

CRX Implement Only Installation Manual

016-4020-004 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.

As with all wireless and satellite signals, several factors may affect the availability and accuracy of wireless and satellite navigation and correction services (e.g. GPS, GNSS, SBAS, etc.). Therefore, Raven Industries cannot guarantee the accuracy, integrity, continuity, or availability of these services and cannot guarantee the ability to use Raven systems, or products used as components of systems, which rely upon the reception of these signals or availability of these services. Raven Industries accepts no responsibility for the use of any of these signals or services for other than the stated purpose.

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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.

This manual applies to the installation of a CRX Implement Only system, or an ISO Standalone Steering system.

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 CRX Implement Only 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.

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 ISO or CRX Standalone Steering 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. CRX Implement Only, CR7, ISObus Ready Tractor Kit (P/N 117-4020-004 Rev. A)

QTY	PART #	DESCRIPTION
1	053-0159-321	BOX, SHIPPING
1	103-0001-039	MOUNT, 1" RAIL, RAM C
1	115-7300-171	CABLE, CR7 ISO IN-CAB 9P AUX POWER
1	115-8000-437	CABLE, RTK CORRECTIONS SPLIT
1	016-0171-649	SHEET, WARRANTY/HELP

FIGURE 2. CRX Implement Only, CR7, Non-ISObus Ready Tractor Kit (P/N 117-4020-005 Rev. A)

QTY	PART #	DESCRIPTION
1	053-0159-321	BOX, SHIPPING
1	103-0001-039	MOUNT, 1" RAIL, RAM C
1	115-7300-172	CABLE, CR7 TRACTOR CHASSIS, IBBC
1	053-0159-385	GRIP-SEAL GAB, PE, 160 X 220
1	107-8000-033	BRACKET, IBBC, IR
1	053-0159-384	GRIP-SEAL GAB, PE, 100 X 150
4	311-4060-137K	SCREW SOCKET CAP, 8.8, M6X25
4	312-6001-017K	HEX L. NUT, DIN985-8, M6X1.0 ZINC
8	313-6000-010K	WASHER, ZINC, DIN125A M6
1	115-8000-437	CABLE, RTK CORRECTIONS SPLIT
1	016-0171-649	SHEET, WARRANTY/HELP

FIGURE 3. CRX Implement Only, CR12, ISObus Ready Tractor Kit (P/N 117-4020-006 Rev. A)

QTY	PART #	DESCRIPTION
1	053-0159-321	BOX, SHIPPING
1	103-0001-039	MOUNT, 1" RAIL, RAM C
1	115-7300-156	CABLE, CR12 ISO IN-CAB AUX POWER INT
1	115-8000-437	CABLE, RTK CORRECTIONS SPLIT
1	016-0171-649	SHEET, WARRANTY/HELP

FIGURE 4. CRX Implement Only, CR12, Non-ISObus Ready Tractor Kit (P/N 117-4020-007 Rev. A)

QTY	PART #	DESCRIPTION
1	053-0159-321	BOX, SHIPPING
1	103-0001-039	MOUNT, 1" RAIL, RAM C
1	115-8000-064	HARNESS, IN-CAB VPR4 ISO
1	115-8000-214	HARNESS, CHASSIS, EXTENSION, 2M
1	115-8000-060	HARNESS, POWER, IMPLEMENT READY
1	408-4002-131	CONNECTOR, REC PANEL, POWELL IBBC
1	107-8000-033	BRACKET, IBBC, IR
1	053-0159-384	GRIP-SEAL BAG, PE, 100 X 150
4	311-4060-137K	SCREW, SOCKET CAP, 8.8, M6X25
4	312-6001-017K	HEX, L. NUT, DIN985-8, M6X1.0 ZINC
8	313-6000-010K	WASHER, ZINC, DIN125A M6
1	115-8000-437	CABLE, RTK CORRECTIONS SPLIT
1	016-0171-649	SHEET, WARRANTY/HELP

FIGURE 5. ISO Implement Only, RTK Connect Kit (P/N 117-4020-008 Rev. A)

QTY	PART #	DESCRIPTION
1	053-0159-321	BOX, SHIPPING
1	115-4020-002	CABLE, IMPLEMENT, SMART ANTENNA TO RTK CORRECTIONS
1	115-0172-448	CABLE, 48" ADAPTER 3P DT SERIAL IN
1	115-0172-643	CABLE, POWER, AUX POWER DIN 9680 TO 3P DT
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

- CRX Implement Only Installation Manual
- 016-4020-004 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 CABLES

When installing an ISObus-ready system, utilize the existing auxiliary power source, 9-pin ISO in-cab connector, and Implement Bus Breakaway Connector (IBBC) of the tractor.

When installing a non-ISObus system, the power cables should always be connected to the battery. Two options are available:

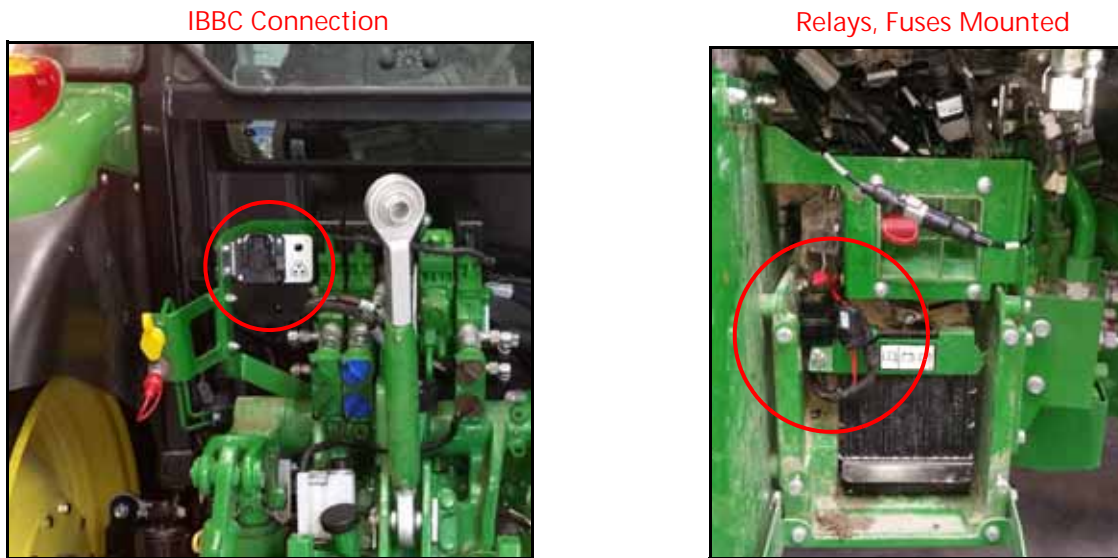
- CR7 - Console and power cable are combined into one harness (P/N 115-7300-172)
- CR12 - Power harness with ISObus IBBC Connector (P/N 115-8000-060), extension cable (P/N 115-8000-214), and CR12 console cable (P/N 115-8000-064)

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.
- The ISObus IBBC connector should be mounted on the back of the tractor at an easy to reach location.

FIGURE 1. IBBC Connection and Relays, Fuses Mounted



ROUTE CABLES

CR7 IMPLEMENT ONLY

This section refers to routing cables when installing a CR7 Implement Only system.

1. Route the console harness (P/N 115-7300-171) from the battery through the cab floor to the inside of the cab.
2. Mount the cables along the chassis.

CR12 IMPLEMENT ONLY

This section refers to routing cables when installing a CR12 Implement Only system.

1. Route the power harness (P/N 115-8000-060) from the battery to the back of the tractor, where the IBBC connector is located.
2. Connect the extension cable (P/N 115-8000-214) to the 12-pin mating connector of the power cable.
3. Lead the 12-pin plug through the cab floor to the inside of the cab.

FIGURE 2. Cable Routed through Cabin Floor



4. Mount the cables along the chassis.
5. Connect the console cable (P/N 115-8000-064) to the 12-pin mating connector of the extension cable.

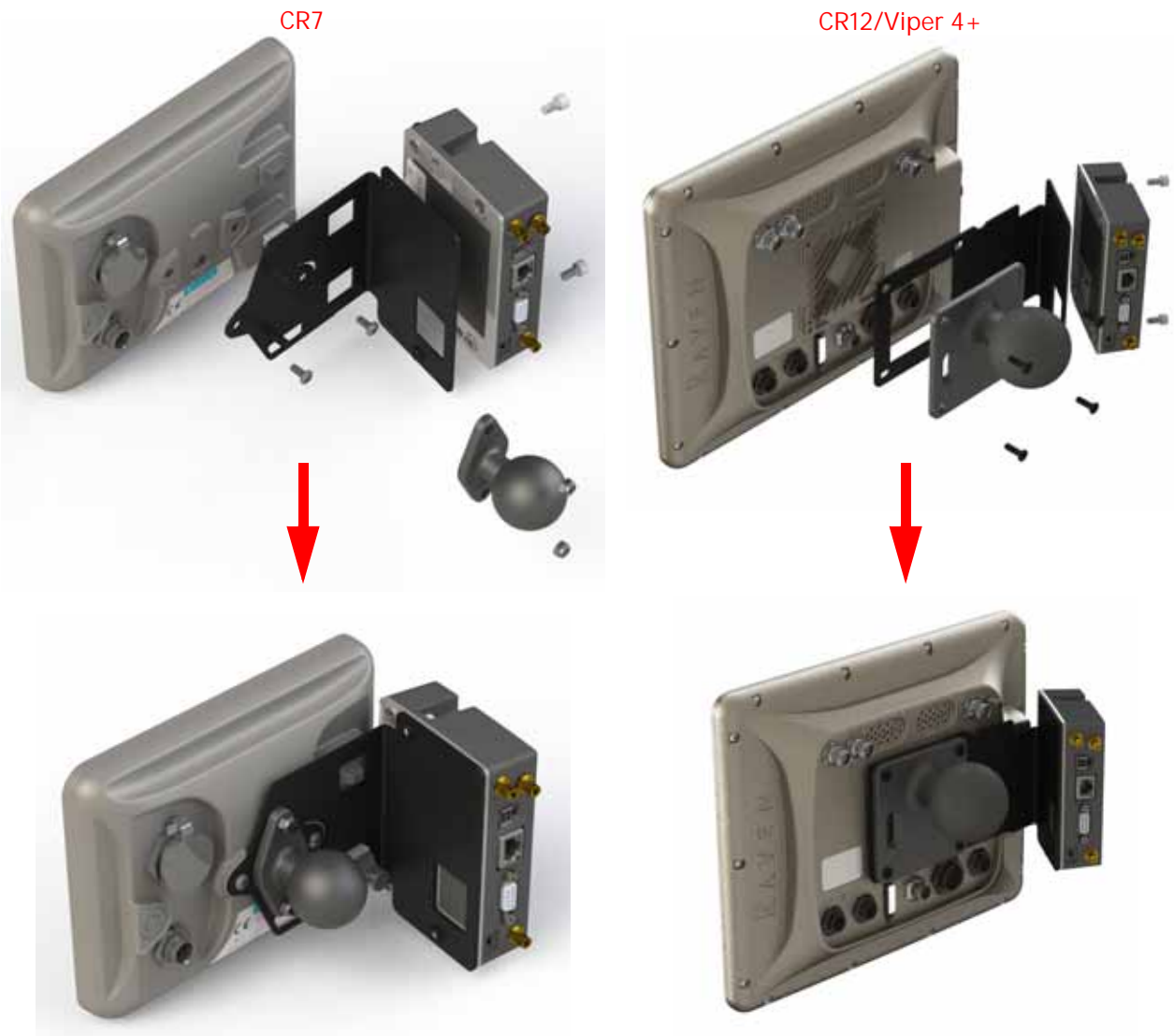
INSTALL SLINGSHOT FIELD HUB

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

- Mount the Slingshot Field Hub inside the cabin. Brackets are available to mount the Field Hub to your field computer as shown in Figure 3 on page 11
- The GPRS/UMTS antennas are equipped with a magnetic base plate and must be placed on top of the cabin. Base plates with double sided tape (P/N 063-8000-125) are also available.
- The antennas should be mounted in a clear, unobstructed area to ensure clear reception.
- The antennas should be mounted as far away from each other as possible. More than 40 inches [100 cm] is recommended.

NOTE: Handle the GPS patch with care; the antenna cable is thin and fragile.

FIGURE 3. Field Hub Mounted to CR7 and CR12/Viper 4(+)



ROUTE FIELD HUB CABLES

CRX IMPLEMENT ONLY

1. Connect the power cable (P/N 115-8000-087) to the connector with the label MODEM POWER.
2. Connect the serial RTK split cable (P/N 115-8000-437) to the Field Hub.
3. Connect the serial RTK split cable to the console cable. Refer to the “System Drawings” on page 14 to view an overview of the connections.
4. If applicable, connect the CR7 Ethernet cable (P/N 420-2002-042) or the CR12/Viper 4(+) Ethernet cable (P/N 115-8000-200) between the Field Hub and the CR7 or CR12/Viper 4(+).

ISO STANDALONE STEERING

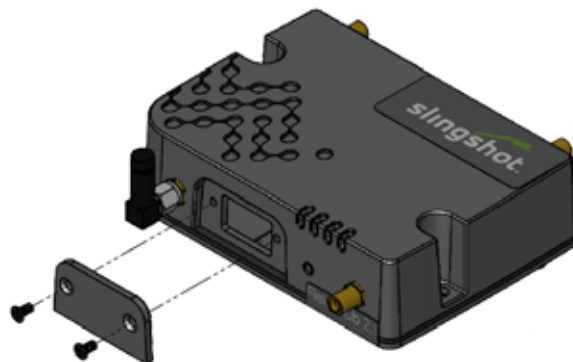
1. Connect the power cable to the auxiliary power adapter cable (P/N 115-0172-643) and connect the other end into the auxiliary power source of the tractor.
2. Connect the serial RTK adapter cable (P/N 115-0172-448) to the Field Hub.
3. Connect the 3-pin connector of the RTK adapter cable to the implement T-cable for RTK corrections (P/N 115-4020-002)
4. Tee in the implement T-cable for RTK corrections between the SC1/IDU cable and the Smart Antenna cable, using the 8-pin connectors.
5. Connect the Cellular, Diversity, and GPS antenna cables to the Field Hub.

FIGURE 4. Field Hub Backside



6. Using a Phillips head screwdriver, remove the two screws from the SIM panel.

FIGURE 5. SIM Slot with Screws



7. If applicable, remove the existing SIM card by pulling it straight out.
8. Position the new SIM card as shown on the front of the Field Hub.

NOTE: The gold contacts on the upper SIM card face down, and the gold contacts on the lower SIM card facing up. If using only one SIM card, insert in the upper SIM slot (Slot 1).

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 6. CR7 Mounted in Various Positions



FIGURE 7. CR12 Mounted



SYSTEM DRAWINGS

FIGURE 8. CRX Implement Only, CR7, ISOBus Ready System Drawing (P/N 054-4020-004 Rev. A)

SYSTEM DRAWING, CRX IMPLEMENT ONLY,
CR7, ISOBUS READY TRACTOR

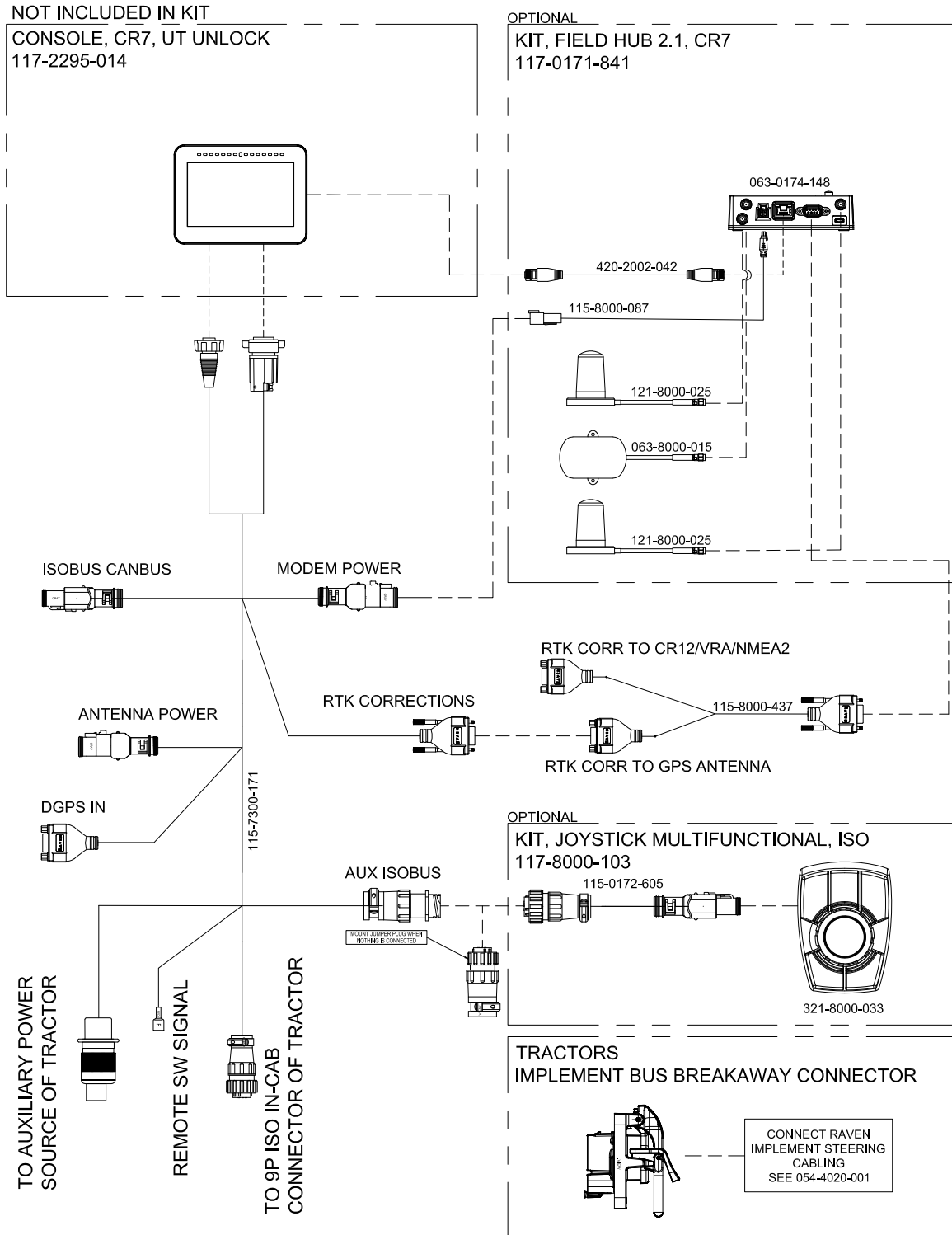


FIGURE 9. CRX Implement Only, CR7, Non-ISObus Ready System Drawing (P/N 054-4020-005 Rev. A)

SYSTEM DRAWING, CRX IMPLEMENT ONLY, CR7, NON-ISOBUS READY TRACTOR

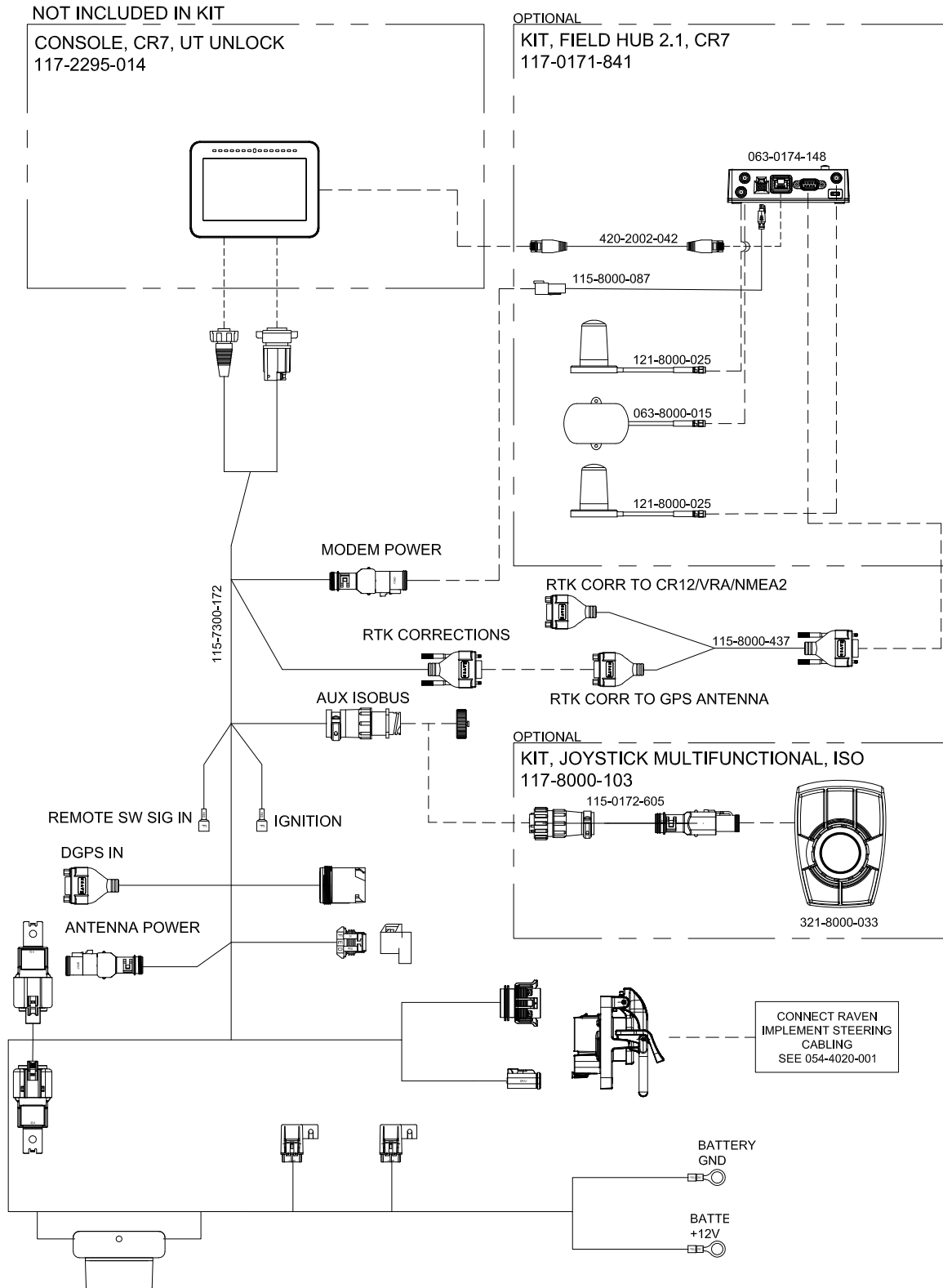


FIGURE 10. CRX Implement Only, CR12, ISOBus Ready System Drawing (P/N 054-4020-006 Rev. A)

SYSTEM DRAWING, CRX IMPLEMENT ONLY, CR12, ISOBUS READY TRACTOR

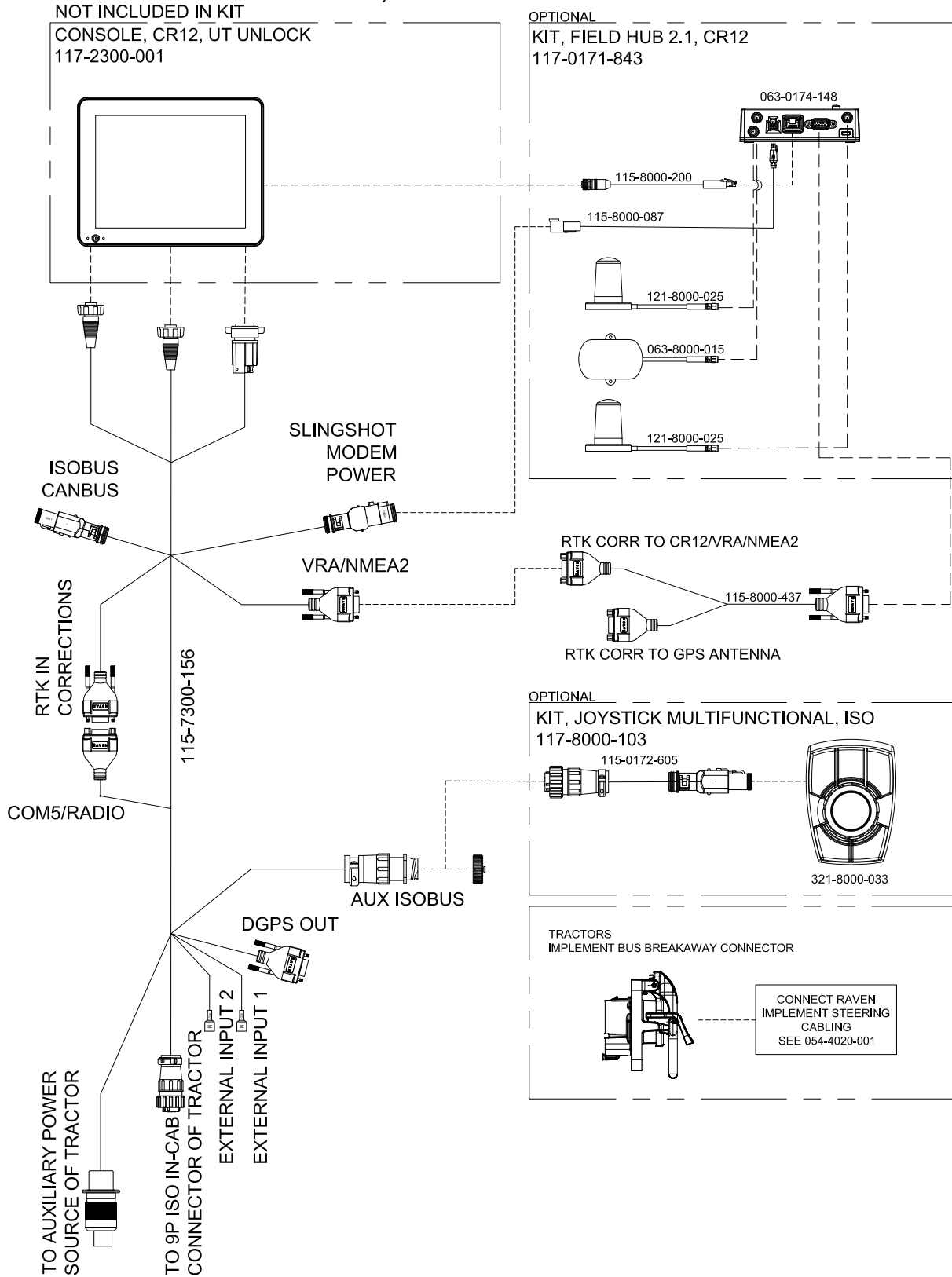


FIGURE 11. CRX Implement Only, CR12, Non-ISOBUS Ready System Drawing (P/N 054-4020-007 Rev. A)

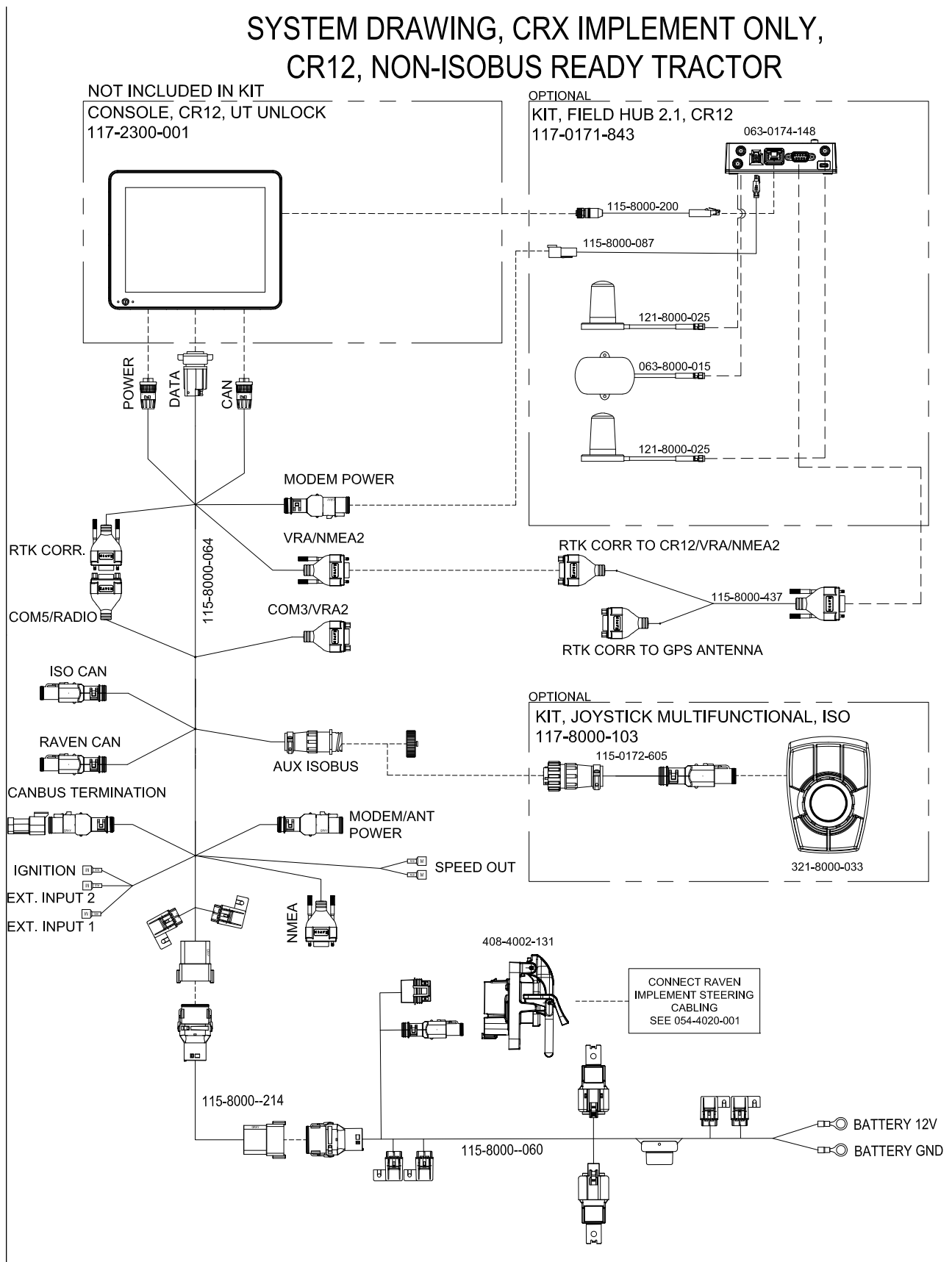
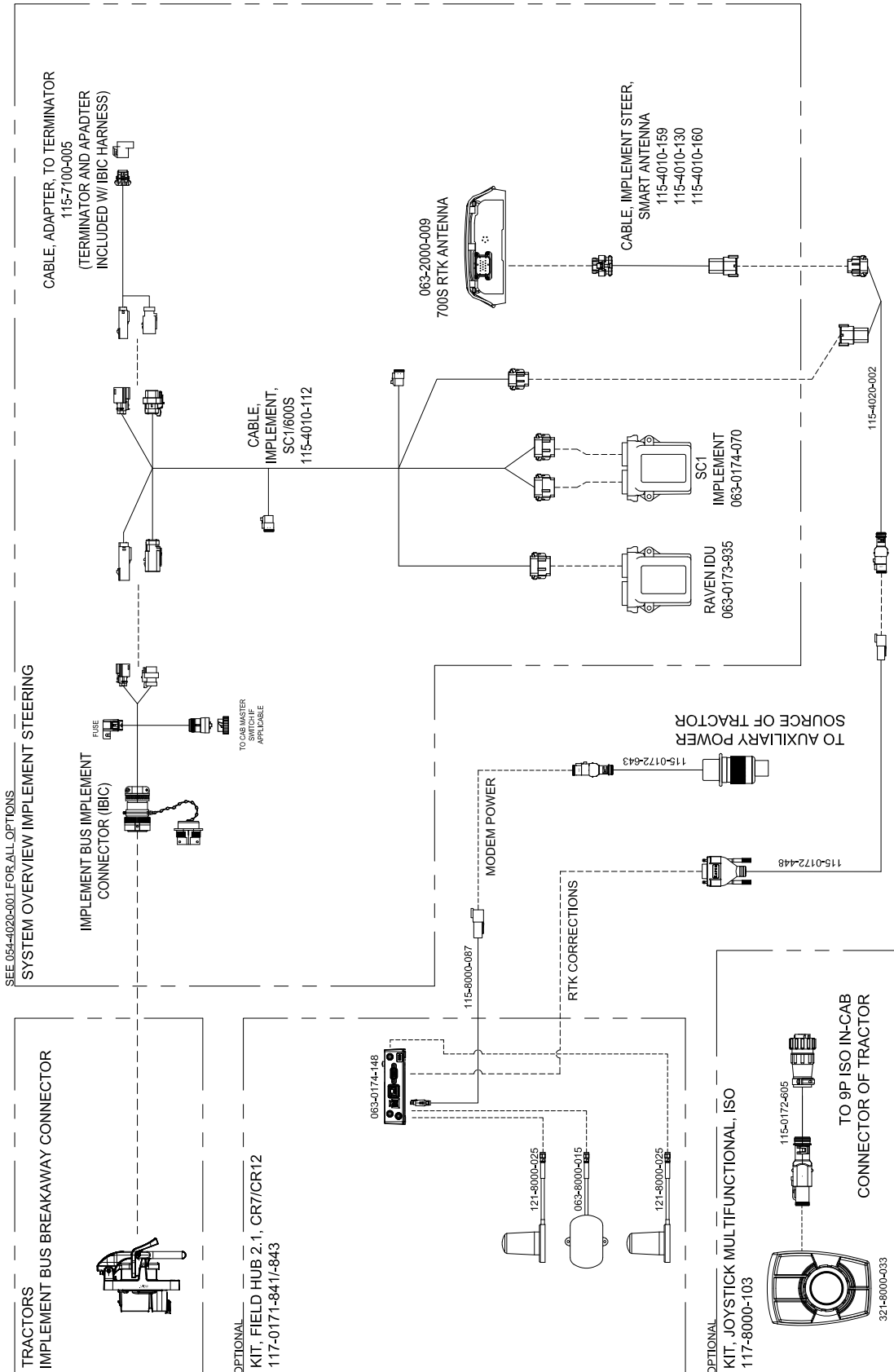


FIGURE 12. ISO Implement Only System Drawing (P/N 054-4020-008 Rev. A)

SYSTEM DRAWING, ISO IMPLEMENT ONLY



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 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.