

# John Deere 4X40, 4X50, and 4X55 Series SmarTrax™ Installation Manual

*P/N 016-5034-021 Rev. B*

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## ***Disclaimer***

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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 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

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- 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

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- 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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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: 4X40, 4X50, and 4X55 Series

**FIGURE 1. John Deere 4955**

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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. 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	Antenna X Position (left to right)	Antenna Y Position (from the rear wheel axle to the antenna position on the cab)	Antenna Z Position (ground to top of antenna)
John Deere 4x40, 4x50 and 4x55	Centered	3 ft./0.914 m	10 ft. 6 in./3.20 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)

- John Deere 4X40, 4X50, and 4X55 Series SmarTrax™ Installation Manual
- P/N 016-5034-021 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.

**NOTE:** The SmarTrax node (P/N 063-0173-228) is sold separately. Contact your local Raven dealer for ordering information.

**TABLE 1. SmarTrax Installation Kit (P/N 117-5034-021)**

Item Description	Part Number	Qty.
Manual - SmarTrax and SmartSteer Calibration & Operation	016-0171-277	1
Manual - John Deere 4X40, 4X50, and 4X55 Series SmarTrax Installation Manual	016-5034-021	1
Valve - Hydraulic Float	063-0131-136	1
Valve - SmarTrax Hydraulic	334-0003-088	1
Switch - Flow	334-0003-085	1
Bracket - Universal Hydraulic Valve Mounting	107-0171-578	1

TABLE 1. SmarTrax Installation Kit (P/N 117-5034-021)

Item Description	Part Number	Qty.
Bracket - SmarTrax Hydraulic Valve Mounting	107-0171-907	1
Bracket - Hydraulic Float Valve Mounting	107-0171-935	1
Bracket - Node Mounting	107-0171-947	1
Cable - Valve Harness	115-4001-204	1
Cable - Node Harness	115-4001-205	1
Assembly - SmarTrax Foot Switch	063-0172-470	1
Bolt - 5/16"-18 x 7/8" Hex	311-0052-104	4
Bolt - 5/16"-18 x 2-1/2" Hex	311-0052-111	2
Bolt - 5/16"-18 x 3-1/2" Hex	311-0052-115	2
Bolt - 3/8"-16 UNC x 1" Hex	311-0054-105	2
Nut - 3/8"-16 Zinc Flanged Lock	312-1001-164	7
Nut - 5/16"-18 Nylon Insert Lock	312-4000-059	4
Washer - 5/16" Split Lock	313-1000-019	4
Washer - 3/8" Flat	313-2300-013	4

TABLE 2. Hydraulic Installation Kit (P/N 117-0199-135)

Item Description	Part Number	Qty.
Fitting - -6 JIC M/F 45° Swivel Elbow	333-0012-027	4
Fitting - -8 JIC M/M/F Swivel Run Tee Adapter	333-0012-039	1
Fitting - -6 JIC M/F 90° Swivel Elbow	333-0012-042	6
Fitting - -6 JIC M/M/F Swivel Run Tee Adapter	333-0012-043	3
Fitting - -6 JIC (M) to -6 SAE O-Ring (M) Straight Adapter	333-0012-045	6
Fitting - -6 JIC (M) to -8 SAE O-Ring (M) Straight Adapter	333-0012-046	2
Fitting - -4 SAE O-Ring (M) Internal Hex Plug	333-0012-051	1
Fitting - -6 SAE O-Ring (M) Internal Hex Plug	333-0012-104	2
Fitting - -6 JIC (M) to -10 SAE O-Ring (M) Straight Adapter	333-0012-106	2
Fitting - -5 JIC M/F 90° Swivel Elbow	333-0012-119	1
Fitting - -5 JIC M/M/F Swivel Run Branch Tee Adapter	333-0012-149	1
Fitting - -8 JIC (F) to -5 JIC (M) Straight Adapter	333-0012-198	1
Hydraulic Hose - -6 JIC (F) to -6 JIC (F) - 27"	214-1000-235	1
Hydraulic Hose - -6 JIC (F) to -6 JIC (F) - 32"	214-1000-236	1
Hydraulic Hose - -6 JIC (F) to -6 JIC (F) - 25"	214-1000-237	1
Hydraulic Hose - -6 JIC (F) to -6 JIC (F) - 90"	214-1000-238	2
Hydraulic Hose - -6 JIC (F) to -6 JIC (F) - 45"	214-1000-240	1

TABLE 2. Hydraulic Installation Kit (P/N 117-0199-135)

Item Description	Part Number	Qty.
Hydraulic Hose - -6 JIC (F) to -5 JIC (F) - 60"	214-1000-241	1
Hydraulic Hose - -6 JIC (F) to -6 JIC (F) - 18"	214-1000-259	1
Hydraulic Hose - -6 JIC (F) 90° to -6 JIC (F) - 18"	214-1000-688	2
Hydraulic Hose - -6 JIC (F) to -6 JIC (M) - 18"	214-1000-741	2







**⚠ WARNING**

Hydraulics are under pressure. Care should always be taken with a system that has been pressurized.

Before beginning the SmarTrax hydraulic installation, turn off the machine and relieve pressure by turning the steering wheel left and right.

Never work on a hot machine. Always allow it to cool before performing diagnostics, maintenance, or routine service.

When disconnecting or purging hydraulic hoses, be aware that the hydraulic fluid within the machine's system may be extremely hot and under high pressure.

Tampering with hydraulic valves may cause serious injury or death, and will void the warranty.



**⚠ CAUTION**

When installing SmarTrax hydraulics or performing diagnostics, maintenance, or routine service, ensure precautions are taken to prevent any foreign material 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 hydraulic valve.

	<b>NOTICE</b>
<p>The appearance of the SmarTrax hydraulic valve may vary slightly from the images contained in this manual. However, the fittings, hose connections, and cable connections remain the same.</p>	

## INSTALL FITTINGS IN THE SMARTRAX VALVE

Before mounting the SmarTrax valve (P/N 334-0003-088) on the machine, install the proper fittings in the valve. This prepares the valve for installation and simplifies the hose connection process later in the procedure.

**FIGURE 1. Fittings Installed in the SmarTrax Valve**



Fitting	Part Number	Port
Fitting - -6 JIC (M) to -8 SAE O-Ring (M) Straight Adapter	333-0012-046	P, T
Fitting - -4 SAE O-Ring (M) Internal Hex Plug	333-0012-051	PS
Fitting - -6 SAE O-Ring (M) Internal Hex Plug	333-0012-104	LSPV, LS STEER
Fitting - -6 JIC (M) to -10 SAE O-Ring (M) Straight Adapter	333-0012-106	A, B

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## INSTALL FITTINGS IN THE FLOW SWITCH

FIGURE 2. Fittings Installed in Flow Switch



1. Remove the existing hydraulic fittings from ports A1 and B3 of the flow switch (P/N 334-0003-085).

**NOTE:** The existing hydraulic fittings are not used in the SmarTrax system.

2. Remove the pressure transducer from Port B1.
3. Remove the plugs from Ports A2 and B2 and install them in Ports A1 and B1.
4. Install the pressure transducer in Port B2.
5. Install -6 JIC (M) to -6 SAE O-ring (M) straight adapter fittings (P/N 333-0012-045) in Ports A2 and B3 of the flow switch.

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## INSTALL FITTINGS IN THE HYDRAULIC FLOAT VALVE

FIGURE 3. Fittings Installed in Hydraulic Float Valve



1. Remove the hydraulic port plugs from Ports A1, A2, B1, and B2 of the hydraulic float valve (P/N 063-0131-136).
2. Install -6 JIC (M) to -6 SAE O-ring (M) straight adapter fittings (P/N 333-0012-045) in the open ports.

## MOUNT THE SMARTRAX VALVE

FIGURE 4. SmarTrax Valve Mounting Location



1. Remove the radiator fan shields and the shield adjacent to the cab.
2. Remove the air cleaner intake stack.

**NOTE:** Cover the intake tube to prevent foreign material from falling to the intake during installation.

3. Raise the hood.

FIGURE 5. Valve Mounting Location



4. Locate the holes in the frame on the left side of the machine.

FIGURE 6. SmarTrax Valve Installed



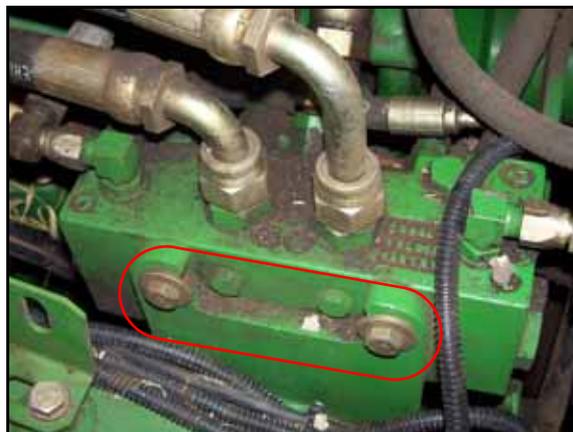
5. Secure the universal mounting bracket (P/N 107-0171-578) to the machine's frame using the existing holes and two 3/8"-16 UNC x 1" hex bolts (P/N 311-0054-105), two 3/8" flat washers (P/N 313-2300-013), and two 3/8"-16 zinc lock nuts (P/N 312-1001-164).
6. Install the SmarTrax valve mounting bracket (P/N 107-0171-907) to the universal mounting bracket using two 3/8"-16 UNC x 1" hex bolts (P/N 311-0054-105), two 3/8" flat washers (P/N 313-2300-013), and two 3/8"-16 zinc lock nuts (P/N 312-1001-164).
7. Install the SmarTrax valve (P/N 334-0003-088) on the valve mounting bracket using four 5/16"-18 x 7/8" hex bolts (P/N 311-0052-104) and four 5/16" lock washers (P/N 313-1000-019).

**NOTE:** Position the SmarTrax valve so that Port LS STEER points down.

## MOUNT THE FLOAT VALVE AND FLOW SWITCH

1. Locate the machine's steering control valve on the right side of the machine, near the exhaust stack.

FIGURE 7. Steering Control Valve Bolts to be Removed



2. Remove the existing bolts installed on the steering control valve.

**FIGURE 8. Float Valve Mounting Bracket Installed**

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3. Install the float valve mounting bracket (P/N 107-0171-935) on the machine's steering control valve using the bolts that were removed.

**FIGURE 9. Steel Lines to be Disconnected**

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4. Disconnect the machine's left steer low pressure, right steer low pressure, and pressure steel lines from the top of the steering control valve.
5. Trace the steel lines to the firewall at the front center of the cab and disconnect them.

**NOTE:** Keep the steel lines for future use.

FIGURE 10. Flow Switch Installed



6. Install the flow switch (P/N 334-0003-085) on the mounting bracket using two 5/16"-18 x 2-1/2" hex bolts (P/N 311-0052-111) and two 5/16" nylon nuts (P/N 312-4000-059).

FIGURE 11. Float Valve Installed



7. Install the float valve (P/N 063-0131-136) on the mounting bracket using two 5/16"-18 x 3-1/2" hex bolts (P/N 311-0052-115) and two 5/16" nylon nuts (P/N 312-4000-059).

**NOTE:** Position the float valve so that Ports A1 and B2 point up.

## INSTALL THE STEERING CONTROL HOSES

FIGURE 12. Left Low Pressure Hose Installed on Steering Control Valve



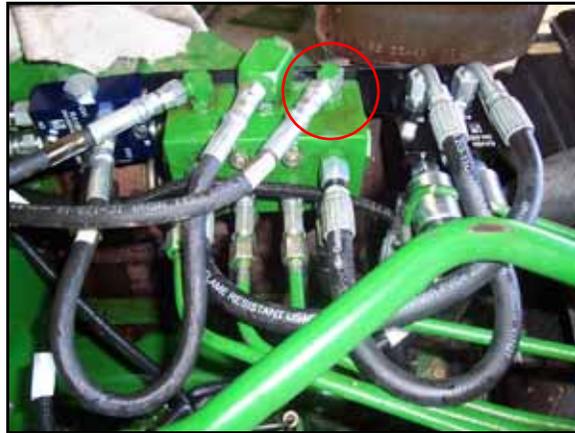
1. Install one end of the supplied hydraulic hose (P/N 214-1000-236) on the left low pressure port of the machine's steering control valve.

FIGURE 13. Left Low Pressure Hose Installed on Firewall Grommet Plate



2. Install the other end of the installed hydraulic hose on the left low pressure port on the firewall grommet plate.

FIGURE 14. Right Low Pressure Hose Installed on Steering Control Valve



3. Install one end of the supplied hydraulic hose (P/N 214-1000-235) on the right low pressure port of the machine's steering control valve.

FIGURE 15. Right Low Pressure Hose Installed on Firewall Grommet Plate

Hydraulic Hose  
(P/N 214-1000-235)



4. Install the other end of the installed hydraulic hose on the right low pressure port on the firewall grommet plate.

FIGURE 16. Left Feed Back Port on Steering Control Valve

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5. Disconnect the steel line from the front left feed back port of the machine's steering valve.
6. Install the male end of the supplied hydraulic hose (P/N 214-1000-741) on the machine's steel line.

**NOTE:** It may be necessary to install a -6 JIC M/F 90° swivel elbow fitting (P/N 333-0012-042) on the steel line to achieve the connection.

FIGURE 17. Hydraulic Hose Connected to Float Valve

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7. Connect the 90° end of the installed hydraulic hose to the fitting installed in Port A2 of the float valve (P/N 063-0131-136).

FIGURE 18. Hydraulic Hose Installed



8. Install the straight end of the supplied hydraulic hose (P/N 214-1000-688) on the open left feed back port.
9. Connect the 90° end of the installed hydraulic hose to the fitting installed in Port A1 of the float valve.

FIGURE 19. Right Feed Back Port on Steering Control Valve



10. Disconnect the steel line from the right feed back port of the machine's steering valve.
11. Install the male end of the supplied hydraulic hose (P/N 214-1000-741) on the machine's steel line.

**NOTE:** It may be necessary to install a -6 JIC M/F 90° swivel elbow fitting (P/N 333-0012-042) on the steel line to achieve the connection.

12. Connect the 90° end of the installed hydraulic hose to the fitting installed in Port B2 of the float valve.

FIGURE 20. Hydraulic Hose Installed

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13. Install the straight end of the supplied hydraulic hose (P/N 214-1000-688) on the open right feed back port.
14. Connect the 90° end of the installed hydraulic hose to the fitting installed in Port B1 of the float valve.

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## INSTALL THE LEFT AND RIGHT STEERING HOSES

FIGURE 21. Left Steering Port on Steering Control Valve

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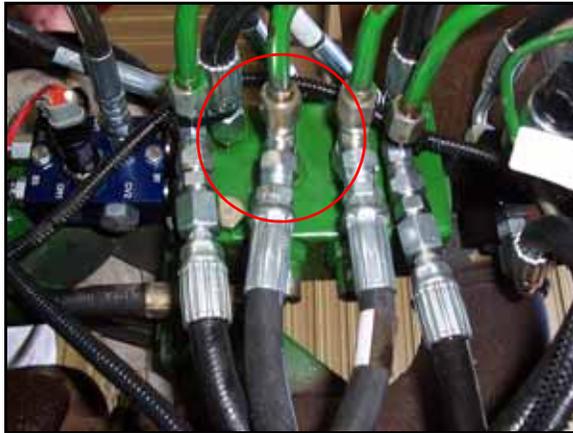


1. Disconnect the left steering line from the machine's steering control valve.

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**FIGURE 22. Left Steering Hose Installed on Steering Control Valve**

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2. Install a -6 JIC M/M/F swivel run tee adapter fitting (P/N 333-0012-043) in the left steering port.
3. Connect the left steering line to the opposite end of the installed tee fitting.
4. Install one end of the supplied hydraulic hose (P/N 214-1000-236) on the 90° end of the installed tee fitting.
5. Route the hose behind the engine and toward the SmarTrax valve.

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**FIGURE 23. Left Steering Hose Installed on SmarTrax Valve**

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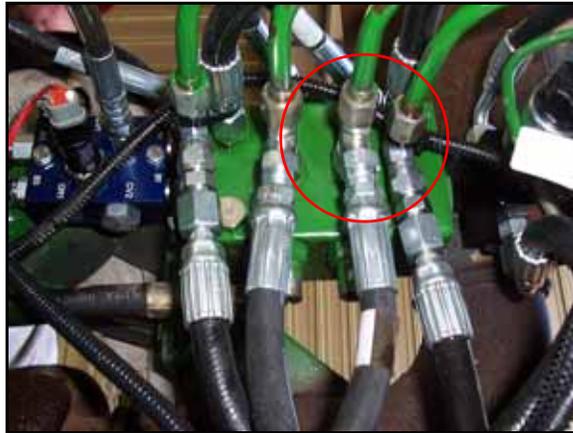


Port A of  
SmarTrax Valve

6. Connect the other end of the installed hydraulic hose to the fitting installed in Port A of the SmarTrax valve (P/N 334-0003-088).

**NOTE:** It may be necessary to install a -6 JIC M/F 90° swivel elbow fitting (P/N 333-0012-042) in Port A of the SmarTrax valve to achieve the connection.

FIGURE 24. Right Steering Hose Installed on Steering Control Valve



7. Install a -6 JIC M/M/F swivel run tee adapter fitting (P/N 333-0012-043) in the right steering port.
8. Connect the right steering line to the opposite end of the installed tee fitting.
9. Install one end of the supplied hydraulic hose (P/N 214-1000-236) on the 90° end of the installed tee fitting.
10. Route the hose behind the engine and toward the SmarTrax valve.

FIGURE 25. Right Steering Hose Installed on SmarTrax Valve



Port B of  
SmarTrax Valve

11. Connect the other end of the installed hydraulic hose to the fitting installed in Port B of the SmarTrax valve.

**NOTE:** It may be necessary to install a -6 JIC M/F 90° swivel elbow fitting (P/N 333-0012-042) in Port B of the SmarTrax valve to achieve the connection.

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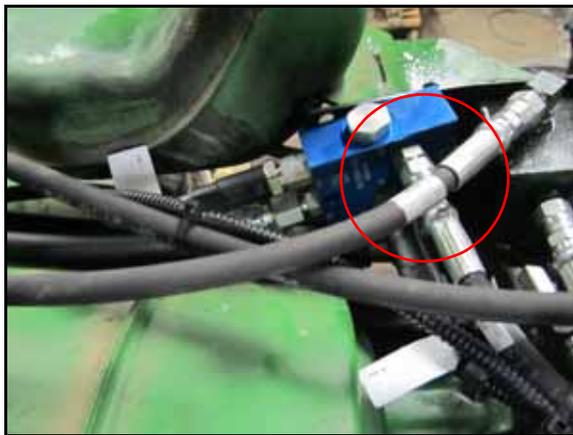
## INSTALL THE PRESSURE HOSES

FIGURE 26. Pressure Hose Installed on Steering Control Valve



1. Install one end of the supplied hydraulic hose (P/N 214-1000-259) on the pressure port of the machine's steering control valve.

FIGURE 27. Pressure Hose Installed on Flow Switch



2. Install the other end of the installed hydraulic hose to the fitting installed in Port A2 of the flow switch (P/N 334-0003-085).

FIGURE 28. Pressure Hose Installed on Firewall Grommet Plate



3. Install a -6 JIC M/M/F swivel run tee adapter fitting (P/N 333-0012-043) in the center pressure port located on the firewall grommet plate.
4. Install one end of the supplied hydraulic hose (P/N 214-1000-237) on the opposite end of the install tee fitting.

FIGURE 29. Pressure Hose Installed on Flow Switch



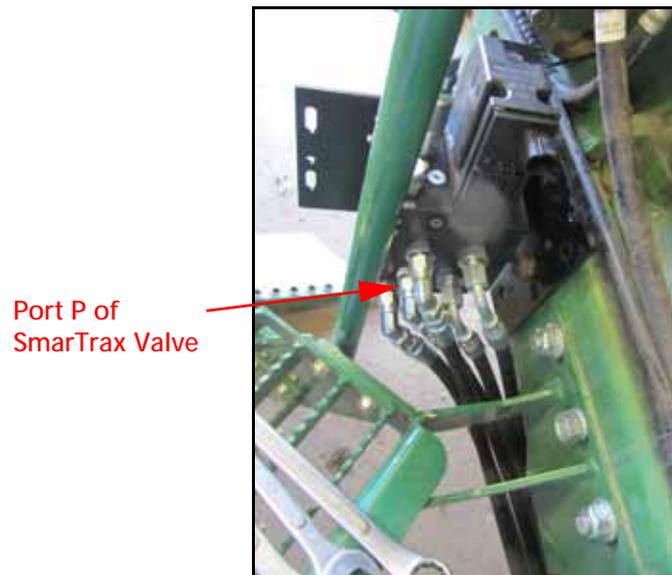
5. Connect the other end of the installed hydraulic hose to the fitting installed in Port B3 of the flow switch.

FIGURE 30. Pressure Hose Installed on Tee Adapter Fitting



6. Install one end of the supplied hydraulic hose (P/N 214-1000-240) on the 90° end of the tee adapter fitting installed on the pressure port at the firewall grommet plate.

FIGURE 31. Pressure Hose Installed on SmarTrax Valve



7. Install the other end of the installed hydraulic hose on the fitting installed in Port P of the SmarTrax valve (P/N 334-0003-088).

**NOTE:** It may be necessary to install a -6 JIC M/F 90° swivel run tee adapter fitting (P/N 333-0012-042) in Port P of the SmarTrax valve to achieve the connection.

## INSTALL THE TANK HOSE

FIGURE 32. Tank Port Location



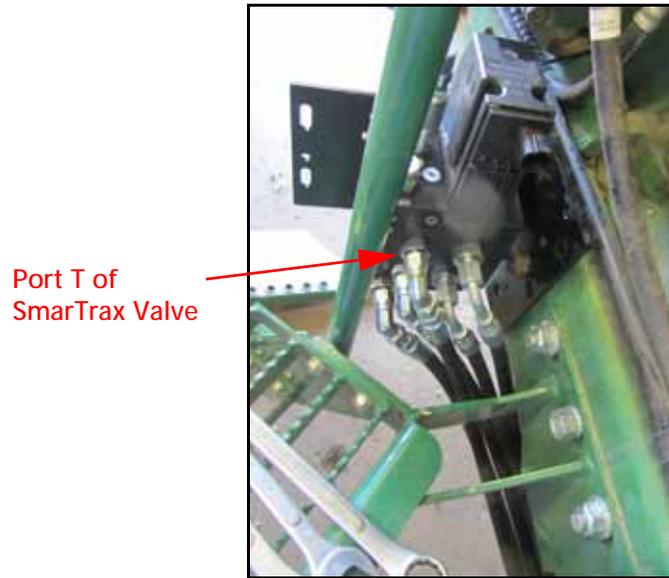
1. Locate the machine's tank port connection next to the left rear wheel.
2. Disconnect the machine's tank hose from the tank port.

FIGURE 33. Tank Hose Installed on Tank Port



3. Install a -5 JIC M/M/F swivel branch tee adapter fitting (P/N 333-0012-149) in the open tank port.
4. Connect the machine's tank hose on one end of the installed tee fitting.
5. Install the supplied hydraulic hose (P/N 214-1000-241) on the remaining end of the installed tee fitting.

FIGURE 34. Tank Hose Installed on SmarTrax Valve

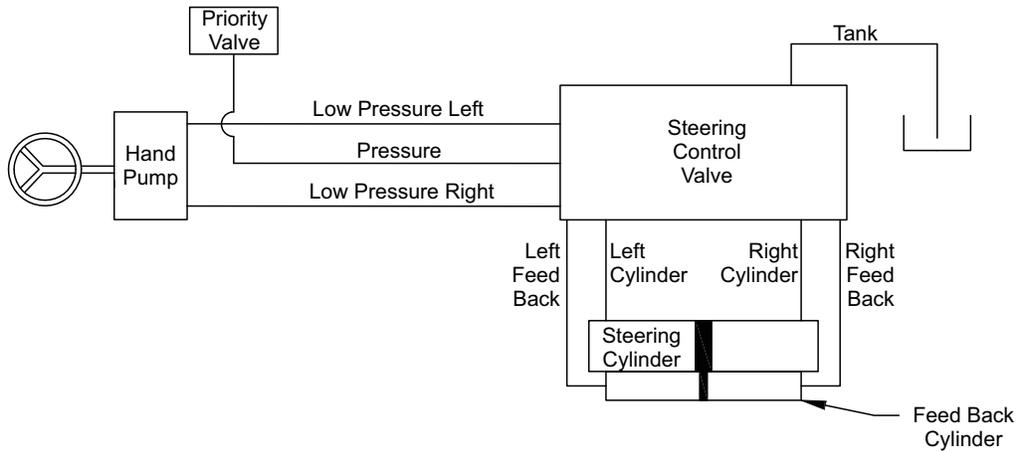


6. Connect the other end of the installed hydraulic hose to the fitting installed in Port T of the SmarTrax valve (P/N 334-0003-088).

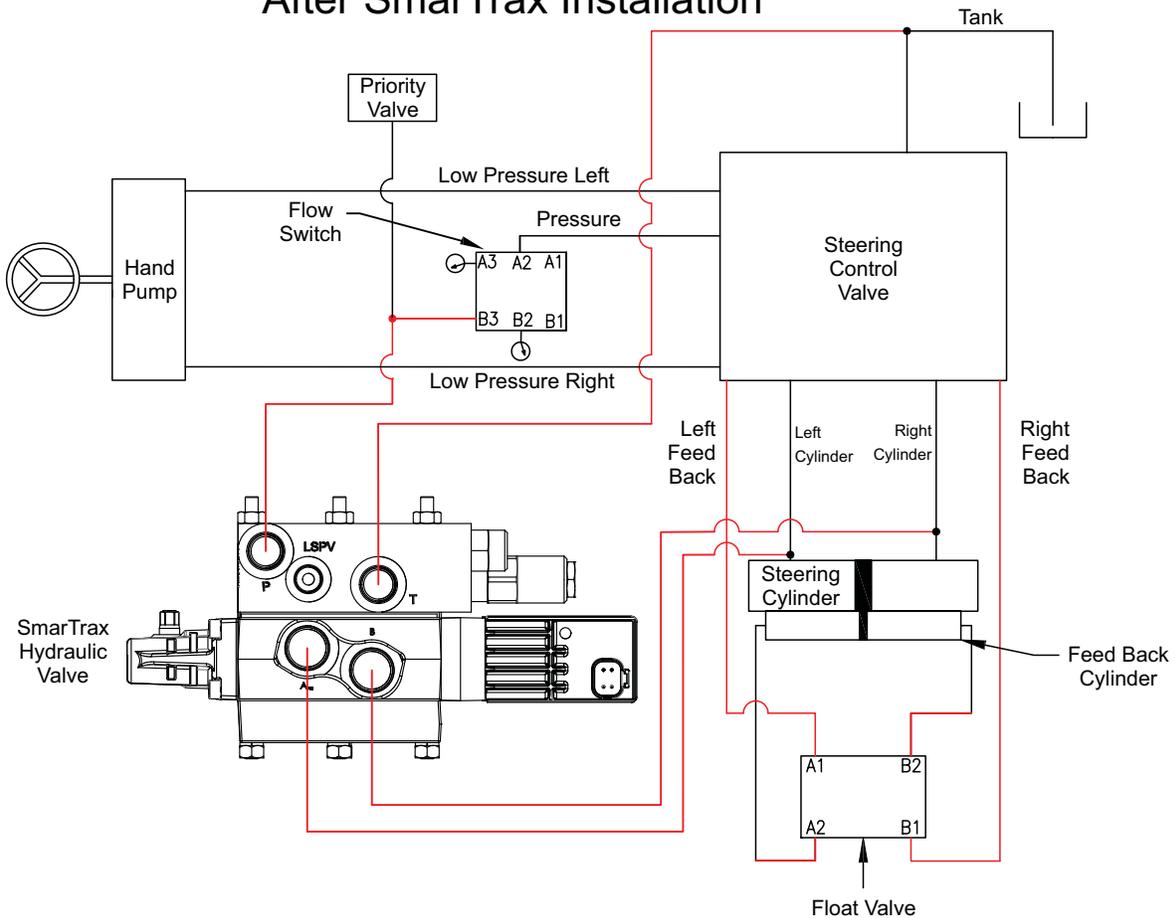
**NOTE:** It may be necessary to install a -6 JIC M/F 90° swivel elbow fitting (P/N 333-0012-042) in Port T of the SmarTrax valve to achieve the connection.

HYDRAULIC DIAGRAM

Before SmarTrax Installation



After SmarTrax Installation



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# CHAPTER

# 4

# CAB COMPONENT INSTALLATION

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## INSTALL THE SMARTRAX NODE

**NOTE:** The SmarTrax node (P/N 063-0173-228) is sold separately. Contact your local Raven dealer for ordering information.

## MOUNT THE SMARTRAX NODE

**FIGURE 1. SmarTrax Node Mounting Location**

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1. Lift the floor mat from the left side of the operator's seat to expose the floor.
2. Remove the floor plate from the left-rear corner of the cab.

**NOTE:** Keep the floor plate for future use. The screws will be used later in the installation procedure.

**FIGURE 2. SmarTrax Node Installed on Mounting Bracket**

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3. Mount the SmarTrax node (P/N 063-0173-228) to the node mounting bracket (P/N 107-0171-947) using three 3/8"-16 zinc flanged lock nuts (P/N 312-1001-164).

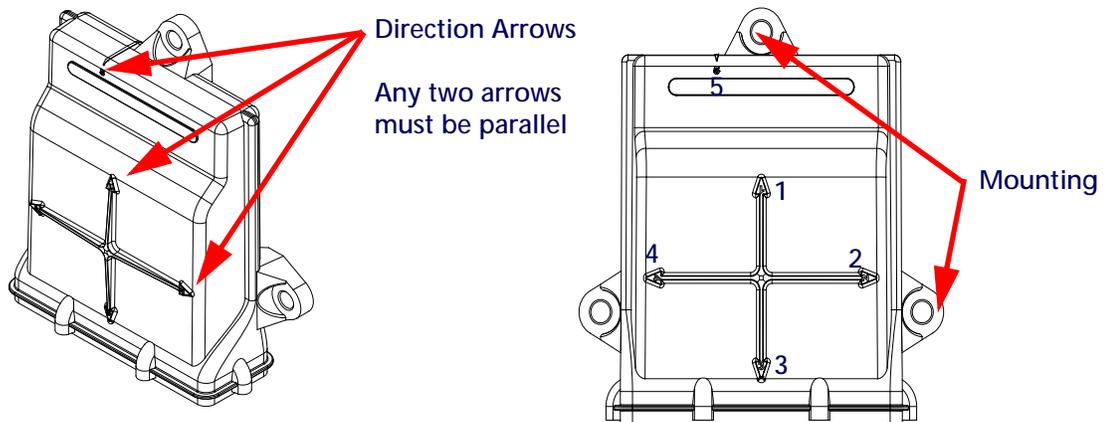
FIGURE 3. SmarTrax Node Installed



4. Position the node mounting bracket over the hole in the floor.
5. Secure the node mounting bracket to the floor using the screws that were removed in step 2.

## NODE MOUNTING LOCATIONS

FIGURE 4. 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 FOOT SWITCH

FIGURE 5. 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 connector to the floor by installing the supplied screws in each of the mounting holes.
4. Route the foot switch cable connector toward the node mounting location.

---

## INSTALL THE NODE HARNESS

FIGURE 6. Node Harness Connected to Node



1. Insert the two large, rectangular connectors of the node harness (P/N 115-4001-205) into the correct ports of the node.
2. Tighten the bolts on the harness connectors to secure the connections.
3. Locate the ENABLE connector on the node harness and connect it to the foot switch cable connector.

---

## INSTALL THE VALVE HARNESS

FIGURE 7. Valve Harness Connected to Node Harness

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1. Connect the 12-pin Deutsch connector on the valve harness (P/N 115-4001-204) to the mating 12-pin connector on the node harness (P/N 115-4001-205)

FIGURE 8. Valve Harness Connected to Flow Switch

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2. Plug the 3-pin PSI 1 and PSI 2 connectors from the valve harness into the pressure transducers installed on the flow switch.

**NOTE:** These connections can be plugged into either transducer.

FIGURE 9. PVES Connection



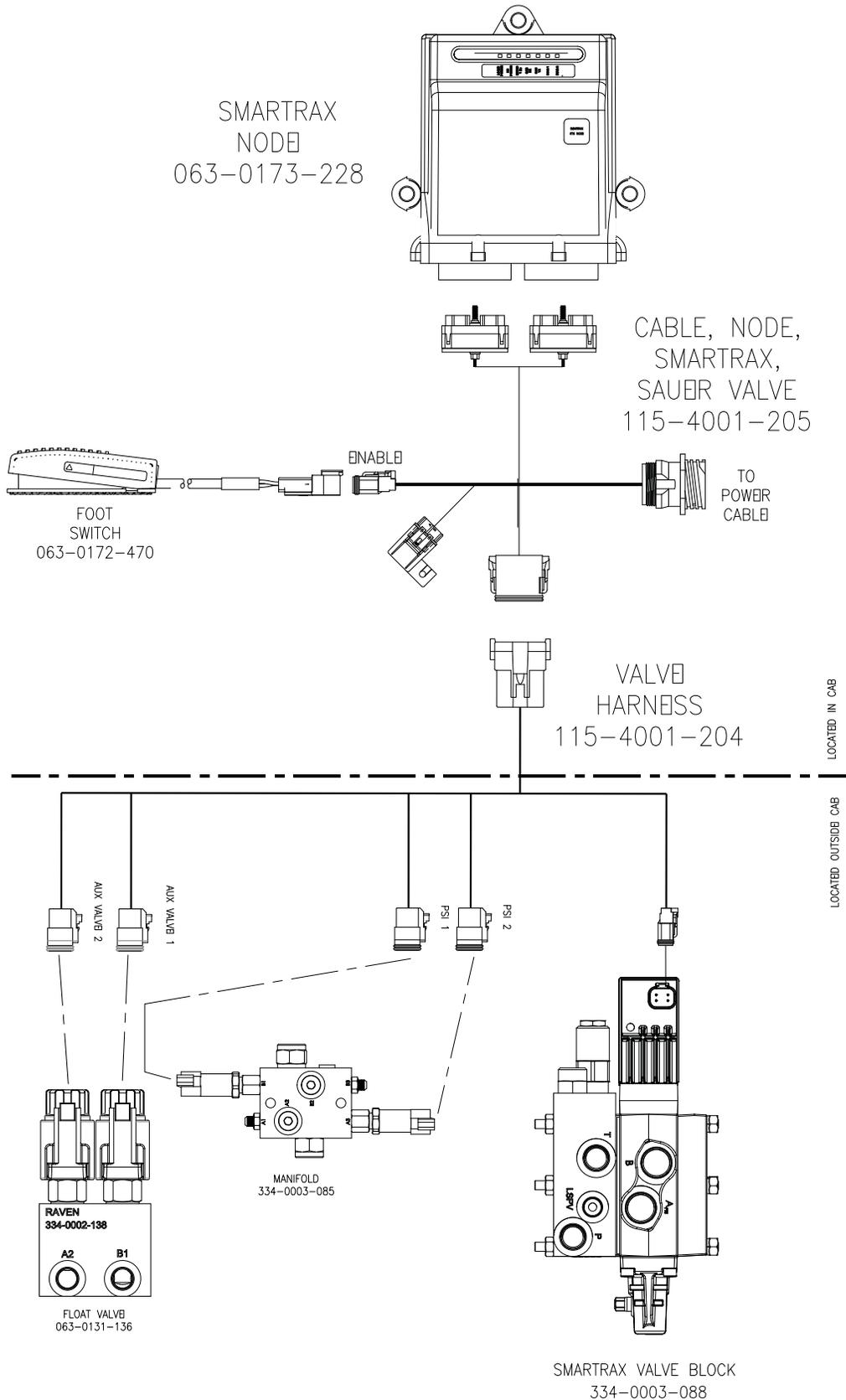
3. Plug the PVES connector from the valve harness into the open 4-pin port of the SmarTrax valve (P/N 334-0003-089).

FIGURE 10. AUX VALVE Connections



4. Connect the AUX VALVE 1 connector to the coil connector above the B ports of the hydraulic float valve (P/N 063-0131-136).
5. Connect the AUX VALVE 2 connector to the coil connector above the A ports of the hydraulic float valve.

FIGURE 11. Harness Wiring Diagram



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## 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, et.), 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 115-4001-205).
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.

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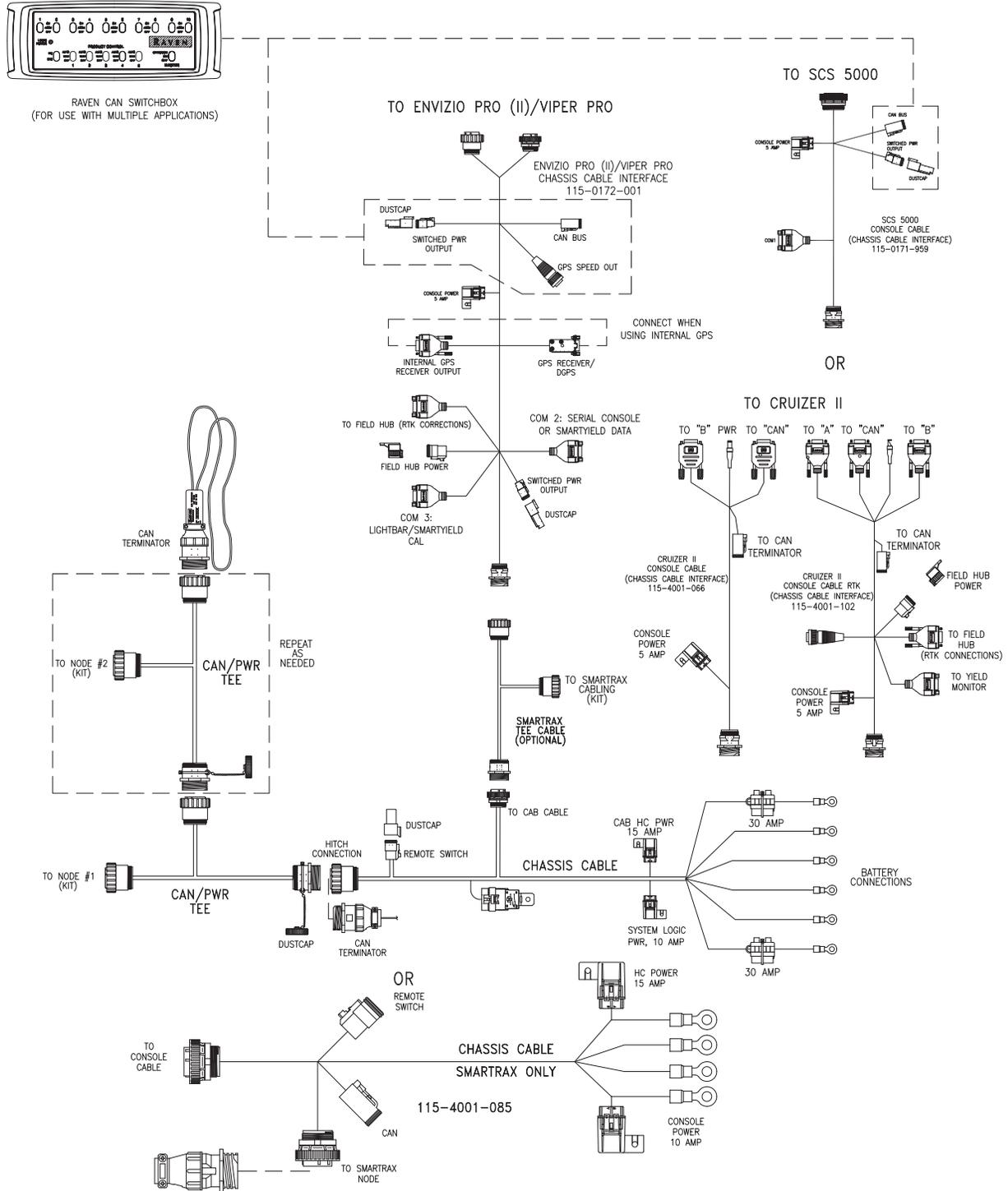
## CONNECT SMARTRAX TO AN EXISTING CHASSIS CABLE (IF APPLICABLE)

**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 115-4001-205) to the remaining SmarTrax interface tee.

SYSTEM DIAGRAMS

GEN II SYSTEM CABLING CONNECTIONS













**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.

## VERIFY THE SMARTRAX SYSTEM INSTALLATION

1. Turn on the machine.
2. Double-check all fittings and hose connections to ensure that:
  - Hoses are not rubbing on or interfering with moving parts.
  - Hydraulic fluid is not leaking from the system.
3. Turn the machine's wheels fully from side to side repeatedly to remove air from the hydraulic system.

**NOTE:** During the SmarTrax system installation, whenever the hydraulic system is purged for maintenance, or when fittings are loosened or disconnected, air is introduced into the lines of the hydraulic system. If air pockets are present, the wheels may not move consistently when the steering wheel is turned.

4. Continue turning the wheels until they move steadily and smoothly when the steering wheel is turned.
5. Access the System Diagnostic screen by selecting the MACHINE TEST option on the Machine Type screen and turn the wheels using the Raven console.

**NOTE:** If there are issues with the SmarTrax system, turn off the machine and correct them immediately. For additional assistance, refer to the SmarTrax and SmartSteer Calibration & Operation Manual (P/N 016-0171-277) or contact your local Raven dealer.

## CALIBRATE THE SMARTRAX SYSTEM

Refer to the SmarTrax and SmartSteer 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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# RAVEN

## Limited Warranty

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### ***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](http://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.**