Degelman

REFERENCE DOCUMENT & PARTS MANUAL

ONEPASS

rotary cutter

142649 v0.0

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ONEPASS
CHEMICAL APPLICATOR FOR ROTARY CUTTER

Degelman

ONEPASS

** Reference Sheet Quick-Start Guide*

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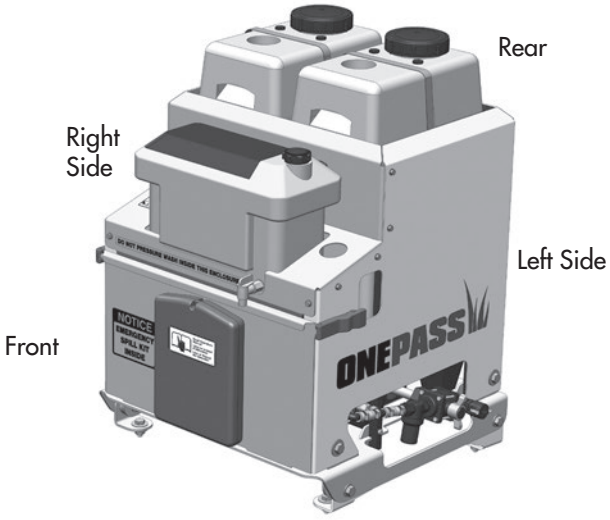
IMPORTANT:

READ MANUAL

Introduction

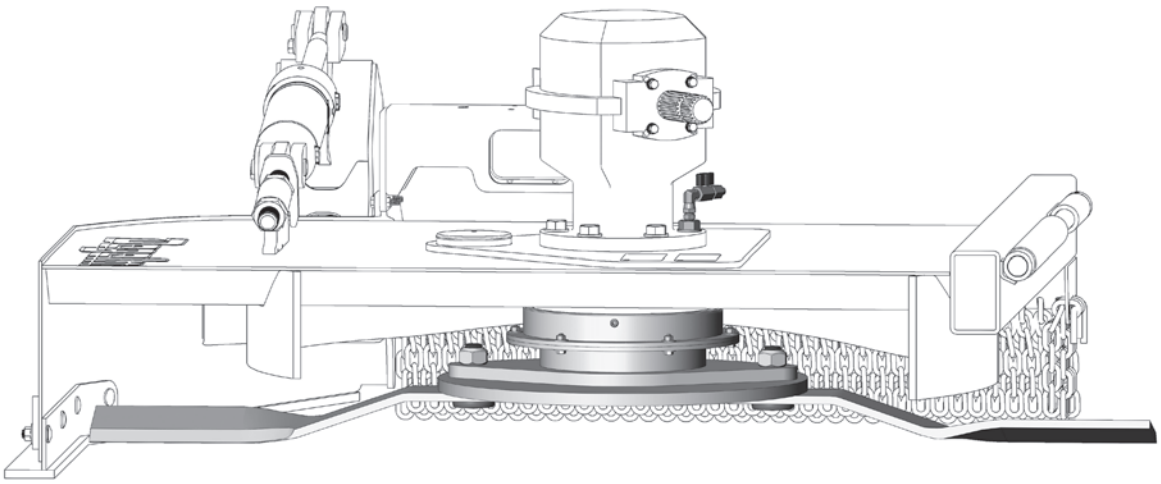


CONGRATULATIONS on your choice of a Degelman OnePass chemical applicator to complement your rotary cutter operation. It has been designed and manufactured to meet the needs of a discerning market for the efficient management of roadside vegetation. Use this manual as your first source of information about this machine. If you follow the instructions given in this manual, your machine will work well for many years.

Safe, efficient and trouble free operation of your Degelman OnePass System requires that you and anyone else who will be operating or maintaining the applicator, read and understand the Safety, Operation, Maintenance and Troubleshooting information contained within this Manual.

Keep this manual handy for frequent reference and to pass on to new operators or owners. Call your Degelman Dealer if you need assistance, information or additional copies of the manual.

OPERATOR ORIENTATION - The directions left, right, front and rear, as mentioned throughout the manual, are as seen from the tractor drivers' seat and facing in the direction of travel.



*Why is **SAFETY** important to **YOU**?*

3 BIG Reasons:

- **Accidents Can Disable and Kill**
- **Accidents Are Costly**
- **Accidents Can Be Avoided**

The **Safety Alert Symbol** means:

ATTENTION!
BECOME ALERT!
YOUR SAFETY IS INVOLVED!

SAFETY ALERT SYMBOL

The **Safety Alert Symbol** identifies important safety messages applied to the OnePass and in this manual. When you see this symbol, be alert to the possibility of **injury or death**. Follow the instructions provided on the safety messages.

SIGNAL WORDS

Pay close attention to the use of product "Signal Words" such as: **DANGER**, **WARNING**, **CAUTION,** and **DANGER-POISON** along with their specific safety messages. These Signal Words typically indicate four levels of toxicity. Keep in mind that some people may be more sensitive than others to specific chemicals.

NOTE: The following Signal Words provide only a general description. Pay close attention to the specific directions and warnings when handling and using your particular product(s):

CAUTION: Indicates the product is slightly toxic or relatively non-toxic. It has only slight potential to cause acute illness if swallowed, inhaled or exposed to the skin. The skin or eye irritation it would cause would be less than those with other signal words.

WARNING: Indicates the product is moderately likely to cause acute illness if swallowed, inhaled or exposed to the skin. It is also likely to cause moderate eye irritation.

DANGER: Indicates the product is highly toxic. These products should not be swallowed, inhaled or exposed to skin. It may indicate that it will cause serious eye irritation. Some products have a time period following an application when children and pets are not allowed on the yard. If allowed onto the yard before the safety period ends and comes in contact with the pesticide, it could result in exposure. Carefully follow safety guidelines.

DANGER/SKULL & CROSSBONES SYMBOL/POISON: Indicates that this product is highly toxic and should be handled carefully. It indicates it will cause severe internal damage or death if swallowed, inhaled or absorbed through the skin or eyes. Carefully follow safety guidelines.

SAFETY

YOU are responsible for the safe operation and maintenance of your Degelman OnePass. **YOU** must ensure that you and anyone else who is going to operate, maintain or work around the OnePass be familiar with the operating and maintenance procedures and related **SAFETY** information contained in this manual and with products used.

Remember, **YOU** are the key to safety. Good safety practices not only protect you but also the people around you. Make these practices a working part of your safety program. Be certain that **EVERYONE** operating this equipment is familiar with the recommended operating and maintenance procedures and follows all the safety precautions. Most accidents can be prevented. Do not risk injury or death by ignoring good safety practices.

- OnePass owners must give operating instructions to operators or employees before allowing them to operate the OnePass, and at least annually thereafter.
- The most important safety device on this equipment is a SAFE operator. It is the operator's responsibility to read and understand ALL Safety and Operating instructions in the manual and to follow these. All accidents can be avoided.
- A person who has not read and understood all operating and safety instructions is not qualified to operate the machine. An untrained operator exposes himself and bystanders to possible serious injury or death.
- Do not modify the equipment in any way. Unauthorized modification may impair the function and/or safety and could affect the life of the equipment.
- Think SAFETY! Work SAFELY!

GENERAL SAFETY

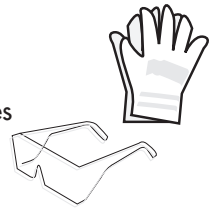
1. Read and understand the Operator's Manual and all safety signs before operating, maintaining or adjusting the OnePass.

2. Install and properly secure all shields and guards before operating.
3. Have a first-aid kit available for use should the need arise and know how to use it.

4. Have a fire extinguisher available for use should the need arise and know how to use it.

5. Wear appropriate protective gear. This list includes but is not limited to:
   - Long sleeve shirt
   - Long pants that reach the shoes
   - Protective shoes, preferably chemical resistant

   Also consider:
   - Chemical resistant gloves
   - Protective glasses or goggles
   - A hat
   - Face Shield
   - Chemical proof apron when mixing chemicals



   Note: The most important thing to remember about Personal Protective Equipment (PPE) clothing, gloves and shoes is that these protection materials only work if the chemicals remain on the outside of the material. If you allow it to get on the inside due to a spill, splashing or careless work, your protective clothing actually works against you. When this happens, it can hold the chemical against the skin. Change any clothing that is no longer doing what it is intended to do. Always choose the best materials and work carefully.

   Note: Familiarize yourself with the location and use of ChemWash and ChemSpill kits.
6. Clear the area of people, especially small children, and remove foreign objects from the machine before starting and operating.
7. Stop tractor engine, set park brake, remove ignition key and wait for all moving parts to stop before servicing, adjusting, repairing or unplugging.
8. Review safety related items with all operators annually.

USE HERBICIDES SAFELY

Learning to use herbicides safely is extremely important. A careless approach will only lead to needless exposure to yourself or others. It can also lead to non-target damage to desirable plants.

This section will help you to better understand some basic principles of chemical safety.

- **Always read the herbicide label completely before opening the container.** To view the entire label on some products, you must peel back the tape as many are folded accordion style and taped closed.
- Make sure you have all the proper personal protection equipment (PPE) that is listed on the label before opening the container.
- Any household items used for herbicide or pesticide use, such as measuring cups, stir sticks, etc. should not be reused in the house. They should be thrown out or used only for herbicide control use.
- Some herbicide solutions are concentrated and must be diluted with another liquid (usually water) for use. Do not add more herbicide than the maximum rate allowed on the label. Adding more than what is allowed will not give better control and, in most cases, it is illegal.
- Estimate the area to be treated and try to mix only the amount you need. Do not dump any excess, but use the solution on the target pests (weeds, grass, etc). If you need to clean the chemical applicator afterwards, a mixture of ammonia and water will break down most chemical residues left in the unit. Never assume an applicator is perfectly clean.
- The best shoes to wear when applicating will be made of chemical resistant rubber or plastic materials. Don't wear tennis shoes or other shoes made from absorbent materials when applying herbicides. After application, remove your shoes before entering the house, so herbicide residue is not tracked inside.
- Pay close attention to label instructions regarding re-entry times. The use of certain products may require that people or pets stay out of the treated area for a specific amount of time.
- Store all herbicides and pesticides, application equipment, and mixing containers away from the reach of children or pets. These chemicals must be kept in the original container with the label intact.
- Be aware that not all organic herbicides are "safe". Read labels carefully. If you are unsure, research the product or use a product you are familiar with.

HERBICIDE EXPOSURE & CONTACT POINTS

In the pesticide industry, the definition of "exposure" means getting a pesticide or herbicide on the skin or in the body.

How serious the hazard is depends on two things:

1. The length of exposure (how long the chemical is left on the body)
2. The toxicity of the chemical.

An examination of the Signal Words show that there are various degrees of toxicity.

The Four "Exposure" Contact Points

1. **Dermal exposure** (Getting chemicals on the skin)

   • In chemical exposure, typically 95% of exposure will occur on the skin. Some areas of the body are more absorptive than others. The most absorptive skin on the body is around the genital area. If you have to take a restroom break while applying chemical or when mixing, be sure to wash your hands thoroughly with soap and water first.

   Other areas of the body that are highly absorptive is the scalp, forehead and ears. Be aware of any cuts or abrasions on the skin that could come in contact with any chemical.

2. **Inhalation Exposure**
   (Breathing in chemical vapor or dust)

   • Inhalation exposure is most likely to occur in poorly ventilated areas or from breathing in overspray. If inside, open windows to create air circulation. Do not turn on the central air or fumes could be transported to other rooms. If outside, be aware of wind conditions. The wind can catch the chemical and blow it into your face.

3. **Ocular Exposure**
   (Chemicals entering through the eye)

   • The eyes will easily absorb certain chemicals and should be protected. Ocular exposure is most likely to occur from a splash during mixing or from spray being blown into the face. Wear goggles or a face shield to prevent this from happening.

4. **Oral Exposure** (By swallowing)

   • Oral exposure most often occurs when residue is passed from the hands to food being consumed. It can also occur while taking a smoke break. Be sure to wash your hands with soap and water before handling a cigarette or eating.

Overview

TO THE NEW OPERATOR OR OWNER

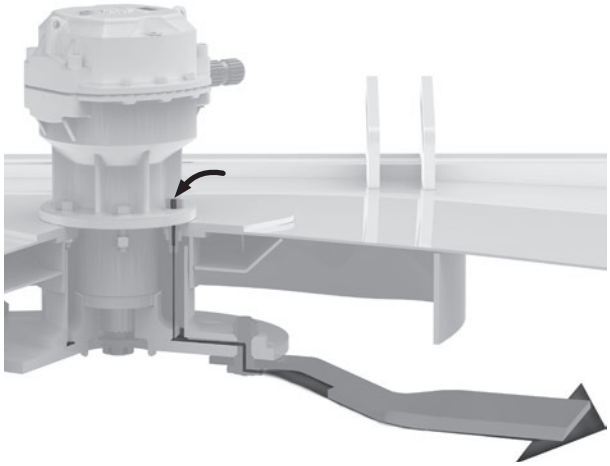
The Degelman OnePass chemical applicator for rotary cutters is designed to efficiently apply herbicide while mowing. Many of the features incorporated into this machine are the result of suggestions made by customers like you.

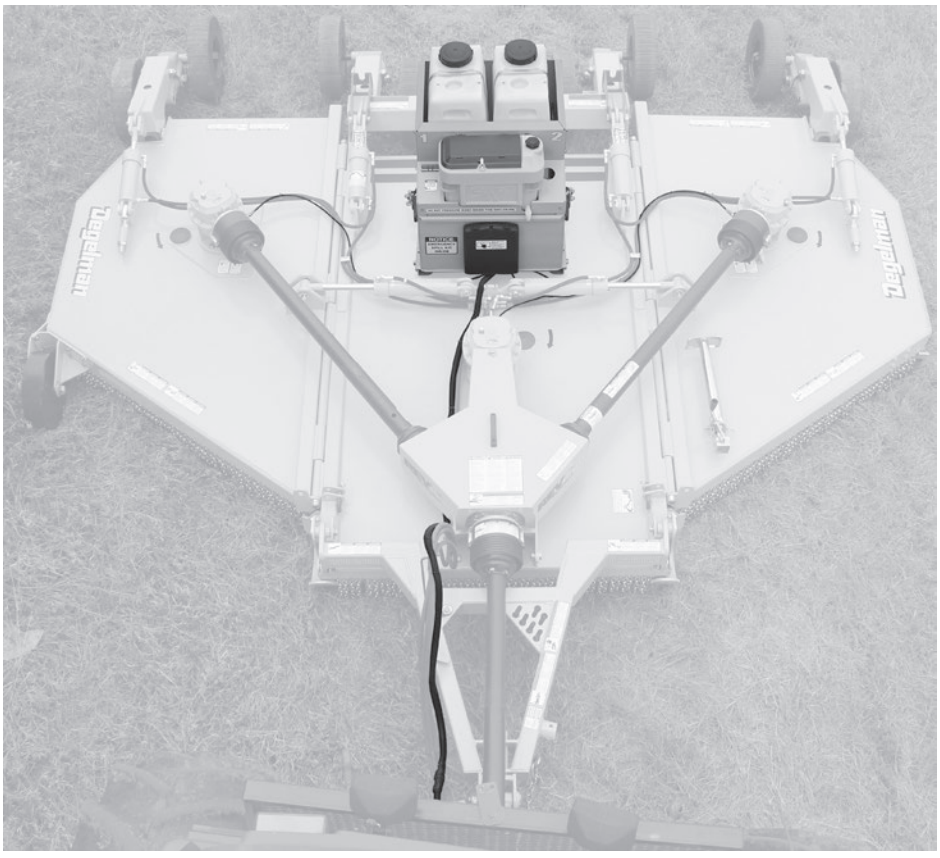
It is the owner's or operator's responsibility to read this manual carefully to learn how to operate the machine safely and how to set it to provide maximum efficiency. Safety is everyone's business. By following safe operating practices, a safe environment is provided for the operator and bystanders.

Following the operating instructions in conjunction with a good maintenance program will help provide your machine with many years of trouble-free service.

PRINCIPLES OF OPERATION

The OnePass system reduces operating costs by mowing and applying herbicide simultaneously. A unique delivery system allows you to apply herbicide in sensitive areas without running the risk of airborne drift or contamination. Instead, herbicide is delivered from a hermetically sealed fluid reservoir, via centrifugal force, through the blade bolt to the underside of the blade. It provides a more efficient use of time and resources since grass is cut and weeds are killed at the source in OnePass.





Preparation

ONEPASS SYSTEM SETTINGS

Boom Cal: ***3 booms*** (15 ft cutter)
60 in each (turn on first 3 switches)

2 booms (10 ft cutter)
60 in each (turn on first 2 switches)

Speed Cal: GPS 785 / Radar 598

Meter Cal: 110

Valve Cal: 2123

Rate Cal: *(User preference)*

128 oz/ac (1 gal/ac)

192 oz/ac (1.5 gal/ac) – *most common*

256 oz/ac (2 gal/ac)

384 oz/ac (2.5 gal/ac)

512 oz/ac (3 gal/ac)

Volume Tank: 1 tank 3200 oz (100 liters filled to cap)
2 tanks 6400 oz (200 liters filled to cap)

Self Test: Enter desired speed in self test mode (MPH)
Example: 2.0 to 10.0 MPH

GPS Baud Rate: 19200

TYPICAL APPLICATION RATES

The application rate to be input into the Raven console is in ounces per acre (oz/acre).

• **For tall, dense vegetation**: Best results are achieved by mixing herbicides to apply at rates of 2 gal/acre (256 oz/acre) or more, but the tank volume will get used up faster.

• **For short, sparse vegetation**: Chemical can be mixed & applied at rates as low as 1 gal/acre (128 oz/acre) or more, but with reduced flow there is a chance that equal delivery to each cutting section is reduced.

Set Console to desired rate in ounces per acre (oz/acre) from the chart below:

TANK VOLUME

100L = 3380 oz = 26.4 gal
(Tank filled right to the bottom of the fill spout)

75L = 2535 oz = 19.8 gal
(Filled to the top of the level indicator decal)

50L = 1690 oz = 13.2 gal
(Half tank approximately)

25L = 845 oz = 6.6 gal
(Quarter tank approximately)

5L = 170 oz = 1.3 gal
(Tank filled to the bottom of the level indicator decal)

NOTE: For Console settings, assume full tank volume is ***3200 oz***. *(actual volume can vary due to how the tank bulges or caves inward).*

CALCULATING ACRES PER HOUR

To estimate **acres per hour :**

For a 15 foot Rotary Cutter:
Multiply **Speed** (mph) X **1.82**
- ***Example***: **3** mph x **1.82** = 5.46 acres/hr

For a 10 foot Rotary Cutter:
Multiply speed (mph) X **1.21**
- ***Example***: **3** mph x **1.21** = 3.63 acres/hr

CALCULATING TOTAL APPLICATION TIME

To estimate **total application time,** look at application rate chart & select the corresponding "Acres Treated" & divide by the estimated acres per hour from previous calculation.

Example:

5.46 acres/hr *(from first example above)*

33.2 acres *(Both tanks at 1.5 gal/acre, from **Typical Application Rate Chart** below)*

33.2 acres ÷ **5.46** acres/hr = 6.08 hrs.

Typical Application Rate Chart

Rate (gal/acre)	Rate (oz/acre) Console	Rate (ml/acre) for Reference	**Acres Treated** with **Full Tank** (3200 oz)	**Acres Treated** with **Both Tanks** (6400 oz)
1 gal/acre	***128 oz/acre***	3785 ml/acre	25 acres	50 acres
1.5 gal/acre	***192 oz/acre***	5680 ml/acre	16.6 acres	33.2 acres
2 gal/acre	***256 oz/acre***	7570 ml/acre	12.5 acres	25 acres
2.5 gal/acre	***320 oz/acre***	9465 ml/acre	10 acres	20 acres
3 gal/acre	***384 oz/acre***	11355 ml/acre	8.3 acres	16.6 acres

CALCULATING MIXING RATES

Find the application rate for the particular herbicide on the product label, box or instruction sheet.

NOTE: One way to determine the mix ratio is to divide the chemical application rate *(from label)* by the total application rate *(determined by user)*. This gives you the percentage of chemical to mix into a desired volume of water.

Example Mixing Chemical:

1. **Product suggested application rate:**
   0.25L/ha = 101.2 ml/acre

   (If application rate on label is in L/ha *multiply by* **404.8** *to get* ml/acre) Reference: 1 ha = 2.47 acres

2. **Desired application rate setting:**
   1.5 gal/acre = 5680 ml/acre
   (From chart on previous page)

   Note: *This is the total volume per acre of chemical after mixing with water.*

3. **Mix Ratio:**
   101.2 ml/acre ÷ 5680 ml/acre = 0.01782
   (chemical rate from label) (desired application rate)

4. Multiply the mix ratio above with the volume you plan to fill the tank to:

   Full tank: 100L x 0.01782 = **1.782 litres** of chemical added to tank, then fill to top with water.

   3/4 tank: 75L x 0.01782 = **1.337 litres** of chemical added to tank, then fill to 75L mark with water.

   1/2 tank: 50L x 0.01782 = **0.891 litres** of chemical added to tank, then fill to 50L mark with water.

   1/4 tank: 25L x 0.01782 = **0.446 litres** of chemical added to tank, then fill to 25L mark with water.

NOTE: For chemicals like Tordon 101 at 3.7L/ha, you could apply at 2 ½ or 3 gal/acre to dilute it more with water, but the actual volume of chemical per acre is still the same.

NOTE: User preference & knowledge of the product & how it works with particular vegetation in a region, plus past experience is key to know how to mix the chemical & at what rate it should be applied.

MIXING CHEMICALS

⚠ **IMPORTANT:** Ensure you have read the herbicide safety information and followed the product recommendations for required PPE during handling/preparation.

When mixing the chemical with water:

• First, fill the tanks with water to at least half the desired level.

• Add the calculated and measured amount of chemical to the tanks.

• Continue to fill the tanks with additional water to the desired level.

NOTE: Do not add *unmixed chemical* to the tank first, or it may not mix properly. When the machine is operating there is sufficient vibration occurring to keep the chemical mixed.

OPERATING THE SYSTEM WHILE STATIONARY

For testing, use the following steps for operating the system while stationary:

• Adjust the valves as desired (make sure at least one input & output valve is open)

• Press "SELF TEST" on the console & enter a desired speed (usually between 2 & 10 MPH)

• Set console to desired rate, ensure boom switches are on & turn on master switch.

The pump should run & liquid should be flowing at the desired rate.

NOTE: If the speed keeps changing to zero unexpectedly after you have entered in a self test speed, unplug the Radar or GPS speed input cable at the console. (*If this is not unplugged, any vibration or grass movement under the tractor will keep zeroing the speed*).

PUMP VOLUME REFERENCE CHART

Pump Volume Chart for 180" Deck (OZ/MIN)					
Speed (MPH)	1 Gal / Acre	1-1/2 Gal / Acre	2 Gal / Acre	2-1/2 Gal / Acre	3 Gal / Acre
2	7.74	11.63	15.49	19.38	23.22
2.5	9.7	14.54	19.41	24.27	29.1
3	11.63	17.41	23.26	29.08	34.89
3.5	13.56	20.35	27.11	33.91	40.68
4	15.53	23.3	31.06	38.82	46.59
4.5	17.45	26.17	34.9	43.62	52.35
5	19.41	29.11	38.82	48.52	58.23
5.5	21.33	32	42.67	53.33	64
6	23.27	34.91	46.55	58.18	69.82
6.5	25.21	37.82	50.42	63.03	75.64
7	27.17	40.73	54.3	67.88	81.45
7.5	29.09	43.64	58.18	72.73	87.27
8	31.03	46.55	62.06	77.58	93.09

Note: Colors on the chart above are only for visual separation as all of the values shown are well within the operating capacity of the pump which is rated at 5 to 200 oz/min.

*Shutting off one boom section will cut these numbers by 1/3 or two sections will cut these numbers by 2/3.

Operation

PREPARATION CHECKLIST

- ☐ Read and understand the Rotary Cutter and OnePass operator's manuals and all safety decals & information.
- ☐ Read herbicide safety information and followed recommendations for required PPE when handling/applying product.
- ☐ Check that all safety guards and shields are in place and secure.
- ☐ Lubricate all grease fittings and check the oil level in all gear cases. (Refer to the "Maintenance" section)
- ☐ Check that all hardware is in place and properly tightened. (Refer to the "Maintenance" section)

ONEPASS QUICK-START SETTINGS

(For operating console ***after*** initial set-up and programming has been completed)

1. **Press Power Button**
2. **Press Product Select Button** (Highlights Product 2)
   Note: *Product 1 is the console node & can be left off.*
3. **Press Product On/Off Button**
4. **Enter Tank Volume (oz)**
5. **Check Rate Cal (oz/ac)**
6. **Check Boom Switches are "On"**
7. **Turn on PTO**
8. **Begin Driving Forward**
9. **Turn "On" Master Switch**

APPLYING HERBICIDE

⚠ **IMPORTANT:** When ready to apply liquid, make sure that the valves on the OnePass are in the desired position.

NOTE: REMEMBER to reset the acres, distance & volumes if required for personal data records. Also be sure to either enter the actual volume of product that is in the tank. If one tank is filled, then set to 3200 oz & if both tanks are filled right up with product then set to 6400 oz.

- Ensure all the desired boom switches are in the on position. **Make sure the master switch is in the off position until the cutter is in motion.**
- Lower & engage the PTO to begin cutting. The user can turn the master switch on at any time & the Raven console will display the speed, vol/min, distance or rate, depending on what the operator wants to see.
- **IMPORTANT:** When in operation, if the **cutter is brought to a stop** for any reason, such as a passing vehicle, **the pump will stop** applying liquid & **will not restart** when the cutter goes back into motion. The master switch has to be turned off while stopped *(A warning alarm should show up on the console when this happens).* After resuming motion the **master switch can be turned back on and the pumps will operate again.**
- Driving at one constant speed is not necessary. The Raven console will adjust the speed of the pump so that the correct rate is being applied at any given speed. Speed is picked up by either ground radar or GPS.

SAFE MAINTENANCE PROCEDURES

Danger: *To prevent serious injury or death to you or others, and to prevent damage to your equipment, always follow these safety messages:*

- Follow safety procedures for the Rotary Cutter, OnePass and Sidearm *(if applicable)* and review their safety messages and procedures before servicing.
- Never lubricate, adjust, or service machine while it is moving. Ensure tractor engine is off, all moving parts have stopped, and the PTO driveline has been disconnected before servicing.
- Wear appropriate protective and/or chemical resistant gear when servicing as needed.
- Ensure all guards, shielding, and their components are replaced and secured after service is complete.

FLUSHING SYSTEM BETWEEN APPLICATIONS

IMPORTANT: The **CHEMWASH TANK** must only be filled with fresh water for rinsing the system.

NOTE: It is a good idea to keep the outlet valve from the Chemwash tank in the **OFF** position to avoid possible contamination from the rest of the system.

TO RINSE

1. Turn the outlet valve on the underside of the Chemwash tank to **ON**, turn the valves on the Product tanks off. In that position, the suction will come from the Chemwash tank only. Run the system as desired to flush out the delivery system.
2. Reverse procedure to return to application mode & the system is ready to operate or store.

LONG TERM STORAGE OR NON-USE

1. If long term storage or non-use is planned, take extra steps to clean out & preserve the system.

   NOTE: Cold or Freezing conditions, add plumbing or RV antifreeze to all tanks & run the system in rinse & in application positions until it is obvious that antifreeze has filled the entire system.
2. Remove the OnePass product delivery blade bolts, #500564 & replace with standard blade bolts, #117415.2.
3. Reverse procedure to return to application mode & the system is ready to operate or store.

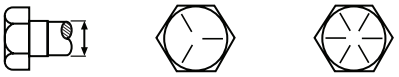
TORQUE SPECIFICATIONS

CHECKING BOLT TORQUE

The tables shown below give correct torque values for various bolts and capscrews. Tighten all bolts to the torques specified in chart unless otherwise noted. Check tightness of bolts periodically, using bolt torque chart as a guide. Replace hardware with the same strength (Grade/Class) bolt.

IMPERIAL TORQUE SPECIFICATIONS

(based on "Zinc Plated" values)



Size	Grade 5	Grade 8
	lb.ft (*N.m*)	lb.ft (*N.m*)
1/4"	**7 (*10*)**	**10 (*14*)**
5/16"	15 (*20*)	20 (*28*)
3/8"	**25 (*35*)**	**35 (*50*)**
7/16"	40 (*55*)	60 (*80*)
1/2"	**65 (*90*)**	**90 (*120*)**
9/16"	90 (*125*)	130 (*175*)
5/8"	**130 (*175*)**	**180 (*245*)**
3/4"	230 (*310*)	320 (*435*)
7/8"	**365 (*495*)**	**515 (*700*)**
1"	550 (*745*)	770 (*1050*)
1-1/8"	**675 (*915*)**	**1095 (*1485*)**
1-1/4"	950 (*1290*)	1545 (*2095*)
1-3/8"	**1250 (*1695*)**	**2025 (*2745*)**
1-1/2"	1650 (*2245*)	2690 (*3645*)

METRIC TORQUE SPECIFICATIONS

(based on "Zinc Plated" values)

Size	Class 8.8	Class 10.9
	lb.ft (*N.m*)	lb.ft (*N.m*)
M6	**7 (*10*)**	**10 (*14*)**
M8	16 (*22*)	23 (*31*)
M10	**30 (*42*)**	**45 (*60*)**
M12	55 (*75*)	80 (*108*)
M14	**90 (*120*)**	**125 (*170*)**
M16	135 (*185*)	195 (*265*)
M18	**190 (*255*)**	**270 (*365*)**
M20	265 (*360*)	380 (*515*)
M22	**365 (*495*)**	**520 (*705*)**
M24	460 (*625*)	660 (*895*)
M27	**675 (*915*)**	**970 (*1315*)**
M30	915 (*1240*)	1310 (*1780*)
M33	**1250 (*1695*)**	**1785 (*2420*)**
M36	1600 (*2175*)	2290 (*3110*)

REPOSITIONING SEAL MOUNT

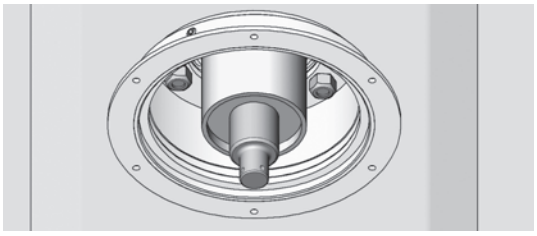
The following are instructions for repositioning the "Seal Mount" on the blade mount assembly after changing a gearbox or also if only replacing the seals, (*if only replacing seals, start at Step 4*).

⚠ *Ensure all gearbox/fluid transfer bolts are positioned, installed and torqued properly before installing the blade mount assembly.*

START HERE FOR INSTALLING A NEW GEARBOX

1. **Gearbox Installation**:

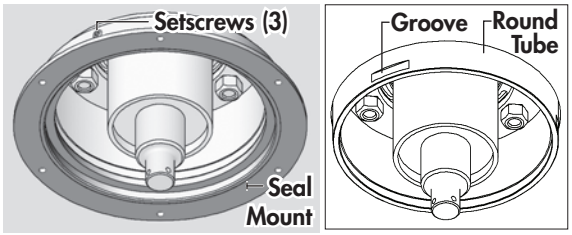
- Install new gearbox with the input shaft in the correct orientation to the driveline.
- Install the gearbox fluid transfer bolt in the same hole as previously located.
- Torque gearbox bolts evenly to **400 ft-lb** (540 Nm).



2. **Loosen 3 Setscrews** *(not remove)*:

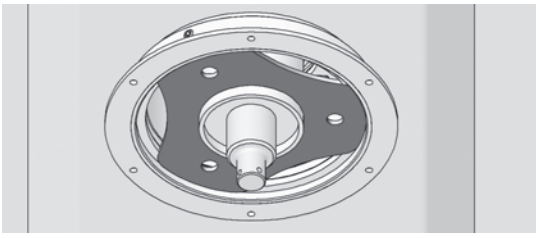
- Do not remove but loosen the 3 set screws that hold the "Seal Mount Assembly" to the "Round Tube" on the underside of the deck.

  NOTE: If the seal mount assembly was removed, then remove most of the caulking & apply ***new*** silicone caulking to the same location on the seal mount.



3. **Positioning Seal Mount**:

- Position the seal mount centering jig as shown. (*part reference #501824*)

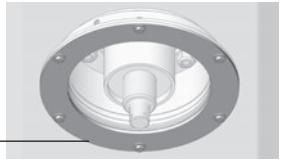


- The seal mount should be bottomed out on the mower deck tube with the set screws lined up with the grooves on the deck tube.
- The center should be a snug fit to the gearbox.
- Once centered tighten all 3 set screws evenly while continuing to check that the Seal Mount is centered and that the set screws remain in the grooves.
- Torque setscrews to **80 ft-lb** (110 Nm).
- Remove centering jig.

START HERE FOR INSTALLING A NEW SEAL

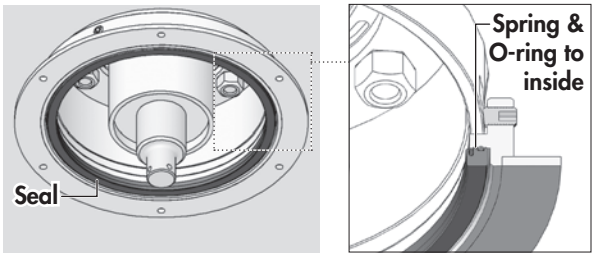
4. **Clean & Install New Seal**:

- If you are replacing an existing seal, start by removing the blade mount & 6 bolts on the seal retainer plate.



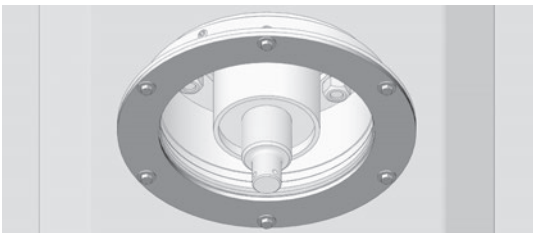
- Remove existing seal, clean surface & install a new seal if existing seal is worn or damaged.

- Install new Seal with the "O-ring" & the "Coil Spring" to the inside as shown below. Take care not to twist or damage the seal.



5. **Install the Seal Retainer Plate**:

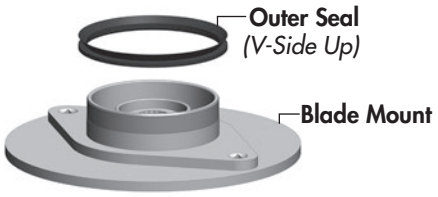
- Install the seal retainer plate with the six bolts & nuts to hold in place as shown, but **Do Not Tighten Bolts** at this stage.



- Smear a thin film of grease onto the seal lip to aid in installing the "Blade Mount".

6. **Install Outer Seal Ring**:

- Some versions have an "Outer Seal Ring" that needs to be installed before the blade mount is installed on the cutter.



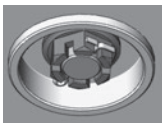
- Install the outer seal onto the blade mount by hand or by using a pry bar with rounded edges, as not to cause damage.
- Slide down until the bottom of the seal is 1/4 inch away from the weld around the blade mount tube.

7. **Install the Blade Mount**:

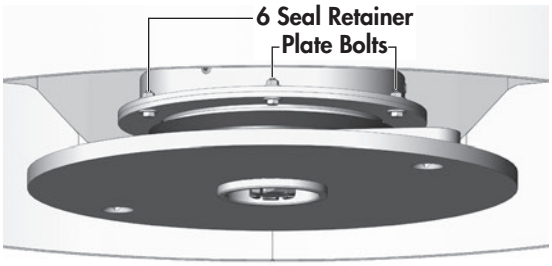
⚠ *Ensure all gearbox/fluid transfer bolts are positioned, installed and torqued properly before installing the blade mount assembly.*

- Install the "Blade Mount" by aligning the spline shaft with the hub. The Blade Mount should slide most of the way on. *Take care not to damage the seal while installing the blade mount.*

- Install and torque the Castle Nut to **800 ft-lb** (1085 Nm).
- Install Cotter Pin.

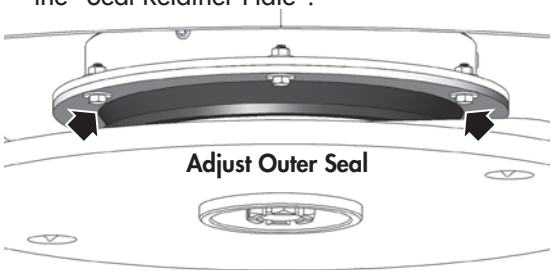


- The seal is now centered to the blade mount.
- Torque the six bolts on the "Seal Retainer Plate" to 33 lb-ft to lock the seal in place.



8. **Position the Outer Seal**:

- Slide the "Outer Seal" up until the rubber flange is at least 1/8 inch past where it first contacts the "Seal Retainer Plate".



- Spin the blade mount by hand, it should rotate smooth, without binding & appear centered to the seal holder as it rotates.

BASIC TROUBLESHOOTING

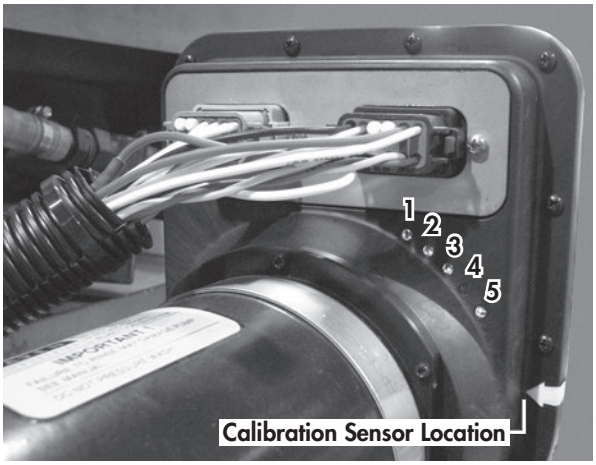
⚠ **IMPORTANT: <u>Never unplug or plug in any electrical connectors while the Raven console is powered up!</u>**

The result of this can range from the pump or motor control not responding, or the pump running at various rates out of control. Other issues may result such as CAN (controller area network) going offline.

If no liquid is coming out of the blade mount bolts, check the following:

1. Check the output hole on the blade mount for plugging, either with an air or water hose.
   - If this appears clear then verify that liquid is getting to the blade mount. (Next step below).
   - If this is not clear then back flush the blade mount bolts with a pressure washer held a couple feet away from the head of the bolt. Some water may flow back through the dust seal or the opposite blade bolt if it clears.
2. Undo a delivery hose right at the gearbox delivery bolt. Run the system to see if liquid comes out.
   - If it does, then the problem is after the hose. If not, then check upstream at the manifold.
   - If it appears to be a problem after the hose, then remove the check valve & fittings from the gearbox delivery bolt & verify they are not plugged.
3. Remove the blades & blade mount from the cutter & check inside for debris. If debris is present, then the seal may be worn or damaged. Replace seal.

PUMP STATUS LED'S

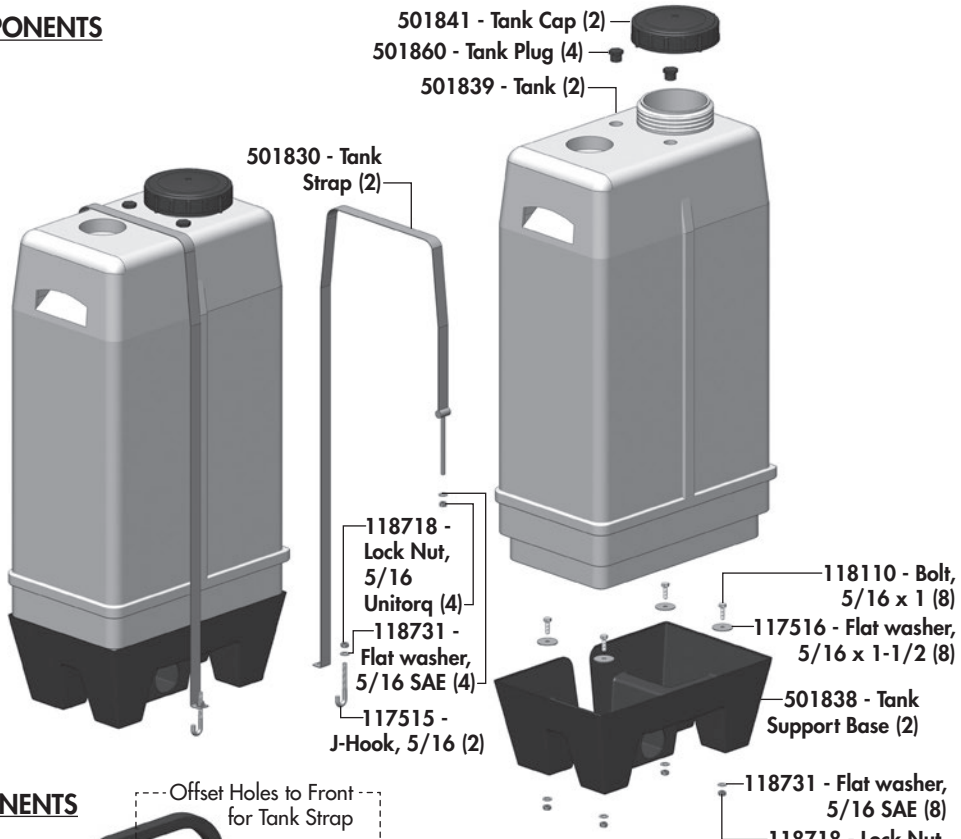


<u>LED Locations</u>:

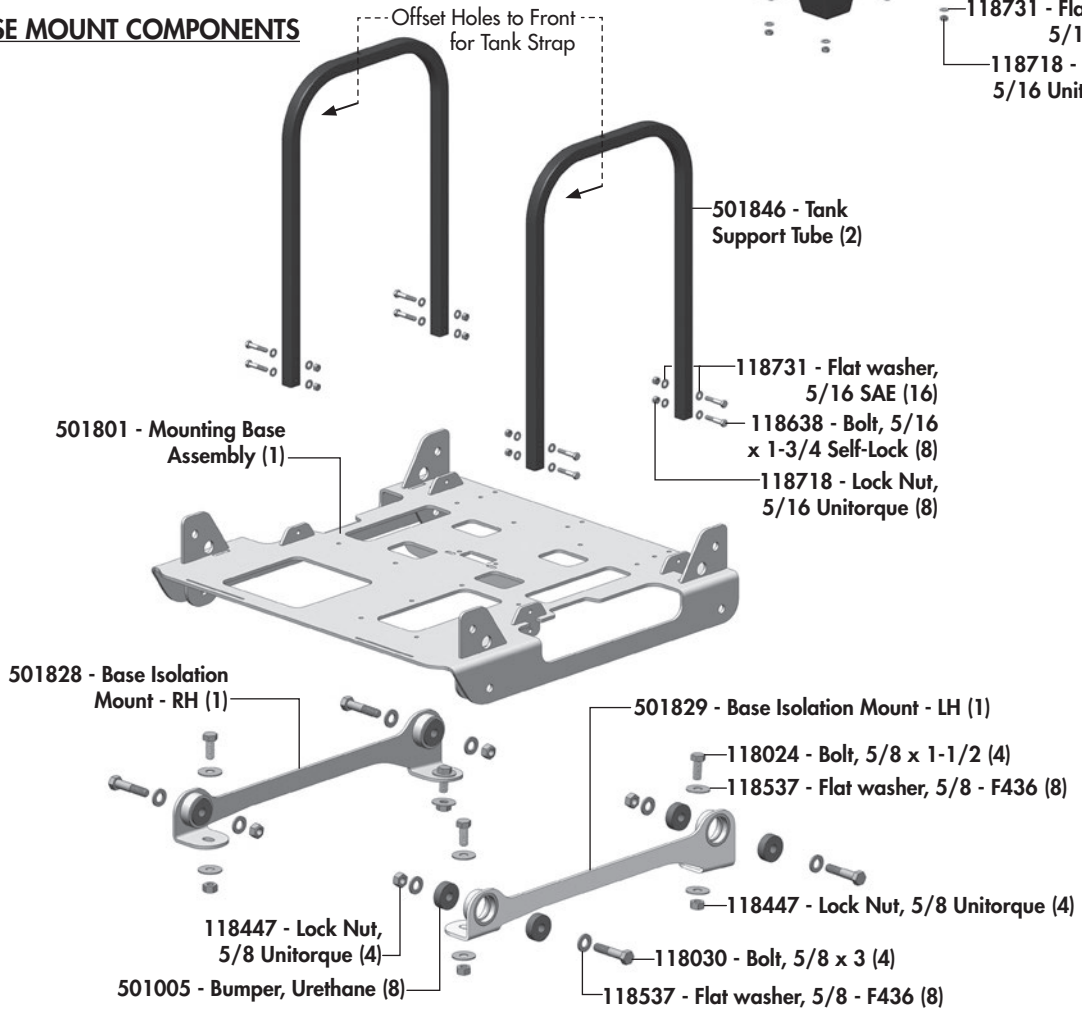
1. **Logic Power**. LED light is solid if logic power at motor control node.
2. **High Current Power**. LED light is solid if high current power present at motor control node.
3. **CAN Status**. Flashes once per second if okay, 4 times per second if no communication.
4. **Flow Switch State**. Flashes once per revolution of the pump shaft.
5. **Calibration Switch State**. Flashes when senses metal object passing by. Swipe metal object past sensor twice to initiate calibration mode.

Base Mounting Components

PRODUCT TANK COMPONENTS

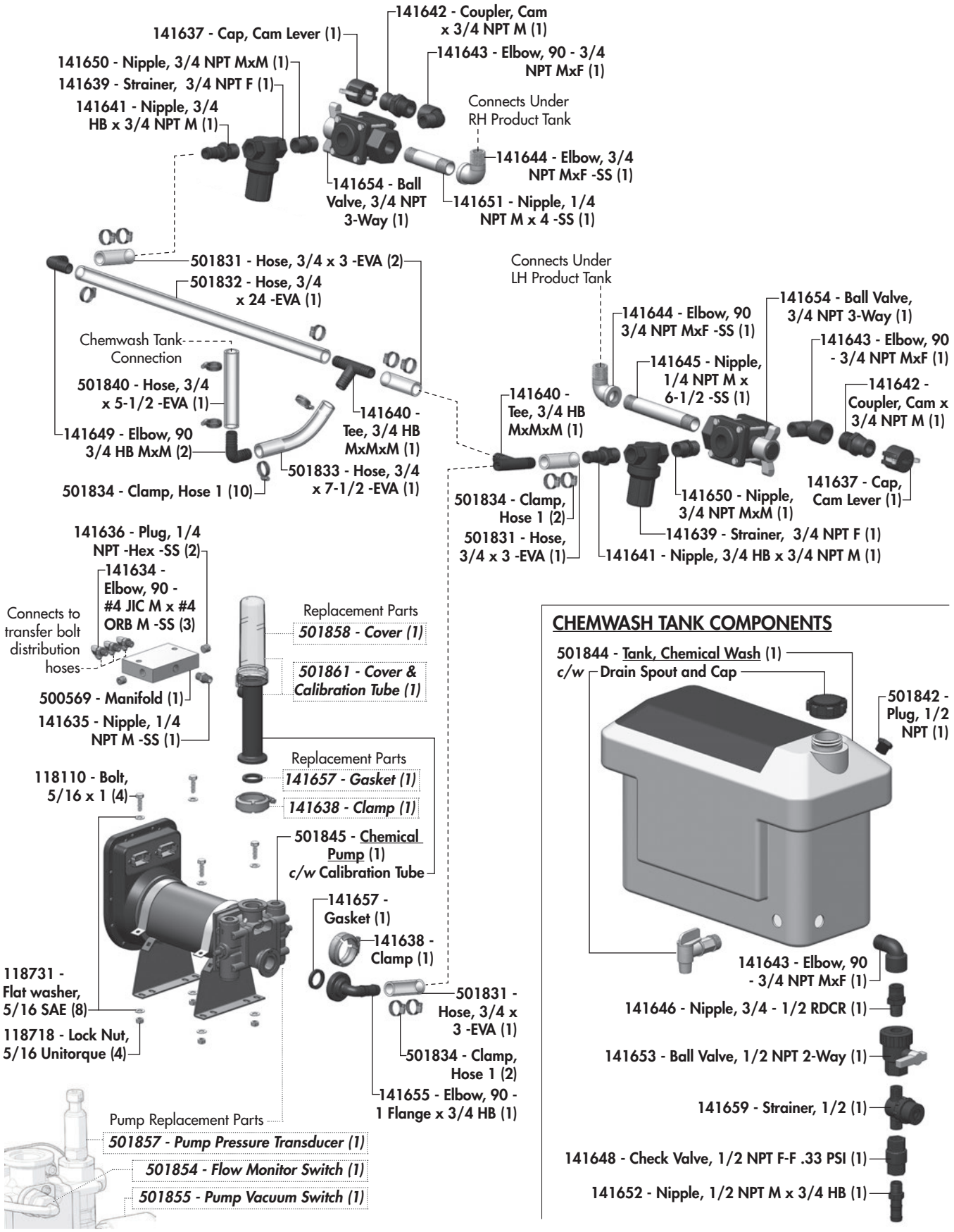


BASE MOUNT COMPONENTS



Pump & Tank Connections

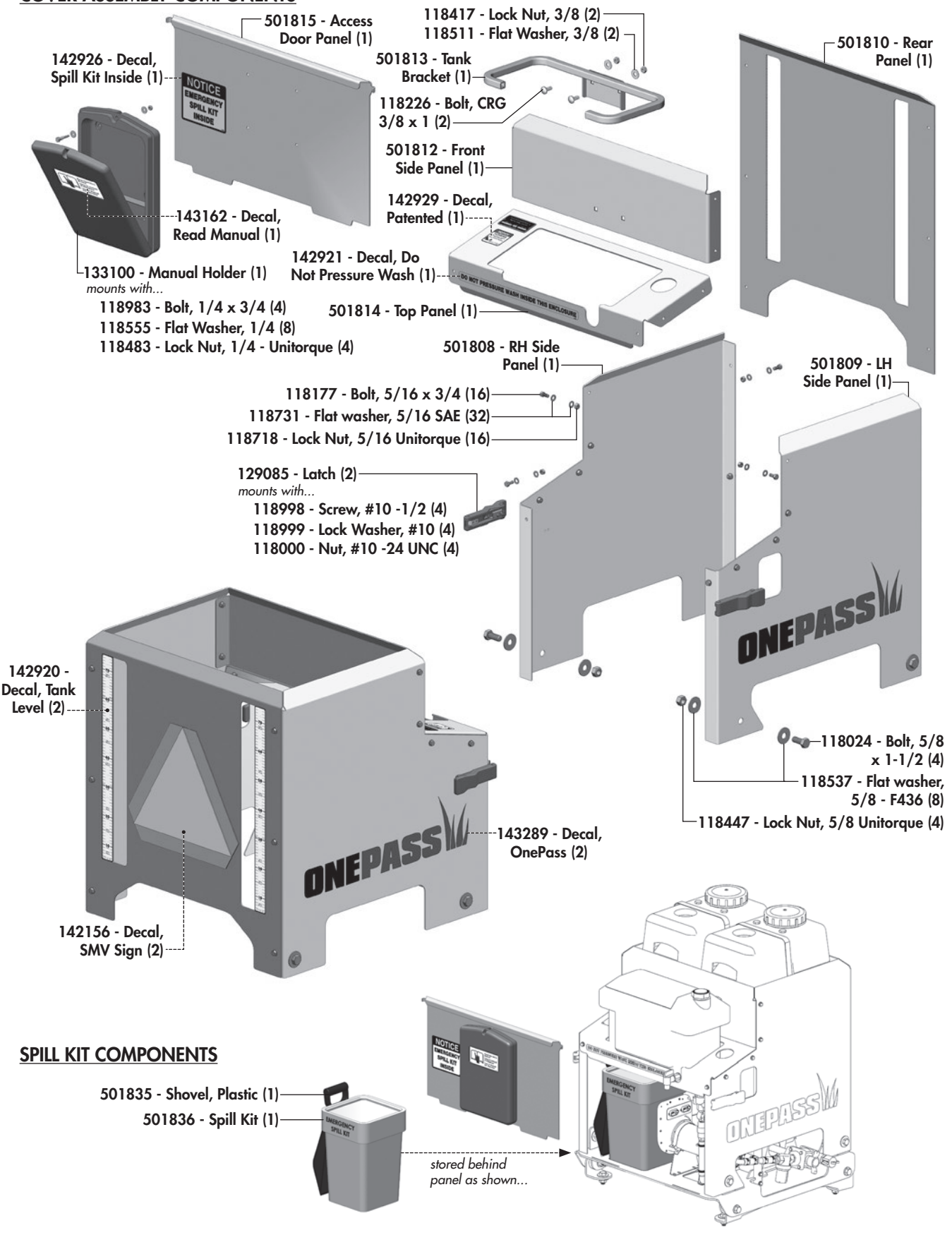
CHEMICAL PUMP & LINE COMPONENTS



CHEMWASH TANK COMPONENTS

Cover Assembly Components

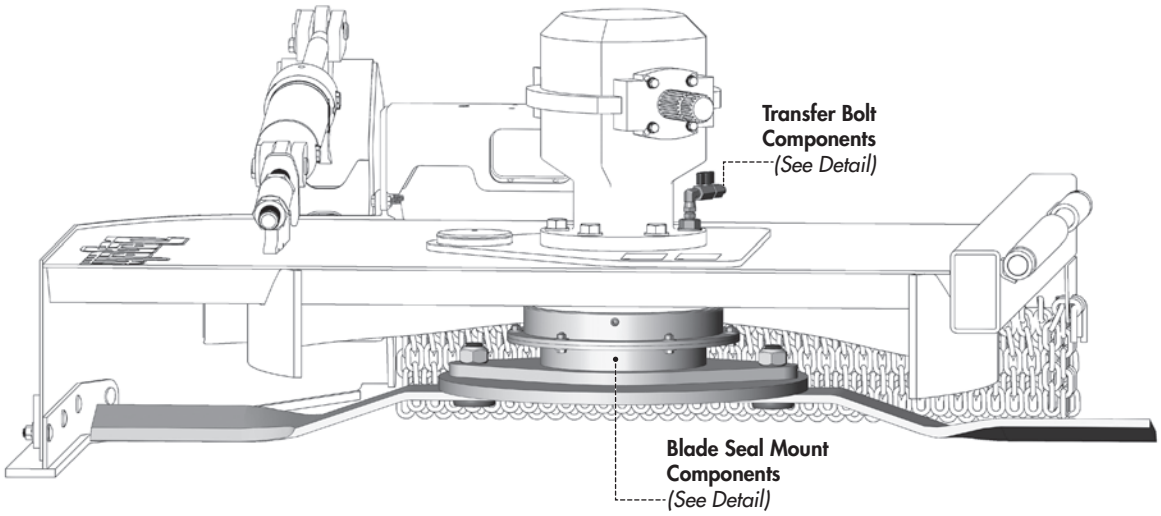
COVER ASSEMBLY COMPONENTS



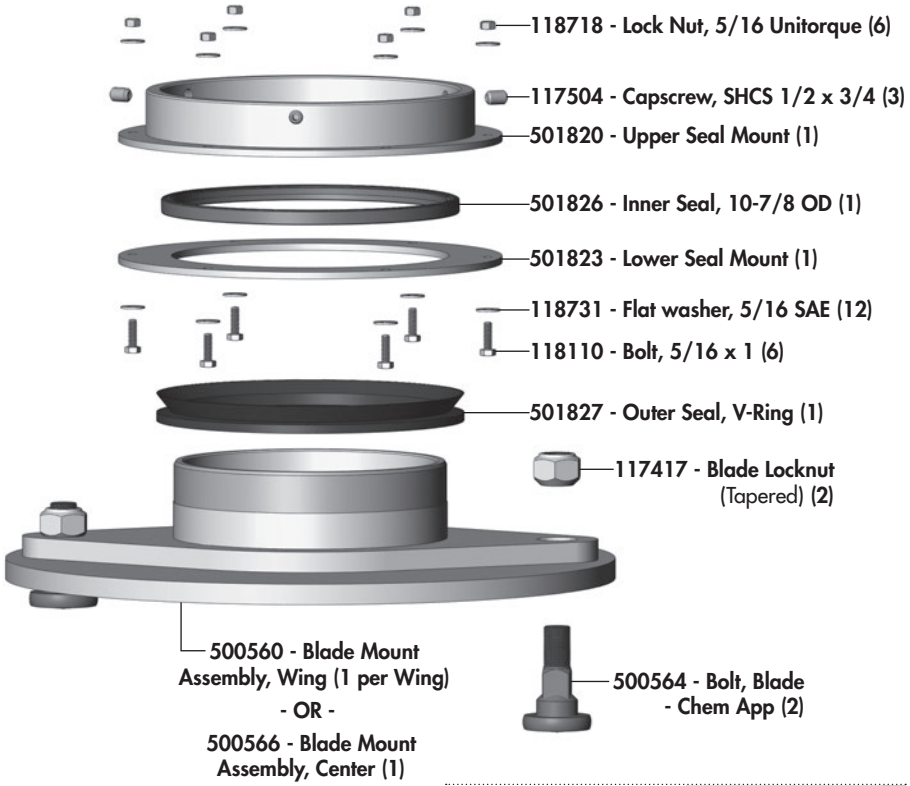
SPILL KIT COMPONENTS

Blade Seal Mount & Transfer Bolt Components

TRANSFER BOLT & SEAL MOUNT COMPONENTS

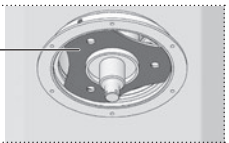


BLADE SEAL MOUNT COMPONENTS *(Qty Per Section)*

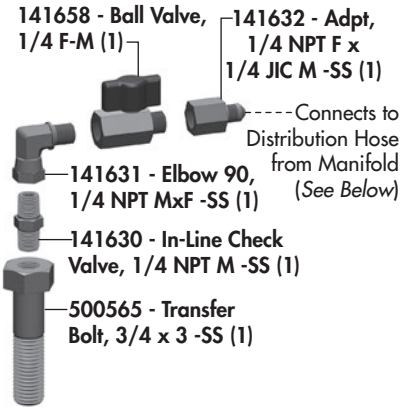


501824 - Seal Mount Centering Jig (1)

(Used for centering *"Upper Seal Mount"* during install.)



TRANSFER BOLT COMPONENTS



DISTRIBUTION HOSES

Hose from Manifold block to Wing

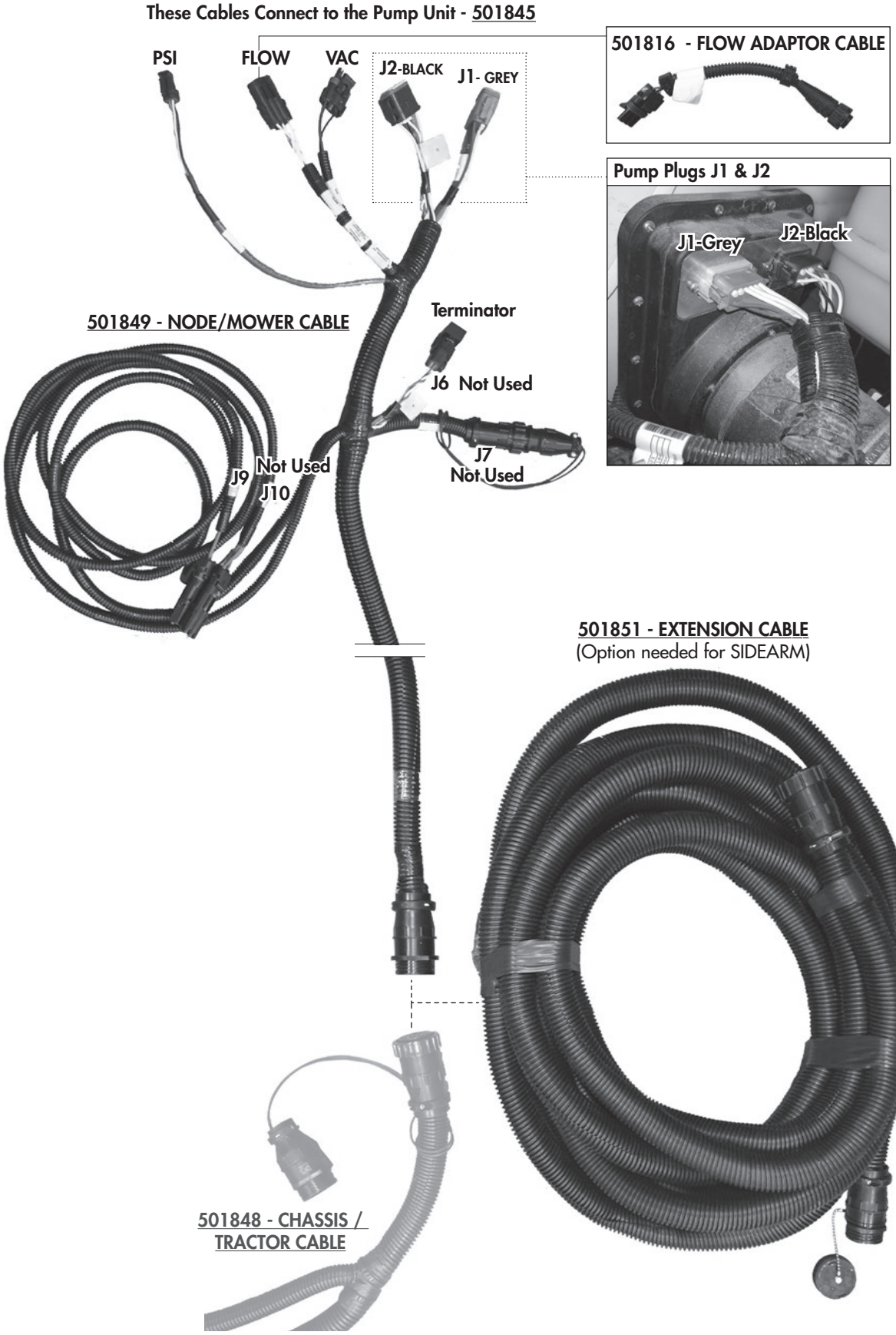
126099 - Hose, 1/8 x 90 - #4 JIC F-SW (1 per Wing)

Hose from Manifold block to Center

126098 - Hose, 1/8 x 48 - #4 JIC F-SW (1)

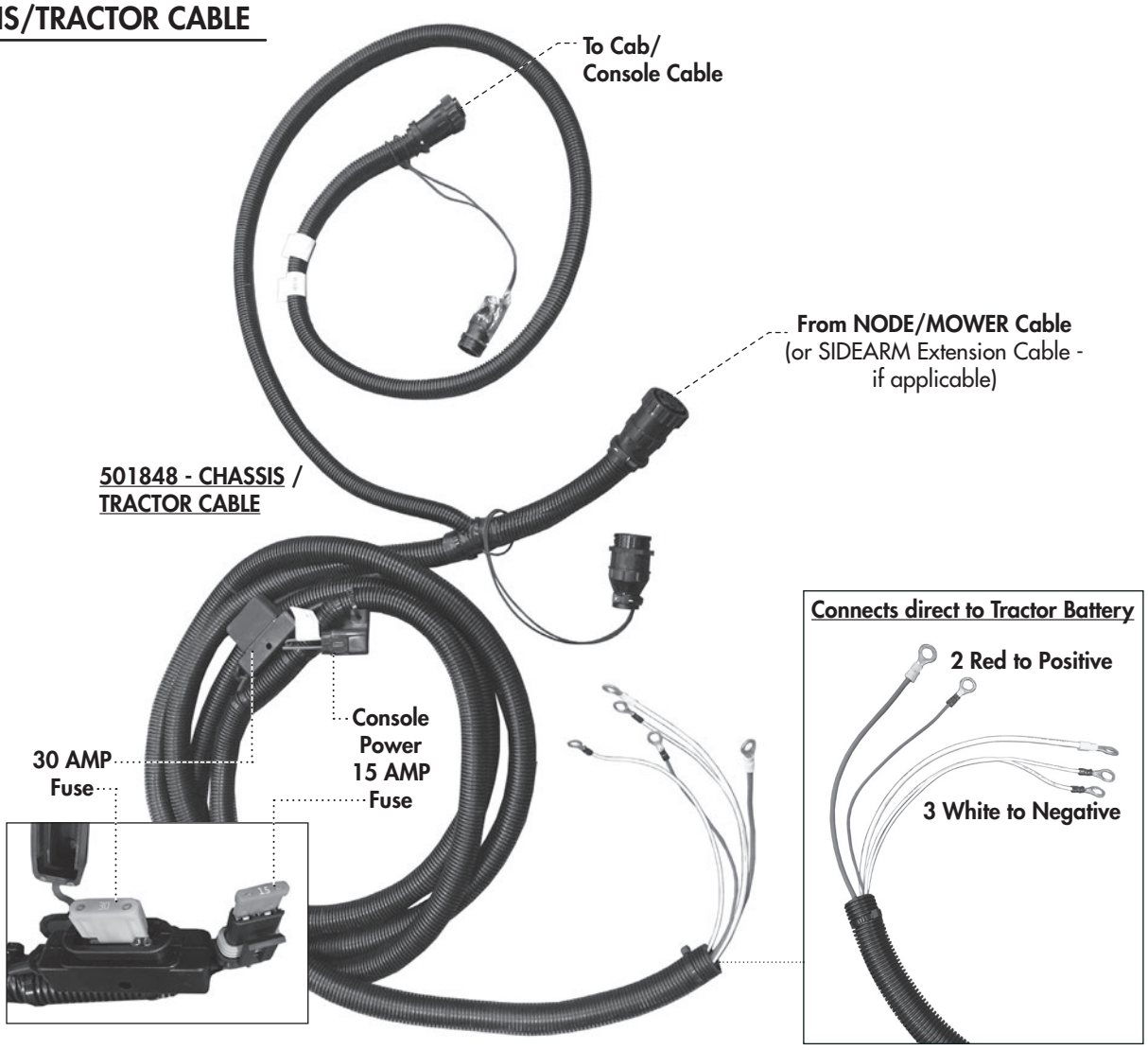
Wiring Component Overview

NODE/MOWER CABLE

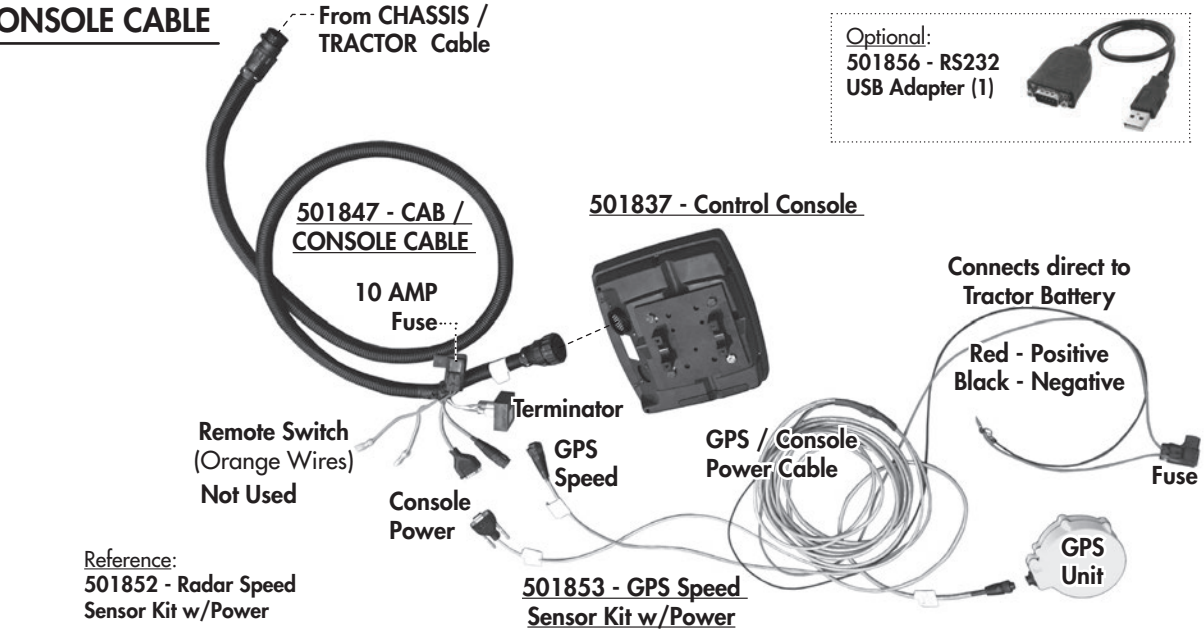


Wiring Component Overview

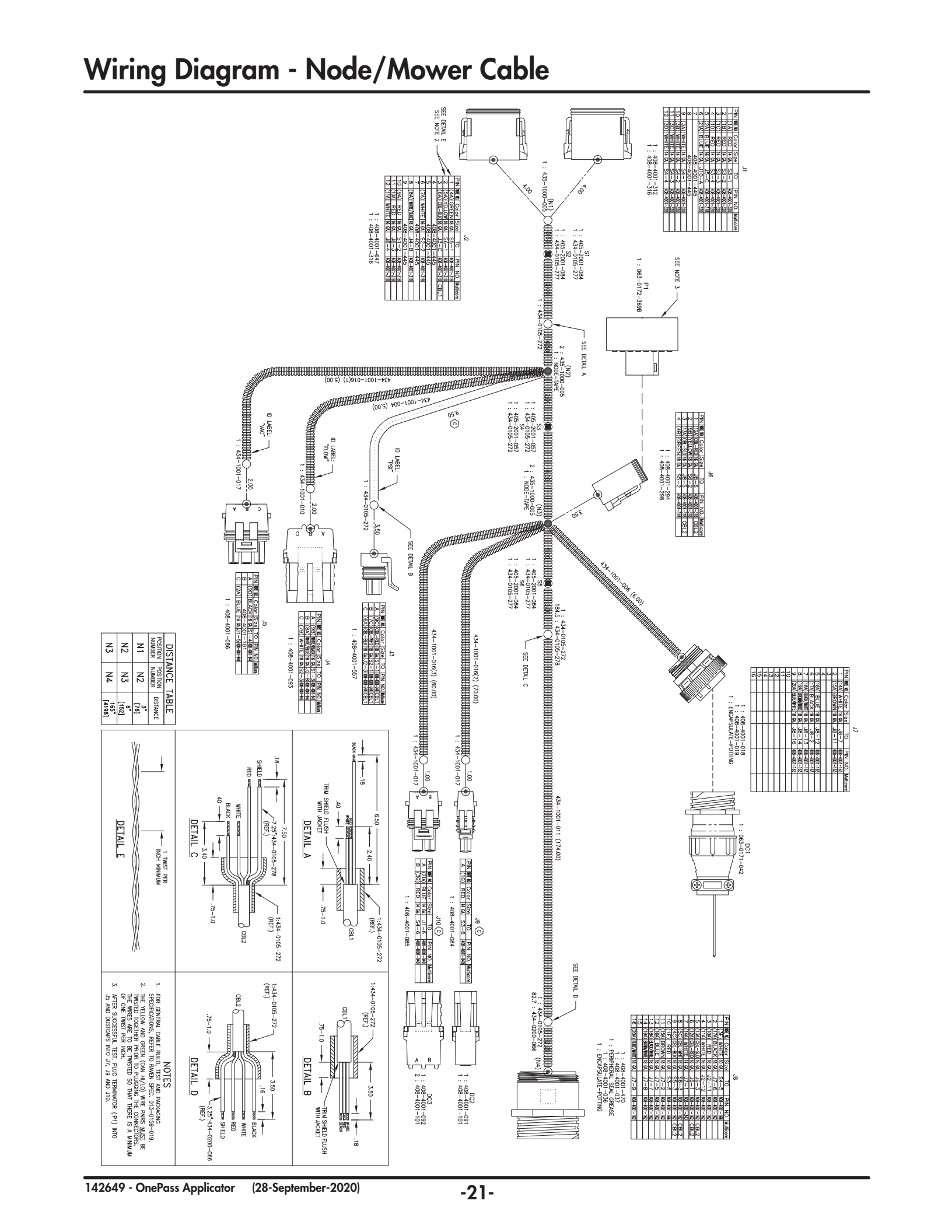
CHASSIS/TRACTOR CABLE



CAB/CONSOLE CABLE



Wiring Diagram - Node/Mower Cable



PIN	WIRE NO.	Color	Size	TO	PIN NO.	Multicore
1	(1A)	RED	14 GA.	S3-1	408-4001-38	
2	(1B)	RED	14 GA.	S3-2	408-4001-38	
3	(1C)	RED	14 GA.	S3-3	408-4001-38	
4	(1D)	RED	14 GA.	S3-4	408-4001-38	
5	(2A)	BLUE	14 GA.	J5-C	408-4001-38	
6	(2A)	BLUE	14 GA.	408-4001-445		
7				408-4001-445		
8	(3A)	WHITE	14 GA.	S4-1	408-4001-38	
9	(3B)	WHITE	14 GA.	S4-2	408-4001-38	
10	(3C)	WHITE	14 GA.	S4-3	408-4001-38	
11	(3D)	WHITE	14 GA.	S4-4	408-4001-38	
12						
13						
14						
15						
16						

J1

PIN	WIRE NO.	Color	Size	TO	PIN NO.	Multicore
1	(4A)	GREEN	18 GA.	S5-1	408-4001-38	
2	(5A)	YELLOW	18 GA.	S5-2	408-4001-38	
3	(6A)	ORANGE	18 GA.	S5-3	408-4001-38	
4				408-4001-445		
5				408-4001-445		
6	(7A)	WHITE	18 GA.	S5-4	408-4001-38	
7	(8A)	BRIDGE	18 GA.	J4-B	408-4001-38	
8	(8A)	BRIDGE	18 GA.	S2-2	408-4001-38	
9	(9A)	RED	18 GA.	408-4001-445		
10	(10A)	RED	18 GA.	J8-3	408-4001-38	
11	(10A)	RED	18 GA.	J8-4	408-4001-38	
12	(11A)	WHITE	18 GA.	J8-4	408-4001-38	

J2

PIN	WIRE NO.	Color	Size	TO	PIN NO.	Multicore
A	(9D)	RED	18 GA.	S3-5	408-4001-38	
B	(6A)	WHITE	18 GA.	S2-3	408-4001-38	
C	(7D)	WHITE	18 GA.	S2-5	408-4001-38	

J3

PIN	WIRE NO.	Color	Size	TO	PIN NO.	Multicore
A	(9D)	RED	18 GA.	S3-5	408-4001-38	
B	(6A)	WHITE	18 GA.	S2-3	408-4001-38	
C	(7D)	WHITE	18 GA.	S2-5	408-4001-38	

J4

PIN	WIRE NO.	Color	Size	TO	PIN NO.	Multicore
A	(9D)	RED	18 GA.	S3-5	408-4001-38	
B	(6A)	WHITE	18 GA.	S2-3	408-4001-38	
C	(7D)	WHITE	18 GA.	S2-5	408-4001-38	

J5

PIN	WIRE NO.	Color	Size	TO	PIN NO.	Multicore
1	(4A)	GREEN	18 GA.	S5-1	408-4001-38	
2	(5A)	YELLOW	18 GA.	S5-2	408-4001-38	
3	(6A)	ORANGE	18 GA.	S5-3	408-4001-38	
4				408-4001-445		
5				408-4001-445		
6	(7A)	WHITE	18 GA.	S5-4	408-4001-38	
7	(8A)	BRIDGE	18 GA.	J4-B	408-4001-38	
8	(8A)	BRIDGE	18 GA.	S2-2	408-4001-38	
9	(9A)	RED	18 GA.	408-4001-445		
10	(10A)	RED	18 GA.	J8-3	408-4001-38	
11	(10A)	RED	18 GA.	J8-4	408-4001-38	
12	(11A)	WHITE	18 GA.	J8-4	408-4001-38	CBL2

J6

PIN	WIRE NO.	Color	Size	TO	PIN NO.	Multicore
1	(1A)	BLUE	18 GA.	J8-17	408-4001-83	
2	(1A)	BLACK	18 GA.	J7-1	408-4001-83	
3	(1A)	WHITE	18 GA.	J8-16	408-4001-83	
4						
5						
6	(1A)	BLUE	18 GA.	J8-2	408-4001-83	
7	(1A)	BLACK	18 GA.	J8-1	408-4001-83	
8	(2A)	WHITE	18 GA.	J8-15	408-4001-83	
9	(3A)	WHITE	18 GA.	J8-14	408-4001-83	
10						
11						
12						
13						
14						
15						
16						

J7

PIN	WIRE NO.	Color	Size	TO	PIN NO.	Multicore
1	(1A)	BLUE	18 GA.	J7-17	408-4001-83	
2	(1A)	BLACK	18 GA.	J7-6	408-4001-83	
3	(1A)	WHITE	18 GA.	J7-12	408-4001-83	
4	(1A)	BLACK	18 GA.	J7-3	408-4001-83	CBL2
5	(1A)	BLUE	18 GA.	J8-1	408-4001-83	CBL2
6	(2A)	WHITE	18 GA.	J8-15	408-4001-83	CBL2
7	(3A)	WHITE	18 GA.	J8-14	408-4001-83	CBL2
8	(4A)	GREEN	18 GA.	S5-3	408-4001-83	CBL2
9	(4A)	GREEN	18 GA.	S5-3	408-4001-83	CBL2
10	(5A)	YELLOW	18 GA.	J7-2	408-4001-83	
11	(5A)	BROWN	18 GA.	J7-5	408-4001-83	
12	(6A)	BLUE	18 GA.	J7-5	408-4001-83	
13	(6A)	BROWN	18 GA.	J7-8	408-4001-83	
14	(7A)	WHITE	18 GA.	J7-8	408-4001-83	
15	(8A)	BRIDGE	18 GA.	J7-9	408-4001-83	
16	(20A)	BLUE	18 GA.	J7-9	408-4001-83	

J8

PIN	WIRE NO.	Color	Size	TO	PIN NO.	Multicore
A	(1D)	RED	14 GA.	S3-6	408-4001-40	

J9

PIN	WIRE NO.	Color	Size	TO	PIN NO.	Multicore
A	(1D)	RED	14 GA.	S4-6	408-4001-40	
B	(2A)	BLUE	14 GA.	J5-C	408-4001-40	
C	(3D)	RED	14 GA.	J5-A	408-4001-40	

J10

POSITION NUMBER	POSITION NUMBER	DISTANCE
N1	N2	3" [76]
N2	N3	6" [152]
N3	N4	165" [4198]

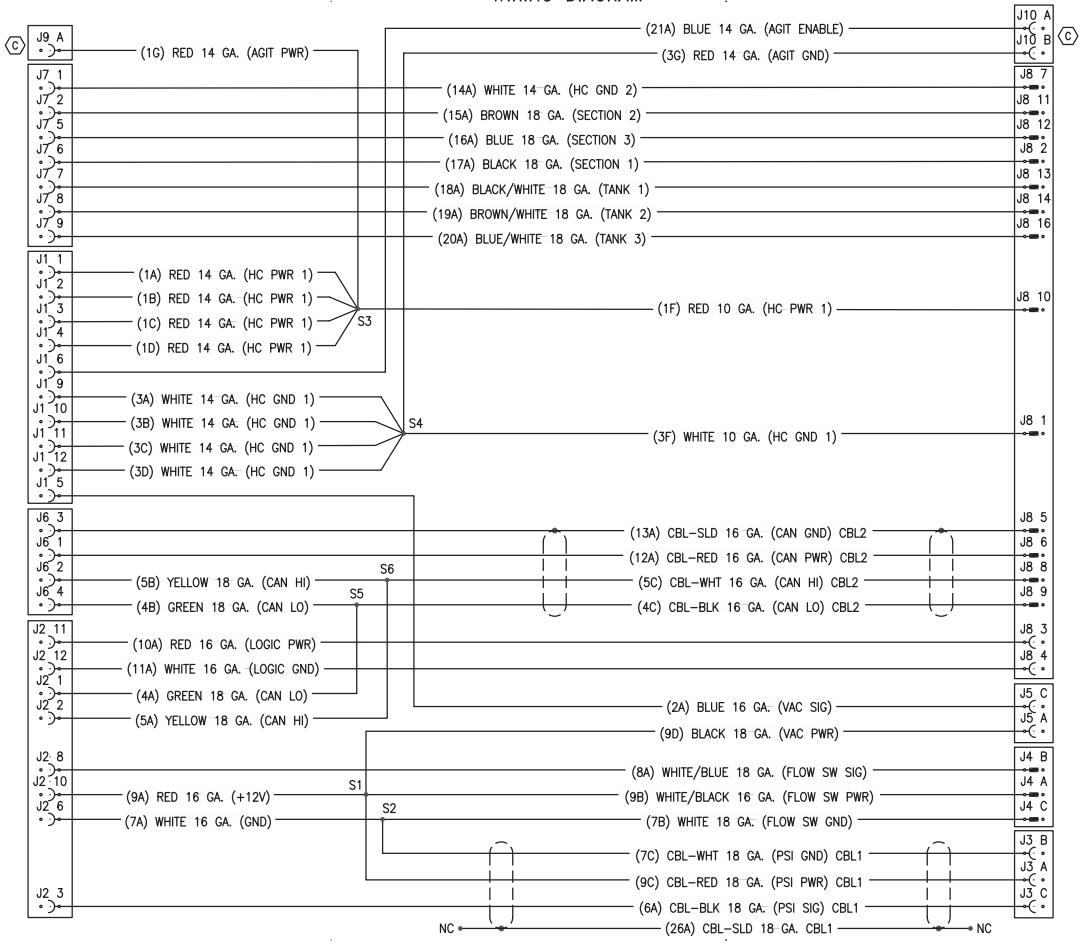
DISTANCE TABLE

NOTES

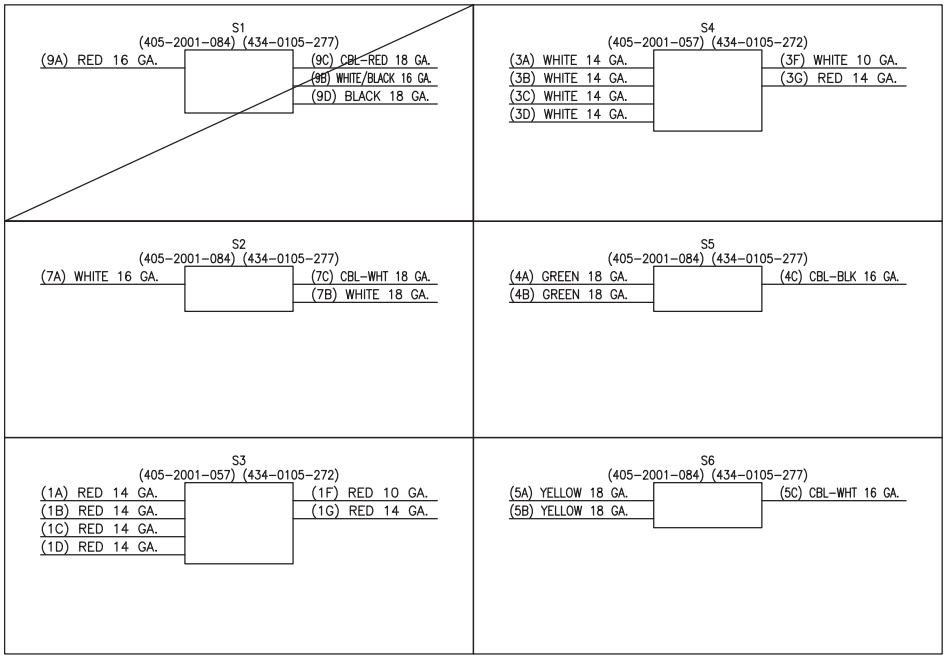
1. FOR GENERAL CABLE BUILD, TEST AND PACKAGING SPECIFICATIONS, REFER TO RAVEN SPEC. 013-0159-019.
2. THE YELLOW AND GREEN (CAN H/LO) WIRE PAIRS MUST BE TWISTED TOGETHER PRIOR TO PLUGGING THE CONNECTORS. THE WHITE WIRE MUST BE TWISTED SO THAT THERE IS A MINIMUM OF ONE TWIST PER INCH.
3. AFTER SUCCESSFUL TEST, PLUG TERMINATOR (IP1) INTO J5 AND DUSTCAPS INTO J7, J9 AND J10.

Wiring Diagram - Node/Mower Cable

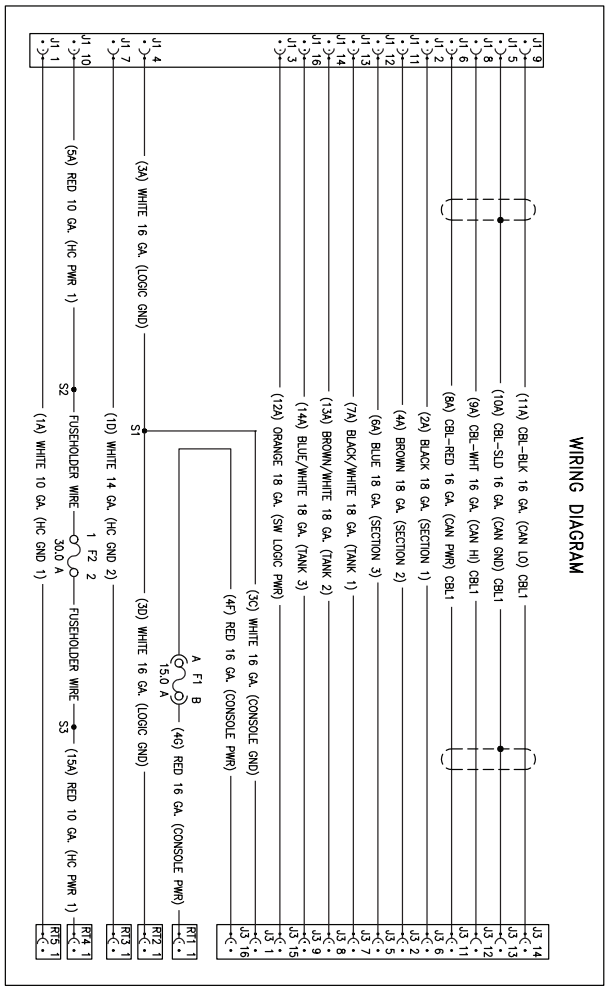
WIRING DIAGRAM

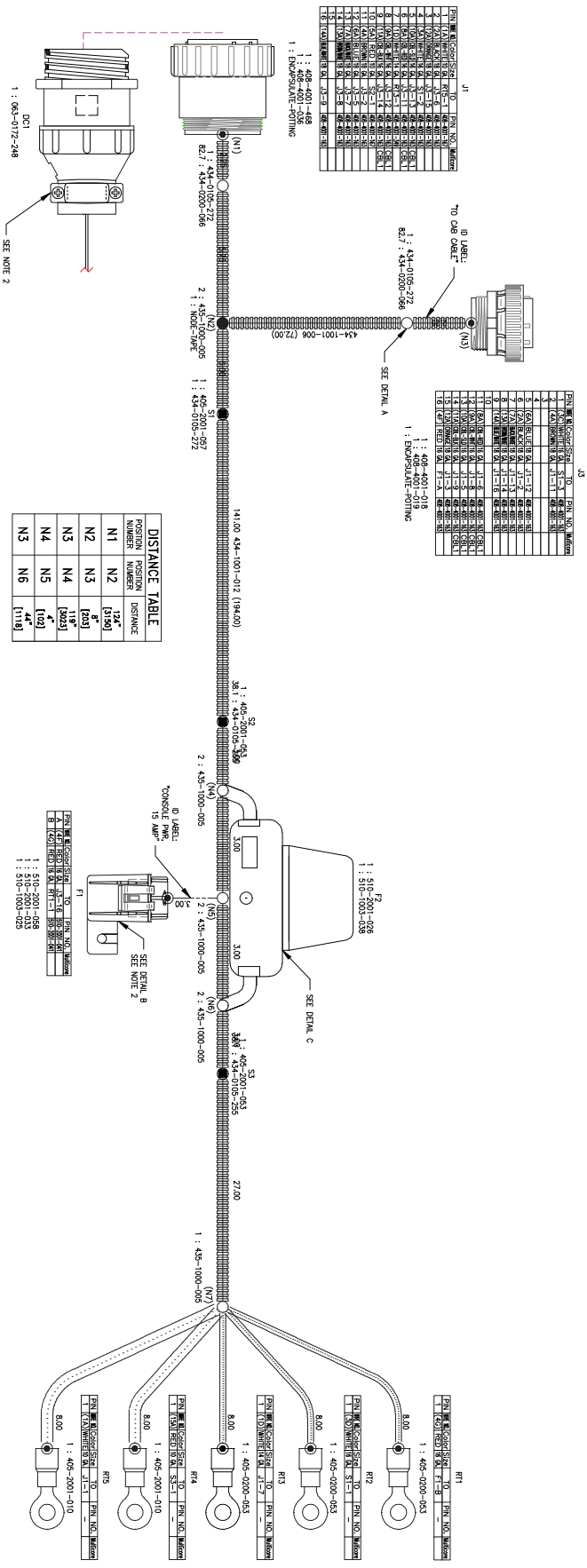


SPLICE DETAILS

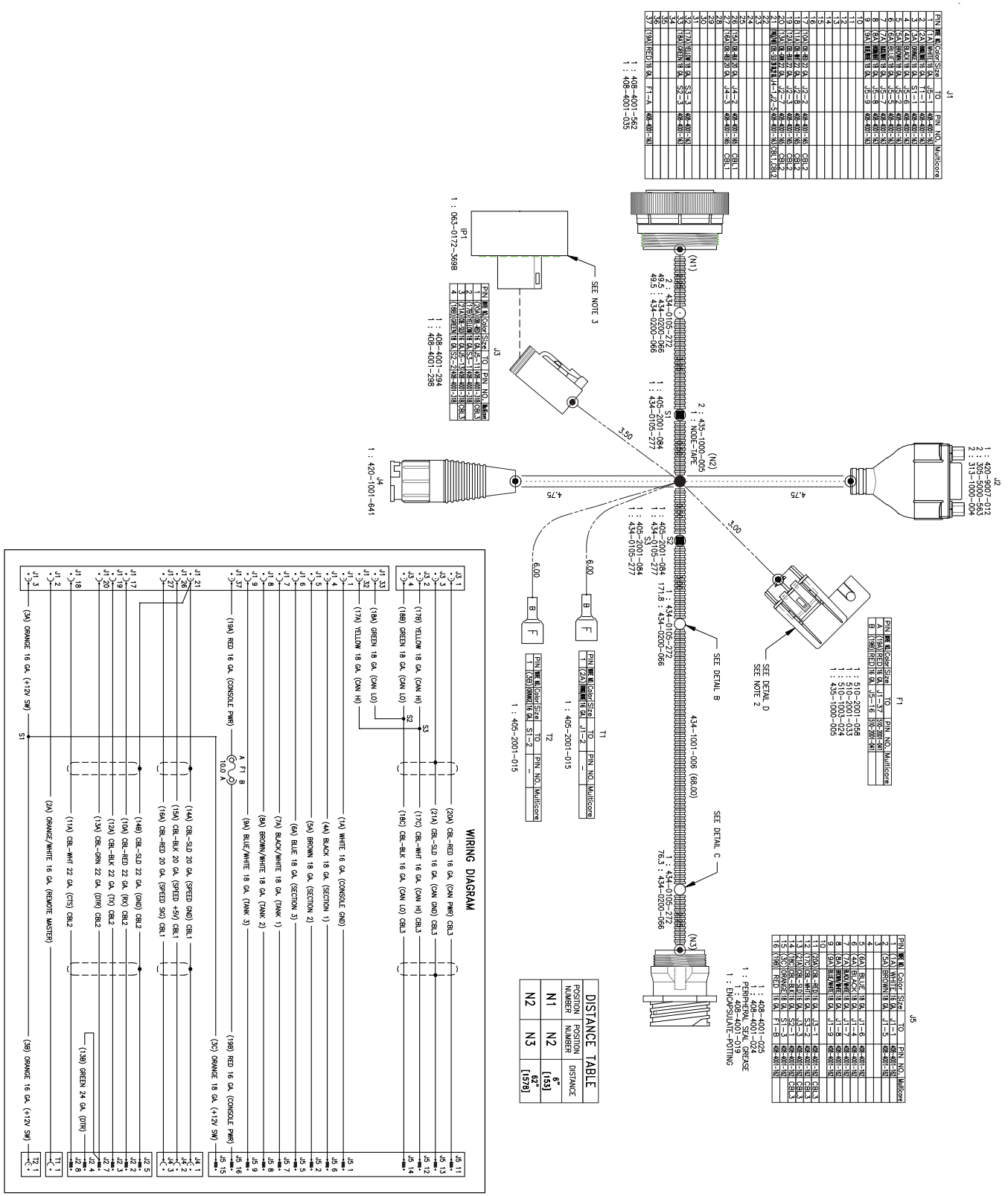


Wiring Diagram - Chassis/Tractor Cable

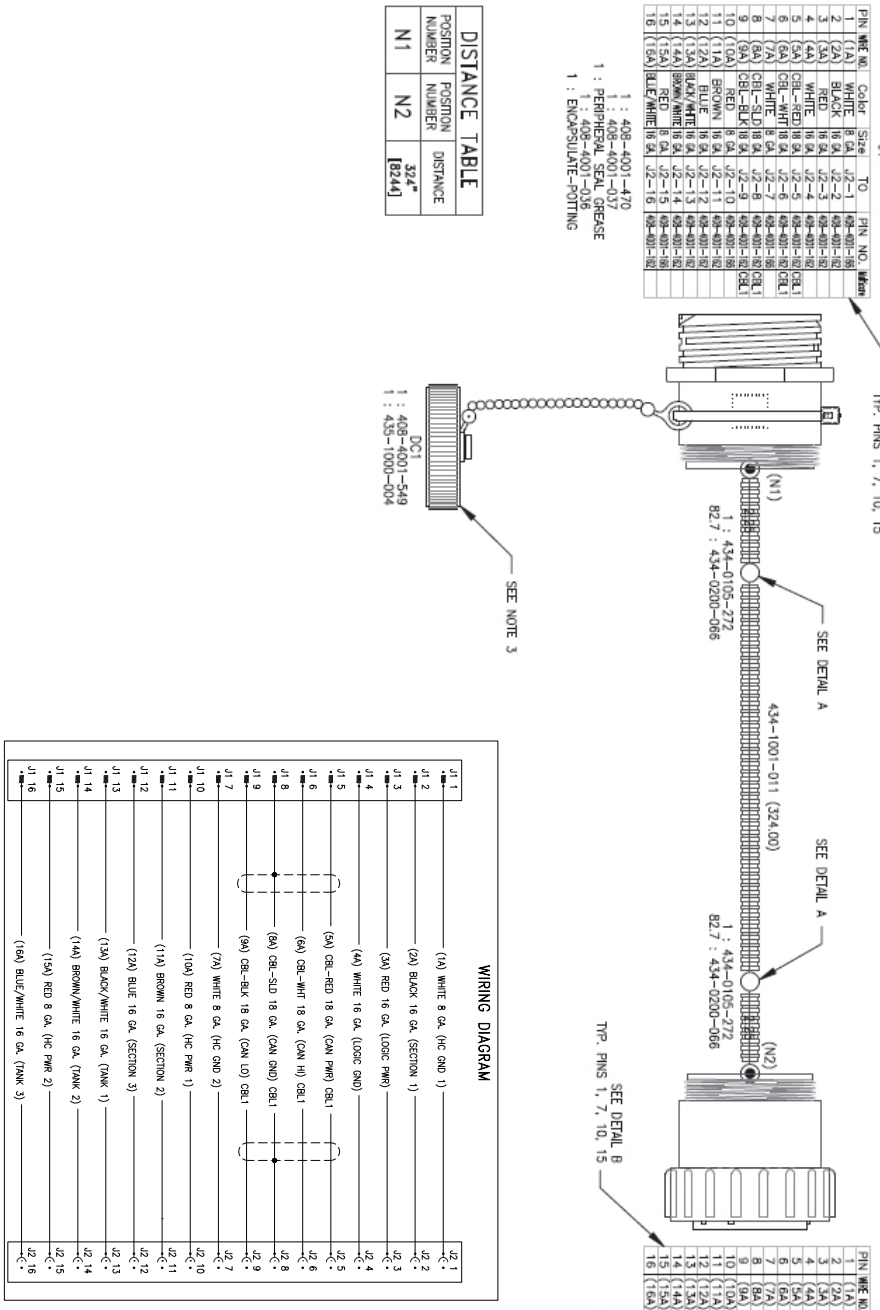




Wiring Diagram - Cab/Console Cable



Wiring Diagram - Sidearm Extension Cable



RAVEN SCS 4400 Console Settings

INTRODUCTION

1. This section is to ensure that the RAVEN SCS 4400 console unit is correctly calibrated for our Degelman OnePass. The image below shows the console.

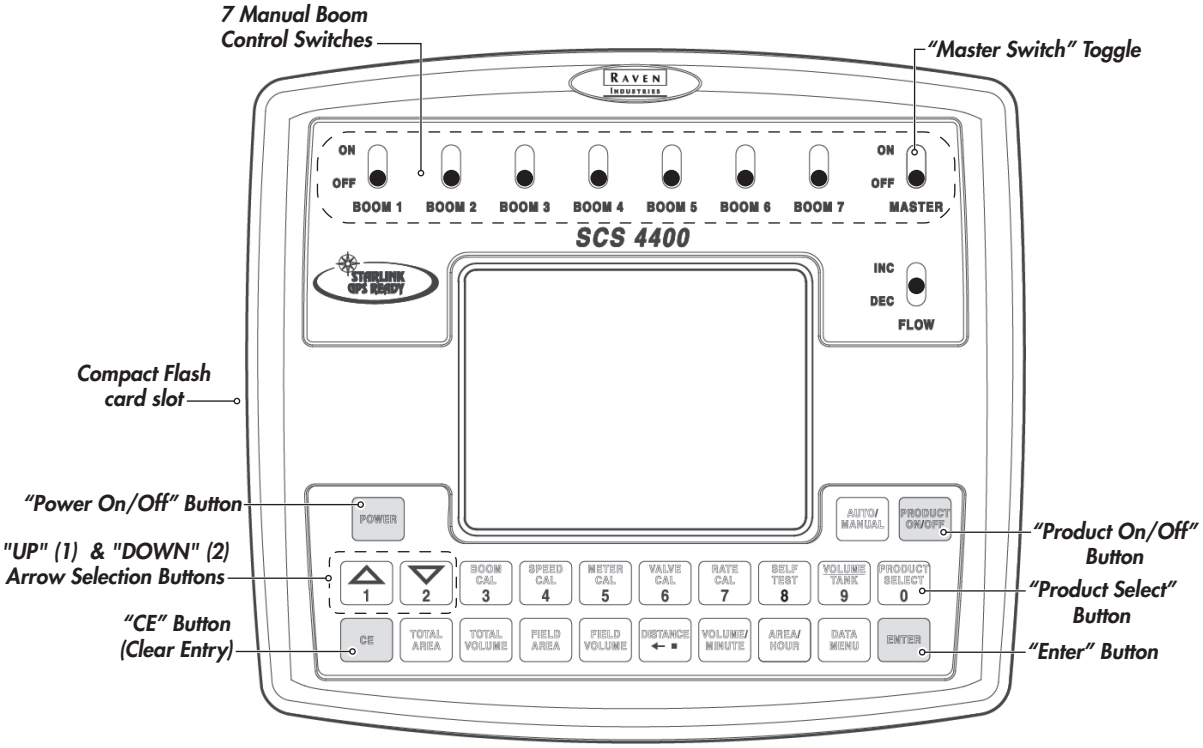
2. Once all the OnePass components are installed onto the Degelman cutter, it is time to calibrate the console unit.
3. Connect the end of the "Cab / Console Cable" coming into the cab to the Console Unit.
4. Once hooked up, push the power button on the Console Unit to turn it on. The screen will power on & display the main screen.

5. The image below shows general overview layout of the console unit and some of the components.

INSTALLING THE SCS CONSOLE

Refer to the following requirements when selecting a mounting location for the SCS console:

- The console is not weatherproof. Mount the console inside the machine cabin or drivers compartment within easy reach of the driver or operator.
- Secure the console to an existing post or monitor bar using the provided clamps. Once mounted, the console should not impede normal machine operation.
- The console should be mounted in a location where it will not be jarred during normal equipment operation. Keep the console clear of moving elements within the machine cabin.
- Keep cable routing in mind when selecting a mounting location to avoid tripping hazards or damage to the cable during normal operation.



RAVEN SCS 4400 Console Settings

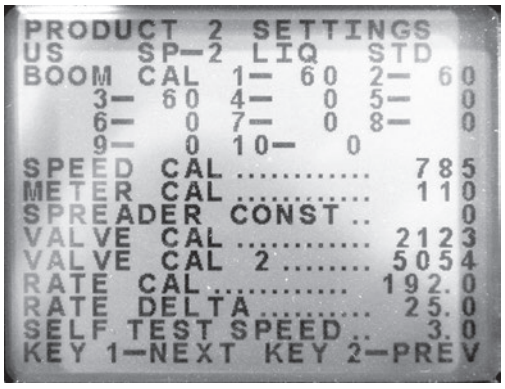
CONSOLE SETTINGS

SCREEN SHOTS - FOR REFERENCE ONLY

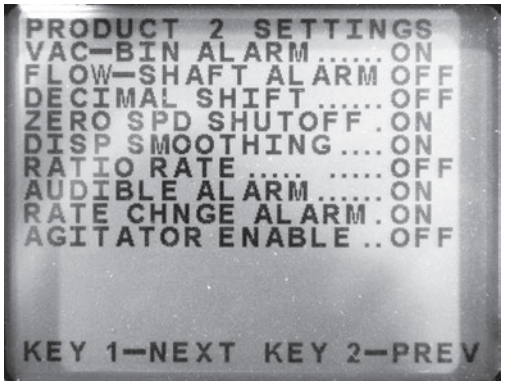
NOTE: *Settings could vary based on operators preference.*

This section is to ensure that the RAVEN SCS 4400 console unit is correctly calibrated for our Degelman OnePass. The image below shows the console.

1.



2.



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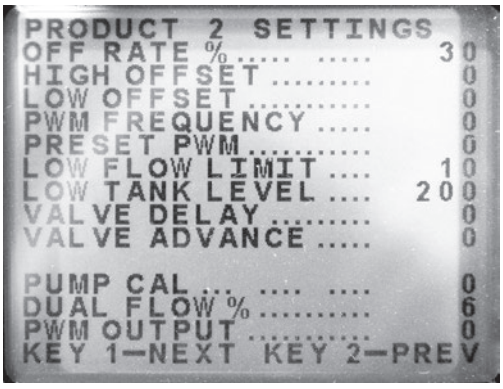

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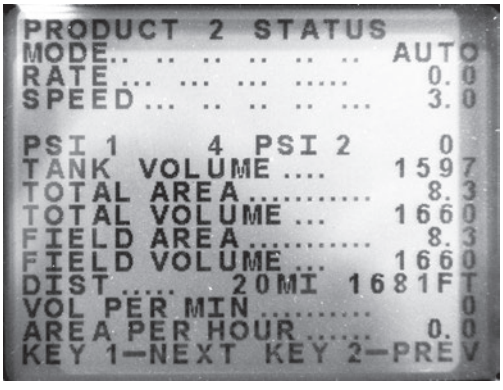
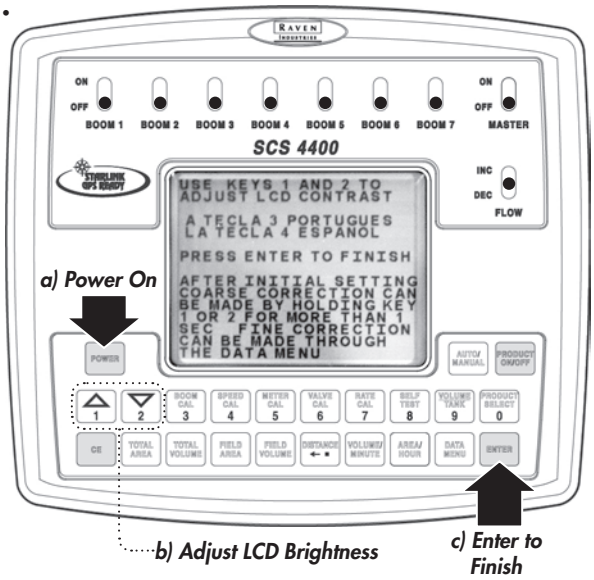


Calibration & Initial Console Programming

INTRODUCTION

1. This section is to ensure that the RAVEN SCS 4400 console unit is correctly calibrated for our Degelman OnePass. The image below shows the console.

1.



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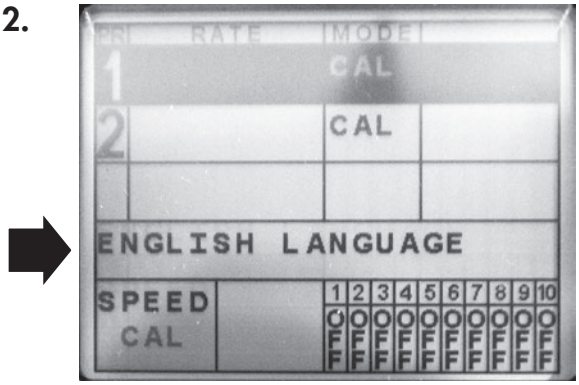

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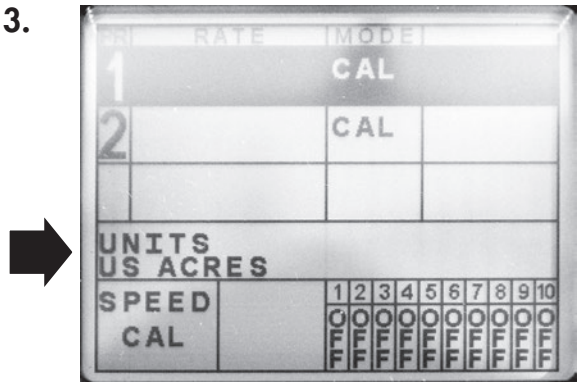

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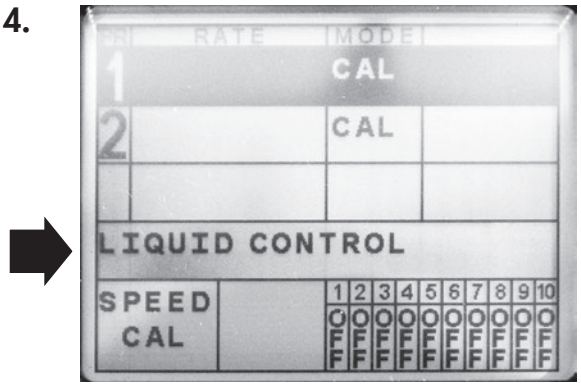

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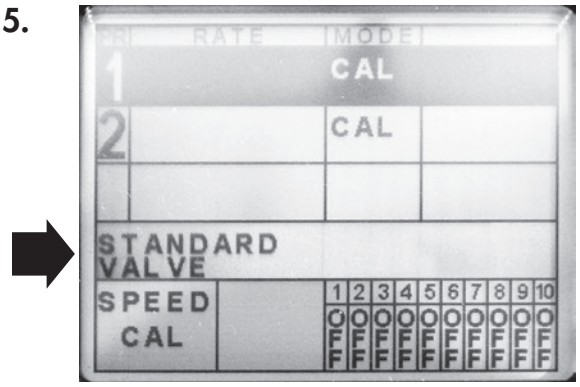

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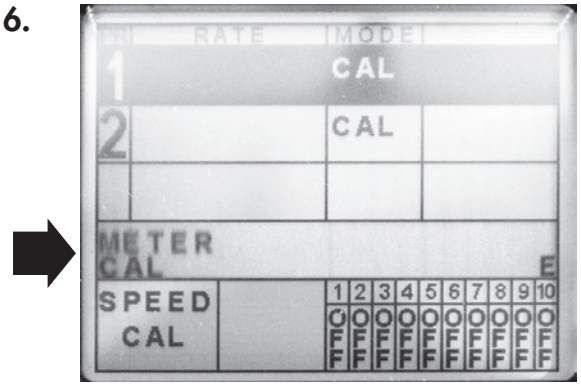

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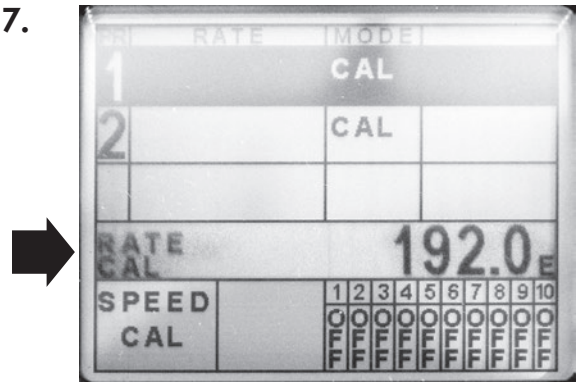

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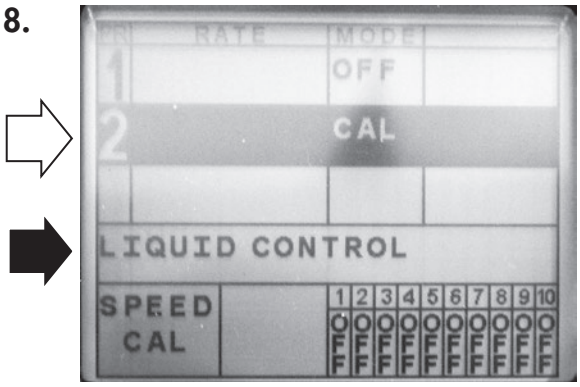

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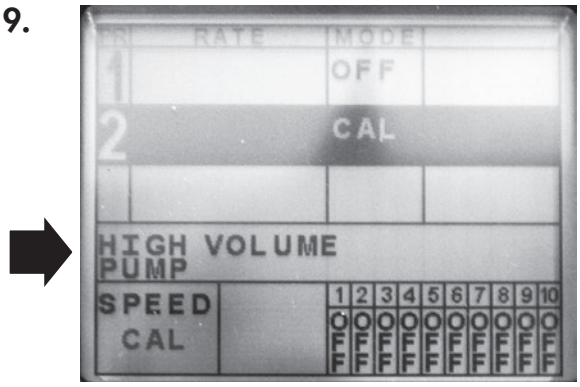

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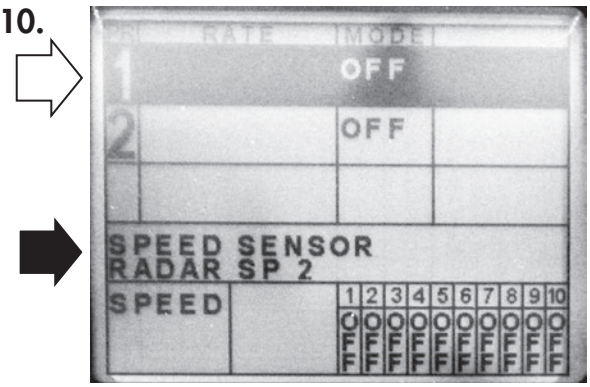

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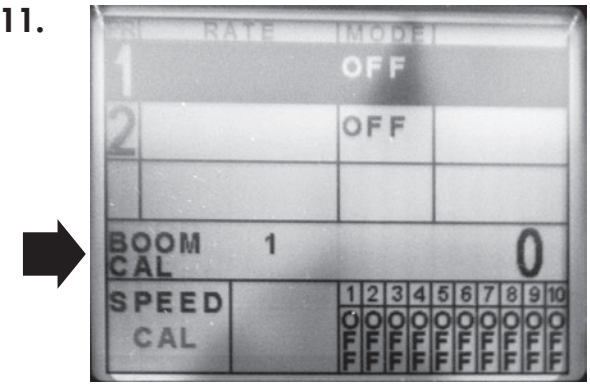

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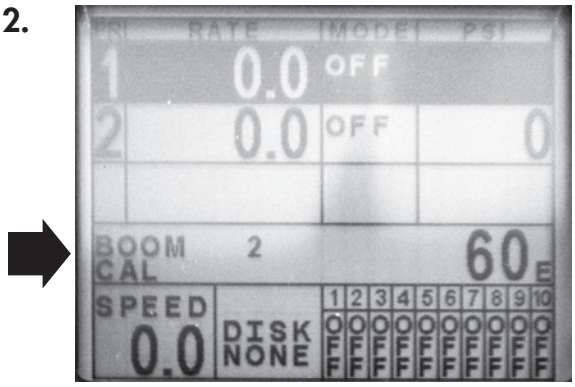

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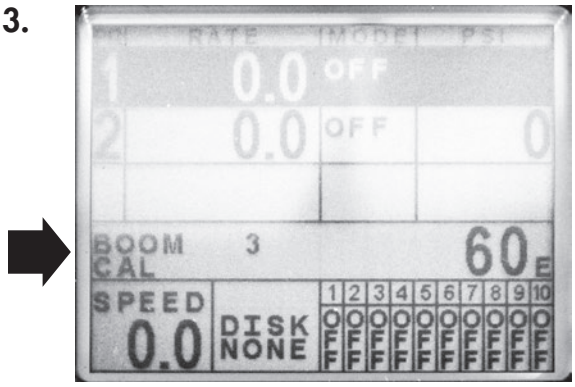

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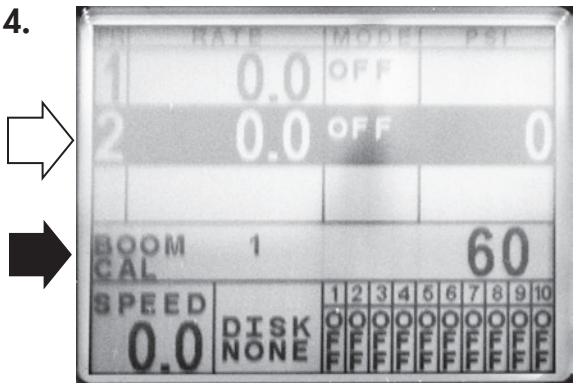
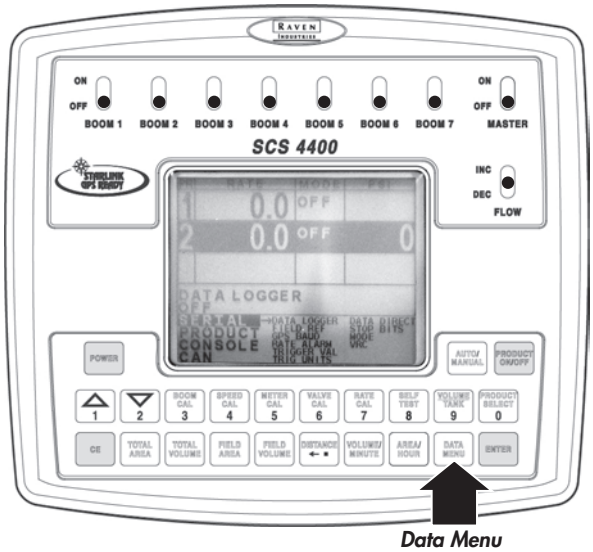


Console Programming - SERIAL Settings



Data Menu

DATA LOGGER OFF

SERIAL	→ DATA LOGGER	DATA DIRECT
PRODUCT	FIELD REF	STOP BITS
CONSOLE	GPS BAND	MODE
CAN	RATE ALARM	VRC
	TRIGGER VAL	
	TRIG UNITS	

FIELD REFERENCE 0

SERIAL	DATA LOGGER	DATA DIRECT
PRODUCT	→ FIELD REF	STOP BITS
CONSOLE	GPS BAND	MODE
CAN	RATE ALARM	VRC
	TRIGGER VAL	
	TRIG UNITS	

GPS BAUD 19200

SERIAL	DATA LOGGER	DATA DIRECT
PRODUCT	FIELD REF	STOP BITS
CONSOLE	→ GPS BAND	MODE
CAN	RATE ALARM	VRC
	TRIGGER VAL	
	TRIG UNITS	

VARIABLE RATE CHANGE ALARM ON

SERIAL	DATA LOGGER	DATA DIRECT
PRODUCT	FIELD REF	STOP BITS
CONSOLE	GPS BAND	MODE
CAN	→ RATE ALARM	VRC
	TRIGGER VAL	
	TRIG UNITS	

TRIGGER VALUE 1E

SERIAL	DATA LOGGER	DATA DIRECT
PRODUCT	FIELD REF	STOP BITS
CONSOLE	GPS BAND	MODE
CAN	RATE ALARM	VRC
	→ TRIGGER VAL	
	TRIG UNITS	

TRIGGER UNITS SECONDS

SERIAL	DATA LOGGER	DATA DIRECT
PRODUCT	FIELD REF	STOP BITS
CONSOLE	GPS BAND	MODE
CAN	RATE ALARM	VRC
	TRIGGER VAL	
	→ TRIG UNITS	

SAVE DATA TO CARD DATALOG VERSION D

SERIAL	DATA LOGGER	→ DATA DIRECT
PRODUCT	FIELD REF	STOP BITS
CONSOLE	GPS BAND	MODE
CAN	RATE ALARM	VRC
	TRIGGER VAL	
	TRIG UNITS	

SERIAL PORT COM 1 1 STOP BIT

SERIAL	DATA LOGGER	DATA DIRECT
PRODUCT	FIELD REF	→ STOP BITS
CONSOLE	GPS BAND	MODE
CAN	RATE ALARM	VRC
	TRIGGER VAL	
	TRIG UNITS	

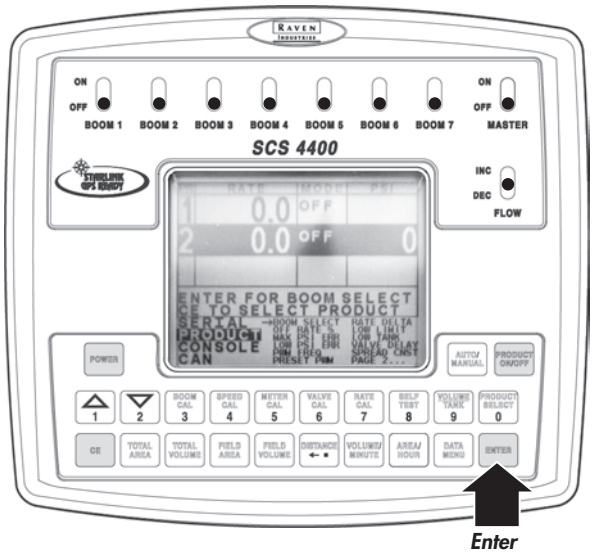
GPS AND CONSOLE DATA MASTER SW PAUSE LOG

SERIAL	DATA LOGGER	DATA DIRECT
PRODUCT	FIELD REF	STOP BITS
CONSOLE	GPS BAND	→ MODE
CAN	RATE ALARM	VRC
	TRIGGER VAL	
	TRIG UNITS	

VARIABLE RATE CONTROL ENABLED

SERIAL	DATA LOGGER	DATA DIRECT
PRODUCT	FIELD REF	STOP BITS
CONSOLE	GPS BAND	MODE
CAN	RATE ALARM	→ VRC
	TRIGGER VAL	
	TRIG UNITS	

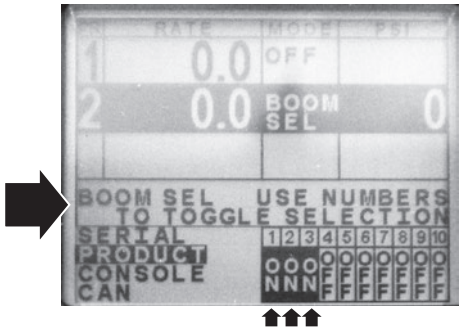
Console Programming - PRODUCT Settings (pg.1)



ENTER FOR BOOM SELECT
CE TO SELECT PRODUCT

SERIAL
PRODUCT
CONSOLE
CAN

→ BOOM SELECT	RATE DELTA
OFF RATE %	LOW LIMIT
MAX PSI ERR	LOW TANK
LOW PSI ERR	VALVE DELAY
PWM FREQ	SPREAD CNST
PRESET PWM	PAGE 2 . . .



OFF RATE PERCENT **30**

SERIAL
PRODUCT
CONSOLE
CAN

BOOM SELECT	RATE DELTA
→ OFF RATE %	LOW LIMIT
MAX PSI ERR	LOW TANK
LOW PSI ERR	VALVE DELAY
PWM FREQ	SPREAD CNST
PRESET PWM	PAGE 2 . . .

MAX PSI ALARM OFF

SERIAL
PRODUCT
CONSOLE
CAN

BOOM SELECT	RATE DELTA
OFF RATE %	LOW LIMIT
→ MAX PSI ERR	LOW TANK
LOW PSI ERR	VALVE DELAY
PWM FREQ	SPREAD CNST
PRESET PWM	PAGE 2 . . .

LOW PSI ALARM OFF

SERIAL
PRODUCT
CONSOLE
CAN

BOOM SELECT	RATE DELTA
OFF RATE %	LOW LIMIT
MAX PSI ERR	LOW TANK
→ LOW PSI ERR	VALVE DELAY
PWM FREQ	SPREAD CNST
PRESET PWM	PAGE 2 . . .

OPTION NOT APPLICABLE

SERIAL
PRODUCT
CONSOLE
CAN

BOOM SELECT	RATE DELTA
OFF RATE %	LOW LIMIT
MAX PSI ERR	LOW TANK
LOW PSI ERR	VALVE DELAY
→ PWM FREQ	SPREAD CNST
PRESET PWM	PAGE 2 . . .

OPTION NOT APPLICABLE

SERIAL
PRODUCT
CONSOLE
CAN

BOOM SELECT	RATE DELTA
OFF RATE %	LOW LIMIT
MAX PSI ERR	LOW TANK
LOW PSI ERR	VALVE DELAY
PWM FREQ	SPREAD CNST
→ PRESET PWM	PAGE 2 . . .

RATE BUMP DELTA **25.0E**

SERIAL
PRODUCT
CONSOLE
CAN

BOOM SELECT	→ RATE DELTA
OFF RATE %	LOW LIMIT
MAX PSI ERR	LOW TANK
LOW PSI ERR	VALVE DELAY
PWM FREQ	SPREAD CNST
PRESET PWM	PAGE 2 . . .

LOW FLOW LIMIT **0**

SERIAL
PRODUCT
CONSOLE
CAN

BOOM SELECT	RATE DELTA
OFF RATE %	→ LOW LIMIT
MAX PSI ERR	LOW TANK
LOW PSI ERR	VALVE DELAY
PWM FREQ	SPREAD CNST
PRESET PWM	PAGE 2 . . .

LOW TANK LIMIT **200**

SERIAL
PRODUCT
CONSOLE
CAN

BOOM SELECT	RATE DELTA
OFF RATE %	LOW LIMIT
MAX PSI ERR	→ LOW TANK
LOW PSI ERR	VALVE DELAY
PWM FREQ	SPREAD CNST
PRESET PWM	PAGE 2 . . .

VALVE DELAY **0**

SERIAL
PRODUCT
CONSOLE
CAN

BOOM SELECT	RATE DELTA
OFF RATE %	LOW LIMIT
MAX PSI ERR	LOW TANK
LOW PSI ERR	→ VALVE DELAY
PWM FREQ	SPREAD CNST
PRESET PWM	PAGE 2 . . .

SPREADER CONSTANT **0**

SERIAL
PRODUCT
CONSOLE
CAN

BOOM SELECT	RATE DELTA
OFF RATE %	LOW LIMIT
MAX PSI ERR	LOW TANK
LOW PSI ERR	VALVE DELAY
PWM FREQ	→ SPREAD CNST
PRESET PWM	PAGE 2 . . .

Console Programming - PRODUCT Settings (pg.2)

Enter

VALVE CAL 2 **5054**

SERIAL	. . . PAGE 1		PRESSURE
PRODUCT	→	VALVE CAL 2	PRESS 1 CAL
CONSOLE		PUMP CAL	PRESS 2 CAL
CAN		FER ERR CAL	AGITATOR EN
		VAC ALARM	VLV STATUS
		VLV ADVANCE	PAGE 1 . . .

PUMP RPM CAL **0**

SERIAL	. . . PAGE 1		PRESSURE
PRODUCT		VALVE CAL 2	PRESS 1 CAL
CONSOLE	→	PUMP CAL	PRESS 2 CAL
CAN		FER ERR CAL	AGITATOR EN
		VAC ALARM	VLV STATUS
		VLV ADVANCE	PAGE 1 . . .

VACUUM ALARM ON

SERIAL	. . . PAGE 1		PRESSURE
PRODUCT		VALVE CAL 2	PRESS 1 CAL
CONSOLE		PUMP CAL	PRESS 2 CAL
CAN	→	FER ERR CAL	AGITATOR EN
		VAC ALARM	VLV STATUS
		VLV ADVANCE	PAGE 1 . . .

VALVE ADVANCE **0**

SERIAL	. . . PAGE 1		PRESSURE
PRODUCT		VALVE CAL 2	PRESS 1 CAL
CONSOLE		PUMP CAL	PRESS 2 CAL
CAN		FER ERR CAL	AGITATOR EN
		VAC ALARM	VLV STATUS
	→	VLV ADVANCE	PAGE 1 . . .

PSI 1 **0** **PSI 2** **0**

SERIAL	. . . PAGE 1	→	PRESSURE
PRODUCT		VALVE CAL 2	PRESS 1 CAL
CONSOLE		PUMP CAL	PRESS 2 CAL
CAN		FER ERR CAL	AGITATOR EN
		VAC ALARM	VLV STATUS
		VLV ADVANCE	PAGE 1 . . .

ENTER PSI 1

SERIAL	. . . PAGE 1		PRESSURE
PRODUCT		VALVE CAL 2	→ PRESS 1 CAL
CONSOLE		PUMP CAL	PRESS 2 CAL
CAN		FER ERR CAL	AGITATOR EN
		VAC ALARM	VLV STATUS
		VLV ADVANCE	PAGE 1 . . .

ENTER PSI 2

SERIAL	. . . PAGE 1		PRESSURE
PRODUCT		VALVE CAL 2	PRESS 1 CAL
CONSOLE		PUMP CAL	→ PRESS 2 CAL
CAN		FER ERR CAL	AGITATOR EN
		VAC ALARM	VLV STATUS
		VLV ADVANCE	PAGE 1 . . .

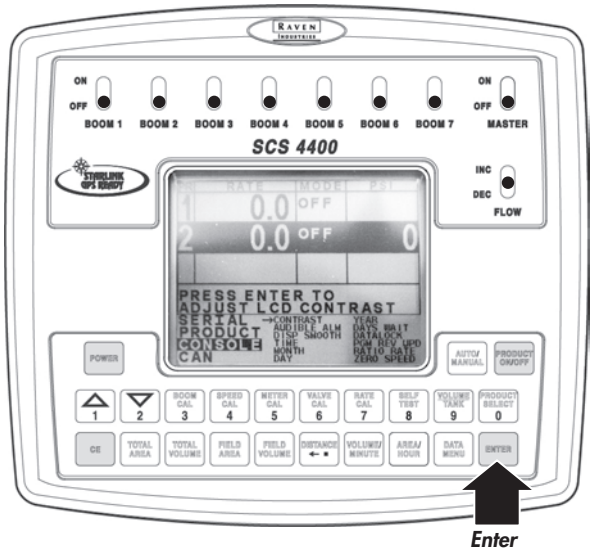
AGITATOR CONTROL OFF

SERIAL	. . . PAGE 1		PRESSURE
PRODUCT		VALVE CAL 2	PRESS 1 CAL
CONSOLE		PUMP CAL	PRESS 2 CAL
CAN		FER ERR CAL	→ AGITATOR EN
		VAC ALARM	VLV STATUS
		VLV ADVANCE	PAGE 1 . . .

VALVE IDLE

SERIAL	. . . PAGE 1		PRESSURE
PRODUCT		VALVE CAL 2	PRESS 1 CAL
CONSOLE		PUMP CAL	PRESS 2 CAL
CAN		FER ERR CAL	AGITATOR EN
		VAC ALARM	→ VLV STATUS
		VLV ADVANCE	PAGE 1 . . .

Console Programming - CONSOLE Settings



PRESS ENTER TO ADJUST LCD CONTRAST

SERIAL	→ CONTRAST		YEAR
PRODUCT		AUDIBLE ALM	DAYS WAIT
CONSOLE		DISP SMOOTH	DATALOCK
CAN		TIME	PGM REV UPD
		MONTH	RATIO RATE
		DAY	ZERO SPEED

AUDIBLE ALARM ON

SERIAL		CONTRAST	YEAR
PRODUCT	→	AUDIBLE ALM	DAYS WAIT
CONSOLE		DISP SMOOTH	DATALOCK
CAN		TIME	PGM REV UPD
		MONTH	RATIO RATE
		DAY	ZERO SPEED

DISPLAY SMOOTHING ON

SERIAL		CONTRAST	YEAR
PRODUCT		AUDIBLE ALM	DAYS WAIT
CONSOLE	→	DISP SMOOTH	DATALOCK
CAN		TIME	PGM REV UPD
		MONTH	RATIO RATE
		DAY	ZERO SPEED

TIME 16:30E

SERIAL		CONTRAST	YEAR
PRODUCT		AUDIBLE ALM	DAYS WAIT
CONSOLE	→	DISP SMOOTH	DATALOCK
CAN		TIME	PGM REV UPD
		MONTH	RATIO RATE
		DAY	ZERO SPEED

MONTH 7E

SERIAL		CONTRAST	YEAR
PRODUCT		AUDIBLE ALM	DAYS WAIT
CONSOLE		DISP SMOOTH	DATALOCK
CAN		TIME	PGM REV UPD
	→	MONTH	RATIO RATE
		DAY	ZERO SPEED

DAY 15

SERIAL		CONTRAST	YEAR
PRODUCT		AUDIBLE ALM	DAYS WAIT
CONSOLE		DISP SMOOTH	DATALOCK
CAN		TIME	PGM REV UPD
		MONTH	RATIO RATE
	→	DAY	ZERO SPEED

YEAR 18

SERIAL		CONTRAST	→ YEAR
PRODUCT		AUDIBLE ALM	DAYS WAIT
CONSOLE		DISP SMOOTH	DATALOCK
CAN		TIME	PGM REV UPD
		MONTH	RATIO RATE
		DAY	ZERO SPEED

POWERDOWN DAYS WAIT 10

SERIAL		CONTRAST	YEAR
PRODUCT	→	AUDIBLE ALM	DAYS WAIT
CONSOLE		DISP SMOOTH	DATALOCK
CAN		TIME	PGM REV UPD
		MONTH	RATIO RATE
		DAY	ZERO SPEED

PRESS ENTER TO DATALOCK

SERIAL		CONTRAST	YEAR
PRODUCT		AUDIBLE ALM	DAYS WAIT
CONSOLE	→	DISP SMOOTH	DATALOCK
CAN		TIME	PGM REV UPD
		MONTH	RATIO RATE
		DAY	ZERO SPEED

PGM 164 VER 1.90 PRESS ENTER TO UPDATE

SERIAL		CONTRAST	YEAR
PRODUCT		AUDIBLE ALM	DAYS WAIT
CONSOLE		DISP SMOOTH	DATALOCK
CAN	→	TIME	PGM REV UPD
		MONTH	RATIO RATE
		DAY	ZERO SPEED

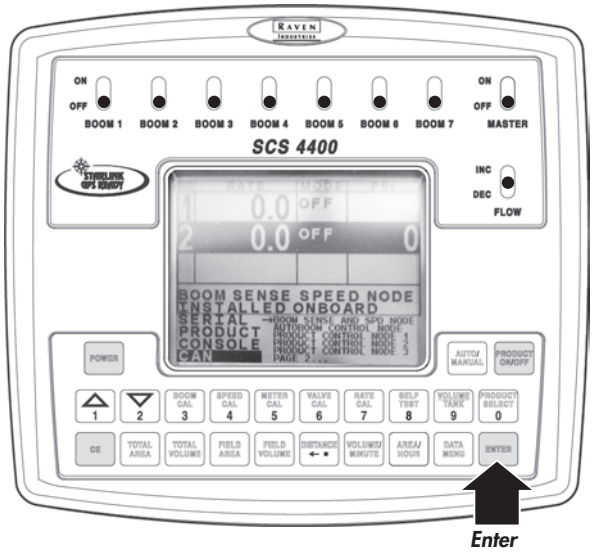
RATIO RATE MODE OFF

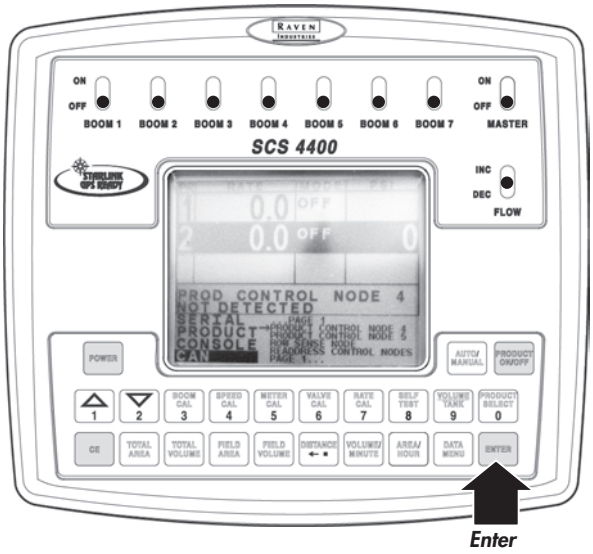
SERIAL		CONTRAST	YEAR
PRODUCT		AUDIBLE ALM	DAYS WAIT
CONSOLE		DISP SMOOTH	DATALOCK
CAN		TIME	PGM REV UPD
	→	MONTH	RATIO RATE
		DAY	ZERO SPEED

ZERO SPEED SHUTOFF ON

SERIAL		CONTRAST	YEAR
PRODUCT		AUDIBLE ALM	DAYS WAIT
CONSOLE		DISP SMOOTH	DATALOCK
CAN		TIME	PGM REV UPD
		MONTH	RATIO RATE
	→	DAY	ZERO SPEED

Console Programming - CAN Settings (pg.1 & 2)





BOOM SENSE SPEED NODE INSTALLED ONBOARD

SERIAL
PRODUCT
CONSOLE
CAN

→BOOM SENSE AND SPD NODE
AUTOBOOM CONTROL NODE
PRODUCT CONTROL NODE 1
PRODUCT CONTROL NODE 2
PRODUCT CONTROL NODE 3
PAGE 2...

AUTOBOOM CONTROL NODE NOT DETECTED

SERIAL
PRODUCT
CONSOLE
CAN

BOOM SENSE AND SPD NODE
→AUTOBOOM CONTROL NODE
PRODUCT CONTROL NODE 1
PRODUCT CONTROL NODE 2
PRODUCT CONTROL NODE 3
PAGE 2...

PROD CONTROL NODE 1 INSTALLED ONBOARD

SERIAL
PRODUCT
CONSOLE
CAN

BOOM SENSE AND SPD NODE
AUTOBOOM CONTROL NODE
→PRODUCT CONTROL NODE 1
PRODUCT CONTROL NODE 2
PRODUCT CONTROL NODE 3
PAGE 2...

PROD CONTROL NODE 2 PGM 271 VER 1.12

SERIAL
PRODUCT
CONSOLE
CAN

BOOM SENSE AND SPD NODE
AUTOBOOM CONTROL NODE
PRODUCT CONTROL NODE 1
→PRODUCT CONTROL NODE 2
PRODUCT CONTROL NODE 3
PAGE 2...

PROD CONTROL NODE 3 NOT DETECTED

SERIAL
PRODUCT
CONSOLE
CAN

BOOM SENSE AND SPD NODE
AUTOBOOM CONTROL NODE
PRODUCT CONTROL NODE 1
PRODUCT CONTROL NODE 2
→PRODUCT CONTROL NODE 3
PAGE 2...

PROD CONTROL NODE 4 NOT DETECTED

SERIAL
PRODUCT
CONSOLE
CAN

→...PAGE 1
PRODUCT CONTROL NODE 4
PRODUCT CONTROL NODE 5
ROW SENSE NODE
READDRESS CONTROL NODES
PAGE 1...

PROD CONTROL NODE 4 NOT DETECTED

SERIAL
PRODUCT
CONSOLE
CAN

...PAGE 1
→PRODUCT CONTROL NODE 4
PRODUCT CONTROL NODE 5
ROW SENSE NODE
READDRESS CONTROL NODES
PAGE 1...

PROD CONTROL NODE 5 NOT DETECTED

SERIAL
PRODUCT
CONSOLE
CAN

...PAGE 1
PRODUCT CONTROL NODE 4
→PRODUCT CONTROL NODE 5
ROW SENSE NODE
READDRESS CONTROL NODES
PAGE 1...

ROW SENSE NODE NOT DETECTED

SERIAL
PRODUCT
CONSOLE
CAN

...PAGE 1
PRODUCT CONTROL NODE 4
PRODUCT CONTROL NODE 5
→ROW SENSE NODE
READDRESS CONTROL NODES
PAGE 1...

PRESS ENTER TO READDRESS PROD NODES

SERIAL
PRODUCT
CONSOLE
CAN

...PAGE 1
PRODUCT CONTROL NODE 4
PRODUCT CONTROL NODE 5
ROW SENSE NODE
→READDRESS CONTROL NODES
PAGE 1...

2 Year

Limited Warranty - Agricultural Products

Degelman Industries LP ("Degelman") warrants to the original purchaser of any new Degelman equipment, purchased from an authorized Degelman dealer, that the equipment will be free from defects in material and workmanship for a period of two (2) years from the date of delivery, for non-commercial use (including farm, institutional, government, and municipality) and (1) year from the date of delivery for commercial use. The obligation of Degelman to the purchaser under this warranty is limited to the repair or replacement of defective parts in the first year and to the provision, but not the installation of replacement parts in the second year. Degelman reserves the right to inspect any equipment or parts which are claimed to have been defective in material or workmanship.

This warranty limits its replacement or repair coverage to what is consistent with the warranty of Degelman's suppliers of purchased components.

Replacement or repair parts installed in the equipment covered by this limited warranty are warranted for ninety (90) days from the date of delivery of such part or the expiration of the applicable new equipment warranty period, which ever occurs later. Warranted parts shall be provided at no cost to the user at an authorized Degelman dealer during regular working hours. Warranted replacement parts will either be replaced or rebuilt at Degelman's discretion.

Disclaimer of implied warranties & consequential damages

This warranty shall not be interpreted to render Degelman Industries LP liable for injury, death, property damage or damages of any kind, whether direct, consequential, or contingent to property. Without limiting the generality of the foregoing, Degelman shall not be liable for damages resulting from any cause beyond its reasonable control, including, without limitation, loss of crops, any expense or loss of labour, supplies, rental machinery or loss of use.

No other warranty of any kind whatsoever, express or implied is made with respect to this sale; and all implied warranties of merchantability and fitness for a particular purpose which exceed the obligations set forth in this written warranty are hereby disclaimed and excluded from this sale. This exclusion shall not apply in any jurisdiction where it is not permitted by law.

This limited warranty shall not apply:

1. If, in the sole opinion of Degelman, the unit has been subjected to misapplication, abuse, misuse, negligence accident or incorrect off-site machine set-up.
2. To any goods that have sustained damage or deterioration attributable to a lack of routine maintenance (eg. Check and Re-torque of fastening hardware, Hydraulic fluid purities, drive train alignments, and clutch operation)
3. If parts not made or supplied by Degelman have been used in the connection with the unit, if, in the sole judgement of Degelman such use affects its performance, safety, stability or reliability.
4. If the unit has been altered or repaired outside of an authorized Degelman dealership in a manner which, in the sole judgement of Degelman, affects its performance, safety, stability or reliability.
5. To expendable or wear items such as (eg. Harrow tines, Rock Picker and Rock Rake wear teeth and replaceable bushings and pins.) and any other items that in the company's sole judgement are a wear item.

No employee or representative of Degelman Industries LP is authorized to change this limited warranty in any way or grant any other warranty unless such change is made in writing and signed by the Degelman Service Manager.

This limited warranty is subject to any future availability of supply, which may directly affect Degelman's ability to obtain materials or manufacture replacement parts.

Degelman reserves the right to make improvements in design or changes in specifications at any time, without incurring obligations to owners of equipment previously delivered.

This limited warranty is subject to compliance by the customer to the enclosed *Retail Customer's Responsibility Under Degelman Warranty.*

Warranty

Retail Customer's Responsibility Under Degelman Warranty.

It is the retail customer and/or Operator's responsibility to read the Operator's Manual, to operate, lubricate, maintain and store the equipment in accordance with all instructions and safety procedures. Failure of the operator to read the operators manual is a misuse of this equipment.

It is the retail customer and/or operators responsibility to inspect the product and to have any part(s) repaired or replaced when continued operation would cause damage or excessive wear to other parts or cause safety hazard.

It is the retail customer's responsibility to deliver the product to the authorized Degelman dealer, from whom he purchased it, for service or replacement of defective parts, which are covered by warranty. Repairs to be submitted for warranty consideration must be made within forty-five days of failure.

It is the Retail Customer's responsibility for any cost incurred by the dealer for hauling of the product for the purpose of performing a warranty obligation or inspection.

WARRANTY INFORMATION

Make certain the warranty registration card has been forwarded to:

Degelman Industries LP
Box 830 -272 Industrial Dr.
Regina, SK, Canada
S4P 3B1

Always give your dealer the serial number of your Degelman product when ordering parts or requesting service or other information.

The serial number is located on the machine as shown in the diagram below. In the space provided record the model number, the serial number and the date of purchase to assist your dealer in providing you with prompt and efficient service.

SERIAL NUMBER: _____

MODEL NUMBER: _____

DATE OF PURCHASE: _____