

Dry Grain Bagger

R990 model
R1090 model



Operator's Manual
Parts list



WE MEET YOUR PRODUCTION NEEDS

CDEC00518D

Dry Grain Bagger

R-990 model

R-1090 model

Operator's Manual

This manual

Richiger has endeavored to provide the most accurate and clear information on this equipment. Because of efforts to produce the best equipment possible, upgrades and improvements may precede this or subsequent manuals' updates. Therefore, contents of this manual are based on development in effect at the time of publication and are subject to change without notice.

Important

Before attempting machine operation, read this manual's instructions carefully.

This manual contains information and recommendations that may vary in accordance with user experience, climate, grain type, tractor weight and other variable conditions.

Important information



This is the safety alert symbol. It is used to alert the operator about personal safety and risk factors involved when using this equipment. Always observed and follow these important instructions in order to promote safe operation with good work habits.

Richiger baggers are designed and manufactured for years of dependable service when used for the purpose for which it is intended, and when proper maintenance is carried out.

This operator's manual should be thoroughly studied and understood for safe and efficient use of the machine. Keep it near at hand for consultation and ensure that anyone who uses the machine reads it before he operates it for the first time.

READ THIS MANUAL CAREFULLY. Pay special attention to symbols and safety decals, and their meaning detailed here, that you will find on the bagger and throughout this manual.

NEVER OPERATE THIS EQUIPMENT UNTIL USER FULLY UNDERSTANDS THE COMPLETE CONTENTS OF THIS MANUAL. FOR OWNERS WHO DO NOT OPERATE THIS EQUIPMENT, IT IS THE OWNER'S RESPONSIBILITY THAT THE USER IS PROPERLY INSTRUCTED AND IS FULLY AWARE OF THIS MANUAL' S CONTENTS.

This is important in the safe handling of this equipment and to promote an efficient operation. If there are any questions about sections in this manual, it is important to contact your dealer for clarification.

This machine is guaranteed as stated on the next page. A Warranty Registration Card is to be filled and signed with data pertaining to the machine, the buyer and the seller, and promptly returned to the factory. The card provides a ready reference to help you in securing warranty and in answering questions that you may have at some later date.

The serial number and identification tag is located in the forward section of the frame. Please refer to these numbers when parts or warranty communication is necessary.

PLEASE WRITE DOWN THE INFORMATION ABOUT YOUR MACHINE MODEL, UNIT NUMBER AND SERIAL NUMBER AS INDICATED IN THE REGISTRATION PLATE SO THAT YOU HAVE IT AT HAND IF NEEDED.

MACHINE MODEL:

UNIT N°:

SERIAL N°:

Warranty policy

Warranty terms

Unit: **Grain bagger model R-990 or model R-1090**

Richiger Maquinarias SA, located in Avellaneda 661, (S2322BCM) Sunchales, Province of Santa Fe, Argentina, warrants its products Grain bagger R-990 or Grain Bagger R-1090, whichever applies to the present purchase, from defects in materials and workmanship under normal operating conditions and proper application, in accordance with the specifications for operation as described by the manufacturer, for the period of 12 months from date of delivery to buyer. The buyer of the machine, or the Service Center, representative or dealer of the machine in his representation shall return this certificate to **Richiger Maquinarias SA** within 30 days after delivery of the product for the warranty terms to apply. Repairs performed under guarantee and the related parts replaced are guaranteed until termination of the normal warranty validity period.

Limitations on Warranty

This warranty is expressly in lieu of any other warranties, express or implied, including any warranty of merchantability or fitness for a particular purpose.

Buyer's sole and exclusive remedy under this warranty shall be limited to the repair, replacement or exchange of warranted products at our option, F.O.B. our factory, or designated Service Center, representative or dealer. Should one of them grant any warranty greater in scope or time period or labor allowance than that detailed herein, **Richiger Maquinarias SA** shall not be liable beyond the herein stated limitations.

Equipment and accessories not of our manufacture are not covered by this warranty. Any claim with regards to defective aforementioned equipment and accessories shall be submitted by **Richiger Maquinarias SA** to the original manufacturers for analysis and subsequent non-approval or approval of repair, replacement or exchange, at their option. No special, incidental, consequential or other damages or contingent liabilities including, but not limited to, loss of life, personal injury, loss of production, loss due to fire or water damage, loss of business or business income, down time costs and trade or other commercial loss arising out of the failure of product. The term product and products as used in this warranty designates the whole finished unit in its entirety, i.e. the complete assembled machine, and/or all and every individual component, part, equipment and accessory that forms said complete assembled machine.

Normal wear and tear associated with use is expressly excluded from this warranty.

No products shall be returned without prior authorization from **Richiger Maquinarias SA**.

Buyers and their agents shall prepay all transportation charges for the return of such products to **Richiger Maquinarias SA** or designated Service Center. There will be no acceptance of any charges for labor and/or parts incidental to the removal and remounting of product repaired or replaced under this warranty.

This warranty does not cover conditions over which **Richiger Maquinarias SA** has no control, including, without limitation, contamination, pressures in excess of recommended maximum, products damaged or subject to accident, abuse or misuse after shipment from factory, products altered and repaired by anyone other than **Richiger Maquinarias SA** factory personnel or dealer or source approved by **Richiger Maquinarias SA** in writing prior to commencement of said work.

The first buyer is responsible for proof of delivery date of product for the purpose of establishing warranty time of validity. Warranty can continue for new user should product be resold by first buyer during valid period of warranty, only if this situation is reported in writing, with enclosed documentation as proof of purchase. Warranty will not be applicable if series number or other identification markers are erased, obliterated or otherwise altered.



Limitations on Warranty

The following are types of failures which are not attributable to defects in materials and/or workmanship and which are not considered by **Richiger Maquinarias SA** as part of the warranty extended hereunder. This listing is by way of example and not intended to be exhaustive:

- 1) Product suffered damages attributable to accident, abuse, neglect or ignorance.
- 2) Product was not used in accordance with manufacturer's recommendations.
- 3) Product did not receive required maintenance.
- 4) Failure ensued after replacement of original parts without express consent of **Richiger Maquinarias SA**, or modifications that in **Richiger Maquinarias SA's** judgement may have affected performance, safety and/or dependability parameters.
- 5) Product was used in a manner or for a purpose for which it was not designed or intended to be used by the manufacturer.
- 6) Incorrect mounting of external gears, pulleys, etc.
- 7) Stripped splines or keyways on drive shafts.
- 8) Damage due to deterioration during periods of storage by the purchaser prior to operation.
- 9) Damage of any kind from erosive or corrosive action of any gases or liquids handled by the machinery.
- 10) Lack of or incorrect type of hydraulic fluid, lubricant, oil and/or grease.
- 11) Contamination of the hydraulic fluid.
- 12) Operating beyond recommended maximum speeds, pressures and temperatures.
- 13) Repairs or disassembly by unauthorized personnel.
- 14) Misalignments of drive shafts, gears, sprockets and power driven elements.
- 15) Damage due to voltage spikes, static discharge, electrical storms, physical abuse, externally controlled device failure and improper fusing.

Buyer inspection and acceptance

Within 8 days after delivery to or receipt of product, buyer (User Customer) shall inform seller (Service Center, representative or dealer) in writing if product is found defective or short in any respect. Failure to so inform seller or any use by buyer of product shall constitute conclusive evidence that seller satisfactorily performed and buyer waives any right to reject product thereafter.

About the Warranty Registration Card

The Warranty Registration Card is to be filled in completely and signed by the buyer, and promptly returned to factory by the buyer or by the Service center, representative or dealer. It certifies delivery and provides a ready reference to help you is securing parts and in answering questions that you may have at a later time.

This card does not put you on a mailing list. Nor is the information on the card made available to anyone else.

We urge the return of this card so that you will receive maximum service benefits.

Cut the Warranty Registration Card on next page along the dotted lines and hand over to the Service Center, representative or dealer who sold and delivered the machine, or mail directly to:

Richiger Maquinarias SA
Avellaneda 661,
S2322BCM Sunchales,
Province of Santa Fe,
Argentina

Cut-Out Warranty Registration Card

This form must be filled out and signed by the customer at the time of delivery, and sent to factory within 30 days of delivery.

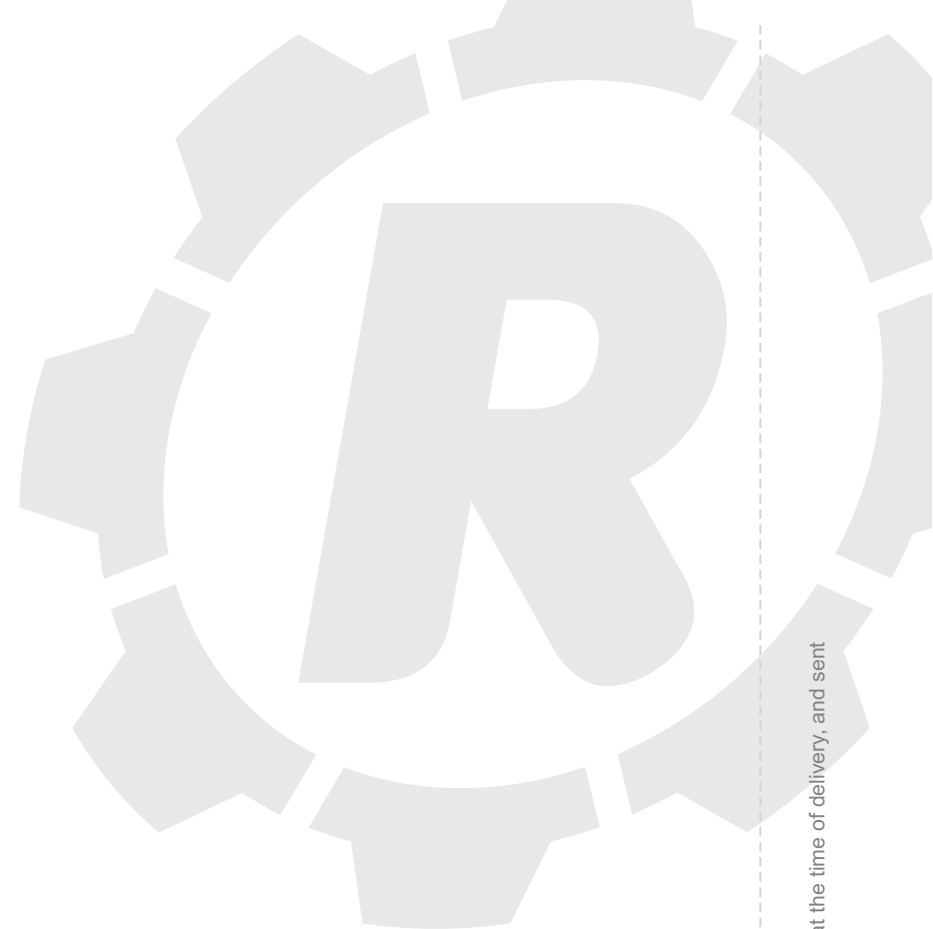


| | | | |
|----------------------|--|--------|--|
| Machine Description: | | | |
| Model #: | | | |
| Unit #: | | | |
| Date of Purchase: | | | Date of Delivery: <input type="text"/> |
| Customer Name: | | | |
| Address: | | | |
| City: | | State: | |
| Dealer Name: | | | |
| Address: | | | |
| City: | | State: | |

The machine detailed above and the Operator's Manual have been received and I understand and have been thoroughly instructed by my dealer about how to operate the machine, Operator's Manual content, equipment care, safe operation & warranty terms, and have personally reviewed the Warranty Policy Terms.

| | |
|--|------------------|
| | Owner Signature: |
|--|------------------|





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Richiger Maquinarias SA
Avellaneda 661,
S2322BCM Sunchales,
Province of Santa Fe,
Argentina

Cut-Out Warranty Registration Card

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The following Safety Alert Symbols mean **ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!** They stress an attitude of “Active Safety” and can be found throughout this Operation Manual and on the machine itself. **BEFORE YOU ATTEMPT TO OPERATE THIS EQUIPMENT, READ AND STUDY THE FOLLOWING SAFETY INFORMATION. IN ADDITION, MAKE SURE THAT EVERY INDIVIDUAL WHO OPERATES OR WORKS WITH THIS EQUIPMENT IS FAMILIAR WITH THESE SAFETY PRECAUTIONS.**



DANGER

Indicates one of the most serious potential hazards. Death or serious injury will occur.



WARNING

Indicates a hazard less serious than one indicated by a DANGER decal. Death or serious injury could occur.



CAUTION

Reminds operators of a safety instruction and identifies a hazard less serious than one indicated by a WARNING decal. Minor or moderate injury may occur.



IMPORTANT

Offers reminders or supplementary information.



Mandatory safety shutdown procedure

READ and follow the instructions on all decals.

REMEMBER! It is the owner's responsibility for communicating information on the safe use and proper maintenance of this machine! This includes providing understandable interpretation of these instructions for all machine operators.

BEFORE cleaning, adjusting, lubricating or servicing the unit:

1. Remove the ignition key from the power unit engine.
2. Make sure that all movement of the unit has ceased. **ONLY** when you have taken this precaution can you be sure it is safe to proceed with any hands-on maneuver. Failure to follow the above procedure could lead to death or serious bodily injury.
3. Disconnect the PTO before starting actual work on the machine.

Safety reminders

USER/OPERATOR SAFETY PRACTICES are included in this Operation Manual and are intended to promote **SAFE OPERATION** of the unit.

The safety guidelines presented here are not a substitute for security codes, insurance company constraints or traffic regulations. Make sure your machine is equipped with the elements required in your country for towing or fifth if travel on roads. These guidelines do not preclude the use of good judgment, care, and common sense as may be indicated by the particular job site work conditions.

It is important, in order to avoid accidents involving oneself or others, to be familiar with this machine. The study the location and operation of all controls. Survey the controls in a safe area before actually operating in the field.

It is essential that operators be physically and mentally free of mind altering drugs and chemicals and thoroughly trained in the safe operation of the unit. Such training should be presented completely to all new operators and not condensed for those claiming previous experience.

Some photographs used in this manual may show Doors, Guards, and Shields open or removed for illustration purposes.

BE SURE that all doors, guards, and shields are in their proper operating positions **BEFORE** operating the unit. **NEVER** operate this unit with any guards or shields not in place. Replace any missing or damaged ones.

Keep hands and feet away from all moving parts. Do not wear loose clothing, scarves or pendants that can get caught in moving parts.

NEVER assume that everybody is as safety conscious as you are.



Personal safety

- Do not** allow minors and any unqualified trained personnel to operate or be near the unit unless properly supervised!
 - Do not** allow anyone to ride on the unit at anytime!
 - Never** leave the unit running unattended! Whenever the bagger if the is working, tractor should not be left unattended so that PTO shaft can be stopped in the event of an unforeseen situation.
 - Always** wear appropriate personal safety gear as called for by the job or working conditions!
 - Never** wear loose clothing while working around moving parts.
 - Always** be aware of pinch point areas on the unit!
 - Always** keep hands, feet, hair and clothing away from moving parts.
 - Stop** and disengage PTO and shut off tractor before doing any adjusting or servicing to unit.
 - Never** step on or over PTO drive-line at any time.
 - Always** use appropriate personal protection equipment (gloves, head and eye protection gear) when doing maintenance work.
 - Never** stand in front of the wheels when disengaging brakes as the bagger can start forward unexpectedly due to rain pressure inside the bag. This sudden movement can imperil anyone in the machine's path.
- Decals with safety indications and warnings should be strictly heeded, kept in good condition and replaced if necessary.

Pre-operation and operation safety

- Follow a regular maintenance program.
- DO NOT** pull the unit without having safety chains attached to the tractor.
- Do not have anyone stand** in front, behind, or along side of the machine when machine is running.
- Always use a hitch pin with a retaining clip!
- Check wheel bolts regularly and tighten them as required.
- Check recommended tire pressures of 50 PSI.
- Keep hands, feet, hair and clothing away from moving parts.
- Make sure all guards are in place before using the bagger.
- Replace any parts which show signs of excessive wear, cracking, or likelihood of failure, with original equipment service parts.
- Be familiar with the levers controlling all hydraulically controlled components.
- Before loading** grain, make sure that the unit does not have any foreign object or material lodged in it that could cause equipment damage or personal injury.
- Check that PTO slides freely, is not damaged and is secured properly to tractor and unit. Make sure that there is approximately 1/3 over-lap of engagement.
- Never use a tractor that is not recommended for the unit you are using. If you have any questions contact your Richiger dealer.
- Keep hands, feet, hair and clothing away from moving parts.
- Disconnect hydraulic hoses and drive shaft when performing maintenance chores on the machine.
- Make sure there is a fire extinguisher on board the tractor and that the date has not expired.
- Do not have anyone stand** in front, behind, or along side of the machine when machine is running.
- When parking unit, leave it hitched to tractor – the latter with brakes applied – to prevent movement.



Towing safety

Drive with caution when travelling with the bagger on public roads.

Drawbar hitch pin and retaining clip must be properly secured.

Attach safety chains between tractor and bagger for added security on roads.

Verify tire pressures (60 Lbs. standard for work) and wheel bolts.

The bagger's rear end must be raised as high as possible for best road clearance, i.e. hydraulic cylinder must be completely closed and circuit depressurized.

Hydraulic hoses and hoist remote control cables should be adequately secured in place.

Brakes should be completely released.

The PTO drive shaft should be properly secured in its vertical stow-away position.

The bag supporting cradle should be correctly fastened to the hood with its spring clasps.

The bag supporting tray must be held up securely against the frame by turning and locking the hand winch when the retaining steel cables are taut.

Hydraulic system safety

Do not smoke while working on hydraulic systems!

Never use your hand to search for hydraulic fluid leaks; escaping fluid under pressure can be invisible and can penetrate the skin and cause a serious injury!

USE A SCRAP PIECE OF CARDBOARD TO CHECK FOR LEAKS!

If any fluid is injected into your skin, see a doctor at once! Notify medical staff that there is an injection injury with hydraulic fluid. Injected fluid must be surgically removed by a doctor familiar with this type of injury or gangrene may result!

Do not attempt to loosen or disconnect any hydraulic lines, hoses or fittings without first relieving hydraulic circuit pressure. Also, be careful not to touch any hydraulic components that have been in recent operation because they can be extremely hot!

Always replace hydraulic components with manufacturer recommended replacement parts. Improperly rated components may result in system failure and/or injuries.

Contact your local Richiger dealer to order replacement parts.

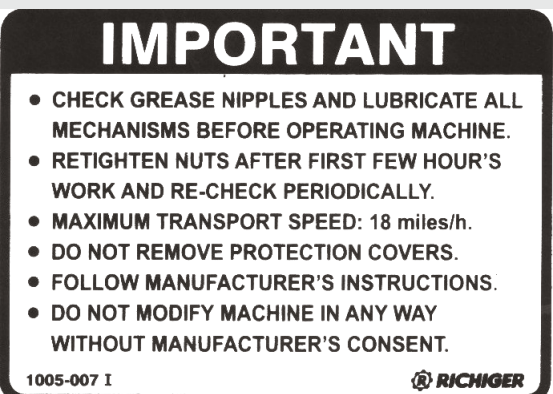
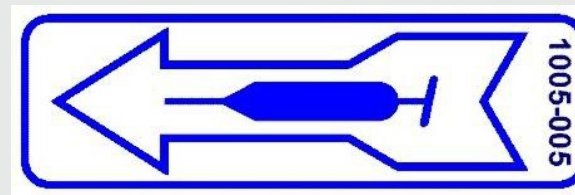
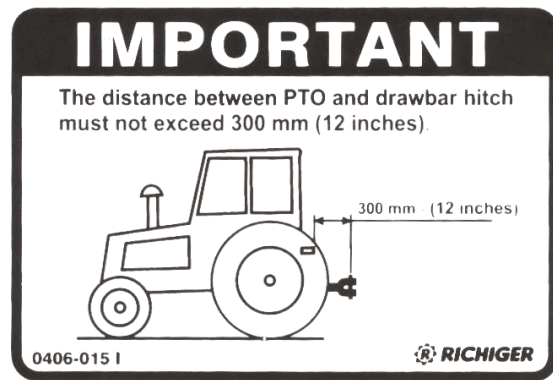
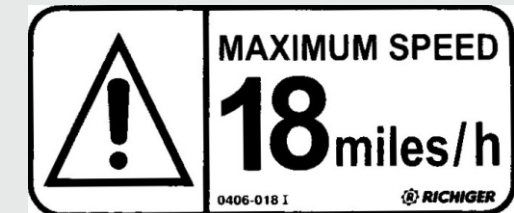
Importance of safety signs

Safety signs or decals provide very important information and instructions designed to alert you to dangers and hazards that can be present during operation of this equipment. However, safety sign instructions must be read, understood and followed to be effective.

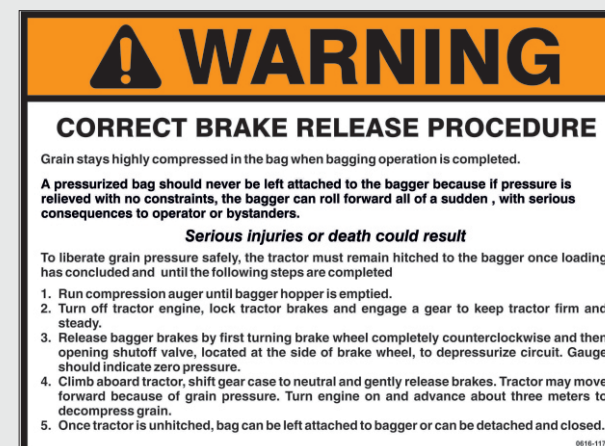
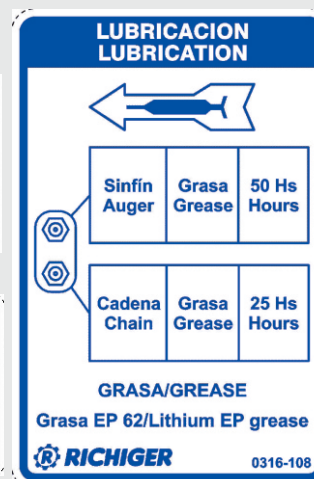
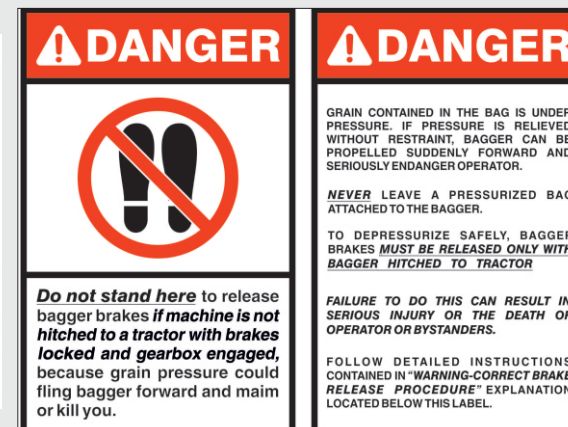
Replacing safety signs

Safety signs or decals must be kept clean and readable. If they become unreadable for any reason, they must be replaced with an identical replacement decal. Safety decals must also be replaced if parts are repaired or replaced with new parts that do not already include the necessary safety decals.

Order replacement decals by part number through your nearest dealer. Part numbers are printed on the lower margin of each decal. Following are reproductions of the decals on the grain carts.



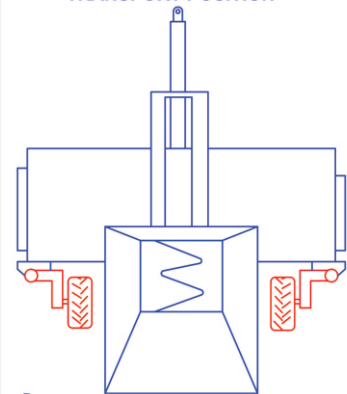
Decals listing



Instruction decals

TRANSPORTE / TRABAJO TRANSPORT / WORK

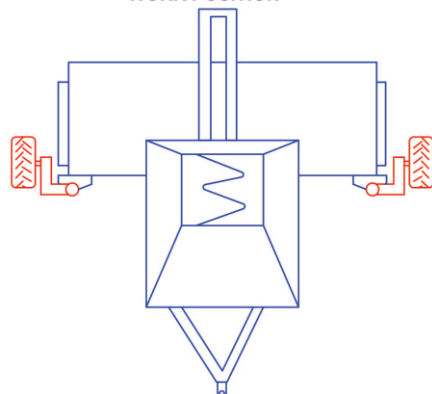
POSICIÓN DE TRANSPORTE
TRANSPORT POSITION



RICHIGER

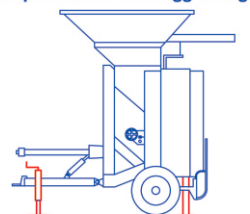
0316-103

POSICIÓN DE TRABAJO
WORK POSITION



CAUTION!

When bagger is left in work position - wheels positioned at the sides of tunnel - it should be propped up for safety. Two jacks are provided for the rear section and a screwjack is provided for the bagger tongue.



RICHIGER

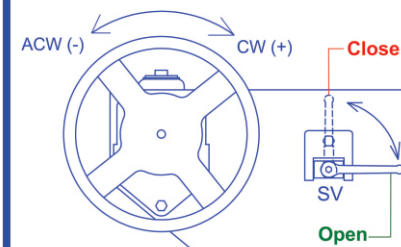
0316-106i

BRAKING PROCEDURE

PROCESS

- 1)-Open safety valve (SV) to allow free oil flow.
- 2)- Turn wheel clockwise (CW) to increase braking pressure and anti-clockwise (ACW) to decrease braking pressure.
- 3)- When desired pressure is set, close safety valve to lock brake circuit.
- 4)- Remember to first open and then close safety valve each time brakes are reset to a different pressure during operation.
- 5)- To release brakes, open safety valve and slowly turn wheel anti-clockwise till pressure gauge shows zero.

It is best to execute 3 or 4 extra turns and reach the wheel's final stop to ensure there is no residual pressure left in the circuit.



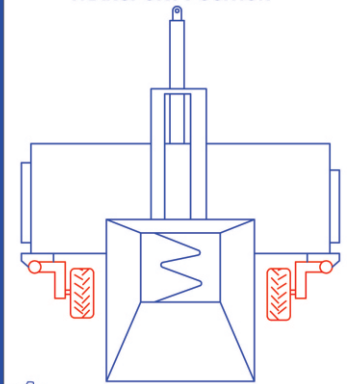
Use DOT 3 brake fluid.

RICHIGER

0316-101i

TRANSPORTE / TRABAJO TRANSPORT / WORK

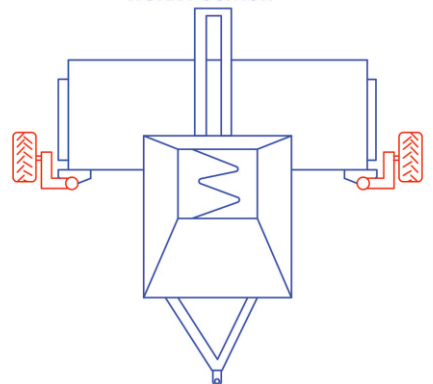
POSICIÓN DE TRANSPORTE
TRANSPORT POSITION



RICHIGER

0316-103

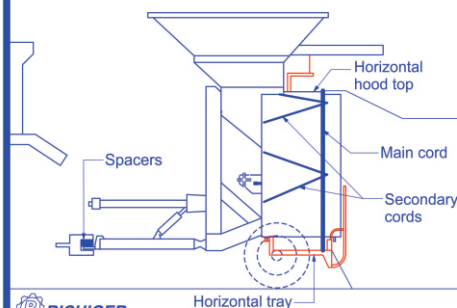
POSICIÓN DE TRABAJO
WORK POSITION



SET-UP & OPERATION GUIDELINES

- 1)- Check that tire pressure is 60 PSI.
- 2)- Fit bag on tunnel hood, pull out plastic from outermost fold, and seal end of bag.
- 3)- Secure bag with 16 mm main cord and 6 mm secondary cords as shown in diagram.
- 4)- Position machine horizontally and maintain level throughout bagging operation.
- 5)- Use spacer bushings to prevent tongue movement.
- 6)- Ensure that tractor brakes always stay off and that bagger advances in a straight line.
- 7)- Hydraulic brake operation:
 - Braking pressures should accord with stretch guidelines provided by bag manufacturer. Initial braking pressure should be around 30 Bar (435 Psi) until grain has settled within the bag in the first two meters.
 - After advancing about two meters, correct brake pressure to achieve bag stretch suggested by manufacturer. The pressure required will depend mainly on grain condition, tractor weight and terrain slope. In extreme conditions it may be necessary to release brakes completely or inversely, to apply maximum brake pressure. The latter should never exceed 130 Bar = 1,885 Psi.

THE INSTRUCTIONS ARE MEANT AS A GENERAL GUIDE AND CAN BE MODIFIED IN ACCORDANCE WITH OPERATOR EXPERIENCE AND DIFFERING CONDITIONS.



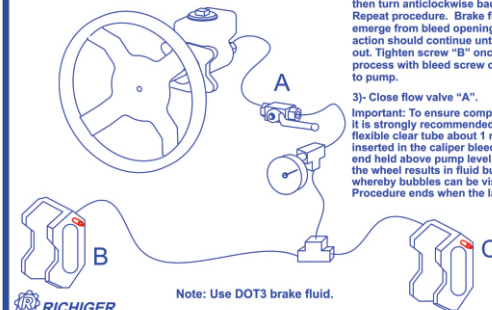
RICHIGER

0316-104i

BLEEDING THE BRAKE CIRCUIT

Air in the circuit can cause defective braking. Proceed as follows:

- 1)- Open flow valve "A".
 - 2)- Loosen bleed screw of caliper "B", farthest from pump. Turn wheel clockwise 3 or 4 turns, then turn anticlockwise back to initial point. Repeat procedure. Brake fluid will begin to emerge from bleed opening, and the turning action should continue until no bubbles come out. Tighten screw "B" once finished. Repeat process with bleed screw of caliper "C", closest to pump.
 - 3)- Close flow valve "A".
- Important: To ensure complete air removal, it is strongly recommended that a 1/4" PVC flexible clear tube about 1 meter long be inserted in the caliper bleed opening, its loose end held above pump level. Continuing to turn the wheel results in fluid buildup in the tube, whereby bubbles can be visually monitored. Procedure ends when the last bubble is gone.

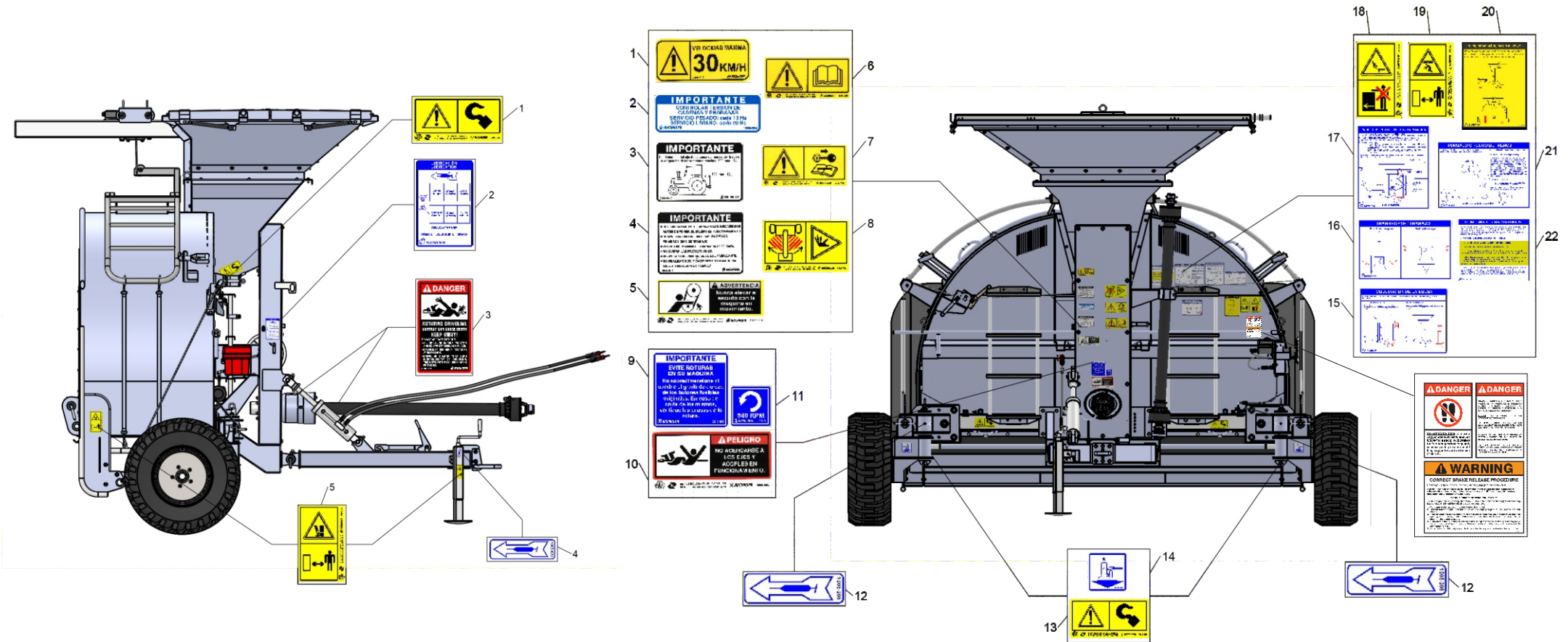


Note: Use DOT3 brake fluid.

RICHIGER

0316-102i

Decal placement on baggers



Purpose

02

Richiger's R-990 and R-1090 baggers are machines designed for one basic purpose: storing all types of dry grain inside bags. Alternatively, products such as fertilizers that run freely and flow in a way similar than grain does can be also be stored in bags. Nevertheless, these are machines designed for particular and not multiple applications. Caution is recommended and utilization of the machine with materials out of its specific range of use will be considered inappropriate.

This manual also contains information about adequate preparation of the ground, correct layout of bags and other considerations that should be taken into account when using Richiger's dry grain bagger..

General Features

Heavy duty frame

Solid structural frame has been designed to stand up to the toughest working and transport conditions for many years of trouble-free operation.



Braking system

The disc brake system acts independently on each wheel. Hub and disc are cast as a single integrated piece to obtain a simpler, sturdier unit. The wheel braking circuit is monitored with a pressure gauges and once pressure is set, valves maintain it constant. This precise control of braking action contributes to the overall efficiency of the bagging operation.



Compression auger

The uncovered screw is mounted on self-aligning, shielded bearings that are adjustable both horizontally and vertically. They are located in topmost position inside the tunnel to achieve better filling of the bag, and horizontal layout ensures minimum breakage of grain



Drive shaft transmission

Transmission works through chain driven reduction gears for positive non-slip action. It works with a PTO standard speed of 540 RPM, reduced to half that speed at the compression auger to prevent grain damage. Excessive auger speed could also generate centrifugal forces that slow down the bagging process.



Tongue

Heavy duty tongue built of structural steel tubing allows hydraulic and mechanical height regulation.



Supporting rail

The hoist assembly slides on a double rail support structure that can handle bags up to 150 meters long and is controlled from the ground to ensure operator safety.
The electric hoist is driven by the tractor's 12V battery and allows the operator to raise the bag via remote control without physical exertion.



Grain hopper

Ample length and width allow the loading of grain with less grain cart maneuvering



Tunnel

Tunnel shape is optimized to form a tall bag that will hold more grain. Standard 9 ft. and 10 ft. bags of up to 150 meters (500 ft.) in length are used in Richiger's R990 and R1090 models.



This operator's manual has been prepared with the latest information available. Read it through before using the bagger. The terms “left” and “right” when mentioned in the manual in relation to the machine are used from the operator's point of view, seated in the tractor facing forward. All information used in the manual was updated at the time of printing, but changes carried out in factory could show some differences between pictures, illustrations and data depicted here and the actual product. The manufacturer reserves the right to modify the models described in this user's manual without prior notice.



WARNING

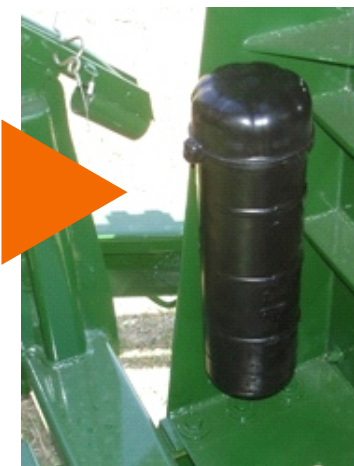
Some of the pictures in this manual show the machine with protective covers and shields removed in order to show a feature more clearly. Do not operate the bagger if any of the protective covers is missing.

Serial number and operator's manual

Serial number and machine model is important information pertaining to your machine. This information is required when ordering spare parts.



The canister with the manual is located inside the pillar on the left



Technical Specifications

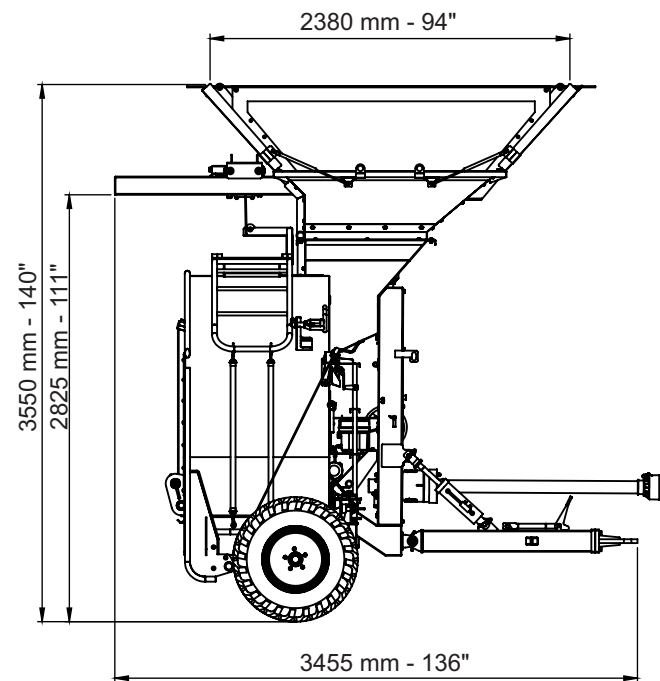
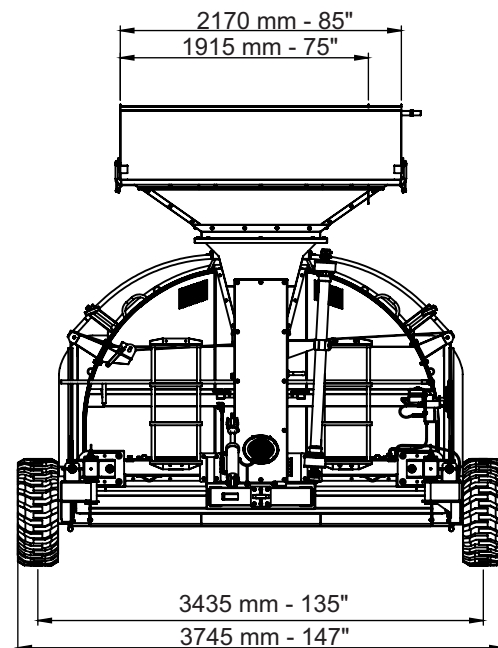
04

R990

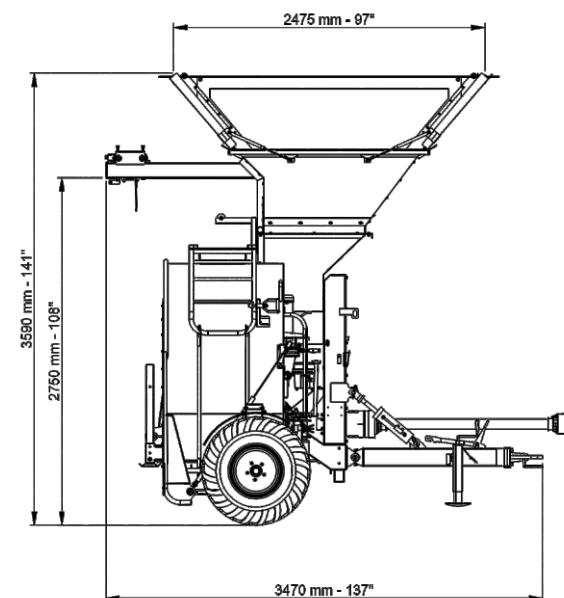
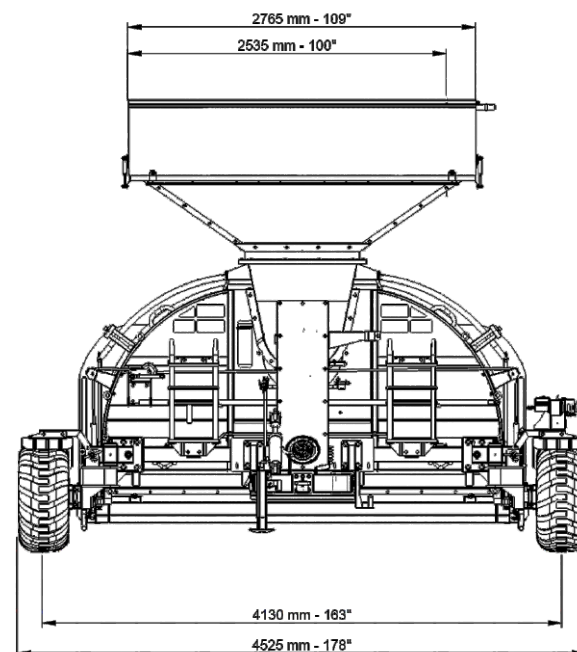
R1090

| | | |
|---------------------------------------|--|---|
| tunnel | Flattened bell shape for 9 ft bags up to 500 ft. in length | Flattened bell shape for 10 ft bags up to 330 ft. in length |
| Bag setup | Bag cradle is raised with a 12 V. electric hoist that slides along a supporting rail. Operator works safely from the ground. | |
| Materials suitable for bagging | All kinds of dry grains and pelletized materials such as fertilizers and stock feed. | |
| Transport system | Can be towed or loaded on a trailer for long distances. | |
| Height adjustment | By means of a hydraulic cylinder. | |
| Tongue | Folds for easy transport on truck or trailer. | |
| Tractor requirements | 45 HP with 540 rpm PTO | 80 HP with 540 rpm PTO |
| Drive shaft | Level PTO to gearbox angle | |
| Braking system | Disc brakes integrated with wheel hubs. Individual brake circuits for each wheel | |
| Compression screw | 410 mm screw runs at 250 rpm Maximum capacity: 600 tons / hour (23,600 bu / hr) | 600 mm screw runs at 250 rpm Maximum capacity: 1,200 tons / hour (47,300 bu /hr) |
| Bag fastening system | Rope harness | |
| Tires | 12-16.5 10 Ply | 400/600 – 15.5 14 Ply |
| Weight | 1,500 kilograms | 1,660 kilograms |

R990



R1090



The tractor used with the R-990 bagger should have no less than 45 HP.

The tractor used with the R-1090 bagger should have no less than 80 HP.

Hydraulic circuit can be either open loop or closed loop.

The PTO drive shaft should not exceed a 360 millimeter (14") length, measured from end of PTO stub shaft to drawbar hitch pin (Fig. 1) This is to ensure adequate torque transference between the two sections of the drive shaft.

A 12V electric hoist is used to raise and place bag in position on the tunnel hood, so the tractor's battery should provide that voltage.

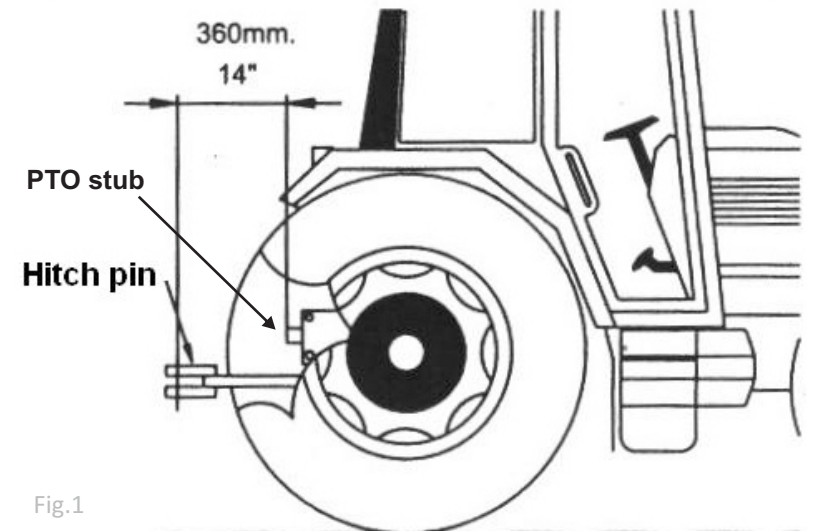


Fig.1

Hitch pin "A" should be 30 to 32 mm. (1 3/16" to 1 1/4") in diameter and have its corresponding retaining clip "B" (Fig. 2). A spacer should be placed between hitch tongue and drawbar to prevent vertical rocking motion.

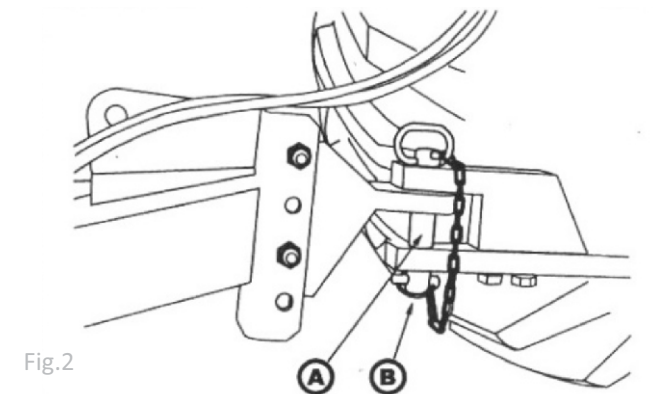


Fig.2



The hydraulic cylinder is used to set the machine's inclination angle and working height. Hoses connect to tractor hydraulic system through 1/2" NPT quick couplings (Fig. 3, "A").

Before connecting hoses to tractor: stop tractor engine and depressurize hydraulic circuit by moving control lever in both directions. Remove female plugs (Fig. 3, "B") and wipe clean coupling ends before connecting.

Before disconnecting hoses from tractor: stop tractor engine and depressurize hydraulic circuit by moving control lever in both directions. Pull out quick connect couplings and cover ends with plugs.

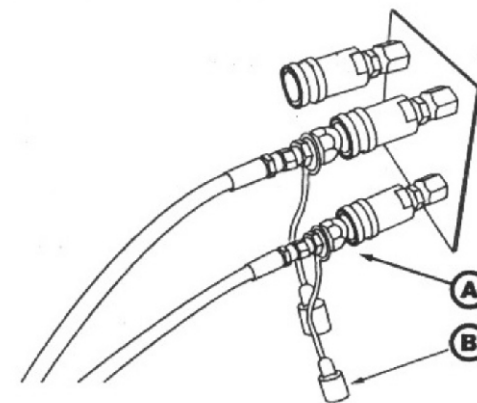


Fig.3



CAUTION

After connecting the hoses, check that they are not left so short that the bagger cannot maneuver without pulling at them, nor too long that there is risk of them snagging a machine part.

The correct bagger position when working is approximately horizontal, i.e. neither front nor rear of the machine pointing downward. Since the weight of the incoming grain will tend to push down the rear end, as he gains experience the operator can learn to compensate this effect by slightly tilting the machine to the front with the hydraulic cylinder. However, any hydraulic movement has to be done before the bag begins to be filled with grain because afterward the mass of grain in the tunnel makes the machine virtually unmovable. Using the cylinder at that stage could cause mechanical malfunction or damage.

Make sure that the correct extremity (i.e., the square bar) of the drive shaft is connected to the tractor's PTO. This is clearly indicated on the shaft itself.

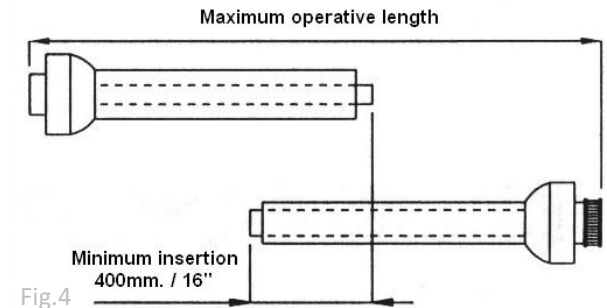


CAUTION

The PTO drive shaft demands that the operator be attentive and use maximum caution around it. Make sure that protection shields installed on tractor and shaft do not interfere with each other or with normal shaft movement during work. Verify there is no excessive angle disparity between connection points: drive shaft should be as horizontal as possible.

Check maximum and minimum lengths of shaft when open and closed. Read following instructions to adjust length:

- Disassemble shaft into its male and female component halves.
- With bagger hitched to tractor and square bar telescoping section (male half) connected to PTO, place round tube section (female half) alongside and verify that there are at least 400 mm. (16") of square bar that will insert (Fig. 4).
- This maximum allowable length should not be exceeded because torsion effort could damage the shaft, or even worse, the sections could come loose.
- Also check that drive shaft is not left so short that adjoining sections could make contact.
- Apply grease to sliding parts.
- When connecting yokes to tractor and bagger, ensure that they lock properly.
- The protection shields have chains attached to their ends so that they can be secured and be prevented from rotating simultaneously with drive shaft. Check that they turn freely before chaining them down.



DANGER

A drive shaft connected to a live PTO that comes loose at the bagger's end will flail around uncontrollably, posing a mortal danger to operator and bystanders, and can badly damage equipment at the very least. To avoid this possibility ensure that:

- a) Enough length of square shaft is inserted in adjoining female section
- b) Quick release yokes are securely locked to splined stubs on tractor and bagger
- c) Regular maintenance is carried out and U-joints are replaced if necessary

Choosing and preparing the ground

It is important, as a first step in achieving good conservation of stored grain, to plan ahead and make preparations taking into account the following guidelines:

- Ground should be compact, so that tires of tractor and machine have a good grip.
- Ground should be elevated, not subject to flooding, and with no trees.
- Ground should be flat with no potholes, puddles or mud that can cause erratic braking action.
- Ground should be free of weeds and stubble that can damage the bag and kept that way by using herbicides.
- If the ground has a slight slope it is better to operate with tractor climbing the slope as this will favor better compaction of grain at lower end of the bag.
- Ground should be level across the width of the bag because this ensures an even distribution of grain to both left and right sides. Gradient plus gravity can result in excessive bag stretch on one side due to disproportionate weight distribution.
- If possible, the area in use should be fenced in if there is a presence of animals that could damage the bags.
- The area should be kept free of rodents and burrowers.
- The ideal orientation for bags is North/South because of more uniform exposure to solar radiation as the day advances.



IMPORTANT

Before laying down the bags, it is important to decide surface distribution of bags and corridors. Width of passageways between bags is important because it must permit circulation of self unloading carts, trucks, tractors and grain extraction equipment. The actual surface taken up by each bag depends on factors such as type of grain being bagged, degree of bag stretch and temperature. A bag done in cool weather will tend to flatten and sag at the sides to some extent when temperatures soar. As a reference value, a minimum of 5 meters (app. 17 ft.) separation distance between rows of bags is recommended (Figs. 5).

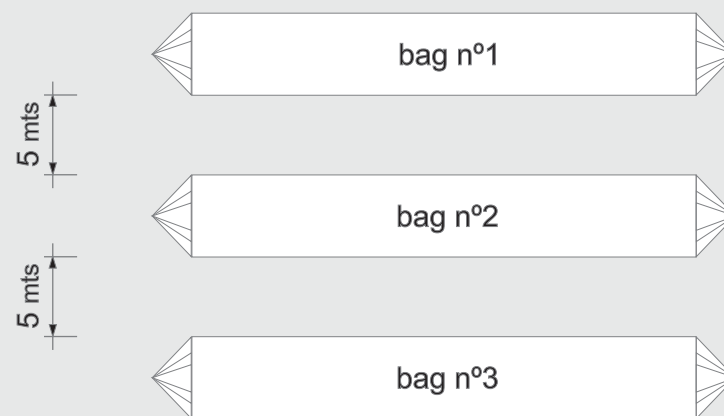


Fig. 5

As previously mentioned, the best orientation for bags is the North/South axis because both sides of the bag get exposed to similar amounts of solar radiation during the day (Fig. 6)

With an East/West orientation there will be a tendency for heat to build up more readily on the exposed side of the bag. This effect is more conspicuous in locations that are farther away from the equator; in the Northern hemisphere sun will shine on the flank of bag facing South, and in hot summer days this could cause plastic film stress and overstretching.

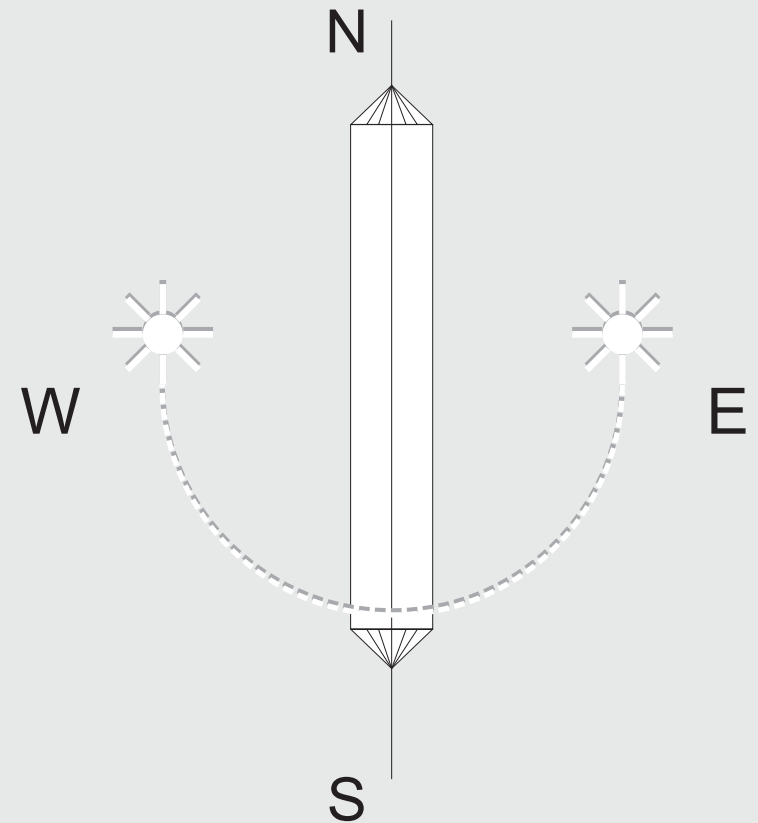


Fig. 6



1

Bagger is shown being towed by truck (Figs. 7 & 8). This should be done with wheels in transport (inward) position, the machine being towed by its auxiliary (rear) tongue.



Fig. 7



Fig. 8

2

Set screw jack located in rear section of machine to hold up auxiliary tongue (Fig. 9). Then unhitch the towing vehicle and move it away. Fit the other two jacks provided in square sockets below tunnel to prop up the machine (Fig. 10).



Fig. 9



Fig. 10

3

Once the rear jacks are holding up the bagger, remove the screw jack from the auxiliary tongue and reinstall it on the main tongue while it is still in upright position (Fig. 11). Then lower the tongue with the hydraulic cylinder so that screw jack rests on the ground (Fig. 12).



Fig. 11



Fig. 12

4

Remove the PTO drive shaft from its storage position on bagger (Fig. 13). Connect the shear pin extremity of the PTO shaft (usually the round tube section) to the bagger's end stub (Fig. 14).



Fig. 13



Fig. 14

5

Move tractor in and hitch to bagger (Fig. 15). If necessary introduce a spacer bushing between tractor drawbar and tongue to stop vertical rocking motion. Connect drive shaft to tractor PTO (Fig. 16).

Make sure both ends are locked fast as a loose, flailing shaft poses mortal danger. Check that drive shaft plastic shields turn freely and secure the chains at both ends to fixed points on the machine.



Fig. 15



Fig. 16

6

Connect cylinder hoses to tractor's hydraulic system (Fig. 17).

Operate hydraulics to raise the bagger, at which point the wheels will lift off the ground and the machine will rest on the tractor drawbar and the rear positioned jacks (Fig. 18).



Fig. 17



Fig. 18

7

Remove the wing nuts that hold the wheels in place (Fig. 19) and rotate them outward to work position at the sides of the tunnel. Once aligned, reinstall the wing nuts and secure with retaining clips (fig. 20).



Fig. 19



Fig. 20

8

Connect the crocodile clips of the electric winch to the 12 volt battery terminal posts or to the tractor's electricity outlet (Figs. 21 and 22).



Fig. 21



Fig. 22

9

A hand winch is used to control bag tray inclination. The operator controls the lock mechanism with his left hand while turning the handle clockwise or anticlockwise with his right hand to pull in or release cable (Figs. 23 and 24). When transporting the machine, the cable should be tightened to hold the tray fast against the tunnel and then secured with pins provided.



Fig. 23



Fig. 24

10

The bag supporting cradle is held in place with wing nuts on each side (Fig. 25). These should be removed now. Also check that the winch cable is hooked to the bag cradle so that it can be hoisted.



Fig. 25

Mounting 60 to 90 meter long bags

1

The vehicle with the bag should back up against the bagger tunnel and the box containing it lowered to the ground (Fig. 26). The box indicates correct orientation of bag.

The box is opened and the bag extended full length on the ground (Fig. 27). Notice the bag's folds are still tied with straps to prevent them from unfolding. They should be untied at a later stage.



Fig. 26



Fig. 27



2

A three meter long pole is fitted to the bagger (Fig. 28). It is used to pull the winch cart forward, with bag cradle attached (Fig. 29).



Fig. 28

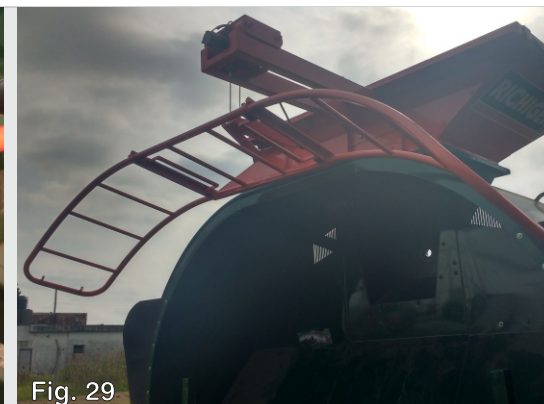


Fig. 29

3

The cradle can now be lowered onto the bag's lower half (Fig. 30). The cradle is not rigid but has two hinges that lets it adopt a flattened shape instead of its normal rounded shape atop the hood. This makes it easy for a single operator to place the upper half of the bag over the cradle, since the lifting motion is limited to a few inches off the ground (Fig. 31).



Fig. 30



Fig. 31



CAUTION

There is no need for the operator to climb on the machine - and risk a fall - at any time when installing the bag. The following instructions show how the whole procedure is carried out with operator standing on the ground.



IMPORTANT:

The bag should be grasped from its inner part when being placed on the cradle, with white layer facing outside and black layer facing inside. Check that the bag is correctly oriented by tugging at the top white layer; it must unfold outward, away from tractor and machine.

4

Either before or after hoisting the bag, make sure that the hydraulic cylinder is lowered (Fig. 32). This will in turn raise the bagger rear section (Fig. 33), allowing gravity to aid the operator in pushing back the bag for final placement over the tunnel, as will be seen in the next step.



Fig. 32

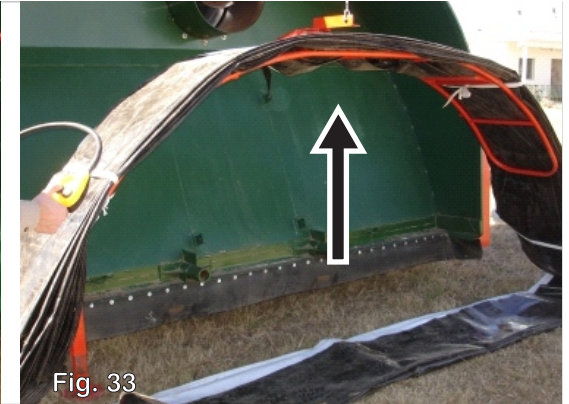


Fig. 33

5

When at mid-height, stop hoisting and check that the stretch control marks printed on the plastic are positioned correctly at the sides of the bag (Fig. 34). This will later permit inspection of the bag area subject to higher stretching forces. Continue raising the cradle until it clears the hood by a few centimeters and, using the metal pole, push winch cart, cradle and bag to the back of the hood until they touch the hopper base (Fig. 35).



Fig. 34



Fig. 35

6

Simultaneously with pushing the cradle back, the plastic folds are arranged in an ordered manner around the tunnel (Fig. 36) and over the tray (Fig. 37). Once the tray and bag are in their final position, operate the hydraulic cylinder to set the bagger back to horizontal working position.



Fig. 36



Fig. 37

7

The cradle is fitted with brackets that create a gap above the tunnel (Figs. 38 & 39). This extra clearance allows the plastic to remain taut around the tunnel, helping the bag floor remain crease-free as plastic folds are pushed out by the grain. Reattach the cradle to the hood as shown in Fig. 25.



Fig. 38



Fig. 39

Mounting 100 to 150 meter long bags

1

For longer bags, the tray can be separated from the bagger frame to move it forward and facilitate bag installation.

Remove the pins that hold the bag tray at both sides so that it is effectively detached (Fig. 40). Notice that the tray will remain attached through four straps that connect it to the bag cradle resting atop of the hood.



Fig. 40

2

Use the electric winch to raise the cradle from the hood. Pull the cradle forward with the pole shown in Fig. 28, until it has cleared the hood. The tray will hang from the cradle (Fig. 41).

Lower the assembly with the winch until first the tray and then the cradle are on the ground. Direct the latter so that it lies next to the tray, but farther away from the tunnel (Fig. 42). Detach the four straps.



Fig. 41



Fig. 42

3

The vehicle with the bag should then back up against the bagger tunnel (Fig. 43) and the box containing it lowered to the ground. Correct orientation of bag is indicated on the box.

The box is opened and the bag extended full length on the ground (Fig. 44). Notice the bag's folds are still tied with straps to prevent unfolding and disarray. They should be untied at a later stage.



Fig. 43



Fig. 44

4

Mount the upper part of the bag on the cradle (Fig. 45) and then raise it with the winch until it reaches the height of the tunnel (Fig. 46).



Fig. 45



Fig. 46

5

Remove pin from sliding bracket (Fig. 47) and move the bag restraining arms located at both sides of the tray 90° inward (Fig. 48) to allow positioning of bag over tray.



Fig. 47



Fig. 48

6

Lift bag (Fig. 49) and place the bottom part of the bag on the tray (Fig. 50).



Fig. 49



Fig. 50

7

Lower the cradle and finish extending the bag over the tray (Fig. 51). Reverse the procedure carried out in Figs. 47 and 48 and lock the restraining arms outward so they hold the bag folds from the inside.

Reattach the four straps that connect the tray with the cradle (Fig. 52).



Fig. 51



Fig. 52

8

Raise the assembly till it clears the hood (Fig. 53) and push it backward (Fig. 54) with the pole until it bumps against the hopper.

Once the bag is positioned around the tunnel, reattach the lower tray to the machine frame with its corresponding pins, as shown in Fig. 40.



Fig. 53



Fig. 54

9

If the rubber flaps located at the side of the tunnel get stuck under the folds, pull them back so they stand out (Fig. 55).

Extend the cradle support stands to get clearance between tunnel and cradle. This produces a taut sheet of plastic and helps keep the bag floor free of creases as it unfolds (Fig. 56).

Lastly, screw on the wing nuts that hold the cradle in place, as shown in Fig. 42.



Fig. 55

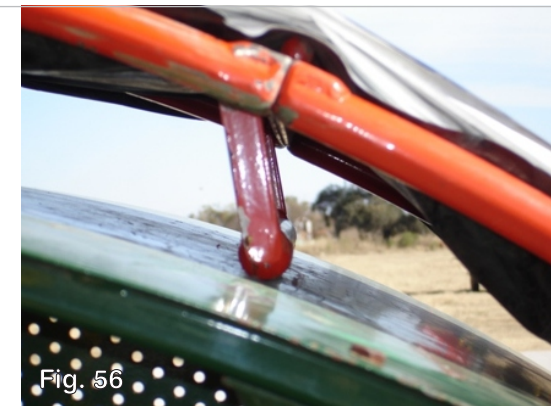


Fig. 56

Pulling out the bag to start work

1

Taking hold of the outermost fold, pull out plastic sheet from all around tunnel and tray to a uniform length of about 3 meters, being careful not to disarray the folds (Fig. 57). The operator should then enter the tunnel and check that the folds have remained well stacked on the tray (Fig. 58).



Fig. 57



Fig. 58

2

The bag should remain orderly and tidy, both the folds on the tunnel and the plastic pulled outward. Smoothen the plastic sheet and lay the end of the bag completely flat on the ground (Figs. 59 & 60).



Fig. 59



Fig. 60

3

The ends of the plastic sheet should be wrapped a few times around a 1" or 2" x 4" board about 4 meters in length or longer (Fig. 61). A second board of the same length is nailed onto the first, and this accomplishes initial closure (Fig. 62).

Nails should be placed a distance of about 30 cm from one another. It is important that the nail heads be hammered flush with the wood to prevent the ripping the plastic. The boards are turned round several times and tucked under the bag.

Alternatively the bag can be sealed with plastic strips that are positioned in place and crimped with a special tool. See more details in the section "Closure of bag" further ahead.



Fig. 61



Fig. 62



IMPORTANT

It is crucial that the heads of the nails used to tack the boards together are flush with the wood surface and that the length of the nails be calculated accurately enough that their points can penetrate the third board but not go through the other side. Otherwise they will puncture the plastic when the boards are turned round and not form a water-resistant seal.

4

A rope harness is used to keep the bag in position during the filling operation. Beginning from either the left or the right side of the machine, the main cord is first secured to one of the two cleats welded to the sides of the tray (Fig. 63).

The free end of the cord is then passed from bottom to top through the 1" diameter hole located close to the lateral edge of the tray (there is a symmetrical hole on the opposite side of the tray).

The cord is then passed to the other side of the bagger over the tunnel hood (Fig. 64), then threaded through the second tray hole from top to bottom (Fig. 65) and finally tied firmly to the adjoining cleat.

The cord should be fastened sufficiently tight because this prevents backflow of grain that can work its way past the rope and into the folds.

Three secondary cords are used to prevent the main cord from being pulled out with the plastic folds. They are passed behind the main cord (Fig. 66).

Two cords go on the sides and the third goes on the upper part of the hood, attached by hooks to rings especially welded to the tunnel for that purpose.



Fig. 63



Fig. 64



Fig. 65



Fig. 66



IMPORTANT

The main cord must encircle the hood in front of, but not over the folds and the cradle that holds them. The cord is tightened in front of the cradle to hold the folds at the back of the hood and ensure that they slide out one at a time as they are pulled out.

1

Brakes should only be used for work or when transporting the machine on a trailer..

2

The wheel brakes are hydraulically driven by a hand pump, and are regulated from commands located on the left section of the machine (Fig. 67). Calipers act upon discs that are integral with the wheel hubs as units cast in a single piece (Fig. 68).

The large wheel is turned clockwise to increase braking force and anti-clockwise to decrease it. A pressure gauge next to the wheel indicates braking pressure. While setting the pressure, the cut-off valve right next to the gauge must be open so that fluid can reach the brake calipers. Once braking force has been adjusted, the valve should be shut close to ensure there will be no fluid backflow that alters the settings. Brake pressure can be modified at any time during operation, with special attention paid to opening and closing the cutoff valve each time pressure is reset.



Fig. 70



Fig. 71



IMPORTANT

For optimum brake performance, set tire pressure to 60 PSI. The ground under the bag should be firm and level, with no holes, mud or obstacles.

Braking pressure determines the degree of stretch experienced by the bag. Bag manufacturer recommendations should be followed to avoid overstretch and its associated problems.

Use DOT 3 brake fluid. Do not exceed 1,900 PSI braking pressure.



IMPORTANT

For optimum brake performance, set tire pressure to 60 Lbs. The ground under the bag should be firm and level, without holes, mud or obstacles.

Braking pressure determines the degree of stretch experienced by the bag. Bag manufacturer recommendations should be followed to avoid overstretch and its associated problems.

1

Set initial brake pressure to 30 PSI (see next section: “Adjusting the brakes”). Shift tractor gears to neutral, engage PTO and increase RPM progressively. As soon as the PTO starts operating, the grain wagon can begin delivering grain. Depending on the amount of grain per minute being processed by the bagger, the PTO can be operated at somewhat less than maximum speed of 540 RPM, as operator gains familiarity with continued use.

2

When approximately two meters of bag have been filled, braking action should be reinforced. Increase the pressure to about 100 PSI. This is not to be taken as an absolute value, as several variables come into play such as tractor weight, type of grain and terrain conditions. The more force applied to the brakes, the heavier the load applied by the compression auger to the incoming grain and the higher the pressure of grain packed inside the bag. The wheels of the bagger must grip the ground and turn, not slide. If this happens, brake pressure should be diminished to the point where proper wheel traction is restored, even if grain gets less packed inside the bag. Bag manufacturers print stretch mark indicators at regular intervals along the length of the bag that are measured with a ruler to establish actual degree of stretch (Fig. 69). This monitoring provides the feedback necessary to adjust the brakes and stay within safe pressure limits. Should it be necessary to increase or decrease braking action it should be done by small increments to avoid a sudden discontinuity of grain pressure within the bag.



Fig. 69

3

Check periodically that the tractor is progressing in a straight line. Since it is being pushed forward by the advancing bag it may tend to veer to some degree, and if this happens the steering wheel should be corrected. The object is to achieve a bag that is as straight as possible because this will later simplify extraction of grain.



DANGER

Never allow personnel or occasional bystanders to stand in front of the tractor or between tractor and bagger during work. People positioned in the path of machine or tractor is not required at any stage of the bagging procedure.

Never execute bagging operation with tractor brakes on. If inadvertently this happens, pressure will mount inside the bag as grain keeps coming in but the machine is unable to advance. If the situation is not corrected, the bag will burst open and spill its contents, so it is imperative to release the tractor brakes.

But there is potential danger should this corrective action be performed hastily. If the brakes are released all of a sudden, the tractor can spring forward several feet in an uncontrolled manner, impelled by grain pressure in the bag.

This will seriously imperil the life of any bystander standing in the way.

If it is noticed that the bag is not advancing while grain is coming in, engine or PTO should be turned off first, so time is gained to evaluate the situation before taking corrective action.

If the problem lies with the brakes, then these should be released progressively to allow the tractor to advance in a controlled manner instead of darting forward abruptly. When the tractor stops, its inertia spent, the bag's contents have decompressed sufficiently for the operation to resume normally.



DANGER

Never execute bagging operation with tractor brakes on or gearbox engaged. If accidentally tractor brakes are left on while work is underway, tremendous pressure will gather inside the bag as grain keeps coming in but the bag doesn't unfold. As a consequence it could burst open and spill contents. But there is also an element of personal danger: if the tractor brakes are released suddenly or gearbox disengaged without due precaution, it could cause the tractor, impelled by the pressure in the bag, to spring forward several feet in an uncontrolled manner and imperil bystanders standing in the way. If it is noticed that the bag is not advancing, engine or PTO should be immediately turned off and the cause investigated. If it originates in tractor brakes or gearbox, tractor should be eased gently forward with brakes applied to decompress bag contents before resuming operation.

1

Bags generally have special markings printed at the sides indicating that there is little plastic left and the operation should conclude, or alternatively few folds are seen to remain on the hood. Since the standard fold measures 50 centimeters, counting the folds on the hood will give an accurate idea of how much plastic is left. Either because all the plastic has been used, or because the harvest has ended, or because labor is interrupted due to rain, or the bagger is to be towed to some other location, the bag must be detached from the machine and sealed. When for any of these reasons it is decided to finish the bag, delivery of grain should stop and the compression auger continue to turn for a few seconds until there is no grain left inside hopper.

Brake release procedure

2

The first step when finishing the bag is the release of the bagger's brakes. Bag contents are compressed when operation finishes, reason for which brakes must be released correctly or the bagger can be propelled forward and endanger the operator.

Never leave a bag filled with grain under pressure attached to the bagger, especially when the tractor is driven away and the bagger stands by itself.

3

To liberate pressure from the bag, follow the sequence detailed, always with bagger hitched to tractor:

Grain stays highly compressed in the bag when bagging operation is completed.

A pressurized bag should never be left attached to the bagger because if pressure is relieved with no constraints, the bagger can be impelled forward in a sudden manner, with serious consequences to operator or bystanders.

Serious injuries or death could result if a bag under pressure is left attached to a bagger and brakes are suddenly released.

To liberate grain pressure safely, the tractor must remain hitched to the bagger once bagging has concluded. The tractor acts as an anchor to hold the bagger still and steady until brake release is accomplished. The following steps should be carefully completed:

1. Run compression auger until bagger hopper is emptied.
2. Turn off tractor engine, lock tractor brakes and engage a gear to keep tractor firm and steady.
3. Release bagger brakes by first turning brake wheel completely counterclockwise and then opening shutoff valve, located at the side of brake wheel, to depressurize circuit. Gauge should indicate zero pressure.
4. Climb aboard tractor, shift gear case to neutral and gently release brakes. Tractor may move forward because of grain pressure. Turn engine on and advance about three meters to decompress grain contained in bag.
5. Once tractor is unhitched, bag can be left attached to bagger or can be detached and closed.



DANGER

GRAIN CONTAINED IN THE BAG IS UNDER PRESSURE. IF THAT PRESSURE IS RELIEVED WITHOUT RESTRAINT, THE BAGGER CAN BE PROPELLED FORWARD ALL OF A SUDDEN AND SERIOUSLY ENDANGER OPERATOR OR BYSTANDERS.

NEVER LEAVE A PRESSURIZED BAG ATTACHED TO THE BAGGER.

TO DEPRESSURIZE SAFELY, THE BAGGER BRAKES MUST BE RELEASED **ONLY WITH THE BAGGER HITCHED TO THE TRACTOR**

THE TRACTOR SHOULD BE AT A STANDSTILL, WITH ENGINE STOPPED, BRAKES LOCKED & GEARBOX ENGAGED. THE TRACTOR STEADIES THE BAGGER AND PREVENTS IT FROM JUMPING FORWARD WHEN THE OPERATOR RELEASES BAGGER BRAKES.

FAILURE TO DO THIS CAN RESULT IN SERIOUS INJURY OR DEATH OF OPERATOR

Closing the bag

4

In most cases closure will be done immediately upon finishing loading, at which point the bag has been filled either partly or entirely. If only part of the bag was filled, tractor and bagger are driven forward some two or three meters, which will leave that length of empty bag trailing behind the bagger (Fig. 70). The bag is then cut with a sharp blade around its whole circumference, following the line of the hood (Fig. 71).



Fig. 70



Fig. 71

Closure of bag

(When finished loading grain or whenever bag is opened to unload part of its contents)

If plastic closure strips with crimping tool are used, first flatten the end of the bag from top to bottom to expel the air, then seal the bag with the strip, turn it around a number of times to tighten the plastic and finally tuck it underneath the bag (Fig. 76) Old tires can be placed on top of the sloping end to help keep plastic in place. A deficient closure is to be avoided at all costs because it could either burst open and spill contents, or allow entry of water.

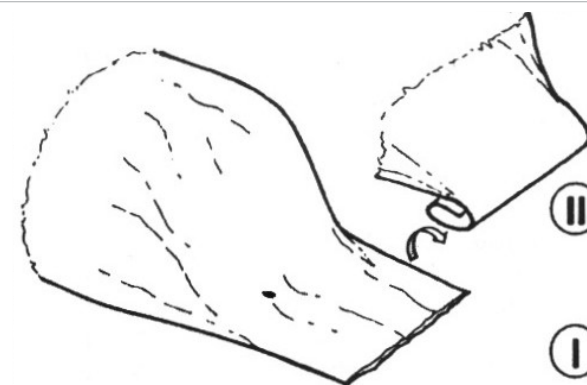


Fig. 76

Wooden boards are considered a good and safe alternative to plastic strips. Use 1"x 2" or thicker/wider boards (up to 2"x 4") that are approximately four meters long (Fig. 77). This shows the procedure using three boards instead of the usual two. Place the plastic around a board and turn it round a few times till the sheet is tightly wrapped. This board is then sandwiched between two additional boards and all three are nailed or screwed together with a 30 or 40 cm separation between nails. The boards are rolled inward to wrap some more plastic and are then tucked under the bag. The boards can be recovered later and used repeatedly. It is important that the nails penetrate the two or the three boards used to seal the bag, but it is equally critical that their points do not come through the last board because they will then puncture the plastic when the boards are rolled. This makes it necessary to determine nail length in accordance with the boards used.

One important advantage of using boards over plastic strips is that the bag end attains its maximum width. When the bag is later emptied, the wide and square breach allows the unloading machine to advance to the end of the bag and so reduce the amount of grain that must be unloaded by hand.

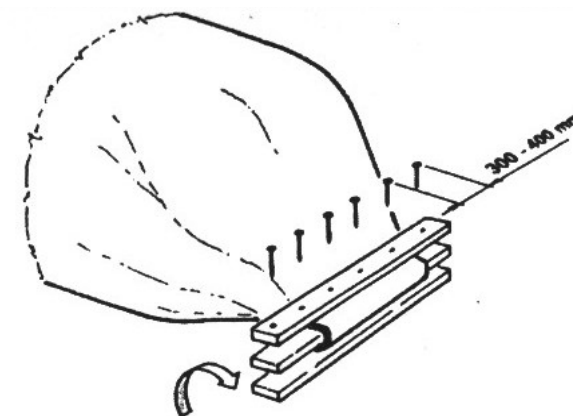


Fig. 77



IMPORTANT

It is very important when using wooden boards that the plastic sheet be wrapped several times and as tightly as possible around the boards in order to ensure a good, water-resistant seal. It is also important to tuck the boards as securely and as far under the bag as possible to prevent the possibility of the plastic unwrapping. It should be remembered that the bag will probably come in contact with water from rain or snow at some point, and if water does enter the bag then wicker action could spread the moisture farther inside the bag.

Towing the bagger away

Before driving away, completely close the cylinder to get maximum road clearance. If desired, the plastic sheet remaining on the hood can be removed and repacked once again, care being taken that the folds are not disarrayed by tying them with straps or string as in the original presentation.

General considerations about grain conservation

08

Bag stretching limits

- Dry grains in plastic bags mimic the behavior of liquids or molasses due to their tendency to “flow” in containment.
- Since they do not stick together or form clusters, they spread out to the sides of the bag, subjecting the plastic to stress and causing the typical flattened shape observed in bags.
- Round-shaped grain that is clean and dry and has a high specific weight will have an increased propensity to flow. If a particular braking force is used when bagging grain with some or all of these characteristics, deformation or flattening of the bag will be more manifest than if the same braking force is used to bag grain that clings together and doesn't flow well.
- An important consideration is the time of day when work is done because bag stretching behavior changes with ambient temperature. In summer, the bag will stretch more under the sun at noon or in the afternoon than early in the morning.
- Because of these reasons, it is strongly recommended that bag manufacturer stretching limits not be exceeded. Although if stretched beyond normal parameters the bag will most probably hold its own without difficulty, a safety margin must be allowed for. As a standard rule, a 10% increase in length when stretched can be taken as a maximum value not to go beyond.

Moisture levels

In general, the moisture levels that are considered adequate for storage in bags are similar to the levels considered safe for standard silo bins. Keeping grain with higher levels of moisture in bags may cause losses of commercial quality, quantity, nutritional value, and other factors associated with high humidity, risk increasing proportionally to time spent in storage as happens with conventional methods

Risk in relation to grain moisture

| Grain | Risk related to grain humidity | | |
|----------------------|--------------------------------|------------|------------------|
| | Low (1) | Medium low | Medium high |
| Soy, Corn, Wheat (2) | Up to 14% | 14 - 16% | Greater than 16% |
| Sunflower | Up to 11% | 11 - 14% | Greater than 14% |

Risk in relation to storage time

| Grain/Moisture content | Risk related to storage time | | |
|--|------------------------------|------------|-------------|
| | Low (1) | Medium low | Medium high |
| Soy,corn,wheat 14%-Sunflower 11% | 6 months | 12 months | 18 months |
| Soy,corn,wheat 14-16%-Sunflower 11-14% | 2 months | 6 months | 12 months |
| Soy,corn,wheat over 16%-Sunflower over 14% | 1 month | 2 months | 3 months |

(1) For seed grain these values must be lowered by 1 – 2 %

(2) It is not recommended that wheat be stored with a moisture level of more than 14%

Nevertheless, anaerobic conditions inside the bag permit the storage of high moisture grain for short periods of time with less risk than if stored in bins. When high moisture grain is again exposed to air once extracted from the bag, aerobic organisms begin multiplying in great numbers and material can suffer rapid degradation, reason for which grain should be dried as soon as possible after removal from bag and before being traded.

How long will a bag last?

This is an important consideration and should be checked with your bag provider. Sun and high temperatures can break down plastic given enough time, reason for which the outer layer of a bag is white to absorb less infrared radiation and it also contains additives to protect against UVR and delay the degradation process. In consequence, how much a bag can last depends to a great degree on geographic latitude and time of the year in which it is used. As a rule of thumb, and even though bags have far surpassed this span of time with contents in good condition, it is recommended that bags not remain exposed for more than one summer.



Periodic controls

Success in bagging grain is closely related to adequate supervision performed during time of storage. It is important to carry out controls almost daily. Every possible precaution should be taken to maintain integrity of the plastic cover and to repair it if necessary. It should be born in mind that that relatively small tears can cause localized yet important losses through aerobic degradation. In different areas causal agents may vary but most can be prevented or controlled.

Sampling

It is important to periodically take samples in order to control the evolution of stored material. A probe can be used or alternatively two strips of adhesive tape can be taped vertically, superimposed on one another in a section of bag that is relatively under-stretched, and a short slit cut open with a sharp blade for a sample to be extracted. The slit is then patched up with tape provided by bag manufacturer or third parties.

**Rodents
& wild animals**

While filling bags, care should be taken not to spill grain on the ground that can act as an attractant. Frequent checking, preferably daily, is advisable. Holes should be sealed with thick tape as soon as detected. To discourage entrance to the storage area, it should be kept free of weeds and tall vegetation. Should there be a problem with bigger animals such as deer, electric fences could help.

Hailstorms

If one occurs, bags should be immediately checked for damage sustained. If damage is slight, it can be repaired with appropriate sealing tape. If damage is considerable, the only solution might be repacking the grain in bags once more. The more the bag is stretched, the more potential for harm a hailstorm has

Fire

Winter crop stubble poses the most risk in this department. If storage area borders a stubble field and conditions warrant it, it might be convenient to make a few passes with a disk harrow to minimize risk.

Storing

- Remove and repack the remainder of the plastic bag left on the tunnel, using lengths of string to tie the folds so they do not fall into disarray.
- Wash unit thoroughly (do not direct water under pressure at the bearings).
- Lubricate entire machine after washing.
- Check nuts and bolts and tighten if necessary.
- See if decals are in good condition and replace if necessary.
- Relieve pressure of hydraulic and brake circuits.
- Repair or change damaged or worn parts. Use original spares.
- Repaint spots where paint has worn down.
- Keep the machine under shelter in clean and dry surroundings.

After storage

Before the new season:

- Clean dirt and debris that may have accumulated on machine.
- Lubricate as indicated in this manual.
- Check tire pressures.
- Verify that hydraulic and brake circuits are in good order.
- Confirm that machine movements are smooth and there are no rattling sounds.



Before initial operation it is convenient to carry out a lube check up that will also help the operator become familiar with the lubrication points (Fig.78).

- Clean grease fittings and grease pump every time you apply grease.
- Replace any grease fitting that is missing or damaged.
- Apply neither too much nor too little grease.
- Disconnect PTO while working.

Lubrication chart

R1090
R990

| Lube spot | Section | Description | Grease fittings (Quantity) | Lubricant | Lube frequency (hours) |
|-----------|-----------------|------------------------|----------------------------|-----------|------------------------|
| 1 | Transmission | Chain & idler sprocket | 1 | Grease | 50 |
| 2 | Driveline | Bearing housing | 2 | Grease | 25 |
| 3 | | Splined shaft | Apply with brush | | |
| 4 | Wheels | Hubs | - | Grease | 100 |
| 5 | Pivoting wheels | Pivot shafts | 2 | Grease | 100 |
| 6 | Jacks | Threaded rods | 2 | Grease | 100 |
| 7 | Brake pump | - | - | Oil | 100(1) |
| 8 | Auger | Rear bearing block | 1 | Grease | 25 |
| 9 | | Bearing housing | | | |
| 10 | Drive shaft | Plastic protections | 2 | Grease | 25 |
| 11 | | Telescopic sections | Apply with brush | | |
| 12 | | U- joints/yokes | 2 | | |

(1) Every 100 hours of use check oil level / Grease type: 62 EP / Oil: Hydraulic Oil DOT 3

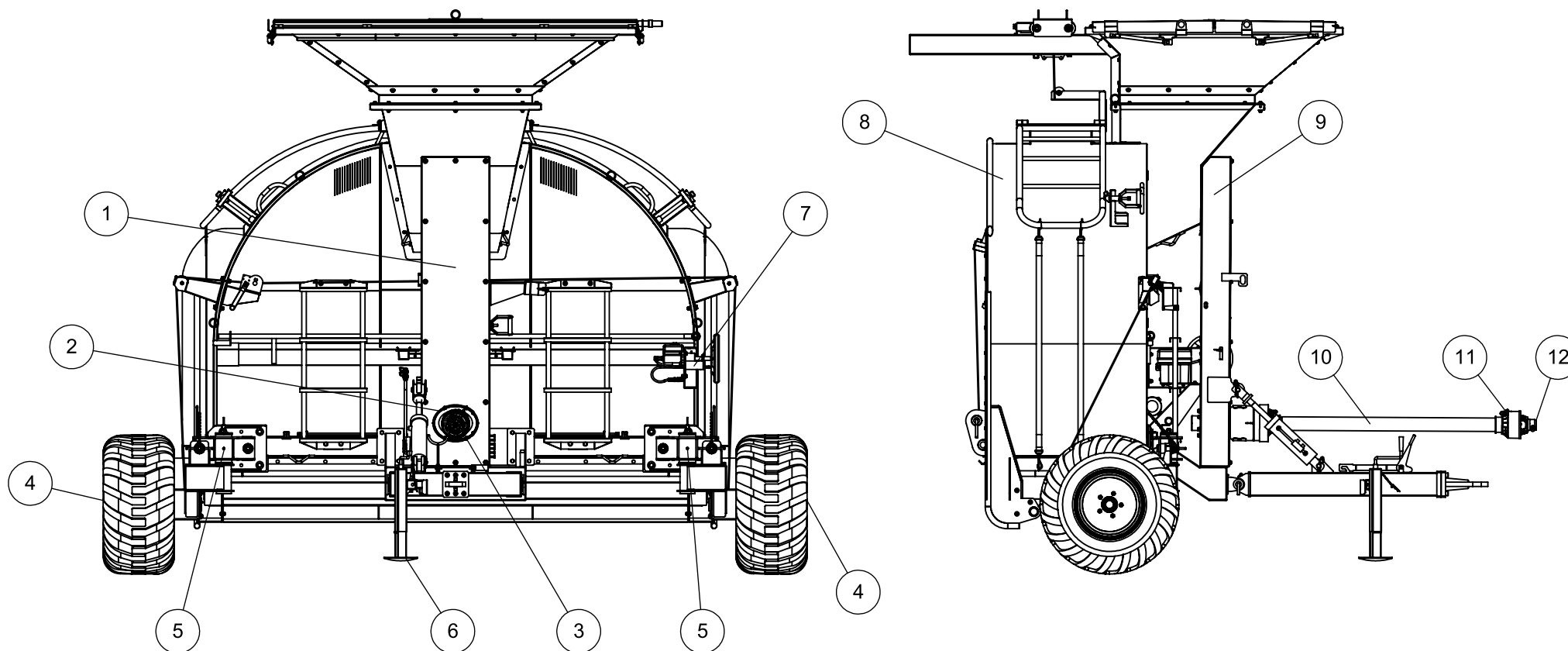


Fig. 78



IMPORTANT

Used oil and lubricants should be disposed of in accordance with local laws and regulations. Contact an authorized distributor to inquire about correct disposal procedure.



It is important, in order to avoid accidents that affect oneself and others, to be familiar with the operation of agricultural machinery.

Therefore, please follow these guidelines:

1. Allow only people with a working knowledge of the machine, controls and safety rules to operate it.
2. Verify that all safety and instructional decals are in place and in good condition. If they're not, replace them.
3. For machinery that uses the PTO:



- a) Confirm that all protective shields are in place and do not interfere with moving parts. Drive shaft shields should be secured with chains to prevent them from turning.
 - b) Follow instructions regarding minimum coupling lengths for drive shaft sections. Disconnection during operation can have dire consequences.
 - c) Check correct PTO rpm's indicated for your machine, either 540 or 1,000.
4. Do not tow agricultural machinery with automotive vehicles at high speeds on public roads. They are mostly designed to be towed by tractors on country roads at low speeds of not more than 15 mph.
 5. Make sure the total width of machinery you are towing on public roads does not exceed what is legally permitted. Use signaling lights or banners, or travel with a signaling companion vehicle.
 6. Do not allow people on machines, either working or in transport.
 7. Check that all nuts and bolts are properly tightened.
 8. Follow maintenance indications detailed in user's manual.
 9. Do not attempt to revise or repair anything if there are moving parts or tractor's engine is running.
 10. Hands, feet, hair and loose clothing are especially at risk of being snagged by moving shafts and driveline components. Operator should use adequate shoes and tight fitting clothes, and avoid using rings, watches, chains or other types of jewelry. He should also wear head, eye and ear protection if necessary.
 11. In all machines equipped with hydraulic circuits used for elevation or rotation, do not perform maintenance work without ensuring that:
 - a) Engine is off.
 - b) Nobody has ignition keys to inadvertently turn engine on.
 - c) Safety stops are in place
 - d) There are supporting stands between machine and ground.
 12. Ensure that operator is familiar with fire hazard procedures and proficient with a fire extinguisher.

Following all safety routines involves a high degree of responsibility. Be responsible to yourself and others.

Hand signals have been developed to provide a uniform means of communication between workers on the ground and equipment operators. They are especially useful when noise, distance, or language barriers make voice communication difficult.

There are eleven recognized hand signals found in ASAE Standard S351. They are illustrated here in figures.



Fig. 1 THIS FAR TO GO.
Put hands in front of face, palms facing each other. Move hands together or farther apart to indicate how far to go.



Fig. 2 COME TO ME.
(May mean "Come help me" in an emergency). Raise arm straight up palm to the front and move arm around in a large circle.



Fig. 3 MOVE TOWARD ME FOLLOW ME.
Look toward person or vehicle you want moved. Hold one hand in front of you, palm facing you, and move your forearm back and forth.



Fig. 4 MOVE OUT TAKE OFF.
Face desired direction of movement. Extend arm straight out behind you, then swing it overhead and forward until it's straight out in front of you.



Fig. 5 STOP.
Raise arm straight up, palm to the front.



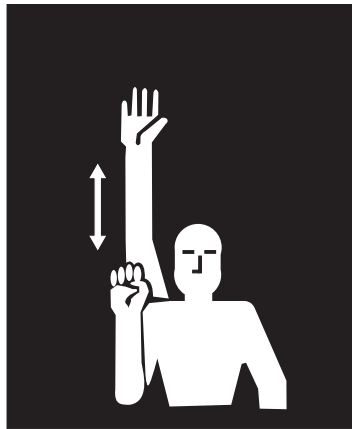


Fig. 6 SPEED IT UP.
Clenching your fist, bend your arm so your hand is at shoulder level. Thrust arm rapidly straight up and down several times.

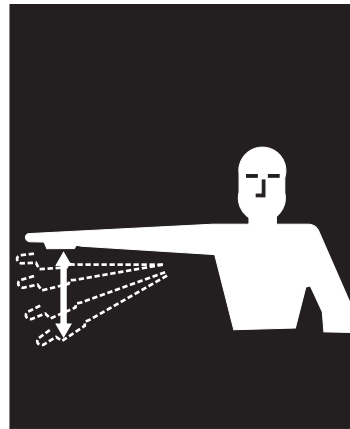


Fig. 7 SLOW IT DOWN.
Extend arm straight out to the side palm down. Keeping arm straight, move it up and down several times.

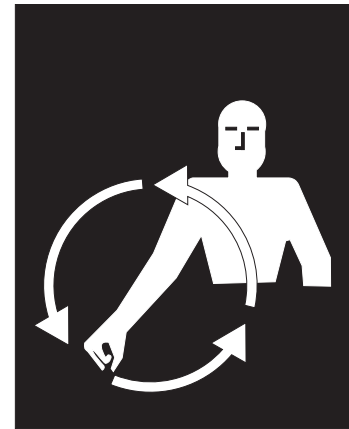


Fig. 8 START THE ENGINE.
Move arm in a circle at waist level as though you were cranking an engine.

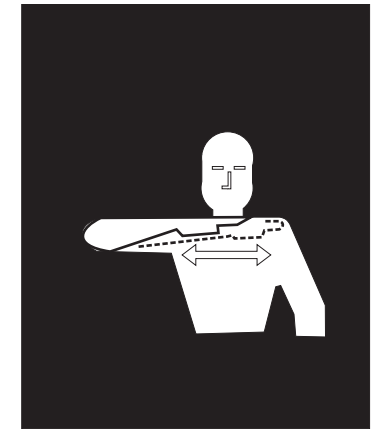


Fig. 9 STOP THE ENGINE.
Move your right arm across your neck from left to right in a “throat-cutting” motion.

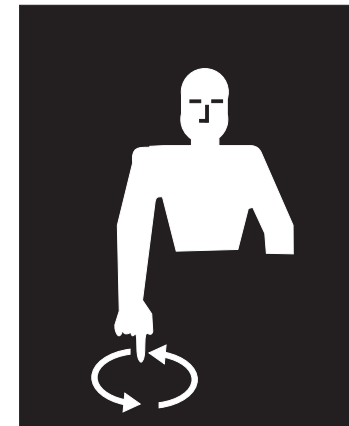


Fig. 10 LOWER EQUIPMENT.
Point toward the ground with the forefinger of one hand while moving the hand in a circle.

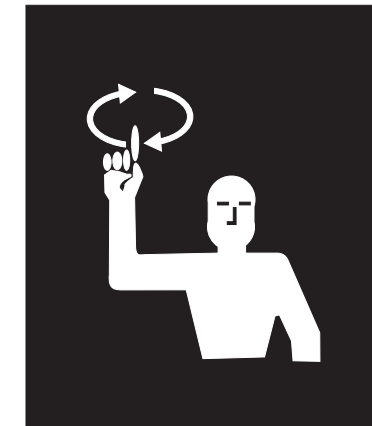
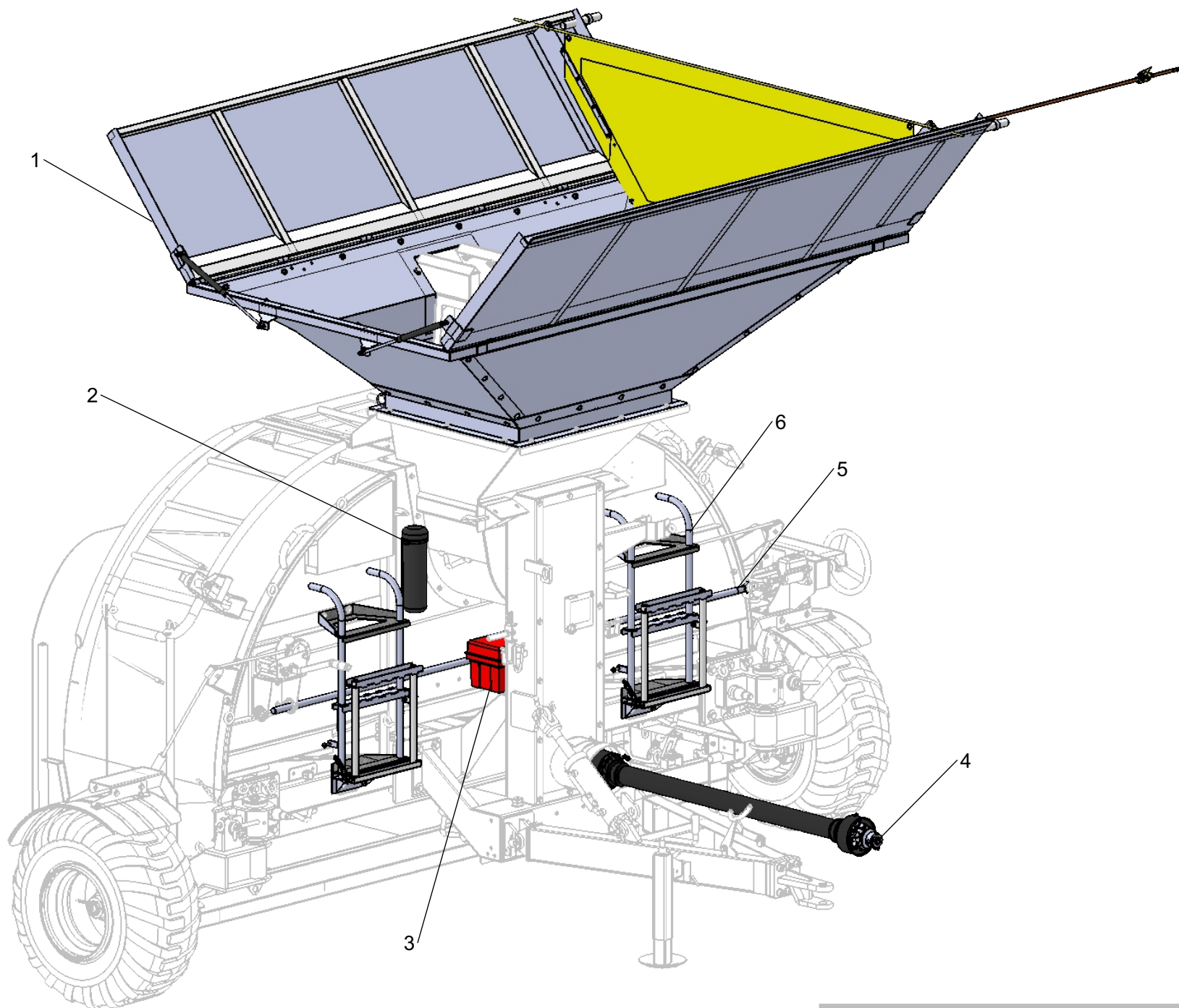


Fig. 11 RAISE EQUIPMENT.
Point upward with forefinger, while making a circle at head level with your hand.

Parts Manual

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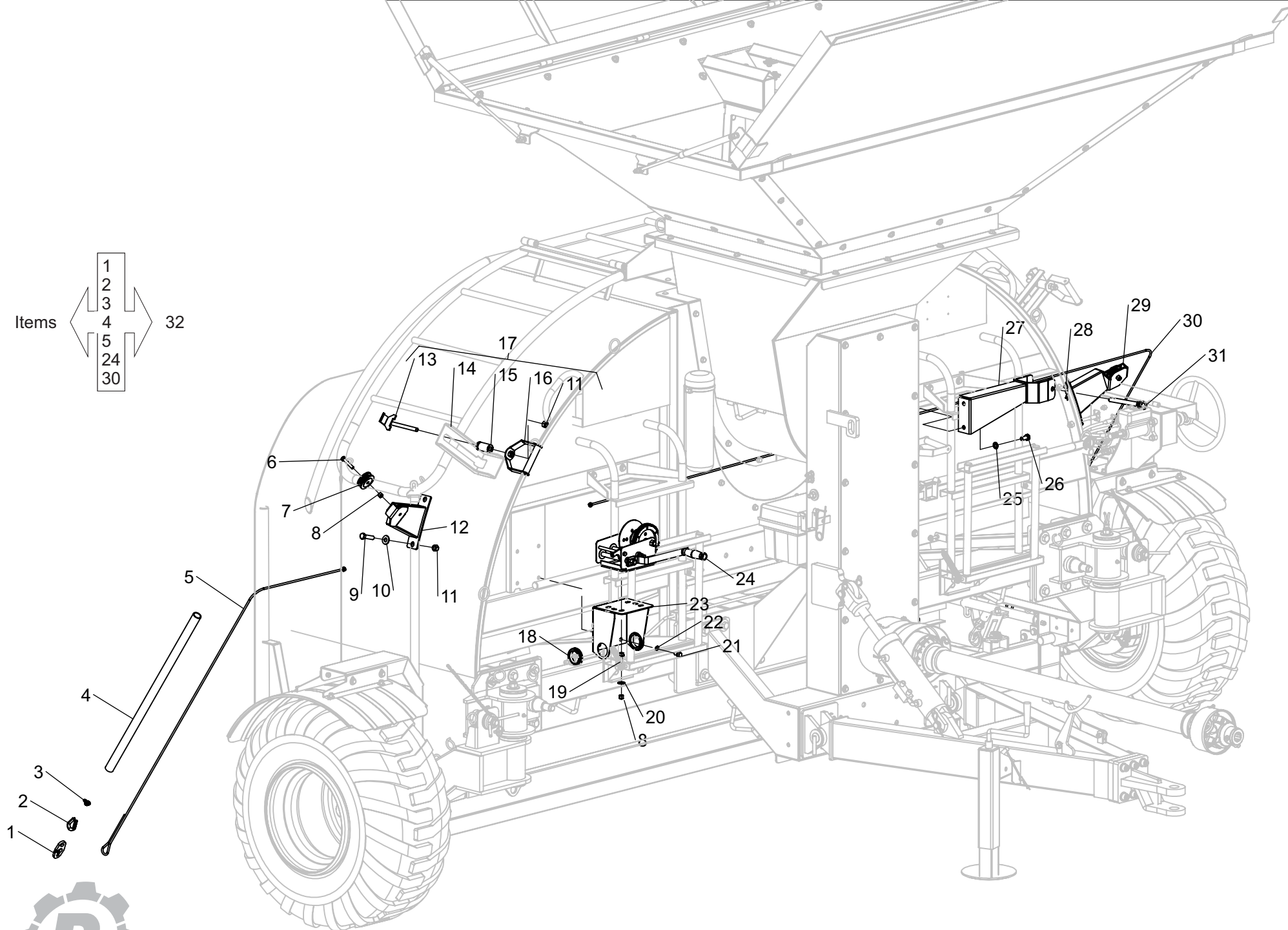
| | |
|---|-----|
| R990/R1090 - Sheet N° 1 - Full machine | 50 |
| R990/R1090 - Sheet N° 2 - Hand winch assembly & Cradle docking assembly | 52 |
| R990 - Sheet N° 3 - Compression auger drive | 54 |
| R1090 - Sheet N° 3 - Compression auger drive | 56 |
| R990 - Sheet N° 4 - Hopper base & compression auger | 58 |
| R1090 - Sheet N° 4 - Hopper base & compression auger | 60 |
| R990 - Sheet N° 5 - Drive shaft & hydraulic cylinder | 62 |
| R1090 - Sheet N° 5 - Drive shaft & hydraulic cylinder | 64 |
| R990/R1090 - Sheet N° 6 - Drive shaft | 66 |
| R990/R1090 - Sheet N° 7 - Bag tray, bag cradle & electric winch | 68 |
| R990 - Sheet N° 8 - Bag cradle | 70 |
| R1090 - Sheet N° 8 - Bag cradle | 72 |
| R990/R1090 - Sheet N° 9 - Tongue & hitch | 74 |
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| R1090 - Sheet N° 11 - Frame & wheels | 80 |
| R990/R1090 - Sheet N° 12 - Brake pump | 82 |
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| R990 - Sheet N° 14 - Brake circuit | 86 |
| R1090 - Sheet N° 14 - Brake circuit | 88 |
| R990/R1090 - Sheet N° 15 - Bag tray | 90 |
| R990/R1090 - Sheet N° 16 - Bag support | 92 |
| R990/R1090 - Sheet N° 17 - Towing tongue & support jacks | 94 |
| R990 - Sheet N° 18 - Hopper | 96 |
| R1090 - Sheet N° 18 - Hopper | 98 |
| R1090 - Sheet N° 18 - Hopper | 100 |
| R1090 - Sheet N° 19 - Side cover | 102 |
| R990 - Sheet N° 20 - Upper hopper | 104 |
| R1090 - Sheet N° 20 - Upper hopper | 106 |
| R990/R1090 - Sheet N° 21- Decals | 108 |
| R990/R1090 - Sheet N° 22 - Decals | 110 |
| R990/R1090 - Sheet N° 23 - Decals | 112 |
| R990 - Sheet N° 24 - Decals | 114 |
| R1090 - Sheet N° 24 - Decals | 116 |
| R990 - Sheet N° 25 - Lubrication circuit | 118 |
| R1090 - Sheet N° 25 - Lubrication circuit | 120 |



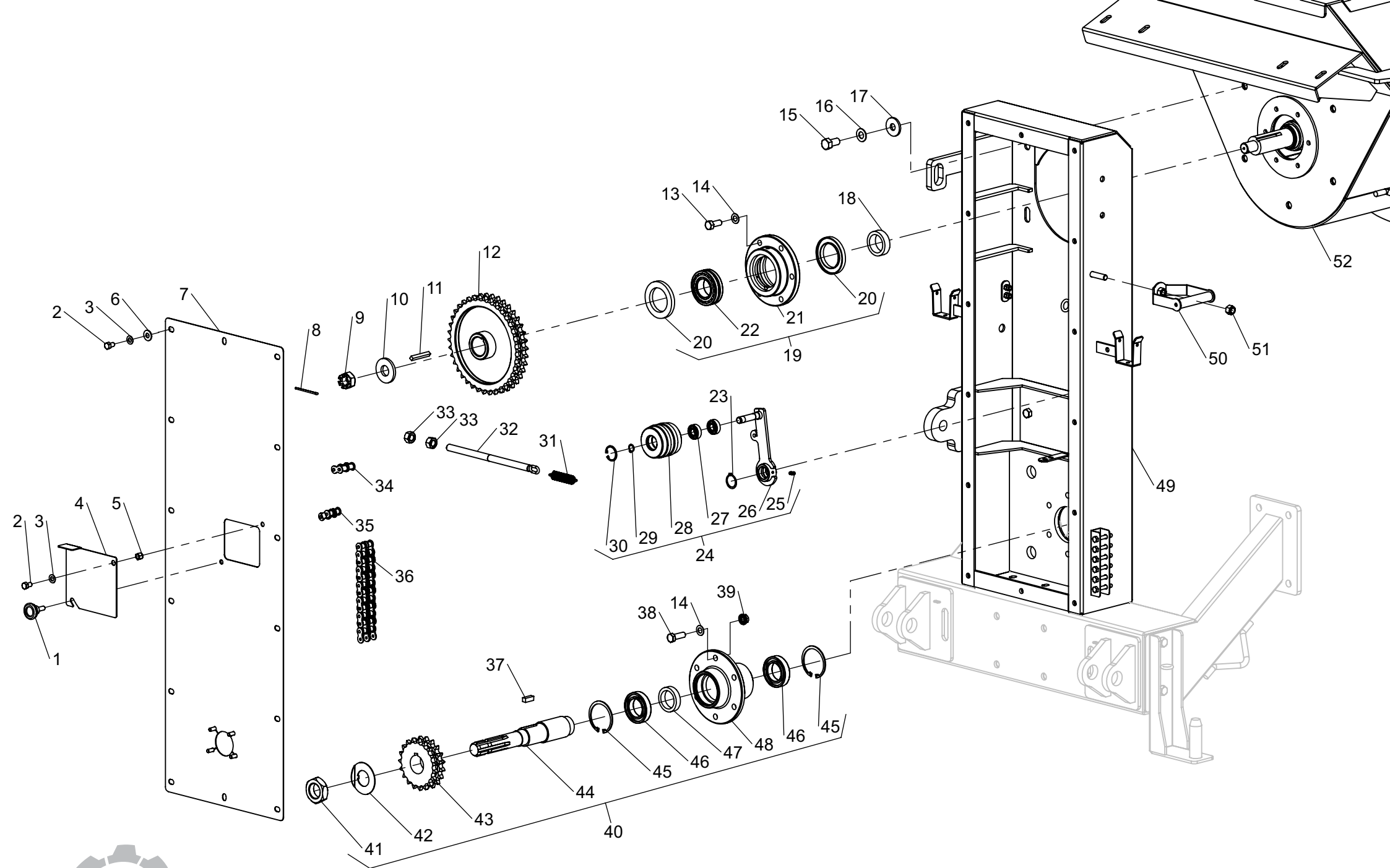
| R990 - Sheet N° 1 - Full machine | | | |
|----------------------------------|---------------------------|------------|--------|
| Nº | Description | Code | Quant. |
| 1 | Assembled hopper | CDEC50148A | 1 |
| 2 | User's manual canister | MCPL00013A | 1 |
| 3 | Tool box | MCPL00014A | 1 |
| 4 | Main drive shaft assembly | MCBA00051A | 1 |
| 5 | Pull rod | CDEC50106A | 1 |
| 6 | Front cover | CDEC50157A | 2 |

| R1090 - Sheet N° 1 - Full machine | | | |
|-----------------------------------|---------------------------|------------|--------|
| Nº | Description | Code | Quant. |
| 1 | Large size hopper assy | CDEC50195A | 1 |
| 2 | User's manual canister | MCPL00013A | 1 |
| 3 | Tool box | MCPL00014A | 1 |
| 4 | Main drive shaft assembly | MCBA00058A | 1 |
| 5 | Pull rod | CDEC50106A | 1 |
| 6 | Front cover | CDEC50157A | 2 |

- Items
- | |
|----|
| 1 |
| 2 |
| 3 |
| 4 |
| 5 |
| 24 |
| 30 |
- 32

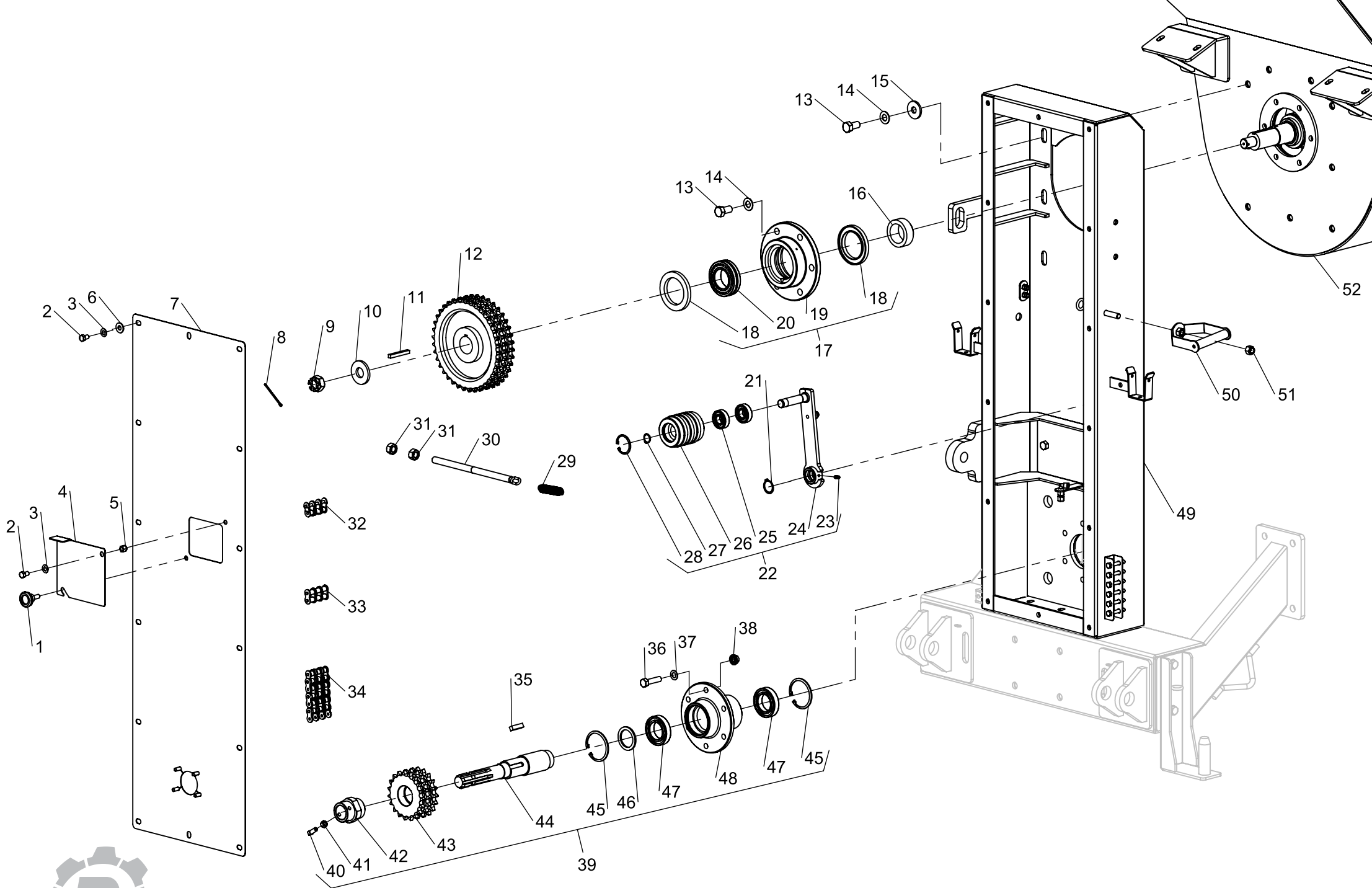


| R990/R1090 - Sheet N° 2 - Hand winch assembly & Cradle docking assembly | | | |
|---|--|------------|--------|
| Nº | Description | Code | Quant. |
| 1 | Hook | CDEC00579A | 2 |
| 2 | Cable thimble 3/16" | MCES01004A | 2 |
| 3 | Cable sleeve (crimp) 3/16" | MCES01029A | 4 |
| 4 | Tube 1"x 31" | CDEC00199A | 2 |
| 5 | Steel cable 2300 mm | CDEG50154A | 1 |
| 6 | Hex bolt gr. 5 BSW 3/8"x2" | MCBU00012A | 2 |
| 7 | Pulley | MCPL00045A | 2 |
| 8 | Self locking nut BSW 3/8" | MCTU06001A | 5 |
| 9 | Hex bolt gr. 5 BSW 1/2"x2" | MCBU00028A | 4 |
| 10 | Flat washer galvanized 1/2" | MCAR00007A | 4 |
| 11 | Self locking nut BSW 1/2" | MCTU06003A | 6 |
| 12 | Pulley bracket assy, right side | CDEC50164A | 1 |
| 13 | Threaded pin | CDEC50096A | 2 |
| 14 | Cradle bracket | CDEC00299A | 2 |
| 15 | Bushing | CDEC00300A | 2 |
| 16 | Wingnut w/washer | CDEC50095A | 2 |
| 17 | Cradle support assy. | CDEC50138A | 2 |
| 18 | Ring | MCGO00078A | 2 |
| 19 | Hex bolt gr. 5 BSW 3/8"x1" | MCBU00007A | 3 |
| 20 | Flat washer galvanized 3/8" | MCAR00005A | 3 |
| 21 | Hex bolt gr. 5 BSW 3/8"x3/4" | MCBU00005A | 4 |
| 22 | Disc springs 3/8" (20x10,2x0.8 mm) | MCAR01006A | 4 |
| 23 | Front cover bracket | CDEG00383A | 1 |
| 24 | Hand winch | CDEG50188A | 1 |
| 25 | Disc springs 1/2" (24x13x2,8 mm) | MCAR03002A | 2 |
| 26 | Hex bolt gr. 5 BSW 1/2"x1" | MCBU00024A | 2 |
| 27 | Vertical position support, drive shaft | CDEC50156A | 1 |
| 28 | R-clip 2.5x60 mm | MCCH00005A | 1 |
| 29 | Pulley bracket assy, left side | CDEC50166A | 1 |
| 30 | Steel cable 4850 mm | CDEG50155A | 1 |
| 31 | Pin, upper bracket | CDCM50016A | 1 |
| 32 | Hand winch | CDEG50148A | 1 |



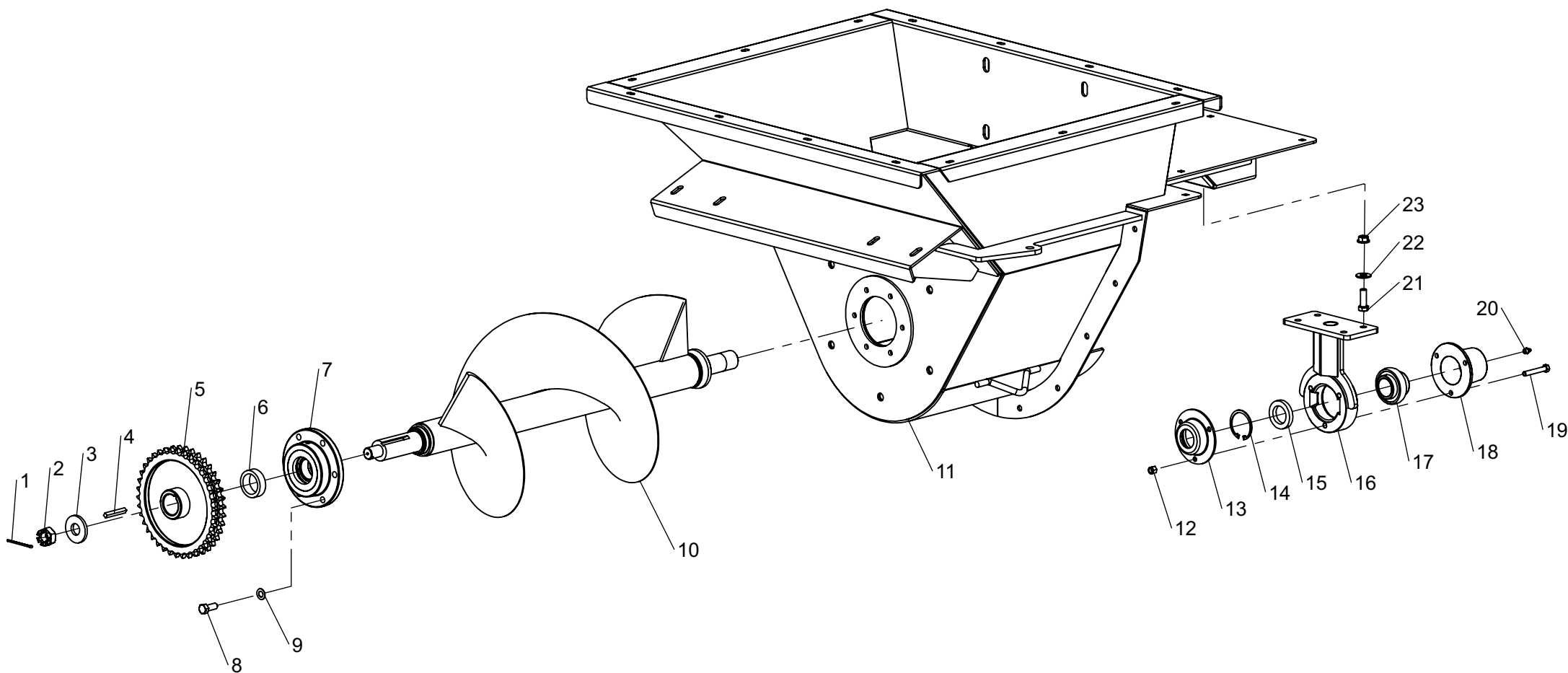
| R990 - Sheet N° 3 - Compression auger drive | | | |
|---|--|------------|--------|
| Nº | Description | Code | Quant. |
| 1 | Knob with screw 3/8" x 1" | MCPL00050A | 1 |
| 2 | Hex bolt gr. 5 BSW 3/8"x5/8" | MCBU00031A | 15 |
| 3 | Disc springs 3/8" (20x10,2x0.8 mm) | MCAR01006A | 15 |
| 4 | Inspection cover | CDEH00503A | 1 |
| 5 | Self locking nut BSW 3/8" | MCTU06001A | 1 |
| 6 | Flat washer galvanized 3/8" | MCAR00005A | 14 |
| 7 | Cover | CDEC50188A | 1 |
| 8 | Split pin 4x60 mm | MCCH01033A | 1 |
| 9 | Castle nut NF 1" | MCTU10005A | 1 |
| 10 | Flat washer 1/4" OD 60/ ID 26 mm | CDAA42013A | 1 |
| 11 | Square key 8x8x60 mm | CDBR00089A | 1 |
| 12 | Double sprocket 38 teeth, ASA 60/2 chain | CDBE00024A | 1 |
| 13 | Hex bolt gr. 5 BSW 1/2"x1 1/4" | MCBU00003A | 6 |
| 14 | Disc springs 1/2" (24x13x2,8 mm) | MCAR03002A | 6 |
| 15 | Hex bolt gr. 5 BSW 5/8"x1 1/4" | MCBU00034A | 7 |
| 16 | Disc springs 5/8" (31,5x16,3x1,75 mm) | MCAR01003A | 7 |
| 17 | Flat washer 3/16" OD 45/ ID 16 mm | CDAA42019A | 7 |
| 18 | Spacer | CDBE00025A | 1 |
| 19 | Bearing assy, compression auger | CDBQ50021A | 1 |
| 20 | Oil seal 60x90x10 mm | MCRE00032A | 2 |
| 21 | Bearing housing for bearing 22209 | CDBE00018A | 1 |
| 22 | Bearing 22209 CC W33 | MCRO05003A | 1 |
| 23 | Snap ring 30A DIN471 | MCSE01008A | 1 |
| 24 | Chain tensioner assy | CDEG50003A | 1 |
| 25 | Grease fitting, straight SAE 1/4" | MCAL00002A | 1 |
| 26 | Tensioner arm | CDEG50005A | 1 |

| R990 - Sheet N° 3 - Compression auger drive | | | |
|---|--|------------|--------|
| Nº | Description | Code | Quant. |
| 27 | Bearing 6202 2RS | MCRO00011A | 2 |
| 28 | Tensioner roller | CDEC00047A | 1 |
| 29 | Snap ring 15A DIN471 | MCSE01020A | 1 |
| 30 | Snap ring 35I DIN472 | MCSE00011A | 1 |
| 31 | Tensioner spring 2.5x20x65 mm | MCRS00014A | 1 |
| 32 | Tensioner stud | CDEG50177A | 1 |
| 33 | Hex nut gr. 5 BSW 5/8" | MCTU00007A | 2 |
| 34 | Connecting link, ASA 60/2 roller chain | MCCA01025A | 1 |
| 35 | Offset link ASA 60/2 roller chain | MCCA01036A | 1 |
| 36 | Roller chain ASA 60/2 | CDEC00511A | 1 |
| 37 | Square key 10x10x28 mm | CDBR00085A | 1 |
| 38 | Hex bolt gr. 5 BSW 1/2"x1 1/2" | MCBU00026A | 6 |
| 39 | Hex nut gr. 5 BSW 1/2" | MCTU00005A | 6 |
| 40 | Drive shaft assy | CDEC50103A | 1 |
| 41 | Nut, drive shaft | MCTU12027A | 1 |
| 42 | Washer, drive shaft | CDAI00006A | 1 |
| 43 | Double sprocket 19 teeth, ASA 60/2 chain | CDBO00013A | 1 |
| 44 | Drive shaft w/push-button lock | CDBQ00127A | 1 |
| 45 | Snap ring 75I DIN472 | MCSE00009A | 2 |
| 46 | Bearing 6009 2RS | MCRO00001A | 2 |
| 47 | Spacer bushing | CDBO00014A | 1 |
| 48 | Drive shaft housing | CDBV00025A | 1 |
| 49 | Drive housing | CDEC50182A | 1 |
| 50 | Wingnut w/washer | CDEC50095A | 1 |
| 51 | Self locking nut BSW 1/2" | MCTU06003A | 1 |
| 52 | Base for CG300/R990 | CDCP50304A | 1 |

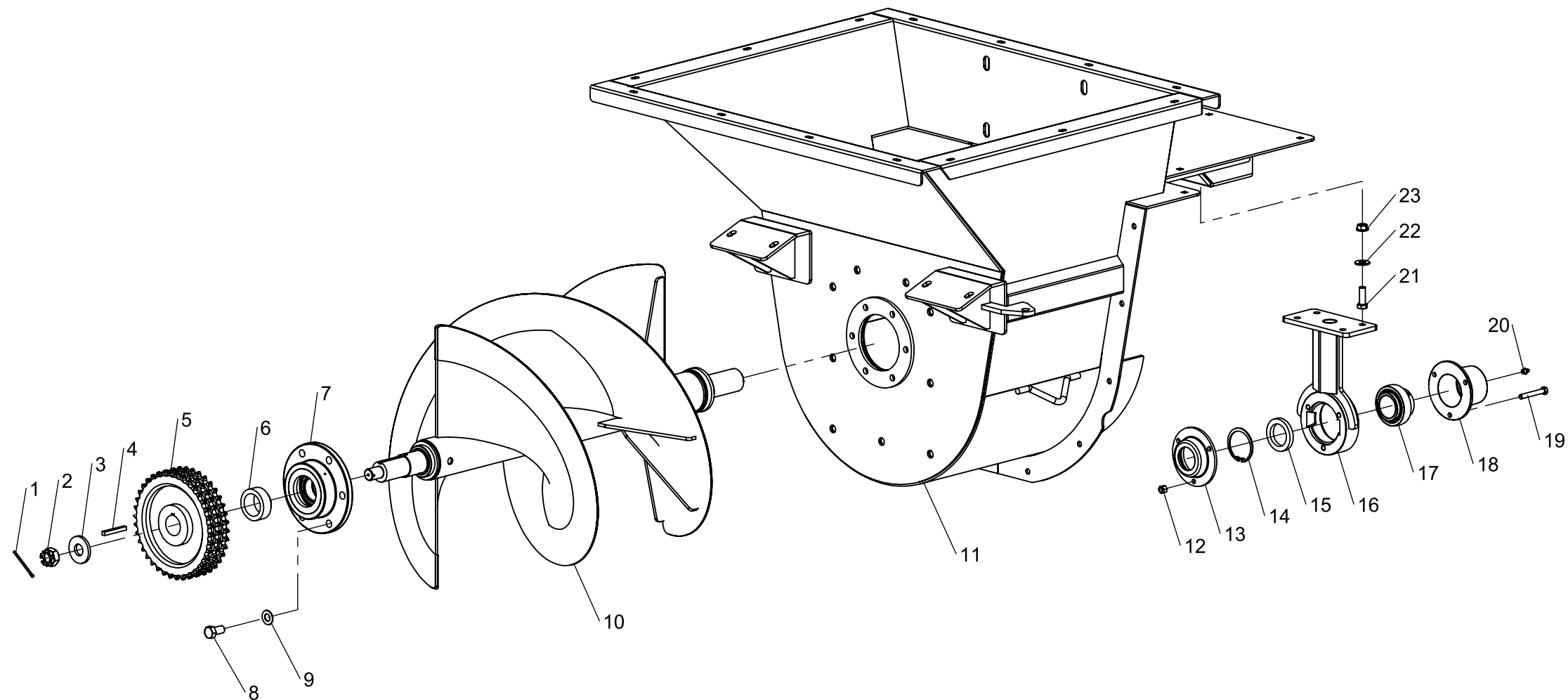


| R1090 - Sheet N° 3 - Compression auger drive | | | |
|--|--|------------|--------|
| Nº | Description | Code | Quant. |
| 1 | Knob with screw 3/8" x 1" | MCPL00050A | 1 |
| 2 | Hex bolt gr. 5 BSW 3/8"x5/8" | MCBU00031A | 15 |
| 3 | Disc springs 3/8" (20x10,2x0.8 mm) | MCAR01006A | 15 |
| 4 | Inspection cover | CDEH00503A | 1 |
| 5 | Self locking nut BSW 3/8" | MCTU06001A | 1 |
| 6 | Flat washer galvanized 3/8" | MCAR00005A | 14 |
| 7 | Cover | CDEG50114A | 1 |
| 8 | Split pin 4x60 mm | MCCH01033A | 1 |
| 9 | Castle nut NF 1" | MCTU10005A | 1 |
| 10 | Flat washer 1/4" OD 60/ ID 26 mm | CDAA42013A | 1 |
| 11 | Square key 8x8x67 mm | CDEG00416A | 1 |
| 12 | Triple sprocket 38 teeth, ASA 60/3 chain | CDEG00406A | 1 |
| 13 | Hex bolt gr. 5 BSW 5/8"x1 1/4" | MCBU00034A | 15 |
| 14 | Disc springs 5/8" (31,5x16,3x1,75 mm) | MCAR01003A | 15 |
| 15 | Flat washer 3/16" OD 45/ ID 16 mm | CDAA42019A | 9 |
| 16 | Spacer | CDBR00058A | 1 |
| 17 | Bearing assy, compression auger | CDBR50026A | 1 |
| 18 | Oil seal 70x100x10 mm | MCRE00043A | 2 |
| 19 | Bearing housing for bearing 22210 | CDBR00071A | 1 |
| 20 | Bearing 22210 E | MCRO05002A | 1 |
| 21 | Snap ring 30A DIN471 | MCSE01008A | 1 |
| 22 | Triple tensioner stud | CDEG50161A | 1 |
| 23 | Grease fitting, straight SAE 1/4" | MCAL00002A | 1 |
| 24 | Triple tensioner arm | CDEG50160A | 1 |
| 25 | Bearing 6204 2RS | MCRO00015A | 2 |
| 26 | Triple tensioner roller | CDEG00408A | 1 |

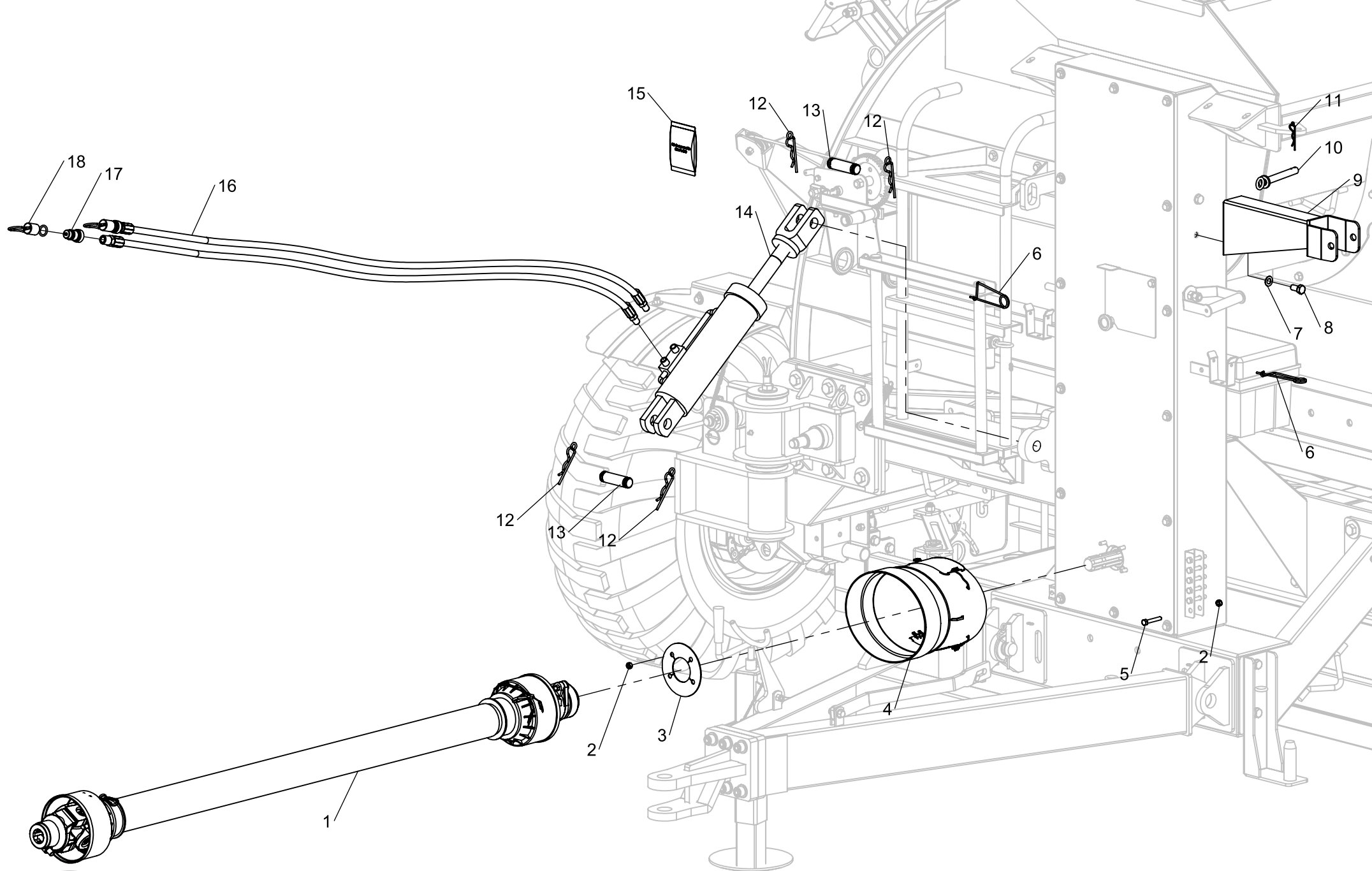
| R1090 - Sheet N° 3 - Compression auger drive | | | |
|--|--|------------|--------|
| Nº | Description | Code | Quant. |
| 27 | Snap ring 20A DIN471 | MCSE01004A | 1 |
| 28 | Snap ring 47I DIN472 | MCSE00002A | 1 |
| 29 | Tensioner spring 2.5x20x65 mm | MCRS00014A | 1 |
| 30 | Tensioner stud | CDEG50177A | 1 |
| 31 | Hex nut gr. 5 BSW 5/8" | MCTU00007A | 2 |
| 32 | Connecting link, ASA 60/3 roller chain | MCCA01037A | 1 |
| 33 | Offset link ASA 60/3 roller chain | MCCA01038A | 1 |
| 34 | Roller chain ASA 60/3 | CDEG00417A | 1 |
| 35 | Square key 10x10x38 mm | CDEG00415A | 1 |
| 36 | Hex bolt gr. 5 BSW 1/2"x2" | MCBU00028A | 6 |
| 37 | Disc springs 1/2" (24x13x2,8 mm) | MCAR03002A | 6 |
| 38 | Hex nut gr. 5 BSW 1/2" | MCTU00005A | 6 |
| 39 | Drive shaft assy. | CDEG50165A | 1 |
| 40 | Square head set screw 3/8"x7/8" | MCPR00015A | 1 |
| 41 | Hex nut gr. 5 BSW 3/8" | MCTU00015A | 1 |
| 42 | Gear fixing nut | CDEG00409A | 1 |
| 43 | Triple sprocket 19 teeth, ASA 60/3 chain | CDEG00407A | 1 |
| 44 | Drive shaft w/push-button lock | CDBQ00127A | 1 |
| 45 | Snap ring 75I DIN472 | MCSE00009A | 2 |
| 46 | Spacer bushing | CDBO00040A | 1 |
| 47 | Bearing 6009 2RS | MCRO00001A | 2 |
| 48 | Drive shaft housing | CDBV00025A | 1 |
| 49 | Drive housing | CDEG50113A | 1 |
| 50 | Wingnut w/washer | CDEC50095A | 1 |
| 51 | Self locking nut BSW 1/2" | MCTU06003A | 1 |
| 52 | Base for CG300/R1090 | CDCP50290A | 1 |



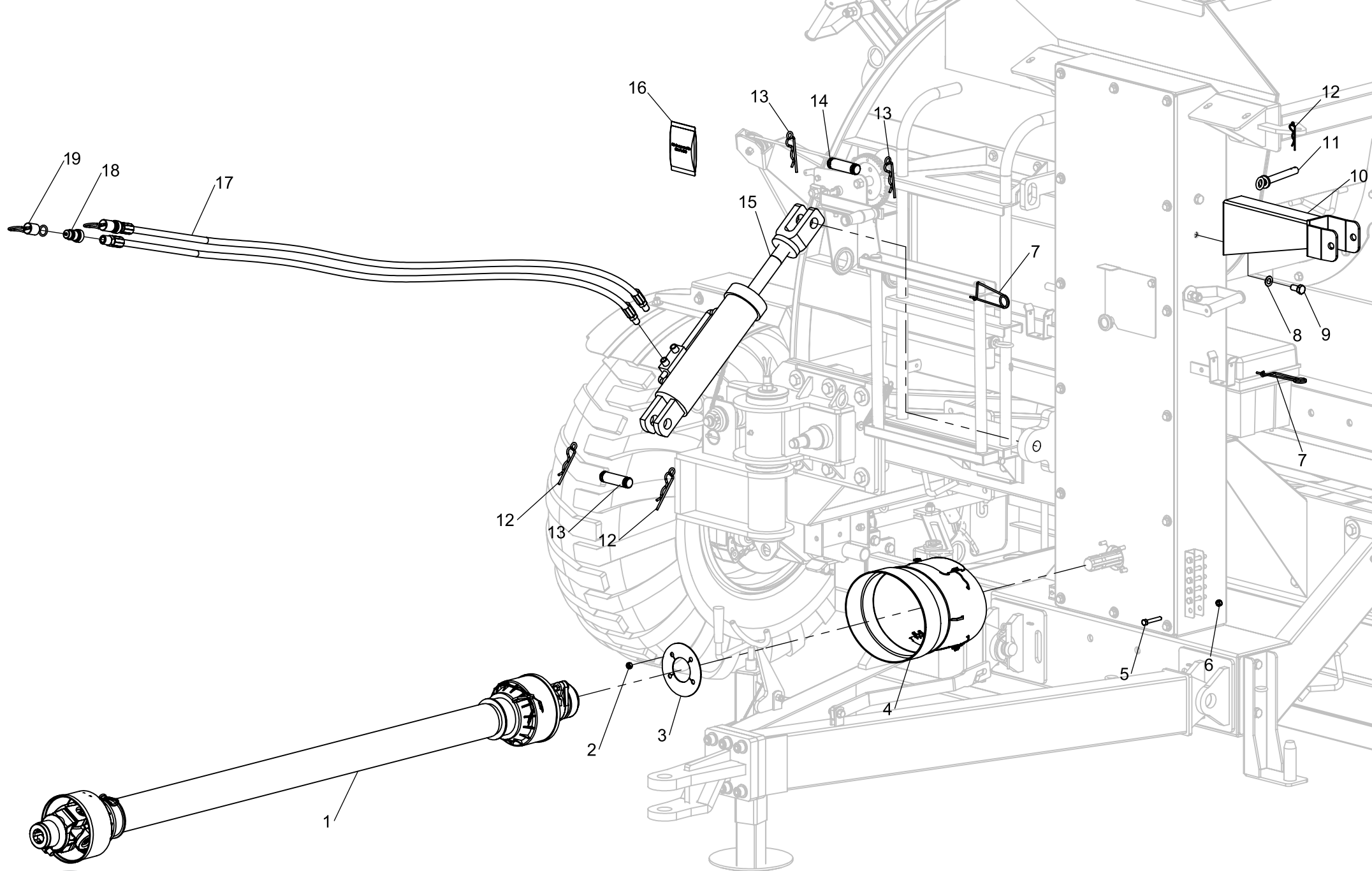
| R990 - Sheet N° 4 - Hopper base & compression auger | | | |
|---|--|------------|--------|
| Nº | Description | Code | Quant. |
| 1 | Split pin 4x60 mm | MCCH01033A | 1 |
| 2 | Castle nut NF 1" | MCTU10005A | 1 |
| 3 | Flat washer 1/4" OD 60/ ID 26 mm | CDAA42013A | 1 |
| 4 | Square key 8x8x60 mm | CDBR00089A | 1 |
| 5 | Double sprocket 38 teeth, ASA 60/2 chain | CDBE00024A | 1 |
| 6 | Spacer | CDBE00025A | 1 |
| 7 | Bearing, compression auger | CDBQ50021A | 1 |
| 8 | Hex bolt gr. 5 BSW 1/2"x1 1/4" | MCBU00003A | 6 |
| 9 | Disc springs 1/2" (24x13x2,8 mm) | MCAR03002A | 6 |
| 10 | Compression auger | CDEC50049A | 1 |
| 11 | Base for CG300/R990 | CDCP50304A | 1 |
| 12 | Self locking nut BSW 3/8" | MCTU06001A | 3 |
| 13 | Bearing cover, front | CDCS00101B | 1 |
| 14 | Snap ring 62I DIN472 | MCSE00003A | 1 |
| 15 | Oil seal 40x62x10 mm | MCRE00028A | 1 |
| 16 | Hanger f/UC-208 | CDCT50019A | 1 |
| 17 | Bearing UC-208 3L | MCRO12010A | 1 |
| 18 | Bearing cover, rear | CDCS00105A | 1 |
| 19 | Hex bolt gr. 5 BSW 3/8"x2 1/2" | MCBU00056A | 3 |
| 20 | Grease fitting, straight SAE 1/8" | MCAL00001A | 1 |
| 21 | Hex bolt gr. 5 BSW 1/2"x1 1/2" | MCBU00026A | 4 |
| 22 | Flat washer galvanized 1/2" | MCAR00007A | 4 |
| 23 | Hex nut gr. 5 BSW 1/2" | MCTU00005A | 4 |



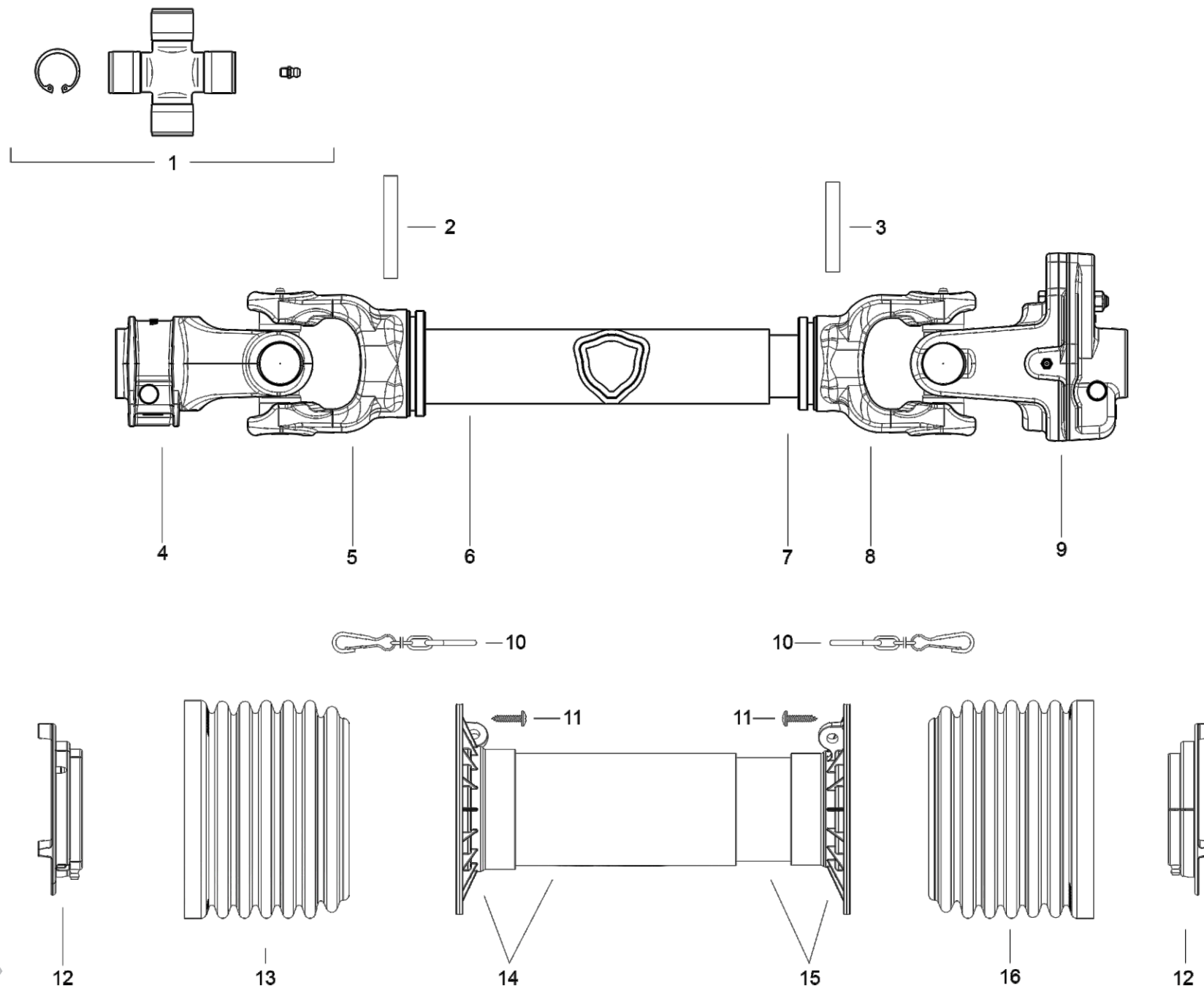
| R1090 - Sheet N° 4 - Hopper base & compression auger | | | |
|--|--|------------|--------|
| Nº | Description | Code | Quant. |
| 1 | Split pin 4x60 mm | MCCH01033A | 1 |
| 2 | Castle nut NF 1" | MCTU10005A | 1 |
| 3 | Flat washer 1/4" OD 60/ ID 26 mm | CDAA42013A | 1 |
| 4 | Square key 8x8x67 mm | CDEG00416A | 1 |
| 5 | Double sprocket 38 teeth, ASA 60/3 chain | CDEG00406A | 1 |
| 6 | Spacer | CDBR00058A | 1 |
| 7 | Bearing, compression auger | CDBR50026A | 1 |
| 8 | Hex bolt gr. 5 BSW 5/8"x1 1/4" | MCBU00034A | 6 |
| 9 | Disc springs 5/8" (31,5x16,3x1,75 mm) | MCAR01003A | 6 |
| 10 | Compression auger | CDEG50111A | 1 |
| 11 | Base for CG300/R1090 | CDCP50290A | 1 |
| 12 | Self locking nut BSW 1/2" | MCTU06001A | 3 |
| 13 | Bearing cover, front | CDEG00174A | 1 |
| 14 | Snap ring 72I DIN472 | MCSE00005A | 1 |
| 15 | Oil seal 50x72x10 mm | MCRE00008A | 1 |
| 16 | Hanger f/UC-210 | CDEG50101A | 1 |
| 17 | Bearing UC-210 | MCRO12007A | 1 |
| 18 | Bearing cover, rear | CDEG00175A | 1 |
| 19 | Hex bolt gr. 5 BSW 3/8"x2 3/4" | MCBU00046A | 3 |
| 20 | Grease fitting, straight SAE 1/8" | MCAL00001A | 1 |
| 21 | Hex bolt gr. 5 BSW 1/2"x1 1/2" | MCBU00026A | 4 |
| 22 | Flat washer galvanized 1/2" | MCAR00007A | 4 |
| 23 | Hex nut gr. 5 BSW 1/2" | MCTU00005A | 4 |



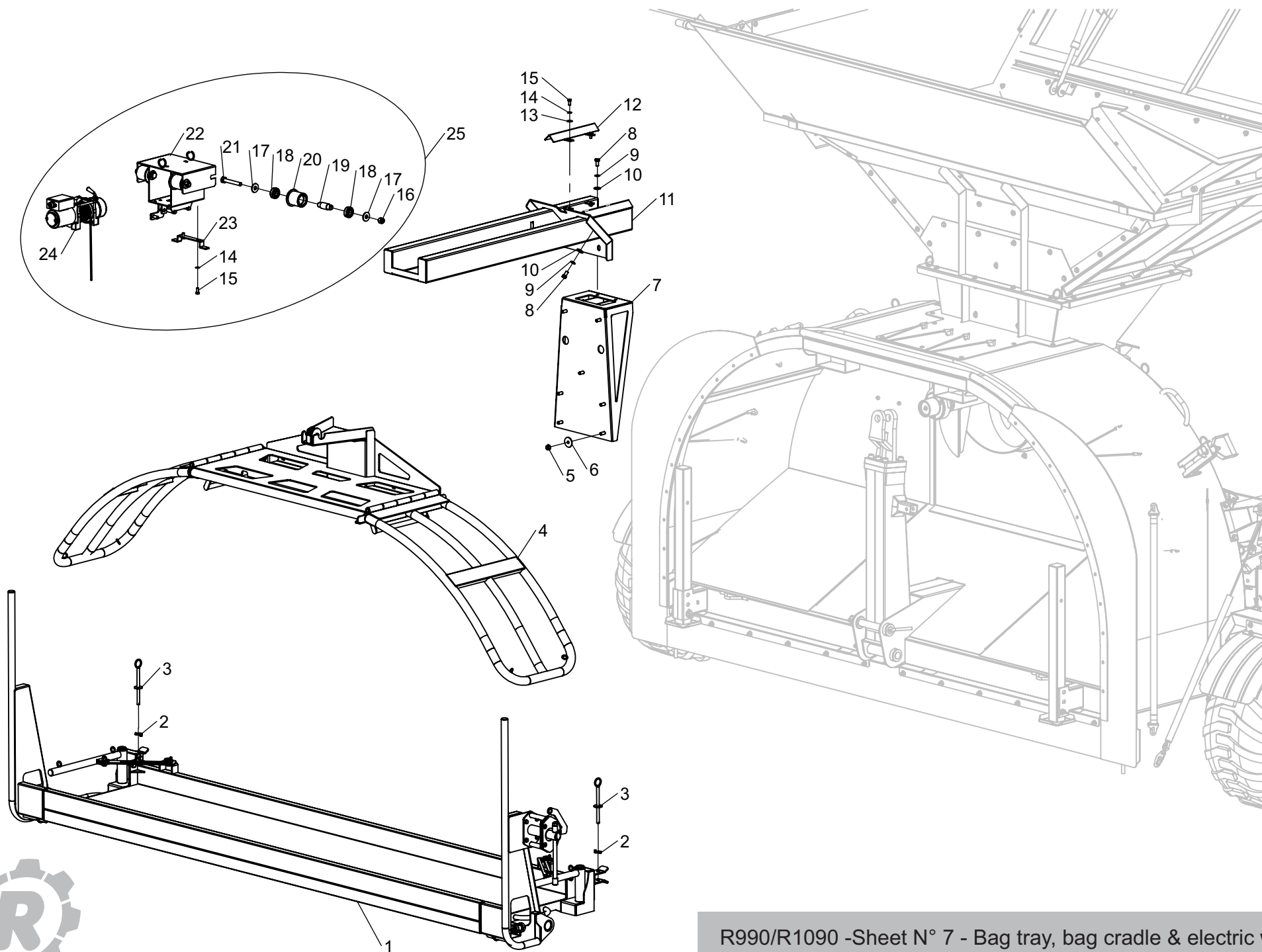
| R990 - Sheet N° 5 - Drive shaft & hydraulic cylinder | | | |
|--|---|------------|--------|
| Nº | Description | Code | Quant. |
| 1 | Drive shaft | MCBA00051A | 1 |
| 2 | Self locking nut BSW 5/16" | MCTU06002A | 10 |
| 3 | Retaining washer, plastic shield | CDBQ00036A | 1 |
| 4 | Plastic shield, PTO | CDBZ00112A | 1 |
| 5 | Hex bolt gr. 5 BSW 5/16"x2" | MCBU00059A | 6 |
| 6 | Pin clip 3,5 x 145 mm | MCCH02002A | 2 |
| 7 | Disc springs 1/2" (24x13x2,8 mm) | MCAR03002A | 2 |
| 8 | Hex bolt gr. 5 BSW 1/2"x1" | MCBU00024A | 2 |
| 9 | Vertical position support, drive shaft | CDEC50156A | 1 |
| 10 | Pin, upper bracket | CDCM50016A | 1 |
| 11 | R-clip 2.5x60 mm | MCCH00005A | 1 |
| 12 | R-clip 4x90 mm | MCCH00007A | 4 |
| 13 | Clevis pin 1" x 90 mm, hydraulic cylinder | MCHI07100A | 2 |
| 14 | Hydraulic cylinder 3" x 8" w/check valve | MCHI02022A | 1 |
| 15 | Repair kit, hydraulic cylinder | MCHI00017A | 1 |
| 16 | Hydraulic hose 1/4" R2 AT LEP= 2000 mm | MCHI04027A | 2 |
| 17 | Quick disconnect coupling PNH 1/2" NPT | MCHI07055A | 2 |
| 18 | Plastic plug BTHP 1/2" | MCHI07027A | 2 |



| R1090 - Sheet N° 5 - Drive shaft & hydraulic cylinder | | | |
|---|---|------------|--------|
| Nº | Description | Code | Quant. |
| 1 | Drive shaft | MCBA00058A | 1 |
| 2 | Self locking nut BSW 5/16" | MCTU06002A | 4 |
| 3 | Retaining washer, plastic shield | CDBQ00036A | 1 |
| 4 | Plastic shield, PTO | CDBZ00112A | 1 |
| 5 | Hex bolt Class 8.8 M10-1.5x50 mm | MCBU04006A | 6 |
| 6 | Self locking nut M10 | MCTU08004A | 6 |
| 7 | Pin clip 3,5 x 145 mm | MCCH02002A | 2 |
| 8 | Disc springs 1/2" (24x13x2,8 mm) | MCAR03002A | 2 |
| 9 | Hex bolt gr. 5 BSW 1/2"x1" | MCBU00024A | 2 |
| 10 | Vertical position support, drive shaft | CDEC50156A | 1 |
| 11 | Pin, upper bracket | CDCM50016A | 1 |
| 12 | R-clip 2.5x60 mm | MCCH00005A | 1 |
| 13 | R-clip 4x90 mm | MCCH00007A | 4 |
| 14 | Clevis pin 1" x 90 mm, hydraulic cylinder | MCHI07100A | 2 |
| 15 | Hydraulic cylinder 3" x 8" w/check valve | MCHI02022A | 1 |
| 16 | Repair kit, hydraulic cylinder | MCHI00017A | 1 |
| 17 | Hydraulic hose 1/4" R2 AT LEP= 2000 mm | MCHI04027A | 2 |
| 18 | Quick disconnect coupling PNH 1/2" NPT | MCHI07055A | 2 |
| 19 | Plastic plug BTHP 1/2" | MCHI07027A | 2 |



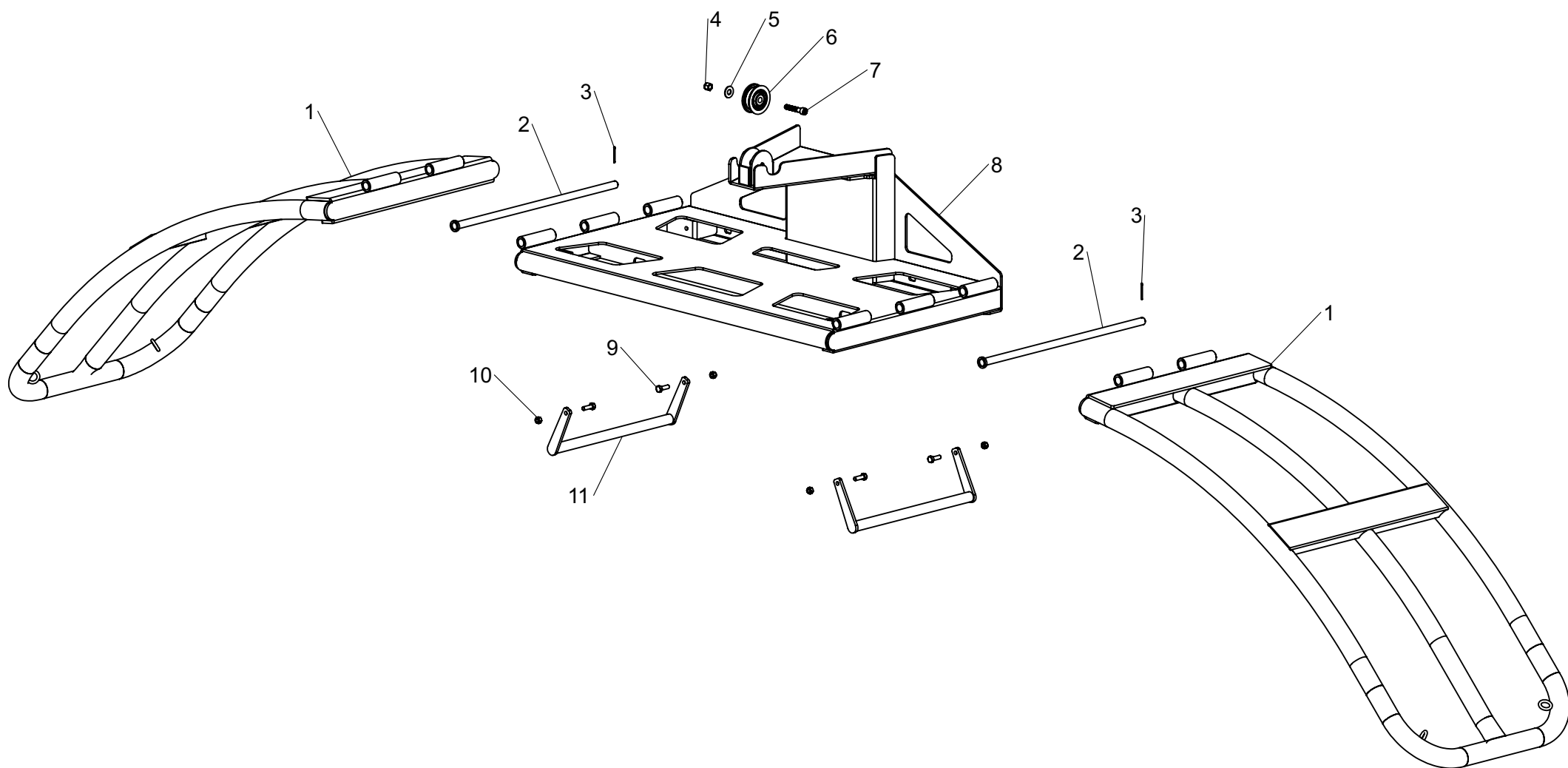
| R900/R1090 - Sheet N° 6 - Drive shaft | | | |
|---------------------------------------|---|------------|--------|
| N° | Description | Code | Quant. |
| 1 | U-joint for simple knots 30,2x91,4 - G7 | MCBA01211A | 2 |
| 2 | Outdoor spring pin 10x75 - G7/G8 | MCBA01213A | 1 |
| 3 | Inner spring pin 10x65 - G7/G8 | MCBA01216A | 1 |
| 4 | Yoke, overhand knots with pushbutton 1 3/8" - Z6 - G7 | MCBA01210A | 1 |
| 5 | Yoke, simple knots for external tubes G7 | MCBA01212A | 1 |
| 6 | Triangular outer tube, drive shaft | MCBA01258A | 1 |
| 7 | Triangular inner tube, drive shaft | MCBA01259A | 1 |
| 8 | Yoke, simple knots for inner tubes G7 | MCBA01217A | 1 |
| 9 | Power limiter | MCBA01218A | 1 |
| 10 | Chain hook in "S" L=60 | MCBA01195A | 2 |
| 11 | Self-tapping screw 4,8x22 zink | MCBA01221A | 6 |
| 12 | Outer tube support ring G7 | MCBA01220A | 1 |
| 13 | Flexible Bando for simple knot G7 | MCBA01219A | 2 |
| 14 | Guard, outer tube | MCBA01260A | 1 |
| 15 | Guard, inner tube | MCBA01261A | 1 |
| 16 | Flexible Bando for simple knot G7 | MCBA01219A | 1 |



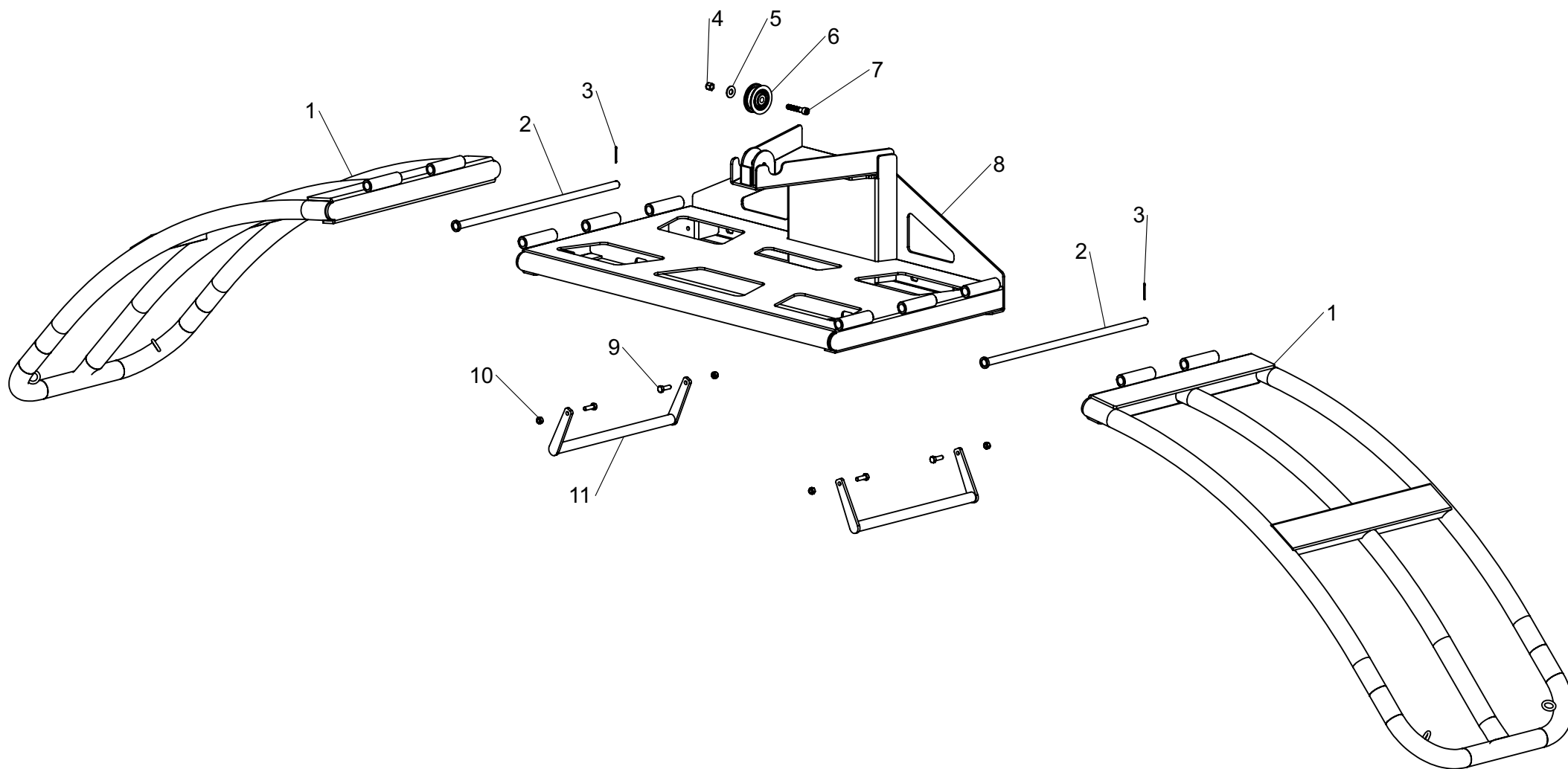
R990/R1090 -Sheet N° 7 - Bag tray, bag cradle & electric winch

| R990 - Sheet N° 7 - Bag tray, bag cradle & electric winch | | | |
|---|----------------------------------|------------|--------|
| Nº | Description | Code | Quant. |
| 1 | Bag tray assy. | CDEC50186A | 1 |
| 2 | R-clip w/ring | MCCH03001A | 2 |
| 3 | Lock pin | CDEG50137A | 2 |
| 4 | Bag cradle assy. | CDEC50184A | 1 |
| 5 | Hex nut BSW 1/4" | MCTU00005A | 7 |
| 6 | Flat washer 1/8" OD 50/ ID 13 mm | CDAA42034A | 7 |
| 7 | Support bracket, jib crane | CDEG50141A | 1 |
| 8 | Hex bolt gr. 5 BSW 5/8"x2" | MCBU00024A | 2 |
| 9 | Split lock washer 1/2" | MCAR01010A | 4 |
| 10 | Flat washer galvanized 1/2" | MCAR00007A | 4 |
| 11 | Twin rail jib crane | CDEC50089A | 1 |
| 12 | Anti-grain folding | CDEG00411A | 2 |
| 13 | Flat washer galvanized 3/8" | MCAR00005A | 4 |
| 14 | Split lock washer 7/8" | MCAR01006A | 6 |
| 15 | Hex bolt gr. 5 BSW 7/16"x4" | MCBU00006A | 6 |
| 16 | Self locking nut NF 1" | MCTU06005A | 4 |
| 17 | Flat washer galvanized 5/8" | MCAR00009A | 8 |
| 18 | Bearing 6211 2RS | MCRO00017A | 8 |
| 19 | Trolley axle | CDEC00113A | 4 |
| 20 | Trolley wheel | CDEC00112A | 4 |
| 21 | Hex bolt gr. 5 BSW 1/4" x 2 1/4" | MCBU00077A | 4 |
| 22 | Trolley | CDEC50093A | 1 |
| 23 | U bracket | CDEC00335A | 1 |
| 24 | Winch 12 V f/R1090 | MCEL04087A | 1 |
| 25 | Trolley and winch assy. f/R1090 | CDEC50090A | 1 |

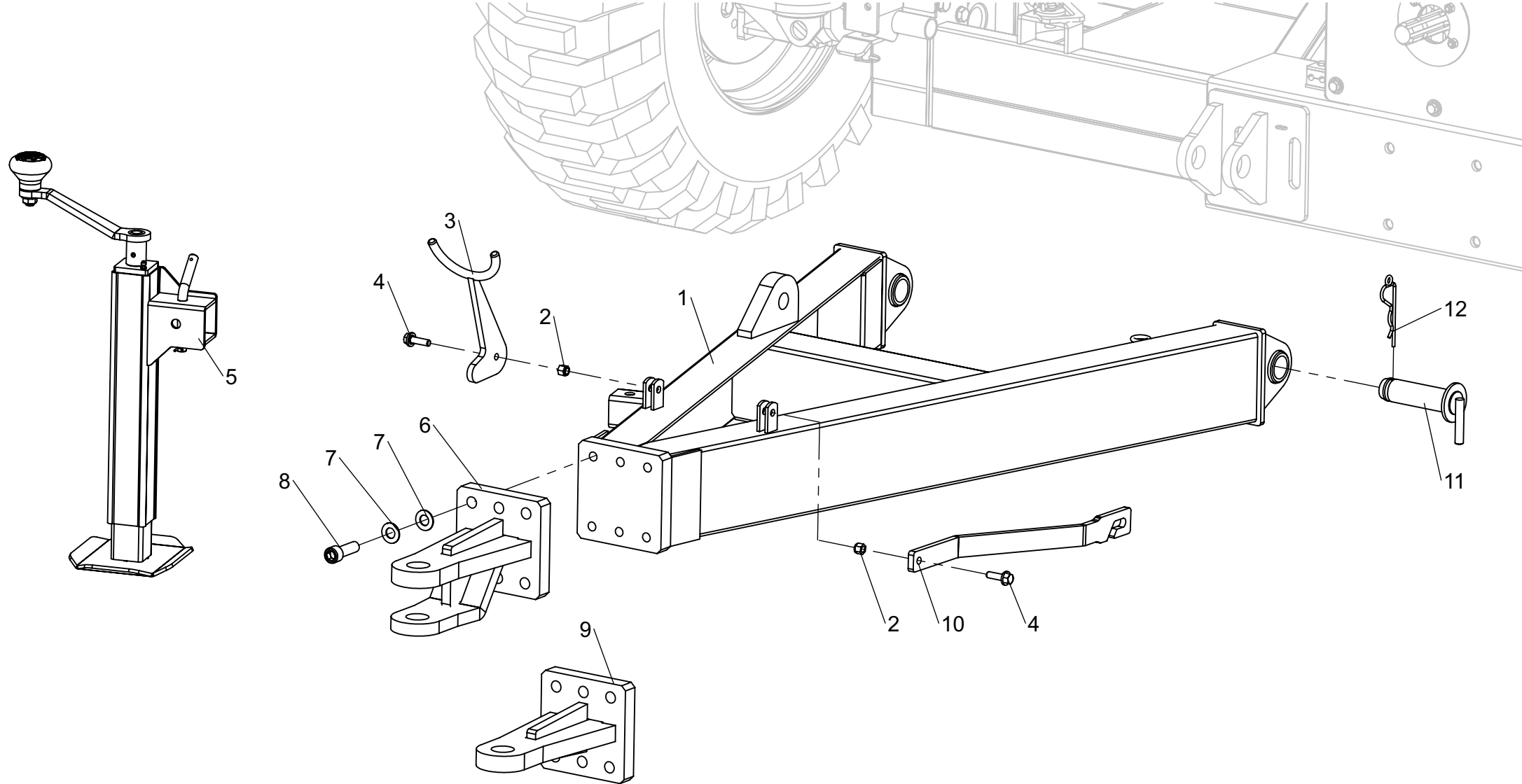
| R1090 - Sheet N° 7 - Bag tray, bag cradle & electric winch | | | |
|--|----------------------------------|------------|--------|
| Nº | Description | Code | Quant. |
| 1 | Bag tray assy. | CDEC50186A | 1 |
| 2 | R-clip w/ring | MCCH03001A | 2 |
| 3 | Lock pin | CDEG50137A | 2 |
| 4 | Bag cradle assy. | CDEC50184A | 1 |
| 5 | Hex nut BSW 1/4" | MCTU00005A | 7 |
| 6 | Flat washer 1/8" OD 50/ ID 13 mm | CDAA42034A | 7 |
| 7 | Support bracket, jib crane | CDEG50141A | 1 |
| 8 | Hex bolt gr. 5 BSW 5/8"x2" | MCBU00024A | 2 |
| 9 | Split lock washer 1/2" | MCAR01010A | 4 |
| 10 | Flat washer galvanized 1/2" | MCAR00007A | 4 |
| 11 | Twin rail jib crane | CDEC50089A | 1 |
| 12 | Anti-grain folding | CDEG00411A | 2 |
| 13 | Flat washer galvanized 3/8" | MCAR00005A | 4 |
| 14 | Split lock washer 7/8" | MCAR01006A | 6 |
| 15 | Hex bolt gr. 5 BSW 7/16"x4" | MCBU00006A | 6 |
| 16 | Self locking nut NF 1" | MCTU06005A | 4 |
| 17 | Flat washer galvanized 5/8" | MCAR00009A | 8 |
| 18 | Bearing 6211 2RS | MCRO00017A | 8 |
| 19 | Trolley axle | CDEC00113A | 4 |
| 20 | Trolley wheel | CDEC00112A | 4 |
| 21 | Hex bolt gr. 5 BSW 1/4" x 2 1/4" | MCBU00077A | 4 |
| 22 | Trolley | CDEC50093A | 1 |
| 23 | U bracket | CDEC00335A | 1 |
| 24 | Winch 12 V f/R1090 | MCEL04087A | 1 |
| 25 | Trolley and winch assy. f/R1090 | CDEC50090A | 1 |



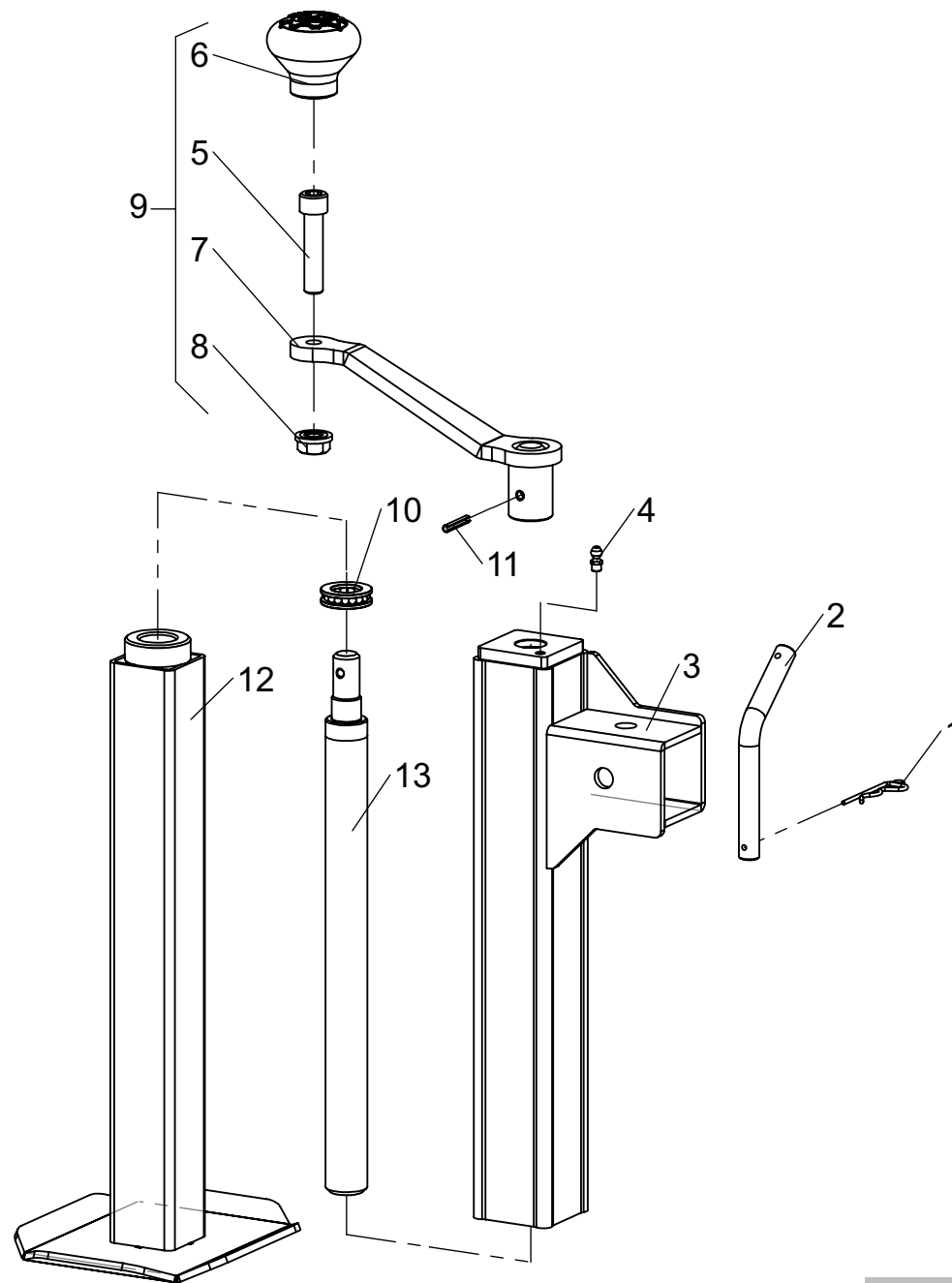
| R990 - Sheet N° 8 - Bag cradle | | | |
|--------------------------------|------------------------------|------------|--------|
| N° | Description | Code | Quant. |
| 1 | Bag cradle end | CDEG50198A | 2 |
| 2 | Hitch pin | CDEG50199A | 2 |
| 3 | Split pin 3.5x30 mm DIN 94 | MCCH01009A | 2 |
| 4 | Self locking nut NF 3/8" | MCTU06001A | 1 |
| 5 | Flat washer galvanized 3/8" | MCAR00005A | 1 |
| 6 | Pulley Ø 63 mm | CDAA48003A | 1 |
| 7 | Socket head screw 1/2"x4" | MCTO00037A | 1 |
| 8 | Bag cradle anchor | CDEC50244A | 1 |
| 9 | Hex bolt gr. 5 BSW 1/4"x1/2" | MCBU00001A | 4 |
| 10 | Self locking nut NF 3/8" | MCTU06002A | 4 |
| 11 | Support stand, cradle | CDBQ50012A | 2 |



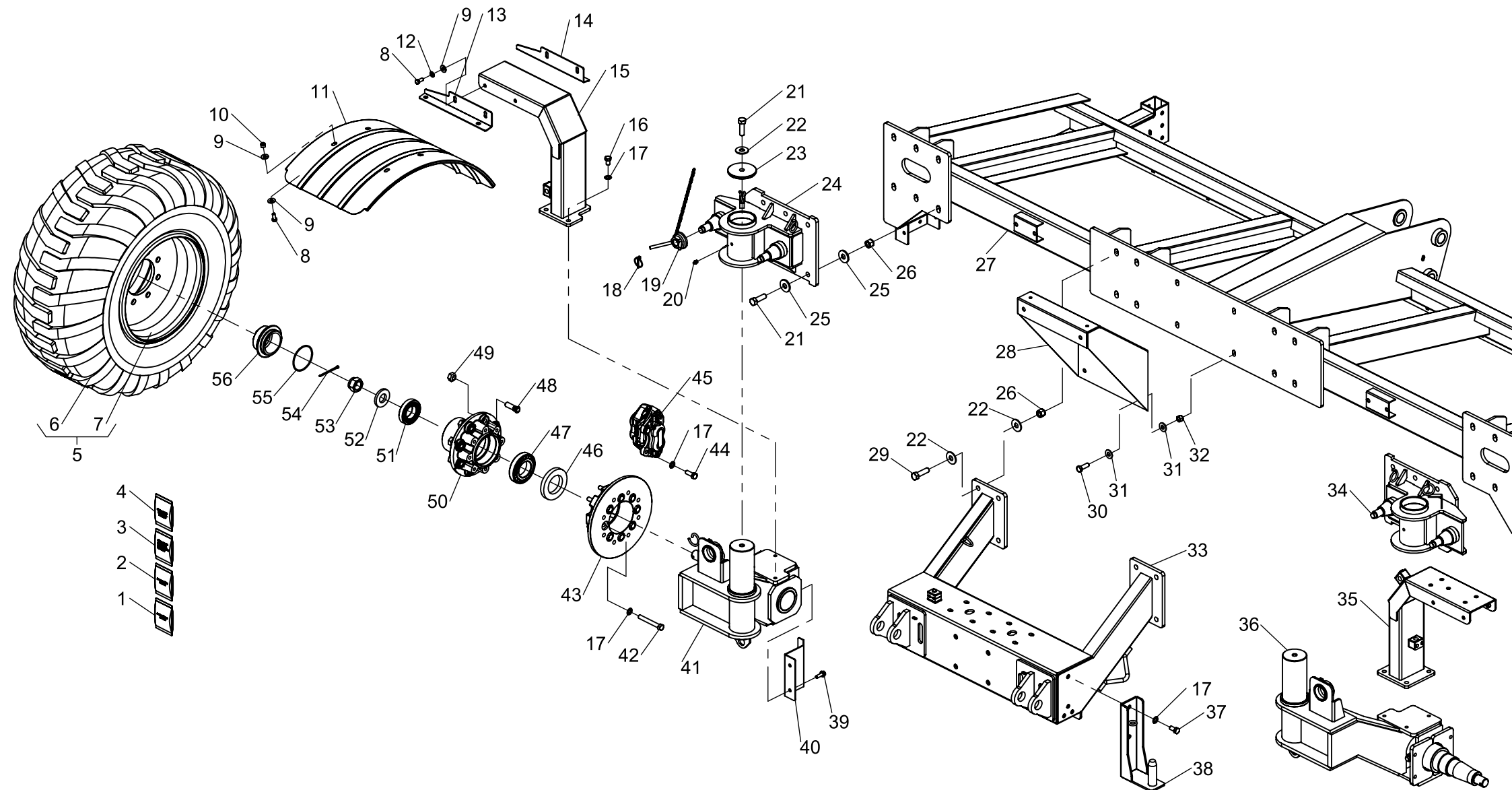
| R1090 - Sheet N° 8 - Bag cradle | | | |
|---------------------------------|------------------------------|------------|--------|
| N° | Description | Code | Quant. |
| 1 | Bag cradle anchor | CDEG50197A | 1 |
| 2 | Support stand, cradle | CDBQ50012A | 2 |
| 3 | Bag cradle end | CDEG50198A | 2 |
| 4 | Hitch pin | CDEG50199A | 2 |
| 5 | Split pin 3.5x30 mm DIN 94 | MCCH01009A | 2 |
| 6 | Hex bolt gr. 5 BSW 1/4"x1/2" | MCBU00001A | 4 |
| 7 | Self locking nut NF 3/8" | MCTU06002A | 4 |
| 8 | Pulley Ø 63 mm | CDAA48003A | 1 |
| 9 | Socket head screw 1/2"x4" | MCTO00037A | 1 |
| 10 | Flat washer galvanized 3/8" | MCAR00005A | 1 |
| 11 | Self locking nut NF 3/8" | MCTU06001A | 1 |



| R990/R1090 - Sheet N° 9 - Tongue & hitch | | | |
|--|---------------------------------------|------------|--------|
| Nº | Description | Code | Quant. |
| 1 | Tongue assy | CDEC50126A | 1 |
| 2 | Self locking nut BSW 3/8" | MCTU06001A | 2 |
| 3 | Support bracket | CDDW50025A | 1 |
| 4 | Hex bolt gr. 5 BSW 3/8"x1 1/4" | MCBU00008A | 2 |
| 5 | Screw jack | CDFH50021A | 1 |
| 6 | Hitch assy, rear | CDEC50206A | 1 |
| 7 | Disc springs 5/8" (31,5x16,3x1,75 mm) | MCAR01003A | 12 |
| 8 | Allen screw | MCTO10002A | 6 |
| 9 | Hitch assy, rear | CDEC50124A | 1 |
| 10 | Support bracket | CDEC00431A | 1 |
| 11 | Pivot pin, drawbar | CDBQ50004A | 2 |
| 12 | R-clip 4x100 mm | MCCH00008A | 2 |

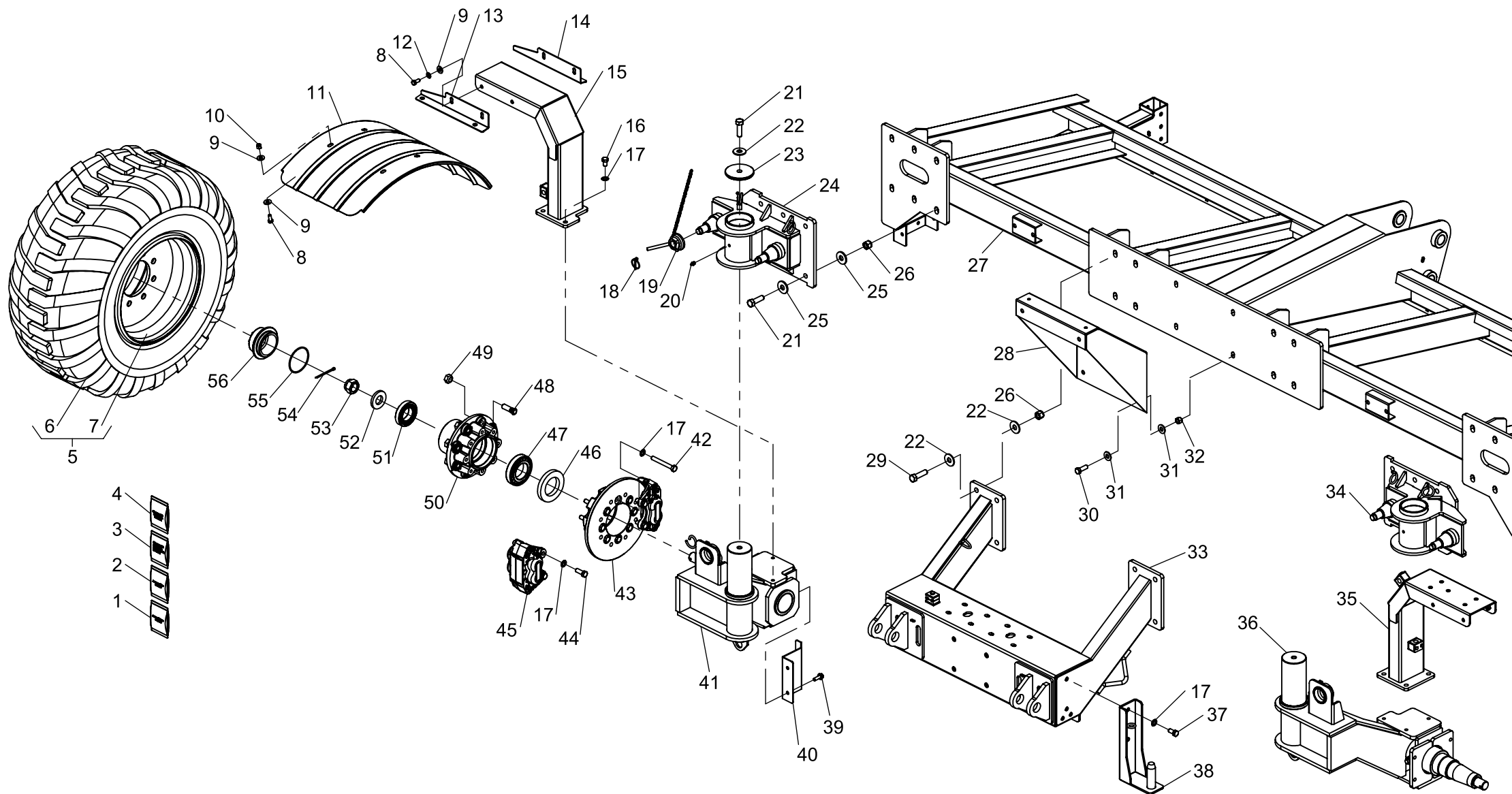


| R990/R1090 - Sheet N° 10 - Screw jack | | | |
|---------------------------------------|-----------------------------------|------------|--------|
| Nº | Description | Code | Quant. |
| 1 | R-clip 2.5x60 mm | MCCH00005A | 1 |
| 2 | Retaining pin | CDFH00060A | 1 |
| 3 | Slidable main arm | CDFH50020A | 1 |
| 4 | Grease fitting, straight SAE 1/4" | MCAL00002A | 1 |
| 5 | Socket head screw 1/2"x2" | MCTO00058A | 1 |
| 6 | Knob | MCPL00083A | 1 |
| 7 | Crank handle | CDFH50028A | 1 |
| 8 | Hex nut gr. 5 BSW 1/2" | MCTU00005A | 1 |
| 9 | Crank handle assembly | CDFH50027A | 1 |
| 10 | Thrust ball bearings 51104 | MCRO07002A | 1 |
| 11 | Roll pin 4.5 x 30 mm | MCCH04001A | 1 |
| 12 | Fixed inner arm | CDFH50025A | 1 |
| 13 | Threaded rod | CDFH00049A | 1 |



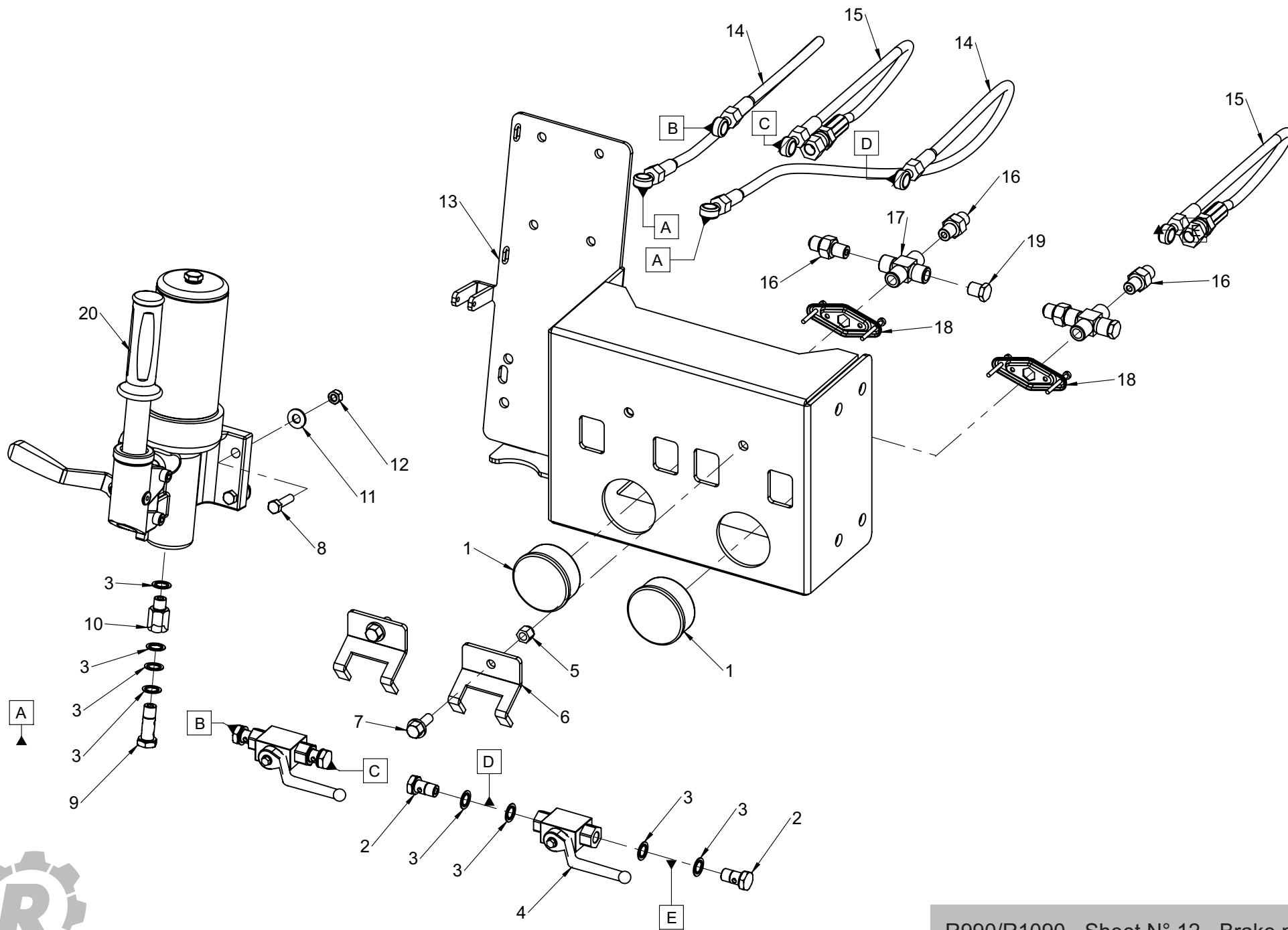
| R990 - Sheet N° 11 - Frame & wheels | | | |
|-------------------------------------|--|------------|--------|
| Nº | Description | Code | Quant. |
| 1 | Brake piston set | MCHI00016A | 1 |
| 2 | Brake pad set | MCHI00015A | 1 |
| 3 | Repair kit brake caliper, rubber parts | MCHI00090A | 1 |
| 4 | Repair kit brake caliper, metal parts | MCHI00020A | 1 |
| 5 | Wheel assembly w/ 12-16,5/10 ply tire | MCLL50034A | 2 |
| 6 | Tire 12/16,5 NHS - 10 ply | MCCC00030A | 2 |
| 7 | Wheel rim 9.75 -13.5 MC-196336 | MCLL00038A | 2 |
| 8 | Hex bolt gr. 5 BSW 3/8"x7/8" | MCBU00006A | 16 |
| 9 | Flat washer galvanized 3/8" | MCAR00005A | 24 |
| 10 | Self locking nut BSW 3/8" | MCTU06001A | 8 |
| 11 | Mudguard | CDEI00094A | 2 |
| 12 | Disc springs 3/8" (20x10,2x0.8 mm) | MCAR01006A | 8 |
| 13 | Mudguard bracket, LH | CDEC00464A | 2 |
| 14 | Mudguard bracket, RH | CDEC00468A | 2 |
| 15 | Mudguard support base | CDEC50170A | 1 |
| 16 | Hex bolt gr. 5 BSW 1/2"x3/4" | MCBU00014A | 6 |
| 17 | Disc springs 1/2" (24x13x2,8 mm) | MCAR03002A | 18 |
| 18 | R-clip w/ring | MCCH03001A | 2 |
| 19 | Wingnut | CDCV50033A | 2 |
| 20 | Grease fitting, straight SAE 1/8" | MCAL00001A | 2 |
| 21 | Hex bolt gr. 5 BSW 5/8"x2" | MCBU00037A | 14 |
| 22 | Flat washer galvanized 5/8" | MCAR00009A | 18 |
| 23 | Washer 5/16 100x17 | CDEC00067A | 2 |
| 24 | Pivot wheel support base RH | CDEC50203A | 1 |
| 25 | Flat washer 3/16" OD 45 / ID 18 (mm.) | CDAA42009A | 24 |
| 26 | Self locking nut BSW 5/8" | MCTU06005A | 20 |
| 27 | Tunnel frame | CDEC50177A | 1 |
| 28 | Support bracket | CDEG00358A | 1 |

| R990 - Sheet N° 11 - Frame & wheels | | | |
|-------------------------------------|-----------------------------------|------------|--------|
| Nº | Description | Code | Quant. |
| 29 | Hex bolt gr. 5 BSW 5/8"x2 1/4" | MCBU00038A | 8 |
| 30 | Hex bolt gr. 5 BSW 1/2"x1 1/2" | MCBU00026A | 4 |
| 31 | Flat washer galvanized 1/2" | MCAR00007A | 8 |
| 32 | Self locking nut BSW 1/2" | MCTU06003A | 4 |
| 33 | Support frame | CDCP50296A | 1 |
| 34 | Pivot wheel support base LH | CDEC50204A | 1 |
| 35 | Brake pump support base | CDEC50160A | 1 |
| 36 | Pivot wheel assy, RH | CDEC50225A | 1 |
| 37 | Hex bolt gr. 5 BSW 1/2"x1" | MCBU00024A | 2 |
| 38 | Drive shaft support | CDEC50040A | 1 |
| 39 | Hex bolt gr. 5 BSW 3/8"x1" | MCBU00007A | 4 |
| 40 | Hose guard | CDEG00451A | 2 |
| 41 | Pivot wheel assy, LH | CDEC50226A | 1 |
| 42 | Hex bolt gr. 5 BSW 1/2" x 4" | MCBU00086A | 16 |
| 43 | Hub & brake disc unit | CDEG00446A | 2 |
| 44 | Hex bolt gr. 5 NF 1/2"x1 1/4" | MCBU02022A | 8 |
| 45 | Brake caliper | MCHI08002A | 4 |
| 46 | Oil seal 70x115x15 mm | MCRE00024A | 2 |
| 47 | Bearing 30212 | MCRO06010A | 2 |
| 48 | Hex bolt gr. 5 NF 5/8"x 53mm | MCBU06032A | 16 |
| 49 | Conical bolt, 5/8" NF galvanized | MCTU12005A | 16 |
| 50 | Wheel hub | CDEG00431A | 2 |
| 51 | Bearing 30210 | MCRO06008A | 2 |
| 52 | Flat washer 5/16" OD 66/ ID 33 mm | CDAA42081A | 2 |
| 53 | Castle nut NF 1 1/4" | MCTU10007A | 2 |
| 54 | Split pin 5.5x80 mm DIN 94 | MCCH01047A | 2 |
| 55 | O-ring seal 88,49x95,55x3,53mm | MCRE01040A | 2 |
| 56 | Hub cap | CDEG00448A | 2 |

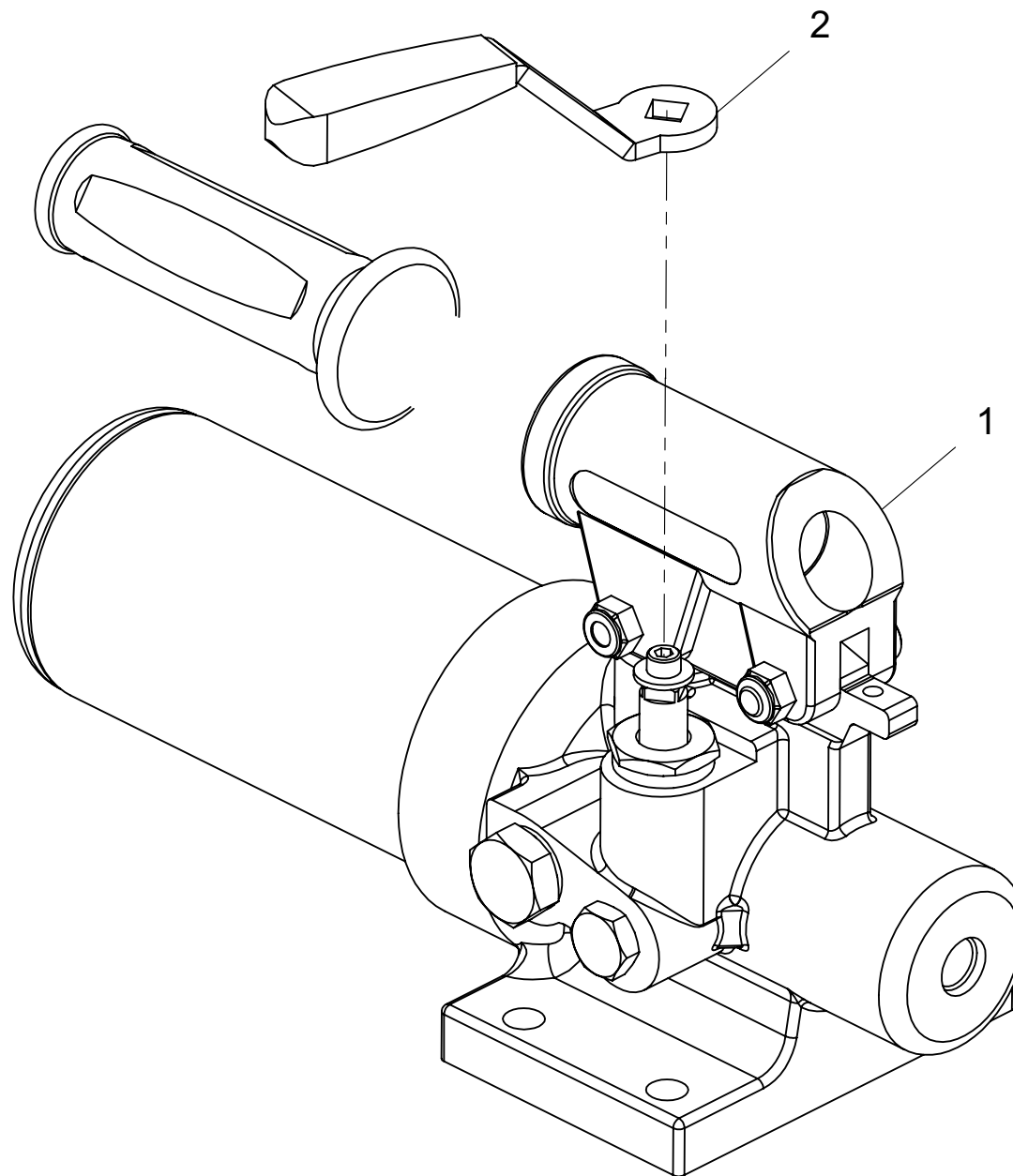


| R1090 - Sheet N° 11 - Frame & wheels | | | |
|--------------------------------------|---|------------|--------|
| Nº | Description | Code | Quant. |
| 1 | Brake piston set | MCHI00016A | 1 |
| 2 | Brake pad set | MCHI00015A | 1 |
| 3 | Repair kit brake caliper, rubber parts | MCHI00090A | 1 |
| 4 | Repair kit brake caliper, metal parts | MCHI00020A | 1 |
| 5 | Wheel assembly w/ 400/60 -15.5, 14 ply tire | MCLL50033A | 2 |
| 6 | Tire 400/60 -15.5, 14 ply | MCCC00040A | 2 |
| 7 | Wheel rim 13 -15.5 MC-196389 | MCLL00040A | 2 |
| 8 | Hex bolt gr. 5 BSW 3/8"x7/8" | MCBU00006A | 16 |
| 9 | Flat washer galvanized 3/8" | MCAR00005A | 24 |
| 10 | Self locking nut BSW 3/8" | MCTU06001A | 8 |
| 11 | Mudguard | CDCP00435A | 2 |
| 12 | Disc springs 3/8" (20x10,2x0.8 mm) | MCAR01006A | 8 |
| 13 | Mudguard bracket, RH | CDEG00402A | 2 |
| 14 | Mudguard bracket, LH | CDEG00401A | 2 |
| 15 | Mudguard support base | CDEC50170A | 1 |
| 16 | Hex bolt gr. 5 BSW 1/2"x3/4" | MCBU00014A | 6 |
| 17 | Disc springs 1/2" (24x13x2,8 mm) | MCAR03002A | 20 |
| 18 | R-clip w/ring | MCCH03001A | 2 |
| 19 | Wingnut | CDCV50033A | 2 |
| 20 | Grease fitting, straight SAE 1/8" | MCAL00001A | 2 |
| 21 | Hex bolt gr. 5 BSW 5/8"x2" | MCBU00037A | 14 |
| 22 | Flat washer galvanized 5/8" | MCAR00009A | 18 |
| 23 | Washer 5/16 100x17 | CDEC00067A | 2 |
| 24 | Pivot wheel support base RH | CDEC50203A | 1 |
| 25 | Flat washer 3/16" OD 45 / ID 18 (mm.) | CDAA42009A | 24 |
| 26 | Self locking nut BSW 5/8" | MCTU06005A | 20 |
| 27 | Tunnel frame | CDEG50122A | 1 |
| 28 | Support bracket | CDEG00358A | 1 |

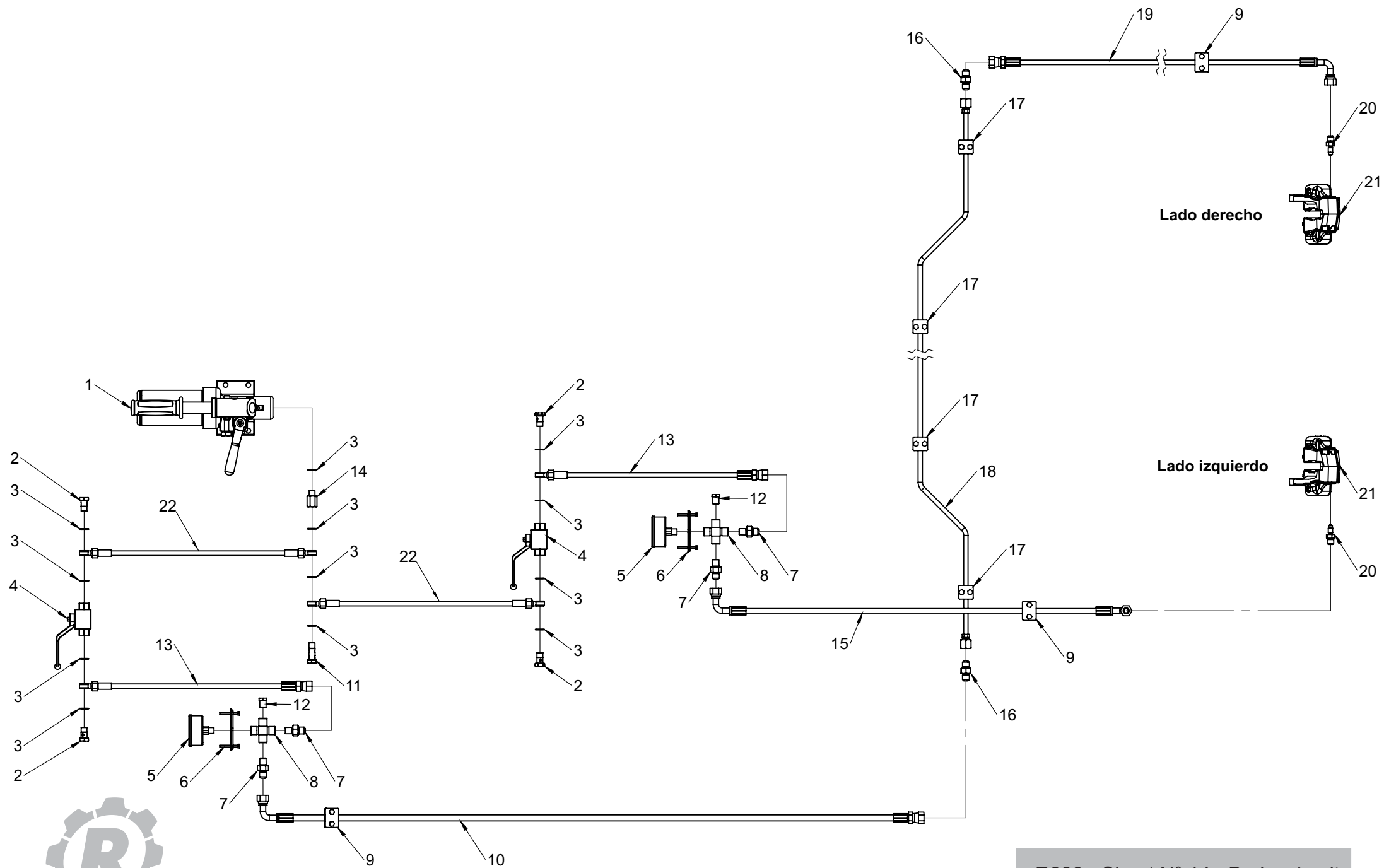
| R1090 - Sheet N° 11 - Frame & wheels | | | |
|--------------------------------------|-----------------------------------|------------|--------|
| Nº | Description | Code | Quant. |
| 29 | Hex bolt gr. 5 BSW 5/8"x2 1/4" | MCBU00038A | 8 |
| 30 | Hex bolt gr. 5 BSW 1/2"x1 1/2" | MCBU00026A | 4 |
| 31 | Flat washer galvanized 1/2" | MCAR00007A | 8 |
| 32 | Self locking nut BSW 1/2" | MCTU06003A | 4 |
| 33 | Support frame | CDCP50296A | 1 |
| 34 | Pivot wheel support base LH | CDEC50204A | 1 |
| 35 | Brake pump support base | CDEG50158A | 1 |
| 36 | Pivot wheel assy, RH | CDEG50171A | 1 |
| 37 | Hex bolt gr. 5 BSW 1/2"x1" | MCBU00024A | 2 |
| 38 | Drive shaft support | CDEC50040A | 1 |
| 39 | Hex bolt gr. 5 BSW 3/8"x1" | MCBU00007A | 4 |
| 40 | Hose guard | CDEG00451A | 2 |
| 41 | Pivot wheel assy, LH | CDEG50173A | 1 |
| 42 | Hex bolt gr. 5 BSW 1/2" x 4" | MCBU00086A | 16 |
| 43 | Hub & brake disc unit | CDEG00446A | 2 |
| 44 | Hex bolt gr. 5 NF 1/2"x1 1/4" | MCBU02022A | 8 |
| 45 | Brake caliper | MCHI08002A | 4 |
| 46 | Oil seal 70x115x15 mm | MCRE00024A | 2 |
| 47 | Bearing 30212 | MCRO06010A | 2 |
| 48 | Hex bolt gr. 5 NF 5/8"x 53mm | MCBU06032A | 16 |
| 49 | Conical bolt, 5/8" NF galvanized | MCTU12005A | 16 |
| 50 | Wheel hub | CDEG00431A | 2 |
| 51 | Bearing 30210 | MCRO06008A | 2 |
| 52 | Flat washer 5/16" OD 66/ ID 33 mm | CDAA42081A | 2 |
| 53 | Castle nut NF 1 1/4" | MCTU10007A | 2 |
| 54 | Split pin 5.5x80 mm DIN 94 | MCCH01047A | 2 |
| 55 | O-ring seal 88,49x95,55x3,53mm | MCRE01040A | 2 |
| 56 | Hub cap | CDEG00448A | 2 |



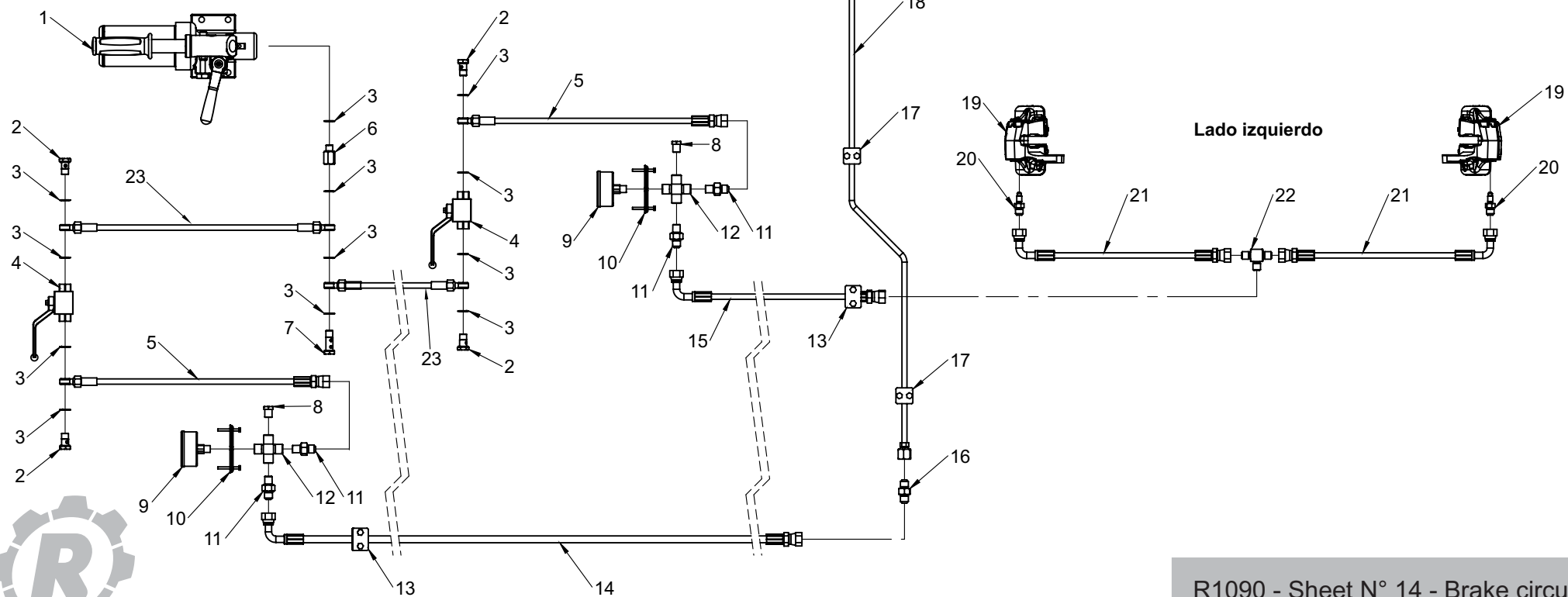
| R990/R1090 - Sheet No. 12 - Brake pump assembly | | | |
|---|--|------------|--------|
| Nº | Description | Code | Quant. |
| 1 | Pressure gauge | MCHI07077A | 2 |
| 2 | Bolt w/opening male 1/4" x 19h BSP | MCHI07231A | 4 |
| 3 | Rubber metal washer 14 X 22mm | MCHI07261A | 12 |
| 4 | Ball valve 1/4" BSP | MCHI06039A | 2 |
| 5 | Self locking nut BSW 3/8" | MCTU06001A | 2 |
| 6 | Flow valve bracket | CDEC00293A | 2 |
| 7 | Hex bolt gr. 5 BSW 3/8"x1" | MCBU00007A | 2 |
| 8 | Hex bolt gr. 5 BSW 1/2"x3/4" | MCBU00002A | 2 |
| 9 | Bolt w/twin openings male 1/4" x 19h BSP | MCHI07272A | 1 |
| 10 | Adapter 1/2"male x 20 UNF -H 1/4" x 19 BSP | MCHI07239A | 1 |
| 11 | Flat washer galvanized 5/16" | MCAR00004A | 4 |
| 12 | Self locking nut BSW 5/16" | MCTU06002A | 4 |
| 13 | Soporte bomba de frenos | CDEV50013A | 1 |
| 14 | Hydraulic hose 1/4" SAE 100R17 AT x 520 mm | MCHI04130A | 2 |
| 15 | Hydraulic hose 1/4" SAE 100R17 AT x 500 mm | MCHI04118A | 2 |
| 16 | Adapter 9/16"male UNF x male 1/4" NPT | MCHI07157A | 4 |
| 17 | Crosshead 1/4" (all) | MCHI07366A | 2 |
| 18 | Bracket, pressure gauge | MCHI07079A | 2 |
| 19 | Threaded plug 1/4" NPT | MCHI07365A | 2 |
| 20 | Brake pump | CDEV50018A | 1 |



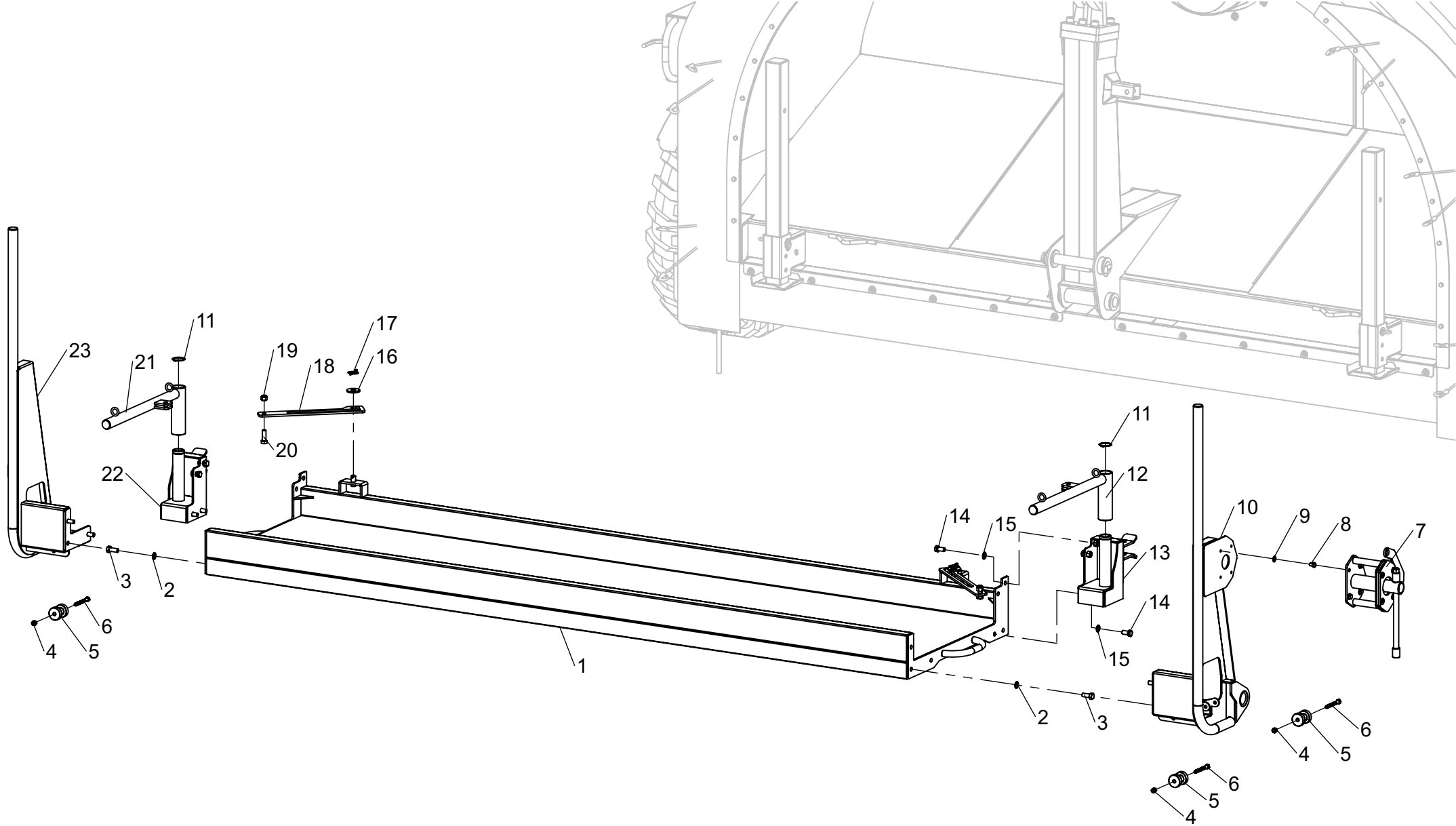
| R990/R1090 - Sheet N° 13 - Brake pump | | | |
|---------------------------------------|--------------------|------------|--------|
| Nº | Description | Code | Quant. |
| 1 | Brake pump | MCHI03019A | 1 |
| 2 | Square hole mitten | CDEV00024A | 1 |



| R990 - Sheet N° 14 - Brake circuit | | | |
|------------------------------------|---|------------|--------|
| Nº | Description | Code | Quant. |
| 1 | Bomba de frenos hidráulicos armada | CDEV50015A | 1 |
| 2 | Bolt w/opening male 1/4" x 19h BSP | MCHI07231A | 4 |
| 3 | Steel rubber washer 14 x 22 mm | MCHI07261A | 12 |
| 4 | Ball valve 1/4" BSP | MCHI06039A | 2 |
| 5 | Pressure gauge | MCHI07077A | 25 |
| 6 | Bracket, pressure gauge | MCHI07079A | 2 |
| 7 | Adapter 9/16" male UNF x male 1/4" NPT | MCHI07157A | 4 |
| 8 | Crosshead 1/4" (all) | MCHI07366A | 2 |
| 9 | Plastic tubing bracket | MCHI07280A | 3 |
| 10 | Hydraulic hose 1/4" SAE 100R17 AT x 1450 mm | MCHI04131A | 1 |
| 11 | Bolt w/twin openings male 1/4" x 19h BSP | MCHI07272A | 1 |
| 12 | Threaded plug 1/4" NPT | MCHI07365A | 2 |
| 13 | Hydraulic hose 1/4" SAE 100R17 AT x 500 mm | MCHI04118A | 2 |
| 14 | Adapter 1/2" male x 20 UNF -H 1/4" x 19 BSP | MCHI07239A | 1 |
| 15 | Hydraulic hose 1/4" SAE 100R17 AT x 900 mm | MCHI04133A | 1 |
| 16 | Adapter 9/16" male UNF JIC 37° | MCHI07274A | 2 |
| 17 | Plastic tubing bracket | MCHI07056A | 4 |
| 18 | Hydraulic hose 1/4" SAE 100R2 A T x 1700 mm | MCHI05055A | 1 |
| 19 | Hydraulic hose 1/4" SAE 100R17 AT x 1700 mm | MCHI04134A | 1 |
| 20 | Adapter 3/8" male UNF x 9/16" male UNF | MCHI07237A | 2 |
| 21 | Brake caliper | MCHI08001A | 2 |
| 22 | Hydraulic hose 1/4" SAE 100R17 AT x 520 mm | MCHI04130A | 2 |

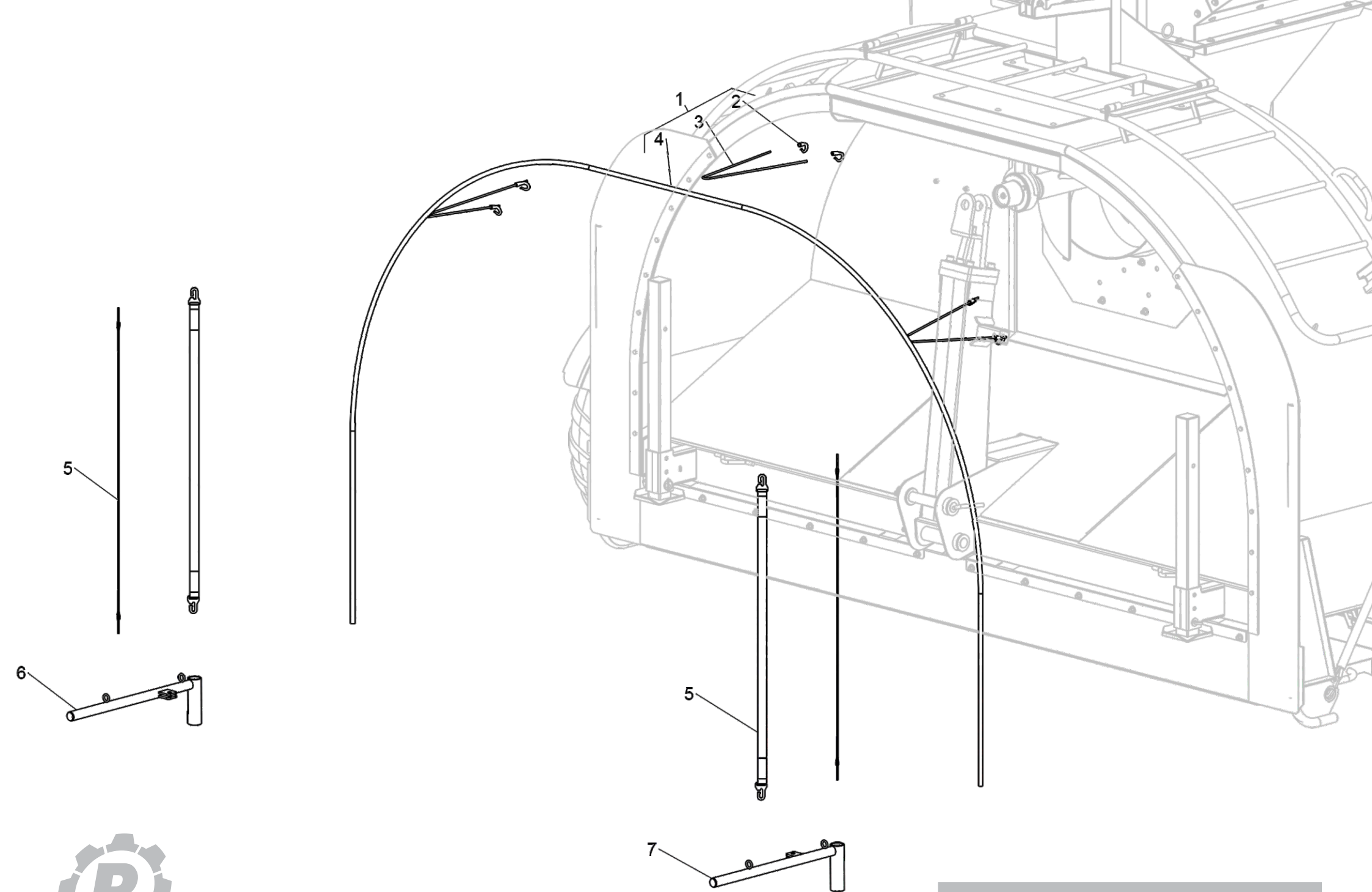


| R1090 - Sheet N° 14 - Brake circuit | | | |
|-------------------------------------|---|------------|--------|
| Nº | Description | Code | Quant. |
| 1 | Bomba de frenos hidráulicos armada | CDEV50015A | 1 |
| 2 | Bolt w/opening male 1/4" x 19h BSP | MCHI07231A | 4 |
| 3 | Steel rubber washer 14 x 22 mm | MCHI07261A | 12 |
| 4 | Ball valve 1/4" BSP | MCHI06039A | 2 |
| 5 | Hydraulic hose 1/4" SAE 100R17 AT x 500 mm | MCHI04118A | 2 |
| 6 | Adapter 1/2"male x 20 UNF -H 1/4" x 19 BSP | MCHI07239A | 1 |
| 7 | Bolt w/twin openings male 1/4" x 19h BSP | MCHI07272A | 1 |
| 8 | Threaded plug 1/4" NPT | MCHI07365A | 2 |
| 9 | Pressure gauge | MCHI07077A | 2 |
| 10 | Bracket, pressure gauge | MCHI07079A | 2 |
| 11 | Adapter 9/16"male UNF x male 1/4" NPT | MCHI07157A | 4 |
| 12 | Crosshead 1/4" (all) | MCHI07366A | 2 |
| 13 | Plastic tubing bracket | MCHI07280A | 3 |
| 14 | Hydraulic hose 1/4" SAE 100R17 AT x 1450 mm | MCHI04131A | 2 |
| 15 | Hydraulic hose 1/4" SAE 100R17 AT x 590 mm | MCHI04122A | 1 |
| 16 | Adapter 9/16" male UNF JIC 37° | MCHI07274A | 2 |
| 17 | Plastic tubing bracket | MCHI07056A | 4 |
| 18 | Hydraulic hose 1/4" SAE 100R2 A T x 1700 mm | MCHI05054A | 1 |
| 19 | Brake caliper | MCHI08001A | 2 |
| 20 | Adapter 3/8"male UNF x 9/16" male UNF | MCHI07237A | 4 |
| 21 | Hydraulic hose 1/4" SAE 100R17 AT x 400 mm | MCHI04132A | 4 |
| 22 | Tee connector male 9/16" UNF JIC 37° | MCHI07140A | 2 |
| 23 | Hydraulic hose 1/4" SAE 100R17 AT x 520 mm | MCHI04130A | 2 |



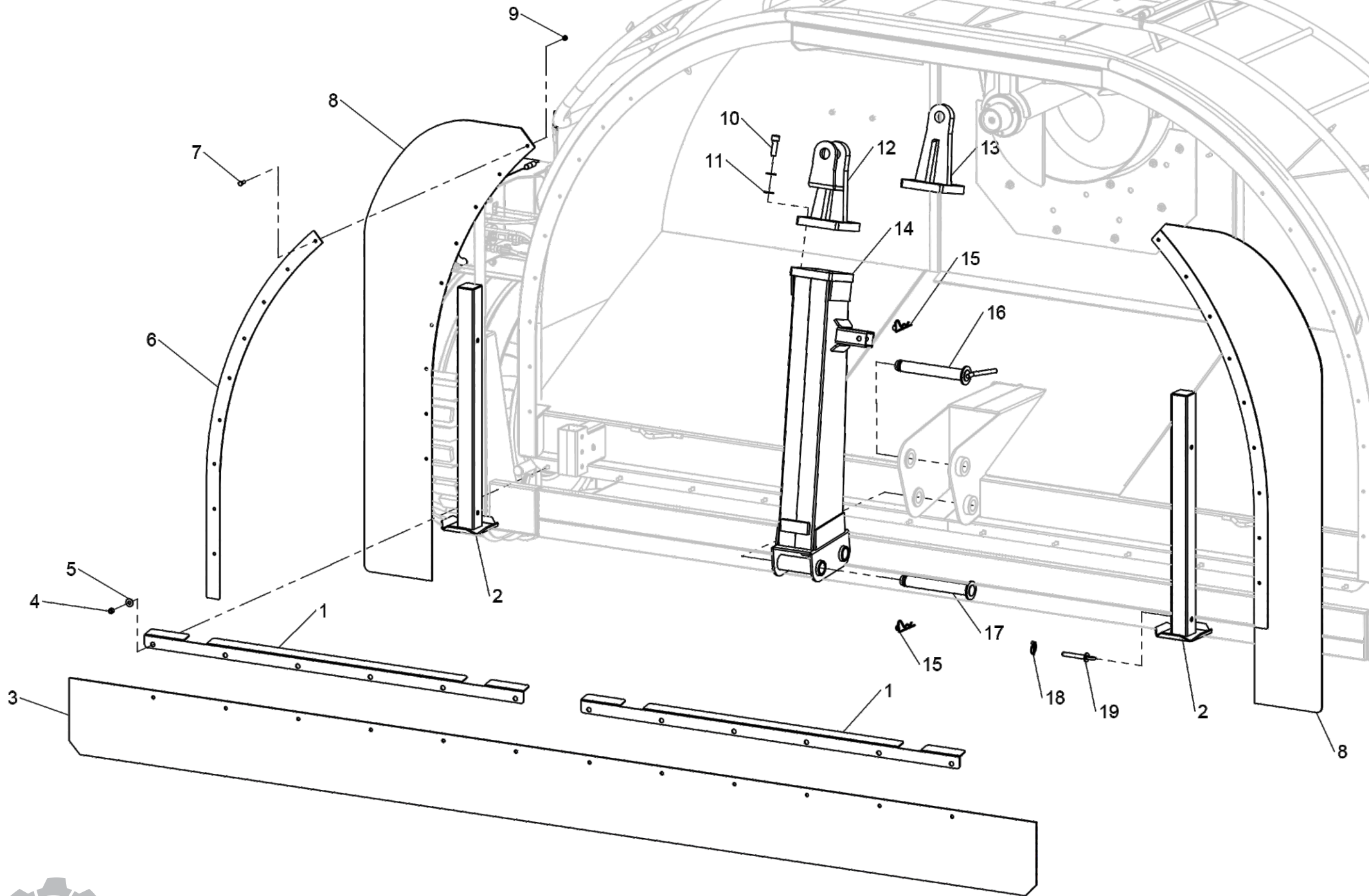
| R990 - Sheet N° 15 - Bag tray | | | |
|-------------------------------|------------------------------------|------------|--------|
| Nº | Description | Code | Quant. |
| 1 | Tray bottom | CDEC50187A | 1 |
| 2 | Disc springs 1/2" (24x13x2,8 mm) | MCAR03002A | 6 |
| 3 | Hex bolt gr. 5 BSW 1/2"x1 1/4" | MCBU00003A | 6 |
| 4 | Self locking nut BSW 3/8" | MCTU06001A | 4 |
| 5 | Roldana cuerda bandeja | CDFC00351A | 4 |
| 6 | Hex bolt gr. 5 BSW 3/8"x3 1/4" | MCBU00015A | 4 |
| 7 | Tensor de cuerda | CDFC50127A | 1 |
| 8 | Hex bolt gr. 5 BSW 3/8"x1/2" | MCBU00062A | 4 |
| 9 | Disc springs 3/8" (20x10,2x0.8 mm) | MCAR01006A | 4 |
| 10 | Tray deflector, RH | CDEG50195A | 1 |
| 11 | Snap ring 40A DIN471 | MCSE01012A | 2 |
| 12 | Bag support bracket, RH | CDEC50169A | 1 |
| 13 | Tray fastening bracket, RH | CDEG50152A | 1 |
| 14 | Hex bolt gr. 5 BSW 1/2"x1" | MCBU00024A | 4 |
| 15 | Disc springs 1/2" (24x13x2,8 mm) | MCAR03002A | 4 |
| 16 | Flat washer 3/16" OD 45/ ID 16 mm | CDAA42019A | 2 |
| 17 | R-clip w/ring | MCCH03001A | 2 |
| 18 | Bag support arm | CDEC00577A | 2 |
| 19 | Self locking nut BSW 1/2" | MCTU06003A | 2 |
| 20 | Hex bolt gr. 5 BSW 1/2"x1 1/2" | MCBU00026A | 2 |
| 21 | Bag support bracket, LH | CDEC50168A | 1 |
| 22 | Tray fastening bracket, LH | CDEG50153A | 1 |
| 23 | Tray deflector, LH | CDEG50194A | 1 |

| R1090 - Sheet N° 15 - Bag tray | | | |
|--------------------------------|------------------------------------|------------|--------|
| Nº | Description | Code | Quant. |
| 1 | Tray bottom | CDEC50187A | 1 |
| 2 | Disc springs 1/2" (24x13x2,8 mm) | MCAR03002A | 6 |
| 3 | Hex bolt gr. 5 BSW 1/2"x1 1/4" | MCBU00003A | 6 |
| 4 | Self locking nut BSW 3/8" | MCTU06001A | 4 |
| 5 | Roldana cuerda bandeja | CDFC00351A | 4 |
| 6 | Hex bolt gr. 5 BSW 3/8"x3 1/4" | MCBU00015A | 4 |
| 7 | Tensor de cuerda | CDFC50127A | 1 |
| 8 | Hex bolt gr. 5 BSW 3/8"x1/2" | MCBU00062A | 4 |
| 9 | Disc springs 3/8" (20x10,2x0.8 mm) | MCAR01006A | 4 |
| 10 | Tray deflector, RH | CDEG50195A | 1 |
| 11 | Snap ring 40A DIN471 | MCSE01012A | 2 |
| 12 | Bag support bracket, RH | CDEC50169A | 1 |
| 13 | Tray fastening bracket, RH | CDEG50152A | 1 |
| 14 | Hex bolt gr. 5 BSW 1/2"x1" | MCBU00024A | 4 |
| 15 | Disc springs 1/2" (24x13x2,8 mm) | MCAR03002A | 4 |
| 16 | Flat washer 3/16" OD 45/ ID 16 mm | CDAA42019A | 2 |
| 17 | R-clip w/ring | MCCH03001A | 2 |
| 18 | Bag support arm | CDEC00577A | 2 |
| 19 | Self locking nut BSW 1/2" | MCTU06003A | 2 |
| 20 | Hex bolt gr. 5 BSW 1/2"x1 1/2" | MCBU00026A | 2 |
| 21 | Bag support bracket, LH | CDEC50168A | 1 |
| 22 | Tray fastening bracket, LH | CDEG50153A | 1 |
| 23 | Tray deflector, LH | CDEG50194A | 1 |



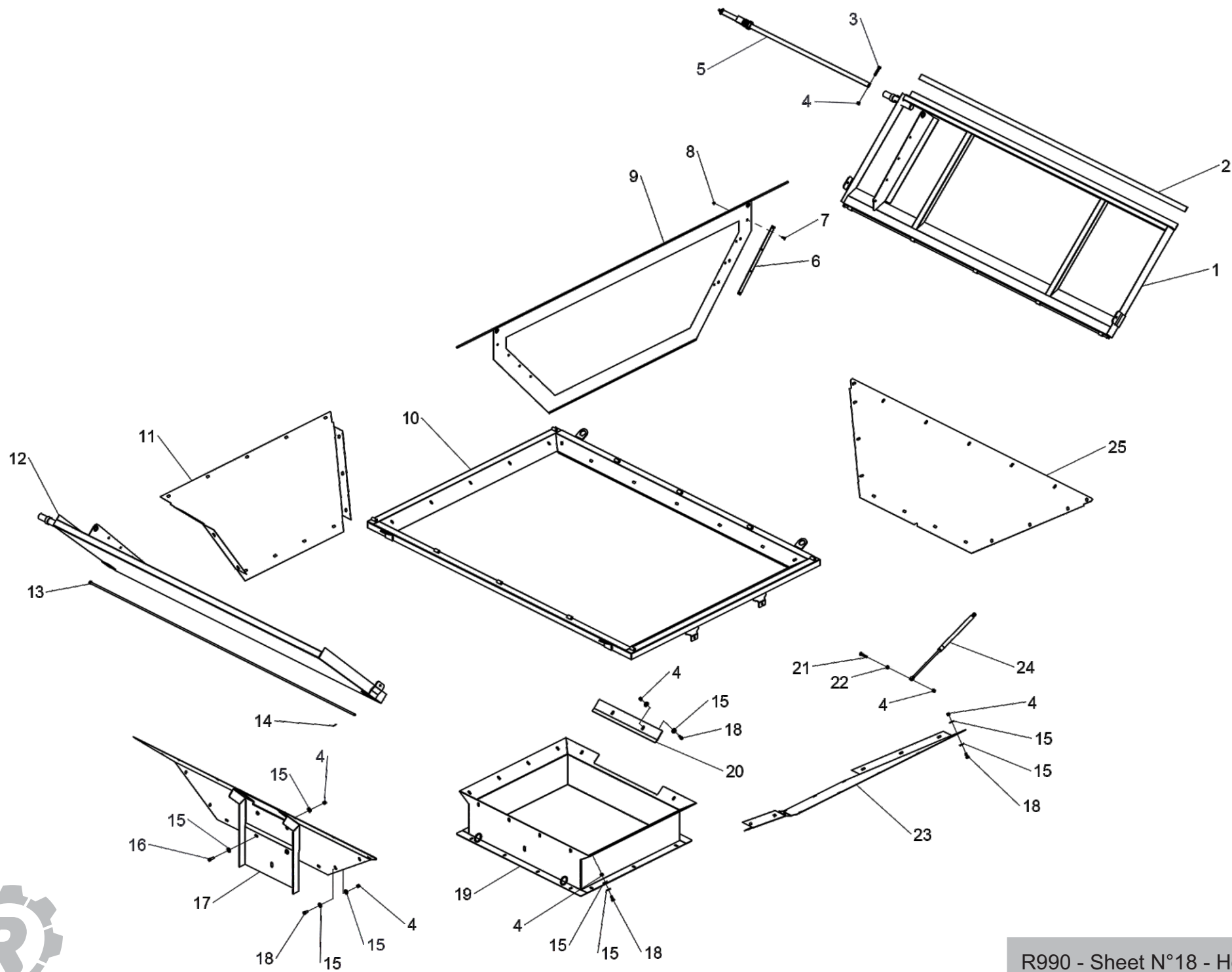
| R990 - Sheet N° 16 - Bag support | | | |
|----------------------------------|---------------------------------|------------|--------|
| Nº | Description | Code | Quant. |
| 1 | Rope harness | CDEC50207A | 1 |
| 2 | Plastic hook | MCES00003A | 8 |
| 3 | Polypropylene rope 6 x 2500 mm | CDEC00580A | 4 |
| 4 | Polypropylene rope 16 x 8000 mm | CDBQ00128A | 1 |
| 5 | Strap w/fasteners | CDEC50190A | 4 |
| 6 | Bag support bracket, LH | CDEC50168A | 1 |
| 7 | Bag support bracket, RH | CDEC50169A | 1 |

| R1090 - Sheet N° 16 - Bag support | | | |
|-----------------------------------|---------------------------------|------------|--------|
| Nº | Description | Code | Quant. |
| 1 | Rope harness | CDEC50207A | 1 |
| 2 | Plastic hook | MCES00003A | 8 |
| 3 | Polypropylene rope 6 x 2500 mm | CDEC00580A | 4 |
| 4 | Polypropylene rope 16 x 8000 mm | CDBQ00128A | 1 |
| 5 | Strap w/fasteners | CDEC50121A | 4 |
| 6 | Bag support bracket, LH | CDEC50168A | 1 |
| 7 | Bag support bracket, RH | CDEC50169A | 1 |

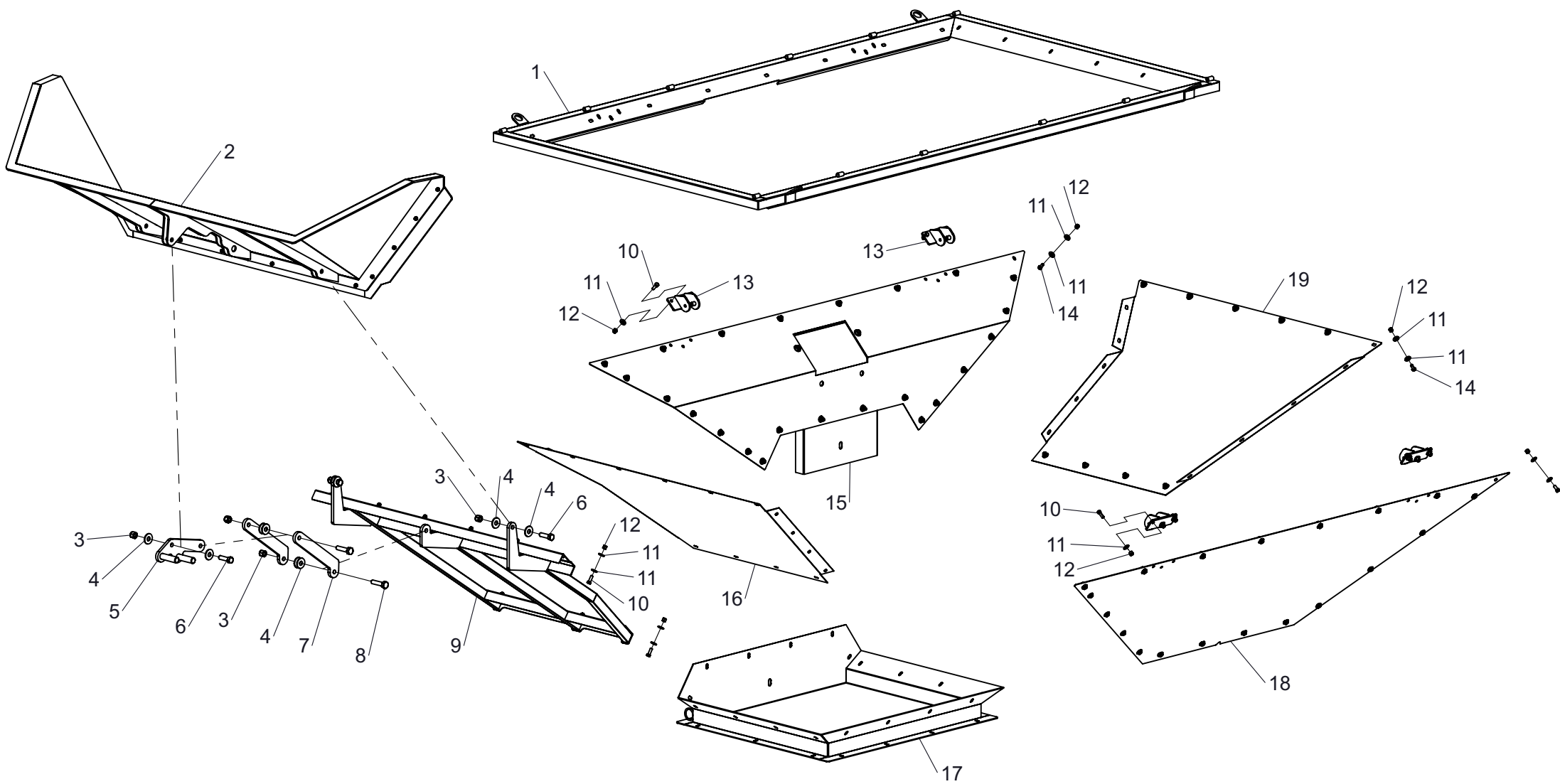


| R990 - Sheet N° 17 - Towing tongue & support jacks | | | |
|--|---------------------------------------|------------|--------|
| Nº | Description | Code | Quant. |
| 1 | Tray rim | CDEC00515A | 2 |
| 2 | Jack | CDEG50134A | 2 |
| 3 | Rubber deflector 3350 x 250 mm | CDEC00514A | 1 |
| 4 | Self locking nut BSW 3/8" | MCTU06001A | 12 |
| 5 | Flat washer galvanized 3/8" | MCAR00005A | 12 |
| 6 | Tunnel rim | CDEC00516A | 2 |
| 7 | Hex bolt gr. 5 BSW 5/16"x1" | MCBU00001A | 16 |
| 8 | Rubber deflector 1410 x 616 mm | CDEC00517A | 2 |
| 9 | Self locking nut BSW 5/16" | MCTU06002A | 16 |
| 10 | Allen screw | MCTO10002A | 6 |
| 11 | Disc springs 5/8" (31,5x16,3x1,75 mm) | MCAR01003A | 12 |
| 12 | Hitch assy, rear | CDEC50206A | 1 |
| 13 | Hitch assy, rear | CDEC50124A | 1 |
| 14 | Tongue assy, rear | CDEG50124A | 1 |
| 15 | R-clip 4x100 mm | MCCH00008A | 2 |
| 16 | Hitch pin | CDEC50085A | 1 |
| 17 | Hitch pin | CDEC50097A | 1 |
| 18 | R-clip w/ring | MCCH03001A | 2 |
| 19 | Pin | CDBZ50083A | 2 |

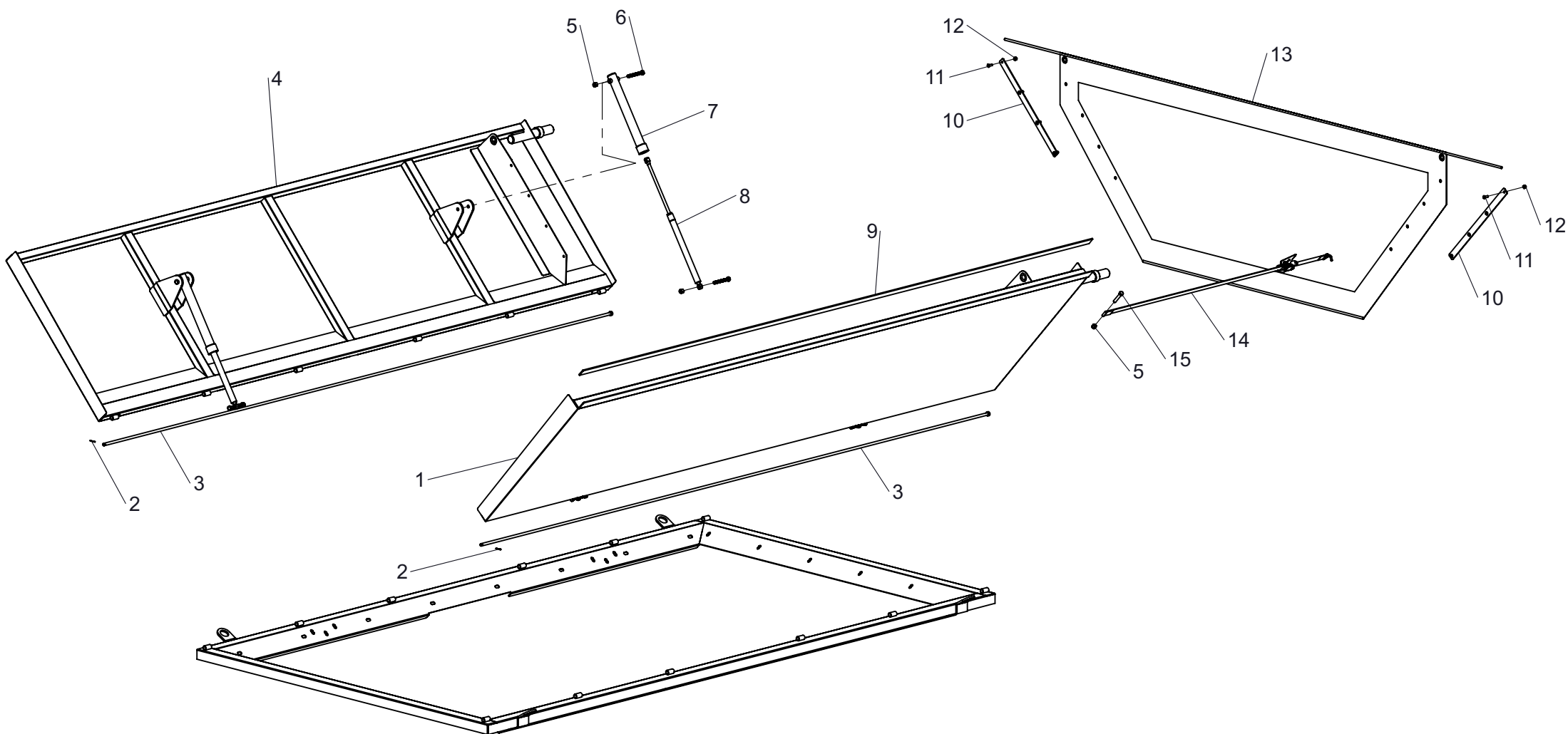
| R1090 - Sheet N° 17 - Towing tongue & support jacks | | | |
|---|---------------------------------------|------------|--------|
| Nº | Description | Code | Quant. |
| 1 | Tray rim | CDEG00363A | 2 |
| 2 | Jack | CDEG50134A | 2 |
| 3 | Rubber deflector 3600 x 250 mm | CDEG00356A | 1 |
| 4 | Self locking nut BSW 3/8" | MCTU06001A | 12 |
| 5 | Flat washer galvanized 3/8" | MCAR00005A | 12 |
| 6 | Tunnel rim | CDEG00427A | 2 |
| 7 | Hex bolt gr. 5 BSW 5/16"x1" | MCBU00001A | 18 |
| 8 | Rubber deflector 1555 x 632 mm | CDEG00428A | 2 |
| 9 | Self locking nut BSW 5/16" | MCTU06002A | 18 |
| 10 | Allen screw | MCTO10002A | 6 |
| 11 | Disc springs 5/8" (31,5x16,3x1,75 mm) | MCAR01003A | 12 |
| 12 | Hitch assy, rear | CDEC50206A | 1 |
| 13 | Hitch assy, rear | CDEC50124A | 1 |
| 14 | Tongue assy, rear | CDEG50124A | 1 |
| 15 | R-clip 4x100 mm | MCCH00008A | 2 |
| 16 | Hitch pin | CDEC50085A | 1 |
| 17 | Hitch pin | CDEC50097A | 1 |
| 18 | R-clip w/ring | MCCH03001A | 2 |
| 19 | Pin | CDBZ50083A | 2 |



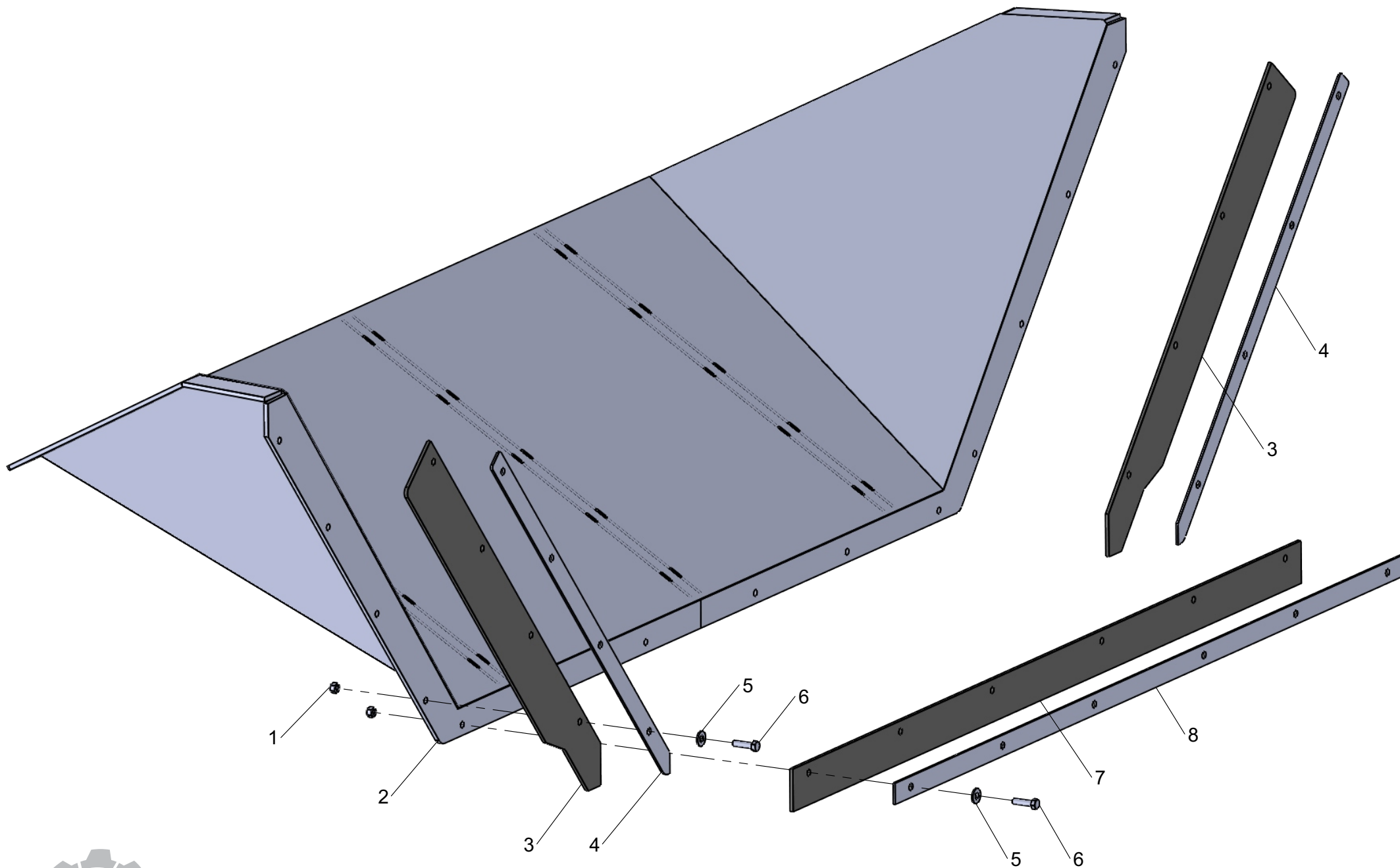
| R990 - Sheet N° 18 - Hopper | | | |
|-----------------------------|--|------------|--------|
| Nº | Description | Code | Quant. |
| 1 | Hopper cover, front | CDEC50094A | 1 |
| 2 | Cover gasket | CDEC00340A | 1 |
| 3 | Hex bolt gr. 5 BSW 3/8"x2" | MCBU00012A | 1 |
| 4 | Self locking nut BSW 3/8" | MCTU06001A | 61 |
| 5 | Cable attach assy | MCES02040A | 1 |
| 6 | Tarp tightener | CDEG00391A | 2 |
| 7 | Trusshead screw BSW galvanized 1/4" x 3/4" | MCTO03003A | 8 |
| 8 | Self locking nut BSW 1/4" | MCTU06004A | 8 |
| 9 | Tarp | CDEC00292A | 1 |
| 10 | Upper frame | CDEC50091A | 1 |
| 11 | Hopper panel, right side | CDEC00256A | 1 |
| 12 | Hopper cover, rear | CDEC50088A | 1 |
| 13 | Cover hinge | CDEC50098A | 2 |
| 14 | Split pin 2x20 mm | MCCH01002A | 2 |
| 15 | Flat washer galvanized 3/8" | MCAR00005A | 104 |
| 16 | Hex bolt gr. 5 BSW 3/8"x1 1/4" | MCBU00008A | 2 |
| 17 | Hopper panel, rear | CDEC50150A | 1 |
| 18 | Hex bolt gr. 5 BSW 3/8"x7/8" | MCBU00006A | 50 |
| 19 | Lower frame | CDEC50149A | 1 |
| 20 | Front panel bracket | CDEG00376A | 1 |
| 21 | Hex bolt gr. 5 BSW 3/8"x1 3/4" | MCBU00091A | 8 |
| 22 | Hex nut gr. 5 BSW 3/8" | MCTU00003A | 8 |
| 23 | Hopper panel, left side | CDEC00262A | 1 |
| 24 | Gas shock | MCRS04006A | 4 |
| 25 | Hopper panel, front | CDEC00261A | 1 |



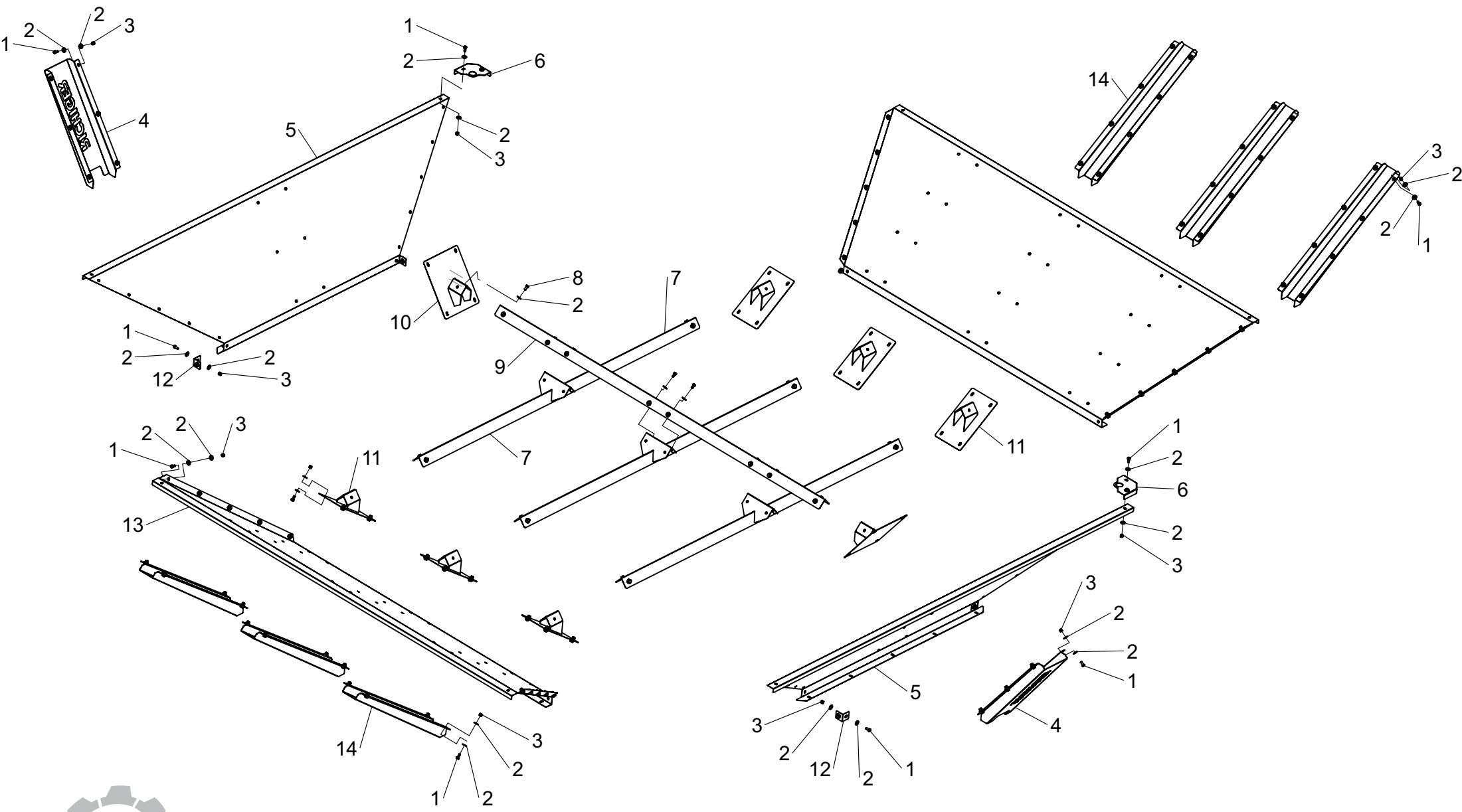
| R1090 - Sheet N° 18 - Hopper | | | |
|------------------------------|--------------------------------|------------|--------|
| Nº | Description | Code | Quant. |
| 1 | Upper frame | CDEG50185A | 1 |
| 2 | Side cover | CDEG50182A | 1 |
| 3 | Self locking nut BSW 5/8" | MCTU06005A | 5 |
| 4 | Flat washer galvanized 5/8" | MCAR00009A | 10 |
| 5 | Side arm hopper | CDEG50181A | 1 |
| 6 | Hex bolt gr. 5 BSW 5/8"x2 1/4" | MCBU00038A | 3 |
| 7 | Side arm hopper | CDEG00458A | 2 |
| 8 | Hex bolt gr. 5 BSW 5/8"x2 3/4" | MCBU00040A | 2 |
| 9 | Side frame support hopper | CDEG50179A | 1 |
| 10 | Hex bolt gr. 5 BSW 3/8"x1" | MCBU00108A | 22 |
| 11 | Flat washer galvanized 3/8" | MCAR00005A | 140 |
| 12 | Self locking nut BSW 3/8" | MCTU06001A | 85 |
| 13 | Lower anchor gas shock | CDEG50180A | 4 |
| 14 | Hex bolt gr. 5 BSW 3/8"x7/8" | MCBU00006A | 52 |
| 15 | Rear panel, large size hopper | CDEC50197A | 1 |
| 16 | Hopper panel, left side | CDEC00553A | 1 |
| 17 | Lower frame, large size hopper | CDEC50196A | 1 |
| 18 | Hopper panel, front | CDEC00552A | 1 |
| 19 | Hopper panel, right side | CDEC00551A | 1 |



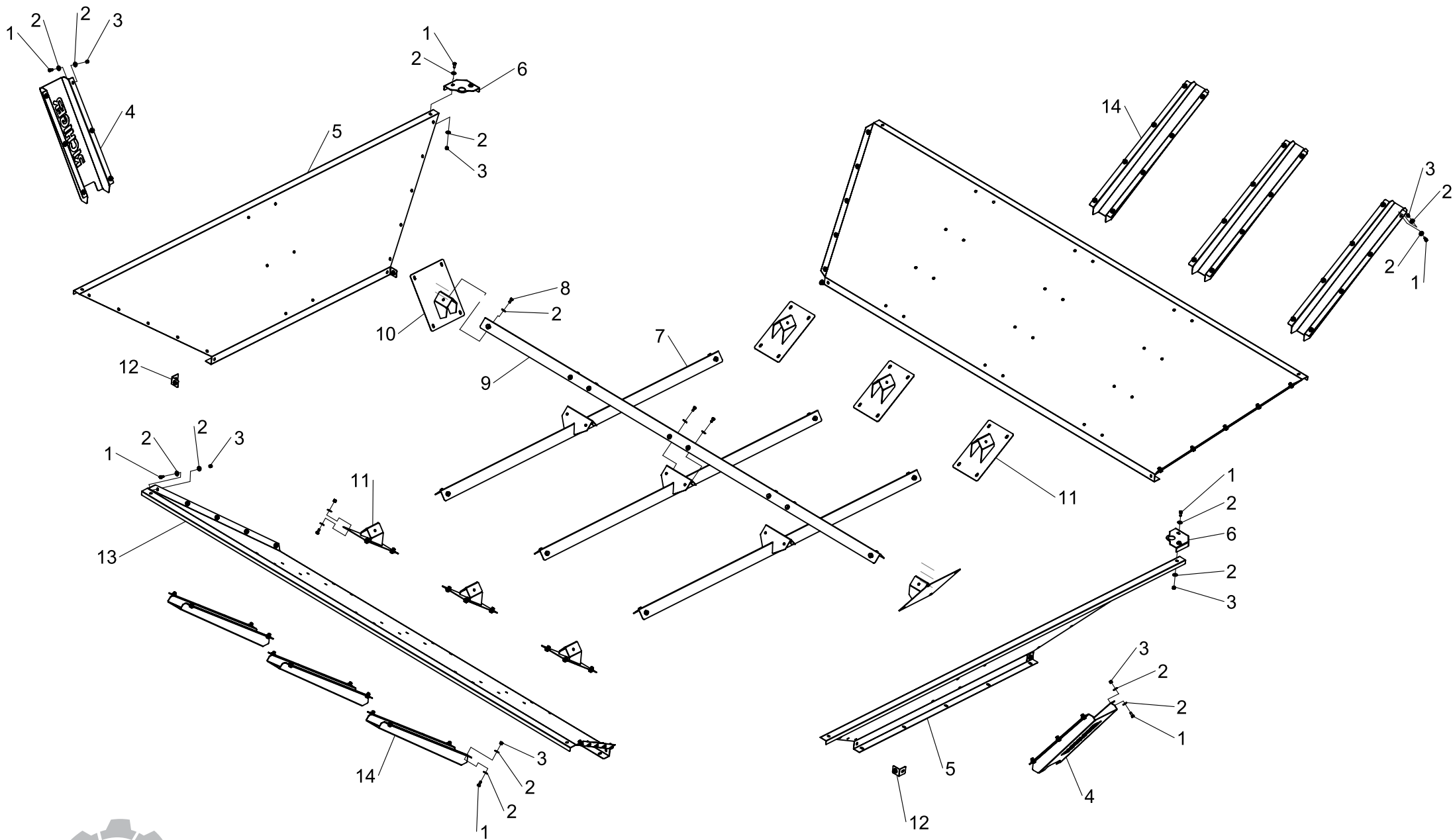
| R1090 - Sheet N° 18 - Hopper | | | |
|------------------------------|--|------------|--------|
| Nº | Description | Code | Quant. |
| 1 | Hopper cover, front | CDEG50184A | 1 |
| 2 | Split pin 2x20 mm DIN 94 | MCCH01002A | 2 |
| 3 | Cover hinge | CDEC50201A | 2 |
| 4 | Hopper cover, rear | CDEG50183A | 1 |
| 5 | Self locking nut BSW 3/8" | MCTU06001A | 85 |
| 6 | Hex bolt gr. 5 BSW 3/8"x3" | MCBU00068A | 8 |
| 7 | Covers gas shock | CDEG50187A | 4 |
| 8 | Gas shock | MCRS04006A | 4 |
| 9 | Cover gasket | CDEC00573A | 1 |
| 10 | Tarp tightener | CDEG00391A | 2 |
| 11 | Trusshead screw BSW galvanized 1/4" x 3/4" | MCTO03003A | 8 |
| 12 | Self locking nut BSW 1/4" | MCTU06004A | 8 |
| 13 | Tarp | CDEC00292A | 1 |
| 14 | Cable attach assy | MCES02040A | 1 |
| 15 | Hex bolt gr. 5 BSW 3/8"x2" | MCBU00012A | 1 |



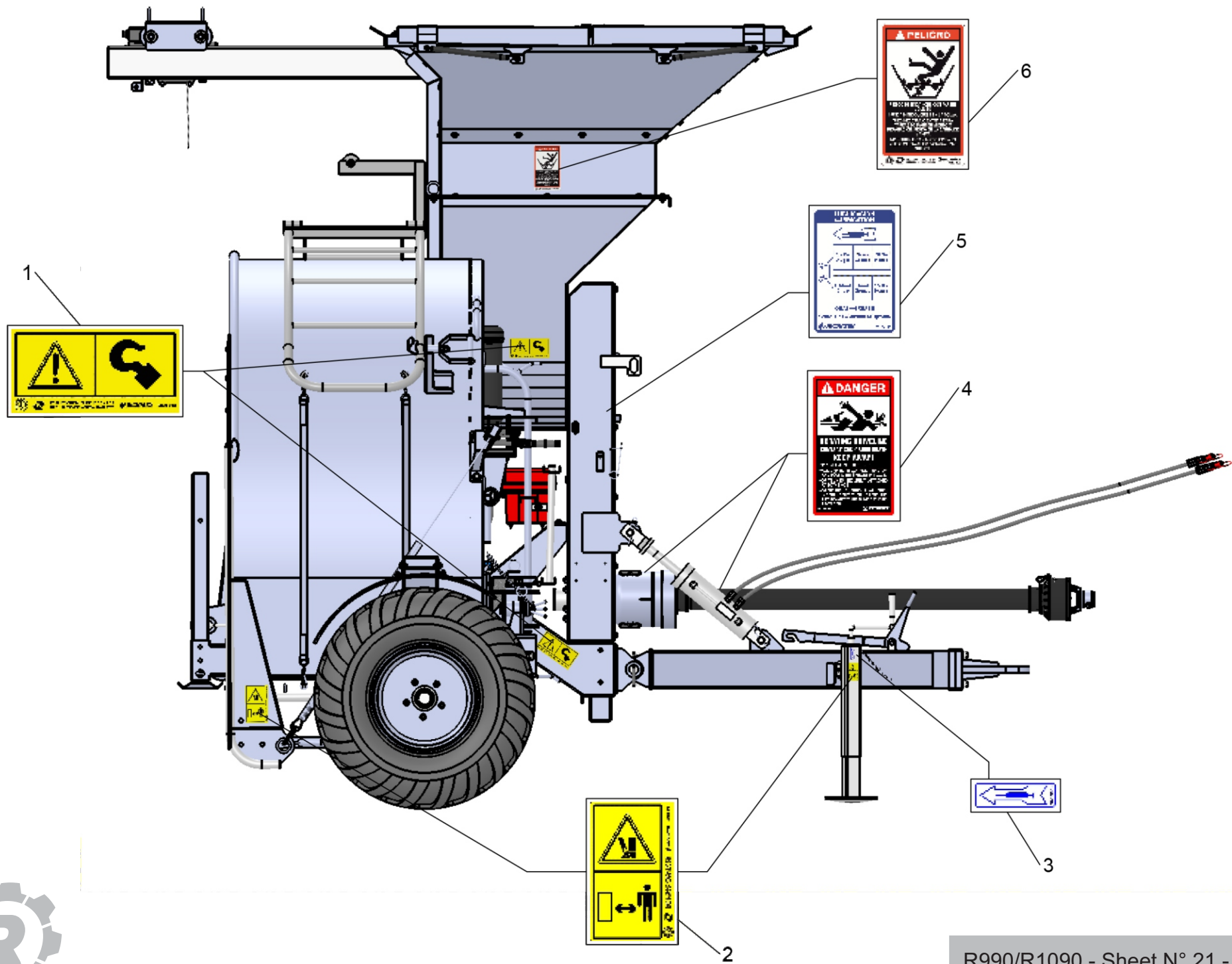
| R1090 - Sheet N° 19 - Side cover | | | |
|----------------------------------|---------------------------------|------------|--------|
| Nº | Description | Code | Quant. |
| 1 | Self locking nut BSW 5/16" | MCTU06002A | 14 |
| 2 | Side cover | CDEG50178A | 1 |
| 3 | Rubber deflector | CDEG00478A | 2 |
| 4 | Hopper rim | CDEG00485A | 2 |
| 5 | Flat washer galvanized 5/16" | MCAR00004A | 14 |
| 6 | Hex bolt gr. 5 BSW 5/16"x1 1/4" | MCBU00002A | 14 |
| 7 | Rubber deflector | CDEG00477A | 1 |
| 8 | Hopper rim | CDEG00486A | 1 |



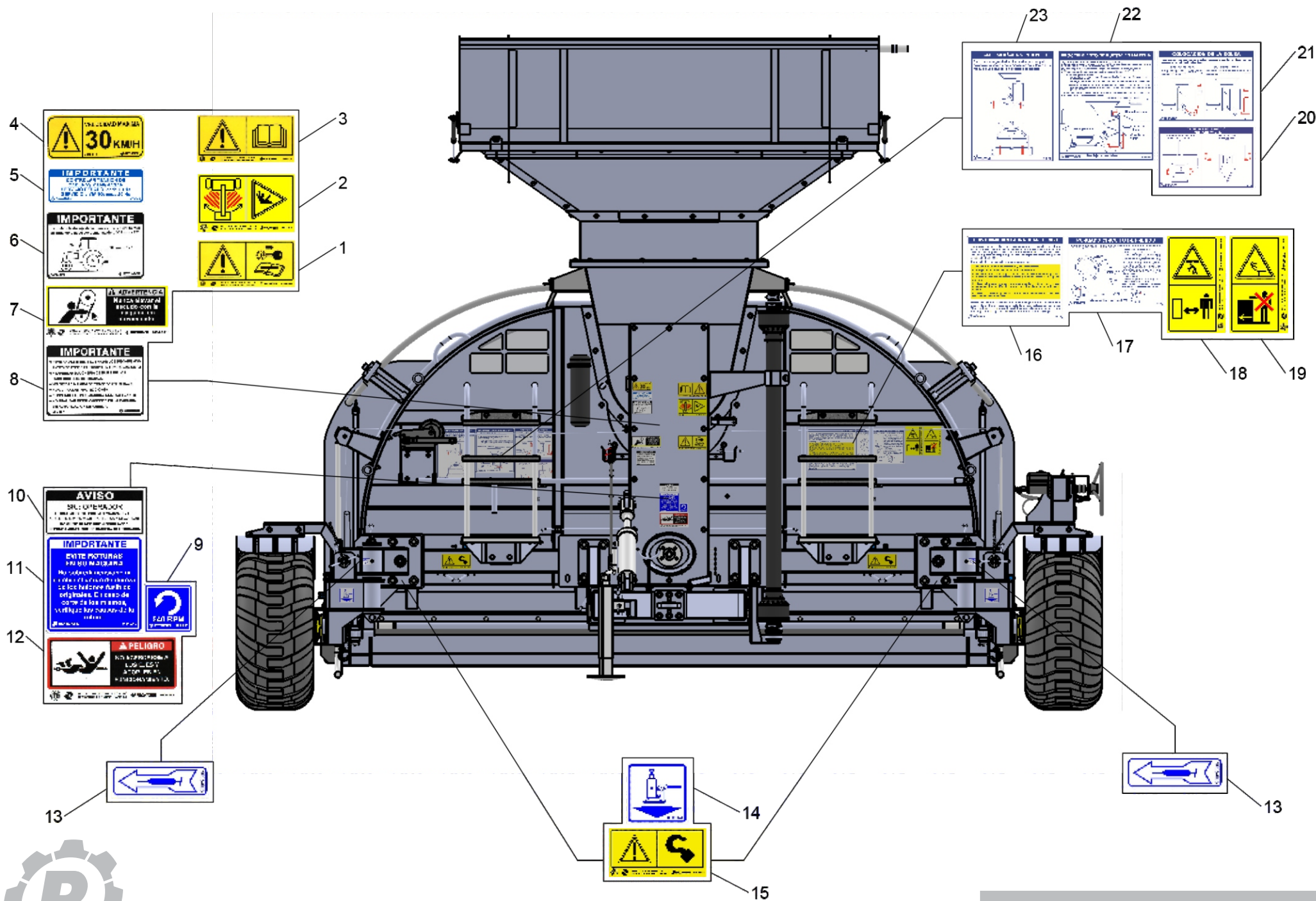
| R990 - Sheet N° 20 - Upper hopper | | | |
|-----------------------------------|--------------------------------------|------------|--------|
| Nº | Description | Code | Quant. |
| 1 | Hex bolt gr. 5 BSW 3/8"x7/8" | MCBU00006A | 96 |
| 2 | Flat washer galvanized 3/8" | MCAR00005A | 220 |
| 3 | Self locking nut BSW 3/8" | MCTU06001A | 96 |
| 4 | Hopper lateral reinforcement | CDEC00600A | 2 |
| 5 | Side hopper | CDEC00608A | 2 |
| 6 | Upper hopper reinforcement | CDEC00601A | 4 |
| 7 | Internal hopper reinforcement | CDEC50215A | 3 |
| 8 | Hex bolt gr. 5 BSW 3/8"x3/4" | MCBU00107A | 28 |
| 9 | Internal hopper reinforcement | CDEC00607A | 1 |
| 10 | Internal reinforcement anchor hopper | CDEC50212A | 2 |
| 11 | Internal reinforcement anchor hopper | CDEC50211A | 6 |
| 12 | Reinforcement tab | CDBI00210A | 4 |
| 13 | Hopper panel, front | CDEC00606A | 2 |
| 14 | Front hopper reinforcement | CDEC00598A | 6 |



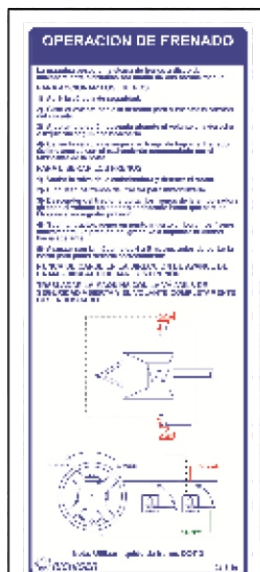
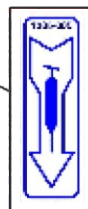
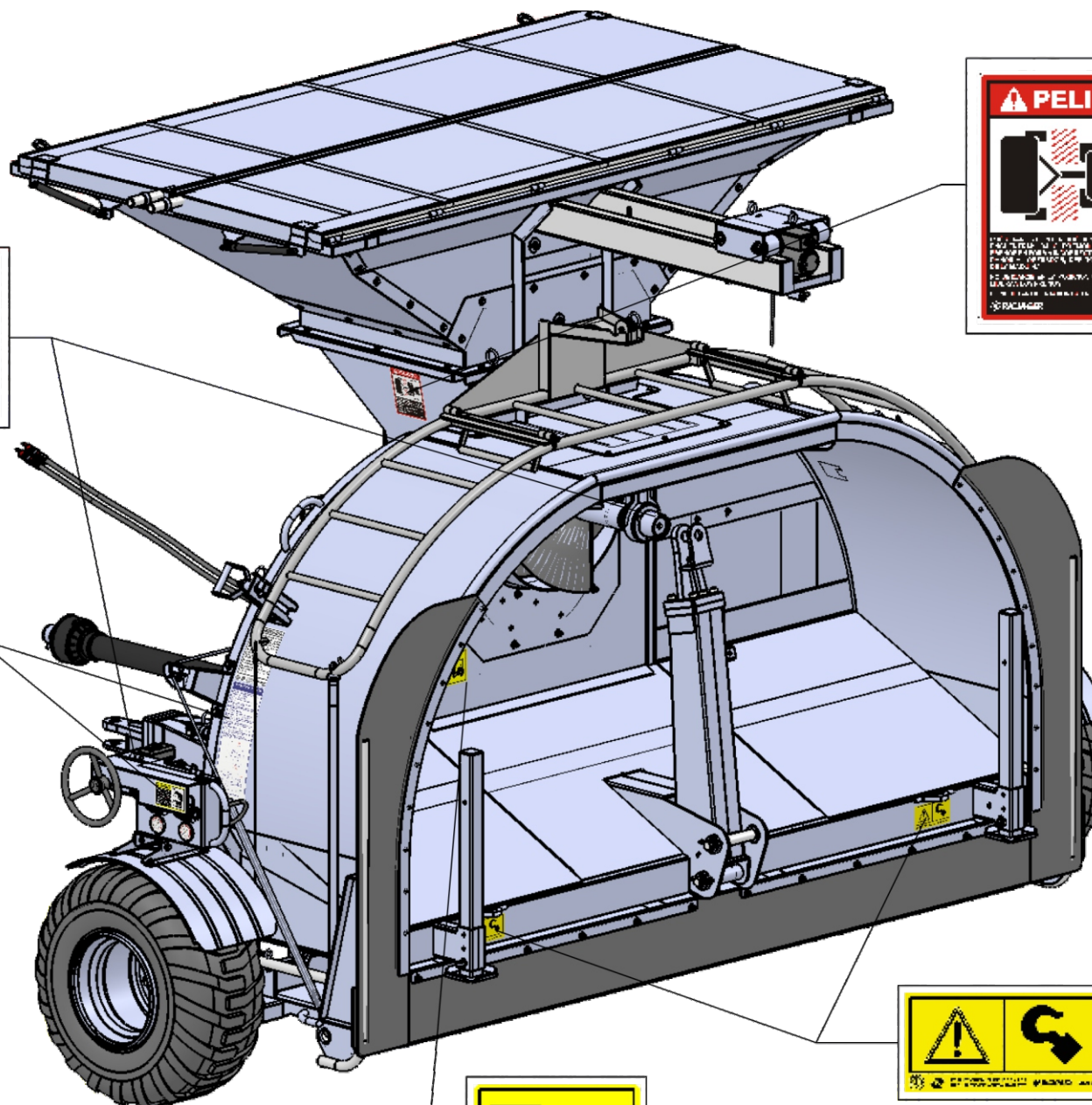
| R1090 - Sheet N° 20 - Upper hopper | | | |
|------------------------------------|--------------------------------------|------------|--------|
| Nº | Description | Code | Quant. |
| 1 | Hex bolt gr. 5 BSW 3/8"x7/8" | MCBU00006A | 96 |
| 2 | Flat washer galvanized 3/8" | MCAR00005A | 200 |
| 3 | Self locking nut BSW 3/8" | MCTU06001A | 96 |
| 4 | Hopper lateral reinforcement | CDEC00600A | 2 |
| 5 | Side hopper | CDEC00596A | 2 |
| 6 | Upper hopper reinforcement | CDEC00601A | 4 |
| 7 | Internal hopper reinforcement | CDEC50213A | 3 |
| 8 | Hex bolt gr. 5 BSW 3/8"x3/4" | MCBU00107A | 28 |
| 9 | Internal hopper reinforcement | CDEC00595A | 1 |
| 10 | Internal reinforcement anchor hopper | CDEC50212A | 2 |
| 11 | Internal reinforcement anchor hopper | CDEC50211A | 6 |
| 12 | Reinforcement tab | CDBI00210A | 4 |
| 13 | Hopper panel, front | CDEC00594A | 2 |
| 14 | Front hopper reinforcement | CDEC00598A | 6 |



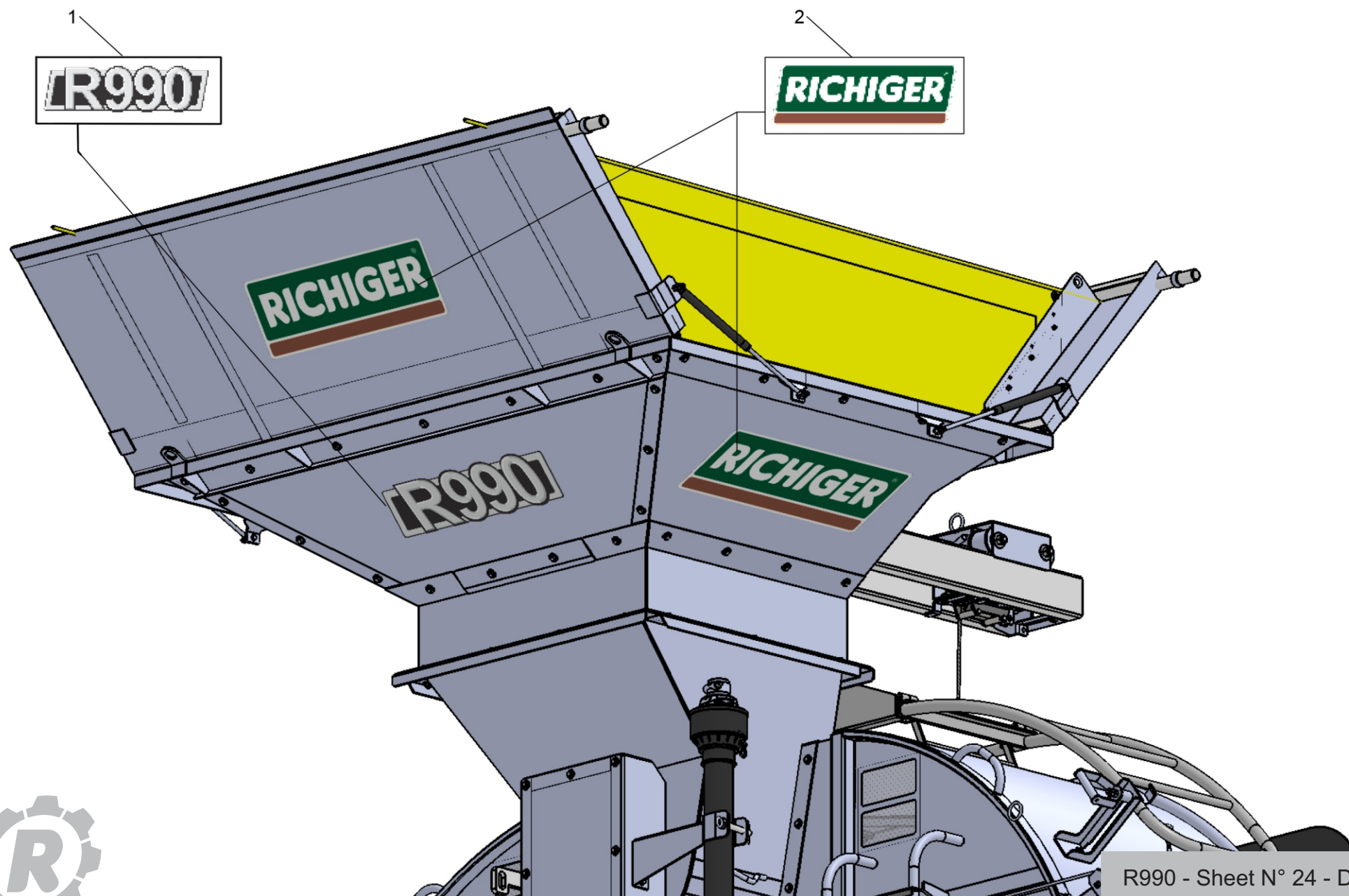
| R990/R1090 - Sheet N° 21- Decals | | | |
|----------------------------------|---|------------|--------|
| Nº | Description | Code | Quant. |
| 1 | Decal "Hoisting sling attach point" | CDAA00087A | 4 |
| 2 | Decal "Stay a safe distance from machine" | CDAA00083A | 3 |
| 3 | Decal "Apply grease" | CDAA00021A | 1 |
| 4 | Decal "Danger, rotating driveline" | CDAA00331A | 2 |
| 5 | Decal "Centralized lubrication" | CDAA00307A | 1 |
| 6 | Decal "Do not enter hopper" | CDAA00109A | 2 |



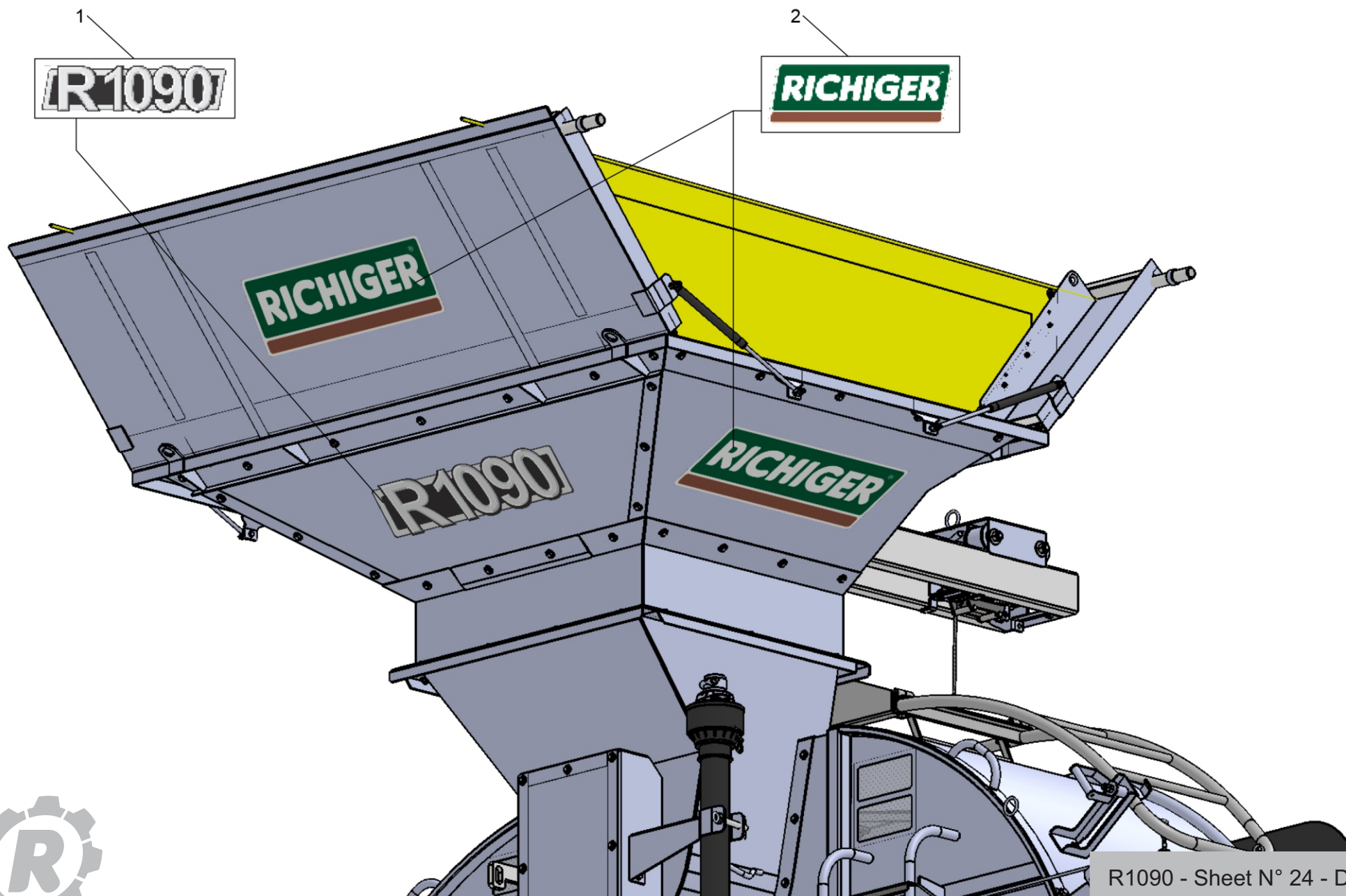
| R990/R1090 - Sheet N° 22 - Decals | | | |
|-----------------------------------|--|------------|--------|
| Nº | Description | Code | Quant. |
| 1 | Decal "Consult user's manual and turn off engine" | CDAA00079A | 1 |
| 2 | Decal "Keep away from this area" | CDAA00082A | 1 |
| 3 | Decal "Consult user's manual" | CDAA00078A | 1 |
| 4 | Decal "Maximum speed 18 miles/h" | CDAA00043A | 1 |
| 5 | Decal "Important - Check tension and apply grease" | CDAA00018A | 1 |
| 6 | Decal "Important - Tractor & hitch distance" | CDAA00038A | 1 |
| 7 | Decal "Warning" | CDAA00010A | 1 |
| 8 | Decal "Important" | CDAA00024A | 1 |
| 9 | Decal "540 RPM" | CDAA00097A | 1 |
| 10 | Decal "Operator notice" | CDAA00005A | 1 |
| 11 | Decal " Important" | CDAA00100A | 1 |
| 12 | Decal "Danger" | CDAA00016A | 1 |
| 13 | Decal "Apply grease" | CDAA00021A | 2 |
| 14 | Decal "Jack support point" | CDAA00086A | 2 |
| 15 | Decal "Hoisting sling attach point" | CDAA00087A | 2 |
| 16 | Decal "Brake release procedure" | CDAA00306A | 1 |
| 17 | Decal "Brake bleeding procedure" | CDAA00302A | 1 |
| 18 | Decal "Crushing risk- Keep distance" | CDAA00084A | 1 |
| 19 | Decal "Do not ride on machine" | CDAA00085A | 1 |
| 20 | Decal "Work & transport positions" | CDAA00303A | 1 |
| 21 | Decal "Bag tray" | CDAA00304A | 1 |
| 22 | Decal "Work procedure" | CDAA00305A | 1 |
| 23 | Decal "Stationary machine" | CDAA00308A | 1 |



| R990/R1090 - Sheet N° 23 - Decals | | | |
|-----------------------------------|-------------------------------------|------------|--------|
| Nº | Description | Code | Quant. |
| 1 | Decal "Danger zone" | CDAA00320A | 1 |
| 2 | Decal "Apply grease" | CDAA00021A | 2 |
| 3 | Decal "Braking procedure" | CDAA00301A | 1 |
| 4 | Decal "Warning" | CDAA00070A | 1 |
| 5 | Decal "Locking hand wheel" | CDAA00326A | 1 |
| 6 | Forklift bracket | CDAA00330A | 1 |
| 7 | Decal "Hoisting sling attach point" | CDAA00087A | 2 |

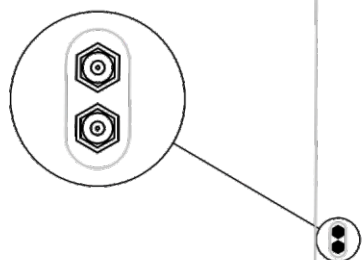


| R990 - Sheet N° 24 - Decals | | | |
|-----------------------------|------------------|------------|--------|
| Nº | Description | Code | Quant. |
| 1 | Decal "R990" | CDAA00299A | 1 |
| 2 | Decal "Richiger" | CDAA00186A | 4 |

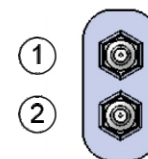


| R1090 - Sheet N° 24 - Decals | | | |
|------------------------------|------------------|------------|--------|
| Nº | Description | Code | Quant. |
| 1 | Decal "R1090" | CDAA00300A | 1 |
| 2 | Decal "Richiger" | CDAA00186A | 4 |

DETALLE A

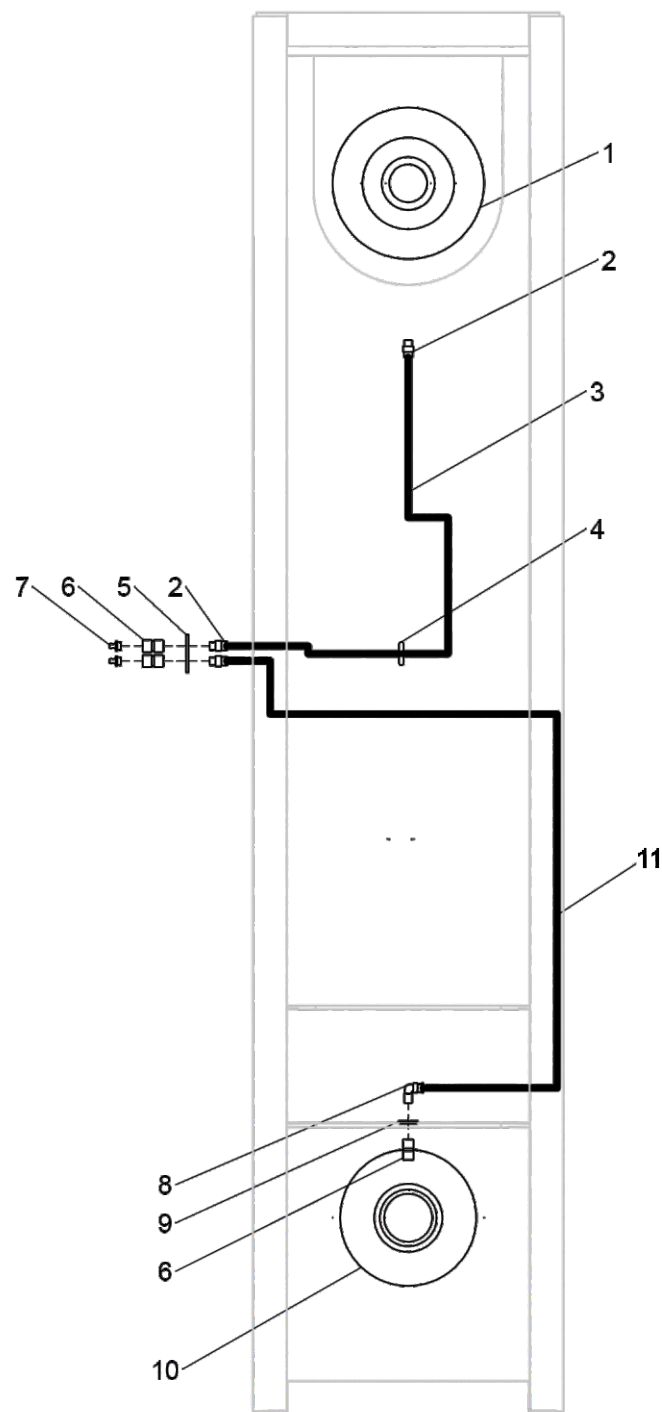


DETALLE A



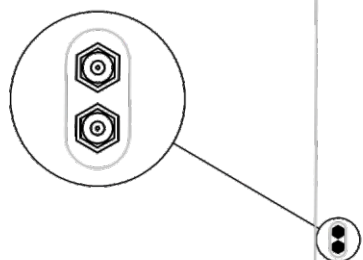
1. Tubing dia. 6 mm, length 500 mm

2. Tubing dia. 6 mm, length 800 mm

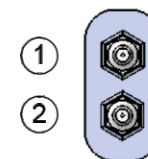


| R990 - Sheet N° 25 - Lubrication circuit | | | |
|--|-----------------------------------|------------|--------|
| Nº | Description | Code | Quant. |
| 1 | Shaft bearing, compression auger | CDBR50026A | 1 |
| 2 | Connector male 1/8" NPT | MCNE04047A | 3 |
| 3 | Tubing dia. 6 mm, length 500 mm | CDCT00066A | 1 |
| 4 | Ring | CDBR00011A | 1 |
| 5 | Conduit, twin openings | CDCE00218A | 1 |
| 6 | Connector female 1/8" NPT | MCNE04046A | 3 |
| 7 | Grease fitting, straight SAE 1/8" | MCAL00001A | 2 |
| 8 | Coupling 90° | MCNE04049A | 1 |
| 9 | Conduit | CDCV00257A | 1 |
| 10 | Shaft bearing, main drive | CDBQ50020A | 1 |
| 11 | Tubing dia. 6 mm, length 800 mm | CDCT00061A | 1 |

DETALLE A

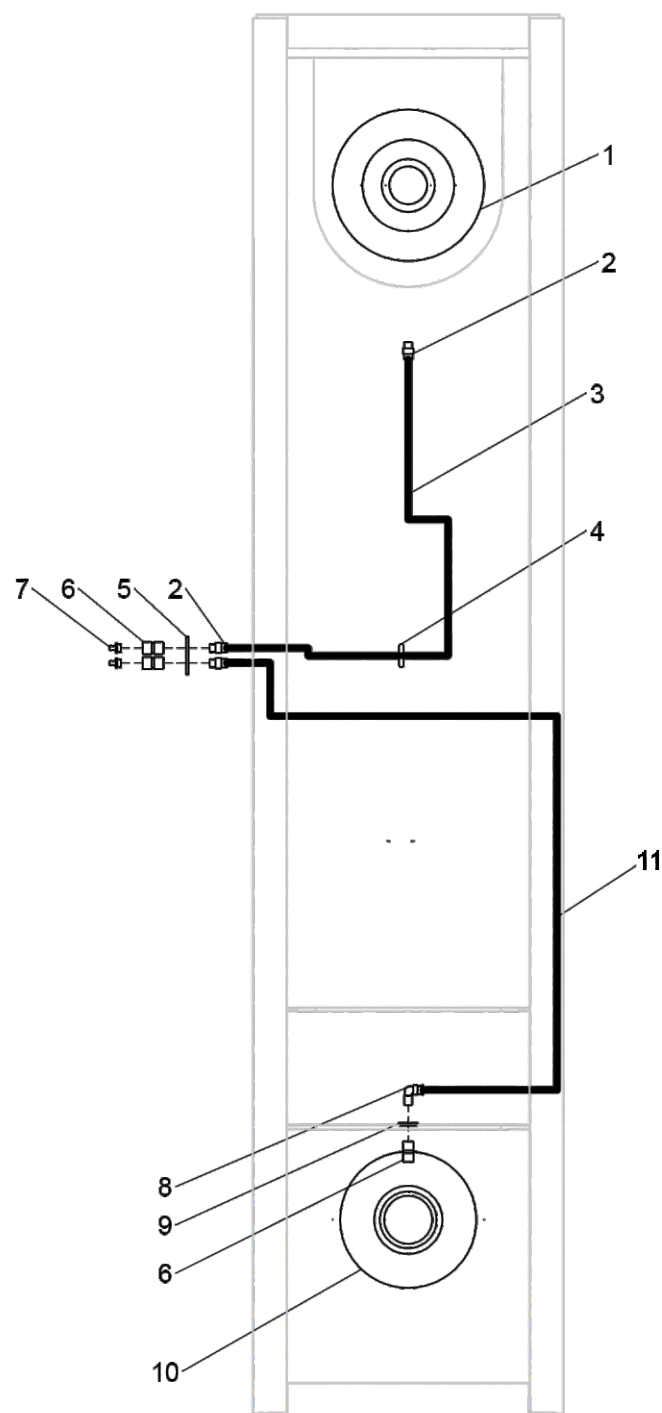


DETALLE A



1. Tubing dia. 6 mm, length 500 mm

2. Tubing dia. 6 mm, length 950 mm



| R1090 - Sheet N° 25 - Lubrication circuit | | | |
|---|-----------------------------------|------------|--------|
| Nº | Description | Code | Quant. |
| 1 | Shaft bearing, compression auger | CDBR50026A | 1 |
| 2 | Connector male 1/8" NPT | MCNE04047A | 3 |
| 3 | Tubing dia. 6 mm, length 500 mm | CDCT00066A | 1 |
| 4 | Ring | CDBR00011A | 1 |
| 5 | Conduit, twin openings | CDCE00218A | 1 |
| 6 | Connector female 1/8" NPT | MCNE04046A | 3 |
| 7 | Grease fitting, straight SAE 1/8" | MCAL00001A | 2 |
| 8 | Coupling 90° | MCNE04049A | 1 |
| 9 | Conduit, single opening | CDCV00257A | 1 |
| 10 | Shaft bearing, main drive | CDBQ50020A | 1 |
| 11 | Tubing dia. 6 mm, length 950 mm | CDEG00003A | 1 |

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