

RS1™ Installation Manual
for Claas OSI Tractors
(Model Year 2022 and
Newer)

016-5036-025 Rev. A

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DISCLAIMER

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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, this system or any of its components. Raven Industries shall not be held responsible for any modifications or repairs made outside our facilities, nor damages resulting from inadequate maintenance of this system.

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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

This manual applies to the following machines.


Make. Claas


Model. OSI Tractors (Model Year 2022 or Newer)

FIGURE 1. Claas 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. RS1™ Installation Kit for Claas OSI Tractors (Model Year 2022 and Newer) with CR7™ (P/N 117-5036-025 Rev. A)

QTY	PART #	DESCRIPTION
1	053-0159-323	BOX, SHIPPING
1	115-4010-254	CABLE, RS1, CLAAS OSI TRACTOR, 2022 MODEL
1	115-4010-255	CABLE, RS1, ISO EXTENSION, CLAAS OSI TRACTOR, 2022 MOD
1	117-5001-058	KIT, ROOF, RS1, STICK-ON
1	115-7300-171	CABLE, CR7, ISO, IN-CAB 9P AUXILIARY POWER
1	016-0171-649	SHEET, WARRANTY/HELP

FIGURE 3. RS1™ Installation Kit for Claas OSI Tractors (Model Year 2022 and Newer) with CR12™ (P/N 117-5036-026 Rev. A)

QTY	PART #	DESCRIPTION
1	053-0159-323	BOX, SHIPPING
1	115-4010-254	CABLE, RS1, CLAAS OSI TRACTOR, 2022 MODEL
1	115-4010-255	CABLE, RS1, ISO EXTENSION, CLAAS OSI TRACTOR, 2022 MOD
1	117-5001-058	KIT, ROOF, RS1, STICK-ON
1	115-7300-157	CABLE, CR12, ISO, IN-CAB 9P AUX PWR, EXTERNAL GPS
1	016-0171-649	SHEET, WARRANTY/HELP

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 Claas OSI Tractors (Model Year 2022 and Newer)
- 016-5036-025 Rev. A
- Any comments or feedback (include chapter or page numbers if applicable).
- Let us know how long you have 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.

NOTE: Make sure that your local Claas dealer installs the Raven steering unlock prior to installing the Raven system onto the tractor. If not done so, the ATP will lock itself from 3rd party steering systems.

The tractor must be registered with Claas as a tractor with the CEMIS 1200 display. The tractor will also require Claas updates to load the new configuration and activate the power supply relay (RLH6, which can be found in the ceiling) for auto-steering.

MOUNT THE HARNESS

1. Remove the right side panel (left image) from the underside of the cab roof and the backside panel (right image) from the underside of the cab roof, to install the cables.

FIGURE 1. Right Side Panel and Backside Panel Locations

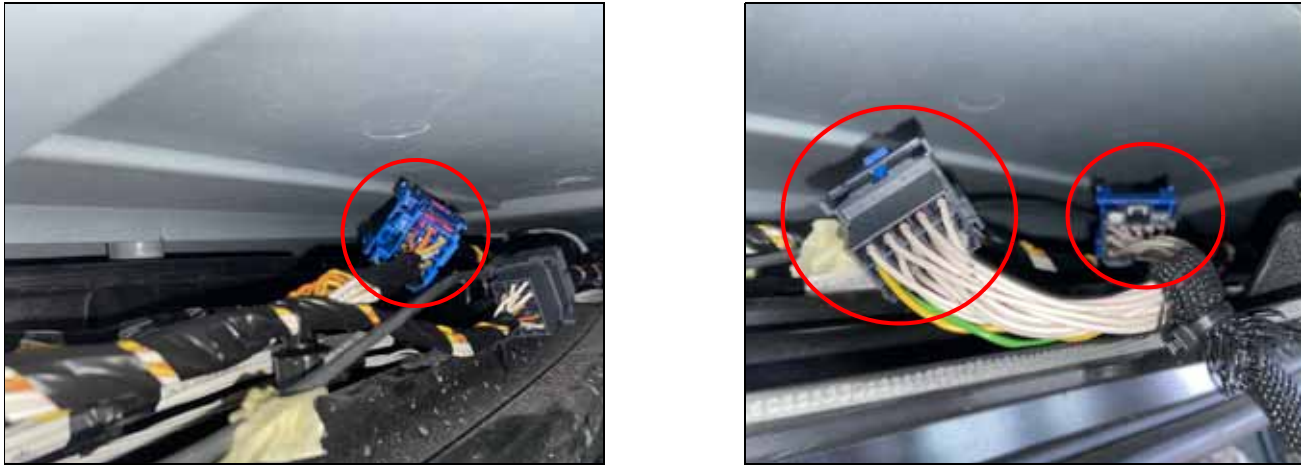


2. After removing the backside panel, take out the rubber grommet.

NOTE: The rubber grommet will be reused after the RS1™ cabling is routed to water-proof the cab pass-through.

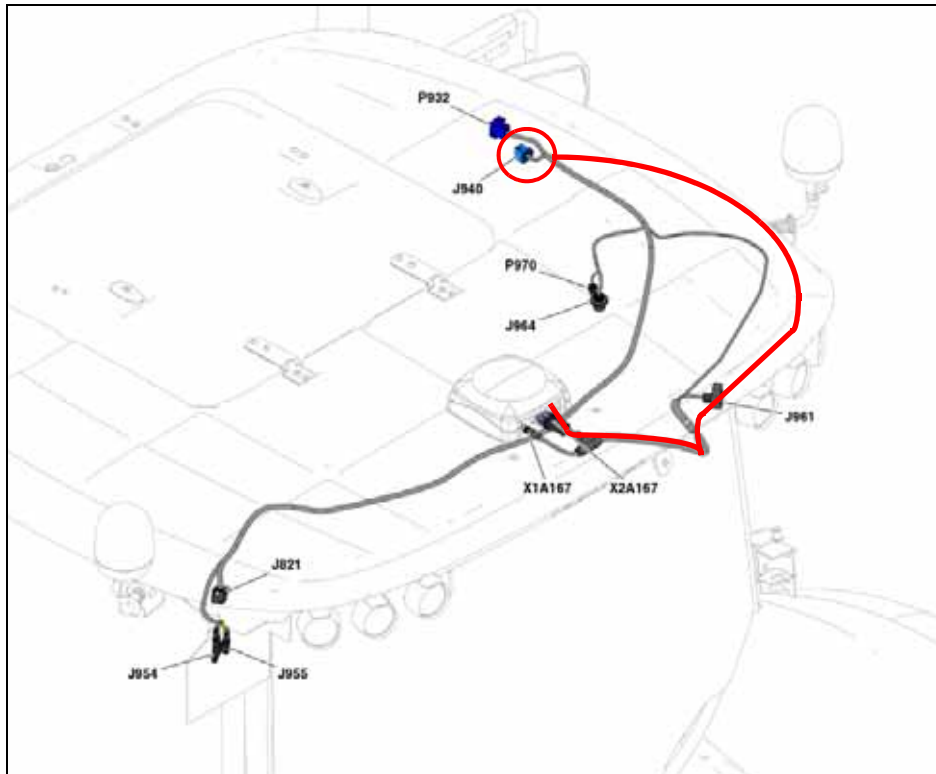
3. After removing the side panel, take out the plastic cover inside the hole of the roof and set aside. Locate the existing machine connector J940.

FIGURE 2. J940 Connector Location



4. Disconnect the J940 connector and tee the RS1™ ISO Extension cable (P/N 115-4010-255) into the J940 connection.
5. Route the cable from the J940 connector to the pass-through at the rear of the cab roof. Shown in the diagram below.

FIGURE 3. Wiring Example



6. Route the 4-pin connector on the RS1™ ISO Extension cable (P/N 115-4010-255) through the cab pass-through at the back underside of the cab roof.
7. Connect the 4-Pin Deutsch connector to the RS1™ Claas OSI Tractor cable (P/N 115-4010-254).

FIGURE 4. OEM Plate on the Roof of the Tractor



8. Remove the OEM plate from the roof.
9. Insert the 12-pin DTM connector into the RS1™ Claas OSI Tractor cable (P/N 115-4010-254).
10. Insert the 12-pin connector on the RS1™ Claas OSI Tractor cable (P/N 115-4010-254) into the 12-pin port on the RS1™.
11. Connect the 4-pin DT connector from the RS1™ ISO Extension cable (P/N 115-4010-255) to the 4-pin receptacle of the RS1™ Claas OSI Tractor cable (P/N 115-4010-254).
12. Tuck and secure all cables and wiring into roof compartments as applicable.

NOTE: The rubber grommet will be reused after the RS1™ cabling is routed to water-proof the cab pass-through.

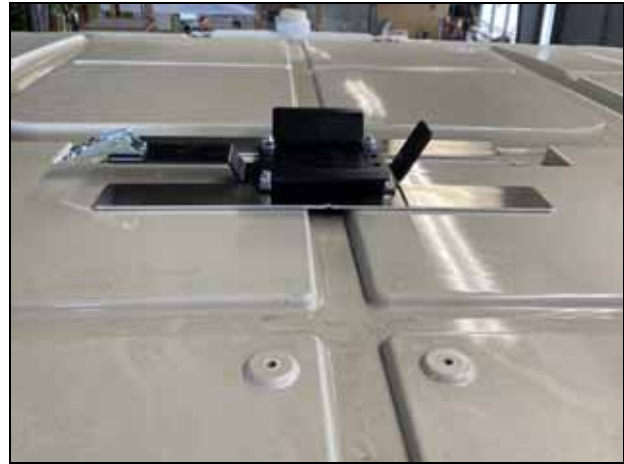
13. Review the *Harness Routing* section on page 2.

NOTE: It may be recommended to test the RS1™ functionality prior to reinstalling all roof access panels.

INSTALL THE RS1™

1. Using the supplied hardware, secure the RS1™ bottom mounting bracket to the two supplied adhesive aluminum strips.
2. Remove the adhesive backing and secure the bottom mounting bracket assembly to the front section of the cab roof on the centerline of the machine.

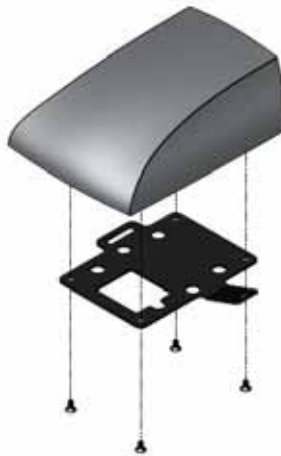
FIGURE 5. Lower RS1™ Mounting Bracket Stick-on Kit



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

3. Mount the latch plate onto the RS1™ using the provided screws.

FIGURE 6. RS1™ Mounted on Generic Bracket



NOTE: This latch plate stays connected to the RS1™.

4. Secure the RS1™, already connected to the latch plate, onto the fixed plate.
5. Secure the assembly with the latch.

6. Mount the round adhesive plate for the Laird antenna within 90 cm (35.4 in.) from the RS1™ bracket.

FIGURE 7. Laird Antenna Adhesive Plate



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

- The antennas are mounted at least 50 cm (19.7 in.) apart.
- The antennas are positioned to point to the backside of the tractor.
- The GPS antenna is mounted in front of the rear axle.

FIGURE 8. RS1™ Mounted and Cable Connected



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 9. SIM Card Inserted in SIM Slot



NOTE: The SIM card must be inserted into the J11 slot.

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 Mount 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. Example of CR7™ Mounted in Various Positions



FIGURE 11. Example of CR12™ Mounted in Various Positions

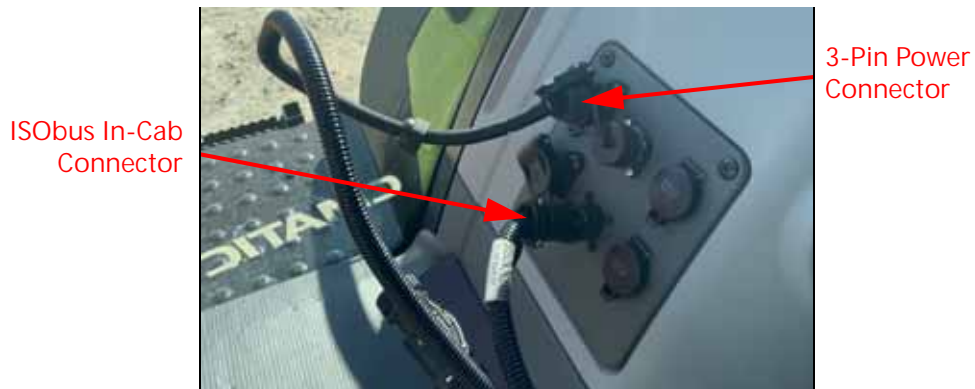


INSTALL FIELD COMPUTER HARNESS

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

- Install the field computer harness 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. In-cab and Power Connections



ACTIVATE AUTOMATIC STEERING

NOTE: Make sure that your local Claas dealer installs the Raven steering unlock prior to installing the Raven system onto the tractor. If not done so, the ATP will lock itself from 3rd party steering systems.

The tractor must be registered with Claas as a tractor with the CEMIS 1200 display. The tractor will also require Claas updates to load the new configuration and activate the power supply relay (RLH6, which can be found in the ceiling) for auto-steering.

To activate automatic steering for Claas Autoguide systems with RS1™:

FIGURE 13. Claas Dealer Codes for Raven

Characteristics	Part Number
I41_0580	00 1403 178 0

FIGURE 14. Activation Button on joystick



1. Press this button to activate the auto-steering.
2. Please note that Claas OSI tractors do not accept an engage from the CR7™/CR12™/Viper® 4(+) but only from the button on the joystick. Either in a job or during calibration.

SYSTEM DRAWINGS

FIGURE 15. CR7™ & RS1™ for Claas OSI Tractors (Model Year 2022 and Newer), System Drawing (P/N 054-5036-025 Rev. A)

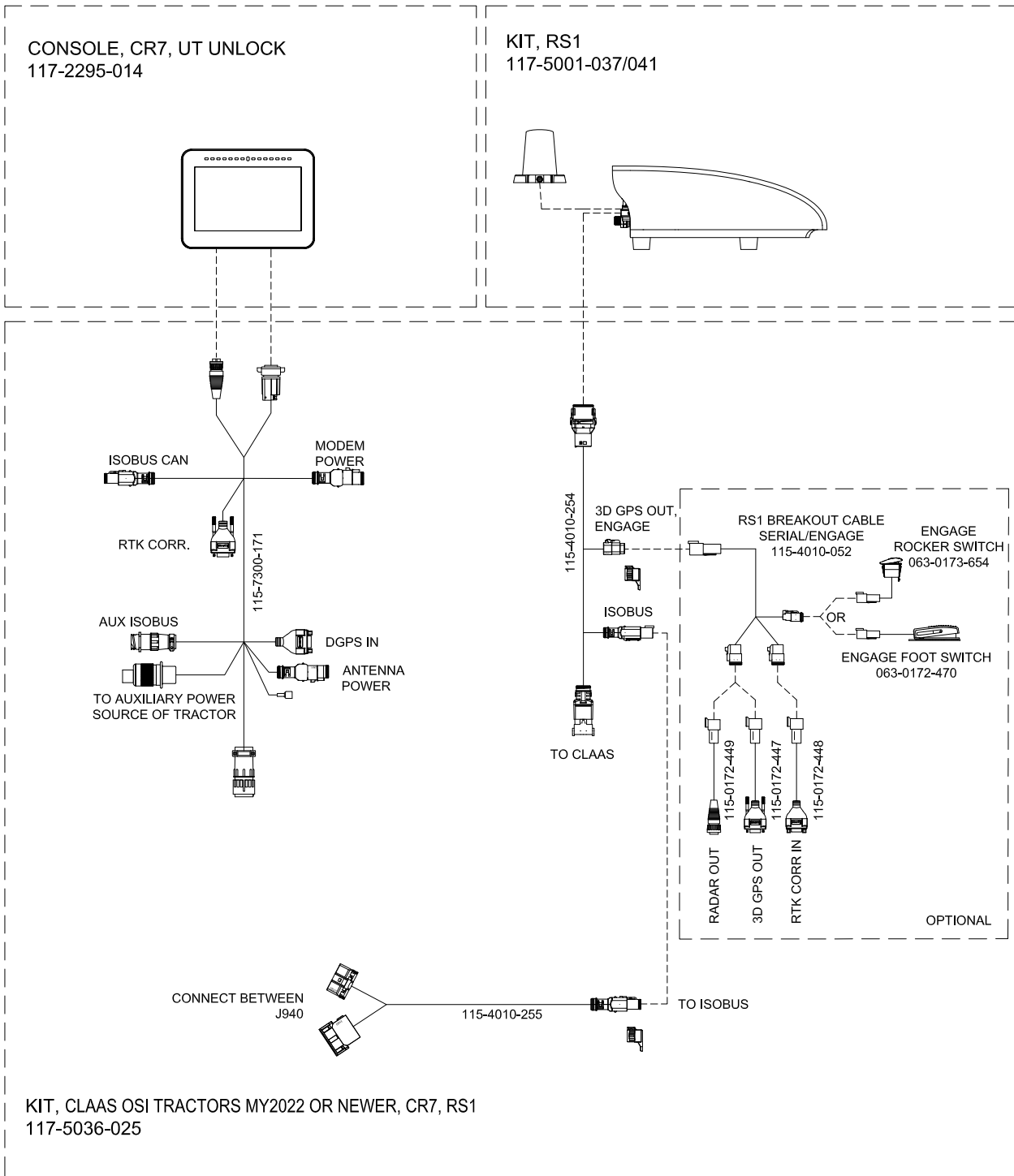
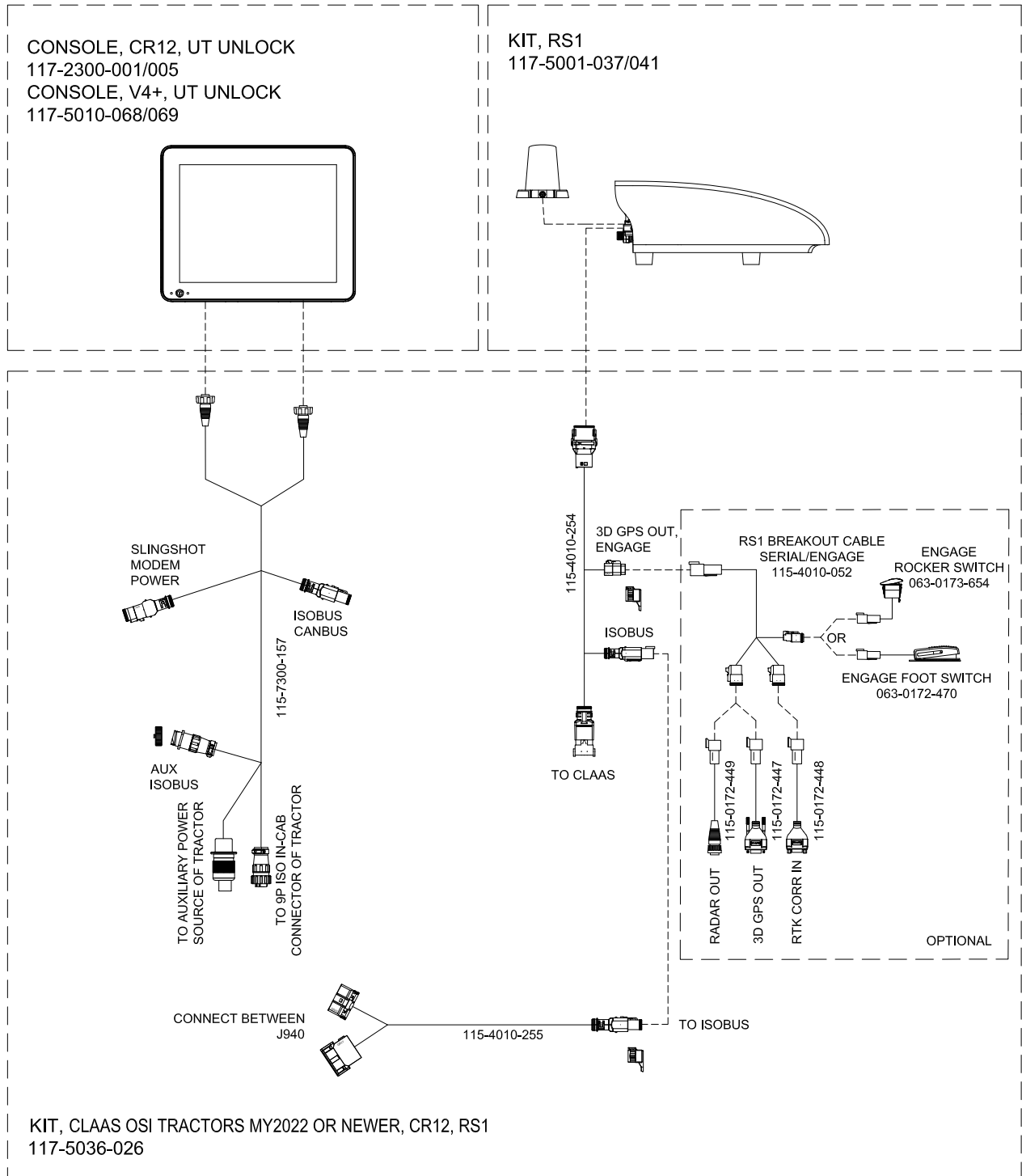


FIGURE 16. CR12™ & RS1™ for Claas OSI Tractors (Model Year 2022 and Newer), System Drawing (P/N 054-5036-026 Rev. A)



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 36 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 completed RMA form, Certificate of Decontamination, and retail 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 this product or any component of the product found to be defective during the warranty period. Replacement will be made with a new or remanufactured product or component. Standard return freight will be paid, regardless of 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 outside our facility 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, improper installation and maintenance are not covered by this warranty.
- Worn/Chafed hoses and cables.
- Items in contact with fluids and chemicals including seals and O-rings.
- Software downloads and updates.
- Tamper-Evident label broken or customer disassembly.
- Any customer modification to the original product outside normal calibration and adjustments, without written approval.
- Intentional modification to cables.
- Failures due to lack of cleaning or preventive maintenance, and any condition, malfunction or damage not resulting from defects in material or workmanship.
- Items in contact with fluids or chemicals, returned without proper cleaning, decontamination and documentation.

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.portal.ravenprecision.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 completed RMA form, Certificate of Decontamination, and Extended Warranty Registration Number) 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 warranty claim, Raven Industries will (at our discretion) repair or replace this product or any component of the product found to be defective during the warranty period. Replacement will be made with a new or remanufactured product or component. Standard return freight will be paid, regardless of 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 outside our facility 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, improper installation and maintenance are not covered by this warranty.
- Worn/Chafed hoses and cables.
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- Software downloads and updates.
- Tamper-Evident label broken or customer disassembly.
- Any customer modification to the original product outside normal calibration and adjustments, without written approval.
- Intentional modification to cables.
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