

RAVEN

Simply improving your position.SM

Installation Manual



SmartRow™

Disclaimer

While every effort has been made to ensure the accuracy of this document, Raven Industries assumes no responsibility for omissions and errors. Nor is any liability assumed for damages resulting from the use of information contained herein.

Raven Industries shall not be held responsible or liable for the effects of atmospheric conditions and sunspot activity on the performance of our products.

Raven Industries cannot guarantee the accuracy, integrity, continuity, or availability of the GPS signal from the U.S. Department of Defense/NAVSTAR GPS satellites, the OmniSTAR correction service or the WAAS correction service.

Raven Industries accepts no responsibility for the use of the signal for other than the stated purpose. Raven Industries shall not be responsible or liable for incidental or consequential damages or a loss of anticipated benefits or profits, work stoppage or loss or impairment of data arising out of the use, or inability to use, the SmarTrax or any of its components.

CHAPTER 1 *Important Safety Information* 1

 Electrical Safety 2

CHAPTER 2 *Introduction* 3

 Installation 3

 Updates 4

 Overview of the SmartRow Installation Process 4

 Recommendations 4

 Reviewing SmartRow Kit Contents 5

 Electric Clutch Systems 5

CHAPTER 3 *Electric Clutch Systems Installation* 7

 Process Overview 7

 Recommendations 7

 Installing the Power Harness and Planter Harness 8

 Parts Needed for this Procedure 8

 To Install the Power Harness 8

 To Install the Planter Harness 9

 Installing the Remote Switch 11

 Parts Needed for this Procedure 11

 To Install the Remote Switch 11

 Installation Complete 12

 System Cable Drawing 13

CHAPTER 4 *Air Clutch Systems Installation* 15

 Process Overview 15

 Recommendations 15

 Installing the Power Harness and Planter Harness 16

 Parts Needed for this Procedure 16

 To Install the Power Harness 16

 To Install the Planter Harness 17

 Installing the Remote Switch 18

 Parts Needed for this Procedure 18

 To Install the Remote Switch 18

 Installation Complete 19

 System Cable Drawing 20

Table of Contents

CHAPTER

1

*Important Safety
Information*

NOTICE

Read this manual carefully before installing the SmartRow 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 SmartRow 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 SmartRow, observe the following safety measures:

- Be alert and aware of surroundings.
- Do not operate SmartRow 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 SmartRow is engaged.
- Do not drive the machine with SmartRow enabled on any public thorough-fare or main road.
- Ensure SmartRow is disabled prior to starting any maintenance work on SmartRow or the machine.

Please review the operation and safety instructions included with your implement and/or controller.



Electrical Safety

Do not reverse power leads. Doing so could cause severe damage to the equipment. Always make sure that the power leads are connected to the correct polarity as marked. Ensure that the power cable is the last cable to be connected.

CHAPTER 2 *Introduction*

Congratulations on your purchase of the Raven SmartRow™ system! This system is designed to provide worry-free turn on and turn off of your row units with respect to an as-applied coverage area. The following instructions are designed to assist you in the proper installation of the SmartRow system. See the Operation Manual of your SmartRow console for instructions on setting up the software and using the SmartRow system.

Installation

	<p>⚠ WARNING</p> <p>Read all safety requirements and precautions in the this manual prior to operating a machine equipped with the SmartRow feature. Failure to follow safety precautions may lead to damage to equipment, injury, or death.</p>
-------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

Updates

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

<http://www.ravenprecision.com/Support/index2.jsp>

Sign up for e-mail alerts and we will notify you when updates for your Raven products are available on the Raven web site.

<http://www.ravenprecision.com>

Overview of the SmartRow Installation Process

TABLE 1. SmartRow Installation Overview

For information about this step...	See this chapter...
Review your SmartRow kit contents and gather the necessary tools	Chapter 2
Electric Clutch Systems Installation	Chapter 3
Air Clutch Systems	Chapter 4

Recommendations

Observe the following recommendations while installing the SmartRow system:

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

Reviewing SmartRow Kit Contents

This section contains a list of the kit contents that you should have received in these SmartRow kits. Before you begin assembling the kit, compare the items in your SmartRow kit with this list. If you have questions about your kit, contact your Raven dealer.

The following components are required for complete installation of the Raven SmartRow system.

Electric Clutch Systems

SmartRow 2 Clutch (Mounted) Kit (P/N 117-3001-007)

Component	Part Number	Quantity
SmartRow Installation Manual	016-3001-002	1
Remote Switch Assembly	063-0172-967	1
SmartRow Power Cable	115-3001-020	1
SmartRow Clutch Cable for 2 Clutch System (Mounted)	115-3001-021	1
6' GPS Cable	115-0171-119	1
12' Receiver Cable	115-0171-460	1
SmartRow Console	063-0172-828	1

SmartRow 2 Clutch Kit (P/N 117-3001-008)

Component	Part Number	Quantity
SmartRow Installation Manual	016-3001-002	1
Remote Switch Assembly	063-0172-967	1
SmartRow Power Cable	115-3001-020	1
SmartRow Clutch Cable for 2 Clutch System	115-3001-022	1
6' GPS Cable	115-0171-119	1
12' Receiver Cable	115-0171-460	1
SmartRow Console	063-0172-828	1

SmartRow 3 Clutch Kit (P/N 117-3001-009)

Component	Part Number	Quantity
SmartRow Installation Manual	016-3001-002	1
Remote Switch Assembly	063-0172-967	1
SmartRow Power Cable	115-3001-020	1



**SmartRow 3 Clutch Kit
(P/N 117-3001-009)**

Component	Part Number	Quantity
SmartRow Clutch Cable for 3 Clutch System	115-3001-023	1
6' GPS Cable	115-0171-119	1
12' Receiver Cable	115-0171-460	1
SmartRow Console	063-0172-828	1

**SmartRow 4 Clutch Kit
(P/N 117-3001-010)**

Component	Part Number	Quantity
SmartRow Installation Manual	016-3001-002	1
Remote Switch Assembly	063-0172-967	1
SmartRow Power Cable	115-3001-020	1
SmartRow Clutch Cable for 4 Clutch System	115-3001-024	1
6' GPS Cable	115-0171-119	1
12' Receiver Cable	115-0171-460	1
SmartRow Console	063-0172-828	1

Air Clutch Systems

**Air Clutch 8 Systems Kit
(P/N 117-3001-006)**

Component	Part Number	Quantity
SmartRow Installation Manual	016-3001-002	1
Remote Switch Assembly	063-0172-967	1
SmartRow Power Cable	115-3001-035	1
SmartRow Clutch Cable for Air Clutch Systems	115-3001-019	1
6' GPS Cable	115-0171-119	1
12' Receiver Cable	115-0171-460	1
SmartRow Console	063-0172-828	1

CHAPTER

3

Electric Clutch Systems Installation

Process Overview

To install the SmartRow Electric Clutch, you must complete the following steps:

1. Install the Power Harness.
2. Install the Planter Harness.
3. Install the Remote Switch.

Recommendations

Observe the following recommendations while installing the AutoBoom system:

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

Installing the Power Harness and Planter Harness

Parts Needed for this Procedure

Component	Part Number	Quantity
SmartRow Electric Clutch Power Cable	115-3001-020	1
SmartRow Clutch Cable for Clutch System	115-3001-021/22/23/24	1
SmartRow Console	063-0172-828	1
6' GPS Cable	115-0171-119	1
12' Receiver Cable	115-0171-460	1

To Install the Power Harness

Note: Refer to the “SmartBoom/SmartRow Installation and Operation Manual” for instructions on mounting the SmartRow console.

1. Connect the power harness to the SmartRow console.
 - a. Locate the 20 pin connector on the SmartRow power harness (P/N 115-3001-020) and connect to the Control receptacle on the rear of the SmartRow console.
 - b. Locate the 4 pin connector on the SmartRow power harness (P/N 115-3001-020) and connect to the Power receptacle on the rear of the SmartRow console.
2. Route the power harness to the rear of the cab.
3. Locate a source of 12V switched power.
4. Referring to the SmartRow power harness (P/N 115-3001-020).
 - a. Connect the red wire to clean source of 12V switched power.
 - b. Connect the white wire to a source of ground.
5. Route the power harness to the hitch and secure with the supplied tie straps.

Note: Be sure to allow enough slack in the harness to allow for the machine movement (articulated tractors) in order to prevent pinching or stretching of the harness.

To Install the Planter Harness

1. Route the 14 pin connector to the planter hitch and secure with the supplied straps.
2. Locate the existing electric clutches on the planter and route the section leads to their respective clutch.

Section Orientation: (Seated in the tractor, facing forward)

- Section 1 = Left outer clutch (Black)
- Section 2 = Left inner clutch (Brown)
- Section 3 = Right inner clutch (Blue)
- Section 4 = Right outer clutch (Green)

Note: *The example above is for a 4 clutch system. For a 2 clutch system, Section 1 would be the left clutch and Section 2 would be the right clutch, etc.*

Important: **Be sure to route the section leads along the existing wiring harness to prevent the section leads from being stretched or pinched during folding operations.**



3. Attach section leads to clutches.

Note: *Most electric clutches will have threaded studs to attach ring terminals. It may be necessary to replace the supplied ring terminal with connectors specific to the clutch.*

4. Locate positive (+) stud or terminal on clutch and attach the section lead.



FIGURE 1. John Deere 7200 Clutch



FIGURE 2. White 8500 Clutch

Installing the Remote Switch

Parts Needed for this Procedure

Component	Part Number	Quantity
Remote Switch Assembly	063-0172-967	1

To Install the Remote Switch

1. Refer to the Remote Switch Assembly kit instructions.

Note: *SmartRow will control clutches and generate coverage map on a console, only when the switch is activated. Be sure to mount the switch to accommodate varying field conditions and planting depths to ensure the switch will always be activated during seeding.*

2. Locate a suitable mounting location for the remote switch, so the switch is activated when the planter is in the ground.

Suggested Remote Switch Mounting Locations:

- Toolbar raise/lower cylinder linkage.



FIGURE 3. 8500 White Toolbar Cylinder Linkage



- A row unit linkage.



FIGURE 4. Kinze Row Unit Linkage

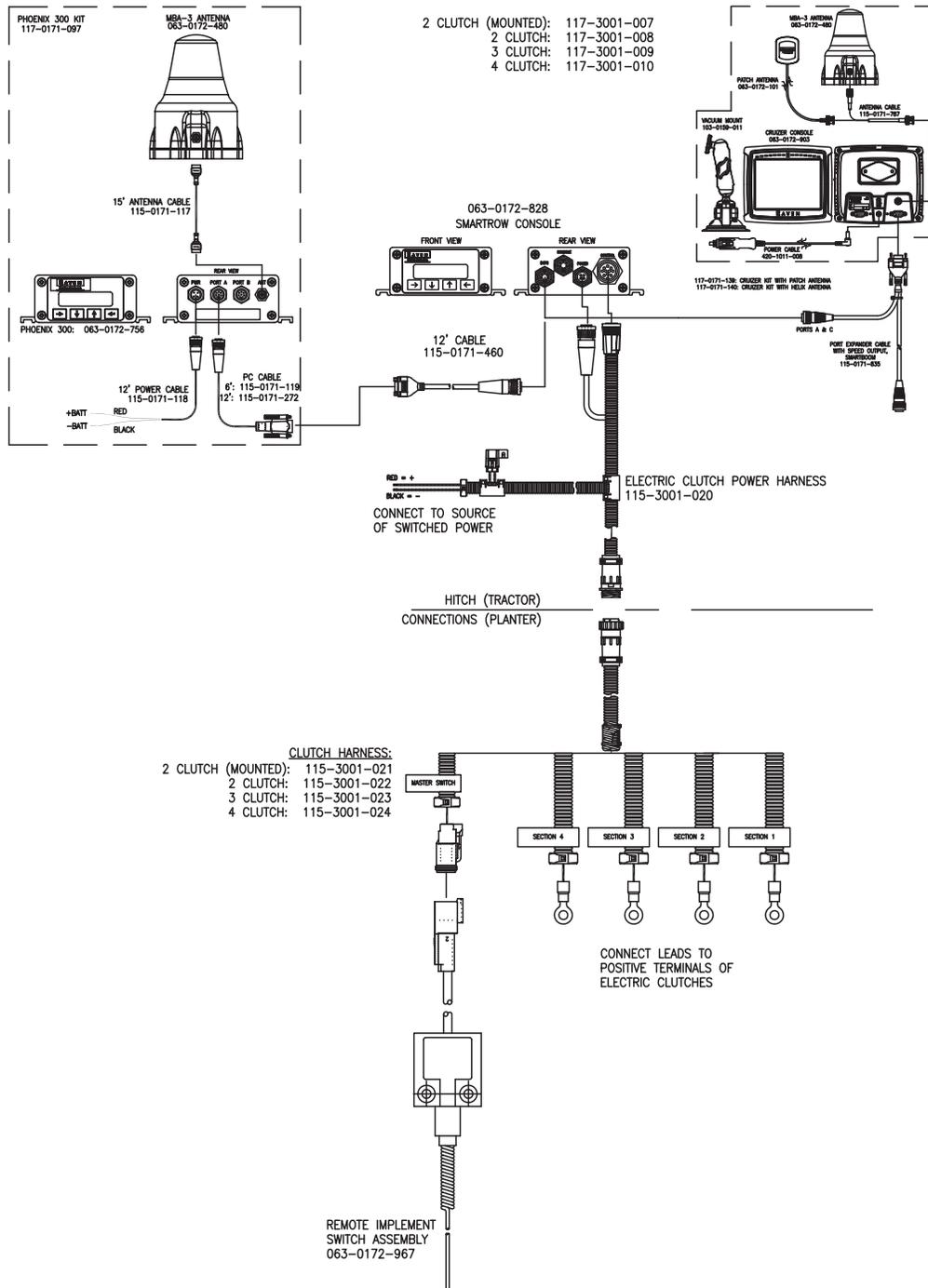
3. Route the remote switch harness lead to the remote switch and connect.

Installation Complete

Refer to the “*SmartBoom/SmartRow Installation and Operation Manual*” for instructions on mounting the SmartRow console.

System Cable Drawing

SMARTROW ELECTRIC CLUTCH KITS



CHAPTER

4

Air Clutch Systems Installation

Process Overview

To install the SmartRow Electric Clutch, you must complete the following steps:

1. Install the Power Harness.
2. Install the Planter Harness.
3. Install the Remote Switch.

Recommendations

Observe the following recommendations while installing the AutoBoom system:

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

Installing the Power Harness and Planter Harness

Parts Needed for this Procedure

Component	Part Number	Quantity
SmartRow Air Clutch Power Cable	115-3001-035	1
SmartRow Clutch Cable for Clutch System	115-3001-019	1
SmartRow Console	063-0172-828	1
6' GPS Cable	115-0171-119	1
12' Receiver Cable	115-0171-460	1

To Install the Power Harness

Note: Refer to the “SmartRow Installation and Operation Manual” for instructions on mounting the SmartRow console.

1. Connect the power harness to the SmartRow console.
 - a. Locate the 20 pin connector on the SmartRow power harness (P/N 115-3001-020) and connect to the Control receptacle on the rear of the SmartRow console.
 - b. Locate the 4 pin connector on the SmartRow power harness (P/N 115-3001-020) and connect to the Power receptacle on the rear of the SmartRow console.
2. Route the power harness to the rear of the cab.
3. Locate a source of 12V switched power.
4. Referring to the SmartRow power harness (P/N 115-3001-020).
 - a. Connect the red wire to clean source of 12V switched power.
 - b. Connect the white wire to a source of ground.
5. Route the power harness to the hitch and secure with the supplied tie straps.

Note: Be sure to allow enough slack in the harness to allow for the machine movement (articulated tractors) in order to prevent pinching or stretching of the harness.

To Install the Planter Harness

1. Route the 14 pin connector to the planter hitch and secure with the supplied straps.
2. Locate the 6 pin packard connectors from the air valve box extension harness.

4- Section System:

- Connect “Sections 1-4” of the AccuRow lead to the air clutch harness.
- Additional sections of the AccuRow harness will not be used.

8- Section System:

- Connect “Sections 1-4” of the AccuRow lead to the extension harness for sections 1-4.
- Remove and discard the dust cap from “Sections 5-8,” of the AccuRow lead and connect to the extension harness for “Sections 5-8”. If seated in the tractor, facing forward, section 1 is the far left section. Section numbers increase from left to right.



Installing the Remote Switch

Parts Needed for this Procedure

Component	Part Number	Quantity
Remote Switch Assembly	063-0172-967	1

To Install the Remote Switch

1. Refer to the Remote Switch Assembly kit instructions.

Note: *SmartRow will control clutches and generate coverage map on a console, only when the switch is activated. Be sure to mount the switch to accommodate varying field conditions and planting depths to ensure the switch will always be activated during seeding.*

2. Locate a suitable mounting location for the remote switch, so the switch is activated when the planter is in the ground.

Suggested Remote Switch Mounting Locations:

- Toolbar raise/lower cylinder linkage.



FIGURE 1. 8500 White Toolbar Cylinder Linkage

- A row unit linkage.



FIGURE 2. Kinze Row Unit Linkage

3. Route the remote switch harness lead to the remote switch and connect.

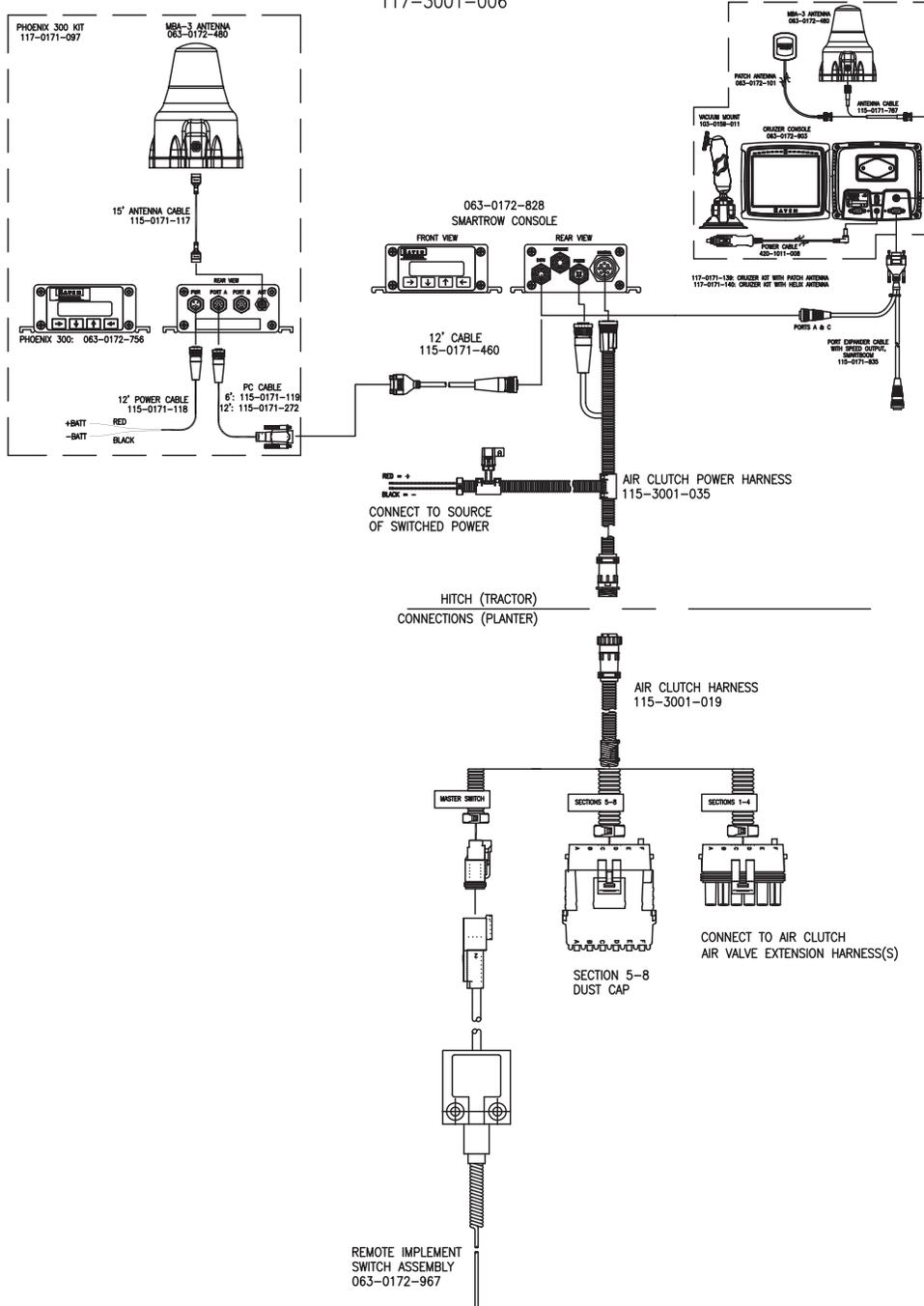
Installation Complete

Refer to the “SmartBoom/SmartRow Installation and Operation Manual” for instructions on mounting the SmartRow console.



System Cable Drawing

SMARTROW AIR CLUTCH KITS 117-3001-006



RAVEN

RAVEN INDUSTRIES

Limited Warranty

What Does this Warranty Cover?

This warranty covers all defects in workmanship or materials in your Raven Applied Technology Product under normal use, maintenance, and service.

How Long is the Coverage Period?

Raven Applied Technology 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.

R A V E N

SmartRow
Installation Manual
(P/N 016-3001-002 Rev A 04/09)

Simply improving your position.SM



Raven Industries
Applied Technology Division
P.O. Box 5107
Sioux Falls, SD 57117-5107

Toll Free (U.S. and Canada): (800)-243-5435
or Outside the U.S. :1 605-575-0722

Fax: 605-331-0426

www.ravenprecision.com
atdinfo@ravenind.com

Notice: This document and the information provided are the property of Raven Industries, Inc. and may only be used as authorized by Raven Industries, Inc. All rights reserved under copyright laws.