(LIGHT BLUE)

Operator's/Parts Manual

Air Drill
1990-1991

Great Plains
Manufacturing, Inc.
P.O. Box 5060 • Salina, Kansas 67402-5060

Read the operator's manual entirely. When you see this symbol, the subsequent instructions and warnings are serious - follow without exception. Your life and the lives of others depend on it!

Great Plains

INTRODUCTION

Your Great Plains Air Drill is designed to give you many years of dependable service. This manual has been prepared to instruct you in the safe and efficient operation of this machine. Read and study it thoroughly. Follow all instructions and service procedures carefully.

The parts on your Air Drill have been specially designed and should only be replaced with genuine Great Plains parts. Therefore, should your Air Drill require replacement parts, purchase them from your Great Plains dealer.

Space has been provided below for you to record your model number and serial number of your drill. Be sure to bring this information with you to your dealer when ordering parts or attachments for your drill.

The Safety Alert Symbol indicates that there is a potential hazard to personal safety involved and extra safety precautions must be taken. When you see this symbol, be alert and carefully read the message that follows it. In addition to design and configuration of equipment; hazard control and accident prevention are dependent upon the awareness, concern, prudence and proper training of personnel involved in the operation, transport, maintenance and storage of equipment.

SERIAL NUMBER _____

MODEL NUMBER _____

DATE PURCHASED _____

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SAFETY RULES

The safe operation of any machinery is a big concern to farmers and manufacturers. We have designed the Air Drill with many built-in safety features. However, no one should operate this machine before carefully reading this operators manual.

1. NEVER permit anyone to ride on or walk beside the Air Drill when moving.

2. NEVER permit anyone to ride on the tractor while the drill is in tow.

3. NEVER allow anyone to be near the drill when folding or unfolding.

4. Allow proper clearance both overhead and on the ground when folding or unfolding.

5. Be aware of any overhead or roadside obstructions when transporting. (Power lines, bridges, fence rows, culverts)

6. ALWAYS install the proper pins and locks before transporting.

7. ALWAYS fold and unfold the implement SLOWLY and on level ground.

8. NEVER transport the drill faster than 15 mph.

9. Comply with all Federal, State, and Local laws when transporting.

10. DO NOT attempt to lubricate, adjust or repair the air drill while it is in operation.

11. DO NOT permit smoking or open flame where combustible lubricants are used.

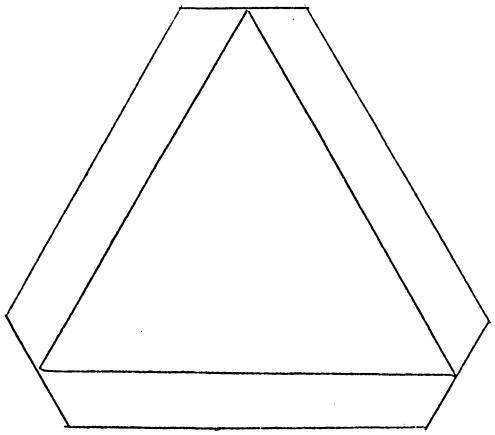
12. Avoid contact with treated seed and fertilizer.

13. Reduce speed when transporting over hills or steep slopes.

14. Use caution and reduce speed when transporting or operating with full seed bins.

15. CAUTION! Escaping fluid under pressure can have sufficient force to penetrate the skin. Check all hydraulic lines and hoses before applying pressure. Fluid escaping form a very small hole can be almost invisible. Use paper or cardboard, not body parts, to check for suspected leaks. If injured, seek medical assistance from a doctor that is familiar with this type of injury. Foreign fluids in the tissue must be surgically removed within a few hours or gangrene will result.

SAFETY DECALS



WARNING

LOW PRESSURE OIL RADIATOR

1. At all times be sure that RETURN LINE from Oil Radiator is connected to tractor before engaging Hydraulic Motor.
2. To avoid damage to Hydraulic Motor, slowly engage remote lever with tractor engine at IDLING SPEED.
3. Under no circumstances should return oil line from Radiator be connected to remote outlets of tractor. Return oil must be put directly back into tractor oil supply to avoid back pressure caused by possible restriction in remote outlet.
4. Be sure that screen of Oil Radiator is free of foreign matter at all times to prevent overheating.

WARNING

STAND CLEAR WHILE FOLDING, UNFOLDING, RAISING, OR LOWERING IMPLEMENT.

818-045C

CAUTION

AIR LEAKS WILL CAUSE ERRATIC METERING RATES.

BINS SHOULD BE PERIODICALLY CHECKED FOR AIR LEAKAGE. (SEE OPERATING MANUAL)

DANGER

SEVERE DAMAGE OR PERSONAL INJURY MAY RESULT IF THE FOLD CYLINDERS AND HOSES ARE NOT BLED FREE OF AIR AND FULLY CHARGED WITH HYDRAULIC OIL BEFORE FOLDING THE IMPLEMENT.

818-046C

LIFT CYLINDERS
OPERATING INSTRUCTIONS

THIS MACHINE IS EQUIPPED WITH REPHASING MASTER SLAVE LIFT CYLINDERS. THESE CYLINDERS MAY AFTER A PERIOD OF TIME GET OUT OF TIME OR PHASE. THE EFFECTS OF THIS CAN BE SEEN WHEN ONE SECTION IS RUNNING TOO LOW OR TOO HIGH BECAUSE ITS LIFT CYLINDER IS EITHER OVEREXTENDED OR OVERRETRACTED COMPARED TO THE OTHER LIFT CYLINDERS. TO REPHASE THE CYLINDERS, RAISE THE IMPLEMENT COMPLETELY UP AND HOLD THE TRACTOR HYDRAULIC LEVER ON FOR A FEW SECONDS TO GIVE THE CYLINDERS TIME TO REPHASE. THIS SHOULD BE DONE EACH TIME THE MACHINE IS RAISED OUT OF THE GROUND. MOMENTARILY REVERSING THE HYDRAULIC LEVER IMMEDIATELY AFTER REPHASING TO ALLOW THE CYLINDERS TO RETRACT ABOUT 1/2" WILL HELP IN MAINTAINING A LEVEL IMPLEMENT.

818-043C

NOTICE

TRACTOR HYDRAULICS MUST BE CAPABLE OF A SUSTAINED OUTPUT OF 15 GPM AT 2000 PSI. 15 GPM IS THE MINIMUM FIGURE; THE CONTROL VALVE USED TO REGULATE FAN RPM WILL ADMIT UP TO 30 GPM, WHICH IS THE MAXIMUM FIGURE.

818-044C

--IMPORTANT--

* Your Air Drill comes equipped with all safety decals in place.

* Always keep safety decals clean and legible.

* Replace all damaged or missing safety decals. To order new safety decals, go to your GREAT PLAINS Dealer and reference part numbers as shown on page 25.

* To install new safety decals:

  A) Clean the area the decal is to be placed. (Refer to page 25.)
  B) Peel backing from decal and press firmly onto surface.

NUT AND BOLT TORQUING CHART

This chart is based on torque requirements in foot pounds for grade 5 bolts.

BOLT DIAMETER	MINIMUM TORQUE	MAXIMUM TORQUE	BOLT DIAMETER	MINIMUM TORQUE	MAXIMUM TORQUE
1/4"	9	11	3/4"	270	324
5/16"	17	20	7/8"	400	480
3/8"	35	42	1"	580	696
7/16"	54	64	1 1/8"	800	880
1/2"	80	96	1 1/4"	1120	1240
9/16"	110	132	1 3/8"	1460	1680
5/8"	150	180	1 1/2"	1940	2200

NOTE: Torque requirements listed above do not apply to self-locking nuts. For self-locking nuts increase torque requirements listed above by 15%.

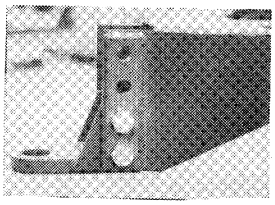
TIRE INFLATION CHART

TIRE SIZE	INFLATION PSI
7.50 x 20" 4 Ply Drill Rib	28
9.0 x 24" 8 Ply Rib Implement	40
9.5L x 15" 6 Ply Rib Implement	32
9.5L x 15" 8 Ply Rib Implement	44
9.5L x 15" 12 Ply Rib Implement	60
11L x 15" 6 Ply Rib Implement	28
11L x 15" 12 Ply Rib Implement	52
12.5L x 15" 8 Ply Rib Implement	36
12.5L x 16" 10 Ply Rib Implement	44
16.5L x 16.1" 10 Ply Rib Implement	36

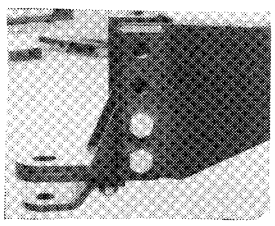
TRACTOR DRAW-BAR HOOK-UP

With the cart on level ground, adjust the hitch, ref. fig. 1 and 2, to the height of the tractor draw bar so the cart frame is parallel to the ground. Both hitches are reversible for a greater range of adjustment. The clevis type hitch must only be attached to tractors having a single draw bar.

NOTE: When the clevis hitch is reversed it is necessary to reassemble the offset tang so it is always on the bottom.



Single Strap Hitch
Fig. 1



Clevis Hitch
Fig. 2

TRACTOR HYDRAULIC HOOK-UP

For easiest operation, the tractor should be equipped with six remote hydraulic hook-ups (three pairs). If your tractor has four remote hook-ups (two pairs), some hoses must be relocated to different remotes to change from folding to seeding operation.

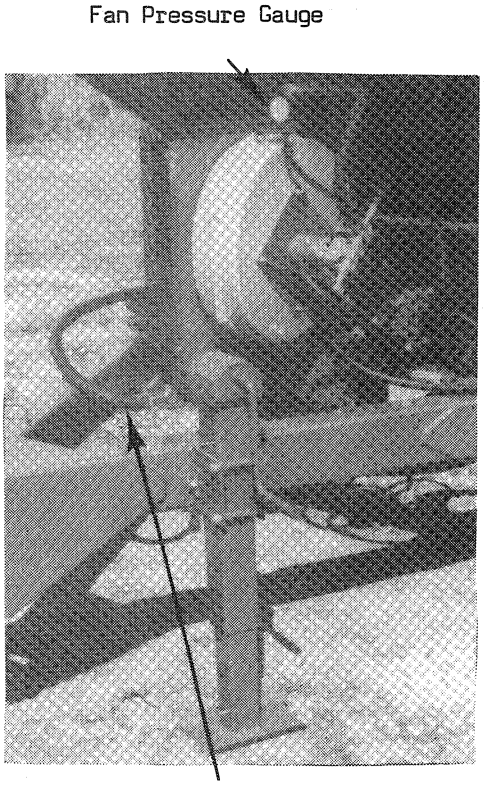
The large 3/4" I.D. hydraulic return line, fig. 3, from the oil cooler MUST be attached to the tractor reservoir BEFORE attempting to engage the fan motor. If this is not done, damage will occur to the oil cooler.

On initial tractor hook-up, mount the female section of the large disconnect coupler onto the rear of the tractor. Run the 3/4" hose from the coupler directly to the tractor hydraulic reservoir or to the return line from the remote outlet valve bank. This 3/4" line is the return line from the cart's hydraulic system and MUST BY-PASS the remote outlets and tractor hydraulic valves.

ON TRACTORS WITH RETURN LINE FILTERS, damage may occur to the tractor hydraulic system if the return oil is dumped directly into the reservoir instead of running through the filters. These filter systems are used on certain John Deere, Allis Chalmers and Case tractors. Consult your dealer or Great Plains representative for correct hydraulic procedures.

NOTE: The pressure in the 3/4" I.D. line must not exceed 200 psi or severe oil cooler damage will occur.

The tractor must be at IDLE speed when engaging the hydraulics to the fan motor. After the fan is running, increase the tractor to the desired speed. The fan hydraulics may be shut off at any time and the fan will free-wheel to a stop.



Hydraulic Return Line
Fig. 3

NOTE: It is very important that the oil in the hydraulic circuits is clean. You should start with clean oil in the tractor reservoir, add clean oil when necessary and maintain all filters according to recommended factory specifications to ensure minimum downtime and efficient fan, distributor motor and valve operation. The Air Drill hydraulic system requires approximately 13 gallons for 45 ft. drill or 7 gallons for the 34 ft. drill to fill.

BLEEDING THE HYDRAULIC LIFTING SYSTEM

The implement lifting system is equipped with rephasing type hydraulic cylinders that require a special procedure for bleeding air from the hydraulic circuits. Read and follow the procedure carefully. The rephasing type cylinders will not function properly with air in the hydraulic circuit. Bleeding the system may have been done during initial set up of the drill.

NOTE: Check the hydraulic fluid in the tractor reservoir and fill to the proper level. Add fluid to the system as needed. A low reservoir level may draw air back into the system, causing jerky or uneven cylinder movement.

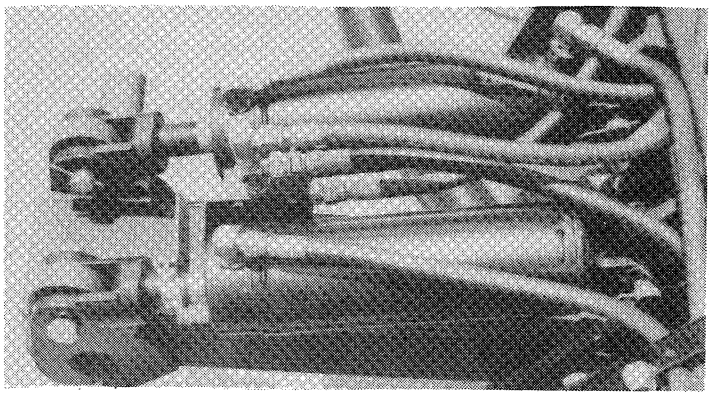
BLEEDING THE HYDRAULIC LIFTING SYSTEM (CON'T.)

1. Jack up and support the front member of each implement frame section at a point close to each gauge wheel. If the gauge wheel cylinders have previously been engaged, they may be used to assist in raising the frame.

2. With the frame blocked and supported, unpin the rod end of the gauge wheel cylinders. Pivot the cylinders up and wire or otherwise safely support the rod end port higher than the base end port.

NOTE: The cylinders located directly behind the cart, fig. 4, will not pivot upward for bleeding, and must be unpinned at both ends and then supported with the rod end port higher than the base end port.

3. With the tractor engine at an idle speed, hold the remote lever on to put fluid into the lifting circuit. When the outboard cylinders on BOTH sides of the implement have completely extended, hold the remote lever on for one minute.



Center Hydraulic Cylinders
Fig. 4
(34 Ft. Air Drill Shown)

4. Retract the cylinder rods. Extend the rods again and hold the remote lever on for one more minute. Repeat this step two more times to completely bleed the system. If gauge wheel leveling adjustments are to be made, leave the cylinders unpinned and the implement frame supported.

5. Recheck the tractor reservoir and fill to the proper level.

BLEEDING THE FOLDING SYSTEM

DANGER! THE FOLDING CYLINDERS MUST BE BLED FREE OF AIR BEFORE ATTEMPTING TO FOLD OR UNFOLD THE IMPLEMENT, OTHERWISE SEVERE DAMAGE AND BODILY INJURY MAY RESULT!

NOTE: Check the hydraulic fluid in the tractor reservoir and fill to the proper level. Add fluid to the system as needed. A low reservoir level may draw air back into the system, causing jerky or uneven cylinder movement.

1. Unpin the rod end of the fold cylinders and block, wire or otherwise safely support the cylinders so when the rod end is fully extended it does not contact anything.

2. Cycle the cylinders completely in and out a minimum of three times to purge the air from the fold system. NOTE: On the 45' model if one side is completely in or out and the other side is not moving release the tractor hydraulic lever momentarily reverse it and try again.

3. Fully extend the cylinders to repin the rod ends.

4. Recheck the tractor reservoir and fill to the proper level.

OPERATING THE LIFTING HYDRAULIC SYSTEM

The lift cylinders may after a period of time get out of time or phase. The effects of this can be seen when one section is running too low or too high because its lift cylinder is either overextended or overretracted compared to the other lift cylinders. To rephase the cylinders, raise the implement completely up and hold the tractor hydraulic lever on for a few seconds to give the cylinders time to rephase. This should be done each time the machine is raised out of the ground. Momentarily reversing the hydraulic lever immediately after rephasing to allow the cylinders to retract about 1/2" will help in maintaining a level implement.

OPERATING THE FOLDING HYDRAULIC SYSTEM

FOLDING

CAUTION! SAFETY PRECAUTIONS MUST BE TAKEN DURING FOLDING AND UNFOLDING OPERATIONS!

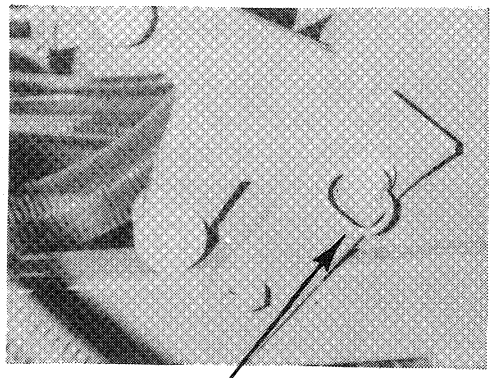
1. Folding is best achieved on level ground. Be aware of the clearance required to fold the drill.

2. NEVER allow anyone near the drill during folding operations. Hydraulic failure could result in serious injury or death.

3. Set the tractor engine at idle speed. Hydraulically raise the drill frame to the highest position.

4. Check for overhead obstructions and SLOWLY fold the implement frames. (Watch to be sure the hoses do not get pinched or kinked during folding.) On the 45' models the two outboard sections of the implement frame will fold up before the inboard sections.

5. When folding is completed, install the folding lock pins, fig. 5, where the vertical and horizontal folded sections come together.



Folding Lock Pin
Fig. 5
(34 Ft. Air Drill Shown)

UNFOLDING

1. Unfolding is best achieved on level ground.

2. Be aware of the clearance requirements of the drill width (45'for 45' model and 35' for 34' model).

3. NEVER allow anyone near the drill during unfolding operations. Hydraulic failure could result in serious injury or death.

4. Remove the folding lock pins, fig. 5.

5. SLOWLY unfold the implement. Watch to be sure the hoses do not get pinched or kinked during unfolding. For maximum flex in the field continue to hold the hydraulic lever until the fold cylinders are fully extended.

On the 45' model only, one inboard wing section will unfold and hydraulically lock at approximately a 45 degree angle. The attached outboard wing section will unfold and these sections will lower to the ground.

Release the lever and momentarily shift it as if to fold the implement. This action will cause a spool to shift in the sequencing valve. The other side of the implement may now be unfolded.

FRAME LEVELING

Equal seeding depth across the drill can only be maintained if all frames are level. Leveling adjustments may have been done during initial setup of drill. Periodic frame leveling should not be necessary, however, you may field check level by laying a straight edge across at least two frame members and out over a gauge wheel of that frame. Measure the distance from the bottom of the straight edge to the top of the gauge wheel tire. Compare this measurement at the other gauge wheel tires (see instruction 4 page 9). If leveling is necessary follow the instructions on the next page.

FRAME LEVELING (CON'T.)

PROCEDURE FOR 45' DRILL

1. The gauge wheel hydraulic circuit should be bled of air and full of oil (see "Bleeding the Hydraulic Lifting System").

2. Hydraulically lower the entire implement frame. The frame should then be jacked up and supported (see "Bleeding the Hydraulic Lifting system"), and sections 1 & 6 non-castored gauge wheel cylinders should be unpinned at the rod end and safely supported.

3. Retract all gauge wheels cylinders fully. Since the dual gauge wheels on sections 3 & 4 are non-adjustable all adjustments will be made with these as a reference. A reference measurement must be taken from the top of the implement frame to the center of one of the dual gauge wheel axles, fig. 6.

4. With all cylinders fully retracted lay a straight edge across at least two frame members of either section 3 or 4 and extend the straight edge out over the dual gauge wheel axle of that section. Measure the distance from the bottom of the straight edge to the center of the dual gauge wheel axle (approximately 11 5/8").

Sections 1 & 6 non-castored gauge wheels should center on the measurement determined above. Sections 1 & 6 castored (outboard) gauge wheels should be set approximately 1/2" higher (subtract 1/2" from your measurement) because they carry less weight.

5. Lay a straight edge across the top of at least two frame members of section 1 and out over the non-castored gauge wheel axle. Raise the unpinned gauge wheel and arm assembly up to where the center of the gauge wheel axle is at the measurement determined in number 4 above. Support the gauge wheel at that point. Swing the cylinder down to the gauge wheel arm and adjust the Eye-Bolt, fig. 7, until the pin holes line up. Secure Eye-Bolt with the jam nut and repin the cylinder onto the gauge wheel arm.

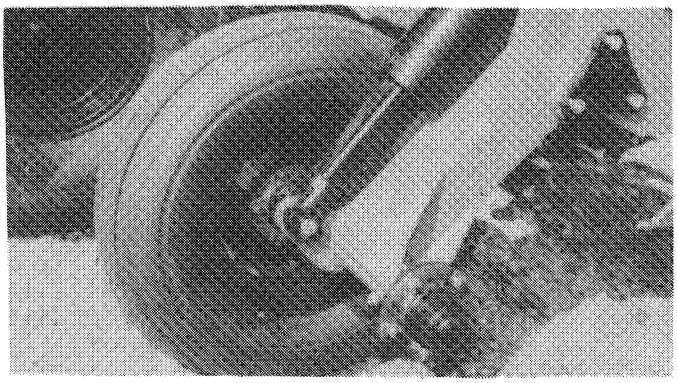
6. Now move the straight edge so it lies over the castored gauge wheel axle. Adjust the Eye-Bolt at the base end of the cylinder until the center of the axle is approximately 1/2" higher (subtract 1/2") than the measurement determined in number 4. Secure Eye-Bolt by tightening the jam nuts.

7. Repeat instructions number 5 & 6 for section 6.

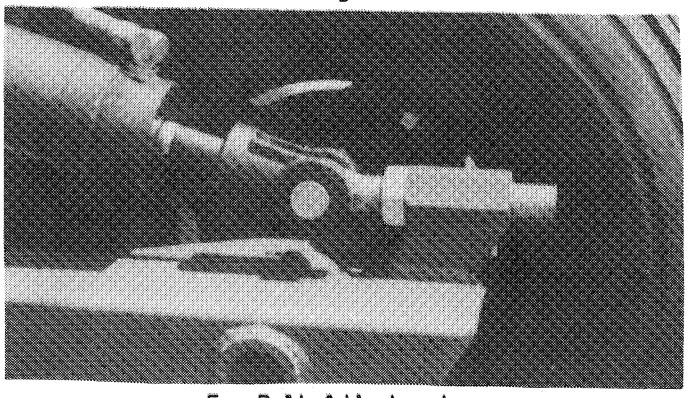
8. Make sure that all cylinders are securely pinned.

9. The center of the implement is held by the cart sling, fig. 8. This should be adjusted so the center of the machine is level during field operation.

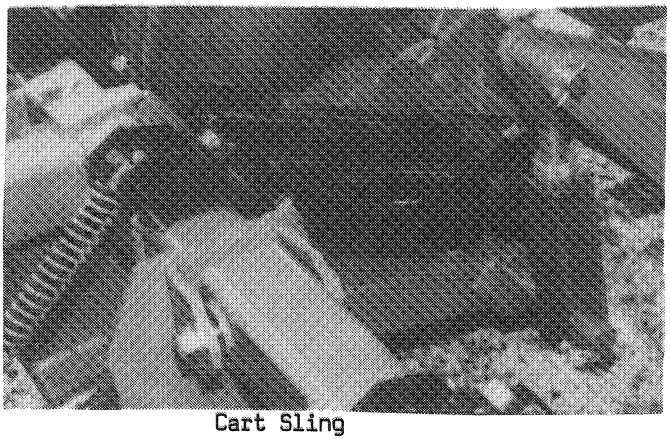
10. For front to back leveling of the implement frame see number 2 of "Planting Depth Adjustments".



Dual Gauge Wheel Arm
Fig. 6



Eye-Bolt Adjustment
Fig. 7



Cart Sling
Fig. 8

FRAME LEVELING (CON'T.)

PROCEDURE FOR 34'DRILL

1. The gauge wheel hydraulic circuit should be bled of air and full of oil (see "Bleeding the Hydraulic System" on page 6).

2. Hydraulically lower the entire implement frame. The frame should then be jacked up and supported (see "Bleeding the Hydraulic Lifting system"), and sections 1 & 6 non-castored gauge wheel cylinders should be unpinned at the rod end and safely supported.

3. Retract all gauge wheels cylinders fully. Since the dual gauge wheels on sections 2 & 3 are non-adjustable all adjustments will be made with these as a reference. A reference measurement must be taken from the top of the implement frame to the center of one of the dual gauge wheel axles; fig. 6, page 9.

4. With all cylinders fully retracted lay a straight edge across at least two frame members of either section 2 or 3 and extend the straight edge out over the dual gauge wheel axle of that section. Measure the distance from the bottom of the straight edge to the center of the dual gauge wheel axle (approximately 11 5/8").

5. Sections 1 & 4 gauge wheels should center on the measurement determined above. Lay a straight edge across the top of at least two frame members of section 1 and out over the gauge wheel axle. Raise the unpinned gauge wheel and arm assembly up to where the center of the gauge wheel axle is at the measurement determined in number 4 above. Support the gauge wheel at that point. Swing the cylinder down to the gauge wheel arm and adjust the Eye-Bolt; fig. 7, page 9, until the pin holes line up. Secure Eye-Bolt with the jam nut and repin the cylinder onto the gauge wheel arm.

6. Repeat instruction number 5 for section 4.

7. Make sure that all cylinders are securely pinned.

8. The center of the implement is held by the cart sling; fig. 8, page 9. This should be adjusted so the center of the machine is level during field operation.

9. For front to back leveling of the implement frame see number 2 of "Planting Depth Adjustments".

TRANSPORTING

1. Insert the two gauge wheel lock channels (two for 34" Drill and three for 45' Drill), fig. 9, over the cylinder rods. Place one lock channel on each dual gauge wheel cylinder. Located next to cart tires and on the 45' models, place the third lock channel on the master cylinder, directly behind the cart frame, without the stroke control stop.

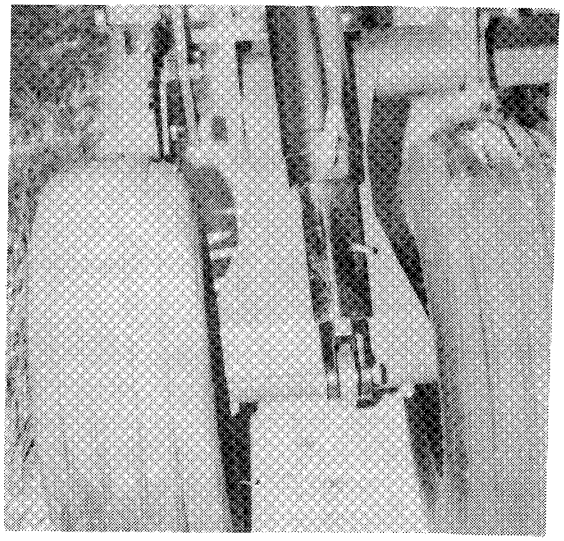
2. Check to see all locks; fig. 9, and pins, fig. 5, are in place.

3. In the transport position, the 45' Drill is 20' wide and 15'2" high; and, the 34' Drill is 20' wide and 12'7" high.

4. Never transport the drill faster than 15 mph.

5. Check to see that the gauge wheel tires and cart tires are properly inflated. Gauge wheel tire pressure is 32 psi and the cart tires are 36 psi.

6. Conform to all Federal, State, and Local safety laws.



Gauge Wheel Lock Channels
Fig. 9

SEED METERING PREPARATION AND OPERATING CART FAN HYDRAULICS

WITH THE TRACTOR AT IDLE SPEED, engage the fan motor with the proper tractor remote lever. It is advisable to secure the tractor remote lever for the fan with a wire, flexible band, or tarp strap. Do not rely on the valve detent to keep the fan running.

Reset the tractor engine RPM to an approximate field-speed. Adjust the fan speed control at the front of the cart until the fan pressure gauge directly above the fan reaches approximately 12 oz. psi; fig. 3, page 6. Heavy seeding or fertilizer rates may require a faster fan speed to prevent hose plugging.

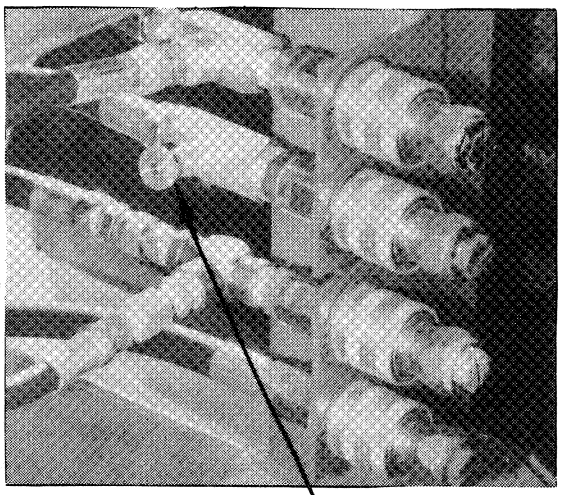
Check the lid of each seed bin for air leaks. The lids must be air tight for proper seed metering.

NOTE: Always start the fan motor with the tractor at idle speed.

NOTE: Make sure the quick disconnect, with the jumper hose going to the return line from the distributor motors, located at the rear of the cart right side, fig. 10, is plugged into the hose going to the stroke control valve located on the gauge wheel cylinder directly behind cart. This shuts off the metering system when the lifting circuit is pressurized to raise the implement.

Adjust the needle valve, fig. 10, located on the hydraulic harness at the rear of the seed bin cart right side, to set the speed of the Hydra-spin Distributor motors in each tower. Optimum distributor motor speed should be between 400 and 600 RPM.

If the air flow system appears to operate properly, turn off the tractor to begin the seed calibration.



Needle Valve
Fig. 10

SEED AND FERTILIZER CALIBRATION

Load the seed or seed and fertilizer into the bins. If a more-fertilizer-than-seed ratio is desired, put the fertilizer into the larger bin.

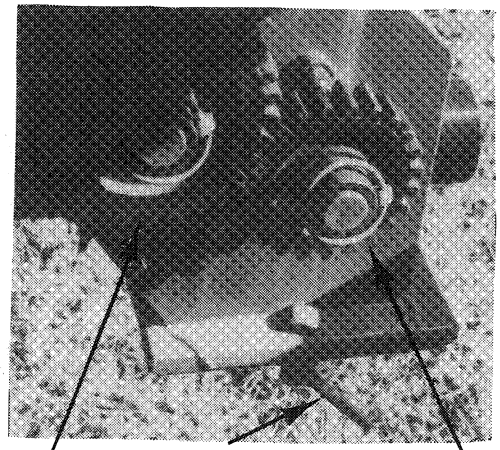
1. Remove the cover plate on the bottom of the bin to be calibrated by unscrewing the two wing nuts on the underside of the bottom plate, fig. 11.

2. Look up the desired seeding or fertilizer rate on the seeding charts located on pages 13 & 14 of this manual or between the bins above the gearboxes. Read across and note:

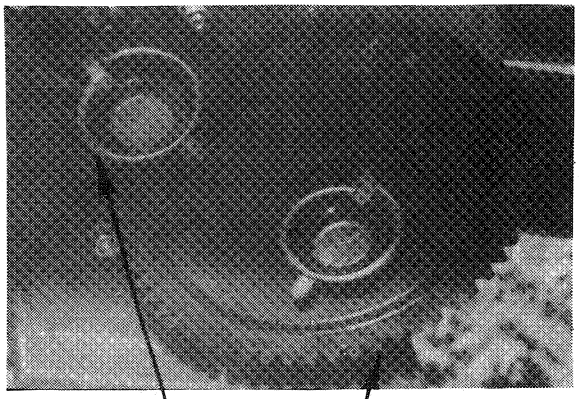
   A. Sprocket Combination
   B. Gear Combination
   C. Gear Box Lever Settings

3. Put the gears and sprockets in the desired combinations.

NOTE: The upper shaft (agitator) in the metering assembly is the DRIVER for the gears. The lower shaft (meter shaft) in the assembly is the DRIVEN gear. The sprocket on the gear box is the DRIVER for the sprockets. See figures 11 and 12.



Wing Nut on Bottom Plate
Fig. 11



Driver and Driven Gear
Fig. 12

4. Shift the gear box levers, fig. 13, on the bin to be calibrated to the appropriate letter and number setting using the following procedure:

A. Rotate the plate gear handle, fig. 13, on the side of the gear box until the cam at the base of the lever allows the handle to float outward.
B. With the handle rotated properly, the shifting levers should operate freely. Shift the appropriate levers to the desired letter and number settings.
C. Re-engage the gear box by rotating the plate gear handle back so the cam forces the plate gear to mesh with the plate gear pinions in the gear box. Should binding occur, place the clutch handle into the input shaft, fig. 14, on the side of the cart and rock the shaft slightly until the teeth seat properly.

Rotating the plate gear handle out will disengage the gears and shut down the metering system for that bin. This may be used to operate only one bin when both bins are filled.

5. Using the clutch handle, rotate the input shaft enough to fill the metering wheels (approximately 1/2 turn). Allow a small amount of seed to spill on the ground to be sure the wheels are full.

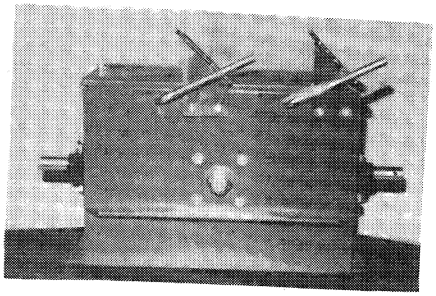
6. Place a container below the metering box to catch seed. Slowly turn the clutch handle for one acre (see acre meter) (one-half or one-quarter acre may be used depending on the capacity of your weight scale).

NOTE: 160 turns on the clutch handle = 1 Acre

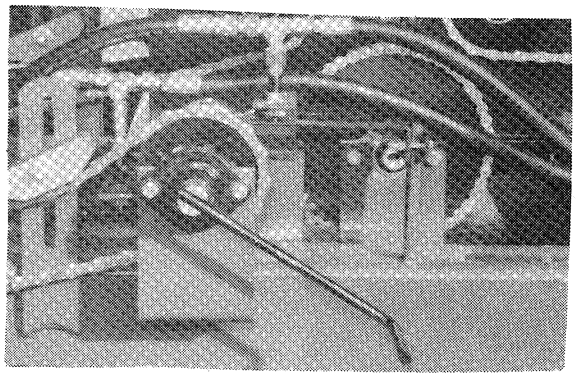
7. Weigh the amount of seed caught and adjust the gears and lever settings up or down as needed according to the seed chart.

8. Replace the cover on the bottom of the bin.

NOTE: These seed charts are derived from cleaned, non-treated, average-sized seed and should be used as a guide. Seeding rates will vary with seed size, test weight and flowability.



Gear Box Levers
Fig. 13



Clutch Handle
Fig. 14

AIR DRILL SEEDING RATES IN POUNDS PER ACRE

GEARING SELECTION					GRAIN									FERTZ.
Sprockets		Gears		Gear Box	Rates Listed in Pounds Per Acre									Dry
Driver	Driven	Driver	Driven	Levers	Wheat	Oats	Barley	Sorghum	Millet	Rape	Sunflower	Rye	Alfalfa	Granultd
20	30	17	54	A1	2.0	1.4	1.6	2.0	1.8	1.7	0.9	2.1	2.1	2.5
20	30	17	54	B1	2.3	1.6	1.8	2.3	2.0	1.9	1.1	2.4	2.4	2.8
20	30	17	54	A2	2.5	1.7	2.0	2.5	2.2	2.1	1.2	2.6	2.6	3.1
20	30	17	54	C1	2.7	1.8	2.1	2.7	2.4	2.2	1.2	2.8	2.8	3.3
20	30	17	54	A3	3.0	2.0	2.4	3.0	2.7	2.5	1.4	3.1	3.1	3.7
20	30	17	54	A4	3.5	2.4	2.8	3.5	3.1	2.9	1.6	3.7	3.6	4.4
20	30	17	54	A5	4.0	2.7	3.1	4.0	3.6	3.4	1.9	4.2	4.1	5.0
20	30	17	54	B5	4.6	3.1	3.6	4.6	4.1	3.8	2.1	4.8	4.7	5.7
20	30	17	54	E2	5.0	3.4	3.9	5.0	4.5	4.2	2.3	5.2	5.2	6.2
20	30	17	54	D4	5.6	3.8	4.4	5.6	5.0	4.7	2.6	5.9	5.8	7.0
20	30	17	54	E3	6.0	4.1	4.7	6.0	5.3	5.0	2.8	6.3	6.2	7.5
20	30	17	54	E4	7.0	4.8	5.5	7.0	6.2	5.9	3.3	7.4	7.3	8.7
20	30	17	54	E5	8.0	5.4	6.3	8.0	7.1	6.7	3.7	8.4	8.3	10.0
30	20	17	54	A5	9.0	6.1	7.1	9.0	8.0	7.6	4.2	9.4	9.3	11.2
30	20	17	54	B5	10.3	7.0	8.1	10.3	9.2	8.7	4.8	10.8	10.7	12.8
30	20	17	54	E2	11.3	7.6	8.8	11.3	10.0	9.5	5.2	11.8	11.7	14.0
30	20	17	54	D4	12.7	8.6	9.9	12.6	11.2	10.6	5.9	13.2	13.1	15.7
30	20	17	54	E3	13.6	9.2	10.6	13.5	12.0	11.4	6.3	14.2	14.0	16.8
30	20	17	54	D5	14.5	9.8	11.3	14.4	12.8	12.1	6.7	15.1	14.9	17.9
30	20	17	54	E4	15.8	10.7	12.4	15.8	14.0	13.3	7.3	16.5	16.3	19.6
30	20	17	54	E5	18.1	12.2	14.2	18.0	16.0	15.1	8.4	18.9	18.7	22.4
20	30	54	17	A1	20.3	13.7	15.9	20.2	18.0	17.0	9.4	21.2	20.9	25.1
20	30	54	17	B1	23.2	15.7	18.1	23.1	20.5	19.4	10.7	24.2	23.9	28.7
20	30	54	17	C1	27.1	18.3	21.2	26.9	24.0	22.6	12.5	28.3	27.9	33.5
20	30	54	17	A3	30.4	20.6	23.8	30.3	27.0	25.5	14.1	31.8	31.4	37.7
20	30	54	17	C2	33.8	22.8	26.5	33.7	30.0	28.3	15.7	35.3	34.9	41.8
20	30	54	17	A4	35.5	24.0	27.8	35.3	31.4	29.7	16.4	37.1	36.6	43.9
20	30	54	17	A5	40.6	27.4	31.7	40.4	35.9	34.0	18.8	42.4	41.8	50.2
20	30	54	17	B5	46.4	31.3	36.3	46.2	41.1	38.8	21.5	48.4	47.8	57.4
20	30	54	17	E2	50.7	34.3	39.7	50.5	44.9	42.4	23.5	53.0	52.3	62.8
20	30	54	17	C5	54.1	36.5	42.3	53.9	47.9	45.3	25.0	56.5	55.8	66.9
20	30	54	17	D4	56.8	38.4	44.4	56.6	50.3	47.5	26.3	59.3	58.6	70.3
20	30	54	17	E3	60.9	41.1	47.6	60.6	53.9	50.9	28.2	63.6	62.8	75.3
20	30	54	17	D5	64.9	43.9	50.8	64.6	57.5	54.3	30.0	67.8	66.9	80.3
30	20	54	17	A3	68.5	46.3	53.6	68.2	60.7	57.3	31.7	71.5	70.6	84.7
20	30	54	17	E4	71.1	48.0	55.6	70.7	62.9	69.5	32.9	74.2	73.3	87.9
30	20	54	17	C2	76.1	51.4	59.5	75.7	67.4	63.7	35.2	79.5	78.4	94.1
20	30	54	17	E5	81.2	54.8	63.5	80.8	71.9	67.9	37.6	84.8	83.7	100.4
30	20	54	17	A5	91.3	61.7	71.4	90.9	80.9	76.4	42.3	95.3	94.1	113.0
30	20	54	17	B5	104.3	70.5	81.6	103.9	92.4	87.3	48.3	109.0	107.6	129.1
30	20	54	17	D3	109.6	74.0	85.7	109.1	97.0	91.7	50.7	114.4	113.0	135.6
30	20	54	17	E2	114.1	77.1	89.3	113.6	101.1	95.5	52.8	119.2	117.7	141.2
30	20	54	17	C5	121.7	82.2	95.2	121.2	107.8	101.9	56.3	127.1	125.5	150.6
30	20	54	17	D4	127.8	86.3	100.0	127.2	113.2	106.9	59.2	133.5	131.8	158.2
30	20	54	17	E3	137.0	92.5	107.1	136.3	121.3	114.6	63.4	143.0	141.2	169.5
30	20	54	17	D5	146.1	98.7	114.3	145.4	129.4	122.2	67.6	152.6	150.6	180.8
30	20	54	17	E4	159.9	108.0	125.1	159.2	141.6	133.8	74.0	167.0	164.9	197.9
30	20	54	17	E5	182.6	123.4	142.8	181.8	161.7	152.8	84.5	190.7	188.3	225.9

AIR DRILL SEEDING RATES IN KILOGRAMS PER HECTARE

GEARING SELECTION					GRAIN									FERTZ
Sprockets		Gears		Gear Box	Rates Listed in Kilograms Per Hectare									Dry
Driver	Driven	Driver	Driven	Levers	Wheat	Oats	Barley	Sorghum	Millet	Rape	Sunflower	Rye	Alfalfa	Granultd
20	30	17	54	A1	2.3	1.5	1.8	2.2	2.0	1.9	1.0	2.4	2.3	2.8
20	30	17	54	B1	2.6	1.7	2.0	2.6	2.3	2.2	1.2	2.7	2.7	3.2
20	30	17	54	A2	2.8	1.9	2.2	2.8	2.5	2.4	1.3	2.9	2.9	3.5
20	30	17	54	C1	3.0	2.0	2.4	3.0	2.7	2.5	1.4	3.1	3.1	3.7
20	30	17	54	A3	3.4	2.3	2.6	3.4	3.0	2.8	1.6	3.5	3.5	4.2
20	30	17	54	A4	3.9	2.7	3.1	3.9	3.5	3.3	1.8	4.1	4.1	4.9
20	30	17	54	A5	4.5	3.0	3.5	4.5	4.0	3.8	2.1	4.7	4.6	5.6
20	30	17	54	B5	5.2	3.5	4.0	5.1	4.6	4.3	2.4	5.4	5.3	6.4
20	30	17	54	E2	5.6	3.8	4.4	5.6	5.0	4.7	2.6	5.9	5.8	7.0
20	30	17	54	D4	6.3	4.3	4.9	6.3	5.6	5.3	2.9	6.6	6.5	7.8
20	30	17	54	E3	6.8	4.6	5.3	6.7	6.0	5.7	3.1	7.1	7.0	8.4
20	30	17	54	E4	7.9	5.3	6.2	7.9	7.0	6.6	3.7	8.2	8.1	9.8
20	30	17	54	E5	9.0	6.1	7.1	9.0	8.0	7.5	4.2	9.4	9.3	11.2
30	20	17	54	A5	10.1	6.9	7.9	10.1	9.0	8.5	4.7	10.6	10.5	12.6
30	20	17	54	B5	11.6	7.8	9.1	11.5	10.3	9.7	5.4	12.1	12.0	14.3
30	20	17	54	E2	12.7	8.6	9.9	12.6	11.2	10.6	5.9	13.2	13.1	15.7
30	20	17	54	D4	14.2	9.6	11.1	14.1	12.6	11.9	6.6	14.8	14.6	17.6
30	20	17	54	E3	15.2	10.3	11.9	15.1	13.5	12.7	7.0	15.9	15.7	18.8
30	20	17	54	D5	16.2	11.0	12.7	16.2	14.4	13.6	7.5	16.9	16.7	20.1
30	20	17	54	E4	17.8	12.0	13.9	17.7	15.7	14.9	8.2	18.6	18.3	22.0
30	20	17	54	E5	20.3	13.7	15.9	20.2	18.0	17.0	9.4	21.1	20.9	25.1
20	30	54	17	A1	22.7	15.4	17.8	22.6	20.1	19.0	10.5	23.8	23.5	28.1
20	30	54	17	B1	26.0	17.6	20.3	25.9	23.0	21.7	12.0	27.1	26.8	32.2
20	30	54	17	C1	30.3	20.5	23.7	30.2	26.9	25.4	14.0	31.7	31.3	37.5
20	30	54	17	A3	34.1	23.0	26.7	34.0	30.2	28.5	15.8	35.6	35.2	42.2
20	30	54	17	C2	37.9	25.6	29.7	37.7	33.6	31.7	17.5	39.6	39.1	46.9
20	30	54	17	A4	39.8	26.9	31.1	39.6	35.3	33.3	18.4	41.6	41.0	49.2
20	30	54	17	A5	45.5	30.7	35.6	45.3	40.3	38.1	21.1	47.5	46.9	56.3
20	30	54	17	B5	52.0	35.1	40.7	51.8	46.0	43.5	24.1	54.3	53.6	64.3
20	30	54	17	E2	56.9	38.4	44.5	56.6	50.4	47.6	26.3	59.4	58.6	70.4
20	30	54	17	C5	60.7	41.0	47.4	60.4	53.7	50.7	28.1	63.3	62.5	75.0
20	30	54	17	D4	63.7	43.0	49.8	63.4	56.4	53.3	29.5	66.5	65.7	78.8
20	30	54	17	E3	68.2	46.1	53.4	67.9	60.4	57.1	31.6	71.3	70.4	84.4
20	30	54	17	D5	72.8	49.2	56.9	72.5	64.5	60.9	33.7	76.0	75.0	90.1
30	20	54	17	A3	76.8	51.9	60.0	76.4	68.0	64.2	35.5	80.2	79.1	95.0
20	30	54	17	E4	79.7	53.8	62.3	79.3	70.6	66.7	36.9	83.2	82.1	98.6
30	20	54	17	C2	85.3	57.6	66.7	84.9	75.5	71.4	39.5	89.1	87.9	105.5
20	30	54	17	E5	91.0	61.5	71.2	90.6	80.6	76.1	42.1	95.0	93.8	112.6
30	20	54	17	A5	102.4	69.1	80.1	101.9	90.7	85.6	47.4	106.9	105.5	126.6
30	20	54	17	B5	117.0	79.0	91.5	116.4	103.6	97.9	54.1	122.2	120.6	144.7
30	20	54	17	D3	122.8	83.0	96.1	122.3	108.8	102.8	56.8	128.3	126.6	152.0
30	20	54	17	E2	127.9	86.4	100.1	127.4	113.3	107.0	59.2	133.6	131.9	158.3
30	20	54	17	C5	136.5	92.2	106.7	135.9	120.9	114.2	63.2	142.5	140.7	168.9
30	20	54	17	D4	143.5	96.8	112.1	142.6	126.9	119.9	66.3	149.6	147.7	177.3
30	20	54	17	E3	153.5	103.7	120.1	152.8	136.0	128.5	71.1	160.3	158.3	190.0
30	20	54	17	D5	163.8	110.6	128.1	163.0	145.1	137.0	75.8	171.0	168.8	202.6
30	20	54	17	E4	179.2	121.1	140.2	178.4	158.8	150.0	83.0	187.2	184.8	221.8
30	20	54	17	E5	204.7	138.3	160.1	203.8	181.3	171.3	94.7	213.8	211.1	253.7

PLANTING DEPTH ADJUSTMENTS

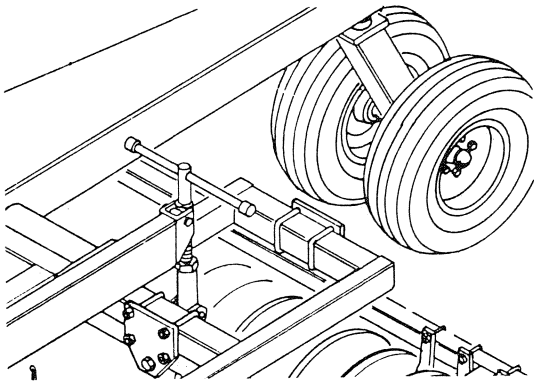
1. A depth control stop clamp is bolted to the rod of one of the cylinders located on the implement frame directly behind the cart, fig. 16. With the openers set in the soil at the desired planting depth, slide the depth control stop clamp up the cylinder rod as far as possible to where it completely depresses the hydraulic cut-off plunger attached to the cylinder. Secure the stop clamp at that position. The implement frame should now stop at the same planting depth each time it is lowered.

Adjustments are made faster by understanding that the gauge wheels set the depth and the press wheels level the openers from front-to-rear.

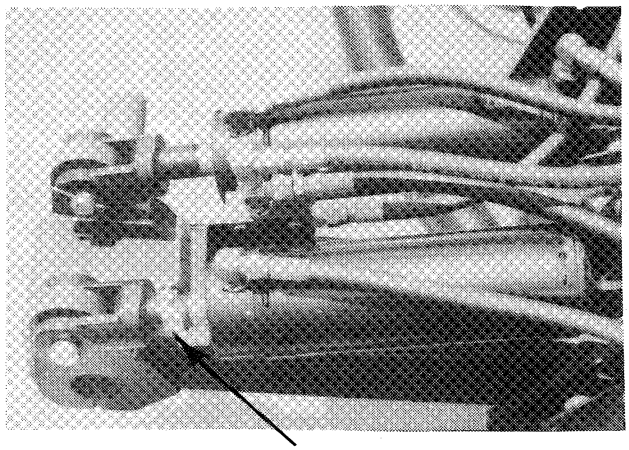
2. During field testing, hydraulically lower the implement, placing the openers in the soil. Since hydraulic raising and lowering occurs at the gauge wheels, check for an equal depth across the front rank of openers. If the frames have been leveled all front rank openers should have the same penetration. If frames have not been leveled see, "Frame Leveling" page 9 & 10.

3. Check the depth of the rear rank openers. If the penetration varies from the front rank openers, adjust the threaded press wheel adjustment screws, fig. 15, located above the press wheel gangs to obtain an equal planting depth throughout the implement.

4. Test the drill to determine a desired planting depth for your crop and set the openers into the soil at that depth.



Press Wheel Adjustment Screws
Fig. 15



Stop Clamp
Fig. 16
(34' Air Drill Shown)

INDIVIDUAL OPENER ADJUSTMENTS

DEPTH ADJUSTMENT

The planting depth of the hoe openers may be adjusted at each opener as well as at the gauge wheels (see "Planting Depth Adjustments"). Openers running in the tractor tire tracks, for example, may require additional depth or down pressure adjustments. If you determine that any or all openers should be adjusted, read this section carefully.

The hoe opener seeding depth is adjusted where the spring bar connects to the upper shank of the opener arm. Mount the spring bar in a lower hole for more shallow seeding. (See fig. 17 and fig. 18 on page 16)

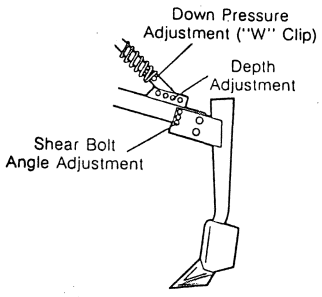
NOTE: By changing the spring bar from its factory-set position, the angle that the hoe tip travels through the soil has also changed. For longer hoe-tip life, it must be reset to its original position. See "Hoe Tip Adjustment" page 16.

INDIVIDUAL OPENER ADJUSTMENTS (CON'T.)

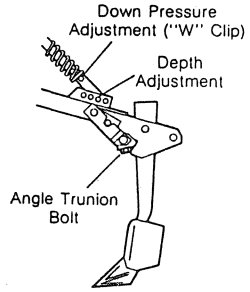
HOE-TIP ADJUSTMENT

The tip of the hoe openers should operate with the point running 1/8" lower than the heel, fig. 19. SHEAR-BOLT OPENERS, fig. 17, have three shear-bolt positions located where the upper and lower shanks connect. If the spring bar is moved to a higher position (see "Depth Adjustments" page 15), remove the shear-bolt, pivot the lower shank to the rear and relocate the bolt into a higher hole. Check the hoe tip for proper heel-to-tip angle of 1/8".

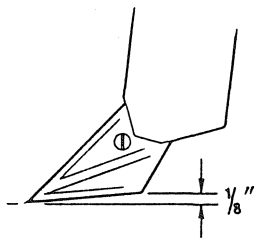
SPRING RESET OPENERS have an adjustable trunnion located on the front edge of the lower shank where it connects to the upper shank. If opener depth adjustments have been made, turn the trunnion bolt until the hoe-tip angle is correct (1/8" heel-to-tip). See fig. 19.



Shear Bolt Opener
Fig. 17



Spring Reset Opener
Fig. 18



Hoe Tip
Fig. 19

OPENER DOWN-PRESSURE ADJUSTMENTS

The amount of down-pressure exerted by the hoe opener is adjusted at the lower end of the spring rod which connects to the top of the opener arm. Move the "W" clip at the bottom of the spring to a higher position for more down-pressure, to a lower position for less. This adjustment may be considered for openers running in tire tracks.

FIELD OPERATIONS

1. Always keep the filling screens in the lid opening of the bins in place to keep foreign objects from entering and damaging the metering system.

2. Keep the oil cooler and screen free from oil and dirt build-up.

3. Do not rely on tractor hydraulic valve detent to maintain the fan and metering operation. You should secure the tractor remote lever. See "Operating Cart Fan Hydraulics" page 11.

4. When raising the drill at the end of the field, fully extend the gauge wheel cylinders and hold the hydraulic lever on for a few seconds. This action will rephase all of the gauge wheel cylinders and ensure accurate depth control across the width of the drill.

5. When lowering the drill for field operations the drill must always be lowered until stopped by the depth stop (on one of the master cylinders behind the cart). Anytime the drill is raised off the depth stop the metering system is deactivated (see "Seed Metering" page 11).

6. Avoid making sharp turns with the openers in the soil. A sharp turn will cause the openers on the inside of the turn to back up, causing plugging and possible opener damage.

7. Never back up or let the drill roll backwards with the openers in the ground. Opener plugging may result.

FIELD OPERATIONS (CON'T.)

8. Engaging the fan will activate the air flow for the seed metering system. Avoid forward motion with the fan running at low pressure or slow speed. Seed metering with too little air flow may cause the hoses to plug.

9. Be aware of the 5 foot to 10 foot delay before the seed reaches the openers when forward motion begins. If stopping in the field is necessary, raise the openers and back up 10 feet before continuing. Lower the drill and continue to drill.

10. (If applicable) Replace the shear bolts on shear bolt hoe openers as necessary with a 5/16" x 3" long Grade 5 bolt ONLY. (Great Plains part number 802-131C)

11. Periodically check for plugged openers and hoses if your unit is not equipped with a monitor system. Leave the fan running and manually crank the metering system using the clutch handle (see "Seed and Fertilizer Calibration" page 11). Check below each opener for seed output. By stopping for this check at a field corner or row end, any gaps (see #9 above) will be planted when the corners and ends are sown out.

12. Maintain the correct tire pressure. Gauge wheels = 32 psi. Cart tires = 36 psi.

13. ALWAYS operate farm machinery with safety in mind.

NOTE: Always start the fan motor with the tractor engine at IDLE SPEED ONLY.

OPERATING CHECK LIST

Before operating your drill for the first time, make sure you have checked the following:

1. Read this operating manual completely to understand the different systems and procedures of the drill.
2. Read the Safety Rules.
3. Follow the procedures for:
   a. Bleeding the hydraulic system
   b. Operating the air system
   c. Folding and unfolding the air drill
   d. Seeding calibrations
   e. Setting the planting depth
4. Check the machine for loose bolts, pins and chains.
5. See that all tires have proper air pressure.
6. Lubricate drill.
7. Inspect the bins for foreign material.
8. Rotate the input shaft with the clutch handle to see that the metering system is operating smoothly.
9. Check the bin lids for air tight seal.
10. Check to be sure the fan air pressure gauge is at a proper level.
11. Check the hydraulic system for leaks. (See Safety Rules page 3)

MAINTENANCE

SERVICE

1. Periodically check and secure all bolts, pins and fasteners.

2. 8 to 12 hours lubrication points on the implement frame:

   a. Hoe opener pivots
   b. Gauge wheel pivots
   c. Lift-assist pivots
   d. Caster wheel shafts
   e. Press wheel gang bearings.
   f. Press wheel gang pivot bushings.
   g. Cart Pull-link pivots

3. 8 to 12 hour lubrication points on the cart and air system:

   a. Fan impeller bearings
   b. Metering box agitator
   c. Meter bearings
   d. Clutch shaft bearings

4. 30 hour lubrication points:

   a. Frame section folding pivots
   b. Press wheel adjustment screw
   c. Parallel arm pivots on outer gauge wheels
   d. Clean out panel pivot shaft, both ends, on the metering box.

5. Lubricate the wheel bearings each season.

6. Remove and soak the drive and metering chains in oil between seasons.

7. It is very important to have clean oil in the hydraulic circuits. Begin air drill operations with clean oil and change the oil filter as necessary or after 3000 acres. Follow the tractors manufacturer's recommendations for oil reservoir maintenance. The Air Drill filter is Great Plains part number 810-053C.

8. Check the gear box oil levels seasonally. Check by taking off lids and measuring depth of oil. Proper oil level is 2 1/2" deep. Add SAE 140 gear oil if needed. A dry box takes approximately 5.8 U.S. quarts to fill.

9. Periodically check the rubber seals on the bin lids for possible maintenance. An air tight seal is important for proper seed metering.

CLUTCH

The main drive clutch on your Air Drill is of a friction wrap design. There are two hydraulically actuated spring bars, one which disengages the clutch when the blower fan is turned off and the other which disengages the clutch when the implement portion of the machine is raised out of the ground. The lower rear cylinder, fig. A, is connected to the fan hydraulic motor circuit. When the fan is running the cylinder should push the spring bar away from the clutch, fig. B, allowing the clutch to turn. When the fan is off, the spring bar should contact the clutch tab, fig. C, and disengage the clutch. The upper front cylinder is connected to the gauge wheel lift circuit. When the implement is raised out of the ground the cylinder pushes the spring bar down to the clutch tab, fig. D, and disengages the clutch. When the implement is lowered on the depth stop the spring bar should rise, fig. E, and allow the clutch to turn. IMPORTANT: During field operation, the implement must be lowered until stopped by the gauge wheel cylinder depth stop; otherwise, the gauge wheel activated clutch shutoff cylinder will disengage the clutch and stop the metering system. If adjustment of the lower rear spring bar is necessary, use the following procedure:

CLUTCH (CON'T.)

1. Turn off fan. Clutch cylinder should be retracted.
2. Loosen mounting nuts on the cylinder and raise cylinder up from spring bar.
3. Loosen spring bar mounting bolts and slide spring bar up or down until the end of the spring bar is centered on clutch tab, fig. C, and retighten mounting bolts.
4. Adjust cylinder until it just contacts the top of the spring bar and tighten cylinder nuts at this point.

The lower rear spring bar is now adjusted and when fan is turned on the cylinder should push the spring bar down allowing the clutch to turn. If adjustment of the upper front spring bar is necessary, use the following procedures:

1. Raise the implement out of ground and hold with hydraulic pressure (do not set machine down on the gauge wheel transport locks). Clutch cylinder should be extended.
2. Loosen mounting nuts on the cylinder and raise cylinder up from spring bar.
3. Loosen spring bar mounting bolts and slide spring bar up or down until end of spring bar clears the outside diameter of the clutch tab by 1/16" to 3/32", fig. E, and retighten cylinder nuts at this point.
4. Adjust cylinder down so that it pushes spring bar down until end of spring bar is centered on clutch tab and tighten cylinder nuts at this point.

The upper front spring bar is now adjusted and when the implement is lowered in the ground on the depth stop, the cylinder should retract allowing the spring bar to rise up and allow the clutch to turn.

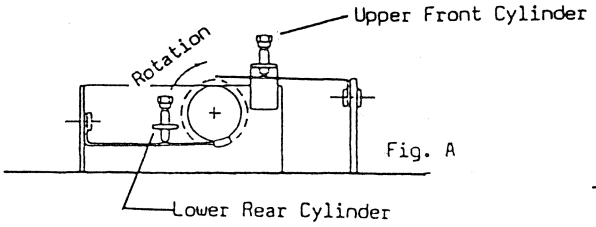


Fig. A

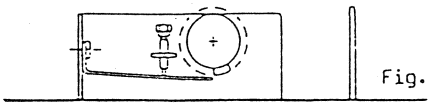


Fig. B

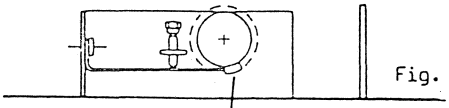


Fig. C

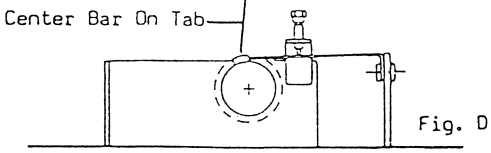


Fig. D

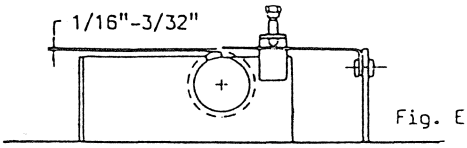


Fig. E

DANGER! STAY CLEAR OF THE IMPLEMENT. IF HYDRAULIC FAILURE SHOULD OCCUR THE IMPLEMENT WOULD FALL TO THE GROUND.

DRIVE TRAIN OPERATIONS

CHAIN DRIVE

Your Air Drill uses standard no. 40 and 20-40 roller chain throughout it's drive system. Chain tension should be checked daily during the drilling season and adjusted if needed.

It is important not to adjust your chains too tight as this may cause damage to the drive train. Oil impregnated wood idler blocks are provided for adjustment on all long chains.

SPEEDCHANGE DRIVE

The speedchange box is a 21 speed gear box with output speeds ranging from 1/2 to 2 times the input speed. The speedchange box in conjunction with the quick change sprockets and gears gives 84 possible drive ratios of which 48 are listed in the seed rate chart. Most of the ratios not listed fall in the lower half of the seed rate chart. For applications that require rates not listed, contact your Great Plains dealer. The speedchange boxes have been lubricated at the factory with SAE 140 gear oil. Check oil level seasonally by taking off the lids and measuring depth of the oil with a tape measure. Oil should be 2 1/2" deep (Approximately 5.8 U.S. quarts).

STORAGE

1. If you store the drill in an unfolded position, unpin the rod end of the folding cylinders and retract the rods into the cylinders to prevent rust.

2. Release the clamps on the bin fill lids to relax the load on the seals.

3. Empty the bins of any grain and fertilizer (corrosive) by loosening the wing nuts that secure the cover plate at the bottom of each bin and removing the cover plate, fig. 20. Remove the wing nut and bolt that hold the clean-out handle in position (R.H. side of the cart). Swing the handle down and remove any seed or fertilizer.

Wash and clean the bins, especially the fertilizer bin, to prevent corrosion.

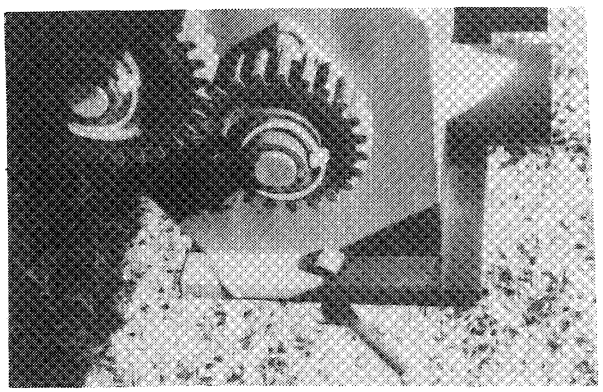


Fig. 20

4. If the cart is disconnected from the implement, plug the 3" hose ends to prevent birds from nesting in the air system.

Before each season, be sure to check the bin bottoms for foreign material. Manually wind the metering shaft to be sure that all moving parts are operating freely. Then start the fan motor and check to see that all hoses have proper air flow.

5. Remove and soak the drive and seed metering chains in oil between seasons.

6. Lubricate the necessary fittings (see "Maintenance Service" page 18).

7. Check all bolts, pins, fittings and hoses. Tighten, repair or replace parts as necessary.

NOTE: Proper storage and maintenance will help prevent unnecessary down-time and ensure longer, dependable drill operation.

OPTIONAL FILL-AUGER OPERATING INSTRUCTIONS

These instructions apply if your drill is equipped with the optional fill auger.

1. Position the auger outlet spout over the bin to be filled.

2. Back truck up to auger inlet hopper.

3. Position double selector valve, fig. 21, for hydraulic oil to flow to auger.

4. Engage tractor hydraulic lever. It will be necessary to hold lever with tarp strap, wire or some other means.

5. With tractor engine running at slow speed turn on 2 position 3 way valve, fig. 21. If auger runs backwards reverse tractor hydraulic lever.

NOTE: Steps 4 & 5 may be reversed.

6. Fill bin. Shut off flow of seed or fertilizer just before bin is full to allow auger to clean out. DO NOT leave seed or fertilizer in auger as this may cause plugging and corrosion.

7. When auger is cleaned out shut off auger with 2 position 3 way valve or by disengaging tractor hydraulic lever.

NOTE: In an emergency the double selector valve will also shut off the auger but will pressurize the folding circuit if the tractor hydraulic lever is still engaged.

8. Disengage tractor hydraulic lever (if not already done) and return double selector valve and 2 position 3 way valve to original positions for field operation.

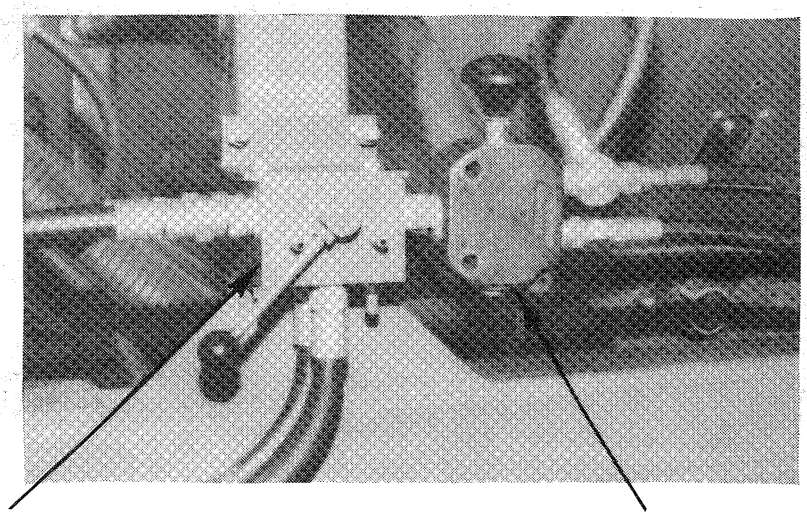


Fig. 21

CAUTION! IF AUGER HAS NOT BEEN USED FOR SOME TIME, IT IS A GOOD IDEA TO RUN AUGER DRY FOR A FEW SECONDS TO RID IT OF FOREIGN OBJECTS LIKE BIRD NESTS.

DO NOT RUN AUGER DRY FOR AN EXTENDED PERIOD OF TIME.

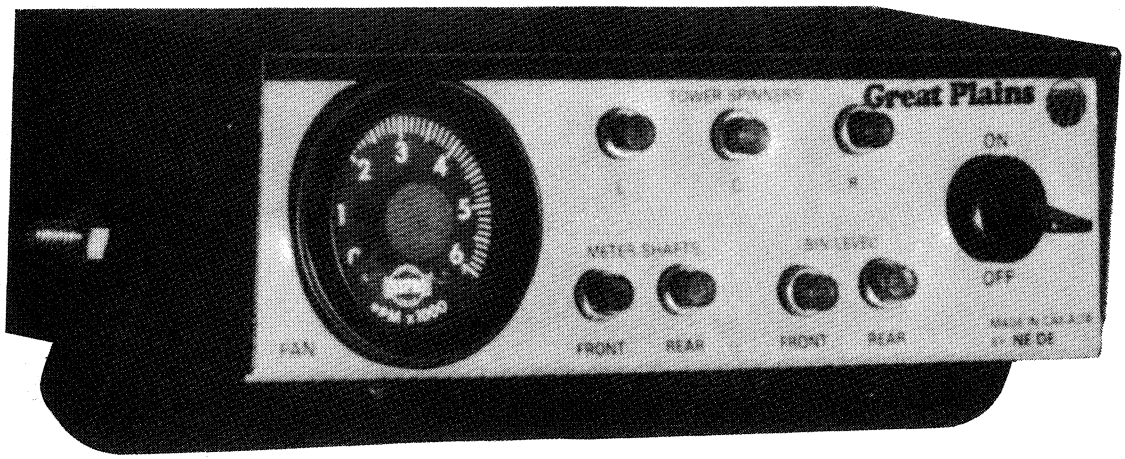
IF AUGER IS TO BE STORED OUTSIDE, THE HOPPER SHOULD BE TURNED UPSIDE DOWN TO PROTECT INLET FROM RAIN.

DANGER! DANGER! KEEP HANDS, FEET, LONG HAIR, CLOTHING OR ANYTHING ELSE LIABLE TO GET CAUGHT IN AUGER FROM AUGER INLET. IF AUGER BECOMES PLUGGED, TURN OFF AUGER AND TRACTOR BEFORE ATTEMPTING TO CLEAN IT OUT!

OPTIONAL AIR DRILL MONITOR

(PART NO. 823-028C)

The optional Air Drill Monitor Package allows the operator to monitor key functions of the air drill from the tractor. Material levers in both 75 Bu. and 100 Bu. bins, spinner shaft rotation in all three towers, meter shaft rotation in both bins and fan rpm are displayed on the labeled control console to be mounted in the tractor cab. 12 volt power from the tractor operates the system.



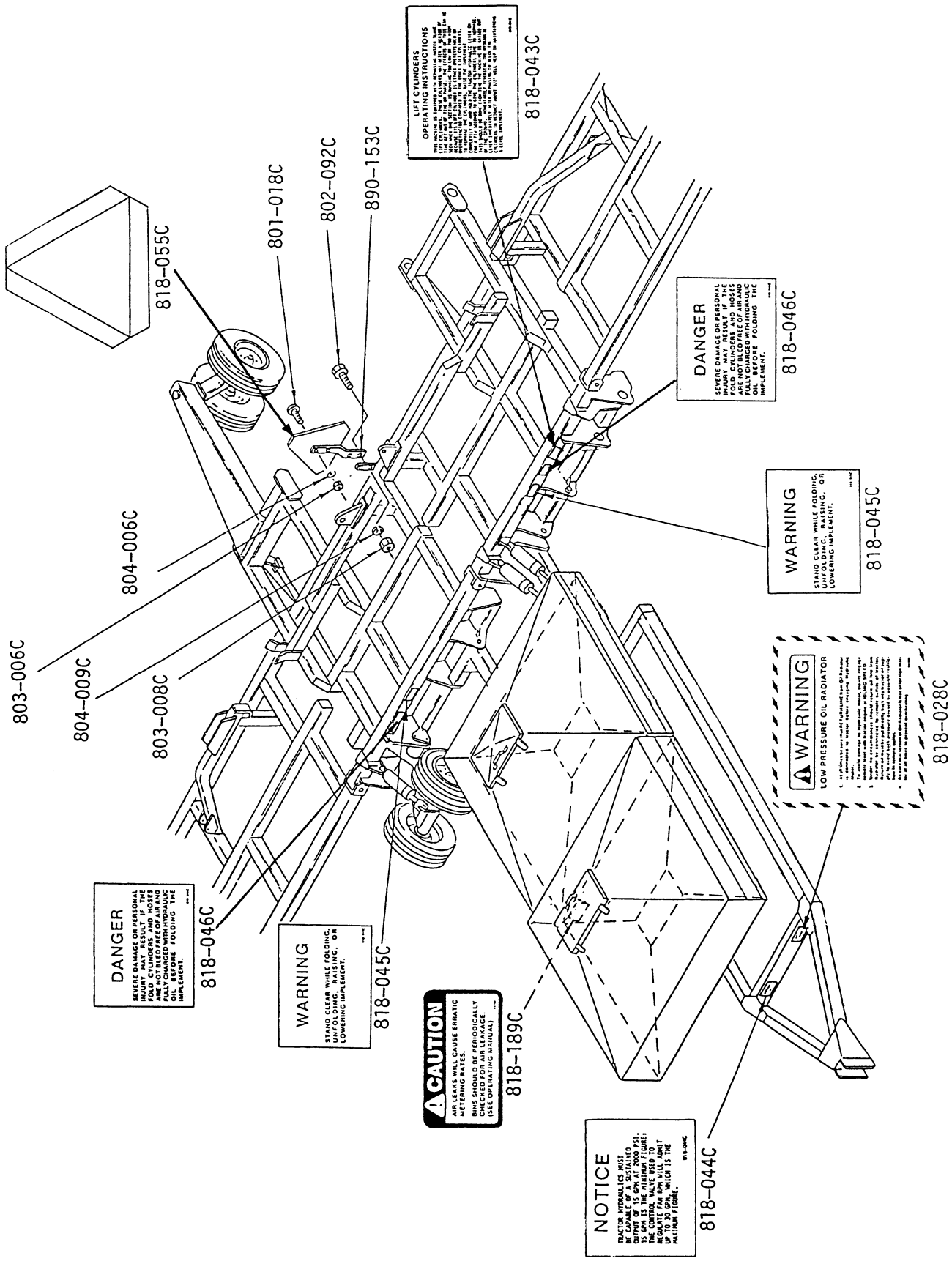
TROUBLE SHOOTING

PROBLEM	POSSIBLE CAUSES AND SOLUTIONS
1. Actual seeding rate is different than desired.	a. Check for air leaks in bins. A small air leak can lower seeding rate drastically. b. Quickchange gears on left side of bin metering box are in wrong range. c. Quickchange sprockets between gearbox and bin are turned around. d. Gear box is in wrong gear. e. Check tire pressure on cart tires. Proper inflation is 36 psi. f. Liquid seed treatment will affect seeding rate if chemicals build up in the metering star wheels. Remove cover plate on bottom bin and check metering star wheels for build up. g. Damp fertilizer can also build up on metering star wheels. h. Check adjustment of clutch shutoff cylinders and spring bars. Improper adjustment may cause the spring bars to stop the clutch from turning and shutting off the metering system (see page 18 on clutch operation)
2. Erratic seeding pattern.	a. Check that spinner shaft in towers are turning. b. Hydraulic motors in towers turning too slow. Adjust needle valve on rear of cart (see page 11, fig. 10) so that spinner motors turn between 400 and 600 rpm. c. Check adjustment of clutch shutoff cylinders and spring bars. Improper adjustment may cause the spring bars to stop the clutch from turning and shutting off the metering system (see page 18 on clutch operation).
3. Seeding pattern is skipping rows.	a. Opener is plugged. b. 1" seed hose from tower to opener is plugged. c. Foreign object inside tower blocking outlet to 1" seed hose.
4. 1" seed hoses from towers to openers plugging.	a. Hoses have too much slack and need tightened. When taking up slack in a seed hose that goes to an opener on a different section than the tower, leave enough slack to allow for down flex between sections. b. Seed hose sags between tower and opener. Install more seed hose loops, Great Plains part no. 160-016H. c. Fan speed too low.
5. Openers plugging with dirt.	a. Drilling in damp or wet conditions may cause this. Lower openers into soil while moving forward and never back up with openers in the ground. b. Turning too sharp and causing inside of machine to back up with openers in ground. Lift openers out of ground if a sharp turn is necessary. c. Hoe tip angle too flat. (See page 16 fig. 19)
6. 3" seed hoses from bins to towers plugging.	a. Metering system not shutting off, when fan is off, and filling 3" seed hoses with seed. Check adjustment of fan activated clutch cylinder, see 1h. b. Fan speed too slow.

TROUBLE SHOOTING (CON'T.)

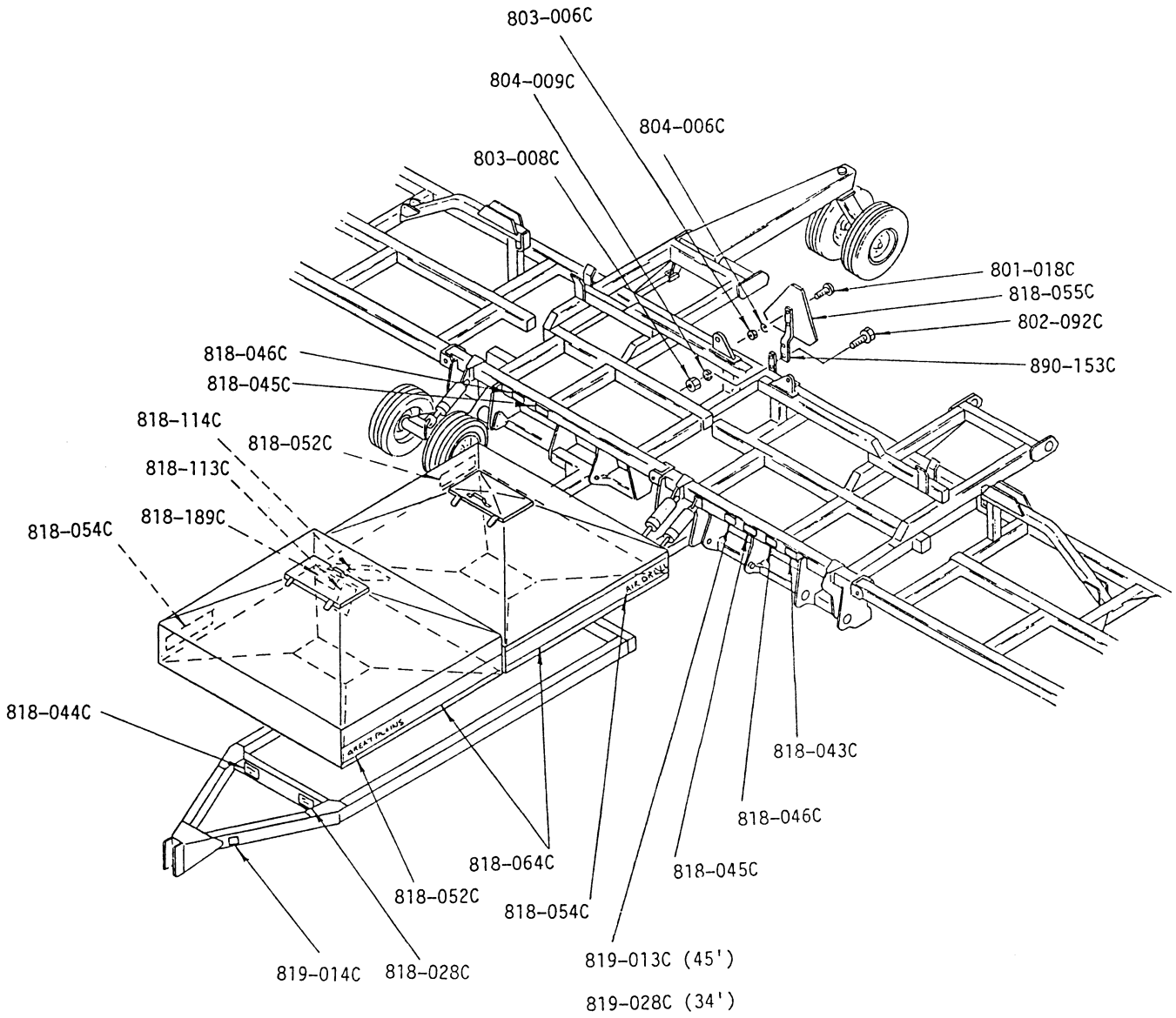
PROBLEM	POSSIBLE CAUSES AND SOLUTIONS
7. Front and rear hoe openers not planting at same depth.	a. Press wheels out of adjustment. See PLANTING DEPTH ADJUSTMENTS page 15. b. Check air pressure in gauge wheel tires. Proper inflation is 32 psi.
8. Planting depth varies between sections.	a. Gauge wheel cylinders need rephasing. See OPERATING THE HYDRAULIC SYSTEM page 7. b. Gauge wheel cylinders have air in them. See BLEEDING THE HYDRAULIC LIFTING SYSTEM page 6. c. Check air pressure in gauge wheel tires. Proper inflation is 32 psi. d. Implement is out of level. See FRAME LEVELING pages 8-10. e. One of the gauge wheel cylinders is the wrong size. The Cessna part no. is stamped on the casting on the rod end of the cylinder. See AIR DRILL IMPLEMENT page in the parts section for correct cylinder size, location, and the Cessna part number.
9. Creeping up or down of sections during field operation.	a. Gauge wheel cylinders have air in them. See BLEEDING THE HYDRAULIC SYSTEM page 6. b. Leaky gauge wheel cylinder. If a cylinder is leaking oil past the piston, that cylinder will retract and all cylinders outside of that cylinder will extend. See parts section for seal kit and service information.
10. All sections settling simultaneously during field operations.	a. O-ring seal on depth control plunger is leaking. Remove plunger and replace o-ring (see parts section for service information).
11. Fan won't run fast enough.	a. Tractor hydraulics not pumping enough oil. The fan and tower motors require approximately 10 gpm to operate at full speed. b. Filter on Air Drill cart is plugged. Replace element with Part No. 810-053C. c. Tractor oil level is low. d. Check valve is installed backwards. See CART HYDRAULICS in the parts section. The arrow on the valve must point as shown.
12. Return hose from radiator blows off.	a. Return hose is improperly plumbed to tractor. Consult your GREAT PLAINS dealer or your tractor dealer. b. Hose clamps are too loose. c. On some models of tractors, hydraulic return oil passes through a filter on the tractor before it dumps into the reservoir. If this filter is dirty it will cause high back pressure in the return hose from the radiator.

SAFETY DECAL PLACEMENT



Ref.	Part No.	Description
	160-138A	34' Air Drill Saftey Decal Package. Includes all Safety Decals as shown above.

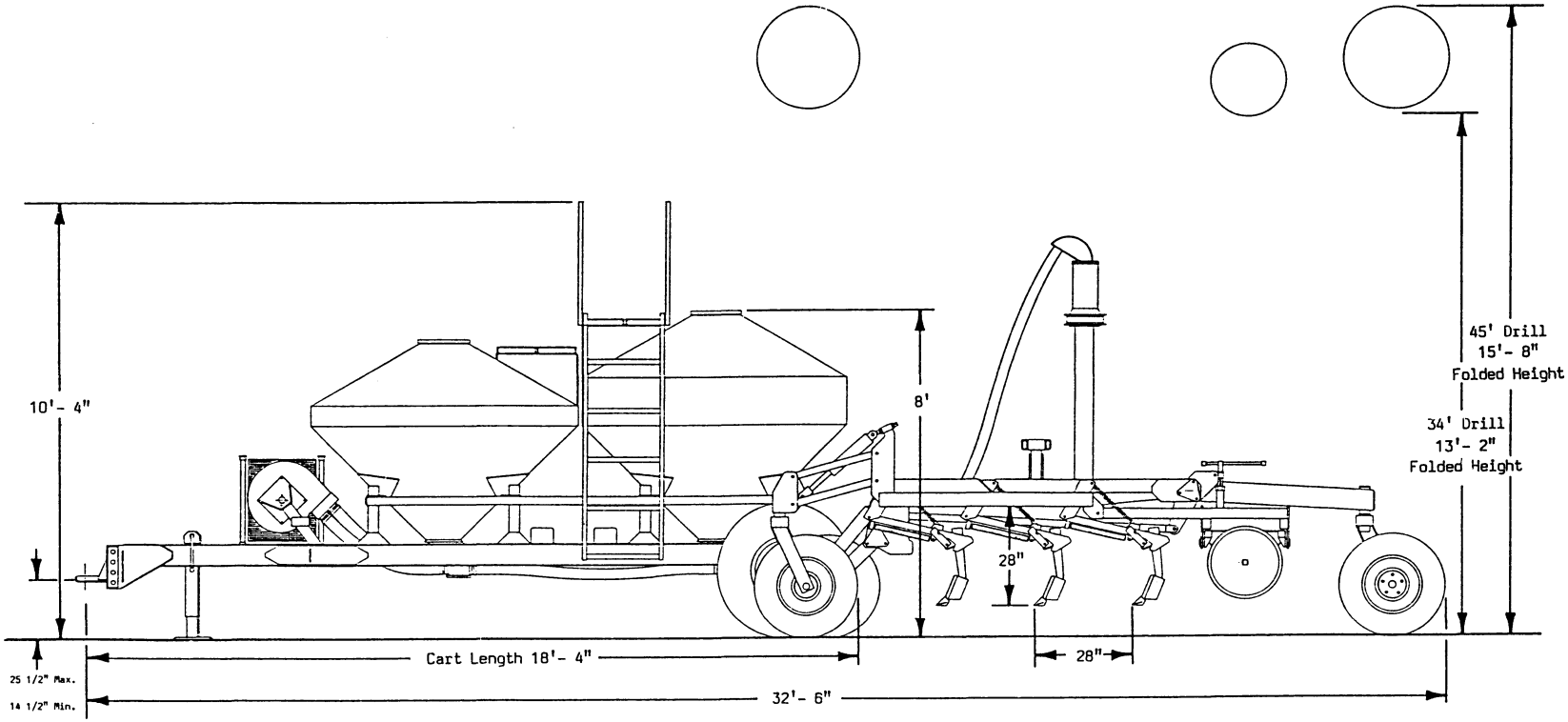
DECAL PLACEMENT



Ref.	Part No.	Description
	160-140A	34' Air Drill Package. Includes ALL Decals as shown above.
	160-139A	45' Air Drill Package. Includes ALL Decals as shown above.

SPECIFICATIONS

DIMENSIONS



GENERAL

OPENER SPACING	NO. OF OPENERS		DRILLING WIDTH		UNFOLDED WIDTH		FOLDED WIDTH	CART WEIGHT	IMPLEMENT WEIGHT		TOTAL WEIGHT	
	34'	45'	34'	45'	34'	45'	34' & 45'		34'	45'	34'	45'
7"	57	75	33'3"	43'9"	33'5"	45'	19'6"	3700#	8500#	12550#	12200#	16250#
10"	42	54	35'0"	45'0"	34'7"	45'	20'0"	3700#	7200#	10950#	10900#	14650#
12"	32	45	33'0"	35'0"	34'7"	45'	20'0"	3700#	6600#	10300#	10300#	14000#
14"	27	36	31'6"	42'0"	33'5"	45'	19'6"	3700#	6000#	9600#	9700#	13300#

BIN CAPACITY

	Seed	Fertilizer
Front	75 Bu.	6000 lb.
Rear	100 Bu.	8000 lb.

TIRE SIZE

Implement	9.5L-15	6 Ply
Cart	16.5L-16.1	10 Ply

Tongue weight with both bins full of fertilizer = 5600 lbs.

Tongue weight with both bins empty = 1900 lbs.

Warranty

Great Plains Manufacturing, Incorporated warrants to the original purchaser that this grain drill will be free from defects in material and workmanship for a period of one year from the date of original purchase when used as intended and under normal service and conditions. This Warranty is limited to the replacement of any defective part by Great Plains Manufacturing, Incorporated and the installation by the dealer of any such replacement part: provided that any such defective part is returned to Great Plains within thirty (30) days of the failure.

This Warranty does not apply to any part or product which in Great Plains' judgment shall have been misused or damaged by accident or lack of normal maintenance or care, or which has been repaired or altered in a way which adversely affects its performance or reliability, or which has been used for a purpose for which the product is not designed. This Warranty shall not apply if the product is towed at a speed in excess of 20 miles per hour.

Claims under this Warranty must be made to the dealer which originally sold the product and all warranty adjustments must be made through such dealer. Great Plains reserves the right to make changes in materials or design of the product at any time without notice.

This Warranty shall not be interpreted to render Great Plains liable for damages of any kind, direct, consequential, or contingent, to property. Furthermore, Great Plains shall not be liable for damages resulting from any cause beyond its reasonable control. This Warranty does not extend to loss of crops, losses caused by harvest delays or any expense or loss for labor, supplies, rental machinery or for any other reason.

No other warranty of any kind whatsoever, express or implied, is made with respect to this sale; and all implied warranties of merchantability and fitness for a particular purpose which exceed the obligations set forth in this written warranty are hereby disclaimed and excluded from this sale.

This Warranty is not valid unless registered with Great Plains Manufacturing, Incorporated within 10 days from the date of original purchase.

PARTS DRAWINGS
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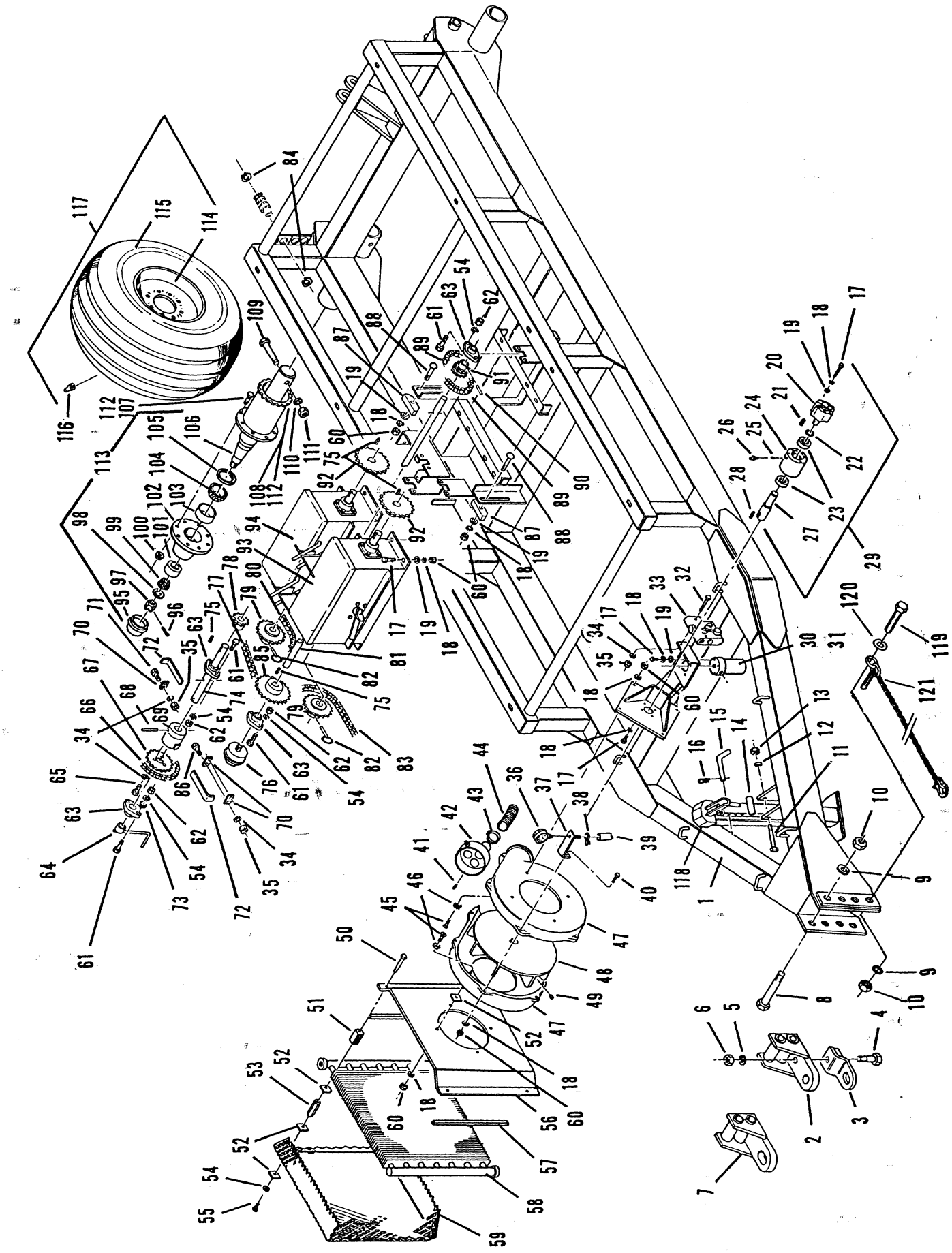
CART FRAME ASSEMBLY



CART FRAME ASSEMBLY (CON'T.)

Ref.	Part No.	Description
1.	166-035H	1987 Air Drill Cart Frame
2.	170-034H	Single Hitch Strap-Small
3.	170-040H	Lower Hitch
4.	802-169C	Bolt, Hex Head 1"-8 x 3 1/2" Long Gr 5
5.	804-027C	Washer, Lock Spring 1"
6.	803-031C	Nut, Hex 1"-8
7.	170-033H	Single Hitch Strap-Large
8.	802-166C	Bolt, Hex Head 1 1/4"-7 x 9 1/2" Long Gr 5
9.	804-030C	Washer, Lock Spring 1 1/4"
10.	803-034C	Nut, Hex 1 1/4"-7
11.	802-045C	Bolt, Hex Head 1/2"-13 x 5" Long Gr 5
12.	804-015C	Washer, Lock Spring 1/2"
13.	803-020C	Nut, Hex 1/2"-13
14.	166-091D	Jack Mount Spreader Tube
15.	114-045D	Jack Pin 3/4" x 4 3/4" Long
16.	805-032C	Pin, Hair Cotter .148" Wire
17.	802-017C	Bolt, Hex Head 3/8"-16 x 1" Long Gr 5
18.	804-013C	Washer, Lock Spring 3/8"
19.	804-012C	Washer, Flat 3/8" SAE
20.	810-044C	Hydraulic Motor Air Drill
21.	168-094D	1/8" Square Key
22.	800-004C	Snap Ring, (IRR#3100-118)
23.	822-035C	Bearing Fan Impeller
24.	890-103C	Impeller Bearing Housing
25.	801-015C	Screw, Set, Socket Head 1/4"-20 x 1/2" Long
26.	800-022C	Zerk 1/4"-18 NPT
27.	168-067D	Impeller Shaft
28.	168-030S	Impeller Bearing Housing & Motor Assembly (Includes Items 17 Through 27)
29.	168-068D	Blower Wheel Key 5/16" x 2 3/8" Long
30.	810-036C	Oil Filter Assembly
31.	810-053C	Oil Filter Element
	810-099C	Filter Housing O-Ring (3.005 ID x .104)
32.	802-097C	Bolt, Hex Head 1/4"-20 x 2 1/2" Long Gr 5
33.	810-038C	Valve Flow Control
34.	804-006C	Washer, Lock Spring 1/4"
35.	803-006C	Nut, Hex 1/4"-20
36.	890-086C	Air Drill Blower Gauge
37.	168-092H	Pressure Gage Bracket Weldment
38.	800-034C	Clamp Hose 9/16" Dia.
39.	168-141D	Air Gauge Hose x 32" Long
40.	802-079C	Bolt, Hex Head 3/8"-16 x 1 1/4" Long Gr 5
41.	801-002C	Screw, Socket Head 10"-16 x 3/8" Long
42.	168-122H	Fan Outlet Transition
43.	800-023C	3" Air Hose Band Clamp
44.	168-175D	Fan Transition To Front Bin Hose
45.	801-014C	Screw, Flat, Socket Cap 3/8"-16 x 1 1/4" Long
46.	804-045C	Washer, Lock 3/8" External Tooth Countersunk
47.	890-081C	Aluminum Fan Housing
48.	890-080C	16 1/2" Dia. Aluminum Blower Wheel
49.		Screw, Set 1/2"-13 x 5/8" Long Knurled Cup Point
50.	802-172C	Bolt, Hex Head 5/16"-18 x 2 1/2" Gr 5
51.	816-030C	Oil Cooler Rubber Mounting Block
52.	168-138D	Washer, Square 10 Ga x 1" x 1"
53.	803-010C	Nut, Hex Coupler 5/16"-18 x 1 3/4" Long
54.	804-009C	Washer, Lock Spring 5/16"
55.	802-007C	Bolt, Hex Head 5/16"-18 x 3/4" Long Gr 5
56.	168-151D	Radiator Shroud
57.	816-021C	Radiator Side Seal
58.	810-067C	Oil Cooler
59.	168-139D	Radiator Grill
60.	803-014C	Nut, Hex 3/8"-16
61.	802-010C	Bolt, Hex Head 5/16"-18 x 1 1/4" Long Gr 5
62.	803-008C	Nut, Hex 5/16"-18
63.	822-073C	Bearing 2 Bolt Cam Lock x 1" Bore
64.	168-003H	Clutch Handle
65.	802-004C	Bolt, Hex Head 1/4"-20 x 3/4" Long Gr 5

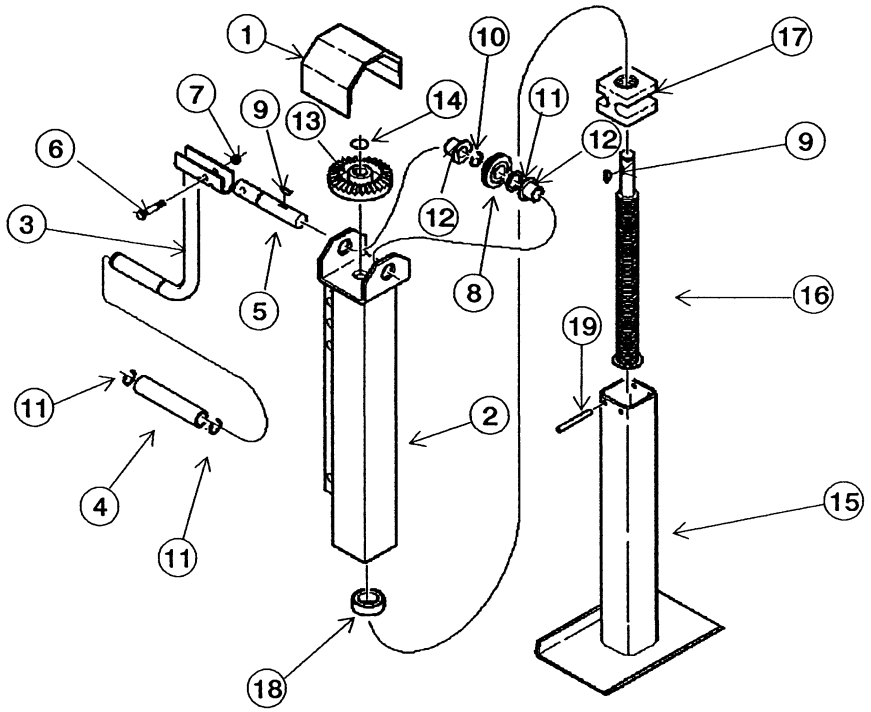
(Continued On Next Page.)

CART FRAME ASSEMBLY (CON'T.)

Ref.	Part No.	Description
66.	809-028C	Chain Roller #20-40 x 127 Pitches (45' Air Drills)
	809-054C	Chain Roller #20-40 x 130 Pitches (34' Air Drills)
67.	168-123D	40A29 Clutch Sprocket (45' Air Drills)
	168-183D	40A38 Clutch Sprocket (34' Air Drills)
68.	805-025C	Pin, Roll 3/16" x 2" Long
69.	176-025S	Clutch Clockwise (See Page 33)
70.	168-074D	Spring Bar Clamp
71.	802-005C	Bolt, Hex Head 1/4"-20 x 1" Long Gr 5
72.	168-075D	1/8" Clutch Spring Bar
73.	804-010C	Washer, Flat 5/16" USS
74.	168-218D	Air Drill Clutch Shaft
75.	123-004D	Drive Sprocket Key 1/4" x 1" Long
76.	890-108C	Acre Meter Air Drill 40 RPA
77.	809-065C	Chain Roller #40 x 61 Pitches
78.	808-024C	Sprocket 40B12 x 1" Bore
79.	168-165H	30 Tooth #40 Quick Change Sprocket
	168-166H	20 Tooth #40 Quick Change Sprocket
80.	809-066C	Chain Roller #20-40 x 86 Pitches
81.	168-219D	Air Drill Jackshaft
82.	805-015C	Pin, Lynch 5/16" x 1 3/4" Long
83.	809-051C	Chain Roller #20-40 x 80 Pitches
84.	800-044C	Snap Ring External 1 1/2"Shaft
85.	808-012C	Sprocket 40B48 x 1" Bore
86.	802-167C	Bolt, Hex Head 1/4"-20 x 1 1/2" Long Gr 5
87.	890-084C	Idler Block
88.	802-145C	Bolt, Carriage 3/8"-16 x 2 1/2" Long Gr 5
89.	809-064C	Chain Roller #40 x 56 Pitches
90.	805-076C	Pin, Roll 3/16" x 1 3/4" Long
91.	168-116H	Jackshaft Double Sprocket
92.	808-064C	Sprocket 40B37 x 1" Bore
93.	168-167K	Front Gearbox Assembly (See Page 34)
94.	168-168K	Rear Gearbox Assembly (See Page 34)
95.	890-032C	Hub Cap
96.	805-016C	Pin, Cotter 3/16" x 1 1/4" Long
97.	803-029C	Nut, Hex Slotted 7/8"-14
98.	804-055C	Washer, Spindle 7/8"
99.	822-038C	Bearing Cone #2790
100.	803-089C	Nut, Hex Flanged 5/8"-18
101.	822-039C	Bearing Cup #2720
102.	200-006D	8-Bolt Wheel Hub
103.	822-037C	Bearing Cup #3720
104.	822-036C	Bearing Cone #3780
105.	816-019C	8-Bolt Hub Seal
106.	201-022D	Air Drill Cart Spindle
107.	802-182C	Wheel Stud 5/8"-18 x 2 3/8" Long Gr 5
108.	168-082H	Drive Sprocket Assembly #40 x 45 Tooth
109.	802-069C	Bolt, Hex Head 3/4"-10 x 5" Long Gr 5
110.	804-023C	Washer, Lock Spring 3/4"
111.	803-027C	Nut, Hex 3/4"-10
112.	200-008S	8-Bolt Hub With Cups & Studs (Left Side) (Includes Items 101,102,103 & 107)
	200-010S	8-Bolt Hub With Cups, Studs & Drive Sprocket (Right Side) (Includes Items 101,102,103,107 & 108)
113.	200-009K	8-Bolt Hub & Spindle Package (Left Side) (Includes Items 95 Through 99; 101 Through 107)
	200-011K	8-Bolt Hub & Spindle Package With Drive Sprocket (RH Side) (Includes Items 95 Through 99; 101 Through 108)
114.	814-020C	Wheel 8-Bolt 16.1 x 14 Flat Center
115.	814-019C	Tire 16.5L x 16.1 10 Ply Tubeless
116.	816-035C	Valve Stem TR415 x .625 x 1 1/4" Long
117.	168-035K	Cart Wheel & Tire Assembly (Includes Items 114 Through 116)
118.	116-064K	Square Tube Jack With Swing Away Handle (See Page 33)
119.	802-298C	Bolt, Hex 1 1/4"-7 x 4" Long
120.	194-070D	Safety Chain Washer
121.	890-184C	Safety Chain - 30,000 Pound

JACK ASSEMBLY

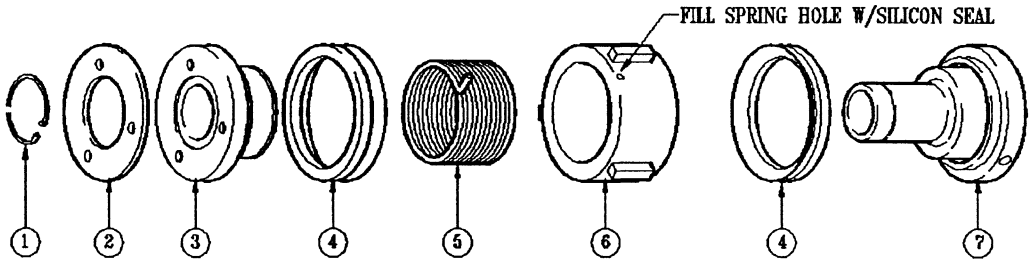
September 15, 1991



10002

Ref.	Part No.	Description
1.	116-069D	Jack Lid
2.	116-035H	Jack Housing
3.	116-040H	Jack Handle With Pivot
4.	116-068D	Jack Crank Hand Grip
5.	116-071D	Jack Crank Shaft
6.	802-012C	Bolt, Hex Head 5/16"-18 x 1 1/2" Long Gr 5
7.	803-011C	Nut, Lock 5/16"-18
8.	116-065D	Bevel Gear 15 Tooth x 7 Pitch
9.	800-046C	Woodruff Key #606, 3/16" x 3/4" Long
10.	800-042C	External E Snap Ring 3/4" ID
11.	890-111C	Machinery Bushing 1-1/2"X 3/4" x 18 Ga.
12.	116-066D	Jack Crank Bushing
13.	116-064D	Bevel Gear 30 Tooth x 7 Pitch
14.	800-015C	Snap Ring 3/4" ID
15.	116-037H	Jack Leg With Foot
16.	116-038H	Jack Screw With Stop
17.	116-055D	Jack Nut
18.	822-055C	Banded Thrust Bearing 3/4" ID
19.	116-062D	Jack Nut Pin

CW CLUTCH ASSEMBLY (176-025S)

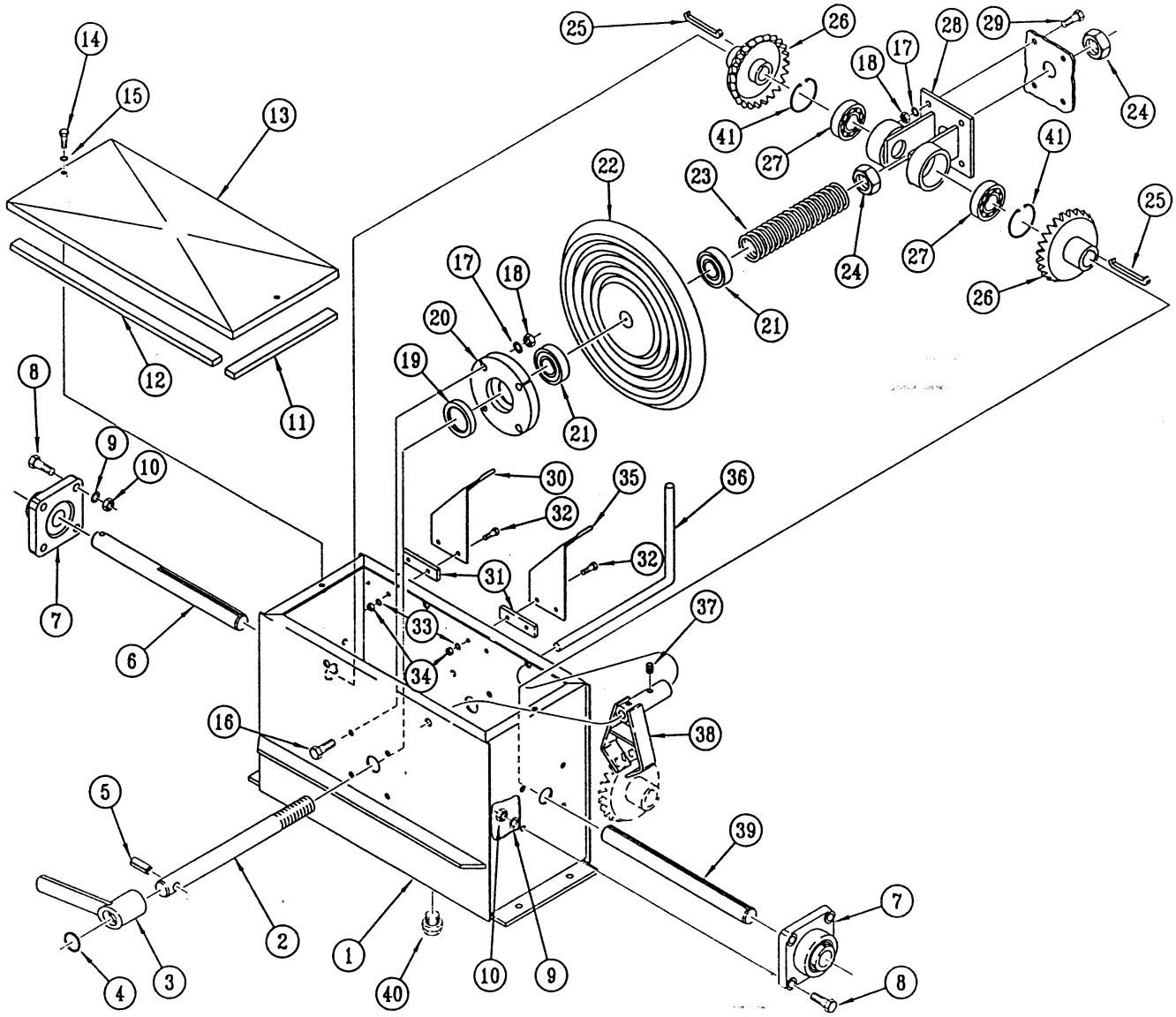


10003

Ref.	Part No.	Description
1.	800-077C	Snap Ring 1 1/4" Internal
2.	816-066C	Outer Seal
3.	176-043D	Clutch Hub
4.	816-067C	Seal Forseda V-65A
5.	807-048C	Clutch Wrap Spring - Clockwise
6.	176-024H	Clutch Control Ring
7.	176-030V	Clutch Drive Hub

Note: CW or CCW Is Stamped on Clutch to Designate Rotation.

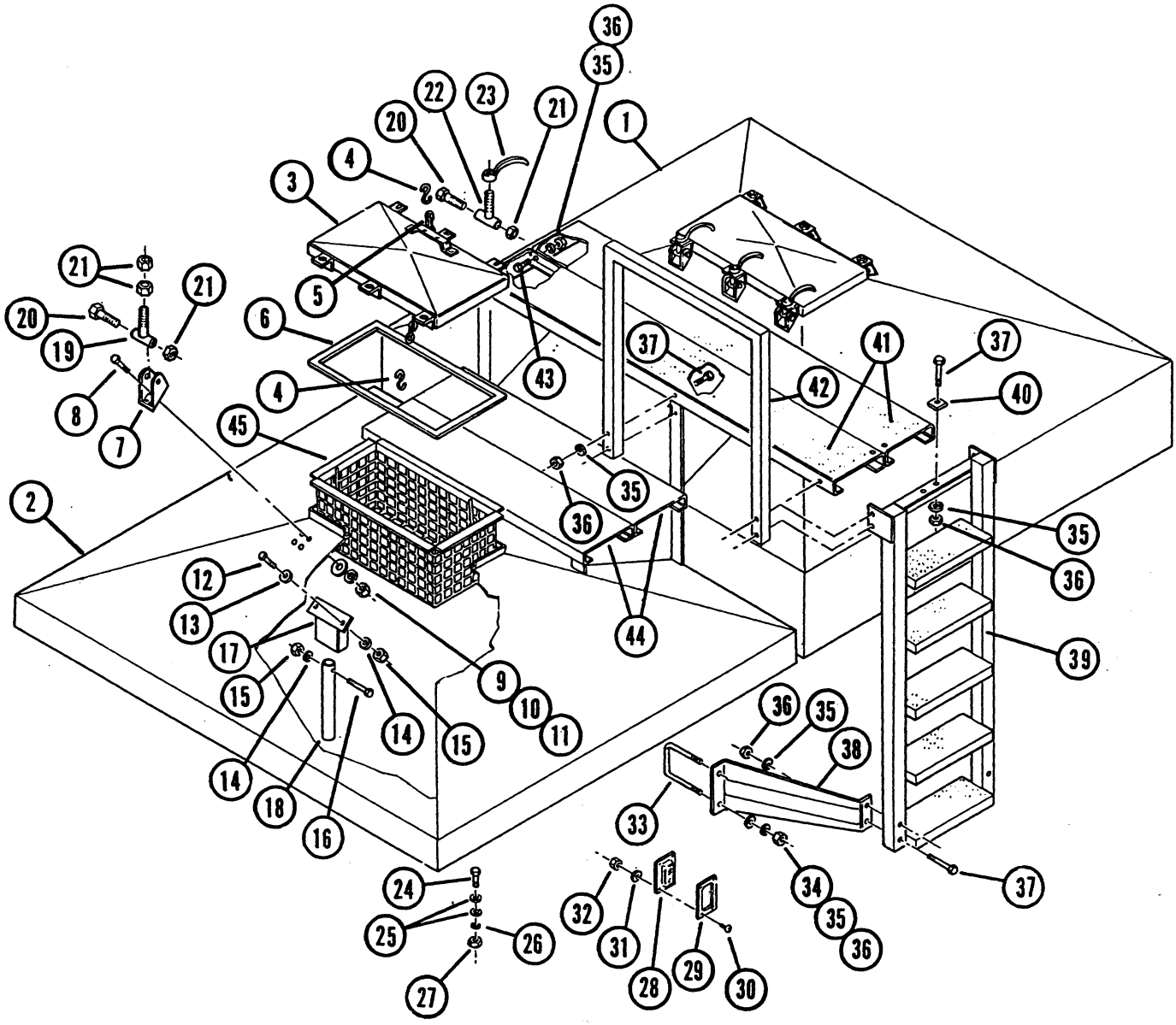
GEARBOX ASSEMBLY



GEARBOX ASSEMBLY (CON'T.)

Ref.	Part No.	Description
1.	168-155H	Front Gearbox Housing
	168-156H	Rear Gearbox Housing
2.	168-212D	Plate Gear Shaft
3.	168-159H	Gearbox Clutch Lever
4.	816-054C	O-Ring 1/8" x 1" ID x 1 1/4" OD
5.	805-123C	Pin, Roll 1/2" x 1 1/4" Long
6.	168-214D	Gearbox Output Shaft
7.	822-074C	Bearing 4 Bolt Cam Lock x 1" Bore
8.	802-029C	Bolt, Hex Head 7/16"-14 x 1 1/2" Long Gr 5
9.	804-014C	Washer, Lock 7/16"
10.	803-015C	Nut, Hex 7/16"-14
11.	168-221D	Gearbox Lid End Seal
12.	168-222D	Gearbox Lid Side Seal
13.	168-164H	Gearbox Lid
14.	802-087C	Bolt, Hex Head 5/16"-18 x 1" Long Gr 5 Stainless Steel
15.	804-009C	Washer, Lock Spring 5/16"
16.	802-079C	Bolt, Hex Head 3/8"-16 x 1 1/4" Long Gr 5
17.	804-013C	Washer, Lock Spring 3/8"
18.	803-014C	Nut, Hex 3/8"-16
19.	816-053C	Seal, Oil 1 1/2" ID x 2 1/8" OD x 5/16" Wide
20.	168-208D	Clutch Seal Housing
21.	822-069C	Bearing, Thrust 1" ID x 2" OD
22.	168-187D	Multi Gear Plate Gear
23.	807-041C	Gearbox Clutch Spring
24.	803-030C	Nut, Hex Jam 1"-8
25.	168-211D	Gearbox Bevel Gear Key
26.	168-188D	24 Tooth Bevel Pinnion Gear
27.	822-070C	Bearing Ball 1" ID x 2" OD
28.	168-157H	Gearbox Bearing Mount
29.	802-017C	Bolt, Hex Head 3/8"-16 x 1" Long Gr 5
30.	168-161H	Front Gearbox Output Gear Indicator
	168-163H	Rear Gearbox Output Gear Indicator
31.	168-209D	Gear Indicator Spacer
32.	802-004C	Bolt, Hex Head 1/4"-20 x 3/4" Long Gr 5
33.	804-006C	Washer, Lock Spring 1/4"
34.	803-006C	Nut, Hex 1/4"-20
35.	168-160H	Front Gearbox Input Gear Indicator
	168-162H	Rear Gearbox Input Gear Indicator
36.	168-210D	Shift Lever
37.	801-023C	Screw, Socket Head Set 3/8"-16 x 3/8" Long
38.	168-158H	Shift Fork
39.	168-213D	Gearbox Input Shaft
40.	800-066C	Drain Plug 3/4"-16 UNF
41.	800-088C	Snap Ring 2" Internal

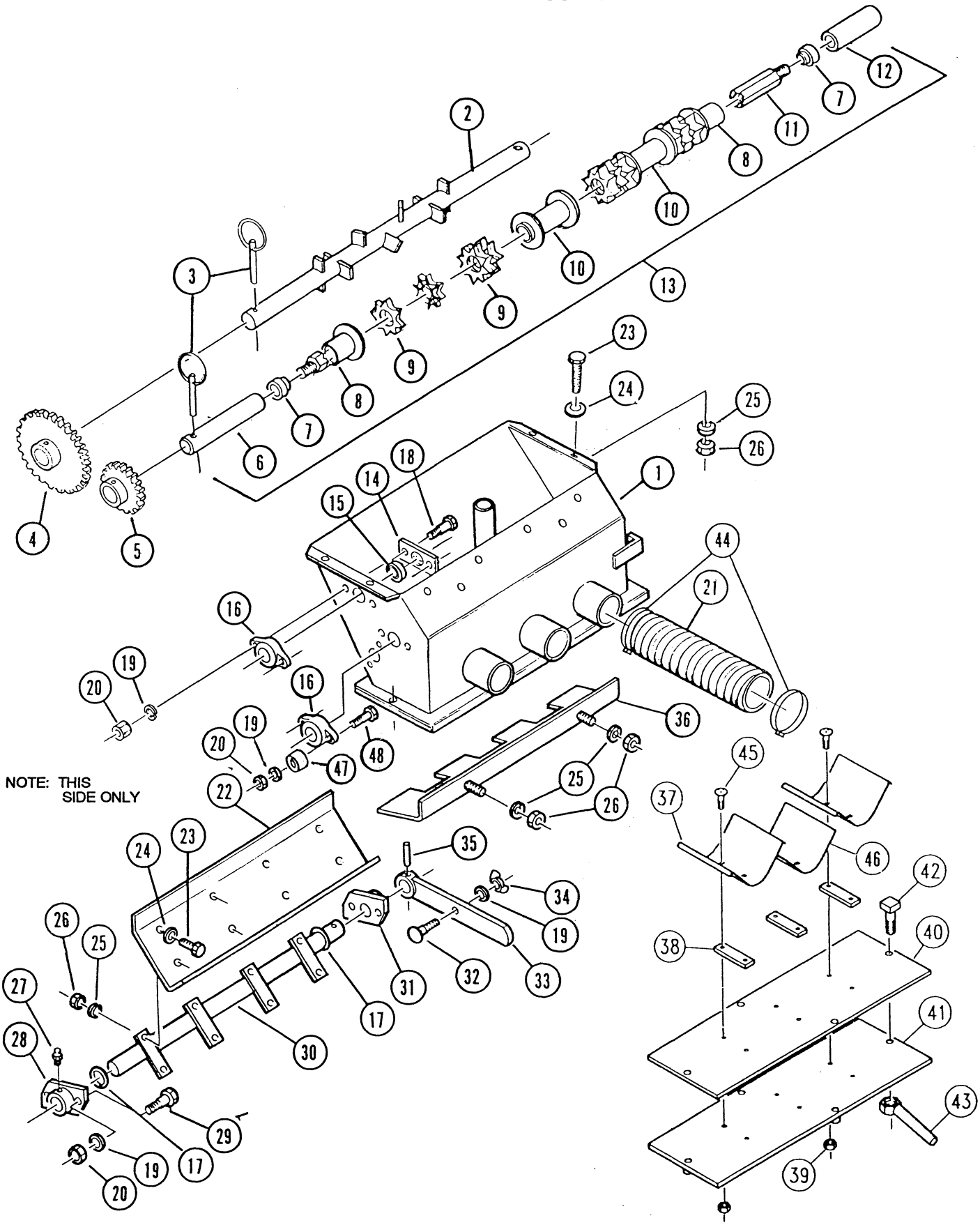
BIN ASSEMBLIES



BIN ASSEMBLIES (CON'T.)

Ref.	Part No.	Description
1.	167-008H	100 Bushel Bin
2.	167-007H	75 Bushel Bin
3.	167-028H	Air Drill Bin Lid
4.	800-041C	S-hook #772-.177 Wire x 1 1/8"
5.	167-071D	Lid Chain 26 Links 1/0 Machine Chain
6.	816-027C	Seal Air Drill Bin Lid
7.	167-075D	Lid Latch Pivot Bracket
8.	802-002C	Bolt, Carriage 1/4"-20 x 3/4" Long Gr 5
9.	804-075C	Washer, Flat 1/4" USS
10.	804-006C	Washer, Lock Spring 1/4"
11.	803-006C	Nut, Hex 1/4"-20
12.	802-007C	Bolt, Hex Head 5/16"-18 x 3/4" Long Gr 5
13.	804-036C	Washer, Flat 5/16" SAE
14.	804-009C	Washer, Lock Spring 5/16"
15.	803-008C	Nut, Hex 5/16"-18
16.	802-138C	Bolt, Hex 5/16"-18 x 2 1/4" Long Gr 5
17.	167-006H	Pressure Equalizer Head
18.	168-012D	Pressure Equalizer Pipe 100 Bushel Bin
18.	168-079D	Pressure Equalizer Pipe 75 Bushel Bin
19.	167-030H	Hinge Pivot Tube Weldment
20.	802-024C	Bolt, Hex Head 3/8"-16 x 3" Long Gr 5
21.	803-013C	Nut, Lock 3/8"-16
22.	167-029H	Lid Latch Pivot Tube Weldment
23.	803-164C	Handle Nut 3/8"-16 x 4 1/4" Long
24.	802-064C	Bolt, Hex Head 3/4"-10 x 2" Long Gr 5
25.	804-025C	Washer, Flat 3/4" SAE
26.	804-023C	Washer, Lock Spring 3/4"
27.	803-027C	Nut, Hex 3/4"-10
28.	817-007C	Grain Level Sight Glass
29.	816-013C	Sight Glass Gasket
30.	801-003C	Screw, Head Rd 10-24 x 1/2" Long
31.	804-004C	Washer, Internal Star #10
32.	803-001C	Nut, Hex 10-24
33.	806-022C	U-Bolt 3/8"-16 x 6 1/32" x 5" Long
34.	804-012C	Washer, Flat 3/8" SAE
35.	804-013C	Washer, Lock Spring 3/8"
36.	803-014C	Nut, Hex 3/8"-16
37.	802-143C	Bolt, Hex Head 3/8"-16 x 2" Long Gr 5
38.	167-063D	Ladder Support Arm
39.	167-002H	100 Bushel Bin Ladder
40.	119-032D	Washer, 2" x 2" x 7 Ga.
41.	167-044D	Air Drill Extended Walk Board
42.	167-001H	Walkway Hand Rail
43.	802-017C	Bolt, Hex Head 3/8"-16 x 1" Long Gr 5
44.	167-045D	Air Drill Short Walk Board
45.	167-019H	Hopper Basket

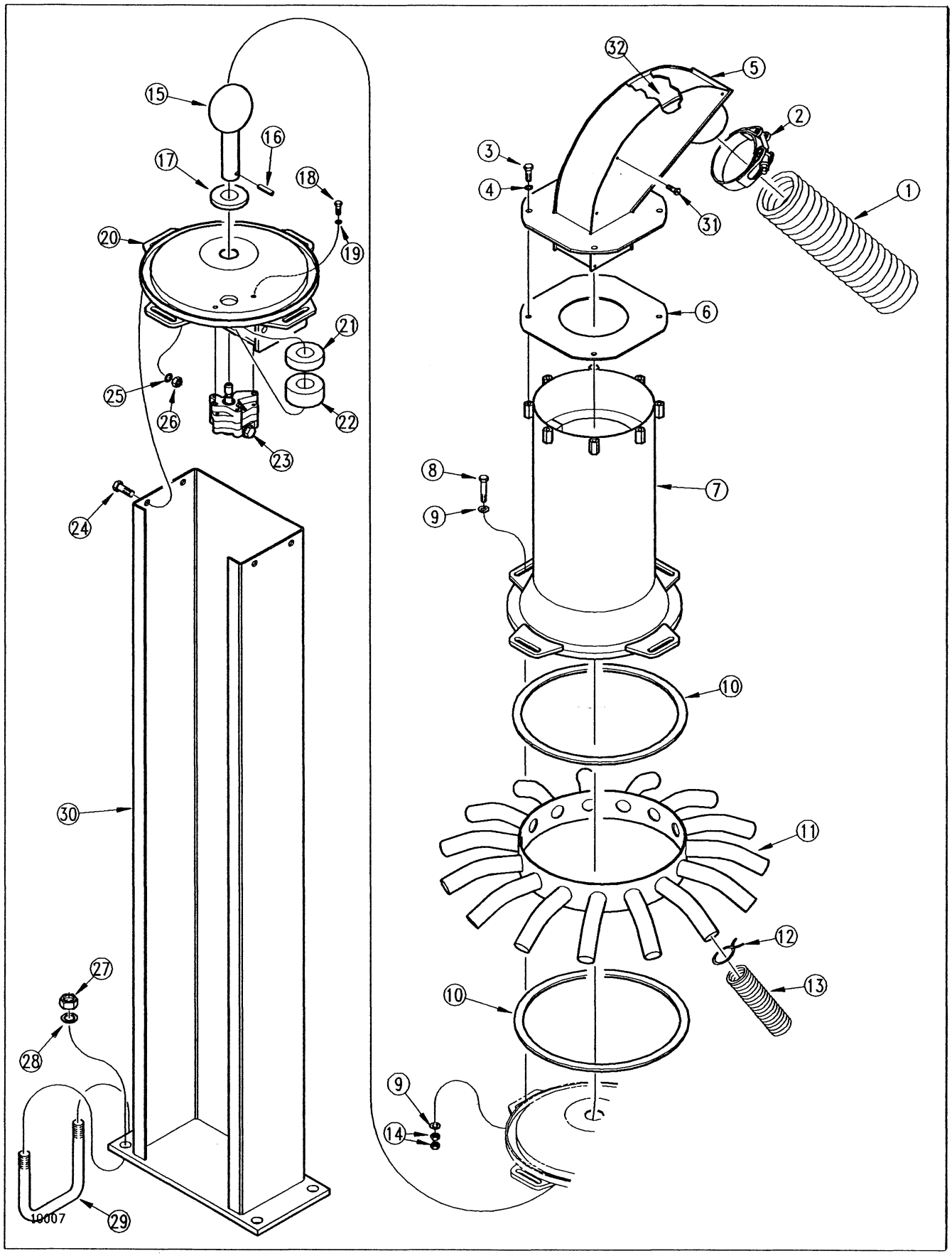
METERING BOX ASSEMBLY



METERING BOX ASSEMBLY (CON'T.)

Ref.	Part No.	Description
1.	168-004H	Metering Box Weldment
2.	168-013E	Metering Box Agitator
3.	805-015C	Pin, Lynch 5/16" x 1 3/4" Long
4.	168-128D	54 Tooth Quick Change Gear
5.	808-034C	17 Tooth Quick Change Gear
6.	168-045D	Star Shaft Stub
7.	168-028D	Star Shaft Locating Bushing
8.	168-006H	Star Shaft End Spacer
9.	817-018C	Agitator 8 Point Half
10.	168-007H	Star Shaft Middle Spacer
11.	168-027D	Star Shaft
12.	168-042D	Star Shaft Short Stub
13.	168-015S	Star Shaft Assembly (Includes Items 6 Through 12)
14.	168-170D	Shaft Seal Housing
15.	816-048C	Metering Box Shaft Seal
16.	822-073C	Bearing 2 Bolt Cam Lock x 1" Bore
17.	816-023C	O-Ring 3/4" ID x 7/8" OD
18.	802-012C	Bolt, Hex Head 5/16"-18 x 1 1/2" Long Gr 5
19.	804-009C	Washer, Lock Spring 5/16"
20.	803-008C	Nut, Hex 5/16"-18
21.	168-059D	Front To Rear Bin Hose 3 ID x 71" Long
22.	168-043D	Metering Box Cleaning Out Flat
23.	802-004C	Bolt, Hex Head 1/4"-20 x 3/4" Long Gr 5
24.	804-007C	Washer, Flat 1/4" SAE
25.	804-006C	Washer, Lock Spring 1/4"
26.	803-006C	Nut, Hex 1/4"-20
27.	800-001C	Zerk, Straight 1/4"-28
28.	168-012H	Clean Out Gate Bushing LH
29.	802-007C	Bolt, Hex Head 5/16"-18 x 3/4" Long Gr 5
30.	168-009H	Cleanout Shaft Weldment
31.	168-011H	Clean Out Gate Bushing RH
32.	802-009C	Bolt, Carriage 5/16"-18 x 1 1/4" Long
33.	168-008E	Clean Out Handle
34.	803-058C	Nut, Wing 5/16"-18
35.	805-023C	Pin, Roll 3/16" x 1 1/4" Long
36.	168-014H	Metering Box Shield Weldment
37.	168-228D	Metering Box Divider (Side)
38.	168-230D	Divider Spacer
39.	803-007C	Nut, Hex Lock 1/4"-20
40.	816-018C	Access Lid Seal
41.	168-010H	Access Lid Weldment
42.	802-134C	Bolt, Square Head 1/2"-13 x 2" Long
43.	168-005H	Access Lid Wing Nut
44.	800-023C	3" Air Hose Band Clamp
45.	802-310C	Bolt, Carriage 1/4"-20 x 1 1/4" Long Gr 5
46.	168-229D	Metering Box Divider (Center)
47.	168-231D	Metering Box Spacer Tube
48.	802-138C	Bolt, Square Head 5/16"-18 x 2 1/4" Long Gr 5 Plated

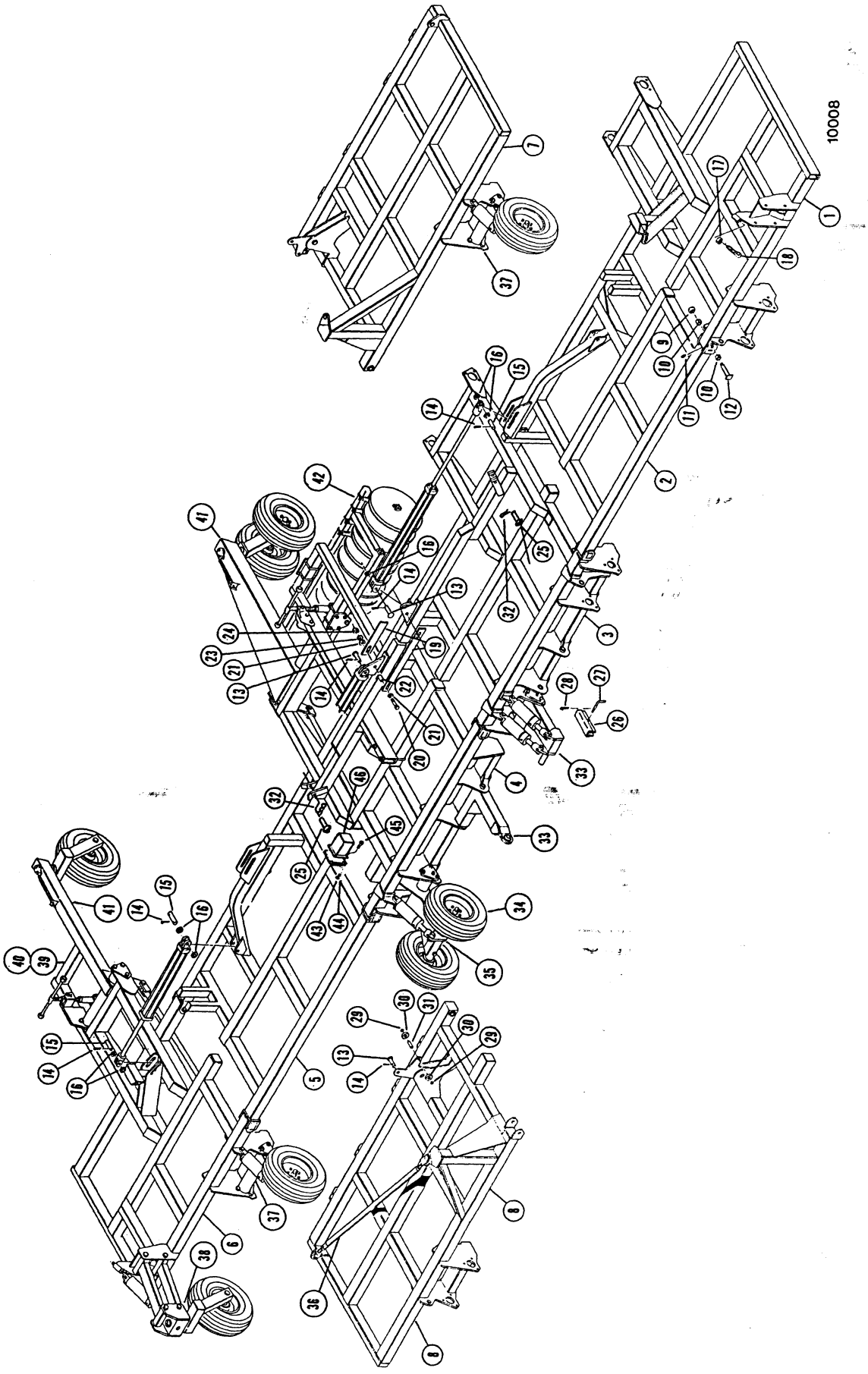
AIR DRILL TOWER ASSEMBLY



AIR DRILL TOWER ASSEMBLY (CON'T.)

Ref.	Part No.	Description
1.	168-060D	3" Air Hose, Rear Bin To Distributor Tower (45' Air Drills)
	168-182D	3" Air Hose, Rear Bin To Distributor Tower (34' Air Drills)
2.	800-023C	3" Air Hose Band Clamp
3.	802-007C	Bolt, Hex Head 5/16"-18 x 3/4" Long Gr 5
4.	804-009C	Washer, Lock Spring 5/16"
5.	168-126H	Tower Inlet Head
6.	816-022C	Distributor Tower Inlet Gasket
7.	168-072H	Distributor Tower Cylinder Weldment
8.	802-119C	Bolt, Hex 5/16"-18 x 3 3/4" Long Gr 5
9.	804-036C	Washer, Flat 5/16" SAE
10.	816-024C	Neoprene Tower Seal
11.	168-018H	15 Hole Distributor Band
	168-019H	25 Hole Distributor Band
	168-036H	18 Hole Distributor Band
	168-108H	19 Hole Distributor Band
	168-149H	14 Hole Distributor Band
	168-150H	11 Hole Distributor Band
12.	800-025C	1" Spring Hose Clamp
13.	817-039C	Plastic Seed Hose, 1" Diameter (276' On 34' 12" Air Drills) (351' On 34' 10" Air Drills) (477' On 34' 7" Air Drills) (379' On 45' 12" Air Drills) (454' On 45' 10" Air Drills) (631' On 45' 7" Air Drills)
14.	803-008C	Nut, Hex 5/16"-18
15.	168-095H	Spinner Weldment - Long
16.	805-080C	Pin, Roll 1/8" x 1" Long
17.	890-110C	Spinner Shaft Dust Slinger
18.	802-004C	Bolt, Hex Head 1/4"-20 x 3/4" Long Gr 5
19.	804-006C	Washer, Lock Spring 1/4"
20.	168-094H	Distributor Mounting Plate
21.	816-026C	Distributor Rotor Felt Seal
22.	168-148D	Plastic Spinner Sleeve Bearing
23.	810-066C	Hydraulic Motor, Air Drill Tower
24.	802-017C	Bolt, Hex Head 3/8"-16 x 1" Long Gr 5
25.	804-013C	Washer, Lock Spring 3/8"
26.	803-014C	Nut, Hex 3/8"-16
27.	803-021C	Nut, Hex 5/8"-11
28.	804-022C	Washer, Lock Spring 5/8"
29.	806-008C	U Bolt, 5/8"-11 x 4 x 5 1/4" Long
30.	168-093H	Distributor Tower Mounting Base
31.	801-002C	Screw, Hex Head Slotted 10-16 x 3/8" Long, Thread Cutting
32.	168-181D	Tower Inlet Head Top Plastic Liner

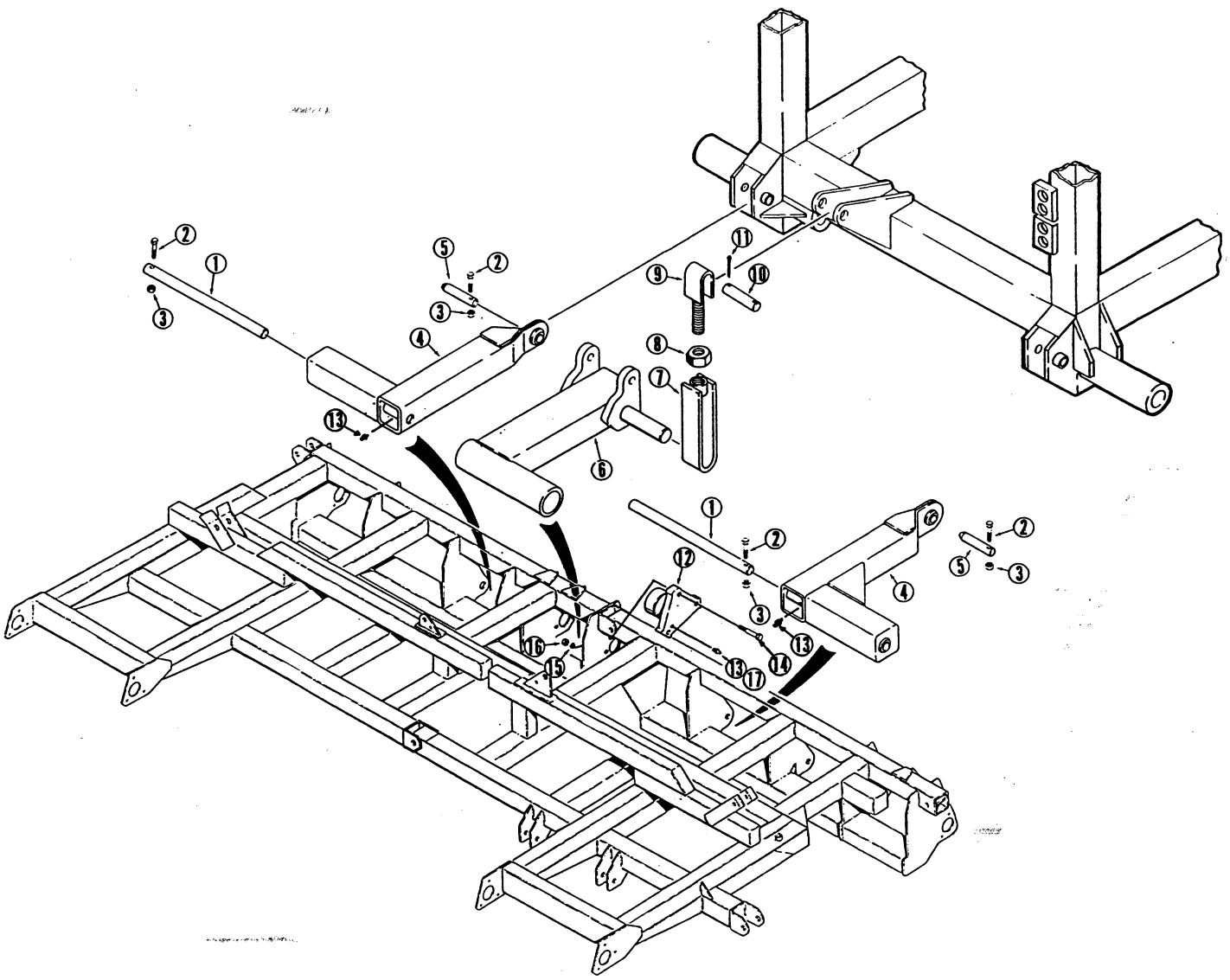
AIR DRILL IMPLEMENT FRAME ASSEMBLY



AIR DRILL IMPLEMENT FRAME ASSEMBLY (CON'T.)

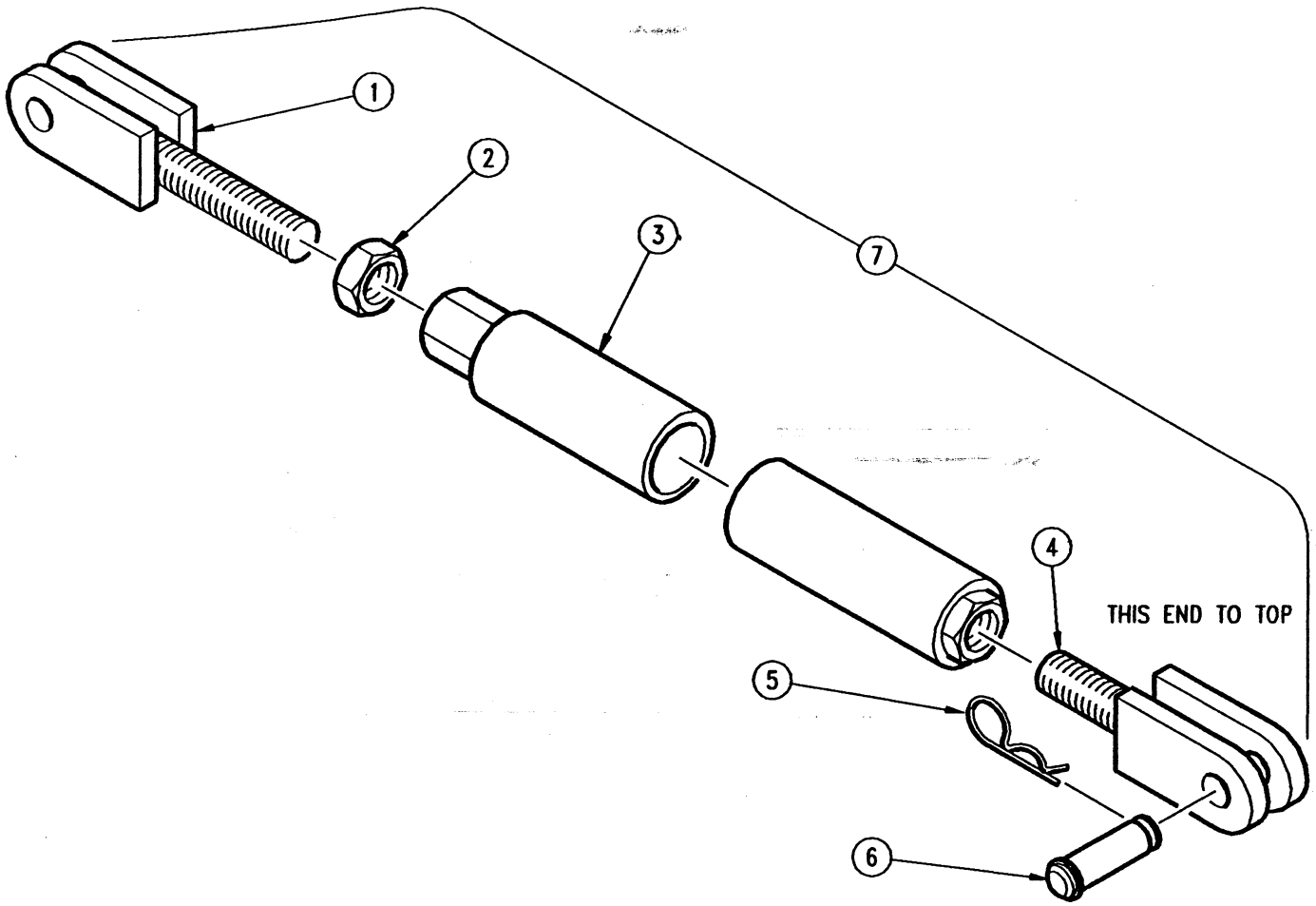
Ref.	Part No.	Description
1.	160-007H	No. 1 Section Frame, 45' 10" Spacing & 12" Spacing
	160-062H	No. 1 Section Frame, 45' 7" Spacing
2.	160-006H	No. 2 Section Frame, 45' 10" Spacing & 12" Spacing
	160-063H	No. 2 Section Frame, 45' 7" Spacing
3.	160-002H	No. 3 Section Frame, 45' 10" Spacing & 12" Spacing
		No. 2 Section Frame, 34' 10" Spacing & 12" Spacing
	160-064H	No. 3 Section Frame, 45' 7" Spacing
		No. 2 Section Frame, 34' 7" Spacing
4.	160-001H	No. 4 Section Frame, 45' 10" Spacing & 12" Spacing
		No. 3 Section Frame, 34' 10" Spacing & 12" Spacing
	160-065H	No. 4 Section Frame, 45' 7" Spacing
		No. 3 Section Frame, 34' 7" Spacing
5.	160-005H	No. 5 Section Frame, 45' 10" Spacing & 12" Spacing
	160-066H	No. 5 Section Frame, 45' 7" Spacing
6.	160-008H	No. 6 Section Frame, 45' 10" Spacing & 12" Spacing
		160-067HNo. 6 Section Frame, 45' 7" Spacing
7.	160-079H	No. 1 Section Frame, 34' 7" Spacing
	160-124H	No. 1 Section Frame, 34' 10" Spacing & 12" Spacing
8.	160-080H	No. 4 Section Frame, 34' 7" Spacing
	160-125H	No. 4 Section Frame, 34' 10" Spacing & 12" Spacing
9.	803-038C	Nut, Hex 1"-8 Nylon Insert
10.	890-011C	Bushing, Spindle 1 1/2" x 1 1/4" x 1" Long
11.	800-001C	Zerk, Straight 1/4"-28
12.	160-077H	Bolt, Pivot Clevis
13.	805-124C	Pin, Clevis 1" x 3 11/16" Long Gr 5
14.	805-017C	Pin, Cotter 3/16" x 1 3/4" Long
15.	160-045D	Pin, Folding Cylinder
16.	804-029C	Washer, Flat 1" SAE
17.	803-032C	Nut, Hex Jam 1 1/4"-7
18.	161-004H	Gauge Wheel Eye Bolt
19.	160-125D	Flex Limiter Bar, 34' & 45', 7" Row Spacing
	160-195D	Flex Limiter Bar, 34' & 45', 10" & 12" Row Spacing
20.	802-126C	Bolt, Hex Head 7/8"-9 x 3 1/2" Long Gr 5
21.	804-026C	Washer, Flat 7/8" SAE
22.	160-126D	Flex Limiter Bar Spacer Tube
23.	804-037C	Washer, Lock Spring 7/8"
24.	803-049C	Nut, Hex 7/8"-9
25.	805-153C	Pin, Hitch 1" x 5" Usable Length (Includes Hair Pin Cotter)
26.	161-036H	Cylinder Lock Channel
27.	805-152C	Pin, Bent 3/8" x 2 1/2" Usable Length (Includes Hair Pin Cotter)
28.	805-010C	Pin, Hair Cotter .094" Dia. Wire
29.	800-085C	Snap Ring, External x 1" Heavy
30.	160-186D	Flex Link Roller
31.	160-187D	Flex Link Roller Shaft
32.	805-088C	Pin, Hair Cotter 3/16" Dia. Wire
33.		Cart Hook Up Assembly (See Page 44)
34.		Hub, Wheel, & Tire Assembly (See Page 46)
35.		34' & 45' Dual Gauge Wheel Assembly (See Page 48)
36.		Frame Strut Assembly (See Page 45)
37.		34' & 45' Single Gauge Wheel Assembly (See Page 47)
38.		Parallel Linkage Gauge Wheel Assembly (See Page 49)
39.		Rigid Press Wheel Adjustment
		And Press Wheel Hanger Assembly (Shown) (See Page 56)
40.		C-Spring Press Wheel Adjustment Assembly (See Page 58)
41.		Lift Assist Wheel Assemblies (See Page 50)
42.		Press Wheel Gang Chart (See Page 60)
43.	803-020C	Nut 1/2"-13
44.	804-015C	Washer, Lock 1/2"
45.	802-082C	Bolt, Hex 1/2"-13 x 1 3/4"
46.	160-141H	Center Tube Weldment

CART HOOK UP ASSEMBLY

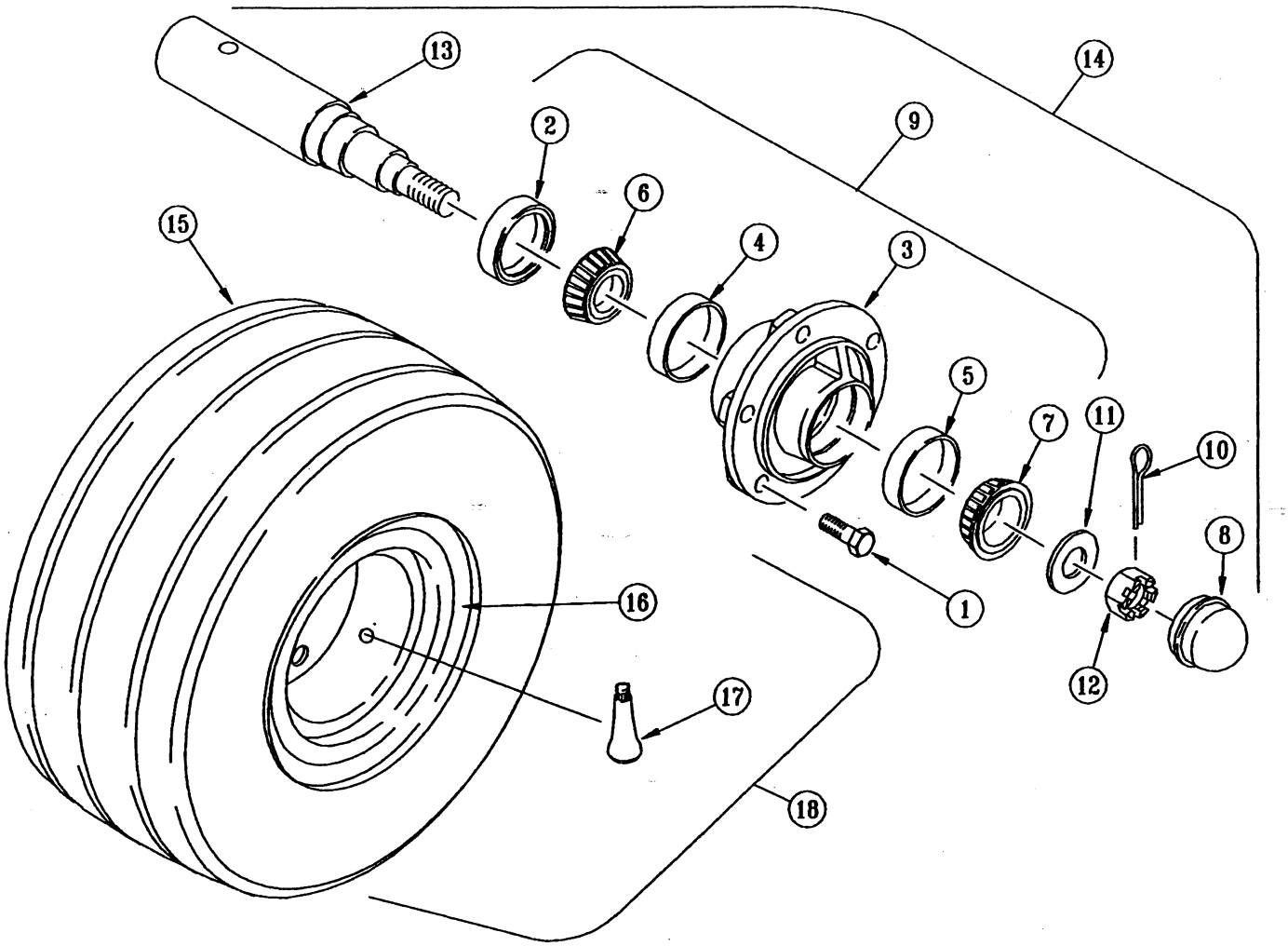


Ref.	Part No.	Description
1.	160-005D	Cart Link Shaft
2.	802-138C	Bolt, Hex 5/16"-18 x 2 1/4" Long Gr 5
3.	803-011C	Nut, Lock 5/16"-18
4.	160-076H	Cart Link
5.	166-116D	Cart Link Pin 1 1/4" x 7 5/8" Long
6.	161-001H	Master Cylinder Lift Arm Weldment
7.	161-042H	Cart Sling Bottom Link
8.	803-063C	Nut, Hex Jam 1 1/2"-6
9.	161-041H	Cart Sling Upper Link
10.	160-066D	Cart Sling Pin
11.	805-021C	Pin, Cotter 1/4" x 2" Long
12.	161-040D	Axle Tube Bushing
13.	800-001C	Zerk, Straight 1/4"-28
14.	802-057C	Bolt, Hex Head 5/8"-11 x 2 1/4" Long Gr 5
15.	804-022C	Washer, Lock Spring 5/8"
16.	803-021C	Nut, Hex 5/8"-11
17.	800-058C	Zerk, Grease 1/4"-28 x 45 Degree (Opposite Of Side Shown)

FRAME STRUT ASSEMBLY

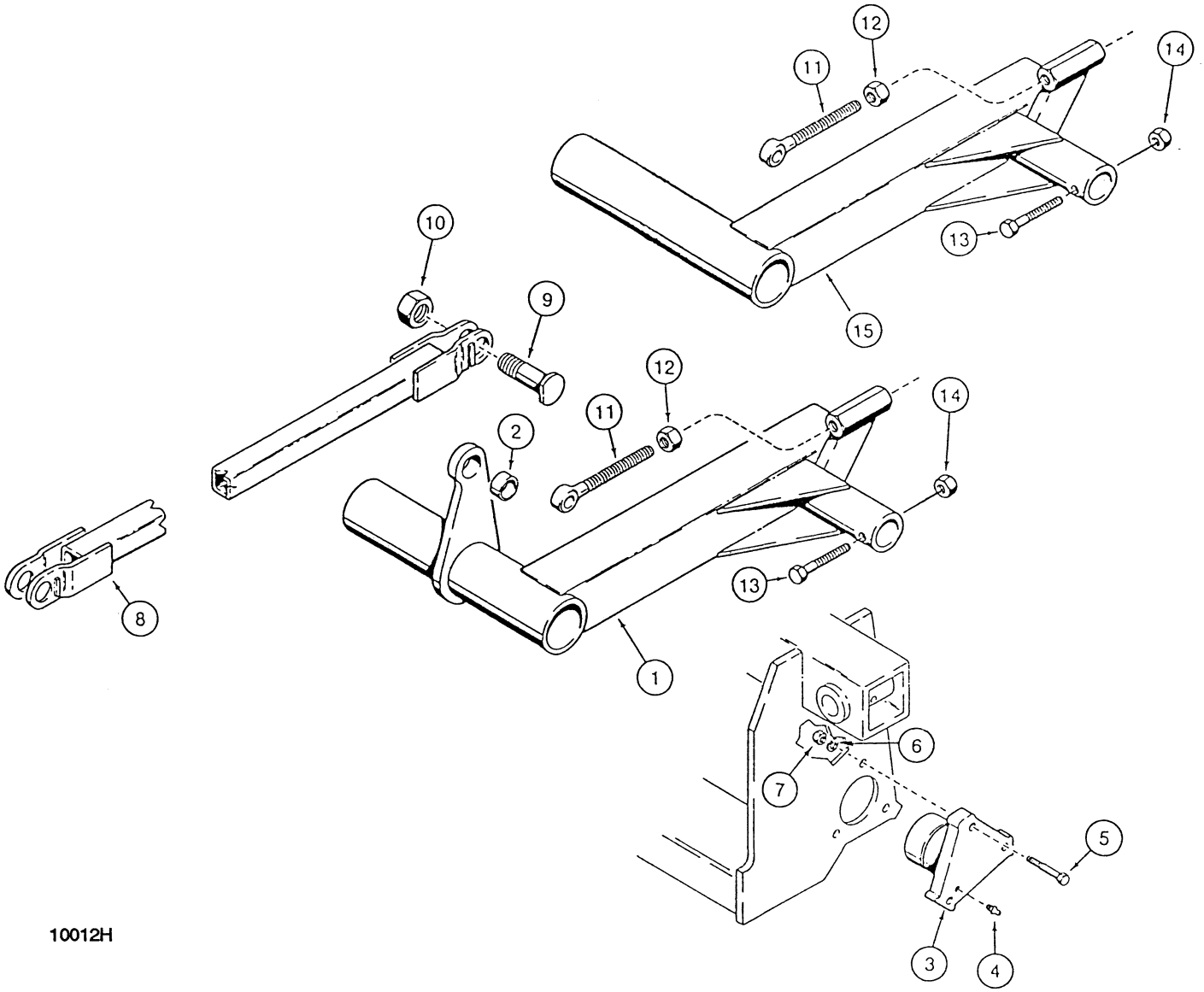


Ref.	Part No.	Description
1.	160-101H	Bottom Strut Clevis RH
2.	803-032C	Nut, Hex Jam 1 1/4"-7
3.	160-103H	Frame Strut Weldment (34', 7" Row Spacing)
	160-120H	Frame Strut Weldment (34', 10 &" 12" Row Spacing)
4.	160-102H	Top Strut Clevis LH
5.	805-095C	Hair Pin Cotter 3/32" Dia. Wire
6.	805-004C	Pin, Clevis 1" x 2 3/4" Usable Length, With Cotter (805-004C Includes Items 5 & 6)
7.	160-106S	Frame Strut Assembly (34', 7" Row Spacing) (Includes Items 1 Through 4)
	160-121S	Frame Strut Assembly (34', 10" & 12" Row Spacing) (Includes Items 1 Through 4)



Ref.	Part No.	Description
1.	802-104C	Bolt, Hub Lug 1/2-20 x 1" Long Gr 5
2.	816-011C	Hub Seal, 6-Bolt
3.	200-003D	Wheel Hub, 6-bolt
4.	822-019C	Inner Bearing Cup LM-29710
5.	822-020C	Outer Bearing Cup LM-67010
6.	822-018C	Inner Bearing Cone LM-29749
7.	822-021C	Outer Bearing Cone LM-67048
8.	200-001D	Hub Grease Cap
9.	200-001S	Hub Package, 6-Bolt (Includes Items 1 Through 8)
10.	805-016C	Pin, Cotter 3/16" x 1 1/4" Long
11.	804-055C	Washer, Spindle - 7/8"
12.	803-029C	Nut, Hex Slotted 7/8"-14
13.	201-009D	6-Bolt Single Ended Spindle
14.	200-007K	6-Bolt Hub & Spindle Package (Includes Items 1 Through 13)
15.	814-026C	Tire 9.5L-15 6 Ply Rib Implement
16.	814-008C	Wheel 8 x 15 x 6 Bolt
17.	816-035C	Valve Stem TR415 x .625 x 1 1/4" Long
18.	161-046K	6-Bolt Wheel & Tire Assembly, 6 Ply Tubeless (Includes Items 15 Through 17)

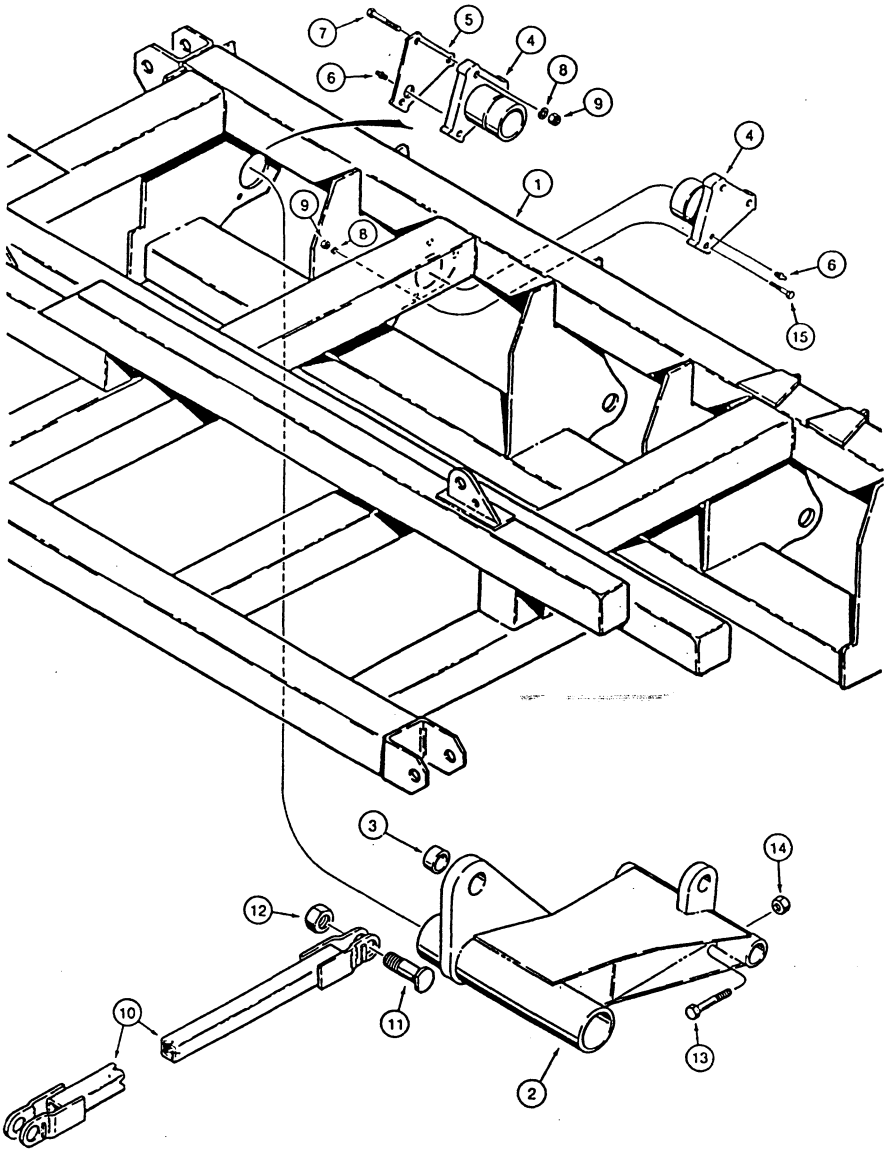
34' & 45' SINGLE GAUGE WHEEL ASSEMBLY



10012H

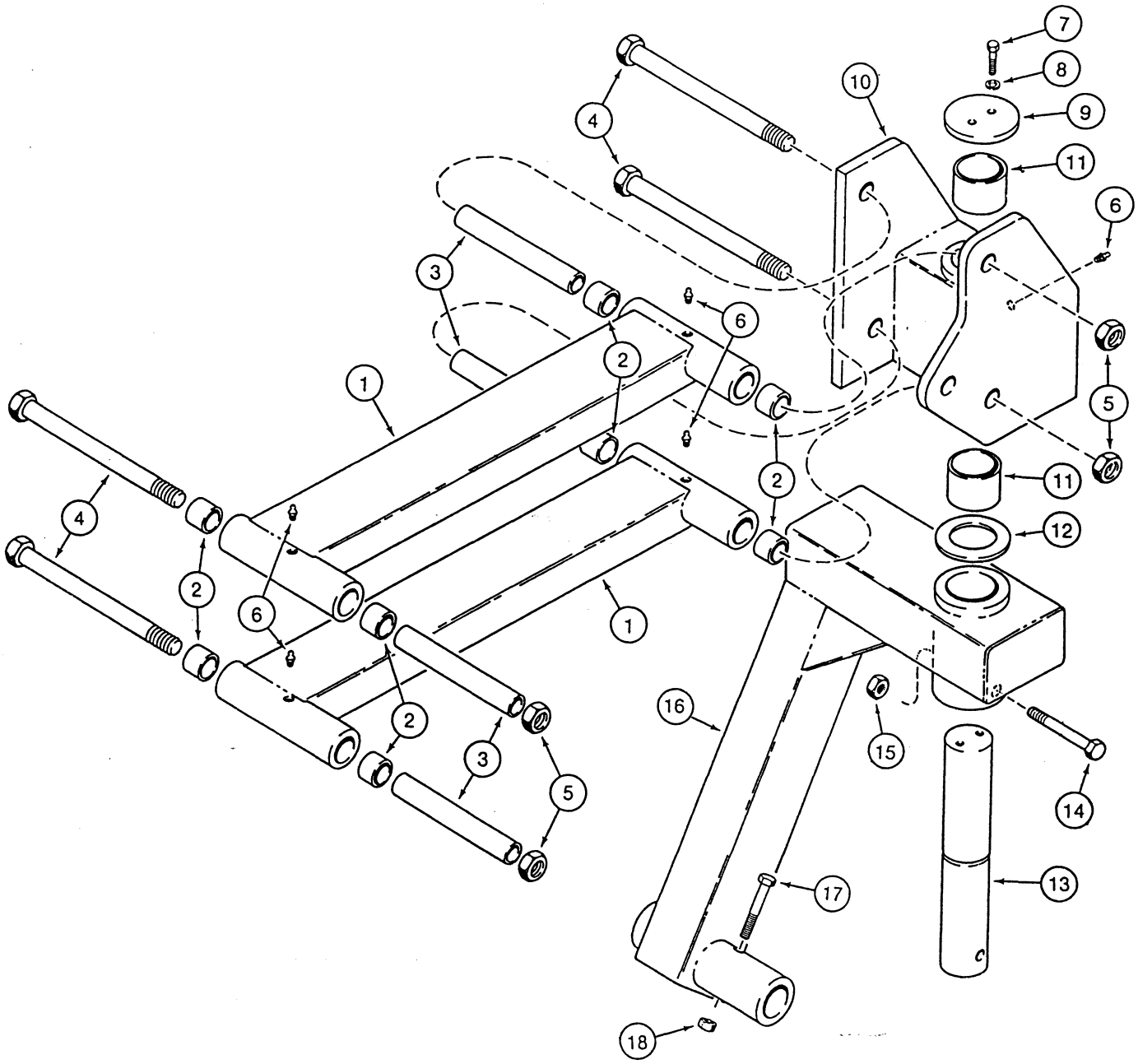
Ref.	Part No.	Description
1.	161-007H	(45' Drill) Section #1 Gage Wheel Weldment (Shown)
	161-008H	(45' Drill) Section #6 Gage Wheel Weldment
2.	890-011C	Bushing 1 1/2" OD x 1 1/4" ID x 1" Long (45' Drills Only)
3.	161-040D	Axle Tube Bushing
4.	800-001C	Zerk, Straight 1/4"-28
5.	802-057C	Bolt, Hex Head 5/8"-11 x 2 1/4" Long Gr 5
6.	804-022C	Washer, Lock Spring 5/8"
7.	803-021C	Nut, Hex 5/8"-11
8.	161-044H	Lift Assist Link (45' Drills Only)
9.	161-119D	Bolt, Flat Head 1 1/4"-7 x 3 3/16" Long Gr 8 (45' Drills Only)
10.	803-051C	Nut, Hex Jam 1 1/4"-7 Nylock Insert (45' Drills Only)
11.	161-004H	Gage Wheel Eye Bolt
12.	803-032C	Nut, Hex Jam 1 1/4"-7
13.	802-099C	Bolt, Hex Head 1/2"-13 x 3 1/4" Long Gr 5
14.	803-019C	Nut, Lock 1/2"-13
15.	161-057H	(34' Drill) Section #1 - 10" & 12" Section #4 - 7" Gauge Wheel (Shown)
	161-058H	(34' Drill) Section #4 - 10" & 12" Section #1 - 7" Gauge Wheel

34' & 45' DUAL GAUGE WHEEL ASSEMBLY



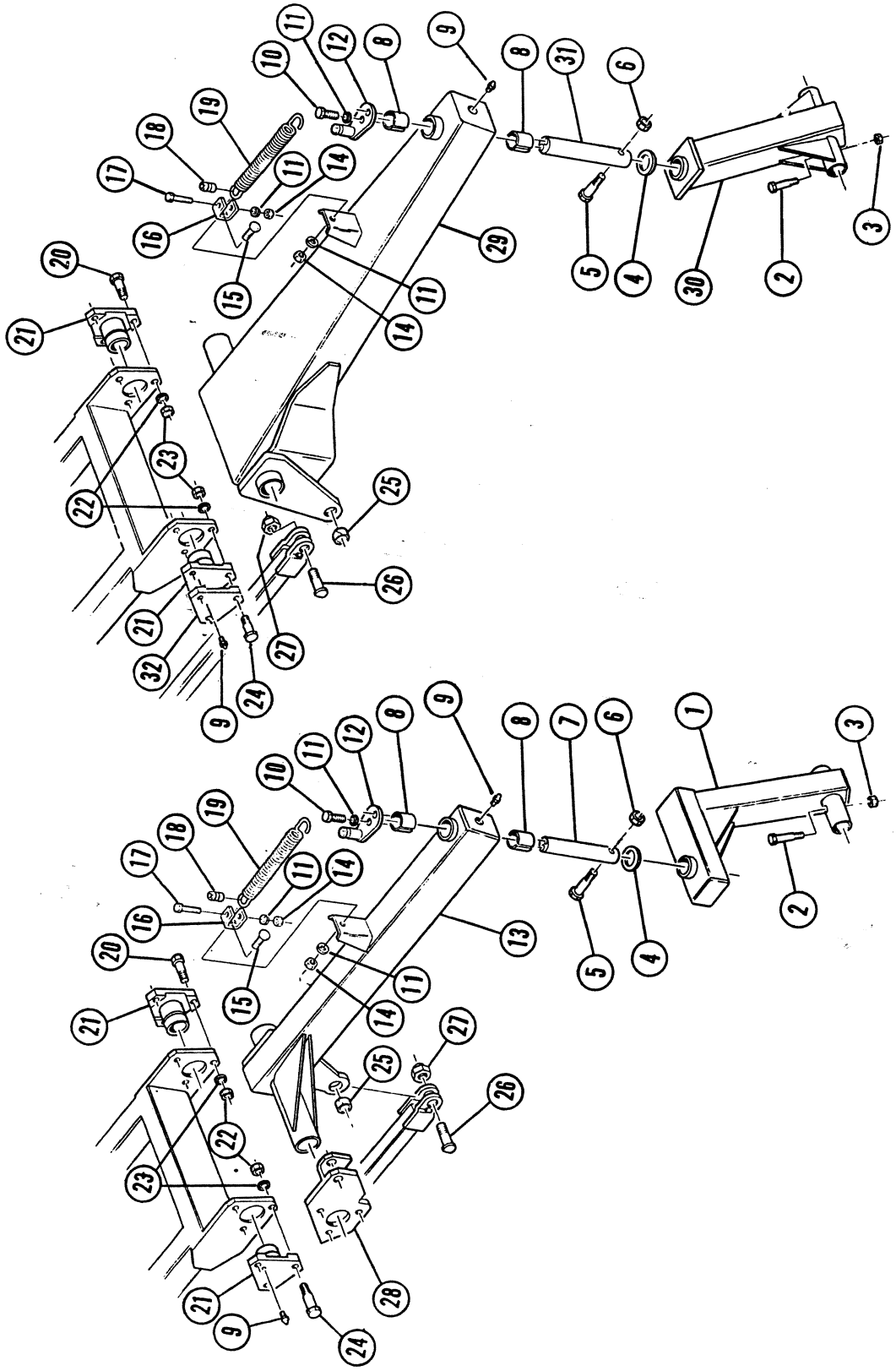
Ref.	Part No.	Description
1.	160-064H	No. 3 Frame Section (45') 7" Row Spacing (Shown)
		No. 2 Frame Section (34') 7" Row Spacing
	160-065H	No. 4 Frame Section (45') 7" Row Spacing
		No. 3 Frame Section (34') 7" Row Spacing
	160-001H	No. 4 Frame Section (45') 10 & 12" Row Spacing
		No. 3 Frame Section (34') 10 & 12" Row Spacing
	160-002H	No. 3 Frame Section (45') 10 & 12" Row Spacing
		No. 2 Frame Section (34') 10 & 12" Row Spacing
2.	161-013H	Section #3 Gauge Wheel Weldment (Shown)
	161-037H	Section #4 Gauge Wheel Weldment (7" Row Spacing)
	161-014H	Section #4 Gauge Wheel Weldment (10" & 12" Row Spacing)
3.	890-011C	Bushing 1 1/2" OD x 1 1/4" ID x 1" Long
4.	161-040D	Axle Tube Bushing
5.	161-105D	Axle Tube Bushing Plate
6.	800-001C	Zerk, Straight 1/4"-28
7.	802-281C	Bolt, Hex Head 5/8"-11 x 2 3/4" Long Gr 5
8.	804-022C	Washer, Lock Spring 5/8"
9.	803-021C	Nut, Hex 5/8"-11
10.	161-044H	Lift Assist Link
11.	161-119D	Bolt, Flat Head 1 1/4"-7 x 3 3/16" Long Gr 8
12.	803-051C	Nut, Hex Jam 1 1/4"-7 Nylock Insert
13.	802-099C	Bolt, Hex Head 1/2"-13 x 3 1/4" Long Gr 5
14.	803-019C	Nut, Lock 1/2"-13
15.	802-057C	Bolt, Hex Head 5/8"-11 x 2 1/4" Long Gr 5

PARALLEL LINKAGE GAUGE WHEEL CASTER ASSEMBLY



Ref.	Part No.	Description
1.	161-003H	Gauge Wheel Parallel Arm
2.	890-074C	Bushing 1 3/8" OD x 1 1/8" ID x 1 1/4" Long
3.	161-057D	Parallel Arm Inner Pivot Tube
4.	802-140C	Bolt, Hex Head 7/8"-9 x 10 Long Gr 5
5.	803-028C	Nut, Nylock 7/8"-9
6.	800-001C	Zerk, Straight 1/4"-28
7.	802-034C	Bolt, Hex Head 1/2"-13 x 1 1/4" Long Gr 5
8.	804-015C	Washer, Lock Spring 1/2"
9.	161-114D	Caster Retainer Cap
10.	161-005H	Parallel Arm, Caster Spindle Weldment
11.	890-072C	Bushing 2 1/2"OD x 2 1/4" ID x 2" Long
12.	161-056D	Caster Spacer
13.	161-115D	Gauge Wheel Caster Shaft
14.	802-060C	Bolt, Hex Head 5/8"-11 x 4 Long Gr 5
15.	803-024C	Nut, Lock 5/8"-11
16.	161-045H	Single Gauge Wheel Caster Arm Weldment
17.	802-099C	Bolt, Hex Head 1/2"-13 x 3 1/4" Long Gr 5
18.	803-019C	Nut, Lock 1/2"-13

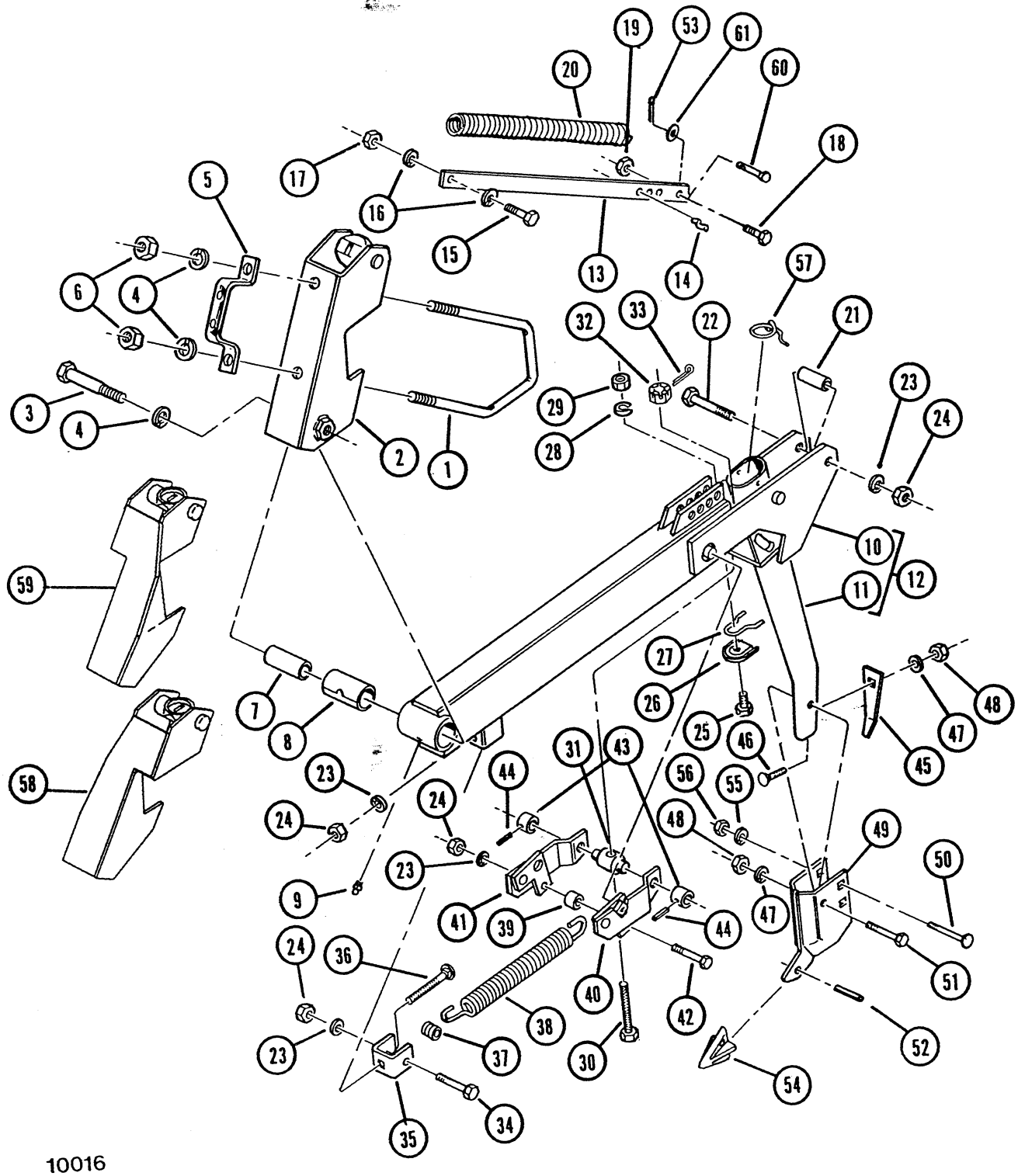
LIFT ASSIST WHEEL ASSEMBLIES



LIFT ASSIST WHEEL ASSEMBLIES (CON'T.)

Ref.	Part No.	Description
1.	161-006H	Lift Assist Caster Weldment
2.	802-099C	Bolt, Hex Head 1/2"-13 x 3 1/4" Long Gr 5
3.	803-019C	Nut, Lock 1/2"-13
4.	161-056D	Caster Spacer
5.	802-060C	Bolt, Hex Head 5/8"-11 x 4 Long Gr 5
6.	803-024C	Nut, Lock 5/8"-11
7.	161-116D	Lift Assist Caster Shaft
8.	890-072C	Bushing 2 1/2" OD x 2 1/4" ID x 2" Long
9.	800-001C	Zerk, Straight 1/4"-28
10.	802-034C	Bolt, Hex Head 1/2"-13 x 1 1/4" Long Gr 5
11.	804-015C	Washer, Lock Spring 1/2"
12.	161-062H	Caster Cap Spring Arm
13.	161-063H	Section #1 Lift Assist Arm (45' Drills Only) (Shown)
	161-064H	Section #6 Lift Assist Arm (45' Drills Only)
14.	803-020C	Nut, Hex 1/2"-13
15.	802-129C	Bolt, Carriage 1/2"-13 x 2" Long Gr 5
16.	164-018D	Front Spring Retainer Channel
17.	802-130C	Bolt, Hex 1/2"-13 x 2 1/2" Long Gr 5
18.	164-032D	Front Spring Hook Tube
19.	807-016C	Spring
20.	802-055C	Bolt, Hex Head 5/8"-11 x 2" Long Gr 5
21.	161-040D	Axle Tube Bushing
22.	804-022C	Washer, Lock Spring 5/8"
23.	803-021C	Nut, Hex 5/8"-11
24.	802-058C	Bolt, Hex Head 5/8"-11 x 2 1/2" Long Gr 5
25.	890-011C	Bushing Spindle 1 1/2" OD x 1 1/4" ID x 1" Long
26.	161-119D	Bolt, Flat Head 1 1/4"-7 x 3 3/16" Long Gr 8
27.	803-051C	Nut, Hex Jam 1 1/4"-7 Nylock Insert
28.	162-006H	Press Wheel Adjustment Screw Clevis LH (Shown) (Section #1, 45' Drills Only) (Used With Rigid Press Wheel Gangs) 162-007H Press Wheel Adjustment Screw Clevis RH (Section #6, 45' Drills Only) (Used With Rigid Press Wheel Gangs)
	162-169H	Spring Cushioned Press Wheel Adjustment Screw Clevis LH (Section #1, 45' Drills Only) (Used With C-Spring Cushioned Press Wheel Gangs)
	162-168H	Spring Cushioned Press Wheel Adjustment Screw Clevis RH (Section #6, 45' Drills Only) (Used With C-Spring Cushioned Press Wheel Gangs)
29.	161-065H	LH Lift Assist Transport Arm (Shown)
	161-066H	RH Lift Assist Transport Arm
30.	161-017H	Dual Lift Assist Caster Weldment
31.	161-117D	Lift Assist Dual Caster Shaft
32.	161-105D	Axle Tube Bushing Plate

SPRING RESET HOE OPENER ASSEMBLY

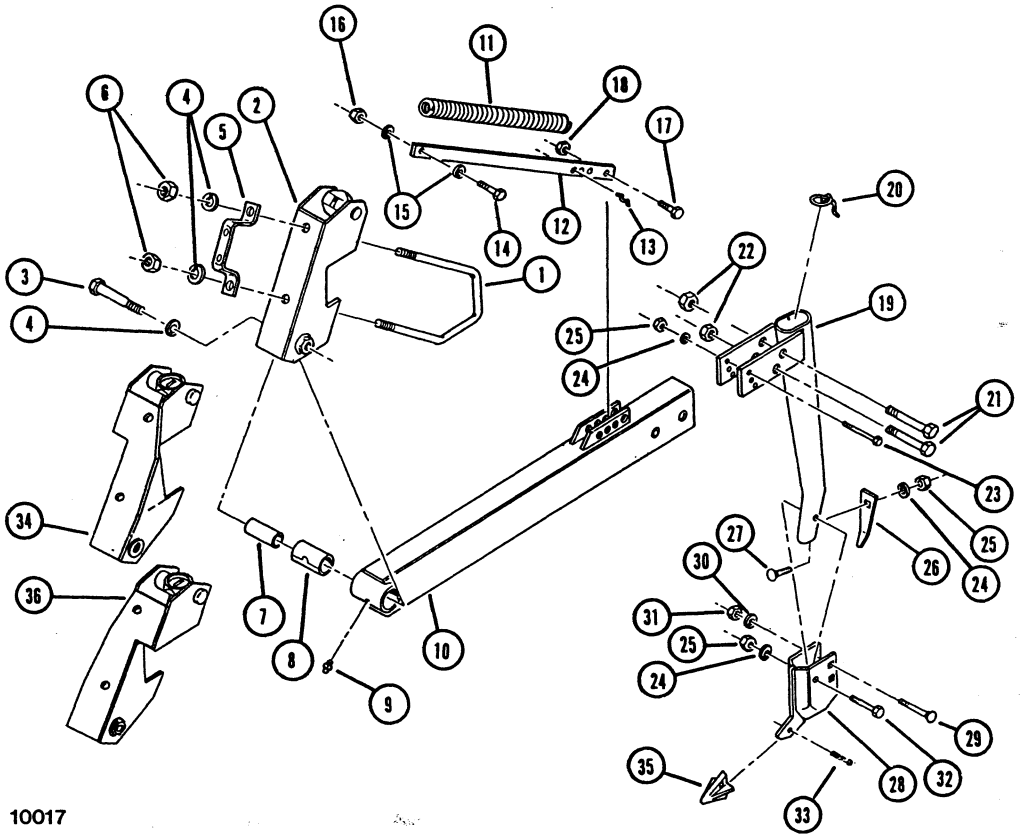


10016

SPRING RESET HOE OPENER ASSEMBLY (CON'T.)

Ref.	Part No.	Description
1.	806-017C	U-Bolt, 3-Corner, 5/8"-11
2.	164-026E	Floating Hoe Mount Bracket
3.	802-151C	Bolt, Hex Head 5/8"-11 x 4 1/4" Long Gr 5
4.	804-022C	Washer, Lock Spring 5/8"
5.	164-038D	Hydraulic Hose Clip
6.	803-021C	Nut, Hex 5/8"-11
7.	132-084D	Inner Pivot Bushing
8.	890-077C	Outer Pivot Bushing
9.	800-001C	Zerk, Straight 1/4"-28
10.	164-030H	Spring Reset Hoe Pull Arm Weldment (Used With Centered Hoe Mount Brackets 164-026E And With 3/4" Offset Hoe Mount Brackets 164-041H & 164-042H)
11.	164-005E	Spring Reset Hoe Shank Weldment
12.	164-006H	Spring Reset Hoe Shank Assembly (Shown) (Includes Items 10 & 11)
	164-031H	1 11/16" LH Offset Spring Reset Hoe Shank Assembly
	164-032H	1 11/16" RH Offset Spring Reset Hoe Shank Assembly
13.	164-010D	Hoe Spring Rod
14.	164-004D	Hoe Spring "W" Clip
15.	802-017C	Bolt, Hex Head 3/8"-16 x 1" Long Gr 5
16.	804-013C	Washer, Lock Spring 3/8"
17.	803-014C	Nut, Hex 3/8"-16
18.	802-079C	Bolt, Hex Head 3/8"-16 x 1 1/4" Long Gr 5 (Shown)
	802-022C	Bolt, Hex Head 3/8"-16 x 1 1/2" Long Gr 5 (Used With 3/4" Offset Hoe Brackets Only)
19.	803-013C	Nut, Lock 3/8"-16
20.	807-017C	Floating Hoe Spring
21.	164-031D	Side Bar Spacer
22.	802-099C	Bolt, Hex Head 1/2"-13 x 3 1/4" Long Gr 5
23.	804-015C	Washer, Lock Spring 1/2"
24.	803-020C	Nut, Hex 1/2"-13
25.	802-004C	Bolt, Hex Head 1/4"-20 x 3/4" Long Gr 5
26.	122-065D	Tension Spring Retainer
27.	807-022C	Trunnion Bolt, Spring Clip
28.	804-006C	Washer, Lock Spring 1/4"
29.	803-006C	Nut, Hex 1/4"-20
30.	164-076D	Trunnion Bolt
31.	132-107D	Hoe Trunnion
32.	803-056C	Nut, Hex Slotted 5/8"-11 Gr 5
33.	805-016C	Pin, Cotter 3/16" x 1 1/4" Long
34.	802-130C	Bolt, Hex Head 1/2"-13 x 2 1/2" Long Gr 5
35.	164-018D	Front Spring Retainer Channel
36.	802-129C	Bolt, Carriage 1/2"-13 x 2" Long Gr 5
37.	164-032D	Front Spring Hook Tube
38.	807-016C	Extension Spring, Spring Reset Hoe
39.	164-022D	Rear Spring Hook Tube
40.	164-007E	Link Bar & Bracket LH
41.	164-008E	Link Bar & Bracket RH
42.	802-128C	Bolt, Hex Head 1/2"-13 x 2" Long Gr 5
43.	164-034D	Trunnion Bushing
44.	805-055C	Pin, Spiral 5/16" x 1 1/4" Long
45.	164-009D	Seed Deflector
46.	802-092C	Bolt, Carriage 5/16"-18 x 3/4" Long Gr 5
47.	804-009C	Washer, Lock Spring 5/16"
48.	803-008C	Nut, Hex 5/16"-18
49.	164-003E	Hoe Boot Weldment
	164-070E	Manitoba Hoe Boot Weldment {Optional - For Clay Soil}
50.	802-136C	Bolt, Carriage 7/16-14 x 2 1/2" Long Gr 5
51.	802-138C	Bolt, Hex Head 5/16"-18 x 2 1/4" Long Gr 5
52.	805-156C	Pin, Roll 5/16" x 1" Long
53.	805-019C	Pin, Cotter 5/32 x 1" Long
54.	820-081C	Hoe Tip
55.	804-014C	Washer, Lock Spring 7/16"
56.	803-015C	Nut, Hex 7/16-14
57.	800-019C	1" Air Hose Clamp
58.	164-041H	LH 3/4" Offset Hoe Bracket (Shown)
	164-033H	LH 1 11/16" Offset Hoe Mount Bracket
59.	164-042H	RH 3/4" Offset Hoe Bracket (Shown)
	164-034H	RH 1 11/16" Offset Hoe Mount Bracket
60.	805-091C	Pin, Clevis 3/8" x 1 33/64 Long (Used With 1 11/16" Offset Hoe Brackets Only)
61.	804-012C	Washer, Flat 3/8" SAE

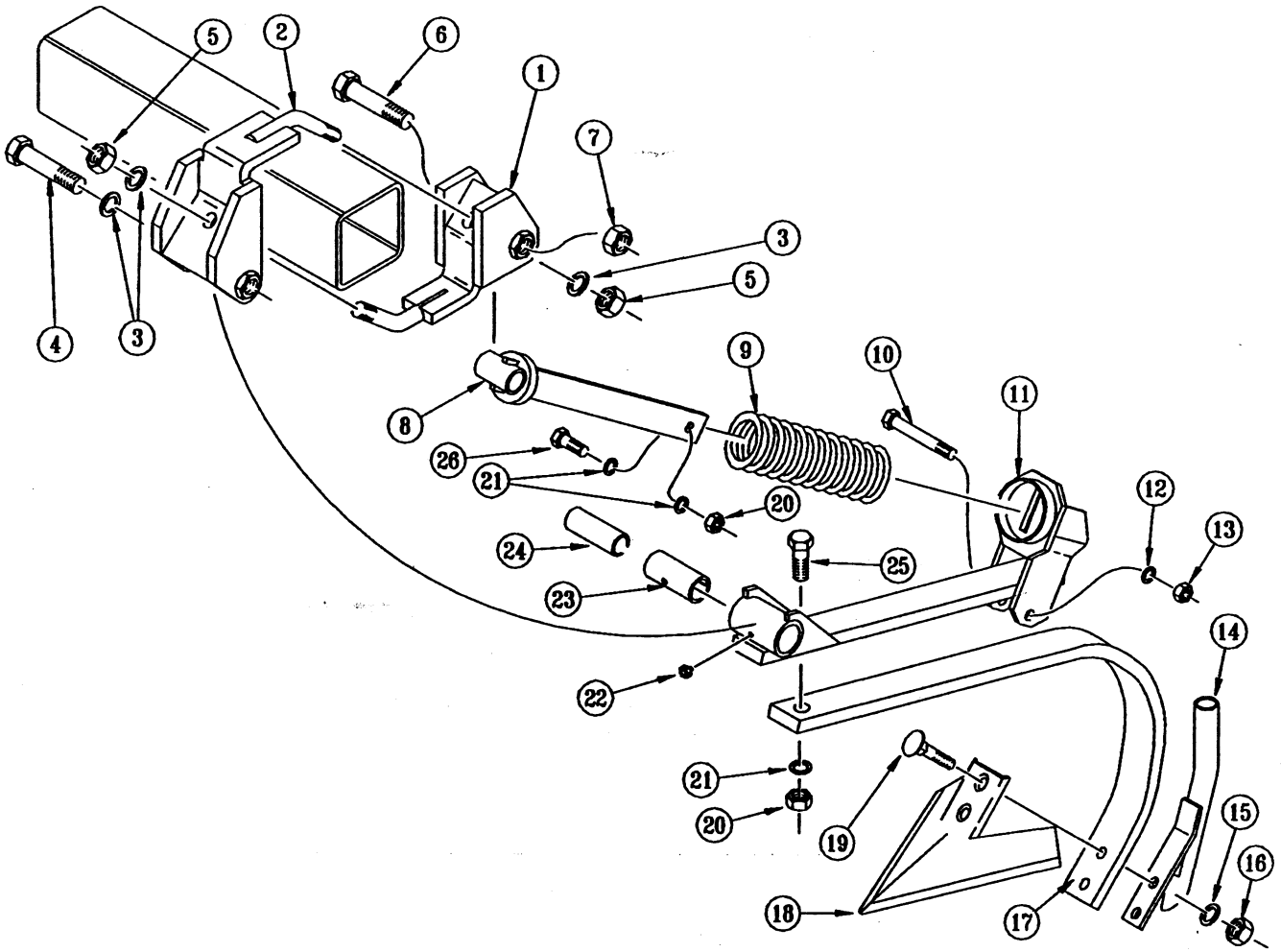
SHEAR BOLT HOE OPENER ASSEMBLY



10017

Ref.	Part No.	Description
1.	806-017C	U-Bolt, 3-Corner, 5/8"-11
2.	164-026E	Floating Hoe Mount Bracket
3.	802-151C	Bolt, Hex Head 5/8"-11 x 4 1/4" Long Gr 5
4.	804-022C	Washer, Lock Spring 5/8"
5.	164-038D	Hydraulic Hose Clip
6.	803-021C	Nut, Hex 5/8"-11
7.	132-084D	Inner Pivot Bushing
8.	890-077C	Outer Pivot Bushing
9.	800-001C	Zerk, Straight 1/4"-28
10.	164-002E	Floating Hoe Pull Arm, Shear Bolt
11.	807-017C	Floating Hoe Spring
12.	164-010D	Hoe Spring Rod
13.	164-004D	Hoe Spring W Clip
14.	802-017C	Bolt, Hex Head 3/8"-16 x 1" Long Gr 5
15.	804-013C	Washer, Lock Spring 3/8"
16.	803-014C	Nut, Hex 3/8"-16
17.	802-079C	Bolt, Hex Head 3/8"-16 x 1 1/4" Long Gr 5 (Shown)
	802-022C	Bolt, Hex Head 3/8"-16 x 1 1/2" Long Gr 5 (Used With 3/4" Offset Hoe Brackets Only)
18.	803-013C	Nut, Lock 3/8"-16
19.	164-001E	Shear Trip Hoe Shank
20.	800-019C	1" Air Hose Clamp
21.	802-099C	Bolt, Hex Head 1/2"-13 x 3 1/4" Long Gr 5
22.	803-019C	Nut, Lock 1/2"-13
23.	802-131C	Bolt, Hex Head 5/16"-18 x 3 Long Gr 5
24.	804-009C	Washer, Lock Spring 5/16"
25.	803-008C	Nut, Hex 5/16"-18
26.	164-009D	Seed Deflector
27.	802-092C	Bolt, Carriage 5/16"-18 x 3/4" Long Gr 5
28.	164-003E	Hoe Boot Weldment
	164-070E	Manitoba Hoe Boot Weldment {Optional - For Clay Soil}
29.	802-136C	Bolt, Carriage 7/16-14 x 2 1/2" Long Gr 5
30.	804-014C	Washer, Lock 7/16"
31.	803-015C	Nut, Hex 7/16-14
32.	802-138C	Bolt, Hex Head 5/16"-18 x 2 1/4" Long Gr 5
33.	805-156C	Pin, Roll 5/16" x 1" Long
34.	164-042H	RH 3/4" Offset Hoe Bracket
35.	820-081C	Hoe Tip
36.	164-041H	LH 3/4" Offset Hoe Bracket

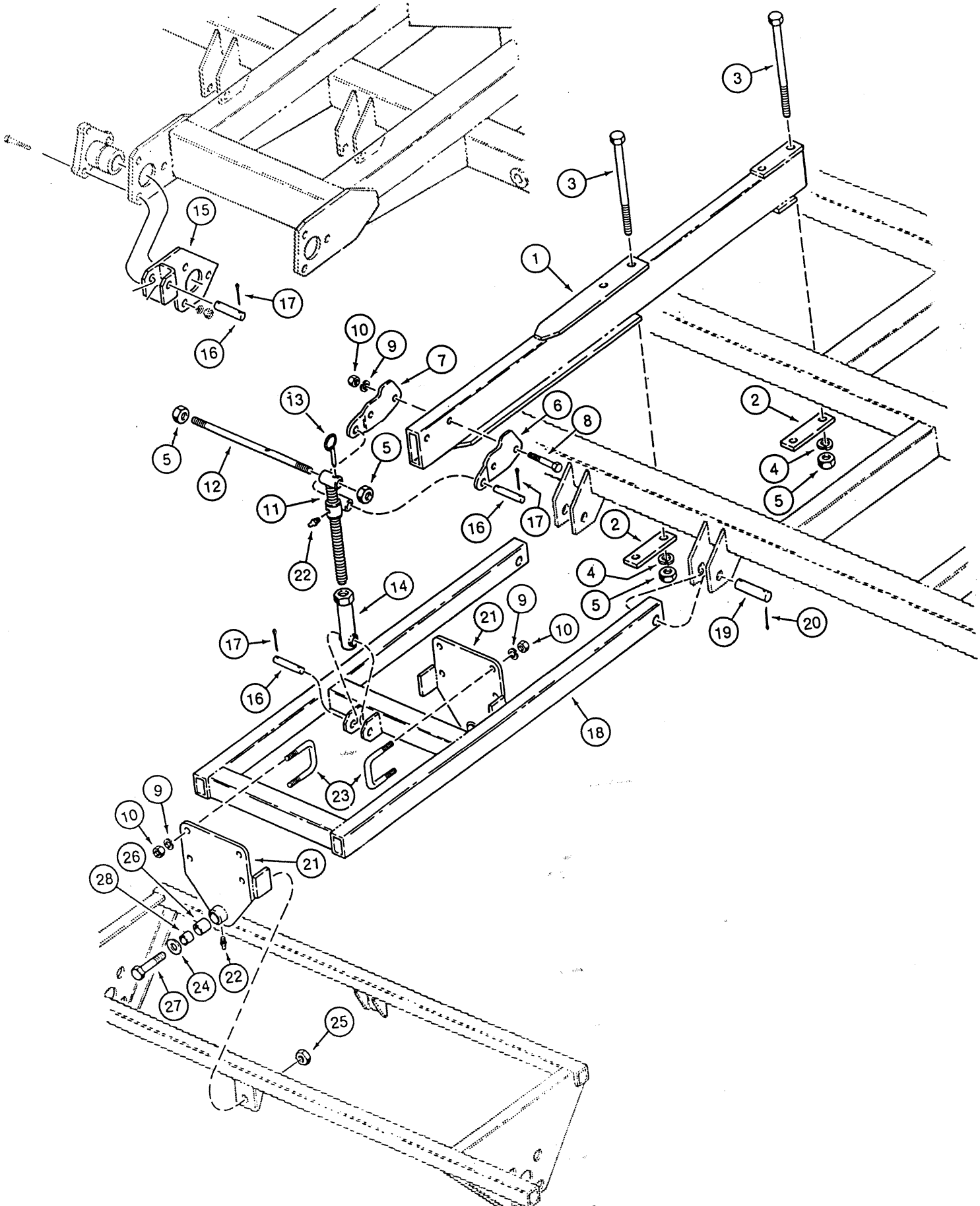
FIELD CULTIVATOR SHANK ASSEMBLY
(34' AIR DRILLS ONLY)



Ref.	Part No.	Description
1.	164-055H	Field Cultivator Mount Bracket, Rear Half
2.	164-056H	Field Cultivator Mount Bracket, Front Half
3.	804-023C	Washer, Lock Spring 3/4"
4.	802-068C	Bolt, Hex Head 3/4"-10 x 4" Long Gr 5
5.	803-027C	Nut, Hex 3/4-10
6.	802-066C	Bolt, Hex Head 3/4"-10 x 3 1/2" Long Gr 5
7.	803-048C	Nut, Hex Jam 3/4"-10
8.	164-054H	Spring Rod Weldment, Field Cultivator Shank
9.	807-039C	Field Cultivator Shank Spring
10.	802-099C	Bolt, Hex Head 1/2"-13 x 3 1/4" Long Gr 5
11.	164-058H	Field Cultivator Shank Pull Arm Weldment
12.	804-015C	Washer, Lock Spring 1/2"
13.	803-020C	Nut, Hex 1/2"-13
14.	164-063H	Seed Hose Hookup, Field Cultivator Shank
15.	804-014C	Washer, Lock 7/16"
16.	803-015C	Nut, Hex 7/16"-14
17.	820-038C	Field Cultivator Shank 3/4" x 1 3/4"
18.	820-064C	9 Inch Cultivator Sweep, Hard Faced
19.	802-122C	Bolt, Plow 7/16"-14 x 1 3/4" Long Gr 5
20.	803-021C	Nut, Hex 5/8"-11
21.	804-022C	Washer, Lock Spring 5/8"
22.	800-001C	Zerk, Straight 1/4"-28
23.	890-139C	Bushing 1 3/8" OD x 1 1/8" ID x 2 11/16" Long
24.	164-055D	Inner Pivot Tube, Field Cultivator Shank
25.	802-057C	Bolt, Hex Head 5/8"-11 x 2 1/4" Long Gr 5
26.	802-050C	Bolt, Hex Head 5/8"-11 x 1 1/4" Long Gr 5

November 28, 1989

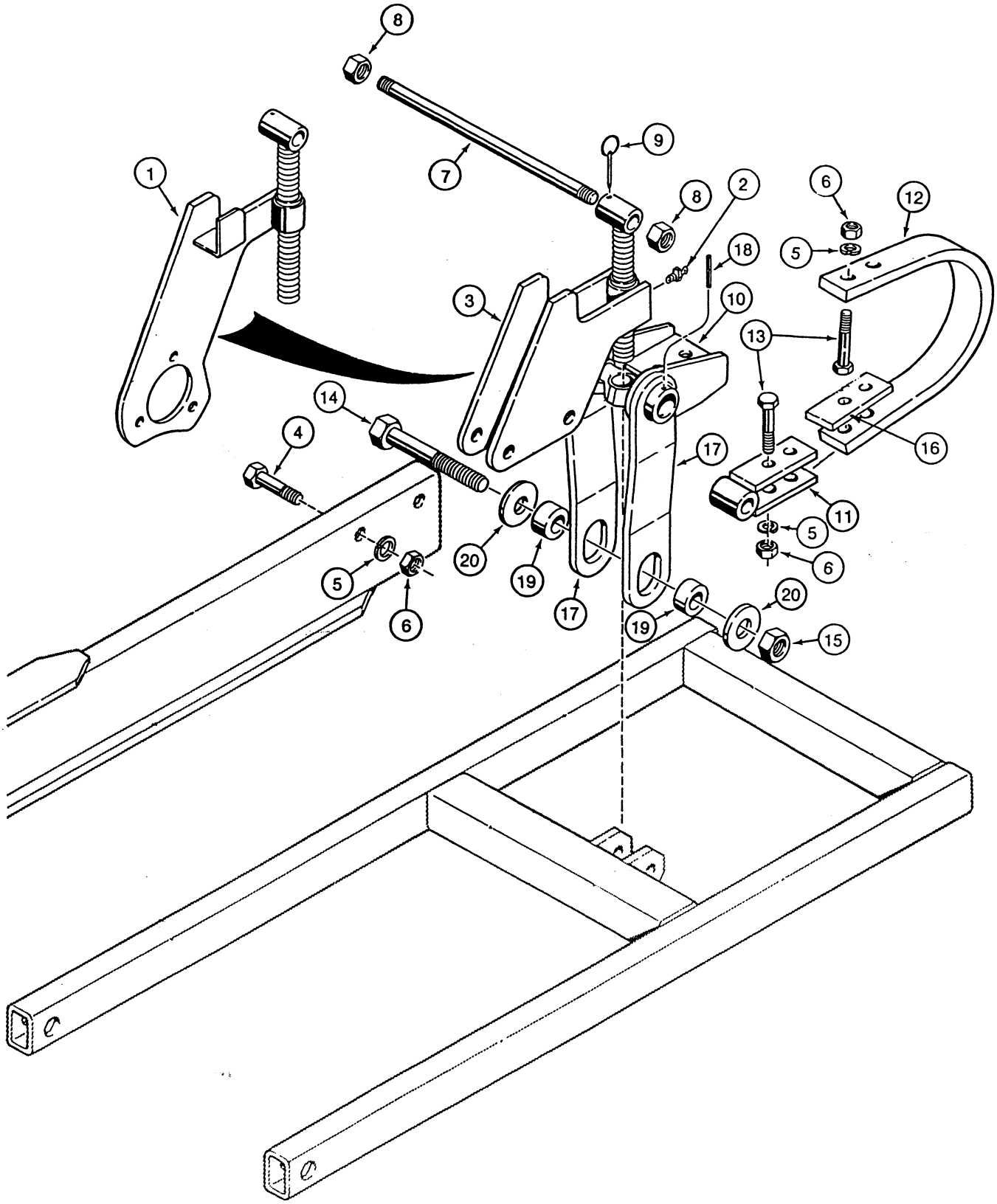
PRESS WHEEL HANGER ASSEMBLY AND RIGID PRESS WHEEL ADJUSTMENT ASSEMBLY



PRESS WHEEL HANGER ASSEMBLY AND
RIGID PRESS WHEEL ADJUSTMENT ASSEMBLY (CON'T.)

Ref.	Part No.	Description
1.	162-164H	Press Wheel Gang Support Tube Weldment
2.	162-018D	Press Wheel Gang Support Tube Bolt Plate
3.	802-141C	Bolt, Hex Head 3/4"-10 x 13 Long Gr 5
4.	804-023C	Washer, Lock Spring 3/4"
5.	803-027C	Nut, Hex 3/4"-10
6.	162-114D	RH Rigid Press Wheel Adjustment Mount Side Plate
7.	162-113D	LH Rigid Press Wheel Adjustment Mount Side Plate
8.	802-162C	Bolt, Hex Head 5/8"-11 x 3 1/2" Long Gr 5
9.	804-022C	Washer, Lock Spring 5/8"
10.	803-021C	Nut, Hex 5/8"-11
11.	162-003H	Screw, Rigid Press Wheel Adjustment
12.	162-115D	Press Wheel Adjustment Handle Rod
13.	805-093C	Cotterless Hitch Pin 1/4" x 2" Long
14.	162-004H	Press Wheel Adjustment Tube Weldment
15.	162-006H	Press Wheel Adjustment Screw Clevis LH (Shown) (Section #1, 45' Drills Only)
	162-007H	Press Wheel Adjustment Screw Clevis RH (Section #6, 45' Drills Only)
16.	162-020D	Press Wheel Adjustment Screw Pivot Pin
17.	805-016C	Pin, Cotter 3/16" x 1 1/4" Long
18.	162-002H	Narrow Press Wheel Hanger (23" Wide)
	162-001H	Wide Press Wheel Hanger (29" Wide)
19.	162-021D	Press Wheel Hanger Pivot Pin
20.	805-058C	Pin, Cotter 3/16" x 2" Long
21.	162-170H	Press Wheel Frame Hanger
22.	800-001C	Zerk, Straight 1/4"-28
23.	806-018C	U-Bolt, 5/8"-11 x 3 1/32" x 4 1/4" Long Gr 5
24.	804-026C	Washer, Flat 7/8" SAE
25.	803-028C	Nut, Hex 7/8"-9 Nylock
26.	890-122C	Bushing 1 1/2" OD x 1 1/4" ID x 1 1/2" Long
27.	802-126C	Bolt, Hex Head 7/8"-9 x 3 1/2" Long Gr 5
28.	162-119D	Press Wheel Pivot Sleeve

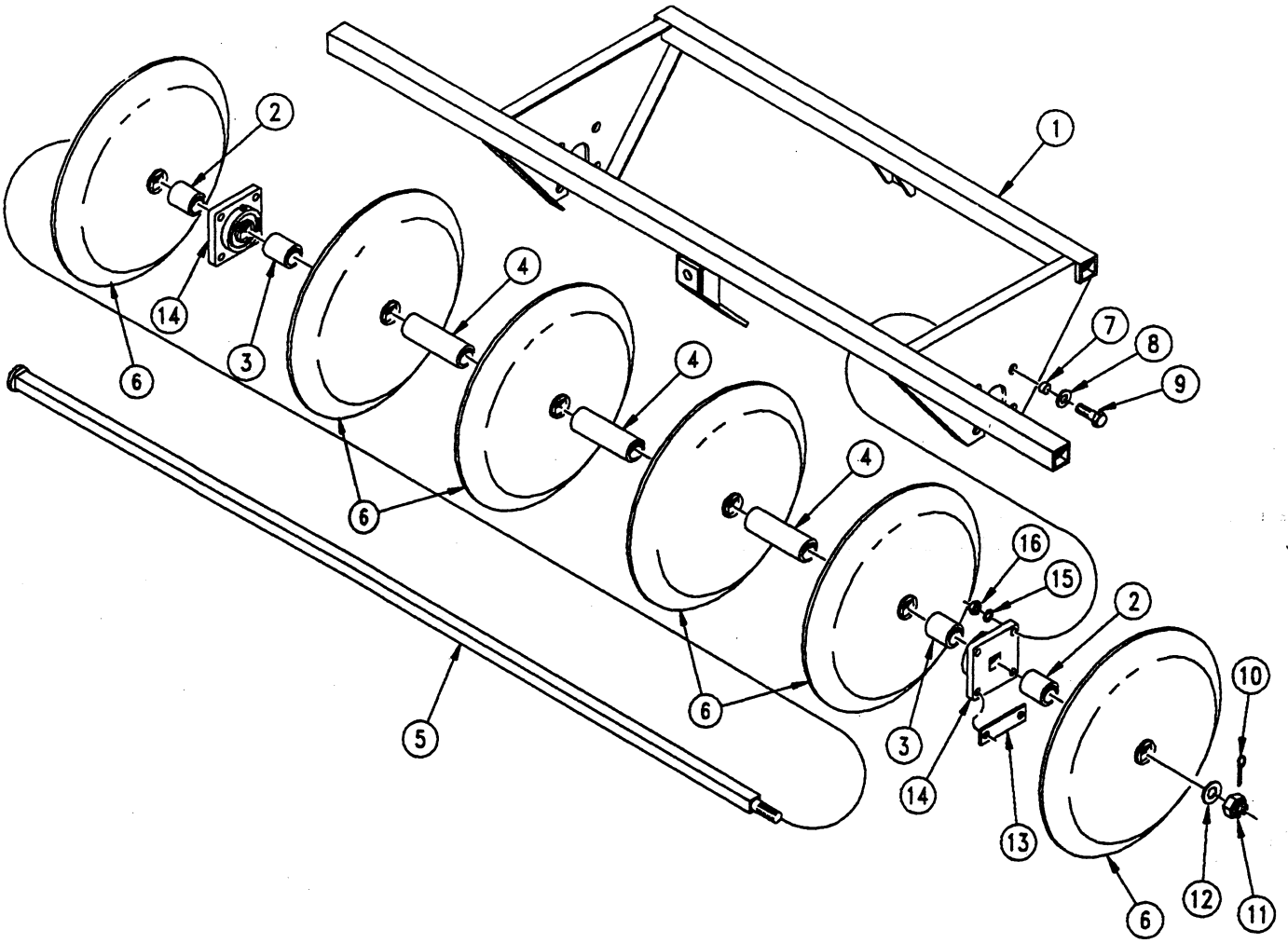
SPRING CUSHIONED PRESS WHEEL ADJUSTMENT ASSEMBLY



SPRING CUSHIONED PRESS WHEEL ADJUSTMENT ASSEMBLY (CON'T.)

Ref.	Part No.	Description
1.	162-168H	RH Press Wheel Adjustment Screw Support (Shown) (Section #6, 45' Drills Only)
	162-169H	LH Press Wheel Adjustment Screw Support (Section #1, 45' Drills Only)
2.	800-001C	Zerk, Straight 1/4"-28
3.	162-167H	C-Spring Press Wheel Adjustment Screw Weldment
4.	802-162C	Bolt, Hex Head 5/8"-11 x 3 1/2" Long Gr 5
5.	804-022C	Washer, Lock Spring 5/8"
6.	803-021C	Nut, Hex 5/8"-11
7.	162-115D	Press Wheel Adjustment Handle Rod
8.	803-027C	Nut, Hex 3/4"-10
9.	805-093C	Cotterless Hitch Pin 1/4" x 2" Long
10.	162-359H	Press Wheel C-Spring Trunnion Mount
11.	162-166H	Press Wheel C-Spring Pivot Mount
12.	807-027C	Press Wheel C-Spring 1 1/4" x 2" x 4 1/2" Radius
13.	802-059C	Bolt, Hex Head 5/8"-11 x 3" Long Gr 5
14.	802-070C	Bolt, Hex Head 3/4"-10 x 6" Long Gr 5
15.	803-025C	Nut, Hex 3/4"-10 Nylock
16.	162-175D	Press Wheel C-Spring Shim
17.	162-172D	C-Spring Travel Limiter Bar
18.	805-025C	Pin, Roll 3/16" x 2" Long
19.	162-173D	Travel Limiter Bar Bushing
20.	162-174D	Travel Limiter Bar Washer

PRESS WHEEL GANG ASSEMBLIES



Ref.	Part No.	Description
		(ALSO REFER TO CHARTS ON FOLLOWING PAGES)
1.	REF.	Press Wheel Gang Frame (See Charts For Part Number & Details)
2.	REF.	Press Wheel Spacer Tube (See Charts For Part Number & Details)
3.	REF.	Press Wheel Spacer Tube (See Charts For Part Number & Details)
4.	REF.	Press Wheel Spacer Tube (See Charts For Part Number & Details)
5.	REF.	Press Wheel Axle (See Charts For Part Number & Details)
6.	REF.	Press Wheel (See Charts For Part Number & Details)
7.	162-032D	Press Wheel Bearing Spacer Tube
8.	804-021C	Washer, Flat 5/8" SAE
9.	802-057C	Bolt, Hex Head 5/8"-11 x 2 1/4" Long Gr 5
10.	805-060C	Pin, Cotter 7/32" x 2" Long
11.	803-071C	Nut, Hex Slotted 1-8
12.	804-029C	Washer, Flat 1" SAE
13.	162-087D	Press Wheel Tie Strap
14.	822-025C	4 Bolt Bearing, 1 1/4" Square Bore
15.	804-022C	Washer, Lock Spring 5/8"
16.	803-021C	Nut, Hex 5/8"-11

(Continued On Next Page.)

REF NO.	DESCRIPTION	PRESSWHEEL GANG DESCRIPTION			
		8 WHEEL GANG 7 IN SPACING WITH 3X21 STEEL V PW	8 WHEEL GANG 7 IN SPACING WITH 3X21 STEEL CROWN PW	8 WHEEL GANG 7 IN SPACING WITH 2X21 STEEL CROWN PW	8 WHEEL GANG 7 IN SPACING WITH 2X20 RUBBER PW
		PART NUMBERS			
1	PW FRAME	NOT AVAILABLE	162-173H	162-173H	162-173H
2	PW SPACER TUBE (TUBE LENGTH)	NOT AVAILABLE	162-079D (3 19/32)	162-079D (3 19/32)	162-079D (3 19/32)
3	PW SPACER TUBE (TUBE LENGTH)	NOT AVAILABLE	162-080D (37/64)	162-080D (37/64)	162-080D (37/64)
4	PW SPACER TUBE (TUBE LENGTH)	NOT AVAILABLE	162-081D (1 37/64)	162-081D (1 37/64)	162-081D (1 37/64)
5	PW AXLE	NOT AVAILABLE	162-296E	162-296E	162-296E
6	PRESSWHEEL	NOT AVAILABLE	162-193E	162-295E	162-298S

REF NO.	DESCRIPTION	PRESSWHEEL GANG DESCRIPTION			
		12 WHEEL GANG 7 IN SPACING WITH 3X21 STEEL V PW	12 WHEEL GANG 7 IN SPACING WITH 3X21 STEEL CROWN PW	12 WHEEL GANG 7 IN SPACING WITH 2X21 STEEL CROWN PW	12 WHEEL GANG 7 IN SPACING WITH 2X20 RUBBER PW
		PART NUMBERS			
1	PW FRAME	NOT AVAILABLE	162-176H	162-176H	162-176H
2	PW SPACER TUBE (TUBE LENGTH)	NOT AVAILABLE	162-079D (3 19/32)	162-079D (3 19/32)	162-079D (3 19/32)
3	PW SPACER TUBE (TUBE LENGTH)	NOT AVAILABLE	162-080D (37/64)	162-080D (37/64)	162-080D (37/64)
4	PW SPACER TUBE (TUBE LENGTH)	NOT AVAILABLE	162-081D (1 37/64)	162-081D (1 37/64)	162-081D (1 37/64)
5	PW AXLE	NOT AVAILABLE	162-140E	162-140E	162-140E
6	PRESSWHEEL	NOT AVAILABLE	162-193E	162-295E	162-298S

REF NO.	DESCRIPTION	PRESSWHEEL GANG DESCRIPTION			
		13 WHEEL GANG 7 IN SPACING WITH 3X21 STEEL V PW	13 WHEEL GANG 7 IN SPACING WITH 3X21 STEEL CROWN PW	13 WHEEL GANG 7 IN SPACING WITH 2X21 STEEL CROWN PW	13 WHEEL GANG 7 IN SPACING WITH 2X20 RUBBER PW
		PART NUMBERS			
1	PW FRAME	NOT AVAILABLE	162-177H	162-177H	162-177H
2	PW SPACER TUBE (TUBE LENGTH)	NOT AVAILABLE	162-079D (3 19/32)	162-079D (3 19/32)	162-079D (3 19/32)
3	PW SPACER TUBE (TUBE LENGTH)	NOT AVAILABLE	162-080D (37/64)	162-080D (37/64)	162-080D (37/64)
4	PW SPACER TUBE (TUBE LENGTH)	NOT AVAILABLE	162-081D (1 37/64)	162-081D (1 37/64)	162-081D (1 37/64)
5	PW AXLE	NOT AVAILABLE	162-139E	162-139E	162-139E
6	PRESSWHEEL	NOT AVAILABLE	162-193E	162-295E	162-298S

REF NO.	DESCRIPTION	PRESSWHEEL GANG DESCRIPTION			
		9 WHEEL GANG 10 IN SPACING WITH 3X21 STEEL V PW	9 WHEEL GANG 10 IN SPACING WITH 3X21 STEEL CROWN PW	9 WHEEL GANG 10 IN SPACING WITH 2X21 STEEL CROWN PW	9 WHEEL GANG 10 IN SPACING WITH 2X20 RUBBER PW
		PART NUMBERS			
1	PW FRAME	162-178H	162-178H	162-178H	162-178H
2	PW SPACER TUBE (TUBE LENGTH)	130-132D (1")	162-088D (2 37/64)	162-088D (2 37/64)	162-088D (2 37/64)
3	PW SPACER TUBE (TUBE LENGTH)	130-140D (6")	162-089D (6 19/32)	162-089D (6 19/32)	162-089D (6 19/32)
4	PW SPACER TUBE (TUBE LENGTH)	130-141D (4 23/32)	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE
5	PW AXLE	162-013E	162-203E	162-203E	162-203E
6	PRESSWHEEL	130-132E	162-193E	162-295E	162-298S

REF NO.	DESCRIPTION	PRESSWHEEL GANG DESCRIPTION			
		7 WHEEL GANG 12 IN SPACING WITH 3X21 STEEL V PW	7 WHEEL GANG 12 IN SPACING WITH 3X21 STEEL CROWN PW	7 WHEEL GANG 12 IN SPACING WITH 2X21 STEEL CROWN PW	7 WHEEL GANG 12 IN SPACING WITH 2X20 RUBBER PW
		PART NUMBERS			
1	PW FRAME	162-179H	162-179H	162-179H	162-179H
2	PW SPACER TUBE (TUBE LENGTH)	130-142D (2")	162-128D (3 37/64)	162-128D (3 37/64)	162-128D (3 37/64)
3	PW SPACER TUBE (TUBE LENGTH)	130-143D (6 23/32)	162-129D (8 19/32)	162-129D (8 19/32)	162-129D (8 19/32)
4	PW SPACER TUBE (TUBE LENGTH)	130-144D (8")	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE
5	PW AXLE	162-012E	162-202E	162-202E	162-202E
6	PRESSWHEEL	130-132E	162-193E	162-295E	162-298S

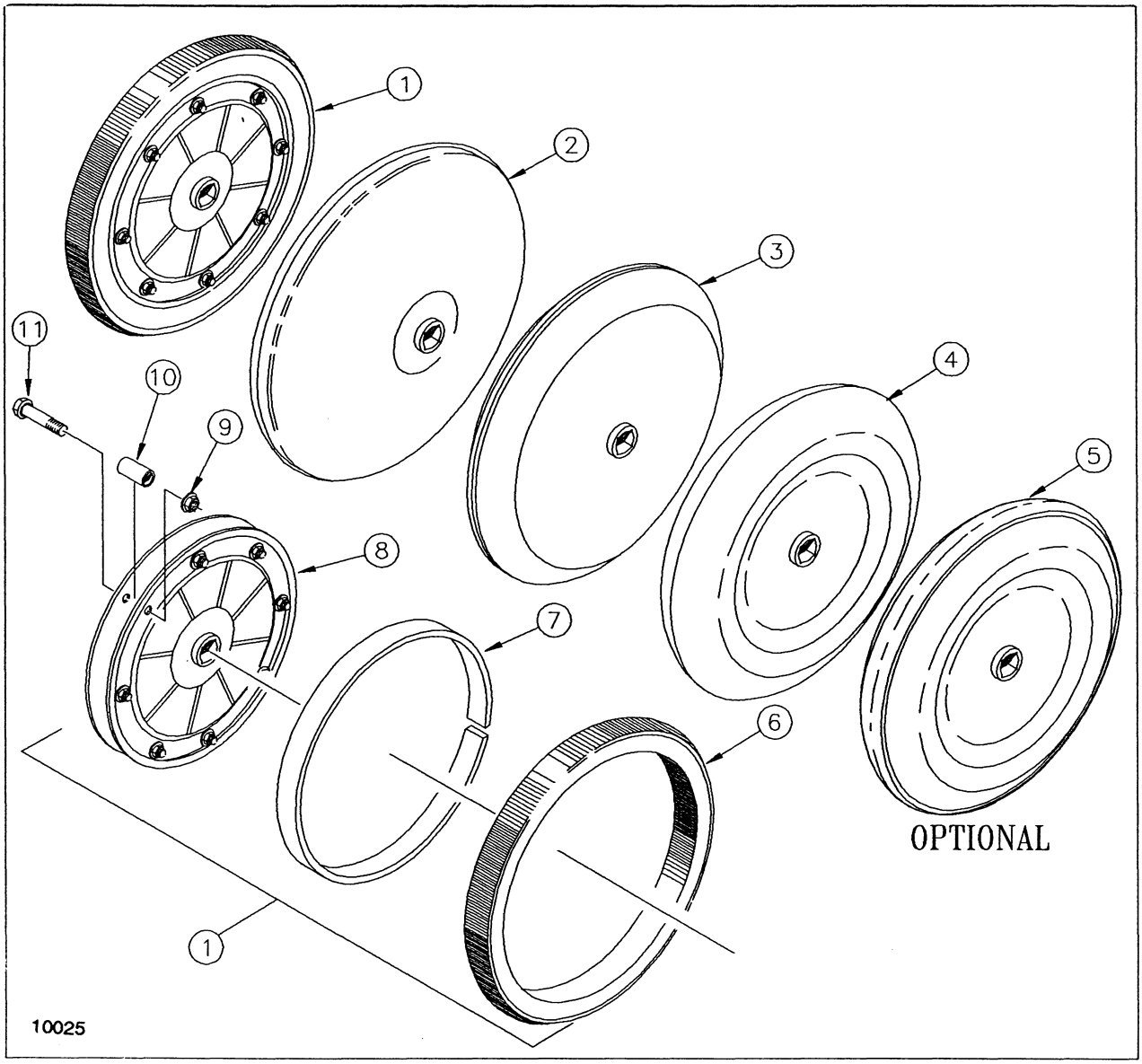
REF NO.	DESCRIPTION	PRESSWHEEL GANG DESCRIPTION			
		8 WHEEL GANG 12 IN SPACING WITH 3X21 STEEL V PW	8 WHEEL GANG 12 IN SPACING WITH 3X21 STEEL CROWN PW	8 WHEEL GANG 12 IN SPACING WITH 2X21 STEEL CROWN PW	8 WHEEL GANG 12 IN SPACING WITH 2X20 RUBBER PW
		PART NUMBERS			
1	PW FRAME	162-180H	162-180H	162-180H	162-180H
2	PW SPACER TUBE (TUBE LENGTH)	130-142D (2")	162-128D (3 37/64)	162-128D (3 37/64)	162-128D (3 37/64)
3	PW SPACER TUBE (TUBE LENGTH)	130-143D (6 23/32)	162-129D (8 19/32)	162-129D (8 19/32)	162-129D (8 19/32)
4	PW SPACER TUBE (TUBE LENGTH)	130-144D (8")	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE
5	PW AXLE	162-010E	162-139E	162-139E	162-139E
6	PRESSWHEEL	130-132E	162-193E	162-295E	162-298S

REF NO.	DESCRIPTION	PRESSWHEEL GANG DESCRIPTION			
		6 WHEEL GANG 10 IN SPACING WITH 3X21 STEEL V PW	6 WHEEL GANG 10 IN SPACING WITH 3X21 STEEL CROWN PW	6 WHEEL GANG 10 IN SPACING WITH 2X21 STEEL CROWN PW	6 WHEEL GANG 10 IN SPACING WITH 2X20 RUBBER PW
		PART NUMBERS			
1	PW FRAME	162-266H	162-266H	162-266H	162-266H
2	PW SPACER TUBE (TUBE LENGTH)	130-132D (1")	162-088D (2 37/64	162-088D (2 37/64	162-088D (2 37/64
3	PW SPACER TUBE (TUBE LENGTH)	130-140D (6")	162-089D (6 19/32)	162-089D (6 19/32)	162-089D (6 19/32)
4	PW SPACER TUBE (TUBE LENGTH)	130-141D (4 23/32)	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE
5	PW AXLE	130-058E	162-275E	162-275E	162-275E
6	PRESSWHEEL	130-132E	162-193E	162-295E	162-298S

REF NO.	DESCRIPTION	PRESSWHEEL GANG DESCRIPTION			
		4 WHEEL GANG 12 IN SPACING WITH 3X21 STEEL V PW	4 WHEEL GANG 12 IN SPACING WITH 3X21 STEEL CROWN PW	4 WHEEL GANG 12 IN SPACING WITH 2X21 STEEL CROWN PW	4 WHEEL GANG 12 IN SPACING WITH 2X20 RUBBER PW
		PART NUMBERS			
1	PW FRAME	162-267H	162-267H	162-267H	162-267H
2	PW SPACER TUBE (TUBE LENGTH)	130-142D (2")	162-128D (3 37/64)	162-128D (3 37/64)	162-128D (3 37/64)
3	PW SPACER TUBE (TUBE LENGTH)	130-144D (8")	162-129D (8 19/32)	162-129D (8 19/32)	162-129D (8 19/32)
4	PW SPACER TUBE (TUBE LENGTH)	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE
5	PW AXLE	162-271E	162-270E	162-270E	162-270E
6	PRESSWHEEL	130-132E	162-193E	162-295E	162-298S

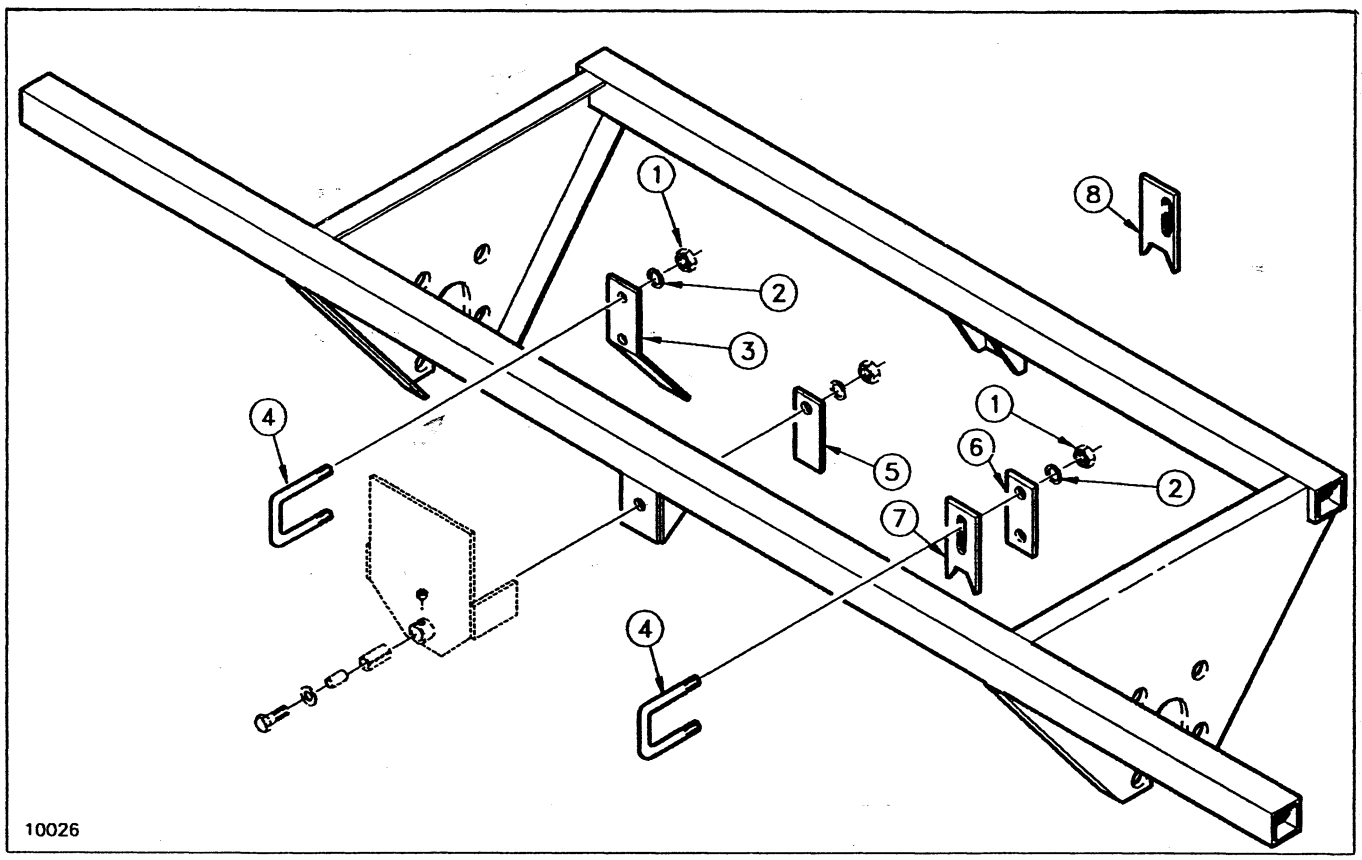
REF NO.	DESCRIPTION	PRESSWHEEL GANG DESCRIPTION			
		5 WHEEL GANG 12 IN SPACING WITH 3X21 STEEL V PW	5 WHEEL GANG 12 IN SPACING WITH 3X21 STEEL CROWN PW	5 WHEEL GANG 12 IN SPACING WITH 2X21 STEEL CROWN PW	5 WHEEL GANG 12 IN SPACING WITH 2X20 RUBBER PW
		PART NUMBERS			
1	PW FRAME	162-268H	162-268H	162-268H	162-268H
2	PW SPACER TUBE (TUBE LENGTH)	130-142D (2")	162-128D (3 37/64)	162-128D (3 37/64)	162-128D (3 37/64)
3	PW SPACER TUBE (TUBE LENGTH)	130-143D (6 23/32)	162-129D (8 19/32)	162-129D (8 19/32)	162-129D (8 19/32)
4	PW SPACER TUBE (TUBE LENGTH)	130-144D (8")	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE
5	PW AXLE	130-053E	162-273E	162-273E	162-273E
6	PRESSWHEEL	130-132E	162-193E	162-295E	162-298S

PRESS WHEEL DETAILS



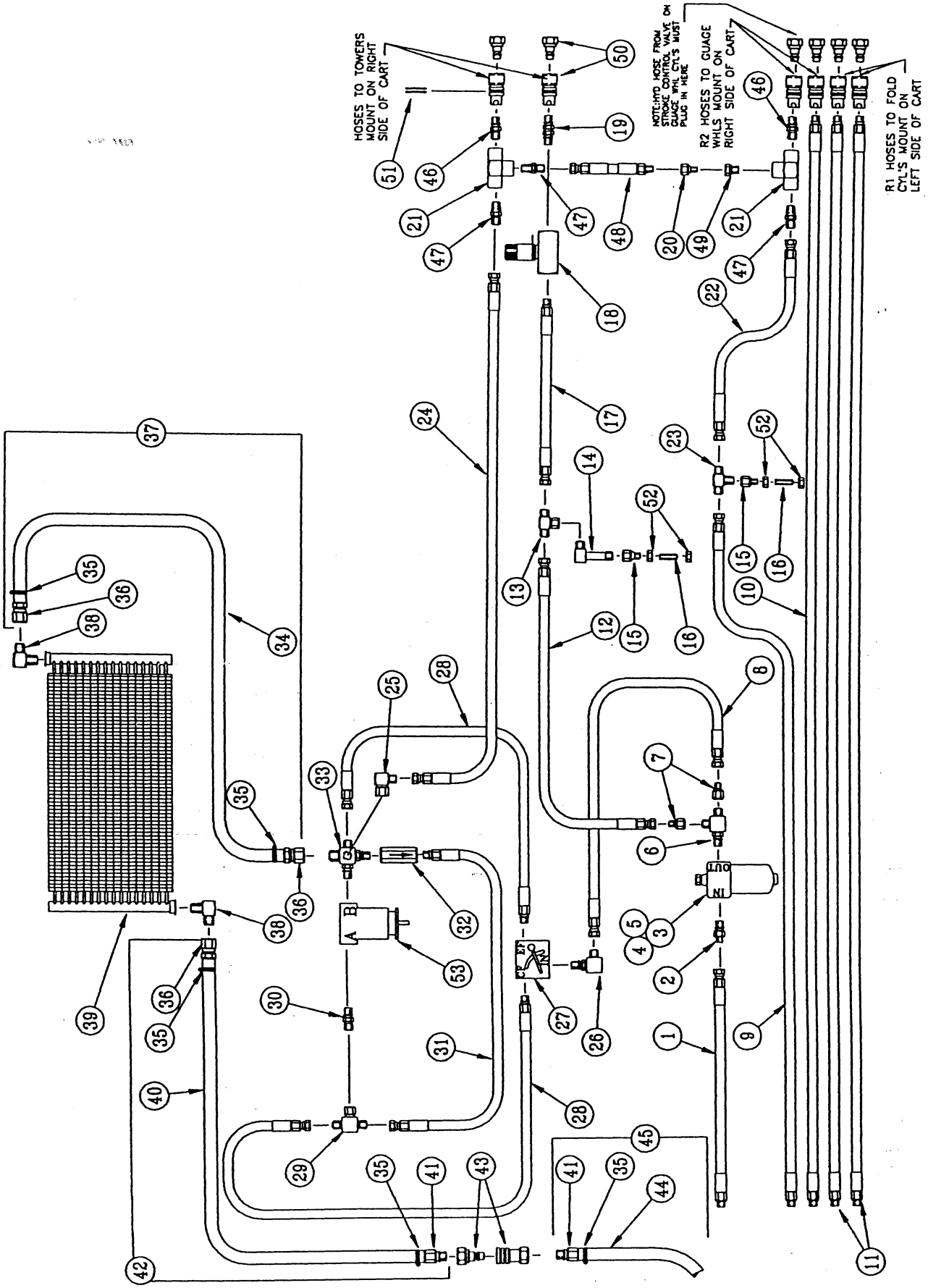
Ref.	Part No.	Description
1.	162-298S	2" x 20 Rubber Press Wheel Assembly (Includes Items 6 Through 11)
2.	162-295E	2" x 21" Steel Crown Press Wheel
3.	130-132E	3" x 21" Steel "V" Press Wheel
4.	162-193E	3" x 21" Steel Crown Press Wheel
5.	162-382E	3" x 21" Steel Crown Press Wheel With Cap
6.	814-014C	Tire, 2" x 20 Rubber Press Wheel
7.	130-106D	Rubber Press Wheel Retainer Ring
8.	162-297E	2" x 20 Rubber Press Wheel Hub Weldment
9.	803-043C	Nut, Hex Flange 5/16"-18
10.	890-048C	Press Wheel Bolt Spacer Tube
11.	802-094C	Bolt, Hex Flange Head 5/16"-18 x 1 3/4" Long Gr 5

PRESS WHEEL SCRAPER & ROCK GUARD ASSEMBLY



Ref.	Part No.	Description
1.	803-020C	Nut, Hex 1/2"-13
2.	804-015C	Washer, Lock Spring 1/2"
3.	162-033D	Press Wheel Rock Guard
4.	806-023C	U-Bolt 1/2"-13 x 2 1/32" x 3 1/4" Long
5.	162-064D	21" Steel Press Wheel Pivot Scraper
6.	162-065D	Press Wheel Scraper Washer Plate
7.	162-060D	21" Steel Press Wheel Scraper
8.	162-144D	Offset 21" Steel Press Wheel Scraper

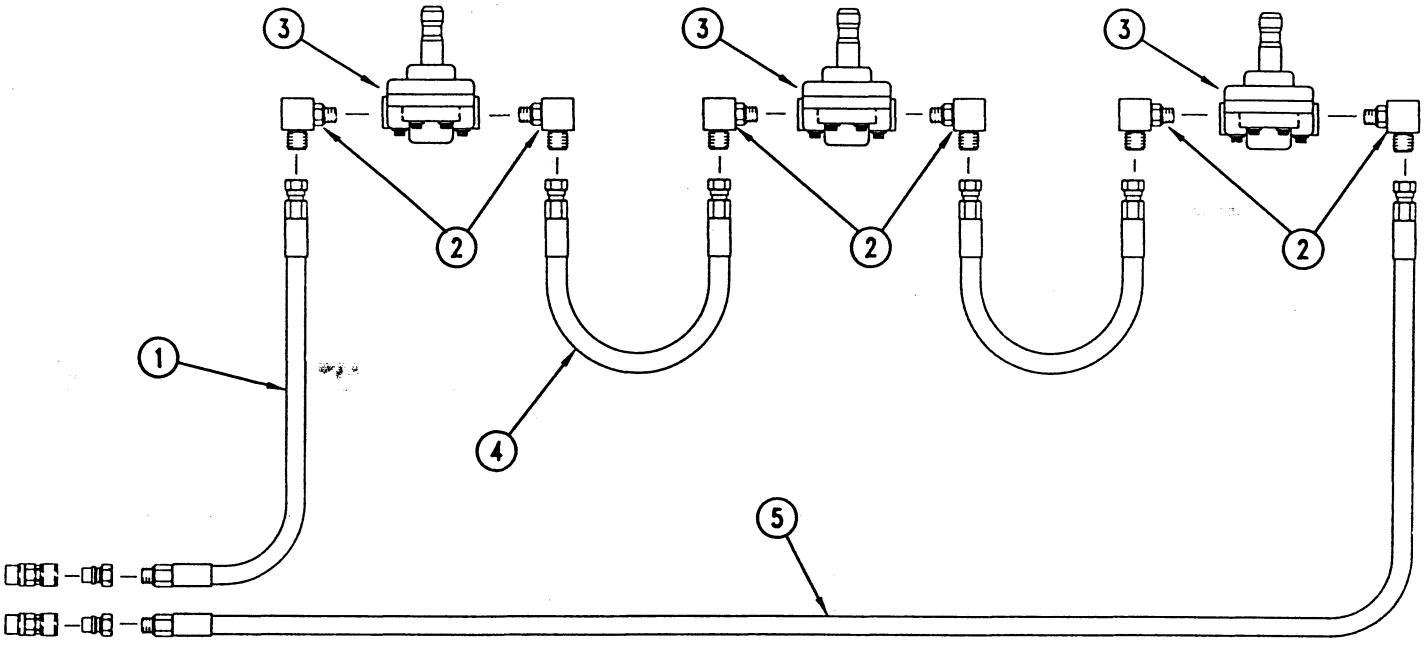
CART HYDRAULICS



CART HYDRAULICS (CON'T.)

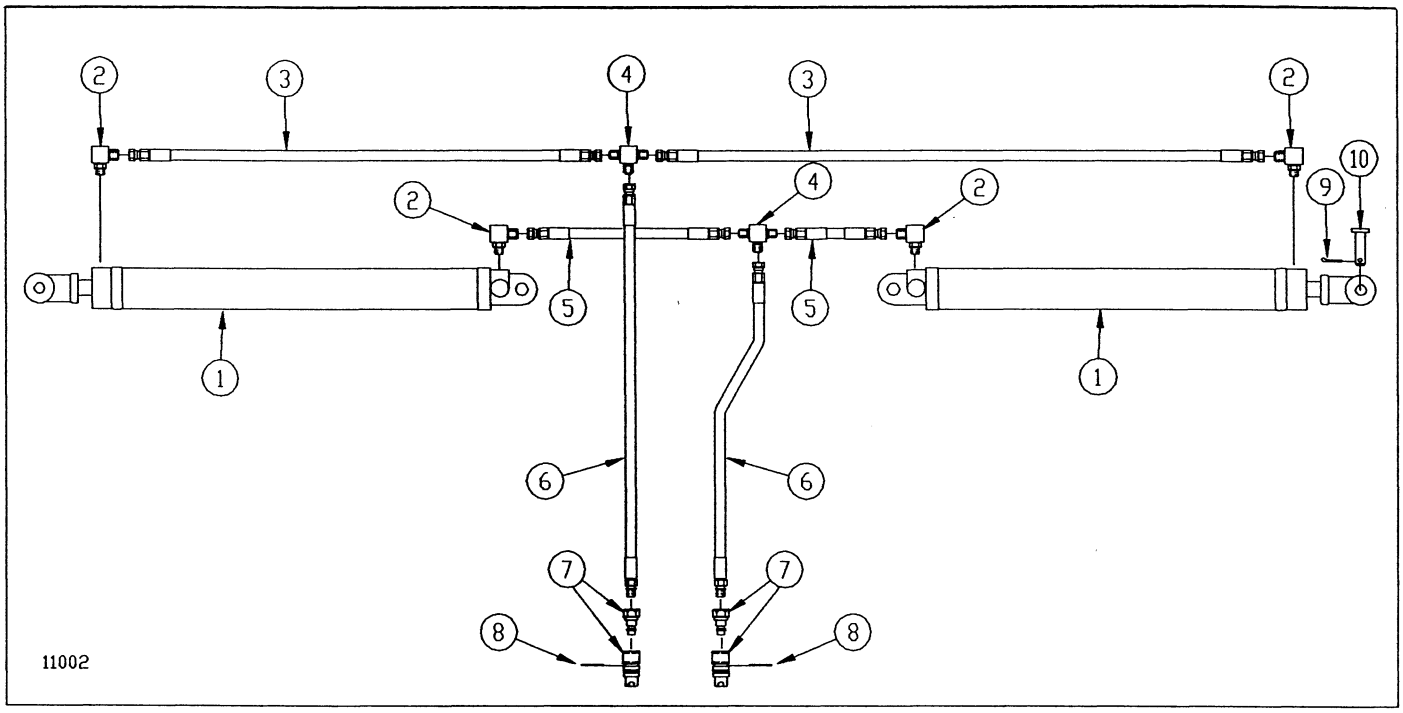
Ref.	Part No.	Description
1.	811-102C	Hydraulic Hose 1/2" R1 x 1/2" MNPT x 3/4" FJIC x 103 Long
2.	811-205C	Hydraulic Fitting, Adapter 1 1/16" MORB x 3/4" MJIC
3.	810-036C	Oil Filter Assembly
4.	810-053C	Oil Filter Element
5.	810-099C	Filter Housing O-Ring (3.005 ID x .104)
6.	811-092C	Hydraulic Fitting, Run Tee 1 1/16" MORB x 1 1/16" MJIC
7.	811-090C	Hydraulic Fitting, Reducer 1 1/16" FJIC x 3/4" MJIC
8.	811-106C	Hydraulic Hose 1/2" R1 x 3/4" FJIC x 28 Long
9.	811-254C	Hydraulic Hose 3/8" R2 x 1/2" MNPT x 3/4" FJIC x 184 Long
10.	811-110C	Hydraulic Hose 3/8" R2 x 1/2" MNPT x 3/4" MORB x 264 Long
11.	811-109C	Hydraulic Hose 3/8" R1 x 1/2" MNPT x 3/4" MORB x 264 Long
12.	811-103C	Hydraulic Hose 3/8" R1 x 3/4" FJIC x 9/16" FJIC x 113 Long
13.	811-193C	Hydraulic Fitting, Branch Tee 9/16" JIC
14.	811-198C	Hydraulic Fitting, Long Elbow, 1/4" MNPT x 9/16" MJIC
15.	811-084C	Hydraulic Fitting, Reducer 1/4" FNPT x 1/16" MNPT
16.	810-045C	Clutch Cylinder 1/16" FNPT
17.	811-104C	Hydraulic Hose 3/8" R1 x 9/16" FJIC x 3/4" MORB x 54 Long
18.	810-043C	Needle Valve 3/4" FORB
19.	811-086C	Hydraulic Fitting, Union 3/4" MORB
20.	810-089C	Hydraulic Velocity Fuse 1/4" FNPT x 1/4" MNPT
21.	811-188C	Hydraulic Fitting, Pipe Tee 3/8" FNPT
22.	811-253C	Hydraulic Hose 3/8" R2 x 9/16" FJIC x 62" Long
23.	811-089C	Hydraulic Fitting, Tee 1/4" MNPT x 9/16" MJIC
24.	811-252C	Hydraulic Hose 1/4" R1 x 9/16" FJIC x 177 Long
25.	811-250C	Hydraulic Fitting, Elbow 3/4" FJIC x 9/16" MJIC
26.	811-081C	Hydraulic Fitting, Elbow 7/8" MORB x 3/4" MJIC
27.	810-038C	Flow Control Valve 7/8" FORB
28.	811-107C	Hydraulic Hose 1/2" R1 x 3/4" FJIC x 7/8" MORB x 28 Long
29.	811-079C	Hydraulic Fitting, Swivel Branch Tee 3/4" JIC
30.	811-192C	Hydraulic Fitting, Adapter 7/8" MORB x 3/4" MJIC
31.	811-195C	Hydraulic Hose 1/2" R1 x 3/4" MORB x 3/4" FJIC x 28 Long
32.	810-037C	Line Check Valve 3/4" FORB
33.	811-191C	Hydraulic Fitting 5 Port Junction Block
34.	168-136D	Radiator Supply Hose 3/4" ID x 30 Long
35.	800-103C	Clamp Worm Drive 11/16-1 1/2"
36.	811-111C	Hydraulic Fitting, Swivel Female Stem 1 1/16" FJIC x 3/4"
37.	168-090S	Radiator Inlet Hose Assembly x 30 Long (Includes Items 34-36)
38.	811-087C	Hydraulic Fitting, Elbow 1" MNPT x 1 1/16" MJIC
39.	810-067C	Oil Cooler
40.	168-135D	Radiator Return Hose 3/4" ID x 98 Long
41.	811-112C	Hydraulic Fitting, Solid Male Stem 1 1/16" MORB x 3/4"
42.	168-089S	Radiator Return Hose Assembly x 98 Long (Includes Items 35, 36, 40, & 41)
43.	811-069C	Hydraulic Fitting, Quick Coupler 1 1/16" FORB
44.	168-069D	Hydraulic Dump Hose 3/4" R4 x 120 Long
45.	168-034S	Radiator Dump Hose Assembly (Includes Items 35,41 & 44)
46.	811-190C	Hydraulic Fitting, Adapter 3/8" MNPT x 3/4" MORB
47.	811-151C	Hydraulic Fitting, Adapter 3/8" MNPT x 9/16" MJIC
48.	811-251C	Hydraulic Hose 1/4" R1 x 1/4" MNPT x 9/16" FJIC x 14 Long
49.	811-255C	Hydraulic Fitting, Reducer 3/8" MNPT x 1/4" FNPT
50.	811-204C	Hydraulic Fitting, Quick Coupler 3/4" FORB Bulkhead Mount
51.	800-044C	Snap Ring External 1 1/2" Shaft
52.	803-018C	Nut, Hex 1/2"-20
53.	810-044C	Hydraulic Motor Air Drill (Gresen MGG20025BBIB3)
	168-107A	Seal Kit (Gresen MGG2) Motor

TOWER HYDRAULICS



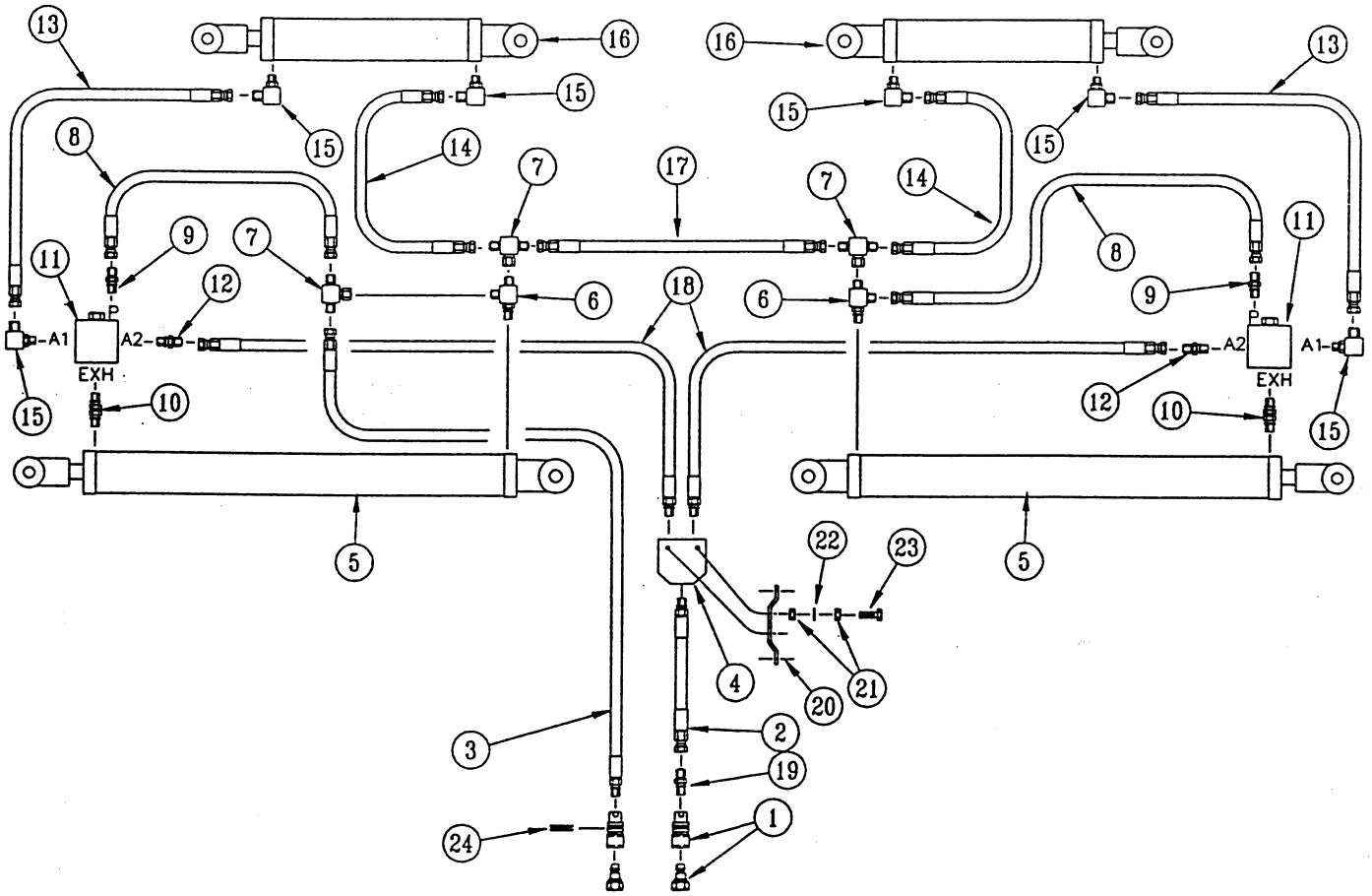
Ref.	Part No.	Description
1.	811-199C	Hydraulic Hose 3/8" R1 x 9/16" FJIC x 3/4" MORB x 340 Long (45' Air Drills)
	811-238C	Hydraulic Hose 3/8" R1 x 9/16" FJIC x 3/4" MORB x 189 Long (34' Air Drills)
2.	811-065C	Hydraulic Fitting, Elbow 9/16" MORB x 9/16" MJIC
3.	810-066C	Hydraulic Motor, Air Drill Tower
	74112	(Hydraulic Repair Seal Kit For 810-066C)
4.	811-200C	Hydraulic Hose 1/4" R1 x 9/16" FJIC x 254" Long (45' Air Drills)
	811-242C	Hydraulic Hose 1/4" R1 x 9/16" FJIC x 240" Long (34' Air Drills)
5.	811-201C	Hydraulic Hose 3/8" R1 x 9/16" FJIC x 3/4" MORB x 262" Long
6.	811-204C	Hydraulic Fitting, Quick Coupler 3/4" FORB Bulkhead Mount

34' FOLDING HYDRAULICS



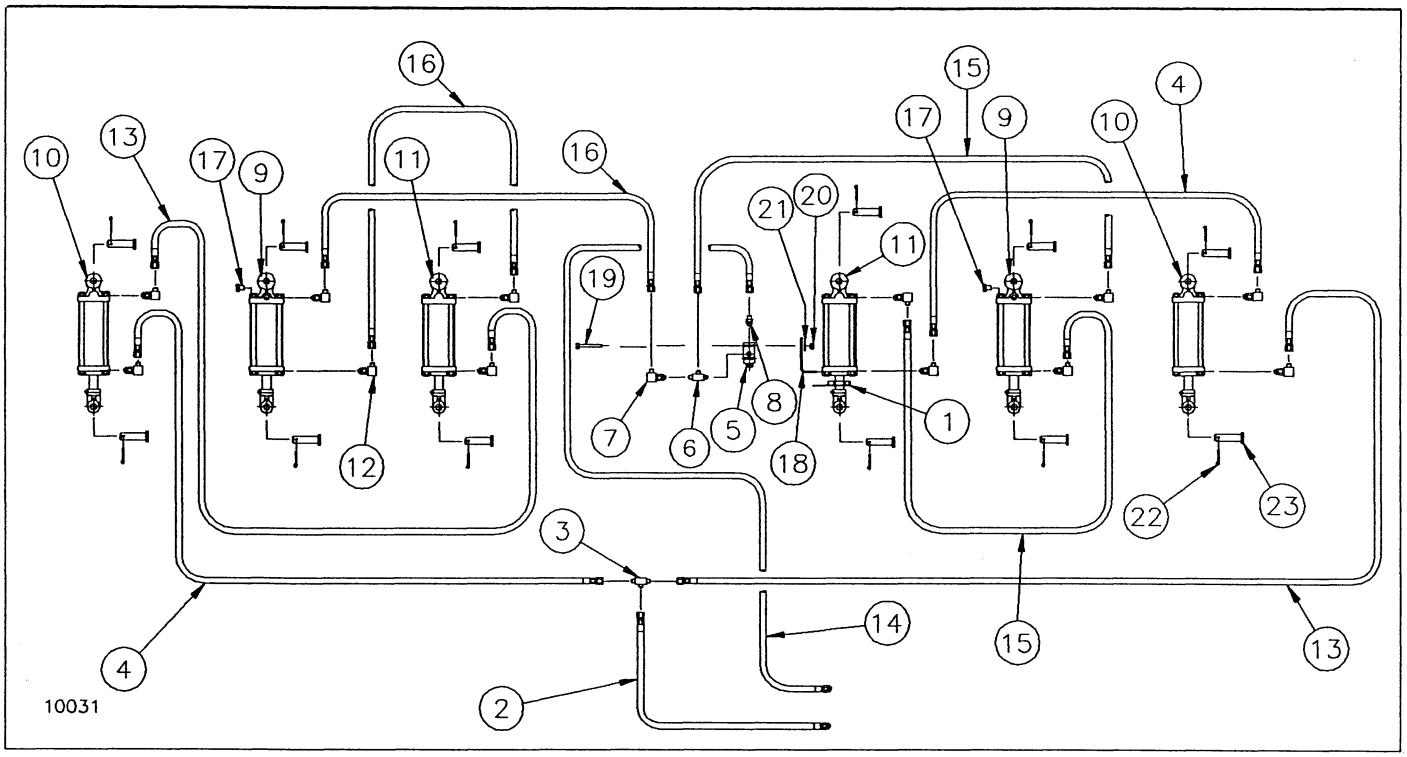
Ref.	Part No.	Description
1.	810-083C	Hydraulic Cylinder 3 1/2" x 36" x 1 1/2" Rod
2.	811-063C	Hydraulic Fitting, Elbow 3/4" MORB x 3/4" MJIC
3.	811-240C	Hydraulic Hose 3/8" R1 x 3/4" FJIC x 75" Long
4.	811-078C	Hydraulic Fitting, Tee 3/4" MJIC
5.	811-241C	Hydraulic Hose 3/8" R1 x 3/4" FJIC x 21" Long
6.	811-239C	Hydraulic Hose 3/8 R1 x 3/4" FJIC x 3/4" MORB x 75" Long
7.	811-204C	Hydraulic Fitting, Quick Coupler 3/4" FORB Bulkhead Mount
8.	800-044C	Snap Ring External 1 1/2" Shaft
9.	805-124C	Pin, Clevis 1" x 3 11/16" Long Gr 5 Plated
10.	805-017C	Pin, Cotter 316" x 1 3/4" Plated

45' FOLDING HYDRAULICS



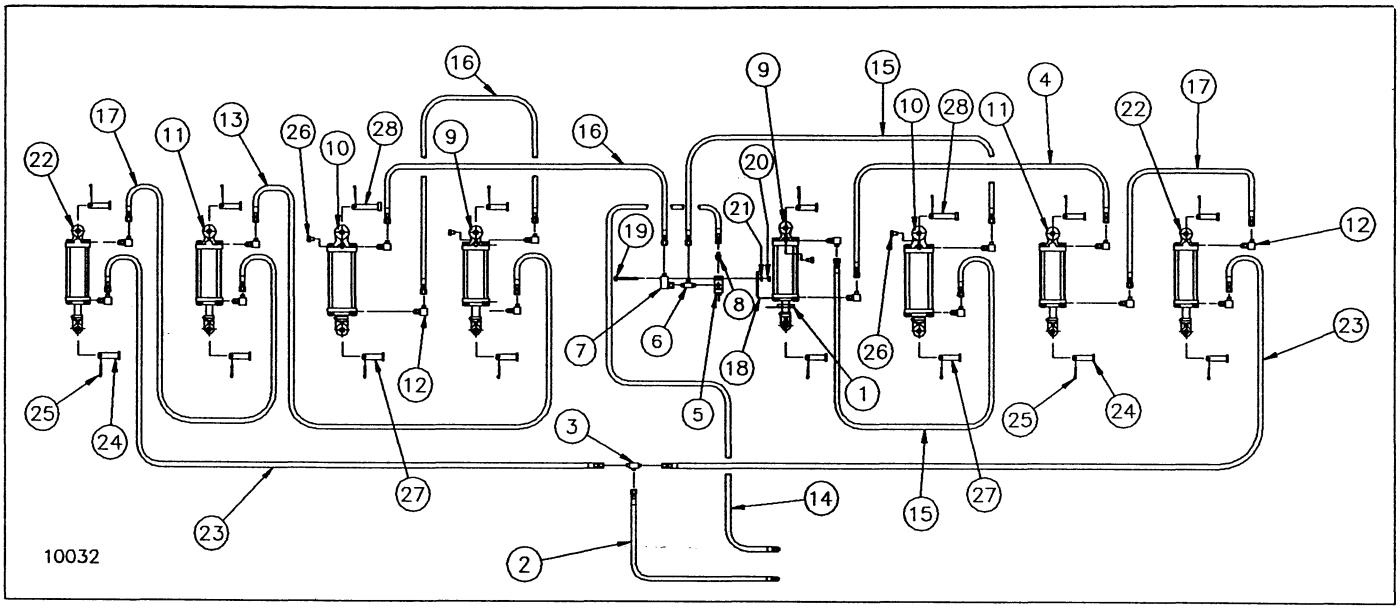
Ref.	Part No.	Description
1.	811-204C	Hydraulic Fitting, Quick Coupler 3/4" FORB Bulkhead Mount
2.	811-116C	Hydraulic Hose 3/8" R1 x 3/4" FJIC x 3/4" MORB x 66" Long
3.	811-117C	Hydraulic Hose 3/8" R1 x 3/4" FJIC x 3/4" MORB x 90" Long
4.	810-006C	Sequence Valve
5.	810-031C	Hydraulic Cylinder 4" x 40" x 1 1/2" Rod
6.	811-080C	Hydraulic Fitting, Run Tee 3/4" MORB x 3/4" MJIC
7.	811-079C	Hydraulic Fitting, Swivel Branch Tee 3/4" JIC
8.	811-118C	Hydraulic Hose 3/8" R1 x 9/16" FJIC x 3/4" FJIC x 41" Long
9.	811-170C	Hydraulic Fitting, Adapter 9/16" MORB x 9/16" MJIC
10.	811-086C	Hydraulic Fitting, Adapter 3/4" MORB
11.	810-086C	Pilot Operated Check Valve
12.	811-088C	Hydraulic Fitting, Adapter 3/4" MORB x 3/4" MJIC
13.	811-095C	Hydraulic Hose 3/8" R1 x 3/4" FJIC x 158 Long
14.	811-094C	Hydraulic Hose 3/8" R1 x 3/4" FJIC x 176 Long
15.	811-063C	Hydraulic Fitting, Elbow 3/4" MJIC x 3/4" MORB
16.	810-030C	Hydraulic Cylinder 3 1/2" x 20" x 1 1/2" Rod
17.	811-093C	Hydraulic Hose 3/8" R1 x 3/4" FJIC x 47" Long
18.	811-096C	Hydraulic Hose 3/8" R1 x 3/4" FJIC x 3/4" MORB x 108" Long
19.	811-114C	5/64" Orifice Adapter 3/4" MORB x 3/4" MJIC
20.	164-038D	Hydraulic Hose Clip
21.	803-014C	Nut, Hex 3/8"-16
22.	804-013C	Washer, Lock Spring 3/8"
23.	802-143C	Bolt, Hex Head 3/8"-16 x 2" Long Gr 5
24.	800-044C	Snap Ring External 1 1/2" Shaft

34' TRANSPORT HYDRAULICS

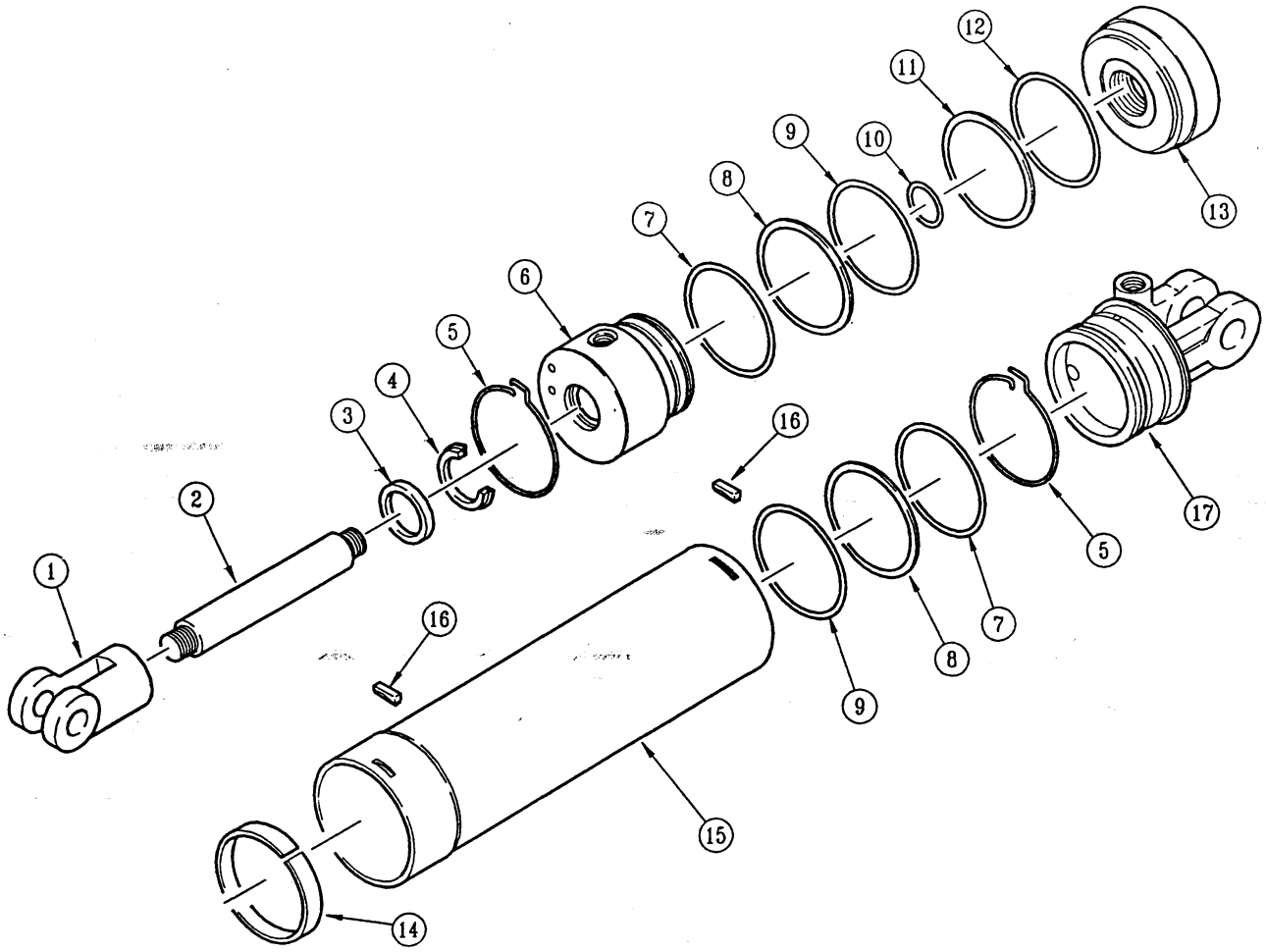


Ref.	Part No.	Description
1.	810-114C	Stop Clamp Assembly 1 1/2" Rod
2.	811-236C	Hydraulic Hose 3/8" R2 x 3/4" FJIC x 3/4" MORB x 84" Long
3.	811-078C	Hydraulic Fitting, Tee 3/4" MJIC
4.	811-237C	Hydraulic Hose 3/8" R2 x 3/4" FJIC x 174" Long
5.	810-084C	Valve, Hydraulic Stroke Control
6.	811-080C	Hydraulic Fitting 3/4" MORB x 3/4" MJIC Run Tee
7.	811-150C	Hydraulic Fitting 3/4" MJIC x 3/4" FJIC Elbow
8.	811-088C	Hydraulic Fitting, Adapter 3/4" MORB x 34/" MJIC
9.	810-140C	Rephasing Cylinder 4 1/2" x 8" x 1 1/2" Rod (Used On Drills With Serial No. After 1139I)
	810-032C	Rephasing Cylinder 4 1/2" x 8" x 1 1/2" Rod (Used On Drills With Serial No. Before 1140I)
10.	810-138C	Rephasing Cylinder 4" x 8" x 1 3/8" Rod (Used On Drills With Serial No. After 1139I)
	810-034C	Rephasing Cylinder 4" x 8" x 1 3/8" Rod (Used On Drills With Serial No. Before 1140I)
11.	810-139C	Rephasing Cylinder 4 1/4" x 8" x 1 1/2" Rod (Used On Drills With Serial No. After 1139I)
	810-033C	Rephasing Cylinder 4 1/4" x 8" x 1 1/2" Rod (Used On Drills With Serial No. Before 1140I)
12.	811-063C	Hydraulic Fitting, Elbow 3/4" MORB x 3/4" MJIC
13.	811-235C	Hydraulic Hose 3/8" R2 x 3/4" FJIC x 222" Long
14.	811-123C	Hydraulic Hose 3/8" R2 x 3/4" FJIC x 3/4" MORB x 51" Long
15.	811-245C	Hydraulic Hose 3/8" R2 x 3/4" FJIC x 74" Long
16.	811-127C	Hydraulic Hose 3/8" R2 x 3/4" FJIC x 111" Long
17.	811-203C	Hydraulic Fitting, Plug 3/4" MORB
18.	196-008D	Depth Stop Mounting Bracket (Used On Drills With Serial No. After 1139I)
	161-120D	Stroke Control Valve Mount (Used On Drills With Serial No. Before 1140I)
19.	802-097C	Bolt, Hex 1/4"-20 x 2 1/2" Long Gr 5
20.	803-006C	Nut, Lock 1/4"-20
21.	804-006C	Washer, Lock Spring 1/4"
22.	805-017C	Pin, Cotter 3/16" x 1 3/4" Long
23.	805-124C	Pin, Clevis 1" x 3 11/16" Long Gr 5

45' TRANSPORT HYDRAULICS



Ref.	Part No.	Description
1.	194-013C	Stop Clamp Assembly 1 1/2" Rod
2.	811-236C	Hydraulic Hose 3/8" R2 x 3/4" FJIC x 3/4" MORB x 84" Long
3.	811-078C	Hydraulic Fitting, Tee 3/4" MJIC
4.	811-310C	Hydraulic Hose 3/8" R2 x 3/4" FJIC x 198" Long
5.	810-084C	Valve, Hydraulic Stroke Control
6.	811-080C	Hydraulic Fitting 3/4" MORB x 3/4" MJIC Run Tee
7.	811-150C	Hydraulic Fitting 3/4" MJIC x 3/4" FJIC Elbow
8.	811-088C	Hydraulic Fitting, Adapter 3/4" MORB x 3/4" MJIC
9.	810-140C	Cylinder, Rephasing 4 1/2" x 8" x 1 1/2" Rod
10.	810-141C	Rephasing Cylinder 4 3/4" x 8" x 1 1/2" Rod (Used On Drills With Serial No. After 1139I)
	810-069C	Rephasing Cylinder 4 3/4" x 8" x 1 1/2" Rod (Used On Drills With Serial No. Before 1140I)
11.	810-139C	Rephasing Cylinder 4 1/4" x 8" x 1 1/2" Rod (Used On Drills With Serial No. After 1139I)
	810-033C	Rephasing Cylinder 4 1/2" x 8" x 1 1/2" Rod (Used On Drills With Serial No. Before 1140I)
12.	811-063C	Hydraulic Fitting, Elbow 3/4" MORB x 3/4" MJIC
13.	811-311C	Hydraulic Hose 3/8" R2 x 3/4" FJIC x 242" Long
14.	811-123C	Hydraulic Hose 3/8" R2 x 3/4" FJIC x 3/4" MORB x 51" Long
15.	811-245C	Hydraulic Hose 3/8" R2 x 3/4" FJIC x 74" Long
16.	811-127C	Hydraulic Hose R2 3/8" R2 x 3/4" FJIC x 111" Long
17.	811-125C	Hydraulic Hose 3/8" R2 x 3/4" FJIC x 82" Long
18.	196-008D	Depth Stop Mounting Bracket (Used On Drills With Serial No. After 1139I)
	161-120D	Stroke Control Valve Mount (Used On Drills With Serial No. Before 1140I)
19.	802-097C	Bolt, Hex 1/4"-20 x 2 1/2" Long Gr 5
20.	803-006C	Nut, Lock 1/4"-20
21.	804-006C	Washer, Lock Spring 1/4"
22.	810-138C	Rephasing Cylinder 4" x 8" x 1 3/8" Rod (Used On Drills With Serial No. After 1139I)
	810-034C	Rephasing Cylinder 4" x 8" x 1 3/8" Rod (Used On Drills With Serial No. Before 1140I)
23.	811-124C	Hydraulic Hose 3/8" R2 x 3/4" FJIC x 268" Long
24.	805-124C	Pin, Clevis 1" x 3 11/16" Long Gr 5
25.	805-017C	Pin, Cotter 3/16" x 1 3/4" Long
26.	811-203C	Hydraulic Fitting, Plug 3/4" MORB
27.	2A0206	Pin, Short Clevis Midway {Comes With Cylinder}
28.	2A0207	Pin, Long Clevis Midway {Comes With Cylinder}



4 1/2" X 8" X 1 1/2" ROD, REPHASING CYLINDER (810-032C)

Ref.	Part No.	Description
1.	56007-1403	Rod End
2.	56006-1426	Piston Rod
3.	16074-225	Wiper Seal
4.	16184-228	U-Cup Seal
5.	16098-36	Lock Ring
6.	56009-444	Bearing
7.	56011-44	O-Ring Dust Seal
8.	16012-222	Back-Up Washer
9.	16004-22	O-Ring
10.	16004-21-90	O-Ring
11.	16102-272	Slipper Ring
12.	16003-27-90	O-Ring
13.	56002-9	Piston
14.	16000-136	Wear Ring
15.	56004-4408	Barrel
16.	56010-4	Slot Cover
17.	56001-444	Head
	810-047C	Seal Kit

4 1/4" X 8" X 1 1/2" ROD, REPHASING CYLINDER (810-033C)

Ref.	Part No.	Description
1.	56007-1403	Rod End
2.	56006-1426	Piston Rod
3.	16074-225	Wiper Seal
4.	16184-228	U-Cup Seal
5.	16098-34	Lock Ring
6.	56009-424	Bearing
7.	56011-42	O-Ring Dust Seal
8.	16012-220	Back-Up Washer
9.	16004-20	O-Ring
10.	16004-19-90	O-Ring
11.	16102-268	Slipper Ring
12.	16003-27-90	O-Ring
13.	56002-8	Piston
14.	16000-134	Wear Ring
15.	56004-4208	Barrel
16.	56010-3	Slot Cover
17.	56001-420	Head
	810-048C	Seal Kit

4" X 8" X 1 3/8" ROD, REPHASING CYLINDER (810-034C)

Ref.	Part No.	Description
1.	56007-1303	Rod End
2.	56006-1326	Piston Rod
3.	16074-222	Wiper Seal
4.	16184-125	U-Cup Seal
5.	16098-25	Lock Ring
6.	56009-404	Bearing
7.	56011-40	O-Ring Dust Seal
8.	16012-218	Back-Up Washer
9.	16004-18	O-Ring
10.	16004-17-90	O-Ring
11.	16102-264	Slipper Ring
12.	16003-25-90	O-Ring
13.	56002-7	Piston
14.	16000-132	Wear Ring
15.	56004-4008	Barrel
16.	56010-3	Slot Cover
17.	56001-400	Head
	810-049C	Seal Kit

4 3/4" X 8" X 1 1/2" ROD, REPHASING CYLINDER (810-069C)

Ref.	Part No.	Description
1.	56007-1405	Rod End
2.	56006-1426	Piston Rod
3.	16074-225	Wiper Seal
4.	16184-228	U-Cup Seal
5.	16098-38	Lock Ring
6.	56009-464	Bearing
7.	56011-46	O-Ring Dust Seal
8.	16012-224	Back-Up Washer
9.	16004-24	O-Ring
10.	16004-23-90	O-Ring
11.	16102-276	Slipper Ring
12.	16003-27-90	O-Ring
13.	56002-10	Piston
14.	16000-138	Wear Ring
15.	56004-4608	Barrel
16.	56010-4	Slot Cover
17.	56001-464	Head
	810-074C	Seal Kit

Tools required for servicing the wry-loc cylinder:
A complete special tool servicing kit or the individual special tools may be purchased directly from Cessna.

Cessna Tool Servicing Kit 5100-900
which consists of one each of the following:

51100-901 Piston Spanner Wrench
51100-902 9/16-18 UNF-3/8 NPTF Port Wrench
51100-903 3/4-16 UNF-1/2 NPFT Port Wrench

Additional Equipment Required:

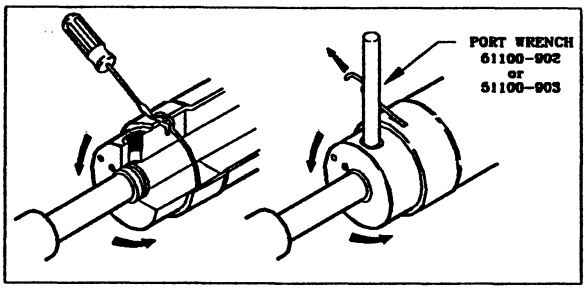
Heavy duty vise
1" dia. steel rod 8" long or 1-1 1/2" dia. rod 8" long
3/4" drive torque wrench (700 ft. lb. maximum)
Automotive type ring compressor or smooth surface hose clamp to fit O.D. of piston
O-Ring hook tool

DISASSEMBLY

1. Drain oil from cylinder and plug all ports. Thoroughly clean outside of cylinder.

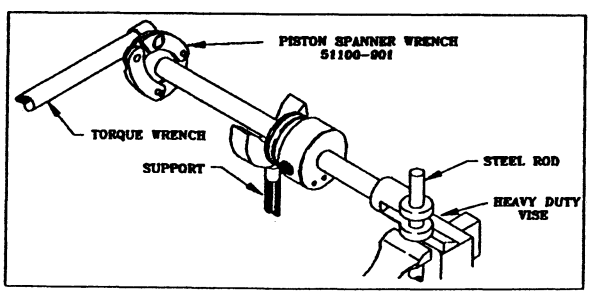
2. Clamp barrel of cylinder in vise near head end. NOTE: Scribe line across barrel and bearing to assure proper reassembly.

3. Remove lock ring on bearing end by lifting up on lock ring at the slot with a screwdriver while rotating the bearing. (A strap wrench or pipe wrench may be used if special port wrench is not available). NOTE: Be sure tab on end of lock ring is in hole in bearing prior to rotating the bearing.



4. Pull out on rod assembly until piston touches bearing, then pull on rod until back up washer and o-ring are exposed under slot in barrel. Use an o-ring hook tool to pull out on o-ring and back up washer through slot. Cut both items and pull out through slot in barrel.

5. Remove piston assembly from barrel.



6. Clamp the appropriate size 8" long steel rod (same dia. as pin hole in clevis) in a heavy duty vise in a vertical position and slide clevis end of cylinder rod over steel rod.

7. Rest piston rod on an appropriate support to keep rod from moving while loosening piston.

8. Use spanner wrench and 3/4" socket drive to loosen piston from rod. NOTE: It is only necessary to remove the piston from the rod to properly service the seals in the cylinder. Occasionaly the clevis may loosen from the rod before the piston. In the event the clevis should loosen first, use the spanner wrench to retorque the piston and clevis to the rod to the proper torque as noted in the torque chart. Retorque the piston till it moves on the rod. Once again use the spanner wrench to remove the piston from the rod, the piston will now loosen before the clevis loosens.

9. Remove bearing from rod.

10. Remove lock ring from head end of cylinder using the same procedure as described when removing bearing from the barrel. Cut and remove back up washer and o-ring then remove head end from barrel.

11. Remove all o-rings, slipper ring, back up washers, u-cup seal and wiper seal from parts.

INSPECTION

The o-rings, slipper ring, back up washer, u-cup seal, wiper seal and lock rings need not be inspected as they are included in the seal repair kit available for these cylinders and should be replaced as new items.

1. Remove all nicks and burrs from all parts with emery cloth.
2. Inspect I.D. of barrel for scoring & excessive wear.
3. Inspect rod for dents, scratches, scoring or pitting.
4. Inspect O.D. of piston for scoring.

REASSEMBLY

1. Clean and dry all parts thoroughly. All parts should be lightly oiled prior to assembly.

2. Install new u-cup seal in I.D. of bearing with u-groove towards pressure side of cylinder (inside of cylinder).

3. Install new wiper seal in I.D. of bearing with lip outward.

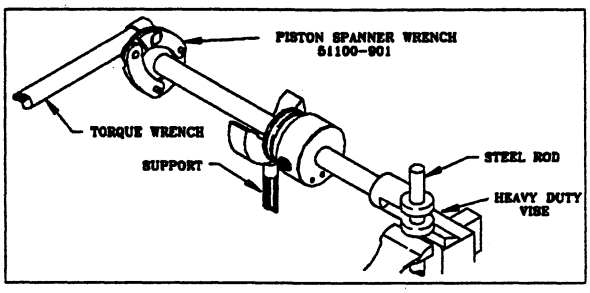
4. Install new back up washer and o-ring on O.D. of bearing with o-ring towards the pressure side.

5. Install new back up washer and o-ring on O.D. of head end with o-ring towards pressure side.

6. Oil rod and carefully slide bearing over rod with a straight forward motion. NOTE: One end of rod has a slight chamfer on O.D. to aid the installation of the bearing over the rod. Always assembly chamfered end of rod through the u-cup and rod wiper seals.

7. Install new o-ring in I.D of piston and install piston to chamfered end of rod.

8. Place support under rod and place clevis on the vertical steel rod in vise. Use 3/4" drive torque wrench and spanner wrench and retorque clevis and piston to rod per the torque specifications required in torque chart. NOTE: It is extremely important that the piston and clevis be retorqued to the required torque specifications.



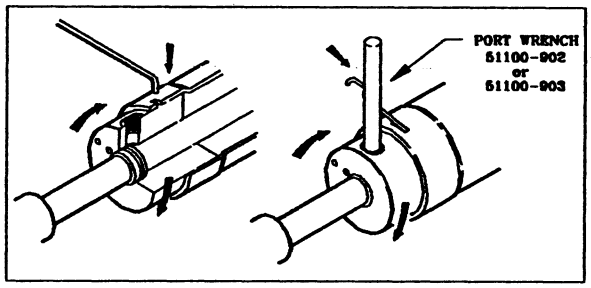
9. Install new o-ring, the one with the red dot, on O.D. of piston, carefully work the slipper ring over piston and into groove. The slipper ring will stretch as it is installed on the piston and it must be compressed after installation to help retain its original size. An automotive type ring compressor or a smooth hose clamp is recommended as a field tool to compress the slipper ring.

Fluid Power Division
Eaton Corporation
P.O. Box 1028
Hutchinson, KS 67501
Phone: (316) 663-5751

10. Clamp barrel assembly in vise and carefully slip in head end. (CAUTION: It may be necessary to use a blunt tool to depress seals as they pass under slot in barrel). Line up lock ring hole in the head with the lock ring groove in the cylinder barrel. Insert lock ring in the hole in head and rotate head until lock ring enters slot in barrel. Guide end of wire into slot then lightly tap end down into slot with hammer.

11. Lubricate O.D. of piston and insert rod and piston assembly into barrel with a straight forward motion. Lubricate bearing O.D. and slide bearing into barrel. (CAUTION: It may be necessary to use a blunt tool to depress seals as they pass under slot in barrel.) Line up lock ring hole in the bearing with lock ring groove in barrel using original scribe line as a guide.

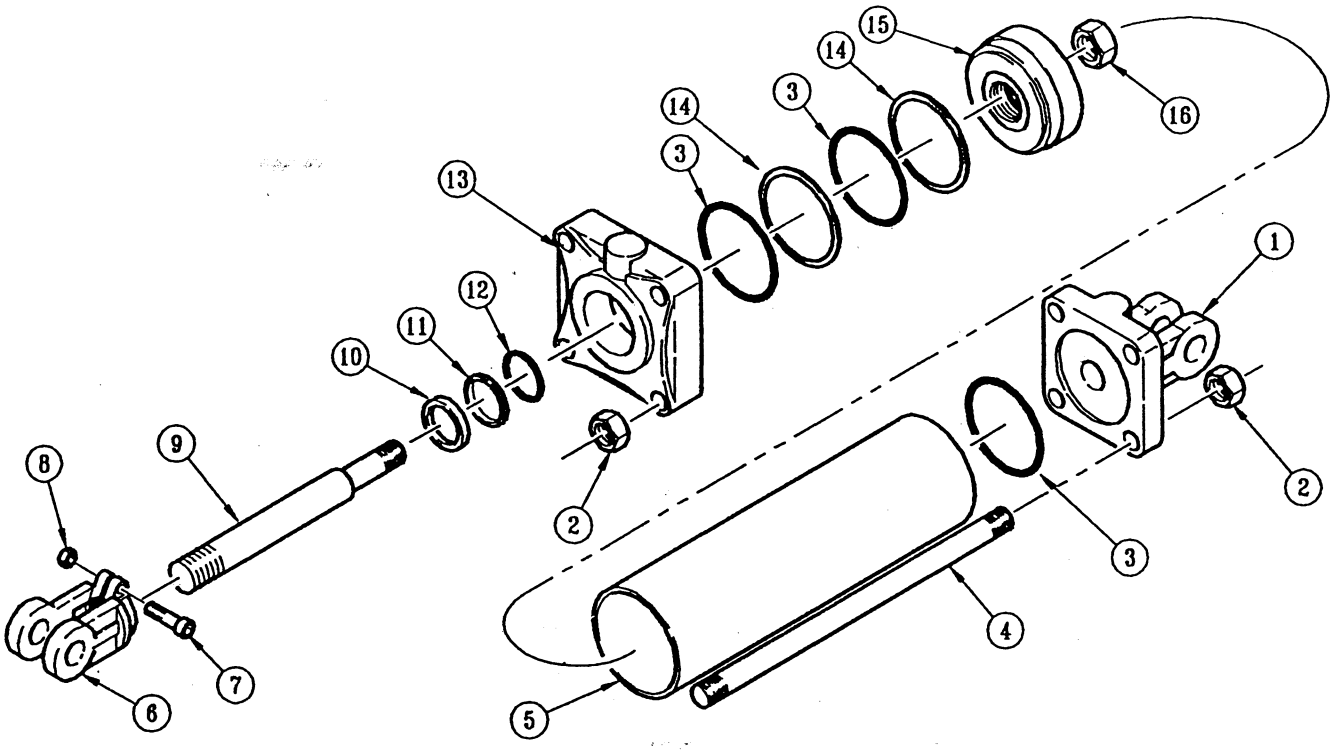
12. Insert lock ring and rotate bearing until lock ring enters slot in barrel. Guide end of wire into slot then lightly tap end down into slot with hammer. Make sure work port is in its original position and scribe lines are in line.



13. Cycle cylinder and check for leaks.

TORQUE SPECIFICATIONS
FOR
PISTON AND ROD CLEVIS

Rod Size	Rod Thread Size	Actual Ft. Lbs. Torque	Torque Wrench Setting Using Spanner Wrench
1-1 8" Dia.	15 16 -16 UN	100	No Holes
1-1 4" Dia.	1-16 UN	205	185
1-3 8" Dia.	1-1 6-16 UN	285	255
1-1 2" Dia.	1-3 16-16 UN	335	300
1-5 8" Dia.	1-5 16-16 UN	425	385
1-3 4" Dia.	1-7 16-16 UN	490	440
1-7 8" Dia.	1-9 16-16 UN	555	500
2" Dia.	1-11 16-16 UN	705	635



3 1/2" X 20" X 1 1/2" ROD, FOLDING CYLINDER (810-030C)

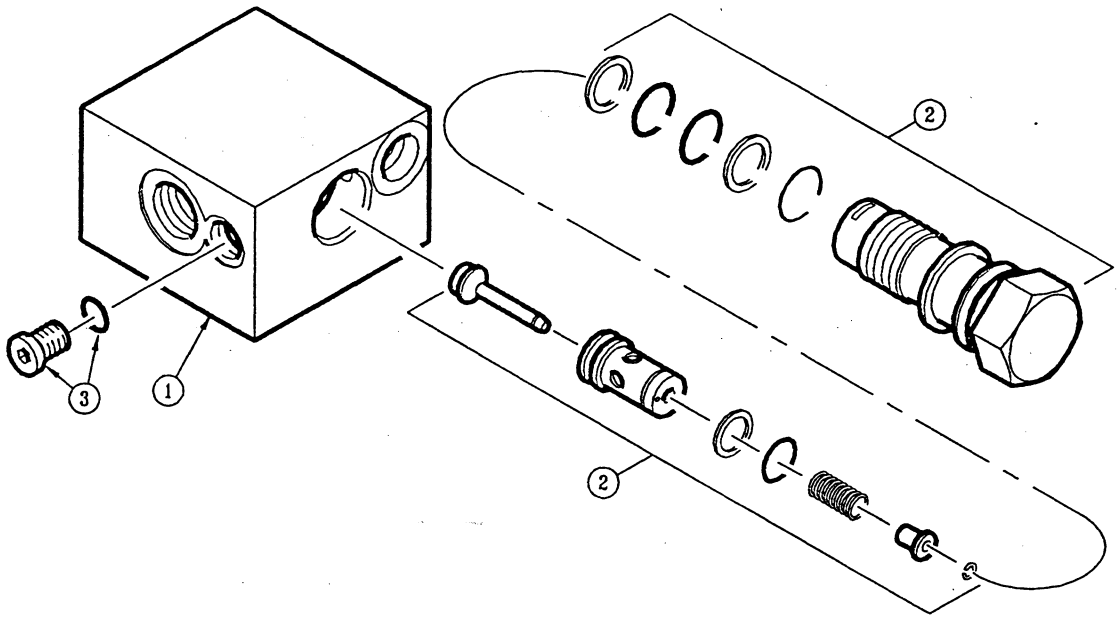
Ref.	Part No.	Description
1.	6M5164	Base
2.	803-023C	Nut, Hex 5/8"-18
3.	2A0076	O-Ring
4.	7M5328	Tie Rod
5.	5M2128	Barrel
6.	1M8022	Clevis
7.	2A0006	Screw, Socket Head Cap 3/8"-16 x 1 3/4" Long
8.	803-014C	Nut, Hex 3/8"-16
9.	2M5528	Rod
10.	2A0040	Wiper
11.	2A0264	Back Up Washer
12.	2A0058	O-Ring
13.	3M5512	Head
14.	2A0098	Back Up Washer
15.	4M5102	Piston
16.	2A0024	Nut, Piston Locking 1"-14
	810-059C	Seal Kit

4" X 40" X 1 1/2" ROD, FOLDING CYLINDER (810-031C)

Ref.	Part No.	Description
1.	6M6164	Base
2.	803-023C	Nut, Hex 5/8"-18
3.	2A0078	O-Ring
4.	7M6348	Tie Rod
5.	5M6148	Barrel
6.	1M8022	Clevis
7.	2A0006	Screw, Socket Head Cap 3/8"-16 x 1 3/4" Long
8.	803-014C	Nut, Hex 3/8"-16
9.	2M6548	Rod
10.	2A0040	Wiper
11.	2A0264	Back Up Washer
12.	2A0058	O-Ring
13.	3M6512	Head
14.	2A0100	Back Up Washer
15.	4M6102	Piston
16.	2A0024	Nut, Piston Locking 1"-14
	810-060C	Seal Kit

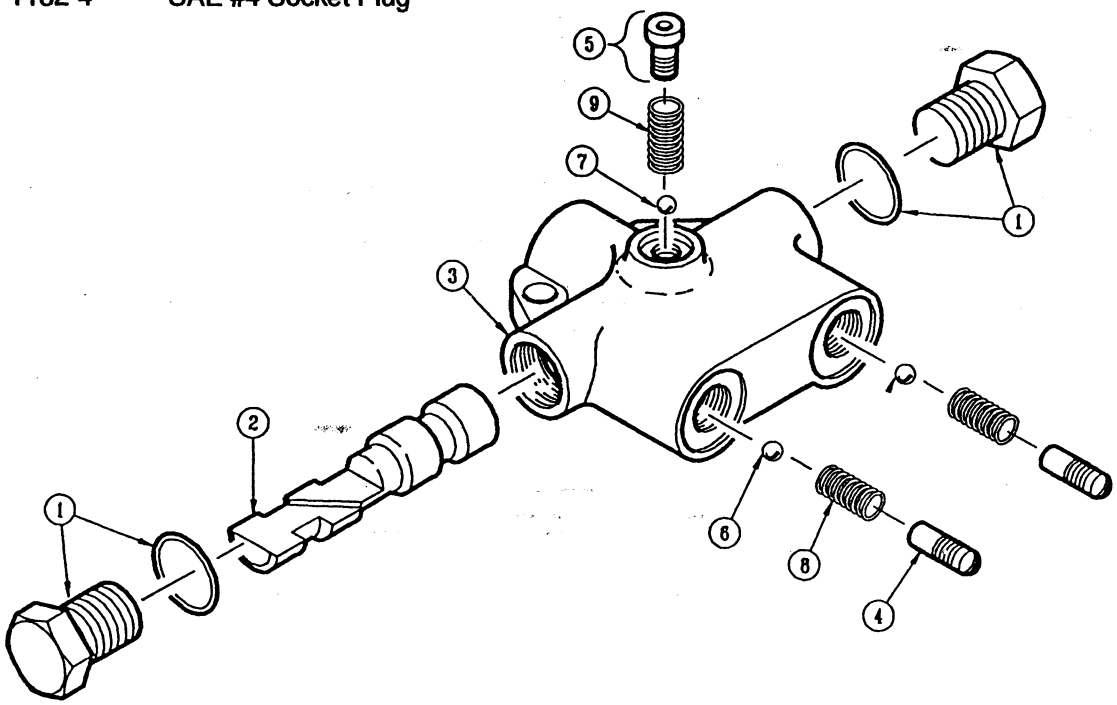
3 1/2" X 36" X 1 1/2" ROD, FOLDING CYLINDER (810-083C)

Ref.	Part No.	Description
1.	6M5164	Base
2.	803-023C	Nut, Hex 5/8"-18
3.	2A0076	O-Ring
4.	7M5344	Tie Rod
5.	5M5144	Barrel
6.	1M8022	Clevis
7.	2A0006	Screw, Socket Head Cap 3/8"-16 x 1 3/4" Long
8.	803-014C	Nut, Hex 3/8"-16
9.	2M5545	Rod
10.	2A0040	Wiper
11.	2A0264	Back Up Washer
12.	2A0058	O-Ring
13.	3M5512	Head
14.	2A0098	Back Up Washer
15.	4M5102	Piston
16.	2A0024	Nut, Piston Locking 1"-14
	810-059C	Seal Kit



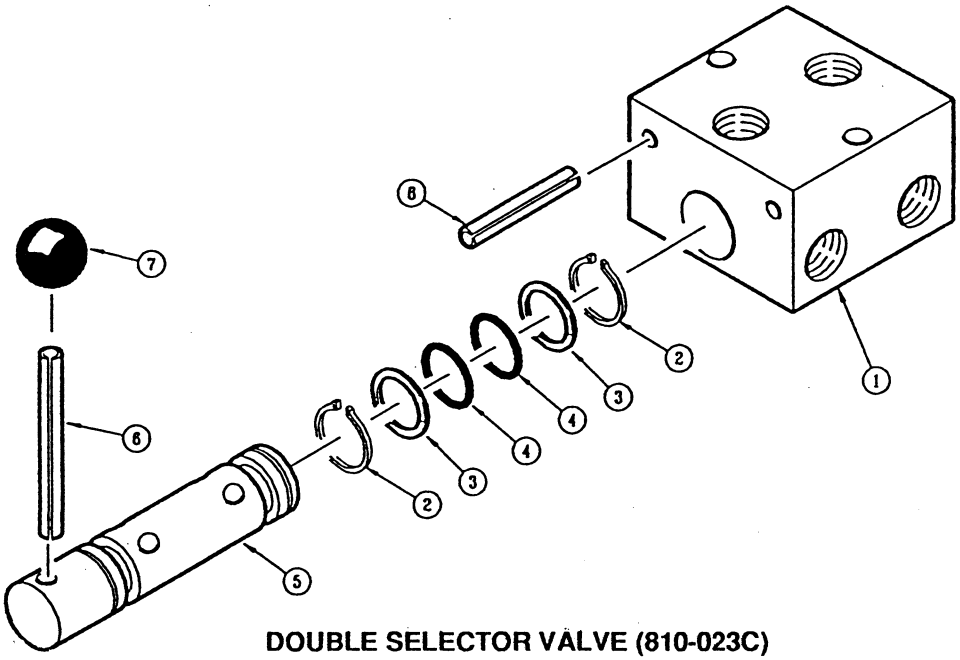
PILOT OPERATED CHECK VALVE (810-004C)

Ref.	Part No.	Description
1.	3084	Body, Special Manifold
2.	1151	Check Valve, Cartridge
3.	1132-4	SAE #4 Socket Plug



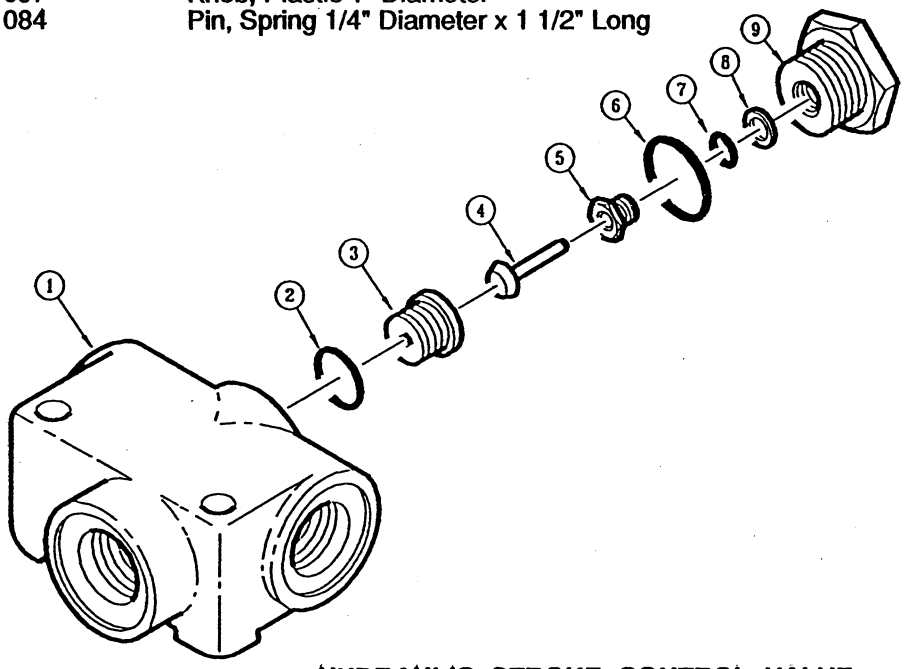
SEQUENCE VALVE (810-006C)

Ref.	Part No.	Description
1.	1V1880	0-Ring Boss Plug Assembly
2.	1V1882	Spool
3.	1V2003	Body Machining
4.	1V2003	Check Valve Retainer
5.	3-V4152-022	O-Ring Boss Plug Assembly
6.	2A0017-6	3/16" Ball
7.	2A0017-8	1/4" Ball
8.	2A9018-3	Check Valve Spring
9.	2A9024-1	Spring
	2A0353-12	Shipping Plug



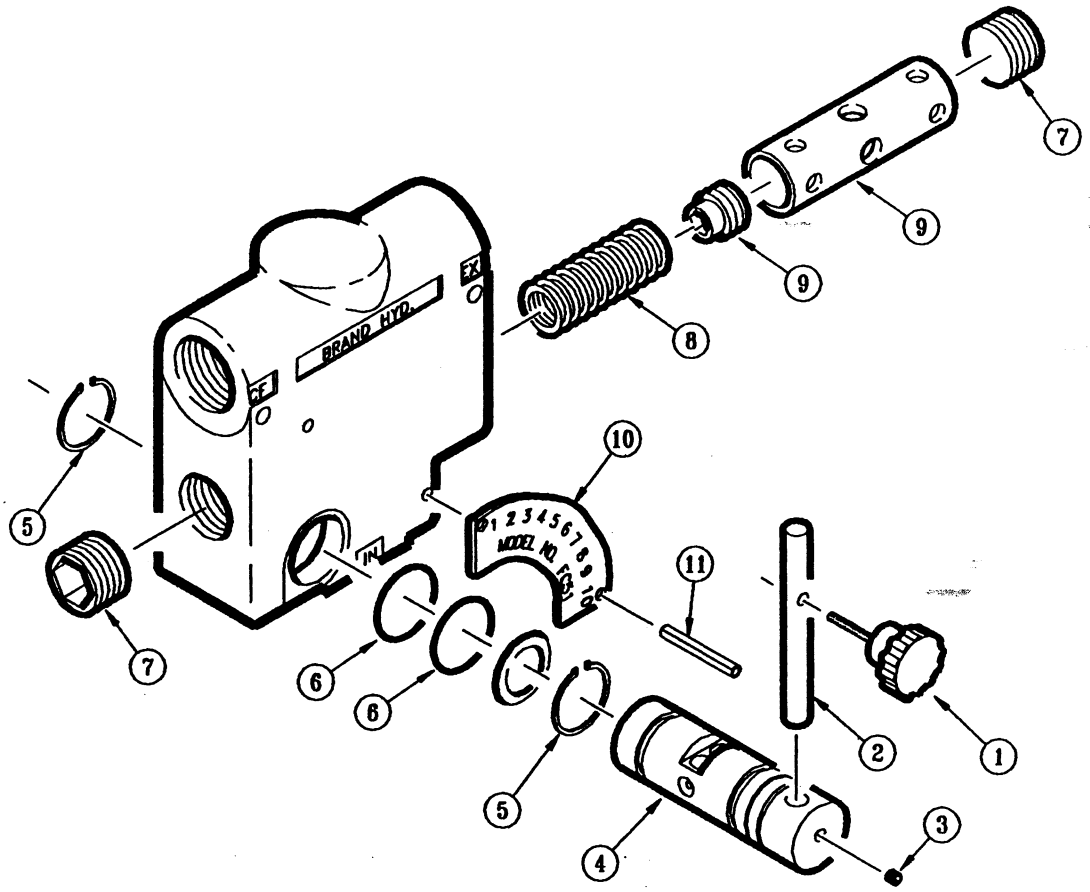
DOUBLE SELECTOR VALVE (810-023C)

Ref.	Part No.	Description
1.	3062	Body
2.	1079	Retaining Ring - Tru-Arc 5100-100
3.	1089-210	Teflon Back-Up Ring 210
4.	1088-210	O-Ring 70 Duro. 210 Buna-N
5.	2007	Spool
6.	1083	Pin, Spring .312" Diameter x 4" Long
7.	1097	Knob, Plastic 1" Diameter
8.	1084	Pin, Spring 1/4" Diameter x 1 1/2" Long



HYDRAULIC STROKE CONTROL VALVE

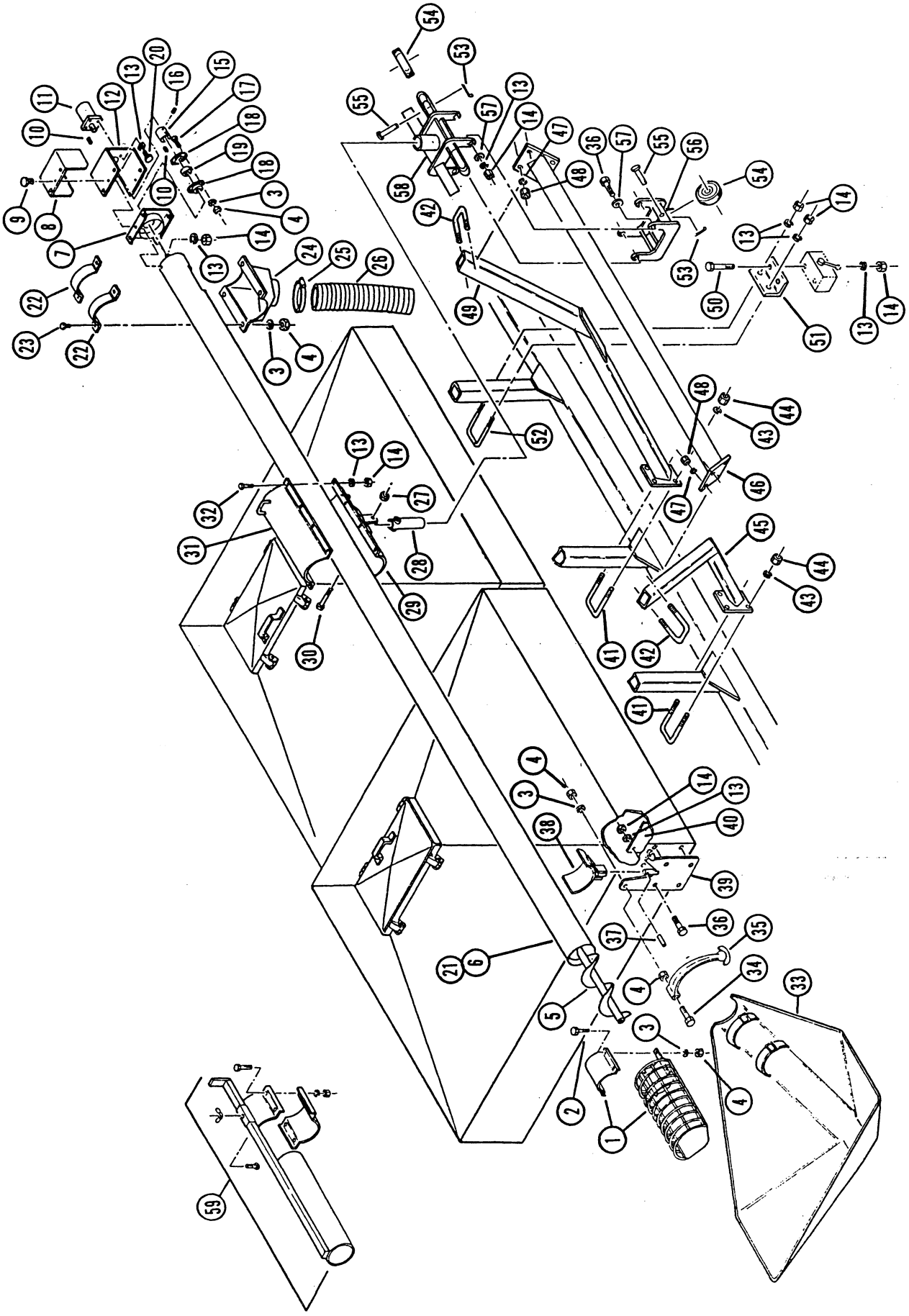
Ref.	Part No.	Description
1.	DM1062000	Valve Body Machined
2.	81908503	O-Ring
3.	DM1119000	Seat
4.	DM1119000	Poppet
5.	DM1117000	Seal Retainer
6.	51912503	O-Ring
7.	81010903	O-Ring
8.	81010564	Back Up Ring, Plastic
9.	DM1116000	Plug



FLOW CONTROL VALVE

Ref.	Part No.	Description
1.	B5068	Thumb Screw
2.	B5021	Handle
3.	AP57	Screw, Set
4.	B5020	Side Lever Spool
5.	B5023	Snap Ring
6.	B5024	O-Ring - 116
7.	B503	Pipe Plug 3/4" NPT
8.	B504	Metering Spring
9.	C-9A	Metering Spool
10.	B5069	Dial Plate 3/8" x 3/4" Valve
11.	B5058	Pin, Roll 3/16" x 7/8"

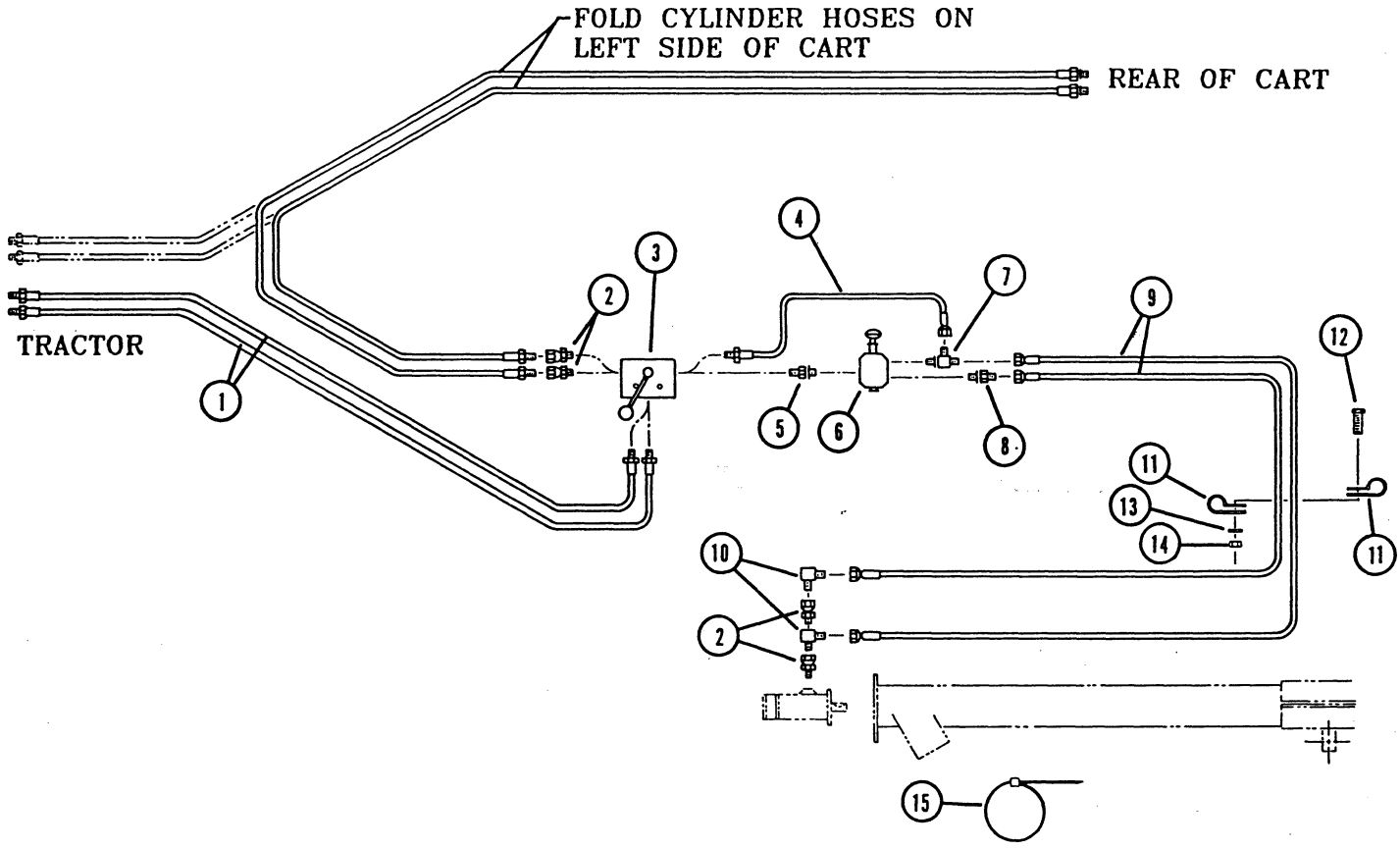
AUGER ASSEMBLY
(OPTIONAL)



AUGER ASSEMBLY (CON'T.)
(OPTIONAL)

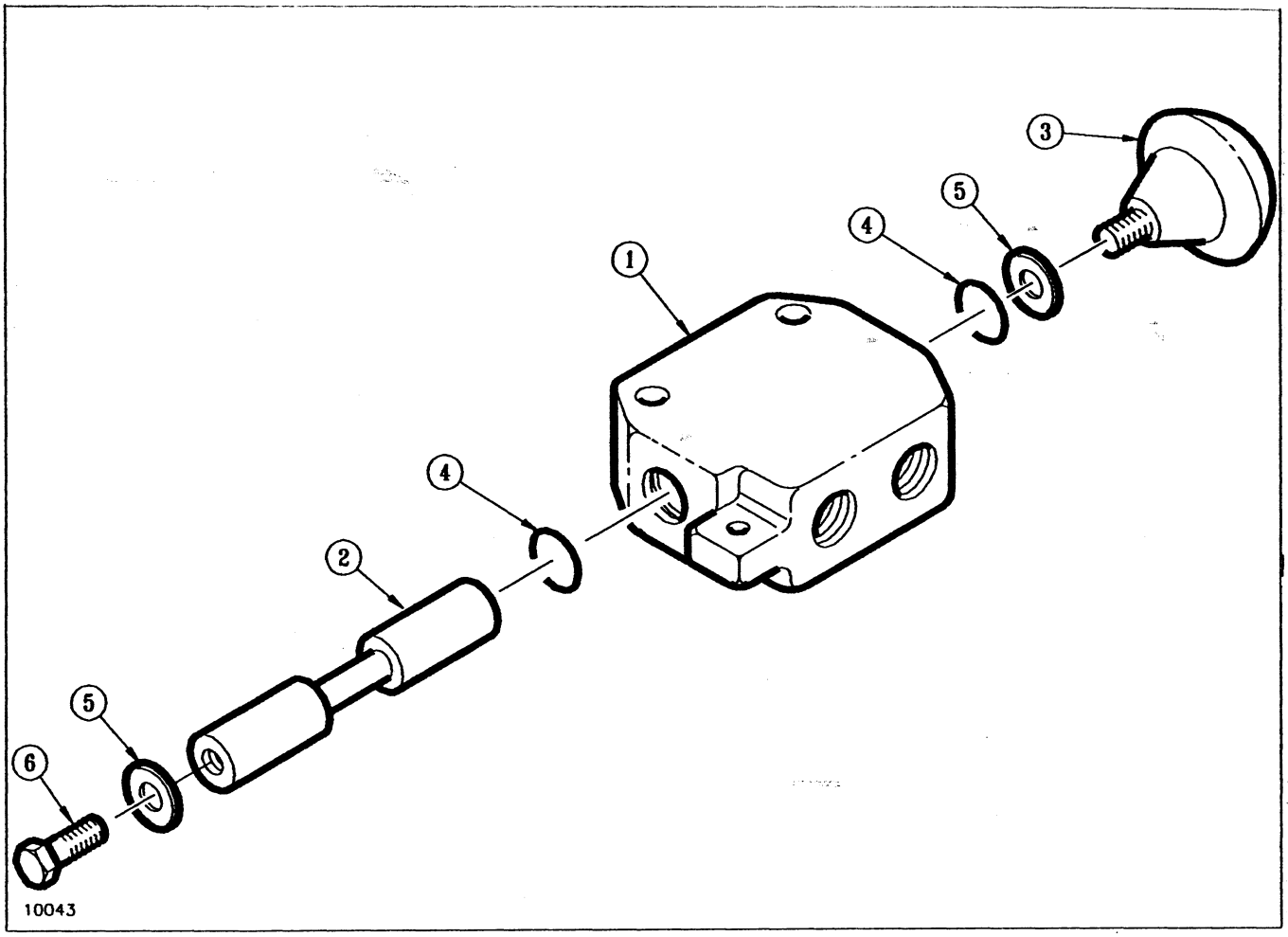
Ref.	Part No.	Description
1.	41-56014	Auger Skid With Intake Guard
2.	802-012C	Bolt, Hex Head 5/16"-18 x 1 1/2" Long Gr 5
3.	804-009C	Washer, Lock Spring 5/16"
4.	803-008C	Nut, Hex 5/16"-18
5.	42-56002	Auger Flighting - 17 Ft.
6.	42-56017	Auger Housing - 17 Ft.
7.	42-56049	Auger Head Plate
8.	42-56068	Hydraulic Motor Guard
9.	802-017C	Bolt, Hex Head 3/8"-16 x 1" Long Gr 5
10.	109-031D	Key 1/4" x 1 1/2" Long
11.	41-95012	Hydraulic Motor, 1/2" NPT
12.	42-56061	Hydraulic Motor Mount
13.	804-013C	Washer, Lock Spring 3/8"
14.	803-014C	Nut, Hex 3/8"-16
15.	42-96051	Hydraulic Motor Shaft Coupler
16.	801-015C	Set Screw 1/4"-20 x 1/2" Long
17.	802-092C	Bolt, Carriage 5/16"-18 x 3/4" Long Gr 5
18.	822-032C	Flangette 52 MST
19.	822-060C	Bearing (NTN #AS205-100)
20.	802-014C	Bolt, Hex Head 3/8"-16 x 3/4" Long Gr 5
21.	823-015C	17 x 6 Utility Auger (Contains Items 1 Through 20)
22.	823-017C	6 Half Band Clamp
23.	802-159C	Bolt, Hex Head 5/16"-18 x 1" Long Gr5
24.	166-010H	Auger Discharge Spout
25.	800-033C	Clamp 6 Inch Worm Drive
26.	166-066D	Auger Flexible Spout 6"
27.	803-025C	Nut, Hex 3/4"-10 Nylock
28.	166-036H	Auger Pivot Cross
29.	166-011H	Auger Bottom Clamp
30.	802-069C	Bolt, Hex Head 3/4"-10 x 5" Long Gr 5
31.	166-012H	Auger Top Clamp
32.	802-022C	Bolt, Hex Head 3/8"-16 x 1 1/2" Long Gr 5
33.	823-016C	Fiber Flexible Hopper
34.	802-138C	Bolt, Hex 5/16"-18 x 2 1/4" Long Gr 5
35.	816-025C	12 Inch Rubber Latch Strap
36.	802-079C	Bolt, Hex Head 3/8"-16 x 1 1/4" Long Gr 5
37.	805-024C	Pin, Roll 3/16" x 1 1/2" Long
38.	166-034H	Auger Storage Saddle
39.	166-033H	Auger Storage Mount
40.	166-064D	Auger Storage Back Up Plate
41.	806-018C	U-Bolt 5/8"-11 x 3 1/32" x 4 1/4" Long Gr 5
42.	806-010C	U-Bolt 1/2"-13 x 2 1/2" x 3 1/2" Long Gr 5
43.	804-022C	Washer, Lock Spring 5/8"
44.	803-021C	Nut, Hex 5/8"-11
45.	166-041H	LH Auger Track Support
46.	166-039H	Auger Track
47.	804-015C	Washer, Lock Spring 1/2"
48.	803-020C	Nut, Hex 1/2"-13
49.	166-040H	RH Auger Track Support
50.	802-147C	Bolt, Hex Head 3/8"-16 x 3 1/2" Long Gr 5
51.	166-065D	Auger Control Mount Bracket
52.	806-021C	U-Bolt 3/8"-16 x 3 1/32" x 4" Long
53.	805-019C	Pin, Cotter 5/32" x 1" Long
54.	814-047C	Wheel 4" x 1 1/4" Solid Plastic
55.	805-154C	Pin, Clevis 3/8" x 2 1/64" Usable
56.	166-038H	Bottom Track Wheel Mount
57.	804-012C	Washer, Flat 3/8" SAE
58.	166-037H	Top Track Wheel Mount
59.	823-030C	Auger Control Gate, 6" (Optional)

AUGER HYDRAULICS
(OPTIONAL)



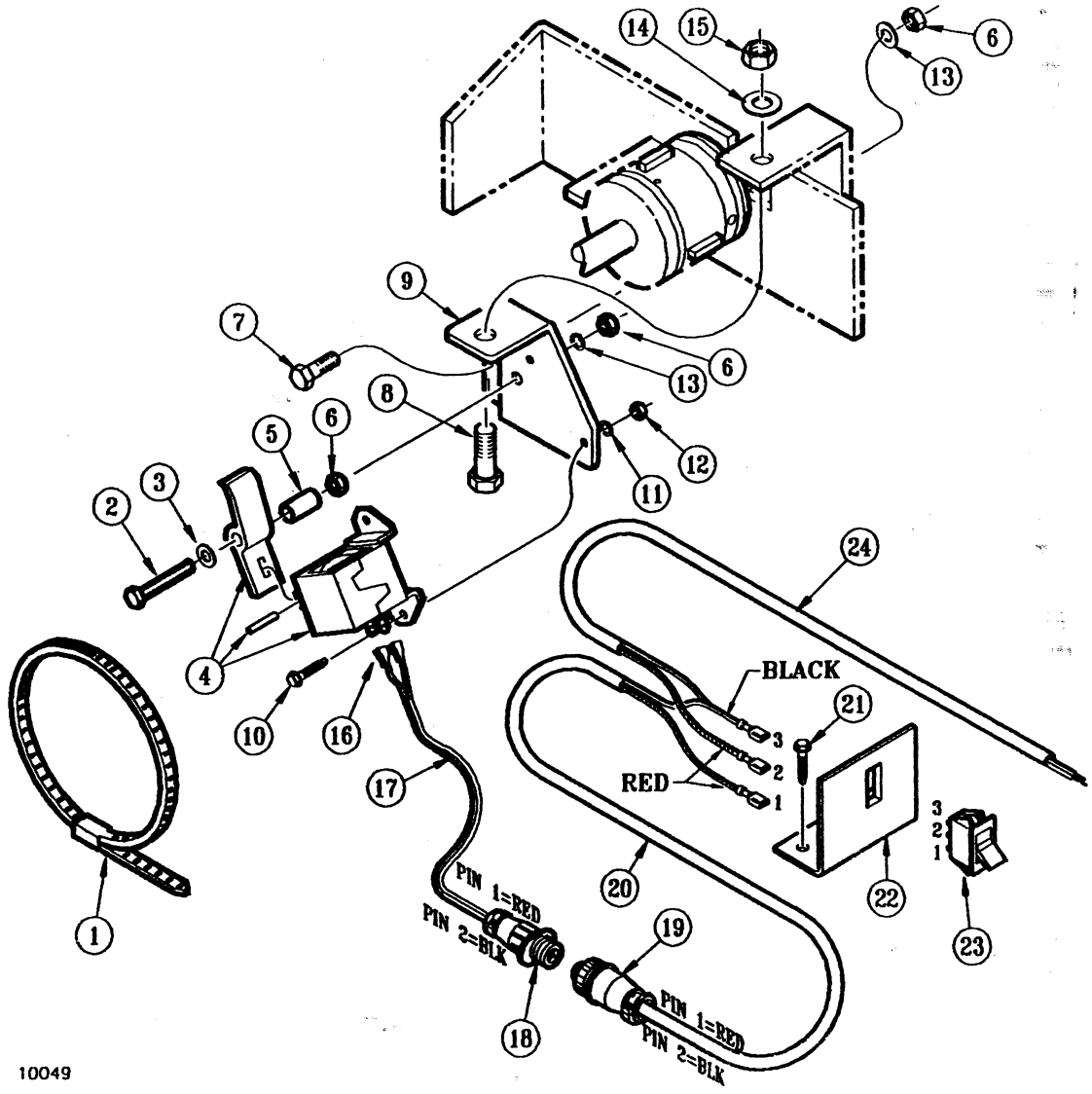
Ref.	Part No.	Description
1.	811-020C	Hydraulic Hose 1/2" R2 x 1/2" MNPT x 144" Long
2.	811-158C	Hydraulic Fitting 1/2" FNPT Swivel x 1/2" MNPT
3.	810-023C	Double Selector Valve
4.	811-162C	Hydraulic Hose 3/8" R1 x 1/2" MNPT x 3/4" FJIC x 21" Long
5.	811-016C	Hydraulic Fitting, Adapter 3/4" MORB x 1/2" MNPT
6.	810-062C	Valve Selector, 3 Way, 2 Position
7.	811-080C	Hydraulic Fitting, Run Tee 3/4" MORB x 3/4" MJIC
8.	811-088C	Hydraulic Fitting, Adapter 3/4" MORB x 3/4" MJIC
9.	811-278C	Hydraulic Hose 3/8" R1 x 3/4" FJIC x 200" Long
10.	811-038C	Hydraulic Fitting, Elbow 3/4" MJIC x 1/2" MNPT
11.	800-064C	Hose Clip 13/16" ID
12.	802-017C	Bolt, Hex Head 3/8"-16 x 1" Long Gr 5
13.	804-013C	Washer, Lock Spring 3/8"
14.	803-014C	Nut, Hex 3/8"-16
15.	800-035C	Cable Tie 24" Long

HYDRAULIC SELECTOR VALVE



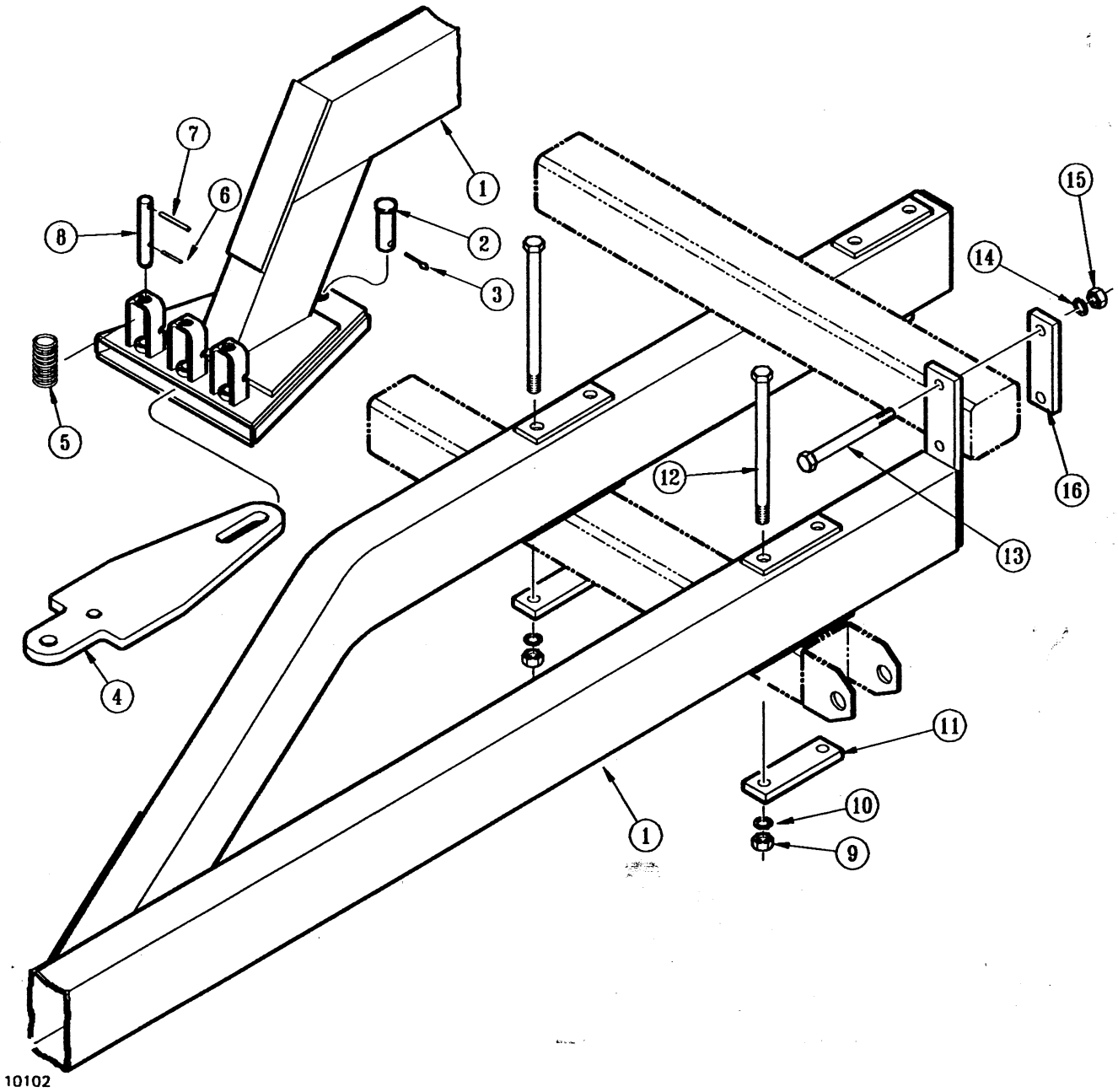
Ref.	Part No.	Description
1.	R-1151	Selector Valve Body
2.	A-3136	Selector Valve Spool
3.	A-3296	Knob
4.	80306	O-Ring 3/4" x 15/16"
5.	81524	Washer, Flat 3/8"
6.	80796	Screw, Cap Hex Head 3/8"-24 UNF 3/4" Long

ELECTRIC CLUTCH ASSEMBLY



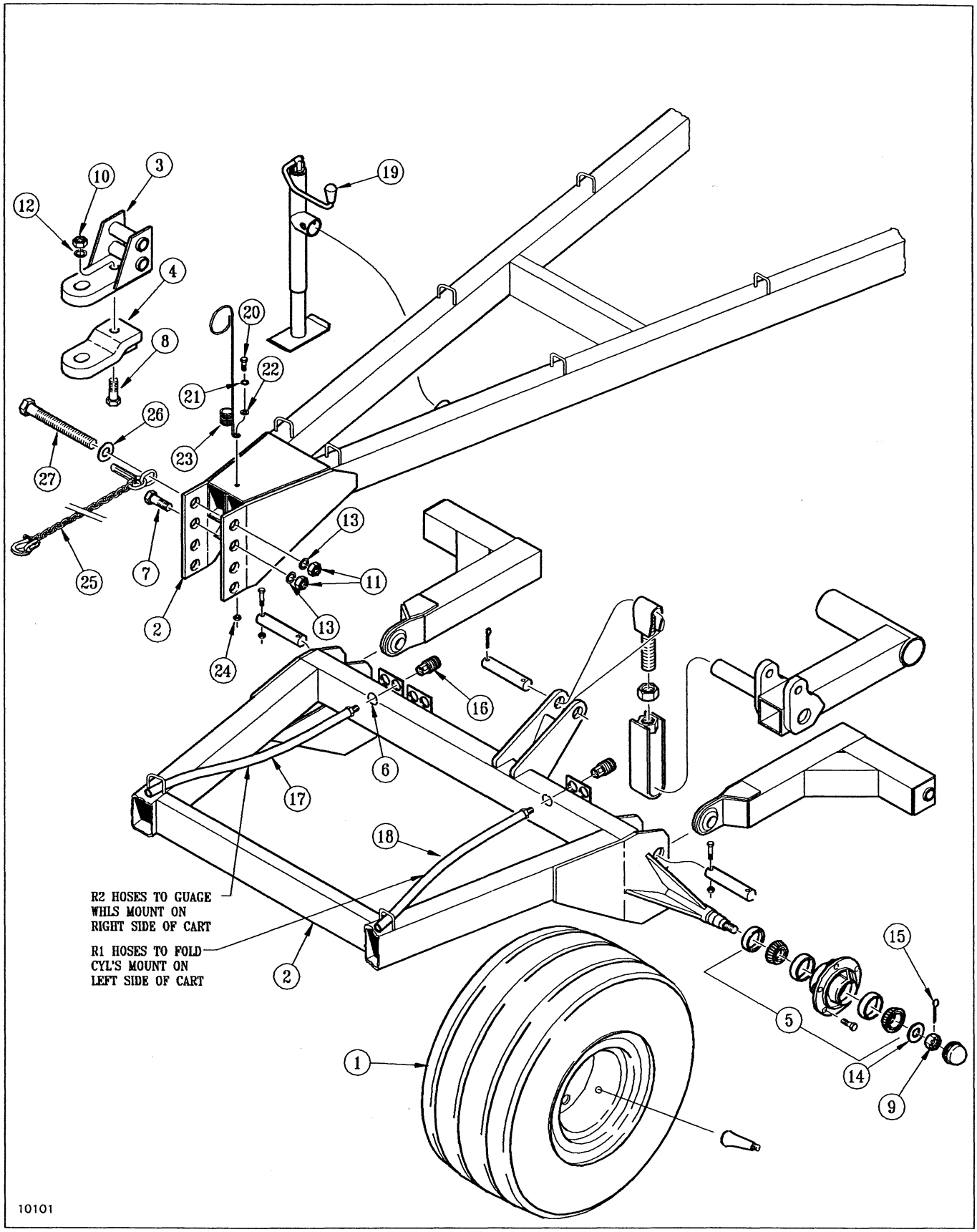
Ref.	Part No.	Description
1.	800-082C	Cable, Tie 21" Long
2.	802-197C	Bolt, Hex Head 5/16"-18 x 2 3/4" Long
3.	804-036C	Washer, Flat 5/16"
4.	823-022C	Coil & Actuator Assembly - Clockwise
5.	116-053D	Clutch Pivot Bushing
6.	803-008C	Nut, Hex 5/16"-18 Gr 2
7.	802-012C	Bolt, Hex Bead 5/16"-18 x 1 1/2" Long Gr5
8.	802-258C	Bolt, Hex Head 1/2"-13 x 1" Long Gr 5
9.	116-129D	Air Drill Clutch Solenoid Mount
10.	802-163C	Bolt, Hex Head #10-24 x 1/2" Long Gr 5
11.	804-054C	Washer, Lock #10
12.	803-001C	Nut, Hex #10-24 Plated
13.	804-009C	Washer, Lock Spring 5/16" Plated
14.	804-015C	Washer, Lock Spring 1/2" Plated
15.	803-020C	Nut, Hex 1/2"-13 Gr 2 Plated
16.	112-2564-000	Female Push-On Terminal 18-14, .250
17.	325-0014-000	2 Lead 18 Ga. Wire 16' Long
18.	112-2637-001	2 Prong Male Disconnect (Amp No. 1-480723 With N.S.)
19.	112-2637-000	2 Prong Female Disconnect (Amp No. 1-480724 With N.S.)
20.	309-1882-POO	2 Lead 18 Ga. Wire 10' Long
21.	801-002C	Screw, Hex Slotted #10-16 x 3/8"
22.	116-128D	Single Clutch Switch Mounting Plate
23.	110-0109-001	Illuminated Rocker Switch-Carling No. LTA111-PDB-R-12V
24.	309-1882-POO	2 Lead 18 Ga. Wire 8' Long
25.	823-051C	Air Drill Clutch Wiring Harness

NURSE TANK HITCH KIT



Ref.	Part No.	Description
1.	116-059H	Air Drill Nurse Tank Hitch
2.	805-137C	Pin, Clevis 1" x 2" Long Plated
3.	805-104C	Pin, Cotter 3/16" x 1 1/2" Long Plated
4.	116-099D	Nurse Tank Hitch Tongue
5.	807-058C	Spring .793" I.D. x 3.75" Long x .080" Wide
6.	805-076C	Pin, Roll 3/16" x 1 3/4" Long Plated
7.	805-117C	Pin, Roll 1/4" x 2 1/2" Long
8.	116-100D	Nurse Tank Hitch Lock Pin
9.	803-027C	Nut, Hex 3/4"-10 Plated
10.	804-023C	Washer, Lock Spring 3/4" Plated
11.	162-018D	Press Wheel Adjustment Screw Arm Bolt Plate
12.	802-141C	Bolt, Hex Head 3/4"-10 x 13" Long Plated Gr 5
13.	802-062C	Bolt, Hex Head 5/8"-11 x 5" Long Gr 5
14.	804-022C	Washer, Lock Spring 5/8" Plated
15.	803-021C	Nut, Hex 5/8"-11 Plated
16.	116-101D	Nurse Tank Hitch Bolt Plate

PULL HITCH BUNDLE
(PART NO. 166-045A)



PULL HITCH BUNDLE (CON'T.)
(PART NO. 166-045A)

Ref.	Part No.	Description
1.	161-046K	6 Bolt Wheel & Tire 6 Ply Tubeless (See Page 46)
2.	166-044H	Air Drill Pull Hitch
3.	170-034H	Single Hitch Strap - Small
4.	170-040H	Lower Hitch
5.	200-001S	Hub Package 6 Bolt (See Page 46)
6.	800-044C	Snap Ring, External 1 1/2" Shaft
7.	802-166C	Bolt, Hex Head 1 1/4"-7 x 9 1/2" Long Gr 5
8.	802-169C	Bolt, Hex Head 1"-8 x 3 1/2" Long Gr 5
9.	803-029C	Nut, Hex Slotted 7/8"-14 Plated
10.	803-031C	Nut, Hex 1"-8 Plated
11.	803-034C	Nut, Hex 1 1/4"-7 Plated
12.	804-027C	Washer, Lock Spring 1" Plated
13.	804-030C	Washer, Lock Spring 1 1/4" Plated
14.	804-055C	Washer, Spindle 7/8"
15.	805-016C	Pin, Cotter 3/16" x 1 1/4" Long Plated
16.	811-204C	Hydraulic Fitting Q.D. Coupler -8 FORB Bulk Head
17.	811-314C	Hydraulic Hose 3/8" R2 x 217" Long
18.	811-313C	Hydraulic Hose 3/8" R1 x 217" Long
19.	890-007C	Jack, Screw
20.	802-091C	Bolt, Hex Head 1/2"-13 x 1 1/2" Long Gr 5
21.	804-015C	Washer, Lock Spring 1/2" Plated
22.	804-017C	Washer, Flat 1/2" USS Plated
23.	807-073C	Spring Hose Loop 5/16" x 21
24.	803-020C	Nut, Hex 1/2"-13 Plated
25.	890-184C	Safety Chain 30,000#
26.	194-070D	Safety Chain Washer
27.	802-298C	Bolt, Hex Head 1 1/4"-7 x 4" Long Gr 5