



Fertilizer Spreader

Air Command™ Section Control

Operator's Manual

Models 1050, 1250, 1450, 1850 & 2250

Serial Number B47010100 & Higher

Part No. 417281

Foreword

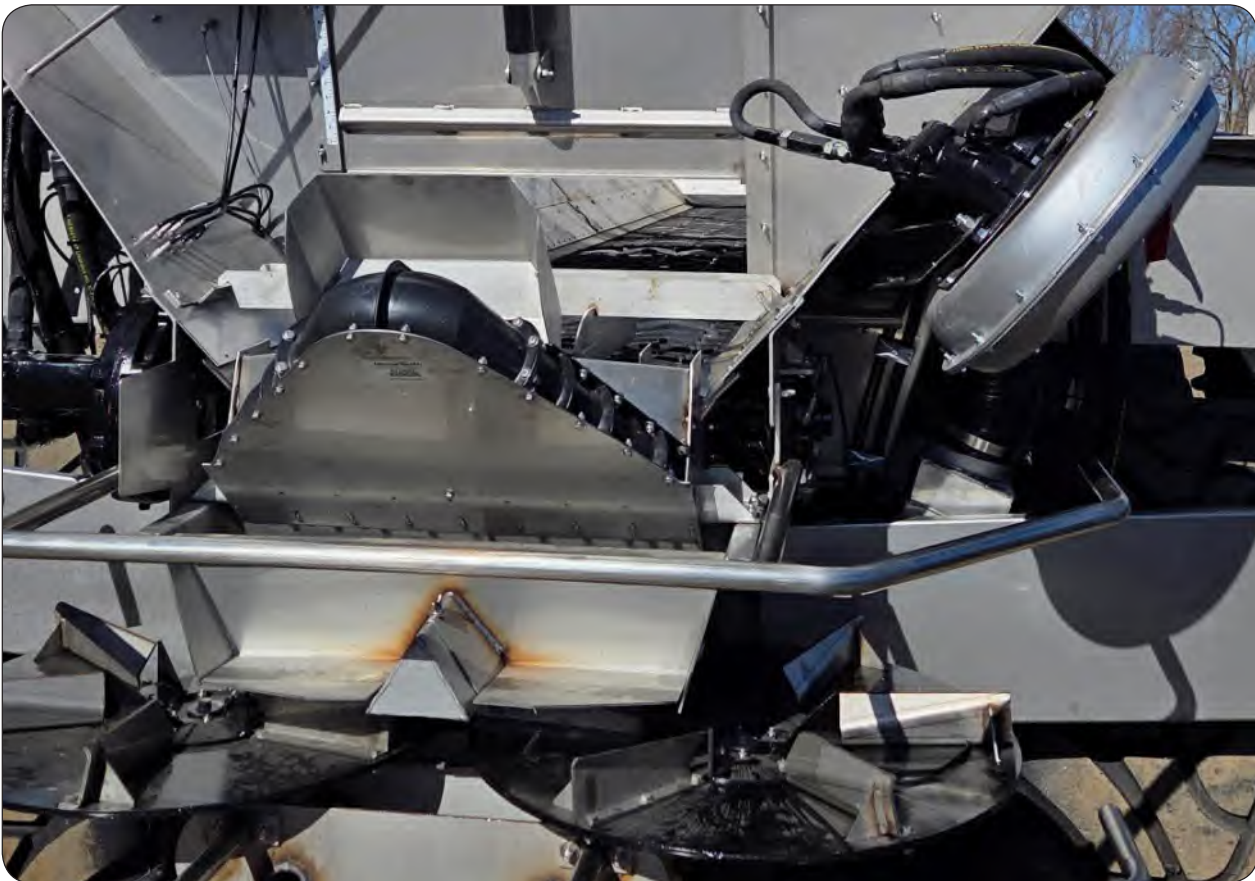


This symbol identifies important safety messages. When you see it, read the message that follows and be alert to the possibility of personal injury.

Remember, safety instructions stated in this manual are for your protection. Read them carefully and follow them closely when working around or using this machine.

Read and study this manual completely before attempting to operate this implement. Take this manual to the field for handy reference when operating, adjusting, or servicing your machine. It can be stored in the supplied tube located on the implement.

When referenced, “Right-Hand” (RH) and “Left-Hand” (LH) side of the machine are determined by standing behind the machine and facing in the direction of travel.



IMPORTANT

- *The information, specifications, and illustrations in the manual are based on information available at the time it was written. Due to continuing improvements in the design and manufacture of Unverferth products, all specifications and information contained herein are subject to change without notice.*

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Section I

Safety

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General Hazard Information

No accident-prevention program can be successful without the wholehearted cooperation of the person who is directly responsible for the operation of the equipment.

A large number of accidents can be prevented only by the operator anticipating the result before the accident is caused and doing something about it. No power-driven equipment, whether it be transportation or processing, whether it be on the highway, in the field, or in the industrial plant, can be safer than the person who is at the controls. If accidents are to be prevented--and they can be prevented--it will be done by the operators who accept the full measure of their responsibility.

It is true that the designer, the manufacturer, and the safety engineer can help; and they will help, but their combined efforts can be wiped out by a single careless act of the operator.

It is said that, "the best kind of a safety device is a careful operator." We, at Unverferth Mfg. Co., Inc. ask that you be that kind of operator.



REMEMBER:
THINK SAFETY
A CAREFUL OPERATOR IS THE
BEST INSURANCE AGAINST AN
ACCIDENT!

SIGNAL WORDS



INDICATES AN EXTREMELY HAZARDOUS SITUATION OR ACTION THAT WILL RESULT IN SERIOUS INJURY OR DEATH.



INDICATES A HAZARDOUS SITUATION OR ACTION THAT COULD RESULT IN SERIOUS INJURY OR DEATH.



INDICATES AN UNSAFE SITUATION OR ACTION THAT MAY RESULT IN PERSONAL INJURY.

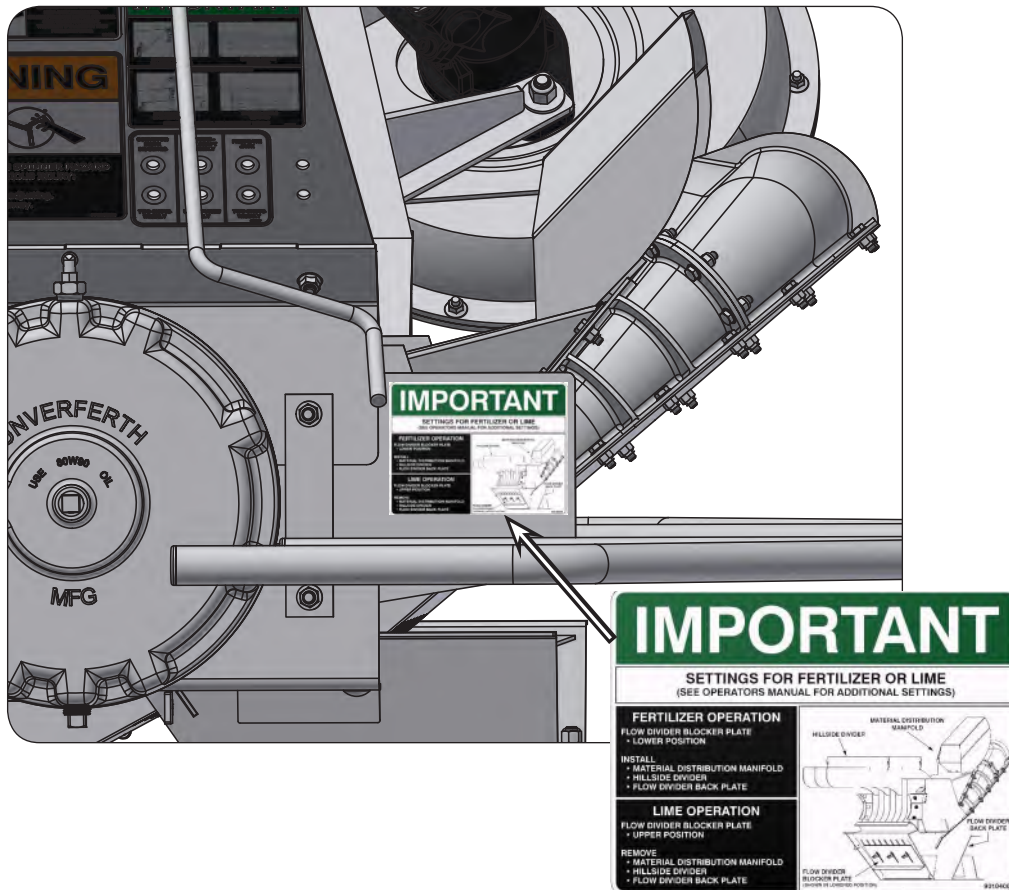


Is used for instruction on operating, adjusting, or servicing a machine.

Safety Decals

WARNING

- REPLACE LOST, DAMAGED, PAINTED, OR UNREADABLE DECALS IMMEDIATELY. IF PARTS THAT HAVE DECALS ARE REPLACED, ALSO MAKE SURE TO INSTALL NEW DECALS. THESE DECALS INFORM AND REMIND THE OPERATOR WITH OPERATIONAL INFORMATION AND SAFETY MESSAGES.



Part No.
9010406

Following Safety Instructions

- Read and understand this operator's manual before operating.



- All machinery should be operated only by trained and authorized personnel.

- To prevent machine damage, use only attachments and service parts approved by the manufacturer.

- Always shut tractor engine off and remove key before servicing the implement.



- Avoid personal attire such as loose fitting clothing, shoestrings, drawstrings, pants cuffs, long hair, etc., that may become entangled in moving parts.

- Do not allow anyone to ride on the implement. Make sure everyone is clear before operating machine or towing vehicle.



- Never attempt to operate implement unless you are in driver's seat.



Before Servicing or Operating

- Avoid working under an implement; however, if it becomes absolutely unavoidable, make sure the implement is safely blocked. 
- Sharp edges on the machine can cause injury. Be careful when working around the machine.
- To prevent personal injury or death, always ensure that there are people who remain outside the dry spreader to assist the person working inside, and that all safe workplace practices are followed. There is restricted mobility and limited exit paths when working inside the implement.
- Check equipment for leaks. Repair any leaks before beginning or resuming operation.
- Always make certain everyone and everything is clear of the machine before beginning operation.
- This machine is only intended to be used with corresponding Pro-Force dry spreader. Any other use is prohibited and may pose safety risks to operators and others.
- Hot parts can cause severe burns. Use caution when working around power system/ground engaging components. Allow parts to cool before servicing.

During Operation

- Comply with all laws and product label directions governing safe product application.
- Never service or lubricate equipment when in operation.
- Do not leave towing vehicle unattended with engine running.

Pressurized Oil

- Relieve pressure before disconnecting hydraulic lines from tractor, loosening any hydraulic fittings or servicing hydraulic system. See hydraulic power unit manual for procedure to relieve pressure.
- High-pressure fluids can penetrate the skin and cause serious injury or death. Leaks of high-pressure fluids may not be visible. Use cardboard or wood to detect leaks in hydraulic system. Seek medical treatment immediately if injured by high-pressure fluids.
- Hydraulic system must be purged of air before operating to prevent serious injury or death.
- Do not bend or strike high-pressure lines. Do not install bent or damaged tubes or hoses.
- Repair all oil leaks. Leaks can cause fires, personal injury, and environmental damage.
- Route hoses and lines carefully to prevent premature failure due to kinking and rubbing against other parts. Make sure that all clamps, guards and shields are installed correctly.
- Check hydraulic hoses and tubes carefully. Replace components as necessary if any of the following conditions are found:
 - End fittings damaged, displaced, or leaking.
 - Outer covering chafed/cut or wire reinforcing exposed.
 - Outer covering ballooning locally.
 - Evidence of kinking or crushing of the flexible part of a hose.

Fertilizer and Chemical Hazards

- Always wear personal protective equipment when working with or near fertilizers and/or chemicals. This equipment includes, but is not limited to: protective eye wear, gloves, shoes, socks, long-sleeved shirt, and long pants. Additional protection may be required for many types of fertilizers and/or chemicals.
- Seek and receive fertilizer and/or chemical product training prior to using agricultural fertilizers and/or chemicals.
- Read and understand the entire label of every fertilizer and/or chemical being applied with this dry spreader.
- Wash hands before eating, drinking, chewing gum, or using the toilet.
- Remove clothing immediately if fertilizers and/or chemicals penetrate clothing and contact skin. Wash thoroughly and put on clean clothing.
- Dispose of unused fertilizer and/or chemical in accordance with fertilizer and/or chemical label directions and local/national regulations.

Preparing for Emergencies

- Keep a first aid kit and properly rated fire extinguisher nearby.



- Keep emergency numbers for fire, rescue, and poison control personnel near the phone.



Wearing Protective Equipment

- Wear clothing and personal protective equipment appropriate for the job.



- Wear steel-toed shoes when operating.



- Wear hearing protection when exposed to loud noises.



- Do not wear additional hearing impairing devices such as radio headphones, etc.



Notes

Section II

Set Up

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Pre-Delivery Checklist

After the dry spreader has been completely assembled, use the following checklist and inspect the dry spreader. Check off each item as it is found satisfactory or after proper adjustment is made.

- ☐ Power wash any road salt off this unit to help prevent corrosion.
- ☐ Verify section control unlock is equipped on the tractor.
- ☐ Check fan operation. See “Air Command Start Up Procedure” in OPERATION section.
- ☐ Check fan components for leaks.
- ☐ Test run the actuator sections. See “Actuator Test Procedure” in MAINTENANCE section.
- ☐ Check hydraulic components for leaks and check hose routing.

Rate Control Module (RCM) Fertilizer Spreading Set Up

The Air Command is a section control system designed for pull-type Pro-Force spreaders and is compatible with single and dual fertilizer product application. It can spread cover crops and other granular materials. It is not compatible with lime or litter spreading operation.

Program RCM controller by creating two spreading profiles. One profile is for “Fertilizer Spreading” with Air Command and the second profile is for “Lime Spreading”. See “Rate Control (RCM) Lime Spreading Set Up” in this section for information on lime spreading.

When turning on the RCM for the first time, the following steps have to be performed in order for the RCM to function properly right away.

NOTE: This set up guide uses the latest RCM software at the time of printing.

1. Park the empty spreader on a firm, level surface. Block the machine to keep it from moving. Set the tractor's parking brake, shut off the engine, remove the ignition key, disconnect hydraulics from the tractor to the spreader, and PTO, if equipped.



2. Attach RCM to tractor IBBC connector to provide power to the RCM.
3. Initial start-up screen. At “Profile Name” box, name as “AirCmd-Fert”. Click “Machine Type” and select “Pull-Behind Spreader”. Next, enter 90 FT. for “Application Width”. Click next page icon. (FIG. 2-1)

NOTE: Complete spread test procedure to validate spread width. See “Dry Spreader Operator's Manual” and “Spread Test Procedure” in OPERATION section for details. Change “Application Width” after spread test procedure is complete.

NOTE: The question mark provides additional information and outlines what happens when adjusting each setting. (FIG. 2-2)

4. Default for “ECU” box is 1. Click “Number of Products” box and unless your spreader is equipped with optional dual bins, stay with the default 1 in this box. If equipped with dual bin, enter 2. Click next page icon. (FIG. 2-2)
5. Default for “Number of Spinner RPM Sensors” box is 1. Ensure “Enable Spinner RPM Control” box is checked. Click next page icon. (FIG. 2-3)

FIG. 2-1 Name Profile

Profile Name
AirCmd-Fert

Machine Type
Pull-Behind Spreader

Application Width
90.000 (ft)

Software Version Number
25.4.0.61

Hardware Serial Number
60401

RAVEN

Next Page Icon

FIG. 2-2 Setup System

ECU S/N	ECU #	Number of Products
RCM-60401	1	1 ?

RAVEN

Next Page Icon

Setup Fan/Spinner RPM

Select the number of spinner or fan RPM sensors installed on the Implement used for fan or spinner RPM monitoring or control

1

Enable Fan/Spinner RPM Control ☒

FIG. 2-3

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Next Page Icon

RCM Fertilizer Spreading Set Up (continued)

6. Under “Application Type”, select “Granular Fertilizer” for product type. The number of products selected correlates with the number of products in figure 2-4. Click next page icon. (FIG. 2-4)

NOTE: A Duo-Force spreader with two products is shown figure 2-4. The final entry is always RPM Spinner/Fan.

Setup Application Type

Product	Application Type
1 *	Granular Fertilizer
2 *	Granular Fertilizer
3 *	Not Installed
4 *	Not Installed
5 *	RPM Spinner/Fan

FIG. 2-4

7. Under “Product 1 Granular Application Mode”, select “Granular RPM Compensated”. Click next page icon. (FIG. 2-5)

Setup Application Type

Product 1 Granular Application Mode

* Granular RPM Compensated

Application Mode - Granular Multi-Section RPM Compensated Dry or seed application using multiple shutoff sections. Meter/conveyor RPM is controlled/compensated based on machine speed and active width as sections turn on and off. Application rate is entered and documented as Pounds/Acre (Kilograms/Hectare).

FIG. 2-5

NOTE: This screen will not be displayed if using one product. (FIG 2-6)

NOTE: If using one product, skip to step 9.

8. Under “Product 2 Granular Application Mode”, select “Granular RPM Compensated”. Click next page icon. (FIG. 2-6)

Setup Application Type

Product 2 Granular Application Mode

* Granular RPM Compensated

Application Mode - Granular Multi-Section RPM Compensated Dry or seed application using multiple shutoff sections. Meter/conveyor RPM is controlled/compensated based on machine speed and active width as sections turn on and off. Application rate is entered and documented as Pounds/Acre (Kilograms/Hectare).

FIG. 2-6

RCM Fertilizer Spreading Set Up (continued)

9. Ensure “AUX-N Enabled” and “Weather Station Enabled” boxes are unchecked. Click next page icon. (FIG. 2-7)

10. Make sure this box is YES. Click next page icon. (FIG. 2-8)

Yes				No			
Product 1 Sections				Product 1 Sections			
15.00	15.00	15.00	15.00	15.00	15.00	15.00	15.00
1	2	3	4	1	2	3	4
Product 2 Sections				Product 2 Sections			
15.00	15.00	15.00	15.00	30.00	30.00	30.00	30.00
1	2	3	4	7	8		

RCM Fertilizer Spreading Set Up (continued)

11. Enter “4” for the number of sections. (FIG. 2-9)
12. Ensure “Equal Width Sections” and “Actuator Section Control” boxes are checked. Click next page icon. (FIG. 2-9)

Setup Sections

Number of Sections ?

Equal Width Sections ☒

Actuator Section Control ☒

FIG. 2-9 RAVEN

NOTE: The values for figure 2-10 are your spread width divided by four.

13. This value auto populates for the width of each section. Click next page icon. (FIG. 2-10)

Setup Section Width

Enter the width of the sections

1 (ft)

2 (ft)

3 (ft)

4 (ft)

FIG. 2-10 RAVEN

14. Next to “Auxiliary Driver 1”, select “Aux Driver 5”. (FIG. 2-11)

NOTE: “Aux Driver 5” is for the boundary control feature.

15. Ensure “Auxiliary Driver 2-6” boxes are selected as “None”. Click next page icon. (FIG. 2-11)

Setup Auxiliary Drivers

Auxiliary Driver 1 ?

Auxiliary Driver 2

Auxiliary Driver 3

Auxiliary Driver 4

Auxiliary Driver 5

Auxiliary Driver 6

FIG. 2-11 RAVEN

RCM Fertilizer Spreading Set Up (continued)

16. Ensure “Auxiliary Driver 7-12” boxes are selected as “None”. Click next page icon. (FIG. 2-12)

Setup Auxiliary Drivers

Auxiliary Driver 7: None

Auxiliary Driver 8: None

Auxiliary Driver 9: None

Auxiliary Driver 10: None

Auxiliary Driver 11: None

Auxiliary Driver 12: None

FIG. 2-12

17. Ensure “Latched Aux Output 1” box is checked. Click next page icon. (FIG. 2-13)

Auxiliary Drivers Assignment

Latched Aux Output 1: ☒

FIG. 2-13

NOTE: FIG. 2-14 shows how many bins are equipped.

18. No action required on this screen. Shows product width summary. Continue to next page. (FIG. 2-14)

Section Summary

89.999 (ft)

Product 1

90
1
1

Product 2

90
1
1

Liquid Section Width Granular Section Width Wired Signal Driver Switch Number

FIG. 2-14

RCM Fertilizer Spreading Set Up (continued)

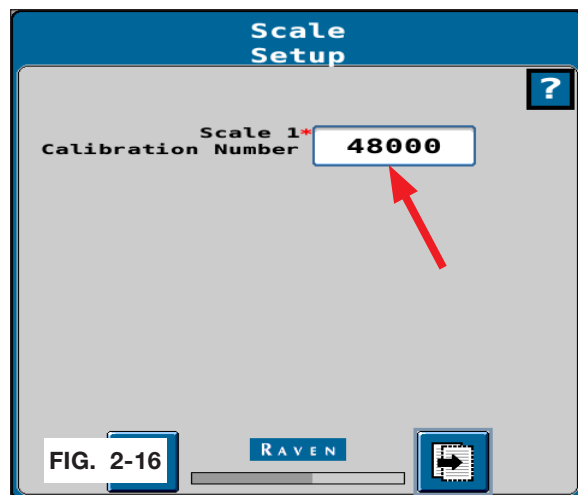
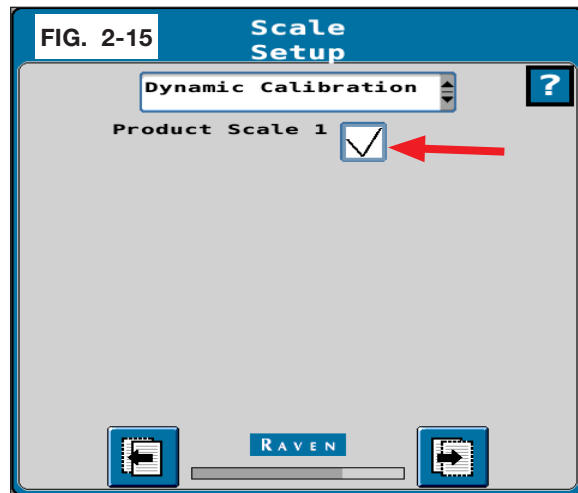
NOTE: If unit is NOT equipped with a scale, leave boxes blank and skip to step 22.

19. If the unit is equipped with a scale, select “Dynamic Calibration” box. (FIG. 2-15)

20. Ensure “Product Scale 1” box is checked. Click next page icon. (FIG 2-15)

NOTE: The scale detects the combined weight of **ALL** products.

21. Enter “32000” for Calibration Number for 4-point scale spreader models 1050 through 1450. Enter “48000” for 6-point scale spreader models 1850 and 2250. Click next page icon. (FIG. 2-16)



RCM Fertilizer Spreading Set Up (continued)

22. Next to “Pressure Sensor 1”, select “0-55 in/H₂O (3-5V)”. (FIG. 2-17)

NOTE: “0-55 in/H₂O (3-5V)” is for the fan pressure.

23. Ensure “Pressure Sensor 2-4” boxes are selected as “None”. Click next page icon. (FIG. 2-17)

Setup Pressure Sensors

Pressure Sensor 1: 0-55 in/H₂O (3-5V)

Pressure Sensor 2: None

Pressure Sensor 3: None

Pressure Sensor 4: None

FIG. 2-17

RAVEN

24. Ensure all product boxes are checked. Click next page icon. (FIG. 2-18)

Setup Pressure Assignment

Pressure Sensor 1

Product 1: ☒

Product 2: ☒

FIG. 2-18

RAVEN

NOTE: “Pressure 1” is for the fan pressure. (FIG. 2-19)

25. For “Pressure 1”, enter “5” for min. and “30” for max pressure. Select “Alarm”, if desired. Click next page icon. (FIG. 2-19)

Setup Pressure Alarms

	Min	Max	Alarm?
Pressure 1 (in. of H ₂ O)	5	30	☒
Pressure 2 (PSI)	0	0	☐
Pressure 3 (PSI)	0	0	☐
Pressure 4 (PSI)	0	0	☐
Pressure 5 (PSI)	0	0	☐

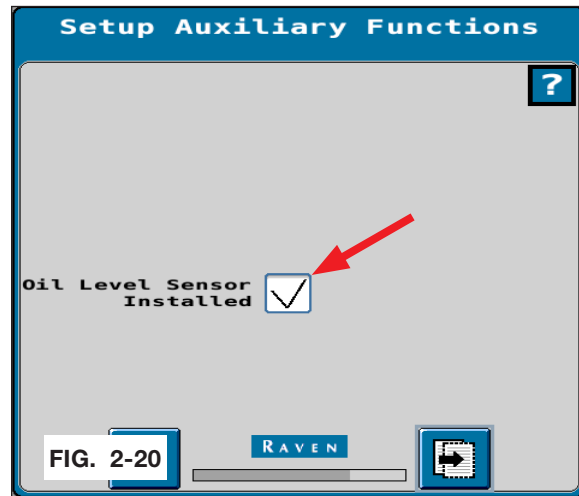
FIG. 2-19

RAVEN

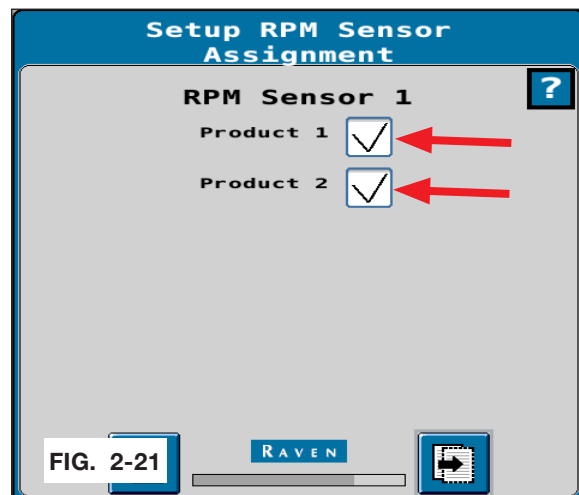
RCM Fertilizer Spreading Set Up (continued)

NOTE: If unit is 1450 and smaller with SCV driven combined hydraulics, leave box blank and skip to step 27.

26. For PTO pump units, ensure “Oil Level Sensor Installed” box is checked. Click next page icon. (FIG. 2-20)



27. Ensure each box is checked for all products. The number of products will correspond to the number of compartments on the spreader. Click next page icon. (FIG. 2-21)



RCM Fertilizer Spreading Set Up (continued)

28. “Product 1” is the set up for the main conveyor. For “Control Valve Type”, select “PWM Close”. (FIG. 2-22)

NOTE: Model 2250 & 1850 spreaders use 1 servo valve and 1 PWM valve on the 2 flow control valve blocks. (FIG. 2-23)

NOTE: Model 1450 & shorter spreaders use 1 servo valve and 1 PWM valve on the main hydraulic valve block. (FIG. 2-24)

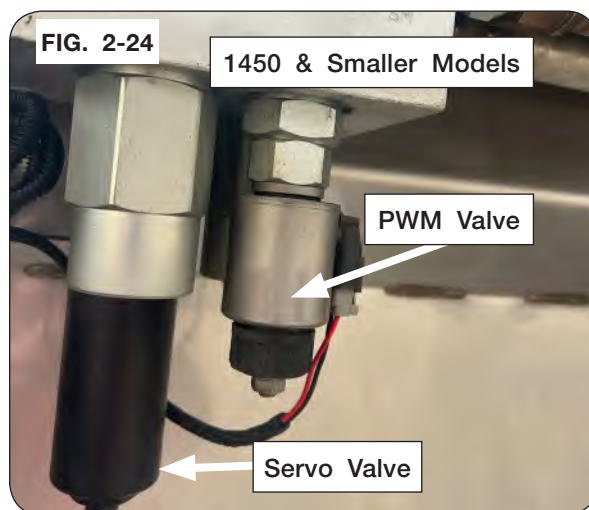
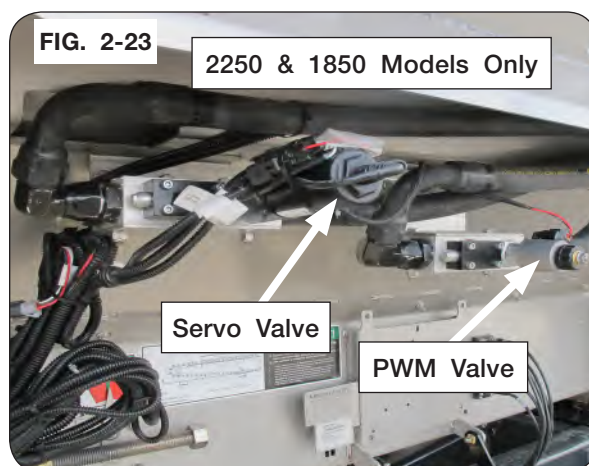
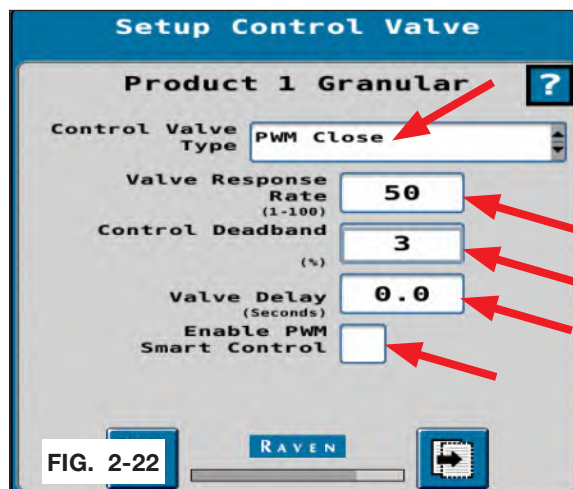
29. For “PWM Close” valve type, set “Valve Response Rate” at 50 as shown in figure 2-22. This is how fast the valve responds.

NOTE: If valve is hunting, reduce “Valve Response Rate” 2%. Repeat as needed. If valve is not responding quickly, increase “Valve Response Rate” 2%. Repeat as needed.

30. Ensure “Control Deadband %” box is 3.

31. “Valve Delay” box remains at 0.

32. Ensure “Enable PWM Smart Control” box is unchecked as shown in figure 2-22. Click next page icon.

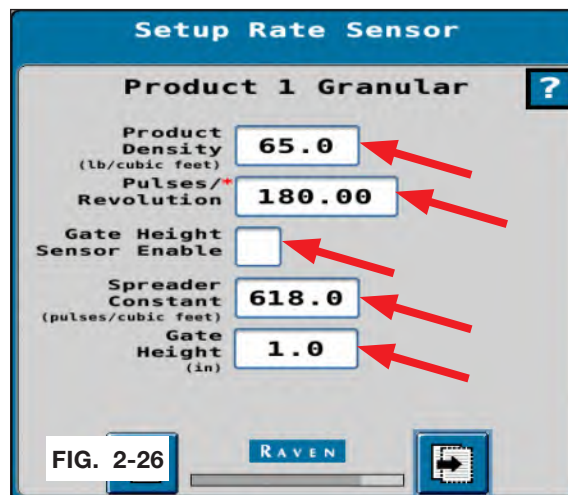
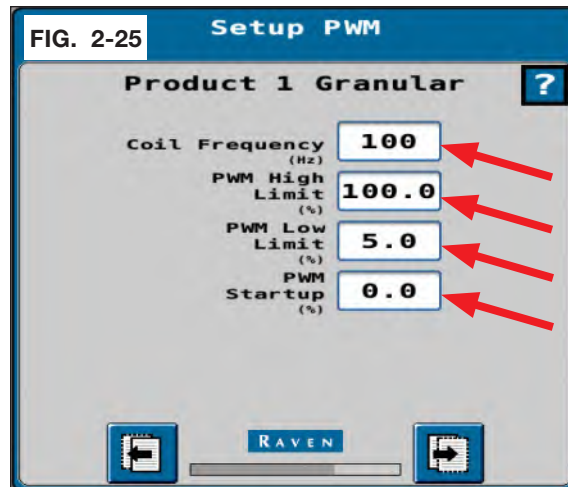


RCM Fertilizer Spreading Set Up (continued)

33. For the PWM valve (9009773) “Coil Frequency”, this value defaults to 60. Change value to 100. (FIG. 2-25)
 34. Set “PWM High Limit” at 100, “PWM Low Limit” at 5 and “PWM Startup” at 0. Click next page icon. (FIG. 2-25)
 35. Use Density Scale in spread pattern kit 414542R to determine material product density. Enter this value. For quick setup, enter “Product Density” to 65 lbs./cu.ft. This value can be changed later. (FIG. 2-26)
 36. Enter recommended “Spreader Constant” and desired “Gate Height”. These values are only used for product 1 on main conveyor. Ensure “Gate Height Sensor Enable” box is unchecked. See single and Duo-Force tables below. (FIG. 2-26)
- NOTE:** Perform catch test calibration to achieve proper spreader constant.
37. Enter 180 for “Pulses/Revolution”. This value is only used for product 1 on main conveyor motor. Click next page icon. (FIG. 2-26)

Primary Bin with Single Bin Only	
Gate Setting	Spreader Constant
1 INCH	618
2 INCH	309
3 INCH	206
4 INCH	154
5 INCH	123
6 INCH	103
7 INCH	88
8 INCH	77
9 INCH	69
10 INCH	62
11 INCH	56
12 INCH	51
13 INCH	48
14 INCH	44
15 INCH	41
16 INCH	39
17 INCH	36
18 INCH	34

Primary Bin with Duo-Force	
Gate Setting	Spreader Constant
0.5 INCH (A)	1382
1.5 INCH (B)	461
2.5 INCH MAX (C)	276



RCM Fertilizer Spreading Set Up (continued)

38. “Tank Capacity” of primary bin depends on number of bins and size of spreader. For testing purposes, entering 15000 is recommended. Multiplying product density by struck capacity determines tank capacity. (FIG. 2-27)

39. “Current Tank Level” box remains at 0.

40. “Low Tank Level” is the value an alarm is set off for a low bin level. This setting remains at 0 and ensure the “Alarm” box is unchecked.

41. Ensure “Low Bin Level Sensor” box is checked and “Bin Level Sensor Type” is Default. Click next page icon. (FIG. 2-27)

Setup Tank/Bin

Product 1 Granular

Tank Capacity (Lb)

Current Tank Level (Lb)

Low Tank Level (Lb) Alarm? ☐

Low Bin Level Sensor ☒

Bin Level Sensor Type ?

FIG. 2-27

42. “Set Up Rates” page controls the application rates for main conveyor speed and determines how much product is being applied for “Product 1” and main conveyor. Enter three “Preset Rate Values”, as desired, which can be clicked between on the homescreen. On the homescreen, rates can be entered as well. (FIG. 2-28)

43. Enter “Rate Bump” value in an increment as desired.

44. For “Rate Selection”, manually input a selection or select “Predefined or Rx”. This enables selection of rate from the preset value choices or from a prescription map that is imported from a Universal Terminal.

FIG. 2-28 Setup Rates

Product 1 Granular ?

	Rate 1	Rate 2	Rate 3
Preset Rate Values (lb/ac)	100	200	300

Rate Bump (lb/ac)

Rate Selection

Display Smoothing ☒

Decimal Shift

45. “Display Smoothing” needs to be checked and “Decimal Shift” remains at 0. Click next page icon. (FIG. 2-28)

46. Enter 20 for “Off Rate Alarm” and check “Alarm” box. (FIG. 2-29)

NOTE: Alarm prompts when over 20% off target rate.

47. Do not check “Shaft Sensor Alarm” box. Click next page icon. (FIG. 2-29)

FIG. 2-29 Setup Alarms

Product 1 Granular ?

Off Rate Alarm (% off target rate) Alarm? ☒

Shaft Sensor Alarm ☐

RCM Fertilizer Spreading Set Up (continued)

NOTE: The question mark provides additional information and outlines what happens when adjusting each value setting.

NOTE: If equipped with a single bin, skip to step 68.

48. “Product 2” is the set up for the Duo-Force conveyor. For “Control Valve Type”, always select “PWM Close” for conveyor. (FIG. 2-30)

49. Set “Valve Response Rate” at 50.

50. Ensure “Control Deadband %” box is 3.

51. “Valve Delay” box remains at 0.

52. Ensure “Enable PWM Smart Control” box is unchecked. Click next page icon. (FIG. 2-30)

53. For the PWM valve “Coil Frequency”, this value defaults to 60. Change the value to 100. (FIG. 2-31)

54. Set the “PWM High Limit” at 100, “PWM Low Limit” at 5 and “PWM Startup” at 0. Click next page icon. (FIG. 2-31)

55. Use Density Scale in spread pattern kit 414542R to determine material product density. Enter this value. For quick setup, enter “Product Density” to 80 lbs./cu.ft. This value can be changed later. (FIG. 2-32)

NOTE: When measuring gate opening for Duo Force, add 1/2” to measurement to account for chain material depth.

56. Enter recommended “Spreader Constant” and desired “Gate Height”. These values are only used for product 2 on Duo-Force conveyor. Ensure “Gate Height Sensor Enable” box is unchecked. See table below. (FIG. 2-32)

Gate Setting	Spreader Constant
1 INCH	505
2 INCH	253
2.4 INCH MAX	210

57. Enter 90 for “Pulses/Revolution”. This value is only used for product 2 on Duo-Force conveyor motor. Click next page icon. (FIG. 2-32)

Setup Control Valve

Product 2 Granular ?

Control Valve Type: PWM Close

Valve Response Rate (1-100): 50

Control Deadband (%): 3

Valve Delay (Seconds): 0.0

Enable PWM Smart Control: ☐

FIG. 2-30

FIG. 2-31 Setup PWM

Product 2 Granular ?

Coil Frequency (Hz): 100

PWM High Limit (%): 100.0

PWM Low Limit (%): 5.0

PWM Startup (%): 0.0

Setup Rate Sensor

Product 2 Granular ?

Product Density (lb/cubic feet): 80.0

Pulses/Revolution: 90.00

Gate Height Sensor Enable: ☐

Spreader Constant (pulses/cubic feet): 505.0

Gate Height (in): 1.0

FIG. 2-32

RCM Fertilizer Spreading Set Up (continued)

58. "Tank Capacity" of the secondary bin will depend on product density and spreader configuration. For testing purposes, entering 15000 is recommended. (FIG. 2-33)
59. "Current Tank Level" box remains at 0.
60. "Low Tank Level" is the value an alarm is set off for a low bin level. This setting remains at 0 and ensure the "Alarm" box is unchecked.
61. Ensure the "Low Bin Level Sensor" box is checked, the "Mid Bin Level Sensor" is unchecked, "Mid Tank Level" is 0, and "Bin Level Sensor Type" is Default. Click next page icon. (FIG. 2-33)
62. "Set Up Rates" page controls the application rates for Duo-Force conveyor speed and determines how much product is being applied for "Product 2" and Duo-Force conveyor. Enter three "Preset Rate Values", as desired, which can be clicked between on the homescreen. On the homescreen, target rates can be entered as well. (FIG. 2-34)
63. Enter "Rate Bump" value in an increment as desired.
64. For "Rate Selection", manually input a selection or select "Predefined or Rx". This enables selection of rate from the preset value choices or from a prescription map that is imported from a Universal Terminal.
65. "Display Smoothing" needs to be checked and "Decimal Shift" remains at 0. Click next page icon. (FIG. 2-34)
66. Enter 20 for "Off Rate Alarm" and check "Alarm" box. (FIG. 2-35)
67. Ensure "Shaft Sensor Alarm" box is unchecked. Click next page. (FIG. 2-35)

Setup Tank/Bin

Product 2 Granular

Tank Capacity (Lb)

Current Tank Level (Lb)

Low Tank Level (Lb)

Low Bin Level Sensor ☒

Mid Bin Level Sensor ☐

Mid Tank Level (%)

Bin Level Sensor Type

Alarm? ☐

FIG. 2-33

FIG. 2-34 Setup Rates

Product 2 Granular

Preset Rate Values (lb/ac)

Rate 1	Rate 2	Rate 3
20	40	60

Rate Bump (lb/ac)

Rate Selection

Display Smoothing ☒

Decimal Shift

FIG. 2-35 Setup Alarms

Product 2 Granular

Off Rate Alarm (% off target rate)

Shaft Sensor Alarm ☐

Alarm? ☒

RCM Fertilizer Spreading Set Up (continued)

NOTE: Spinner control is numbered as a product. The product number is 1 more than the number of bin(s) equipped.

NOTE: For example: if two products were selected during initial set up. Third product is spinner control.

68. “Product 3 RPM” is the set up for spinner speed. For “Control Valve Type”, always select “Fast Close” for spinners. (FIG. 2-36)
69. For “Valve Response Rate” and PTO models 1850 and 2250, enter 18. All other models enter 35 to start. If spinner speed is erratic, then enter lower value as desired.
70. Default for “Control Deadband %” is 3.
71. For “Control Effort” and PTO models 1850 and 2250, enter 18. All other models enter 14. Click next page icon. (FIG. 2-36)
72. Enter 4 for “RPM Cal”. Click next page icon. (FIG. 2-37)
73. Enter “Preset Rate Values” for spinner target speed, as desired. For less dense products, lower RPM is recommended. For denser products, higher RPM, up to 650 is recommended. (FIG. 2-38)
74. For “Rate Bump” enter 0 for rates to run in manual mode or enter 10 if a rate bump is desired. (FIG. 2-38)
75. “Display Smoothing” needs to be checked. Click next page icon. (FIG. 2-38)

Setup Control Valve

Product 3 RPM ?

Control Valve Type: Fast Close

Valve Response Rate (1-100): 35

Control Deadband (%): 3

Control Effort (%): 14

FIG. 2-36 RAVEN

Setup Rate Sensor

Product 3 RPM ?

RPM Cal* Pulses/Rev: 4

FIG. 2-37 RAVEN

FIG. 2-38 Setup Rates

Product 3 RPM ?

	Rate 1	Rate 2	Rate 3
Preset* Rate Values (RPM)	550	600	650
Rate Bump (RPM)	0		
Rate Selection	Predefined or Rx		
Display Smoothing	☒		

FIG. 2-38 RAVEN

RCM Fertilizer Spreading Set Up (continued)

76. Enter 20 for “Off Rate Alarm” and check “Alarm” box. Click next page icon. (FIG. 2-39)

FIG. 2-39 Setup Alarms

Product 3 RPM ?

Off Rate Alarm (% off target rate) Alarm? ☒

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NOTE: “Number of Products” corresponds to bins. 1 for single bin and 2 for Duo-Force. (FIG. 2-40)

77. No action required on this screen. Shows the set up summary. Continue to next page and then click the next page icon to finish the RCM set up. (FIG 2-40)
78. Complete a catch test for each bin before spreading in the field to ensure accurate rates. See “Catch Test Calibration Chute Install” in OPERATION section for details.
79. If equipped with scales, ensure two profiles are set up for scale calibration. The “Fertilizer Spreading” and “Lime Spreading” profiles. See “Dry Spreader Operator’s Manual” and “Scale Calibration Procedure” outlined in SET UP section for details.

FIG. 2-40 Setup Summary

Profile Name AirCmd-Fert
Machine Type Pull-Behind Spreader

Number of Products 2
Number of Sections 4
Implement Width(ft) 90.000
Switchbox Present No
Master Clutch No

Granular Product Sections Power to Apply No

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Rate Control Module (RCM) Lime Spreading Set Up

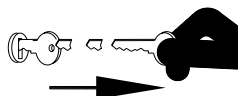
The Air Command section control system is not compatible with lime or litter spreading operation.

The material distribution manifold assembly, section control hillside flow divider and material flow divider back plate must be removed and the flow divider blocker plate moved to the upper position. See “Spreading Operation - Lime Spreading” outlined in OPERATION section.

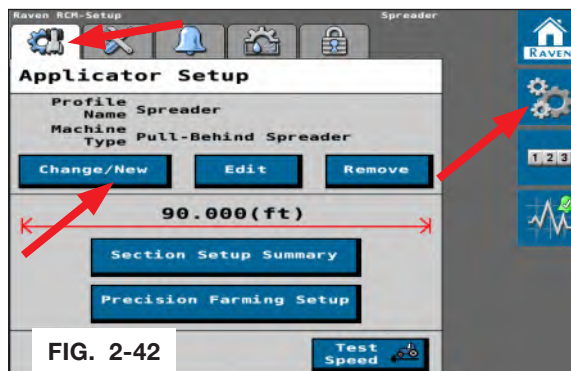
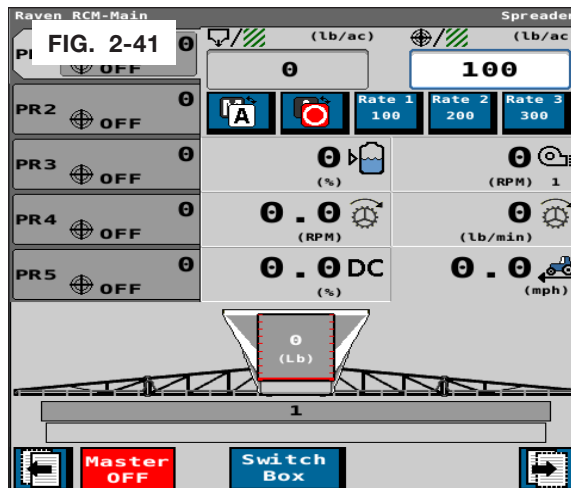
Before starting this section, ensure RCM controller is programmed with a “Fertilizer Spreading” profile. See “Rate Control (RCM) Fertilizer Spreading Set Up” in this section to create fertilizer spreading profile. Once complete, use the next procedure to create “Lime Spreading” profile.

When turning on the RCM for the first time, the following steps will have to be performed in order for the RCM to function properly right away.

1. Park the empty spreader on a firm, level surface. Block the machine to keep it from moving. Set the tractor's parking brake, shut off the engine, remove the ignition key, disconnect hydraulics from the tractor to the spreader, and PTO, if equipped.



2. Attach RCM to tractor IBBC connector to provide power to the RCM.
3. Go to Main Home Screen shown. (FIG. 2-41)
4. To create the “Lime Profile”, go to Settings page - the 3 gears tab. (FIG. 2-42)
5. In the Settings page, select the “Applicator Setup” tab. (FIG. 2-42)
6. In the “Applicator Setup” page, click the “Change/New” button shown. (FIG. 2-42)
7. Initial start-up screen. At the drop down menu, select “New Profile”. Click the checkmark button. (FIG. 2-43)



RCM Lime Spreading Set Up (continued)

8. At “Profile Name” box, name as “Lime”. Click “Machine Type” and select “Pull-Behind Spreader”. Next, enter 60 FT. for “Application Width”. Click next page icon. (FIG. 2-44)

NOTE: Complete spread test procedure to validate spread width. See “Dry Spreader Operator’s Manual” and “Spread Test Procedure” in OPERATION section for details. Change “Application Width” after spread test procedure is complete.

FIG. 2-44 Name Profile

Profile Name
Lime

Machine Type
Pull-Behind Spreader

Application Width
60.000 (ft)

Software Version Number
25.4.0.61

Hardware Serial Number
60401

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NOTE: The question mark provides additional information and outlines what happens when adjusting each setting. (FIG. 2-45)

9. Default for “ECU” and “Number of Products” boxes is 1. Click next page icon. (FIG. 2-45)

FIG. 2-45 Setup System

ECU S/N
RCM-60401

ECU #
1

Number of Products
1 ?

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10. Default for “Number of Spinner RPM Sensors” box is 1. Ensure “Enable Spinner RPM Control” box is checked. Click next page icon. (FIG. 2-46)

Setup Fan/Spinner RPM

Select the number of spinner or fan RPM sensors installed on the Implement used for fan or spinner RPM monitoring or control

1

Enable Fan/Spinner RPM Control ☒

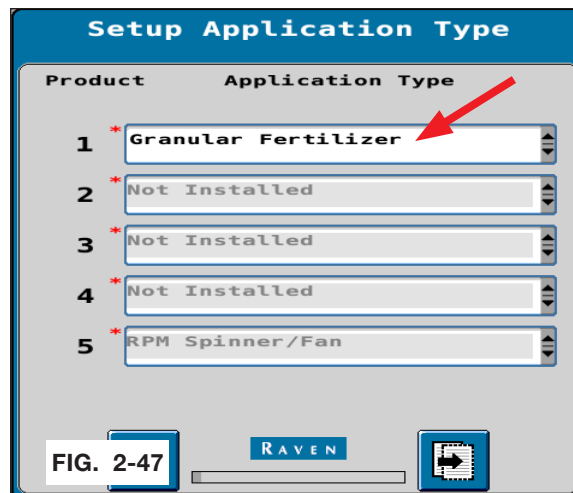
FIG. 2-46

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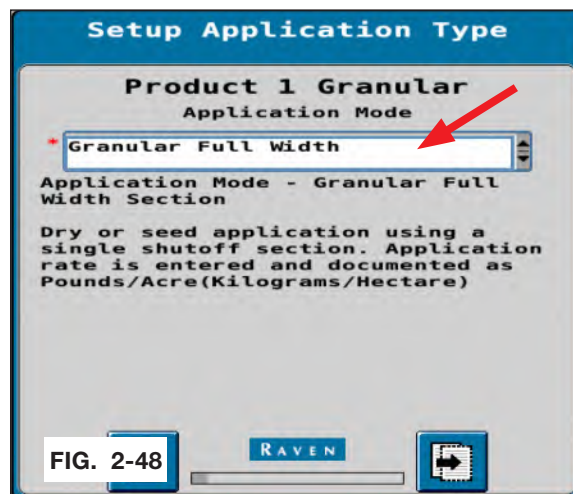
RCM Lime Spreading Set Up (continued)

11. Under “Application Type”, select “Granular Fertilizer” for product type. Click next page icon. (FIG. 2-47)

NOTE: A single bin spreader with one product is shown figure 2-47. The second line is always RPM Spinner/Fan.

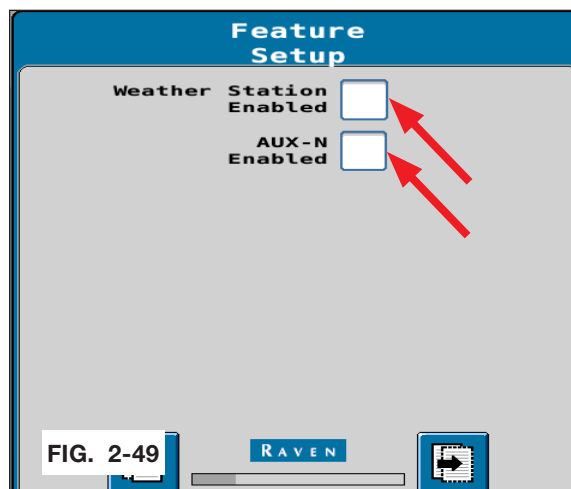


12. Under “Product 1 Granular Application Mode”, select “Granular Full Width”. Click next page icon. (FIG. 2-48)



RCM Lime Spreading Set Up (continued)

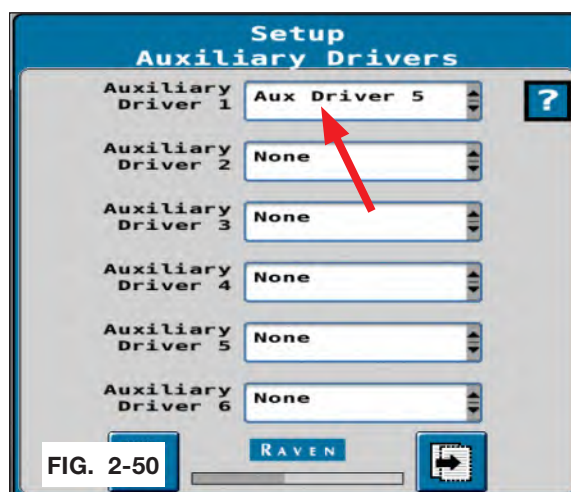
13. Ensure “AUX-N Enabled” and “Weather Station Enabled” boxes are unchecked. Click next page icon. (FIG. 2-49)



14. Next to “Auxiliary Driver 1”, select “Aux Driver 5”. (FIG. 2-50)

NOTE: “Aux Driver 5” is for the boundary control feature.

15. Ensure “Auxiliary Driver 2-6” boxes are selected as “None”. Click next page icon. (FIG. 2-50)



16. Ensure “Auxiliary Driver 7-12” boxes are selected as “None”. Click next page icon. (FIG. 2-51)

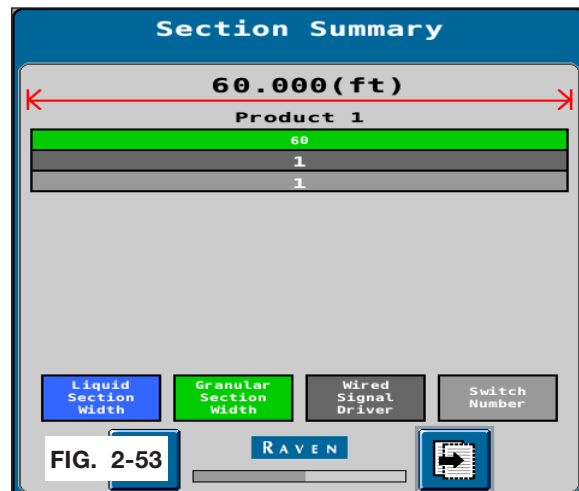


RCM Lime Spreading Set Up (continued)

17. Ensure “Latched Aux Output 1” box is checked. Click next page icon. (FIG. 2-52)



18. No action required on this screen. Shows product width summary. Continue to next page. (FIG. 2-53)



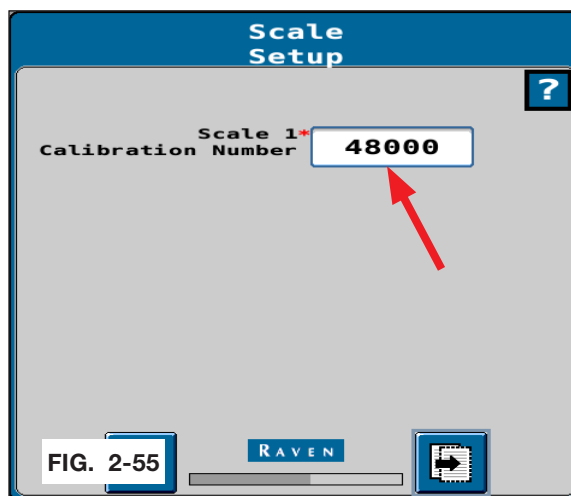
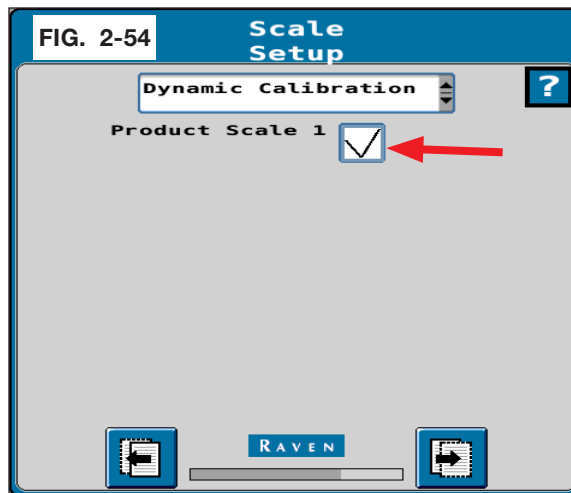
RCM Lime Spreading Set Up (continued)

NOTE: If unit is NOT equipped with a scale, leave box blank and skip to step 22.

19. If the unit is equipped with a scale, select “Dynamic Calibration” box. (FIG. 2-54)

20. Ensure “Product Scale 1” box is checked. Click next page icon. (FIG 2-54)

21. Enter “32000” for Calibration Number for 4-point scale spreader models 1050 through 1450. Enter “48000” for 6-point scale spreader models 1850 and 2250. Click next page icon. (FIG. 2-55)



RCM Lime Spreading Set Up (continued)

22. Next to “Pressure Sensor 1”, select “0-55 in/H₂O (3-5V)”. (FIG. 2-56)

NOTE: “0-55 in/H₂O (3-5V)” is for the fan pressure.

23. Ensure “Pressure Sensor 2-4” boxes are selected as “None”. Click next page icon. (FIG. 2-56)

Setup Pressure Sensors

Pressure Sensor 1: 0-55 in/H₂O (3-5V)

Pressure Sensor 2: None

Pressure Sensor 3: None

Pressure Sensor 4: None

FIG. 2-56 RAVEN

24. Ensure “Product 1” box is checked. Click next page icon. (FIG. 2-57)

Setup Pressure Assignment

Pressure Sensor 1

Product 1 ☒

FIG. 2-57 RAVEN

NOTE: “Pressure 1” is for the fan pressure. (FIG. 2-58)

25. For “Pressure 1”, enter “0” for min. and “5” for max pressure. Select alarm, if desired. Click next page icon. (FIG. 2-58)

Setup Pressure Alarms

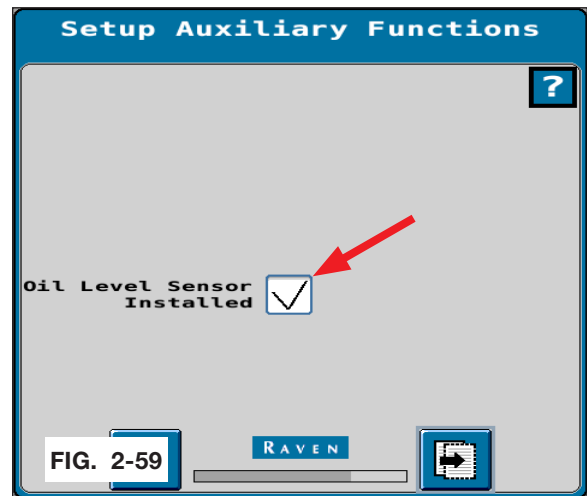
	Min	Max	Alarm?
Pressure 1 (in. of H ₂ O)	0	5	☒
Pressure 2 (PSI)	0	0	☐
Pressure 3 (PSI)	0	0	☐
Pressure 4 (PSI)	0	0	☐

FIG. 2-58 RAVEN

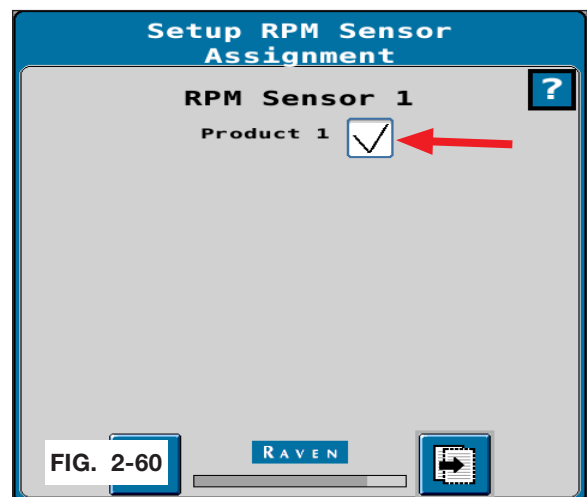
RCM Lime Spreading Set Up (continued)

NOTE: If unit is 1450 and smaller with SCV driven combined hydraulics, leave box blank and skip to step 27.

26. For PTO pump units, ensure “Oil Level Sensor Installed” box is checked. Click next page icon. (FIG. 2-59)



27. Ensure “Product 1” box is checked. Click next page icon. (FIG. 2-60)



RCM Lime Spreading Set Up (continued)

28. “Product 1” is the set up for the main conveyor. For “Control Valve Type”, select “PWM Close”. (FIG. 2-61)

NOTE: Model 2250 & 1850 spreaders use 1 servo valve and 1 PWM valve on the 2 flow control valve blocks. (FIG. 2-62)

NOTE: Model 1450 & shorter spreaders use 1 servo valve and 1 PWM valve on the main hydraulic valve block. (FIG. 2-63)

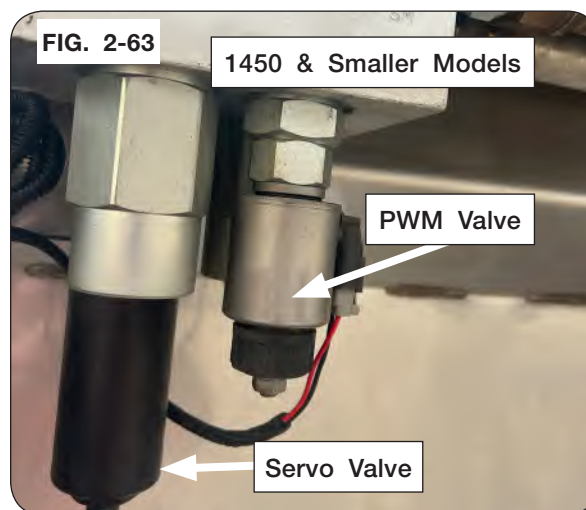
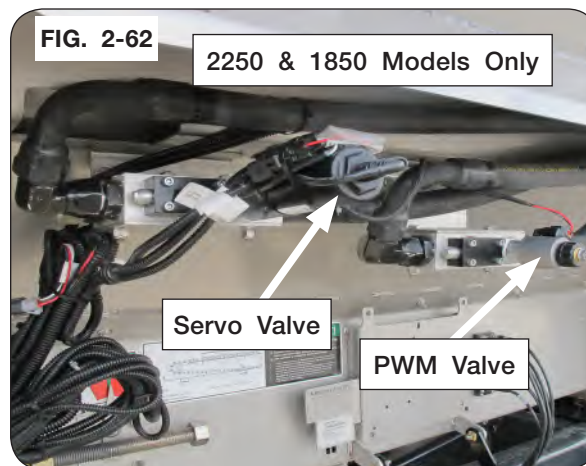
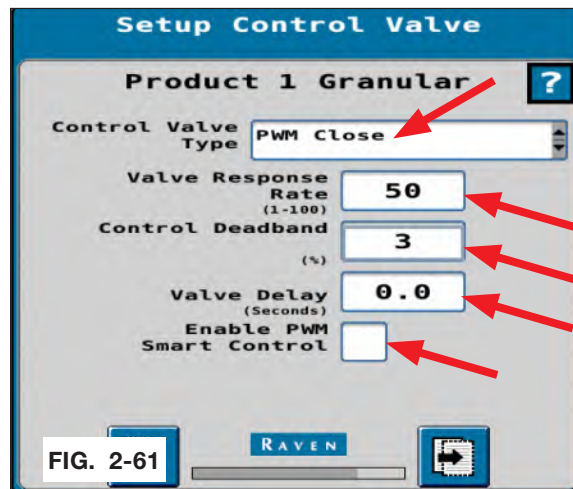
29. For “PWM Close” valve type, set “Valve Response Rate” at 50 as shown in figure 2-61. This is how fast the valve responds.

NOTE: If valve is hunting, reduce “Valve Response Rate” 2%. Repeat as needed. If valve is not responding quickly, increase “Valve Response Rate” 2%. Repeat as needed.

30. Ensure “Control Deadband %” box is 3.

31. “Valve Delay” box remains at 0.

32. Ensure “Enable PWM Smart Control” box is unchecked as shown in figure 2-61. Click next page icon.



RCM Lime Spreading Set Up (continued)

33. For the PWM valve (9009773) “Coil Frequency”, this value defaults to 60. Change value to 100. (FIG. 2-64)
 34. Set “PWM High Limit” at 100, “PWM Low Limit” at 5 and “PWM Startup” at 0. Click next page icon. (FIG. 2-64)
 35. Use Density Scale in spread pattern kit 414542R to determine material product density. Enter this value. For quick setup, enter “Product Density” to 65 lbs./cu.ft. This value can be changed later. (FIG. 2-65)
 36. Enter recommended “Spreader Constant” and desired “Gate Height”. These values are only used for product 1 on main conveyor. Ensure “Gate Height Sensor Enable” box is unchecked. See single bin table below. (FIG. 2-65)
- NOTE:** Perform catch test calibration to achieve proper spreader constant.
37. Enter 180 for “Pulses/Revolution”. This value is only used for product 1 on main conveyor motor. Click next page icon. (FIG. 2-65)

Primary Bin with Single Bin Only	
Gate Setting	Spreader Constant
1 INCH	618
2 INCH	309
3 INCH	206
4 INCH	154
5 INCH	123
6 INCH	103
7 INCH	88
8 INCH	77
9 INCH	69
10 INCH	62
11 INCH	56
12 INCH	51
13 INCH	48
14 INCH	44
15 INCH	41
16 INCH	39
17 INCH	36
18 INCH	34

FIG. 2-64 Setup PWM

Product 1 Granular ?

Coil Frequency (Hz) **100**

PWM High Limit (%) **100.0**

PWM Low Limit (%) **5.0**

PWM Startup (%) **0.0**

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FIG. 2-65 Setup Rate Sensor

Product 1 Granular ?

Product Density (lb/cubic feet) **65.0**

Pulses/Revolution **180.00**

Gate Height Sensor Enable ☐

Spreader Constant (pulses/cubic feet) **618.0**

Gate Height (in) **1.0**

FIG. 2-65 RAVEN

RCM Lime Spreading Set Up (continued)

38. “Tank Capacity” of primary bin depends on size of spreader. For testing purposes, entering 15000 is recommended. Multiplying product density by struck capacity determines tank capacity. (FIG. 2-66)

39. “Current Tank Level” box remains at 0.

40. “Low Tank Level” is the value an alarm is set off for a low bin level. This setting remains at 0 and ensure the “Alarm” box is unchecked.

41. Ensure “Low Bin Level Sensor” box is checked and “Bin Level Sensor Type” is Default. Click next page icon. (FIG. 2-66)

Setup Tank/Bin

Product 1 Granular

Tank Capacity (Lb)

Current Tank Level (Lb)

Low Tank Level (Lb)

Low Bin Level Sensor ☒

Bin Level Sensor Type

FIG. 2-66

42. “Set Up Rates” page controls the application rates for main conveyor speed and determines how much product is being applied for “Product 1” and main conveyor. Enter three “Preset Rate Values”, as desired, which can be clicked between on the homescreen. On the homescreen, rates can be entered as well. (FIG. 2-67)

43. Enter “Rate Bump” value in an increment as desired.

44. For “Rate Selection”, manually input a selection or select “Predefined or Rx”. This enables selection of rate from the preset value choices or from a prescription map that is imported from a Universal Terminal.

FIG. 2-67 Setup Rates

Product 1 Granular

Preset Rate Values (lb/ac)

Rate 1	Rate 2	Rate 3
100	150	200

Rate Bump (lb/ac)

Rate Selection

Display Smoothing ☒

Decimal Shift

45. “Display Smoothing” needs to be checked and “Decimal Shift” remains at 0. Click next page icon. (FIG. 2-67)

46. Enter 20 for “Off Rate Alarm” and check “Alarm” box. (FIG. 2-68)

NOTE: Alarm prompts when over 20% off target rate.

47. Do not check “Shaft Sensor Alarm” box. Click next page icon. (FIG. 2-68)

FIG. 2-68 Setup Alarms

Product 1 Granular

Off Rate Alarm (% off target rate)

Off Rate Alarm Alarm? ☒

Shaft Sensor Alarm ☐

RCM Lime Spreading Set Up (continued)

NOTE: Second product is spinner control.

48. “Product 2 RPM” is the set up for spinner speed. For “Control Valve Type”, always select “Fast Close” for spinners. (FIG. 2-69)
49. For “Valve Response Rate” and PTO models 1850 and 2250, enter 18. All other models enter 35 to start. If spinner speed is erratic, then enter lower value as desired.
50. Default for “Control Deadband %” is 3.
51. For “Control Effort” and PTO models 1850 and 2250, enter 18. All other models enter 14. Click next page icon. (FIG. 2-69)
52. Enter 4 for “RPM Cal”. Click next page icon. (FIG. 2-70)
53. Enter “Preset Rate Values” for spinner target speed, as desired. For less dense products, lower RPM is recommended. For denser products, higher RPM, up to 650 is recommended. (FIG. 2-71)
54. For “Rate Bump” enter 0 for rates to run in manual mode or enter 10 if a rate bump is desired. (FIG. 2-71)
55. “Display Smoothing” needs to be checked. Click next page icon. (FIG. 2-71)

Setup Control Valve

Product 2 RPM ?

Control Valve Type: Fast Close

Valve Response Rate (1-100): 35

Control Deadband (%): 3

Control Effort (%): 14

FIG. 2-69 RAVEN

Setup Rate Sensor

Product 2 RPM ?

RPM Cal* Pulses/Rev: 4

FIG. 2-70 RAVEN

FIG. 2-71 Setup Rates

Product 2 RPM ?

	Rate 1	Rate 2	Rate 3
Preset* Rate Values (RPM)	550	600	650
Rate Bump (RPM)	0		
Rate Selection	Predefined or Rx		
Display Smoothing	☒		

FIG. 2-71 RAVEN

RCM Lime Spreading Set Up (continued)

56. Enter 20 for “Off Rate Alarm” and check “Alarm” box. Click next page icon. (FIG. 2-72)

FIG. 2-72 Setup Alarms

Product 2 RPM ?

Off Rate Alarm (% off target rate) 20 Alarm? ☒

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57. No action required on this screen. Shows the set up summary. Continue to next page and then click the next page icon to finish the RCM set up. (FIG 2-73)
58. Complete a catch test for each bin before spreading in the field to ensure accurate rates. See “Catch Test Calibration Chute Install” in OPERATION section for details.
59. If equipped with scales, ensure two profiles are set up for scale calibration. The “Fertilizer Spreading” and “Lime Spreading” profiles. See “Dry Spreader Operator’s Manual” and “Scale Calibration Procedure” outlined in SET UP section for details.

FIG. 2-73 Setup Summary

Profile Name Lime
Machine Type Pull-Behind Spreader

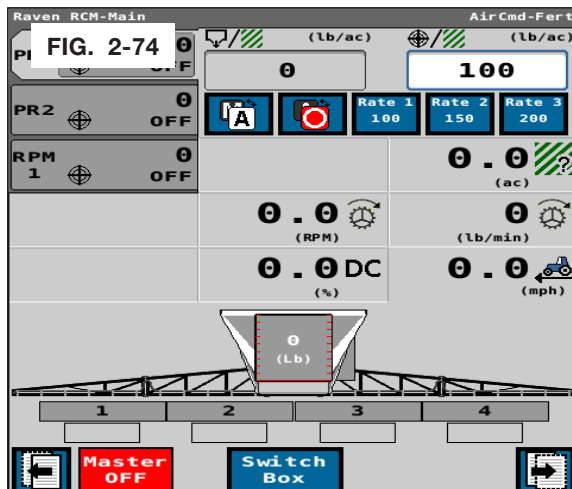
Number of Products 1
Number of Sections 1
Implement Width(ft) 60.000
Switchbox Present No
Master Clutch No

Granular Product Sections Power to Apply No

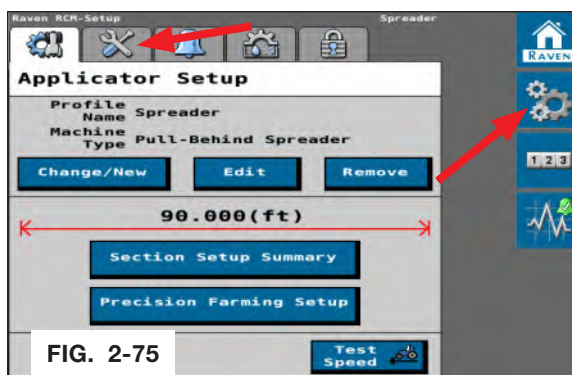
RAVEN

Turn Off Dynamic Scale Calibration

1. Go to the Main Home Screen shown. (FIG. 2-74)

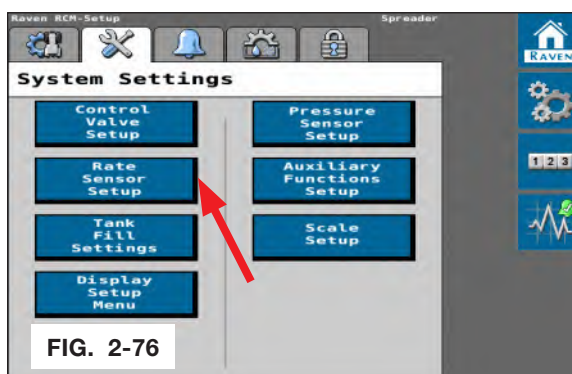


2. To set scale calibration, go to Settings page - the 3 gears tab. (FIG. 2-75)
3. In the Settings page, select the “System Settings” tab. (FIG. 2-75)



4. In the “System Settings” page, click the “Rate Sensor Setup” button shown. (FIG. 2-76)

(Continued on next page)



Turn Off Dynamic Scale Calibration (continued)

5. After selecting “PR1”, click “Dynamic Cal Setup” button. (FIG. 2-77)

Setup Rate Sensor

PR1 **RPM 1**

Pulses/Revolution: 180.00

Product Density (lb/cubic feet): 60.0

Spreader Constant (pulses/cubic feet): 617.0

Gate Height (in): 1.0

Dynamic Cal Setup

Catch Test Calibration Applied Product Calibration

FIG. 2-77 RAVEN

6. After selecting “PR1”, ensure “Enable Dynamic Cal” box is unchecked. (FIG. 2-78)
7. Click “Check Mark” to finish procedure. (FIG. 2-78)

Dynamic Cal Setup

PR1 **RPM 1**

Enable Dynamic Cal ☐

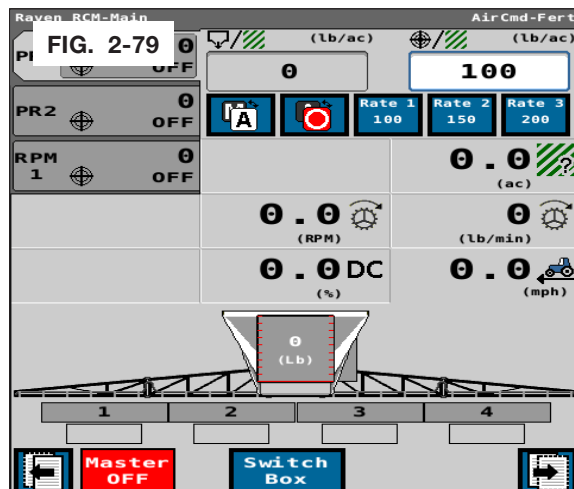
Density Adjustment Frequency (Lb): 1000

Adjustment Sensitivity (%): 25

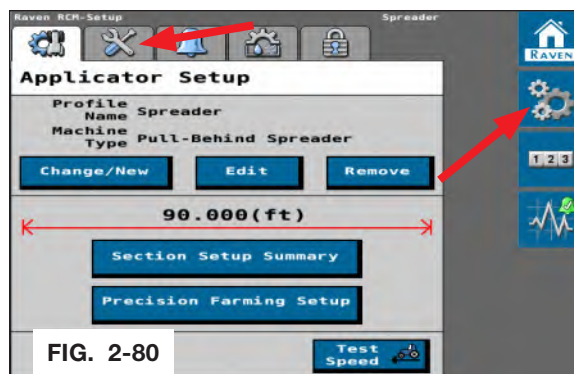
FIG. 2-78 RAVEN

Add Boundary Control Button to Home Page

1. Go to the Main Home Screen shown. (FIG. 2-79)

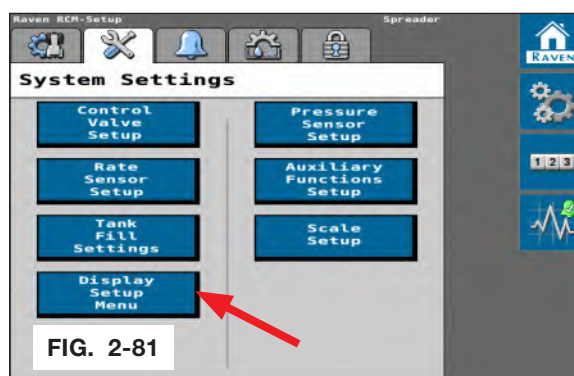


2. To add boundary control button, go to Settings page - the 3 gears tab. (FIG. 2-80)
3. In the Settings page, select the “System Settings” tab. (FIG. 2-80)



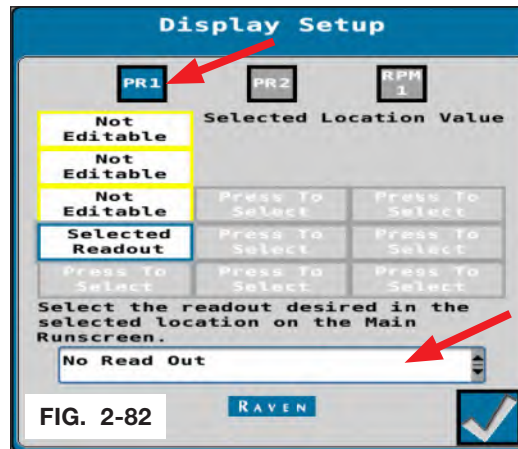
4. In the “System Settings” page, click the “Display Setup Menu” button shown. (FIG. 2-81)

(Continued on next page)

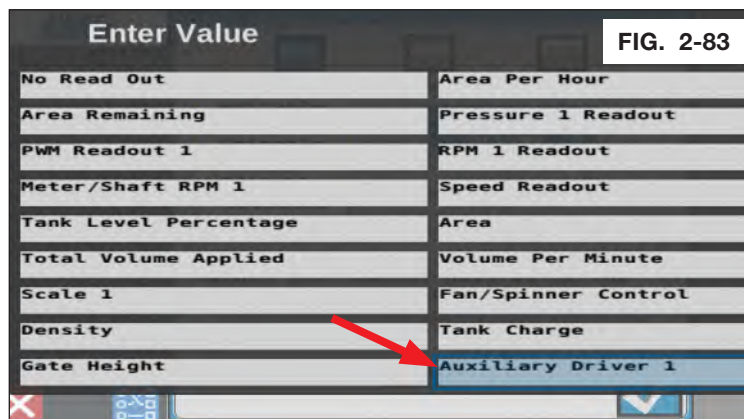


Add Boundary Control Button to Home Page (continued)

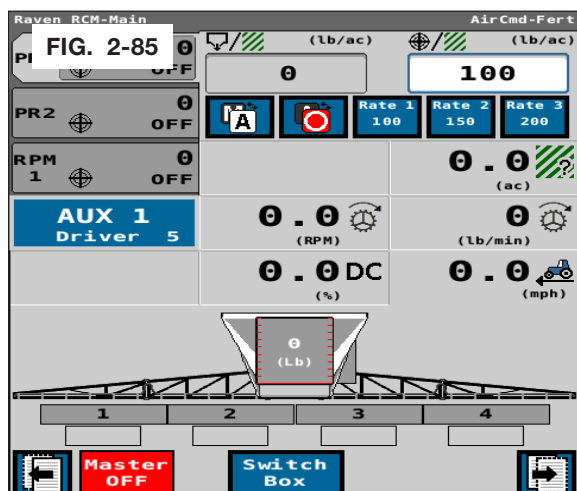
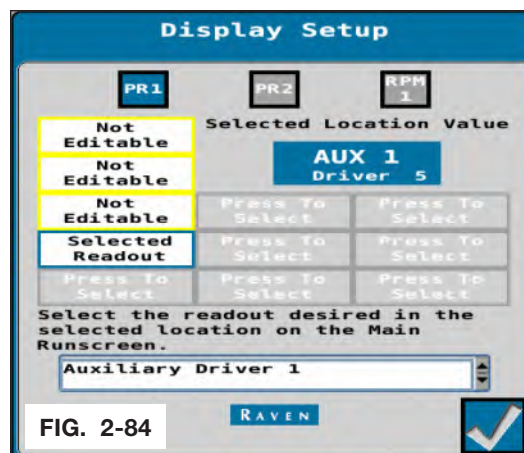
- After selecting “PR1”, click any gray box labelled “Press To Select” and the box changes to “Selected Readout”. This is where the boundary control button appears on the Main Home Screen. (FIG. 2-82)
- Click drop down box. (FIG. 2-82)



- Select “Auxiliary Driver 1” from the list. (FIG. 2-83)

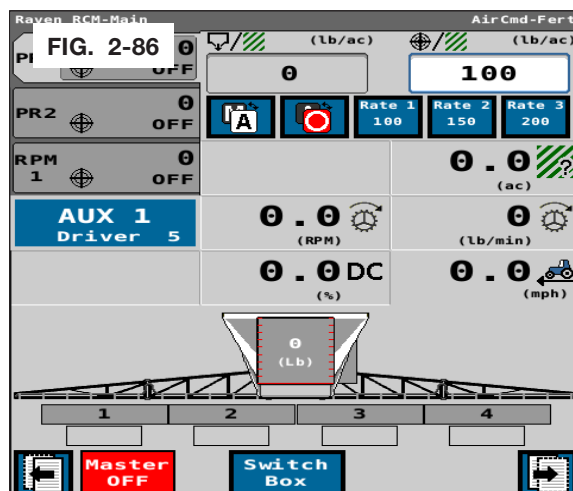


- Click the check box. (FIG. 2-84)
- Click the “Home” button and return to the Main Home Screen. (FIG. 2-85)
- The boundary control button appears. When engaged, button background turns green. (FIG. 2-85)

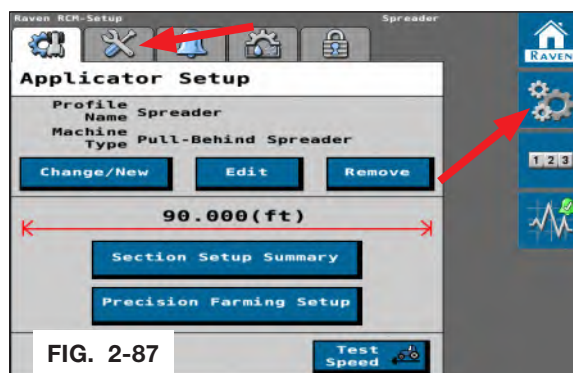


Add Fan Pressure Button to Home Page

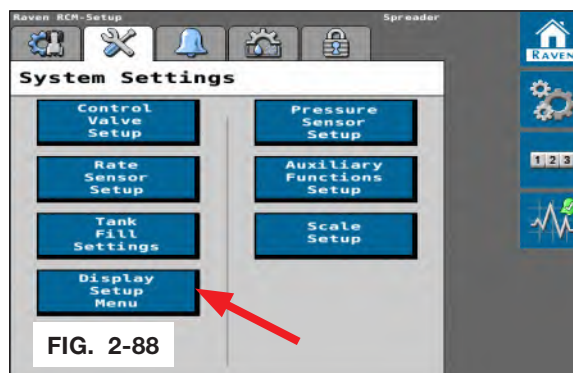
1. Go to the Main Home Screen shown. (FIG. 2-86)



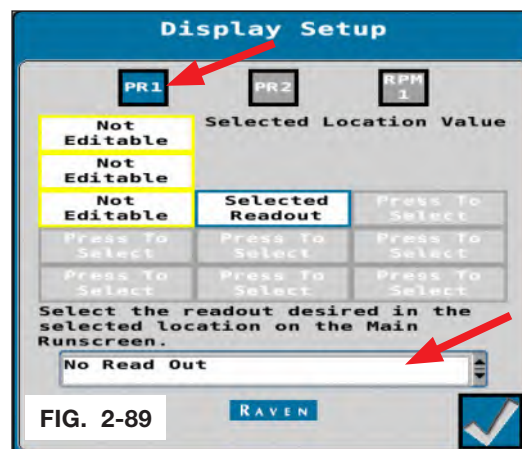
2. To add pressure 1 button, go to Settings page - the 3 gears tab. (FIG. 2-87)
3. In the Settings page, select the “System Settings” tab. (FIG. 2-87)



4. In the “System Settings” page, click the “Display Setup Menu” button shown. (FIG. 2-88)



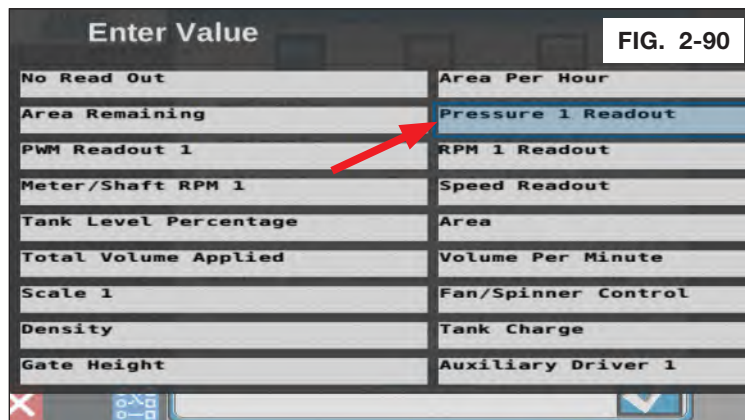
5. After selecting “PR1”, click any gray box labelled “Press To Select” and the box changes to “Selected Readout”. This is where the pressure 1 button appears on the Main Home Screen. (FIG. 2-89)
6. Click drop down box. (FIG. 2-89)



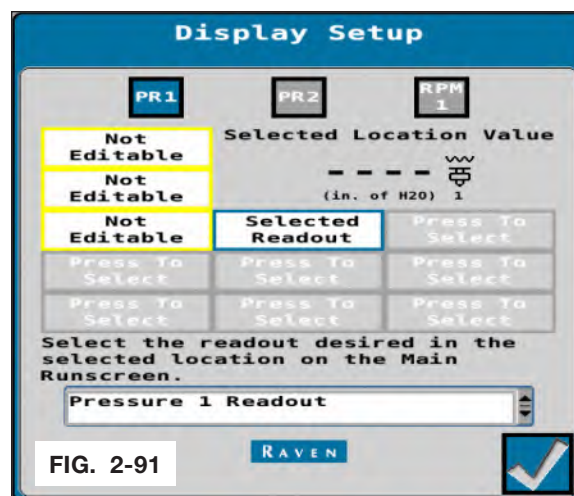
(Continued on next page)

Add Fan Pressure Button to Home Page (continued)

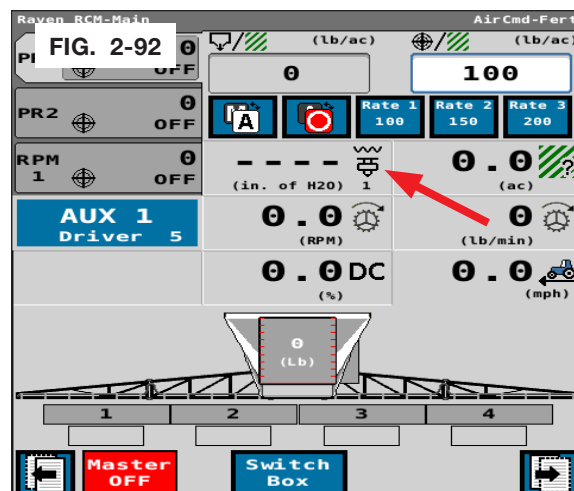
7. Select “Pressure 1 Readout” from the list. (FIG. 2-90)



8. Click the check box. (FIG. 2-91)



9. Click the “Home” button and return to the Main Home Screen. (FIG. 2-92)
10. The pressure 1 button appears. When engaged, button background turns green. (FIG. 2-92)
11. Complete the fan start up to view section valve and fan pressure reading information. See “Air Command Start Up Procedure” in OPERATION section for more details.



Section III

Operation

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Theory of Operation Overview

The Air Command is a section control system designed to be used on pull-type Pro-Force spreaders and is compatible with single and dual product application. Air Command can spread fertilizer, cover crops and other granular materials. It is not compatible with lime or litter spreading operation.

When a section is designated to be turned OFF, the Air Command system opens an air valve for the related section. This allows air from the hydraulic fan to blow fertilizer into the material distribution manifold at the rear instead of falling onto the spinner disc. This fertilizer is then distributed to the remaining sections and falls onto the spinner discs. The feed belt is automatically slowed to account for this additional fertilizer applied to the remaining sections.

When the air valve is open, the application for that section is OFF. This valve can be controlled manually or automatically via mapping software.

Preparing Spreader

Perform the service checks as outlined below. Repair or replace any damaged or worn parts before operating.

Hardware

Check for loose bolts and nuts, and tighten as needed. Check again after the first half-day of operation.

Hydraulic System



- RELIEVE HYDRAULIC SYSTEM OF ALL PRESSURE BEFORE ADJUSTING OR SERVICING. SEE TRACTOR OPERATOR'S MANUAL FOR PROPER PROCEDURES.
- HIGH-PRESSURE FLUIDS CAN PENETRATE THE SKIN AND CAUSE SERIOUS INJURY OR DEATH. LEAKS OF HIGH-PRESSURE FLUIDS MAY NOT BE VISIBLE. USE CARDBOARD OR WOOD TO DETECT LEAKS IN THE HYDRAULIC SYSTEM. SEEK MEDICAL TREATMENT IMMEDIATELY IF INJURED BY HIGH-PRESSURE FLUIDS.

Check all hoses and cylinders for signs of leakage. Hoses should not be kinked, twisted or rubbing against sharp edges. Re-route or repair hoses as necessary. Refer to SAFETY section for additional information on safe repair and inspection of hydraulic components.

AIR COMMAND FAN HYDRAULIC SYSTEM REQUIREMENTS:
10 gpm @ 3000 psi.

Refer to “Dry Spreader Operator’s Manual” and “Preparing Spreader - Hydraulic System” outlined in OPERATION section for additional information.

Hydraulic Connections

IMPORTANT

- When coupling hydraulic hoses to ports on the tractor, be sure that the coupler ends are clean of dust, dirt and debris. Failure to do so could contaminate hydraulic system resulting in excessive wear and possible failure.
- Return line has unique quick coupler (PF1202-8434) that may weep oil to protect hydraulic components. This weeping is normal and does not indicate issues with the hydraulic system.

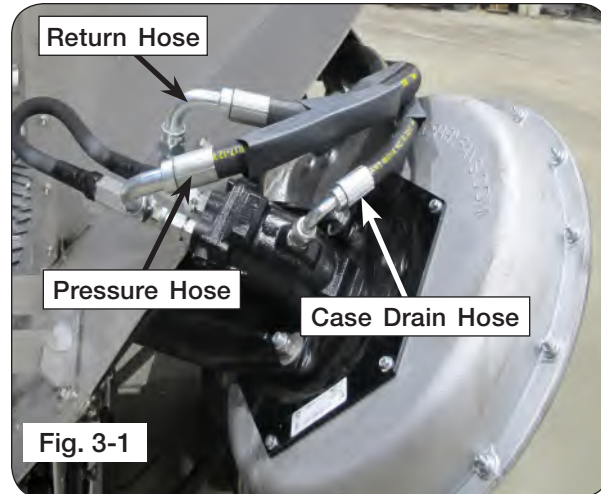
Clean hydraulic hose couplers before connecting to the tractor.

NOTE: All Air Command units use tractor hydraulics to power the fan.

NOTE: Air Command system hydraulic requirements are 10 GPM.

For all units:

Connect yellow(+/-) hose grip pair for one SCV placed in continuous flow for all oil. Connect yellow(-) case drain hose grip to the separate zero-pressure case drain port on the tractor. See tractor's Operator's Manual for more information. The case drain hose has a flat face end connector (9006048). (FIG. 3-1)



All units utilize one (1) SCV circuit for hydraulic pressure/return and one (1) case drain.

Refer to “Dry Spreader Operator's Manual and Parts Catalog” for PTO hydraulics information.

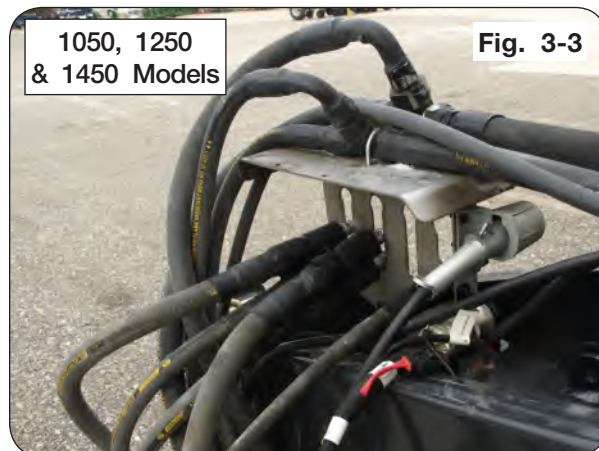
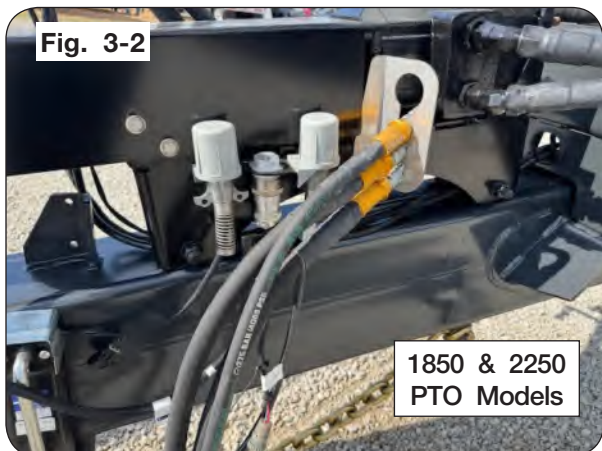
Hose Grip Color	Function 	Function 
Yellow	Fan Pressure	Fan Return

After initial set-up or replacement of any hydraulic component on the spreader, air must be removed from the spreader's hydraulic system. Refer to “Dry Spreader Operator's Manual” and “Purging Hydraulic System” outlined in MAINTENANCE section for additional information.

Route hoses away from areas that may cause abrasion or kinking of hoses during operation.

Hydraulic Connections (continued)

Storage slots are provided when the unit is disconnected from the tractor. (FIGS. 3-2 & 3-3)



Air Command Start Up Procedure

WARNING

- EYE PROTECTION AND OTHER APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT MUST BE WORN WHILE SERVICING IMPLEMENT.
- KEEP HANDS CLEAR OF PINCH POINT AREAS.
- RELIEVE HYDRAULIC SYSTEM OF ALL PRESSURE BEFORE ADJUSTING OR SERVICING. SEE TRACTOR OPERATOR'S MANUAL FOR PROPER PROCEDURES.
- HIGH-PRESSURE FLUIDS CAN PENETRATE THE SKIN AND CAUSE SERIOUS INJURY OR DEATH. LEAKS OF HIGH-PRESSURE FLUIDS MAY NOT BE VISIBLE. USE CARDBOARD OR WOOD TO DETECT LEAKS IN THE HYDRAULIC SYSTEM. SEEK MEDICAL TREATMENT IMMEDIATELY IF INJURED BY HIGH-PRESSURE FLUIDS.
- MOVING OR ROTATING COMPONENTS CAN CAUSE SERIOUS INJURY OR DEATH. ENSURE FEEDGATE DOOR, CHAIN/BELT COVERS AND SERVICE COVERS ARE IN PLACE BEFORE OPERATING THE SPREADER.

1. Start tractor and keep the key in the ON position.
2. For 1850 & 2250 PTO units, ensure the PTO is off, driveline stopped, and check hydraulic reservoir oil level before running the PTO pump and fill hydraulic reservoir as needed. See "Dry Spreader Operator's Manual" the outlined "Lubrication" and "Hydraulic Reservoir Tank" for oil specifications in MAINTENANCE section.
3. Turn the hydraulic reservoir tank ball valve to the open position. (FIG. 3-4)



FIG. 3-4

IMPORTANT

- Running the PTO pump without oil will result in pump damage.
4. On the ISO product control screen, ensure the master is OFF and all products are OFF. (FIG. 3-5)

NOTE: Fan pressure reading is shown in FIG. 3-5

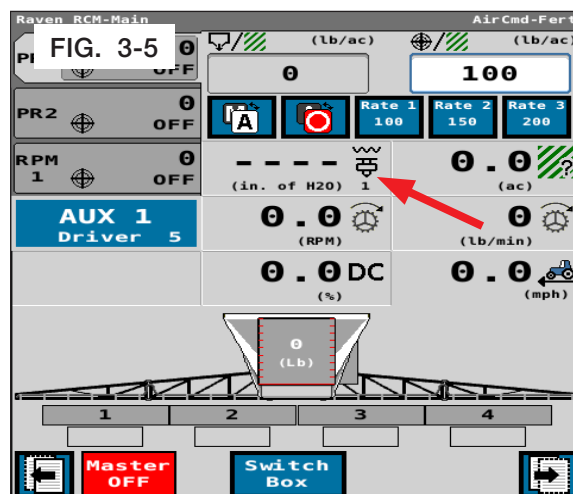
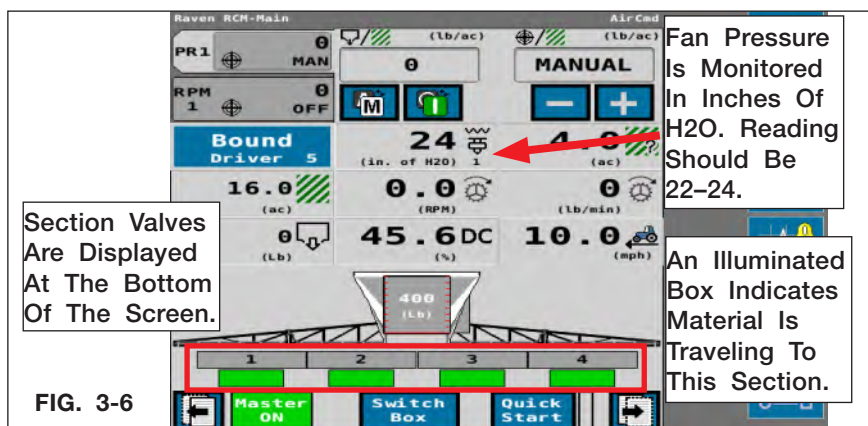


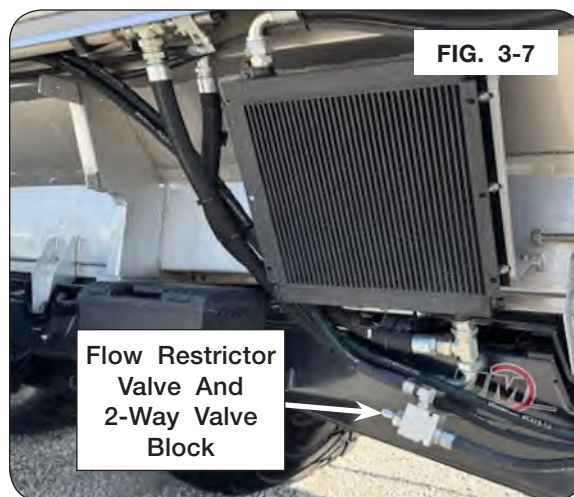
FIG. 3-5

Air Command Start Up Procedure (continued)

- Engage fan SCV into constant flow.
- Turn the master ON. (FIG. 3-6)
- On the ISO product control screen, ensure the bottom boxes turn green to indicate section valves are shut and fan is ON. (FIG. 3-6)
- Adjust fan SCV flow until 22–24 in. of H₂O is available. (FIG. 3-6)



NOTE: If fan pressure cannot achieve 22–24 in. of H₂O, refer to “Fan Speed Control” in MAINTENANCE section for details. (FIG. 3-7)



NOTE: For 1850 & 2250 PTO units, skip to step 11. Otherwise, continue to step 10.

- For 1450 & smaller units, engage tractor hydraulics into constant flow and bring engine RPMs to operating range. Skip to step 13.
- Engage tractor PTO at low engine RPM.
- Increase engine RPM until 1,000 PTO RPM is reached.
- Turn spinner RPM ON.
- Turn Product 1 ON.
- See “Dry Spreader Operator’s Manual” and “Spreader Start Up Procedure” in OPERATION section to finish procedure.

Lime Spreading Start Up Procedure

WARNING

- EYE PROTECTION AND OTHER APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT MUST BE WORN WHILE SERVICING IMPLEMENT.
- KEEP HANDS CLEAR OF PINCH POINT AREAS.
- RELIEVE HYDRAULIC SYSTEM OF ALL PRESSURE BEFORE ADJUSTING OR SERVICING. SEE TRACTOR OPERATOR'S MANUAL FOR PROPER PROCEDURES.
- HIGH-PRESSURE FLUIDS CAN PENETRATE THE SKIN AND CAUSE SERIOUS INJURY OR DEATH. LEAKS OF HIGH-PRESSURE FLUIDS MAY NOT BE VISIBLE. USE CARDBOARD OR WOOD TO DETECT LEAKS IN THE HYDRAULIC SYSTEM. SEEK MEDICAL TREATMENT IMMEDIATELY IF INJURED BY HIGH-PRESSURE FLUIDS.
- MOVING OR ROTATING COMPONENTS CAN CAUSE SERIOUS INJURY OR DEATH. ENSURE FEEDGATE DOOR, CHAIN/BELT COVERS AND SERVICE COVERS ARE IN PLACE BEFORE OPERATING THE SPREADER.

1. Start tractor and keep the key in the ON position.
2. For 1850 & 2250 PTO units, ensure the PTO is off, driveline stopped, and check hydraulic reservoir oil level before running the PTO pump and fill hydraulic reservoir as needed. See "Dry Spreader Operator's Manual" the outlined "Lubrication" and "Hydraulic Reservoir Tank" for oil specifications in MAINTENANCE section.
3. Turn the hydraulic reservoir tank ball valve to the open position. (FIG. 3-8)



FIG. 3-8

IMPORTANT

- Running the PTO pump without oil will result in pump damage.
4. On the ISO product control screen, ensure the bottom boxes are gray, the master is OFF, and all products are OFF. (FIG. 3-9)

NOTE: For lime operation, fan pressure reading must remain at zero during start up and is shown in FIG. 3-9.

NOTE: For 1850 & 2250 PTO units, skip to step 6. Otherwise, continue to step 5.

5. For 1450 & smaller units, engage tractor hydraulics and bring engine RPMs to operating range. Skip to step 8.

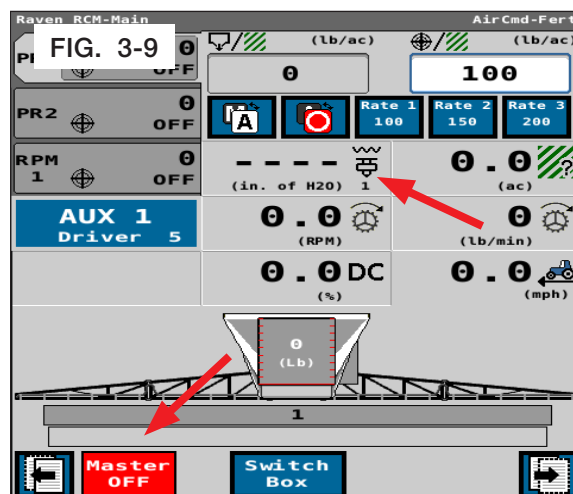


FIG. 3-9

Lime Spreading Start Up Procedure (continued)

6. Engage tractor PTO at low engine RPM.
7. Increase engine RPM until 1,000 PTO RPM is reached.
8. Turn spinner RPM ON.
9. Turn Product 1 ON.
10. See “Dry Spreader Operator’s Manual” and “Spreader Start Up Procedure” in OPERATION section to finish procedure.

Catch Test Calibration Chute Install Preparation

WARNING

- **UNEXPECTED SPINNER MOVEMENT CAN CAUSE SERIOUS INJURY OR DEATH. BEFORE PERFORMING CATCH TEST, ENSURE SPINNER CONTROL VALVE IS DISCONNECTED AND EVERYONE IS AWAY FROM MACHINE.**
- **EYE PROTECTION AND OTHER APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT MUST BE WORN WHILE SERVICING IMPLEMENT.**
- **KEEP HANDS CLEAR OF PINCH POINT AREAS.**
- **FALLING OBJECTS CAN CAUSE SERIOUS INJURY OR DEATH. DO NOT WORK UNDER THE MACHINE AT ANY TIME WHILE BEING HOISTED. BE SURE ALL LIFTING DEVICES AND SUPPORTS ARE RATED FOR THE LOADS BEING HOISTED. THESE ASSEMBLY INSTRUCTIONS WILL REQUIRE SAFE LIFTING DEVICES UP TO 50 LBS. SPECIFIC LOAD RATINGS FOR INDIVIDUAL LOADS WILL BE GIVEN AT THE APPROPRIATE TIME IN THE INSTRUCTIONS.**

IMPORTANT

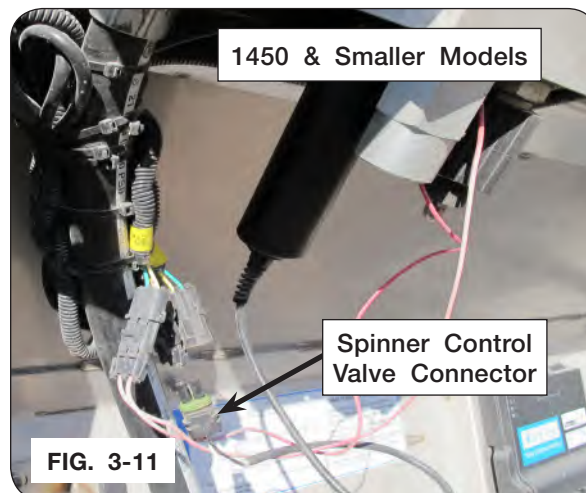
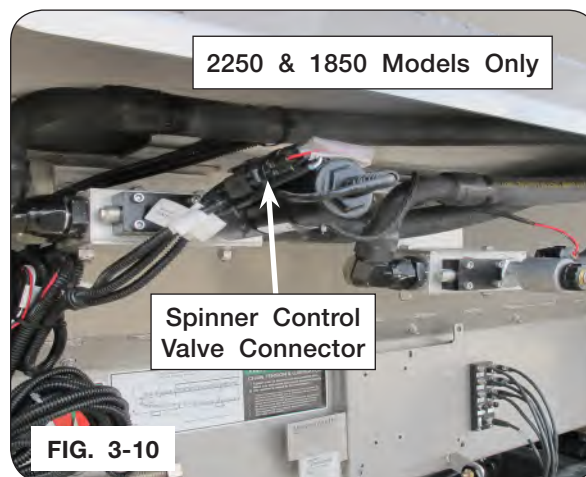
- *Catch all product in approved spread pattern pan(s) (PF1218-9991). Avoid product spills that may cause contamination.*
- *Clean and dispose of any product in accordance with product label directions and local/national regulations.*

NOTE: Complete a catch test for Duo-Force, if equipped.

1. Park the empty spreader on a firm, level surface. Block the machine to keep it from moving. Set the vehicle's parking brake, shut off the engine, remove the ignition key, disconnect PTO and hydraulics from the vehicle to the spreader.

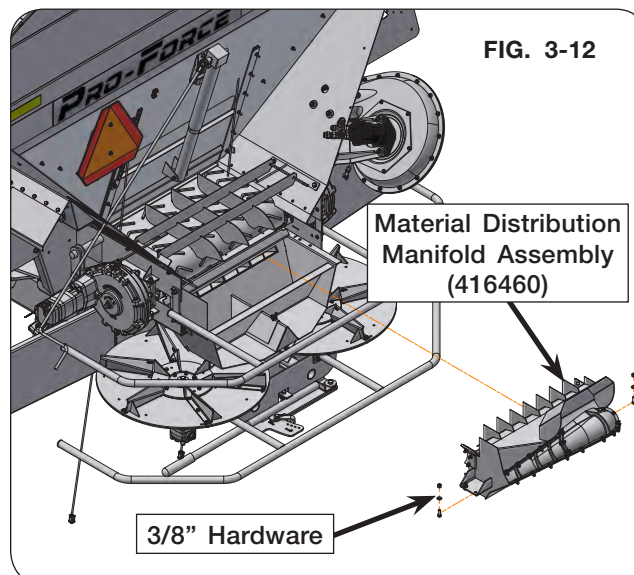


2. Unplug the spinner control valve connector (PF1211-01A) as shown for 2250 & 1850 models in figure 3-10 & 1450 & smaller models in figure 3-11.
3. Turn on spinner controls to verify spinners do not spin. **Do not proceed until this step is complete!**
4. Turn off spinner controls after verifying spinners do not spin.

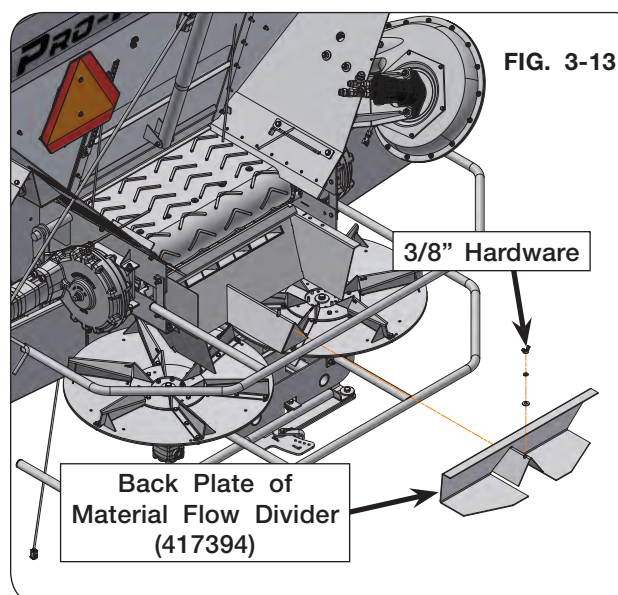


Catch Test Calibration Chute Install Preparation (continued)

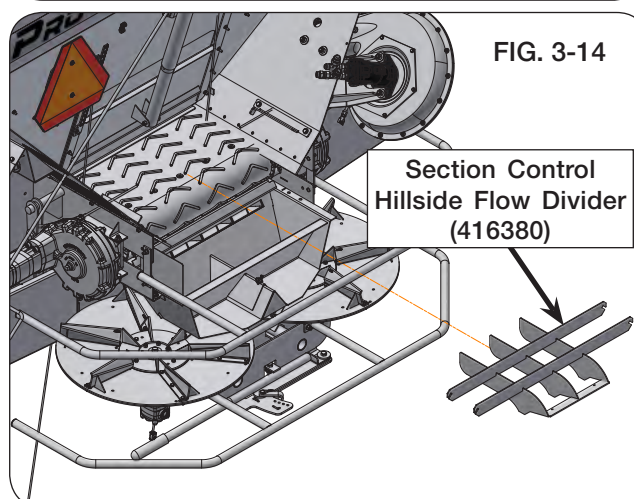
5. Use a safe lifting device rated for 50 lbs., support material distribution manifold assembly (416460) and unscrew two sets of 3/8" hardware from left-hand and right-hand sides. (FIG. 3-12)
6. Lift and remove the material distribution manifold assembly (416460). (FIG. 3-12)



7. Remove the back plate of material flow divider (417394) by unscrewing the single 3/8" wing nut and hardware. (FIG. 3-13)
8. Reattach single 3/8" wing nut and hardware back in place.



9. Remove section control hillside flow divider (416380). Retain this part for future use. Duo-Force uses different section control hillside flow divider. (FIG. 3-14)
10. Refer to "Dry Spreader Operator's Manual" and "Catch Test Calibration Chute Install" and "Catch Test Procedure" in SET UP section to complete the catch test.



NOTE: Multiple tests are available before spreading in the field to ensure accurate rates. Refer to "Dry Spreader Operator's Manual" and "Applied Test Procedure", "Test Speed Procedure", and "Tuning Control Valve Response" outlined in SET UP section for details.

Spreading Operation

Use the following procedure to switch from “Fertilizer Spreading” to “Lime Spreading”.

Lime Spreading Conversion

WARNING

- TIPPING OR MOVEMENT OF THE MACHINE CAN CAUSE SERIOUS INJURY OR DEATH. BE SURE MACHINE IS SECURELY BLOCKED.
- EYE PROTECTION AND OTHER APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT MUST BE WORN WHILE SERVICING IMPLEMENT.
- ALWAYS WEAR PERSONAL PROTECTIVE EQUIPMENT WHEN WORKING WITH OR NEAR CHEMICALS. THIS EQUIPMENT INCLUDES, BUT IS NOT LIMITED TO: PROTECTIVE EYE WEAR, GLOVES, SHOES, SOCKS, LONG-SLEEVED SHIRT, AND LONG PANTS. ADDITIONAL PROTECTION MAY BE REQUIRED FOR MANY TYPES OF CHEMICALS.
- KEEP HANDS CLEAR OF PINCH POINT AREAS.
- FALLING OBJECTS CAN CAUSE SERIOUS INJURY OR DEATH. DO NOT WORK UNDER THE MACHINE AT ANY TIME WHILE BEING HOISTED. BE SURE ALL LIFTING DEVICES AND SUPPORTS ARE RATED FOR THE LOADS BEING HOISTED. THESE ASSEMBLY INSTRUCTIONS WILL REQUIRE SAFE LIFTING DEVICES UP TO 50 LBS. SPECIFIC LOAD RATINGS FOR INDIVIDUAL LOADS WILL BE GIVEN AT THE APPROPRIATE TIME IN THE INSTRUCTIONS.

IMPORTANT

- *Stainless steel hardware has natural tendency to cold weld/gall when installed/uninstalled at high speeds and/or high torques. It is recommended to apply thread lubricant approved for stainless steel such as graphite-based anti-seize or molybdenum disulfide based anti-seize when performing an assembly/disassembly of stainless steel hardware. Unverferth PN 9504206 or equivalent.*

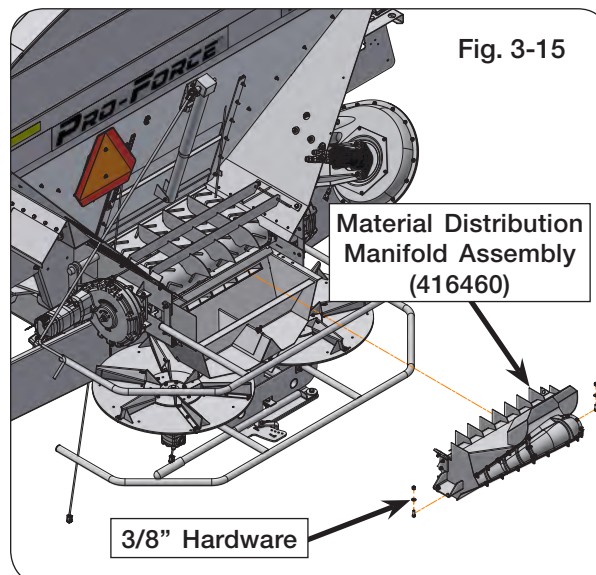
NOTE: Air command section control system is not compatible with lime or litter spreading operation.

1. Park the empty spreader on a firm, level surface. Block the machine to keep it from moving. Set the tractor's parking brake, shut off the engine, remove the ignition key, disconnect hydraulics from the tractor to the spreader, and PTO, if equipped.



NOTE: Keep all parts and hardware for switching back to “Fertilizer Spreading”.

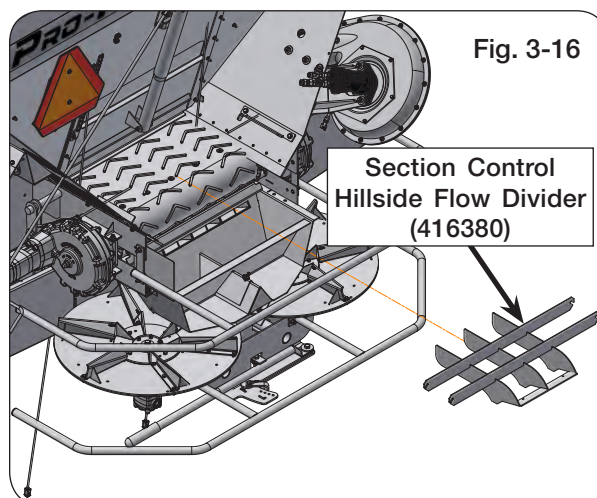
2. Use a safe lifting device rated for 50 lbs., support material distribution manifold assembly (416460) and unscrew two sets of 3/8” hardware from left-hand and right-hand sides. (FIG. 3-15)
3. Lift and remove the material distribution manifold assembly (416460). (FIG. 3-15)



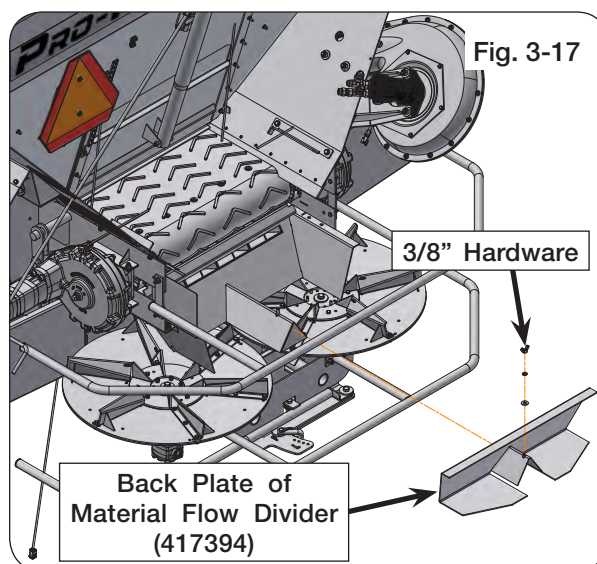
Spreading Operation (continued)

Lime Spreading Conversion (continued)

4. Slide the section control hillside flow divider (416380) off the rails. (FIG. 3-16)



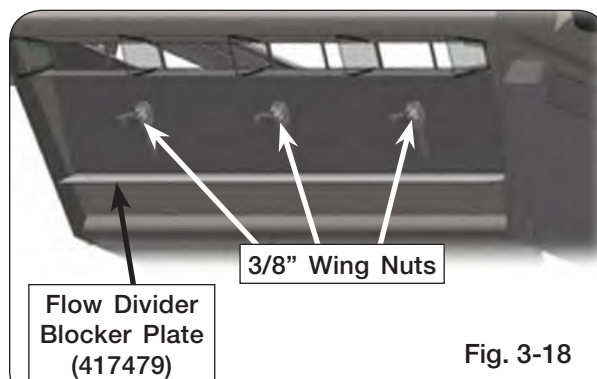
5. Remove the back plate of material flow divider (417394) by unscrewing the single 3/8" wing nut and hardware. (FIG. 3-17)



6. Reattach single 3/8" wing nut and hardware back in place.

7. Loosen three 3/8" wing nuts attached to flow divider blocker plate (417479). (FIG. 3-18)

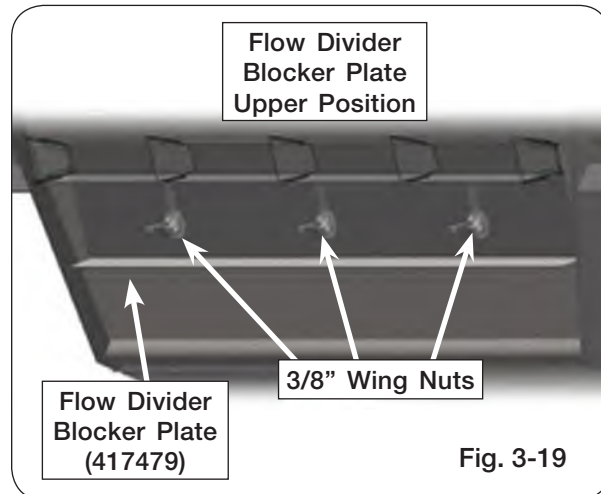
NOTE: Deflectors, spinner guards, and conveyor parts removed in FIG. 3-18 for illustration only.



Spreading Operation (continued)

Lime Spreading Conversion (continued)

8. Slide flow divider blocker plate to upper position as shown. (FIG. 3-19)
9. Hand tighten three 3/8" wing nuts attached to flow divider blocker plate.

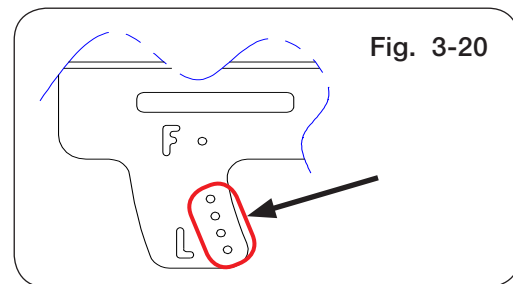


10. Open the feedgate to at least 7 inches.
11. Adjust the spinner to one of the four "L" (lime) positions depending on spread pattern test results. (FIG. 3-20)

NOTE: Lime DENSITY and PARTICLE SIZE varies greatly. When adjusting DENSITY, do not adjust the spreader constant or gate.

NOTE: DO NOT run fan when spreading lime.

12. Switch from fertilizer with Air Command profile to "lime" profile in RCM and adjust spreader constant for the new gate setting. See "RCM Lime Spreading Set Up" in SET UP section
13. Refer to "Dry Spreader Operator's Manual" and "Spinner Disc Adjustments" in OPERATION section for spread test, spinner speed setting & spread pattern info.

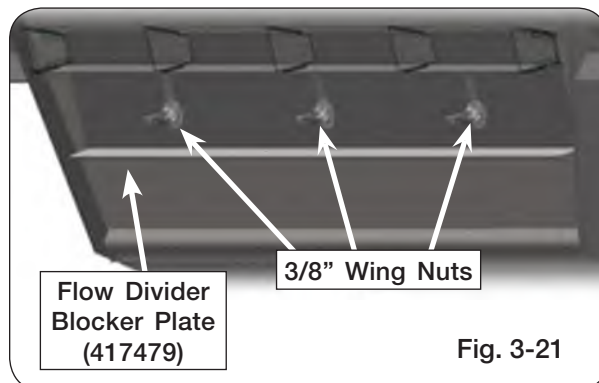


Spreading Operation (continued)

Section Control Fertilizer Spreading

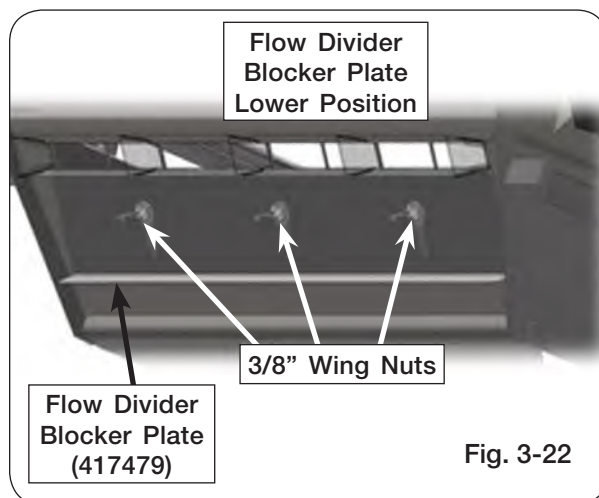
NOTE: If going from spreading lime to fertilizer, follow the next steps.

1. Loosen three 3/8" wing nuts attached to flow divider blocker plate (417479). (FIG. 3-21)

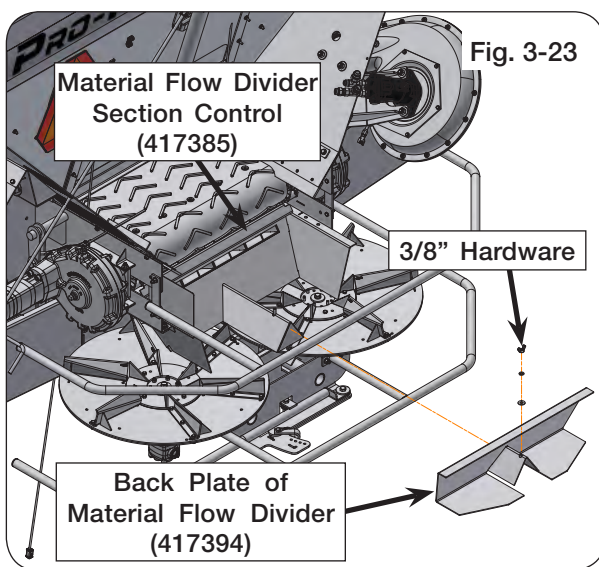


2. Slide flow divider blocker plate to lower position as shown. (FIG. 3-22)
3. Hand tighten three 3/8" wing nuts attached to flow divider blocker plate.

NOTE: Deflectors, spinner guards, and conveyor parts removed in FIG. 3-22 for illustration only.



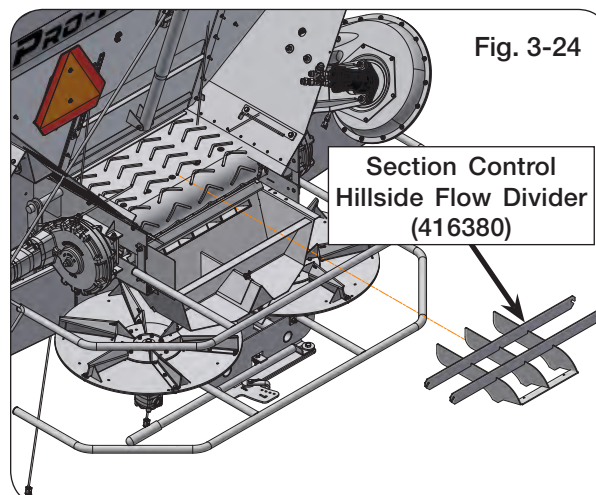
4. Unscrew single 3/8" wing nut and hardware from material flow divider section control. (FIG. 3-23)
5. Reattach the back plate of material flow divider (417394) by screwing the single 3/8" wing nut and hardware. (FIG. 3-23)



Spreading Operation (continued)

Section Control Fertilizer Spreading (continued)

- Slide the section control hillside flow divider (416380) back on the rails. (FIG. 3-24)



- Use a safe lifting device rated for 50 lbs., lift and reattach the material distribution manifold assembly (416460) by screwing two sets of 3/8" hardware to left-hand and right-hand sides. (FIG. 3-25)

- Torque hardware to specification. See "Complete Torque Chart" in MAINTENANCE.

- Open the feedgate to 2 inches or lower.

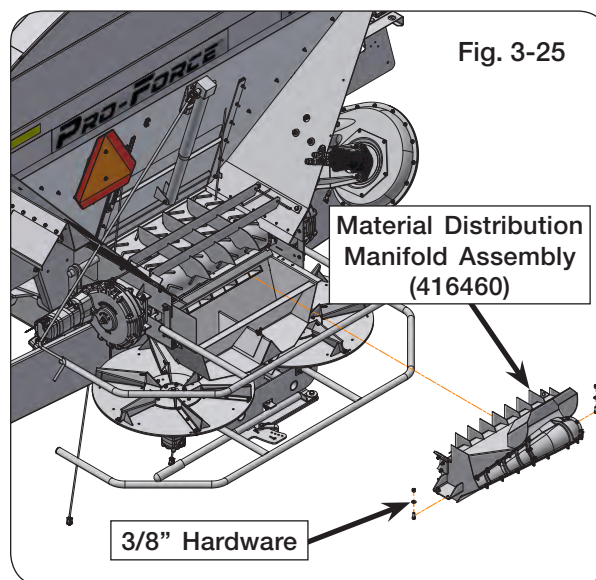
NOTE: Spinners should always be in the "F" position when utilizing multi-section. (FIG. 3-26)

NOTE: When the spinner is in the "F" position, the closest forward the spinner assembly is positioned. See "Spinner Disc Set Up" in SET UP section. (FIG. 3-26)

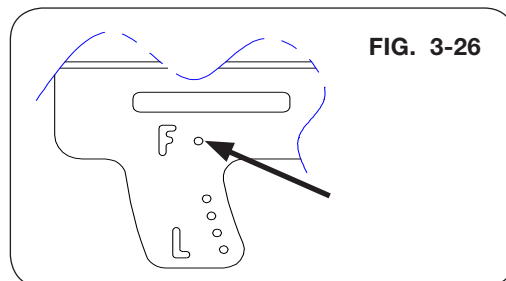
- Ensure "fertilizer" with Air Command profile is followed in RCM and adjust spreader constant for the new gate setting. See "RCM Fertilizer Set Up" in SET UP section.

- Refer to "Dry Spreader Operator's Manual" and "Spinner Disc Adjustments" in OPERATION section for spread test, spinner speed setting & spread pattern info.

NOTE: The chart below lists common fertilizer densities.



Fertilizer	Density (Lbs./Cu.Ft.)
Prilled Urea	45-51
Granular Urea	45-51
Prilled Ammonium Nitrate	53-61
Crystalline Ammonium Sulfate	62-69
Ammonium Sulfate	49-65
Diammonium Phosphate (DAP)	54-66
Granular Monoammonium Phosphate (MAP)	54-66
Powdered Monoammonium Phosphate (MAP)	53-62
Granular Triple Superphosphate (TSP)	59-75
Ammonium Phosphate	56-75



Section IV Maintenance

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Air Command Maintenance

WARNING

- TIPPING OR MOVEMENT OF THE MACHINE CAN CAUSE SERIOUS INJURY OR DEATH. BE SURE MACHINE IS SECURELY BLOCKED.
- EYE PROTECTION AND OTHER APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT MUST BE WORN WHILE SERVICING IMPLEMENT.
- KEEP HANDS CLEAR OF PINCH POINT AREAS.
- ALWAYS WEAR PERSONAL PROTECTIVE EQUIPMENT WHEN WORKING WITH OR NEAR FERTILIZERS AND/OR CHEMICALS. THIS EQUIPMENT INCLUDES, BUT IS NOT LIMITED TO: PROTECTIVE EYE WEAR, GLOVES, SHOES, SOCKS, LONG-SLEEVED SHIRT, AND LONG PANTS. ADDITIONAL PROTECTION MAY BE REQUIRED FOR MANY TYPES OF FERTILIZERS AND/OR CHEMICALS.
- AVOID BREATHING CHEMICALS AND FUMES.
- WASH HANDS BEFORE EATING, DRINKING, CHEWING GUM, OR USING TOILET.
- NEW HYDRAULIC SYSTEMS OR SYSTEMS THAT HAVE BEEN MAINTAINED MUST BE PURGED OF AIR BEFORE OPERATING OR MOVING MACHINE TO PREVENT SERIOUS INJURY OR DEATH.

CAUTION

- SHARP EDGES ON SPREADER CAN CAUSE SERIOUS INJURY. BE CAREFUL WHEN WORKING AROUND SPREADER.

Air Command Maintenance (continued)

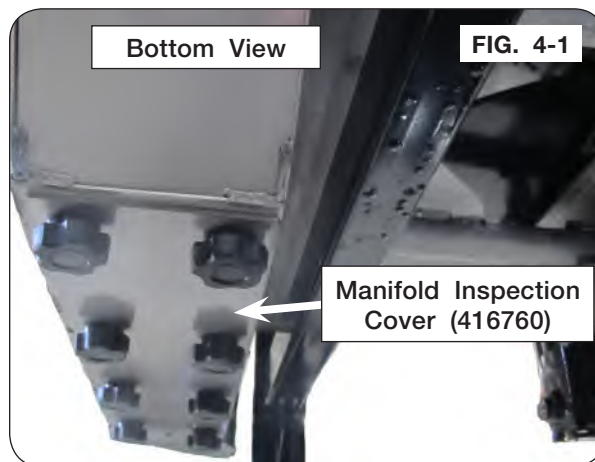
50-Hour Service

NOTE: Clean out section control manifold (417505) every 50 operating hours and end of season.

1. Park the empty spreader on a firm, level surface. Block the machine to keep it from moving. Set the tractor's parking brake, shut off the engine, remove the ignition key, disconnect hydraulics from the tractor to the spreader, and PTO, if equipped.



2. Unscrew 8 knobs from the bottom of section control manifold and remove manifold inspection cover (416760). Keep knobs and manifold inspection cover. (FIG. 4-1)
3. Use an air compressor to completely clean debris from fan, section control manifold, and material distribution manifold.
4. Completely wash machine thoroughly to remove corrosive fertilizer/chemicals inside and out before storing. When using pressure washers, maintain an adequate distance so not to blast water into bearings, hydraulic and fan seals, or electrical connections.
5. Reattach manifold inspection cover to the bottom of section control manifold using the 8 knobs. (FIG. 4-1)



NOTE: Hydraulic hoses and parts removed in FIG. 4-1 for illustration only.

- Inspect fan vanes and inside faces of the material distribution manifold for wear, replace before next season.
- After any period of unused time, unit should be operated to check function of hydraulic system and section control air valves move freely.

NOTE: Refer to “Dry Spreader Operator’s Manual” MAINTENANCE section for procedure to purge hydraulics and set hydraulic system flow.

Air Command Maintenance (continued)

Seasonal Storage

Refer to “Dry Spreader Operator’s Manual” and “Winterizing” outlined in MAINTENANCE section before storing the spreader in freezing climates.

Completely wash machine thoroughly to remove corrosive fertilizer/chemicals inside and out before storing. When using pressure washers, maintain an adequate distance so not to blast water into bearings, hydraulic and fan seals, or electrical connections.

- Check material flow is not obstructed.
- Repaint all areas where paint has been removed to keep rust from developing.
- Inspect machine for parts that may need to be replaced so they may be ordered in the off season.
- Check hydraulic hoses for weather cracks and replace accordingly.

Troubleshooting

PROBLEM	SOLUTION
ACTUATOR VT FAULT ERROR	1. PERFORM ACTUATOR TEST FUNCTION THROUGH RCM. REFER TO “ACTUATOR TEST PROCEDURE” IN THIS SECTION FOR DETAILS. 2. CYCLE KEY OFF/ON AND TEST ACTUATOR IN TEST SECTION TO VALIDATE ISSUE. 3. CHECK/VALIDATE ACTUATOR IS NOT PHYSICALLY FULLY EXTENDING/RETRACTING. 4. REMOVE LOWER MANIFOLD INSPECTION COVER (416760) TO ENSURE CORRECT VALVE IS MOVING AND NO DEBRIS IS OBSTRUCTING VALVE MOVEMENT. 5. DISSASSEMBLE ACTUATOR FROM VALVE AND CHECK VALVE ROTATION.
SPREAD PATTERN DOES NOT CHANGE WHEN SECTIONS SHUTOFF	1. VALIDATE SECTION CONTROL UNLOCK IS PRESENT IN VIRTUAL TERMINAL. 2. VALIDATE FAN PRESSURE IS 22–24 IN. H₂O WITH ALL SECTION VALVES CLOSED. 3. VALIDATE CORRESPONDING SECTION ACTUATORS ARE ALLOWING AIR WHEN SECTION IS OFF. 4. CHECK FOR DEBRIS/BLOCKAGE IN MATERIAL DISTRIBUTION MANIFOLD. 5. VALIDATE FLOW DIVIDER BLOCKER PLATE IS DOWN AND NOT OBSTRUCTING AIRFLOW.
CANNOT ACHIEVE 22–24 IN. H ₂ O	1. ENSURE ALL SECTION VALVES ARE CLOSED. 2. VALIDATE CORRECT SCV FLOW SETTING. 3. ENSURE FAN SCREEN IS FREE OF DEBRIS. 4. ADJUST FLOW RESTRICTOR VALVE (PF1222-669) ON UNIT. REFER TO “FLOW RESTRICTOR VALVE ADJUSTMENT” IN THIS SECTION FOR DETAILS.
NO FAN PRESSURE	1. ENSURE FAN IS SPINNING WHEN HYDRAULICS ARE MOVING IN CORRECT DIRECTION. 2. CHECK SENSOR WIRING. PINOUT: A=SUPPLY +12V (BROWN) B=GROUND (BLUE) C=SIGNAL (BLACK)

Actuator Test Procedure

WARNING

- EYE PROTECTION AND OTHER APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT MUST BE WORN WHILE SERVICING IMPLEMENT.
- KEEP HANDS CLEAR OF PINCH POINT AREAS.
- MOVING OR ROTATING COMPONENTS CAN CAUSE SERIOUS INJURY OR DEATH. ENSURE FEEDGATE DOOR, CHAIN/BELT COVERS AND SERVICE COVERS ARE IN PLACE BEFORE OPERATING THE SPREADER.

1. Park the empty spreader on a firm, level surface. Block the machine to keep it from moving. Set the tractor's parking brake, shut off the engine, remove the ignition key, disconnect hydraulics from the tractor to the spreader, and PTO, if equipped.



2. Go to Main Home Screen and click "Diagnostic" button. (FIG. 4-2)
3. In the "Diagnostic" page, select the "Tests" tab. (FIG. 4-3)

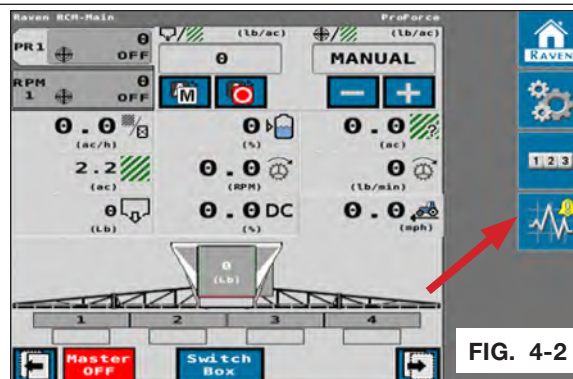


FIG. 4-2

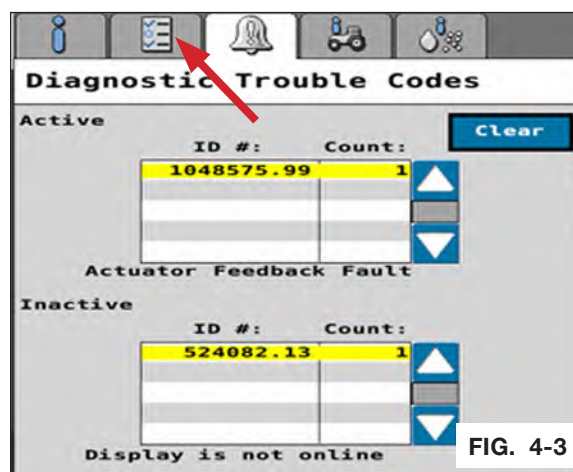


FIG. 4-3

4. After selecting "PR1" box, click drop down box. (FIG. 4-4)

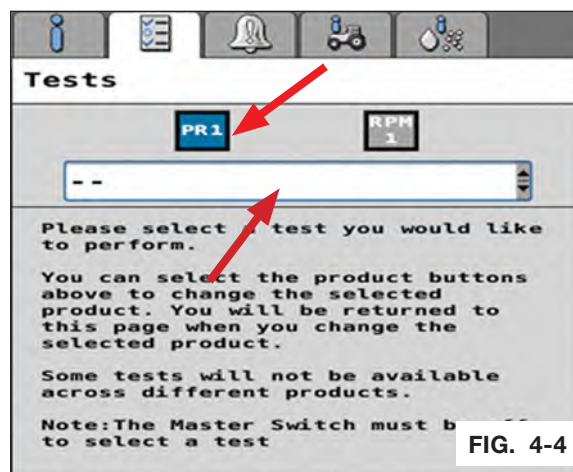
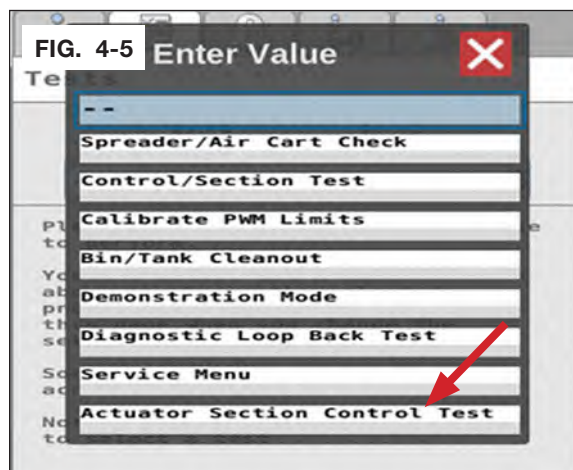


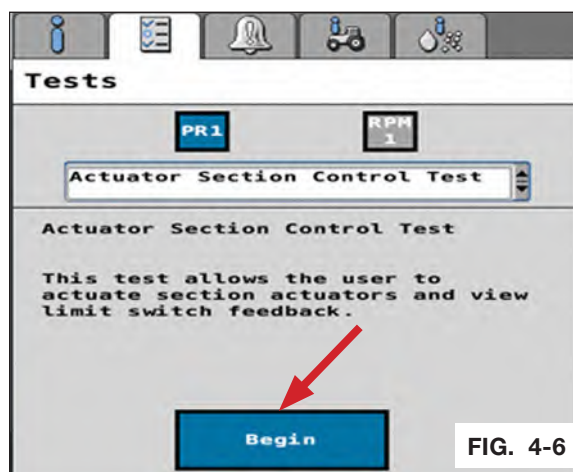
FIG. 4-4

Actuator Test Procedure (continued)

5. Select “Actuator Section Control Test” from the list. (FIG. 4-5)

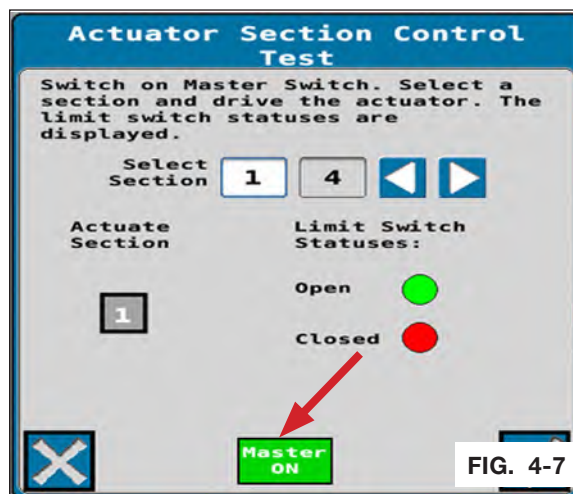


6. Click “Begin” button. (FIG. 4-6)



7. Turn master switch “ON”. (FIG. 4-7)

(Continued on next page)



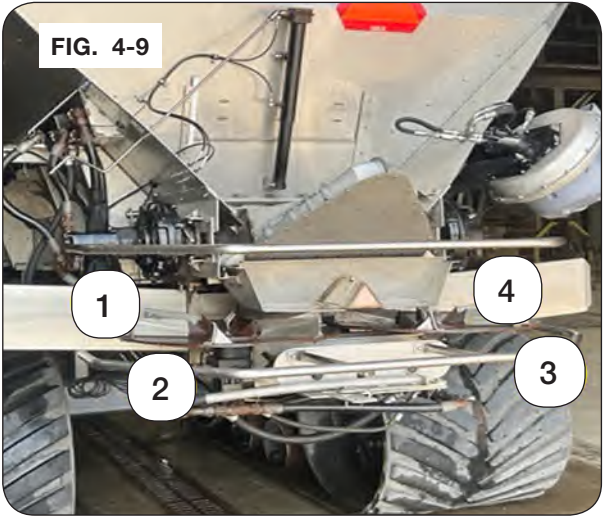
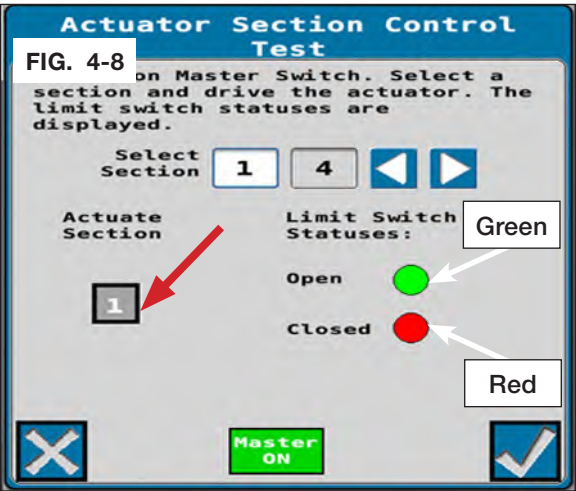
Actuator Test Procedure (continued)

8. Click “Actuate Section” button to cycle the actuator. (FIG. 4-8)

NOTE: When “Actuate Section” is clicked, button alternates between gray and blue. (FIG. 4-8)

NOTE: When function is cycled, actuator is extended when “Open” light is green and retracted when “Closed” light is green. (FIG. 4-8)

NOTE: Figure 4-9 and charts show the actuator and corresponding section overview.

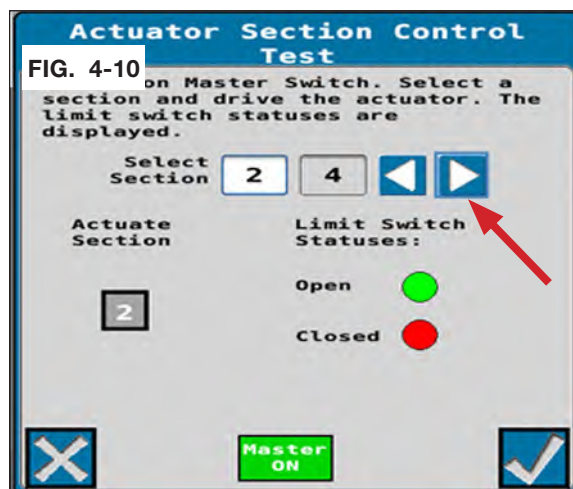


SECTION	CORRESPONDING ACTUATOR LOCATION
SECTION 1	Top Left
SECTION 2	Bottom Left
SECTION 3	Bottom Right
SECTION 4	Top Right

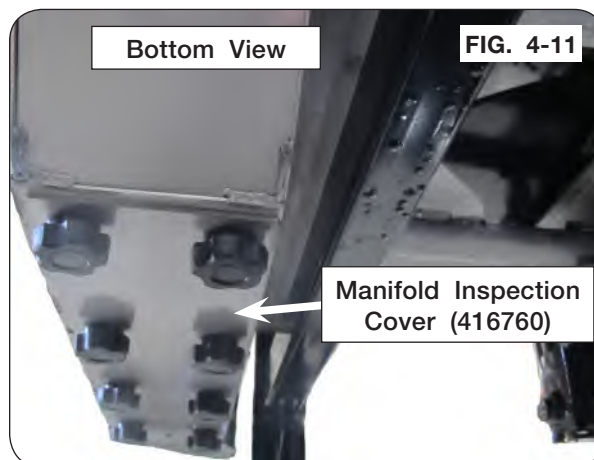
ACTUATOR POSITION	VALVE POSITION	SECTION STATUS
Extended	Open (Getting Air)	SECTION OFF
Retracted	Closed (Not Getting Air)	SECTION ON

Actuator Test Procedure (continued)

9. Click “arrows” to select next actuator.
(FIG. 4-10)
10. Repeat steps 8 and 9 until all 4 actuators are verified operational in both directions.



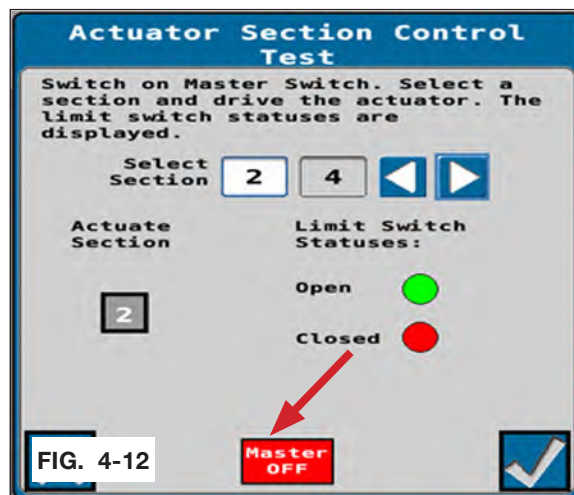
11. Unscrew 8 knobs from the bottom of section control manifold and remove manifold inspection cover (416760). Keep knobs and manifold inspection cover. (FIG. 4-11)
12. Verify proper sections move on the manifold when actuated on the display.
13. Reattach manifold inspection cover to the bottom of section control manifold using the 8 knobs. (FIG. 4-11)



NOTE: Hydraulic hoses and parts removed in FIG. 4-11 for illustration only.

14. Turn master switch “OFF”. (FIG. 4-12)

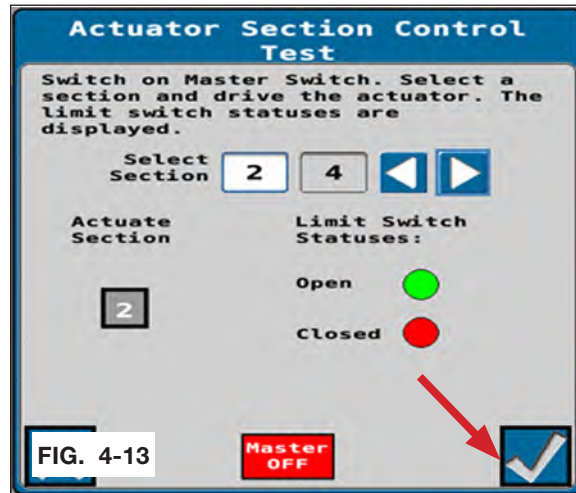
(Continued on next page)



Actuator Test Procedure (continued)

15. Click “check mark” to finish test. (FIG. 4-13)

NOTE: Actuators fully retract once the “check mark” is clicked.



Fan Speed Control

WARNING

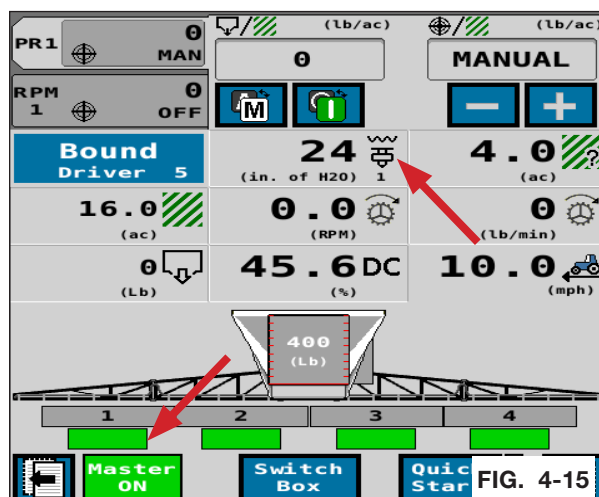
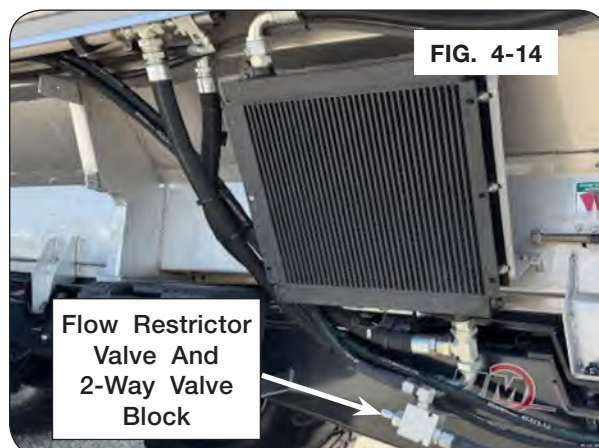
- EYE PROTECTION AND OTHER APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT MUST BE WORN WHILE SERVICING IMPLEMENT.
- KEEP HANDS CLEAR OF PINCH POINT AREAS.
- HIGH-PRESSURE FLUIDS CAN PENETRATE THE SKIN AND CAUSE SERIOUS INJURY OR DEATH. LEAKS OF HIGH-PRESSURE FLUIDS MAY NOT BE VISIBLE. USE CARDBOARD OR WOOD TO DETECT LEAKS IN THE HYDRAULIC SYSTEM. SEEK MEDICAL TREATMENT IMMEDIATELY IF INJURED BY HIGH-PRESSURE FLUIDS.
- MOVING OR ROTATING COMPONENTS CAN CAUSE SERIOUS INJURY OR DEATH. ENSURE FEEDGATE DOOR, CHAIN/BELT COVERS AND SERVICE COVERS ARE IN PLACE BEFORE OPERATING THE SPREADER.

IMPORTANT

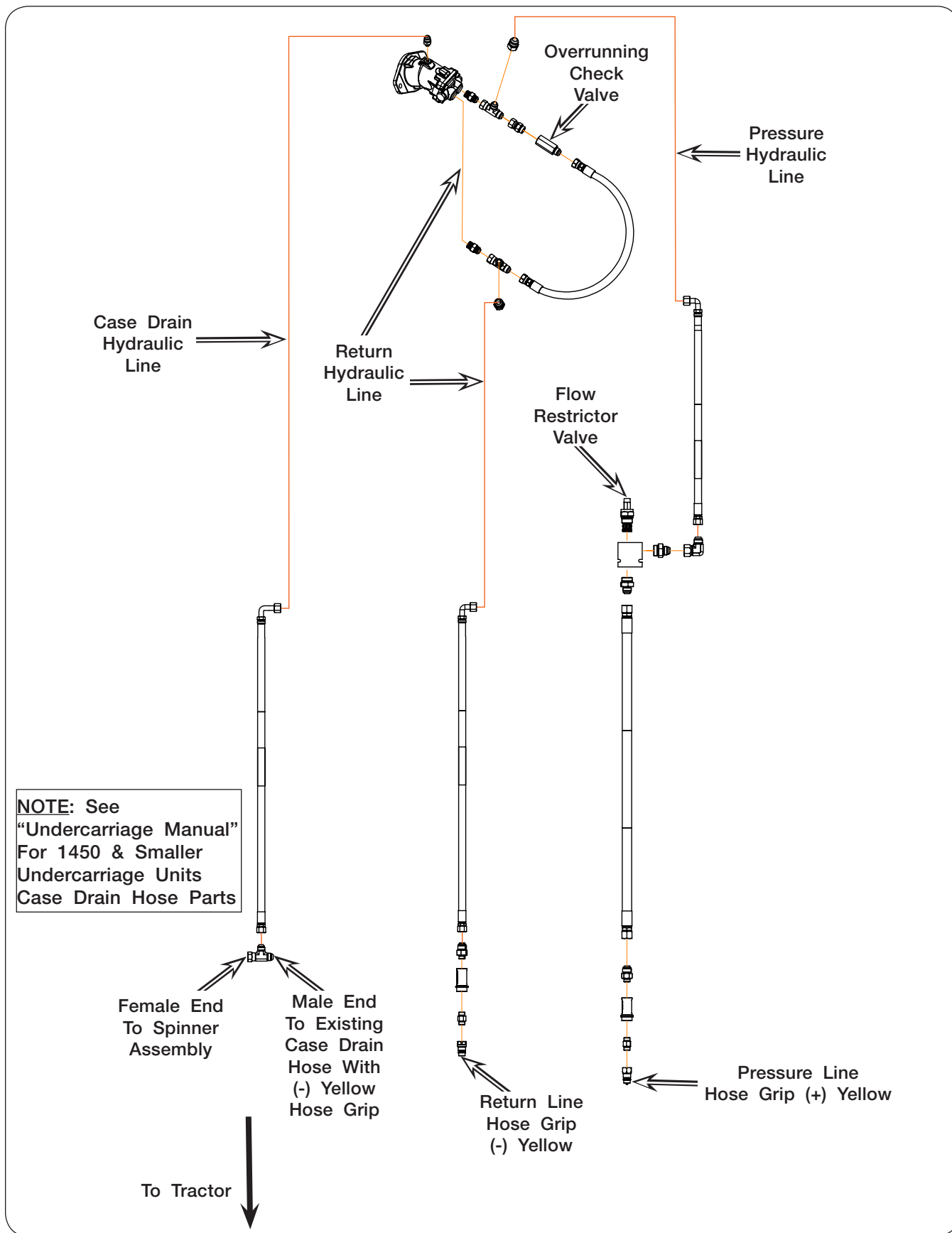
- The hydraulic fan is designed to provide 22–24 inches of H_2O pressure. Run the fan between 22–24 inches of H_2O pressure. DO NOT exceed 30 in. of H_2O pressure. Damage to fan, housing, and machine may result.

NOTE: The flow restrictor valve (PF1222-669) and 2-way valve block (PF1222-112) protects the fan from spinning too fast. (FIG. 4-14)

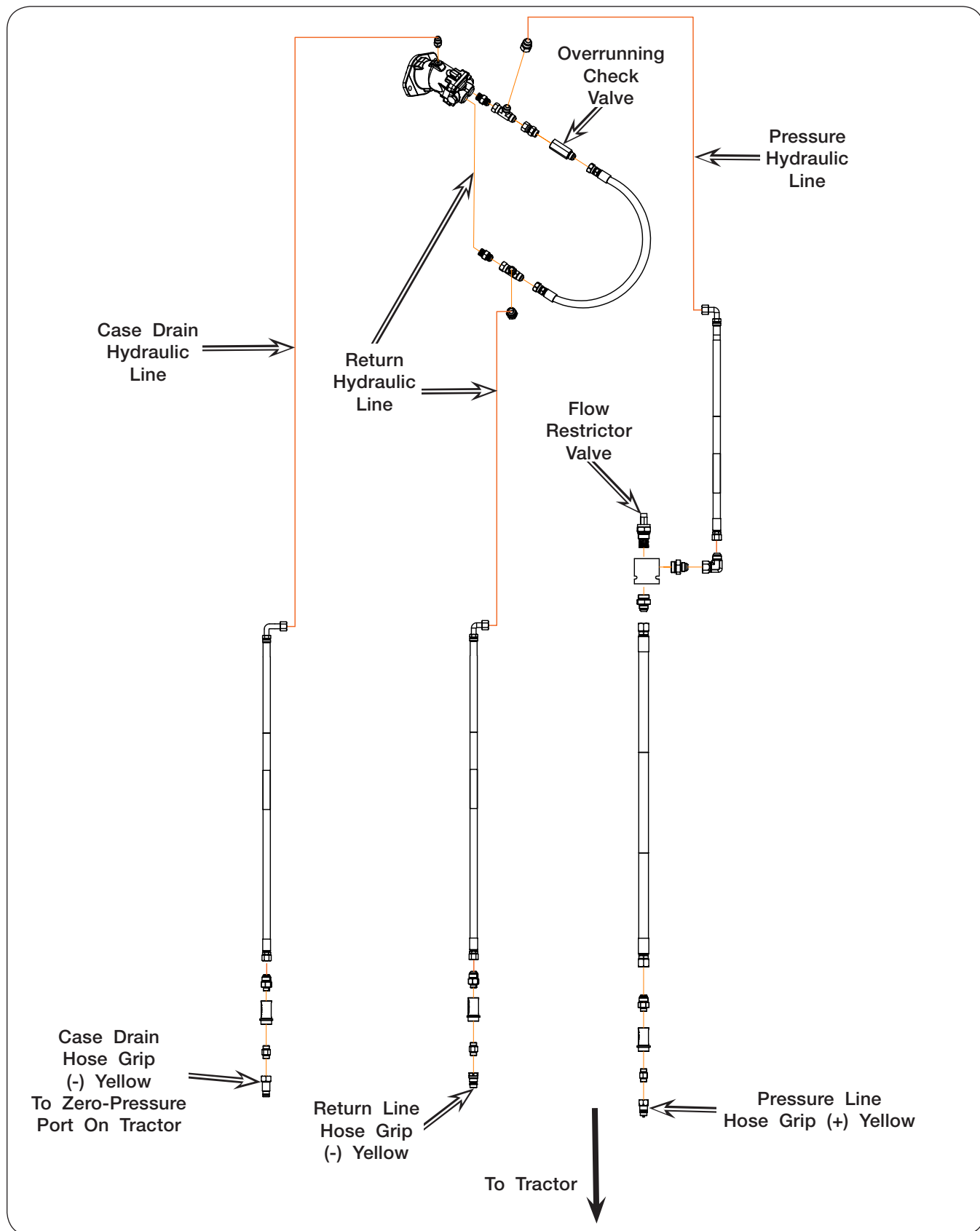
1. Park the empty spreader on a firm, level surface. Block the machine to keep it from moving. Set the tractor's parking brake. Start tractor and keep the key in the ON position.
2. Engage tractor SCV fan hydraulics into constant flow.
3. Adjust SCV flow to achieve 22–24 in. of H_2O pressure.
4. If SCV flow will not achieve 22–24 in. of H_2O , use the following procedure to adjust the flow restrictor valve.
5. On the ISO product control screen, ensure the bottom boxes turn green and master is ON. (FIG. 4-15)
6. Remove protective cap from flow restrictor valve. (FIG. 4-14)
7. Turn restrictor valve counter clockwise to increase pressure to 22–24 in. of H_2O OR turn valve clockwise to lower pressure to 22–24 in. of H_2O . (FIG. 4-14)
8. Reattach protective cap to flow restrictor valve. (FIG. 4-14)



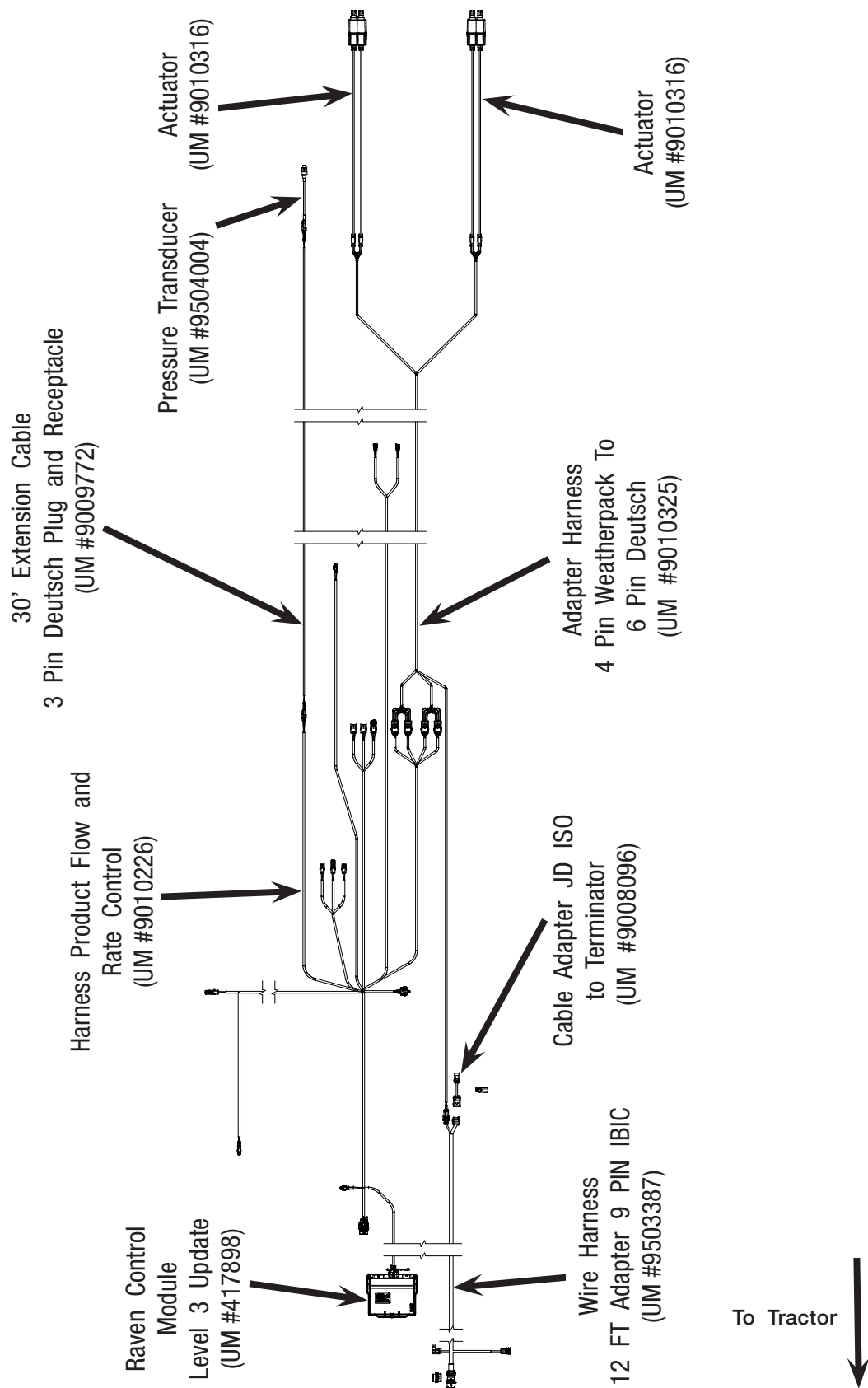
Hydraulic Schematic — Fan Hydraulics (1450 & Smaller Models)



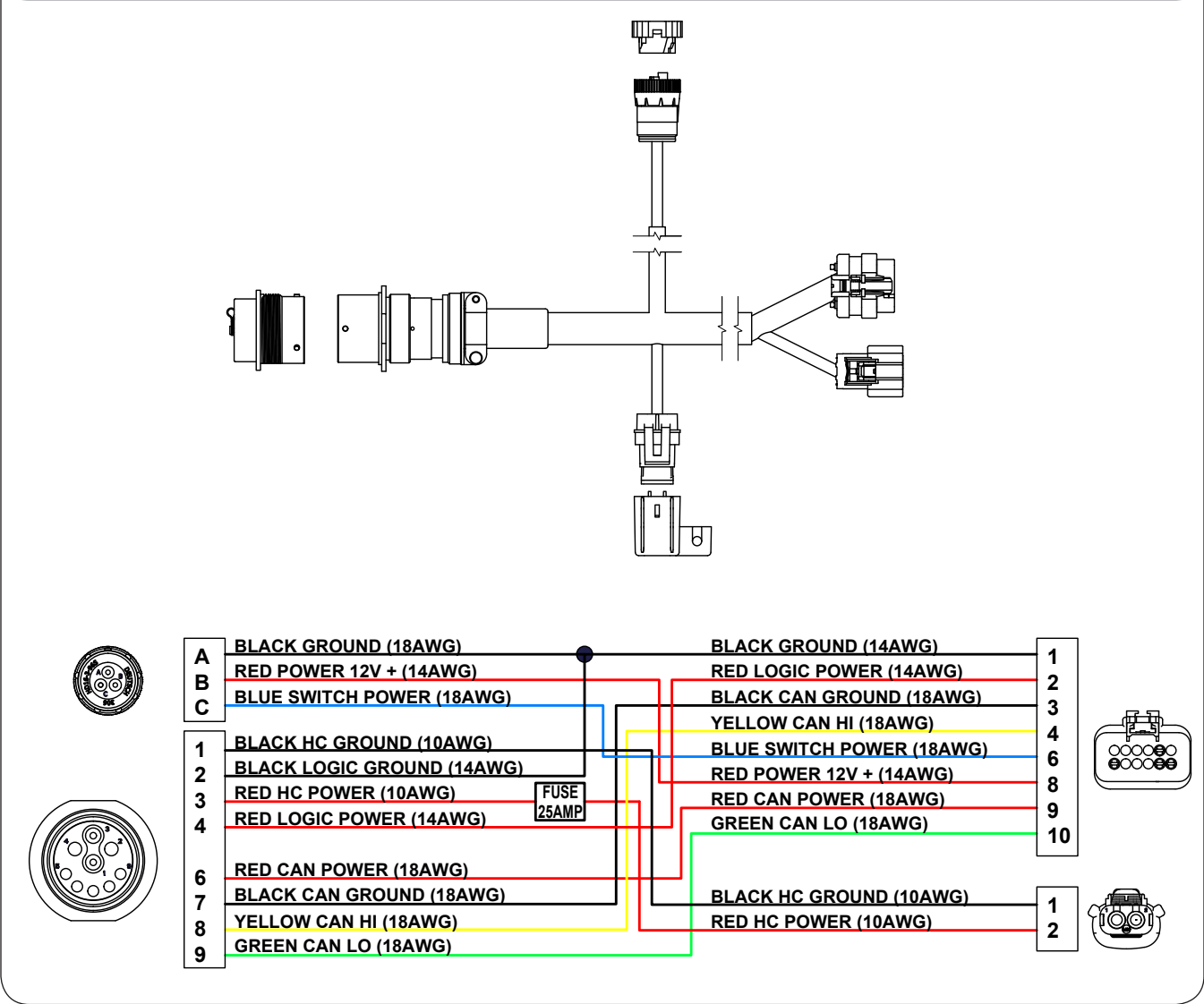
Hydraulic Schematic — Fan Hydraulics (1850 & 2250 Models)



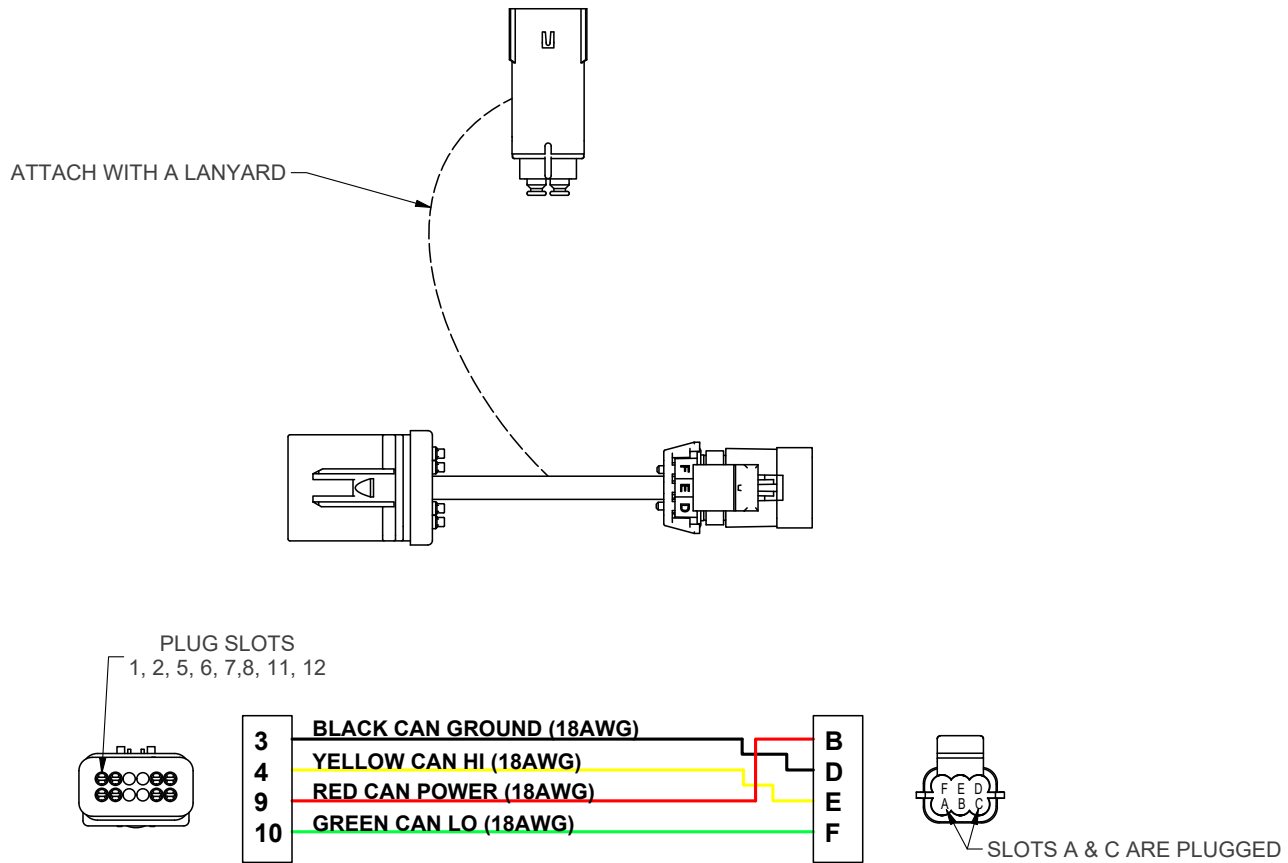
Electrical Schematic — Wiring Harness Overview Layout



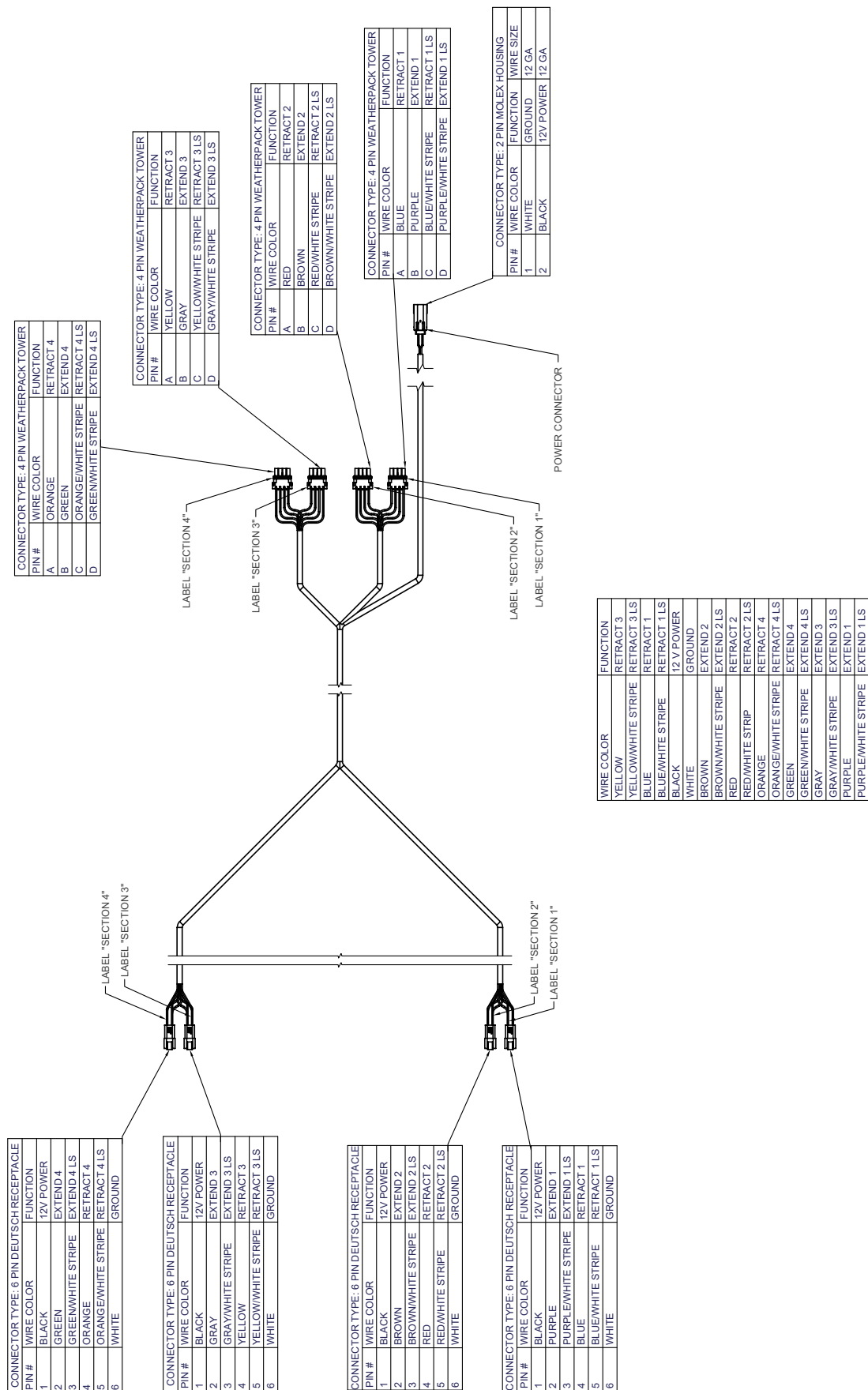
Schematic — Adapter Harness, 9-Pin IBIC Hitch #9503387



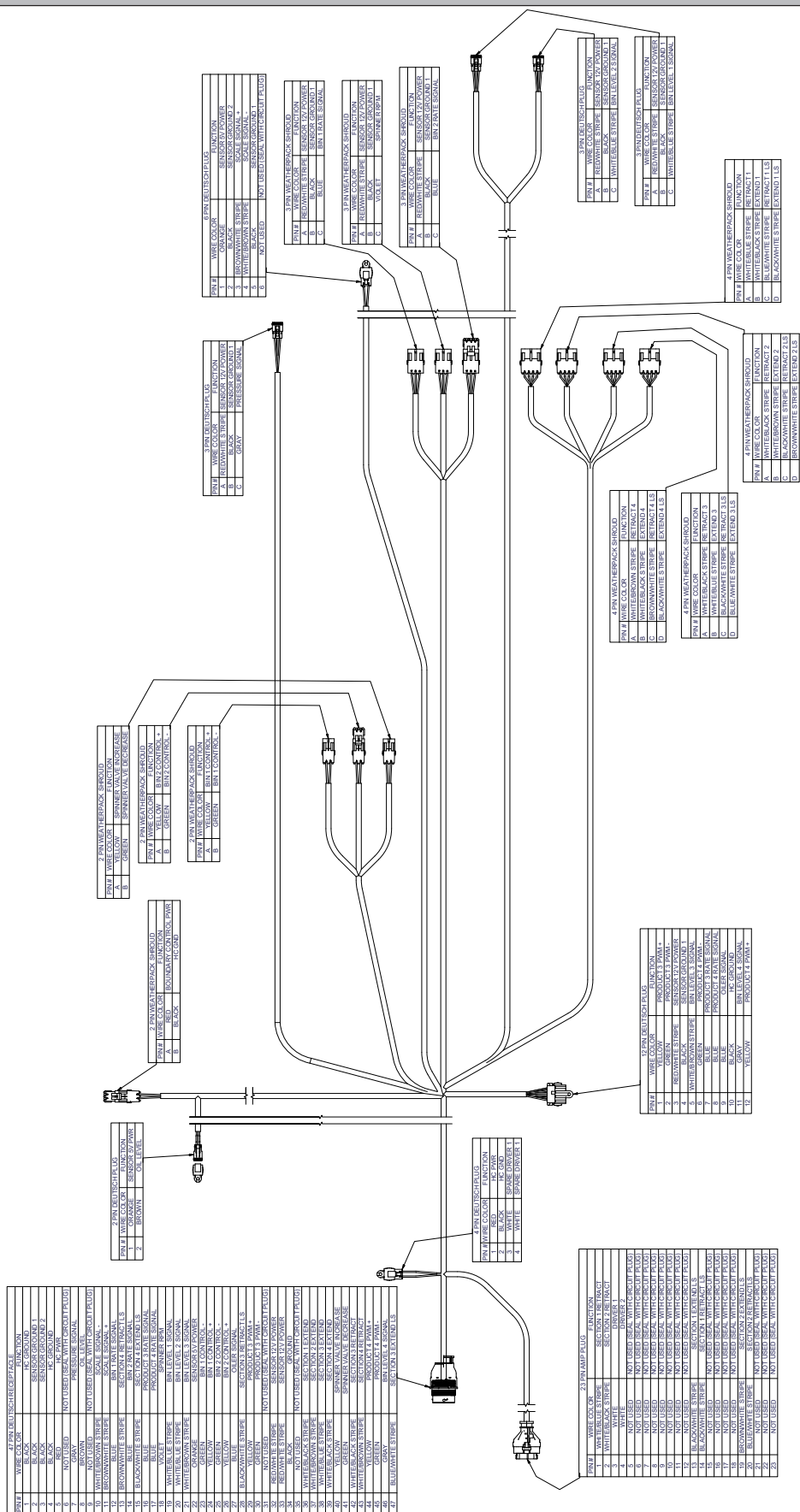
Schematic — Adapter Cable, JD ISO To Terminator #9008096



Schematic — Adapter Harness, #9010325
4 Pin Weatherpack To 6 Pin Deutsch

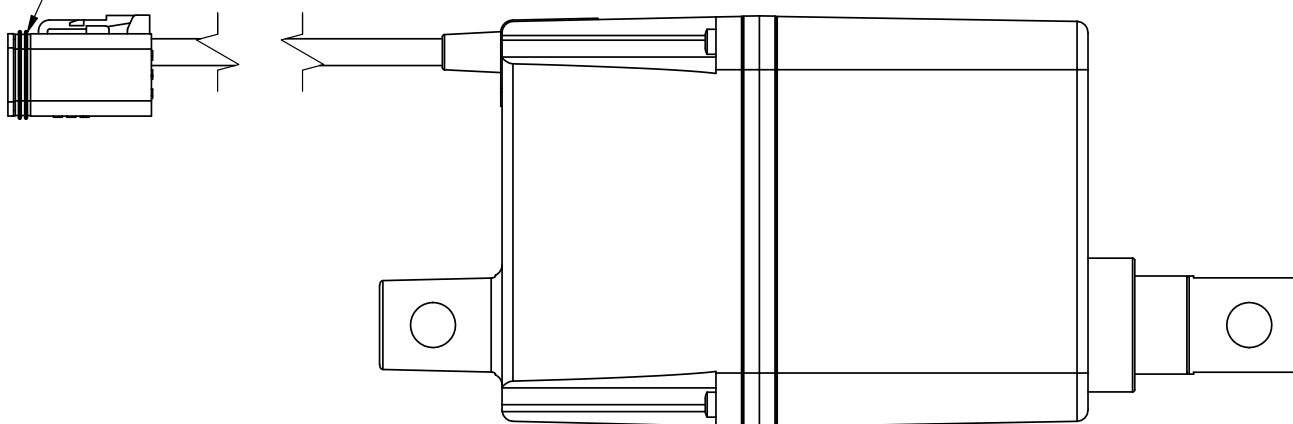


Schematic — Product Flow & Rate Control Harness #9010226



Schematic — Actuator #9010316

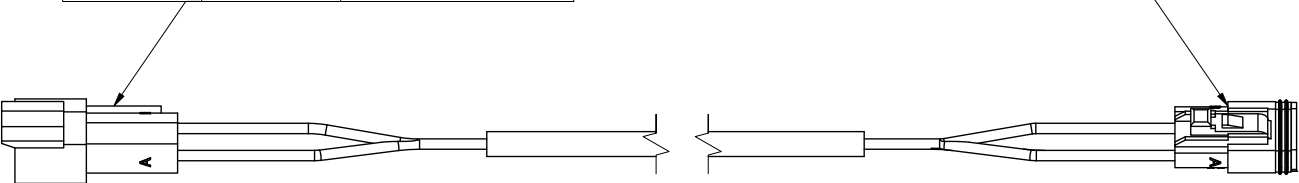
CONNECTOR TYPE: 6 PIN DEUTSCH PLUG		
PIN #	WIRE COLOR	FUNCTION
1	RED	12V POWER
2	VIOLET	EXTEND CONTROL
3	BLUE	EXTEND FEEDBACK
4	ORANGE	RETRACT CONTROL
5	BROWN	RETRACT FEEDBACK
6	BLACK, GREY	GROUND



Schematic — Pressure Transducer 30' Extension Cable,
#9009772

CONNECTOR TYPE 3 PIN DEUTSCH RECEPTACLE		
PIN #	WIRE COLOR	FUNCTION
A	BROWN	+12V
B	BLUE	GROUND
C	BLACK	SIGNAL

CONNECTOR TYPE: 3 PIN DEUTSCH PLUG		
PIN #	WIRE COLOR	FUNCTION
A	BROWN	+12V
B	BLUE	GROUND
C	BLACK	SIGNAL

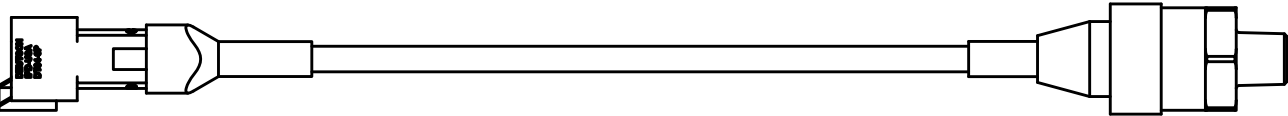


Schematic — Pressure Transducer #9504004

To 30' Extension Cable

PINOUT:
A=SUPPLY +12V (BROWN)
B=GROUND (BLUE)
C=SIGNAL (BLACK)

To Fan



Complete Torque Chart**Stainless Steel Capscrews - ASTM F593****IMPORTANT**

- Stainless steel hardware has a natural tendency to cold weld/gall when installed/uninstalled at high speeds and/or high torques. It is recommended to apply a thread lubricant approved for stainless steel such as graphite-based anti-seize or molybdenum disulfide based anti-seize when performing an assembly/disassembly of stainless steel hardware. Unverferth PN 9504206 or equivalent.
- The torque recommendations below are for lubricated stainless steel hardware.

SIZE	INCH POUNDS	NEWTON METERS
1/4-20	62	7
1/4-28	71	8
5/16-18	128	15
5/16-24	142	16

SIZE	FOOT POUNDS	NEWTON METERS
3/8-16	19	26
3/8-24	21	29
7/16-14	30	41
7/16-20	34	46
1/2-13	46	63
1/2-20	52	71
9/16-12	67	91
9/16-18	74	100
5/8-11	92	125
5/8-18	104	141
3/4-10	113	153
3/4-16	126	171
7/8-9	182	247
7/8-14	201	273
1-8	273	370
1-14	306	415
1 1/4-7	545	739
1 1/4-12	604	819
1 3/8-6	715	970
1 3/8-12	813	1102
1 1/2-6	949	1287
1 1/2-12	1067	1447

Complete Torque Chart (continued)**Capscrews - Grade 5****NOTE:**

- Grade 5 capscrews can be identified by three radial dashes on the head.
- Capscrews have a yellow or clear appearance.



SIZE	FOOT POUNDS	NEWTON METERS
1/4-20	8-10	11-13
1/4-28	9-11	12-15
5/16-18	15-17	20-23
5/16-24	17-19	23-26
3/8-16	25-28	34-38
3/8-24	28-31	38-42
7/16-14	40-45	54-61
7/16-20	45-50	61-68
1/2-13	62-68	84-92
1/2-20	68-75	92-102
9/16-12	90-98	122-133
9/16-18	100-110	134-148
5/8-11	120-135	162-183
5/8-18	124-137	168-186
3/4-10	200-220	270-300
3/4-16	210-230	285-310
7/8-9	330-350	425-475
7/8-14	360-380	460-515
1-8	500-525	675-710
1-14	540-560	730-760
1 1/8-7	600-635	815-860
1 1/8-12	665-700	920-950
1 1/4-7	850-895	1150-1215
1 1/4-12	940-990	1275-1340
1 3/8-6	1125-1175	1525-1590
1 3/8-12	1280-1335	1735-1810
1 1/2-6	1500-1560	2035-2115
1 1/2-12	1685-1755	2285-2380

IMPORTANT

- Follow these torque recommendations except when specified in text.

Hydraulic Fittings – Torque and Installation

WARNING

- EYE PROTECTION AND OTHER APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT MUST BE WORN WHILE SERVICING THE IMPLEMENT.
- HIGH-PRESSURE FLUIDS CAN PENETRATE THE SKIN AND CAUSE SERIOUS INJURY OR DEATH. LEAKS OF HIGH-PRESSURE FLUIDS MAY NOT BE VISIBLE. USE CARDBOARD OR WOOD TO DETECT LEAKS IN THE HYDRAULIC SYSTEM. SEEK MEDICAL TREATMENT IMMEDIATELY IF INJURED BY HIGH-PRESSURE FLUIDS.
- HYDRAULIC SYSTEM MUST BE PURGED OF AIR BEFORE OPERATING TO PREVENT SERIOUS INJURY OR DEATH.
- RELIEVE HYDRAULIC SYSTEM OF ALL PRESSURE BEFORE ADJUSTING OR SERVICING. SEE TRACTOR OPERATOR'S MANUAL FOR PROPER PROCEDURES.



Tightening O-Ring Fittings

1. Inspect components for damage or contamination. Do not connect any other type of fitting to an O-ring fitting.
2. For adjustable fittings, ensure the jam nut and washer are fully backed up.
3. Lubricate the O-ring and threads on the fitting with hydraulic oil.
4. Turn the fitting into the port until it is finger tight.
5. For adjustable fittings, set in the desired position.
6. Using a wrench, torque the fitting to the value in the below table. For adjustable fittings the jam nut will be tightened.

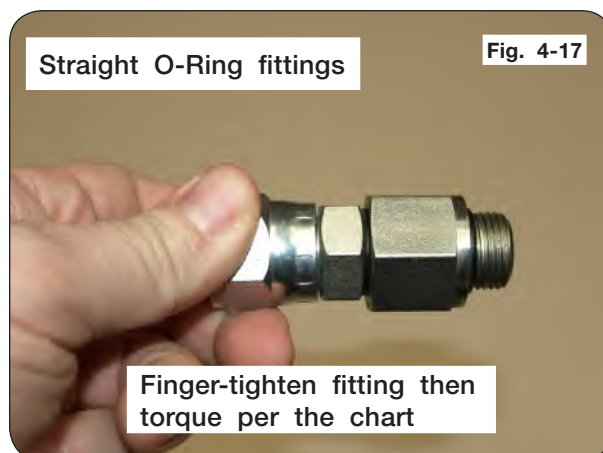
NOTE: Never use a power tool to install a fitting.

Dash Size	Thread Size	Straight Stud Torque (Ft-Lbs)	Adjustable Stud Torque (Ft-Lbs)
-5	1/2-20	14-19	10-14
-6	9/16-18	18-24	12-16
-8	3/4-16	27-43	20-30
-10	7/8-14	36-48	30-36
-12	1-1/16-12	65-75	44-54
-14	1-3/16-12	75-99	53-70
-16	1-5/16-12	85-123	59-80
-20	1-5/8"-12	115-161	75-100
-24	1-7/8"-12	125-170	105-125



O-Ring fittings

Fig. 4-16



Straight O-Ring fittings

Fig. 4-17

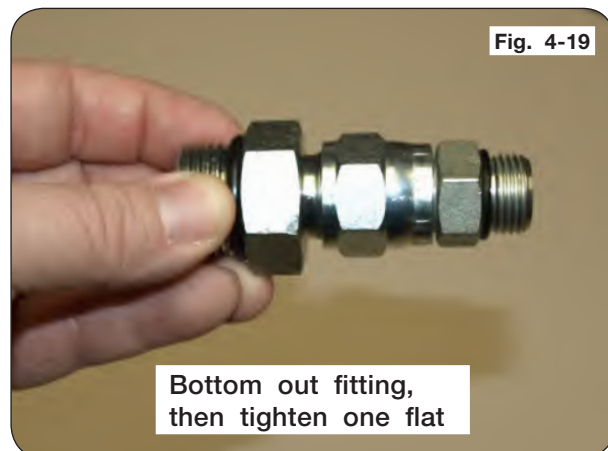
Finger-tighten fitting then torque per the chart

Hydraulic Fittings - Torque and Installation (continued)

Tightening JIC Fittings

1. Inspect all components for damage or contamination. Do not connect any other type of fitting to a JIC fitting.
2. Lubricate the threads with hydraulic oil.
3. Turn the fitting into the port until it bottoms out.
4. Use one wrench on the fixed hex on the hose to prevent twisting and a second on the swivel. Tighten the fitting another 60 degrees (or one flat)

NOTE: Never use a power tool to install a fitting



Steel 37° JIC Adapters		
DASH SIZE	FLARED THREAD SIZE	TORQUE FT.-LBS
-6	9/16"-18	18-20
-8	3/4"-16	27-39
-10	7/8"-14	36-63
-12	1 1/16"-12	65-88
-14	1 3/16"-12	75-103
-16	1 5/16"-12	85-113
-20	1 5/8"-12	115-133
-24	1 7/8"-12	125-167

Section V

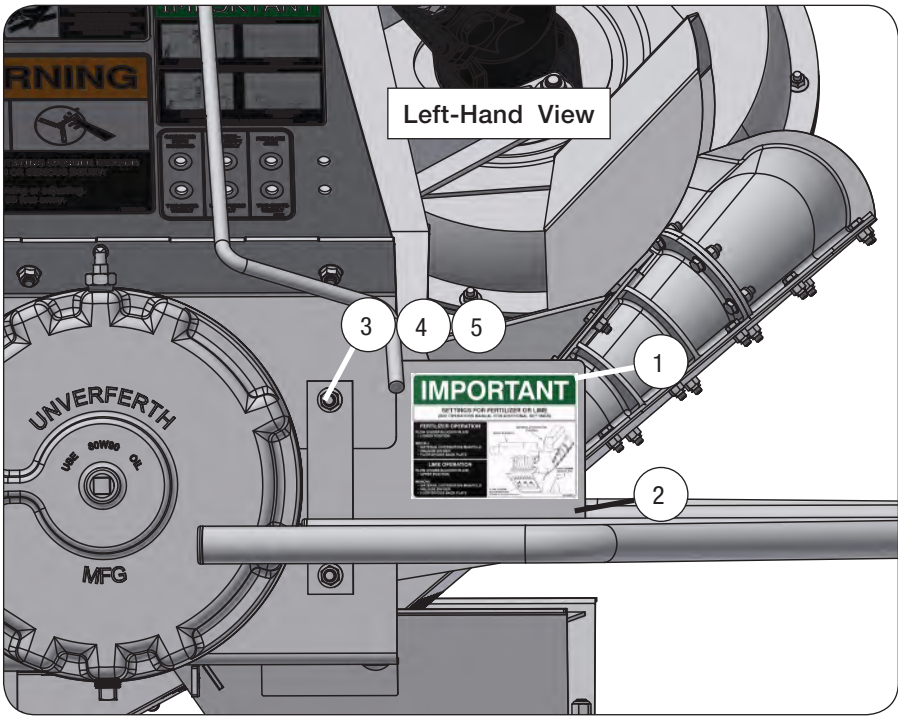
Parts

Please visit www.unverferth.com/parts/ for the most current parts listing.

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Decals

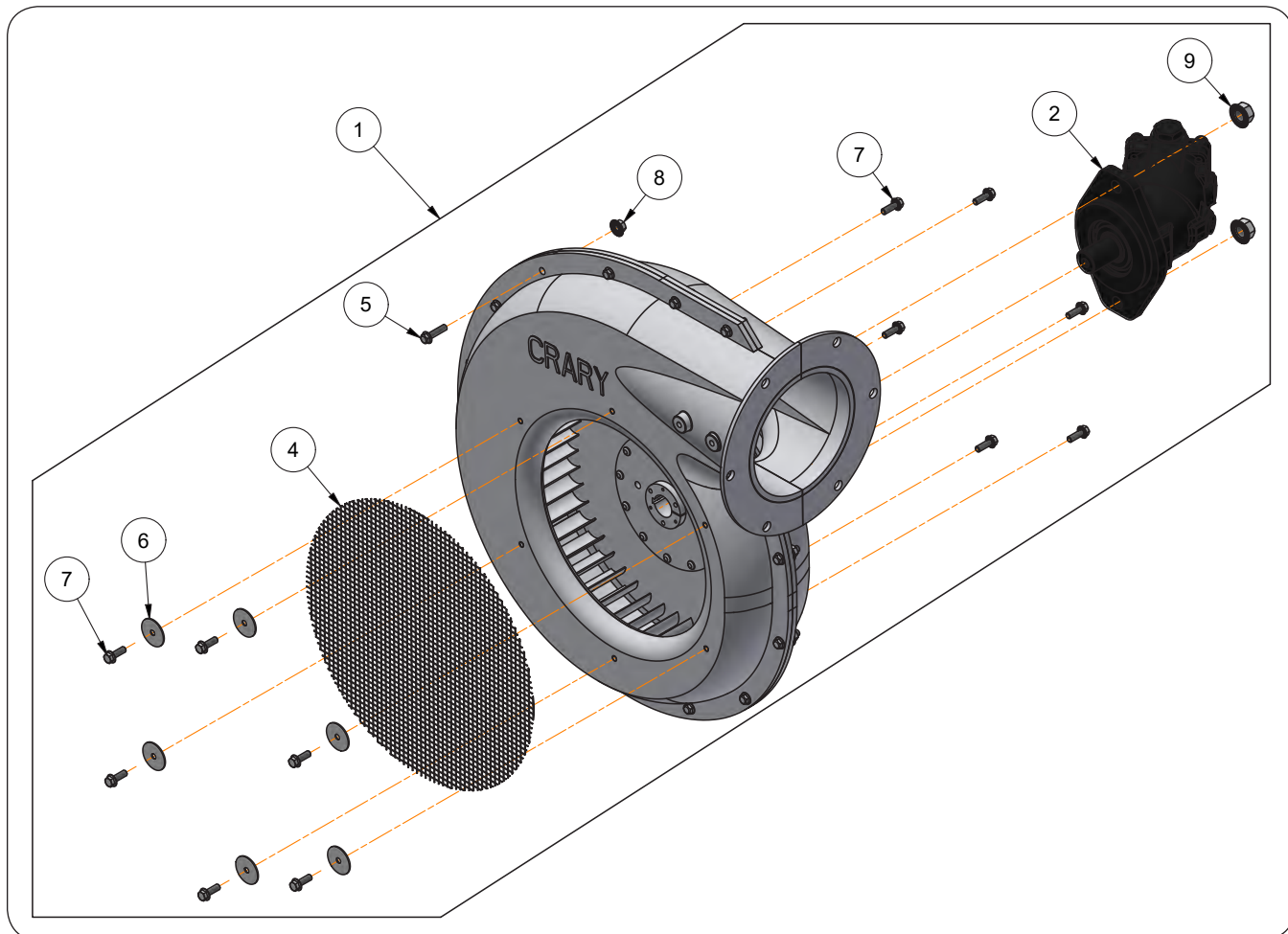
Please visit www.unverferth.com/parts/ for the most current parts listing.



ITEM	PART NUMBER	DESCRIPTION	QTY	NOTES
1	9010406	DECAL, IMPORTANT "SECTION CONTROL OPERATION"	1	
2	417778	Decal Mount Plate (SS)	1	
3	900900-056	Capscrew, 3/8"-16UNC x 1 1/4" (SS)	2	Used For Item 1
4	900902-037	Flat Washer, 3/8" SAE (SS)	2	
5	900905-012	Lock Nut, 3/8"-16UNC (SS)	2	

Fan Assembly

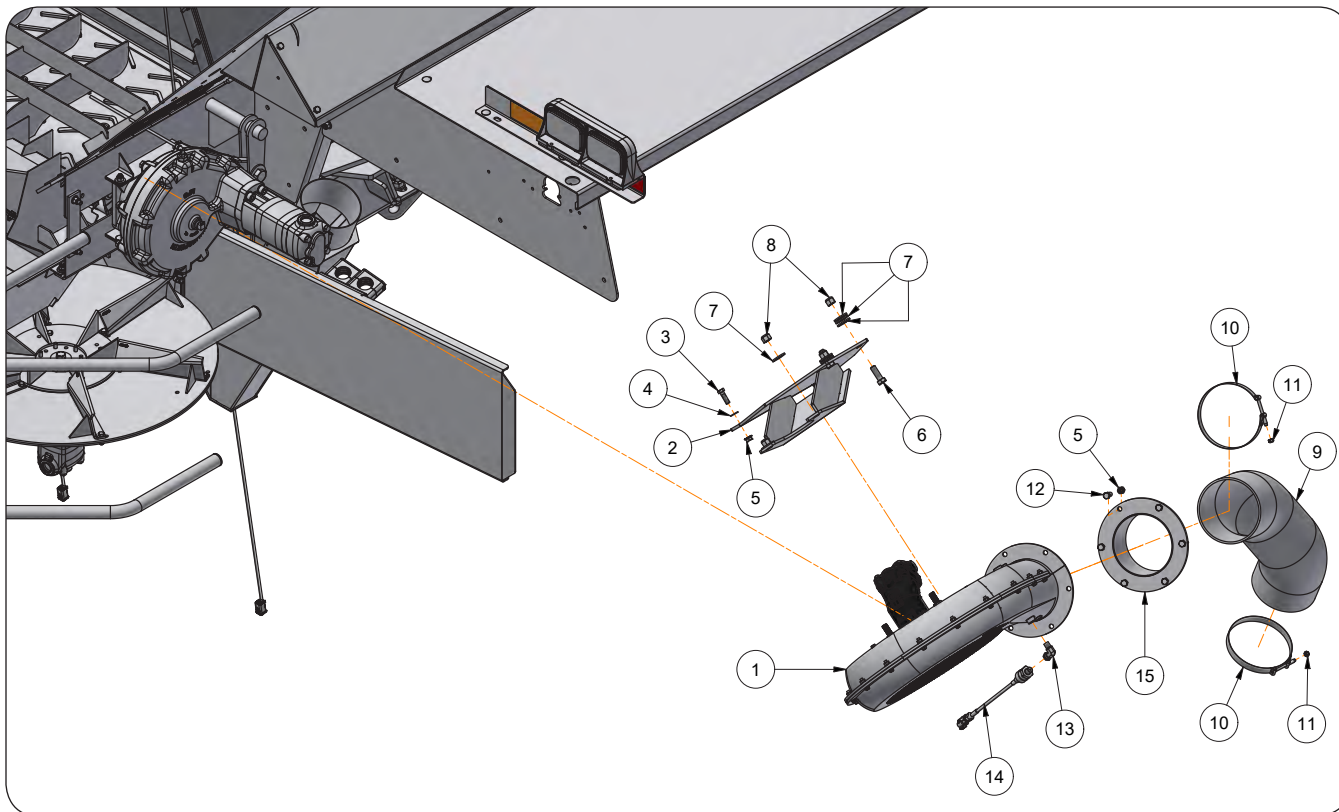
Please visit www.unverferth.com/parts/ for the most current parts listing.



ITEM	PART NUMBER	DESCRIPTION	QTY	NOTES
1	9502296	Aluminum Fan With 6" Flanged Outlet	1	Includes All Items
2	9502587	Bent Axis Piston Motor 12CC =Black=	1	Includes Item 3
3	9502586	Motor Seal Kit	1	Not Shown
4	9503544	Inlet Screen	1	
5	901101	Flange Screw, 1/4"-20UNC x 1"	15	
6	105005	Fender Washer, 1/4"	6	
7	97420	Flange Screw, 1/4"-20UNC x 3/4" Grade 5	12	
8	97189	Hex Nut, 1/4"-20UNC	15	
9	91267	Flange Nut, 1/2"-13UNC	2	

Fan Components

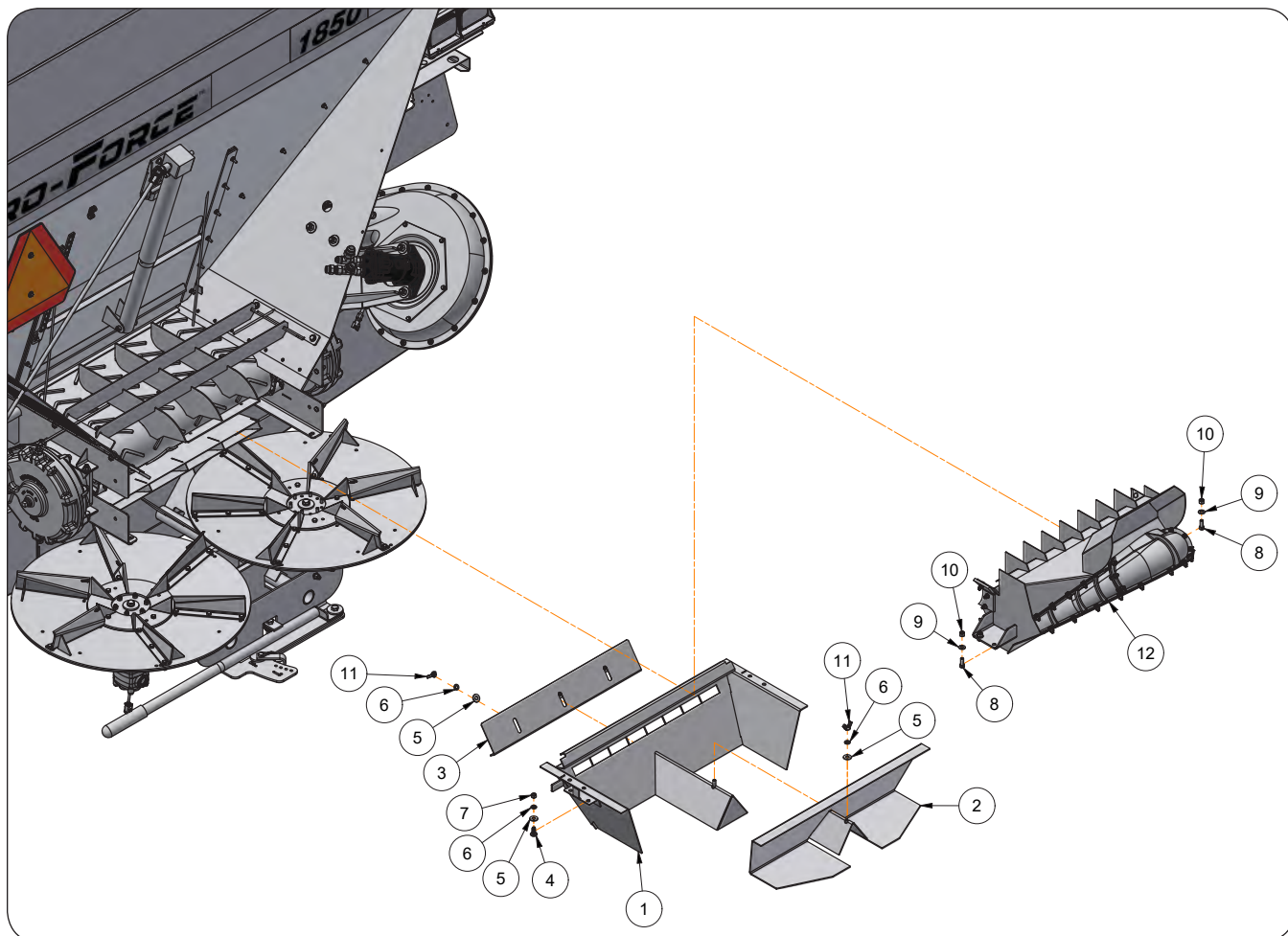
Please visit www.unverferth.com/parts/ for the most current parts listing.



ITEM	PART NUMBER	DESCRIPTION	QTY	NOTES
1	9502296	Aluminum Fan With 6" Flanged Outlet	1	See "Fan Assembly" For Parts List
2	416289B	Fan Mount Weldment =Black=	1	
3	900900-057	Capscrew, 3/8"-16UNC X 1 1/2" (SS)	2	
4	900902-037	Flat Washer, 3/8" SAE (SS)	2	
5	900905-012	Elastic Stop Nut, 3/8"-16UNC (SS)	8	
6	900900-101	Capscrew, 1/2"-13UNC X 1 1/2" (SS)	2	
7	900902-044	Flat Washer, 1/2" (SS)	8	
8	900905-016	Elastic Stop Nut, 1/2"-13UNC (SS)	4	
9	417723	Air Tube, 6" Dia.	1	
10	98060	T-Bolt Clamp, 6 1/2" to 6" I.D. x 3/4"	2	Includes Item 11
11	9398-008	Elastic Lock Nut, 1/4"-28UNF	1	
12	900900-055	Capscrew, 3/8"-16UNC X 1" (SS)	6	
13	9004304	90° Elbow, 1/4"-18 (NPTF) Male x 1/4"-18 (NPSM) Female	1	
14	9504004	Pressure Transducer	1	
15	415477	Fan Mount Weldment (SS)	1	

Material Flow Divider & Flow Divider Blocker Plate Components

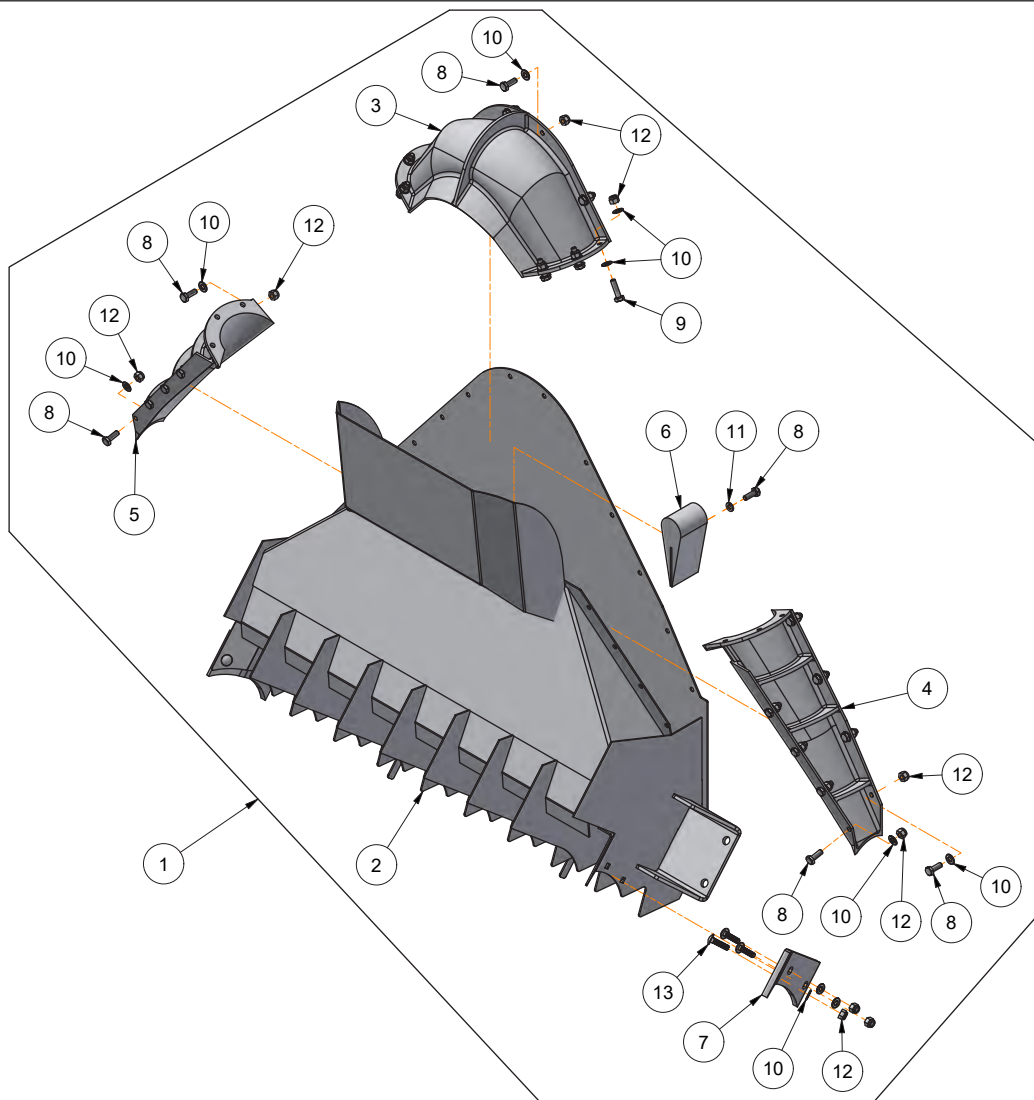
Please visit www.unverferth.com/parts/ for the most current parts listing.



ITEM	PART NUMBER	DESCRIPTION	QTY	NOTES
1	417385	Material Flow Divider Section Control Weldment SS	1	
2	417394	Back Plate Flow Divider Weldment SS	1	
3	417479	Flow Divider Blocker Plate SS	1	
4	9007908-051	Carriage Bolt 3/8"-16UNC x 1" SS	2	
5	900902-038	Flat Washer 3/8" SS	6	
6	900903-021	Lock Washer 3/8" SS	6	
7	900901-006	Hex Nut 3/8"-16UNC SS	2	
8	900900-055	Capscrew 3/8"-16UNC x 1" SS	4	
9	900902-037	Flat Washer 3/8" SS	4	
10	900905-012	Elastic Stop Nut 3/8"-16UNC SS	4	
11	9010310	Wing Nut, 3/8"-16UNC SS	4	
12	416460	Material Distribution Manifold Assembly	1	See "Material Distribution Manifold Assembly" For Parts List

Material Distribution Manifold Assembly

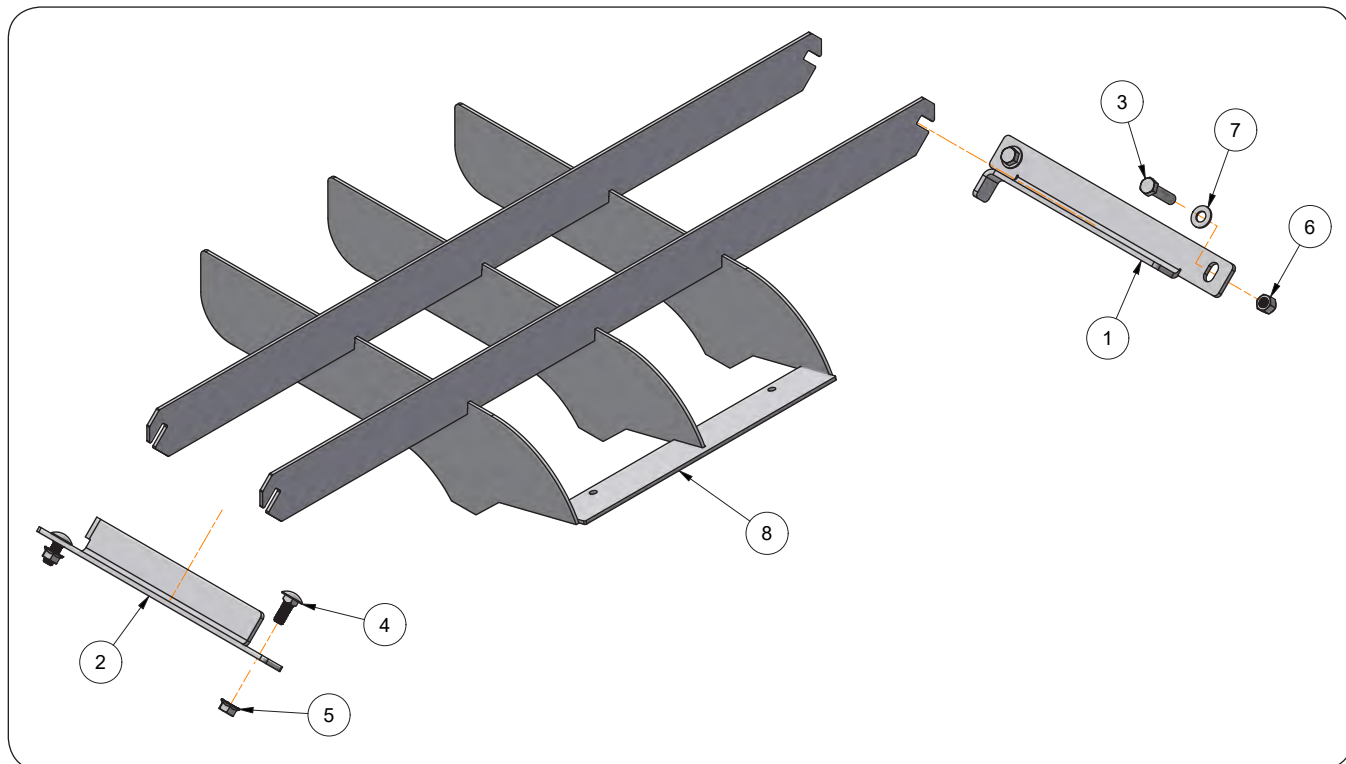
Please visit www.unverferth.com/parts/ for the most current parts listing.



ITEM	PART NUMBER	DESCRIPTION	QTY	NOTES
1	416460	Material Distribution Manifold Assembly	1	Includes All Items
2	415457	Material Distribution Manifold Weldment (SS)	1	
3	416343	Upper Manifold Arc	1	(Black HDPE Material)
4	416344	Left-Hand Manifold Arc	1	(Black HDPE Material)
5	416345	Right-Hand Manifold Arc	1	(Black HDPE Material)
6	416393	Center Manifold Wedge	1	(Black HDPE Material)
7	416467	Manifold Edge Seal	2	(Rubber Material)
8	900900-003	Capscrew 1/4"-20UNC x 3/4" (SS)	21	
9	900900-005	Capscrew 1/4"-20UNC x 1" (SS)	6	
10	900902-026	Flat Washer 1/4" (SS)	38	
11	900903-017	Lock Washer 1/4" (SS)	1	
12	900905-007	Elastic Stop Nut 1/4"-20UNC (SS)	32	
13	9007908-003	Carriage Bolt 1/4"-20UNC x 1" (SS)	6	

Air Command Hillside Flow Divider

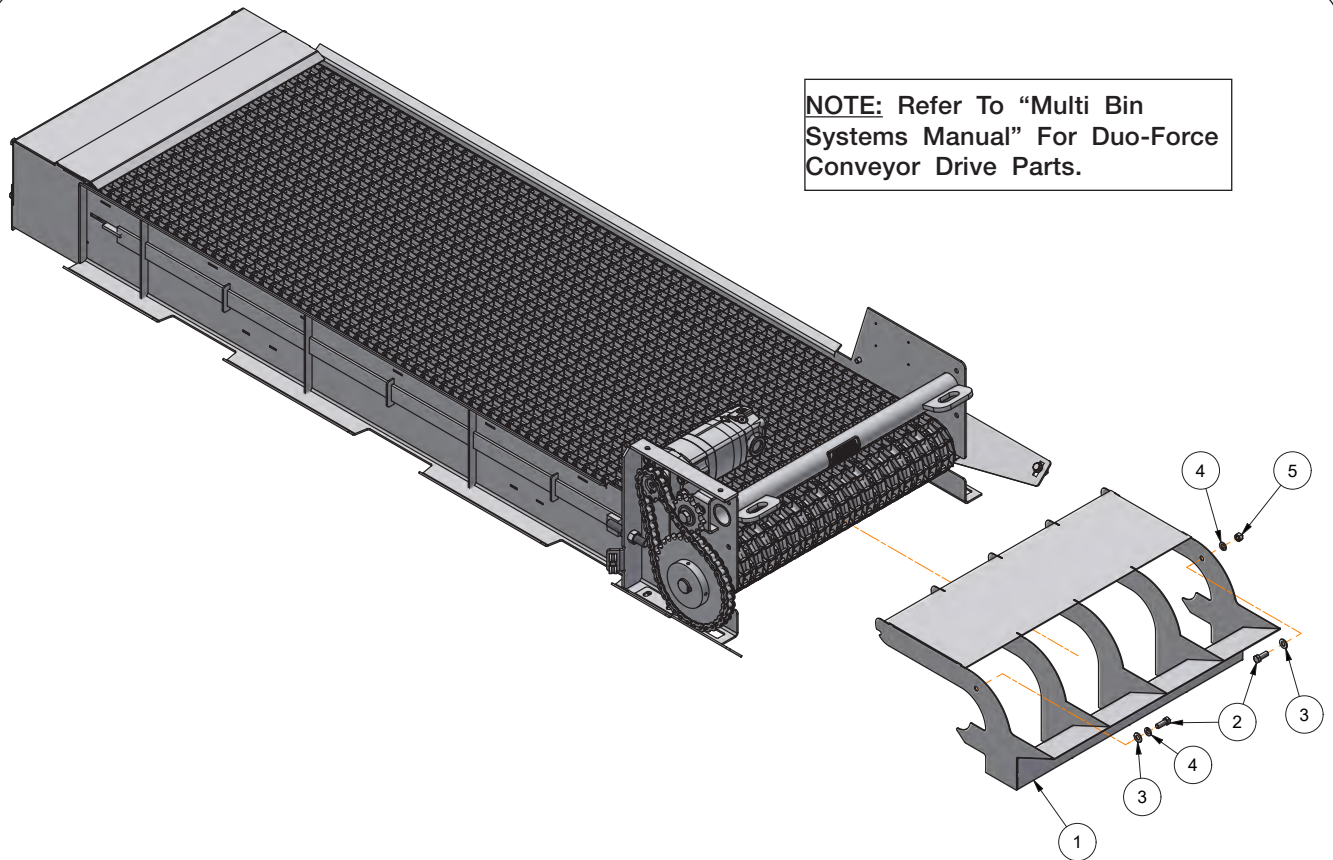
Please visit www.unverferth.com/parts/ for the most current parts listing.



ITEM	PART NUMBER	DESCRIPTION	QTY	NOTES
1	PFHFD-104	BRACKET, HILLSIDE FLOW DIVIDER, RH (SS)	1	
2	PFHFD-104L	BRACKET, HILLSIDE FLOW DIVIDER, LH (SS)	1	
3	900900-057	CAPSCREW, 3/8"-16UNC X 1 1/2" (SS)	2	
4	9007908-051	BOLT, CARRIAGE 3/8"-16UNC X 1" (SS)	2	
5	9005640	SERRATED FLANGE NUT, 3/8"-16UNC (SS)	2	
6	900905-012	ELASTIC STOP NUT, 3/8"-16UNC (SS)	2	
7	900902-037	FLAT WASHER, 3/8" SAE (SS)	2	
8	416380	SECTION CONTROL HILLSIDE FLOW DIVIDER WELDMENT, (SS)	1	

Duo-Force Air Command Hillside Flow Divider

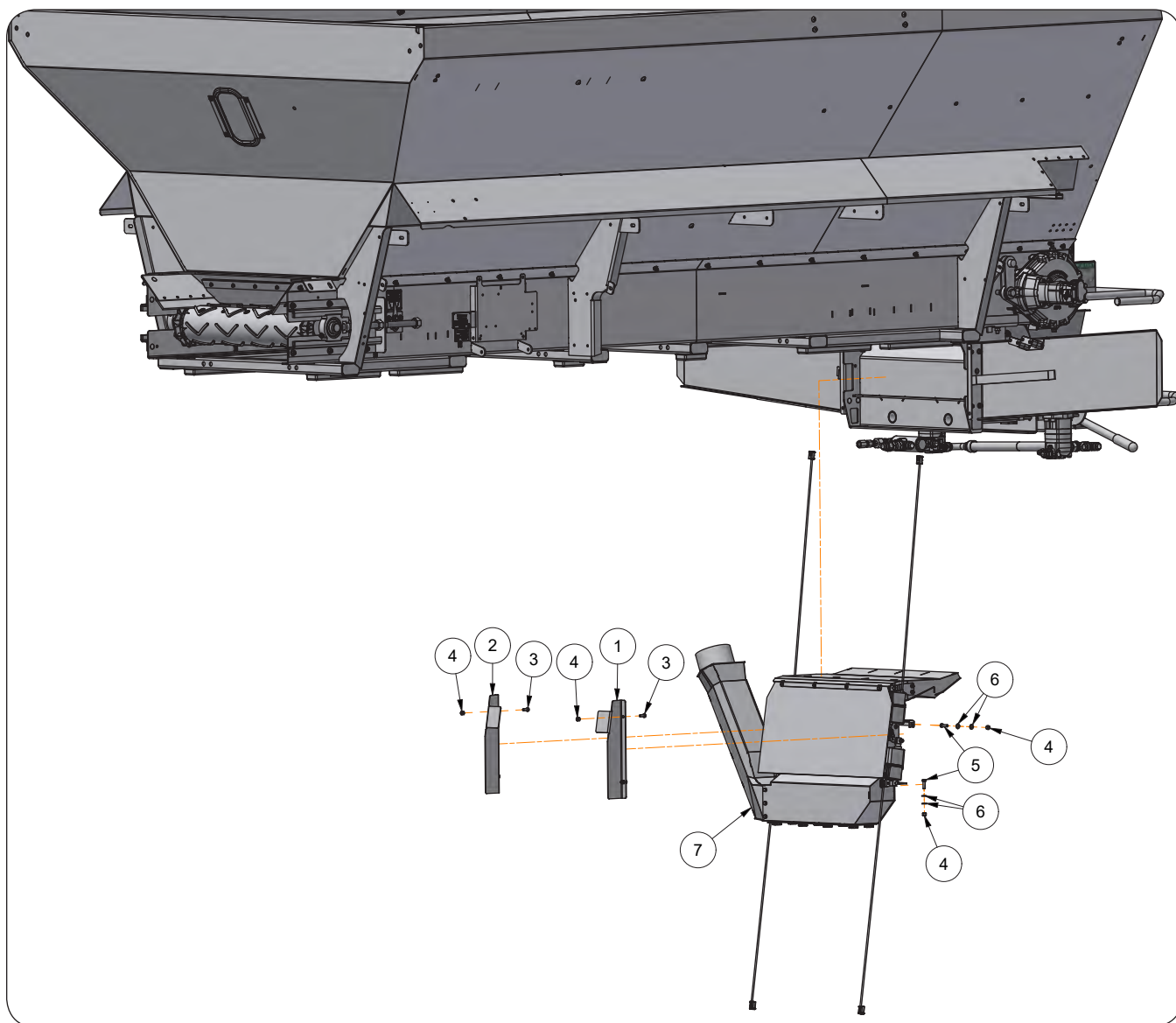
Please visit www.unverferth.com/parts/ for the most current parts listing.



ITEM	PART NUMBER	DESCRIPTION	QTY	NOTES
1	416384	DUO-FORCE SECTION CONTROL HILLSIDE FLOW DIVIDER WELDMENT, (SS)	1	
2	900900-055	CAPSCREW, 3/8"-16UNC X 1" (SS)	2	
3	900902-037	FLAT WASHER, 3/8" SAE (SS)	2	
4	900903-021	LOCK WASHER, 3/8" (SS)	2	
5	900901-006	HEX NUT, 3/8"-16UNC (SS)	1	

Section Control Manifold Mounting & Cover Components

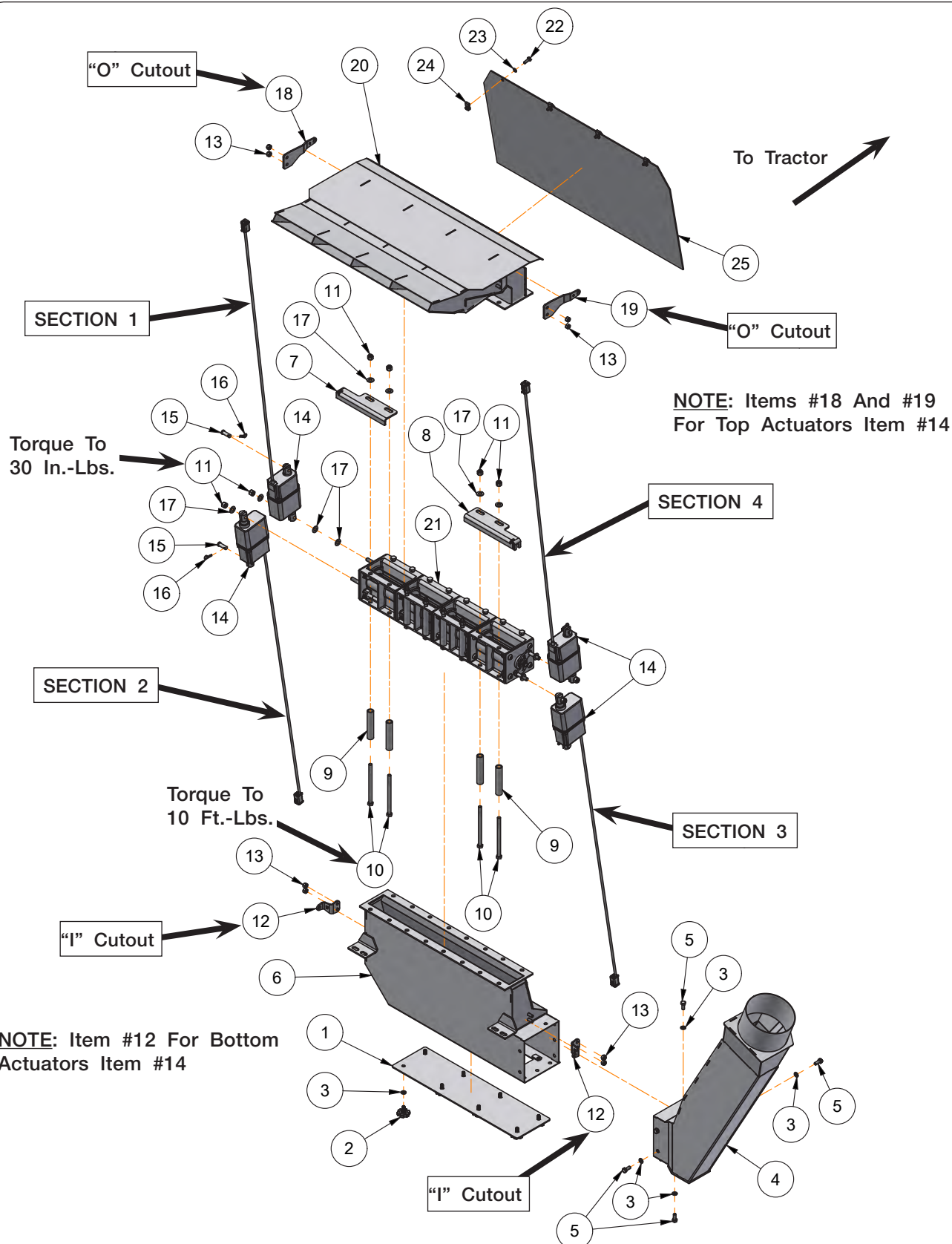
Please visit www.unverferth.com/parts/ for the most current parts listing.



ITEM	PART NUMBER	DESCRIPTION	QTY	NOTES
1	417483	Left-Hand Manifold Cover SS	1	
2	417659	Right-Hand Manifold Cover SS	1	
3	900900-054	Capscrew 3/8"-16UNC x 7/8" SS	4	
4	900905-012	Elastic Stop Nut 3/8"-16UNC SS	8	
5	900900-056	Capscrew 3/8"-16UNC x 1 1/4" SS	4	
6	900902-037	Flat Washer 3/8" SS	8	
7	417505	Section Control Manifold Assembly	1	See "Section Control Manifold Assembly" For Parts List

Section Control Manifold Assembly

Please visit www.unverferth.com/parts/ for the most current parts listing.



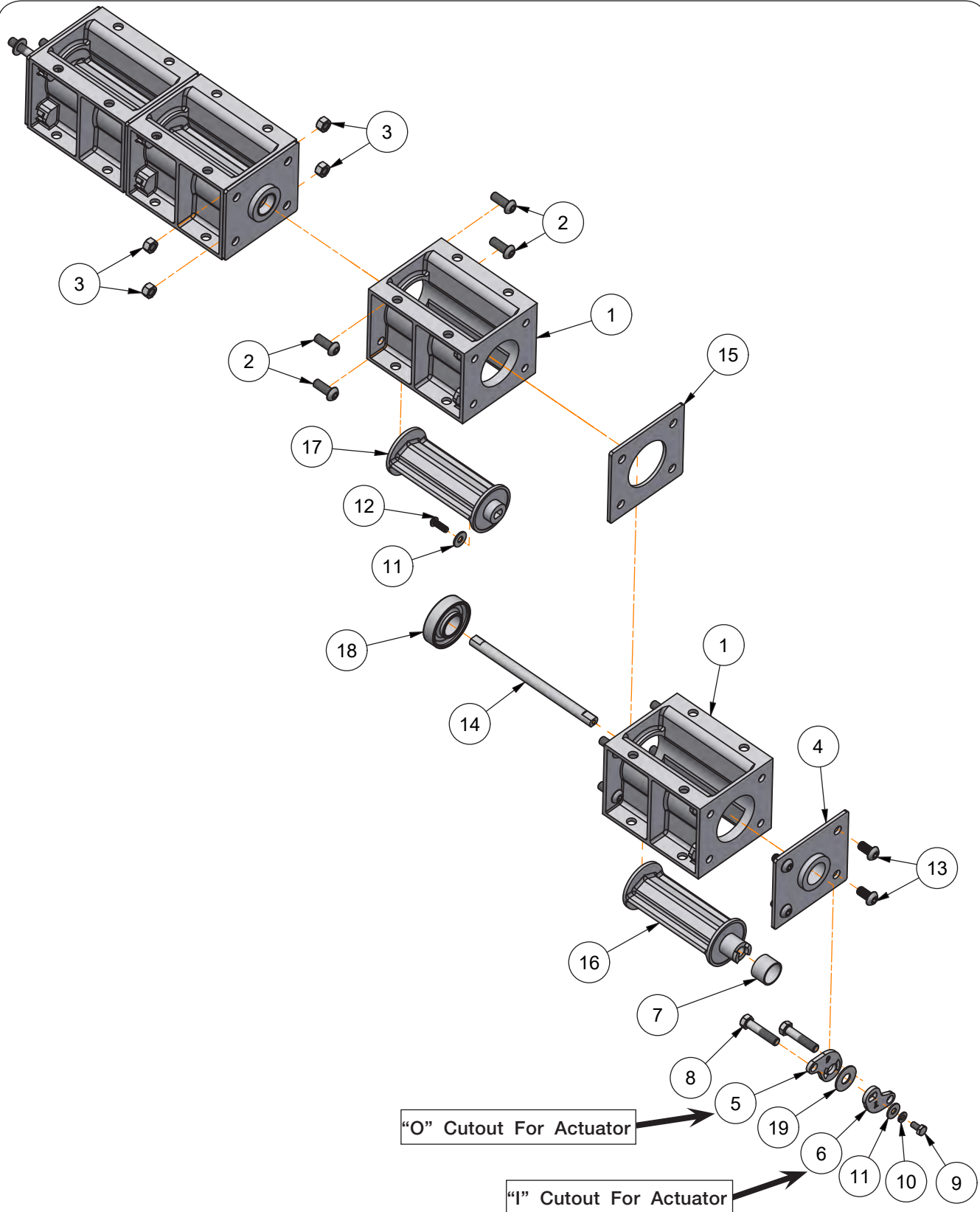
Section Control Manifold Assembly

Please visit www.unverferth.com/parts/ for the most current parts listing.

ITEM	PART NUMBER	DESCRIPTION	QTY	NOTES
	417505	Section Control Manifold Assembly	1	Includes All Items
1	416760	Manifold Inspection Cover SS	1	
2	9009383	Thumb Screw, 5/16"-18UNC x 3/4" SS	8	
3	900903-019	Lock Washer, 5/16" SS	17	
4	417053	Inlet Manifold Weldment SS	1	
5	900900-028	Capscrew 5/16"-18UNC x 3/4" SS	9	
6	417490	Lower Manifold Weldment SS	1	
7	417488	Left-Hand Manifold Mount SS	1	
8	417489	Right-Hand Manifold Mount SS	1	
9	417235	Manifold Spacer Tube SS	16	
10	900900-070	Capscrew 3/8"-16UNC x 5 1/2" SS	16	Torque To 10 Ft.-Lbs.
11	900905-012	Elastic Stop Nut 3/8"-16UNC SS	20	
12	417497	Inner Actuator Mount SS	2	
13	900905-010	Elastic Stop Nut 5/16"-16UNC SS	8	
14	9010316	Actuator - 50MM Stroke, 250 N	4	
15	9010339	Clevis Pin, 3/8" Dia. x 1 3/32" SS	4	
16	9010342	Hairpin Clip, 0.08" Dia. x 1.1875" SS	4	
17	900902-037	Flat Washer, 3/8" SAE SS	12	
18	417511	Left-Hand Outer Actuator Mount SS	1	
19	417512	Right-Hand Outer Actuator Mount SS	1	
20	417498	Upper Manifold Weldment SS	1	
21	417777	Section Control Valve Assembly 4 Section	1	See "Section Control Valve Assembly 4 Section" For Parts List
22	900900-003	Capscrew 1/4"-20UNC x 3/4" SS	4	
23	900903-017	Lock Washer, 1/4" SS	4	
24	9504864	Panel Nut, 1/4"-20UNC	4	
25	417678	Rubber Cover	1	

Section Control Valve Assembly 4 Section

Please visit www.unverferth.com/parts/ for the most current parts listing.



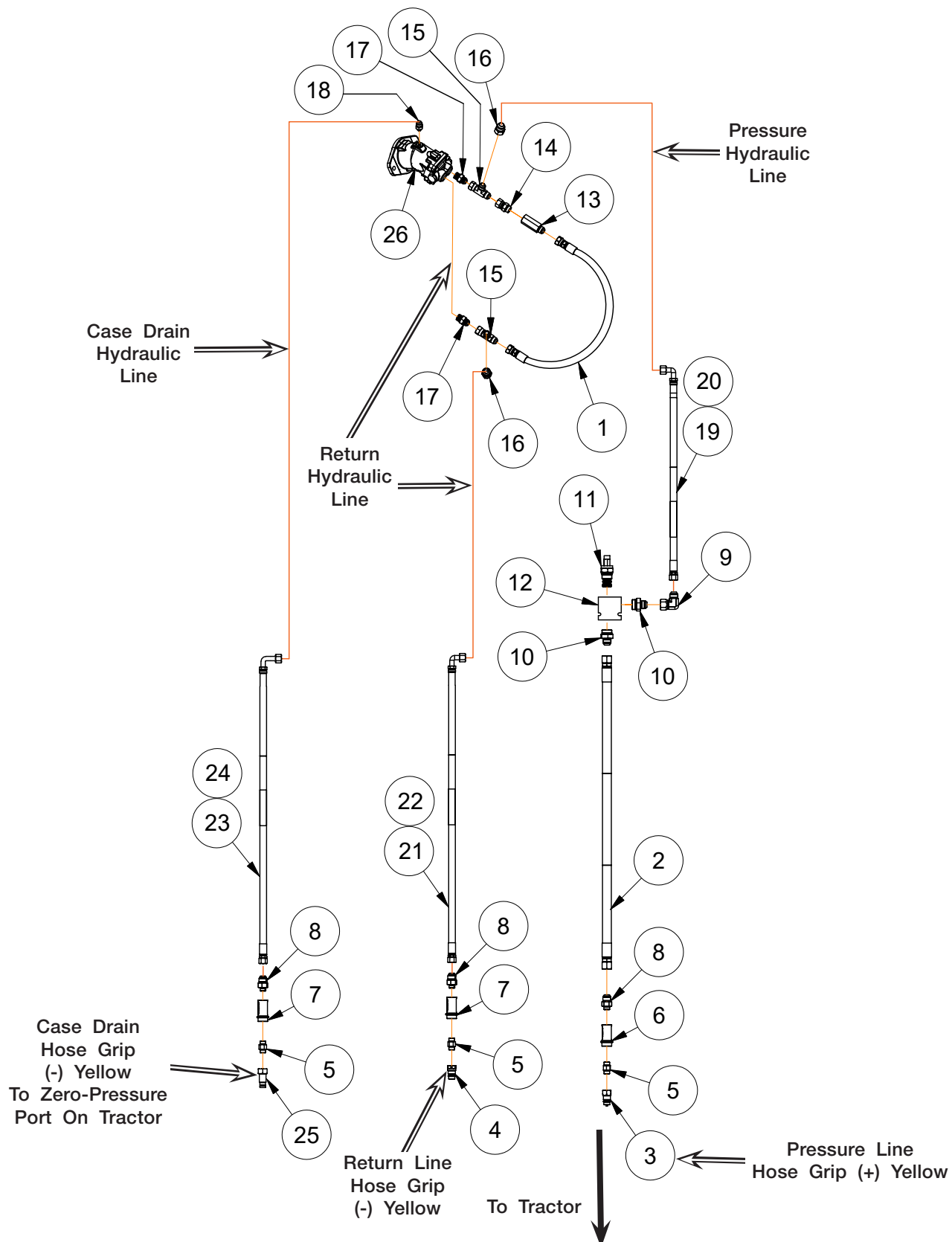
Section Control Valve Assembly 4 Section

Please visit www.unverferth.com/parts/ for the most current parts listing.

ITEM	PART NUMBER	DESCRIPTION	QTY	NOTES
	417777	Section Control Valve Assembly 4 Section	1	Includes All Items
1	417508	Section Control Valve Housing	4	(Black HDPE Material)
2	9010236	Button Hex Head Screw, 3/8"-16UNC x 1" SS	12	
3	900901-006	Hex Nut, 3/8"-16UNC SS	20	
4	416219	Valve Hinge Weldment SS	3	
5	416335	Outer Valve Actuator Plate SS	2	
6	416336	Inner Valve Actuator Plate SS	2	
7	9004397	Self-Lubricating Bushing, 1.131" O.D. x 1.008" I.D. x 0.75"	3	
8	900900-058	Capscrew 3/8"-16UNC x 1 3/4" SS	4	
9	900900-001	Capscrew 1/4"-20UNC x 1/2" SS	2	
10	900903-017	Lock Washer, 1/4" SS	4	
11	900902-032	Flat Washer, 1/4" SS	4	
12	9008010	Button Hex Head Screw, 1/4"-20UNC x 3/4" SS	2	
13	9008066	Button Hex Head Screw, 3/8"-16UNC x 3/4" SS	8	
14	417510	Valve Actuator Rod, 1/2" Dia. x 7 1/2" SS	2	
15	416636	Valve Hinge Plate SS	2	
16	417506	Section Control Outer Valve	2	(Black HDPE Material)
17	417509	Section Control Inner Valve	2	(Black HDPE Material)
18	416625	Valve Spacer	2	(Black HDPE Material)
19	PF1209-61	Flat Washer, 1/2" Dia. SS	2	

Fan Hydraulic Components (1850 & 2250 Models)

Please visit www.unverferth.com/parts/ for the most current parts listing.



Air Command Section Control — Parts

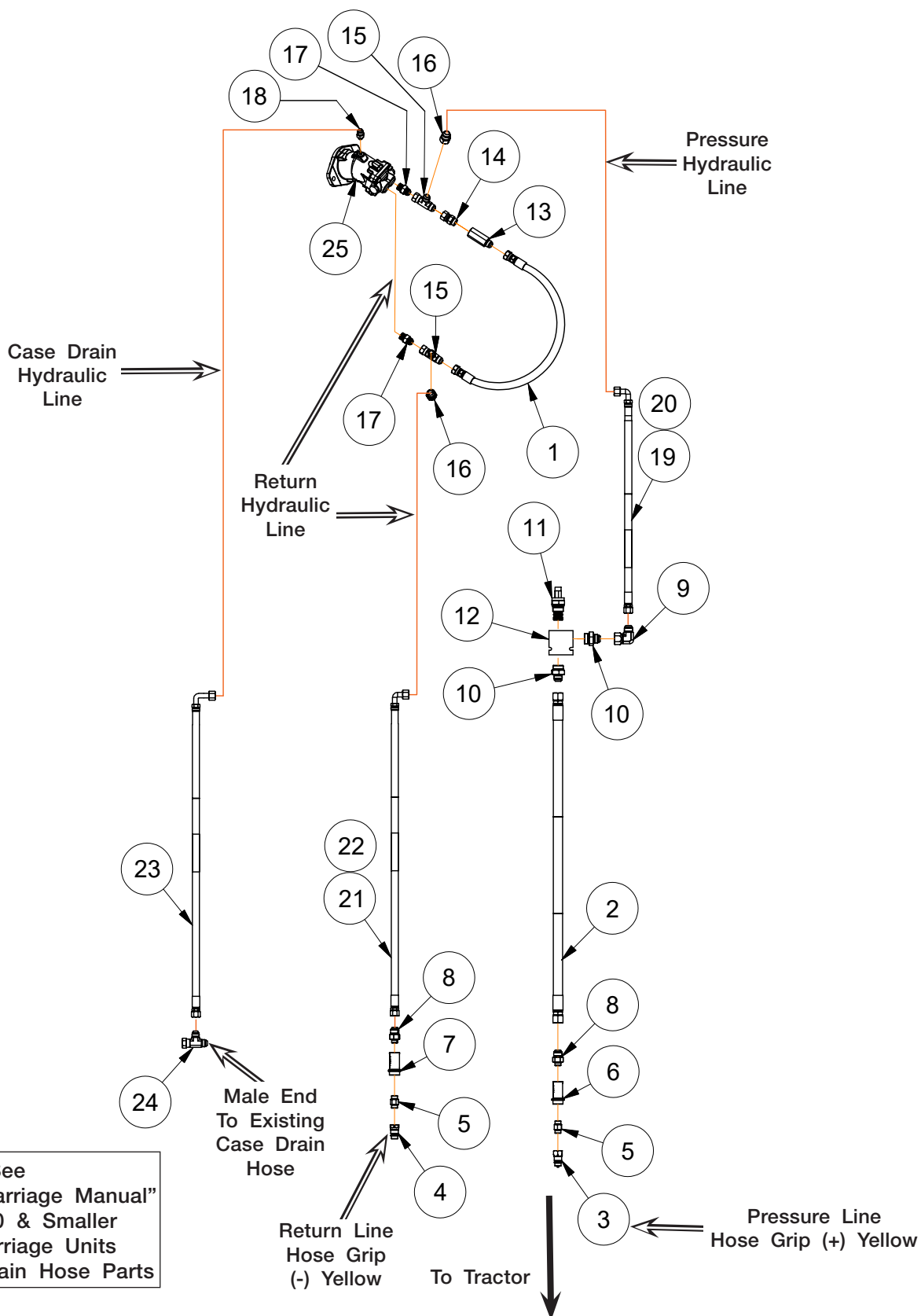
Fan Hydraulic Components (1850 & 2250 Models)

Please visit www.unverferth.com/parts/ for the most current parts listing.

ITEM	PART NUMBER	DESCRIPTION	QTY	NOTES
1	TAWC99416	Hydraulic Hose, 1/2" x 16 1/2" 3,000 PSI SAE	1	
2	9009811	Hydraulic Hose, 3/4" x 192" 3,000 PSI SAE	1	
3	91383	Male Coupler Tip, 3/4"-16 O-Ring Female	1	
4	PF1202-8434	Quick Connect Fitting, 3/4"-16 O-Ring Male	1	
5	98508	Adapter, O-Ring 3/4"-16 Male to O-Ring 3/4"-16 Male	3	
6	9009759	Aluminum Hose Grip, Yellow (+)	1	Fan Pressure
7	9009760	Aluminum Hose Grip, Yellow (-)	2	Fan Return & Case Drain
8	103347	Adapter, 1 1/16"-12 JIC Male to 3/4"-16 O-Ring Male	3	
9	103370	90° Elbow, 1 1/16"-12 JICM to 1 1/6"-12 JICF Swivel	1	
10	98255	Adapter, 1 1/16"-12 JICM to 1 5/16"-12 O-Ring Male	2	
11	PF1222-669	Hydraulic Flow Restrictor Valve	1	
12	PF1222-112	2-Way Block - C16-2	1	
13	902729	Check Valve With O-Ring	1	
14	97686	Adapter, 7/8"-14 O-Ring Male to 7/8"-14 JIC Female	1	
15	95478	Tee Fitting, 7/8"-14 JIC Male	2	
16	9010219	Reducer, 7/8"-14 JIC Female to 1 1/16"-12 JIC Male	2	
17	9002443	Adapter, 7/8"-14 JIC Male to 7/8"-14 O-Ring Male	2	
18	95475	Adapter, 3/4"-16 JIC Male to 9/16"-18 O-Ring Male	1	
19	9009809	Hydraulic Hose, 3/4" x 244" 3,000 PSI SAE	1	2250 Model Pressure Hose
20	9009808	Hydraulic Hose, 3/4" x 196" 3,000 PSI SAE	1	1850 Model Pressure Hose
21	9010252	Hydraulic Hose, 3/4" x 446" 3,000 PSI SAE	1	2250 Model Return Hose
22	9010224	Hydraulic Hose, 3/4" x 398" 3,000 PSI SAE	1	1850 Model Return Hose
23	9010253	Hydraulic Hose, 1/2" x 446" 3,000 PSI SAE	1	2250 Model Case Drain Hose
24	9009238	Hydraulic Hose, 1/2" x 397" 3,000 PSI SAE	1	1850 Model Case Drain Hose
25	9006048	Male Coupler Tip, 3/4"-16 Male Flat Face	1	
26	See Fan Assembly	Bent Axis Piston Motor 12CC =Black=	1	

Fan Hydraulic Components (1450 & Smaller Models)

Please visit www.unverferth.com/parts/ for the most current parts listing.



Air Command Section Control — Parts

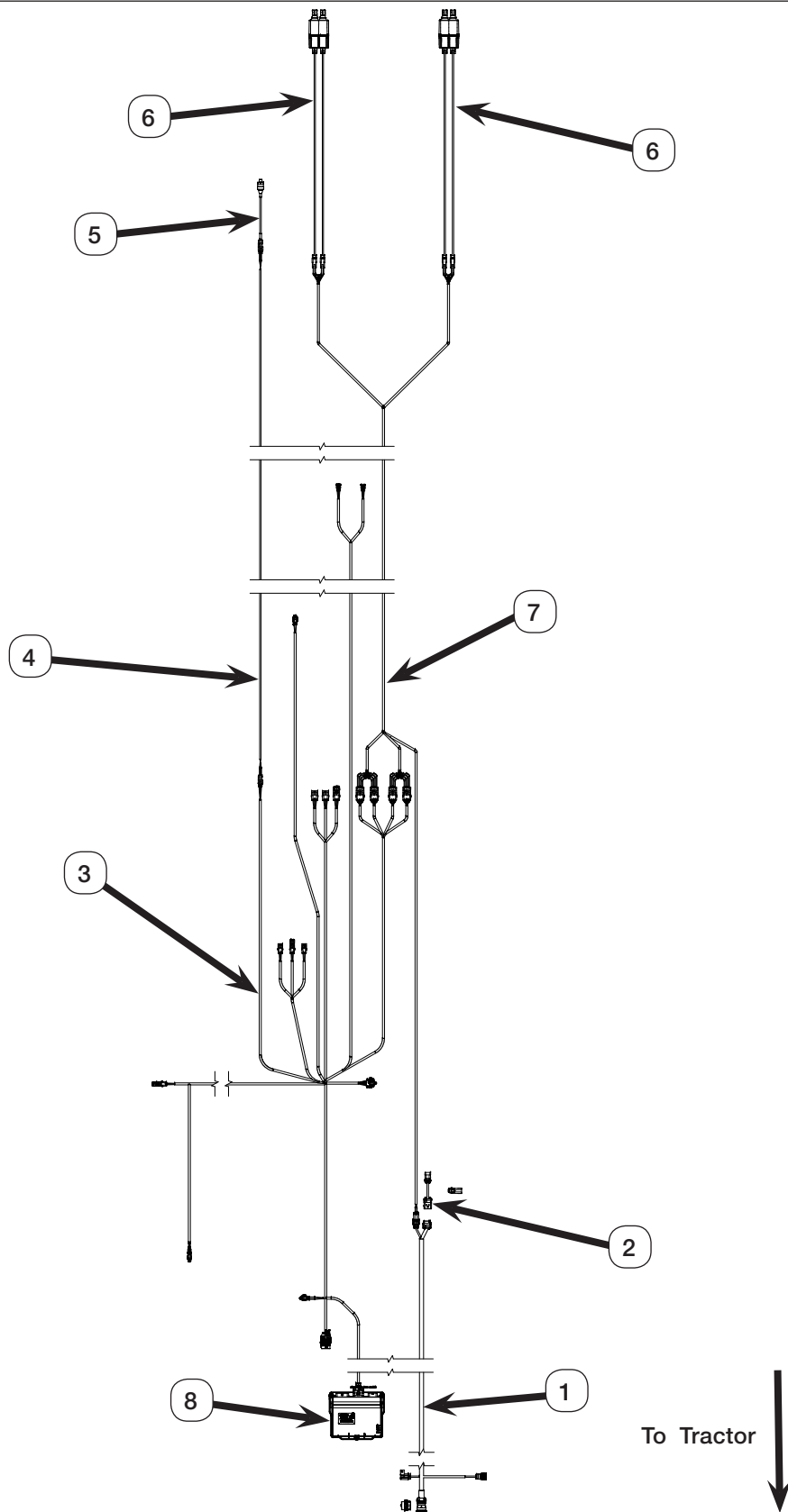
Fan Hydraulic Components (1450 & Smaller Models)

Please visit www.unverferth.com/parts/ for the most current parts listing.

ITEM	PART NUMBER	DESCRIPTION	QTY	NOTES
1	TAWC99416	Hydraulic Hose, 1/2" x 16 1/2" 3,000 PSI SAE	1	
2	9009811	Hydraulic Hose, 3/4" x 192" 3,000 PSI SAE	1	
3	91383	Male Coupler Tip, 3/4"-16 O-Ring Female	1	
4	PF1202-8434	Quick Connect Fitting, 3/4"-16 O-Ring Male	1	
5	98508	Adapter, O-Ring 3/4"-16 Male to O-Ring 3/4"-16 Male	2	
6	9009759	Aluminum Hose Grip, Yellow (+)	1	Fan Pressure
7	9009760	Aluminum Hose Grip, Yellow (-)	1	Fan Return
8	103347	Adapter, 1 1/16"-12 JIC Male to 3/4"-16 O-Ring Male	2	
9	103370	90° Elbow, 1 1/16"-12 JICM to 1 1/6"-12 JICF Swivel	1	
10	98255	Adapter, 1 1/16"-12 JICM to 1 5/16"-12 O-Ring Male	2	
11	PF1222-669	Hydraulic Flow Restrictor Valve	1	
12	PF1222-112	2-Way Block - C16-2	1	
13	902729	Overrunning Check Valve With O-Ring	1	
14	97686	Adapter, 7/8"-14 O-Ring Male to 7/8"-14 JIC Female	1	
15	95478	Tee Fitting, 7/8"-14 JIC Male	2	
16	9010219	Reducer, 7/8"-14 JIC Female to 1 1/16"-12 JIC Male	2	
17	9002443	Adapter, 7/8"-14 JIC Male to 7/8"-14 O-Ring Male	2	
18	95475	Adapter, 3/4"-16 JIC Male to 9/16"-18 O-Ring Male	1	
19	9009807	Hydraulic Hose, 3/4" x 148" 3,000 PSI SAE	1	1450 Model Pressure Hose
20	9010338	Hydraulic Hose, 3/4" x 124" 3,000 PSI SAE	1	1250 & 1050 Model Pressure Hose
21	9010225	Hydraulic Hose, 3/4" x 350" 3,000 PSI SAE	1	1450 Model Return Hose
22	9010337	Hydraulic Hose, 3/4" x 326" 3,000 PSI SAE	1	1250 & 1050 Model Return Hose
23	9007328	Hydraulic Hose, 1/2" x 100" 3,000 PSI SAE	1	1450, 1250, 1050 Model Case Drain Hose
24	95059	Tee, 3/4"16 MJIC x 3/4"-16 F Swivel Nut Run x 3/4"16 MJIC	1	
25	See Fan Assembly	Bent Axis Piston Motor 12CC =Black=	1	

Electrical & Wiring Harness Components

Please visit www.unverferth.com/parts/ for the most current parts listing.



Electrical & Wiring Harness Components

Please visit www.unverferth.com/parts/ for the most current parts listing.

ITEM	PART NUMBER	DESCRIPTION	QTY	NOTES
1	9503387	WIRE HARNESS, 12 FT ADAPTER 9 PIN IBIC	1	Tractor Wire Harness
2	9008096	CABLE - ADAPTER, JD ISO TO TERMINATOR	1	
3	9010226	WIRE HARNESS - PRODUCT FLOW & RATE CONTROL	1	
4	9009772	PRESSURE TRANSDUCER 30' EXT. CABLE - 3 PIN DEUTSCH PLUG & RECEPTACLE	1	
5	9504004	PRESSURE TRANSDUCER	1	
6	9010316	ACTUATOR - 50MM STROKE, 250 N	4	
7	9010325	ADAPTER HARNESS - 4 PIN WPT TO 6 PIN DTR	1	
8	417898	NODE - LEVEL 3 UPDATE RAVEN CONTROL MODULE	1	



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