

R A V E N

SmarTrax™ Installation Manual



**John Deere 8R-Series - Steering Ready
Model Year 2009-2010**

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CHAPTER

1

Important Safety Information

NOTICE

Read this manual and the operation and safety instructions included with your implement and/or controller carefully before installing the SmarTrax™ system.

- Follow all safety information presented within this manual.
- If you require assistance with any portion of the installation or service of your Raven equipment, contact your local Raven dealer for support.
- Follow all safety labels affixed to the SmarTrax system components. Be sure to keep safety labels in good condition and replace any missing or damaged labels. To obtain replacements for missing or damaged safety labels, contact your local Raven dealer.

When operating the machine after installing SmarTrax, observe the following safety measures:

- Be alert and aware of surroundings.
- Do not operate SmarTrax or any agricultural equipment while under the influence of alcohol or an illegal substance.
- Remain in the operator's position in the machine at all times when SmarTrax is engaged.
- Disable SmarTrax when exiting the operator's seat and machine.
- Do not drive the machine with SmarTrax enabled on any public road.
- Determine and remain a safe working distance from other individuals. The operator is responsible for disabling SmarTrax when the safe working distance has diminished.
- Ensure SmarTrax is disabled prior to starting any maintenance work on SmarTrax or the machine.

WARNING

- When starting the machine for the first time after installing SmarTrax, be sure that all persons stand clear in case a hose has not been properly tightened.
- The machine must remain stationary and switched off during SmarTrax installation or maintenance.

 **CAUTION**

Hydraulic Safety

- Raven Industries recommends that appropriate protective equipment be worn at all times when working on the hydraulic system.
- Never attempt to open or work on a hydraulic system with the equipment running. Care should always be taken when opening a system that has been previously pressurized.
- When disconnecting the hydraulic hoses or purging is required, be aware that the hydraulic fluid may be extremely hot and under high pressure. Caution must be exercised.
- Any work performed on the hydraulic system must be done in accordance with the machine manufacturer's approved maintenance instructions.
- When installing SmarTrax hydraulics or performing diagnostics, maintenance, or routine service, ensure that precautions are taken to prevent any foreign material or contaminants from being introduced into the machine's hydraulic system. Objects or materials that are able to bypass the machine's hydraulic filtration system will reduce performance and possibly damage the SmarTrax valve.

Electrical Safety

- Always verify that the power leads are connected to the correct polarity as marked. Reversing the power leads could cause severe damage to the equipment.
- Ensure that the power cable is the last cable to be connected.

CHAPTER

2

Introduction

Congratulations on your purchase of the SmarTrax system! This system is designed to provide cutting-edge, hands-free steering of the machine via Global Positioning System (GPS) coordinates.

This manual applies to the following machines:

MAKE: John Deere

MODEL: 8225R, 8245R, 8270R, 8295R, 8320R and 8345R - Steering Ready

YEAR: 2009-2010

FIGURE 1. John Deere 8225R



Preparing for Installation

Before installing the SmarTrax system, park the machine where the ground is level, clean, and dry. Turn off the machine and leave it turned off for the duration of the installation process. Bleed pressure from the hydraulic system by loosening the hydraulic fittings slowly, where applicable.

During the installation process, follow good safety practices. Be sure to carefully read the instructions in this manual as you complete the installation process.

Recommendations

Raven Industries recommends the following best practices when installing or operating the SmarTrax system for the first time, at the start of the season, or when moving the SmarTrax system to another machine:

- Install the GPS antenna as close to the rear axle as possible on the roof of the machine's cab.
- Ensure the machine's hydraulic filters have been recently changed and there are no issues with the machine's hydraulic system (e.g., pump issues, faulty hydraulic motors, fine metal deposits in the hydraulic hoses, etc.).
- Ensure the machine's hydraulic system is using fresh oil and debris is flushed from the hydraulic hoses, valves, and filters.

Raven Industries recommends the following best practices when installing the SmarTrax system:

- Use part numbers to identify the parts.
- Do not remove the plastic wrap from a part until it is necessary for installation.
- Do not remove plastic caps from a part until it is necessary for installation.

Point of Reference

The instructions in this manual assume that you are standing behind the machine, looking toward the cab.

Updates

Software and manual updates are available on the Raven Applied Technology website:

<http://www.ravenhelp.com>

At Raven Industries, we strive to make your experience with our products as rewarding as possible. One way to improve this experience is to provide us with feedback on this manual.

Your feedback will help shape the future of our product documentation and the overall service we provide. We appreciate the opportunity to see ourselves as our customers see us and are eager to gather ideas on how we have been helping or how we can do better.

To serve you best, please send an email with the following information to

techwriting@ravenind.com

-John Deere 8R-Series - Steering Ready (Model Year 2009-2010) SmarTrax™ Installation Manual

-Manual No. 016-5034-013 Rev. B

-Any comments or feedback (include chapter or page numbers if applicable).

-Let us know how long have you been using this or other Raven products.

We will not share your email or any information you provide with anyone else. Your feedback is valued and extremely important to us.

Thank you for your time.




Kit Contents

This section contains a list of the components that are included in the SmarTrax kit. Before beginning the SmarTrax installation, compare the items in the kit with the components on this list. If you have questions about the kit, contact your Raven dealer.

TABLE 1. SmarTrax Installation Kit (P/N 117-5034-013)

Picture	Item Description	Part Number	Qty.
Not Pictured	Manual - SmarTrax and SmartSteer Calibration & Operation	016-0171-277	1
Not Pictured	Manual - John Deere 8R-Series (Model Year 2009-2010) SmarTrax Installation	016-5034-013	1
	Node - SmarTrax RTK	063-0173-228	1
	Bracket - Node Mounting	107-0172-055	1
	Cable - Node Harness	115-4001-087	1
	Cable - Valve Harness	115-4001-156	1
	Assembly - Enable Foot Switch	063-0172-470	1
	Terminator - Encoder	063-4001-003	2
	Terminator - Flow Meter	063-4001-007	1

TABLE 1. SmarTrax Installation Kit (P/N 117-5034-013)

Picture	Item Description	Part Number	Qty.
	Terminator - John Deere 8R-Series Wheel Angle Sensor (WAS)	063-4001-006	1
	Tape - 3.5" Double-Sided	332-0000-019	6
	Nut - 3/8"-16 Nylon Insert Lock	312-4001-109	3

Install the SmarTrax Node

Mount the SmarTrax Node

FIGURE 1. SmarTrax Node Installed

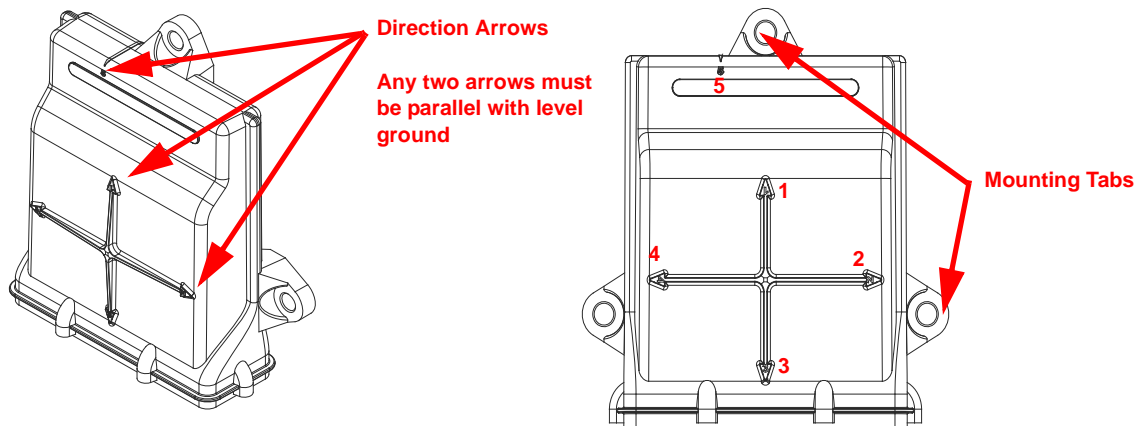


1. Mount the SmarTrax node (P/N 063-0173-228) on the node mounting bracket (P/N 107-0172-055) using three 3/8"-16 nylon insert lock nuts (P/N 312-4001-109).
2. Insert the two large, rectangular connectors of the node harness (P/N 115-4001-087) into the correct ports of the node.
3. Tighten the bolts on the harness connectors to secure the connections.
4. Lift the floor mat along the left side of the operator's seat.
5. Place six double-sided tape strips (P/N 332-0000-019) on the bottom of the node mounting bracket.
6. Remove the backing from the double-sided tape and adhere the node to the cab floor near the back-left corner of the operator's seat.

Note: *Position the node so that the connectors point forward.*

Node Mounting Locations

FIGURE 2. Node Mounting



When choosing the location for the SmarTrax node, consider the following points:

- Mount the SmarTrax node inside the machine's cab on a flat, level surface for proper performance and cable connection.
- One of the six numbered direction arrows on the node must be oriented in the direction of forward vehicle travel, one arrow pointing straight up, and two of the arrows parallel to the ground.

Note: Make a note of the number of the arrow that is oriented in the direction of forward vehicle travel. This number will be needed during the SmarTrax calibration process.

- The node mounting location must not create tripping hazards.
- Mount the node in a location where it will not be kicked or jarred during normal equipment operation.
- The location must allow cable routing to avoid crimping or damaging the cables or the node connections.
- Securely fasten the node using bolts or screws through at least two of the three mounting holes. When mounted properly, the node should not become loose or rotate.

Connect to the Steering Wheel Encoder

FIGURE 3. Steering Column Shroud Removed



1. Remove the shroud surrounding the steering column.

FIGURE 4. Encoder Connections



2. Locate and disconnect the machine's two encoder connections.
3. Route the STEERING WHEEL ENCODER connector from the node harness (P/N 115-4001-087) into one of the machine's mating encoder connectors.

Note: The machine's remaining encoder connector will not be used in the SmarTrax system.

FIGURE 5. Encoder Terminator



4. Install the two encoder terminators (P/N 063-4001-003) on the machine's cables that were disconnected from the encoder.

Install the Foot Switch

FIGURE 6. Foot Switch Installed



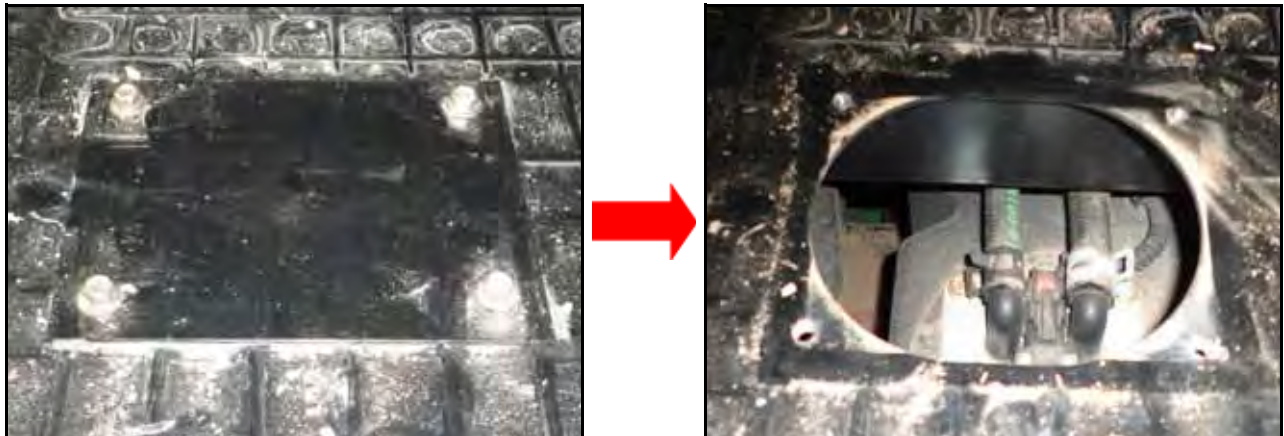
1. Select a suitable location for the foot switch (P/N 063-0172-470) to be installed.

Note: *The foot switch should be installed in a location where the operator has easy access to it and is able to fully press the pedal.*

2. Using the holes in the foot switch as a template, drill holes in the floor of the cab.
3. Secure the foot switch to the floor by installing the supplied screws in each of the mounting holes.
4. Locate the ENABLE connector on the node harness (P/N 115-4001-087) and connect it to the foot switch cable connector.

Install the Valve Harness

FIGURE 7. Cab Floor Access Plate Removed



1. Lift the floor mat just inside the door.
2. Remove the cab floor access plate.
3. Cut a notch (approximately 1" x 1") into the cab floor access plate.
4. From outside the cab, route the 12-pin connector of the valve harness (P/N 115-4001-156) into the cab through the access hole in the floor.
5. Connect the 12-pin connector to the mating connector on the node harness (P/N 115-4001-087).

FIGURE 8. Machine's Existing Steering Valve Connection



6. Disconnect the machine's existing cable connection from the steering valve located in the front of the cab.
7. Connect the VALVE connector on the valve harness to the open port of the steering valve.

FIGURE 9. Machine's Configuration

Wheel Angle Sensor Connection



Flow Meter



8. Determine whether the machine has a wheel angle sensor (WAS) or a flow meter installed.
 - **WAS** - Trace the WAS cable from the front-left kingpin. Locate and disconnect the 8-pin WAS connection on the left side of the tractor, then connect the WHEEL ANGLE SENSOR connector on the valve harness to the machine's WAS connector. Install the WAS terminator (P/N 063-4001-006) on the machine's remaining cable end.

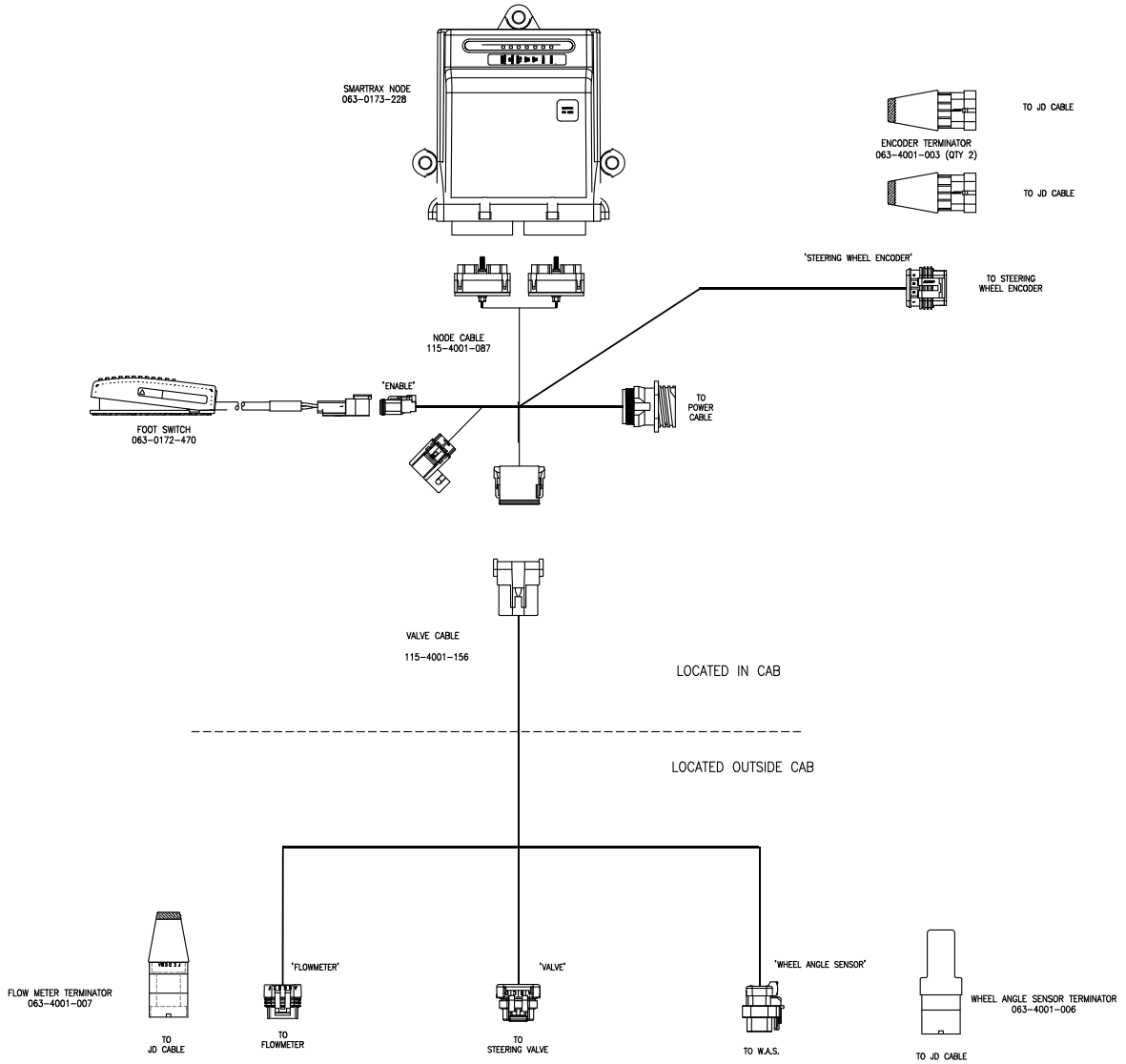
Note: *If the machine contains a WAS, the FLOWMETER connector on the valve harness will not be used.*

- **Flow Meter** - Locate and disconnect the machine's flow meter connection on the left side of the tractor. Plug the FLOWMETER connector of the valve harness into the flow meter. Install the flowmeter terminator (P/N 063-4001-007) on the machine's disconnected flowmeter cable.

Note: *If the machine contains a flow meter, the WHEEL ANGLE SENSOR connector on the valve harness will not be used.*

9. Sliding the valve harness into the notch, reinstall the cab floor access plate.

FIGURE 10. Valve Harness Wiring Diagram



Install the Chassis Cable - SmarTrax-Only Systems (If Applicable)

If the machine does not contain an existing chassis power system (such as AutoBoom, product control, etc.), it is necessary to install the chassis power cable to operate the SmarTrax system. If a CAN system already exists on the machine, refer to *Connect SmarTrax to an Existing Chassis Cable (If Applicable)* below to connect power to the SmarTrax system.

Note: *The chassis cable is sold separately. Contact your local Raven dealer for ordering information.*

1. Locate the SmarTrax chassis cable (P/N 115-4001-085).
2. Connect the TO SMARTRAX NODE connector from the chassis cable to the round 16-pin connector on the node harness (P/N 115-4001-087).
3. Connect the TO CONSOLE CABLE connector to the Raven console cable.
4. Install a terminator (P/N 063-0172-369) on the CAN cable connector.
5. Loop and tie-off the REMOTE SWITCH cable connection, securing it with plastic cable ties as necessary.

Note: *The REMOTE SWITCH connector is not used in the SmarTrax system. Ensure the cable is secured away from moving parts and heat sources.*

6. Connect the ring terminals to the battery.

Note: *The positive connectors are fused.*

Connect SmarTrax to an Existing Chassis Cable (If Applicable)

Note: *The SmarTrax interface tee is sold separately. Contact your local Raven dealer for ordering information.*

1. Locate and disconnect the connection between the Raven console cable and chassis cable on the machine's existing CAN system.
2. Install the SmarTrax interface tee cable (P/N 115-4001-070 or 115-4001-071) between the chassis and Raven console harness.
3. Connect the SmarTrax node harness (P/N 115-4001-087) to the remaining SmarTrax interface tee.

System Diagrams

FIGURE 11. Existing Chassis System Wiring Diagram

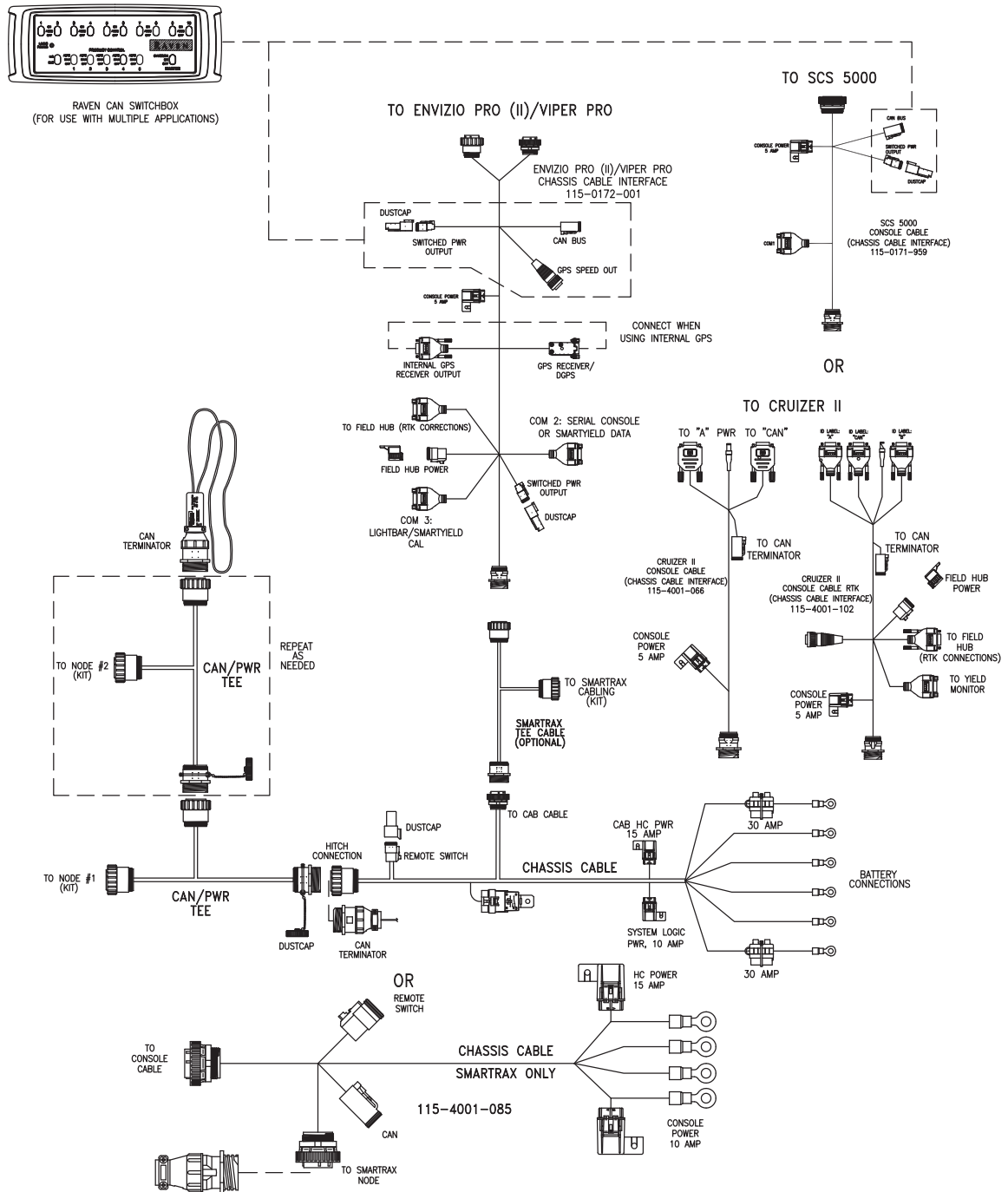


FIGURE 13. Envizio Pro/Viper Pro SmarTrax with Slingshot

ENVIZIO PRO/VIPER PRO SMARTRAX W/SLINGSHOT

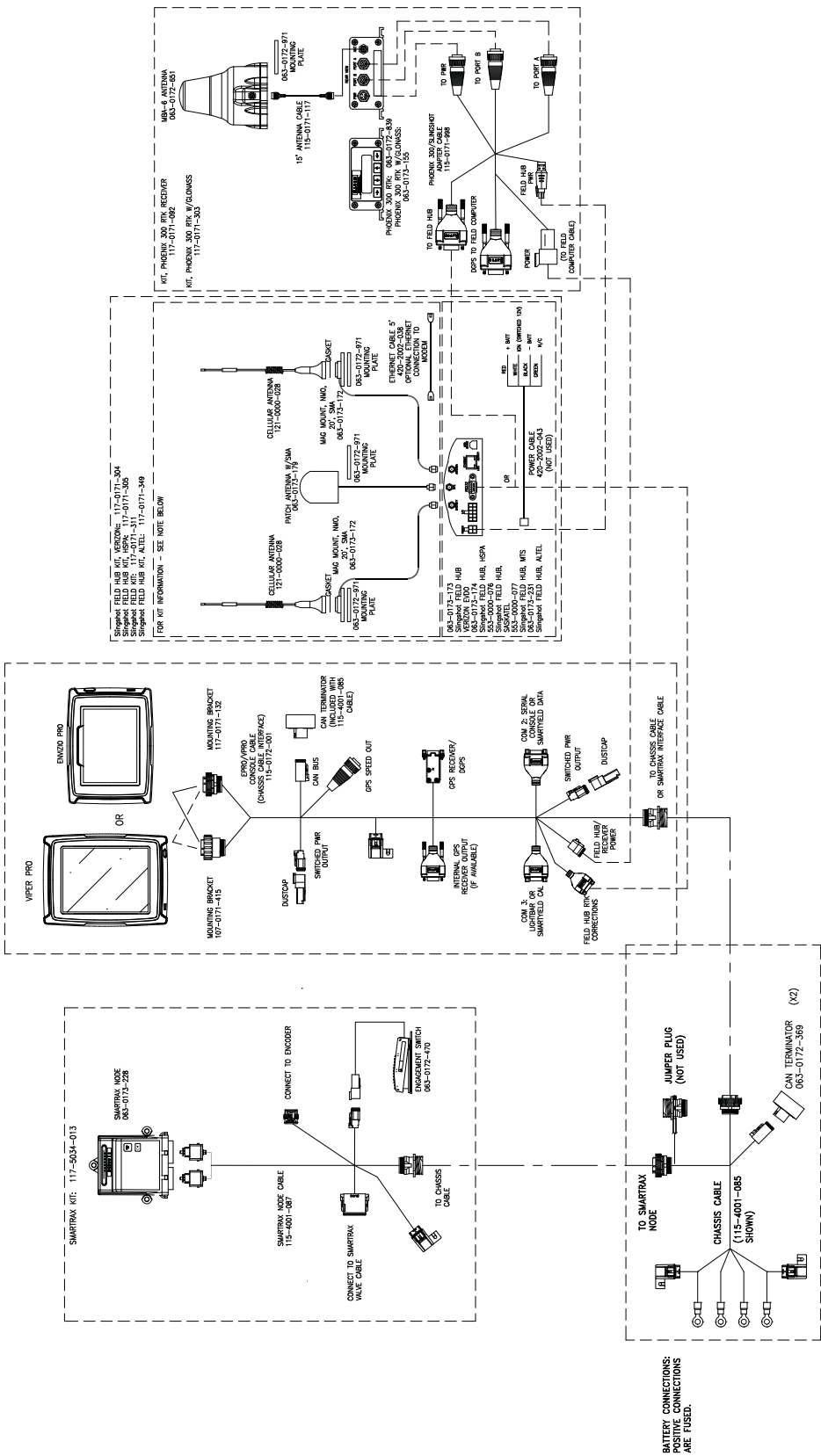
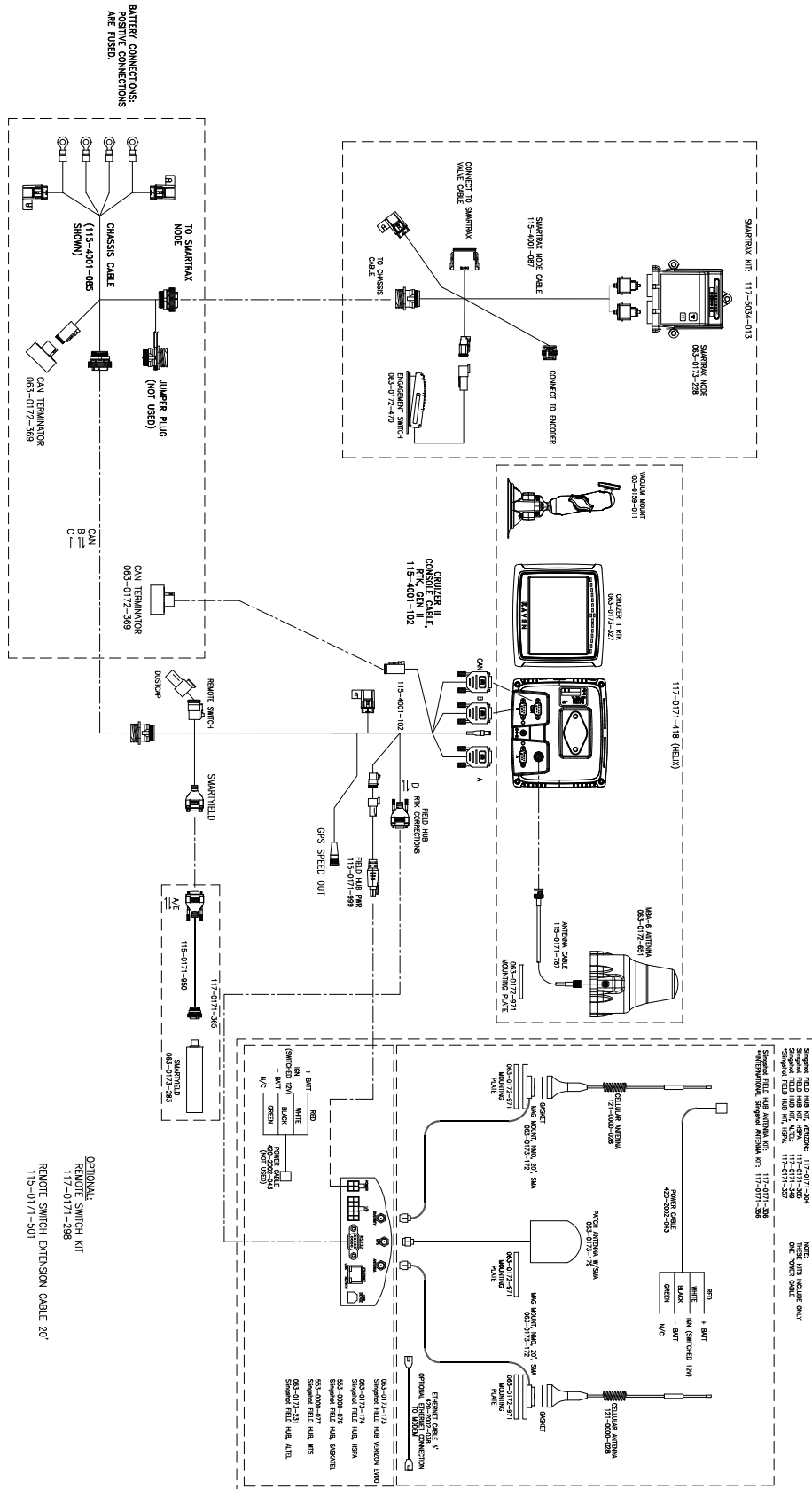


FIGURE 14. Cruiser II RTK SmarTrax with Slingshot



CRUIZER II RTK SMARTRAX W/SLINGSHOT

CHAPTER

4

Startup Procedures



⚠ WARNING

When starting the machine for the first time after installing SmarTrax, be sure that all persons stand clear in case a hose has not been properly tightened.



⚠ WARNING

Do not use hands to check for leaks. Hydraulic fluid under pressure can penetrate the skin and cause serious injury or death.

Calibrate the SmarTrax System

Refer to the SmarTrax & SmartSteer Calibration and Operation Manual (P/N 016-0171-277) for instructions on calibrating the SmarTrax system, adjusting system settings, and system operation.

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Limited Warranty

What Does this Warranty Cover?

This warranty covers all defects in workmanship or materials in your Raven Applied Technology Division product under normal use, maintenance, and service.

How Long is the Coverage Period?

Raven Applied Technology Division products are covered by this warranty for 12 months after the date of purchase. This warranty coverage applies only to the original owner and is nontransferable.

How Can I Get Service?

Bring the defective part and proof of purchase to your Raven dealer. If your dealer agrees with the warranty claim, the dealer will send the part and proof of purchase to their distributor or to Raven Industries for final approval.

What Will Raven Industries Do?

Upon confirmation of the warranty claim, Raven Industries will, at our discretion, repair or replace the defective part and pay for return freight.

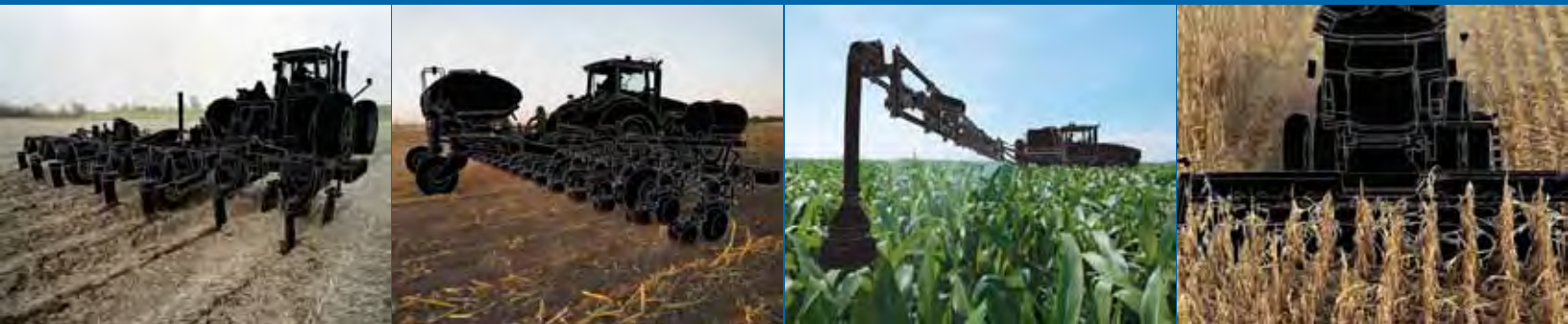
What is not Covered by this Warranty?

Raven Industries will not assume any expense or liability for repairs made outside our facilities without written consent. Raven Industries is not responsible for damage to any associated equipment or products and will not be liable for loss of profit or other special damages. The obligation of this warranty is in lieu of all other warranties, expressed or implied, and no person or organization is authorized to assume any liability for Raven Industries.

Damages caused by normal wear and tear, misuse, abuse, neglect, accident, or improper installation and maintenance are not covered by this warranty.

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Model Year 2009-2010
SmarTrax™ Installation Manual
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