



RICHIGER EA-350 UNLOADER

**Operator's Manual
Parts list**



WE MEET YOUR PRODUCTION NEEDS

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Limitations on Warranty

Unit: **Hydraulic-Mechanical Grain Bag Unloader**

Model: **EA-350**

RICHIGER MAQUINARIAS S.A, located in Avellaneda 661, Sunchales, Santa Fe province, Argentina, warrants its product EA-350 mechanical grain unloader 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 365 days from date of delivery to buyer.

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 parts at our option, F.O.B. our factory, or designated service center, agent or representative. If the agent or representative grants any warranty greater in scope or time period or labor allowance than that detailed herein, RICHIGER MAQUINARIAS S.A 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 S.A 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 crops, 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 S.A.

Buyers and their agents shall prepay all transportation charges for the return of such products to RICHIGER MAQUINARIAS S.A. 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 S.A. has no control including, without limitation, contamination, pressures in excess of the 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 S.A. factory personnel or representative or source approved by RICHIGER MAQUINARIAS S.A. 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 the product be resold by the 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.



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- 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 S.A. , or modifications that in RICHIGER MAQUINARIAS S.A.'s judgment 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.
- 6) Incorrect mounting of external gears, pulleys.
- 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 hydraulic fluid.
- 12) Operating beyond recommended maximum speeds, pressures and temperatures.
- 13) Repairs or disassembly by unauthorized personnel.
- 14) Misalignment 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 15 days after delivery to or receipt by the buyer of the product, the buyer shall inform the seller in writing if product is found defective or short in any respect. Failure to so inform the seller or any use by buyer of product shall constitute conclusive evidence that the seller satisfactorily performed and the buyer waives any right to reject the product thereafter

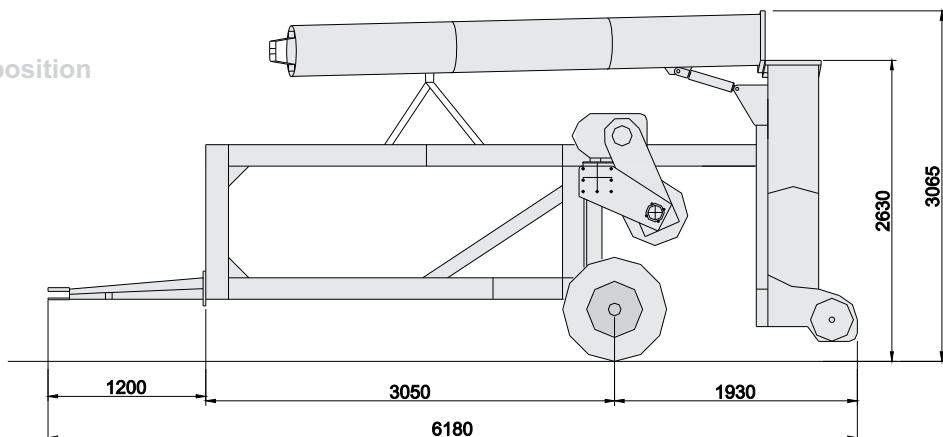


Technical specifications

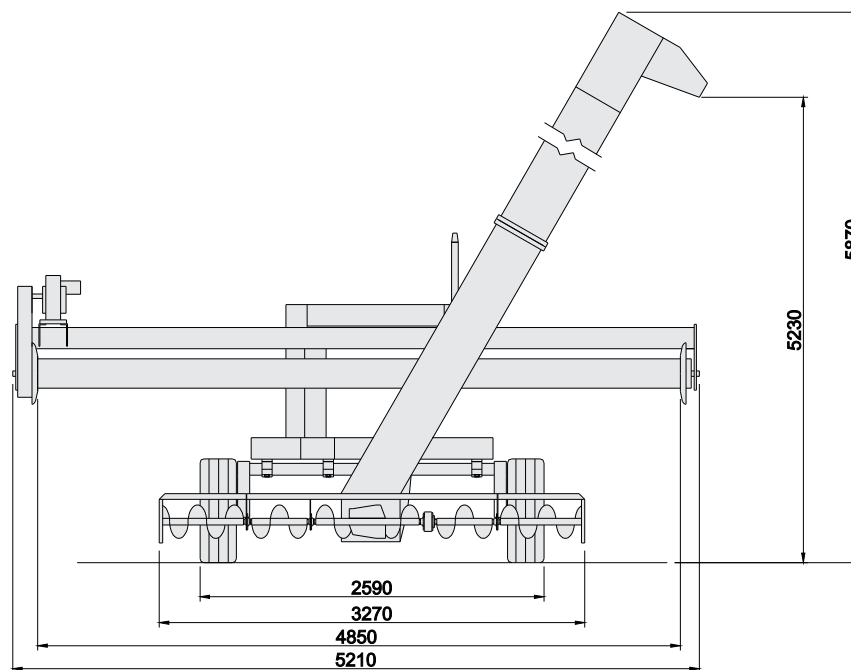
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Materials to be extracted	All kinds of dry grains (wheat, sorghum, maize, sunflower, soybeans, rice, etc.) and pelletized materials	
Capacity	Up to 300 tons/tour (*)	
Tractor	Minimum power:	60 CV
	PTO revolutions:	540 rpm
Extraction system	Automatic bag pickup system	
	Working height hydraulically controlled	
	Bag slasher blade	
	Works mechanically and hydraulically	
	Adjustable working width	
Extraction	High clearance discharge auger, mechanical drive	
PowerTransmission	Drive shaft w / shear bolt protection	
	Mechanical central discharge auger & cross augers	
Tires	11 L15 – 10 ply	
	Tire pressure:	30 lbs./sq. in.
Total weight	2000 kg. (4400 lbs.)	
(*) Work capacity can vary according to grain type, moisture content and other factors		
Manufacturer reserves right to change specifications at any given time without previous notification		

Transport position



Work position



Safety precautions

04



- Most accidents are caused by human error. Follow all safety procedures.
- Make sure all people are safely positioned before starting tractor's engine and engaging the PTO.
- Keep unloader clean and sheltered when not in use. This diminishes risk of deterioration and eventual failure.
- Keep a fire extinguisher handy.
- Decals with safety indications and warnings should be strictly heeded, kept in good condition and replaced if necessary.
- When towing the machine, drive with the utmost caution on public roads.
- Keep hands, feet and clothing well away from moving parts.
- Stop the tractor's engine before attempting a hands-on task on the unloader.

For the operator

In order to obtain maximum performance from your grain bag unloader, we recommend you keep the owner's manual in a handy place for quick consultation. Read the manual carefully before attempting to unload grain from bags and pay special attention to operating and maintenance instructions.

Before transporting the grain unloader, verify that:

- a) The tow bar pin is properly secured
- b) Check tire pressure
- c) Check that wheel bolts are properly tightened
- d) Attach safety chains between machine's tow bar and tractor drawbar for added security on the road



IMPORTANT

The operator should become familiarized with machine controls before attempting actual operation. Keep unit in good working condition. Any modification could cause malfunctioning, potentially dangerous situations, or reduced machine durability.



WARNING:

At no time during the unloading operation should anyone, except the operator standing at the hydraulic controls, approach unloader or bag, and that includes both tractor and truck drivers. Onlookers should keep a safe distance. And never allow anyone to lean against the bag: augers are turning inside.

1) Hitch tractor to unloader, connect hoses to the tractor's hydraulic circuit and connect drive shaft to the tractor's power take-off.

2) To the side of the machine, on the roller cross beam, an array of three levers, a turn knob and a pressure limiting valve control the unloader's hydraulics. A decal attached next to them (Fig. 1) shows each control's function.

First step in preparing for work is raising the discharge auger. With the tractor's hydraulics turned on, move the first lever to its upward position (Fig. 2). This will raise the auger tube slowly.

As soon as auger is fully extended, move back the lever to its mid (neutral) position. Once the unloader has finished working and is to be towed away, the sequence is reversed and the tube is lowered by moving down the lever.

The sequence ends once the upper half is resting firmly upon its transport prop and the control lever is returned to neutral position.

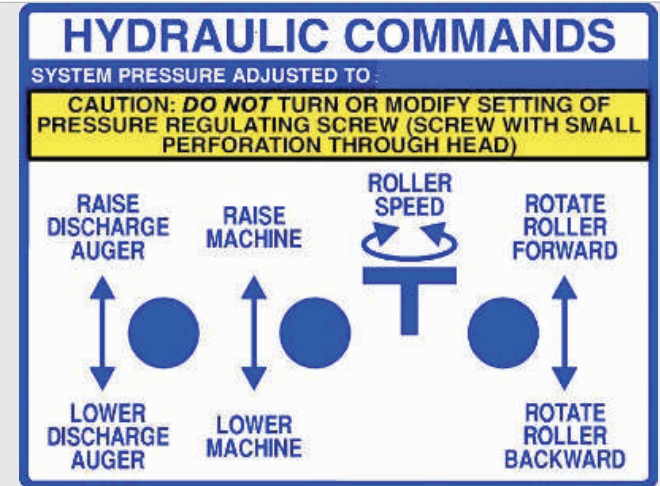


Fig.1



Fig.2





NOTE:

A pressure limiting valve set to 850 PSI is provided as a safeguard against excessive pressure in the hydraulic circuit. If this value is exceeded, oil will bypass the hydraulic motor and momentarily bring operation to a standstill.

3) Next, the second lever is used to regulate working height (i.e., clearance of the sweep augers to the ground) by means of a hydraulic cylinder. First, this center lever should be moved to top position in order to raise the unloader. To adjust for desired clearance, and the object here is to set the sweep augers as close to the ground as possible without scraping against it and compromising bag integrity (see “General indications for efficient operation” on page 26), a set of three clamp-on stops of different size is provided.



Fig.3

Once a combination of stops or a single stop have been selected and placed around the cylinder rod, the control lever is pulled down (Fig. 3) so that the weight of the unloader comes to rest upon the stops (Fig. 4). At this point the lever is returned to its neutral position. The height of the machine can be modified at any point, even when the sweep augers are inside the bag.



Fig.4



IMPORTANT:

The unloader should not be raised or lowered with the hydraulic cylinder if the augers are deep within the grain mass, as this could place undue strain on some components. The correct procedure is to release a few feet of plastic from the roller by counter rotating it hydraulically, advance forward with tractor to extricate the sweep augers from the grain, modify machine clearance with the hydraulic cylinder removing or adding stops as necessary, back the machine once again into the bag to position the augers next to the grain, and reinitiate PTO and roller to continue unloading.

4) The third lever, used to control roller rotation, is not used at this stage.

5) Remove the pin at the base of the support stand, swing the stand upward and attach temporarily to main beam with same pin (Fig. 5).

Fig.5



6) Pull back the spring-loaded pin that holds the roller assembly in place during transport and swivel it 90° to work position (Figs. 6 & 7).

Fig.6



Fig.7



7) Lower the support stand and reinsert pin at the base (Fig. 8).

Fig.8



8) Remove the sweeper screw extensions from their transport location and insert them in the main auger shafts, not mixing left and right hand screws. Also remove protection grids and install (Figs. 9 & 10).

9) The sequence is reversed when changing back to transport mode.

Fig.9



Fig.10



Attaching the bag

06

1) Open the end of the bag and along the top section make a lengthwise cut approximately 2 meters (7 ft.) long.

Spread open the resultant flaps to the side

Fig.11



Fig.12



CAUTION:

Do not prolong the cut to the point where grain is filling the bag and exerting pressure. This could cause a rip that spreads along the full length of the bag.

2) Swivel the cutter blade around so that its cutting edge faces outward. The blade will cut open the bag as the roller pulls it in. (Fig. 13).



Fig.13

3) Drive the tractor/unloader pair in reverse and align with the bag opening as straight and dead center as possible. Back up the unloader into the bag until the sweep augers come lightly in contact with the grain, but do not shove or attempt to wedge the sweep augers forcefully into the mass of grain. Be careful that the wheels are not treading on any part of the bag (Fig. 14).



Fig.14

4) Use the third hydraulic lever to rotate the bag pick-up roller until the row of sharpened studs that will hold the bag fast reach the topmost position. (Figs. 15 & 16).



Fig.15



Fig.16

5) Lift the bottom half of the bag bringing it up to the roller. Notice that the bottom half is one continuous section of plastic that runs the entire length of the roller and that it is the black inner layer of plastic that is visible.

Punch the plastic sheet through each holding stud (Fig. 17) leaving a remainder of 10 or 20 inches to the edge. Do not worry if the plastic is not perfectly distributed along the length of the roller or if folds and creases remain after attachment (Fig. 18).

Do not worry if the plastic is not perfectly distributed along the length of the roller or if folds and creases



Fig.17



Fig.18

6) Once the bottom half of the bag has been secured in this manner, place the upper half over the bottom half already fitted; punch the plastic sheet through each stud (Fig. 19), starting from the studs at the end of the roller and progressing toward the center. Notice that it is the white outer layer that is now visible and that there are two sections of plastic: the initial cut has divided the top part of the bag in two parts. The left segment must be passed to the left of the discharge auger and fastened to the studs on that side of the roller, while the right segment must be passed to the right of the auger tube and fastened to the studs on that side (Fig. 20). Once unloading operation is underway, the initial cut will be continued by the cutter blade.

Once unloading operation is underway, the initial cut will be continued by the cutter blade.



Fig.19



Fig.20



IMPORTANT:

There is no need to be overly precise when fastening the bag to the roller. Even though at this stage the plastic may look crumpled and in disarray, it will stretch and straighten after a few turns of the roller. The basic consideration here is having the bottom part of the bag (the part hooked to the roller first) hold some slack relative to the upper part attached last (one or two feet is enough). The latter should be attached shorter so that the roller tugs at it first. The small margin of slack in the bottom section plus the plastic sheet's elasticity helps form a rounded shape that contains the grain as the bag is rolled in. The round shape also helps keep adequate clearance between bag and sweep augers (see "General indications for efficient operation", page 26).

1) Make absolutely sure that the tractor's gear case is disengaged and brakes are off. Failure to comply with this can result in a torn bag or mechanical malfunction. The machine is now ready to begin unloading grain. First, use control lever to turn roller forward about half a turn or more so that it gathers some plastic sheet (Fig. 21) and then move lever back to neutral. Check that the bag passes through the cutter blade located on the auger tube (Fig. 22) in preparation for beginning work.



2) Engage the tractor PTO with engine idling, throttle so PTO reaches 500/540 rpm's and once the augers are turning move the roller control lever to its upper position. Normally it is left in that position until the unloading operation is finished (Fig. 23). Turn to the variable flow valve. This valve handles roller rotation speed through a turning knob located at the top of the hydraulic valve array (Fig. 24). Turning the knob anti-clockwise *increases* rotational speed; turning it clockwise *decreases* it. The higher the speed, the more grain is brought in. At any point during operation roller can be brought to a complete halt by closing the valve knob. Open the valve if it was previously closed and augment speed so that grain begins to be delivered through the discharge auger and to accumulate at the front end of the bag.



3) To determine proper speed, wait until grain reaches a level that is approximately 10 centimeters (4 inches) below the roller's level and keep it there by adjusting the knob in either direction. (See "General indications for efficient operation" on page 22 for further information on regulating grain height within bag).

This can be verified visually by observing the mass of grain through the cutter blade opening at the top of the bag. If the gap between grain level and pick-up roller grows too close, *and* grain is being pulled up into the roller with the bag folds, then too much material is accumulating inside the bag faster than it can be discharged.

Operating speed must be lowered by turning knob *clockwise*. If the gap between roller and grain increases, more grain must be supplied by turning the knob *anti-clockwise* and speeding up the roller. The knob is turned very gradually, avoiding any abrupt changes of grain flow.

The unloader should now be delivering a steady stream of grain to the receiving truck or trailer (Fig. 25). The truck will have to move every so often to stay alongside the retreating bag.



Fig.25



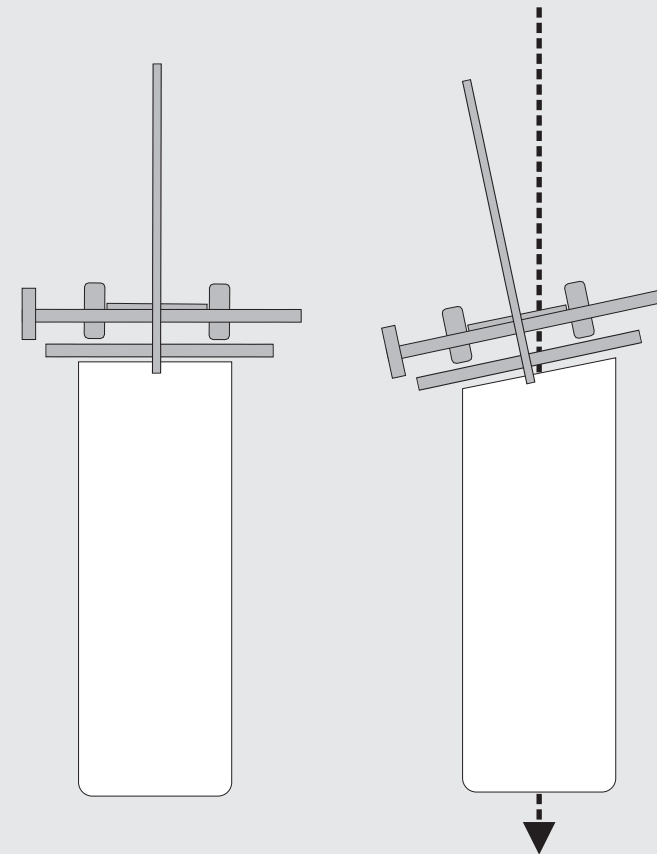
CAUTION:

It is critical that grain not be allowed to collect higher up in the bag than level recommended (see "General indications for efficient operation", page 26) because it can be drawn up with the bag, rolled in with the plastic sheet and form large masses of bulging grain that continue to get bigger. If that happens, operation is stopped, roller is disengaged (see "Detaching bag from roller, page 20), tractor is made to advance a few meters so that enough plastic is unrolled to be cut off with a knife, all the used plastic is discarded from the roller and operation is recommenced. Although it is ideal that no grain be picked up by the roller, small bulges here and there can be put up with as long as roller speed is decreased and grain ceases to be pulled in.

4) It is advisable to check direction once in a while and if necessary correct the steering wheel so that the tractor continues to be pulled back in a straight line. It is very important to prevent the sweep auger extremities from touching the bag sidewalls as this could tear the plastic.

That is the reason tractor and machine should be positioned in a straight line and aligned with the bag when initiating labor. If noticed that the unloader is not working aligned with the bag and that the auger protection grids have either come into contact with the plastic or are about to make contact, it may be too late to correct the situation by steering alone.

When bags are filled on uneven terrain or the tractor pulling the bagger swerves or the bagger's brakes are adjusted while working, the bag can curve, and the curvature can be quite sudden and pronounced. The operator should watch for this while unloading and try to follow curvature with the tractor's steering wheel as far as possible to avoid contact of the augers with the bag's walls.



CAUTION:

When not possible to correct misalignment by steering action only - in situations as described above - operation should be halted and the unloader realigned before it ruptures the bag and grain is lost. It should be done as follows: PTO is turned off and the roller is counter-rotated hydraulically to slacken off as much plastic sheet as may be necessary to provide scope for maneuvers (there is no need to detach bag from roller for this specific correction). Tractor and unloader are first driven forward to extract the sweep augers from the grain and then maneuvered to line up straight with the bag, sweep augers placed next to the grain (not wedged forcefully into the grain) ready to initiate work again once PTO and roller are reengaged.

Ending grain extraction

08

When the bag is to be closed because work has been completed and the unloader is being taken away, sufficient plastic is unrolled, either hydraulically or by mechanically disengaging the roller, for the bag to be sealed with plastic strips or 2" x 4" boards nailed together.



IMPORTANT:

Whenever grain extraction is ended, either if the unloader will remain with bag attached to continue work later or if it will be towed away, the correct termination sequence is as follows:

- a) The roller is brought to a complete standstill by setting valve lever in neutral position or closing flow control knob, in order to stop the input of grain.
- b) PTO is left engaged and working for a few minutes so that all loose grain is unloaded, ensuring there is no buildup inside the discharge auger tube that could be cause of transmission overload and breakdown.

Emptying the last section of bag

09

- 1) When the unloader reaches a point where it can advance no further because the bag is almost finished and the augers are not picking up any more grain (Fig. 27), it is time to cut short the main operation. After stopping hydraulics and stopping the PTO for reason of safety, the operator should use a knife to rip open the upper part of the bag, remove stops and lower the machine so that the augers may pick up additional grain (Fig. 28) while the roller remains stationary. The tractor can engage in some gentle forward and reverse action to boost grain collection. Repeating this sweeping action, the volume to be loaded by hand can be considerably reduced.



WARNING:

At this stage no one should approach the bag to hasten discharge by heaping grain onto the augers, or attempt any other action in proximity of the augers since these are turning and could cause serious injury or worse. **Stay away!**





Fig.26



Fig.27

2) Once all grain possible has been picked up in this way the tractor engine is stopped. For reason of operator safety, it is now necessary to disconnect the sweep augers from the main transmission while still allowing the discharge auger to turn and unload grain. Remove the lock pin from the sweep auger gear case and pull out the coupling gears' handle (Fig. 28), which will disconnect the auger drive. With sweep augers disconnected, the auxiliary hopper is attached to the slot located at the base of the discharge auger.



Fig.28

At this stage the sliding panel or divider that separates the sweep augers from the discharge auger is introduced in corresponding space between auger flightings (Fig. 29). Then provided crescent shaped covers are attached to the ends of the divider, thus effectively covering and sealing both openings of the cylinder shaped grain reception chamber (Fig. 30). In this way the totality of grain introduced in the auxiliary hopper will be captured by the discharge auger, valuable loading time gained as no grain is tossed out of the chamber by the whipping and churning action of the auger.



Fig.29

The tractor engine is turned on, its PTO is engaged and the last grain remaining in the bag is shoveled into the auxiliary auger by hand (Fig. 31). Once unloading is concluded and engine turned off, the sweep auger coupling gears' handle should be pushed in and the lock pin reinserted. The coupling gears are connected to the drive shaft by means of a flange fitted with shear bolts. Should these bolts be cut, unscrew gear case cover and replace with low carbon steel SAE 1010 or C10 bolts of same diameter as the original.

Fig.30



Fig.31



CAUTION:

Always disable the sweep augers when grain is being introduced manually in the hopper in the final stages of work.

To release the bag from the roller once the bag has been completely emptied, the following sequence is followed:

a) The front section of the roller chain cover is unscrewed from the bottom and pulled up, where it is secured in place with the same screw. The double sprocket and chain that drive the roller are now visible (Figs. 32 & 33).

Fig.32



Fig.33



b) Roller hydraulic valve is opened to advance transmission until lock pin that links drive sprocket and roller comes into view (Figs. 34 & 35).

Fig.34



Fig.35



c) R-clip is removed and this lets the operator draw out the lock pin, thus disconnecting transmission to roller and allowing it to turn freely and plastic to be pulled off (Figs. 36 & 37).

Fig.36

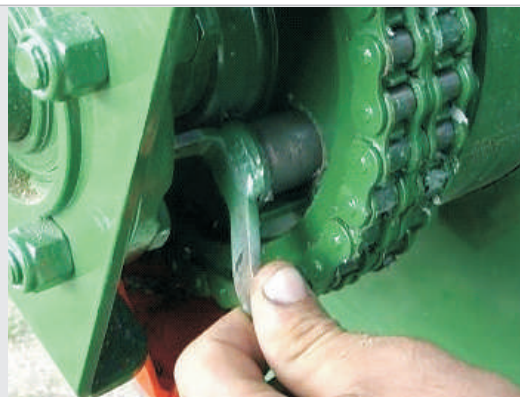


Fig.37





IMPORTANT:

Plastic sheet litter is an eyesore and doesn't help the environment. Inquire about recycling alternatives from your plastic bag supplier or local environmental agency.

d) The bag is held from its end as the tractor advances unrolling plastic until the entire strip lies on the ground (Figs. 38 & 39).

Fig.38



Fig.39



Back to transport mode

Reverse the order of previous steps to set up the machine for transport:

- a) Raise hydraulic cylinder to its maximum height, clamp all the stops on the cylinder rod and lower again to rest machine on stops. It is important to set highest clearance for the road.
- b) Fold the discharge auger.
- c) Disconnect hydraulic hoses and remove PTO drive shaft.
- d) After lifting up the pivoting support stand, swivel roller cross beam $\frac{1}{4}$ of a circle into its transport position. Then remember to secure support stand to its base once again.
- e) Turn cutter blade round so cutting edge faces inward.
- f) Remove outer sweeper screws and grids so machine does not exceed road transport width allowance.
- g) Hitch unloader to towing vehicle.

**WARNING:**

Never perform maintenance or lubrication tasks when there are moving parts. Always stop tractor's engine and remove the ignition key as an extra precaution.

To check for main drive chain slack, remove covers located on front part of frame and discharge auger tube, and adjust idler sprockets if needed.

Shear bolts

The drive shaft that connects to tractor's PTO is equipped with two shear bolts linking yoke and flange elements (Fig. 40).

They have been installed there to protect the unloader's driveline and transmission from overloads. Should they have to be replaced, use soft low carbon steel **SAE 1010 or C10 bolts** of same diameter as the original.

Never use hardened steel bolts or pins as replacements.

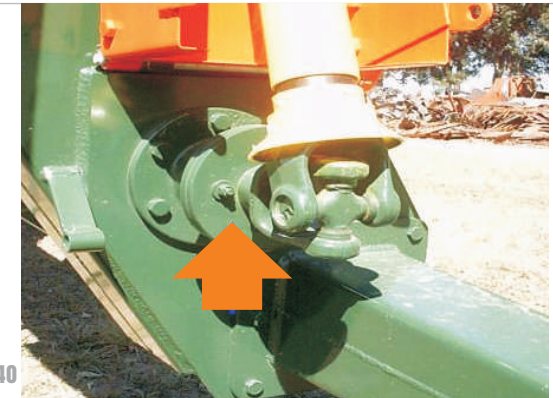


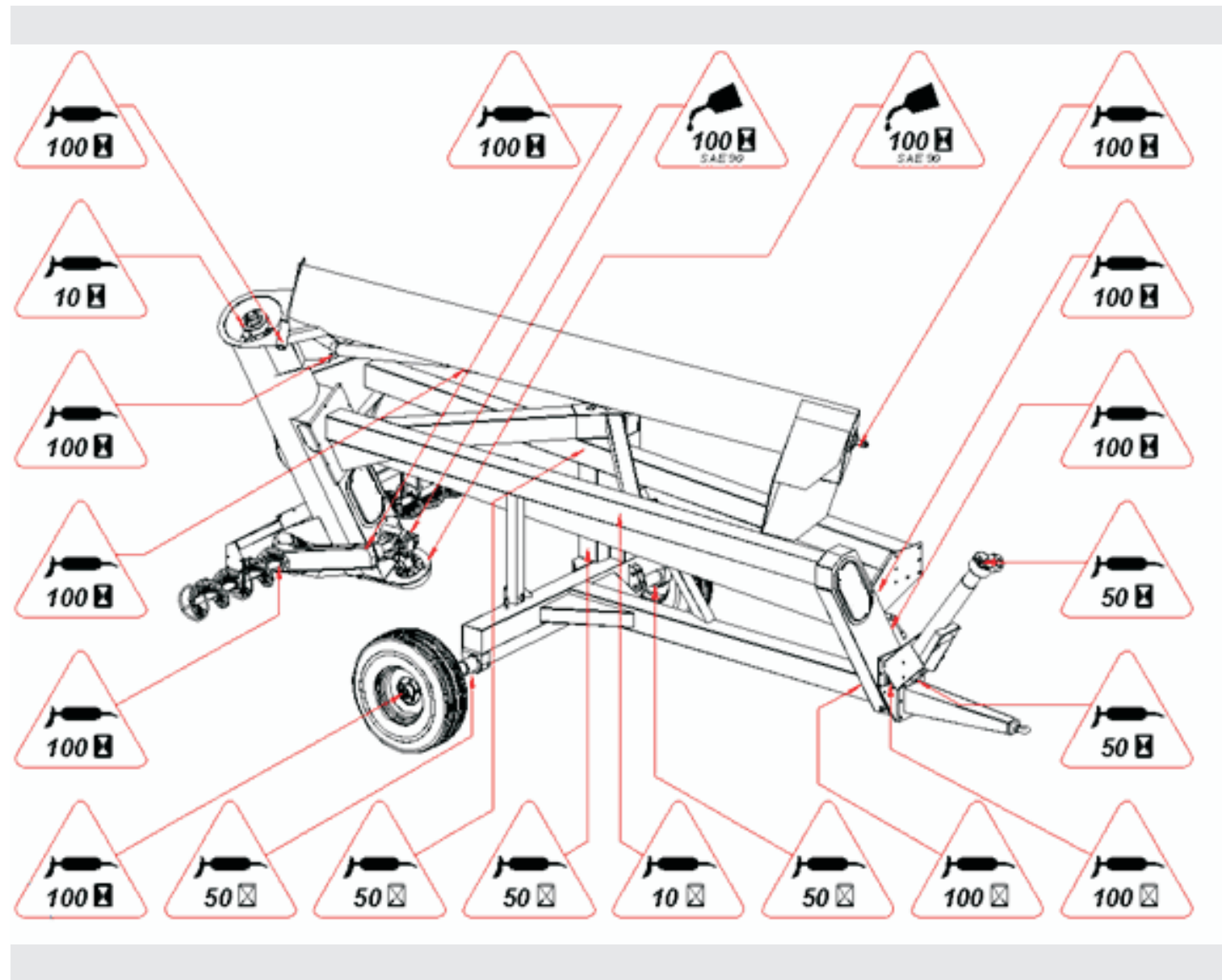
Fig.40

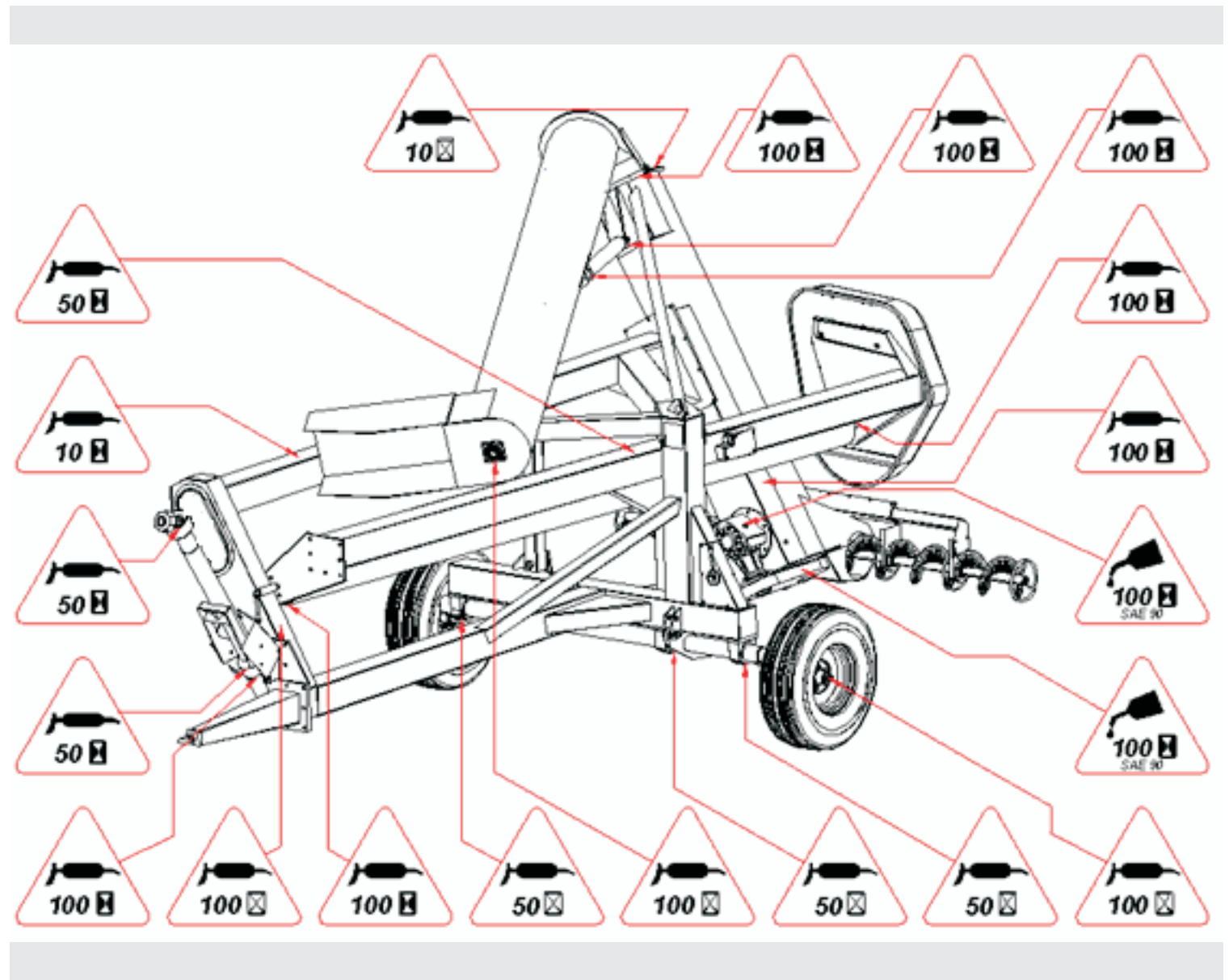
Lubrication

Roller gearbox, sweep auger and discharge auger transmission cases and chains:
Use **85W-140 premium heavy duty gear lube.**

Bearings and chains:

Use **heavy duty lithium grease.**





The aptitude of different kinds of grain to flow can be approximately determined by the angle formed by the sides of a mound lying on the ground. A steep angle indicates bad grain flow (Fig. 39) whilst a shallow angle indicates a good flow rate (Fig. 40).

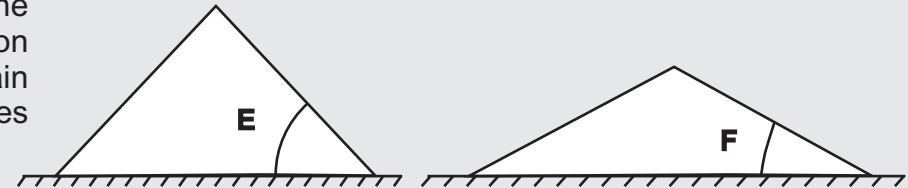


Fig.39

Fig.40

Some of the factors that contribute to good grain flow are the following:

Bigger grain size
Smooth outer surface
Round shaped grain
Dry grain
Clean grain



Low heap angle



Smooth flow, higher rate of extraction

Examples of grains with good flow characteristics that can be unloaded at higher speeds are:

- Corn below 21% moisture
- Soybeans below 21% moisture
- Wheat below 19% moisture

Grains that flow with more difficulty should be extracted at a slower pace as the higher speeds cannot be attained and if attempted the unloader could suffer mechanical damage. Examples of these grains are:

- Corn above 22% moisture
- Soybeans above 22% moisture
- Wheat above 20% moisture
- Sunflower
- Oats
- Barley
- Paddy rice
- Chickpeas



Remember: the whole working principle of the unloader rests upon the flow characteristics of grain.

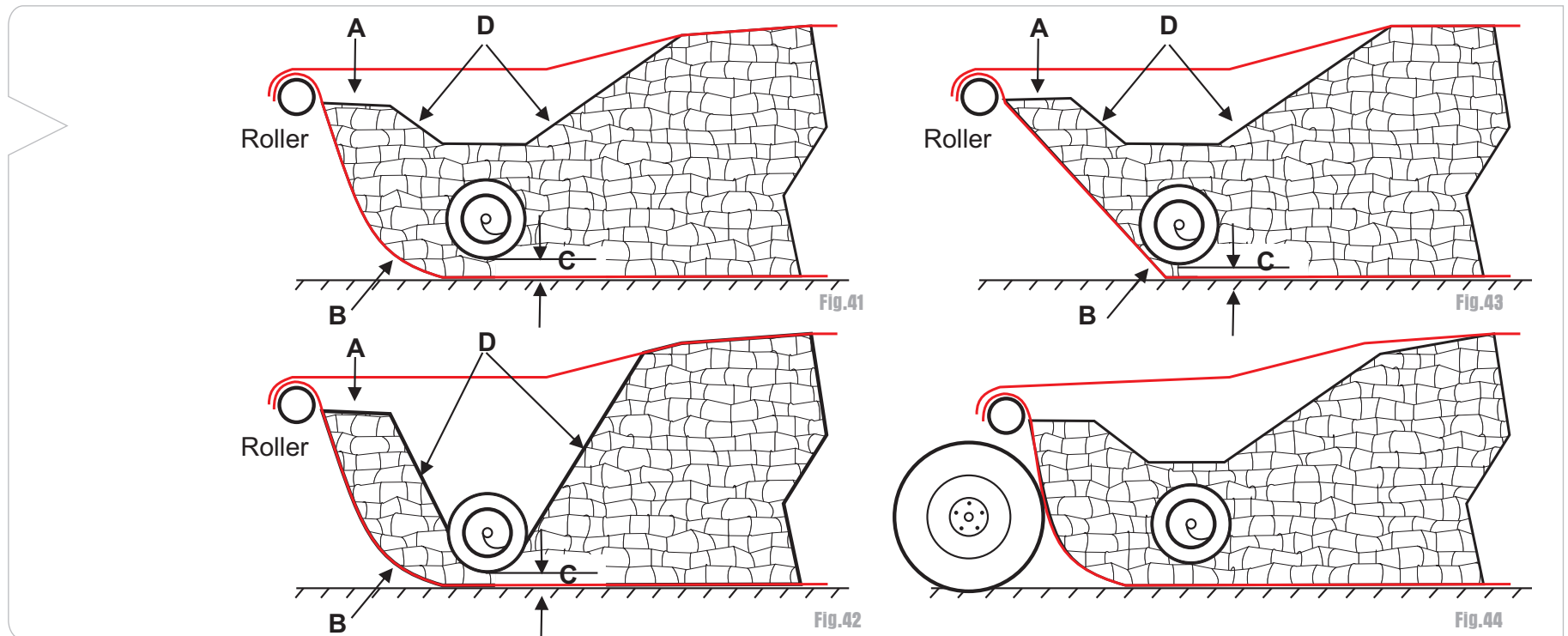
General indications for efficient operation

15

Sweep auger efficiency is dependent on the type of grain being unloaded. The highest output measured in tons extracted per hour is obtained with grains that run well. Free running grain results in more efficient auger operation, a higher discharge rate and less stress on mechanical components.

The opposite is true of grain that does not run so well, that clusters together because of contamination with straw or twigs, excessive moisture, or because grain shape lends itself to interlocking. In these less than ideal conditions, work speed is necessarily compromised.

The following drawings depict magnitudes A, B, C & D. The text that follows can help you assess how these parameters interact with each other and with different grains to help optimize operation:



“A” is the height that grain within the bag can be taken to by increasing or reducing the pickup roller's RPM's. This level must not exceed the roller's height to prevent grain from being picked up with the plastic sheet. With this constraint, grain level should normally be maintained as high as possible so that, with the aid of gravity, it can readily fall back onto the sweep augers and be directed to the discharge auger.

“B” shows the curved shape that the front part of the bag should adopt - Figs. 41 & 42 - in order that the plastic sheet does not come in contact with the sweep augers or their protection grids with risk of ripping open and losing contents. The curvature is formed by the grain mass weighing down the tip of the bag as it is rolled in. When grain does not accumulate there, the plastic will tend to go up to the roller in a straight line - Fig. 43 - dangerously close to or actually touching the augers, with possibility of bag damage. With grain that flows easily (e.g. dry wheat), if the sweep augers are set with their normal low clearance to the ground (see “C” below), it can happen that due to quick passage, no layer of grain is left between the sweep augers and the floor. With no grain weighing down the bottom part of the bag and grain being unloaded at a very fast pace because it flows freely, it might not accumulate at the front as in fig. 41 but take on the shape shown in Fig. 43. In this case, sweeper height (“C”) should be increased to permit some grain to pass beneath the sweepers without being gathered so that it can weigh down the bottom of the bag and collect at the front (“B”). However, if sweeper height is excessive, too much grain could accumulate there and project forward, making contact with the unloader's wheels (Fig. 44), a situation that should be avoided. The weight of grain contained within the curved shape “B” can reach tons. For that reason too it is important to pay close attention to grain level within the bag and prevent it from climbing above the roller as this will add even more volume and weight, the problem compounded by a large amount of grain that will immediately be pulled up by the roller along with the plastic, forming huge lumps of rolled material. If it goes unchecked, this progression could cause failure of mechanical components.

“C” is the clearance between sweep augers and bag bottom (or ground). This distance should be small so that the sweep augers lie low inside the bag and are well covered with grain, which ensures adequate delivery to the discharge auger. The clearance is set via clamp stops placed on the hydraulic cylinder rod. Since the augers should not touch the ground as this would endanger bag integrity, the convenience of placing the bags on terrain as flat as possible becomes clear. If the ground is rough, this will force operation with sweeper augers placed higher up than optimum because a rut will cause the unloader to dip, with the consequence of sweepers bumping against the ground and ripping the plastic. Especially with grain that clings together and flows badly, it is important to place the sweeper augers as low as possible. Generally speaking and in average conditions, low may be considered to be a clearance of about four to six inches from auger flighting to floor.

“D” indicates the slope or angle of grain inside the bag. Materials that flow easily will form a shallow slope Fig. 41 -, whilst those that do not will tend to form a steeper slope - Fig. 42 - that in extreme cases will flow only with great difficulty and could keep the augers uncovered and visible (or partially visible) while the machine is working, instead of fully covered with grain which constitutes the most desirable situation. Free flowing grain will typically cover the augers with a foot thick layer of grain. In relation to this, it is very important to remember that quick starting the augers deeply immersed in grain will most likely result in shear bolts that snap or transmission breakages. When labor is interrupted, PTO must not be restarted when augers are deep inside grain. The correct procedure is to unwind a certain length of plastic by hydraulically turning the roller in reverse and then advancing forward with tractor and unloader the distance it takes to extricate the augers from the mass of grain. When reinitiating work, augers should not be thrust into the grain by the tractor, but should be pulled into the mass of grain by roller action.



The main rule when dealing with difficult, hard flowing grain is to ***slow down the operation***. This means lessening the volume of incoming grain, which in turn means ***slowing down the roller's revolutions per minute***.

Let us present a practical example applying some of the parameters mentioned above by analyzing an extraction of “difficult” grain in detail. Most of these indications are applicable grains in general, but grain that flows with difficulty better exemplifies the precautions that should be taken. Once the operator becomes knowledgeable about how the unloader handles different types of grain, using the correct approach becomes a matter of routine. The intention is not to impose a rigid set of rules, but to provide general guidelines that the operator can follow while he familiarizes himself with the machine.

If we consider a bag filled with grain that will not flow easily, in a situation such as depicted in Fig. 42, the grain forms a compact mass that the sweep augers can only penetrate with difficulty. The augers will move less quantity of grain per unit of time compared with free flowing material.

A) First adjust “C” so that sweeper distance to the ground is the minimum possible. This allows the augers to tackle the mass of grain from a lower point, so that more grain can accumulate above them and form a steeper angle “D”. This will cause the wall of grain to tumble down more readily and better feed the augers. Remember that minimum is a relative term and can very well mean 4 or 6 inches or more from the floor, to compensate for the unloader lurching into a hole or depression and causing the augers to thump on the ground and rip the plastic. Therefore, sweeper clearance “C” will tend to increase with ground bumpiness.

B) When backing up the tractor into the bag, the unloader must never be rammed forcefully against the grain as this can damage the sweeper augers or even bend the beam that supports them. The unloader should be introduced with prudence in the bag and the augers should not penetrate the mass of grain, but make light contact with it. See warning (above in “D” section) about not initiating work with augers surrounded by grain.

C) The PTO should always work within its normal 500/540 rpm range, not slower. Whatever grain characteristics are, PTO revs are not reduced and augers work at a uniform speed.

D) Once the bag has been hooked to the roller and the augers are moving, the operator should begin to haul in the bag by gradually turning open the hydraulic flow control valve (with the roller control lever in its upper position).

E) Grain will start coming out of the discharge auger and simultaneously it will start building up inside the bag to form shape “B” with a certain gradient “D”. The operator should allow a buildup of grain that will probably take a few minutes to reach point “A”.

F) If level of grain inside bag goes too high the roller must be slowed down to allow more grain to be removed by the sweeper and discharge augers. Grain picked up and rolled as one with the plastic sheet is the telltale sign that should be watched out for. The roller extremes where the plastic folds converge on the centering discs is where grain is more likely to collect. If grain is being picked up then roller speed has to be reduced. If the roller picks up too much grain resulting in prominent and growing bulges under the plastic, it will be necessary to stop operation, cut the bag, remove plastic sheet from roller, and reinitiate operation.

G) If grain height reaches point “A”, where a substantial amount of grain is being unloaded with none being picked up by the roller, then roller speed should be stabilized there. Usually point “A” is the highest point that the grain can reach without being pulled in with the plastic folds, but the actual clearance to the roller measured in centimeters can vary. When this plateau is reached, the roller is turning at the correct speed.

H) This is the point of equilibrium where inflow and outflow of grain are equal. The amount of grain that can be handled has reached its peak. Increasing discharge speed should not be attempted at this stage since no benefit in terms of time or volume will be obtained and failure of mechanical parts is a possibility.

I) If in doubt, first always try working slower before increasing speed in a gradual manner.

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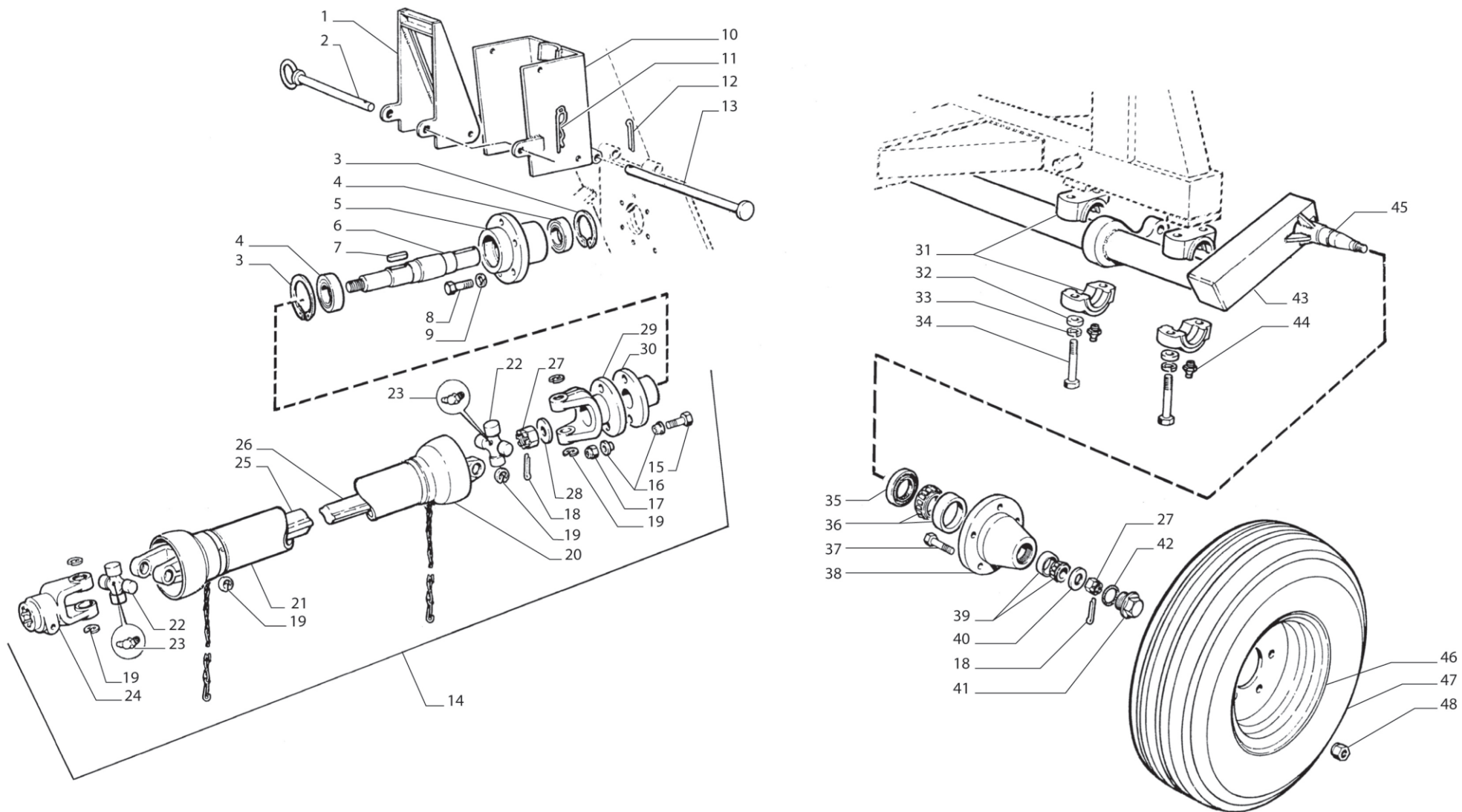


Diagram 1
PTO driveline & wheels

Diagram 1 - PTO driveline & wheels

N°	DESCRIPTION	CODE	QTY.
1	Cover guard, lower drive assy.	EX-18070C	1
2	Lock pin, cover guard drive assy.	EX-18070A	1
3	Snap ring DIN 472 75/I	MP0846	2
4	Ball bearing 6009 2RS	MP0124	2
5	Drive shaft housing	EX9-223	1
6	Drive shaft, short	EX-18020	1
7	Square key 10x10x40 (mm.)	EX-18121	1
8	Hex bolt gr. 5 BSW 1/2" x 1 3/4"	MP2066	6
9	Split lock washer 1/2"	MP1504	6
10	Cover guard, upper drive assy.	EX-18070D	1
11	R-clip 2,5 x 50 (mm.)	MP1070	1
12	Split pin 2,5 x 30 (mm.)	MP1008	1
13	Hinge pin, cover guard drive assy.	EX-18070B	1
14	Drive shaft assy., 6 spline, yoke U-joint 30.2 x 92 (mm.)	MP0507	1
15	Shear bolt grade 2 steel 1/4" x 1 3/4"	MP1907	2
16	Bushing 1/4" ID, shear bolt	A-818-83	4
17	Self locking nut BSW 1/4"	MP1329	2
18	Split pin 3 x 40 (mm.)	MP1018	2
19	Snap ring CF-604	MP0545	8
20	Plastic shield, inner	MP0536	1
21	Plastic shield, outer	MP0538	1
22	U-joint K-518 (92 mm.x 30,2mm. cap dia.)	MP0544	2
23	Grease zerk, 45° angle SAE 1/4"	MP1456	2
24	Splined yoke x 35 mm	MP0520	1
25	Female half shaft w/yoke x 800 mm	MP0571	1

N°	DESCRIPTION	CODE	QTY.
26	Male half shaft w/yoke x 800 mm	MP0567	1
27	Castle nut UNF 3/4"	MP1320	2
28	Flat washer 3/16" OD 38 / ID 20 (mm.)	AR-483820	1
29	Flanged yoke K-518	MP0524	1
30	Shear bolt flange	A-815-83	1
31	Bearing cap, wheel axle	EX-18013A	3
32	Flat washer 3/16" OD 35 / ID 20 (mm.)	AR-483520	6
33	Split lock washer 3/4"	MP1507	6
34	Hex bolt SAE 3/4" x 5"	MP2158	6
35	Oil seal 48 x 82 x 8 (mm.)	MP2935	2
36	Taper roller bearing 30208	MP0196	2
37	Hex bolt gr. 5 SAE 1/2" x 1 1/2"	MP2133	12
38	Wheel hub	EX-18009	2
39	Taper roller bearing 30205	MP0193	2
40	Flat washer 3/16" OD 36 / ID 20 (mm.)	AR-483520	2
41	Hub cap	EGH96-001R	2
42	O-ring seal 52,07 x 57,31 x 2,62 (mm.)	MP2975	2
43	Main wheel axle assy.	EX-18012C	1
44	Grease zerk, straight GAS 1/8"	MP1451	3
45	Axle spindle	EX-18011	2
46	Tire rim 15"	MP1821	2
47	Tire 11L-15 10 ply	MP1849	2
48	Lug nut 1/2" UNF	MP1361	12

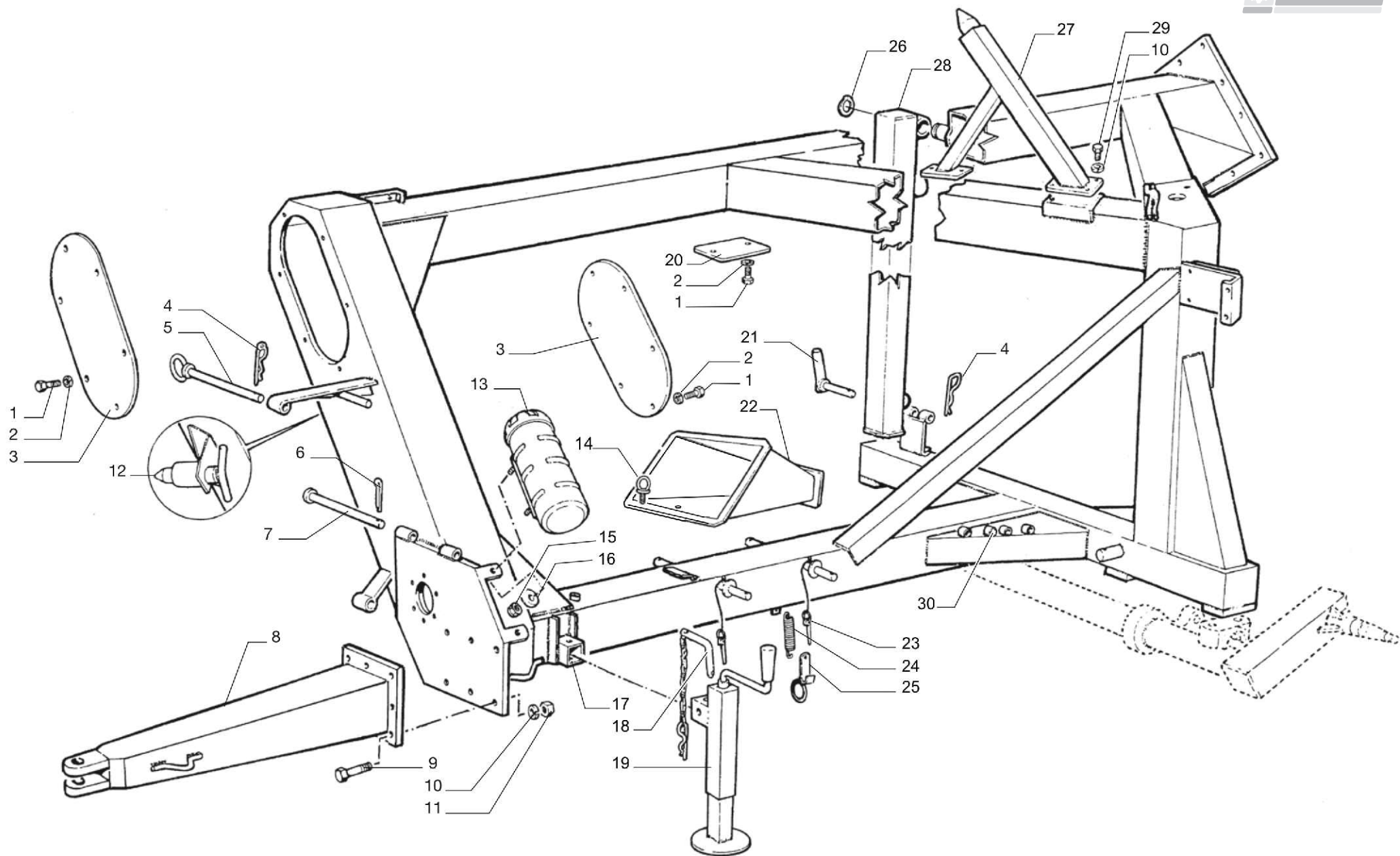


Diagram 2
Frame

Diagram 2 - Frame

N°	DESCRIPTION	CODE	QTY.
1	Hex bolt gr. 5 BSW 1/4" x 5/8"	MP2043	16
2	Tooth lock washer 1/4" x 15 mm.	MP1582	16
3	Cover plate, chain 1"	EX-18085B	2
4	R-clip 2,5 x 50 (mm.)	MP1070	2
5	Lock pin, cover guard drive assy.	EX-18070A	1
6	Split pin 2,5 x 30 (mm.)	MP1008	1
7	Hinge pin, cover guard drive assy.	EX-18070B	1
8	Drawbar w/ clevis hitch	EX-18109	1
9	Hex bolt gr. 5 BSW 1/2" x 1 1/2"	MP2065	6
10	Split lock washer 1/2"	MP1504	10
11	Hex nut gr. 5 BSW 1/2"	MP1334	6
12	Spring loaded lock pin	EX-18003	1
13	User's manual canister	MP3546	1
14	Wing bolt 3/8"	EGH96-236	1
15	Self locking nut BSW 3/8"	MP1314	2
16	Flat washer galvanized 3/8"	MP1517	2
17	Square socket, screw jack	V-0001	1
18	Hitch pin w/ R-clip, screw jack	EGH96-004	1
19	Screw jack	MP3084	1
20	Cover plate, frame beam	EX-18085D	2
21	Lock pin, roller support pillar	EX-18010A	1
22	Auxiliary bin	MP3549	1
23	R-clip w/ ring	MP3209	4

N°	DESCRIPTION	CODE	QTY.
24	Extension spring 2 x 15 x 100 (mm.)	MP2838	4
25	Latch, protection grids	EX-18117	4
26	Snap ring DIN 471 35/A	MP0812	1
27	Support bracket, discharge auger	EX-18113	1
28	Supporting pillar, roller assy.	EX-18010	1
29	Hex bolt gr. 5 BSW 1/2" x 1"	MP2063	4
30	Support bracket, grid extension	EX-24001	4



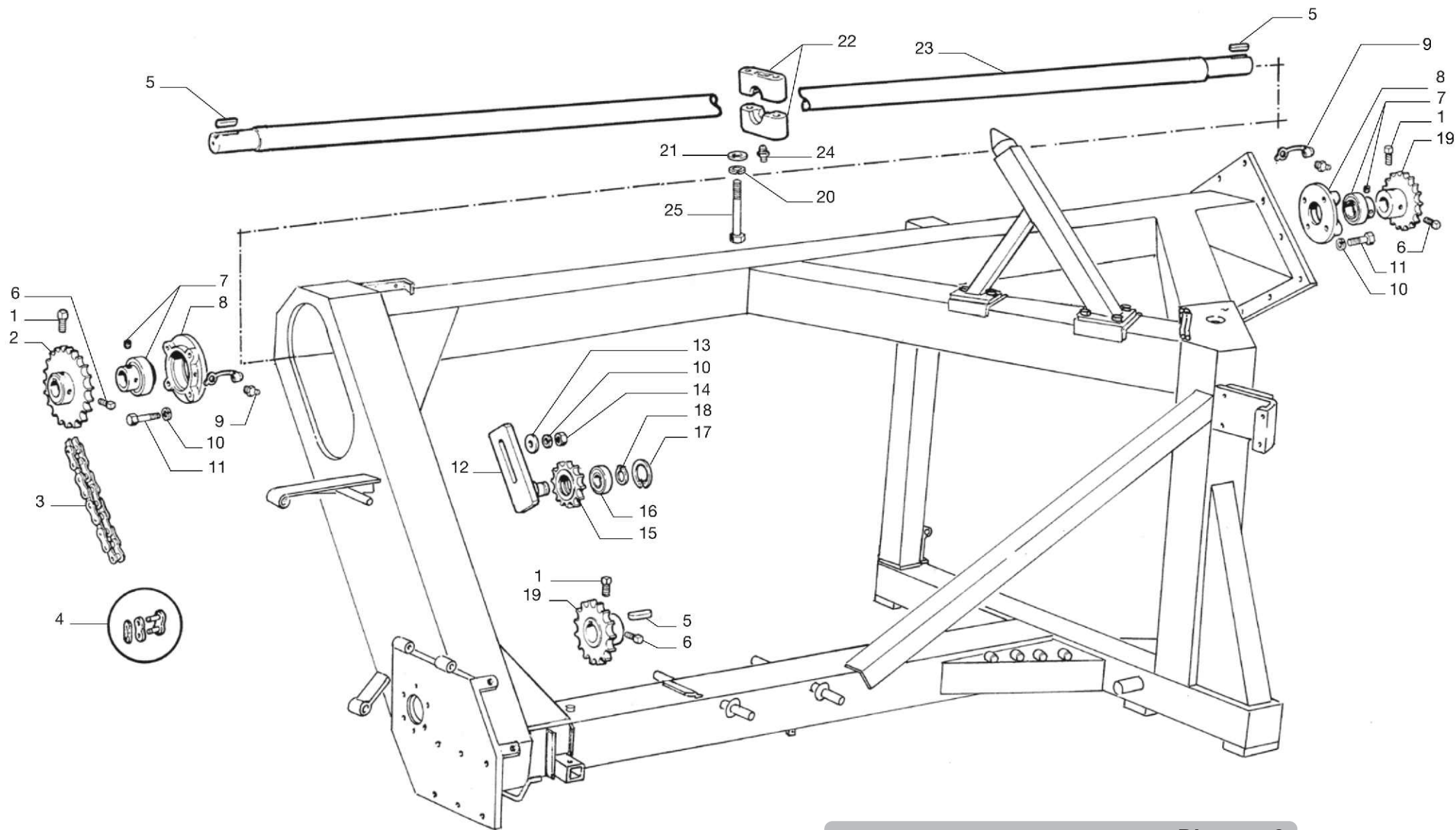


Diagram 3
Front end driveline & main drive shaft

Diagram 3 - Front end driveline & main drive shaft

N°	DESCRIPTION	CODE	QTY.
1	Square head set screw 3/8" x 1/2"	MP1415	3
2	Sprocket 22 tooth f/ASA 80/1 chain	EX-18024	1
3	Roller chain ASA 80/1	EX-18138	1
4	Connecting link, ASA 80 roller chain	MP1263	1
5	Square key 10x10x50 (mm.)	EX-18120	3
6	Square head set screw 3/8" x 3/4"	MP1417	3
7	Insert bearing UC 208	MP0235	2
8	Bearing housing FC 208	MP0244	2
9	Grease zerk, straight SAE 1/4"	MP1452	2
10	Split lock washer 1/2"	MP1504	9
11	Hex bolt gr. 5 BSW 1/2" x 2"	MP2067	8
12	Idler arm, front	EX-18081	1
13	Flat washer galvanized 1/2"	MP1519	1
14	Hex nut gr. 5 BSW 1/2"	MP1334	1
15	Idler sprocket 12 tooth f/ASA 80/1 chain	EX-18023	1
16	Ball bearing 6205 2RS	MP0151	1
17	Snap ring DIN 472 52/l	MP0841	1
18	Snap ring DIN 471 25/A	MP0807	1
19	Sprocket 17 tooth f/ASA 80/1 chain	EX-18021	2
20	Split lock washer 3/8"	MP1502	4
21	Flat washer galvanized 3/8"	MP1517	4
22	Bearing cap, drive shaft	MP4321	2
23	Long drive shaft	EX-18026C	1
24	Grease zerk, straight SAE 1/8"	MP1451	2
25	Hex bolt gr. 5 BSW 3/8" x 5"	MP2062	4



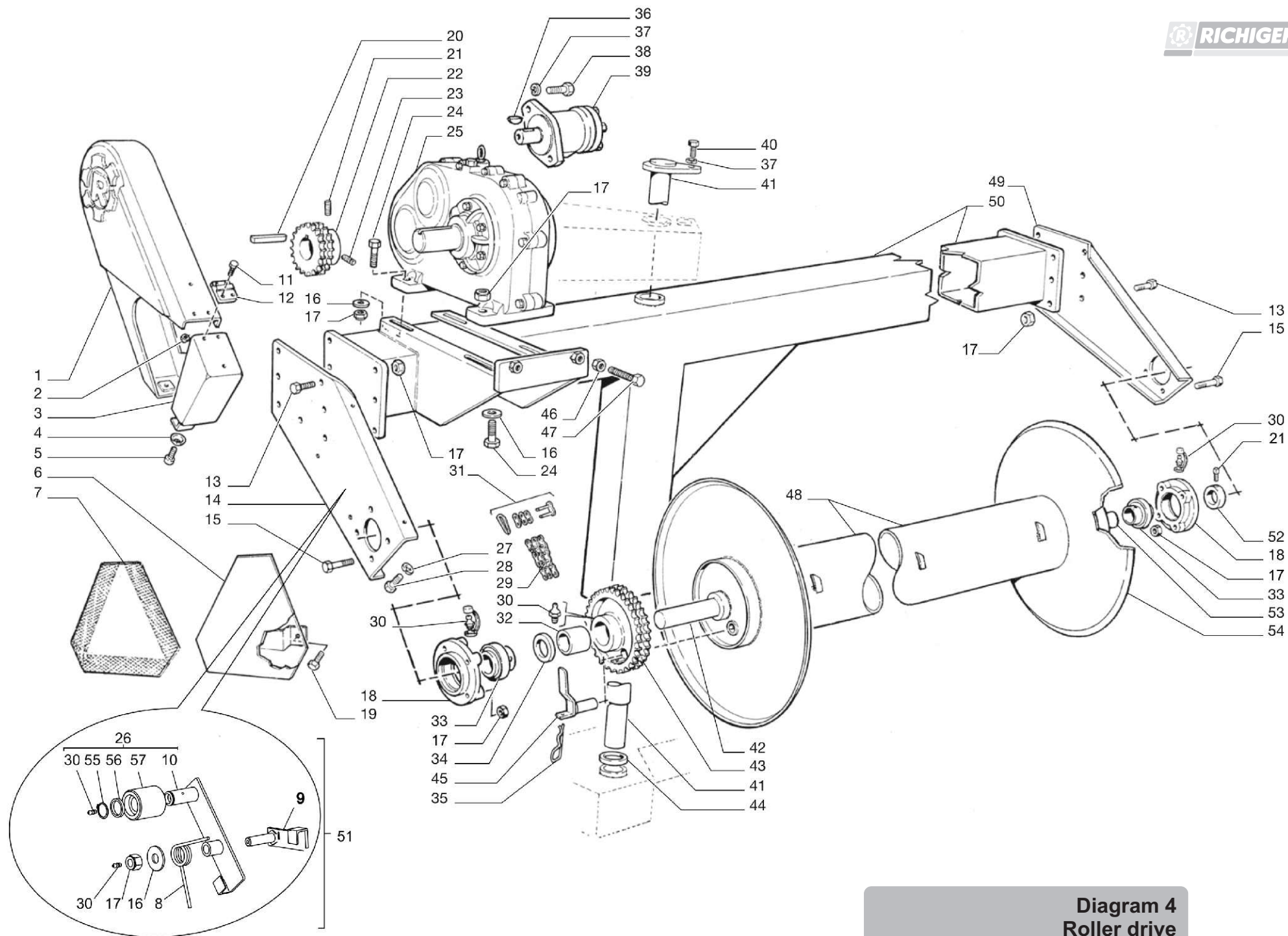


Diagram 4
Roller drive

Diagram 4 - Roller drive

N°	DESCRIPTION	CODE	QTY.
1	Chain cover	MP3548	1
2	Self locking nut BSW 1/4"	MP1329	4
3	Chain cover, front section	V-0050	1
4	Conical washer, plastic	V-0051	1
5	Socket head cap screw 1/4" x 1 1/4"	MP4007	1
6	Backplate, reflective triangle	EX-20031	1
7	SMV warning triangle	Triangulo	1
8	Torsion spring 5 x 29 x 39 (mm.)	MP2851	1
9	Spindle, idler arm	EX-280R052	1
10	Idler arm, roller chain	EX-280R053	1
11	Socket flat head screw 1/4" x 1"	V-0053	4
12	Plastic hinge	V-0054	1
13	Hex bolt gr. 5 BSW 5/8" x 1 1/2"	MP2075	14
14	Mounting bracket, roller drive	EX-280060	1
15	Hex bolt gr. 5 BSW 5/8" x 2 1/4"	MP2078	8
16	Flat washer galvanized 5/8"	MP1521	4
17	Self locking nut BSW 5/8"	MP1342	27
18	Bearing housing FC 210	MP0348	2
19	Hex bolt gr. 5 BSW 5/16" x 7/8"	MP2061	2
20	Square key 10x10x60 (mm.)	EX-20021	1
21	Square head set screw 3/8" x 1/2"	MP1415	2
22	Double sprocket 19 teeth, ASA 60/2 chain	EX-20022	1
23	Square head set screw 3/8" x 3/4"	MP1417	1
24	Hex bolt gr. 5 BSW 5/8" x 2 1/2"	MP2079	4
25	Gearbox, roller	MP3787	1
26	Idler arm assy., roller chain	EX-280R054	1
27	Split lock washer 1/4"	MP1500	2
28	Hex bolt gr. 5 BSW 1/4" x 1"	MP2060	2
29	Roller chain ASA 60/2	EX-20033	1

N°	DESCRIPTION	CODE	QTY.
30	Grease zerk, straight SAE 1/4"	MP1452	5
31	Connecting link, ASA 60/2 roller chain	MP1270	1
32	Bushing, double sprocket 38 teeth	EX-20023	1
33	Insert bearing UC 210	MP0237	2
34	Spacer bushing	EX-20019	1
35	R-clip 2,5 x 50 (mm.)	MP1070	1
36	Woodruff key 1/4" x 25 x 11 (mm.)	V-0048	1
37	Split lock washer 1/2"	MP1504	3
38	Hex bolt gr. 5 BSW 1/2" x 1 1/2"	MP2065	2
39	Sauer Danfoss orbital motor, 50 cc displacement	MP4575	1
40	Hex bolt gr. 5 BSW 1/2" x 1"	MP2063	1
41	Pivot pin, roller assy.	EX-18078	1
42	Drive spindle, roller	EX-20008	1
43	Double sprocket 38 teeth, ASA 60/2 chain	EX-20027	1
44	Washer, pivot pin	EX-18016	1
45	Lock pin, roller	EX-20026	1
46	Hex nut gr. 5 BSW 1/2"	MP1334	2
47	Tightener, gearbox	EX-18071	2
48	Roller w/end spindles	EX-24005	1
49	Mounting bracket, roller	EX-280061	1
50	Pivoting beam, roller assy.	EX-24002	1
51	Complete idler assy., roller chain	EX-280R055	1
52	End cap, spindle	EX-20018	1
53	Spindle, roller	EX-20009	1
54	Centering disc, roller	EX-280089	2
55	Snap ring DIN 471 25/A	MP0807	1
56	Centering ring, idler pulley	EX-280087	1
57	Idler pulley, roller chain	EX-280088	1

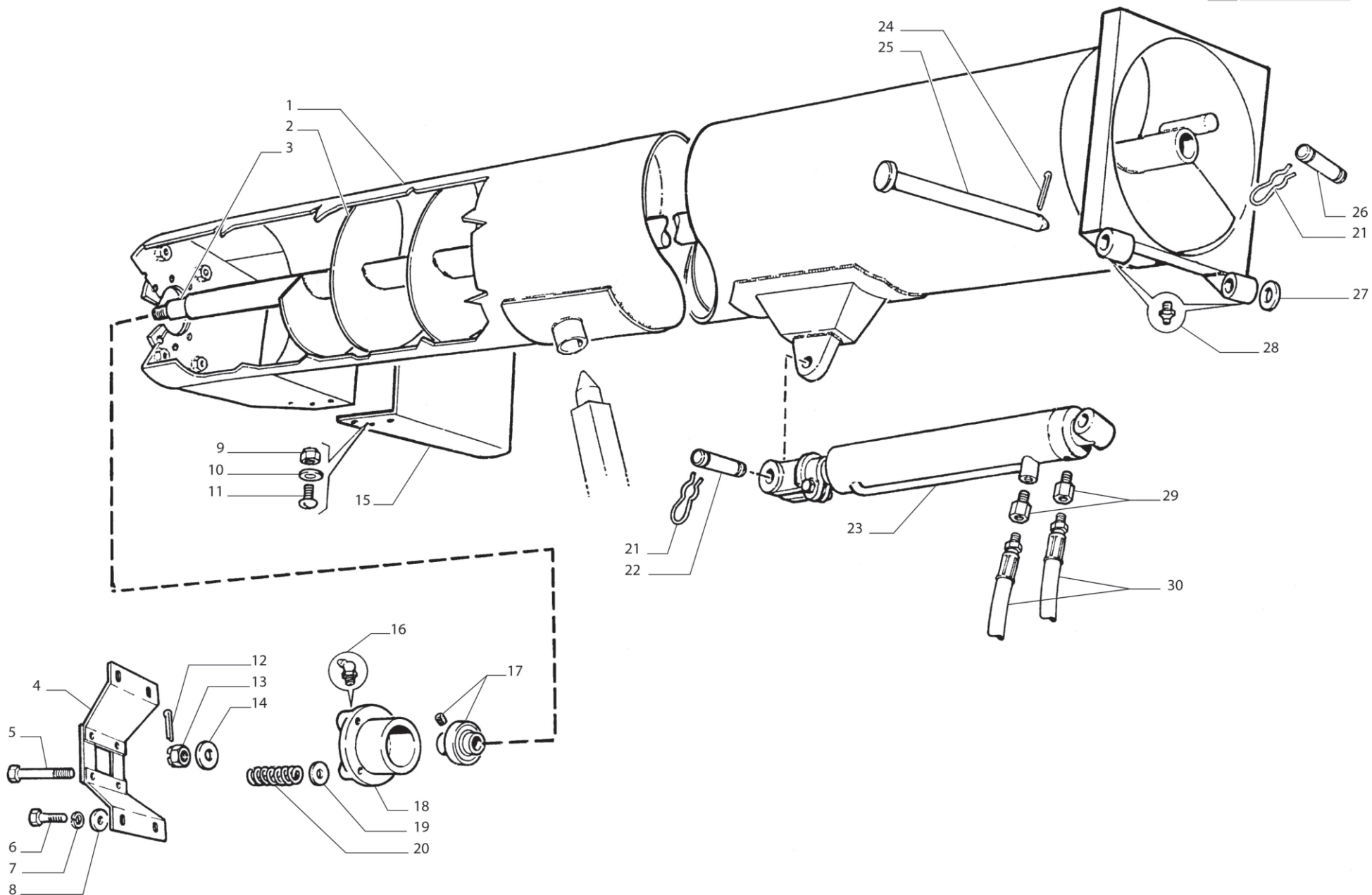


Diagram 5
Discharge auger, upper section

Diagram 5 - Discharge auger, upper section

N°	DESCRIPTION	CODE	QTY.
1	Outer tube, upper section	EX-18031	1
2	Discharge auger w/end stubs, upper section	EX-18048	1
3	End stub, upper auger shaft	EX-18041	1
4	Bracket, bearing housing	EX-18031A	1
5	Hex bolt gr. 5 BSW 1/2" x 6" w/40 mm thread	MP1985	4
6	Hex bolt gr. 5 BSW 3/8" x 1"	MP2046	4
7	Split lock washer 3/8"	MP1502	4
8	Flat washer galvanized 3/8"	MP1517	4
9	Self locking nut BSW 3/8"	MP1314	6
10	Flat washer galvanized 3/8"	MP1517	6
11	Trusshead screw BSW galvanized 3/8" x 3/4"	MP1682	6
12	Split pin 3 x 40 (mm.)	MP1018	1
13	Castle nut UNF 3/4"	MP1320	1
14	Flat washer 3/16" OD 36 / ID 20 (mm.)	AR-483620	1
15	Extension	EX-18038	1
16	Grease zerk, straight SAE 1/4"	MP1452	1
17	Insert bearing UC-207 2L	MP0246	1
18	Bearing housing UC 207	EX-18090	1
19	Flat washer galvanized 1/2"	MP1519	4
20	Compression spring 3 x 26 x 120 (mm.)	MP2825	4
21	Hair Pin clip 4,5 x 90 (mm.)	MP1094	2
22	Clevis pin 25 x 94,5 mm., hydraulic cylinder	V-0055	1
23	Hydraulic cylinder 1 1/4" rod diameter x 2 1/2" sleeve bore x 500 mm. stroke	MP4567	1
24	Split pin 5 x 60 (mm.)	MP1064	1
25	Hinge pin, auger tube	A-83583	1

N°	DESCRIPTION	CODE	QTY.
26	Clevis pin 25 x 108 mm., hydraulic cylinder	V-0056	1
27	Flat washer 3/16" OD 50 / ID 30 (mm.)	AR-485030	1
28	Grease zerk, straight SAE 1/8"	MP1451	2
29	Adapter, 3/8" female NPT to 3/8" male NPT	MP4558	2
30	Hydraulic hose 1/4" SAE 100R2 AT x 1100 mm., connectors 9/16" male UNF JIC 37° x 3/8" male NPT	V-0030	2

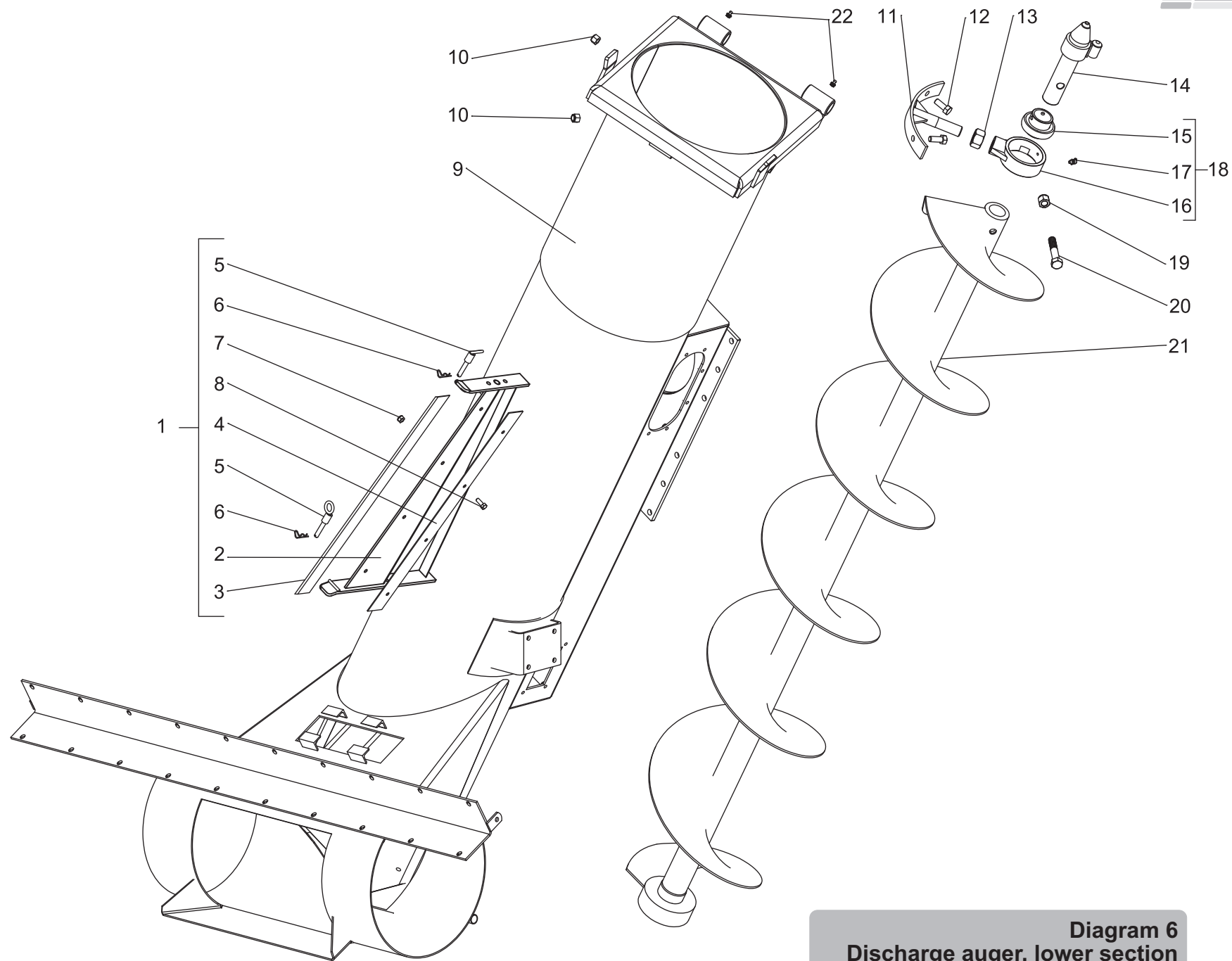


Diagram 6
Discharge auger, lower section

Diagram 6 - Discharge auger, lower section

N°	DESCRIPTION	CODE	QTY.
1	Complete cutter blade assy.	EX-24017	1
2	Holding bracket, cutter blade	EX-24016	1
3	Cutter blade, 600 x 50 x 1.5 (mm.)	MP3791	1
4	Fastening bracket, cutter blade	EX-24012	1
5	Lock pin, cutter blade	EX-18122	2
6	R-clip 2 x 40 (mm.)	MP1078	2
7	Self locking nut BSW 5/16"	MP1315	4
8	Hex bolt gr. 5 BSW 5/16" x 7/8"	MP2061	4
9	Discharge tube, lower section	EX-280R059	1
10	Self locking nut BSW 1/2"	MP1317	2
11	Support bracket, bearing housing	EX-18065	1
12	Hex bolt gr. 5 BSW 1/2" x 1 1/4"	MP2042	2
13	Hex nut gr. 5 BSW 1"	MP1339	1
14	Coupling, auger lower section	EX-18111	1
15	Insert bearing UC-208 3L	MP0248	1
16	Bearing housing UC-208 3L	EX-18065A	1
17	Grease zerk, 45° angle SAE 1/4"	MP1456	1
18	Complete UC-208 bearing & bracket assy.	EX-18373	1
19	Self locking nut BSW 5/8"	MP1342	1
20	Hex bolt gr. 5 BSW 5/8" x 3 1/4"	MP2082	1
21	Discharge auger, lower section	EX-18372	1
22	Grease zerk, straight SAE 1/8"	MP1451	2



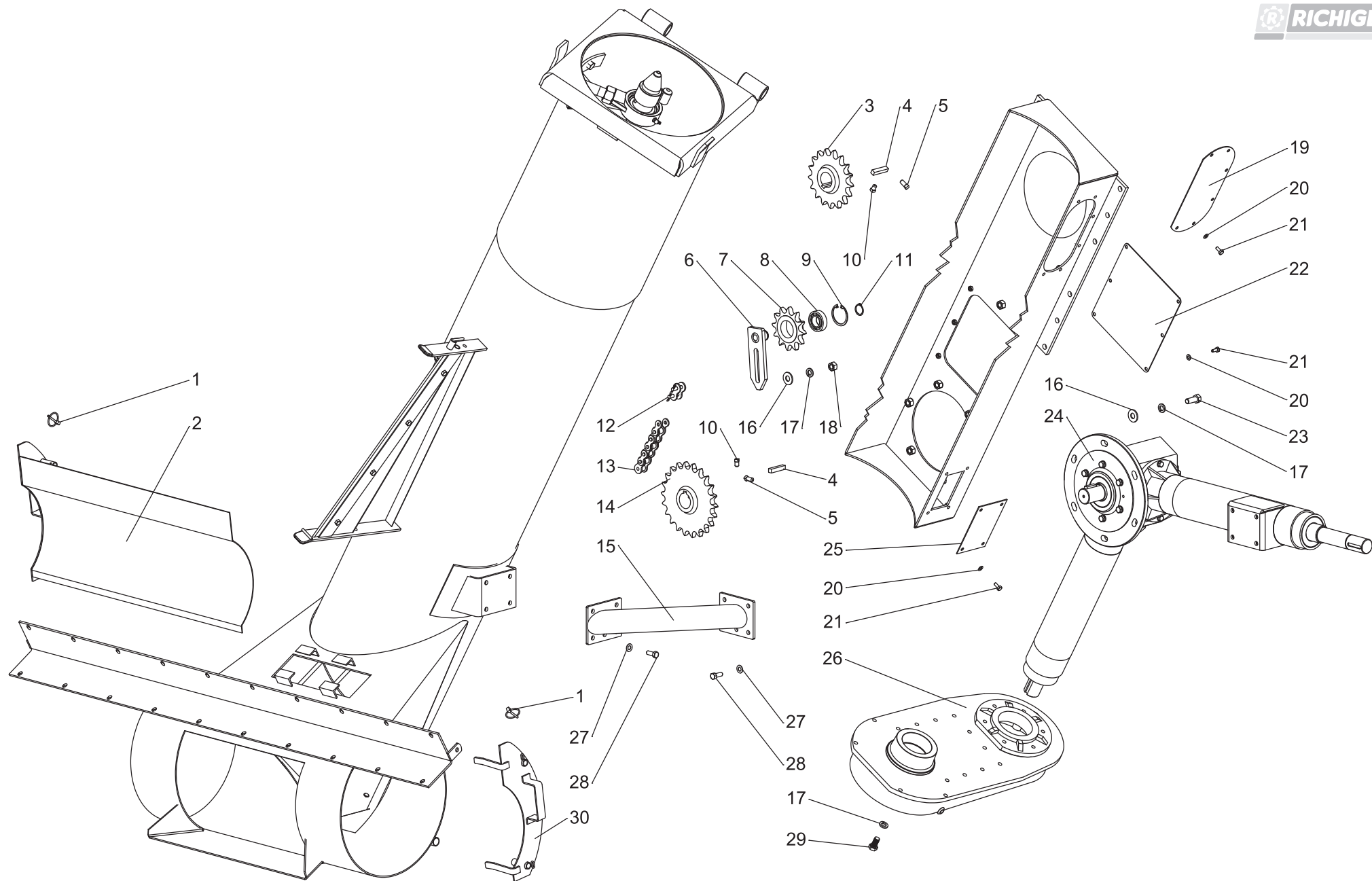


Diagram 7
Rear end driveline

Diagram 7 - Rear end driveline

N°	DESCRIPTION	CODE	QTY.
1	R-clip w/ ring	MP3209	2
2	Left side cover, slide plate	EX-280R008	1
3	Sprocket 17 tooth f/ASA 80/1 chain	EX-18021	1
4	Square key 10x10x50 (mm.)	EX-18120	2
5	Square head set screw 3/8" x 3/4"	MP1417	2
6	Idler arm, rear	EX-18082	1
7	Idler sprocket 12 tooth f/ASA 80/1 chain	EX-18023	1
8	Ball bearing 6205 2RS	MP0151	1
9	Snap ring DIN 472 52/I	MP0841	1
10	Square head set screw 3/8" x 1/2"	MP1415	1
11	Snap ring DIN 471 25/A	MP0807	1
12	Connecting link, ASA 80 roller chain	MP1263	1
13	Roller chain ASA 80/1	EX-280R028	1
14	Sprocket 22 tooth f/ASA 80/1 chain	EX-18024	1
15	Bracket, driveshaft casing	EX-280R013	1
16	Flat washer galvanized 1/2"	MP1519	7
17	Split lock washer 1/2"	MP1504	11
18	Hex nut gr. 5 BSW 1/2"	MP1334	1
19	Cover plate chain 1", side	EX-18085A	1
20	Disc springs 14x7,2x0,8 (mm.)	MP1582	16

N°	DESCRIPTION	CODE	QTY.
21	Hex bolt gr. 5 BSW 1/4" x 5/8"	MP2043	16
22	Large cover plate, discharge tube	EX-280024	1
23	Hex bolt gr. 5 BSW 1/2" x 1 1/4"	MP2042	6
24	Gearbox, single input/double output	MP4329	1
25	Small cover plate, discharge tube	R10-190	1
26	Chain drive aasy., discharge auger	MP3704-B	1
27	Disc springs 20x10,2x1,1 (mm.)	MP1583	8
28	Hex bolt gr. 5 BSW 3/8" x 1"	MP2046	8
29	Hex bolt gr. 5 BSW 1/2" x 1"	MP2063	4
30	Right side cover, slide plate	EX-280R009	1



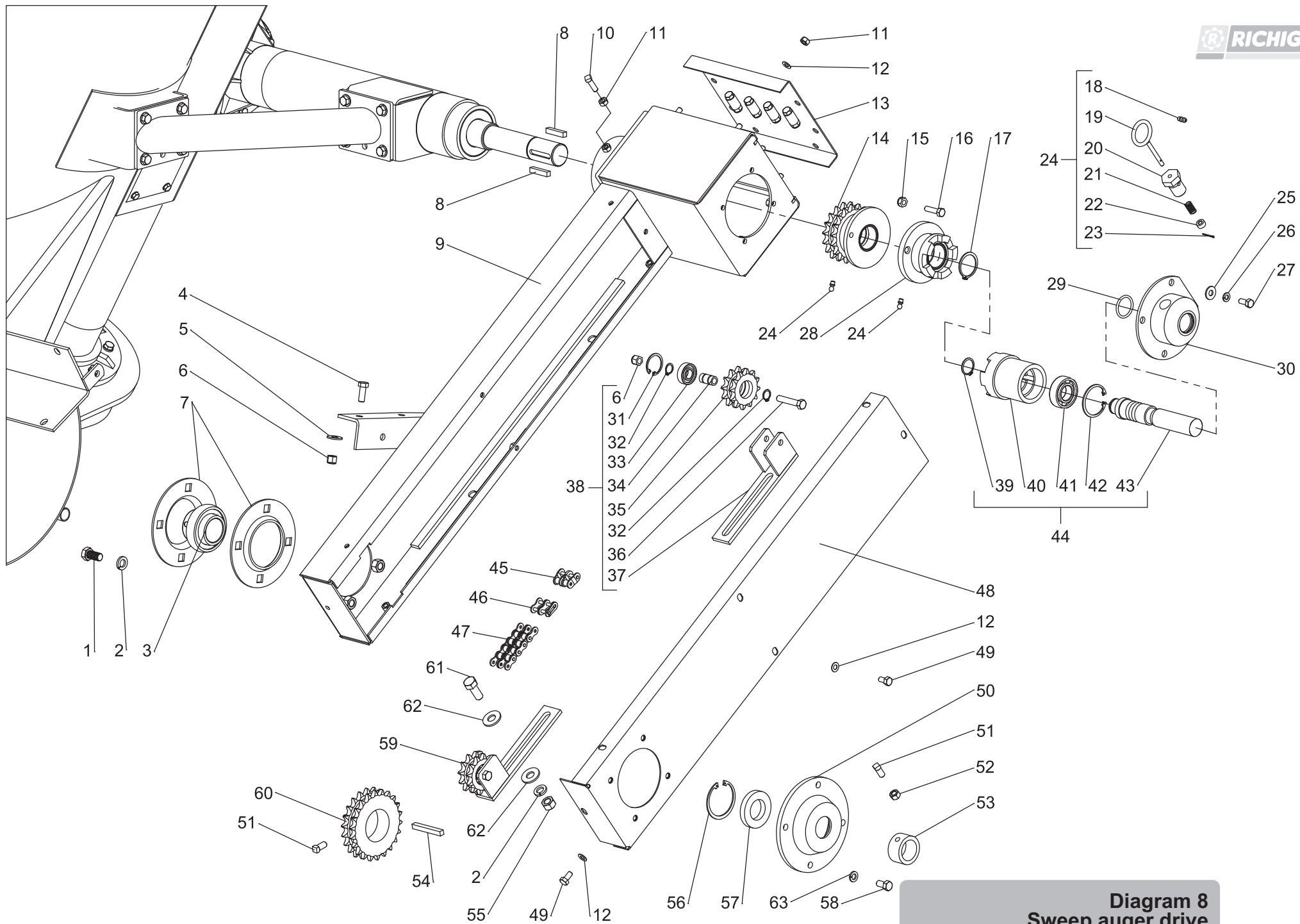


Diagram 8
Sweep auger drive

Diagram 8 - Sweep auger drive

Nº	DESCRIPTION	CODE	QTY.
1	Hex bolt gr. 5 BSW 1/2" x 1"	MP2063	6
2	Split lock washer 1/2"	MP1504	4
3	Insert bearing UC-208 3L	MP0248	1
4	Hex bolt gr. 5 BSW 3/8" x 1"	MP2046	3
5	Flat washer galvanized 3/8"	MP1517	3
6	Self locking nut BSW 3/8"	MP1314	5
7	Bearing housing PF 208	MP0349	1
8	Square key 8x8x40 (mm.)	EX-280058	2
9	Housing, sweep auger drive	EX-280R060	1
10	Square head set screw 5/16" x 1"	MP1412	2
11	Hex nut gr. 5 BSW 5/16"	MP1331	10
12	Disc springs 16x8,2x0,9 (mm.)	MP1581	16
13	Cover, gearcase	EX-280R004	1
14	Double gear 18 teeth w/ bronze bushing	EX-280R002	1
15	Self locking nut BSW 5/16"	MP1315	1
16	Hex bolt gr. 5 BSW 5/16" x 1 1/4"	MP2041	1
17	Snap ring DIN 471 38/A	MP0813	1
18	Grease zerk, straight SAE 1/4"	MP1452	3
19	Lock pin, sweep augers	EX-280R020	1
20	Bushing, lock pin	EX-280048	1
21	Spring, lock pin	MP2829	1
22	Bushing, small	EX-280069	1
23	Split pin 2 x 20 (mm.)	MP1000	1
24	Complete lock pin assy.	EX-280R026	1
25	Flat washer 5/16"	MP1516	4

Nº	DESCRIPTION	CODE	QTY.
26	Split lock washer 5/16"	MP1501	4
27	Hex bolt gr. 5 BSW 5/16" x 3/4"	MP2050	4
28	Gear coupling w/ bronze bushing, sweep augers	EX-280R003	1
29	O-ring seal 31,34 x 38,4 x 3,53 (mm.)	MP2965	1
30	Lock, gear coupling	EX-280R061	1
31	Snap ring DIN 471 35/I	MP0849	2
32	Snap ring DIN 471 15/A	MP0848	4
33	Ball bearing 6202 2RS	MP0145	2
34	Bushing, idler gear	EX-280011	2
35	Idler gear	EX-280010	2
36	Hex bolt gr. 5 BSW 3/8" x 2"	MP2051	2
37	Idler arm	EX-280R014	2
38	Idler arm, right side	EX-280R015D	1
39	Snap ring DIN 471 25/A	MP0807	
40	Gear coupling, sweep augers	EX-280003	1
41	Ball bearing 6205 2RS	MP0151	1
42	Snap ring DIN 472 52/I	MP0841	1
43	Handle, gear coupling	EX-280051	1
44	Complete gear coupling handle assy.	EX-280R022	1
45	Offset link ASA 50/2 roller chain	MP1300	1
46	Connecting link, ASA 50/2 roller chain	MP1274	1
47	Roller chain ASA 50/2	EX-280R025	1
48	Chain cover	EX-280R005	1
49	Hex bolt gr. 5 BSW 5/16" x 5/8"	MP2086	8
50	Flange bracket, oil seal	EX-280039	1

Diagram 8 - Sweep auger drive

N°	DESCRIPTION	CODE	QTY.
51	Square head set screw 3/8" x 3/4"	MP1417	2
52	Hex nut gr. 5 BSW 3/8"	MP1332	1
53	Outer ring, flange bracket	EX-280006	1
54	Square key 8x8x65 (mm.)	EX-280057	1
55	Hex nut gr. 5 BSW 1/2"	MP1334	2
56	Snap ring DIN 471 62/l	MP0821	1
57	Oil seal 35 x 62 x 10 (mm.)	MP2930	1
58	Hex bolt gr. 5 BSW 3/8" x 3/4"	MP2044	4
59	Idler arm, left side	EX-280R015l	1
60	Double gear 22 teeth, sweep augers	EX-280R000	1
61	Hex bolt gr. 5 BSW 1/2" x 1 1/4"	MP2042	2
62	Flat washer 1/2"	MP1519	4
63	Split lock washer 3/8"	MP1502	4



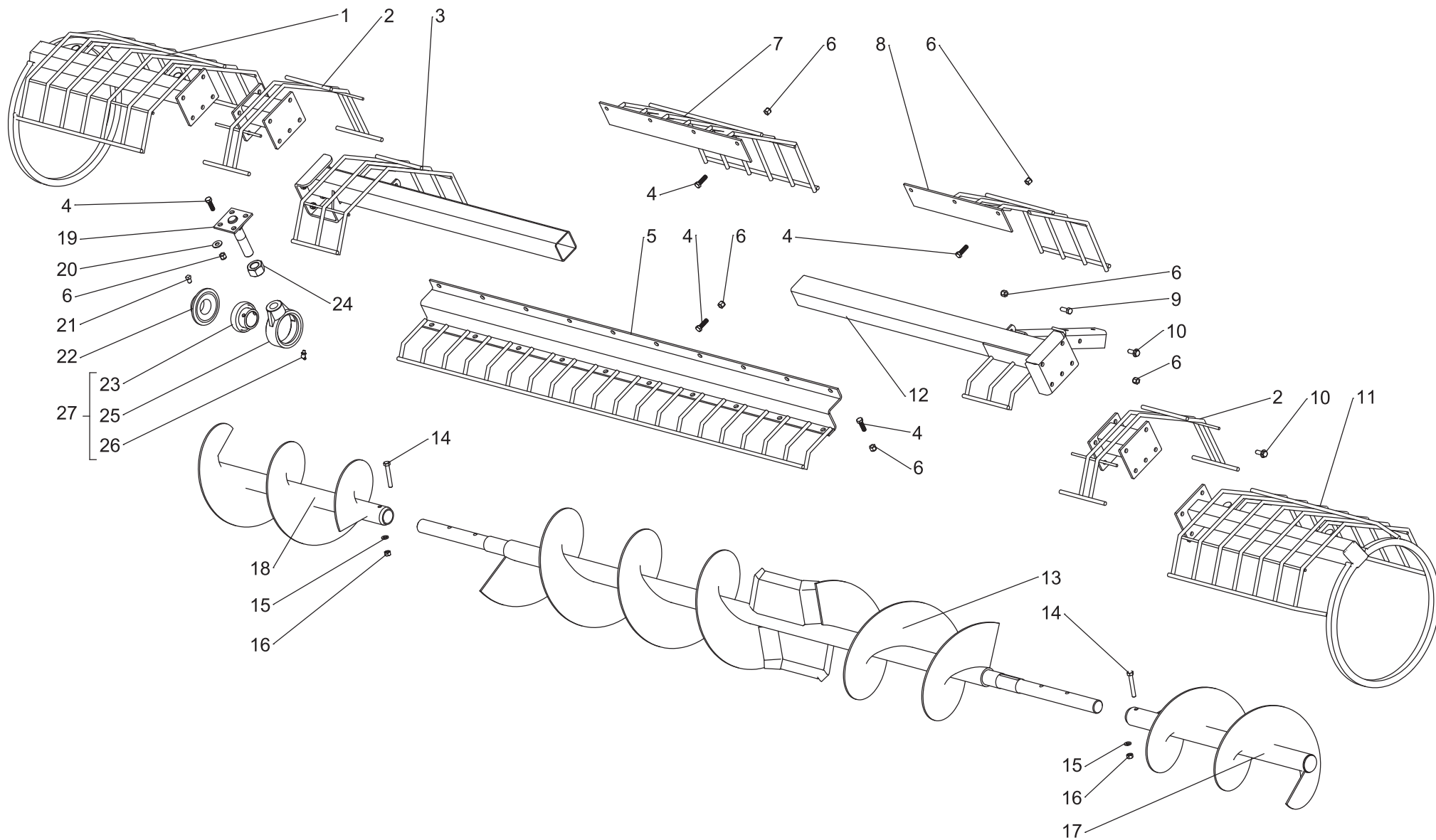


Diagram 9
Sweep augers

Diagram 9 - Sweep augers

N°	DESCRIPTION	CODE	QTY.
1	Protection grid, left end section	EX-18035I	1
2	Protection grid, supplementary section	EX-24007	2
3	Protection grid, left middle section	EX-280R032	1
4	Hex bolt gr. 5 BSW 3/8" x 1 1/4"	MP2047	24
5	Protection grid, center section	EX-280R038	1
6	Self locking nut BSW 3/8"	MP1314	34
7	Protection grid, left rear section	EX-280R037I	1
8	Protection grid, right rear section	EX-280R037D	1
9	Hex bolt gr. 5 BSW 3/8" x 1"	MP2046	3
10	Flange bolt gr. 5 BSW 3/8" x 1"	MP2193	10
11	Protection grid, right end section	EX-18035D	1
12	Protection grid, right middle section	EX-280R034	1
13	Sweep auger, center section	EX-280R010	1
14	Hex bolt BSW 3/8" x 2 1/2"	MP1943	2
15	Split lock washer 3/8"	MP1502	2
16	Hex nut gr. 5 BSW 3/8"	MP1332	2
17	Sweep auger, right end section	EX-24006D	1
18	Sweep auger, left end section	EX-24006I	1
19	Support bracket, bearing housing	EX-280R011	1
20	Flat washer galvanized 3/8"	MP1517	4
21	Square head set screw 3/8" x 1/2"	MP1415	1
22	Dust seal	EX-280025	1
23	Insert bearing UC-208 3L	MP0248	1
24	Hex nut gr. 5 BSW 1"	MP1339	1
25	Bearing housing UC-208 3L	EX-18065A	1
26	Grease zerk, 45° angle SAE 1/4"	MP1456	1
27	Complete UC-208 bearing & bracket assy.	EX-18373	1

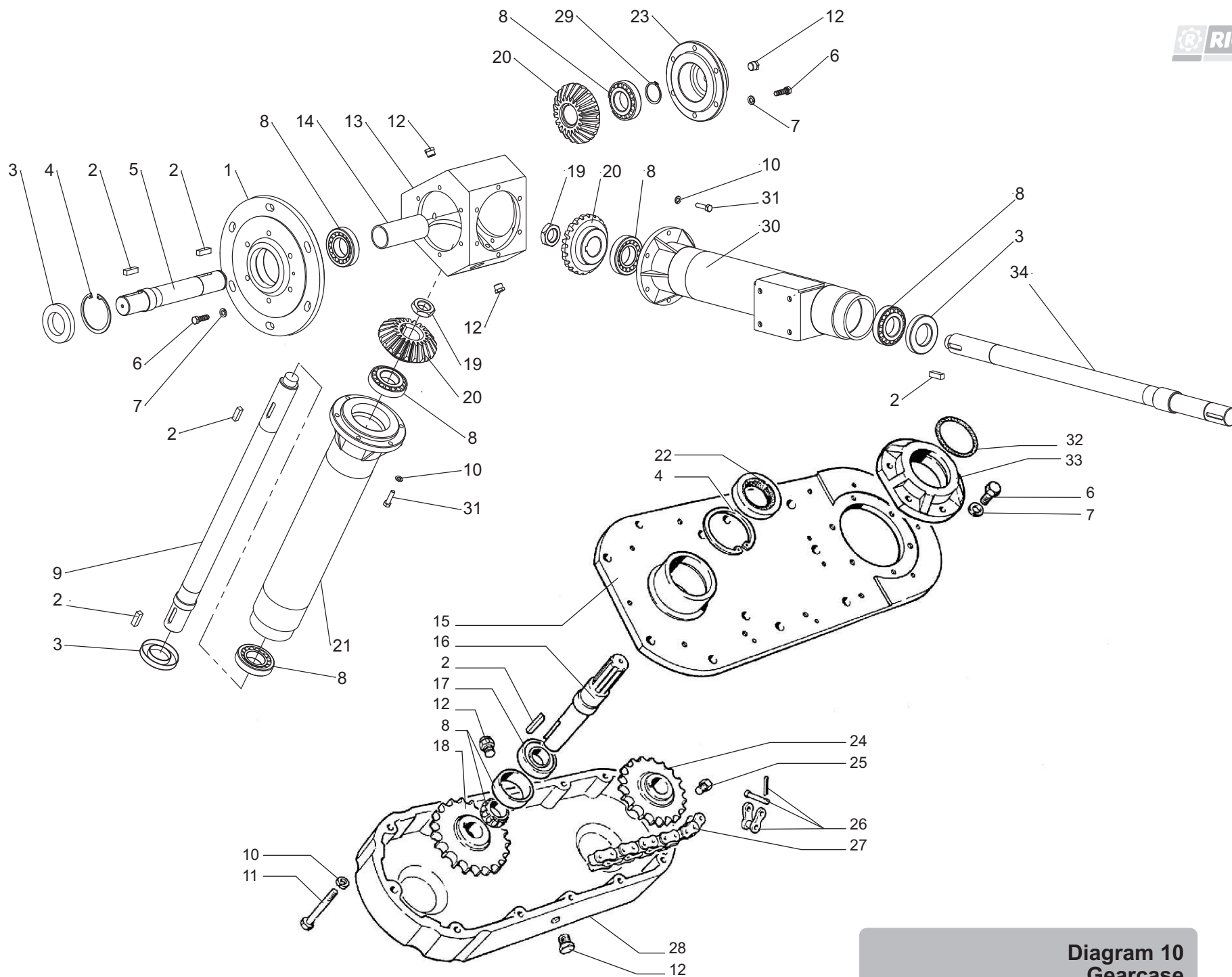


Diagram 10
Gearcase

Diagram 10 - Gearcase

N°	DESCRIPTION	CODE	QTY.
1	Plate flange, input shaft	EX-18091	1
2	Square key 5 x 10 (mm.)	MP3202	6
3	Oil seal 5367	MP2938	3
4	Snap ring DIN 472 80/l	MP0800	2
5	Input shaft	EX-18092A	1
6	Hex bolt BSW 3/8" x 1 1/4"	MP1938	18
7	Split lock washer 3/8"	MP1502	18
8	Taper roller bearing 30208	MP0196	7
9	Rear driveline	EX-280046	1
10	Split lock washer 5/16"	MP1501	16
11	Hex bolt gr. 5 BSW 5/16" x 3"	MP2059	4
12	Threaded plug 3/8" GAS	MP3717	4
13	Housing, gearbox	EX-18093A	1
14	Spacer bushing	EX-18094	1
15	Cover plate, chain drive	EX-18098	1
16	Splined shaft, chain drive	EX-18092D	1
17	Ball bearing 6208 2RS	MP0157	1
18	Driven sprocket 18 tooth f/ASA 80/1 chain	EX-18099B	1
19	Hex nut UNF 1 1/8"	MP1355	2
20	Conical gear 21 tooth	EX-18099A	3

N°	DESCRIPTION	CODE	QTY.
21	Housing, rear driveline	EX-280R012	1
22	Oil seal 6645	MP2939	1
23	Bearing housing 30208	EX-18096	1
24	Drive sprocket 18 tooth f/ASA 80/1 chain	EX-18099C	1
25	Threaded plug 1/4" GAS	MP3718	1
26	Connecting link, ASA 80 roller chain	MP1263	1
27	Roller chain ASA 80/1	MP1203	1
28	Casing, chain drive	EX-18093B	1
29	Snap ring DIN 471 40/A	MP0814	1
30	Housing, sweep auger drive shaft	EX-280R016	1
31	Hex bolt BSW 5/16" x 1 1/4"	MP1919	12
32	O-ring seal 91,67 x 98,73 x 3,53 (mm.)	MP2976	1
33	Base flange, cover plate	EX-18097	1
34	Drive shaft, sweep augers	EX-280021	1



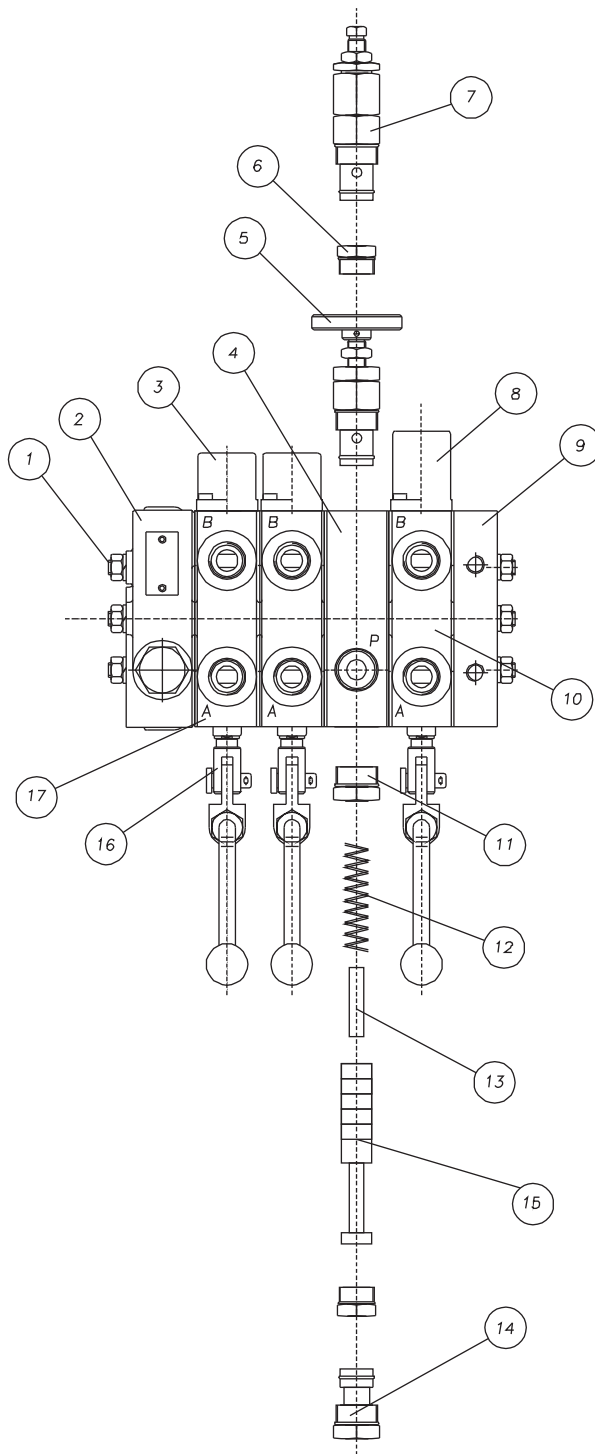
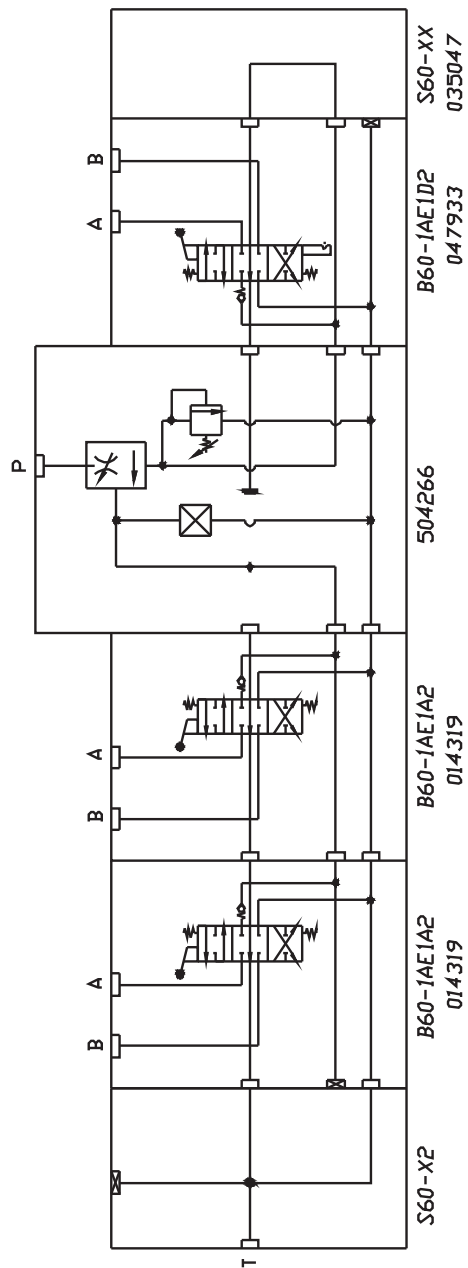


Diagram 11
Hydraulic controls

Diagram 11 - Hydraulic controls

N°	DESCRIPTION	CODE	QTY.
1	Tie-rod	11926	3
2	Outlet body	35047	1
3	Spring centered spool	11869	2
4	Inlet body w/ flow divider (includes items 5, 6, 7, 11, 12, 13, 14, 15)	504266	1
5	Flow control valve	503651	1
6	Plug, hollow	14224	2
7	Pressure relief valve	500391	1
8	Spring centered spool, 1 position detent	12791	1
9	Closure section	035047	1
10	Central body (includes items 8, 16)	47933	1
11	Plug, solid	12353	1
12	Spring, divider spool	02293	1
13	End section, divider spool	42964	1
14	Replacement plug SVLP	12743	1
15	Divider spool	42398	1
16	Lever actuator assy.	08490	3
17	Central body (includes items 3,16)	14319	2



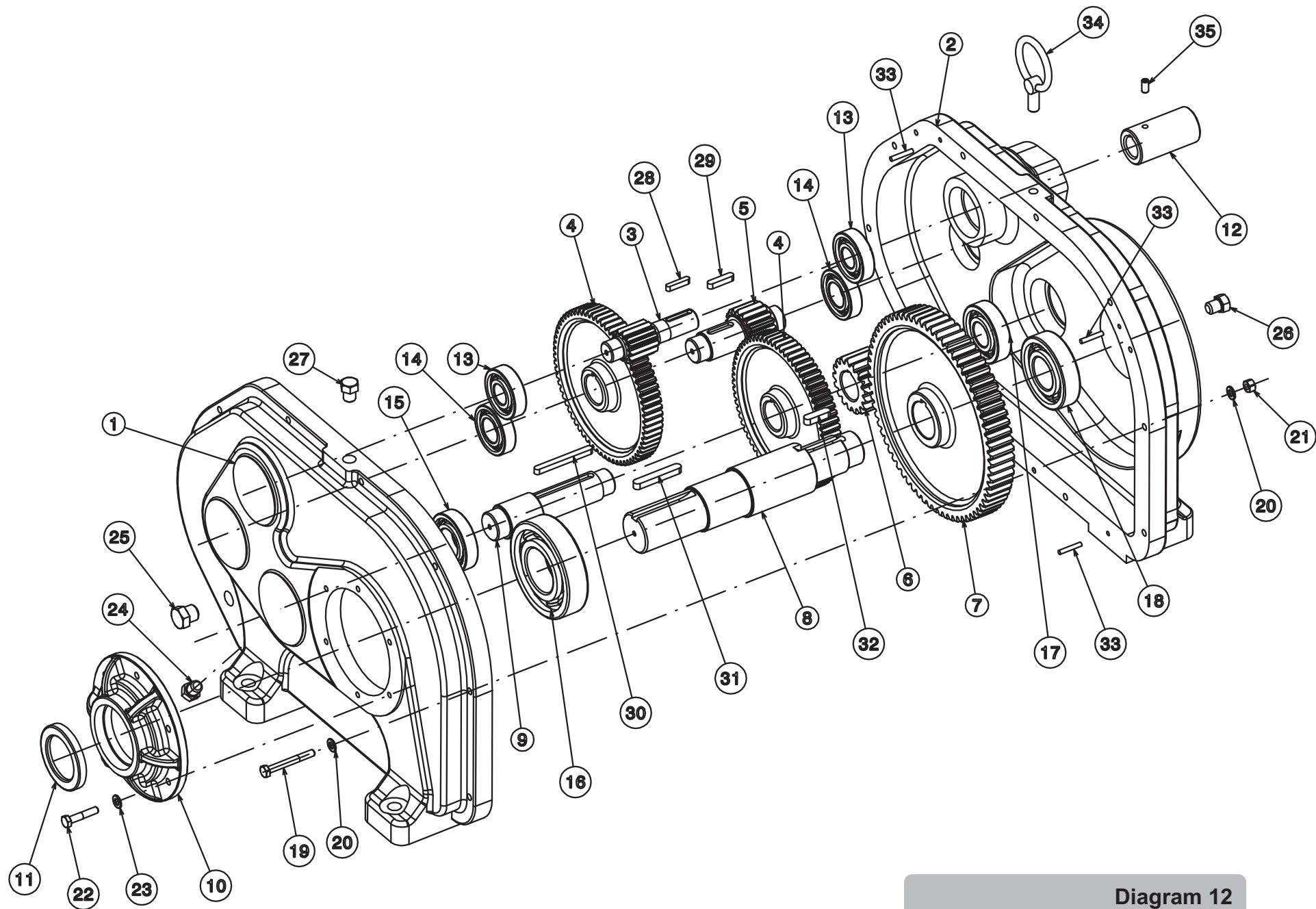


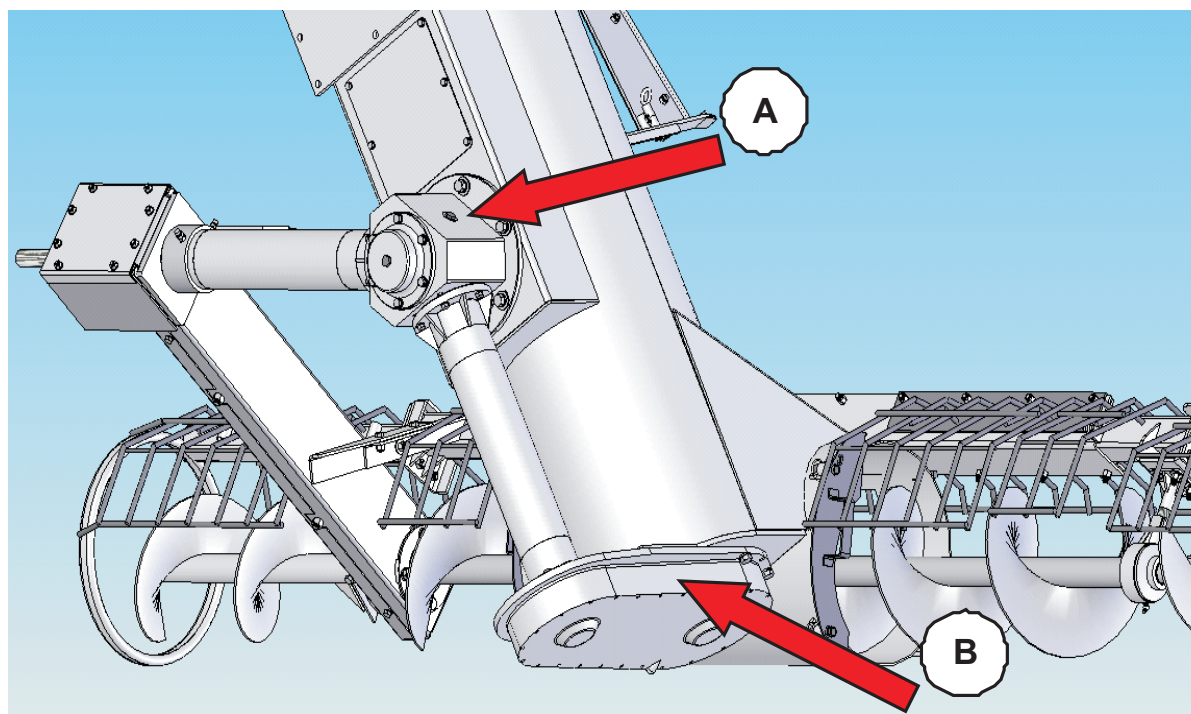
Diagram 12
Gearbox, roller

Diagram 12 - Gearbox, roller

N°	DESCRIPTION	CODE	QTY.
1	Housing, front	V-0057	1
2	Housing, rear	V-0058	1
3	Gear 12 teeth	V-0059	1
4	Gear 68 teeth	V-0060	2
5	Gear 18 teeth	V-0061	1
6	Gear 17 teeth	V-0062	1
7	Gear 70 teeth	V-0063	1
8	Output shaft	V-0064	1
9	Intermediate shaft	V-0065	1
10	Housing, output shaft	V-0066	1
11	Oil seal	V-0067	1
12	Sleeve coupling	V-0068	1
13	Ball bearing 6305 2RS	MP0178	2
14	Ball bearing 6206 2RS	MP0153	2
15	Ball bearing 6207 2RS	MP0155	1
16	Ball bearing 6311 2RS	V-0069	1
17	Ball bearing 6306 2RS	MP0179	1
18	Ball bearing 6308 2RS	MP0182	1
19	Hex bolt UNF 5/16" x 2 1/2"	V-0070	14
20	Flat washer 5/16"	MP1516	28
21	Self-locking nut UNF 5/16"	V-0071	14
22	Hex bolt UNF 5/16" x 1"	V-0072	6
23	Lock washer 5/16"	MP1501	6
24	Threaded plug 3/8" GAS	MP3717	1
25	Threaded plug 3/8" GAS	MP3717	1

N°	DESCRIPTION	CODE	QTY.
26	Threaded plug 3/8" GAS	MP3717	1
27	Venting valve 3/8" GAS	V-0073	1
28	Square key 1/4"x1/4"x1 1/4"	V-0074	1
29	Square key 8x7x35 (mm.)	V-0075	1
30	Square key 8x7x80 (mm.)	V-0076	1
31	Square key 10x8x65 (mm.)	V-0077	1
32	Square key 10x8x35 (mm.)	V-0078	1
33	Roll pin 5 x 33 (mm.)	V-0079	4
34	Eye bolt 1/2"	V-0080	1
35	Set screw 5/16"	V-0081	1





- A) The driveline case shown in “A” takes about 4 liters of SAE 85W-140 heavy duty gear oil in two stages. The filling procedure is as follows:
- Pour in oil until gear case “A” is full. This will require about two liters (slightly over half a gallon) of oil. Leave it standing for about 24 hours, or to speed up the process connect to tractor and drive the transmission for an hour, preferably with the fill plug removed to facilitate air venting.
 - The oil will gradually drain down and once it does the gear case must be refilled with about two additional liters. Oil passage is slow, especially in low temperatures, and this is the reason why two filling steps are required. It helps if oil is warmed slightly.
 - Before replacing the fill plug, turn transmission on. Any oil quantity in excess will be thrust out through the plug opening. Peering down, oil should be visible at about mid level to ensure proper gear lubrication. If oil surface is not visible, pour in some additional quantity.
- B) The gear case shown in “B” is filled with about 3 liters of SAE 85W-140 gear lube. Oil is poured through the fill opening at the side of the gear case until oil reaches and flows out of the smaller drain opening. Both fill and drain plugs are then screwed on in place.

Diagram 13
Charging Procedure transmission oil SAE 140

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