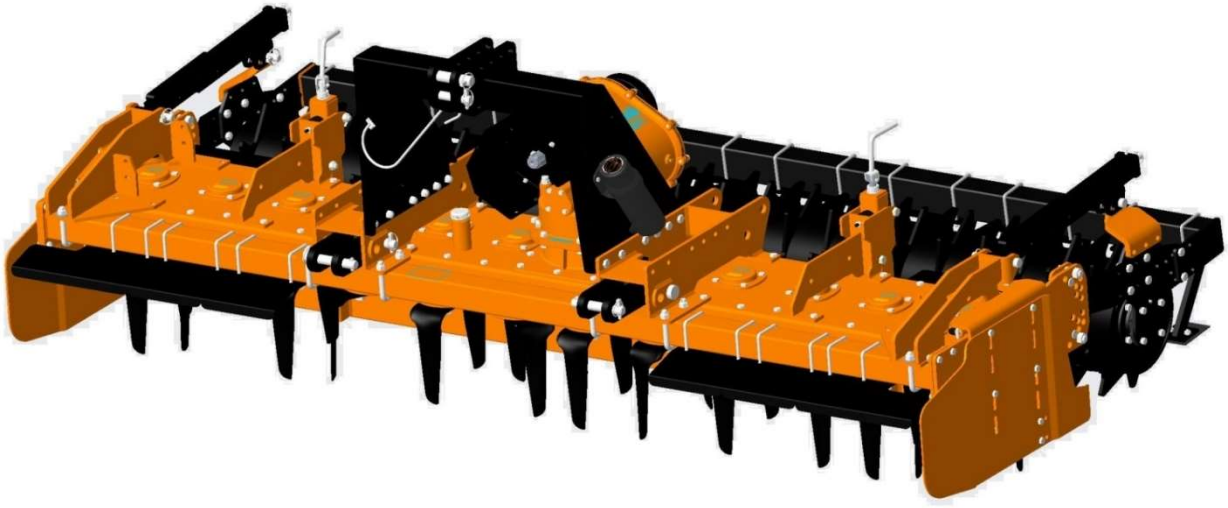
POWER HARROW M120/160 SERIES MODELS 250 (2.5m) 300 (3.0m)

Cosmo Bully



OPERATOR'S AND PARTS MANUAL

CE

OM2514-21EN-000_17

Congratulation for purchasing your new COSMO BULLY Power harrow!

This machine has been designed and manufactured following all safety and quality requirements needed for a safe and satisfactory use over time.

A careful reading of this manual will permit you to familiarize with your new equipment, and will provide you all the tools needed to use it safely.

A proper maintenance and knowledge of the safety rules of use will allow to obtain the best performance and a long service life of the machine.

The Safety Alert Symbol used throughout this manual and on safety decals of the machine indicates the presence of potential hazard to the operator. When you see this symbol, be alert and carefully read the message that follows it.

The Safety Alert Symbol is used in conjunction with following Signal Words, according to the degree of possible injuries that may result operating the implement:

DANGER

Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury.

WARNING

Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.

CAUTION

Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

IMPORTANT

Indicates instructions or procedures that, if not observed, can cause damage to equipment or environment.

NOTE

Indicates helpful information.

READ, UNDERSTAND, and FOLLOW the safety messages following the Safety Alert Symbol and Signal Words. Failure to comply with safety messages could result in serious bodily injury or death.

TO THE PURCHASER

This manual contains valuable information about COSMO BULLY POWER HARROW. It has been carefully prepared to give you helpful suggestions for operating, adjusting, servicing repair parts.

Keep this manual in a convenient place for quick and easy reference. Study it carefully. You have purchased a dependable and sturdy machine, but only by proper care and operation can you expect to get the service and long life designed and built into it.

RIGHT-HAND AND LEFT-HAND sides are determined by watching from the tractor side.

Sometime in the future your power harrow may need new parts to replace those are worn or broken. If so, go to nearest COSMO BULLY dealer and provide him the model and part number.

Customer information

Name _____

Purchased from _____

Purchased date _____

Model No. _____

Serial No. _____

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1. ABOUT THIS MANUAL

The operator must read the manual for a correct understanding of the hazards that may present when operating the power harrow ("the machine"), as well as for obtain optimum performance from the machine.

The manual is part of the machine, it must be kept in good condition and remain with the machine even in case of resale, until its demolition. In case of loss or damage, request a new copy to the Manufacturer or your Dealer.

The information, descriptions and illustrations in this manual describe the state of the product at the time of its publication, and may not reflect the product in the future.

The Manufacturer reserve the right to make design improvements or changes in specifications without incurring in any obligation to install them on units previously sold.

Text, illustrations and drawings of this manual cannot be disclosed or transmitted, in whole or in part, to third parties without the written permission of the Manufacturer. All rights are reserved.

2. INTRODUCTION

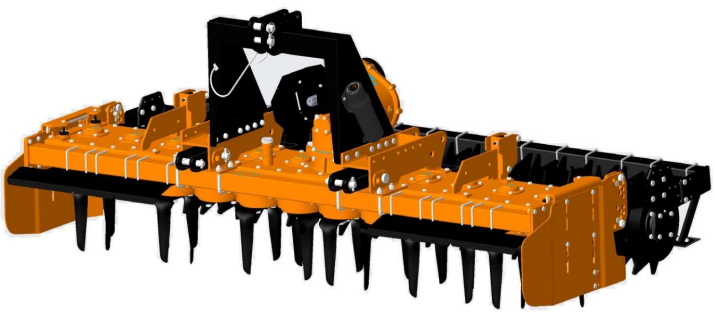
2.1. IDENTIFICATION

Each machine is provided with a plate for unique identification (see picture below), showing the CE marking together with following information:

- Manufacturer name and address
- Type of machine ("TYPE")
- Model of machine ("MODEL")
- Serial number ("SERIAL No.")
- Construction year ("YEAR")
- Machine weight ("MASS")
- Speed required at Implement Input Connection ("INPUT").

It's recommended to note down all data shown on the plate.

Any request for assistance or information regarding the machine must be directed to the Manufacturer or Dealer always referring to the model and serial number as shown on the plate affixed to the machine.



2.2. INTENDED USE

The power harrow model M120/160 CHAMPION is specifically designed for agricultural application and is intended to be used to refine the soil and prepare the seedbed.

The machine, mounted on the tractor by means of the hydraulic three-point linkage, operates on the ground thanks to its own weight and to the dynamic action of vertical tools (blades) placed on the rotors, driven - through a gears transmission - from the tractor PTO by means of the PTO shaft connection. Each rotor composes of two blades, with opposite rotation compared to the contiguous rotors. The PTO shaft is equipped with a safety device to preserve the machine's transmission from excessive overloads.

The machine allows a very good job of seedbed levelling and finishing, with rich production of fine soil homogeneously distributed on the ground surface, and is used at best in operations on tough soils, not subjected to excessive action of the atmospheric conditions (for example, for the preparation in autumn-winter season of a cereal's seedbed, following to a summer crop).

The power harrow is equipped with a levelling bar and a rear roller.

The leveling bar, together with the side plates, allows to retain the thickest clods in the working area of the rotors, improving the soil refining, and generating a first levelling action before the action of the roller.

The rear roller, supported by a frame linked to the side plates of the machine by means of two swinging arms, allows the working depth control and the soil levelling.Depending on the characteristics of the soil and the desired result, the following types of roller can be used:

- **Cage roller:** is suitable for dry soils or with medium-low degree of humidity. It allows to control the working depth, level the worked soil, and complete the refinement of the seedbed.
- **Packer roller:** is suitable for any type and condition of soil. It is recommended for heavy soils and for soil preparation in combination with a seed drill. Allows to refine the surface of the seedbed, and has a great effect leveling and crumbling on the surface and in depth.
- **Spike roller:** is suitable for each type and condition of soil, in particular for soils with high degree of humidity. It does not compact the soil, but leaves it levelled and ventilated, providing excellent drainage. It is mainly used when is required a preparatory work of the soil already deeply worked.

The machine is designed to be mounted on medium-high power tractors equipped with hydraulic lift and universal three2point hitch that can support the implement weight and is driven by the power of the tractor through the PTO Shaft.

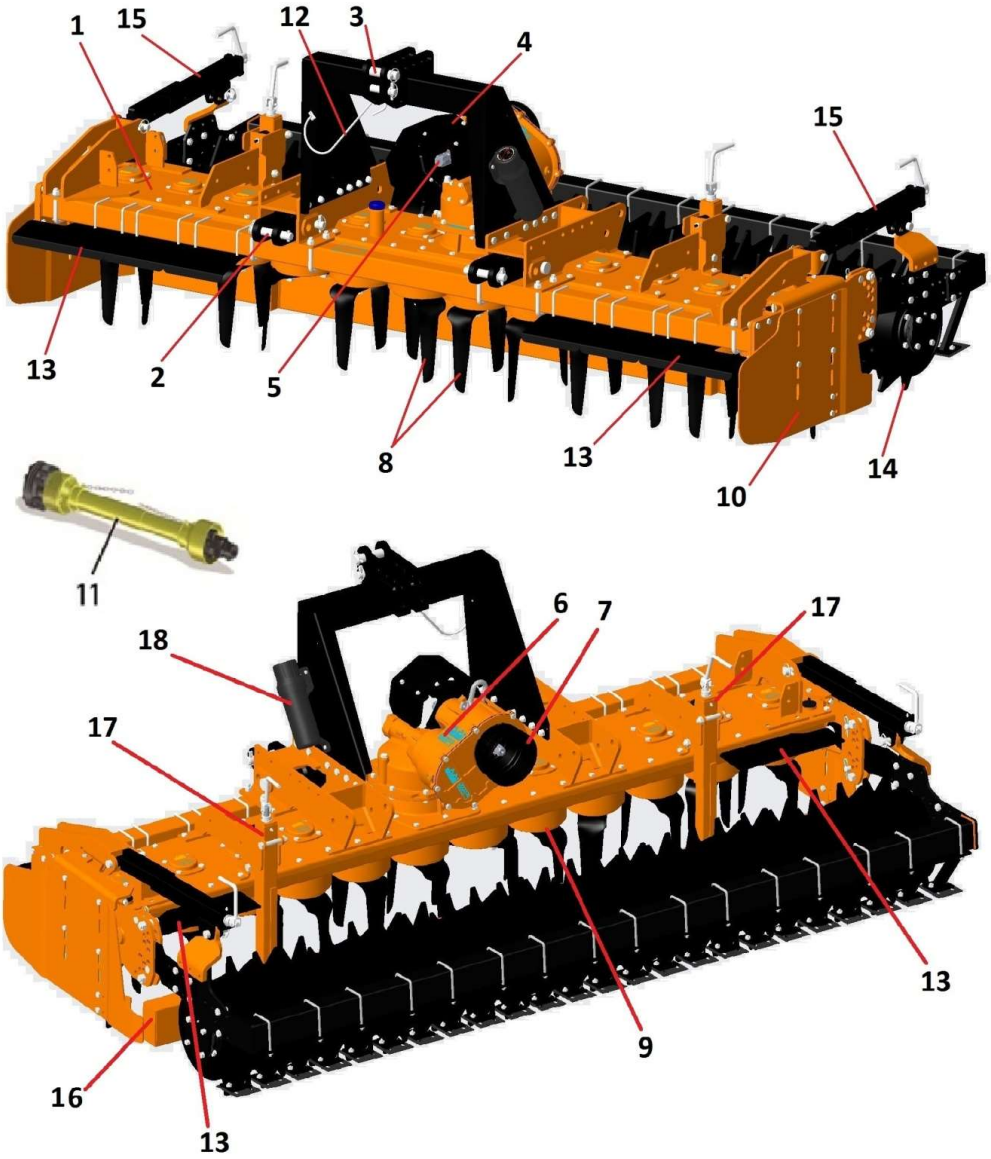
The tractors used to operate the machines must have the following requirements:

Hitch Category:	3-point, Category2 (ISO 730 standard)
PTO:	540 RPM / 1000 RPM
Horsepower:	As per Technical Specification

DANGER

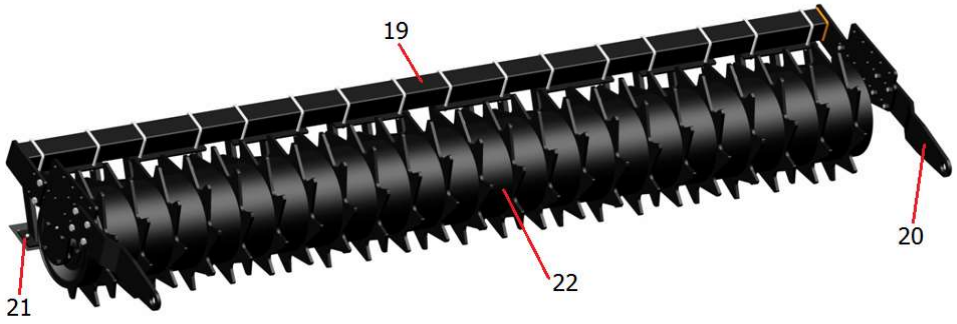
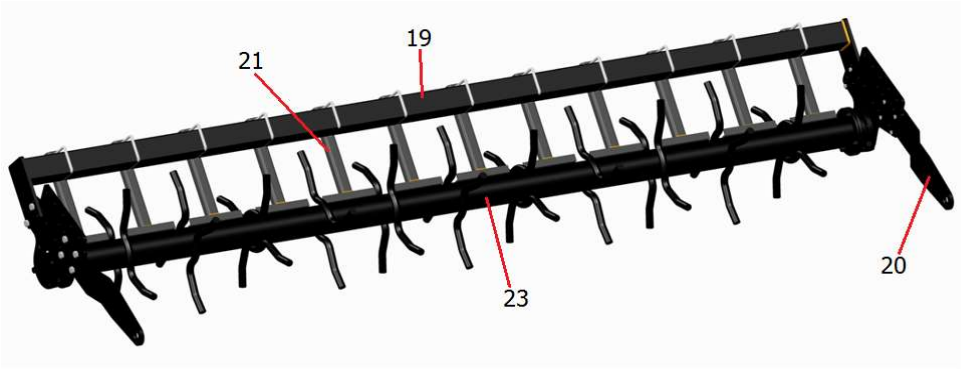
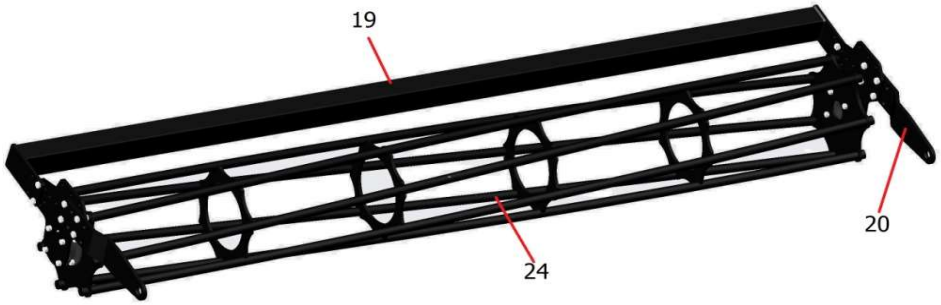
Any use of the machine other than the intended use is non-intended use, and is to be considered as unauthorized and dangerous. The manufacturer assumes no liability for damage resulting from non-intended use.

2.3. MAIN PARTS DESCRIPTION



1. Frame
2. Lower hitch
3. Upper hitch
4. Input shaft cover
5. Input shaft
6. Gearbox
7. Rear PTO
8. Blades
9. Blades rotor
10. Side plate
11. PTO shaft
12. PTO shaft hook
13. Front protection CE guard
14. Rear roller
15. Jack for rear roller adjustment
16. Levelling bar
17. Jack for leveling bar adjustment
18. Manual holder

2.4. REAR ROLLERS

	Packer Roller (∅500)
	INDENT ONLY Spike Roller (∅490/∅540)
	Cage Roller (∅450)

19. Roller frame
20. Lifting arm
21. Scraper plate
22. Packer Roller
23. Spike Roller
24. Cage Roller

NOTE
To make the illustrations more clear, some images of this manual may refer to the machine lacking ofsome components (e.g. safety devices and barriers).

2.5. SPECIFICATIONS

MODEL		**M120-160 / 250**	**M120-160 / 300**
Overall dimensions (with Packer Roller)	cm	252x125x157	300x125x157
Working width	cm	250	300
	inches	98	118
Tractor power recommended	HP	100-160	
3-point Hitch type	-	Category 2 (standard ISO 730)	
Power Input speed	rpm	540 / 1000	
Rotors speed	Rpm @540	343 / 376	
	Rpm @1000	334 / 369	
Number of rotors	-	10	12
Distance between rotors	mm	240	
Working depth (max)	cm	28	
	inches	11	
Rotor blades shaft diameter	mm	55	
PTO Shaft safety device	-	Disk clutch (standard) / automatic limiter (optional)	
Weight (no roller)	kg	850.00	950.00
Packer Roller			
Overall dimension	cm	250x60x60	300x60x60
Diameter	cm	500	
Weight	kg	305.00	360.00
Cage Roller			
Overall dimension	cm	2500x48x61	3008x48x61
Diameter	cm	450	
Weight	kg	145.00	166.00
Spike Roller			
Overall dimension	cm	2500x50x62	3008x50x62
Diameter	cm	490	540
Weight	kg	160.00	185.00
Levelling Bar			
Weight	kg	54.00	62.00
Optionals			
Roller positioning by pins	-	Std.	Std.
Roller lifting by mechanical jacks	-	✓	✓
Roller lifting by hydraulic jacks	-	✓	✓
Track eradicators	-	✓	✓
Quick-blade fitting	-	✓	✓

3.SAFETY

Proper use of the equipment, a strict observance of the safety messages listed below and application of all reasonable practices to avoid any risks, prevents accidents or injury, allows the machine working better and longer, and minimize the failures.

The manufacturer assumes no liability for any damage resulting from not applying the behavioral rules indicated into the manual.

3.1. GENERAL SAFETY INSTRUCTION

DANGER

The machine must be used only by authorized and well trained operators. The operator must have read and understood the instructions of this manual, it must make adequate preparation for the proper use of the machine and must hold a driving license. In case of doubt about the use of the machine and/or the interpretation of this manual, the operator must contact the Manufacturer or the Dealer.

WARNING

The manual must always remain with the machine. In case of loss or damage, request a new copy to the Manufacturer or your Dealer.

WARNING

Follow strictly the rules prescribed by the safety pictograms applied to the machine.

WARNING

Be sure that all safety pictograms are legible. If pictograms are worn, they must be replaced with others obtained from the Manufacturer, and placed in the position indicated by this manual.

DANGER

Before using the machine, make sure that all safety devices are installed and in good working conditions. In case of damages of shields, replace them immediately.

DANGER

Is absolutely forbidden to remove or alter safety devices.

DANGER

Before starting, and during operation of the machine, make sure there are no people or animals in the operation area: the machine can project material, with risks of serious injury or death.

DANGER

Do not leave the tractor engine running where in enclosed areas and without a system ventilation capable to dispose the harmful exhaust gases produced in the air.

DANGER

Pay maximum attention to avoid any accidental contact with rotating parts of the machine.

DANGER

During operation, adjustment, maintenance, repairing or transportation of the machine, the operator must always use appropriate Personal Protective Equipment (PPE).

DANGER

Do not operate the implement while wearing loose fitting clothing that can give rise to entanglement in parts of the machine.

DANGER

Do not operate the implement when tired, not in good condition or under the influence of alcohol or drugs.

CAUTION

If the use of the machine is required at night or in conditions of reduced visibility, use the lighting system of the tractor and possibly an auxiliary lighting system.

3.2. EQUIPMENT SAFETY INSTRUCTIONS

WARNING

Use the machine for its intended purpose only. Improper use can damage the machine and cause serious injury to persons, animals, or death.

DANGER

The machine should be used by a single operator driving the tractor.

WARNING

Any unauthorized modification of the machine may cause problems in safety and relieves the Manufacturer from any liability for damages or injuries that may result to operators, third parties and objects.

WARNING

Before using the machine, familiarize yourself with its controls and its working capacity.

WARNING

Do not leave the machine unattended with tractor engine running.

WARNING

Do not operate the machine on too muddy, sandy or rocky soils.

WARNING

Keep the machine clean from debris and foreign objects which may damage functioning or cause injury.

WARNING

Do not use the machine if the category of the connecting pins does not match that of the tractor hitch system.

WARNING

Do not use the machine with missing bolts, screws, pins or safety pins.

WARNING

Never use the machine to transport or lift people, animals or objects.

WARNING

Make certain, by adding front ballast, that at least 20% of the total weight (tractor, implement and ballast) is on the front axle of the tractor, to ensure stability.

WARNING

Before engaging the tractor PTO, make sure the tractor PTO speed is set as required for the machine (540 or 1000 rpm). Do not over speed PTO or machine breakage may result.

DANGER

Do not operate the machine if the PTO Shaft is damaged. The PTO Shaft could be subjected to breakage during operation, causing serious injury or death. Remove the PTO Shaft and replace it with an undamaged.

DANGER

When themachine isdisconnected from the tractor, rest the driveline on the provided support.

3.3. OPERATING SAFETY INSTRUCTION

WARNING

Before using the machine, be sure to have cleared the operating area from obstacles (stones, branches, debris, etc...). Mark all the obstacles that cannot be eliminated (e.g. by means flags).

DANGER

Never engage the tractor PTO in the presence of people close to the PTO Shaft. The body, hair or clothing of a person can get caught in rotating parts, causing serious injury or death.

DANGER

Before engaging the PTO and during all operations, make sure that no person or animal is in immediate area of action of the machine. Never use the machine if people are in his working area.

DANGER

It's absolutely forbidden to stand near the machine with moving parts.

WARNING

The operator must operate machine lifting/lowering only from the driving seat of the tractor. Do not perform lifting maneuvers on side or behind the tractor.

WARNING

Before making changes in direction, turns or going in reverse, slightly lift the machine from the ground after disengaged the power take-off, to prevent damages to the machine.

DANGER

In presence of steep slopes (greater than 15 degrees) the action of the machine may cause instability of the tractor, with risk of tipping and consequent serious injury or death hazard. Consult the manual for the tractor to determine the maximum slope that the tractor is able to deal with.

DANGER

Always disengage the PTO before raising the machine, and never engage the PTO with the machine in raised position. The machine might throw objects at high speed, causing serious injury or death.

WARNING

Never leave the driver's seat when the tractor is turned on. Before leaving the tractor, lower the machine to the ground, disengage the PTO, insert the parking brake, stop engine and remove the key from the control panel.

DANGER

The PTO shields of tractor and implement sides, the PTO Shaft shielding and the PTO Shaft retaining chains must be properly installed and in good condition, to avoid risk of entanglement with serious injury or death.

DANGER

Before engaging the PTO of the tractor, always make sure that the drive shaft is mounted in the correct direction, and that its clamping elements are properly connected both to tractor side and to implement side.

WARNING

Stop operating immediately if blades strike a foreign object. Repair all damage and make certain that rotor and blades are in good condition before resuming operation.

WARNING

Always disengage the tractor PTO when the PTO Shaft exceed an angle of 10 degrees up or down while operating. An excessive angle with PTO Shaft rotating can break the PTO Shaft and cause flying projectiles.

CAUTION

Avoid clutch's overheating caused by too long or frequent slipping of the clutch, since it can damage the clutch components. Before checking slip clutch, make sure it has cooled. Clutch could be extremely hot and cause severe burn.

CAUTION

Prolonged use of the machine can cause overheating of the gearbox. Do not touch the gearbox during use and immediately after, it could be extremely hot and cause severe burn.

WARNING

All adjustment operations on the machine must be performed by qualified and trained operators, with the tractor engine off, the PTO disengaged, the machine lowered to the ground or on security stands, the ignition key off and the parking brake set.

3.4. TRANSPORTING SAFETY INSTRUCTIONS

WARNING

Before transporting, determine the stopping characteristics of the tractor-implement assembly.

WARNING

Transport only at speeds where you can maintain control of the equipment.

WARNING

When driving on roads, the machine must be in transport position adequately raised from the road surface, with tractor lifting hydraulics locked so that the machine cannot be lowered accidentally.

DANGER

The implement may be wider than the tractor. Pay attention during transporting to persons, animals or obstacles exposed.

WARNING

When turning, use extreme care and reduce tractor speed.

WARNING

Do not operate the tractor with weak or faulty brakes or worn tires.

CAUTION

Always use tractor lighting system and auxiliary lighting system for adequate warning to operators of other vehicles, especially when transporting at night or in conditions of reduced visibility.

DANGER

In case of machine lifting, make sure that the lifting device chosen is suitable to perform the operation safely, and use only the lifting points prescribed for the machine.

3.5. MAINTENANCE SAFETY INSTRUCTION

WARNING

All maintenance and repairing operations must be performed by qualified and trained operators, with the tractor engine off, the PTO disengaged, the machine lowered to the ground or on security stands, the ignition key off and the parking brake set.

WARNING

Perform repairs and replacements necessary to the machine using only original spare parts provided by the manufacturer or your Dealer.

DANGER

Perform maintenance operations always using appropriate Personal Protective Equipment (protective eye glasses, hard hat, hearing protection, safety shoes, overall and work gloves, filter mask).

DANGER

During any cleaning and maintenance operations, make sure that there is adequate ventilation to prevent accumulations of toxic vapors in the air.

CAUTION

Before any maintenance operation, make sure that the parts which may become hot during use (friction clutch, gear box...) have cooled.

WARNING

Do not perform repairs that you do not know. Always follow the manual instructions and in case of doubt contact the Manufacturer or your Dealer.

DANGER

Do not swallow fuels or lubricants. In case of accidental contact with eyes, rinse well with water and consult a doctor.

DANGER

Always keep oils and lubricants out from children.

3.6. STORAGE SAFETY INSTRUCTIONS

WARNING

Never leave the tractor unattended with the machine in lifted position. Accidental operation of lifting lever or a hydraulic failure may cause sudden drop of unit with injury or death by crushing.

DANGER

Following operation, or before unhooking the machine, stop the tractor, set the brakes, disengage the PTO, lower the attached machine to the ground, shut off the engine, remove the ignition key and wait for all moving parts to stop.

WARNING

Make sure all parked machines are on a hard, level surface and engage all safety devices.

CAUTION

Place support blocks under the machine as needed to prevent unit from tipping over onto a child and/or an adult. A machine that tips over can result in injury or death.

CAUTION

Store the unit in an area away from human activity.

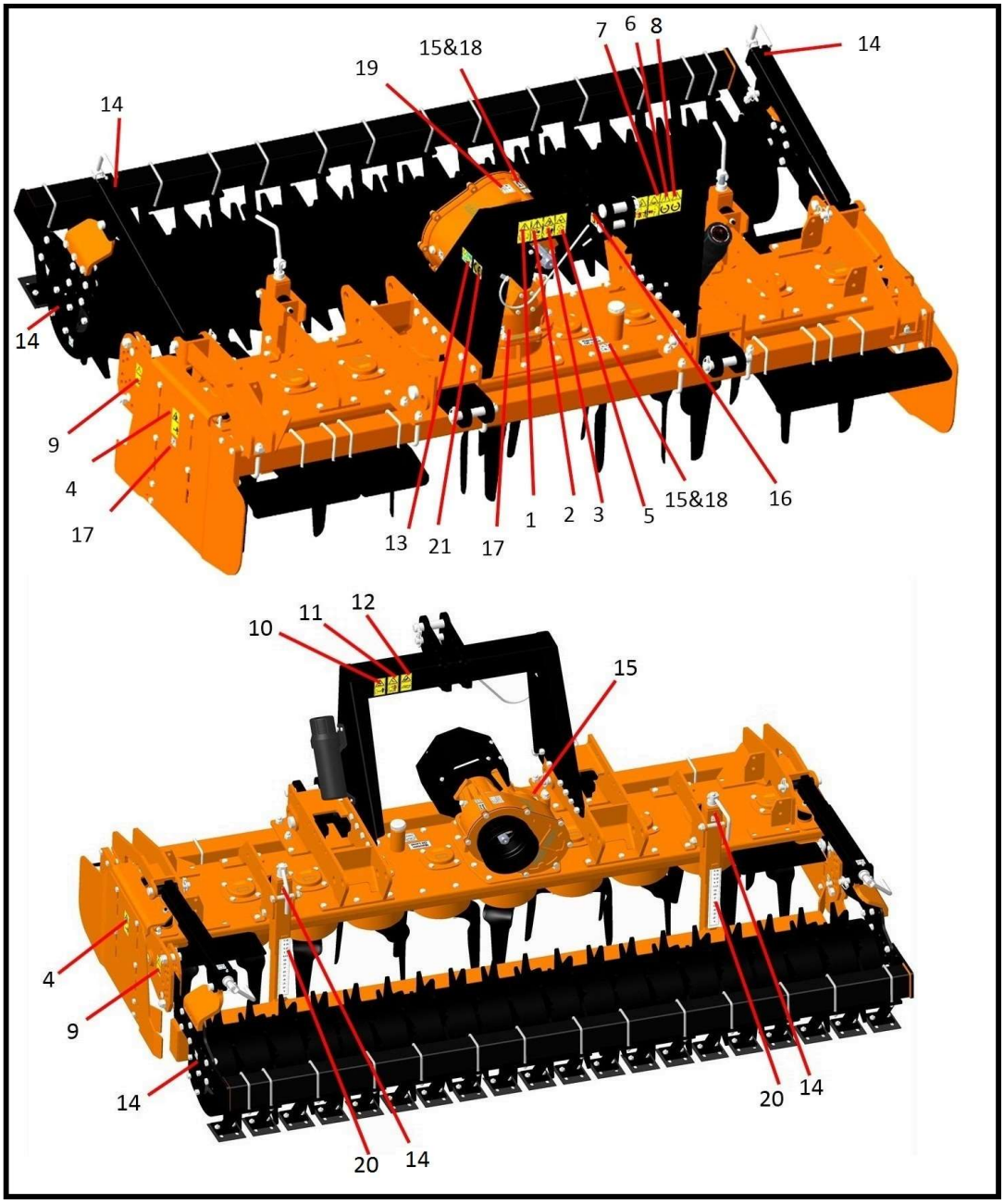
3.7. SAFETY LABELS

The safety labels applied on the machine give fundamental information for using the machine safely.

Make sure safety labels are in good conditions. If pictograms are worn, they must be replaced with others obtained from the Manufacturer and placed in the position indicated by this manual.

Make sure the safety labels are legible. If necessary, wipe them by a cloth, with soap and water.

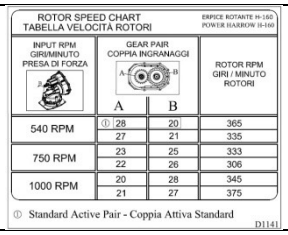
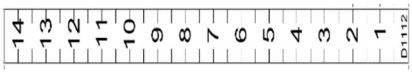
SAFETY LABELS POSITION AND DESCRIPTION



SR.NO.	SPARE CODE	DESCRIPTION	DECALS
1	D1090	Carefully read the operator's manuals of the machine, tractor and PTO shaft before using the machine.	
2	D1038	Disengage the PTO, turn off the tractor engine, remove the key and ensure that all rotating parts have stopped before approaching the implement. Read the operator's manual before performing any maintenance operation.	
3	D1095	Thrown or flying objects hazard. Keep a safe distance from the machine.	
4	D1145	Rotating knives: severing of lower limbs hazard. Keep a safe distance from the machine.	

5	D1078	Cutting of fingers or hand hazard. Wait until all machine components have completely stopped before touching them.	
6	D1098	Implement input driveline: body entanglement hazard. Do not open or remove safety shields while engine is running.	
7	D1097	Crushing hazard. Stay clear of draft link lifting range while in operation. Crushing hazard. Stay clear of draft link lifting range while in operation.	
8	D1144	Before engaging the tractor PTO, check that rpm rate and sense of rotation are those prescribed for the implement.	
9	D1122	Upper limbs crushing hazard. Keep hands at safe distance from the machine.	

10	D1091	Danger of burning. Hot surface. Before touching the gearbox surface, wait until it has cooled.	
11	D1092	Risk of falling. It is forbidden to ride on the implement or climb the implement when running.	
12	D1093	Skin injection hazard. Relieve pressure before disconnecting hydraulic lines and tighten all connections before applying pressure. Read the manual for maintenance procedures.	
13	D1082	Always wear protective clothing and equipment appropriate for the job: hearing protection, safety shoes, safety gloves, safety glasses and overall.	
14	D1008	Lubrication point (grease).	
15	D1007	Lubrication point (oil).	

16	D1083	Lifting point.	
17	D1009	Drain plug	
18	D1006	Maintain oil level	
19	D1141	RPM indication label (SPH)	
20	D1112	Height indication label (SPH)	
21	D1108	CE logo	

4.SET-UP

The machine is delivered equipped with a PTO Shaft with torque limiter (clutch discs) and related operating manual.

When the machine is delivered, check that there is no damage to the machine or PTO Shaft. In case of damage or missing parts immediately notify the Manufacturer or your Dealer.

Because of his size, the machine could be delivered with some parts disassembled (for instance, the EC safety guards).

In this case, the assembly of such parts is an owner's task, and must be performed carefully, with reference to the breakdown tables of the Spare parts section, applying the correct tightening of screws and bolts. In case of doubt immediately contact the Manufacturer or your Dealer.

ATTENTION

For proper tightening torques of bolts and screws, refer to the table of this manual.

4.1. HANDLING

To perform machine lifting and/or handling, operators must use a lifting device (e.g.: crane) with suitable load capacity, equipped with accessories (belts, chains...) in good condition. The machine must be hooked at the appropriate lifting points indicated by pictograms (see Paragraph "Safety labels").

To make sure that the load capacity of the lifting device is correct, check the weight of the machine under the paragraph "Specifications" of this manual.

Before performing any operation the operator must:

• make sure there are no people or animals in the operation area;

• clear and delimit the handling area, making sure that there is an escape space in case of falling of the load;

• check the load capacity of the lifting device.

During handling:

• do not touch suspended loads and remain at a safe distance;

• unless special needs, avoid to lift the loads to more than 20 cm from the ground.

The transportation of the machine disconnected from the tractor is possible using a truck with suitable power and size, selected in accordance with the machine weight and dimensions given in the paragraph "Specifications" of this manual. The truck shall be equipped with a loading bed, in order to avoid movements during the transportation.

After performing the lifting and the positioning of the machine over the truck, firmly secure the machine to the loading bed by means of ropes or chains pulled taut to the anchor points provided.

After transportation, verify that the position of the machine do not represent a danger. Remove the ropes or chains and proceed with unloading, following the same attention used during loading.

DANGER

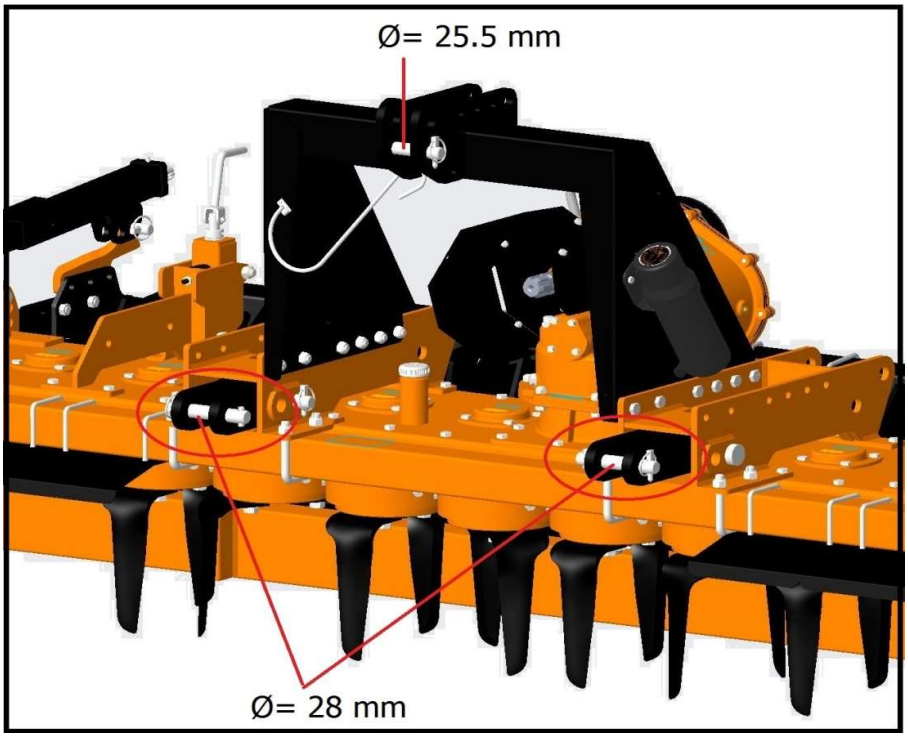
Lifting and transportation operations can be very dangerous and must be done paying the maximum attention, by authorized and trained operators, equipped with appropriate Personal Protective Equipment (PPE).

4.2. LOWER HITCHES CHECK

The power harrows M120 CHAMP are designed to be mounted on tractors equipped with **3-point hitch Category 2 (ISO 730 standard)**.

Before connecting the machine to the tractor:

- make sure that the machine is equipped with lower clevises having Category 2 pins (D=28 mm). The clevises must be oriented into their slots as showed into the picture below;
- make sure that the machine is equipped with Category 2 upper pin (D=25.5 mm), positioned on the lower hole of the mast plate (see picture).



If the dimension of the pins is not corresponding to Category 2, contact the Manufacturer or the Dealer to obtain the pins of right dimension.

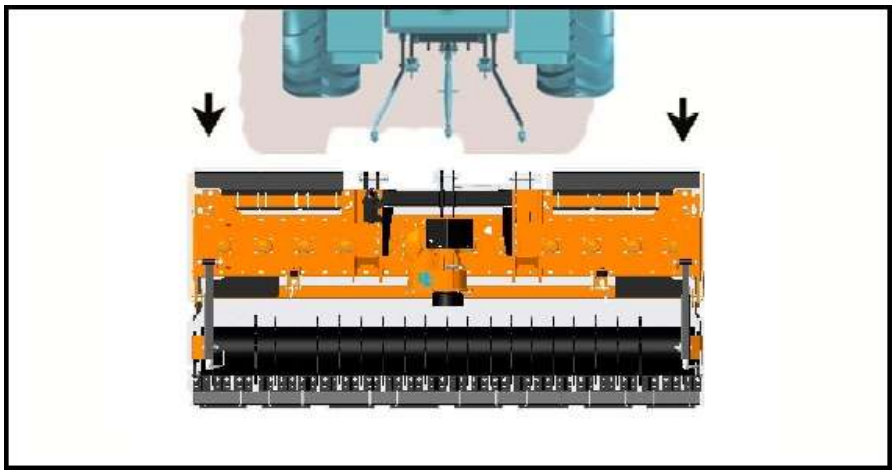
4.3. CONNECTING TO THE TRACTOR

WARNING

Before connecting the machine to the tractor, make sure that tractor and machine are on a flat, stable and dry surface.

To connect the machine to the tractor the operator must do the following:

- drive the tractor in reverse up to the machine placed in parked position, then align the hydraulic lifting arms to the machine's lower hitches (see the picture below);



- set the tractor's parking brake, stop engine, remove the ignition key and get off the tractor;
- connect the lifting arms of the tractor to the lower hitches of the machine, through the use of the pins and the related safety split pins;
- connect the tractor top link to the machine top link plate through the use of the pin and relative safety split pin;
- raise the machine until PTO of tractor and machine are at the same height, then adjust the tractor top link so that the front of the machine is leveled to the back (the axis of the machine input connection shaft must be parallel to the ground), in order to limit stress transmitted to the machine through the PTO shaft;
- make sure that left side of the machine is leveled with the right, by adjusting the tractor lifting arms, then lock the arms to prevent swinging that could compromise the stability of tractor and machine;
- Proceed with the driveline connection (see Section Driveline installation).

4.4. DRIVELINE INSTALLATION

The machine is equipped with a PTO Shaft with torque limiter (friction discs clutch or automatic cam clutch) that preserves the machine from overloads.

Before installing the PTO Shaft, the operator must read the manuals of PTO Shaft and tractor, checking in particular that rpm and direction of rotation of the tractor PTO match those of the machine (540 or 1000 rpm).

If the direction of rotation of the tractor PTO does not match that of the machine, contact the Manufacturer or your Dealer.

To connect the PTO Shaft to the tractor and implement, the operator must:

- park tractor and machine on a flat surface, with parking brake set, engine off, and ignition key removed;
- check that safety devices of PTO Shaft, machine and tractor are in good condition, otherwise provide for their replacement;
- remove the PTO shield of the machine through the fixing screws;
- position the PTO Shaft with clutch turned towards the implement side;
- insert the clutch hub on the input connection shaft of the machine, then ensure its tightening onto shaft through its fastener;
- replace the PTO shield of the machine through the fixing screws;
- insert the PTO Shaft yoke on the tractor PTO, then ensure its tightening onto shaft through its fastener;
- Hook to the tractor and machine the two retaining chains of the driveline shielding, to prevent shielding rotation during functioning of the machine.

DRIVELINE LENGTH CHECK

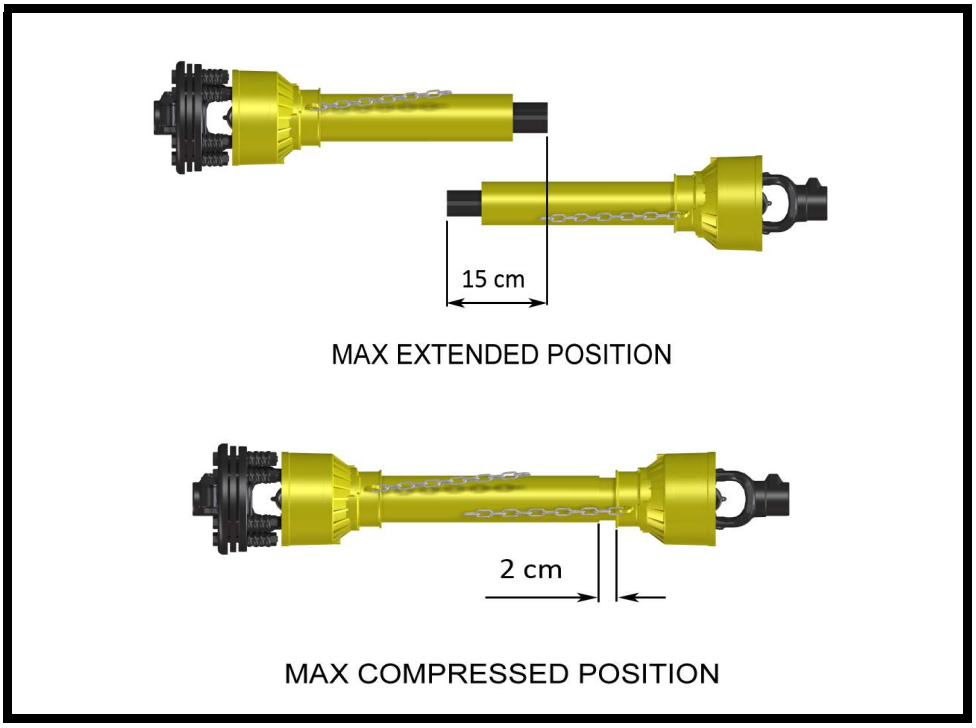
Before operating the machine, ensure that the size of the PTO Shaft is adequate. The PTO Shaft supplied with the machine has a standard length, therefore it may need an adaptation of the length, depending of the tractor which the machine is combined.

The length of the PTO Shaft must be such to:

- avoid bottom out of the transmission tubes, when the PTO Shaft is in compressed position (when machine is raised up off the ground);
- Ensure an overlapping of the transmission tubes enough to transmit the torque required, when the PTO Shaft is in max extension (when the machine is in its lowest position in the ground).

When the PTO Shaft is at its minimum length (max compressed position), there must be at least a 2 cm of distance between the ends of each transmission tube and the yokes side.

When the PTO Shaft is at its maximum operational extension, there must be an overlap between the tubes profiles of 15 cm at least.



A PTO Shaft too long may cause structural damages to the tractor and machine. If the PTO Shaft is too long, it may be adapted by removing it and shortening the tubes according to the instructions provided by the Manufacturer in its use and maintenance manual.

A PTO Shaft too short can cause disengage of the tubes during operation, with severe hazard for the operator and structural damage to the tractor and machine. If the PTO Shaft is too short, it must be replaced with a longer one. In this case contact the Manufacturer or your Dealer.

IMPORTANT

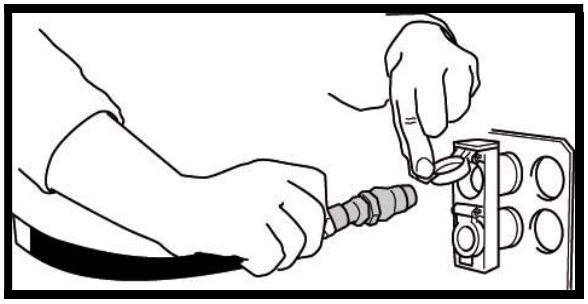
- before operating the machine, the first time, make sure that the PTO Shaft is lubricated in accordance with how indicated in the instruction booklet;
- if the torque limiter provided with the PTO shaft is a friction discs clutch, before operating the machine the first time, and after long periods of inactivity, make sure that the driveline clutch has run a short "run in" in accordance with what indicated in the instruction manual of the Manufacturer, removing the possible oxidation of the components that may compromise the correct slipping during the usage (see also section "Maintenance")
- Always engage the tractor PTO at low rpm to minimize the effect of the peak torque on the driveline and the machine.

4.5. HYDRAULIC CONNECTION

If the machine is equipped with a rear roller with hydraulic cylinders, it is necessary to connect the machine's hydraulics to the tractor to allow the appropriate adjustments of the roller (lifting and lowering).

To make the connection the operator must press vigorously the hydraulic hoses with quick coupling into the corresponding seats of the tractor, until the connection is done (see picture).

Sticking labels are placed next to the quick couplings of the hydraulic pipes to identify the lifting hose and the lowering hose of the roller.



WARNING

Check the hydraulic pipes frequently and replace them whenever they show signs of wear or if small cracks form in the rubber.

DANGER

Before carrying out operations on hydraulic lines under pressure or disconnecting hydraulic components, ensure the line has been previously depressurized and does not contain any hot fluid.

CONNECTION OF ADDITIONAL IMPLEMENTS

The power harrow can be combined with other implements that complete his work, like fertilizers spreaders or seeders.

In this case, to allow the connection of the above implements to the power harrow, is required a dedicated support frame provided by the Manufacturer or by the Dealer (not included in the standard harrow supplied), and the operator must perform the following operations:

- connecting the support frame to the power harrow;
- connecting the implement (fertilizers spreader/seeder) to the support frame;
- connecting the additional PTO Shaft from the implement to the power harrow;
- connecting the implement hydraulic lines (where provided) to the tractor.

Always refer to the Operators Manuals of the implements to perform correctly the above operations.

Check the compatibility of the tractor's performance with the weight transferred by the machine and additional implements to the tractor 3-point hitch. In case of doubt, contact the tractor manufacturer.

The maximum working speed of the tractor when the machine is equipped with additional implements must not exceed 3 km/h in order to avoid breakage or damages.

WARNING

If additional implements are used combined to the machine, keep much attention to the risks that may be generated during the phases of connection, use and disconnection of the implements.

All maintenance and repairing operations must be performed by qualified and trained operators, with the tractor engine off, the PTO disengaged, the machine lowered to the ground or on security stands, the ignition key off and the parking brake set.

4.6. TRACTOR-MACHINE STABILITY

Connecting the machine to the tractor implies a change of loads distribution on the tractor axles.

Before connecting the machine to the tractor it is required to check the stability of the tractor-machine system, in order to determine the ballast to apply to the front of the tractor, and assure adequate distribution of the weight on the axles.

In order to assure the stability it is necessary that the following relations are verified (see table below for definitions):

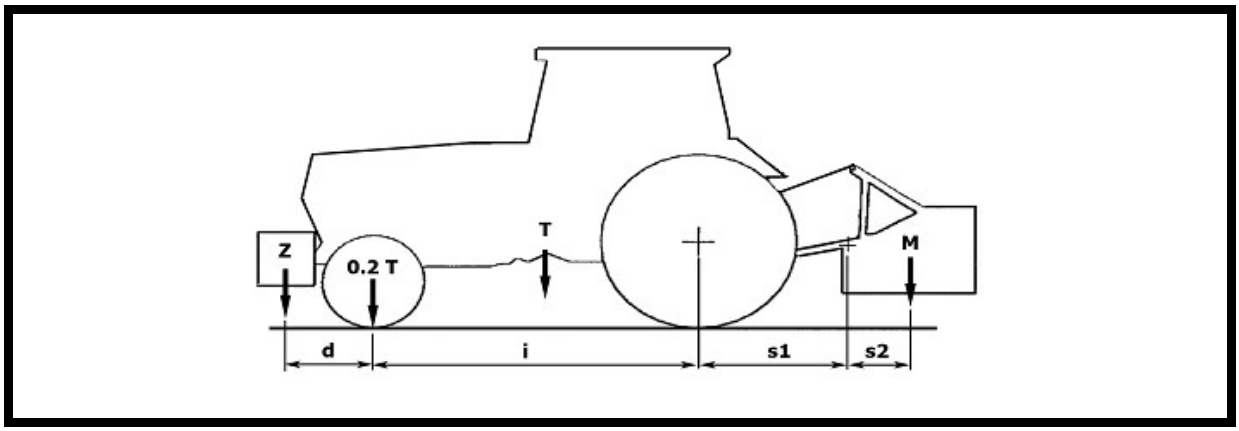
$$\mathbf{1)\ M \times (S1+S2) \leq 0.2 \times T \times i + Z \times (d+i)}$$

$$\mathbf{2)\ M \leq 0.3T}$$

Consequently, the minimum ballast required is:

$$\mathbf{Zmin = (M \times (S1+S2) - 0.2 \times T \times i)/(d+i)}.$$

To determine the appropriate characteristics of the ballast, refer to the manual of the tractor.



i =	Tractor wheelbase (cm)
d =	Distance between front axle and ballast center of mass (cm)
T =	Weight of tractor + operator (75 kg)
Z =	Ballast weight (kg)
M =	Power harrow + roller weight (kg)
s1 =	Distance between rear axle and lower hitch point (cm)
s2 =	Distance between lower hitch point and power harrow center of mass (cm) (s2=68 cm for power harrow with Packer roller)

If the machine is combined with other machines (fertilizers spreaders or seeders), the ballast check must be done considering:

M = total weight of the implements (power harrow+roller+spreader/seeder),

S2 = Distance between lower hitch points and center of mass of implements (power harrow+roller+spreader/seeder).

CAUTION

The weight of the machine modifies the stability of the system tractor-machine, resulting in loss of steering control and braking.

5. OPERATING

Before operate the machine, make sure you have read and understood the operating manuals of the machine, tractor and PTO shaft, and followed what is described in the section "Set Up".

DANGER

During operation, adjustment, maintenance, repairing or transportation of the machine, the operator must always use appropriate Personal Protective Equipment (PPE).

Before starting work, ensure that tractor, implement and driveline's safety guards are in good conditions and fully functional.

During operation, the machine can throw material from the back: prevent people and animals to approach the operational area.

5.1. START UP AND REUSING

Before the start up and before reusing the machine after a long term storage (e.g. after seasonal end), perform the following **pre-operational inspections and service of the implement**, to assure that the machine is in perfect condition and ready to be used:

- check that the machine has not damaged functional parts and has all mechanical parts in good condition. Repair and / or replace the damaged parts;
- check that the machine has no missing parts (pins, safety pins, plugs oil ...). Restore the missing parts;
- check that all guards and safety devices have no damages and are properly positioned. Repair and / or replace the damaged shielding, restore the correct position;

- verify that the PTO Shaft is properly installed (see section: Driveline installation);
- check that the torque limiter provided with the PTO shaft is in good condition, and, in case is a friction discs clutch, that its components are not subject to "sticking" (see section PTO Shaft maintenance);
- check for oil leaks from the gearbox or the transmission side cover. Identify the reason of loss, then repair and / or replace the damaged components;
- check the presence of lubricant in all greasing points of the machine (PTO Shaft, supports...) (see section Maintenance);
- check the correct oil level in the gearbox and in the gears trough (see section Maintenance);
- check for oil leaks from the gearbox, the gears trough, hydraulic tubes. Identify the reason of loss, then repair and / or replace the damaged components;
- check that blades are not excessively worn and the relating hardware is correctly tightened (see section Maintenance);
- check that all the hardware is properly tightened. Refer to the tightening table in the manual for proper torque values;
- check that all safety decals are correctly positioned, in good condition and legible. Replace any damaged decals;
- check that there is no constraints that may prevent the movement of the machine. Remove any constraint;
- check the tractor, to ensure correct direction of PTO and rpm speed.

Before the start up and before each use, make the following checks on the area identified for operating the machine:

- check that area is clear of foreign objects (rocks, branches or debris). Remove any obstacle and visibly highlight obstacles that cannot be eliminated (e.g. by means flags);
- make sure in the working area exposed there are no people or animals;
- make sure the soil to be worked is not too grassy, muddy, sandy or rocky.

WARNING

Before conducting the above inspections and service, make sure the tractor engine is off, all rotation parts are completely stopped and the tractor is in park with the parking brake engaged. Make sure the machine is resting on the ground or securely blocked up and the tractor lifting hydraulics locked.

Once all the checks above have been done, start tractor and machine as follows:

- start engine tractor and engage the tractor PTO at low rpm, making sure that the machine is not in the raised position but close to the ground, then increase speed engine until to 540 rpm or 1000 rpm, according to the tractor model and the gears set into the gearbox (see section "Gearbox speed adjustment");
- lower the machine on the ground and simultaneously start driving the tractor at low speed. Subsequently increase the ground speed until the desired speed is obtained, depending on ground conditions;
- if the environmental temperature is very cold, it's recommended to wait a few minutes with the PTO of the tractor at low rate before completely lowering the machine on the ground;

- drive for a while operating the machine, then stop the tractor to check the quality of the work performed and if the machine is adjusted properly.

If the working depth and/or soil texture are not as desired, correct them performing the necessary adjustments that can be performed on the machine (see sections "Adjustments"), then start operating again following instruction described into the section "Operating Instructions".

WARNING

If you need to get off the tractor, lift the machine just out of the ground, reduce engine speed and disengage PTO, set the parking brake, stop engine and remove the ignition key.

5.2. OPERATING INSTRUCTIONS

Drive the tractor adjusting the ground speed according to the desired grade of soil refining. A low ground speed allows a better crumbling effect and a high grade of soil refining, while a high ground speed allows a reduced crumbling effect and a lower grade of soil refining.

In addition to the tractor ground speed, the factors influencing the grade of soil refining are the following:

- nature of the soil (medium texture, sandy, clayey etc.) and soil humidity;
- working depth;
- blades rotation speed;
- levelling bar height.

High blades speed gives high crumbling capacity and soil refining and vice-versa. The machine is equipped with a central gearbox with speed change that allows changing the blades speed (see "Gearbox speed adjustment") according to different working conditions (nature of the soil, soil humidity content, ground tractor speed etc.).

ATTENTION

The higher the blades speed, the greater the grade of soil refining, but also the power absorbed by the tractor, as well the greater the wear of the tools. In most cases it is suggested, therefore, the use of the lower rotation speed.

During operations:

- always keep the tractor ground speed adequate to conditions of the soil to be worked (from 2 to 8 km/h approx.). Reduce speed in the case of hard or stony soils;
- always keep the tractor engine at rpm rate ensuring to the machine the right power required for the use;
- choose a driving pattern that provides the maximum pass length and minimizes turning;
- when working on hills, do "climbing" in the sense of the slope if possible, in any case do not work along the hillsides, and make the steps from top to bottom to reduce terracing effect;
- always perform changes and reverse of direction with PTO disengaged and the machine slightly lifted from the ground to avoid damage to the machine;
- do not allow the machine to drop heavily on the ground, but lower it slowly leaving the blades gradually penetrating the soil, in order to limit mechanical stresses on machine components, and preserving its integrity;

- do not operate the machine loosely out of the soil. Never work in reverse;
- periodically check for foreign objects wrapped around the blades, rotor shafts and roller. Remove them, after disengaging PTO, turning off tractor engine, and removing ignition key;
- if the blades strike a foreign object, or in case of prolonged intervention of the clutch due to an object wedged into the rotors, stop operating immediately, idle the engine speed and disengage the PTO. Wait for stopping of all rotating parts, then raise the implement and proceed to removing the object, after stopped the tractor, set the parking brake, stopped engine and removed the ignition key. Repair any damages immediately, and make sure rotor and blades are in good condition before restarting operation;
- always disengage the tractor PTO when the PTO Shaft exceed an angle of 10 degrees up or down between end yokes while operating. An excessive angle with PTO Shaft rotating can break the PTO Shaft and cause flying projectiles.
- avoid friction clutch overheating caused by too long or too frequent slipping of the clutch (friction discs clutch or cam-type clutch), since this can damage the friction plates and/or clutch parts. In case of functioning problem, do not open the clutch but contact the Manufacturer or a service center.

Some of typical problems that may occur when operating the machine are described into Troubleshooting section, together with their possible solutions.

5.3. ADJUSTMENTS

WARNING

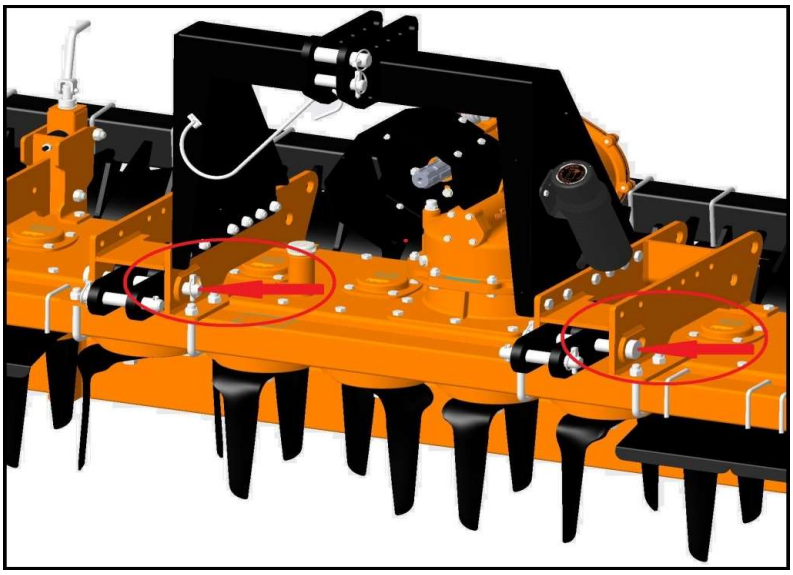
All adjustment operations must be performed with the tractor engine off, the PTO disengaged, the machine lowered to the ground or on security stands, the parking brake set and the ignition key off. Secure blocking prevents equipment from dropping due to hydraulic leak down, hydraulic system failures, or mechanical component failures.

LOWER HITCHES ADJUSTMENT

The machine is provided with swinging lower hitches, that allow an adaptation of the machine to the ground profile during soil working. The hitches can be adjusted in two different positions, to make the PTO shaft length between tractor and machine suitable in the most number of cases.

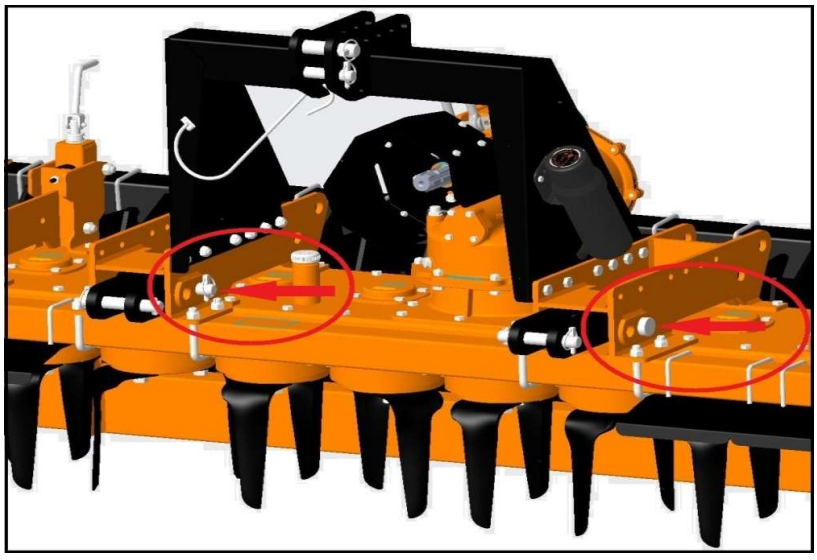
With reference to the section "Driveline length check":

- when connecting the PTO Shaft to tractor and implement, if the driveline's length is too short, it is required to position the lower hitches so that the pins for connection to the frame are in the most distant position from the input connection shaft (see picture – page 27).



If, after the adjustment, the PTO shaft is still too short, the operator will have to replace it by one of greater length. In this case, contact the Manufacturer or the Dealer.

- When connecting the PTO Shaft to tractor and implement, if, on the contrary, the driveline's length is too long, it is required to position the lower hitches so that the pins for connection to the frame are in the nearest position from the input connection shaft (see picture below).



If, after the adjustment, the PTO shaft is still too long, the operator will have to uninstall and adapt it by shortening the transmission tubes, according to the instructions of the use and maintenance manual of the driveline Manufacturer.

WORKING DEPTH ADJUSTMENT

The working depth of the machine is determined by the position of the rear roller. The rear roller performs following functions:

- determine the working depth of the tools into the soil,
- levelling and re-compacting the soil, reducing the excessive softness subsequent to soil working, and assuring a good contact of the seeds with the soil moisture.

The roller is supported by a frame linked to the side plates of the machine by means of two swinging arms.

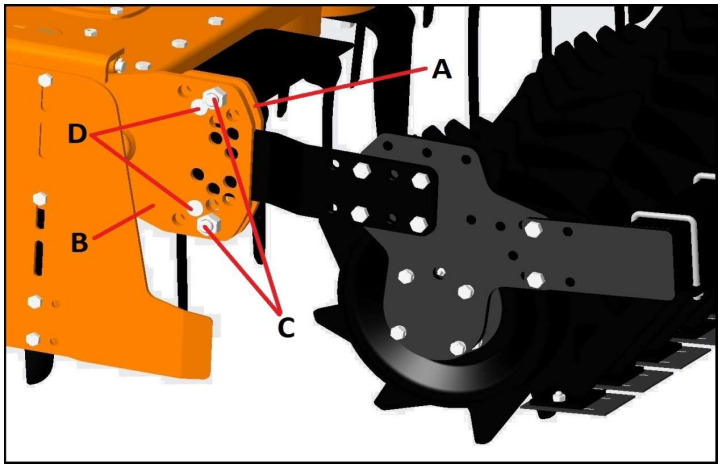
The position of the roller can be adjusted by the operator manually (in case the machine is provided with adjustment by pins or mechanical jacks), or hydraulically (in case the machine is provided with hydraulic jacks), as described in the following paragraphs.

DANGER

Crushing hazard. The roller is very heavy, all adjustment operations must be performed only by use of support stands that prevent the accidental dropping of the machine.

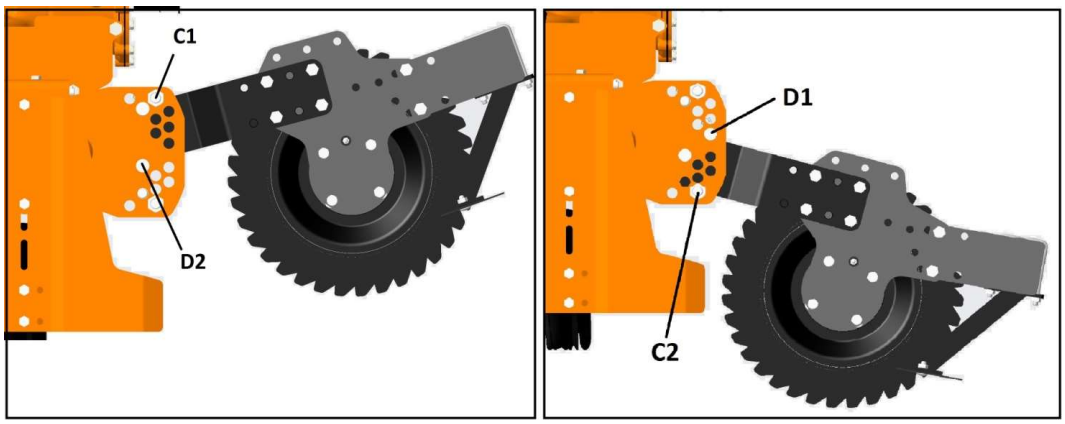
ROLLER ADJUSTMENT BY PINS

In case of roller adjustment by pins, the machine is equipped, on both sides, with an additional plate (A) with holes, connected to the plate (B) of the frame through two bolts with spacers (C), and two removable pins (D) with elastic pins for adjustments (see picture below).

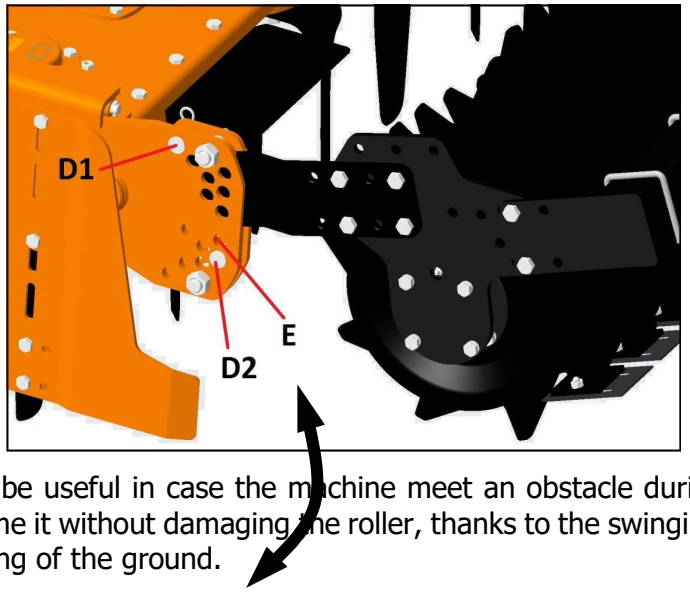


Operator can adjust the roller height in eight different positions, by inserting the two adjusting pins (D) into the holes immediately above and below the roller's swinging arms, according to the desired working height.

The maximum roller height from the ground is got positioning the roller between the upper connecting bolt (C1) and the lower adjusting pin (D2) (see picture below - left). The minimum roller height from the ground is got positioning the roller between the upper adjusting pin (D1) and the lower connecting bolt (C2) (see picture below - right).



The roller can be left in floating configuration, free to follow the ground contour, by positioning the adjusting pin (D2) in a hole lower to position (E) immediately below to the connecting arm, or by removing it altogether.



This configuration can be useful in case the machine meet an obstacle during operation, allowing the machine to overcome it without damaging the roller, thanks to the swinging arms, and obtaining a nearly uniform levelling of the ground.

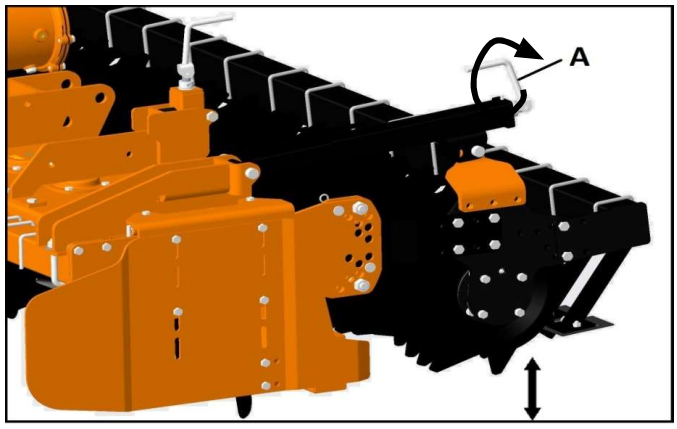
WARNING

Always make sure to position the roller at the same height on both sides of the machine, by checking that the pins are inserted in the corresponding hole positions of the side plates.

ROLLER ADJUSTMENT BY MECHANICAL JACKS

In the case the roller is equipped with mechanical jacks for lifting, to adjust the height of the roller is required rotating the crank (1), until the desired height is reached (see picture below).

The lifting of the roller corresponds to an increase of the working depth of the machine, the lowering of the roller corresponds to a decrease of the working depth.



The position of the roller frame relating to the swinging arms affects the adjustment of the working depth.

WARNING

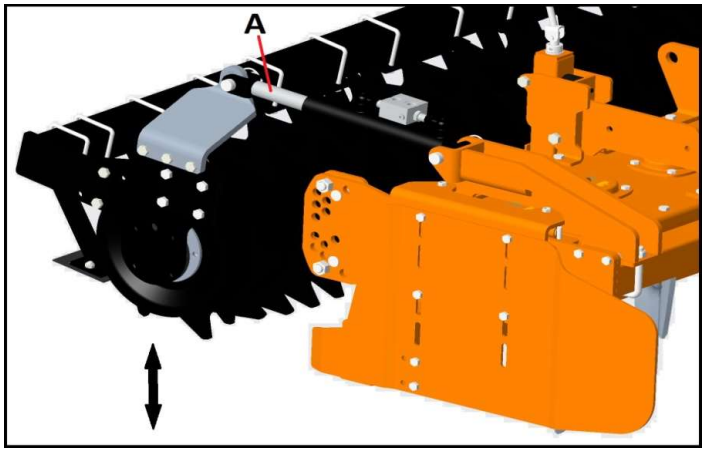
Always make sure that the roller is positioned at the same height on both sides, through the suitable indicator of the jack.

ROLLER ADJUSTMENT BY HYDRAULIC JACKS

In the case the roller is equipped with hydraulic jacks for lifting, the roller height adjustment is effected by actuating the cylinders (A) directly by the hydraulic control system of the tractor

The lifting of the roller corresponds to an increase of the working depth of the machine, the lowering of the roller corresponds to a decrease of the working depth.

The position of the roller frame relating to the swinging arms affects the adjustment of the working depth.

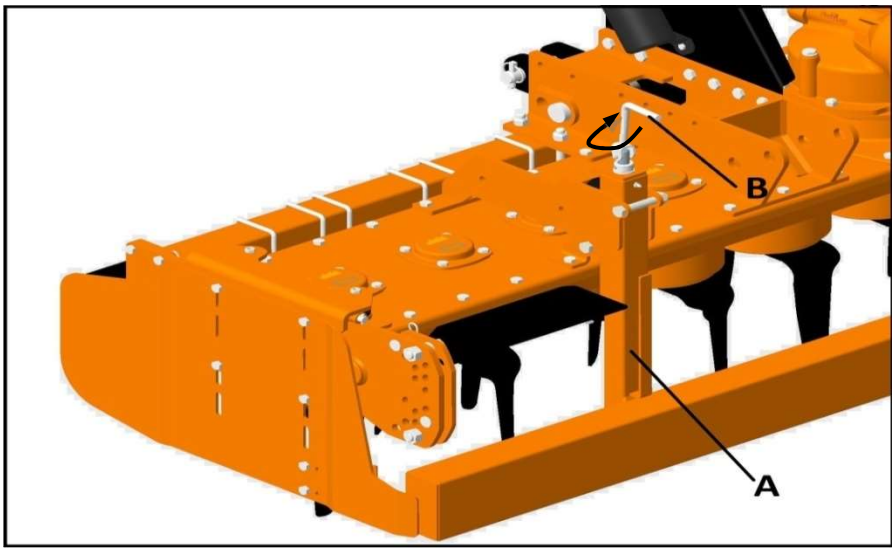


LEVELLING BAR ADJUSTMENT

The leveling bar is positioned between the rear roller and the power harrow frame, to which is connected through two mechanical adjustment jacks.

The leveling bar, together with the side plates, allows to retain the thickest clods in the working area of the rotors, ensuring the complete crumbling of the soil in aggregates of small size, thereby improving the soil refining, and generates levelling action before the passage of the roller.

The bar is adjustable in height through the two side jacks (A). To adjust the bar height, operator must rotate the crank (B) until the desired height is reached (see picture below).



It is recommended to set the bar position at 4-5 cm higher compared to the position of the roller on the ground.

WARNING

Always make sure that the leveling bar is positioned at the same height on both sides, through the suitable indicator of the jack.

GEARBOX SPEED ADJUSTMENTS

The gearbox of the machine is equipped with a pair of gears that can be interchanged or replaced by a second reserve pair (provided together with the machine), in order to:

- operate with the different rotation speeds of the tractor PTO (540 or 1000 rpm) to which the machine can be combined;
- obtain two different rotation speeds of the rotors (thereby of the tools), to meet the operator's needs according to different possible working conditions. To choose the most suitable rotation speed of the rotors, see the section "Operating instructions".

The permitted combinations for the two pairs of gears above mentioned, with the related rotation speed of the rotor, are printed on a plate applied to the machine, as given below (speed are expressed in RPM):

	Tractor PTO speed (RPM)	Gears pair	Rotor/blades speed (RPM)
Gearbox	540	z28-z20	365
	540	z27-z21	335
	750	z23-z25	333
	750	Z22-z26	306
	1000	Z20-z28	345
	1000	Z21-z27	375

To get further speed combinations (available as optional), ask the Manufacturer or your Dealer.

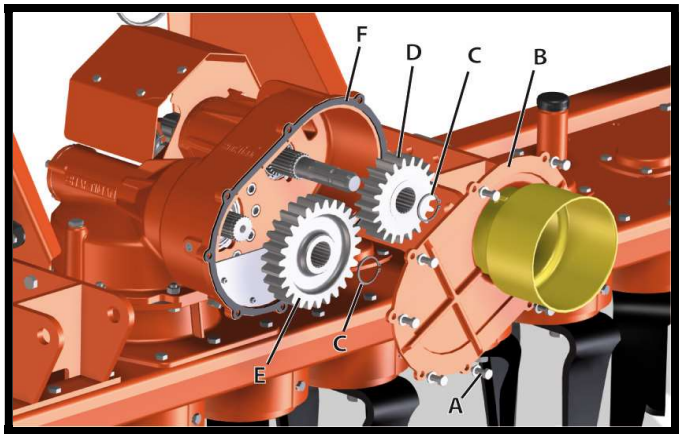
WARNING

The configurations permitted for gears and speeds are indicated in the table. The use of different configurations can seriously affect the functioning of the machine, damaging it permanently.

To change the speed, the operator must:

- remove the screws (A) with related washers, fixing the back cover (B) of the gearbox, and remove the cover, paying attention to possible oil spills;
- remove the elastic rings (C), then remove the gears (D) and (E), respectively fitted on the input connection shaft and pinion shaft;

- exchange the position between the gears, or replace the current pair of gears with the reserve pair, according to the rotation speed of the tractor PTO shaft (540 or 1000 rpm) and the required speed of the blades;
- replace the elastic rings in their seats and replace the cover, after cleaning the edge of the seal (F), by tightening bolts and washers.



WARNING

Before perform a gearbox speed adjustment, make sure that the temperature of the gearbox is low enough to allow the necessary operations. Wear the required PPE, in particular the gloves, because of danger of burns.

Any adjustment on the gearbox must be done with the machine disconnected from the tractor or the tractor with the engine off and the machine on the ground.

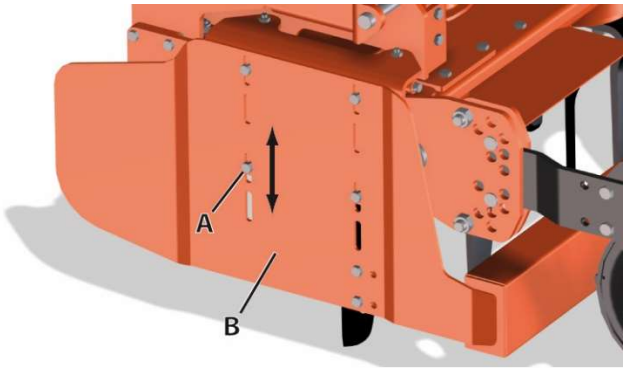
SIDE PLATES ADJUSTMENT

The side plates allow to retain the thickest clods in the working area of the rotors, preventing it from coming out and from accumulating in external ridges.

The plates can be adjusted in height, to be adapted to different types of working conditions (with more or less abundant production of fine soil), and to take into account the knives consumption.

To perform the side plates adjustment (see picture):

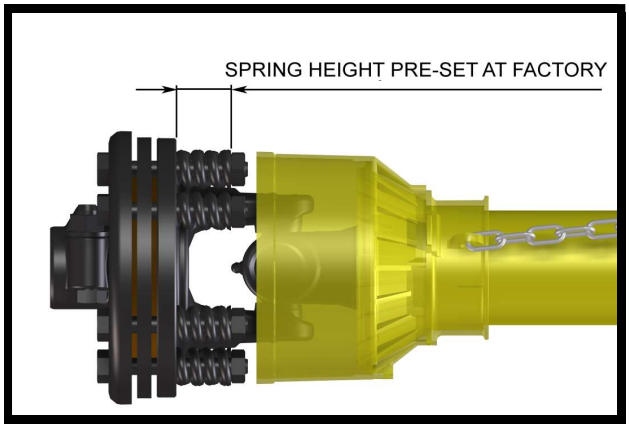
- remove the four screws (A);
- shift the mobile plate (B) until the position required;
- replace the fixing screws.



FRICTION CLUTCH ADJUSTMENT

If the machine is equipped with a PTO shaft with friction discs clutch, the safety device protects the machine from overloads during use through the slipping of the clutch discs, and limits the maximum torque transmitted from the tractor to the machine at a predetermined value, thanks to the springs height preset at the factory (see picture).

It is therefore recommended to leave the spring's height value unchanged to avoid damage to the machine or to the PTO shaft.



An adjustment can be done, however, when the clutch slipping is too frequent, which means that the calibration is too low. In this case, the tightening of nuts over the compressed springs will give an increase in torque transmissible. On the contrary, a loosening of the nuts over the springs will give a decrease in torque transmissible.

IMPORTANT

For details about clutch adjustment, refer to the user manual of the Manufacturer of the PTO Shaft installed. The Manufacturer is not liable for damages resulting from a wrong modification of the clutch calibration.

NOTES

Excessive tightening of the springs can prevent the clutch from slipping and to protect the machine from overload.

Make sure that the height of all the compressed springs is equal to prevent clutch malfunctioning.

5.4. STOPPING AND DISCONNECTION

To stop the machine at the end of a working session:

- bring the tractor on a dry and level surface;
- stop the tractor and place the transmission in park or neutral;
- reduce the engine speed, then disengage the PTO;
- wait for stopping of all rotating parts;
- lower the implement to the ground;
- set the parking brake;

- shut down the engine and remove the key before exiting the tractor;
- do the cleaning and maintenance required to make the machine ready for later use (see section Maintenance).

WARNING

Never leave the tractor unattended with the implement in the lifted position.

To disconnect the machine from the tractor (e.g. to make a change of implement):

- bring the tractor on a dry and level surface;
- stop the tractor and place the transmission in park or neutral;
- reduce the engine speed, then disengage PTO;
- wait for stopping of all rotating parts;
- lower the implement to the ground;
- set the parking brake;
- shut down the engine and remove the key before exiting the tractor;
- disconnect the driveline from the tractor PTO and rest it on and store in appropriate place;
- disconnect the top link and the rear lifting arms of the tractor from the machine hitches;
- check the machine stability. If needed, place safety blocks to prevent unit from tipping;
- get on the tractor, start the engine and move away from the machine slowly;
- make sure that the machine remains stored in a protected area, to prevent that unauthorized personnel can approach it.

Before a long term storage (e.g. at seasonal end), do cleaning and maintenance operations as specified in sections Maintenance and Storage.

5.5. TRANSPORT

To set the machine for transportation, when connected to the tractor, perform the following steps:

- idle tractor engine, disengage tractor PTO, and wait for stopping of all rotating parts;
- lock the tractor lifting hydraulics, turn off the engine, set the parking brake, remove ignition key and get off the tractor;
- be sure that the tractor's lifting arms are locked horizontally, to prevent the machine from swinging, compromising the stability of the tractor and the machine;
- check the lifting capacity and stability of the tractor connected to the machine in transport position (see section "Tractor-machine stability"), and apply to the tractor a ballast of at least 20% of tractor and implement weight. Without ballast, the front wheels of the tractor could lift up, resulting in loss of steering control and braking. Ballast can be added to the front wheels or to the front of the tractor;
- lift the machine until the transport position (approx. 35-40 cm from the ground), making sure the driveline transmission tubes does not hit either the tractor or the machine gearbox. A minimum gap of 2 cm should be leaved between the tubes and tractor and machine (see also section Driveline installation).

CAUTION

Make sure PTO is disengaged and blades have stopped turning before raising the machine to transport position.

WARNING

Never leave the tractor unattended with the implement in the lifted position.

During transportation:

- always use caution and select a safe ground speed appropriate for the terrain. Reduce speed when under adverse surface conditions, turning, or on inclines. Take care that the implement does not strike obstacles such as trees, fences or buildings;
- do not operate PTO. Always transport the implement with disengaged PTO;
- do not transport on steep slopes;
- do not transport equipment while under the influence of alcohol or drugs;
- do not use the machine to transport people, animals or things;

During transportation on public roads:

- install all the warning devices required by current regulations for transit (rear reflectors, lighting systems, flashing, Slow Moving Vehicle signal and/or Protruding Moving Vehicle signal);
- always comply strictly with all federal, state and local laws and traffic regulations.

WARNING

When driving on public roads, reduce your speed, be aware of traffic around you and proceed in such a way that faster moving vehicles may pass you safely.

Always use tractor lighting system and auxiliary lighting system for adequate warning to operators of other vehicles, especially when transporting at night or in conditions of reduced visibility.

6. MAINTENANCE

Proper and regular maintenance ensures a long life of your implement, avoids failures and saves time and repair costs.

Periodic inspections and maintenance operations described in this section must be performed by operator in the times and terms prescribed. Failure to comply with maintenance prescriptions can compromise the functioning and duration of the machine, and consequently invalidate the warranty.

The frequency of maintenance indicated refers to normal conditions of use: it must be intensified in severe or in usual operating conditions (frequent stops and starts, prolonged cutting season etc ...).

Repairs, maintenance and modifications other than those mentioned in this paragraph should not be performed without consulting the Manufacturer or your Dealer. Manufacturer, as the case, may give the authorization to proceed with the repair together with all necessary instructions.

Wrong or inappropriate repairs or maintenance may generate abnormal operating conditions, equipment damage and generate risks for the operator.

IMPORTANT

Before perform any maintenance operation, be sure to read and understand the information relating to safety instructions listed in the section "Maintenance safety instruction" of this manual.

WARNING

For safety reasons, all maintenance operations must be performed with tractor PTO disengaged, machine stopped and completely lowered to the ground or onto support blocks, parking brake set, tractor engine shut off, and ignition key removed.

WARNING

Perform maintenance operations always using appropriate Personal Protective Equipment (protective eye glasses, hard hat, safety shoes, overall and work gloves, filter mask).

6.1. BLADE REPLACEMENT

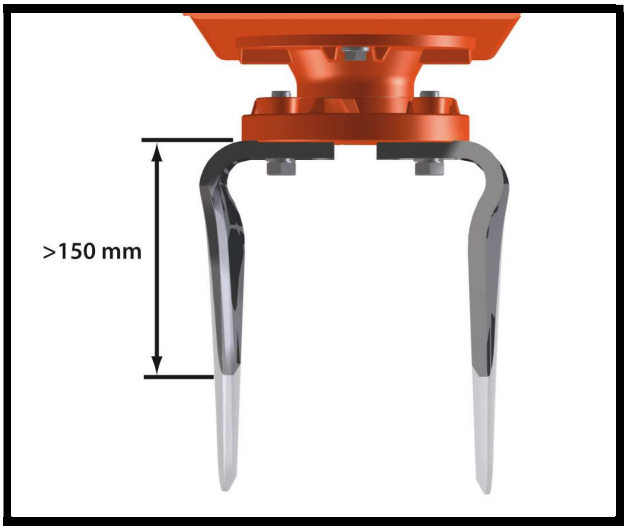
Frequently check the wear of the tools on the rotors through visual inspection. The wear of the blades is very variable depending on the type of soil.

The replacement of tools is necessary when they are damaged (deformed, cracked or broken) for accidental reasons following the working operations, or when their dimensions are significantly reduced compared to the original.

IMPORTANT

The length of the blades should never be less than 150 mm (see picture below).

Operating the machine with tools in bad condition compromises the quality of work and may damage the machine.



Before perform the replacement of the tools:

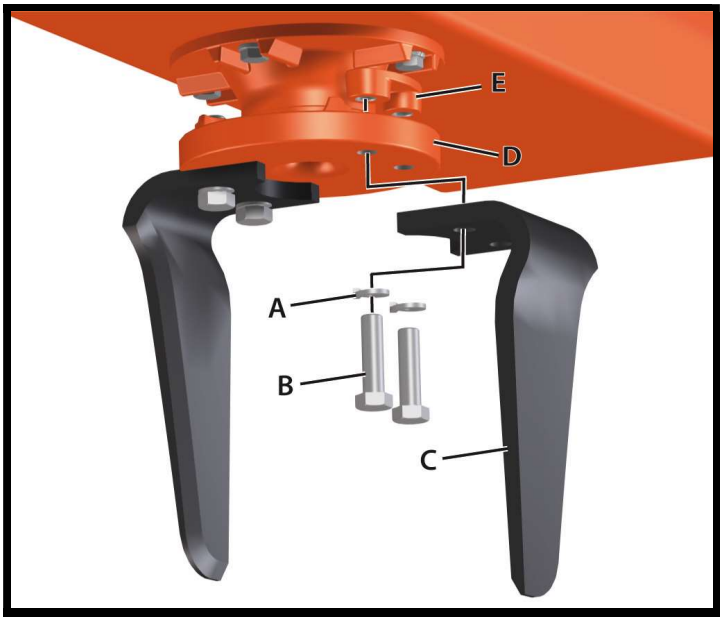
- idle tractor engine, set the parking brake, disengage tractor PTO, and wait for all moving parts to come to a complete stop;
- place the machine slightly raised off the ground on blocks or safety stands;
- lock the hydraulic lift of the tractor;

switch off the engine and remove the key from the control panel.

§§§

To perform the replacement of the blades do following steps (see picture below):

- remove the stone protection cover (where provided);
- remove the screws (B) and spring washers (A) clamping the blade (C) to the rotor flange (D) by means the screws stopping (E);
- remove the worn blade;
- position a new blade exactly instead of the worn blade. Be sure to install the blade with the cutting edge in the same direction of the previous one (same sense of rotation than therotor);
- replace screws and spring washers, retightening them to the screws stopping. Refer to the "Torque values table" of the manual for identify proper torque values;
- replace the stone protection cover (where provided);
- repeat the same procedure for the second blade of the rotor and for all the rotors.



WARNING

Blades on contiguous rotors have different orientations (right blades and left blades): always install the new blades with cutting edge having the direction of rotation of the rotor flange which they are connected to.

Worn blades can be very sharp! Apply extreme caution in handling.

IMPORTANT

Remove and install one blade at a time to ensure that blades are correctly oriented when installed.

Periodically check the tightness of screws and nuts, and tighten if necessary.

Replace worn blades only with original spare parts provided by the manufacturer or your Dealer.

§§§

WARNING

The machine has been designed with an arrangement of contiguous rotors having diversified angles, to allow the gradual entry of the blades into the soil, with consequent reduction of vibrations transmitted to the tractor and reduction of fuel consumption.

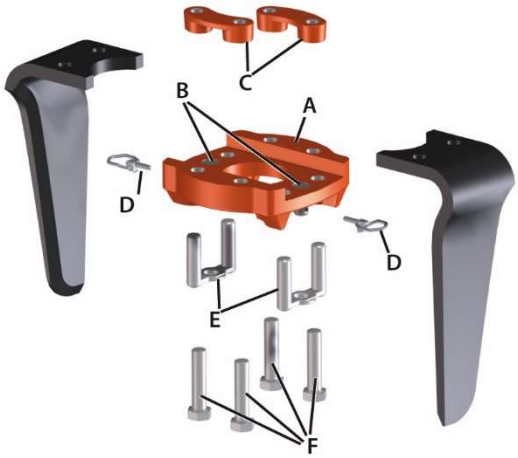
In case the replacement of one or more rotor flanges is required, it is essential to respect the original assembly layout. In case of any doubt contact the Manufacturer of the Dealer.

6.2. TOOLS REPLACEMENT (QUICK BLADE FITTING SYSTEM)

If the machine is equipped with the *quick blade fitting system*(patented) the blades replacement is particularly easy, because the removal of the blades do not requires wrenches or pneumatic tools.

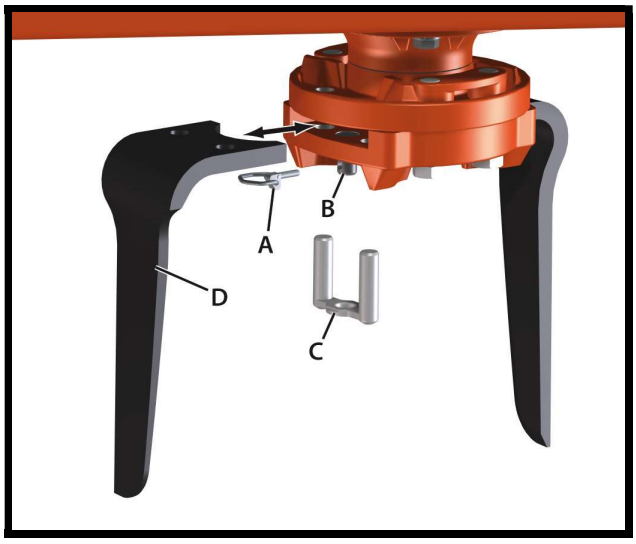
The *quick blade fitting system* consists of (see picture):

- one blade mount housing (A), complete with two tight-fitted pins (B);
- two blade stopping forks (E);
- two snap pins (D);
- two screws stopping (C).
- four fixing screws (F).



The blade housing is clamped to the rotor flange by means the screws and screws stopping, and hosts the two blades, locked in the housing through the stopping forks and the snap pins.

To perform the replacement of the blades do following steps (see picture below):



- remove the snap pin (A) from pin (B) and remove the stopping fork (C);
- remove the worn blade (D) from the housing;
- replace a new blade into the housing, instead of the worn blade. Be sure to install the blade with the cutting edge in the same direction of the previous one (same sense of rotation than therotor);
- replace the stopping fork in his seat and replace the split pin inside the pin;
- replace the stone protection cover (where provided);
- repeat the same procedure for the second blade of the rotor and for all the rotors.

WARNING

Blades on contiguous rotors have different orientations (right blades and left blades): always install the new blades with cutting edge having the direction of rotation of the rotor flange which they are connected to.

Worn blades can be very sharp! Apply extreme caution in handling.

IMPORTANT

Remove and install one blade at a time to ensure that blades are correctly oriented when installed.

Periodically check the tightness of screws and nuts, and tighten if necessary.

Replace worn blades only with original spare parts provided by the manufacturer or your Dealer.

Notes: the *quick blade fitting system* can be installed on a machine that does not have it also at a later time from the purchasing.

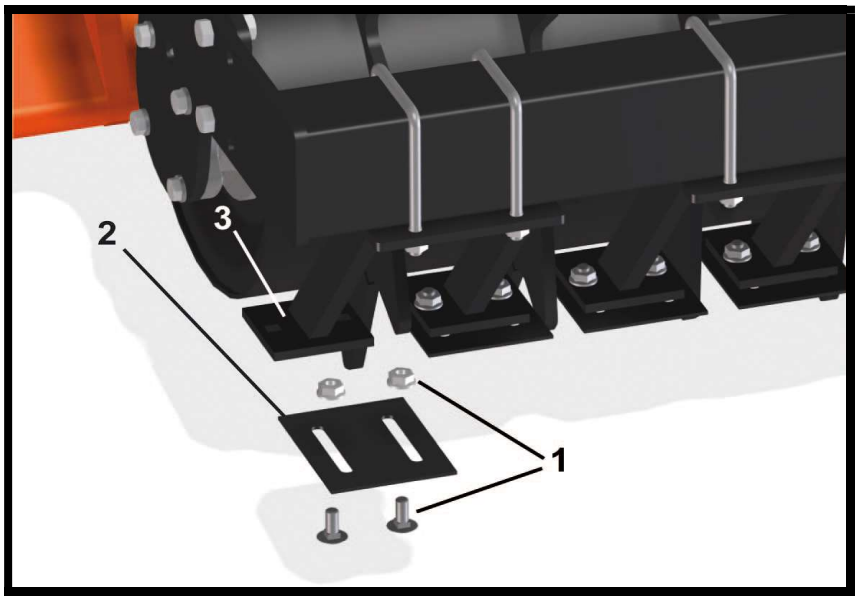
6.3. SCRAPER PLATES REPLACEMENT (PACKER ROLLER)

The packer roller is equipped with a rear bar supporting a series of scraper blades, which have the function to clean the roller by the accumulation of the soil. The optimal distance between the roller and each scraper is 2-3 mm.

Frequently check the wear of the scrapers, and provide for the replacement of the blades excessively worn, in order to assure a more efficient cleaning of the roller.

To perform the substitution of a scraper blade (see picture below):

- unscrew the mounting bolts (1) and remove the blade (2);
- position the new blade on the support (3) through the bolts and tighten them only partially;
- slide the blade on the support through the slots, until the desired distance from the roller is reached (distance suggested: 2-3 mm), then complete the tightening of the bolts. For the correct torque values refer to the section "Torque values table" of the manual.



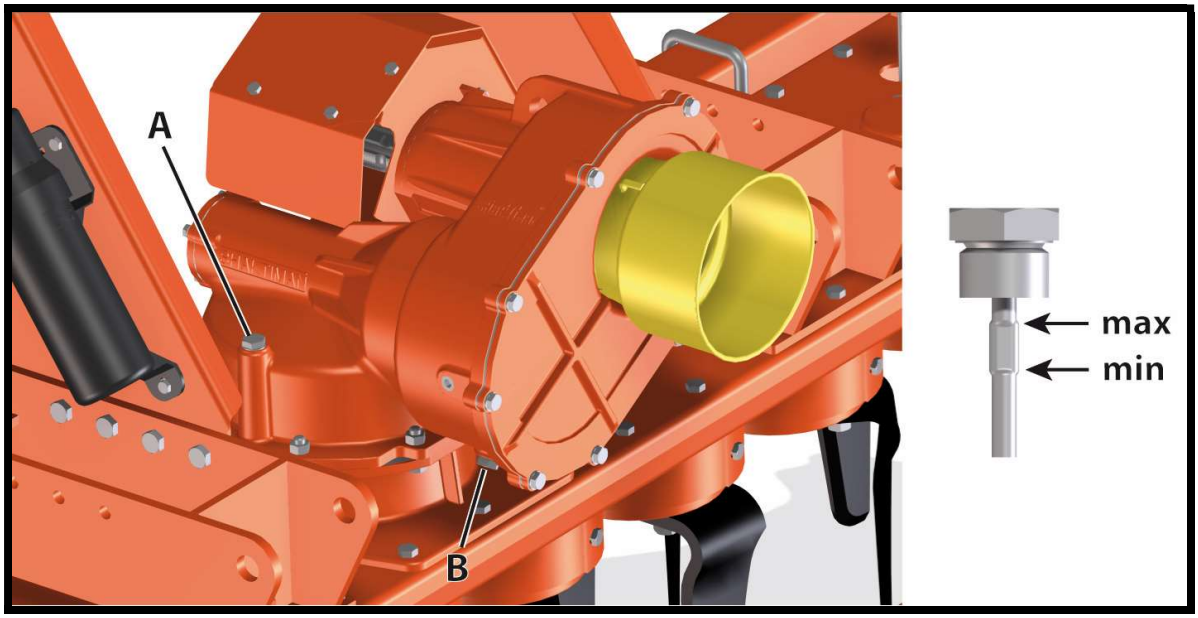
IMPORTANT

At the first use, or after replacement of the blades, it is suggested to adjust the blades after few minutes of machine working.

6.4. GEARBOX LUBRICATION

Lubricant: SAE 85W/140 gear oil.

Check the oil level every 50 hours, making sure that the mark left from the oil on the dipstick of the filling plug (A) is located between the two reference marks (minimum and maximum).



If the mark is below the minimum, fill up oil till the correct levelisrestored.

The oil change must be performed:

- after the first 50 working hours;

- each 400 working hours.

The oil quantity required for the complete oil change in the gearbox is the following: 4.5 liters

To make oil change:

- place a tank under the oil drain plug (B) at the bottom of gearbox;
- unscrew the oil drain plug and drain oil completely into the tank;
- retighten the drain plug;
- unscrew the oil filling plug (A);
- fill up oil till restore the correct level (between the two reference marks on dipstick);
- retighten the filling plug;
- dispose the discharged oil into containers for used oil.

CAUTION

Before touching the gearbox wait until it has cooled sufficiently.

IMPORTANT

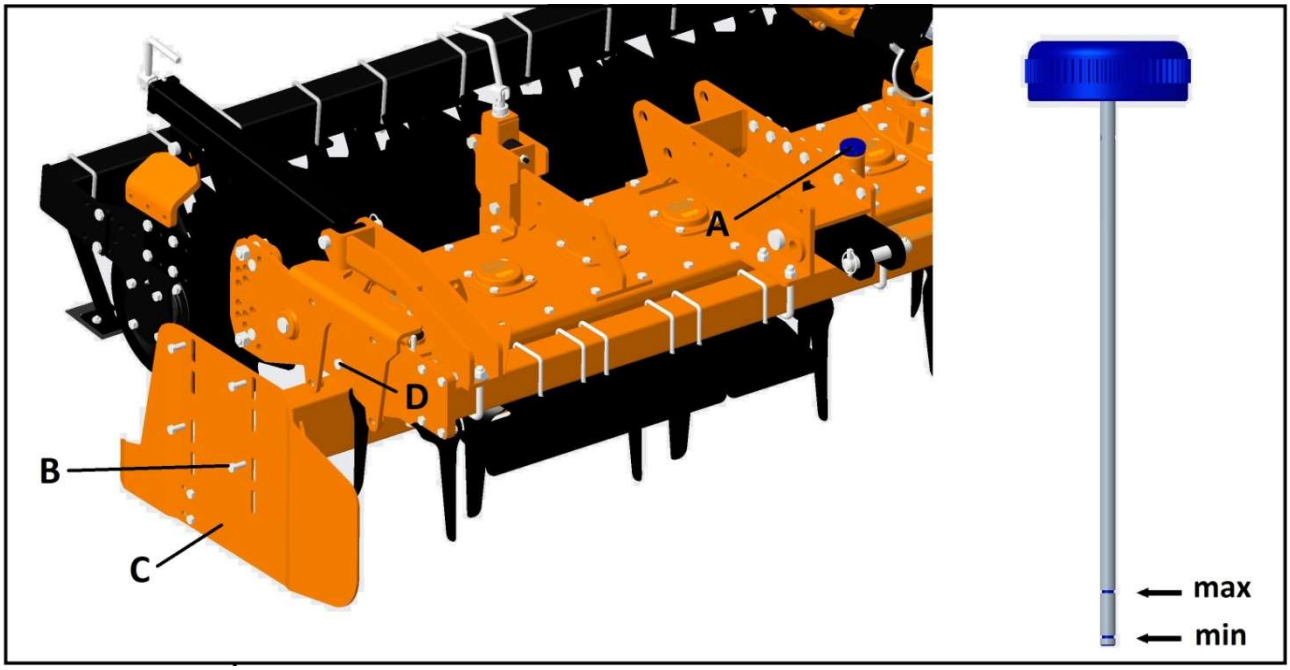
Frequently check possible oil leaks from the machine through visual inspection, and in case of leakage provide immediately proper maintenance.

Avoid oil leaks on the ground when restoring oil level or making oil change.

6.5. GEARS TROUGH LUBRICATION

Lubricant: SAE 85W/140 gear oil.

Check the oil level every 50 hours, making sure that the mark left from the oil on the dipstick of the filling plug (A) on the frame is located between the two reference marks (minimum and maximum).



If the mark is below the minimum, fill up oil till the correct level is restored.

The oil change must be performed:

- after the first 50 working hours;
- each 400 working hours.

The oil quantity required for the complete oil change on the trough is the following: 20 liters (model 2.5 - 2.5 meters), 22 liters (Model 3.0 - 3 meters).

To make oil change:

- remove screws (B) clamping the left side plate (C) and remove the plate;
- place a tank under the oil drain plug (D) at the bottom of the frame;
- unscrew the oil drain plug and drain oil completely into the tank;
- retighten the drain plug;
- replace the left side plate and retighten the clamping screws;
- unscrew the oil filling plug (A);
- fill up oil till restore the correct level (between the two reference marks on dipstick);
- retighten the filling plug;
- dispose the discharged oil into containers for used oil.

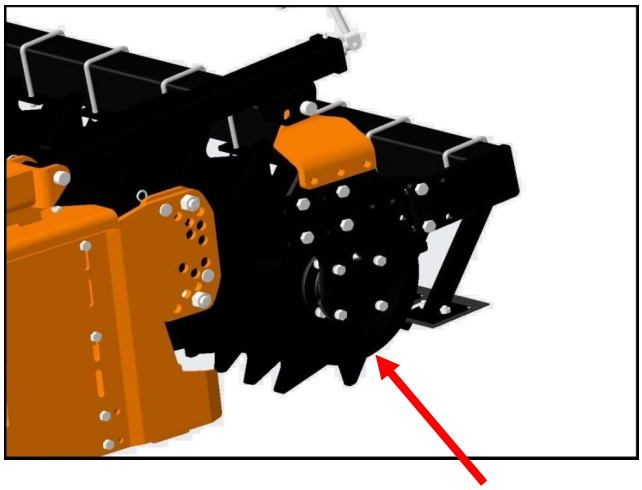
6.6. REAR ROLLER BEARINGS LUBRICATION

Lubricant: SAE multi-purpose lithium-type grease.

The rear roller's bearing housings are built with pre-lubricated sealed bearings. Exposure to water or dust, however, require occasional relubrication with high quality grease.

It is suggested to grease the bearings every 50 hours, till to observe the first oozing fat from the outer ring of the bearing, in order to prevent overfilling.

The greasing point is shown in the figure below.



IMPORTANT

Make sure to clean the fitting zerk before using the grease gun.

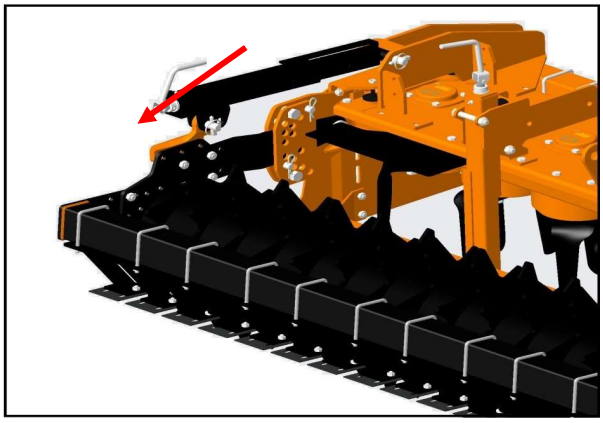
Do not let excess grease collect on or around parts, particularly when operating in sandy areas.

6.7. MECHANICAL JACKS LUBRICATION

Lubricant: SAE multi-purpose lithium-type grease.

The mechanical jacks are designed to lift the levelling bar and the rear roller (where provided).

It is suggested to grease the mechanical jacks every 50 hours. The greasing points are shown in the figure below.



IMPORTANT

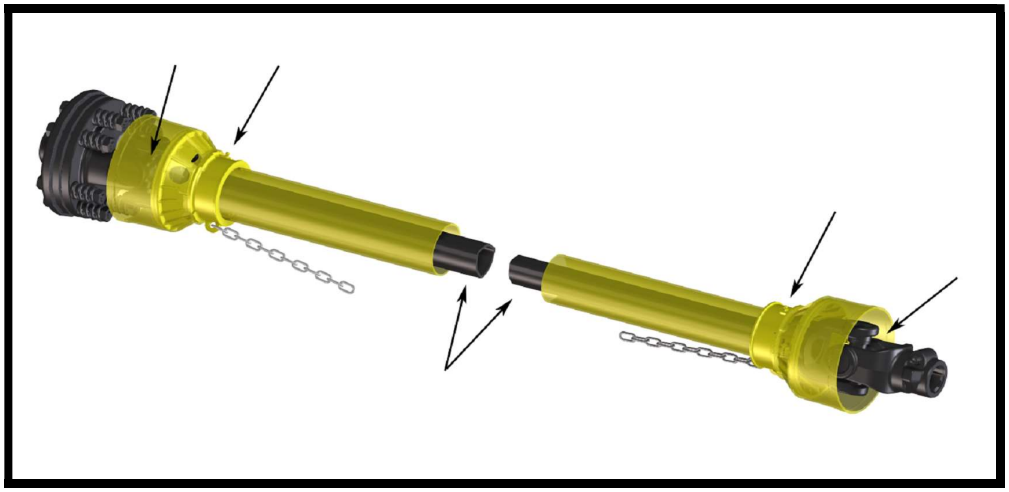
Make sure to clean the fitting zerk before using the grease gun.

Do not let excess grease collect on or around parts, particularly when operating in sandy areas.

6.8. PTO SHAFT MAINTENANCE

Lubricant: SAE multi-purpose lithium-type grease

Grease crosses, sliding parts of protective shielding and PTO Shaft transmission tubes.



IMPORTANT
For details about maintenance and lubrication of the PTO Shaft, refer to the user manual of the PTO Shaft Manufacturer.

If the machine is equipped with a PTO shaft with friction discs clutch, exposition to the elements of the machine and PTO Shaft, or a long period of inactivity, generally results in oxidation of some clutch components, and creates "sticking" effect on the clutch.

Consequently, the torque required to the slippage of the clutch could increase considerably compared to the value set at factory, and this may be cause of PTO Shaft breakage during operation, or damage to the tractor or implement.

To avoid it, before re-using the machine, operator must perform a short "run-in" of the clutch, as follows:

- take note of the height of the compressed springs;
- loosen the bolts that compress the springs;
- connect the machine to the tractor (see section Connecting to the tractor);
- connect the PTO Shaft (see section Driveline installation);
- start the tractor and engage PTO for few seconds, in order to cause slippage and separation of the parts "sticked" of the clutch;
- turn off the tractor, remove key and wait for all components are stopped before dismounting from tractor;
- retighten the bolts restoring the original springs position on the PTO Shaft.

NOTE
For replacement of the PTO Shaft service parts (e.g. friction discs), refer to the user manual of the PTO Shaft Manufacturer.

6.9. HYDRAULIC HOSES MAINTENANCE

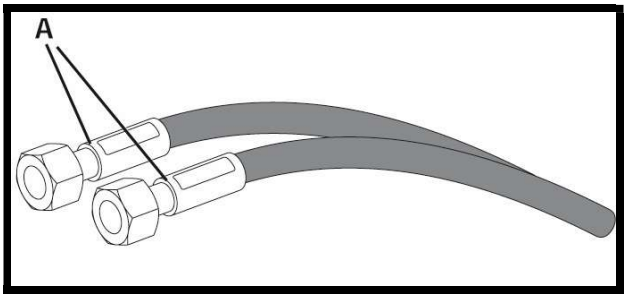
Frequently check the hydraulic hoses and replace them whenever they show:

• signs of wear or damage (cuts, tears);

• deformations not corresponding to the natural shape of the pipes (crushing and / or swelling);

• loss or corrosion near the joint's armor (A).

Always replace the hydraulic hoses no later than 3 years from the manufacturing date stamped on the armor of the pipes.



DANGER

Before carrying out operations on hydraulic lines under pressure or disconnecting hydraulic components, ensure the line has been previously depressurized and does not contain any hot fluid.

Do not use hands to locate pressure fluid losses.

7.STORAGE

Before leaving the machine unused for a long time, it's necessary to carry out following tasks to preserve the appearance and functionality of the machine, and to make easier the restart at later use:

- park the machine on a flat surface, in a dry place protected from exposition to the elements, if possible with temperature between 0 and 50°C (see section Stopping and disconnection);
- thoroughly clean the machine, and remove from the rotors all residues due to soil working, in order to avoid damage from grass and stagnant water;
- inspect carefully the machine, checking for worn and/or damaged parts. Perform immediately all repairs and/or replacements needed, in order to make the machine ready for restarting;
- in case of abrasion of painted surfaces, provide restoring the surface protection through touch-up paint, in order to prevent rust;
- make sure the safety decals are in their original positions, intact and legible. When required, replace the decals immediately;
- lubricate properly all grease points, and restore oil levels as indicated in the Maintenance section. Use protective oil to coat the exposed mechanical components and to protect them against rust.

If the connecting PTO Shaft is equipped with a friction discs clutch, it is suggested to take note of the height of the compressed springs and loosen the bolts that compress the springs, to prevent the "sticking" effect of the discs due to moisture, that may cause clutch failure at restart of the activities (see also PTO Shaft maintenance).

Before restart the operations, restore the original height of the springs.

8.SCRAPPING

In case of scrapping, the machine must be disposed in appropriate and authorized sites, according to local legislation of the Country where the machine is used.

Before scrapping, separate plastic parts from rubber parts, aluminum, steel, etc.and dispose the parts to authorized centers.

Recover and dispose any exhausted oils to authorized centers for oil collecting.

IMPORTANT

Respect the environment. Store and/or dispose any exhausted lubricants as indicated by lubricant Manufacturer.

9. TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	POSSIBLE SOLUTION
Noise from PTO shaft during machine lifting	Bad connection between machine and tractor	Adjust the tractor top link
	Machine is lifted too much	Limit the lifting
Noise noticeable and constant from gearbox/gears transmission trough	Low oil level	Add oil
	Worn gears	Replace gears
Intermittent noise from the machine	Loose blades	Tighten blades hardware
	Gear tooth damaged	Replace damaged gear
Noise and/or vibration from machine	Blades worn or damaged	Replace blades
	Bearings worn or damaged	Replace bearings
	Rotor(s) damaged	Repair/replace rotor(s)
	Rotors/blades incorrectly installed (incorrect rotor arrangement and/or blades orientation)	Install rotors/blades correctly (follow rotors arrangement shown in the manual and /or reinstall blades with correct orientation)
	Front of the machine not levelled to the back	Adjust 3-point tractor top link making input connection shaft parallel to the ground
	Machine not stable at sides	Lock tractor lifting arms to prevent machine swinging
	Hard soil	Reduce ground speed
Driveline vibration	Worn PTO Shaft	Replace PTO Shaft
	Machine lifted too high	Lower machine and read just tractor top link
	Debris wrapped around blades and/or rotors	Remove debris
Rotor stops turning	Slip clutch slipping	Reduce load to the machine or adjust slip clutch
	Broken gear(s) in gearbox/ /gears transmission trough	Replace gear(s)
Smoke and/or hot smell from the machine	Debris wrapped around blades and/or rotors	Remove debris
	Low oil level	Add oil
	Slip clutch slipping	Reduce load to machine or adjust slip clutch
Gearbox/gears transmission trough overheating	Low oil level	Add oil
	Hard soil	Reduce ground speed
Blades wear frequently	Muddy or sandy soil	Reduce ground speed

Blades break frequently	Stony soil	Reduce ground speed
Oil leaking from gearbox/ gears transmission trough	Gearbox/gears transmission trough overfilled	Drain to proper level
	Loose filling/drain plug	Tighten filling/drain plug
	Damaged breather plug	Replace breather plug
	Damaged seals	Replace seals
Working depth insufficient	Hard soil	Reduce ground speed.Do soil working in more steps
	Required transmission of higher load from the tractor	Increase PTO speed
	Machine to raised from the ground	Raise rear roller
	Blades worn or bent	Replace blades
	Rotors/blades incorrectly installed (incorrect rotor arrangement and/or blades orientation)	Install rotors/blades correctly (follow rotors arrangement shown in the manual and /or reinstall blades with correct orientation)
	Debris wrapped around blades and/or rotors	Remove debris
Soil texture too coarse	Levelling bar too high	Lower levelling bar
	Hard soil	Reduce ground speed.Do soil working in more steps
	PTO speed too low	Increase PTO speed
	Ground speed too high	Reduce ground speed
Soil texture too fine	Levelling bar too low	Raise levelling bar
	Crumbly soil	Increase ground speed
	PTO speed too high	Reduce PTO speed
	Ground speed too slow	Increase ground speed
Machine choking upwith soil	Blades worn or bent	Replace blades
	Rotors/blades incorrectly installed (incorrect rotor arrangement and/or blades orientation)	Install rotors/blades correctly (follow rotors arrangement shown in the manual and /or reinstall blades with correct orientation)
	Soil too wet	Wait until soil dries
	Ground speed too fast	Reduce ground speed
	Excessive working depth	Lower rear roller
Machine skipping on ground, vibrating or leaving crop residue	Blades worn or bent	Replace blades
	Clutch slips too frequently	Lower the tractor load transmitted to the machine or adjust the clutch
	Rotors/blades incorrectly installed (incorrect rotor arrangement and/or blades orientation)	Install rotors/blades correctly (follow rotors arrangement shown in the manual and /or reinstall blades with correct orientation)
	Debris entangled in rotors and/or blades	Clear rotors and/or blades

	Ground speed too fast	Reduce ground speed
	Soil too hard	Reduce ground speed.Do soil working in more steps
Soil appears not uniform after working	Blades worn or bent	Replace blades
	Left side of the machine not levelled to the right	Adjust the tractor lifting arms and/or the rear roller and/or the levelling bar position
	Ground speed too fast	Reduce ground speed
Too load required to tractor	Excessive working depth	Lower rear roller
	Excessive PTO speed	Reduce PTO speed
	Ground speed too fast	Reduce ground speed
	Levelling bar too low	Raise levelling bar
Soil accumulation between rotor and levelling bar	Soil too wet	Wait until soil dries. Remove levelling bar
Obstruction/blockage of Packer roller	Blades scrapers worn and/or in incorrectly position	Replace scrapers and/or adjust position
	Plant residues obstructing blades scrapers	Remove residues and clean scrapers
Soil accumulation ahead of Packer roller, resulting in Roller stop	Soil too sandy	Extend 3-point tractor top link
		Reduce ground speed
		If possible, use roller with increased diameter
Obstruction/blockage of Cage roller	Soil too wet	Wait until soil dries. Use Packer roller

10. TORQUE VALUES TABLE

Frequently check hardware to make sure that screws and bolts are tightened according to torque values listed in following table (friction coefficient: 0.14):

STD.		Grade (new)		4.8		5.8		6.8		8.8		10.9		12.9	
DIN 267		Grade (old)		4 S		5 S		6 S		8 G		10 K		12 K	
SCREW	Wrench	Pitch		Pitch		Pitch		Pitch		Pitch		Pitch		Pitch	
DIAM.	dimens.	Coarse	Fine	Coarse	Fine	Coarse	Fine	Coarse	Fine	Coarse	Fine	Coarse	Fine	Coarse	Fine
mm.	mm.	mm.	mm.	Nm.	Nm.	Nm.	Nm.	Nm.	Nm.	Nm.	Nm.	Nm.	Nm.	Nm.	Nm.
M 8	13	1,25	1	13	14	16	17	19	20	25	27	35	38	42	46
M 10	17	1,5	1,25	25	26	31	33	37	39	50	53	70	74	84	89
M 12	19	1,75	1,5	42	45	53	56	64	67	85	89	119	125	143	150
M 14	22	2	1,5	68	74	84	92	101	111	135	148	190	208	228	250
M 16	24	2	1,5	106	113	132	141	159	170	212	226	298	318	357	382
M 18	27	2,5	2	145	155	182	194	218	233	290	310	402	436	490	523
M 20	30	2,5	2	206	218	258	273	310	327	413	436	580	614	697	736
M 22	34	2,5	2	284	299	355	373	426	448	568	597	798	840	958	1008
M 24	36	3	2	357	390	446	488	535	586	714	781	1004	1098	1204	1317
M 27	41	3	2	525	570	656	712	788	855	1050	1139	1477	1602	1772	1923
M 30	46	3,5	2	714	795	893	994	1072	1193	1429	1590	2009	2236	2411	2648
M 33	50	3,5	2	970	1068	1213	1335	1456	1602	1941	2136	2729	3004	3275	3605
M 36	55	4	3	1248	1326	1561	1658	1873	1989	2497	2652	3511	3730	4213	4476
M 39	60	4	3	1621	1715	2026	2144	2431	2573	3242	3430	4559	4824	5471	5789
M 42	65	4,5	3	2005	2175	2507	2718	3008	3262	4011	4349	5640	6116	6768	7339
M 45	70	4,5	3	2520	2701	3149	3376	3779	4051	5039	5401	7086	7596	8503	9115

11. WARRANTY

Tirth Agro Technology Pvt. Ltd. offer the following warranty to the purchaser of COSMO BULLY ROTARY HOE mentioned herein above subject to the conditions set out herein after provided the COSMO BULLY ROTARY HOE shall be in the possession of and used by such purchaser as from the date of delivery.
Tirth Agro Technology Pvt. Ltd. warrants its products for a period of twevle (12) months against defective parts. This warranty shall not apply to implements or parts that have been subjected to negligence, of accident, or that have been altered or repaired or used with non-genuine parts.

CONDITIONS

<u>If you wish to make a warranty claim you must first contact the supplier of your goods to begin the claim process.</u>

The following are the warranty terms and conditions for new goods sold in Australia by Farm Implements P/L in conjunction with the manufacture Tirth Agro Technology Pvt. Ltd ("We", "Our" or "Us"), both of 16 Cahill Street, Dandenong, Victoria, Australia, 3175.

1. To the extent that any goods or services supplied by Us are supplied to a 'consumer' as defined in the Australian Consumer Law, We will comply with any applicable consumer guarantees and the following statement will apply: "Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure."
2. 'Australian Consumer Law' means Schedule 2 of the Competition and Consumer Act 2010 (Cth).
3. The warranties provided in this document are in addition to any other rights or remedies available to you under the law, and do not limit the consumer guarantees for 'consumers' under the Australian Consumer Law.
4. *Goods presented for repair may be replaced by refurbished goods of the same type rather than being repaired. Refurbished parts may be used to repair the goods.*
5. Any warranty claim that is the result of operator abuse, neglect or unauthorised modifications being made to the good will not be considered valid, subject to the Australian Consumer Laws. The warranty does not cover costs of claiming under this warranty; depreciation, damage, malfunction or failure caused by normal wear and tear; lack of reasonable maintenance or improper servicing; failure to follow operating instructions; misuse or lack of proper protection during storage. The expected normal working conditions and maintenance requirements are outlined in the relevant operator's manual.
6. All new Implements are provided with a 12 month comprehensive warranty from the date of invoice against faulty workmanship or materials, under normal working conditions and service, as outlined in the relevant operational manual for the particular good. Your warranty for those goods will be considered void if any damage to the implement is caused by operator abuse, neglect, or if any unauthorised modifications have been made.
7. If you wish to make a warranty claim, <u>you must immediately report the defect to the supplier within the warranty or consumer guarantee claim period</u>, including a written statement of your claim, along with photos of the current condition of the goods by mail (or if possible, email) to the address of the place from which you purchased the good. You will be required to present valid proof of purchase, and at your expense promptly provide the goods to the supplier immediately after notification of a service issue.
8. Please note that We require an assessment of the condition of the goods to be conducted by either the supplier, Us or the manufacturer, as well as obtaining a history of use of the good, before We can determine whether a consumer guarantee or manufacturer's warranty is applicable. We are not responsible for any transportation cost incurred in the repair or replacement of parts not covered by the warranty.

9. To the maximum extent permitted by law, and except in circumstances where the consumer guarantee provisions under the Australian Consumer Law apply and are inconsistent with the following, Our liability for the supply of the goods is limited, at Our discretion, to 1) replacement of the goods or the supply of equivalent goods; 2) repair of the goods; 3) payment of the cost of replacing the goods or acquiring equivalent goods; or 4) payment of the cost of having the goods repaired.
10. You acknowledge that use of the goods is inherently dangerous and agree that to the maximum extent permitted by law, We are not liable in any event for consequential loss, damage or injury, including loss of crops, loss of profits, or personal injury or death howsoever caused.
11. Farm Implements Dealers have no authority to make any representation, promise or admission on behalf of Us or to modify the terms or limitations of these Warranty Conditions in any way. Nothing in these Warranty Conditions constitutes a partnership between Us and any Farm Implements Dealer, or constitutes any Authorised Dealer as an agent or employee of Ours for any purpose at all. Our Dealers have no authority or power to bind Us, to contract in the name of Farm Implements P/L or to create a liability against Us in any way or for any purpose at all, including but not limited to representations regarding performance or fitness for any purpose of the goods.

If you have specific queries regarding the warranties or consumer guarantees provided by Farm Implements P/L in conjunction with the manufacture Tirth Agro Technology Pvt. Ltd please send details of your claim to Our attention at 16 Cahill Street, Dandenong, Victoria, Australia, 3175, or via email at sales@farmimplements.com.au **or phone 03-9706-5166.**

THIS CONTRACT WILL BE INEFFECTIVE AND INOPERATIVE IF:

a. The COSMO BULLY ROTARY HOE has not been delivered, assembled, started and put into operation by the company or it's Authorized Representative.
b. The warranty card has not been returned within 30 days of date of purchase.
c. The COSMO BULLY ROTARY HOE parts thereof is subjected to neglect, fire, flood or other acts of God or if in the company's opinion any damage has caused to the COSMO BULLY ROTARY HOE in transportation.
d. The original numbers are removed, obliterated or altered from the unit.
e. Any attempt is made to have the repairs executed by a person or persons, other than the company or its authorized representative.
f. Any defect is not informed immediately to the company or its authorized representative, any alteration in warranty card is made.
g. Any change in the location of the COSMO BULLY ROTARY HOE or in its ownership during the warranty period must be intimated in writing to the company or its Authorized Representative ten days before the change. Failure to do so will absolve the company from the obligation under this warranty.
h. Damage to the COSMO BULLY ROTARY ROTARY HOE or any part thereof caused, during shifting or transportation is not covered by this warranty.

i. This warranty is given in lieu of all other guarantees and condition expressed or implied by law or by any person purporting to act on behalf of the COMPANY and excludes every condition, warranty or guarantee not herein expressly set out.

NT – Parts/materials that are not covered by the warranty are as follows:

1. **Blade**
2. **Universal Joint Cross**
3. **Paint**
4. **Bearing**
5. **Rubber Parts**
6. **Gaskets**
7. **Fasteners**

❖ **WHEN THE WARRANTY BECOMES VOID**

Besides the cases specified in the supply agreement, the warranty shall in any case become void:

- Should there have been a maneuvering error, use of an inadequate safety bolt on the cardan shaft torque limiter or when the cardan shaft clutch has been damaged through improper maintenance.
- When the implement has been used beyond the specified power limit as given in the technical data chart.
- When following repairs made by the customer without authorization from the manufacturer or owing to instillation of spurious spare parts, the machine is subjected to variations and the damage can be ascribed to these variations.
- Whenever the user or anyone else on his behalf applies equipment to the machine that has not been expressly approved by the manufacturer.
- When the user failed to comply with the instructions in this manual book.

12. SPARE PARTS

All repairs and replacements on the machine must be performed only by using original spare parts, which must be obtained from the Manufacturer or your Dealer.

When requesting spare parts to Manufacturer, always give following indications:

- type of machine;
- machine serial number;
- description and p/number of the spare parts;
- quantities.

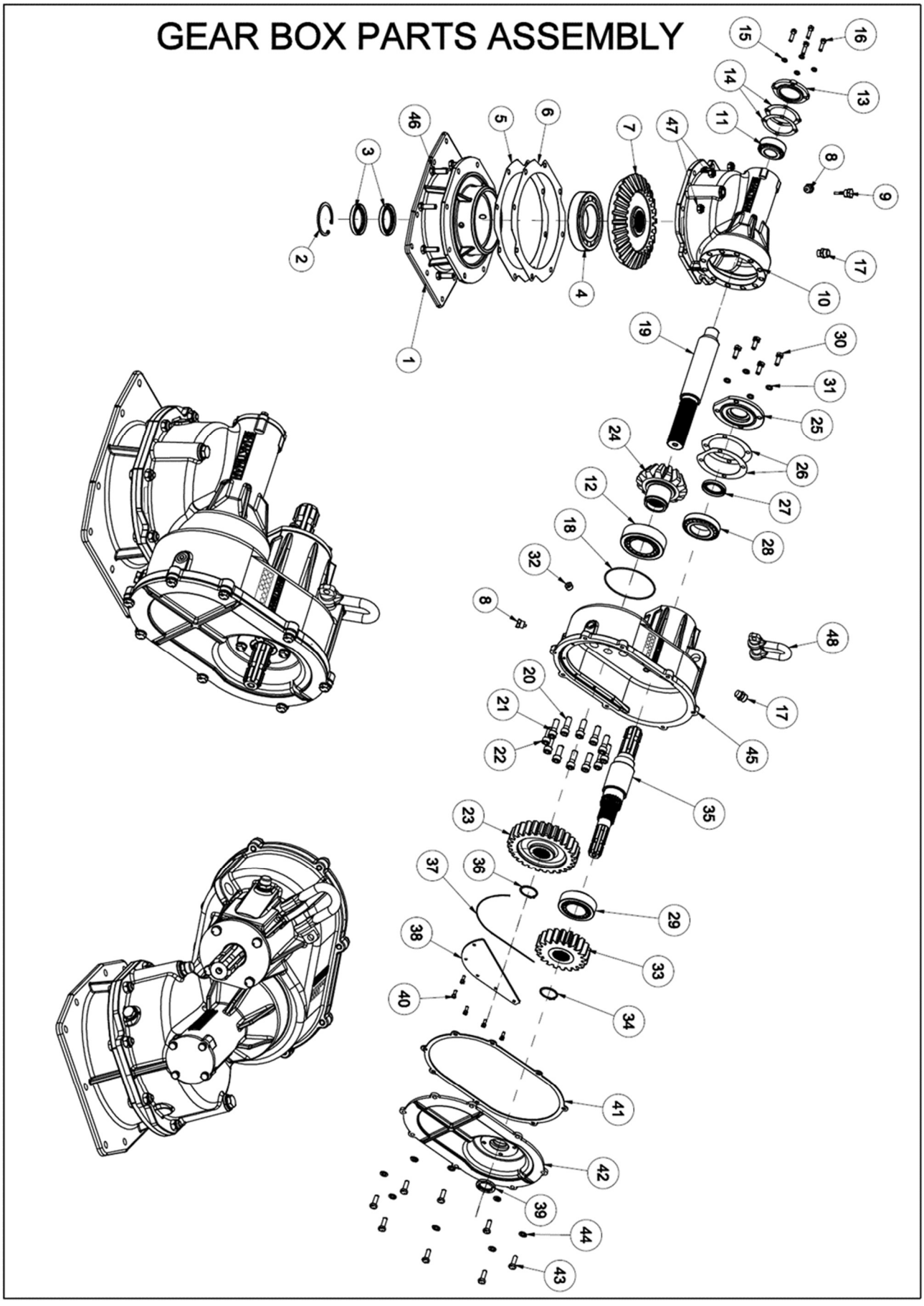
NOTE

For identification of p/numbers and description of safety decals refer to the Section Safety labels.

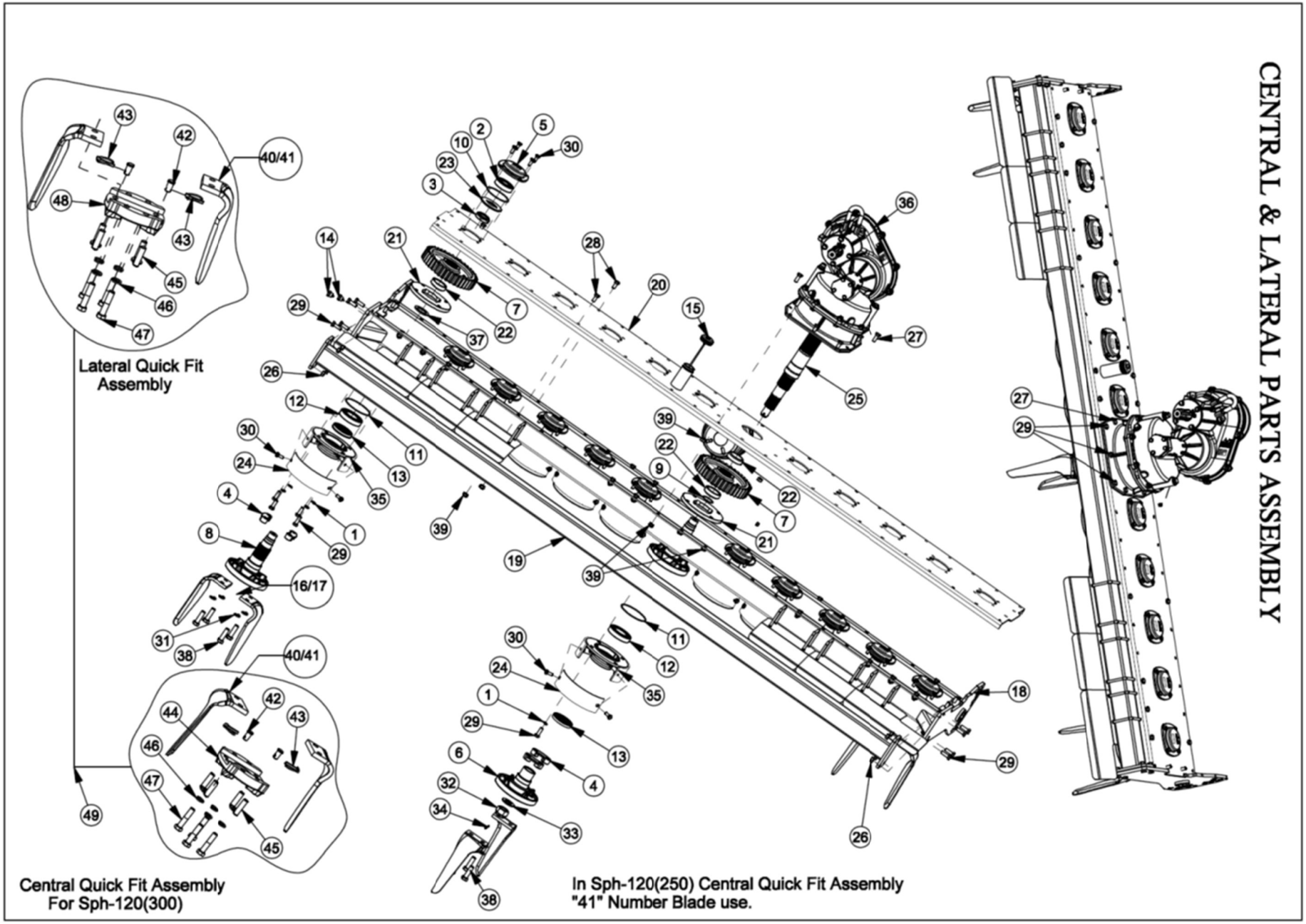
For identification of p/numbers and description of PTO driveline parts, refer to the manual of the PTO Shaft Manufacturer.

The Manufacturer reserves the right to substitute a required part with an equivalent part, if applicable.

GEAR BOX PARTS ASSEMBLY



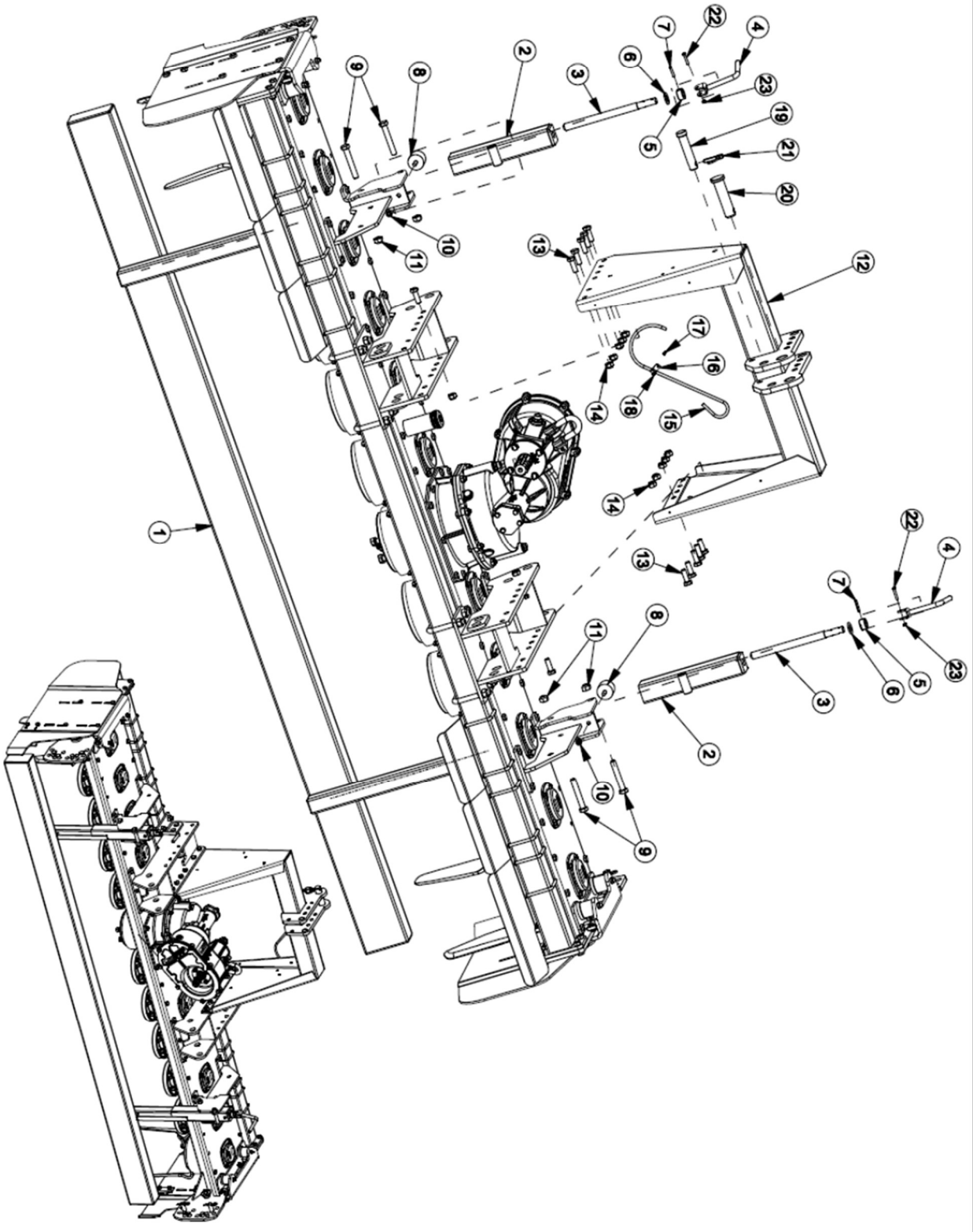
CENTRAL & LATERAL PARTS ASSEMBLY



CENTRAL & LATERAL PARTS ASSEMBLY

SR. NO	MANUAL CODE	PART NAME	QTY	
			300	250
1	1306	SPRING WASHER 12mm	48	40
2	8043	BEARING 6307 2RS	11	9
3	23065	CASTLE NUT M45 X 1.5	11	9
4	6731	BLADE SCREWS BRACKET 60mm (SPH-120)	24	20
5	6504	BEARING SUPP. COVER UPPER (SPH-120)	11	9
6	6733	BLADE SUPP CENTR QUICK FIT (SPH-120)	1	1
7	6510	CENTRAL GEAR Z40 (SPH-120)	12	10
8	6734	BLADE SUPP LATER QUICK FIT (SPH-120)	11	9
9	6513	O RING 45 X 3	1	1
10	6514	O RING 100 X 3	12	10
11	6515	O RING 115 X 3	12	10
12	6520	BEARING 6211 2RS C3	12	10
13	6527	CASSETTE SEAL 65 X 90 X 13	12	10
14	6530	MAGNETIC DRAIN PLUG(M18X1.5)(1MSCM40A)	2	2
15	6531	DIPSTICK 195MM (1"1/2 GAS) (1WFZA202)	1	1
16	6737	BLADE 100X12X300 LH C-60 (SPH-120)	12	10
17	6738	BLADE 100X12X300 RH C-60 (SPH-120)	12	10
18	6537	TROUGH WELD ASM 300 (SPH-120)	1	-
	6633	TROUGH WELD ASM 250 (SPH-120)	-	1
19	6543	FRONT BEAM, WELDMENT 300 (SPH-120)	1	-
	6635	FRONT BEAM, WELDMENT 250 (SPH-120)	-	1
20	6899	TROUGH COVER WELD NEW G/B 300 (SPH-120)	1	-
	6898	TROUGH COVER WELD NEW G/B 250 (SPH-120)	-	1
21	6560	INNER FLANGE (SPH-120)	12	10
22	6561	SPACER FOR GEAR (SPH-120)	13	11
23	6562	FLANGE BEARING PROTECTION (SPH-120)	11	9
24	6565	BEARING SUPP. COVER FRONT (SPH-120)	12	10
25	6568	MAIN DRIVE SHAFT (SPH-120)	1	1
26	6584	HEX NUT M12 X 1.25 DIN 934	12	12
27	6587	HEX BOLT M12 X 1.25 X 30 DIN 961 - 8.8	4	4
28	6588	HEX BOLT M12 X 1.25 X 25 DIN 961 - 8.8	16	8
29	6589	HEX BOLT M12 X 1.25 X 35 DIN 961 - 8.8	62	54
30	6591	HEX BOLT M10 X 1.25 X 25 DIN 961 - 8.8	68	56
31	1308	SPRING WASHER 16mm	48	40
32	6604	CASTLE NUT M30 X 2 DIN 935	1	1
33	6607	WASHER M30 DIN 125-A	1	1
34	6608	COTTER PIN D5 X 50 IS 549	1	1
35	6628	CENTRAL INC. SUPP. PROT. (SPH-120)	12	10
36	6941	TRANSMISSION MOUNTING (SPH-160)	1	1
37	6639	SPACER 65 X 46 X 4 (SPH-120)	11	9
38	6660	HEX BOLT M16 X 1.5 X 55 HT 12.9	48	40
39	6663	SELF LOCK NUT M12 X 1.25 DIN 980V	26	24
QUICK FIT ASSEMBLY				
40	6659	BLADE 100X15X300 RH (SPH-120)	12	10
41	6658	BLADE 100X15X300 LH (SPH-120)	12	10
42	6627	SNAP PIN (SPH-120)	24	20
43	1218	LINCH PIN	24	20
44	6505	SUPP. CENTR. QUICK RELEASE (SPH-120)	1	1
45	6597	FORK STOP KNIFE (SPH-120)	24	20
46	1308	SPRING WASHER 16mm	48	40
47	6744	HEX BOLT M16 X1.5 X 75 (HT) (12.9)	48	40
48	6732	SUPP. LATERAL QUICK RELEASE (SPH-120)	11	9
49	6900	KIT QUICK FIT M/C W/T BLADE 250(SPH-120)	-	1
	6901	KIT QUICK FIT M/C W/T BLADE 300(SPH-120)	1	-

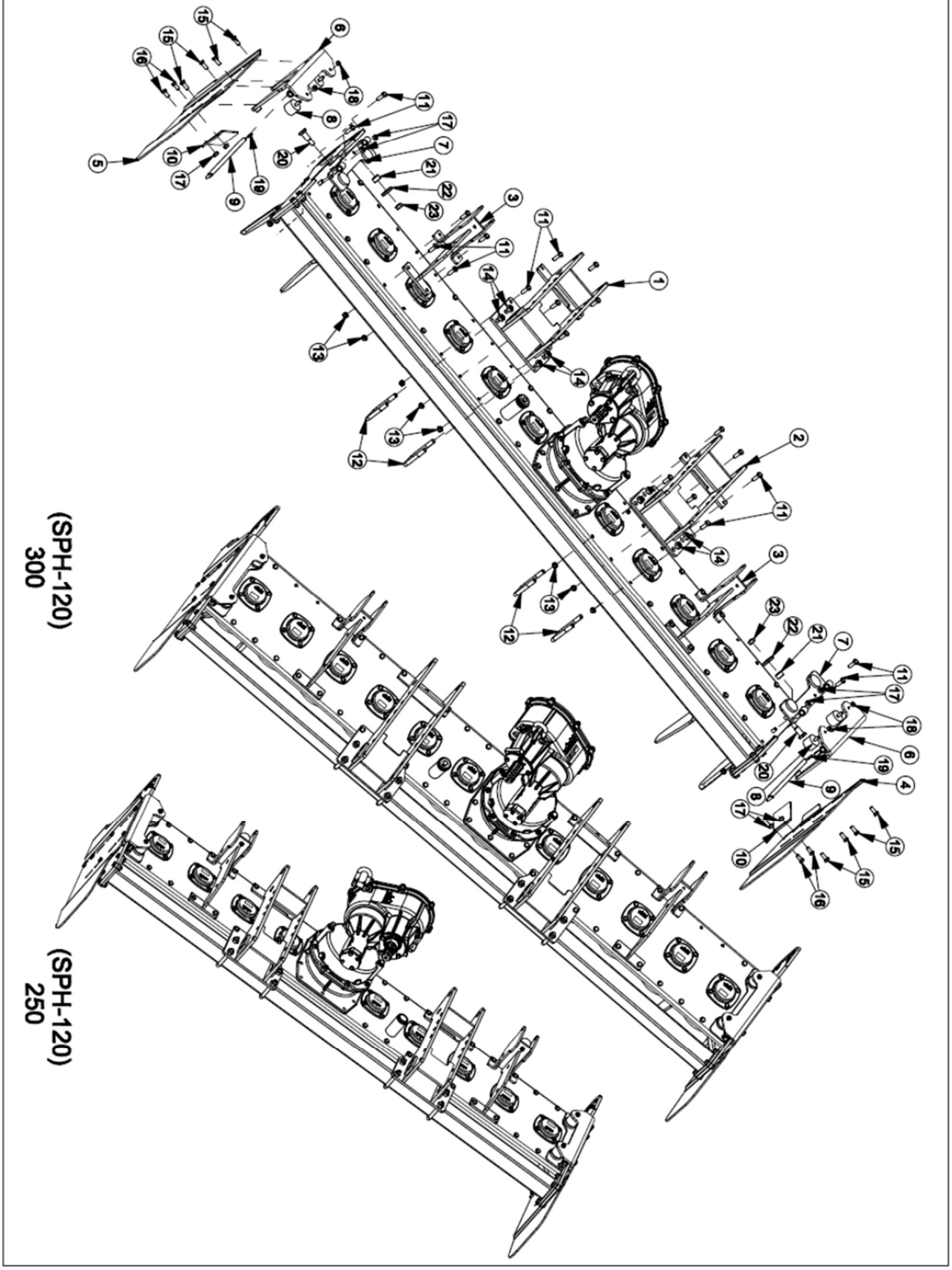
LEVELER & TOP MAST PARTS ASSEMBLY



LEVELER & TOP MAST PARTS ASSEMBLY

SR.NO	MANUAL CODE	PART NAME	QTY	
			(SPH-120) 300	(SPH-120) 250
1	6553	LEVELING BAR WELD. 300 (SPH-120)	1	-
	6637	LEVELING BAR WELD. 250 (SPH-120)	-	1
2	6551	MECH. JACK WELD UPPER PART (SPH-120)	2	2
3	6557	THREADED BAR (SPH-120)	2	2
4	6549	HANDLE WELD. (SPH-120)	2	2
5	6550	BUSHING MECH. JACK (SPH-120)	2	2
6	23248	WASHER M20 DIN 125	2	2
7	25195	DOWEL PIN 6 X 36 (ISO8752)	2	2
8	6546	BUMPER M10X1.5X40 (SPH-120)	2	2
9	6664	HEX BOLT M16 X2 X 100 DIN 931	4	4
10	17272	HEX NUT M10 X 1.50 DIN 934	2	2
11	17942	SELF LOCK NUT M16X2 DIN 980V	4	4
12	6541	TOP MAST WELD. (SPH-120)	1	1
13	6586	HEX BOLT M14 X 1.50 X 40 DIN 961 - 8.8	12	12
14	6594	SELF LOCK NUT M14 X 1.50 DIN 980V	12	12
15	23146	DRIVELINE HOOK 370MM	1	1
16	23147	PLATE,HOOK HOLDING (JUMBO)	1	1
17	24528	HEX BOLT M4 X 0.75 X 20 (FT) - SCH	1	1
18	23028	HEX NUT M4 X 0.75	1	1
19	1215	HINCH PIN TOP CAT-II (DIA- 25 X 126)	1	1
20	23155	PIN, TOP HITCH (CATEGORY III) (JUMBO)	1	1
21	23062	LINCH PIN (D10XL45)	2	2
22	6601	HEX BOLT M6 X 1 X 35 DIN 931	2	2
23	6583	HEX NUT M6 X 1 DIN 934	2	2

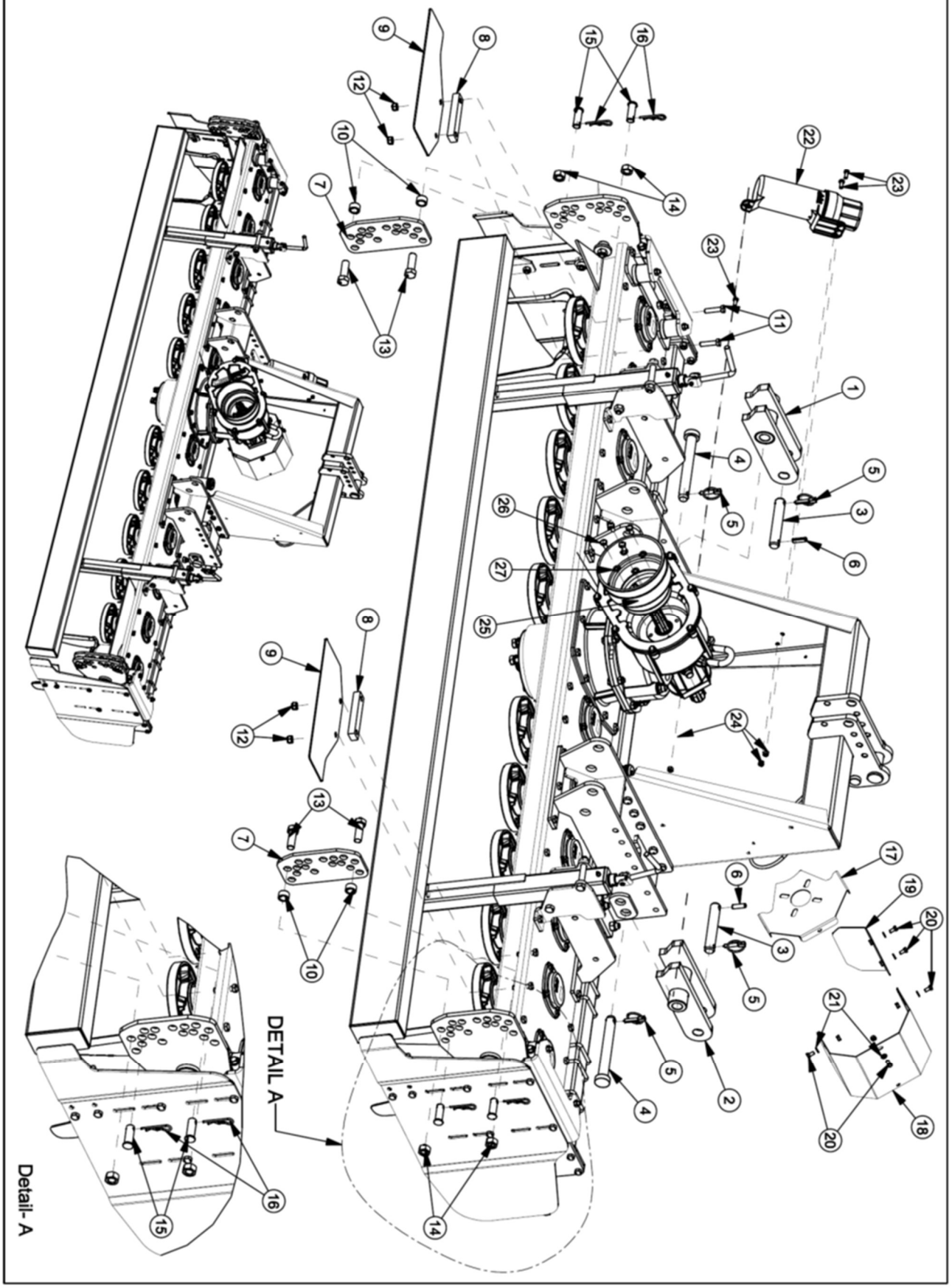
SIDE PLATE ATTACHMENT, LOWER 3 POINT HITCH & LEVELER BAR ATTACHMENT PARTS ASSEMBLY



SIDE PLATE ATTACHMENT,LOWER 3 POINT HITCH & LEVELER BAR ATTACHMENT PARTS ASSEMBLY

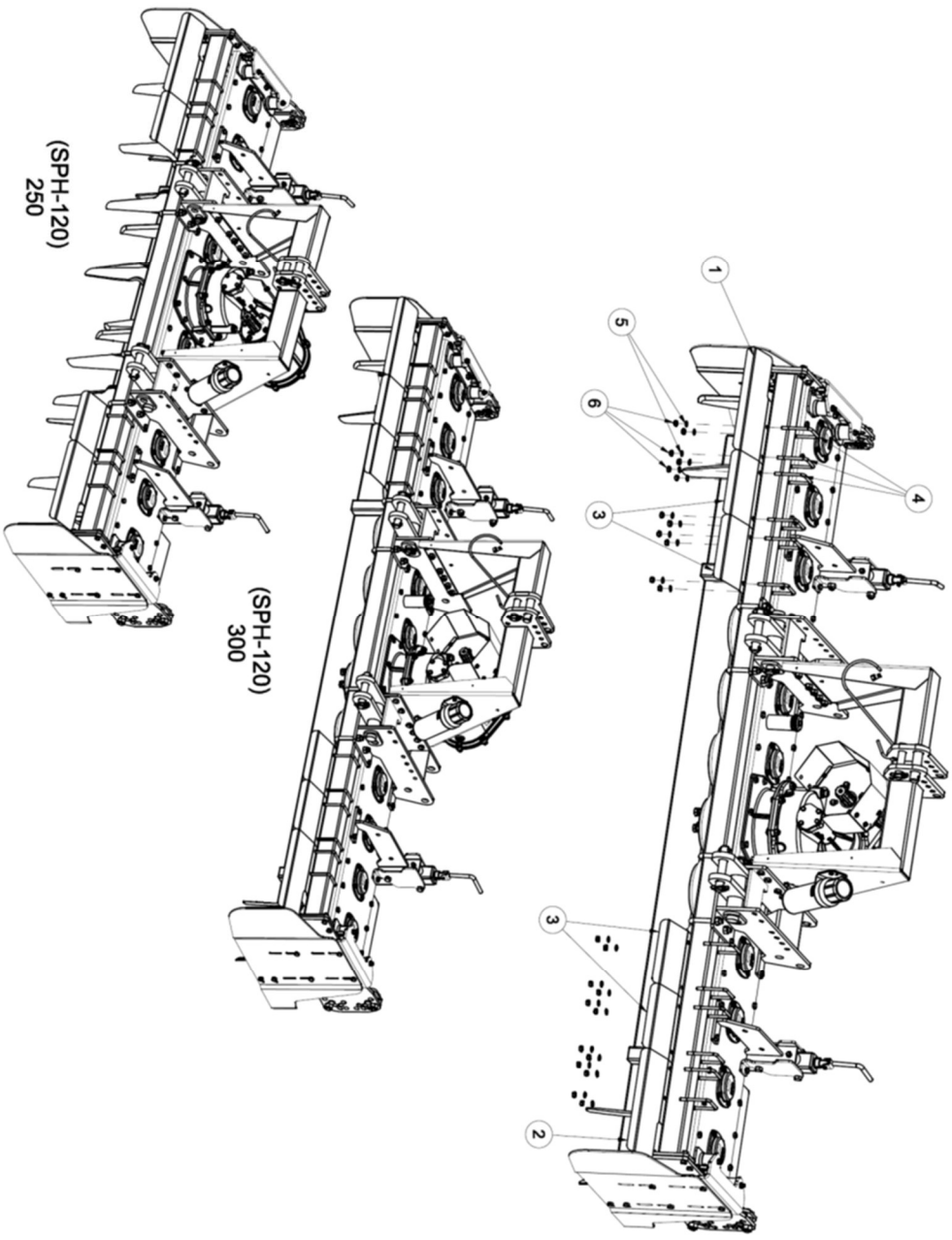
SR. NO	MANUAL CODE	PART NAME	QTY.	
			(SPH-120) 300	(SPH-120) 250
1	6539	LOWER 3 POINT BASE WELD RH (SPH-120)	1	1
2	6540	LOWER 3 POINT BASE WELD LH (SPH-120)	1	1
3	6538	LEVELING BAR SUPP. WELD. (SPH-120)	2	2
4	6641	SIDE PLATE LEFT (SPH-120)	1	1
5	6642	SIDE PLATE RIGHT (SPH-120)	1	1
6	6544	SIDE PLATE ATTACH WELD (SPH-120)	2	2
7	6632	PLATE SUPP. COMP. SUSPENSION (SPH-120)	2	2
8	6546	BUMPER M10X1.5X40 (SPH-120)	4	4
9	6545	ROD HINGE SIDE PLATE WELD. (SPH-120)	2	2
10	6640	PLATE DEFLECTOR (SPH-120)	2	2
11	6589	HEX BOLT M12 X 1.25 X 35 DIN 961 - 8.8	24	24
12	6548	U-BOLT M16 X 1.5 X 130 X 97 X 40TL	4	4
13	6663	SELF LOCK NUT M12 X 1.25 DIN 980V	24	24
14	6595	SELF LOCK NUT M16 X 1.50 DIN 980V	8	8
15	6587	HEX BOLT M12 X 1.25 X 30 DIN 961 - 8.8	8	8
16	6588	HEX BOLT M12 X 1.25 X 25 DIN 961 - 8.8	4	4
17	6584	HEX NUT M12 X 1.25 DIN 934	8	8
18	17272	HEX NUT M10 X 1.50 DIN 934	4	4
19	6609	DOWEL PIN D6 X 24 DIN 1481	2	2
20	6571	PIN ROLL HINGE (SPH-120)	2	2
21	6563	SPACER 30X21X14 (SPH-120)	2	2
22	6572	SPACER 50X17X8 (SPH-120)	2	2
23	6582	HEX NUT M16 X 1.5 DIN 934	2	2

LOWER HITCH BRACKET,CE GAURD, & REAR ATTACHMENT PARTS ASSEMBLY



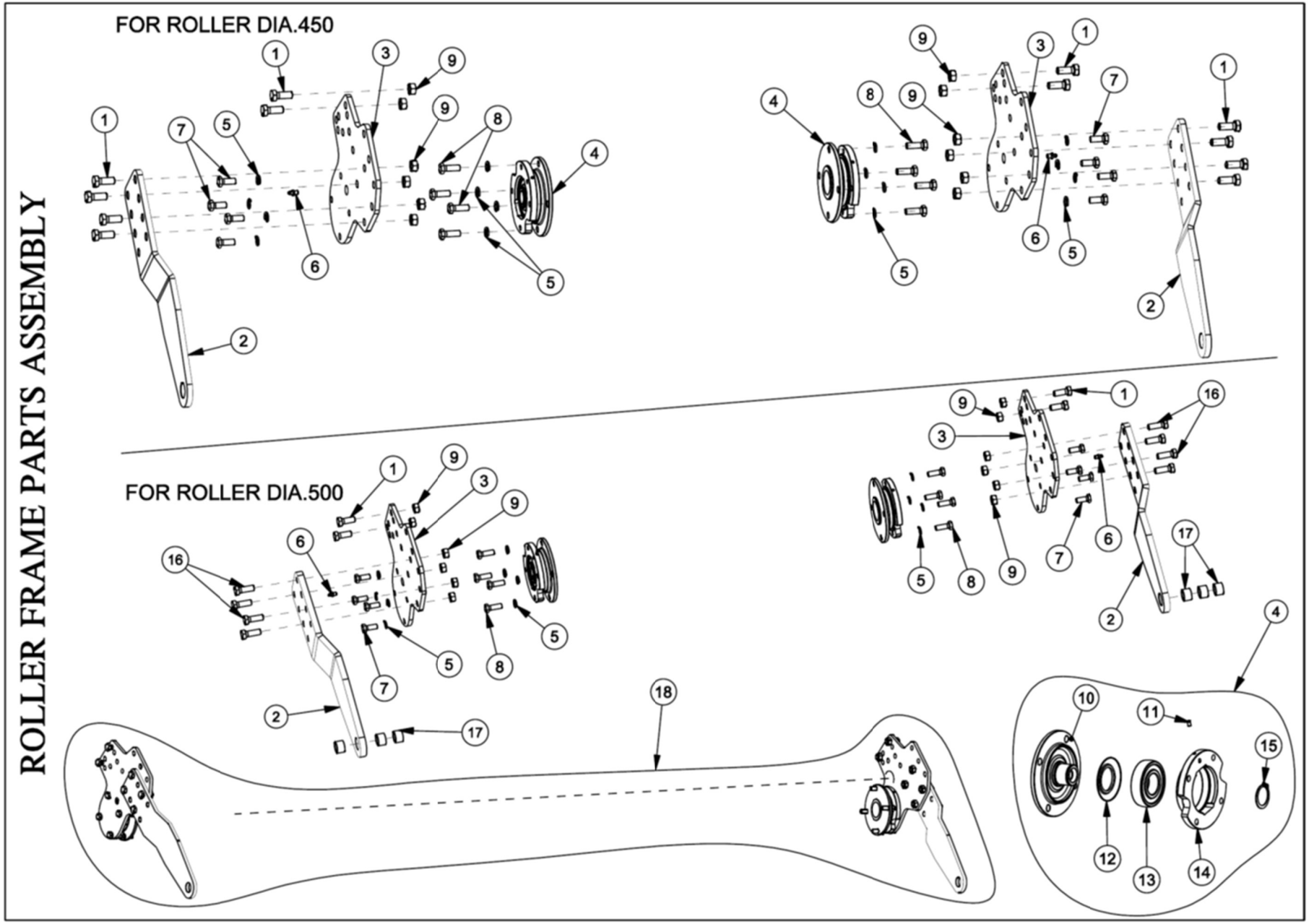
LOWER HITCH BRACKET, CE GUARD, & REAR ATTACHMENT PARTS ASSEMBLY				
SR. NO	MANUAL CODE	PART NAME	QTY.	
			(SPH-120) 300	(SPH-120) 250
1	6542	HITCH BRACKET CAT II WELD RH (SPH-120)	1	1
2	6631	HITCH BRACKET CAT II WELD LH (SPH-120)	1	1
3	23103	PIN,LOWER HITCH (CATEGORY II) (JUMBO)	2	2
4	6547	PIN HINGE HITCH BRACKET (SPH-120)	2	2
5	23062	LINCH PIN (D10XL45)	4	4
6	23067	SPRING PIN D12X40	2	2
7	6564	PLATE ROLL ADJUSTMENT (SPH-120)	2	2
8	6643	SPACER PLATE CE (SPH-120)	2	2
9	6644	CE BARRIER 300 (SPH-120)	2	-
	6638	CE BARRIER 250 (SPH-120)	-	2
10	6563	SPACER 30X21X14 (SPH-120)	4	4
11	6592	HEX BOLT M12 X 1.25 X 50 DIN 961 - 8.8	4	4
12	6663	SELF LOCK NUT M12 X 1.25 DIN 980V	4	4
13	6648	HEX BOLT M20 X 1.50 X 60 DIN 960	4	4
14	6581	HEX NUT M20 X 1.5 DIN 934	4	4
15	7073	PIN (Dia20X60) (SRP)	4	4
16	15055	R-CLIP WIRE DIA 4.00MM	4	4
17	6847	COMPOSED SUPP. PTO PROTECTION (SPH-250)	1	1
18	6849	PTO PROTECTION (SPH-250)	1	1
19	6851	LOWER PTO COVER WELD. (SPH-160)	1	1
20	8190	HEX BOLT M8 X 1.25 X 15	5	5
21	8064	PLAIN WASHER 8MM (BS-4320)	5	5
22	26030	MANUAL BOX COVER 1/2(SMMSD)	1	1
23	8040	HEX BOLT M8 X 1.25 X 20	3	3
24	1297	NYLOCK NUT M8X1.25 (DIN-982)	3	3
25	17788	PTO SHAFT GUARD PLASTIC	1	1
26	17276	HEX BOLT M10 X 1.50 X 20(FT)(8.8) DIN933	4	4
27	8078	PLAIN WASHER 10mm	4	4

CE FRONT GUARD



CE FRONT GUARD				
Sr No.	MANUAL CODE	PART NAME	QTY.	
			(SPH-120)	(SPH-120)
			300	250
1	6996	FRONT SIDE PROTEC. GUARD 500 (SPH-250)	1	1
2	6997	FRONT SIDE PROTEC. GUARD 600 (SPH-250)	1	1
3	6845	FRONT SIDE PROTEC. GUARD (SPH-120)	4	2
4	23227	SQ.BEND U-BOLT M10X1.25X91X112X25 T.L	12	8
5	8078	PLAIN WASHER 10MM (BS-4320)	24	16
6	6556	HEX NUT M10X1.25 DIN 934	24	16

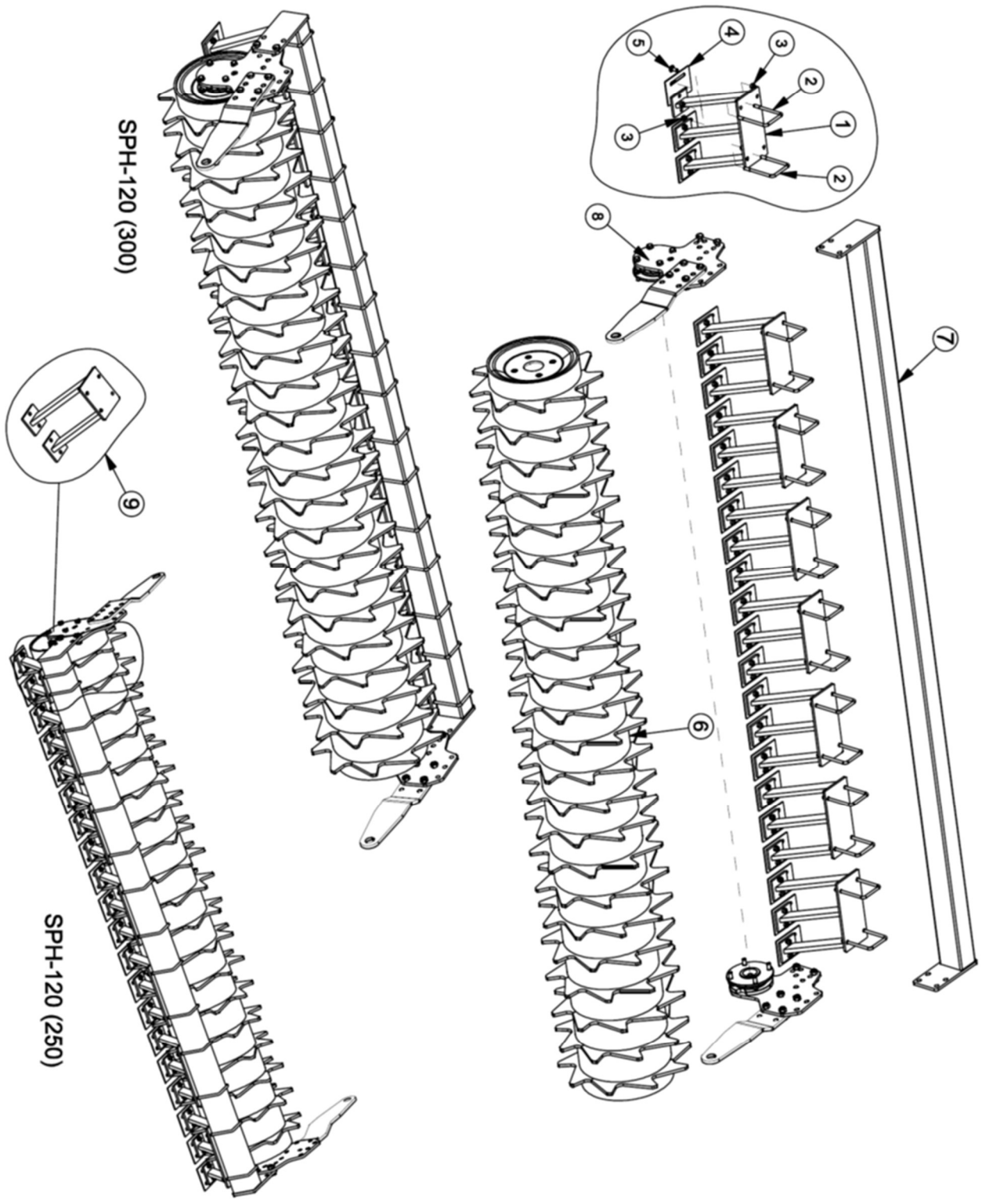
ROLLER FRAME PARTS ASSEMBLY



ROLLER FRAME PARTS ASSEMBLY

	FOR ROLLER DIA.450		
SR. NO	MANUAL CODE	PART NAME	QTY.
18	**6672**	**KIT S-ROLL FRAME (SPH-120)**	**1**
1	6585	HEX BOLT M14 X 1.50 X 35 DIN 961 - 8.8	12
2	6614	ARM ROLL 12MM (SPH-120)	2
3	6671	END PLATE ROLL FRAME (SPH-120)	2
4	23284	MOUNTING SUPPORT ROLLER COMP.	2
5	1306	SPRING WASHER 12mm	16
6	6559	GREASE NIPPLE M8 X 1	2
7	6587	HEX BOLT M12 X 1.25 X 30 DIN 961 - 8.8	8
8	6589	HEX BOLT M12 X 1.25 X 35 DIN 961 - 8.8	8
9	14338	HEX NUT M14 X 1.50 (10.9) DIN934	12
	FOR ROLLER DIA.500		
18	**6778**	**KIT B-ROLL FRAME (SPH-120)**	**1**
1	6585	HEX BOLT M14 X 1.50 X 35 DIN 961 - 8.8	4
2	6665	ARM ROLL 16MM (SPH-120)	2
3	6671	END PLATE ROLL FRAME (SPH-120)	2
4	23284	MOUNTING SUPPORT ROLLER COMP.	2
5	1306	SPRING WASHER 12mm	16
6	6559	GREASE NIPPLE M8 X 1	2
7	6587	HEX BOLT M12 X 1.25 X 30 DIN 961 - 8.8	8
8	6589	HEX BOLT M12 X 1.25 X 35 DIN 961 - 8.8	8
9	14338	HEX NUT M14 X 1.50 (10.9) DIN934	12
16	6586	HEX BOLT M14 X 1.50 X 40 DIN 961 - 8.8	8
17	6777	SPACER 30X21X18 (SPH-160)	6
4	**23284**	**MOUNTING SUPPORT ROLLER COMP.**	
10	23282	HUB SUPPORT ROLLER	2
11	12090	GRUB SCREW M6 X 1 X 10	2
12	23283	DUST RING	2
13	23386	Y-BEARING 6308-2RS1	2
14	23281	BEARING SUPPORT	2
15	8027	CIRCLIP EXTERNAL 40MM	2

PACKER ROLLER ASSEMBLY



PACKER ROLLER PARTS ASSEMBLY (D-450)

6623 - KIT PACKER ROLL FIX. D450 300 (SPH-120)

SR. NO	MANUAL CODE	NAME	QTY.
1	23270	SCRAPER WELDMENT (TRIPLE SCRAPER)	8
2	6775	U BOLT M10 X 1.25 X 132 X 91 X 25 T.L.	16
3	6556	HEX NUT M10X1.25 DIN 934	80
4	23271	SCRAPER PLATE, PACKER ROLLER	24
5	6606	R.HEAD SQ.NECK M10X1.25X25 UNI 5732 8.8	48
6	6612	PACKER ROLL WELD D450 300 (SPH-120)	1
7	6615	COMPOUND BEAM SCRAPER 300 (SPH-120)	1
8	6672	KIT S-ROLL FRAME (SPH-120)	1

6652 - KIT PACKER ROLL FIX D450 250 (SPH-120)

SR. NO	MANUAL CODE	NAME	QTY.
1	23270	SCRAPER WELDMENT (TRIPLE SCRAPER)	6
2	6775	U BOLT M10 X 1.25 X 132 X 91 X 25 T.L.	14
3	6556	HEX NUT M10X1.25 DIN 934	68
4	23271	SCRAPER PLATE, PACKER ROLLER	20
5	6606	R.HEAD SQ.NECK M10X1.25X25 UNI 5732 8.8	40
6	6650	PACKER ROLL WELD D450 250 (SPH-120)	1
7	6651	COMPOUND BEAM SCRAPER 250 (SPH-120)	1
8	6672	KIT S-ROLL FRAME (SPH-120)	1
9	23269	SCRAPER WELDMENT (DOUBLE SCRAPER)	1

PACKER ROLLER PARTS ASSEMBLY (D-500)

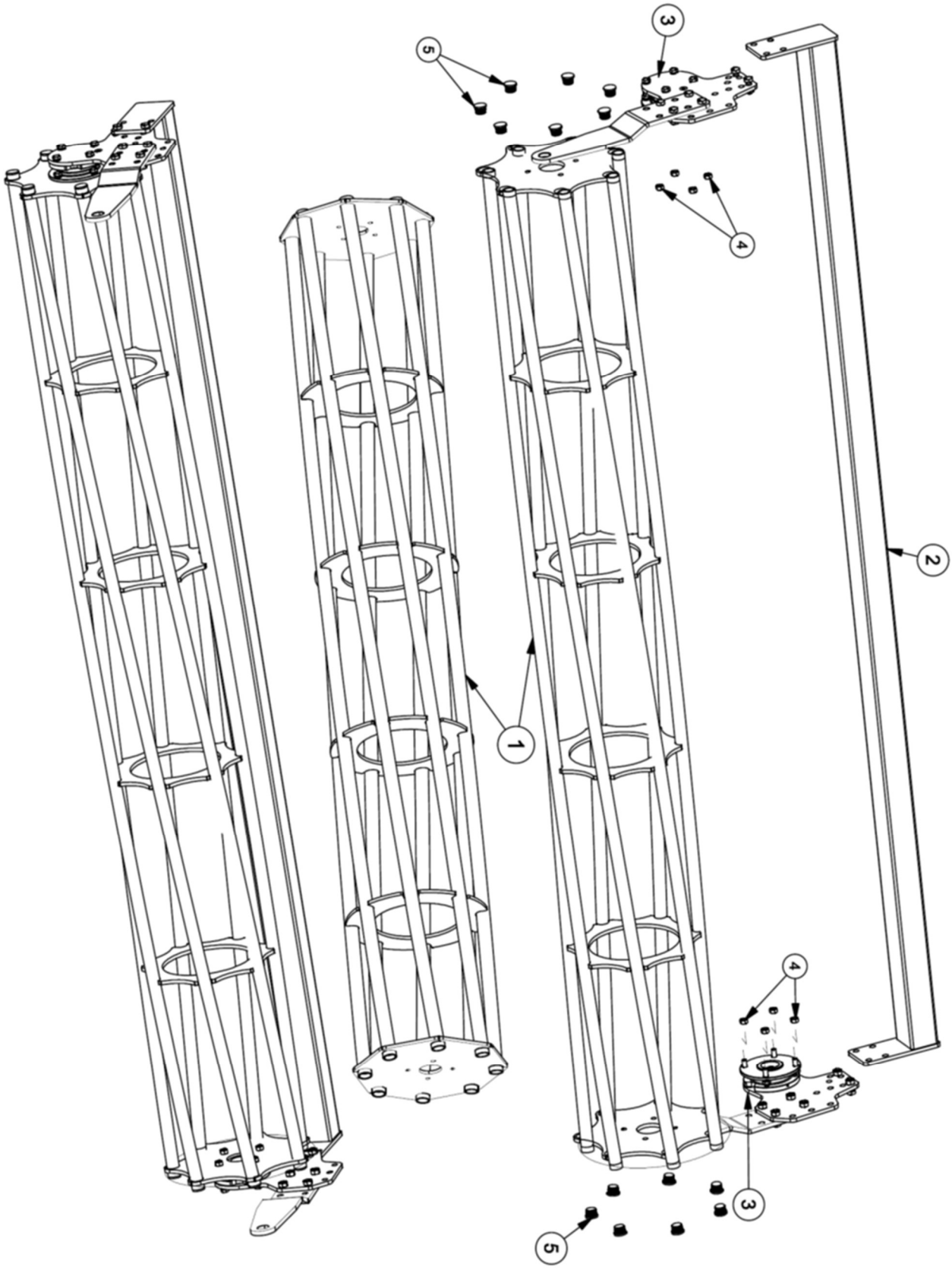
6687 - KIT PACKER ROL FIX D500 300 (SPH-120)

SR. NO	MANUAL CODE	NAME	QTY.
1	23270	SCRAPER WELDMENT (TRIPLE SCRAPER)	8
2	6775	U BOLT M10 X 1.25 X 132 X 91 X 25 T.L.	16
3	6556	HEX NUT M10X1.25 DIN 934	80
4	23271	SCRAPER PLATE, PACKER ROLLER	24
5	6606	R.HEAD SQ.NECK M10X1.25X25 UNI 5732 8.8	48
6	6666	PACKER ROLL WELD D500 300 (SPH-120)	1
7	6615	COMPOUND BEAM SCRAPER 300 (SPH-120)	1
8	6778	KIT B-ROLL FRAME (SPH-120)	1

6688 - KIT PACKER ROL FIX D500 250 (SPH-120)

SR. NO	MANUAL CODE	NAME	QTY.
1	23270	SCRAPER WELDMENT (TRIPLE SCRAPER)	6
2	6775	U BOLT M10 X 1.25 X 132 X 91 X 25 T.L.	14
3	6556	HEX NUT M10X1.25 DIN 934	68
4	23271	SCRAPER PLATE, PACKER ROLLER	20
5	6606	R.HEAD SQ.NECK M10X1.25X25 UNI 5732 8.8	40
6	6667	PACKER ROLL WELD D500 250 (SPH-120)	1
7	6651	COMPOUND BEAM SCRAPER 250 (SPH-120)	1
8	6778	KIT B-ROLL FRAME (SPH-120)	1
9	23269	SCRAPER WELDMENT (DOUBLE SCRAPER)	1

CAGE ROLLER PARTS ASSEMBLY



CAGE ROLLER PARTS ASSEMBLY (D-400)

6624 - CAGE ROLL ASM. D.400 300 (SPH-120)

6656 - CAGE ROLL ASM. D.400 250 (SPH-120)

SR. NO	MANUAL CODE	NAME	QTY.
1	6613	CAGE ROLL WELD D400 300 (SPH-120)	1
	6655	CAGE ROLL WELD D400 250 (SPH-120)	
2	6615	COMPOUND BEAM SCRAPER 300 (SPH-120)	1
	6651	COMPOUND BEAM SCRAPER 250 (SPH-120)	
3	6672	KIT S-ROLL FRAME (SPH-120)	1
4	6584	HEX NUT M12 X 1.25 DIN 934	8
5	6625	CLOSING PLUG DIA.26 D400	14

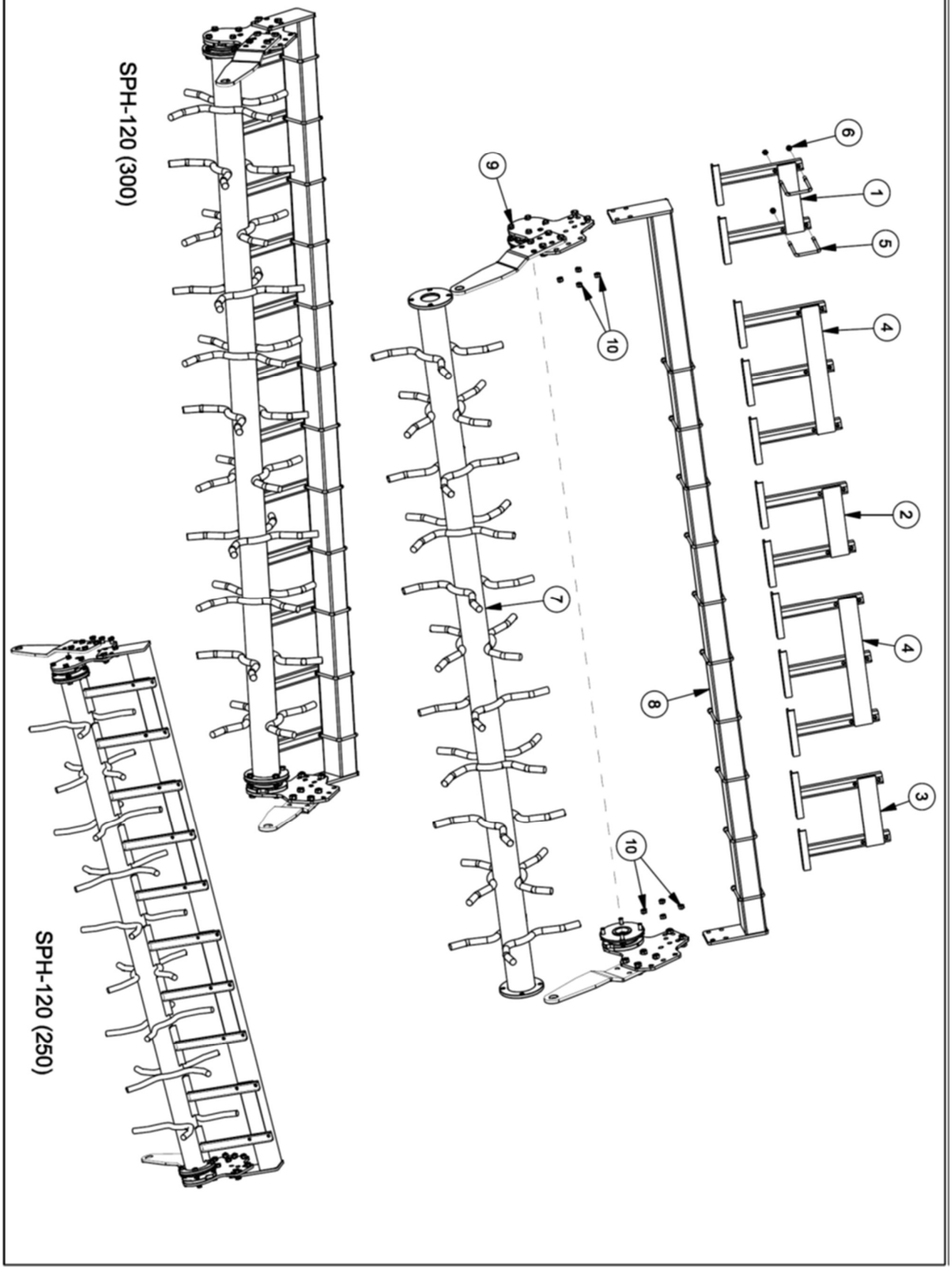
CAGE ROLLER PARTS ASSEMBLY (D-450)

6690 - CAGE ROLL ASM. D450 300 (SPH-120)

6691 - CAGE ROLL ASM. D450 250 (SPH-120)

SR. NO	MANUAL CODE	NAME	QTY.
1	6669	CAGE ROLL WELD D450 300 (SPH-120)	1
	6670	CAGE ROLL WELD D450 250 (SPH-120)	
2	6615	COMPOUND BEAM SCRAPER 300 (SPH-120)	1
	6651	COMPOUND BEAM SCRAPER 250 (SPH-120)	
3	6778	KIT B-ROLL FRAME (SPH-120)	1
4	6584	HEX NUT M12 X 1.25 DIN 934	8
5	6692	CLOSING PLUG DIA.34 D450	14

SPIKE ROLLER ASSEMBLY



SPIKE ROLLER PARTS ASSEMBLY (D-490)

6620 - SPIKE ROLL ASM. D.490 300 (SPH-120)

SR. NO	MANUAL CODE	NAME	QTY.
1	6617	SCRAPER COMP. LAT. DA 2 DX (SPH-120)	1
2	6619	SCRAPER COMP. DA 2 SPIKE (SPH-120)	1
3	6616	SCRAPER COMP. LAT. DA 2 SX (SPH-120)	1
4	6618	SCRAPER COMP. DA 3 SPIKE (SPH-120)	2
5	6775	U BOLT M10 X 1.25 X 132 X 91 X 25 T.L.	12
6	6556	HEX NUT M10X1.25 DIN 934	24
7	6610	SPIKE ROLL WELD D490 300 (SPH-120)	1
8	6615	COMPOUND BEAM SCRAPER 300 (SPH-120)	1
9	6881	KIT ROLL FRAME ASM 3.0 (SPH-120)	1
10	6584	HEX NUT M12 X 1.25 DIN 934	8

6654 - SPIKE ROLL ASM. D.490 250 (SPH-120)

SR. NO	MANUAL CODE	NAME	QTY.
1	6617	SCRAPER COMP. LAT. DA 2 DX (SPH-120)	1
3	6616	SCRAPER COMP. LAT. DA 2 SX (SPH-120)	1
4	6618	SCRAPER COMP. DA 3 SPIKE (SPH-120)	2
5	6775	U BOLT M10 X 1.25 X 132 X 91 X 25 T.L.	10
6	6556	HEX NUT M10X1.25 DIN 934	20
7	6653	SPIKE ROLL WELD D490 250 (SPH-120)	1
8	6651	COMPOUND BEAM SCRAPER 250 (SPH-120)	1
9	6672	KIT S-ROLL FRAME (SPH-120)	1
10	6584	HEX NUT M12 X 1.25 DIN 934	8

SPIKE ROLLER PARTS ASSEMBLY (D-540)

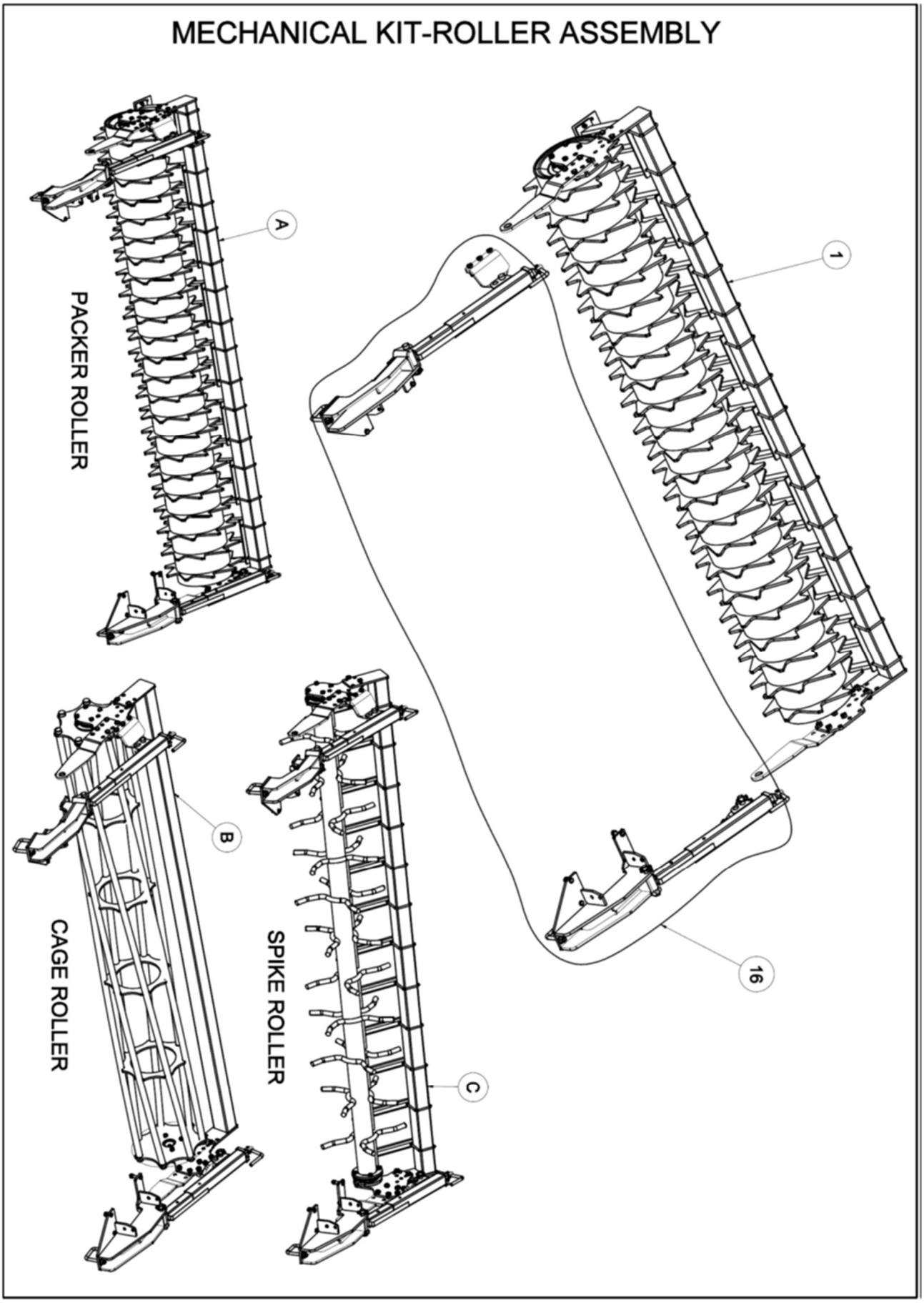
6621 - SPIKE ROLL ASM. D.540 300 (SPH-120)

SR. NO	MANUAL CODE	NAME	QTY.
1	6617	SCRAPER COMP. LAT. DA 2 DX (SPH-120)	1
2	6619	SCRAPER COMP. DA 2 SPIKE (SPH-120)	3
3	6616	SCRAPER COMP. LAT. DA 2 SX (SPH-120)	1
4	6618	SCRAPER COMP. DA 3 SPIKE (SPH-120)	2
5	6775	U BOLT M10 X 1.25 X 132 X 91 X 25 T.L.	12
6	6556	HEX NUT M10X1.25 DIN 934	24
7	6611	SPIKE ROLL WELD D540 300 (SPH-120)	1
8	6615	COMPOUND BEAM SCRAPER 300 (SPH-120)	1
9	6778	KIT B-ROLL FRAME (SPH-120)-300	1
10	6584	HEX NUT M12 X 1.25 DIN 934	8

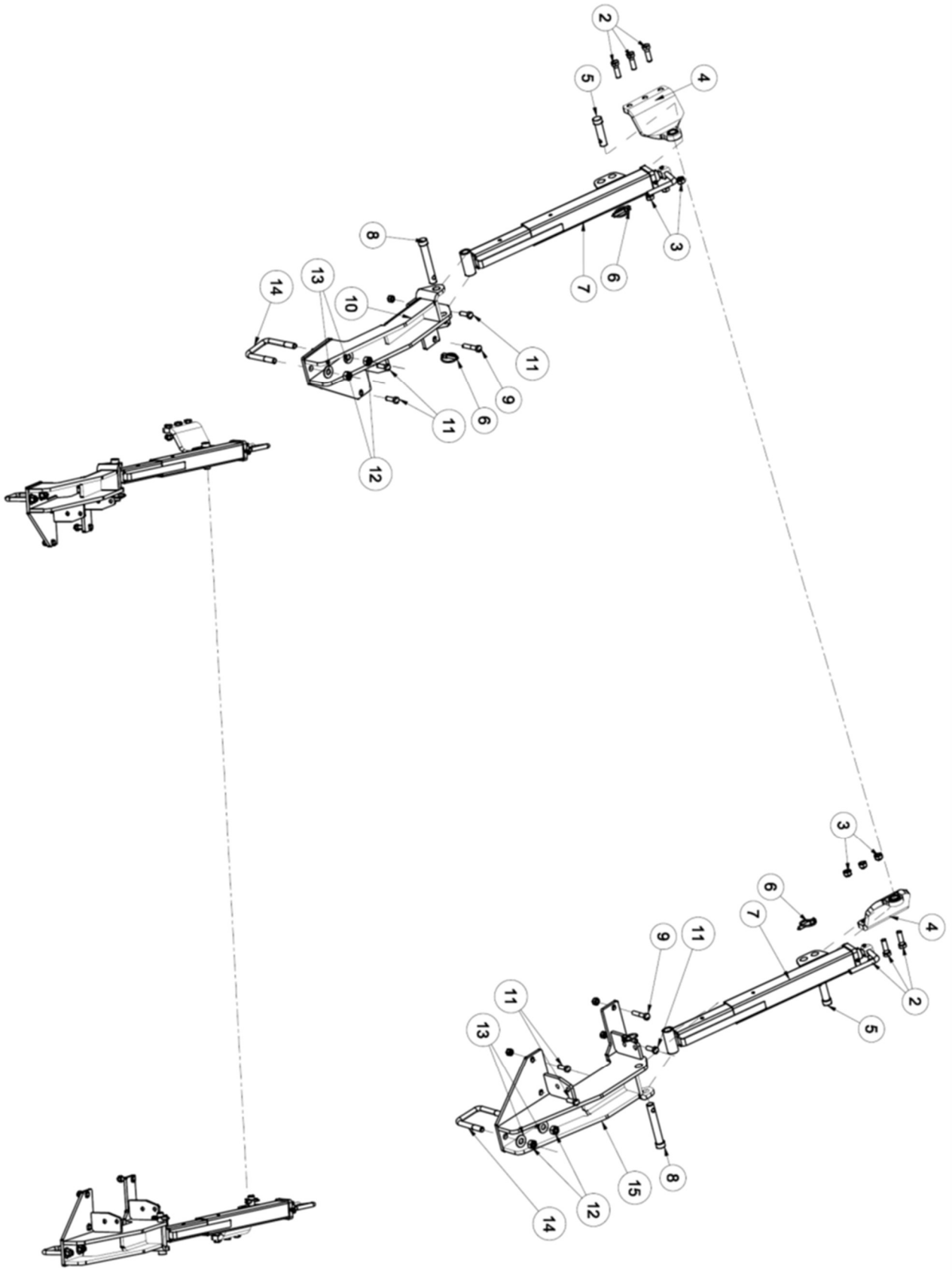
6689 - SPIKE ROLL ASM. D540 250 (SPH-120)

SR. NO	MANUAL CODE	NAME	QTY.
1	6617	SCRAPER COMP. LAT. DA 2 DX (SPH-120)	1
3	6616	SCRAPER COMP. LAT. DA 2 SX (SPH-120)	1
4	6618	SCRAPER COMP. DA 3 SPIKE (SPH-120)	2
5	6775	U BOLT M10 X 1.25 X 132 X 91 X 25 T.L.	10
6	6556	HEX NUT M10X1.25 DIN 934	20
7	6668	SPIKE ROLL WELD D540 250 (SPH-120)	1
8	6651	COMPOUND BEAM SCRAPER 250 (SPH-120)	1
9	6778	KIT B-ROLL FRAME (SPH-120)-250	1
10	6584	HEX NUT M12 X 1.25 DIN 934	8

MECHANICAL KIT-ROLLER ASSEMBLY



KIT ROLL.MECH. (FIX TO MECH) (SPH-120)

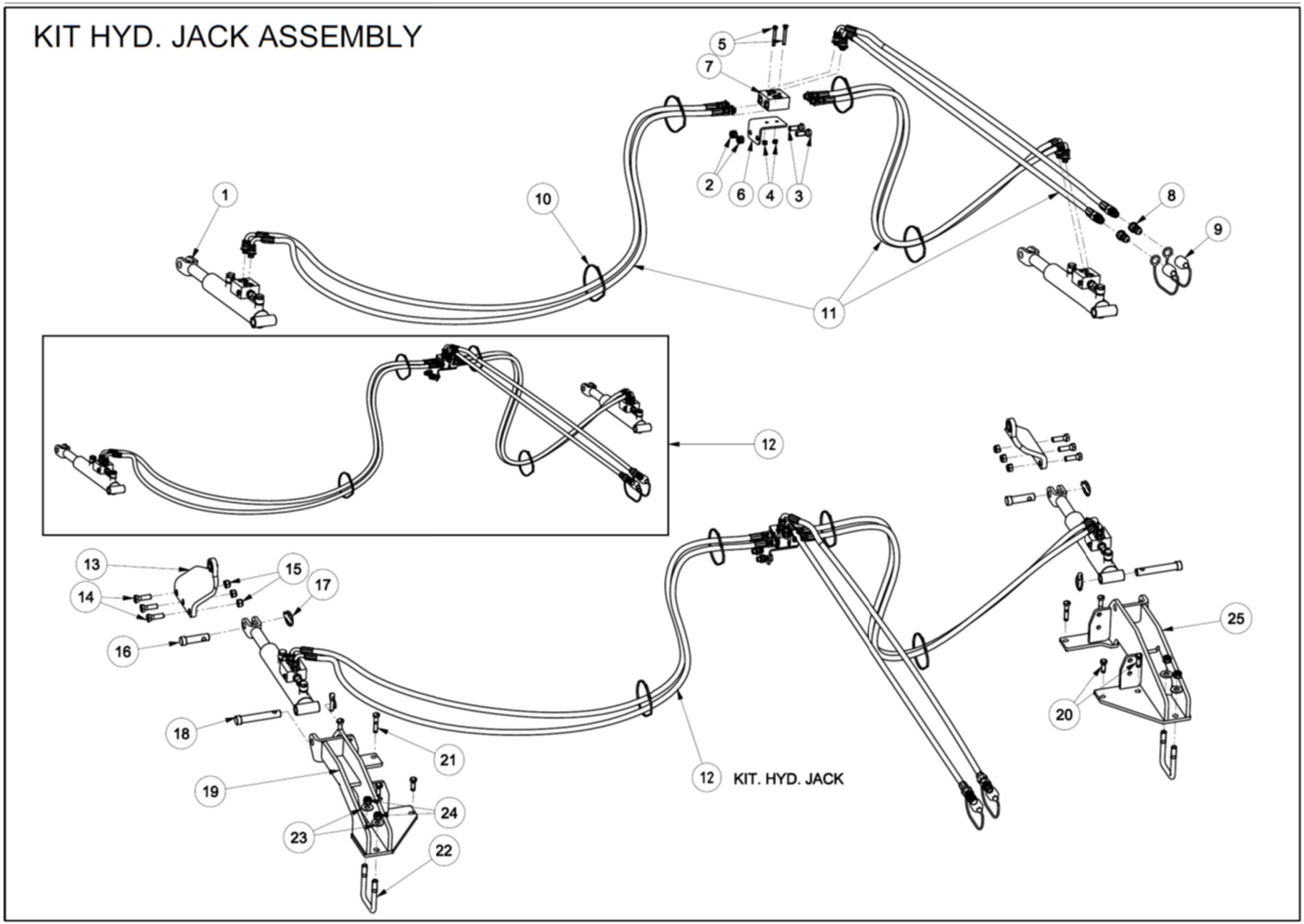


Sr No.	Manual Code	Part Name	Qty.
A-1	**6693**	**KIT PACKER ROL MECH D450 300 (SPH-120)**	
1	6623	KIT PACKER ROLL FIX. D450 300 (SPH-120)	1
16	6673	KIT ROLL.MECH. (FIX TO MECH) (SPH-120)	1
A-2	**6695**	**KIT PACKER ROL MECH D450 250 (SPH-120)**	
1	6652	KIT PACKER ROLL FIX D450 250 (SPH-120)	1
16	6673	KIT ROLL.MECH. (FIX TO MECH) (SPH-120)	1
A-3	**6694**	**KIT PACKER ROL MECH D500 300 (SPH-120)**	
1	6687	KIT PACKER ROL FIX D500 300 (SPH-120)	1
16	6673	KIT ROLL.MECH. (FIX TO MECH) (SPH-120)	1
A-4	**6696**	**KIT PACKER ROL MECH D500 250 (SPH-120)**	
1	6688	KIT PACKER ROL FIX D500 250 (SPH-120)	1
16	6673	KIT ROLL.MECH. (FIX TO MECH) (SPH-120)	1
B-1	**6701**	**KIT CAGE ROL MECH D400 300 (SPH-120)**	
1	6624	KIT CAGE ROLL FIX. D.400 300 (SPH-120)	1
16	6673	KIT ROLL.MECH. (FIX TO MECH) (SPH-120)	1
B-2	**6703**	**KIT CAGE ROL MECH D400 250 (SPH-120)**	
1	6656	KIT CAGE ROLL FIX. D.400 250 (SPH-120)	1
16	6673	KIT ROLL.MECH. (FIX TO MECH) (SPH-120)	1
B-3	**6702**	**KIT CAGE ROL MECH D450 300 (SPH-120)**	
1	6690	KIT CAGE ROLL FIX. D.450 300 (SPH-120)	1
16	6673	KIT ROLL.MECH. (FIX TO MECH) (SPH-120)	1
B-4	**6704**	**KIT CAGE ROL MECH D450 250 (SPH-120)**	
1	6691	KIT CAGE ROLL FIX. D.450 250 (SPH-120)	1
16	6673	KIT ROLL.MECH. (FIX TO MECH) (SPH-120)	1
C-1	**6697**	**KIT SPIKE ROL MECH D490 300 (SPH-120)**	
1	6620	KIT SPIKE ROLL FIX. D.490 300 (SPH-120)	1
16	6673	KIT ROLL.MECH. (FIX TO MECH) (SPH-120)	1
C-2	**6699**	**KIT SPIKE ROL MECH D490 250 (SPH-120)**	
1	6654	KIT SPIKE ROLL FIX. D.490 250 (SPH-120)	1
16	6673	KIT ROLL.MECH. (FIX TO MECH) (SPH-120)	1
C-3	**6698**	**KIT SPIKE ROL MECH D540 300 (SPH-120)**	
1	6621	KIT SPIKE ROLL FIX. D.540 300 (SPH-120)	1
16	6673	KIT ROLL.MECH. (FIX TO MECH) (SPH-120)	1

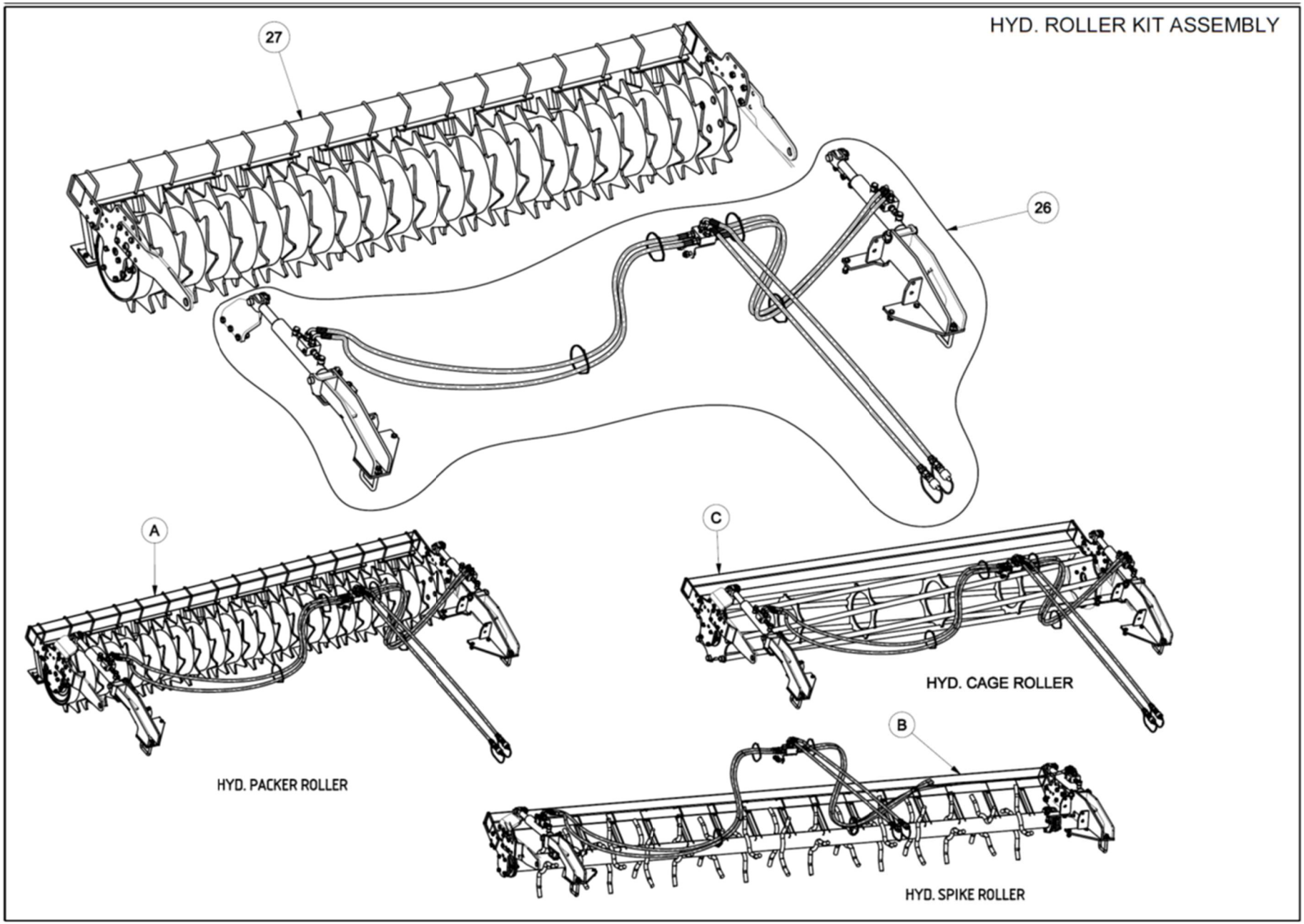
C-4	6700	KIT SPIKE ROL MECH D540 250 (SPH-120)	
1	6689	KIT SPIKE ROLL FIX. D.540 250 (SPH-120)	1
16	6673	KIT ROLL.MECH. (FIX TO MECH) (SPH-120)	1

2	3339	HEX BOLT M14 X 1.50 X 45 (8.8) DIN931	6
3	6594	SELF LOCK NUT M14 X 1.50 DIN 980V	6
4	6679	COMPOUND BRACKET FOR ROLL (SPH-120)	2
5	6682	PIN Ø22.00 X 95.00 (SPH-250)	2
6	23062	LINCH PIN (D10XL45)	4
7	6676	MECH. JACK ASM. (SPH-120)	2
8	6683	PIN Ø22.00 X 152.00 (SPH-250)	2
9	6649	HEX BOLT M12 X 1.25 X 60 DIN 961 - 8.8	2
10	6680	INCL. DX ATTACH CYL. ROLL (SPH-120)	1
11	6589	HEX BOLT M12 X 1.25 X 35 DIN 961 - 8.8	6
12	6595	SELF LOCK NUT M16 X 1.50 DIN 980V	4
13	1078	PLAIN WASHER 16MM (BS-4320)	4
14	6548	U-BOLT M16 X 1.5 X 130 X 97 X 40TL	2
15	6681	INCL. SX ATTACH CYL. ROLL (SPH-120)	1
16	**6673**	**KIT ROLL.MECH. (FIX TO MECH) (SPH-120)**	**1**

KIT HYD. JACK ASSEMBLY



HYD. ROLLER KIT ASSEMBLY



Sr No.	Manual Code	Part Name	Qty.
A-1	**6705**	**KIT PACKER ROL HYD. D450 300 (SPH-120)**	
27	6623	KIT PACKER ROLL FIX. D450 300 (SPH-120)	1
26	6674	KIT ROLL.HYD. 300 (FIX TO HYD) (SPH-120)	1
A-2	**6707**	**KIT PACKER ROL HYD. D450 250 (SPH-120)**	
27	6652	KIT PACKER ROLL FIX D450 250 (SPH-120)	1
26	6751	KIT ROLL.HYD. 250 (FIX TO HYD)(SPH-120)	1
A-3	**6706**	**KIT PACKER ROL HYD D500 300 (SPH-120)**	
27	6687	KIT PACKER ROLL FIX D500 300 (SPH-120)	1
26	6674	KIT ROLL.HYD. 300 (FIX TO HYD) (SPH-120)	1
A-4	**6696**	**KIT PACKER ROL MECH D500 250 (SPH-120)**	
27	6688	KIT PACKER ROLL FIX D500 250 (SPH-120)	1
26	6673	KIT ROLL.MECH. (FIX TO MECH) (SPH-120)	1
B-1	**6709**	**KIT SPIKE ROL HYD. D490 300 (SPH-120)**	
27	6620	SPIKE ROLL ASM. D.490 300 (SPH-120)	1
26	6674	KIT ROLL.HYD. 300 (FIX TO HYD) (SPH-120)	1
B-2	**6711**	**KIT SPIKE ROL HYD. D490 250 (SPH-120)**	
27	6654	KIT SPIKE ROLL FIX. D.490 250 (SPH-120)	1
26	6751	KIT ROLL.HYD. 250 (FIX TO HYD)(SPH-120)	1
B-3	**6710**	**KIT SPIKE ROL HYD. D540 300 (SPH-120)**	
27	6621	KIT SPIKE ROLL FIX. D.540 300 (SPH-120)	1
26	6674	KIT ROLL.HYD. 300 (FIX TO HYD) (SPH-120)	1
B-4	**6712**	**KIT SPIKE ROL HYD. D540 250 (SPH-120)**	
27	6689	KIT SPIKE ROLL FIX. D.540 250 (SPH-120)	1
26	6751	KIT ROLL.HYD. 250 (FIX TO HYD)(SPH-120)	1
C-1	**6713**	**KIT CAGE ROL HYD. D400 300 (SPH-120)**	
27	6624	KIT CAGE ROLL FIX. D.400 300 (SPH-120)	1
26	6674	KIT ROLL.HYD. 300 (FIX TO HYD) (SPH-120)	1
C-2	**6715**	**KIT CAGE ROL HYD. D400 250 (SPH-120)**	
27	6656	KIT CAGE ROLL FIX. D.400 250 (SPH-120)	1
26	6751	KIT ROLL.HYD. 250 (FIX TO HYD)(SPH-120)	1
C-3	**6702**	**KIT CAGE ROL MECH D450 300 (SPH-120)**	
27	6690	KIT CAGE ROLL FIX. D.450 300 (SPH-120)	1
26	6673	KIT ROLL.MECH. (FIX TO MECH) (SPH-120)	1
C-4	**6716**	**KIT CAGE ROL HYD. D450 250 (SPH-120)**	
27	6670	CAGE ROLL ASM. D.450 250 (SPH-120)	1
26	6691	KIT CAGE ROLL FIX. D.450 250 (SPH-120)	1

Sr No.	Manual Code	Part Name	Qty.	
			SPH-120(250)	SPH-120(300)
1	6677	HYD. CYL. 510X640 WITH CHECK VALVE (SPH)	2	2
2	6594	SELF LOCK NUT M14 X 1.50 DIN 980V	2	2
3	6586	HEX BOLT M14 X 1.50 X 40 DIN 961 - 8.8	2	2
4	1297	NYLOCK NUT M8X1.25 (DIN-982)	2	2

5	19164	HEX BOLT M8 X 1.25 X 60 (FT)	2	2
6	6740	BRACKET,HYDRAULIC VALVE SUPP. (SPH-120)	1	1
7	23015	HYD. DISTRIBUTOR VALVE 3/8"(JUMBO)	1	1
8	8290	QUICK COUPLING 1/2" MALE	2	2
9	18269	QRC PLASTIC CAP (1/2 BSP) FEMALE	2	2
10	23390	CABLE TIE 400MM	4	4
11	6893	HYD. CIRCUIT KIT ROLLER 3.0 (SPH-120)	-	1
	6892	HYD. CIRCUIT KIT ROLLER 2.5 (SPH-120)	1	-
12	**6741**	**KIT HYD. JACK ASM. 300 (SPH-120)**	**-**	**1**
	6742	**KIT HYD. JACK ASM. 250 (SPH-120)**	**1**	**-**

12	6741	KIT HYD. JACK ASM. 300 (SPH-120)	-	1
	6742	KIT HYD. JACK ASM. 250 (SPH-120)	1	-
13	6679	COMPOUND BRACKET FOR ROLL (SPH-120)	2	2
14	3339	HEX BOLT M14 X 1.50 X 45 (8.8) DIN931	6	6
15	6594	SELF LOCK NUT M14 X 1.50 DIN 980V	6	6
16	6682	PIN Ø22.00 X 95.00 (SPH-250)	2	2
17	23062	LINCH PIN (D10XL45)	4	4
18	6683	PIN Ø22.00 X 152.00 (SPH-250)	2	2
19	6680	INCL. DX ATTACH CYL. ROLL (SPH-120)	1	1
20	6589	HEX BOLT M12 X 1.25 X 35 DIN 961 - 8.8	4	6
21	6649	HEX BOLT M12 X 1.25 X 60 DIN 961 - 8.8	4	2
22	6548	U-BOLT M16 X 1.5 X 130 X 97 X 40TL	2	2
23	1078	PLAIN WASHER 16MM (BS-4320)	4	4
24	6595	SELF LOCK NUT M16 X 1.50 DIN 980V	4	4
25	6681	INCL. SX ATTACH CYL. ROLL (SPH-120)	1	1
26	**6674**	**KIT ROLL.HYD. 300 (FIX TO HYD) (SPH-120)**	**-**	**1**
	6751	**KIT ROLL.HYD. 250 (FIX TO HYD)(SPH-120)**	**1**	**-**

13. "EC" DECLARATION OF CONFORMITY

In accordance with the EC Machinery Directive 2006/42/EC

The company

COSMO S.R.L in conjunction with **Tirth Agro Technology Pvt. Ltd.**
(An ISO 9001:2008 Certified Company)
National Highway – 27, Nr. Bharudi Toll Plaza,
Gondal Road At.: Bhunava – 360311 Ta. Gondal,
Dist.: Rajkot. State: Gujarat- INDIA.

hereby declares that the machine:

Type: **POWER HARROW**
Model: **Series M120/160 CHAMPION SERIES - Models 2.5-3.0**

satisfies the basic safety and health requirements established by European Directive 2006/42/EC.

Harmonized standards used:

EN ISO 12100
Safety of machinery - General principles for design - Risk assessment and risk reduction

EN ISO 4254-1
Agricultural machinery - Safety - Part 1: General requirements

EN ISO 4254-5
Agricultural machinery - Safety - Part 5: Power-driven soil-working machines

EN ISO 13857
Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs

Other technical standard used:

ISO 11684
Tractors, machinery for agriculture and forestry, powered lawn and garden equipment - Safety signs and hazard pictorials - General principles

Rajkot,
Ashwin Gohil / Hasmukh Gohil
Chairman / Managing Director

NOTES:

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Manufactured by:

Tirth Agro Technology Pvt. Ltd.
"COSMO BULLY", Survey No.-108/1,
Plot No. B, NH-27, Nr. Bharudi Toll Plaza,
Bhunava (Village), Taluka: Gondal,
Dist.: Rajkot – 360311,
State: Gujarat- INDIA

Distributed by:

FARM IMPLEMENTS Pty Ltd
14 Tarmac Way
Pakenham Victoria AUSTRALIA 3810
AUST: +61 3 9706 5166
NZ: +64 9 237 1500
info@cosmobully.com
www.cosmobully.com