eDrive VSi Installation Guide

Kit: eDTC / eDX VSi - JD7020SF

P/Ns 911-1019-000 (TC), 911-4016-000 (eDX)

Fits John Deere Tractor Models:

6n30*	7n30*	R Series
6230	7130	6105R
6330	7230	6115R
6430	7330	6125R
6530	7430	6130R
6534	7530	6140R
6630		6150R
6830		6170R
6930		6190R

** Premium cab machines only*

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 kit are detailed in the table that follows the safety warnings beginning 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.

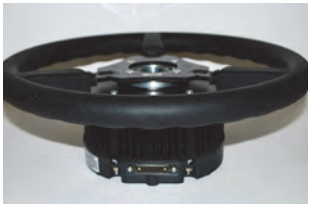
Before attempting to install any of the components:

- 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

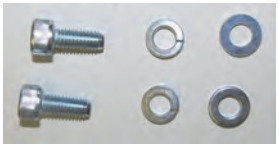
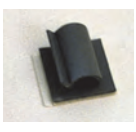
Before you perform any drilling, cutting or fastening, ensure that no other machine components, such as electrical wiring, will be damaged. Failure to follow this warning may cause physical injury and/or damage to the machine.

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 with D)	
C		4	Screw, M5 x 10 flat head socket cap screws (Attach B to A)	
D		1	Spline adapter (Use with B)	
E		3	Screw, M5 x 16 hex head (Attach D to B)	

Kit Contents - eDriveTC and eDriveX *(continued)*

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
F		1	Anti-rotation (a/r) bracket (Attach to A using G)	
G		2 2 2	Bolt, M6 x 16, hex head Washer, spring Washer, flat (Attach F to A)	
H		1	Special nut, M18 (Attach A to steering shaft)	
I		1	Steering wheel center cover	
J	750-8003-000	1	VSi power cable	
K	750-8002-000	1	VSi junction box	
L		1	Junction box mounting bracket	
M	750-8005-000	1	CAN bus terminator	
N		1	Junction box comms cable clip	

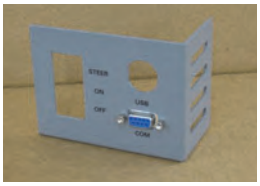
Kit Contents - eDriveTC Only

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 (Use to connect CAN-PWR cable 051-0166 to battery)	
	806-1007-03A	1	ECU, eDriveTC	
	054-0044-003	1	Power cable, eDriveTC	
TC	051-0259-000	1	CAN bus harness, eDriveTC	

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	054-0117-000	1	Power switch (Use EGa to mount if necessary)	
EGa	726-1093-000	1	Switch bracket (Mount EG, if necessary)	
EH	051-0166-000	1	CAN-PWR cable (Use with EI to connect to battery)	
EI	054-0123-000	1	Battery terminal cable (Connect EH to battery)	
EJ	640-0091-000	1	ECU (EK) mounting bracket	

Kit Contents - eDriveX only *(continued)*

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
EK	806-1031-000	1	ECU, eDriveX	
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, eDriveX	
EP	677-2002	20	Tie straps, 11" heavy duty	

eDrive VSi Installation Procedure

NOTE: *On a clean surface lay out all the components and check them against the "Kit Contents - eDriveTC and eDriveX" on page 2. 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 13 or "Appendix B - eDriveX VSi Connections" on page 14).*

1. Prepare the VSi electric steering wheel.

a. 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).

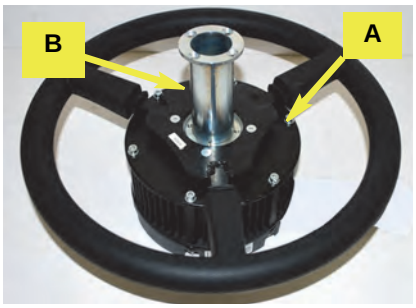


Figure 1a: Installing the shaft adapter

At steps 1b and 1c following, tighten the screws to the specified torque only. DO NOT OVER-TIGHTEN - DAMAGE MAY OCCUR.

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

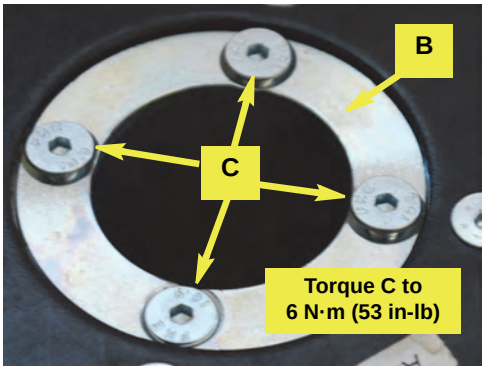


Figure 1b: Securing the shaft adapter

c. Flip the wheel over and, using the three hex head screws **E**, install spline adapter **D** on the bottom of shaft adapter **B**. Torque screws **E** to **6 N·m (53 in-lb)** (Figure 1c with inset).

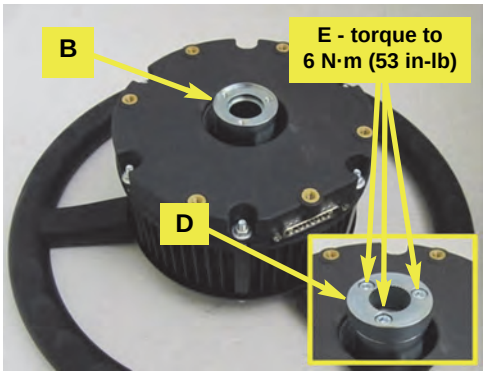


Figure 1c with inset: Spline adapter installed on shaft adapter

2. Install the anti-rotation bracket.

When completing this step, ensure that you (i) use only the fasteners provided, (ii) use all the washers provided and (iii) leave the screws loose enough to be able to push the bracket firmly against the steering column once installed.

Using hardware **G** attach anti-rotation bracket **F** to the steering wheel assembly as follows (do not tighten **G** yet).

With the communications (comms) port toward you, mount the bracket—its tabs upward and inward (so bending back out toward the rim of the wheel)—on the right side of the steering wheel assembly (Figure 2).

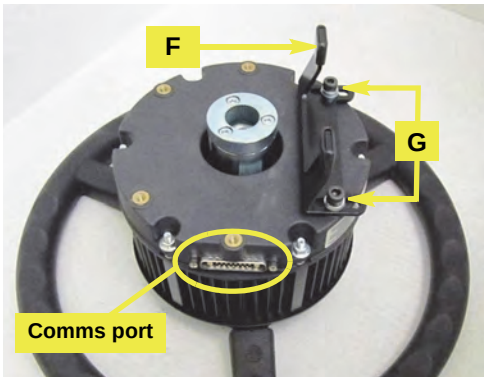


Figure 2: Anti-rotation bracket installation

3. Remove the machine's steering wheel.

Remove the steering wheel center cap (you will not reuse this - Figures 3-a and 3-b). Remove the steering wheel nut (you will not reuse this either - Figures 3-b and 3-c). Remove the steering wheel (Figure 3-d).

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

Figure 3 (a-d): Removing the steering wheel

4. Install the VSi steering wheel assembly and secure the anti-rotation bracket.

a. Apply a small amount of an anti-seize compound (not supplied) to the splines of spline adapter **D** (Figure 4a, lower left inset) then, carefully aligning **D**'s splines with those on the steering shaft, slide the steering wheel assembly onto the shaft. Position the anti-rotation bracket **F** on the driver's side of the steering column (so comms port to the right - Figure 4a and right inset).

Using special nut **H**, secure the steering wheel (Figure 4a, upper left inset).

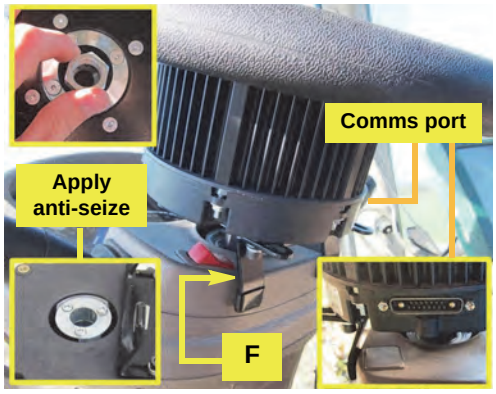


Figure 4a with insets: Steering wheel and anti-rotation bracket installation

At the next step, tighten hardware G 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)

b. Push anti-rotation bracket **F** firmly against the steering column and secure it. Torque screws **G** to no more than **5 N·m (44 in-lb)** (Figure 4b).

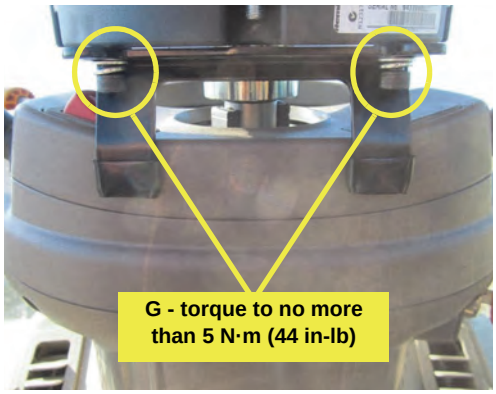


Figure 4b: Tightening the anti-rotation bracket screws

c. Install the steering wheel center cover **I** (Figure 4b).

Figure 4b: 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 13.*

a. Route the power supply cable **J** (not shown) from the battery into the cab to where you will mount the junction box **K** 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 K in the following steps, ensure that the ON/OFF switch (Figure 5a) on the junction box is within easy reach of the operator. 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 communications port.

b. Mount the electric steer junction box bracket **L** (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 **K** into place on its bracket **L** (neither shown) then connect **K**'s 15-pin connector cable to the communications port on the steering wheel assembly (Figure 5b). Use clip **N** suitably (not shown).

d. Connect the gray connector of the power cable **J** **(**routed into the cab at step 5a) to the gray cable from the junction box **K** (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 **K**. Connect the CAN bus terminator **M** to the other threaded connector on the junction box (Figure 5d).

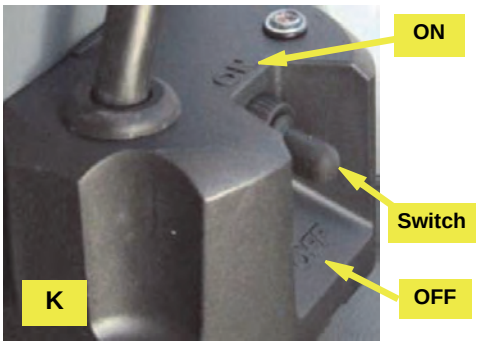


Figure 5a: Junction box ON/OFF switch - within easy reach of the operator

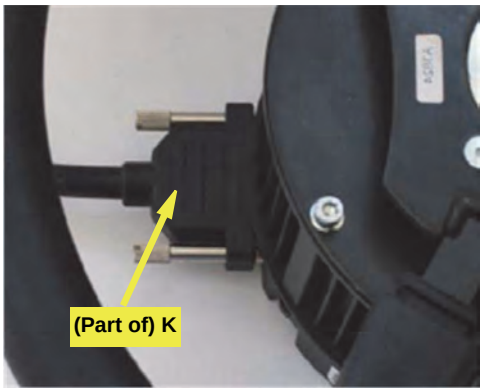


Figure 5b: Junction box comms cable connected to steering wheel assembly

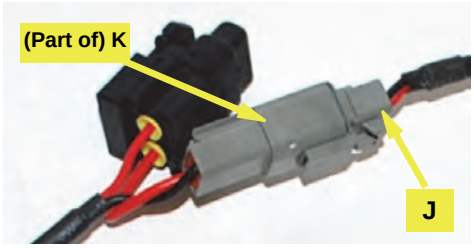


Figure 5c: Power cable to junction box cable

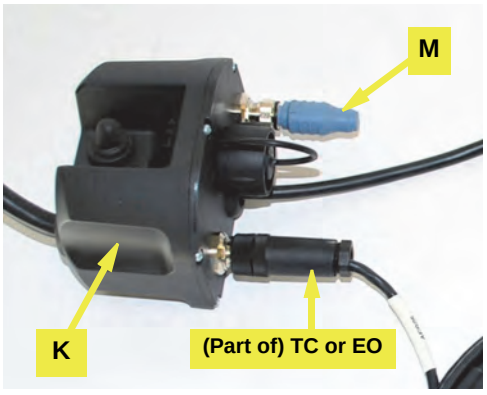


Figure 5d: CAN harness and terminator connected to junction box

5. Install and connect the electric steer junction box *(continued)*.

f. ***eDriveTC:*** Connect the two other connectors on CAN cable **TC** to the ‘eDriveTC’ (as labeled) and the terminal/receiver (Figure 5e-i).

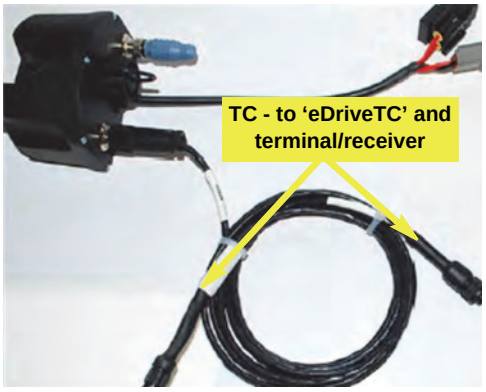


Figure 5e-i: CAN cables to eDriveTC and terminal/receiver

eDriveX: Connect CAN cable **EO** to the eDriveX main cable’s (**EA**) branch cable labeled ‘STEERING CONTROLLER’ (Figure 5e-ii - you will install **EA** in the next section).

Figure 5e-ii: CAN cable to eDriveX

Installation - Electronic Control Unit (ECU)

NOTE: *The high precision guidance capability of eDriveX 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 underfloor cabling compartment.

1. Install the ECU and main cable.

NOTE: *Although measurements and floor mat references provide an accurate guide, ensure that when installed, the bracket will be perpendicular to the front of the machine (that is, parallel to the machine's fore/aft centerline). Also, use a small level to set the bracket as level as possible - see steps following.*

a. Identify the ECU mounting location on the cab floor to the left of the driver's seat (Figure 1a, left image). Facing the one-inch tabs of bracket **EJ** away from the seat, place the bracket with (Figure 1a, right image):

- The outer edge of its front one-inch tab 1½″ from the left edge of the floor mat recess.
- Its rear edge against the rear edge of the floor mat recess.

NOTE: *At the next step, do not overtighten the self-drilling screws. Overtightening could cause the fastener to fail.*

b. Using hardware **EL** or **EM** (depending on the floor thickness - see warning above) fasten the bracket to the cab floor (Figure 1a, left image). Use a small level (not shown) to check the level of the bracket. Adjust accordingly.

c. Using hardware **EN** (two visible) attach the ECU **EK** to the inner face of bracket **EJ**. Have the wire connections toward the rear and the power and communications indicators at the top (Figure 1b).

d. Connect main cable **EA** to the socket on the ECU **EK** that is in line with the power and communications indicators at the opposite end of the ECU (**EA** will only fit that socket—the upper socket in this installation). Use an Allen wrench to secure the cable to the ECU (Figure 1b, right image).

Figure 1: Example pre-drilling check

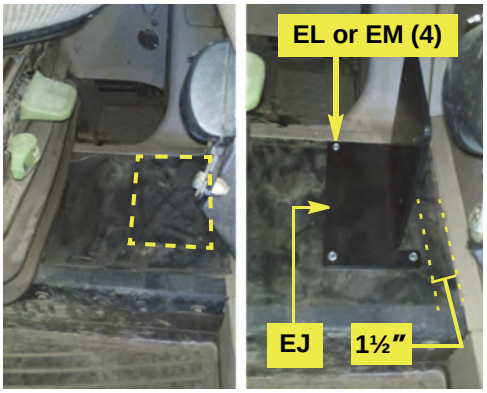


Figure 1a: Installed ECU mounting bracket - location and installed

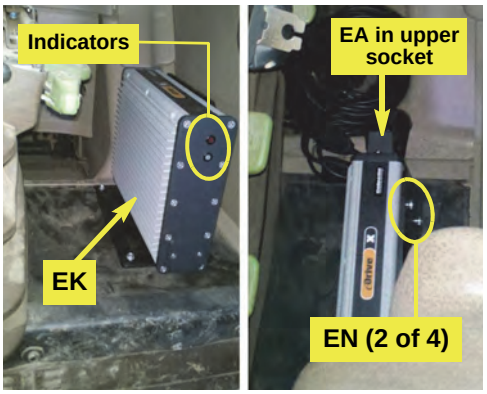


Figure 1b: ECU installed, main cable connected

2. Assemble and install the remaining 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 14. Use cable ties **EP** as required.

a. Routing cables suitably, attach cable **EA**’s connector labeled ‘STEERING CONTROLLER’ to cable **EO** connected to the VSi junction box **K** (see ***eDriveX***, step 5f, page 10).

b. Attach power switch **EG** to **EA**’s connector labeled ‘SWITCH’. Some machines are equipped with pop out tabs that you can remove and replace with switch **EG**. If no tab is available, you can use bracket **EGa** 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.*

c. Install CAN-PWR cable **EH** between **EA**’s open connection labeled ‘TERMINAL/RECEIVER’ and the guidance terminal. Route the cable in the cab so that it is clear of any machine operation controls.

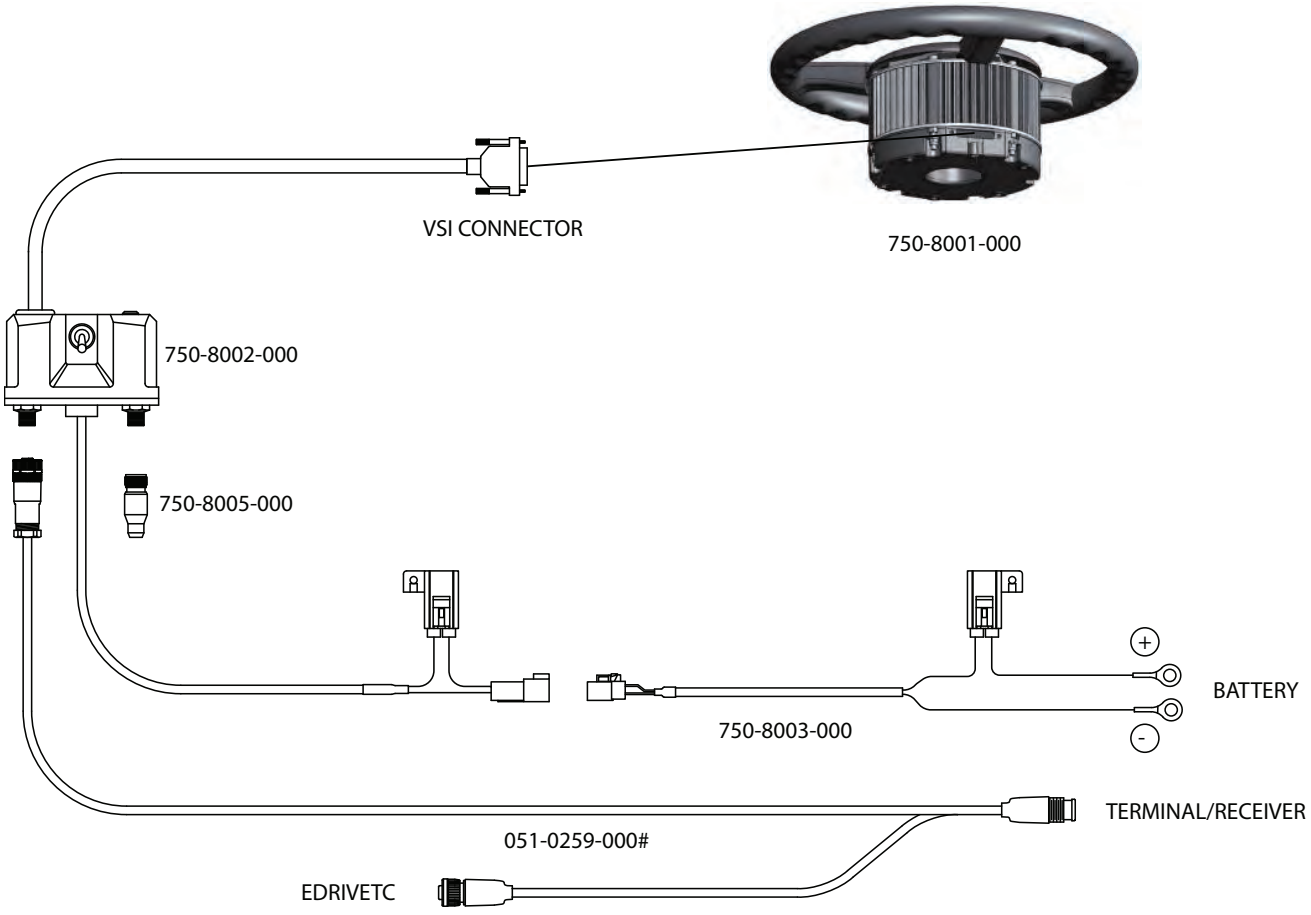
d. Install battery terminal cable **EI** between **EH**’s remaining connector and the machine’s 12V battery.

⚠WARNING:

*Ensure you have connected main cable **EA** to the ECU (step 1d, page 11) and reconnected **EA**’s power cable (after routing in/out of the cab) before you connect to the machine’s battery at the next step.*

e. Connect **EA**’s power cable to the machine’s 12V battery and connect it.

Appendix A - eDriveTC VSi Connections



Appendix B - eDriveX VSi Connections