

eDrive VSi Installation Guide

Kit: eDTC / eDX VSi - CIH88

P/Ns 911-1010-000 (TC), 911-4005-000 (eDX)

Fits CaseIH Combine Models:

1620	2144	2344	2577	5088	5130 *
1640	2166	2366	2588	6088	6130 *
1644	2188	2377		7088	7130 *
1660		2388			
1666					
1668					
1680					
1688					

** Deluxe cab models only, see picture at far right.*



Read and Follow Safety Messages

- In these instructions, you will see the heading WARNING and the safety alert symbol . They indicate a hazardous situation that, if not avoided, could result in death or serious injury. The safety messages provide information to identify a hazard associated with potential injury.
- Do not allow anyone to operate without instruction.
- Keep these instructions and all related safety information with the manuals for your machine and other implements.

If you have questions or need assistance, contact your local dealer or distributor.

Overview

This is a general guideline for the installation of the VSi electric steering wheel and either eDriveTC or eDriveX. Every effort has been made to verify the following installation procedure. However, due to the manufacturing process outside of Hemisphere GPS' control, the installer may have to adapt this kit to your distinct situation.

The items in the kits are detailed in the table that follows the safety warnings starting below. After the kit tables there are step-by-step installation instructions.

Please read this manual thoroughly before beginning the installation.

WARNING:

The VSi Electric Steering Wheel is designed as a driver aid for precision agriculture applications. At all times the driver is fully responsible for the safe operation of the vehicle. It is not intended for and must not be enabled for use on roadways.

⚠ WARNING:

To avoid serious injury or death during machine operation, install the appropriate kit for your make and model.

Machine Preparation

⚠ WARNING:

Inspect the machine and perform any needed maintenance before installing the VSi kit (for example, adjust the steering linkage so that the machine drives straight ahead without manual steering). This kit cannot perform as intended on a machine that is not maintained properly. Errors in performance increase the risk of operator and bystander injury or death.

Failure to maintain properly adjusted steering linkage can cause loss of directional control resulting in serious injury or death.

Turn off the machine and power off all components when installing or performing maintenance.

Before attempting to install any of the components:

- Park the machine on a clean level floor
- Ensure adequate clearance to work all around
- Lower all implements and headers to the ground
- Apply the park brake and chock the wheels

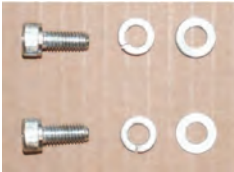
Before you perform any drilling, cutting or fastening, ensure that no other machine components, such as electrical wiring, will be damaged. Failure to follow this warning may cause physical injury and/or damage to the machine.

Kit Contents - eDriveTC and eDriveX

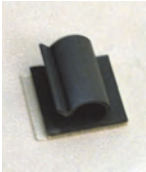
Unpack the supplied kit and identify the required parts as shown. Kit items, which are applicable to both VSi/eDriveTC and VSi/eDriveX installations, are referenced as A, B, C etc. with the item references being used in the step-by-step installation sections of this guide.

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
A	750-8001-000	1	VSi steering wheel	
B		1	Shaft adapter (Use in A)	
C		4	Screw, M5 x 10 flat head socket cap screws (Attach B to A)	

Kit Contents - eDriveTC and eDriveX (continued)

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
D		1	Anti-rotation (a/r) bracket (Mount on A using E. Note: Mount differently on 16nn models from 21nn-71nn models - details provided at step 2, page 8.)	
E		2	Bolt, M6 x 14, hex head	
		2	Washer, M6 spring	
		2	Washer, M6 plain (Attach D to A)	
F		1	Special nut, M20 (Attach A to steering shaft - replaces machine's original steering wheel nut)	
G		1	Steering wheel center cover	
H	750-8003-000	1	VSi power cable	
I	750-8002-000	1	VSi junction box	
J		1	Junction box mounting bracket	

Kit Contents - eDriveTC and eDriveX *(continued)*

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
K	750-8005-000	1	CAN bus terminator	
L		1	Junction box comms cable clip	

Kit Contents - eDriveTC Only

Unpack the supplied kit and identify the required parts as shown. Only item TC is referenced in the step-by-step installation sections of this guide. For information of the installation of the other items, refer to “Installing the eDriveTC” in Chapter 2 of the **Outback eDrive User Guide**.

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
	051-0166-000	1	CAN-PWR cable (Use 054-0123 to connect to battery)	
	054-0123-000	1	Battery terminal cable (Connect CAN-PWR cable to battery)	
	806-1007-03A	1	eDrive TC ECU	
	054-0044-003	1	TC Power cable	
TC	051-0259-000	1	CAN bus harness - TC	

Kit Contents - eDriveX Only

Unpack the supplied kit and identify the required parts as shown. Kit items, which are applicable to VSi/eDriveX installations only, are referenced as EA, EG, EH etc. (from ECU - see Note after EA) with the item references being used in the step-by-step installation sections of this guide.

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
EA	051-0226-000#	1	Main cable	
Note: Cables EB to EF are not used in this installation				
EG	051-0166-000	1	CAN-PWR cable (Use 054-0123 to connect to battery)	
EH	054-0123-000	1	Battery terminal cable (Connect CAN-PWR cable to battery)	
EI	054-0117-000	1	Power switch	
EJ	640-0091-000	1	ECU (EK) mounting bracket	
EK	806-1031-000	1	eDX ECU	

Kit Contents - eDriveX only (continued)

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
Bag E1 of 1 contains EL, EM and EN				
EL	675-1197-000	4	Screw, self-drilling, #10-16 x 2-1/2", Hex, ZP (Attach EJ to cab floor - or use EM)	
EM	675-1192-000	4	Screw, self-drilling, #10-16 x 3", Hex, ZP (Attach EJ to cab floor - or use EL)	
EN	675-1188-000	4	Screw, mach, M6 x 12mm, PPH, ZP (Attach EK to EJ)	
EO	051-0316-000	1	CAN bus harness - eDX	
EP	726-1093-000	1	Switch bracket	
EQ	677-2002	20	Tie straps, 11" heavy duty	
ER	051-0304-000#	1	Power cable - long (combines only) (eDriveX only)	

VSi Installation Procedure

NOTE:

On a clean surface lay out all the components and check them against the “Kit Contents - eDriveTC and eDriveX” table on pages 2 to 4. Become familiar with the components and where they are to be installed before proceeding with the installation (see “Appendix A - eDriveTC VSi Connections” on page 14 or “Appendix B - eDriveX VSi Connections” on page 15).

1. Prepare the VSi electric steering wheel.

- Place the VSi steering wheel **A** on a clean surface with the wheel facing up. Insert shaft adapter **B** into steering wheel **A** (Figure 1a).



At step 1b, tighten the screws to the specified torque only. **DO NOT OVERTIGHTEN - DAMAGE MAY OCCUR.**

- Using the four countersunk screws **C**, secure the shaft adapter **B** in steering wheel **A**. Torque the screws to **6 N·m (53 in-lb)** (Figure 1b).

2. Install the anti-rotation bracket.



(i) When completing this step, ensure that you (a) use only the fasteners provided, (b) use the washers provided. Tighten the fasteners to the specified torque only at step 4b, page 9. **DO NOT OVERTIGHTEN OR OMIT WASHERS - DAMAGE WILL OCCUR.**

(ii) The anti-rotation bracket is installed differently on the steering wheel assembly for 16nn models. Note the difference.

All models: Turn the steering wheel assembly over and set the comms port toward you. Using hardware **E** (do not tighten yet - see step 4c) in the left-side holes (as viewed), attach the anti-rotation (a/r) bracket **D** to the bottom of the wheel as follows:

21nn-71nn models: Mount **D** with its tabs upward and inward (so bending outward from the center of the wheel - Figure 2-i).

16nn models: Mount **D** with its tabs upward and outward (so bending in toward the center of the wheel - Figure 2-ii).

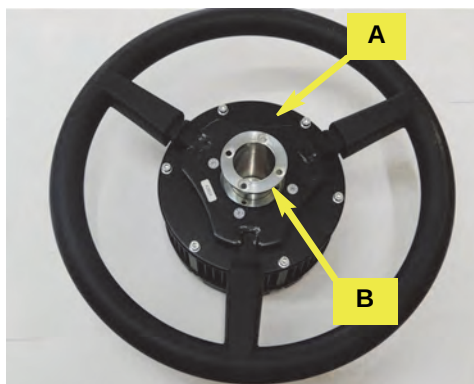


Figure 1a: Installing the shaft adapter

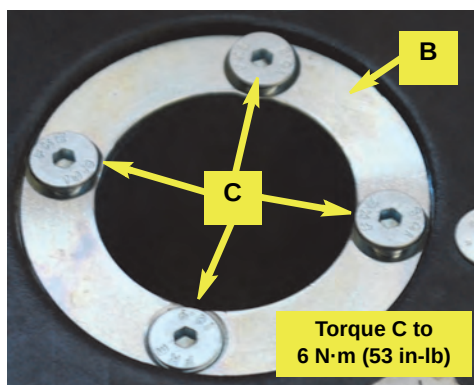


Figure 1b: Securing the shaft adapter

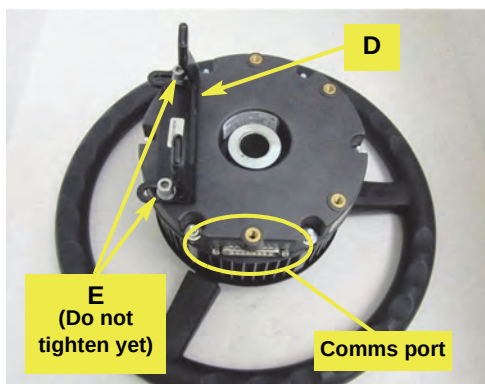


Figure 2-i: **21nn-71nn models** - Anti-rotation bracket installed. When the wheel assembly is installed, the a/r bracket will be to the front of the steering column, the comms port to the right.

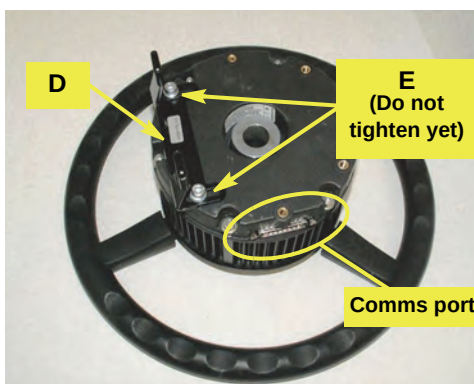


Figure 2-ii: **16nn models** - Anti-rotation bracket installed. When the wheel assembly is installed, the a/r bracket will be to the left of the steering column, the comms port to the front.

3. Remove the machine's steering wheel.

NOTE:

Figure 3 and its top insets show the 21nn-71nn models steering wheel removal. The bottom inset shows the 16nn models wheel removed.

Remove the center cap from the steering wheel (Figure 3, left inset). Remove the steering wheel nut (Figure 3, right inset) and the steering wheel (Figure 3).

NOTE:

Consult your equipment dealer if you are unsure of the correct procedure for removing the steering wheel.

4. Install the VSi steering wheel assembly.

NOTE:

Depending on how you installed the anti-rotation bracket **D** at step 2, when installing the wheel assembly, set the bracket to either the front face or the left side of the steering column - see step a following.

- a. Apply a small amount of an anti-seize compound (not supplied) to the splines of shaft adapter **B** (Figure 4a, top left inset), then, carefully aligning the splines with those on the steering shaft, slide the steering wheel assembly onto the shaft, positioning anti-rotation bracket **D** as follows:

21nn-71nn models: On the front of the steering column (so the comms port to the right - Figure 4a and top right inset).

16nn models: On the left of the steering column (so the comms port to the front - Figure 4a bottom inset).

- b. Using special nut **F**, secure the steering wheel (Figure 4b inset). Torque special nut **F** to the machine manufacturer's specification.

NOTE:

At the next step, tighten hardware **E** in the base of the steering wheel assembly only until the spring washers are fully compressed, that is, to no more than 5 N·m (44 in-lb).

- c. Press anti-rotation bracket **D** firmly against the front face (or left side) of the steering column and tighten **E** (see note preceding) to secure it.
- d. Install the steering wheel center cover **G** (Figure 4c).



Figure 3 with insets: Removing the steering wheel

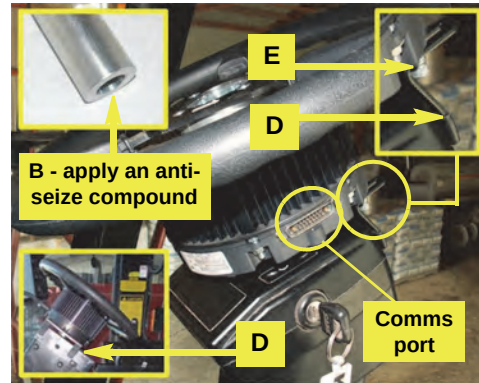


Figure 4a with insets: Steering wheel/anti-rotation bracket assembly installed - 21nn-71nn models (16nn models, bottom inset)

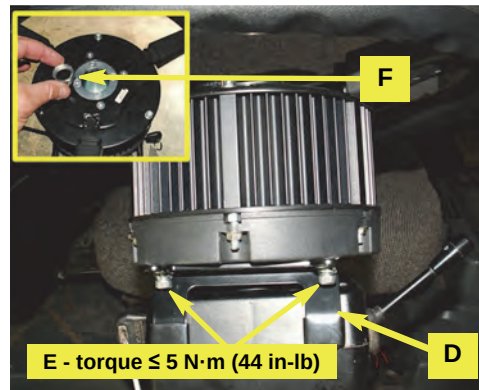


Figure 4b with inset: Securing the steering wheel and anti-rotation bracket (21nn-71nn models)



Figure 4c: Steering wheel center cover installed

5. **Install and connect the electric steer junction box.**

NOTE:

Before continuing, refer again to “Appendix A - eDriveTC VSi Connections” on page 14 or “Appendix B - eDriveX VSi Connections” on page 15.

- a. Route the power supply cable **H** from the battery into the cab to where you will mount the junction box **I** at steps 5b and 5c. Ensure the cable will not be a trip hazard. Connect the ring terminals to the battery (not shown).



When mounting the junction box in the following steps, ensure that the ON/OFF switch on the junction box is within easy reach of the operator. See Figure 5a. The switch must be in the OFF position when the vehicle is not under field guidance or on a road.

Ensure that the mounted junction box cannot interfere with movement of the steering column or visibility to the work area. Also keep in mind the location of the steering wheel assembly's comms port.

- b. Mount the electric steer junction box bracket **J** (not shown) on the steering column or windscreen using your preferred method, for example fasteners, double-sided tape, nylon ties (not provided).



If drilling the steering column, ensure nothing inside the column can be damaged.

- c. Clip the junction box **I** into place on its bracket **J** (neither shown) then connect **I**'s 15-pin connector cable to the communications port on the steering wheel assembly (Figure 5b). Use clip **L** suitably (not shown).
- d. Connect the gray connector of the power cable **H** (routed into the cab at step 5a) to the gray cable from the junction box **I** (Figure 5c).
- e. Connect the threaded 5-pin connector on the CAN bus harness **TC** (eDriveTC) or **EO** (eDriveX) to either of the threaded connectors on the junction box **I**. Connect the CAN bus terminator **K** to the other threaded connector on the junction box (Figure 5d).

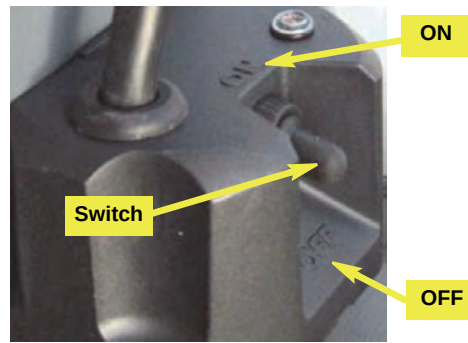


Figure 5a: Junction box ON/OFF switch - within easy reach of the operator

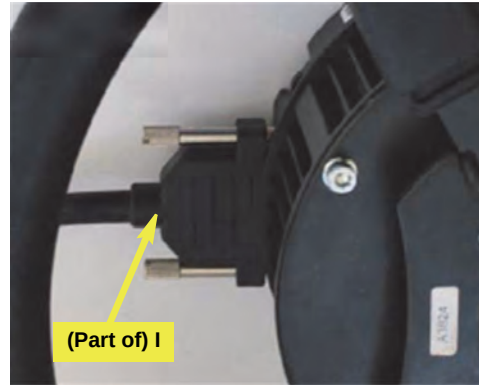


Figure 5b: Junction box comms cable connected to steering wheel assembly



Figure 5c: Power cable to junction box cable

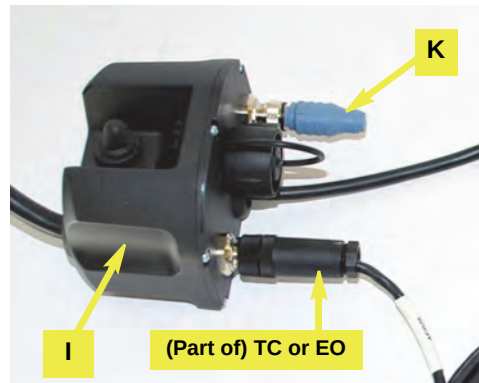


Figure 5d: CAN harness and terminator connected to junction box

5. **Install and connect the electric steer junction box (continued).**
- f. **eDriveTC:** Connect the two other connectors on CAN cable **TC** to the 'eDrive TC' (as labelled) and the terminal/receiver (Figure 5e).

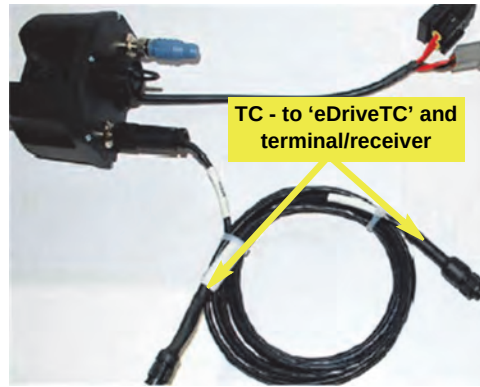


Figure 5e: CAN cables to eDriveTC and terminal/receiver

- g. **eDriveX:** Connect CAN cable **EO** to the eDriveX main cable's (**EA**) branch cable labelled 'STEERING CONTROLLER' (Figure 5f - you will install **EA** in the next section).



Figure 5f: CAN cable to eDriveX

Installation - Electronic Control Unit (ECU)

NOTE:

The high precision guidance capability of eDrive X depends, in part, on the exact installation of the ECU as detailed in this section. For details on installing an eDriveTC, refer to “Installing the eDriveTC” in Chapter 2 of the *Outback eDrive User Guide*.



Before drilling (or using self-drilling screws) in the cab, make sure there is nothing that can be damaged by the drilling or any self-drilling screws used to secure the ECU mounting bracket. Secure anything that could be damaged away from where the screws come through. See Figure 1 for an example of a pre-drilling check; it shows an under-floor cabling compartment.

1. Install the ECU.

NOTE:

Ensure that when installed, the bracket will be parallel to the front of the machine, that is, perpendicular to the machine's fore/aft centerline. Also, use a small level to set the bracket as level as possible - see step following.

- a. Identify the ECU mounting location on the cab floor in front of the cabling compartment on the right of the driver's seat.

Facing the one inch tabs of bracket **EJ** toward the cabling compartment, place the bracket with (Figure 1a):

- The back edges of the one inch tabs $1\frac{3}{4}$ " from the base of the cabling compartment.
- The outer edge of the outer tab $9\frac{1}{2}$ " from the right edge of the cab floor.

Using hardware **EL** or **EM** (depending on the floor thickness - see warning above) fasten the bracket to the cab floor. Use a small level (not shown) to check the level of the bracket. Adjust accordingly.

NOTE:

Do not overtighten the self-drilling screws. Overtightening could cause the fastener to fail.

- b. Using hardware **EN** (not visible) attach the ECU **EK** to the front face of bracket **EJ**. Have the wire connections toward the window and the power and communications indicators at the top (Figure 1b).



Figure 1: Example pre-drilling check

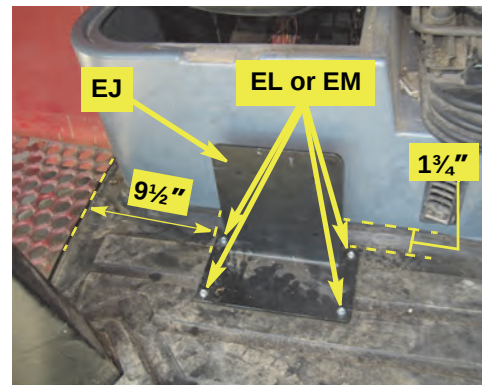


Figure 1a: ECU mounting bracket location and installation

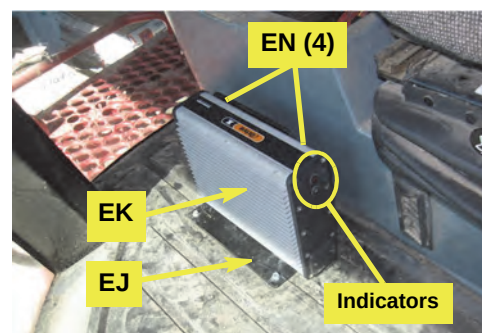


Figure 1b: ECU installed

2. Assemble and install the cables.

On a clean surface lay out all the cables and become familiar with the connections and where they are to be placed. See “Appendix B - eDriveX VSi Connections” on page 15. Use cable ties **EQ** as required.

- a. Connect cable **EA** to the ECU **EK** using an Allen wrench to secure the cable. The **EA** connector will only fit the ECU socket that is in line with the power and communications indicators at the opposite end of the ECU—the top socket in this installation (Figure 2).
- b. Routing cables suitably, attach cable **EA**’s connector labeled ‘STEERING CONTROLLER’ to cable **EO** connected to the VSi junction box **I** (see step 5g, page 11).
- c. Attach power switch **EI** to **EA**’s connector labeled ‘SWITCH’. Some machines are equipped with pop out tabs that you can remove and replace with switch **EI**. If no tab is available, you can use bracket **EP** mounting it in the cab at the operator’s preferred location.

NOTE:

*Set the switch to OFF before connecting **EA** to the battery at step e below.*

- d. Connect CAN-PWR cable **EG** to **EA**’s open connection labeled ‘TERMINAL/RECEIVER’. Route the cable in the cab so that it is clear of any machine operation controls. Connect the opposite end of cable **EG** to the guidance terminal.

⚠ WARNING:

*Ensure you have connected main cable **EA** to the ECU (step 2a) and **ER** to **EA** (step e following) before you connect **ER** to the machine’s battery.*

- e. Disconnect the standard length power cable from ECU main cable **EA** and connect the extended power cable **ER**. Route the extended power cable to the tractor’s 12V battery and connect it.

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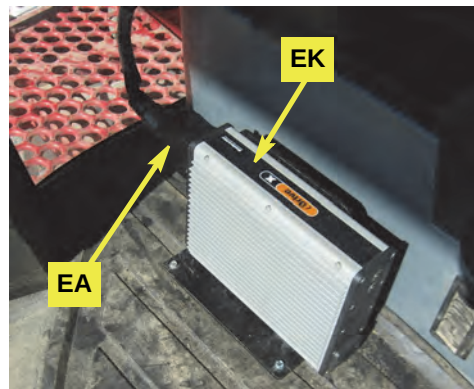
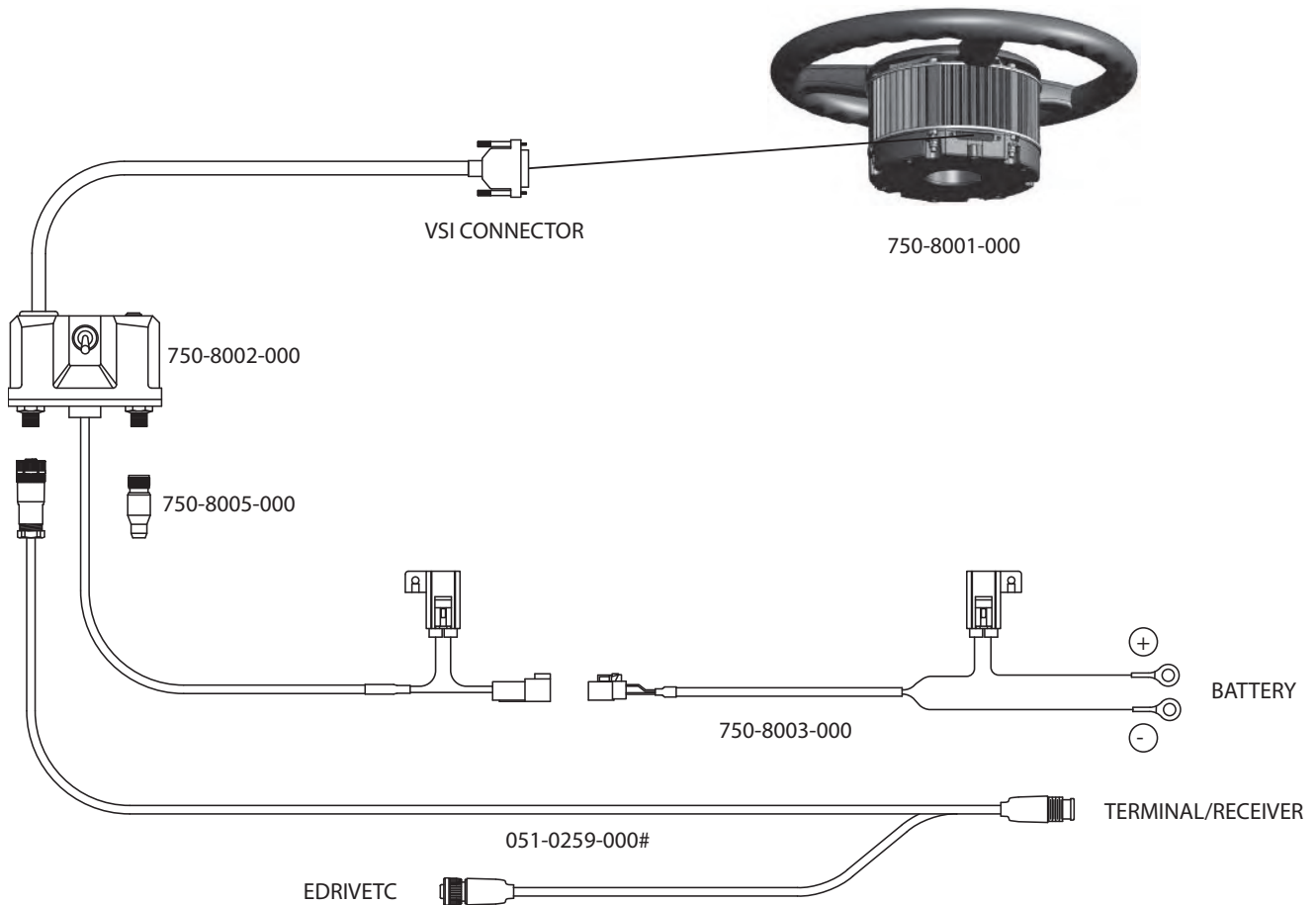


Figure 2: Main cable connected to ECU

Appendix A - eDriveTC VSi Connections



Appendix B - eDriveX VSi Connections

