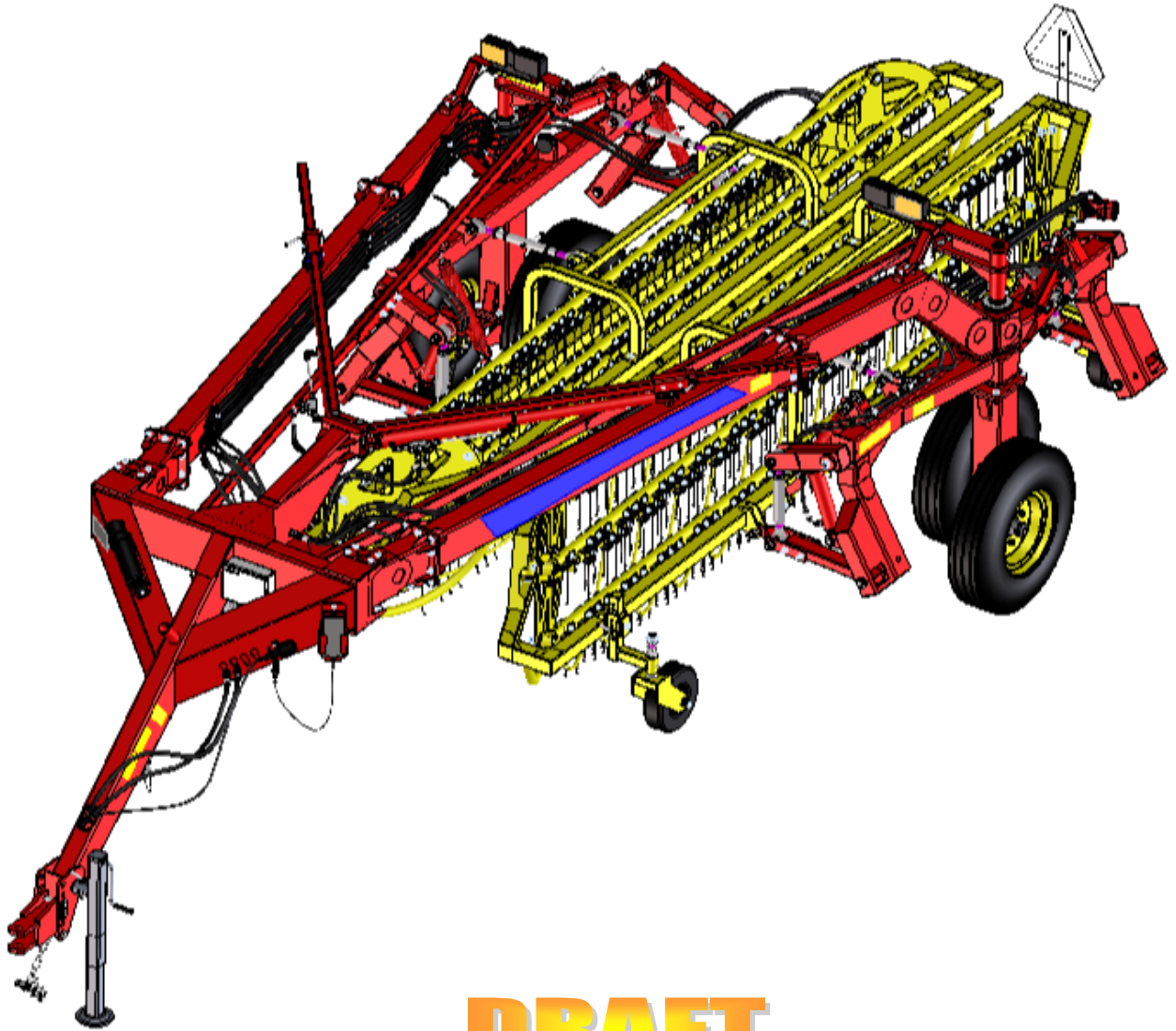


ASSEMBLY, USE AND MAINTENANCE



DRAFT

APPROXIMATE INSTALLATION TIME: 10.0 hours 1 person

BASKET RAKE

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DRAFT

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SECTION 1 GENERAL INFORMATION

DRAFT

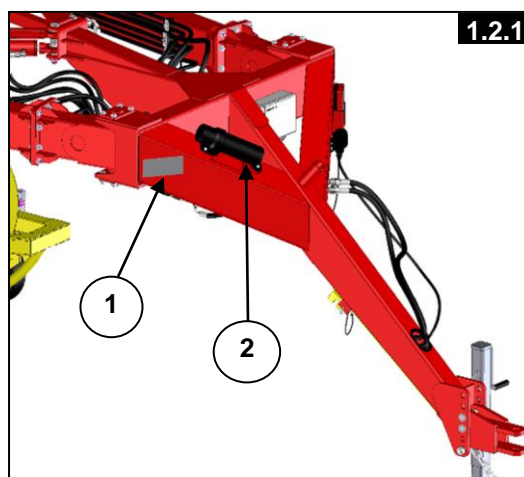
1.1 PRODUCT IDENTIFICATION NUMBER (PIN)

The product identification number (PIN) plate **(1)** is located on the right hand brace of the drawbar. See **picture 1.2.1**.

1.2 OPERATOR'S MANUAL STORAGE

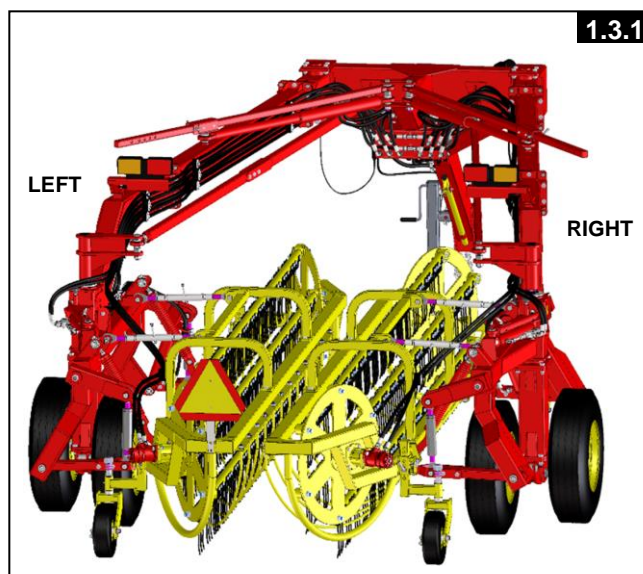
The rake has a storage box **(2)** for the operator's manual on the drawbar. See **picture 1.2.1**.

NOTE: Always keep the operator's manual with the machine.



1.3 MACHINE ORIENTATION

On this equipment, the left-hand and right-hand sides are determined by standing behind the unit, and looking in the direction of travel.



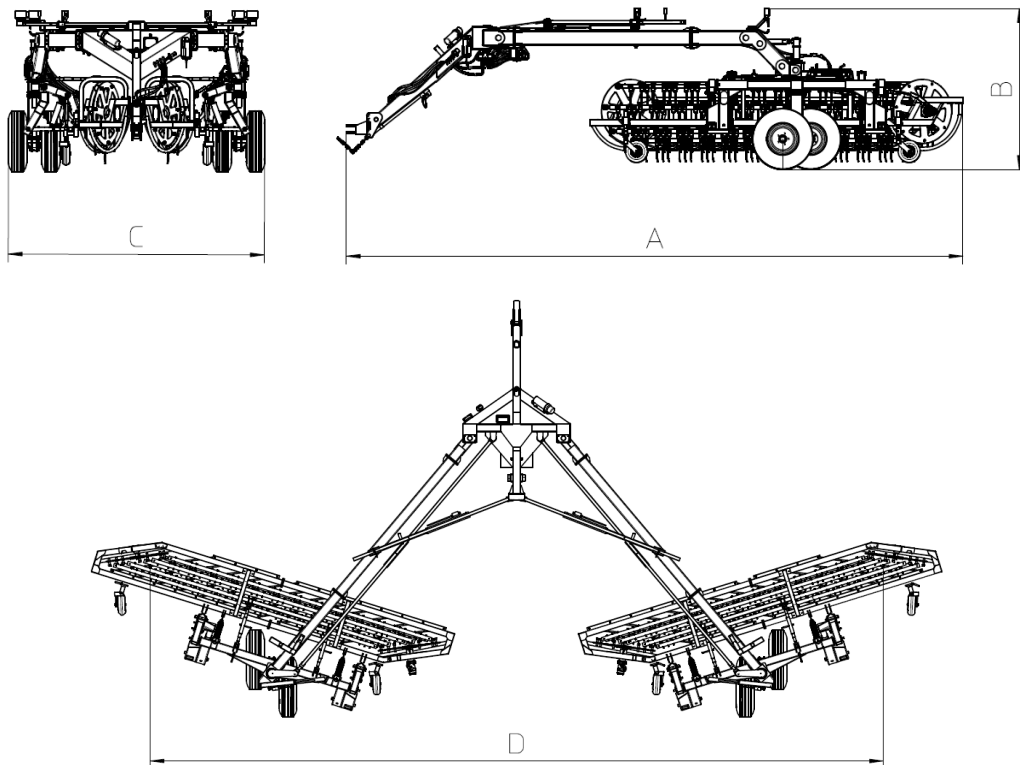
SECTION 2 TECHNICAL SPECIFICATIONS

DRAFT

2.1 TRACTOR REQUIREMENTS

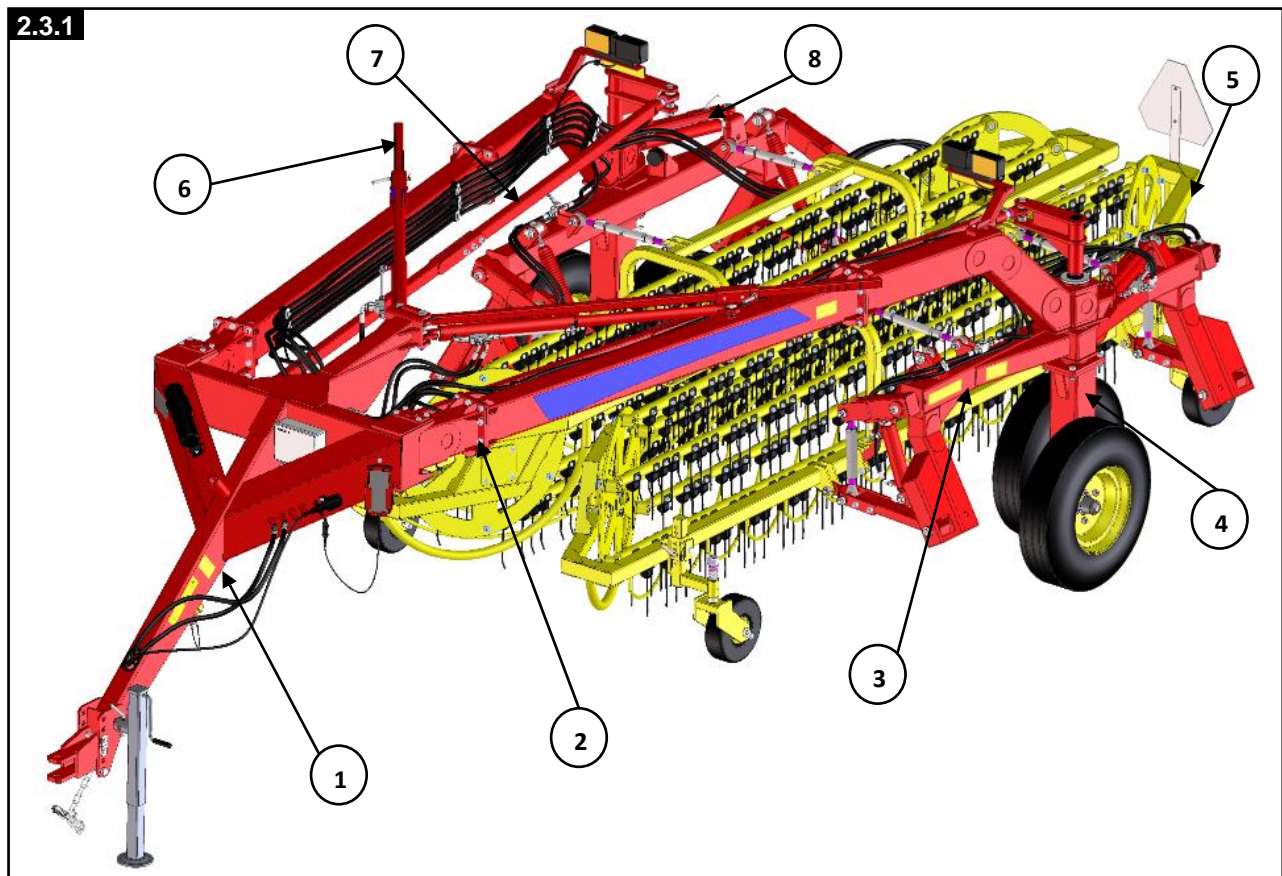
N° of remote outlets	1
Minimum hydraulic flow	34 l/min (9.0 US gpm)

2.2 RAKE TECHNICAL SPECIFICATIONS



Overall height (B)	2,0m (6'6")
Transport width (C)	3.2m (10'5")
Transport length (A)	7.8m (25'6")
Weight, approximate	2900 kg (6390 Lbs)
Maximum working width (D)	Up to 9.2m (30')
Number of tine bars	14 (7 bars per basket)
Number of tines	518 (37 tines per bar)
Basket speed	Variable (60 - 90 rpm max recommended)
Operating speed	3 – 16 km/h (2 – 10 mph)
Transport speed (max)	32 km/h (20 mph)
Wheels	Tandem
Tires	235/75-R15
Power supply	12 V DC 7-pin connector
Maximum hydraulic pressure	17000 kPa (2465 psi)

2.3 MACHINE IDENTIFICATION



- 1) DRAWBAR
- 2) ARM
- 3) BASKET SUPPORT
- 4) TANDEM WHEEL
- 5) BASKET
- 6) OPENING INDICATOR
- 7) WHEEL ROD
- 8) ANGLE INDICATOR

SECTION 3 ASSEMBLY

DRAFT

3.1 DELIVERY AND UNPACKING

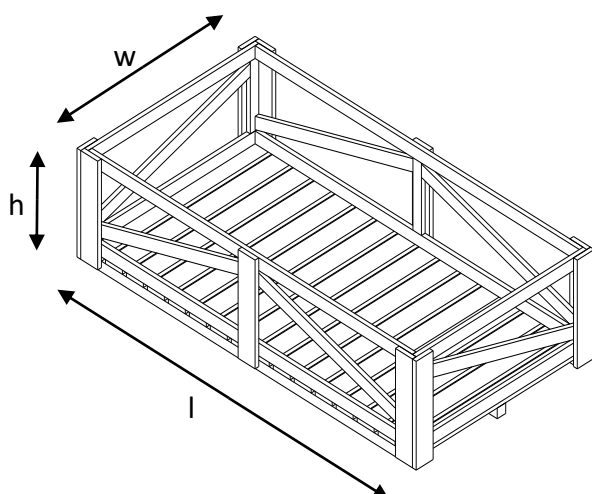
The machine is delivered partially assembled in crates containing other cardboard boxes.

The cardboard boxes contain all the various accessories for assembly (pins, bolts, fittings, etc.).

All components are checked before being shipped by the manufacturer. Upon receipt of the machine, check that the crates are in good condition and that the contents have not been damaged during transport. If there is any damage and/or irregularities, notify your dealer immediately.

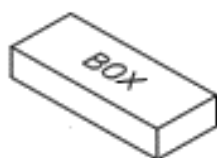
Note: the packing materials consist of wood, plastic film, cardboard and steel supports, and must be disposed of in accordance with your local laws.

Handle the crates and pallets using forklifts that are suitable both for lifting the weight indicated and for giving stability to the crates and pallets.



Crate name	l [cm] (inches)	w [cm] (inches)	h [cm] (inches)
A	285 (112)	160 (63)	85 (33)
B	285 (112)	160 (63)	85 (33)

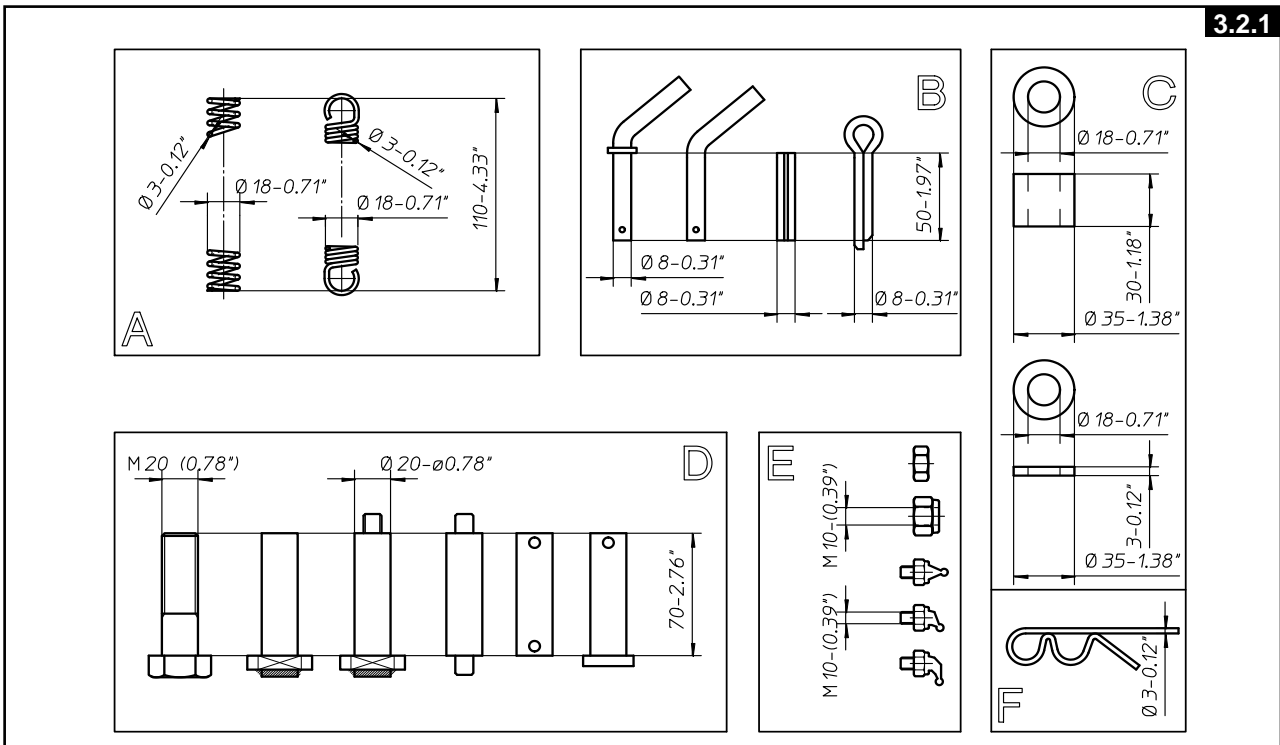
Total weight: 3300 kg (7275 lbs)



Box n°	Box name
1	DRAWBAR
2	TIE ROD
3	ASSEMBLY OPENING CYLINDERS + SECTION
4	LIGHTS KIT
5	TANDEM ASSEMBLY + CHAIN
6	CYLINDER ANGLE ASSEMBLY
7	ASSEMBLY LOWER ARMS AND LOWER TIE RODS
8	ASSEMBLY UPPER TIE RODS
9	WHEEL AND BASKET ASSEMBLY
10	LIFTING CYLINDER ASSEMBLY
11	ASSEMBLY HYDRAULIC PIPES
12	BAR ASSEMBLY + STRIPES

3.2 ASSEMBLY INSTRUCTIONS

The **picture 3.2.1** shows an example of general measurements for identifying the assembly accessories based on type.



For tightening torques, see the table below (the class of the material is normally stamped on the head of the bolts).

MINIMUM HARDWARE TIGHTENING TORQUES IN NEWTON-METERS (FOOT POUNDS) FOR NORMAL ASSEMBLY APPLICATIONS METRIC NON-FLANGED HARDWARE AND LOCKNUTS

NOMINAL SIZE	CLASS 5.8		CLASS 8.8		CLASS 10.9		LOCKNUT CL.8 W/CL8.8 BOLT
	UNPLATED	PLATED W/ZnCr	UNPLATED	PLATED W/ZnCr	UNPLATED	PLATED W/ZnCr	
M 4	1.7 (15)*	2.2 (19)*	2.6 (23)*	3.4 (30)*	3.7 (33)*	4.8 (42)*	2.3 (20)*
M 6	5.8 (51)*	7.6 (67)*	8.9 (79)*	12 (102)*	13 (155)*	17 (150)*	7.8 (69)*
M 8	14 (124)*	18 (159)*	22 (195)*	28 (248)*	31 (274)*	40 (354)*	19 (169)*
M 10	28 (21)	36 (27)	43 (32)	56 (41)	61 (45)	79 (58)	38 (28)
M 12	49 (36)	63 (46)	75 (55)	97 (72)	107 (79)	138 (102)	66 (49)
M 16	121 (89)	158 (117)	186 (137)	240 (177)	266 (196)	344 (254)	164 (121)
M 20	237 (175)	307 (228)	375 (277)	485 (358)	519 (383)	671 (495)	330 (243)
M 24	411 (303)	531 (392)	648 (478)	839 (619)	897 (662)	1160 (855)	572 (422)

NOTE: torque values shown with* are inch pounds

3.3 METRIC-INCHES CONVERSION TABLE

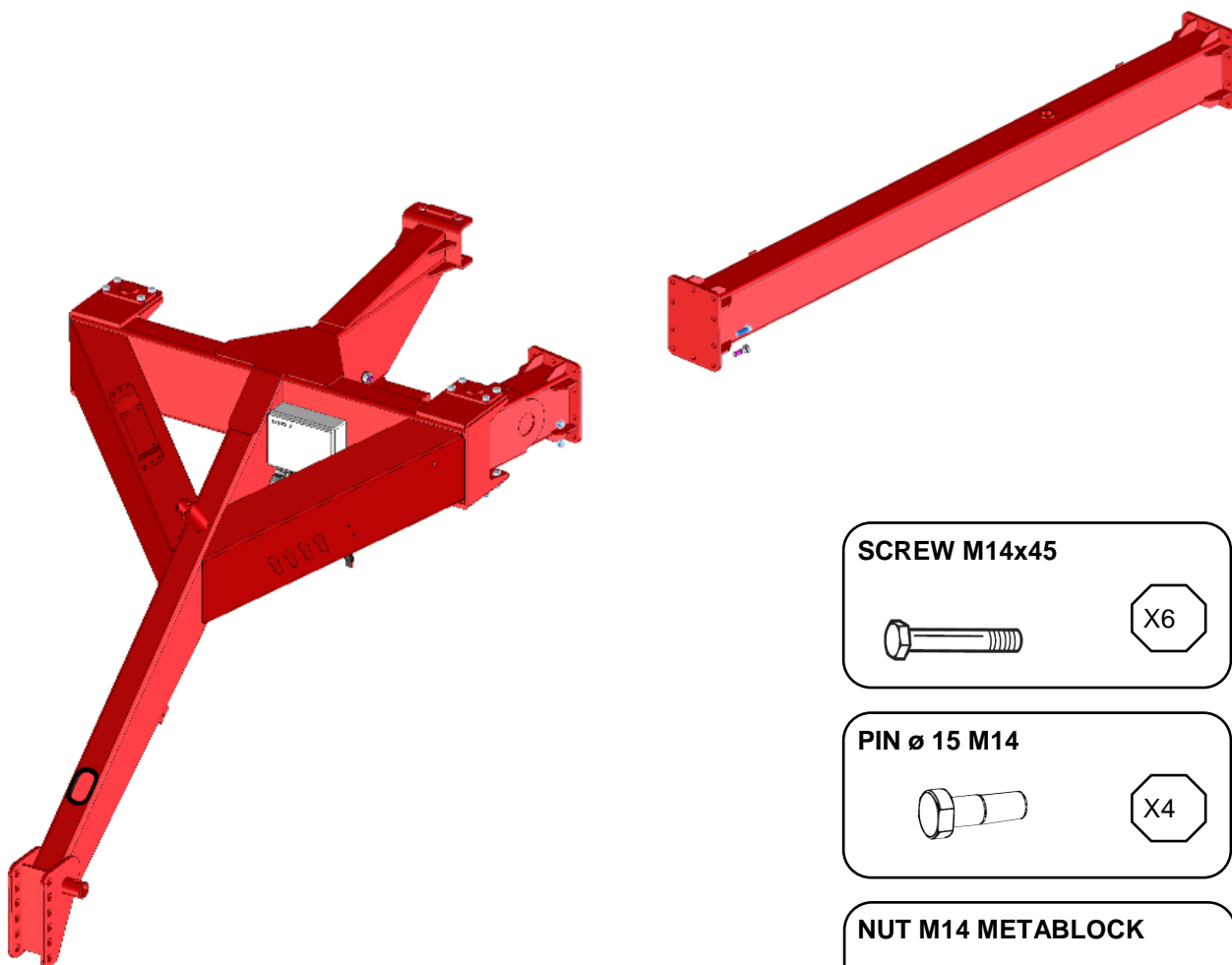
mm	inches	mm	inches	mm	inches	mm	inches
1	1/32"	26	1"1/64	55	2"5/32	300	11"51/64
2	5/64"	27	1"1/16	60	2"23/64	350	13"49/64
3	7/64"	28	1"3/32	65	2"35/64	400	15"47/64
4	5/32"	29	1"9/64	70	2"3/4	450	17"45/64
5	3/16"	30	1"11/64	75	2"15/16	500	19"43/64
6	15/64"	31	1"7/32	80	3"9/64	550	21"41/64
7	17/64"	32	1"1/4	85	3"11/32	600	23"39/64
8	5/16"	33	1"19/64	90	3"17/32	650	25"37/64
9	11/32"	34	1"21/64	95	3"47/64	700	27"35/64
10	25/64"	35	1"3/8	100	3"59/64	750	29"33/64
11	27/64"	36	1"13/32	110	4"21/64	800	31"31/64
12	15/32"	37	1"29/64	120	4"23/32	850	33"29/64
13	1/2"	38	1"31/64	130	5"7/64	900	35"27/64
14	35/64"	39	1"17/32	140	5"1/2	950	37"25/64
15	37/64"	40	1"9/16	150	5"57/64	1000	39"23/64
16	5/8"	41	1"39/64	160	6"19/64	1050	41"21/64
17	21/32"	42	1"41/64	170	6"11/16	1100	43"19/64
18	45/64"	43	1"11/16	180	7"5/64	1150	45"17/64
19	47/64"	44	1"23/32	190	7"15/32	1200	47"15/64
20	25/32"	45	1"49/64	200	7"55/64	1250	49"13/64
21	13/16"	46	1"51/64	210	8"17/64	1300	51"11/64
22	55/64"	47	1"27/32	220	8"21/32	1350	53"9/64
23	57/64"	48	1"7/8	230	9"3/64	1400	55"7/64
24	15/16"	49	1"59/64	240	9"7/16	1450	57"5/64
25	31/32"	50	1"61/64	250	9"53/64	1500	59"3/64

3.4 MACHINE ASSEMBLY

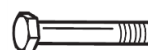
The assembly instructions illustrate only once the operations that must be performed twice, on both sides of the machine. These operations are marked with the symbol:



3.4.1

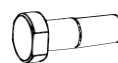


SCREW M14x45



X6

PIN \varnothing 15 M14



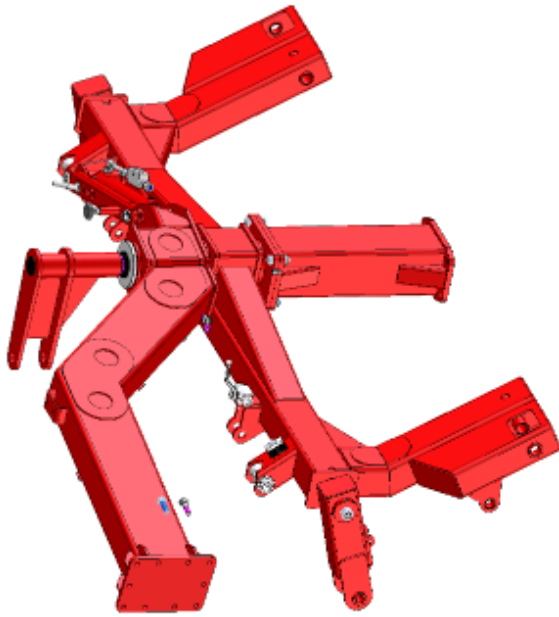
X4

NUT M14 METABLOCK



X10





SCREW M14x45



X6

PIN \varnothing 15 M14



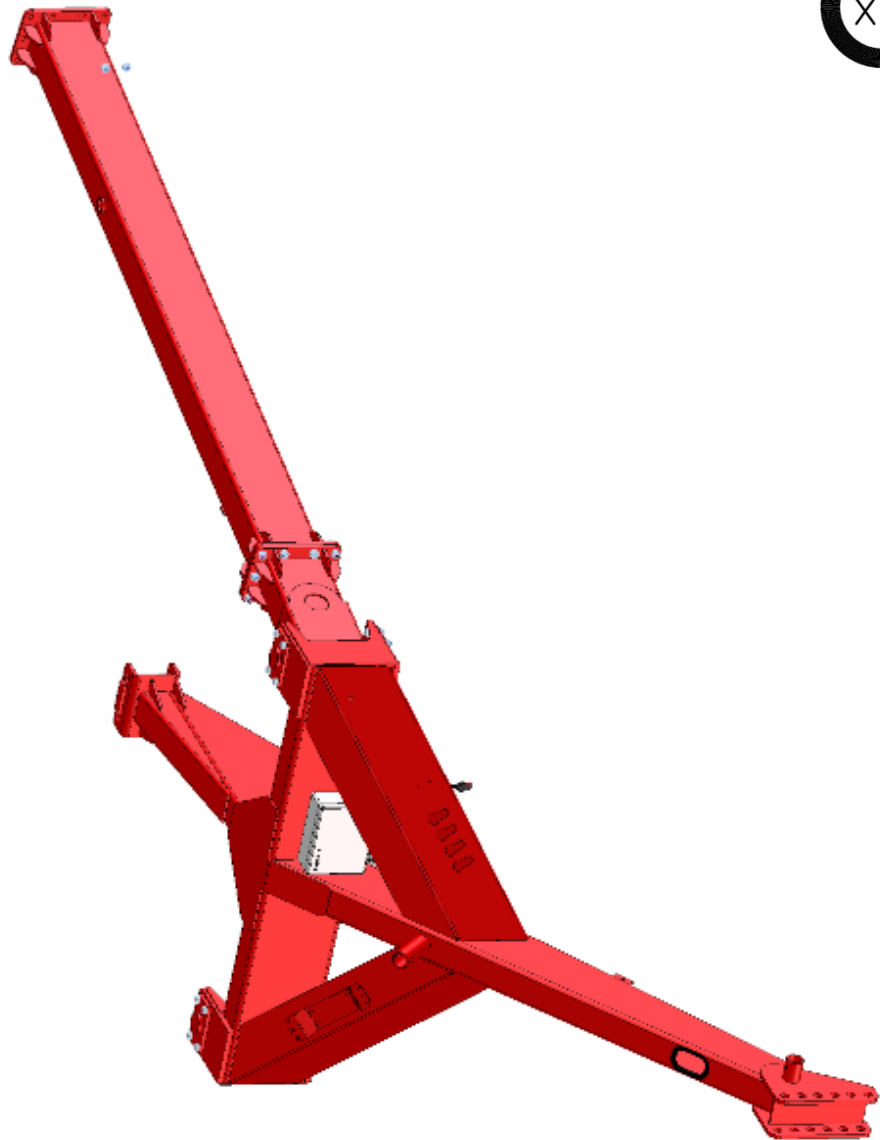
X4

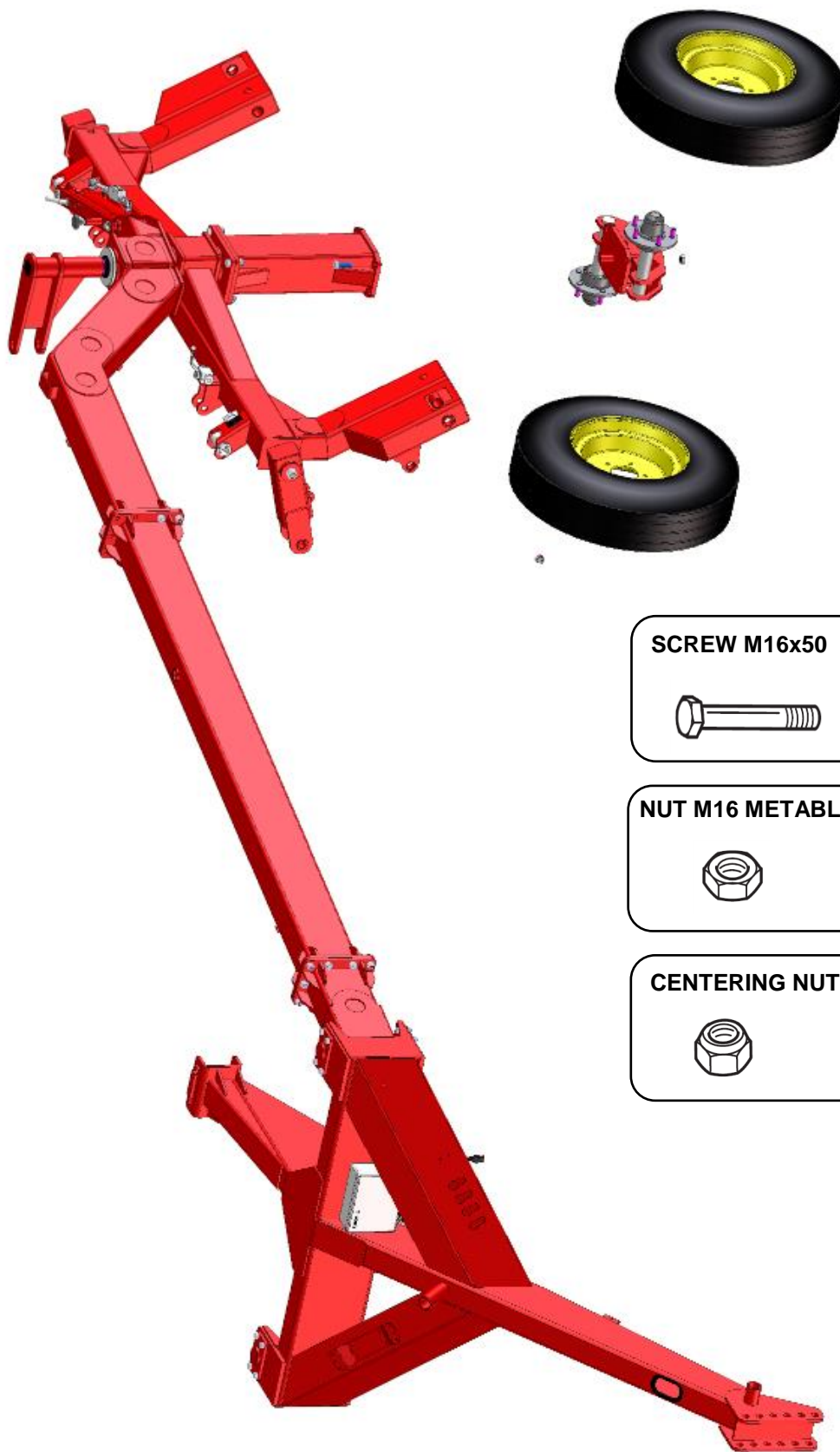
NUT M14 METABLOCK

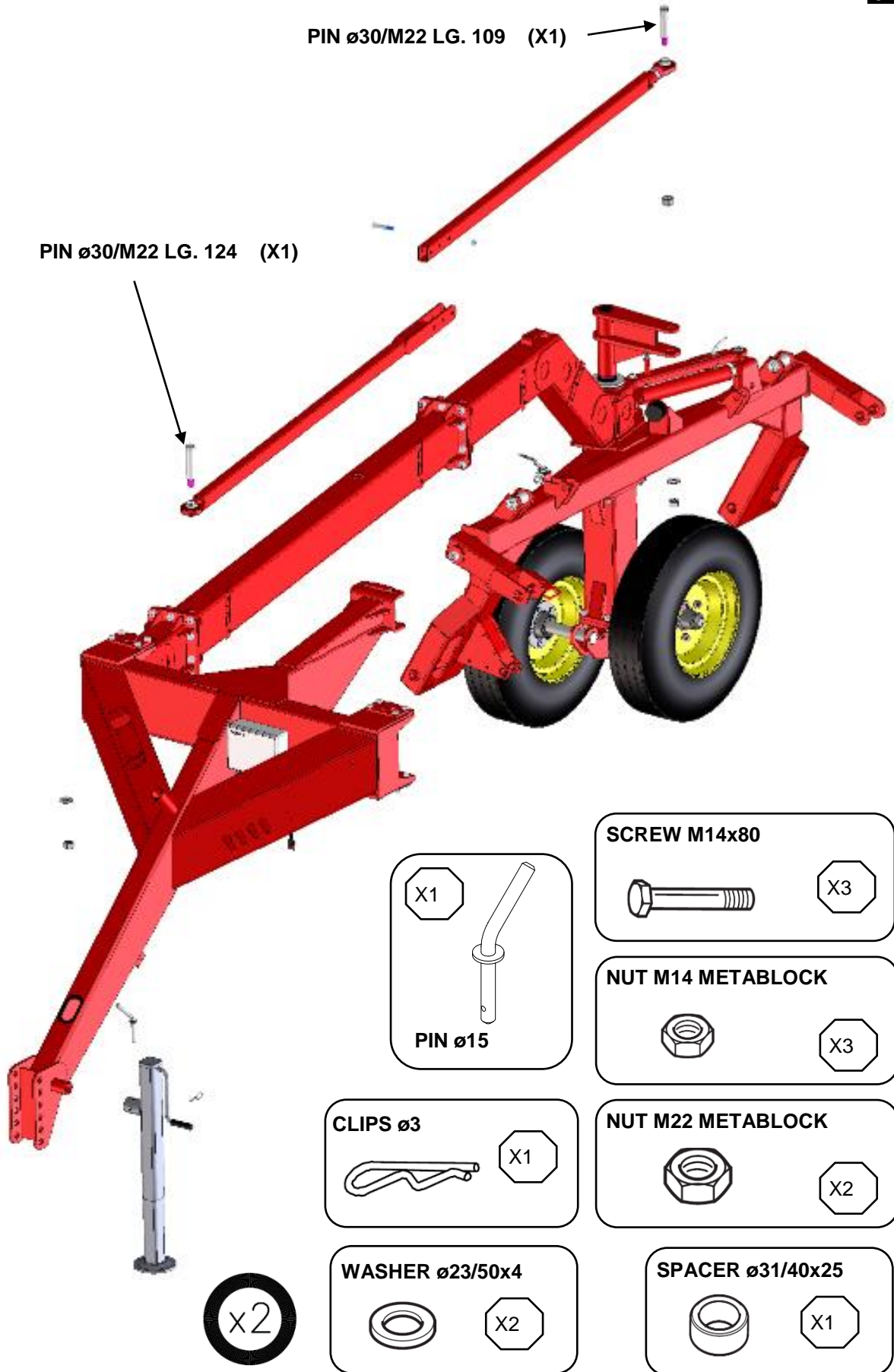


X10

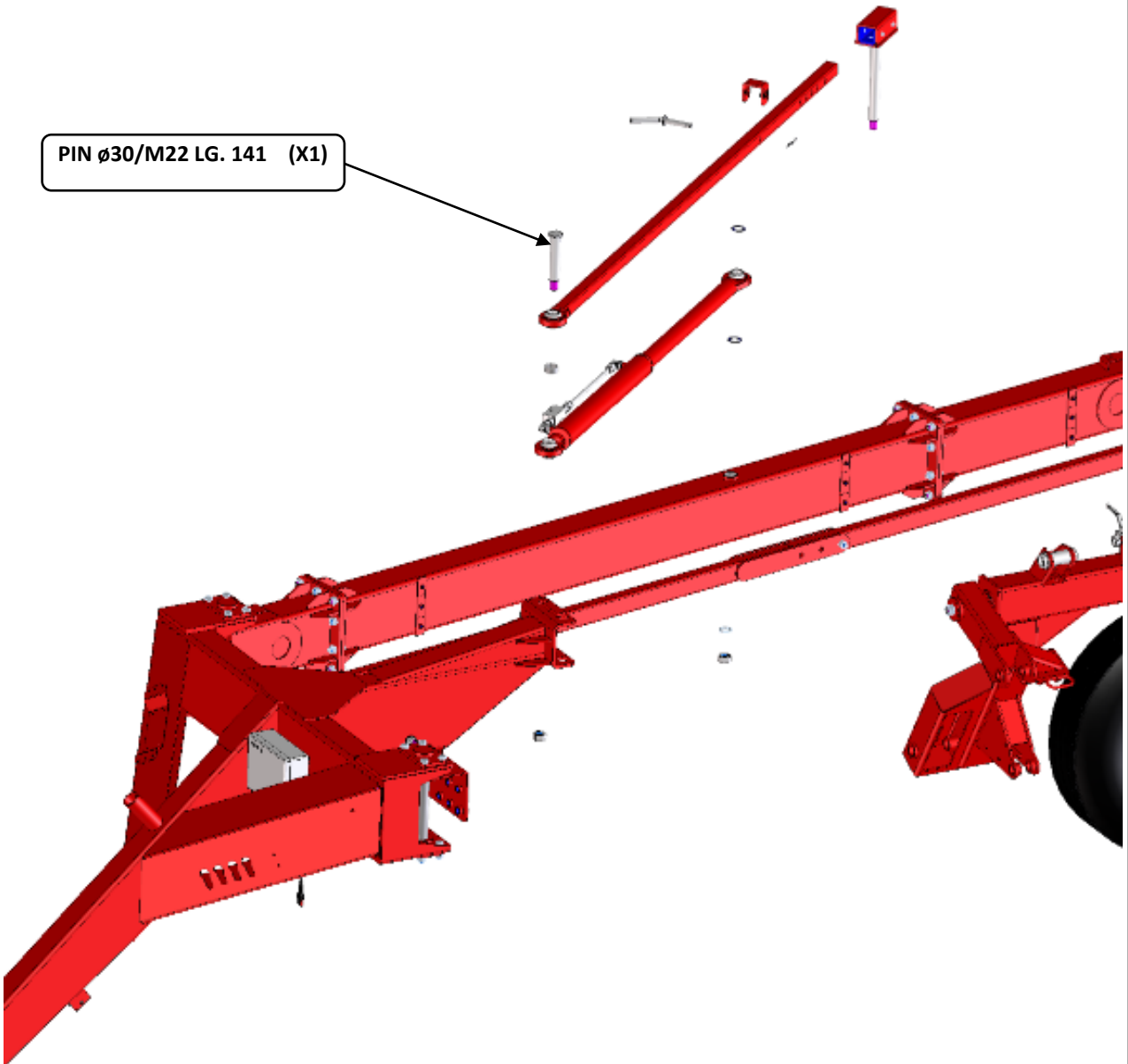
x2







PIN $\phi 30$ /M22 LG. 141 (X1)



CLIPS $\phi 3$



X1

SPACER $\phi 30.5/40 \times 18$



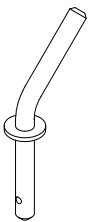
X1

NUT M22 METABLOCK



X2

X1



PIN $\phi 15$

WASHER $\phi 24/39 \times 3$



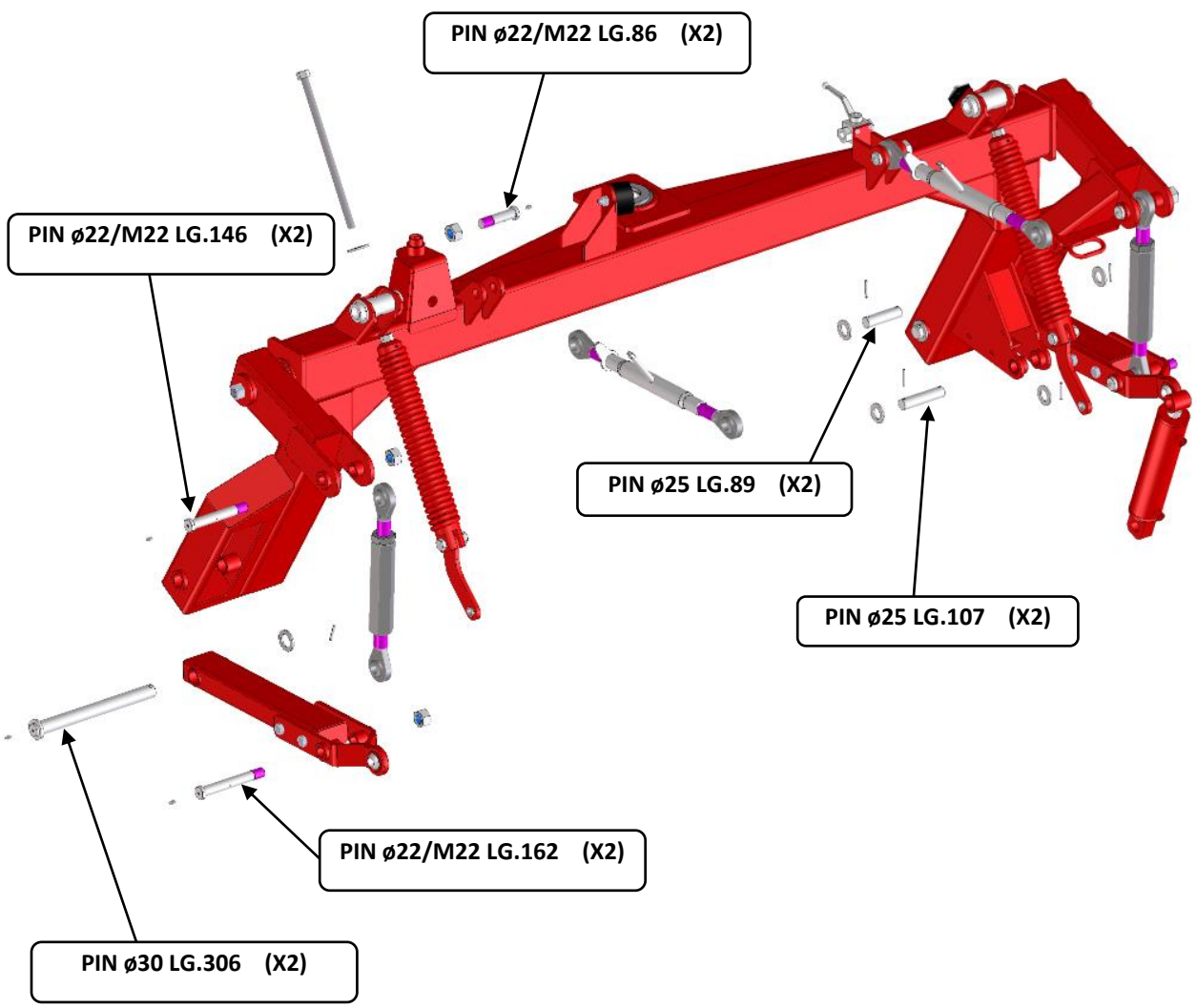
X1

SPACER $\phi 30.3/39.8 \times 1$




X2

X2




GREASER M6




X6

WASHER $\phi 31/48 \times 4$




X2

ELASTIC PIN $\phi 5 \times 40$




X4

ELASTIC PIN $\phi 6 \times 40$




X2

NUT M22 METABLOCK



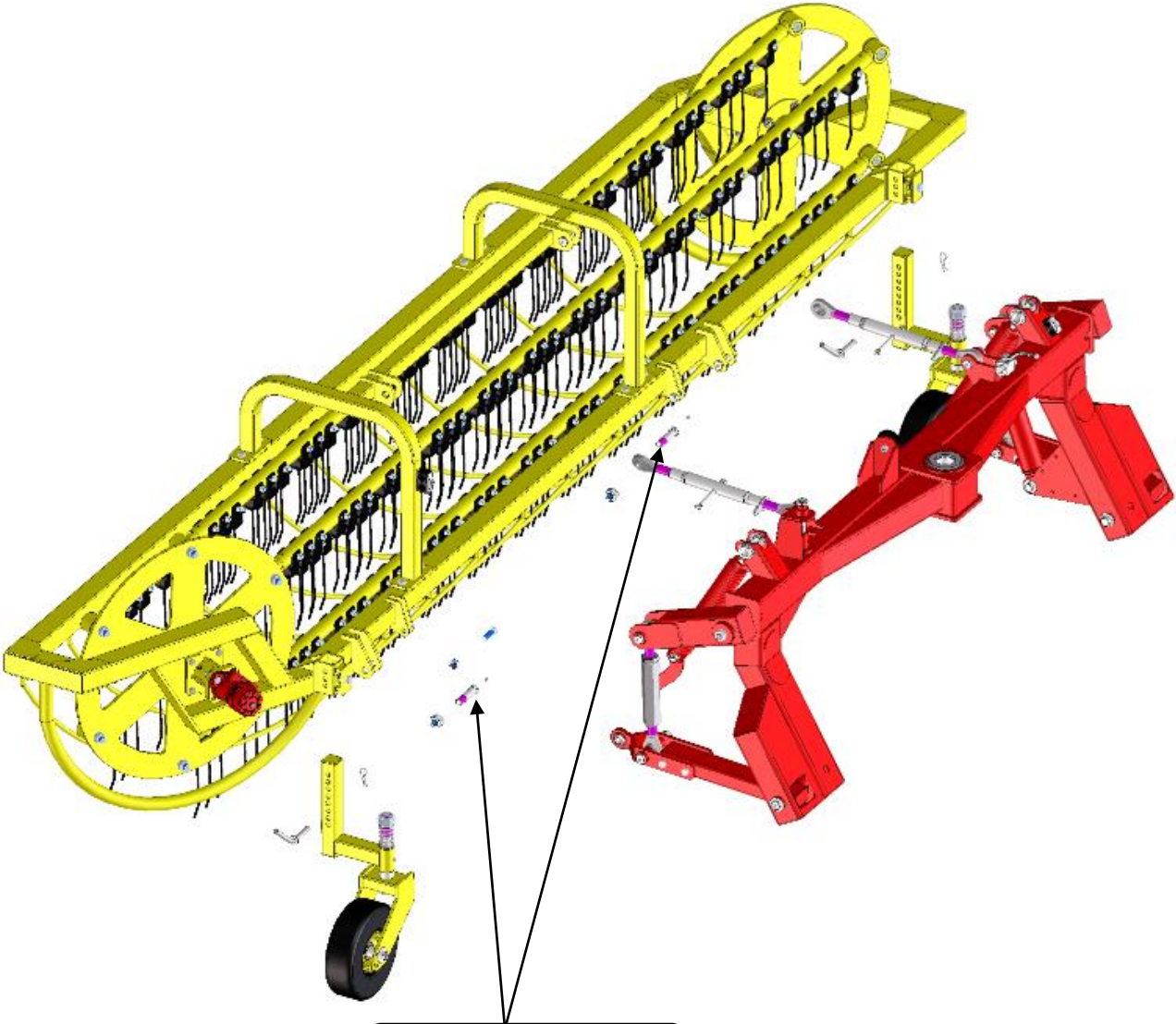
X6

WASHER $\phi 26/44 \times 4$



X4

x2



PIN $\varnothing 22$ LG. 86 (X4)

X2

CLIPS $\varnothing 3$

X2

x2

NUT M16 METABLOCK

SCREW M16x50

X2

GREASER M6

NUT M22 METABLOCK

X4

3.5 HYDRAULIC AND ELECTRICAL SYSTEM ASSEMBLY



DANGER !!!



The hydraulic cylinders are empty to start with, and in order to fill them very dangerous uncontrolled movements may occur.

The cylinders must be filled before connecting them to the machine, lowering and raising them several times with the controls to remove air from the circuit. These operations must be carried out in completely safe conditions, with the machine connected to the tractor and the operator sitting in the driver's seat, making sure that nothing and no one is within the operating range of the machine.

The assembly instructions illustrate only once the operations that must be performed twice, on both sides of the machine. These operations are marked with the symbol:



When the system is used for the first time, make sure that there are no oil leaks. If there is any leakage, first of all tighten all the fittings.

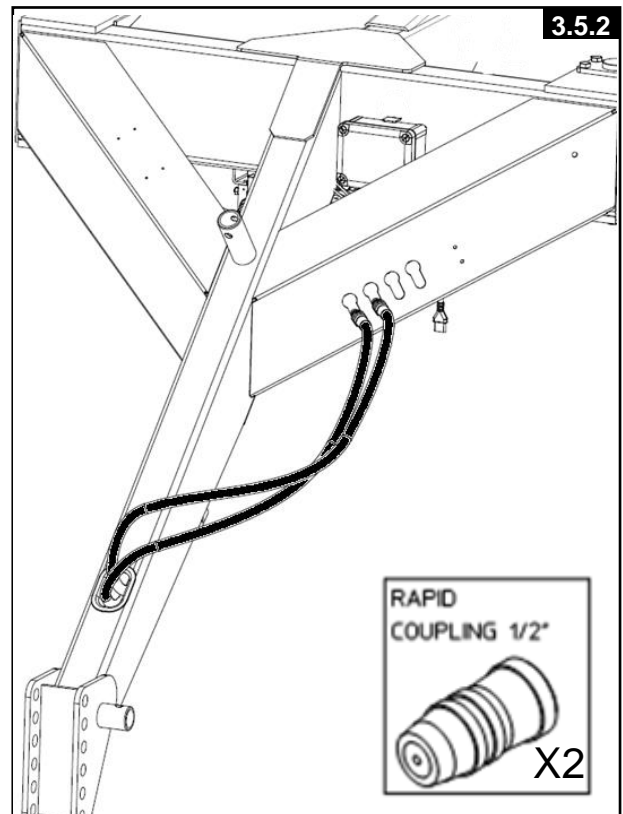
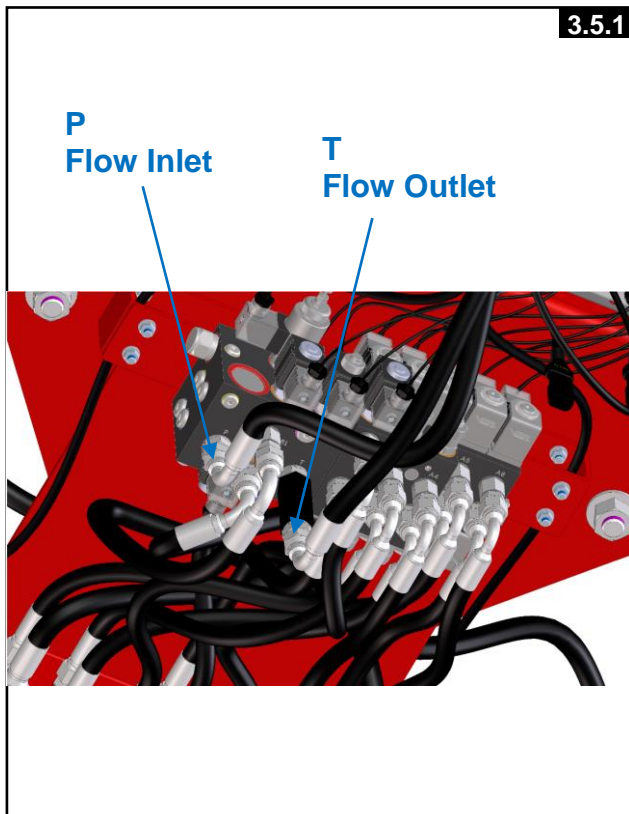


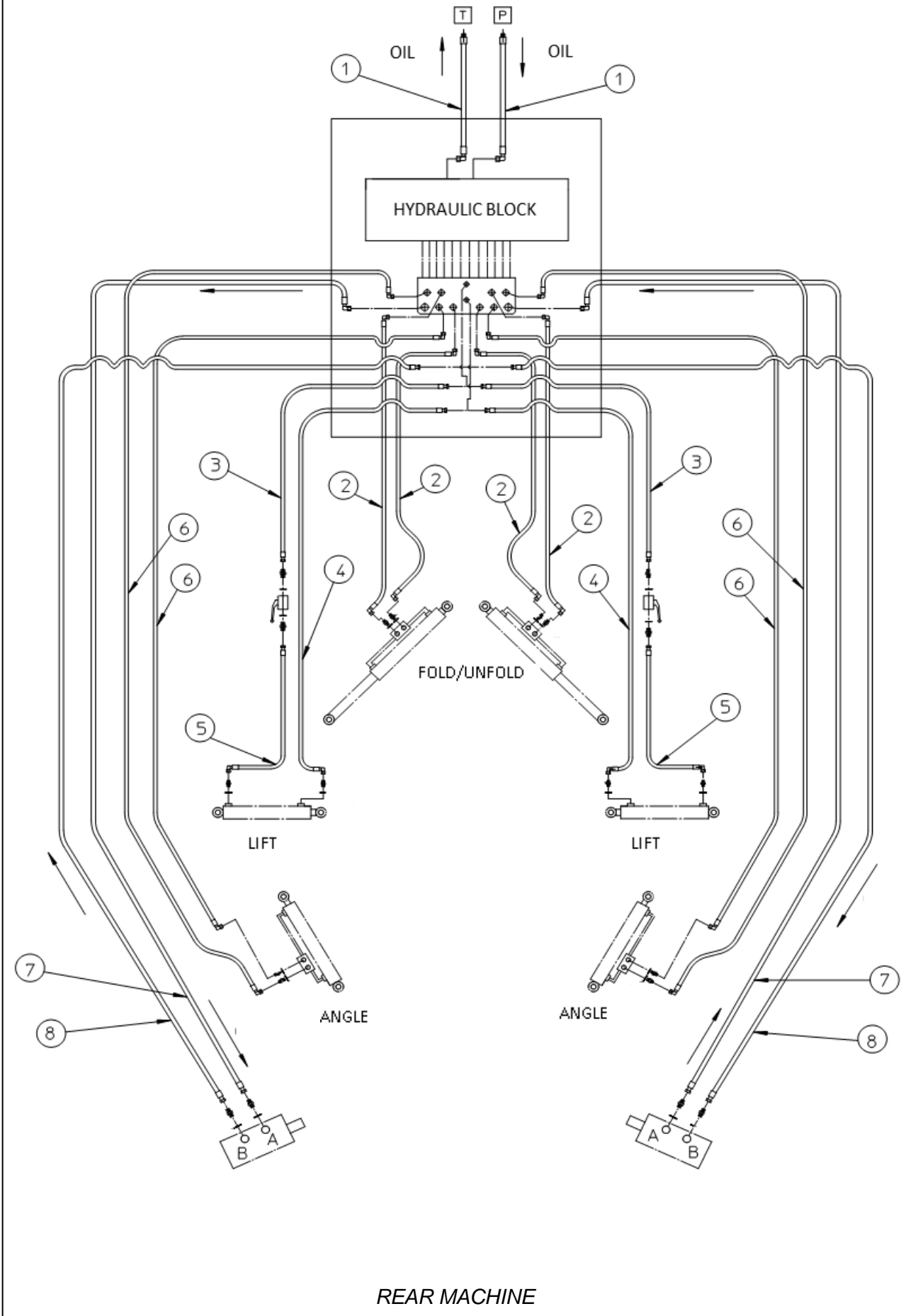
DANGER !!!



The assembly must be done carefully and accurately for the safety of the people and to ensure the correct operation of the machine.

This must take place on a flat, solid surface, using the proper tools and clothing, making sure that all people not involved in the assembly are kept at a safe distance.

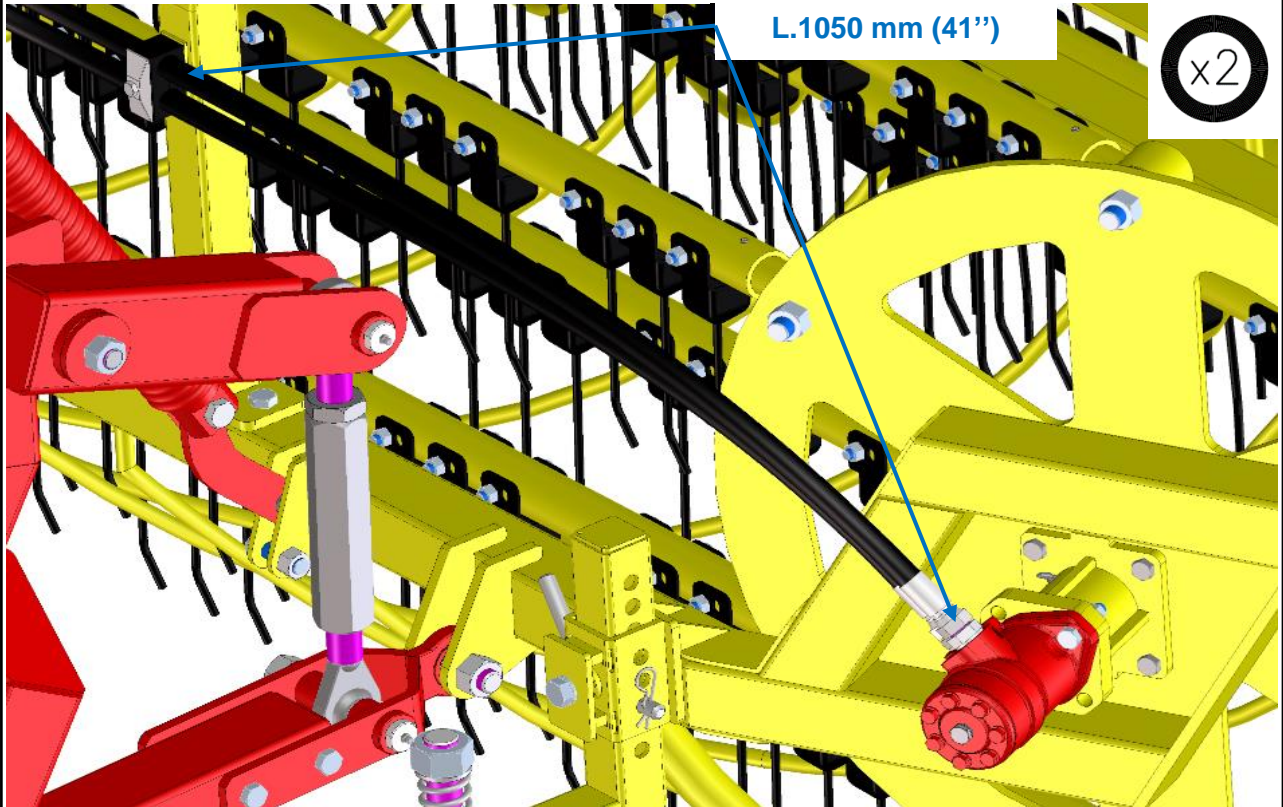




ITEM	PART N°	QTY	DESCRIPTION	NOTE
1	601.031	2	COND.SAE100R2ATx1/2 L. 3000 MD 1/2-14 NPTF F90 7/8 JIC	
2	601.077	4	COND.SAE100R2ATx3/8 L. 1400 F90 3/4 JIC - F90 3/4 JIC	
3	601.034	2	COND.SAE100R2ATx3/8 L. 5000 FD 3/4 JIC - FD 3/4 JIC	
4	601.035	2	COND.SAE100R2ATx3/8 L. 6200 FD 3/4 JIC - F90 3/4 JIC	
5	601.041	2	COND.SAE100R2ATx3/8 L. 1200 FD 3/4 JIC - F90 3/4 JIC	
6	601.037	4	COND.SAE100R2ATx3/8 L. 5200 F90 3/4 JIC - F90 3/4 JIC	
7	601.038	2	COND.SAE100R2ATx1/2 L. 6500 FD 7/8 JIC - F90 7/8 JIC	
8	601.039	2	COND.SAE100R2ATx1/2 L. 6400 FD 7/8 JIC - FD 7/8 JIC	

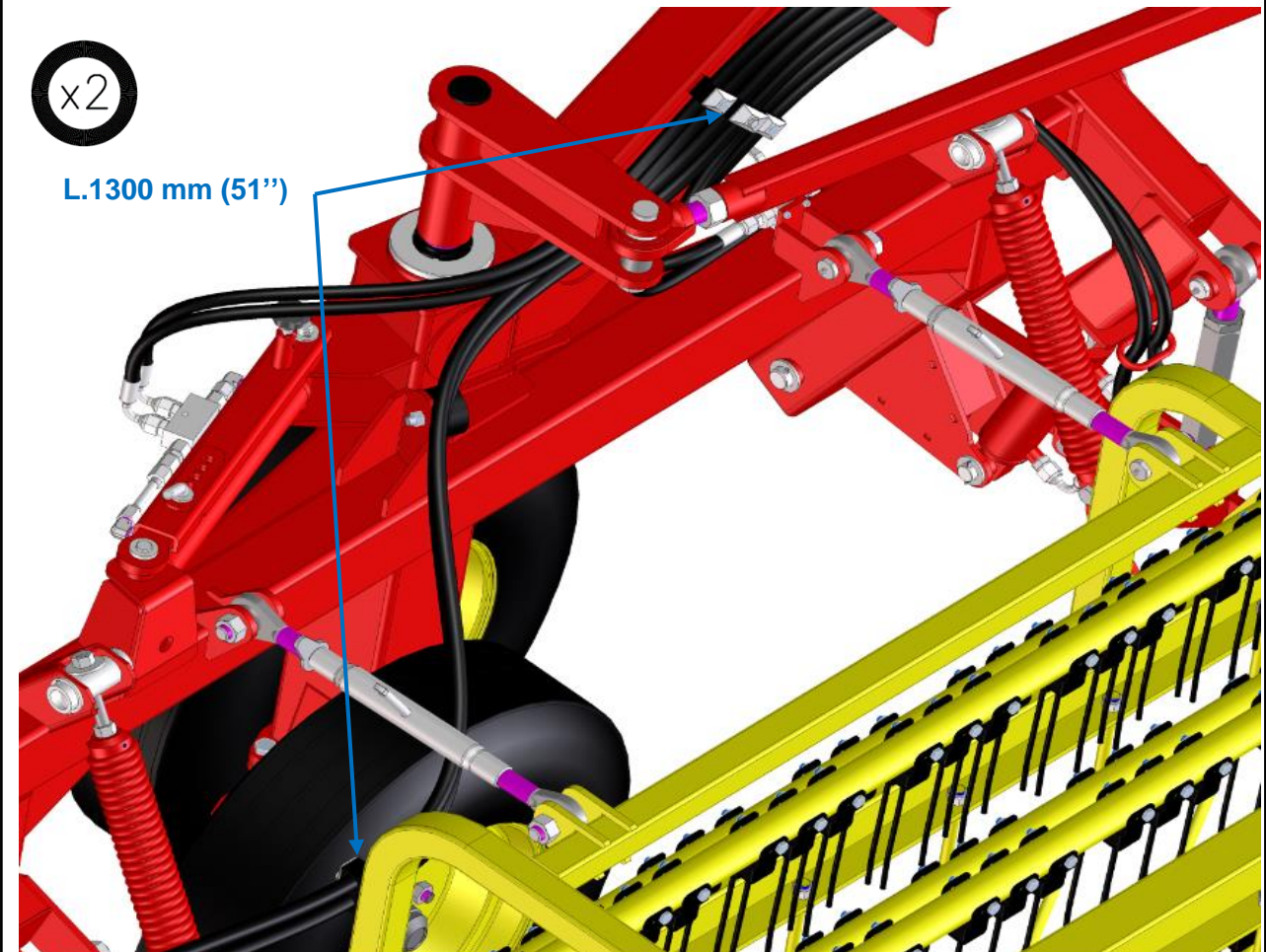
MOTOR – SEE PAGES 18-19

3.5.4



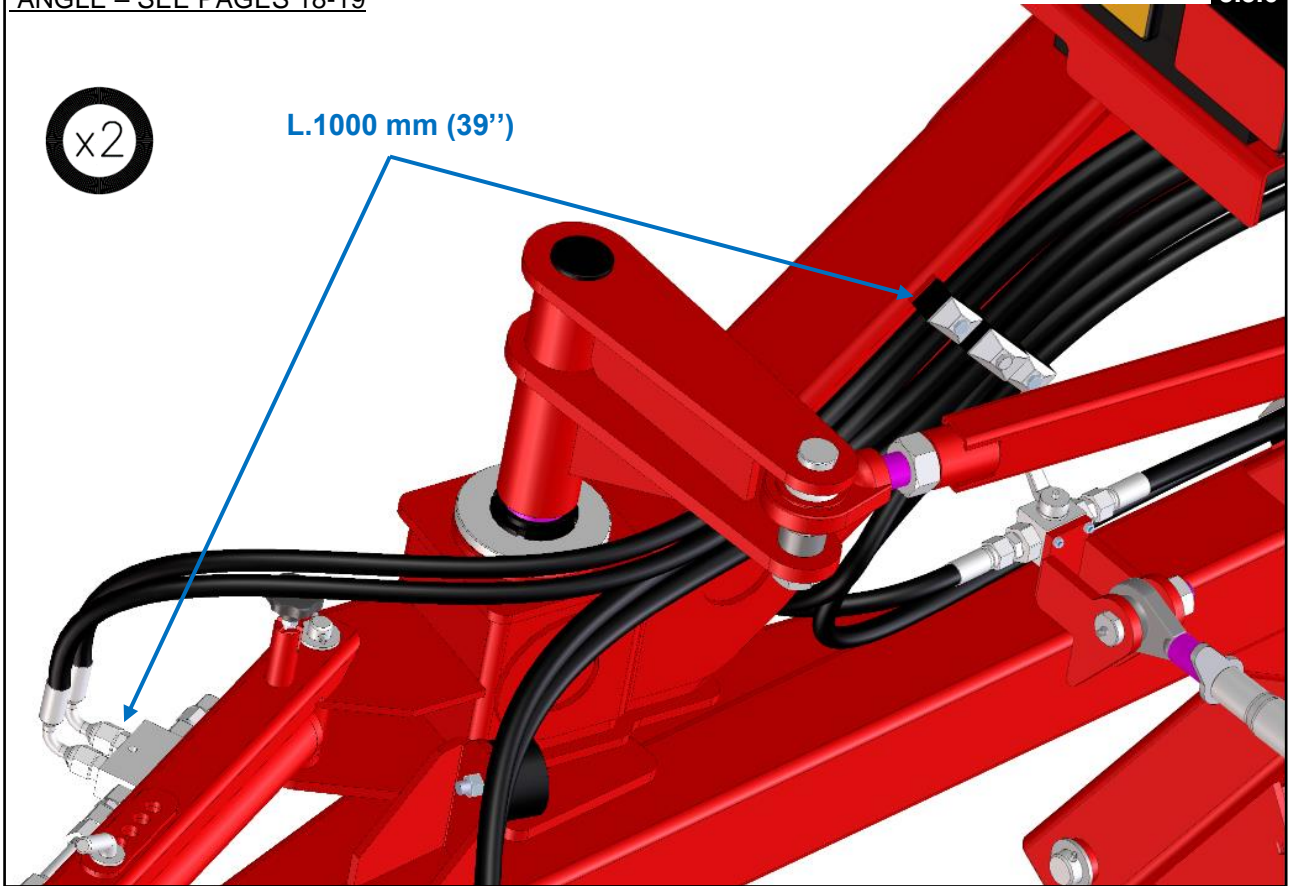
MOTOR – SEE PAGES 18-19

3.5.5



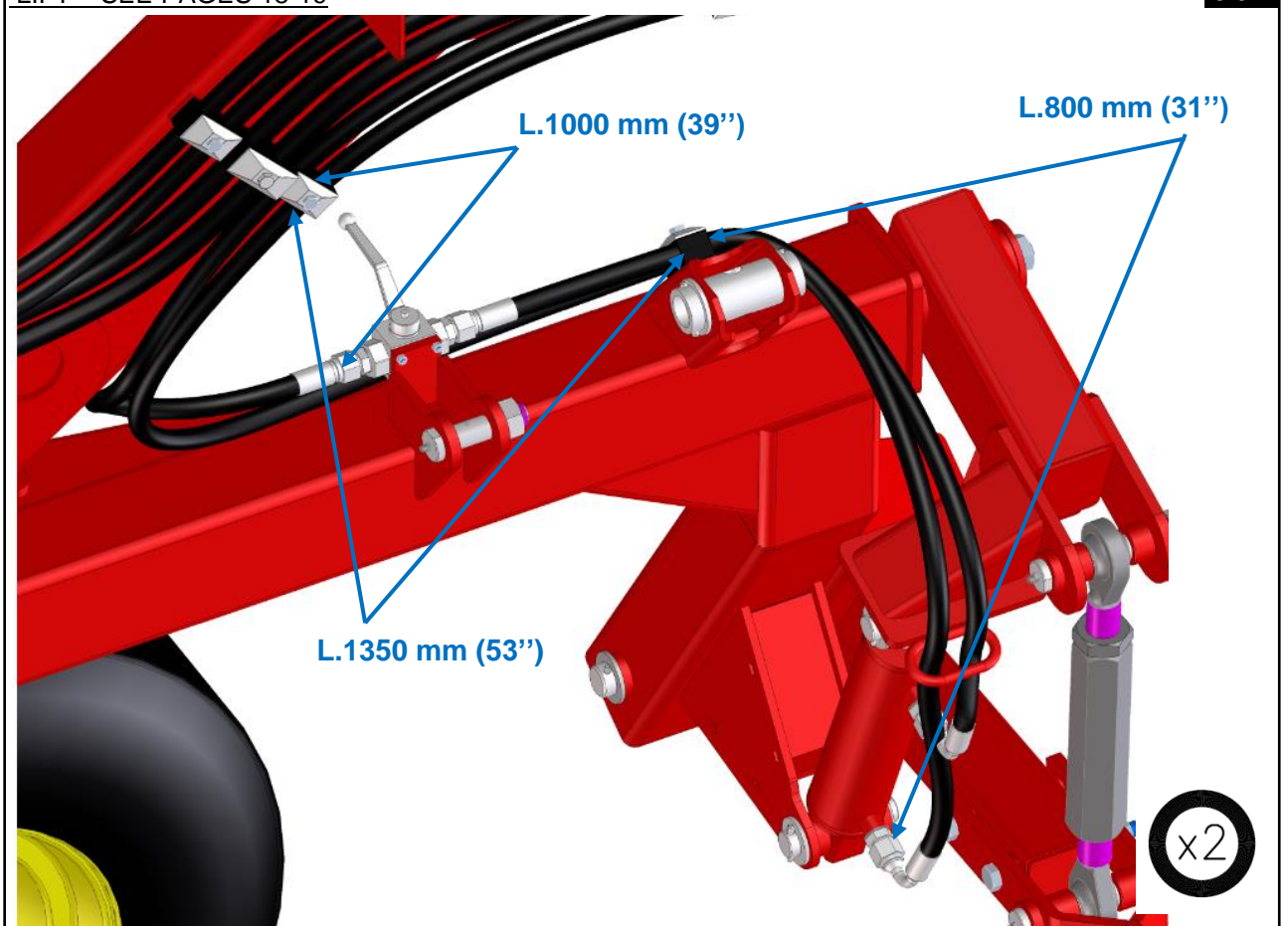
ANGLE – SEE PAGES 18-19

3.5.6

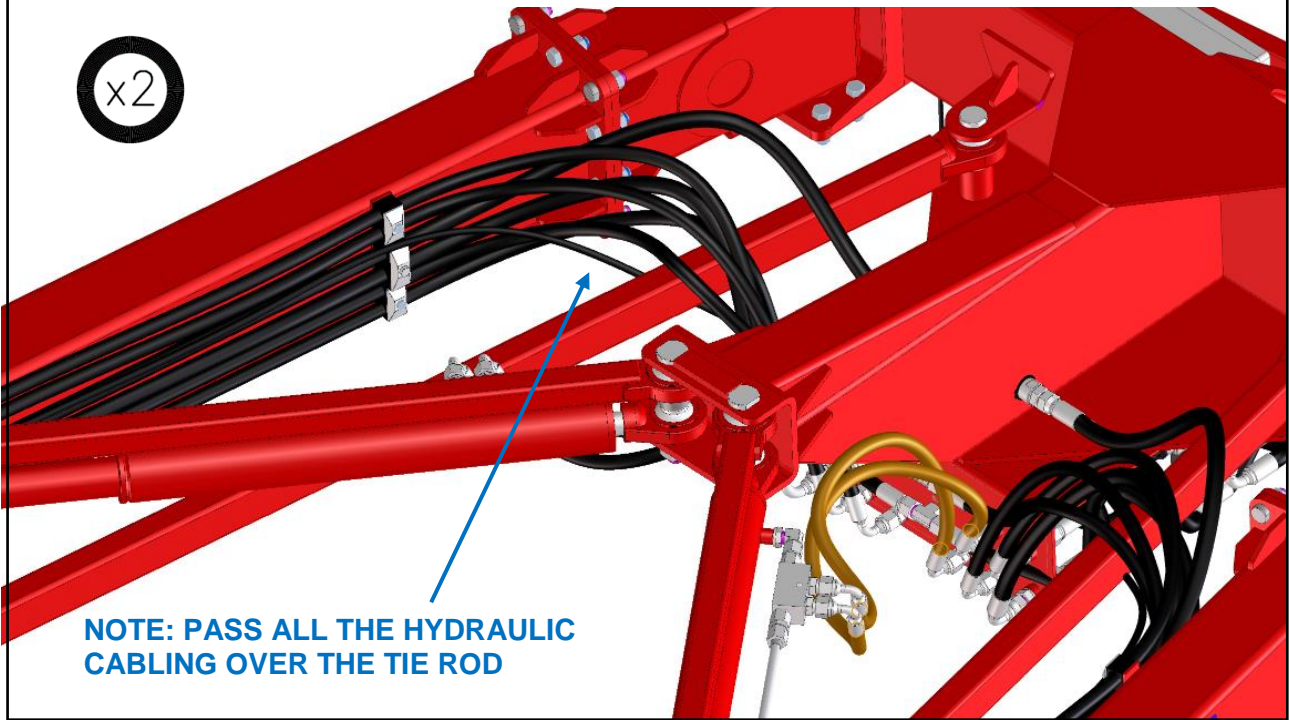


LIFT – SEE PAGES 18-19

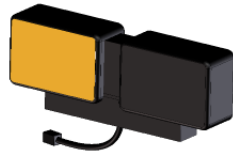
3.5.7



x2



NOTE: PASS ALL THE HYDRAULIC CABLING OVER THE TIE ROD



SPRING WASHER $\varnothing 8$



NUT M8 METABLOCK



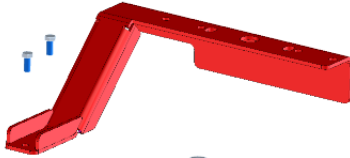
WASHER $\varnothing 8/24 \times 2$



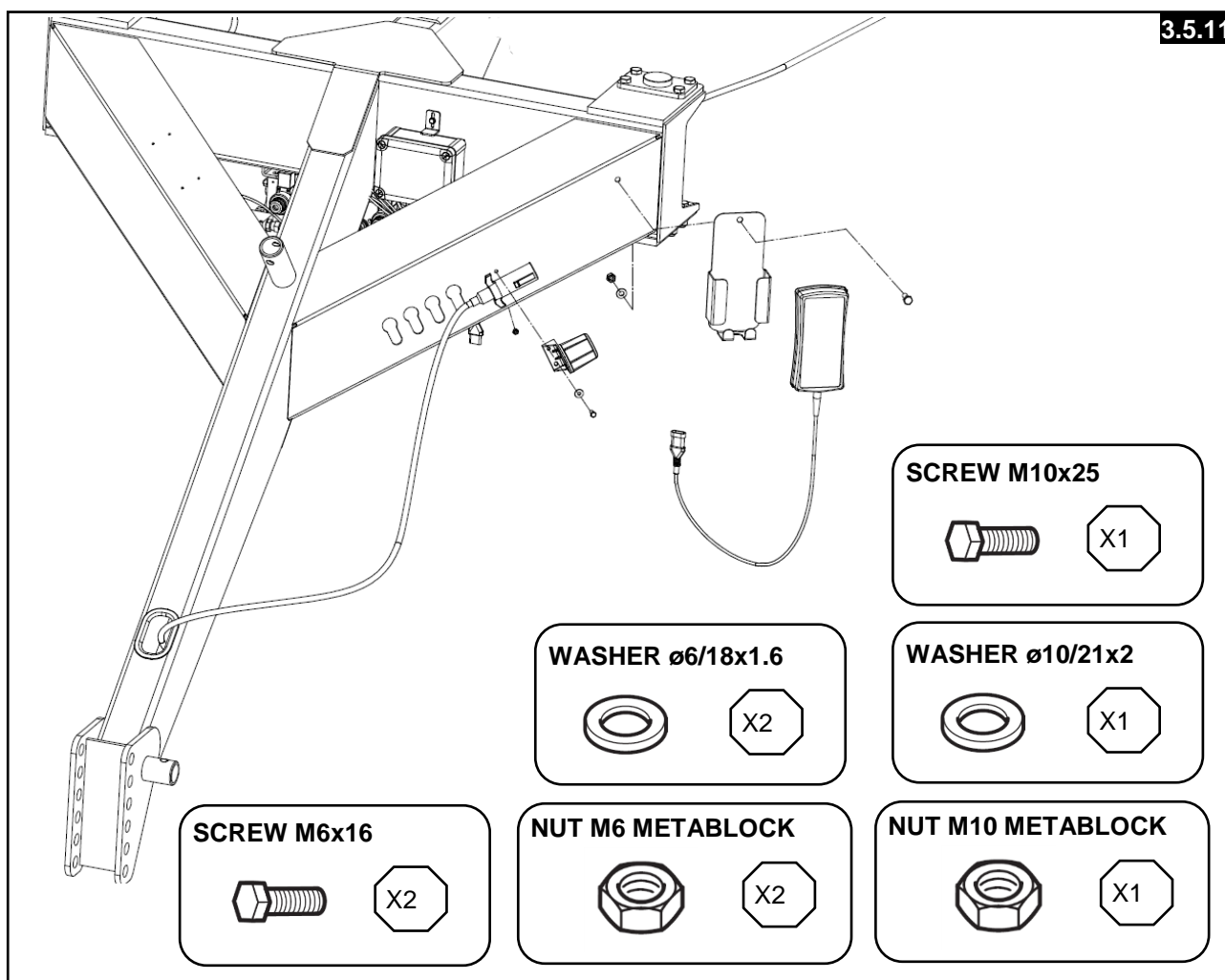
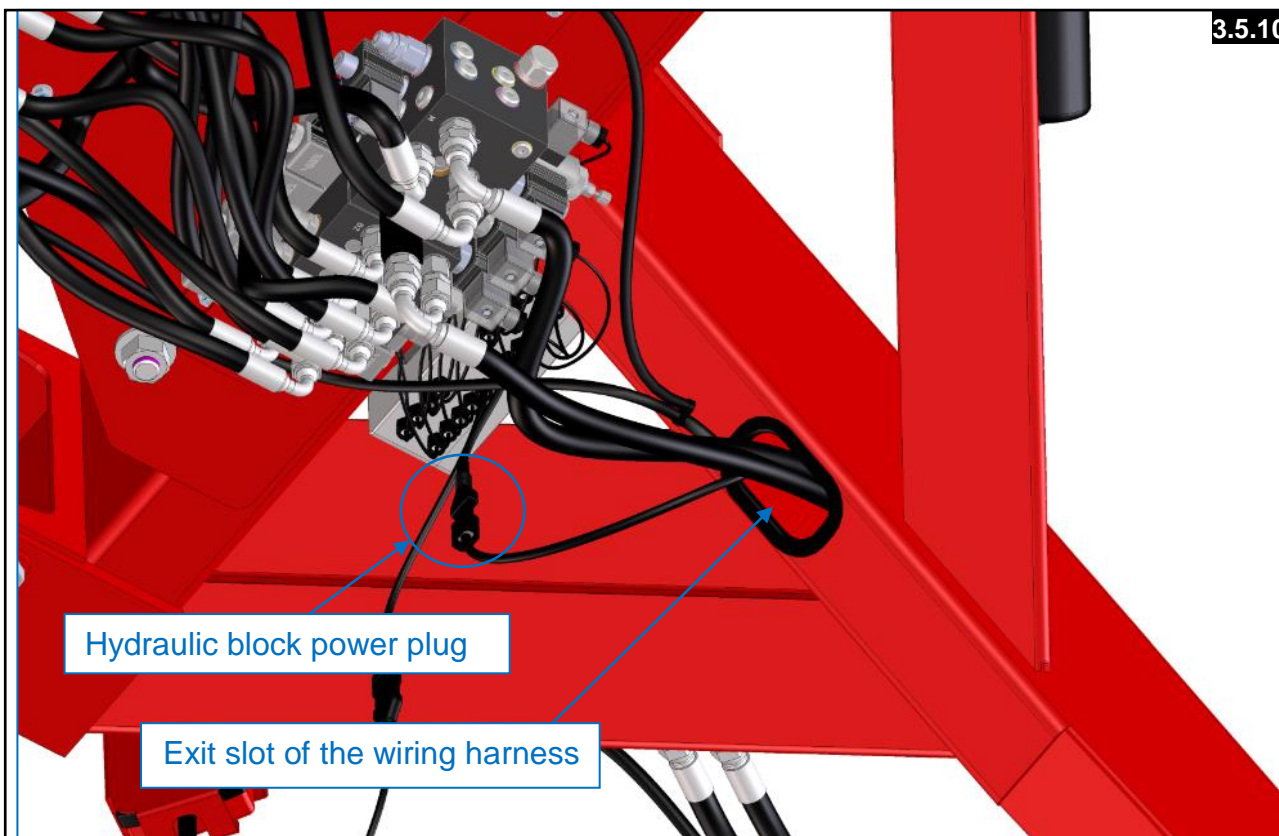
SCREW M8x20



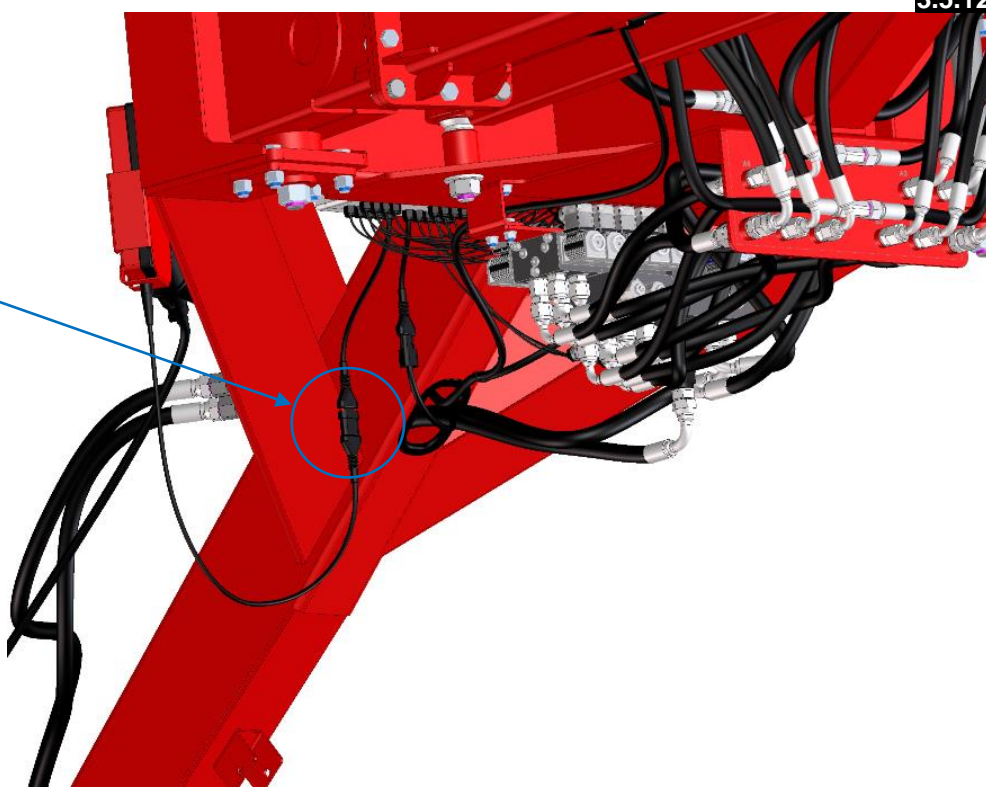
SCREW M8x25



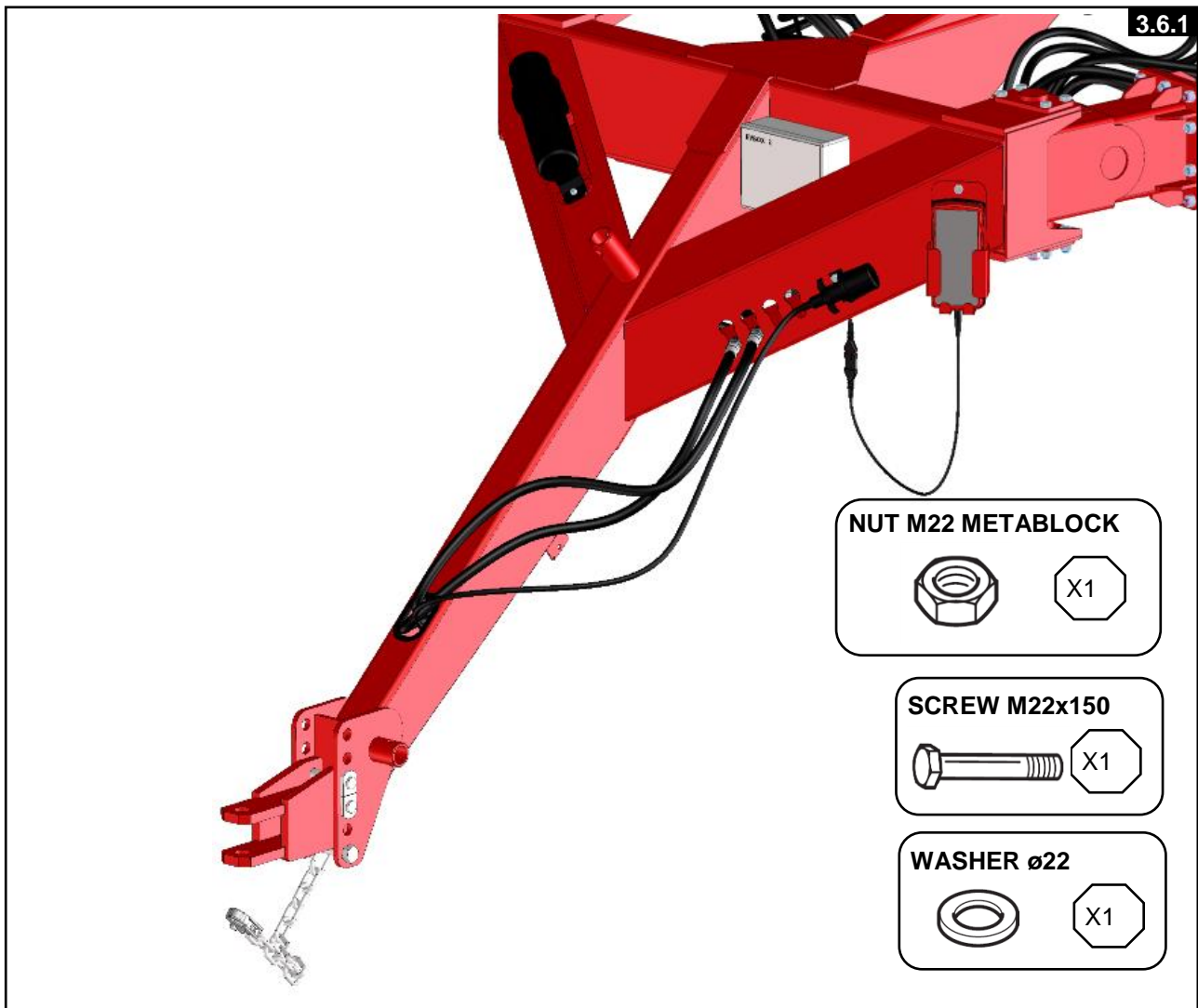
(*) Enter slot of the wiring harness
Look at the **picture 3.5.10** for the exit slot



Command rake
power plug



3.6 SAFETY CHAIN

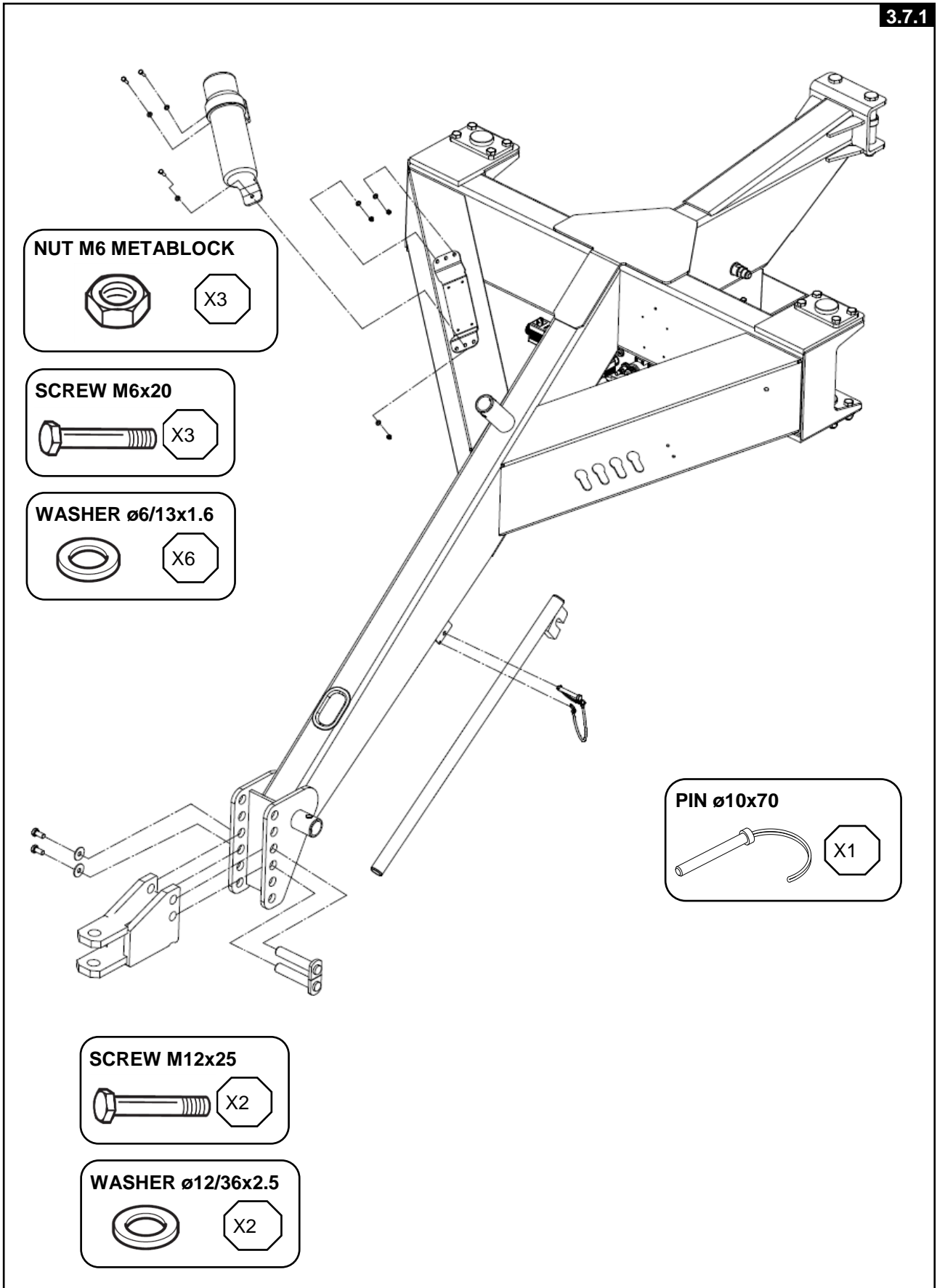


⚠ ATTENTION !!! ⚠

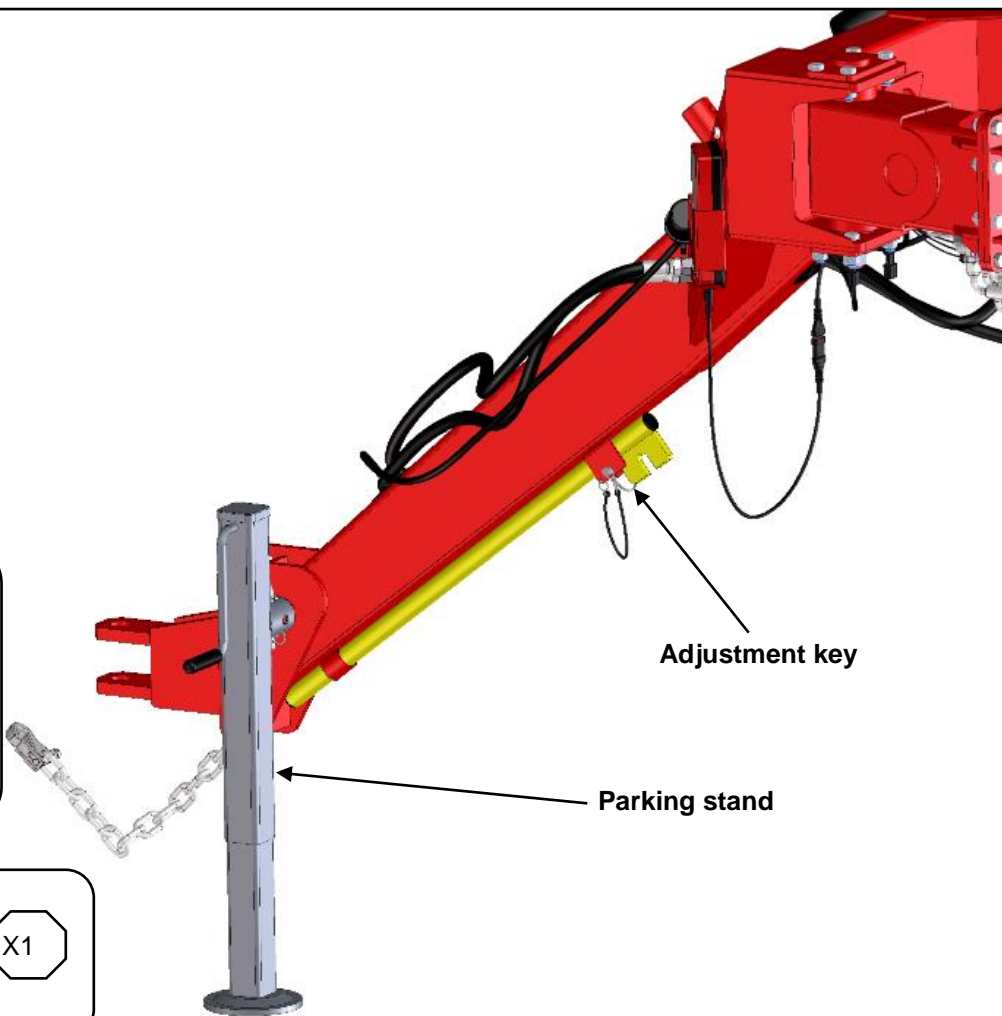
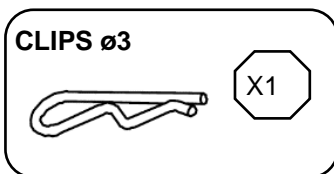
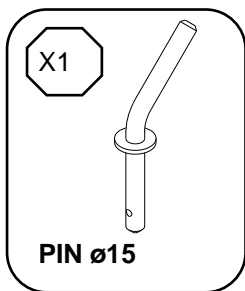
Attach end of the chain to an appropriate place on the tractor.

3.7 ACCESSORIES

3.7.1



3.7.2



SECTION 4 TRANSPORT OPERATIONS

DRAFT

4.1 BEFORE TRANSPORTING

Be sure to lubricate all the parts as specified in **picture 6.1.1**. Check the state of the hydraulic hoses and fittings. Check the state of the wheels. Check the tire pressure. Inflate to recommended pressure. Check all safety devices (chains, guards etc.).

4.2 HITCHING TO THE TRACTOR

Hitching to the tractor is a very dangerous phase.

Make sure that you carry out this operation following the instructions.

Hitch the machine to the tractor as follow:

1. Make sure the tractor is rated for the machine it has to tow.
2. Check to make sure there is nothing (people or animals) in and around the machine.
3. Make sure that the machine is in a stable and horizontal position and that the drawbar hitch is at the same height as the tractor attachment.
4. Slowly approach the tractor to the machine and to the attachment position.
5. Secure the drawbar to the tractor attachment with the relevant pins.



ATTENTION !!!



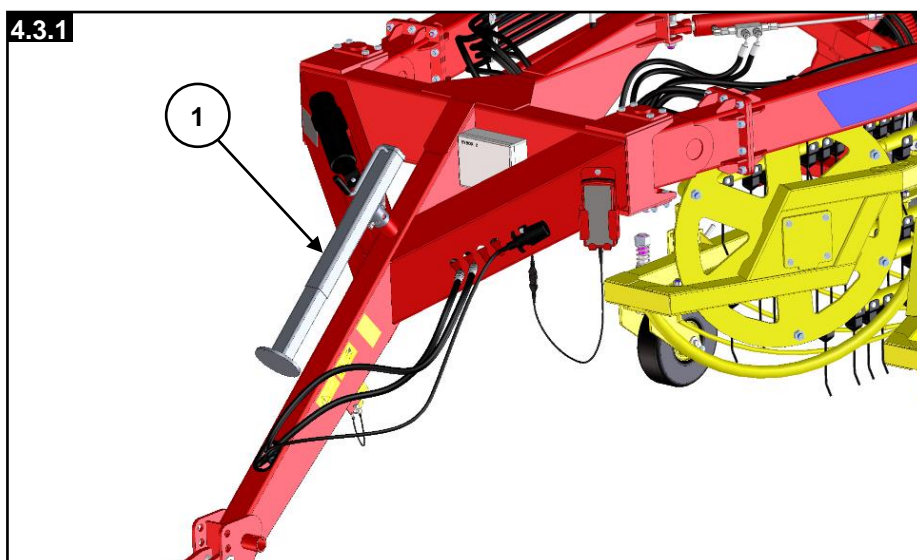
Do not make sharp turns (> 60° degrees) in order to prevent the drawbar of the rake from hitting the tractor, bending the drawbar or causing even worse damage.

Set the parking stand in the transporting position.

Connect the hydraulic pipes to the tractor distinguishing between those for the opening system and those for the lifting of the splitter wheels.

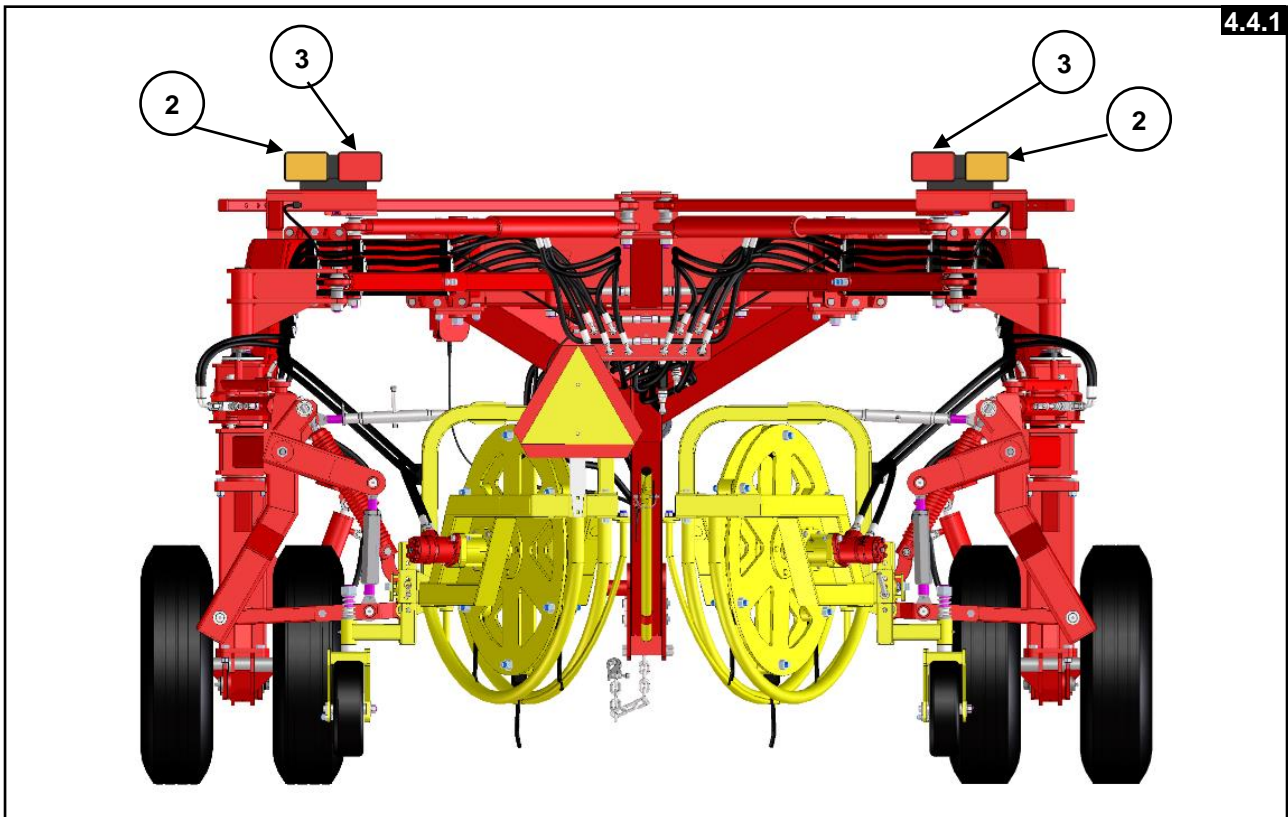
4.3 PARKING STAND

Put the parking stand **(1)** on the transport support, as shown here below, and lock with pin and clip (**picture 3.7.2**).



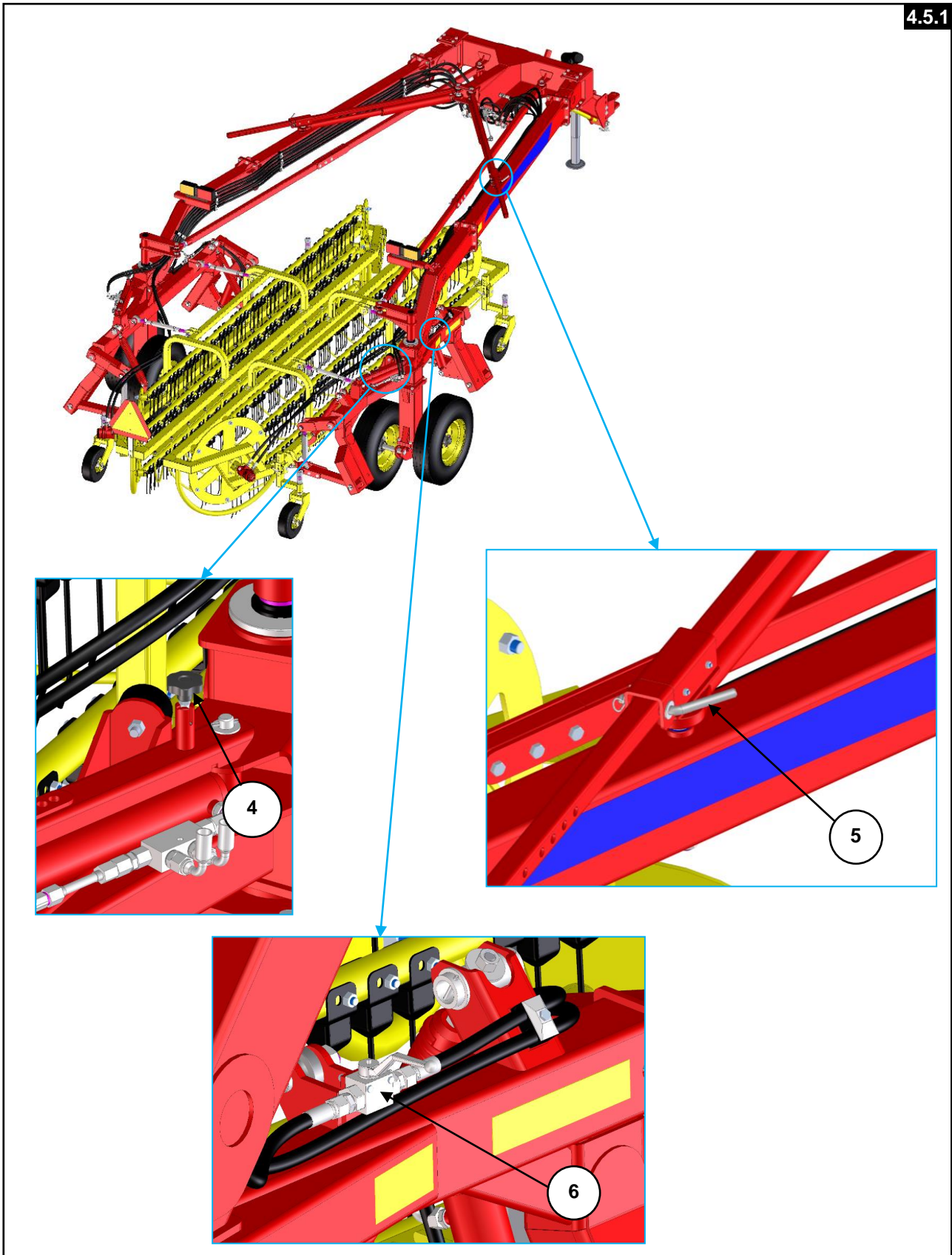
4.4 TRANSPORT LIGHTING

The trailing lights consists of two amber flashing lights **(2)** and two red tail/brake lights **(3)** attached to the mainframe.



4.5 LOCKING SYSTEM

When the unit is fully folded, apply the pins (4) and (5) to secure the arms and put the valves (6) in the position shown in the picture here below.



SECTION 5 ADJUSTMENT, PREPARATION AND USE

DRAFT

5.1 BEFORE USING



DANGER !!!



The operations required to adjust the machine and prepare it for work must always be carried out with the tractor off and blocked.

5.2 WHEELS

Always check them for wear and pressure of the wheels (2,5 Bar – 30 PSI).

5.3 WORK POSITION



DANGER !!!



When the machine is running, the operator MUST be in the driver's seat because it is only from this position that he can operate correctly. Before leaving the driver's seat, the operator MUST stop the machine, put the emergency brake on and switch the tractor off.

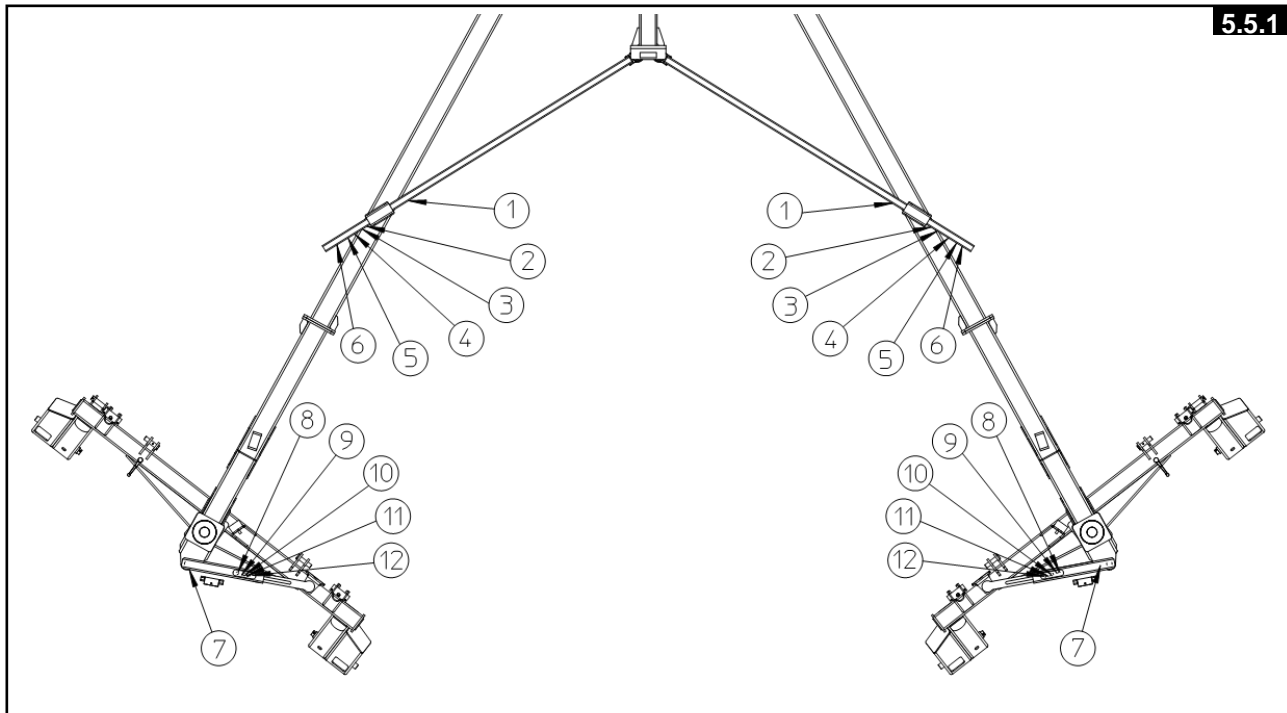
5.4 ADJUSTMENTS

The adjustments to carry out on the hay rake are the following: raking width and windrow width, basket settings and wheel convergence.

5.5 RAKING WIDTH AND WINDROW WIDTH

Field operation

The rake can form windrows **0.6 - 2.5 m (2 - 8.2 ft)**.
The maximum raking width is **9.2 m (30 ft)**.

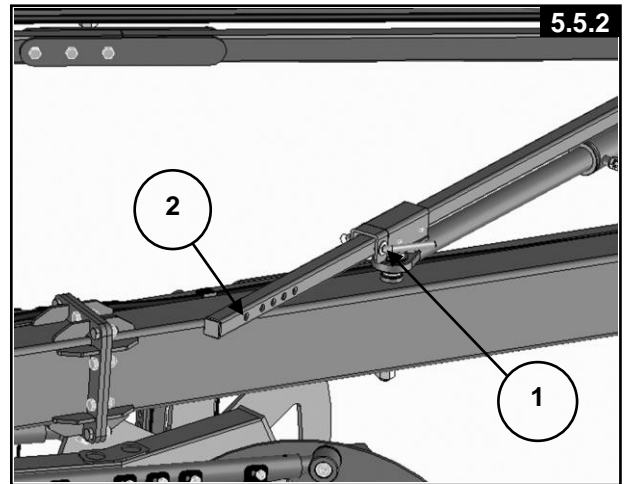


POSITION	OPERATION	OVERALL WIDTH				FRAME FOLD/UNFOLD		BASKET ANGLE	
		m		ft		LH	RH	LH	RH
T	Transport	3,2		10,5		1	1	7	7
		WINDROW WIDTH		RAKING WIDTH					
		m	ft	m	ft				
A	Raking	0,6	2	7	23,0	2	2	8	8
B	Raking	0,9	3	7,5	24,6	3	3	9	9
C	Raking	1,2	4	8	26,2	4	4	10	10
D	Raking	1,5	5	8,5	27,9	5	5	11	11
E	Raking	2	6,6	9,2	30,2	6	6	12	12

Arms swing

To unfold/fold the arms of the machine:

1. Remove the transport locking pin and the stop bracket **(1)** (**picture 5.5.2**);
2. Connect the two hydraulic outlets and the power current plug to the tractor;
3. Switch on the current on the tractor to energize the electrical system of the rake;
4. Move the remote lever on the tractor to pump the oil into the rake;
5. Start moving the tractor (forward or reward);
6. Push the buttons "UNFOLD" or "FOLD" on the command rake to move the arms until the position wanted (**picture 5.5.3**);



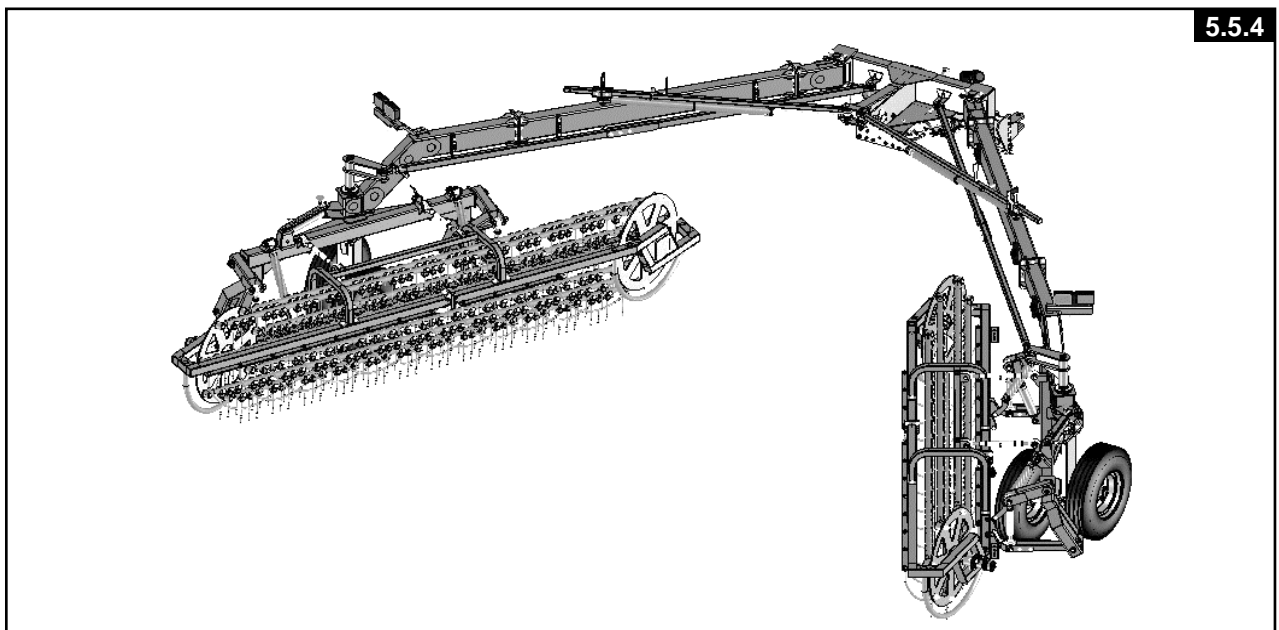
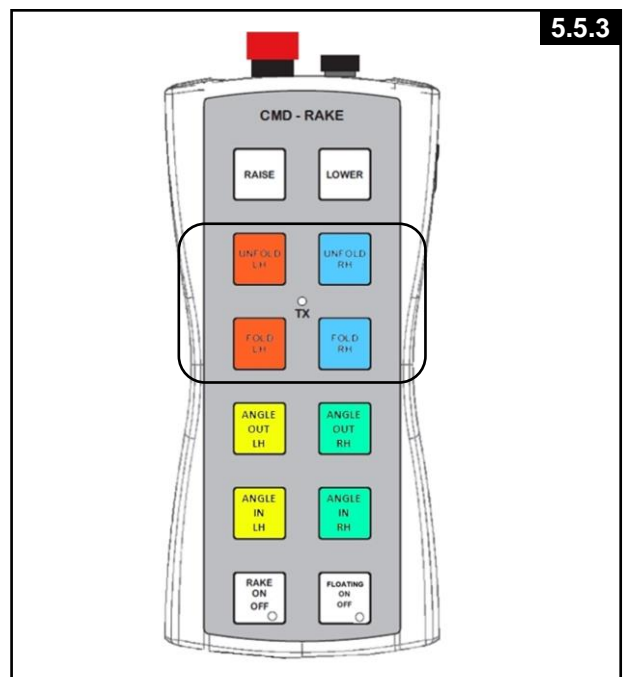
NOTE: The swing of the left and the right arm are independent one to each other.

NOTE: After adjusting the swing of the arms, check and adjust the basket angle and the tine clearance.

NOTE: Place the pin and the stop bracket **(1)** into the hole **(2)** during the use of the machine.

NOTE: It is possible to adjust the rake swing also when the motors are switched on.

NOTE: Remember to keep moving the tractor during the FOLD/UNFOLD operations. Standing still, the hydraulic system cannot move the rake.

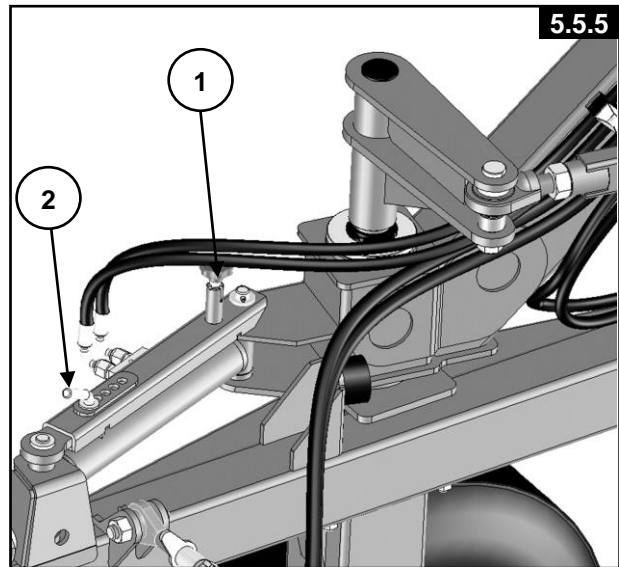


Basket angle

NOTE: Before increasing the rake's baskets angles, be sure that the arms are moved apart far enough to keep the baskets from contacting each other.

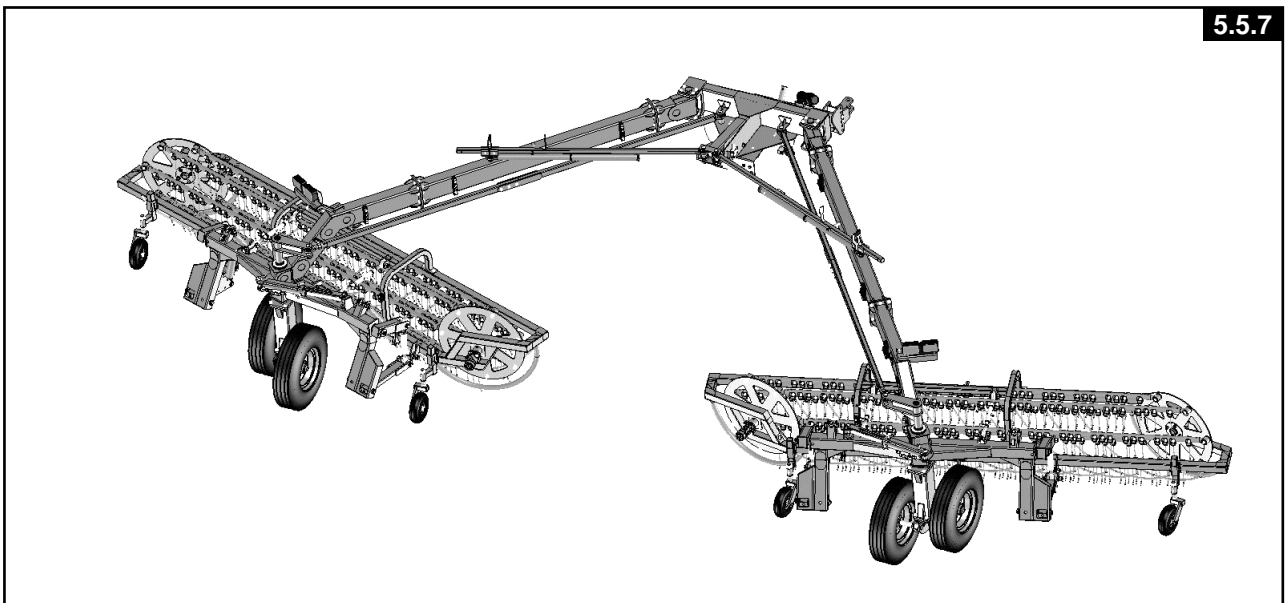
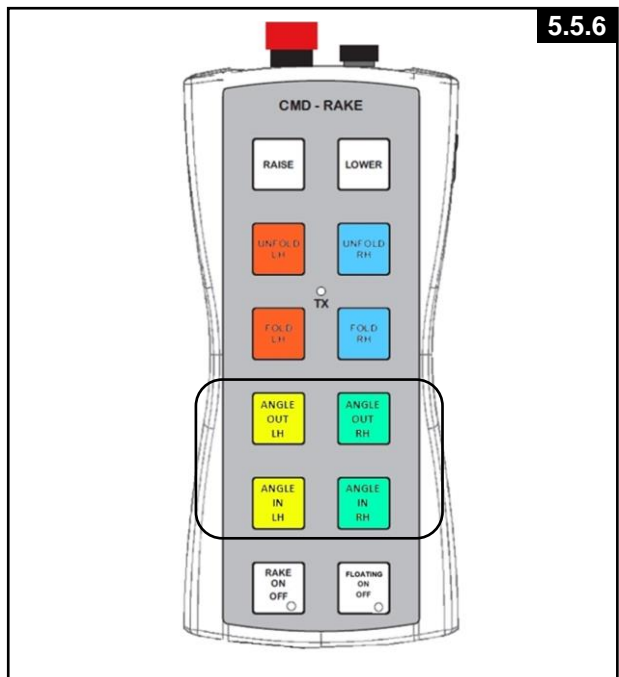
To angle the baskets:

1. Unlock the system by pulling up and turn 90° the secure pin **(1)**. When release, the pin goes into the disengaged position;
2. Connection to the tractor. Same operations 2, 3 and 4 of the previous page;
3. Choose the angle by inserting the pin **(2)** into the correct hole.
4. Push the buttons of the **picture 5.5.6** to angle the baskets.



NOTE: The movements of the left and right baskets are independent one to each other.

NOTE: It is possible to adjust the baskets angle also when the motors are switched on.



5.6 BASKET SETTINGS

Basket tilt

Adjust the basket upper links **(1)** so the top of the basket is nearly level:

1. Loosen the secure nuts of the links;
2. Shorten or lengthen the links using the own lever;
3. Tighten the secure nuts when the tilt is correct;
4. Repeat for the other basket.

NOTE: Adjust the tine height from the ground after adjusting the basket tilt.

Tine height

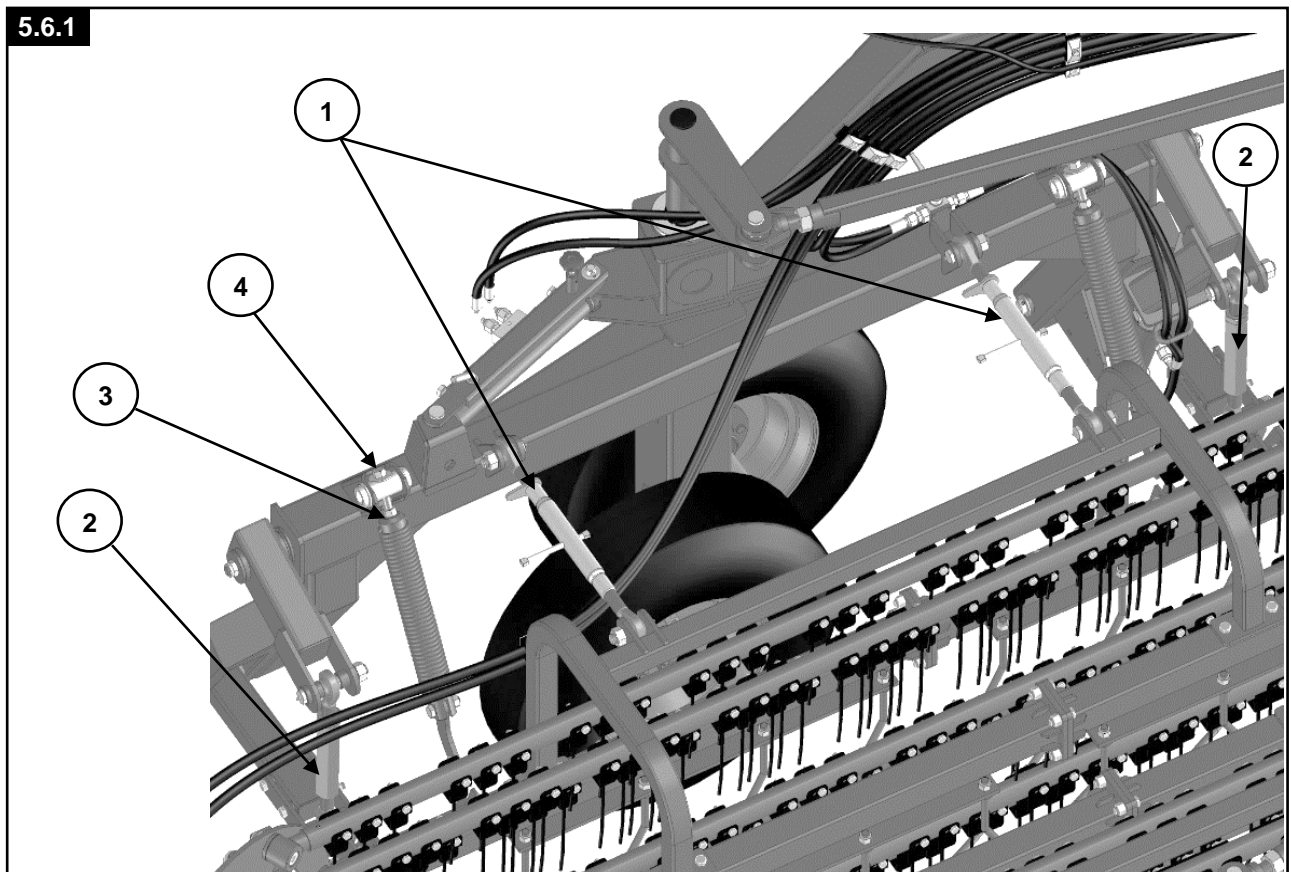
The tines should clear the ground as much as possible without missing any of the crop.

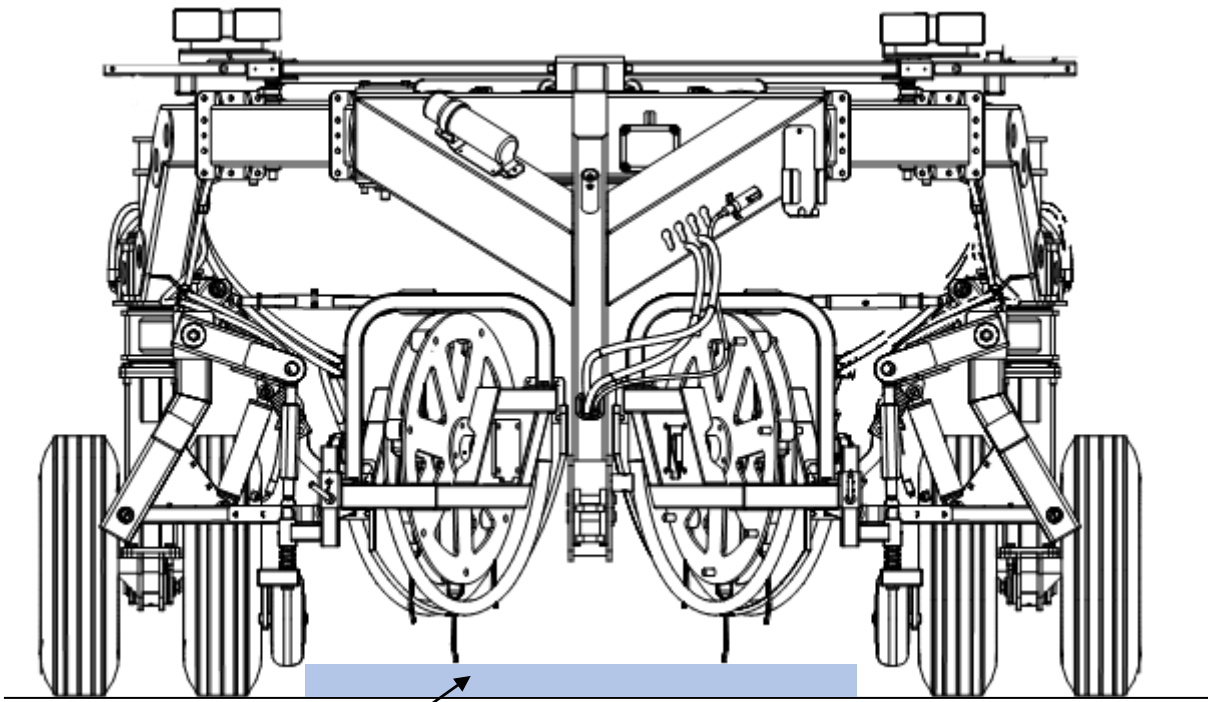
1. Lower the baskets so that the lift cylinders are fully retracted;
2. Adjust the raking width and windrow width as explained at paragraph 5.5;
3. Use a key 46 DIN 894 to adjust the length of the lower links **(2)**.
All the tines clear the ground by about **13 mm (0.5")** when the reel is turned by hand;
4. Recheck tine height at each end of the basket

NOTE: Check the tine height and readjust as needed after adjusting raking width, basket angle, basket tilt.

Set spring flotation tension

1. Back off the jam nut **(3)** from the top of the spring;
2. For increased tension, turn the bolt head **(4)** clockwise.
For decreased tension, counterclockwise;
3. After adjusting to the proper flotation tension, tighten the jam nut **(3)**.





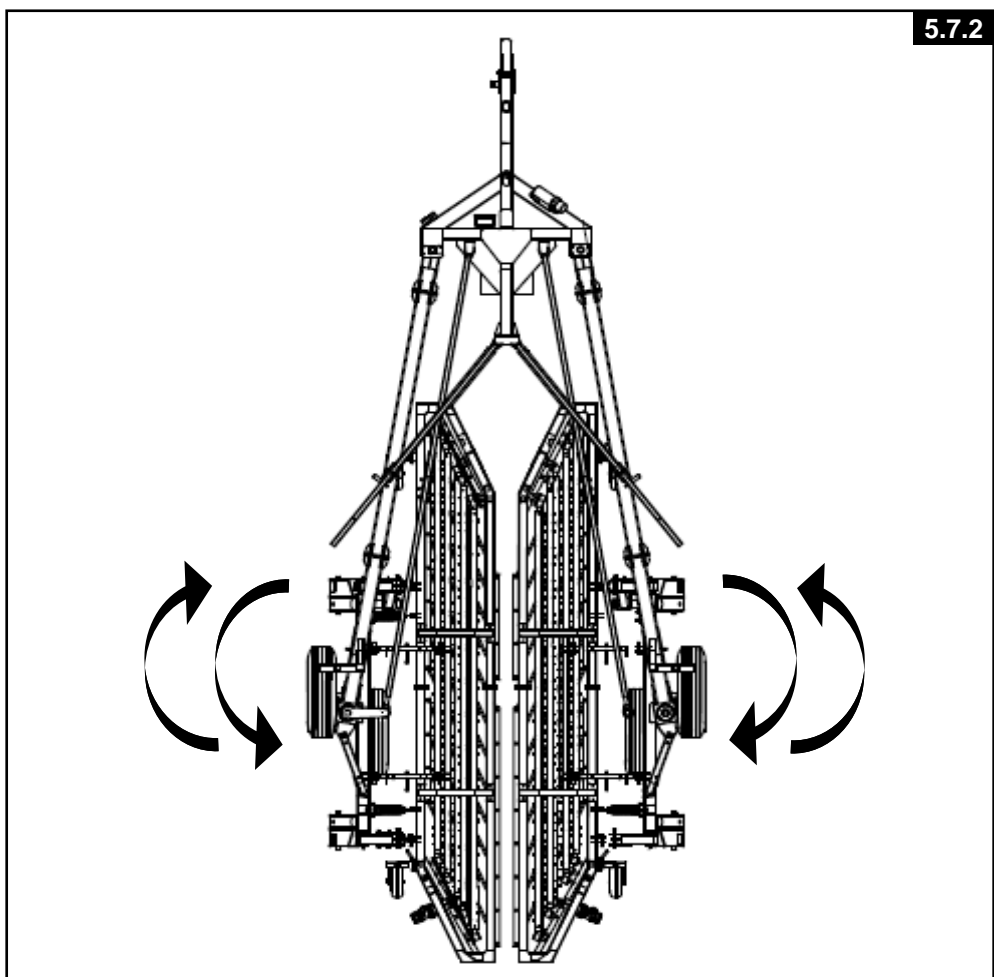
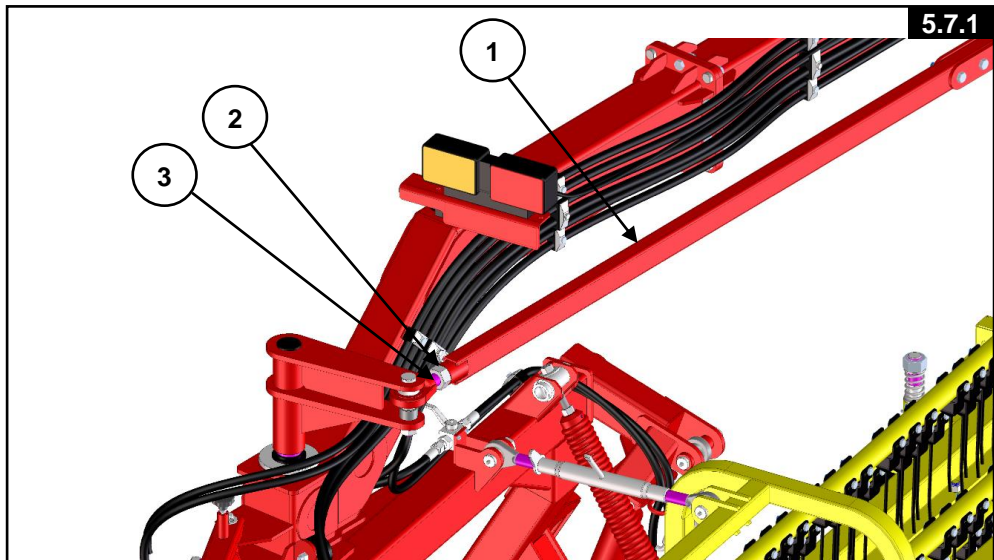
Tine height from the ground

5.7 WHEEL CONVERGENCE

If needed, change the length of the rod (1) to set the correct angle of the tandem wheels. Make as much as possible the wheels parallel to the tractor.

To act on the rod:

1. Unlock the jam nut (2);
2. Shorten or lengthen the bolt (3);
3. Lock the jam nut (3).



5.8 STARTING THE RAKE

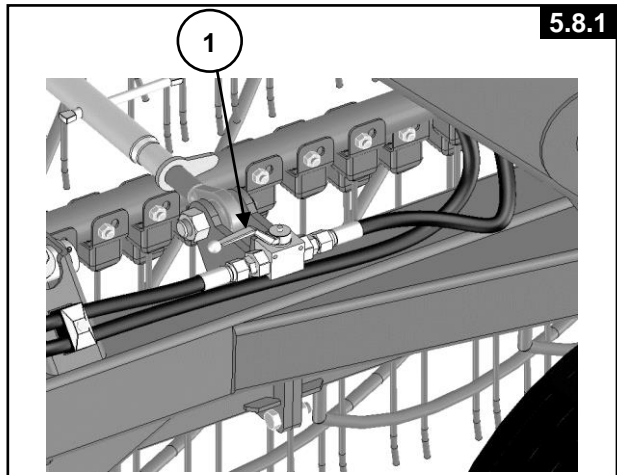
After the adjustments of the previous paragraphs:

Lower the baskets

1. Unlock the valve **(1)** by turning it in the position shown in the **picture 5.8.1**;
2. Push the button **"LOWER"** on the joystick command rake (**picture 5.8.2**).
Keep pushing until the cylinder is fully retracted. **THIS IS VALID ONLY FOR UNIT WITHOUT CASTOR WHEELS.**
3. For the unit with castor wheels push the button **"FLOATING"** to let the baskets lower and start floating.

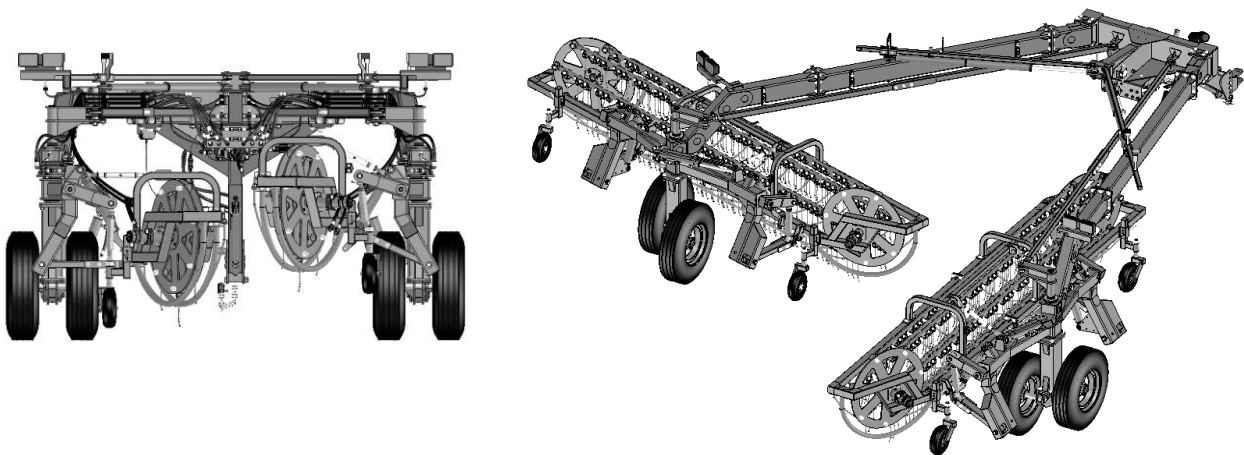
NOTE: It is possible to work only with one basket, leaving close one of the two valves **(1)** (**picture 5.8.3**).

NOTE: To lift up the baskets have to push the button **"RAISE"** (**picture 5.8.2**).



Example of "only left" working phase

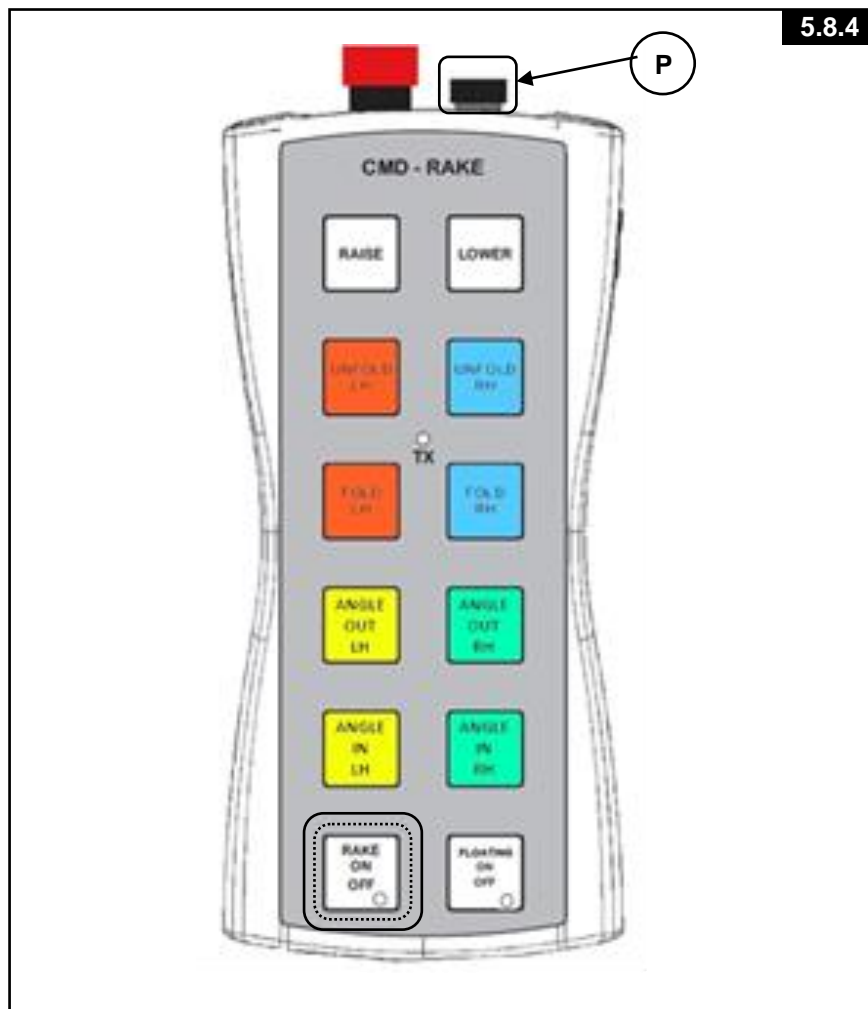
5.8.3



Switch ON/OFF the reels

To operate the hydraulic motors, which drive the reels:

1. Push the “**RAKE ON**” button (picture 5.8.4). Once started the two motors, release the buttons;
2. Rotate the potentiometer (**P**) clockwise to increase the rpm of the reels and counterclockwise to decrease (the range of speed is 60 – 90 rpm);
3. To switch off the motors and stop the reels, push the button “**RAKE OFF**” (picture 5.8.4).



NOTE: While the reels are rotating:

- It is possible to lift up and down the baskets;
- It is possible to FOLD/UNFOLD the arms;
- It is possible to ANGLE the baskets.

5.9 UNHITCHING FROM THE TRACTOR



DANGER !!!



Park the machine on flat, level ground.

Carry out the operations in the following order:

- 1) Secure the machine with chocks under the wheels.
- 2) Disconnect the hydraulic hoses and electric wires.
- 3) Secure the hydraulic hoses and electric wires in the bracket.
- 4) Unhook the safety chain.
- 5) Remove the parking stand from the transport position.
- 6) Install the parking stand in the parking position
- 7) Secure the stand with the handle pin and clip
- 8) Turn the crank of the stand until it lowers to the ground and continue until the machine is loosened from the tractor hitch.
- 9) Remove the pin

The machine is now unhitched.

5.10 STORAGE FOR LONG PERIODS

At the end of the season, or when the machine will not be used for a fairly long period of time, it is recommended that the following be done:

1. Clean the machine and let it dry;
2. Check it carefully and replace any damaged or worn parts;
3. Thoroughly tighten all screws and bolts;
4. Grease the machine, cover it completely and then store it in a dry place.

It is to the operator's advantage to carry out these operations carefully. In this way, the machine will be in perfect condition when work resumes.

When restarting work, repeat all the checks, in order to be sure that you are working in maximum safety conditions.

IMPORTANT

During long periods of inactivity the hydraulic cylinder shafts that remain exposed must be carefully protected with a layer of grease.

SECTION 6 GENERAL INSTRUCTIONS FOR MAINTENANCE

DRAFT

6.1 MAINTENANCE

After the first hours of operations, check to make sure that all the nuts and bolts are well tightened.

Grease all the grease zerks positioned on the machines as shown on the **picture 6.1.1**.

Check tire pressure (2.5 bars).

Periodically inspect rake and make necessary repairs:

- Check frame for fatigue or cracking. Replace or repair worn or damaged parts;
- Check decals, replace if missing or damaged;
- Check the condition of the tines;
- Check hydraulic cylinder, motors and hoses for leaks or damage.

