



C400

SERIES

TECHNICAL MANUAL

CONTENTS

1. Instructions.....	5
2. Description.....	6
2.1. Models: C400.....	7
2.2. C400 PRO models.....	8
3. Safety rules.....	9
3.1. PPE Table (Personal Protective Equipment).....	9
3.2. Hazardous areas around the tractor and front loader.....	9
3.3. Non-compliance with safety and use rules.....	11
4. OPG operator protective guard.....	12
4.1. Description.....	12
4.2. Safety instructions.....	12
4.3. Safety stickers.....	12
4.4. Maintenance.....	13
5. Counterweight.....	14
6. Commissioning the loader - checklist.....	15
6.1. Static test procedure.....	15
6.2. Dynamic test procedure.....	16
7. Maintenance.....	17
7.1. Maintenance instructions.....	17
7.2. Bracket maintenance checks and instructions.....	19
8. Identification plate.....	21
9. Recycling MX products.....	22
10. Loader hitching.....	23
11. Loader unhitching.....	26
12. Loader hydraulics.....	30
12.1. Loader hydraulics diagram for C401, C401 XL.....	30
12.2. Loader hydraulics diagram for C402, C402 XL, C403, C405, C407, C403 PRO, C405 PRO, C407 PRO.....	31
12.3. Loader hydraulics diagram for C404 PRO, C406 PRO, C408 PRO.....	32
12.4. MACH System Compact	33
12.5. Maintenance: oil leaks.....	34
12.6. Lifting circuit.....	35
12.7. Lifting circuit check.....	36
12.8. Dumping circuit.....	37
12.9. Dumping circuit check.....	38
12.10. Checking the pressure limiter - C404 PRO, C406 PRO, C408 PRO loaders.....	40
12.11. Loader performance.....	40
12.12. 3rd function circuit - C401, C401 XL.....	42
12.13. 3rd function circuit - Other models.....	44
12.14. Safety when lifting and dumping.....	46
12.15. Checking the control valve for internal leaks.....	47
12.16. SHOCK ELIMINATOR System.....	48
13. Loader electrics.....	51
13.1. MACH System Compact wiring loom.....	51

13.2. 3rd function wiring loom - 306288. Mach Compact assembly..... 52

13.3. 3rd function wiring loom - 306288. Coupler assembly..... 53

13.4. Solenoid checking procedure..... 54

13.5. Solenoid valve cleaning..... 55

1. Instructions

General

This manual is the user guide for handling, using and maintaining the machine.

Read this manual carefully and keep it handy for future reference.

Carry out specified maintenance to keep the machine in full working order and to ensure sustained reliability.

Washing



CAUTION: Never direct high-pressure sprays towards electrical components (housings, wiring looms, connectors, etc.).

Electrical/electronic components may fail if they are subjected to water at high pressure.

Safety

Before using the machine:

— read the safety rules and follow all recommendations and instructions.

For more information, please refer to the loader user manual.

Spare parts



DANGER: Failure to follow these guidelines may make your machine unsafe. The manufacturer will not be held liable in the event of damage or injury.

Only use genuine MX spare parts.

Do not carry out any modifications, whether yourself or anyone else, on the machine and its attachments (mechanical, electrical, hydraulic or pneumatic) without first requesting express approval from the manufacturer.

Warranty

Warranty cover will cease immediately in the event of failure to observe the standards and instructions for use and maintenance of the machine as provided in this manual or the user manual.

2. Description

C400 without parallelogram	
	Direct hitching as standard: — C401 — C401 XL
C400 without parallelogram	
	Direct hitching (with implement carrier option): — C403 — C405
	Implement carrier hitching: — C407
C400 with parallelogram	
	Implement carrier hitching: — C402 — C402 XL

C400 PRO without parallelogram



Implement carrier hitching:

- C403 PRO
- C405 PRO
- C407 PRO

C400 PRO with parallelogramm



Implement carrier hitching:

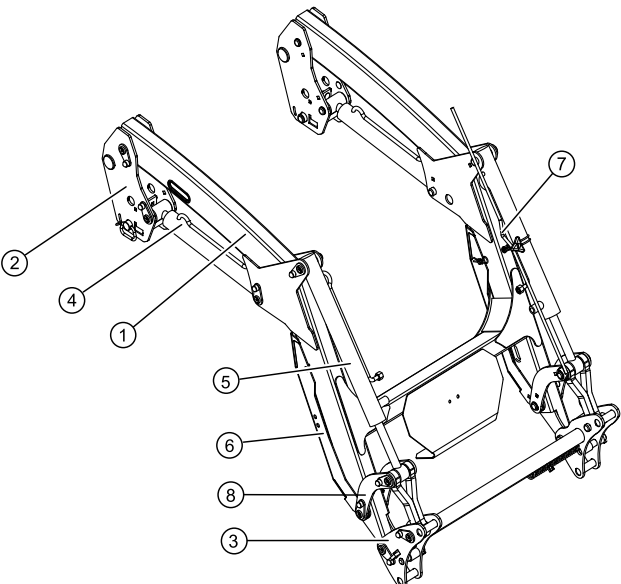
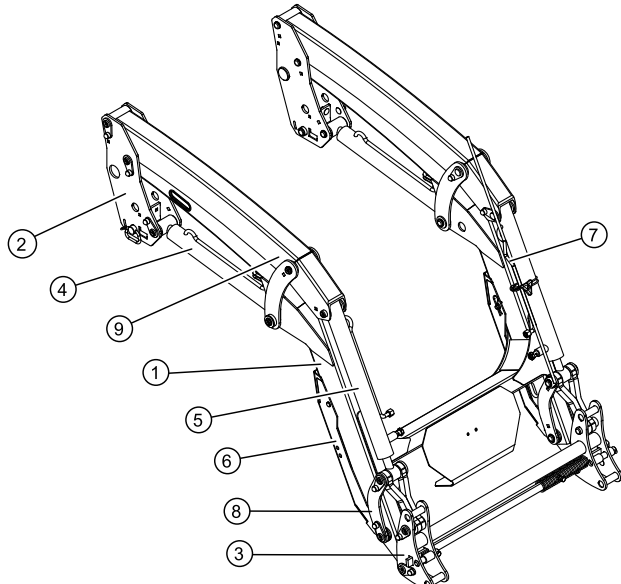
- C404 PRO
- C406 PRO
- C408 PRO

2.1. Models: C400

C401, C401 XL	C402, C402 XL	C403, C405, C407
Technical drawing of the C401, C401 XL implement. It shows the side profile with numbered callouts: 1 points to the main body, 2 to the top bracket, 4 to the top pivot, 5 to the lower bracket, and 6 to the bottom pivot.	Technical drawing of the C402, C402 XL implement. It shows the side profile with numbered callouts: 1 points to the main body, 2 to the top bracket, 4 to the top pivot, 5 to the lower bracket, 6 to the bottom pivot, 8 to the bottom pivot, and 9 to the top pivot.	Technical drawing of the C403, C405, C407 implement. It shows the side profile with numbered callouts: 1 points to the main body, 2 to the top bracket, 4 to the top pivot, 5 to the lower bracket, and 6 to the bottom pivot.

Marking	Description
(1)	Boom
(2)	Half-frame
(3)	Implement carrier
(4)	Lift ram
(5)	Dumping ram
(6)	Parking stands
(7)	Indicator rod
(8)	Crank
(9)	Parallelogram tie rod

2.2. C400 PRO models

C403 PRO, C405 PRO, C407 PRO	C404 PRO, C406 PRO, C408 PRO
	

Marking	Description
(1)	Boom
(2)	Half-frame
(3)	Implement carrier
(4)	Lift ram
(5)	Dumping ram
(6)	Parking stands
(7)	Indicator rod
(8)	Crank
(9)	Parallelogram tie rod

3. Safety rules

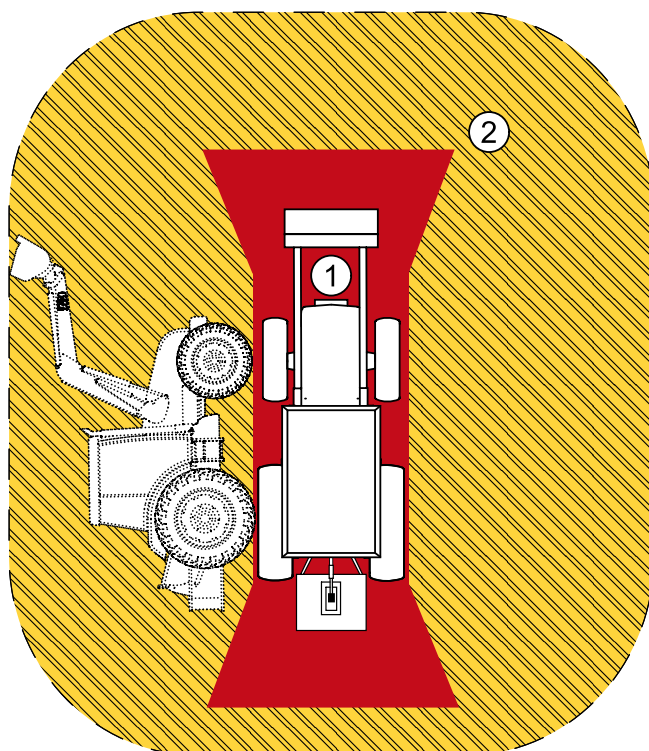
3.1. PPE Table (Personal Protective Equipment)

Symbol	Meaning	Example of risk
	Protective gloves must be worn.	Cuts, trapped fingers, when unlocking the implement on the loader.
	Hearing protection must be worn.	Bucket shaking in a tractor without a cab.
	Eye protection must be worn.	Splashes during high-pressure cleaning.
	Safety helmets must be worn.	Impacts to the head from the loader during tractor maintenance.
	Protective clothing must be worn.	Splashes during high-pressure cleaning.
	Safety footwear must be worn.	Crushing when positioning parking stands.

3.2. Hazardous areas around the tractor and front loader

Using a front loader creates hazardous areas around the equipment, posing risks both to the operator and to people nearby. Clear identification of these areas is essential to ensure safety during handling, movement or ground-level operations.

③



(1) Critical hazardous area (red) / (2) Peripheral hazardous area (striped orange) / (3) Working area



DANGER: Keep hazardous areas clear and prohibit access to untrained persons. Constant vigilance is required.

Area	Description	Associated risks
(1) Critical hazardous area (red)	Immediate area around and under the tractor/loader unit.	Risk of serious injury or death in the event of the machine tipping, risk of mechanical crushing, reduced visibility for the operator, risk of entrapment in moving parts.
(2) Peripheral hazardous area (striped orange)	Area corresponding to the potential tipover area of the tractor fitted with a loader.	Risk of serious injury or death in the event of the machine tipping, risk of load falling on anyone within the area, reduced operator visibility.
(3) Working area (in relation to the type and layout of the farm)	Area encompassing all possible movements of the tractor and front loader during their operation.	Risk of collision, risk of crushing, limited operator field of view.

3.3. Non-compliance with safety and use rules

- Only use genuine MX spare parts. Do not carry out any modifications yourself or have anyone else do so on your MX loader and its implements (mechanical, electrical, hydraulic or pneumatic specifications) without obtaining MX's prior written approval.

IMPORTANT: Failure to comply with these rules may make your MX loader unsafe; in the event of damage or injury, MX will not be held liable in any way.

- Warranty cover will cease immediately in the event of failure to observe the standards and instructions for use and maintenance of the MX loader as stipulated in the user manual. MX may not be held liable for any accident resulting from actions contrary to these restrictions.

4. OPG operator protective guard

4.1. Description

The tractor-loader assembly can be fitted with an OPG (Operator Protective Guard) to protect the operator against dropped unit loads, particularly when handling round bales.

The need to fit this device depends on the loader specifications (lifting capacities) and the tractor equipment (no cab or 4-post ROPS roll cage).

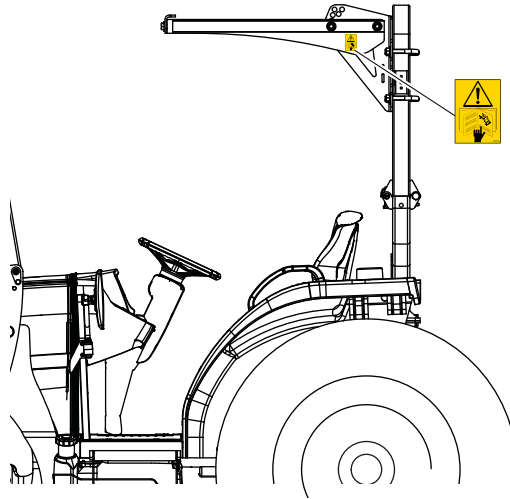
NOTE: The Operator Protective Guard (OPG) is not intended to replace the Roll-Over Protective Structure (ROPS) or the Falling Object Protective Structure (FOPS).

4.2. Safety instructions

- Make sure that the OPG is properly attached to the ROPS structure (fasteners tightened to the prescribed torque).
- Once fitted, the OPG should not be disassembled.
- Check that the OPG is in good condition (no cracks, warping, corrosion or loose components).
- The OPG is mechanically connected to the tractor's ROPS structure. **The ROPS-OPG assembly must always be in operating position.**
- Check that the total height of the tractor fitted with the OPG can pass under existing structures.
- Never make modifications to the OPG (threading holes, welds, cuts, etc.).
- The OPG does not replace the need for good driving practices (moderate speed, unit load held in place, etc.).
- The OPG only protects the driver's cab. Do not transport passengers on the tractor when handling the loader.
- Do not use the OPG as a point for securing, lifting, or attaching accessories.
- In the event of any impact or object falling on the OPG, stop using it immediately and arrange for a competent professional to check over the integrity of the structure.
- Do not stack loads beyond the implement's recommendations: unit loads must be lifted with the load secured in place. Unsecured loads pose a falling hazard.
- Caution: risk of head injury when accessing the driving position.
- When disposing of the OPG, ensure that it can no longer be used.
- The PPE (Personal Protective Equipment) listed in the [PPE Table](#) must be worn when operating this machinery.

4.3. Safety stickers

Ensure that these stickers are clean and legible; replace them if they become damaged. If a sticker needs replacing, clean the surface with isopropyl alcohol and affix the sticker using an appropriate tool.



Symbol

Meaning



Read the safety and operating instructions for the OPG before using the tractor-front loader assembly.

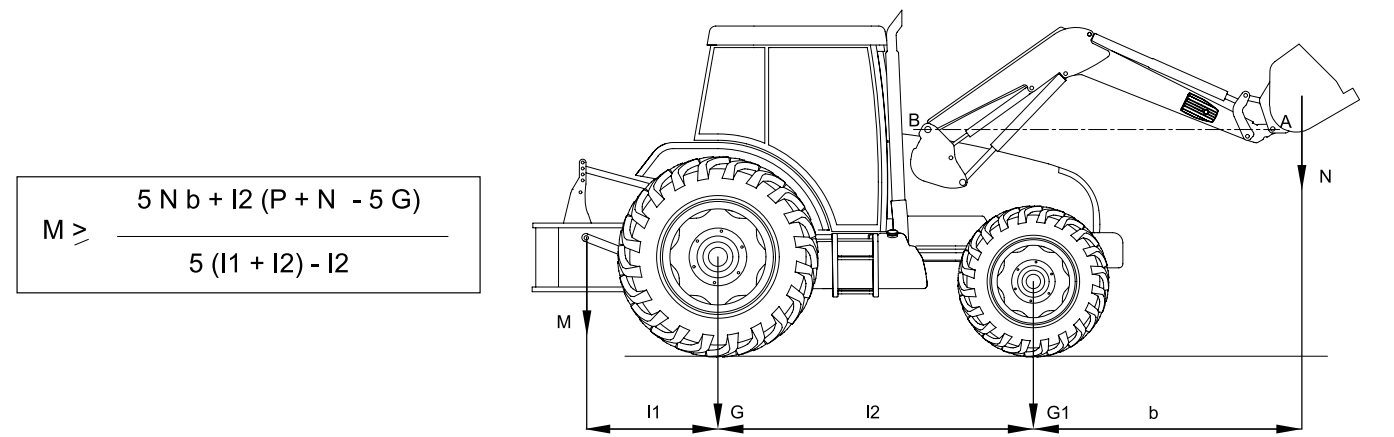
4.4. Maintenance

- Perform monthly inspections looking for cracks, warping, corrosion and loose fasteners.
- Check the tightening torque of the fasteners once a month, using the manufacturer's recommended values.
- A damaged OPG should be replaced immediately.
- When replacing an OPG, mount the structure using the original fasteners.
- Clean the OPG regularly to prevent dirt or corrosive substances from building up.

5. Counterweight

Tractor-loader unit stability can only be ensured with a counterweight installed on the rear of the tractor. This should ensure that 20% of the gross weight (tractor, loader, implement, maximum load and counterweight) remains on the rear axle of the tractor, for optimal working safety.

The formula includes the information shown below and is used to calculate the mass (M) of the counterweight (standard EN12525 + A2 2010).



Letter	Correspondence
G	Load on rear axle, no counterweight, implement empty (kg)
G1	Load on front axle, no counterweight, implement empty (kg)
b	Distance from front axle to the implement's centre of gravity (mm)
I1	Distance from linkage arm pin to rear axle (mm)
I2	Wheelbase (mm)
N	Loader payload for implement pivot point (A), horizontally level with loader pivot point (B) (kg)
P	G + G1 (kg)
M	Counterweight (kg)

NOTE: the counterweight must not exceed the axle loads recommended by the manufacturer.

6. Commissioning the loader - checklist



CAUTION: All loader test operations must be carried out by the operator from their cab. All persons must be kept away from the area in which the loader is being operated. When checking the loader controls, check that the control levers are in neutral.



CAUTION: For tractor maintenance operations, the tractor engine must be turned off; it is strongly recommended that you unhitch the loader. Unhitching is a simple, quick operation that provides the best guarantees of safety and efficiency for tractor maintenance.

After hitching the loader, carefully check all the functions before use. In the event of a malfunction, take the necessary corrective measures.

- Check that the loader is correctly hitched to the tractor. For more information, please refer to [Loader Hitching](#).
- Check the stability of the loader-tractor unit. For more information, please refer to [Counterweight](#).
- Check the condition of the fasteners. Replace, clean and re-tighten if necessary. For more information, please refer to [Maintenance](#).
- Check there is no interference between the loader and the tractor. Make sure that the wheels do not touch the loader with steering at full lock. Adjust the spacing or limit the turning angle, if necessary.
- Check that the indicator rod is working correctly.
- Ensure that all maintenance operations are carried out correctly and in accordance with the maintenance schedule. For more information, please refer to [Maintenance](#).
- Test all loader functions at both maximum load and low speed to check that the hydraulic circuit is properly sealed and that the hoses are correctly positioned. For more information, please refer to [Maintenance](#).
- Bleed the air from the hydraulic system by pressurising the functions several times.
- Check the tractor oil level and top up, if necessary.
- Check that the implement is correctly hitched to the loader. For more information, please refer to [Implement Hitching](#). Press the implement down on the ground (until the tractor's front wheels lift up) to check that it locks in place correctly. Check that the indicator rod is correctly adjusted. For more information, please refer to [Level Indicator](#) (optional for the C400 range).
- Check the loader's mechanical condition (any cracks, warping, end stop matting, clearance, parking stands, etc.).

6.1. Static test procedure

Check the structural integrity of the front loader and its compliance with the technical specifications before use:

- Examine the loader's overall structure for cracks, faulty welds, or warping.
- Check the fasteners (bolts, nuts, rivets) to make sure they are properly tightened and show no signs of damage.
- Check the condition of the loader and pivot points for wear or excessive play. For more information, please refer to [Maintenance](#).

- Check that the loader complies with the technical specifications. For more information, please refer to Technical Specifications.
- Check the rams and hydraulic components (hoses, connectors, etc.) for damage or wear.

6.2. Dynamic test procedure



DANGER: All loader tests must be carried out by the operator from the cab. All other persons must be kept away from the area in which the loader is being operated.

Test the loader's operational performance and safety under actual conditions of use:

- Hitch the loader with an implement to the tractor. For more information, please refer to [Loader Hitching](#) and Implement Hitching.
- Raise and lower the loader to various heights to check that everything is moving smoothly.
- Load the implement with the maximum authorised weight and check the loader's ability to lift and hold the load. For more information, please refer to Technical Specifications.
- Check the hydraulic rams and pipes for leaks.
- Check that the lifting/dumping safety system is working properly. For more information, please refer to [Safety when lifting and dumping](#). (OPTION)

7. Maintenance



WARNING: Drain the tractor's hydraulic circuit regularly and change the filters in accordance with the manufacturer's recommendation.

Contaminated oil no longer lubricates and can cause damage to all hydraulic components (pumps, control valves, rams, etc.); even clear-looking oil may be worn out.

7.1. Maintenance instructions

- Maintenance operations must be performed by qualified people, authorised by the dealer. Otherwise, these operations come under the sole responsibility of the person carrying out the work.
 - The PPE (personal protective equipment) listed in the [PPE Table](#) must be worn for all maintenance operations.
 - Switch off the tractor engine before carrying out any maintenance work on the loader and/or its implements.
 - For loader maintenance operations, never work on mechanical parts under stress, a pressurised hydraulic circuit or part, or an electrical circuit that is switched on.
 - For tractor maintenance operations, it is strongly recommended that you unhitch the loader. Unhitching is a simple, quick operation that provides the best guarantees of safety and efficiency for tractor maintenance.
 - For any work with the loader lifted, the loader must be locked in position.
 - Unlocking the MACH System, or closing the lifting rams supply valve for a loader without MACH System.
 - For any maintenance operation on a loader and/or its implements:
 - Switch off the tractor's engine.
 - PPE must be worn.
 - The loader must be on the ground with the implement and any accessories (grab, rotor, etc.) at rest.
 - Decompress the hydraulic circuit:
 - Switch on.
 - Activate the loader monolever (depending on version).
 - Activate the monolever and perform all movements (lifting, lowering, crowding and dumping).*
 - Activate the 3rd and 4th functions in both directions or operate the Easyplug function (depending on version).
 - Switch off.
- *in some cases, in order to decompress the hydraulic circuits, it may be necessary to start the tractor and activate the floating positions.

Grease every 10 hours and after each wash, especially after a high-pressure wash, as water drives out the grease. [See the lubricating points below.]

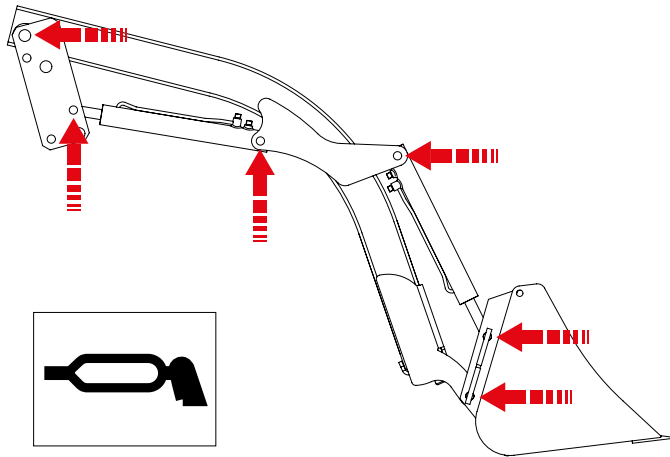
NOTE: NLGI 2 grease is recommended for maintenance.

Clean the implement and the front of the loader after each use. Slurry acid, fertiliser and silage can damage paint, steel and pivot points.

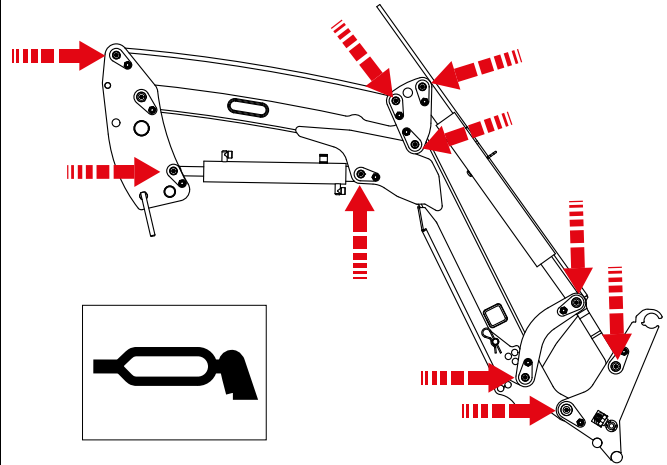


CAUTION: When using a pressure washer, avoid spraying water on electric components.

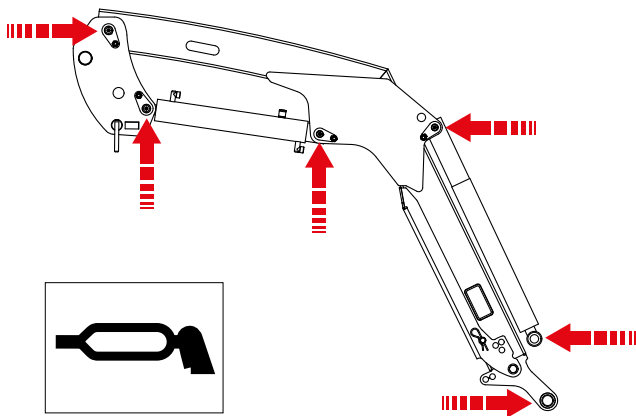
C401, C401 XL



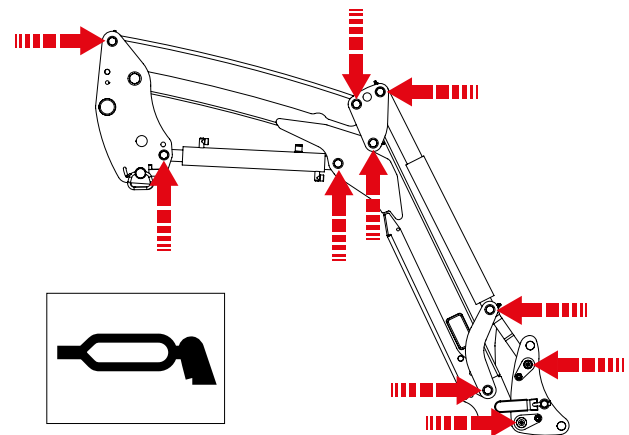
C402, C402 XL



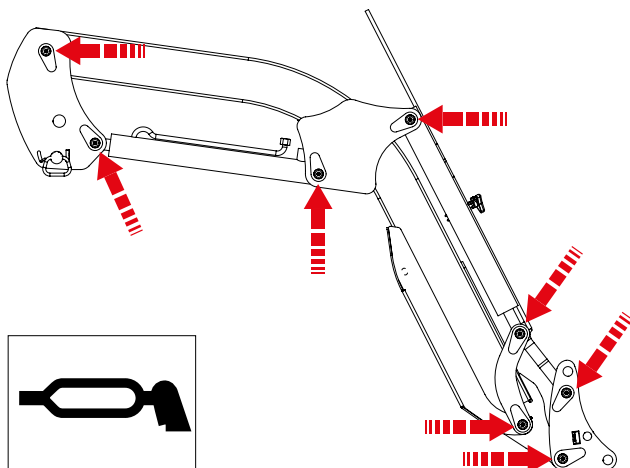
C403, C405



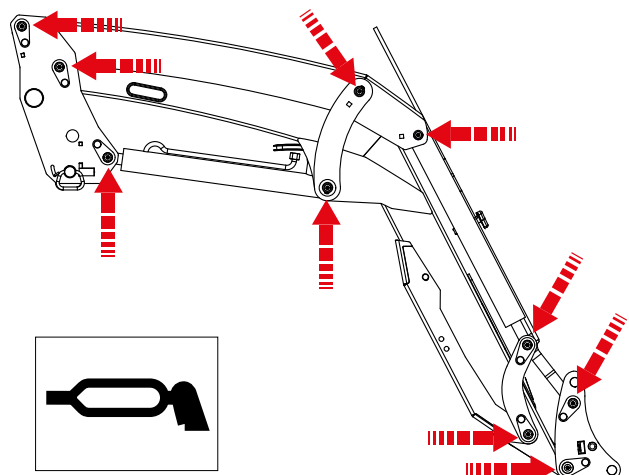
C407



C403 PRO, C405 PRO, C407 PRO

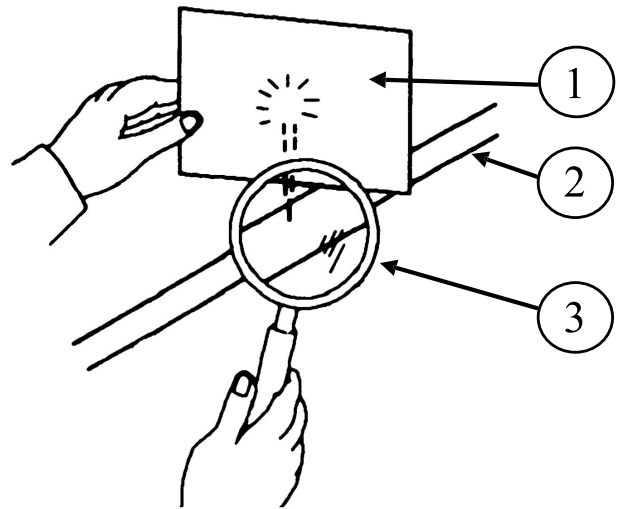


C404 PRO, C406 PRO, C408 PRO



⚠ DANGER: Oil escaping under pressure can have sufficient force to penetrate the skin and cause serious injury. Before disconnecting the hoses, ensure that you have released all the pressure. Before pressurising the system, check that all fittings are tight and that the hoses and hydraulic circuit are not damaged.

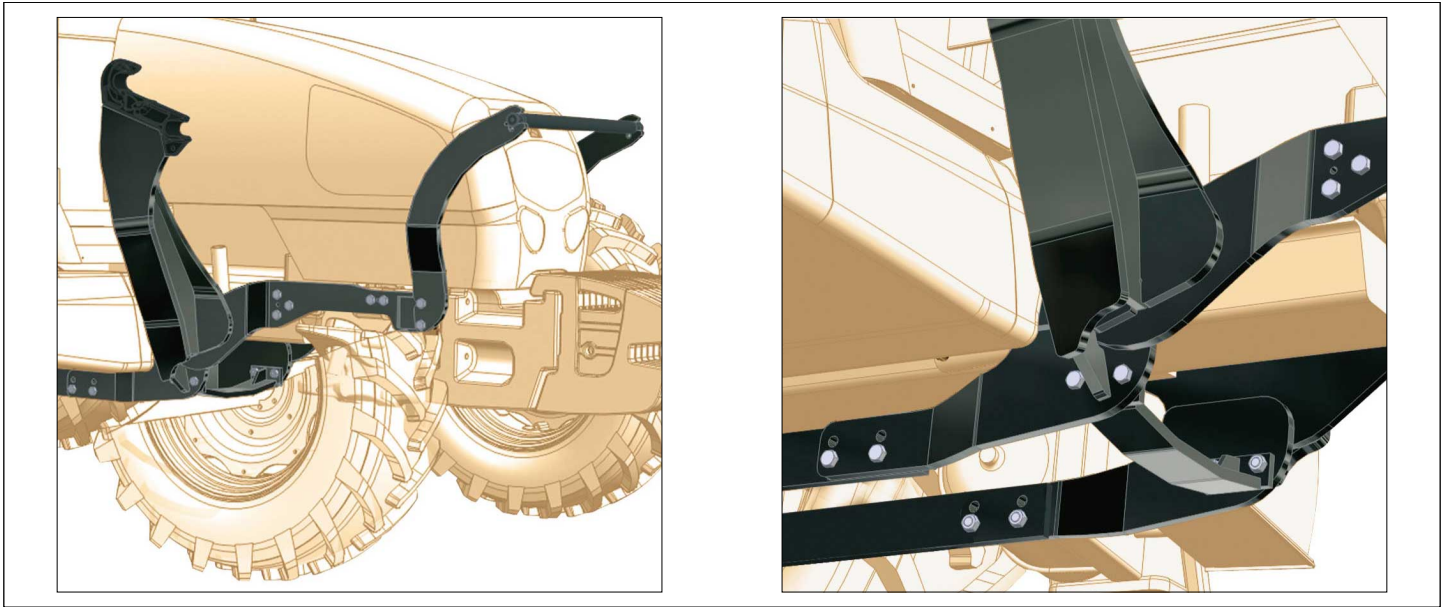
⚠ DANGER: Oil escaping from a very small hole can be almost invisible. Use a piece of cardboard or wood, rather than your hands, to detect suspected leaks. If you are injured by a pressurised leak, seek immediate medical attention. An infection or serious reaction may develop if appropriate medical treatment is not immediately provided.



(1) Cardboard / (2) Hydraulic circuit / (3) Magnifying glass

7.2. Bracket maintenance checks and instructions

- To ensure effective tightening of the screws on the tractor, check that the threads of the tractor's fixing points are clean. Running a suitable tap through the threads will eliminate paint, rust, impurities and other contamination. This also applies to new tractors.
- Remove any paint from the contact areas between our supplied product and the tractor, as well as from the other areas listed in the instructions, to ensure the tightening torque is effective.
- Impact wrenches must not be used to screw or tighten the fasteners used on the tractor or between the parts of our supplied product.
- Warranty cover will immediately cease if the machinery assembly recommendations in this document are not complied with.
- All fasteners must be fitted using either lock, Belleville or Nord-Lock washers. When fitting with an oblong hole, position the washer (flat or spring) along the oblong side.
- When assembling moving parts, such as the motor pulley interface, fasteners must be fitted using a locking compound.
- Position everything before any blocking, unless otherwise specified in the fitting instructions.
- Once all the bolts and screws are in place, tighten the unit to the torque recommended for cast iron and steel, as detailed in the table below.
- After tightening to the recommended torque, make a mark on the fasteners.



Tightening torque

Class of bolt	stud marking (ISO 898)	Thread											
		M5	M6	M7	M10	M12	M14	M16	M18	M20	M22	M24	M27
8.8	○	5.2	9	21.6	43	73	117	180	259	363	495	625	915
10.9	□	7.6	13.2	31.8	63	108	172	264	369	517	704*	890	1304
12.9	△	8.9	15.4	37.2	73	126	201	309	432	605	824	1041	1526

For cast steel (Nm) $\pm 15\%$

* Unless otherwise specified

8. Identification plate

The identification plate is located inside the loader's right arm. The serial number and loader model shown on this plate must be quoted in any request for spare parts information or technical assistance.

MX

CEUKCA

Designation

Type/Model

Serial number

Year of manufacture

Maximum weight

kg

For Loader: Maximum Load (on pallet carrier)

g

Manufactured by M-extend france SAS
19 rue de rennes 35690 ACIGNE - FRANCE



Mark- ing	Description
(1)	Product designation
(2)	Product type/model
(3)	Serial number
(4)	Year of manufacture
(5)	Max. product weight
(6)	Maximum safe working load on pallet fork and carrier
(7)	Manufacturer's address

1

3

5

7

MX

CEUKCA

Designation

Type/Model

Serial number

Year of manufacture

Maximum weight

kg

For Loader: Maximum Load (on pallet carrier)

kg

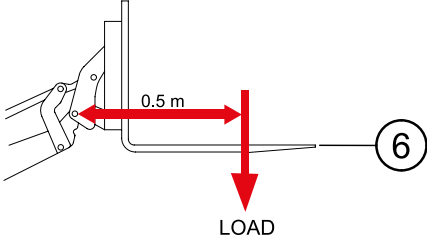
Manufactured by M-extend france SAS
19 rue de rennes 35690 ACIGNE - FRANCE

2

4

6

MAXIMUM LOAD (on pallet carrier)



9. Recycling MX products

Disposal: please contact your dealer or a company specialising in materials recycling.

Hydraulic system

- End-of-life MX products must have their hydraulic oil drained by an authorised technician.
- The hydraulic hoses must be removed before the equipment can be recycled.
- All MX product owners are required to comply with these environmentally-friendly precautions if they decide to dismantle their end-of-life products themselves.

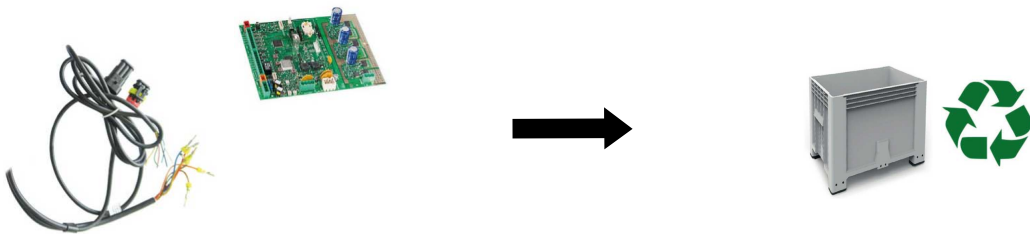
Disposal of hazardous waste (oils and hoses)

- Hydraulic oils must be stored in containers or drums provided for this purpose and sent to approved disposal facilities.
- For hydraulic hoses, the steel connectors can be separated from the rubber hoses.
- The steel end caps must be recycled as scrap by approved facilities.
- The rubber hoses must be placed in watertight containers and sent for processing by approved facilities.



High-tech MX product components and electrical and electronic equipment

- Waste electrical and electronic equipment (WEEE) present in MX products must be removed and disposed of by authorised services for recovery.



Recycling of decontaminated MX products

- Decontaminated MX products must be sent to authorised services for iron and metal recycling.

10. Loader hitching



WARNING: This operation must be carried out by the driver, who must leave the cab and not perform any manoeuvres while working on the loader.

- Advance the tractor slowly so that the bracket is approx. 5 cm behind the frames.
- Apply the hand brake.
- Stop the engine.



- Connect the hydraulics and the electrics:

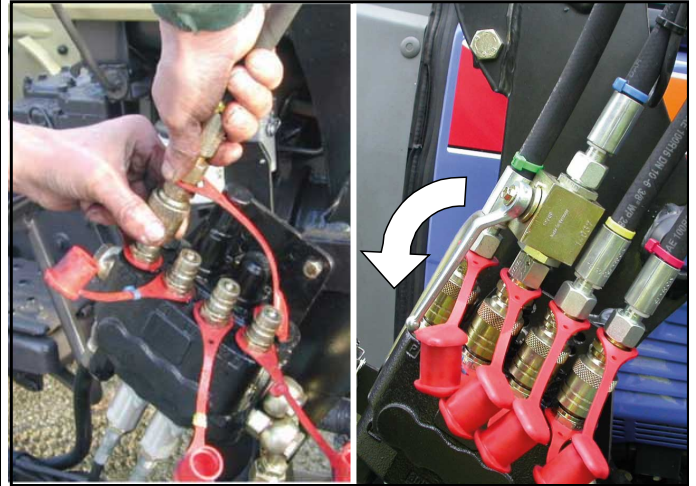
Loader **with** MACH System Compact

- Ensure that the male and female couplings are clean before hitching. If necessary, clean them.
- Lift the handle to lock the MACH System Compact.



Loader **without** MACH System Compact

- Remove the caps.
- Connect the hydraulic couplings, matching the colours.
- Open the valve.



- Dump the implement so as to lift the front of the loader: by pivoting, the frames engage with the bracket yokes.



- Lift the loader 0.3 m from the ground.



- Lock the loader frame onto the bracket with the spindles and locking pins.

 **CAUTION:** Ensure that the pins are locked using the safety catches (1).



11. Loader unhitching

WARNING: This operation must be carried out by the driver, who must leave the cab and not perform any manoeuvres while working on the loader.

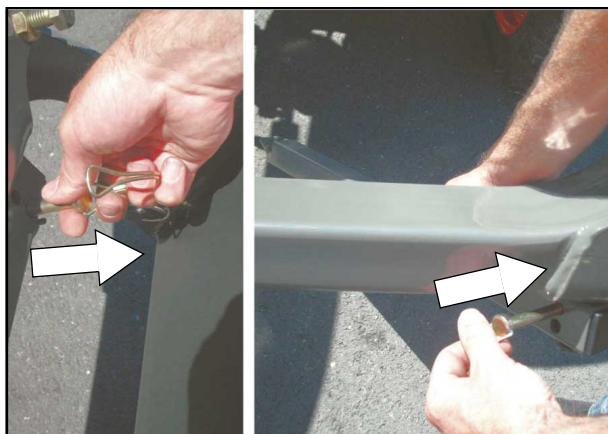
— Choose a level and solid surface.

CAUTION: The loader must always be connected to an implement in order to unhitch it.



— Lower the left and right parking stands.

C401, C401 XL



Other models in the range



— Remove the locking pins from the frame and put them in the available holes.

C401, C401 XL



Other models in the range



- Lower in double action to retract the lifting rams.
- Position the implement on the ground, slightly dumped (approx. 20°).
- Crowd slightly to set down the parking stands.



- Crowd slightly by moving forwards to release the bracket frames.
- Apply the hand brake.
- Stop the engine.



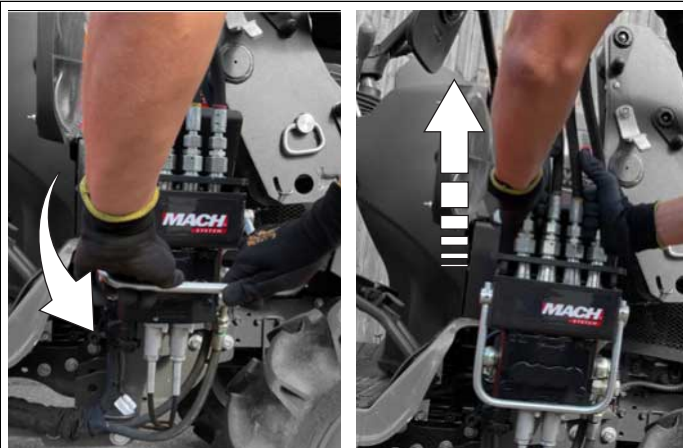
- Fully decompress all the hydraulic circuits.



- Disconnect the hydraulics and the electrics:

Loader **with** MACH System Compact

- Lower the handle to release the MACH System Compact.

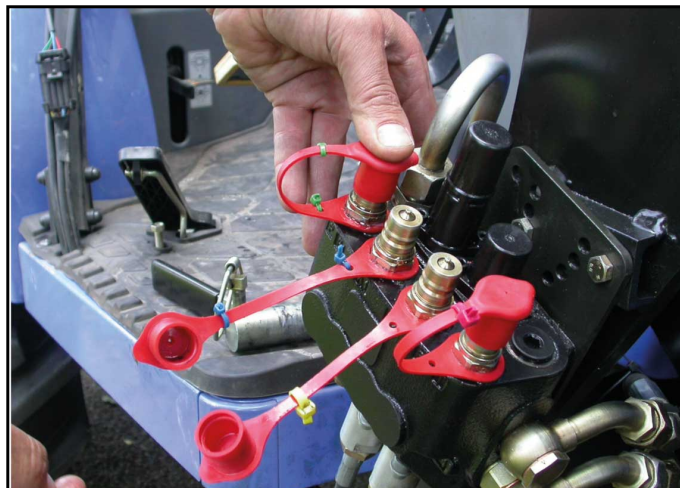


- Hook the MACH System Compact housing onto its support.

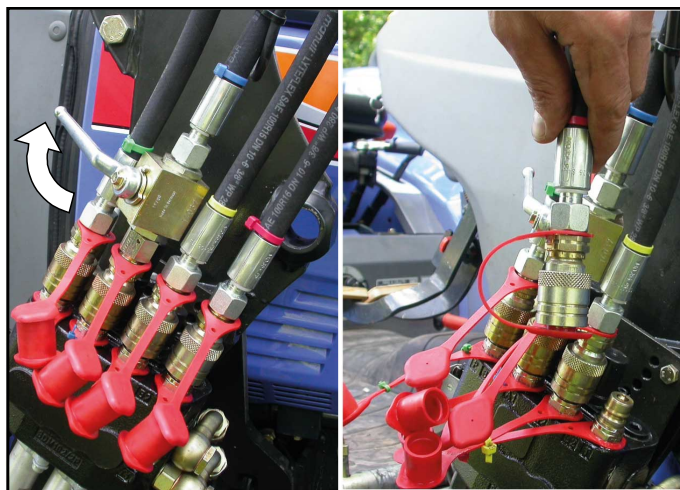


Loader **without** MACH System Compact

- Close the valve and disconnect the hydraulic couplings.



- Install (clean) protection caps on the male and female couplings.
- Stow the hoses on the loader.



- Reverse the tractor slowly, to clear the loader from the bracket.
- Check the stability of the whole assembly.

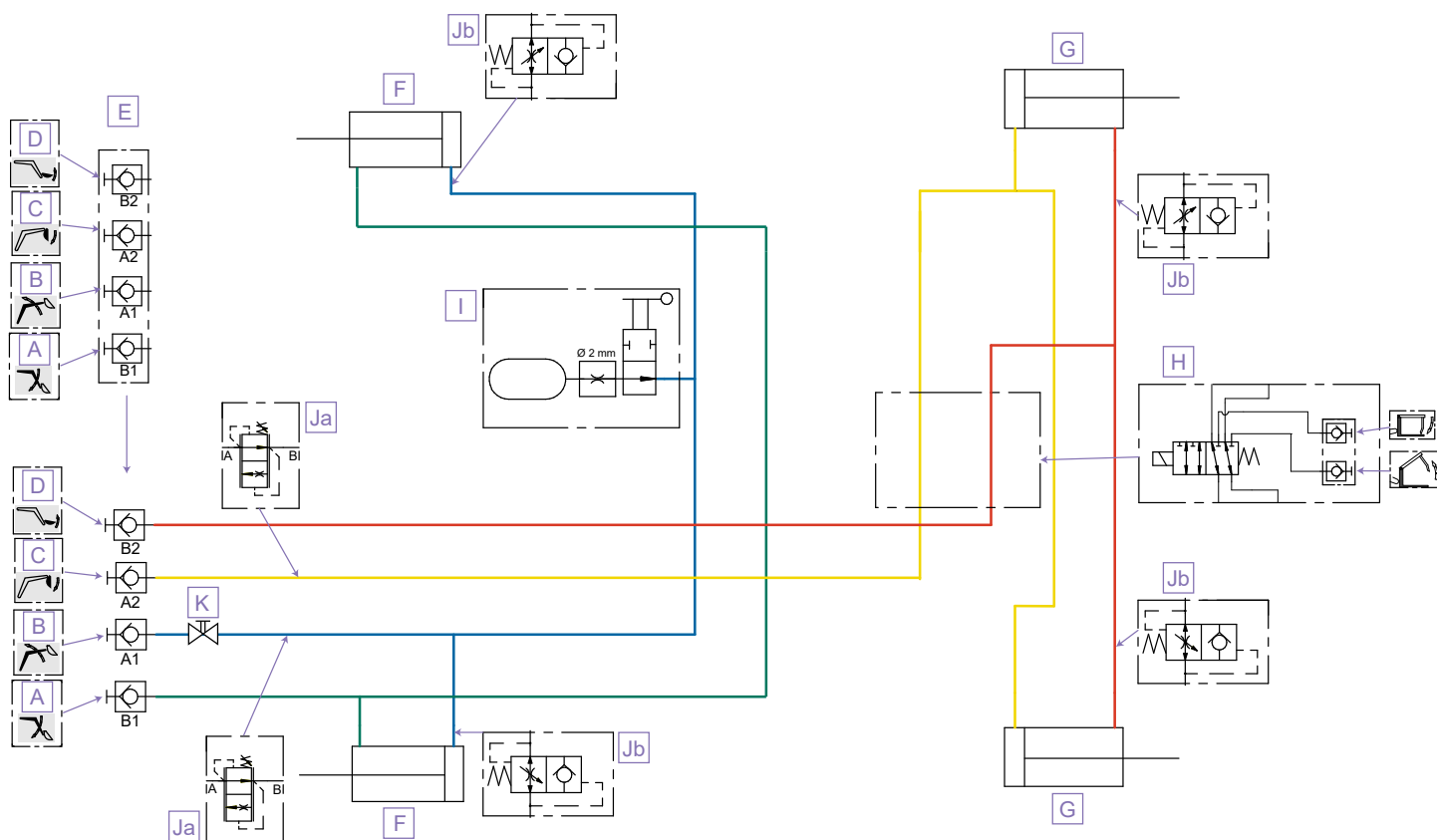


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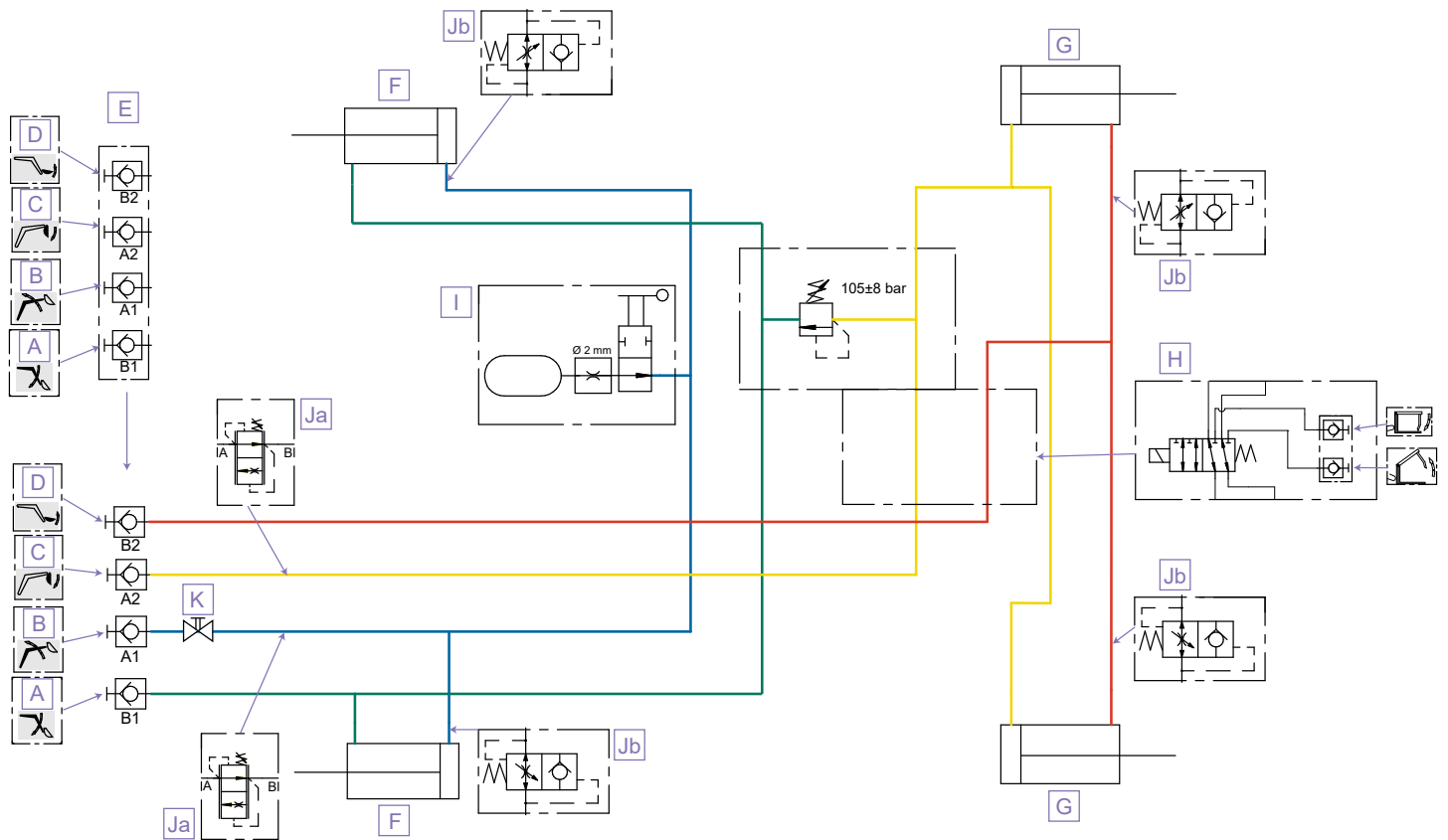
10

12.2. Loader hydraulics diagram for C402, C402 XL, C403, C405, C407, C403 PRO, C405 PRO, C407 PRO



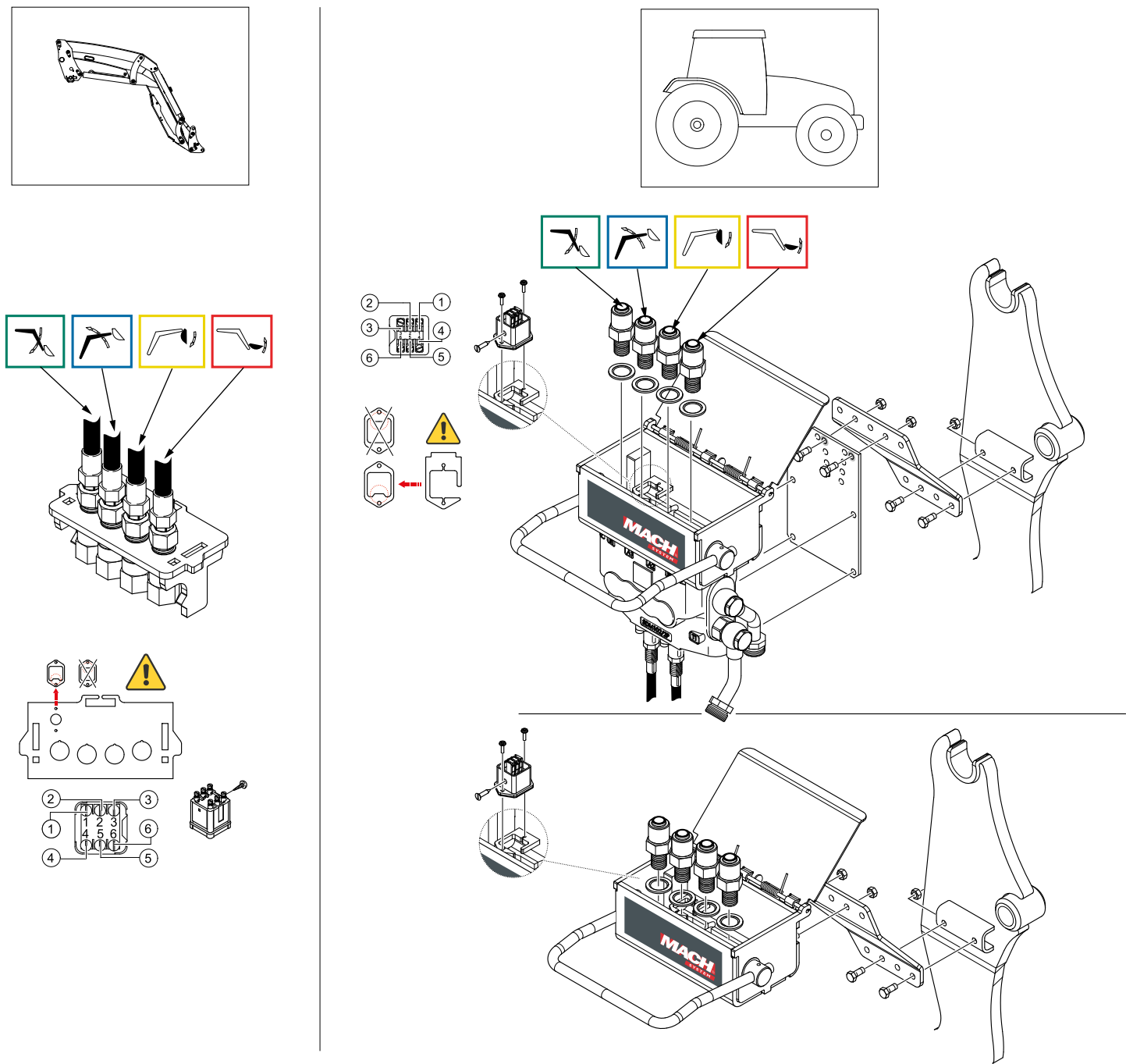
Marking	Description
A	Green
B	Blue
C	Yellow
D	Red
E	MACH System Compact (C400 PRO only)
F	Lift ram
G	Crowding ram
H	3rd function
I	Shock Eliminator
Ja	Safety when lifting and dumping: flow rate controller
Jb	Safety when lifting and dumping: safety valve
K	Valve (on coupling version)

12.3. Loader hydraulics diagram for C404 PRO, C406 PRO, C408 PRO



Marking	Description
A	Green
B	Blue
C	Yellow
D	Red
E	MACH System Compact
F	Lift ram
G	Crowding ram
H	3rd function
I	Shock Eliminator
Ja	Safety when lifting and dumping: flow rate controller
Jb	Safety when lifting and dumping: safety valve
K	Valve (on coupling version)

12.4. MACH System Compact



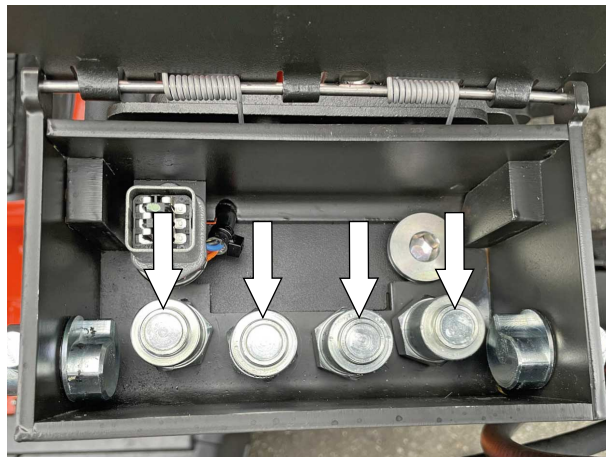
Marking	Description
1	Blue (- Ground)
2	not connected
3	not connected
4	Brown (3rd function)
5	Red (+ 12 V)
6	not connected

12.5. Maintenance: oil leaks

MACH System housing checks

- Disconnect the MACH System housing.
- Pressurise the control valve and check for oil leaks in the couplings.
- If a leak is found, switch off the engine and decompress the hydraulic circuit.
- The male coupling cannot be repaired.

Note: To replace it, loosen using a 27 mm spanner.



MACH System housing checks

Check the condition of the O-ring seal inside the female coupling:

- If the seal is in good condition, check the coupling assembly.



- Damaged seals should be replaced.
- Extract the seal using a small screwdriver.

Note: when replacing 16.4 x 2 seals, check their hardness, which should be 90 Shore (seal ref. MX 305408).



Replacing the female coupling

- Connect the MACH System housing, switch off the engine and decompress the hydraulic circuit.
- Loosen the hose (1) and remove the circlips (2).



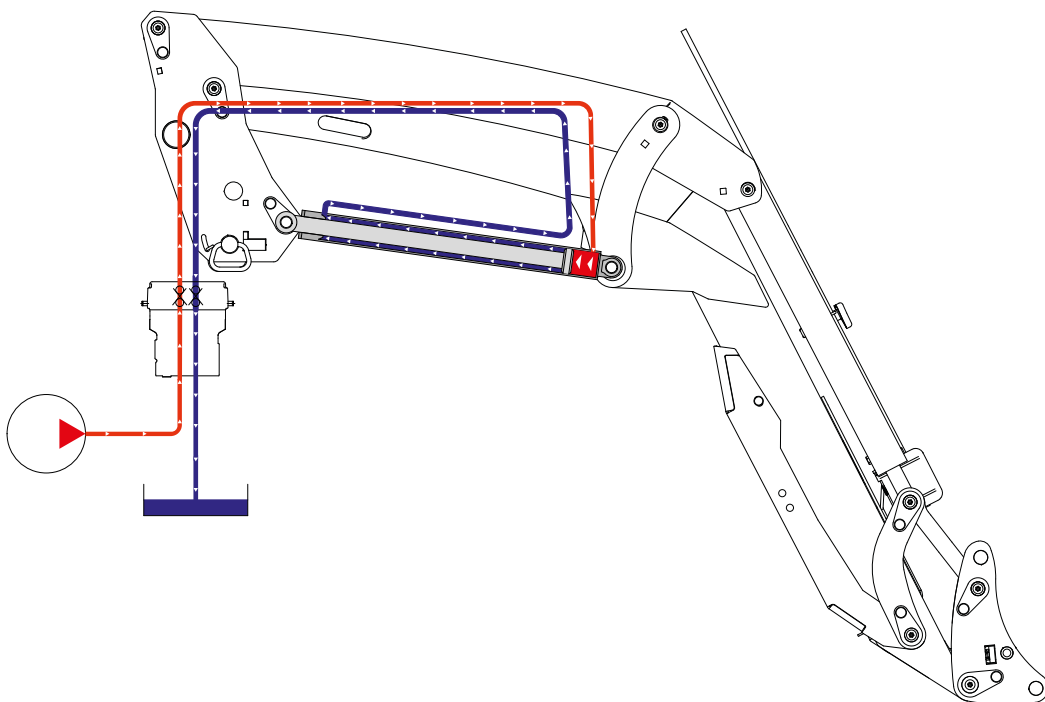
12.6. Lifting circuit

The lifting circuit comprises two double acting rams fitted in parallel.

When the base end chamber of the ram is pressurised, the loader lifts. The ram chamber is opened to the return circuit.

With the lifted loader, when the control lever is pushed halfway, just before the notch, the ram chamber is pressurised and the other base end is opened to return.

When the lever is fully pushed, it switches to floating position (MX control), meaning that the ram chamber and base end chamber are opened to tank.

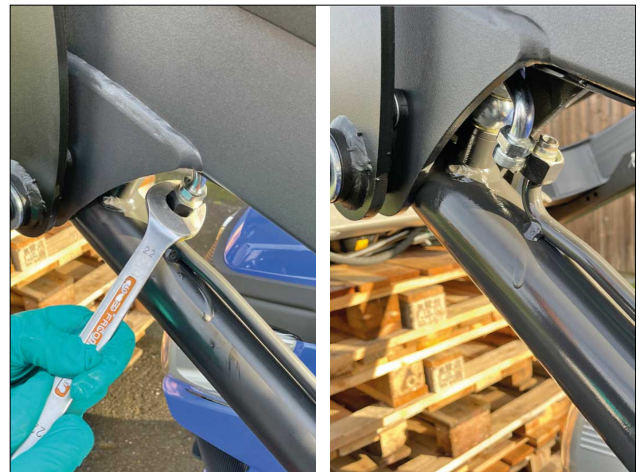


12.7. Lifting circuit check

- Check that the control valve neutral setting is correct, then load the implement.
- Lower the loader in double action mode, so that the lift ram chamber is correctly filled.
- To work safely, position the implement at height on a solid surface in the floating position.
- Switch off the tractor engine.



- Remove the right and left lift ram rod-side supply hoses.



- After disconnecting the hoses, restart the tractor.
- Disengage the floating position, then back the tractor away from the solid surface.
- Switch off the tractor engine.
- If oil leaks from one of the rams, replace the seals of the affected ram.



12.7.1. Maintenance: ram seal replacement kit

- Unscrew the ram head.



- Unscrew the piston locking nut.



- Unscrew the piston locking nut (other model).

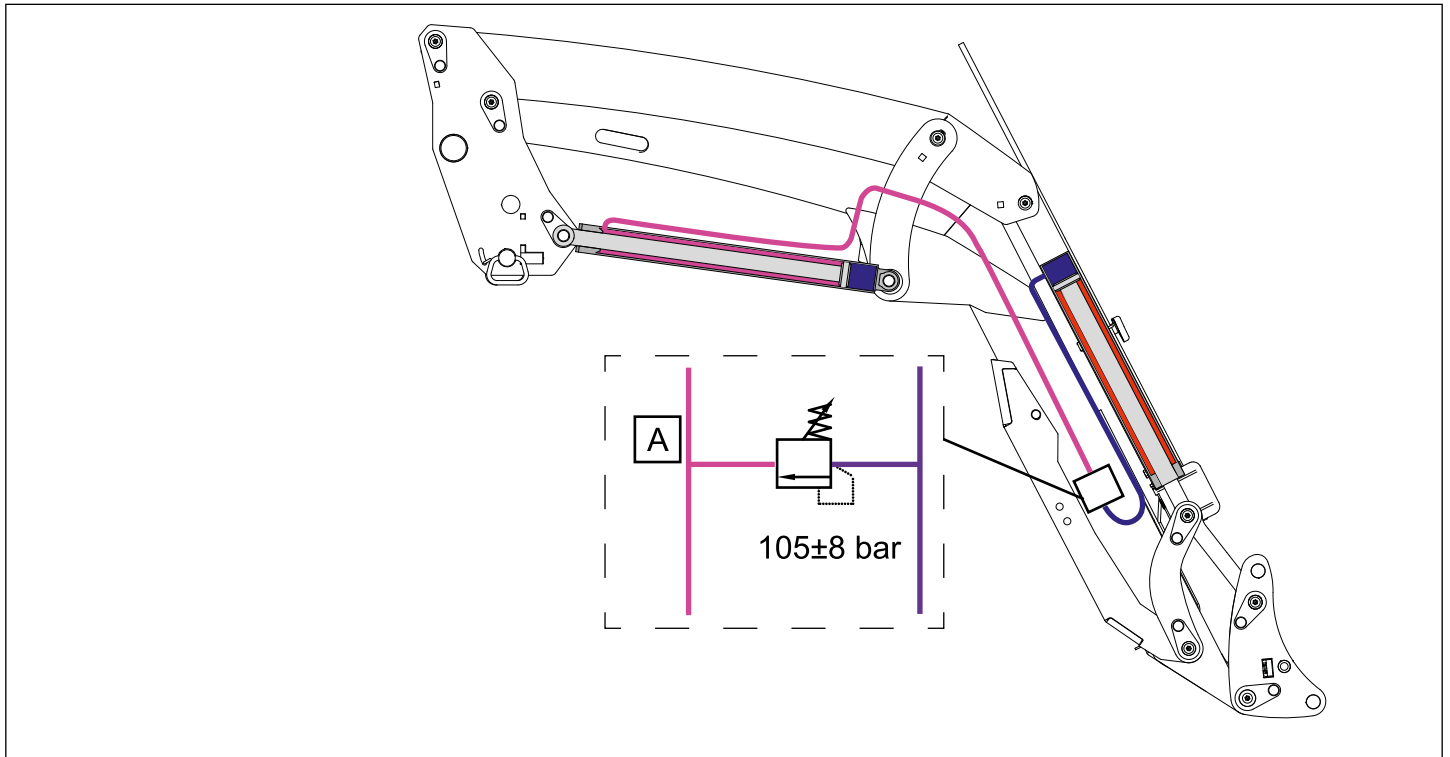


12.8. Dumping circuit

The dumping function comprises two movements:

- Crowding is achieved by moving the joystick to the left and tilts the bucket towards the tractor. This movement is used for filling the bucket.
- Dumping is achieved by moving the joystick to the right and tilts the bucket forwards. This movement is used for emptying the bucket.

Note: This circuit comprises two dumping rams and a pressure limiter unit, which acts as a shock valve (A). The pressure limiter block is only present on C404 PRO, C406 PRO and C408 PRO loaders.



12.9. Dumping circuit check

- Check that the control valve neutral setting is correct.
- Lower the loader in double action mode.
- Stop the loader approximately 1 m from the ground, then crowd fully.



- Disconnect the left and right hoses at the base-end of the dumping rams.
- Maintain pressure by crowding fully.
- If non-stop dripping or a continuous stream is observed coming from the rams, fit this ram with new seals.



12.9.1. Maintenance: ram seal replacement kit

- Unscrew the ram head.



- Unscrew the piston locking nut.



- Unscrew the piston locking nut (other model).



12.10. Checking the pressure limiter - C404 PRO, C406 PRO, C408 PRO loaders

The dumping rams are connected to a pressure limiter (also known as a shock valve). This block raises the loader when the implement is fully dumped.

It also protects the loader in backward motion during the scraping phase.

The limiter block is calibrated at 105 bar.

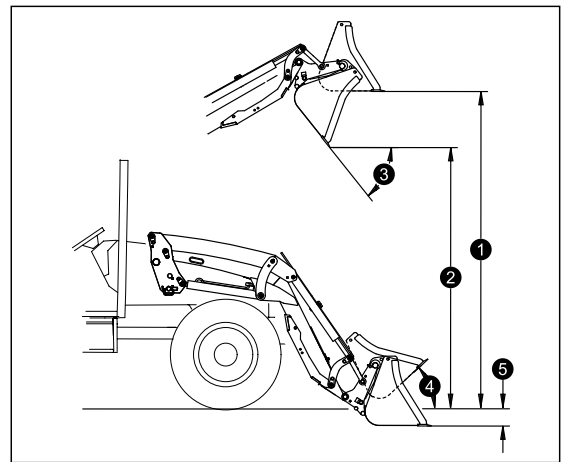
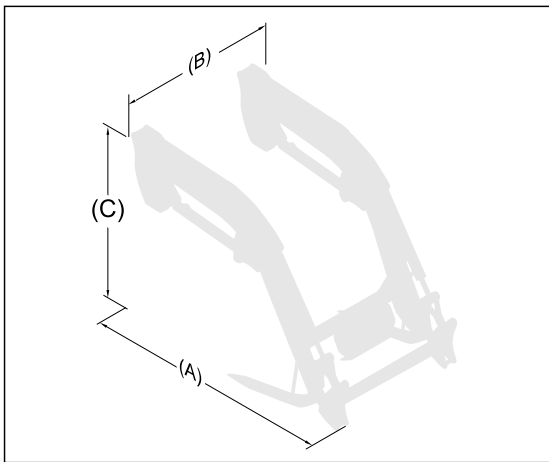
12.10.1. Checking the dumping pressure limiter

- Fit a pressure gauge with a tee-fitting on the dumping line of the MACH System housing.
- Dump the implement fully, then raise the loader.
- Read the pressure on the pressure gauge as the loader is lifting. This pressure should be between 100 and 120 bar, if not, replace the pressure limiter.



12.11. Loader performance

Check the values measured against the loader specifications listed below:



	C401/C401 XL	C402/C402 XL	C403	C405	C407
Tractor power	15 - 30 hp	15 - 30 hp	20 - 35 hp	25 - 50 hp	40 - 70 hp
Parallelogram	No	Yes	No	No	No
Dimensions					
Footprint (A)	1.20 m	1.38 m	1.48 m	1.58 m	1.78 m
Footprint (B)	0.90 m	1.10 m	1.10 m	1.10 m	1.20 m
Height (C)	1.05 m	1.20 m	1.20 m	1.25 m	1.35 m
Lifting range					
Maximum height at implement pivot*	1.92 m	1.90 m	2.20 m	2.50 m	2.80 m
Max. height under horizontal bucket (1) #	1.80 m	1.73 m	2.04 m	2.28 m	2.58 m
Max. height under dumped bucket (2) #	1.50 m	1.32 m	1.69 m	1.95 m	2.26 m
Working angles					
Dumping angle at full height (3) #	40°	50°	42°	36°	36°
Crowding angle (4) #	30°	42°	26°	25°	25°
Digging depth (5) #	10 cm	10 cm	15 cm	15 cm	15 cm
Lifting force at implement pivot*	485 kg	510 kg	984 kg	1120 kg	1495 kg
Lifting capacity at implement pivot over entire height*	485 kg	390 kg	657 kg	980 kg	1180 kg
Payload at 0.5 m from implement pivot**					
On the ground	320 kg	355 kg	600 kg	720 kg	995 kg
At 1.5 m from the ground	320 kg	310 kg	450 kg	660 kg	860 kg
At max. height	320 kg	310 kg	370 kg	505 kg	705 kg
Lifting time	3.0 s	2.8 s	3.2 s	5.2 s	4.2 s
Dumping time	3.0 s	3.1 s	2.4 s	3.3 s	2.6 s
Max. weight	106 kg/111 kg	179 kg/186 kg	130 kg	153 kg	216 kg

	C403 PRO	C404 PRO	C405 PRO	C406 PRO	C407 PRO	C408 PRO
Tractor power	20 - 35 hp	20 - 35 hp	25 - 50 hp	25 - 50 hp	40 - 70 hp	40 - 70 hp
Parallelogram	No	Yes	No	Yes	No	Yes
Dimensions						
Footprint (A)	1.25 m	1.25 m	1.45 m	1.45 m	1.80 m	1.81 m
Footprint (B)	1.05 m	1.05 m	1.05 m	1.05 m	1.12 m	1.12 m
Height (C)	1.42 m	1.52 cm	1.45 m	1.55 m	1.30 m	1.42 m
Lifting range						
Maximum height at implement pivot*	2.30 m	2.30 m	2.60 m	2.60 m	2.90 m	2.90 m
Max. height under horizontal bucket (1) #	2.10 m	2.10 m	2.47 m	2.47 m	2.76 m	2.76 m
Max. height under dumped bucket (2) #	1.73 m	1.73 m	1.96 m	1.96 m	2.25 m	2.25 m
Working angles						
Dumping angle at full height (3) #	55°	55°	51°	51°	51°	51°
Crowding angle (4) #	42°	42°	43°	43°	43°	43°
Digging depth (5) #	15 cm	15 cm	13 cm	13 cm	14 cm	14 cm
Lifting force at implement pivot*	812 kg	812 kg	900 kg	900 kg	1100 kg	1100 kg
Lifting capacity at implement pivot over entire height*	812 kg	812 kg	840 kg	840 kg	1080 kg	1080 kg
Payload at 0.5 m from implement pivot**						
On the ground	525 kg	660 kg	580 kg	690 kg	750 kg	895 kg
At 1.5 m from the ground	525 kg	660 kg	565 kg	690 kg	750 kg	895 kg
At max. height	525 kg	660 kg	530 kg	690 kg	730 kg	895 kg
Lifting time	4.1 s	4.1 s	4.5 s	4.5 s	3.9 s	3.9 s
Dumping time	2.2 s	2.2 s	2.2 s	2.2 s	1.7 s	1.7 s
Max. weight	233 kg	258 kg	248 kg	268 kg	263 kg	303 kg

Data may vary depending on the type of tractor being equipped.

Figures provided for a general purpose bucket.

Specifications established at:

- 140 bar pressure and a flow rate of 15 litres/min for the C401/C401 XL/C402/C402 XL.
- 160 bar pressure and a flow rate of 20 litres/min for the C403/C403 PRO/C404 PRO/C405/C405 PRO/C406 PRO.
- 180 bar pressure and a flow rate of 30 litres/min for the C407/C407 PRO/C408 PRO.

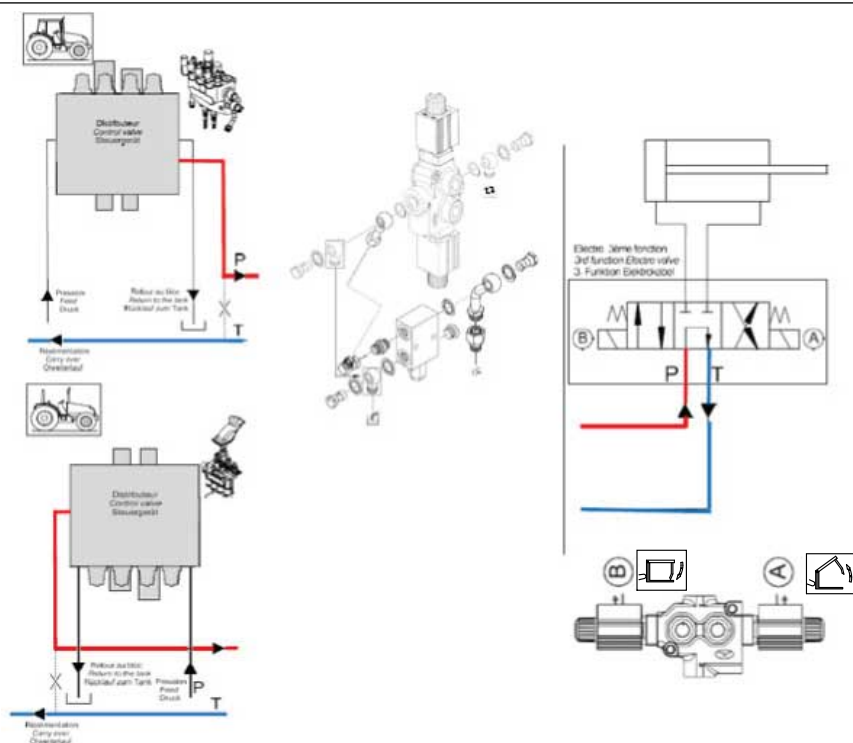
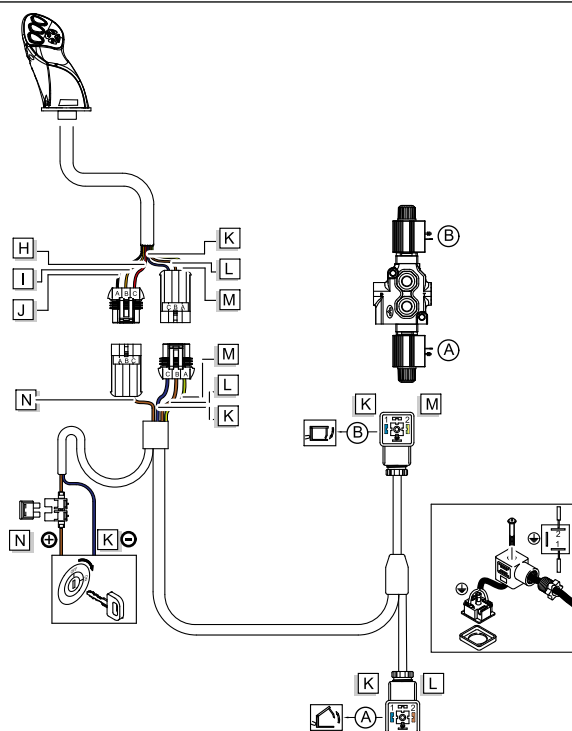
* Only payloads are counted. The values at ground level and at the implement pivot cannot be used.

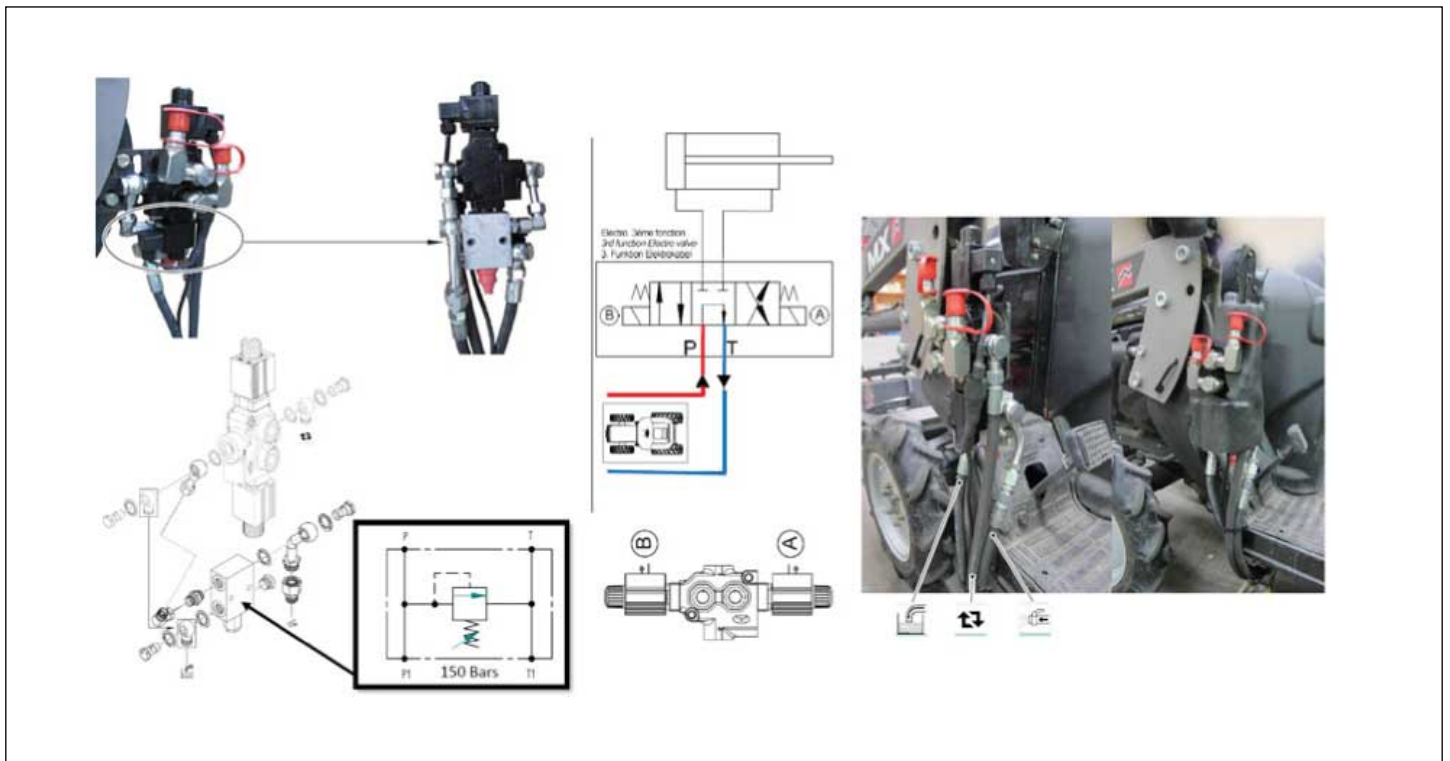
** The payload is calculated using an implement of:

- C401/C401 XL: BRC 118 R pin hitch.
- C402/C402 XL: BRC 120 R Euro hitch.
- C403/C403 PRO/C404/C404 PRO: BRC 140 R Euro hitch.
- C405/C405 PRO/C406/C406 XL/C406 PRO: BRC 160 M Euro hitch.
- C407/C407 PRO/C408/C408 PRO: BRC 180 M Euro hitch.

12.12. 3rd function circuit - C401, C401 XL

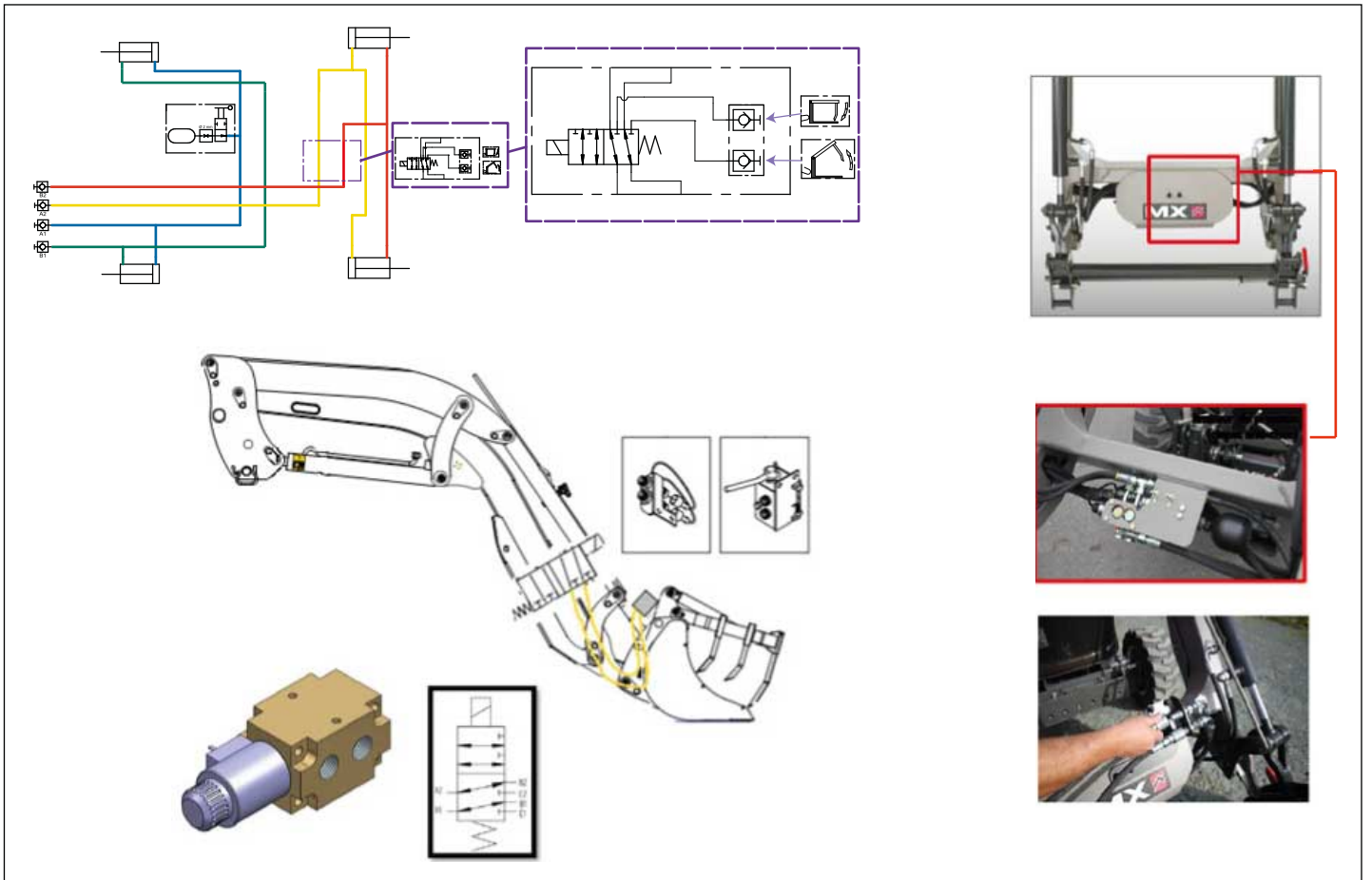
This is used for implements requiring hydraulic function (grab); this circuit consists of a solenoid valve assembled on the bracket. This solenoid valve uses the oil supplied by the dumping control valve to divert it to the loader's front-end in order, for instance, to power the grab on an implement.



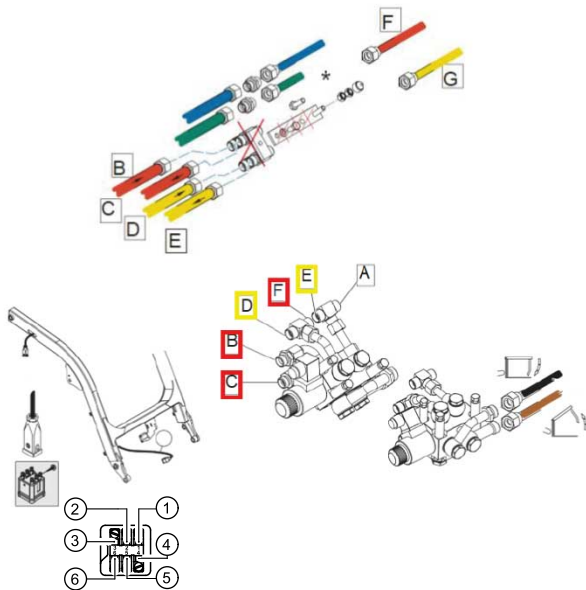


12.13. 3rd function circuit - Other models

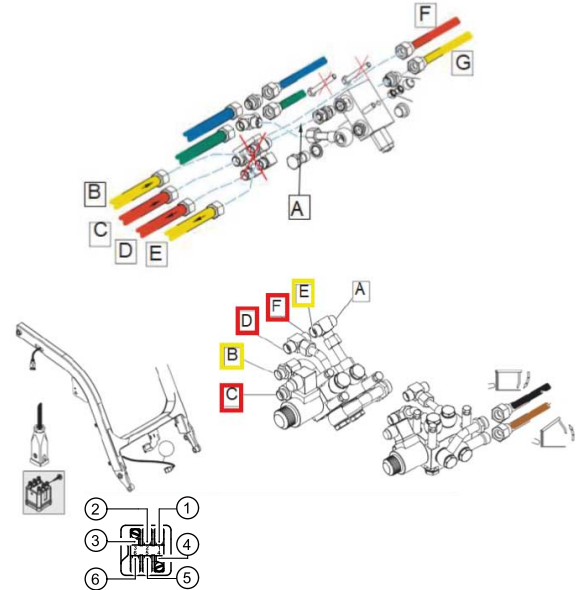
This is used for implements requiring hydraulic function (grab), this circuit consists of a solenoid valve built into the cross-bar. This solenoid valve uses the oil supplied by the dumping control valve to divert it to the loader's front-end in order, for instance, to power the grab on an implement.



MX C402, C402 XL, C403, C405, C407



MX C404 PRO, C406 PRO, C408 PRO



Marking	Description
1	Blue (- Ground)
2	not connected
3	not connected
4	Brown (3rd function)
5	Red (+ 12 V)
6	not connected

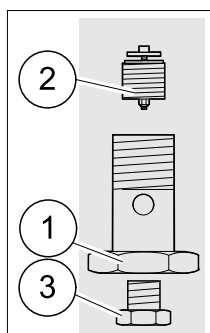
12.14. Safety when lifting and dumping

IMPORTANT: This device is essential for working when people are present near the load (optional).

Safety valves (parachute valves) are fitted to the lifting and dumping rams. They provide full protection in the event of hose rupture.

The device is integrated with the ram supply connections.

The device complies with EN 12525 A2-2010



(1) Ram supply connection. / (2) Parachute valve. / (3) Cap.

12.15. Checking the control valve for internal leaks

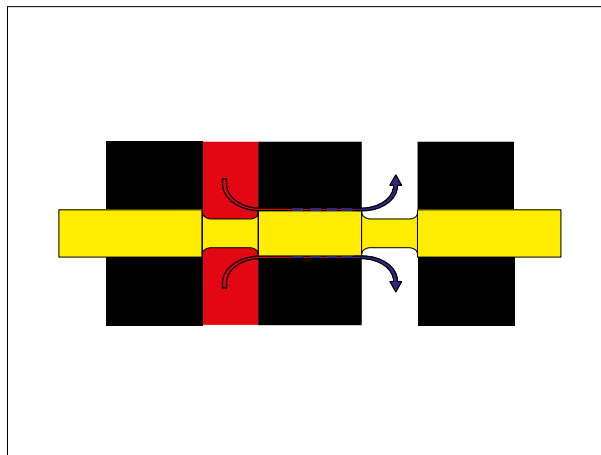
12.15.1. Control valve spools

Control devices consist of spool valves with metal-to-metal sealing.

The fit between the control valve body and the spool provides for a smooth and progressive sliding action:

- Clearance of less than 4 microns will result in the spool seizing in the control valve.
- Clearance in excess of 10 microns prevents comfortable use of the loader by the operator.

Notice: It is entirely normal for a loader to lower slightly without any action by the operator when the monolever handle is in neutral.



12.15.2. Checking the control valve for internal leaks

IMPORTANT: Check the rams for leaks before performing the following checks.

- Check that the control valve neutral setting is correct and that the oil temperature is constant, then load the implement.
- Raise the loader to at least 50 cm above the ground, then stop the tractor's engine.
- Measure the rod extension, wait for 15 mins, then repeat the measurement. Then calculate the difference between the two measurements.
- Measure the rod extension, wait for 15 mins, then repeat the measurement. Then calculate the difference between the two measurements.

$Q = (S \times L) / t$	
Unit	Description
Q	Leak flow rate
S	Active ram surface area
L	Length of rod displacement
t	Time of reading

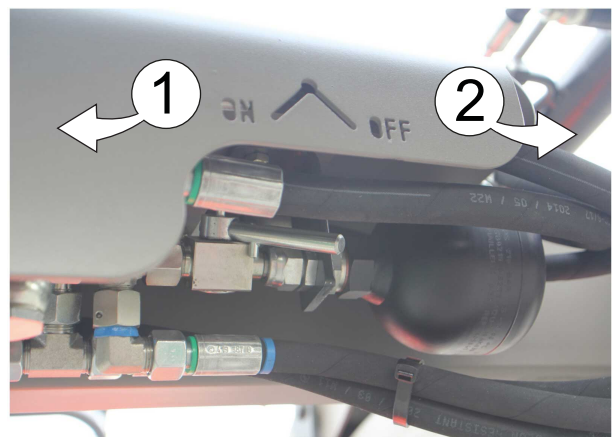
IMPORTANT: The leak value must remain between **4 cm³/min** and 10 cm³/min for normal operation.

ACTIVE RAM SURFACE AREA		
Loaders	Lifting rams	Dumping rams
C401, C401 XL	25.13 cm ²	15.31 cm ²
C402, C402 XL	25.13 cm ²	22 cm ²
C403	31.8 cm ²	22 cm ²
C404	31.8 cm ²	15.31 cm ²
C405	47.52 cm ²	25.13 cm ²
C407	56.55 cm ²	33.38 cm ²
C408 PRO	39.27 cm ²	33.38 cm ²
C407 PRO	39.27 cm ²	25.13 cm ²
C406 PRO	39.27 cm ²	25.13 cm ²
C405 PRO	39.27 cm ²	25.13 cm ²
C404 PRO	39.27 cm ²	25.13 cm ²
C403 PRO	39.27 cm ²	25.13 cm ²

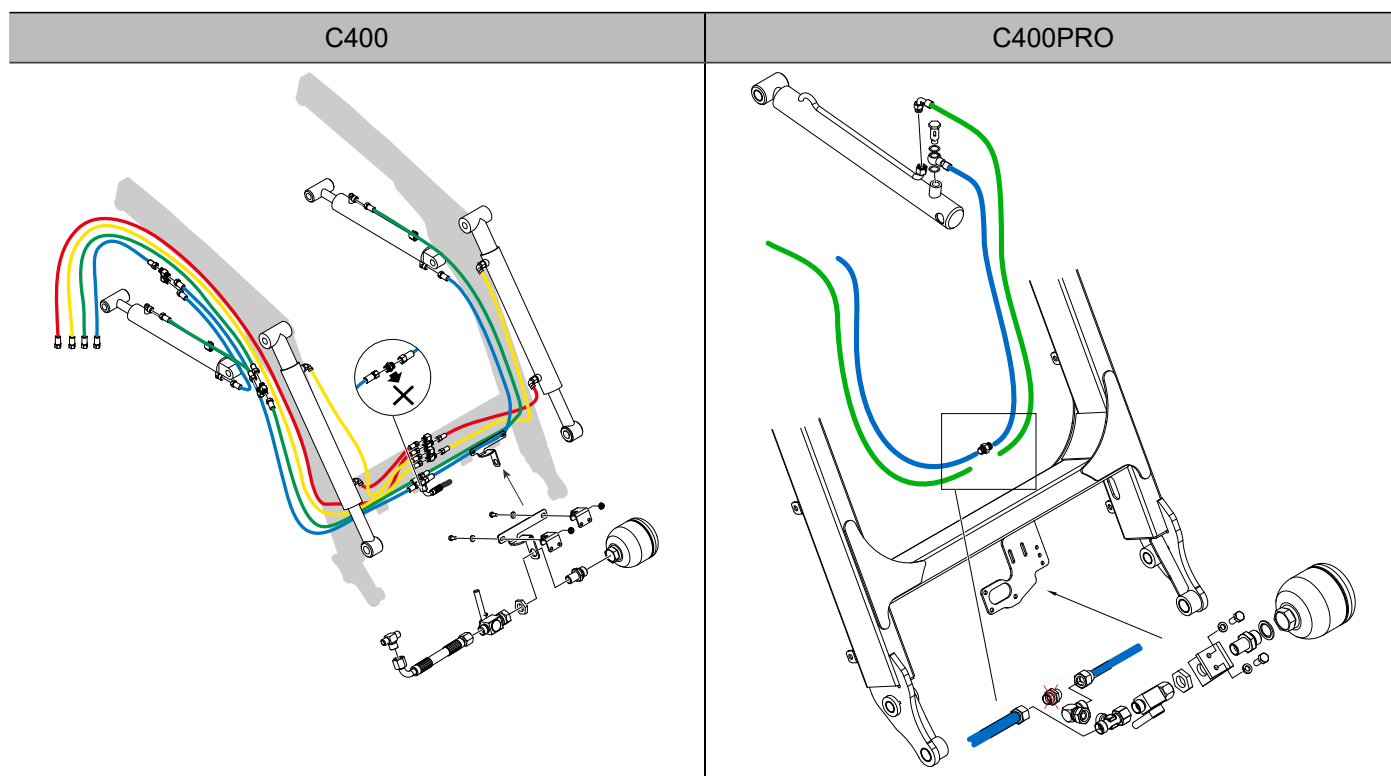
12.16. SHOCK ELIMINATOR System

12.16.1.

Shocks are eliminated during movement or when stopping the loader quickly when lowering.



(1) Suspension system active/(2) Suspension system inactive



12.16.2. Checking the SHOCK ELIMINATOR system

Test 1 - Testing conditions	
Valve open test	Valve closed test
1. Set the valve to the open position. 2. Stop the tractor engine. 3. Lower the loader, stopping it approximately 1 m from the ground. 4. Observe the loader's behaviour as it is stopping.	1. Set the valve to the closed position. 2. Stop the tractor engine. 3. Lower the loader, stopping it approximately 1 m from the ground. 4. Observe the loader's behaviour as it is stopping.
Test 1 - Test analysis	
Valve open test	Valve closed test
It should come to a stop smoothly: — If this is the case, the Shock Eliminator accumulator is working correctly and suspension is functioning. — If not, proceed to test 2 and compare.	The stop should be sharp and immediate.

If both tests result in the same behaviour, this means that the Shock Eliminator accumulator is not working effectively. It should be replaced.

Test 2 - Testing conditions

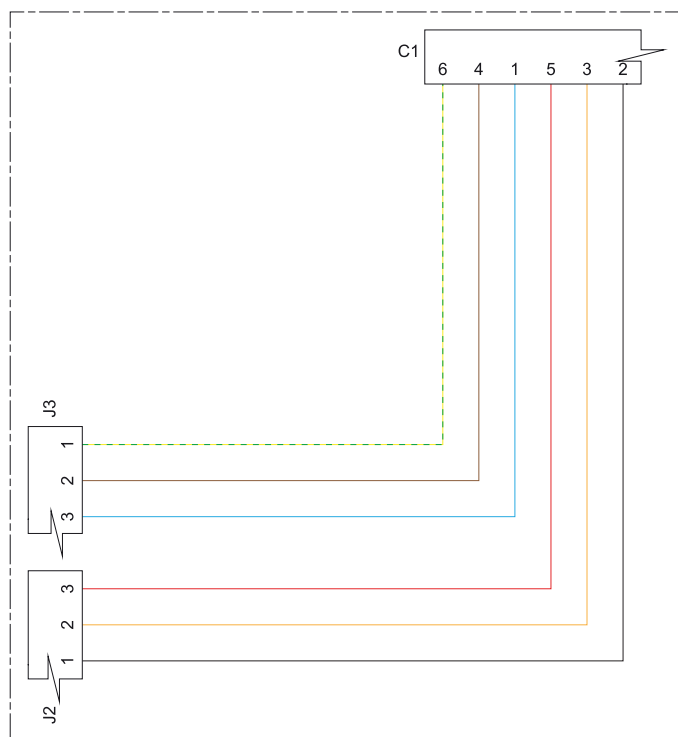
1. Lower the loader to the ground in the floating position.
2. Set the valve to the closed position.
3. Load the implement with a heavy load.
4. Lower the loader to 1 m from the ground.
5. Set the valve to the open position.

Test 2 - Test Analysis

- The loader descends slightly: the Shock Eliminator accumulator is working effectively.
 - The loader does not move: the Shock Eliminator accumulator is no longer effective. It should be replaced.
-

13. Loader electrics

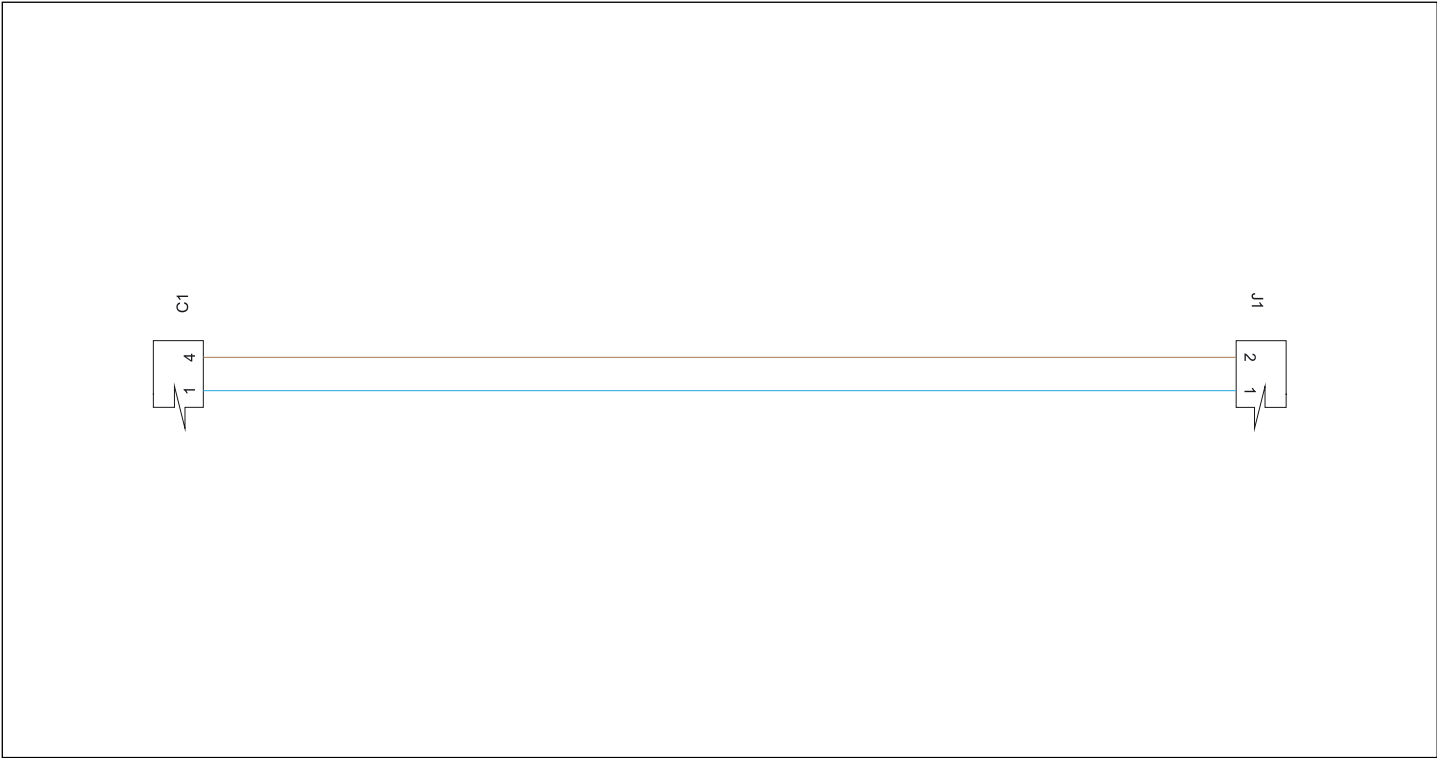
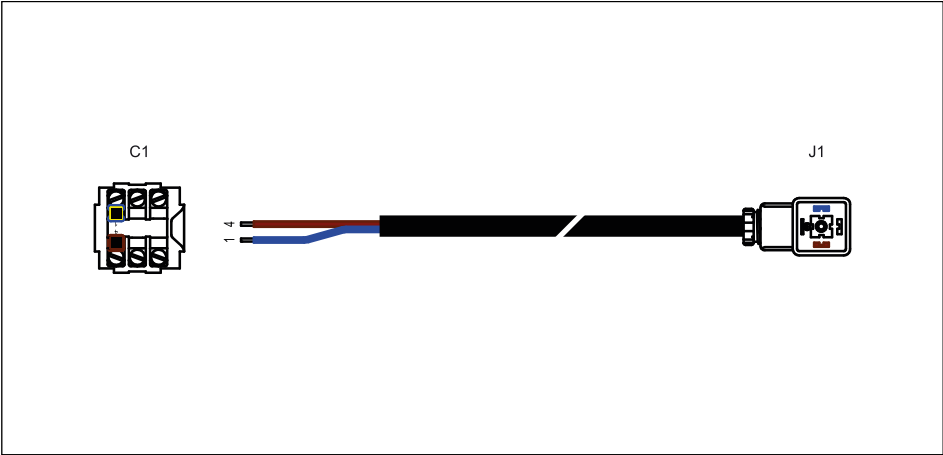
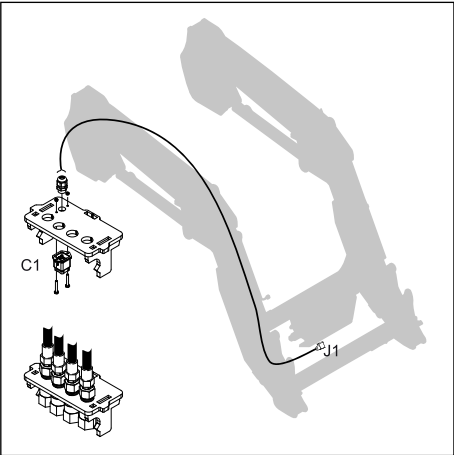
13.1. MACH System Compact wiring loom



Marking	Description
J2	MACH System Compact/tractor connector
J3	MACH System Compact/tractor connector
C1	MACH System connector
J3-1, C1-6	Yellow/green (Not connected)
J3-2, C1-4	Brown (3rd function)
J3-3, C1-1	Blue (- Ground)
J2-1, C1-2	Black (Not connected)
J2-2, C1-3	Orange (Not connected)
J2-3, C1-5	Red (+ 12 V)

13.2. 3rd function wiring loom - 306288. Mach Compact assembly

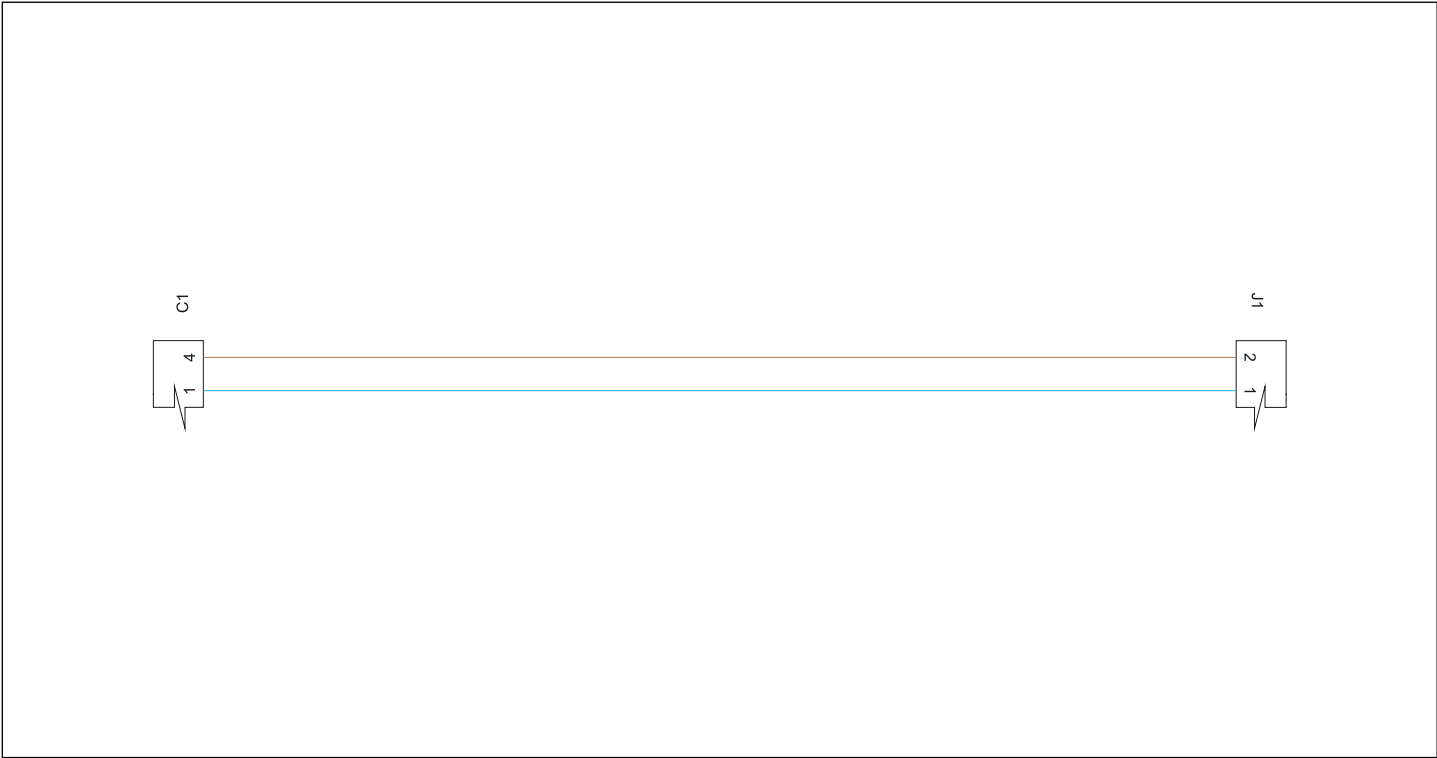
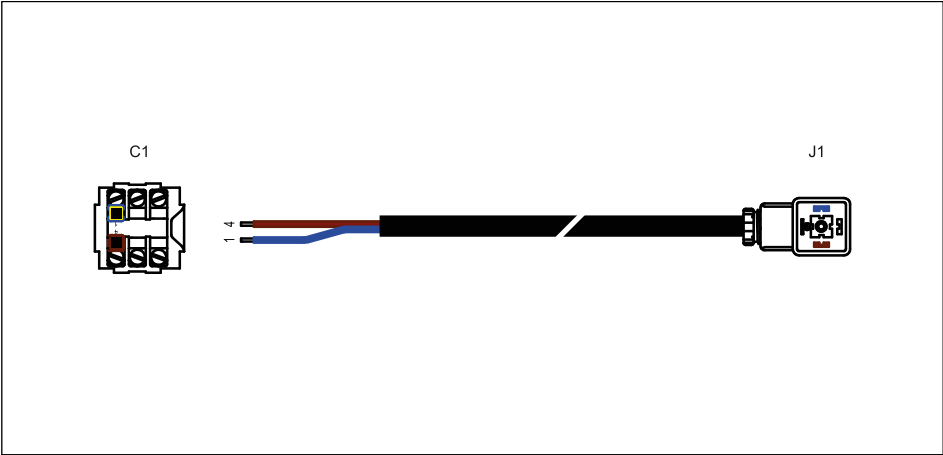
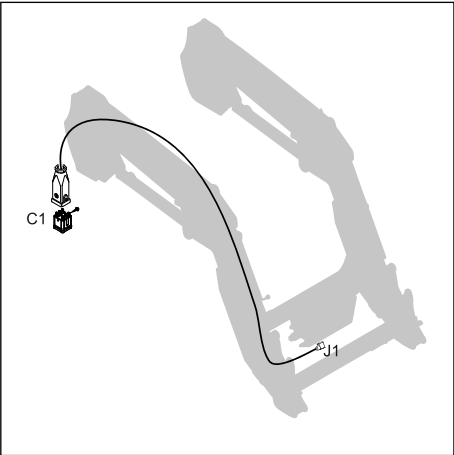
3rd function wiring loom connection to the Mach Compact housing.



Marking	Description
C1	MACH System Compact connector
J1	3rd function solenoid valve connector
C1-4, J1-2	Brown (3rd function)
C1-1, J1-1	Blue (- Ground)

13.3. 3rd function wiring loom - 306288. Coupler assembly

3rd function wiring loom connection to the protruding connector.



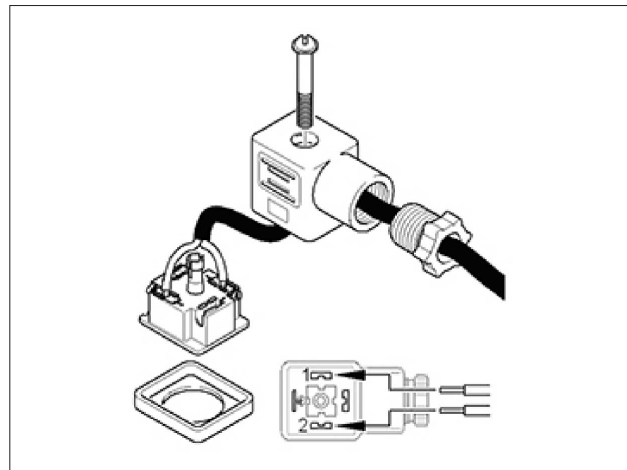
Marking	Description
C1	Protruding connector
J1	3rd function solenoid valve connector
C1-4, J1-2	Brown (3rd function)
C1-1, J1-1	Blue (- Ground)

13.4. Solenoid checking procedure

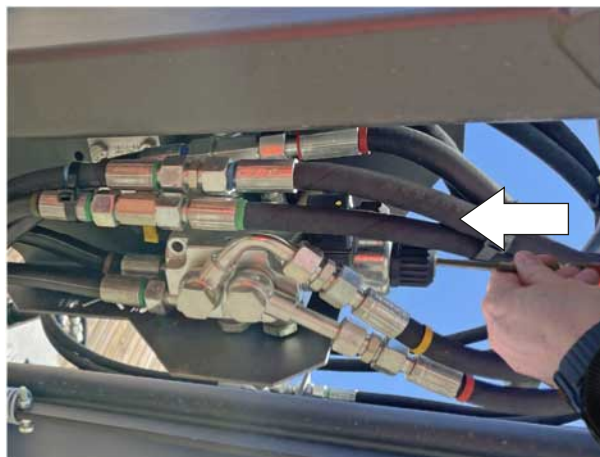
- Power the solenoid with a cable directly from the battery to the solenoid's two opposing terminals.

NOTE: Solenoids are not polarity sensitive.

- If the solenoid valve is working, look for the fault in the control circuit.



- If the solenoid valve is not working, activate the emergency control.

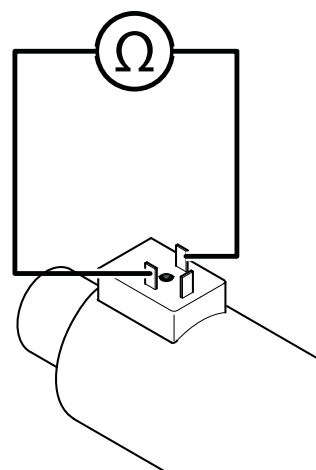


Activating the emergency control lever on the 3rd function solenoid valve.

13.4.1. Resistance measurement

Disconnect the solenoid valve before measuring resistance.

- Connect the ohmmeter to the solenoid valve's terminals.



3rd function solenoid valve on the C400PRO loader.

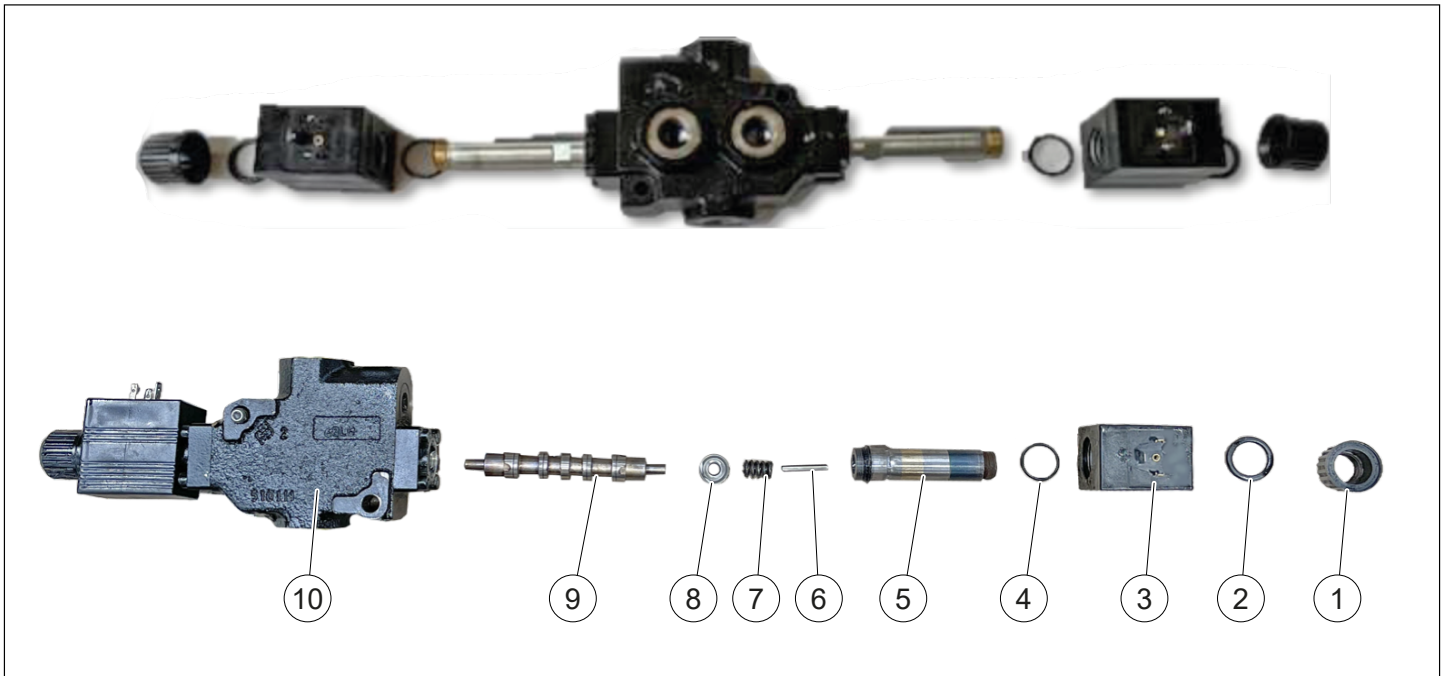
Option	Loader model	Power	Resistance
3rd function	C401, C401 XL	20 W max with 12 V. $I = 1.67$ A	between 7 and 8 Ohm
3rd function	C402 to C408 PRO	38 W max with 12 V. $I = 3.17$ A	between 3 and 4 Ohm

13.5. Solenoid valve cleaning

If the resistance value is good and the emergency mechanical action is not enough to operate the solenoid valve normally, the valve should be cleaned.

13.5.1. Cleaning the solenoid valve - C401, C401 XL

- Remove the nut (1) and the seal (2).
- Pull the solenoid (3) and the seal (4).
- Using a 17 mm spanner, remove the armature (5).
- Remove the armature (5) carefully, in order to retrieve the spring (7) and the spool (9). The pusher (6) often remains inside the armature (5).
- Clean everything, including the body (10).
- Re-assemble it in reverse order.



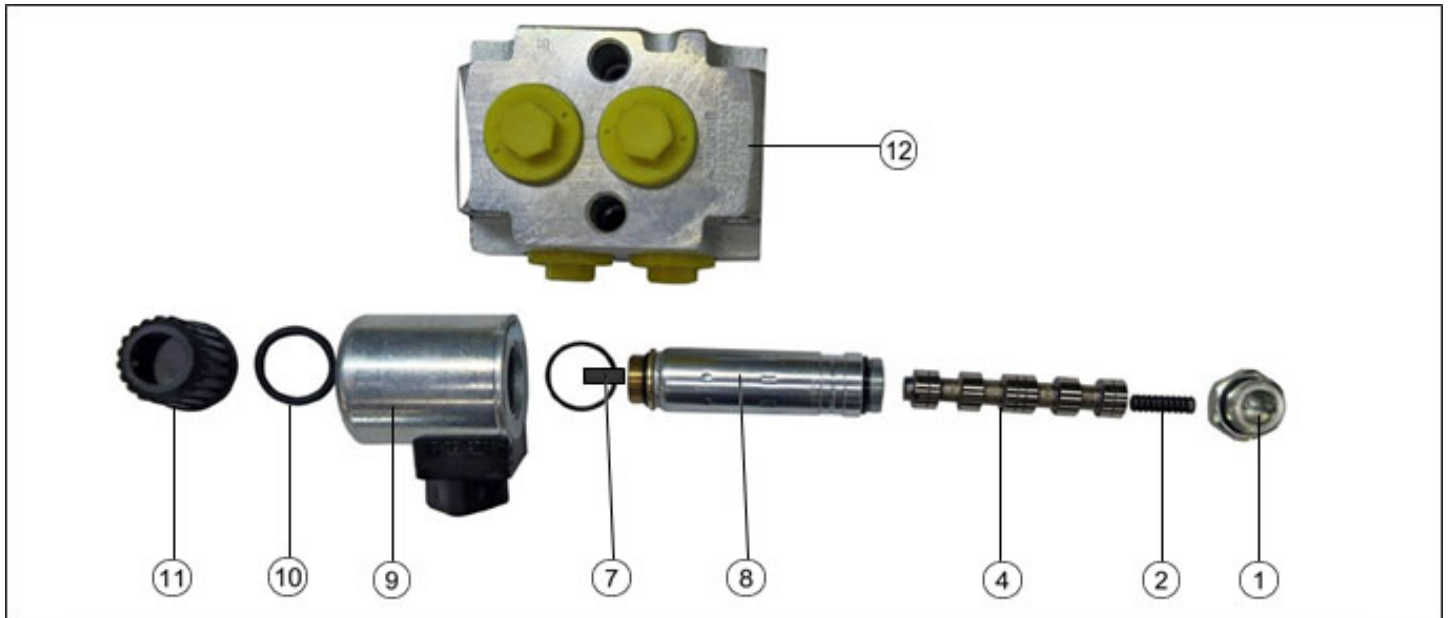
Recommendations for use to avoid solenoid valve clogging:

Clean the couplings on the loader side and the implement side before each hitching.

Note: The **MACH 2** option is recommended, because this connection unit's cover protects the female couplings.

13.5.2. Cleaning the solenoid valve - C402 to C408 PRO

- Remove the cap (1) on top of the solenoid valve.
- Retrieve the spring (2).
- Remove the nut (11) and the seal (10).
- Pull the solenoid (9).
- Using a 22 mm spanner, remove the armature (8).
- Carefully remove the armature (8) in order to retrieve the spring and the spool (4). The pusher (7) often remains inside the armature (8).
- Clean everything, including the body (12).
- Re-assemble it in reverse order.



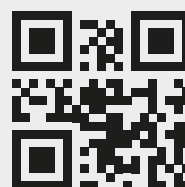
Recommendations for use to avoid solenoid valve clogging:

Clean the couplings on the loader side and the implement side before each hitching.

Note: The **MACH 2** option is recommended, because this connection unit's cover protects the female couplings.



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