Réf. LD2003

MONOSEM

COMPAGNIE RIBOULEAU

PNEUMATIC PLANTER
Operator's Manual

16-Row 30" Pull type Planter

WING FOLD

MONOSEM NG Plus 2

Includes Instructions For :
OPERATION, ADJUSTMENT and MAINTENANCE

2 precautions for successful planting :

1- Choose a reasonable working speed adapted to the field conditions and desired accuracy.

2- Check proper working of the seed metering, seed placement, spacing and density when starting up and from time to time during planting.

… and don't forget : accurate planting is the key to a good stand !

TYPE - Pull Type - Center-Flex Hydraulic Front Fold, 16 Row

PLANTING UNIT TYPES
- NG plus MONOSEM
- Pneumatic metering box
- Double disc opener
- Gauge wheels
- “V” closing wheels

STANDARD ROW SPACING - 16 Row Narrow - 30" Rows

TRANSPORT TIRES
- Eight 7.50" x 20" , 6 ply Transport/Ground drive tires
- Adjustable height wheels for ridge planting

TYPE LIFT
- Master/Slave hydraulics
16 Row master/slave rephasing with assist cylinders (8 cylinders)

ROW MARKERS - Heavy-duty conventional : Low profile three-fold

HYDRAULICS
- Hydraulics for 16 Row dual SCV for independent operation of lift and markers.
- Hydraulic sequence valve with flow controls for markers.
- Hydraulics for front fold 16 Row.

Dimensions/Weights

PLANTER SIZE	16 Row 30"
Transport Width	23' 2" (7100 mm)
Single Frame Length	24' 6" (7500 mm)
Single Frame Weight*	10489 lbs. (4760 Kg)

* The base machine weight includes planter frame, row markers, drive components, tires and wheels, hydraulic cylinders and NG plus MONOSEM row unit with seed hopper and lid.

Following Operation :

- Following operation, or when unhitching, stop the tractor or towing vehicle, set the brakes, disengage the PTO and all power drives, shut off the engine and remove the ignition keys.
- Store the planter in an area away from human activity.
- Do not permit children to play on or around the stored planter.
- The planter should be stored in a dry and dust-free location with the hydraulic cylinders closed.
- Engage all safety devices for storage.
- Wheel chocks may be needed to prevent the parked planter from rolling.

Performing Maintenance :

- Good maintenance is your responsibility.
- Make repairs in an area with plenty of ventilation. Never operate the engine of the towing vehicle in a closed building. The exhaust fumes may cause asphyxiation.
- Before working on the planter, stop the towing vehicle, set the brakes, disengage the PTO and all power drives, shut off the engine and remove the ignition keys.
- Be certain all moving parts have come to a complete stop before attempting to perform maintenance.
- Always use the proper tools or equipment for the job at hand.
- Never use your hands to locate a hydraulic leak. Use a small piece of cardboard or wood. Hydraulic fluid escaping under pressure can penetrate the skin. **If injured by escaping hydraulic fluid, see a doctor at once. Gangrene can result. Without immediate medical treatment, serious infection and reactions can occur.**
- Replace all shields and guards after servicing and before moving.
- After servicing, be sure all tools, parts and service equipment are removed.
- If the planter has been altered in any way from the original design, the manufacturer does not accept any liability for injury or warranty.

Tire Safety :

- Inflating or servicing tires can be dangerous. Whenever possible, trained personnel should be called to service and / or mount tires.
- Do not attempt to mount a tire unless you have the proper equipment and experience to do the job.
- Failure to follow proper procedures when mounting a tire on a wheel or rim can produce an explosion which way result in serious injury or death.

Before Operation :

- Carefully study and understand this manual.
- Do not wear loose-fitting clothing which may catch in moving parts.
- It is recommended that suitable protective hearing and (eye protection) sight protectors be worn.
- The operator may come in contact with certain materials witch may require specific safety equipment, relative to the handling of such materials (examples : extremely dusty, molds, fungus, bulk fertilizers, insecticides, etc.)
- Assure that the planter tires are inflated evenly.
- Give the planter a visual inspection for any loose bolts, worn parts or cracked welds, and make necessary repairs.
- Be sure that there are no tools lying on or in the planter.
- Don't hurry the learning process or take the unit for granted. Ease into it and become familiar with your new planter.
- Practice operation of your planter and its attachments. Completely familiarize yourself and other operators with its operations before using.
- Do not allow anyone to stand between the tongue or hitch and the towing vehicle when backing up the planter.

During Operation :

- Beware of bystanders, particularly children ! Always look around to make sure that it is safe to start the engine of the towing vehicle.
- No passengers allowed anywhere on, or in the planter during operation.
- Keep hands and clothing clear of moving parts.
- Do not clean, lubricate or adjust your equipment while it is moving.
- When halting operation, even periodically, set the tractor or towing vehicle brakes, disengage the PTO, shut of the engine and remove the ignition key.
- Be especially observant of the operating area and terrain – watch for holes, rocks or other hidden hazards. Always inspect the area prior the operation.

  Do not operate near the edge of drop-offs or banks.

  Do not operate on steep slopes as overturn may result.

  Be extra careful when working on inclines.
- As a precaution, always recheck the hardware on equipment following every 100 hours of operation. Correct all problems.

PLANTER PREPARATION

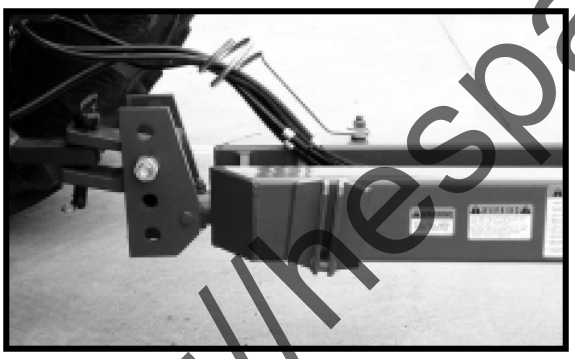
For the initial preparation of the planter, lubricate the planter and row units as outlined in the lubrication section of this manual. Make sure all tires are properly inflated, that all drive chains have the proper tension, alignment and lubrication.

TRACTOR PREPARATION

Consult your dealer for information on the minimum tractor horse power requirements and tractor capability. Tractor requirements will vary with planter options, tillage and terrain.

One dual remote hydraulic outlet (SCV) is required on models equipped with the standard single valve hydraulic system. Two dual remote hydraulic outlets (SCV) are required on models equipped with the optional dual valve hydraulic system.

PLANTER ATTACHMENT TO TRACTOR



Use the following six steps to attach your planter to the tractor.

1. Adjust the tractor drawbar so it is 13 to 17 inches above the ground. Adjust the drawbar so that the hitch pin holes is directly below the center line of the PTO shaft. Make sure the drawbar is in a stationary position.

2. Back the tractor to the planter and connect them with a hitch pin. Make sure the hitch pin is secured with a locking pin or cotter pin.

3. Connect the PTO drive shaft to the tractor. In addition to a standard 540 rpm PTO, a 1000 rpm shaft is available.

CAUTION – Make sure that you connect the proper end of the PTO to the tractor. An arrow on the PTO indicates the end of the constant velocity (double clutch) that is attached to the tractor.

The following sticker is placed on your PTO shaft for your safety...

DANGER – Rotating drive line contact can cause death – keep away. Do not operate without all driveline, tractor and equipment shields in place ; without drivelines securely attached at both ends, and without driveline shields that turn freely on driveline.

4. Connect the hydraulic hoses to tractor ports in a sequence which is both familiar and comfortable to the operator.

DANGER – Before applying pressure to the hydraulic system, make sure all connections are tight and hoses and fittings have not been damaged. Hydraulic fluid escaping under pressure can have sufficient force to penetrate skin, causing injury or infection.

CAUTION – Always wipe hose ends to remove any dirt before connecting couplers to tractor parts.

5. Raise the jack stand and remount horizontally on the storage bracket.

6. Lower the planter to the planting position and check that the planter is level (front to back and side to side). If the hitch height is too high or too low, disconnect the planter and adjust the hitch clevis in an up or down position as necessary.

LEVELING THE PLANTER

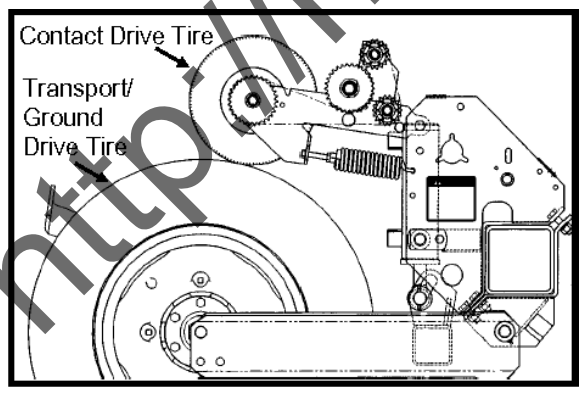
For proper operation of the planter and row units, it is important that the unit operate level.

Unless the tractor drawbar is adjustable for height, the fore and aft level adjustment must be maintained by the position of the hitch clevis. Holes in the hitch bracket allow the clevis to be raised or lowered. When installing clevis mounting bolt, tighten hex nut to proper torque setting.

With the planter lowered to proper operating depth, check to be sure the frame is level fore and aft (front to back and side to side). Recheck once the planter is in the field.

It is also important for the planter to operate level laterally. Tire pressure must be maintained at pressures specified.

TIRE PRESSURE



Tire pressure should be checked regularly and maintained as follows :

Transport Ground Drive : 7.50" x 20" - 40 psi (2,7 bars)
Contact Drive : 4.10" x 8"- 60 psi (4 bars)

DANGER Rim and tire servicing can be dangerous. Explosive separation of a tire and rim parts can cause serious injury or death.

Do not attempt to mount a tire unless you have the proper equipment and experience to perform the job. This should only be done by properly trained and equipped to do the job.

Maintain the correct tire pressure. Do not inflate the tires above the recommended pressure.

When inflating tires, use a clip-on air chuck and extension hose long enough to allow you to stand to one side, and not in front of or over the tire assembly. Use a safety cage to enclose the tire and assembly when inflating.

Inspect tires and wheels daily. Do not operate with low pressure, cuts, bubbles, damaged rims or missing lug bolts and nuts.

OPERATING SPEED

The operating speed needs to be selected as a function of :

- The desired consistency in the row
- The ground conditions
- The density of the seed

A high speed is not conducive to accuracy, especially in rough or rocky conditions which causes the unit to bounce.

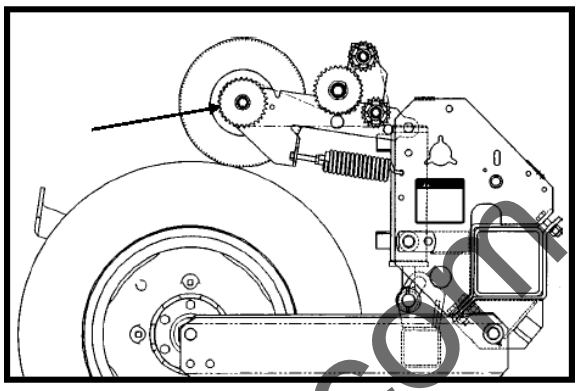
Likewise, a high seed density may cause the disc to rotate fast, burdening the metering.

It should also be noted, and especially for corn, the misshapen and angular seeds are difficult to sow regularly, especially at high working speeds.

A base speed of 3 ½ to 4 ½ mph (5/7 km/h) assures good results for most seeds in the majority of conditions. However when planting corn at lighter population more than 6” (15 cm) between the seed, 5/6 mph (8/10 km/h) is quite possible.

For planting of high seed population such as peanuts, edible beans, and kidney beans, best results can be obtained by not going faster than ¾ mph (4,5/6 km/h).

STANDARD RATE DRIVE



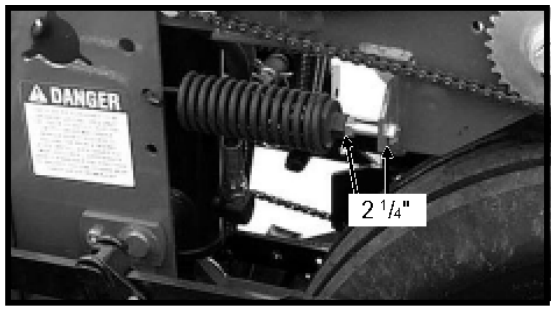
Seed planting rate charts are based on the standard rate drive. The standard rate drive uses a 30 tooth sprocket on each contact drive tire.

IMPORTANT : After each sprocket combination adjustment, make a field check to be sure you planting at the desired rate.

CONTACT DRIVE WHEEL SPRING ADJUSTMENT

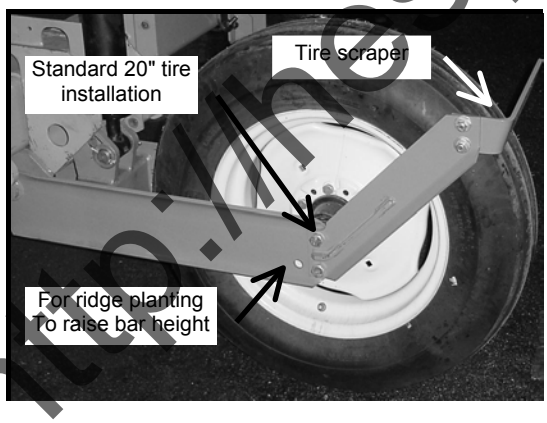
There are two down pressure springs on each contact drive wheel. The down pressure is factory pre-set and should need no further adjustment.

The spring tension is set leaving 2 ¼" between the spring plug and the bolt head.



TIRE SCRAPER

Due to the clearance between the wheel assembly and the transport tire when a planter is equipped with the 20" transport tire, a tire scrapper should always be used. This will help prevent a build-up of dirt/mud between the wheel arm assembly and the tire. Adjust the scrapper so it does not contact the tire.



RIDGE PLANTING

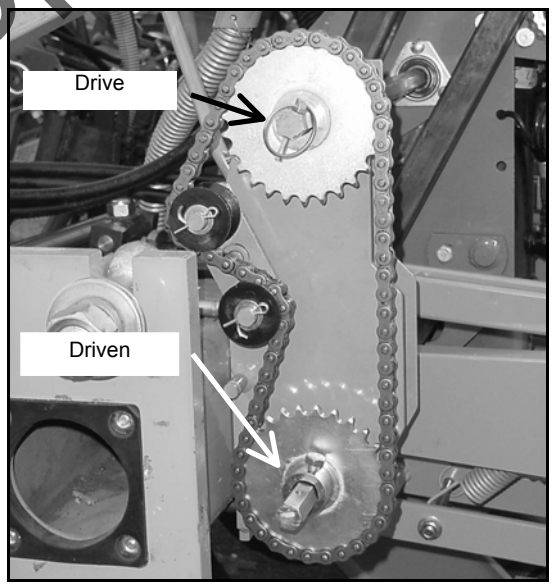
For ridge planting mount the 20" tires in the lower rear holes in the ground drive wheel arm to raise the bar height 3". Mount the contact drive wheel arm and springs in the lower set of mounting holes in the wheel module mount and raise the hitch height to maintain fore and aft levelness.

TRANSMISSION ADJUSTMENT

Planting population rate changes are made at the end mounted transmission. The planter is designed to allow simple, rapid changes in sprockets to obtain the desired planting population. By removing the lynch pins on the hexagon shafts, sprockets can be interchanged with those from the sprocket storage rod bolted to the transmission.

Chain tension is controlled by a spring-loaded dual sprocket idler. The idler assembly is adjusted with a ratchet arm. This arm has a release position to remove spring tension for replacing sprockets. The amount of spring tension on the chain can be controlled by the ratchet arm.

The planting rate chart on the following pages of this section will aid you in selecting the correct sprocket combinations.



WARNING: Always make sure safety/warning lights, reflectors and SMV emblem are in place and visible prior to transporting the machine on public roads. In this regard, check federal, state/provincial and local regulations.

WARNING: Always install safety lockups on lift cylinders and make sure wing lockup pins are in place to secure wings at hitch.

TRACTOR PLANTING SEED

Planters are designed to operate within a speed range of 2 to 8 mph. See “planting and application rate charts”. Variations in ground speed will produce variations in rates.

NOTE : Due to a multitude of variables, seed spacing can be adversely affected at speeds above 5,5 mph.

METRIC CONVERSION TABLE

Multiply	By	To Get
Inches (in.)	x 2.54	= centimeters (cm)
Inches (in.)	x 25.4	= millimeters (mm)
Feet (ft.)	x 30.48	= centimeters (cm)
Acres	x 0.405	= hectares (ha)
Miles per hour (mph)	x 1.609	= kilometers per hour (Km/h)
Pounds (lbs.)	x 0.453	= kilograms (kg)
Bushels (bu.)	x 35.238	= liters (l)
Gallons (gal.)	x 3.785	= liters (l)
Pounds per square inch (psi)	x 6.894	= kilopascals (kPa) (100 kPa = 1 bar)
Inch pounds (in. lbs.)	x 0.113	= newtons-meters (N•m)
Foot pounds (ft. lbs.)	x 1.356	= newtons-meters (N•m)
Centimeters (cm)	x .394	= inches (in.)
Millimeters (mm)	x .0394	= inches (in.)
Centimeters (cm)	x .0328	= feet (ft.)
Hectares (ha)	x 2.469	= acres
Kilometers per hour (Km/h)	x 0.621	= miles per hour (mph)
Kilograms (kg)	x 2.208	= pounds (lbs.)
Liters (l)	x 0.028	= bushels (bu.)
Liters (l)	x 0.264	= gallons (gal.)
Kilopascals (kPa) (100 kPa = 1 bar)	x 0.145	= pounds per square inch (psi)
Newtons-meters (N•m)	x 8.85	= inch pounds (in. lbs.)
Newtons-meters (N•m)	x 0.738	= foot pounds (ft. lbs.)

FIELD TEST

With any change of field and/or planting conditions, seed size or planter adjustment, we recommend a field test be made to ensure proper seed placement and operation of row units. See “Rate Charts”, “Checking Seed Population”, and “Checking Granular Chemical Application Rate” at end of this section :

- Check the planter for fore to aft and lateral level operation. See “Leveling The Planter”.
- Check all row units to be certain they are running level. When planting, the row unit parallel arms should be approximately parallel to the ground.
- Check row markers for proper operation and adjustment. See “Marker Adjustment” and “Marker Speed Adjustment”.
- Check for proper application rates and placement of granular chemicals on all rows. See “Checking Granular Chemical Application Rate”.
- Check for desired depth placement and seed population on all rows. See “Checking Seed Population”.

After the planter has been field tested, reinspect the machine :

- Hoses and fittings
- Bolts and nuts
- Cotter pins and spring pins
- Drive chain alignment

TRANSPORT TO FIELD OPERATION

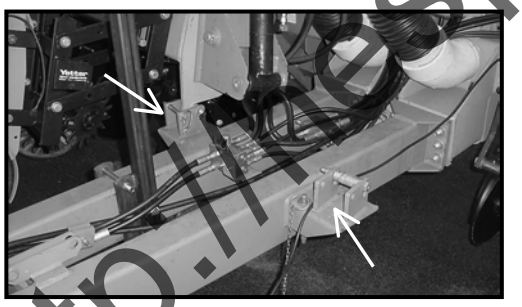
Hydraulic Wing Fold

WARNING : Be sure the planter is on a level surface, fore and aft and side to side. Avoid standing between the wing and main frame when folding the planter. Wing may swing suddenly.

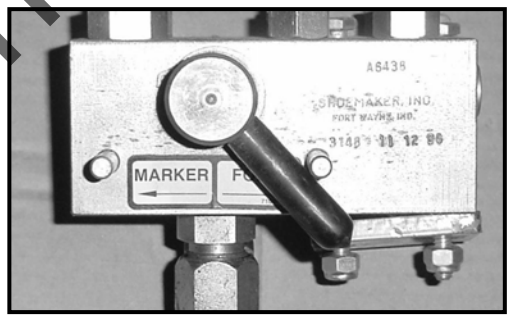
SUMMARIZED TRANSPORT TO FIELD SEQUENCE
. With center lift cylinders retracted and lock ups in place remove wing lock pins.
. Move selector valve to "fold" position.
. Hydraulically fold wings out.
. Swing wing locking bolts into place.
. Extend lift cylinders.
. Remove center section lift cylinder lockups.
. Lower planter.
. Tighten wing locking bolts.
. Release turnbuckle at center of planter.
. Move selector valve to "marker" position.
NOTE : Read the following information for more detailed instructions.

1. If the wing lift tires are not retracted, with the cylinder lockups in place on the four center section lift cylinders, move the tractor hydraulic lever to the lowering position until the cylinders are fully retracted thus raising the wing tires.

2. With the planter raised and the cylinder lockups in place, remove the wing lock pins at the marker support and hitch.



3. Position the selector handle on the manual selector valve in the "fold" position.



4. Move the tractor hydraulic lever and fold the wings out to operating position.

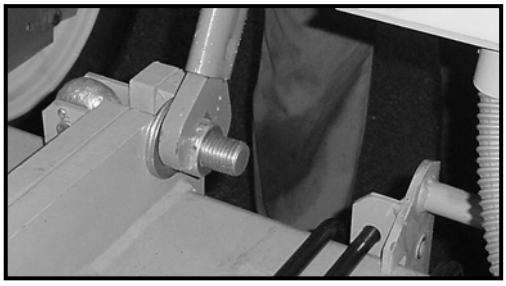
5. Swing the wing locking bolts into position to lock each wing.

6. Operate the hydraulic lever to extend all the lift cylinders.

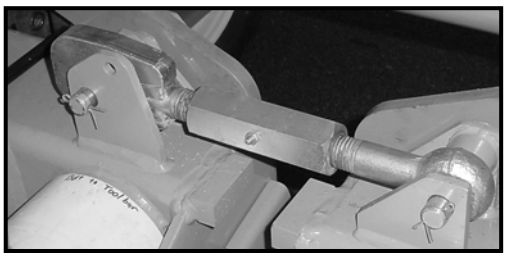
7. Remove the cylinder lockups from the four center section lift cylinders and place them in the storage position on the wheel modules.

8. Lower the planter.

9. Using the special wrench which is stored on the hitch of the planter, tighten the ¼" hex nuts to secure the wing locking bolts.



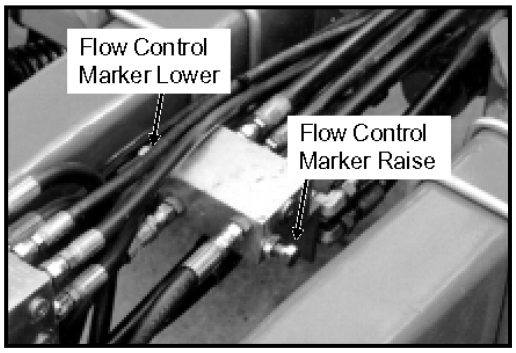
10. **Release the turnbuckle located in the center of the planter frame**, using the special wrench, **and fold it to one side**. Return wrench to the storage position on the longue.



11. Move the selector handle on the manual selector valve to the "marker" position. (Remove pressure from the hydraulic system before moving the selector handle).

MARKER SPEED ADJUSMENT

The marker hydraulic system includes two flow control valves. One flow control valve controls the lowering speed of both markers and one controls the raising speed of both markers. To adjust marker speed, loosen the jam nut and turn the control(s) clockwise or IN to slow the travel speed and counter clockwise or OUT to increase the travel speed. The flow controls determine the amount of oil flow restriction through the valves, therefore determining travel speed of the markers.



DANGER: The flow controls should be properly adjusted before the marker assembly is first put into use. Excessive travel speed of the markers can be dangerous and/or damage the marker assembly.

NOTE: When oil is cold, hydraulics operate slowly. Make sure all adjustments are made with warm oil.

NOTE: On a tractor where the oil flow can not be controlled, the rate of flow of oil from the tractor may be greater than the rate at which the marker cylinder can accept it. The tractor hydraulic control lever will have to be held until the cylinder reaches the end of its stroke. This occurs most often on tractors with an open center hydraulic system.

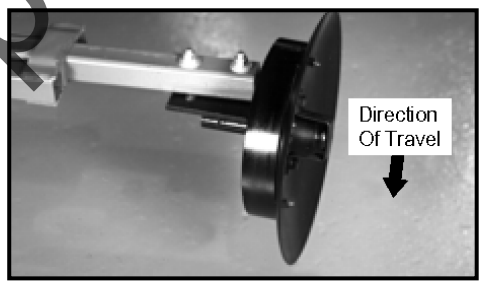
On tractors with a closed center hydraulic system, the tractor's hydraulic flow control can be set so the tractor's detent will function properly.

MARKER ADJUSTMENT

To determine the correct length at which to set the marker assemblies, multiply the number of rows by the average row spacing in inches. This provides the total planting width. Adjust the marker extension so the distance from the marker blade to the center line of the planter is equal to the total planting width previously obtained. Both the planter and marker assembly should be lowered to the ground when measurements are being taken. The measurement should be taken from the point where the blade contacts the ground. Adjust right and left marker assemblies equally and securely tighten clamping bolts. An example of marker length adjustment follows:

Number of rows x Row spacing inches = Dimension between planter center line and marker blade.

16 Rows x 30" Spacing = 480" Marker Dimension



The marker blade is installed so the concave side of the blade is outward to throw dirt away from the grease seals. The spindle bracket is slotted so the hub and blade can be angled to throw more or less dirt. To adjust the hub and spindle, loosen the 1/2" mounting hardware and move the bracket as required. Tighten bolts to the specified torque.

IMPORTANT: A marker blade assembly that is set at a sharper angle than necessary will add unnecessary stress to the complete marker assembly and shorten the life of bearings and blades. Set the blade angle only as needed to leave a clear mark.

A field test is recommended to ensure the markers are properly adjusted. After the field test is made, make any minor adjustments as necessary.

PLANTER METERING UNIT NG PLUS 2

The NG Plus 2 metering unit in fig. 40 is shown with standard features. Other options are available for specific conditions or uses.

The drive chain is mounted as per fig. 41.

The individual disengaging of a metering unit is possible by removing the lynch pin (rep.1) of by disconnecting the vacuum hose.

The seed depth is adjusted by the handwheel (rep.2) which changes the height of the 2 depth wheels (rep.3) in relation to the furrow disc openers (rep.4). A sticker close to the handwheel, provided with a gradual scale, ensures the uniformity of the depth control on all row units of the planter.

The furrow opener and ground adjustment system guarantees an accurate and regular seed depth in all types of soil and conditions because the depth wheels are positioned perpendicular to the falling point of seeds.

The two rear press wheels (rep.5) affect only the closing of the seed furrow. They float independently and therefore do not have any effect on the ground engaging. Their soil pressure is regulated by the handwheel (rep.6). This pressure has to be chosen carefully in order to assure proper seed to soil contact. Soil should be pressed over the complete length of the row. This setting depends on the type and humidity of the soil.

In order for the furrow disc opener to remain properly cleaned, the 2 gauge wheels (rep.3) have to touch (without pinching their outside circumference). After starting up the planter, the factory assembly may need readjustment.

Adjust gauge wheel spacing by putting the washers (rep.7) from one side of the articulating arms to the other.

Adjust the pressure of the scrapers of discs by tightening or loosening the bolts (rep.8). Before and during each new planting season, check if the seed tubes (rep.9) are in good condition as consistent and regular seeding will depend on this. Do not hesitate to replace them if they are worn or damaged. To replace them, remove pin (rep.10) after removing the gauge wheel and furrow disc opener on one side (Fig.42).

The function of clod removers (rep.11) is to clear the surface of the soil but not to plow a furrow. One use of the front brace of the clod remover is to slice open hard soil and move stones away from the track of the disc opener. They need to be adjusted accordingly. Using them in stony soils may be a problem because they can cause clogging and blocking. In this case it is better to choose an assembly with a flexible support bracket (fig. 43) which is efficient in difficult soil conditions.

Fig.43

Fig.40

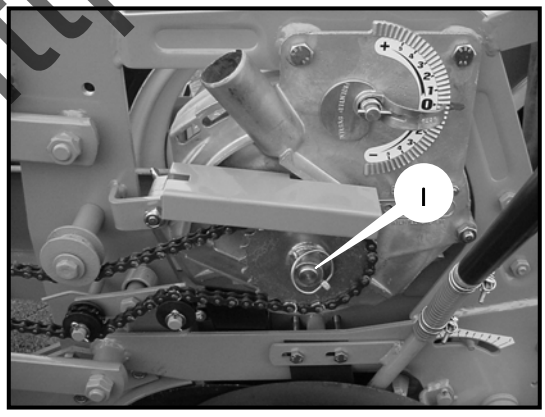


Fig.41

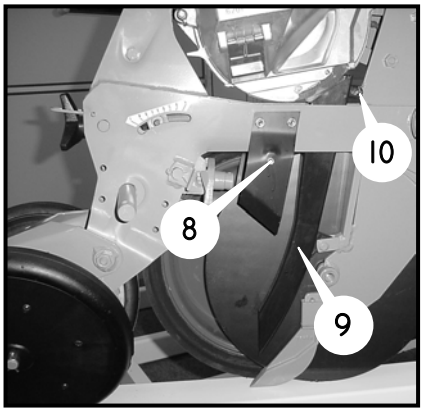


Fig.42

METERING BOX

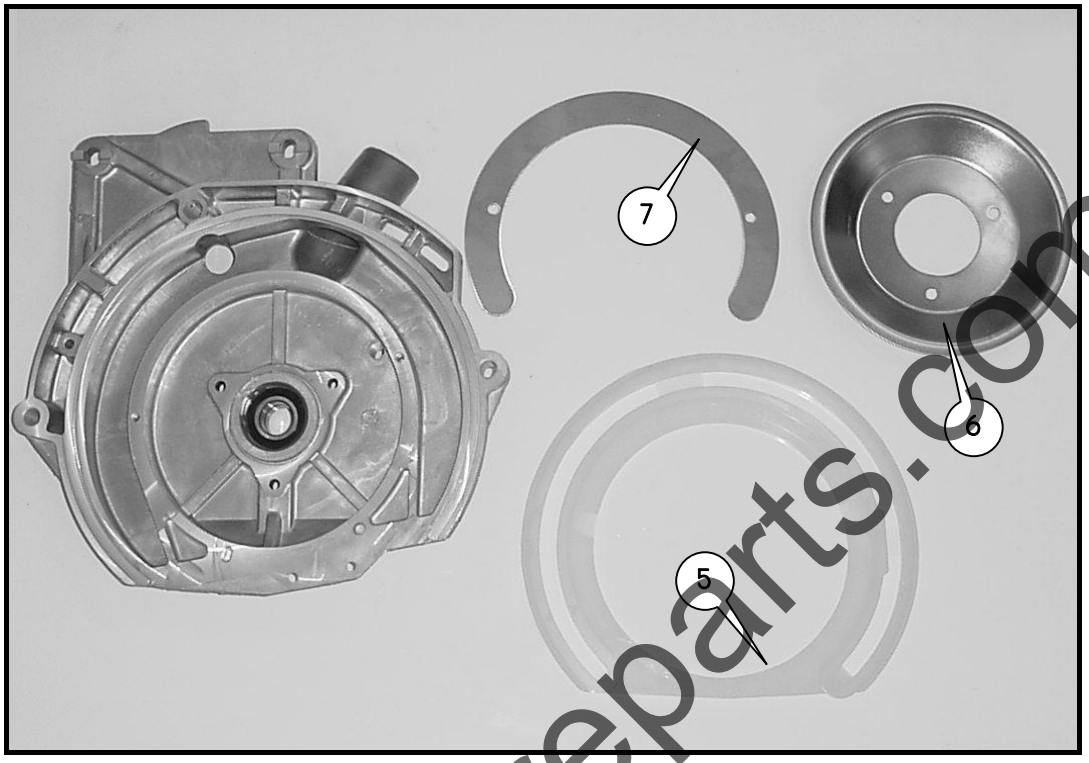


Fig.33

The plastic wear gasket 5 on which the seed disc rotates should be smooth and in good condition. Under normal operating conditions, it should be replaced only after 500 to 1000 ha (1250 to 2500 acres). The metal brace 7 should be positioned with its tab notched in the hole of the housing. The outer edge of the plastic wear gasket is then rotating , and is then held in position by cup 6 and 3 bolts. (Fig.33)

NOTE : Thoroughly clean the metering box housing, before installing a new wear gasket. Any residue left from previous use will not allow the gasket to fit in the proper position.

SUGGESTED SEED DISC USE

Crop	**Seed disc**
Corn	DC1850-Low population DC2450-Medium population DC3050-High population
Sunflower	DC1225-Low population (Oils & confection) DC1825-High population (Oils & confection)

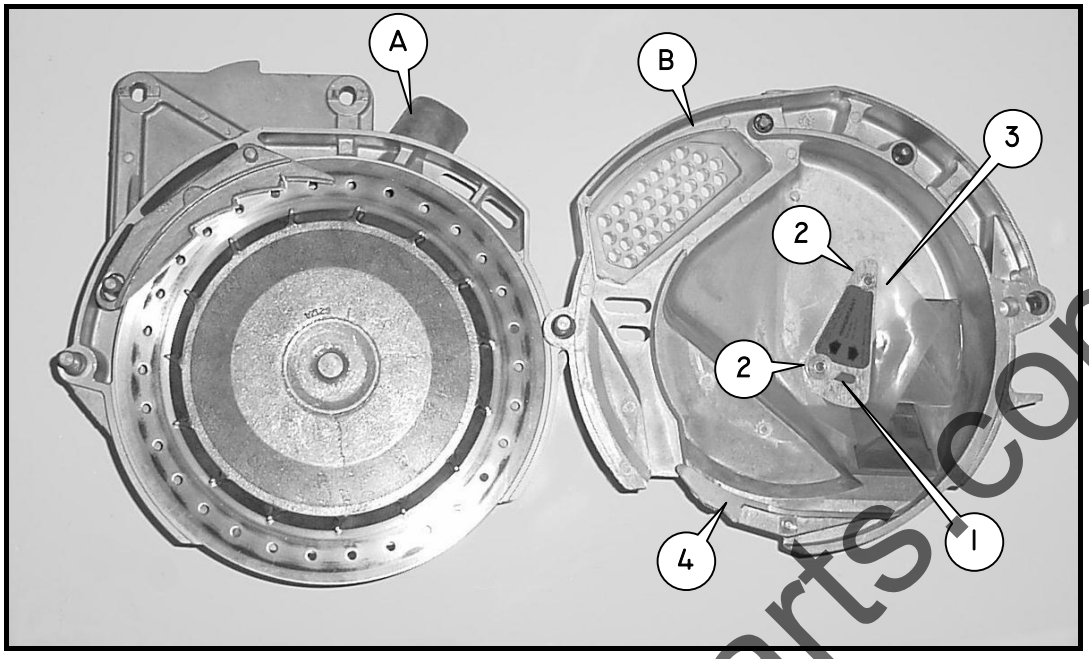


Fig.35

A sheet metal shutter ① is mounted inside the cover B. This shutter regulate the flow of seeds coming from the hopper and provide a constant and sufficient level in front of the disc. According to the seed used, the shutter as to be checked and adjusted at 2 different positions before planting:

1. High position : <u>For large seeds such as corn , soybean, edible beans, peanuts, cotton, etc.</u>

2.Low position (fig.35) : <u>For small seeds such as sunflower, beet, sorghum, etc.</u>
This position should also be used for large seeds when the planter has to work for several hundred meters (1000 or more) on slopes of more than 20%.

The shutter is adjusted by lowering it after loosening the two bolts ②. A small plastic sheet ③ located under the shutter is also used to limit the level of seeds in front of the disc .

Before beginning your season, make sure that it is in good condition.

A special metering box cover with a larger opening (to improve the seed flow into the seed chamber), a large discharge channel (to avoid blockage) , and a special less

aggressive seed scraper (to avoid skips) are available for the planting of large seeds such as peanuts, kidney beans and large squash.

A special metal shutter is available for planting small seeds such as cabbage , rape seed, etc. to reduce the seed flow into the seed chamber.

A special ejector block maybe needed to eliminate bridging in the discharger channel in the cover for large peanuts and large squash seed.

The ejector block ④ enables the seeds to fall regularly. For this purpose, it is recommended to check its conditions periodically.

METERING ADJUSTMENT

Two factors influence the degree of seed:

1.The position of the seed scraper in relation to the holes of the disc. It is therefore necessary to adjust the eight of the scraper as needed for each seed type.

2.The degree of suction (depression) at the seed disc. It is therefore necessary to adjust the degree of suction to the weight of the seed to be planted;

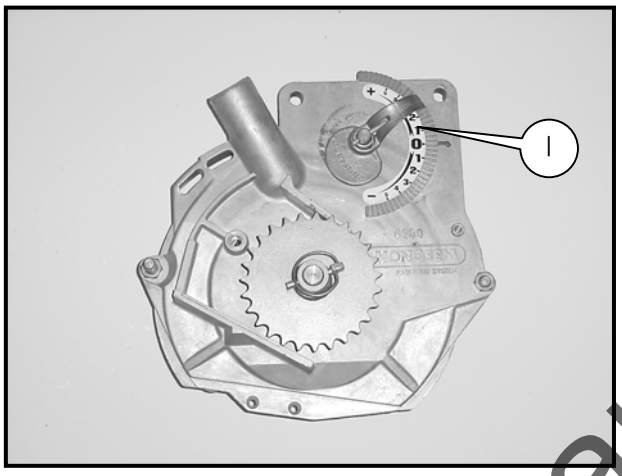


Fig.36

The (patented) MONOSEM system allows a unique adjustment (fig. 36-37).

- To adjust the height of the scraper and at the same time
- To adapt the degree of suction to the weight and size of the seed.

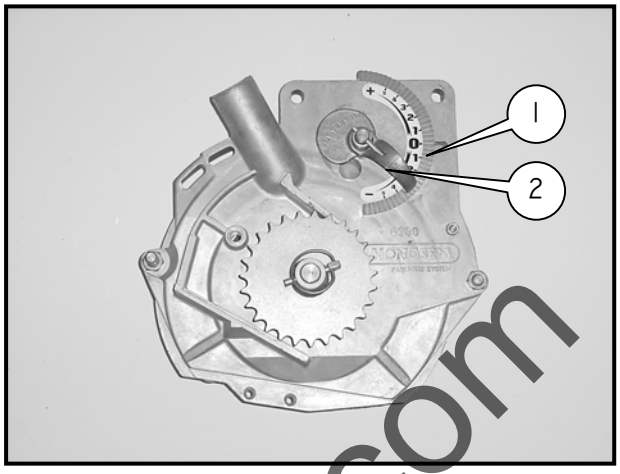


Fig.37

When the indicator 1 is positioned to the “+” (fig 36) it raises the scraper over the holes of the disc and increases the degree of suction (closing the size of the hole 2) . This may cause doubles if raised too high.

When the indicator 1 is positioned to (fig 37). It lower the scraper over the holes and reduces the degree of suction (opening the size of the hole 2) . This may cause skipping if too low.

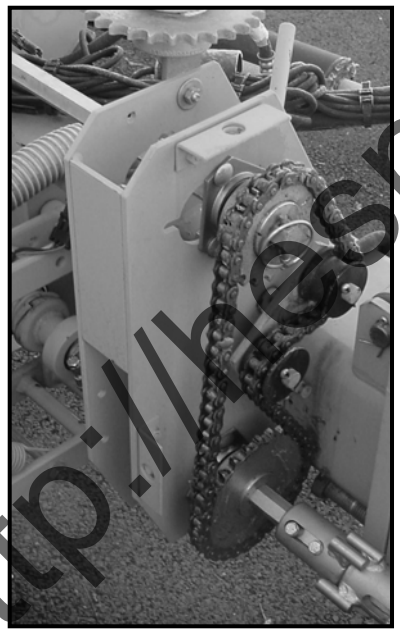
A control window in the cover allows you to monitor the results.

TRANSMISSION ADJUSTMENT

Planting population rate changes are made at the end mounted transmission. The planter is designed to allow simple, rapid changes in sprockets to obtain the desired planting population. By removing the lynch pins on the hexagon shafts, sprockets can be interchanged with those from the sprocket storage rod bolted to the transmission.

Chain tension is controlled by a spring-loaded dual sprocket idler. The idler assembly is adjusted with a ratchet arm. This arm has a release position to remove spring tension for replacing sprockets. The amount of spring tension on the chain can be controlled by the ratchet arm.

The planting rate chart on the following pages of this section will aid you in selecting the correct sprocket combinations.



OPTIONAL EQUIPMENT

An optional hydraulic drive for the turbofan is available. You must then double check that there is adequate oil flow for the turbofan to run at 500 rpm. Use an rpm gauge to check, placing it at the center of the lower pulley.

A vacuum gauge may also be mounted to the turbofan. (The vacuum gauge is standard equipment when ordering the hydraulic drive).

SOWING DISTANCES

Planting distances obtained with standard assembly and sprocket system.

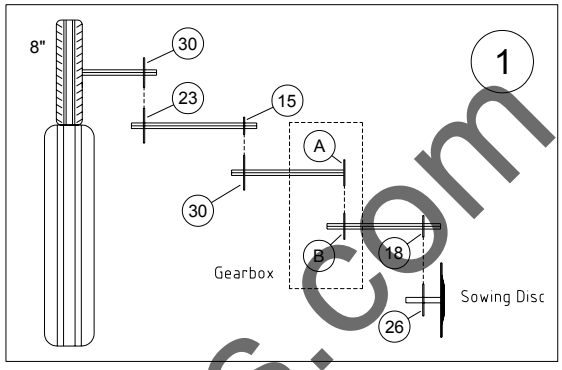
IMPORTANT : Make sure the chains are tight and properly lubricated, and tires are properly inflated.

The above indicated spacings are theoretical and may vary from 5-10 % depending on soil conditions.

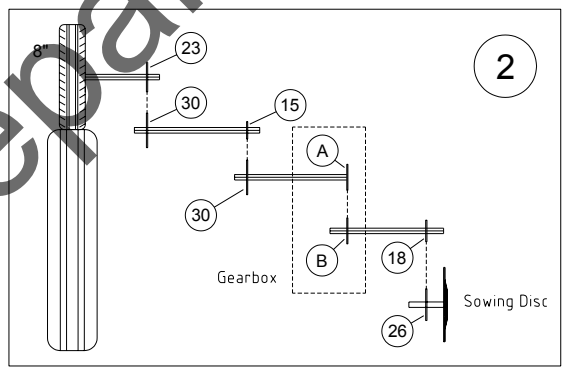
Check proper working of the seed metering, seed placement, spacing and density when starting up and from time to time during planting.

The following drawings show the two possibilities of wheel unit mounting.

30 toothed drive sprocket with 23 toothed driven sprocket:



23 toothed drive sprocket with 30 toothed driven sprocket:



TRANSMISSION SELECTION

The seed spacing is shown in cm

B=28

Number of holes in the seed disc **Drawing N°1** **30/23**

	A	27	25	24	23	21	19	17	15
	B	28	28	28	28	28	28	28	28
24 Sunflower		12,7	13,7	14,3	14,9	16,4	18,1	20,2	22,9
30 Corn		10,2	11,0	11,5	12,0	13,1	14,5	16,2	18,3
60 Soybean		5,1	5,5	5,7	6,0	6,5	7,2	8,1	9,2

Number of holes in the seed disc **Drawing N°2** **23/30**

	A	27	25	24	23	21	19	17	15
	B	28	28	28	28	28	28	28	28
24 Sunflower		21,7	23,4	24,4	25,4	27,8	30,8	34,4	39,0
30 Corn		17,3	18,7	19,5	20,3	22,3	24,6	27,5	31,2
60 Soybean		8,7	9,4	9,7	10,2	11,1	12,3	13,8	15,6

B=27

Number of holes in the seed disc **Drawing N°1** **30/23**

	A	28	25	24	23	21	19	17	15
	B	27	27	27	27	27	27	27	27
24 Sunflower		11,8	13,3	13,8	14,4	15,8	17,4	19,5	22,1
30 Corn		9,5	10,6	11,0	11,5	12,6	14,0	15,6	17,7
60 Soybean		4,7	5,3	5,5	5,8	6,3	7,0	7,8	8,8

Number of holes in the seed disc **Drawing N°2** **23/30**

	A	28	25	24	23	21	19	17	15
	B	27	27	27	27	27	27	27	27
24 Sunflower		20,1	22,6	23,5	24,5	26,8	29,7	33,2	37,6
30 Corn		16,1	18,0	18,8	19,6	21,5	23,7	26,5	30,1
60 Soybean		8,1	9,0	9,4	9,8	10,7	11,9	13,3	15,0

B=25

Number of holes in the seed disc **Drawing N°1** **30/23**

	A	28	27	24	23	21	19	17	15
	B	25	25	25	25	25	25	25	25
24 Sunflower		11,0	11,4	12,8	13,3	14,6	16,1	18,0	20,5
30 Corn		8,8	9,1	10,2	10,7	11,7	12,9	14,4	16,4
60 Soybean		4,4	4,5	5,1	5,3	5,8	6,5	7,2	8,2

Number of holes in the seed disc **Drawing N°2** **23/30**

	A	28	27	24	23	21	19	17	15
	B	25	25	25	25	25	25	25	25
24 Sunflower		18,6	19,3	21,8	22,7	24,9	27,5	30,7	34,8
30 Corn		14,9	15,5	17,4	18,2	19,9	22,0	24,6	27,8
60 Soybean		7,5	7,7	8,7	9,1	9,9	11,0	12,3	13,9

B=24

Number of holes in the seed disc **Drawing N°1** **30/23**

	A	28	27	25	23	21	19	17	15
	B	24	24	24	24	24	24	24	24
24 Sunflower		10,5	10,9	11,8	12,8	14,0	15,5	17,3	19,6
30 Corn		8,4	8,7	9,4	10,2	11,2	12,4	13,9	15,7
60 Soybean		4,2	4,4	4,7	5,1	5,6	6,2	6,9	7,9

Number of holes in the seed disc **Drawing N°2** **23/30**

	A	28	27	25	23	21	19	17	15
	B	24	24	24	24	24	24	24	24
24 Sunflower		17,9	18,6	20,0	21,8	23,9	26,4	29,5	33,4
30 Corn		14,3	14,8	16,0	17,4	19,1	21,1	23,6	26,7
60 Soybean		7,2	7,4	8,0	8,7	9,5	10,6	11,8	13,4

B=23

Number of holes in the seed disc **Drawing N°1** **30/23**

	A	28	27	25	24	21	19	17	15
	B	23	23	23	23	23	23	23	23
24 Sunflower		10,1	10,5	11,3	11,8	13,4	14,9	16,6	18,8
30 Corn		8,1	8,4	9,0	9,4	10,8	11,9	13,3	15,1
60 Soybean		4,0	4,2	4,5	4,7	5,4	5,9	6,6	7,5

Number of holes in the seed disc **Drawing N°2** **23/30**

	A	28	27	25	24	21	19	17	15
	B	23	23	23	23	23	23	23	23
24 Sunflower		17,2	17,8	19,2	20,0	22,9	25,3	28,3	32,0
30 Corn		13,7	14,2	15,4	16,0	18,3	20,2	22,6	25,6
60 Soybean		6,9	7,1	7,7	8,0	9,1	10,1	11,3	12,8

B=21

Number of holes in the seed disc **Drawing N°1** **30/23**

	A	28	27	25	24	23	19	17	15
	B	21	21	21	21	21	21	21	21
24 Sunflower		9,2	9,5	10,3	10,7	11,2	13,6	15,2	17,2
30 Corn		7,4	7,6	8,2	8,6	9,0	10,9	12,1	13,7
60 Soybean		3,7	3,8	4,1	4,3	4,5	5,4	6,1	6,9

Number of holes in the seed disc **Drawing N°2** **23/30**

	A	28	27	25	24	23	19	17	15
	B	21	21	21	21	21	21	21	21
24 Sunflower		15,7	16,2	17,5	18,3	19,1	23,1	25,8	29,2
30 Corn		12,5	13,0	14,0	14,6	15,3	18,5	20,6	23,4
60 Soybean		6,3	6,5	7,0	7,3	7,6	9,2	10,3	11,7

Densities - Seed Population Chart

AVERAGE SEED SPACING (cm)	ROW SPACING (cm)					
	45	50	70	75	76,2 (30")	80
5	444444	400000	285714	266667	262467	250000
6	370370	333333	238095	222222	218723	208333
7	317460	285714	204082	190476	187477	178571
8	277778	250000	178571	166667	164042	156250
9	246914	222222	158730	148148	145815	138889
10	222222	200000	142857	133333	131234	125000
11	202020	181818	129870	121212	119303	113636
12	185185	166667	119048	111111	109361	104167
13	170940	153846	109890	102564	100949	96154
14	158730	142857	102041	95238	93738	89286
15	148148	133333	95238	88889	87489	83333
16	138889	125000	89286	83333	82021	78125
17	130719	117647	84034	78431	77196	73529
18	123457	111111	79365	74074	72908	69444
19	116959	105263	75188	70175	69070	65789
20	111111	100000	71429	66667	65617	62500
21	105820	95238	68027	63492	62492	59524

Seed population per ha :

D = Seed population per ha (Seed/ha)
I = Row spacing (m)
E = Seed spacing (m)

$$D = \frac{10.000}{I \times E}$$

Example : $D = \frac{10.000}{0,75 \times 0,13} = 102.564$ Seed/ha

Seed spacing :

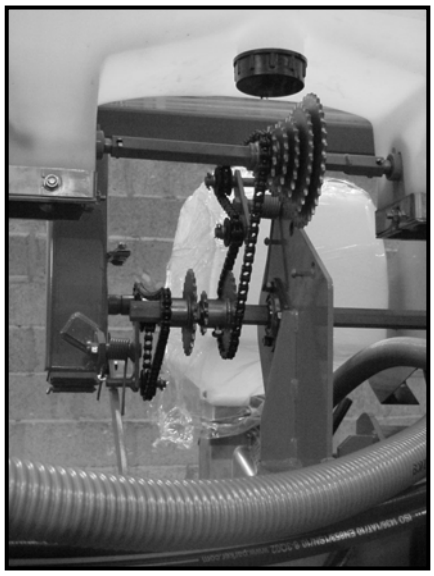
D = Seed population per ha (Seed/ha)
I = Row spacing (m)
E = Seed spacing (m)

$$E = \frac{10.000}{I \times D}$$

Example : $D = \frac{10.000}{90.000 \times 0,75} = 0,148$ m (14,8 cm)

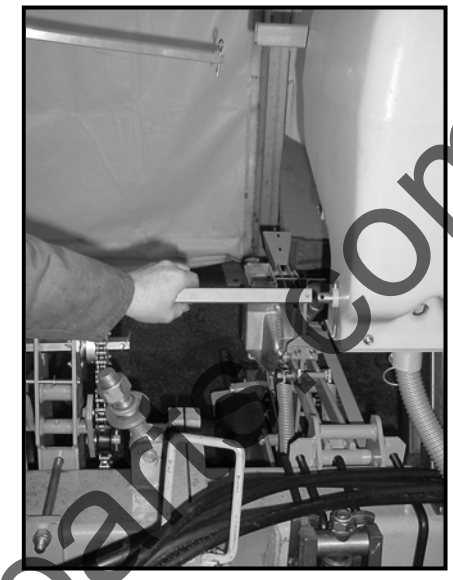
FERTILIZER

Gearbox for fertilizer low adjustment. See following page for adjustments.



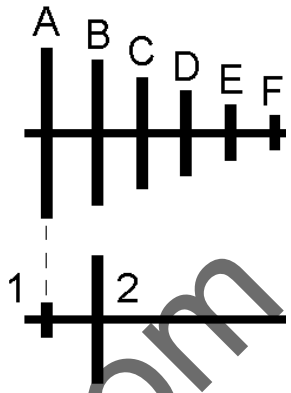
175 litres hopper for 2 rows.

Linking tube to be disconnected for the folding of the planter.



Double discs for fertilizer. To be positionned at 6 – 8 cms from the sowing line.

FERTILIZER



I Set on A1 adjustment.
II Make 100 m
III Use the following formula :

$$\frac{10000}{\text{inter-row spacing (cm)}} \times \text{weight calculated on one outlet (gr)}$$

You obtain the weight/ha. And then you determine the column on the chart corresponding to the ratio used.

Example : - *Inter-row spacing = 30" = 76,2 cm*
- *weight calculated = 533 gr. On ratio 1*

$$\frac{10000}{76,2} \times 533 = 70.000 \text{ gr/ha} = 70 \text{ kg/ha}$$

The column ④ is used = 70 kg/ha, with a choice from 70 to 350 kg/ha according to the adjustment.

	Requirement per Hectare for different fertilizers									
				④						
A1	40	50	60	**70**	80	90	100	110	120	130
B1	45	60	70	**80**	90	105	115	125	140	150
C1	60	80	95	**110**	120	140	160	175	190	205
D1	70	90	110	**125**	140	160	180	195	215	230
A2	75	100	120	**135**	150	175	190	210	230	250
E1	80	105	130	**145**	160	185	205	230	250	270
B2	100	120	140	**160**	180	205	230	250	275	300
F1	110	140	165	**190**	215	245	270	300	325	350
C2	120	160	180	**210**	235	270	300	330	360	390
D2	140	180	210	**240**	270	310	340	380	410	445
E2	160	200	250	**280**	315	360	400	440	480	520
F2	200	250	300	**350**	390	450	500	550	600	650

By means of an initial adjustment (**A1**) for a known surface area, calculate the minimum requirement per hectare for the fertilizer used : 80-90-100-110 etc … kilo/ha. The table will then give the setting (**A1-B1-C1…**) suitable for the required amount per hectare.

IMPORTANT – Fertilizer application rates can vary from the weight calculated in the above chart due to different brands, temperature, humidity, etc… check your manual for procedure to measure your fertilizer to the above chart.

WARNING - Agricultural chemicals can be dangerous. Improper use can result in injury to persons, animals and soil. Handle with care and follow instructions of chemical manufacturer.

MICROSEM

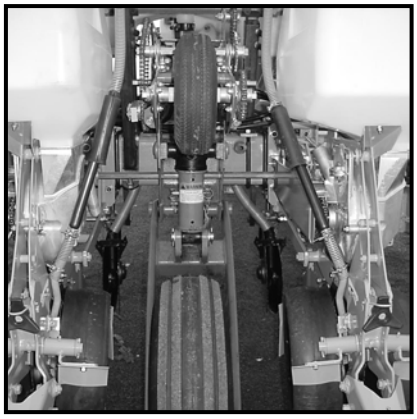
The Microsem is ground driven, and the output set by means of a transmission which is unaffected by a change in planting speed. The Microsem system is mounted to the toolbar frame to reduce weight on the planter unit. Each Microsem hopper has an 18 lt. capacity

Setting of the output = the output is a function of the number of rotations of the spindle of the metering boxes. The drive system is a central drive system which is set primarily with the double sprocket and the interchangeable sprockets the Microsem setting chart will assist with the setting and also indicates the sprockets to be used.

Gearbox assembly

Microsem hopper assembly

Microsem hopper assembly



Microsem tube assembly

ATTENTION : Avoid moisture contamination. This unit should be used only with microgranulars and not with powders or granulates. Agricultural chemicals can be dangerous. Improper use can result in injury to persons, animals and soil. Handle with care and follow instructions of chemical manufacturer.

MICROSEM ADJUSTMENT

1. Put the product in a 2 outlet microgranulator.
2. Position in smallest ration : A = 12
   B = 30 (ratio = 0.24- see here under)
   C = 12
   ↳ (N° Microsem shaft rotations for 1 leading shaft rotation)
3. Make 100 m.
4. Weigh the product recuperated on the two outlets.
5. Use the following formula :

$$\text{Output} = \frac{10 \times \text{quantity weighed (g.)}}{\text{Inter-row (cm)} \times 2}$$

Example : Inter-rows = 60 cm, Quantity weighed = 60 g } Output = $\frac{10 \times 60}{60 \times 2}$ = 5 Kg/ha

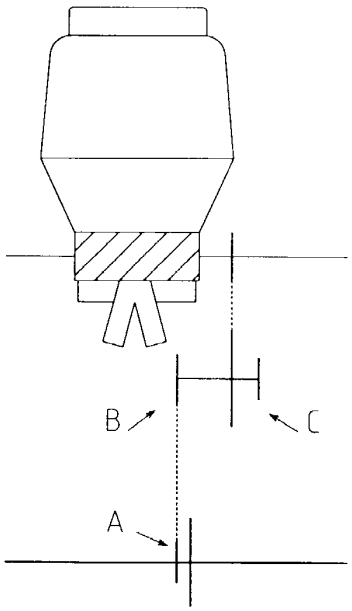
If you require 10 Kg/ha, choose the ratio
2 x 0.24 = 0.48
i.e. : A = 12
B = 15
C = 12

If you require 15 Kg/ha, choose the ratio
3 x 0.24 = 0.72
i.e. : A = 12
B = 15 } The nearest standard
C = 20

Note : Checking when starting up remains essential.

Possible combinations of the sprockets A-B-C	Obtained ratios
12-35-12 teeth	0.21
12-32-12 teeth	0.22
12-**30**-12 teeth	0.24
12-**25**-12 teeth	0.29
12-**22**-12 teeth	0.33
12-20-12 teeth	0.36
12-**18**-12 teeth	0.40
12-16-12 teeth	0.45
12-**15**-12 teeth or 12-25-20	0.48
12-23-20 teeth	0.51
12-22-20 teeth	0.54
12-21-20 teeth	0.57
12-**12**-12 teeth	0.60
25-24-12 teeth	0.63
12-**18**-20 teeth	0.66
25-**22**-12 teeth	0.68
12-10-12 teeth	0.72
25-20-12 teeth	0.75
12-**15**-20 teeth	0.80
25-**18**-12 teeth	0.83
25-16-12 teeth	0.94
25-15-12 teeth or 12-12-20	1
25-**22**-20 teeth	1.13
12-10-20 teeth	1.2
25-**12**-12 teeth	1.25
25-**18**-20 teeth	1.4
25-10-12 teeth	1.5
25-**15**-20 teeth	1.66
25-**12**-20 teeth	2.08
25-10-20 teeth	2.5

Less product ↑ ↓ More product



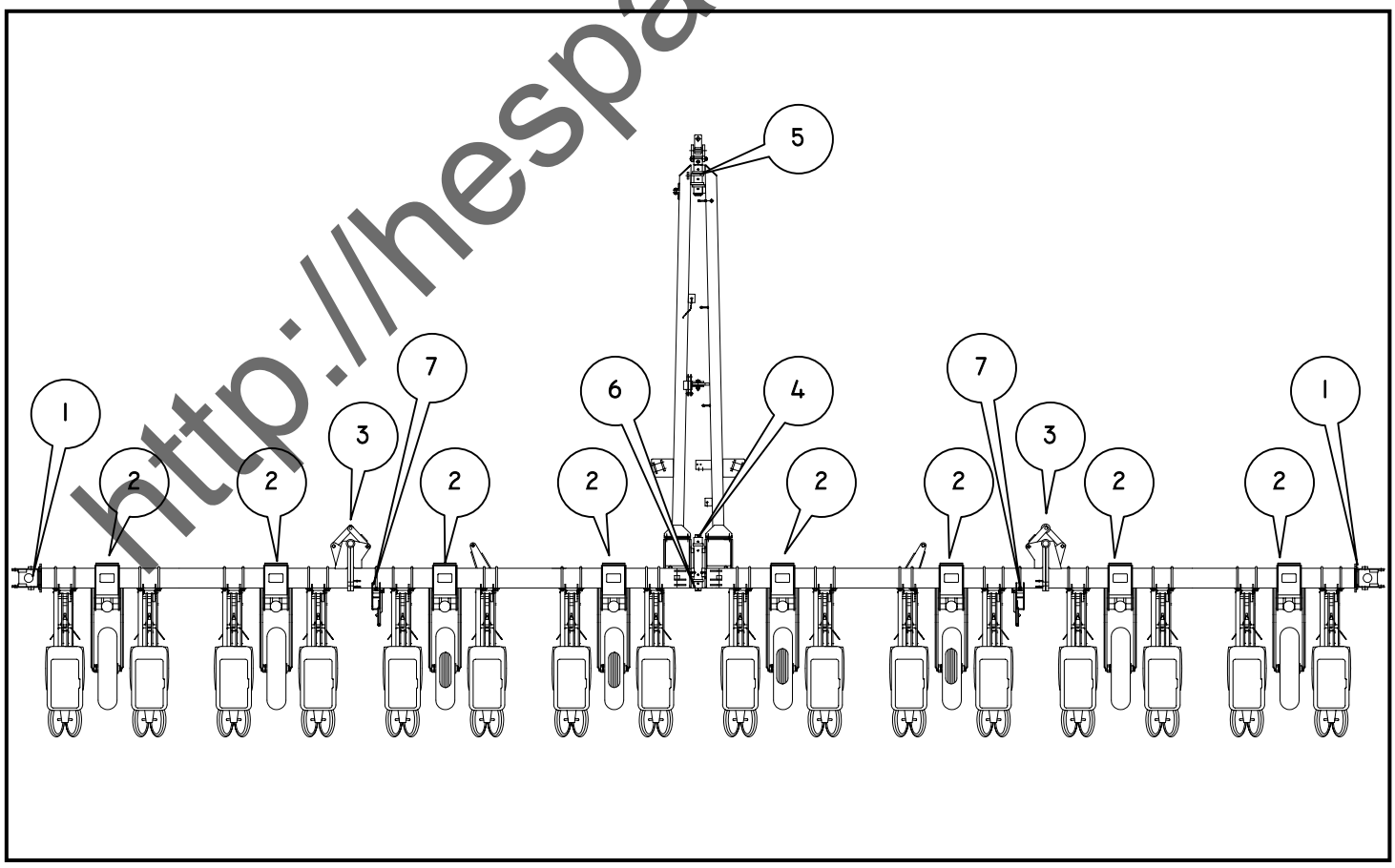
The interchangeable **sprockets B** in bold characters are **delivered as standard (12-15-18-22-25-30 teeth)**, those in ordinary characters are delivered on request (10-11-13-14-16-17-19-20-21-23-24-26-27-32-35 teeth).

WHEEL BEARINGS

All wheel bearings should be repacked annually and checked for wear. This applies to all drive wheels, transport wheels and marker hubs. To check for wear, lift the wheel off the ground. Check for endplay in the bearings by moving the tire in and out. Rotate the tire to check for roughness in the bearings. If bearings sound rough, the hub should be removed and the bearings inspected and replaced if necessary. See “Wheel Bearing Lubrication or Replacement”. To repack wheel hubs, follow the procedure outlined for wheel bearing replacement with the exception that bearings and bearing cups are reused.

DANGER: Always install safety lockups or lower to the ground before working under or around the machine.

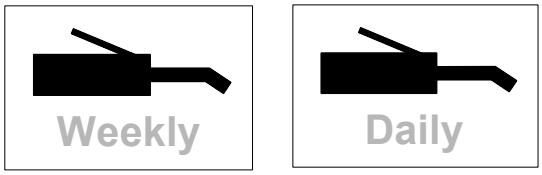
NOTE: Numbers on below illustration correspond to photos on following pages showing lubrication frequencies.



The following pages show the locations of all lubrication points. Proper lubrication of all moving parts will help ensure efficient operation of your MONOSEM planter and prolong the life of friction producing parts.

DANGER : Always install safety lockups or lower to the ground before working under the machine.

LUBRICATION SYMBOLS

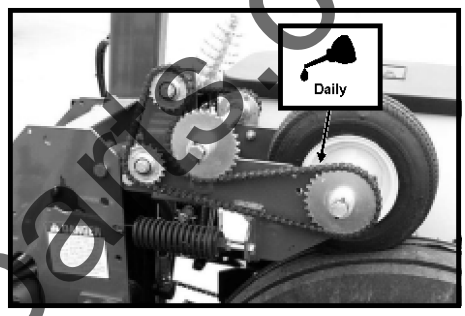


Lubricate at frequency indicated with an SAE multipurpose type grease.

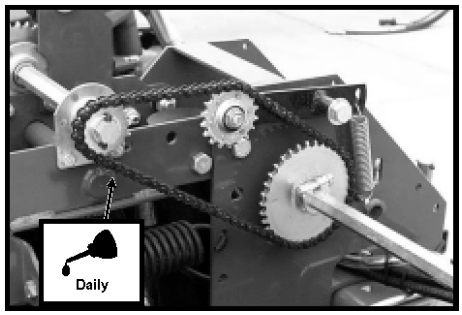
Lubricate at frequency indicated with a high quality SAE 10 weight oil or a quality spray lubricant.

DRIVE CHAINS

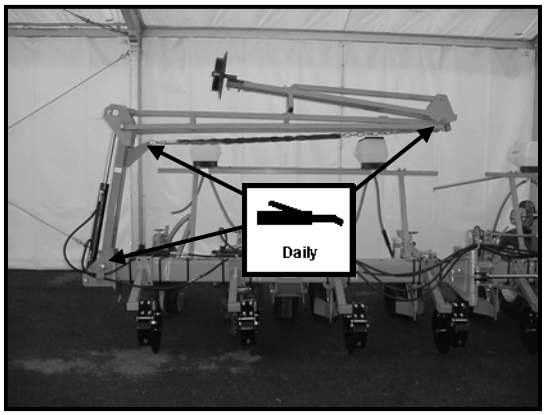
All transmission and drive chains should be lubricated daily with a high quality SAE 10 weight oil or a quality spray lubricant. Extreme operating conditions such as dirt, temperature or speed may require more frequent lubrication. If a chain become stiff, it should be removed, soaked and washed in solvent to loosen and remove dirt from the joints. Then soak the chain in oil so the lubricant can penetrate between the rollers and bushings.



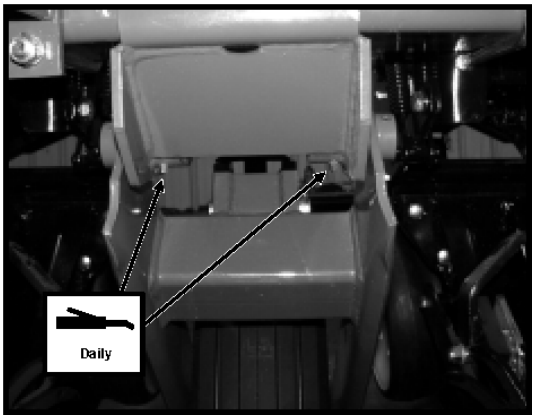
Contact drive chain



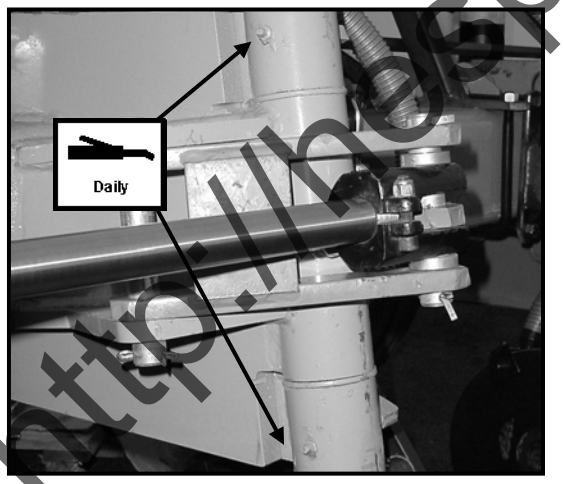
Jack shaft chain



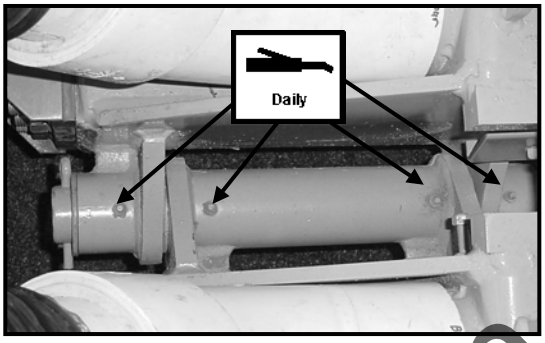
1.Marker Assemblies : 3 Greasers per assembly.



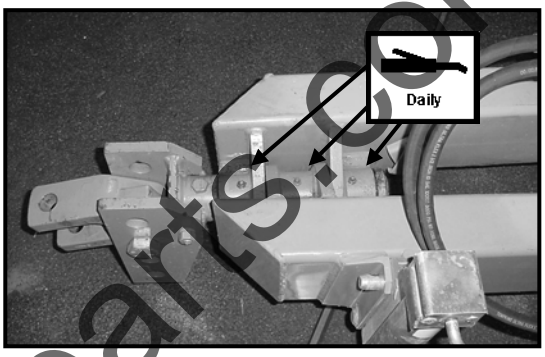
2. Wheel pivots : 2 Greasers per wheel module.



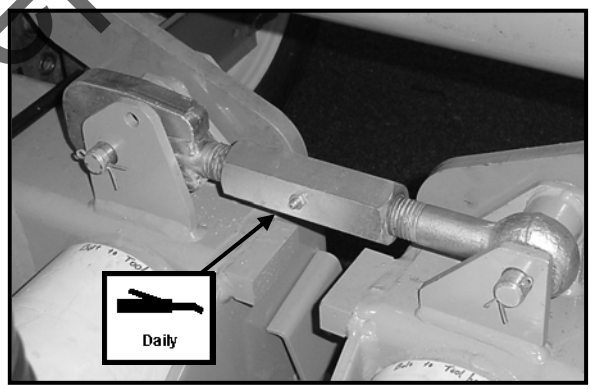
3. Wing hinges : 2 Greasers per wing.



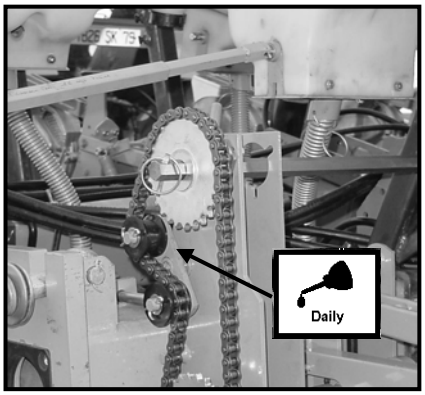
4. Center frame flex pin : 4 Greasers.



5. Hitch flex pin : 3 Greasers.



6. Turnbuckle : 1 Greaser.



7. Transmission Assemblies: 1 Greaser (Idler).

MARKER SEQUENCING/FLOW CONTROL VALVE INSPECTION

The valve block assembly consists of the marker sequencing and flow control valves in one assembly. The sequencing valve portion consists of a chambered body containing a spool and series of check valves to direct hydraulic oil flow. Should the valve malfunction, the components may be removed for inspection.

1. Remove valve block assembly from planter.
2. Remove detent assembly and port adapter assemblies from rear of valve block.

IMPORTANT: Damage to the spool may occur if the detent assembly and port adapter assemblies are not removed prior to removal of the spool.

3. Remove plug from both sides of valve block and remove spool.

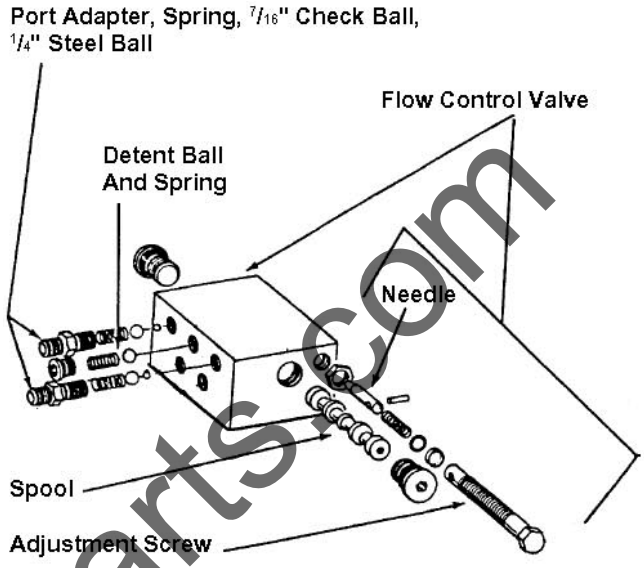
4. Inspect all parts for pitting, contamination or foreign material. Also check seating surfaces inside the valve. Replace any parts found to be defective.

5. Lubricate spool with a light oil and re-install. Check to be sure spool moves freely in valve body.

IMPORTANT: Make sure correct check ball(s) and spring are installed in each valve bore upon reassembly.

A flow control valve is located on each side of the block assembly. The flow control valves should be adjusted for raise and lower speed as part of the assembly procedure or upon initial operation. If the valve fails to function properly or requires frequent adjustment, the needle valve should be removed for inspection. Check for foreign material and contamination. Be sure needle moves freely in adjustment screw. Replace any components found to be defective.

NOTE: When oil is cold, hydraulics operate slowly. Make sure all adjustments are made with warm oil.



TROUBLE SHOOTING AND CAUSES

Excessive skipping :

- Transfer scraper too low (incorrect setting on indicator).
- Transfer scraper is bent (no flat).
- Seed disc is bend or worn.
- Transfer scraper is dirty with chemical product.
- Plastic wear surface of metering box warped or used up.
- Holes of seed disc too small (do not match).
- Holes of seed clogged (sugarbeets, rapeseed, cabbage). To be double checked from time to time.
- Excessive working speed.
- Defective vacuum hoses.
- Insufficient vacuum suction.
- PTO speed is to low.
- Foreign material mixed with seed.
- Seed blockage in the hopper (seed treatment product too moist).
- Fan belt is too loose.

Excessive Doubling :

- Transfer scraper too high (bad setting on indicator).
- Transfer scraper worn.
- Holes seed disc too large (do not fit).
- Excessive PTO speed.
- Excessive working speed.
- Seed level too high in the metering box.

Irregular Seeding (skipping-doubles) :

- Excessive working speed.
- Holes of seed disc too large (cut off seeds).
- Field are too steep.
- Shutter adjusted incorrectly.
- Ejector is damaged.

Irregular spacing :

- Excessive working speed.
- Soil too wet and stricking to drive wheel tires.
- Incorrect tire pressure
- Shutter adjusted incorrectly.

Safety slipcluch is actived :

- Seizing of metering box
- Foreign material in the seed.
- Blockage in transmission units.

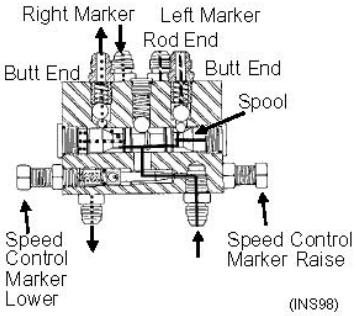
Fertilizer :

- Foreign material in fertilizer.
- Clods/clumps in fertilizer.
- Clogging of outlet or chute caused by moisture.
- Auger is defective (warped).

Microsem (Output varies between chutes and cases) :

- Foreign material mixed with product.
- Attention : moisture in product.
- Improper assembly of metering unit (auger reversed).
- Outlet chute unit warped.
- Hose clogged because too long or bent.

MARKER OPERATION TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	SOLUTION
Same marker always operating.  	Spool in sequencing valve not shifting.	Remove spool. Inspect for foreign material, making sure all ports in spool are open. Clean and reinstall.
Both markers lowering and only one raising at a time.	Hoses from cylinders to valve connected backwards.	Check hosing diagram in manual and correct.
Both markers lower and raise at same time	Foreign material under check ball in sequencing valve.	Remove hose fitting, spring and balls and clean. May be desirable to remove spool and clean as well.
	Check ball missing or installed incorrectly in sequencing valve.	Disassemble and correct. See above illustration.
Marker (in raised position) settling down.	Damaged o-ring in marker cylinder or cracked piston.	Disassemble cylinder and inspect for damage and repair.
	Spool in sequencing valve not shifting completely because detent ball or spring is missing.	Check valve assembly and install parts as needed.
	Spool in sequencing valve shifting back toward center position.	Restrict flow of hydraulic oil from tractor to sequencing valve.
Neither marker will move.	Flow control closed too far.	Loosen locking nut and turn flow control adjustment bolt out or counterclockwise until desired speed is set.
Markers moving too fast.	Flow control open too far.	Loosen locking nut and turn flow control adjustment bolt in or clockwise until desired speed is set.
Sporadic marker operation speed.	Needle sticking open in flow control valve.	Remove flow control, inspect and repair or replace.

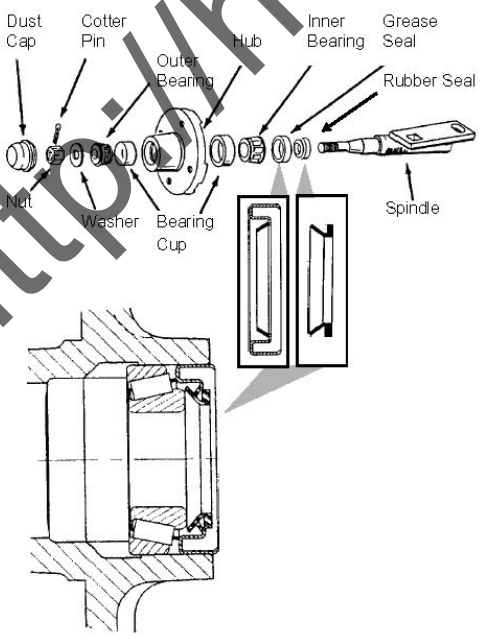
LIFT CIRCUIT OPERATION TROUBLESHOOTING

PROBLEM	POSSIBLE CAUSE	TROUBLESHOOTING*	SOLUTION
Planter raising uneven.	Master cylinder is leaking.	With turnbuckle off, raise planter **slowly** until master cylinder reaches end of stroke. If master cylinder is leaking it will lag behind the slave cylinder, causing the tire to squat less. If planter settles when hydraulic lever is released, check assist cylinders.	Check for contamination in rephasing valve in piston. Prior to removing rephasing valve, measure the set screw setting by turning the set screw clockwise and counting the revolutions until it bottoms out. After cleaning rephasing valve, bottom the screw out and back it out the same number of revolutions as the original setting. Replace rephasing valve and adjust as stated above or replace piston. Install seal kit. Consult your KINZE® Dealer for leak testing and rephasing valve adjustment if necessary.
	Slave cylinder is leaking.	With turnbuckle off, raise and lower planter. As planter lowers, the side with leaking slave cylinder will drop rapidly. With turnbuckle on, install wheel lockups on master and assist cylinders. Retract slave cylinder and observe which tire settles. If planter settles when hydraulic lever is released, check assist cylinders.	Check for contamination in rephasing valve in piston. Prior to removing rephasing valve, measure the set screw setting by turning the set screw clockwise and counting the revolutions until it bottoms out. After cleaning rephasing valve, bottom the screw out and back it out the same number of revolutions as the original setting. Replace rephasing valve and adjust as stated above or replace piston. Install seal kit. Consult your KINZE® Dealer for leak testing and rephasing valve adjustment if necessary.
Planter raising even; however, planter settles when hydraulic lever is released.	Assist cylinder is leaking.	With turnbuckle on, install lockups on the master cylinder and slave cylinders. Retract assist cylinder and observe which tire settles.	Seal on piston is leaking. Install seal kit.

* Operate hydraulics slowly to accentuate the problem . Rephase after each lowering cycle.

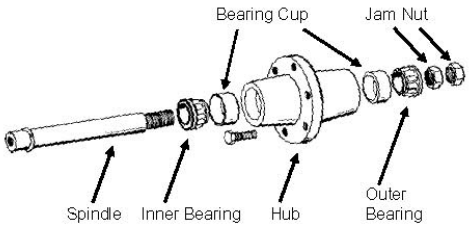
MARKER BEARING LUBRICATION OR REPLACEMENT

1. Remove marker blade.
2. Remove dust cap from hub.
3. Remove cotter pin, nut and washer.
4. Slide hub from spindle.
5. Remove bearings and cups and discard if bearings are being replaced. Clean hub and dry. Remove bearings only and not cups if repacking.
6. Press in new bearing cups with thickest edge facing in. (Bearing replacement procedure only.)
7. Pack bearings with heavy duty wheel bearing grease thoroughly forcing grease between roller cone and bearing cage. Also fill the space between the bearing cups in the hub with grease.
8. Install rubber seal into grease seal. Place inner bearing in place and press in new rubber seal/grease seal.
9. Clean spindle and install hub.
10. Install outer bearing, washer and slotted hex nut. Tighten slotted hex nut while rotating hub until there is some drag. This assures that all bearing surfaces are in contact. Back off slotted nut to nearest locking slot and install cotter pin.
11. Fill dust caps approximately 3/4 full of wheel bearing grease and install on hub.
12. Install blade and dust cap retainer on hub and tighten evenly and securely.

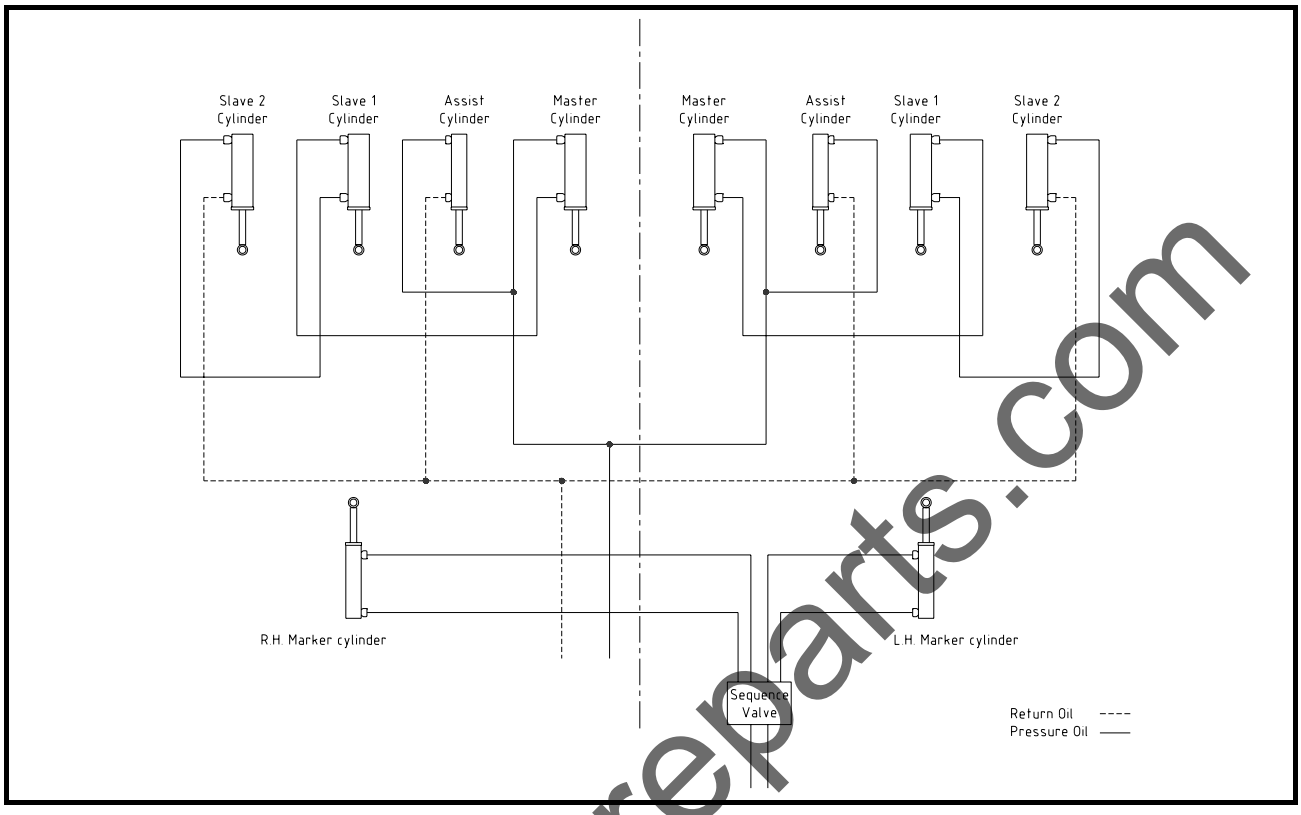


WHEEL BEARING LUBRICATION OR REPLACEMENT

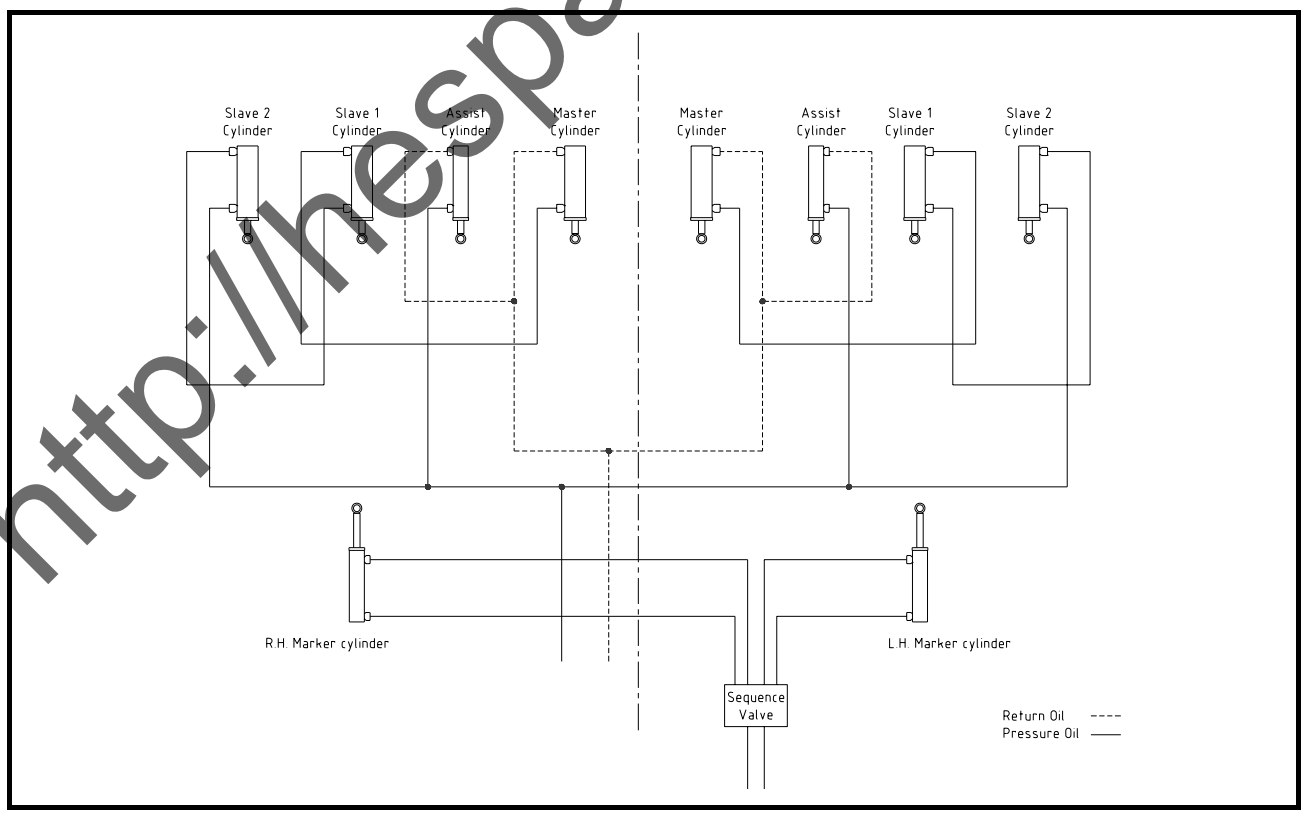
1. Raise tire clear of ground and remove wheel.
2. Remove double jam nuts and slide hub from spindle.
3. Remove bearings and cups and discard if bearings are being replaced. Clean hub and dry. Remove bearings only and not cups if repacking.
4. Press in new bearing cups with thickest edge facing in. (Bearing replacement procedure only.)
5. Pack bearings with heavy duty wheel bearing grease thoroughly forcing grease between roller cone and bearing cage. Also fill the space between the bearing cups in the hub with grease.
6. Place inner bearing in place.
7. Clean spindle and install hub.
8. Install outer bearing and jam nut. Tighten jam nut while rotating hub until there is some drag. This assures that all bearing surfaces are in contact. Back off jam nut 1/4 turn or until there is only slight drag when rotating the hub. Install second jam nut to lock against first.
9. Install wheel on hub and tighten evenly and securely.



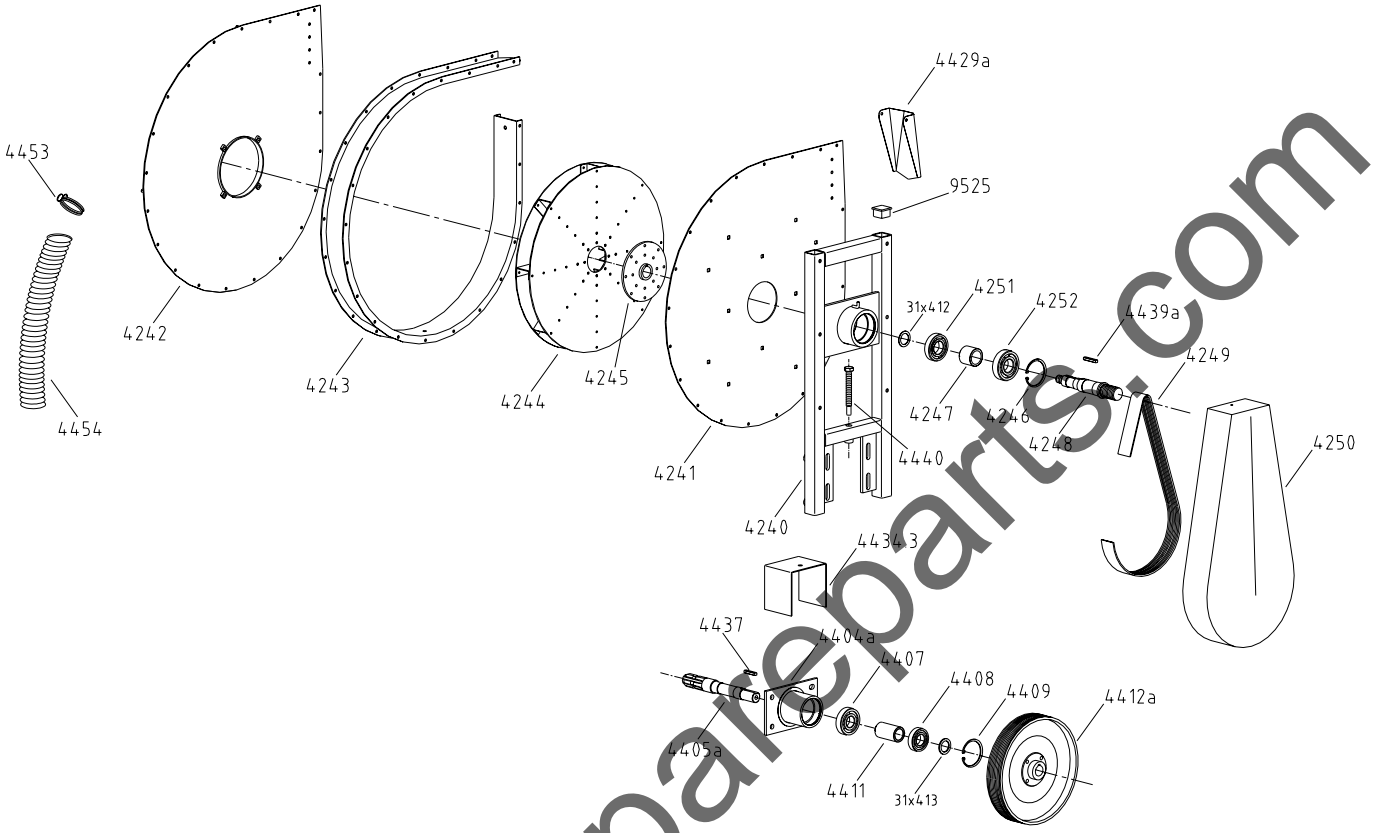
HYDRAULIC SYSTEM SCHEMATIC Planter Raising



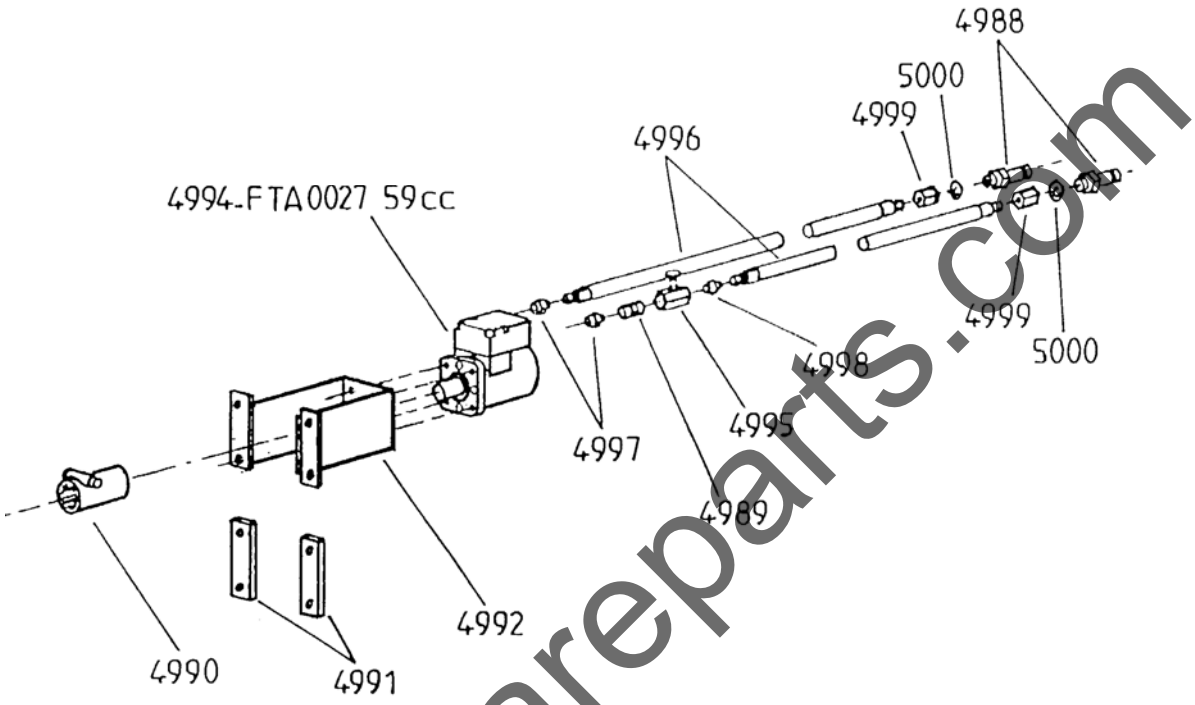
HYDRAULIC SYSTEM SCHEMATIC Planter Lowering



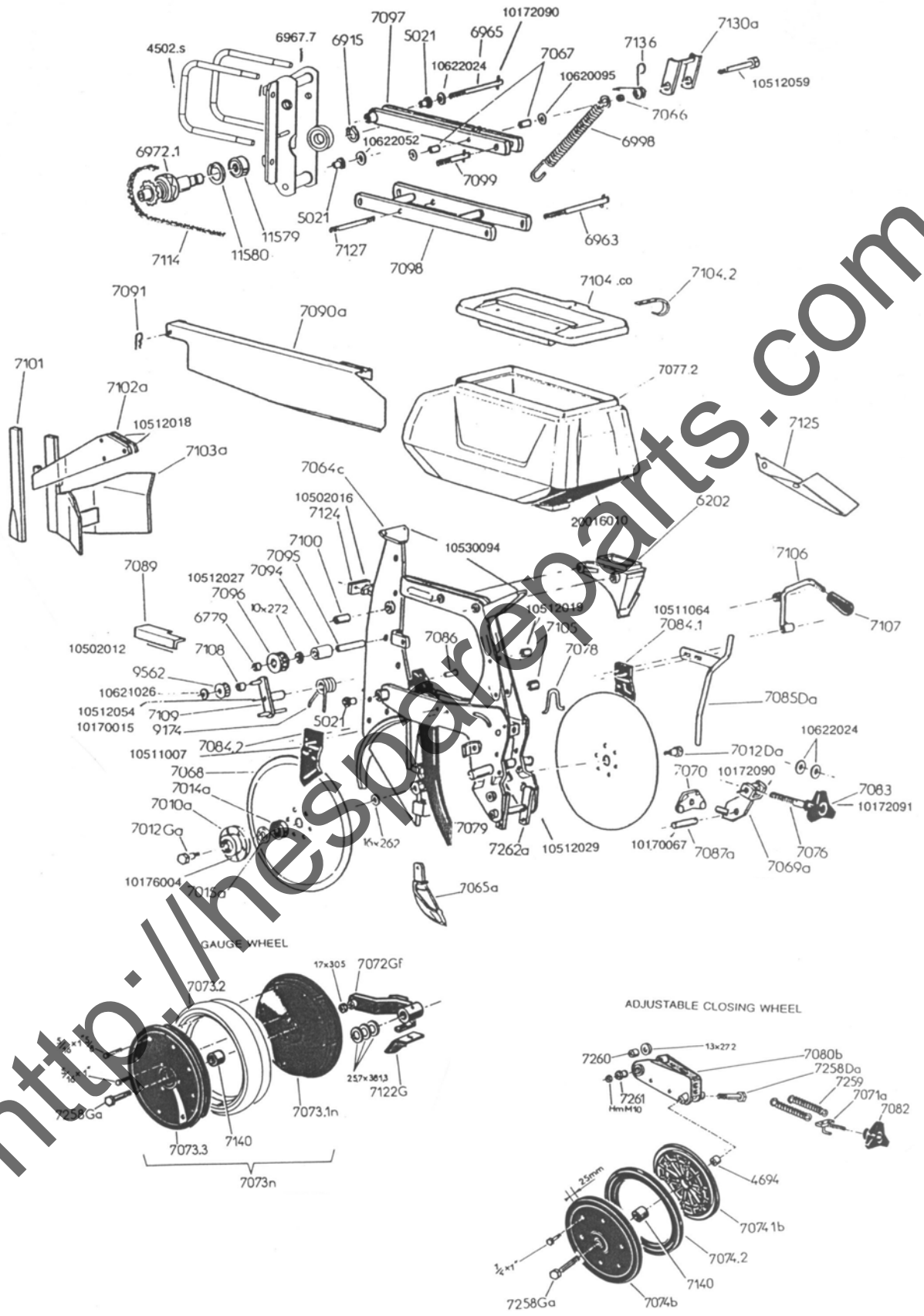
SPARE PARTS



PART NO.	DESCRIPTION
4240	SUPPORT FRAME EXTRA HI-OUTPUT TURBOFAN
4241	TURBOFAN HOUSING DRIVE BELT SIDE
4242	TURBOFAN HOUSING MANIFOLD SIDE
4243	FRAME BAND, EXTRA HI-OUTPUT TURBOFAN
4244	TURBOFAN BLADE, EXTRA HI-OUTPUT TURBOFAN
4245	SUPPORT DISC, EXTRA HI-OUTPUT TURBOFAN
4246	SNAPRING
4247	BUSHING
4248	SPINDLE
4249	PULLEY BELT, 540 RPM
4249.1	PULLEY BELT, 1000 RPM
4250	COVER SHIELD
4251	BEARING, UPPER SPINDLE (62072RS)
4252	BEARING, UPPER SPINDLE (63072RS)
4404.A	EXTRA HI-OUTPUT TURBOFAN SUPPORT BRACKET
4405.A	SPINDLE WITH ADAPTOR
4407	BEARING 62 MM (62062RS)
4408	BEARING 72 MM (63062RS)
4409	SNAPRING (LARGE)
4411	BUSHING
4412.A	PULLEY 500 RPM 11 ⅜” DIA.
4412.1A	PULLEY 1000 RPM 5 ⅞” DIA.
4429.A	OUTPUT SHIELD
4434.3	SAFETY SHIELD
4437	LOCK KEY 8X7X40
4439.A	LOCK KEY 6X6
4440	BOLT TO ADJUST BELT TENSION
4450	MANIFOLD, 12 HOLE
4453	HOSE CLAMP
4454	VACUUM HOSE, SPECIFY LENGTH
9525	END CAP, SUPPORT FRAME
31X412	WASHER
31X413	WASHER



PART NO.	QTY.	DESCRIPTION
4988	2	PUSH-PULL CMC ½
4989	1	MGCYL FITTING – ½ X FJ ⅞
4990	1	COUPLING SLEEVE
4991	2	BLOCK FOR STANDARD TURBOFAN
4992	1	HYDRAULIC MOTOR BRACKET
4994	1	HYDRAULIC MOTOR WITH VALVE 59 CC – FTA0027
4995	1	UNIDIRECTION CHOKE ½
4996	2	HOSE ½ LG.4 M
4997	2	UNION MSAE ¾ X MLIC ⅞
4998	1	UNION MGCYL ½ X MJ ⅞
4999	2	UNION UM 15L X ½ GCYL NU
5000	2	BUSHING BS ½



PART NO.	DESCRIPTION
4502.S	U BOLT, 7X7
5021	BUSHING (B25)
5681.B	SCRAPER SPRING, TENSION
6090	SNAPRING 6 MM
6202	COLLAR BRACE FOR COVER
6463	PIN, 6 MM DIA. X 65 MM LENGTH
6779	BUSHING SELF-LUBRICATING
6795	WING NUT, 8 MM
6915	SNAPRING, 30 MM
6963	PIVOT PIN REAR, LOWER PARALLEL LINKAGE
6965	PIVOT PIN FRONT, UPPER PARALLEL LINKAGE
6967.7	CLAMP FACING, 7X7
6972.1	SAFETY CLUTCH
6998	SPRING
7012.DA	REMOVAL RIGHT-HAND SPINDLE
7012.GA	REMOVAL LEFT-HAND SPINDLE
7014.A	BEARING
7048.A	BUSHING, SHOULDERED
7049	SPRING
7064.C	MAIN FRAME, NG PLUS 2
7065	INTERCHANGEABLE CAST POINT
7065.A	V-SLICE INSERT
7065.S	V SHOE INSERT, SMALL SEED
7067	SPACERS FOR UNIT LOCK UP
7068.CO	OPENING DISC COMPLETE
7068	OPENING DISC Ø380 MM
7010.A	DISC HUB, USES 6X22 RIVETS
7014.A	DISC BEARING (3204-2RS)
7015.A	WASHER (6204ID)
7069.A	ADJUSTABLE BLOCK FOR DEPTH CONTROL
7070	SWING BRACKET
7076	ROD FOR PRESSURE ADJUSTMENT
7077.2	PLASTIC HOPPER, 60 L
7078	WIRESTOP DEPTH ROD
7079	BLANK TUBE
7079.2	STANDARD TUBE WITH SENSOR
7079.1	STANDARD TUBE ONLY
D1700270S1	STANDARD SENSOR ONLY
7079.2S	STANDARD TUBE WITH SENSITIVE SENSOR
7079.4	TUBE FOR SMALL SEED ONLY
D2440891S1	SENSITIVE SENSOR ONLY
7079.3S	PEANUT TUBE WITH SENSOR
7079.3	PEANUT TUBE ONLY
D1700270S1	STANDARD SENSOR ONLY
7083	HANDWHEEL DEPTH CONTROL
7084.1	RIGHT OUTSIDE SCRAPER
7084.2	LEFT OUTSIDE SCRAPER
7085.DA	INSECTICIDE DROP TUBE, RIGHT
7085.GA	INSECTICIDE DROP TUBE, LEFT
7086	PIN SEED TUBE
7087.A	PIN FOR ADJ. BLOCK DEPTH CONTROL, USES TWO 5X40 SPLIT PINS
7089	SMALL CHAIN SHIELD
7090.A	CHAIN GUARD
7091	HAIR PIN
7094	BUSHING
7095	PIVOT PIN
7096	CHAIN ROLLER
7097	UPPER PARALLEL LINKAGE ARM
7098	LOWER PARALLEL LINKAGE ARM
7099	PIVOT PIN REAR, UPPER PARALLEL LINKAGE ARM
7100	SELF-LUBRICATING BUSHING
7101	FRONT BRACE CLOD REMOVER
7102.A	CLOD REMOVER BRACKET

PART NO.	DESCRIPTION
7103.A	CLOD REMOVER
7104.CO	LID PLASTIC HOPPER, WITH SPRING CLIP
7104.2	SPRING CLIP
7105	SPACERS FOR UNIT
7106	METAL HANDLE FOR UNIT LOCK UP
7106.ASY	HANDLE FOR UNIT LOCK UP
7107	PLASTIC HANDLE FOR UNIT LOCK UP
7108	BUSHING
7109	CHAIN TIGHTENER
7114	DRIVE CHAIN METERING UNIT (124 LINKS)
7124	UNIT STOP
7125	SEED CHUTE
7127	THREADED ROD
7130.BASY	UNIT LOCK UP ASSEMBLY W/HANDLE
7130.A	UNIT LOCK UP
7066	BUSHING
7136	SPRING
7262.A	REAR SPACER
7269	INTERMEDIATE PRESS WHEEL, SS
7271	BRACKET, INTERMEDIATE PRESS WHEEL
7272	BRACKET, SCRAPER PIVOTING
7273	BRACKET, SCRAPER MOUNTING
7274	SCRAPER GREENFLEX
7275	SHOULDERED BOLT, BRACKET PIVOTING
7276	LOCKUP STOP
7278	RETAINING RING, BEARING
11579	BEARING (30X55X13)
11580	SNAPRING (I55)

HARDWARE :

F38664	HEX METRIC 10X70
F40166	HEX NUT, 10 MM
10170015	2,5X5 COTTER PIN
10502012	10X15 BOLT
10502016	10X25 BOLT
10511007	6X100 BOLT
10511064	8X70 BOLT
10512018	10X35 BOLT
10512019	10X40 BOLT
10512027	10X100 BOLT
10512029	10X120 BOLT
10512054	12X70 BOLT
10512059	12X120 BOLT
10530094	6X20 BOLT
10170065	5X30 COTTER PIN
10170067	5X40 COTTER PIN
10172090	6X25 ROLL PIN
10172091	6X30 ROLL PIN
10176004	6X22 RIVET
10620095	10X27X2 WASHER
10621026	13X18X2 (12X18X2) WASHER
10622024	16.5X26X1 (16X26X1) WASHER
10622026	16.5X20X2 (16X26X2) WASHER
10622052	17X50X1 (16X50X1) WASHER
20016010	7X41 WASHER

GAUGE WHEEL :

7072.DF	GAUGE WHEEL ARM, RIGHT-HAND
7072.GF	GAUGE WHEEL ARM, LEFT-HAND
7073.N	NYLON GAUGE WHEEL COMPLETE
7073.2	TIRE ONLY
7122.D	GAUGE WHEEL SCRAPER, RIGHT HAND
7122.G	GAUGE WHEEL SCRAPER, LEFT HAND
900125	BEARING, 40 MM
30513015	RIGHT-HAND 16X80 BOLT
30513115	LEFT-HAND 16X80 BOLT

ADJUSTABLE CLOSING WHEEL :

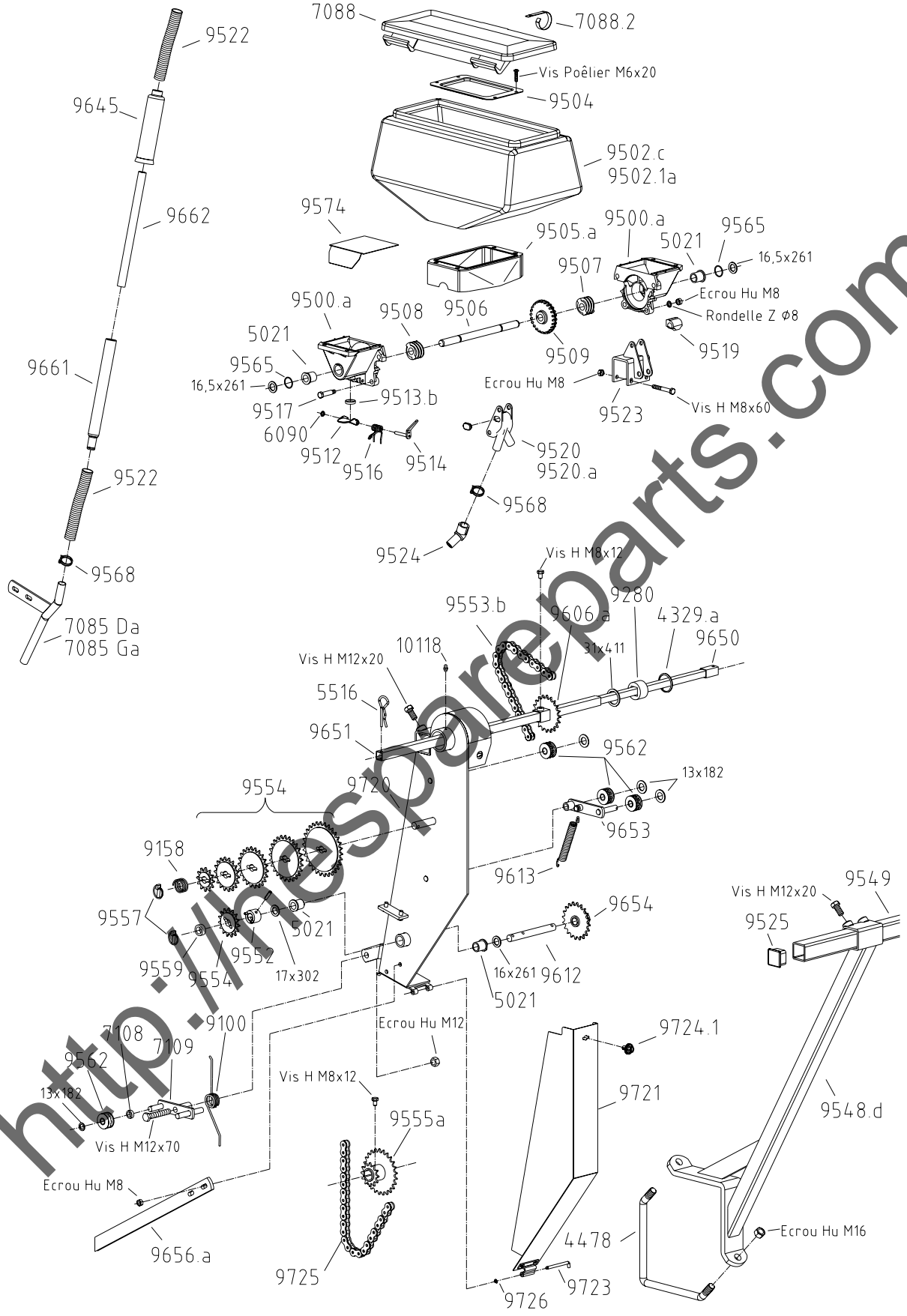
7071.A	TENSION ROD
7074.NASY	COMPLETE ADJ. CLOSING WHEEL W/BRACKET
7074.N	COMPLETE ADJ. CLOSING WHEEL
7074.1B	HALF ADJ. CLOSING WHEEL
7074.2	TIRE, CLOSING WHEEL, 1X12
7080.B	BRACKET ADJ. CLOSING WHEEL
7082	HANDWHEEL PRESSURE CONTROL
7259	SPRING
7260	STOP WASHER
7261	NUT
F38709	12X45 BRACKET MOUNTING BOLT
F40165	12 MM HEX NUT
F13005	HSC ¼ - 20X1Z5
10621046	13X27X2 WASHER
900125	BEARING, 40 MM
900159	BUSHING
30513015	RIGHT-HAND MOUNTING BOLT
30513115	LEFT-HAND MOUNTING BOLT

PART NO.	DESCRIPTION
4329.A	SNAPRING
5692	WING NUT, 10 MM
6077	LYNCH PIN
6089	RUBBER RING
6090	SNAPRING 6 MM
6092	SPRING (R132)
6200.A	HOUSING FOR METERING BOX ONLY
6201	COVER
6202	COLLAR BRACE FOR COVER
6203.A	PLASTIC INSERT
6204.A	BRONZE INJECTOR BLOCK ASSEMBLY WITH 6X10 SCREW
6205	CONTROL WINDOW
6206	TIGHTENING CAP
6207	SHAFT METERING BOX
6208	TIGHTENING ROD COVER
6209.A	BRACE FOR PLASTIC INSERT
6210	PRESSURE PIN SCRAPER
6211	STANDARD SCRAPER
6211.2A	SCRAPER USE WITH PEANUTS, LARGE SEED
6212.A	AGITATOR, BRASS (STANDARD)
6213	SNAPRING (E20)
6214	TRAP DOOR
6215	SPRING FOR TRAP DOOR
6216	FIXED PIN SCRAPER
6217	ADJUSTABLE PIN SCRAPER
6218	PRESSURE SPRING
6219	PIN CONTROL WINDOW
6221	BEARING
6222	HARDWARE FOR 6212.A AGITATOR
6225	CASING FOR EJECTOR BLOCK SPRING
6227	SPRING, SELECTOR HANDLE
6228	SELECTOR HANDLE
6230.A	REMOVABLE PLUG
6232	GASKET INSIDE METERING BOX COVER
6233	GATE INSIDE METERING BOX COVER
6233.1	SPECIAL PLATE FOR SMALL SEED
6235	COMPLETE COVER, STANDARD
6235.M	PEANUT COVER, COMPLETE
6238	EJECTOR, PEANUT
7110	SPROCKETS, 27 TOOTH
7115	SPROCKET, 26 TOOTH
7117	DUAL SPROCKET, 26-12 TOOTH
9999.NG	METERING BOX COMPLETE, NG
9999.NG+	METERING BOX COMPLETE, NG+
10072094	SCREW, FOR METERING BOX BRACE, 6209.A
10530060	SCREW, PHILLIPS HEAD, 5X10
10172043	ROLL PIN, 4X35
10172099	ROLL PIN, 6X70
10173022	ROLL PIN, 8X50

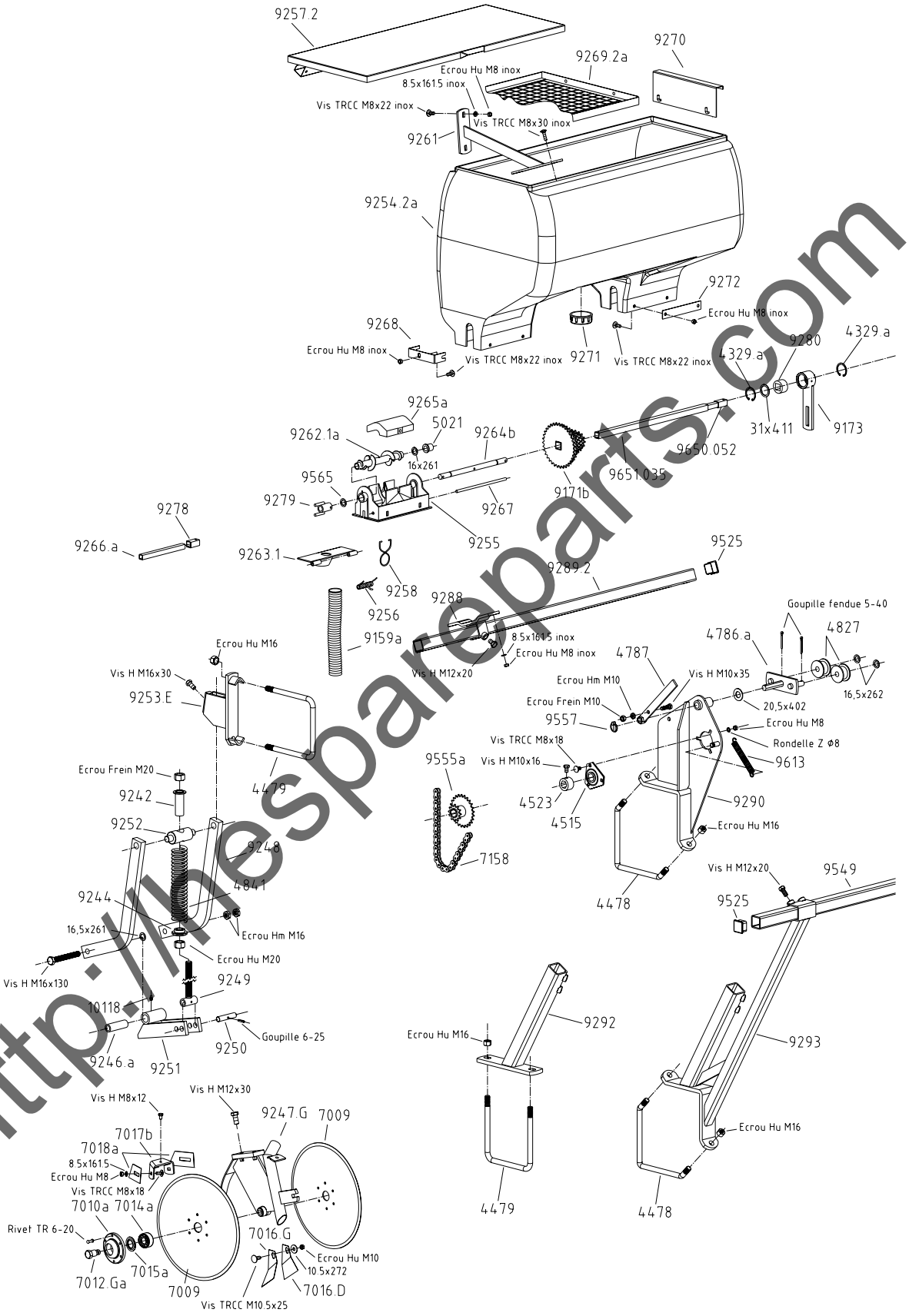
Standard seed discs, complete with agitator :

DC0325	3 hole, 2.5 mm, melons, low population
DC3x2x2.5	3 hole, 2.5 mm, melons, double seed drop
DC0335	3 hole, 3.5 mm, pumpkin, low population
DC0625	6 hole, 2.5 mm, melons, medium population
DC0635	6 hole, 3.5 mm, pumpkin, low population
DC0925	9 hole, 2.5 mm, melons, high population
DC0930D	9 hole, 3.0 mm, hilldrop cotton, double seed drop
DC0930T	9 hole, 3.0 mm, hilldrop cotton, triple seed drop
DC0935	9 hole, 3.5 mm, pumpkin, high population
DC1225	12 hole, 2.5 mm, sunflower, low population (oils & confection)
DC1230D	12 hole, 3.0 mm, hilldrop cotton, double seed drop
DC1230T	12 hole, 3.0 mm, hilldrop cotton, triple seed drop
DC1820	18 hole, 2.0 mm, cucumber, hand harvest
DC1825	18 hole, 2.5 mm, sunflower, high population (oils & confection)
DC1850	18 hole, 5.0 mm, corn, low population
DC2437	24 hole, 3.7 mm, sweetcorn, small seed
DC2445	24 hole, 4.5 mm, sweetcorn, large seed
DC2450	24 hole, 5.0 mm, corn, medium population
DC3016	30 hole, 1.6 mm, sugarbeets, small-medium
DC3020	30 hole, 2.0 mm, pickles, machine harvest
DC3050	30 hole, 5.0 mm, corn, high population
DC3065	30 hole, 6.5 mm, kidney beans, large peanuts
DC3610	36 hole, 1.0 mm, onion, low population
DC3612	36 hole, 1.2 mm, cabbage/cauliflower/pepper/tomato, low population
DC3622	36 hole, 2.2 mm, sorghum, low population
DC3635	36 hole, 3.5 mm, cotton, low population
DC3660	36 hole, 6.0 mm, peanut/beans, large
DC3665	36 hole, 6.5 mm, peanut (large, jumbo) Beans (large kidney)
DC4016	40 hole, 1.6 mm, sugarbeets, small, medium, large
DC4020	40 hole, 2.0 mm, sugarbeets, medium, large pellets
DC4060	40 hole, 6.0 mm, peanut, small to medium
DC4850	48 hole, 5.0 mm, beans, large (pinto)
DC6035	60 hole, 3.5 mm, beans, small (navy)
DC6045	60 hole, 4.5 mm, beans medium, (snap) & soybeans (pinto)
DC7210	72 hole, 1.0 mm, onion, high population
DC7212	72 hole, 1.2 mm, cabbage/cauliflower/pepper/tomato, high population
DC7222	72 hole, 2.2 mm, sorghum, high population
DC7235	72 hole, 3.5 mm, cotton, high population

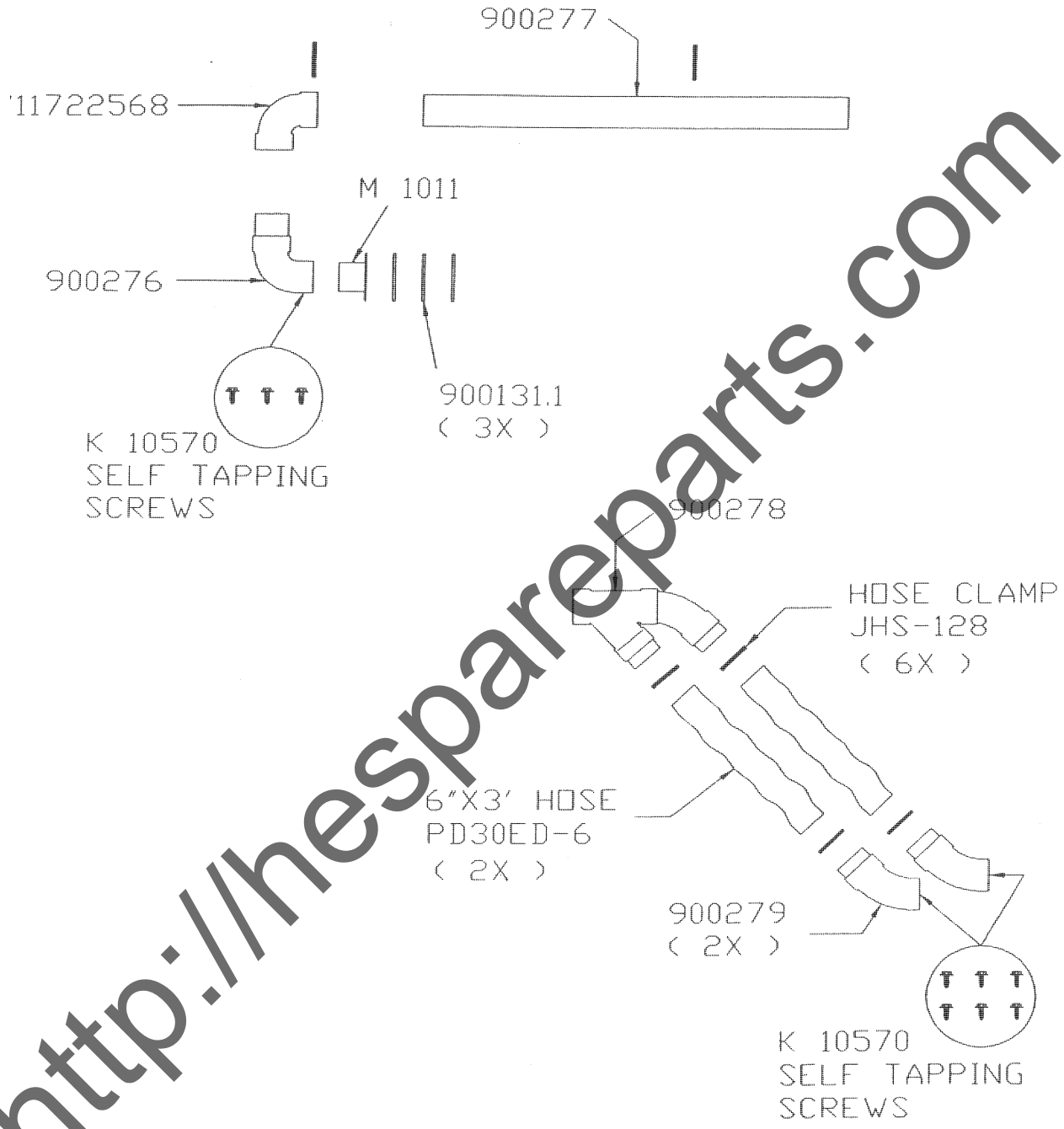
DN….. Seed disc only (stainless portion with holes) less agitator, order seed disc number preceded by DN

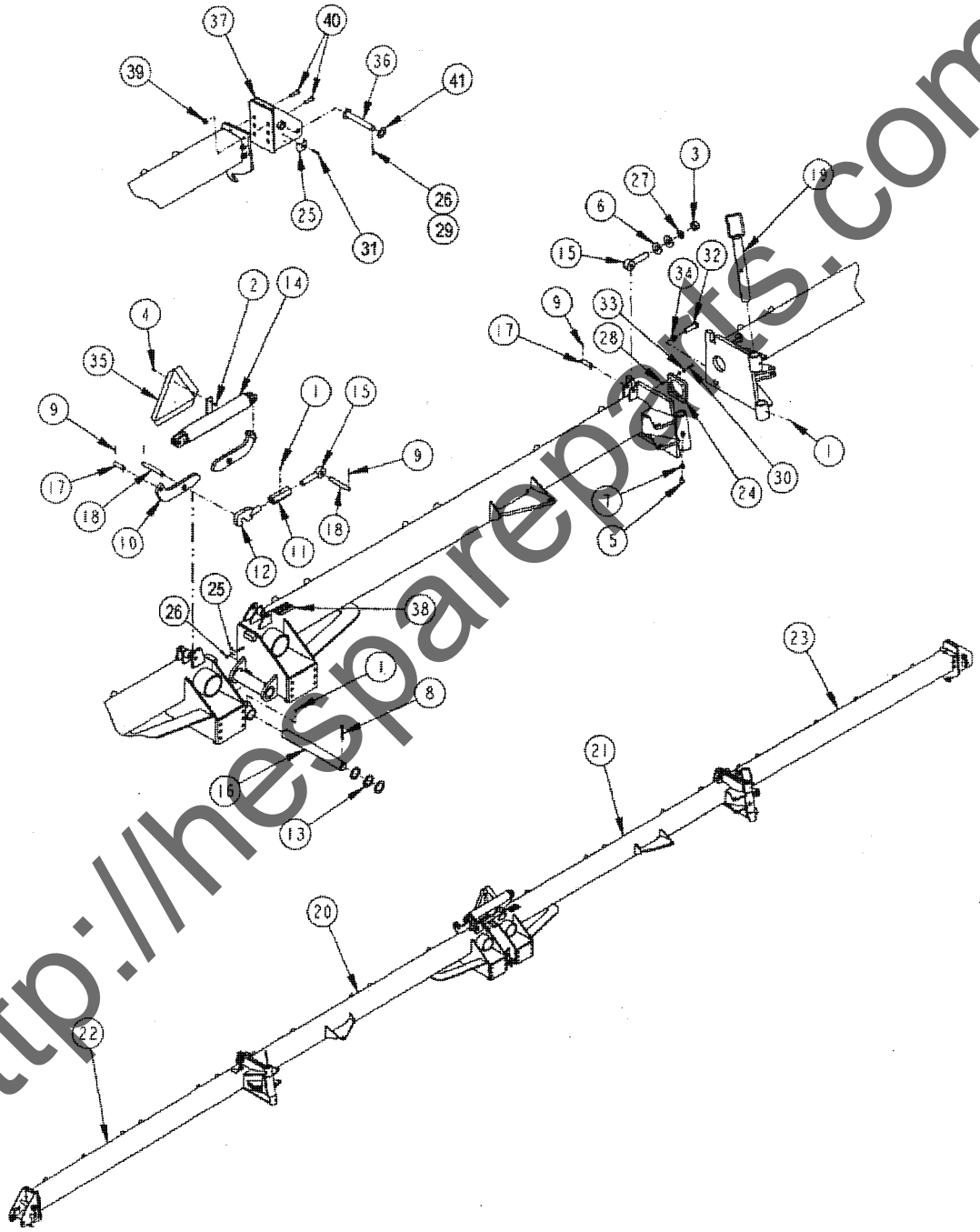


PART NO.	DESCRIPTION
4329.A	SNAPRING
4478	V BOLT Ø16, 7 X 7
4821	PART FOR HYDRAULIC TUBE HOLDING
5021	BUSHING (B25)
5516	HAIR PIN
6090	SNAPRING, 6MM
7085.DA	INSECTICIDE DROP TUBE, RIGHT
7085.GA	INSECTICIDE DROP TUBE, LEFT
7088	HOPPER LID, 25 LT.
7088.2	CLIP FOR HOPPER LID
7108	SPACER BUSHING
7109	NG PLUS UNIT IDLER
7158	MICROSEM DRIVE CHAIN 7X7, LOWER 70 LINKS
9158	SPRING (R57)
9174	TENSION SPRING
9280	BUSHING
9500.A	LEFT & RIGHT SIDE HOUSING
9502.1A	HELICID HOPPER
9502.C	MICROSEM HOPPER
9504	STEEL BASE, HOPPER
9505.A	RUBBER FLAP
9506	MAIN SPINDLE
9507	LEFT WORM GEAR (V75G)
9508	RIGHT WORM GEAR (F75G)
9509	CENTRAL GEAR
9512	TRAP DOOR
9513.B	SEAL TRAP DOOR
9514	LEVER STOPPER
9516	SPRING (R139)
9517	BOLT (A117)
9518	PART FOR MICROSEM HOSE HOLDING
9519	UNIT CAP
9520	DOUBLE OUTLET, INSECTICIDE
9520.A	DOUBLE OUTLET, HERBICIDE
9521	PLUG
9522	MICROSEM HOSE, SPECIFY LENGTH
9523	CLAMP
9525	END CAP
9548.D	SUPPORT BAR, 7 X 7 STD
9549	CARRIER BAR, SPECIFY LENGTH
9552	BUSHING, USES 2 4X25RP AND 2 6X30RP
9553.B	MICROSEM DRIVE CHAIN 7X7, UPPER 110 LINKS
9554.3	12 TOOTH SPROCKET
9554.6	15 TOOTH SPROCKET
9554.9	18 TOOTH SPROCKET
9554.13	22 TOOTH SPROCKET
9554.16	25 TOOTH SPROCKET
9554.21	30 TOOTH SPROCKET
9555.A	SPROCKET 12-25 TOOTH
9557	SMALL LYNCH PIN
9559	BUSHING
9562	ROLLER FOR CHAIN TIGHTNER
9565	RUBBER O RING
9568	MICROSEM HOSE CLAMP
9574	PLATE FOR HOPPER, 1 OUTLET
9606.A	UPPER DRIVE SPROCKET, 20 TOOTH
9612	INTERMEDIATE SPINDLE
9613	SPRING CHAIN TIGHTNER
9638.A	ADJUSTABLE MICRO BRACKET DOUBLE PILLOW BLOCK
9645	RUBBER SLEEVE
9650.2T	INTERIOR MICROSEM ROD, 2 HOLES
9651.2T	EXTERIOR MICROSEM ROD, 2 HOLES
9653	CHAIN TIGHTNER
9654	DBLE INTERMEDIATE SPROCKET
9656.1	REINFORCEMENT PLATE, 7X7 STD
9658	ROLLER SPACER TUBE
9661	FEMALE SHOE DROP TUBE
9662	MALE SLIDING TUBE
9720	SUPPORT BRACKET, 7X7 STD
9721	OPENING SAFETY SHIELD, DRIVE CHAIN
9723	CLOSING PIN, SAFETY SHIELD
9724.1	CLOSING CLIPS
9726	SNAP RING
10118	GREASER

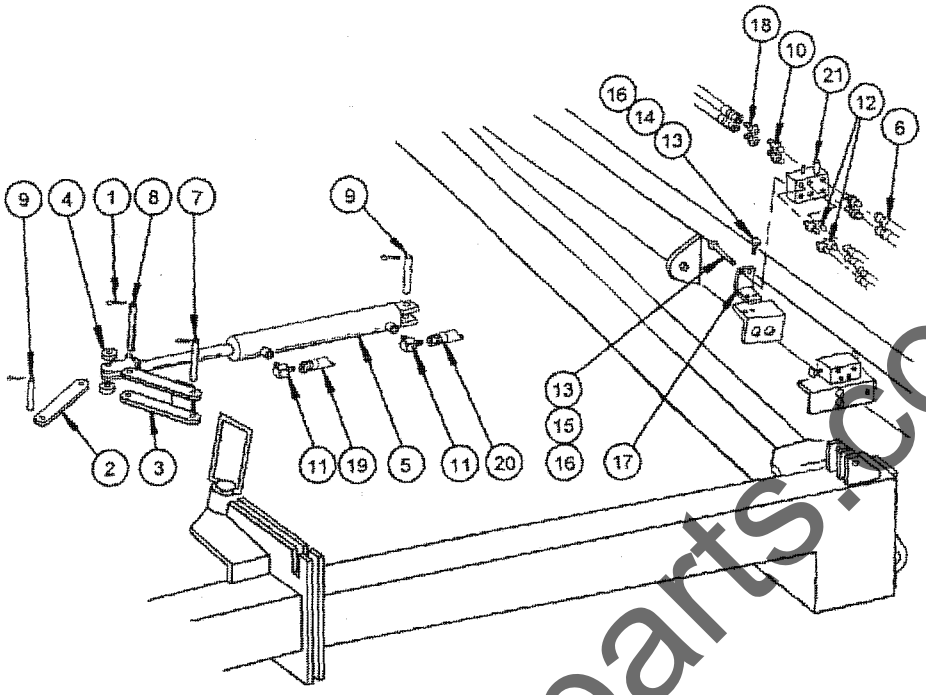


PART NO.	DESCRIPTION
4329.A	SNAPRING
4478	V CLAMP Ø16
4479	U CLAMP Ø16
4515	BEARING
4523	BUSHING STOP
4786.C	7X7 GEARBOX IDLER (96)
4787	7X7 WHEEL UNIT IDLER HANDLE
4827	CHAIN IDLER ROLLER
4841	BALANCING SPRING
5021	BUSHING (B25)
7009	DISK ONLY
7010.A	DISK HUB
7012.DA	REMOVABLE RH SPINDLE
7012.GA	REMOVABLE LH SPINDLE
7014.A	DISK BEARING (32042RS, 52042RS)
7015.A	WASHER (6204ID)
7016.D	SCRAPER, INSIDE RIGHT
7016.G	SCRAPER, INSIDE LEFT
7017.B	BRACKET SCRAPERS
7018.A	SCARPER, OUTSIDE
7158	LATERAL CHAIN ON NG METERING UNIT
9159.A	FERTILIZER HOSE COMPLETE 24"
9171.B	SPROCKET CLUSTER, FERTILIZER DRIVE
9173	BEARING HOLDER
9242	FERTILIZER DISK BRACKET SLEEVE TUBE
9244	SPRING BUSHING
9246.2	ARTICULATION TUBE
9247.D	RIGHT FERTILIZER DISK BRACKET
9247.G	LEFT FERTILIZER DISK BRACKET
9248	FERTILIZER DISK ARM
9249	FERTLIZER DEPTH CONTROL THREADRED ROD
9250	FERTILIZER FIXING SHAFT
9251	FERTILIZER FIXING FORK
9252	FERTILIZER DEPTH CONTROL ARTIC. SHAFT
9253.D	FERTILIZER BRACKET FORK
9254.2A	PLASTIC FERTILIZER HOPPER, 2 OUTLET
9255	ALUMINIUM HOUSING
9256	SPRING, TRAP DOOR
9257.2	METAL LID FOR HOPPER, 2 OUTLET
9258	FERTILIZER HOSE CLAMP
9261	INSIDE HOPPER REINFORCEMENT
9262.1A	STANDARD FERTILIZER AUGER
9263.1	TRAP DOOR, 1 OUTLET
9264.B	SPINDLE FOR FERTILIZER METERING UNIT 95
9265.C	INSIDE CAP FOR FERTILIZER 93
9266.A	DRIVE SHAFT BETWEEN HOPPERS, FOR 4-ROW
9267	PIN FOR TRAP DOOR
9268	REINFORCEMENT BRACKET
9269.2A	FERTILIZER SLEVE FOR 2 OUTLET HOPPER
9279	DRIVE FORK
9280	BUSHING
9281	FERTILIZER DISK OFF-SET
9282	FERTILIZER DISK OFF-SET CLAMP
9288	FERTILIZER HOPPER SUPPORT
9289.2	SUPPORT BAR FERTILIZER 2 OUTLET HOPPER
9290	FERTILIZER DRIVE BRACKET
9292	FERTILIZER BRACKET SIMPLE FOOT
9293	FERTILIZER BRACKET COMBINED FOOT
9525	END CAP MICROSEM BAR
9549	MICROSEM BRACKET BAR
9555.A	SPROCKET, 12-25 TOOTH
9557	SMALL LYNCH PIN
9565	O RING
9613	SPRING CHAIN TIGHTNER (R81)
9650.052	INTERIOR DRIVE CONNECTOR ROD, 52 CM
9651.035	EXTERIOR DRIVE CONNECTOR ROD, 31,5 CM
10118	GREASER

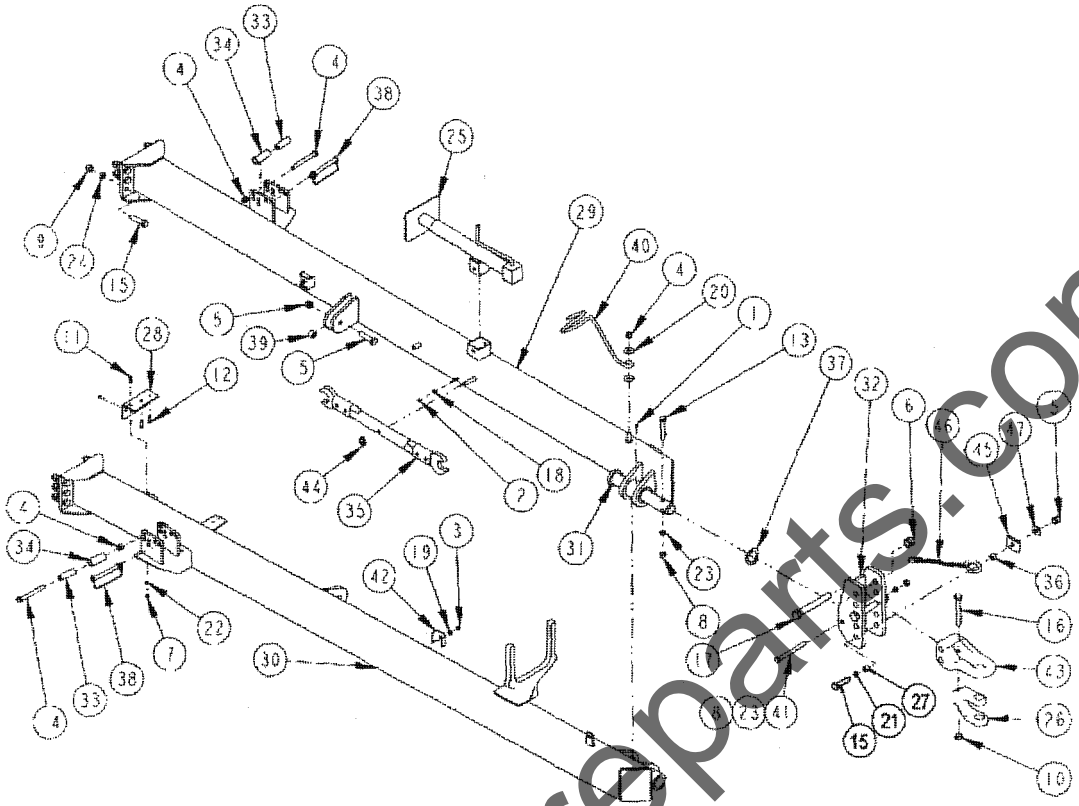




ITEM	PART	NO. QTY.	DESCRIPTION
1.	1-298-010001-1	10	FITTING, GREASE ¼-28
2.	1-512-010005-01	2	NUT, HEX 1/4-20 GRB
3.	1-512010007-16	2	NUT, HEX 1-1/4-7 GRB
4.	1-654-010047-04	2	SCREW, HEX HEAD CAP ¼-20 X ¾ GR5
5.	1-654-010059-03	2	SCREW, HEX HEAD CAP ⅝ -11 X 1- ½ GR5
6.	1-861-010032-29	4	WASHER, FLAT 1- ¼ W
7.	1-861-010034-15	2	WASHER, SPLIT LOCK ⅝
8.	101406	3	PIN, COTTER ⅜ X 3
9.	104033	12	PIN, COTTER 5/32 X 1-½
10.	116076	2	SPRING LEVELING ARM WELDMENT
11.	116237	1	TURNBUCKLE, CONNECTOR WING TO MAIN FRAME
12.	116238	1	HOOK WELDMENT
13.	116248	10	BUSHING, MACHINERY, 10GA
14.	116260	1	CENTER SPRING WELDMENT
15.	116051	3	EYEBOLT
16.	116358	1	PIN, 2-⅛ X 20
17.	116359	4	PIN, ⅞ X 3-⅛
18.	116363	2	PIN, ⅞ X 6-9/16
19.	116365	2	WING HINGE WELDMENT
20.	116241	1	MAIN FRAME WELDMENT, RH (1230 REAR VAC)
21.	116212	1	MAIN FRAME WELDMENT, LH (1230 REAR VAC)
22.	116186	1	WING WELDMENT, RH (1230 REAR VAC)
23.	116187	1	WING WELDMENT, LH (1230 REAR VAC)
24.	116367	2	RUBBER SPACER, WING HINGE, MAIN FRAME
25.	103817	2	HOSE CLAMP
26.	1-512-01005-05	2	NUT, HEX LOCK ⅜
27.	100825	2	WASHER, SLOTTED LOCK 1-¼
28.	1-512-010005-03	8	NUT, HEX LOCK 5/16 - 18
29.	1-557-010362-63	REF	PIN, COTTER ¼ X 2
30.	1-654-010049-07	8	SCREW, HEX HEAD CAP 5/16 -18 X 1- ½ GR5
31	1-654-010051-09	REF	SCREW, HEX HEAD CAP ⅜ -16 X 2 GR5
32	1-654-010125-10	2	SCREW, HEX HEAD CAP ⅛ X 3- ¼
33	1-861-010032-09	16	WASHER, FLAT 5/16
34	-1861-010032-09	2	WASHER, SPLIT LOCK 1"
35	70260977	1	SMV EMBLEM
36	116034	REF	PIN, DBL HOLE ROW MARKER PIVOT
37	116070	2	ROW MARKER PIVOT WELDMENT
38	116514	1	DECAL, WARNING MONOSEM
39	1-512-010005-13	REF	NUT, HEX LOCK ⅝ -11
40	112120	REF	SCREW, HEX HEAD CAP ⅝ -11 X 2-1/4 GR8
41	116100	REF	WASHER, FLAT 1 – ¼ N
42	1-512-010005-15	4	NUT, HEX LOCK ¾ -10
43	1-654-010061-05	2	SCREW, HEX HEAD CAP ¾ -10 X 2 GR5

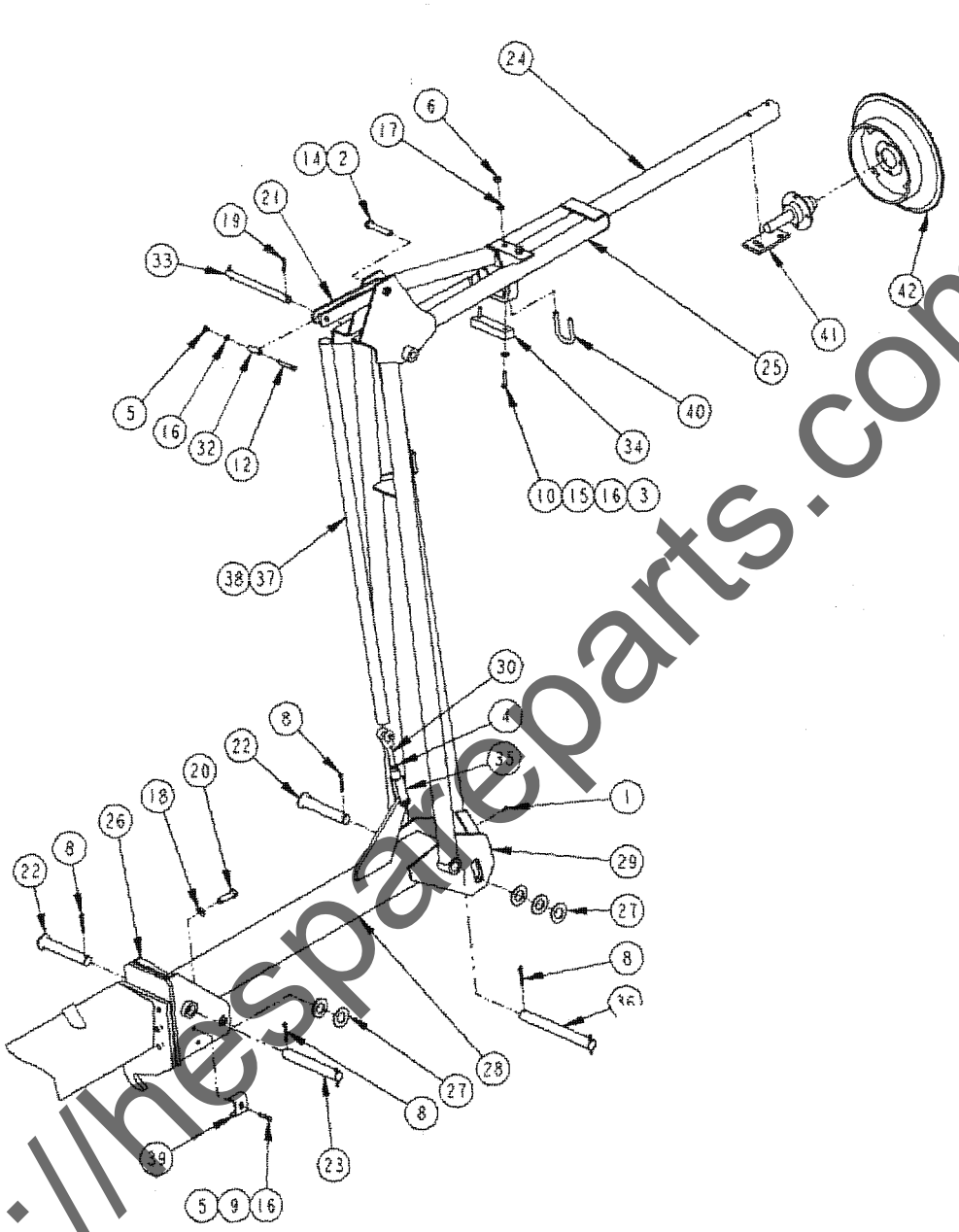


ITEM	PART NO.	QTY.	DESCRIPTION
1	1/4 X 1-1/2	24	PIN, COTTER 1/4 X 1-1/2
2	116037	2	BAR, WING HINGE, PIVOT
3	116256	2	ARM WELDMENT, WING HINGE
4	116258	4	SPACER WING HINGE
5	116341	2	CYLINDER BASE, 3 X 16
6	116429	2	HOSE ASSEMBLY 3/8 X 25
7	116440	2	PIN, 1 X 7-3/16
8	116441	2	PIN, 1 X 5-3/4
9	116442	4	PIN, 1 X 3-1/8
10	118-2680-010	4	CONNECTOR
11	2062-8-6S	4	ELBOW 90
12	620-0859	4	ADAPTER
13	1-512-010007-05	4	NUT, HEX 1/4-20
14	1-654-010047-06	2	SREW, HEX HEAD CAP 1/4-20 X 1
15	1-654-010047-14	2	SREW, HEX HEAD CAP 1/4-20 X 3
16	1-681-010034-09	4	WASHER, SPLIT LOCK 1/4
17	116259	1	ANGLE W/ HOLES
18	102-1123	2	SWIVEL (12/16 ROW REAR & TOP VAC)
19	116430	2	HOSE ASSEMBLY 3/8 X 158 (16 ROW REAR & TOP VAC)
20	112158	2	HOSE ASSEMBLY 3/8 X 136 (16 ROW REAR & TOP VAC)
21	116350	1	VALVE ASSEMBLY



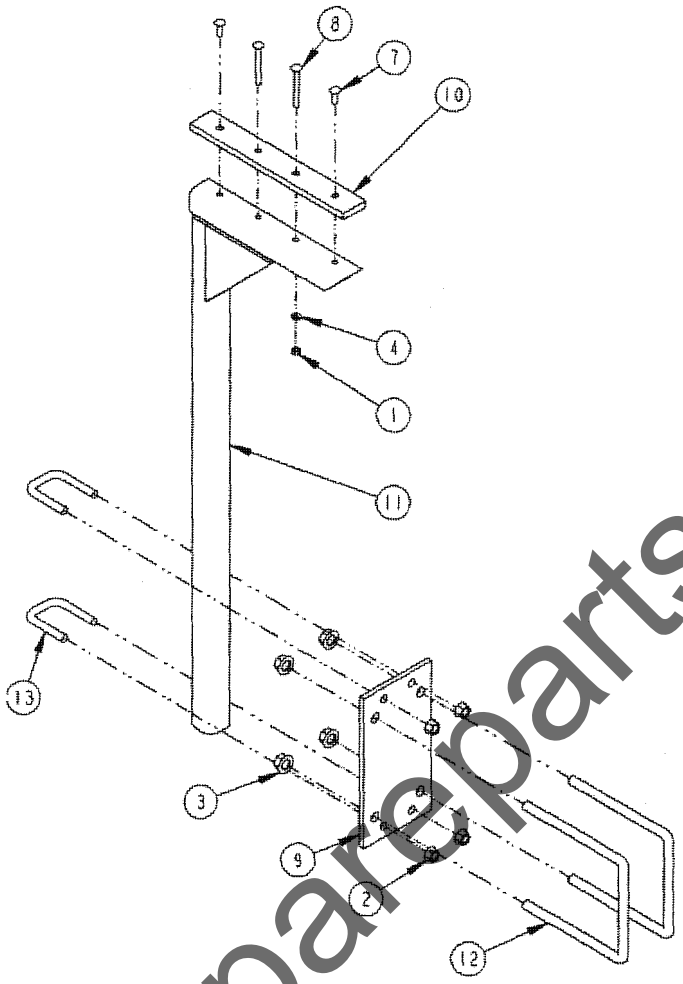
ITEM	PART NO.	QTY.	DESCRIPTION
1	1-298-010001-1	3	ZERK, FITTING 1/4
2	1-512-010005-01	1	NUT, HEX LOCK 1/4-20
3	1-512-010005-05	3	NUT, HEX LOCK 3/8-16
4	1-512-010005-13	3	NUT, HEX LOCK 5/8-11 GRB
5	1-512-010005-15	2	NUT, HEX LOCK 3/4-10 GRB
6	1-512-010005-19	3	NUT, HEX LOCK 1-8 GRB
7	1-512-010007-06	2	NUT, HEX LOCK 5/16-18
8	1-512-010007-11	2	NUT, HEX LOCK 5/8-11 GRB
9	1-512-010007-12	12	NUT, HEX 3/4-10 GRB
10	1-512-010008-12	1	NUT, HEX 3/4-16 GRB
11	1-654-010049-05	2	SCREW, HEX HEAD CAP 5/16-18 X 1 GR5
12	1-654-010051-05	2	SCREW, HEX HEAD CAP 3/8-16 X 1 GR5
13	1-654-010059-13	1	SCREW, HEX HEAD CAP 5/8-11 X 4 GR5
14	1-654-010059-16	2	SCREW, HEX HEAD CAP 5/8-11 X 5-1/2 GR5
15	1-654-010061-09	14	SCREW, HEX HEAD CAP 3/4-10 X 3 GR5
16	1-654-010087-16	1	SCREW, HEX HEAD CAP 3/4-16 X 5-1/2 GR8
17	1-654-010125-20	2	SCREW, HEX HEAD CAP 1-8 X 7-1/2 GR8
18	1-861-010032-07	1	WASHER, FLAT 1/4W
19	1-861-010032-11	2	WASHER, FLAT 3/8W
20	1-861-010032-19	2	WASHER, FLAT 5/8W
21	1-861-010032-21	1	WASHER, FLAT 3/4W
22	1-861-010034-10	2	WASHER, SPLIT LOCK 5/16

ITEM	PART NO.	QTY.	DESCRIPTION
23	1-861-010034-15	2	WASHER, SPLIT LOCK 5/8
24	1-861-010034-17	12	WASHER, SPLIT LOCK 3/4
25	1A63478	1	JACK 7000 LB.
26	100214	1	HITCH, CLEVIS PPI-208V
27	100676	1	BUSHING 1.06 X 0.79 X 0.62
28	116036	1	BRACKET, HITCH
29	116093	1	HITCH TUBE WELDMENT LH
30	116106	1	HITCH TUBE WELDMENT RH (1230/1630 REAR & TOP VAC)
	117402	1	HITCH TUBE WELDMENT RH W/O TURBO MNT (1228 TOP VAC & 2422 REAR & TOP VAC)
31	116113	1	PIN WELDMENT PULL HITCH
32	116183	1	HITCH CAP WELDMENT
33	116184	2	SLEEVE, 3-3/16
34	116185	2	SLEEVE, 3-1/8
35	116196	1	WRENCH WELDMENT
36	116211	1	TUBE, SPACER SAFETY CHAIN
37	116248	2	BUSHING, MACHINERY 10GA
38	116250	2	PIN, 5/8 W/L
39	116407	1	BUSHING, HITCH MIDDLE HINGE
40	116445	1	HOSE HOLDER
41	116715	1	SCREW, HEX HEAD CAP 5/8-11 X 6-1/2 GR8
42	2-181-010001	6	HOSE CLAMP
43	2-375-010601	1	HITCH, RING CAT III
44	70239854	1	PIN, QUICK HITCH
45	70328064	1	BLOCK, SPACING
46	70594087	1	CHAIN ASSEMBLY, SAFETY TOW 10,500#
47	709273326	1	WASHER, PLATE .78 X 1.75 X 7 GA

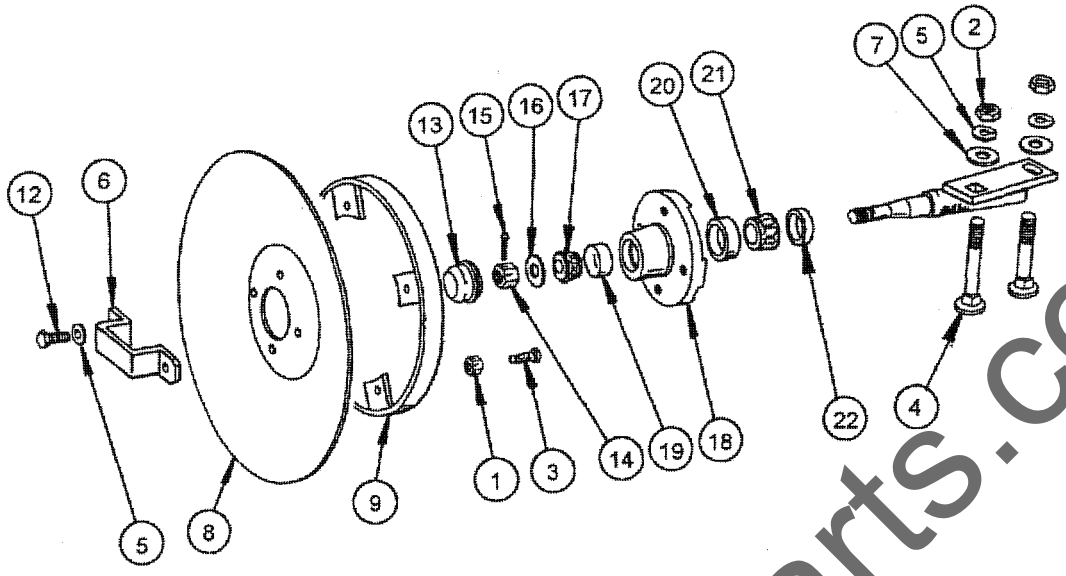


ITEM	PART NO.	QTY.	DESCRIPTION
1	1-298-010001-1	6	FITTING, GREASE 1/4-28
2	1-511-010001-07	2	NUT, HEX JAM 5/8-11
3	1-512-010005-05	4	NUT, HEX LOCK 3/8-16
4	1-512-010005-13	4	NUT, HEX LOCK 5/8-11
5	1-512-010007-07	4	NUT, HEX 3/8-16
6	1-512-010007-09	4	NUT, HEX 1/2-13
8	1-557-010362-63	12	PIN, COTTER 1/4 X 2
9	1-654-010051-07	2	SCREW, HEX HEAD CAP 3/8-16 X 1-1/2 GR5
10	1-654-010051-08	4	SCREW, HEX HEAD CAP 3/8-16 X 1-3/4 GR5
12	1-654-010051-11	2	SCREW, HEX HEAD CAP 3/8-16 X 2-1/2 GR5
14	1-654-010059-11	2	SCREW, HEX HEAD CAP 5/8-11 X 3-1/2 GR5

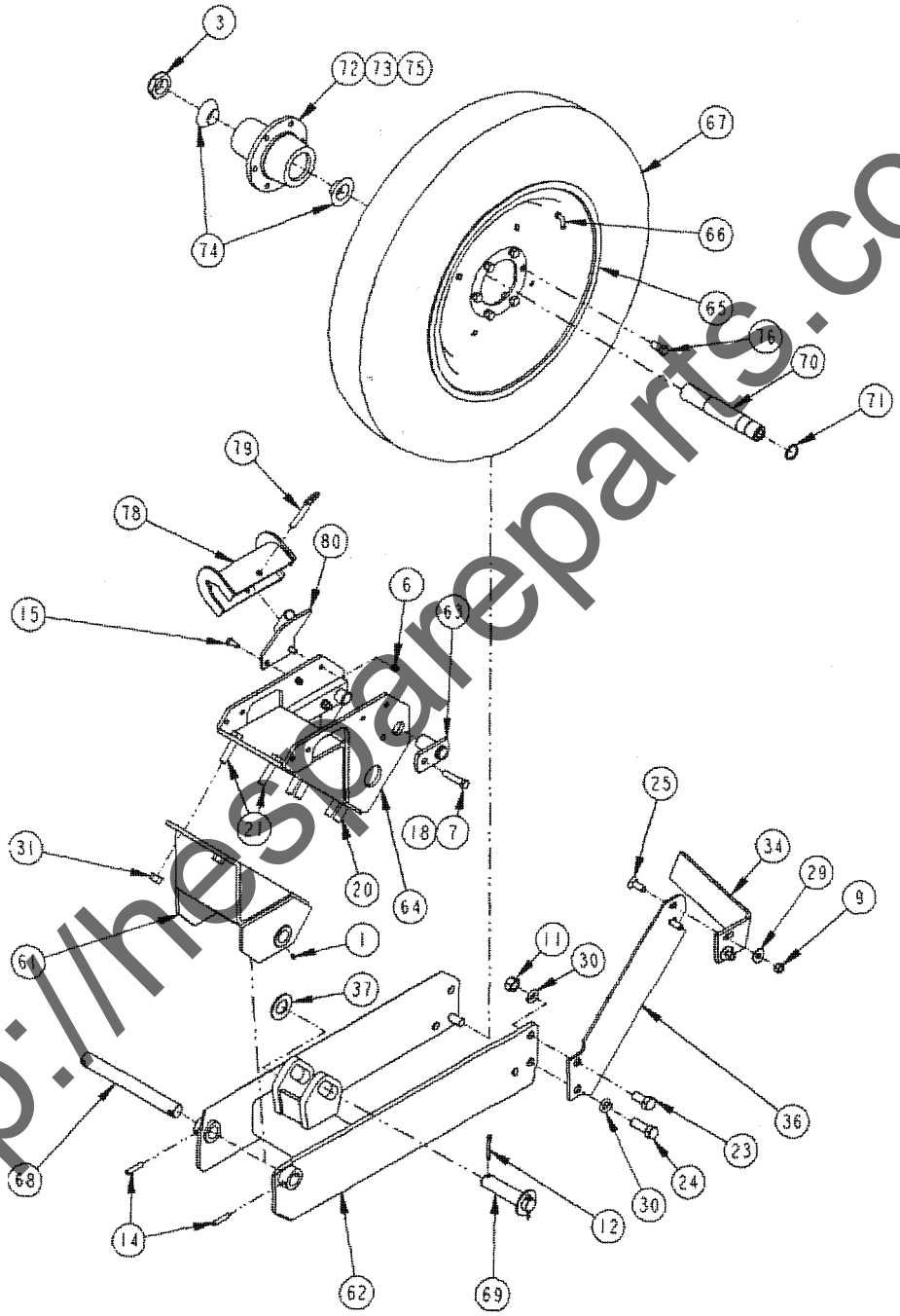
ITEM	PART NO.	QTY.	DESCRIPTION
15	1-861-010032-11	4	WASHER, FLAT 3/8W
16	1-861-010034-11	6	WASHER, SPLIT LOCK 3/8
17	1-861-010034-13	4	WASHER, SPLIT LOCK 1/2
18	1-861-010034-15	8	WASHER, SPLIT LOCK 5/8
19	119084	4	PIN, COTTER 1/4 X 1-1/2
20	112120	12	SCREW, HEX HEAD CAP 5/8-11 X 2-1/4 GR8
21	116029	2	ROW MARKER LINKAGE WELDMEBT
22	116032	4	PIN, WASHER ROW MARKER WLDMT
23	116034	2	PIN, DOUBLE HOLE ROW MARKER PIVOT
24	116035	2	EXTENSION TUBE/R/MKR ASSEMBLY
25	116454	2	ROW MARKER OUTER ASSEMBLY (16 ROW)
26	116070	REF	ROW MARKER PIVOT ASSEMBLY
27	116100	12	WASHER, FLAT 1-1/4N
28	116176	2	ROW MARKER FIRST ARM WELDMENT
29	116452	2	ROW MARKER MID ARM WELDMENT (16 ROW)
30	116339	2	YOKE EXTERNAL THREADED PLAIN
31	116344	2	CYLINDER, MARKER 2-1/2 X 20
32	116354	2	TUBE 5/8 X 1-7/8
33	116355	2	PIN 7/8 X 11
34	116366	2	RUBBER SPACER ROW MARKER OUTER ARM
35	116405	2	YOKE, INTERNAL THREADED CLEVIS
36	116438	2	PIN, 1-1/4 X 12-1/4
37	120369	2	CHAIN, ROW MARKER (16 ROW)
38	120400	2	CHAIN COVER ROW MARKER (16 ROW)
39	2-181-010001	2	HOSE CLAMP
40	8-102-010019	2	U-BOLT SCRAPPER
41	116446		LH SPINDLE & HUB WELDMENT
	116447		RH SPINDLE & HUB WELDMENT
41	116337		BLADE SOLID, 16" PLAIN

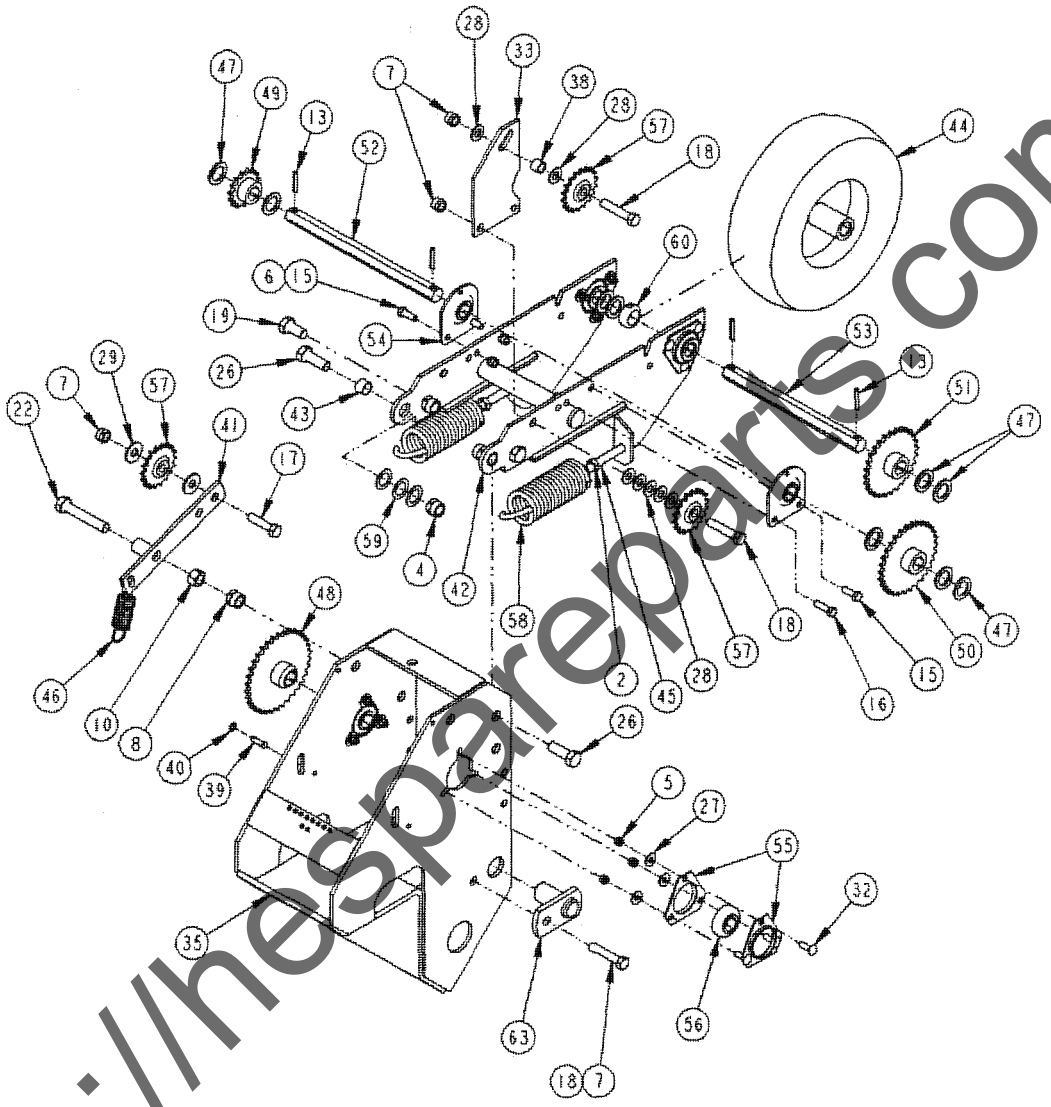


ITEM	PART NO.	QTY.	DESCRIPTION
1	1-512-010007-06	8	NUT, HEX 5/16 - 18
2	1-512-010007-09	8	NUT, HEX ½ - 13
3	1-512-010007-11	8	NUT, HEX ⅝ - 11
4	1-861-010034-10	8	WASHER, SPLIT LOCK 5/16
7	104031	4	SCREW, RD HEAD SQ NECK 5/16 – 18 x 1 GR5
8	104906	4	SCREW, RD HEAD SQ NECK 5/16 – 18 x 3 GR5
9	117184	2	PLATE, MARKER BRACE (16 ROW)
10	117186	2	RUBBER ARMORITE
11	117185	2	BRACE ASSEMBLY (16 ROW)
12	70593063	4	U BOLT
13	8-102-010019	4	U BOLT SCRAPER (16 ROW)



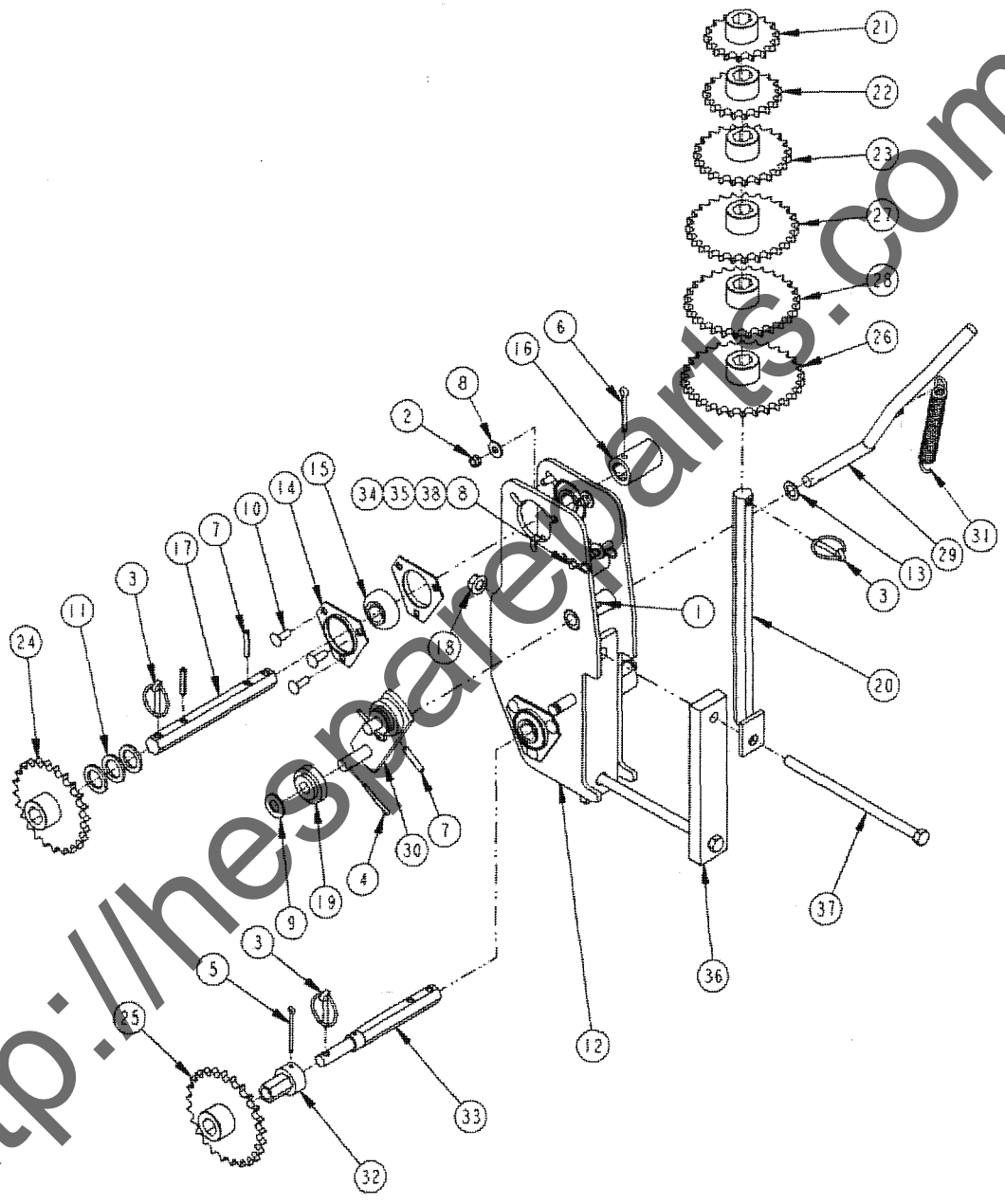
ITEM	PART NO.	DESCRIPTION
1	1-512-010005-03	NUT, HEX LOCK 5/16-18
2	1-512-010007-09	NUT, HEX 1/2-13
3	1-654-010049-05	SCREW, HEX HEAD CAP 5/16-18 X 1 GR5
4	1-654-010070-11	SCREW, RD HEAD SQ. NECK 1/2-13 X 3-1/2
5	1-861-010034-13	WASHER, SPLIT LOCK 1/2
6	116038	SHIPPING RETAINER, ROW MARKER HUB
7	116254	WASHER MARKER MOUNT
8	116337	BLADE, SOLID 16" PLAIN
9	116390	DEPTH BAND WELDMENT
10	116446	LH SPINDLE AND HUB WELDMENT (ITEMS 13-22)
11	116447	RH SPINDLE AND HUB WELDMENT (ITEMS 13-22)
12	830025	SCREW, HEX HEAD CAP 1/2-20 X 1
13	125612	HUB CAP 1517 (P502013)
14	125616	NUT, HEX SLOTTED 5/8-18 (P251701)
15	125615	PIN, COTTER 5/32 X 1-1/2 (P401905)
16	125617	WASHER, FLAT 5/8 (P301801)
17	70336915	OUTER CONE LM11749 (P752231)
18	125614	HUB W/ CUPS (084000-4) (INCL. ITEMS 19-20)
19	70336914	OUTER CUP LM11710 (P702218)
20	70336916	INNER CUP L44610 (P702215)
21	125613	INNER CONE (P752316)
22	125611	GREASE SEAL CR12411 (P602123)



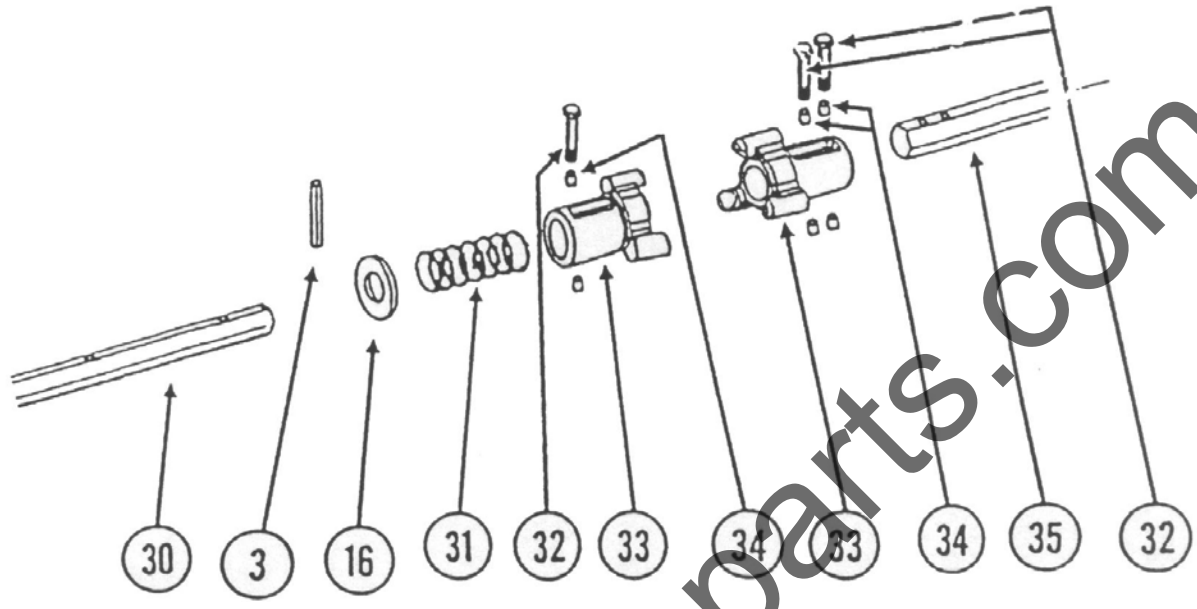


ITEM	PART NO.	DESCRIPTION
1	1-298-010001-1	FITTING, GREASE 1/4-28
2	1-511-010001-05	NUT, HEX JAM 1/2-13
3	70917835	NUT, HEX THIN LOCK NYLONJAM 1/2-13
4	1-512-010002-14	NUT, HEX LOCK 5/8-18
5	1-512-010005-03	NUT, HEX LOCK 5/16-18 GRB
6	1-512-010005-05	NUT, HEX LOCK 3/8-16 GRB
7	1-512-010005-09	NUT, HEX LOCK 1/2-13 GRB
8	1-512-010005-13	NUT, HEX LOCK 5/8-11 GRB
9	1-512-010007-09	NUT, HEX 1/2-13 GRB
10	1-512-010007-11	NUT, HEX 5/8-11 GRB
11	1-512-010007-12	NUT, HEX 3/4-10 GRB
12	1-557-010362-63	PIN, COTTER 1/4 X 2
13	1-647-010004217	PIN, SLOTTED SPRING 1/4 X 1-1/2
14	1-647-010004255	PIN, SLOTTED SPRING 3/8 X 2
15	1-654-010051-05	SCREW, HEX HEAD CAP 3/8-16 X 1 GR5
16	1-654-010051-06	SCREW, HEX HEAD CAP 3/8-16 X 1 GR5
17	1-654-010055-05	SCREW, HEX HEAD CAP 1/2-13 X 2 GR5
18	1-654-010055-07	SCREW, HEX HEAD CAP 1/2-13 X 2-1/2 GR5
19	1-654-010059-02	SCREW, HEX HEAD CAP 5/8-11 X 2 GR5
20	1-654-010059-05	SCREW, HEX HEAD CAP 5/8-11 X 2 GR5
21	1-654-010059-07	SCREW, HEX HEAD CAP 5/8-11 X 2-1/2 GR5
22	1-654-010059-11	SCREW, HEX HEAD CAP 5/8-11 X 3-1/2 GR5
23	1-654-010061-03	SCREW, HEX HEAD CAP 3/4-10 X 1-1/2 GR5
24	1-654-010061-05	SCREW, HEX HEAD CAP 3/4-10 X 2 GR5
25	1-654-010070-03	SCREW, RD HEAD SQ NECK 1/2-13 X 1-1/2
26	1-654-010090-04	SCREW, HEX HEAD CAP 5/8-18 X 1-3/4 GR8
27	1-861-010032-09	WASHER, FLAT 5/16W
28	1-861-010032-14	WASHER, FLAT 1/2N
29	1-861-010032-15	WASHER, FLAT 1/2W
30	1-861-010034-17	WASHER, SPLIT LOCK 3/4
31	100827	NUT, FLANGE HD SERR. 5/8-11
32	104031	SCREW, RD HEAD SQ NECK 5/16-18 X 1 GR5
33	116044	BAR TENSIONER MOUNT
34	116068	SCRAPER
35	116079	DRIVE WHEEL ASSEMBLY
36	116086	SCRAPER MOUNT WELDMENT
37	116100	WASHER, FLAT 1-1/4N
38	166235	SPACER
39	116249	PIN, CLEVIS 5/16 X 1
40	116336	RING RETAINING EXT 5/16
41	116368	IDLER ARM WELDMENT
42	116401	ADJUSTABLE DRIVE MOUNT
43	116439	TUBE
44	116620	CONTACT DRIVE WHEEL AND HUB ASSEMBLY - 8 INCH
45	116716	SCREW, HEX FULL THREAD 1/2-13 X 4
46	117414	SPRING CHAIN TIGHTENER
47	117957	MACHINERY BUSHING
48	122831	SPROCKET, TRANSMISSION 30 TEETH W/ CLUTCH
49	122835	SPROCKET, TRANSMISSION 15 TEETH

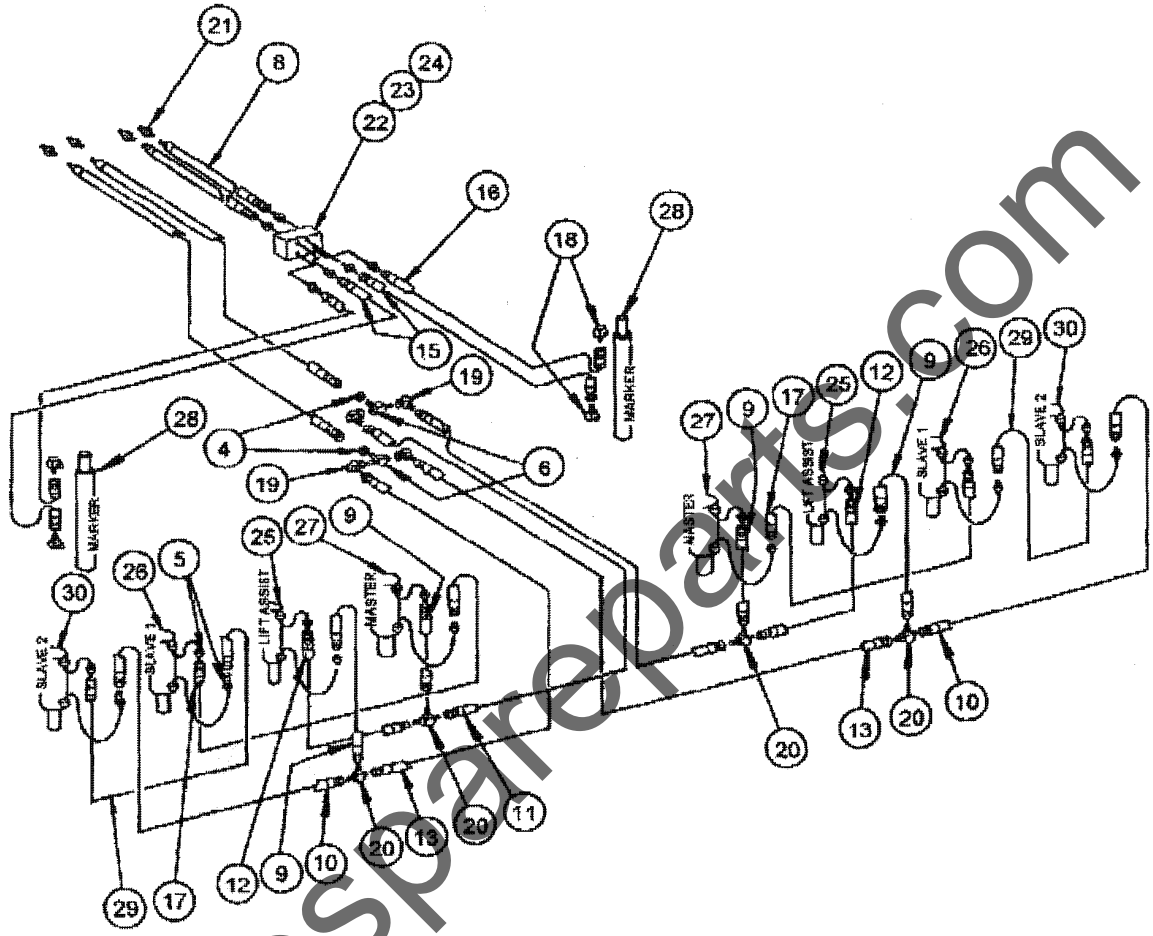
ITEM	PART NO.	DESCRIPTION
50	122836	SPROCKET, TRANSMISSION 30 TEETH
51	122838	SPROCKET, TRANSMISSION 23 TEETH
52	122840	SHAFT, HEX 7/8 X 12-3/4
53	122841	SHAFT, HEX 7/8 X 11-5/8
54	122846	HANGER BEARING, 7/8 HEX SHAFT
55	122847	BEARING MOUNT TRIANGULAR
56	122848	BEARING SELF ALIGNING 7/8 HEX SHAFT
57	122871	SPROCKET, TRANSMISSION 18 TEETH IDLER
58	2-720-010034	SPRING, EXT SPRAY SHIELD
59	7/8MACH BUSH	BUSHING MACHINERY 7/8
60	71503635	COLLAR RETAINING 1"
61	116018	DRIVE WHEEL CLAMP ASSEMBLY, TOP
62	116023	DRIVE WHEEL ARM ASSEMBLY
63	116041	RETAINING PIN WELDMENT
64	116090	WHEEL TOWER ASSEMBLY
65	116346	RIM 5-1/2 X 20
66	116348	VALVE STEM
67	116353	TIRE 7-1/2 X 20
68	116356	PIN, 1-1/4 X 12
69	116360	PIN, 1-1/4 X 5-5/8
70	116406	SPINDLE TRANSPORT AND GROUND WHEEL
71	116569	SNAP RING
72	123879	HUB ASSEMBLY (INCL. ITEMS 73-76)
73	125626	HUB W/ CUPS (INCL. ITEM 75)
74	125627	BEARING CONE 13600LA
75	125628	BEARING CUP 13621
76	125629	WHEEL BOLT 9/16-18 X 1-1/8
78	116087	LOCK-UP WELDMENT
79	116251	PIN, DETENT 1/2 X 4-1/2
80	116065	LOCK-UP MOUNT



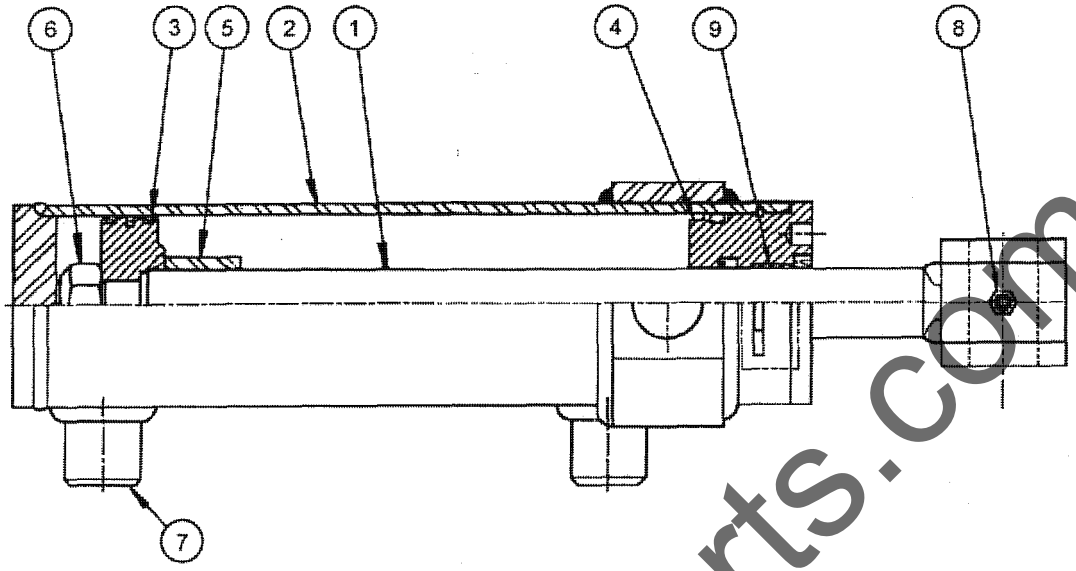
ITEM	PART NO.	QTY	DESCRIPTION
1	1-298-010001-1	2	ZERK FITTING 1/4
2	1-512-010005-03	24	NUT, HEX LOCK 5/16-18 GRB
3	1-557-010327	6	PIN, LYNCH 1/4 X 1-1/4
4	1-557-010362-51	4	PIN, COTTER 3/16 X 1-1/2
5	1-557-010362-54	2	PIN, COTTER 3/16 X 2-1/4
6	1-557-010362-63	4	PIN, COTTER 1/4 X 2
7	1-647-010004217	8	SPRING PIN, SLOTTED 1/4 X 1-1/2
8	1-861-010032-09	18	WASHER, FLAT 5/16W
9	1-861-010032-18	4	WASHER, FLAT 5/8N
10	104031	24	SCREW, RD HEAD SQ NECK 5/16-18 X GR5
11	117957	8	MACHINERY BUSHING
12	117974	2	TRANSMISSION WELDMENT
13	118657	4	BUSHING, MACH 5/8 X 1
14	122847	16	BEARING MOUNT, TRIANGULAR
15	122848	8	BEARING, SELF ALIGN HEX SHAFT 7/8
16	122853	4	COUPLER, DRIVE SHAFT
17	122865	2	SHAFT, UPPER 7/8 HEX
18	124971	4	NUT, HEX FLANGE SPIRALOCK 1/2-13
19	125706	4	IDLER, CHAIN #50
20	125711	2	SPROCKET, STORAGE WELDMENT
	125784	2	SPROCKET, TRANSMISSION 15 TEETH
21	125713	2	SPROCKET, TRANSMISSION 17 TEETH
22	125715	2	SPROCKET, TRANSMISSION 19 TEETH
	125716	2	SPROCKET, TRANSMISSION 21 TEETH
23	125717	2	SPROCKET, TRANSMISSION 23 TEETH
24	125718	2	SPROCKET, TRANSMISSION 24 TEETH
25	125719	2	SPROCKET, TRANSMISSION 25 TEETH
26	125720	2	SPROCKET, TRANSMISSION 30 TEETH
27	125780	2	SPROCKET, TRANSMISSION 27 TEETH
28	125783	2	SPROCKET, TRANSMISSION 28 TEETH
29	125793	2	HANDLE WELDMENT, CHAIN TIGHTENER
30	125934	2	PLATE WELDMENT, CHAIN TIGHTENER
31	125935	2	SPRING, CHAIN TIGHTENER
32	125948	2	COUPLER SHEAR
33	125949	2	SHAFT, TRANSMISSION
34	125953	2	PIN, LOCK CHAIN TIGHTENER
35	125954	2	SPRING , COMPRESSION
36	126354	2	PLATE, TRANSMISSION
37	126368	4	SCREW, HEX HEAD CAP 1/2-13 X 9-1/2
38	70918196	4	PIN, QUICK .094 X 1.625



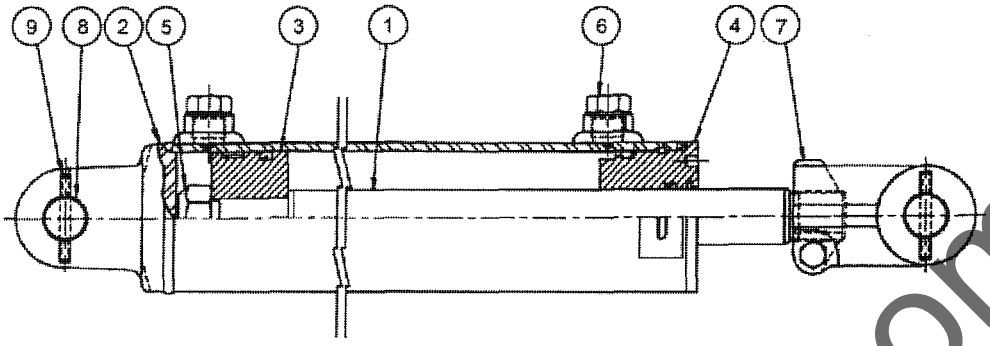
ITEM	PART	DESCRIPTION
3.		Spring pin, ¼" x 1 - ½"
16.	4967	Machine bushing, 1" x 1 – ½" x ⅛"
31.	4969	Spring
32.		Hex head cap screw ¼-20 x 2-¼"
		¼-20 Nylock
33.	4986	Coupler
34.	4968	Bushing ½"



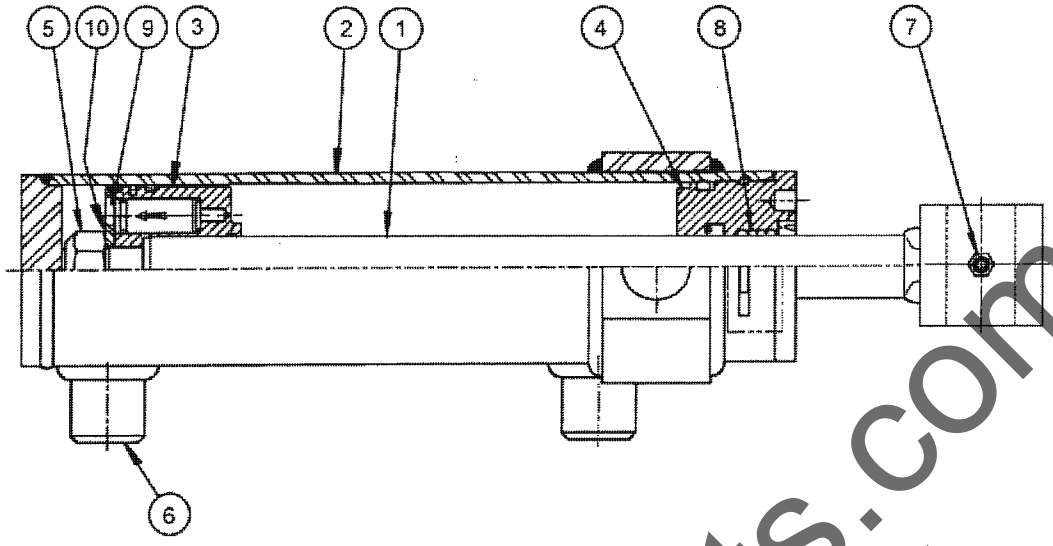
ITEM	PART NO.	QTY.	DESCRIPTION
1	1-512-010005-05	1	NUT, HEX LOCK ⅜ - 16
2	1-654-010051-06	1	SCREW, HEX HEAD CAP ⅜ - 16 x 1 – ¼ GR5
3	1-861-010032-11	2	WASHER, FLAT ⅜ W
4	1-861-010032-20	2	WASHER, FLAT ¾ N
5	102-1095	12	ADAPTER STRAIGHT
6	102-1170	2	FITTING, TEE
7	105874	16	TIE, STRAP PLASTIC (NOT SHOWN)
8	116428	4	HOSE ASSEMBLY ⅜ x 173
9	116431	4	HOSE ASSEMBLY ⅜ x 15
10	116434	4	HOSE ASSEMBLY ⅜ x 120
11	116489	2	HOSE ASSEMBLY ⅜ x 64
12	116490	2	HOSE ASSEMBLY ⅜ x 78
13	116492	2	HOSE ASSEMBLY ⅜ x 128
14	116497	1	VIBRATION STRAP
15	117161	2	HOSE ASSEMBLY ⅜ x 312
16	117162	2	HOSE ASSEMBLY ⅜ x 324
17	117163	2	HOSE ASSEMBLY ⅜ x 196
18	2062-8-8S	4	ADAPTER, 90
19	2071-8-8S	4	ADAPTER, 90
20	3-299-010016	4	TEE
21	8010-4	4	COUPLER, MALE ½
22	1-654-010051-05	2	SCREW, HEX HEAD CAP ⅜ - 16 x 1 GR5
23	1-861-010034-11	2	WASHER, SPLIT LOCK ⅜
24	116349	1	VALVE ASSEMBLY
25	116340	REF	CYLINDER, ASSIST LIFT 3 – ¼ x 8
26	116342	REF	CYLINDER, SLAVE LIFT 3 – ¼ x 8
27	116343	REF	CYLINDER, MASTER LIFT 3 – ½ x 8
28	116344	REF	CYLINDER, MARKER 2 – ½ x 20
30	BC-0868	REF	CYLINDER, SLAVE 3 x 8 REPHASE



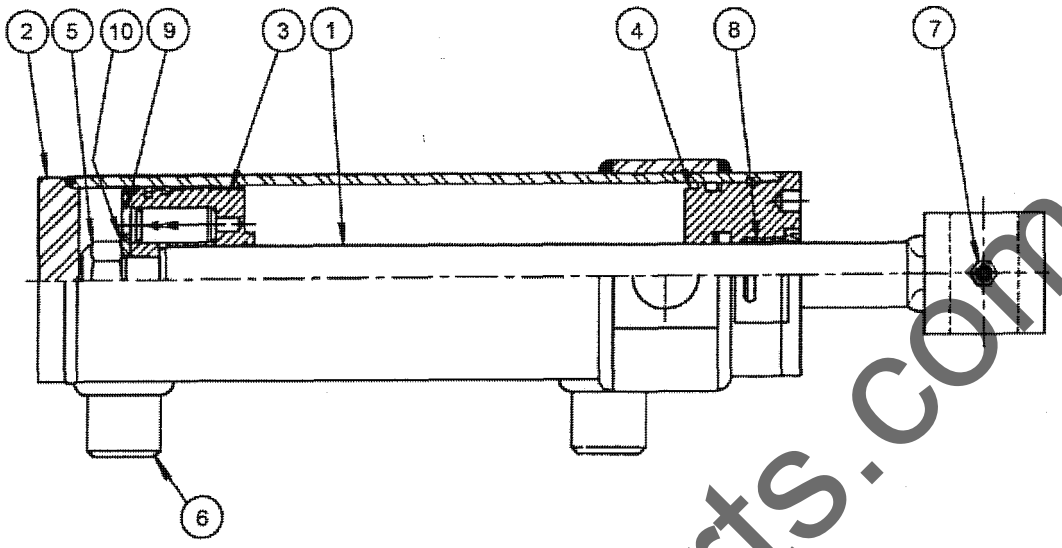
ITEM	PART NO.	QTY.	DESCRIPTION
	116340		Cylinder, Hydraulic lift assist 3- ¼ x 8
1	117515	1	Piston rod assembly
2		1	Butt & tube assembly
3	117519	1	Piston
4	117520	1	Gland
5	125564	1	Spacer
6	220000209	1	Locknut
7	200300040	2	Shipping plug
8	125565	1	Grease zerk
9	125566	1	Du-bushing
	117522		Packing kit (Incl. All o-ring and seals)



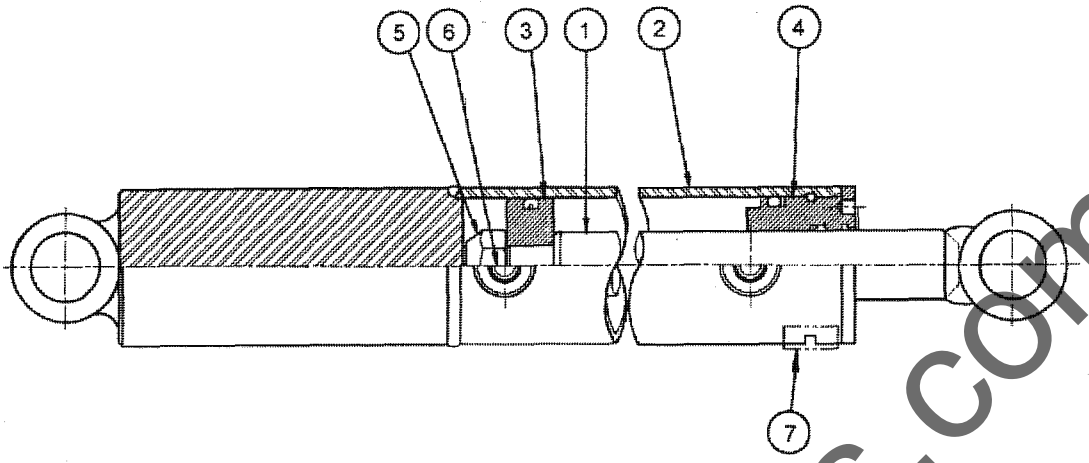
ITEM	PART NO.	QTY	DESIGNATION
	116341		Cylinder, Hydraulic wing fold 3 x 16
1	117523	1	Piston rod assembly
2		1	Butt & tube assembly
3	117524	1	Piston
4	117525	1	Gland
5	220000209	1	Locknut
6	200300040	2	Shipping plug
7	100000423	1	Clevis assembly
8	190400108	2	Clevis pin
9	111789	4	Roll pin
	117526		Packing kit (Incl. All o-ring and seals)



ITEM	PART NO.	QTY	DESIGNATION
	116342		Cylinder, Hydraulic slave lift 3- ¼ x 8
1	117515	1	Piston rod assembly
2		1	Butt & tube assembly
3	117519	1	Piston
4	117520	1	Gland
5	220000209	1	Locknut
6	200300040	2	Shipping plug
7	125565	1	Grease zerk
8	125566	1	Du-bushing
9	125567	1	Relief valve
10	125568	1	Washer
	117521		Packing kit (Incl. All o-ring and seals)



ITEM	PART NO.	QTY	DESIGNATION
	116343		Cylinder, Hydraulic master lift 3- ¼ x 8
1	117515	1	Piston rod assembly
2		1	Butt & tube assembly
3	117516	1	Piston
4	117517	1	Gland
5	220000209	1	Locknut
6	200300040	2	Shipping plug
7	125565	1	Grease zerk
8	125566	1	Du-bushing
9	125567	1	Relief valve
10	125568	1	Washer
	117518		Packing kit (Incl. All o-ring and seals)



ITEM	PART NO.	QTY	DESIGNATION
	116344		Cylinder, Hydraulic marker 2- ½ x 20
1	120802	1	Piston rod assembly
2		1	Butt & tube assembly
3	117512	1	Piston
4	120803	1	Gland
5	220000208	1	Locknut
6	200300040	2	Shipping plug
7	125563	1	SQ. Wire tape
	117514		Packing kit (Incl. All o-ring and seals)

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