

RS1 Installation Manual  
for Fendt Vario Guide  
900/1000 & Challenger  
1000

*016-5033-011 Rev. A*

*1/2021*

*E36638*



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<b>Chapter 1</b>	<b>Important Information.....</b>	<b>1</b>
Safety .....		<b>1</b>
Displays and Control Consoles .....		<b>1</b>
Electrical safety .....		<b>2</b>
Touch Screen .....		<b>2</b>
Recommendations and Best Practices .....		<b>2</b>
Harness Routing .....		<b>2</b>
<b>Chapter 2</b>	<b>Introduction.....</b>	<b>5</b>
Installation Best Practices .....		<b>5</b>
Recommendations .....		<b>5</b>
Point of Reference .....		<b>5</b>
Kit Components .....		<b>6</b>
Updates .....		<b>7</b>
<b>Chapter 3</b>	<b>Installation .....</b>	<b>9</b>
Install the RS1 and Bracket .....		<b>9</b>
Install the RS1 Roof Bracket .....		<b>9</b>
Install CR7 or CR12 .....		<b>14</b>
Install Field Computer Harness .....		<b>15</b>
Activate Automatic Steering .....		<b>15</b>
System Drawings .....		<b>16</b>



## SAFETY

### **NOTICE**

Follow the operation and safety instructions included with the implement and/or controller and read this manual carefully before installing or operating this Raven system.

- Follow all safety information presented within this manual. Review implement operation with your local dealer.
- Contact a local Raven dealer for assistance with any portion of the installation, service, or operation of Raven equipment.
- Follow all safety labels affixed to system components. Be sure to keep safety labels in good condition and replace any missing or damaged labels. Contact a local Raven dealer to obtain replacements for safety labels.

Observe the following safety measures when operating the implement after installing this Raven system:

- Do not operate this Raven system or any agricultural equipment while under the influence of alcohol or an illegal substance.
- Be alert and aware of surroundings and remain in the operator seat at all times when operating this Raven system.
  - Do not operate the implement on any public road with this Raven system enabled.
  - Disable this Raven system before exiting the operator seat.
  - Determine and remain a safe working distance from obstacles and bystanders. The operator is responsible for disabling the system when a safe working distance has diminished.
  - Disable this Raven system prior to starting any maintenance work on the implement or components of this Raven system.
- Do not attempt to modify or lengthen any of the system control cables. Extension cables are available from a local Raven dealer.

## DISPLAYS AND CONTROL CONSOLES

- If the display will not be used for an extended period, it is best to remove the display from the machine and store it in a climate controlled environment. This may help to extend the service life of electronic components.
- To prevent theft, secure the display and GPS antenna when leaving the machine unattended.

## CAUTION

### ELECTRICAL SAFETY

- Always verify that power leads are connected to the correct polarity as marked. Reversing the power leads could cause severe damage to the Raven system or other components.
- To prevent personal injury or fire, replace defective or blown fuses with only fuses of the same type and amperage.
- Do not connect the power leads to the battery until all system components are mounted and all electrical connections are completed.
- Always start the machine before initializing this Raven system to prevent power surges or peak voltage.
- To avoid tripping and entanglement hazards, route cables and harnesses away from walkways, steps, grab bars, and other areas used by the operator or service personnel when operating or servicing the equipment.

### TOUCH SCREEN

- Only touch the touch-screen with your finger or by using a special touch-screen stylus/pen. Operating the touch-screen with sharp objects may cause permanent damage to the screen.
- Only clean the screen using a damp cloth. Never use caustic or other aggressive substances.

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## RECOMMENDATIONS AND BEST PRACTICES

### HARNESS ROUTING

The word “harness” is used to describe any electrical cables and leads, both bundled and unbundled. Use the following guidelines and recommendations when connecting and routing harnesses while installing or maintaining this Raven system:

- Leave protective caps/covers over harness connectors until needed to avoid dirt and moisture from contaminating electrical circuits.
- Secure the harness to the frame or solid structural members at least every 12 in [30 cm].
- Follow existing harness runs already routed on the implement as much as possible. Proper harness routing should:
  - Secure harnessing and prevent the harness from hanging below the implement.
  - Provide sufficient clearance from moving components and operational zones around shafts; universal joints and suspension components; pulleys, gears, belts, and chains; moving linkages, cylinders, articulation joints, etc.
  - Protect harnessing from field debris and surrounding hazards (e.g. tree limbs, fence posts, crop stubble, dirt clumps or rocks that may fall or be thrown by the implement).
  - Protect harnessing from sharp bends, twisting, or flexing over short distances and normal implement operation.
  - Connectors and splices should not be located at bending points or in harness sections that move.
  - Ensure sufficient length for free movement of the implement during normal operation and prevent pulling, pinching, catching, or rubbing, especially in articulation and pivot points. Clamp harnessing securely to force controlled movement of the harness.

- Avoid abrasive surfaces and sharp edges such as sheared or flame cut corners, fastener threads or cap screw heads, hose clamp ends, etc.
- Do not connect, affix, or allow harnessing to come into contact with components with high vibration forces, hot surfaces, or components carrying hot fluids beyond the temperature rating of harness components.
  - Harnessing should be protected or shielded if routing requires the hose to be exposed to conditions beyond harnessing component specifications.
- Avoid routing harnesses in areas where damage may occur due to build up of material (e.g. dirt, mud, snow, ice, etc.).
- Avoid routing harnesses in areas where the operator or service personnel might step or use as a grab bar.

**IMPORTANT:** Avoid applying direct spray or pressure washing of electrical components and connections. High pressure streams and sprays can penetrate seals, cause corrosion, or otherwise damage electrical components.  
When performing maintenance:

- Inspect electrical components and connectors for corrosion, damaged pins or housings, etc. Repair or replace components or harnessing as necessary.
- Ensure connectors are kept clean and dry. Apply dielectric grease to the sealing surfaces of all connections exposed to moisture, dirt, debris, and other contaminants. Repair or replace harnessing as necessary.
- Clean electrical components with pressurized air, aerosol electrical cleaning agent, or low pressure rinse.
- Remove visible surface water from electrical components and connections using pressurized air or an aerosol cleaning agent. Allow components to dry thoroughly before reconnecting cables.





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# CHAPTER

# INTRODUCTION

## 2

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Congratulations on your purchase of the Raven RS1™ 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. For future reference, write your serial number in the space below.

Make	Model
Fendt	900/1000
Challenger	1000

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## INSTALLATION BEST PRACTICES

	<b>WARNING</b> 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.
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## RECOMMENDATIONS

Before installing the RS1™ system, park the machine where the ground is level, clean, and dry. Bleed pressure from the hydraulic system and 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.

Raven Industries recommends the following best practices when installing or operating the RS1™ system for the first time, at the start of the season, or when moving the RS1™ system to another machine:

- Verify that the machine's hydraulic system is using fresh oil and that the filters have been recently changed
- Ensure 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.).

## POINT OF REFERENCE

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

## KIT COMPONENTS

This section contains a list of the components that are included in the RS1 kit. Before beginning the system installation, compare the items in the kit with the components on this list. If you have questions about the kit, contact your Raven dealer.

FIGURE 1. Fendt Tractors, RS1 Bracket Kit Components (P/N 117-5033-011 Rev. A)

QTY	PART #	DESCRIPTION
1	053-0159-209	BOX, SHIPPING
1	107-0172-515	BRACKET, AGCO, RS1 MOUNT
1	107-0172-685	BRACKET, MOUNTING PLATE, RS1, FENDT TRACTOR
1	115-4010-180	CABLE, ROOF, RS1, FENDT VARIOGUIDE
1	053-0159-074	ENVELOPE, PLASTIC
4	311-0003-041	SCREW, MACHINE, 1/4"-20 X 1/2" FLAT HEAD HEX, 82 DEG CC
4	311-4050-140K	HEX BOLT DIN931, M6 X 40MM, CLASS II
4	313-2300-310	WASHER, STEEL, FLAT, 1/4", ZINC
1	319-1000-013	LATCH, SWELL, RS1, AGCO
4	327-1960-750	SPACER, CLEARANCE HOLE, ALUM., ROUND, 1/4" ID X 3/8" OD
7"	332-0000-042	TAPE, 2-SIDED 1.6 X 19MM 3M 4956, 2 PIECES @ 3.5"

FIGURE 2. Fendt Tractors, RS1, 593 Bracket Kit Components (P/N 117-5033-012 Rev. A)

QTY	PART #	DESCRIPTION
1	053-0159-209	BOX, SHIPPING
1	107-0172-689	BRACKET, RS1, -593 MOUNTING PLATE, FENDT TRACTORS
1	115-4010-180	CABLE, ROOF, RS1, FENDT VARIOGUIDE
1	053-0159-074	ENVELOPE, PLASTIC
4	311-4050-140K	HEX BOLT DIN931, M6 X 40MM, CLASS II
4	313-2300-310	WASHER, STEEL, FLAT, 1/4", ZINC
4	327-1960-750	SPACER, CLEARANCE HOLE, ALUM., ROUND, 1/4" ID X 3/8" OD
18"	332-0000-042	TAPE, 2-SIDED 1.6 X 19MM 3M 4956, 2 PIECES @ 9"

**NOTE:** Kit 117-5033-012 above will only be used if the RS1 is being transferred from a different machine with a 107-0172-593 (e.g. RoGator C) bracket to the Fendt/Challenger tractor.

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## UPDATES

Updates for Raven manuals as well as software updates for Raven consoles, and product controllers are available at the Applied Technology Division web site:

<https://portal.ravenprecision.com>

Sign up for e-mail alerts to receive notifications when updates for your Raven products are available on the Raven web site.

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)

- RS1 Installation Manual for Fendt Vario Guide 900/1000 & Challenger 1000
- 016-5033-011 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.



### INSTALL THE RS1 AND BRACKET

#### INSTALL THE RS1 ROOF BRACKET

1. Mount the roof bracket to the cab of the machine by removing the roof vent bolts and installing the bracket using the provided M6 bolts, washers, and spacers.
2. Apply the two-sided tape to the flange on the bracket so it sticks to the top cab toward the front of the machine.

FIGURE 1. RS1 Bracket Secured to Machine Cab

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FIGURE 2. Roof Hatch Lining

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3. Inside the cab, remove the lining of the roof hatch by gently pulling on the sides. It might be required to remove four screws from the corners.

FIGURE 3. Roof Hatch Lining Removed

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4. Open the metal plate of the roof hatch by removing the twelve M6 screws.

NOTE: Use caution when slowly lowering the metal plate.

5. Locate the Fendt connector inside the cabin roof.

FIGURE 4. Black Fendt Connector

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6. Remove the upper, front, right light housing.

FIGURE 5. Light Housing



7. Route the flying leads on the RS1 cable through the upper, left grommet as seen in Figure 6.

FIGURE 6. RS1 Cable Routed through Grommet

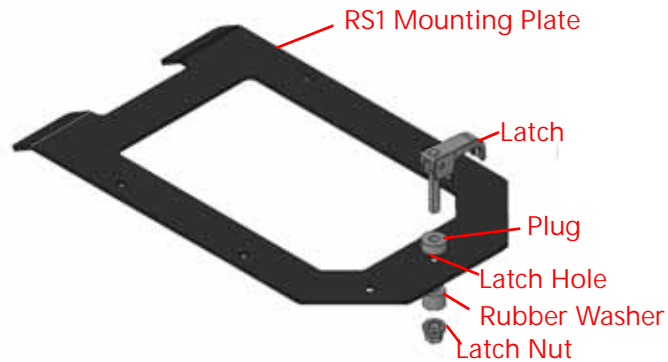


8. Mount the RS1 to the bracket provided or use the existing RS1 and latch it to the bracket.
9. If using the provided bracket, use the countersunk 1/4" bolts to mount the bracket to the bottom of the RS1.

10. Assemble the latch, plug, rubber washer, and latch nut through the latch hole on the RS1 mounting plate.

FIGURE 7. Latch Assembly

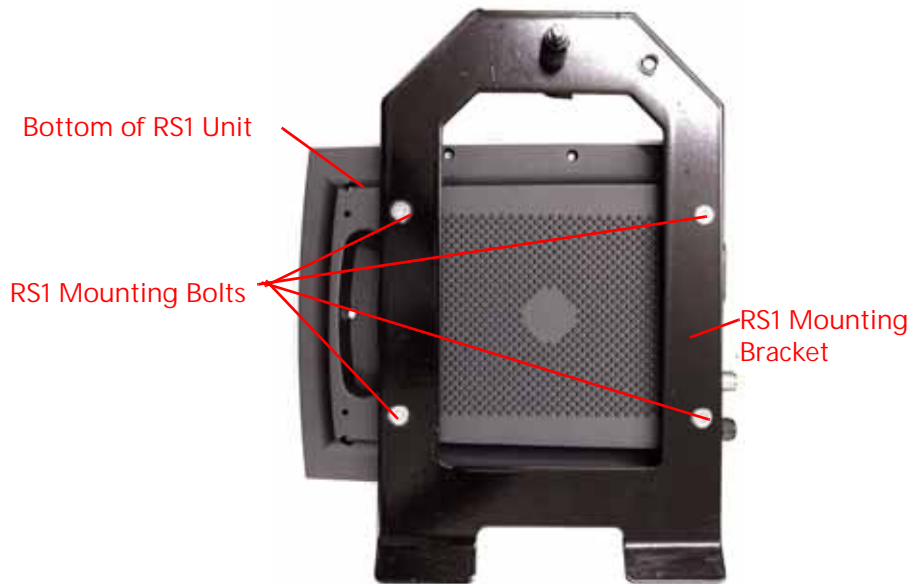
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11. Using the four 1/4" - 20 x 1/2" flat head machine screws provided, install the RS1 mounting bracket to the bottom of the RS1 unit.

FIGURE 8. RS1 Mounted to Bracket

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12. With the front of the RS1 (sloped edge) towards the front of the machine, place the installation tab of the RS1 mounting bracket in the installation tab slot.



13. Once mounted, the RS1 can be plugged in and excess cable can be routed into the cab through the grommet and reinstall the headlight.

FIGURE 9. Final Roof Orientation



14. Grab the loose connector provided with the 115-4010-180 cable. The pins will be gently inserted until they lock in place. The connector has labels 1-12 where wires can be inserted. Refer to Table 1 below to populate the connector.

TABLE 1.

Connector Number	Connection Description
1	Red
2	Black
3	Orange
4	Dust Plug
5	White and Green
6	White and Yellow
7	Yellow
8	Green
9	Dust Plug
10	Dust Plug
11	Dust Plug
12	Dust Plug

NOTE: Some of the connector cavities will not be populated. White dust plugs are provided in the connector that will be placed in the unpopulated cavities.

15. Connect the newly populated connector to the Fendt cable under the metal plate as shown in Figure 4 on page 10.
16. Reinstall the metal plate and roof covers.
17. Connect the connector.

## INSTALL CR7 OR CR12

Ensure the installer follows all of the following guidelines for best installation practices.

- Always ensure the terminal is placed in the most appropriate position facing the driver seat for easy access and use.
- Always use a RAM-C ball attachment.
- Mount the terminal with a solid bracket in a place free of vibrations.
- Secure all cables in the cabin so there are no free-hanging cables.
- Ensure the driver has a clear, unobstructed view all around the cabin.

FIGURE 10. CR7 Mounted in Various Positions



FIGURE 11. CR12 Mounted in Various Positions



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## INSTALL FIELD COMPUTER HARNESS

Ensure the installer follows all of the following guidelines for best installation practices.

- Install the field computer harness (sold separately) between the field computer and the standard connectors of the tractor.
- Mount the 9-pin ISOBUS connector to the panel mount connector in the cabin of the tractor.
- Mount the 3-pin power connector.
- Guide the harness to the field computer.

FIGURE 12. ISOBUS and Power Connector



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## ACTIVATE AUTOMATIC STEERING

To activate automatic steering for Fendt Varioguide systems with RS1:

1. Press the pre-activation steering button.

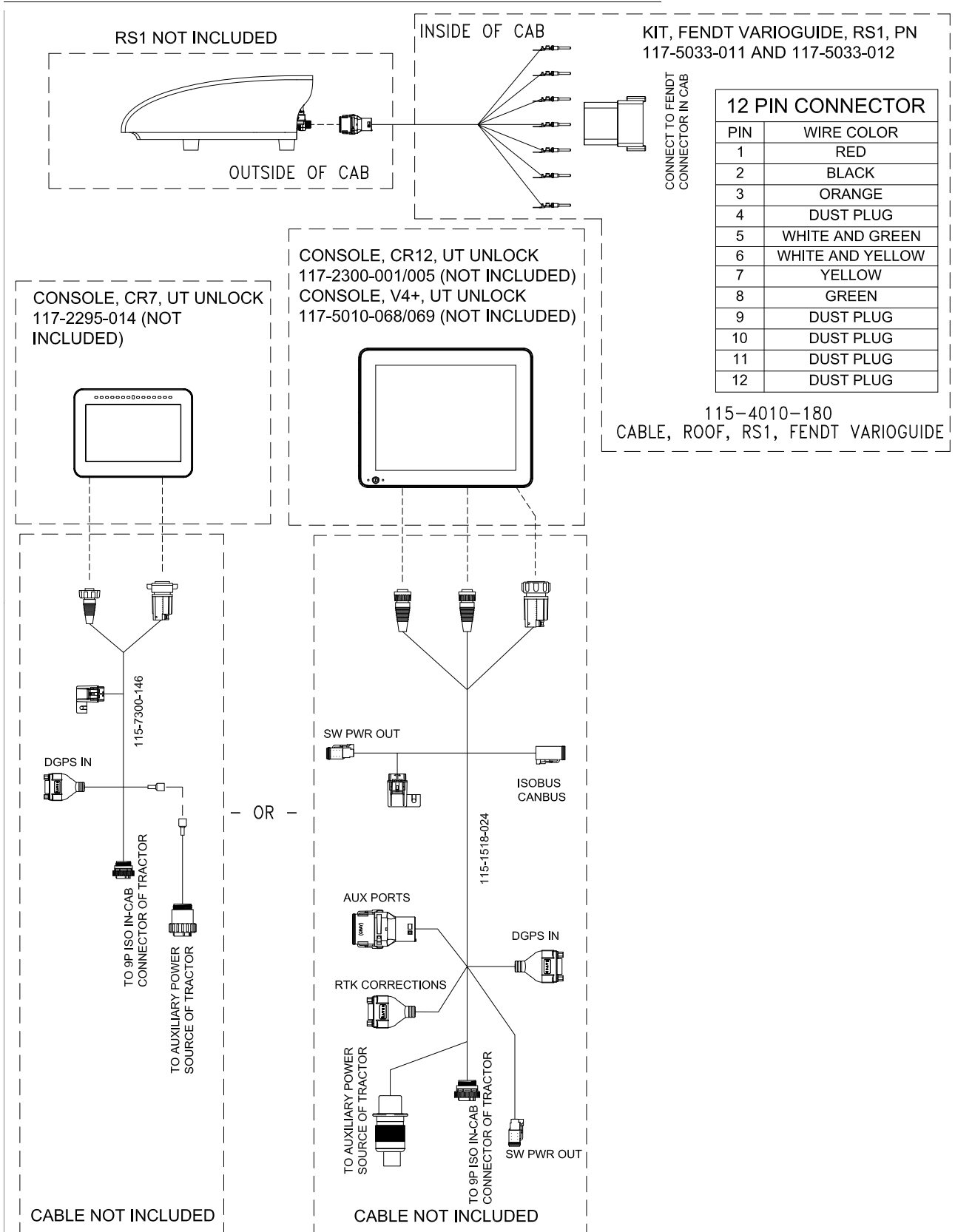
FIGURE 13. Pre-Activation on Armrest



2. After a successful self-test of the steering system, the LED will activate and automatic steering can be activated.

SYSTEM DRAWINGS

FIGURE 14. RS1 Fendt Vario Guide 9XX/10XX & Challenger 10XX Drawing (P/N 054-5033-011 Rev. B)



## C

Computer Harness 15  
CR12 14  
CR7 14

## I

Introduction  
  Installation  
    Recommendations 5  
  Point of Reference 5

## R

Roof Bracket 9  
RS1 9

## S

System Drawings 16

## U

Updates 7



# 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](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.**