

RS1™ Installation Manual
for John Deere 8000
Series Autotractor-Ready
(Non-ISO)

016-5034-324 Rev. A

2/2022

E40684



Chapter 1	Important Information.....	1
Safety	.....	1
Displays and Control Consoles	.....	1
Electrical safety	.....	2
Touch Screen	.....	2
Recommendations and Best Practices	.....	2
Harness Routing	.....	2
Chapter 2	Introduction.....	5
Installation Best Practices	.....	5
Recommendations	.....	6
Point of Reference	.....	6
Kit Components	.....	6
Updates	.....	8
Chapter 3	Installation	9
Power Harness and Power Cabling	.....	9
Best Mounting Practices	.....	9
Install the Hydraulic Drive Unit (HDU)	.....	10
Instructions for mounting the Wheel angle sensor on john deere 8020 ils series tractor	.....	13
Route Chassis Cabling	.....	15
Route the RS1™ Antenna Cables	.....	16
Insert the SIM Card	.....	17
Install the RS1™	.....	18
Install CR7™ or CR12™	.....	20
Field Computer Harness	.....	21
Install the Field Computer Harness	.....	21
System Drawings	.....	22

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.

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.

CHAPTER

INTRODUCTION

2

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. John Deere

Model. 8x10 8x20 8x30 Series (Non ISO Steer-ready)

FIGURE 1. John Deere 8000 Series Tractor



INSTALLATION BEST PRACTICES



WARNING

Carefully read and follow all safety requirements and precautions contained in this manual and the machine-specific Installation Manual. Failure to follow safety instructions may lead to equipment damage, personal injury, or death.

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 2. John Deere Non-ISO AR 8000 Series, CR7, RS1 w/o IBBC (P/N 117-5034-324 Rev. A)

QTY	PART #	DESCRIPTION
1	107-8000-006	BRACKET, STU, MANIFOLD V3
1	117-5001-058	KIT, ROOF, RS1, STICK-ON
1	107-8000-082	BRACKET, RAM, CAB NH/JD
1	115-8000-377	HARNESS, CHASSIS, HYDRAULICS, HDU
1	115-8000-381	CABLE, JUMPER, DT8P, CBL-377 TO HDU
1	115-8000-141	HARNESS, POWER, BASIC
2	063-4001-003	TERMINATOR, ENCODER, LO, JD
1	063-4001-001	TERMINATOR, JD WAS 7000 SERIES
1	117-8000-341	KIT, MOUNTING, TRACTOR
1	063-0173-887	ECU, HYDRAULIC DRIVER UNIT HDU
1	115-4010-204	CABLE, HDU, JOHN DEERE 7-8 SERIES AR, NON-ISO
1	115-8000-327	HARNESS, IN-CAB, CR7 STANDALONE
1	115-8000-330	HRNS, IN-CAB, TEE, RS1, 4.5M
1	117-4010-005	KIT, WAS, 180DEG, BRACKET, UNIVERSAL, W/ 5M CABLE
1	016-5034-324	MANUAL , INSTALLATION, RS1, JOHN DEERE 8000 SERIES AUT

FIGURE 3. John Deere Non-ISO AR 8000 Series, CR7, RS1 w/ IBBC (P/N 117-5034-325 Rev. A)

QTY	PART #	DESCRIPTION
1	107-8000-006	BRACKET, STU, MANIFOLD V3
1	117-5001-058	KIT, ROOF, RS1, STICK-ON
1	107-8000-082	BRACKET, RAM, CAB NH/JD
1	107-8000-033	BRACKET, IBBC, IR
1	408-4002-131	CONNECTOR, RECEPTACLE PANEL MOUNT, POWELL IBBC
1	115-8000-377	HARNESS, CHASSIS, HYDRAULICS, HDU
1	115-8000-381	CABLE, JUMPER, DT8P, CBL-377 TO HDU
1	115-8000-060	HARNESS, POWER, IMPLEMENT READY
2	063-4001-003	TERMINATOR, ENCODER, LO, JD
1	063-4001-001	TERMINATOR, JD WAS 7000 SERIES
1	117-8000-341	KIT, MOUNTING, TRACTOR
1	063-0173-887	ECU, HYDRAULIC DRIVER UNIT HDU
1	115-4010-204	CABLE, HDU, JOHN DEERE 7-8 SERIES AR, NON-ISO
1	115-8000-327	HARNESS, IN-CAB, CR7 STANDALONE
1	115-8000-330	HRNS, IN-CAB, TEE, RS1, 4.5M
1	117-4010-005	KIT, WAS, 180DEG, BRACKET, UNIVERSAL, W/ 5M CABLE
1	016-5034-324	MANUAL , INSTALLATION, RS1, JOHN DEERE 8000 SERIES AUT

FIGURE 4. John Deere Non-ISO AR 8000 Series, CR12, RS1 w/o IBBC (P/N 117-5034-326 Rev. A)

QTY	PART #	DESCRIPTION
1	107-8000-006	BRACKET, STU, MANIFOLD V3
1	117-5001-058	KIT, ROOF, RS1, STICK-ON
1	107-8000-082	BRACKET, RAM, CAB NH/JD
1	115-8000-377	HARNESS, CHASSIS, HYDRAULICS, HDU
1	115-8000-381	CABLE, JUMPER, DT8P, CBL-377 TO HDU
1	115-8000-141	HARNESS, POWER, BASIC
2	063-4001-003	TERMINATOR, ENCODER, LO, JD
1	063-4001-001	TERMINATOR, JD WAS 7000 SERIES
1	117-8000-341	KIT, MOUNTING, TRACTOR
1	063-0173-887	ECU, HYDRAULIC DRIVER UNIT HDU
1	115-4010-204	CABLE, HDU, JOHN DEERE 7-8 SERIES AR, NON-ISO
1	115-8000-376	HARNESS, IN-CAB, CR12, EXTERNAL GPS
1	115-8000-330	HRNS, IN-CAB, TEE, RS1, 4.5M
1	117-4010-005	KIT, WAS, 180DEG, BRACKET, UNIVERSAL, W/ 5M CABLE
1	016-5034-324	MANUAL , INSTALLATION, RS1, JOHN DEERE 8000 SERIES AUT

FIGURE 5. John Deere Non-ISO AR 8000 Series, CR12, RS1 w/ IBBC (P/N 117-5034-327 Rev. A)

QTY	PART #	DESCRIPTION
1	107-8000-006	BRACKET, STU, MANIFOLD V3
1	117-5001-058	KIT, ROOF, RS1, STICK-ON
1	107-8000-082	BRACKET, RAM, CAB NH/JD
1	107-8000-033	BRACKET, IBBC, IR
1	408-4002-131	CONNECTOR, RECEPTACLE PANEL MOUNT, POWELL IBBC
1	115-8000-377	HARNESS, CHASSIS, HYDRAULICS, HDU
1	115-8000-381	CABLE, JUMPER, DT8P, CBL-377 TO HDU
1	115-8000-060	HARNESS, POWER, IMPLEMENT READY
2	063-4001-003	TERMINATOR, ENCODER, LO, JD
1	063-4001-001	TERMINATOR, JD WAS 7000 SERIES
1	117-8000-341	KIT, MOUNTING, TRACTOR
1	063-0173-887	ECU, HYDRAULIC DRIVER UNIT HDU
1	115-4010-204	CABLE, HDU, JOHN DEERE 7-8 SERIES AR, NON-ISO
1	115-8000-376	HARNESS, IN-CAB, CR12, EXTERNAL GPS
1	115-8000-330	HRNS, IN-CAB, TEE, RS1, 4.5M
1	117-4010-005	KIT, WAS, 180DEG, BRACKET, UNIVERSAL, W/ 5M CABLE
1	016-5034-324	MANUAL , INSTALLATION, RS1, JOHN DEERE 8000 SERIES AUT

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

- RS1™ Installation Manual for John Deere 8000 Series Autotractor-Ready (Non-ISO)
- 016-5034-324 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.

POWER HARNESS AND POWER CABLING

When installing an autosteer system, the power cables should always be connected to the battery. Two options are available:

- Implement Ready Power Harness (P/N 115-8000-060/315) with a ISObus IBBC connector
- Basic Power Harness (P/N 115-8000-141)

The Implement Ready Power Harness is the only harness with the ISObus IBBC connector, and should be mounted on the back of the tractor.

FIGURE 1. ISObus IBBC Connection



BEST MOUNTING PRACTICES

Ensure the installer follows all of the following guidelines for best mounting practices:

- Mount the relays in fixed position on a clean, dry, easily accessible spot.
- The red wire is positive (12V). The black wires is minus (ground). Ensure that the first part of the red wire cannot be damaged during operation.
- Do not tie down the extra length between the battery and the fuses, but ensure the cable is an appropriate length. Be sure to use cable sockets with the correct size for proper connection.
- If a ground switch is used in the tractor, connect the wiring harness behind the ground switch, not at the battery side of the ground switch.
- If a main (12V) switch is used in the tractor, connect the red wire to the wiring harness behind the main switch, not at the battery side of the main switch.
- If no main switch is used, always connect the wiring harness directly to the battery.

- If the system is connected to a 24V machine, always use a 24V to 12V converter. Never connect between the two batteries of a 24V machine.
- Tie down the harnesses so they are free from vibration and friction.

FIGURE 2. Relays and Fuses Correctly Mounted



INSTALL THE HYDRAULIC DRIVE UNIT (HDU)

BEST INSTALLATION PRACTICES

Ensure the installer follows all of the following guidelines for best Hydraulic Drive Unit (HDU) practices:

- Mount the HDU near the steering valve on the left side of the tractor. The HDU can be mounted to the chassis with the supplied bracket (P/N 107-8000-006).
- Try to mount the HDU with the connectors facing down to avoid water ingress.
- Do not mount the HDU too close to machine parts that experience high temperatures, such as the exhaust system or engine parts.

FIGURE 3. Mounted HDU



ROUTE THE HDU CABLES

1. Connect the John Deere 7 Series AR, Non-ISO HDU cable (P/N 115-4010-204) to the steering valve, wheel angle sensor, and the steer encoder.
2. Disconnect the existing cable connection from the steering valve located in the front of the cab. This is accessible from the left side.
3. Connect the valve connector on the valve harness to the opening port of the steering valve.
4. Mount the supplied dustcap to the existing connector.
5. Locate and disconnect the 6-pin wheel angle sensor (WAS) connection on the right side of the tractor.
6. Connect the WAS connector on the valve harness to the WAS connector on the tractor.
7. Install the WAS terminator (P/N 063-4001-001) on the remaining cable end.

FIGURE 4. All Connected Cables



8. Remove the shroud surrounding the steering column.

FIGURE 5. Removed Shroud from Steering Column



9. Locate and disconnect the two encoder connections of the machine.

10. Route the steering wheel encoder connector from the HDU harness (P/N 115-4010-203) into one of the mating encoder connectors.

FIGURE 6. Steering Wheel Encoder



NOTE: The remaining encoder connector will not be used in the SC1™ system.

11. Install the two encoder terminators (P/N 063-4001-003) on the cables that were disconnected from the encoder.

INSTRUCTIONS FOR MOUNTING THE WHEEL ANGLE SENSOR ON JOHN DEERE 8020 ILS SERIES TRACTOR

NOTE: When the tractor is equipped with an independent front axle suspension, there is a flow sensor installed instead of a regular WAS. This means a Raven WAS needs to be installed.

Please use the following pictures as a guidance on how to install the WAS.

FIGURE 7. ILS Suspended Front Axle



FIGURE 8. Installing Raven WAS



NOTE: The brackets are not supplied, figures 8 and 9 are for indication only.

FIGURE 9. Installing Raven WAS



FIGURE 10. Installing Raven WAS

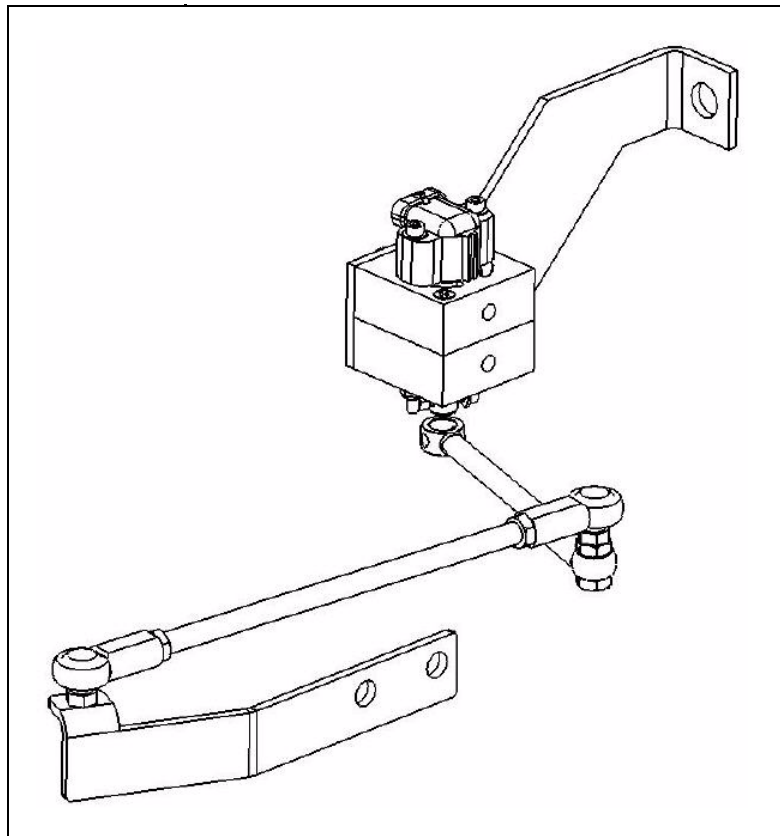


FIGURE 11. Installing Raven WAS



ROUTE CHASSIS CABLING

1. Connect the Hydraulics, HDU Chassis Harness (P/N 115-8000-377) to the 12-pin mating connector of the power cable.
2. Mount the cable along the chassis and route it to the HDU.
3. Lead the 12-pin plug through the cab floor to the inside of the cab.

FIGURE 12. Cable Routed through Cab Floor



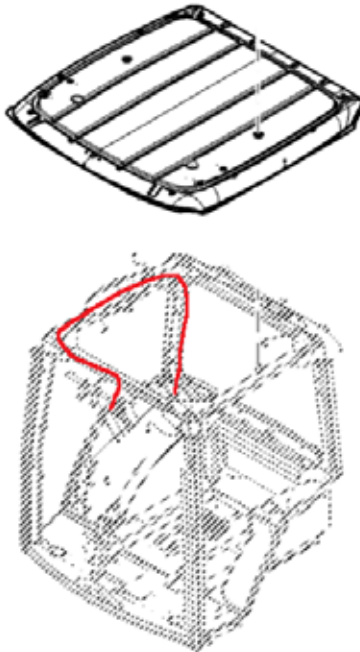
ROUTE THE RS1™ ANTENNA CABLES

1. Install the RS1 T-cable (P/N 115-8000-330) from the side console to the RS1 antenna on the front of the cab.
2. Open the roof of the cab by access and unscrewing some screws located on the top of the cab and some screws from the bottom edge of the cab.

NOTE: Some screws are hidden above the work lights.

3. Route the 115-8000-330 cable from the console to the RS1 antenna bracket through the C-pillar to the front of the roof. The cable can be fed through the hole of the front windshield wiper.
4. Connect the gray 12-pin connector to the mating connector of the chassis HDU cable.
5. Mount the cable behind the lining.

FIGURE 13. Suggested Antenna Cable Routing Path



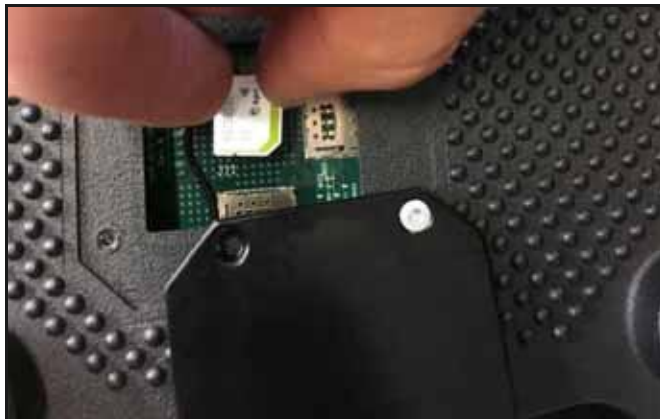
INSERT THE SIM CARD

When the RS1 is used with RTK accuracy or remote support, a working SIM card is needed. Before installing the SIM card, ensure the SIM pin code is switched off.

To install a SIM card:

1. Unscrew the four screws located on the bottom of the RS1.
2. Remove the SIM slot cover.
3. Insert the SIM card into the SIM slot.

FIGURE 14. SIM Card Inserted in SIM Slot

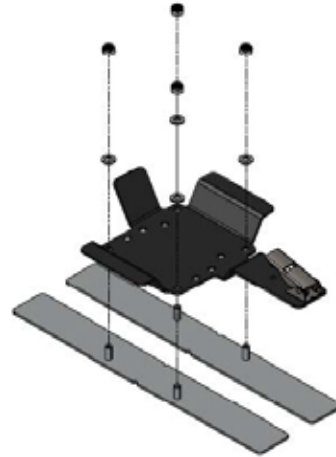


NOTE: The SIM card must be inserted into the J11 slot or the RS1™ will not receive any GPS signal.

INSTALL THE RS1™

1. Mount the RS1 bottom assembly on the center line on the front section of the roof of the cab, using the two adhesive aluminum strips.

FIGURE 15. Bottom Assembly of RS1 Mount



NOTE: The mount stays permanently attached to the roof of the tractor.

2. Mount the latch plate onto the RS1 using the provided screws.

FIGURE 16. RS1 Mounted on Generic Bracket



NOTE: This latch plate stays connected to the RS1.

3. Secure the RS1, already connected to the latch plate, onto the fixed plate.
4. Secure the assembly with the latch.
5. Mount the round adhesive plate for the Laird antenna within 50 cm from the RS1 bracket.

FIGURE 17. Laird Antenna Adhesive Plate



NOTE: The LAIRD antenna is the main receiver of the RS1. Ensure all of the following for best functionality of RS1:

- The antennas are mounted at least 50 cm apart.
- The antennas are positioned to point to the backside of the tractor.
- The GPS antenna is mounted in front of the rear axle.

6. Connect the 115-8000-330 cable to the RS1.

FIGURE 18. RS1 Mounted



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 19. CR7 Mounting Examples



FIGURE 20. CR12 Mounting Examples



FIELD COMPUTER HARNESS

The ideal type of harness depends on the type of the field computer:

Field Computer	Ideal Harness
CR7	In-Cab CR7 Standalone Harness (P/N 115-8000-327)
CR12/Viper 4+	In-Cab CR12 / Viper 4+ ISO Harness (P/N 115-8000-064) In-Cab CR12, External GPS, Harness (P/N 115-8000-376)

INSTALL THE FIELD COMPUTER HARNESS

1. Connect the 12-pin connector to the mating connector of the RS1 T-cable (P/N 115-8000-330).
2. Guide the harness to the field computer, routing the cables behind the lining of the cab where possible.

FIGURE 21. Field Computer Harness from Floor to A-Pillar



SYSTEM DRAWINGS

FIGURE 22. John Deere 8000 Series (Autotrac-Ready) Non-ISO, RS1, CR7, w/o IBBC System Drawing (P/N 054-5034-324 Rev. A)

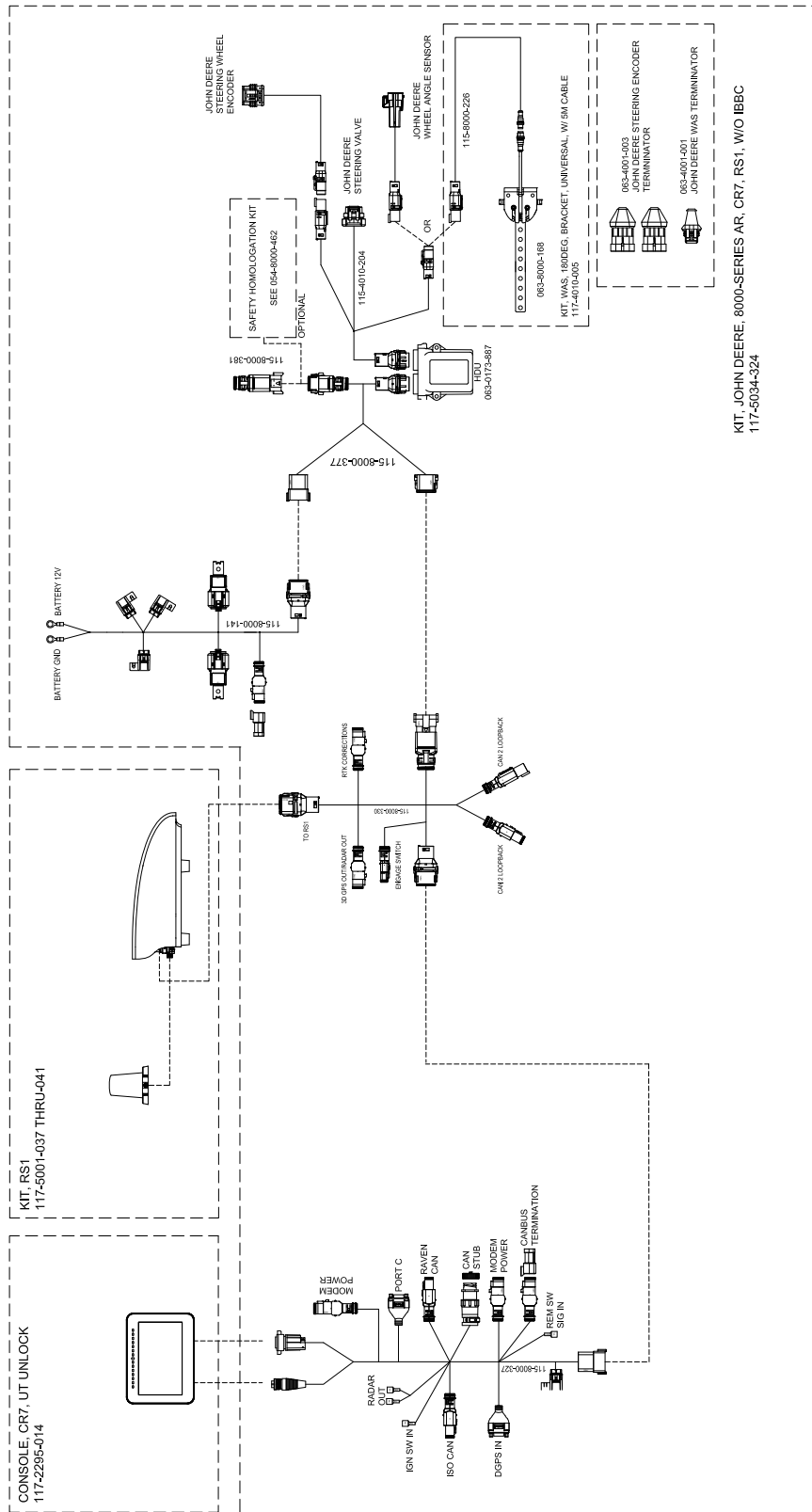
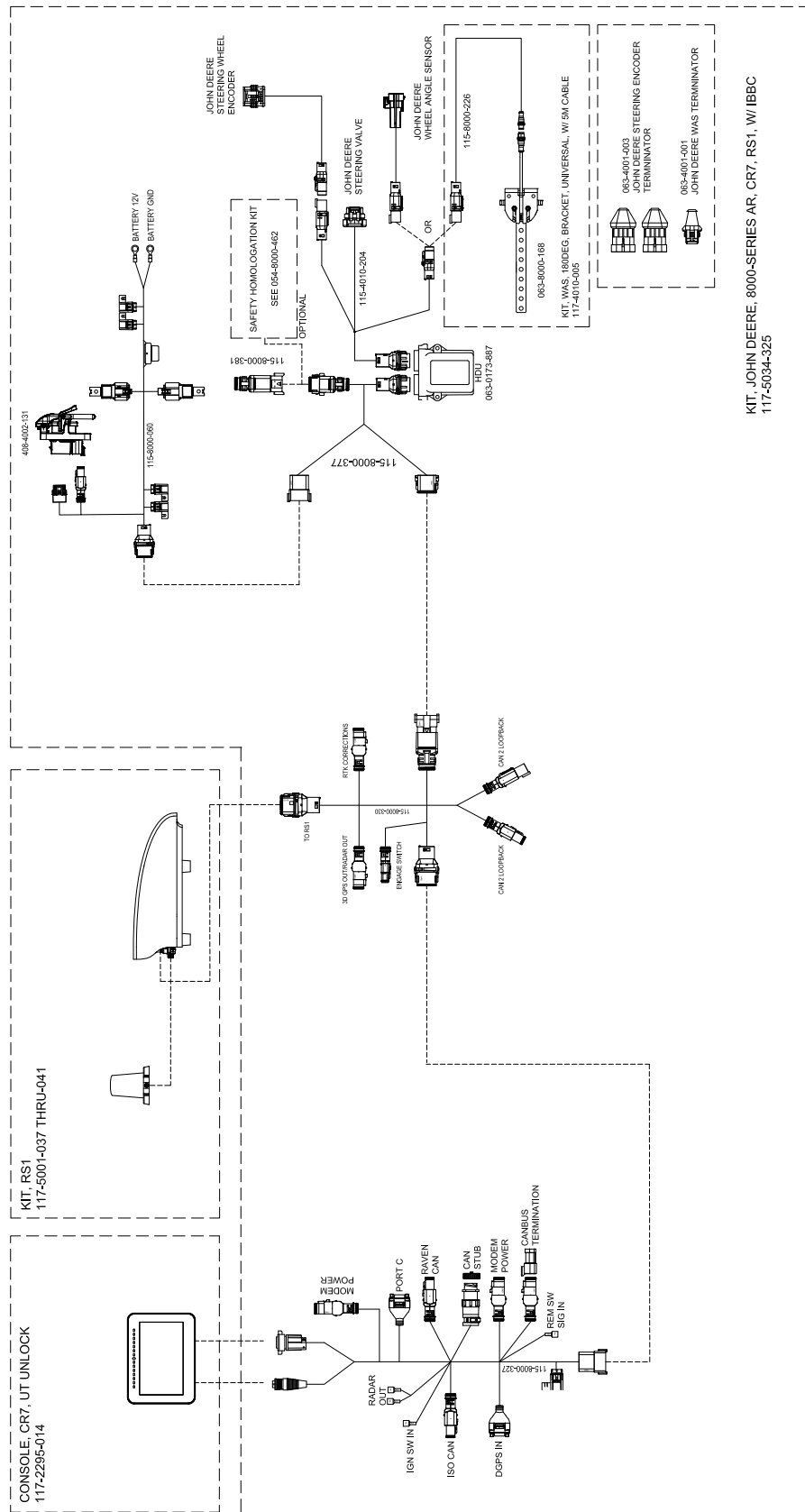


FIGURE 23. John Deere 8000 Series (Autotrac-Ready) Non-ISO, RS1, CR7, w/ IBBC System Drawing (P/N 054-5034-325 Rev. A)



KIT, JOHN DEERE, 8000-SERIES AR, CR7, RS1, W/ IBBC
117-5034-325

FIGURE 24. John Deere 8000 Series (Autotrac-Ready) Non-ISO, RS1, Viper 4+/CR12, w/o IBBC System Drawing (P/N 054-5034-326 Rev. A)

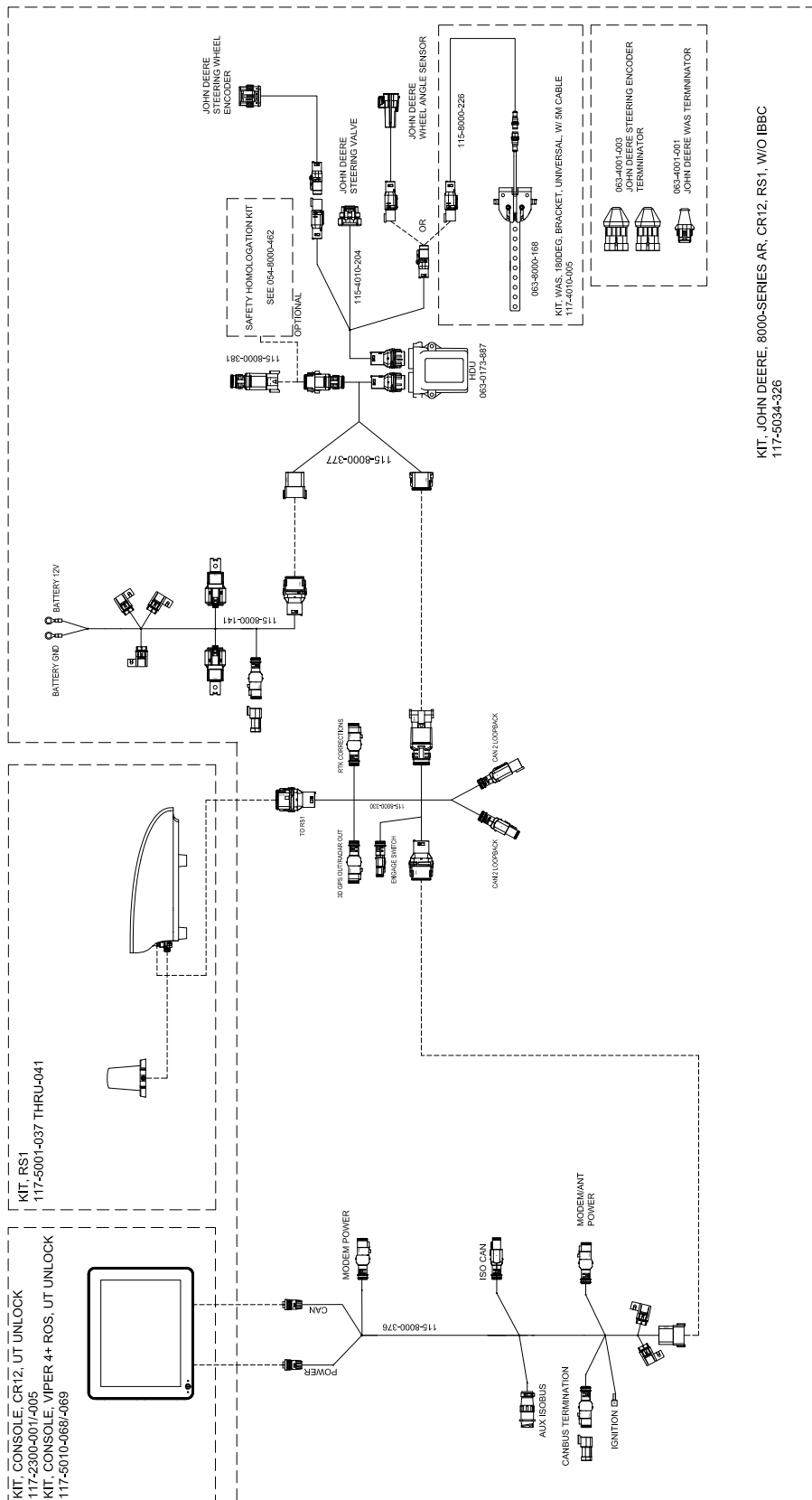
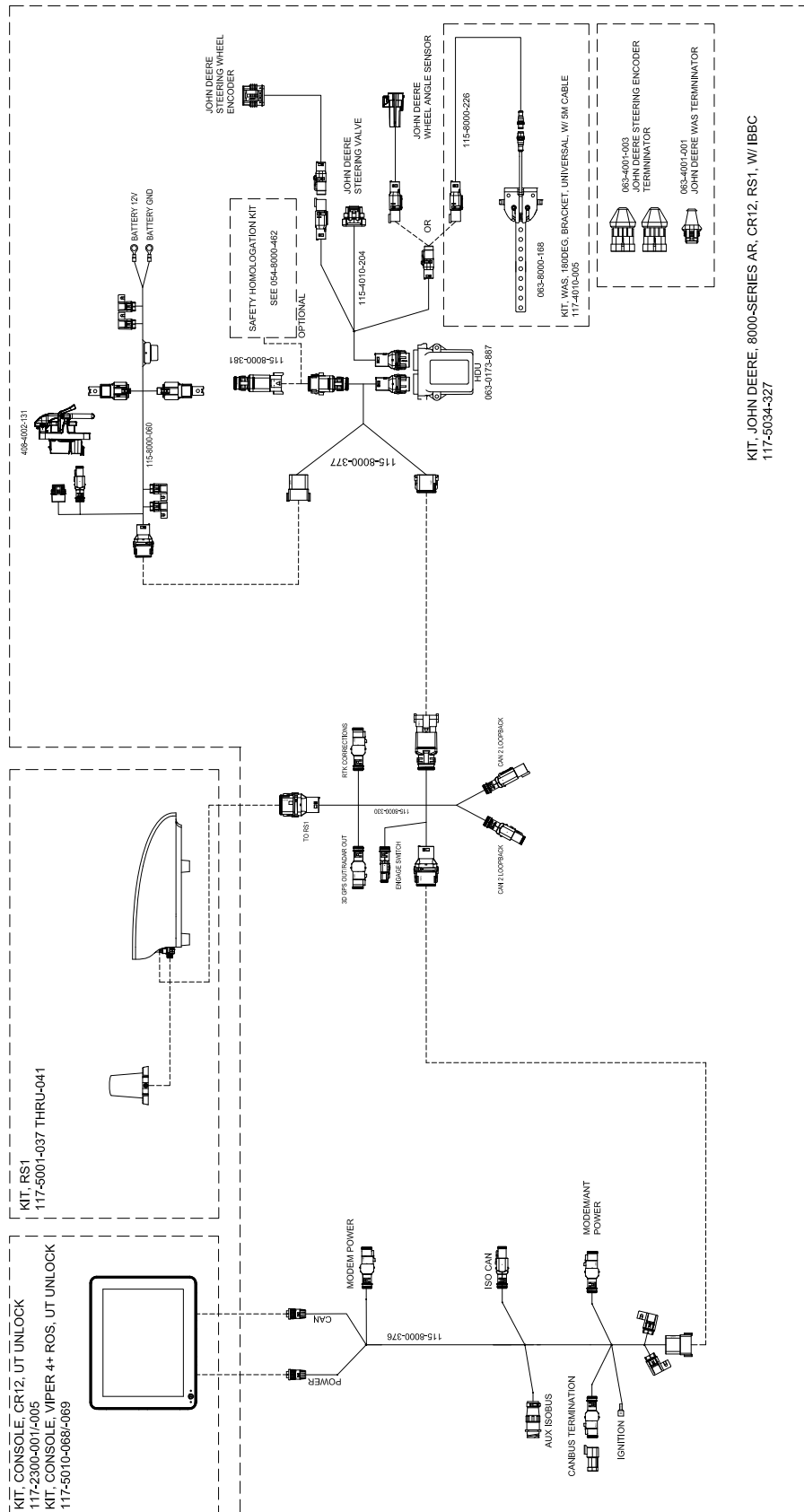


FIGURE 25. John Deere 8000 Series (Autotrac-Ready) Non-ISO, RS1, Viper 4+ /CR12, w/ IBBC System Drawing (P/N 054-5034-327 Rev. A)



C

Chassis Cabling 15
Computer Harness 21
CR12 20
CR7 20

H

HDU 10, 13

I

Introduction
Installation
 Recommendations 6
Point of Reference 6

R

RS1 16, 18

S

System Drawings 22

U

Updates 8

