Sales & Service Training

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NH3 Application Equipment

All Kits are designed off of these calculations

Calculation for required lbs of N/hour

Applicator Width	X	Application Speed	X	Lbs of N/Acre	X	CF(.1212)	=	Lbs of N/ Hour
70 FT	X	5 MPH	X	120	X	.1212	=	5090.0 Lbs N/Hr
40 FT	X	9 MPH	X	220	X	.1212	=	9599.0 Lbs N/Hr

Calculation for required Gallons/Minute

Total Lbs of N per hour	X	Calculation Factor of .004	=	gallons/minute
5090	X	.004	=	20.36 g/min
9599	X	.004	=	38.39 g/min

maXquip

Traditional System Cooler

Continental Superflow Metering System

- Used with an auto rate controller to more accurately adjust rates on the go.
- Does require vapor lines.
- Maximum Capacity with 1-1/4” plumbing:
  - 6000 lbs./hr. @ 50 psi tank pressure
  - 7000 lbs./hr. @ 100 psi tank pressure.
- Maximum Capacity with 1-1/2” plumbing:
  - 8,750 lbs./hr. @ 50 psi tank pressure
  - 11,500 lbs./hr. @ 100 psi tank pressure.
- Comes with 4 orifices to match your typical application rates
- Configured on Raven Platform

Traditional Cooler
Valve for Sectional Control Kits

- Optional Master on/off valve for Superflow and Accuflow Sectional Control Kits
- Shuts down cooler vapor dump tubes when all on/off valves are closed and saves the NH3 from being leaked out of the system.
- Plugs into the master on/off boom control on the flow harness
- Can be retro fitted onto any cooler application.

Standard Cooler Application Kit 1/2 or 3/8 inch Tubing

	Tank Pressure		
	50 PSI	75 PSI	100 PSI
Accuflow Cooler – 1/2” or 3/8” Hose	105 lbs/acre	120 lbs/acre	140 lbs/acre
Continental Cooler – ½” or 3/8” Hose	145 lbs/acre	165 lbs/acre	190 lbs/acre

Based on 60ft applicator traveling 5mph with 1 ¼ Breakaway and Hose

Plumbing should be at least (for cooler only)

- *1” feed up to 3600 lbs/hr*
- *1-1/4” feed up to 6000 lbs/hr*
- *1-1/2” feed over 6000 lbs/hr*

Max Flow Rate (gpm) is typically no more than 2% of tank capacity

Maximum Capacity per Tank Pressures Using Coolers (Lbs N/Hour)			
	50 PSI	75 PSI	100 PSI
3 Way Splitter	3,000	3,500	4,000
4 Way Splitter	4,100	4,800	5,400
5 Way Splitter	5,100	6,000	6,800
6,7,8,9,10 Way Splitter	10,560	12,540	13,860

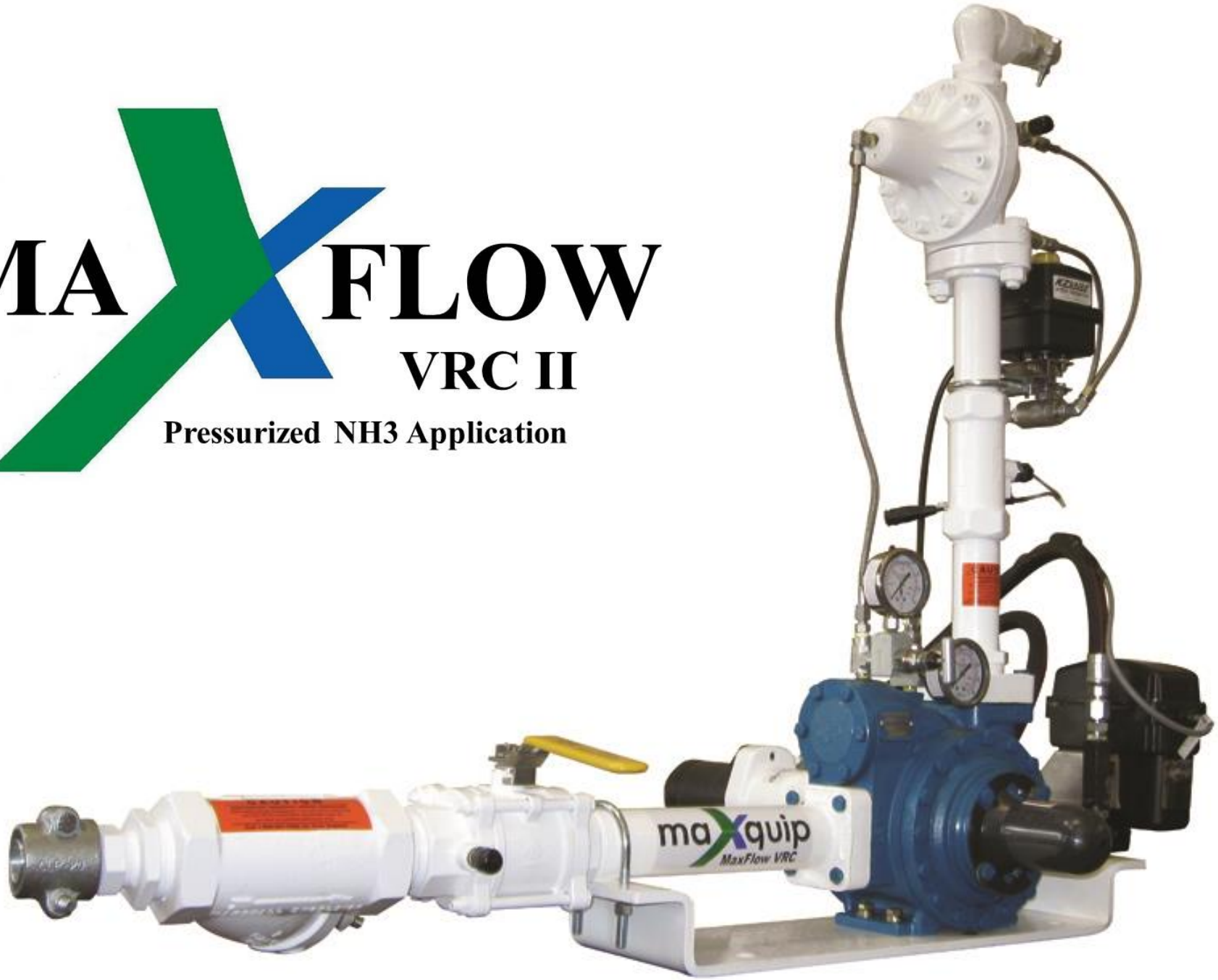
Hybrid Cooler Application Kit 1/4 inch Tubing

	Maximum Capacity at Various Tank Pressures (LBS N / Hour / Opener)		
	50 PSI	75 PSI	100 PSI
Hybrid Cooler Metering & Manifold System w/ O.170 hose	77	88	100
Hybrid Cooler Metering & Manifold System w/ 0.125” hose	60	70	80
Hybrid Cooler Metering & Manifold System w/ 0.125” hose & 0.085 SS Tubes	48	55	62
Hybrid Cooler Metering & Manifold System w/ 0.085” hose	40	46	52

MAXFLOW

VRC II

Pressurized NH3 Application



Maxflow VRC II
System Features & Benefits

- Higher Range of Application Rates
- Significantly Improved Distribution Accuracy Across Whole Applicator
- Eliminates Freezing Openers & Hoses
- Significantly (up to 16 Seconds) Better System Response Time to Rx Mapping which amounts to 112ft in field at 5mph
- Instant Manual Sectional Control just Add GPS to make it Automatic to Reduce Input Costs from 5 to 15% depending on Land Shape.
- Higher Application Rates up to 13,500 lbs/hour.
- Integrates with Auto Rate Controllers (Raven platform)
- Instant On/Off Response at Headlands
- Superior Seed to Fertilizer Safety with pin point accuracy. When Maxquip recommendations are followed.

MAXFLOW VRC II
Pressurized NH3 Application

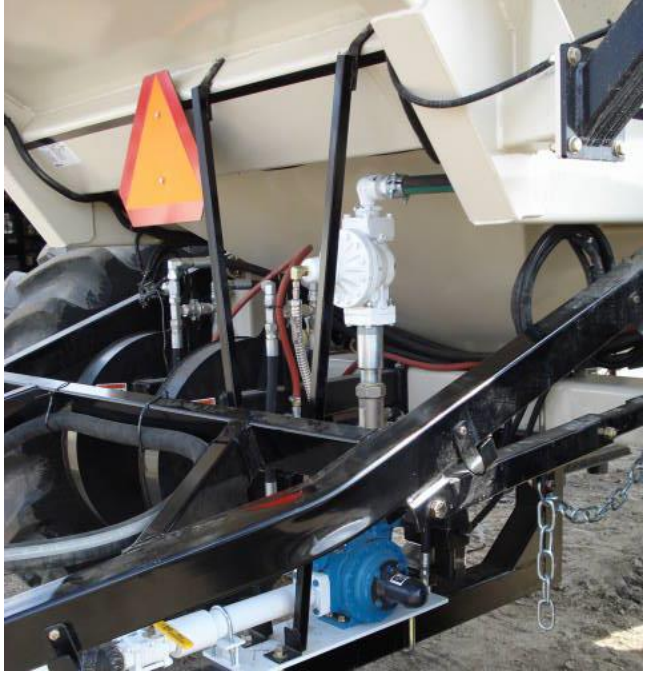
Blackmer Pump Capacities

	Tank Pressure		
	50 PSI	75 PSI	100 PSI
Maxflow VRC II w/ Max 2A pump	210 lbs/acre	240 lbs/acre	275 lbs/acre
Maxflow VRC II w/ Standard pump	280 lbs/acre	320 lbs/acre	370 lbs/acre

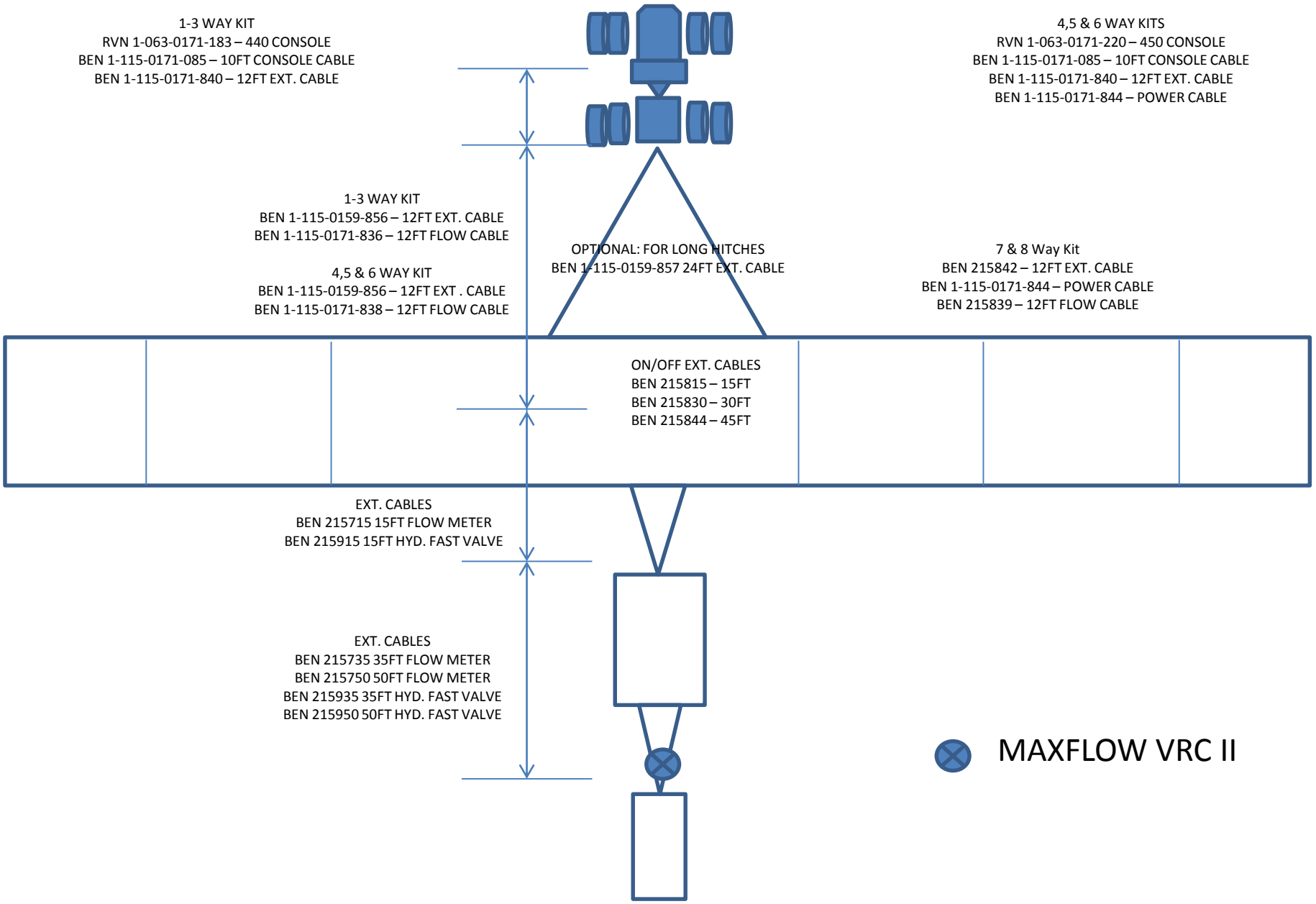
- *Based on a 60' wide implement at 5 MPH*
- *Plumbing should be at least (for VRC's)*
  - *1-1/4" feed up to 3000 lbs/hr*
  - *1-1/2" feed up to 5500 lbs/hr*
  - *2" feed over 5500 lbs/hr*
  - *If feed line is going up and over a gooseneck it is recommended that plumbing be 2" to the top of it.*

Maxflow VRC II
Manifold Capacities

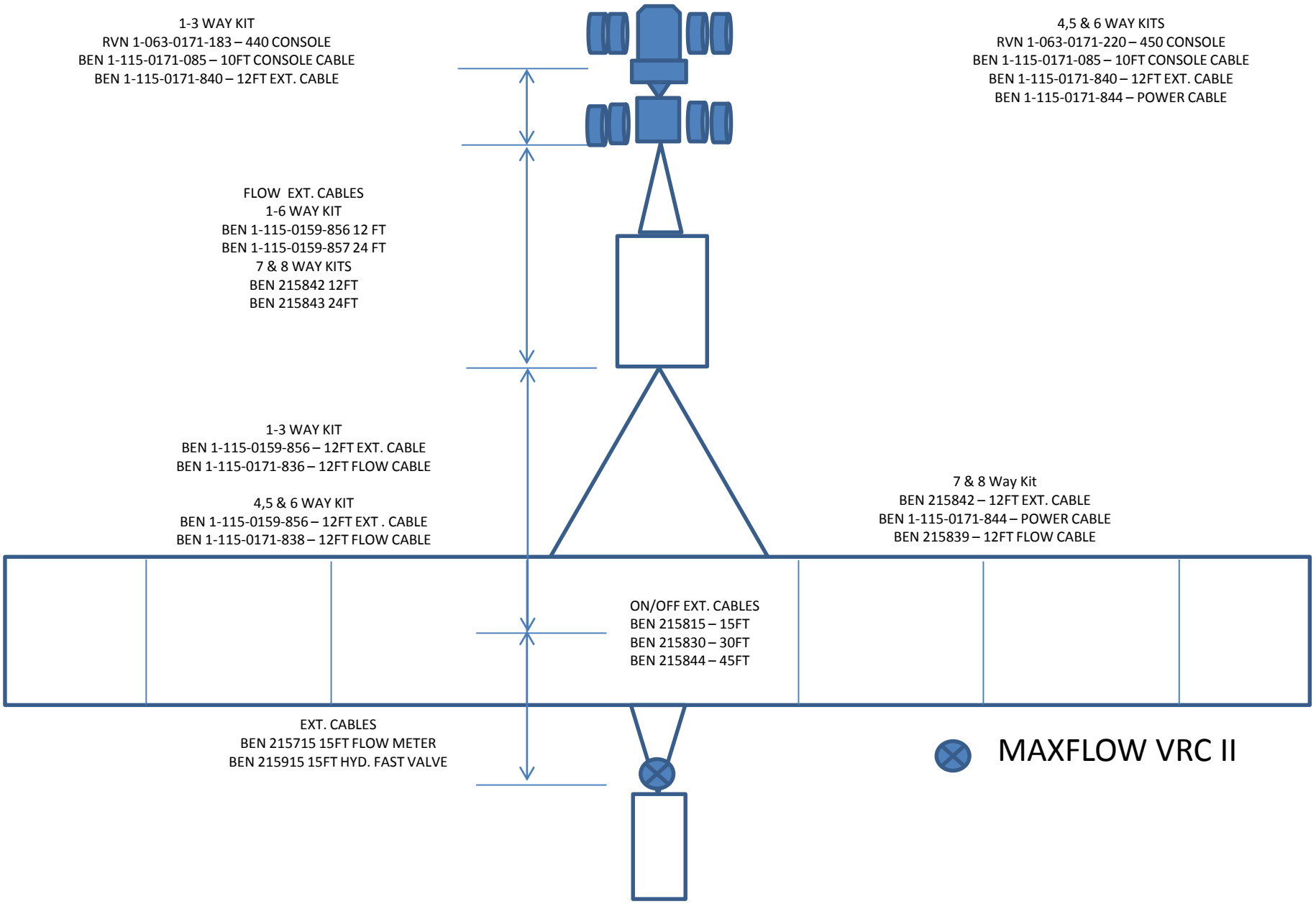
	Range of Application by hose size (LBS N / Hour / Opener)
Manifold w/ 0.085” hose	16 to 95 (Typically Used with Variety of Applicators and openers)
Manifold w/ 0.125” hose	125 to 350 (Typically Used in High Capacity Applicators)
Manifold w/ O.170 hose	180 to 640 (Typically used in the Corn Belt of the US)
Manifold w/ 0.125” hose & 0.085 SS Tubes	30 to 180 (Typically Only used in conjunction with Bourgualt Mid-row Banders)
Manifold w/ 0.125” hose & 0.055 SS Tubes	16 to 105 (Typically Only used in conjunction with Morris Contour II



Pump Installations



Tow Behind Cart VRC Cabling Diagram



Tow Between Cart VRC Cabling Diagram

STRAIGHT POLY HOSE

ON/OFF HOSES FROM SPLITTER – STANDARD FOLD DRILLS

- TAKE THE FULL FOOTAGE OF THE MACHINE AND DIVIDE IT BY TWO
- TAKE THIS NUMBER AND TIMES IT BY THE NUMBER OF MANIFOLDS ON THE MACHINE

ON/OFF HOSES FROM SPLITTER – WING BACK DRILLS

- TAKE THE FULL FOOTAGE OF THE MACHINE AND DIVIDE BY TWO ADD 6 FT
- TAKE THIS NUMBER AND TIMES IT BY THE NUMBER OF MANIFOLDS ON THE MACHINE

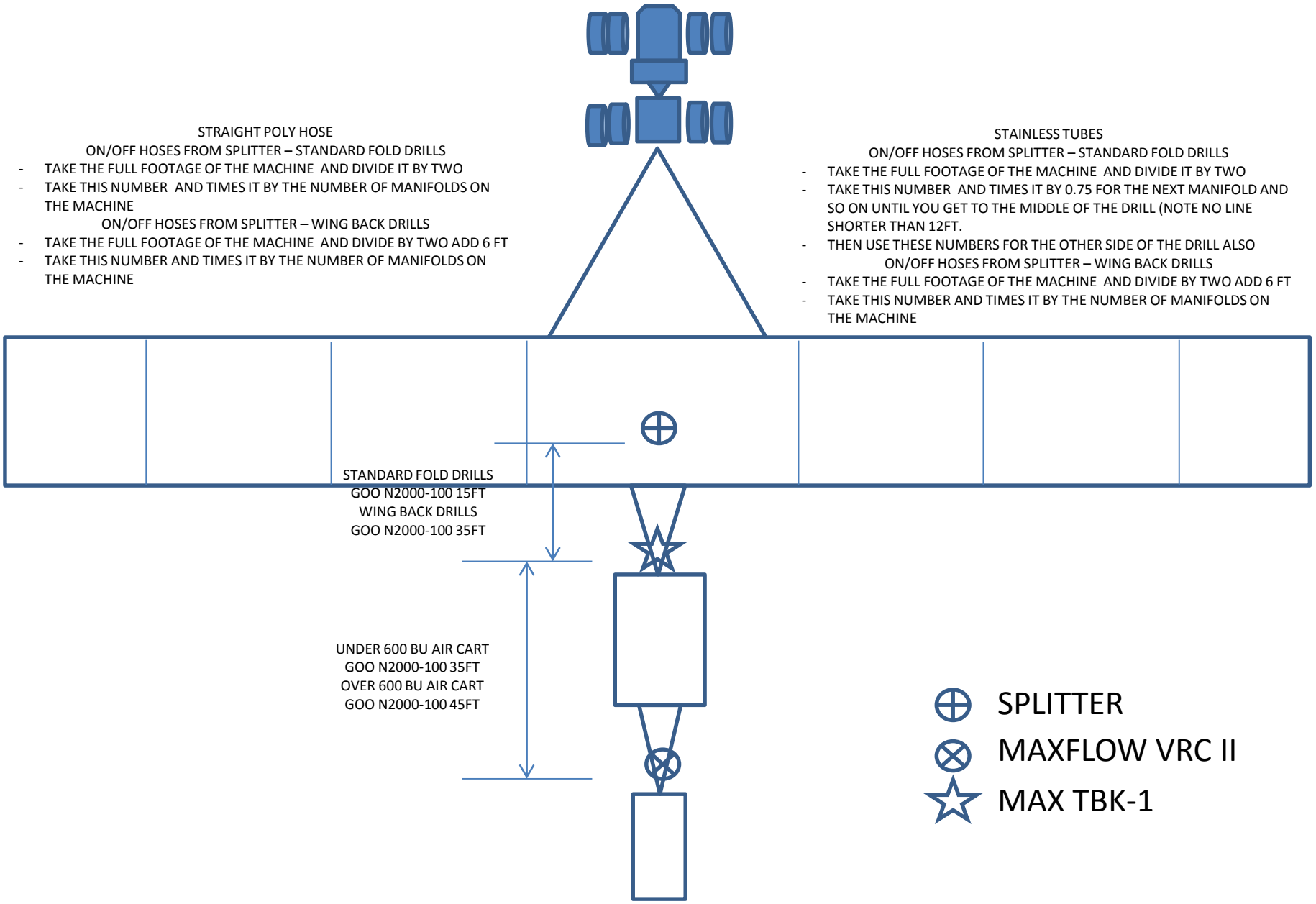
STAINLESS TUBES

ON/OFF HOSES FROM SPLITTER – STANDARD FOLD DRILLS

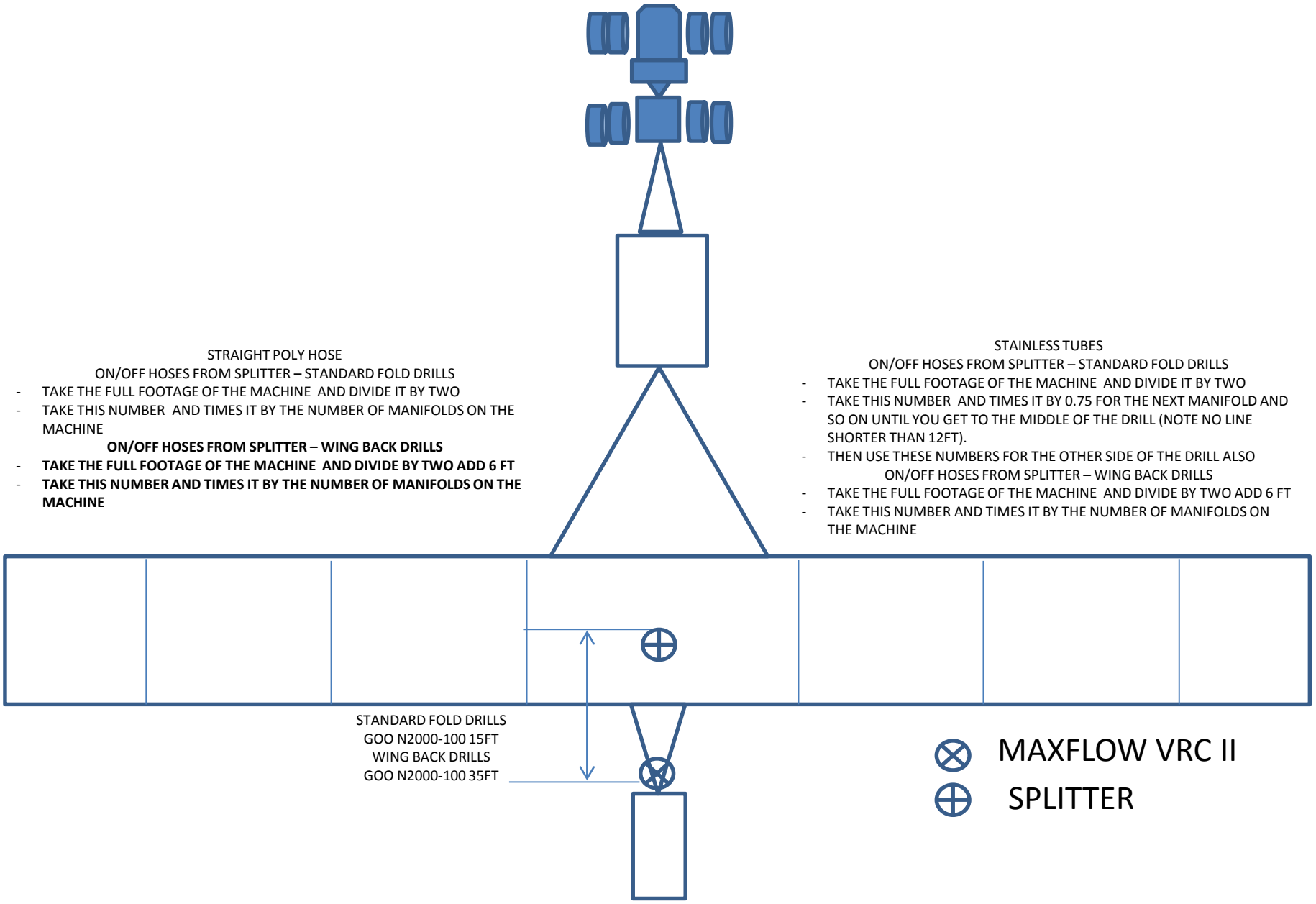
- TAKE THE FULL FOOTAGE OF THE MACHINE AND DIVIDE IT BY TWO
- TAKE THIS NUMBER AND TIMES IT BY 0.75 FOR THE NEXT MANIFOLD AND SO ON UNTIL YOU GET TO THE MIDDLE OF THE DRILL (NOTE NO LINE SHORTER THAN 12FT.
- THEN USE THESE NUMBERS FOR THE OTHER SIDE OF THE DRILL ALSO

ON/OFF HOSES FROM SPLITTER – WING BACK DRILLS

- TAKE THE FULL FOOTAGE OF THE MACHINE AND DIVIDE BY TWO ADD 6 FT
- TAKE THIS NUMBER AND TIMES IT BY THE NUMBER OF MANIFOLDS ON THE MACHINE



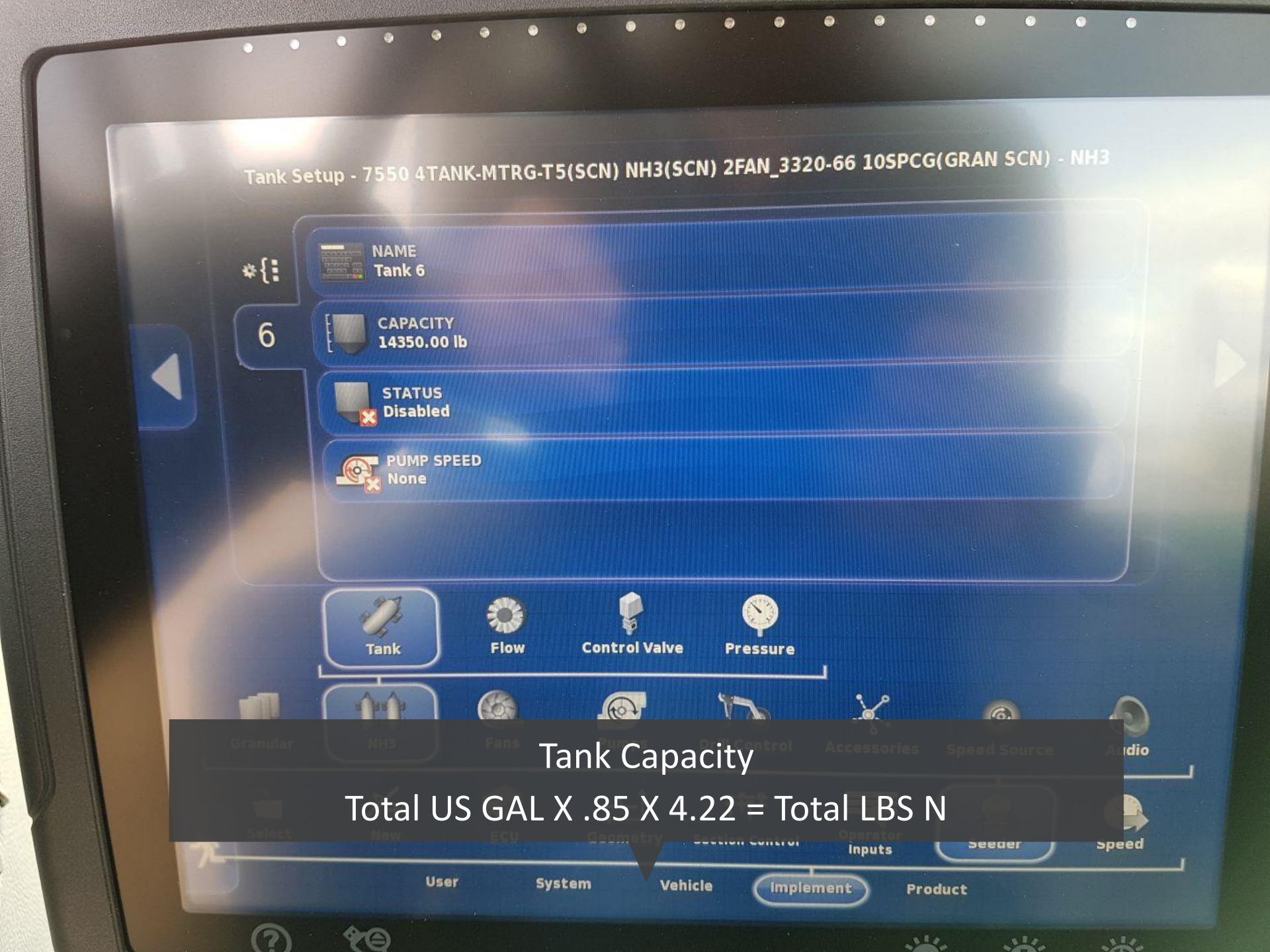
Tow Behind Cart VRC Hose Cart



Tow Between Cart VRC Hose Cart

Topcon Apollo Settings

Flow Meter Setting – Pulses per 1 LB

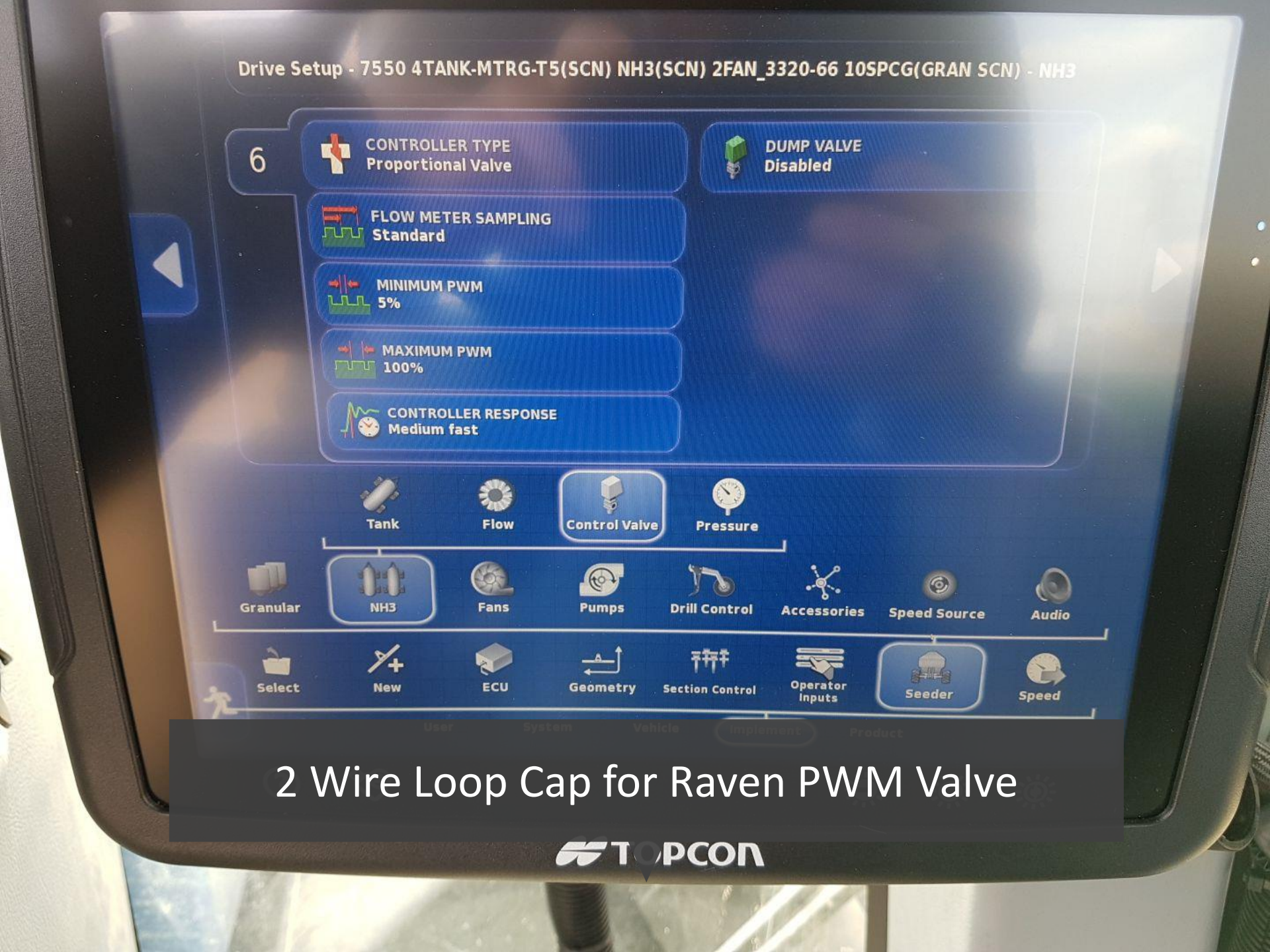


Tank Capacity

Total US GAL X .85 X 4.22 = Total LBS N

2 Wire Loop Cap for Raven Standard Valve

Silicon Cap for Raven Fast Valve



2 Wire Loop Cap for Raven PWM Valve

Raven 440/450/4400

Initial Start up (CAL mode)

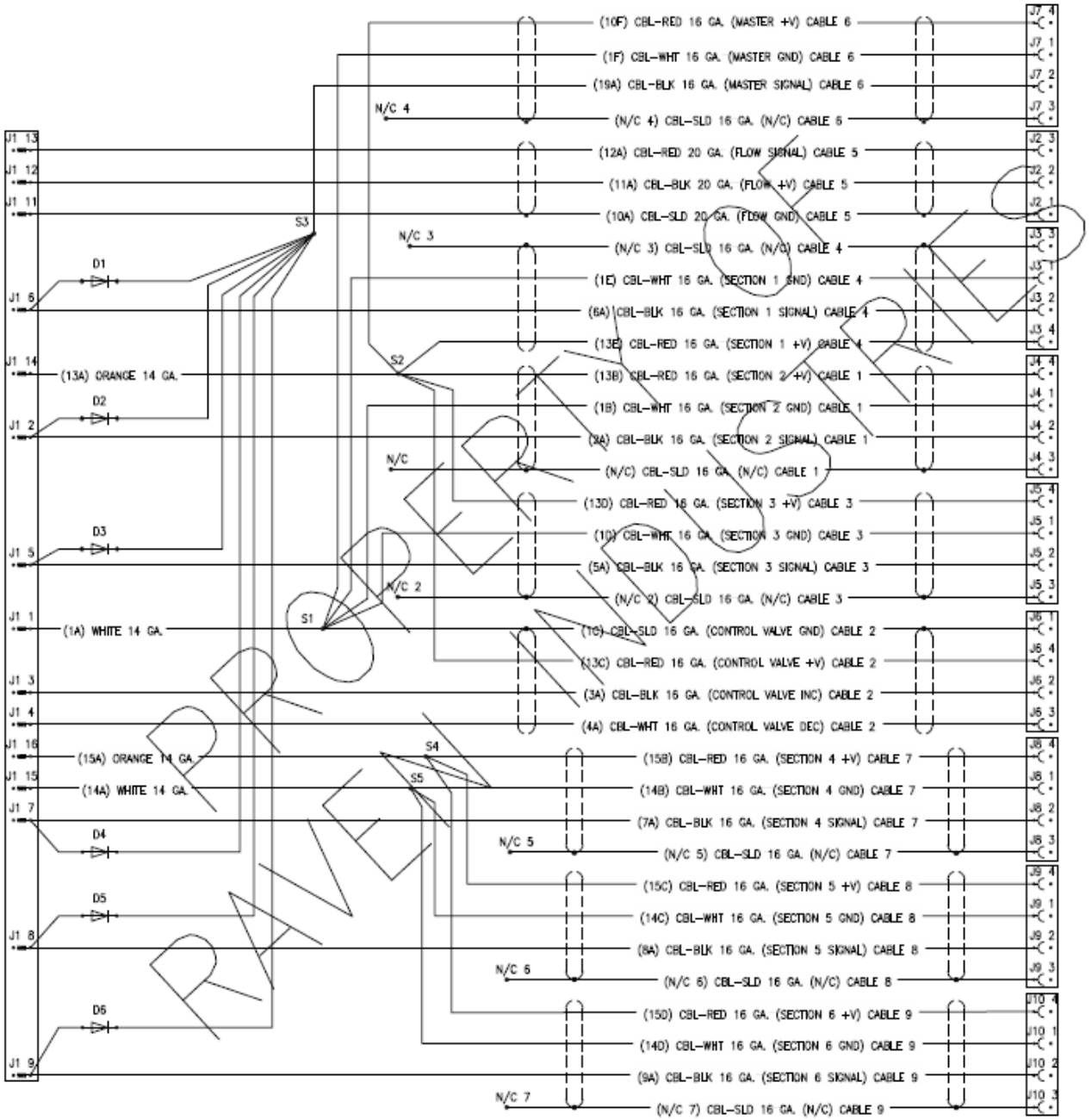
- Units – US Gallons
- Radar – SP2(GPS or Radar)
- Control Valve – C-SD(Standard Valve)
  - C-FC(Fast Close Valve)
  - C-PC(PWM Valve)

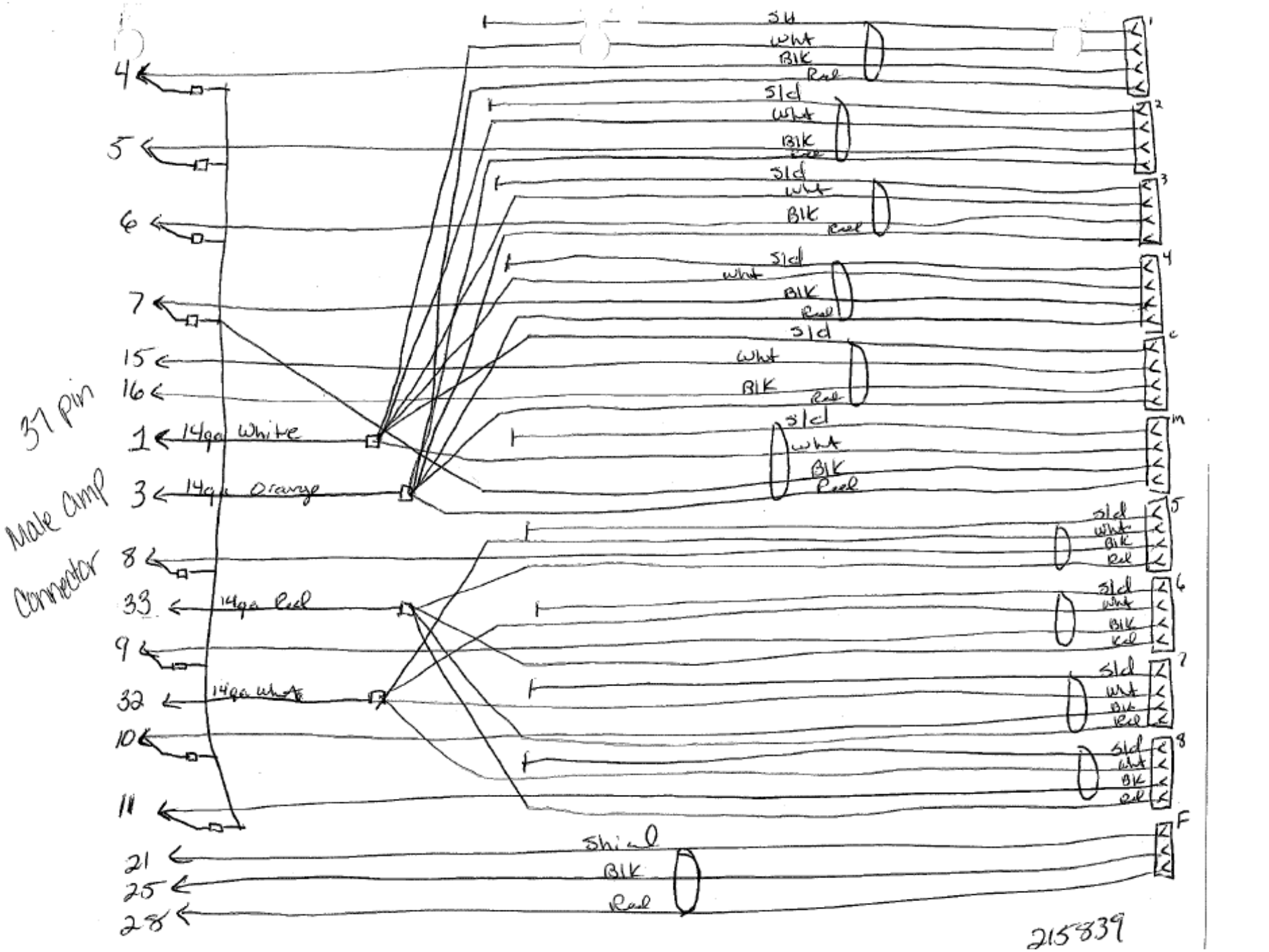
* Use the CE button to change setting and the ENTER button to accept
* For below settings press ENTER put number in then press ENTER again

- NON-Sectional Booms – Use boom 1 enter in footage as inches eg. 40ft enter in 480
  - Zero out remaining booms ENTER 0 ENTER, on initial start up you have to do this
  - For sectional, enter the footage into each boom and zero out the rest
- Speed Cal – Enter in 585 drive the tractor forward to see if the speed matches
  - if it doesn't calculate it out eg. Actual/X * 585/Monitor Speed = New Speed Cal
- Meter Cal – Enter in the Pulses/10 Lbs found on the Flowmeter Tag
- Valve Cal – Enter in 2123 for Standard, 743 for Fast and 43 for PWM Valve
- Rate 1 – Enter in amount of Actual N/Acre
- Rate 2 – Enter in second rate of Actual N/Acre
  * Initially you need to set this up to have the monitor come out of CAL mode
- Volume Tank – Enter in actual Lbs if you want to know what is left in tank
  - Enter in 0 if you do not want the monitor to track tank volume
- To change Units, Radar, and Control Valve after initial start up hold the Self-Test button down. it will flip through the three options for about 30 seconds when it stops you can now change these setting

Troubleshooting Raven

WIRING DIAGRAM




37 pin
Male amp
Connector
4
5
6
7
15
16
1
3
8
33
9
32
10
11
21
25
28
14ga White
14ga Orange
14ga Red
14ga White
Shield
Blk
Red
Wht
Sld
1
2
3
4
C
M
5
6
7
8
F
215839

NH3 FLOWMETERS TROUBLESHOOTING

Symptom	Correction
Inaccurate Rates	- Check flow meter tag and make sure the number is programmed properly (Raven 710-730, 168-172, 14XX, 33X) (Maxquip 3XXX, 8XXX, 7XX, 19-2XXX) - Clean the strainer before the flow meter - Verify that the speed input is correct. Do a distance calibration. - Check cables to make sure there are no breaks or bare wires. - Check voltages on the flow cables (see following page on procedures). - If cables check out replace flow meter sensor part# 1-063-0171-669 or BEN 215701 or SMK 4.5015U - If issue is not corrected replace flow meter Part# MXQ FLOWMETER - If issue is not corrected go to troubleshooting control valve
Rate reads “0000” 440,450 Monitors	- Verify that you have a speed input in the monitor - Check voltages on the flow cables (see following page)
Rate does not change in either manual or automatic mode	- Refer to Control valve trouble shooting.
Total Volume does not register	- Test the flow meter cables for wiring issues (see following page)
Total Volume registers flow inaccurately	- Verify product flow corresponds to the direction of the arrow on the flow meter.

Procedure to Test Flow Meter Cables

PIN DESIGNATIONS

2 o'clock socket location is ground.
10 o'clock socket location is power.
6 o'clock socket location is signal.

VOLTAGE READINGS

1) 2 o'clock socket to 6 o'clock socket = +5 VDC.
2) 2 o'clock socket to 10 o'clock socket = +5 VDC.
If a +5 VDC voltage reading is not present, disconnect
The Speed Sensor cable. If the Flow reading is
Restored, Test the Speed Sensor cable per Appendix

PROCEDURE TO CHECK CABLE:

1) Enter a METER CAL number of one (1) in key labelled
2) Depress key labelled
3) Place BOOM switches to ON.
4) With small jumper wire (or paper clip), short between the 2 o'clock and 6 o'clock Sockets with a "short-no short" motion. Each time a contact is made, the TOTAL VOLUME should increase by increments of 1 or more counts.
5) If TOTAL VOLUME does not increase, remove the section of cable and repeat test at connector next closest to Console. Replace defective cable as required.
6) Perform above voltage checks.
7) If all cables test good, replace Flow Sensor.
NOTE: After testing is complete, re-enter correct METER CAL numbers before application.

Flowmeter check

Keyway in 12 oclock position

Test between
2 to 10 oclock 5 volts
2 to 6 oclock 5 volts.

If nothing there go to 16 pin coming out of rate control box.

On 16 pin harness
11 to 12 5 volts
11 to 13 5 volts

On 37 pin cable cable that runs from rate controller to adapter cable.
21 to 25 5 volts
21 to 28 5 volts.

4:00 PM

CONTROL VALVE TROUBLESHOOTING

Symptom	Correction
Control valve to slow or too fast	- Verify the setting in the monitor should be 743 for Raven Controllers. - Increase or decrease the first digit between 1-9. 1 being the fastest and 9 being the slowest.
Control valve always over shooting or under shooting intended rate	- Verify the setting in the monitor should be 743 for Raven Controllers - Increase or Decrease the second digit between 1-9. 1 being fastest and 9 being the slowest. Explanation of the 2nd digit on the valve calibration % away from target before the valve slows down 1=10%, 2=20% 3=30% and so on.
Control Valve not responding to rate changes	- Verify the setting in the monitor should be 743 for Raven Controllers. - Increase or Decrease the third digit between 1-9. 1 being the fastest and 9 being the slowest. Explanation of the 3rd digit on the valve calibration. % of deviation allowed before the valve responds 1=1% 2=2% 3=3% and so on
Rate does not change in either manual or automatic mode	- Check cables for breaks or bare wires - Verify voltage on the Flow Cables and Extensions Flow Cable 10 o'clock position – Constant 12 Volts 2 o'clock position – Ground 4 o'clock position – 12 Volt Increase 6 o'clock position – 12 Volt Decrease Flow Cable Extensions Pin 1 – Ground Pin 14 – Constant 12 Volts Pin 3 – 12 Volt Increase Pin 4 – 12 Volt Decrease - If cables are good replace Motor drive on Fast Valve. Part # 1-063-0172-982 (Motor Only) - Maxflow VRC Only – Verify that the customer does not have the following cables on the machine – BEN 215515 or BEN 215535. These cables are adapter cables going from 4 pin connector to a 2 pin connector. If they do sell them the replacement cable – BEN 215915 or BEN 215935.

Fast Valve Troubleshooting

Keyway 12 o'clock

2 o'clock ground
10 o'clock constant 12 volts
4 o'clock increase
8 o'clock decrease

2 to 10 - 12 volts
2 to 8 master off - 12 volts
2 to 4 master on - 12 volts

On 16 Pin Harness

Pin 1 ground
Pin 14 contant 12 volts
Pin 3 decrease
Pin 4 increase

1 to 3 - 12 volts master off
1 to 4 - 12 volts master on

On 37 Pin Harness

Pin 32 ground
Pin 33 constant 12 volts
Pin 15 decrease
Pin 16 increase

32 to 15 - 12 volts master off
32 to 16 - 12 volts master on

On/off valve troubleshooting

Key way 12 oclock position

10 oclock ground
2 oclock constant 12 volts
8 oclock signal

Check power between 10 and 2 - 12 volts
Check power boom on 10 and 8 - 12 volts
Check power boom off 10 and 8 - 0 volts

On 16 pin harness signal wires ground to pin 1

Boom 1 - pin 6
Boom 2 - pin 2
Boom 3 - pin 5
Boom 4 - pin 7
Boom 5 - pin 8
Boom 6 - pin 9

Last modified: 12:29 AM


maXquip
MaxFlow VRC

Questions??