



TROUBLESHOOTING GUIDE

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Recon Blockage Plus™ Troubleshooting Guide

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Record of Revisions

Revision Number	Change Description	Revision Date	Inserted By
1.0	Initial release	July 27, 2022	AAL
1.1	Updated damaged ECU question, added warning about incorrect wiring, updated gateway harness pinout, added question about checking CAN network	March 1, 2023	AAL



TIP: If you don't see your problem listed or your problem is not resolved after completing all troubleshooting steps, contact your Intelligent Ag™ dealer for assistance.

Before you Begin

Before you begin troubleshooting, make sure that you complete the following items.

iPad and app checks

1. Make sure that your iPad has the latest iOS software installed.
2. Make sure that you have the latest version of the Recon Blockage Monitor app downloaded.
3. Make sure that you have the Recon Blockage Monitor app, not the Intelligent Ag app.

Recon Blockage Monitor app	
Intelligent Ag app	

4. Plug in your iPad and make sure that it's charging.
5. Force-restart (hard reboot) your iPad. Refer to Apple's website for instructions based on your iPad type: support.apple.com/guide/ipad/force-restart-ipad-ipad9955c007/ipados.
6. Close all apps except for the Recon Blockage Monitor app.

Hardware checks

1. Make sure that the tractor is running.
2. Make sure that the gateway is powered on.
3. Make sure that your iPad is connected to the IASBlockage Wi-Fi network in the iPad settings.
4. Make sure that the ECUs are powered on.
5. Make sure that the ECU LED is blinking once per second.
6. Make sure that all other electronics in the cab are powered down.

Gateway

I can't communicate with the system.

1. Verify that you are connected to the IASBlockage Wi-Fi network in the iPad's Settings page.
2. Check for app updates in the App Store. You must be connected to a home Wi-Fi network (not the IASBlockage network). If an update is available, download it.
3. Verify that you have power to your ECUs and that the green LED is blinking about once per second.
4. Verify that your gateway has power and that the LED is green.
5. Check for possible Wi-Fi interference. "Forget" any networks that the iPad has been connected to in the past that appear in the My Networks network list.
6. If you have any of the following devices connected, disconnect them:
 - Wireless camera (disconnect both the cab display and camera on implement)
 - Wi-Fi booster/relay station
 - 2-way radio
7. Go to a "quiet" location. If you're in the farmyard, drive out to a field away from the yard's electrical interference and any other interference.
8. Shut off all other electronics except for your blockage and flow monitor components.

The gateway doesn't power down.

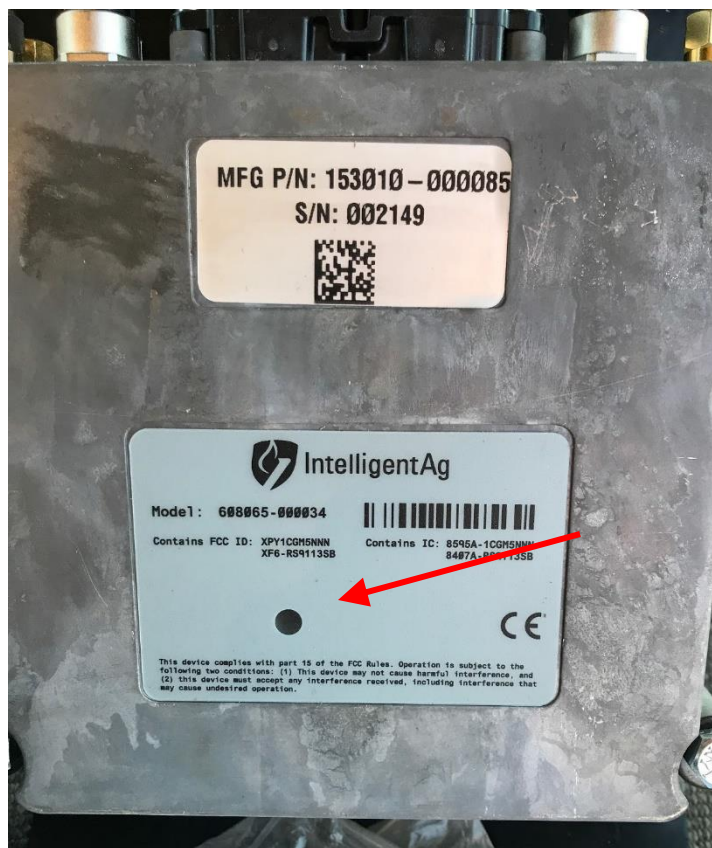
Open the Recon Blockage Monitor app. If it prompts you to update the gateway, perform the update. If the update is successful, your wireless network will be named IASBlockage and the gateway will recognize the key switch (blue wire) to power off the gateway with key power.

I can see the Wi-Fi network, but I can't connect to it.

If you've recently gotten a new gateway, the system may be trying to connect to the old one. "Forget" and re-connect to the IASBlockage network.

1. Tap the **Settings** icon on the iPad home screen.
2. Tap **Wi-Fi**, then tap the network name.
3. Tap **Forget This Network**.
4. Re-connect to the network.

What should the Gateway LED look like?



LED COLOR	LED STATE	DESCRIPTION
YELLOW	SOLID	BASE SDK (SOFTWARE DEVELOPMENT KIT)
WHITE	SOLID	STARTUP - POWERED PRE-BOOT
PURPLE/BLUE	FLASHING	STARTUP - BOOTING
GREEN	SOLID	NORMAL OPERATION
RED	SOLID	RECOVERY MODE - BOOT ERROR
RED	FLASHING	BIT ERROR
BLUE	FLASHING	REPROGRAMMING MODE

Flashing green means it is performing the safe shutdown sequence.

ECU

What is an ECU?



The Electronic Control Unit (ECU) communicates the flow measurement data recorded by the flow sensors to Recon Blockage Plus™.



The ECUs will not update.

Refer to the steps in *Before you Begin* on page 6.

Why is there a Wi-Fi symbol or disconnected plug symbol over an ECU in the app?

If you see a Wi-Fi symbol  or disconnected plug symbol , you have lost connection to that ECU.

1. Close and re-open the app.
2. Ensure that the ECU Power LED is illuminated. If it isn't:
 - a. Ensure that the ECU is plugged in to tractor power. If it is on key power, the key has to be on.
 - b. Ensure that the connectors are not damaged and that the leads are properly seated.
 - c. Check if any wiring has been pinched or cut by folding the implement wings. This may be the problem if the system was working before moving to another field.
 - d. Connect the ECU wiring harness to a different ECU and see if it powers on.
 - e. Use a multimeter to verify that the ECU power is 11 to 14 volts.

The ECU will not fit on the tower.

Refer to the instructions below for your drill manufacturer.

Pillar: These drills have a sub frame that sits under the main frame of the drill. The manifolds are mounted low, preventing the standard vertical mounting on the riser.

The ECU can be mounted horizontally on the frame directly in front of the paired manifolds with factory "frame" 3/8" u-bolts. If all run blockage is installed, it may be necessary to bolt the ECU to the back of the risers horizontally in order for the auditory tubes to reach. A bracket is required to secure one end of the ECU bracket to the risers.

John Deere: Use a horizontal bracket to mount the ECU. Otherwise, zip tie on the bottom of the bracket. A 3" U-Bolt can be used on the top of the bracket to mount it over the bottom of the manifold.

Bourgault: Use self-tapping screws into the drill's 1" support bracket.

Horsch: Primaries are 5" diameter and require a larger u-bolt than is supplied. The following parts can be procured from Butler Machinery or Horsch:

Description	Part #	Qty
U-bolt 5"	04119709	20
Washer 1/4"	S5A04000	40
Lock Nut 1/4"	00508062	40

Morris: Manifolds are a horizontal fan style. Use self-tapping screws into the frame just below the manifolds.

Other manufacturer: Contact Intelligent Ag™ for alternative mounting options for your drill.

I cannot see all of my ECUs when running the setup wizard.

1. Verify that you are connected to the IASBlockage Wi-Fi network in the iPad's Settings page.
2. Check for app updates in the App Store. You must be connected to a home Wi Fi network (not the IASBlockage network). If an update is available, download it.
3. Verify that you have power to your ECUs and that the green LED is blinking about once per second.
4. Verify that your gateway has power and that the LED is green.
5. Shut off all other electronics except for your blockage and flow monitor components.
6. Complete all other steps in *Before you Begin* on page 6.

ECUs were damaged during storage and now the ECU will not read flow.

If the ECUs were damaged during storage, it is likely that moisture or dust got into the microphone and has damaged it. Swap the auditory hose to an unused port and see if the new port works.

- If it works, navigate to the Edit Config screen in the app settings and re-assign the port.
- If it still does not work, verify that the sensor has been replaced with a new one and that the auditory tube is not kinked or pinched anywhere.

The ECUs are not connecting.

1. Refer to the table below to understand the ECU's LED status.

LED status	Meaning
Flashing green	Normal operation
Flashing purple/blue	ECU is starting up
Flashing blue	ECU is reprogramming
Light off	No power to ECU

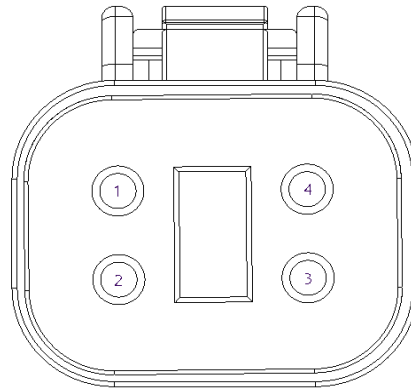
2. Refer to the steps in *Before you Begin* on page 6.
3. Check for voltage starting at the ECU closest to the center Y of the harness and record measurement observed. ECUs require a minimum of 10 VDC but may experience disconnects when below 12 VDC. If low voltage is found, trace the issue back to the closest ECU that had 12 VDC and begin checking all connections from that point on for corroded pins, debris in the connectors or damaged harness. Replace components as required.

There is power at the 4-pin plug going into the ECU, but the ECU will not turn on.

1. Check to make sure the pins are seated in the 4-pin plug.
2. Thoroughly clean the plug and make sure there is no debris or corrosion in or on the pins.
3. If the ECU still will not turn on, replace the ECU.

What is the ECU harness (353050 000097) pinout?

Refer to the pinout information below to troubleshoot ECU harness issues. The pins for each connector are the same.



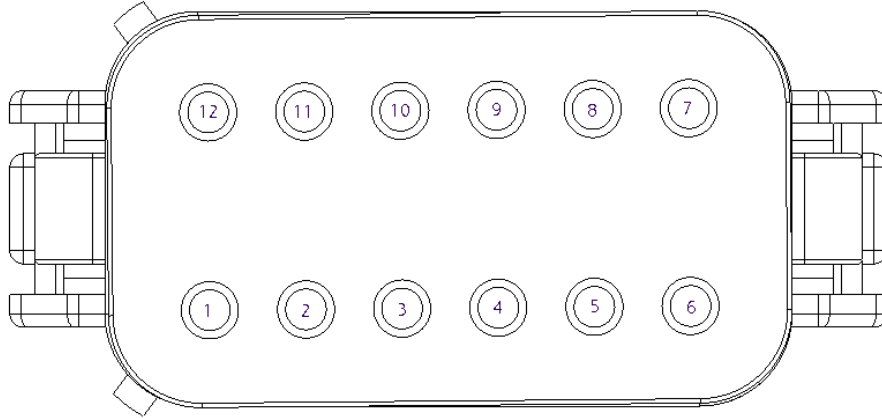
Pin	Color	Circuit Name
1	Black	Ground
2	Red	Switched Power
3	Yellow	CAN High
4	Green	CAN Low

What is the gateway harness (353050-000101) pinout for S1 and S2?

Refer to the pinout information below to troubleshoot gateway harness issues.

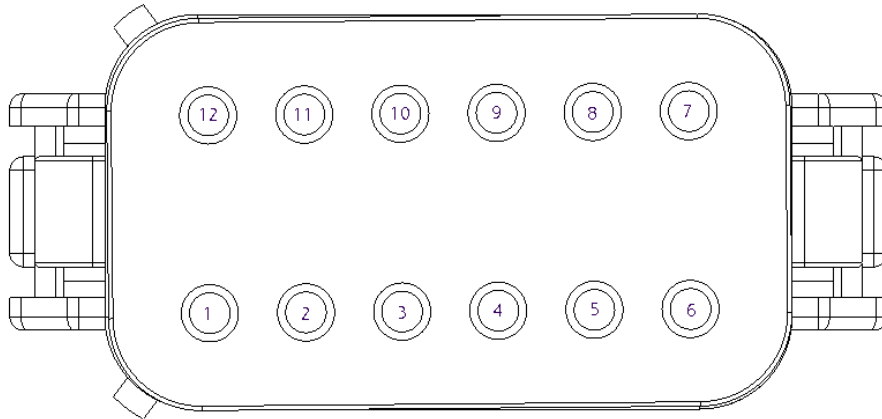
IMPORTANT: Damage could occur, and your warranty will be voided if harnessing is wired incorrectly.

S1 Pinout



Pin	Color	Circuit Name
1	Red	Power
2	Black	Ground
3	n/a	Plugged
4	White	Work Switch Positive
5	n/a	Plugged
6	n/a	Plugged
7	n/a	Plugged
8	n/a	Plugged
9	White/Black Stripe	Work Switch Ground
10	n/a	Plugged
11	n/a	Plugged
12	Blue	Switched Power

S2 Pinout



Pin	Color	Circuit Name
1	n/a	Plugged
2	n/a	Plugged
3	n/a	Plugged
4	n/a	Plugged
5	Yellow	CAN 3 High
6	Yellow	CAN 4 High
7	Green	CAN 4 Low
8	Green	CAN 3 Low
9	n/a	Plugged
10	n/a	Plugged
11	n/a	Plugged
12	n/a	Plugged

How much current does each ECU use?

Each ECU draws .088 Amps at 12 VDC.

What does the LED on the ECU indicate?

LED status	Meaning
Flashing green	Normal operation
Flashing purple/blue	ECU is starting up
Flashing blue	ECU is reprogramming
Light off	No power to ECU

Recon Blockage Monitor App

Why am I experiencing section variance?

Manifold flow variances of up to 10% are common. On large implements, outer manifolds may consistently vary by more than 10%.

1. Verify that primary runs are clear of obstructions.
2. Remove manifold caps and run your fan to clear any debris.
3. Check for obstructions at the cart's meter roll.
4. Check for obstructions at the bottom of the bin.

If your machine is outside of these ranges, there could be more air going to that section. The only way to verify this is with an anemometer at the towers and comparing the wind speed.

If you're experiencing section variance with a low rate product (such as canola), refer to the steps in the next section.

Why am I experiencing section variance with a low rate product (canola)?

This is normal. The system works by hearing the amount of sound generated by product striking the sensor plate. The size and speed of the product has a large effect on the amount of sound generated.

What is the mass flow number?

Recon Blockage Plus™ provides a mass flow number to help you ensure consistent product application. Mass flow can alert you to equipment issues that are disrupting flow such as open bin lids, product bridging, meter buildup, and primary blockage. It is a relative number and shouldn't be confused with seeding rate or population. The mass flow number is affected by changes in ground speed, fan speed, product type, and application rate. Be wary of claims made by other monitoring systems pertaining to seed counting accuracy. The best way to ensure your desired application rate is being met is by obtaining a seeds per pound figure from your seed supplier.

What do I do if the mass flow number is abnormal?

If there has been a recent change in rate, fan speed, or product, a different mass flow number is normal. If there hasn't, try the following steps.

1. Verify that there is product left in your bins. Flow will be reduced if a bin runs empty.
2. See if there is product bridging over the metering roll.
3. Verify that bin lids are securely latched. Verify that all primary hoses are securely attached.

Why can't I see mass flow or individual flow levels?

1. Refer to the steps in *Before you Begin* on page 6.
2. Restart the app.
 - a. Double-click the Home button (if you have one) or swipe up and right from the bottom of the screen.
 - b. Swipe left or right until you have located the Recon Blockage Monitor app.
 - c. Swipe up on the app's preview to close it.
 - d. Press the Home button (if you have one) or swipe up from the bottom of the screen to return to your home screen. Re-open the app.
3. Check for app updates in the App Store. You must be connected to a home Wi Fi network (not the IASBlockage network). If an update is available, download it.
4. If you have a dual product system but can only see one mass flow number, make sure that the system is configured to monitor two products and that product A and product B manifolds are correctly assigned.

Why am I seeing false blockages?

1. Do a crank test to ensure that product flows from each opener.
2. On air seeders, ensure that you can feel air flow beneath the opener.
3. Ensure that the flow rate is set correctly in the app's settings page.
4. Configure light products, such as canola, flax, alfalfa, and grass, as "low" product flow. Configure very low rate products such as sunflower as "very low" product flow.
5. Navigate to the Edit Config screen in the app settings and verify that each primary or section has the correct ECU serial number assigned to it.
6. Navigate to the Edit Config screen in the app settings, then tap the green arrow in the lower right of the screen until you advance to the port config screen. Verify that ECU ports are enabled and correctly mapped.
7. Verify that you are checking the right hose. Before shutting off product flow, take a screenshot of the blockage screen. The screenshot will be stored in your iPad's photos.
8. Verify that the auditory hose is not kinked or pinched.
9. Verify that the auditory hose is attached to the correct ECU port.
10. Verify that the auditory hose is securely attached to the ECU by pushing the hose onto the ECU port.
11. Move the auditory hose to a new port on the ECU to assess if the problem is a port on the ECU not functioning correctly. Ensure that you re-assign that run to the new ECU port in the app by pressing and holding until it "lifts" and then dragging it and dropping it on the new port.
12. Verify that sensors are not installed backwards or upside down. The arrow on the sensor should point downward.
13. Check if the sensor is clogged.
14. Disconnect the seed hose to check for buildup on the sensor membrane.

How do I add additional sensors to an existing system?

1. Verify that the sensors you have are the same size and style as the currently installed sensors.
2. Verify that you have enough available and working ports to accept the new sensors on the ECU.
3. Install the sensors in the same manner as the other sensors on the drill. Make note of what tower, ECU serial number, run, and ECU port the sensors are connected to.
4. Open the app. Tap the **Settings** icon, then tap **Edit Config**. Change the number of sensors accordingly on each tower.
5. Navigate to the next page (the port config page). Edit each ECU to make the layout on screen match the actual layout on the drill by dragging and dropping ports. When you're done, save and exit.
6. Navigate to the main blockage screen and verify that the new sensors were added.

The mass flow does not change in the app.

1. Verify that the work switch is set correctly.
2. Verify that the work switch status in the app is green when seeding.

The work switch status in the app is green when the drill is in the air and white when it is in the ground.

Navigate to the **Settings** page in the app and enable the **Work Switch Inverted** switch.



The alarms are not making any noise.

1. Verify that the iPad is not muted with the side switch (if you have one).
2. Verify that the work switch status in the app is green.
3. Make sure that the iPad is not connected to any other audio devices via Bluetooth.
4. Force-restart the iPad. Refer to Apple's website for instructions based on your iPad type: support.apple.com/guide/ipad/force-restart-ipad-ipad9955c007/ipados.

How do I update the Recon Blockage Monitor app?

1. Download updates from the App Store.
 - a. Connect the iPad to an internet-enabled network.
 - b. Open the App Store and search for *Recon Blockage Monitor*. If there is an update available, tap **Update**.
 - c. Keep the iPad connected to the internet until the app is downloaded.
2. Take the iPad to the machine and connect to the Intelligent Ag™ network. Check the following:
 - a. Verify that the tractor is running.
 - b. Verify that the iPad is fully charged and connected to a charging cable.
 - c. Verify that the ECUs all have a minimum of 12 VDC.
 - d. Verify that the gateway has power.
3. Open the app. The first time you open the app, it will automatically update your gateway, then your ECUs.

Why are there no audible alarms when a blocked run is displayed?

1. Verify that the iPad is not muted with the side switch (if applicable) or that the volume is not turned all the way down. Swipe down from the top right corner of the iPad screen and make sure that the mute  icon does not appear.
2. Verify that audible alarms are enabled in the app's settings.
3. Make sure that the iPad is not connected to any other audio devices via Bluetooth.
4. Verify that the alarm delay in the app's settings isn't set too high.
5. If you are dual shooting, ensure that the app is configured for two products.
 - a. Tap the settings  icon.
 - b. Tap **Edit Config**.
 - c. Tap on a Primary or Section number and select the correct product type. For example, seed could be Product A and fertilizer could be Product B.
6. Lift and lower the implement and verify that the work switch indicator in the app changes.
7. Restart the app.
 - a. Double-click the Home button (if you have one) or swipe up and right from the bottom of the screen.
 - b. Swipe right until you have located the Recon Blockage Monitor app.
 - c. Swipe up on the app's preview to close it.
 - d. Press the Home button (if you have one) or swipe up from the bottom of the screen to return back to your home screen.
 - e. Re-open the app.

I cannot access the setup wizard.

1. Verify that the iPad is connected to the IASBlockage network.
2. Verify that the app is not in demo mode. You can access the setup wizard in demo mode, but you won't be able to access your system's ECUs (only demo ECUs).

My port configuration isn't saving.

Make sure that you tap **Done** in the lower right corner to save your configuration.

I have the Intelligent Ag™ app. How do I get the Recon Blockage Monitor app?

1. Download the Recon Blockage Monitor app from the App Store.
 - a. Connect the iPad to the internet.
 - b. Tap the App Store icon from the iPad's home screen.
 - c. Type *Recon Blockage Monitor* in the search field and tap **Search**.
 - d. Tap **Get** next to the Recon Blockage Monitor app when it appears in your search results and install the app.
2. Open the Intelligent Ag app. Write down your settings so that you can configure them in the new app.
3. Delete the Intelligent Ag app so that the two apps do not interfere with each other.

Sensors

I have fertilizer buildup on my sensors.

Cleaning Buildup

Fertilizer buildup on sensors can cause false blockages in the app. Gently scrape off buildup with a screwdriver. Or, use a garden hose with a nozzle. If you use water to clean the sensor, make sure the system is completely dry before running product through it.

Preventing Buildup

Fertilizer build-up issues often depend on the quality of the product supplied to you. Dusty products combined with high humidity can coat many components throughout an air seeder. The blockage sensor is oftentimes the first indication of poor quality fertilizer, and without it, you may be caught unaware when this muck plugs a manifold or metering roll. If you have encountered this issue, we recommend adding one or more of the following:

- Soy or canola oil additives: thecombineforum.com/threads/anyone-applied-soy-canola-oil-to-fertilizer.201322/
- Nitrogen Stabilizer (Agrotain): kochagronomicservices.com/us/products/agriculture/agrotain
- Substitute sulfate products with Mezz or 40 Rock
 - Mezz (12-40-0-10s-1zn)
 - 40 rock (12-40-0-7s-1zn) (least dusty)
- Blockage Prevention System: The BPS is a hydraulic oil cooler that significantly reduces humidity. More info: airguardproducts.com/Store/Airguard-Blockage-Prevention

Detailed results: thecombineforum.com/threads/airguard-blockage-prevention-system.199930/

How do I mount my sensors?

Refer to the section called *Installing Flow Sensors* in the Recon Blockage Plus™ Installation Manual.

Why are my sensors wearing out?

It is normal for sensors to start to wear out after 5-7 years in regular conditions.

Can I shorten or lengthen the auditory tubes?

No, all of the auditory tubes need to be the same length so that the same amount of sound is coming from each sensor.

Is there a sensor available for primary lines?

No, only 1" and 1.25" sensors.

What is the maximum distance that a sensor can be mounted from the tower?

There is no maximum as long as all of the sensors on the machine can be mounted at equal distances from the tower. They must also be mounted so that the exit end of the sensor is lower than any other portion of the hose between the manifold and sensor. We recommend a minimum of 8" from the tower.

My sensors are not showing flow.

1. Swap sensor locations to the opposite part of the manifold or try a different manifold. It is possible the sensor is on a part of the manifold that does not have as much product running through it as the other runs, thus giving a lower acoustic signal.
2. Checked for a kinked acoustic hose.
3. Take off the sensor and look to see if there is build-up on the plate.
4. Swap acoustic hose with another sensor that is working and see if it moves to the other sensor.
 - If it moves to the other sensor, then the sensor is damaged.
 - If it stays on the same port, then the microphone in the ECU is damaged.
5. Check for unusual wear in the poly around the metal plate in the sensor.
6. Check for cracked gaskets.
7. Check for dented plates.

Can I replace parts of a sensor?

No, the sensors are not repairable components.

Can I replace the auditory tubes?

Yes, the tubing comes in a 10' bulk roll (part number 353070-000082).

My hoses are loose in the sensor. Do I need adapters?

Yes, refer to the list of part numbers below for your sensor type. Call your IAS dealer to order adapters.

Adapter Measurement	Part Number
1-1/4" to 1"	353070-000252
1-1/4" to 15/16"	353070-000112
1-1/2" to 1"	353070-000022

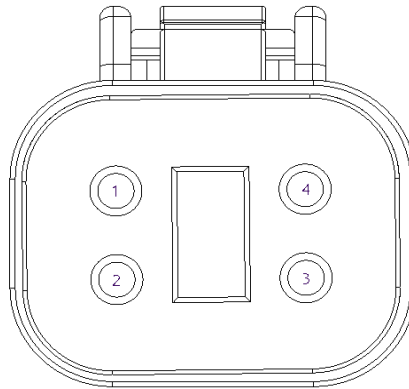
Harness

Do I need to run power to the cab of the tractor?

Yes, the gateway and ECUs require clean 12 volt power and key switch power.

How do I check if the CAN network is working properly?

Use a multimeter to check the resistance across the ECU harness (353050 000097) CAN High and CAN Low wires. When the CAN network is terminated properly, it should be approximately 60 ohms.



Pin	Color	Circuit Name
1	Black	Ground
2	Red	Switched Power
3	Yellow	CAN High
4	Green	CAN Low

Work Switch

The work switch is not working.

The work switch is an open-closed switch. This setting can be inverted so that you have full control over how you choose to mount the work switch.

Verify that the work switch is mounted in a way that it can cycle when the implement is in the ground and out of the ground.

