

NEW LEADER[®]

MODEL MICROBIN

UNIT SERIAL NUMBER _____

MANUAL NUMBER: 305252-C

EFFECTIVE 03/2014



Highway Equipment Company

Building the best since 1939.

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INSERT CURRENT NEW
LEADER WARRANTY

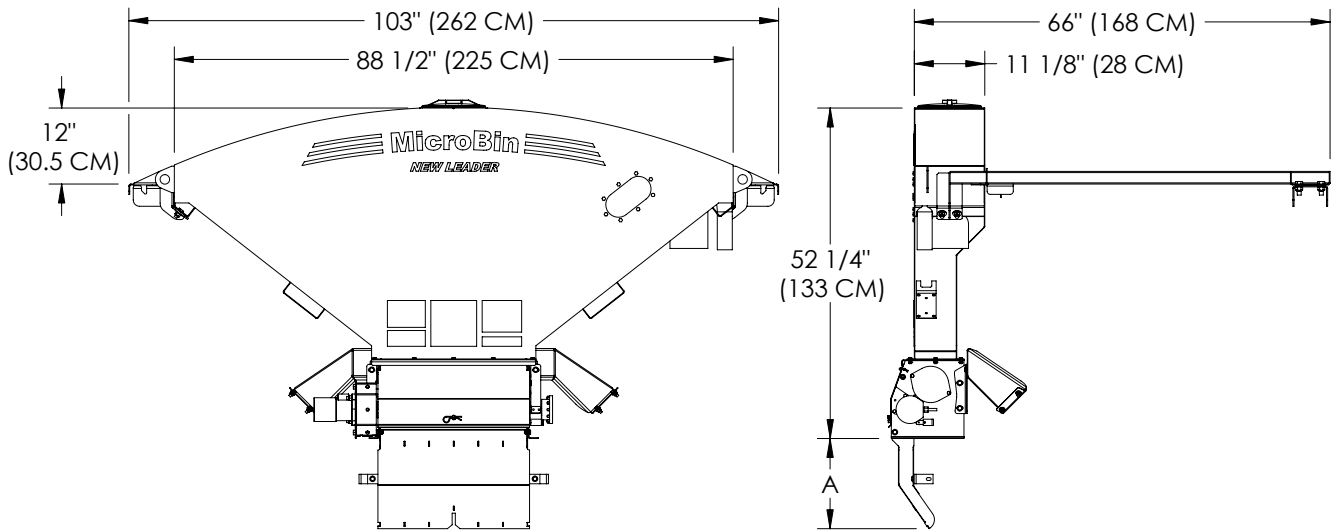
The Model MICROBIN is a hopper-type spreader intended for spreading micro-nutrients and seeds. **The MICROBIN is not intended for spreading herbicides.** Designed for mounting on 102" wide New Leader spreaders, it may be used with New Leader single bin or dual bin spreaders—providing the capabilities of up to three product bins at once.

Hydraulic power drives the metering wheel by means of an orbital type hydraulic motor. An encoder fastened to the drive shaft provides feedback of meter wheel revolutions.

The MICROBIN is designed to be used with a pneumatic fill system (not provided). A 2-1/4" pipe with a camlock quick connect is provided for attaching the pneumatic fill.

This product is intended for commercial use only.

DIMENSIONS & CAPACITIES



Capacity Cu Yd (Cu M) Cu Ft	Approximate Weight Lb (Kg)
0.407 (0.312) 11.0	440 (199.6)

Units	A
For use without MULTAPPLIER L3020G4/L3020XP/L3220G4 MR/L3030G4 MR	14-1/4" (36 CM)
For use with MULTAPPLIER L3220G4 & L3030G4 Complete	23-5/8" (60 CM)

DIMENSIONS & CAPACITIES



HYDRAULIC REQUIREMENTS

NOTICE! Hydraulic and truck requirements must be determined prior to installation of the MICROBIN.

Pump Flow: 3 GPM (Gallons per Minute)

Relief Pressure: 1000 PSI

NOTE: New Leader spreaders are equipped with hydraulics that supply the additional flow needed to run the MICROBIN.

TRUCK REQUIREMENTS

Before installing the MICROBIN spreader, the following major questions must be considered:

1. Does the CA (Cab to Axle) dimension of the truck permit the addition of the MICROBIN?
2. Is the truck's GAWR (Gross Axle Weight Rating) and the GVWR (Gross Vehicle Weight Rating) adequate to carry the fully loaded spreaders?

Refer to your New Leader dealer to find the GAWR and GVWR for most trucks, and how to calculate the weight distribution on each axle and total loaded vehicle weight.

FEEDGATE HANDLE MODIFICATION – Use with L3020G4, L3220G4 MR & L3030G4 MR

Parts needed:

ITEM	DESCRIPTION	QTY	
1	Handle Extension	1	<ol style="list-style-type: none"> 1. Remove existing feedgate handle. 2. Install Handle Extension (1) in existing u-joint and secure with Hair Pin (2). 3. Slide Handle Bracket (3) over Handle Extension. 4. Slide new Handle (5) through bracket on side sheet and fasten to Handle Extension with U-Joint (4) and Hair Pins. 5. Mount MICROBIN per instructions on the following pages and fasten Handle Bracket to hopper with existing hardware as shown in Figure 1.
2	Hair Pin	3	
3	Handle Bracket	1	
4	U-Joint	1	
5	Handle	1	
6	Pipe	1	

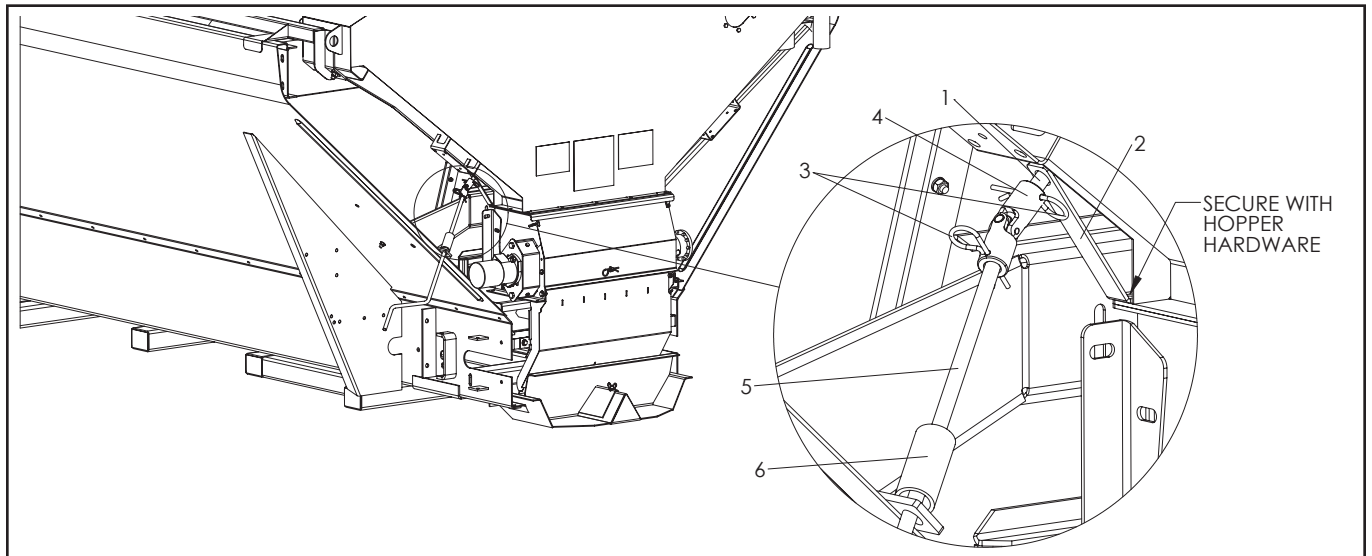


Figure 1 – Feedgate Handle Modification

Handle Modification use with MICROBIN Removed

A pipe coupling is provided to lock the handle joint when the MICROBIN is not installed. Remove the top Hair Pin, slide the Pipe (6) over the U-Joint and replace the Hair Pin.

MICROBIN MOUNTING**Spreader Preparation**

Clean the spreader thoroughly. Remove the roll tarp rear endgate cover and tarp brackets if applicable.

Installing MICROBIN Mounts

Parts needed:

<u>ITEM</u>	<u>DESCRIPTION</u>	<u>QTY</u>	<u>ITEM</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	Template – Lower Mount	1	9	Cap Screw – 3/8-16 x 1	10
2	Bracket – Lower Mount	1	10	Cap Screw – 3/8-16 x 1-1/2	2
3	Cradle Weldment	1	11	Flat Washer – 3/8	16
4	Clamp	2	12	Lock Nut – 3/8-16	12
5	Cap Screw – 5/8-11 x 1-3/4	4	13	Cap Screw – 1/2-13 x 1-1/4	4
6	Lock Nut – 5/8-11	4	14	Flat Washer – 1/2	4
7	LH Angle – Lower Mount	1	15	Lock Nut – 1/2-13	4
8	RH Angle – Lower Mount	1			

**CAUTION**

Make sure drill will not puncture gas tank or harm any other obstruction before drilling holes!

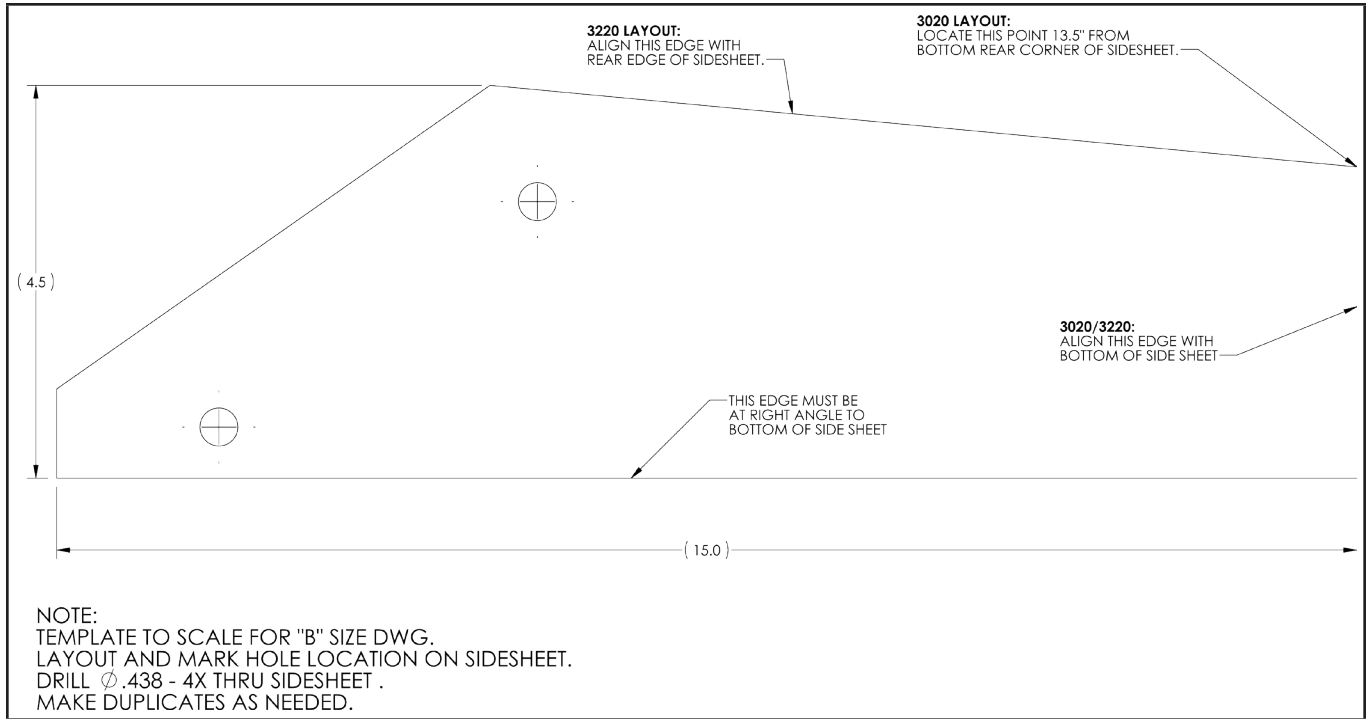
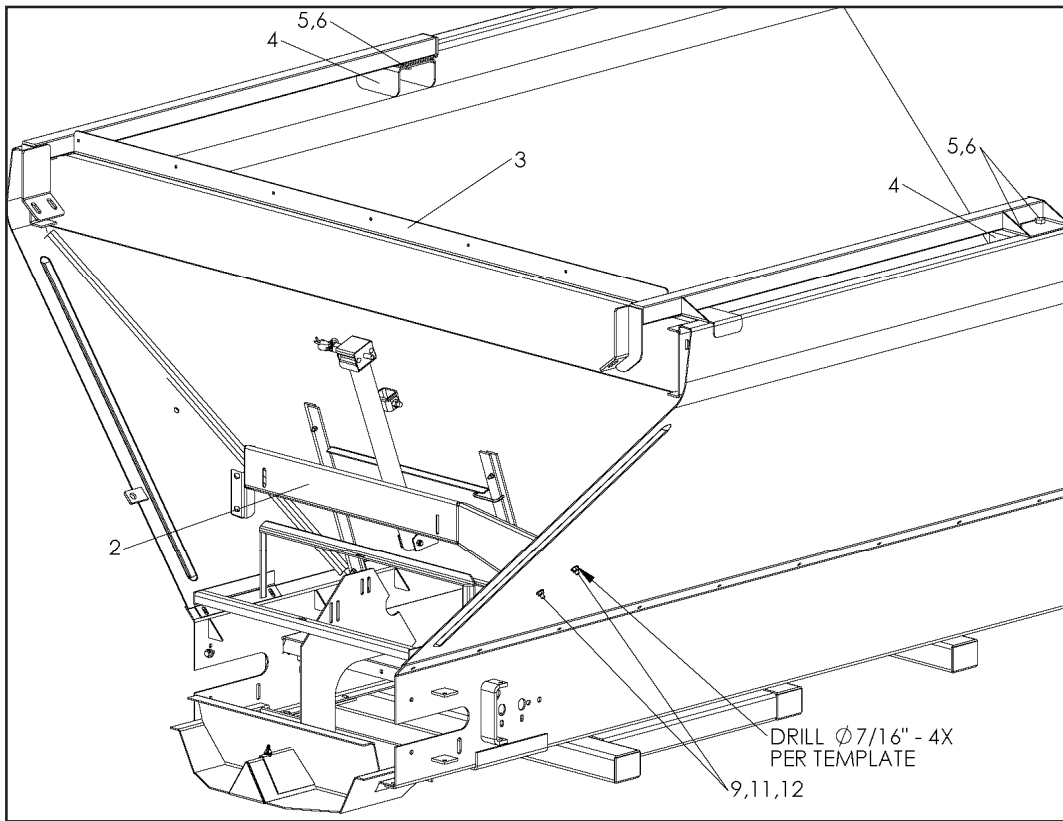


Figure 2 – Template

*13.5" = 34.29cm

1. Locate holes in side sheets using the template (1, Figure 2) supplied with the mount kit and drill as specified.
2. Install Lower Mount Bracket (2) between side sheets in drilled holes as shown in Figure 3. Secure with 3/8 x 1 hardware (9,11,12) and tighten to recommended torque.
3. Position Cradle Weldment (3) on top of spreader with the rear angle over the rear endgate as shown in Figures 3 & 4.
4. Place Clamps (4) under side sheet top flanges and align with holes in cradle as shown in Figure 3. Secure with 5/8" hardware (5, 6) and tighten to recommended torque.



5. Drill two 7/16" (1.11cm) holes in top of rear endgate as shown in Figure 4, using Cradle as a template.
6. Fasten Cradle to rear endgate with 3/8 x 1-1/2" hardware and tighten to recommended torque.

Figure 3 – Lower Mount Bracket and Cradle

7/16" = 1.11cm

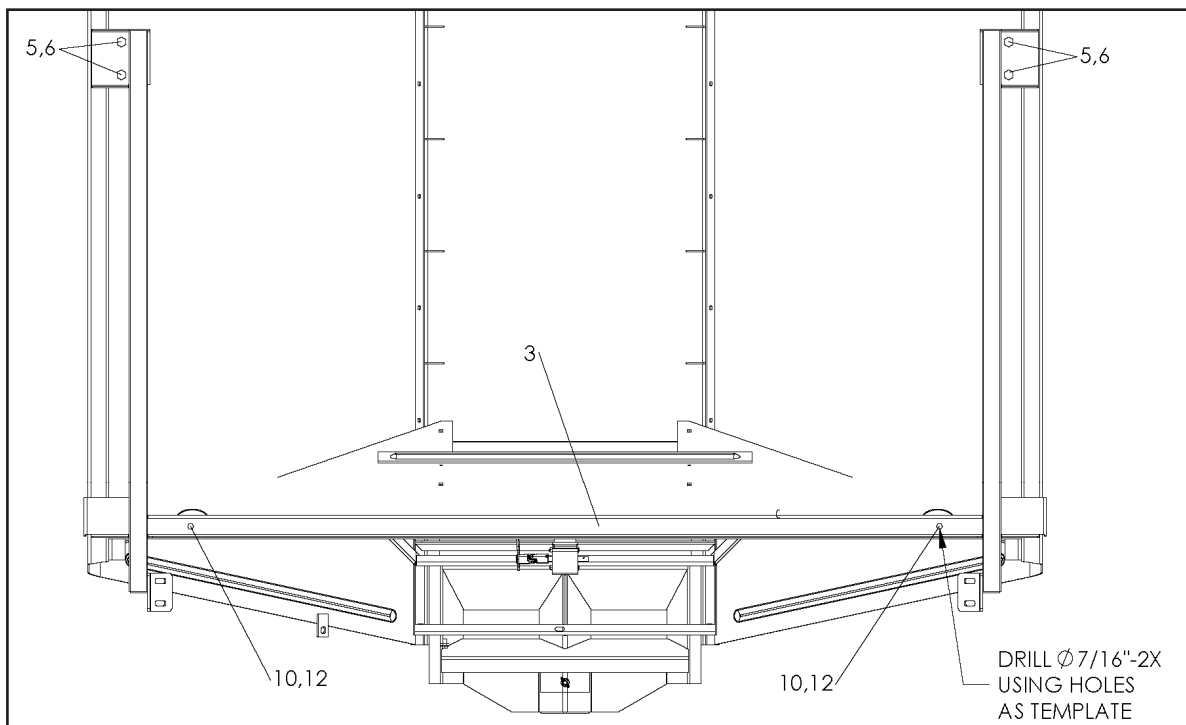


Figure 4 – Cradle Installation

Figure 87/16" = 1.11cm

INSTALLATION

MICROBIN Installation**WARNING**

Lifting devices used should always meet or exceed OSHA standard 1910.184. Never exceed work load limits or lift equipment over people. Empty spreader before lifting. Loads may shift or fall if improperly supported, causing injury or damage to the unit.

**WARNING**

Keep unit supported until mounting is complete. Unit could slip off chassis, causing injury or damage to unit.

7. Using a suitable lifting device, lift empty MICROBIN onto mounts. Always inspect unit lift points for signs of wear, cracking, corrosion, gouges, alterations, or distortion. Always use a sling, spreader bar, or lifting bar that attaches to the lifting points with a minimum of 60 degrees from horizontal. It is preferable to use an "H" style lifting bar that keeps the attaching chains in a near vertical orientation.
8. Secure to Cradle with 1/2" hardware (13,14,15) and torque as required.
9. Install Brackets (7 & 8) on MICROBIN as shown in Figure 5 for units without MULTAPPLIERS installed. Switch Brackets to opposite side when installing on units with MULTAPPLIERS installed. Secure using 3/8 x 1" hardware (9,11,12). Fasten to Lower Mount Bracket with remaining hardware. Tighten hardware to recommended torques.

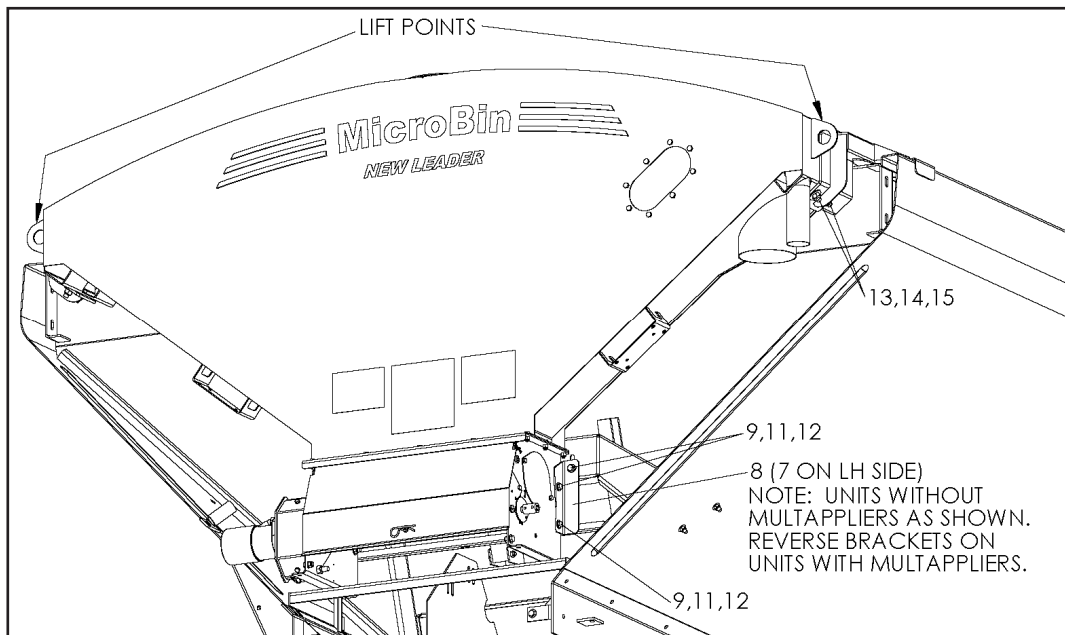
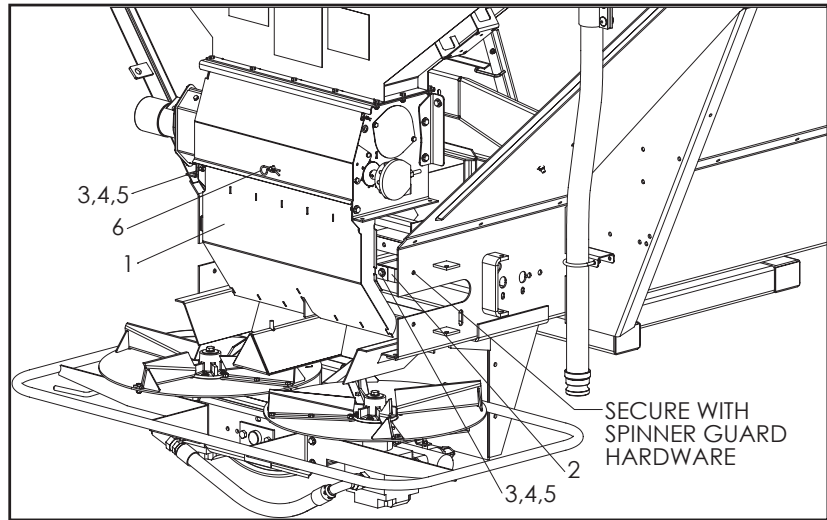


Figure 5 – Bin Mounting

DIVIDER

Parts needed:

ITEM	DESCRIPTION	QTY
1	Divider	1
2	Mounting Angle	2
3	Cap Screw – 3/8-16 x 3/4	4
4	Flat Washer – 3/8	6
5	Lock Nut – 3/8-16	4
6	Hair Pin	1

**Figure 6 – Divider Installation**

1. Remove upper spinner guard and rear material divider plate.
2. Loosely fasten Mounting Angles (2) to Divider (1) with hardware provided (3,4,5).
3. Lift the hopper cover and position Divider (1) between sills as shown in Figure 6. Loosely attach to hopper with remaining Hardware.
4. Close hopper cover over divider and secure with Hair Pin (6).
5. Attach Mounting Angle to Divider with remaining hardware.
6. Replace rear material divider plate.
7. Replace upper spinner guard and secure Mounting Angles to sills with the upper guard hardware.
8. Make sure Divider is centered over material divider and tighten all hardware.

FILL PIPE

Parts needed:

ITEM	DESCRIPTION	QTY
1	Bracket	1
2	Cap Screw – 5/16-18 x 1	2
3	Lock Nut – 5/16-18	2
4	Fill Pipe	1
5	Adapter	1
6	Coupling	1
7	U-Bolt	1

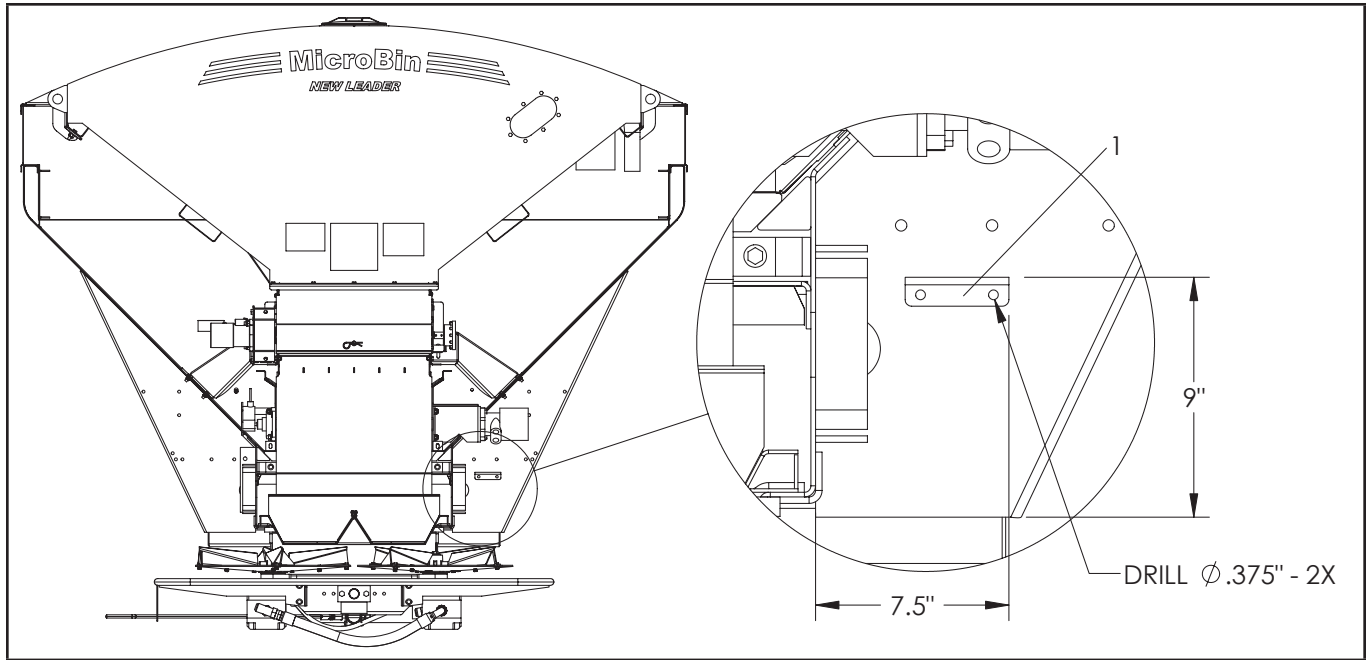


Figure 8 – Fill Pipe Bracket

*.375 = .95cm

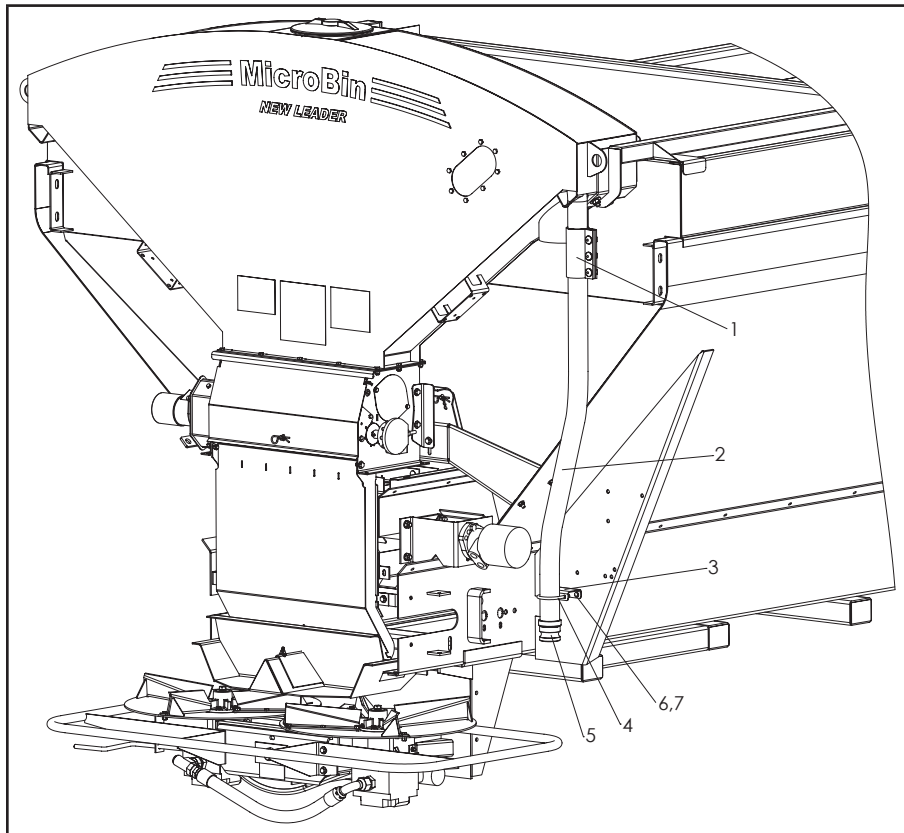


Figure 9 – Extended Fill Pipe

1. Place Bracket (1) against stake as shown in Figure 8 and mark hole locations. Drill two 3/8" holes.
2. Mount Bracket on stake using 5/16" hardware (2,3) provided.
3. Determine orientation of Fill Pipe (4).
 - Units with MULTAPPLIERS – long leg of pipe is on top as shown in Figure 9.
 - Units without MULTAPPLIERS – long leg of pipe is on bottom (not shown).
4. Weld Adapter (5) to bottom end of Fill Pipe.
5. Slide Coupling (6) over top of Fill Pipe and insert pipe on MICROBIN into Coupling. Tighten Coupling.
6. Place U-Joint (7) over Fill Pipe and fasten to Bracket.

INSTALLATION

HYDRAULICS – L3020G4/L3220G4

Parts needed:

ITEM	DESCRIPTION	QTY	ITEM	DESCRIPTION	QTY
1	Valve Assembly	1	8	Cap Screw – 5/16-18 x 2-1/2	3
2	Tube	1	9	Flat Washer – 5/16	3
3	Hose – 1 x 40"	1	10	Lock Nut – 5/16	3
4	Hose – 1 x 35-1/2"	1	11	Clamp Backplate	2
5	Tee (existing)	0	12	Hose (existing)	0
6	Adapter	1	13	Hose (existing)	0
7	Clamp	3	14	Tube (existing)	0

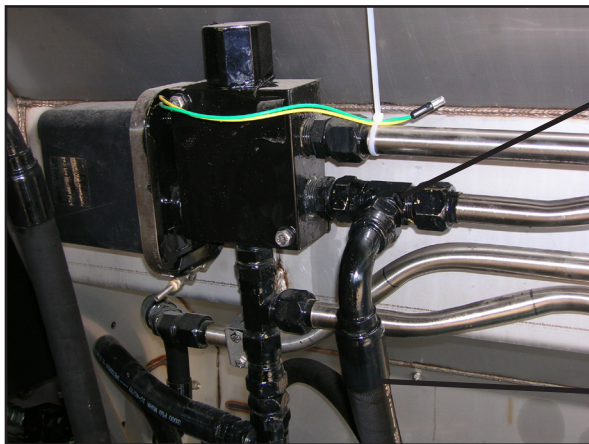


Figure 10A – LH Hydraulics at Front Existing

- 5
- 1. Remove Tee (5) and set aside for later use.
- 12



Figure 10B – LH Hydraulics at Front with MICROBIN

- 7,8,9,10
- 2. Install Valve Assembly (1) in Tee's place.
- 3. Connect Hose (12) to Valve Assembly.
- 4. Connect Tube (2) to Valve Assembly.
- 5. Mount Tube on stakes using Clamps (7) and Hardware (8,9,10) provided. Use Clamp Backplates (11) on two rearmost stakes.
- 2
- 1
- 12

INSTALLATION

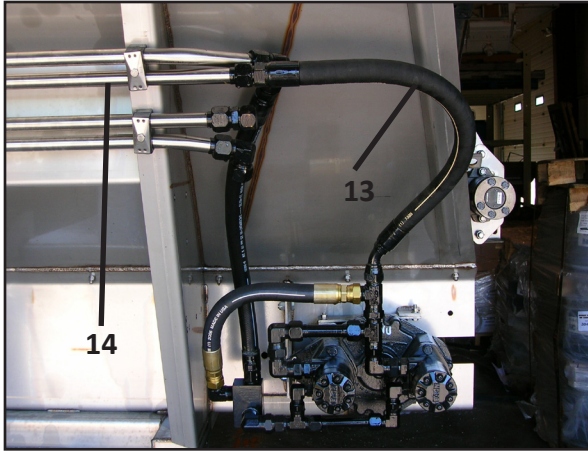


Figure 10C – LH Hydraulics at Rear Existing

6. Connect Tee (5) to rear of Tube (2).
7. Disconnect Hose (13) from existing Tube (14) and connect to Tee (5).

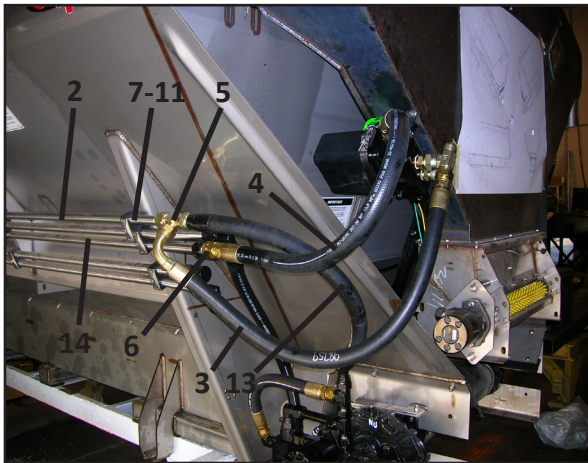


Figure 10D – LH Hydraulics at Rear With MICROBIN

8. Connect 40" (101.6cm) Hose (3) from Tee to MICROBIN valve.
9. Connect Adapter (6) to end of existing Tube (14).
10. Connect 35-1/2" Hose (4) from Adapter to MICROBIN valve.

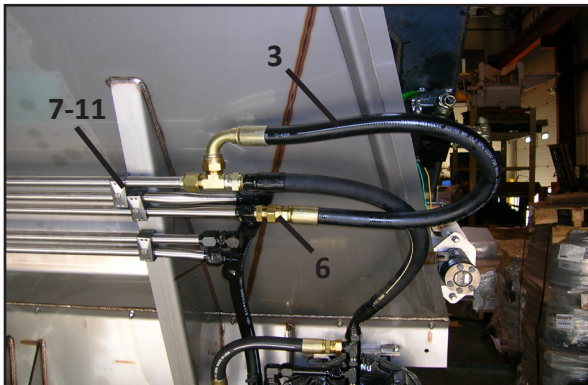


Figure 10E – LH Hydraulics at Rear MICROBIN Removed

To remove MICROBIN:

1. Disconnect 35-1/2" (90.17cm) Hose (4) from Adapter (6).
2. Disconnect 40" Hose (3) from MICROBIN valve and connect to Adapter (6).

HYDRAULICS – L3020XP

Parts needed:

<u>ITEM</u>	<u>DESCRIPTION</u>	<u>QTY</u>	<u>ITEM</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	Valve Assembly	1	12	Clamp	AR
2	Tube	1	13	Cap Screw – 5/16-18 x 2-1/2	AR
3	Hose – 3/4 x 38"	1	14	Flat Washer – 5/16	AR
4	Hose – 3/4 x 40"	1	15	Lock Nut – 5/16	AR
5	Hose – 3/4 x 36"	1	16	Clamp Backplate	AR
6	Hose – 3/4 x 28-7/8"	1	17	Adapter (existing)	0
7	Tee – Male	1	18	Elbow (existing)	0
8	Elbow	1	19	Tube (existing)	0
9	Bushing	1	20	Hose (existing)	0
10	Elbow with Swivel	1	21	Bushing (existing)	0
11	Tee with Swivel	1	22	Tube (existing)	0

AR – As Required

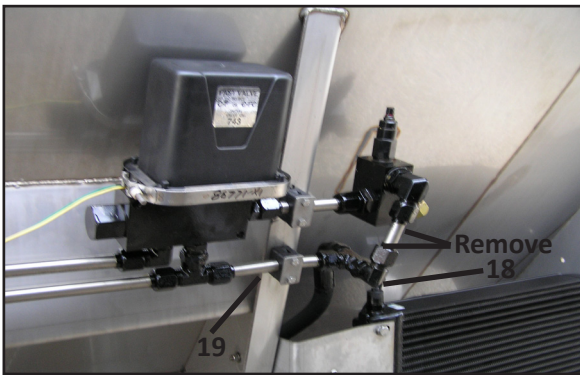


Figure 11A – RH Hydraulics at Front Existing

1. Remove tube and tee shown in Figure 11A and discard.
2. Remove Elbow (18) and reconnect to existing Tube (19).

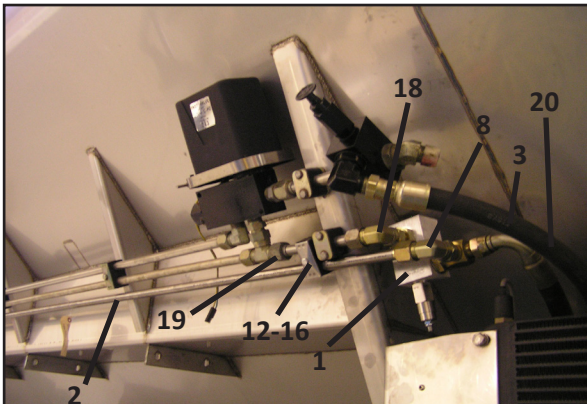
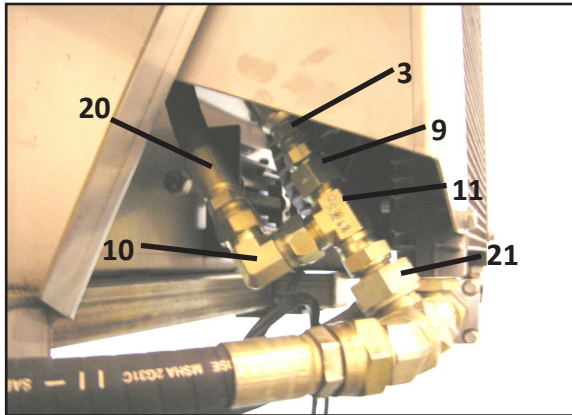


Figure 11B – RH Hydraulics at Front With MICROBIN (Above Cooler)

3. Connect Valve Assembly (1) to Elbow (18).
4. Install Elbow (8) on Valve Assembly.
5. Connect Tube (2) to Elbow (8).
6. Mount Tube on stakes using Clamps (12), Backplates (16) and Hardware (13,14,15) provided.
7. Reconnect existing Hose (20) to Valve Assembly.
8. Connect 38" (96.52cm) Hose (3) to existing relief valve.

INSTALLATION



**Figure 11C – RH Hydraulics at Front
With MICROBIN (Below Cooler)**

9. Connect Bushing (9) to end of 38" Hose (3).
10. Connect Tee (11) to Bushing (9).
11. Route 38" (96.52cm) Hose (3) behind cooler mount.
12. Disconnect existing Hose (20) from Bushing (21).
13. Connect Elbow with Swivel (10) to existing Hose (20).
14. Connect Elbow with Swivel (10) to Tee (11).
15. Connect Tee (11) to existing Bushing (21).

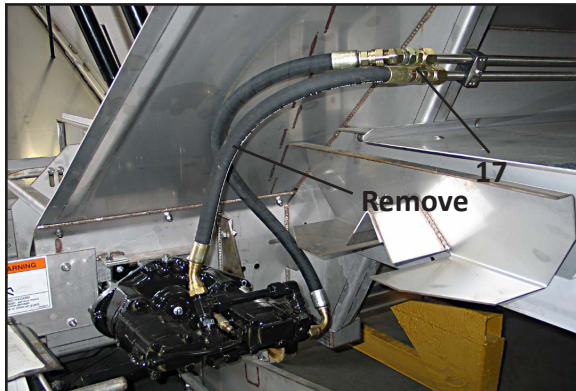
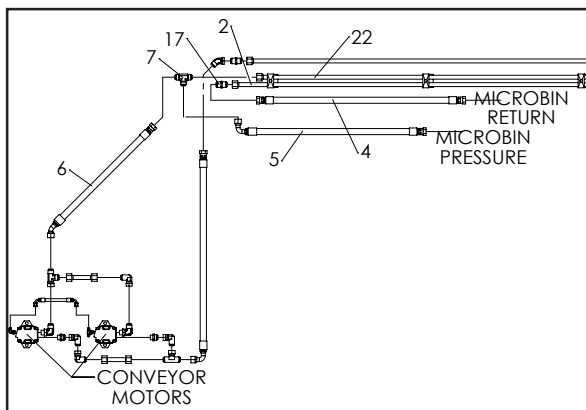


Figure 11D – RH Hydraulics at Rear Existing

16. Remove hose shown in Figure 11D.
17. Remove Adapter (17) and reconnect to new Tube (2).



**Figure 11E – RH Hydraulics at Rear
With MICROBIN**

18. Connect Tee (7) to existing Tube (22).
19. Install 28-7/8" (73.34cm) Hose (6) between Tee (7) and conveyor motor.
20. Connect 36" (91.44cm) Hose (5) to Tee (7) and route to MICROBIN valve's pressure port.
21. Install 40" (101.6cm) Hose (4) between Adapter (17) and MICROBIN valve's return port.

To remove MICROBIN:

1. Disconnect 40" (101.6cm) Hose (4) from Adapter (17).
2. Disconnect 36" (91.44cm) Hose (5) from MICROBIN valve and connect to Adapter (17).

HYDRAULICS – L3030G4

ITEM	DESCRIPTION	QTY	ITEM	DESCRIPTION	QTY
1	Valve Assembly	1	7	Clamp	AR
2	Tube	1	8	Cap Screw – 5/16-18 x 2-1/2	AR
3	Hose – 1 x 40"	1	9	Flat Washer – 5/16	AR
4	Hose – 1 x 35-1/2"	1	10	Lock Nut – 5/16	AR
5	Tee	1	11	Tee (existing)	0
6	Adapter	1	12	Tube (existing)	0

AR – As Required

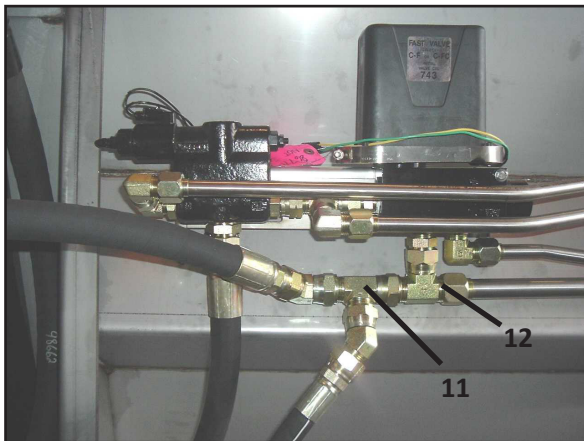


Figure 12A – LH Hydraulics at Front Existing

1. Disconnect Tee (11) from Tube (12)/tee.

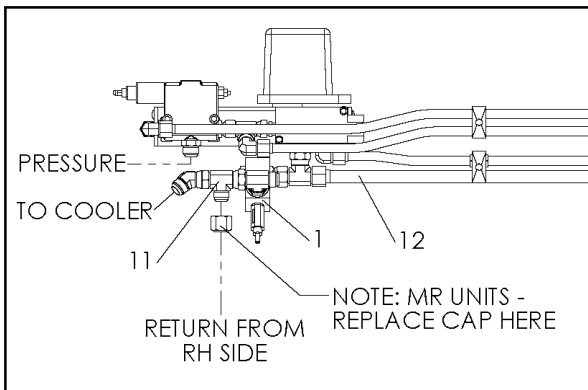


Figure 12B – LH Hydraulics at Front With MICROBIN

2. Install Valve Assembly (1) on Tube (12)/tee.
3. Connect Tee (11) to Valve Assembly.

INSTALLATION

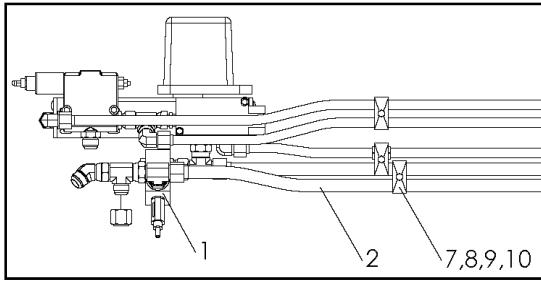


Figure 12C – LH Hydraulics at Front With MICROBIN

4. Connect Tube (2) to Valve Assembly.
5. Mount Tube on stakes using Clamps (7) and Hardware (8,9,10) provided.



Figure 12D – LH Hydraulics at Rear Existing

6. Install Tee (5) on new Tube (2).
7. Disconnect Tee (11) from Tube (12) and reconnect to new Tee (5).

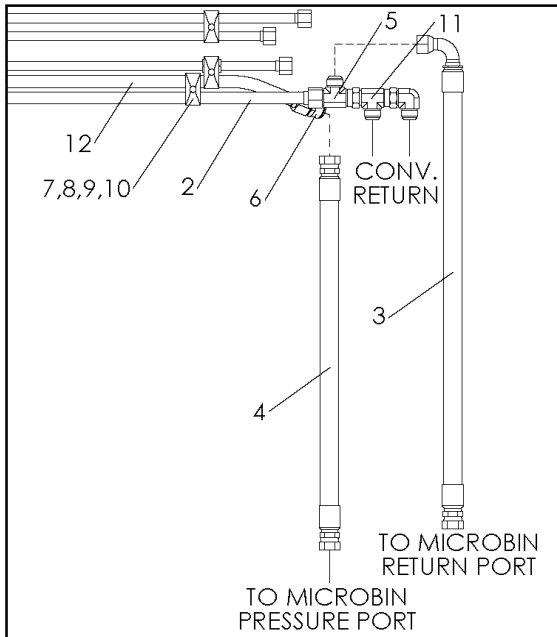


Figure 12E – LH Hydraulics at Rear With MICROBIN

8. Install 40" (101.6cm) Hose (3) on new Tee (5) and route to MICROBIN valve's return port.
9. Connect Adapter (6) to new Tube (2).
10. Install 35-1/2" (90.17cm) Hose (4) between Adapter (2) and MICROBIN valve's pressure port.

To Remove MICROBIN:

1. Disconnect 40" (101.6cm) Hose (4) from Adapter (6).
2. Disconnect 35-1/2" (90.17cm) Hose (3) from MICROBIN valve and connect to Adapter (6).

HYDRAULICS – REAR VALVE

Parts needed:

ITEM	DESCRIPTION	QTY
1	Return Hose – 1" 100R2 2000 PSI minimum	Not Supplied
2	Pressure Hose – 1" 100R2 2000 PSI minimum	Not Supplied

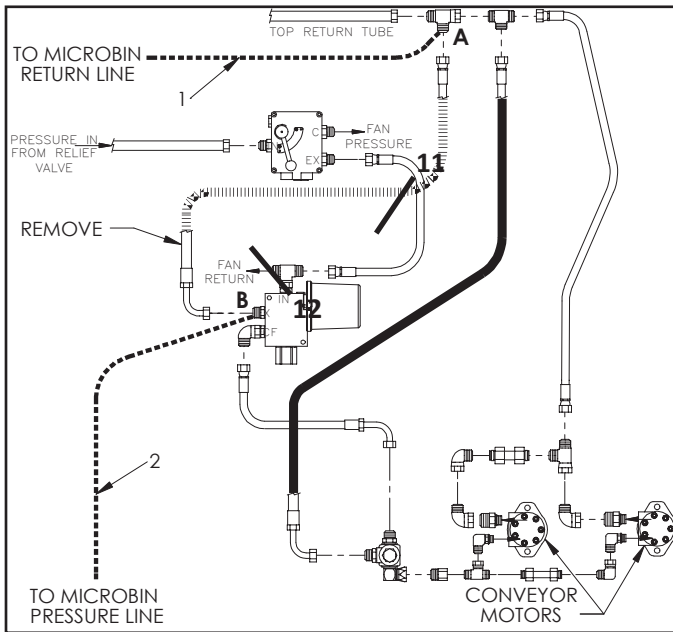


Figure 13A – Rear Valve Hydraulic System

1. Remove Hose shown in Figure 13A and discard.
 2. Route new Return Hose (1–Not Supplied) from tee at back of unit’s top return tube (A) to MICROBIN valve’s return.
 3. Route new Pressure Hose (2–Not Supplied) from unit’s conveyor valve (B) to MICROBIN’s valve assembly.
- NOTE: Hoses must be at least 1" diameter 100R2 rated at 2000 PSI.

To Remove MICROBIN:

1. Disconnect Pressure Hose (2) from conveyor valve (B).
2. Disconnect Return Hose (1) from MICROBIN hydraulics and connect to conveyor valve (B).

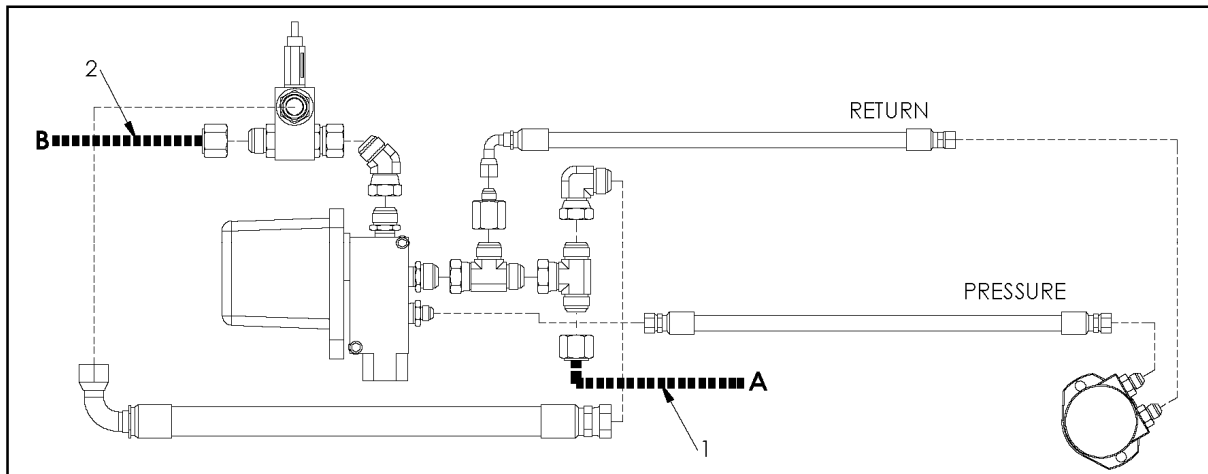


Figure 13B – MICROBIN Hydraulics for Rear Valve System

INSTALLATION

Hydraulic Hose Installation

See spreader manual for hose installation instructions.

MICROBIN REMOVAL

**WARNING**

Lifting devices used should always meet or exceed OSHA standard 1910.184. Never exceed work load limits or lift equipment over people. Empty spreader before lifting. Loads may shift or fall if improperly supported, causing injury or damage to the unit.

1. Make sure MICROBIN hydraulics are disconnected from the spreader before removal. Reroute the hydraulics per *To Remove MICROBIN* instructions under the spreader specific *Hydraulics* section of the "Installation Instructions".
2. Remove u-bolt securing the fill pipe.
3. Remove the MICROBIN divider.
4. Secure suitable lifting device to MICROBIN's lift points, shown in Figure 5.
5. Remove mounting hardware shown under *MICROBIN Installation Instructions*
6. Lock the feedgate handle joint as described under *Feedgate Handle Modification/Handle Modification use without MICROBIN*.

CHECKING INSTALLATION

See "Initial Start-Up" procedure.



WARNING Stand clear of moving machinery.

NOTE: Do not load spreader with material.

1. Check entire unit to make sure all fasteners are in place and properly tightened per *Standard Torques National Coarse (NC) Capscrews* section in this manual.
2. Make sure no other persons are in vicinity of vehicle or spreader.
3. Make sure no loose parts in bin.
4. Check oil level in reservoir; fill as necessary. Refer to spreader manual.



WARNING

DO NOT check leaks with hands while system is operating as high pressure oil leaks can be dangerous! If skin is pierced with hydraulic fluid at high pressure seek immediate medical attention as fluid injected into the skin could cause gangrene if left untreated. Relieve pressure before disconnecting hydraulic lines or working system. Make sure all hydraulic fluid connections are tight and all hydraulic hoses and lines are in good condition before applying pressure to the system. Wear protective gloves and safety glasses or goggles when working with hydraulic systems.



WARNING

DO NOT check for leaks adjacent to moving parts while system is operating as there may be danger of entanglement!

5. Make sure the controller is programmed and setup to operate the MICROBIN. Refer to the control's operation manual for instructions.
6. Run the meter wheel to make sure it starts and stops properly.
NOTE: **Theoretical CFR is .0364 for yellow meter wheels.**
7. Check all connections in hydraulic system to make sure there are no leaks.
8. Check hydraulic oil reservoir and refill to maintain level around mid-point of sight gauge.
Unit is now ready for field testing.

The following procedure is a guide for field testing of the MICROBIN only.

1. Read spreader manual's "Field Testing" section. The spreader manual includes instructions for the conveyor and spinner.
2. Make sure unit has been properly serviced. Do not load spreader.

**DANGER**

Take proper safety precautions when observing meter wheel speed while vehicle is in motion! These may include use of suitable mirrors clamped to permit observation by a safely seated observer, following the spreader in another vehicle at a safe distance, or other suitable means. Do not stand on fenders, in body or on any part of spreader as there is danger of falling off the vehicle or into moving parts! Use great care in performing this test!

3. Refer to the control's operation manual for channel (conveyor) operating instructions. The MICROBIN's meter wheel operates as a separate channel. Set program to operational mode and begin forward travel. Move channel switch to "on" position. Meter wheel should start immediately when vehicle moves and should continue to run at speeds which should vary directly with the vehicles road speed; the meter wheel should speed up as truck speed increases and slow down as truck speed reduces.

NOTICE The MICROBIN is intended for dispensing micronutrients and seeds only—NOT HERBICIDES.

1. Read *General Operating Procedures* section of spreader manual.
2. Make sure unit has been properly serviced and is in good operating condition. Field test unit prior to first use, prior to each spreading season's use and following overhaul or repair work, to verify that all components and systems are functioning properly. See *Field Testing* section.

**DANGER**

Pneumatic system must be bonded to MICROBIN to avoid static build-up. Always use stainless steel fill tubes. Static build-up could cause fire or explosion.

**CAUTION**

Refer to Material Safety Data Sheets (MSDS) for proper material handling prior to filling MICROBIN. Pneumatic filling may produce hazardous dust.

NOTICE

The MICROBIN is intended for dispensing micronutrients and seeds only—NOT HERBICIDES. The manufacturer is not liable for damage resulting from improper use.

NOTICE

The spinner may damage seeds, especially at higher rates. Check seeds distributed from spinner. Slow spinner rate if seeds show signs of damage.

3. Pneumatically fill bin with material to be spread.
4. Drive to location where spreading is to be done.
5. Set program for MICROBIN to desired values.
6. Engage pump drive PTO.

**CAUTION**

Drive only at speeds which permit good control of vehicle!

7. Drive at speeds that allow engine to turn at proper RPM.

*Visit www.newleadervip.com for interactive tools to calculate yield, proper feedgate opening, conveyor revolutions per minute, and mph to maximize the performance of your spreader.

PREVENTATIVE MAINTENANCE PAYS!

The handling and spreading of commercial fertilizers is a most severe operation with respect to metal corrosion. Establish a frequent, periodic preventative maintenance program to prevent rapid damage to spreading equipment. Proper cleaning, lubrication and maintenance will give you longer life, more satisfactory service and more economical use of your equipment.

**WARNING**

Shut off all power and allow all moving parts to come to rest before performing any maintenance operation.

HYDRAULIC SYSTEM

See spreader manual.

CLEAN UP**NOTICE!**

High pressure wash can inject water and/or fertilizer into control components, causing damage. Use caution when cleaning these areas.

Thoroughly wash unit every two to three days during the operating season to maintain minimal maintenance operation. Hose unit down under pressure to free all sticky and frozen material.

It is important the unit be thoroughly cleaned at the end of each operating season. All lubrication and maintenance instructions should be closely followed. Repaint worn spots to prevent formation of rust.

FASTENERS

Tighten all screws fasteners to recommended torque's after first week of operation and annually thereafter. If loose fasteners are found at anytime, tighten to recommended torque. Replace any lost or damaged fasteners or other parts immediately. Check MULTIBIN's mounting hardware every week.



WARNING

Shut off all power and allow all moving parts to come to rest before performing any maintenance operation.

The spreader should be regularly lubricated with the lubricants recommended in this manual in accordance with the following chart:




<u>LOCATION</u>	<u>PLACES</u>	<u>METHOD</u>	<u>FREQUENCY</u>
Hydraulic System			
See Spreader Manual			
Drive			
Chain Coupling	1	Spray Oil	Monthly

NOTE: Unusual conditions, such as excessive dust, temperature extremes or excessive moisture may require more frequent lubrication of specific parts.

- Symptom: Spinners turn but meter wheel does not run in manual mode. See reasons 1, 2, 3, 4, 5 & 8.
- Symptom: Console in operation mode, but the conveyor and/or meter wheel does not move when the machine moves. See reasons 1, 2, 3, 4, 5 & 8.
- Symptom: Meter wheel does not run with cab control "On", PTO engaged and vehicle driving forward. See reasons 5 & 8.
- Symptom: Meter wheel runs when control switch in cab is in "Off" position. See reasons 5 & 6.
- Symptom: Meter wheel starts to run when PTO is engaged See reasons 5, 7 & 8
- Symptom: Peak conveyor revolutions cannot be achieved. See reason 6.
- Symptom: Spreader issue, including hydraulics, conveyor and spinner. Refer to the spreader manual.
- Symptom: Controller application or programming. Refer to the control manual's *Troubleshooting* section.

<u>Reason:</u>	<u>Correction:</u>
1. MICROBIN relief valve open to return line.	Using relief valve testing adapter and flow meter, test valve for opening pressure. If not 1500 PSI (103.4 b), replace relief valve.
2. Jammed or frozen meter wheel.	Free up conveyor.
3. Jammed or frozen meter wheel hydraulic motor.	Replace motor.
4. Meter wheel hydraulic motor shaft key sheared.	Replace key.
5. MICROBIN hydraulic circuit is not routed correctly.	Route hydraulic circuit per instructions specific to spreader.
6. MICROBIN runs by using excess hydraulic flow from spreader.	Increase feedgate opening or slow driving speed.
7. Spreader hydraulics - excessive oil is being pumped.	Refer to spreader manual.
8. Involves the controller.	Refer to control manual.

CAP SCREW GRADE IDENTIFICATION - MARKINGS ON HEAD

- SAE GRADE 2  NO MARKINGS
- SAE GRADE 5  THREE MARKS - 120 DEGREES APART
- SAE GRADE 8  SIX MARKS - 60 DEGREES APART

USE GRADE 2 TORQUES FOR STAINLESS STEEL FASTENERS AND CARRIAGE BOLTS.

CAP SCREW SIZE	TORQUE - FOOT-POUNDS					
	GRADE 2		GRADE 5		GRADE 8	
	DRY	LUBE	DRY	LUBE	DRY	LUBE
1/4"	5	4	8	6	12	9
5/16"	11	8	17	13	25	18
3/8"	20	15	30	23	45	35
7/16"	30	24	50	35	70	55
1/2"	50	35	75	55	110	80
9/16"	65	50	110	80	150	110
5/8"	90	70	150	110	220	170
3/4"	100	120	260	200	380	280
7/8"	140	110	400	300	600	460
1"	220	160	580	440	900	650

TORQUES



Order from the **AUTHORIZED DEALER** in your area.

1. Always give the pertinent model and serial number.
2. Give part name, part number and the quantity required.
3. Give the correct address to where the parts are to be shipped, and the carrier if there is a preference.

Unless claims for shortages or errors are made immediately upon receipt of goods they will not be considered. Any part returns should be directed through the dealer from which they were purchased.

When broken goods are received, a full description of the damage should be made by the carrier agent on the freight bill. If this description is insisted upon, full damage can always be collected from the transportation company.

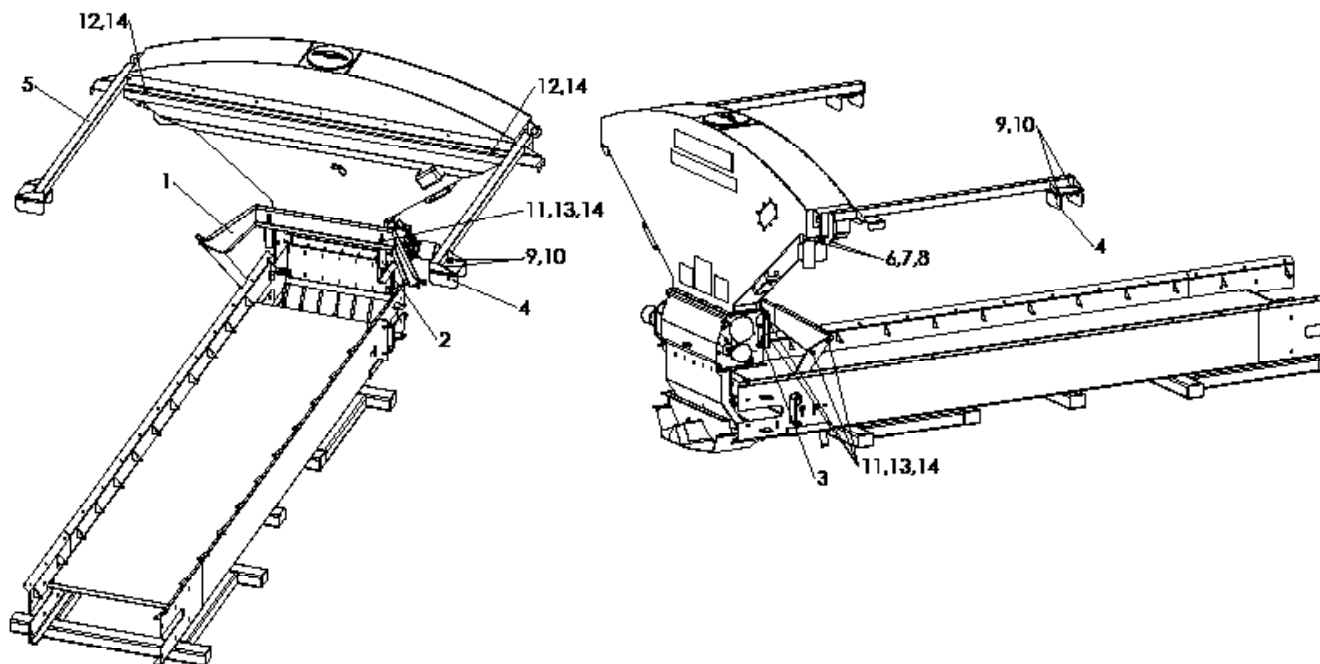
No responsibility is assumed for delay or damage to merchandise while in transit. Our responsibility ceases upon delivery of shipment to the transportation company from whom a receipt is received showing that shipment was in good condition when delivered to them, therefore, claims (if any) should be filed with the transportation company and not with Highway Equipment Company.

If your claims are not being handled (by the transportation company) to your satisfaction, please call the Parts Manager at Highway Equipment Company (319-363-8281 or 1-800-363-8267) for assistance.

In the parts list the following symbols and abbreviations stand for:

- * - Not Shown
- AR – As Required
- CS – Carbon Steel
- SS – Stainless Steel

The parts listed under the different steel types (CS, 409 SS and 304 SS) are for that type of unit and do not necessarily mean the part is made of that type of steel.

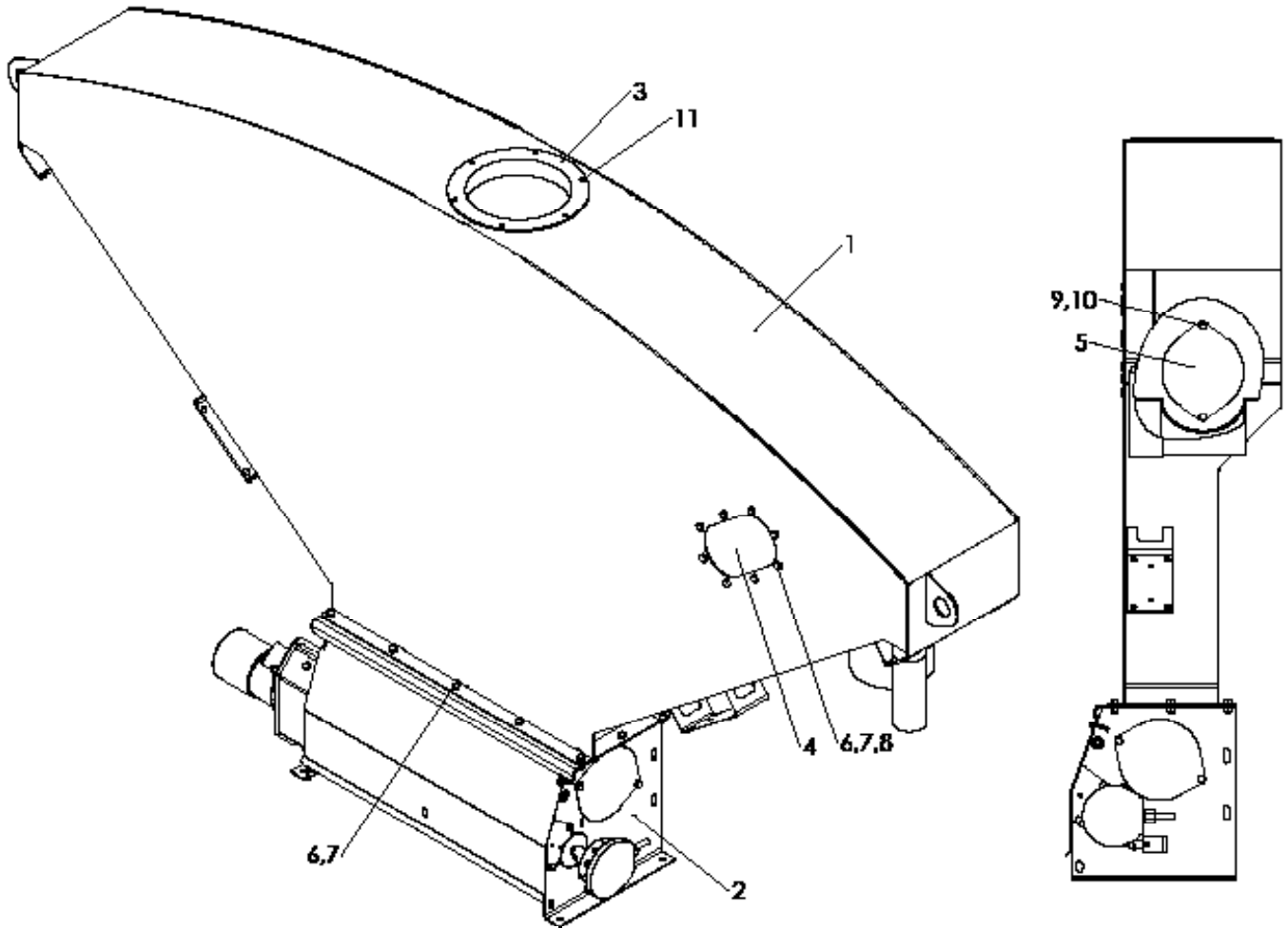


NOTE: Some parts removed for clarity.

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	304155	Bracket – Bin Lower Mount	1
2	304156-AB	Angle – Lower Mount LH	1
3	304156-AA	Angle – Lower Mount RH	1
4	304146	Clamp – Cradle Bolt-on	2
5	304151	Cradle – Weldment	1
6	36402	Cap Screw – 1/2-13 x 1-1/4	4
7	36426	Washer – Flat 1/2	4
8	39016	Nut – Lock 1/2-13	4
9	58800	Cap Screw – 5/8-11 x 1-3/4	4
10	41762	Nut – Lock 5/8-11	4
11	36398	Cap Screw – 3/8-16 x 1	10
12	34858	Cap Screw – 3/8-16 x 1-1/2	2
13	36425	Washer – Flat 3/8	16
14	72054	Nut – Lock 3/8-16	12
15	* 304182	Template – Lower Mount	1

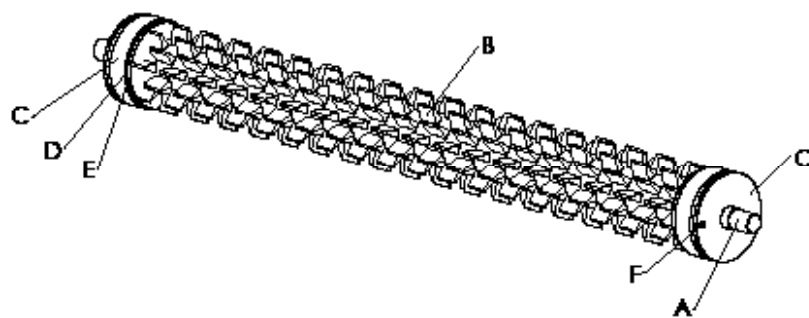
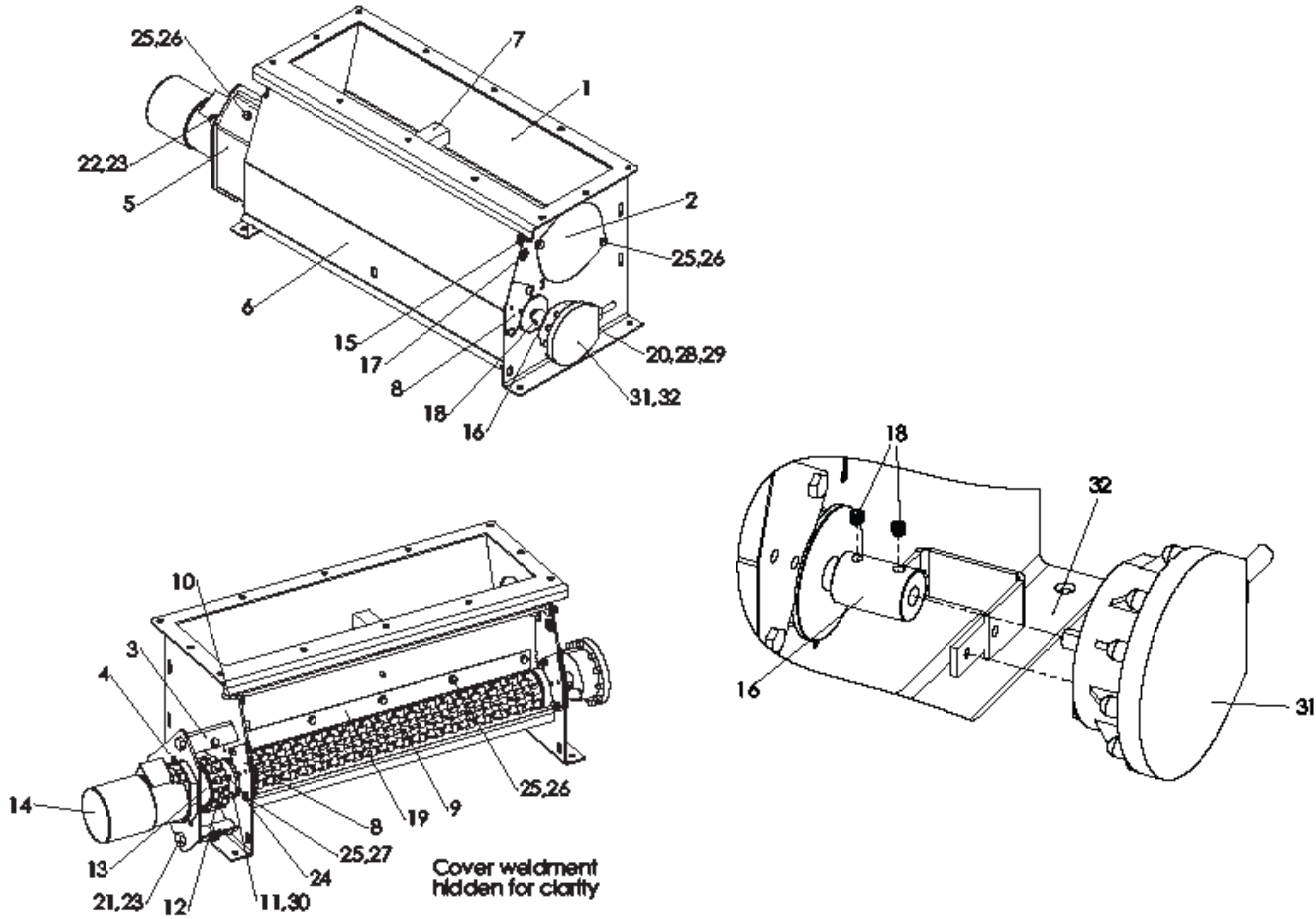
* - Not Shown

PARTS LIST



<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	304100	Bin – Weldment	1
2	304132	Hopper – Assembly	1
3	304107	Lid – 8” with Ring	1
4	304177	Window – Sight	1
5	304115	Cover – Hopper Clean-out	1
6	56858	Cap Screw – 5/16-18 x 3/4	20
7	42221	Nut – Lock 5/16-18	20
8	36424	Washer – Flat 5/16	8
9	36393	Cap Screw – 1/4-20 x 3/4	2
10	36418	Washer – Lock 1/4	2
11	56315	Screw - #6-20 x 1/2 Self Drilling	6

HOPPER



Meter Wheel

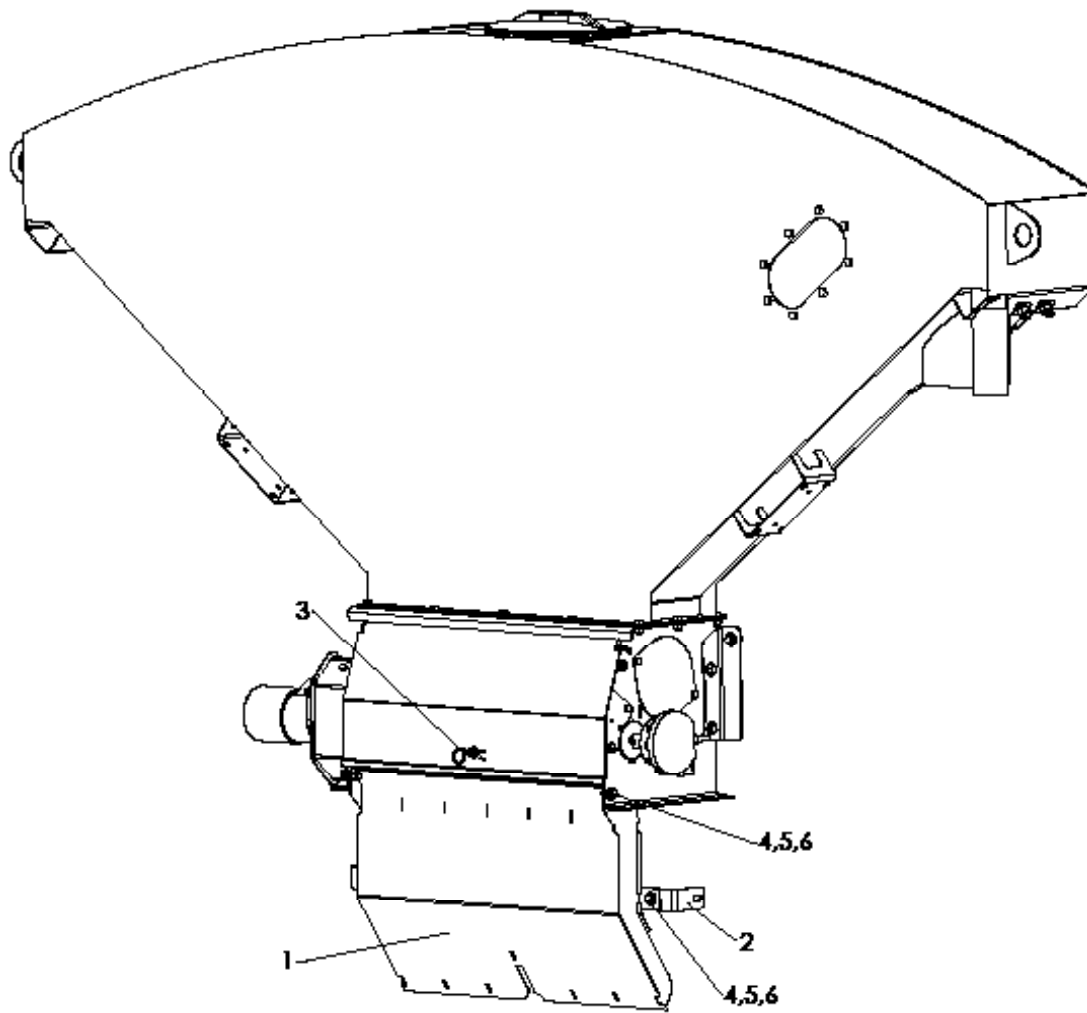
<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	304114	Hopper – Weldment	1
2	304115	Cover – Hopper Clean-out	1
3	304123	Shield – Weldment Drive	1

PARTS LIST

<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
4	304116	Plate – Motor Mount	1
5	304119	Cover – Shield Drive	1
6	304122	Cover – Weldment Rain	1
7	98787-AB	Lead – 18" Bin Level Sensor	1
8	304128	Clamp – Weldment Hub	2
9	304131	Wheel – Assembly Meter	1
A	304130	Shaft – Meter Wheel	1
B	304134-AA	Wheel – Meter Section	18
C	304125	Hub – Bearing	2
D	304133	Washer - .641 ID	2
E	96066	Washer – Rubber 5/8 ID	2
F	56313	Pin – Roll 3/16 x 3/4	2
10	304124	Rod – Formed 1/4	1
11	39685	Coupling – Chain Half	1
12	31078	Chain – Assembly	1
13	11409	Coupling – Chain Half	1
14	304129	Motor – Hydraulic 11.9 CID	1
15	41779	Pin – Hair 1-7/16 x .073	1
16	304170	Coupling – Encoder 5/8	1
17	21983	Grommet – Rubber	1
18	20735	Screw – Set 1/4-20 x 1/4	2
19	304153	Angle – Deflector Hopper	1
20	304171	Bracket – Encoder	1
21	56318	Cap Screw – 1/2-13 x 3-1/2	3
22	36539	Cap Screw – 1/2-13 x 1-1/2	2
23	39016	Nut – Lock 1/2-13	5
24	20737	Screw – Set 1/4-20 x 1/2	4
25	36393	Cap Screw – 1/4-20 x 3/4	13
26	36418	Washer – Lock 1/4	9
27	42034	Nut – Lock 1/4-20	4
28	36398	Cap Screw – 3/8-16 x 1	1
29	72054	Nut – Lock 3/8-16	1
30	34562	Key – Woodruff 5/32 x 5/8	1
31	303994	Encoder – 180 Count	1
32	304171	Bracket - Encoder 304	1
33	* 37285	Serial Plate	1
34	* 6276	Screw – Drive #4 x 1/4	4

* - Not Shown

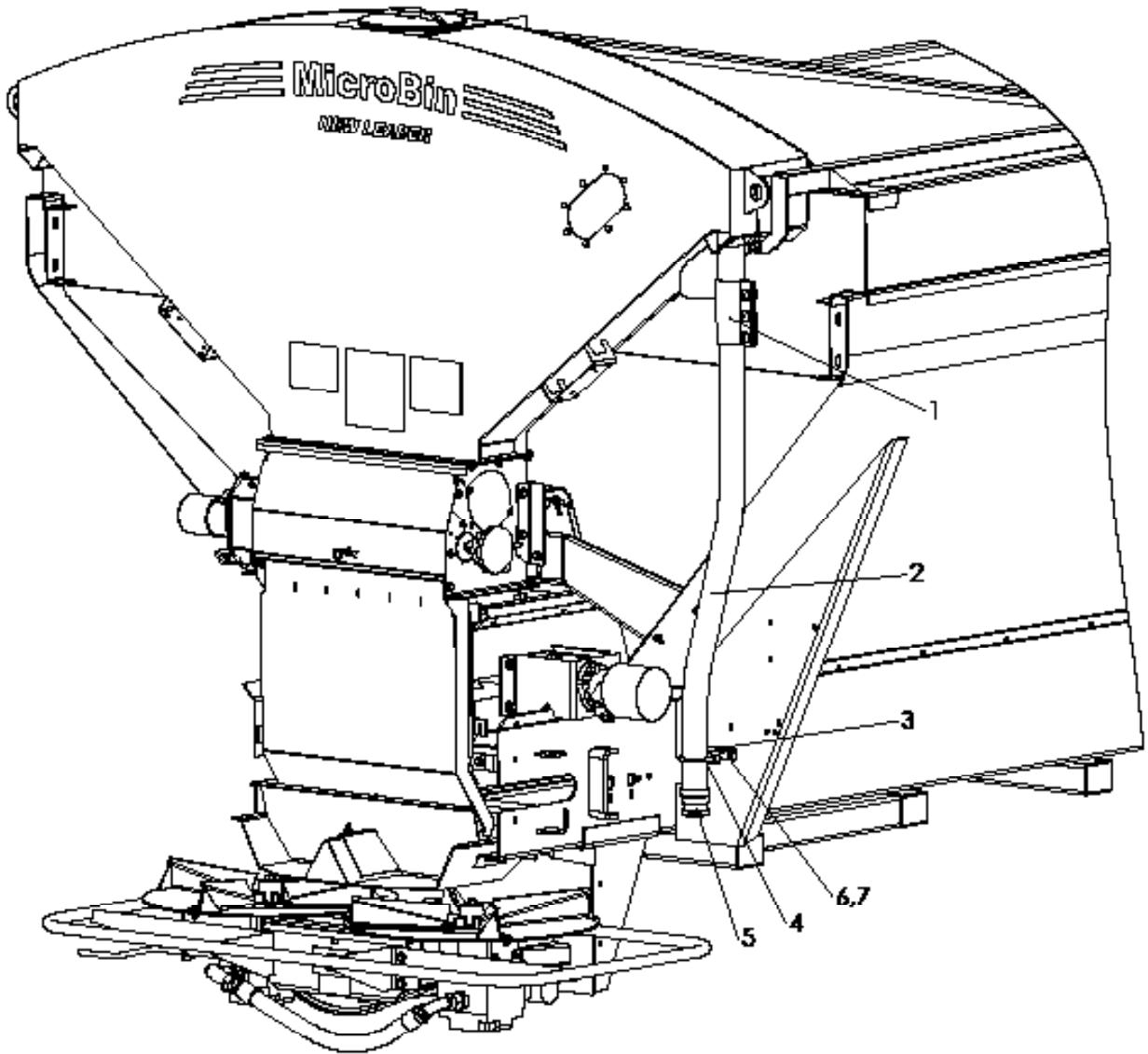
DIVIDER



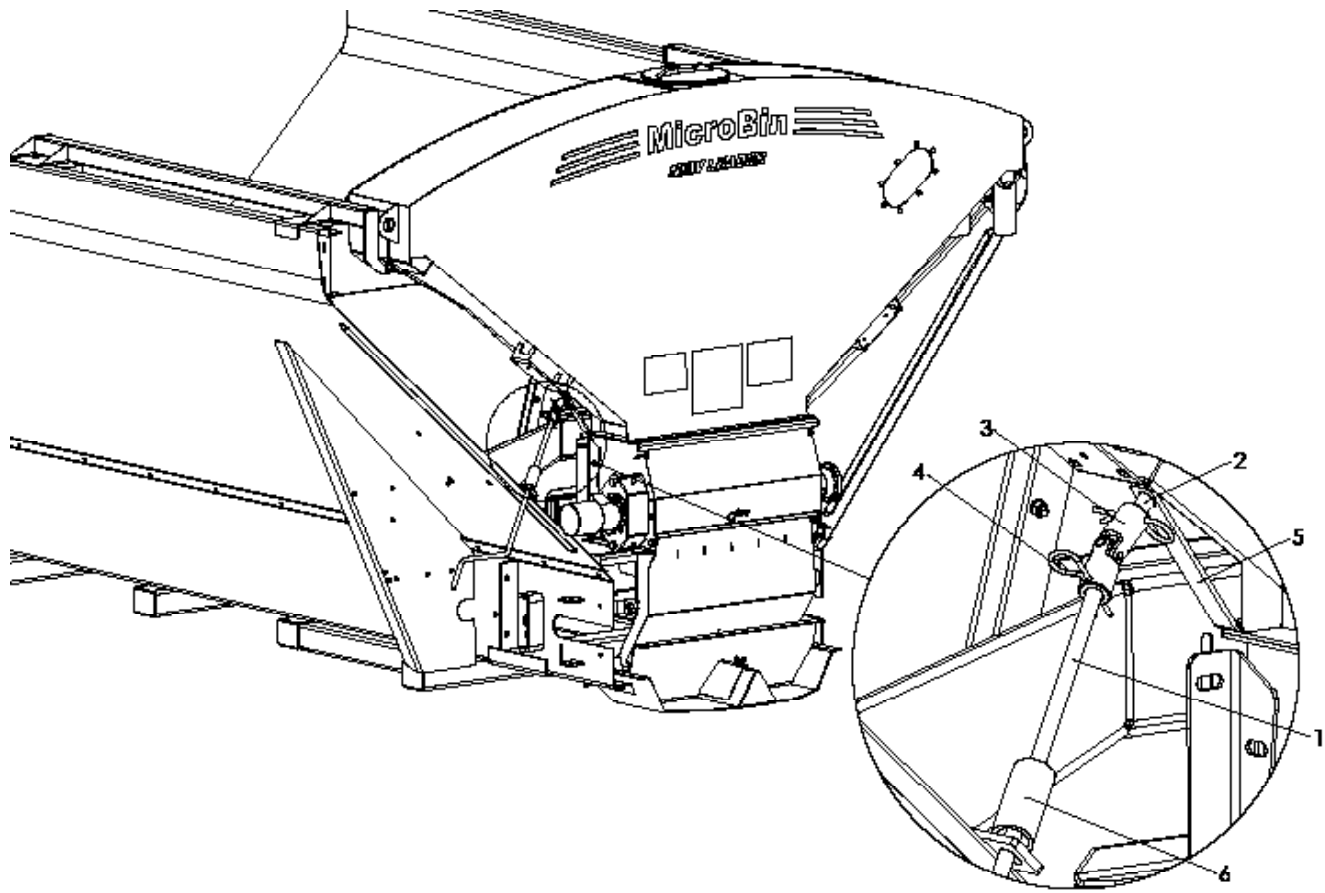
<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	304169	Divider – Weldment	1
	* 304160	Divider – Weldment MULTAPPLIER	1
2	304163	Angle – Divider Lower Mount	2
3	36429	Pin – Hair 2-9/16 x .148	1
4	36293	Cap Screw – 3/8-16 x 3/4	4
5	36425	Washer – Flat 3/8	6
6	72054	Nut – Lock 3/8	4

* - Not Shown

PARTS LIST

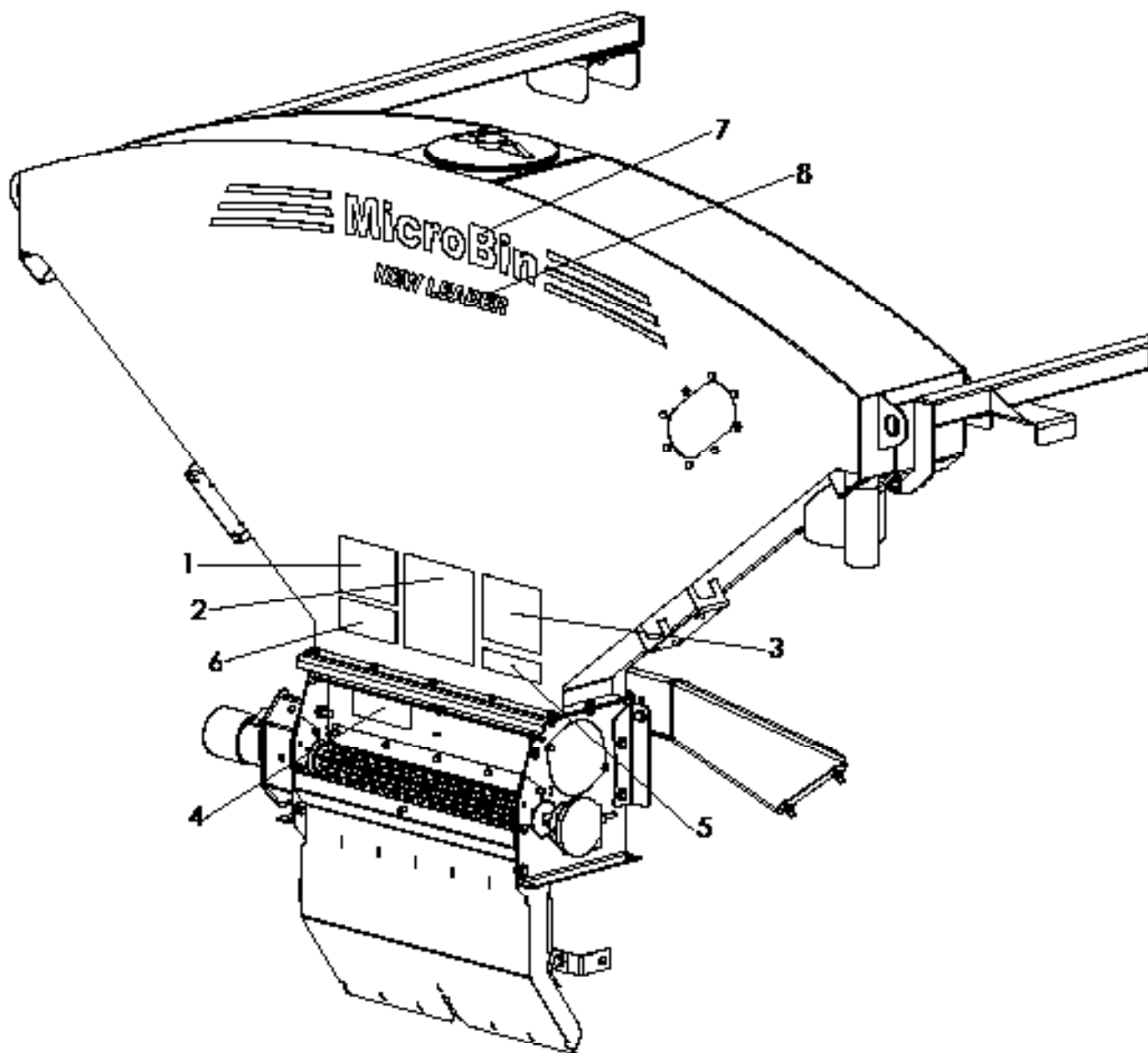


<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	304183	Coupling – Compression 2-3/8"	1
2	304184	Pipe – Fill Ext. 2"	1
3	304185	Bracket – Fill Pipe Mount	1
4	304186	U-Bolt – 2"	1
5	304149	Adapter – 2" NPS Socket Weld	1
6	34580	Cap Screw – 5/16-18 x 1	2
7	42221	Nut – Lock 5/16-18	2

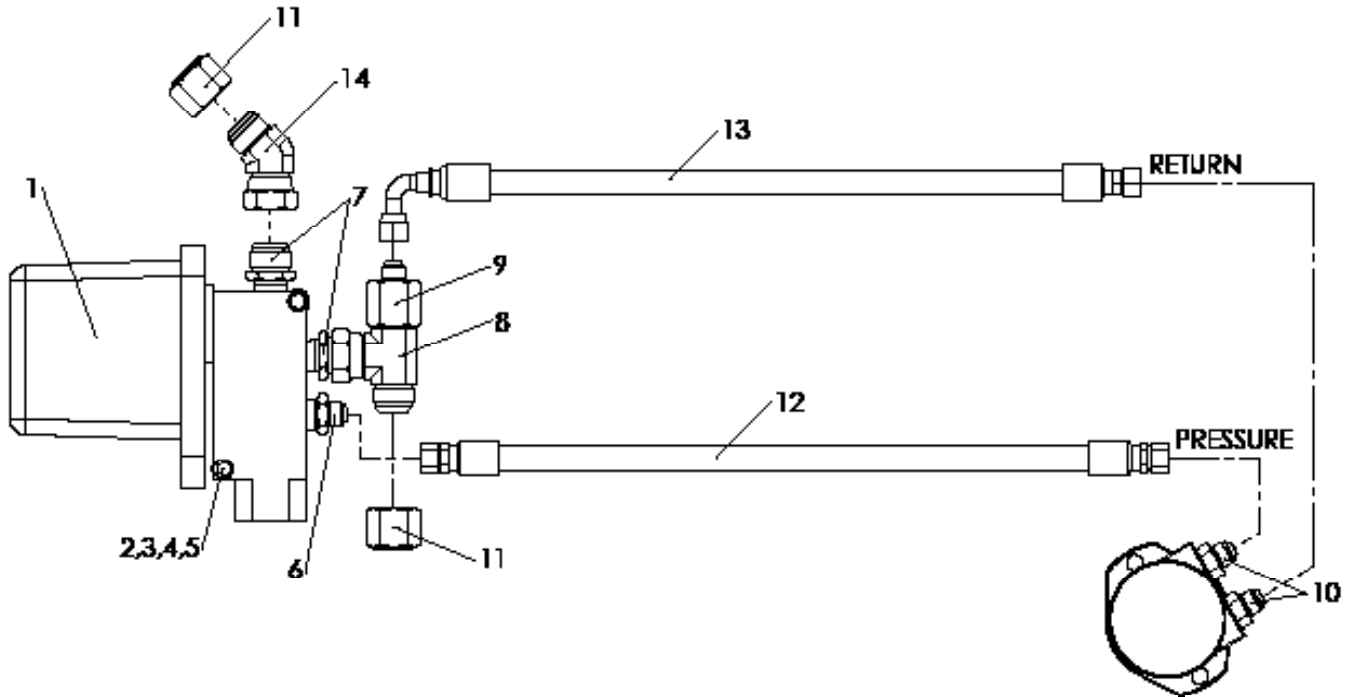


<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	304197	Handle	1
2	304198	Handle – Extension	1
3	85002	U-Joint	1
4	86878	Pin – Hair 2-9/16 x .148	3
5	304191	Bracket – Feedgate Handle	1
6	304192	Pipe – Coupling Feedgate+	1

- For use when MICROBIN is not installed.

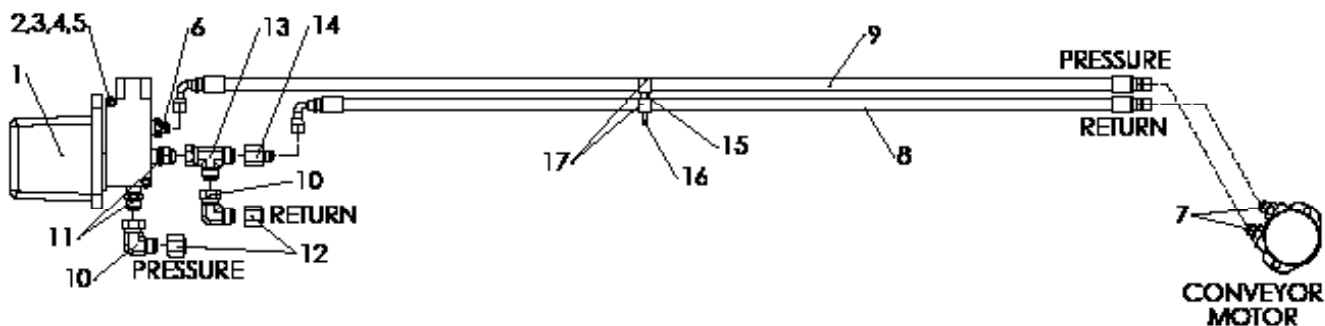


<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	39138	Decal – Warning High Pressure Fluid	1
2	55631	Decal – Warning Moving Part Hazard	1
3	321	Decal – Caution Hazardous Material	1
4	77380	Decal – Danger Guard Missing	1
5	39017	Decal – No Step	1
6	304206	Decal – No Herbicide	1
7	304195	Decal – MICROBIN	1
8	87164	Decal – New Leader Black	1



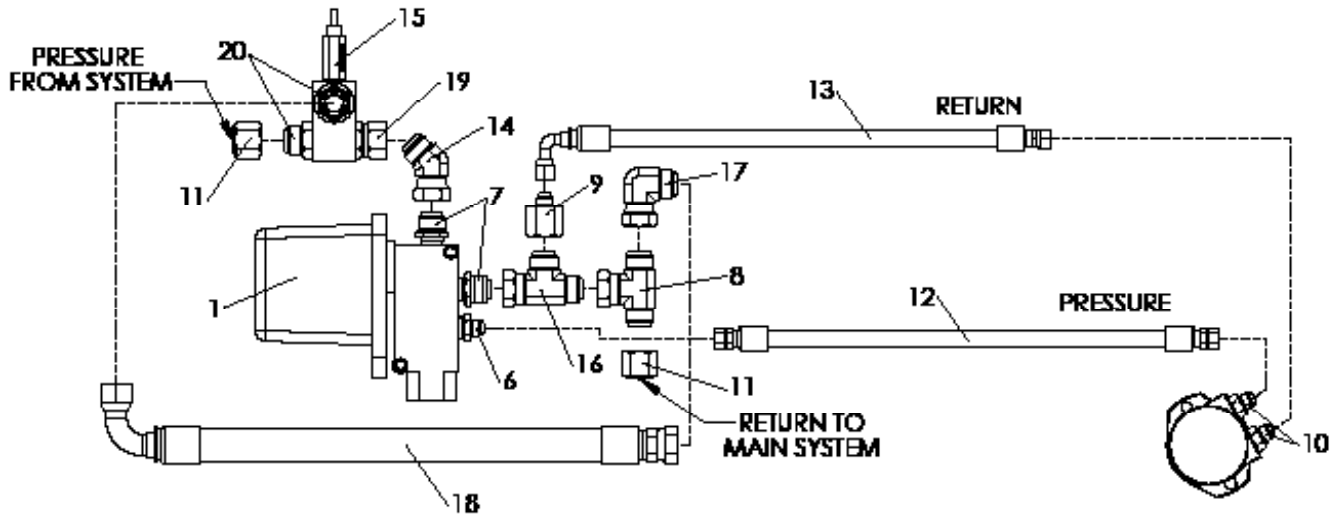
ITEM	PART NO.	DESCRIPTION	QTY
1	302871-X1	Valve – 25 GPM Raven II	1
	306379	Seal – Kit Raven II Valves	1
2	302097	Washer – Step 1/4 ID x 1/8	4
3	34866	Cap Screw – 1/4-20 x 2-3/4	2
4	36423	Washer – Flat 1/4	2
5	42034	Nut – Lock 1/4-20	2
6	29775	Fitting – 8-12 070120	1
7	29836	Fitting 16-12 070120	2
8	29836	Fitting 16-16-16 070433	1
9	34807	Fitting – 16-8 070123	1
10	29771	Fitting – 8-10 070120	2
11	29802	Fitting – -16 070112	2
12	304214	Hose – Assembly 1/2" x 24	1
13	304213	Hose – Assembly 1/2" x 24	1
14	29806	Fitting – 16-16 070321	1

PARTS LIST



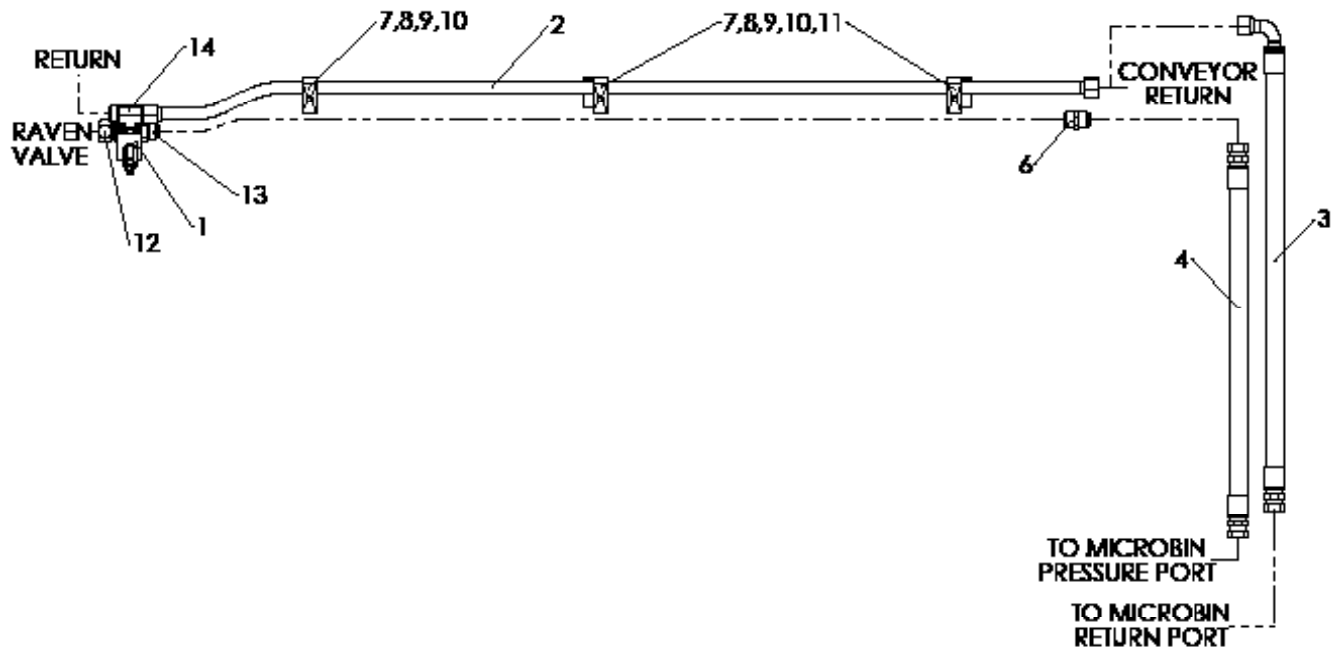
<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	302871-X1	Valve – 5 GPM Raven II	1
2	302097	Washer – Step 1/4 ID x 1/8	4
3	34866	Cap Screw – 1/4-20 x 2-3/4	2
4	36423	Washer – Flat 1/4	2
5	42034	Nut – Lock 1/4-20	2
6	34842	Fitting – 8-12 070120	1
7	29771	Fitting – 8-10 070120	2
8	304228	Hose – Assembly 1/2" x 58	1
9	304227	Hose – Assembly 1/2" x 66	1
10	34709	Fitting – 12-12 070221	2
11	29789	Fitting – 12-12 070120	2
12	29801	Fitting – -12 070112	2
13	29781	Fitting – 12-12-12 070432	1
14	56406	Fitting – 12-8 070123	1
15	97539	Pipe – 1/4" Sch 40 x 1-1/4	1
16	71830	Cap Screw – 5/16-18 x 2-1/2	1
17	304386	Clamp – Insulated Closed	2

MICROBIN HYDRAULICS - REAR VALVE



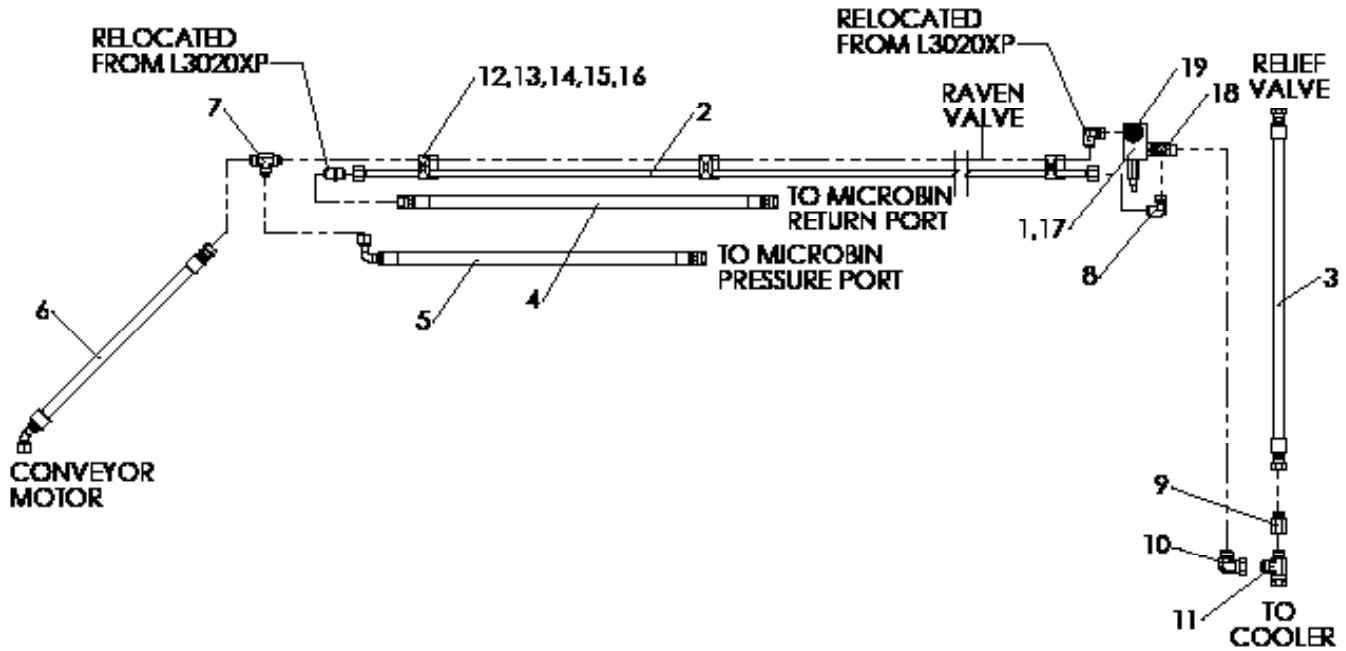
ITEM	PART NO.	DESCRIPTION	QTY
1	302871-X1	Valve – 5 GPM Raven II	1
2	302097	Washer – Step 1/4 ID x 1/8 Thick	4
3	34866	Cap Screw – 1/4-20 x 2-3/4	2
4	36423	Washer – Flat 1/4	2
5	42034	Nut – Lock 1/4-20	2
6	34842	Fitting – 8-12 070120	1
7	29775	Fitting – 16-12 070120	2
8	29836	Fitting – 16-16-16 070433	1
9	34807	Fitting – 16-8 070123	1
10	29771	Fitting – 8-10 070120	2
11	29802	Fitting – -16 070112	2
12	304214	Hose – Assembly 1/2" x 24	1
13	304213	Hose – Assembly 1/2" x 24	1
14	29806	Fitting – 16-16 070321	1
15	98109-X1	Valve – Relief 1000 PSI	1
16	29850	Fitting – 16-16-16 070432	1
17	29807	Fitting – 16-16 070221	1
18	74814	Hose – Assembly 1" x 26-5/8	1
19	34810	Fitting – 16-16 S1040-30 NS	1
20	29803	Fitting – 16-16 070120	2

PARTS LIST



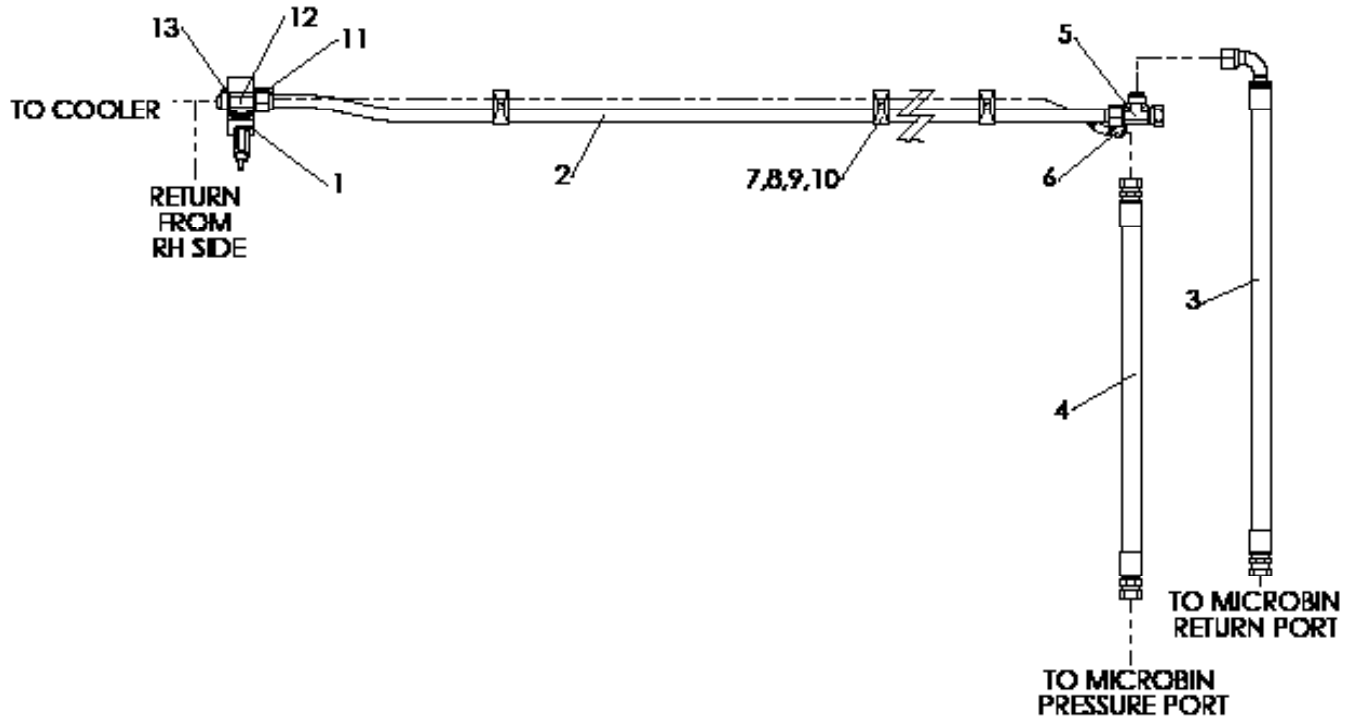
<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	98109-X1	Valve – Relief 1000 PSI	1
2	98515	Tube – Assembly 1" x 77-5/8, 13' Unit	1
	98516	Tube – Assembly 1" x 89-5/8, 14' Unit	1
3	98759	Hose – Assembly 3/4" x 38 Return	1
4	56128	Hose – Assembly 3/4" x 40	1
5	29850	Fitting – 16-16-16 070432	0
6	34719	Fitting – 16-16 070101	1
7	300033	Clamp – Twin 1"	3
8	71830	Cap Screw – 5/16-18 x 2-1/2	3
9	36424	Washer – Flat 5/16	3
10	42221	Nut – Lock 5/16-18	3
11	304212	Backplate – Clamp Twin	2
12	34810	Fitting – 16-16 S1040-30 NS	1
13	29803	Fitting – 16-16 070120	1
14	34750	Fitting – 16-16-16 070429	1

* - Not Shown



ITEM	PART NO.	DESCRIPTION	QTY
1	98109-X1	Valve – Relief 1000 PSI	1
2	98640	Tube – Assembly 3/4" x 92, 12' Unit	1
	304231	Tube – Assembly 3/4" x 100-1/2, 12'6" Unit	1
	98641	Tube – Assembly 3/4" x 104, 13' Unit	1
	304232	Tube – Assembly 3/4" x 116, 14' Unit	1
3	304229	Hose – Assembly 3/4" x 38 Return	1
4	74886-X1	Hose – Assembly 3/4" x 40	1
5	304234	Hose – Assembly 3/4" x 36	1
6	304233	Hose – Assembly 3/4" x 28-7/8	1
7	29792	Fitting – 12-12-12 070401	1
8	34709	Fitting – 12-12 070221	1
9	34849	Fitting – 16-12 070123	1
10	29807	Fitting – 16-16 070221	1
11	29850	Fitting – 16-16-16 070432	1
12	75036	Clamp – Twin 3/4"	AR
13	71830	Cap Screw – 5/16-18 x 2-1/2	AR
14	36424	Washer – Flat 5/16	AR
15	42221	Nut – Lock 5/16-18	AR
16	304212	Backplate – Clamp Twin	AR
17	34810	Fitting – 16-16 S1040-30 NS	1
18	34750	Fitting – 16-16-16 070429	1
19	56311	Fitting – 16 070109A	1

AR - As Required



<u>ITEM</u>	<u>PART NO.</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	98109-X1	Valve – Relief 1000 PSI	1
2	98514	Tube – Assembly 1" x 65-5/8, 11' Unit	1
	98515	Tube – Assembly 1" x 77-5/8, 12' Unit	1
	98516	Tube – Assembly 1" x 89-5/8, 13' Unit	1
	98517	Tube – Assembly 1" x 101-5/8, 14' Unit	1
3	98759	Hose – Assembly 1" x 40	1
4	56128	Hose – Assembly 1" x 35-1/2	1
5	29850	Fitting – 16-16-16 070432	1
6	34719	Fitting – 16-16 070101	1
7	300033	Clamp – Twin 1"	AR
8	71830	Cap Screw – 5/16-18 x 2-1/2	AR
9	36424	Washer – Flat 5/16	AR
10	42221	Nut – Lock 5/16-18	AR
11	34810	Fitting – 16-16 S1040-30 NS	1
12	34750	Fitting – 16-16-16 070429	1
13	56311	Fitting – 16 070109A	1