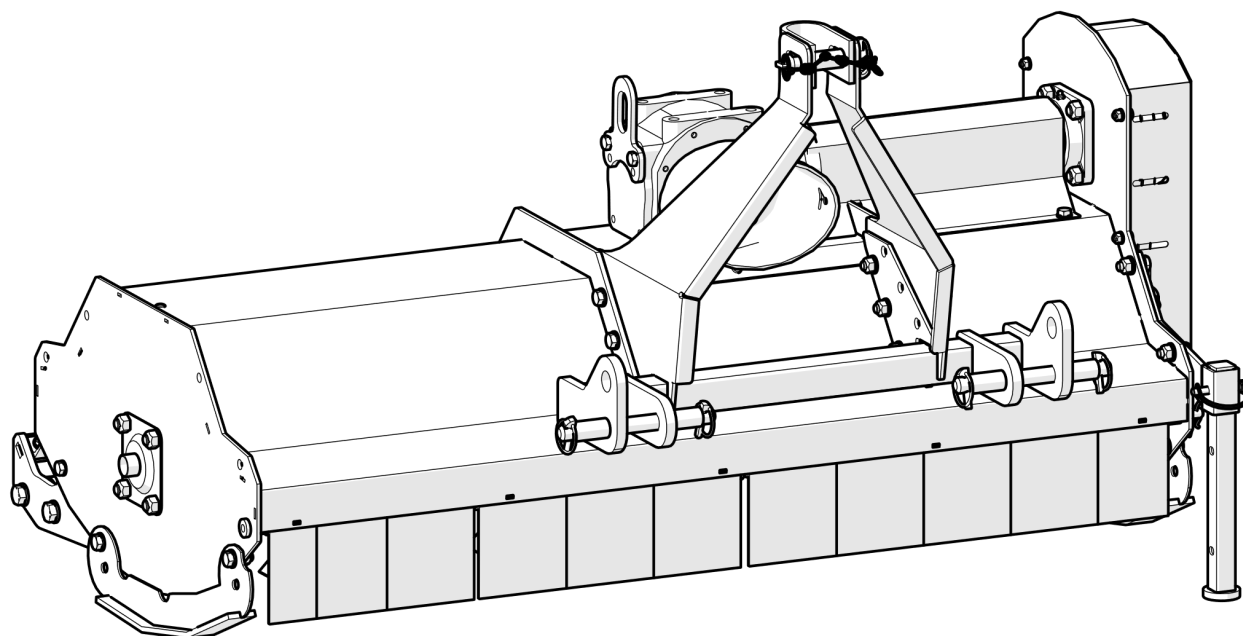


## USE AND MAINTENANCE MANUAL

# SLASHER WITH HORIZONTAL AXLE TYPE FLIPPER





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## PREFACE

### **DEL MORINO SRL**

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DEL MORINO thanks you for choosing us and for your confidence in the quality of our implements.

### This manual is an integral part of the implement

It must always come with the implement and be at user's disposal.  
All attachments are integral part of the manual.

### The purpose of this manual

This manual provides information for the correct and safe use of the implement.  
The owner must read this manual carefully before working with the implement.

### Responsibility of the owner

The owner is responsible for accidents or damage caused to people or things due to negligence in following the instructions of this manual.

### Assistance in using this manual

Explanations: contact the dealer.

Request for additional copies of the manual: in case of loss or wear and tear, or in case the manual is needed in a different language, ask the dealer or the manufacturer.

### Pay attention to the warning labels



**DANGER:** indicates an imminent dangerous situation which, if not avoided, will cause death or serious injury and/or damage.



**WARNING:** indicates a potentially dangerous situation which, if not avoided, will cause death or serious injury and/or damage.



**CAUTION:** indicates a potentially dangerous situation which, if not avoided, can cause minor to moderate damage or it warns about an unsafe procedure.



**IMPORTANT:** indicates instructions that must be followed precisely in order to avoid damage to the product, process or environment.



**NOTE:** indicates supplementary information.

## DESCRIPTION

### FIELD OF USE

The implement according to the different flails can make different functions like cut grass, cut up poles etc.

The use of a technical constructive concept trended to the search of high performances, reduction of trebles and durability, improves the power/consumption ratio of the tractor thanks to the elasticity of the implement frame, to the flails shape, to the perfect rotor balancing and to many original technical solutions.

### PERFORMANCE

The implement is connected to the tractor with a three-point hitch that gives the motion of translation and with a PTO shaft connected with the tractor PTO that gives the motion of rotation to the hoes shaft.

The working width is fixed and it's determined by the choice of the implement type.

The working depth is adjustable.

The working zone is centered with tractor axis.

The rear roll adjusts the cutting height and provides to tread the cut material.

### PERFORMANCE LIMITS

- Operating the implement at speeds higher than the normal can compromise the condition of the implement, the quality of the work and the safety of the operator.
- Maximum power applicable to the gearbox: 22-32 kW (29-43 hp)  $\pm$  5% with 540 or 1000 r.p.m. If more power is applied to the gearbox, for example, due to thick grass or brush, or running too fast, the gearbox can be irreparably damaged.

### STANDARD FEATURES

- Standard PTO shaft.
- Cast iron gearbox.
- Free wheel device integrated in the gearbox.
- Reversible third-point hitch.
- Blade flails.
- Rear roller extension.
- Adjustable slides.

### VARIANTS & ACCESSORIES

- Hammer flails
- Spatula flails
- Mechanical shifting.
- Hydraulic shifting.
- Quick hitch Kit:
  - For fixed hitch only on 132÷214 types;
  - For shifting hitch only on 106÷214 types.

TECHNICAL SPECIFICATIONS

**SPECIFICATIONS PER MODEL**

Model	Type	Version	Power*		Working width		Weight		Dimensions A x B x H		Flails n°	Rotor RPM	Tip Speed	
			Hp	Kw	cm	in	kg	lbs	cm	in			n°	g/min
FLIPPER	80	C	29-4 3	22-32	80	32	157	346	94x60x60	38x32x2 8	24	2410	45	147
	106	C	29-4 3	22-32	106	42	180	397	120x60x60	48x32x2 8	32	2410	45	147
	132	C	29-4 3	22-32	132	52	232	420	133x60x60	58x32x2 8	40	2410	45	147
	158	C	29-4 3	22-32	158	62	255	511	133x60x60	68x32x2 8	48	2410	45	147
	186	C	29-4 3	22-32	186	72	285	628	146x60x60	78x32x2 8	56	2410	45	147
	214	C	29-4 3	22-32	204	82	368	811	172x60x60	88x32x2 8	64	2410	45	147
FLIPPER	80	3C	29-4 3	22-32	80	32	157	346	94x60x60	38x32x2 8	36	2410	45	147
	106	3C	29-4 3	22-32	106	42	180	397	120x60x60	48x32x2 8	48	2410	45	147
	132	3C	29-4 3	22-32	132	52	232	420	133x60x60	58x32x2 8	60	2410	45	147
	158	3C	29-4 3	22-32	158	62	255	511	133x60x60	68x32x2 8	72	2410	45	147
	186	3C	29-4 3	22-32	186	72	285	628	146x60x60	78x32x2 8	84	2410	45	147
	214	3C	29-4 3	22-32	204	82	368	811	172x60x60	88x32x2 8	96	2410	45	147
FLIPPER	80	M	29-4 3	22-32	80	32	157	346	94x60x60	38x32x2 8	12	2410	45	147
	106	M	29-4 3	22-32	106	42	180	397	94x60x60	48x32x2 8	16	2410	45	147
	132	M	29-4 3	22-32	132	52	232	420	107x60x60	58x32x2 8	20	2410	45	147
	158	M	29-4 3	22-32	158	62	255	511	107x60x60	68x32x2 8	24	2410	45	147
	186	M	29-4 3	22-32	186	72	285	628	120x60x60	78x32x2 8	28	2410	45	147
	214	M	29-4 3	22-32	204	82	368	811	120x60x60	88x32x2 8	32	2410	45	147
FLIPPER	80	S	29-4 3	22-32	80	32	157	346	94x60x60	38x32x2 8	36	2410	52	170
	106	S	29-4 3	22-32	106	42	180	397	94x60x60	48x32x2 8	48	2410	52	170
	132	S	29-4 3	22-32	132	52	232	420	107x60x60	58x32x2 8	60	2410	52	170
	158	S	29-4 3	22-32	158	62	255	511	107x60x60	68x32x2 8	72	2410	52	170
	186	S	29-4 3	22-32	186	72	285	628	120x60x60	78x32x2 8	84	2410	52	170
	214	S	29-4 3	22-32	204	82	368	811	120x60x60	88x32x2 8	96	2410	52	170

\* data related to the gearbox

C = Y-blade flail



3C = 3 blade flails (Y blade flails + 1 short blade flail)

M = Hammer flail

S= Scarifying flail (Y blade flails + 1 long blade flail)

## SAFETY INFORMATION

### GENERAL REQUIREMENTS



**CAUTION:** to prevent injury due to objects or parts of the flails thrown by the implement, be sure that no persons or animals are within a radius of 50 meters (164 ft) of the implement before starting to work.

- Work only during daytime.
- Wear long trousers and heavy shoes.
- The protective flaps and other devices are integral part of the implements: never work without the protective flaps or devices.
- Make sure that there are no stones, sticks, wires, etc., on the ground.
- Pay attention when using the implement on slopes: proceed in the direction of the maximum slope and never work in oblique direction.
- Before leaving the driver's seat, disengage the engine-shaft transmission and turn off the engine.
- Check the implement immediately if it hits a foreign object.
- Check the implement immediately if it begins vibrating strongly.
- Change defective parts immediately.

### ATTENTION, DANGER!

The gearbox is equipped with a free-wheel device. After stopping the PTO, the rotor continues to spin for at least 30 seconds: keep away from the flails until the rotor has stopped turning.

### ATTENTION!

To prevent damage to the PTO shaft and to the gearbox, do not start the implement roughly.

### SAFETY RESTRICTIONS

Do not allow children or people who are unfamiliar with these instructions to use the implement.

Local regulations may restrict the use of the implement based on age.

## SAFETY LABELS ON THE IMPLEMENT

In this section, the safety labels of the implement are reproduced and explained.

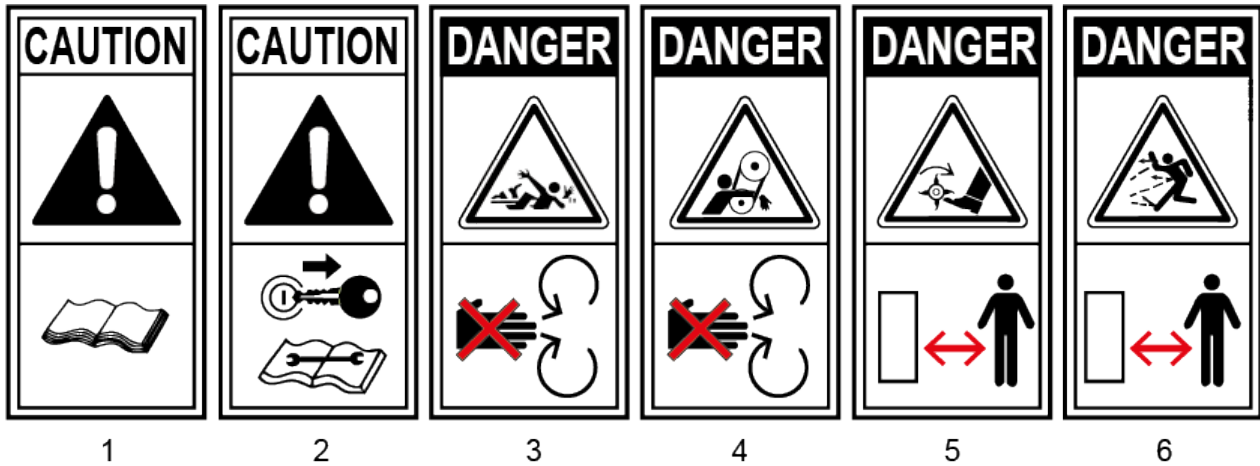


Fig. 1

### Legend

1. Read the manual.
2. Remove the key from the ignition of the tractor before performing maintenance or repairs.
3. Stay at a safe distance from the PTO shaft.
4. Stay at a safe distance from the transmission belts.
5. Stay at a safe distance from the flails.
6. Stay at a safe distance: possible flying objects.

### The safety labels on the implement must be always legible

If damaged, the labels must be replaced.

If parts of the implement with the safety labels are replaced, the labels must be replaced as well.

### Supply of new labels and application procedure

Contact your dealer to obtain new safety labels with instructions for application.

## BEFORE OPERATING THE IMPLEMENT FOR THE FIRST TIME



**IMPORTANT:** it is mandatory, before the first start-up, to check the proper lubrication of moving parts, the oil level in the gearbox, and the tension of the belts.

To perform these operations correctly, operate exclusively as described in the instructions provided in the chapter "MAINTENANCE INSTRUCTIONS", specifically at points 1, 2, and 4.

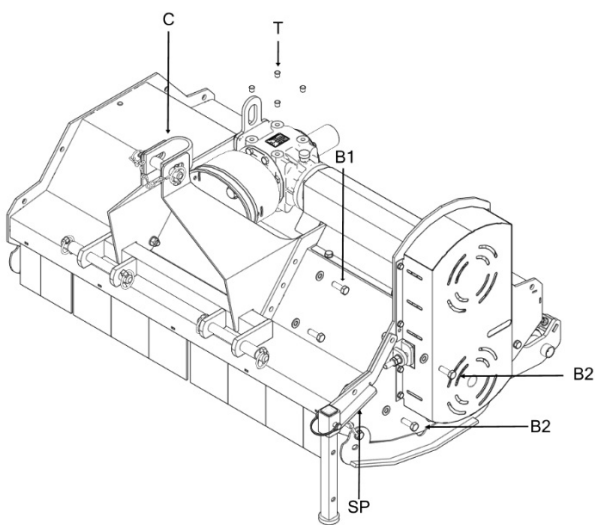
## SHIFTING HITCH ASSEMBLY



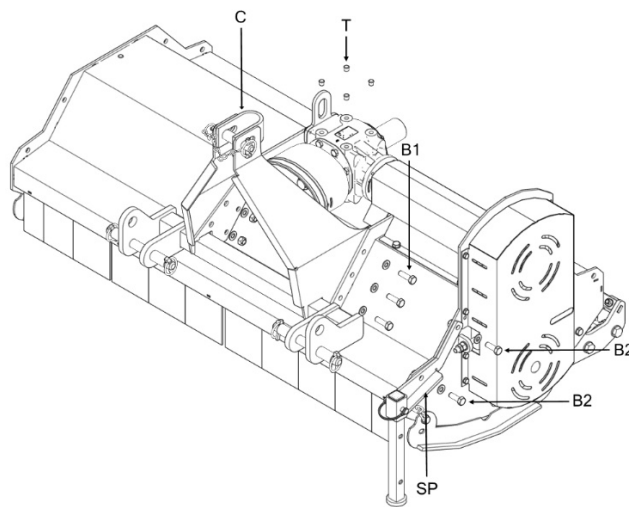
**IMPORTANT:** In order to avoid any damage to the third-point of the hydraulic side shifting, before to operate the hydraulic translator, it is MANDATORY to lift the machine from the ground.

## FLIPPER 106-186

The following instructions are valid for the assembly of both the hydraulic shifting kit and the screw shifting kit.

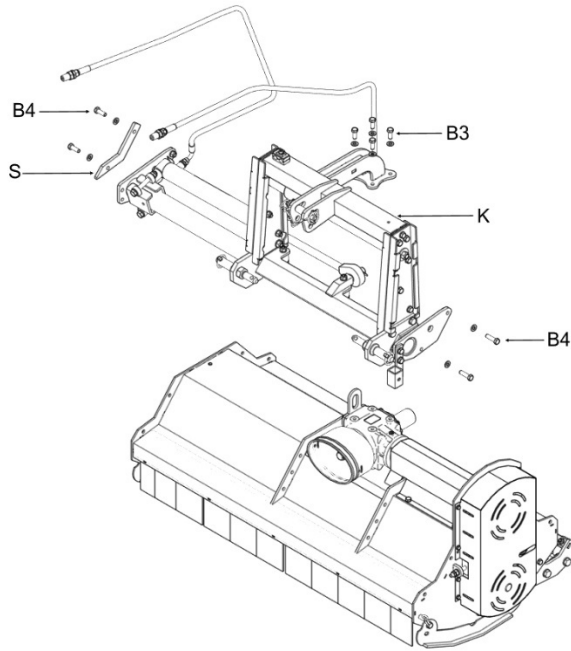


Flipper 106

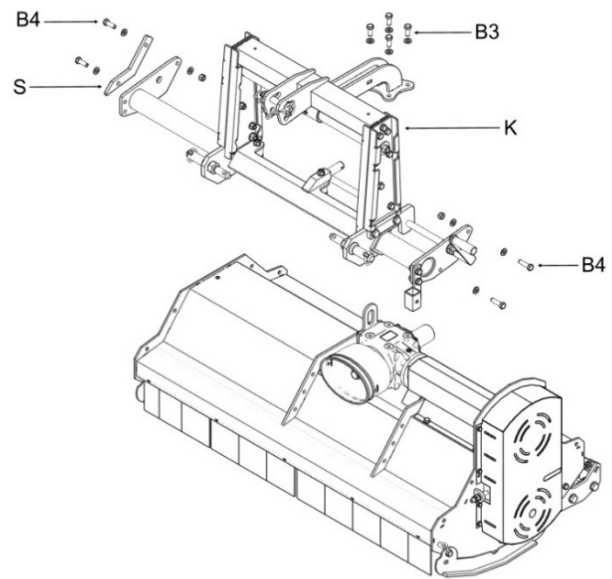


Flipper 132-186

1. Remove the six (four in the 106 model) bolts "B1" and remove the third-point attachment "C",
2. Remove the two bolts "B2" and remove the support "SP",
3. Remove the four corks "T",

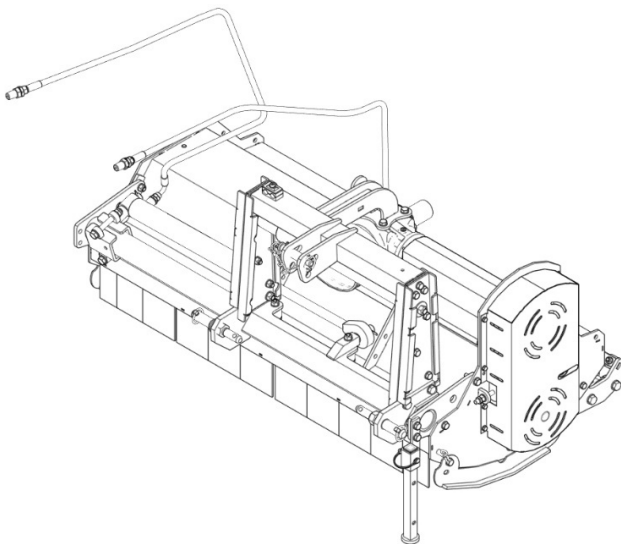


Hydraulic shifting kit

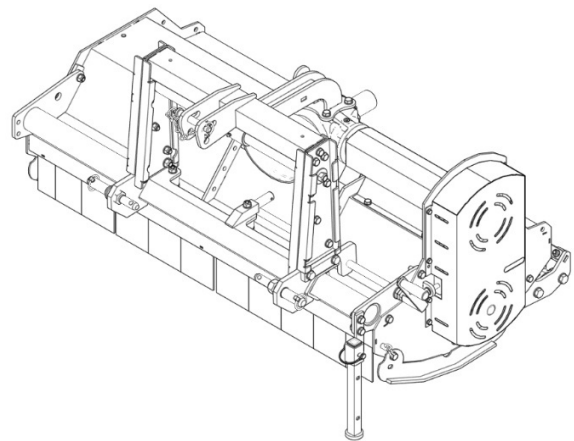


Screw shifting kit

4. Assemble the kit "K" using the four bolts "B3" to fix the kit on top of the gearbox and the four bolts "B4" to fix the kit to the frame of the implement. All the mentioned bolts are provided with the kit.  
NOTE: for 132, 158, 186 models be careful to put the spacer "S" between the frame and the kit in the right side panel of the implement, as shown in the picture above,

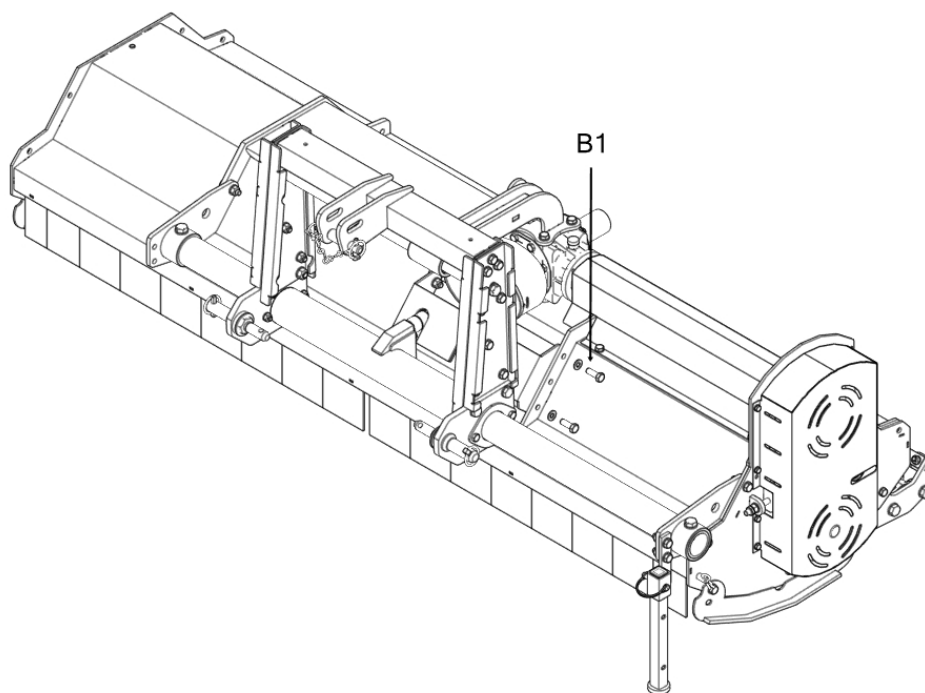


Hydraulic Shifting Kit Assembled

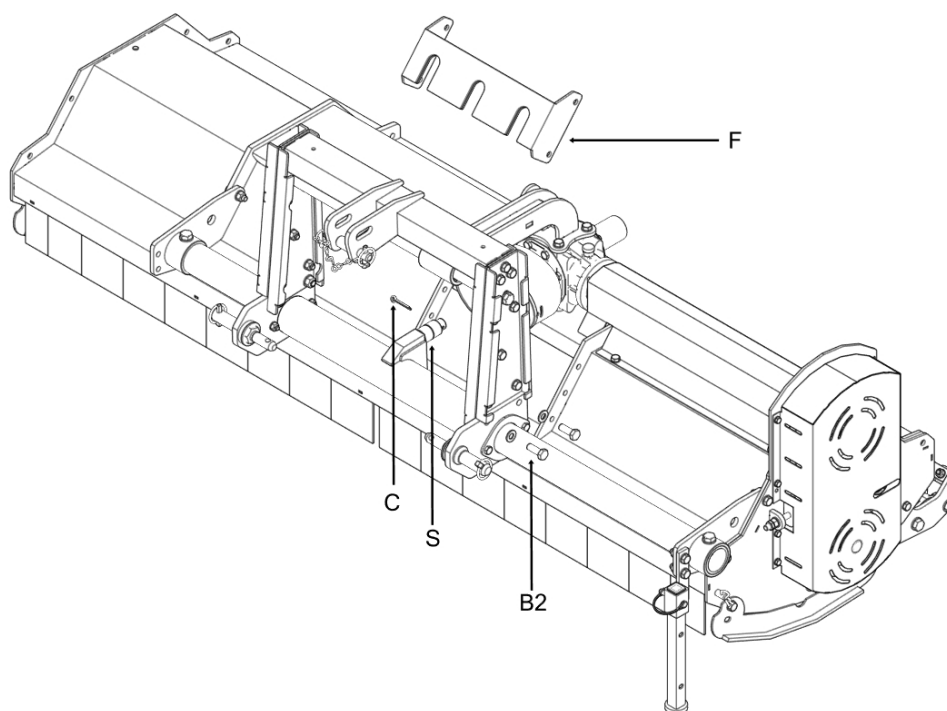


Screw Shifting Kit Assembled

## FLIPPER 214

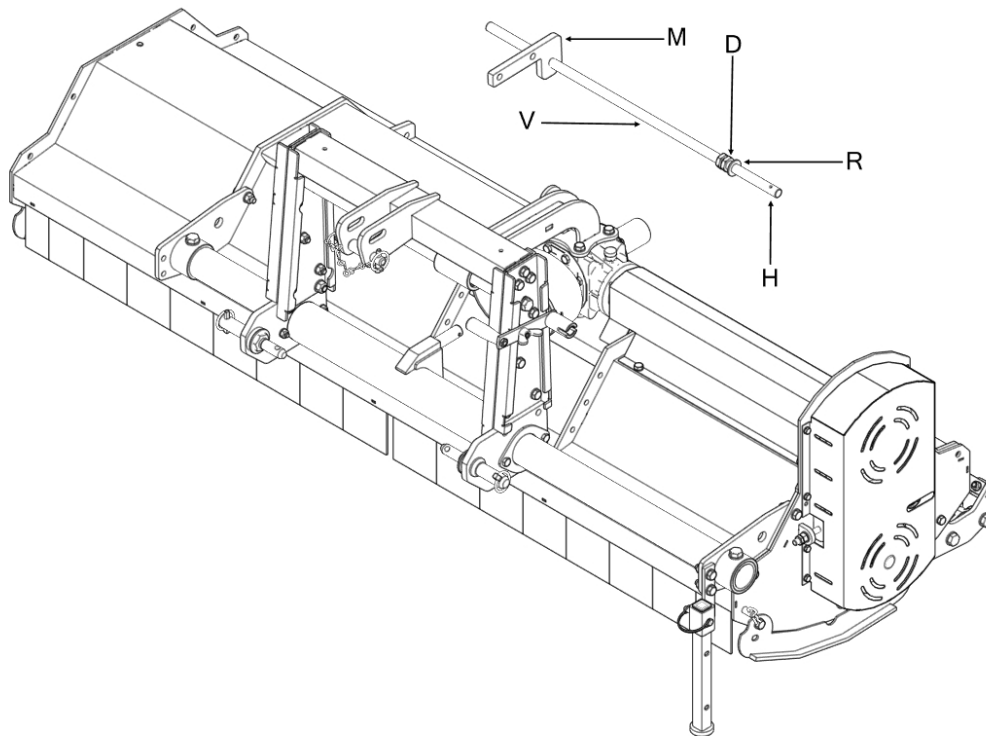


1. Remove the four bolts "B1",



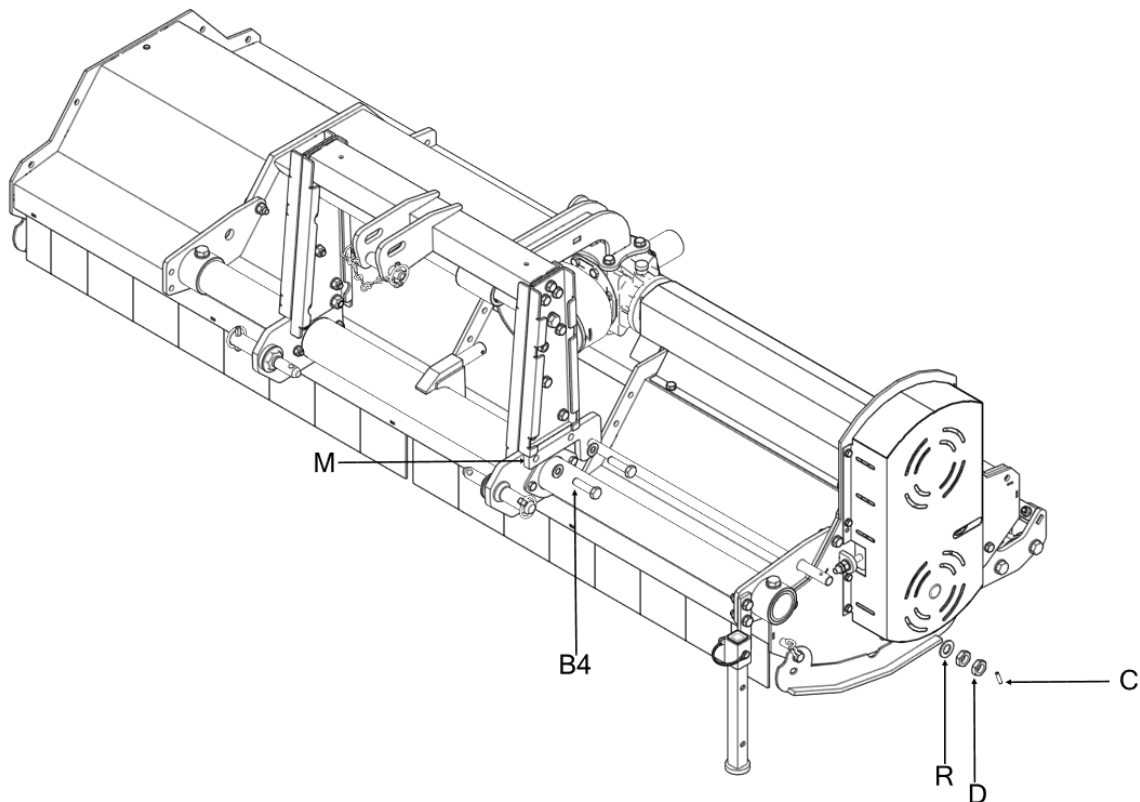
2. Remove the locking plate "F",
3. Remove the cotter pin "C" and the two spacer "S",  
ONLY FOR SCREW SHIFTING → Remove the two bolts "B2",

## a) SCREW SHIFTING



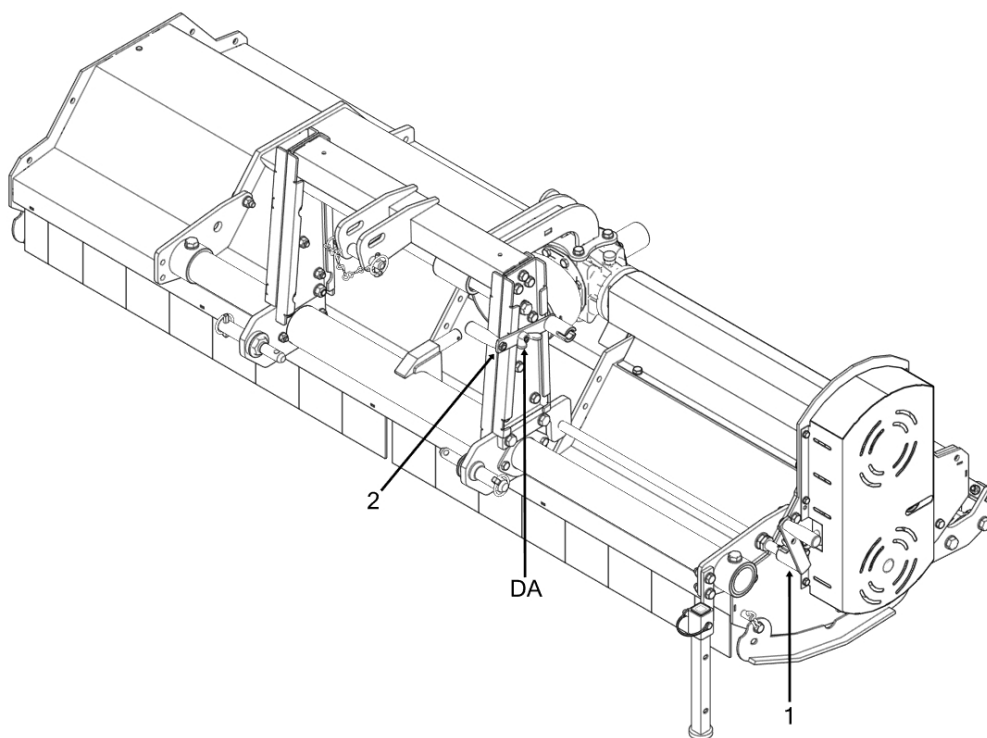
4a. Screw the bracket with threaded hole "M" on the screw "V" on the opposite side of the hole "H" about 4 inches apart.

Screw one nut "D" onto the screw "V" about 4 inches from the side with the hole "H", lock it in position with another nut "D" then insert one washer "R".



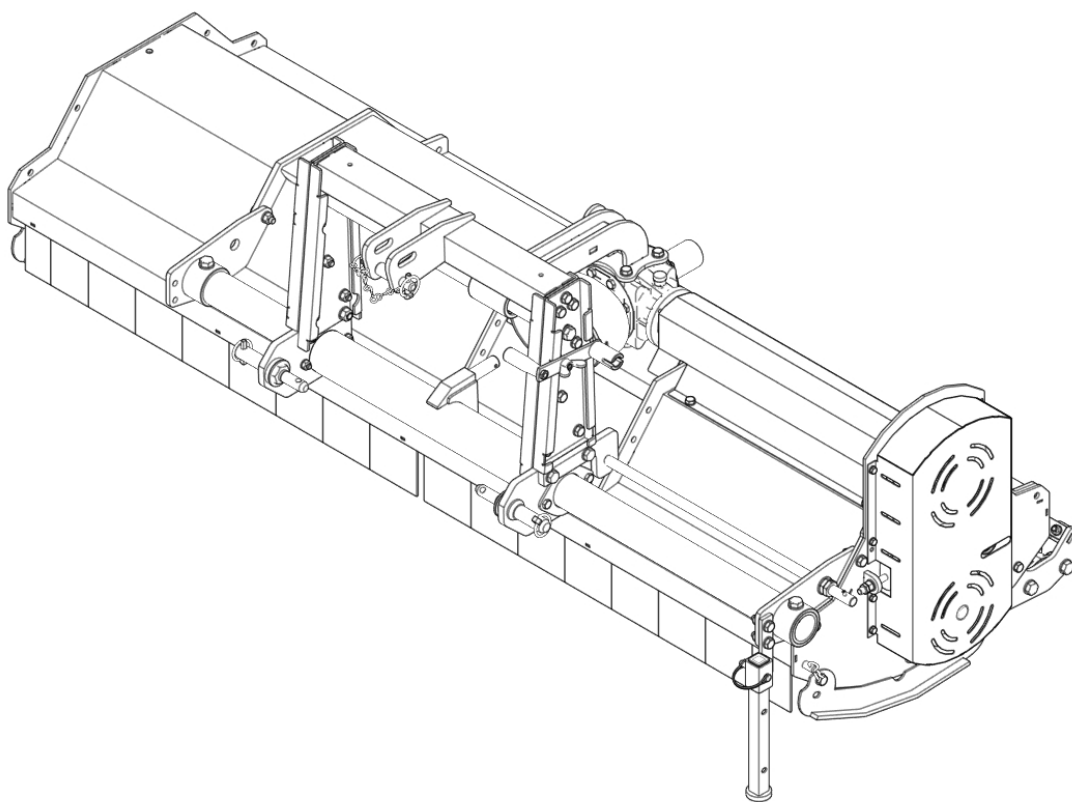
5a Insert the screw "V" into the hole on the left side panel of the implement and secure the lead screw "M" to the three-point hitch using the two bolts "B4". Tighten the nuts.

6a. Insert one washer "R", screw one nut "D" and lock it in position with another nut "D", check that the screw "V" can rotate freely. Insert the cotter pin "C" into the hole "H". Tighten the nuts.



7a. Insert the crank into the screw in position "1" and rotate it to move the three-point hitch to the desired position. Tighten all the nuts.

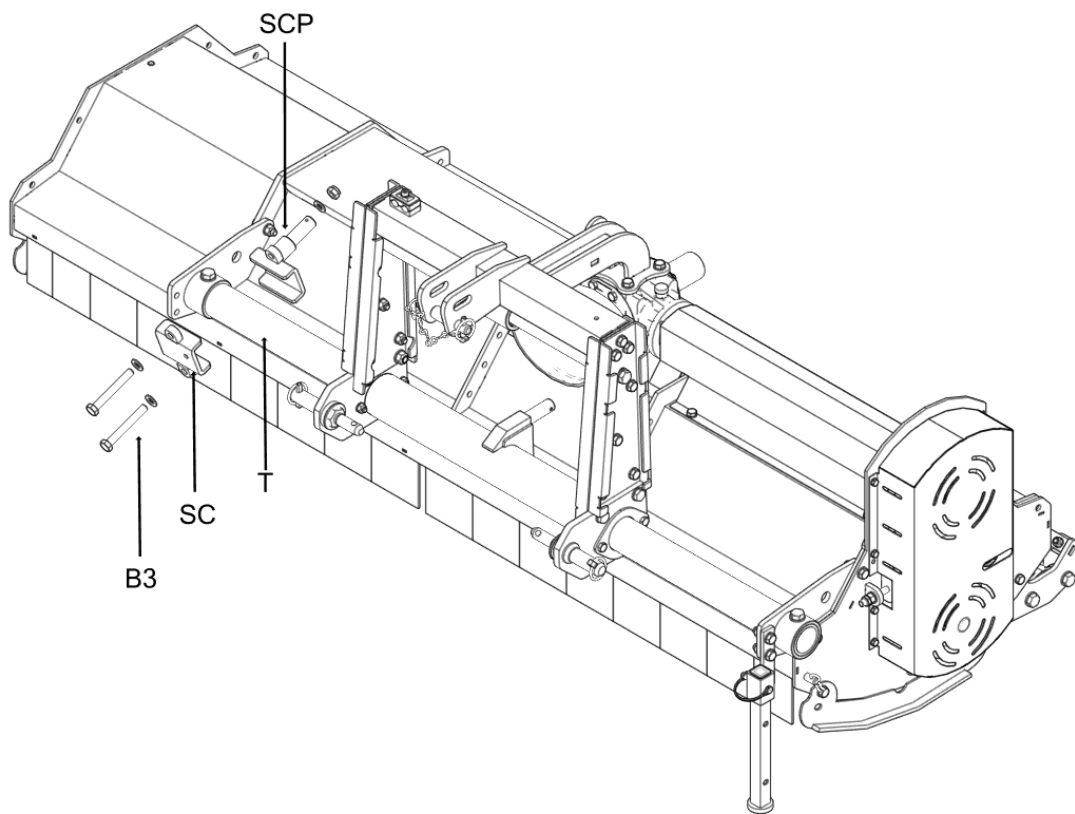
8a. Remove the crank and secure it to the three-point hitch in position "2" by using the wingnut "DA" to prevent losing it during work.



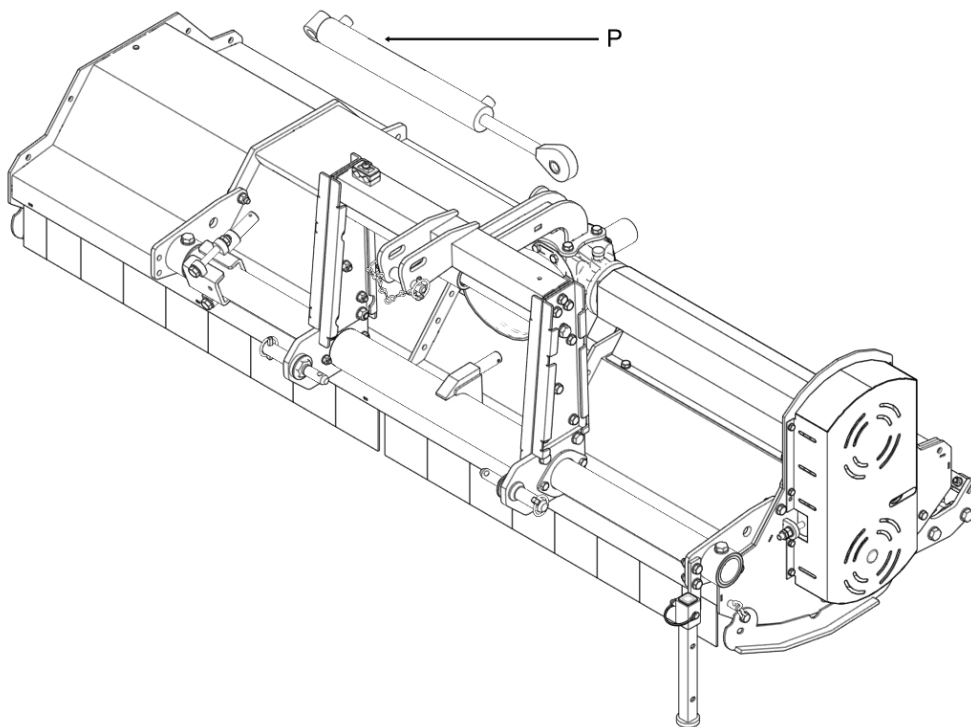
Screw Shifting Kit Assembled



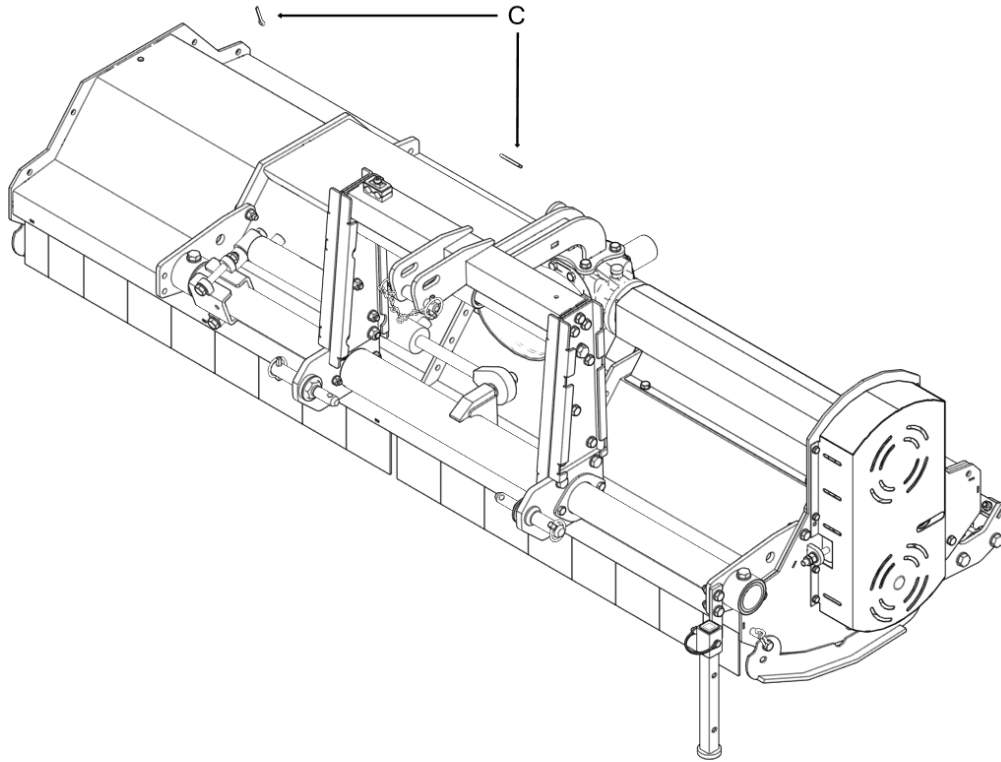
## b) HYDRAULIC SHIFTING



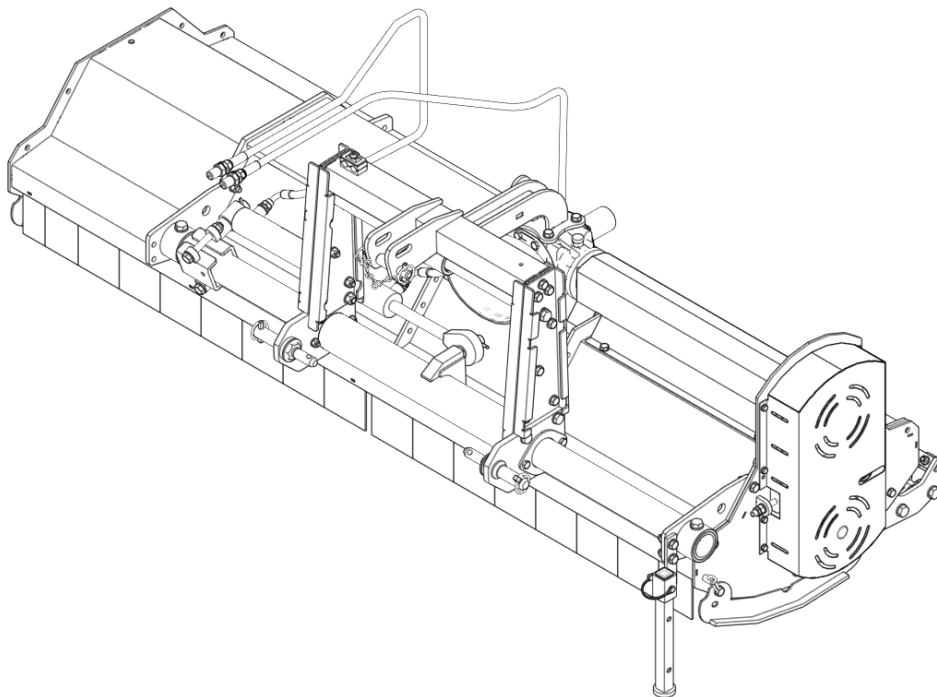
4b. Mount the bracket "SCP" and the mechanical stop "SC" onto the tube "T" using the two bolts "B3",



5b. Mount the hydraulic piston "P" onto the bracket at the bottom end of the cylinder. Insert the end of the rod into the pin of the three-point hitch.



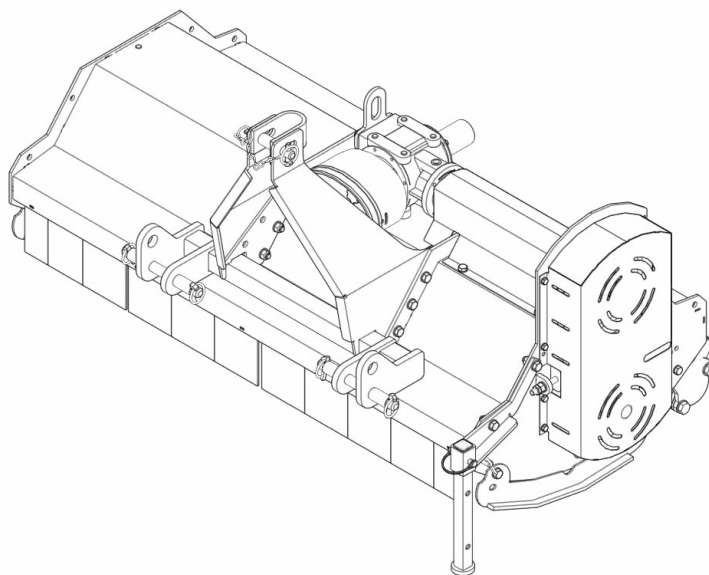
6b. Lock the hydraulic piston in position using the two cotter pin "C".



Hydraulic Shifting Kit Assembled

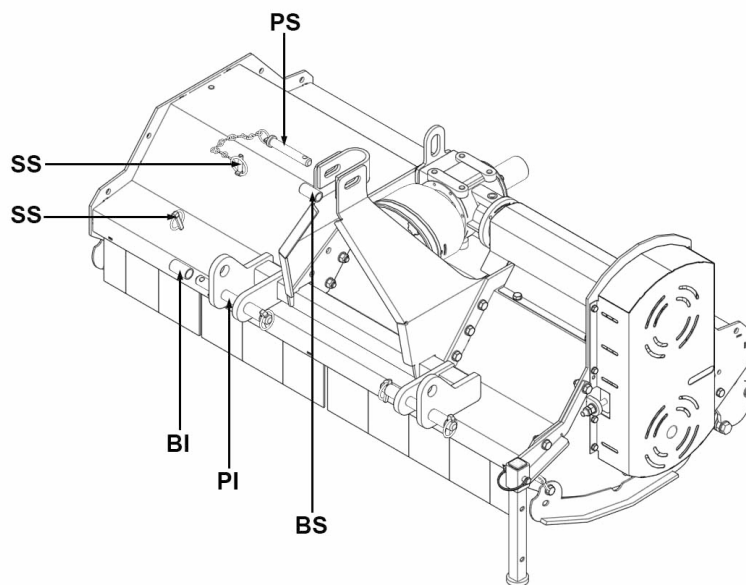
## QUICK HITCH KIT ASSEMBLY FOR FIXED HITCH (IF REQUIRED)

The implement is shipped with a standard Category I and II hitch suitable for tractors with a standard 3-point hitch. A Category I "Quick Hitch Kit" is supplied with the implement to make the hitch suitable for tractors equipped with a Category I Quick-Hitch. The "Quick Hitch Kit" must be installed on the implement's 3-point hitch to make it compatible with the Quick-Hitch.

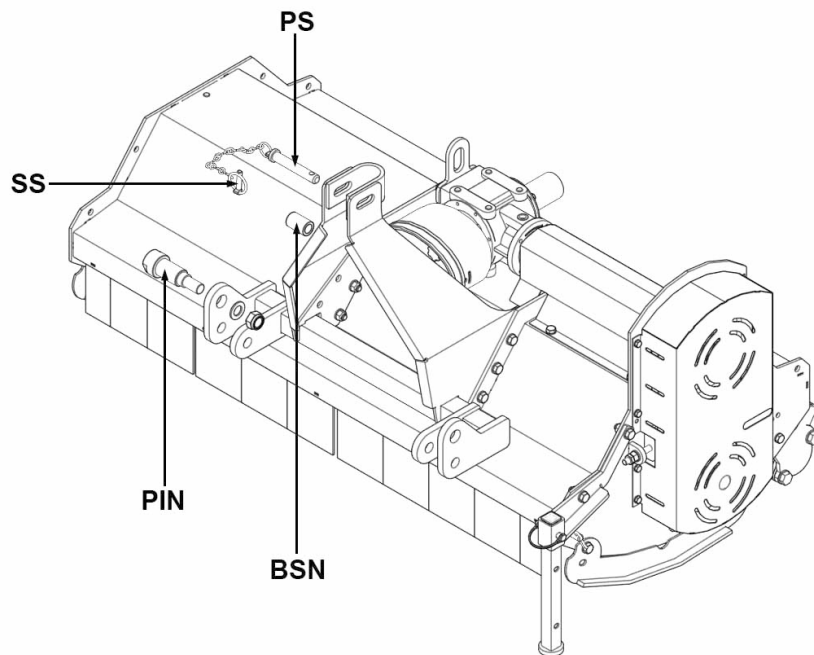


Standard Attachment

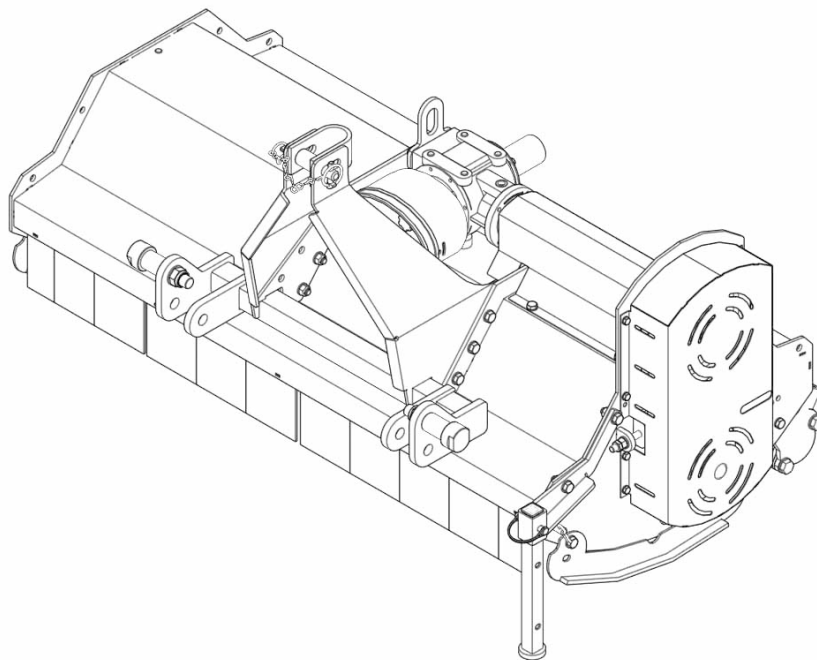
To install the "Quick Hitch Kit", proceed as follows:



1. Remove the SS safety pin from the lower "PI" pins. Remove the "PI" pins and "BI" bushings.
2. Remove the safety pin "SS" from the upper pin "PS". Slide out the pin "PS" and remove the bushing "BS".



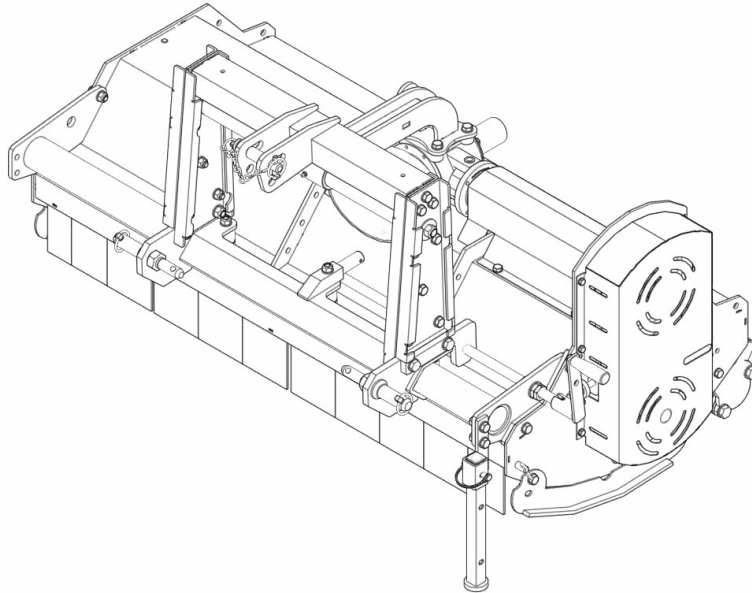
1. Insert the bushing "BI" onto the lower right pin "PI" and then lock it with the spring pin "SE".
2. Repeat step 1 with the left lower pin "PI".
3. Insert the bushing "BS" into the III-point hitch, then insert the bolt "BU" and tighten the nut.



Quick Hitch Compatible for Fixed Attachment

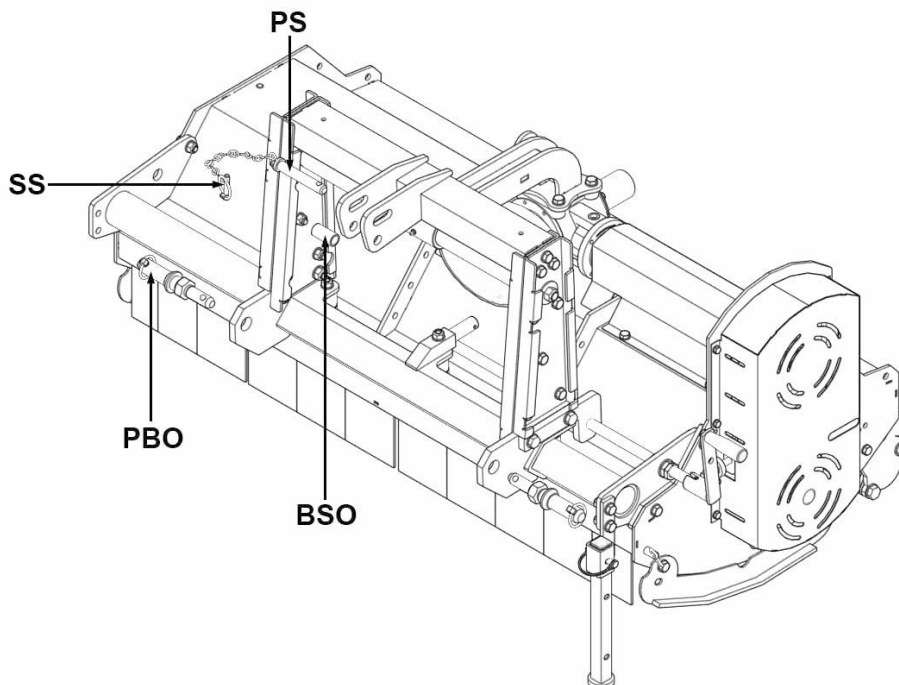
## QUICK HITCH KIT ASSEMBLY FOR SHIFTING HITCH (IF REQUIRED)

The implement is shipped with a standard Category I and II hitch suitable for tractors with a standard 3-point hitch. A Category I "Quick Hitch Kit" is supplied with the implement to make the hitch suitable for tractors equipped with a Category I Quick-Hitch. The "Quick Hitch Kit" must be installed on the implement's 3-point hitch to make it compatible with the Quick-Hitch.

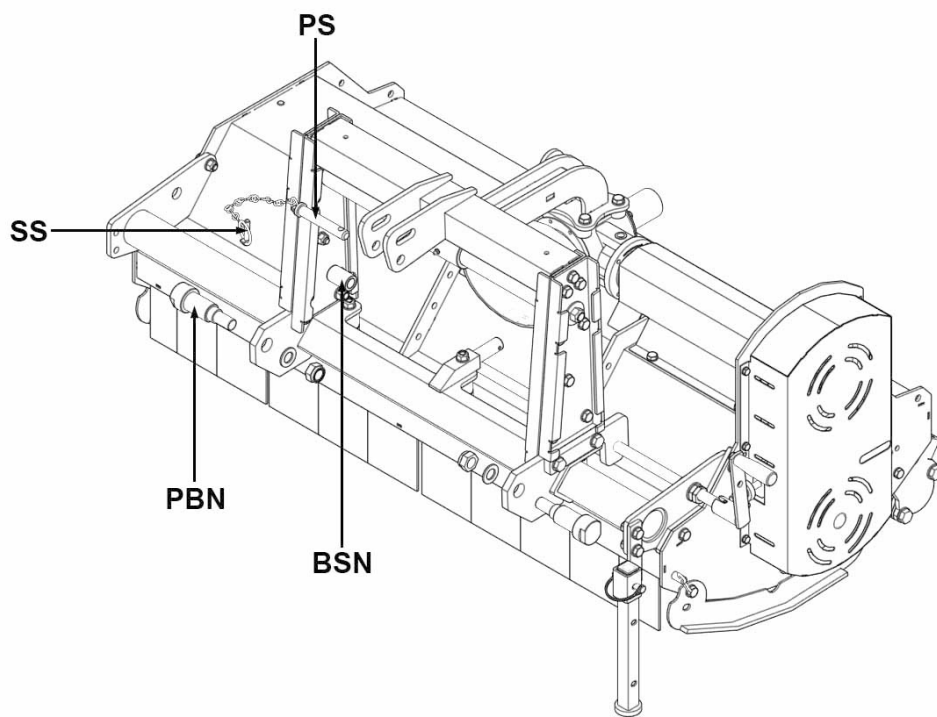


Standard Fixed Attachment

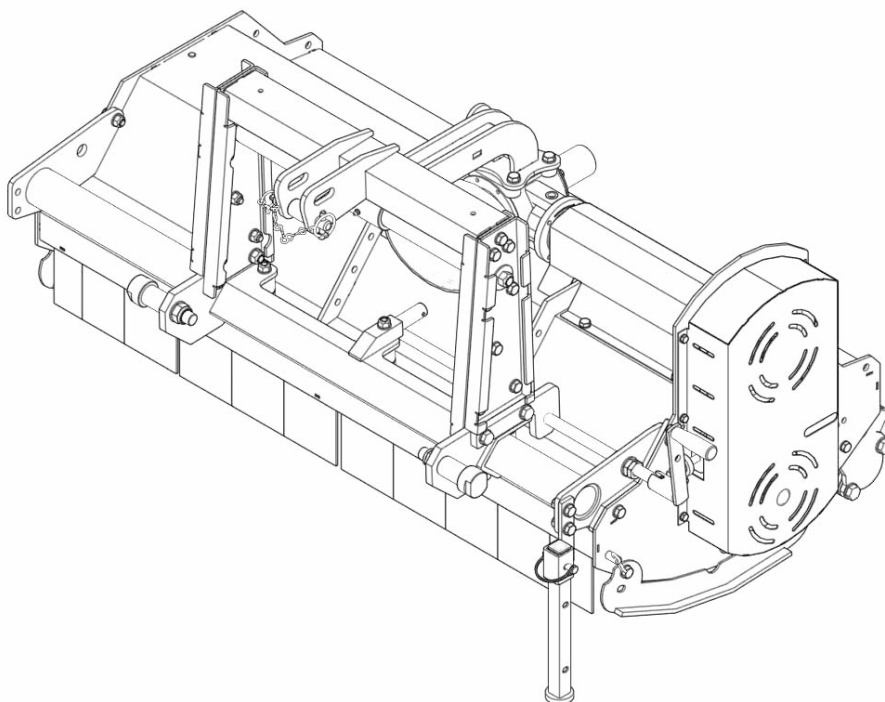
To mount the quick hitch kit, proceed as follows:



1. Remove the "PBO" bottom pins.
2. Remove the safety pin "SS" from the upper pin "PS". Slide off the upper pin "PS" and remove the bushing "BSO".



1. Fit the two lower pins "PBN, tighten the nuts securely.
2. Insert the bushing "BSN" in the iii-point hitch, insert the pin "PS" and lock it with the safety pin "SS".

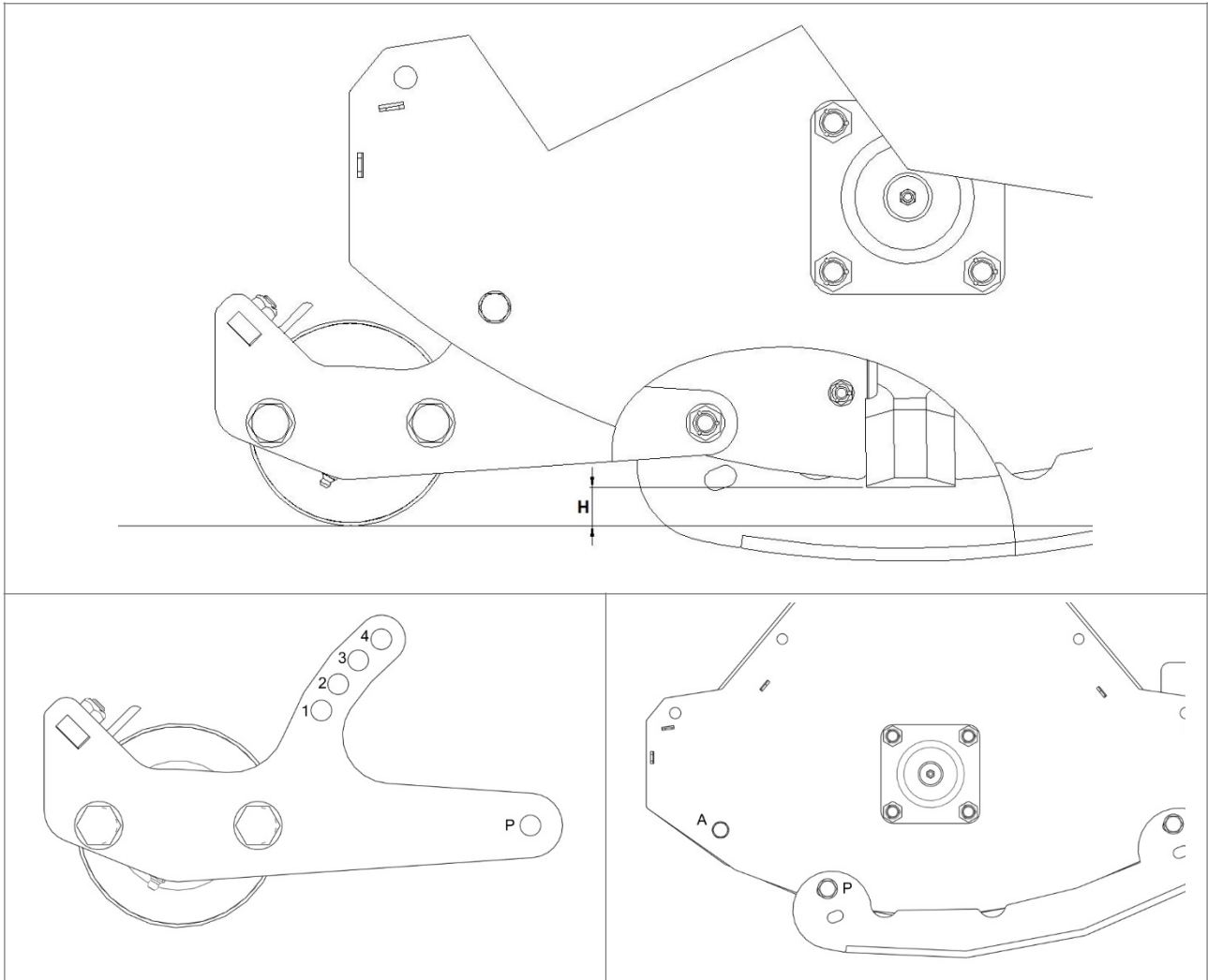


Quick Hitch Compatible for Shifting Attachment



## CHANGE THE CUTTING HEIGHT

Adjust the position of the Rear Roller Extension to achieve the desired cutting height as follows:



CUTTING HEIGHT "H" *		ASSEMBLY COMBINATION
[mm]	[in]	
25	1	1-A
50	2	2-A
78	3	3-A
105	4	4-A

\* All heights are referenced to the implement in the horizontal position

## CHECK THE LENGTH OF THE PTO SHAFT

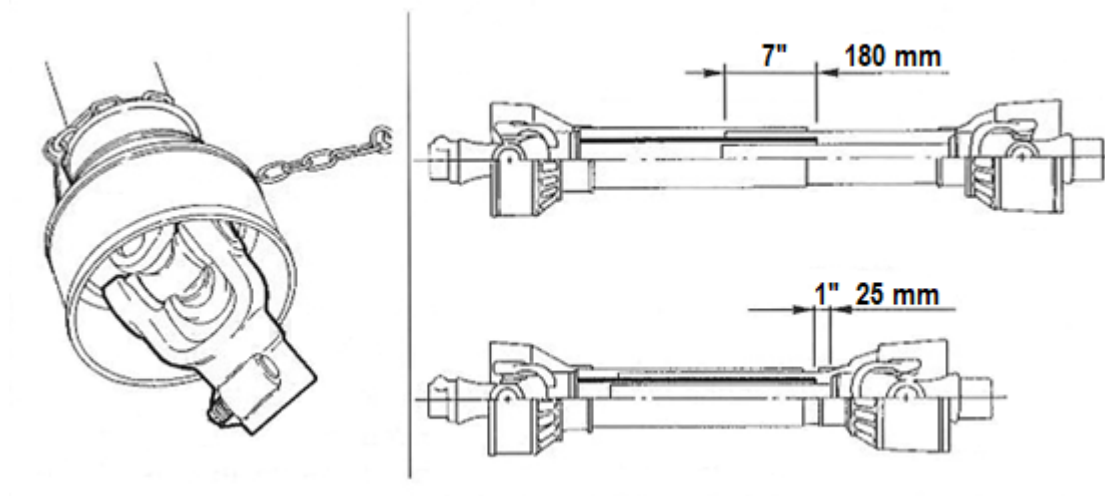


Fig. 4

1. Connect the implement to the 3-point hitch and adjust it so that it is level and centered on the tractor.
2. Insert the PTO shaft between the PTO of the tractor and the implement.
3. Verify that the length of the PTO shaft is correct.
4. To do so, check that the minimum overlap between the inner and outer tube is not less than 180 mm (7 in) in every working position; at the same time, when the shaft is not extended, it should be able to move at least 25 mm (1 in).
5. If the minimum coupling distance is less than 180 mm (7 in), the PTO shaft is too short and must be replaced with a longer one.
6. If the PTO shaft is not able to move at least 25 mm (1 in) when is not extended, it is too long and must be shortened.



**IMPORTANT:** shortening the PTO shaft is complicated and must be carried out carefully following the instructions in the next chapter, otherwise the PTO shaft may be damaged.



## HOW TO SHORTEN THE PTO SHAFT

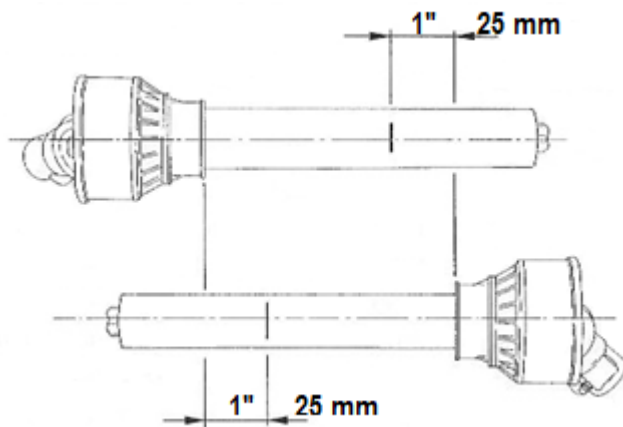


Fig. 5

1. Lift the implement to bring it as close as possible to the tractor.
2. In this position, block the lift arms and turn off the engine.
3. Pull the two parts of the PTO shaft apart.
4. Attach the female semi-cardan (tube with larger diameter) to the PTO.
5. Attach the male semi-cardan (tube with smaller diameter) to the implement.
6. With the two parts parallel, use a felt pen to mark the cutting point, as shown in Fig. 5.

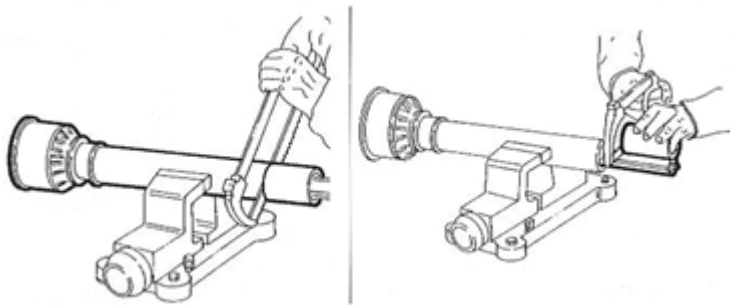


Fig. 6

1. Cut the plastic tube of one of the semi cardan with a hacksaw on the cutting line (see Fig. 6 above).
2. Align the cut plastic tube with the end of the metal tube and then cut it.
3. Repeat the same operations on the other section of the PTO shaft.
4. Use a file to smooth down the edges of the metal tubes.
5. Clean and grease the two metal tubes and then insert one section into the other.
6. Install the PTO shaft between the tractor and the implement, then verify the length again.

## INSTRUCTIONS FOR USE

### BEFORE STARTING TO WORK

- a) Connect the implement to the tractor as follows:
  1. Remove the safety pins from the two lower connection points of the implement.
  2. Insert the lower connection points of the implement into the lower arms of the tractor hitch and lock with the safety pins.
  3. Connect the tie-rod of the tractor's upper link to the upper connection point of implement and lock with safety pin.
- b) With the implement raised, go to work area.
- c) Connect the tractor PTO with implement PTO and attach the chains to the tractor and the implement to prevent the safety guards of the PTO from rotating.
- d) Adjust the cutting height as follows:
  1. Rear Roller:
    - a. Adjust the rear roller to the desired height (see the instruction "CHANGE THE CUTTING HEIGHT" in the chapter "BEFORE OPERATING THE IMPLEMENT FOR THE FIRST TIME").
    - b. Lower the implement until the rear roller touches the ground and check the cutting height.
  2. Cutting height adjustment using the III° point tie rod:
    - a. Extend the tie rod to increase or shortened the cutting height.
    - b. Lower the implement until the rear roll touches the ground and check the cutting height. When lowering the implement be sure that the flails are not touching the ground.
    - c. After the adjustment, lock the safety nut of the tie rod.

### RUNNING IN (ONLY ON FIRST START)

The new implement must be broken in.

During first usage, attach the implement to the tractor, connect the PTO shaft, lower the implement to 15 cm (6 in) from the ground, start the PTO and gradually increase the RPM to 540.

Let the implement runs for about 15 minutes.

### START WORKING

- Make sure that there is no one within a radius of 50 meters (164 ft) around the implement.
- Insert the PTO and increase the rotation speed gradually to its normal speed.
- Lower the implement until the rear roller touches the ground.
- Start working.

### WHEN WORK IS FINISHED

- Stop the tractor and shut-off the PTO shaft. Wait for at least 30 seconds until the rotor has completely stopped.
- Lift the implement up.
- Disconnect the PTO shaft from the PTO of the tractor.
- Raise the implement fully.

## MAINTENANCE INSTRUCTIONS

Maintenance operations and their corresponding intervals are listed in sheet “A”.

Not following the schedule maintenance intervals jeopardizes the proper functioning of the implement, thus voiding the guarantee.

### SHEET “A” - SCHEDULED MAINTENANCE

	FIRST USE	AFTER 10 H.	EVERY 30 H.	EVERY 500 H.	END OF THE SEASON	BEGINNING OF WORK	END OF WORK
<b>IMPLEMENT</b>	Grease		Grease		Clean Grease		Clean
<b>GEARBOX</b>	Check oil level	Top oil	Check oil level	Oil change			
<b>SCREWS</b>		Tighten	Tighten				
<b>FLAILS</b>			Check		Check	Check	Check
<b>BELTS</b>	Check tension	Check tension		Replace			

**NOTE:** transmission belts will stretch during the first hour of operation.



After the first use, the tension of the belts must be checked and adjusted according to the instructions in paragraph 4 of the MAINTENANCE INSTRUCTIONS to prevent the belts from wearing out prematurely due to excessive slippage.

## 1. GREASING

Grease the points "B", "C", "D", "E", "F", and "G" (refer to Fig.8).

Greasing points are equipped with a HYDRAULIC GREASER MODEL "A" UNI 7663.

Use only MULTIFUNCTIONAL LITHIUM-BASED OIL TYPE NLGI 2.

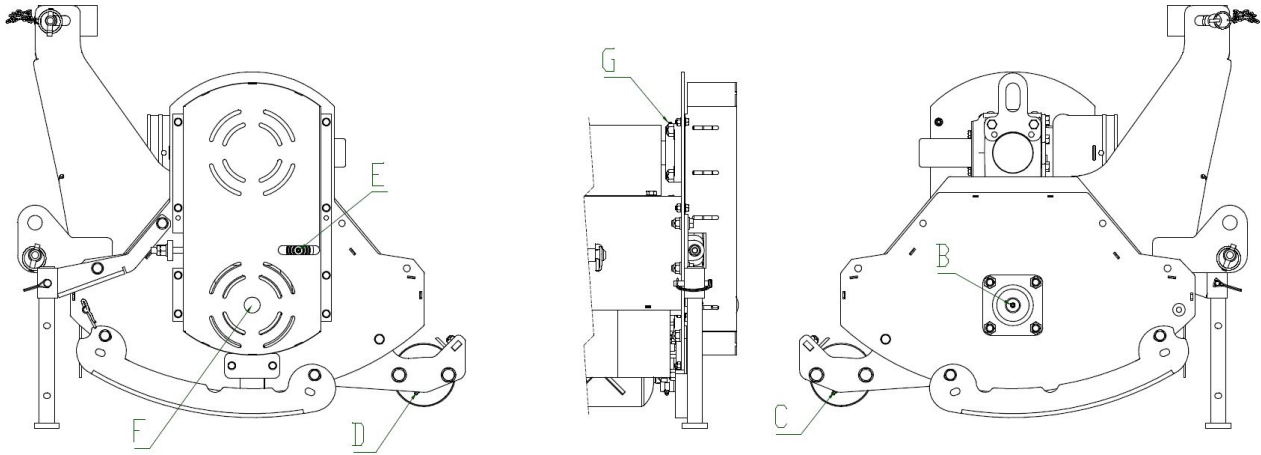


Fig. 8

## 2. OIL LEVEL - OIL CHANGE

At the times indicated in sheet "A", check the level or and top up or replace the oil in the gearbox.

Oil capacity: 0,8 liter. Use only SAE 90 oil.

- To check the oil level in the gearbox (refer to Fig. 9):
  1. With the implement on a level surface, remove the plastic protection on the front of the gearbox, unscrew the cap "TL" and check that the oil reaches the edge of the hole.
  2. If the level is OK, tighten the cap "TL" carefully.
  3. If the level is LOW, unscrew the cap "TR" and fill with oil until it reaches the edge of the hole "TL".
  4. Tighten the caps "TL" and "TR" and mount the plastic protection.
- To replace the oil in the cast iron gearbox (refer to Fig. 9):
  1. Remove the plastic protection mounted on the front of the gearbox and place a container under the cap "TS". Unscrew the caps "TL", "TR" and the drain cap "TS" and wait for all the oil to come out.
  2. Screw in and tighten the drain cap "TS" and pour the new oil into hole "TR".
  3. Once the oil level reaches the edge of hole "TL", screw the "TL" and "TR" cap back on and replace the plastic protection.

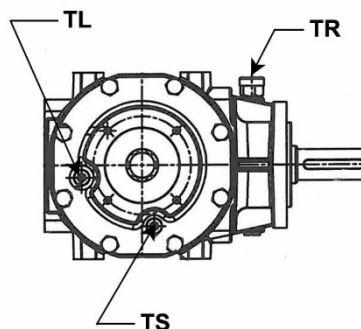


Fig. 9

### 3. FLAILS REPLACEMENT

To replace blade (both Y and I) or hammer flails (refer to Fig. 11):

1. Unscrew the nut then take out the screw "B".
2. Remove flails "A" and the bushings (if present).
3. Insert the new flails.
4. Fit the screw "B" then tighten the nut.
5. **ATTENTION: all flails must be of the same type, size and weight.**
6. **ATTENTION: changing type of flail is possible using original Del Morino flails. If other flails are used the rotor may have to be balanced.**

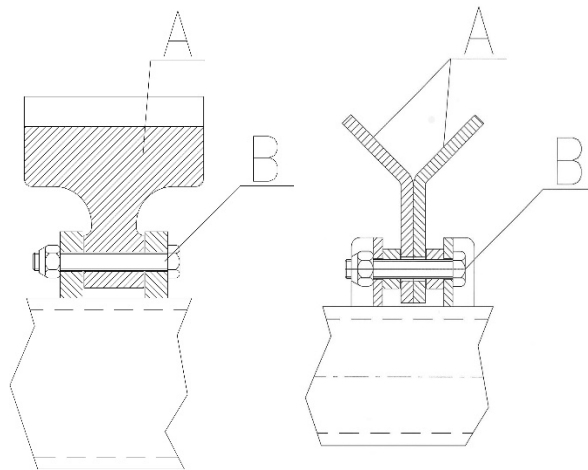


Fig. 11

## 4. ADJUSTMENT AND REPLACEMENT OF THE TRANSMISSION BELTS

a) To adjust the tension of the transmission belts (refer to Fig 12a and Fig 12b):

1. Remove belt cover "A" by unscrewing the eight screws "B".
2. Loosen the lock nut "C" of the belt tensioner and screw/unscrew the nut "D" to increase or decrease the tension of the belts. The belt tension is correct when the belts flex about 1/8" - 1/4" when pushing them on the side opposite of the belt tensioner.
3. Tighten the lock nut "C" then then install the belt cover "A".

b) To change the transmission belts, operate as follow:

1. Remove belt cover "A" by unscrewing the eight screws "B".
2. Loosen the lock nut "C" and remove the nut "D".
3. Remove the old belts "E". Install new belts of the same size and type. All belts must be replaced to prevent adjusting problems.
4. Adjust the tension of the belts as described in item "a)" above.
5. **ATTENTION:** the belts will stretch during the first hour of work and the tension should be checked and, if necessary, adjusted.

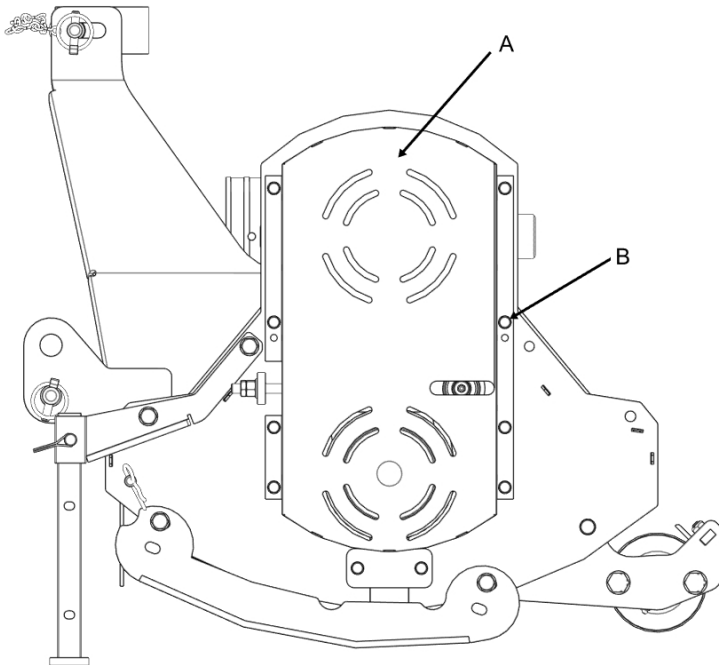


Fig. 12a

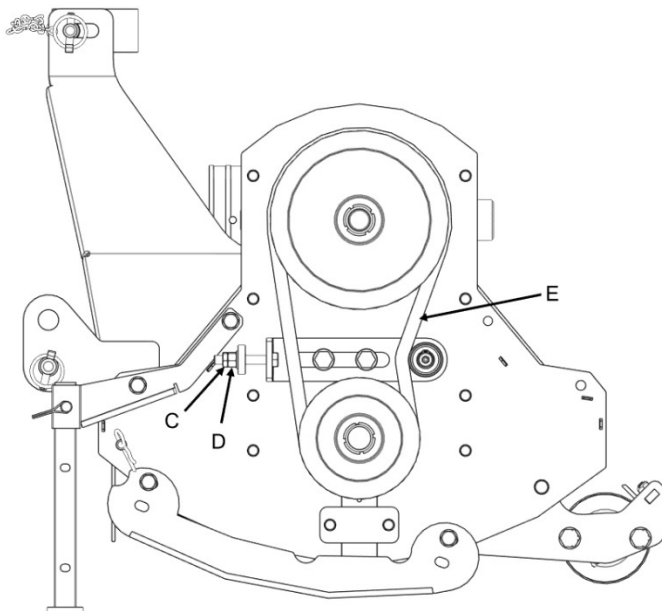


Fig. 12b

## TROUBLESHOOTING

MALFUNCTION	POSSIBLE CAUSE	SOLUTION
<b>Abnormal vibrations</b>	1) Unbalanced rotor. 2) Loss or breakage of one or more flails. 3) Worn out bearings.	1) Contact the dealer. 2) Replace missing flails. 3) Replace worn out bearings.
<b>Irregular or unsatisfactory cutting</b>	1) Worn out flails. 2) Incorrect choice of flails.	1) Replace worn out flails. 2) Replace them with another type.

## VARIOUS INFORMATION

### TRANSPORT

Outside its normal field of use, the PTO must be disengaged when transporting the implement.



**IMPORTANT:** proceed at moderate speed avoiding holes and rough surfaces.



**NOTE:** on public road, abide by the traffic laws. Attach warning labels to the rear and side of the implement indicating the contour of the implement. Abide by all local regulations.



**CAUTION:** secure the lifting arms of the tractor with chains and parallel tensioners to prevent the arms from moving side to side.

### STORAGE

Store the implement in a dry and dust-free place.

### INFORMATION ABOUT DEMOLITION



At the end of its working life, the implement must be demolished and that can only be done by an authorized authority, in accordance with the national laws about the environment. Therefore, it is necessary to get information from qualified local authorities about the procedure to follow. The implement is mainly composed of iron materials, rubber and epoxide paints.

### WARRANTY

The implement is covered by the manufacturer's warranty for 24 months from date of sale to the end-user.

The warranty is void if:

- a) The implement has not been correctly maintained.
- b) The implement has been used outside its field of use.
- c) The implement has been modified without the prior written permission of the manufacturer.









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