

Case IH Patriot 2250, Model Year 2017 & Newer - Steering Ready SmarTrax™ Installation Manual

P/N 016-5032-035 Rev. A

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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 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**

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

INTRODUCTION

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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 2250 - Steering Ready

YEAR: 2017 & Newer

FIGURE 1. Case IH Patriot 2250



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 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 antenna 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)
CIH SPX 2240 2014	Centered	11 ft. 6 in./3.51 m	11ft. 3 in./3.43 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.

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

- Case IH Patriot 2250, Model Year 2017 & Newer - Steering Ready SmarTrax™ Installation Manual
- P/N 016-5032-035 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 2250 WITH NO 600S GPS 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 Installation Kit (P/N 117-5032-035)










Picture	Item Description	Part Number	Qty.
Not Pictured	Manual - SmarTrax Calibration & Operation	016-0171-277	1
Not Pictured	Manual - Case IH Patriot 2250, Model Year 2017 & Newer - Steering Ready SmarTrax Installation	016-5032-035	1
	Node - SmarTrax RTK	063-0173-228	1
	Interface - Case IH	063-0173-038	1

TABLE 1. SmarTrax Installation Kit (P/N 117-5032-035)







Picture	Item Description	Part Number	Qty.
	Bracket - Node Mounting	107-0172-084	1
	Cable - 6" Sense Adapter	115-0172-218	1
	Cable - Case IH Box Interface to SmarTrax Node	115-4001-245	1
	Bolt - M6 Hex	311-0070-010	4
	Nut - 3/8" - 16 UNC 3B Nylon Insert Lock	312-4000-061	3
	Nut - M6 Lock	312-4000-207	4
	Washer - 1/4" Lock	313-1000-016	4
	Washer - 0.25" ID x 0.562" OD	313-2300-009	4

CASE IH PATRIOT 2250 WITH 600S GPS RECEIVER

TABLE 2. SmarTrax Installation Kit (P/N 117-5032-036)

Picture	Item Description	Part Number	Qty.
Not Pictured	Manual - SmarTrax Calibration & Operation	016-0171-277	1
Not Pictured	Manual - 600S Installation and Operation	016-0171-614	1
Not Pictured	Manual - Case IH Patriot 2250, Model Year 2017 & Newer - Steering Ready SmarTrax Installation	016-5032-035	1
	Node - SmarTrax RTK	063-0173-228	1
	Interface - Case IH	063-0173-038	1
	Receiver - 600S GPS	063-2000-001	1
	Bracket - 600S GPS Receiver Mounting	063-2000-004	1
	Bracket - Node Mounting	107-0172-084	1
	Cable - 6" Sense Adapter	115-0172-218	1
	Cable - 600S GPS Receiver to Case Harness	115-0172-288	1

TABLE 2. SmarTrax Installation Kit (P/N 117-5032-036)

Picture	Item Description	Part Number	Qty.
	Cable - Case IH Box Interface to SmarTrax Node	115-4001-245	1
	Bolt - M6 Hex	311-0070-010	4
	Nut - 3/8"-16 UNC 3B Nylon Insert Lock	312-4000-061	3
	Nut - M6 Lock	312-4000-207	4
	Washer - 1/4" Lock	313-1000-016	4
	Washer - 0.25" ID x 0.562" OD	313-2300-009	4

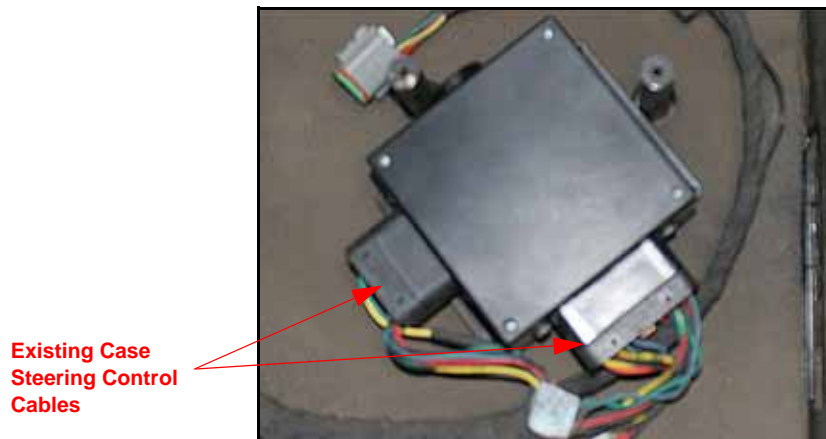
CHAPTER

3

CAB COMPONENT INSTALLATION

INSTALL THE CASE IH INTERFACE BOX

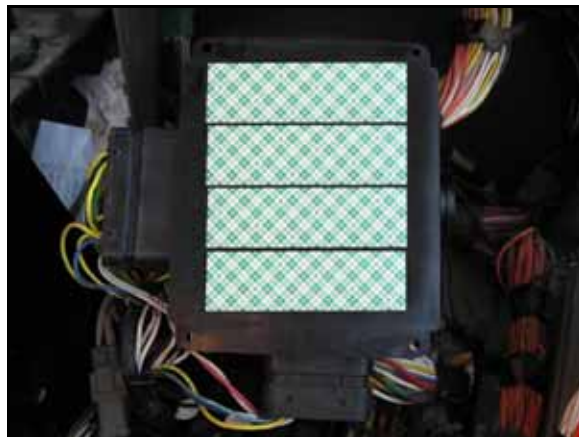
FIGURE 1. Case IH Interface Cables Connected to the Case Interface Box



1. Connect the existing Case steering control cables to the Case interface box (P/N 063-0173-038).

NOTE: The steering control cables are located behind the right-rear corner of the seat, under the fuse panel cover.

FIGURE 2. Double-Sided Tap on Case Interface Box



2. Remove the backing from the double-sided tape strips and adhere the Case interface box to a clean, open area in the fuse panel location.

INSTALL THE SMARTRAX NODE

MOUNT THE SMARTRAX NODE

FIGURE 3. Node Mounting Location



1. Remove the plastic molding behind the seat by removing the nuts and bolts used to secure it.
2. Install the node mounting bracket (P/N 107-0172-084) in the tapped holes on the back wall of the cab using four M6 hex bolts (P/N 311-0070-010), four flat washers (P/N 313-2300-009), and four 1/4" lock washers (P/N 313-1000-016).

IMPORTANT: Install the washers on the bottom bolts between the wall and the mounting plate to level the node. The mounting plate must be within +/- 2° of level to the wall for the SmarTrax system to operate properly.

NOTE: Install the node mounting bracket so that the cable connectors of the node (P/N 063-0173-228) face the operator's seat when installed.

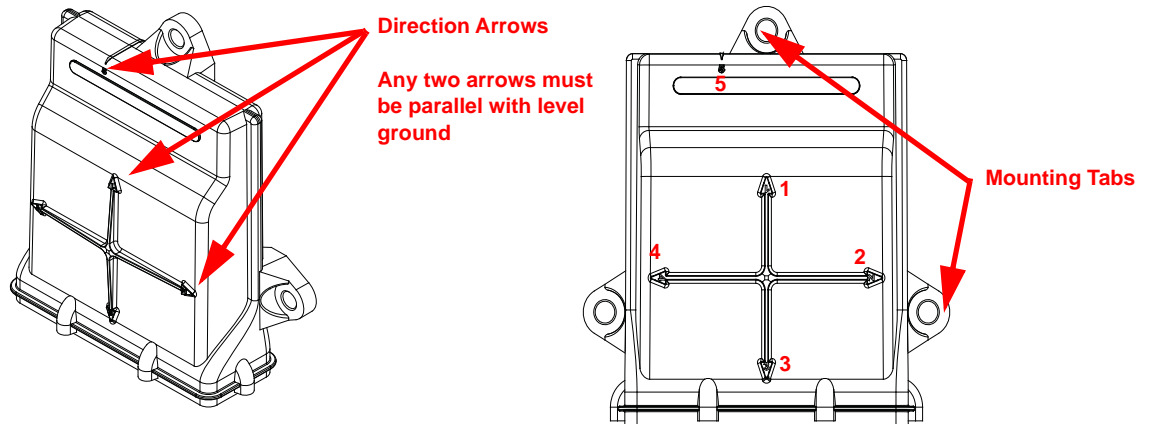
FIGURE 4. SmarTrax Node Installed



3. Mount the SmarTrax node to the node mounting bracket using three 3/8"-16 lock nuts (P/N 312-4000-061).

NODE MOUNTING LOCATIONS

FIGURE 5. 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 NODE HARNESS

FIGURE 6. Node Harness Installed on the Node

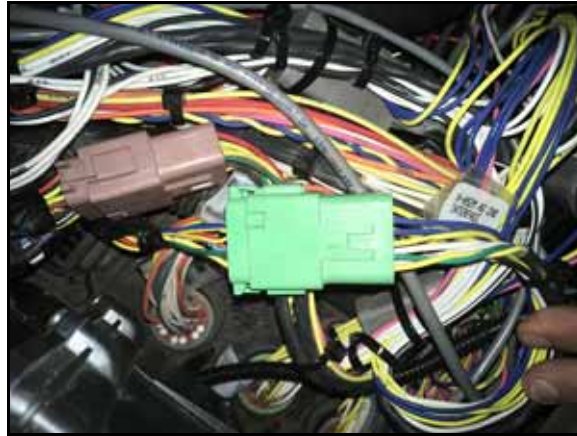


1. Install the two large, rectangular connectors of the node harness (P/N 115-4001-245) into the correct ports of the node, tightening the bolts on the harness connectors to secure the connections.

NOTE: The connectors should be pointing toward the operator's seat.

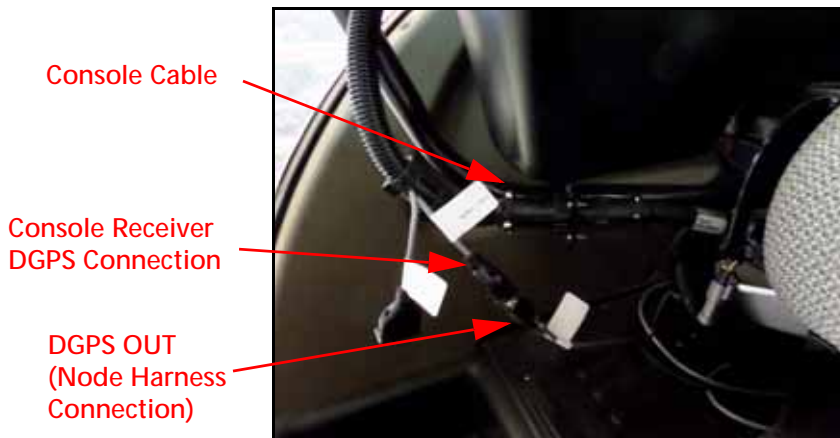
2. Connect the round, 37-pin connector from the node harness to the 37-pin port of the Case interface box (P/N 063-0173-038).

FIGURE 7. Machine's CAN System Connection



3. Locate and disconnect the machine's green 12-pin C052F and F-052M connectors of the machine's harness under the fuse panel.
4. Install the CAN TEE connectors of the node harness on the mating connectors of the machine's harness.

FIGURE 8. DGPS OUT Connected to Console Receiver Connection



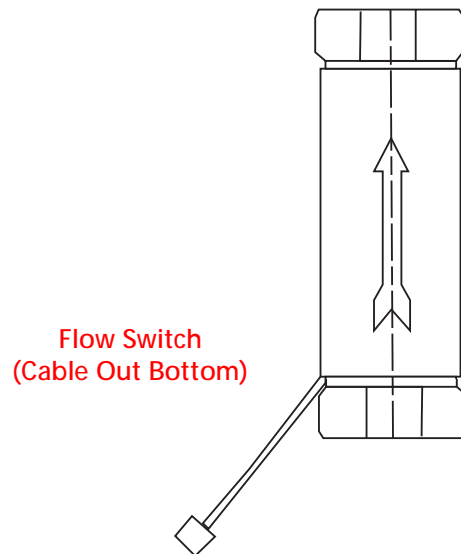
5. Route and connect the DGPS OUT connector to the console's DGPS connector.
6. Connect the CASE GPS connection and the DGPS IN connection from the node harness cable together.
7. Loop and tie-off the ENABLE cable connection, securing it with plastic cable ties as necessary.

NOTE: The ENABLE connector is not used in the SmarTrax system other than for diagnostic purposes. Ensure the cable is secured away from moving parts and heat sources.

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 9. 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 2240 2014.

INSTALL THE 600S GPS RECEIVER (IF APPLICABLE)

FIGURE 10. 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 115-0172-288) 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 node harness (P/N 115-4001-245) CASE GPS and DGPS IN connections together.

FOOT/ENABLE SWITCH

FIGURE 11. Foot Switch



A factory-installed switch is located on the floor of the machine's cab. Use this foot switch to engage and disengage the SmarTrax system after installation and calibration of the system is complete. Refer to the SmarTrax Calibration & Operation Manual (P/N 016-0171-277) for instructions on performing the system calibration.

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.

C

Cab Component Installation

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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 when used for intended purpose.

How Long is the Coverage Period?

Raven Applied Technology products are covered by this warranty for 12 months from the date of retail sale. In no case will the Limited Warranty period exceed 24 months from the date the product was issued by Raven Industries Applied Technology Division. This warranty coverage applies only to the original owner and is non-transferable.

How Can I Get Service?

Bring the defective part and proof of purchase to your Raven dealer. If the dealer approves the warranty claim, the dealer will process the claim and send it to Raven Industries for final approval. The freight cost to Raven Industries will be the customer's responsibility. The Return Materials Authorization (RMA) number must appear on the box and all documentation (including proof of purchase) must be included inside the box to be sent to Raven Industries.

What Will Raven Industries Do?

Upon confirmation of the warranty claim, Raven Industries will (at our discretion) repair or replace the defective product and pay for the standard return freight, regardless of the inbound shipping method. Expedited freight is available at the customer's expense.

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, labor, or other 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.



Extended 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 when used for intended purpose.

Do I Need to Register My Product to Qualify for the Extended Warranty?

Yes. Products/systems must be registered within 30 days of retail sale to receive coverage under the Extended Warranty. If the component does not have a serial tag, the kit it came in must be registered instead.

Where Can I Register My Product for the Extended Warranty?

To register, go online to www.ravenhelp.com and select Product Registration.

How Long is the Extended Warranty Coverage Period?

Raven Applied Technology products that have been registered online are covered for an additional 12 months beyond the Limited Warranty for a total coverage period of 24 months from the date of retail sale. In no case will the Extended Warranty period exceed 36 months from the date the product was issued by Raven Industries Applied Technology Division. This Extended Warranty coverage applies only to the original owner and is non-transferable.

How Can I Get Service?

Bring the defective part and proof of purchase to your Raven dealer. If the dealer approves the warranty claim, the dealer will process the claim and send it to Raven Industries for final approval. The freight cost to Raven Industries will be the customer's responsibility. The Return Materials Authorization (RMA) number must appear on the box and all documentation (including proof of purchase) must be included inside the box to be sent to Raven Industries. In addition, the words "Extended Warranty" must appear on the box and all documentation if the failure is between 12 and 24 months from the retail sale.

What Will Raven Industries Do?

Upon confirmation of the product's registration for the Extended Warranty and the claim itself, Raven Industries will (at our discretion) repair or replace the defective product and pay for the standard return freight, regardless of the inbound shipping method. Expedited freight is available at the customer's expense.

What is Not Covered by the Extended 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, labor, or other damages. Cables, hoses, software enhancements, and remanufactured items are not covered by this Extended Warranty. 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.