

ENGAGE[®]

ZONE CONTROL

INSTALLATION MANUAL

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Engage® Zone Control Installation Manual

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Related Documentation

Document Number	Document Title
600840-000047	Engage® Zone Control Maintenance Manual
600890-000059	Engage® Zone Control Operator's Guide

WARNING



CAUTION: The Engage® Zone Control unit is heavy. Use proper precautions such as steel toe boots and gloves. Lifting and installing the unit may require two people.



CAUTION: Unplug the bin harness from the Engage Zone Control unit enclosure before performing any maintenance.



CAUTION: Engage Zone Control unit gates and cleaning tools are sharp. Use caution when handling these components.

IMPORTANT: Read the Engage Zone Control Installation Manual (600840-000043) before installing the system.

This document may have been recently updated. For current documentation, videos, and other resources, visit www.intelligentag.com/support.

1. Introduction

1.1. About Engage® Zone Control

Engage Zone Control is a retrofit section control system for your John Deere 1910 air cart. The system communicates with your air seeder's existing GPS mapping system to prevent overlap by opening and closing up to eight sections per bin, controlling all the bins on your air cart.

1.2. Additional Required Tools and Equipment

You will need the following tools and equipment to install the Engage Zone Control system:

- Metric and standard wrench set
- Metric and standard socket set (with deep well sockets and extension)
- Wire brush, putty knife, or other tool to clean rust and product buildup on air cart
- Cordless drill with 5/16 driver or flathead screwdriver
- Cordless drill with 5/16 drill bit (tow-between carts only)
- Metal cutting tool such as a grinder with cut-off wheel or Sawzall (2014 or newer air carts only)

1.3. Installation Overview

- ☐ Install Engage Zone Control units
- ☐ Install gateway
- ☐ Install Wi-Fi antenna
- ☐ Install work switch
- ☐ Connect harnessing

NOTE: Detailed wiring diagrams are found in Appendix A.

For videos, current documentation, and other resources, visit www.intelligentag.com/support.

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At the end of the season, refer to the Engage Zone Control Maintenance Manual (600840-000047) for storage and cleaning requirements.

Failure to follow proper cleaning and maintenance protocols may reduce product performance and may void warranty on motor and other internal components.

2. Installing Engage® Zone Control System

2.1. Installing Engage Zone Control Units

The Engage Zone Control units open and close individual sections to control the flow of product on each bin.

Part name	Part number	Quantity needed	Contained within
Engage Zone Control unit	153510-000121	1/bin	Bin kit
Manifold plate insert	153510-000116	2/bin	Bin kit
Meter housing divider (left)	353070-000095	1/bin	Bin kit
Meter housing divider (right)	353070-000096	1/bin	Bin kit
Sealing wedge	353070-000098	1/bin	Bin kit
Canola insert (optional)	353070-000104	varies	Accessory
Canola insert foam (optional)	353070-000182	varies	Accessory
Bolt	356060-000122	6/bin	Bin kit
Nut	356060-000104	6/bin	Bin kit

Installation location: 1 per bin, installed below the meter housing



Figure 1: Engage Zone Control units installation location

Preparing the John Deere manifold

1. Remove the meter roll from the meter housing.
2. Remove the John Deere meter housing dividers and sealing wedge from the meter housing.
3. **OPTIONAL:** To make the manifold lighter, remove the manifold bottom cover by unclipping the two fasteners on the cover.
4. Remove or loosen the manifold, depending on the type of cart and location of the manifold.

- **Rear manifold on tow-between cart:**

- a. Loosen the rear bin primary tube hose clamps and remove the black plastic couplers under the metal hose clamps. Remove the primary tubes on both sides of the manifold.

NOTE: On double shoot systems, the primary tubes might be different lengths. Take note of which tubes are installed on the top row and which are installed on the bottom row.

NOTE: To make re-connection easier, do not completely remove the metal hose clamps or black plastic couplers around the primary tubes near the fan.

- b. Remove the 6 bolts that connect the manifold to the meter housing. Remove the manifold.

TIP: Have someone hold the manifold or use cable ties to temporarily secure the manifold when removing the bolts.

- **All other manifolds:** Remove the 6 bolts and nuts that connect the manifold to the meter housing. The manifold will be held in place by the primaries.

5. If you have a model year 2014 or newer air cart, cut off part of the mounting tabs on the rear of the meter housing using a metal cutting tool, such as a grinder with cut-off wheel or Sawzall, as shown in the hashed area in Figure 2. This allows the Engage® Zone Control unit to be mounted flush with the meter housing.

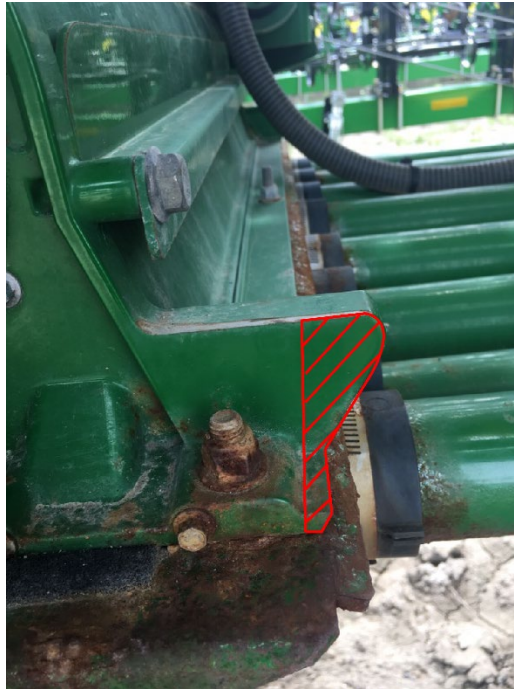


Figure 2: Cutting meter housing mounting tabs

6. Clean the manifold and meter housing.
 - a. Remove the black gasket on the manifold. Clean the top of the manifold and inside the meter housing with a wire brush and remove as much rust or product buildup as possible
 - b. Clean inside the manifold with a flathead screwdriver to remove product buildup inside the recessed area, as shown in Figure 3.



Figure 3: Cleaning inside the manifold

7. Reach into the meter housing and place a manifold plate insert (153510-000116) with the gasket facing down on each side of the manifold.



Figure 4: Installing the manifold plate inserts

Installing the Engage® Zone Control unit



CAUTION: The Engage Zone Control unit is heavy. Use proper precautions such as steel toe boots and gloves. Lifting and installing the unit may require two people.

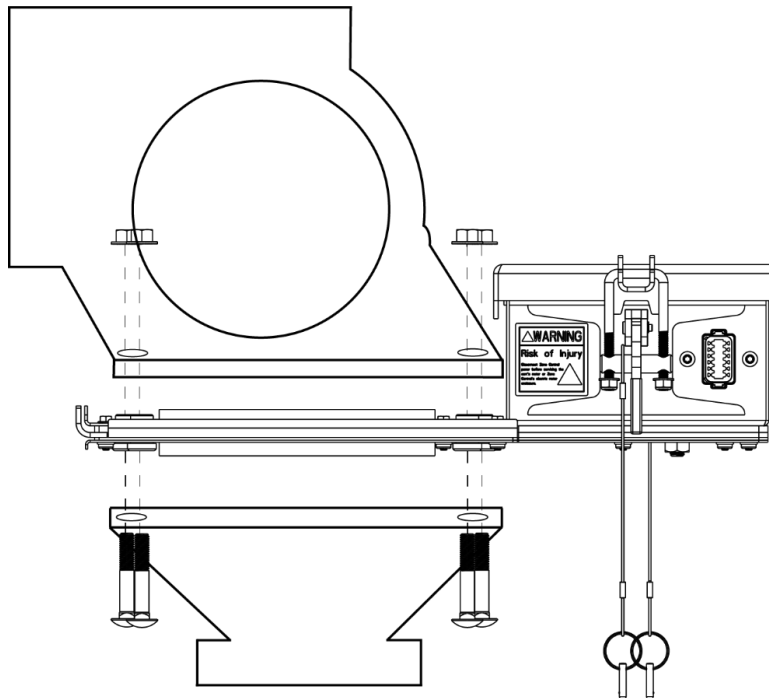


Figure 5: Installing the Engage Zone Control unit

1. Undo the latches that secure the lid to the unit, then slide the lid off. Make sure that you don't get any dirt inside the enclosure or damage the harnessing in the unit.
2. Install the Engage Zone Control unit (153510-000121).

- **Rear manifold on tow-between cart:**

- a. Align the Engage Zone Control unit plate with the 6 bolt holes under the meter housing, as shown in Figure 5.
- b. Re-align the manifold with the 6 bolt holes and secure the unit and manifold to the meter housing with the 6 bolts (356060-000122) and nuts (356060-000104) included in the bin kit.

TIP: Have someone hold the unit and manifold or use cable ties to temporarily secure the equipment before replacing the bolts.

- c. Clean the black plastic couplers from the primary tubes and remove any corrosion on the tubes. Re-install the primary tubes, and secure with the black plastic couplers and metal hose clamps.

TIP: Begin reconnecting the center, top tubes and work your way to the outside and bottom tubes.

NOTE: If the tubes no longer align correctly with the openings, shim down the fans or fan bracket until the tubes are level again.

- **All other manifolds:**

- a. Carefully slide the Engage® Zone Control unit plate between the meter housing and manifold, as shown in Figure 5. Align the plate with the 6 bolt holes under the meter housing.

NOTE: If more clearance is needed for the bin unit to slide in, loosen the 6 meter housing bolts of the closest meter.

- b. Secure the unit and manifold to the meter housing with the 6 bolts (356060-000122) and nuts (356060-000104) included in the bin kit. **Leave the nuts loose until all units have been installed.**

TIP: Have someone hold the unit and manifold or use cable ties to temporarily secure the equipment before replacing the bolts.

3. Re-install the manifold bottom cover, if it was removed.

4. If you are applying canola seed or other low rate/small seeds, place canola insert foam (353070-000182) into each canola insert (353070-000104). Then, place a canola insert into each section of the meter housing dividers (353070-000095 and 353070-000096), as shown in Figure 6.

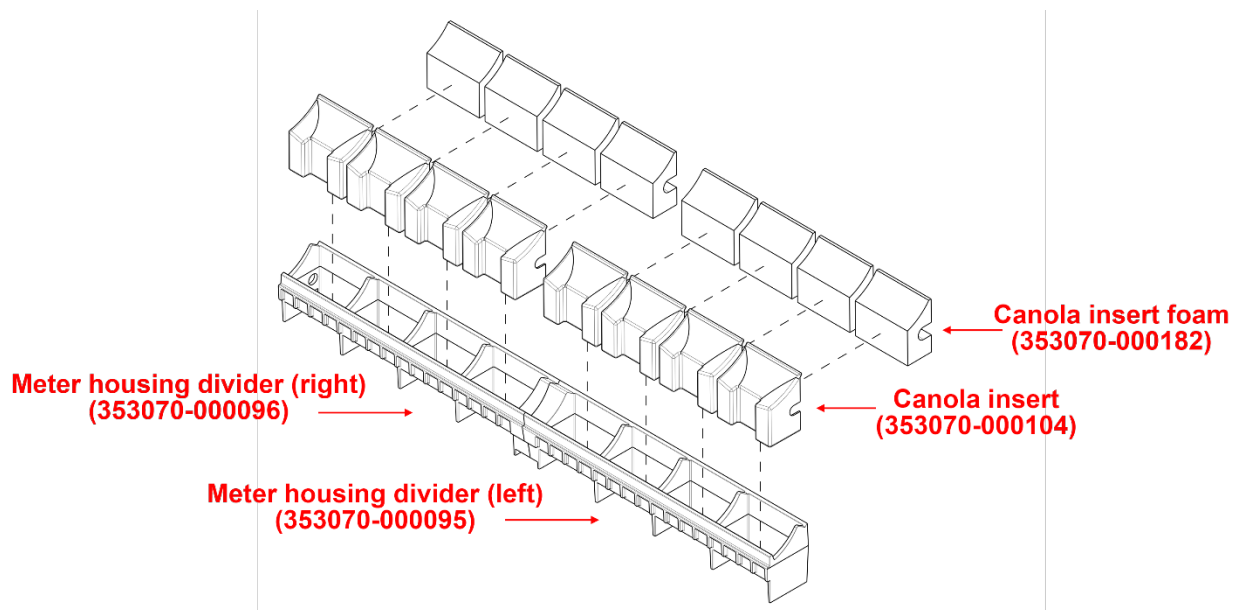


Figure 6: Inserting canola inserts

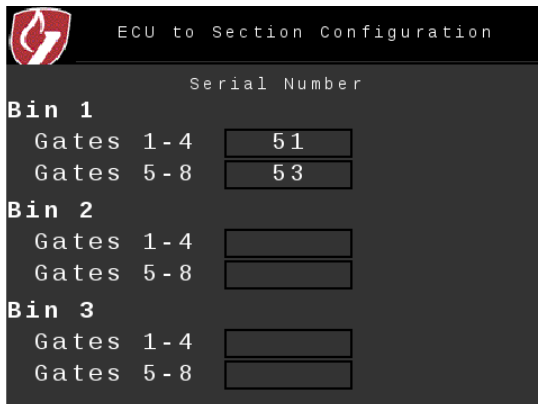
5. Insert the supplied left and right meter housing dividers (353070-000095 and 353070-000096) into the meter housing as shown in Figure 6, ensuring that the hole in the right divider lines up with the pressure port. Then, insert the provided sealing wedge (353070-000098).



Figure 7: Inserting meter housing dividers

6. Re-insert and secure the meter roll.
7. Repeat the steps above for each bin.

8. Fully tighten the 6 nuts on each manifold.
9. Record the serial numbers for the motor controllers inside the bin units and the gates they are associated with. You will assign the serial numbers to their associated gates during configuration, as shown in the example screenshot below. More information will be given in the Engage® Zone Control Operator's Guide.
 - Gates 1-4 correspond with the serial number on the leftmost motor controller in the unit, and gates 5-8 correspond with the rightmost motor controller.
 - Bin 1 is the bin closest to the tractor. Bins 2 and 3 (if applicable) are further away from the tractor.



The screenshot shows a software window titled "ECU to Section Configuration" with a red and white logo in the top left corner. Below the title bar, the text "Serial Number" is centered. The window is divided into three sections for "Bin 1", "Bin 2", and "Bin 3". Each section contains two rows: "Gates 1-4" and "Gates 5-8", each followed by a text input field. In the "Bin 1" section, the "Gates 1-4" field contains the number "51" and the "Gates 5-8" field contains the number "53". The "Bin 2" and "Bin 3" sections have empty input fields for both gate ranges.

Bin	Gates 1-4	Gates 5-8
Bin 1	51	53
Bin 2		
Bin 3		

Figure 8: Recording serial numbers

2.2. Installing Gateway

The gateway is a computing platform that enables communication from the Engage® Zone Control units to the Virtual Terminal. The gateway is shipped with generic firmware; instructions for programming the gateway are given in the Engage Zone Control Operator's Guide.

Follow the instructions below, depending on if you have a tow-between air cart (the cart is between the tractor and the implement) or tow-behind air cart (the cart is behind the implement).

Part name	Part number	Quantity needed	Contained within
Gateway 300	153010-000042	1	Gateway kit
Washer	352012-000002	8	Gateway kit
U-bolt and mounting hardware	352013-000007	2	Gateway kit
Gateway 300 mounting bracket	353070-000079	1	Gateway kit
Screw	356060-000033	4	Gateway kit
Nut	356060-000075	4	Gateway kit

Tow-between air cart

Installation location: On the back of the air cart frame. The mounting location must be at least 8 inches (20 cm) away from the operator to ensure safe operation.

Installing the Gateway

1. Position the Gateway 300 (153010-000042) on the back of the air cart frame with the connectors facing any direction but up. Ensure that the Gateway harness (353050-000032) and Wi-Fi antenna cables will reach the mounting location (See the wiring diagrams in Appendix A).
2. On the back of the air cart frame, mark the location of the four mounting holes shown in Figure 9. Remove the gateway and drill out the holes using a 5/16 inch or 8 mm drill bit.

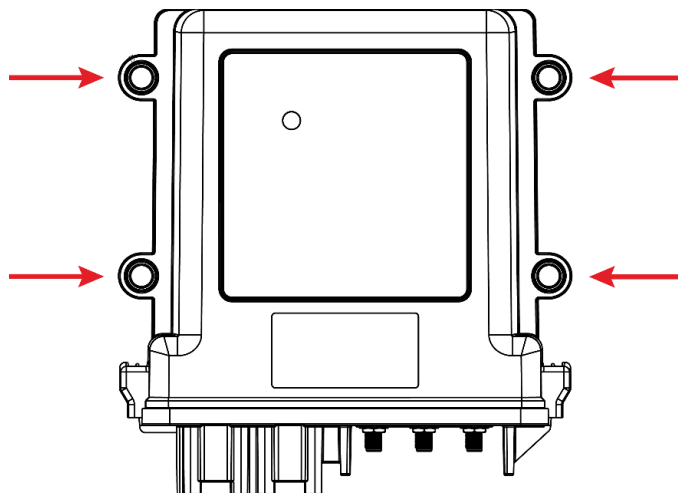


Figure 9: Gateway mounting holes

3. Secure the gateway to the back of the air cart frame using the provided screws (356060-000033), washers (352012-000002), and nuts (356060-000075).

Tow-behind air cart

Installation location: On the front right side of the air cart frame, near the primary tubes. The mounting location must be at least 8 inches (20 cm) away from the operator to ensure safe operation.



Figure 10: Gateway installation location (tow-behind cart)

Installing the Gateway

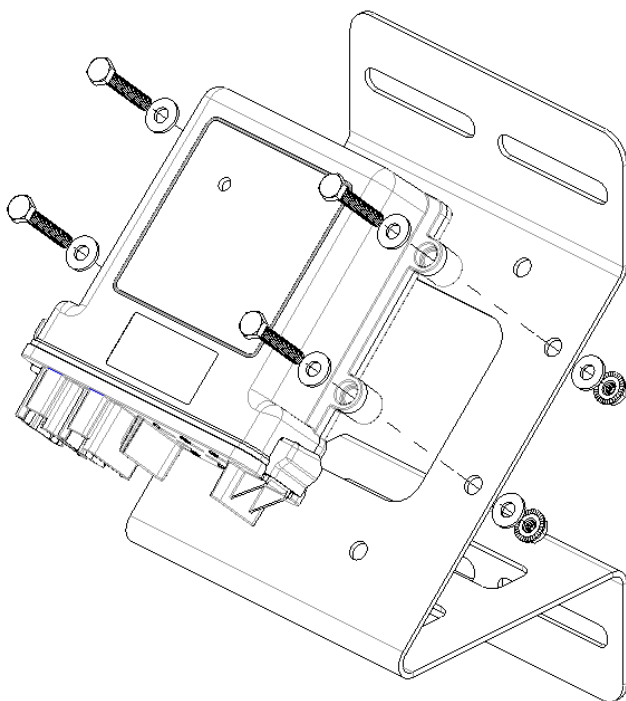


Figure 11: Installing the gateway on a tow-behind air cart

1. Position the Gateway 300 (153010-000042) on the mounting bracket (353070-000079). The gateway can be mounted on the bracket in any direction, but the connectors should not face up when the bracket is mounted on the air cart.
2. Secure the gateway to the mounting bracket using the provided screws (356060-000033), washers (352012-000002), and nuts (356060-000075) as shown in Figure 11.
3. Mount the gateway on the front right side of the air cart frame, near the primary tubes, using the provided u-bolts and mounting hardware (352013-000007) as shown in Figure 10.

Using Engage® Zone Control with the Wireless Blockage and Flow Monitor

If you are already using Intelligent Ag's Wireless Blockage and Flow Monitor, the Engage Zone Control gateway now functions as the WBFM access point.

Uninstall the TP-Link access point, and connect your iPad to the **IASBlockage** network when using the WBFM.

2.3. Installing Wi-Fi Antenna

The Wi-Fi antenna sends information to the gateway.

Part name	Part number	Quantity needed	Contained within
Cap	251015-000139	3	Gateway kit
Wi-Fi antenna	252005-000010	1	Gateway kit
Wi-Fi antenna mounting bracket	353070-000083	1	Gateway kit
3" U-bolt and mounting hardware (tow-behind cart) or 1.5" U-bolt and mounting hardware (tow-between cart)	356060-000137 or 356060-000149	2	System kit or Accessory

Installation location: Mounted on the air cart frame or railing, at least 2 feet (60 cm) away from the operator and at least 8 inches (20 cm) from the gateway to ensure safe operation.

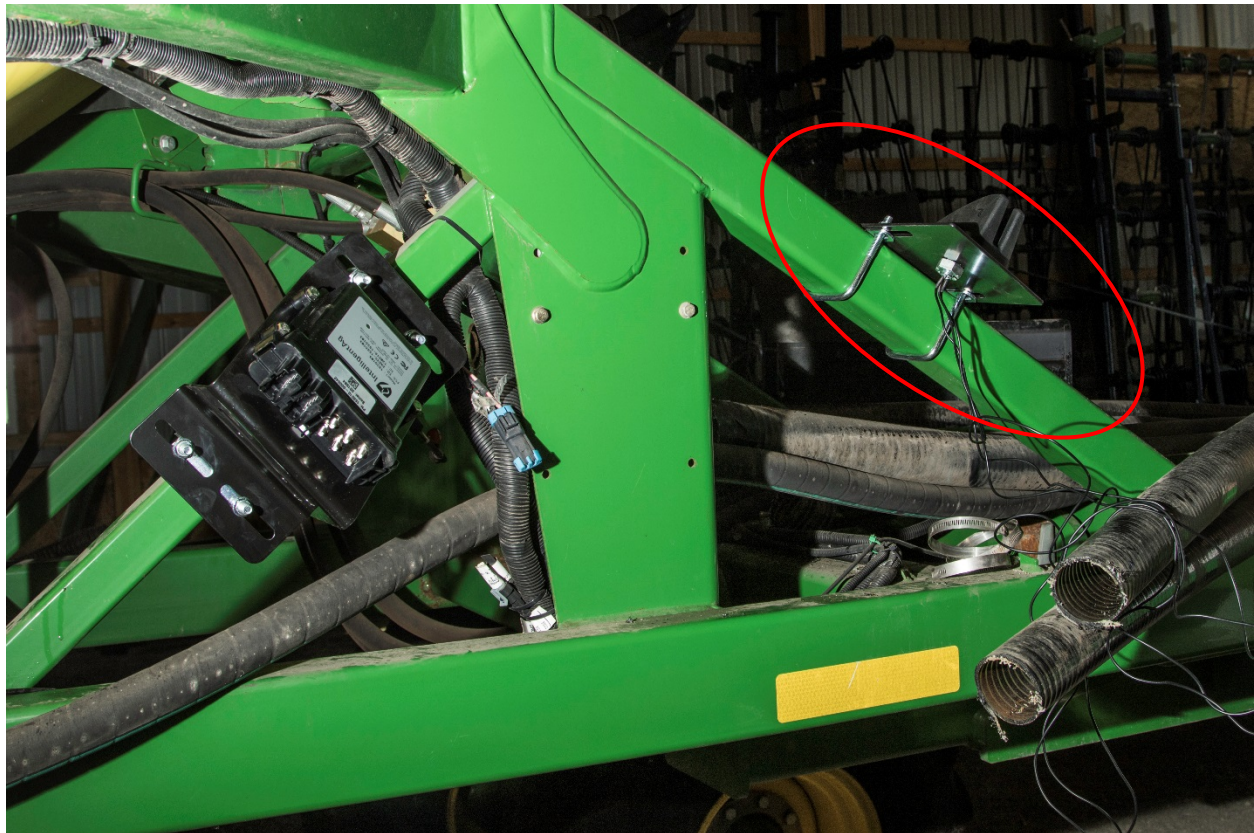


Figure 12: Wi-Fi antenna mounting location (tow-behind cart)

Mounting the Wi-Fi antenna

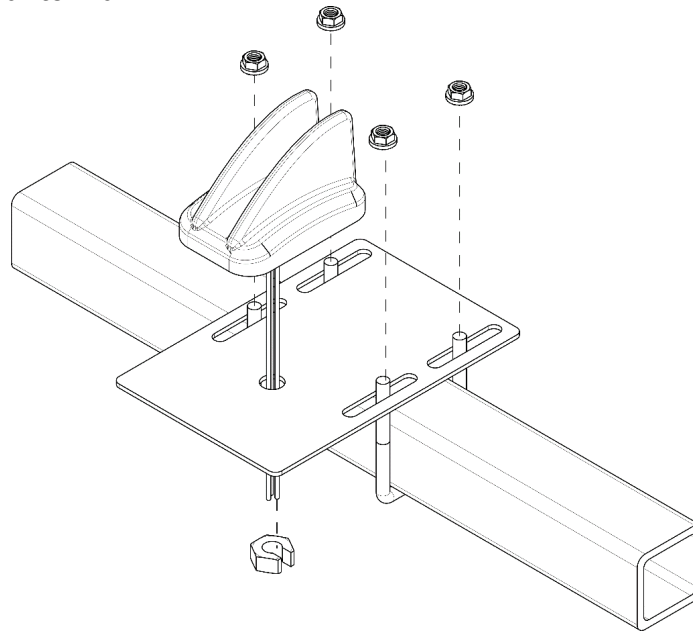


Figure 13: Mounting the Wi-Fi antenna

1. Thread the Wi-Fi antenna (252005-000010) cables through the hole in the mounting bracket (353070-000083) and through the nut. Tighten the nut to secure the antenna to the bracket.
2. **Tow-behind cart:** Mount the bracket on the air cart frame near the gateway using the u-bolts and mounting hardware (356060-000137).
Tow-between cart (2 bins): Mount the bracket on the air cart railing using the u-bolts and mounting hardware (356060-000149).
Tow-between cart (3 bins): Mount the bracket on the air cart frame, as high as possible while ensuring that the antenna cables will reach the gateway. Secure using zip ties.
3. Connect the antenna cables to the gateway using the diagram in Figure 14.

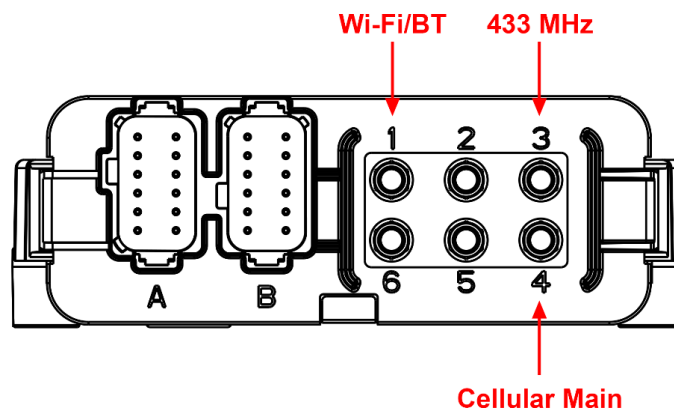


Figure 14: Gateway connectors

4. Cover connectors 2, 5, and 6 with the provided caps (251015-000139).

2.4. Installing the Work Switch

The work switch signals to Engage® Zone Control when the implement is in or out of the ground.

Types of work switches

Intelligent Ag provides two different types of work switches: a whisker switch and a proximity switch.

- If you have a **hoe drill**, install the **whisker switch**.
- If you have a **disc machine**, install the **proximity switch**.

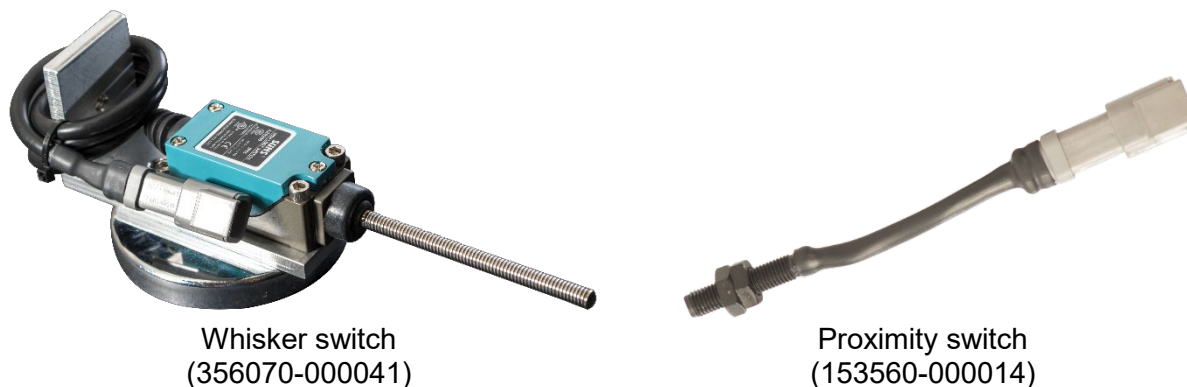


Figure 15: Work switch types

Installation location: Near an existing work switch or near the height sensor.

2.4.1. Installing the whisker switch (hoe drills)

NOTE: Skip this step and follow the instructions in the next section if you have a disc machine.

Part name	Part number	Quantity needed	Contained within
Work switch extension harness	353050-000011	1	System kit
Whisker switch	356070-000041	1	System kit

Installing the whisker switch



Figure 16: Installing the whisker switch

1. Mount the whisker switch (356070-000041) to an existing magnet or to an existing work switch bracket, if one exists.

NOTE: You can unscrew the work switch magnet from the bracket and re-attach it to the other end of the bracket to allow for other mounting orientations.

2. Plug S2 of the work switch extension harness (353050-000011) into the work switch harness.

Determining work switch method

The work switch uses one of two methods to determine when the implement is in the ground:

- **Default method**
 - The work switch is **engaged** (the work switch is triggered by the height sensor) when the **implement is in the ground**.
 - The work switch is **disengaged** (the work switch is not triggered) when the **implement is out of the ground**.
- **Inverted method**
 - The work switch is **disengaged** (the work switch is not triggered) when the **implement is in the ground**.
 - The work switch is **engaged** (the work switch is triggered by the height sensor) when the implement is **out of the ground**.

Inverting the work switch

If your work switch uses the inverted method described above, follow the instructions below to invert your work switch.

1. Remove the three screws from the blue work switch cover and remove the cover.
2. Loosen the 4 interior screws. Move the black and red wires from the top 2 screws (NO) to the bottom 2 screws (NC), as shown in Figure 17. Re-tighten the 4 interior screws.

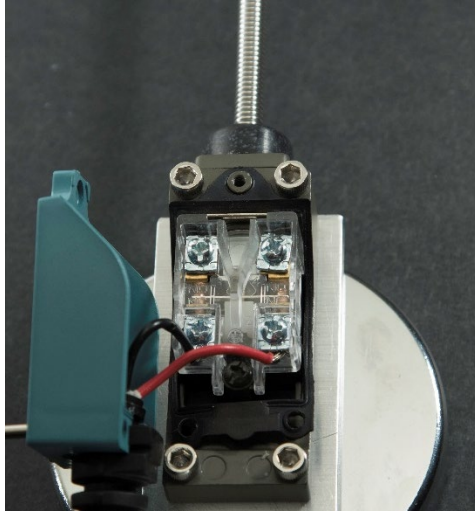


Figure 17: Inverting the whisker switch

3. Put the cover back on and re-install the cover screws.

2.4.2. Installing the proximity switch (disc machines)

Part Name	Part Number	Quantity needed	Contained within
Work switch assembly	153560-000014	1	System kit
Work switch bracket	351050-000016	1	System kit
1/4"-20 x 3/4" steel bolt	352010-000084	2	System kit
1/4"-20 steel locknut	352011-000040	2	System kit
1/4" steel washer	352012-000024	4	System kit
Work switch extension harness	353050-000011	1	System kit
Ceramic work switch magnet	359035-000001	1	System kit

1. Install the work switch magnet (359035-000001) on the hydraulic cylinder as shown in the image below.



Figure 18: Installing the proximity switch

2. Secure the work switch to the cylinder using one of the two methods below.
 - a. Attach the work switch to the cylinder using zip ties.
 - b. Attach the work switch to the cylinder using the work switch bracket.

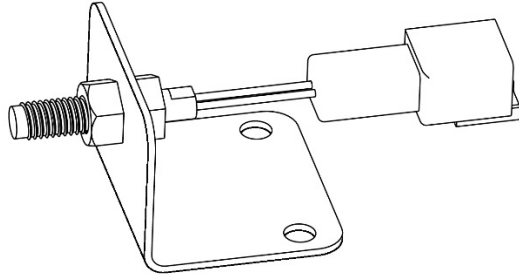


Figure 19: Using the proximity switch bracket

- i. Remove the front locknut from the work switch assembly (153560-000014) and insert it into the work switch bracket (351050-000016). Replace the locknut.
 - ii. Use the included bolts (352010-000084), washers (352012-000024) and locknuts (352011-000040) to mount the bracket. The mounting location should allow at least 4 inches of movement when you're lifting or lowering the tool. To adjust the length of the work switch, adjust the locknuts on the work switch assembly.
 - Moving the locknuts closer to the end of the work switch moves the work switch farther from the magnet.
 - Moving the locknuts away from the end of the work switch moves the work switch closer to the magnet.
3. Plug S2 of the work switch extension harness (353050-000011) into the work switch harness.
4. Route the harness along the hydraulic cylinder away from the work switch.

Determining work switch method

The work switch uses one of two methods to determine when the implement is in the ground:

- **Default method**
 - The work switch is **engaged** (magnet is close to the work switch) when the **implement is in the ground**.
 - The work switch is **disengaged** (magnet and work switch are apart) when the **implement is out of the ground**.
- **Inverted method**
 - The work switch is **disengaged** (magnet is pulled away from the work switch) when the **implement is in the ground**.
 - The work switch is **engaged** when the **implement is out of the ground**.

Your work switch method can be configured during VT configuration. See the Engage Zone Control Operator's Guide (Intelligent Ag document number 600890-000059) for instructions.

3. Connecting Harnessing

Route harnessing along existing harnesses where possible. Otherwise, avoid pinch points and allow for an adequate amount of harness slack at the implement and air cart pivot points. **Refer to Appendix A for full wiring diagrams.**

Part name	Part number	Quantity needed	Contained within
Sealing plug (optional)	153510-000091	1	Accessory
Work switch extension harness	353050-000011	1	System kit
Gateway harness	353050-000032	1	System kit
Tractor harness	353050-000034	1	System kit
Intermediary harness (optional)	353050-000035	1	Accessory
Diagnostic adapter harness (optional)	353050-000047	1	Accessory
Bin harness	353050-000060	1	System kit
Cable tie	355032-000004	varies	System kit
12 pin dust cap	356070-000072	1	System kit

3.1. Installing Tractor Harness

1. Unplug the current ISOBUS harness. Connect S1 of the tractor harness (353050-000034) to the tractor's ISOBUS outlet.
2. Connect S2 of the tractor harness to the ISOBUS harness that you just unplugged.
3. **Tow-between air cart:** Connect S3 and S4 of the tractor harness to S5 and S1 of the gateway harness (353050-000032).

Tow-behind air cart: Connect S3 and S4 of the tractor harness to S1 and S2 of the Intermediary harness (353050-000035). Then, connect S3 and S4 of the Intermediary harness to S5 and S1 of the gateway harness.

3.2. Installing Gateway Harness

1. Connect S2 of the gateway harness (353050-000032) into port A of the Gateway 300 (153010-000042).
2. Connect S3 of the gateway harness into port B of the gateway.
3. **2014 or newer air cart:** Connect S6 of the gateway harness into S2 of the diagnostic adapter harness (353050-000047). Then, connect S1 of the diagnostic adapter harness into the JD diagnostic port. The diagnostic port is located at the back of the air cart on tow-between air carts, and on the front of the air cart on tow-behind air carts.

2013 or older air cart: Unplug the CAN termination from the JD cart harness. The JD cart harness is located at the back of the air cart on tow-between air carts, and on the front of the air cart on tow-behind air carts. Connect S6 of the gateway harness into the JD cart harness.

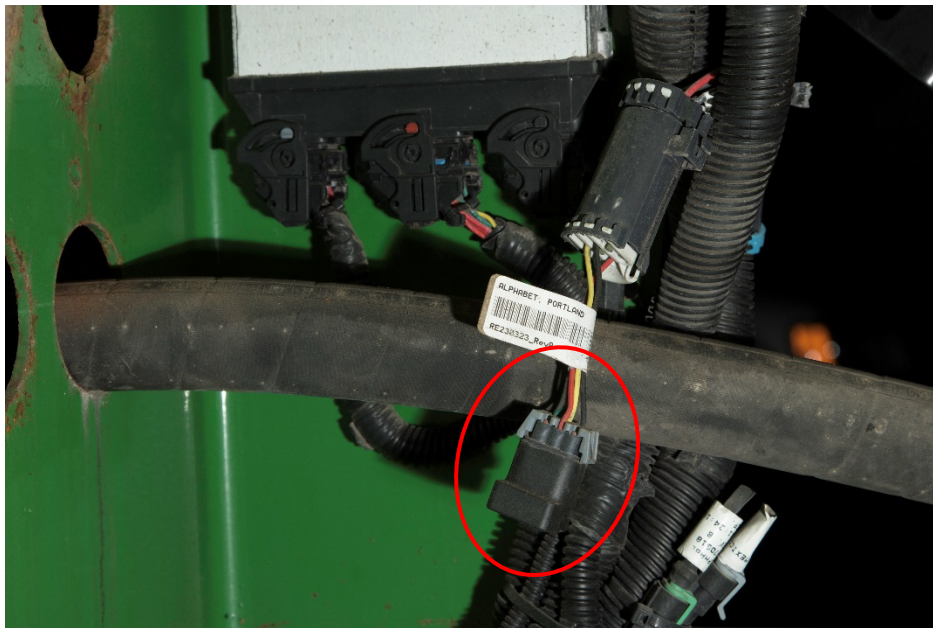


Figure 20: JD cart harness location (2013 or older air carts)

4. **2014 or newer air cart:** Plug the sealing plug (153510-000091) into S7 of the gateway harness.
- 2013 or older air cart:** Plug the JD CAN termination into S7 of the gateway harness.
5. Connect S4 of the gateway harness to S1 of the bin harness (353050-000060).
6. Connect S9 and S10 of the gateway harness to S2 and S6 of the bin harness.
7. Connect S8 of the gateway harness to S1 of the work switch extension harness (353050-000011).

3.3. Installing Bin Harness

Tow-behind cart:

1. Connect S3 of the bin harness (353050-000060) into the Engage® Zone Control unit closest to the tractor.
2. **Two bin system:** Connect S4 of the bin harness into the Engage Zone Control unit farthest from the tractor.

Three bin system: Connect S4 of the bin harness into the Engage Zone Control unit on the middle bin.

3. **Two bin system:** Cover S5 of the bin harness with a dust cap (356070-000072).

Three bin system: Connect S5 of the bin into the Engage Zone Control unit farthest from the tractor.

Tow-between cart:

1. Connect S5 of the bin harness (353050-000060) into the Engage® Zone Control unit closest to the tractor.
2. **Two bin system:** Connect S4 of the bin harness into the Engage Zone Control unit farthest from the tractor.

Three bin system: Connect S4 of the bin harness into the Engage Zone Control unit on the middle bin.

3. **Two bin system:** Cover S3 of the bin harness with a dust cap (356070-000072).

Three bin system: Connect S3 of the bin into the Engage Zone Control unit farthest from the tractor.

3.4. Securing Loose Harnessing

Route any loose harnessing toward the tractor and secure using cable ties (355032-000004). Route harnessing along existing harnesses where possible. Otherwise, avoid pinch points and allow for an adequate amount of harness slack at the implement and air cart pivot points.

4. Using Engage® Zone Control

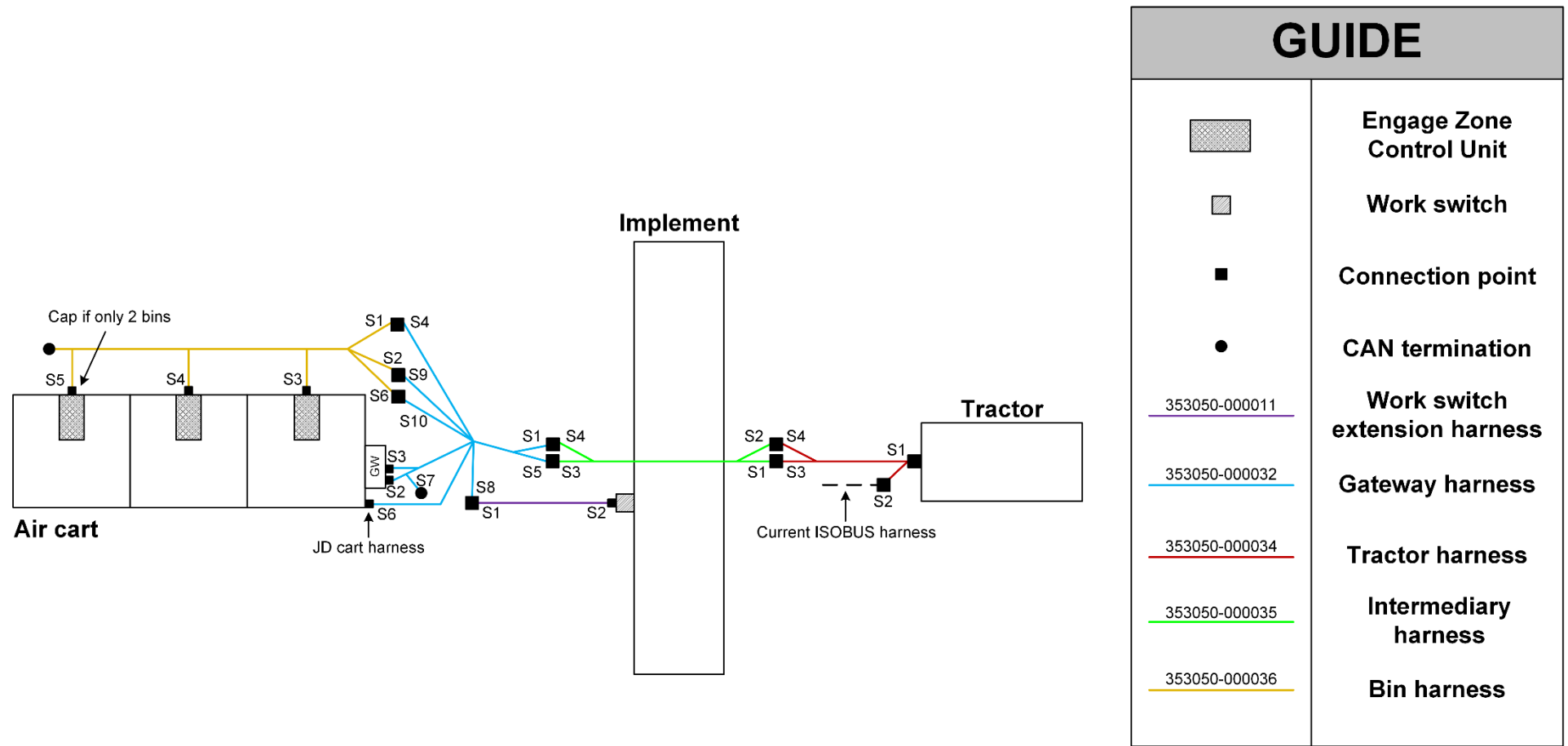
Refer to the Engage Zone Control Operator's Guide (600890-000059) and Intelligent Ag configuration videos to configure and use the Engage Zone Control system.

At the end of the season, refer to the Engage Zone Control Maintenance Manual (600840-000047) for storage and cleaning requirements.

Failure to follow proper cleaning and maintenance protocols may reduce product performance and may void warranty on motor and other internal components.

Appendix A:
Wiring Diagrams

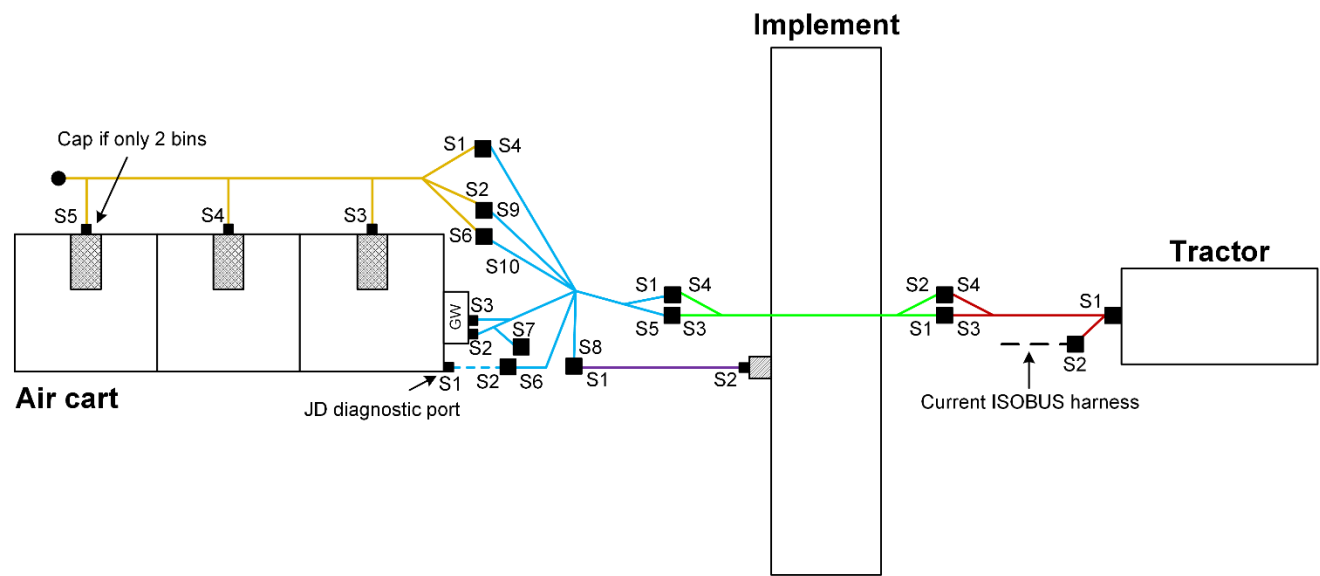
Tow-behind air cart (2013 or older air cart)





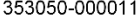
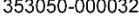
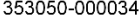
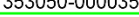




NOTE: Diagram not to scale

Figure 21: Tow-behind air cart wiring diagram (2013 or older air cart)

Tow-behind air cart (2014 or newer air cart)



GUIDE	
	Engage Zone Control Unit
	Work switch
	Connection point
	CAN termination
	Work switch extension harness
	Gateway harness
	Tractor harness
	Intermediary harness
	Bin harness
	Diagnostic adapter harness

NOTE: Diagram not to scale

Figure 22: Tow-behind air cart wiring diagram (2014 or newer air cart)

Tow-between air cart (2013 or older air cart)

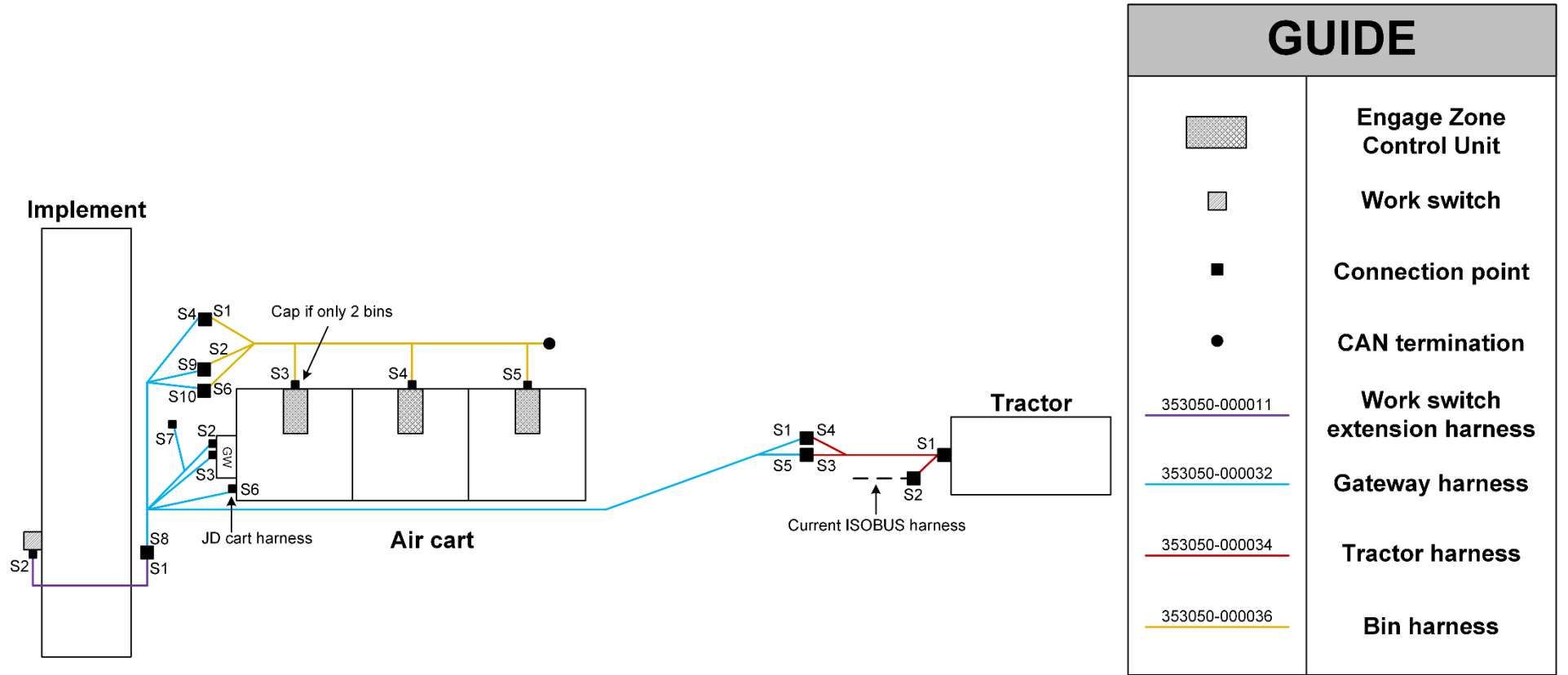


Figure 23: Tow-between air cart wiring diagram (2013 or older air cart)

Tow-between air cart (2014 or newer air cart)

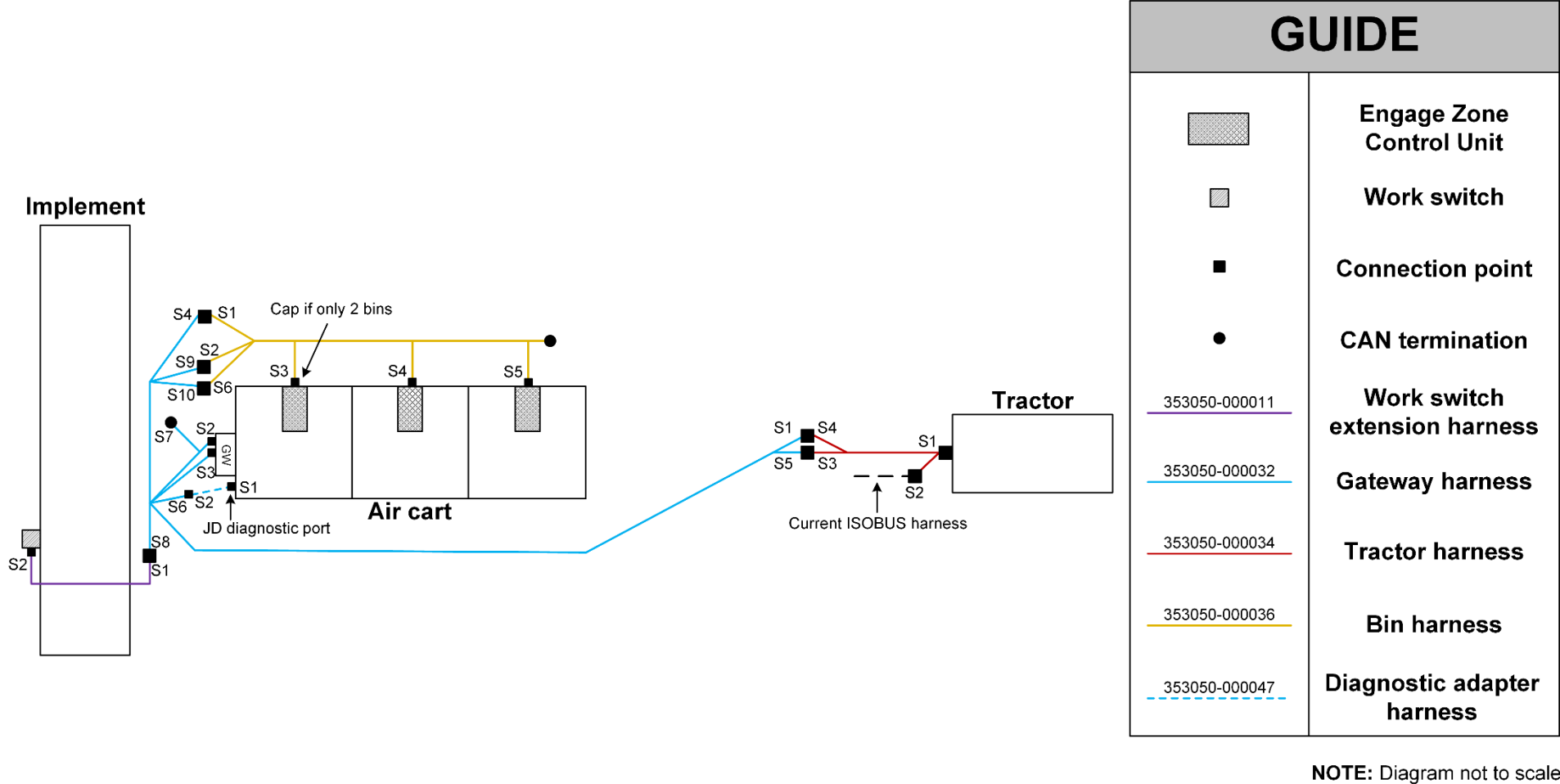


Figure 24: Tow-between air cart wiring diagram (2014 or newer air cart)