

**Challenger MT 7XXC and MT 8XXC  
Series**

**SmarTrax™ Installation Manual**

*P/N 016-0197-003 Rev B    09/15    E17422*

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## CHAPTER

# 1

# *Important Safety Information*

## *Important Safety Information*

### **NOTICE**

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

- Follow all safety information presented within this manual.
- Follow all safety labels affixed to the Steering Control 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.
- If you require assistance with any portion of the installation or service of your Raven equipment, contact your local Raven dealer for support.

When operating the machine after installing the Steering Control system, observe the following safety measures”

- Be alert and aware of surroundings.
- Do not operate the Steering Control system 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 the Steering Control system is engaged.
- Disable the Steering Control system when exiting the operator’s seat and machine.
- Do not drive the machine with the Steering Control system enabled on any public road.
- Determine and remain a safe working distance from other individuals. The operator is responsible for disabling the Steering Control system when the safe working distance has been diminished.
- Ensure the Steering Control system is disabled prior to beginning any maintenance work on the Steering Control system or the machine.

## **WARNING**

- When starting the machine for the first time after installing the Steering Control system, be sure that all persons are standing clear of the machine in case a wheel moves unexpectedly.
- Read all safety requirements and precautions in the machine's operation manual prior to operating a machine equipped with the Steering Control system feature. Failure to follow safety precautions may lead to damage to the equipment, personal injury, or death.
- To prevent accidental engagement of steering and loss of vehicle control, turn the road switch on when driving down the road.

## **CAUTION**

- The GPS steering system does not detect obstacles in the vehicle's path. The operator must observe the path being driven to avoid obstacles.
- When engaged, the GPS steering system controls only the steering of the vehicle. The operator must control the speed of the vehicle.

## CHAPTER

# 2

## *Introduction*

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### *Introduction*

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

This manual applies to the following machines. For future reference, write your serial number in the space below.

**MAKE:** Cat Challenger

**MODEL:** MT 7XXC and MT 8XXC

**YEAR:**

**SERIAL NUMBER:**

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FIGURE 1. Cat Challenger MT Series



## Recommendations

Raven Industries recommends the following best practices when installing the Steering Control system:

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

## Tools Needed

The following tools may be needed for installation of the Steering Control system:

- Screwdrivers of various sizes
- SAE standard-sized wrenches
- Allen wrenches
- Side cutters
- Pliers

## Preparing for Installation

Leave the machine 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.



## CHAPTER

# 3




# *Installing SmarTrax with Cruizer II, Envizio Pro, or Viper Pro*

## *SmarTrax Kit Contents*

The Raven Steering Control system utilizes one standard node mounting kit, and one kit tailored to link the Steering Control system to the Raven products that you have chosen to install on your machine. Before beginning installation, compare the items in the kits with the items listed in the kits below. If you have questions about the kits, contact your Raven dealer.




## **SmarTrax 3D**

TABLE 1. SmarTrax 3D - Steering Control Installation Kit (P/N 117-5033-001)

Picture	Item Description	Part Number	Qty.
Not Pictured	Manual - Terrain Comp	016-0171-277	1
Not Pictured	Manual - Challenger MT 7XXC and MT 8XXC Series SmarTrax Installation	016-0197-003	1
	Switch - SmarTrax Foot	063-0172-470	1
	Cable - SmarTrax Raven Interface	115-4001-089	1
	Node - SmarTrax 3D CAN Control	063-0173-031	1

## Standard Node Mounting Kit

TABLE 2. Standard Steering Control Node Mounting Kit (P/N 117-0197-051)

Picture	Item Description	Part Number	Qty.
	Bracket - Challenger Mounting	107-0171-888	1
	Bolt - 3/8"-16 x 1-1/4" Hex	311-0054-106	3
	Nut - 3/8"-16 UNC Nyloc Lock	312-4000-061	3

## Install the SmarTrax Equipment

**Important:** The Challenger Armrest ECU must be updated to version 2.19 or greater in order to work with the SmarTrax system. Contact your local AGCO or CAT dealer to obtain the software update.

FIGURE 1. Node Installed on Mounting Plate



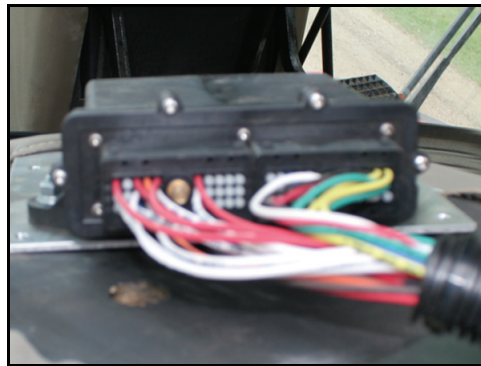
1. Mount the SmarTrax node (P/N 063-0173-031) to the mounting plate (P/N 107-0171-888) using three 3/8"-16 x 1-1/4" hex bolts (P/N 311-0054-106) and three 3/8"-16 UNC nylon lock nuts (P/N 312-4000-061).

FIGURE 2. Mounting Plate Example



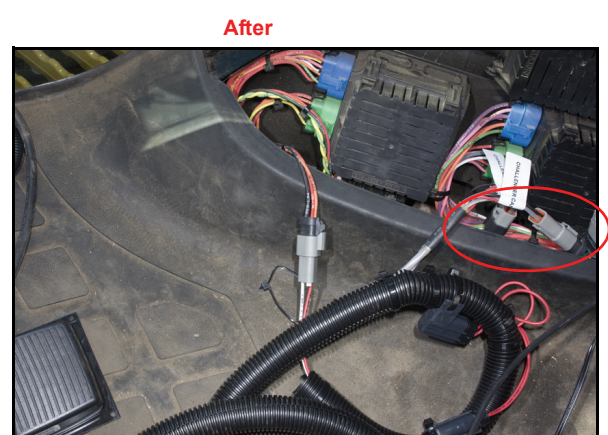
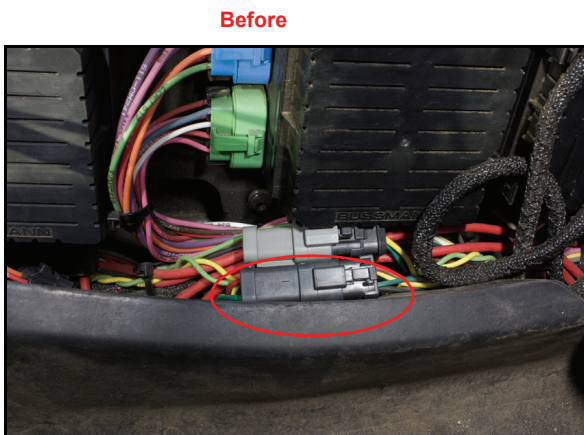
2. Remove the two bolts from monitor mounting bracket.
3. Slide the node mount behind the monitor mounting bracket and replace the bolts as shown in Figure 2.

FIGURE 3. Raven Interface Cable Connected



4. Insert the large, rectangular node connectors on the harness cable (P/N 115-4001-089) into the correct ports of the SmarTrax node.

FIGURE 4. CAT CAN Connectors

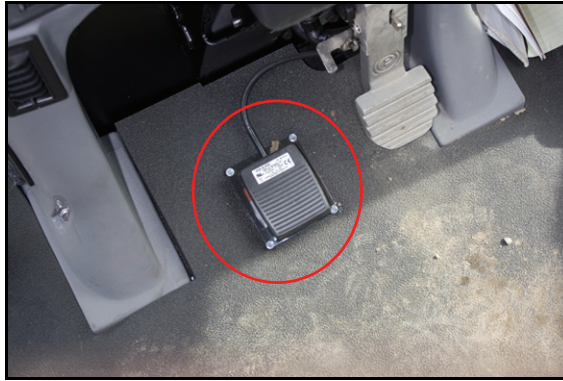


5. Locate the Challenger CANbus connectors in the side panel, break the connection, and install the Raven cable.



FIGURE 5. Foot Switched Installed

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6. Mount the foot switch to the floor of the cab using screws or double-sided tape (not included in the installation kit).

**Note:** *The foot switch should be mounted in a location that allows the front of the pedal to be fully pressed without interference.*

7. Connect the foot switch to the node cable.

### Steering-Only Systems

On systems using the 115-4001-085 chassis cable, leave the jumper plug on the connector labeled “To SmarTrax Node.” Install the 115-4001-089 harness cable between the 115-4001-085 chassis cable and the console cable (P/N 115-0171-926 or 115-4001-066).

### Steering with Additional Nodes

On systems using multiple Raven nodes, install the 115-4001-089 harness cable between the chassis cable (P/N 115-0171-915) and the console cable (P/N 115-0171-926).

## CHAPTER

# 4

## *Installing SmarTrax with Cruiser*


### *SmarTrax Kit Contents*

The Raven Steering Control system utilizes one standard node mounting kit, and one kit tailored to link the Steering Control system to the Raven products that you have chosen to install on your machine. Before beginning installation, compare the items in the kits with the items listed in the kits below. If you have questions about the kits, contact your Raven dealer.



**Note:** *This section contains the kit contents for several different Raven product combinations. Be sure to identify the correct kit for the products being installed on the machine.*

### **SmarTrax 3D - Cruiser**

TABLE 1. SmarTrax 3D - Cruiser Steering Control Installation Kit (P/N 117-0197-054)




Picture	Item Description	Part Number	Qty.
Not Pictured	Manual - Terrain Comp	016-0171-277	1
Not Pictured	Manual - Challenger MT 7XXC and MT 8XXC Series SmarTrax Installation	016-0197-003	1
	Switch - SmarTrax Foot	063-0172-470	1

**TABLE 1. SmarTrax 3D - Cruizer Steering Control Installation Kit (P/N 117-0197-054)**

Picture	Item Description	Part Number	Qty.
	Cable - Steiger/Quadtrac the Steering Control system with Cruizer Raven Interface	115-4001-025	1
	Node - SmarTrax 3D CAN Control	063-0173-031	1




## SmarTrax - Cruizer

**TABLE 2. SmarTrax - Cruizer Steering Control Installation Kit (P/N 117-0197-055)**

Picture	Item Description	Part Number	Qty.
Not Pictured	Manual - Terrain Comp	016-0171-277	1
Not Pictured	Manual - Challenger MT 7XXC and MT 8XXC Series SmarTrax Installation	016-0197-003	1
	Switch - SmarTrax Foot	063-0172-470	1
	Node - SmarTrax CAN Control	063-0173-042	1
	Cable - SmarTrax Node Raven Interface	115-4001-025	1

## Standard Node Mounting Kit

TABLE 3. Standard Steering Control Node Mounting Kit (P/N 117-0197-051)

Picture	Item Description	Part Number	Qty.
	Bracket - Challenger Mounting	107-0171-888	1
	Bolt - 3/8"-16 x 1-1/4" Hex	311-0054-106	3
	Nut - 3/8"-16 UNC Nyloc Lock	312-4000-061	3

## Install the SmarTrax Equipment

**Important:** The Challenger Armrest ECU must be updated to version 2.19 or greater in order to work with the SmarTrax system. Contact your local AGCO or CAT dealer to obtain the software update.

FIGURE 1. Node Installed on Mounting Plate



1. Mount the SmarTrax node (P/N 063-0173-031) to the mounting plate (P/N 107-0171-888) using three 3/8"-16 x 1-1/4" hex bolts (P/N 311-0054-106) and three 3/8"-16 UNC nylon lock nuts (P/N 312-4000-061).



**FIGURE 2. Mounting Plate Example**

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2. Remove the two bolts from monitor mounting bracket and mount the node as shown.

**FIGURE 3. Raven Interface Cable Connected**

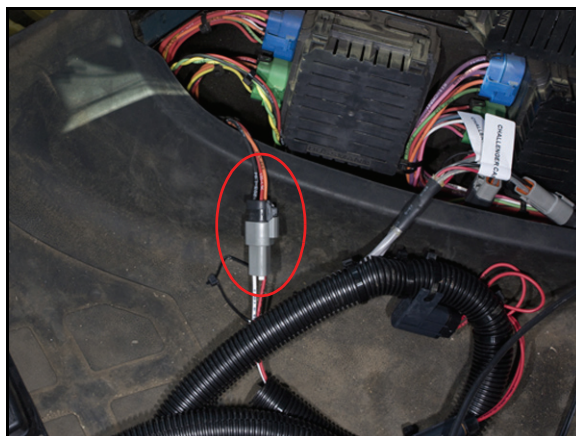
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3. Insert the large, rectangular node connectors on the harness cable (P/N 115-4001-025) into the correct ports of the SmarTrax node.
4. Remove the side panel and locate the 3 pin power connector.

**FIGURE 4. Power Connector**

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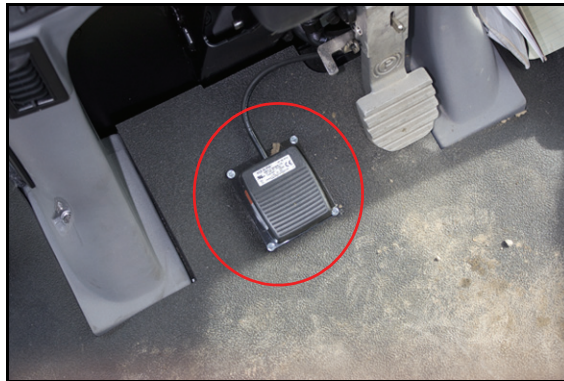
5. Remove protective cover and connect to the Raven cable.
6. Locate the Challenger CANbus connectors in the side panel.

**FIGURE 5. CAT CAN Connectors**



7. Break the connectors and connect the Raven cable.

**FIGURE 6. Foot Switched Installed**



8. Mount the foot switch to the floor of the cab using screws or double-sided tape (not included in the installation kit).

**Note:** *The foot switch should be mounted in a location that allows the front of the pedal to be fully pressed without interference.*

9. Connect the foot switch to the node cable.

## ***Install the Cruiser Equipment***

1. Connect the display cable to the Cruiser port A (the connector underneath the coaxial antenna connector).
2. Connect the DGPS out connector to supplied Cruiser cable (P/N 115-0171-796).
3. Connect GPS source to the cable labeled DGPS.



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**CHAPTER**

**5**

***Wiring Schematics***

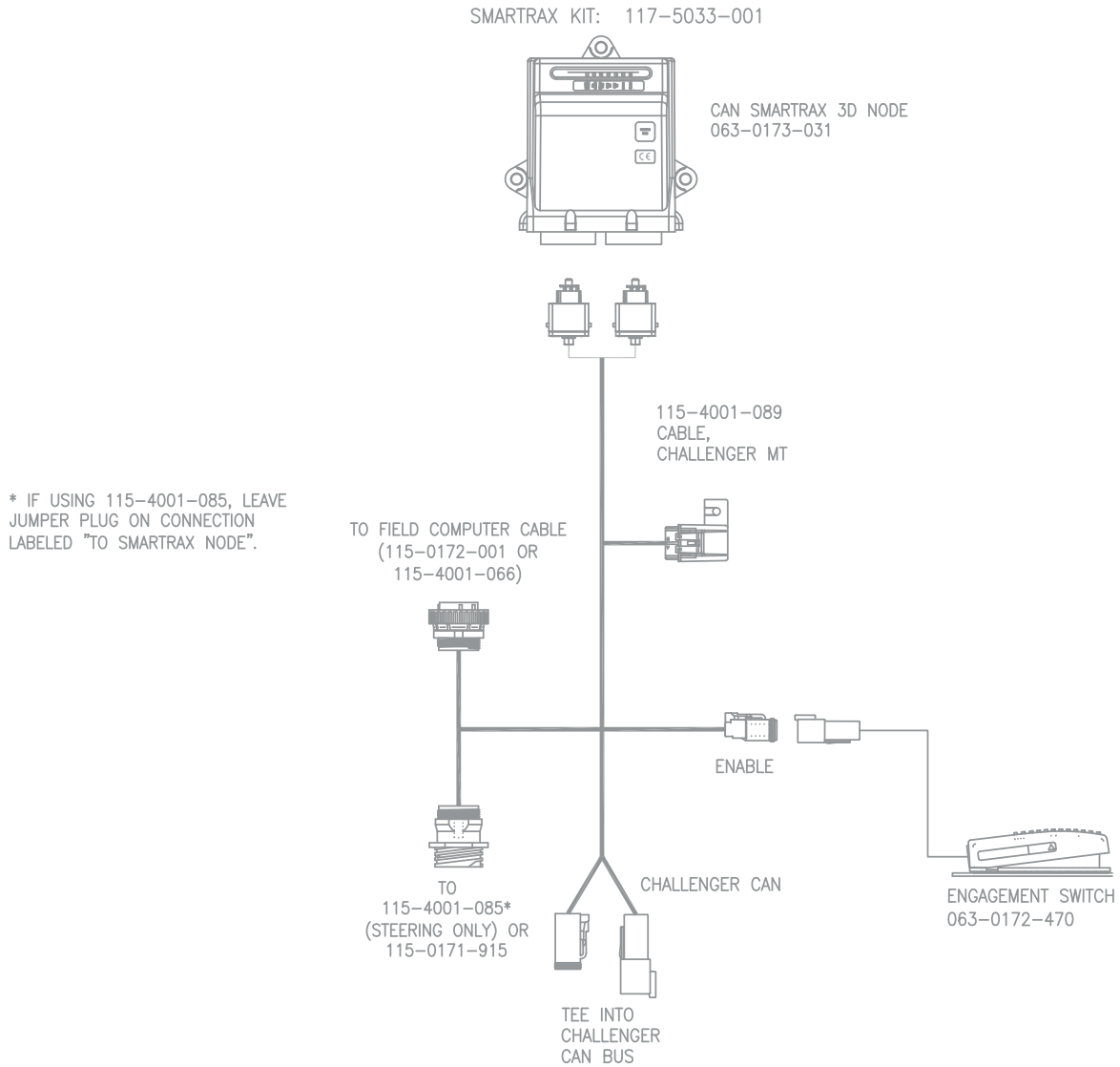
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***SmarTrax Wiring Schematics***

Refer to the Installation & Operation Manual and the appropriate wiring schematic in this chapter for the installation and wiring instructions for your specific field computer.

## Viper Pro, Envizio Pro, Envizio Pro II, and Cruizer II

### CAN SMARTRAX, CHALLENGER MT 700/800C STEER READY

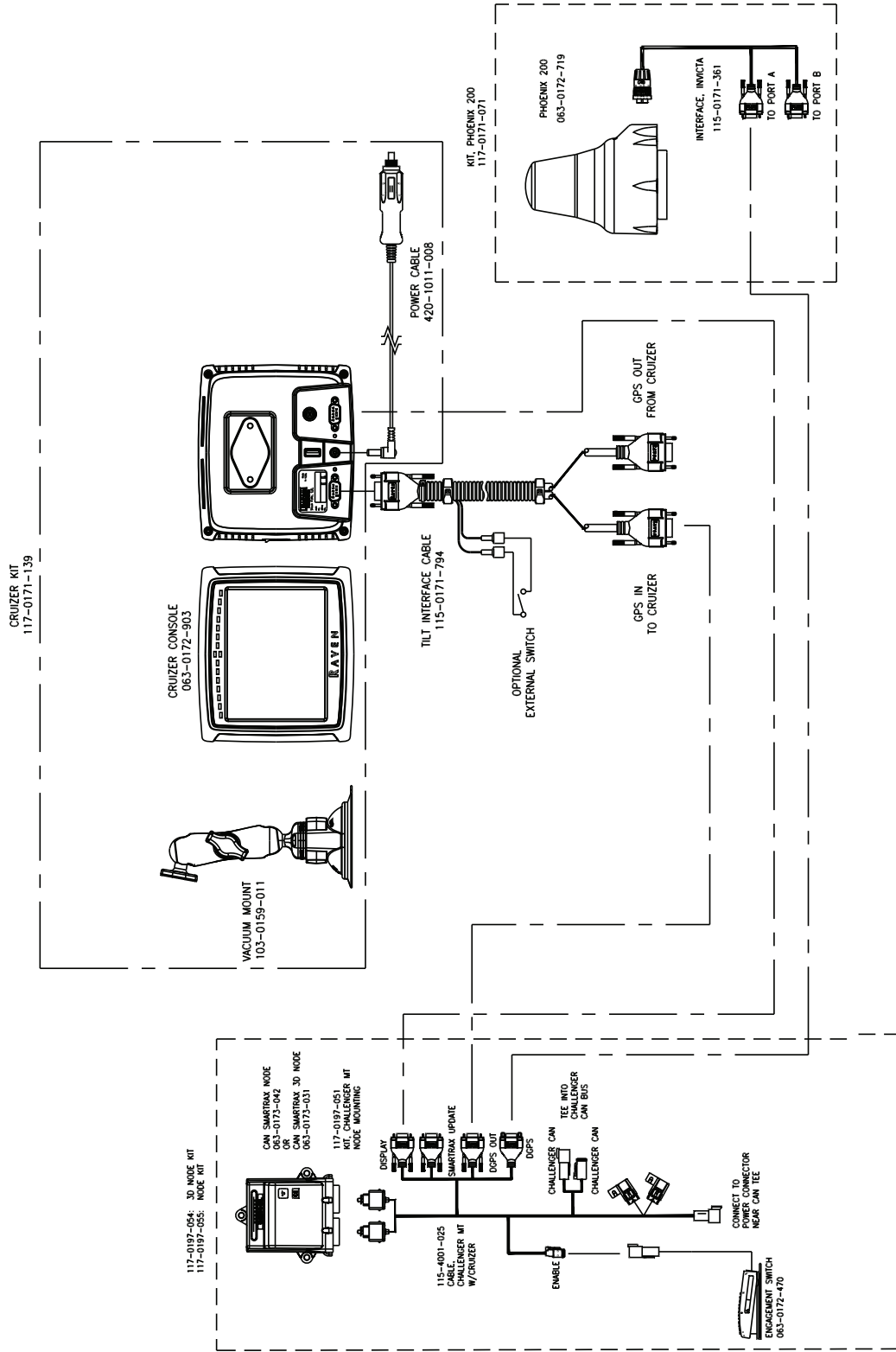


NOTE:

REFER TO DWG. 054-5000-001 FOR OTHER SYSTEM COMPONENTS.

# Cruizer with Phoenix 200 SmarTrax Node

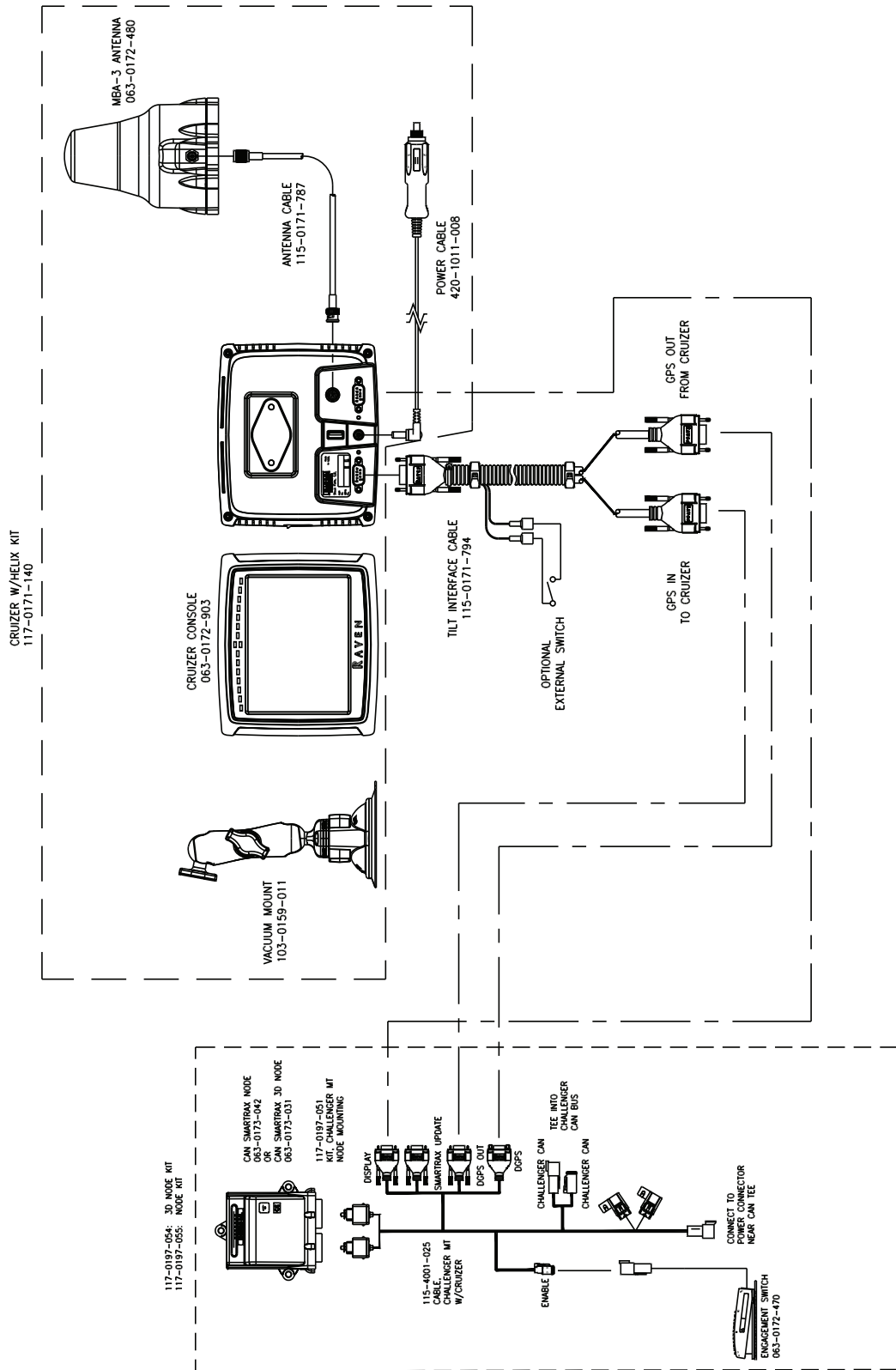
## SMARTRAX NODE, P200, CRUIZER, CHALLENGER MT





# Cruizer with Helix Antenna SmarTrax Node

## SMARTRAX NODE, CRUIZER WITH HELIX ANTENNA, CHALLENGER MT







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**RAVEN**

# **RAVEN INDUSTRIES**

## **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.

### ***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.