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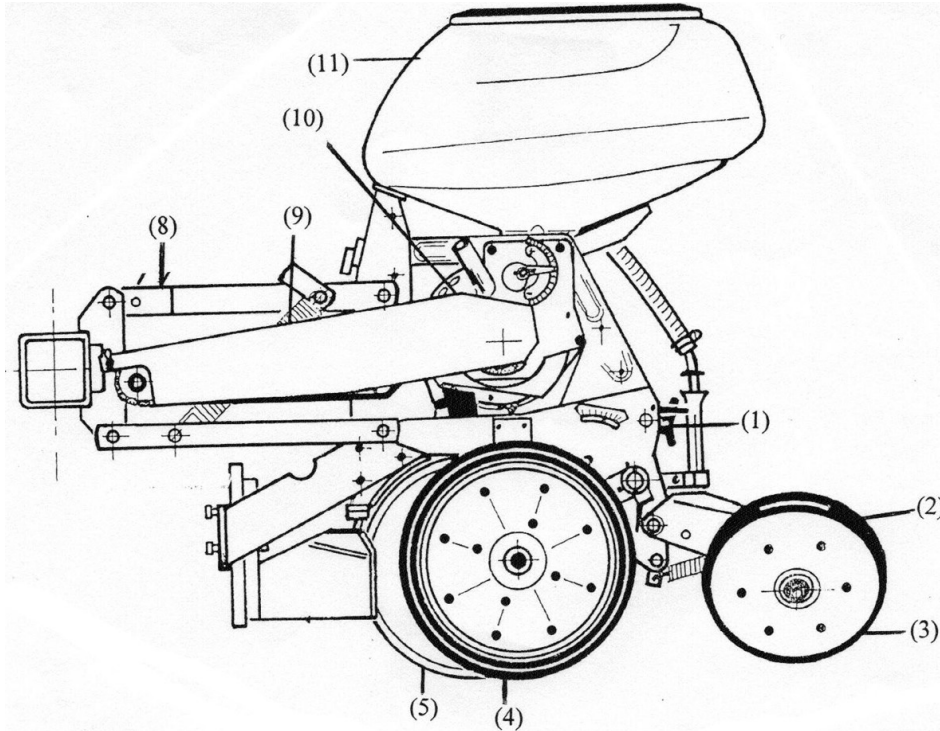
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## ROW UNIT

### NG Plus 3

The NG Plus 3 row unit is shown below with standard features.

Other options are available for specific conditions or uses.



- (1) – Hand wheel
- (2) – Hand wheel
- (3) – Adjustable V Press Wheels
- (4) – Independent Gauge Wheels
- (5) – Heavy-Duty Disc Openers
- (8) – Heavy Duty Parallel Linkage
- (9) – Stabilizing Springs
- (10) – Metering Box
- (11) – Heavy-Duty Plastic Hopper

#### SEED DEPTH

The seed depth is adjusted by the hand wheel (1) that changes the height of the depth gauge wheels (4) in relation to the disc openers (5). A sticker close to the hand wheel, indicating a gradual scale, ensures the uniformity of the depth control on all row units of the planter. Be sure that all row units of the planter are set at the same adjustment.

The disc openers 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.

#### V PRESS WHEELS

The two adjustable rear press wheels (3) affect only the closing of the seed furrow. They float independently and therefore do not have any effect on the ground engaging of the unit. Their soil pressure is regulated by the hand wheel (2). This adjustment allows for shallow (beet), medium (corn) or deep (bean) planting. This pressure has to be chosen carefully with relationship to the type and humidity of the soil, in order to assure proper seed to soil contact.

The width between the bottoms of the adjustable press wheels can also be adjusted with the addition of spacer bushings placed next to the bracket. A spacer of 10mm (25/64") is standard, and can be replaced with a bushing of 8mm (5/16") for narrower closing (such as sugarbeet seed).

Using an oilcan, lubricate the closing wheel assembly at pivot points daily, or as needed. Optional disc closing systems with flat or V press wheels are available. See section under optional wheels.

## ROW UNIT

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### NG Plus 3

#### DEPTH GAUGE WHEELS

The depth gauge wheels (4) are engineered with an equalizing rocker bar to assure uniform depth control of the disc openers, even in clods or rocky conditions. The gauge wheels are independent of each other for a smoother ride through the field. The Optional gauge wheel scrapers can be added, if necessary, to lessen soil buildup to maintain a uniform depth control.

In order for the disc openers to remain properly cleaned and free of soil build-up, the flange of the gauge wheels need to be just touching the disc. To double-check this, raise the unit (using the unit lock up) and manually rotate the gauge wheels; the disc openers should also rotate freely without restriction.

After starting up the planter, the factory assembly may need readjustment. Adjust gauge wheel spacing by putting the washers from one side of the articulating arm to the other. Using an SAE multipurpose grease in a clean grease gun, lubricate the gauge wheel arms as needed.

#### DOUBLE DISC OPENERS

The heavy-duty double disc openers (5) are very durable and mounted on watertight roller bearings. Their function is to slice the soil, and open a straight seed trench. A new interchangeable firming point attached to the frame and positioned ahead of the seed tube also acts as a disc scraper. As mentioned above, the flange of the gauge wheel should be just touching the disc openers, without restricting their movement.

A disc scraper is mounted to the side of each disc. You can adjust the pressure of the scrapers by tightening or loosening the bolts.

#### STABILIZER SPRINGS

The pair of stabilizer springs (9) located within the parallel linkage (shown above) absorbs shock and helps to stabilize the unit in rough terrain. Optional heavy duty down pressure springs are also available.

#### SEED HOPPER

A 52, 60 or 90 ltr. plastic hopper with lid (11) is standard, depending on the type of planter and seed usage

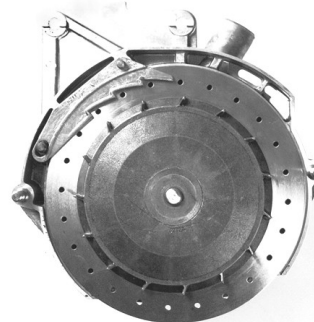
#### DRIVE CHAIN

The drive chain has a hardened surface that increases wear resistance and extends the life of the chain. The drive chains are spring loaded and therefore, self adjusting. The only adjustment needed is to shorten the chain if wear stretches the chain and reduces spring tension. The pivot point of the chain idlers should be checked periodically to ensure they rotate freely. The drive chain is 5R, and has 124 links with the connector link. Use a chain lubricant spray daily, or as needed.

#### SEED METERING SYSTEM

The seed metering system (10) consists of a 2-part metering box made of cast aluminum that is equipped with stainless steel seed discs that deliver the seed to a curved seed tube.

The metering box is located below the seed hopper and is engineered for accuracy and long life. The special shape allows for planting even when a minimum of seed remains in the hopper. The metering box contains sealed bearings for durability.



The stationary part of the metering box is called the **main housing**, shown below, and is mounted in the planter unit frame.

Components in the main housing are the plastic wear gasket (5) and cap (6), seed disc and seed scraper. The plastic wear gasket, on which the seed disc rotates, should be smooth and in good condition. Under normal operating conditions, it should be replaced only after 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 rotated into the groove, locking into place when the stub fits into the hole of the housing, and is then held in position by the cap (6) and 3 bolts.

**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.

**ROW UNIT**

**NG Plus 3**

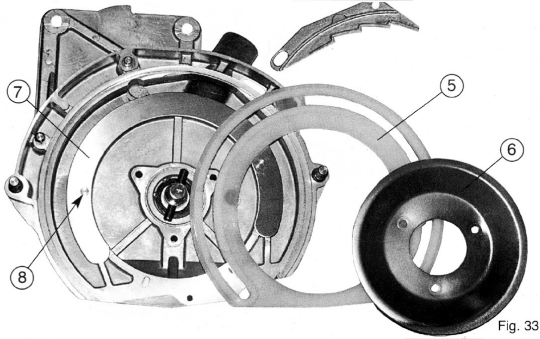


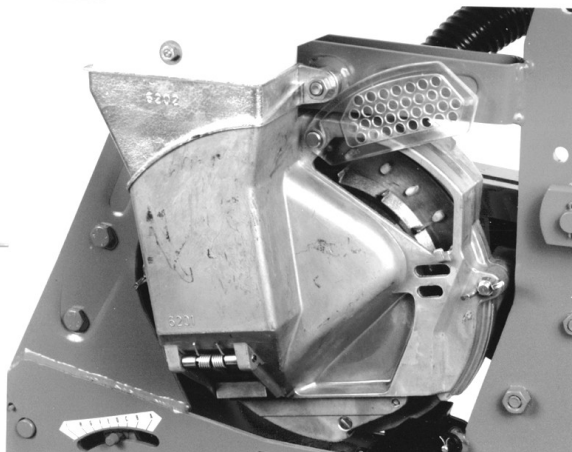
Fig. 33

On the outside of the main housing is the lever for adjusting the air suction to the weight of the seed, as well as setting the height of the seed scraper.



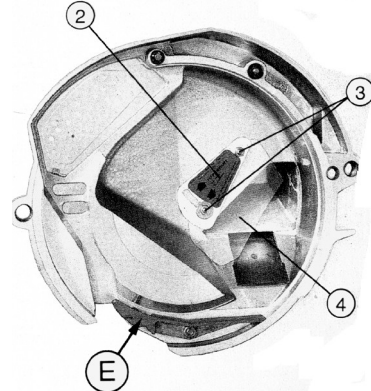
The second part of the metering box is called the **cover**. The cover is secured to the main housing by 2 wing nuts. The components on the outside of the cover are a control window and trap door. The components on the inside of the cover are a metal shutter, and ejector block.

The control window is made of clear plastic and allows for viewing of the seed against the seed disc. It can also be raised for close inspection.

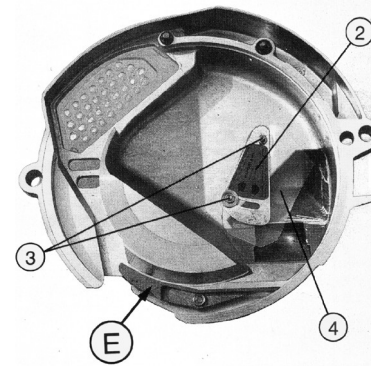


The metal shutter regulates the flow of seeds coming from the hopper and provides a constant and sufficient level in front of the disc. According to the seed used, the shutter has to be checked and adjusted at 2 different positions before planting.

The interior shutter is adjusted by lowering it after loosening the 2 bolts (3). A small plastic sheet (4) is located under the shutter and is also used to limit the level of seeds in front of the disc.



**1 – High Position:** For large seeds, such as corn, soybean, edible beans, cotton, etc. The high position moves the shutter away from the opening.



**2– Low Position:** For small seeds, such as cucumbers, beet, peppers, etc. The low position moves the shutter over part of the opening.

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

The brass ejector block (E) assures that the seed is dropped at a consistent angle to reduce seed bounce inside the seed tube, for more accurate seed placement. Because of the important function of the ejector block, it is recommended to check its condition periodically.

**ROW UNIT**

**NG Plus 3**

**EXTRA LARGE SEED**

A special metering box cover should be used for seeds such as peanuts, and kidney beans. This special metering box cover is designed with a larger opening (to improve the seed flow into the seed chamber), a larger discharge channel (to avoid blockage), and a special less aggressive seed scraper (to avoid skips). The position of the metal shutter should be in a high position for these large seeds.

**NOTE:** If your planter was ordered to plant extra large seed as the main crop and it has the special metering box cover installed, you will also be able to use this cover for smaller seed as corn or beans, by adjusting the metal shutter to a low position.

**DISENGAGING THE METERING BOX**

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

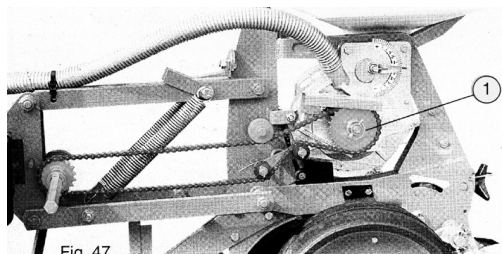


Fig. 47

**SEED TUBE**

The seed tube is the last point of contact the seed has in the metering system. After the seed passes by the brass ejector block, (which ejects the seed at a consistent angle to reduce seed bounce in the seed tube) it is guided through the curved seed tube into the seed trench.

Before and during each new planting season, check to see if the seed tubes are in good condition, as consistent and regular seeding will depend on this. To replace the seed tube, remove the gauge wheel and disc opener on one side to remove the top pin holding the tube in place.

Electronic seed monitors (that monitor the flow of seed through the seed tube) are optional. See optional equipment.

Note: If the optional V shoe insert is used for small seed, it must be removed when planting larger seeds such as beans, as it will cause plugging due to normal crimping of the seed tube during installation.

**METERING BOX ADJUSTMENT**

The outside lever on the metering box cover is unique. It makes two adjustments at the same time.

**It is these two factors that influence the degree of singulation of the seed.**

**(1) It adjusts the height of the scraper in relationship to the holes in the disc, and (2) at the same time adjusts the air suction (from the turbofan) to the weight of the seed.**

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

When the indicator (1) is positioned to the "-" it lowers the scraper over the holes and reduces the degree of suction (opening the size of the hole (2)). This may cause skipping if it is too low.

The clear plastic control window in the cover allows you to monitor the results.

Below is a recommendation for setting the indicator.

Corn	+1 (0 to +2)
Cotton	+1
Beans	+4 to +5
Sunflowers	+1 (0 to +2)
Coated Sugarbeet	+2
Uncoated Sugarbeet	0 (-2 to +1)
Pickles/Melon	- 1 ½ (-1 to -2)
Soybeans/Peas	+4
Sorghum	+3
Kidney Beans	+5
Peanuts	+4 ½ (+4 to +5)
Rape Seed/Cabbage	+2

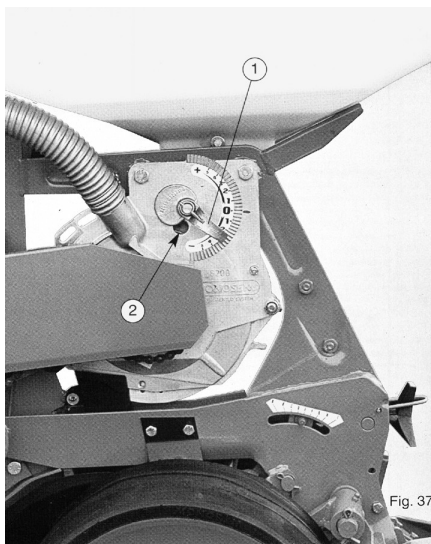
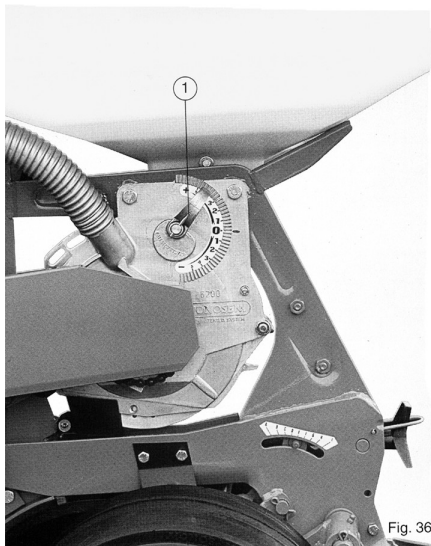
This applies to 500-rpm PTO speed, except for large seed (kidney beans, peanuts, etc.) for which a slightly higher speed (5-10%) is preferable. It is then recommended to run at 540 rpm PTO speed.

**NOTE: The above settings are theoretical, so checking before and during planting is essential.**

## ROW UNIT

### NG Plus 3

#### METERING BOX ADJUSTMENT



#### SEED DISC

Use the proper seed disc for different seeds. Check your type of seed, and use the **Seed Disc Recommendations** chart to determine the correct disc for your crop.

It is important to use seed discs that are clean and in good condition. Customized seed discs are not shown, but are available upon special request. It is not recommended to drill out your own seed discs. Any slight burrs or imperfections in drilling will alter your metering. The precision of your seed discs must be maintained to have proper metering.

The brass agitator screws onto the seed disc with 6 special screws.

If you remove your seed discs from the metering box, to clean or use different seed discs, it would be beneficial, when re-using the seed discs, to place them back into the same metering box. You can use a marker to identify the seed disc to the metering box.

#### SEED CHUTE

A seed chute (shown below) is supplied with each planter, and simplifies emptying of the hoppers.



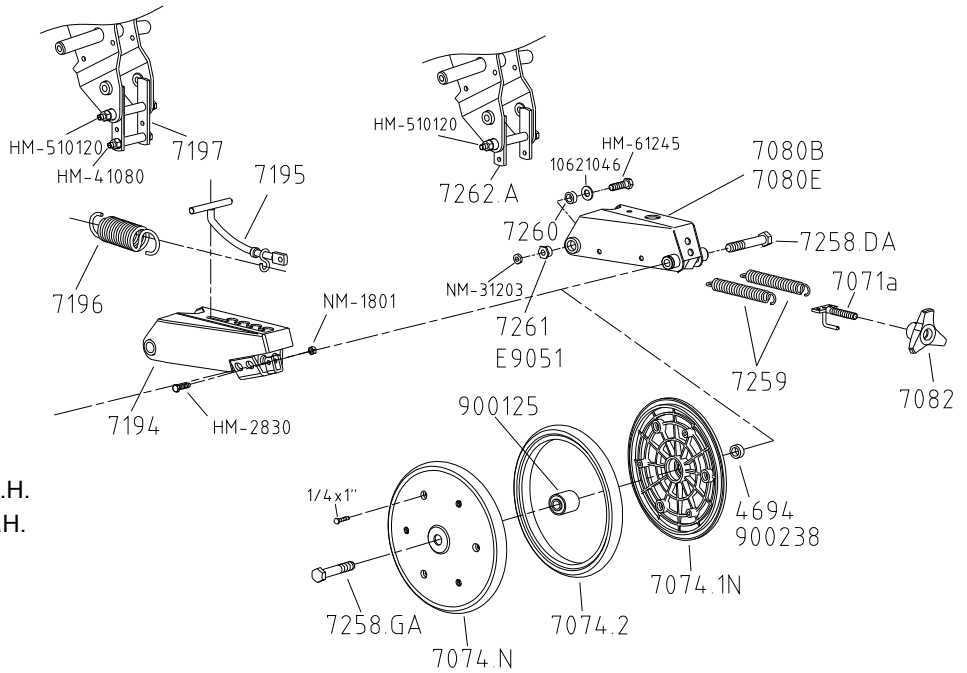
**ROW UNIT**

**NG Plus 3**

**CLOSING WHEEL ASSEMBLY**

**PART No. DESCRIPTION**

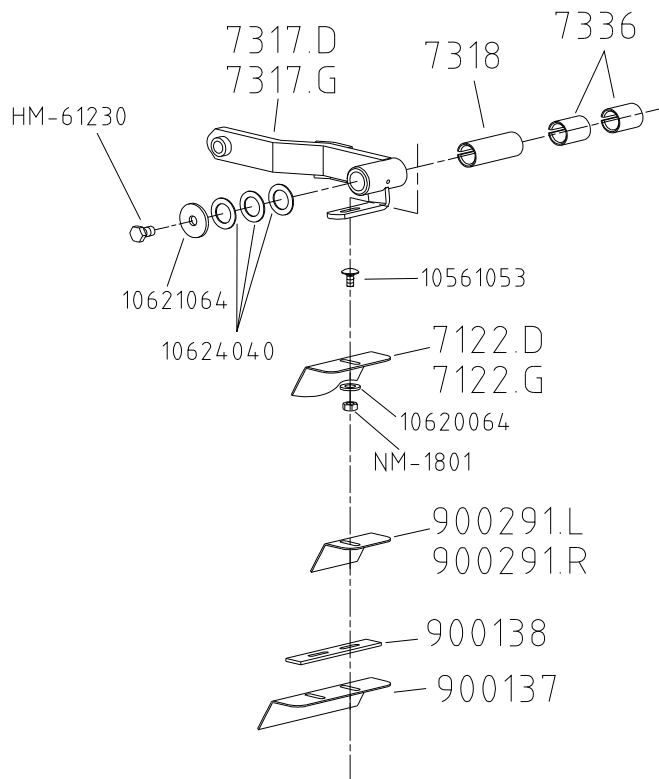
4694	Bushing 10mm
7074.1N	Nylon rim half
7074.2	Tire 1" x 12"
7074.N	Closing wheel complete 1" x 12"
7080.B	Bracket adjustable closing wheels
7080.E	Bracket for narrow and twin rows
7082	Handwheel
7194	Bracket for T-handle
7195	T-handle
7196	Spring
7197	Spring support
7258.DA	Special bolt M16 x 80 R.H.
7258.GA	Special bolt M16 x 80 L.H.
7259	Spring
7260	Spacer bushing
7261	Threaded pivot bushing
7262.A	Spring support
900125	Bearing 40mm
900238	Bushing 8mm
10621046	Washer M13 x 27 x 2
HM-2830	Hex bolt M8 x 30
NM-1801	Hex nut M8
E9051	Eccentric bushing
HM-41080	Bolt M10 x 80
HM-510120	Bolt M10 x 120
HM-61245	Bolt M12 x 45
NM-31203	Jam nut M12



**GAUGE WHEEL ARM**

**PART No. DESCRIPTION**

7318	One piece bushing
7336	Two piece bushing
900137	Scraper blade dbl. g.w.
900138	Extension dbl. g.w.
10561053	Carriage bolt M8 x 18
10620064	Washer M8.5 x 16 x 2
10621064	Washer M13 x 45 x 5
10624040	Washer M33 x 45 x 1.5
7122.D	Scraper blade RH std. g.w.
7122.G	Scraper blade LH std. g.w.
7317.D	Gauge wheel arm RH
7317.G	Gauge wheel arm LH
900291.L	Scraper blade LH narrow g.w.
900291.R	Scraper blade RH narrow g.w.
HM-61230	Hex bolt M12 x 30
NM-1801	Hex nut M8



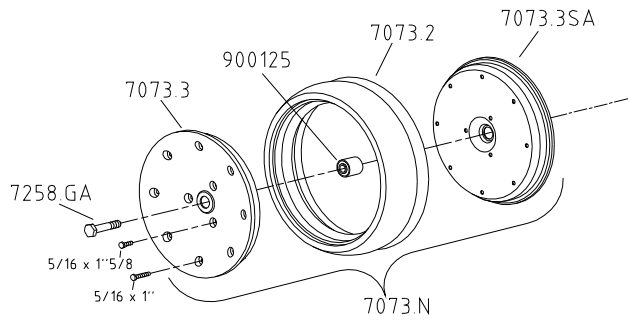
**ROW UNIT**

**NG Plus 3**

**GAUGE WHEEL ASSEMBLY**

**7073.N Gauge wheel complete (black nylon rim)**

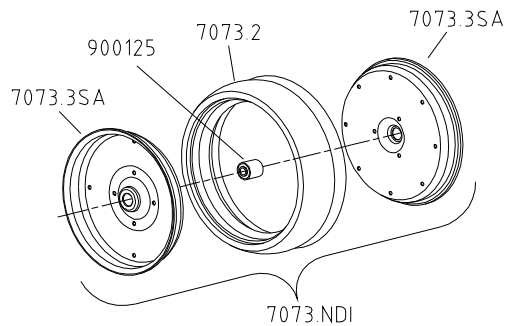
- 900125 Bearing, 40mm (DAC1640442RSL)
- 7073.2 Tire only, standard
- 7073.3 Outer rim (black nylon)
- 7073.3SA Inner rim (black steel)
- 7258.DA RH Hex head bolt 16 x 80
- 7258.GA LH Hex head bolt 16 x 80



**7073.NDI Dual gauge wheel, inside**

(2 blk steel rims with bearing)

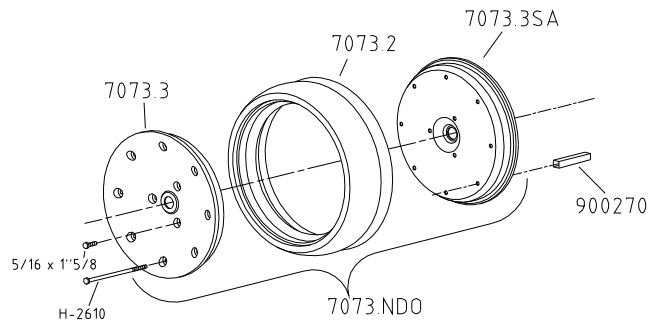
- 900125 Bearing, 40mm (DAC1640442RSL)



**7073.NDO Dual gauge wheel, outside**

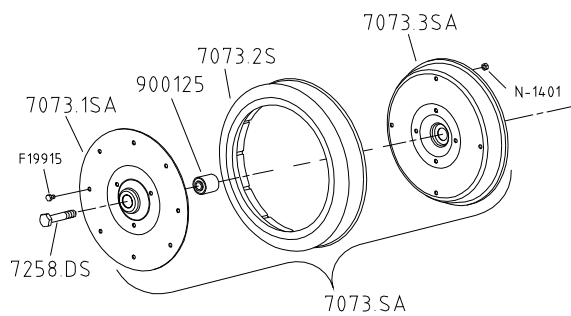
(1 steel rim, 1 nylon rim, no bearing)

- 900270 Spacer, 4" length
- H-2610 Bolt, 5/16" x 6"



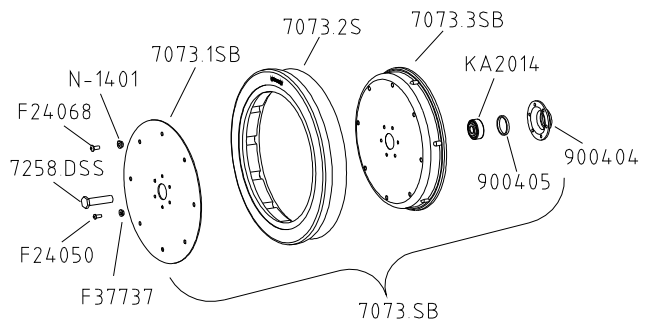
**7073.SA Narrow gauge wheel, complete**

- 900125 Bearing, 40mm (DAC1640442RSL)
- 7073.1SA Outer rim (steel)
- 7073.2S Tire only, narrow
- 7073.3SA Inner rim (black steel)
- 7258.DS RH Hex bolt 16 x 80, W/ 7/32" thick bolt head
- 7258.GS LH Hex bolt 16 x 80, W/ 7/32" thick bolt head
- F19915 Flange head bolt, 5/16-18 x 5/8"
- N-1401 5/16 -18 Flange lock nut



**7073.SB Flat narrow gauge wheel**

- 900404 Bearing housing
- 900405 Spacer
- 7073.1SB Outer rim (steel)
- 7073.2S Tire only, narrow
- 7073.3SB Inner rim (black steel)
- 7258.DSS RH Bolt 16 x 60, W/ 7/32" thick bolt head
- 7258.GSS LH Bolt 16 x 60, W/ 7/32" thick bolt head
- F24050 1/4" -20 x 5/8 Button head socket screw
- F24068 5/16" -18 x 5/8" Button head socket screw
- F37337 1/4 -20 Flange lock nut
- N-1401 5/16 -18 Flange lock nut
- KA2014 Bearing

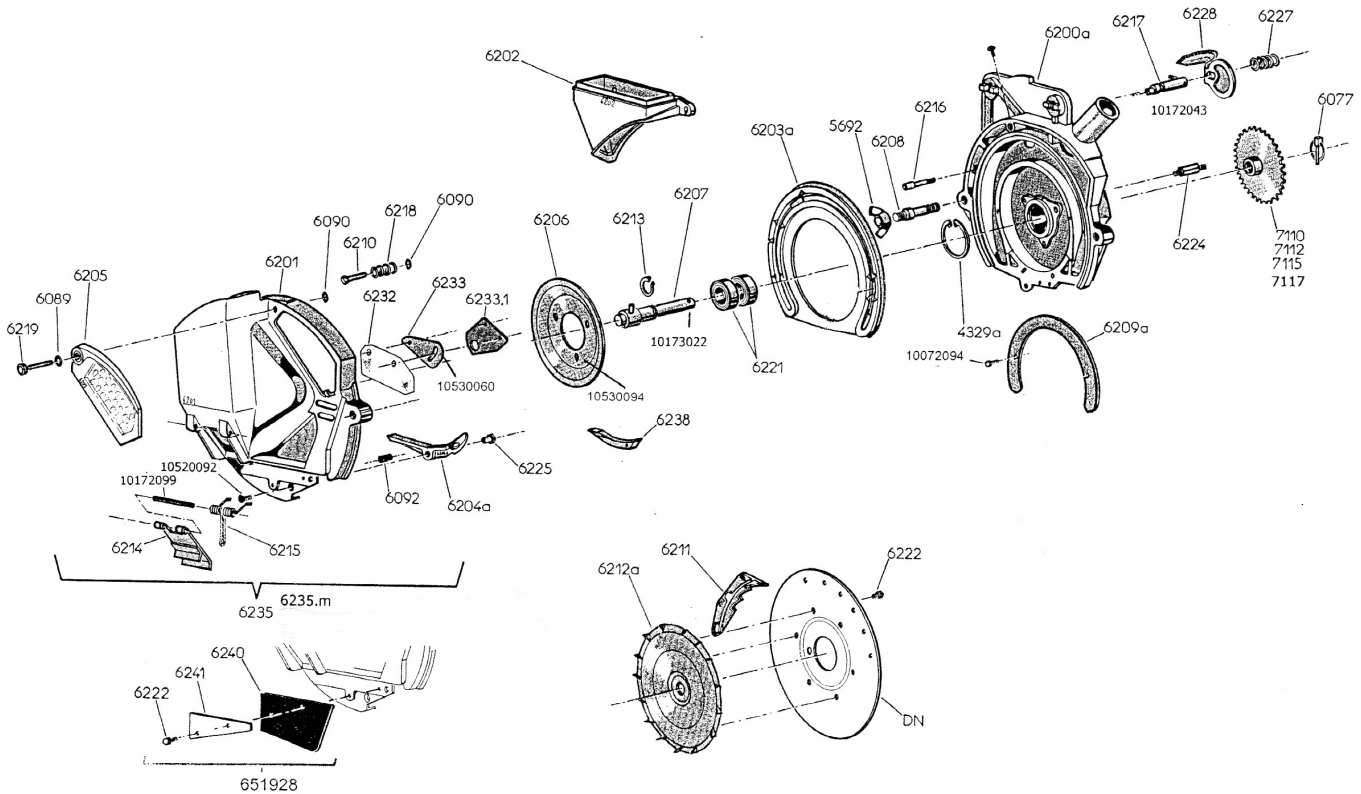




**ROW UNIT**

**NG Plus 3**

**METERING BOX ASSEMBLY**



PART No.	DESCRIPTION
4329.a	Snapping, internal, 57mm
5692	Wing nut, 10mm
6077	Lynch pin, 6mm dia.
6089	Rubber ring
6090	Snapping, 6mm
6092	Spring
6200.a	Housing only for meter box
6201	Meter box cover only
6202	Collar brace
6203.a	Plastic insert
6204.a	Bronze ejector block assembly
6205	Control window
6206	Tightening cap
6207	Shaft, meter box, uses 8x50 roll pin
6208	Threaded tightening rod for cover
6209.a	Brace for plastic insert
6210	Pressure pin scraper
6211	Seed scraper, standard
6211.2a	Seed scraper, extra large seed
6212.a	Agitator, brass
6213	Snapping, external, 20mm
6214	Trap door
6215	Spring for trap door
6216	Fixed pin for seed scraper
6217	Adjustable pin for seed scraper, uses 4x35 roll pin
6218	Spring
6219	Pin for control window
6221	Bearing 42mm, (ref. 60042RS)

PART No.	DESCRIPTION
6222	Screw, used for agitator and wind flap
6225	Nut, to secure ejector block
6227	Spring for selector handle
6228	Selector handle
6232	Gasket for inside meter box cover
6233	Shutter, standard cover
6233.1	Shutter for small seed, standard cover
6233.2	Shutter for medium to small seed, standard cover
6233.2s	Shutter for small seed, large seed cover only
6233.3s	Shutter for medium seed, large seed cover only
6235	Standard cover complete
6235.m	Large seed cover complete, accepts both 6204.a or 6238
6238	Aluminum ejector block (for large seed covers)
6240	Rubber shield
6241	Metal tightener plate
7110	Sprocket, 27 tooth, (4% slow down from std sprocket 7115)
7112	Sprocket, 21 tooth (20% speed up from std sprocket 7115)
7115	Sprocket, 26 tooth, standard drive sprocket
7117	Double sprocket, 26-12 to drive US insecticide
651928	Protection kit
10072094	Screw, 5x6 to secure brace 6209.a
10172043	Roll pin, 4x35 for 6217 pin
10172099	Roll pin, 6x70 to secure trap door
10173022	Roll pin, 8x50 for 6207 shaft
10520092	Screw, 6x16 for ejector block assembly
10530060	Bolt, 5x20
10530094	Phillips screw, 6x20

## **ROW UNIT**

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### **NG Plus 3**

#### **METERING BOX - TROUBLE SHOOTING**

##### **Excessive Skipping**

- Seed scraper is too low. (Incorrect setting on the indicator.)
- Seed scraper is bent. (Not flat)
- Seed disc is bent or worn.
- Seed scraper is dirty with chemical product.
- Plastic wear surface of metering box is warped or used up.
- Holes of the seed disc are clogged (sugarbeets, rapeseed, cabbage.) To be double-checked from time to time.
- Excessive working speed.
- Defective vacuum hoses.
- Insufficient vacuum suction.
- PTO speed is too low.
- Foreign material mixed with seed.
- Seed blockage in the hopper.  
(Seed treatment product may be too moist.)
- Fan belt is too loose.

##### **Excessive Doubling**

- Seed scraper is too high. (Incorrect setting on the indicator.)
- Seed scraper is worn.
- Holes of the seed disc too large for seed.
- Excessive working speed.
- Seed level too high in the metering box.

##### **Irregular Seeding (Skipping and Doubles)**

- Excessive working speed.
- Holes of the seed disc are too large. (Cut off seeds.)
- Fields are too steep
- Shutter is adjusted incorrectly

##### **Irregular Spacing**

- Excessive working speed.
- Soil is too wet and is sticking to tires.
- Incorrect tire pressure.
- Shutter is adjusted incorrectly.
- Ejector is damaged.

**ROW UNIT**

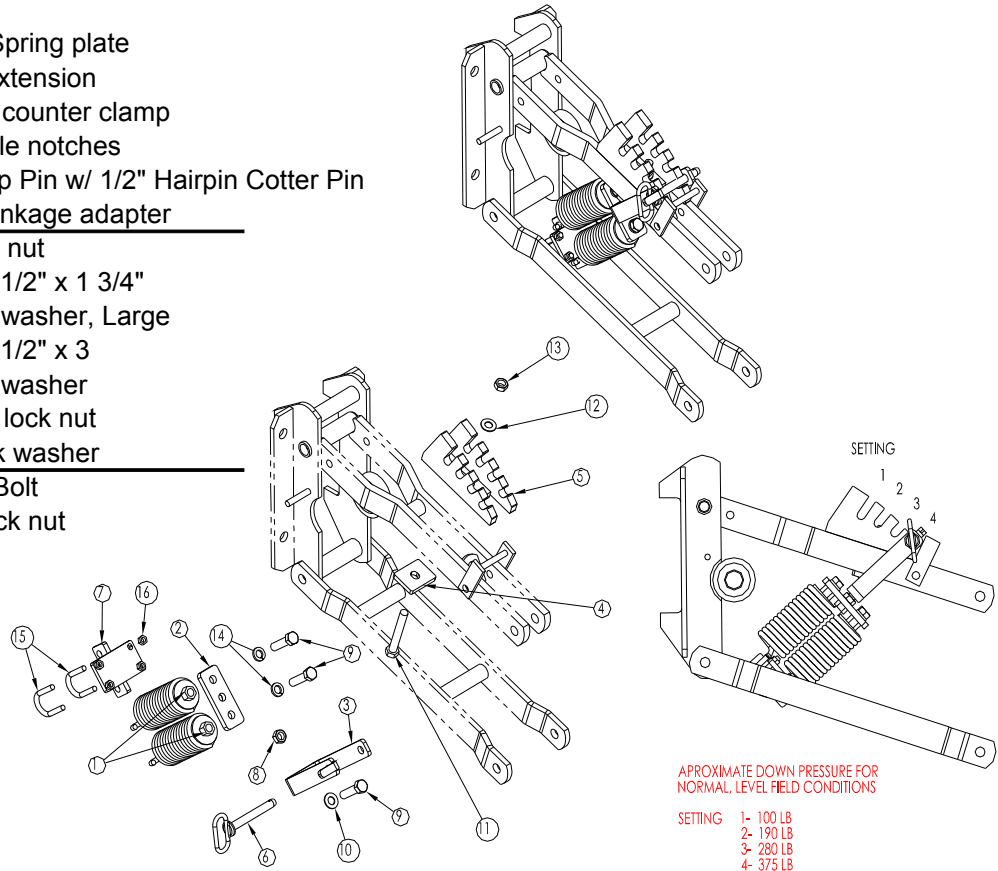
**NG Plus 3**

**UP / DOWN PRESSURE SPRING**

Quick Change Down Pressure, For Use with Narrow Bottom Linkage Sub-Assembly #KA2068QT

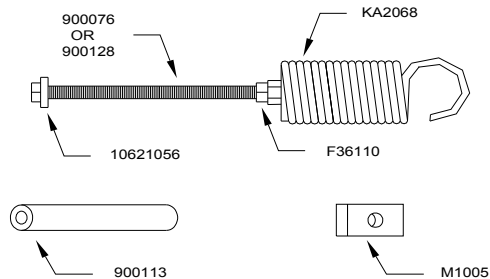
**ITEM PART No. DESCRIPTION**

1	KA2068	Spring
2	800208	Double Spring plate
3	800145.B	Spring Extension
4	800144	Notched counter clamp
5	800143.A	Adjustable notches
6	800228	Easy Grip Pin w/ 1/2" Hairpin Cotter Pin
7	800211	Narrow linkage adapter
8	F36210	1/2" Jam nut
9	F13210	Hex bolt 1/2" x 1 3/4"
10	F33012	1/2" Flat washer, Large
11	F33215	Hex bolt 1/2" x 3
12	F33086	1/2" Flat washer
13	F37214	1/2" Rev lock nut
14	F123498	1/2" Lock washer
15	F42012	5/16" U-Bolt
16	F37021	5/16" Lock nut



**UP/DOWN PRESSURE SPRING KIT PART #'S**

<b>KA2068.ASY</b>	<b>Down Pressure Spring Kit</b>
KA2068	Spring
10621056	Washer, 13x30x6
900076	Bolt, all thread, 1/2-13x8"
900113	Spacer bushing
F36110	Nut, 1/2-13
M1005	Upper linkage tab (if needed)
<b>KA2068.ASYU</b>	<b>Up Pressure Spring Kit</b>
KA2068	Spring
10621056	Washer, 13x30x6
900128	Bolt, all thread, 1/2-13x10"
F36110	Nut, 1/2-13
M1005	Upper linkage tab (if needed)



**ROW UNIT**

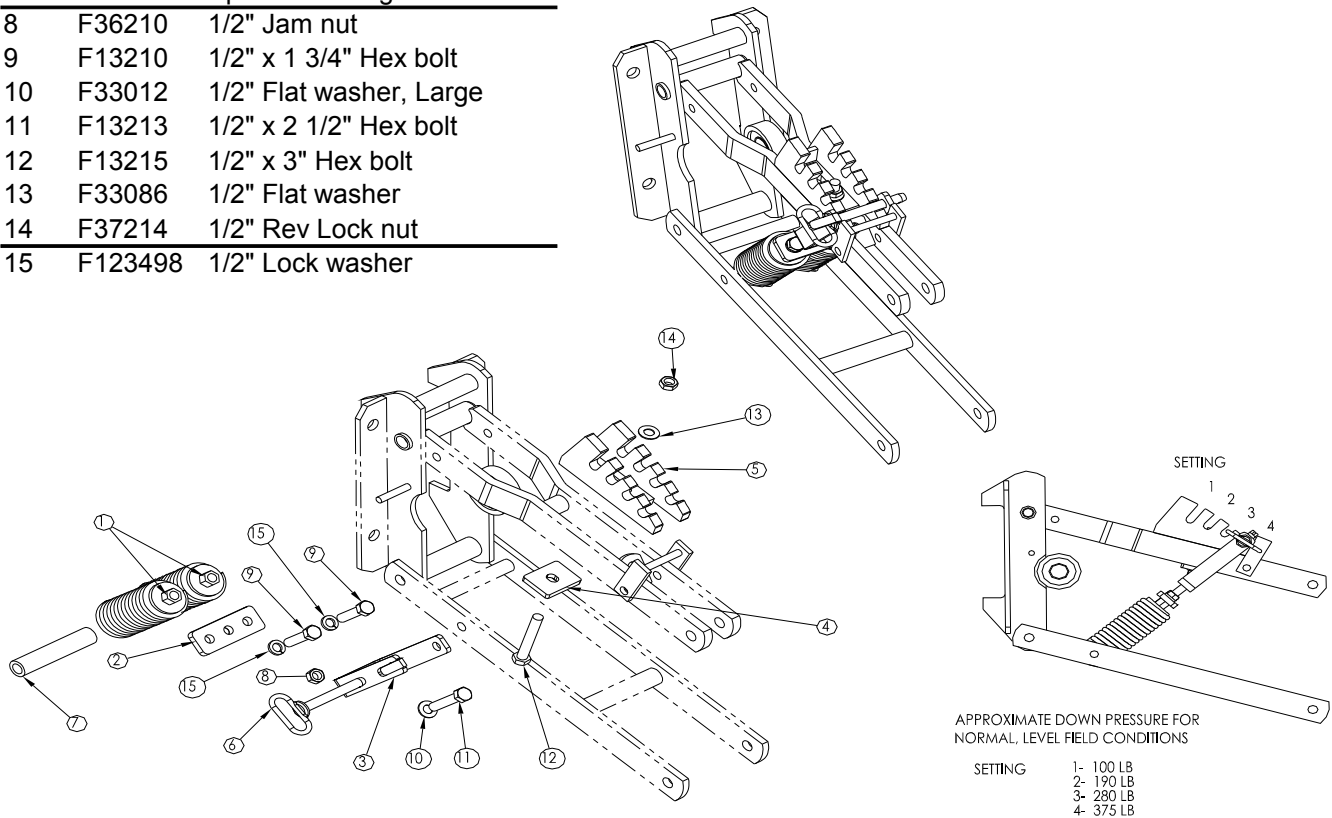
**NG Plus 3**

**UP / DOWN PRESSURE SPRING**

Quick Change Down Pressure, For Use with Standard Linkage Sub-Assembly #KA2068Q

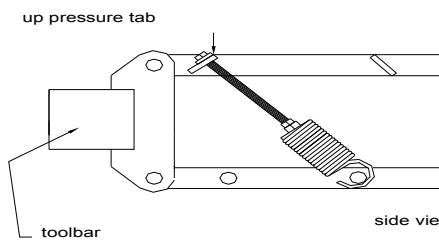
**ITEM PART No. DESCRIPTION**

1	KA2068	Spring
2	800208	Double Spring Plate
3	800145.B	Spring Extension
4	800144	Notch Counter Clamp
5	800143.A	Adjustable Notches
6	800228	Easy Grip pin w 1/2" Hairpin cotter pin
7	900113	Spacer bushing
8	F36210	1/2" Jam nut
9	F13210	1/2" x 1 3/4" Hex bolt
10	F33012	1/2" Flat washer, Large
11	F13213	1/2" x 2 1/2" Hex bolt
12	F13215	1/2" x 3" Hex bolt
13	F33086	1/2" Flat washer
14	F37214	1/2" Rev Lock nut
15	F123498	1/2" Lock washer

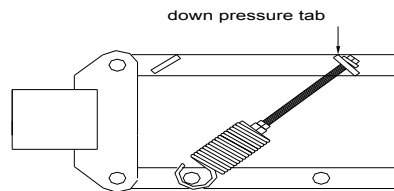


APPROXIMATE DOWN PRESSURE FOR NORMAL, LEVEL FIELD CONDITIONS

SETTING	1- 100 LB
	2- 190 LB
	3- 280 LB
	4- 375 LB



side view of parallel linkage



**ROW UNIT**

**SEED DISC IDENTIFICATION**

The size of the seed disc is engraved into the back of the seed disc. When ordering seed discs, the prefix DN indicates the disc only. The prefix DC indicates the complete disc with brass agitator (6212.a). The first 2 numbers of a 4 number series indicates the number of holes in the seed disc. The second two numbers indicates the size (diameter) of the holes.

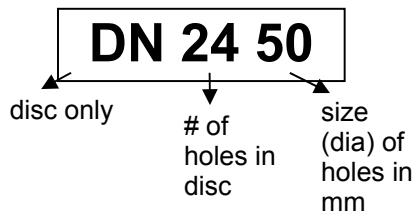
**Example:**

**Seed Disc # DN 2450**

**DN** indicates disc only (no agitator)

**24** indicates 24 holes

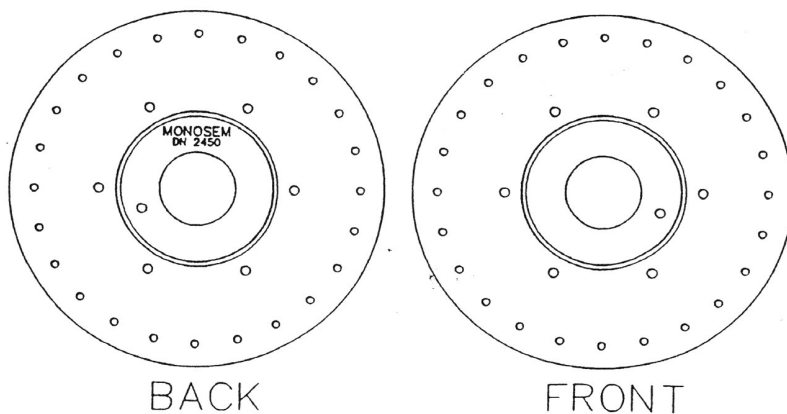
**50** indicates the holes are diameter 5.0 mm.



**HOLE SIZE**

**EXAMPLES**

- 08 = .8 mm
- 10 = 1.0 mm
- 12 = 1.2 mm
- 20 = 2.0 mm
- 35 = 3.5 mm
- 45 = 4.5 mm
- 50 = 5.0 mm
- 60 = 6.0 mm
- 65 = 6.5 mm



**SEED DISC RECOMMENDATIONS**

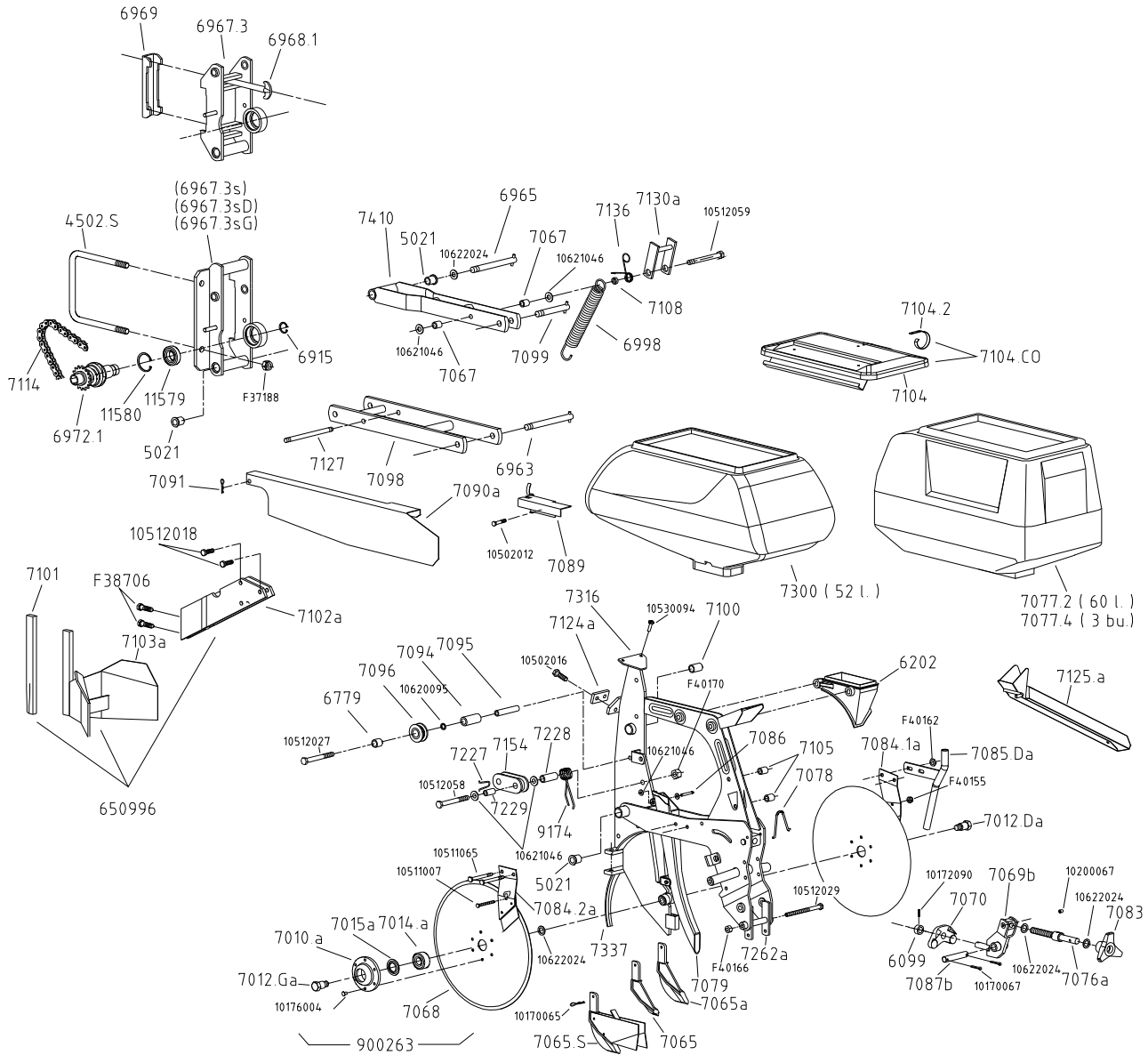
<b>CROP</b>	<b>SEED DISC</b>		<b>SEED SPACING</b>
Beans	DC3665	Large, Kidney	2 3/8 - 7"
	DC4850	Large, Pinto, Romano, Lima, Chicapee	1 3/4 - 5 1/2"
	DC6045	Medium, Snap, Baby Limas, Soybeans	1 3/8 - 4 3/8"
	DC6035	Small, Navy, Peas	1 3/8 - 4 3/8"
Broccoli and Cabbage	DC3612 (low population)		2 3/8 - 7"
	DC7212 (high population)		1 3/16 - 3 1/2"
Canola	DC7212		1 3/16 - 3 1/2"
Cauliflower	DC3612 (low population)		2 3/8 - 7"
	DC7212 (high population)		1 3/16 - 3 1/2"
Collard Greens	DC7208		1 3/16 - 3 1/2"
Corn	DC0950	Field	9 1/2 - 28"
	DC1250		7 - 21"
	DC1850 (low population)		4 3/4 - 14"
	DC2450 (medium population)		3 1/2 - 10 1/2"
	DC3050 (high population)		2 3/4 - 8 1/2"
	DC2437, small, 2700-5000 seeds/lb. Sweet		3 1/2 - 10 1/2"
	DC2445, large, 1700-2700 seeds/lb.		3 1/2 - 10 1/2"
	DC2425	Ornamental	3 1/2 - 10 1/2"
Cotton	DC3635 (low population)	Single seed drop	2 3/8 - 7"
	DC6035 (high population)	Single seed drop	1 3/8 - 4 3/8"
	DC0930D (double seed drop)	Hill drop (seeds 3/4 - 2" apart)	9 1/2 - 28"
	DC0930T (triple seed drop)	Hill drop (seeds 3/4 - 2" apart)	9 1/2 - 28"
	DC1230D (double seed drop)	Hill drop (seeds 3/4 - 2" apart)	7 1/8 - 21"
	DC1230T (triple seed drop)	Hill drop (seeds 3/4 - 2" apart)	7 1/8 - 21"

**ROW UNIT**

Cotton	DC1830D (double seed drop)	Hill drop(seeds 3/4 - 2" apart)	4 3/4 - 14"	
	DC1830T (triple seed drop)	Hill drop(seeds 3/4 - 2" apart)	4 3/4 - 14"	
Cucumbers/ Pickles	DC1820	Hand harvest	4 3/4 - 14"	
	DC3020	Machine harvest	2 3/4 - 8 1/2"	
Kale	DC7208		1 3/16 - 3 1/2"	
Melons	DC0620 (low population)	Watermelon, small seed, Cantaloupe	14 1/4 - 42"	
	DC0920 (medium population)		9 1/2 - 28"	
	DC1820 (high population)		4 3/4 - 14"	
	DC0325 (low population)	Watermelon, large seed	28 1/2 - 84"	
	DC0325D (hill drop )		Drop two seeds, 1-3/8 - 4-3/8" apart	28 1/2 - 84"
	DC0625 (medium population)		14 1/4 - 42"	
	DC0625D (hill drop)		Drop two seeds, 1-3/8 - 4-3/8" apart	14 1/4 - 42"
	DC0925 (high population)		9 1/2 - 28"	
Okra, Artichoke	DC3622		2 3/8 - 7"	
	DC7222		1 3/16 - 3 1/2"	
Onions	DC3610 (low population)	Raw	2 3/8 - 7"	
	DC7210 (high population)		1 3/16 - 3 1/2"	
	DC3622 (low population)	Pelleted	2 3/8 - 7"	
	DC7222 (high population)		1 3/16 - 3 1/2"	
Parsley	DC7208		1 3/16 - 3 1/2"	
Peanuts	DC3665	Jumbo seed	2 3/8 - 7"	
	DC3060 (twin row)	Small to medium seed	2 3/4 - 8 1/2"	
	DC4060	Small to medium seed	2 1/8 - 6 1/2"	
	DC4860(not recommended)	Small to medium seed, (High pop.)	1 3/4 - 5 1/2"	
Peppers	DC3612 (low population)		2 3/8 - 7"	
	DC7212 (high population)		1 3/16 - 3 1/2"	
Pumpkins	DC0335 (low population)		28 1/2 - 84"	
	DC0335D (hill drop)	Drop two seeds, 1-3/8 - 4-3/8" apart	28 1/2 - 84"	
	DC0635 (medium population)		14 1/4 - 42"	
	DC0635D (hill drop)	Drop two seeds, 1-3/8 - 4-3/8" apart	14 1/4 - 42"	
DC0935 (high population)	9 1/2 - 28"			
Radish	DC6015		1 3/8 - 4 3/8"	
Rice	DC9016		15/16 - 2 3/4"	
Sesame	DC7208		1 3/16 - 3 1/2"	
Sorghum	DC3622 (low population)		2 3/8 - 7"	
	DC7222 (high population)		1 3/16 - 3 1/2"	
Spinach	DC6015	Small seed	1 3/8 - 4 3/8"	
	DC6020	Large seed	1 3/8 - 4 3/8"	
	DC12020	Large seed(high populations)	11/16 - 2 1/16"	
Squash	DC0625 (medium population)	Summer	14 1/4 - 42"	
	DC0925 (high population)		9 1/2 - 28"	
	DC0635 (medium population)	Winter	14 1/4 - 42"	
	DC0935 (high population)		9 1/2 - 28"	
Sugarbeets	DC4016 (medium population)	Small, Medium, Large & Pelleted seed	2 1/8 - 6 1/2"	
	DC4020 (medium population)		Medium, Large and Pelleted seed	2 1/8 - 6 1/2"
	DC6020 (high population)		Medium, Large and Pelleted seed	1 3/8 - 4 3/8"
	DC12015 (seed production)		Small, Medium, Large & Pelleted seed	11/16 - 2 1/16"
	DC12020 (seed production)		Medium, Large and Pelleted seed	11/16 - 2 1/16"
Sunflowers	DC1225 (low population)	Oil & Confection	7 1/8 - 21"	
	DC1825 (high population)		4 3/4 - 14"	
Tomatoes	DC7212		1 3/16 - 3 1/2"	
	DC1212T(hill drop 12 x 3 x 1.2)		7 - 21"	
Turnips	DC7208		1 3/16 - 3 1/2"	

**ROW UNIT**

**NG Plus 3 Assembly**



PART No.	DESCRIPTION
4502.S	U bolt, for 7" x 7" x 5/8-11
4503	Nylon locknut, 16mm
5021	Bushing, self lubricated
6099	Collar with 6x25 roll pin
6202	Collar brace
6779	Bushing, self lubricated
6915	Snapping, 30mm
6963	Pivot pin, lower linkage, 165mm(16mm jam nut)
6965	Pivot pin, upper linkage, 155mm (16mm jam nut)
6967.3	Clamp facing, 5x5 toolbar
6967.3S	Clamp facing, 7x7 toolbar
6967.3SD	Clamp facing, 7x7 toolbar R.H.
6967.3SG	Clamp facing, 7x7 toolbar L.H.

PART No.	DESCRIPTION
6968.1	T-bolt, 16mm
6969	Clamp plate, 5x5 toolbar
6972.1	Slipclutch
6998	Spring
7010.A	Cast hub, uses 6x22 rivets
7012.DA	Removable spindle, righthand
7012.GA	Removable spingle, lefthand
7014.A	Bearing double disc opener (52042RS)
7015.A	Sealing washer
7065	Cast point
7065.A	Cast V slice insert
7065.S	V shoe insert for small seed
7067	Spacers for unit lockup bracket

**ROW UNIT**

**NG Plus 3 Assembly**

<b>PART No.</b>	<b>DESCRIPTION</b>
7068	Opening disc only
7069.B	Bracket for wheel stop/depth control rod
7070	Swing bracket
7076.A	Threaded for depth adjustment
7077.2	Seed hopper, standard, 60 ltr
7077.3	Seed hopper, Twin row, 60 ltr
7077.3A	Seed hopper, TwinRow/reversed, 60 ltr
7077.4	Seed hopper, 3 bu.
7077.UNR	Seed hopper, 50 ltr (1.4 bu, uses 7088.n lid)
7078	Wire stop for depth control rod
7079	Blank seed tube
7083	Handwheel for depth control, uses 6x30 roll pin
7084.1A	Right outside scraper
7084.2A	Left outside scraper
7085.DA	Insecticide drop tube, right
7085.GA	Insecticide drop tube, left
7086	Pin for seed tube attachment
7087.B	Pin, uses 2-5x40 cotter pins
7088.N	Lid for 7077.UNR hopper
7089	Small chain guard
7090.A	Drive chain guard
7091	Clip pin
7094	Spacer bushing
7095	Pivot pin, takes 10x100 bolt
7096	Chain roller (cast iron)
7098	Lower parallel linkage arm
7099	Pivot pin, upper linkage, 75mm (16mm jam nut)
7100	Bushing, self lubricated
7101	Front point, clod remover
7102.A	Mounting bracket, clod remover
7103.A	Clod remover
7104	Lid w/o spring clip
7104.CO	Lid complete w/spring clip
7104.2	Spring clip
7105	Spacer
7108	Bushing, self lubricated
7114	Drive chain, 5R, 124 links w conn. Link
7124.A	Unit stop
7125.A	Seed chute

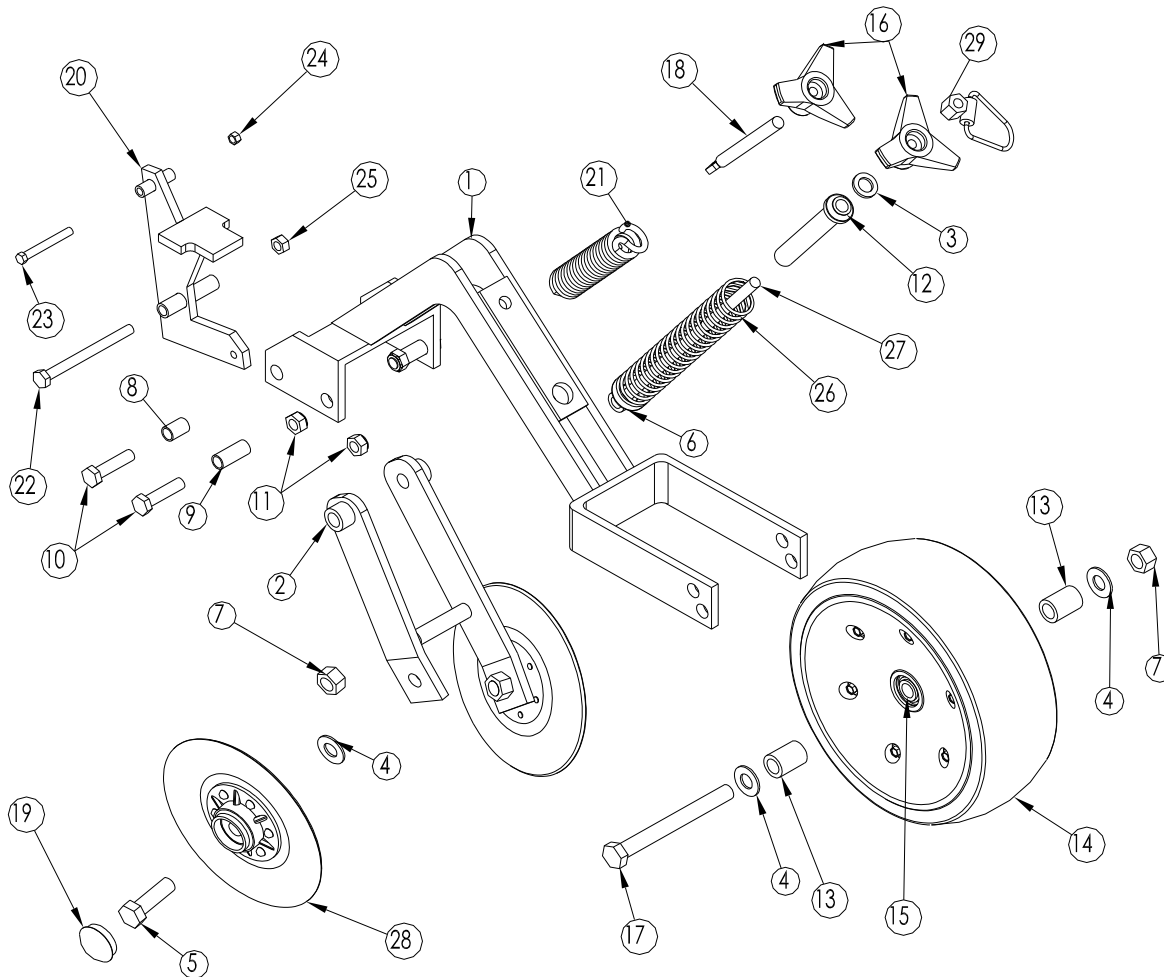
<b>PART No.</b>	<b>DESCRIPTION</b>
7127	Threaded rod
7130.A	Unit lock up bracket
7136	Spring
7262.A	Spring support bracket
7300	Seed hopper, 52 ltr.
7316	Main frame NG+3
7337	Protection point, double disc openers
7410	Upper parallel linkage arm
9174	Spring, chain tightener
11579	Bearing, safety clutch (60062RS)
11580	Snapping, 55mm
650996	Clod remover, complete
900263	Opening disc complete w/bearing
F37188	Nylon locknut 5/8"
F40155	Lock nut 6mm
F40162	Nut, 8mm
F40166	Nut, 10mm
F40170	Nut, 12mm
10170065	Cotter pin, M5 x 30
10170067	Cotter pin, M5 x 40
10172090	Roll pin, M6 x 25
10176004	Rivet, 6 x 22mm
10200067	Red cap, depth indicator
10502012	Bolt, M10 x 15
10502016	Bolt, M10 x 25
10511007	Bolt, M6 x 100
10511065	Bolt, M8 x 75
10512018	Bolt, M10 x 35
10512027	Bolt, M10 x 100
10512029	Bolt, M10 x 120
10512058	Bolt, M12 x 110
10512059	Bolt, M12 x 120
10530094	Bolt, M6 x 20. oval head slotted
10620095	Washer, 10.5 x 27 x 2mm
10621026	Washer, 13 x 18 x 2mm
10621046	Washer, 13x27x2mm
10622024	Washer, 16.5 x 26 x 1mm
10622052	Washer, 17 x 50 x 1mm



**ROW UNIT**

**Twin-Row**

**7.5" HILLER DISC W/ FLAT PRESS WHEEL CLOSING ASSEMBLY**



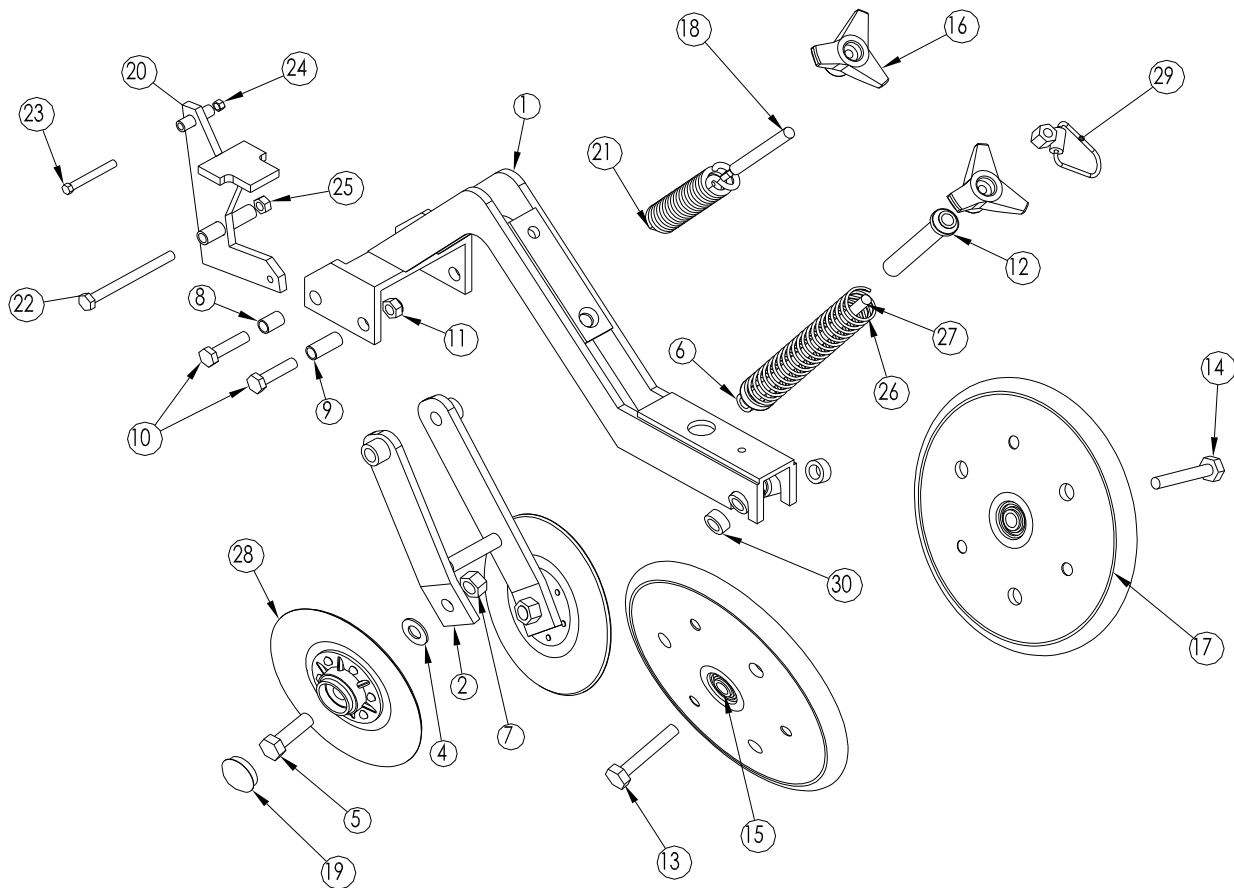
ITEM	PART No.	DESCRIPTION
1	E7521	Closing wheel frame
2	7210.S	Hiller disc mounting bracket
3	F33086	Flat washer, 1/2" SAE
4	F33819	Flat washer, 5/8" SAE
5	F13311	Hex head bolt, 5/8-11 x 2", Gr 5
6	11210	Spring cap
7	F37216	Rev lock nut, 5/8-11
8	E7522.1	Bushing, 23mm long
9	E7523.1	Bushing, 38mm long
10	F39210	Hex head bolt, 12 x 50
11	F40171	Nylon locknut, 12mm
12	7209	Tube for threaded rod
13	900235	Spacer, bushing, 32mm
14	11540.AM	Wheel, 4x 12 flat, complete
	11540.AMC	Wheel, 4x 12 concave, complete
15	900125	Bearing, 40mm (DAC1640442RSLCS)
16	7082	Adjustment knob

ITEM	PART No.	DESCRIPTION
17	F15325	Hex head bolt, 5/8-11x 6", Gr 5
18	7071.2	Tension rod, 12 x 130mm
19	KD11845	Dust cap
20	E7524	Spring mounting bracket/ frame stop
21	7075	Spring
22	F38670	Hex head bolt, 10 x 120
23	F38624	Hex head bolt, 8 x 65
24	F40307	Nut, 8mm
25	F40308	Nut, 10mm
26	5513	Spring
27	7210.1A	Threaded adjustment rod, 12mm
28	900262	Hiller disc
29	E7525	Nut with retainer ring
	E7525.1	Nut only
	E7526	Retainer ring

**ROW UNIT**

**Twin-Row**

**7.5" HILLER DISC W/ V PRESS WHEEL CLOSING ASSEMBLY**

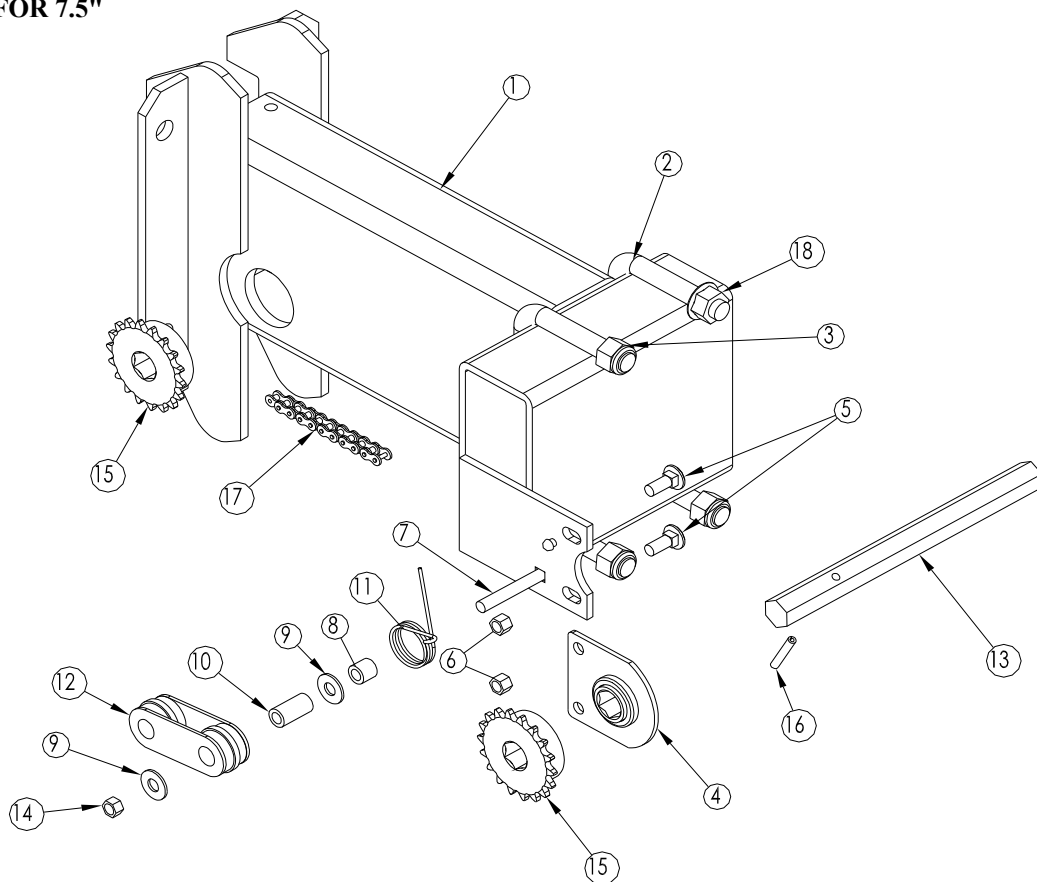


ITEM	PART NO.	DESCRIPTION	ITEM	PART NO.	DESCRIPTION
1	E7527	Closing wheel frame	17	7074.N	Closing wheel, complete
2	7210.S	Hiller disc mounting bracket	7074.2		Tire only, 1 x 12
3	F33086	Flat washer, 1/2" SAE	7074.A40		Nylon half rim
4	F33819	Flat washer, 5/8" SAE	18	7071.2	Tension rod, 12 x 130mm
5	F13311	Hex head bolt, 5/8-11 x 2", Gr 5	19	KD11845	Dust cap
6	11210	Spring cap	20	E7524	Spring mounting bracket/ frame stop
7	F37216	Rev lock nut, 5/8-11	21	7075	Spring
8	E7522.1	Bushing, 23mm long	22	F38670	Hex head bolt, 10 x 120
9	E7523.1	Bushing, 38mm long	23	F38624	Hex head bolt, 8 x 65
10	F39210	Hex head bolt, 12 x 50	24	F40307	Nut, 8mm
11	F40171	Nylon locknut, 12mm	25	F40308	Nut, 10mm
12	7209	Tube for threaded rod	26	5513	Spring
13	30513115	Hex head bolt, 16 x 80, LH	27	7210.1A	Threaded adjustment rod, 12mm
14	30513015	Hex head bolt, 16 x 80, RH	28	900262	Hiller disc
15	900125	Bearing, 40mm (DAC1640442RSLCS)	29	E7525	Nut with retainer ring
16	7082	Adjustment knob	E7525.1		Nut only
			E7526		Retainer ring
			30	900238	Spacer bushing, 8mm wide

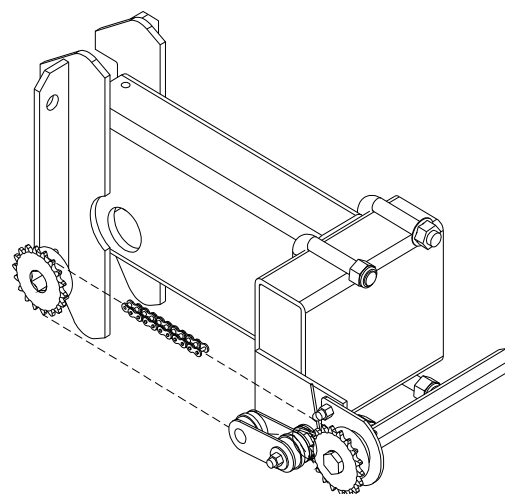
**ROW UNIT**

**Twin-Row**

**OFFSET ASSEMBLY FOR 7.5"**



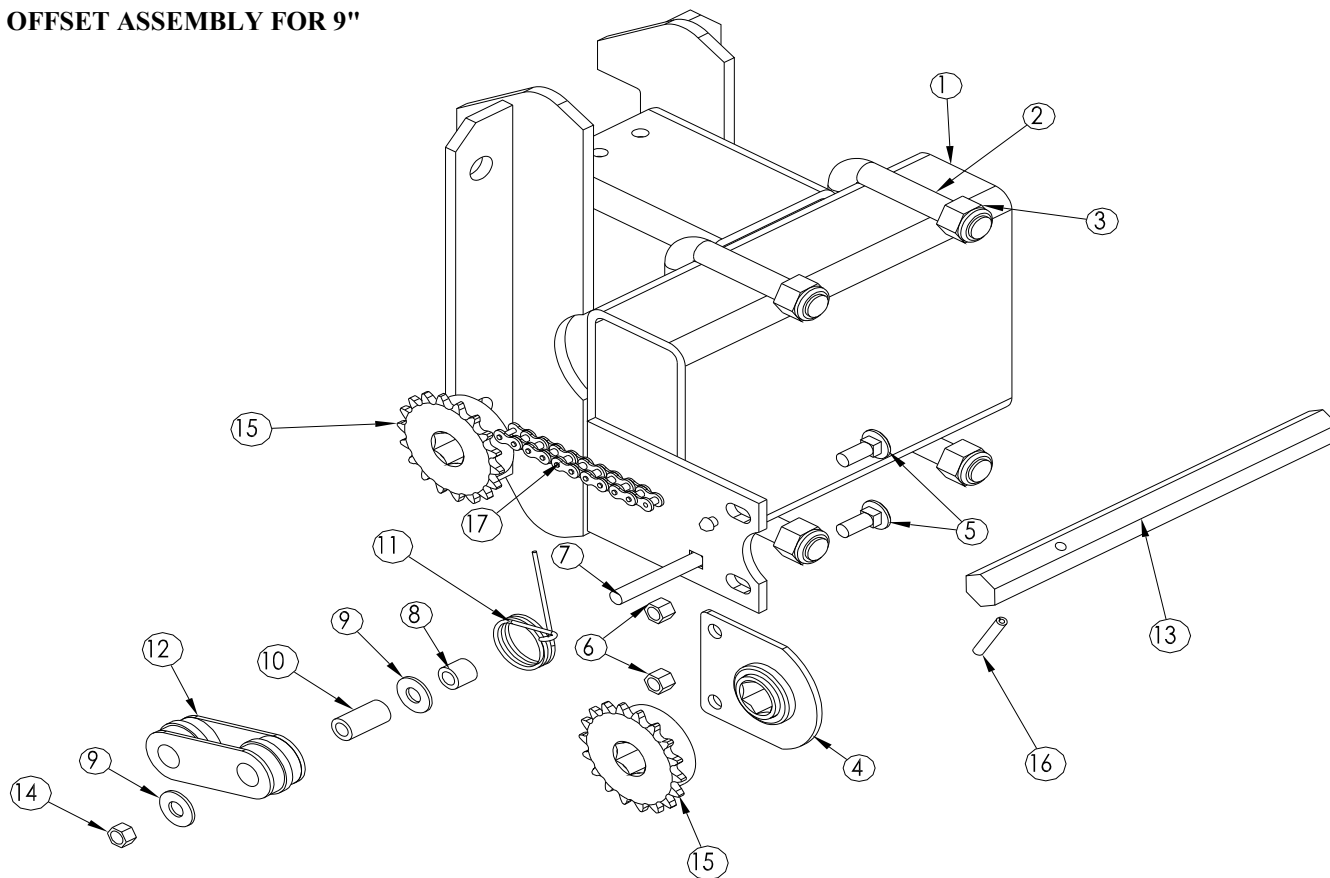
ITEM	PART No.	DESCRIPTION
1	E7501.1	Twin-row offset bracket 7.5"
2	900164	U Bolt 7"x 3"x 5/8"-11
3	N-5101	5/8"-11 Nylock nut
4	KA2180	Bearing hanger 7/8" hex
5	CB-2210	CB 3/8"-16x 1"
6	N-2101	Nylock nut 3/8"-16
7	CB-2231	CB 3/8"-16x 2.5"
8	KD2971	Tube marker 5/8" OD x 3/8" ID
9	W-2210	3/8" Flat washer
10	KD1026	Sleeve bushing 1 3/16"
11	KD11219	Spring, US Insect idler
12	KD11962	Idler
13	E7502.1	Hex shaft for 7.5" offset bracket
14	N-2300	Rev lock nut 3/8"- 16
15	G40B18	Sprocket 40-18
16	F64251	Spring pin 1/4"x 1 1/2"
17	900327	Chain #40
18	N-5401	Flange nut 5/8"-16 REG



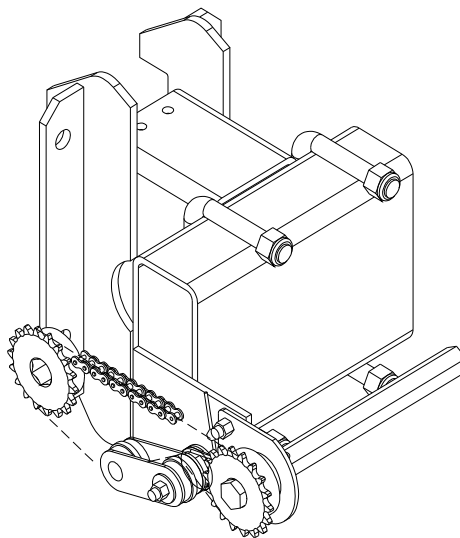
**ROW UNIT**

**Twin-Row**

**OFFSET ASSEMBLY FOR 9"**



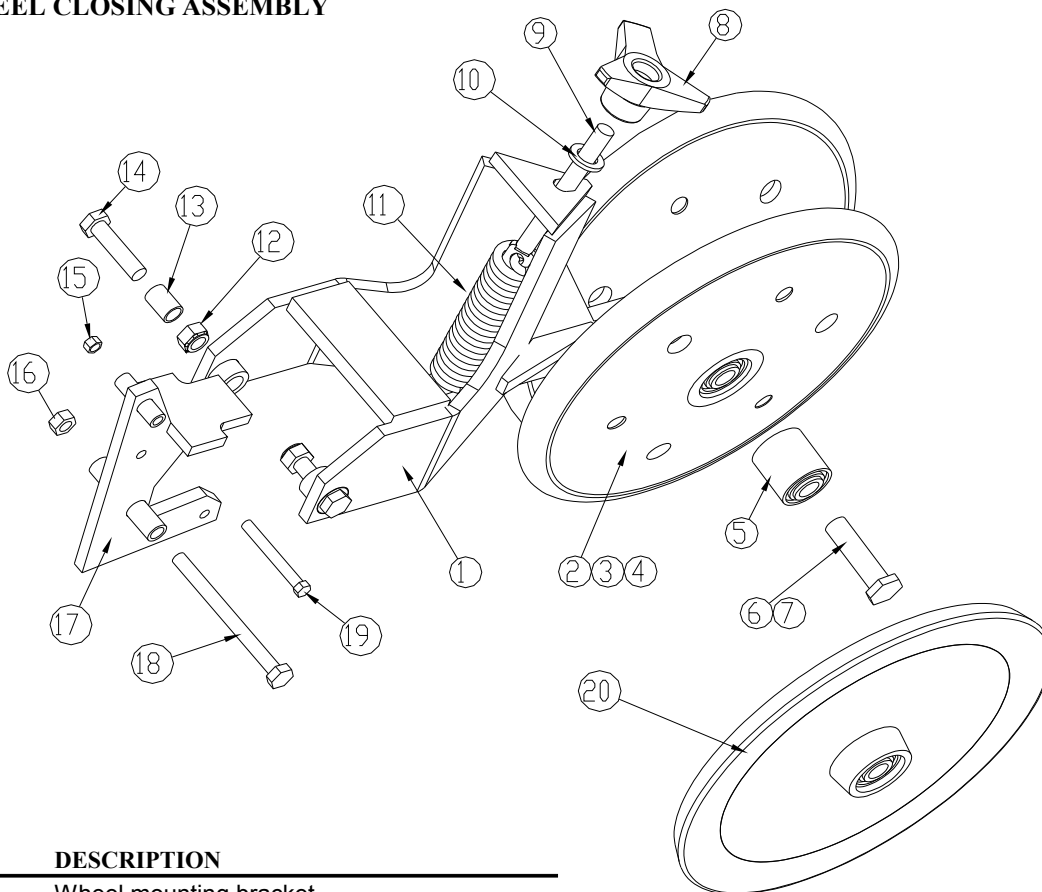
ITEM	PART No.	DESCRIPTION
1	E1001.A	Twin-row offset bracket
2	900164	U Bolt 7"x 3"x 5/8"-11
3	N-5101	5/8"-11 Nylock nut
4	KA2180	Bearing hanger 7/8" hex
5	CB-2210	CB 3/8"-16x 1"
6	N-2101	Nylock nut 3/8"-16
7	CB-2231	CB 3/8"-16x 2.5"
8	KD2971	Tube marker 5/8" OD x 3/8" ID
9	W-2210	3/8" Flat washer
10	KD1026	Sleeve bushing 1 3/16"
11	KD11219	Spring, US Insect idler
12	KD11962	Idler
13	E7502.1	Hex shaft for 7.5" offset bracket
14	N-2300	Rev lock nut 3/8"- 16
15	G40B18	Sprocket 40-18
16	F64251	Spring pin 1/4"x 1 1/2"
17	900184.B	Chain #40, 55 links + master



**ROW UNIT**

**Twin-Row**

**7.5" V PRESS WHEEL CLOSING ASSEMBLY**

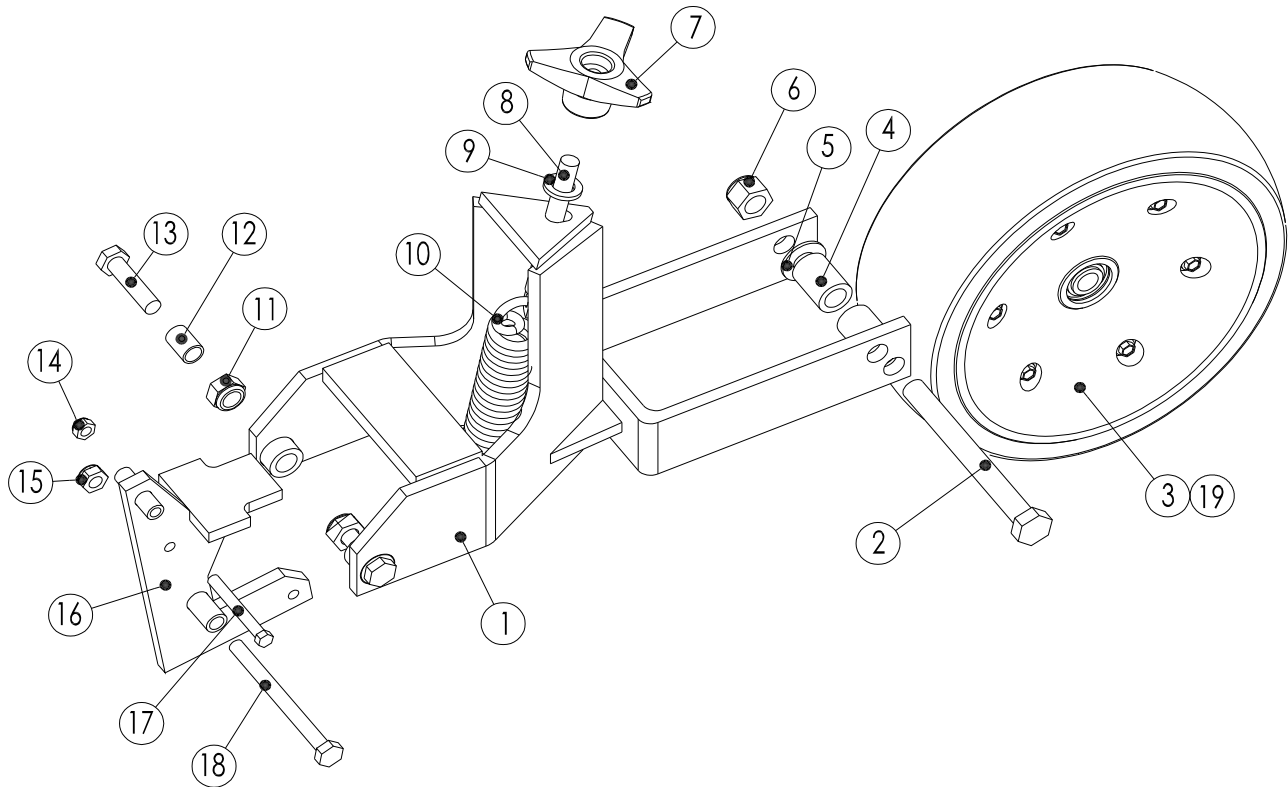


ITEM	PART No.	DESCRIPTION
1	E7528	Wheel mounting bracket
2	7074.N	Closing wheel complete
3	7074.A40	One half of closing wheel rim, nylon
4	7074.2	Rubber tire, closing wheel, 1 X 12"
5	900125	Bearing 40mm (DAC 1640442RSLCS)
6	7258.GSS	Hex head bolt (thin head) LH, 16 X 60mm
7	7258.DSS	Hex head bolt (thin head) RH, 16 X 60mm
8	7082	Hand wheel, 12mm
9	7071.2	Threaded adjustment rod, 12x 130mm
10	W-4405	Flat washer, 1/2" SAE
11	7075	Spring
12	NM-31205	Nylon locknut, 12mm
13	E7522.1	Bushing, 23mm
14	HM-61250	Hex head bolt, 12 X 50mm
15	NM-1801	Locknut, 8mm
16	NM-21011	Locknut, 10mm
17	E7524	Spring plate
18	HM-510120	Hex head bolt, 10 X 120mm
19	HM-2865	Hex head bolt, 8 X 65mm
20	KA6597	Cast iron closing wheel, complete
	E7524.asy	Spring plate assembly (items 8 - 11, and 15 - 19)
	E7528.asy	Mounting bracket assembly (items 1, 6, 7, and 12 -14)

**ROW UNIT**

**Twin-Row**

**7.5" FLAT PRESS WHEEL CLOSING ASSEMBLY**



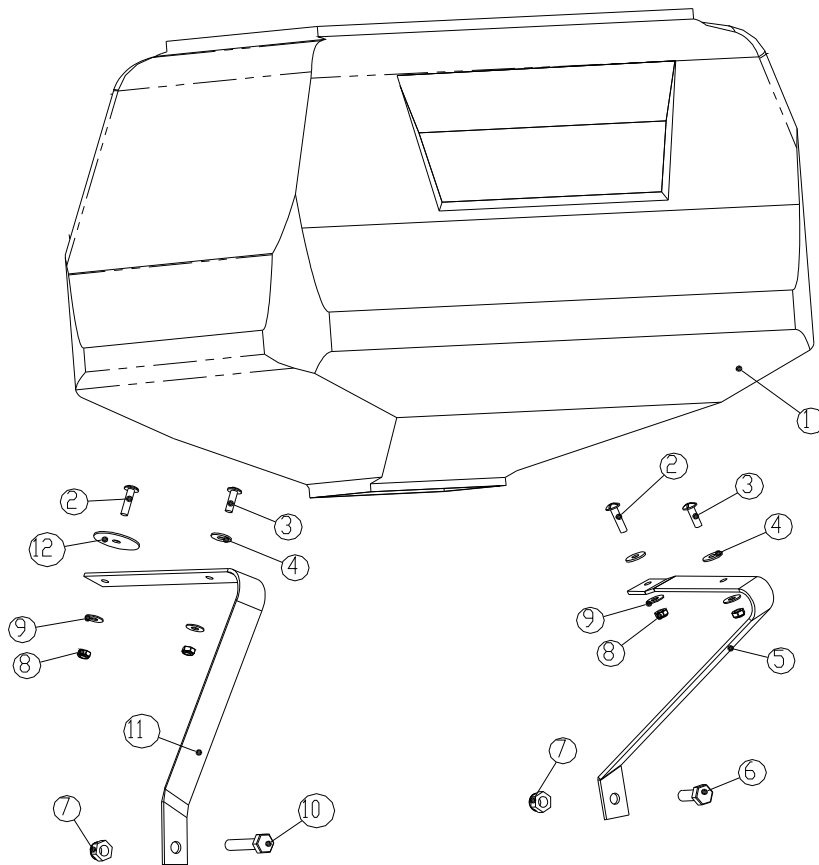
ITEM	PART No.	DESCRIPTION
1	E7530	Wheel mounting bracket
2	F15325	Hex bolt 5/8-11 x 6"
3	11540.AM	Flat closing wheel, 4" x 12" crowned
	11540.AMC	Flat closing wheel, 4" x 12" concave
4	900235	Bushing - 32mm
5	F33086	Flat washer - 5/8" SAE
6	F37188	Nylock nut 5/8-11
7	7082	Knob 12MM
8	7071.2	Tension rod - 12 x 130mm
9	F33800	Flat washer - 1/2" SAE
10	7075	Spring
11	F40171	Lock nut M12
12	E7522.1	Bushing 23mm
13	F39210	Hex bolt M12 x 50mm
14	F40163	Lock nut M8
15	F40167	Lock nut M10
16	E7524	Spring plate
17	F38624	Hex bolt M8 x 65mm
18	F38670	Hex bolt M10 x 120mm
19	900125	Wheel bearing 40mm (DAC1640442RSLCS)

**ROW UNIT**

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**Twin-Row**

**HOPPER ASSEMBLY**



<b>ITEM</b>	<b>PART No.</b>	<b>DESCRIPTION</b>
1	7077.3A	Reversed hopper
2	10530096	Screw M6 x 25 phillips head
3	10530094	Screw M6 x 20 phillips head
4	10620041	Washer, 6.5x18x1.5mm
5	E1020	Front hopper bracket
6	F38655	Bolt M10 x 25
7	F40167	Nylock M10
8	F40155	Nylock M6
9	10620041	Washer, 6.5x18x1.5mm
10	F38659	Bolt M10 x 45
11	E1021	Rear hopper bracket
12	20016010	Washer, 7x41x1 stainless