

# Case IH Patriot 4440, Model Year 2017 & Newer - Steering Ready SmarTrax™ Installation Manual

*P/N 016-5032-041 Rev. A*

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# CHAPTER

# 1

# IMPORTANT SAFETY INFORMATION

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## 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 the system or the machine.

## WARNING

- Carefully read and follow all safety requirements and precautions contained in this manual and the machine-specific Installation Manual. Failure to follow safety instructions may lead to equipment damage, personal injury, or death.
- 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**

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## 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.

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## 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.

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# CHAPTER

# INTRODUCTION

## 2

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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: Case IH  
MODEL: Patriot 4440 - Steering Ready  
YEAR: 2017 & Newer

**FIGURE 1. Case IH Patriot 4440**



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## 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.

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 receiver in the recommended location. Refer to the following table for the machine-specific antenna mounting location.

**NOTE:** If your machine is not listed, install the receiver on the front-center of the cab.

Machine Preset	Receiver X Position (left to right)	Receiver Y Position (from the rear wheel axle to the GPS Receiver position on the cab)	Receiver Z Position (ground to top of GPS Receiver)
Case IH SPX 4430 2014	Centered	14.5 ft./4.42 m	12 ft./3.66 m

- 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.

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## 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](mailto:techwriting@ravenind.com)

- Case IH Patriot 4440, Model Year 2017 & Newer - Steering Ready SmarTrax™ Installation Manual
- P/N 016-5032-041 Rev. A
- 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

### CASE IH PATRIOT 4440 WITHOUT 600S RECEIVER

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 Kit (P/N 117-5032-041)



Picture	Item Description	Part Number	Qty.
Not Pictured	Manual - SmarTrax Calibration & Operation	016-0171-277	1
Not Pictured	Manual - Case IH Patriot 4440, Model Year 2017 & Newer - Steering Ready SmarTrax Installation	016-5032-041	1
	Node - SmarTrax RTK	063-0173-228	1
	Bracket - Node Mounting	107-0171-954	1



TABLE 1. SmarTrax Kit (P/N 117-5032-041)














Picture	Item Description	Part Number	Qty.
	Bracket - Node Support	107-0171-960	1
	Bracket - Node Mounting	107-0172-084	1
	Cable - 6" Adapter Sense	115-0172-218	1
	Cable - Node Harness	115-4001-247	1
	Screw - #10 x 3/4" Slotted Head Self-Tapping	311-0001-321	1
	Bolt - 1/4"-20 x 1-1/4" Hex	311-0050-106	2
	Bolt - 5/16"-18 x 7/8" Hex	311-0052-104	3
	Nut - 3/8" Zinc Flanged Lock	312-1001-164	3
	Nut - 5/16"-18 x 7/8" Hex	312-1001-169	3
	Nut - 1/4"-20 Nylon Insert Lock	312-4000-057	2
	Nut - M6 Lock	312-4000-207	4

TABLE 1. SmarTrax Kit (P/N 117-5032-041)

Picture	Item Description	Part Number	Qty.
	Washer - 1/4" Split Lock	313-1000-016	4
	Washer - 0.250" ID x 0.562" OD x 0.065" Thick	313-2300-009	6

## CASE IH PATRIOT 4440 WITH 600S GPS RECEIVER

TABLE 2. SmarTrax Kit (P/N 117-5032-042)




Picture	Item Description	Part Number	Qty.
Not Pictured	Manual - SmarTrax Calibration & Operation	016-0171-277	1
Not Pictured	Manual - 600S Installation & Operation	016-0171-614	1
Not Pictured	Manual - Case IH Patriot 4440, Model Year 2017 & Newer - Steering Ready SmarTrax Installation	016-5032-041	1
	Node - SmarTrax RTK	063-0173-228	1
	Bracket - 600S GPS Receiver Mounting	063-2000-004	1
	Bracket - Node Mounting	107-0171-954	1
	Bracket - Node Support	107-0171-960	1

TABLE 2. SmarTrax Kit (P/N 117-5032-042)















Picture	Item Description	Part Number	Qty.
	Bracket - Node Mounting	107-0172-084	1
	Receiver - 600S GPS	063-2000-001	1
	Cable - 6" Adapter Sense	115-0172-218	1
	Cable - 600S GPS Receiver to Case Cab Connection	115-0172-285	1
	Cable - Node Harness	115-4001-247	1
	Screw - #10 x 3/4" Slotted Head Self-Tapping	311-0001-321	1
	Bolt - 1/4"-20 x 1-1/4" Hex	311-0050-106	2
	Bolt - 5/16"-18 x 7/8" Hex	311-0052-104	3
	Nut - 3/8" Zinc Flanged Lock	312-1001-164	3
	Nut - 5/16"-18 x 7/8" Hex	312-1001-169	3
	Nut - 1/4"-20 Nylon Insert Lock	312-4000-057	2

TABLE 2. SmarTrax Kit (P/N 117-5032-042)

Picture	Item Description	Part Number	Qty.
	Nut - M6 Lock	312-4000-207	4
	Washer - 1/4" Split Lock	313-1000-016	4
	Washer - 0.250" ID x 0.562" OD x 0.065" Thick	313-2300-009	2



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## CHAPTER

# 3

## CAB COMPONENT INSTALLATION

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### INSTALL THE SMARTRAX NODE

#### INSTALL THE SMARTRAX NODE - PREFERRED MOUNTING METHOD

FIGURE 1. Instructional Seat Mounting Screws

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1. Uninstall the instructional seat cushion by removing the screws that secure it to the frame.
2. Remove any contents from under the instructional seat.

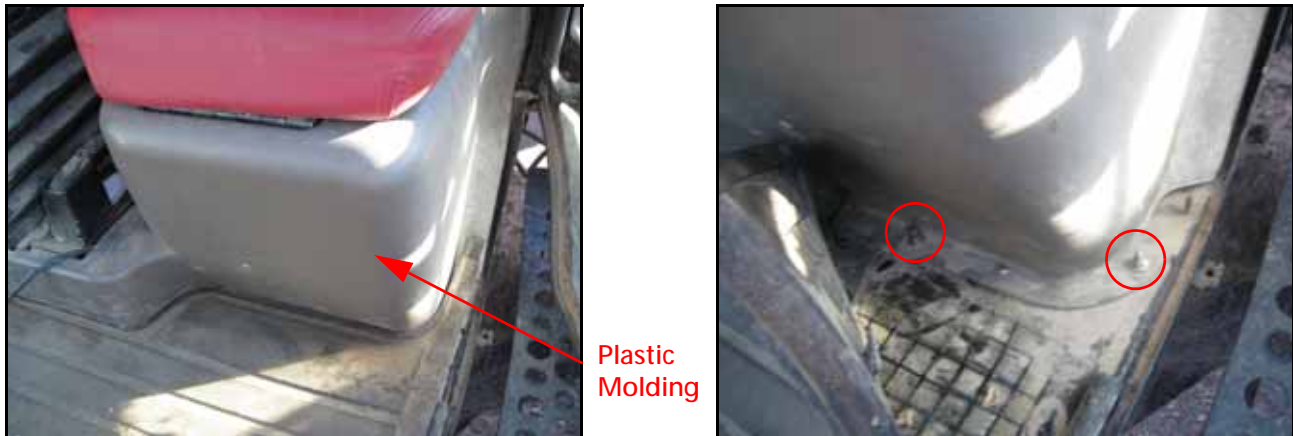
FIGURE 2. Floor Mat Removed from Cab

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3. Lift the floor mat from the floor in front of the seat.

FIGURE 3. Removing Instructional Seat Molding



4. Remove the plastic molding under the instructional seat by removing the nuts and bolts securing it.

FIGURE 4. Node Mounted to Mounting Plate



5. Mount the SmarTrax node (P/N 063-0173-228) to the node mounting bracket (P/N 107-0172-084) using three 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).
6. Place the node in the instructional seat compartment so the connectors face away from the operator's seat.
7. Secure the node mounting bracket to the existing bolts in the floor of the cab using four 1/4" zinc split lock washers (P/N 313-1000-016), four washers (P/N 313-2300-009), and four M6 lock nuts (P/N 312-4000-207).

FIGURE 5. Node Harness Installed on Node



8. Install the two large, rectangular connectors of the node cable (P/N 115-4001-247) into the correct ports of the node, tightening the bolts on the harness connectors to secure the connections.

**NOTE:** The connectors should be facing the window.

9. Locate the ENABLE connector on the node harness and connect it to the foot switch cable connector.
10. Route the node cable into the fuse box and behind the operator's seat.
11. Connect the DGPS connector to the GPS receiver.

FIGURE 6. DGPS OUT Connector Routed Under Operator's Seat



12. Route the DGPS OUT connector out the right corner of the operator's seat base and under the right arm rest.

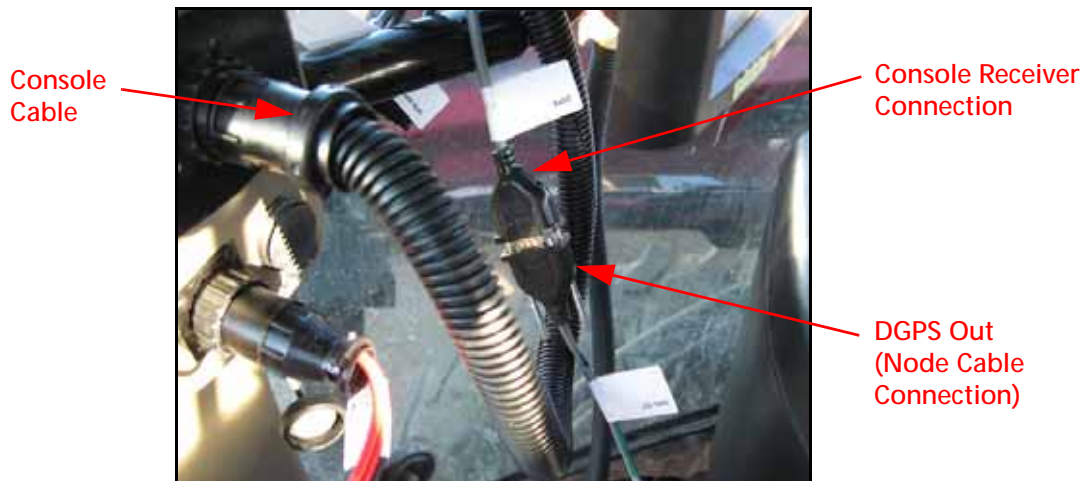


FIGURE 7. Convenience Tray Removed



13. Remove the convenience tray from the right-rear corner of the cab.
14. Locate the connectors labeled POWER GND PORT and RAVEN INTERFACE on the machine's harness in the convenience tray compartment and route them to the node harness.
15. Connect the machine's POWER GND PORT to the mating 6-pin POWER connector on the node harness.
16. Connect the machine's RAVEN INTERFACE connector to the mating 37-pin connector on the node harness.

FIGURE 8. DGPS OUT Connected to Console Receiver Connection



17. Connect the DGPS connector on the node harness to the GPS receiver.
18. Route the DGPS OUT connector on the node harness to the A-post at the front-right corner of the cab.
19. Connect the DGPS OUT connector to the Raven field computer's DGPS receiver connection.

## INSTALL THE SMARTRAX NODE - SECONDARY MOUNTING METHOD

FIGURE 9. Node Mounting Location



1. Identify the node mounting location on the bracket to the right of the operator's seat.
2. If equipped with a traction control foot pedal, remove the existing nut, bolt, and spacer from the bracket that holds the pedal in place.

FIGURE 10. Hole Drilled in Machine's Bracket



3. Align the hole in the node mounting bracket (P/N 107-0171-954) with the hole in the machine's bracket.
4. Using the node mounting bracket as a template, drill a second hole in the machine's bracket.

FIGURE 11. Node Mounting Bracket Installed

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5. If equipped with a traction control foot pedal, reinstall the machine's spacer between the traction control pedal and the machine's bracket.
6. Secure the node mounting bracket to the machine's bracket using two 1/4"-20 x 1-1/4" hex bolts (P/N 311-0050-106), two 1/4" flat washers (P/N 313-2300-009), and two 1/4"-20 nylon insert lock nuts (P/N 312-4000-057).

FIGURE 12. Node Installed on Mounting Bracket

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7. Align the holes in the node with the holes in the node mounting bracket.
8. Install two 5/16"-18 x 7/8" hex bolts (P/N 311-0052-104) and two 5/16" zinc flanged lock nuts (P/N 312-1001-169) in the top and right node mounting tabs.

FIGURE 13. Node Support Bracket Secured to Node Mounting Bracket



9. Position the node support bracket (P/N 107-0171-960) so that the hole aligns with the hole in the bottom node mounting tab.

**NOTE:** The mounting plate must be within +/- 2° of level to the wall for the SmarTrax system to operate properly

10. Secure the node support bracket to the node mounting bracket by inserting a 5/16"-18 x 7/8" hex bolt (P/N 311-0052-104) through both brackets and installing one 5/16" zinc flanged lock nut (P/N 312-1001-169).

FIGURE 14. Node Support Bracket Secured to Cab Floor



11. Secure the node support bracket to the cab floor using one #10 x 3/4" self-tapping slotted hex head screw (P/N 311-0001-321).

FIGURE 15. Node Harness Installed on Node

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12. Install the two large, rectangular connectors of the node harness (P/N 115-4001-247) into the correct ports of the node, tightening the bolts on the harness connectors to secure the connections.

FIGURE 16. Node Harness Routing

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13. Route the node harness into the blower fan compartment located in the right-rear corner of the cab.

FIGURE 17. Convenience Tray Removed



14. Remove the convenience tray from the right-rear corner of the cab.
15. Locate the connectors labeled POWER GND PORT and RAVEN INTERFACE on the machine's harness in the convenience tray compartment and route them to the node harness.
16. Connect the machine's POWER GND PORT to the mating 6-pin POWER connector on the node harness.
17. Connect the machine's RAVEN INTERFACE connector to the mating 37-pin connector on the node harness.

FIGURE 18. CAN Connection



18. Locate and disconnect the machine's green 12-pin AUTOGUIDANCE INTERFACE connections (X-047F and X047M1) from under the instructional seat.
19. Install the CAN TEE connectors of the node harness on the mating connectors of the machine's AUTOGUIDANCE INTERFACE connectors.



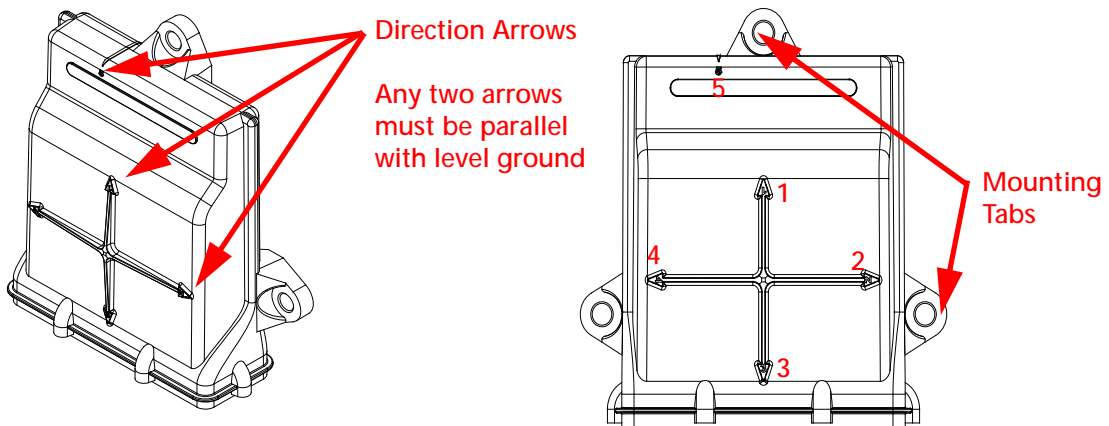
FIGURE 19. DGPS OUT Connected to Console Receiver Connection



- 20. Connect the DGPS connector on the node harness to the GPS receiver.
- 21. Route the DGPS OUT connector on the node harness to the A-post at the front-right corner of the cab.
- 22. Connect the DGPS OUT connector to the Raven field computer's GPS receiver connection.

NODE MOUNTING LOCATIONS

FIGURE 20. 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.

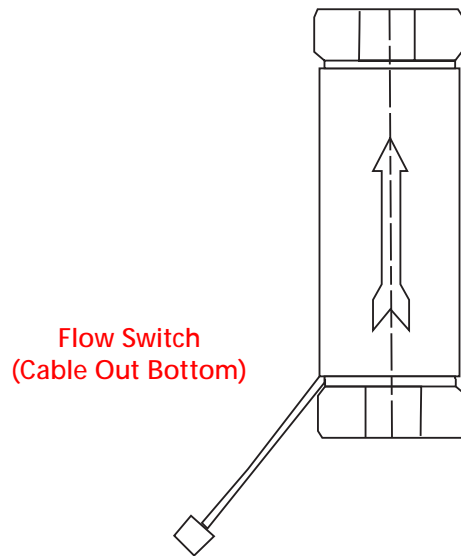
- The node mounting location must not create tripping hazards.
- Mount the node in a location where it will not be kicked or jarred during normal equipment operation.
- The location must allow cable routing to avoid crimping or damaging the cables or the node connections.

- 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.

## INSTALL THE FLOW SWITCH ADAPTER CABLE

**NOTE:** A change to the flow switch in Case IH Patriot Steering-Ready machines causes the disengage signal to not change state. Complete the following steps to ensure the disengage signal is fully functional.

**FIGURE 21. Flow Switch Configuration**



1. Locate the machine's steering valve behind the cab.
2. Disconnect the flow switch cable from the flow switch that is connected to the machine's steering valve.
3. Install the 6" sense adapter cable (P/N 115-0172-218) between the flow switch cable connection and the machine's hydraulic valve.

**NOTE:** During the SmarTrax calibration process, select preset CIH SPX 4430 2014.



## INSTALL THE 600S GPS RECEIVER (IF APPLICABLE)

FIGURE 22. GPS Roof Connection



1. Clean the surface of the machine's existing GPS receiver mounting bracket.

**NOTE:** If no GPS receiver mounting bracket is present, remove the backing of the double-sided tape installed on the back of the 600S GPS receiver mounting bracket (P/N 063-2000-004) and install it on the cab roof.

2. Position the 600S GPS receiver (P/N 063-2000-001) on the receiver mounting bracket.

**NOTE:** The magnets pre-installed on the 600S GPS receiver will secure the receiver to the mounting bracket.

3. Connect the 600S GPS to Case harness cable (P/N 115-0172-285) between the GPS receiver and the GPS roof connection.
4. Secure the 600S GPS to Case harness cable to the receiver mounting bracket using plastic cable ties.
5. Connect the CASE GPS connection of the 600S to Case IH box interface cable to the DGPS IN connection of the node harness (P/N 115-4001-247).

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## ENABLE SWITCH

FIGURE 23. Enable Switch.

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A factory-installed switch is installed on the floor of the machine's cab. Use this enable switch to engage and disengage the SmarTrax system after installation and calibration of the system is complete.

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## CALIBRATE THE SMARTRAX SYSTEM

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



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