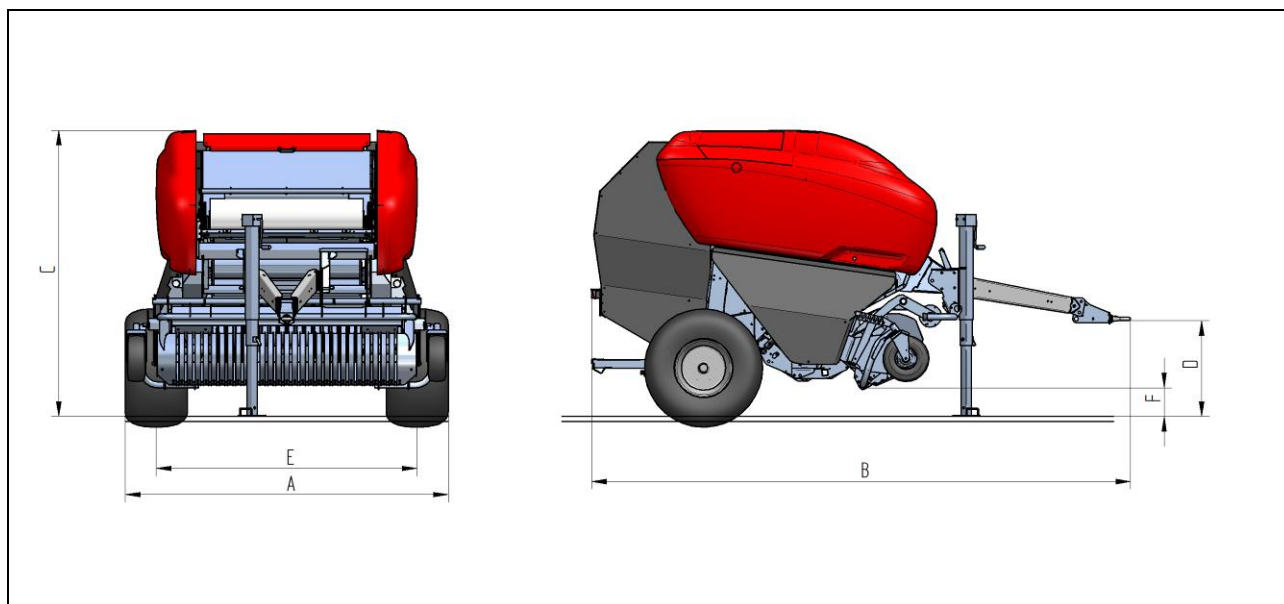


Fig. 2 – Overall dimensions of the machine

2 SAFETY AND PREVENTION

2.1 SAFETY

The user is responsible for making sure the personnel is instructed on the hazards rising from accidents, and on the devices fitted for the operator's safety and the general safety requirements prescribed by the directives and legislation of the country where the machine is used. The safety of the operator is one of the primary concerns of a manufacturer. In designing and producing a new machine, the manufacturer tries to foresee all the possible hazards and, of course, adopt appropriate safety measures. Nevertheless, the level of accidents caused by careless or inexperienced use of various machines is still high. Distraction, thoughtlessness and overconfidence often lead to accidents, as can fatigue and drowsiness. Consequently, this manual, and the safety rules in particular, must be read very carefully.



DANGER

The Manufacturer declines all responsibility for the non-observance of the safety rules and requirements prescribed by the legislation of the country where the machine is used, and of the instructions herein.

2.1.1 Terminology used

Herebelow you'll find the definitions of the figures and specific situations that might directly involve the machine and/or persons in direct contact with the machine.

- **USER:** The user is the person, or corporation or company, that has purchased or hired the machine and that intends to use it for the purposes for which it was designed. The user is responsible for the machine and for training personnel working on and around the machine.
- **HAZARD ZONE:** Any area inside and/or near the machine in which the health and safety of any exposed person is at risk.
- **EXPOSED PERSON:** Any person to be found in a hazard zone, whether fully or partially.
- **OPERATOR:** Description of the people, in a general sense, in charge of installing, operating, adjusting, performing routine maintenance, cleaning, performing minor repairs and transporting a machine.
- **SKILLED PERSONNEL:** The term is used to describe people specially trained and qualified to perform any maintenance or repair needing

for specific knowledge of the machine, its operation, the safety devices, the operating procedures, and who are aware of the hazards rising from the use of the machine and, consequently, are able to avoid them,

- **AUTHORIZED SERVICE CENTRE:** The Authorized Service Centre is the structure legally authorized by the Manufacturer employing skilled personnel qualified to perform all servicing, maintenance and repair work, including complex operations, to keep the machine working efficiently.

2.1.2 General safety rules



WARNING

Failure to comply with the rules described in Section 2 – Safety and accident prevention – and any tampering with the safety devices, shall relieve the Manufacturer from any responsibility in the event of accidents, damage of malfunctioning of the machine.

General Warnings:

- The user undertakes to give the round baler to skilled and trained personnel only.
- The user is obliged to take all necessary measures to deny to unauthorized personnel the access to the machine.
- The personnel must comply with the instructions herein without exception, and observe the general safety requirements prescribed by the legislation of the country where the machine is used.
- The user undertakes to suitably instruct his/her personnel on the application and observance of the safety rules. To this purpose, the user undertakes to ensure that anybody operating the machine is aware of the operating instructions and safety rules in force.
- The personnel must use personal safety equipment, as prescribed by local legislation, at all times, as well as follow the relevant instructions herein.
- The personnel must observe all the hazard and caution signs applied on the machine.
- The authorized personnel must not perform any operations or work that do not fall within its specific sphere of competence.
- The personnel is obliged to report any problem or hazardous situation that might occur to the person concerned.
- Personnel in training must always be supervised by expert personnel.

- Before starting work, practice with the controls and their functions.

**WARNING**

The operation of the machine by anyone who has not read and assimilated the instructions herein, as well as by unskilled personnel, or by personnel not in good health or not holding the right driving license, is strictly forbidden.

- The area in which the machine is used is to be considered a **hazard** zone, especially for people not trained in the machine use. Before starting up the machine, make sure there are no people, animals or obstacles of any nature around the work area.
- When a person is **«exposed»**, that is when standing in a «hazardous area», the operator must take immediate measures, stop the machine and eventually make sure the person is moved away.
- During the operation of the machine, the operator must seat in the tractor so that he cannot fall accidentally and so that the whole machine is under his control, and that appropriate action can be taken whenever the need arises.
- Before starting the equipment, verify no person, children or domestic animals are around the machine and make sure to have a perfect vision around the machine.
- It is strictly forbidden to leave the driver's seat while the tractor is running.
- Use suitable clothing. Avoid absolutely wearing baggy or fluttery clothing as they might get caught up in the rotating parts.
- Before leaving the tractor it is compulsory to stop the engine, enter the parking brake, remove the key from the command panel.
- It is strictly forbidden to carry people or animals on the machine and on the tractor.
- It is strictly forbidden to park the machine near or under: terraces, balconies, haylofts, and platforms of any kind that can be reached by people and/or animals.
- When work near electricity pylons is unavoidable, it is advisable to ensure that all parts of the machine are kept at a minimum safety distance from them. Contact the competent electricity board if you have any enquiries. The machine is mainly made from metal and consequently any contact with a power line or a discharge may occur between the line and the machine, the operator might be involved, even with lethal consequences
- It is strictly forbidden to work or get in contact with the machine while the tractor engine is on, before getting close to the machine or to the P.T.O shaft, stop the P.T.O, stop the tractor, enter the parking brake and remove the key from the command panel.
- During the machine operation, it is strictly forbidden to let any part of your body get near the moving mechanical parts.
- During the machine's operation, the unloading device, when activated, represents a crushing hazard.
- The round baler «DIAVEL 630, DIAVEL 630 CUT», has been manufactured in conformity with the current techniques and guarantees a safe working if used in the proper way. The assembly of pieces of other brands or any modifications can vary the characteristics of the machine and therefore compromise the security of the operations. The Manufacturer consequently declines any responsibility for all damages caused by not original parts used in the machine.
- Machine must be utilized exclusively for the purpose it was intended to.
- User must inform the manufacturer in case of defects or malfunctions of the safety system, as well as of any supposed danger.
- Machine doesn't have to work with the protections removed.
- It is strictly forbidden to remove or tamper with the safety devices (including carter).
- In case carter is removed for maintenance operations, make sure of its correct repositioning before reusing the machine.
- Before operating the machine, check the perfect integrity of its safety systems for transport and use; in case of malfunctions or damages to the safety systems, proceed with relative repair before operating the machine.
- Pay attention to the dangerous signs indicated in this manual or on the machine itself.
- The round baler can be controlled only by the suitable PTO shaft (marked CE) complete with all necessary safety systems and protections secured with the proper chains.
- Pay attention to the PTO shaft when rotating. Duly read also the use manual supplied with it.
- Pay duly attention to the correct assembly of the PTO shaft on the tractor PTO.
- Never install the PTO without having connected the drawbar to the tractor.
- Don't leave the lever operating the PTO when the tractor is off.

- Before starting the PTO, make sure the RPM of the tractor PTO correspond to the RPM forecasted for the round baler.
- Never exceed the prescribed RPM at the power takeoff.
- Always disengage the power takeoff when the PTO shaft forms a too wide angle (never over 15 degrees) and when it is not in use.
- Do not perform any work on the hydraulic system without first relieving the pressure.
- **The Hydraulic system of the round baler contains tanks that can remain under pressure even after detachment from the tractor, the maintenance on the hydraulic system can be operated only by skilled personnel.**
- It is strictly forbidden to stand in between the tractor and the equipment (pict. 3) with the engine on, and without having activated the parking brake and having inserted, under the wheels, a clamping block of suitable dimensions.

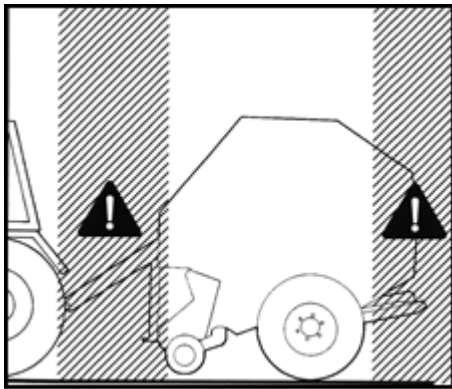


Fig. 3 – Dangerous areas

- **In case of jamming of the collection and harvesting group, it is strictly forbidden to operate on the machine with the PTO and the tractor on. Stop the engine, pull on the parking brake and take off the key from the command panel.**
- Moving out from the working area, must be carried on with the equipment in position of transport.
- Before starting the machine, verify the standing foot is left up and that the machine has been mounted and set properly; also verify that all the parts subjected to usury and deterioration are efficient.
- Always keep oils and greases out of reach of children.
- Always carefully read advice and precautions indicated on all containers.

- Avoid contact with skin of dangerous substances.
- After using the above substances, wash hands carefully.
- All maintenance, regulations and work starting operations, must be done compulsory with the machine leaned on the ground by the standing foot, tractor turned off, well stopped and key off the dashboard.
- Should the machine be used on public roads, follow the traffic laws in force in the country where the machine is used.
- It's very important to bear in mind that the road grip, direction and brake capacity, can be influenced, also remarkably, by the presence of hold or towered equipment.
- On the curves, pay attention to the centrifugal force exercised in a different position, by the center of gravity, with or without towered equipment.
- Hook the equipment, as foreseen, to a tractor having a suitable power and configuration, by the proper device (drawbar), as per the local regulations of the country the machine is used in.
- Pay maximum attention during the hook and unhook phases of the machine.
- Respect the maximum foreseen weight on the axis, the total moving weight, transport rules and traffic laws of the country where operating.
- Eventual transport accessories must be provided with suitable signs and protections.
- Regularly verify the integrity of the machine and protection devices.
- Respect the conformity of suggested oils indicated on the identification plates and on this manual.
- During repair and maintenance operations, it's compulsory to use protections clothing such as: protection glasses, cut resistant gloves, sturdy and anti-crushing shoes.
- Duly operate the maintenance as indicated in this manual: skilled personnel will have to take care to substitute damaged and worn parts.
- In case of use of the round baler together with other machines (i.e.: bale wrappers or carts for hay bales), make sure of the dimensions and/or weight of the bales that can fit these machines before proceeding with the work.

2.1.3 Machine control operations



CAUTION

Periodically check the locking of screws and nuts and if it is necessary to fix them. For this operation it's suggested to use a dynamometric key respecting the following couple values of docking (twisting moment expressed in Nm):

Nm	class	
Ø	8.8	10.9
M 4	3.0	4.4
M 5	5.9	8.7
M 6	10	15
M 8	25	36
M 10	49	72
M 12	85	125
M 14	135	200
M 16	210	310
M 18	300	430
M 20	425	610
M 24	700	990

For setting, maintenance, clearing, assembling, etc... with the machine lifted up, keep as a precaution adequate support equipment.

Spare parts must correspond to the specifications defined by the Manufacturer.

Use original spare parts only

The operating instructions provided in this manual must be read and learned by heart, and the manual itself kept safe for the entire service life of the machine.

2.2 SAFETY SIGNS (PICTOGRAMS)

The machine has been designed and manufactured in compliance with every possible safety standard to assure the safety of the operator.

Nonetheless, there are still a number of residual hazards involved in the use of the machine, i.e. those hazards that it has not been possible to eliminate completely due to the specific nature of the work the machine is designed for and certain operating conditions.

These potential hazards are marked on the machine with stickers (pictograms) that provide a summary indication of the various unsafe and hazardous situations.



WARNING

Keep stickers clean and replace them immediately should they start peeling off or be damaged.



WARNING

All the safety signs positioned on one side of the round baler and illustrated hereunder have to be applied in exactly the same position on the other side as well.

1)



Before starting to work, carefully read the operating instructions.

2)



Before starting cleaning and maintenance operations, stop the machine, remove the key from the control panel and read the operating instructions.

3)



DANGER. While the machine is working no one, beside the operator, can get close to the machine and the machine controls

4)



Crushing Hazard. Do not get close to the area between the tractor and the round baler. Before entering this area, turn off the engine, activate the parking brake of the tractor and get sure of the round baler stability.

5)



Crushing hazard/cutting of upper limbs. Do not remove protections and do not get close to the moving parts.

6)



Entanglement hazard. It is strictly forbidden to get close to the rotating parts (in particular to the PTO shaft)

7)



High noise level. Protect hearing with suitable earmuffs or ear plugs.

8)



Crushing hazard for sudden movements. When the round baler is disconnected from the tractor, activate the parking brake or use the appropriate wedges to be placed under the wheels.

9)



Entanglement hazard and cutting of upper limbs. Do not get close to the rotating parts with the round baler moving or with the tractor in motion. It is compulsory to turn off the engine and the control unit during the maintenance on the machine.

10)



Crushing hazard. Do not get close to the machine and do not stand under the area of discharge of the bale while the rear door is open or without having activate before the suitable safety devices.

11)



Crushing hazard. Do not get close to the machine while it's working and in particular do not stand in between any barrier and the back of the round baler.

12)



Crushing hazard. Do not stand in the operating area of the round baler, especially while the bale is being ejected from the rear of the round baler.

13)



Crushing hazard and cutting of upper limbs. Do not get close to the rotating parts while the round baler is moving or the tractor is in motion. It is compulsory to turn off the engine and the control unit during the maintenance on the machine.

14)



Warning. Use an additional support if the supporting jack of the machine stands on a very soft ground.

15)



Crushing hazard and cutting of upper limbs.

Do not get close to the rotating parts while the round baler is moving or the tractor is in motion. It is compulsory to turn off the engine and the control unit during the maintenance on the machine.

16)



Crushing hazard and cutting of limbs.

Do not get close to the cutting knives. It is compulsory to turn off the engine and the control unit during the maintenance on the machine. Use protection gloves to handle the cutting knives.

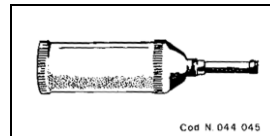
17)



Warning! Do not get close to the feeding parts while the round baler is moving or the tractor is in motion. It is compulsory to turn off the engine and the control unit during the maintenance on the machine

2.3 INDICATION SIGNALS

18)



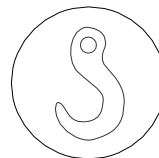
Greasing points

19)



Rotation at power take off

20)



Hook-up points for lifting

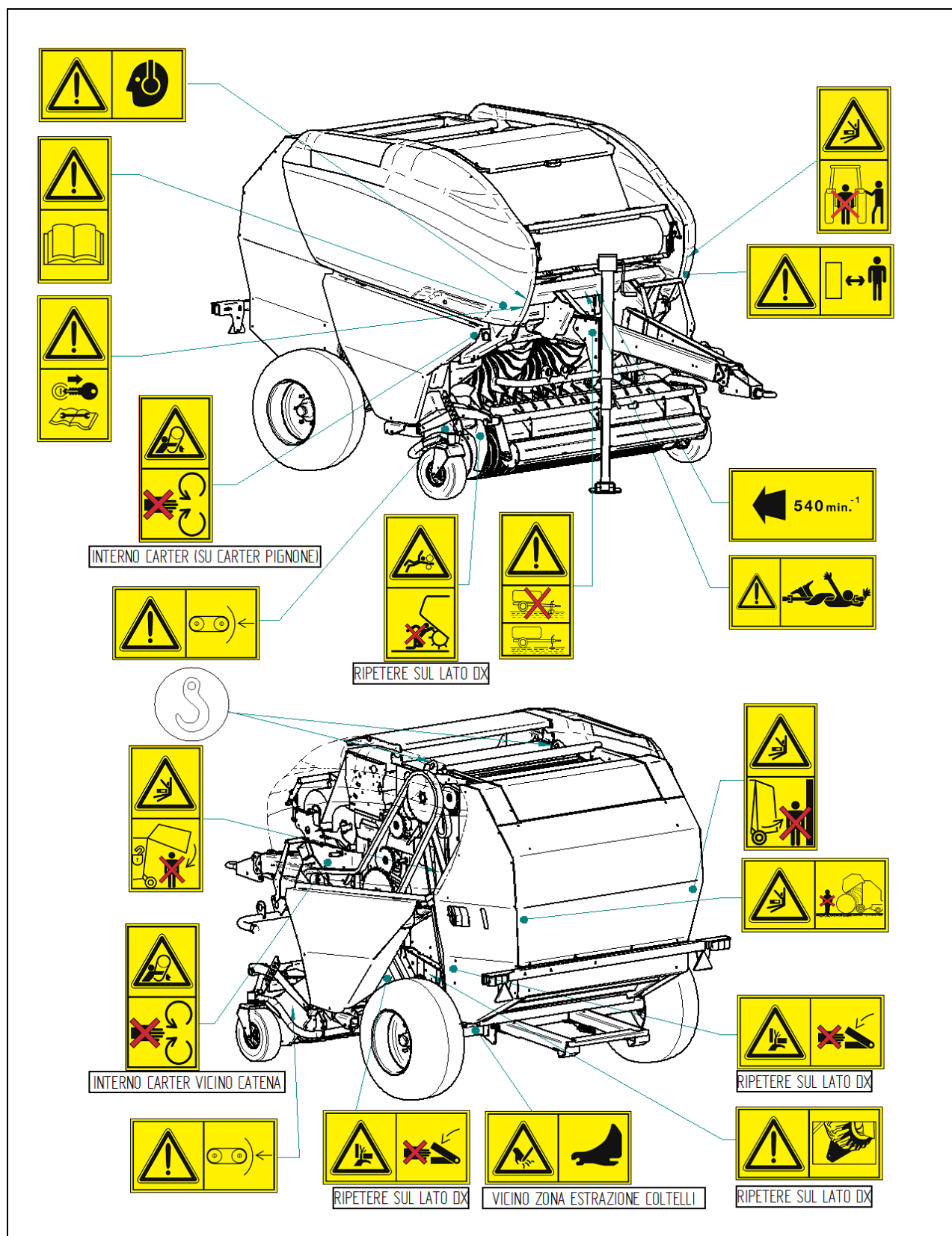


Fig. 4 - Safety signs

2.4 SAFETY DEVICES

The installed devices must be always efficient and properly positioned. In case of breakage or damage of the safety devices, it is compulsory to replace them before resuming work.

- The limiter of the PTO couple, in case of overload, it starts interrupting the transmission.
- PTO protection: PTO is protected in all its mobile parts for its whole length. The protection results to be openable to easily remove the PTO.
- Protection of the transmission shafts: the transmission shafts which bring the motion from the gearbox to the chains are equipped with protections avoiding contact with the operator.
- The limiter of the collector, in case of overload, it starts interrupting the collector movement.
- The safety valve and overcenter valves set on the cylinders, prevent voluntary and involuntary movements of the door. In case of interventions with the door open, close the relative sphere valve.
- Wheels chock or parking brake, must be used to avoid hazardous movements of the machine once disconnected from the tractor.
- Safety protections: side protections of the machine, as per European regulations, are equipped with safety locks which automatically start when the protection is closed. In order to open such protections, the operator will have to intervene with a suitable tool. Once this operation is ended, the operator will have to close protections.



WARNING

Always make sure all the protections are activated before leaving the machine unattended or before its transport

- PTO shaft support: the function of the support is to hold the PTO shaft when the machine is parked. The machine doesn't have to work or be transported when the PTO shaft is set on this support.

2.5 CLOTHING AND PERSONAL PROTECTION



WARNING

- 1) Use suitable clothing. Avoid wearing ties, necklaces, baggy or fluttery clothing as they might get caught up in the rotating parts. Long hair should be tied back.
- 2) During the maintenance and repair work, the use of personal safety gear is compulsory: cut-proof gloves, non-slip safety boots.

2.6 ECOLOGY AND POLLUTION

The paragraph "1.6 Noise level" contains the values of the airborne noise measured on the round baler. The user is responsible to inform authorized personnel about hazards deriving from noise and it is obliged to comply with the relevant national standards in force.



WARNING

Since with the machine working the noise level is in any case higher than what permitted by the relevant standards, appropriate ear protection must be worn.

Observe the laws in force in the country where the machine is used related to the use and disposal of products used for cleaning and servicing the machine, and comply with the procedures recommended by the manufacturers of said products.

Verify before each use of the machine eventual loss of lubricant or hydraulic oil. In case of leakage restore the seals of the system before use.

In case of dismantling the machine, comply with the anti-pollution regulations provided in the country of use of the machine, paying attention in particular to:

- Lubricants (oil and grease)
- Oil of the hydraulic system
- Electric and electronic components (batteries and capacitors)
- Braking gaskets
- Tires and plastic materials

Dispose of hazardous waste by specific licensed companies making sure they release receipt of the occurred waste disposal.

Dispose eventual packing residuals of the machine in the appropriate containers for diversified waste.

2.7 FIRE SAFETY



WARNING

Dry materials that can be worked by the round baler are themselves a product of high fire risk. Pay special attention to the hereunder indications in order to avoid fire hazard:

- Every 8 hours of work, carefully clean the round baler paying particular attention to the product eventually wrapped at the ends of rolls or to the remains of net and/or twine binding.
- Perform correct regular maintenance
- Perform periodic lubrication and greasing of chains and bearings.
- Periodically check the condition of bearings and bushings.
- In case some overheating are noticed, immediately stop work, wait for cooling of the parts and verify the reasons of the overheating. Eventually contact the closest service center.
- It is strictly forbidden to smoke or keep cigarettes or fire burning near the machine
- Before starting any soldering operation, clean well the machine from any flammable material (collections residuals, fuel oils).

3 TRANSPORT AND HANDLING

3.1 GENERAL WARNINGS



WARNING

The operations of unloading, lifting and handling of the machine must be carried out by skilled personnel only.

The user and the personnel engage themselves to previously read and follow all instructions indicated.

The user undertakes to ensure its staff is equipped with all suitable personal protections (gloves, protective shoes, helmet, etc.) and with the proper tools before proceeding to the operations of unloading, lifting and handling of the machine.

Avoid that more operators work at the same time on the same machine without a coordinator, in order to avoid hazardous situations.

Transport must be carried out with the machine unloaded.

In case of transport of the machine for long distance, the machine can be loaded on lorries or on railways wagons.

To this purpose check «1.7 Technical data» for weight and dimensions. These data can be useful to check the possibility to pass tunnels and narrow passages.



WARNING

Operations of lifting and transport can be very dangerous if not carried on with extreme caution: keep away unauthorized personnel; clear and delimit the area of transfer; verify the integrity and suitability of available means; don't touch hanging loads and keep away for safety.



CAUTION

Before proceeding with the lifting operations, make sure the machine is totally empty of any content.



WARNING

The surface on which the machine has to be loaded, must be perfectly levelled in order to avoid eventual load movements.



WARNING

Once moved the machine on the lorry or on the wagon, make sure it is well blocked and steady.

Tires must be blocked using suitable blocks.

Firmly secure the machine to the surface where it's laid by ropes or chains well tied up to the hooking points on the surface and suitable for the machine in order to block the movement.

After the transport and before unbind the machine from all its bindings, verify that the status and the position of the same are not dangerous.

Unbind ropes, take away the blocks and proceed with unloading with the same means and procedures used to load the machine.

In case of transport on the road, by polling, it's necessary that the machine is homologated for circulation under the rules in force in the country in which the machine circulates.



CAUTION

In case the machine is not homologated for circulation on public roads, it is necessary to follow the regulations of the Highway Code in force in the country where the machine circulates.

3.2 LOAD BY CRANE

Check the machine weight and dimensions. Make sure the lifting ropes are equipped with bluebells, have their stickers showing all manufacturer datas and the load capacity clearly readable.

Duly inspect the ropes before using them: they have to show no damages, broken wires, or signs of usury.

Don't twist or tie ropes and follow the manufacturer use instructions.

In order to lift the machine from the ground floor to the loading level, use a crane having suitable capacity, hooking the machine to the proper lifting points indicated (fig. 5).

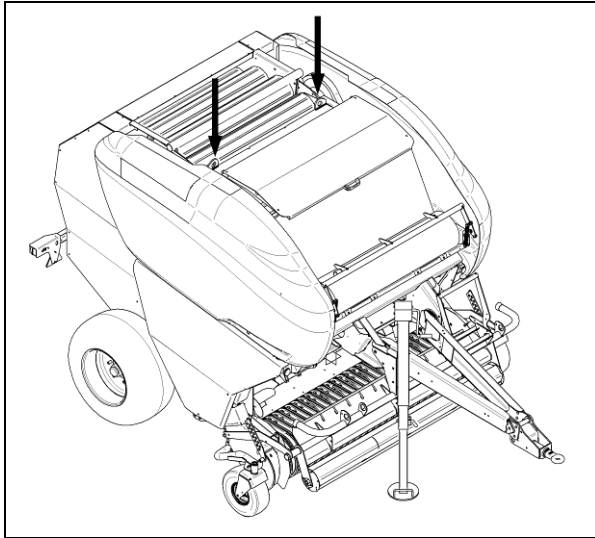


fig. 5 – Lifting points

The hooking points for lifting are indicated with specific stickers. Lift the machine with extreme caution and slowly transfer it, without sudden movements, on the lorry or on the railways wagon. In case the machine is loaded without wheels, support and fix the axis of the round baler on the supports set on the truck bed. Supports must bear the weight of the machine and be firmly fixed to the track bed and to the round baler axis.

During transport, loads can't be lifted more than 20 cm from the ground. Make sure the area of operations is clear and that there is sufficient "escape space", that is a free and safety area in which to quickly move in case of fall of the load.

3.3 LOAD BY LOADING RAMPS

If the roundbaler is configured with wheels 500/50-17, then the machine width overpasses the width of the majority of lorries or trailers. In this case equip the machine with wheels 15.5/55-17 or in alternative, remove the wheels and proceed to load by crane

Connect the machine to a tractor, tow it on ramps and transfer it on the lorry or on the wagon steering very carefully in order to avoid sudden movements. Make sure the ramps can bear the machine weight, in order to avoid dangerous flexures, and that they are set properly depending on the wheels axis of the round baler. Make sure they are clean from oil, grease or ice in order to avoid eventual slipping. Proceed slowly on the ramps, keep the machine at the center of the flatbed. During rise and descent, avoid to correct the direction. Eventually try again.

3.4 CIRCULATION ON THE ROAD

The round baler is considered an agricultural towed machine.



WARNING

For the circulation on the road the machine must be homologated according to the rules in force in the country where circulating.

The circulation on the road must be compulsory with unloaded machine, that is without bales or other material inside.

The machine must be firmly hooked to the tractor drawbar homologated by the country in which it operates.

The tractor has to have a trailer mass equal or bigger than the one of the round baler.

The tractor hooking system has to be able to connect to the drawbar of the machine and to bear the vertical load on the drawbar. Dimensions and load of the drawbar are indicated at paragraph 1.7.

It's very important to bear in mind that the road grip and the direction and braking capacity, can be affected, even remarkably, by the presence of carried or towed equipment.

On the curves, pay attention to the centrifugal force exerted on a different position, to the center of gravity, with or without towed equipment.

The standing foot must be lift from the ground in a position completely lift up, hooked by the proper pivot and assured with the safety pin.

The machine lights system has to be connected to the tractor by the 7 poles outlet (par. 5.2.6).

The pick-up has to be secured in the uplifted position by the proper chain (fig. 6, A).

In some CE countries, in order to circulate on the streets, the pick-up wheels have to be removed from the pick-up and placed in transport position.

Check the country rules in which the machine circulates as far as the encumbrance limits are concerned.

In order to set the pick-up wheels in the transport position, it's necessary to unhook the plug of the adjustment rod, from the adjusting shaft, fix the adjusting shaft to the wheel support by the same pin (fig. 6, B) and take off the dal pick-up wheels

Then insert the wheel pipe into the brackets near the protection pipe of the pick-up till the latch

abuts on the flange; then lower the wheel in the

position fig. 7 in order to hook the latch.

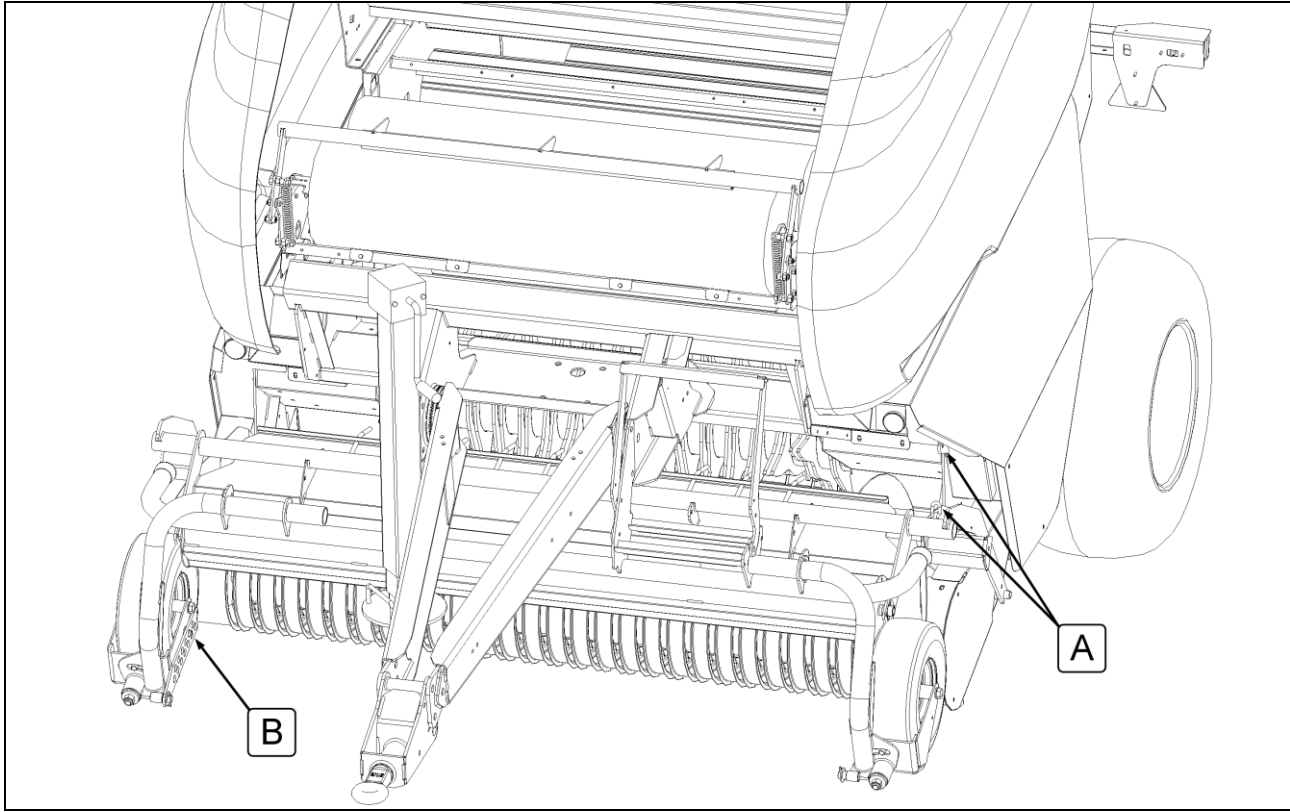


Fig. 6 – Position of the pick-up chain (A) and position of the bracket for wheels adjustment for transport (B)

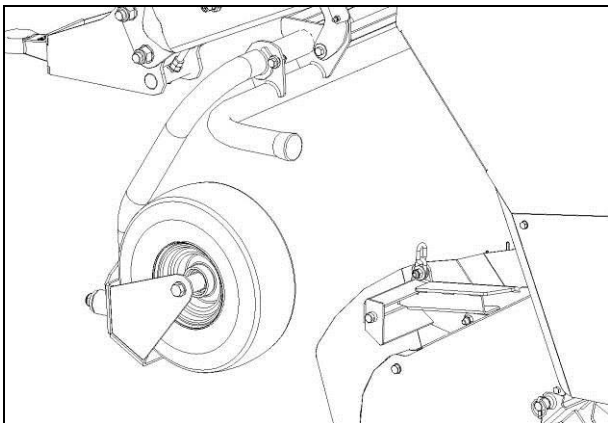


Fig. 7 – Position of the pick-up wheels during transport

If the machine is equipped with braking system, make sure it is connected to the tractor and that parking brake is disconnected before proceeding in the street.

The round baler doesn't have absolutely be used as a mean of transport.

! DANGER

The un-correct set of the tires on the wheels rims and a pressure higher than the one allowed by the tires manufacturers, can cause dangerous accidents. Check the pressure comply with the one showed in this manual and not pass over the 40 km/h road speed.

! WARNING

It is absolutely forbidden to start any function of the round baler during transport on the road. Before taking the road, turn off the PTO and switch off the terminal.

3.4.1 Tire pressure

The round baler DIAVEL 630, DIAVEL 630 CUT can be equipped with different type of tires. Here below tire pressure mounted from the manufacturer. For all the other types of tires please refer to the manufacturer instructions.

Tyres	Pressure (bar)
15.0/55-17 10PR	2.0
500/50-17 10PR	1.5
15.6 x 6 TR13 (pick-up)	2.0



WARNING

It's important to periodically check the right tire pressure in order to avoid accidents.

3.4.2 Admitted slopes

The round baler stability is influenced by the ground conditions and by the type of towing tractor. The presence of the bale inside the chamber might suddenly modify in a dangerous way the tractor and the baler motion.

It is consequently important that the operator well know the ground on which he's working and pay attention to the condition in which he'll have to work.

Pict 9 shows the admitted slopes for the use of the round baler, both frontal as well as side way.

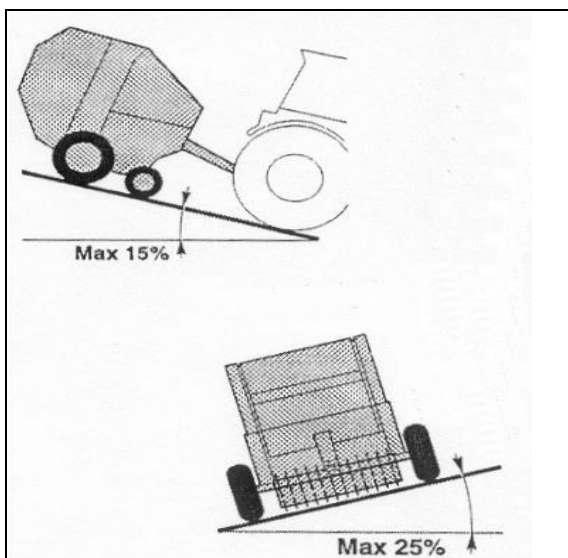


Fig. 9 – Admitted slopes



WARNING

Pay lot of attention when operating with lateral slope in order to avoid the risk that the round baler overturn because of the holes, ditches or other ground irregularities, especially when the door is open.

4 HARVESTING INSTRUCTIONS**4.1 GENERAL GUIDELINES**

The round baler DIAVEL 630, DIAVEL 630 CUT, when connected to a tractor, can perform the collection of harvesting products laid on windrows. The product is conveyed inside the machine and pressed in bales of cylindrical shape. Successively the bale is bound and ejected from the round baler.

Each working phase of the round baler is carried out from one or more specific devices:

- Material harvesting: pick-up and crop guard
- Convey inside the chamber: lateral auger and rotor.
  - Bale formation: Rollers of the pressing chamber
  - Bale pressing: Rollers and rear door cylinders
- Binding: Twine or net binder
- Bale unload: Door and ejector

The bale pressing level is adjustable within the machine parameters.

The DIAVEL 630 CUT version can also cut the entering products.

Bales that have been formed inside the chamber, must be bound in order to remain well packed up once unloaded. The round baler can realize a twine, net binding.

The features and preparation of the product and soil, can vary remarkably the round baler performances.

Before harvesting, make sure the humidity percentage of the product is the right one, in order to avoid useless loss.

For the compression of bales of uniform density and their storage, the best results are obtained having a humidity of approx. 20% for the hay and approx. 40% - 55% for the silage.

The best results are obtained by an windrow 1.10 mt width and 0.30 ÷ 0.40 mt high, both to avoid products loss, as well as to allow a good bailing. If the windrow is low and wide, then the bale comes out better.

4.2 HARVESTING STARTING

Before proceeding with harvesting make sure to have set the machine to work properly (follow instructions of chap. 5).

Depending on the windrow and on the type of soil, modify the regulation of the crop guard and of the pick-up (chap. 5). Make sure the pick-up teeth don't touch the ground causing a transmission overloading and harmful entry of ground together with the forage.

Keep the PTO at 540 rpm.

Harvesting speed varies depending on the windrow dimensions and ground bumps. If the windrow is correctly prepared it's possible to move at a speed of approx. 12-14 Km/h.

It is necessary to look at the pick-up and adapt harvesting speed to the type of windrow to avoid clogging problems or low work of the pick-up.

The product must enter constantly.

**WARNING**

In case the machine floods, it's absolutely forbidden to clear the pick-up with the PTO running

4.3 ADVANTAGES WITH LOW AND WIDE WINDROW

- Faster harvesting
- Low power absorption
- Higher bales weight
- Reduced loss of product
- External permeability
- Good conservation
- Good bale shape even after storage

4.4 DISADVANTAGES WITH HIGH AND NARROW WINDROW

- Low harvesting speed
- Low compression
- Higher power absorption
- Low bales weight
- Loss of product
- Water penetration inside the bale
- Mediocre storage
- Possible deformation after storage
- Difficult driving to keep a serpentine trajectory

4.5 FEEDING PROCEDURE

The feeding procedure during harvesting affects the bale shape, only in case of correct feeding, it's possible to obtain bales of cylindrical shape. If

harvesting is made without paying attention to the feeding procedure, you might obtain bales of conical shape or “barrel” shape.

In case of short or fragile materials, it's opportune to work in any case as showed in the paragraph talking about the narrow windrow. The collected product will consequently fill uniformly the chamber of the round baler.

Feeding with narrow windrow

In case of narrow windrow it's necessary to feed the round baler sideways, not centrally, in order to obtain a bale of cylindrical shape and not of “barrel” shape. In order to obtain this, the operator must ride alternatively 7÷12 mt on the right side and move on the left side for the same distance. Feeding must grant an uniform distribution of the product on the whole chamber length.

Feeding with wide windrow

In case of windrows having such a width to occupy the whole extension of the pick-up, it is necessary to proceed keeping a straight way till both cochleas are occupied by the entering material.

Instead, if the windrow has such a width not to effect the sideways cochlea, then it's necessary to proceed to move right and left sideways as indicated in the paragraph above.

4.6 BALE FORMATION

Material entering from the pick-up is pushed by the rotor inside the chamber. In the round baler DIAVEL CUT, the rotor can cut the material making it passing through the cutting knives. Cutting knives are equipped with a protection which allows the knives reset in case of hit with foreign bodies (such as rocks, branches, etc...).

Inside the chamber, the material starts rotation thanks to the round baler rollers.

The operator can select three levels of bale pressing and control on the manometer on board of the machine the pressure created by the hydraulic cylinders.

Pressure on the material will be zero value till reaching the chamber diameter, to grow then till the value set.

4.7 BINDING

Binding is a fundamental phase for the outcome of a bale of quality, the external consistency of the bale depends first of all on the quality of the binding.

DIAVEL 630, DIAVEL 630 CUT can bind the bale both by net or twine.

The net binding allows to maintain the shape of the bale by a net which wraps it completely, the net gets strained by the entire bale width and wrapped on it with several laps.

For short and cut products we always suggest the net binding to avoid product dispersion.

To arrange a good net binding, we suggest to wrap the bale with at least 2.5 laps of net.

- After wrapping the bale with a defined numbers of net laps, the net get cut by a knife mounted on a guillotine system.
- The twine binding maintain the shape of the bale wrapping it with a twine forming like a spiral around it, at the bale sides the twine get rolled more times maintaining a distance from the border that can be set from the operator. At the end of binding, twines will be cut by the appropriate knives. Parameters set for twine binding are the following:
  - Distance from the bale border (Fig. 30, A)
  - Spiral pitch (Fig. 30, B)

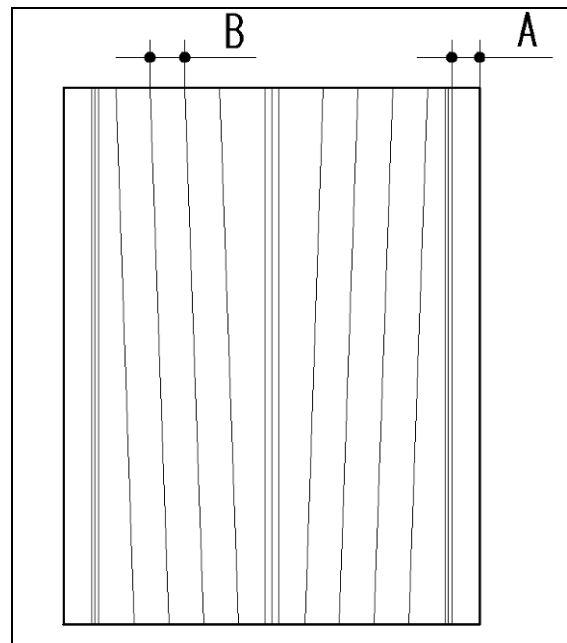


Fig. 10 – Twine binding

For the twine binding we suggest the following types of twine:

- Sisal (vegetable) 200/400 m/kg
- Synthetic 500/700 m/kg

When the twine spools are set, make sure that the writings on them are straight in order to avoid the twisting of the twine may cause malfunctions to the binder.

To ease the sliding of the twine through the various passages it is necessary to join the two twines heads together with the kind of knots shown hereunder in the picture.

- (A) Sisal (vegetable)
- (B) Synthetic

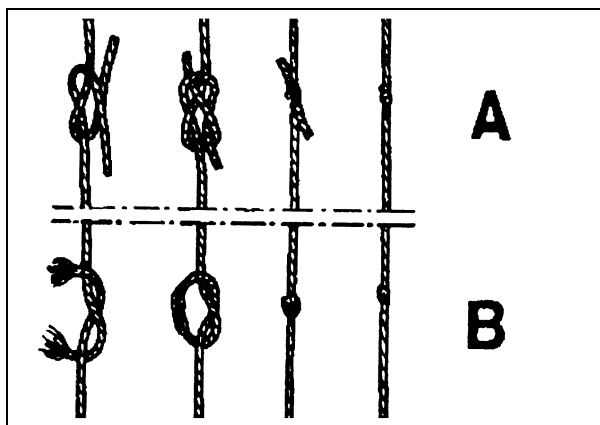


Fig. 11 – Kinds of knots

4.8 BALE DISCHARGE

Once the collection of the material and the twine or net binding has been done, open completely the rear door in order to discharge the bale.



WARNING

Make sure that there are no people around the machine and discharge the bale on a flat terrain.

The bale ejector (optional) has been foreseen in order to kick away the bale while discharging it allowing to close the rear door without having to drive backwards.



WARNING

Don't use the bale ejector on steep slopes. Danger of rolling downhill.



WARNING

In case of operating on slope terrains there might be the danger that the bale rolls downhill once it has been discharged. A bale

rolling gets out of control and can cause severe damages to people or things. Always discharge the bale perpendicularly to the slope in order to avoid the rolling.

4.9 BALER STOP

At the job end, the operator must:

- Stop the run of the tractor on plain and use the parking brake.
- Remove the PTO shaft from the tractor.
- Switch off and disconnect the display.
- Lift up the pickup.
- Stop the engine.
- Fix the pickup in a upper position using the related chain.
- Make sure that the rear door is closed and all the parts of the machine are completely stopped in a steady position.
- Let the standing foot down until it reaches the ground.
- Disconnect the various connections: oleo dynamic pipes and electric cables.
- Remove the PTO shaft from the PTO of the tractor.
- Remove the pin from the eye of the draw bar.



WARNING

Check that the surface on which the standing foot has been placed, is steady and compact enough to support its weight.

Now it is possible to switch on the tractor again and move it somewhere else.

4.10 PARKING

- Before placing the round baler in its warehouse on a flat and suitable surface, make sure that the material has been completely discharged.
- Put the standing foot in contact with the ground.
- Put suitable brake blocks under the tires and make sure that all the protections of the machine are in the correct position.
- Stop the tractor and use the parking brake.
- Once the tractor and the other parts are completely stopped, remove the PTO shaft from the PTO of the tractor.
- Place the PTO shaft on suitable supports so that both the PTO shaft and its protections won't be damaged.
- Release the pressure of the hydraulic circuit.

- Disconnect the hydraulic connection pipes from the tractor.
- Disconnect the electric supply cables.
- Move the tractor away from the draw bar.
- Lubricate and grease every greasing point, including the chains.

**WARNING**

It is very important that the place in which the round baler is parked is:

- **Dry;**
- **Protected from the elements;**
- **Guarded or closed to prevent the free access to the machine to those who are not allowed to use it.**
- **With a steady soil and compact enough to stand the weight of the machine.**

5 USE INSTRUCTIONS**5.1 BEFORE USE****WARNING**

Before starting up the machine, the user must make sure that the deputy operator has read, memorized and understood all the parts of this manual and particularly “Chapter 2 – safety and prevention”.

The operator must check the integrity of the machine with no damages, and that the level of all the lubricating oils is correct and that all the wearing parts are completely efficient.

- Check the tightness of the screws of the fixing
- Check the condition of guards, safety devices and warning signs on the machine
- Make sure all the transmissions elements and the bearings are lubricated
- Check the correct tires pressure
- Check the status of the pick-up, the draw bar and the power supply, in case of scratches, cuts, or locks they have to be repaired before use.
- Operate the machine for a few minutes empty to be able to check the correct operation
- Start the PTO at low engine speeds and open and close the door a few times
- Make sure there are no leaks of oil or lubricant
- Turn off the tractor and check the condition of the machine

The procedure described above must be carried out whenever the machine is inactive for a long time.

**WARNING**

The adjustment and preparation for start up, must be carried out when the machine is turned off and blocked.

5.1.1 Work position**DANGER**

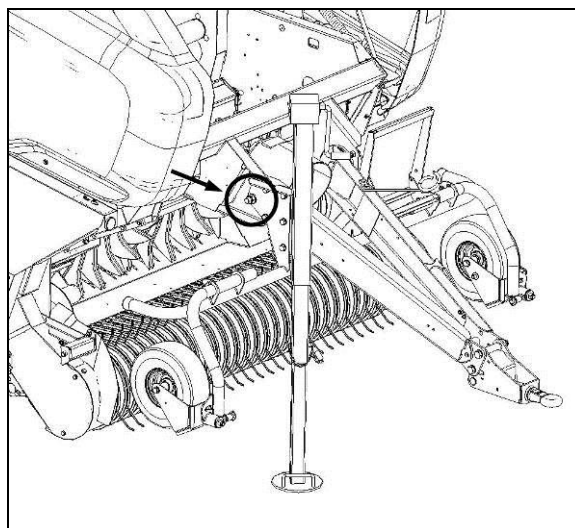
With the machine running, the operator **MUST** be seated in the driver's seat, because only from there he can act properly.

Before leaving the driver's seat, he must stop the machine, engage the parking brake, turn off the tractor and remove the key from the control panel.

5.2 MACHINE PREDISPOSITION**5.2.1. Draw bar adjustment**

The drawbar of the baler can be adjusted in height to be connected to different tractors on the market. The height of the draw bar can be adjusted from 38 to 110 cm following the instructions:

- 1) Make sure that the standing foot is set firmly on the ground and that there are no obstacles around the area of the draw bar; bring the tractor out of the working area.
- 2) Support the drawbar through the appropriate equipment (logs or ropes) so that it does not fall after its loosening
- 3) Loosen the nuts on both sides of the draw bar so that you can adjust it (fig. 12).

**Fig. 12 - Draw bar**

- 4) Lift the draw bar to the height needed. The draw bar can be adjusted with inclinations varying with a step of 5 degrees. The height can be set as shown in the table below.

Corner (angle)	Draw bar height [cm]
30°	37
25°	46
20°	56
15°	67
10°	77
5°	87
0°	98
-5°	109

- 5) Tighten the nuts of the drawbar with a torque wrench, according to the torque values specified in paragraph 2.1.3.
- 6) Loosen the two screws of the eye to be able to move it (Fig. 13, A).
- 7) Bring the eye in a horizontal position, loosening the locknut (Fig. 13, B) and acting on the adjusting screw (Fig. 13, C).

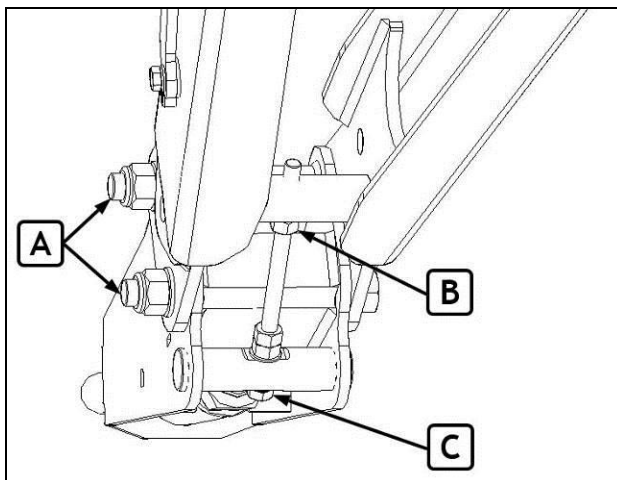


Fig. 13 – Draw bar

Fix the adjusting screw with lock nut, tighten the screws of the eye with a torque wrench, according to the torque values specified in paragraph 2.1.3.

As the draw bar is set in an high or low position in comparison to the PTO of the tractor, the PTO shaft will be in a different position in comparison to the draw bar. For this reason it is necessary to adjust the PTO support in such a way that it is possible to use it when un-hooking the PTO of the tractor.

The PTO support can be configured simply unscrewing the screw which connects the draw bar and resetting it in one of the position of the figure here below.

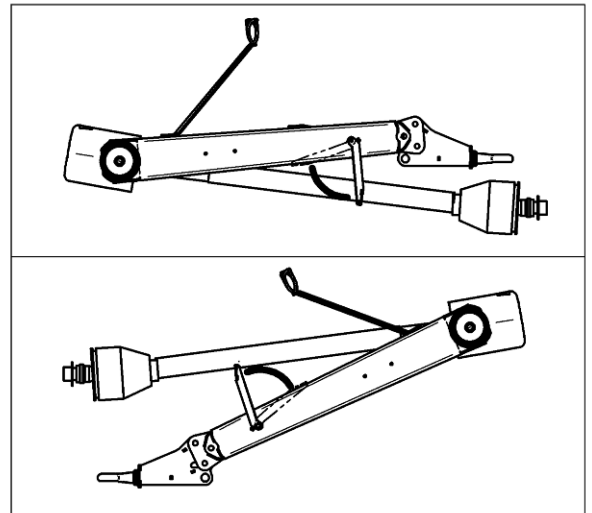


Fig. 14 – PTO support configurations

The PTO has to lean on the support only during parking and after the tractor has been disconnected from the round baler. While working and while the PTO is connected to the tractor, the support has to remain close to the draw bar and it hasn't be in contact with the PTO shaft.

5.2.2. Hooking to the tractor



The hooking of the machine to the tractor is an operation that can be dangerous.

Be very careful in carrying out the whole operation following the instructions written in this manual.

To properly hook the round baler to the tractor, observe the following instructions:

- Be sure to use a tractor with a towing capacity suitable to the weight of the baler (see 1.7 - Technical Data)
- Be sure to use a tractor with a suitable hook to the draw bar of the round baler (see 1.7 - Technical Data)
- If the tractor has a rotating towing link hook, it is necessary to verify the possibility to fix it or, in alternative, to mount on the machine a fixed towing link (optional).

**DANGER**

Do not use rotating towing link on tractors with rotating towing hook. Danger of connection breaking

- Be sure to use a tractor having a power suitable to be used with the round baler (see 1.7 – Technical data).
- Make sure there are no objects placed or persons and/or animals near the working area and that the PTO is disconnected.
- Make sure that the baler is in a steady horizontal position, and that the hitch of the tractor is placed at the same height of the drawbar.
- If necessary, adjust the height of the drawbar (as indicated in par.: 5.2.1).
- Start the tractor and then drive carefully backward approaching the round baler and putting in place the hitch with the drawbar eye. After successful hooking, insert the pin of the eye and fix it.
- Operate the parking brake, turn off the tractor and remove the key from the control panel.
- Put the PTO shaft complete with its full protection in the PTO of the tractor and make sure it is perfectly blocked in the correct position.

**CAUTION**

The PTO shaft must be connected only when the draw bar is hooked to the tractor, to prevent detachments or damages to the PTO shaft itself.

- Lift the standing foot through the crank in Fig. 15. After it is lifted from the ground, place the standing foot in a high position and fix it using the special pin (Fig. 15, A).
- Connect the electric cables and the hydraulic hoses.
- Connect, if there, the braking system to the tractor.

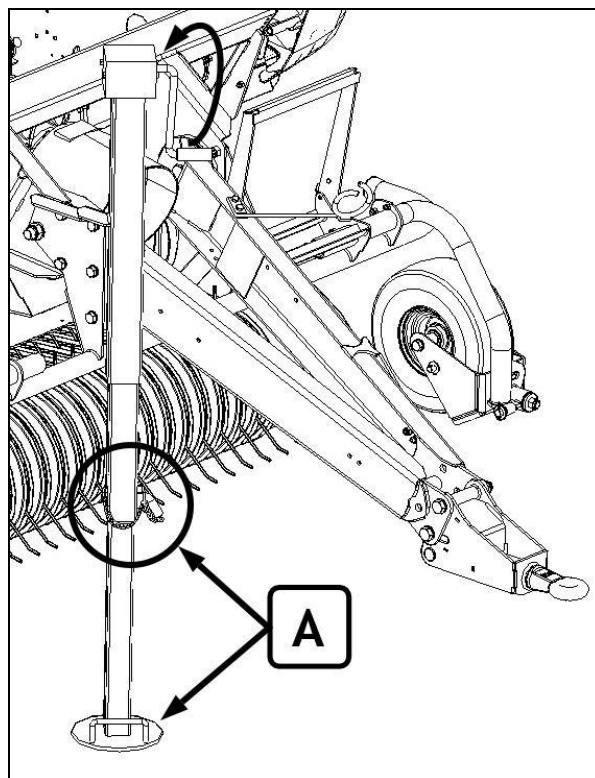


Fig. 15 – Standing foot

To unhook the machine from the tractor follow these instructions:

- Operate the parking brake, turn off the tractor and remove the key from the control panel.
- Operate the parking brake or put the brake blocks.
- Place the standing foot in low position and fix it using the special pin.
- Lower the standing foot using the crank till the eye of the draw bar is released from the tractor's hitch.
- Remove the PTO shaft and place it on the support of the draw bar
- Disconnect the electric plugs and the hydraulic connections.
  - Disconnect the braking system, if there.
  - Take away the pin from the eye of the draw bar and unhook the round baler from the tractor.
- Drive the tractor forward.

5.2.3. PTO shaft



DANGER

The PTO shaft coupled with a tractor, is a mechanical part which, when in use, might be extremely dangerous for the physical integrity of people operating in its area.

Therefore it is necessary to pay lot of attention to the operations related to this mechanical organ.

Read carefully the instructions manual of the PTO shaft attached to it. In case of doubts regarding its functioning, or if it is damaged or worn out or broken or without its protections, replace it exclusively with original PTO shafts marked «CE» since equipped with a specific device related to the machine.

The PTO shaft is fitted with a torque limiter which has the purpose of preserving the machine from peaks during operation; use the torque limiter on the round baler side.

Do not make modifications and adaptations to the PTO shaft. If this becomes necessary, contact the service center of the manufacturer.

Stop the engine, remove the key from the tractor control panel and verify that all rotating parts have stopped before approaching the machine or perform maintenance operations.

To remove the PTO shaft in use and set a new one it is necessary:

- Make sure of the weight of the PTO shaft transmission and in case get suitable lifting and transport devices
- Stop the tractor and the PTO shaft
- Remove the ignition keys of the tractor
- Unhook the chain from the tractor side
- Pull out the PTO shaft from the tractor side and hold it with suitable support
- Unhook the chain from the machine side
- Open the cover of the protection from the machine side (the one fixed on the adaptor box)
- Unscrew the tightening nut of the PTO shaft from the machine side and remove the tightening pin
- Pull out the PTO shaft from the machine side

To install a new PTO shaft, proceed as follows:

- Clean and grease the PTO shaft both from the machine and the tractor side in order to facilitate the installation of the PTO shaft
- Insert the PTO shaft on the machine side

- Insert the tightening pin and screw the related nut
- Fix the cover of the protection from the machine side
- Hook the chain from the machine side
- Insert the plug of the PTO shaft into the PTO of the tractor
- The device has to hook (see use instructions of the PTO shaft)
- Hook the chain from the tractor side

Since the PTO shaft is an organ which rotates at high speed, in the testing phase it is subjected to balancing and any later intervention can cause imbalances that may affect the functionality of the machine itself as well as the integrity of the PTO shaft.

Do not use the PTO shaft as a support or footboard.

The working angle that of the PTO shaft should be as low as possible (max. 70 °), this grants a longer life to the shaft as well as to the baler.

When the PTO shaft is stretched at most, in every working condition, the telescopic pipes must overlap for at least 1/3 of their length (Fig. 16, A).

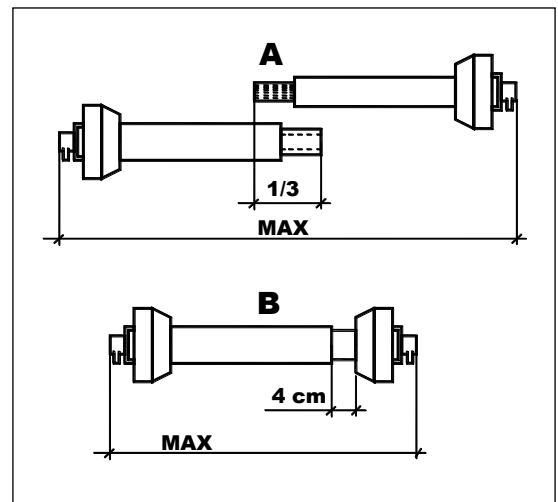


Fig. 16 – PTO shaft.

When fully inserted, the minimum clearance must be 4 cm (Fig. 16, B). If this is not possible, each half of the PTO shaft has to be shortened to the same length.

The shortening of the PTO shaft has to be done by a skilled workshop only.

Once shorted, the coupling of the two halves of the PTO shaft has to be at least 1/3 of their length. In order to shorten the PTO shaft, it is necessary to:

- Uncouple the two parts of the PTO shaft
- Keep the two parts of the PTO shaft one beside each other simulating the moving position
- Make a mark on the pipes of internal and external protection to indicate the length (X) where the pipe has to be cut.
- Remove the protection pipes of each half of the PTO shaft
- Shorten the protection pipe of the length (X).
- Set the cut piece next to the pipe of internal protection.
- Shorten the inside protection pipe of the same length (X).
- Shorten the transmission pipes to the necessary length. Even when the transmission is not under rotation, the telescopic pipes have to keep a suitable overlapping to avoid blockages.
- Perpendicularly cut the inside and outside profiles at the same length (X) – the parts of cut pipes can be used as samples
- Deburr and clean the cut profiles
- If the outside profile of the PTO shaft is equipped with lubricators, the holes to enter to the lubricators have to be made once again.

In any case, before using the PTO shaft, it is necessary to follow these instructions:

- Make sure the PTO shaft is suitable to transmit the power required by the round baler (see technical data on the instructions manual for the PTO shaft). In case of doubt, contact the Service Center of the manufacturer.
- Before starting to work, verify that all protections are in a perfect status and that there are the suitable security chains. Fix these chains one to the machine and the other to the tractor, to avoid that the protections rotate with the PTO shaft.
- It is compulsory to keep efficient the PTO shaft and the machine protections, do not use PTO shafts with ruined protections or worse missing

5.2.4. Automatic torque limiter

The PTO shaft has to have a torque limiter which operates by interrupting the power transmission when a torque peak occurs, over the set value. During the intervention of the device, the power transmission is interrupted and it's necessary to stop the PTO shaft of the tractor

Only successively the connection of the PTO, the power transmission will be restored.



DANGER

If it's necessary to replace the torque limiter, replace it with one of the same or equal dimensions and calibration. Do not use different limiters and do not tamper with the limiter to avoid big damages to the machine or/and to the operator.



CAUTION

Before inserting the PTO, make sure that the rotation speed corresponds to the one required by the machine (540 R/ min).

5.2.5. Hydraulic system

The round baler is equipped with an hydraulic control. The working parameters must remain within the following range:

- Minimum pressure: 150 bar
- Maximum pressure: 200 bar
- Maximum delivery 40 liters/min
- **The tractor must have two hydraulic double effect quick couplings ½" female.**

Connect all pipes with blue cap to the distributor to use, to start the rear door. Connect all the tubes with red and yellow caps to the distributor to use to start the pick-up, the knives and the tray.

- **On one of the two pipes with the blue cap there is a ball valve which blocks the flow. Close the valve every time you intend to operate on the rear door in order to avoid accidental operation.**

The pipes of the hydraulic system are SAE 100 R2AT type, whose technical features are listed in the following table.

Internal diameter		External diameter	Working pressure max	Burst pressure
[Inch]	[mm]	[mm]	[bar]	[bar]
1/4	6.4	15	400	1600
3/8	9.5	19	330	1320



WARNING

In case of wearing or damage of the hydraulic pipes, the oil at high pressure might go out

putting the operator in danger. Replace the pipes in case they are worn out or damaged.

The hydraulic system works with ENI MULTITECH 15W40.

Description of the hydraulic controls

Using the hydraulic distributors and the terminal you can carry out all the working operations of the round baler.

When the controls of the terminal are not in use the distributors carry out the following functions:

- Rear door distributor (blue caps): controlling the distributor in one direction the rear door opens, controlling it in the opposite direction the rear door closes.
- Pick-up distributor – drop floor – knives (yellow and red caps): controlling the distributor in one direction, the pick-up moves upwards. Controlling the distributor in the opposite direction, the pick-up moves down, the drop floor recovers any clearance and the knives are taken to the working pressure.

Through the controls of the terminal the distributors can carry out the following additional functions:

- Pick-up distributor (yellow and red caps): it is used to lower the anti clogging drop floor.
- Pick-up distributor (yellow and red caps): it is used to start the cutting knives (CUT version only).



DANGER

The hydraulic system is made by flexible pipes and accumulators which can remain under pressure also once the machine is stopped. Only specialized personnel adequately trained can make interventions on the hydraulic system. The intervention on the calibration of system valves can cause big damages to the machine and severe danger to the operator. It is forbidden to operate on the valves calibration also for the specialized personnel.

5.2.6. Electric System

The round baler is equipped with two distinct electrical systems, one for the management of the rear lights and one for the control unit and the terminal.

The connection to the electrical system of the baler is via:

- The power socket 3-way (12V, 30A) which supplies the control unit and the terminal (fig. 17, A)
- The power socket 7-way supplying the lights installation (fig. 17;B)
- Connection between the round baler and the terminal is made by a connector (fig. 17,C).

If the tractor doesn't have the electrical socket DIN 9680 3-way, it's possible to ask the cable for the connection to the tractor battery (optional).



CAUTION

Before plugging the 3-pin power plug, make sure that the tractor delivers a voltage of 12 V and that the power of the tractor supports a current of at least 30 A.



Fig. 17 – Connecting plugs

Near to the control unit there are a fuse 2A and a fuse 30A. If the system does not turn on, check the fuse 2A. If the system turns on but the solenoid valves or the motors will not activate, check the fuse 30A .

The control system of the baler is made by a control unit installed on the machine and by a

terminal to be installed in the cab of the tractor via a hitch suction cup. In this way the terminal can be easily set in an area clearly visible by the operator while working.

**WARNING**

Before circulate on the road, it is compulsory to connect the lighting system of the baler to the lighting system of the tractor via the 7-pin plug. You should periodically check the bulbs and, if not working, replace them.

**CAUTION**

Do not mount unsuitable fuses, do not modify cables and don't replace plugs and sockets with others different from the originals.

5.3 USE INSTRUCTIONS

The machine is designed to do the following:

- Harvesting of material in swaths
- Pressing bales in round shape
- Bales binding
- Rear ejection

The harvesting is done by the pick-up, this device can collect material from windrows ranging from 1.2 to 2 mt wide. It's equipped with 4 rows of 28 fingers each. The fingers can fit completely inside the pick-up in case of impact with the ground.

The movement of the fingers of the pick-up takes place through a cam that enables to collect the forage in swath at the best.

The harvesting must leave the smallest quantity of material possible on the ground. Likewise the forage must be of good quality and therefore must not contain traces of soil.

To achieve these results the collector (pick-up) can be adjusted in height depending on the soil type and material.

**CAUTION**

Soil and processing waste lead to a rapid deterioration of the crop, often cause of mold and rots making it unusable.

The conveying of the material within the bale chamber takes place through the side cochleas and the rotor.

Two large cochleas restrict the flow of the material by the width of the collector to the one of the chamber. The rotor brings the material inside the chamber giving the material a first pressing.

If necessary, the harvested product can be cut (cut version).

When the round baler is equipped with a cutting device, it consists essentially of a rotor and 15 cutting knives.

The cutting device provides the regular transfer of the product to the bale chamber, increases the density of the bale and improves the quality of silage.

Thanks to the control valve placed on the tractor and to the terminal, you can select the following cutting modes:

- Cut: all 15 knives are activated, cut length is approx. 7 cm.
- No cut: knives remain deactivated.
- By removing part of the knives you can get different cutting lengths.

All 15 cutting knives are equipped with an hydraulic protection that allows all the knives to fold back as a result of impact with foreign bodies (eg.: stones or branches). The protection comes into operation automatically when the pick-up lower down.

Inside the chamber, the rollers start the rotation of the forage, forming a bale and making the pressing.

The density of the bale is adjusted by the pressure of the hydraulic cylinders of the rear door.

Once reached the pressure set, the control system automatically starts the binding.

The bale is ejected by opening the rear door with an hydraulic control, with no need to disengage the PTO.

**CAUTION**

Before starting to operate with the machine, make sure that the rear door and the covers are closed and correctly secured.

The terminal must be installed inside the cab of the tractor, clearly visible and easy to be reached by the operator.

5.3.1 Machine clogging

During the working phase it may occur that the incoming material gets stuck in the collection and/or feeding devices, causing a blockage (or clogging).

The material collected in the feed unit may cause the block of the mechanical parts (pick-up, auger or rotor), but in any case you should follow the instructions below.

Should this eventuality occur, the round baler is equipped with an anti-clogging device that allows, by dropping the bottom floor, the release the rotor from the exceeding material (see chapter controls 5.4.4).



WARNING

In case of clogging, it is strictly forbidden to clean the baler with the tractor on.

In case the anti-clogging system is insufficient to carry out the cleaning of the collection chamber, it is necessary to:

- 1) Eventually open the rear door and discharge the bale.
- 2) Remove the PTO, stop the tractor, engage the parking brake and remove the key from the control panel.
- 3) Wait till all the moving parts are completely stopped.
- 4) Wear suitable protection gloves.
- 5) Remove the stuck material using a suitable tool.

In case of clogging in the harvesting unit, it is often useful to disassemble the baffle plate to decompress the material. The baffle plate of DIAVEL 630 is equipped with a quick release system which allows to disassemble it in short time (Fig. 20, B).

5.3.2 Ladder and stand

The machine is equipped, in the front, with a stand accessible by a ladder, which allows an easy access to the net binder to carry out the operations of inspection and passage of the net.

The loading operation of the coil on the binder can be performed without the use of the ladder by placing the coil in the space dedicated to the reserve coils and then pushing it into the compartment of use (fig. 23).

The ladder can be positioned low for use and then folded upwards before start working with the machine, simply by acting the release button (fig. 18).

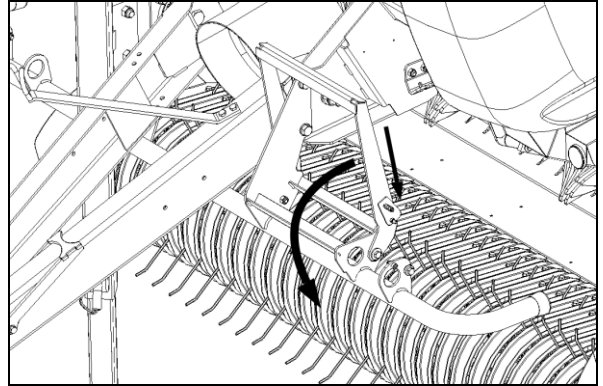


Fig. 18 – Ladder and stand

5.4 REGULATIONS AND CONTROLS

Before operating any control of the baler, make sure the area around is clear, and there are no people or animals that may come into contact with the machine or with the material processed.

The majority of the controls of the round baler are given through the terminal located in the tractor cab. However, there are some functions that must be operated by devices located in different positions.

5.4.1 Adjustment of the collection unit (pick-up)

The pick-up can be used with suitable wheels or can be supported by hydraulic cylinders.

When you are using the wheels, the pick-up follows the morphology of the soil, thus ensuring a better collection. In order to move with the pick-up on the ground, we suggest to maintain the related distributor in a floating position, that is with the center open.

But when the ground conditions are rough and there are cultural residuals that may affect the wheels or the pick-up, it's better to keep the pick-up lifted up by the hydraulic cylinders.



CAUTION

Before getting close to the machine, make sure that the PTO is turned off, the tractor is turned off with the parking brake on and the ignition key is switched off from the control panel.

To adjust the height of the wheels of the pick-up it is necessary to raise it up by the hydraulic distributor.

The adjustment can be made by changing the position of the regulating rod: at each hole of the bracket corresponds to a different height of the collector (Fig. 19).



CAUTION

In case of adjustment by wheels, make sure to perform the same adjustment for both right and left wheel.

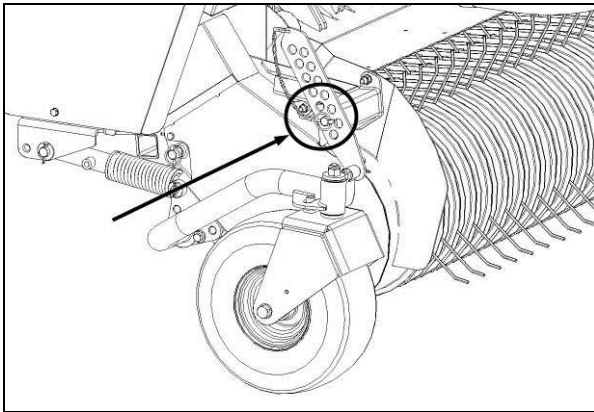


Fig. 19 – Pick-up wheel adjustment

5.4.2 Baffle plate adjustment

The baffle plate device is intended to compress and guide the material at the entrance of the rotor. The position of the baffle plate must be adjusted depending on the height of the swath.

For an optimal collection the baffle plate must be able to compress the material making the height of the swath even without pushing the material forward but conveying it towards the rotor.

During the collection, the baffle plate may still move when in contact with highest points of the swath.

Follow the hereunder rules:

- The baffle plate has to be lowered in case the front roller is not set in rotation by the incoming material or when the baffle plate is placed constantly in the lowest position.
- The baffle plate must be lifted if the material is not conveyed between the baffle plate and the pick-up and the baffle plate is pushed forward or when the baffle plate is constantly pushed by the material higher than what set.

- When the baffle plate reaches frequently the maximum height it is necessary to reduce the size of the swath or the speed of collection.

The position of the baffle plate is adjusted by hooking the chain on its top to the fixing bracket on the frame of the machine (fig. 20, A).

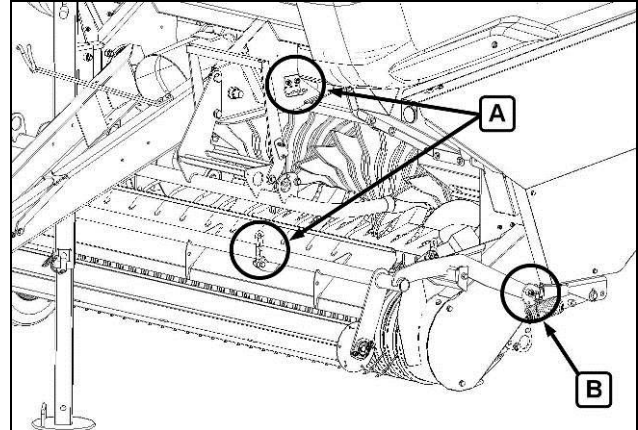


Fig. 20 – Baffle plate

5.4.3 Securing the rear door

If you need to approach the machine while the rear door is open, you must follow the instructions below:

- 1) Make sure that there is no material inside the chamber, otherwise wait until the bale or the material has been unloaded before approaching the round baler.
- 2) Before approaching the baler remove the PTO, engage the parking brake, turn off the tractor and remove the key from the control panel.
- 3) Switch off the terminal.
- 4) Before approaching the rear door, close the ball valve located near the fast couplings of the hydraulic circuit of the door - tensioner (blue caps).

The door is equipped with two safety devices:

- Overcenter valves: they block the cylinders which control the rear door in case of breakage of pipes or involuntary leakage of oil. They are set on the cylinders of the rear door.
- Tap of the door: it disables the control of the rear door. When open, the rear door remains locked even if it is commanded the closing.

**CAUTION**

Before going back to work with the round baler make sure to re-open the ball valve of the rear door

5.4.4 Drop bottom

In the event of a flooding, you can unlock the power supply using the drop bottom.

To lower the drawer and release the collection unit is sufficient:

- To stop the P.T.O. of the tractor.
- To press the F1 key on the terminal: in the "C" area the Fig. 32 will appear: the drop bottom icon.



- Press the Enter key to activate the control: in the "C" area of the fig. 32 the icon of drop bottom activation will appear



- Through the distributor connected to the pick-up, control the descent for all the time the drop bottom enabling icon is there. When the drawer will begin to drop, in the "B" area this icon will appear:



IMPORTANT: continue to maintain the distributor lever in the lowering position of the pick-up even after the drop bottom icon has appeared and till there is the drop bottom enabling icon. When it disappears, immediately release the control of the pick-up, otherwise the drop bottom will begin to close.

- Restart the PTO and wait until the collection unit is free.

- If this is not enough, try to restart again the PTO or follow the instructions of paragraph 5.3.1
- Once the collection unit is free, the rotor and the other organs restart to run normally and the material is conveyed into the round baler
- To return the drop bottom to the working position, WITHOUT pressing any key on the terminal, keep the operating PTO and command the lowering of the pick-up till the drop bottom icon disappear



- The opening of the drop bottom may also cause the deactivation of the cut. If necessary, restore the cutting knives in position by following the instructions in paragraph 5.8.2.
- At this point it is possible to restart the work.

5.4.5 Cutting device (CUT version)

The round baler DIAVEL 630 CUT allows to use, when required, the cutting device.

To activate the cutting device:

- Press the F1 key twice: in the "C" area of Fig. 32 the icon knife will appear.



- Press the Enter key to activate the control: in the "C" area of Figure 32 the enabling knives icon will appear



- Through the distributor connected to the pick-up, start the raising of the pick-up; the knives will move in the cutting position and in the "B" area the following icon will appear:



- Press Esc or Enter to exit the control of knives.

To start the work, the pick-up must be lowered, at the same time also the hydraulic protection of the knives starts to operate

To deactivate the cutting device:

- Press the F1 key twice: in the "C" area of Fig. 32 the icon knife will appear



- Press the Enter key to activate the control: in the "C" area of Figure 32 the enabling the knives icon will appear



- Through the levers connected to the pick-up, control the descent of the pick-up; the knives will move in the cutting position and in the "B" area the following icon will appear:



- Press ESC or ENTER to exit the control of the knives and be able to control only the pick-up.

5.4.6 Extraction of the knives (CUT version)

The round baler DIAVEL 630 CUT is equipped with a cutting device with 15 knives.

In addition to full cut mode, you can get other cutting lengths by extracting part of the knives.

The extraction is also required for sharpening or replacement of the knives.

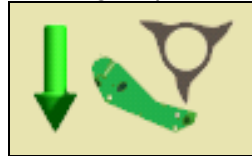
You can access to the knives from the rear of the machine.

The operations to remove or insert the knives are the following:

- Press the F1 key on the terminal: in the "C" area of Fig. 32 the drop bottom icon will appear



- Press the Enter key to activate the command: in the "C" area of Figure 32 the enabling drop bottom icon will appear:



- Through the lever connected to the pick-up, control the raising of the pick-up for all the time icon drop bottom is there; the knives will move in the cutting position and in the "B" area icon will appear:



IMPORTANT: continue to maintain the distributor lever in the pick-up lowering position even after the drop bottom icon has appeared and lower it until there is the drop bottom enabling icon. When it disappears, immediately release the control of the pick-up, otherwise the drop bottom will begin to close.

- Press the F1 key twice: in the "C" area in Fig. 32 icon will appear the icon knife.



- Press the Enter key to activate the command: in the "C" area in Figure 32 will appear enabling the knives



Through the distributor connected to the pick-up, control the lift of the pick-up, knives will get in the cutting position and in the area "B" the following figure will appear:



- Press Esc or Enter to exit the command of knives. At this point the machine is in the

extraction condition of the blades, i.e. with open drawer and raised knives



CAUTION

DON'T ACTIVATE THE P.T.O. SHAFT WHEN THE KINVES ARE IN THIS POSITION.



WARNING

Always wear safety gloves before working on knives

- Loosen the engagement lever knives acting before on the stop plate (Fig. 21).
- Remove or insert the knives by keeping the top end and lifting the front side and then the rear one
- Bring the engagement lever back to the original position.
- Bring back the knives and the bottom floor in the original position using the same controls of the terminal and operating the hydraulic distributors.
- Open the valve of the rear door and close it through the control valve, first check that there are not things or people around.

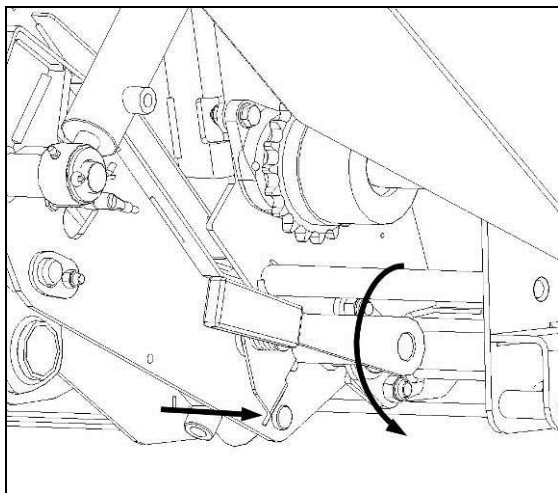


Fig. 21 – knives release lever

The knives removed from the bottom floor can be placed in the holder on the machine (optional) (fig. 22, A). Instead of the knives, the machine can be equipped with fake knives (Fig. 22, B).

False knives do not cut the material, but are used only to close the slots of the drop bottom to prevent remains of stuck material. To use the fake

knives simply remove all cutting knives, install the same way the fake knives and place the machine in cutting mode.

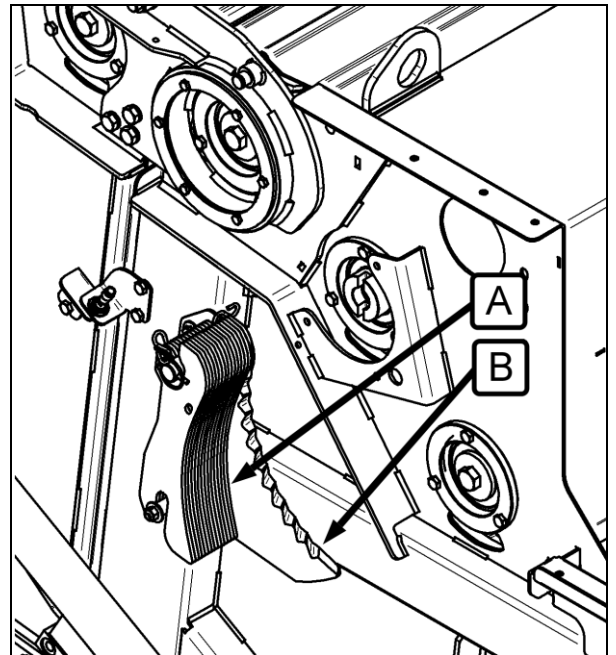


Fig. 22 – Knives holder (optional)

5.4.7 Net binder



DANGER

In the net binder, there is one cutting blade, always wear safety gloves and be careful while working on the net binder.

The net binder can contain net coils having the following dimensions:

- Outer diameter from 90 to 300 mm
- Width from 1230 to 1330

To set up the machine to net binding, you must:

- 1) Release the net brake, bringing it to the open position.
- 2) Move the net roll in the compartment if the roll is too wide or too narrow, adjust the side walls of the compartment (fig. 23, A).

Pay attention to the unrolling of the net, make sure it is as in the figure 24.

- 3) Release the net dragging roller, acting on the lever in the figure 23, point 3.
- 4) Pass the net following the scheme in Figure 24, insert the edge of the net for

about 10 cm between the rubber roller and the metal driving roller.

- 5) Fasten the latches on the dragging roller, bringing it in contact with the rubber roller.
- 6) Bring the net brake back to the working position (in contact with the coil).
- 7) After positioning the first net roll, the binder can hold a second spare one.
- 8) Set the number of turns of the net manually unscrewing the clamping lever (fig.25, 3) and turning the adjustment flange (Fig. 25).
The adjusting flange is provided with 4 notches which correspond, from the bottom, respectively to 2, 3, 4 and 5 turns of the wrapping net.
- 9) On the monitor set the net binding mode (Par.5.6).

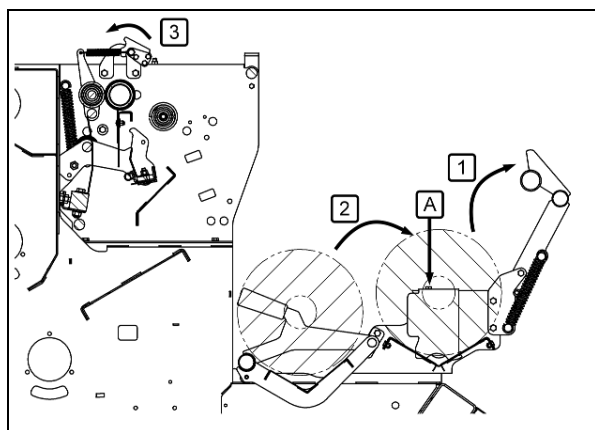


Fig. 23 – Net loading operation

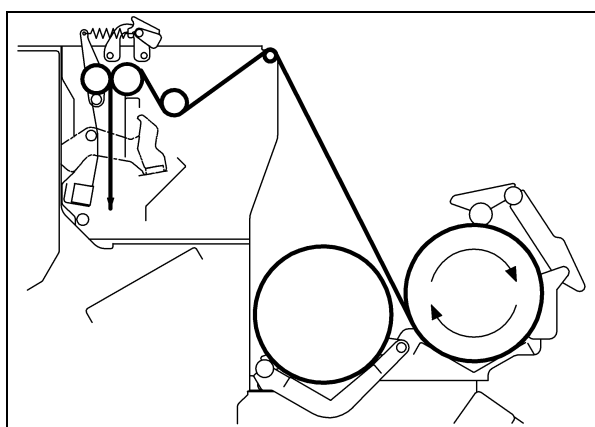


Fig. 24 – Net passage

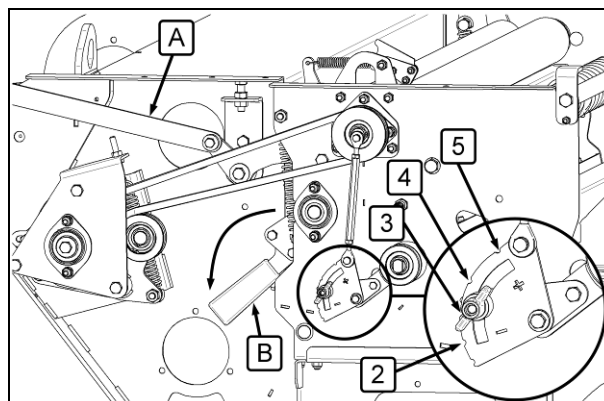


Fig. 25 – Adjustment of the net turns

The reset of the cutting guillotine takes place when the rear door is open by the lever A of fig. 25. If you need to manually reset the guillotine, adjust the lever B of Fig. 25. The net cut is automatic when reaching the set net laps.

During the binding, the net is dragged by the rotation of the material inside the bale chamber. However, different materials and different net involve a different drag force and therefore require a different braking of the net. **In order to vary the braking force, operate on the net's brake located on the left side of the machine (Fig. 26)**

It is recommended not to change the manufacturer setting of the net brake unless it is really necessary.

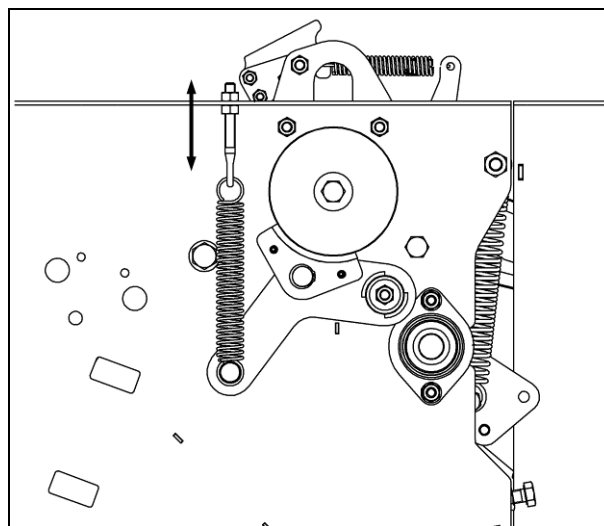


Fig. 26 – Adjustment of net brake

If, during binding, the net is not going to wrap the bale it is necessary to:

- Stop immediately the P.T.O.
- Use a 13 mm wrench to rotate the shaft of Fig. 27 till the guillotine to cut the net snaps.
- Reset the guillotine as indicated by the letter B in Fig. 25

- Restart the P.T.O..
- Press the Start button to restart the binding.

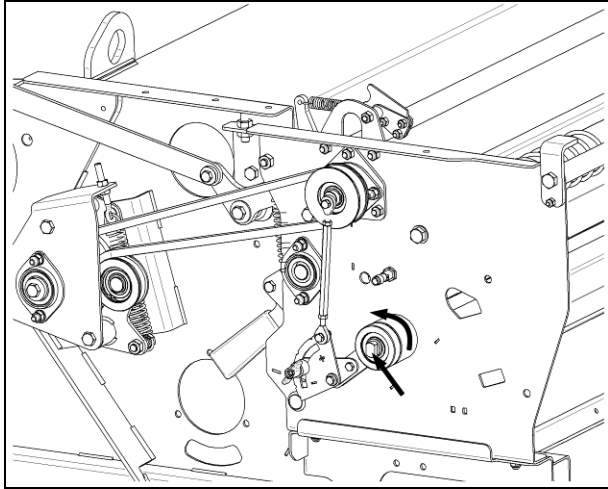


Fig. 27 – Manual net cutting

5.4.8 Twine binding



In the twine binding, there are two cutting blades, always use the anti-cut gloves and pay lot of attention when working on the twine binding.

The twine binding is not recommended in case of collection of very short materials and when using a cutting device (CUT version).

The twine binding can contains 4 coils having the following dimensions:

- Outer diameter max 250 mm
- Height max 270 mm

The twine binder binds the twine forming a spiral around the bale (Figure 10). The winding is performed using the rotation of the bale inside the chamber and the movement of the two carts in the longitudinal direction. Each cart is powered by a coil. The coil in use can be linked to a spare one: in this way when the first coil is fished, the twine of the second coil will enter the binder without having to repeat the operation of twine passage. So in the tray placed under the binding there will be two supply coils (one for each cart) and two spare coils.

To set the machine to the twine binding it is necessary to:

- 1) Place the 2 coils (A, fig. 28) and the two spare coils (B, fig. 28).

- 2) Tie the end of the principal twine to the head of the spare coil as indicated in section 4.7 (Fig. 28), then pass the tied twine through the guide-rings.
- 3) Twines have to pass inside the driving bush, come out from the frame and curve inwards across the twine-brake (C pic. 28), then the twine that come out from the front driving bush has to be wrapped around one of the 4 diameter of the driving force pulley (D pic. 28). The twines now have to curve inwards across the driven bushings that go to the twine sliding rollers (pic. 29).

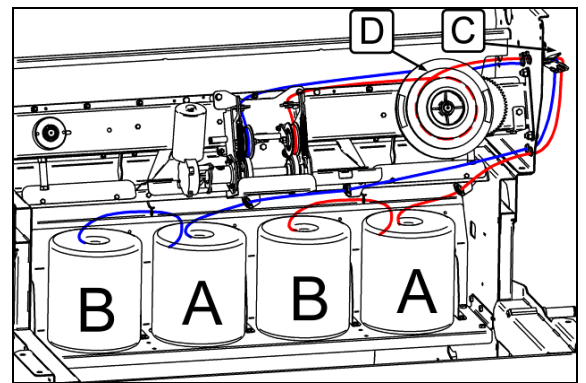


Fig. 28 – Passage of twine

- 4) Slightly open the dragging rollers using the levers A in Fig. 29, then insert the twine in the guide bushes for a length of approx. 15 cm.

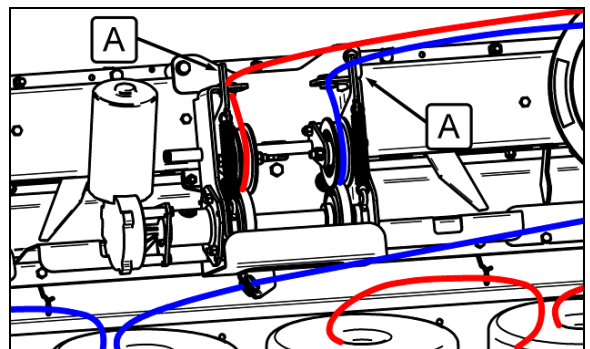


Fig. 29 – Passage of twine

- 5) To avoid the operation of twine passage, it is recommended to move the spare coil in the feeding position before this ends, in this way it is possible to place a new spare coil linking to the one in use as indicated above.
- 6) Through the adjustments of the twine binding, it is possible to modify:
  - The distance from the edge of the bale (4-8-11 cm)

- The step of the turns (6-8-11-17 cm)
- The braking of the twines

The meaning of the binding parameters is indicated on the Par. 4.7.

The values of the edge distance and pitch coils are orientative because irregularities of the material and of the bale rotation speed can significantly change these values.

The distance from the edge of the bale can be changed by moving the switch installed in the twine binding (fig. 30, A). The more externally they are set, less will be the distance between the margin of the binding and the edge of the bale.

The pitch of the coils can be changed by changing the throat of the driving pulley (B, fig. 30) on which the wire is wound: the lower is the diameter on which the twine is wound the, the lower the pitch of the coils binding.

The braking force of the twines can be adjusted acting on the screws indicated with the letter "C" on the Fig. 30. Every twine has its own adjustment screw.

A too low braking force may cause an irregular binding with a not constant pitch of the turns and distance from the edge.

An excessive braking force can cause a sliding between the twine and the dragging rollers.

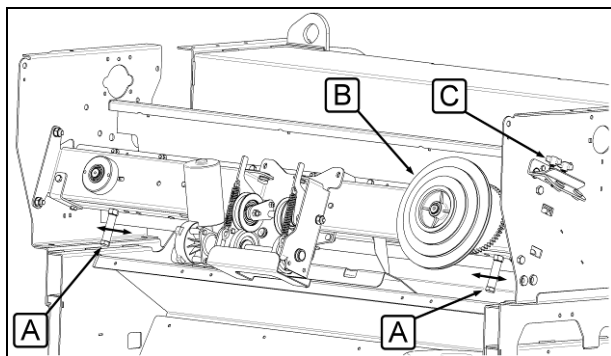


Fig. 30 – Adjustments of the twine binding

The twine binding process always starts with the trolleys in a central position and with the twines placed at the center of the bale.

Once the binding starts, the trolleys capture the twine and move to the outside of the bale making the spiral binding, up to reach and exceed the limit switches which regulate the distance of the twines from the edge of the bale.

At this point the trolleys stop in the outboard position to make a few revolutions of the heads after that they return towards the center of the bale to reach the knives which cut the twine.

In case the binding twine fails, it is necessary to:

- Stop immediately the P.T.O.
- Check if the path of the twines is correct.
- Check that there are no knots or tangles of twine in the coils.
- Check that the twine slides smoothly along its path.
- Check the power set on the twine brake.
- Check the position of the trolleys and eventually take them in a central position by rotating the driving pulley.
- Check that the trolleys has caught the twine.
- Check the sharpness of the twine cutting knives.

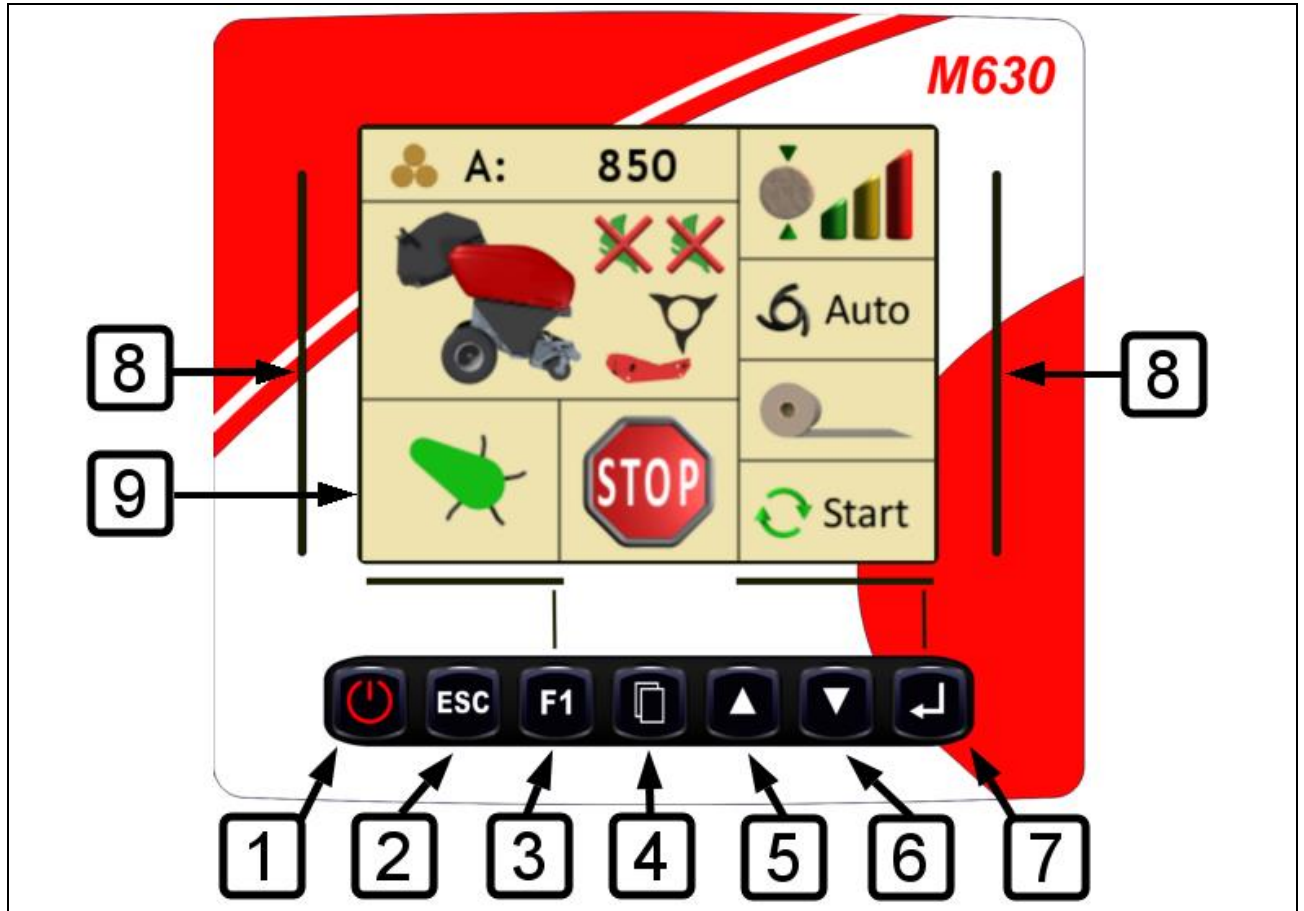


Fig. 31 – Monitor M630

5.5 MONITOR M630



WARNING

Before starting up the baler, make sure that all around the machine there are no people or animals. Make sure you can still have a great visibility.

The working phases of the machine are monitored and controlled by the control system.

The control system of the baler consists of a control unit on the machine and a terminal with which the user is interfaced.

The terminal should be installed inside the cab of the tractor in a place of easy access and visibility.

The figure 31 shows the terminal with various buttons, followed by a brief description of each.

- 1) **Power ON/OFF button:** To turn on the panel just press once, to turn off keep it pressed for 1 second.

- 2) **ESC button:** It exits from a command or the change of a parameter without saving the changes made.
- 3) **F1 button:** Select the control of the drop bottom or of the knives (CUT version); to switch on the selected control press Enter.
- 4) **MENU button:** it is used to access the counter menu or the main menu.
- 5) **Navigation key:** it allows to move the selection up between the various areas of the display.
- 6) **ENTER button:** depending on the icon displayed in the lower right, it allows you to perform the following actions:
  - a. **Start:** it starts the selected binding
  - b. **Modify:** it modifies the selected parameter
  - c. **OK:** it allows the activation of the selected command.

- d. **X - ESC:** Pressing the **Enter** button for more than 1 second or the **ESC** button, the command working is cancelled
- 7) **Side luminous bars:** they indicate the machine status through different colors and flashes.
- 8) **Display:** it shows the status of the devices on the machine, the parameters set and the various menus.

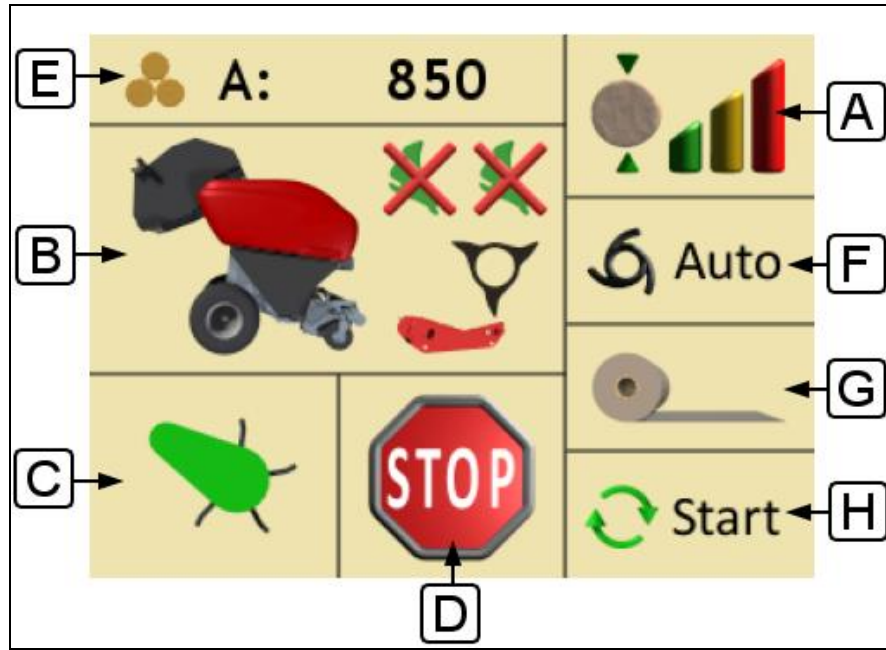


Fig.32 – Operation screen

5.5.1 Operation screen

The operation screen (Fig. 32), is divided into 8 areas in which the machine parameters are displayed. Using the navigation keys, it's possible to select some areas and change the parameters.

- **“Area A”:** it shows the pressure level set. When this area is selected, it's possible to changes the pressure level set by the Enter button.
- **“Area B”:** This space is dedicated to the display of the status of the baler. On the left side there is one of the 7 icons representing the status of the baler.

Below are listed the states of the roundbaler with a brief description:



Status 0: Open rear door. It appears the icon of a red color round baler with the rear door open



Status 1: Rear door closed und chamber not under pressure. The roundbaler becomes green.



Status 2: The roundbaler becomes orange to indicate that the first pressure level is reached.



Status 3: The roundbaler becomes red to indicate that the second pressure level is reached.



Status 4: The roundbaler becomes fuchsia to indicate that the third pressure level is reached and that the rear door has begun to open. The Monitor outputs 3 sound to indicate that the roundbaler has begun the binding and the STOP icon appears on the Area D.



Status 5: the binding icon on the roundbaler appears, to indicate that the binding is in progress.



Status 6: Binding completed: a green arrow to the top appears, the monitor outputs 3 sounds to signal that the rear door is ready to be opened.

During the binding operation, on the left of the Status icon, two symbols could appear:



The hourglass symbol appears during the delay time of binding, i.e. the time that elapses between the achievement of the set pressure value and the beginning of the binding in automatic mode.



The engine symbol appears when the engine of the binder is set. On the right side of this area, when the drop bottom is not completely closed, the following icon appears:



Just above, it displays the status of the cutting device (cut version), relative to the two rows of knives



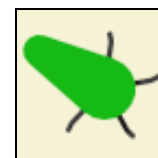
Lifted



Lowered

Area "C": In this area the icons for the command of the pick-up, of the drop bottom and of the knives (CUT version) are shown

Normally only the command of the sole pick-up is active and the following icon appears:

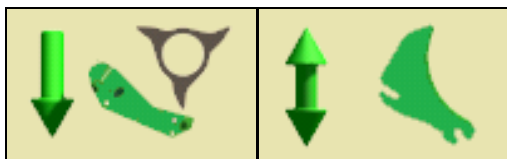


To control the disc tray or the knives it is therefore necessary to:

- View the related icon by pressing the **F1** key



- Press the Enter key to enable the command. One of these icons will appear til the command is active.



- Activate the pickup lever to control the device set.

The command of the drawer switches off automatically after 7 seconds, while the command of the knives must be deactivated by pressing the Enter or the Esc key.

Area “D”: When the machine is ready to harvest, the following symbol appears in this area:



In alternative the STOP symbol will appear



If this symbol appears, it is necessary to stop the harvest of the product, due to one of the following reasons:

- Rear door open.
- Maximum pressure reached.
- Binding in progress or completed.
- Drop bottom open.
- Drop bottom or knives command active.

If the following symbol will appear:



It means that the selected type of binding is not ready to bind.

Net binder: the guillotine is not ready or has released during the activation of the net

Twine binder: the sensor signal doesn't work

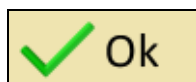
- **Area “E”:** In this area the selected partial counter and the relative numbers of bales are shown
- **Area “F”:** This area displays the selected operating mode: automatic or manual. After selecting the area, setting can be changed whenever you press the Enter key.
- **Area “G”:** This area shows the type of binding set. After selecting the area, it's possible to change the setting whenever you press the Enter Key.
- **Area “H”:** This area shows the function of the Enter button in that moment:



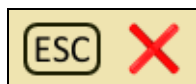
Start: Start the binding.



Modify: Modify the selected parameter.



OK: Active the selected command.



Esc-X: Pressing the **Enter** button for more than 1 second or pressing the **ESC** button, the command or the binding in progress get cancelled

5.5.2 Acoustic signals

The control system of the roundbaler is able to utter different acoustic signals from the terminal.

The acoustic signals have different meanings depending on the status and on the commands given to the machine.

Below the various signal types are listed:

- Sound 1: 1 short beep.

During the collection it indicates the attainment of the pressure previous the one set, that is an alarm that indicates to the operator to slow down the harvesting because the machine is about to reach the set pressure level.

It get uttered during the activation of the drop bottom or knives command (CUT version).

It gets uttered when the binding is manually activated or when it is canceled.

- Sound 2: 1 long beep.

It indicates the attainment of the set pressure level, that is an alarm that indicates to the operator to stop the machine to perform the binding.

- Sound 3: Double short beep

It indicates the end of the binding. It is an alarm that indicates to the operator to open the rear door of the roundbaler to discharge the bale.

5.5.3 Luminous bars

They show the status of the machine through different colors and flashes:

- a. **Green:** Machine ready to harvest.
- b. **Yellow:** the first pressure level reached
- c. **Red:** the second pressure level reached, or binding completed.
- d. **Blue:** Binding in progress.
- e. **Flashing red:** It indicates that the machine is not ready to harvest for one of the following reasons:
  - Rear door open
  - Third pressure level reached
  - Drop bottom open
  - Binders not ready

5.5.4 Menu

The menu looks like a list of selectable parameters, editable by the navigation keys. When you press the Menu key, instead of the operating screen, a drop-down menu with icons will appear. The right side displays the key functions of the terminal.

Pressing once the Menu button, the Counter menu will appear:

	Σ Tot 6752	ESC 
	A: 50	
	B: 120	
	C: 720	 
	D: 360	
B: >> 000 <<		 Ok

Fig. 33 – Counters menu

The first row shows the total number of the bales.

The following rows show the 4 partial counters (A,B,C,D) with the numbers of the bales stored. The active counter is marked with a check mark.

To change a counter, select the desired counter and press the Enter button: this way you enter the modification modality

By the arrow buttons it's possible to increase or decrease the counter and by the F1 key it can get set to zero.

By the ESC key, the modifications get cancelled

Selecting the Enter key the eventual modifications made get saved and the selected counter starts.

Selecting and pressing the Enter key, last Menu item, you'll get into the Statistics Menu:

		ESC 
	/h 64	
	120	
	20	
	84	
		

Fig. 34 – Statistics Menu

In this Menu there are the following items:

- Average bale/Hour
- Number of bale net bound
- Number of bale twine bound
- Number of bale using the cut device (cut version only)

To set to zero one of the 3 counters, it is necessary to select the counter desired by the arrow keys and enter into the modification modality by the Enter key.

Select the F1 key to set to zero the counter and select Enter to confirm or Esc to cancel the modification.

By the Esc key you'll get back to the Counter Menu.

From the Counter Menu, entering again the Menu key, you'll get to the Main Menu:

Menu		ESC	↩
 2 s		⬆	⬆
 3 s		⬇	⬇
 80%			
 100%			
 >>			...

Fig. 35 – Main menu

The menu items are, in order:

- Net binding delay time: 0-5 s
- Twine binding delay time: 0-5 s
- Volume
- Brightness
- Settings Menu

Using the arrow keys you can select the various parameters. Once selected, in order to change them, press the Enter key, then increase or decrease the value using the arrow keys. To confirm the changed value, press the Enter key again or press the Esc key to exit without changing the value.

By selecting Settings menu and pressing the Enter key the submenu opens.



CAUTION

The Settings menu is reserved to qualified staff who have fully understood the operation of the devices and the control system of the baler.

The Settings menu items are, in order:

- Net binding installed (Yes/No)
- Twine binding installed (Yes/No)
- Cutting device installed (Yes/No)
- Inputs diagnostics
- Outputs diagnostics

		ESC	↩
 ✓		⬆	⬆
 ✗		⬇	⬇
 ✓		T 01.10	
 + >>		E 01.04	
 + >>			...

Fig. 36 – Settings menu

On the right side it will appear the functions of the buttons and the software version installed on the terminal (T) and on the control unit (E)

Selecting the item Inputs and pressing Enter is possible to enter the Inputs Diagnostics Menu.

This menu allows the view of the status of the sensors installed on the machine.

On the left column is possible to visualize:

- Status pressure switch P1
- Status pressure switch of the knives P<40 bar
- Status drop bottom sensor
- Status knives sensor (left side)
- Status left twine sensor

On the right column is possible to visualize:

- Status pressure switch P2
- Status rear door sensor
- Status cutting net sensor
- Status knives sensor (right side)
- Status right twine sensor

							
 P1		 P2					
 <40bar							
							
 ←		 →					
 ←		 →					

Fig. 37 – Inputs diagnostic menu

The menu inputs Diagnostic is for display only.

From the Settings menu, selecting the outputs Diagnostic item and pressing the Enter key you can access the menu Diagnostic outputs.

This menu allows viewing and activation of outputs of the control system (motors and solenoid valves).

 		
 		
 		
 		
  P  N 		
		Ok

Fig. 38 – Outputs diagnostic menu

The menu items are, in order:

- electromagnet net binder
- Motor twine binder
- Drop bottom Solenoid
- Solenoid knives

Using the arrow keys you can select various menu items. Once you select an output you can activate it using the Enter key. The commands of the motors are activated for the time when you press the Enter key while the commands drop bottom and knives remain active.

To disable them press any button.

In the right side of each item is displayed on the power output.

5.5.5 Software updates

The control unit and the terminal operate thanks to a program (software) memorized in each unit.

The control software, as all the machine devices, is always under evolution, in order to satisfy the client's requests for the different uses of the round baler.

It's possible to verify the software version that is installed on the machine, going in the Settings menu (fig. 35).

It is possible to ask the most up to date version of the software getting in touch with your dealer or the manufacturer.

Before requesting an updated version of the software, make a note of the currently installed version of the software (Settings menu).

So, to upgrade you need to obtain a micro-SD card in which the control system files are stored.

The micro-SD card HC, XC, HS are not supported. A micro-SD compatible is the Transcend micro-SD 2 GB cod. TS2GUSD.

The micro-SD must be formatted FAT.

You can update the software, the graphics and/or the parameters EEprom of the control system.

The updated files have to have the following names:

- SL35_VT.hex (Software Monitor)
- GRAPH_35.NOR (Graphics Monitor)
- SL35_VT.EEP (EEprom Monitor)
- ECU_M630.hex (Software ECU)

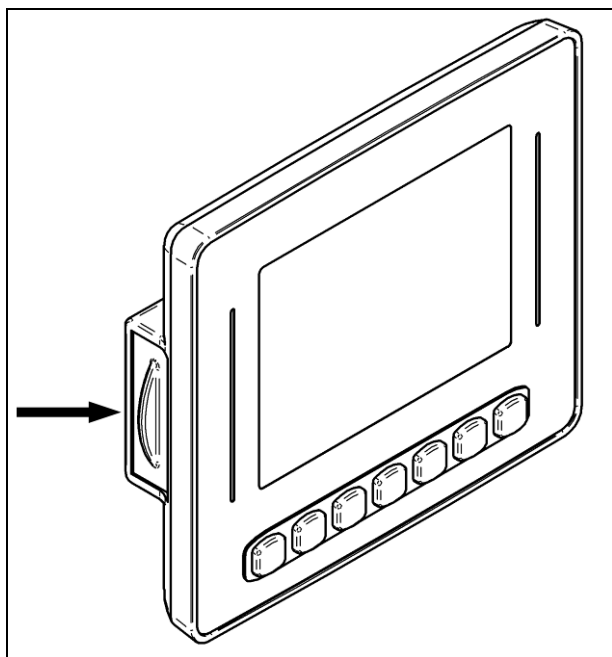
You can only update one or all of the updated file by following this procedure:

- Make sure you copy the update file to the highest level of the micro-SD card and the terminal is turned off. Then remove the rubber cover and insert the card into the terminal slot (fig. 39).

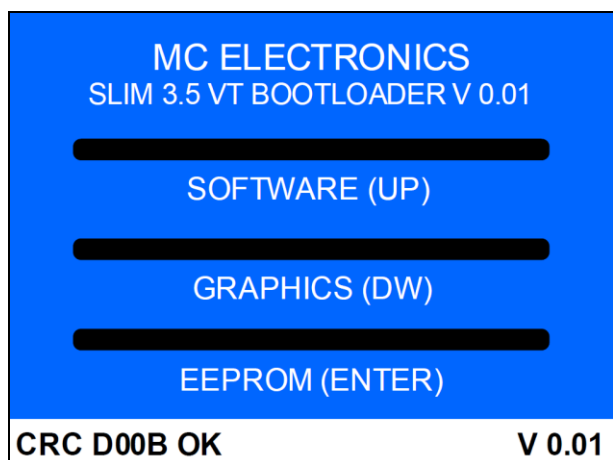


WARNING

Remove and put the SD card always and only with the terminal off!

**Fig. 39 – Slot micro-SD**

- Put the micro-SD, keep pressed the ESC and ENTER buttons, so switch on the monitor with the POWER button. The BOOTLOADER screen will appear. (fig. 40).

**Fig. 40 – Bootloader screen**

- Press the 5 button (UP) to start the loading of the software; press the 6 button (DOWN) to start the loading of the graphics; press the 7 button (ENTER) to start the loading of the EEPROM parameters. (the three procedures cannot be started simultaneously, but you must always wait until the end of the previous).
- If you press the Menu button it goes to the CAN DOWNLOADER screen on a dark green color. On this screen is possible to

update the software of the ECU pressing the 5 button (UP).

- During the loading and until the end the two RGB LED bars of the monitor is illuminated in yellow. Progress is represented with filling progress bar. If an error occurs a message is displayed at the bottom.

➤ **WARNING**

Don't shut off the monitor during this phase!

- In the lower white band appears, on the left the checksum (CRC) and on the right the application of software currently loaded. In case of incorrect checksum appears "ERR" in red.
- Shut off and restart the terminal.
- Verify from the MENU IMPOSTAZIONI if the software has been loaded and its updating version

5.6 USE OF THE ROUNDHALER

The roundbaler DIAVEL 630, DIAVEL 630 CUT, can be used in manual or in automatic mode through the parameters set by the operator.

Before using the round baler, make sure to:

- 9) Have read and well understood the user's manual.
- 10) Have opened the top of the rear door.
- 11) Have properly connected the drawbar to the tractor and lifted the standing foot (par. 5.2.2).
- 12) Have properly connected the PTO SHAFT to the tractor (par. 5.2.3)
- 13) Have properly connected both the hydraulic and electric system to the tractor (par. 5.2.5, 5.2.6).
- 14) Have properly adjusted the pick-up and the presser plate (par. 5.4.1; 5.4.2).
- 15) Have correctly loaded the net and/or the twines and set the binders to work (par. 5.4.7, 5.4.8).
- 16) Have the ladder in working position (par. 5.3.2).
- 17) Make sure that the safety devices and guards are intact and closed. And that

maintenance operations have been completed.

- 18) Check the state of the pick-up, of the draw bar and of the collection devices. In case of damages, do not start working before the repairs have been carried out.

5.6.1 Settings

After verification of the suitability and have performed the adjustment of the baler as indicated in the previous paragraphs, it can be set on the terminal the work's parameters.

On the operation screen, select the parameter to modify using the navigation keys. Press Enter to change the parameters.

To use the drawer or the knives, press the F1 key and then Enter to confirm.

The values set in the working screen are shown in the following table, which refers to the figure 32 to indicate the position of the values on the screen.

Parameter	Position	Values
Pressure inside the chamber	Area "A"	Low-middle-high
Function: pick-up distributor	Area "C"	Pick-up, drop bottom, knives
Function: binding	Area "F"	Automatic, Manual
Type of binding	Area "G"	Net, Twine

Pressure can be set to three levels: minimum, medium, maximum.

The binding operation can be set both manually or automatically:

- Manual: The machine beeps when the bale reaches the set pressure, the operator must press Enter to launch the binding operation.
- Automatic: The machine beeps when the bale reaches the set pressure and the machine will start binding after a while.

5.6.2 Harvesting operation

After adjusting the machine for work and checking safety and maintenance, check that the round baler is prepared to harvest "state 1" – it shall appear the following icons in the areas "B" and "D" in Figure 32.



If the round baler is in another condition the stop sign will be in "D" meanwhile the light bars on the control unit will flashing on red, it needs to make the necessary steps bring it into the "condition 1": the icons like pict. 32 must appear on it.



Alarm with green roundbaler: It means that the binder selected is not ready to tie: arming the knotter knife net (par.5.4.7) or control the position of the string and of the trolleys of the twine tying. Also make sure that the dowel is not opened and both (dowel and knives) not actives.



Status 0: Roundbaler's icon with red with rear door opened: close the rear door.



Status 4: Roundbaler's icon Fuchsia, pressing chamber with maximum pressure, start binding.



Status 5: Roundbaler's icon with binding in progress and lighting bars in blue color: wait the end of the binding with the P.T.O. activated.



Status 6: Roundbaler's icon red with a green arrow, chamber full with tied bale, open the rear door and discharge the bale.

When the control unit return to state 1 (roundbaler green) you can start collecting material.

Make sure there are no other people or foreign organs in the work area, then engage the PTO and bring it to 540 rev / min.

Proceed with the collection following the instructions of section 4.5.

The image of the round baler in the area "B" and the terminal of the light bars will change color depending on the pressure level reached:

- Roundbaler and lighting bars yellow/orange: minimum pressure reached.
- Roundbaler and luminous bars red: middle pressure reached.
- Roundbaler fuchsia and luminous bars flashing red: maximum pressure reached.

You can control the pressure in the chamber even through the manometer installed in the front of the machine.

Just before reaching the set pressure, the terminal will beep (1 sound).

At that point it is necessary to slow the speed of harvest and continue to move forward until it reaches the set pressure; the terminal will emit the sound 2.

At this point, depending if sets the automatic or manual binding mode, the round baler will have a different behavior.



CAUTION

Do not continue the collection of the material after reaching the maximum pressure. Otherwise it may result in serious damage to the machine.

5.6.3 Automatic binding

The use in automatic mode provides that, on reaching the set pressure level, the binding is activated independently from the machine, after a delay time.

The delay time can be set from 0 to 5 seconds from the settings menu.

During the binding, the luminous bars of the terminal will become blue and in the area "B" of the display will show the following icon:



Status 5: Roundbaler's icon red with the symbol of binding in progress.

When the binding is completed, the monitor emits the acoustic signal 3, the lighting bars become flashing red and on the area "B" appears the following icon:



Status 6: Roundbaler's icon red with red arrow; pressure chamber full and tied bale, discharge the bale.

5.6.4 Manual binding operation

The use in manual mode provides that, when the pressure level is achieved, the monitor emits the Sound 2.

At this moment the operator can decide to start binding or continues to harvest to increase the pressure inside the chamber.

On the Area "H" shall appear the word "Start", if not, press "ESC".

To start the binding operations press Enter for 1 second, the binding starts without delay.

If the operator continues to collect up to the maximum allowable pressure, the door will begin to open automatically, and you see that the Stop symbols, baler Fuchsia and Light Bars will become flashing red.

If the operator press the Enter key during harvesting, the binding operation starts even if the set pressure has not been reached.

5.6.5 Bale discharge

When the Status 6 has been reached, the monitor indicates the end of the binding phase and the necessity to discharge the bale.

To discharge the bale is only necessary to open the rear door acting to the hydraulic distributor. Ensure that the bale is ejected before to close the rear door. Follow the instructions indicates on the paragraph 4.8 about the discharge of the bale.

When the roundbaler detects that the door is open, there is no pressure in the chamber and has been reset the network cutting knife, the roundbaler goes into Status 0 with the rear door open.



Status 0: Roundbaler's icon red with the rear door open; close the rear door.

After the discharge of the bale and the closing of the rear door, ensure that in the Area "B" appears the roundbaler's icon green before to proceed to harvest.

6 MAINTENANCE**6.1 MAINTENANCE**

Below is a description of the different routine maintenance.

You should remember that the lowest cost of operation and long life of the machine depends on the observance of these rules.

If maintenance operations are carried out with care, the advantage will be only of the user as to the resumption of the work will find a machine in optimal conditions.

The intervention times reported in this manual are just indicative and are related to normal working conditions, which, however, can vary by kind of use, more or less dusty environment, seasonal factors, etc..

In harsh operating conditions, maintenance should be carried out more often.

**WARNING**

Before proceeding with any operation, make sure the machine is leveled and that it is blocked with suitable chocks under the wheels or that the parking brake is engaged.

Maintenance, adjustment and preparation for the work must be performed with the tractor stationary, parking brake engaged, engine off and the ignition key removed.

**CAUTION**

The lubrication points on the machine are marked with the sticker "greaser" (par. 2.3). Before injecting grease through greasers, you must carefully clean the grease connectors to prevent mud, dust or foreign bodies from mixing with the lubricant, decreasing, or even annulling, the effect of lubrication. Avoid introducing too much grease in the greasers. The introduction in the greasing point of a large amount of grease with high pressure, can damage the bearing shields. Do this with caution.

Wipe with a coat of antirust the abraded areas.

**WARNING**

Keep lubricants, oils, solvents and paints out of reach of children. Carefully read the instructions and safety warnings on containers of liquids used.

After use, wash carefully and thoroughly.

Treat waste oils in accordance with the requirements of anti-pollution.

The following table sets the oils and lubricants recommended for the different parts of the machine

Part	Lubricant	Q.ty
Hydraulic system	ENI MULTITECH 15W-40	2 – 4 L
Chains lubrication	ISO – VG 100	2 L
Gear box	SAE.140EP	2.4 L
Greasing	MAX NLGI 2	As scheme

6.2 PTO SHAFT

As regards the maintenance of the PTO shaft, you must follow the instructions provided by the Manufacturer itself, in the instruction manual supplied with each PTO.

6.3 ROUTINE MAINTENANCE

Repeat with frequency these checks which, however, must be done at the beginning of each season.

The following charts, indicates the lubrication point of the machine, with the quantity of lubrication needs and the waiting time of each lubrication.

The amount of fat is expressed in cm³, for most of the pneumatic greasers equals approximately 1 cm³.

The greasing points are grouped in certain areas of the machine.

Alternatively, you can choose the option of the central greasing system which reduces the number of grease points and shares the amount of grease depending on the bearing size.

Manual greasing

Point	Name	Quantity (cm ³)	Interval (hours)
1-6	Right block	0.5	24
7-14	Left block	0.5	24
15-26	Rear door	0.5	24
27	Left cylinder (drop bottom)	0.5	24
28	Right cylinder (drop bottom)	0.5	24
29	Parking feet	1	50
30	Chain Lubrication	4 L (max)	12

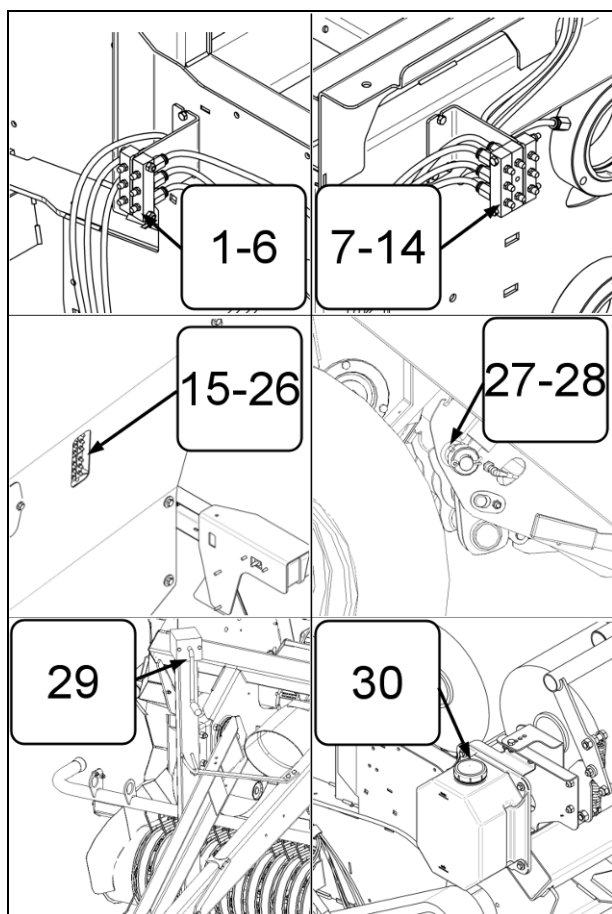


Fig. 41 – Lubrication points (manual system)

Centralized greasing (optional)

Point	Name	Quantity (cm ³)	Interval (hours)
1	Right distributor	1	8
2	Left distributor	1	8
3	Rear door	1	8
4	Left cylinder (drop bottom)	0.5	24
5	Right cylinder (drop bottom)	0.5	24
6	Parking feet	1	50
7	Chain Lubrication	4 L (max)	12

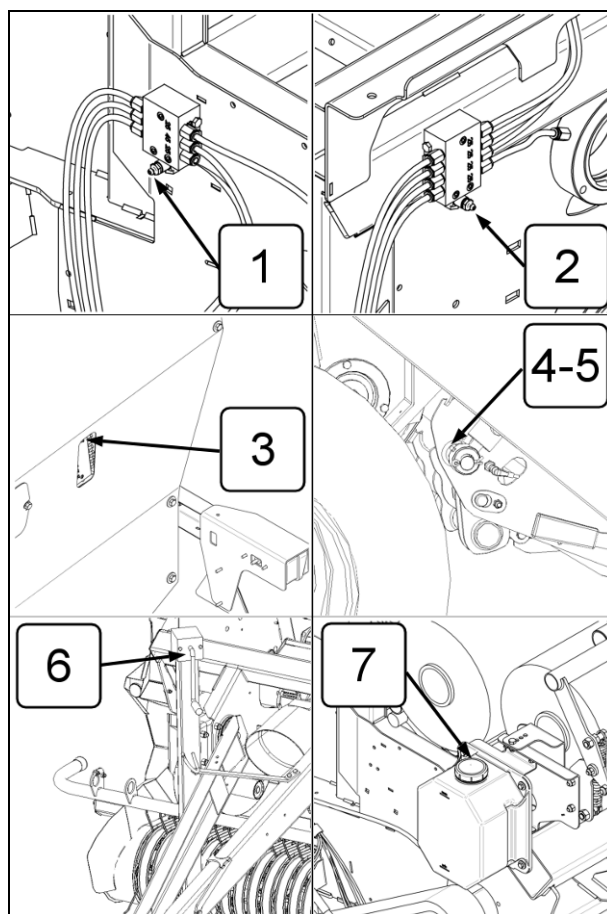


Fig. 42 – Lubrication points (centralized system)

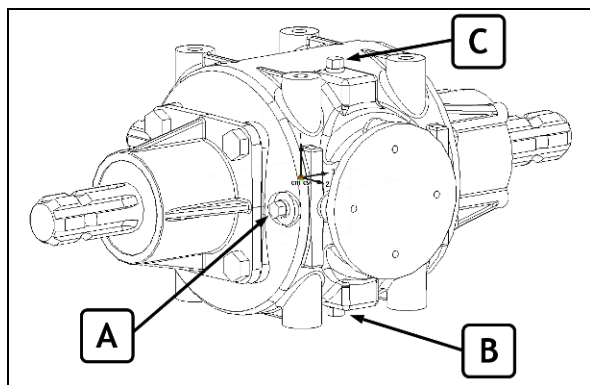


Fig. 43 – Gear box with level cap (A), discharge cap (B) and filling cap (C).

6.3.1 After the first 10 working hours

After the first 10 working hours check:

- The state of the machine.
- The tightening of all fasteners (par. 2.1.3).
- The tension of the drive chains.
- The absence of oil leaks from the hydraulic system.
- The tire pressure (par. 3.4.1).
- The lubrication of transmission components.
- The state of protections.
- The oil level in the gearbox via the oil level plug.
- The presence of air in the hydraulic brake system (optional), eventually draining the system by acting on the drains on the back of the brake cylinders (par. 8.3.1).

6.3.2 Every 8 working hours:

Every 8 working hours:

- Perform a thorough cleaning of the machine.
- Lubricate the components specified in the lubrication chart.
- Check the level of oil in the automatic chain lubrication.
- Restore the correct chain tension
- Check the integrity of the electrical system.
- Make sure there are no leaks in the hydraulic system and the proper functioning of the drives.
- Remove any material wrapped around the rollers and any residual twine or net caught in the machine.

6.3.3 Every 24 working hours

Every 24 working hours:

- Check the state of the machine.
- Lubricate the components specified in the lubrication chart.
- Check the tire pressure (Section 3.4.1).
- Check the condition of the fingers of the pick-up and replace if necessary.

6.3.4 Every 50 working hours

Every 50 working hours:

- Remove the blades and proceed with the sharpening (cut version only).
- Check the oil level in the gearbox the oil level plug and possibly fill from the fill plug (fig. 43).
- Drain condensation from the pneumatic braking system (optional).
- Lubricate the drive shaft following the quantities and procedures indicated on the PTO shaft operating manual.

6.3.5 Every 400 working hours

Every 400 working hours:

- Check for signs of dents or wearing and replace any worn part.
- Check the state of the tensioner.
- Check the condition of the net cutting blade and replace if necessary.
- Check the condition of the brake drums (if any).

6.3.6 Every 1000 working hours

Every 1000 working hours:

- Check the condition of the brake lining of net binder and replace if necessary.
- Check the condition of the belts rubber roller and of the rubber roller of the net driving system.
- Change the oil in the gearbox (drain plugs and filling).
- Check the condition of the bearing.

6.4 EXTRAORDINARY MAINTENANCE

The extraordinary maintenance operations must be carried out by expert staff well trained. The manufacturer is available to give information or

explanation on what to do in case of repair or maintenance.

6.4.1 Lifting through jacks

To carry out the operations of substitution of the tires or intervention on the axle, may be necessary to lift the rear part of the round baler.

If no cranes are available for lifting using the upper lifting points, it is possible to lift the rear of the baler using one or two jacks positioned under the framework of the axle.

Before use, make sure that the lifting capacity of the jacks is adequate for the weight of the machine (par. 1.7).



DANGER

It is absolutely forbidden to lift the baler using jacks to a height of over 10 cm. As this can lead to loss of stability of the machinery and heavy loads on the support bracket.

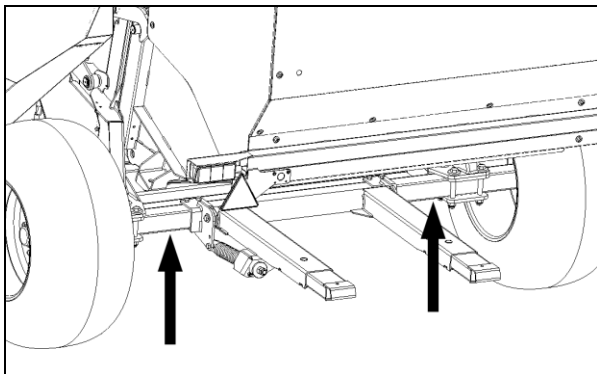


Fig. 44 – Lifting points for the jacks



WARNING

The jacks must be fitted with suitable supports or one side in contact with the round baler made of a non-slip rubber in order to avoid dangerous heeling of the lifted part.



WARNING

Use the lifting by jacks only for interventions on the machine made by trained personnel. Do not leave the machine on jacks for parking or for a period longer than 2 hours.

6.5 MACHINE SETTINGS

The following are all the settings which can be carried out in a machine.

The round baler comes from the factory with settings made correctly, proceed with the settings only if you have problems or malfunctions.

6.5.1 Sensors

The round baler uses inductive sensors for detecting the state of the machine. These sensors detect when a metal object is located at a distance from less than 4 millimeters.

In addition to these sensors, the machine is equipped with two pressure switches which detect the pressing of the bale pressure. These pressure switches are located in the hydraulic block on the right side of the machine, connected to the cylinders of the gate and the front pressure gauge.

The pressure switches are calibrated by the manufacturer and cannot be modified.

A third pressure switch is present in the hydraulic block that handles the knives (cut version).

You can check the operation of the sensor via the terminal:

Menu> Settings> Input Diagnostics

In this menu there is a list of the machine inputs followed by a symbol to indicate whether they are activated or not.

To verify the correct operation of inductive sensors just bring a metal object to the sensor head and check the activation status.

All inductive sensors on the machine must be adjusted to a 2 mm distance from the detection area.

The following chart lists the inputs of the machine.

N°	Sensor	Description
SW1	P1	Signal pressure switch 1
SW2	P2	Signal pressure switch 2
SW3	Pcut	Signal pressure switch knives
DIG1	Drop bottom	Sensor closed drop bottom
DIG2	Rear door	Sensor closed rear door
DIG3	Knives (right)	Sensor knives (right side)
DIG4	Knives (left)	Sensor knives (left side)
DIG5	Net cutting	Armed net cutting blade

DIG6	Twine (right)	Right twine presence lever
DIG7	Twine (left)	Left twine presence lever

6.6 STORAGE

At the end of the season, or if you plan a long period of rest of the machine, you must:

- Make sure the product inside the machine has been completely unloaded.
- Place the machine on a suitable and flat surface.
- Place suitable blocks under the wheels of the machine and make sure that all guards on the machine are in the correct position.
- Wash the machine from any dirt.
- Make a thorough inspection and replace any worn or damaged parts.
- Tighten the bolts.
- Make an accurate lubrication of each point including chains.
- Go with a coat of rust inhibitors on spoiled and abraded areas.
- Keep the machine in a dry and sheltered place.

If these operations are carried out with care, the advantage will be only the user as to the resumption of the work will find an equipment in optimal conditions.

In case of dismantling the machine, follow the anti-pollution laws and, in particular, the disposing of exhaust lubricants and the various elements, according to their differentiated structure (section 2.6).

6.7 PROBLEMS – CAUSES – REMEDIES**WARNING**

Before approaching the machine, make sure that the PTO is disengaged, the tractor is switched off with the parking brake on and the ignition key is disconnected from the dashboard.

PROBLEM	CAUSE	REMEDY
Transmission is too loud	Insufficient lubrication	Check the oil level of the chains lubrication
	Loose chain tensioners	Check the chain tension, adjust the chain tensioner
The rear door doesn't close correctly	Problem with hydraulic system	Check the hydraulic connections between tractor and round baler
		Check the blocking valve of the rear door
	Residuals of material do not allow the closing	Fully open the door, block it using the tap and remove the material
PTO on but the pick-up doesn't work	Clogging of the collection unit	Operate the drop bottom floor
		Raise or completely remove the baffle plate
		Remove residual material on the rotor (WARNING! before stop the PTO and remove the keys from the tractor)
Bale is too light	Wrong setting of the pressure	Adjust the pressure of pressing
		Ensure that the front manometer reaches the red zone during pressing operation.
	RPM are too low	Bring the speed of the PTO at 540 rpm / min
	Collection at too high speed	Reduce the speed of advancement
The bale cannot be discharged	Swath too big	Change the size of the swath
	Too high pressure	Reduce the baling pressure
	Material collected too much on the side	Correct the driving direction of the tractor (section 4.5)
Bad shaped bale	Material that tends to stick on the chamber.	Install the compression plates (Optional)
	Irregular feeding	Correct the progress with the tractor (section 4.5)
Irregular collection	Pick-up too high	Change the height of the pick-up
.021The round baler gets stuck in the feeding unit	Swath too big and irregular	Change size of the swath
	Swath too aside	Correct the progress with the tractor (section 4.5)
	Collection at a too high speed	Stop and go back with PTO engaged, raise and lower the pick-up. Restart driving at a slower speed.

	Too low RPM	Increase the rpm PTO of the baler
Irregular net distribution on the bale surface	The net is not stretched between the support and the binder	Check the net brake
		Check the condition of the wear of the net brake, adjust the roller brake action on the eyelet of the tension spring.
Net is not correctly dragged into the pressing chamber from the material	The net get too much braked	Reduce the force of the net brake.
The net ends up on the rotor	Net braking not sufficient	Increase the force of the net brake.
The ligature doesn't work automatically.	Net/Twine Sensors out of position	Adjust the distance from the sensor (Par. 6.5.1), if persists, change the sensor.
Product is not cut correctly	Cutting knives not activated	Actuate cutting knives
	Knives not sharp	Remove and sharpen knives
Net is not cut correctly	Incorrect positioning of the brake coil	Bring the brake coil in contact with the coil
	Wrong adjustment of the net brake	Adjust the roller brake net acting on the eyelet of the tension spring
	Cutting blade worn out	Replace the cutting blade
Twine not cut correctly	Cutting blade worn out	Replace the cutting blade
Irregular twine ligature	Twine not brake.	Increase the force of the twine brake
Twine ligature only in the middle	The trolleys don't catch the twine	Decrease the winding diameter of the driving pulley
The twine is not dragged by the bale	Incorrect way of strings	Check the way of strings (par. 5.4.8)
	Twine braked excessively	Reduce the braking force of the string
	Presence of knots or tangles in the string or in the coil	Check and remove any knots or tangles of the string
The terminal doesn't switch on	No power supply	Check the 2A fuse located near the control unit
The electro valves and the motors don't work.	No power supply for electro valves/motors	Check the 30A fuse located in the close to the control unit
The terminal cannot detect the net cutting.	Malfunction of the sensor net Cut	Adjust the sensor distance (par. 6.4.1), if the problem persists, replace the sensor
The terminal signals the door open alarm even with closed door	Malfunction of the rear door sensor	Adjust the sensor distance (par. 6.4.1), if the problem persists, replace the sensor
The terminal does not detect the pressure of the bale	Malfunction of the pressure switch P1 e P2	Replace the pressure switch P1 e P2
The terminal detects the bottom floor always open	Malfunction of the drop bottom floor sensor	Adjust the distance from the sensor (Section 6.4.1), if the problem persists, replace the sensor
The terminal does not detect the activation of the cut	Malfunction of the knives sensors	Adjust the sensor distance (par. 6.4.1), if the problem persists, replace sensors

The terminal does not detect the presence of the string	Malfunction of the twine binder sensors	Adjust the sensor distance (par. 6.4.1), if the problem persists, replace sensors
The terminal does not signal the achievement of set pressure	Malfunction of the pressure switch P1 e P2	Replace the pressure switch P1 e P2
The machine does not reach the maximum pressure	Incorrect setting	Set the maximum pressure on the terminal
	Problem to the hydraulic system	Contact service
The parking brake doesn't brake enough	Loose wires	Adjust logs sheaths
	Brakes worn out	Replace the brake linings
The service brakes are not effective and produce ringing or vibration	Brakes worn out	Replace the brake linings
The pneumatic brakes are blocked when connected to the tractor	Insufficient pressure in the system	Check the pressure of the tractor (§ 8.3.2)
The pneumatic brakes are blocked when not connected to the tractor	Release valve not activated Insufficient pressure in the system	Operate the release valve (par. 8.3.2)

6.7.1 Set up of the machine

The round baler DIAVEL 630, 630 DIAVEL CUT are design to work with multiple types of materials, even with very different characteristics between them.

To collect some type of materials, it is necessary to get the machine properly set up to avoid any inconvenience during the working phase. A possible problem could be the twine or net wrapping around the feeding rotor. To avoid it is necessary to set up the machine considering the type of product to collect; the parameters to adjust in this case are:

- Braking net / twine: the braking degree can be easily modified by the adjustment screws located on the left side of the net binder (par.5.4.7) and twine (par.5.4.8). The brake net / twine should be kept normally as previously set in the factory, it should be changed only in case of malfunctions of the tying twine or net.
- Removable Profile scraper (fig. 45): the removable profile helps to avoid that collected material dragging the net or twine on the rotor. In presence of materials that have the particularity to get stuck between the profile and the roller, the profile must be removed: simply unscrew the screw A in Fig. 45.

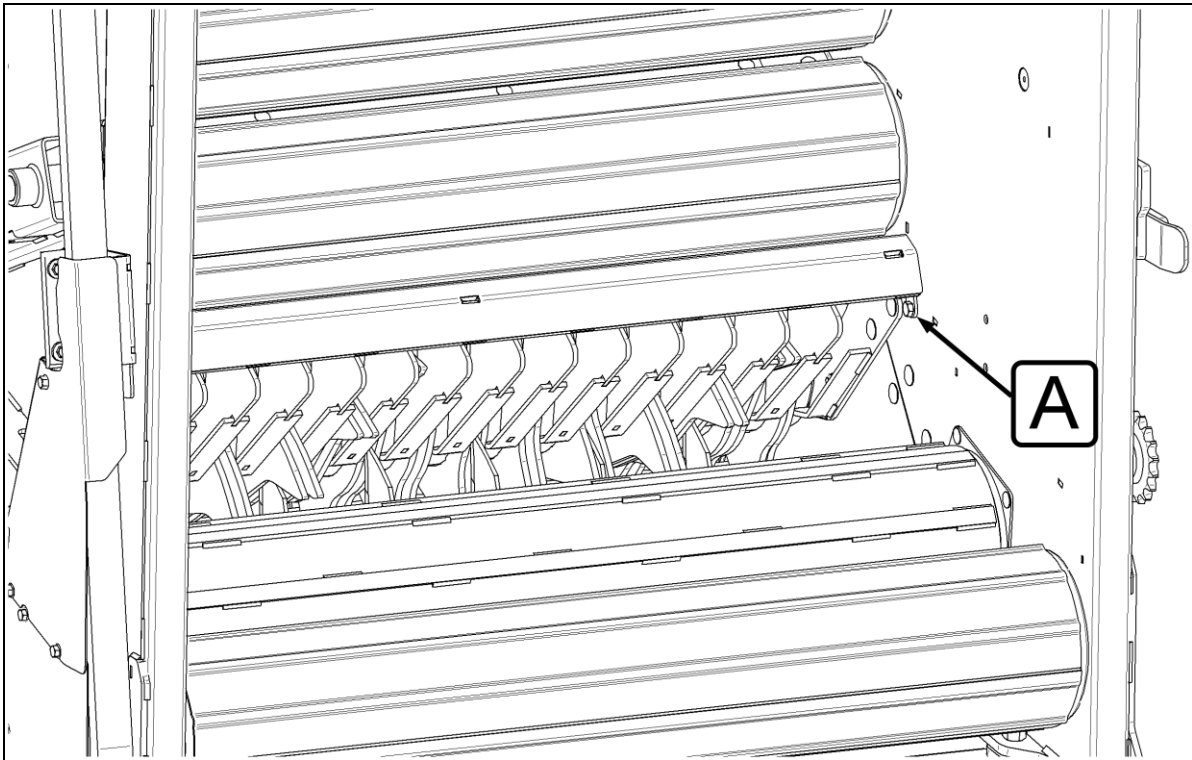
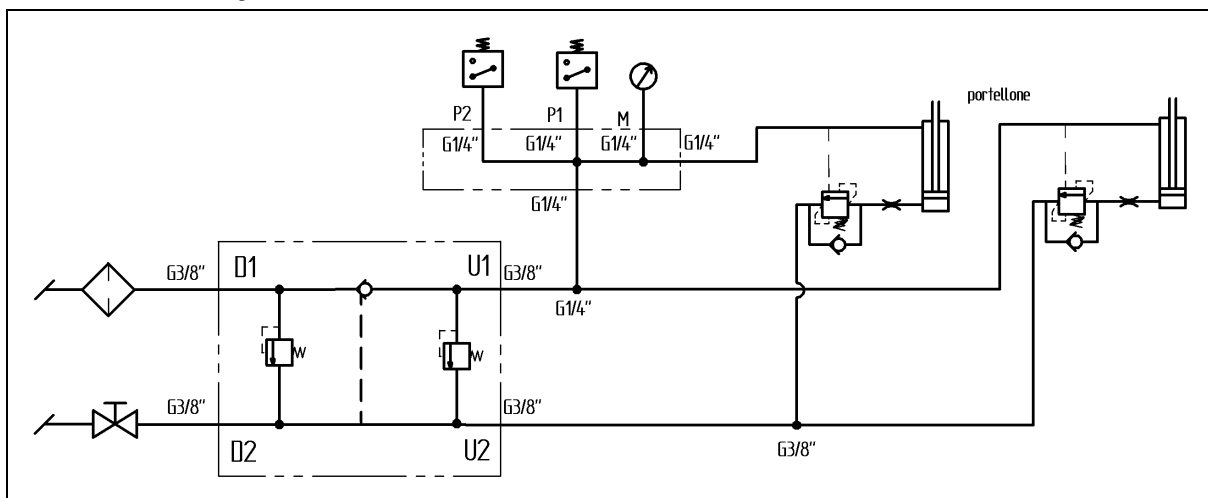


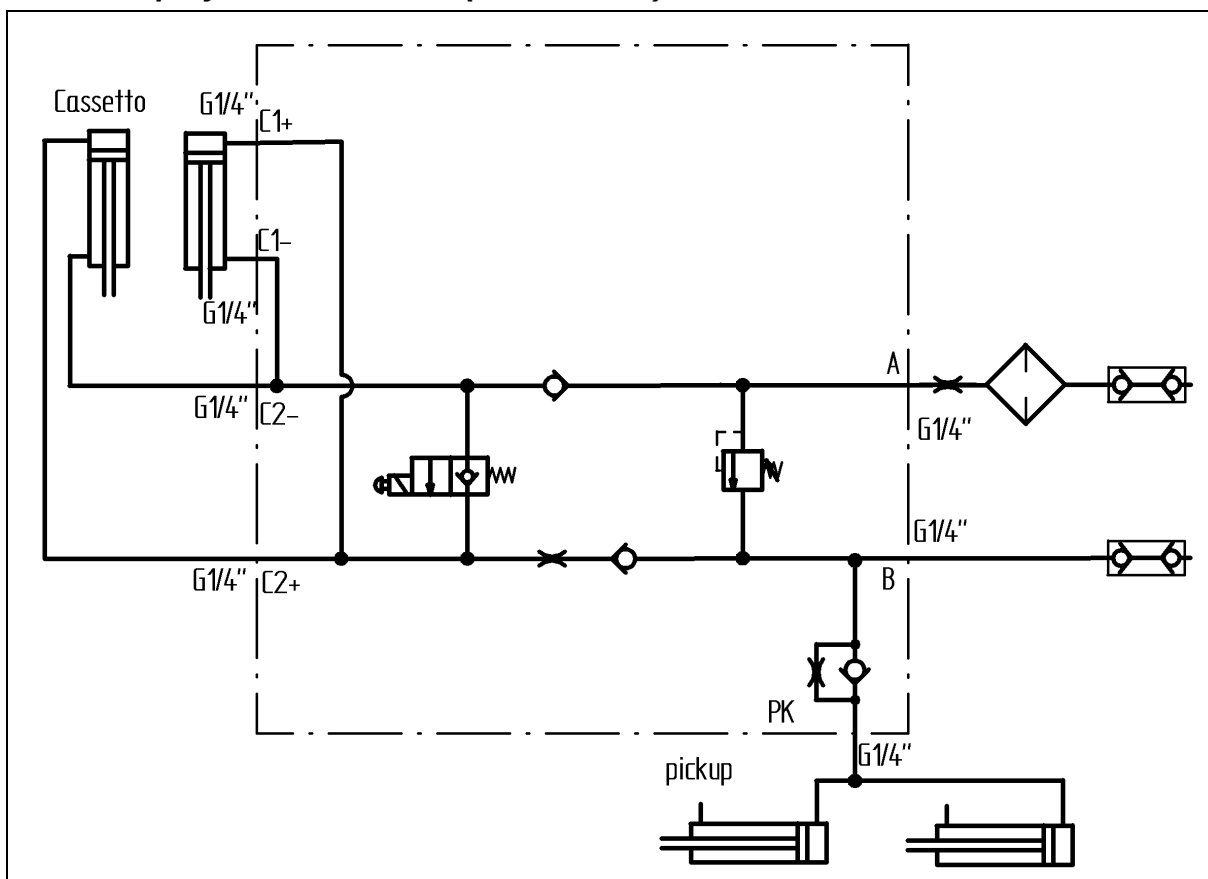
Fig. 45 – Removable scraper profile

6.8 HYDRAULIC SCHEMA

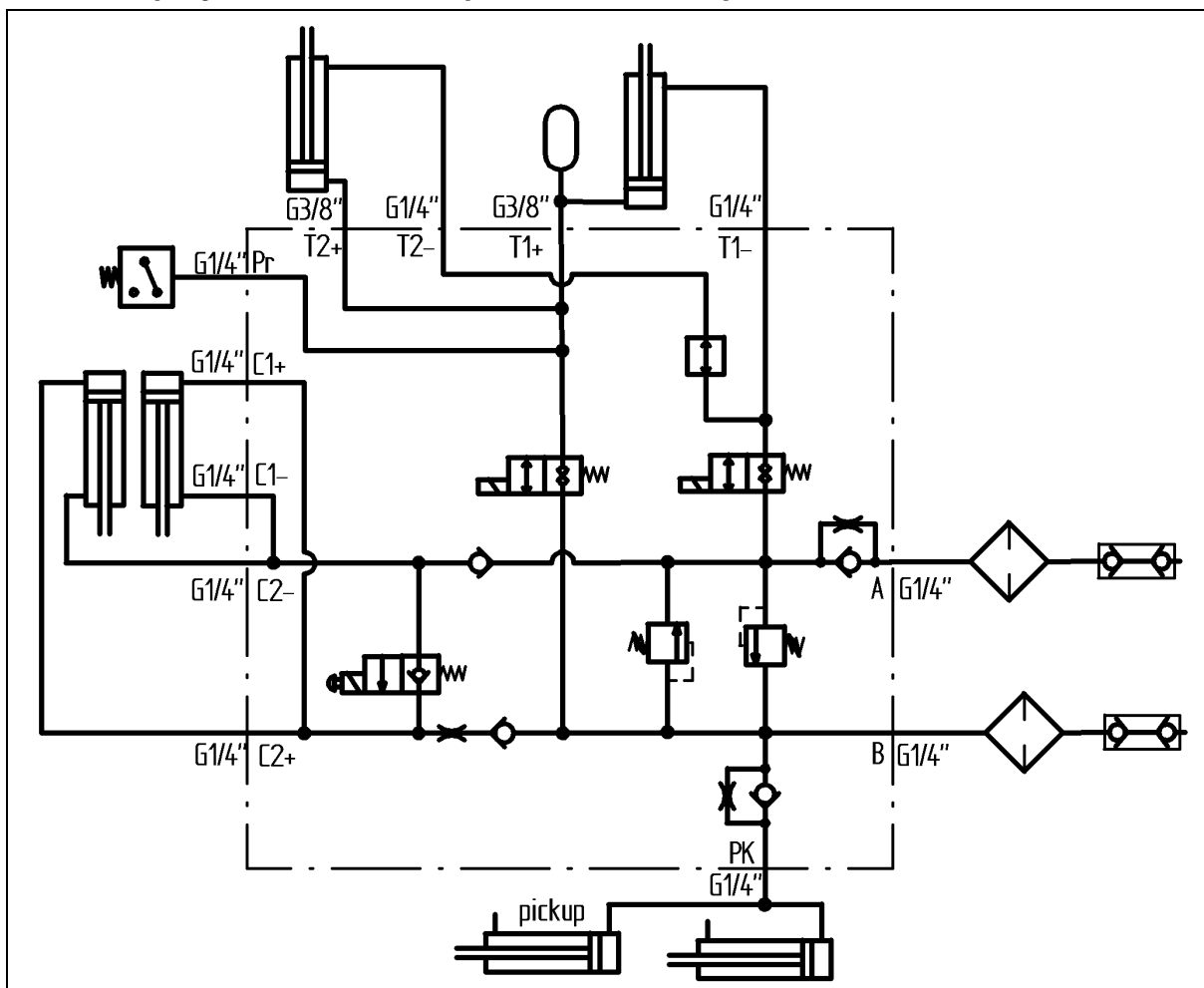
6.8.1 Rear door hydraulic schema



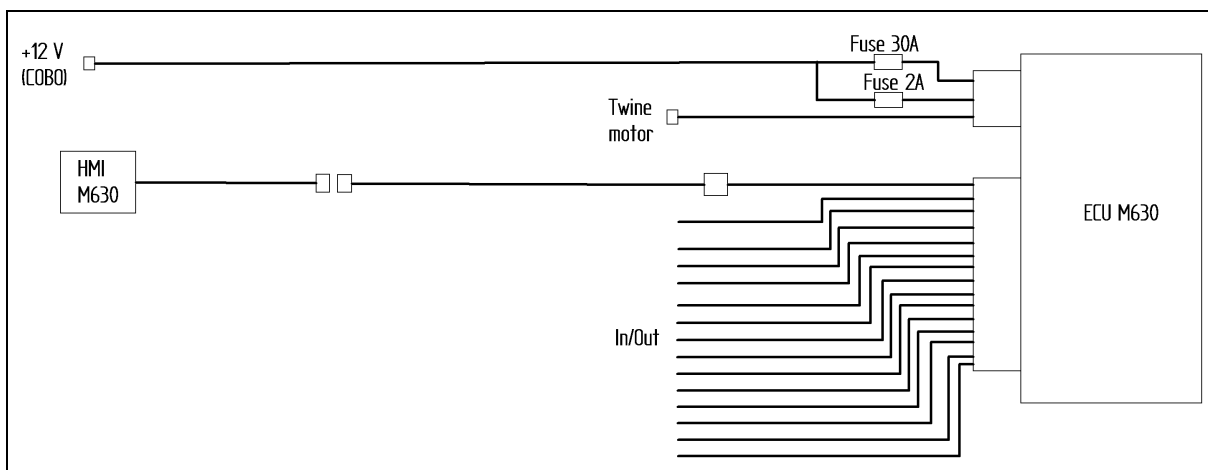
6.8.2 Pick-up hydraulic schema (DIAVEL 630)



6.8.3 Pick-up hydraulic schema (DIAVEL 630 CUT)



6.9 ELECTRIC SCHEMA



7 SPARE PARTS

7.1 SPARE PARTS

All parts of the machine can be requested to the manufacturer specifying:

- Machine model.
- Serial number of the machine.
- Year of production.
- Code number of the desired part (obtainable from the catalog of spare parts), description of the piece and how many.
- Means of transport. If this item is not specified, the Manufacturer, while paying special attention to this service, is not liable for delays in delivery due to force majeure. The shipping costs are always at customer's charge.
- The goods travel at the risk of the buyer even if sold ex warehouse.

Please note, finally, that the Manufacturer is always available for any need and / or spare parts.

7.2 SPARE PARTS CATALOGUE

The spare parts catalog is normally attached to the machine and is available via Internet at: www.mascar.it.

After registration, you can see the spare parts catalog relevant to the machine in possession.

To request a new spare parts catalog contact MASCAR SPA using the references at the end of this manual.

8 ACCESSORIES

The round baler DIAVEL CUT and DIAVEL CUT 630 can be equipped with various accessories depending on the operator's needs, below shows the list of accessories and then some guidelines for the accessories that they need more information.

8.1 LIST OF ACCESSORIES

- Ejector
- Centralized greasing
- Mechanical brakes
- Hydraulic brakes
- Pneumatic brakes
- Wheels 500/50-17 (flotation)
- Fake knives
- Roller crop guard
- Pick-up pivoting wheels
- Drawbar eye Fixed tow DIN
- Bale compression discs
- Battery power cable

8.2 BALE EJECTOR

The ejector is an accessory that leaves the bale after unloading and speeds up the work.

When working without an ejector, it is necessary to withdraw with the machine of a few meters before unloading the bale, and drive forward after the discharge to prevent that rear door damages the bale during closure.



ATTENTION

Do not use the ejector in the presence of land with high slopes.

8.3 BRAKE SYSTEM

For safe driving, the round baler can be equipped with mechanic, hydraulic or pneumatic braking system.

Depending on the country of use, the installation of a type of braking system may be compulsory or not for road use. Follow the rules of the country where the machine circulates to choose the configuration to be adopted for the machine.

In both cases, with pneumatic or hydraulic braking system, the machine will be provided with a mechanical parking brake.

The parking brake consists of a lever on the draw bar of the round baler and a series of cables and steel sheaths. The adjustment of the parking brake can be performed using the casing end threaded which are located at the ends of the relevant sheaths.



WARNING

Always engage the parking brake when you park the round baler near public roads or in areas which are not flat.

Remember to disengage the parking brake when you start moving again with the round baler.



WARNING

It is necessary to check periodically the condition of the brake drums. In case you find poor braking performance and loud noise from the brake contact a service center for an inspection.

The axle seats braking drums are driven by a pair of adjustable levers.

The adjusting of the levers should be performed each time you feel poor braking capacity.

Is necessary to act on the adjusting screw (fig 46) to set the adjusting (deplacing the screw rotation stop). A correct adjusting allows to recover the space from the brake cylinder and the levers maintaining the wheel turning free when not braked.



ATTENTION

Check that the brakes are not blocked after the adjust of the levers.

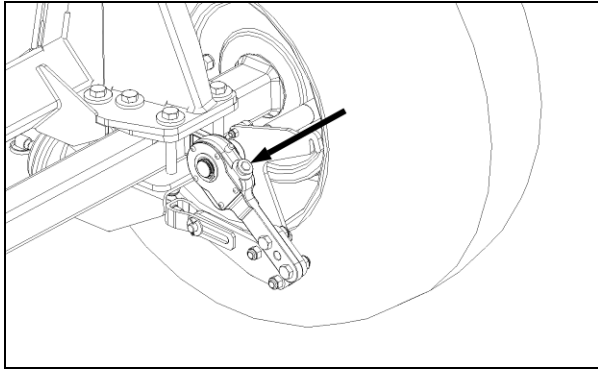


Fig. 46 – adjustable brake lever

8.3.1 Hydraulic braking system

The hydraulic braking system consists of a series of pipes, of a special quick coupling and of two hydraulic cylinders which operate the braking strains.

Before connecting the hydraulic braking system make sure it is compatible with that of the tractor in use, the characteristics of the braking available for DIAVEL 630 and DIAVEL 630 CUT are the following:

$P_{min} = 18 \text{ bar}$

$P_{max} = 100 \text{ bar}$

Where $minP$ is the minimum pressure for the activation of the braking cylinders and $maxP$ is the maximal braking pressure.

The hydraulic braking system to function properly should not contain air inside it, therefore, before the first start of the machine and before putting the machine on the road the system must be liberated from the air inside again after the first 10 hours of operation. To do this you must:

- Connect the braking system to a suitable tractor.
- Get containers, do not spill oil.
- Remove the caps located on the brake cylinders (fig. 47).
- Wait until from the caps holes no more air gets out but only hydraulic oil.
- Screw in the caps and check that there are no oil leaks.

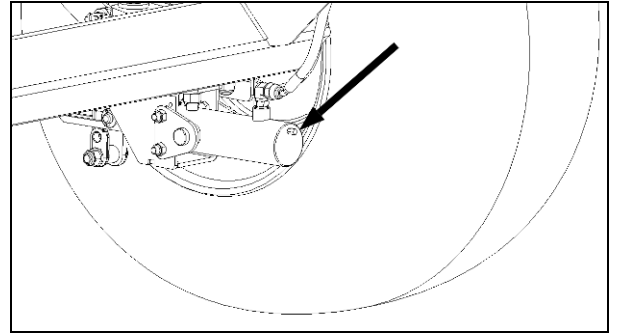


Fig. 47 – Hydraulic brake cylinders



ATTENTION

The hydraulic brake system must be connected to tractors predisposed to this type of brake. It must not under any circumstances be connected directly to the hydraulic valves of the tractor.



CAUTION

It is necessary to periodically check the hydraulic braking system are, in case of oil leakage, contact a service center to repair it.

In case you want to connect the roundbaler with hydraulic braking system to a tractor without a hydraulic trailer brake connection, you can use a special valve (optional) to be connected to the hydraulic distributor of the tractor.

8.3.2 Pneumatic braking system

The pneumatic braking system consists of:

- 19) One or two quick couplings for connection to the tractor.
- 20) A pair of filters
- 21) A release valve brakes
- 22) A proportional distributor for activation of the brakes.
- 23) An air tank
- 24) A pair of brake cylinders

The picture below shows the scheme of the pneumatic brakes representing the various components.

**WARNING**

After connecting the brakes with the tractor, you must wait until the system reaches the operating pressure before starting the baler.

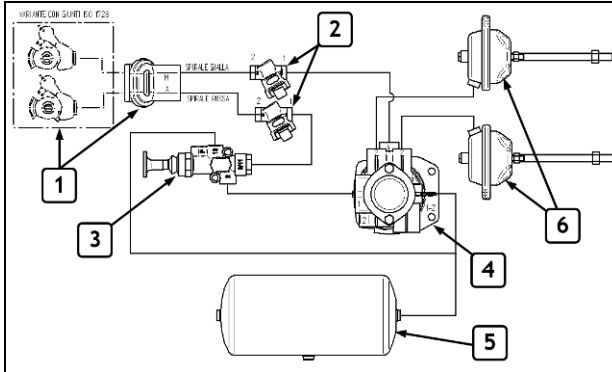


Fig. 48 - Pneumatic braking system

When the system is disconnected from the tractor, the round baler is automatically braked, in order to move the round baler without connecting to the tractor, you must manually operate the release valve (3), placed on the front right side of the machine.

The brake pressure tire must be contained between the values:

minP = 6.5 bar

maxP = 8.5 bar

If the system pressure drops below 2.5 bar, the automatic emergency braking intervenes, to unlock the brakes is necessary to bring the pressure to the operating values.

When the pressure falls below 2.5 bar the release valve is not sufficient to release the brakes

**WARNING**

The automatic braking that intervenes when the system is disconnected, does not replace the parking brake which needs to be engaged in parking position

**CAUTION**

It is necessary to periodically check the condition of the pneumatic braking system, in case of air loss contact a service center to fix it.

Periodically discharge any condensation in the pneumatic braking system by pressing the valve located at the bottom of the tank

8.4 SUPPLY CABLE FROM THE BATTERY

If the tractor is not equipped with a suitable outlet (Sec. 5.2.6), you can request the following cable to be connected directly to the battery:

- Connection cable DIN 9680 (cod. 51002124) - Battery tractor.



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