eDrive VSi Installation Guide

Kit: eDTC / eDX VSi - NHTG

P/Ns 911-1013-000 (TC), 911-4009-000 (eDX)

Fits New Holland TG and T8000 Tractor Models:

New Holland TG		New Holland T8000	
TG210	TG255	T8010	T8040
TG215	TG275	T8020	T8050
TG230	TG285	T8030	
TG245	TG305		

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.

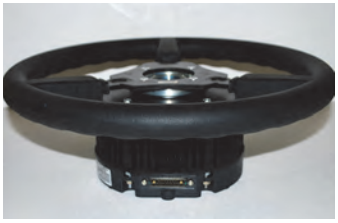
Before attempting to install any of the components:

- 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

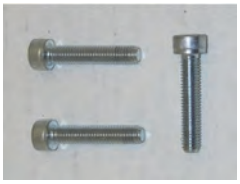
Before you perform any drilling, cutting or fastening, ensure that no other machine components, such as electrical wiring, will be damaged. Failure to follow this warning may cause physical injury and/or damage to the machine.

Kit Contents - eDriveTC and eDriveX

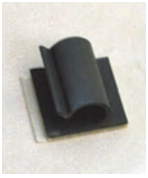
Unpack the supplied kit and identify the required parts as shown. Kit items, which are applicable to both VSi/eDriveTC and VSi/eDriveX installations, are referenced as A, B, C etc. with the item references being used in the step-by-step installation sections of this guide.

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

Kit Contents - eDriveTC and eDriveX *(continued)*

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
E		3	Screw, M5 x 25 hex head (Attach D to B)	
F		1	Anti-rotation bracket	
G		1	Anti-rotation bracket	
H		4 4 4	Bolt, M6 x 14, hex head Washer, spring Washer, flat (Attach F and G to A)	
I		1	Steering wheel center cover	
J	750-8003-000	1	VSi power cable	
K	750-8002-000	1	VSi junction box	

Kit Contents - eDriveTC and eDriveX *(continued)*

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

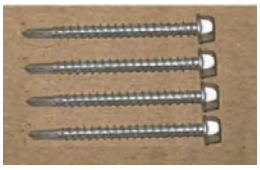
Kit Contents - eDriveTC Only

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.**

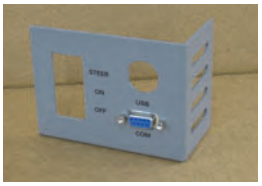
REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
	051-0166-000	1	CAN-PWR cable (Use 054-0123 to connect to battery)	
	054-0123-000	1	Battery terminal cable (Connect CAN-PWR cable to battery)	
	806-1007-03A	1	eDriveTC ECU	
	054-0044-003	1	TC Power cable	
TC	051-0259-000	1	CAN bus harness - TC	

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 **E**CU - 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	
Bag E1 of 1 contains EJ, EK and EL				
EJ	675-1197-000	4	Screw, self-drilling, #10-16 x 2-1/2", Hex, ZP (Attach EM to cab floor - or use EK)	
EK	675-1192-000	4	Screw, self-drilling, #10-16 x 3", Hex, ZP (Attach EM to cab floor - or use EJ)	
EL	675-1188-000	4	Screw, mach, M6 x 12mm, PPH, ZP (Attach EN to EM)	

Kit Contents - eDriveX only *(continued)*

REF	PART NUMBER	QTY	DESCRIPTION	PHOTOGRAPH
EM	640-0091-000	1	ECU (EN) mount bracket	
EN	806-1031-000	1	eDriveX ECU	
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	

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.

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).

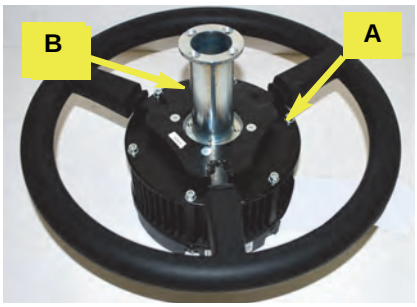


Figure 1a: Installing the shaft adapter

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).

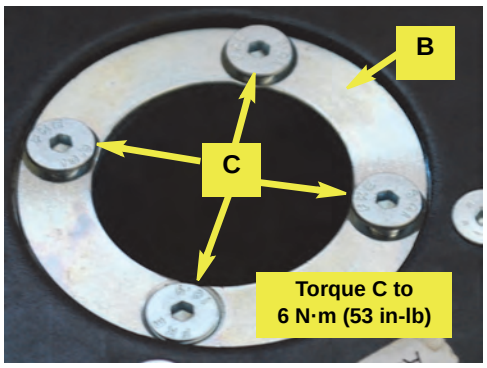


Figure 1b: Securing the shaft adapter

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).

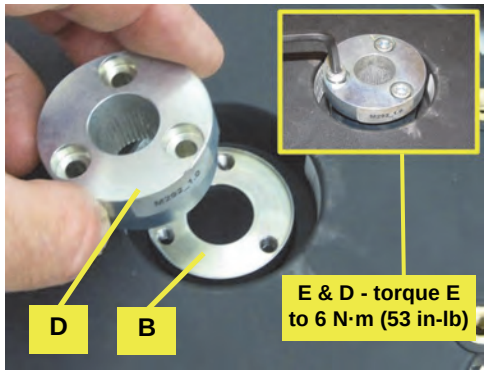


Figure 1c with inset: Spline adapter installed on shaft adapter

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 brackets (F and G) firmly against the steering column once installed.

With the comms port toward you, use hardware **H** to attach anti-rotation brackets **F** and **G** to the steering wheel assembly (but do not tighten yet). Mount **F** on the far side, **G** on the near side with their tabs to the left and upward (Figure 2).

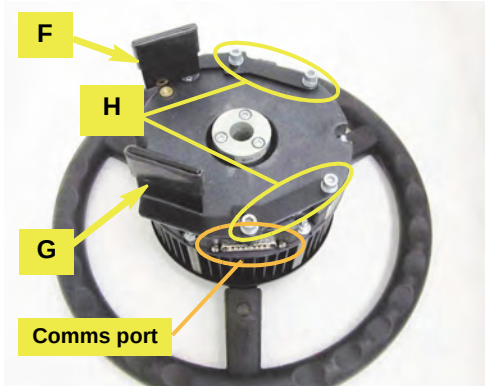


Figure 2: Anti-rotation brackets installed

3. Remove the machine's steering wheel.

Remove the machine's steering wheel as follows:

- Pry the center cap from the steering wheel to expose the steering wheel nut (Figures 3-a and 3-b).
- Remove the steering wheel nut (which you will reuse) and washer (3-c).
- Remove the steering wheel (3-d).

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

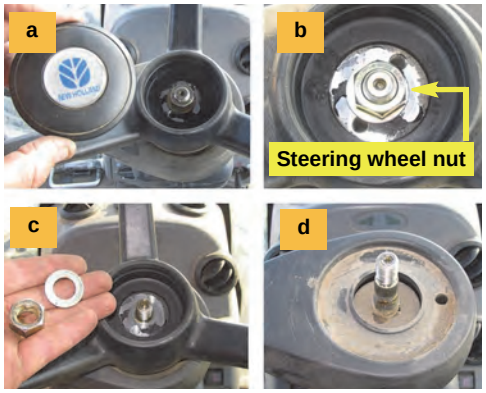


Figure 3 (a-d): Removing the steering wheel

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

a. Apply a small amount of an anti-seize compound (not supplied) to the splines of spline adapter **D** (Figure 4a, left inset), then, carefully aligning the splines with those on the steering shaft, slide the steering wheel assembly—comms port to the front—onto the shaft (Figure 4a).

Using the machine's original steering wheel nut, secure the steering wheel (Figure 4a, right inset).

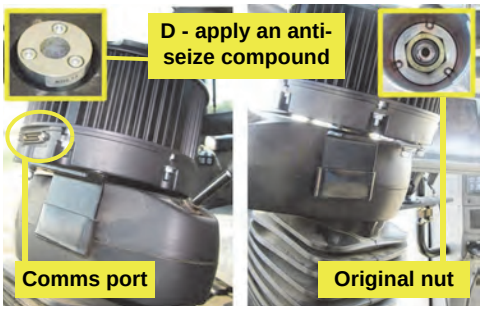


Figure 4a with insets: Steering wheel and anti-rotation brackets installation

NOTE: *Torque the steering wheel nut to the machine manufacturer's specification.*

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

b. Push anti-rotation brackets **G** and **F** firmly against the steering column and secure them (Figure 4b, left and right images). Torque screws **H** to **5 N·m (44 in-lb)**.

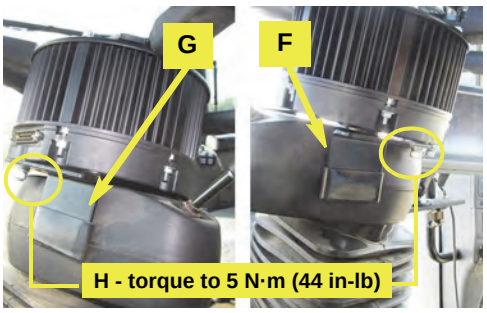


Figure 4b (left and right): Securing the anti-rotation brackets

c. Install the steering wheel center cover **I**.

Figure 4c: 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 **J** 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 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 **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).

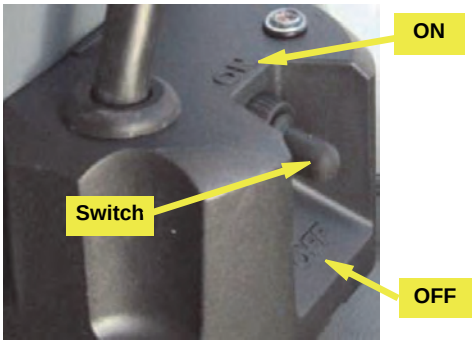


Figure 5a: Junction box ON/OFF switch - within easy reach of the operator

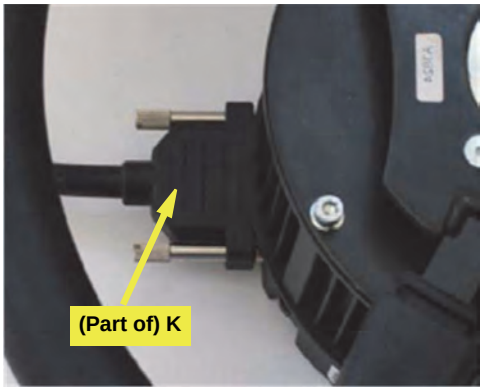


Figure 5b: Junction box comms cable connected to steering wheel assembly

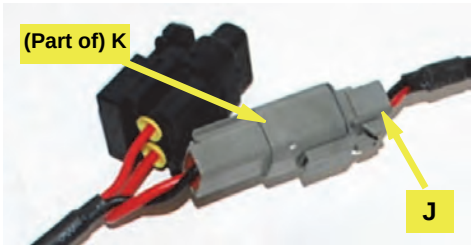


Figure 5c: Power cable to junction box cable

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

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).

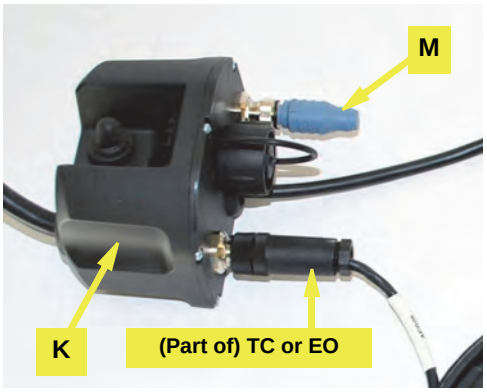


Figure 5d: CAN harness and terminator connected to junction box

f. ***eDriveTC:*** Connect, according to the cable labeling, the two other connectors on CAN cable **TC** to the EDRIVETC and the TERMINAL/RECEIVER (Figure 5e-i).

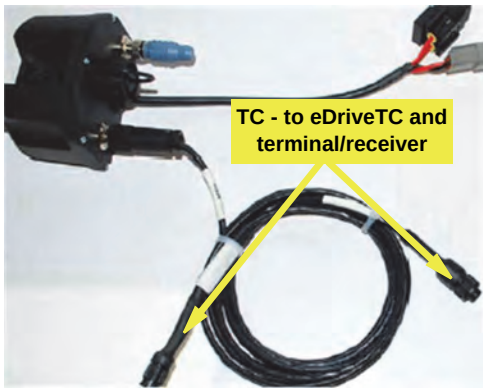


Figure 5e-i: CAN cables to eDriveTC and terminal/receiver

eDriveX: Connect CAN cable **EO** to the eDriveX main cable's (EA) branch cable labelled 'STEERING CONTROLLER' (Figure 5e-ii).

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 by 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.

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. Install the ECU near the rightside window in front of the right fender well. Facing the one-inch tabs of bracket **EM** toward the rightside window, set the bracket so that:

- The outer edge of the front one-inch tab is 2-1/8″ from the window
- The outer edge of the rear one-inch tab is 2-5/8″ from the window
- The inside rear corner of the bracket is 1½″ from the inner edge of the floor mat

Using hardware **EJ** or **EK** (depending on the floor thickness - see warning above) fasten bracket **EM** to the cab floor (Figure 1a). Ensure the bracket is level.

b. Using mounting hardware **EL** (not visible) attach ECU **EN** to the inner face of bracket **EM**. Face the wire connections to the rear of the machine (Figure 1b).

Figure 1: Example pre-drilling check

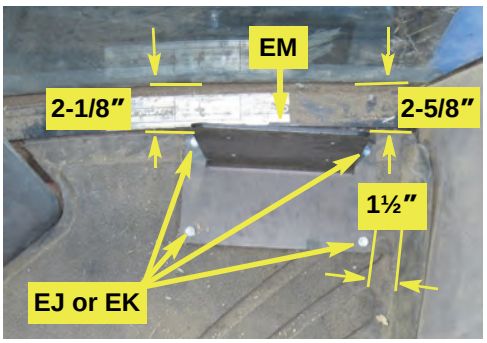


Figure 1a: Installed ECU mounting bracket

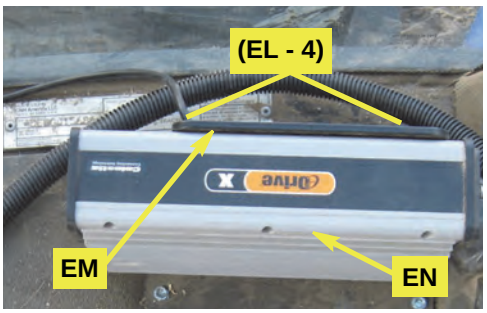


Figure 1b: Installed ECU

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 **EN** 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 bottom connector in this installation (Figure 2a and inset).

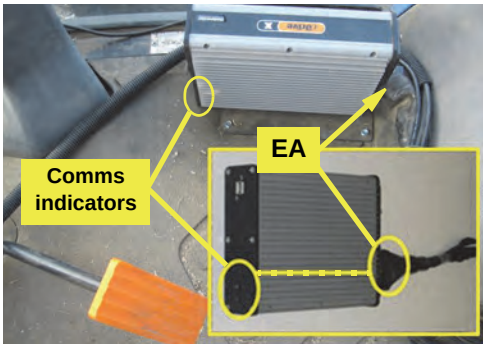


Figure 2a with inset: ECU main cable connected

2. Assemble and install the cables *(continued)*.

b. Attach cable **EA**'s connector labeled 'STEERING CONTROLLER' to cable **EO** connected to the VSi junction box **N** (see ***eDriveX***, step 5f, 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.*

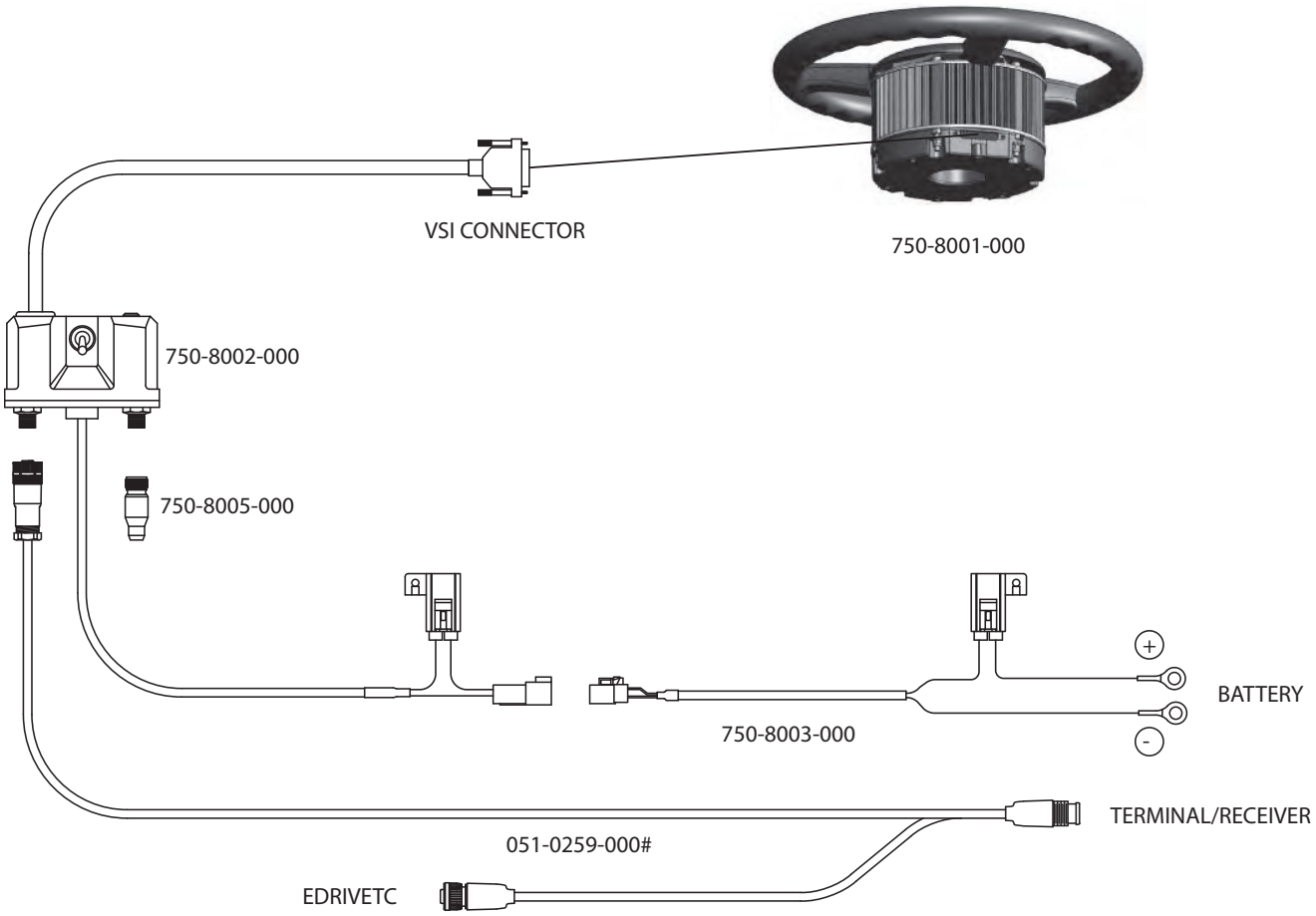
d. Connect CAN-PWR cable **EG** to **EA**'s open connection labeled 'TERMINAL/RECEIVER'. Route the cable in the cab so that it is clear of any machine operation controls. Connect the opposite end of cable **EG** to the guidance terminal.

⚠WARNING:

*Ensure you have connected main cable **EA** to the ECU (step 2a, page 12) 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 machines's 12V battery and connect it.

Appendix A - eDriveTC VSi Connections



Appendix B - eDriveX VSi Connections